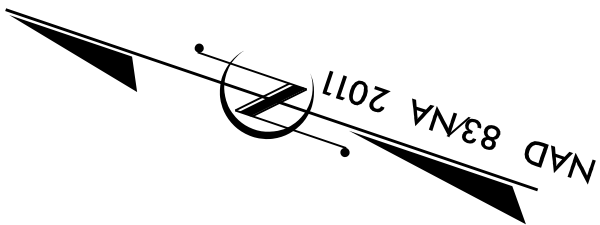
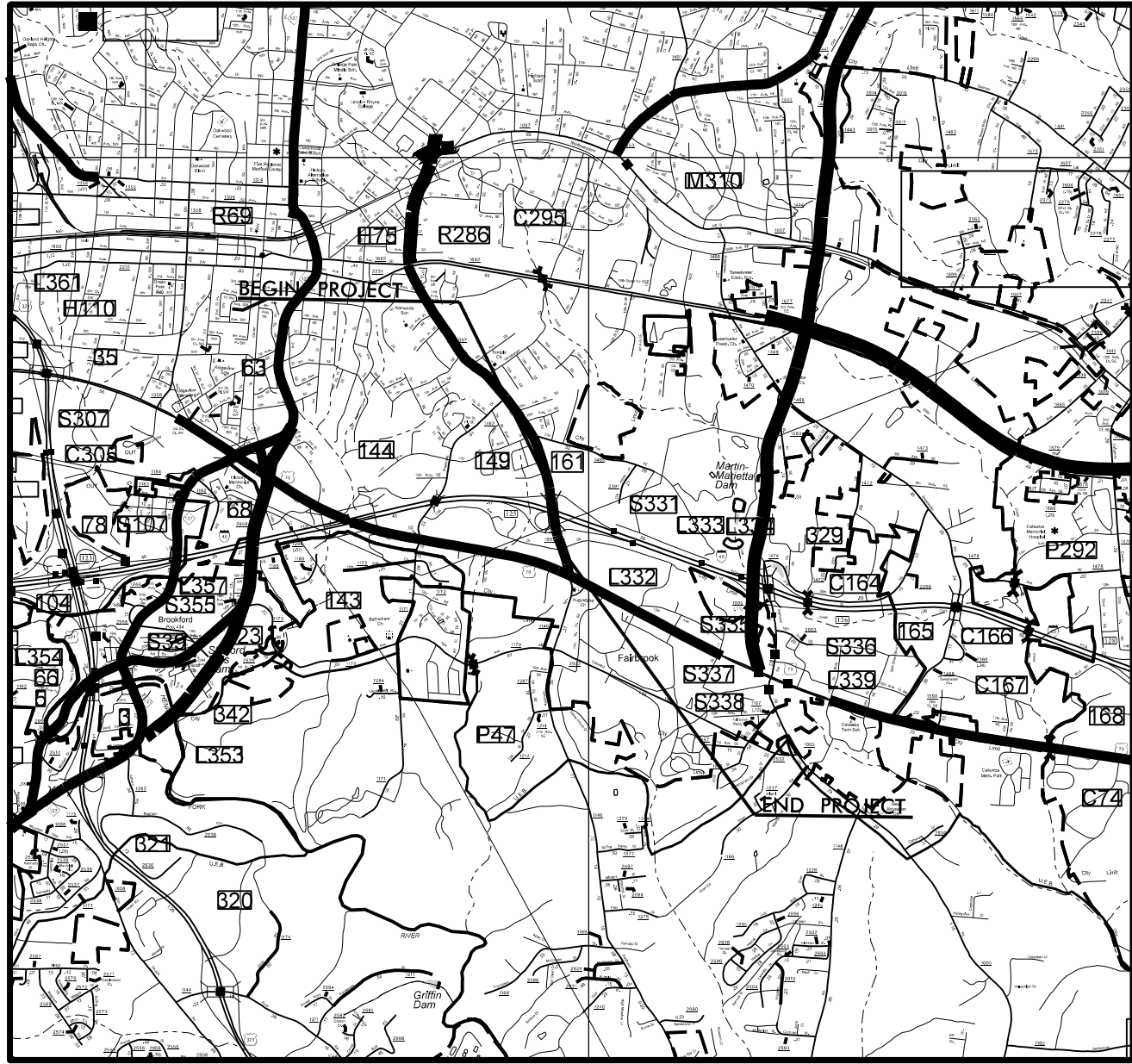


Project: I-5716

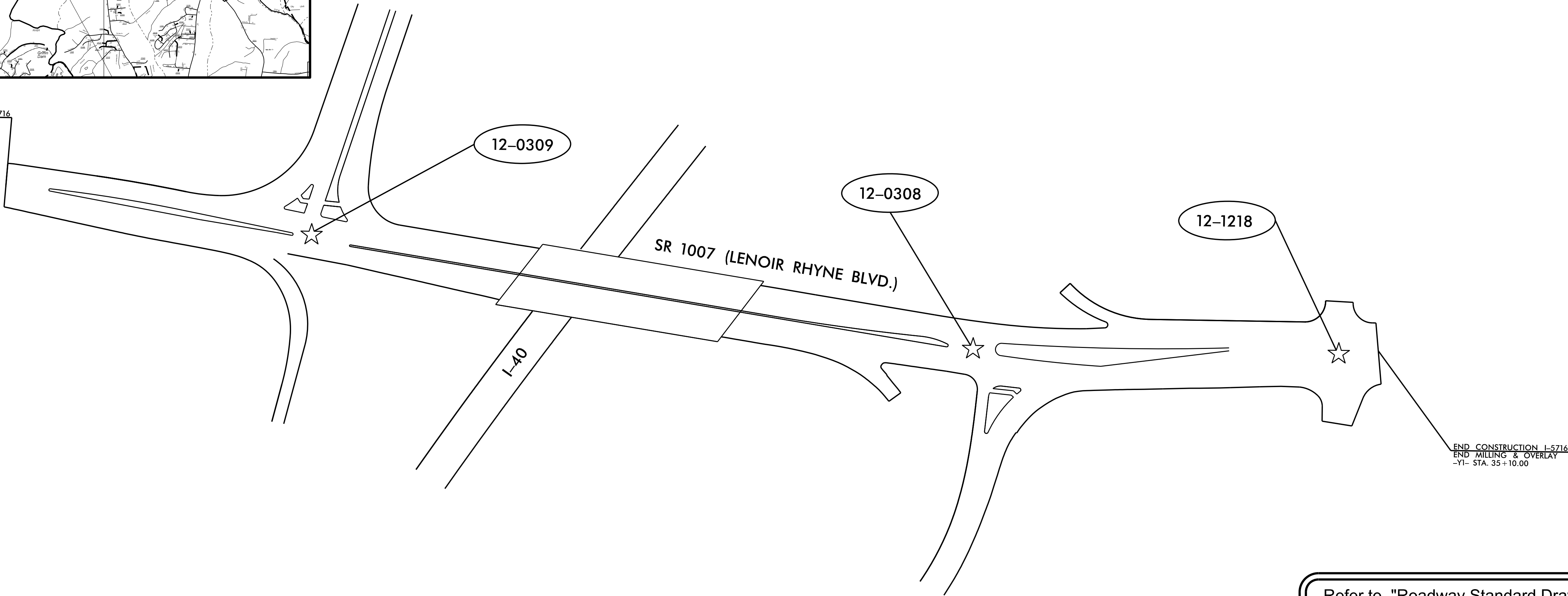
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS CATAWBA COUNTY

LOCATION: SR 1007 (LENOIR RHYNE BLVD.) FROM
I-40 WB RAMPS TO 13TH AVENUE DRIVE SE

TYPE OF WORK: TRAFFIC SIGNALS & SIGNAL COMMUNICATIONS



BEGIN CONSTRUCTION I-5716
BEGIN MILLING & OVERLAY
-YI- STA. 16+64.00



END CONSTRUCTION I-5716
END MILLING & OVERLAY
-YI- STA. 35+10.00

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

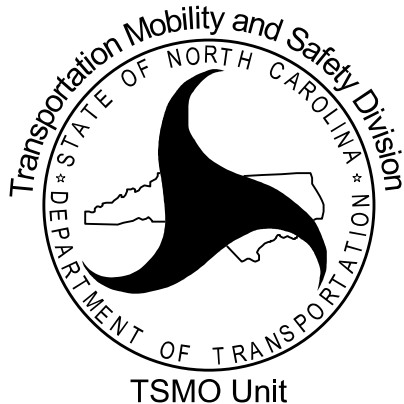
Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	
Sig. 2.0-6.2	12-0309	SR 1007 (Lenoir Rhyne Blvd.) at I-40 WB Ramps	
Sig. 7.0-10.2	12-0308	SR 1007 (Lenoir Rhyne Blvd.) at I-40 EB Ramps	
Sig. 11.0-12.3	12-1218	SR 1007 (Lenoir Rhyne Blvd.) at 13th Avenue Drive SE	
SCP1 - SCP19	N/A	Signal Communication Plans	

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

Contacts:

R. Nicholas Zinser, P.E. - Western Region Signals Engineer
D. Todd Joyce, P.E. - Signal Equipment Project Engineer
Ryan Hough, P.E. - State ITS Engineer

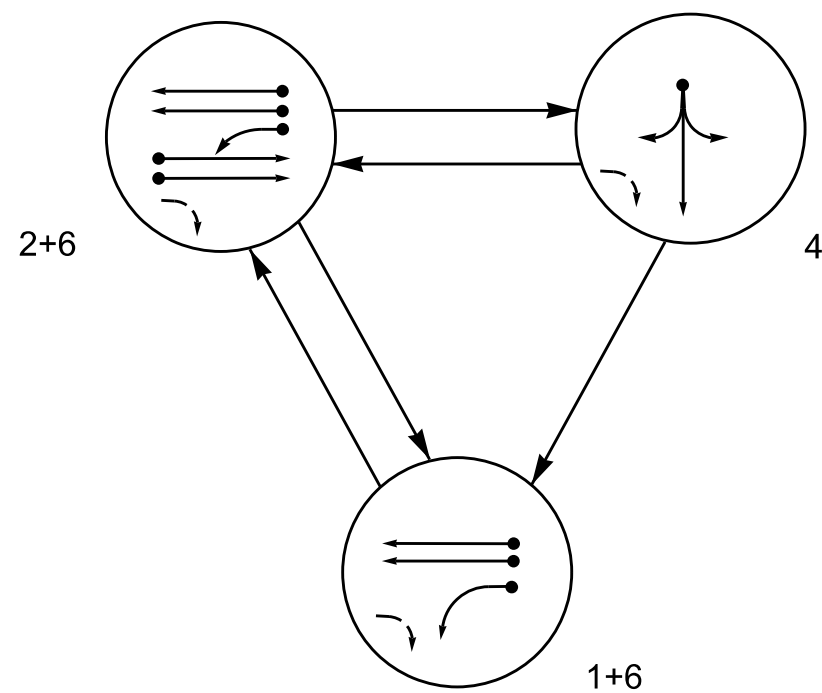
Prepared in the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION



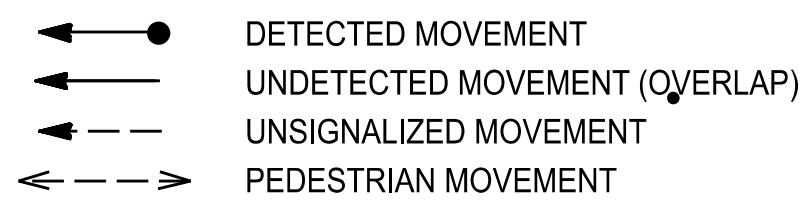
TSMO Unit

750 N. Greenfield Pkwy, Garner, NC 27529

PHASING DIAGRAM



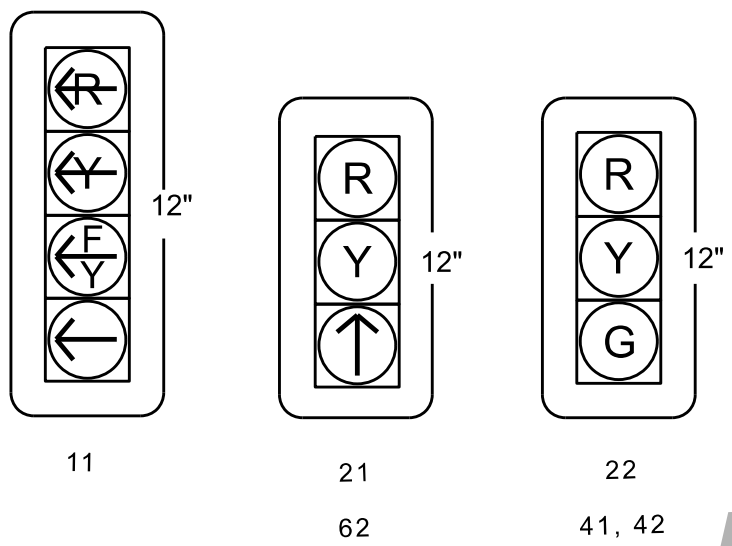
PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE			
	1 + 6	2 + 6	4	11
11	←	↑	→	↓
21	R	↑	R	R
22	R	G	R	R
41, 42	R	R	G	R
61	G	G	R	R
62	↑	↑	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOP						DETECTOR PROGRAMMING													
						ASSIGNED PHASE	TIMING		OPERATION MODE							SWITCH	SYSTEM LOOPS	STATUS	
									0	1	2	3	4	5	6			7	NEW
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/PER LEFT	PROT/PER THROUGH	AND				
1A	*	*	0	*	-	1	15.0	-	X	-	-	-	-	-	-	-	-	-	-
						6	-	-	X	-	-	-	-	-	-	-	-	*	-
4A	*	-	0	*	-	4	5.0	-	X	-	-	-	-	-	-	-	-	*	-

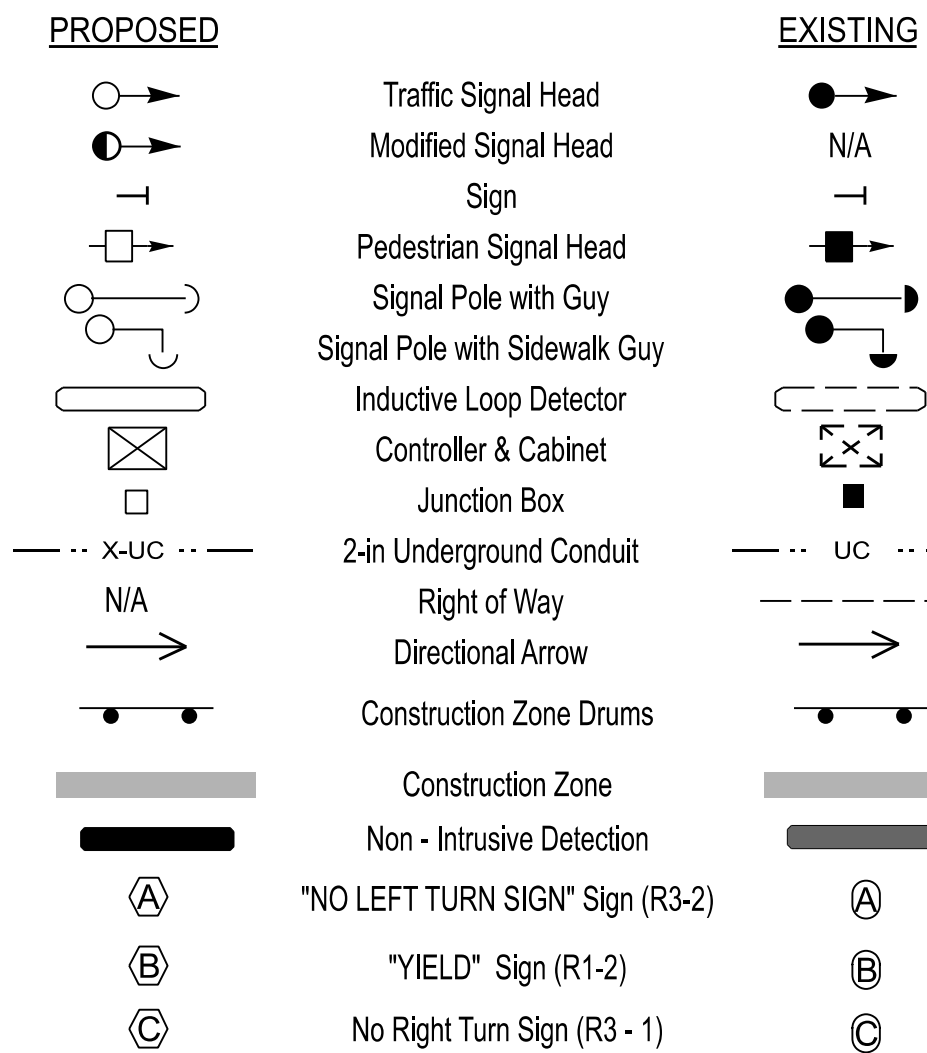
* Multi -Zone Microwave Detection

3-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Install backplates with retro-reflective sheetings for all signal heads.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND



SE-PAC 2070 TIMING CHART

FEATURE	PHASES			
	1	2	4	6
Min Green*	7	12	7	12
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	15	90	30	90
Yellow Change	3.0	4.8	3.7	4.8
Red Clear	2.1	1.0	1.6	1.0
Walk*	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* 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.

Microwave Detection

FUNCTION	SENSOR 1 (2A)			SENSOR 2 (6A)		
Channel	1			1		
Phase	2			6		
Direction of Travel	SB			NB		
Type	Priority			Priority		
Level	1	2	Queue	1	2	Queue
Discovery Zone (ft)	>= 750	<750	-	>= 750	<750	-
Range	900-100	600-100	150-100	900-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y
Speed Range(mph)	35-100	35-100	1-35	35-100	35-100	1-35
Enable Estimated Time of Arrival	Y	Y	N	Y	Y	N
Estimated Time of Arrival (sec)	2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0	-

Signal Upgrade - Temporary Design 1 (TMP Phase 2)

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12 Catawba County Hickory

PLAN DATE: January 2026 REVIEWED BY: R.N Zinser

PREPARED BY: Adja Fall REVIEWED BY:

REVISIONS INIT. DATE

SCALE: 0 50

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

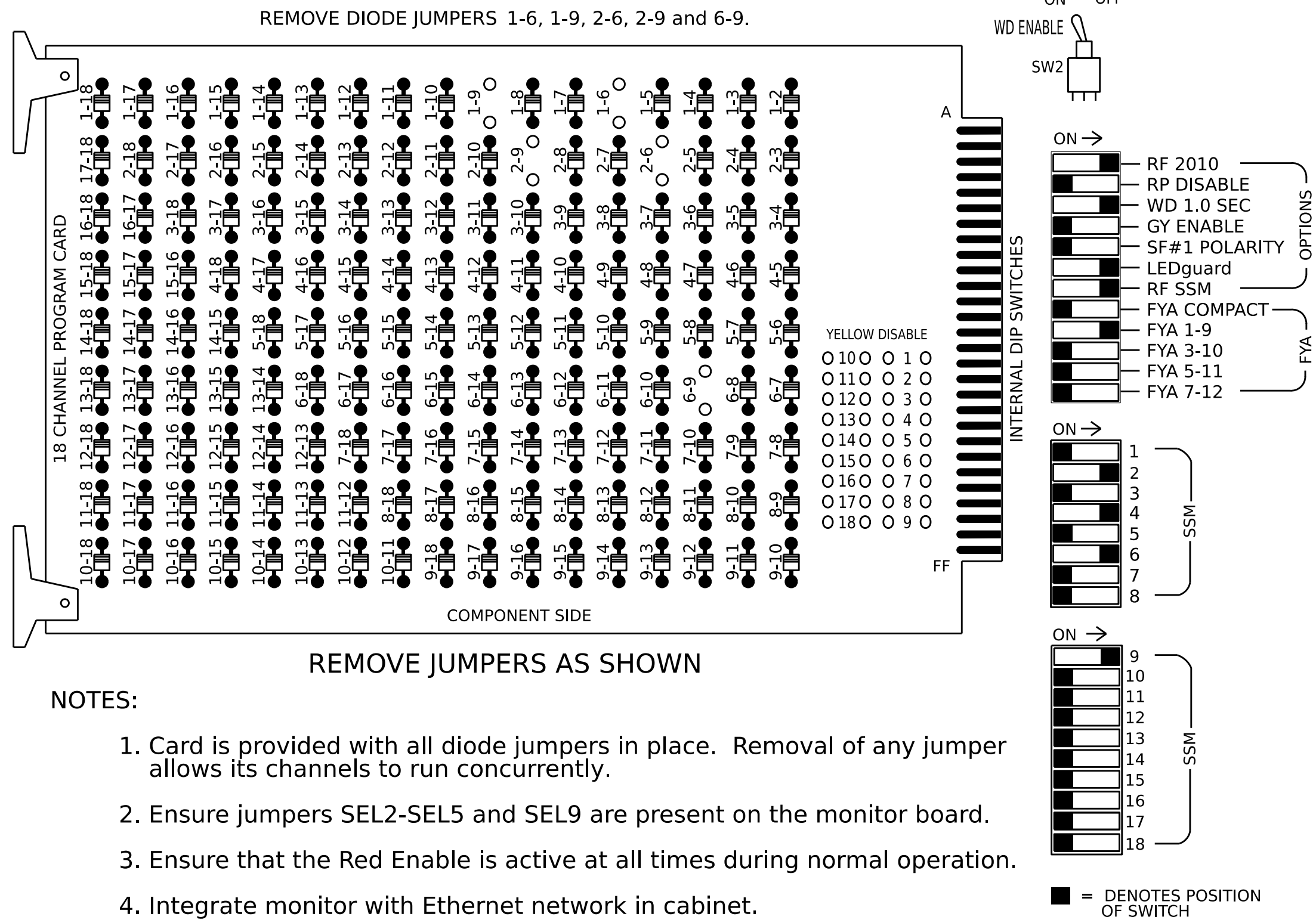
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL 043914
RICHARD N. ZINSER

DocuSigned by:
R. Nicholas Zinser
E:138807347224@...
DATE: 04/13/2026
SIG. INVENTORY NO. 12-0309T1

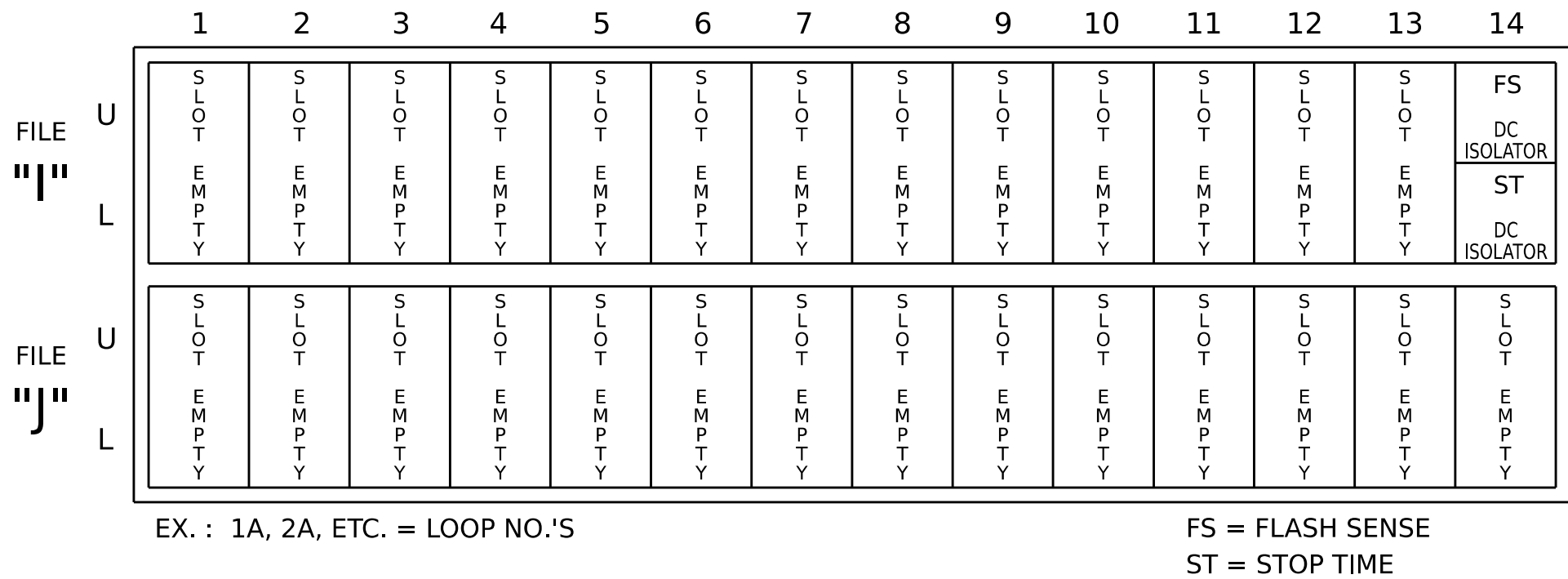
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tslangston

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



INPUT FILE POSITION LAYOUT (front view)



SPECIAL DETECTOR NOTE

Install a multi-zone 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.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 Green.
- Enable simultaneous gap-out feature for all phases.
- The cabinet and controller are part of the Hickory City System.

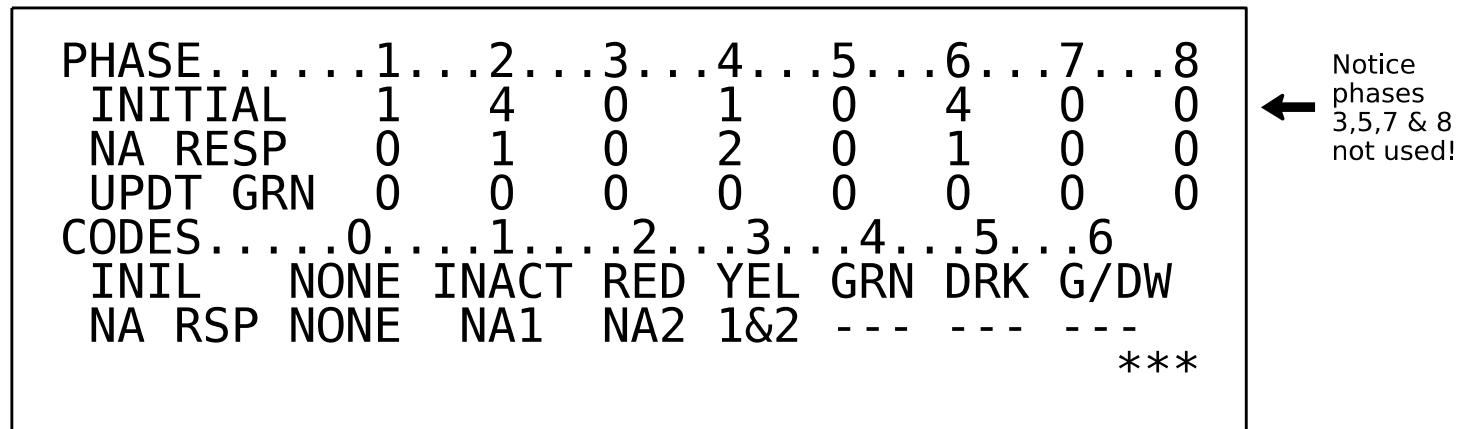
EQUIPMENT INFORMATION

Controller..... 2070
Cabinet..... 332 w/ Aux
Software..... SE-PAC2070
Cabinet Mount..... Base
Output File Positions..... 18 With Aux. Output File
Load Switches Used..... S1, S2, S5, S8, AUX S1
Phases Used..... 1, 2, 4, 6
Overlap "A"..... *
Overlap "B"..... Not Used
Overlap "C"..... Not Used
Overlap "D"..... Not Used

*See overlap programming detail on sheet 2

INIT & N.A. RESP PROGRAMMING DETAIL (program controller as shown below)

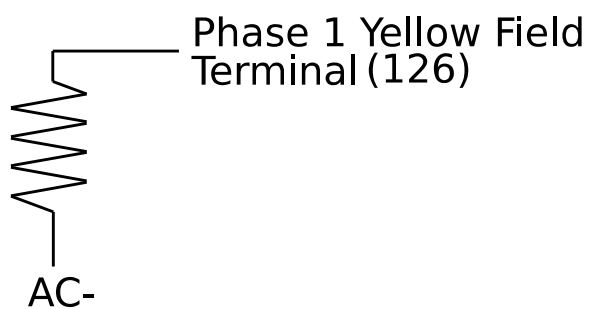
- From Main Menu select **3-PHASE DATA**
- From PHASE DATA Submenu select **4-INIT & N.A. RESP+**



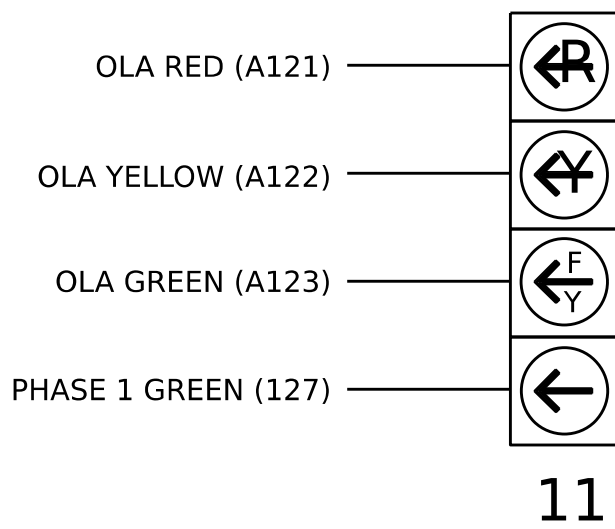
INIT & N.A. RESP PROGRAMMING COMPLETE

LOAD RESISTOR INSTALLATION DETAIL (install resistor as shown)

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



FYA SIGNAL WIRING DETAIL (wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T1
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

Electrical Detail - (TMP Phase 2) - Sheet 1 of 2

Electrical and Programming Details For:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Offices of:		SEAL	
Transportation Mobility and Safety Division		NORTH CAROLINA	
750 N. Greenfield Pkwy, Garner, NC 27529		SEAL 031001	
I-40 EB Ramp at SR 1007 (Lenoir Rhyne Blvd. SE)		ENGINEER	
Division 12, Catawba County, Hickory		D. Todd Joyce	
PLAN DATE: April 2026		REVIEWED BY:	
PREPARED BY: Tim Langston		REVIEWED BY:	
REVISIONS		INIT. DATE	
DocuSigned by: D. Todd Joyce		04/14/2026	
DATE		DATE	
SIG. INVENTORY NO. 12-0309T1			

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap.
Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: FYA E: --- I: --- M: ---
B: --- F: --- J: --- N: ---
C: --- G: --- K: --- O: ---
D: --- H: --- L: --- P: ---

PREV/NEXT TO CYCLE

OVERLAP A

Use Up/Dn/Left/Right keys to position cursor on Overlap 'A', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - A MIN PERM: 1
PHASES: 12345678 90123456
PROT PHASES: 10000000 00000000 DELAY/10
PERM PHASES: 01000000 00000000 FYA: 0
-PED PHASES: 00000000 00000000 -PED: 30
OVERLAPS: ABCDEFGH IJKLMNOP
PROT O-LAPS: x0000000 00000000
PERM O-LAPS: x0000000 00000000

NOTICE FYA
DELAY/10 = 0

OVERLAP PROGRAMMING COMPLETE

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGS TEST-A FLASH: 0

LDSW:123456789 0123456789 0123456789 012
FLSH:110010010 0001000000 0000000000 000
ALT:010010000 0000000000 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456
ENTRY: 01000100 00000000
EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

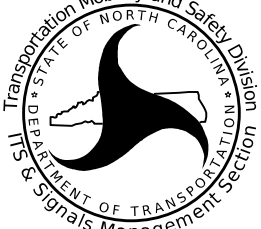
STARTUP TIME: 6 (SEC) STATE: 2 (0-FL
RED REV/10: 40 (TSEC) 1-RED
AUTO PED CLR: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET: 0 (0-NO 1-YES)
SEQUENCE: 1 (1-19)
SPECIAL SEQ: 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 2) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

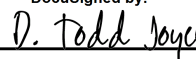
I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12Catawba CountyHickory

PLAN DATE: April 2026REVIEWED BY:

PREPARED BY: Tim LangstonREVIEWED BY:

REVISIONSINIT. DATE

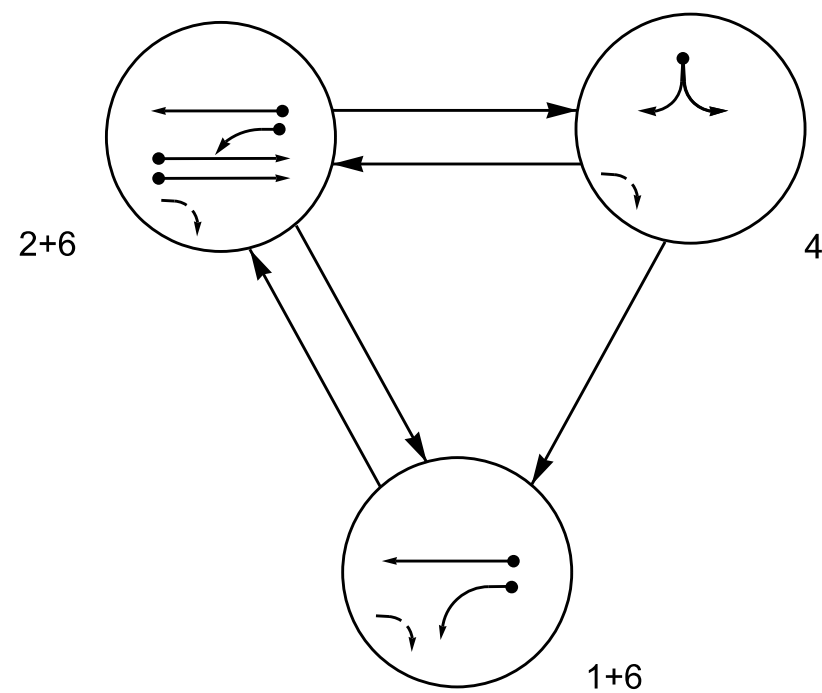
DocuSigned by:

04/14/2026
DATE

SIG. INVENTORY NO. 12-0309T1

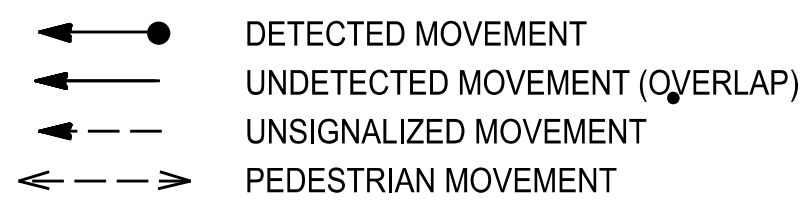
SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
031001
ENGINEER
D. TODD JOYCE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T1
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

PHASING DIAGRAM

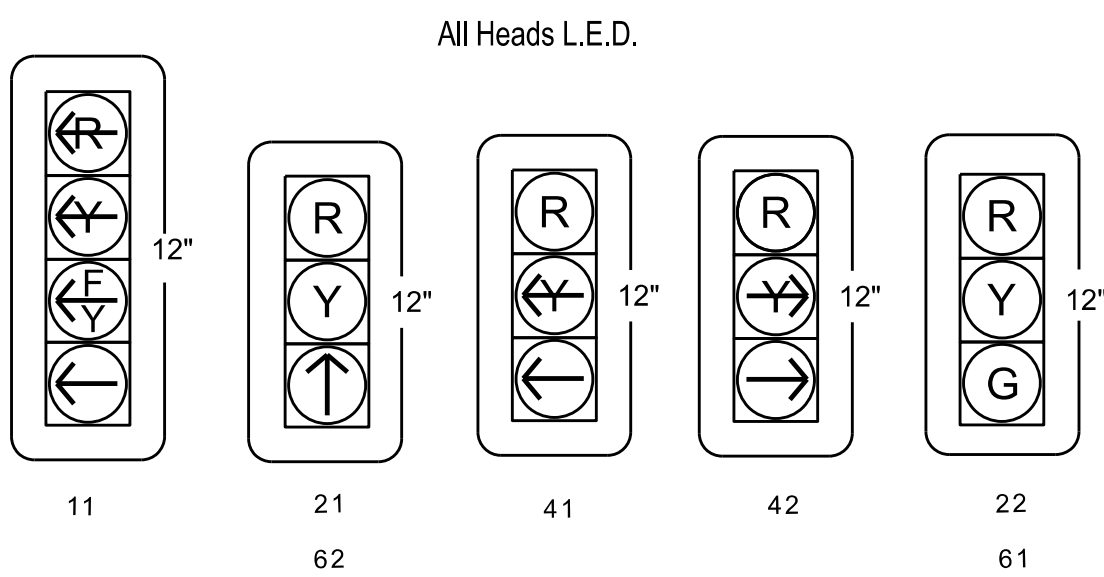


PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE			
	1	2	4	6
11	←	↑	→	↓
21	R	↑	R	R
22	R	G	R	R
41	R	R	←	R
42	R	R	→	R
61	G	G	R	R
62	↑	↑	R	R

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

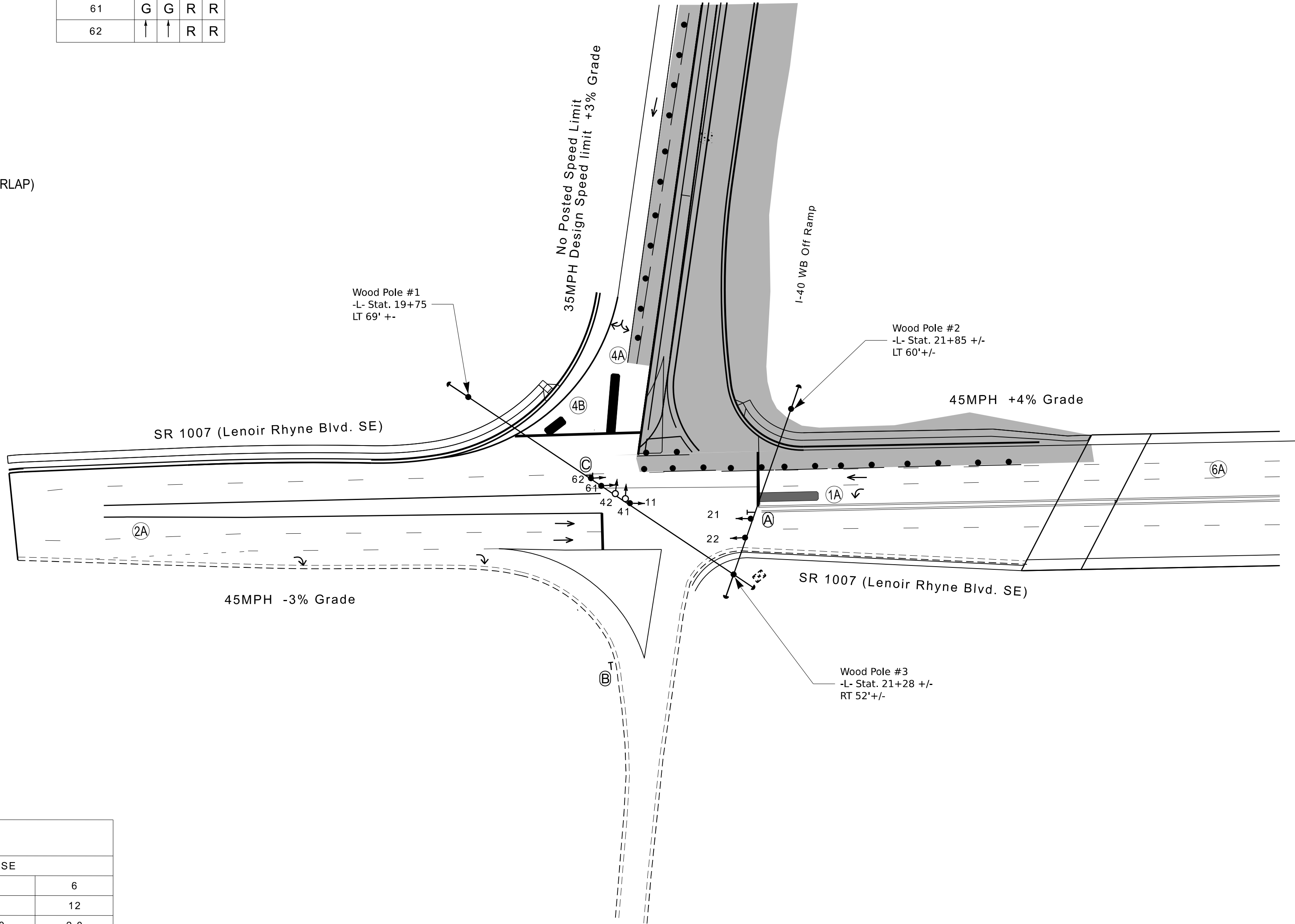
INDUCTIVE LOOP						DETECTOR PROGRAMMING													
						ASSIGNED PHASE	TIMING		OPERATION MODE							SWITCH	SYSTEM LOOPS	STATUS	
									0	1	2	3	4	5	6			7	NEW
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/PER LEFT	PROT/PER THROUGH	AND				
1A	*	*	0	-	*	1	15.0	-	X	-	-	-	-	-	-	-	-		
						6	-	-	X	-	-	-	-	-	-	-	-		
4A	*	*	0	*	-	4	5.0	-	X	-	-	-	-	-	-	-	-		
4B	*	*	0	*	-	4	15.0	-	X	-	-	-	-	-	-	-	-		

* Multi -Zone Microwave Detection

3-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition Signal heads 61 and 62.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Refer to PMP plans for proposed stop line locations
- Install backpalates with retro-reflective sheetings for signal heads 41 and 42.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



SE-PAC 2070 TIMING CHART

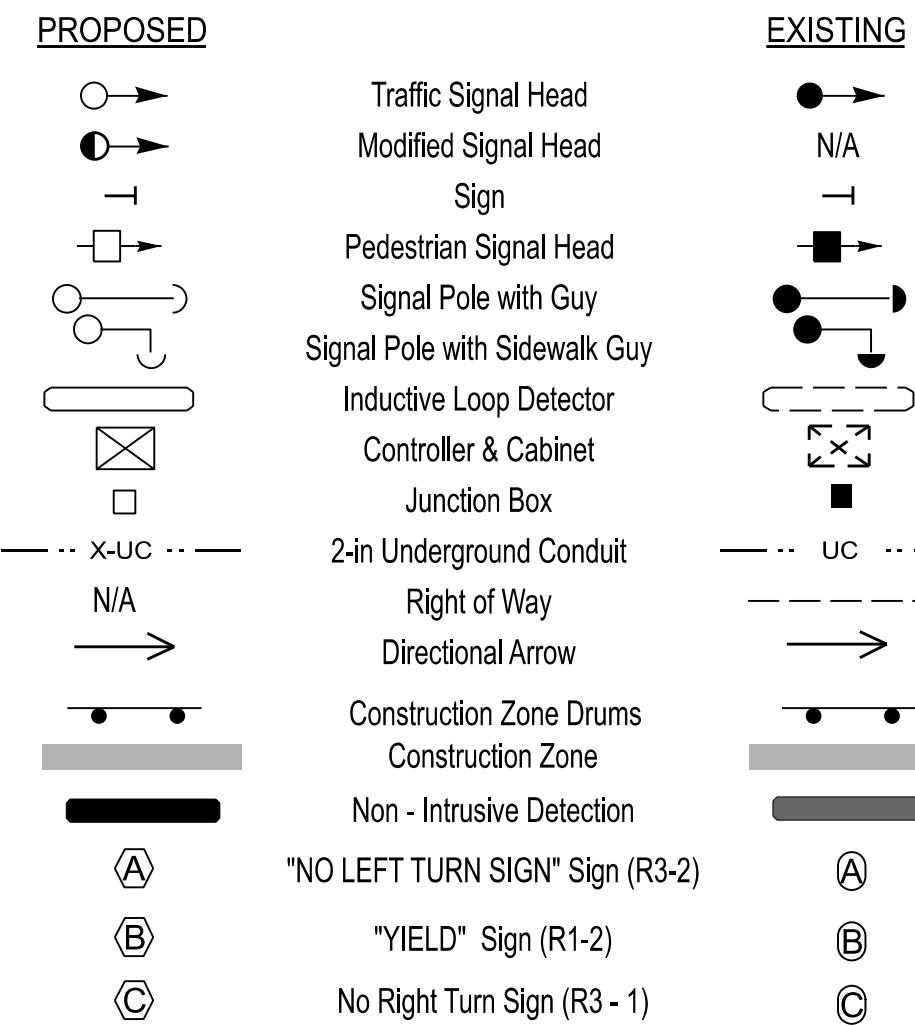
FEATURE	PHASE			
	1	2	4	6
Min Green*	7	12	7	12
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	15	90	30	90
Yellow Change	3.0	4.8	3.7	4.8
Red Clear	2.1	2.5	2.6	2.5
Walk*	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* 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.

Microwave Detection

FUNCTION	SENSOR 1 (2A)			SENSOR 2 (6A)		
	1	2	Queue	1	2	Queue
Channel	1			1		
Phase	2			6		
Direction of Travel	SB			NB		
Type	Priority			Priority		
Level	1	2	Queue	1	2	Queue
Discovery Zone (ft)	>= 750	<750	-	>= 750	<750	-
Range	900-100	600-100	150-100	900-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y
Speed Range(mph)	35-100	35-100	1-35	35-100	35-100	1-35
Enable Estimated Time of Arrival	Y	Y	N	Y	Y	N
Estimated Time of Arrival (sec)	2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0	-

LEGEND



Signal Upgrade -Temporary Design 2 (TMP Phase 3)

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12 Catawba County Hickory

PLAN DATE: January 2026 REVIEWED BY: R.N Zinser

PREPARED BY: Adja Fall REVIEWED BY:

REVISIONS

SCALE: 0 50

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

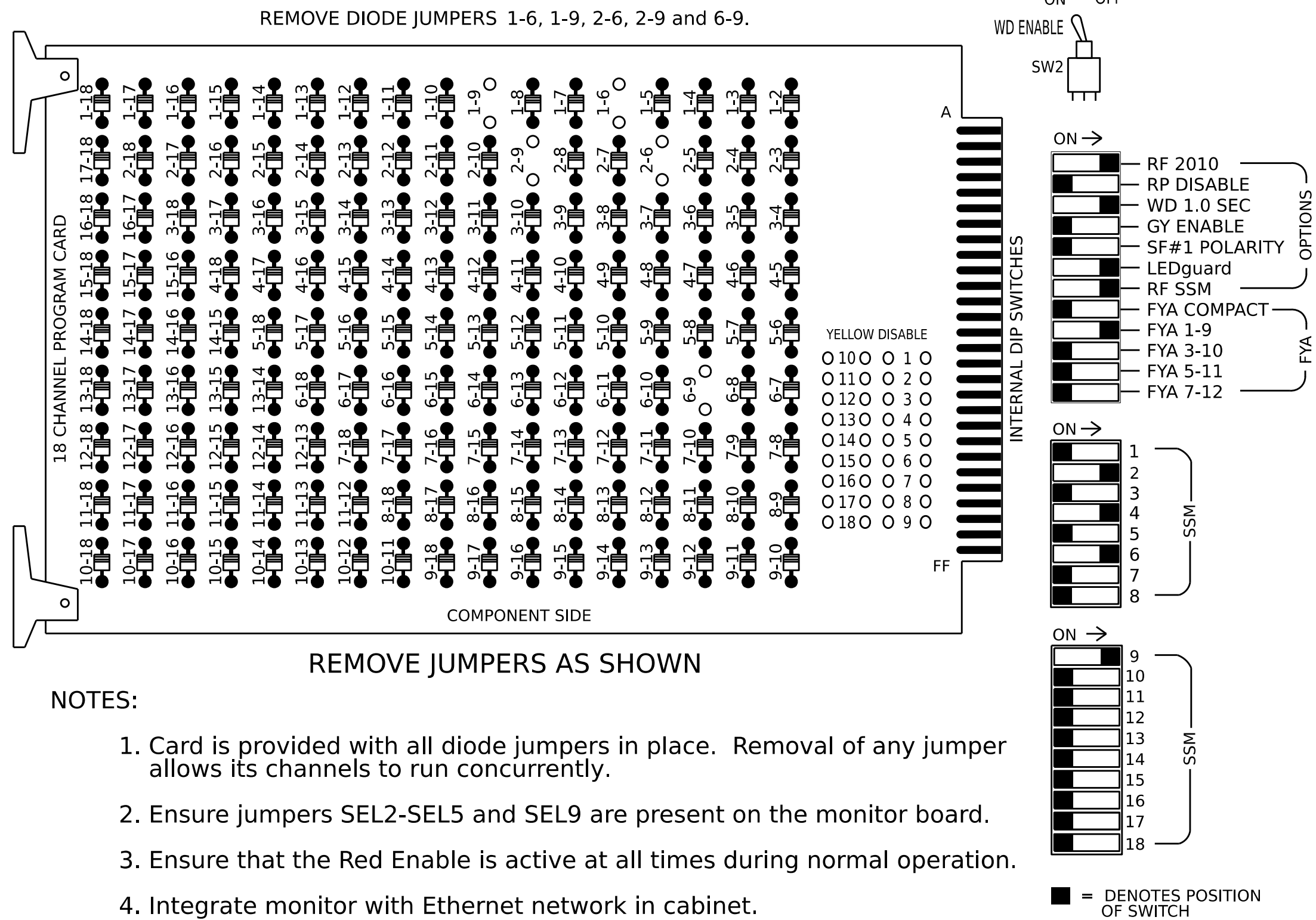
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL 043914
RICHARD N. ZINSER

DocuSigned by:
R. Nicholas Zinser
F138897347248F
DATE: 04/13/2026
SIG. INVENTORY NO. 12-0309T2

14-000-2016-0023
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tslangston

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



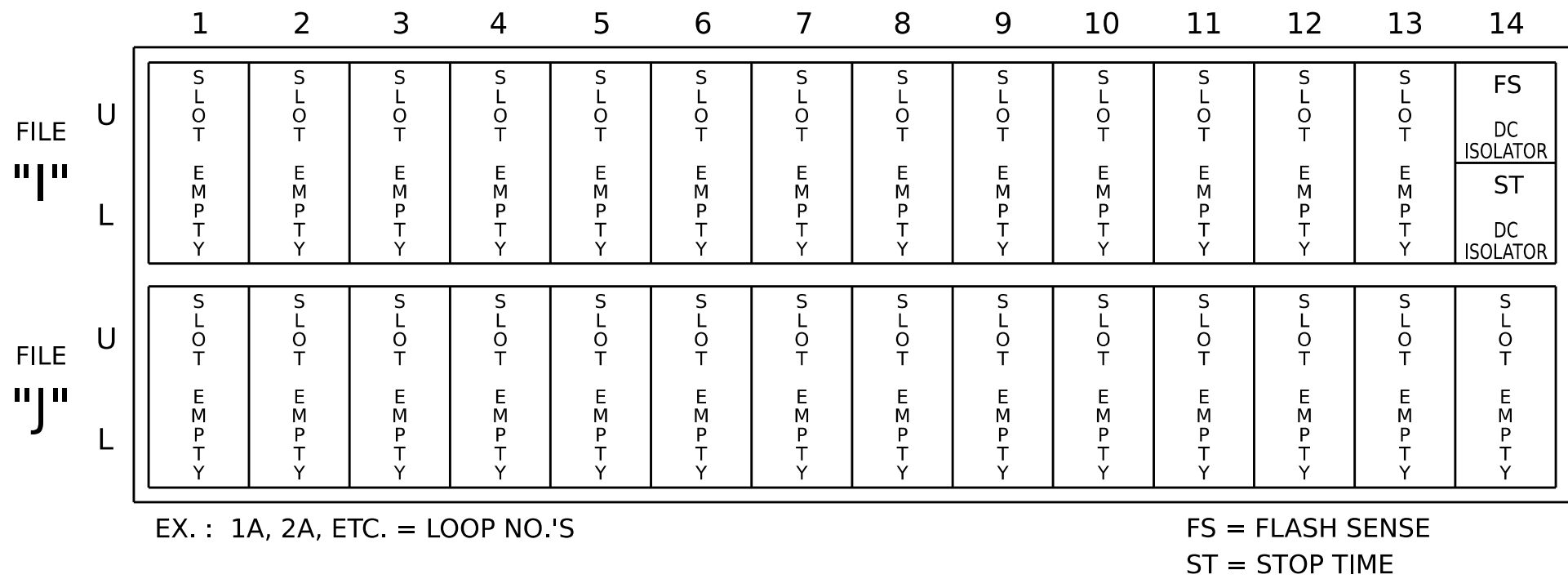
REMOVE JUMPERS AS SHOWN

NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

Install a multi-zone 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.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 Green.
- Enable simultaneous gap-out feature for all phases.
- The cabinet and controller are part of the Hickory City System.

5. Default the controller before programming this detail.

EQUIPMENT INFORMATION

Controller..... 2070
Cabinet..... 332 w/ Aux
Software..... SE-PAC2070
Cabinet Mount..... Base
Output File Positions..... 18 With Aux. Output File
Load Switches Used..... S1, S2, S5, S8, AUX S1
Phases Used..... 1, 2, 4, 6
Overlap "A"..... *
Overlap "B"..... Not Used
Overlap "C"..... Not Used
Overlap "D"..... Not Used

*See overlap programming detail on sheet 2

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **3-PHASE DATA**
- From PHASE DATA Submenu select **4-INIT & N.A. RESP+**

PHASE.....1...2...3...4...5...6...7...8
INITIAL 1 4 0 1 0 4 0 0
NA RESP 0 1 0 2 0 1 0 0
UPDT GRN 0 0 0 0 0 0 0 0
CODES.....0...1...2...3...4...5...6
INIL NONE INACT RED YEL GRN DRK G/DW
NA RSP NONE NA1 NA2 1&2 --- --- ---

Notice
phases
3,5,7 & 8
not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

PROJECT REFERENCE NO.	SHEET NO.
I-5716	Sig. 3.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21	22	NU	NU	41,42	NU	NU	61	62	NU	NU	NU	NU	11★	NU	NU	NU
RED		128	128		101			134	134									
YELLOW	*	129	129					135	135									
GREEN			130					136										
RED ARROW													A121					
YELLOW ARROW					102								A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	130			103				136									
⬅																		
➡																		

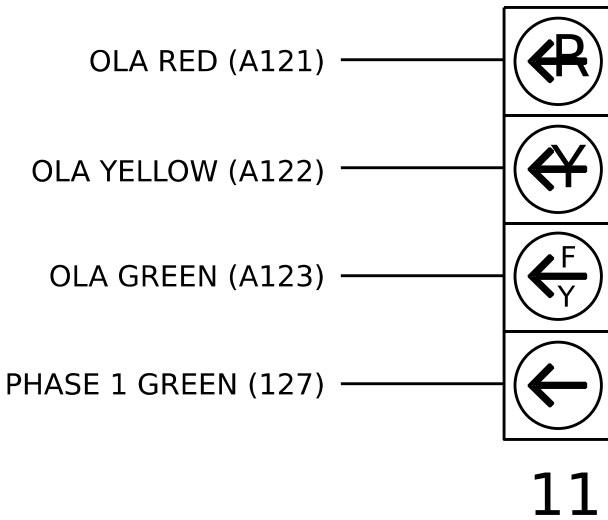
NU = Not Used

*Denotes install load resistor. See LOAD RESISTOR INSTALLATION DETAIL this sheet.

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

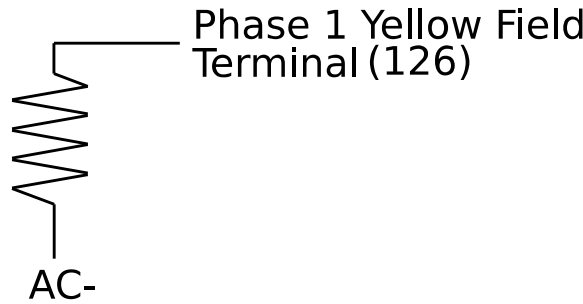
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor 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: 12-0309T2
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

Electrical Detail - (TMP Phase 3) - Sheet 1 of 2

Electrical and Programming Details For:	I-40 EB Ramp at SR 1007 (Lenoir Rhyne Blvd. SE)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	Division 12 PLAN DATE: April 2026 PREPARED BY: Tim Langston REVISIONS INIT. DATE	SEAL NORTH CAROLINA SEAL 031001 ENGINEER D. TODD JOYCE DocuSigned by: D. Todd Joyce 04/14/2026 DATE SIG. INVENTORY NO. 12-0309T2

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap.
Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: FYA E: --- I: --- M: ---
B: --- F: --- J: --- N: ---
C: --- G: --- K: --- O: ---
D: --- H: --- L: --- P: ---

PREV/NEXT TO CYCLE

OVERLAP A

Use Up/Dn/Left/Right keys to position cursor on Overlap 'A', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - A MIN PERM: 1
PHASES: .12345678 90123456
PROT PHASES: 10000000 00000000 DELAY/10
PERM PHASES: 01000000 00000000 FYA: 0
-PED PHASES: 00000000 00000000 -PED: 30
OVERLAPS: .ABCDEFGH IJKLMNOP
PROT O-LAPS: x0000000 00000000
PERM O-LAPS: x0000000 00000000

NOTICE FYA
DELAY/10 = 0

OVERLAP PROGRAMMING COMPLETE

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGS TEST-A FLASH: 0

LDSW:123456789 0123456789 0123456789 012
FLSH:110010010 0001000000 0000000000 000
ALT:010010000 0000000000 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456
ENTRY: 01000100 00000000
EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

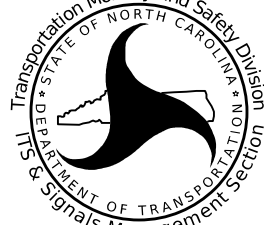
STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL
RED REV/10...: 40 (TSEC) 1-RED
AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET.: 0 (0-NO 1-YES)
SEQUENCE.....: 1 (1-19)
SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 3) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12Catawba CountyHickory

PLAN DATE: April 2026REVIEWED BY:

PREPARED BY: Tim LangstonREVIEWED BY:

REVISIONSINIT. DATE

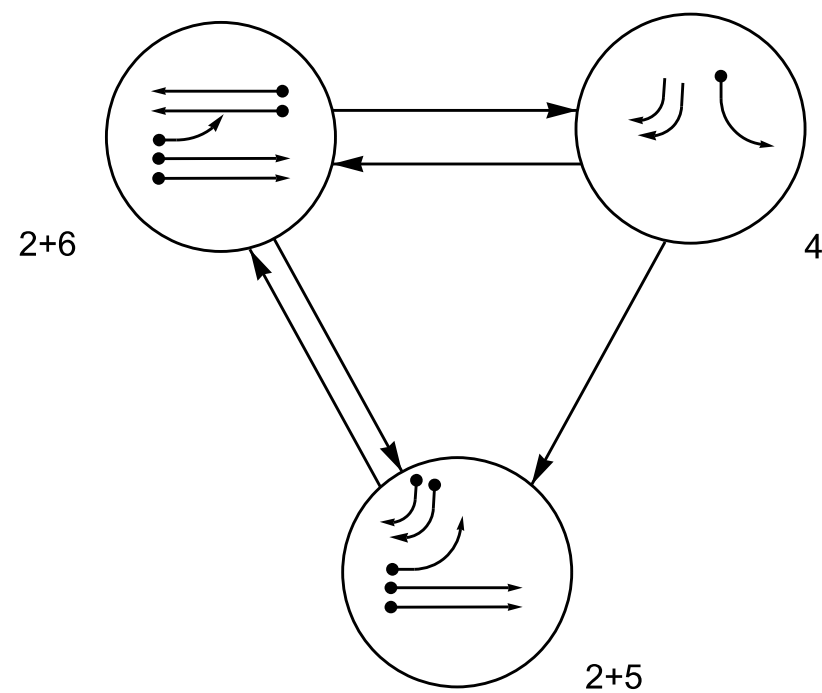
DocuSigned by:
D. Todd Joyce04/14/2026
4495CACE0B042410DATE

SIG. INVENTORY NO. 12-0309T2

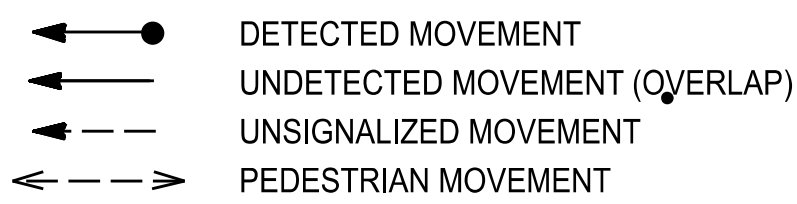
SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
031001
ENGINEER
D. TODD JOYCE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T2
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

PHASING DIAGRAM

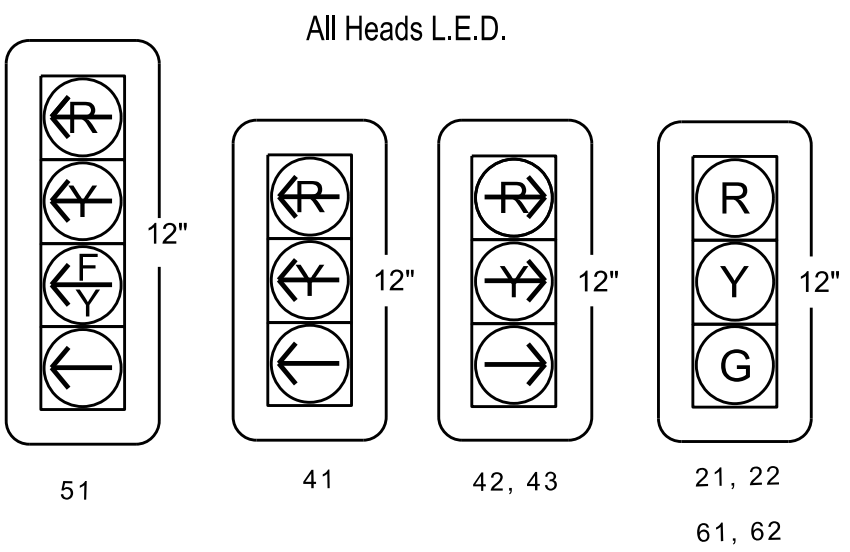


PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE			
	2	4	5	6
21, 22	G	G	R	R
41	R	R	G	G
42, 43	G	G	R	R
51	R	R	G	G
61, 62	R	G	R	R

SIGNAL FACE I.D.



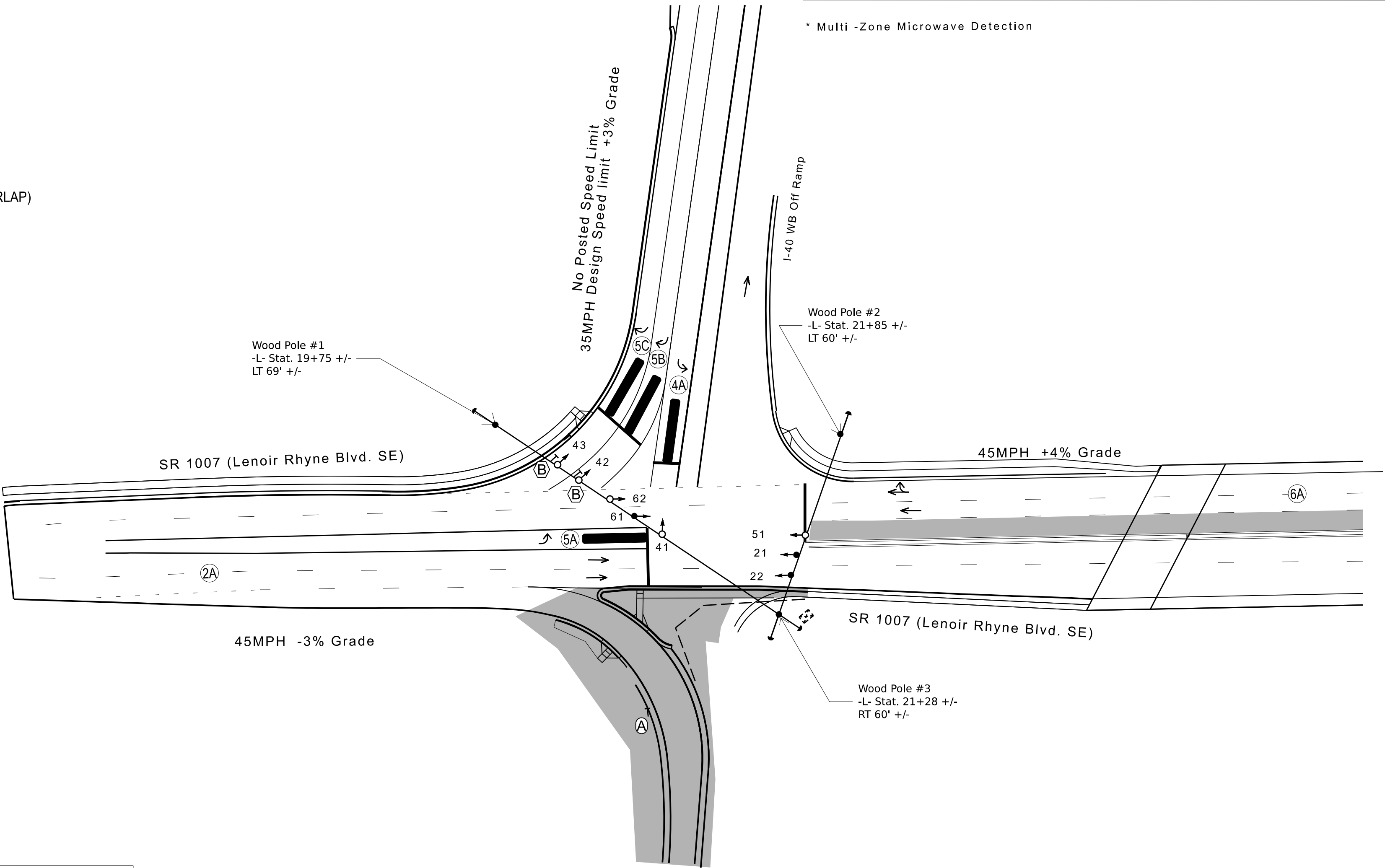
SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART																			
INDUCTIVE LOOP						DETECTOR PROGRAMMING													
						ASSIGNED PHASE	TIMING		OPERATION MODE							SWITCH	SYSTEM LOOPS	STATUS	
0	1	2	3	4	5				6	7	NEW	EXISTING							
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING		DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN			1 CALL	STOP A	STOP B			PROT/PER LEFT	PROT/PER THROUGH
4A	*	*	0	*	-	4	-	-	X	-	-	-	-	-	-	-	-	-	*
5A	*	*	0	*	-	5	15.0	-	X	-	-	-	-	-	-	-	-	-	*
						2	-	-	X	-	-	-	-	-	-	-	-	-	*
5B	*	*	0	*	-	5	-	-	X	-	-	-	-	-	-	-	-	-	*
5C	*	*	0	*	-	5	-	-	X	-	-	-	-	-	-	-	-	-	*

* Multi -Zone Microwave Detection

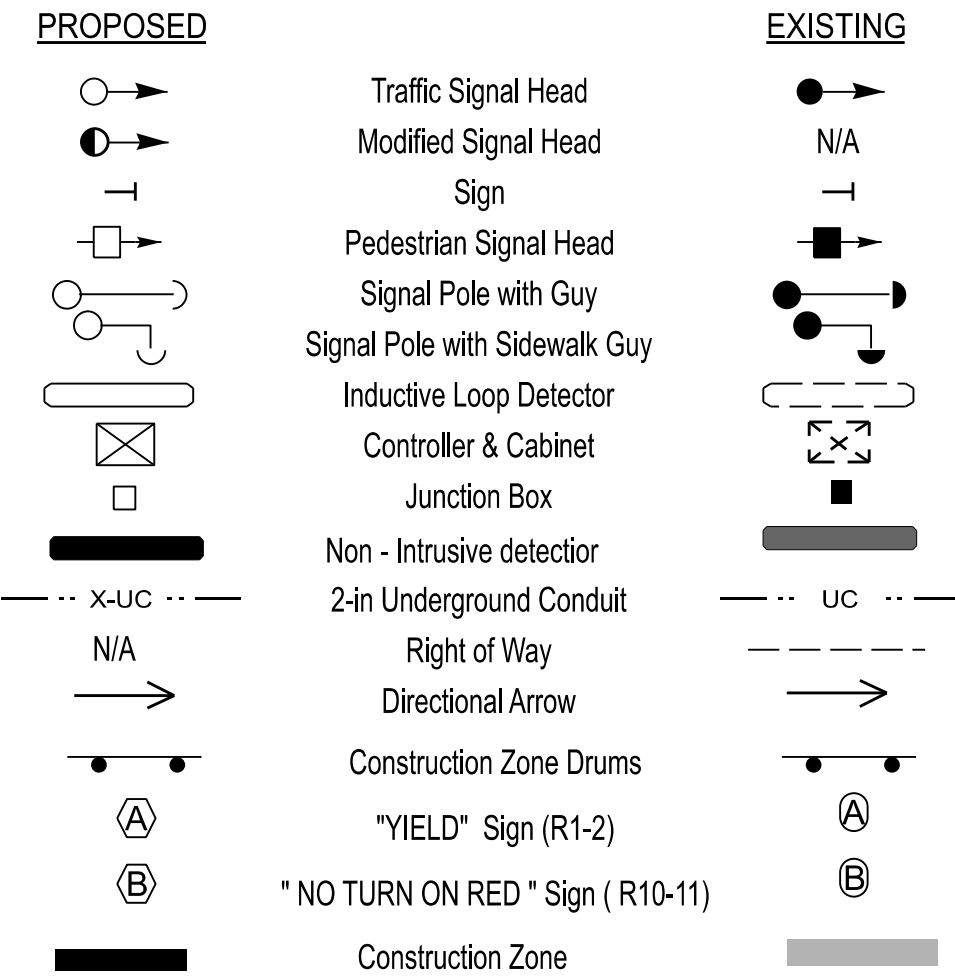
3-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Remove signal head # 11.
- Remove existing "No Right Turn" sign (R3-1).
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Install backplates with retro-reflective sheetings on signal heads 41, 42, 43, 51 and 62.
- See Pavement Marking Plans for proposed stop bar locations.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND



SE-PAC 2070 TIMING CHART				
FEATURE	PHASE			
	2	4	5	6
Min Green*	12	7	7	12
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	90	30	15	90
Yellow Change	4.8	3.7	3.0	4.8
Red Clear	3.1	2.7	2.1	3.1
Walk*	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	LOCK	NON LOCK	NON LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* 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.

Microwave Detection						
FUNCTION		SENSOR 1 (2A)			SENSOR 2 (6A)	
Channel		1			1	
Phase		2			6	
Direction of Travel		SB			NB	
Type		Priority			Priority	
Level		1	2	Queue	1	2
Discovery Zone (ft)		>= 750	<750	-	>= 750	<750
Range		900-100	600-100	150-100	900-100	600-100
Enable Speed		Y	Y	Y	Y	Y
Speed Range(mph)		35-100	35-100	1-35	35-100	35-100
Enable Estimated Time of Arrival		Y	Y	N	Y	N
Estimated Time of Arrival (sec)		2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0

Signal Upgrade -Temporary Design 3 (TMP Phase 4)

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12 Catawba County Hickory

PLAN DATE: January 2026 REVIEWED BY: R.N Zinser

PREPARED BY: Adja Fall REVIEWED BY:

REVISIONS INIT. DATE

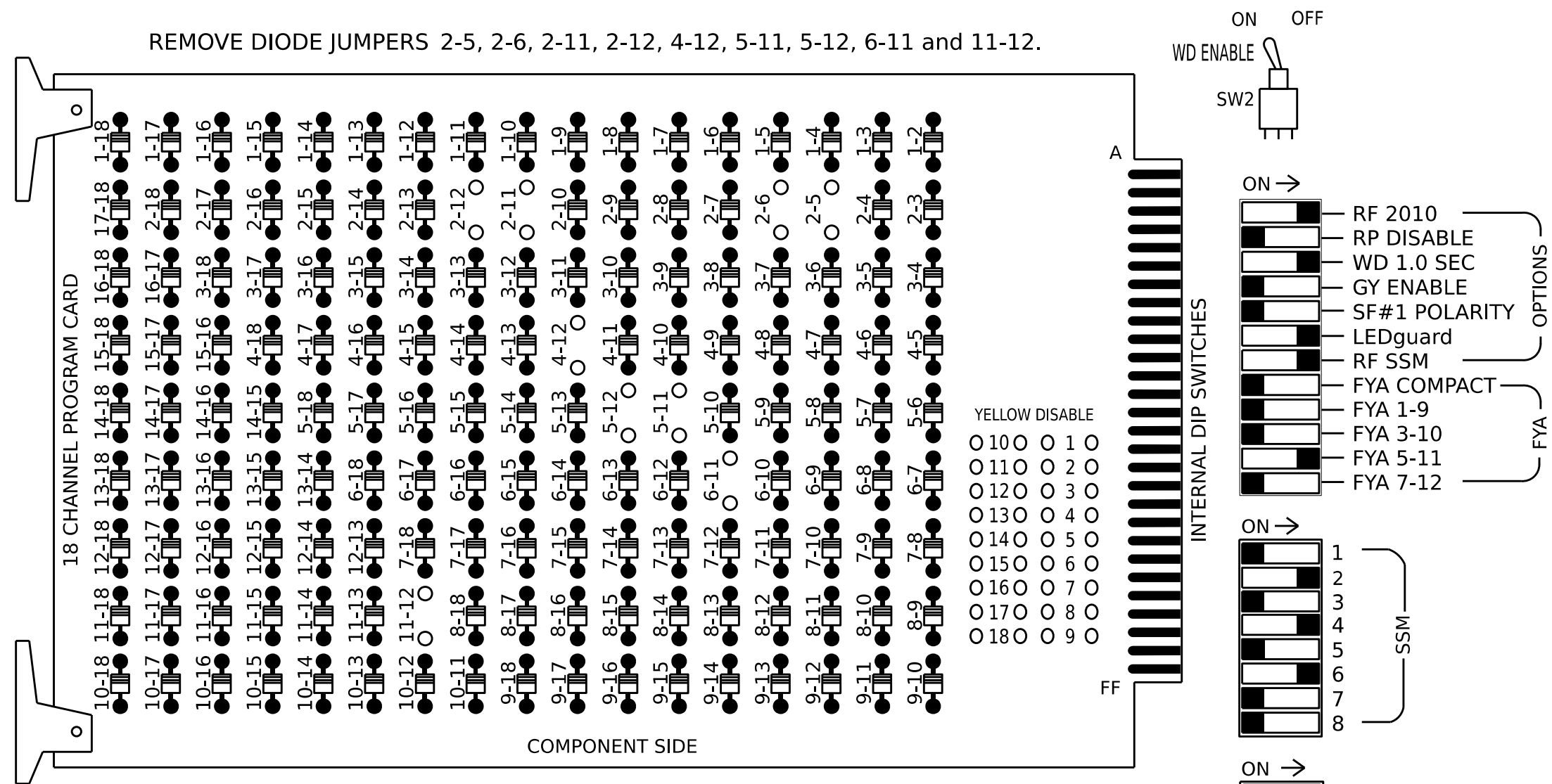
Seal of North Carolina Professional Engineer
R. Nicholas Zinser
043914
04/13/2026

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 12-0309T3

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-12, 4-12, 5-11, 5-12, 6-11 and 11-12.

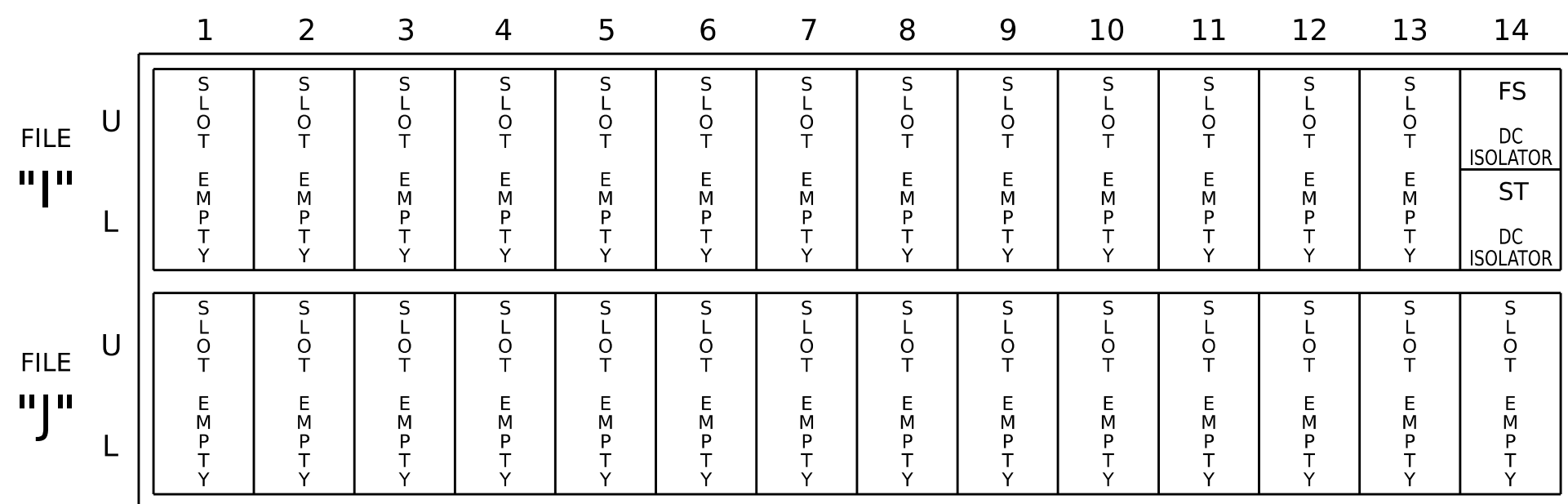


REMOVE JUMPERS AS SHOWN

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.

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multi-zone 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.

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 Plans.
2. Program controller to start up in phases 2 and 6 Green.
3. Enable simultaneous gap-out feature for all phases.
4. The cabinet and controller are part of the Hickory City System.

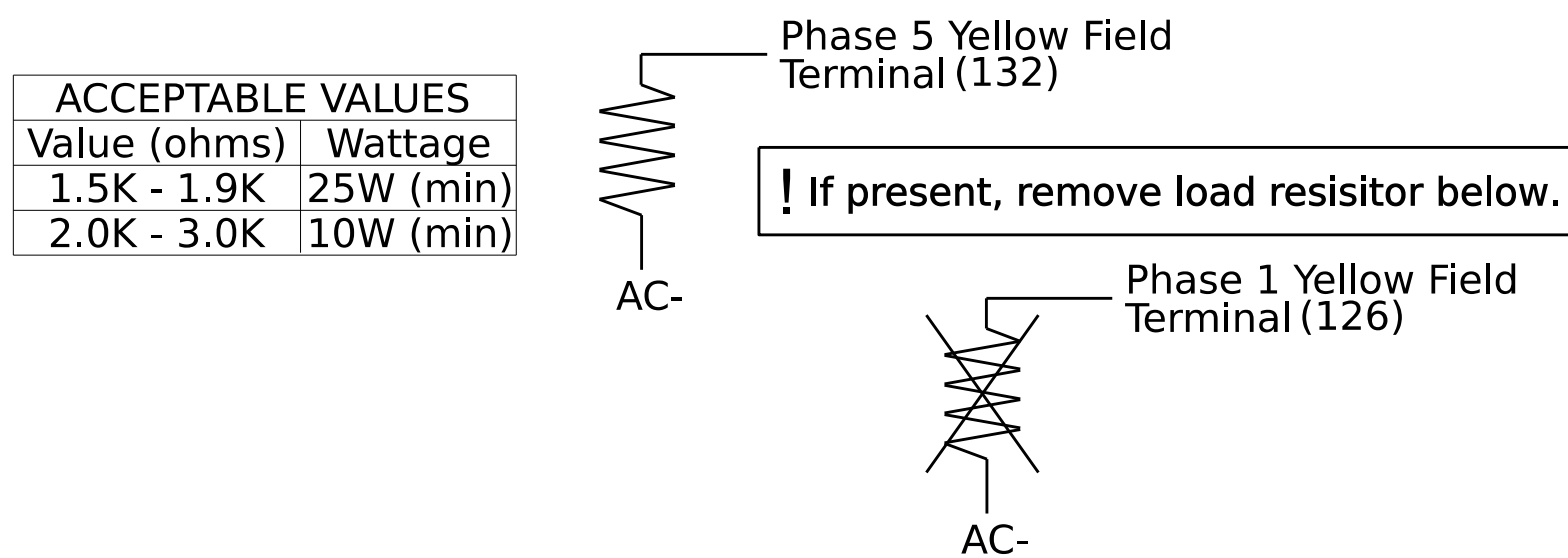
5. Default the controller before programming this detail.

EQUIPMENT INFORMATION

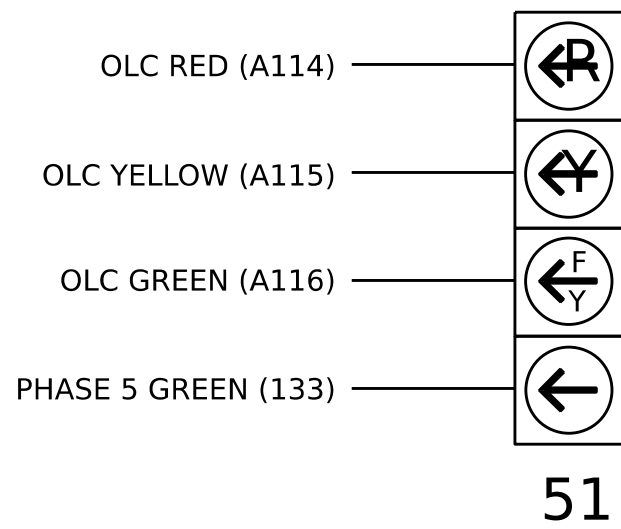
Controller.....	2070
Cabinet.....	332 w/ Aux
Software.....	SE-PAC2070
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S2, S5, S7, S8, AUX S4, AUX S5
Phases Used.....	2, 4, 5, 6
Overlap "A".....	Not Used
Overlap "B".....	Not Used
Overlap "C".....	*
Overlap "D".....	*

*See overlap programming detail on sheet 2

(install resistor as shown)



(wire signal head as shown)



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.

[illegible]

NU = Not Used

*Denotes install load resistor. See LOAD RESISTOR INSTALLATION DETAIL this sheet.

★See pictorial of head wiring in detail this sheet.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T3
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

Electrical Detail - (TMP Phase 4) - Sheet 1 of 2

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
(Lenoir Rhyne Blvd. SE)

Division 12 Catawba County Hickory

PLAN DATE: April 2026

PREPARED BY: Tim Langston

REVISIONS

DATE _____

DocuSigned by:
D. Todd Joyce 04/14/2026

DATE

SIG. INVENTORY NO. 12-0309T3

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap. Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: ---E: ---I: ---M: ---

B: ---F: ---J: ---N: ---

C: FYA G: ---K: ---O: ---

D: STD H: ---L: ---P: ---

PREV/NEXT TO CYCLE

Press ESC

OVERLAP C

Use Up/Dn/Left/Right keys to position cursor on Overlap 'C', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - CMIN PERM: 1

PHASES: 12345678 90123456

PROT PHASES: 00001000 00000000

PERM PHASES: 00000100 00000000FYA: 0

-PED PHASES: 00000000 00000000-PED: 30

OVERLAPS: ABCDEFGH IJKLMNOP

PROT O-LAPS: 00x00000 00000000

PERM O-LAPS: 00x00000 00000000

NOTICE FYA
DELAY/10 = 0

Press ESC

OVERLAP D

Use Up/Dn/Left/Right keys to position cursor on Overlap 'D', use the NEXT key to select 'STD', then press ENT

OVERLAP - D12345678 90123456

PARENTS: 00010000 00000000

+GRN PHASES: 00000000 00000000

-G/Y PHASES: 00000000 00000000

-PED PHASES: 00000000 00000000

TRAIL GREEN STANDARD: 0YEL/10: 40

TRAIL GREEN PREEMPT: 0RED/10: 20

OVERLAP PROGRAMMING COMPLETE

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGSTEST-A FLASH: 0

LDSW:123456789 0123456789 0123456789 012

FLSH:010010110 0000001100 0000000000 000

ALT:010010100 0000001100 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456

ENTRY: 01000100 00000000

EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

STARTUP TIME: 6 (SEC) STATE: 2 (0-FL

RED REV/10: 40 (TSEC) 1-RED

AUTO PED CLR: 0 (0-NO 1-YES) 2-RAF)

STOP T RESET: 0 (0-NO 1-YES)

SEQUENCE: 1 (1-19)

SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 4-INIT & N.A. RESP+

PHASE: 1...2...3...4...5...6...7...8

INITIAL 0 4 0 1 1 4 0 0

NA RESP 0 1 0 2 0 1 0 0

UPDT GRN 0 0 0 0 0 0 0 0

CODES: 0...1...2...3...4...5...6

INIL NONE INACT RED YEL GRN DRK G/DW

NA RSP NONE NA1 NA2 1&2 --- ---

Notice
phases
1,3,7 & 8
not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 4) - Sheet 2 of 2

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 & INFRASTRUCTURE MANAGEMENT

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12Catawba CountyHickory

PLAN DATE: April 2026REVIEWED BY:

PREPARED BY: Tim LangstonREVIEWED BY:

REVISIONS

INIT. DATE

DocuSigned by:
D. Todd Joyce04/14/2026

SIG. INVENTORY NO. 12-0309T3

SEAL

NORTH CAROLINA

PROFESSIONAL

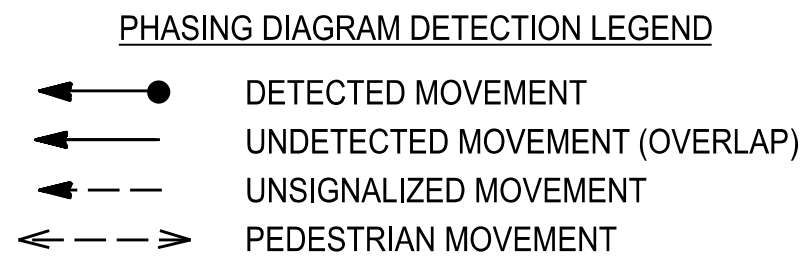
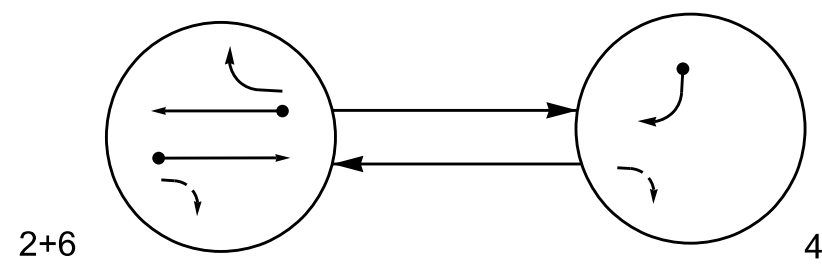
SEAL 031001

ENGINEER

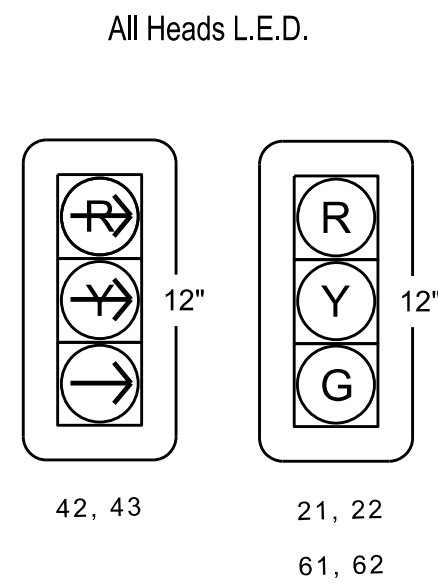
D. TODD JOYCE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T3
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

PHASING DIAGRAM



SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART																		
INDUCTIVE LOOP						ASSIGNED PHASE	DETECTOR PROGRAMMING											
							TIMING		OPERATION MODE							SWITCH	SYSTEM LOOPS	STATUS
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING				DELAY	EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B			5 PROT/PER LEFT
4A	*	*	0	*	-	4	-	-	X	*	*	*	*	*	*	*	*	*
* Multi -Zone Microwave Detection																		

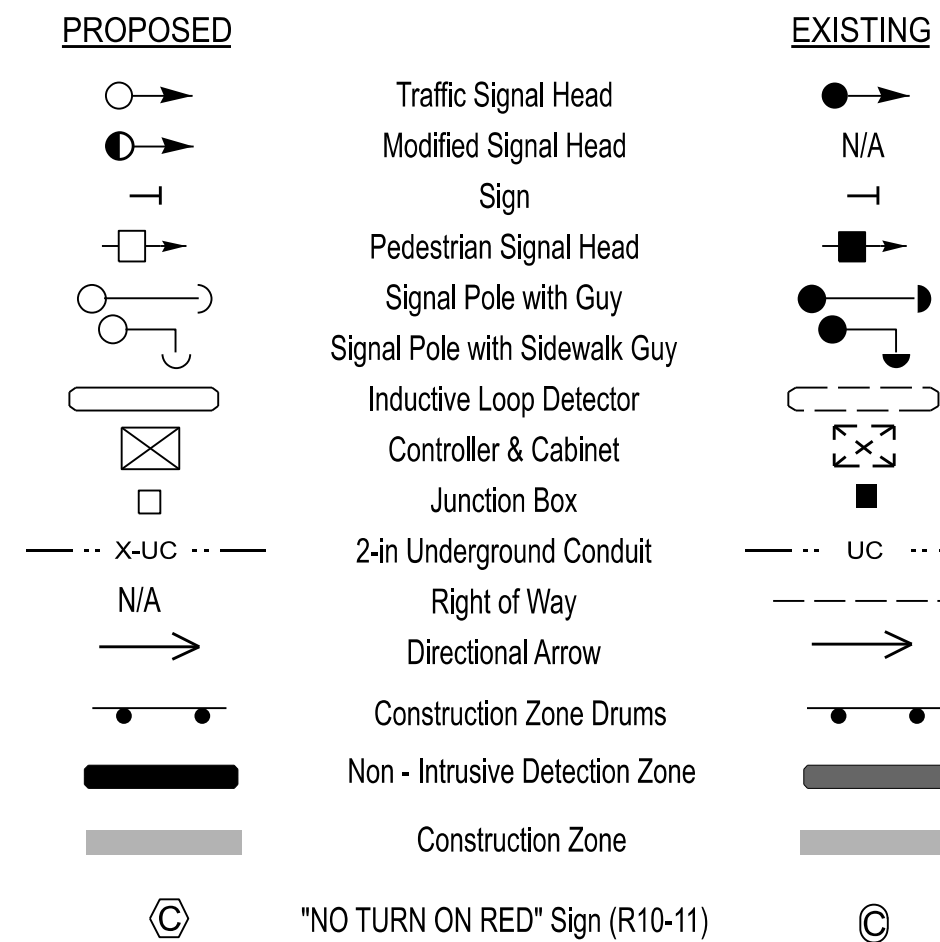
* Multi -Zone Microwave Detection

2-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Remove signal heads number 41 and 51.
- Remove the existing "No Left Turn" Sign (R3-2).
- Remove the existing Yield Sign (R1-2).
- Reposition all signal heads.
- Refer to Pavement Marking Plans for proposed stop bar and crosswalk locations.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND



© "NO TURN ON RED" Sign (R10-11) ©

SE-PAC 2070 TIMING CHART				
FEATURE	PHASE			
	2	4	6	
Min Green*	12	7	12	
Passage Gap*	2.0	2.0	2.0	
Maximum Green*	90	30	90	
Yellow Change	4.8	3.7	4.8	
Red Clear	3.2	2.2	3.2	
Walk*	-	-	-	
Pedestrian Clear	-	-	-	
Added Initial*	-	-	-	
Maximum Initial*	-	-	-	
Time Before Reduction*	-	-	-	
Time To Reduce*	-	-	-	
Minimum Gap	-	-	-	
Recall Mode	MIN RECALL	-	MIN RECALL	
Vehicle Call Memory	LOCK	NON-LOCK	LOCK	
Dual Entry	-	-	-	
Simultaneous Gap	ON	ON	ON	

* 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.

Microwave Detection						
FUNCTION	SENSOR 1 (2A)			SENSOR 2 (6A)		
Channel	1			1		
Phase	2			6		
Direction of Travel	SB			NB		
Type	Priority			Priority		
Level	1	2	Queue	1	2	Queue
Discovery Zone (ft)	>= 750	<750	-	>= 750	<750	-
Range	900-100	600-100	150-100	900-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y
Speed Range(mph)	35-100	35-100	1-35	35-100	35-100	1-35
Enable Estimated Time of Arrival	Y	Y	N	Y	Y	N
Estimated Time of Arrival (sec)	2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0	-

Signal Upgrade -Temporary Design 4 (TMP Phase 7A)

 750 N. Greenfield Pkwy, Garner, NC 27529	I-40 EB Ramp at SR 1007 (Lenoir Rhyne Blvd. SE)		Division 12 Catawba County Hickory	
	PLAN DATE: January 2026		REVIEWED BY: R.N Zinser	
	PREPARED BY: Adja Fall		REVIEWED BY:	
	REVISIONS		INIT.	DATE
		DocuSigned by: R. Nicholas Zinser 04/13/2026		
1" = 50'		SIG. INVENTORY NO. 12-0309T4		

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap. Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: ---E: ---I: ---M: ---
B: ---F: ---J: ---N: ---
C: ---G: ---K: ---O: ---
D: STDH: ---L: ---P: ---

PREV/NEXT TO CYCLE

↓

OVERLAP D

Press ESC

Use Up/Dn/Left/Right keys to position cursor on Overlap 'D', use the NEXT key to select 'STD', then press ENT

OVERLAP - D1234567890123456
PARENTS: 0001000000000000
+GRN PHASES: 0000000000000000
-G/Y PHASES: 0000000000000000
-PED PHASES: 0000000000000000
TRAIL GREEN STANDARD: 0YEL/10: 40
TRAIL GREEN PREEMPT: 0RED/10: 20

OVERLAP PROGRAMMING COMPLETE

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGSTEST-A FLASH: 0

LDSW:12345678901234567890123456789012
FLSH:0100000100000000100000000000000
ALT:0100000000000000010000000000000

0-DARK1-RED2-YELLOW3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 1234567890123456
ENTRY: 0100010000000000
EXIT: 0100010000000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL
RED REV/10...: 40 (TSEC) 1-RED
AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET.: 0 (0-NO 1-YES)
SEQUENCE.....: 1 (1-19)
SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 7A) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp
at
SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12Catawba CountyHickory

PLAN DATE: April 2026REVIEWED BY:

PREPARED BY: Tim LangstonREVIEWED BY:

REVISIONSINIT. DATE

DocuSigned by:
D. Todd Joyce04/14/2026
200C4DE0B62410DATE

SIG. INVENTORY NO. 12-0309T4

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
031001
ENGINEER
D. TODD JOYCE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0309T4
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

PHASING DIAGRAM

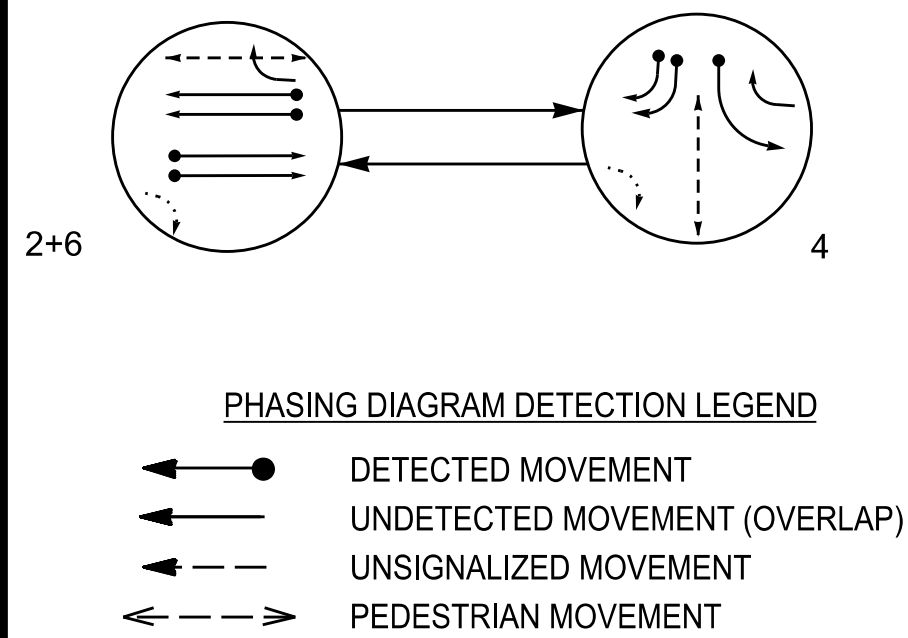
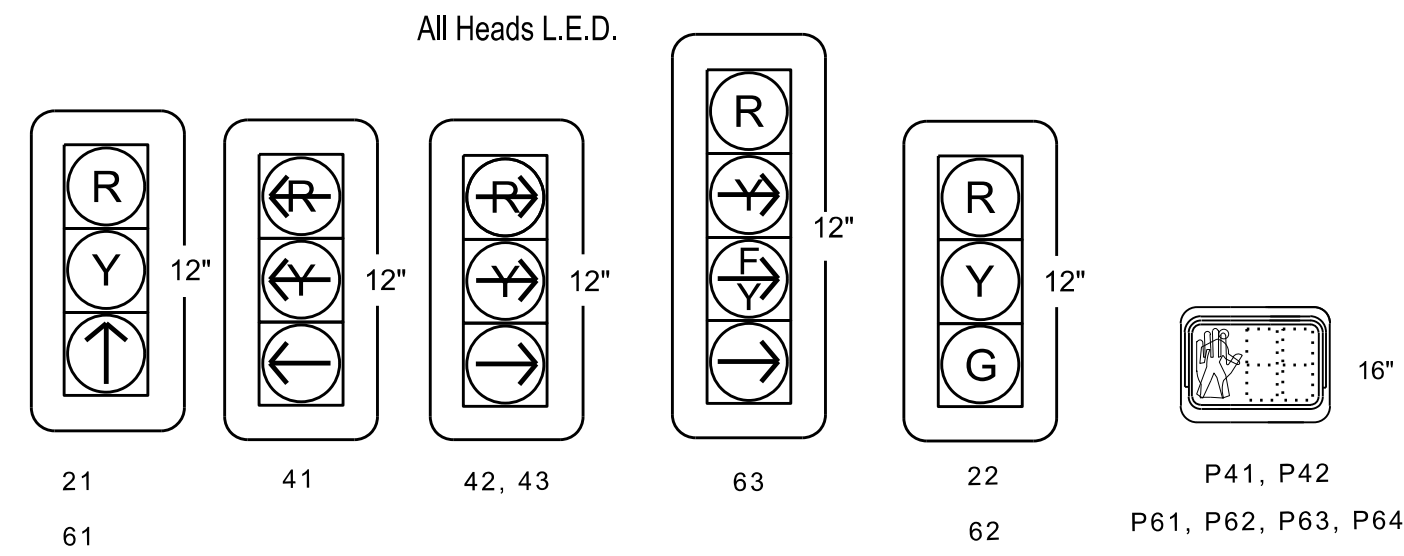


TABLE OF OPERATION				
SIGNAL FACE	F L S H			
	2 6	4		
21	↑	R	R	
22	G	R	R	
41		←	→	
42, 43		→	→	
61	↑	R	R	
62	G	R	R	
63		→	→	
P41, P42	DW	W	DRK	
P61, P62, P63, P64	W	DW	DRK	

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOP						DETECTOR PROGRAMMING														
						ASSIGNED PHASE	TIMING		OPERATION MODE								SWITCH	SYSTEM LOOPS	STATUS	
									0	1	2	3	4	5	6	7			NEW	EXISTING
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROTIPER LEFT	PROTIPER THROUGH	AND					
4A	*	*	0	*	*	4	-	-	X	*	-	-	-	*	*	*	*			
4B	*	*	0	*	*	4	-	-	X	*	-	-	-	*	*	*	*			
4C	*	*	0	-	*	4	-	-	X	*	-	-	-	*	*	*	*			

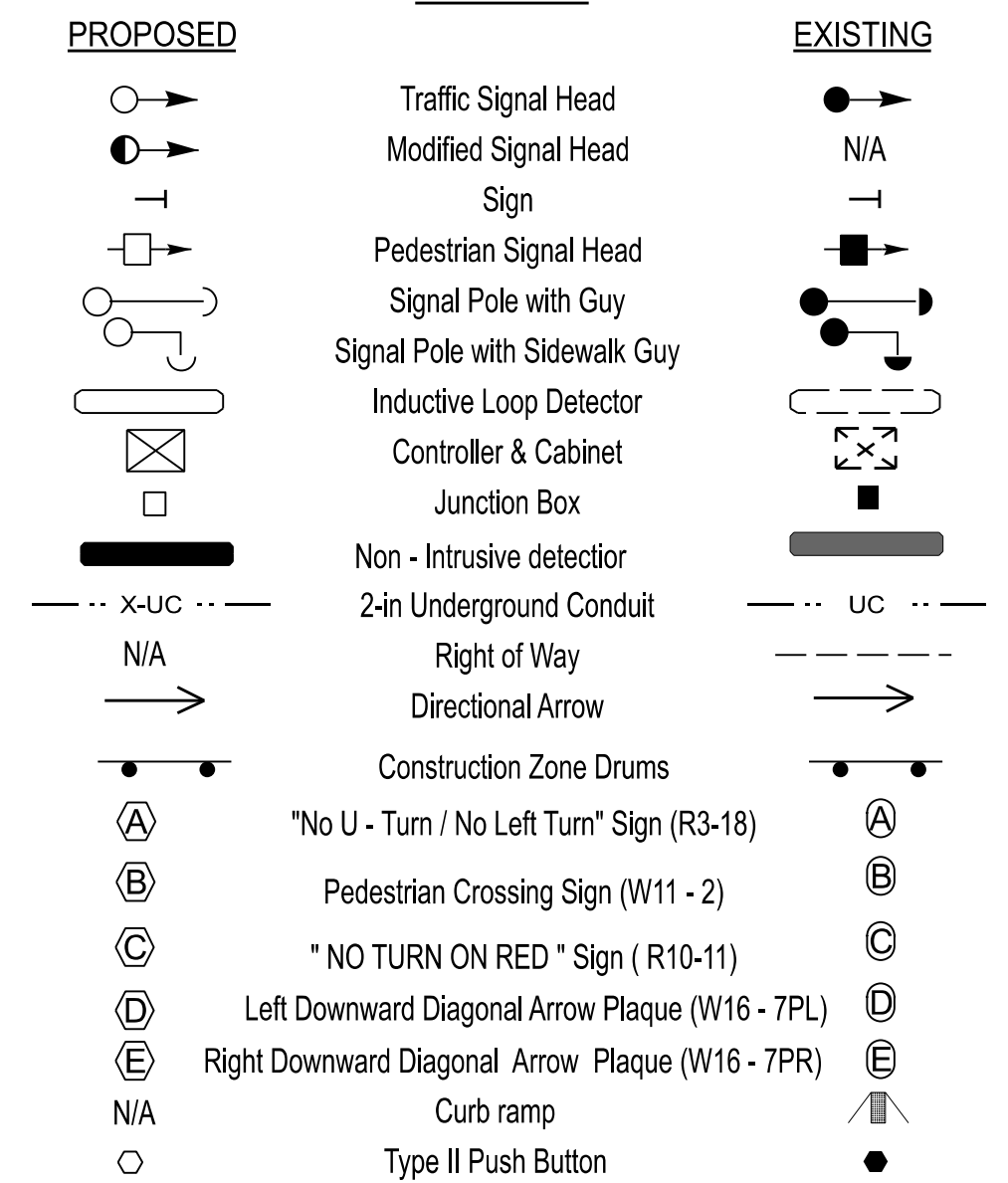
- * Multi -Zone Microwave Detection

2-Phase Fully Actuated Hickory City Signal System

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. Set all detector units to presence mode.
4. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
5. Install backplates with retro-reflective sheetings on signal all signal heads .
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND



FEATURE	PHASE		
	2	4	6
Min Green*	12	7	12
Passage Gap*	2.0	2.0	2.0
Maximum Green*	90	30	90
Yellow Change	4.8	3.7	4.8
Red Clear	3.1	2.6	3.1
Walk*	-	11	14
Pedestrian Clear	-	13	35
Advance Walk	-	4	7
Added Initial*	-	-	-
Maximum Initial*	-	-	-
Time Before Reduction*	-	-	-
Time To Reduce*	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* 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.

Microwave Detection						
FUNCTION	SENSOR 1 (2A)			SENSOR 2 (6A)		
Channel	1			1		
Phase	2			6		
Direction of Travel	SB			NB		
Type	Priority			Priority		
Level	1	2	Queue	1	2	Queue
Discovery Zone (ft)	>= 750	<750	-	>= 750	<750	-
Range	900-100	600-100	150-100	900-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y
Speed Range(mph)	35-100	35-100	1-35	35-100	35-100	1-35
Enable Estimated Time of Arrival	Y	Y	N	Y	Y	N
Estimated Time of Arrival (sec)	2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0	-

Signal Upgrade - Final Design

Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	I-40 EB Ramp at SR 1007 (Lenoir Rhyme Blvd. SE)	SEAL  04/13/2026 R. Nicholas Zinser F1388573472245F SIG. INVENTORY NO. 12-0309
Division 12 Catawba County Hickory		
PLAN DATE: January 2026		REVIEWED BY: R.N Zinser
PREPARED BY: Adja Fall		REVIEWED BY:
REVISIONS		INIT. DATE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap.
Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: FYA

E: ---

I: ---

M: ---

B: ---

F: ---

J: ---

N: ---

C: ---

G: STD

K: ---

O: ---

D: STD

H: ---

L: ---

P: ---

PREV/NEXT TO CYCLE

OVERLAP A

Use Up/Dn/Left/Right keys to position cursor on Overlap 'A', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - A

MIN PERM: 1

PHASES: 12345678 90123456

PROT PHASES: 00010000 00000000

PERM PHASES: 00000100 00000000

FYA: 0

-PED PHASES: 00000000 00000000

-PED: 30

OVERLAPS: ABCDEFGH IJKLMNOP

PROT O-LAPS: x0000000 00000000

PERM O-LAPS: x0000000 00000000

NOTICE FYA DELAY/10 = 0

Press ESC

OVERLAP D

Use Up/Dn/Left/Right keys to position cursor on Overlap 'D', use the NEXT key to select 'STD', then press ENT

OVERLAP - D

12345678 90123456

PARENTS: 00010000 00000000

+GRN PHASES: 00000000 00000000

-G/Y PHASES: 00000000 00000000

-PED PHASES: 00000000 00000000

TRAIL GREEN STANDARD: 0

YEL/10: 40

TRAIL GREEN PREEMPT: 0

RED/10: 20

Press ESC

OVERLAP G

Use Up/Dn/Left/Right keys to position cursor on Overlap 'G', use the NEXT key to select 'STD', then press ENT

OVERLAP - G

12345678 90123456

PARENTS: 00010000 00000000

+GRN PHASES: 00000000 00000000

-G/Y PHASES: 00000000 00000000

-PED PHASES: 00000000 00000000

TRAIL GREEN STANDARD: 0

YEL/10: 40

TRAIL GREEN PREEMPT: 0

RED/10: 20

OVERLAP PROGRAMMING COMPLETE

LOAD SWITCH MAPPING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 9-OUTPUT MAPPING

Use arrow keys to place curson on 'LDSW 1'
then NEXT key to select 'OLG'

OUTPUT MAPPING

EDIT MODE: LDSW

E-TOGGLE MODE

LDSW 1 2 3 4 5 6

RED OLG PH2 PD2 PH3 PH4 PD4

YEL - - - - -

GRN - - - - -

FIO 1 2 3 4 5 6

PREV/NEXT TO CYCLE

D-DISPLAY COMPAT

LOAD SWITCH MAPPING COMPLETE

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGS

TEST-A FLASH: 0

LDSW:123456789 0123456789 0123456789 012

FLSH:110010010 0001000100 0000000000 000

ALT:010010000 0000000100 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456

ENTRY: 01000100 00000000

EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

STARTUP TIME: 6 (SEC) STATE: 2 (0-FL

RED REV/10: 40 (TSEC) 1-RED

AUTO PED CLR: 0 (0-NO 1-YES) 2-RAF)

STOP T RESET: 0 (0-NO 1-YES)

SEQUENCE: 1 (1-19)

SPECIAL SEQ: 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 4-INIT & N.A. RESP+

PHASE: 1 2 3 4 5 6 7 8

INITIAL 0 4 0 1 0 6 0 0

NA RESP 0 1 0 2 0 1 0 0

UPDT GRN 0 0 0 0 0 0 0 0

CODES: 0 1 2 3 4 5 6

INIL NONE INACT RED YEL GRN DRK G/DW

NA RSP NONE NA1 NA2 1&2 --- ---

Notice phases 1,3,5,7 & 8 not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

Electrical Detail - Sheet 2 of 2

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

Signal Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp at SR 1007 (Lenoir Rhyne Blvd. SE)

Division 12

Catawba County

Hickory

PLAN DATE: April 2026

REVIEWED BY:

PREPARED BY: Tim Langston

REVIEWED BY:

REVISIONS

INIT.

DATE

SEAL

NORTH CAROLINA

PROFESSIONAL ENGINEER

SEAL 031001

TODD JOYCE

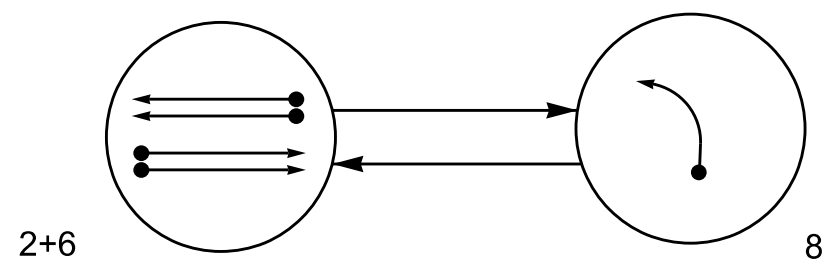
DocuSigned by: D. Todd Joyce

04/14/2026

SIG. INVENTORY NO. 12-0309

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0309
DESIGNED: January 2026
SEALED: 04/13/2026
REVISED: N/A

PHASING DIAGRAM

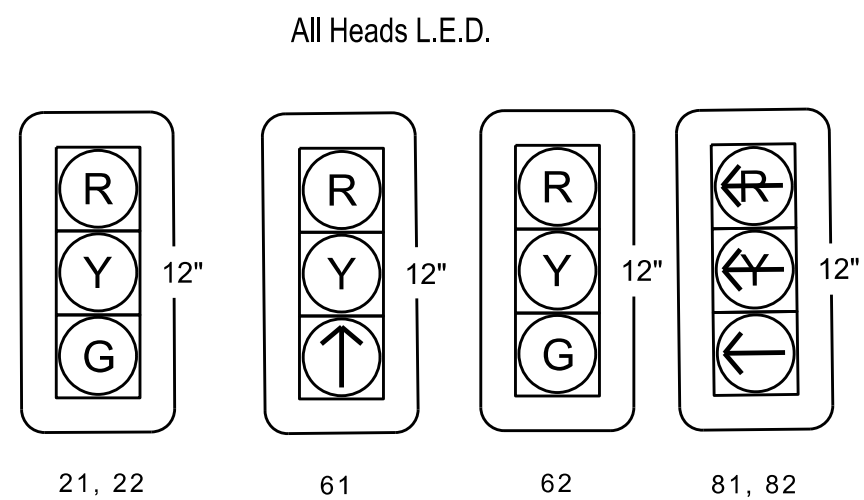


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	TABLE OF OPERATION		
	2	8	10/6
21, 22	G	R	R
61	↑	R	R
62	G	R	R
81, 82	R	←	R

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

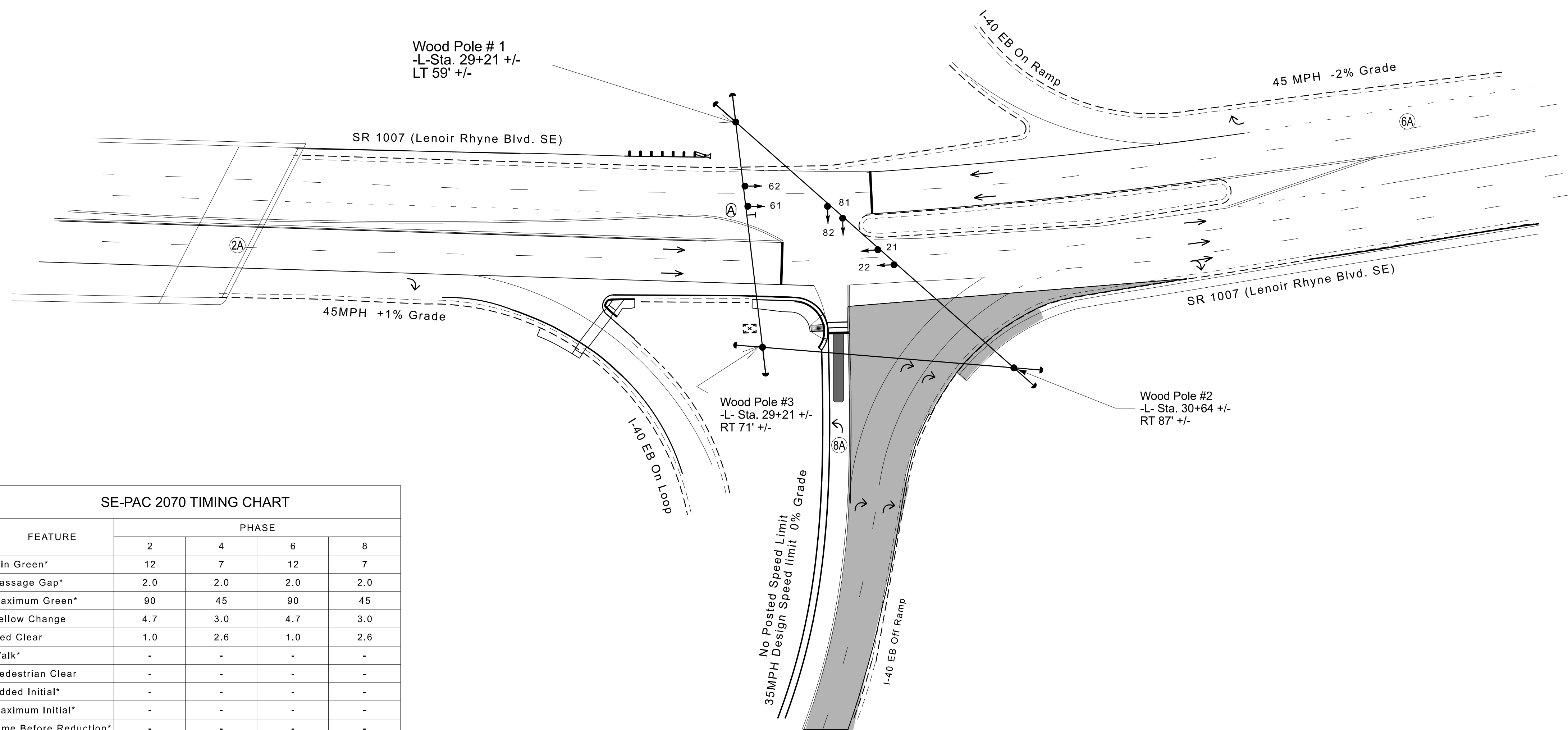
INDUCTIVE LOOP						DETECTOR PROGRAMMING															
						ASSIGNED PHASE	TIMING		OPERATION MODE								SWITCH	SYSTEM LOOPS		STATUS	
									0	1	2	3	4	5	6	7					
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING		DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/PER LEFT	PROT/PER THROUGH	AND		NEW	EXISTING		
8A	*	-	0	-	X	8	-	-	X	-	-	-	-	-	-	-	-	-	X		

* Multi -Zone Microwave Detection

2-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Program phase 4 as a dummy phase for ring 1.



SE-PAC 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green*	12	7	12	7
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	90	45	90	45
Yellow Change	4.7	3.0	4.7	3.0
Red Clear	1.0	2.6	1.0	2.6
Walk*	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

PROPOSED	EXISTING

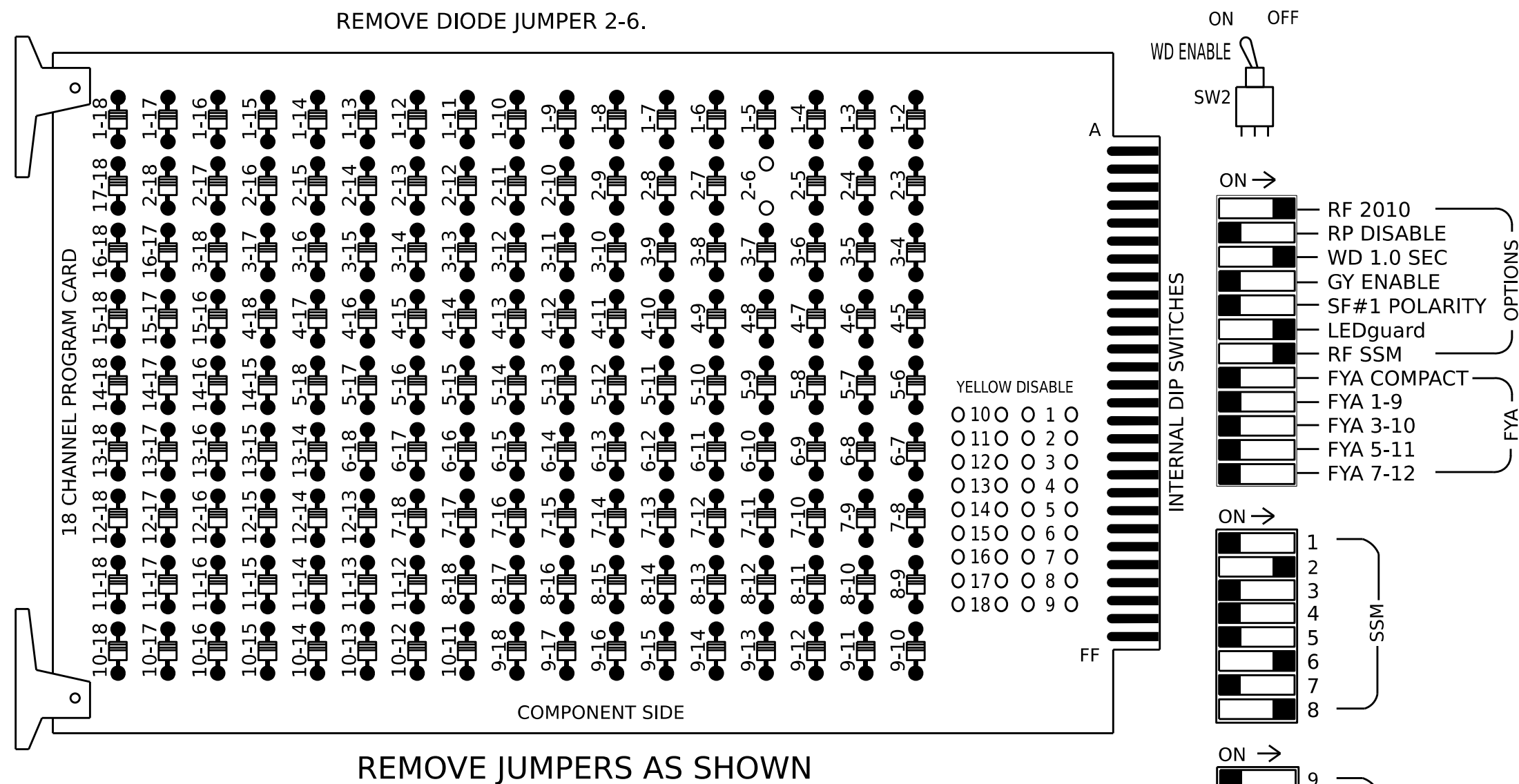
Signal Upgrade -Temporary Design 2 (TMP Phase 5B)

Prepared in the Offices of: Signal Design Section		I-40 EB Ramp at & SR 1007 (Lenoir Rhyne Blvd) & SR 1534 (8th St SE) (West Intersection) Division 12 Catawba County Hickory		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
750 N. Greenfield Pkwy, Garner, NC 27529		PLAN DATE: December 2025		REVIEWED BY: R.N. Zinser	
PREPARED BY: Adja Fall		REVIEWED BY:		DATE: 04/09/2026	
SCALE: 0 40 1" = 40'		REVISIONS		INIT. DATE	
				DATE: 04/09/2026	
				SIG. INVENTORY NO. 12-0308T2	

10-09-2016 13:24
pwa/mcdot-gw.bentley.com/mcdot-gw-01/Documents/NCDDOT Title/NCDDOT TSMO/Signal Design Section/Division_12/12-0308T2/Signal Management/120308T2_sm_elec_yyyymmdd.dgn
tlangston

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)

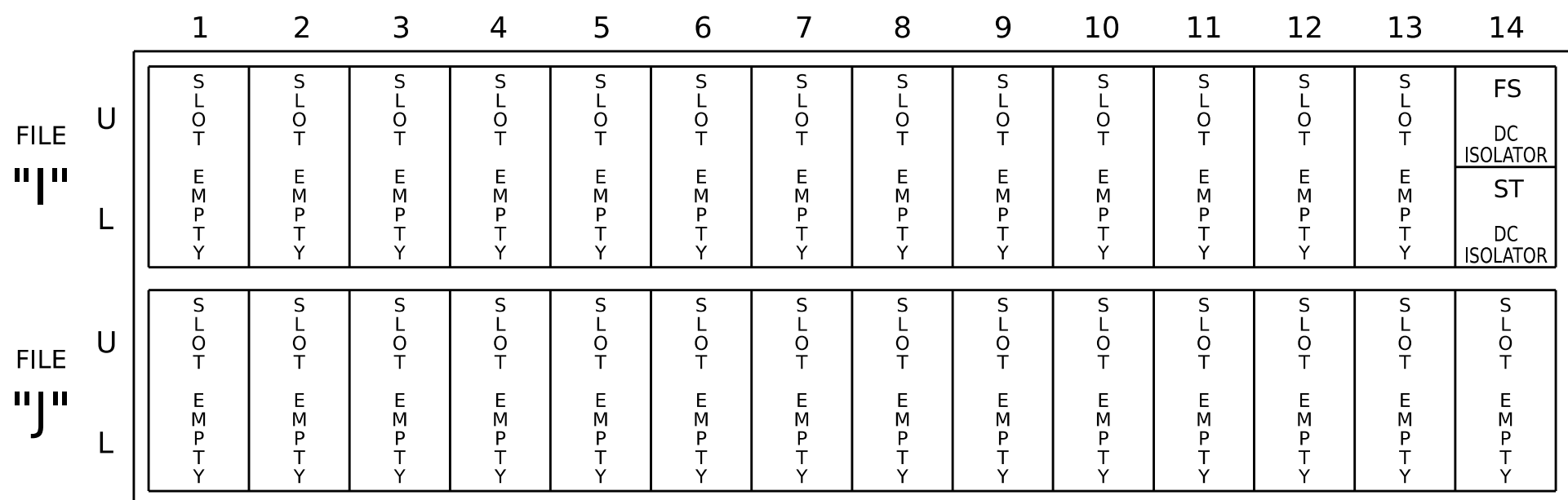


NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multi-zone 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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0308T2
DESIGNED: December 2025
SEALED: 04/09/2026
REVISED: N/A

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 Green.
- Enable simultaneous gap-out feature for all phases.

EQUIPMENT INFORMATION

Controller..... 2070
Cabinet..... 332 w/ Aux
Software..... SE-PAC2070
Cabinet Mount..... Base
Output File Positions..... 18 With Aux. Output File
Load Switches Used..... S2, S8, S11,
Phases Used..... 2, 4, 6, 8
Overlaps..... NONE

ΔPhase used for timing only

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **4-UNIT DATA**
- From UNIT DATA Submenu select **1-STARTUP & MISC**

STARTUP & MISC
STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL
RED REV/10...: 40 (TSEC) 1-RED
AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET.: 0 (0-NO 1-YES)
SEQUENCE..... 1 (1-19)
SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **3-PHASE DATA**
- From PHASE DATA Submenu select **4-INIT & N.A. RESP+**

PHASE.....1...2...3...4...5...6...7...8
INITIAL 0 4 0 1 0 4 0 1
NA RESP 0 1 0 2 0 1 0 2
UPDT GRN 0 0 0 0 0 0 0 0
CODES.....0...1...2...3...4...5...6
INIL NONE INACT RED YEL GRN DRK G/DW
NA RSP NONE NA1 NA2 1&2 - - - - -

Notice
phases
1, 3, 5 & 7
not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

PROJECT REFERENCE NO.	SHEET NO.
I-5716	Sig. 8.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NC	NU	NU	61	62	NU	NU	81,82	NU	NU	NU	NU	NU	NU
RED		128						134	134									
YELLOW		129						135	135									
GREEN		130							136									
RED ARROW											107							
YELLOW ARROW											108							
FLASHING YELLOW ARROW																		
GREEN ARROW								136			109							
Hand icon																		
Walking person icon																		

NU = Not Used
NC = Not Connected

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **4-UNIT DATA**
- From UNIT DATA Submenu select **2-FLASH**
- From FLASH Submenu select **1-REMOTE FLASH SETTINGS**

REMOTE FLASH SETTINGS TEST-A FLASH: 0
LDSW:123456789 0123456789 0123456789 012
FLSH:010000010 0100000000 0000000000 000
ALT:010000000 0000000000 0000000000 000
0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

- From REMOTE FLASH Submenu select **2-REMOTE FLASH ENTRY/EXIT PHASES**

REMOTE FLASH ENTRY/EXIT PHASES

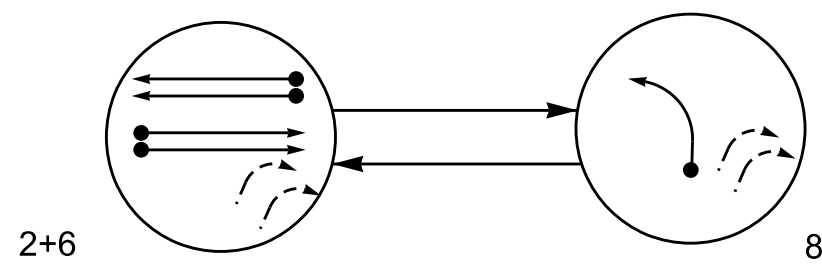
PHASES: 12345678 90123456
ENTRY: 01000100 00000000
EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 5B) - Sheet 1 of 1

Electrical and Programming Details For:	I-40 EB Ramp at SR 1007 (Lenoir Rhyme Blvd) & SR 1534 (8th St SE)(West Intersection) Division 12 Catawba County Hickory	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared in the Offices of:	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031001 D. Todd Joyce	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031001 D. Todd Joyce
750 N. Greenfield Pkwy, Garner, NC 27529	REVISIONS INIT. DATE	DocuSigned by: D. Todd Joyce 04/10/2026 DATE SIG. INVENTORY NO. 12-0308T2

PHASING DIAGRAM



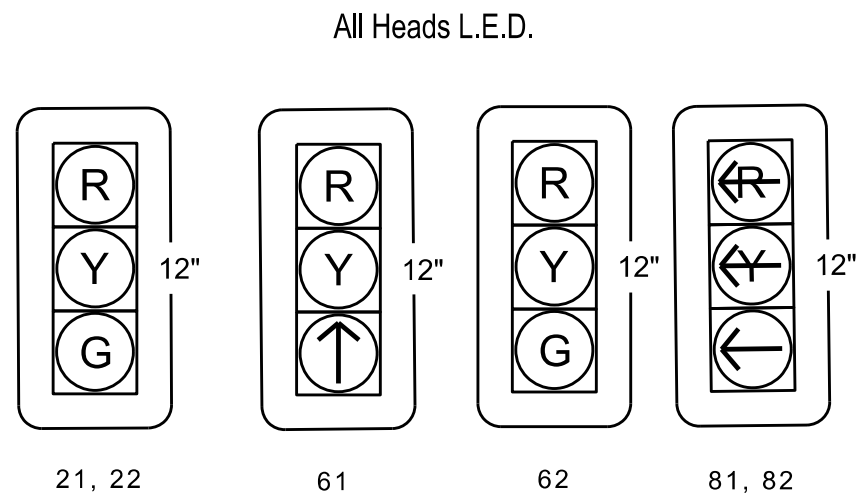
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	TABLE OF OPERATION		
	6+2	8	10+2
21, 22	G	R	R
61	↑	R	R
62	G	R	R
81, 82	←	←	←

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

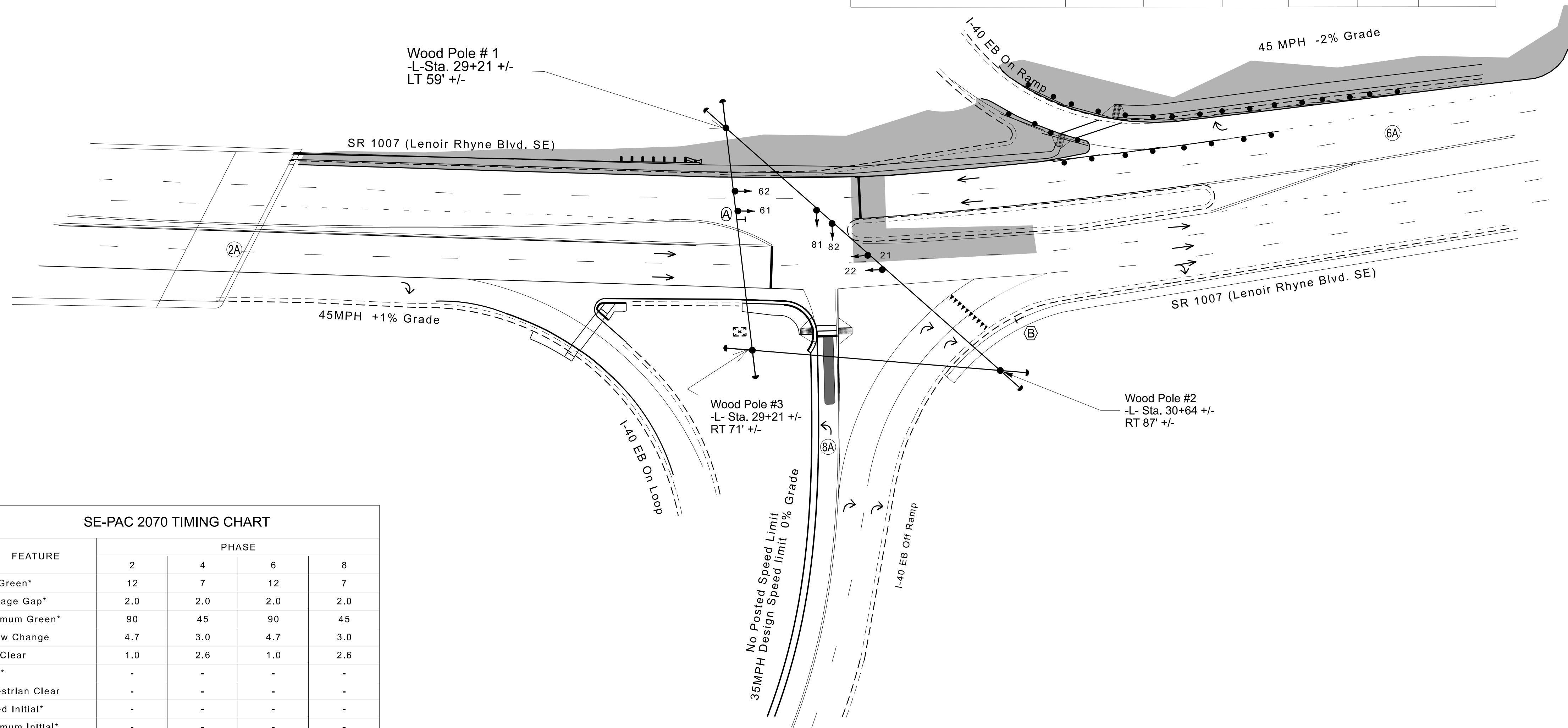
INDUCTIVE LOOP						DETECTOR PROGRAMMING																	
						ASSIGNED PHASE	TIMING		OPERATION MODE										SWITCH	SYSTEM LOOPS		STATUS	
									VEHICLE	PEDESTRIAN	1	2	3	4	5	6	7	NEW				EXISTING	
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING		DELAY	EXTEND (STRETCH)															
8A	*	*	0	*	X	8	*	*	X	*	*	*	*	*	*	*	*	*	*	*	X		

* Multi -Zone Microwave Detection

2-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Program phase 4 as a dummy phase for Ring 1.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



SE-PAC 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green*	12	7	12	7
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	90	45	90	45
Yellow Change	4.7	3.0	4.7	3.0
Red Clear	1.0	2.6	1.0	2.6
Walk*	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

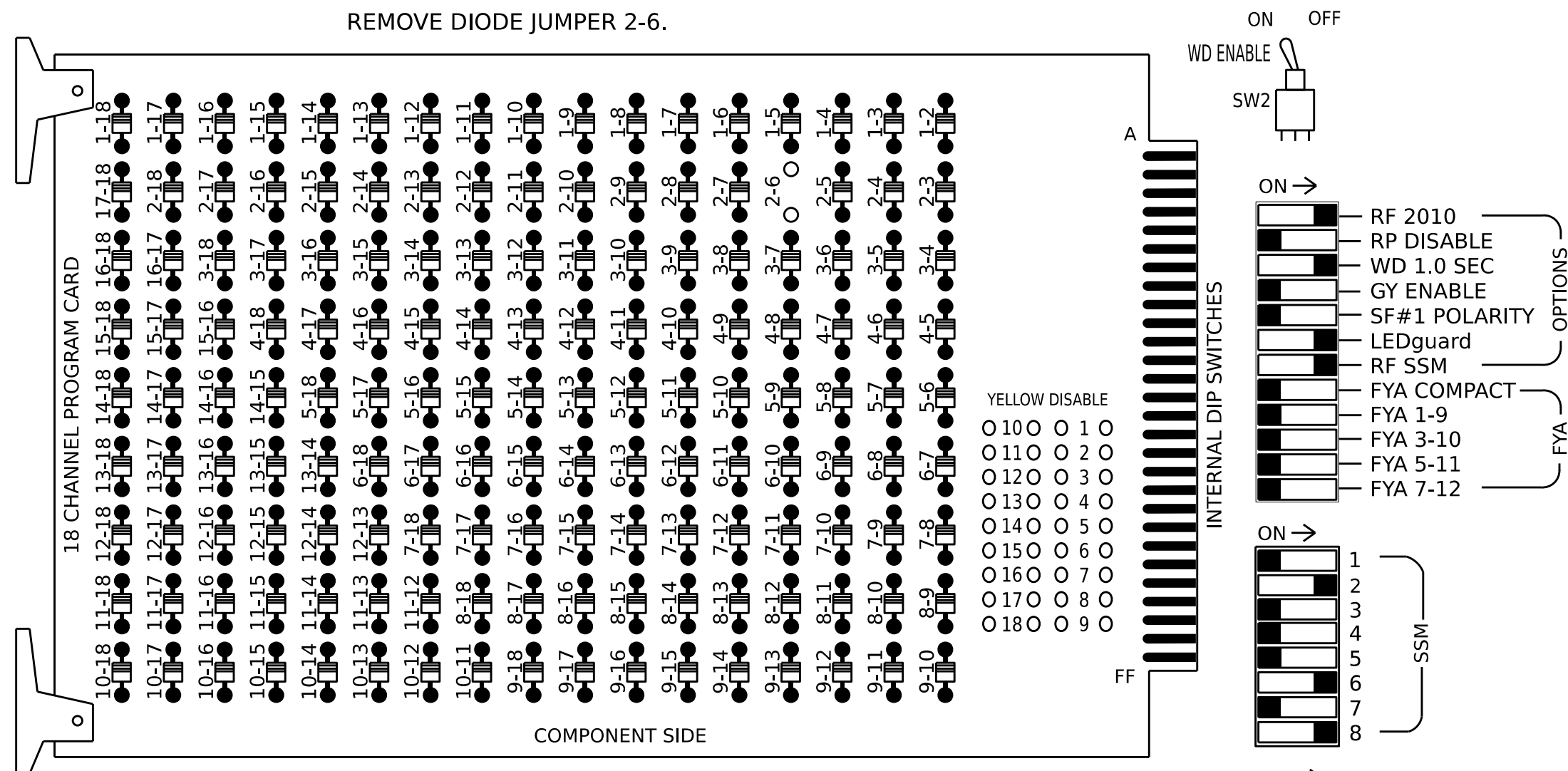
PROPOSED	EXISTING

Signal Upgrade -Temporary Design 3 (TMP Phase 6)

 750 N. Greenfield Pkwy, Garner, NC 27529	I-40 EB Ramp at & SR 1007 (Lenoir Rhyne Blvd) & SR 1534 (8th St SE) (West Intersection) Division 12, Catawba County, Hickory		
	PLAN DATE: December 2025 PREPARED BY: Adja Fall	REVIEWED BY: R.N. Zinser REVIEWED BY:	
SCALE: 0 to 40 feet 1" = 40'	REVISIONS: INIT. DATE		DocuSigned by: Nicholas Zinser F138897347248F DATE: 04/09/2026 SIG. INVENTORY NO. 12-0308T3

(remove jumper and set switches as shown)

REMOVE DIODE JUMPER 2-6.

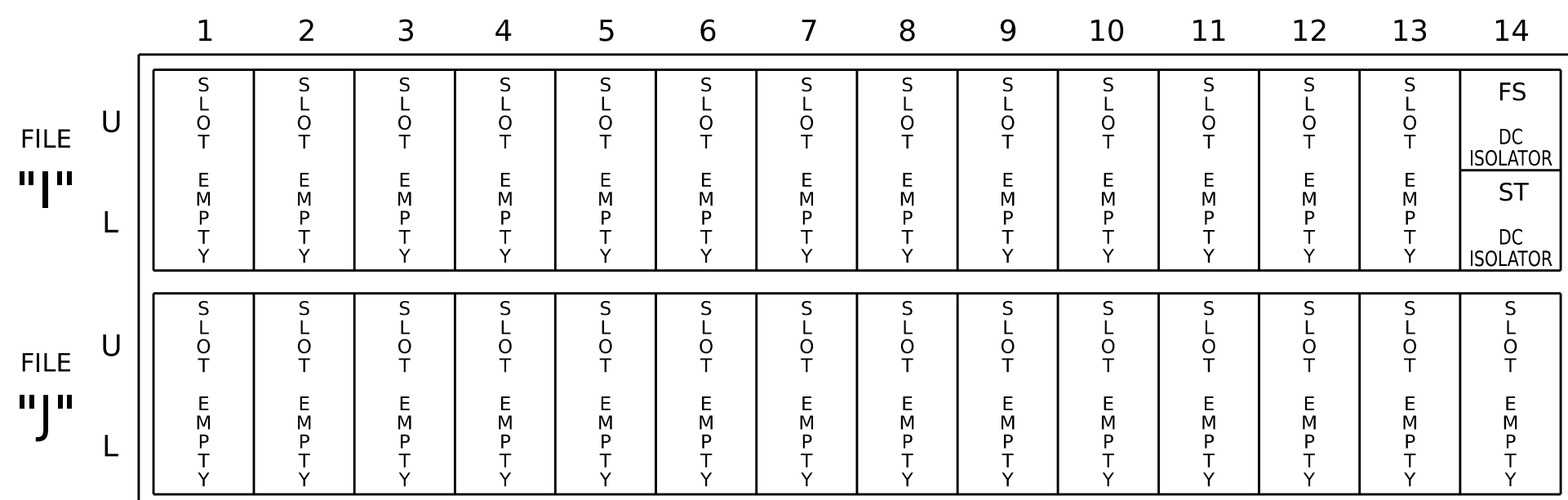


REMOVE JUMPERS AS SHOWN

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.

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

the microwave detection system for vehicle detection.
 - according to manufacturer's directions and
 - approved mounting locations to accomplish the
 - es shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0308T3
DESIGNED: December 2025
SEALED: 04/09/2026
REVISED: N/A

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 Plans.
2. Program controller to start up in phases 2 and 6 Green.
3. Enable simultaneous gap-out feature for all phases.
4. The cabinet and controller are part of the Hickory Signal System.

Controller.....	2070
Cabinet.....	332 w/ Aux
Software.....	SE-PAC2070
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S2, S8, S11,
Phases Used.....	2, ^A 4, 6, 8
Overlaps.....	NONE

Δ Phase used for timing only

(program controller as shown below)

1. From Main Menu select **4-UNIT DATA**
2. From UNIT DATA Submenu select **1-STARTUP & MISC**

```

STARTUP & MISC
STARTUP TIME:      6 (SEC) STATE: 2 (O-FL
RED REV/10...:    40 (TSEC)          1-RED
AUTO PED CLR.:    0 (O-NO 1-YES)      2-RAF)
STOP T RESET.:    0 (O-NO 1-YES)
SEQUENCE.....:    1 (1-19)
SPECIAL SEQ.:     0 (SEE HELP)

```

STARTUP PROGRAMMING COMPLETE

(program controller as shown below)

1. From Main Menu select **3-PHASE DATA**
2. From PHASE DATA Submenu select **4-INIT & N.A. RESP+**

```

PHASE.....1...2...3...4...5...6...7...8
INITIAL      0    4    0    1    0    4    0    1
NA RESP      0    1    0    2    0    1    0    2
UPDT GRN     0    0    0    0    0    0    0    0
CODES.....0...1...2...3...4...5...6
INIL  NONE  INACT RED  YEL GRN  DRK  G/DW
NA RSP NONE  NA1  NA2  1&2  ---  ---  ---

```

INIT & N.A. RESP PROGRAMMING COMPLETE

[illegible]

NU = Not Used
NC = Not Connected

(program controller as shown below)

1. From Main Menu select **4-UNIT DATA**
2. From UNIT DATA Submenu select **2-FLASH**
3. From FLASH Submenu select **1-REMOTE FLASH SETTINGS**

```

REMOTE FLASH SETTINGS      TEST-A FLASH: 0
LD SW: 123456789 0123456789 0123456789 012
FLSH: 0100000010 0100000000 0000000000 000
ALT: 0100000000 0000000000 0000000000 000
0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

```

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select **2-REMOTE FLASH ENTRY/EXIT PHASES**

REMOTE FLASH ENTRY/EXIT PHASES

```

PHASES: 12345678 90123456
ENTRY:  01000100 00000000
EXIT:   01000100 00000000

```

REMOTE FLASH PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 6) - Sheet 1 of 1

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:	I-40 EB Ramp at SR 1007 (Lenoir Rhyne Blvd) & SR 1534 (8th St SE)(West Intersection)
Prepared In the Offices of:	
	
Division 12	Catawba County
PLAN DATE: April 2026	REVIEWED BY:
PREPARED BY: Tim Langston	REVIEWED BY:
REVISONS	INIT.
DATE	

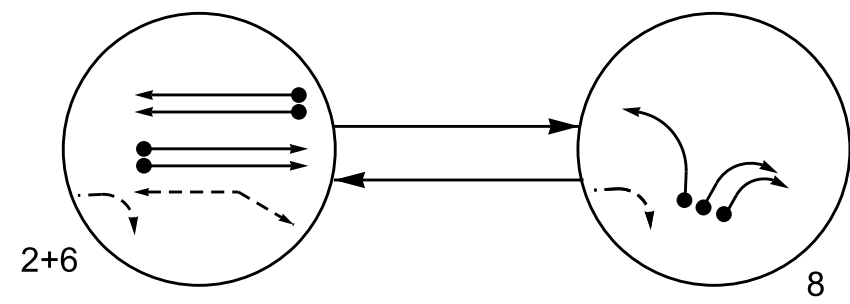
N. Greenfield Pkwy, Garner, NC 27529



DocuSigned by:
D. Todd Joyce 04/10/2018

SIG. INVENTORY NO. 12-0308T

PHASING DIAGRAM



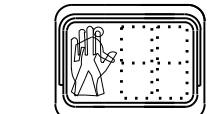
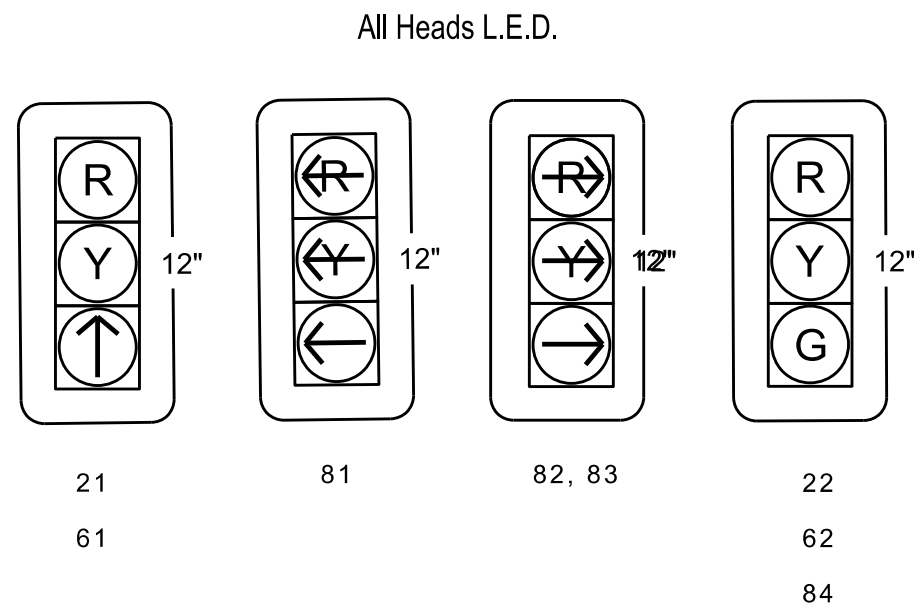
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	FLASH		
	2+6	8	
21	↑	R	R
22	G	R	R
61	↑	R	R
62	G	R	R
81	R	←	←
82, 83	R	→	→
84	R	G	R
P21, P22, P23, P24	W	DWDRK	

SIGNAL FACE I.D.



P21, P22, P23, P24

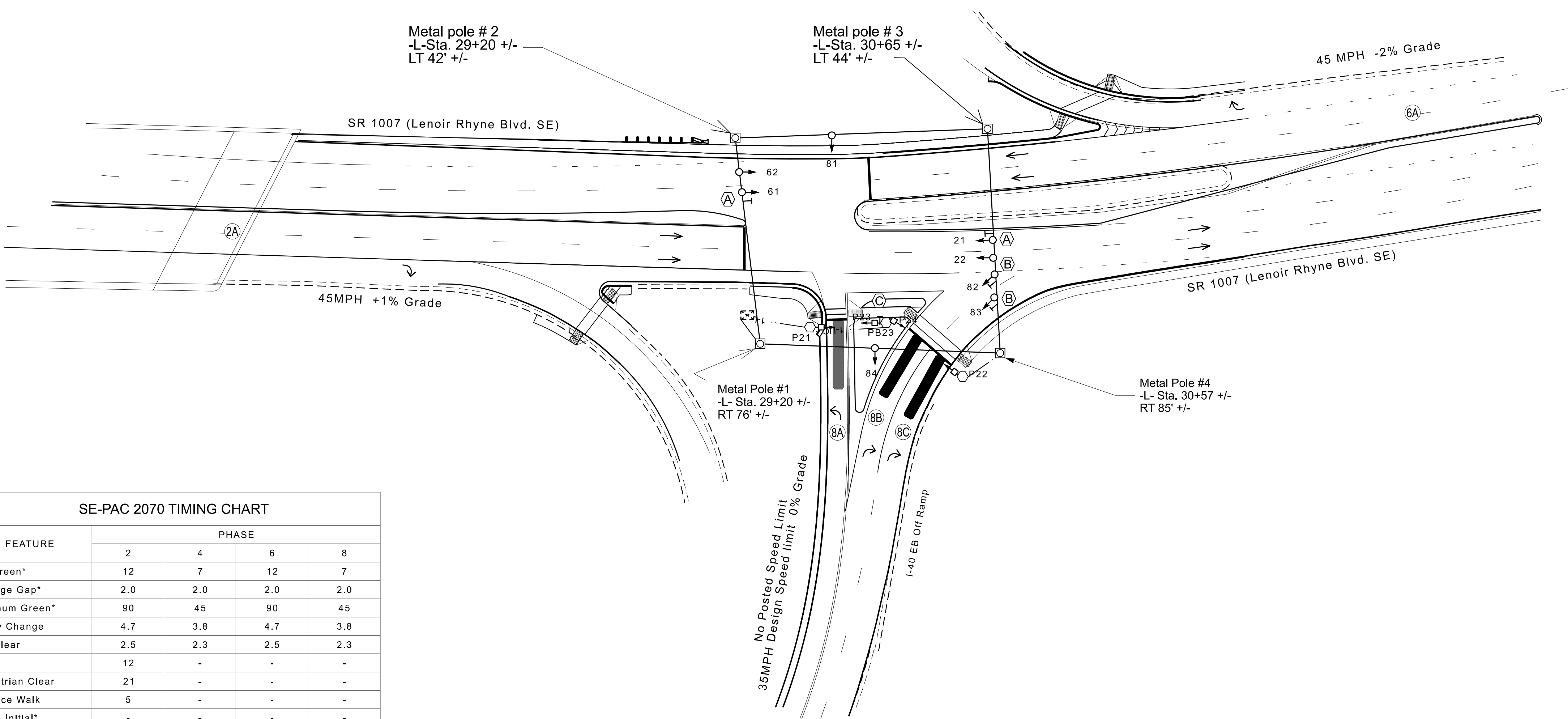
SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART																			
INDUCTIVE LOOP						DETECTOR PROGRAMMING													
						ASSIGNED PHASE	TIMING DELAY EXTEND (STRETCH)		OPERATION MODE							SWITCH	SYSTEM LOOPS	STATUS	
0	1	2	3	4	5				6	7	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B			PROT/PER LEFT	PROT/PER THROUGH
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING														
8A	*	*	0	-	X	8	-	-	X	-	-	-	-	-	-	-	-	-	X
8B	*	*	0	X	-	8	-	-	X	-	-	-	-	-	-	-	-	X	-
8C	*	*	0	X	-	8	-	-	X	-	-	-	-	-	-	-	-	X	-

* Multi -Zone Microwave Detection

2-Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Install backplates with retro-reflective sheeting for all signal heads.
- Program phase 4 as a dummy phase for ring 1.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



SE-PAC 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green*	12	7	12	7
Passage Gap*	2.0	2.0	2.0	2.0
Maximum Green*	90	45	90	45
Yellow Change	4.7	3.8	4.7	3.8
Red Clear	2.5	2.3	2.5	2.3
Walk*	12	-	-	-
Pedestrian Clear	21	-	-	-
Advance Walk	5	-	-	-
Added Initial*	-	-	-	-
Maximum Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduce*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

PROPOSED	EXISTING

Signal Upgrade -Final Design

Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	I-40 EB Ramp at & SR 1007 (Lenoir Rhyne Blvd) & SR 1534 (8th St SE) (West Intersection) Division 12 Catawba County Hickory	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043914 R. Nicholas Zinser 04/09/2026 F1388073472248F SIG. INVENTORY NO. 12-0308
PLAN DATE: December 2025 PREPARED BY: Adja Fall REVIEWED BY: R.N. Zinser	REVISIONS INIT. DATE	DocuSigned by: R. Nicholas Zinser 04/09/2026 DATE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 4-INIT & N.A. RESP+

PHASE.....	1...	2...	3...	4...	5...	6...	7...	8
INITIAL	0	6	0	1	0	4	0	1
NA RESP	0	1	0	2	0	1	0	2
UPDT GRN	0	0	0	0	0	0	0	0
CODES.....	0...	1...	2...	3...	4...	5...	6	
INIL	NONE	INACT	RED	YEL	GRN	DRK	G/DW	
NA RSP	NONE	NA1	NA2	1&2	---	---	---	---

Notice
phases
1, 3, 5 & 7
not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

REMOTE FLASH
PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGS TEST-A FLASH: 0

LDSW:123456789 0123456789 0123456789 012

FLSH:010000010 0100000000 0000000000 000

ALT:010000000 0000000000 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456

ENTRY: 01000100 00000000

EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

ALL RED FLASH STARTUP
PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC

STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL

RED REV/10.: 40 (TSEC) 1-RED

AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)

STOP T RESET.: 0 (0-NO 1-YES)

SEQUENCE.....: 1 (1-19)

SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

Electrical Detail - Sheet 2 of 2

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 & INFRASTRUCTURE MANAGEMENT

750 N. Greenfield Pkwy, Garner, NC 27529

I-40 EB Ramp

at

SR 1007 (Lenoir Rhyne Blvd) &
SR 1534 (8th St SE)(West Intersection)

Division 12 Catawba County Hickory

PLAN DATE: April 2026 REVIEWED BY:

PREPARED BY: Tim Langston REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by:
D. Todd Joyce 04/10/2026

DATE

SIG. INVENTORY NO. 12-0308

SEAL

NORTH CAROLINA

PROFESSIONAL

SEAL 031001

ENGINEER

D. TODD JOYCE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0308
DESIGNED: December 2025
SEALED: 04/09/2026
REVISED: N/A

PHASING DIAGRAM

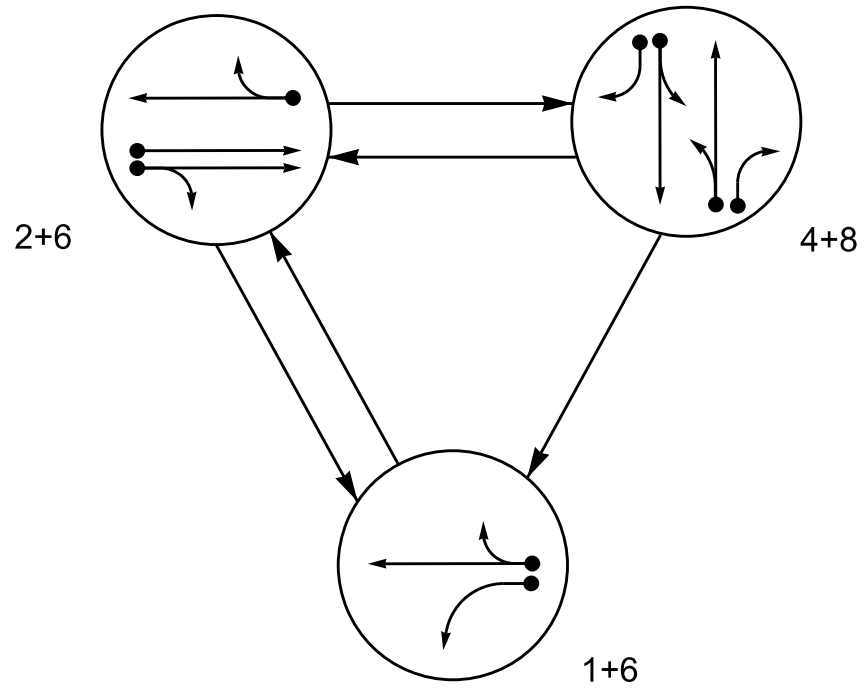
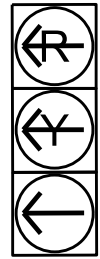


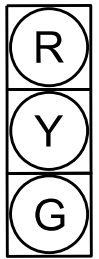
TABLE OF OPERATION				
SIGNAL FACE	1 + 6	2 + 6	4 + 8	ALL-STOP
	11	21, 22	41, 42	61, 62
11	←	→	→	→
21, 22	R	G	R	R
41, 42	R	R	G	R
61, 62	G	G	R	R
81, 82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



11



21, 22

41, 42

61, 62

81, 82

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

						DETECTOR PROGRAMMING														
						ASSIGNED PHASE	TIMING		OPERATION MODE								SWITCH	SYSTEM LOOPS	STATUS	
									0	1	2	3	4	5	6	7			NEW	EXISTING
LOOP NO.	SIZE (FT)	TURNS	DIST. FROM STOP LINE (FT)	NEW	EXISTING	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/PER LEFT	PROT/PER THROUGH	AND					
1A	*	*	0	*	-	1	3.0	-	X	-	-	-	-	-	-	-	-	-	-	
4A	*	*	0	*	-	4	3.0	-	X	-	-	-	-	-	-	-	-	-	-	
4B	*	*	0	*	-	4	15.0	-	X	-	-	-	-	-	-	-	-	-	-	
8A	*	*	0	*	-	8	3.0	-	X	-	-	-	-	-	-	-	-	-	-	
8B	*	*	0	*	-	8	15.0	-	X	-	-	-	-	-	-	-	-	-	-	

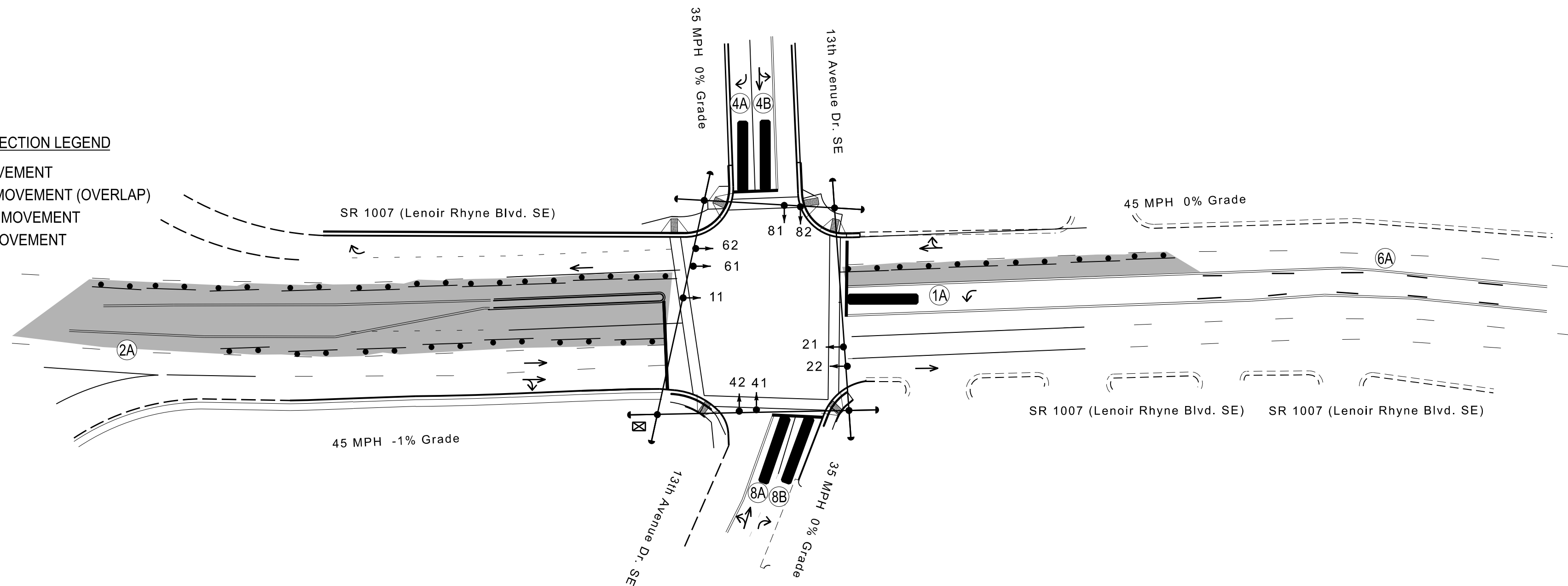
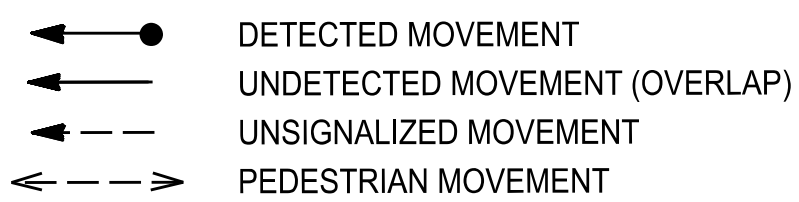
* Multi -Zone Microwave Detection

3 Phase
Fully Actuated
Hickory City Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Refer to pavement marking plans for proposal stop bar and crosswalk locations.
- Phase 1 may be lagged.
- Reposition existing signal heads 21, 22, 61 and 62.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Disconnect and bag existing signal head 51.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



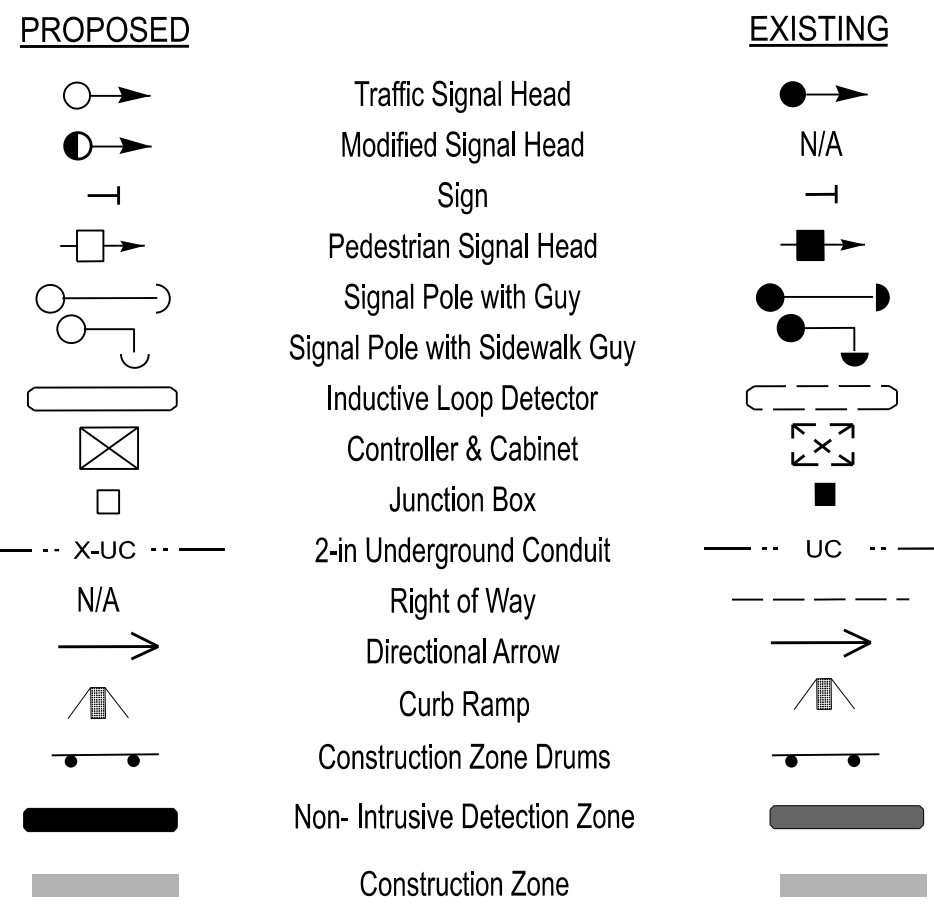
SE-PAC 2070 TIMING CHART

FEATURE	PHASE				
	1	2	4	6	8
Min Green*	7	12	7	12	7
Passage Gap*	2.0	2.0	2.0	2.0	2.0
Maximum Green*	15	90	25	90	25
Yellow Change	3.0	4.6	3.8	4.6	3.8
Red Clear	2.6	1.5	2.5	1.5	2.5
Walk*	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-
Added Initial*	-	-	-	-	-
Maximum Initial*	-	-	-	-	-
Time Before Reduction*	-	-	-	-	-
Time To Reduce*	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* 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.

Microwave Detection						
FUNCTION	SENSOR 1 (2A)			SENSOR 2 (6A)		
	1	2	Queue	1	2	Queue
Channel	1			1		
Phase	2			6		
Direction of Travel	SB			NB		
Type	Priority			Priority		
Level	1	2	Queue	1	2	Queue
Discovery Zone (ft)	>= 750	<750	-	>= 750	<750	-
Range	900-100	600-100	150-100	900-100	600-100	150-100
Enable Speed	Y	Y	Y	Y	Y	Y
Speed Range(mph)	35-100	35-100	1-35	35-100	35-100	1-35
Enable Estimated Time of Arrival	Y	Y	N	Y	Y	N
Estimated Time of Arrival (sec)	2.5-10.0	2.5-6.5	-	2.5-10.0	2.5-10.0	-

LEGEND



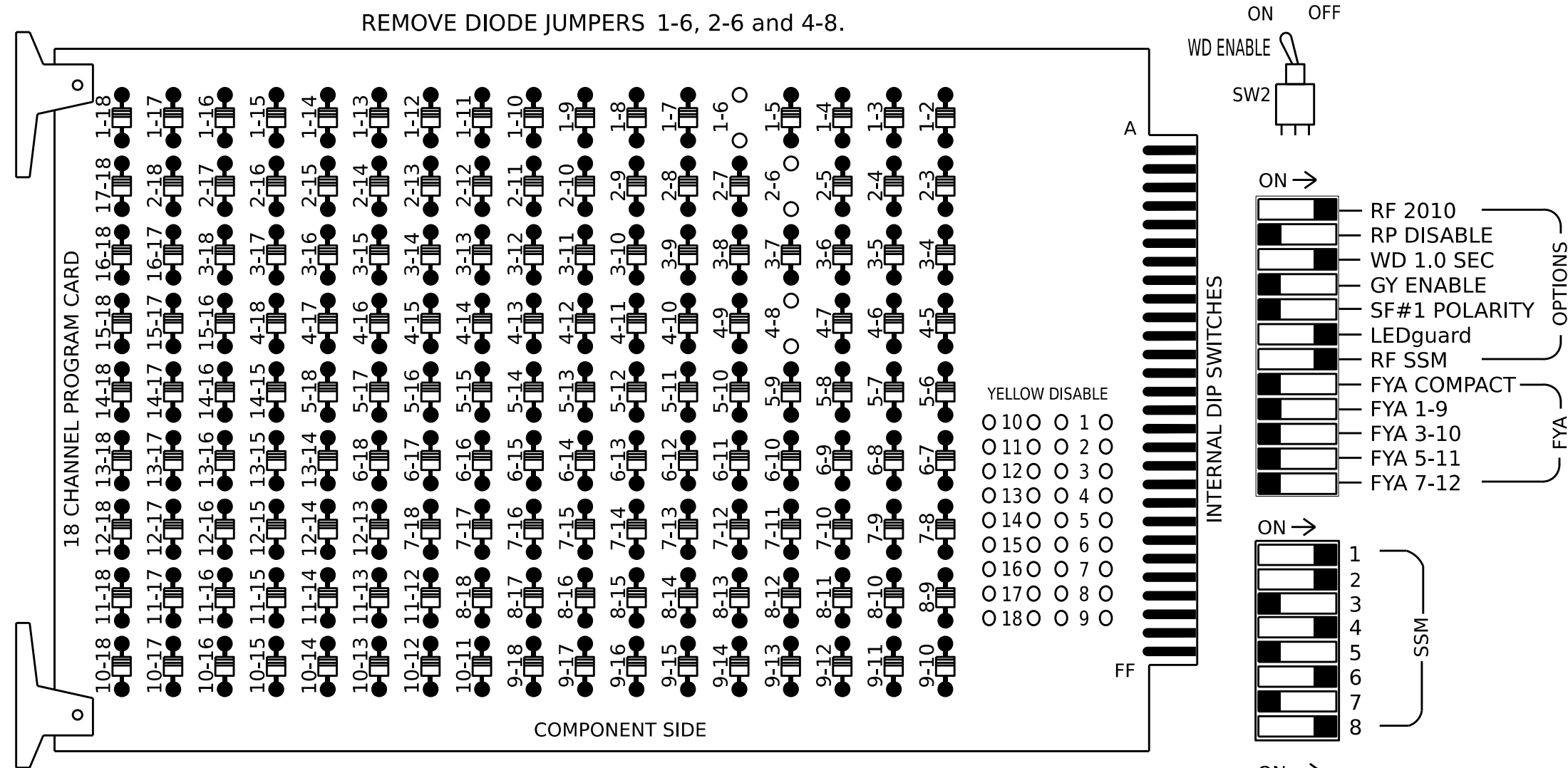
Signal Upgrade Temporary Design 1 (TMP Phase 7D)

Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		SR 1007 (Lenoir -Rhyne Blvd) at SR 2267 (13th Avenue Drive SE)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Division 12 Catawba County Hickory		PLAN DATE: January 2026 PREPARED BY: Adja Fall		REVIEWED BY: R. N. Zinser	
REVISIONS		INIT.		DATE	
0		SCALE		1" = 50'	
Seal of R. Nicholas Zinser, Engineer, No. 043914		DATE: 04/09/2026		SIG. INVENTORY NO. 12-1218T1	

10-ARR-2026-11-27
pwa/nctdot-gw-bentley.com/nctdot-gw-01/Documents/NCDOT Units/NCDOT TSMO/Signal Design/Section/Division_12/12-1218/Signals Management/121218T_en_ele_yyyymmdd.dgn
tlangston

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

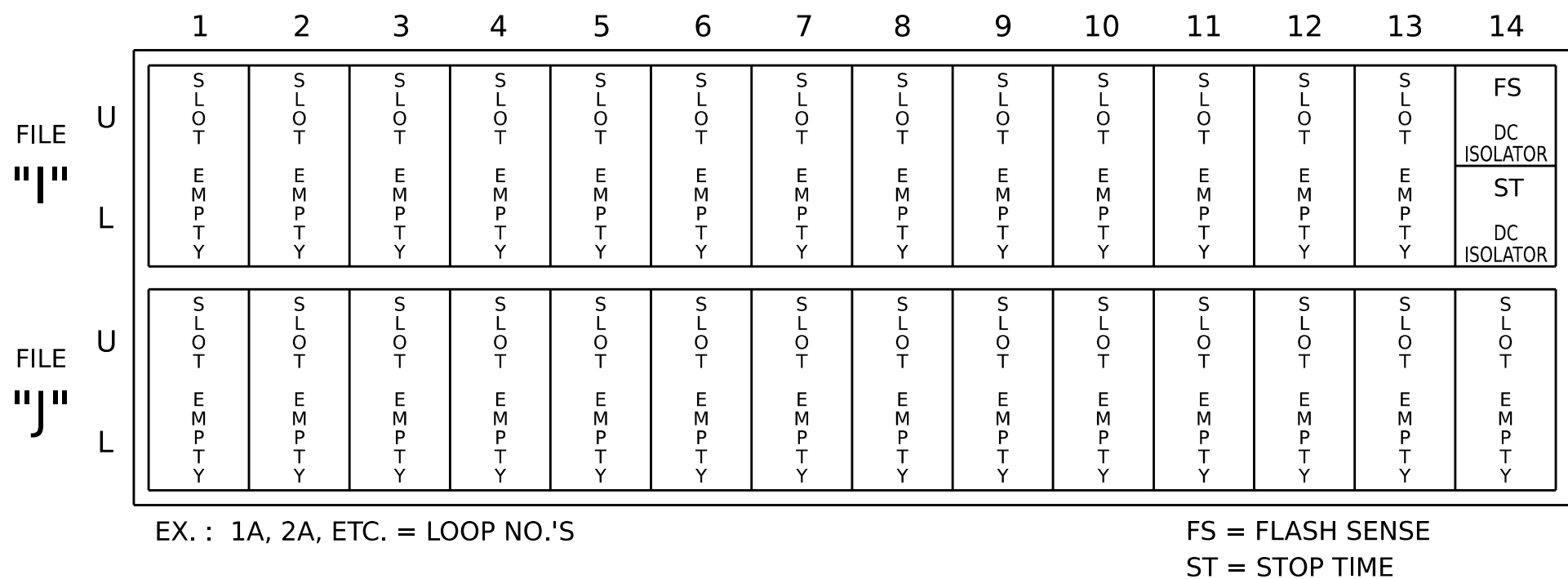


NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

Install a multi-zone 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.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 Green.
- Enable simultaneous gap-out feature for all phases.
- Program phases 4 and 8 for dual entry.

EQUIPMENT INFORMATION

Controller..... 2070
Cabinet..... 332 w/ Aux
Software..... SE-PAC2070
Cabinet Mount..... Base
Output File Positions..... 18 With Aux. Output File
Load Switches Used..... S1, S2, S5, S8, S11
Phases Used..... 1, 2, 4, 6, 8
Overlaps..... NONE

ALL RED FLASH STARTUP PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **4-UNIT DATA**
- From UNIT DATA Submenu select **1-STARTUP & MISC**

STARTUP & MISC
STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL
RED REV/10...: 40 (TSEC) 1-RED
AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET.: 0 (0-NO 1-YES)
SEQUENCE.....: 1 (1-19)
SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **3-PHASE DATA**
- From PHASE DATA Submenu select **4-INIT & N.A. RESP+**

PHASE.....1...2...3...4...5...6...7...8
INITIAL 1 4 0 1 0 4 0 1
NA RESP 0 1 0 2 0 1 0 2
UPDT GRN 0 0 0 0 0 0 0 0
CODES....0...1...2...3...4...5...6
INIL NONE INACT RED YEL GRN DRK G/DW
NA RSP NONE NA1 NA2 1&2 --- --- ---

Notice
phases
3, 5 & 7
not used!

INIT & N.A. RESP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1218T1
DESIGNED: January 2026
SEALED: 04/09/2026
REVISED: N/A

PROJECT REFERENCE NO.	SHEET NO.
I-5716	Sig. 11.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125																	
YELLOW ARROW	126																	
FLASHING YELLOW ARROW																		
GREEN ARROW	127																	
Hand icon																		
Walking person icon																		

NU = Not Used

REMOTE FLASH PROGRAMMING DETAIL

(program controller as shown below)

- From Main Menu select **4-UNIT DATA**
- From UNIT DATA Submenu select **2-FLASH**
- From FLASH Submenu select **1-REMOTE FLASH SETTINGS**

REMOTE FLASH SETTINGS TEST-A FLASH: 0
LDSW:123456789 0123456789 0123456789 012
FLSH:110010010 0100000000 0000000000 000
ALT:010010000 0000000000 0000000000 000
0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

- From REMOTE FLASH Submenu select **2-REMOTE FLASH ENTRY/EXIT PHASES**

REMOTE FLASH ENTRY/EXIT PHASES
PHASES: 12345678 90123456
ENTRY: 01000100 00000000
EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

Electrical Detail - (TMP Phase 7D) - Sheet 1 of 1

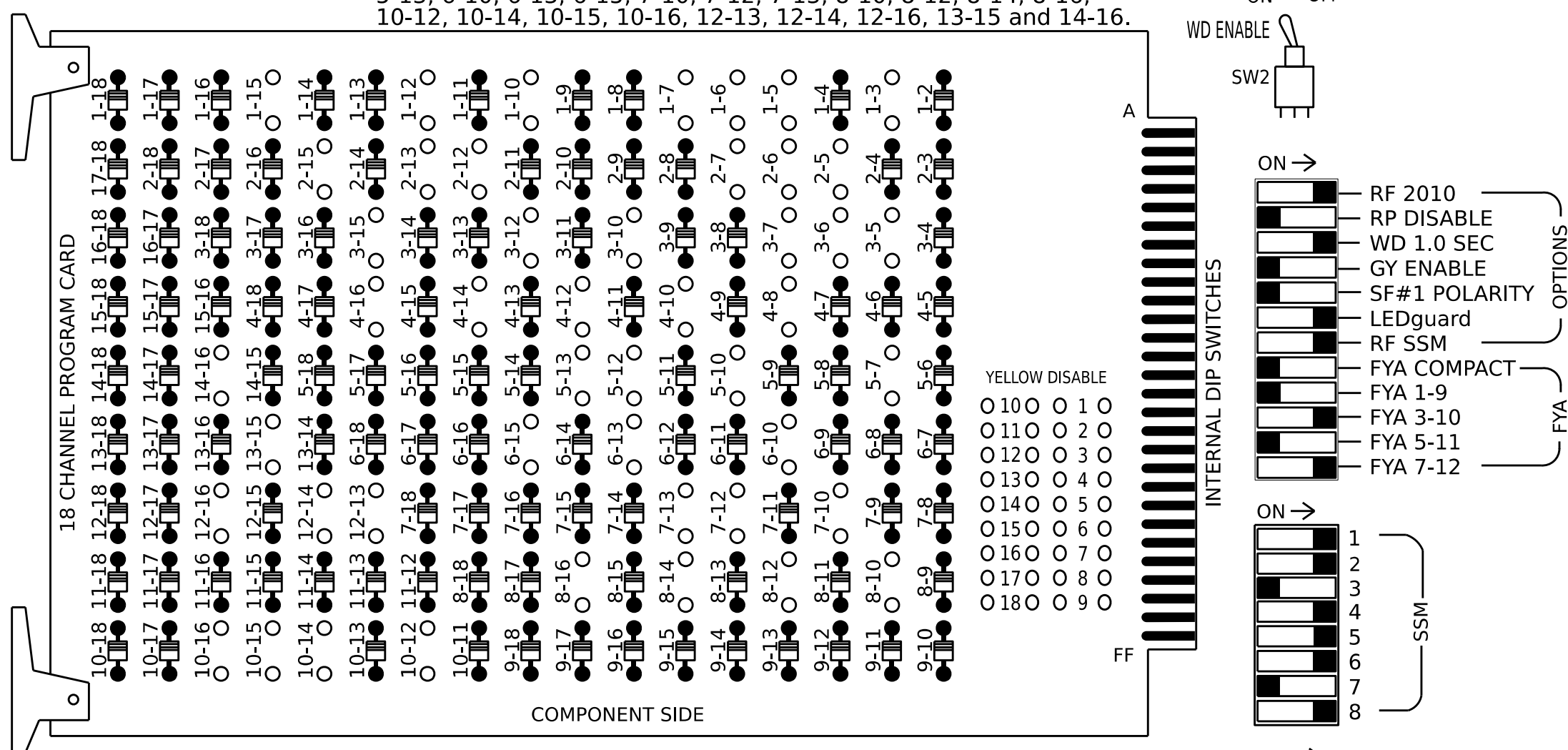
Electrical and Programming Details For:	SR 1007 (Lenoir-Rhyne Blvd) at SR 2267 (13th Avenue Drive SE)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared In the Offices of:	Division 12 Catawba County Hickory	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031001 D. Todd Joyce
	PLAN DATE: March 2026 REVIEWED BY:	DocuSigned by: D. Todd Joyce 04/10/2026
	PREPARED BY: Tim Langston REVIEWED BY:	DATE
	REVISIONS	INIT. DATE
750 N. Greenfield Pkwy, Garner, NC 27529		SIG. INVENTORY NO. 12-1218T1

10-09-2016 11:31
pwa/mcdot-gw-bentley.com/mcdot-gw-01/Documents/NCDDOT Title/NCDDOT TSMO/Signal Design/Section/Division_12/12-1218/Signal Management/121218_sm_ele_vvymmod.dgn
tlangston

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-3, 1-5, 1-6, 1-7, 1-10, 1-12, 1-15, 2-5, 2-6, 2-7, 2-12, 2-13, 2-15, 3-5,
3-6, 3-7, 3-10, 3-12, 3-15, 4-8, 4-10, 4-12, 4-14, 4-16, 5-7, 5-10, 5-12,
5-13, 6-10, 6-13, 6-15, 7-10, 7-12, 7-13, 8-10, 8-12, 8-14, 8-16,
10-12, 10-14, 10-15, 10-16, 12-13, 12-14, 12-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 Green/Don't Walk.
- Enable simultaneous gap-out feature for all phases.
- Program phases 4 and 8 for dual entry.
- The cabinet and controller are part of the Hickory City System.

EQUIPMENT INFORMATION

Controller..... 2070
Cabinet..... 332 w/ Aux
Software..... SE-PAC2070
Cabinet Mount..... Base
Output File Positions..... 18 With Aux. Output File
Load Switches Used..... S1, S2, S3, S4, S5, S6, S7, S8, S9,
S10, S11, S12, AUX S2, AUX S5

Phases Used..... 1, 2, 2PED, 4, 4PED, 5, 6, 6PED,
8, 8PED

Overlap "1"..... Not Used
Overlap "2"..... *
Overlap "3"..... Not Used
Overlap "4"..... *

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5716	Sig. 12.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	OLG #	4	4 PED	5	6	6 PED	OLH #	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22 23	P21, P22	83 ★	41,42	P41, P42	51	61,62	P61, P62	43 ★	81,82	P81, P82	NU	83 ★	NU	NU	43 ★	NU
RED		128			101			134			107			A124			A101	
YELLOW		129		*	102			135		*	108							
GREEN		130			103			136			109							
RED ARROW	125					131												
YELLOW ARROW	126					132								A125			A102	
FLASHING YELLOW ARROW														A126			A103	
GREEN ARROW	127			118		133				124								
Hand icon			113		104			119			110							
Walking person icon			115		106			121			112							

NU = Not Used

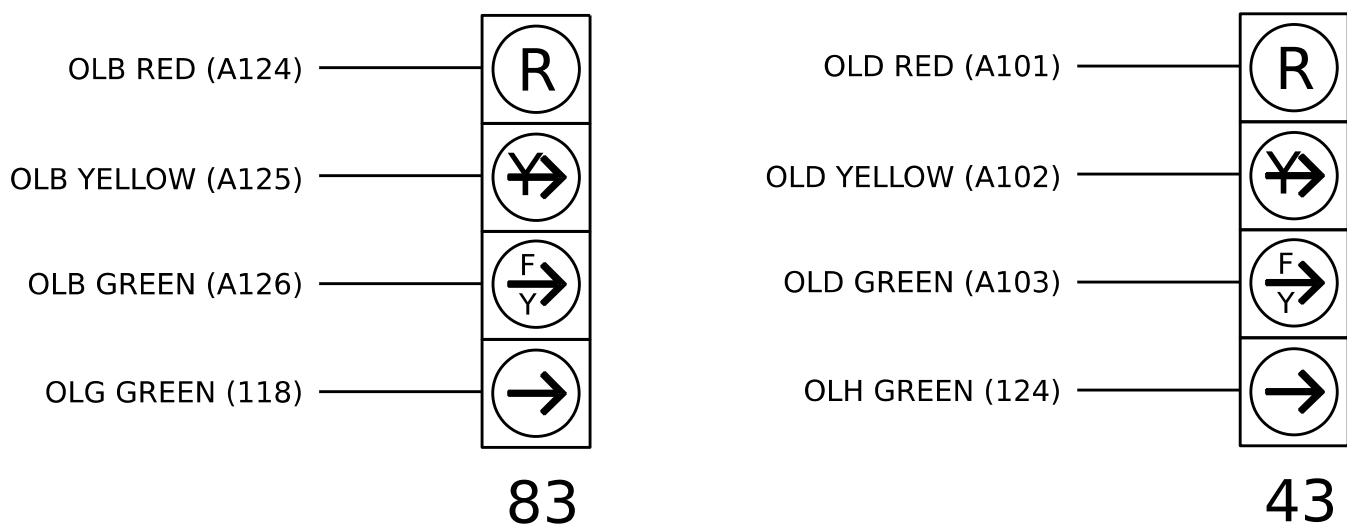
*Denotes install load resistor. See LOAD RESISTOR INSTALLATION DETAIL this sheet.

★See pictorial of head wiring in detail this sheet.

#Load switches reassigned. See LOAD SWICH MAPPING DETAIL on sheet 2.

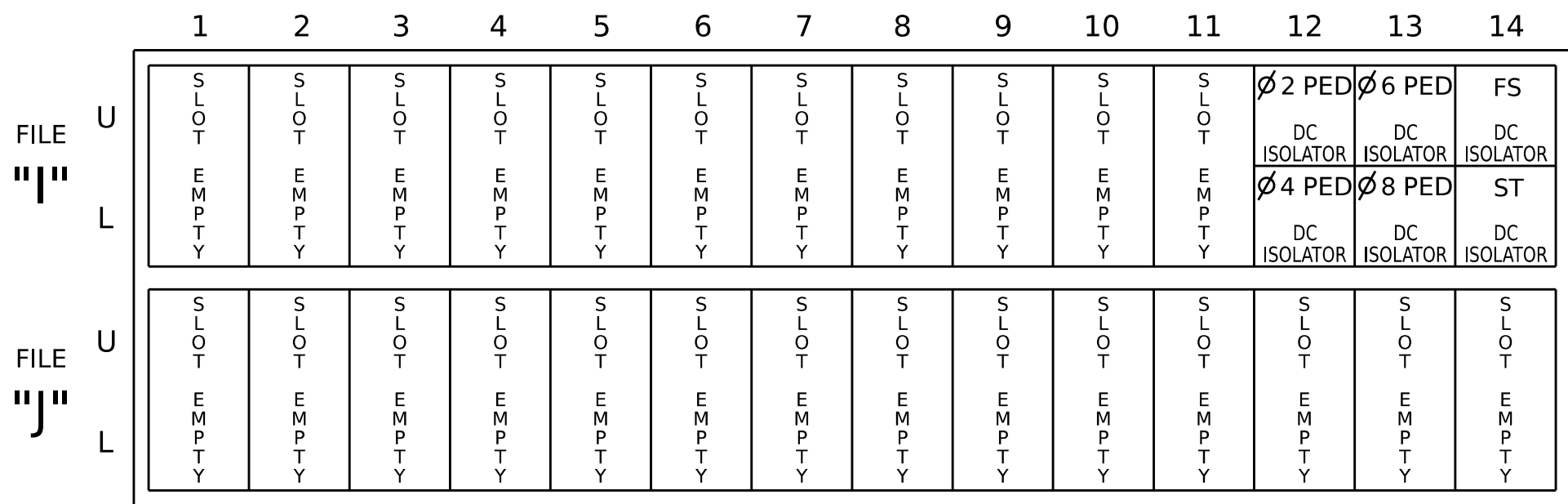
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
I12 AND I13.

INPUT FILE POSITION LEGEND:
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multi-zone 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.

FLASHER CIRCUIT MODIFICATION DETAIL

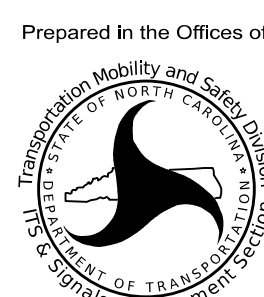
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1218
DESIGNED: January 2026
SEALED: 04/09/2026
REVISED: N/A

Electrical Detail - Sheet 1 of 3

Electrical and Programming Details For:	SR 1007 (Lenoir-Rhyne Blvd) at SR 2267 (13th Avenue Drive SE)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Division 12 PLAN DATE: March 2026 PREPARED BY: Tim Langston REVIEWED BY: REVISIONS INIT. DATE	Seal of the North Carolina Department of Transportation SEAL 031001 ENGINEER D. TODD JOYCE Date: 04/10/2026 SIGNED: 04/10/2026 DATE SIC INVENTORY NO. 12-1218

PED DETECTOR PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 7-DETECTOR DATA
3. From DETECTOR CONFIG Menu select 9-PED 1-8
4. From DETECTOR CONFIG DATA Menu select 4-PEDESTRIAN DET 4+

PED DET 4 PHASE 12345678 90123456
ASSIGNED PHASES...00010001 00000000
SWITCH PHASES.....00000000 00000000
MODE 1 CALL 1 EXT/10 0
VOLUME 0 PASS 0 DLY/10 0
OCCUPY 0 ADDED 0 FAIL 255
LOCK 0 QUEUE 0 QLIMIT 0

← NOTICE
ASSIGNED
PHASES
4 & 8!

PRESS 'ESC' TO RETURN TO DETECTOR CONFIG DATA

4. From DETECTOR CONFIG DATA Menu select 8-PEDESTRIAN DET 8+

PED DET 8 PHASE 12345678 90123456
ASSIGNED PHASES...00010001 00000000
SWITCH PHASES.....00000000 00000000
MODE 1 CALL 1 EXT/10 0
VOLUME 0 PASS 0 DLY/10 0
OCCUPY 0 ADDED 0 FAIL 255
LOCK 0 QUEUE 0 QLIMIT 0

← NOTICE
ASSIGNED
PHASES
4 & 8!

CONTROLLER PED DETECTOR ASSIGNMENT
PROGRAMMING COMPLETE

ADVANCE WALK PED PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 3-PEDESTRIAN DATA
3. From PEDESTRIAN DATA Submenu select 3-PED OFFSET+

PHASE.....1...2...3...4...5...6...7...8
WOFF/10 0 70 0 60 0 50 0 70
MODE 0 0 0 0 0 0 0 0

CODES: * 0=ADVANCE 1=DELAY

ADVANCE WALK PED PROGRAMMING COMPLETE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 3-OVERLAP DATA

Use Up/Dn/Left/Right keys to position cursor on the desired Overlap.
Use the NEXT key to select the overlap type. Press the ENT key and then program as per the Overlap screen(s) shown.

OVERLAP DATA

A: --- E: --- I: --- M: ---
B: FYA F: --- J: --- N: ---
C: --- G: STD K: --- O: ---
D: FYA H: STD L: --- P: ---

PREV/NEXT TO CYCLE

OVERLAP B

Use Up/Dn/Left/Right keys to position cursor on Overlap 'B', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - B MIN PERM: 1
PHASES..12345678 90123456
PROT PHASES: 10000000 00000000 DELAY/10
PERM PHASES: 00000001 00000000 FYA: 0
-PED PHASES: 00000000 00000000 -PED: 30
OVERLAPS..ABCDEFGH IJKLMNOP
PROT O-LAPS: 0x000000 00000000
PERM O-LAPS: 0x000000 00000000

← NOTICE FYA
DELAY/10 = 0

Press ESC

OVERLAP D

Use Up/Dn/Left/Right keys to position cursor on Overlap 'D', use the NEXT key to select 'FYA', then press ENT

FYA OVERLAP - D MIN PERM: 1
PHASES..12345678 90123456
PROT PHASES: 00001000 00000000 DELAY/10
PERM PHASES: 00010000 00000000 FYA: 0
-PED PHASES: 00000000 00000000 -PED: 30
OVERLAPS..ABCDEFGH IJKLMNOP
PROT O-LAPS: 000x0000 00000000
PERM O-LAPS: 000x0000 00000000

← NOTICE FYA
DELAY/10 = 0

Press ESC

OVERLAP G

Use Up/Dn/Left/Right keys to position cursor on Overlap 'G', use the NEXT key to select 'STD', then press ENT

OVERLAP - G 12345678 90123456
PARENTS: 10000000 00000000
+GRN PHASES: 00000000 00000000
-G/Y PHASES: 00000000 00000000
-PED PHASES: 00000000 00000000
TRAIL GREEN STANDARD: 0 YEL/10: 40
TRAIL GREEN PREEMPT: 0 RED/10: 20

Press ESC

OVERLAP H

Use Up/Dn/Left/Right keys to position cursor on Overlap 'H', use the NEXT key to select 'STD', then press ENT

OVERLAP - H 12345678 90123456
PARENTS: 00001000 00000000
+GRN PHASES: 00000000 00000000
-G/Y PHASES: 00000000 00000000
-PED PHASES: 00000000 00000000
TRAIL GREEN STANDARD: 0 YEL/10: 40
TRAIL GREEN PREEMPT: 0 RED/10: 20

OVERLAP PROGRAMMING COMPLETE

LOAD SWITCH MAPPING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 9-OUTPUT MAPPING

Use arrow keys to place cursor on 'LDSW 3'
then NEXT key to select 'OLG'

OUTPUT MAPPING EDIT MODE: LDSW
E-TOGGLE MODE
LDSW ..1.. ..2.. ..3.. ..4.. ..5.. ..6..
RED PH1 PH2 PD2 OLG PH4 PD4
YEL - - - - -
GRN - - - - -
FIO 1 2 3 4 5 6
PREV/NEXT TO CYCLE D-DISPLAY COMPAT

Use arrow keys to place cursor on 'LDSW 7'
then NEXT key to select 'OLH'

OUTPUT MAPPING EDIT MODE: LDSW
E-TOGGLE MODE
LDSW ..7.. ..8.. ..9.. ..10.. ..11.. ..12..
RED PH5 PH6 PD6 OLH PH8 PD8
YEL - - - - -
GRN - - - - -
FIO 7 8 9 10 11 12
PREV/NEXT TO CYCLE D-DISPLAY COMPAT

LOAD SWITCH MAPPING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1218
DESIGNED: January 2026
SEALED: 04/09/2026
REVISED: N/A

Electrical Detail - Sheet 2 of 3

Electrical and Programming
Details For:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1007 (Lenoir-Rhyne Blvd)
at
SR 2267 (13th Avenue Drive SE)

Division 12 Catawba County Hickory
PLAN DATE: March 2026 REVIEWED BY:
PREPARED BY: Tim Langston REVIEWED BY:
REVISIONS INIT. DATE
.....
.....

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
031001
ENGINEER
D. Todd Joyce
DocuSigned by:
D. Todd Joyce 04/10/2026
DATE
SIG. INVENTORY NO. 12-1218

ALL RED FLASH STARTUP
PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 1-STARTUP & MISC

STARTUP & MISC
STARTUP TIME.: 6 (SEC) STATE: 2 (0-FL
RED REV/10...: 40 (TSEC) 1-RED
AUTO PED CLR.: 0 (0-NO 1-YES) 2-RAF)
STOP T RESET.: 0 (0-NO 1-YES)
SEQUENCE.....: 1 (1-19)
SPECIAL SEQ : 0 (SEE HELP)

STARTUP PROGRAMMING COMPLETE

REMOTE FLASH
PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 4-UNIT DATA
2. From UNIT DATA Submenu select 2-FLASH
3. From FLASH Submenu select 1-REMOTE FLASH SETTINGS

REMOTE FLASH SETTINGS TEST-A FLASH: 0
LDSW:123456789 0123456789 0123456789 012
FLSH:110110110 1100100100 0000000000 000
ALT:010010100 1000000100 0000000000 000

0-DARK 1-RED 2-YELLOW 3-STEADY YELLOW

PRESS 'F' TO RETURN TO FLASH

4. From REMOTE FLASH Submenu select 2-REMOTE FLASH ENTRY/EXIT PHASES

REMOTE FLASH ENTRY/EXIT PHASES

PHASES: 12345678 90123456
ENTRY: 01000100 00000000
EXIT: 01000100 00000000

REMOTE FLASH PROGRAMMING COMPLETE

INIT & N.A. RESP PROGRAMMING DETAIL

(program controller as shown below)

1. From Main Menu select 3-PHASE DATA
2. From PHASE DATA Submenu select 4-INIT & N.A. RESP+

PHASE.....1...2...3...4...5...6...7...8
INITIAL 1 6 0 1 1 6 0 1
NA RESP 0 1 0 2 0 1 0 2
UPDT GRN 0 0 0 0 0 0 0 0
CODES.....0...1...2...3...4...5...6
INIL NONE INACT RED YEL GRN DRK G/DW
NA RSP NONE NA1 NA2 1&2 --- --- ---

Notice
phases
3 & 7
not used!

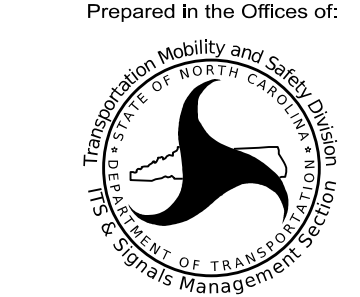
INIT & N.A. RESP PROGRAMMING COMPLETE

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

SR 1007 (Lenoir-Rhyne Blvd)
at
SR 2267 (13th Avenue Drive SE)

Division 12Catawba CountyHickory

PLAN DATE: March 2026REVIEWED BY:

PREPARED BY: Tim LangstonREVIEWED BY:

REVISIONS

INIT. DATE

SEAL

NORTH CAROLINA

PROFESSIONAL

SEAL 031001

ENGINEER

D. TODD JOYCE

DocuSigned by: 04/10/2026

DATE

SIG. INVENTORY NO. 12-1218

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1218
DESIGNED: January 2026
SEALED: 04/09/2026
REVISED: N/A

1	INSTALL COAX CABLE
2	INSTALL ETHERNET CABLE
3	EXISTING ETHERNET (OR COAX) CABLE
4	INSTALL SMFO (SINGLE MODE) CABLE
5	INSTALL NEW MMFO (MULTIMODE) CABLE
5A	EXISTING SINGLE MODE FIBER OPTIC CABLE
5B	EXISTING MULTIMODE FIBER OPTIC CABLE
6	INSTALL SINGLE MODE 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	EXISTING ETHERNET SWITCH
28	INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET
29	INSTALL UNDERGROUND SPLICE ENCLOSURE
30	INSTALL AERIAL SPLICE ENCLOSURE
31	MODIFY EXISTING INTERCONNECT CENTER / SPLICE ENCLOSURE
32	INSTALL POLE MOUNTED SPLICE CABINET
33	INSTALL BASE MOUNTED SPLICE CABINET

34	INSTALL CABINET FOUNDATION
35	INSTALL CCTV CAMERA POLE MOUNTED CABINET
36	INSTALL CCTV CAMERA ASSEMBLY
37	INSTALL CCTV CAMERA WOOD POLE
38	INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39	INSTALL JUNCTION BOX
40A	INSTALL OVERSIZED JUNCTION BOX
40B	INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
41	REMOVE EXISTING JUNCTION BOX
42	INSTALL WOOD POLE
43	REMOVE EXISTING WOOD POLE
44	INSTALL AERIAL GUY ASSEMBLY
45	INSTALL STANDARD GUY ASSEMBLY
46	INSTALL SIDEWALK GUY ASSEMBLY
47	INSTALL MESSENGER CABLE
48A	REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
48B	REMOVE EXISTING COMMUNICATIONS CABLE
49	BACK PULL EXISTING COMMUNICATIONS CABLE
50	INSTALL CELL MODEM AND ANTENNA
51	INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52A	INSTALL DELINEATOR MARKER
52B	INSTALL JUNCTION BOX MARKER
53A	STORE 20 FEET OF COMMUNICATIONS CABLE
53B	STORE 50 FEET OF EACH COMMUNICATIONS CABLE
54	LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE
55	LASH CABLE(S) TO EXISTING MESSENGER CABLE
56	LASH CABLE(S) TO NEW MESSENGER CABLE
57	MODIFY EXISTING ELECTRICAL SERVICE
58	INSTALL NEW ELECTRICAL SERVICE
58A	REUSE EXISTING 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

<u>LEGEND</u>	
	NEW FIBER OPTIC COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT

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

INDICATES NUMBER OF CABLES, LOOPS, ETC.

INDICATES NUMBER OF FIBERS PER CABLE,
TWISTED PAIRS PER CABLE, ETC.

INDICATES NUMBER OF RISER(S) / CONDUIT(S)

INDICATES DIAMETER OF RISER(S) / CONDUIT(S) (INCH)

NUMBER
OF
CABLE(S)

NUMBER OF
FIBERS/TWISTED PAIRS

NEW/ EXISTING CABLE

REMOVE/ MODIFY CABLE

CONDUIT/ RISER

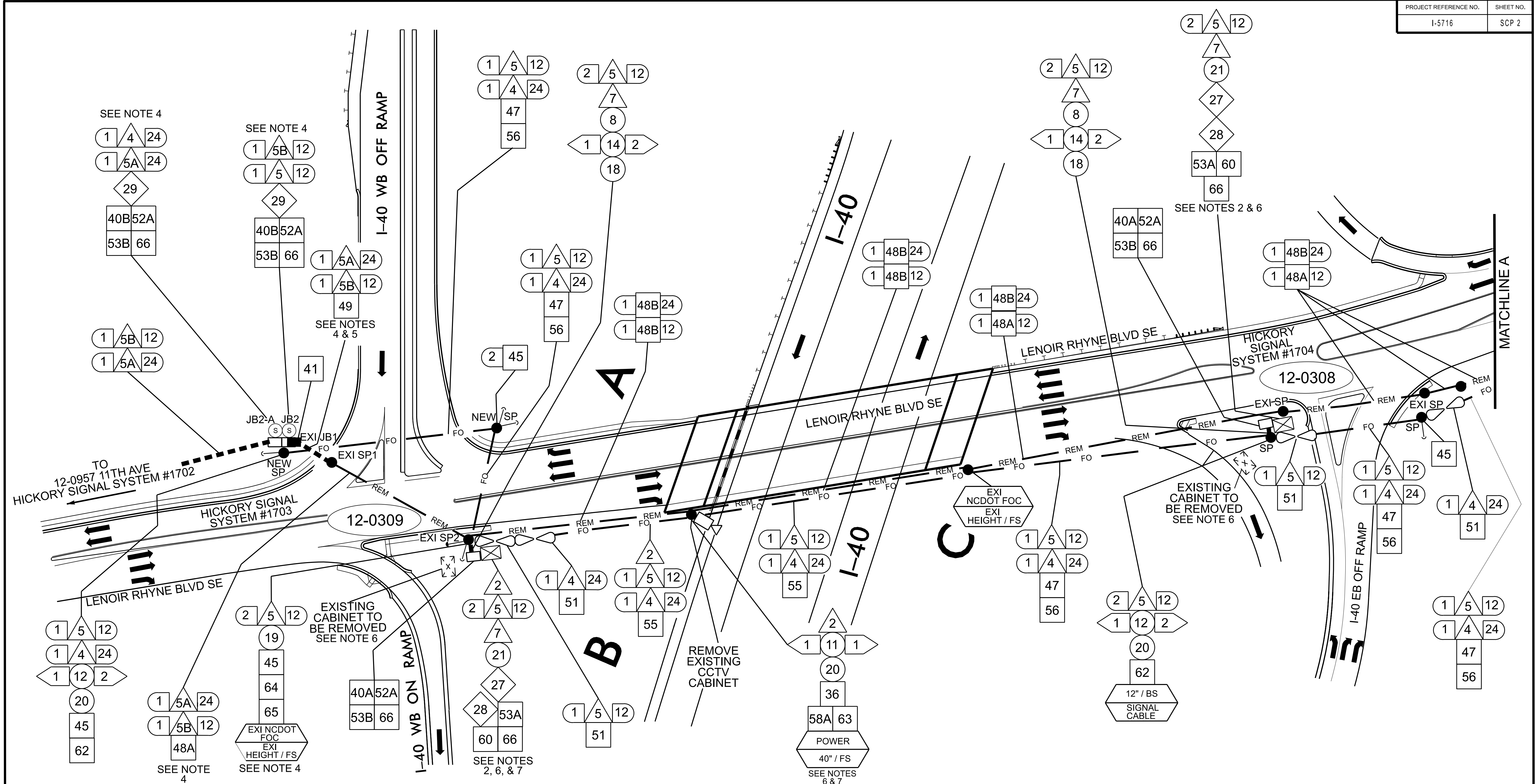
NUMBER
OF
RISER(S)/CONDUIT(S)

DIAMETER
OF
RISER(S)/CONDUIT(S) (INCH)

	DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT
	REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

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

Prepared in the Offices of: 		
	SIGNAL SYSTEM_HICKORY CONSTRUCTION NOTES	
DIVISION 12	CATAWBA	HICKORY
PLAN DATE: MARCH 2026	REVIEWED BY:	
PREPARED BY: H.T.BERGGRN, EI		
REVISIONS	INT.	DATE
SIGNATURE: 		
DATE: 04/13/2026		



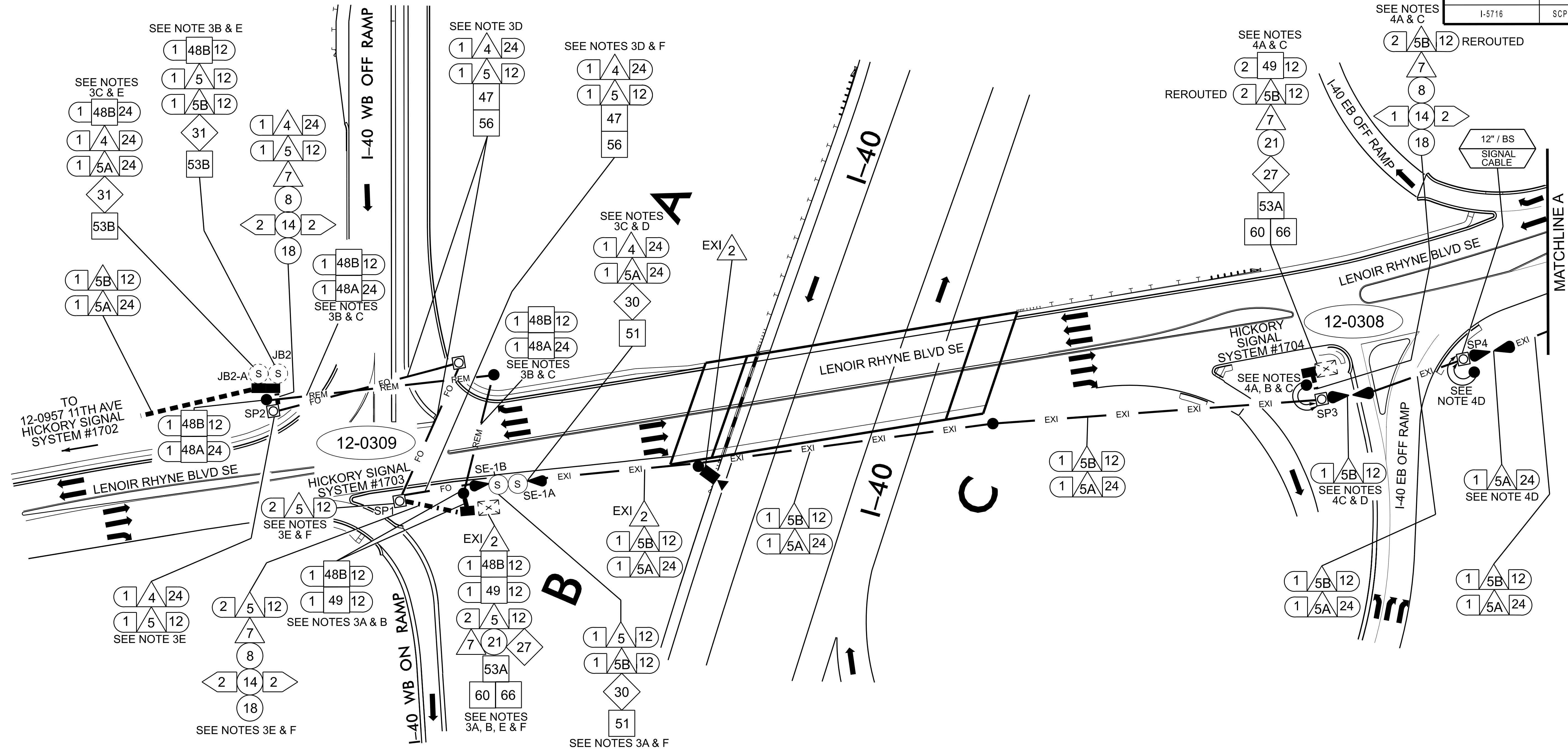
- NOTES:
1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO BEGINNING ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS 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. ALL NCDOT ATTACHMENT POINTS ARE 12" ABOVE SIGNAL CABLE, FRONT SIDE (FS) OF POLE, UNLESS OTHERWISE NOTED.
 4. REMOVE EXISTING JUNCTION BOX, "EXI JB1" AND INSTALL NEW SPECIAL-SIZED HEAVY DUTY JUNCTION BOXES, "JB2" AND "JB2-A". CUT AND BACK PULL THE EXISTING 12-FIBER MULTIMODE AND 24-FIBER SINGLE MODE FIBER OPTIC CABLES FROM EXISTING SIGNAL POLE, "EXI SP1", TO NEW JUNCTION BOXES, "JB2" AND "JB2-A", AS SHOWN.
 5. CUT CONDUIT 30" BELOW GRADE AND ABANDON CONDUIT IN PLACE.
 6. PRIOR TO REMOVAL OF THE EXISTING SIGNAL CABINETS, TRANSFER EXISTING ETHERNET SWITCHES FROM EXISTING SIGNAL CABINETS TO REUSE IN THE NEW SIGNAL CABINETS. ENSURE THAT THE INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND CONNECTORS ARE COMPATIBLE WITH THE EXISTING EQUIPMENT.
 7. REMOVE THE EXISTING CCTV AND MOUNT THE NEW CCTV AT THE EXISTING HEIGHT ON THE EXISTING WOOD POLE. ROUTE NEW ETHERNET CABLE FROM THE NEW CCTV TO THE NEW SIGNAL CABINET AT 12-0309, AS SHOWN. MOUNT THE CCTV PER THE MANUFACTURER'S INSTRUCTIONS. CONNECT THE CCTV TO THE NEW POE DEVICE AND THE EXISTING ETHERNET SWITCH IN THE NEW SIGNAL CABINET PER THE MANUFACTURER'S INSTRUCTIONS.

FOC = FIBER OPTIC CABLE

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

 750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS			
	DIVISION 12	CATAWBA		HICKORY
	PLAN DATE: MARCH 2026	REVIEWED BY:		
	PREPARED BY: H.T. BERGGREN, EI	REVISIONS		INT. DATE
SCALE: 0 N/A		DATE: 04/13/2026		



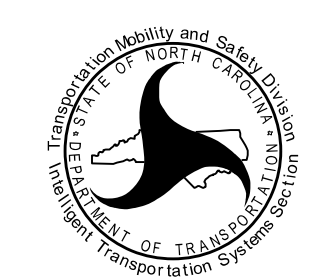
NOTES:

- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO BEGINNING ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
- 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.
- ROUTING FIBER OPTIC CABLES TO THE FINAL METAL SIGNAL POLES AND TO SIGNAL CABINET #12-0309:
 - DISCONNECT AND BACK PULL ONE (1) 12-FIBER MULTIMODE CABLE FROM SIGNAL CABINET #12-0309 TO NEW SPLICE ENCLOSURE SE-1B.
 - REMOVE ONE (1) EXISTING 12-FIBER MULTIMODE CABLE BETWEEN THE SIGNAL CABINET #12-0309 AND THE EXISTING SPLICE ENCLOSURE IN JUNCTION BOX JB2, AS SHOWN.
 - REMOVE THE EXISTING 24-FIBER SINGLE MODE CABLE BETWEEN NEW SPLICE ENCLOSURE SE-1A AND THE EXISTING SPLICE ENCLOSURE JB2-A, AS SHOWN.
 - ROUTE ONE (1) NEW 12-FIBER MULTIMODE AND ONE (1) NEW 24-FIBER SINGLE MODE CABLES ALONG FINAL METAL SIGNAL POLES FROM EXISTING SPLICE ENCLOSURES IN JUNCTION BOXES JB2-A AND JB2 TO NEW SPLICE ENCLOSURES SE-1B AND SE-1A, AND
 - INSTALL ONE (1) NEW ENTRANCE IN BOTH METAL SIGNAL POLES SP2 AND SP1 (USE EXISTING ENTRANCE, IF AVAILABLE) AND ROUTE ONE (1) NEW 12-FIBER MULTIMODE CABLE FROM UNDERGROUND SPLICE ENCLOSURE IN JUNCTION BOX JB2 THROUGH THE METAL POLES, SP2 AND SP1, AND TO SIGNAL CABINET #12-0309, AS SHOWN. ROUTE ONE (1) NEW 24-FIBER SINGLEMODE CABLE FROM UNDERGROUND SPLICE ENCLOSURE IN JUNCTION BOX JB2-A THROUGH METAL SIGNAL POLE SP2, AS SHOWN.
 - ROUTE ONE (1) NEW 12-FIBER MULTIMODE CABLES FROM NEW AERIAL SPLICE ENCLOSURE SE-1B, THROUGH THE METAL SIGNAL POLE SP1 TO SIGNAL CABINET #12-0309, AS SHOWN.
- ROUTING FIBER OPTIC CABLES TO THE FINAL METAL SIGNAL POLE AND TO SIGNAL CABINET #12-0308:
 - DISCONNECT AND BACK PULL TWO (2) 12-FIBER MULTIMODE CABLES FROM THE SIGNAL CABINET #12-0308 TO THE TOP OF THE TEMP SIGNAL POLE.
 - PERFORM A CABLE TRANSFER OF THE TWO (2) 12-FIBER MULTIMODE CABLES AND THE ONE (1) 24-FIBER SINGLE MODE CABLE TO THE NEW METAL POLE SP3, AS SHOWN.
 - INSTALL NEW ENTRANCE IN THE METAL SIGNAL POLE SP3 (USE EXISTING ENTRANCE, IF AVAILABLE) AND ROUTE THE TWO (2) 12-FIBER MULTIMODE CABLES THROUGH THE FINAL METAL SIGNAL POLE SP3 AND TO SIGNAL CABINET #12-0308, AS SHOWN. UNCOIL ADDITIONAL SLACK FROM THE EXISTING SNOE SHOE, IF NEEDED.
 - PERFORM A CABLE TRANSFER OF THE ONE (1) 12-FIBER MULTIMODE CABLE AND THE ONE 24-FIBER SINGLE MODE CABLE TO NEW METAL POLE SP4, AS SHOWN. TIGHTEN UP SLACK IN CABLES ON STORAGE RACKS.

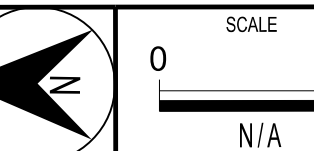
5. ALL NCDOT CABLE ATTACHMENT POINTS ARE 12" ABOVE SIGNAL CABLE, FRONT SIDE (FS) OF POLE, UNLESS OTHERWISE NOTED.

FINAL PHASE

Prepared in the Offices of:



750 N. Greenfield Pkwy., Garner, NC 27529



HICKORY SIGNAL SYSTEM
COMMUNICATIONS CABLE AND
CONDUIT ROUTING PLANS

DIVISION 12 CATAWBA HICKORY

PLAN DATE: MARCH 2026 REVIEWED BY:

PREPARED BY: H.T. BERGGREN, EI

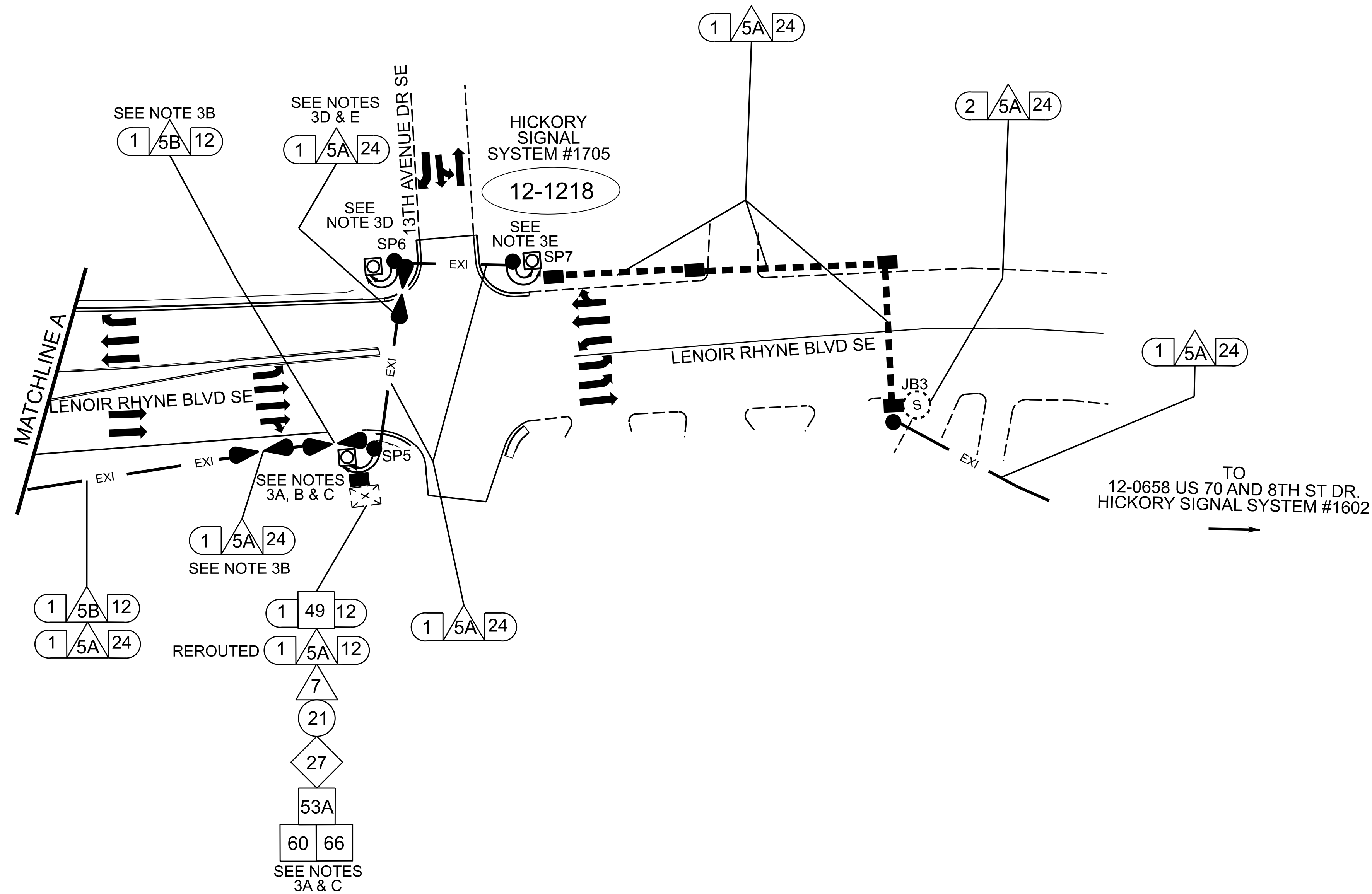
REVISIONS INT. DATE

0 N/A

N/A

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
RYAN W. HOUGH
036833
04/13/2026

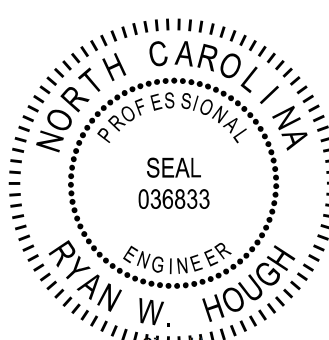


NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO BEGINNING ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS 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. ROUTING FIBER OPTIC CABLES TO THE FINAL METAL SIGNAL POLE AND TO SIGNAL CABINET #12-1218:
 - A. DISCONNECT AND BACK PULL ONE (1) 12-FIBER MULTIMODE CABLE FROM THE SIGNAL CABINET #12-1218 TO THE TOP OF THE TEMP SIGNAL POLE.
 - B. PERFORM A CABLE TRANSFER OF THE ONE (1) 12-FIBER MULTIMODE CABLE AND THE ONE (1) 24-FIBER SINGLE MODE CABLE TO THE NEW METAL POLE SP5, AS SHOWN. UNCOIL ADDITIONAL SLACK FROM THE EXISTING SNOE SHOES, IF NEEDED.
 - C. INSTALL NEW ENTRANCE IN THE METAL SIGNAL POLE SP5 (USE EXISTING ENTRANCE, IF AVAILABLE) AND ROUTE THE ONE (1) 12-FIBER MULTIMODE CABLES THROUGH THE FINAL METAL SIGNAL POLE SP5 AND TO SIGNAL CABINET #12-1218, AS SHOWN. UNCOIL ADDITIONAL SLACK FROM THE EXISTING SNOE SHOE, IF NEEDED.
 - D. PERFORM A CABLE TRANSFER OF THE ONE(1) 24-FIBER SINGLE MODE CABLE TO NEW METAL POLE SP6, AS SHOWN.UNCOIL ADDITIONAL SLACK FROM THE EXISTING SNOE SHOE, IF NEEDED.
 - E. PERFORM A CABLE TRANSFER OF THE ONE(1) 24-FIBER SINGLE MODE CABLE TO NEW METAL POLE SP7, AS SHOWN.UNCOIL ADDITIONAL SLACK FROM THE EXISTING SNOE SHOE, IF NEEDED.
4. ALL NCDOT CABLE ATTACHMENT POINTS ARE 12" ABOVE SIGNAL CABLE, FRONT SIDE (FS) OF POLE, UNLESS OTHERWISE NOTED.

FINAL PHASE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

 750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS		 SEAL 036833 ENGINEER RYAN W. HOUGH Signature by: Ryan Hough 430320FAA2654C3 DATE: 04/13/2026
	DIVISION 12 CATAWBA HICKORY PLAN DATE: MARCH 2026 REVIEWED BY: PREPARED BY: H.T.BERGREN, EI	REVISIONS INT. DATE	

NEW UNDERGROUND SPLICE ENCLOSURE
IN NEW JUNCTION BOX JB2
AT NE CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS
SIG. INV. # 12-0309

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

LEGEND

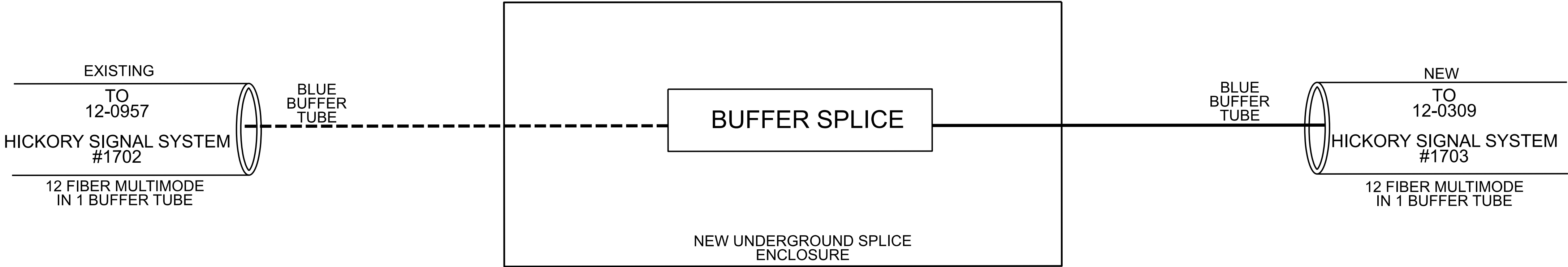
X = FUSION SPLICE
C = CAP IN TRAY

EXPRESS = EXPRESS ALL FIBERS/
BUFFER TUBES

BUFFER SPLICE = SPLICE ALL FIBERS/
BUFFER TUBES

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 |



NOTES:

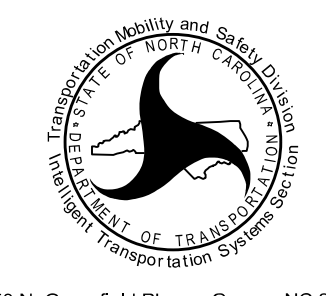
- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:



750 N. Greenfield Pkwy., Garner, NC 27529

HICKORY SIGNAL SYSTEM
SPLICE DETAIL

DIVISION 12CATAWBAHICKORY

PLAN DATE: MARCH 2026REVIEWED BY:

PREPARED BY: H.T. BERGGREN, EIT

REVISIONSINT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
RYAN W. HOUGH
Signed by:
Ryan Hough
SIGNATURE: 43920FAA2654C3
DATE: 04/13/2026

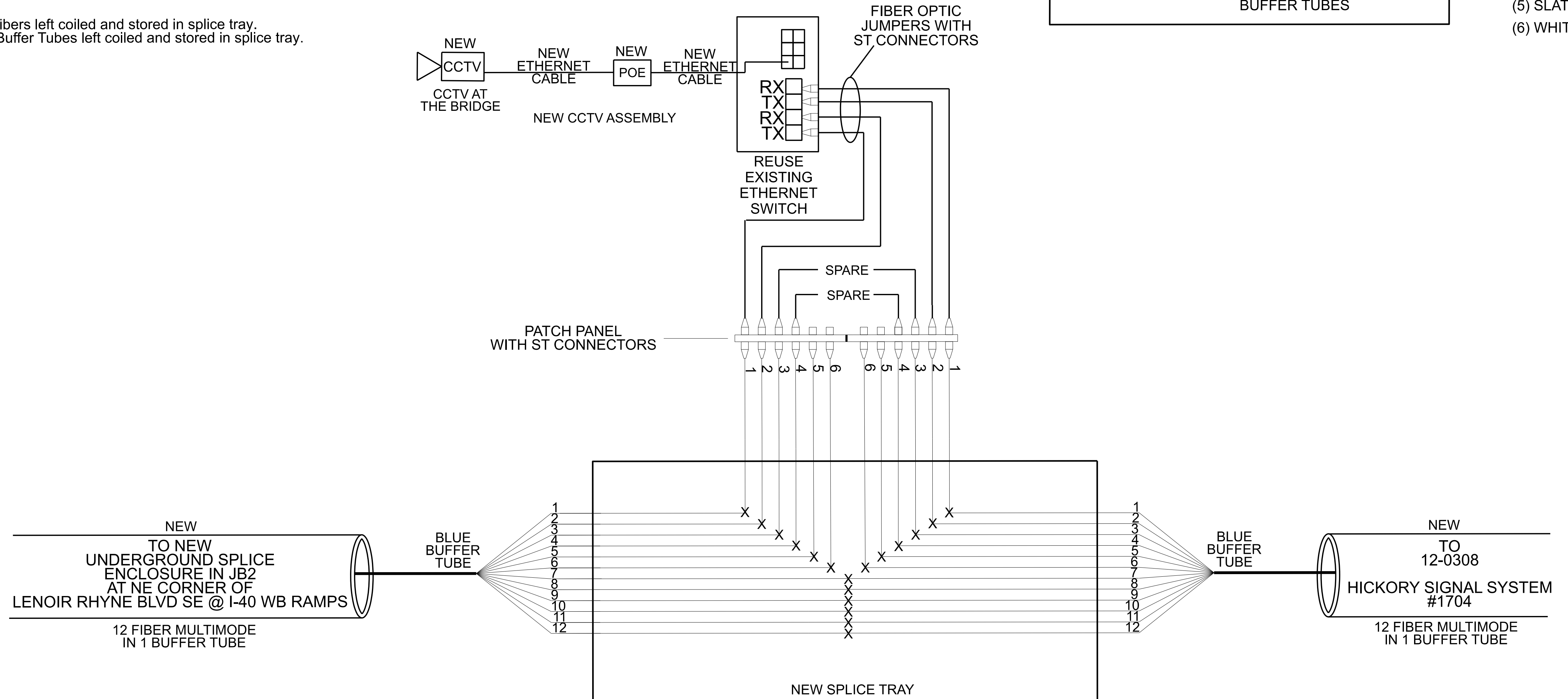
NEW SIGNAL CABINET AT THE SW CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS

SIG. INV. # 12-0309

Notes:

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

HICKORY SIGNAL SYSTEM #1703



LEGEND

X = FUSION SPLICE

C = CAP IN TRAY

EXPRESS

= EXPRESS ALL FIBERS/

BUFFER TUBES

BUFFER SPLICE

= SPLICE ALL FIBERS/

BUFFER TUBES

BUFFER TUBES

COLOR CODE

(1) BLUE

(7) RED

(2) ORANGE (8) BLACK

(3) GREEN (9) YELLOW

(4) BROWN (10) VIOLET

(5) SLATE (11) ROSE

(6) WHITE (12) AQUA

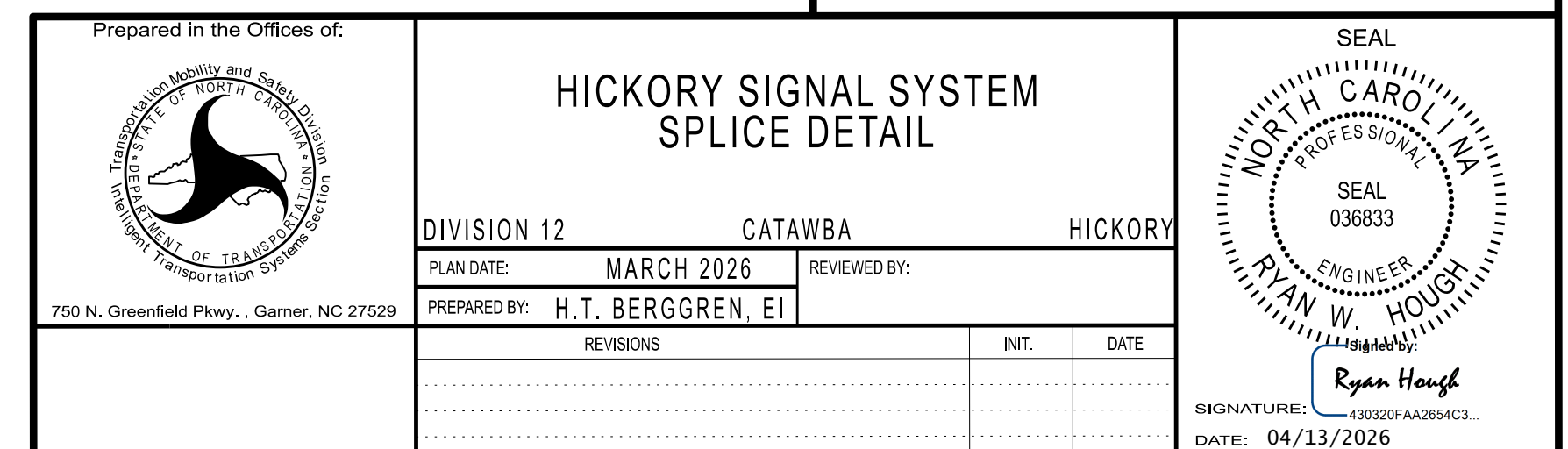
NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS 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. REUSE EXISTING ETHERNET SWITCH. 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



NEW SIGNAL CABINET AT THE NW CORNER OF
LENOIR RHYNE BLVD SE @ I-40 EB OFF RAMP

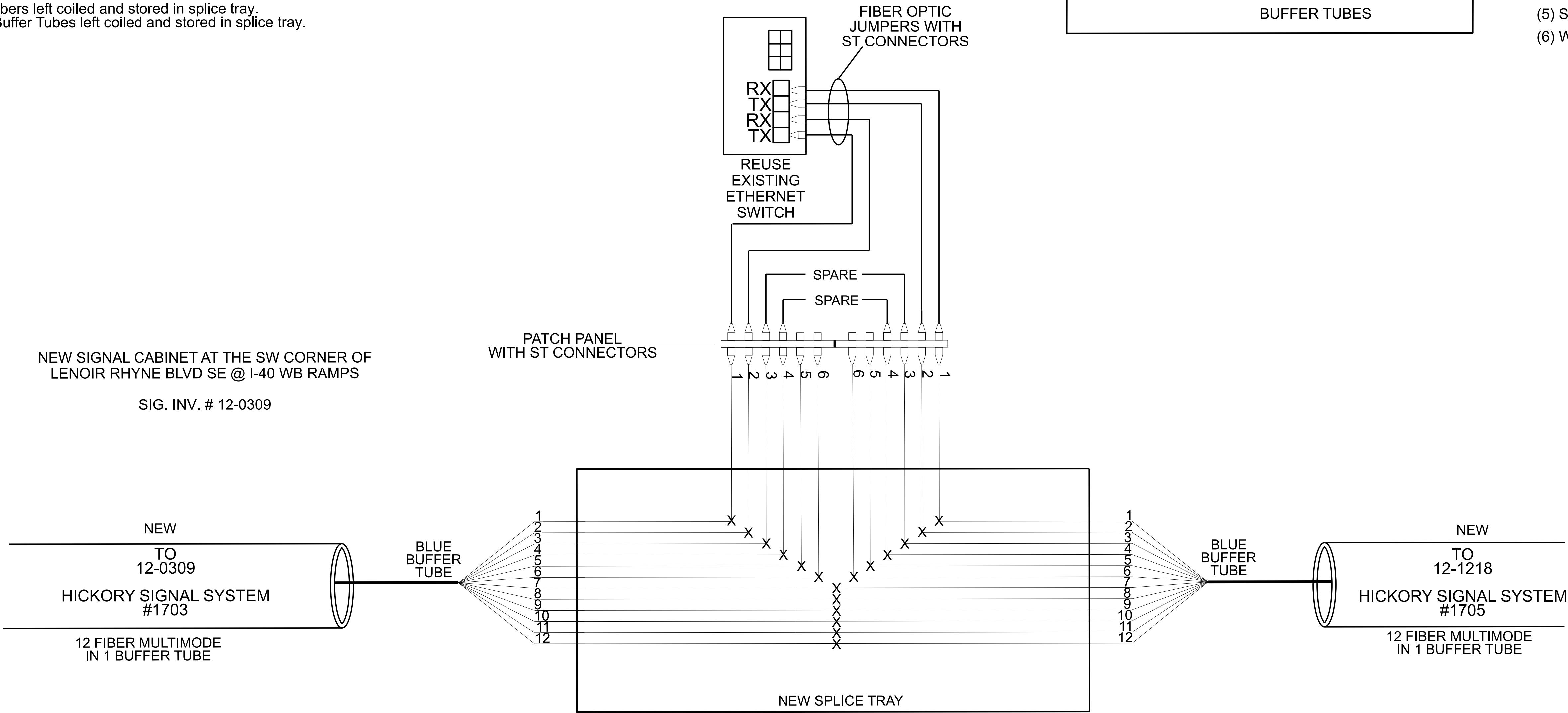
SIG. INV. # 12-0308

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

NEW SIGNAL CABINET AT THE SW CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS

SIG. INV. # 12-0309

HICKORY SIGNAL SYSTEM #1704



LEGEND

X = FUSION SPLICE

C = CAP IN TRAY

EXPRESS

= EXPRESS ALL FIBERS/

BUFFER TUBES

BUFFER SPLICE

= SPLICE ALL FIBERS/

BUFFER TUBES

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 |

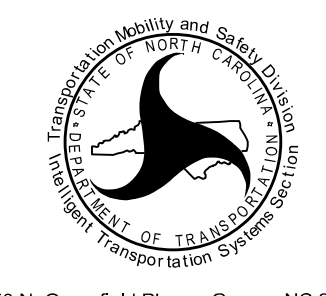
NOTES:

- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
- 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.
- REUSE EXISTING ETHERNET SWITCH. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

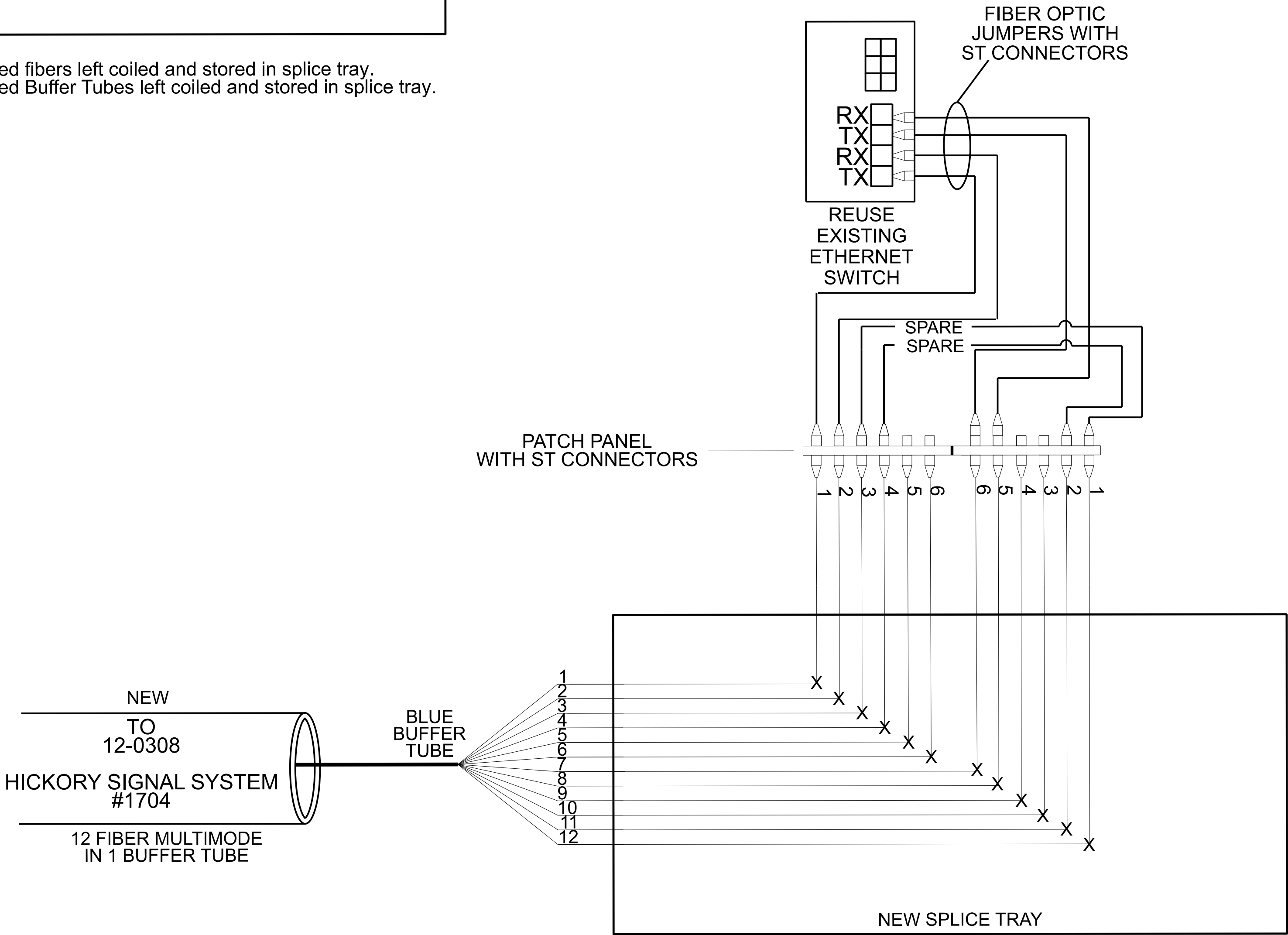
 750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL			 Signed by: <i>Ryan Hough</i> DATE: 04/13/2026
	DIVISION 12	CATAWBA	HICKORY	
	PLAN DATE: MARCH 2026	REVIEWED BY:		
	PREPARED BY: H.T. BERGGREN, EI			
	REVISIONS	INT.	DATE	

NEW SIGNAL CABINET AT THE NW CORNER OF
LENOIR RHYNE BLVD SE @ 13TH AVENUE DR SE

SIG. INV. # 12-1218

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

HICKORY SIGNAL SYSTEM #1705



LEGEND

X = FUSION SPLICE

C = CAP IN TRAY

EXPRESS

= EXPRESS ALL FIBERS/

BUFFER TUBES

BUFFER SPLICE

= SPLICE ALL FIBERS/

BUFFER TUBES

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

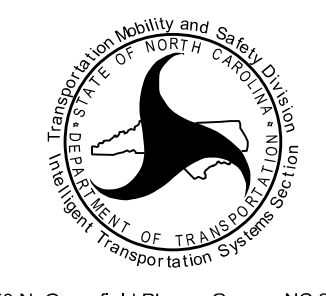
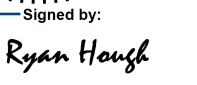
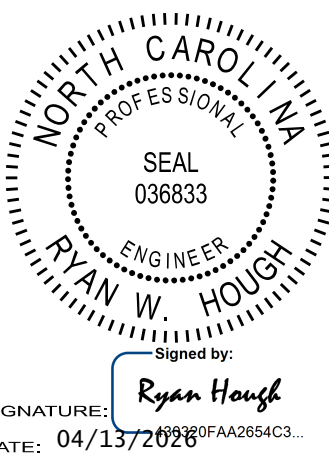
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- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
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- REUSE EXISTING ETHERNET SWITCH. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:  750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL DIVISION 12 CATAWBA HICKORY PLAN DATE: MARCH 2026 REVIEWED BY: PREPARED BY: H.T. BERGGREN, EIT REVISIONS INT. DATE SIGNATURE:  DATE: 04/13/2026	
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NEW UNDERGROUND SPLICE ENCLOSURE
IN NEW JUNCTION BOX JB2-A
AT NE CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS
SIG. INV. # 12-0309

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

LEGEND

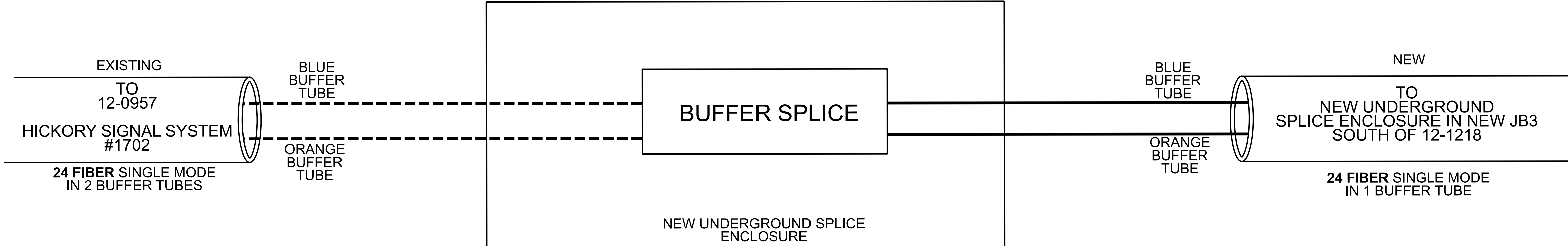
X = FUSION SPLICE
C = CAP IN TRAY

EXPRESS = EXPRESS ALL FIBERS/
BUFFER TUBES

BUFFER SPLICE = SPLICE ALL FIBERS/
BUFFER TUBES

PROJECT REFERENCE NO.		SHEET NO.	
I-5716		SCP 10	

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



NOTES:

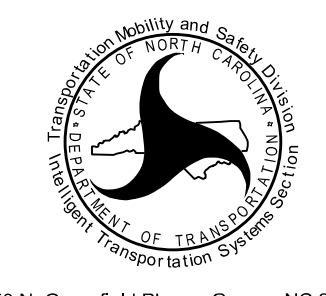
- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:



750 N. Greenfield Pkwy., Garner, NC 27529

HICKORY SIGNAL SYSTEM
SPLICE DETAIL

DIVISION 12CATAWBAHICKORY

PLAN DATE: MARCH 2026REVIEWED BY:

PREPARED BY: H.T. BERGGREN, EIT

REVISIONSINT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
RYAN W. HOUGH
Signed by:
Ryan Hough
43020FAA2654C3...
DATE: 04/13/2026

NEW UNDERGROUND SPLICE ENCLOSURE
IN NEW JUNCTION BOX JB3
SOUTH OF SIGNAL CABINET #12-1218

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

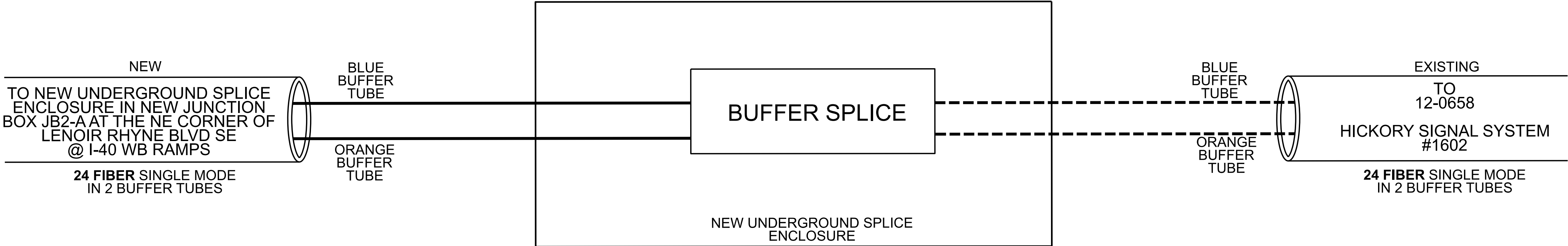
LEGEND

X = FUSION SPLICE
C = CAP IN TRAY

EXPRESS = EXPRESS ALL FIBERS/
BUFFER TUBES

BUFFER SPLICE = SPLICE ALL FIBERS/
BUFFER TUBES

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



NOTES:

- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

TMP PHASE 7D

DOCUMENT NOT CONSIDERED FINAL
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Prepared in the Offices of:	HICKORY SIGNAL SYSTEM SPLICE DETAIL		SEAL SEAL 036833 ENGINEER RYAN W. HOUGH Signature by: Ryan Hough SIGNATURE: 430320FAA2654C3 DATE: 04/13/2026	
	DIVISION 12	CATAWBA		HICKORY
	PLAN DATE: MARCH 2026	REVIEWED BY:		
	PREPARED BY: H.T. BERGGREN, EIT			
	REVISIONS	INT.	DATE	

EXISTING UNDERGROUND SPLICE ENCLOSURE
IN NEW JUNCTION BOX JB2
AT NE CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS
SIG. INV. # 12-0309

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

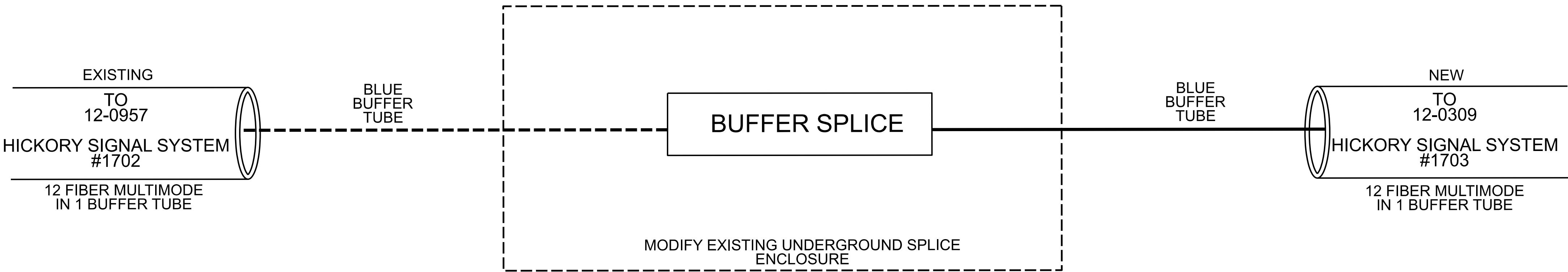
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NOTES:

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FINAL PHASE

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Prepared in the Offices of:

750 N. Greenfield Pkwy., Garner, NC 27529

DIVISION 12

CATAWBA

HICKORY

PLAN DATE: MARCH 2026

REVIEWED BY:

PREPARED BY: H.T. BERGGREN, EI

REVISIONS

INT.

DATE

SEAL

NORTH CAROLINA

PROFESSIONAL ENGINEER

SEAL 036833

RYAN W. HOUGH

Signed by: Ryan Hough

SIGNATURE: 430302F AA2654C3

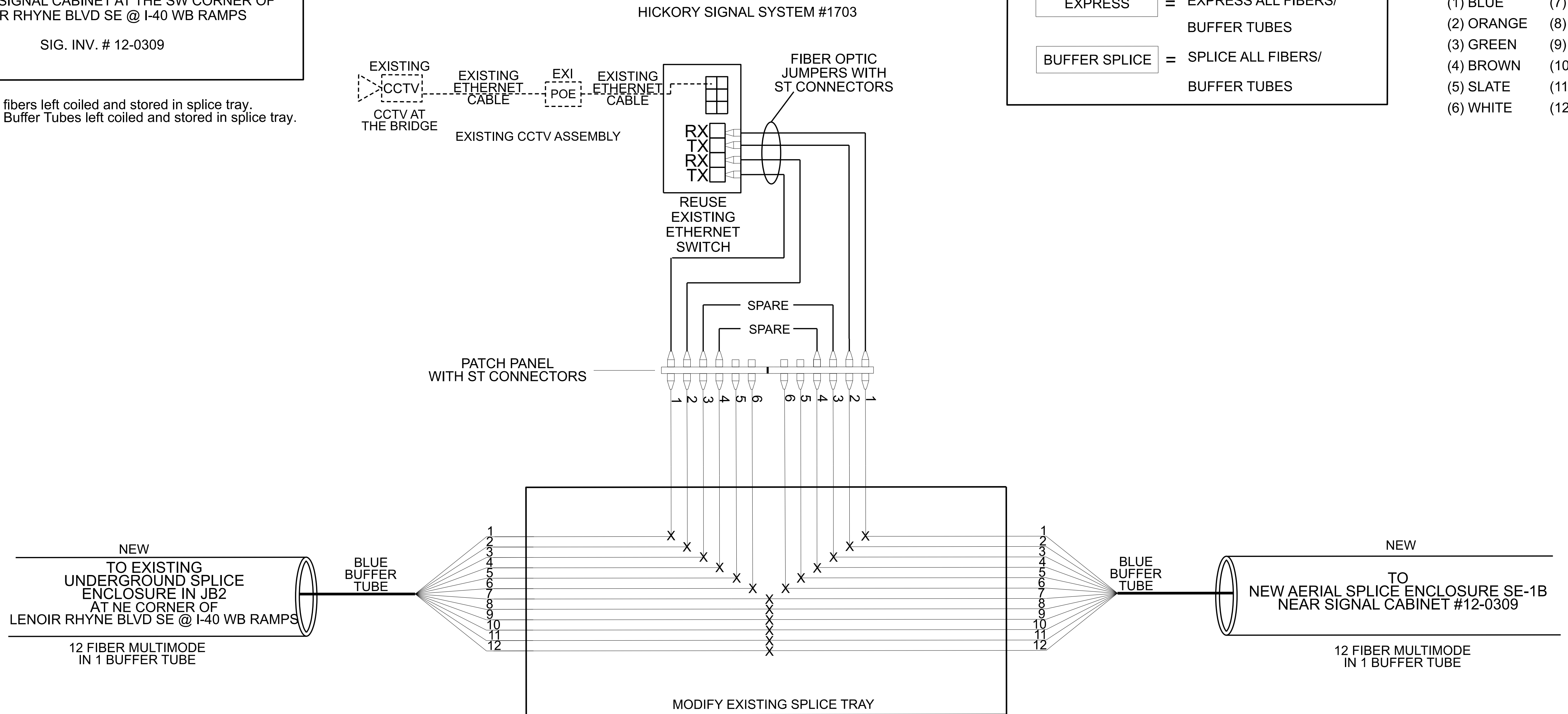
DATE: 04/13/2026

EXISTING SIGNAL CABINET AT THE SW CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS

SIG. INV. # 12-0309

Notes:

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



NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 PRIOR TO ANY WORK ON THE SIGNAL SYSTEM. NOTIFY THE HICKORY TRAFFIC ENGINEER AT (828) 323-7500 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS UP AND OPERATIONAL.
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3. REUSE EXISTING ETHERNET SWITCH. 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"
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FINAL PHASE

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Prepared in the Offices of:  North Carolina Department of Transportation 750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL	SEAL 					
DIVISION 12 CATAWBA HICKORY							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">PLAN DATE: MARCH 2026</td> <td style="width: 50%; padding: 2px;">REVIEWED BY:</td> </tr> </table>		PLAN DATE: MARCH 2026	REVIEWED BY:	SEAL RYAN W. HOUGH ENGINEER 036833			
PLAN DATE: MARCH 2026	REVIEWED BY:						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%; padding: 2px;">PREPARED BY: H.T. BERGGREN, EI</td> <td style="width: 40%; padding: 2px;">REVISIONS</td> </tr> <tr> <td style="height: 40px;"></td> <td style="padding: 2px;">INIT.</td> </tr> <tr> <td style="padding: 2px;">DATE</td> <td style="padding: 2px;">DATE</td> </tr> </table>		PREPARED BY: H.T. BERGGREN, EI	REVISIONS			INIT.	DATE
PREPARED BY: H.T. BERGGREN, EI	REVISIONS						
	INIT.						
DATE	DATE						
SIGNATURE: <u><i>Ryan Hough</i></u> 430209FA0264C3. DATE: 04/13/2026							

NEW AERIAL SPLICE ENCLOSURE SE-1B
NEAR SIGNAL CABINET #12-0309

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

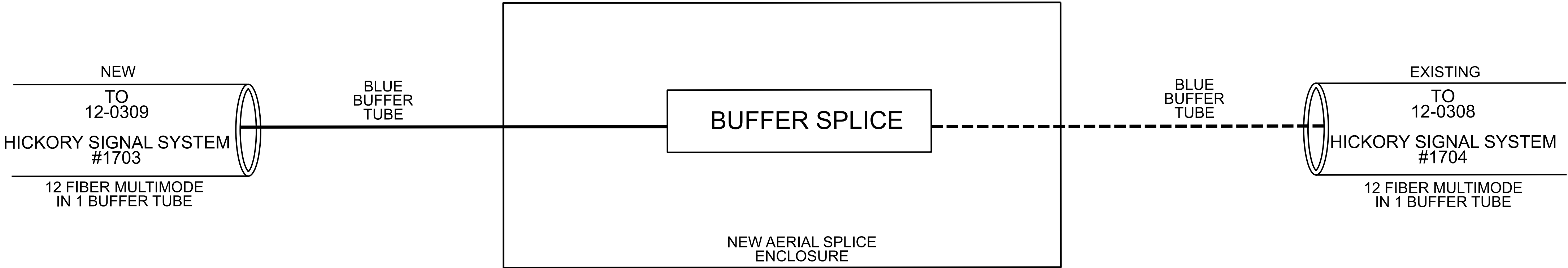
LEGEND

X = FUSION SPLICE
C = CAP IN TRAY

EXPRESS = EXPRESS ALL FIBERS/
BUFFER TUBES

BUFFER SPLICE = SPLICE ALL FIBERS/
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COLOR CODE TIA/EIA 598-A	
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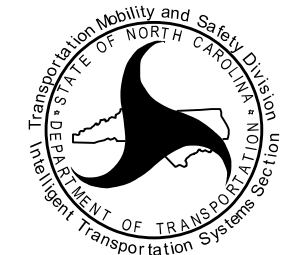
NOTES:

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FINAL PHASE

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Prepared in the Offices of:  750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL			SEAL NORTH CAROLINA PROFESSIONAL ENGINEER RYAN W. HOUGH 036833
	DIVISION 12 CATAWBA HICKORY			
	PLAN DATE: MARCH 2026 REVIEWED BY:			
	PREPARED BY: H.T. BERGGREN, EIT			
	REVISIONS	INT.	DATE	

SIGNATURE: Ryan Hough

DATE: 04/13/2026

EXISTING SIGNAL CABINET AT THE NW CORNER OF
LENOIR RHYNE BLVD SE @ I-40 EB OFF RAMP

SIG. INV. # 12-0308

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

LEGEND

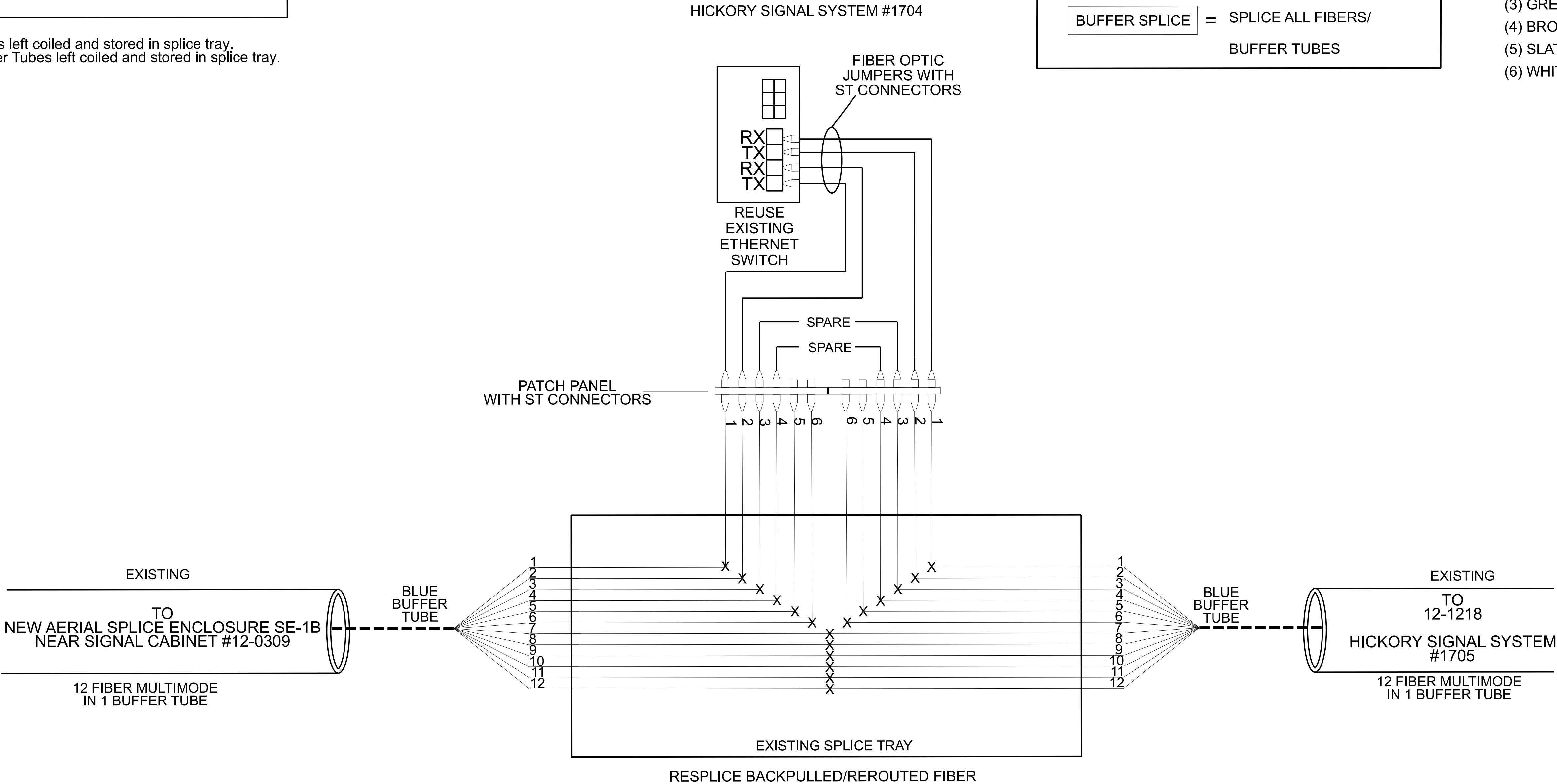
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COLOR CODE
TIA/EIA 598-A

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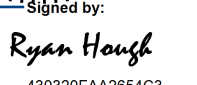
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FINAL PHASE

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Prepared in the Offices of:  750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL			SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PLAN W. HOUGH Signature by:  SIGNATURE: 43020FAA2854C3 DATE: 04/13/2026
	DIVISION 12	CATAWBA	HICKORY	
	PLAN DATE: MARCH 2026	REVIEWED BY:		
	PREPARED BY: H.T. BERGGREN, EI			
	REVISIONS	INT.	DATE	

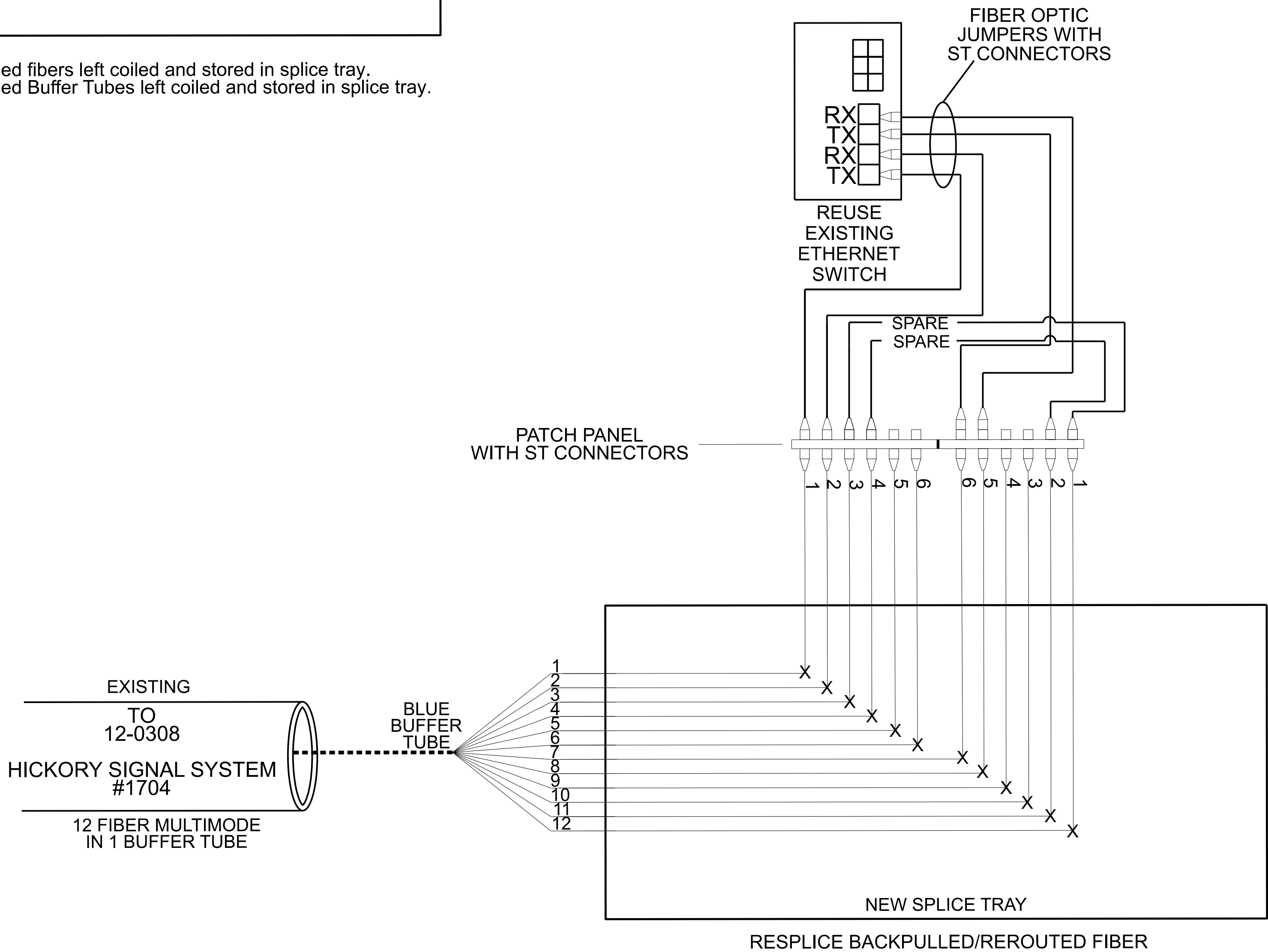
NEW SIGNAL CABINET AT THE NW CORNER OF
LENOIR RHYNE BLVD SE @ 13TH AVENUE DR SE

SIG. INV. # 12-1218

Notes:

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

HICKORY SIGNAL SYSTEM #1705



LEGEND

X = FUSION SPLICE

C = CAP IN TRAY

EXPRESS

= EXPRESS ALL FIBERS/
BUFFER TUBES

BUFFER SPLICE

= SPLICE ALL FIBERS/
BUFFER TUBES

COLOR CODE

TIA/EIA 598-A

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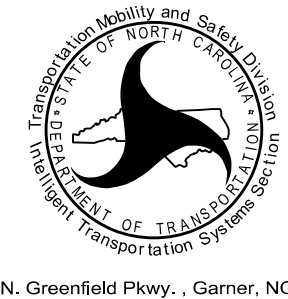
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FINAL PHASE

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 750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL			 Ryan W. Hough ENGINEER SEAL 036833 DATE: 04/13/2026
	DIVISION 12	CATAWBA	HICKORY	
	PLAN DATE: MARCH 2026	REVIEWED BY:		
	PREPARED BY: H.T. BERGGREN, EI			
	REVISIONS	INT.	DATE	

EXISTING UNDERGROUND SPLICE ENCLOSURE
IN NEW JUNCTION BOX JB2-A
AT NE CORNER OF
LENOIR RHYNE BLVD SE @ I-40 WB RAMPS
SIG. INV. # 12-0309

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

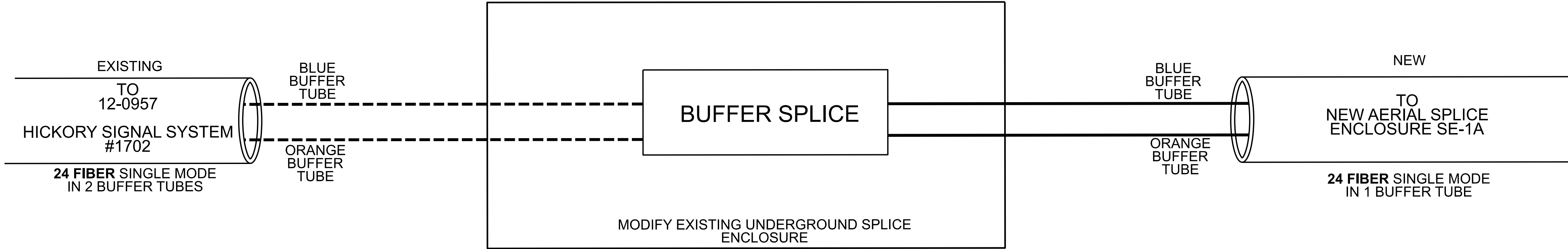
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NOTES:

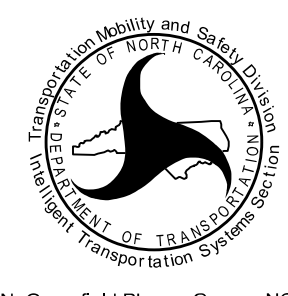
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Prepared in the Offices of:



750 N. Greenfield Pkwy., Garner, NC 27529

HICKORY SIGNAL SYSTEM
SPLICE DETAIL

DIVISION 12CATAWBAHICKORY

PLAN DATE: MARCH 2026REVIEWED BY:

PREPARED BY: H.T. BERGGREN, EIT

REVISIONSINT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
RYAN W. HOUGH
Signed by:
Ryan Hough
SIGNATURE: 04/13/2026
DATE: 04/13/2026

NEW AERIAL SPLICE ENCLOSURE SE-1A
NEAR SIGNAL CABINET #12-0309

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

LEGEND

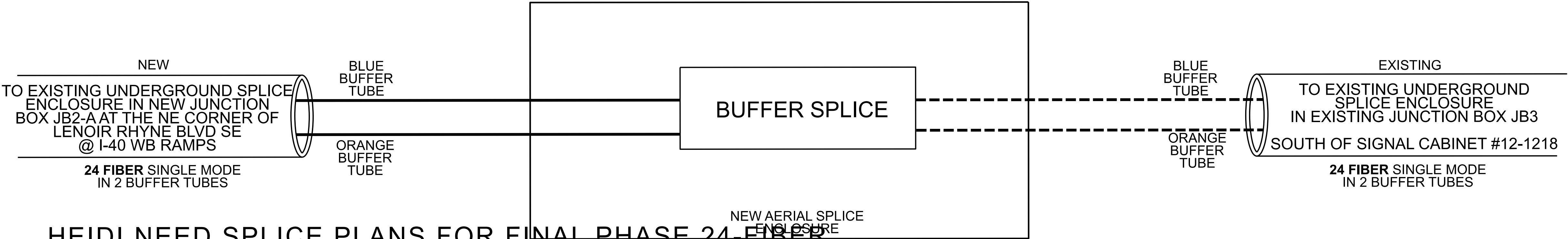
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HEIDI NEED SPLICE PLANS FOR FINAL PHASE 24 FIBER

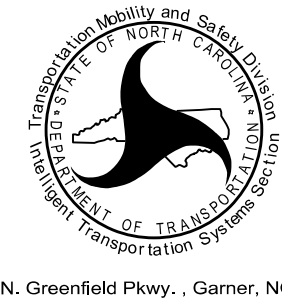
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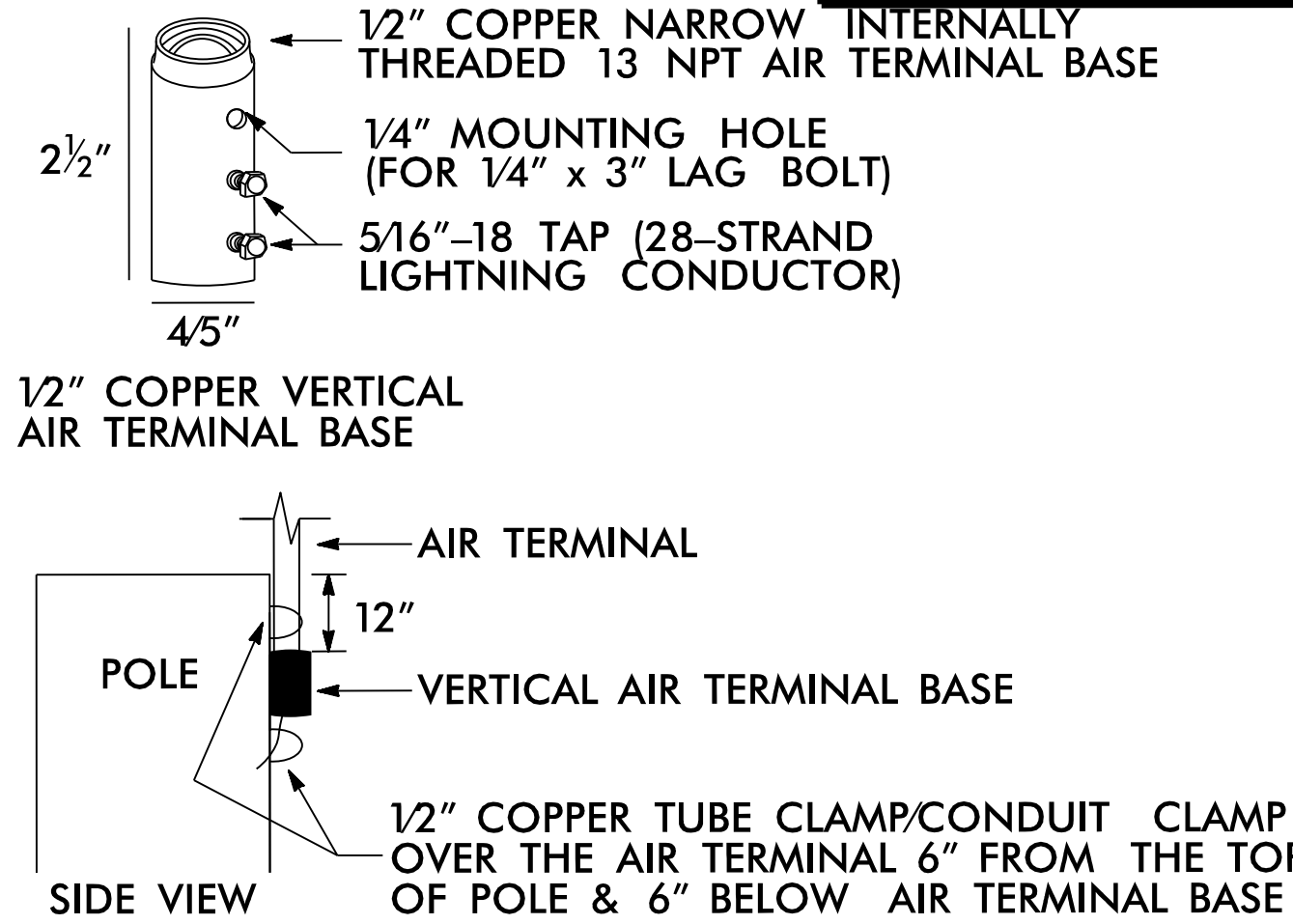
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FINAL PHASE

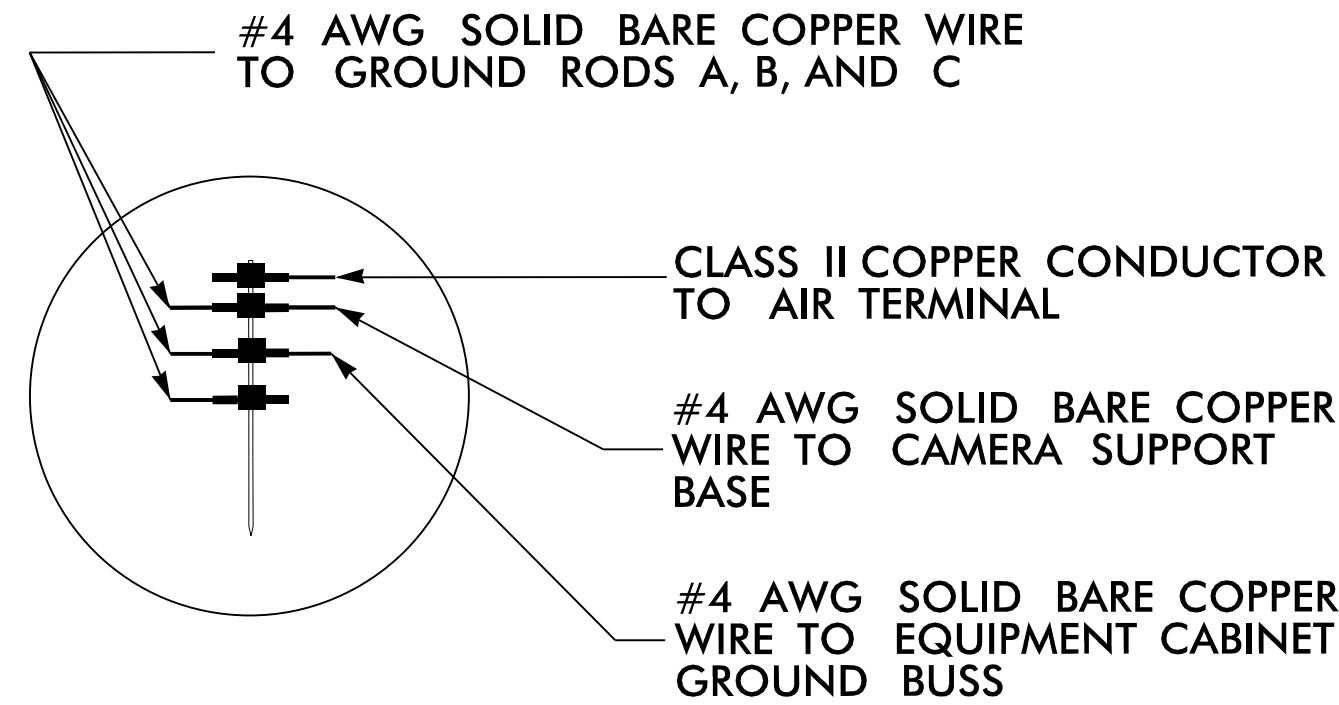
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:  750 N. Greenfield Pkwy., Garner, NC 27529	HICKORY SIGNAL SYSTEM SPLICE DETAIL			SEAL NORTH CAROLINA PROFESSIONAL ENGINEER RYAN W. HOUGH 430320FAA2654C3... DATE: 04/13/2026
	DIVISION 12 CATAWBA HICKORY			
	PLAN DATE: MARCH 2026 REVIEWED BY:			
	PREPARED BY: H.T. BERGGREN, EIT			
REVISIONS		INT.	DATE	

VERTICAL AIR TERMINAL BASE DETAIL



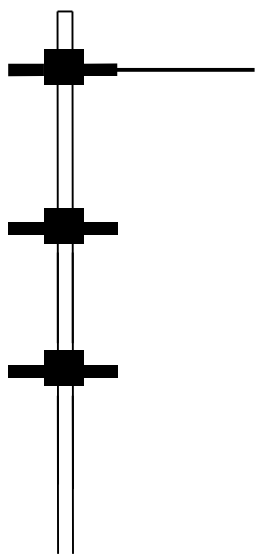
INSET 'A'



INSTALL ELECTRICAL SERVICE POLE NEAR RIGHT OF WAY OR AS DIRECTED BY THE ENGINEER.

ALTERNATE GROUNDING METHOD

IF SPACE IS NOT AVAILABLE TO DRIVE MULTIPLE RODS, DRIVE SECTIONAL GROUND RODS A MINIMUM OF 30 FEET.



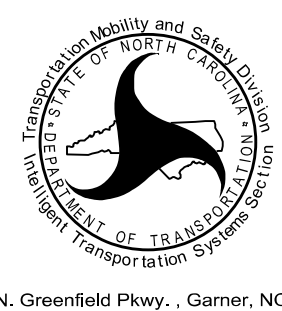
JOIN SECTIONAL GROUND RODS BY IRREVERSIBLE COMPRESSION COUPLER

NOTES

1. BOND CLASS II, 28 STRAND (MINIMUM), 15 AWG (MINIMUM) ROPE-LAY BARE COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN IRREVERSIBLE MECHANICAL CRIMP. MAINTAIN MAXIMUM HORIZONTAL SEPARATION BETWEEN COPPER CONDUCTOR AND RISER.
2. ALL CONNECTIONS TO GROUND RODS SHOULD BE MADE WITH AN IRREVERSIBLE MECHANICAL CRIMP METHOD.
3. REFER TO STANDARD DRAWING 1700-2 FOR ALTERNATE GROUND ROD INSTALLATION METHOD AS APPROVED BY THE ENGINEER.
4. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.
5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUSS AND NEUTRAL BUSS.

FINAL PHASE

Prepared in the Offices of:

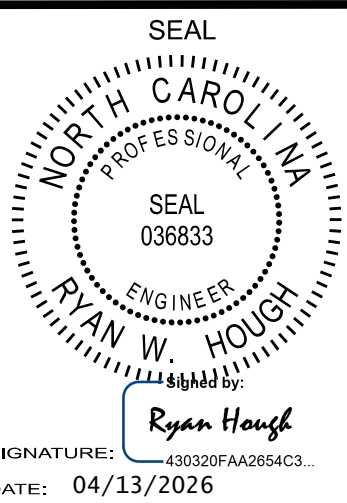


750 N. Greenfield Pkwy., Garner, NC 27529

NTS

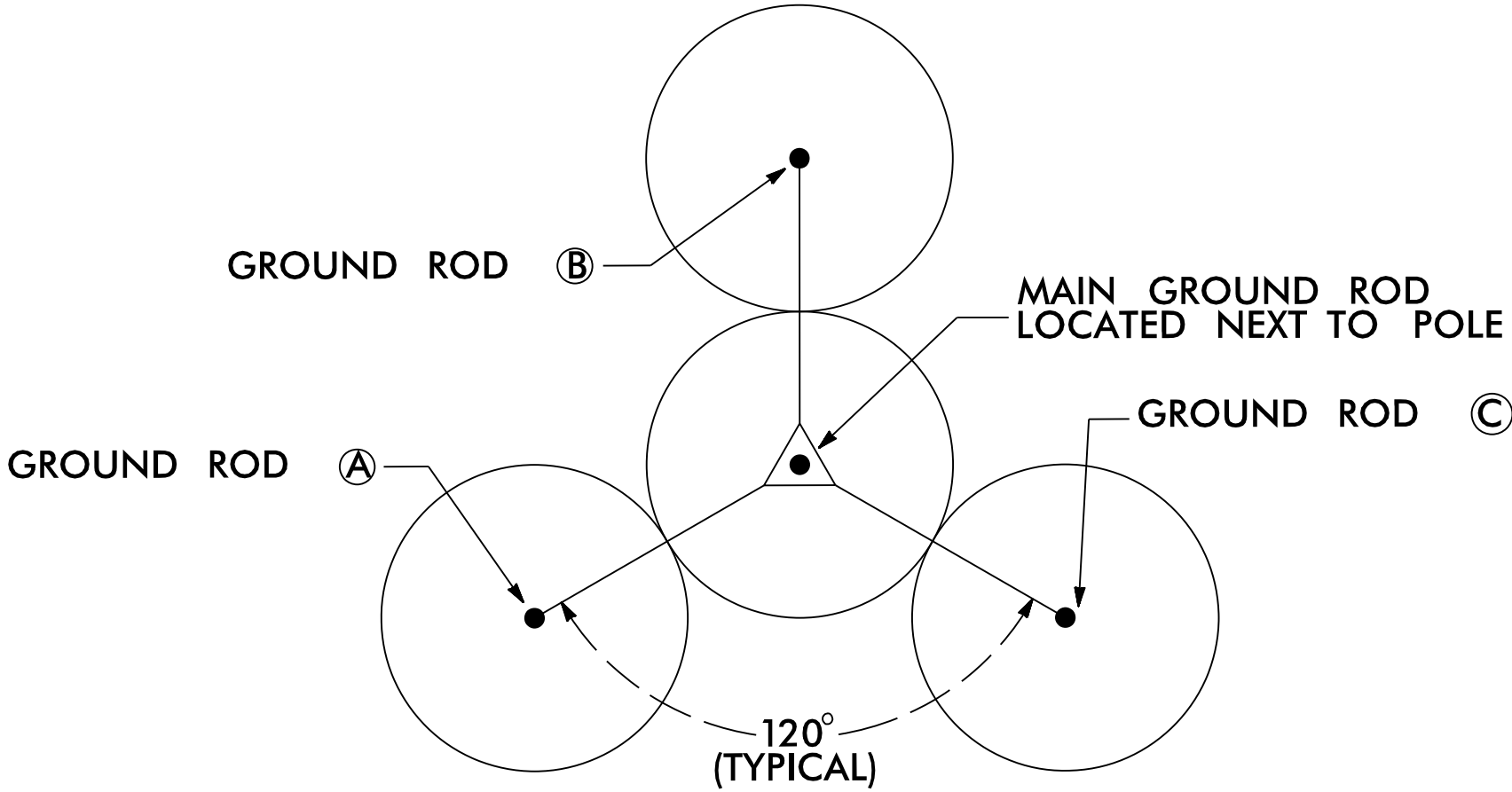
CCTV CAMERA INSTALLATION FOR WOOD POLES WITH AERIAL ELECTRICAL SERVICE TYPICAL DETAIL

DIVISION 12	CATAWBA	HICKORY
PLAN DATE: MARCH 2026	REVIEWED BY:	
PREPARED BY: H.T. BERGGREN, EI		
REVISIONS	INT.	DATE



SIGNATURE: Ryan W. Hough
DATE: 04/13/2026

10 FOOT RADIUS EACH "SPHERE OF INFLUENCE"



GROUND ROD PLACEMENT DETAIL (TYPICAL EACH POLE)

BOND #4 AWG SOLID BARE COPPER WIRE TO CAMERA SUPPORT BASE BY AN ALUMINUM TO COPPER #2 - #14 AWG LUG. ATTACH TO CAMERA BASE WITH A STAINLESS STEEL SELF TAPPING SCREW. REMOVE PAINT OR PROTECTIVE COATING WHERE ATTACHING LUG ONLY.

INSTALL 2-INCH PVC U-GUARD OVER COPPER CONDUCTOR FROM GROUND LEVEL TO 10 FEET (MINIMUM) ABOVE THE GROUND.

2-INCH RIGID GALVANIZED STEEL RISER FOR POWER AND CONTROL WIRES

INSTALL MARKER TAPE 12 INCHES BELOW GRADE AND ABOVE ALL GROUNDING CONDUCTORS.

FINISHED GRADE

24 INCH MIN.

IRREVERSIBLE MECHANICAL CRIMP

GROUND ROD A

TO GROUND ROD B

TO GROUND ROD C

MAIN GROUND ROD INDICATED BY "A" IN GROUND ROD PLACEMENT DETAIL THIS SHEET

5/8 INCH X 10 FOOT MIN. COPPER CLAD STEEL GROUND RODS DRIVEN INTO UNDISTURBED EARTH

10 - 20 FEET

SEE INSET 'A'

INSTALL 1/2 INCH EMT CONDUIT CLAMP EVERY 12 INCHES

1 1/2-INCH RIGID GALVANIZED STEEL RISER WITH WEATHERHEAD

POLE MOUNT EQUIPMENT CABINET

METER BASE /DISCONNECT COMBINATION PANEL

SEE NOTE 5

CONDUIT FOR FEEDER

TO EQUIPMENT CABINET GROUND BUSS

0.5 INCH X 48 INCH MINIMUM COPPER-CLAD AIR TERMINAL (CLASS II)

VERTICAL AIR TERMINAL BASE

SECURE CLASS II, 28 STRAND (MINIMUM), 15 AWG (MINIMUM), ROPE-LAY BARE COPPER LIGHTNING CONDUCTOR TO THE POLE ON 24 INCH CENTERS. USE COPPER CABLE CLIPS DESIGNED FOR USE WITH THE CLASS II COPPER CONDUCTOR. SECURE EACH COPPER CABLE CLIP TO THE POLE USING A 0.25 INCH DIAMETER X 1.5 INCH LONG HEX HEAD, GALVANIZED SCREW.

ELECTRICAL SERVICE DROP CONDUCTORS INSTALLED BY UTILITY COMPANY

CCTV CAMERA

5 FEET

POWER AND CONTROL WIRES

INSTALL 1/2 INCH EMT CONDUIT CLAMP EVERY 12 INCHES

1 1/2-INCH RIGID GALVANIZED STEEL RISER WITH WEATHERHEAD

POLE MOUNT EQUIPMENT CABINET

METER BASE /DISCONNECT COMBINATION PANEL

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ELECTRICAL SERVICE DROP CONDUCTORS INSTALLED BY UTILITY COMPANY

CCTV CAMERA

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POWER AND CONTROL WIRES