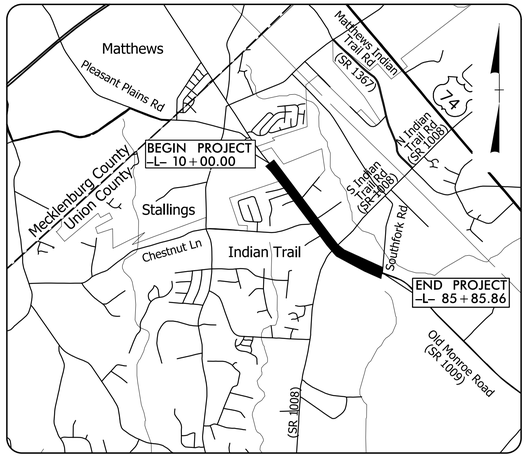
TIP PROJECT: U-4714BA

CONTRACT:



VICINITY MAP

NOT TO SCALE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UNION COUNTY

Project No.	Sheet No.
U-4714BA	Sig. 1.0

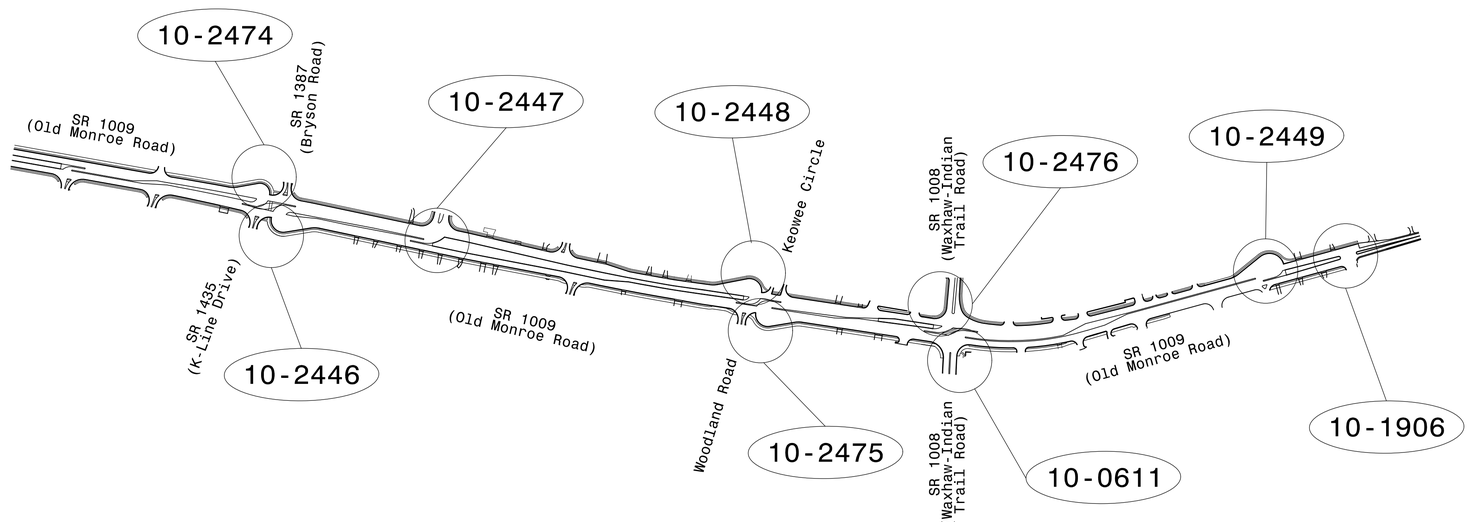


DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: *SR 1009 (OLD MONROE ROAD) FROM WEST OF SR 1387 (BRYSON ROAD) AND K-LINE ROAD TO EAST OF SR 1009 (MONROE ROAD) WB U-TURN AND STALLINGS VOLUNTEER FIRE STATION*

TYPE OF WORK: *TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS*

NAD 83 / NA 2011



STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	N/A	Project Titlesheet
Sig. 2.0–2.2	10–2474	SR 1009 (Old Monroe Road) WB at EB U–Turn/SR 1387 (Bryson Road)
Sig. 3.0–3.2	10–2446	SR 1009 (Old Monroe Road) EB at WB U–Turn/SR 1435 (K–Line Drive)
Sig. 4.0–4.2	10–2447	SR 1009 (Old Monroe Road) WB @ Chestnut Connector
Sig. 5.0–5.2	10–2448	SR 1009 (Old Monroe Road) WB @ EB U–Turn West of SR 1008 (Waxhaw–Indian Trail Road)
Sig. 6.0–7.1	10–2475	SR 1009 (Old Monroe Road) EB @ WB U–Turn West of SR 1008 (Waxhaw–Indian Trail Road)
Sig. 8.0–11.3	10–0611	SR 1009 (Old Monroe Road) EB @ SR 1008 (Waxhaw–Indian Trail Road)
Sig. 12.0–13.3	10–2476	SR 1009 (Old Monroe Road) WB @ SR 1008 (Waxhaw–Indian Trail Road)
Sig. 14.0–15.3	10–2449	SR 1009 (Old Monroe Road) WB @ EB U–Turn East of SR 1008 (Waxhaw–Indian Trail Road)
Sig. 16.0–19.3	10–1906	SR 1009 (Old Monroe Road) @ Stallings Volunteer Fire Department
M1–M9	N/A	2024 Standard Metal Pole Sheets
SCP 1–3	N/A	Signal Communications Wireless Plans

NCDOT TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS UNIT

Contacts:

Bailey M. Harden, PE – Western Region Signals Engineer
Keith M. Mims, PE – State Signal Equipment Design Engineer
Tarylor A. Kenion, PE – State Signal System Design Engineer
Ryan W. Hough, PE – State ITS Engineer

STV Engineers, Inc.

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Trent M. Moody, PE – Senior Associate Engineering Director
Alex M. Wiseman, PE – Traffic Engineer

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

Transportation Mobility and Safety Division · State of North Carolina · Department of Transportation

TSMO UNIT

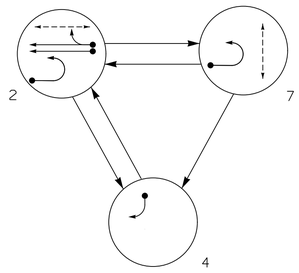
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10/15/2026
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jwilkins

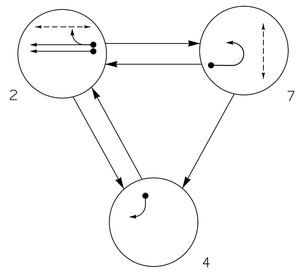
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 2.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	4	7	FLASH
21	↑	R	R	R
22	G	R	R	R
41, 42	~~R~~	→	~~R~~	~~R~~
71	~~F Y~~	~~R~~	←	~~R~~
72	~~F Y~~	~~R~~	↓	~~R~~
P21, P22	W	DW	DW	DRK
P71, P72	DW	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	4	7	FLASH
21	↑	R	R	R
22	G	R	R	R
41, 42	~~R~~	→	~~R~~	~~R~~
71	~~R~~	~~R~~	←	~~R~~
72	~~R~~	~~R~~	↓	~~R~~
P21, P22	W	DW	DW	DRK
P71, P72	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
4A	✳	0	✳	✳	4	-	-	X	-	X	-	✳
7A	✳	0	✳	✳	7	15.0**	-	X	-	X	-	✳
					2#	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

3 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

NOTES

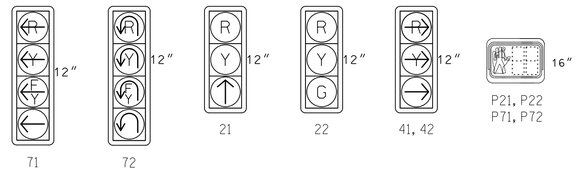
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.
See Note 3



MAXTIME TIMING CHART

FEATURE	PHASE 2	4	7
Walk *	14	–	12
Ped Clear *	12	–	5
Min Green	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	20	30
Yellow Change	4.5	4.6	3.0
Red Clear	3.1	2.2	3.7
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	7	–	5
Non Lock Detector	–	X	X
Vehicle Recall	MIN RECALL	–	–
Dual Entry	–	–	–

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (2A)	
Channel	1	
Phase	2	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊡	Metal Strain Pole	□
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	– – – –
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO LEFT TURN" Sign (R3-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11a)	Ⓑ
Ⓒ	One Way Sign (R6-1R)	Ⓒ

New Installation

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STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) WB
at
EB U-Turn/SR 1387 (Bryson Road)

Division 10 | Union County | Indian Trail

PLAN DATE: March 2026 | REVIEWED BY: T. Moody
PREPARED BY: G. Whitehouse | REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

SIG. INVENTORY NO. 10-2474

8/11/2026
matthew.cook.stvinc.com
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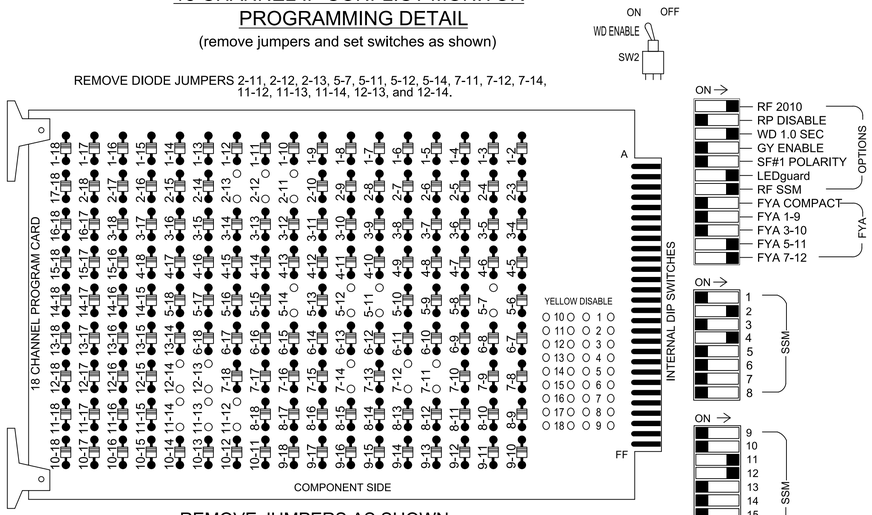
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 2.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-11, 2-12, 2-13, 5-7, 5-11, 5-12, 5-14, 7-11, 7-12, 7-14, 11-12, 11-13, 11-14, 12-13, and 12-14.



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and phase 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S5, S6, S7, S10, AUX S4, AUX S5
Phases Used.....2, 2PED, 4, 7, 7PED
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2		13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2		2 PED	3	4	7 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	P21, P22	NU	41,42	P71, P72	72★	NU	NU	71★	NU	NU	NU	NU	NU	72★	71★	NU
RED		128	128																
YELLOW		129	129					*			*								
GREEN			130																
RED ARROW						101											A114	A101	
YELLOW ARROW						102											A115	A102	
FLASHING YELLOW ARROW																	A116	A103	
GREEN ARROW		130				103		133			124								
				113			104												
				115			106												

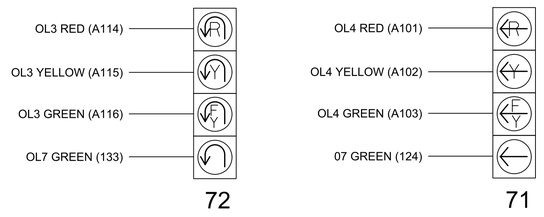
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L												Ø 7 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	2			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P71,P72	TB8-5,6	I12L	69	35	4	PED 7						

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 7A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

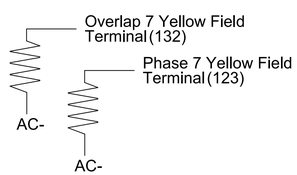
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	2,a,7,b,4,c
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2474
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
EB U-Turn/SR 1387 (Bryson Road)

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

SIG. INVENTORY NO. 10-2474

8/11/2026
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White, Emily

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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 2.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

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

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 5 →

NOTICE PHASE PED 7 ASSIGNED TO CHANNEL 14 →

NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

	Detector	Call Phase	Delay
7A	21	7	0.0
	32	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	3	4	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	7
Modifier Phases	7	7	-
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

← NOTICE INCLUDED PHASE

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

PED 7 PROGRAMMING DETAIL

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

Web Interface
Home >Controller >Detector Configuration >Pedestrian Detector

Plan 1

Detector	Descripton	Call Phase	Call Overlap
2	P21, P22	2	0
4	P71, P72	7	0
6		6	0
8		8	0

NOTICE PHASE 7 PED ASSIGNED TO DETECTOR 4 PED →

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2474
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
EB U-Turn/SR 1387 (Bryson Road)

Prepared for the Offices of:
Transportation Mobility and Safety Division
NC Department of Transportation
Traffic Engineering Branch
Traffic Signal & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

Division 10	Union County	Indian Trail
PLAN DATE: March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY: J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

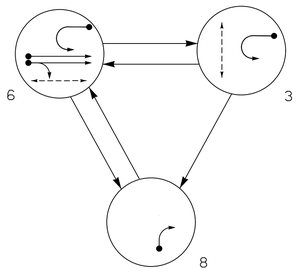
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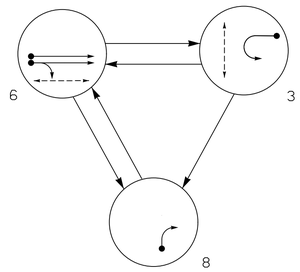
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 3.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 3	6	8	FLASH
31	~~←~~	~~Y~~	~~R~~	~~R~~
32	↰	Y	R	R
61	R	↑	R	R
62	R	G	R	R
81, 82	~~R~~	~~R~~	~~→~~	~~R~~
P31, P32	W	DW	DW	DRK
P61, P62	DW	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 3	6	8	FLASH
31	←	~~R~~	~~R~~	~~R~~
32	↰	R	R	R
61	R	↑	R	R
62	R	G	R	R
81, 82	~~R~~	~~R~~	→	~~R~~
P31, P32	W	DW	DW	DRK
P61, P62	DW	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	✳	0	✳	✳	3	15.0**	-	X	-	X	-	✳
					6#	-	-	X	-	X	-	✳
8A	✳	0	✳	✳	8	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
\# Disable Phase Call for Loop During Alternate Phasing

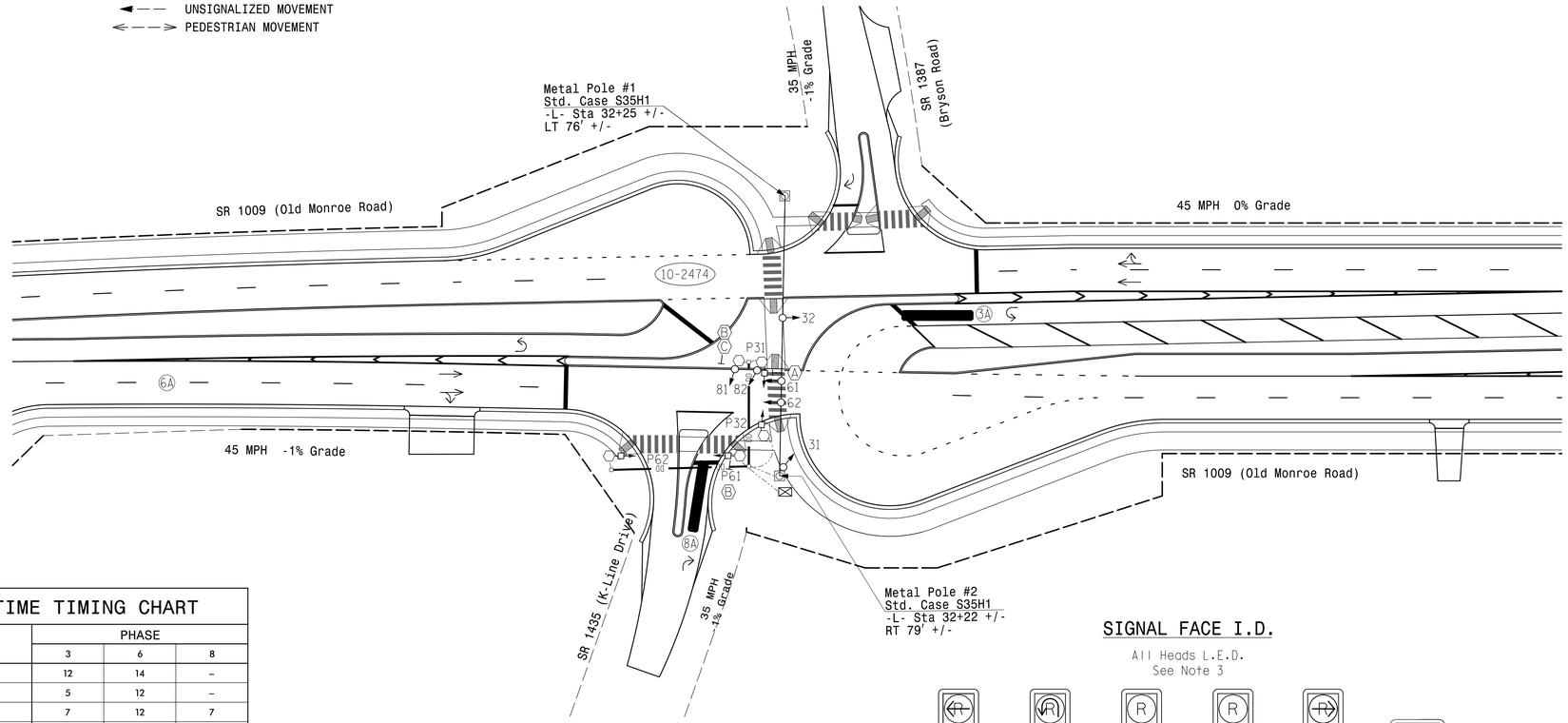
3 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

PHASING DIAGRAM DETECTION LEGEND

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



MAXTIME TIMING CHART

FEATURE	PHASE 3	6	8
Walk *	12	14	–
Ped Clear *	5	12	–
Min Green	7	12	7
Passage *	2.0	2.0	3.0
Max 1 *	20	90	30
Yellow Change	3.0	4.6	3.9
Red Clear	4.3	3.1	3.0
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	5	7	–
Non Lock Detector	X	–	X
Vehicle Recall	–	MIN RECALL	–
Dual Entry	–	–	–

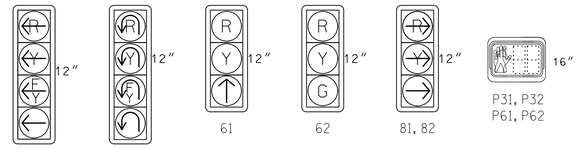
* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Advance Microwave Detection

FUNCTION	SENSOR 1 – (6A)	
Channel	1	
Phase	6	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

SIGNAL FACE I.D.

All Heads L.E.D.
See Note 3



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⧈	Metal Strain Pole	■
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	– – – –
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO LEFT TURN" Sign (R3-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11a)	Ⓑ
Ⓒ	One Way Sign (R6-1R)	Ⓒ

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) EB
at
WB U-Turn /
SR 1435 (K-Line Drive)

Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T. Moody
PREPARED BY:	G. Whitehouse	REVIEWED BY:	A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

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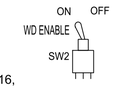
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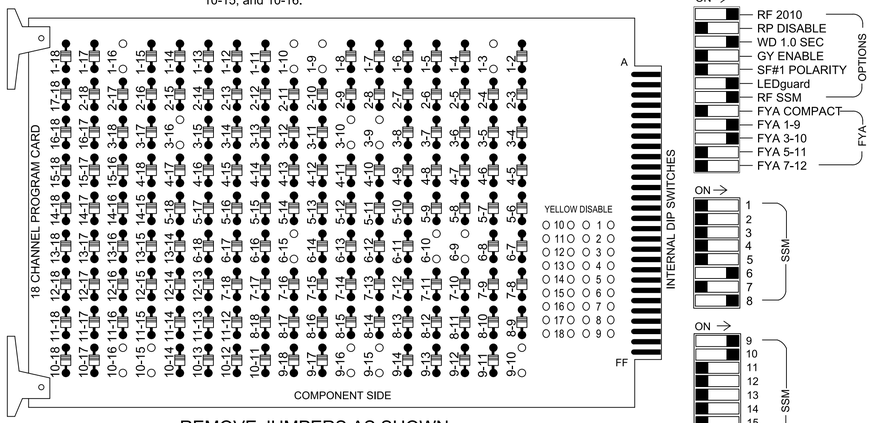
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U-4714BA	Sig. 3.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-3, 1-9, 1-10, 1-16, 3-9, 3-10, 3-16, 6-9, 6-10, 6-15, 9-10, 9-15, 9-16, 10-15, and 10-16.



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Phase Not On and phase 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S4, S8, S9, S11, S12, AUX S1, AUX S2
Phases Used.....3, 3PED, 6, 6PED, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOT USED
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

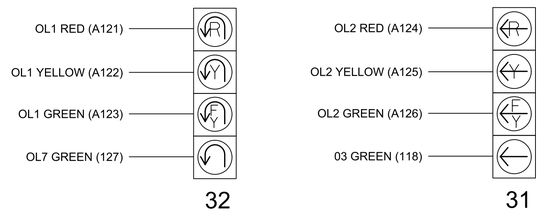
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	OL7	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	3 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	32★	NU	NU	31★	NU	NU	NU	61	62	P61, P62	NU	81,82	P31, P32	32★	31★	NU	NU	NU	NU
RED								134	134										
YELLOW	*			*				135	135										
GREEN									136										
RED ARROW												107		A121	A124				
YELLOW ARROW												108		A122	A125				
FLASHING YELLOW ARROW														A123	A126				
GREEN ARROW	127			118				136				109							
✋										119			110						
🚶										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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 6 PED DC ISOLATOR	FS DC ISOLATOR
	L					NOT USED								Ø 3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
				-	30★	6			X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P31,P32	TB8-8,9	I13L	70	36	8	PED 3						

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

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 3A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

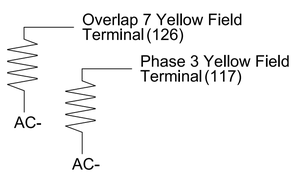
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	6,a,3,b,8,c
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2446
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

Prepared for the Offices of:
Transportation Mobility and Safety Division
NCDOT Traffic Engineering Branch
Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) EB at WB U-Turn / SR 1435 (K-Line Drive)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

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MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 31 and 32 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 1 →

NOTICE PHASE PED 3 ASSIGNED TO CHANNEL 16 →

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

NOTE: ALL RED FLASH

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

3A

Detector	Call Phase	Delay
7	3	0.0
30	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	3 ← NOTICE INCLUDED PHASE
Modifier Phases	3	3	-
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

PED 3 PROGRAMMING DETAIL

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

Web Interface
Home >Controller >Detector Configuration >Pedestrian Detector

Plan 1

NOTICE PHASE 3 PED ASSIGNED TO DETECTOR 8 PED →

Detector	Descripton	Call Phase	Call Overlap
2		2	0
4		4	0
6	PB61, PB62	6	0
8	PB81, PB82	3	0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2446
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 2 of 2

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Electrical and Programming Details For:

SR 1009 (Old Monroe Road) EB
at
WB U-Turn /
SR 1435 (K-Line Drive)

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

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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DocuSigned by: Trent Moody 8/11/2026
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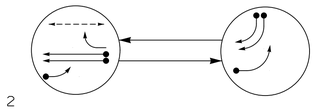
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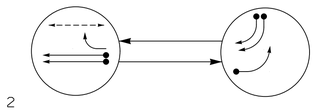
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DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	PHASE 4+7	FLASH
21	↑	R	R
22	G	R	R
23	F Y	R	R
41, 42	R →	— →	R →
71, 72	F Y	↘	R
73	F Y	←	R ←
P21, P22	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	PHASE 4+7	FLASH
21	↑	R	R
22	G	R	R
23	F Y	R	R
41, 42	R →	— →	R →
71, 72	R	↘	R
73	R ←	←	R ←
P21, P22	W	DW	DRK

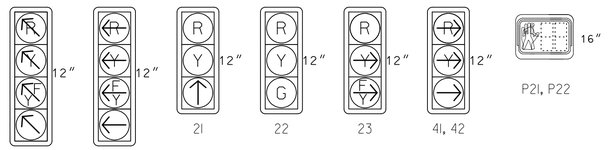
MAXTIME DETECTOR INSTALLATION CHART

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

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

SIGNAL FACE I.D.

All Heads L.E.D.
See Note 3



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 7
Walk *	14	–	–
Ped Clear *	23	–	–
Min Green	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	20	30
Yellow Change	4.5	4.0	3.0
Red Clear	1.6	1.3	2.1
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	7	–	–
Non Lock Detector	–	X	X
Vehicle Recall	MIN RECALL	–	–
Dual Entry	–	X	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (2A)	
Channel	1	
Phase	2	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

2 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
▣	Metal Strain Pole	■
⊣	Sign	⊣
▣↓	Pedestrian Signal Head With Push Button & Sign	■↓
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	– – – –
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
(A)	No U-Turn/No Left Turn Sign (R3-18)	(A)
(B)	"NO TURN ON RED" Sign (R10-11a)	(B)

New Installation

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) WB
at
Chestnut Connector

Division 10 Union County Indian Trail

PLAN DATE: March 2026 REVIEWED BY: T.M. Moody
PREPARED BY: G. Whitehouse REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

SIG. INVENTORY NO. 10-2447

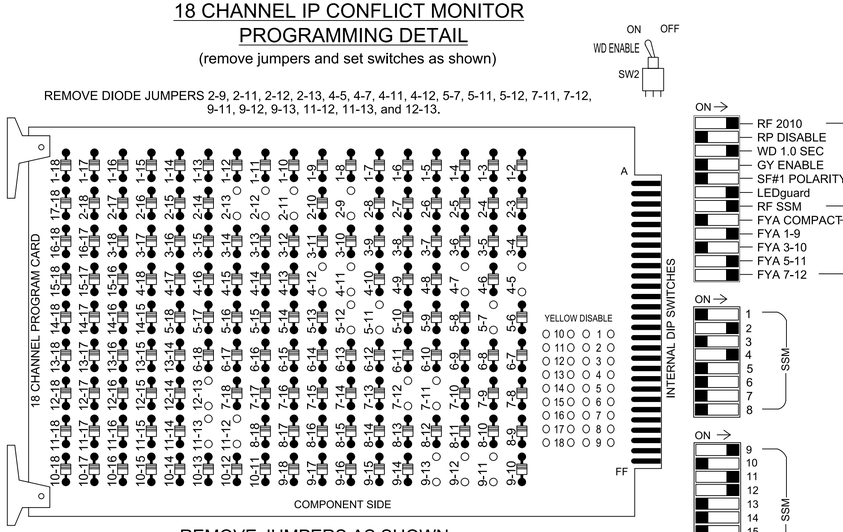
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 4.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and phase 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S5, S7, S10, AUX S1, AUX S4, AUX S5
Phases Used.....2, 2PED, 4, 7
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2		13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2		2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	P21, P22	NU	41,42	NU	73★	NU	NU	71,72★	NU	NU	23★	NU	NU	73★	71,72★	NU
RED		128	128											A121					
YELLOW		129	129					*			*								
GREEN			130																
RED ARROW						101											A114	A101	
YELLOW ARROW						102								A122			A115	A102	
FLASHING YELLOW ARROW														A123			A116	A103	
GREEN ARROW		130				103		133			124								
✋				113															
🚶				115															

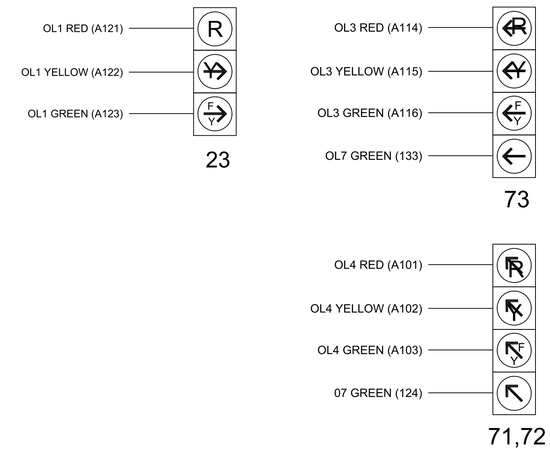
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L												NOT USED		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L					7A NOT USED									

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	2			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						

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

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

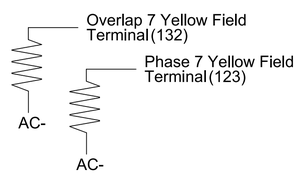
Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zone 7A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

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.

STV Engineers, Inc.
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Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2447
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

New Installation
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:
Traffic Engineering Branch
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) WB
at
Chestnut Connector

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-2447

8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 4.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 5 →

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

↑ ↑
NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 71, 72, and 73 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

7A

Detector	Call Phase	Delay
21	7	0.0
32	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

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

← NOTICE: REMOVE INCLUDED PHASES FOR OL3 & OL4

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2447
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

New Installation
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
Chestnut Connector

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

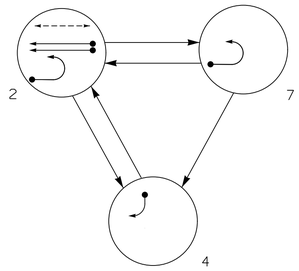
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8/11/2026
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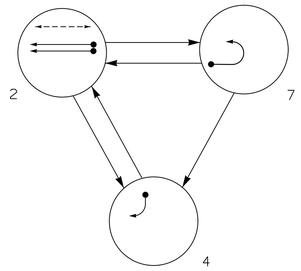
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 5.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	4	7	FLASH
21, 22	↑	R	R	R
41, 42	~~R~~	→	~~R~~	~~R~~
71	~~F Y~~	~~R~~	←	~~R~~
72	F Y	R	↶	R
P21, P22	W	DW	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	4	7	FLASH
21, 22	↑	R	R	R
41, 42	~~R~~	→	~~R~~	~~R~~
71	~~R~~	~~R~~	←	~~R~~
72	R	R	↶	R
P21, P22	W	DW	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
4A	✳	0	✳	✳	4	-	-	X	-	X	-	✳
7A	✳	0	✳	✳	7	15.0**	-	X	-	X	-	✳
					2#	-	-	X	-	X	-	✳

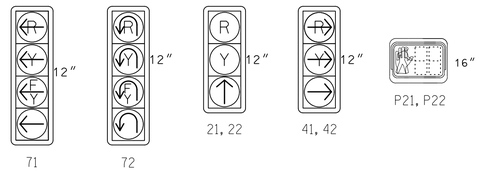
✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.
See Note 3



MAXTIME TIMING CHART

FEATURE	PHASE 2	4	7
Walk *	14	–	–
Ped Clear *	4	–	–
Min Green	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	20	30
Yellow Change	4.5	3.1	3.0
Red Clear	1.9	3.1	2.9
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	7	–	–
Non Lock Detector	–	X	X
Vehicle Recall	MIN RECALL	–	–
Dual Entry	–	–	–

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (2A)	
Channel	1	
Phase	2	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

3 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
◙	Metal Strain Pole	■
⊣	Sign	⊣
▭	Pedestrian Signal Head With Push Button & Sign	■
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	– – – –
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO LEFT TURN" Sign (R3-2)	Ⓐ
Ⓑ	"NO RIGHT TURN" Sign (R3-1)	Ⓑ
Ⓒ	"NO TURN ON RED" Sign (R10-11a)	Ⓒ
Ⓓ	One Way Sign (R6-1R)	Ⓓ

This plan supersedes the plan signed and sealed on 08/11/2026.

New Installation

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) WB
at
EB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE: October 2026 | REVIEWED BY: T. Moody
PREPARED BY: G. Whitehouse | REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 10/15/2026
SIG. INVENTORY NO. 10-2448

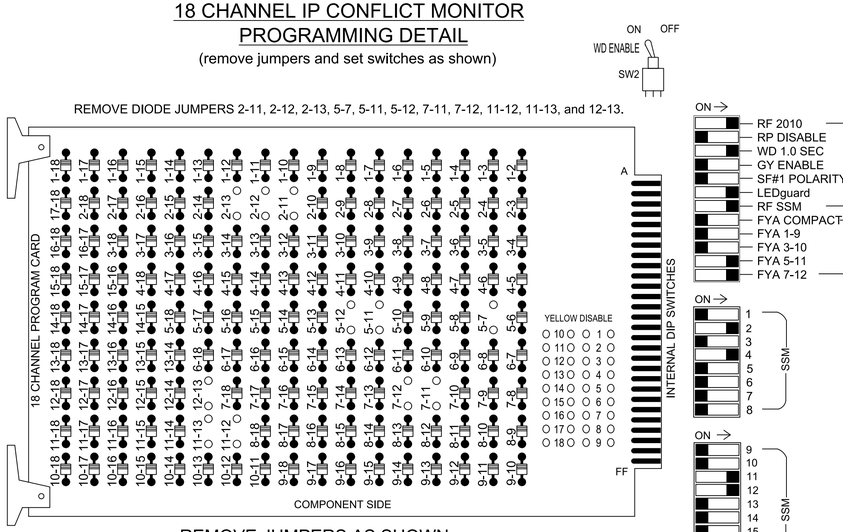
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 5.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and phase 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S5, S7, S10, AUX S4, AUX S5
Phases Used.....2, 2PED, 4, 7
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	NU	72★	NU	NU	71★	NU	NU	NU	NU	NU	72★	71★	NU
RED		128																
YELLOW		129					*			*								
GREEN																		
RED ARROW					101											A114	A101	
YELLOW ARROW					102											A115	A102	
FLASHING YELLOW ARROW																A116	A103	
GREEN ARROW		130			103		133			124								
✋			113															
🚶			115															

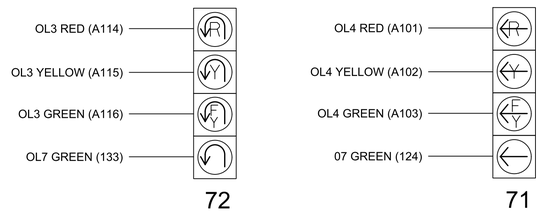
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L												NOT USED		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L					NOT USED									

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	2			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						

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

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 7A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

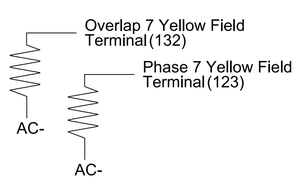
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	2,a,7,b,4,c
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2448
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB at EB U-Turn West of SR 1008 (Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-2448

8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 5.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

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

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 5

NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	3	4	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	7
Modifier Phases	7	7	-
Modifier Overlaps	-	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

NOTICE INCLUDED PHASE

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

7A

Detector	Call Phase	Delay
21	7	0.0
32	0	-

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2448
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

New Installation
Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
EB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

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

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by:
Trent Moody
SIGNATURE
8/11/2026
DATE

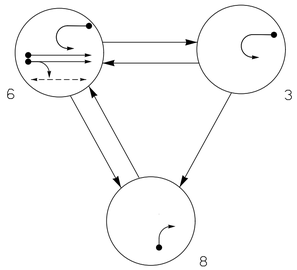
SIG. INVENTORY NO. 10-2448

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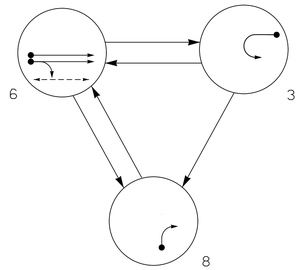
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 6.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 3	6	8	FLASH
31	←	FY	~~R~~	~~R~~
32	↰	FY (R)	(R)	(R)
61	R	↑	R	R
62	R	G	R	R
81, 82	~~R~~	~~R~~	→	~~R~~
P61, P62	DW	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 3	6	8	FLASH
31	←	~~R~~	~~R~~	~~R~~
32	↰	(R)	(R)	(R)
61	R	↑	R	R
62	R	G	R	R
81, 82	~~R~~	~~R~~	→	~~R~~
P61, P62	DW	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	✳	0	✳	✳	3	15.0**	-	X	-	X	-	✳
					6#	-	-	X	-	X	-	✳
8A	✳	0	✳	✳	8	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

3 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

NOTES

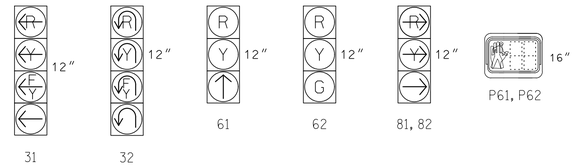
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○─○	Signal Pole with Guy	●─●
○─○	Signal Pole with Sidewalk Guy	●─●
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
▒	Construction Zone	N/A
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
⬡	Type II Signal Pedestal	●
Ⓐ	"NO LEFT TURN" Sign (R3-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11a)	Ⓑ

MAXTIME TIMING CHART

FEATURE	PHASE 3	6	8
Walk *	–	14	–
Ped Clear *	–	11	–
Min Green	7	12	7
Passage *	2.0	2.0	2.0
Max 1 *	20	90	30
Yellow Change	3.0	4.6	3.3
Red Clear	4.0	2.5	3.3
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	–	7	–
Non Lock Detector	X	–	X
Vehicle Recall	–	MIN RECALL	–
Dual Entry	–	–	–

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (6A)	
Channel	1	
Phase	6	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

This plan supersedes the plan signed and sealed on 08/11/2026.

New Installation
Temporary Design - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) EB
at
WB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	October 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Grimm

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 10/30/2026
DATE

SIG. INVENTORY NO. 10-2475T

10/29/2026
awiseman@stvinc.com
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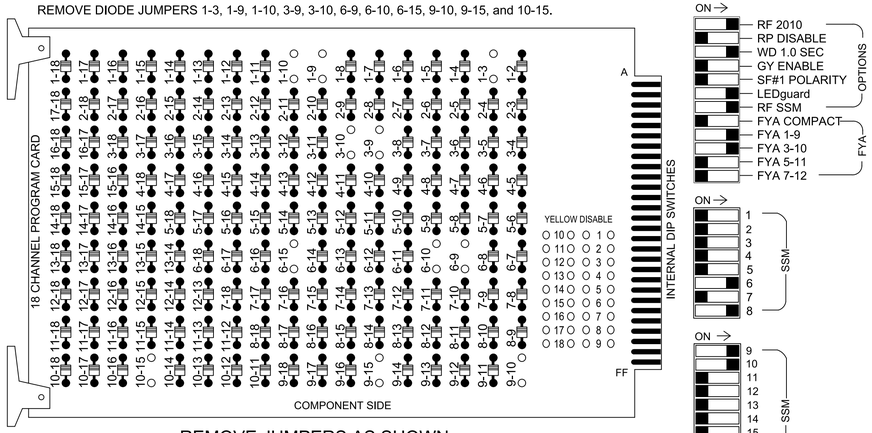
PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 6.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-3, 1-9, 1-10, 3-9, 3-10, 6-9, 6-10, 6-15, 9-10, 9-15, and 10-15.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Phase Not On and phase 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S4, S8, S9, S11, AUX S1, AUX S2
Phases Used.....3, 6, 6PED, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOTUSED
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

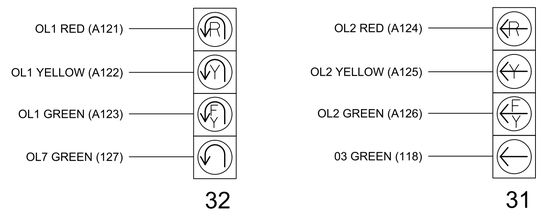
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	OL7	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	32★	NU	NU	31★	NU	NU	NU	61	62	P61, P62	NU	81,82	NU	32★	31★	NU	NU	NU	NU
RED								134	134										
YELLOW	*			*				135	135										
GREEN									136										
RED ARROW												107		A121	A124				
YELLOW ARROW												108		A122	A125				
FLASHING YELLOW ARROW														A123	A126				
GREEN ARROW	127			118				136				109							
✋										119									
🚶										121									

NU = Not Used
*Denotes install load resistor. See load resistor installation detail this sheet.
★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 3 3A NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 6 PED DC ISOLATOR NOT USED	FS DC ISOLATOR ST DC ISOLATOR
	L														
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
				-	30★	6			X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

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

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 3A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

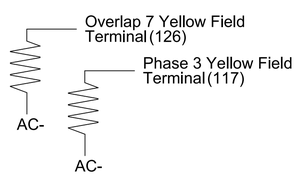
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	6,a,3,b,8,c
2	

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2475T
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design - TMP Phase III
Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) EB at
WB U-Turn West of SR 1008 (Waxhaw-Indian Trail Road)

Division 10	Union County	Indian Trail
PLAN DATE: March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY: J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by:
Trent Moody
SIGNATURE
8/11/2026
DATE

SIG. INVENTORY NO. 10-2475T

8/11/2026
\\stvinc.com#3#GPA#Projects#4018904#4018904_0001#50_Deliverables & Submittals#U-4714BA#Traffic#Signals#U-4714BA#Design#Signals#1024751_sm_ele_2025xxxx.dgn
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 6.2

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 31 and 32 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 1 →

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

NOTE: ALL RED FLASH

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

	Detector	Call Phase	Delay
3A	7	3	0.0
	30	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	7	
Type	FYA 4 - Section	FYA 4 - Section	Normal	
Included Phases	-	-	3	← NOTICE INCLUDED PHASE
Modifier Phases	3	3	-	
Modifier Overlaps	-	-	-	
Trail Green	0	0	0	
Trail Yellow	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2475T
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

Temporary Design - TMP Phase III
Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) EB
at
WB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by:
Trent Moody
SIGNATURE
8/11/2026
DATE

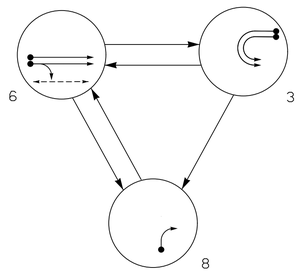
SIG. INVENTORY NO. 10-2475T

8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 7.0

PHASING DIAGRAM

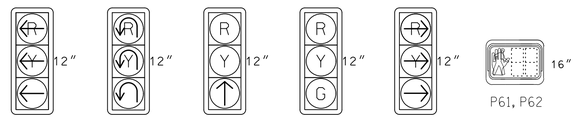


PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 3	PHASE 6	PHASE 8	FLASH
31	←R	←R	←R	←R
32, 33	↶R	↑R	↷R	R
61	R	↑	R	R
62	R	G	R	R
81, 82	→R	→R	→R	→R
P61, P62	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.
See Note 3



MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	✳	0	✳	✳	3	-	-	X	-	X	-	✳
3B	✳	0	✳	✳	3	-	-	X	-	X	-	✳
8A	✳	0	✳	✳	8	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

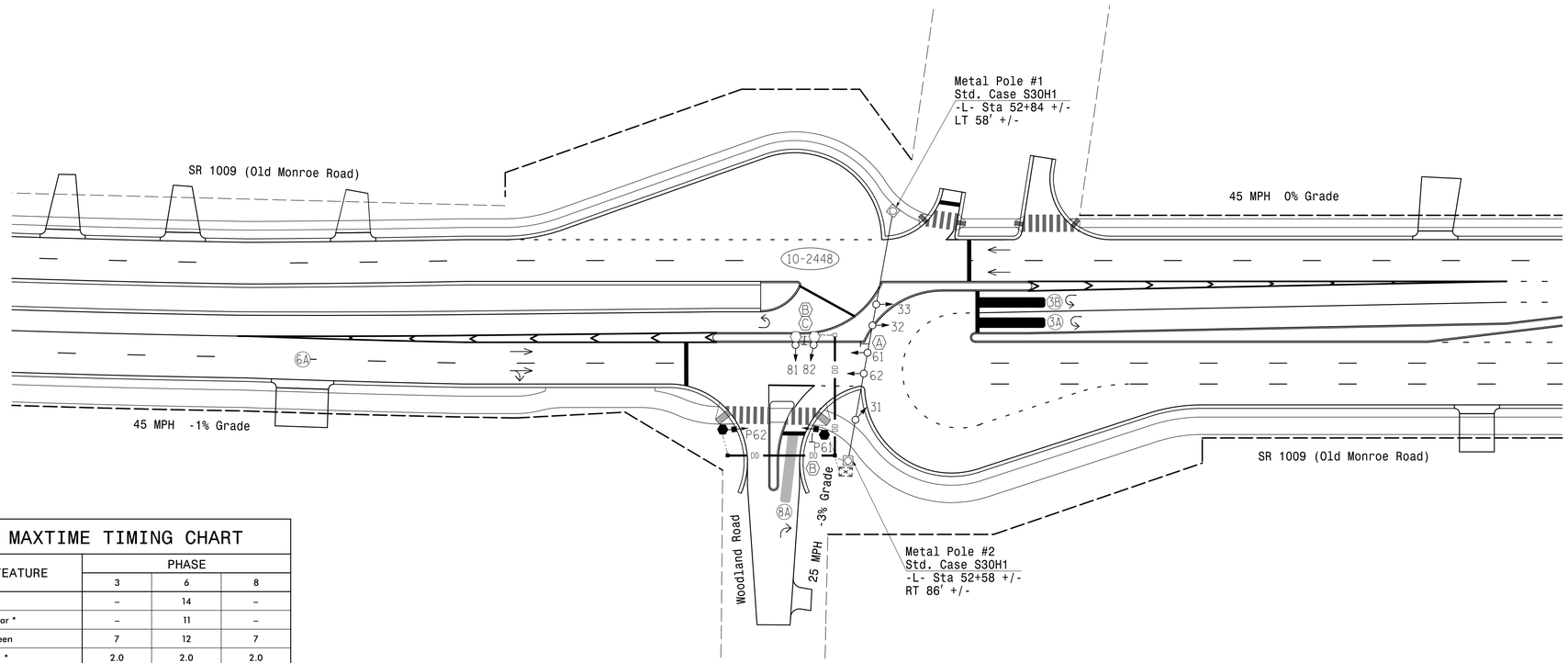
3 Phase
Fully Actuated
D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

PHASING DIAGRAM DETECTION LEGEND

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



MAXTIME TIMING CHART

FEATURE	PHASE 3	PHASE 6	PHASE 8
Walk *	–	14	–
Ped Clear *	–	11	–
Min Green	7	12	7
Passage *	2.0	2.0	2.0
Max 1 *	20	90	30
Yellow Change	3.0	4.6	3.3
Red Clear	5.0	2.6	3.3
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	–	7	–
Non Lock Detector	X	–	X
Vehicle Recall	–	MIN RECALL	–
Dual Entry	–	–	–

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – 6A	
Channel	1	
Phase	6	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊠	Metal Strain Pole	■
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	– – – –
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO LEFT TURN" Sign (R3-2)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11a)	Ⓑ
Ⓒ	One Way Sign (R6-1R)	Ⓒ

This plan supersedes the plan signed and sealed on 08/11/2026.

Signal Upgrade - Final Design

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) EB
at
WB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE: October 2026 REVIEWED BY: T. Moody
PREPARED BY: G. Whitehouse REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 10/15/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-2475

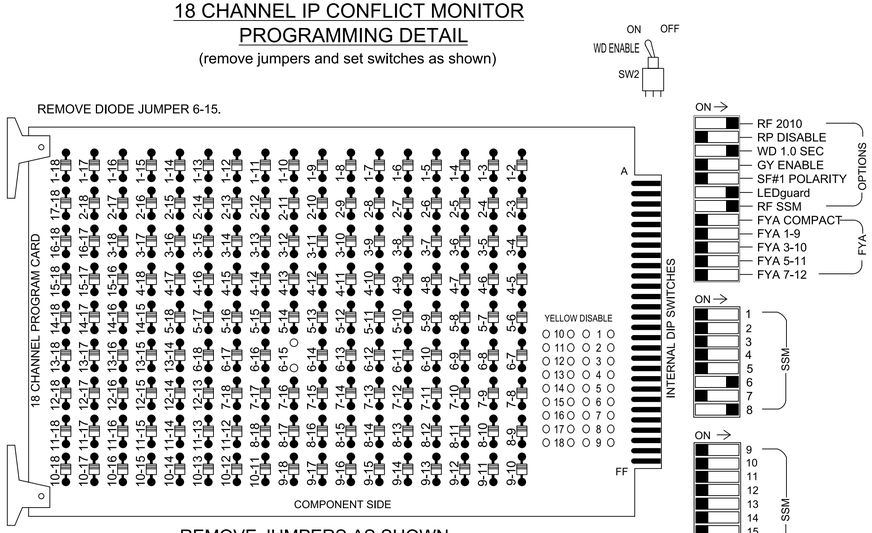
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 7.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Phase Not On and phase 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S4, S8, S9, S11
Phases Used.....3, 6, 6PED, 8
Overlaps.....NOT USED

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.

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	NU	NU	31,32, 33	NU	NU	NU	61	62	P61, P62	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED								134	134										
YELLOW								135	135										
GREEN									136										
RED ARROW				116								107							
YELLOW ARROW				117								108							
FLASHING YELLOW ARROW																			
GREEN ARROW				118				136				109							
✋										119									
🚶										121									

NU = Not Used

OUTPUT CHANNEL CONFIGURATION

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

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

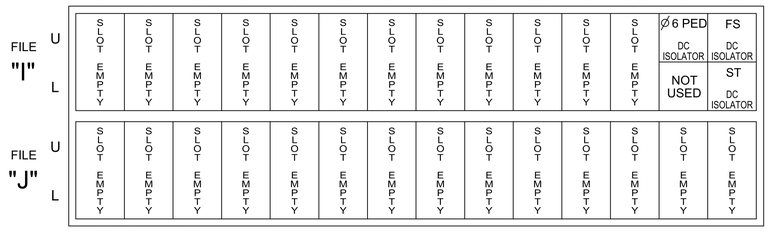
Channel Configuration

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

NOTE: ALL RED FLASH

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.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

NOTE:
INSTALL DC ISOLATOR
IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	6,a,3,b,8,c
2	

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2475
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Signal Upgrade - Final Design
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) EB
at
WB U-Turn West of SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by:
Trent Moody
SIGNATURE
8/11/2026
DATE

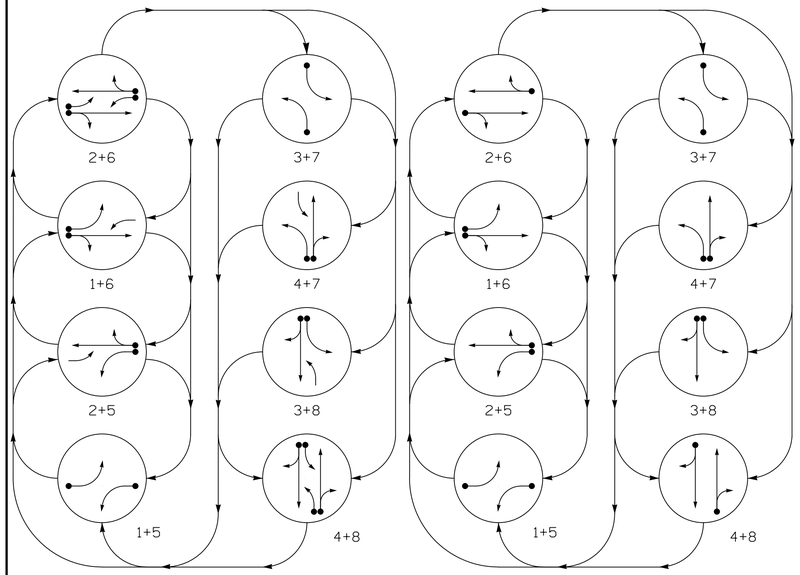
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 8.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM

DEFAULT PHASING TABLE OF OPERATION

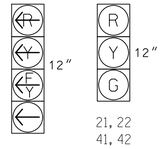
SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←-	←-	←-F/Y	←-F/Y	←-R	←-R	←-R	←-R	←-R
21, 22	R	R	G	G	R	R	R	R	R
31	←-R	←-R	←-R	←-R	←-	←-	←-F/Y	←-F/Y	←-R
41, 42	R	R	R	R	R	R	G	G	R
51	←-	←-F/Y	←-	←-F/Y	←-R	←-R	←-R	←-R	←-R
61, 62	R	G	R	G	R	R	R	R	R
71	←-R	←-R	←-R	←-R	←-	←-F/Y	←-	←-F/Y	←-R
81, 82	R	R	R	R	R	G	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←-	←-	←-R	←-R	←-R	←-R	←-R	←-R	←-R
21, 22	R	R	G	G	R	R	R	R	R
31	←-R	←-R	←-R	←-R	←-	←-	←-R	←-R	←-R
41, 42	R	R	R	R	R	R	G	G	R
51	←-	←-R	←-	←-R	←-R	←-R	←-R	←-R	←-R
61, 62	R	G	R	G	R	R	R	R	R
71	←-R	←-R	←-R	←-R	←-	←-R	←-	←-R	←-R
81, 82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

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

✳ Multi-zone Microwave Detection Zone
* Reduce Delay to 3 Seconds During Alternate Phasing
** Disable Delay During Alternate Phasing
\# Disable Phase Call for Loop During Alternate Phasing

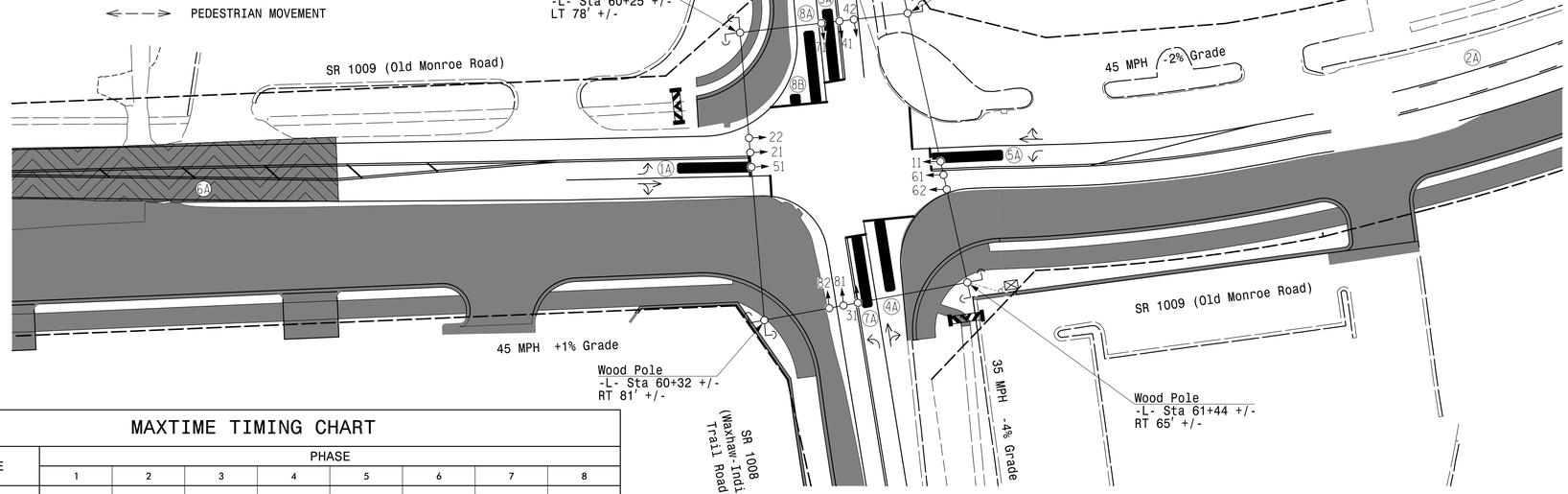
8 Phase Fully Actuated w/ Alternate Phasing Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

PHASING DIAGRAM DETECTION LEGEND

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



MAXTIME TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Walk *	–	–	–	–	–	–	–	–
Ped Clear *	–	–	–	–	–	–	–	–
Min Green	7	12	7	7	7	12	7	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	15	90	20	20	15	90	20	20
Yellow Change	3.0	4.7	3.0	4.1	3.0	4.7	3.0	4.1
Red Clear	2.3	1.1	2.3	1.5	1.9	1.1	1.9	1.5
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Added Initial *	–	–	–	–	–	–	–	–
Maximum Initial *	–	–	–	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–	–	–	–
Time To Reduce *	–	–	–	–	–	–	–	–
Minimum Gap	–	–	–	–	–	–	–	–
Advance Walk	–	–	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	–	X

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

Advance Microwave Detection

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	— — —
→	Directional Arrow	→
▬	Non-Intrusive Detection Zone	▬
▓	Construction Zone	N/A
▨	Construction Barricade	▨
• • •	Construction Zone Drums	• • •

Signal Upgrade
Temporary Design 1 - TMP Phase I

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STV Engineers, Inc.
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Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) at SR 1008 (Waxhaw-Indian Trail Road)
Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T. Moody
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Grimm

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

SIG. INVENTORY NO. 10-06IITI

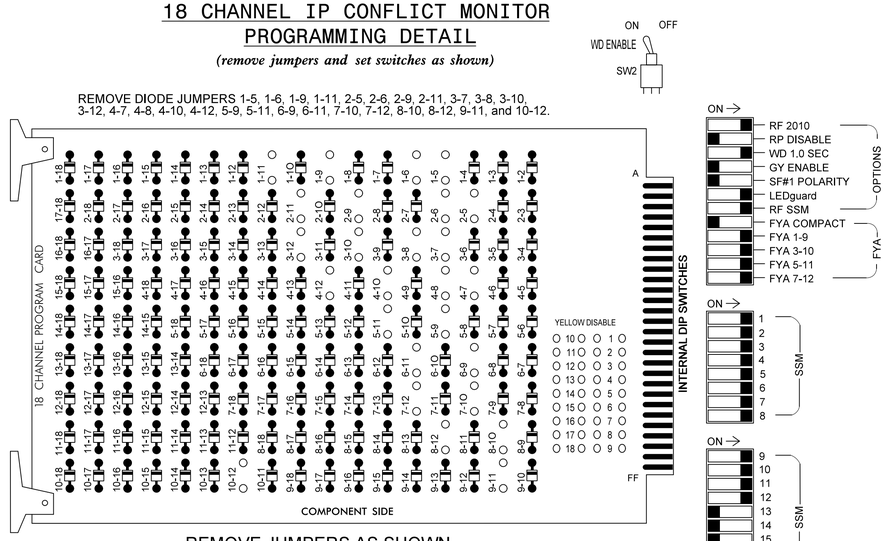
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18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/AUX
SOFTWARE.....Q-FREE MAXTIME
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS.....18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1, S2, S4, S5, S7, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 3, 4, 5, 6, 7, 8
OVERLAP "1".....*
OVERLAP "2".....*
OVERLAP "3".....*
OVERLAP "4".....*

* See overlap programming details on Sheet 2.

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	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.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	71★	81,82	NU	11★	31★	NU	51★	71★	NU
RED	.	128	.	.	101	.	.	134	.	.	107	.	.	.	.	.	.	.
YELLOW	★	129	.	★	102	.	★	135	.	★	108	.	.	.	.	.	.	.
GREEN	.	130	.	.	103	.	.	136	.	.	109	.	.	.	.	.	.	.
RED ARROW	.	.	.	.	.	.	.	.	.	.	.	.	A121	A124	.	A114	A101	.
YELLOW ARROW	.	.	.	.	.	.	.	.	.	.	.	.	A122	A125	.	A115	A102	.
FLASHING YELLOW ARROW	.	.	.	.	.	.	.	.	.	.	.	.	A123	A126	.	A116	A103	.
GREEN ARROW	127	.	.	118	.	.	133	.	.	124	.	.	.	.	.	.	.	.

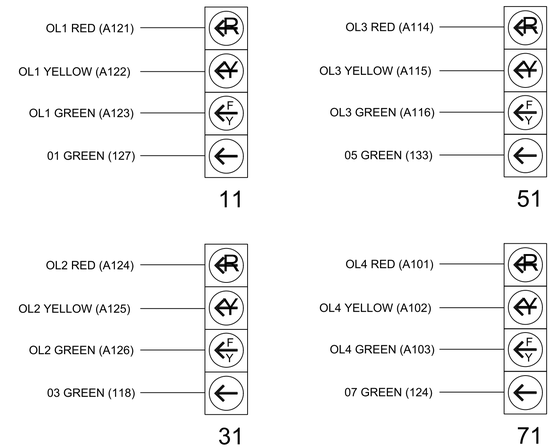
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	ø 1	SLOT	SLOT	SLOT	ø 3	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS
	1A	EMPTY	EMPTY	EMPTY	3A	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	DC ISOLATOR
L	NOT USED				NOT USED									ST
														DC ISOLATOR
U	ø 5	SLOT	SLOT	SLOT	ø 7	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT
	5A	EMPTY	EMPTY	EMPTY	7A	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
L	NOT USED				NOT USED									

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1★	1	15.0		X		X	
				-	29★	6			X		X	
3A	TB4-5,6	I5U	58	20	7★	3	15.0		X		X	
				-	30★	8	3.0		X		X	
5A	TB3-1,2	J1U	55	17	15★	5	15.0		X		X	
				-	31★	2			X		X	
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	4	3.0		X		X	

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

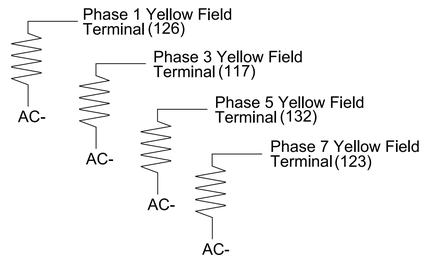
Install a multi-zone microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

For Zones 1A, 3A, 5A, and 7A, inputs associated with the typical slots for an NCDOT installation are compatible with time of day instructions located on Sheet 2 of this electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611T1
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

Temporary Design 1 - TMP Phases I
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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(704) 372-1885
NC License Number F-0991

Prepared for the Offices of:
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

Electrical and Programming Details For:

SR 1009 (Old Monroe Road)
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	J.C. Grimm
PREPARED BY:	A.M. Wiseman	REVIEWED BY:	T.M. Moody

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by:
Trent Moody
SIGNATURE
8/11/2026
DATE

SIG. INVENTORY NO. 10-0611T1

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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 8.2

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More >Channels >Channel Options

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

Channel Configuration

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

NOTE: ALL RED FLASH

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

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

VEH DET PLAN 2: Disables phase 6 call on zone 1A and reduces delay time for phase 1 call on zone 1A to 0.0 seconds.

Disables phase 8 call on zone 3A and reduces delay time for phase 3 call on zone 3A to 3.0 seconds.

Disables phase 2 call on zone 5A and reduces delay time for phase 5 call on zone 5A to 0.0 seconds.

Disables phase 4 call on zone 7A and reduces delay time for phase 7 call on zone 7A to 3.0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	-
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

NOTE INCLUDED PHASES

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

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

1A

Detector	Call Phase	Delay
1	1	0.0
29	0	-

3A

Detector	Call Phase	Delay
7	3	3.0
30	0	3.0

5A

Detector	Call Phase	Delay
15	5	0.0
31	0	-

7A

Detector	Call Phase	Delay
21	7	3.0
32	0	3.0

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611T1
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
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Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design 1 - TMP Phase s I
Electrical Detail - Sheet 2 of 2

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Electrical and Programming Details For:

SR 1009 (Old Monroe Road)
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

Prepared for the Offices of:
Traffic Engineering Branch
Traffic Signal & Signage Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

PLAN DATE:	March 2026	REVIEWED BY:	J.C. Grimm
PREPARED BY:	A.M. Wiseman	REVIEWED BY:	T.M. Moody

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

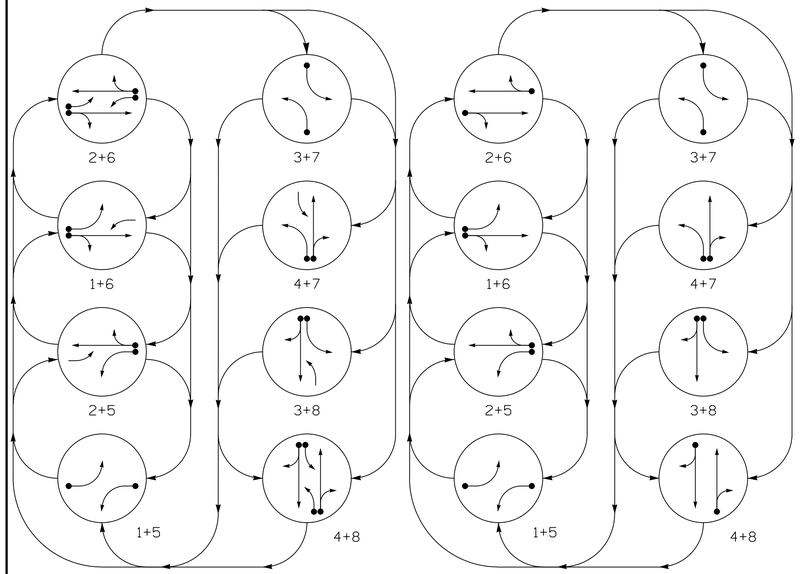
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8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 9.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←●	←●	←Y	←Y	←R	←R	←R	←R	←R
21, 22	R	R	G	G	R	R	R	R	R
31	←R	←R	←R	←R	←●	←●	←Y	←Y	←R
41, 42	R	R	R	R	R	R	G	G	R
51	←●	←Y	←●	←Y	←R	←R	←R	←R	←R
61, 62	R	G	R	G	R	R	R	R	R
71	←R	←R	←R	←R	←Y	←●	←Y	←R	←R
81, 82	R	R	R	R	G	R	G	R	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←●	←●	←R	←R	←R	←R	←R	←R	←R
21, 22	R	R	G	G	R	R	R	R	R
31	←R	←R	←R	←R	←●	←●	←R	←R	←R
41, 42	R	R	R	R	R	R	G	G	R
51	←●	←R	←●	←R	←R	←R	←R	←R	←R
61, 62	R	G	R	G	R	R	R	R	R
71	←R	←R	←R	←R	←●	←R	←R	←R	←R
81, 82	R	R	R	R	R	G	R	G	R

MAXTIME DETECTOR INSTALLATION CHART

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

✳ Multi-zone Microwave Detection Zone
* Reduce Delay to 3 Seconds During Alternate Phasing
** Disable Delay During Alternate Phasing
\# Disable Phase Call for Loop During Alternate Phasing

8 Phase Fully Actuated w/ Alternate Phasing Isolated

NOTES

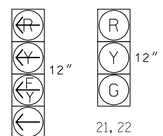
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. Reposition existing signal heads numbered 31, 41, 42, 71, 81, and 82.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Walk *	–	–	–	–	–	–	–	–
Ped Clear *	–	–	–	–	–	–	–	–
Min Green	7	12	7	7	7	12	7	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	15	90	20	20	15	90	20	20
Yellow Change	3.0	4.7	3.0	4.1	3.0	4.7	3.0	4.1
Red Clear	2.1	1.1	1.9	2.1	2.3	1.1	3.2	2.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Added Initial *	–	–	–	–	–	–	–	–
Maximum Initial *	–	–	–	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–	–	–	–
Time To Reduce *	–	–	–	–	–	–	–	–
Minimum Gap	–	–	–	–	–	–	–	–
Advance Walk	–	–	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	–	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (2A)		SENSOR 1 – (6A)	
Channel	1		2	
Phase	2		6	
Direction of Travel	WB		EB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	<750	N/A	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150	100 – 600	100 – 150
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35 – 100	1 – 35	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–	2.5 – 6.5	–

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	————
→	Directional Arrow	→
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
▓	Construction Zone	N/A
▨	Construction Barricade	▨
• • •	Construction Zone Drums	• • •

Signal Upgrade
Temporary Design 2 - TMP Phase II

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STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
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(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) at SR 1008 (Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T. Moody
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Grimm

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

SIG. INVENTORY NO. 10-06IIT2

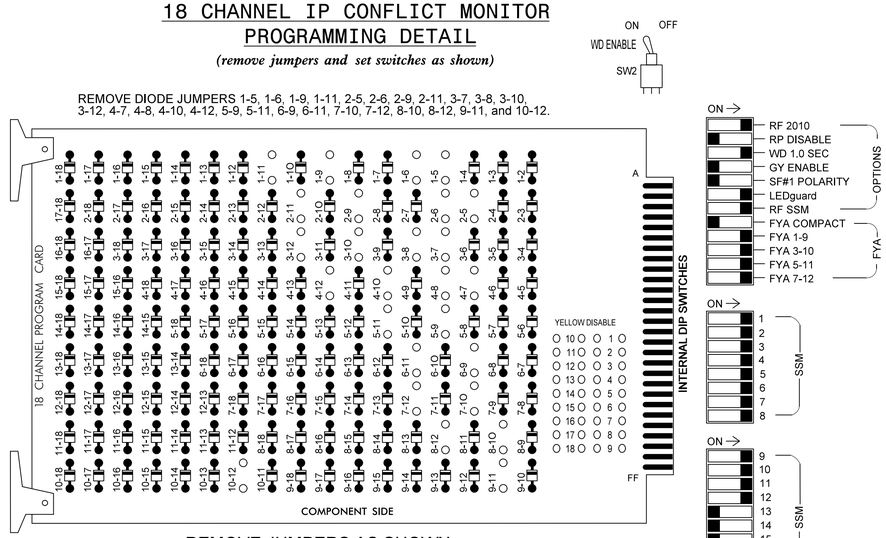
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18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/AUX
SOFTWARE.....Q-FREE MAXTIME
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS.....18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1, S2, S4, S5, S7, S8, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 3, 4, 5, 6, 7, 8
OVERLAP "1".....*
OVERLAP "2".....*
OVERLAP "3".....*
OVERLAP "4".....*

* See overlap programming details on Sheet 2.

PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 9.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	NU	51★	61,62	NU	71★	81,82	NU	11★	31★	NU	51★	71★	NU
RED		128			101			134			107							
YELLOW	★	129		★	102		★	135		★	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124								

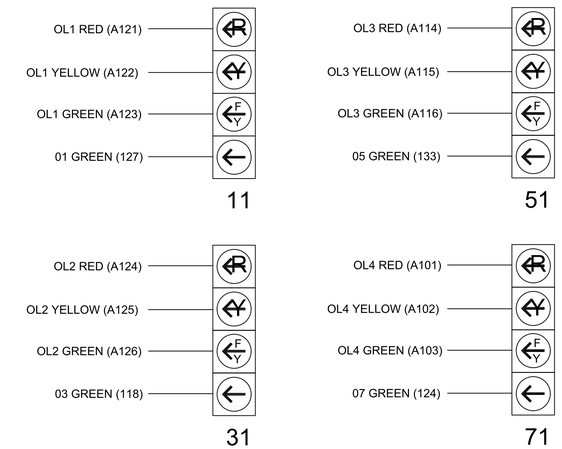
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	ø 1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L	NOT USED				NOT USED									ST DC ISOLATOR
U	ø 5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø 7 7A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
L	NOT USED				NOT USED									

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1★	1	15.0		X		X	
				-	29★	6			X		X	
3A	TB4-5,6	I5U	58	20	7★	3	15.0		X		X	
				-	30★	8	3.0		X		X	
5A	TB3-1,2	J1U	55	17	15★	5	15.0		X		X	
				-	31★	2			X		X	
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	4	3.0		X		X	

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

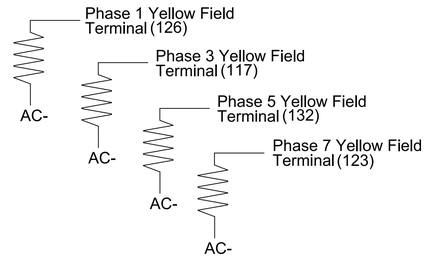
Install a multi-zone microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.

For Zones 1A, 3A, 5A, and 7A, inputs associated with the typical slots for an NCDOT installation are compatible with time of day instructions located on Sheet 2 of this electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611T2
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Electrical and Programming Details For:

Prepared for the Offices of:

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

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road)
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	J.C. Grimm
PREPARED BY:	A.M. Wiseman	REVIEWED BY:	T.M. Moody

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody
SIGNATURE
8/11/2026
DATE

SIG. INVENTORY NO. 10-0611T2

8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 9.2

OUTPUT CHANNEL CONFIGURATION

Front Panel
Main Menu >Controller >More >Channels >Channel Options

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

Channel Configuration

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

NOTE: ALL RED FLASH

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

Unit Flash Parameters

All Red Flash Exit Time
6

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

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

VEH DET PLAN 2: Disables phase 6 call on zone 1A and reduces delay time for phase 1 call on zone 1A to 0.0 seconds.

Disables phase 8 call on zone 3A and reduces delay time for phase 3 call on zone 3A to 3.0 seconds.

Disables phase 2 call on zone 5A and reduces delay time for phase 5 call on zone 5A to 0.0 seconds.

Disables phase 4 call on zone 7A and reduces delay time for phase 7 call on zone 7A to 3.0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	-
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

NOTE INCLUDED PHASES

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

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

1A

Detector	Call Phase	Delay
1	1	0.0
29	0	-

3A

Detector	Call Phase	Delay
7	3	3.0
30	0	3.0

5A

Detector	Call Phase	Delay
15	5	0.0
31	0	-

7A

Detector	Call Phase	Delay
21	7	3.0
32	0	3.0

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611T2
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

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NC License Number F-0991

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 2

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Electrical and Programming Details For:

SR 1009 (Old Monroe Road)
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

Prepared for the Offices of:
Transportation Mobility and Safety Division
State of North Carolina Department of Transportation
Traffic Engineering & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

PLAN DATE: March 2026 | REVIEWED BY: J.C. Grimm
PREPARED BY: A.M. Wiseman | REVIEWED BY: T.M. Moody

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

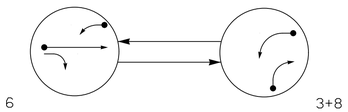
SIG. INVENTORY NO. 10-0611T2

8/11/2026
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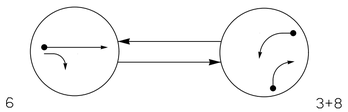
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 10.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

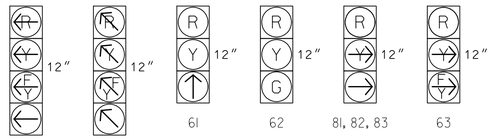
SIGNAL FACE	PHASE 6	PHASE 3+8	PHASE FLASH
31	FYG	\	R
32	FYG	←	R
61	↑	R	R
62	G	R	R
63	FYG	R	R
81, 82, 83	R	→	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 6	PHASE 3+8	PHASE FLASH
31	R	\	R
32	R	←	R
61	↑	R	R
62	G	R	R
63	FYG	R	R
81, 82, 83	R	→	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

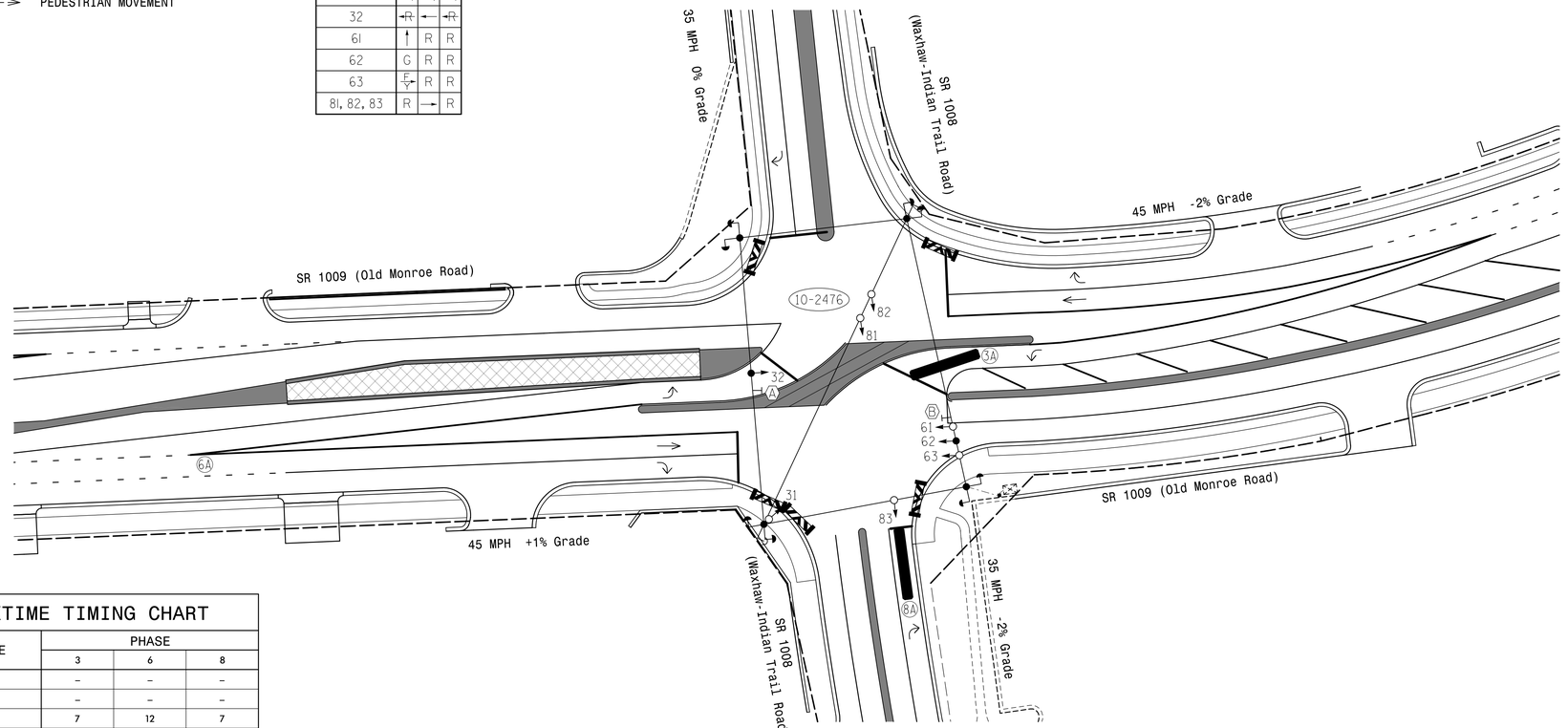
DETECTOR					PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	✳	0	✳	✳	3	15.0**	-	X	-	X	-	✳
					6 #	-	-	X	-	X	-	✳
8A	✳	0	✳	✳	8	15.0	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

2 Phase Fully Actuated w/ Alternate Phasing D10-59_Indian Trail

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. The Division Traffic Engineer will determine the hours of use for each phasing plan.
5. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Renumber existing signal head 51 to 32.
8. Reposition existing signal heads 32 and 62.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
○ with Guy	Signal Pole with Guy	● with Guy
○ with Sidewalk Guy	Signal Pole with Sidewalk Guy	● with Sidewalk Guy
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	— — — —
→	Directional Arrow	→
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
▬	Construction Zone	N/A
▨	Construction Barricade	▨
• • •	Construction Zone Drums	• • •
Ⓐ	"NO U-TURN" Sign (R3-4)	Ⓐ
Ⓑ	"NO LEFT TURN" Sign (R3-2)	Ⓑ

MAXTIME TIMING CHART

FEATURE	PHASE 3	PHASE 6	PHASE 8
Walk *	–	–	–
Ped Clear *	–	–	–
Min Green	7	12	7
Passage *	2.0	2.0	2.0
Max 1 *	20	90	30
Yellow Change	3.0	4.4	4.0
Red Clear	2.6	1.9	1.3
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	–	–	–
Non Lock Detector	X	–	X
Vehicle Recall	–	MIN RECALL	–
Dual Entry	X	–	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (6A)	
Channel	1	
Phase	6	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

Signal Upgrade
Temporary Design 3 - TMP Phase III

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STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T. Moody
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Grimm

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-0611T3

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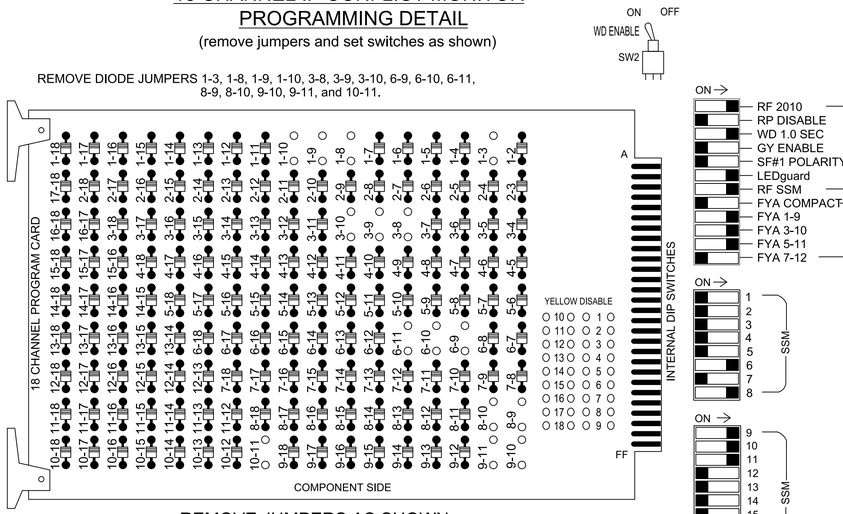
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 10.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-3, 1-8, 1-9, 1-10, 3-8, 3-9, 3-10, 6-9, 6-10, 6-11, 8-9, 8-10, 9-10, 9-11, and 10-11.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Return controller to Factory Defaults before programming per this electrical detail.
3. Program controller to start up in phase 2 Phase Not On and phase 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S4, S8, S11, AUX S1, AUX S2, AUX S4
Phases Used.....3, 6, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....NOT USED
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	OL7	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	32★	NU	NU	31★	NU	NU	NU	61	62	NU	NU	81,82 83	NU	32★	31★	NU	63★	NU	NU
RED								134	134			107					A114		
YELLOW	*			*				135	135										
GREEN									136										
RED ARROW														A121	A124				
YELLOW ARROW												108		A122	A125		A115		
FLASHING YELLOW ARROW														A123	A126		A116		
GREEN ARROW	127			118				136				109							

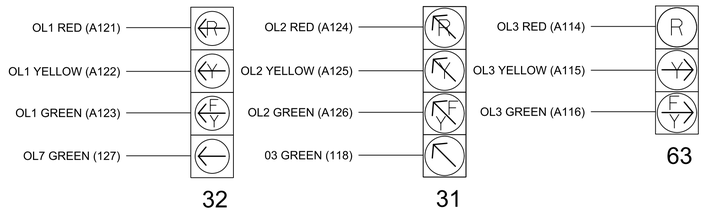
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

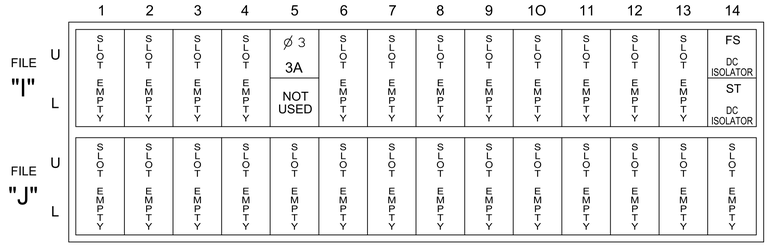
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
				-	30 ★	6			X		X	

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

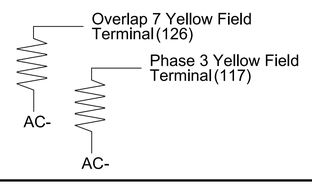
Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zone 3A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0611T3
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 1 of 2

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Electrical and Programming Details For:

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

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-0611T3

8/11/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig.10.2

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 31 and 32 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 1 →

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

NOTE: ALL RED FLASH

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

3A

Detector	Call Phase	Delay
7	3	0.0
30	0	-

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

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

← NOTICE: REMOVE INCLUDED PHASES FOR OL1 & OL2

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611T3
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 2 of 2

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Electrical and Programming Details For:

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

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

Division 10	Union County	Indian Trail
PLAN DATE: March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY: J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by: Trent Moody SIGNATURE 8/11/2026 DATE

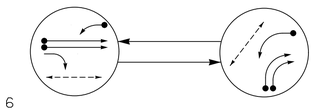
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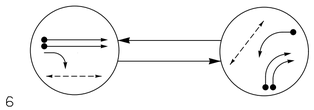
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 11.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

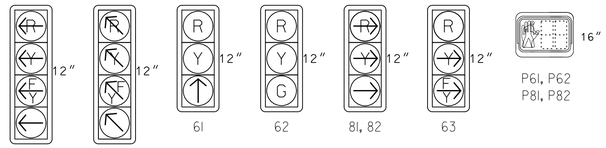
SIGNAL FACE	PHASE 6	PHASE 3+8	FLASH
31	~~R~~ Y	↖	~~R~~
32	~~R~~ Y	←	~~R~~
61	↑	R	R
62	G	R	R
63	~~R~~ Y	R	R
81, 82	~~R~~ →	→	~~R~~
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 6	PHASE 3+8	FLASH
31	~~R~~	↖	~~R~~
32	~~R~~	←	~~R~~
61	↑	R	R
62	G	R	R
63	~~R~~ Y	R	R
81, 82	~~R~~ →	→	~~R~~
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

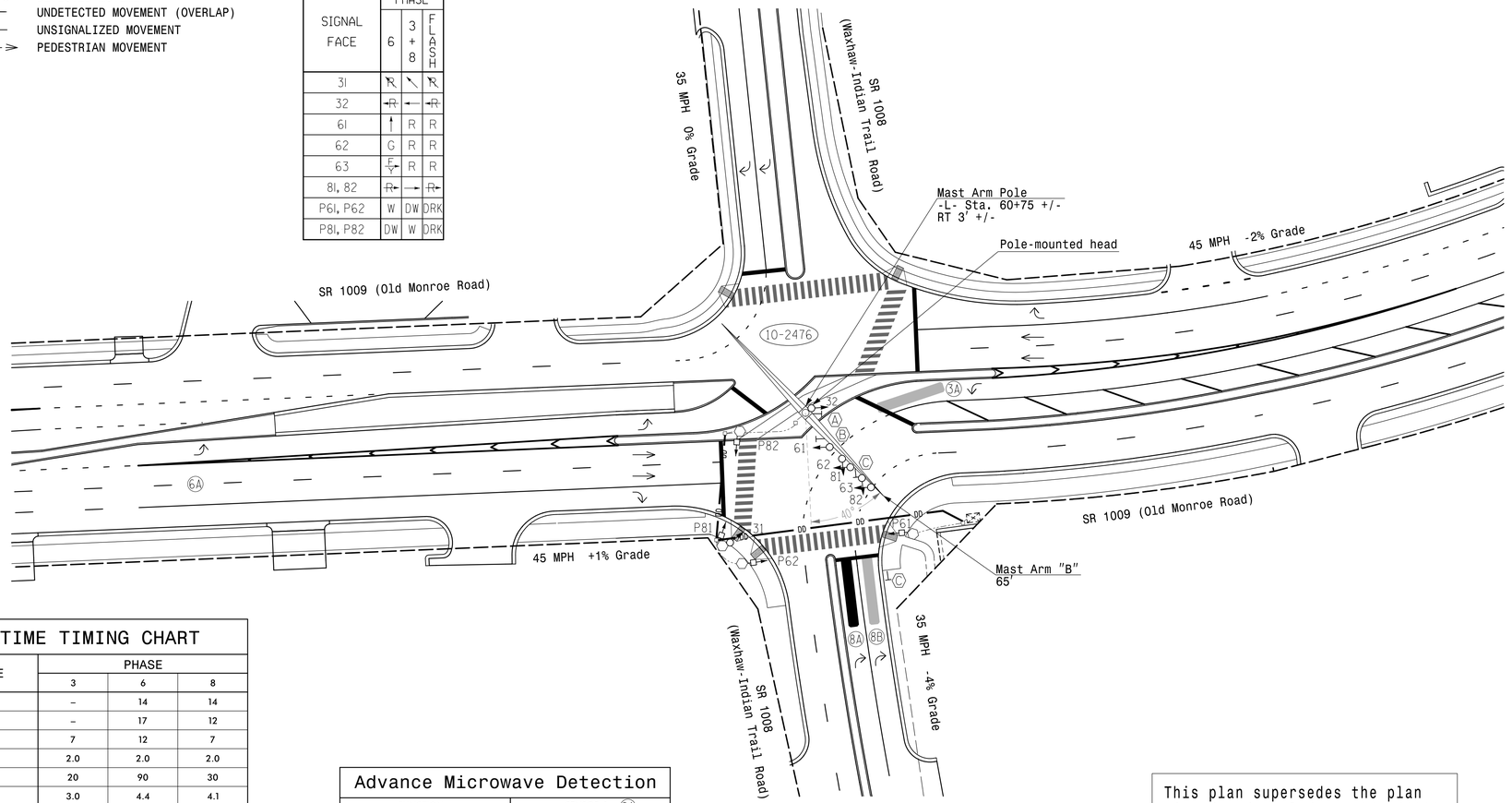
All Heads L.E.D.
See Note 3



MAXTIME DETECTOR INSTALLATION CHART

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

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing



MAXTIME TIMING CHART

FEATURE	PHASE 3	PHASE 6	PHASE 8
Walk *	–	14	14
Ped Clear *	–	17	12
Min Green	7	12	7
Passage *	2.0	2.0	2.0
Max 1 *	20	90	30
Yellow Change	3.0	4.4	4.1
Red Clear	2.9	1.7	1.6
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	–	7	7
Non Lock Detector	X	–	X
Vehicle Recall	–	MIN RECALL	–
Dual Entry	X	–	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 – (6A)	
Channel	1	
Phase	6	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 – 600	100 – 150
Enable Speed	Y	Y
Speed Range (mph)	35 – 100	1 – 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 – 6.5	–

2 Phase Fully Actuated w/ Alternate Phasing D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.
11. Renumber existing detection zone 8A to 8B.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
◎	Metal Strain Pole	◘
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◪
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
— DD —	Directional Drill	N/A
N/A	Right of Way	— — — —
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
(A)	"NO U-TURN" Sign (R3-4)	(A)
(B)	"NO LEFT TURN" Sign (R3-2)	(B)
(C)	"NO TURN ON RED" Sign (R10-11a)	(C)

This plan supersedes the plan signed and sealed on 08/11/2026.

Signal Upgrade - Final Design

stv
STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) EB at SR 1008 (Waxhaw-Indian Trail Road)
Division 10 Union County Indian Trail

PLAN DATE: October 2026 REVIEWED BY: T. Moody
PREPARED BY: G. Whitehouse REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody 10/15/2026
SIGNATURE DATE
SIG. INVENTORY NO. 10-0611

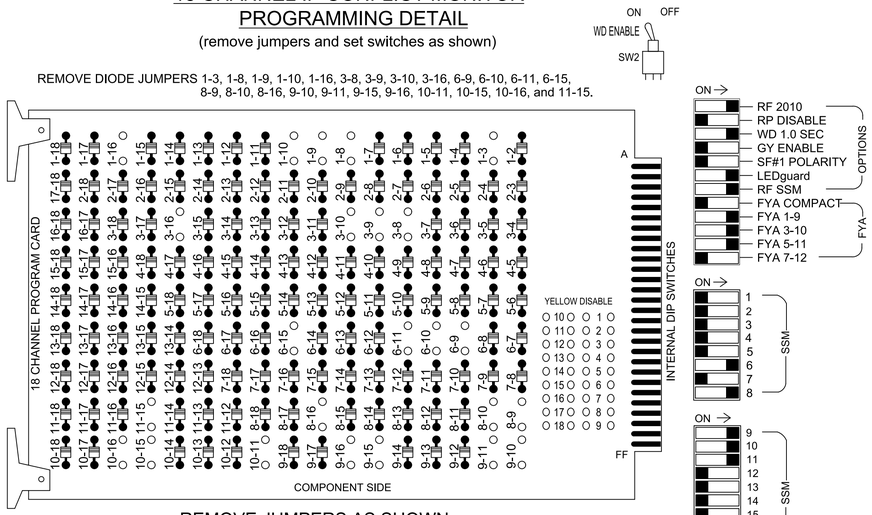
10/14/2026
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Leonard Gaskins

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U-4714BA	Sig. 11.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Phase Not On and phase 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S4, S8, S9, S11, S12, AUX S1, AUX S2, AUX S4
Phases Used.....3, 6, 6PED, 8, 8PED
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....NOT USED
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	OL7	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	32★	NU	NU	31★	NU	NU	NU	61	62	P61, P62	NU	81,82	P81, P82	32★	31★	NU	63★	NU	NU
RED								134	134								A114		
YELLOW	*			*				135	135										
GREEN									136										
RED ARROW												107		A121	A124				
YELLOW ARROW												108		A122	A125		A115		
FLASHING YELLOW ARROW														A123	A126		A116		
GREEN ARROW	127			118				136				109							
✋										119			110						
🚶										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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 6 PED DC ISOLATOR	FS DC ISOLATOR
	L					NOT USED								Ø 8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7★	3	15.0		X		X	
				-	30★	6			X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 3						

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For Zone 3A, inputs associated with the typical slots for an NCDOT installation are compatible with time of day instructions located on Sheet 2 of this electrical detail.

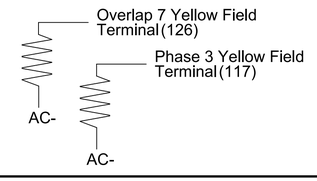
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

This plan supersedes the plan signed and sealed on 08/11/2026.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611
DESIGNED: October 2026
SEALED: 10/15/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Signal Upgrade
Electrical Detail - Sheet 1 of 2

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Electrical and Programming Details For:

Prepared for the Offices of:
Traffic Engineering Branch
Traffic Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	October 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody 10/15/2026
SIGNATURE DATE
SIG. INVENTORY NO. 10-0611

10/14/2026
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U-4714BA	Sig.11.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 1 →

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

↑ ↑
NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 31 and 32 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

3A

Detector	Call Phase	Delay
7	3	0.0
30	0	-

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

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

← NOTICE: REMOVE INCLUDED PHASES FOR OL1 & OL2

This plan supersedes the plan signed and sealed on 08/11/2026.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-0611
DESIGNED: October 2026
SEALED: 10/15/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Signal Upgrade
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:
Traffic Engineering Branch
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	October 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 10/15/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-0611

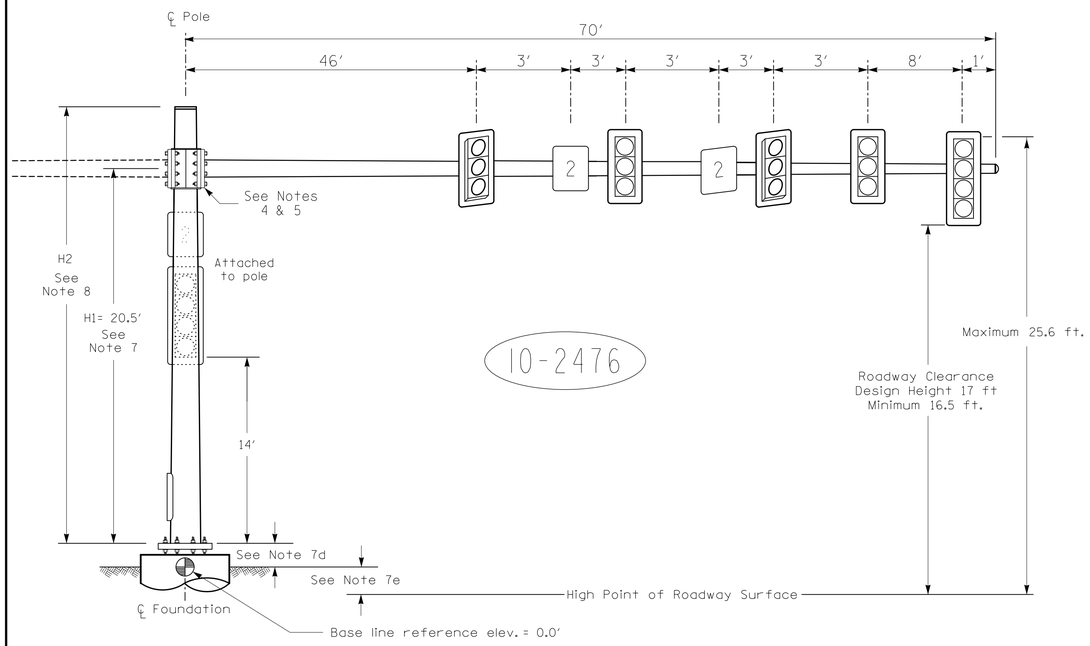
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METAL POLE No. 1

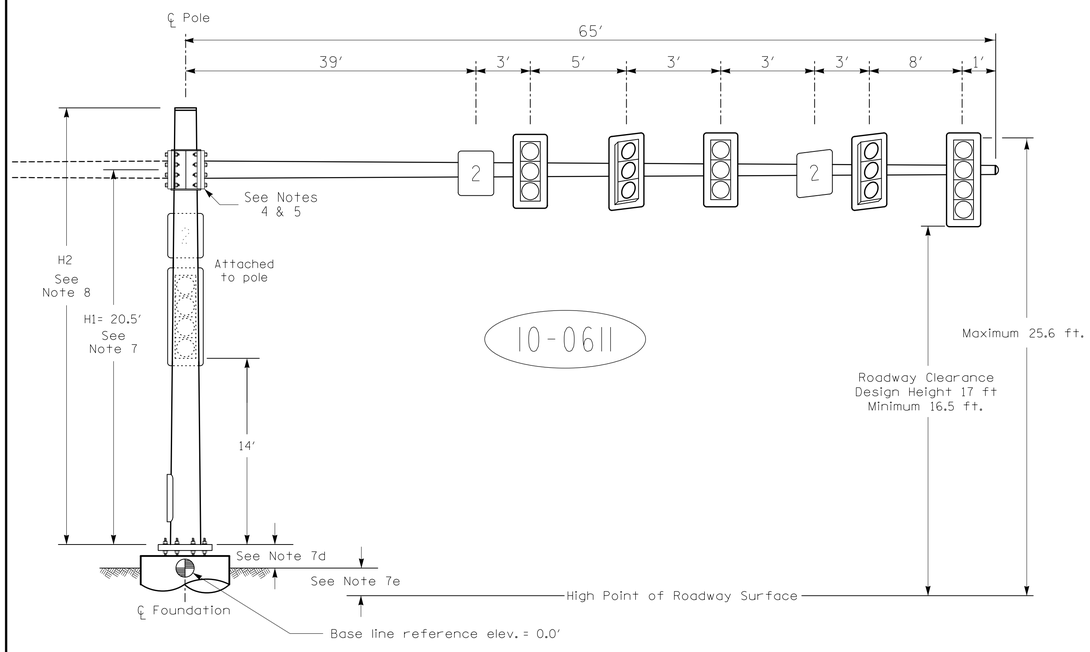
PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 11.3

Design Loading for METAL POLE NO. 1 MAST ARM A



Elevation View @ 320°

Design Loading for METAL POLE NO. 1 MAST ARM B



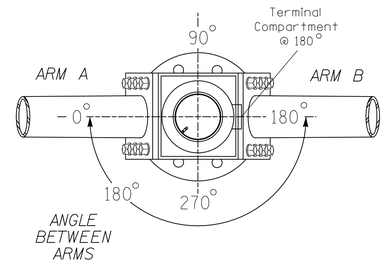
Elevation View @ 140°

SPECIAL NOTE

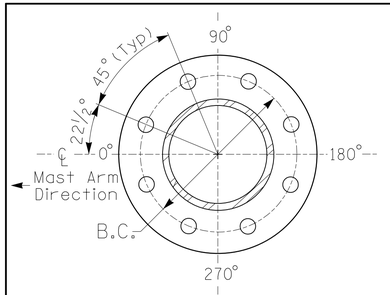
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ⊕ ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.24 ft.	+1.94 ft.
Elevation difference at Edge of travelway or face of curb	-0.23 ft.	+0.17 ft.

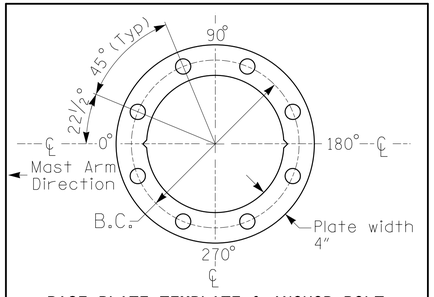


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
▯	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″W X 66.0″L	74 LBS
▯	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

NOTE: All metal poles and mast arms should have black protective coating as specified in the Project Special Provisions. The selected shade BLACK #27038 must be verified and approved by the Engineer and Municipality.

NCDOT Wind Zone 5 (110 mph)

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1009 (Old Monroe Road) EB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE: October 2026 | REVIEWED BY: T. Moody

PREPARED BY: R.L. Aristondo | REVIEWED BY: A. Wiseman

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 040329
ENGINEER
TRENT M. MOODY

DocuSigned by: Trent Moody 10/15/2026
SIGNATURE DATE

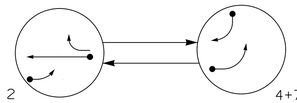
SIG. INVENTORY NO. 10-0611

10/14/2026
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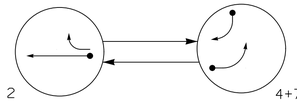
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U-4714BA	Sig. 12.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

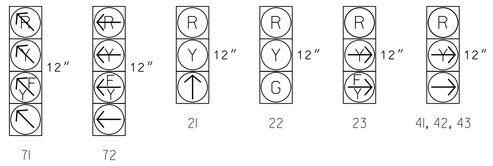
SIGNAL FACE	PHASE 2	PHASE 4+7	PHASE FLASH
21	↑	R	R
22	G	R	R
23	F Y →	R	R
41, 42, 43	R	→	R
71	F Y ↖	↖	R
72	F Y ←	←	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	PHASE 4+7	PHASE FLASH
21	↑	R	R
22	G	R	R
23	F Y →	R	R
41, 42, 43	R	→	R
71	R	↖	R
72	R	←	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

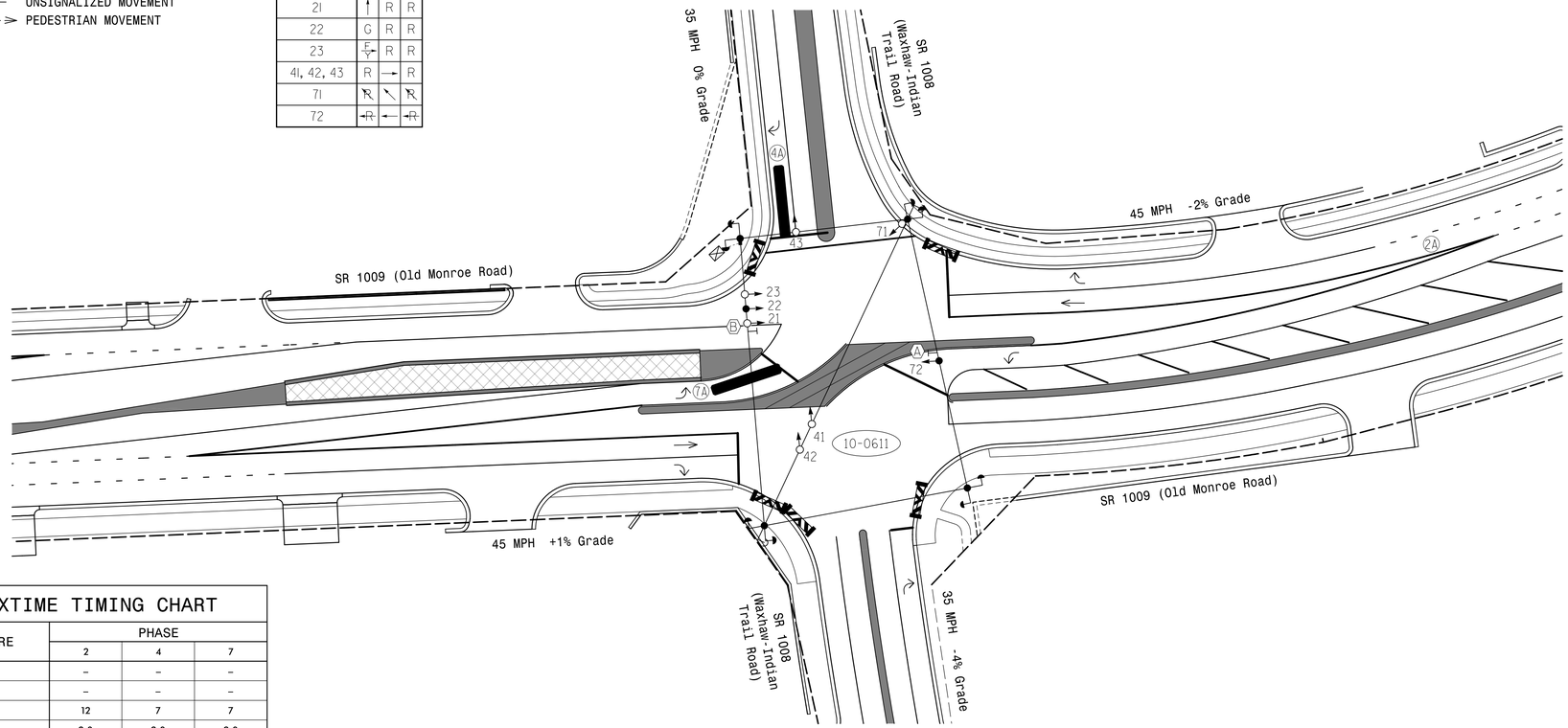
DETECTOR					PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
4A	✳	0	✳	✳	4	15.0	-	X	-	X	-	✳
7A	✳	0	✳	✳	7	15.0**	-	X	-	X	-	✳
					2#	-	-	X	-	X	-	✳

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing

2 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

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. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The Division Traffic Engineer will determine the hours of use for each phasing plan.
6. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Renumber existing signal head 11 to 72.
9. Reposition existing signal heads 22 and 72.



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 7
Walk *	–	–	–
Ped Clear *	–	–	–
Min Green	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	30	20
Yellow Change	4.7	3.8	3.0
Red Clear	1.6	1.1	2.6
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	–	–	–
Non Lock Detector	–	X	X
Vehicle Recall	MIN RECALL	–	–
Dual Entry	–	X	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 - (2A)	
Channel	1	
Phase	2	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 - 600	100 - 150
Enable Speed	Y	Y
Speed Range (mph)	35 - 100	1 - 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 - 6.5	-

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	- - - -
→	Directional Arrow	→
▬	Construction Zone	N/A
▨	Construction Barricade	▨
• • •	Construction Zone Drums	• • •
Ⓐ	"NO U-TURN" Sign (R3-4)	Ⓐ
Ⓑ	"NO LEFT TURN" Sign (R3-2)	Ⓑ

New Installation
Temporary Design - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T. Moody
PREPARED BY:	A. Wiseman	REVIEWED BY:	J. Grimm

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE
SIG. INVENTORY NO. 10-2476T

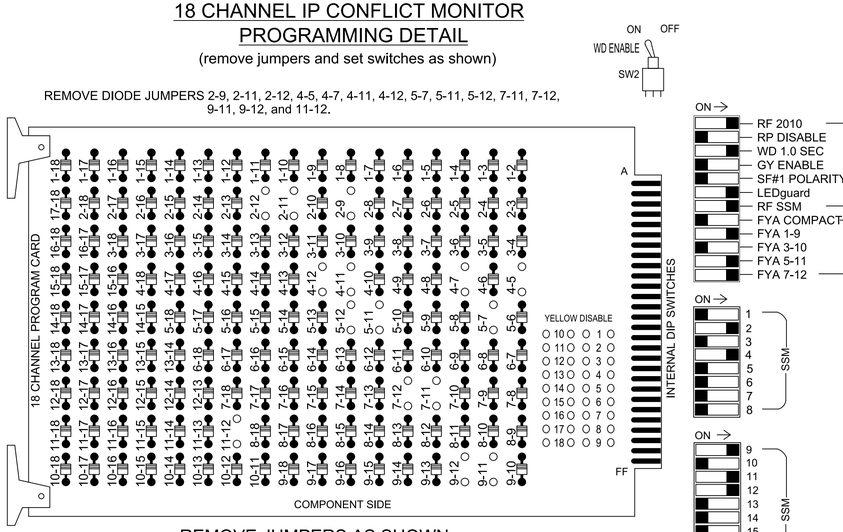
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 12.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and phase 6 Phast Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S5, S7, S10, AUX S1, AUX S4, AUX S5
Phases Used.....2, 4, 7
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2		13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2		2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	41, 42,43	NU	72★	NU	NU	71★	NU	NU	23★	NU	NU	72★	71★	NU
RED		128	128			101								A121					
YELLOW		129	129					*			*								
GREEN			130																
RED ARROW																	A114	A101	
YELLOW ARROW						102								A122			A115	A102	
FLASHING YELLOW ARROW														A123			A116	A103	
GREEN ARROW		130				103		133			124								

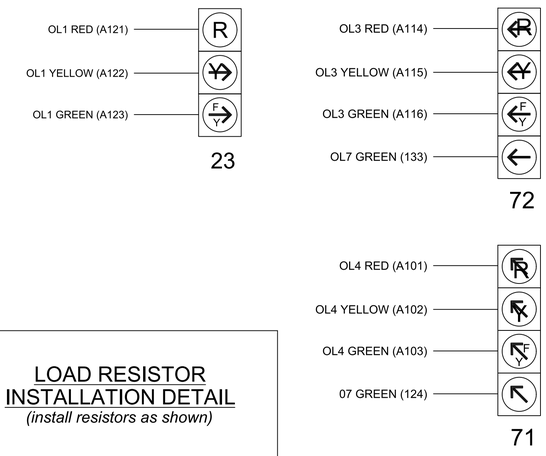
NU = Not Used

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

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	2			X		X	X

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 7A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

Web Interface
Home >Controller >Unit

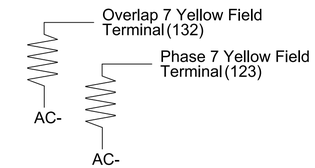
Modify parameters as shown below and save changes.

Start Up Parameters	
StartUp Clearance Hold	
6	

Unit Flash Parameters	
All Red Flash Exit Time	
6	

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2476T
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design - TMP Phase III
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 Union County Indian Trail

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

Prepared for the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

SIG. INVENTORY NO. 10-2476T

8/11/2026
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U-4714BA	Sig. 12.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 5 →

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

NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

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

← NOTICE: REMOVE INCLUDED PHASES FOR OL3 & OL4

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

7A

Detector	Call Phase	Delay
21	7	0.0
32	0	-

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2476T
DESIGNED: March 2026
SEALED: 8/11/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Temporary Design - TMP Phase III
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

Prepared for the Offices of:
Traffic Engineering Branch, Traffic Signal & Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

PLAN DATE:	March 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 8/11/2026
SIGNATURE DATE

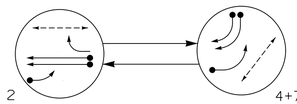
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8/11/2026
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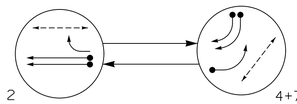
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U-4714BA	Sig. 13.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

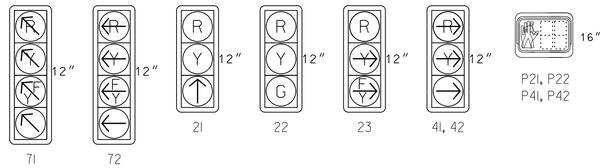
SIGNAL FACE	PHASE 2	PHASE 4+7	FLASH
21	↑	R	R
22	G	R	R
23	F Y	R	R
41, 42	R	→	R
71	Y R	↖	R
72	F Y	←	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 2	PHASE 4+7	FLASH
21	↑	R	R
22	G	R	R
23	F Y	R	R
41, 42	R	→	R
71	R	↖	R
72	R	←	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK

SIGNAL FACE I.D.

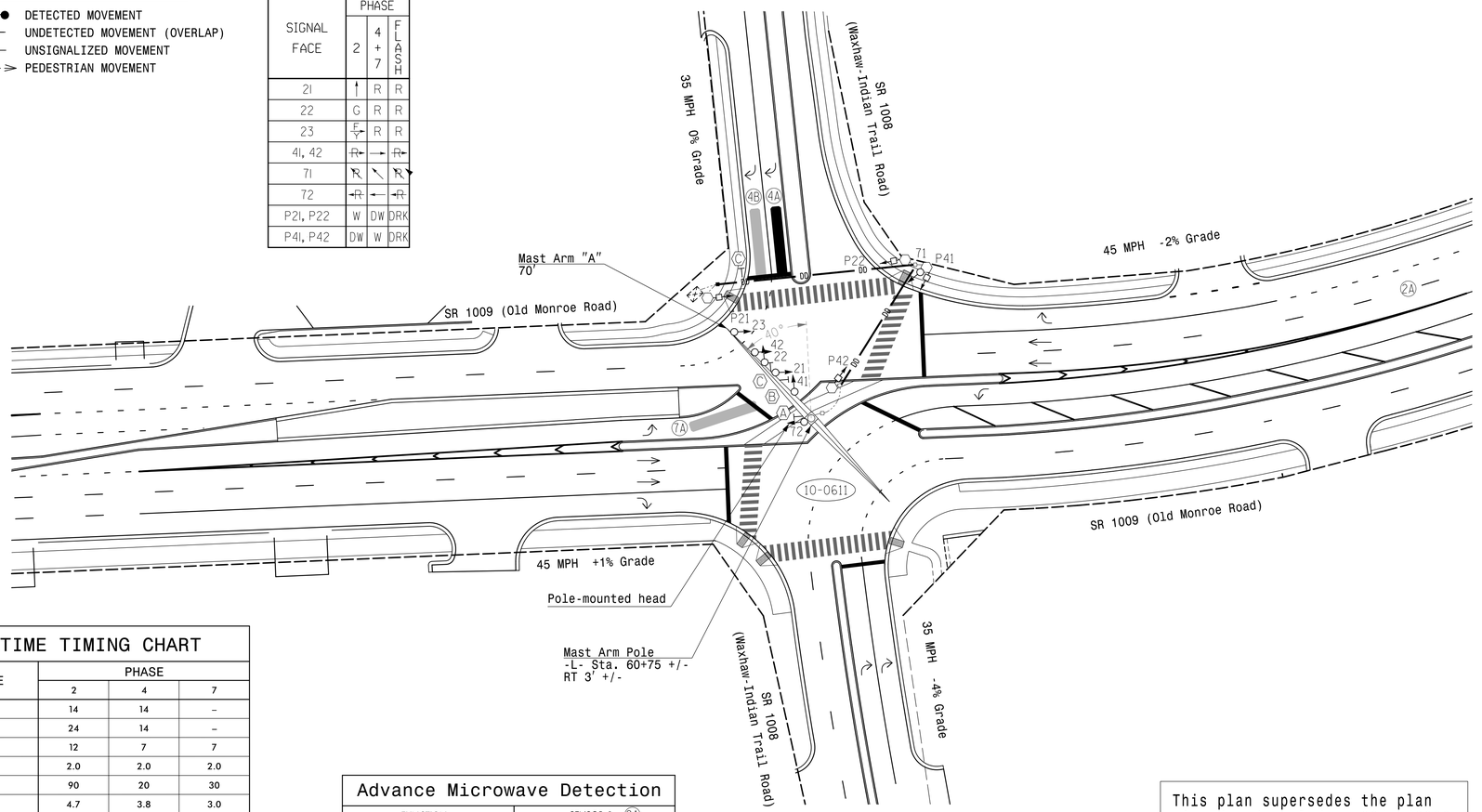
All Heads L.E.D.
See Note 3



MAXTIME DETECTOR INSTALLATION CHART

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

✳ Multi-zone Microwave Detection Zone
** Disable Delay During Alternate Phasing
# Disable Phase Call for Loop During Alternate Phasing



MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 7
Walk *	14	14	–
Ped Clear *	24	14	–
Min Green	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	20	30
Yellow Change	4.7	3.8	3.0
Red Clear	1.6	1.3	2.4
Red Revert	2.0	2.0	2.0
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	–	–	–
Time To Reduce *	–	–	–
Minimum Gap	–	–	–
Advance Walk	7	7	–
Non Lock Detector	–	X	X
Vehicle Recall	MIN RECALL	–	–
Dual Entry	–	X	X

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

Advance Microwave Detection

FUNCTION	SENSOR 1 - (2A)	
Channel	1	
Phase	2	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	N/A
Detection Zone (ft)	100 - 600	100 - 150
Enable Speed	Y	Y
Speed Range (mph)	35 - 100	1 - 35
Enable Estimated Time of Arrival	Y	N
Estimated Time of Arrival (sec)	2.5 - 6.5	-

2 Phase
Fully Actuated
w/ Alternate Phasing
D10-59_Indian Trail

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. Install backplates with retro-reflective sheeting on all signal heads.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestal mounted signal heads shall be mounted a minimum of 8' above the high point of the roadway surface elevation.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
◙	Metal Strain Pole	◘
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
▬	Non-Intrusive Detection Zone	▬
N/A	Curb Ramp	◢
⊠	Controller & Cabinet	⊡
□	Junction Box	■
-----	2-in Underground Conduit	-----
—DD—	Directional Drill	N/A
N/A	Right of Way	-----
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO U-TURN" Sign (R3-4)	Ⓐ
Ⓑ	"NO LEFT TURN" Sign (R3-2)	Ⓑ
Ⓒ	"NO TURN ON RED" Sign (R10-11a)	Ⓒ

This plan supersedes the plan signed and sealed on 08/11/2026.

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Prepared for the Offices of:
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE: October 2026 | REVIEWED BY: T. Moody
PREPARED BY: G. Whitehouse | REVIEWED BY: A. Wiseman

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY
DocuSigned by: Trent Moody 10/15/2026
ENGINEERING SEAL DATE

SIG. INVENTORY NO. 10-2476

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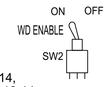
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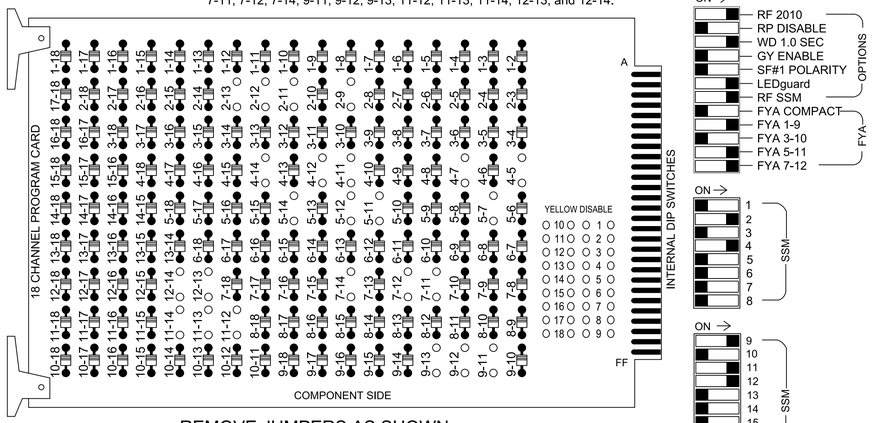
PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 13.1

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-9, 2-11, 2-12, 2-13, 4-5, 4-7, 4-11, 4-12, 4-14, 5-7, 5-11, 5-12, 5-14, 7-11, 7-12, 7-14, 9-11, 9-12, 9-13, 11-12, 11-13, 11-14, 12-13, and 12-14.



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.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and phase 6 Phase Not On.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D10-59_Indian Trail Signal System.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S3, S5, S6, S7, S10, AUX S1, AUX S4, AUX S5
Phases Used.....2, 2PED, 4, 4PED, 7
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....*
Overlap "5".....NOT USED
Overlap "6".....NOT USED
Overlap "7".....*

*See overlap programming detail on sheet 2

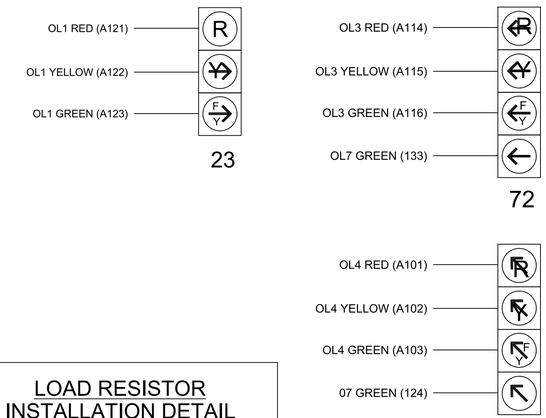
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2		13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2		2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	P21, P22	NU	41, 42	P41, P42	72★	NU	NU	71★	NU	NU	23★	NU	NU	72★	71★	NU
RED		128	128											A121					
YELLOW		129	129					*			*								
GREEN			130																
RED ARROW						101											A114	A101	
YELLOW ARROW						102								A122			A115	A102	
FLASHING YELLOW ARROW														A123			A116	A103	
GREEN ARROW		130				103		133			124								
✋				113			104												
🚶				115			106												

NU = Not Used
*Denotes install load resistor. See load resistor installation detail this sheet.
★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
	L												Ø 4 PED DC ISOLATOR		ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L					NOT USED									

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21★	7	15.0		X		X	
				-	32★	2			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multizone 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.

For zone 7A, inputs associated with typical detector slot for an NCDOT installation is compatible with time of day instructions located on sheet 2 of the electrical detail.

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.

MAXTIME STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Unit

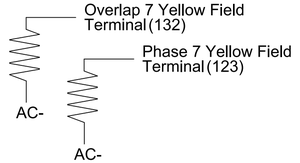
Web Interface
Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters	Unit Flash Parameters
StartUp Clearance Hold	All Red Flash Exit Time
6	6

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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

This plan supersedes the plan signed and sealed on 08/11/2026.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2476
DESIGNED: October 2026
SEALED: 10/15/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE:	October 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 040329 ENGINEER TRENT M. MOODY

DocuSigned by: Trent Moody 10/15/2026
DATE

SIG. INVENTORY NO. 10-2476

10/14/2026
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PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 13.2

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 5 →

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

NOTE: ALL RED FLASH

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

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

← NOTICE: REMOVE INCLUDED PHASES FOR OL3 & OL4

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

7A

Detector	Call Phase	Delay
21	7	0.0
32	0	-

This plan supersedes the plan signed and sealed on 08/11/2026.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2476
DESIGNED: October 2026
SEALED: 10/15/2026
REVISED:

STV Engineers, Inc.
2151 Hawkins Street, Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Prepared for the Offices of: Transportation Mobility and Safety Division, Traffic Engineering Branch, Traffic Signal Management Section, North Carolina Department of Transportation

750 N. Greenfield Pkwy, Garner, NC 27529

Division 10 | Union County | Indian Trail

PLAN DATE:	October 2026	REVIEWED BY:	T.M. Moody
PREPARED BY:	J.C. Grimm	REVIEWED BY:	A.M. Wiseman

REVISIONS	INIT.	DATE

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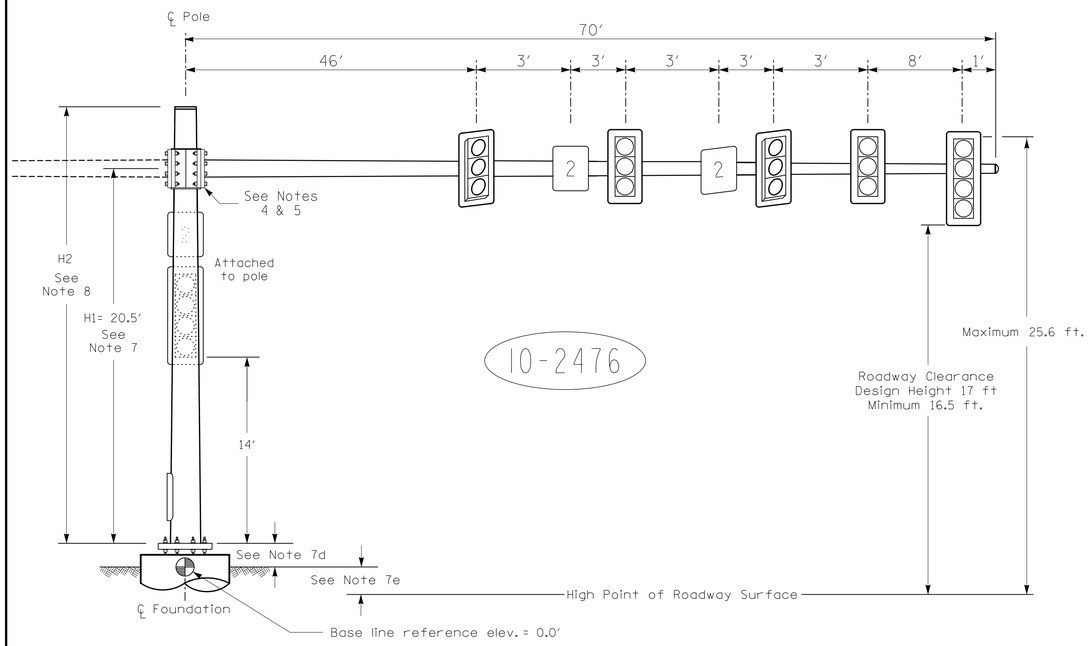
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METAL POLE No. 1

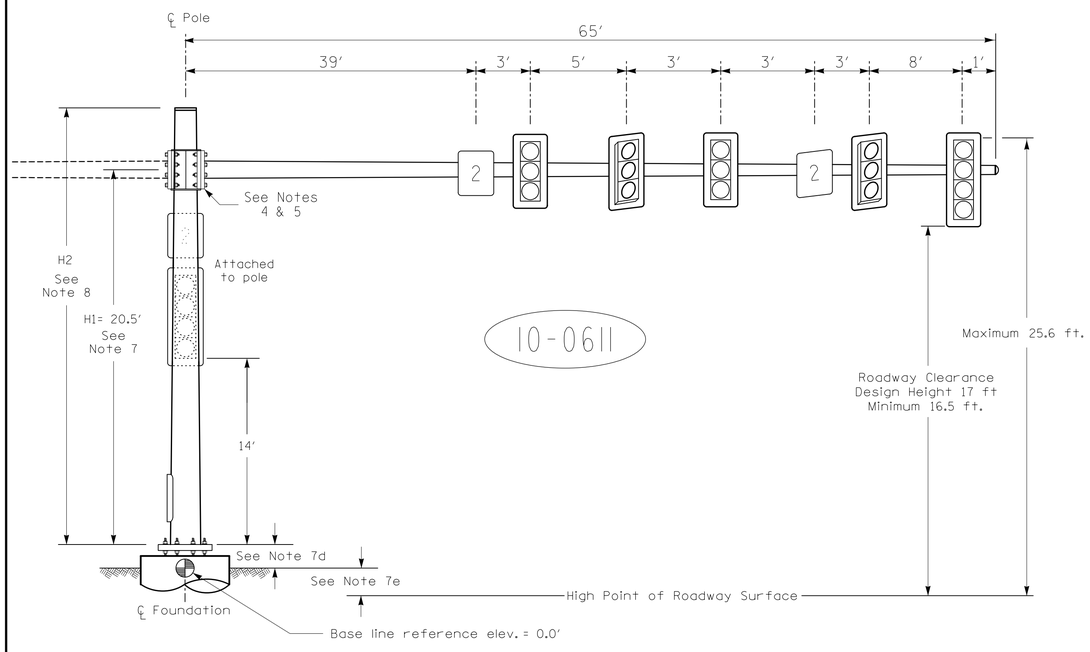
PROJECT REFERENCE NO.	SHEET NO.
U-4714BA	Sig. 13.3

Design Loading for METAL POLE NO. 1 MAST ARM A



Elevation View @ 320°

Design Loading for METAL POLE NO. 1 MAST ARM B



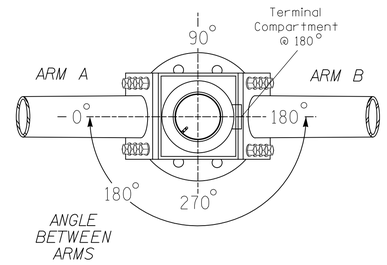
Elevation View @ 140°

SPECIAL NOTE

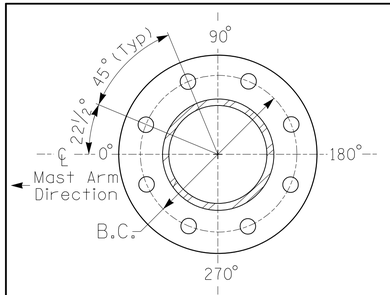
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ⊕ ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.24 ft.	+1.94 ft.
Elevation difference at Edge of travelway or face of curb	-0.23 ft.	+0.17 ft.

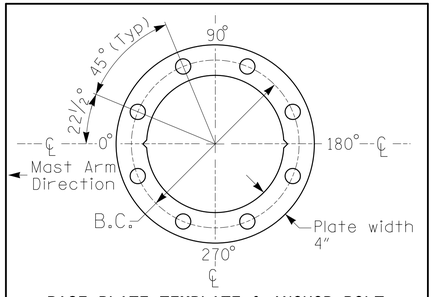


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

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

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

NOTE: All metal poles and mast arms should have black protective coating as specified in the Project Special Provisions. The selected shade BLACK #27038 must be verified and approved by the Engineer and Municipality.

NCDOT Wind Zone 5 (110 mph)

STV Engineers, Inc.
2151 Hawkins St., Suite 1400
Charlotte, NC 28203
(704) 372-1885
NC License Number F-0991

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

SR 1009 (Old Monroe Road) WB
at
SR 1008
(Waxhaw-Indian Trail Road)

Division 10 | Union County | Indian Trail

PLAN DATE: October 2026 | REVIEWED BY: T. Moody

PREPARED BY: R.L. Aristondo | REVIEWED BY: A. Wiseman

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

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