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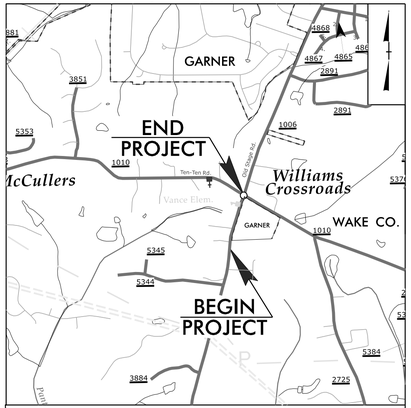
09/08/99

TIP PROJECT: HL-0008F

CONTRACT: DE000393

See Sheet 1A For Index of Sheets
See Sheet 1B For Symbology Sheet



VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

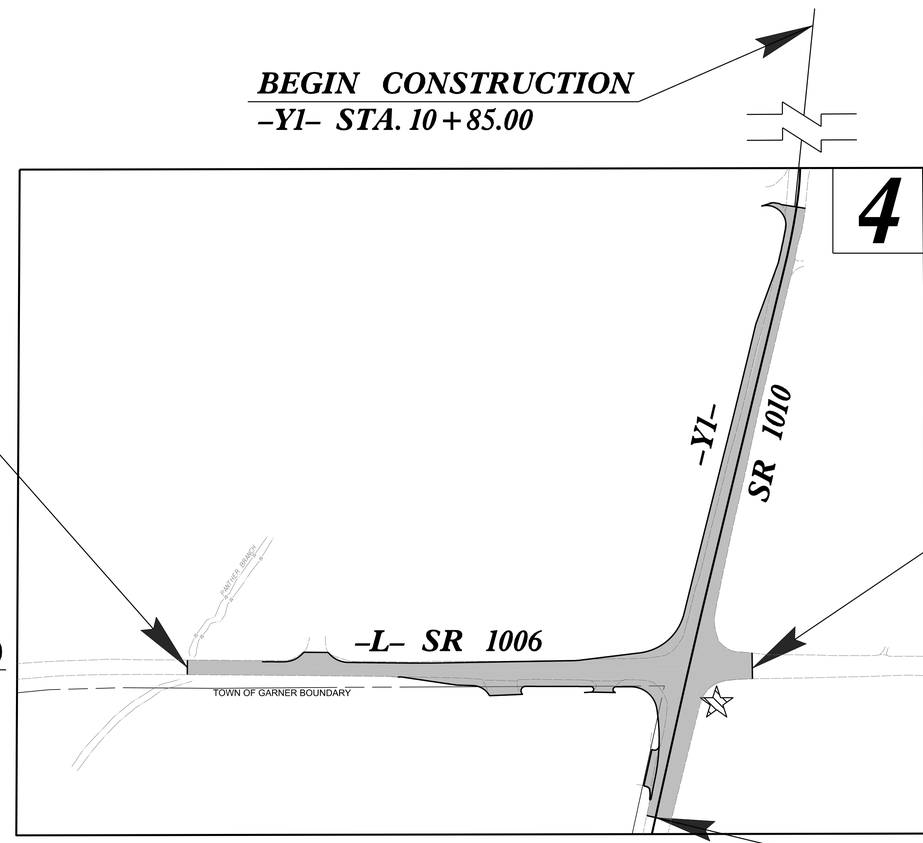
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0008F	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49367.1.1		PE
49367.2.24	4936724	ROW
49367.2.25	4936724	UTIL.
49367.3.15	4936724	CONST.

LOCATION: *SR 1006 (OLD STAGE RD) AND SR 1010 (TEN TEN RD) INTERSECTION IMPROVEMENTS*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, AND SIGNAL*

NAD 83/
NA 2011



BEGIN CONSTRUCTION
-Y1- STA. 10+85.00

BEGIN TIP PROJECT
HL-0008F -L- STA. 10+60.00

END TIP PROJECT HL-0008F
-L- STA. 19+30.00

TO NC-540

TO US-401

END CONSTRUCTION
-Y1- STA. 23+25.00

SIGNAL UPGRADE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2021 = 15,100
ADT 2035 = 18,950
K = 9 %
D = 65 %
T = 4 % *
V = 50 MPH
* TTST =1% DUAL 3%
FUNC CLASS =
MINOR ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT HL-0008F = 0.165 Mi.
TOTAL LENGTH TIP PROJECT HL-0008F = 0.165 Mi.

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

2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 5, 2023

LETTING DATE:
AUGUST 13, 2025

DIMITRI GAMBRELL
PROJECT MANAGER

JORDAN WOODARD, PE
ROADWAY TEAM LEAD

HAN NGUYEN, PE
ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER
DocuSigned by: Matthew J. York, P.E.
SIGNATURE *P.E.* 06/05/2025
NORTH CAROLINA PROFESSIONAL SEAL 043912 ENGINEER Matthew J. York

ROADWAY DESIGN ENGINEER
Signed by: Han Nguyen
SIGNATURE *P.E.* 06/06/2025
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Han C. Nguyen

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

5/26/20

INDEX OF SHEETS

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

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

SIDE ROADS:

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

SUBSURFACE DRAINS:

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

STREET TURNOUT:

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

TEMPORARY SHORING:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

DUKE ENERGY
AT&T
SPECTRUM
SEGRA
VERIZON
DOMINION ENERGY

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.

EFF. 01-16-2024
REV.

2024 ROADWAY ENGLISH STANDARD DRAWINGS

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

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.03	Method of Clearing - Method III
225.02	Guide for Grading Subgrade - Secondary and Local
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
654.01	Pavement Repairs
DIVISION 8 - INCIDENTALS	
806.01	Concrete Right-of-Way Marker
815.02	Subsurface Drain
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.24	Frames and Narrow Slot Sag Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.34	Traffic Bearing Junction Box - for Use with Pipes 42" and Under
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
846.01	Concrete Curb, Gutter and Curb & Gutter
848.04	Street Turnout
876.02	Guide for Rip Rap at Pipe Outlets

HL-0008F
001A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hien C. Nguyen

Signed by:
Hien Nguyen 06/06/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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)*

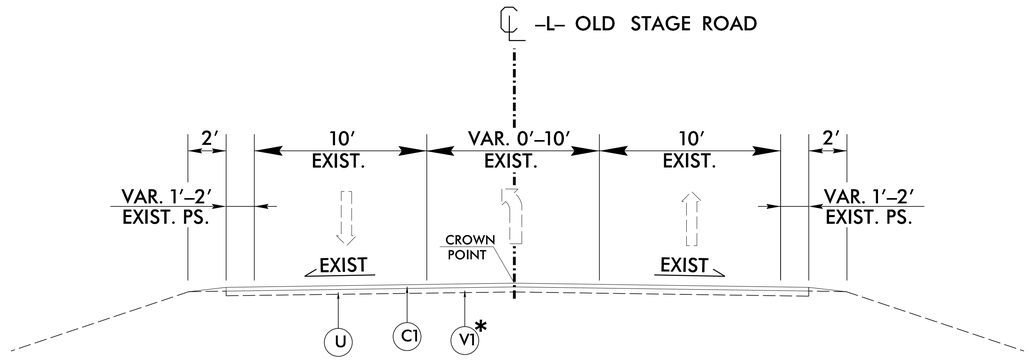
MISCELLANEOUS:

- 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 — AATUR
- End of Information — E.O.I.

5/26/20

FINAL PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
C2	PROP. APPROX. 3″ ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 4″ ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E1	PROP. APPROX. 4″ ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R1	2′-6″ CONCRETE CURB AND GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	MILLING ASPHALT PAVEMENT, 1 ½″ DEPTH.
V2	INCIDENTAL MILLING

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



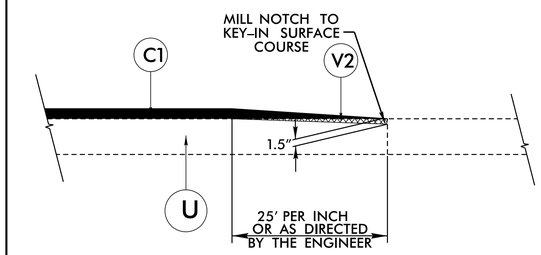
TYPICAL SECTION NO. 1

* –L– STA. 10+60.00 TO 11+37.50

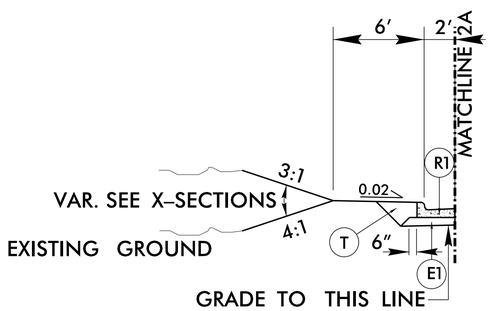
* MILL AND PAVE FOR THIS STATION RANGE

–L– STA. 18+49.12 TO 18+92.50

INCIDENTAL MILLING DETAIL (AT BEGIN AND END FOR TIE–INS)

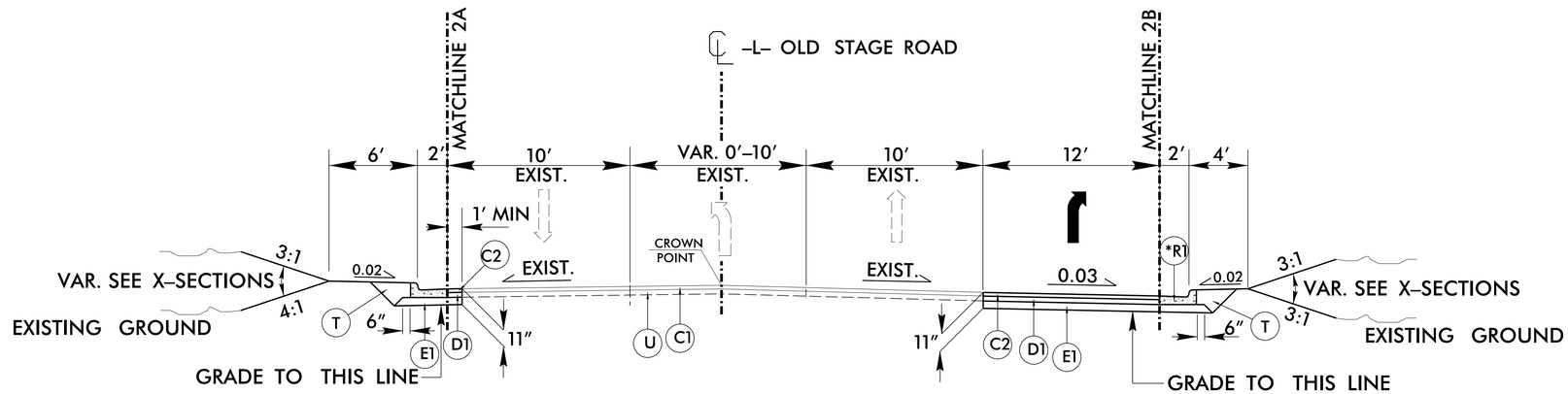


–L– STA. 11+37.50 TO 11+75.00
–L– STA. 18+92.50 TO 19+30.00
–Y1– STA. 13+60.00 TO 13+97.50
–Y1– STA. 22+87.50 TO 23+25.00



INSET 2A, USE WITH TYPICAL NO.2

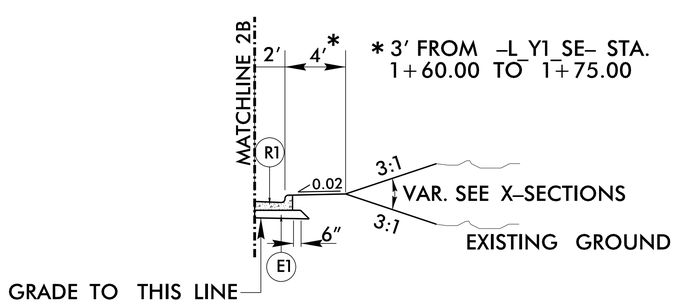
–L– STA. 16+55.10 (–L_Y1_SW– STA 1+00.00) TO
–Y1– STA. 18+45.00 (–L_Y1_SW– STA 4+63.66)



TYPICAL SECTION NO. 2

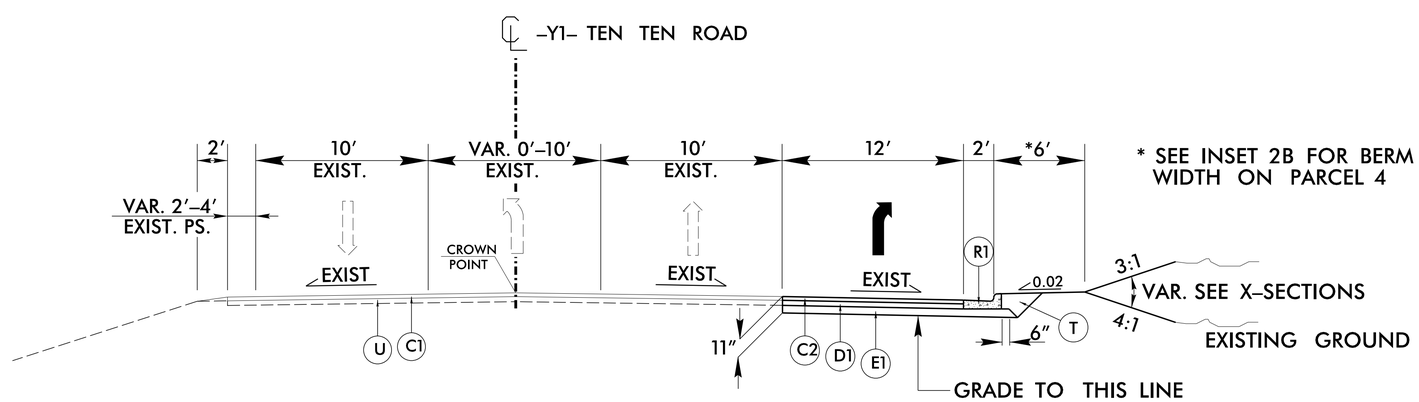
–L– STA. 11+75.00 TO 18+17.22

* SEE PLANS FOR C&G LOCATIONS



INSET 2B, USE WITH TYPICAL NO.2

–L– STA. 17+43.39 (–L_Y1_SE– STA 1+00) TO
–Y1– STA. 22+64.00 (–L_Y1_SE– STA. 2+62.07)



* SEE INSET 2B FOR BERM WIDTH ON PARCEL 4

TYPICAL SECTION NO. 3

–Y1– STA. 13+97.50 TO 22+87.50

HL-0008F
2A-1

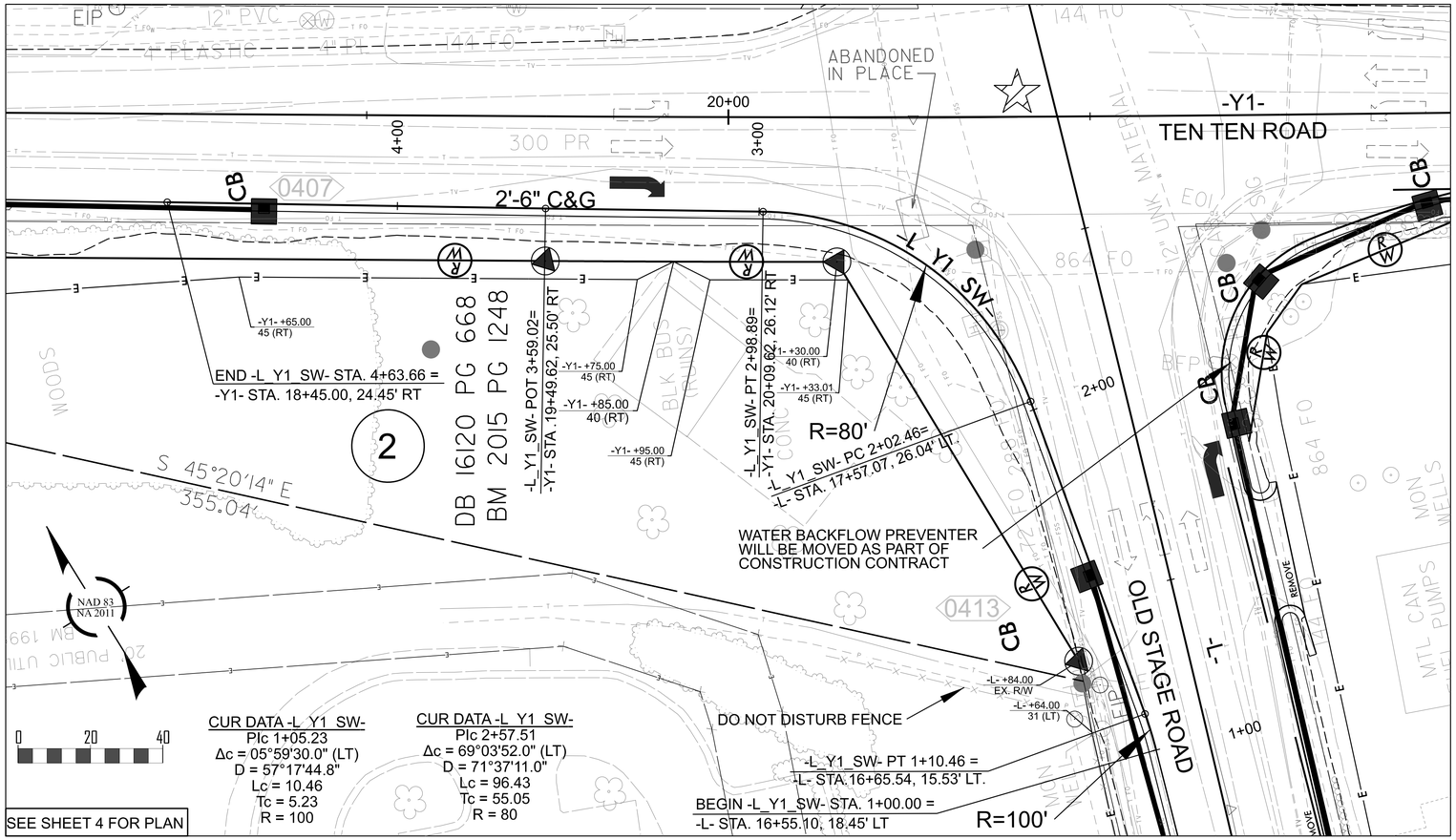
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hon C Nguyen
Signed by: Hon Nguyen 06/06/2025
DocuSign Envelope ID: 1DEA5390-D9A4-
PAVEMENT DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 038176 ENGINEER Shihai Zhang
DocuSigned by: Shihai Zhang 06/05/2025
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

DETAIL OF SOUTHWEST QUADRANT



5/26/20

HL-0008F

2B-1

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hien C. Nguyen

Signed by: Hien Nguyen 06/06/2025

HYDRAULICS ENGINEER

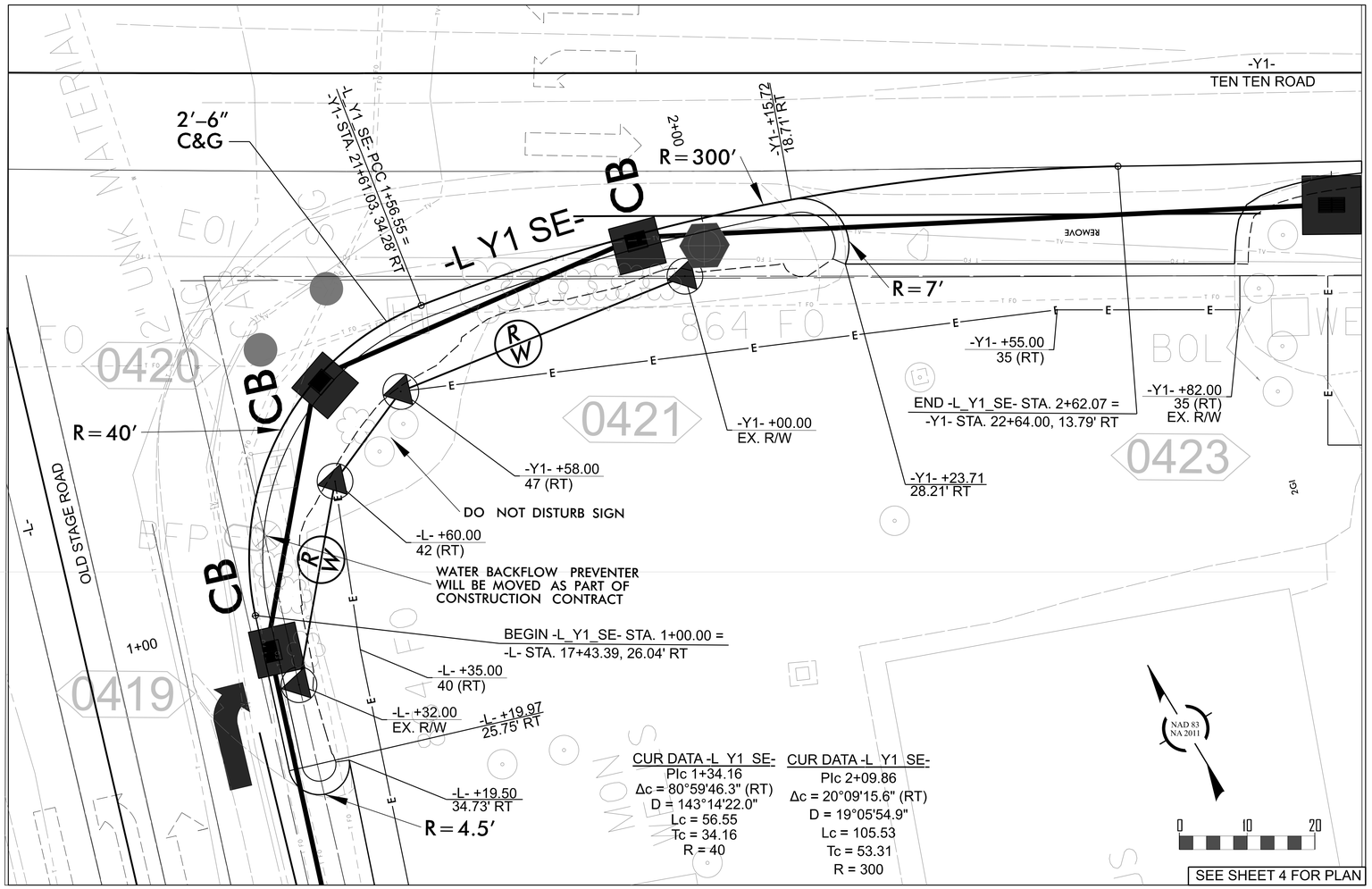
NORTH CAROLINA PROFESSIONAL SEAL 043912 ENGINEER Matthew J. York

DocuSigned by: Matthew J. York 06/06/2025

DISCLAIMER: NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

DETAIL OF SOUTHEAST QUADRANT



HL-0008F

2B-2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hien C. Nguyen

Signed by: Hien Nguyen 06/06/2025
CDEA2200A1BA4D0...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043912 ENGINEER Matthew J. York

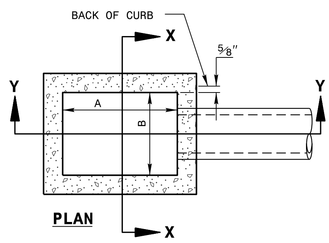
DocuSigned by: Matthew J. York 06/06/2025
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

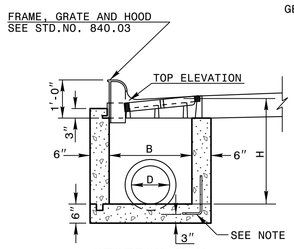
5/26/20

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

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



PLAN



SECTION X-X

GENERAL NOTES:

USE CLASS "B" CONCRETE THROUGHOUT.

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

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

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

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

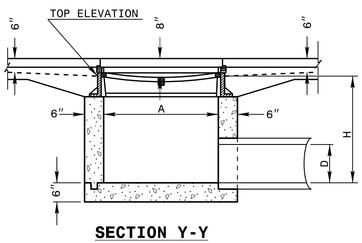
USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

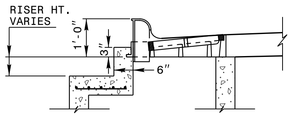
CONSTRUCT WITH PIPE CROWNS MATCHING.

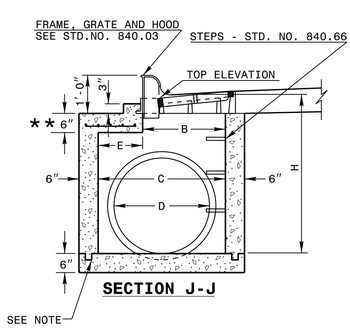
CHAMFER ALL EXPOSED CORNERS 1".

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

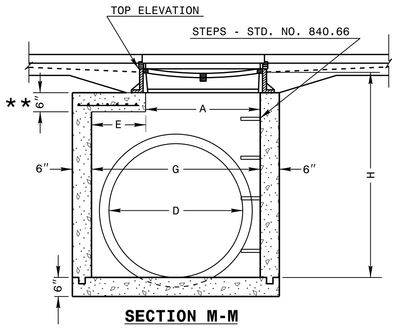


SECTION Y-Y

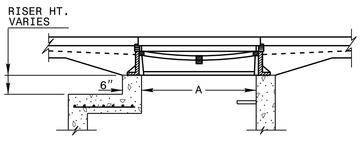




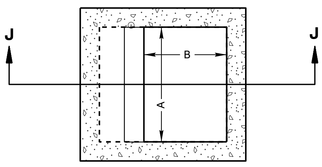
SECTION J-J



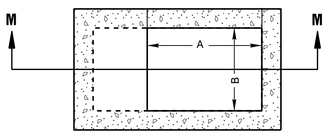
SECTION M-M



DETAIL SHOWING METHOD OF RISER CONSTRUCTION



PLAN



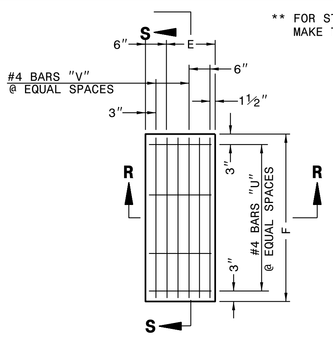
PLAN

SHEET 1 OF 2
840D02

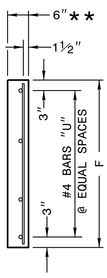
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

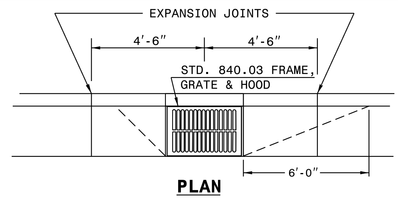
** FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.



PLAN OF TOP SLAB

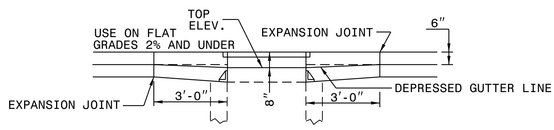


SECTION S-S



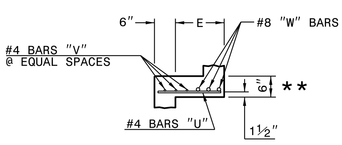
PLAN

CURB AND GUTTER WITH CATCH BASIN ON STEEP GRADES

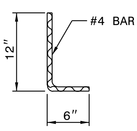


ELEVATION

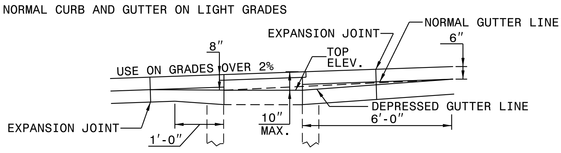
NORMAL CURB AND GUTTER ON LIGHT GRADES



SECTION R-R



DOWEL



ELEVATION

NORMAL CURB AND GUTTER ON STEEP GRADES

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

MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN(BASED ON MIN. HEIGHT, H, WITH NO RISER) *

DIMENSIONS OF BOX AND PIPE						COVER DIMENSION		BARS-U		BARS-V		BARS-W			CU.YDS. CONC. IN BOX			DEDUCTIONS ONE PIPE	
PIPE	SPAN	WIDTH	WIDTH	SPAN	MIN. HEIGHT									TOTAL LBS.	TOP SLAB	BOTTOM SLAB	TOT. CONC. FOR MINIMUM HEIGHT, H		
D	A	B	C	G	H	E	F	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH					C.M.	R.C.
12"	3'-0"	2'-2"	--	--	2'-0"	--	--	--	--	--	--	--	--	--	--	0.235	0.772	0.015	0.026
15"	3'-0"	2'-2"			2'-3"											0.235	0.829	0.023	0.036
18"	3'-0"	2'-2"			2'-6"											0.235	0.887	0.033	0.049
24"	3'-0"	2'-2"			3'-1"											0.235	1.001	0.059	0.085
30"	3'-0"	2'-2"	3'-4"	3'-4"	3'-10"	1'-2"	4'-4"	4	1'-5"	2	4'-1"	3	4'-1"	39	0.123	0.347	1.433	0.092	0.127
36"	3'-0"	2'-2"	3'-10"	3'-10"	4'-6"	1'-8"	4'-10"	4	1'-11"	3	4'-7"	3	4'-7"	43	0.161	0.432	1.714	0.132	0.178
42"	3'-0"	2'-2"	4'-5"	4'-5"	4'-11"	2'-2"	5'-5"	5	2'-5"	4	5'-2"	3	5'-2"	47	0.200	0.543	1.738	0.180	0.243
48"	3'-0"	2'-2"	5'-0"	5'-0"	5'-6"	2'-10"	6'-0"	5	3'-1"	4	5'-9"	3	5'-9"	51	0.235	0.667	2.052	0.235	0.317
54"	3'-0"	2'-2"	5'-7"	5'-7"	6'-0"	3'-5"	6'-7"	6	3'-8"	5	6'-4"	3	6'-4"	56	0.289	0.802	2.387	0.297	0.401
60"	3'-0"	2'-2"	6'-3"	6'-3"	6'-6"	4'-1"	7'-3"	6	4'-4"	5	7'-0"	3	7'-0"	61	0.340	0.973	2.722	0.363	0.546
66"	3'-0"	2'-2"	6'-11"	6'-11"	7'-0"	4'-9"	7'-11"	7	5'-0"	6	7'-8"	3	7'-8"	66	0.391	1.160	3.057	0.440	0.655
72"	3'-0"	2'-2"	7'-6"	7'-6"	7'-6"	5'-3"	8'-6"	7	5'-6"	6	8'-3"	3	8'-3"	72	0.442	1.340	3.392	0.524	0.774
78"	3'-0"	2'-2"	8'-1"	8'-1"	8'-0"	5'-11"	9'-1"	8	6'-2"	7	8'-10"	3	8'-10"	78	0.493	1.530	3.727	0.615	0.893
84"	3'-0"	2'-2"	8'-9"	8'-9"	8'-6"	6'-7"	9'-9"	8	6'-10"	7	9'-6"	3	9'-6"	84	0.544	1.760	4.062	0.713	1.010

SHEET 2 OF 2
840D02

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

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

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

SEE PLATE FOR TITLE

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

Signed by
5B6A2D9B1B4C3...
06/11/2025

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA PROFESSIONAL SEAL 33144 ENGINEER

PROJECT REFERENCE NO.: HL-0008F
SHEET NO.: 2C-1

COMPUTED BY:	KDA	DATE: 10/3/2024
CHECKED BY:	KNM	DATE: 12/19/2024

HL-0008F	
	3B-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK

Station to Station	Uncl. Exc. (C.Y.)	Embank. +% (C.Y.)	Borrow (C.Y.)	Waste (C.Y.)
SUMMARY NO. 1				
-L- STA. 10+60.00 TO 19+30.00	448	319		129
-Y1- STA. 13+60.00 TO 20+09.62	428	29		399
-Y1- STA. 21+61.03 TO 23+25.00	63	2		61
SUMMARY NO. 1 TOTALS	939	350		589
PROJECT SUB TOTALS	939	350		589
Material For Shoulder Construction				
Loss due to Clearing & Grubbing				
Est 5% To Replace Topsoil at Borrow Pit				
GRAND TOTALS	939	350		589
SAY	950			

ESTIMATED UNDERCUT = 300 CY
ESTIMATED SHALLOW UNDERCUT = 100 CY

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

APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

SUMMARY OF ASPHALT PAVEMENT REMOVAL

Station to Station	LOC LT/RT/CL	Square Yards
-L- STA. 11+75.00 TO -L- STA. 13+60.00	LT / RT	341.04
-L- STA. 13+75.00 TO -Y1- STA. 22+15.97	RT / RT	399.55
PROJECT TOTAL		740.59
	SAY	750

5/26/20

HL-0008F	
	3D-1

COMPUTED BY: Paul Tosch DATE: 12.3.2024
CHECKED BY: Matt York DATE: 12.3.2024

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

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

LINE & STATION	OFFSET		STRUCTURE NUMBER		TOP ELEVATION	INVERT ELEVATION	INVERT ELEVATION	MINIMUM REQUIRED SLOPE	Alternate Pipe (RCP, CSP, CAAP, HDPE, or PVC)														R. C. PIPE CLASS IV								ENDWALLS STD. 838.01 OR STD. 838.11 (UNLESS NOTED OTHERWISE)	REINFORCED ENDWALLS	DRAINAGE STRUCTURE	QUANTITIES FOR DRAINAGE STRUCTURES NOTE: TOTAL LIN. FT. FOR PAY QUANTITY SHALL BE A + (1.3 X B)		
SIZE THICKNESS OR GAUGE			FROM	TO	FT.	FT.	FT.	%	12	15	18	24	30	36	42	48	DO NOT USE RCP	DO NOT USE CSP	DO NOT USE CAAP	DO NOT USE HDPE	DO NOT USE PPP	DO NOT USE PVC	12	15	18	24	30	36	42	48	CY	CY	MASONRY CY	0' THRU 5' EACH	A 5' THRU 10' LIN. FT.	B 10' AND ABOVE LIN. FT.
Y1 13+79	18	RT	0400		401.7																													1		
Y1 15+54	24	RT	0402		403.2																													1		
			0402	0403		400.2	400.0																	48												
Y1 15+05	19	RT	0403		402.9																													1		
			0403	0405		400.0	399.6																	100												
Y1 14+04	13	RT	0405		402.2																													1		
			0405	0400		399.6	399.4																	24												
Y1 18+72	27	RT	0407		405.0																													1		
			0407	0430		402.0	401.5																	84												
L 10+71	10	LT	0408		400.5																													1	0.4	
			0408	0425		395.1	395.0																				8									
L 14+07	12	LT	0411		401.7																													1	0.2	
			0411	0408		396.6	395.1																			332										
L 14+52	22	RT	0412		401.3																													1		
			0412	0414		397.7	397.2																		44											
L 17+06	22	LT	0413		403.2																													1		
			0413	0417		400.2	399.2																	184												
L 14+05	16	RT	0414		401.3																													1		
			0414	0411		396.8	396.6																			24										
L 14+99	26	RT	0416		401.4																													1		
			0416	0412		398.2	397.7																		44											
L 15+18	14	LT	0417		402.2																													1		
			0417	0411		399.2	397.35																	108												
L 15+88	27	RT	0418		402.0																													1		
			0418	0416		398.7	398.2																		84											
L 17+38	28	RT	0419		403.5																													1		
			0419	0418		400.5	399.0																	148												
L 17+75	44	RT	0420		403.8																													1		
			0420	0419		400.8	400.5																	40												
Y1 21+93	26	RT	0421		405.2																													1		
			0421	0420		402.2	400.8																	48												
Y1 22+96	20	RT	0423		406.6																													1		
			0423	0421		403.8	402.2																	100												
			0426	0408		396.3	395.6																			24										
			0427	0414		399.9	398.05																		12											
Y1 17+44	25	RT	0428		404.4																													1		
			0428	0429		401.4	400.6																	112												
Y1 16+32	26	RT	0429		403.3																													1		
			0429	0402		400.6	400.2																	76												
Y1 17+88	26	RT	0430		404.5																													1		
			0430	0428		401.5	401.4																	44												
			0431	0432		396.3	395.0																			36										
Y1 14+04	22	RT	0434		402.2																													1		
			0434	0405		399.7	399.6			8																										
L 10+63	16	RT																																		
L 15+14	22	RT																																		
L 16+05	24	RT																																		
L 16+82	23	RT																																		
Y1 21+83	21	RT																																		
Y1 16+67	16	RT																																		
SHEET TOTALS (48" or Less)										8														1116	184	416	8							21	1	
PROJECT TOTALS (48" or Less)										8														1116	184	416	8							21	0.6	

LINE & STATION	STRUCTURE NUMBER		C.B. STD. 840.01 OR STD. 840.02	FRAME, GRATES, AND HOOD STD. 840.03 GRATE TYPE				CONCRETE TRANSITIONAL SECTION		OPEN THROAT C.B. STD. 840.04 OR STD. 840.05	C.B. MIN DEPTH STD. (SPECIAL DETAIL)	CONCRETE BRIDGE APPROACH D.I. STD. 840.13	D.I. STD. 840.14 OR STD. 840.15	D.I. FRAME AND GRATES STD. 840.16	G.D.I. TYPE "A" STD. 840.17 OR STD. 840.26	G.D.I. TYPE "B" STD. 840.18 OR STD. 840.27	G.D.I. TYPE "D" STD. 840.19 OR STD. 840.28	G.D.I. (W.S. FLAT) FRAME WITH GRATE STD. 840.20	G.D.I. (W.S. FLAT) FRAME W/ 2 GRATES STD. 840.20	G.D.I. (W.S. SAG) FRAME W/ GRATE STD. 840.22	G.D.I. (W.S. SAG) FRAME W/ 2 GRATES STD. 840.22	G.D.I. (N.S. SAG) FRAME W/ GRATE STD. 840.24	G.D.I. (N.S. SAG) FRAME W/ 2 GRATES STD. 840.24	G.D.I. (N.S. FLAT) FRAME W/ GRATE STD. 840.29	G.D.I. (N.S. FLAT) FRAME W/ 2 GRATES STD. 840.29	DRIVEWAY D.I. STD. 840.30	FRAME W/ GRATE FOR DRIVEWAY STD. 840.30	J.B. STD. 840.31 OR STD. 840.32		FLOWABLE FILL	CONCRETE COLLARS CL. "B" STD. 840.72	CONCRETE AND BRICK PIPE PLUG STD. 840.71	PIPE REMOVAL	REMARKS
	FROM	TO		E	F	G		D.I. STD. 852.04 OR STD. 852.06	C.B. STD. 852.05																					CY	CY	CY	LIN. FT.	
Y1 13+79	0400			1							1																							Tied to Existing System, with outlet EX 433
Y1 15+54	0402		1			1																												
	0402	0403																																
Y1 15+05	0403					1					1																							
	0403	0405																																
Y1 14+04	0405					1					1																							
	0405	0400																																
Y1 18+72	0407		1			1																												
	0407	0430																																
L 10+71	0408																											1						
	0408	0425																																
L 14+07	0411		1		1																													
	0411	0408																																
L 14+52	0412		1	1																														
	0412	0414																																
L 17+06	0413		1		1																													
	0413	0417																																
L 14+05	0414		1	1																														
	0414	0411																																
L 14+99	0416		1			1																												
	0416	0412																																
L 15+18	0417		1		1																													
	0417	0411																																
L 15+88	0418		1			1																												
	0418	0416																																
L 17+38	0419		1			1																												
	0419	0418																																
L 17+75	0420		1			1																												
	0420	0419																																
Y1 21+93	0421		1			1																												
	0421	0420																																
Y1 22+96	0423																1							1										
	0423	0421																																
	0426	0408																																
	0427	0414																																
Y1 17+44	0428		1			1																												
	0428	0429																																
Y1 16+32	0429					1					1																							
	0429	0402																																
Y1 17+88	0430		1			1																												
	0430	0428																																
	0431	0432																																
Y1 14+04	0434												1	1																				
	0434	0405																																
L 10+63																																	33	24-inches
L 15+14																																	59	15-inches
L 16+05																																	44	15-inches
L 16+82																																	44	15-inches
Y1 21+83																																	102	15-inches
Y1 16+67																																	23	15-inches
SHEET TOTALS (48" or Less)			14	3	3	12					4		1	1		1							1					1					305	
PROJECT TOTALS (48" or Less)			14	3	3	12					4		1	1		1							1					1					305	

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

COMPUTED BY: JLL DATE: 2/23/23
CHECKED BY: Jinyoung Park DATE: 4/3/23

(2-3-23)

PROJECT NO.	SHEET NO.
HL-0008F	3G-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF SUBSURFACE DRAINAGE

LINE	Station	Station	Location LT/RT/CL	Drain Type* UD/BD/SD	LF
CONTINGENCY				SD	500
				TOTAL LF:	500

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

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

LINE	Station	Station	Aggregate Type* ASU(1/2)/ AST	Aggregate Thickness INCHES [8" for ASU(2)]	Shallow Undercut CY	Class IV Subgrade Stabilization TONS	Geotextile for Subgrade Stabilization SY	Stabilizer Aggregate TONS	Class IV Aggregate Stabilization TONS
CONTINGENCY			ASU(1)	12"	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 Subgrade Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.**

MATCHLINE -Y1- STA. 13+00

HL-0008F
004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hien C. Nguyen
Signed by: Hien Nguyen 06/06/2025

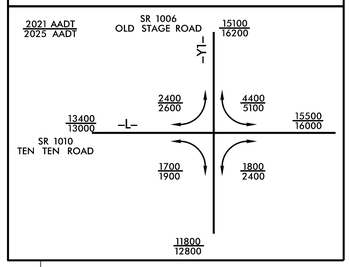
HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 043912 ENGINEER Matthew J. York
DocuSigned by: Matthew J. York 06/06/2025

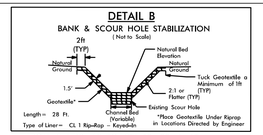
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

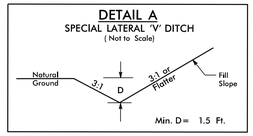
5/26/20

INTERSECTION OF –L– (SR 1010 – TEN TEN ROAD) AND –Y1– (SR 1006 – OLD STAGE ROAD)





FROM STA. 10+60 TO STA. 10+80 –L– LT



FROM STA. 13+90 TO STA. 14+70 –L– RT

CUR DATA -Y1-
PIc 10+81.02
Δc = 03°02'43.3" (RT)
D = 01°52'47.7"
Lc = 161.99
Tc = 81.02
R = 3,047.79
SE = EXIST.

CUR DATA -Y1-
PIc 12+58.34
Δc = 24°26'09.6" (RT)
D = 12°52'37.2"
Lc = 189.76
Tc = 96.35
R = 444.95
SE = EXIST.

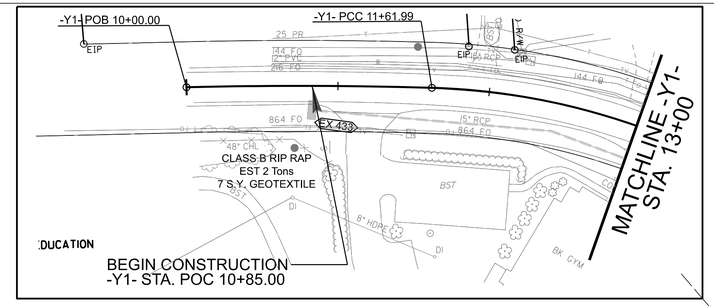
CUR DATA -Y1-
PIc 14+00.99
Δc = 05°16'00.4" (RT)
D = 05°21'08.9"
Lc = 98.40
Tc = 49.23
R = 1,070.46
SE = EXIST.

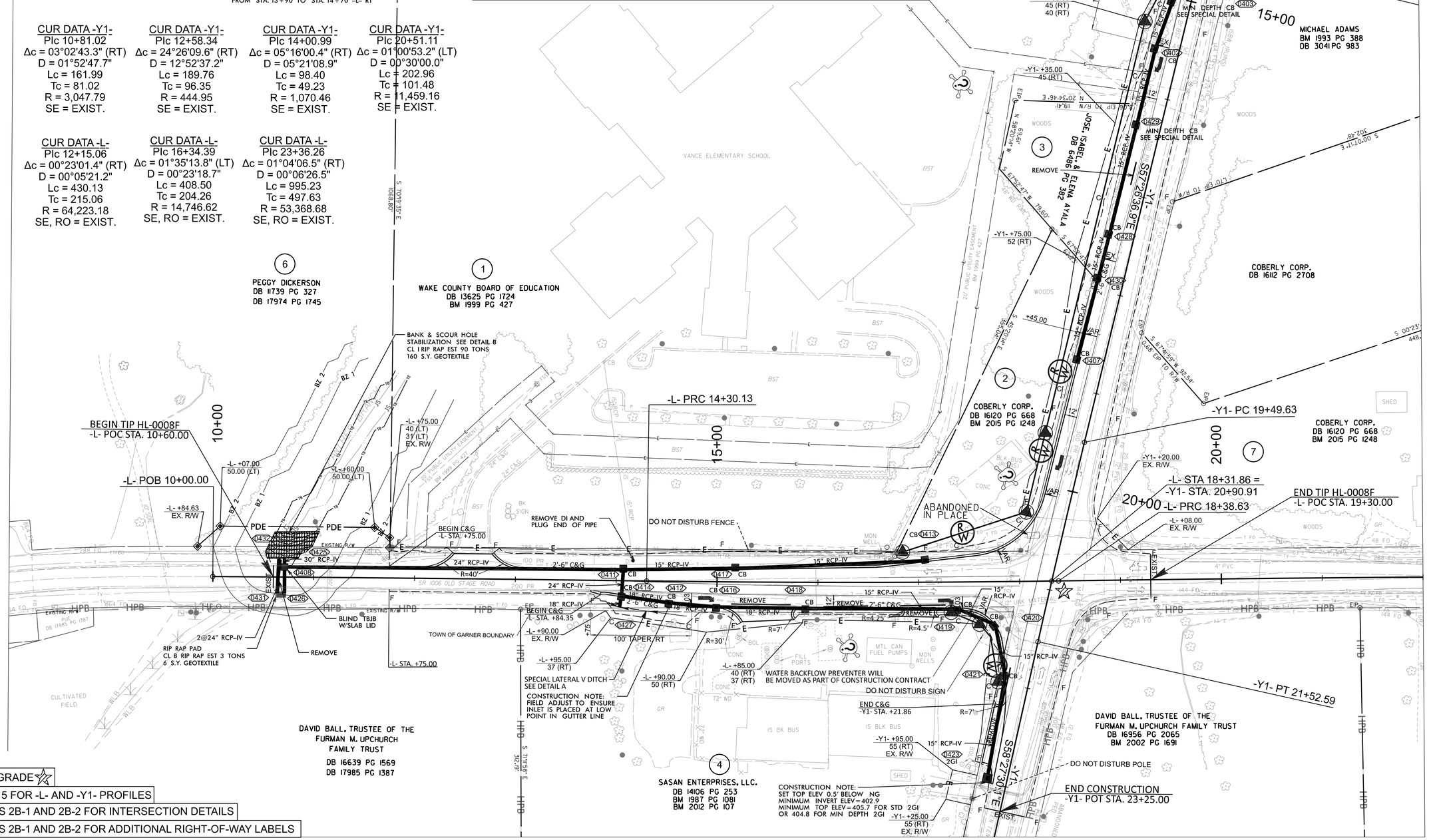
CUR DATA -Y1-
PIc 20+51.11
Δc = 01°00'53.2" (LT)
D = 00°30'00.0"
Lc = 202.96
Tc = 101.48
R = 11,459.16
SE = EXIST.

CUR DATA -L-
PIc 12+15.06
Δc = 00°23'01.4" (RT)
D = 00°05'21.2"
Lc = 430.13
Tc = 215.06
R = 64,223.18
SE, RO = EXIST.

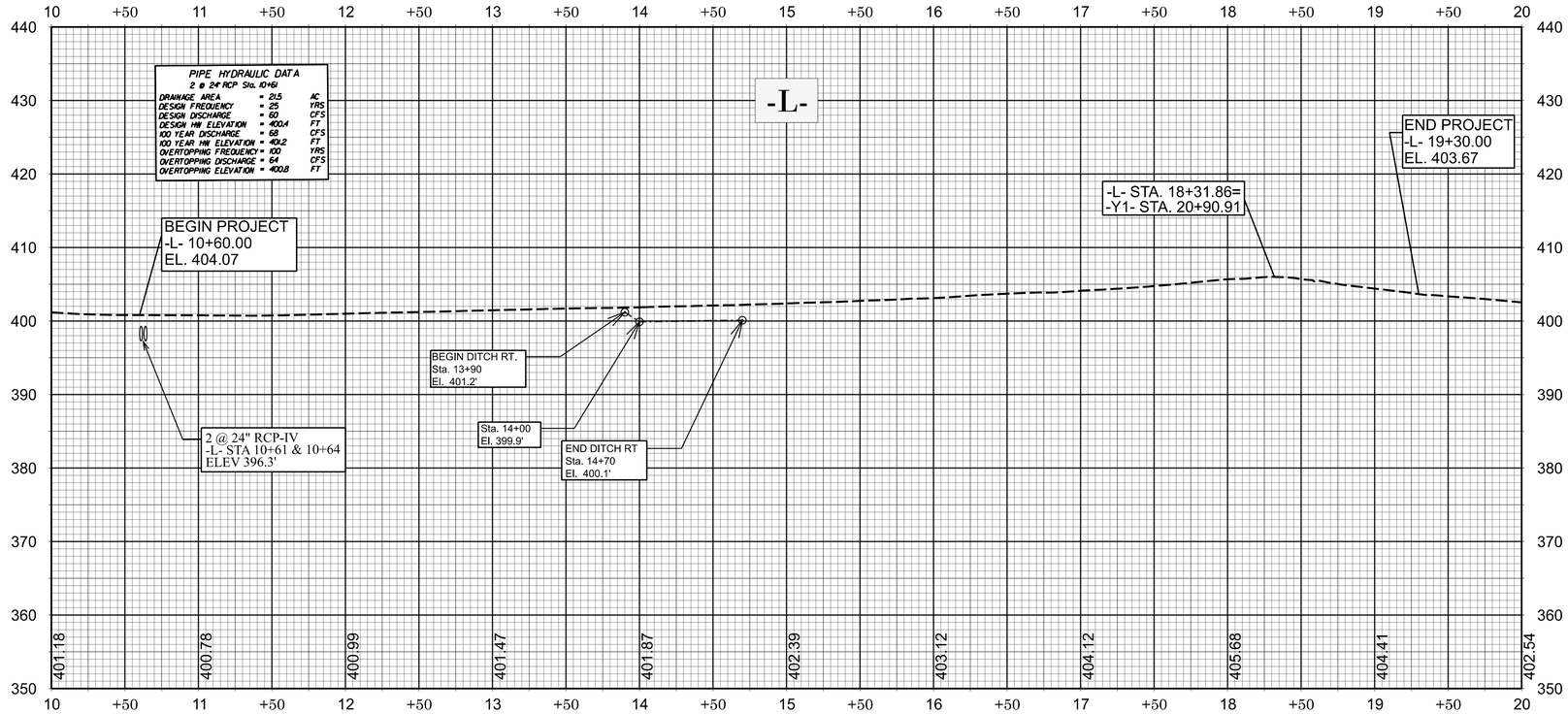
CUR DATA -L-
PIc 16+34.39
Δc = 01°35'13.8" (LT)
D = 00°23'18.7"
Lc = 408.50
Tc = 204.26
R = 14,746.62
SE, RO = EXIST.

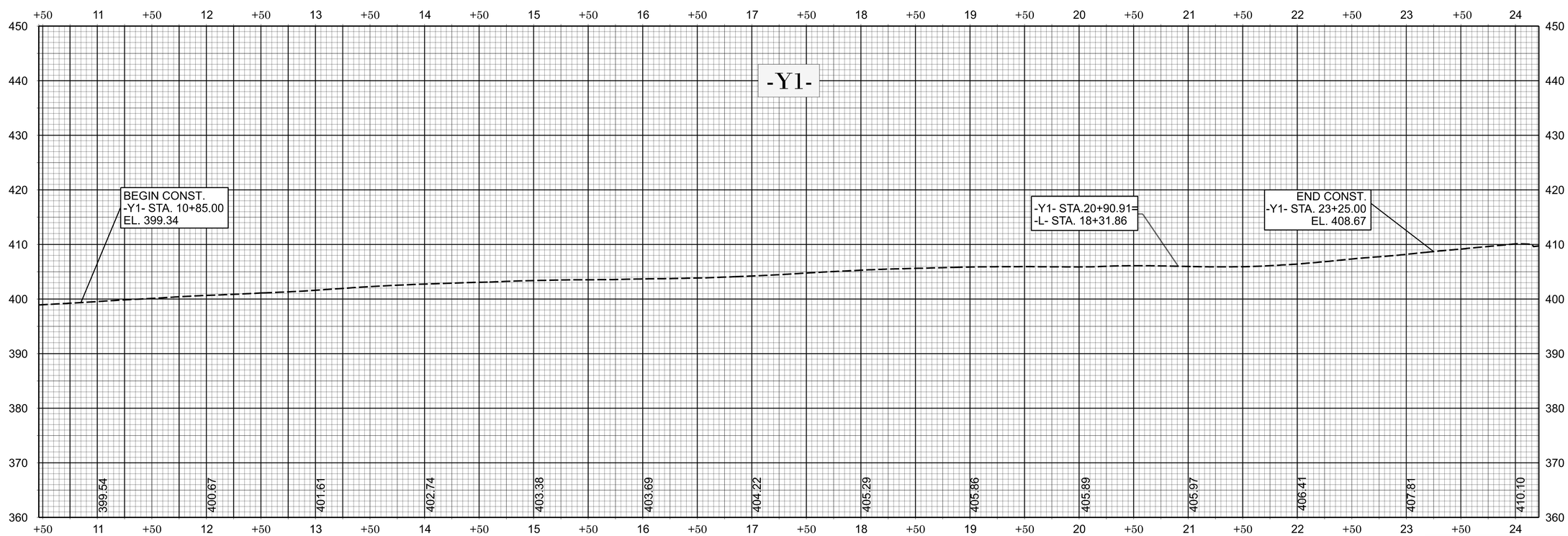
CUR DATA -L-
PIc 23+36.26
Δc = 01°04'06.5" (RT)
D = 00°06'26.5"
Lc = 995.23
Tc = 497.63
R = 53,368.68
SE, RO = EXIST.





SIGNAL UPGRADE
SEE SHEET 5 FOR -L- AND -Y1- PROFILES
SEE SHEETS 2B-1 AND 2B-2 FOR INTERSECTION DETAILS
SEE SHEETS 2B-1 AND 2B-2 FOR ADDITIONAL RIGHT-OF-WAY LABELS





SEE SHEET 4 FOR -L- AND -Y1- PLANS

HL-0008F

005

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADWAY DESIGN UNIT

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 042662 ENGINEER Hien C. Nguyen

Signed by: Hien Nguyen 06/06/2025
CODEA3250B7D8449...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 043912 ENGINEER Matthew J. Yorke

DocuSigned by: Matthew J. Yorke 6/6/2025
CB0A1A0A0A0A4A...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

5/26/20

5/26/20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING PLAN
WAKE COUNTY
LOCATION: OLD STAGE ROAD (SR 1006) AND TEN-TEN ROAD (SR 1010)

ROADWAY STANDARD DRAWING

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

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

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
OLD STAGE ROAD (SR 1006)	THERMOPLASTIC	NONE
TEN-TEN ROAD (SR 1010)	THERMOPLASTIC	NONE

D) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

E) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

F) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

I) UNLESS OTHERWISE SPECIFIED, HEATED-IN-PLACE THERMOPLASTIC MAY BE USED IN LIEU OF EXTRUDED THERMOPLASTIC FOR STOP BARS, SYMBOLS, CHARACTERS AND DIAGONALS. IF HEATED-IN-PLACE IS USED, IT SHALL BE PAID FOR USING THE EXTRUDED THERMOPLASTIC PAY ITEM.

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

MITCH EATON, PE — SIGNING & DELINEATION REGIONAL ENGINEER

ANDREW SCOTT — SIGNING & DELINEATION PROJECT DESIGN 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
T13:	YELLOW DOUBLE CENTER
THERMOPLASTIC (12", 90 MILS)	
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

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4685000000	1205	THERMOPLASTIC (4", 90 MILS)	7114	L.F.
4700000000	1205	THERMOPLASTIC (12", 90 MILS)	51	L.F.
4709000000	1205	THERMOPLASTIC (24", 90 MILS)	208	L.F.
4725000000	1205	THERMOPLASTIC PAVEMENT MARKING SYMBOLS (90 MILS)	14	EA

INDEX

HL-0008F ALT 1

PMP	1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F247484F7...

DATE: 5/5/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

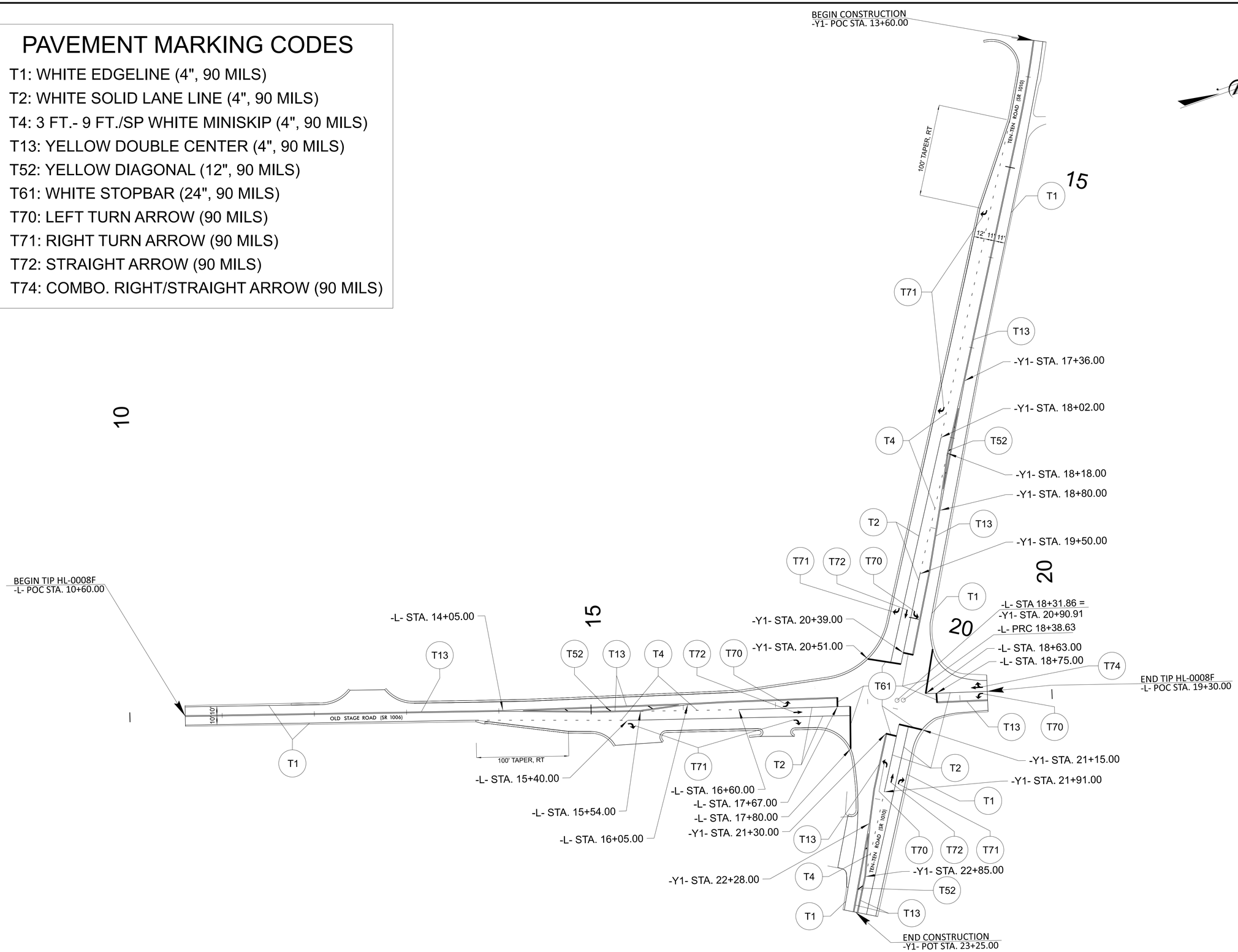
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FEDERAL AID # 4936724 T.I.P.: HL-0008F ALT 1

PAVEMENT MARKING CODES

T1: WHITE EDGELINE (4", 90 MILS)
T2: WHITE SOLID LANE LINE (4", 90 MILS)
T4: 3 FT.- 9 FT./SP WHITE MINISKIP (4", 90 MILS)
T13: YELLOW DOUBLE CENTER (4", 90 MILS)
T52: YELLOW DIAGONAL (12", 90 MILS)
T61: WHITE STOPBAR (24", 90 MILS)
T70: LEFT TURN ARROW (90 MILS)
T71: RIGHT TURN ARROW (90 MILS)
T72: STRAIGHT ARROW (90 MILS)
T74: COMBO. RIGHT/STRAIGHT ARROW (90 MILS)



HL-0008F ALT 1

PMP	2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F247484F7...

DATE: 1/27/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

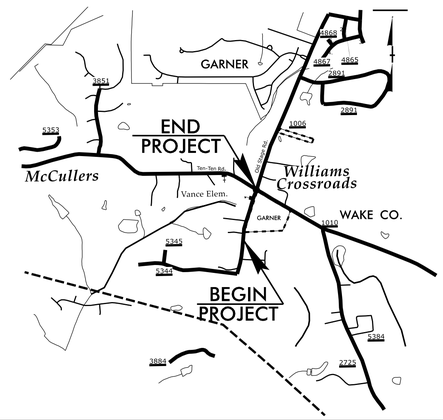
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

T.I.P.: HL-0008F ALT 1

5/26/20

PROJECT: HL-0008F

TIP



VICINITY MAP
NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

WAKE COUNTY

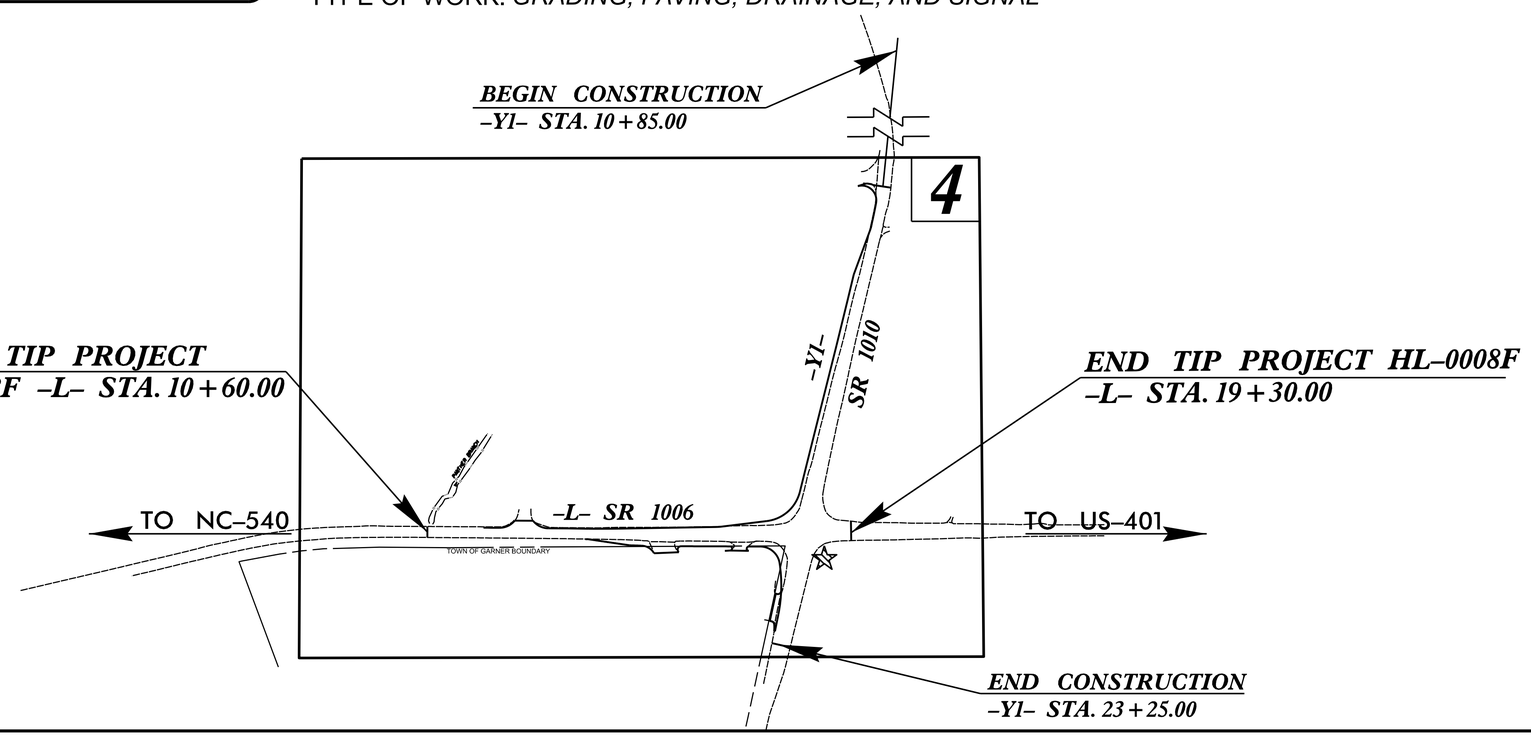
LOCATION: *SR 1006 (OLD STAGE RD) AND SR 1010 (TEN TEN RD). INERSECTION IMPROVEMENTS.*

TYPE OF WORK: *GRADING, PAVING, DRAINAGE, AND SIGNAL*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HL-0008F	EC-1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49367.1.1	4936724	

NAD 83/
NA 2011



SIGNAL UPGRADE

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

ENVIRONMENTALLY SENSITIVE AREA(S) ON THIS PROJECT

Refer To E. C. Special Provisions for Special Considerations.

THIS PROJECT HAS BEEN DESIGNED TO SENSITIVE WATERSHED STANDARDS.

GRAPHIC SCALE

50 25 0 50 100

PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL STORMWATER CONSTRUCTION PERMIT ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

Prepared In the Office of:

ROADSIDE ENVIRONMENTAL UNIT
1 South Wilmington St.
Raleigh, NC 27611

2024 STANDARD SPECIFICATIONS

Designed by:

Noelle Ring — NAME

3456 — LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

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

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	EC-02
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

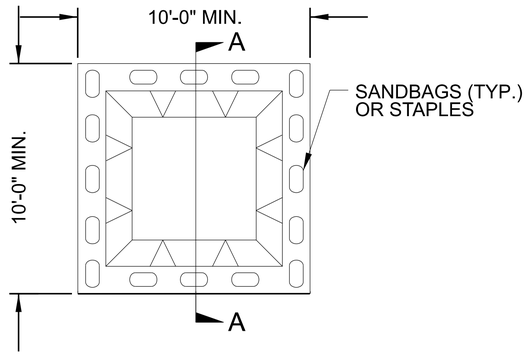
DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

EROSION & SEDIMENT CONTROL LEGEND

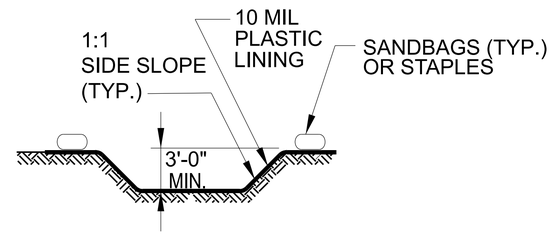
Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1622.01	Temporary Berms and Slope Drains	
1630.02	Silt Basin Type B	
1630.03	Temporary Silt Ditch	TSD
1630.04	Stilling Basin	
1630.05	Temporary Diversion	TD
1630.06	Special Stilling Basin	
1630.07	Skimmer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

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

ONSITE CONCRETE WASHOUT STRUCTURE WITH LINER



PLAN



SECTION A-A

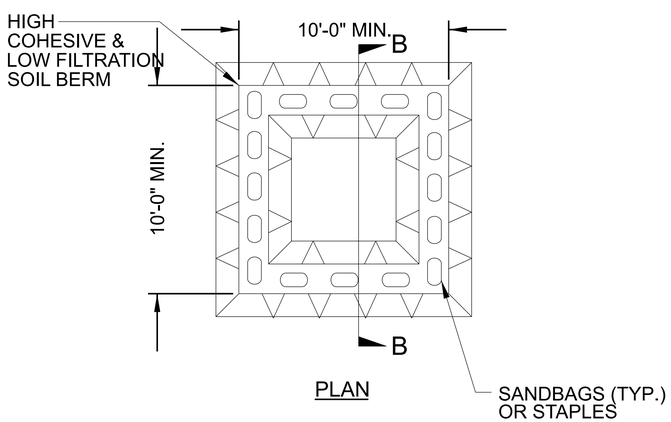
NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

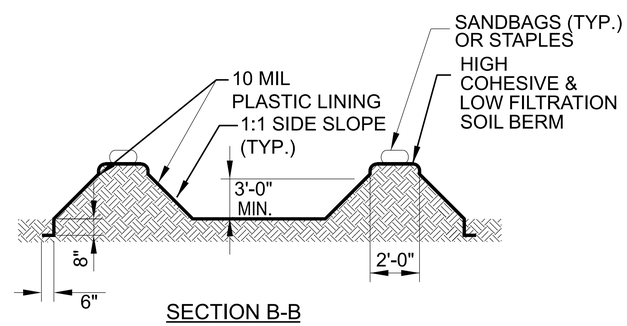
3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

BELOW GRADE WASHOUT STRUCTURE

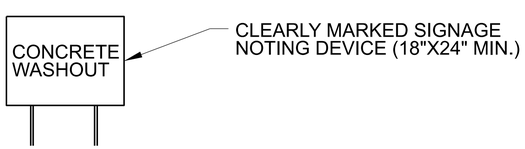
NOT TO SCALE



PLAN



SECTION B-B



NOTES:
1. ACTUAL LOCATION DETERMINED IN FIELD

2. THE CONCRETE WASHOUT STRUCTURES SHALL BE MAINTAINED WHEN THE LIQUID AND/OR SOLID REACHES 75% OF THE STRUCTURES CAPACITY TO PROVIDE ADEQUATE HOLDING CAPACITY WITH A MINIMUM 12 INCHES OF FREEBOARD.

3.CONCRETE WASHOUT STRUCTURE NEEDS TO BE CLEARY MARKED WITH SIGNAGE NOTING DEVICE.

ABOVE GRADE WASHOUT STRUCTURE

HL-0008F
EC 7A
NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY
ROADSIDE ENVIRONMENTAL UNIT

REVISIONS

5/26/20

11/14/23

HL-0008F

EC-3A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADSIDE ENVIRONMENTAL UNIT

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL (STRAW)

EC SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)
4	-L-	13+90		RT	95
				SUBTOTAL	95
MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER					2000
				TOTAL	2095
				SAY	2100

MATTING FOR EROSION CONTROL (STRAW)

EC SHEET NO.	LINE	FROM STATION	TO STATION	SIDE	ESTIMATE (SY)

11/14/23

HL-0008F

EC-3A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADSIDE ENVIRONMENTAL UNIT

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

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 TO 4:1	14 DAYS	7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH WITH SLOPES STEEPER THAN 4:1. 7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	7 DAYS FOR PERIMETER DIKES, SWALES, DITCHES PERIMETER SLOPES, AND HQW ZONES

5/26/20

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 4

DETAIL B
BANK & SCOUR HOLE STABILIZATION
(Not to Scale)

FROM STA. 10+60 TO STA. 10+80 –L– LT

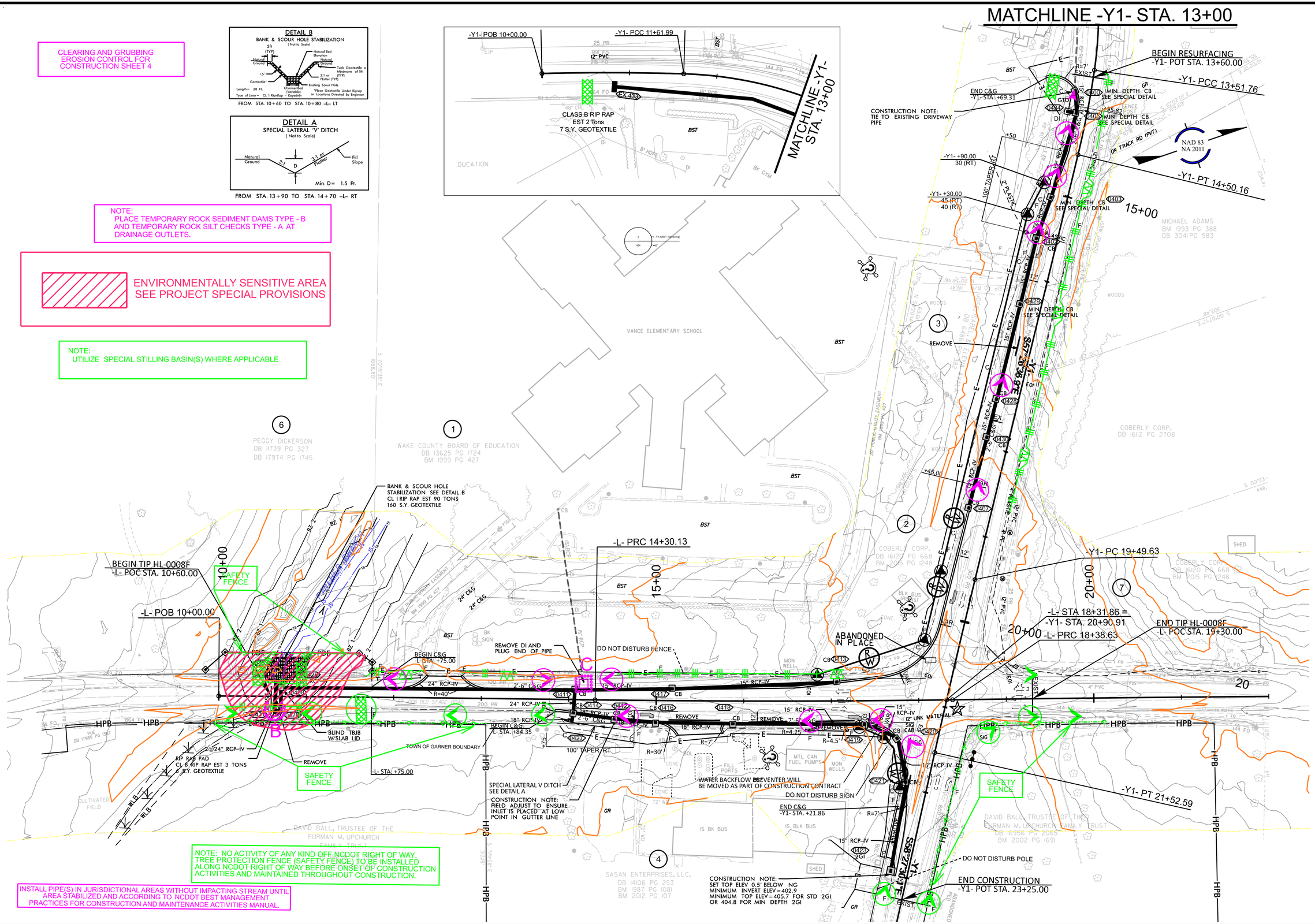
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 13+90 TO STA. 14+70 –L– RT

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

ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

NOTE:
UTILIZE SPECIAL STILLING BASIN(S) WHERE APPLICABLE



NOTE: NO ACTIVITY OF ANY KIND OFF NCDOT RIGHT OF WAY. TREE PROTECTION FENCE (SAFETY FENCE) TO BE INSTALLED ALONG NCDOT RIGHT OF WAY BEFORE ONSET OF CONSTRUCTION ACTIVITIES AND MAINTAINED THROUGHOUT CONSTRUCTION.

INSTALL PIPE(S) IN JURISDICTIONAL AREAS WITHOUT IMPACTING STREAM UNTIL AREA STABILIZED AND ACCORDING TO NCDOT BEST MANAGEMENT PRACTICES FOR CONSTRUCTION AND MAINTENANCE ACTIVITIES MANUAL.

HL-0008F
EC-04 | 004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADSIDE ENVIRONMENTAL UNIT

REVISIONS

1. ROW & DESIGN REV (04/02/2024) REMOVED PDE FROM PARCEL 5 AND PARCEL #5. REMOVED DRAINAGE PIPE FROM 0429 TO 0400 AND ADDED STRUCTURES AND PIPES AT 0400, 0434, 0403. ADJUSTED DRIVEWAY RADIUS PROFILE AT Y2 STA. 13+60 RIGHT, AND ADDED INSET FOR Y2 STA. 14+00 TO 13+00.

5/26/20

MATCHLINE -Y1- STA. 13+00

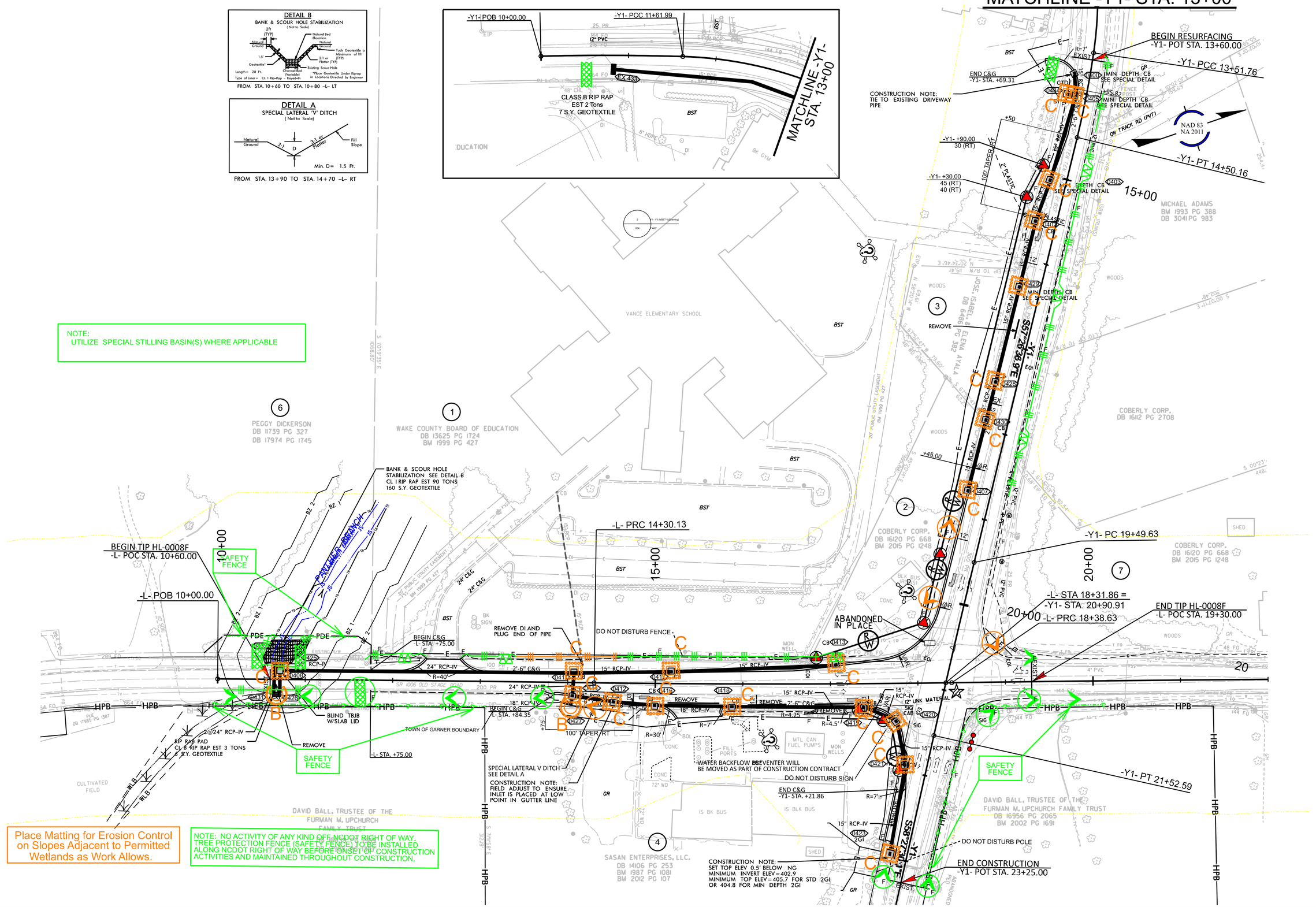
DETAIL B
BANK & SCOUR HOLE STABILIZATION
(Not to Scale)

FROM STA. 10+60 TO STA. 10+80 –L– LT

DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM STA. 13+90 TO STA. 14+70 –L– RT

NOTE:
UTILIZE SPECIAL STILLING BASIN(S) WHERE APPLICABLE



Place Matting for Erosion Control on Slopes Adjacent to Permitted Wetlands as Work Allows.

NOTE: NO ACTIVITY OF ANY KIND OFF NCDOT RIGHT OF WAY. TREE PROTECTION FENCE (SAFETY FENCE) TO BE INSTALLED ALONG NCDOT RIGHT OF WAY BEFORE ONSET OF CONSTRUCTION ACTIVITIES AND MAINTAINED THROUGHOUT CONSTRUCTION.

HL-0008F
EC-05 | 004

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

ROADSIDE ENVIRONMENTAL UNIT

REVISIONS

1. ROW & DESIGN REV (04/02/2024) REMOVED PDE FROM PARCEL 5 AND PARCEL #5; REMOVED DRAINAGE PIPE FROM 0429 TO 0400 AND ADDED STRUCTURES AND PIPES AT 0400, 0434, 0403. ADJUSTED DRIVEWAY RADIUS PROFILE AT -Y4- STA. 13+60 RIGHT, AND ADDED INSET FOR "Y1" STA. 10+00 TO 13+00.

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY
ROADSIDE ENVIRONMENTAL UNIT

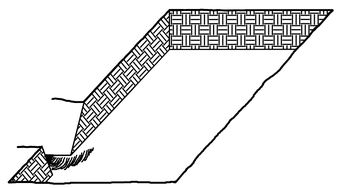
PLANTING DETAILS

SEEDLING / LINER BAREROOT PLANTING DETAIL

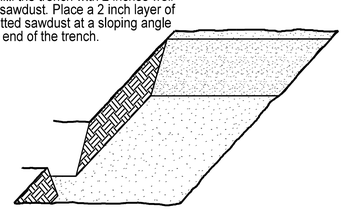
HEALING IN

1. Locate a healing-in site in a shady, well protected area.

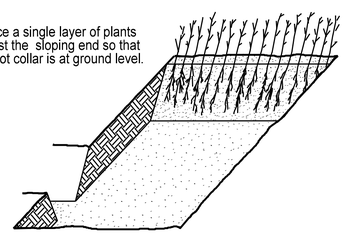
2. Excavate a flat bottom trench 12 inches deep and provide drainage.



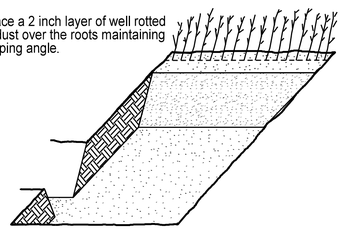
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.



4. Place a single layer of plants against the sloping end so that the root collar is at ground level.

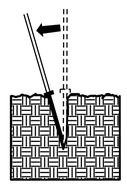


5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.

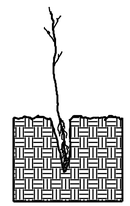


6. Repeat layers of plants and sawdust as necessary and water thoroughly.

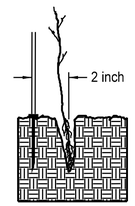
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.

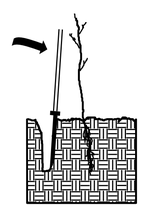


2. Remove planting bar and place seedling at correct depth.

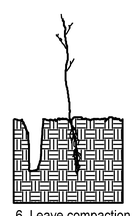


3. Insert planting bar 2 inches toward planter from seedling.

4. Pull handle of bar toward planter, firming soil at bottom.



5. Push handle forward firming soil at top.



6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

REFORESTATION

☐ TREE REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

34% PLATANUS OCCIDENTALIS	AMERICAN SYCAMORE	12 in - 18 in BR
33% LIRIODENDRON TULIPIFERA	YELLOW POPLAR	12 in - 18 in BR
33% NYSSA SYLVATICA	BLACK GUM	12 in - 18 in BR

REVISIONS

REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT

5/26/20

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLAN
WAKE COUNTY

LOCATION: OLD STAGE ROAD (SR 1006) AND TEN-TEN ROAD (SR 1010)

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 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE `D', `E' AND `F' SIGNS ON `U' CHANNEL POSTS
910.20	SCHOOL MARKED AND UNMARKED CROSSWALKS / SPEED REDUCTION REQUIREMENTS

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.

. WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

. THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE GRADE C REFLECTIVE SHEETING UNLESS OTHERWISE NOTED.

SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	53	S.F.
4072000000	903	SUPPORTS, 3 LB STEEL U-CHANNEL	86	L.F.
4102000000	904	SIGN ERECTION, TYPE E	14	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE E (GROUND MOUNTED)	2	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	5	EA.

INDEX

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

MITCH EATON — SIGNING & DELINEATION REGIONAL ENGINEER

ANDREW SCOTT — SIGNING & DELINEATION PROJECT DESIGN ENGINEER

HL-0008F ALT 1

SIGN 1

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F247484F7...

DATE: 5/5/2025

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

FEDERAL AID # 4936724 T.I.P.: HL-0008F ALT 1

5/26/20

401 QUANTITY REQ'D 1

24" X 30"
R2-1

MOUNT BELOW SIGN 404
IN 1 INSTALLATIONS

402 QUANTITY REQ'D 1

30" X 30"
W1-2L

ONE "U" POST PER SIGN

403 QUANTITY REQ'D 2

36" X 36"
S1-1

FLUORESCENT YELLOW-GREEN

MOUNT ABOVE SIGN 405 MOUNT ABOVE SIGN 404
IN 1 INSTALLATIONS IN 1 INSTALLATIONS

404 QUANTITY REQ'D 2

SCHOOL

24" X 9"
S4-3P

FLUORESCENT YELLOW-GREEN

MOUNT ABOVE SIGN 401 MOUNT BELOW SIGN 403
IN 1 INSTALLATIONS IN 1 INSTALLATIONS

405 QUANTITY REQ'D 1

AHEAD

24" X 12"
W16-9P

FLUORESCENT YELLOW-GREEN

MOUNT BELOW SIGN 403
IN 1 INSTALLATIONS

406 QUANTITY REQ'D 1

35
M.P.H.

18" X 18"
W13-1P

MOUNT BELOW SIGN 402
IN 1 INSTALLATIONS

407 QUANTITY REQ'D 1

8:45 - 9:45AM
3:15 - 4:15PM

24" X 12"
S4-1P

MOUNT BELOW SIGN 401
IN 1 INSTALLATIONS

408 QUANTITY REQ'D 1

ALL YEAR

24" X 12"
S4-7P

MOUNT BELOW SIGN 405
IN 1 INSTALLATIONS

409 QUANTITY REQ'D 1

30" X 30"
R1-1

ONE "U" POST PER SIGN

410 QUANTITY REQ'D 3

3" X 60"
U-CHANNEL
POST REFLECTOR

FLUORESCENT YELLOW-GREEN

MOUNT BELOW SIGNS 404,407,408
IN 3 INSTALLATIONS

HL-0008F ALT 1

SIGN 2

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton
DDA1C5F247484F7...

DATE: 1/27/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

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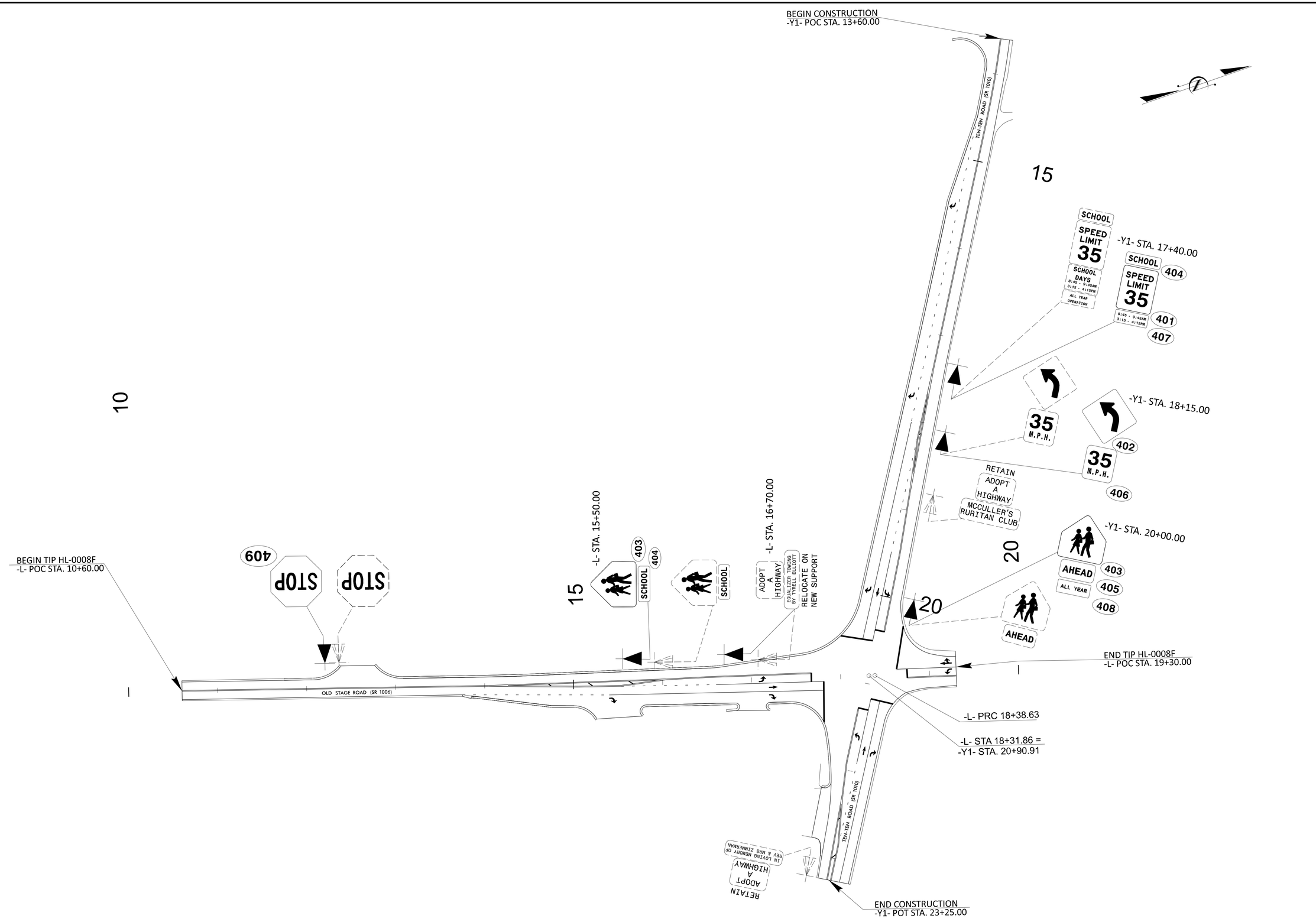
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

T.I.P.: HL-0008F ALT 1

5/26/20



HL-0008F ALT 1

SIGN	3

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

APPROVED: DocuSigned by: David M. Eaton DDA1C5F24748AF7...

DATE: 1/27/2025

SEAL:

NORTH CAROLINA PROFESSIONAL SEAL 043780 ENGINEER DAVID M. EATON

INCOMPLETE PLANS
DO NOT USE FOR ROW ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

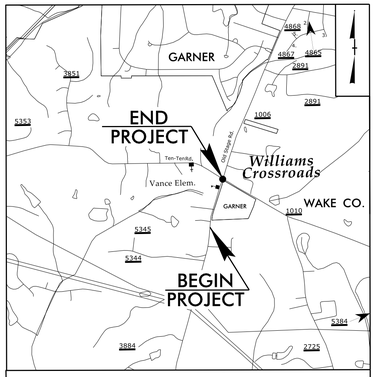
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

T.I.P.: HL-0008F ALT 1

Project No.	Sheet No.
HL–0008F	Sig. 1.0

TIP Project: HL–0008F

CONTRACT: DE000393



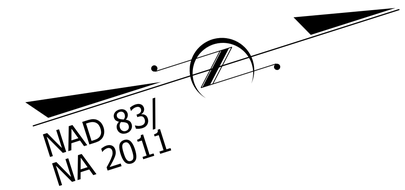
VICINITY MAP (NTS)

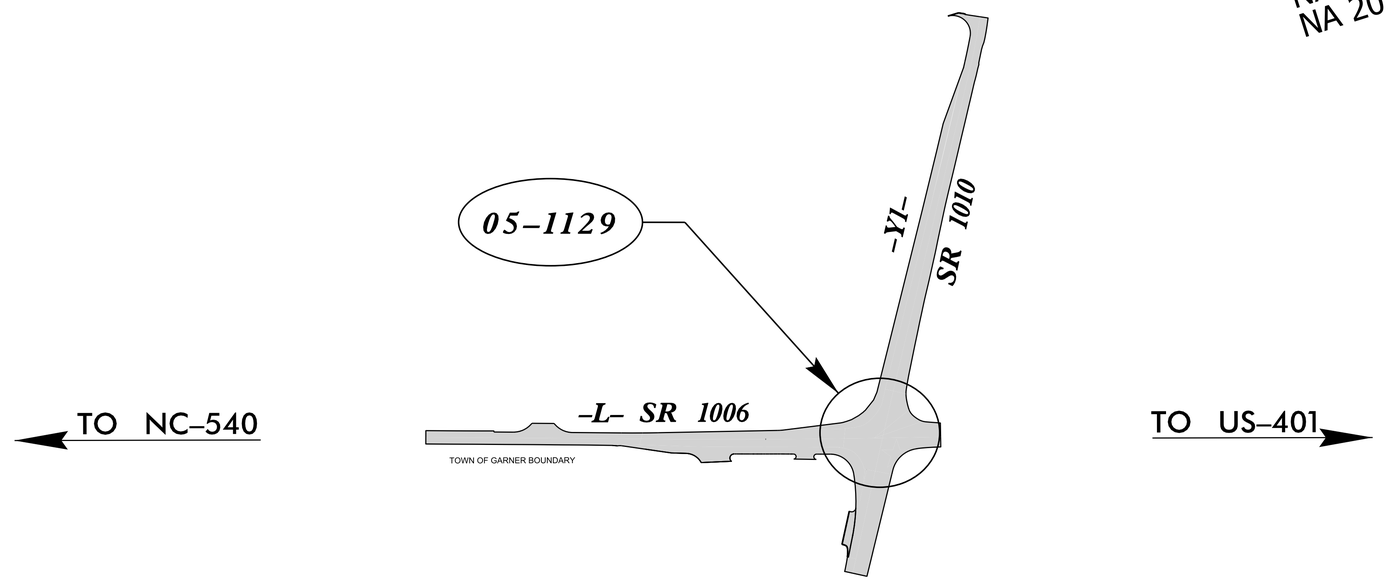
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

LOCATION: INTERSECTION IMPROVEMENT AT SR 1006 (OLD STAGE RD) AND SR 1010 (TEN TEN RD)

TYPE OF WORK: TRAFFIC SIGNAL AND SIGNAL COMMUNICATIONS





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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	N/A	Title Sheet
Sig. 2.0 – 3.2	05–1129	SR 1006 (Old Stage Road) at SR 1010 (Ten Ten Road)
SCP 1–3	N/A	Signal Communications Plans

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS UNIT

Contacts:

Robert J. Ziemba, PE, CPM – Central Region Signals Engineer
Ryan W. Hough, PE – Signal Equipment Design Engineer
Gregory A. Green – Signal Commuincations Project Engineer

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

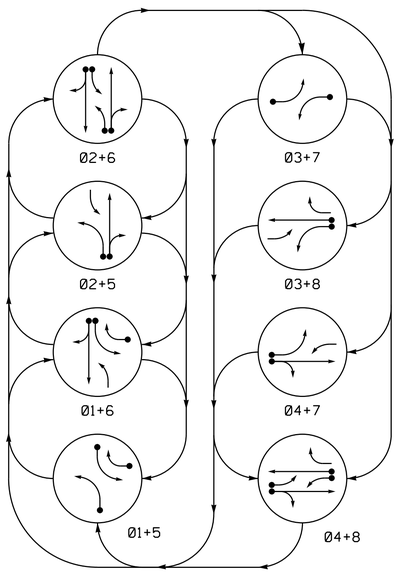
TSMO UNIT

750 N. Greenfield Parkway, Garner, NC 27529

04-DEC-2024 14:12
S:\TPB\SCITS Signals\Signal Design Section\Central Region\Div 5\HL-0008F\HL-0008F_TSH.dgn

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	Sig.2.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM

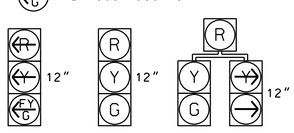
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

= Bimodal Section



11	21, 22	82
31	41, 42	
51	61, 62	
71	81	

DEFAULT PHASING TABLE OF OPERATION

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

MAXTIME DETECTOR INSTALLATION CHART

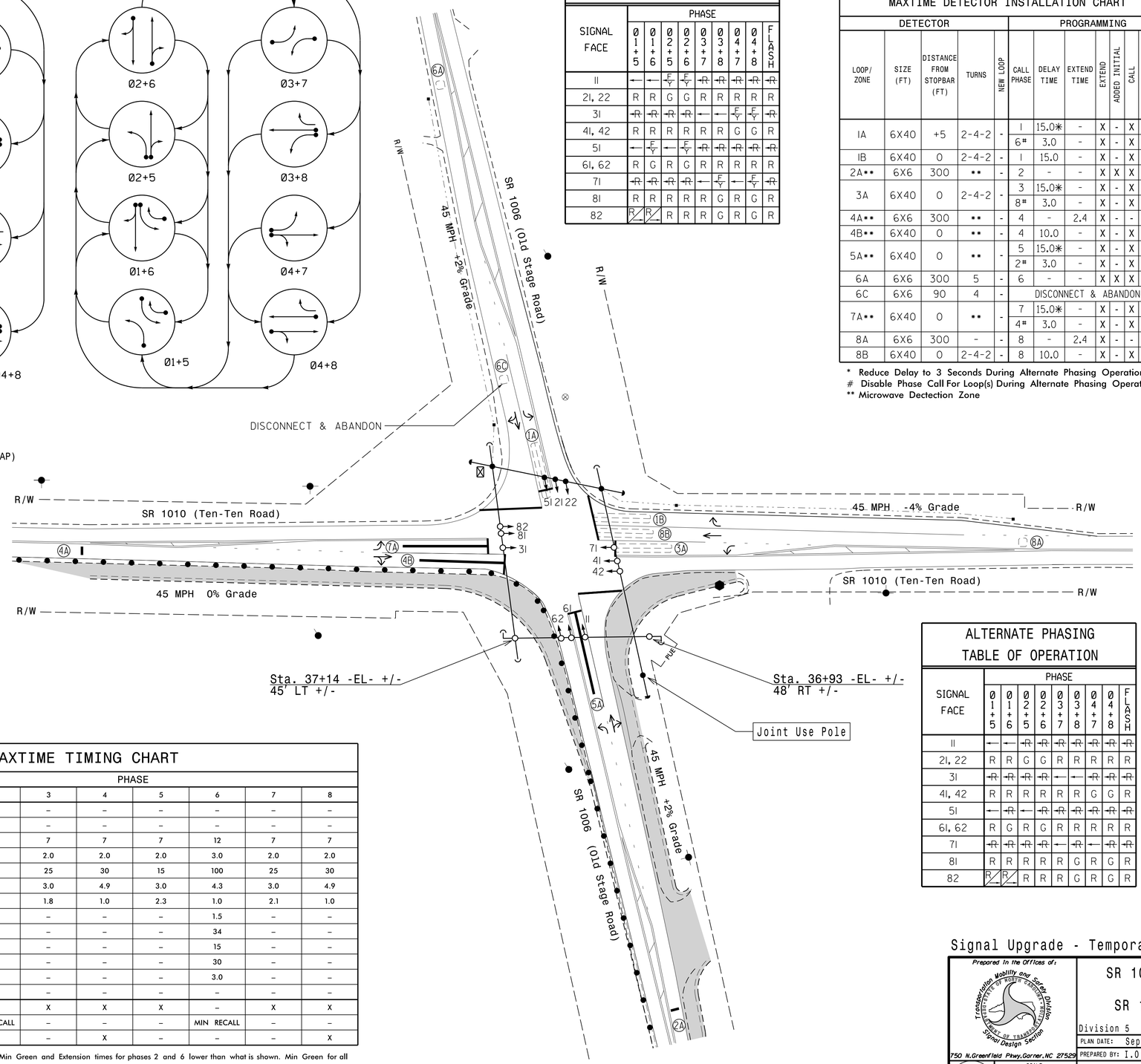
DETECTOR					PROGRAMMING						
LOOP/ ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	+5	2-4-2	-	1	15.0*	-	X	-	X	-	X
					6#	3.0	-	X	-	X	X	X
1B	6X40	0	2-4-2	-	1	15.0	-	X	-	X	-	X
2A**	6X6	300	**	-	2	-	-	X	X	X	-	**
3A	6X40	0	2-4-2	-	3	15.0*	-	X	-	X	-	X
					8#	3.0	-	X	-	X	-	X
4A**	6X6	300	**	-	4	-	2.4	X	-	-	-	**
4B**	6X40	0	**	-	4	10.0	-	X	-	X	-	**
5A**	6X40	0	**	-	5	15.0*	-	X	-	X	-	**
					2#	3.0	-	X	-	X	X	**
6A	6X6	300	5	-	6	-	-	X	X	X	-	X
6C	6X6	90	4	-	DISCONNECT & ABANDON							
7A**	6X40	0	**	-	7	15.0*	-	X	-	X	-	**
					4#	3.0	-	X	-	X	-	**
8A	6X6	300	-	-	8	-	2.4	X	-	-	-	X
8B	6X40	0	2-4-2	-	8	10.0	-	X	-	X	-	X

* Reduce Delay to 3 Seconds During Alternate Phasing Operation.
\# Disable Phase Call For Loop(s) During Alternate Phasing Operation.
** Microwave Dectection Zone

8 Phase
Fully Actuated
SR 1006 (Old Stage Road) @ 540 CLS
Signal System #: D05-17_Fuquay-Varina

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Disconnect and abandon existing loop 6C.
4. Phase 1 and/or phase 5 may be lagged.
5. Phase 3 and/or phase 7 may be lagged.
6. Reposition existing signal heads numbered 21 and 22.
7. Set all detector units to presence mode.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. Pavement markings are existing unless otherwise shown.
10. The Division Traffic Engineer will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ALTERNATE PHASING TABLE OF OPERATION

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

LEGEND

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

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	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	15	100	25	30	15	100	25	30
Yellow Change	3.0	4.3	3.0	4.9	3.0	4.3	3.0	4.9
Red Clear	2.1	1.0	1.8	1.0	2.3	1.0	2.1	1.0
Added Initial *	–	1.5	–	–	–	1.5	–	–
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	–	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.

Signal Upgrade - Temporary Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1006 (Old Stage Road)
at
SR 1010 (Ten-Ten Road)

Division 5 Wake County Near Garner

PLAN DATE: September 2024 REVIEWED BY:
PREPARED BY: I.O. Umozurike REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIMMA

DocuSigned by: Robert J. Zimma 11/04/2024
SIGNATURE DATE

SIG. INVENTORY NO. 05-1129T

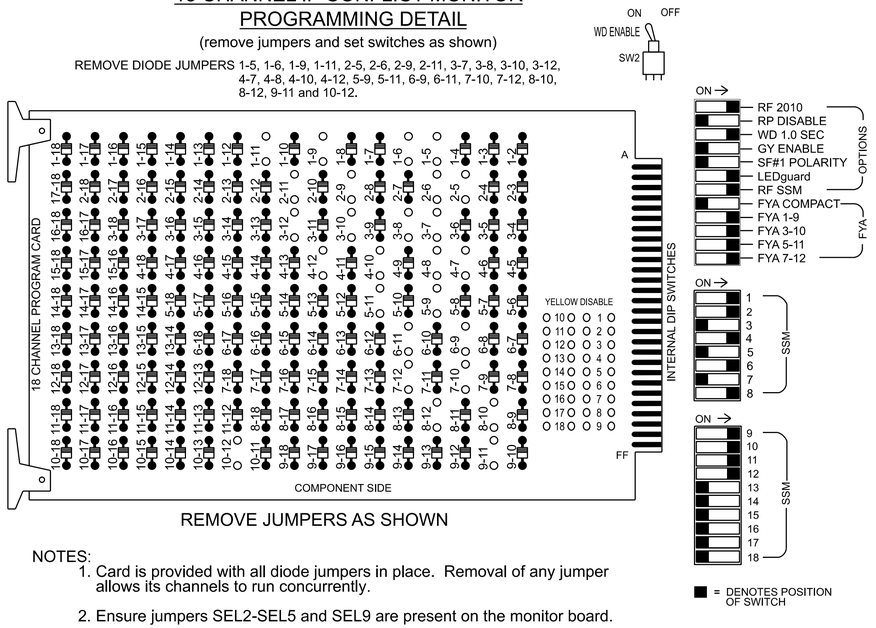
04-NOV-2024 11:27
S:\TMS\SHARED\TIS Signals\Signal Design Section\Central Region\Div 5\HL-0008F\D051129T_sig.dgn_2024nmds.dgn
jounozurike

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	Sig. 2.1

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.



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 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 SR 1006 (Old Stage Road) @ 540 CLS Signal System #: D05-17_Fuquay-Varina.

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

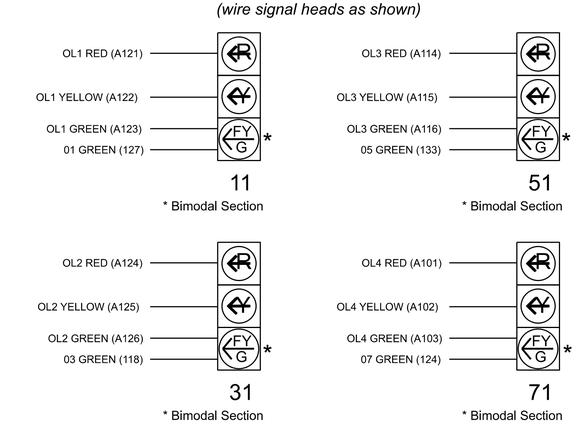
SIGNAL HEAD HOOK-UP CHART

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★	82	21,22	NU	31★	41,42	NU	51★	61,62	NU	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		126												A122	A125		A115	A102	
FLASHING YELLOW ARROW														A123	A126		A116	A103	
GREEN ARROW	127	127			118			133			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)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	1O	11	12	13	14
FILE "I"	U	ø 1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 1 1B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED				NOT USED				NOT USED					ST DC ISOLATOR
FILE "J"	U	ø 5 5A	ø 6 6A	SLOT EMPTY	SLOT EMPTY	ø 7 7A	ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED			NOT USED	ø 8 8B								

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		X		X	
				-	29 ★	6	3		X		X	X
3A	TB4-5,6	I5U	58	20	7 ★	3	15		X		X	
				-	30 ★	8	3		X		X	
1B	TB6-9,10	I9U	60	22	13	1	15		X		X	
** 5A	TB3-1,2	J1U	55	17	15 ★	5	15		X		X	
				-	31 ★	2	3		X		X	X
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
** 7A	TB5-5,6	J5U	57	19	21 ★	7	15		X		X	
				-	32 ★	4	3		X		X	
8A	TB5-9,10	J6U	42	4	22	8		2.4	X			
8B	TB5-11,12	J6L	46	8	23	8	10		X		X	

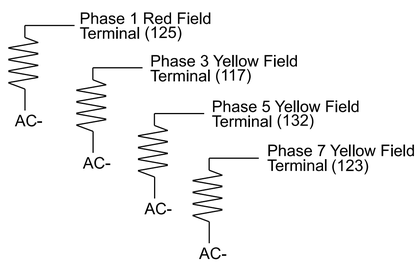
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

★ For the detectors to work as shown on the signal plan see the Detector Programming Detail for Alternate Phasing on Sheet 2 of this plan.

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)



DETECTOR NOTES

1. For areas of detection 2A, 4A, 4B, 5A and 7A install a microwave 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.

** 2. For loops 5A and 7A, detector card placement is typical for a NCDOT installation. Detectors associated with these slots are compatible with the Vehicle Detector Programming Detail located on sheet 2 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1129T
DESIGNED: September 2024
SEALED: 11/04/2024
REVISED:

Electrical Detail - Sheet 1 of 2 Temporary

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1006 (Old Stage Road)
at
SR 1010 (Ten-Ten Road)

Division 05 Wake County near Garner

PLAN DATE: October 2024	REVIEWED BY: Zarrar Zafar
PREPARED BY: Todd Joyce	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER O. TODD JOYCE

DocuSigned by: O. Todd Joyce 11/04/2024
ASSOCIATE ENGINEER DATE
SIG. INVENTORY NO. 05-1129

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TJoyce

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	Sig. 2.2

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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME 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 STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

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.

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	-

3A

Detector	Call Phase	Delay
7	3	3
30	0	-

5A

Detector	Call Phase	Delay
15	5	3
31	0	-

7A

Detector	Call Phase	Delay
21	7	3
32	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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1129T
DESIGNED: September 2024
SEALED: 11/04/2024
REVISED:

Electrical Detail - Sheet 2 of 2 Temporary

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1006 (Old Stage Road)
at
SR 1010 (Ten-Ten Road)

Division 05 Wake County near Garner

PLAN DATE:	October 2024	REVIEWED BY:	Zarrar Zafar
PREPARED BY:	Todd Joyce	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 11/04/2024
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SIG. INVENTORY NO. 05-1129

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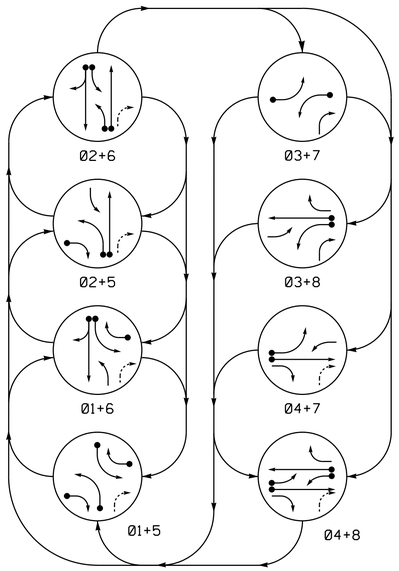
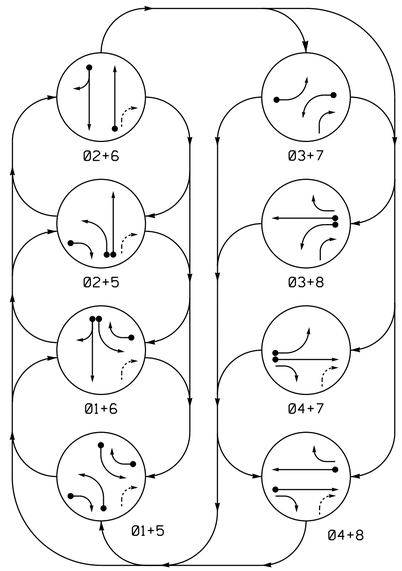
TJoyce

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	Sig.3.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



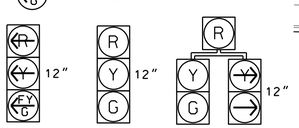
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

= Bimodal Section



11	21, 22	42
31	41, 42	82
51	61, 62	
71	81	

DEFAULT PHASING TABLE OF OPERATION

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

MAXTIME DETECTOR INSTALLATION CHART

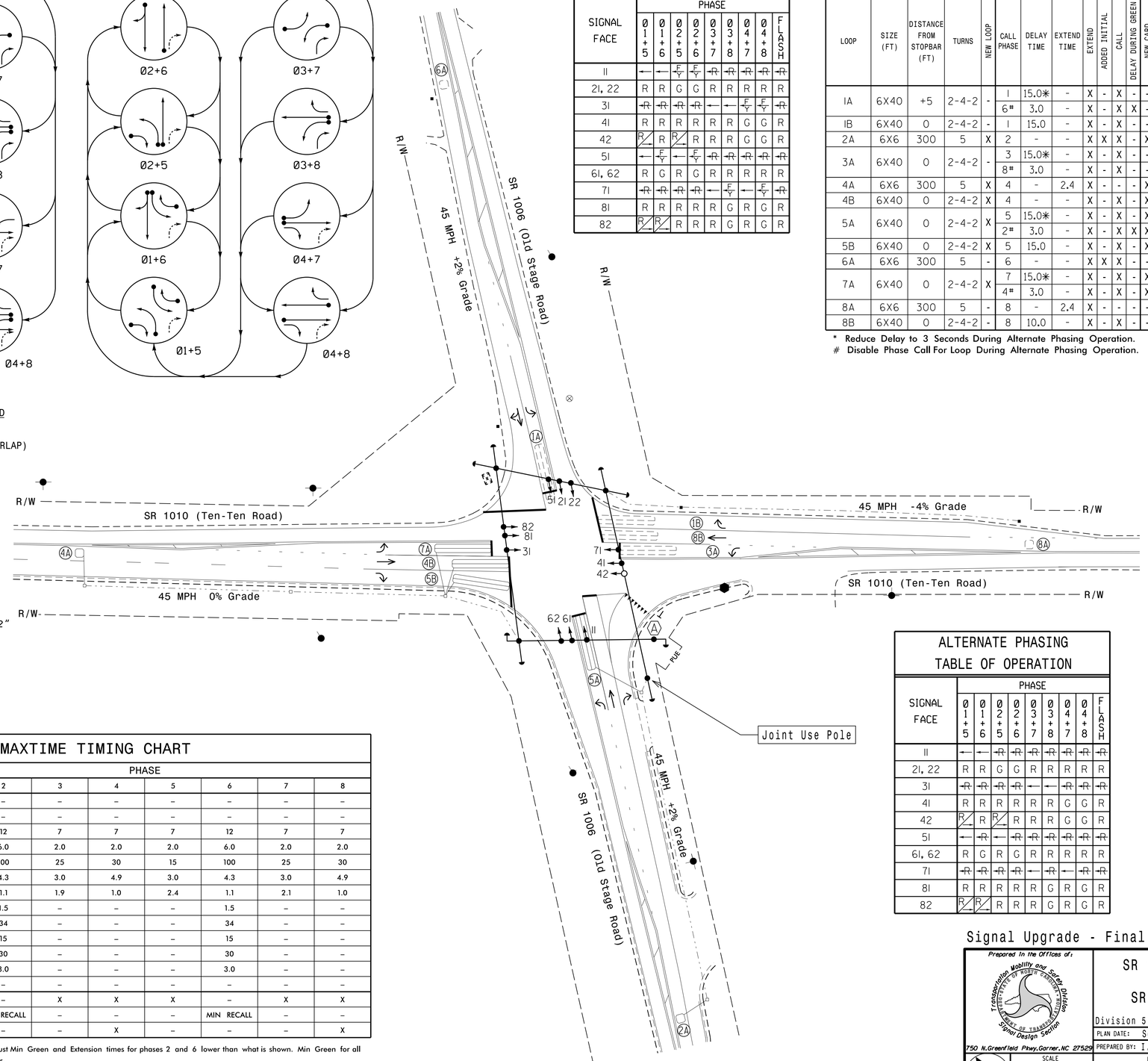
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	+5	2-4-2	-	1	15.0*	-	X	-	X	-	-
					6#	3.0	-	X	-	X	X	-
1B	6X40	0	2-4-2	-	1	15.0	-	X	-	X	-	-
2A	6X6	300	5	X	2	-	-	X	X	X	-	X
3A	6X40	0	2-4-2	-	3	15.0*	-	X	-	X	-	-
					8#	3.0	-	X	-	X	-	-
4A	6X6	300	5	X	4	-	2.4	X	-	-	-	X
4B	6X40	0	2-4-2	X	4	-	-	X	-	X	-	X
5A	6X40	0	2-4-2	X	5	15.0*	-	X	-	X	-	X
					2#	3.0	-	X	-	X	X	X
5B	6X40	0	2-4-2	X	5	15.0	-	X	-	X	-	X
6A	6X6	300	5	-	6	-	-	X	X	X	-	-
7A	6X40	0	2-4-2	X	7	15.0*	-	X	-	X	-	X
					4#	3.0	-	X	-	X	-	X
8A	6X6	300	5	-	8	-	2.4	X	-	-	-	-
8B	6X40	0	2-4-2	-	8	10.0	-	X	-	X	-	-

* Reduce Delay to 3 Seconds During Alternate Phasing Operation.
\# Disable Phase Call For Loop During Alternate Phasing Operation.

8 Phase
Fully Actuated
SR 1006 (Old Stage Road) @ 540 CLS
Signal System #: D05-17_Fuquay-Varina

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 21, 22, 42 and 62.
6. Set all detector units to presence mode.
7. Pavement markings are existing unless otherwise shown.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ALTERNATE PHASING TABLE OF OPERATION

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

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	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	"YIELD" Sign (R1-2)	

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 *	15	100	25	30	15	100	25	30
Yellow Change	3.0	4.3	3.0	4.9	3.0	4.3	3.0	4.9
Red Clear	2.1	1.1	1.9	1.0	2.4	1.1	2.1	1.0
Added Initial *	–	1.5	–	–	–	1.5	–	–
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	–	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.

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

SR 1006 (Old Stage Road) at SR 1010 (Ten-Ten Road)

Division 5 Wake County Near Garner

PLAN DATE: September 2024 REVIEWED BY:
PREPARED BY: I.O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 026486 ENGINEER ROBERT J. ZIEMBA

Docusigned by: Robert J. Ziemba 11/04/2024
SIGNATURE DATE

SIG. INVENTORY NO. 05-1129

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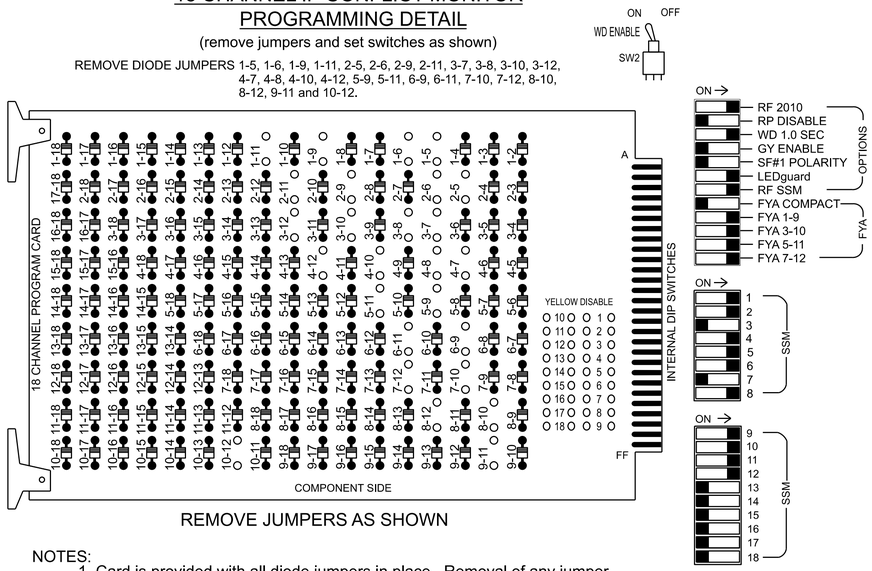
Umozurike

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	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.



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 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 SR 1006 (Old Stage Road) @ 540 CLS Signal System #: D05-17_Fuquay-Varina.

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★	82	21,22	NU	31★	41,42	NU	51★	42	61,62	NU	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		126							132						A122	A125		A115	A102	
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124								
✋																				
🚶																				

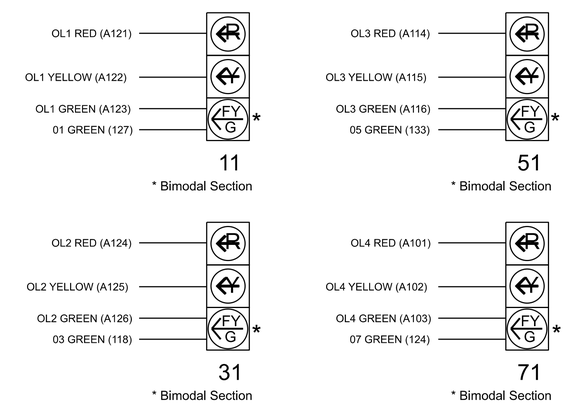
NU = Not Used

*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)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	1O	11	12	13	14
FILE "I"	U	ø 1 1A	ø 2 2A	SLOT EMPTY	SLOT EMPTY	ø 3 3A	ø 4 4A	SLOT EMPTY	SLOT EMPTY	ø 1 1B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	ø 4 4B			NOT USED					ST DC ISOLATOR
FILE "J"	U	ø 5 5A	ø 6 6A	SLOT EMPTY	SLOT EMPTY	ø 7 7A	ø 8 8A	SLOT EMPTY	SLOT EMPTY	ø 5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED			NOT USED	ø 8 8B			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		X		X	
				-	29 ★	6	3		X		X	X
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
3A	TB4-5,6	I5U	58	20	7 ★	3	15		X		X	
				-	30 ★	8	3		X		X	
4A	TB4-9,10	I6U	41	3	8	4		2.4	X			
4B	TB4-11,12	I6L	45	7	9	4			X		X	
1B	TB6-9,10	I9U	60	22	13	1	15		X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15		X		X	
				-	31 ★	2	3		X		X	X
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
7A	TB5-5,6	J5U	57	19	21 ★	7	15		X		X	
				-	32 ★	4	3		X		X	
8A	TB5-9,10	J6U	42	4	22	8		2.4	X			
8B	TB5-11,12	J6L	46	8	23	8	10		X		X	
5B	TB7-9,10	J9U	59	21	27	5	15		X		X	

INPUT FILE POSITION LEGEND: J2L

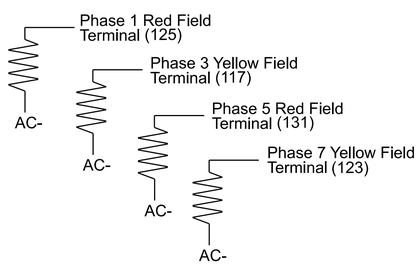
FILE J
SLOT 2
LOWER

★ For the detectors to work as shown on the signal plan see the Detector Programming Detail for Alternate Phasing on Sheet 2 of this plan.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1129
DESIGNED: September 2024
SEALED: 11/04/2024
REVISED:

Electrical Detail - Sheet 1 of 2 Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1006 (Old Stage Road)
at
SR 1010 (Ten-Ten Road)

Division 05 Wake County near Garner

PLAN DATE:	October 2024	REVIEWED BY:	Zarrar Zafar
PREPARED BY:	Todd Joyce	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 11/04/2024
DOCUSIGNED BY: DATE

SIG. INVENTORY NO. 05-1129

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TJoyce

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	Sig. 3.2

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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME 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 STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

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.

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	-

3A

Detector	Call Phase	Delay
7	3	3
30	0	-

5A

Detector	Call Phase	Delay
15	5	3
31	0	-

7A

Detector	Call Phase	Delay
21	7	3
32	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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1129
DESIGNED: September 2024
SEALED: 11/04/2024
REVISED:

Electrical Detail - Sheet 2 of 2 Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1006 (Old Stage Road)
at
SR 1010 (Ten-Ten Road)

Division 05 Wake County near Garner

PLAN DATE:	October 2024	REVIEWED BY:	Zarrar Zafar
PREPARED BY:	Todd Joyce	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 031001 ENGINEER D. TODD JOYCE

DocuSigned by: D. Todd Joyce 11/04/2024
4BDCAE0B0B4A4B... DATE

SIG. INVENTORY NO. 05-1129

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TJoyce

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	SCP-1

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 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
61. DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
62. BOND RISER AND MESSENGER CABLE TO POLE GROUND
63. BOND RISER TO POLE GROUND
64. BOND MESSENGER CABLE TO POLE GROUND
65. INSTALL HEAT SHRINK TUBING RETROFIT KIT
66. INSTALL MOLDABLE DUCT SEAL
67. SLACK SPAN

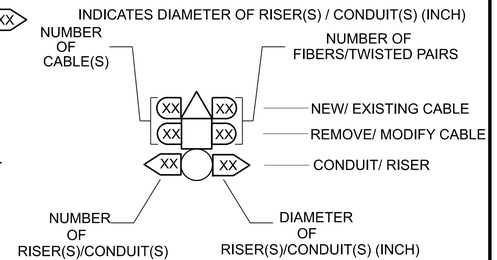
LEGEND

FO	NEW FIBER OPTIC COMMUNICATIONS CABLE
EXI	EXISTING COMMUNICATIONS CABLE
REM	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	EXISTING AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
DD	NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
S	AERIAL SPLICE ENCLOSURE	S
S	UNDERGROUND SPLICE ENCLOSURE	S
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL/EQUIPMENT CABINET	X
S	SPLICE CABINET	S
	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

- XX — INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX — INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX — INDICATES NUMBER OF RISER(S) / CONDUIT(S)
- XX — INDICATES DIAMETER OF RISER(S) / CONDUIT(S) (INCH)



ATTACHMENT POINT:

XX"/SS / YYY	DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT
YYY / XX"/SS	REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

"SS" REFERENCE LOCATION
FS = FRONT SIDE OF POLE
BS = BACK SIDE OF POLE

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Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section

750 N. Greenfield Pkwy, , Garner, NC 27529

CONSTRUCTION NOTES

DIVISION 5 | WAKE COUNTY | FUQUAY VARINA

PLAN DATE: DECEMBER 2024
REVIEWED BY: DocuSigned by: Greg Grew
PREPARED BY: M. DIAZ

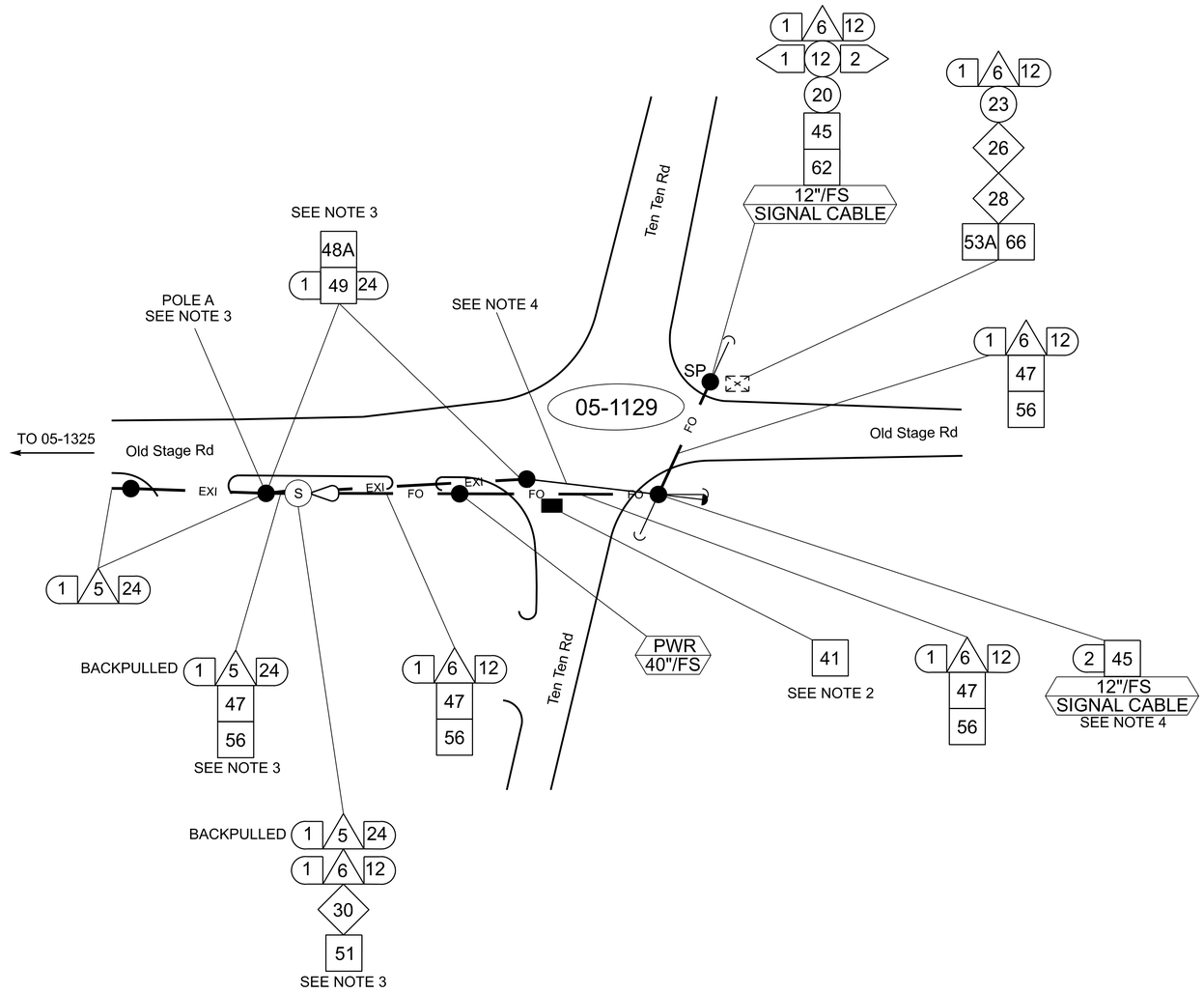
REVISIONS | INIT. | DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D. STEWART

SIGNATURE: Alex D. Stewart
DATE: 12/03/2024

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	SCP-2



1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT 919-536-4000 TO ARRANGE FOR THE TOWN TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITEDTO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE 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. REMOVE AND DISPOSE OF EXISTING JUNCTION BOX, SPLICE ENCLOSURE, CONDUIT, AND 12-FIBER DROP CABLE BETWEEN JUNCTION BOX AND SIGNAL CABINET.

3. BREAK EXISTING 24-FIBER CABLE SPLICES AT THE EXISTING SPLICE ENCLOSURE. BACK PULL THIS CABLE TO POLE A. REINSTALL BACK PULLED CABLE AS SHOWN. REMOVE EXISTING MESSENGER CABLE. SPLICE IN A NEW 12 FIBER DROP CABLE IN THE NEW SPLICE ENCLOSURE AND ROUTE TO THE SIGNAL CABINET AT 05-1129 AND RESPLICE AS SHOWN IN THE SPLICE DETAILS.

4. REMOVE EXISTING AERIAL GUY ASSEMBLY AND STANDARD GUY ASSEMBLY

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Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE
0 N/A

CABLE ROUTING PLANS
D05-17 Fuquay-Varina

DIVISION 5 | WAKE COUNTY | FUQUAY VARINA

PLAN DATE: DECEMBER 2024
PREPARED BY: M. DIAZ
REVIEWED BY: DocuSigned by: Guy Grun 8E7B0BA7C8A4F4...

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 046152 ENGINEER ALEX D. STEWART

SIGNATURE: DocuSigned by: Alex D. Stewart 8A0A0A0A0A0A0A...
DATE: 12/03/2024

PROJECT REFERENCE NO.	SHEET NO.
HL-0008F	SCP-3

AERIAL SPLICE ENCLOSURE
TEN TEN AT OLD STAGE RD
SIG. INV. # 05–1129

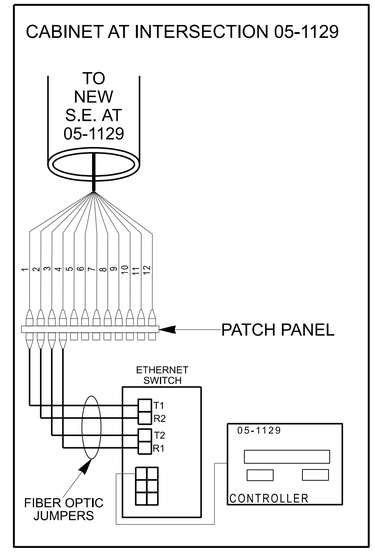
Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

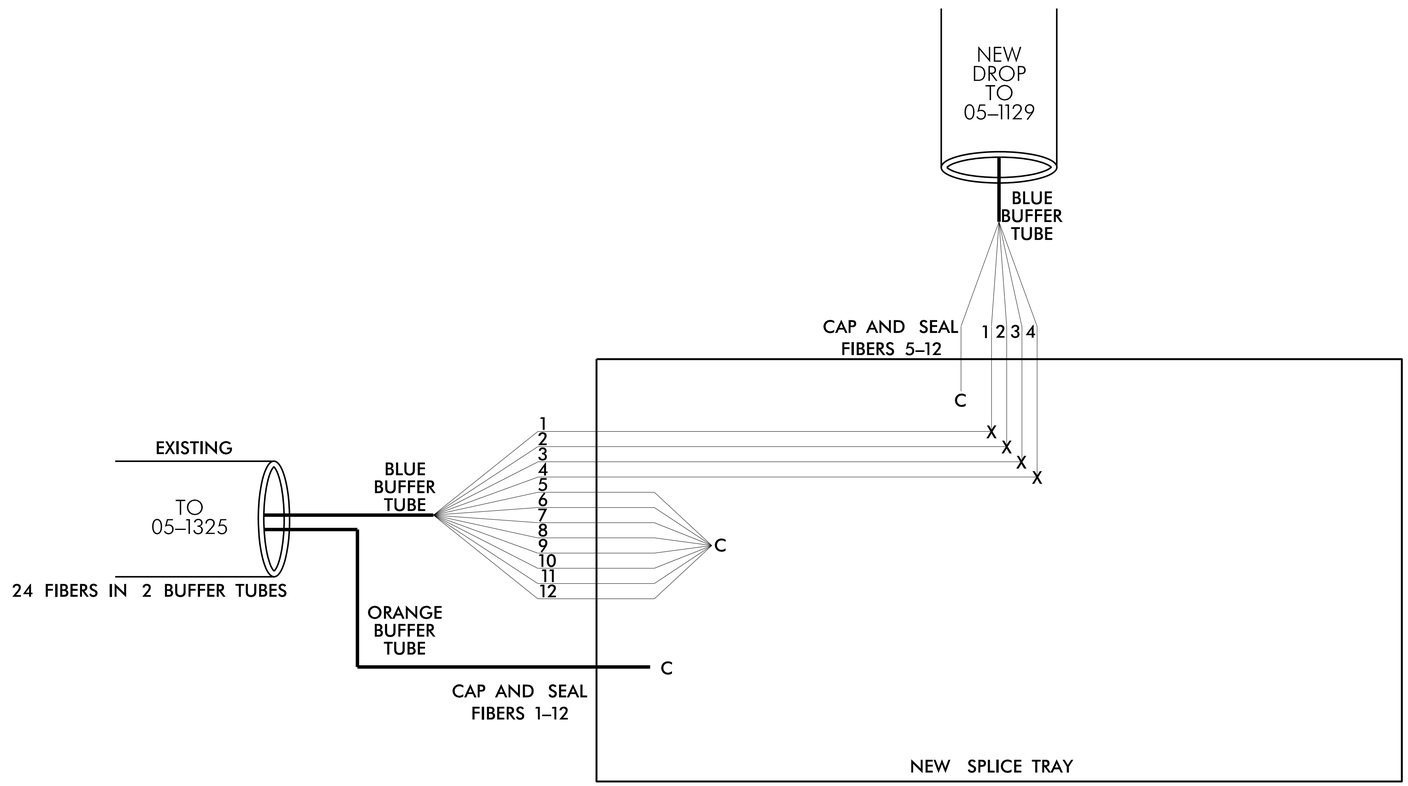
COLOR CODE
TIA/EIA 598–A

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

LEGEND

X = FUSION SPLICE
E = EXISTING SPLICE
C = CAP IN TRAY





1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 5 TRAFFIC ENGINEER AT 919-536-4000 TO ARRANGE FOR THE TOWN TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE 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.

DOCUMENT NOT CONSIDERED FINAL
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Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SPLICING DETAIL
D05-17 Fuquay-Varina

DIVISION 5 | WAKE COUNTY | FUQUAY VARINA

PLAN DATE: DECEMBER 2024
REVIEWED BY: DocuSigned by: Greg Green
PREPARED BY: M. DIAZ

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 048152 ENGINEER ALEX D. STEWART

SIGNATURE: DocuSigned by: Alex D. Stewart
DATE: 12/03/2024

Docusign Envelope ID: DF477710-2CA4-4769-821A-6AA39ADA64CA

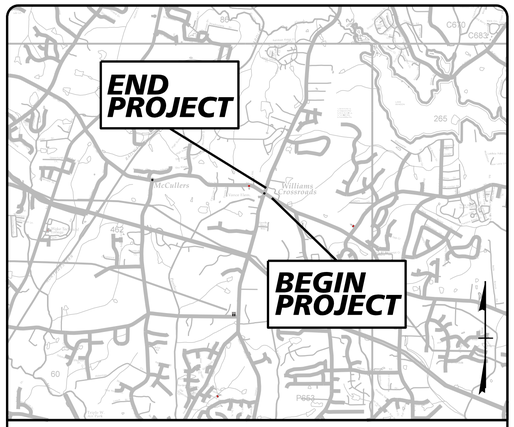
09/08/99

TIP PROJECT: HL-0008F

T.I.P. NO.	SHEET NO.
HL-0008F	UC-1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS
WAKE COUNTY

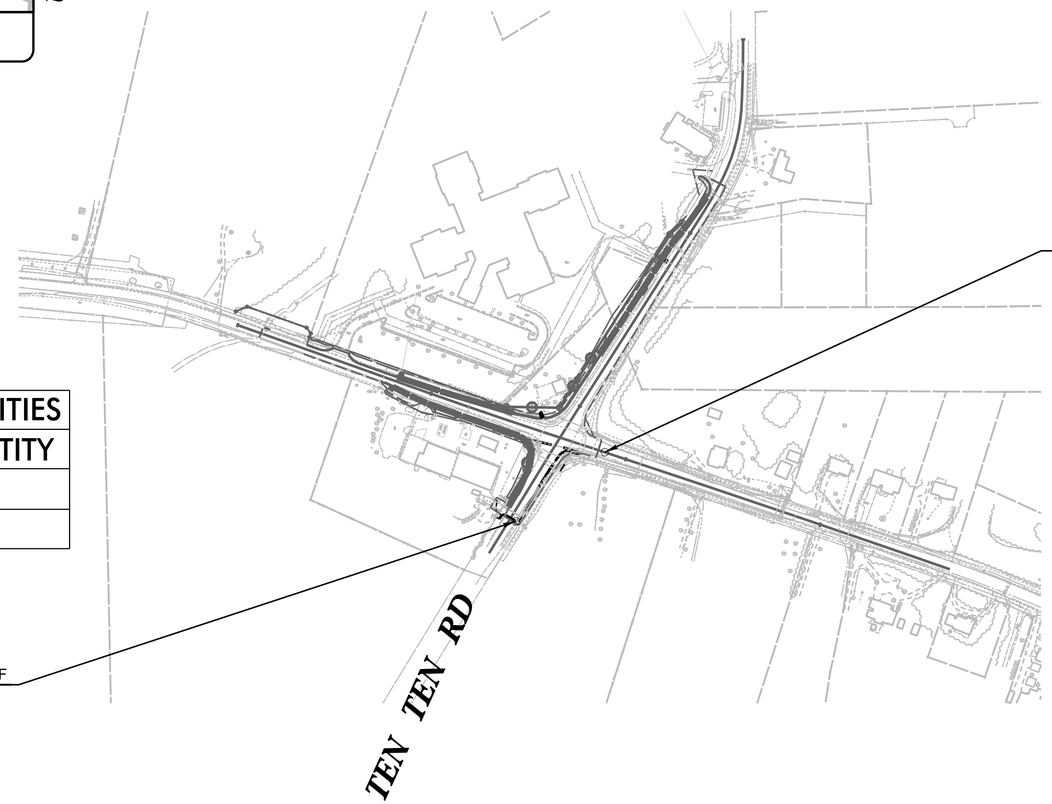


VICINITY MAP N.T.S.

UC PLANS

LOCATION: OLD STAGE ROAD AND TEN TEN ROAD

TYPE OF WORK: WATER LINE AND SANITARY SEWER LINE IMPROVEMENTS



PUBLIC IMPROVEMENTS QUANTITIES		
ITEM	UNIT	QUANTITY
PUBLIC WATER	LF	337
PUBLIC WATER STUB	EA	4

RALEIGH WATER - PLANS AUTHORIZED FOR CONSTRUCTION
Any work authorized by this approval must proceed in accordance with the plans. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.
Patrick Paine, PE
Digitally signed by Patrick Paine, PE
DN: C=US, E=patrick.paine@raleighnc.gov, O=City of Raleigh, OU=Development Review, CN=Patrick Paine, PE
Reason: I am approving this document
Date: 2021.05.19 09:58:15-04'00'

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-4148

The City of Raleigh consents to the connection and extension of the private sewer collection system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain 1 copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____
City of Raleigh Review Officer

DOCUMENT NOT CONSIDERED FINAL UNTIL ALL SIGNATURES ARE COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 5 20
PROFILE (VERTICAL)

INDEX OF SHEETS

WATER AND SEWER OWNERS ON PROJECT

(1) WATER – CITY OF RALEIGH
(2) SANITARY SEWER – WAKE COUNTY

PREPARED IN THE OFFICE OF
Kimley»Horn ©2023
NC LICENSE #F-0102
421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
PHONE: (919) 677-2000

Nathaniel Harvey, P.E. — CONSULTANT CONTACT #1
Jack Christie, E.I. — CONSULTANT CONTACT #2

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY
Docusigned by:
5/19/2025

DIVISION OF HIGHWAYS
PROJECT DELIVERY UNIT
2612 DUKE STREET
DURHAM, NC 27704
PHONE (919) 220-4600
FAX (919) 560-3371

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RACHELLE BEAUREGARD	PROJECT MANAGER
C. DAYTON MARTIN, III	UTILITY COORDINATOR
ALI KOUCHEKI, P.E.	UTILITY ENGINEER

K:\DUR_Utilities\Oil\063143 – Raleigh Water NCDOT Pgm Mgmt\Projects\HL-0008F Old Stage Rd at Ten Ten Rd\02_Planning-Design\07_Plans and Specs\pro\HL0008F_ut_tsh_uc01.dgn

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06/16/22

UTILITY CONSTRUCTION

HL-0008F
UC-02

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

DESIGNED BY:
DRAWN BY:
CHECKED BY:
APPROVED BY:
REVISED:

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

- Water Line (Sized as Shown) — WL
- 11¼ Degree Bend
- 22½ Degree Bend
- 45 Degree Bend
- 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 — PFH
- Relocate Fire Hydrant — REH
- Remove Fire Hydrant — REM FH
- Water Meter — PWM
- Relocate Water Meter — RWM
- Remove Water Meter — REM WM
- Water Pump Station — PS(W)
- RPZ Backflow Preventer — PBPZ
- DCV Backflow Preventer — PBFP
- Relocate RPZ Backflow Preventer — RBPZ
- Relocate DCV Backflow Preventer — RBFP

PROPOSED SEWER SYMBOLS

- Gravity Sewer Line (Sized as Shown) — SS
- Force Main Sewer Line (Sized as Shown) — 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) — OH POW
- Trenchless Installation — TRENCHLESS WL
- Encasement Method — OPEN CUT
- Encasement
- 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 — P
- *Underground Telephone Cable — T
- *Underground Telephone Conduit — TC
- *Underground Fiber Optics Telephone Cable — T FO
- *Underground TV Cable — TV
- *Underground Fiber Optics TV Cable — TV FO
- *Underground Gas Pipeline — G
- Aboveground Gas Pipeline — A/G Gas G
- *Underground Water Line — W
- Aboveground Water Line — A/G Water W
- *Underground Gravity Sanitary Sewer Line — SS
- Aboveground Gravity Sanitary Sewer Line — A/G Sanitary Sewer SS
- *Underground SS Forced Main Line — FSS
- Underground Unknown Utility Line — ?UTL
- SUE Test Hole
- Water Meter
- Water Valve
- Fire Hydrant
- Sanitary Sewer Cleanout

*For Existing Utilities

- Utility Line Drawn from Record (Type as Shown) — W
- Designated Utility Line (Type as Shown)

REVISIONS

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Deportment Permit # N/A

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Deportment Permit # W-4148

The City of Raleigh consents to the connection and extension of the private sewer collection system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Deportment Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval _____

City of Raleigh Review Officer

Docusign Envelope ID: 037DC515-081F-4860-87AA-DCAD4B692461

05/05/22

UTILITY CONSTRUCTION

NCDOT GENERAL UTILITY 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 POTABLE WATER UTILITIES BELONG TO THE CITY OF RALEIGH. THE EXISTING SANITARY SEWER UTILITIES BELONG TO WAKE COUNTY.

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

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT AND THE UTILITY OWNER 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 A MINIMUM OF ONE WEEK PRIOR TO SERVICE INTERRUPTIONS AND TESTING. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

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

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

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

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

PROJECT SPECIFIC UTILITY NOTES:

1. ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT ITS EXPENSE, UNLESS PREVIOUSLY OBTAINED BY THE OWNER AND PROVIDED AT THE PRECONSTRUCTION CONFERENCE.

2. DEVIATION FROM THESE PLANS AND NOTES WITHOUT THE PRIOR WRITTEN CONSENT OF THE UTILITY OWNER OR THEIR REPRESENTATIVE OR THE ENGINEER MAY BE CAUSE FOR THE WORK TO BE UNACCEPTABLE.

3. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY SHOULD ANY FIELD CONDITIONS BE ENCOUNTERED THAT VARY FROM THE INFORMATION PROVIDED IN THE CONTRACT DOCUMENTS. ANY NECESSARY FIELD REVISIONS ARE SUBJECT TO REVIEW & APPROVAL OF AN AMENDED PLAN &/OR PROFILE BY THE UTILITY OWNER PRIOR TO CONSTRUCTION.

4. CONTRACTOR SHALL HOLD AN ON-SITE PRECONSTRUCTION MEETING WITH THE OWNER AND NCDOT AND SHALL DETAIL THE INTENDED INSTALLATION CLEANING, TESTING, AND CONNECTION PLAN. OWNER WILL PROVIDE INSPECTIONS CONTACT INFORMATION. PRECONSTRUCTION MEETING SHALL BE SCHEDULED TO TAKE PLACE AT LEAST 7 DAYS PRIOR TO COMMENCING UTILITY CONSTRUCTION WORK.

5. UNLESS OTHERWISE INDICATED, ALL PROFILE ELEVATIONS ARE ALONG THE PIPE CENTERLINE.

6. CONTRACTOR SHALL NOTIFY PROPERTY OWNERS AND TENNANTS AT LEAST 7 DAYS PRIOR TO CONSTRUCTION THAT UTILITY CONSTRUCTION ACTIVITY WILL TAKE PLACE IN THEIR AREA.

7. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS FOR ALL UTILITY CONSTRUCTION PRIOR TO PLACING THE PIPELINE(S) IN SERVICE (SEE UC SPECIAL PROVISIONS).

8. PIPE ALIGNMENT SHOWN IS BASED ON STANDARD DUCTILE IRON MECHANICAL JOINT FITTINGS. JOINT DEFLECTIONS SHALL NOT EXCEED 75 PERCENT OF MANUFACTURER'S RECOMMENDED DEFLECTION. CONTRACTOR SHALL ADJUST PIPELINE ALIGNMENT AND DEFLECT JOINTS AS NECESSARY TO ACCOMMODATE THE STANDARD BENDS SHOWN.

9. MINIMUM PIPE COVER FOR DISTRIBUTION WATER MAINS SHALL BE 3 FEET.

10. ALL PRESSURIZED FITTINGS SHALL BE DUCTILE IRON RESTRAINED MECHANICAL JOINT WITH PRESSURE RATING EQUAL TO OR HIGHER THAN HOST PIPE, UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

11. ALL MECHANICAL JOINTS SHALL BE FITTED WITH WEDGE-TYPE MECHANICAL RESTRAINT ACCESSORY KITS DESIGNED FOR THE INTENDED USE AND MATERIAL, AS APPROVED BY UTILITY OWNER.

12. ALL POTABLE WATER UTILITY WORK SHALL CONFORM TO APPLICABLE REQUIREMENTS OF THE CITY OF RALEIGH PUBLIC UTILITIES HANDBOOK, THE UC PLANS, AND THE UC SPECIAL PROVISIONS.

REVISIONS

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-4148

The City of Raleigh consents to the connection and extension of the private sewer collection system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

City of Raleigh Review Officer

HL-0008F

UC-03

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY

Docusigned by: Nathaniel Harvey
5/13/2025

DESIGNED BY: NLH

DRAWN BY: JHC

CHECKED BY: NLH

APPROVED BY:

REVISED:

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

Docusign Envelope ID: 037DC515-081F-4860-87AA-DCAD4B692461

06/16/22

PROJECT TYPICAL DETAILS

UTILITY CONSTRUCTION

HL-0008F

UC-3A

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

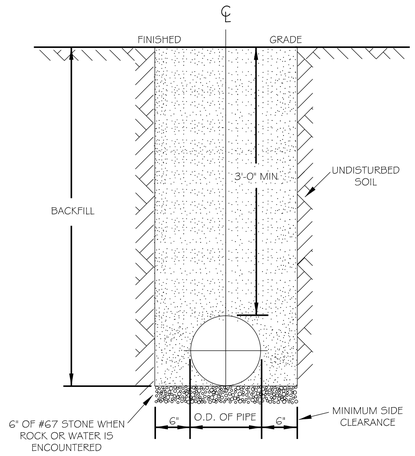
UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY 06/16/2025

DESIGNED BY: NLH
DRAWN BY: JHC
CHECKED BY: NLH
APPROVED BY:
REVISED:

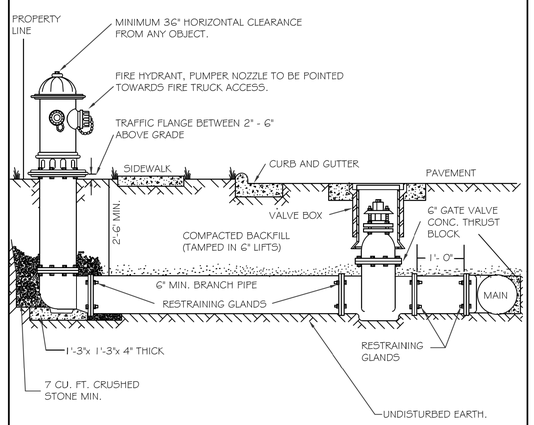
UTILITIES ENGINEERING SEC.
PHONE:(919)707-6690
FAX:(919)250-4151



NOTES:
1. TRENCHES REQUIRING SHORING AND BRACING, DIMENSIONS SHALL BE TAKEN FROM THE INSIDE FACE OF THE SHORING AND BRACING.
2. NO ROCKS OR BOULDERS 4" OR LARGER TO BE USED IN BACKFILL.
3. ALL BACKFILL MATERIAL SHALL BE SUITABLE NATIVE MATERIAL.
4. BACKFILL SHALL BE TAMPED IN 6" LIFTS.
5. ACHIEVE 95% COMPACTION IN BACKFILL.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
TRENCH BOTTOM DIMENSIONS & BACKFILLING REQUIREMENTS FOR DUCTILE IRON

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-3	D.W.C.	9-3-99	ABB	2-15-05
	RRH	3-31-00	J.P.S.	10-29-10

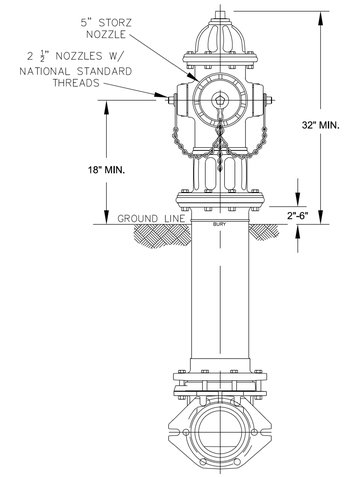


NOTES:
1. FIRE HYDRANT SHALL BE AS MANUFACTURED: MUELLER, AMERICAN DARLING, KENNEDY, M&H, WATEROUS, CLOW, EAST JORDAN IRON WORKS, OR US PIPE.
2. BRANCH PIPE SHALL BE DUCTILE IRON AWWA C150-96
3. 6" GATE VALVE SHALL BE AWWA C500-86 OPEN LEFT
4. STEEL RODS AND BOLTS SHALL BE $\frac{3}{4}$" HOT DIPPED GALVANIZED
5. FIRE HYDRANTS WILL BE INSTALLED IN TRUE VERTICAL POSITION RODS SHALL NOT BE COUPLED MORE THAN ONCE. IF THE LENGTH FROM THE VALVE TO THE HYDRANT EXCEEDS 20' THEN A MECHANICAL RESTRAINING GLAND WITH A REBAR CAGE SHALL BE INSTALLED NO MORE THAN 10' FROM HYDRANT AND POURED IN CONCRETE. FIRE HYDRANTS TO BE LOCATED IN ROW OR 2 FOOT EASEMENT ADJACENT TO ROW

ANYTIME SITE WORK, CONSTRUCTION, ROAD WORK, OR ANY OTHER WORK CHANGES THE GRADE OF THE FIRE HYDRANT, THE PERSON RESPONSIBLE FOR THE WORK IS RESPONSIBLE FOR ADJUSTING THE FIRE HYDRANT TO STAY WITHIN COMPLIANCE.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD FIRE HYDRANT INSTALLATION DETAIL

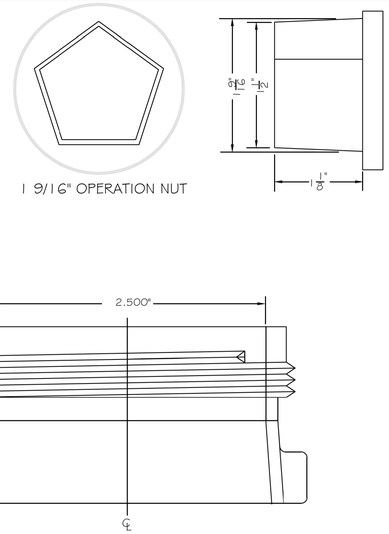
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-4	ABB	4-6-04	PAP	2/17/09
	DHL	2/14/06		



NOTES:
1. ALL PUBLIC FIRE HYDRANTS IN THE CITY OF RALEIGH AND THE MERGER TOWNS OF GARNER, ROLESVILLE, WAKE FOREST, KNIGHTDALE, WENDELL AND ZEBULON SHALL BE PAINTED CHROME YELLOW WITH HIGH REFLECTIVE ALUMINUM SILVER CAPS, BONNETS AND OPERATING NUTS.
2. ALL PRIVATE FIRE HYDRANTS SHALL BE RED.

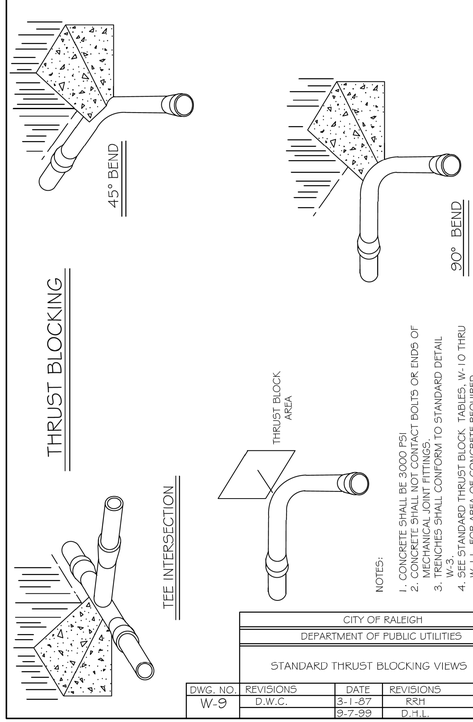
CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
RALEIGH, GARNER, KNIGHTDALE, ROLESVILLE WAKE FOREST, WENDELL & ZEBULON
STANDARD FIRE HYDRANT WITH 5" STORZ PUMPER NOZZLE

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-5	MAB	6-30-16		
	KAT	9-15-17		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
HYDRANT OPERATING NUT AND 2 1/2" OUTLET THREADS

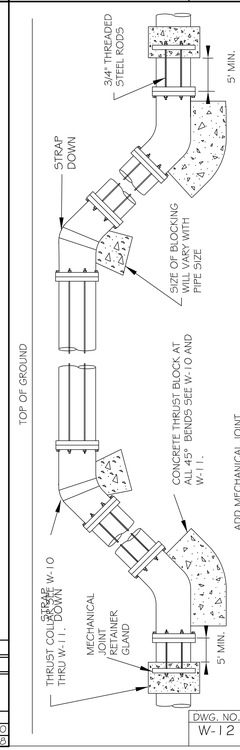
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-6	RRH	3-31-00	DHL	2-18-08
	A.B.B	4-13-04	J.P.S	11-1-10



NOTES:
1. CONCRETE SHALL BE 3000 PSI
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS.
3. TRENCHES SHALL CONFORM TO STANDARD DETAIL W-3.
4. SEE STANDARD THRUST BLOCK TABLES, W-10 THRU W-11, FOR AREA OF CONCRETE REQUIRED.
5. ALL BENDS AND INTERSECTIONS SHALL HAVE CONCRETE THRUST BLOCKING.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD THRUST BLOCKING VIEWS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-9	D.W.C.	3-1-87	RRH	3-31-00
		9-7-99	D.H.L.	6-18-08



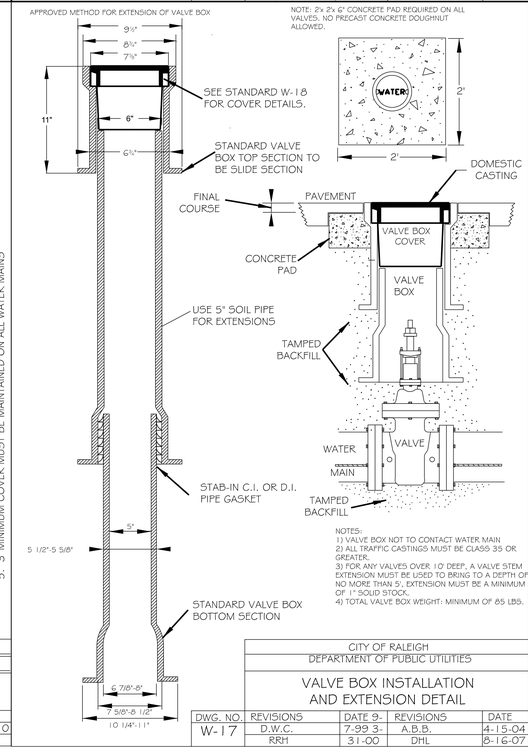
ROD REQUIREMENTS

SIZE OF 45° BEND	STATIC THRUST IN POUNDS	NO. OF RODS REQUIRED
6"	4,328	2
8"	7,694	4
12"	17,312	4
16"	30,776	8
24"	69,252	8

GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3" MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
STANDARD VERTICAL BEND

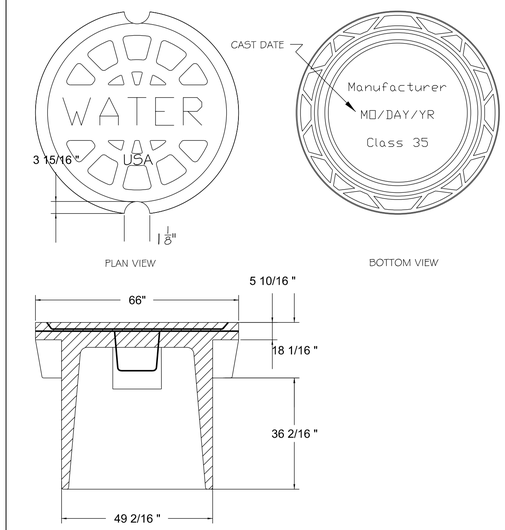
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-12	ABB	4-6-04	J.P.S.	11-1-10
	D.H.L.	6-18-08		



NOTES:
1) VALVE BOX NOT TO CONTACT WATER MAIN
2) ALL TRAFFIC CASTINGS MUST BE CLASS 35 OR GREATER.
3) FOR ANY VALVES OVER 10' DEEP, A VALVE STEM EXTENSION MUST BE USED TO BRING TO A DEPTH OF NO MORE THAN 5'. EXTENSION MUST BE A MINIMUM OF 1" SOLID STOCK.
4) TOTAL VALVE BOX WEIGHT: MINIMUM OF 85 LBS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
VALVE BOX INSTALLATION AND EXTENSION DETAIL

DWG. NO.	REVISIONS	DATE 9-	REVISIONS	DATE
W-17	D.W.C.	7-99 3-	A.B.B.	4-15-04
	RRH	31-00	DHL	8-16-07



NOTE 1 - "WATER" LETTERING MUST BE 1" RAISED (RECESSED FLUSH)
NOTE 2 - VALVE COVER SHALL BE DOMESTICALLY CAST.
NOTE 3 - COVER MUST HAVE A MINIMUM WEIGHT OF 25 POUNDS.
NOTE 4 - COVER MUST BE CLASS 35 OR GREATER.
NOTE 5 - COVER MUST MEET OR EXCEED AASHTO H-20 LOAD REQUIREMENTS.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES
5 1/4" VALVE BOX DROP LID WITH 4" SKIRT

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-18				

Water and Sewer Permits if applicable

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-4148

The City of Raleigh consents to the connection and extension of the City's Public Transportation system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

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City of Raleigh Development Approval _____

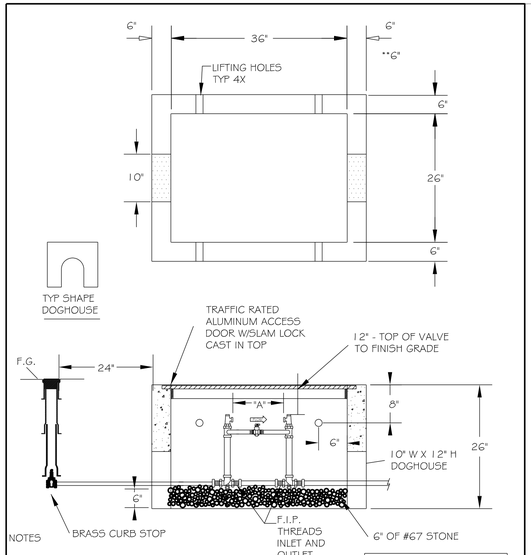
City of Raleigh Review Officer

REVISIONS

Docusign Envelope ID: 037DC515-081F-4860-87AA-DCAD4B692461

02/02/22

PROJECT TYPICAL DETAILS



NOTES

1. METER AS MANUFACTURED BY SENSUS OR NEPTUNE.
2. BACKFILL TAMPED IN 6" LIFTS.
3. REINFORCEMENT: #4 @ 6" OCEW
4. CONCRETE: 4,000 PSI @ 28 DAYS
5. ALL RPZ BACKFLOW PREVENTION DEVICES MUST BE INSTALLED PRIOR TO METER BEING SET.
6) ALL COPPER SETTERS ARE TO HAVE A BALL TYPE SHUT OFF VALVE ON BOTH SIDES OF COPPER SETTER WITH HIGH RISE BYPASS THAT IS MANUFACTURED BY FORD, MUELLER, OR AY McDONALD. (NO EXCEPTIONS)

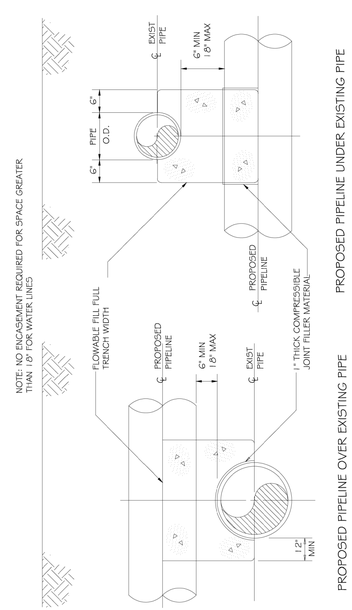
DIMENSION "A"	
1 1/2" METER	13 1/4"
2" METER	17 1/4"

** TRAFFIC RATED VAULT WALL THICKNESS

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

TYPICAL 1 1/2"- 2" WATER METER BOX INSTALLATION

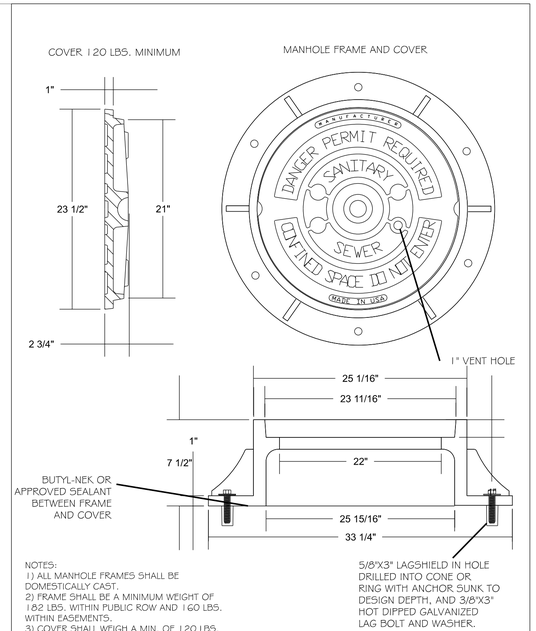
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-31	A.B.B.	8-17-04	J.F.S.	11-4-10
	D.H.L.	6-18-08		



CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

CONCRETE CRADLE PROTECTION FOR WATER LINE CROSSINGS

DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
W-41	DHL	2-20-08		



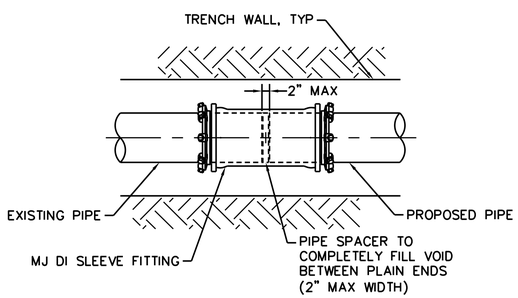
NOTES:
1) ALL MANHOLE FRAMES SHALL BE DOMESTICALLY CAST.
2) FRAME SHALL BE A MINIMUM WEIGHT OF 182 LBS. WITHIN PUBLIC ROW AND 160 LBS. WITHIN EASEMENTS.
3) COVER SHALL WEIGH A MIN. OF 120 LBS.
4) ALL MANHOLE FRAMES OUTSIDE OF PAVED SURFACES SHALL BE BOLTED TO THE CONE SECTION OR RING WITH A MINIMUM OF 4 BOLTS PER FRAME.

5/8"X3" LAGSHIELD IN HOLE DRILLED INTO CONE OR RING WITH ANCHOR SUNK TO DESIGN DEPTH, AND 3/8"X3" HOT DIPPED GALVANIZED LAG BOLT AND WASHER.

CITY OF RALEIGH
DEPARTMENT OF PUBLIC UTILITIES

STANDARD MANHOLE COVER

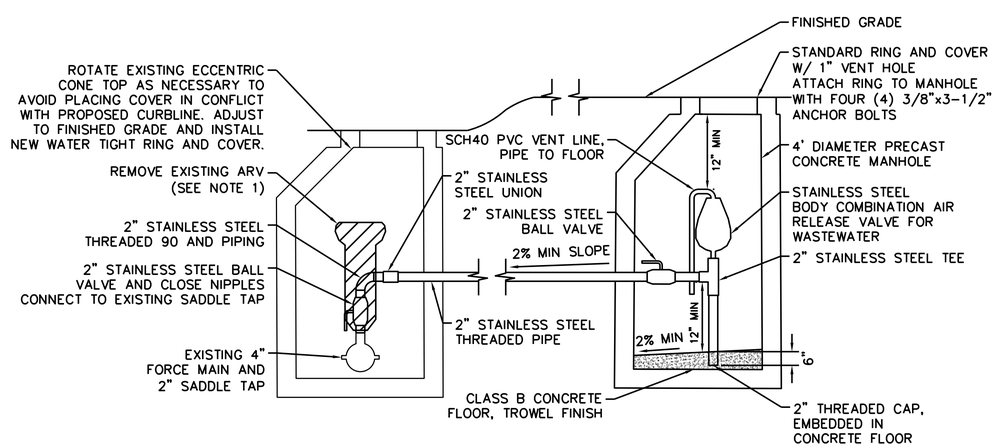
DWG. NO.	REVISIONS	DATE	REVISIONS	DATE
S-25	3-1-87	3-1-87	A.B.B.	2-9-05
	RRH	3-30-00	D.H.L.	6-18-08



NOTES:

1. SLEEVES SHALL BE DUCTILE IRON MECHANICAL JOINT (DI MJ) OF THE SAME OR HIGHER PRESSURE RATING AS THE HOST PIPE.
2. RESTRAINT GLANDS SHALL BE DESIGNED FOR THE INTENDED USE AND SHALL CONSIST OF MULTIPLE GRIPPING WEDGES INCORPORATED INTO A FOLLOWER GLAND AND BOLT-ACTUATED BY TORQUE-LIMITING TWIST OFF NUTS.
2. RESTRAINT GLANDS SHALL NOT BE USED ON CAST IRON PIPE.

1	RESTRAINED MJ SOLID SLEEVE
UC-3B	SCALE: N.T.S.



NOTES:
1. COORDINATE SHUTDOWN OF FORCE MAIN WITH WAKE COUNTY TO FACILITATE REMOVAL OF EXISTING AIR RELEASE VALVE AND INSTALLATION OF PROPOSED PIPING.
2. USE TYPE 304 STAINLESS STEEL FOR ALL PROPOSED PIPING AND FITTINGS. USE ANTI-SEIZE COMPOUND ON ALL THREADED JOINTS.

2	RELOCATE AIR RELEASE VALVE
UC-3B	SCALE: N.T.S.

HL-0008F
UC-3B

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY
2/2/2022

DESIGNED BY: NLH
DRAWN BY: JHC
CHECKED BY: NLH
APPROVED BY:
REVISED:

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

REVISIONS

Water and Sewer Permits (if applicable)

The City of Raleigh consents to the connection and extension of the City's Public Sewer System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # N/A

The City of Raleigh consents to the connection and extension of the City's Public Water System as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook. City of Raleigh Public Utilities Department Permit # W-4148

The City of Raleigh consents to the connection and extension of the private sewer collection system as shown on this plan. The material and Construction methods used for this project shall conform to the standards and specifications of the City's Public Utilities Handbook.

City of Raleigh Public Utilities Department Permit # N/A

CITY OF RALEIGH - PLANS AUTHORIZED FOR CONSTRUCTION

Electronic Approval: This approval is being issued electronically. This approval is valid only upon the signature of a City of Raleigh Review Officer below. The City will retain a copy of the approved plans. Any work authorized by this approval must proceed in accordance with the plans kept on file with the City. This electronic approval may not be edited once issued. Any modification to this approval once issued will invalidate this approval.

City of Raleigh Development Approval ____

City of Raleigh Review Officer

Docusign Envelope ID: 037DC515-081F-4860-87AA-DCAD4B692461

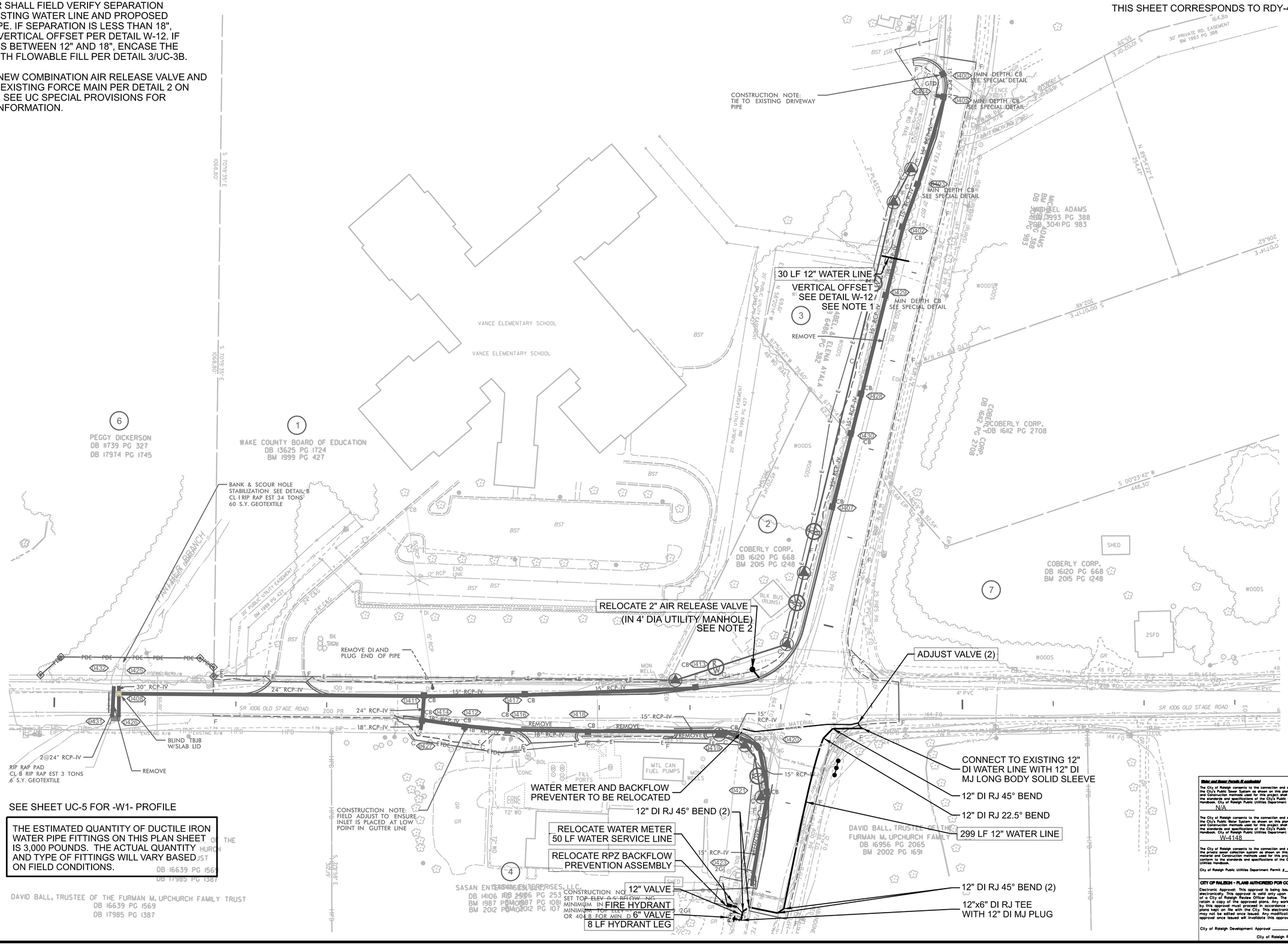
09-29-21

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY SEPARATION BETWEEN EXISTING WATER LINE AND PROPOSED DRAINAGE PIPE. IF SEPARATION IS LESS THAN 18", CONSTRUCT VERTICAL OFFSET PER DETAIL W-12. IF SEPARATION IS BETWEEN 12" AND 18", ENCASE THE CROSSING WITH FLOWABLE FILL PER DETAIL 3/UC-3B.
2. CONSTRUCT NEW COMBINATION AIR RELEASE VALVE AND CONNECT TO EXISTING FORCE MAIN PER DETAIL 2 ON SHEET UC-3B. SEE UC SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION.

UTILITY CONSTRUCTION

THIS SHEET CORRESPONDS TO RDY-4



HL-0008F

UC-04

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION PLANS ONLY

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY 9/29/2025

DESIGNED BY: NLH

DRAWN BY: JHC

CHECKED BY: NLH

APPROVED BY:

REVISED:

UTILITIES ENGINEERING SEC.

PHONE:(919)707-6690

FAX:(919)250-4151

REVISIONS

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City of Raleigh Public Utilities Department Permit # N/A

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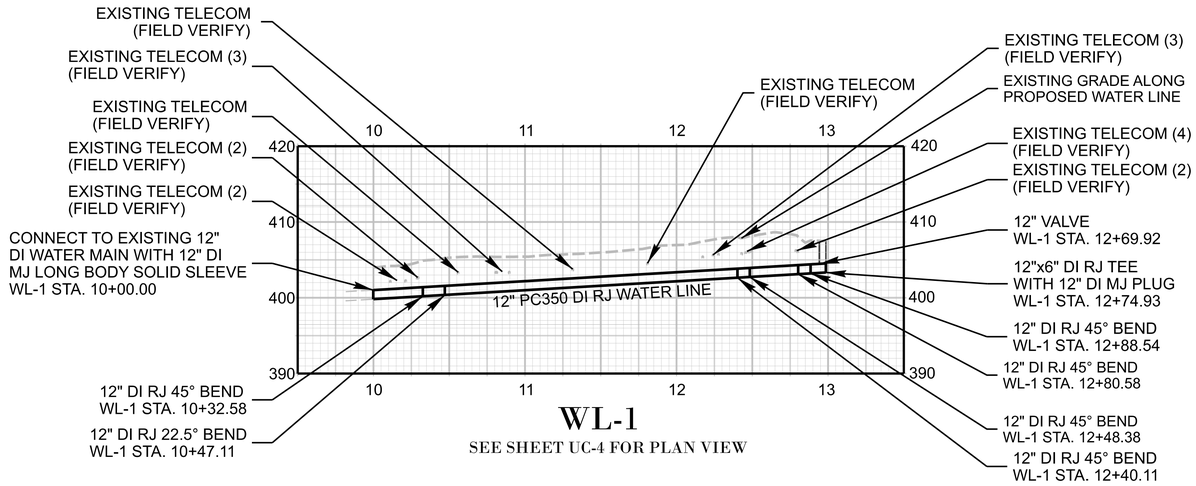
09-29-21

UTILITY CONSTRUCTION



WL-1

SEE SHEET UC-4 FOR PLAN VIEW

HL-0008F

UC-05

NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WAKE COUNTY

UTILITY DESIGN UNIT

UTILITY CONSTRUCTION
PLANS ONLY

Docusign Envelope ID: 037DC515-081F-4860-87AA-DCAD4B692461

NORTH CAROLINA PROFESSIONAL SEAL 045249 ENGINEER NATHANIEL L. HARVEY

9/29/2025

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City of Raleigh Review Officer

HL–0008F
CROSS SECTION INDEX

CROSS SECTION SUMMARY	X–1A
–L–	X–2 THRU X–9
–Y1–	X–10 THRU X–18

PROJ. REFERENCE NO.	SHEET NO.
HL-0008F	X-1A

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CROSS-SECTION SUMMARY

NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

Station L	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
10+60.00	0	0
11+00.00	0	0
11+50.00	0	0
12+00.00	3	17
12+50.00	6	12
13+00.00	4	4
13+50.00	6	32
14+00.00	10	39
14+50.00	15	39
15+00.00	23	31
15+50.00	40	29
16+00.00	37	24
16+50.00	37	20
17+00.00	33	13
17+50.00	51	2
18+00.00	112	0
18+50.00	60	1
19+00.00	10	3
19+30.00	1	0

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
13+60.00	0	0
14+00.00	25	3
14+50.00	6	11
15+00.00	7	4
15+50.00	22	1
16+00.00	29	1
16+50.00	45	0
17+00.00	62	0
17+50.00	53	0
18+00.00	56	0
18+50.00	39	0
19+00.00	27	0
19+50.00	25	1
20+00.00	32	2
20+09.62	0	0

Station Y1	Uncl. Exc. (cu. yd.)	Embt (cu. yd.)
21+61.03	33	1
22+00.00	19	1
22+50.00	11	0
23+00.00	0	0
23+25.00	0	0

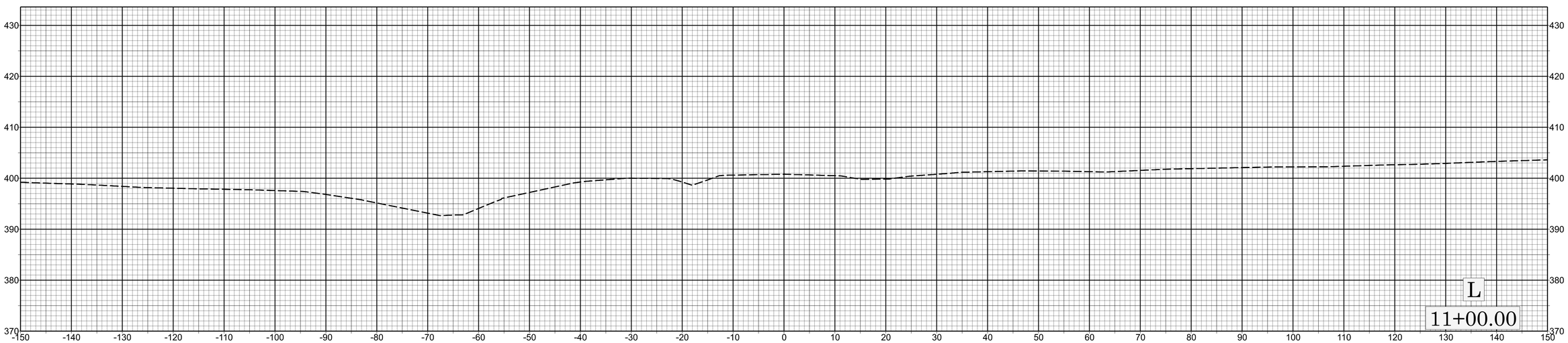
Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".

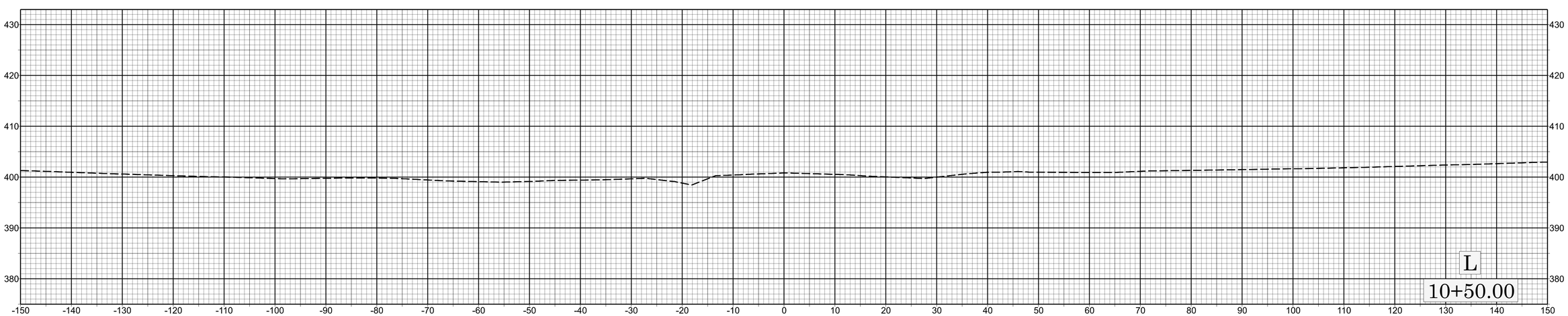
5/26/20

0 10 20

HL-0008F

X-02





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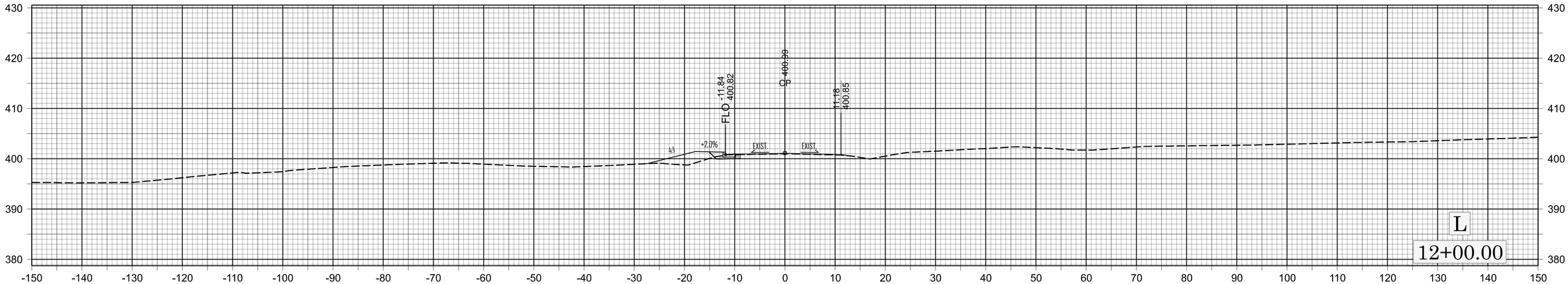
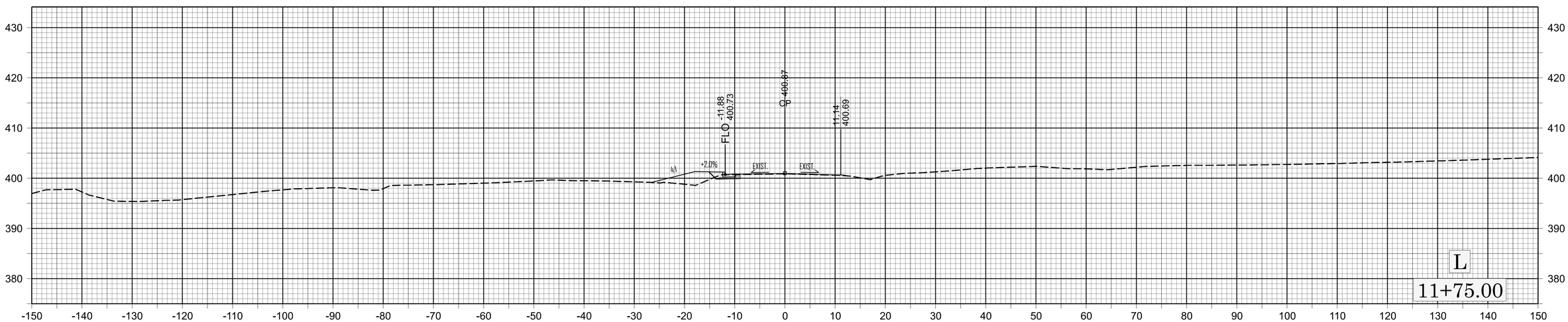
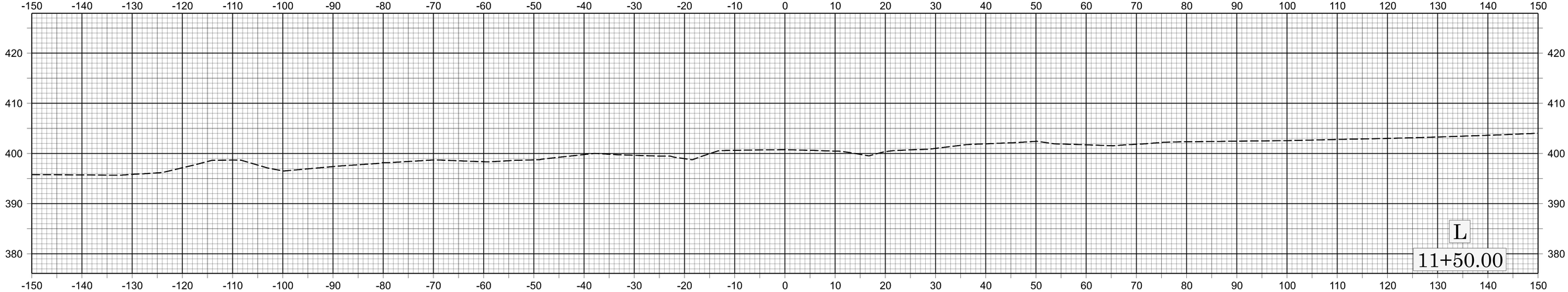
X-03







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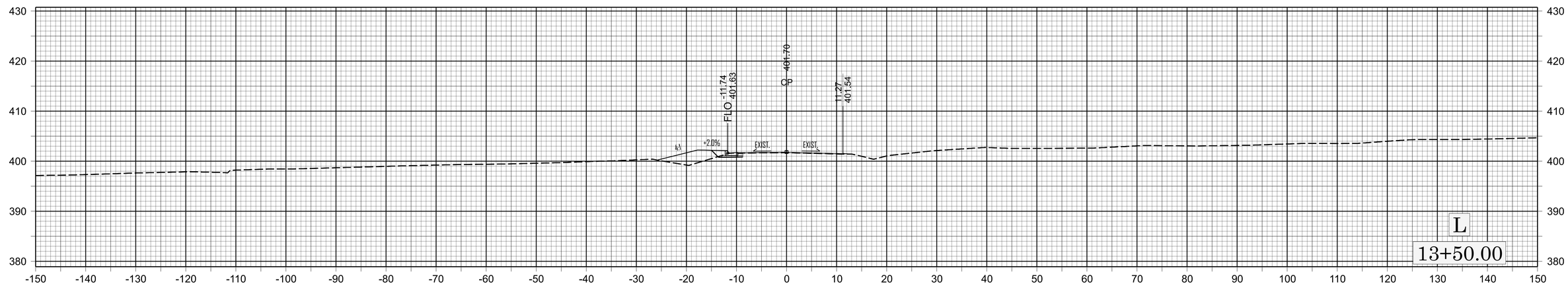
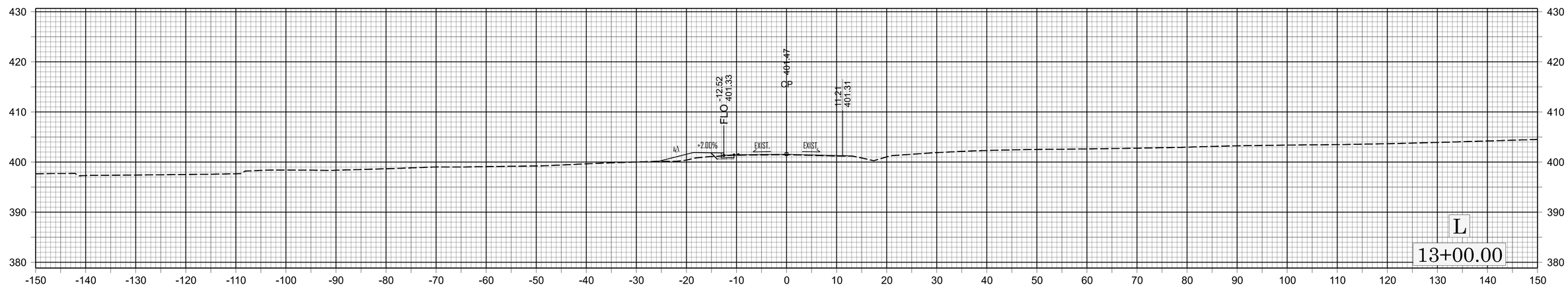
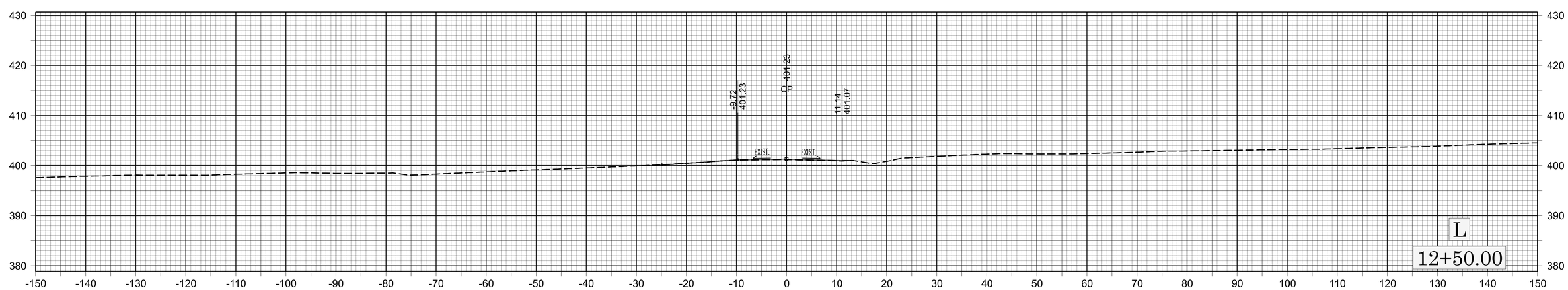
X-04







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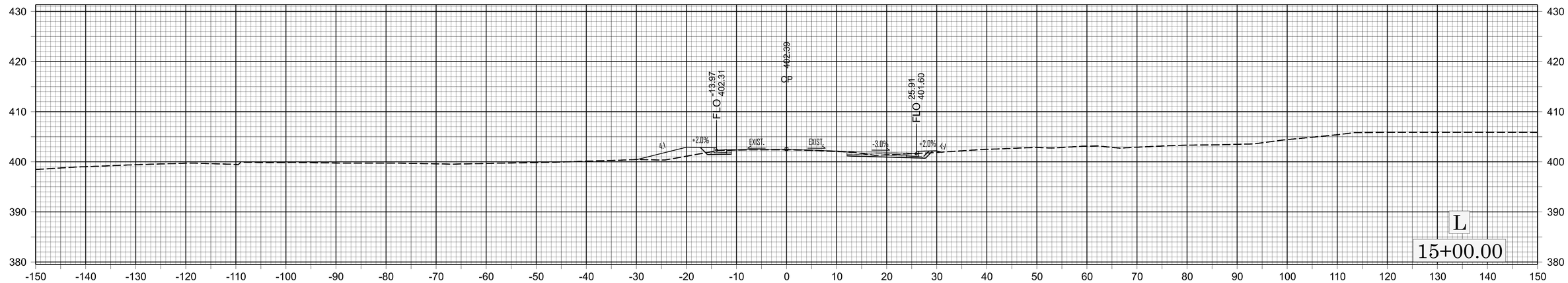
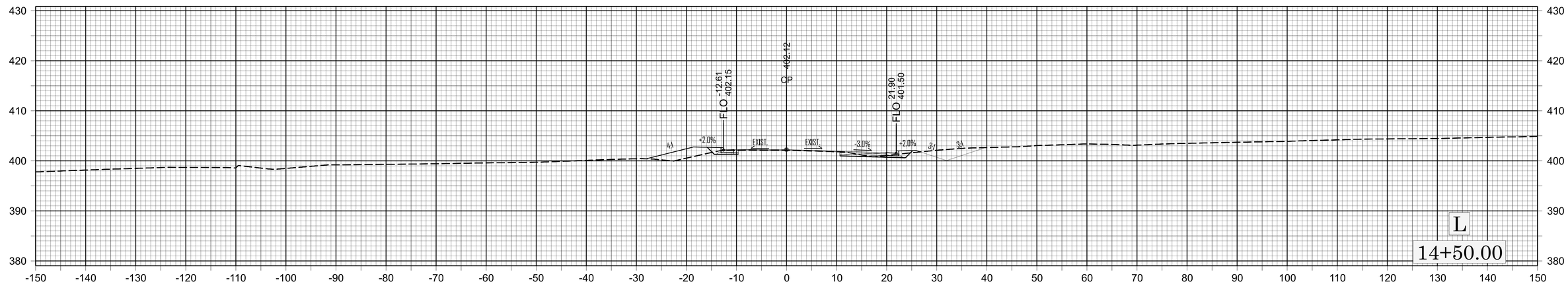
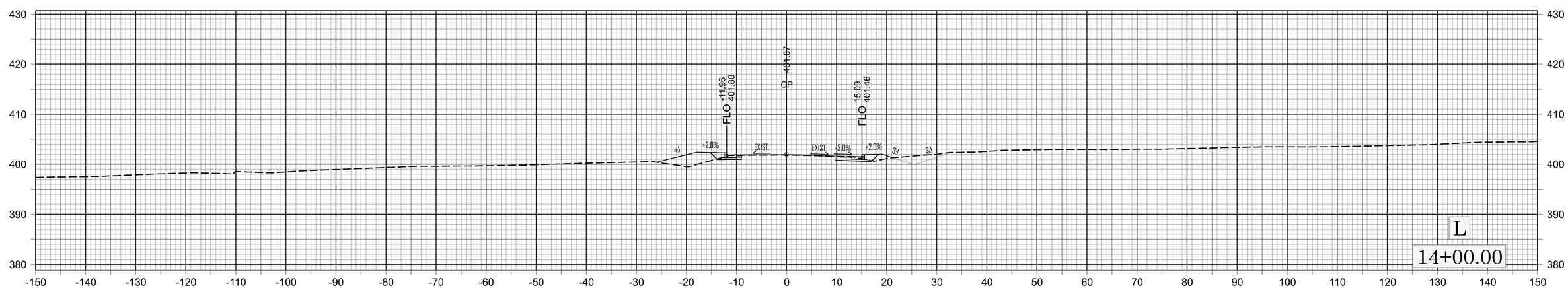
X-05







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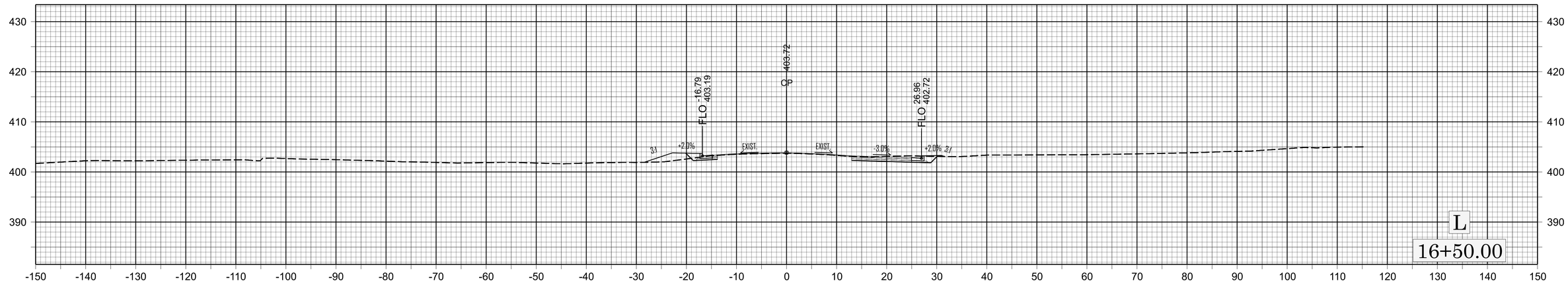
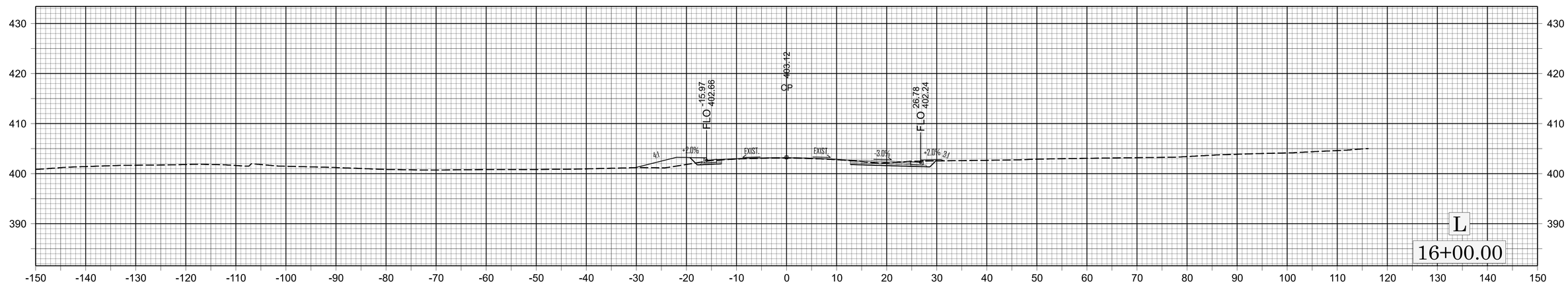
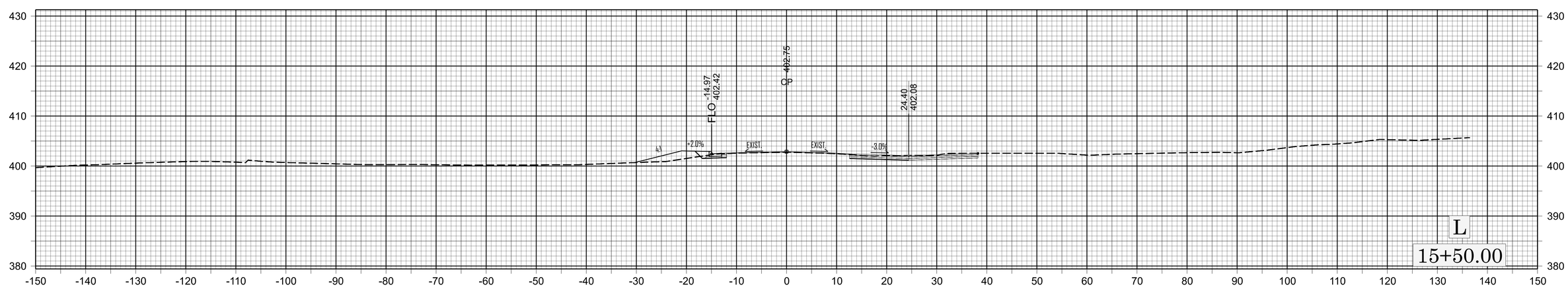
X-06







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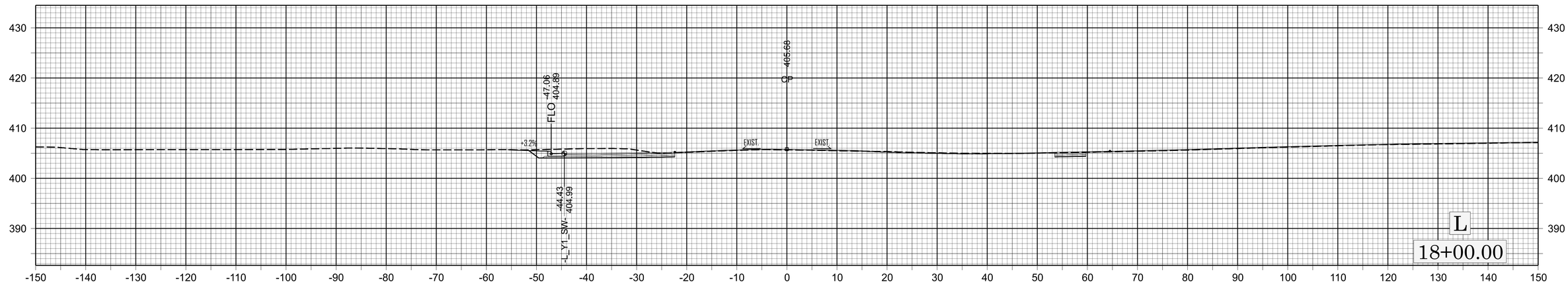
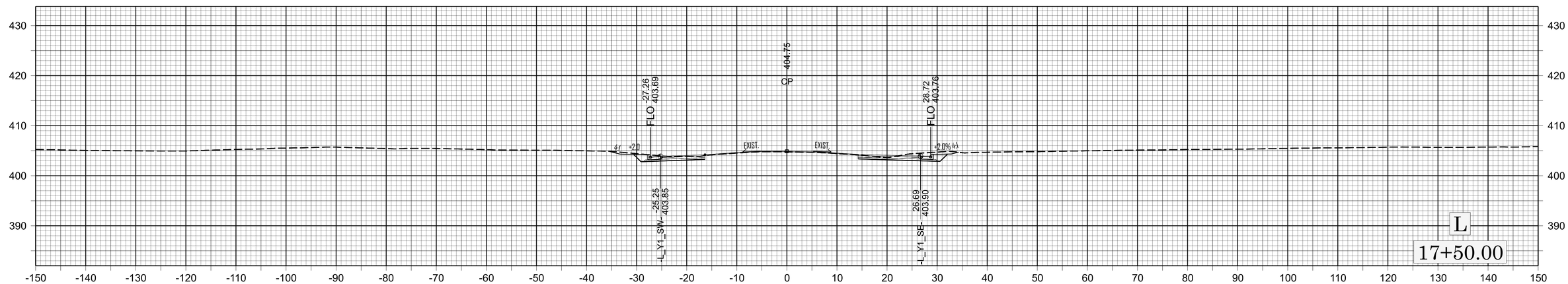
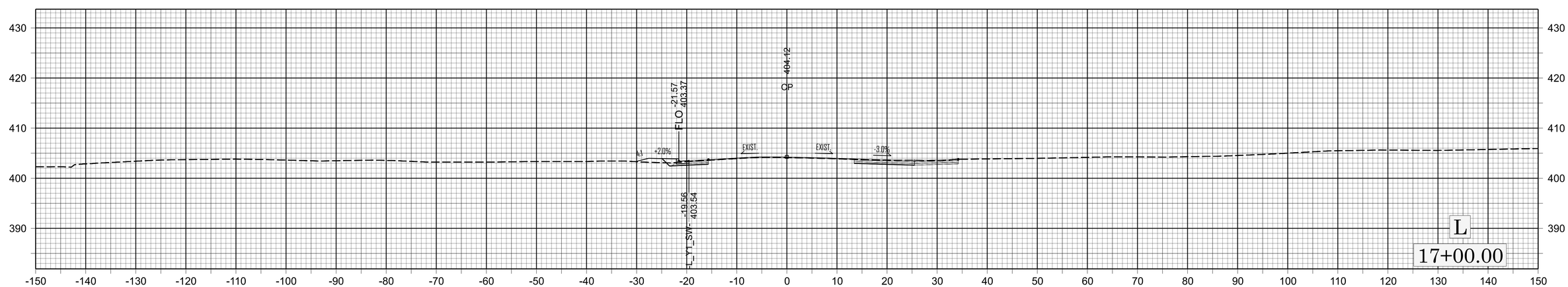
X-07







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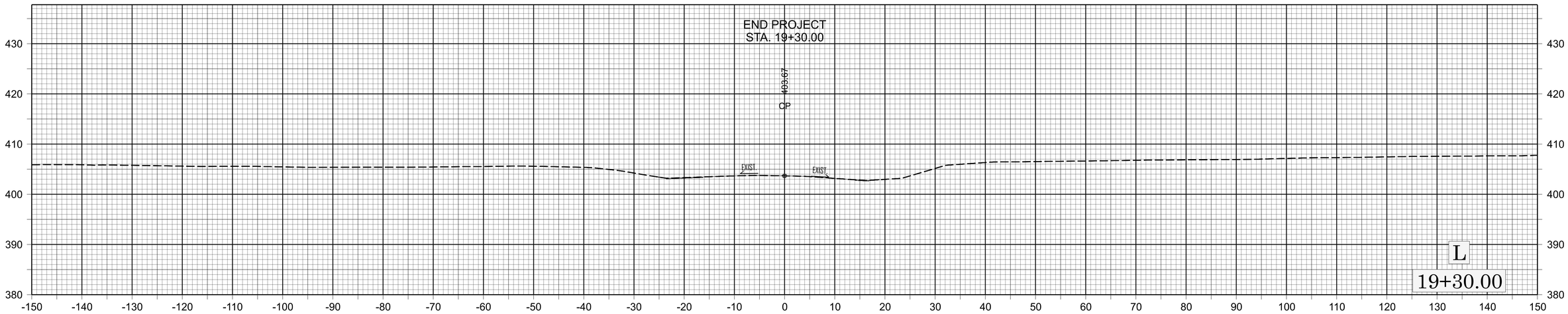
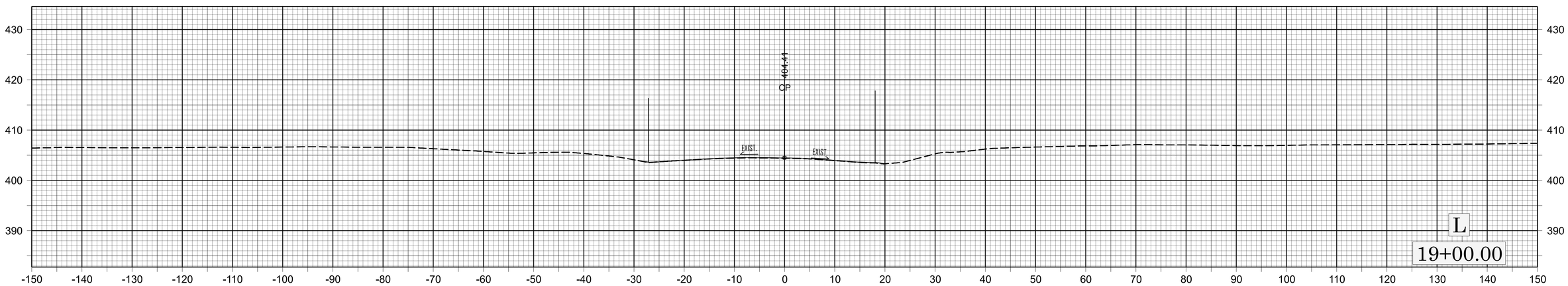
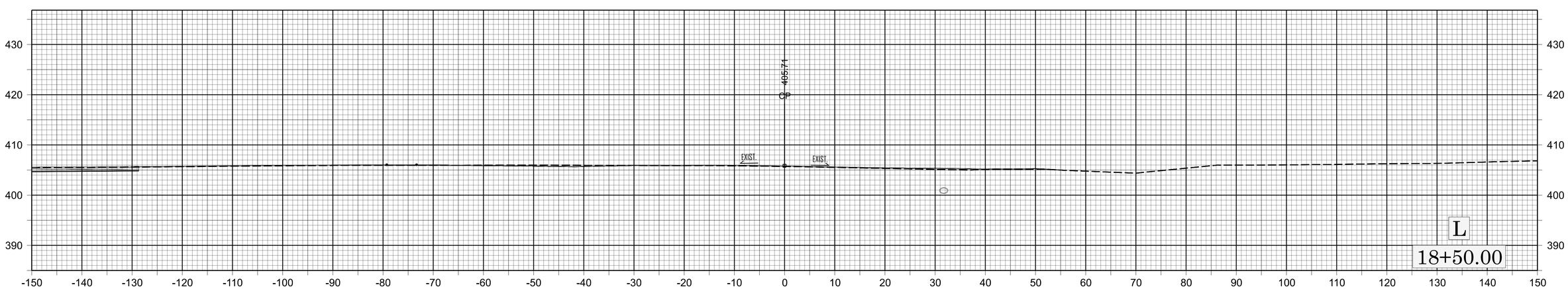
X-08







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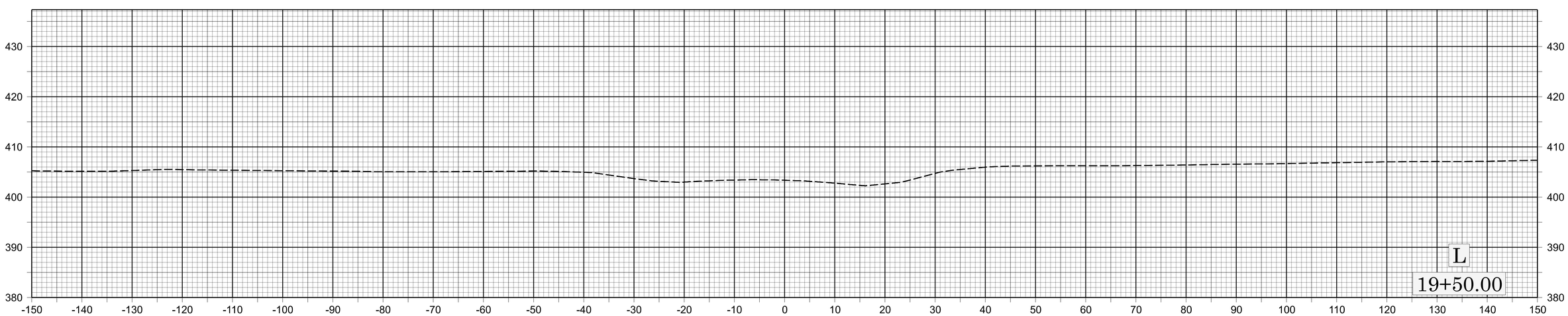

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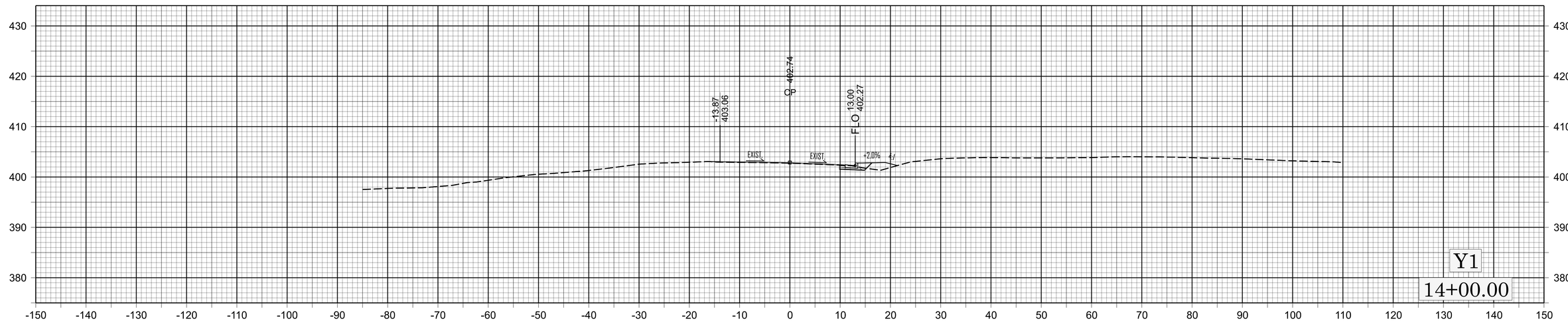
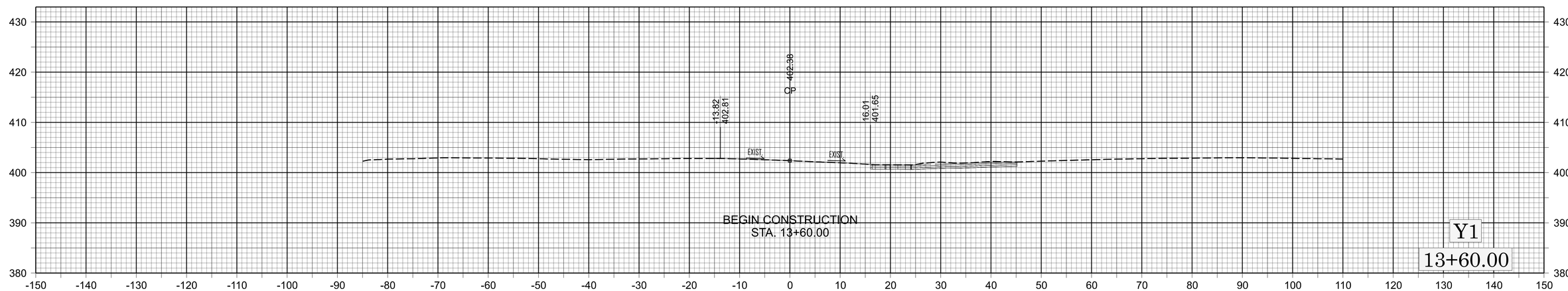
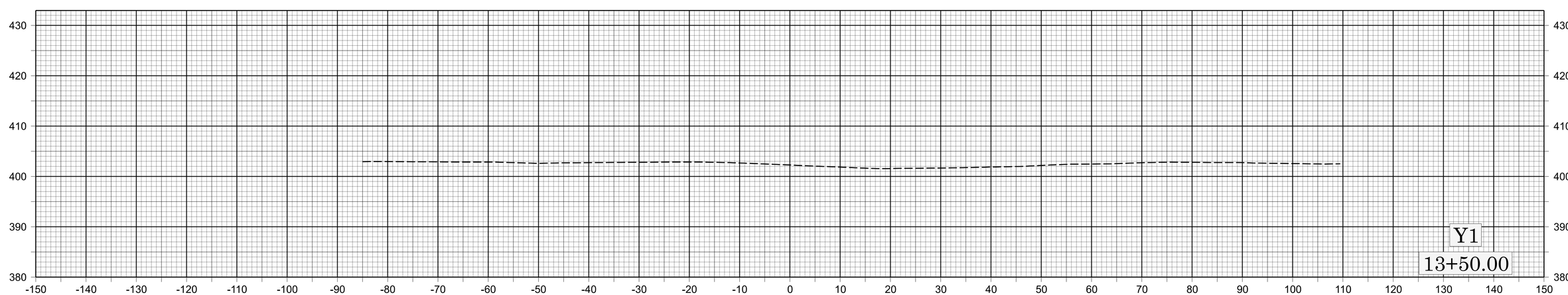
X-10







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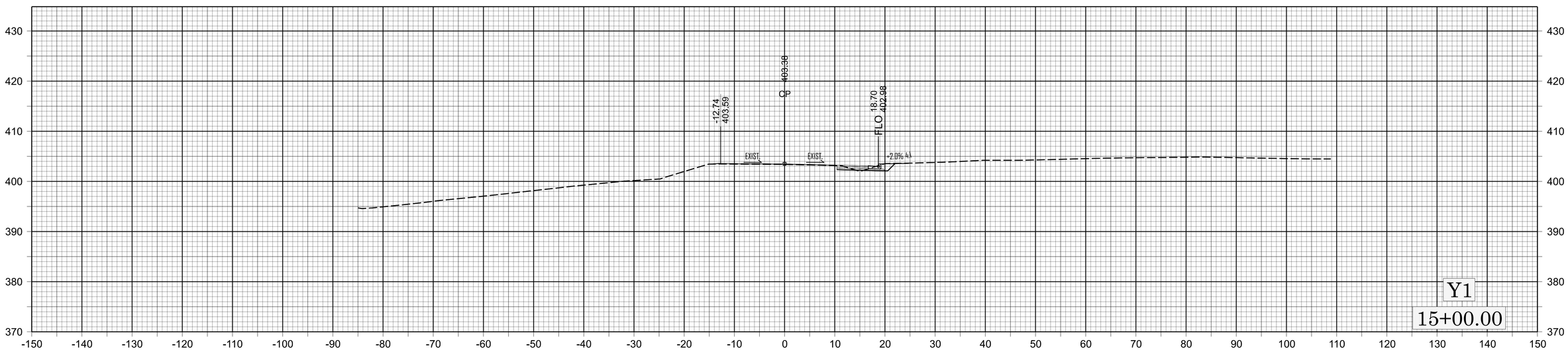
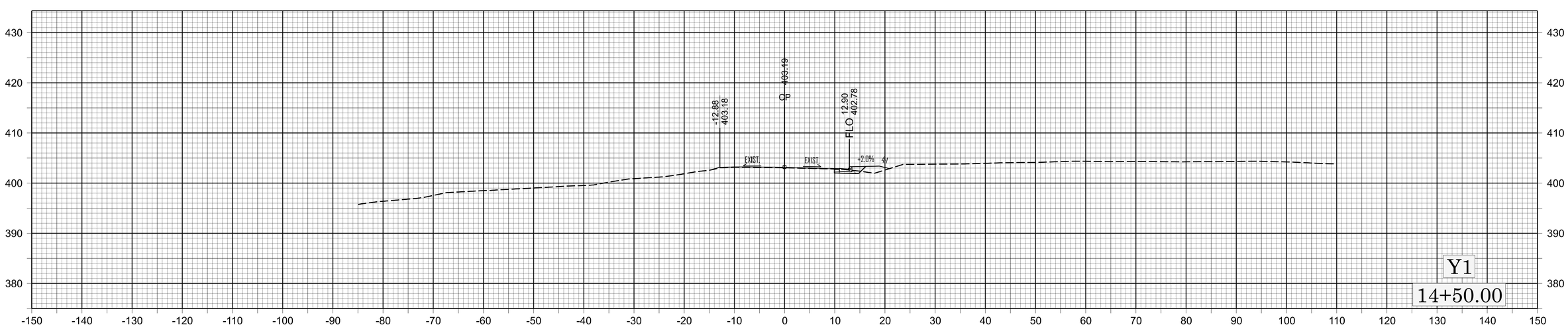
HL-0008F

X-11





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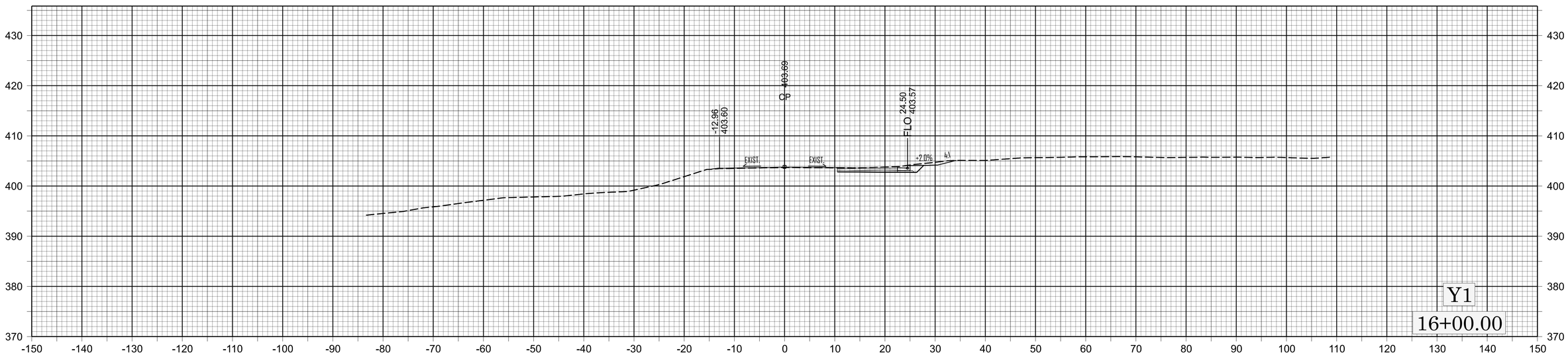
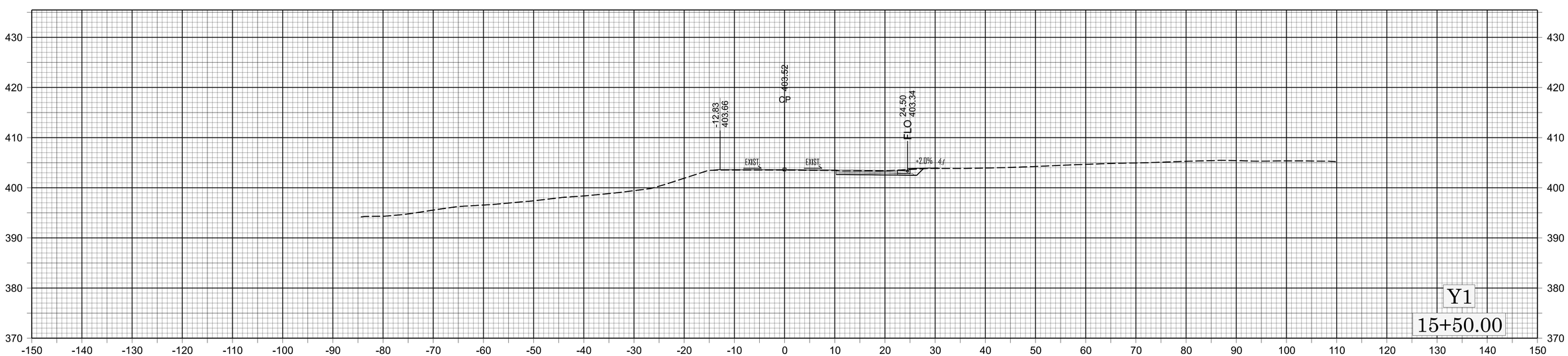
X-12





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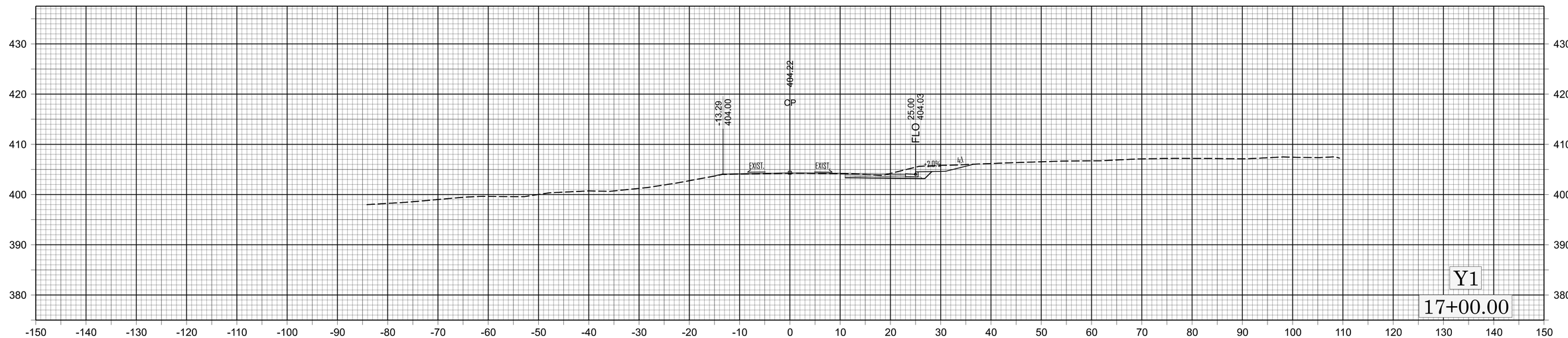

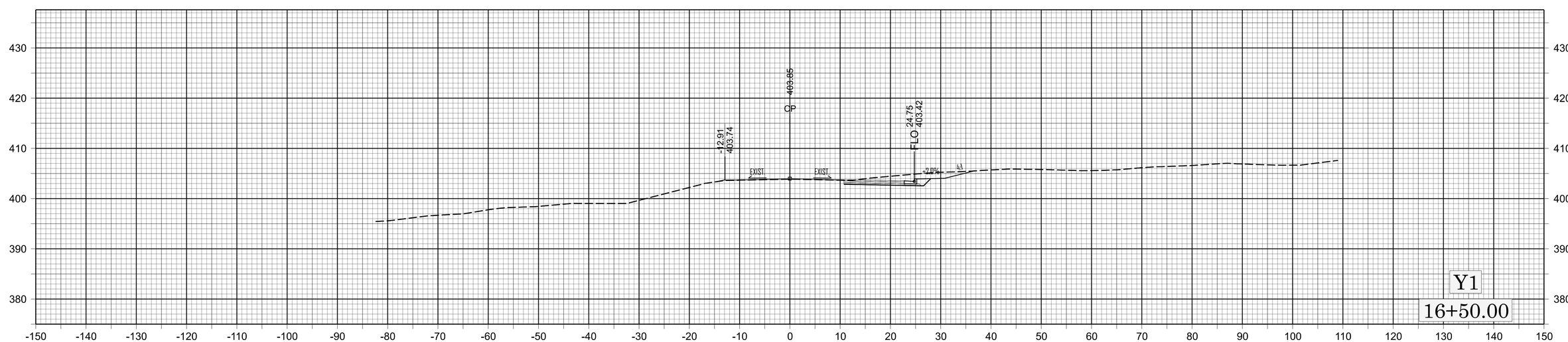

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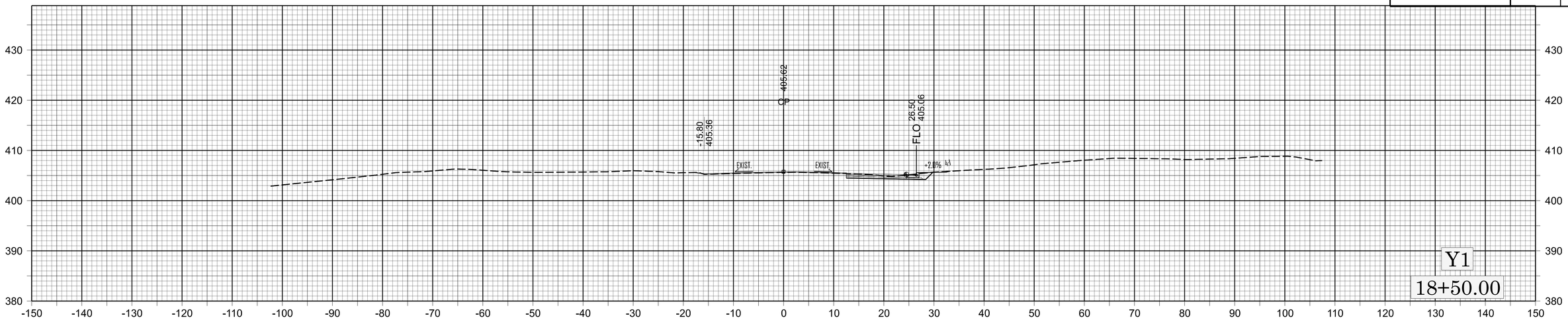
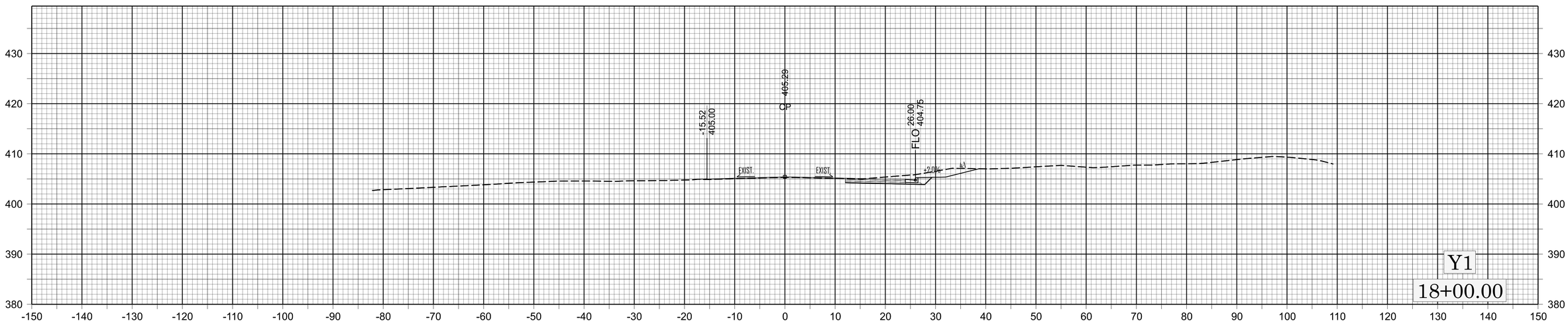
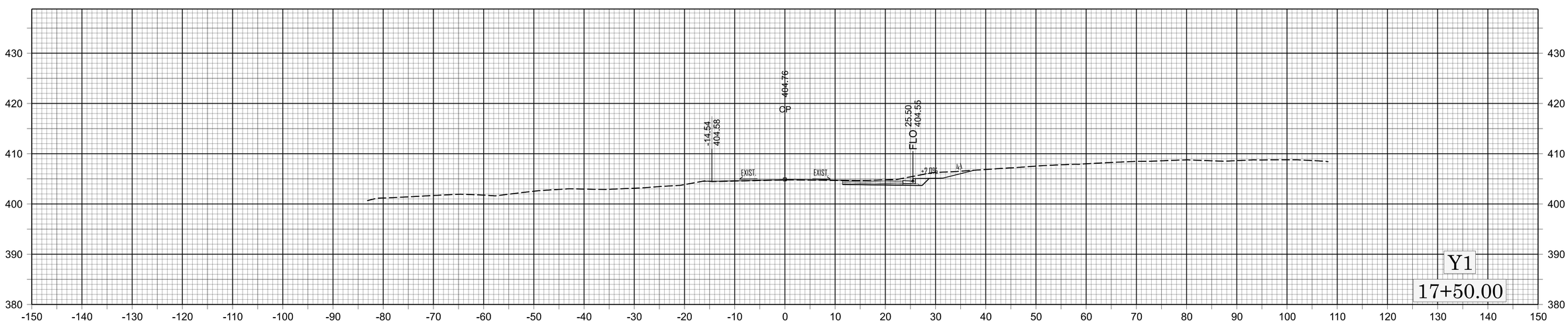
X-14







5/26/20

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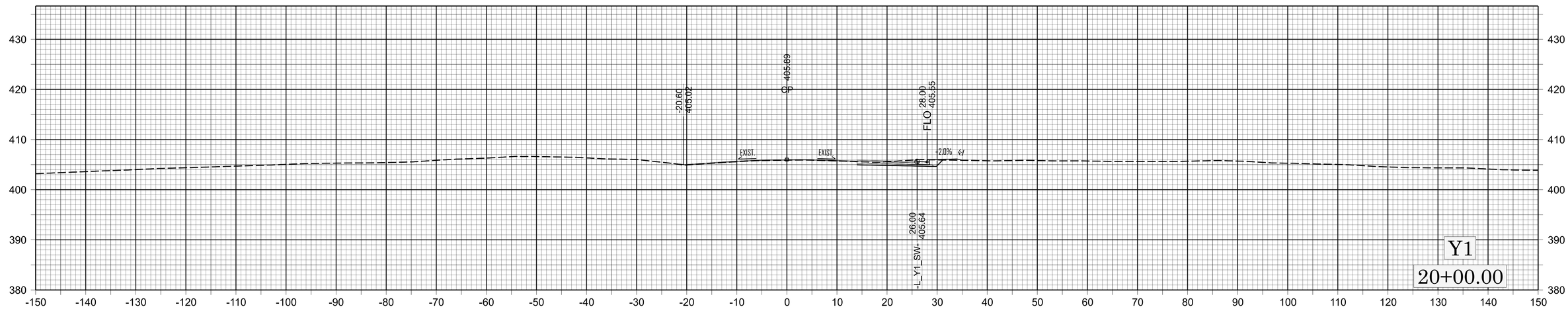

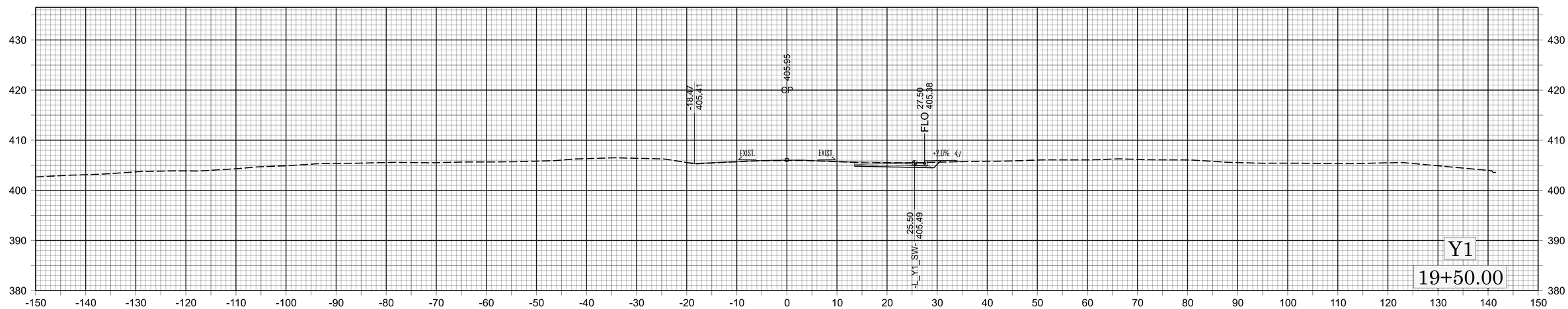

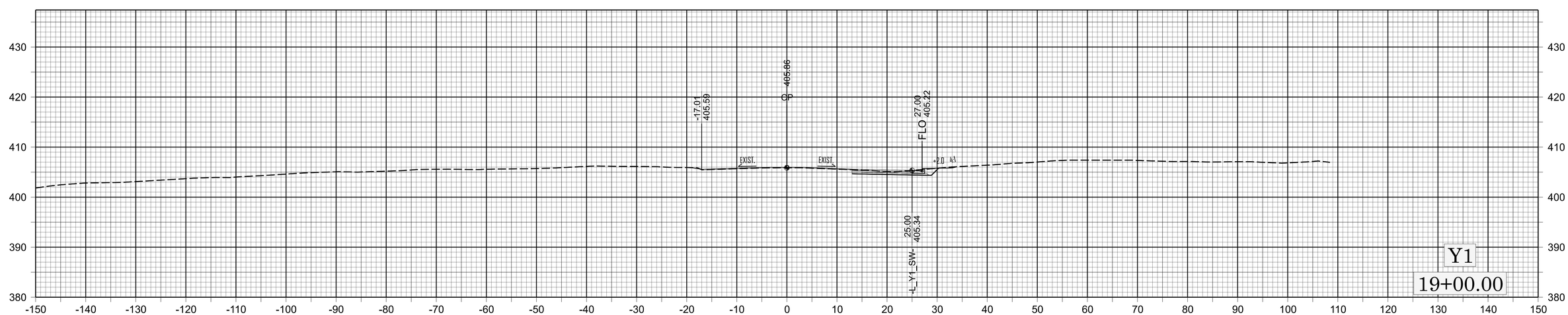

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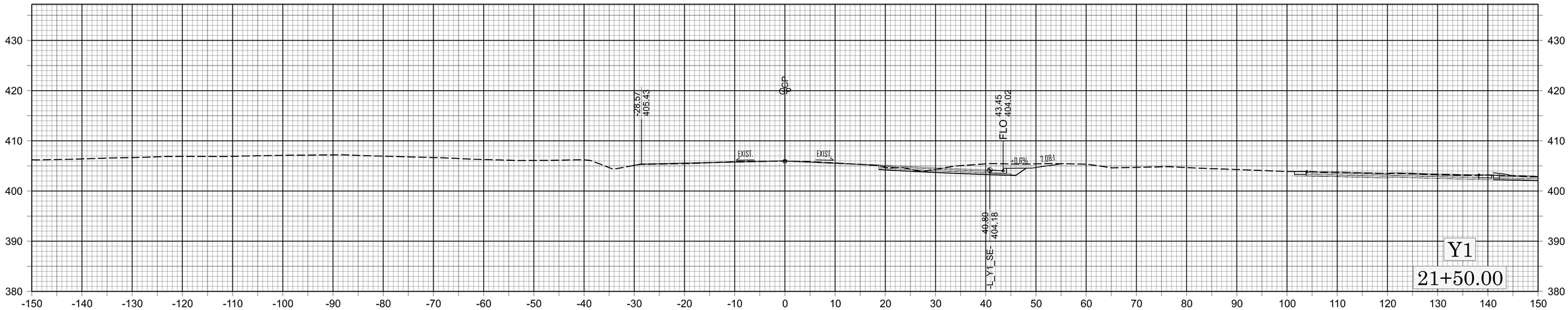

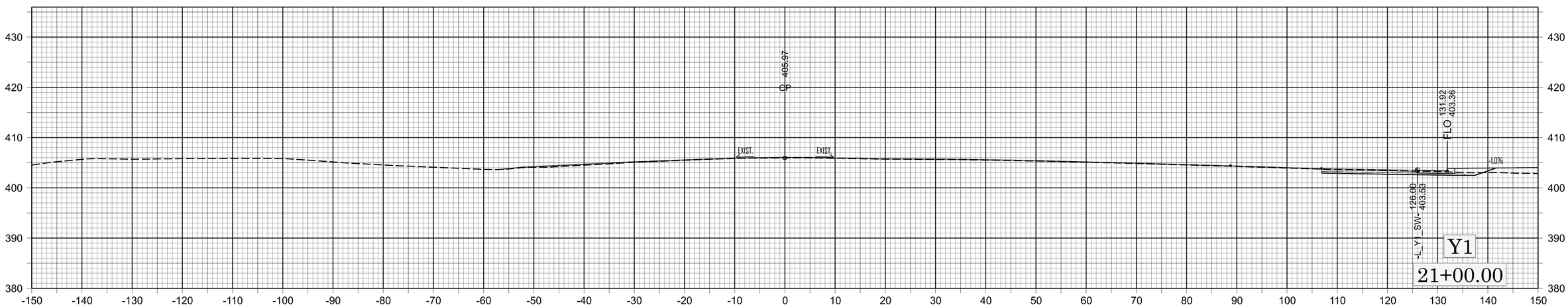

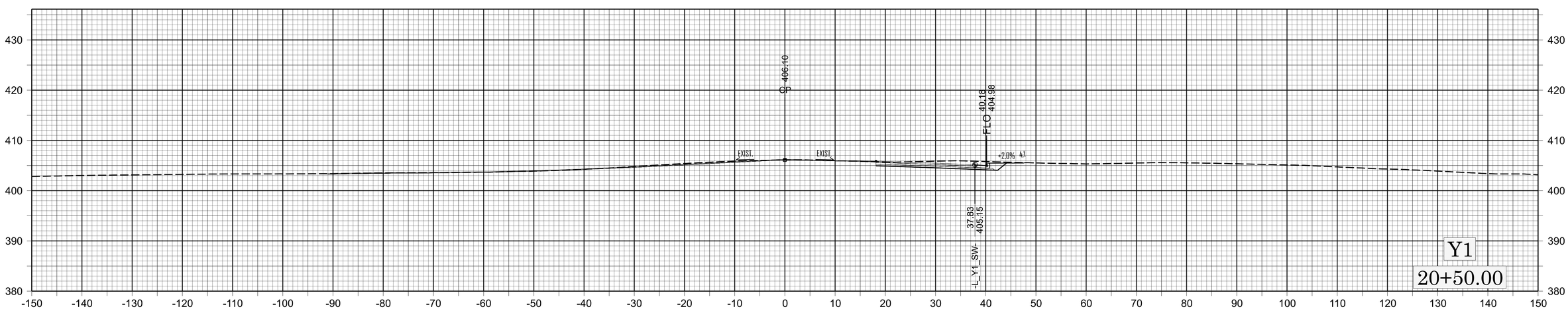

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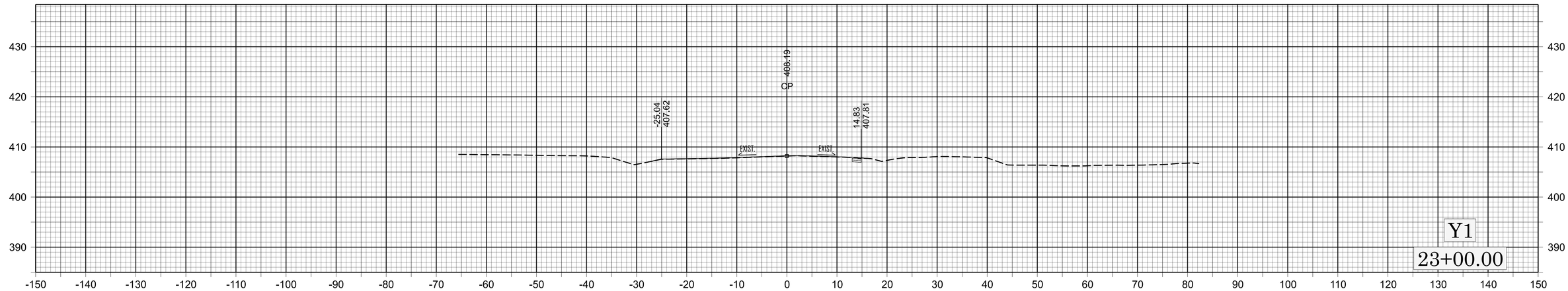

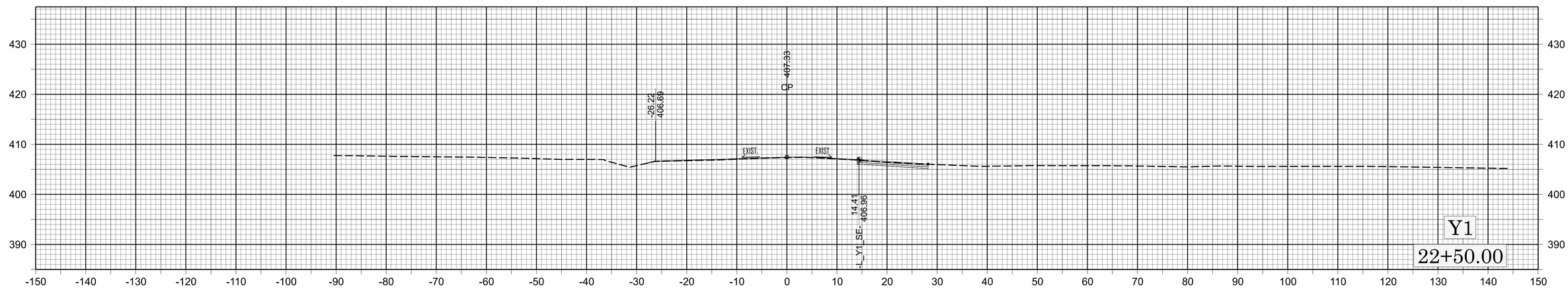

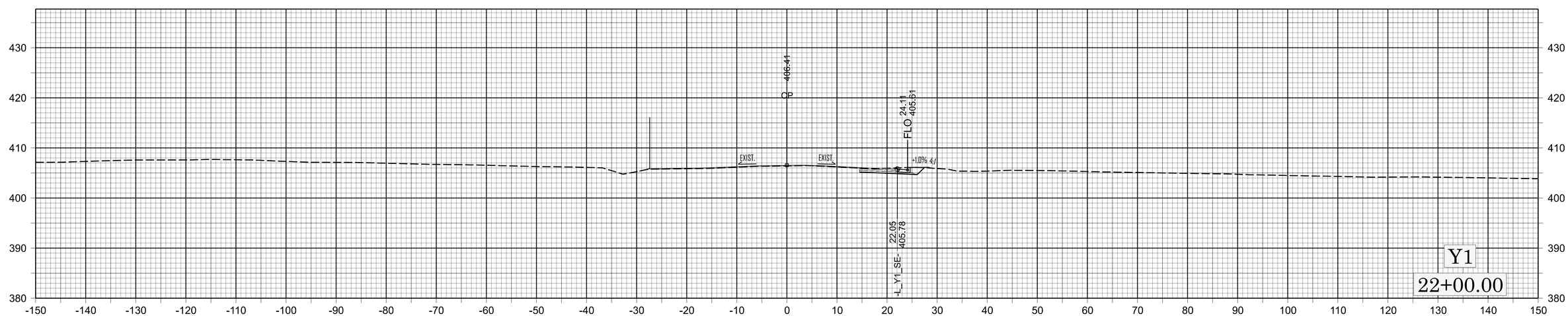

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