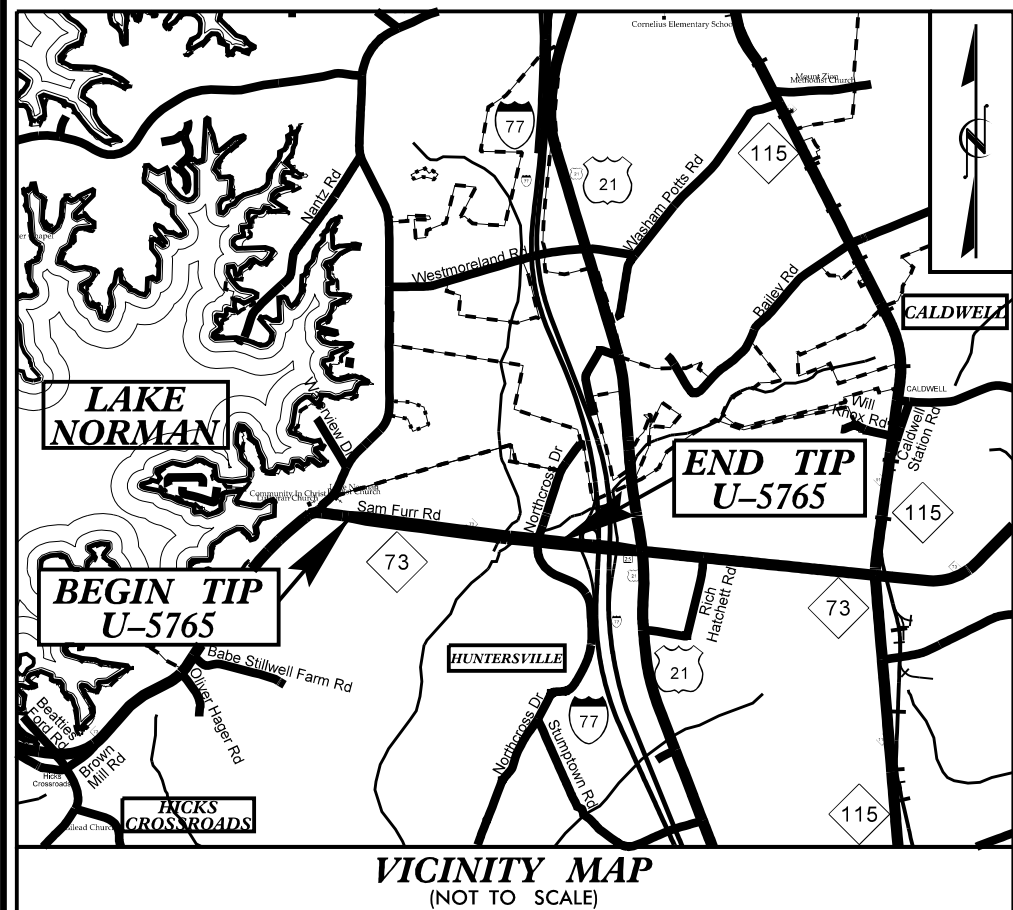


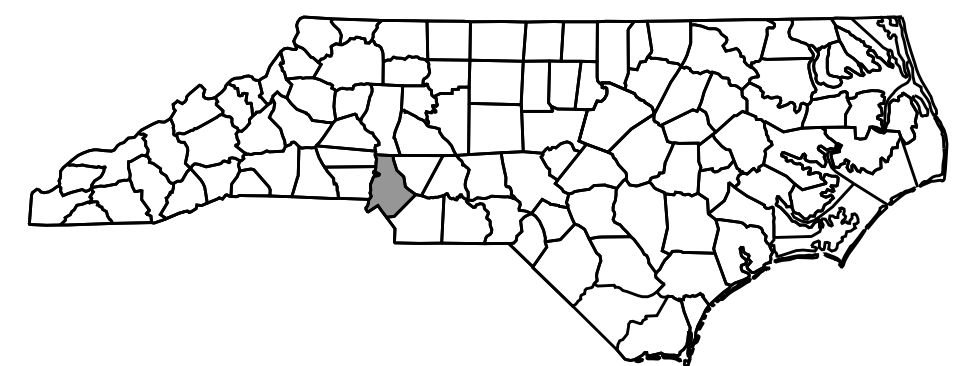


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

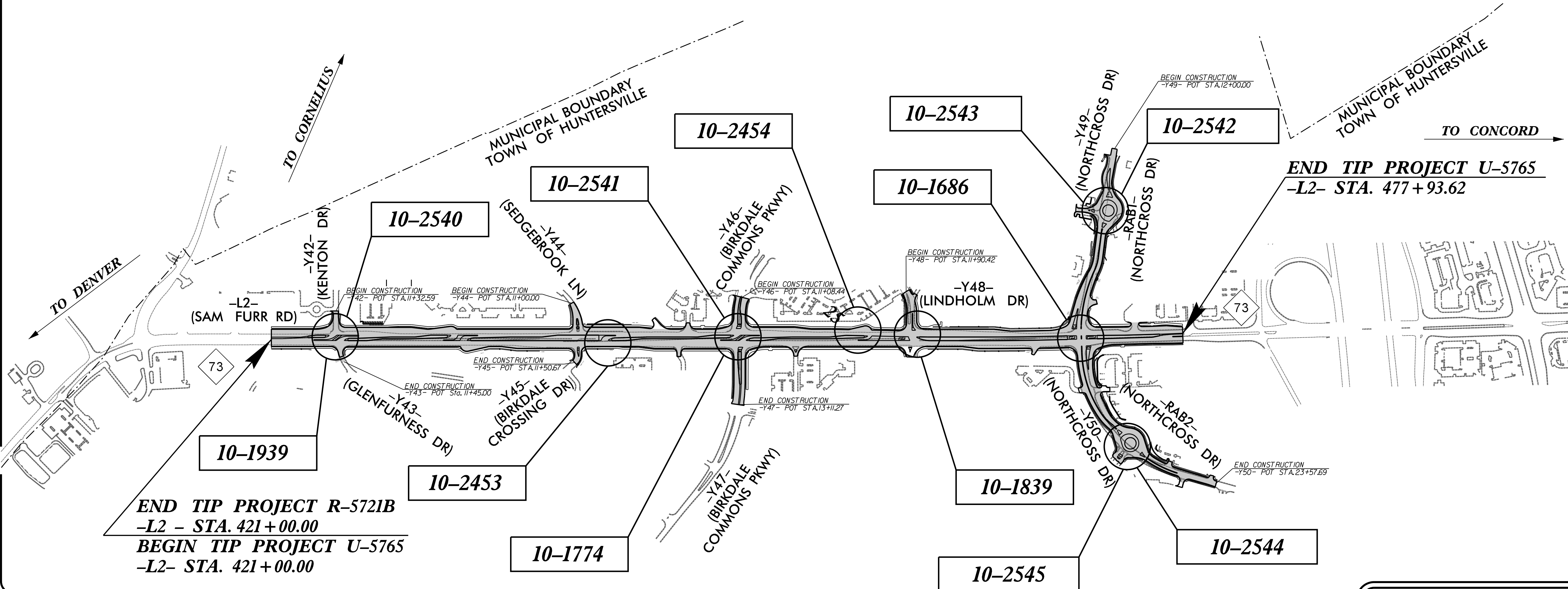
MECKLENBURG COUNTY

**LOCATION: NC 73 – SR 5544 (WEST CATAWBA AVENUE) TO
SR 2316 (NORTHCROSS DRIVE)**

**TYPE OF WORK: TRAFFIC SIGNAL PLANS AND
TRAFFIC SIGNAL COMMUNICATION PLANS**



TIP PROJECT: U-5765



END TIP PROJECT R-5721B
-L2 – STA. 421+00.00
BEGIN TIP PROJECT U-5765
-L2- STA. 421+00.00

INDEX OF PLANS

Sheet Number	SIN	Location /Description
Sig 1.0	-	Title Sheet
Sig 2.0-6.2, 8.0-8.5	10-1939	NC 73 at Glenfurness Dr
Sig 7.0-7.2, 9.0-9.5	10-2540	NC 73 at Kenton Dr
Sig 10.0-10.2	10-2453	NC 73 U-Turn East of Sedgebrook Ln
Sig 11.0-14.2, 16.0-16.5	10-1774	NC 73 EB at Birkdale Commons Pkwy
Sig 15.0-15.2, 17.0-17.5	10-2541	NC 73 WB at Birkdale Commons Pkwy
Sig 18.0-18.2	10-2454	NC 73 U-Turn West of Lindholm Dr
Sig 19.0-25.4	10-1839	NC 73 at Lindholm Dr
Sig 26.0-31.4	10-1686	NC 73 at Northcross Dr
Sig 32.0-32.2	10-2542	Pedestrian Hybrid Beacon #1
Sig 33.0-33.2	10-2543	Pedestrian Hybrid Beacon #2
Sig 34.0-32.4	10-2544	Pedestrian Hybrid Beacon #3
Sig 35.0-35.2	10-2545	Pedestrian Hybrid Beacon #4
SCP 1-12	-	Signal Communication Plans
SCP 13-14	-	Temporary Signal Communication Plans

PLAN PREPARED BY:

Karl Hector P.E., PTOE – Traffic Signal Engineer

**INTELLIGENT TRANSPORTATION
AND SIGNALS UNIT**

Matthew F Cowhig, PE. – Signal Project Engineer

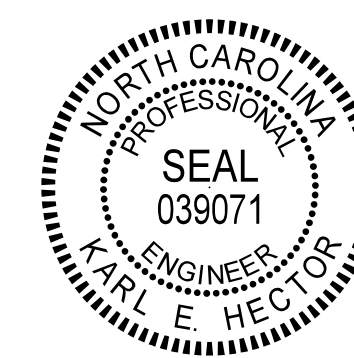
Keith Mims, P.E. – State Signal Equipment Engineer

Ryan W. Hough, PE– State ITS Engineer

Heidi Berggren – Signal System Design Engineer

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, NC 27601
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**TRAFFIC SIGNAL
ENGINEER**



7/10/2026

SIGNATURE:

P.E.

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

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



750 N. Greenfield Parkway, Garner, NC 27529

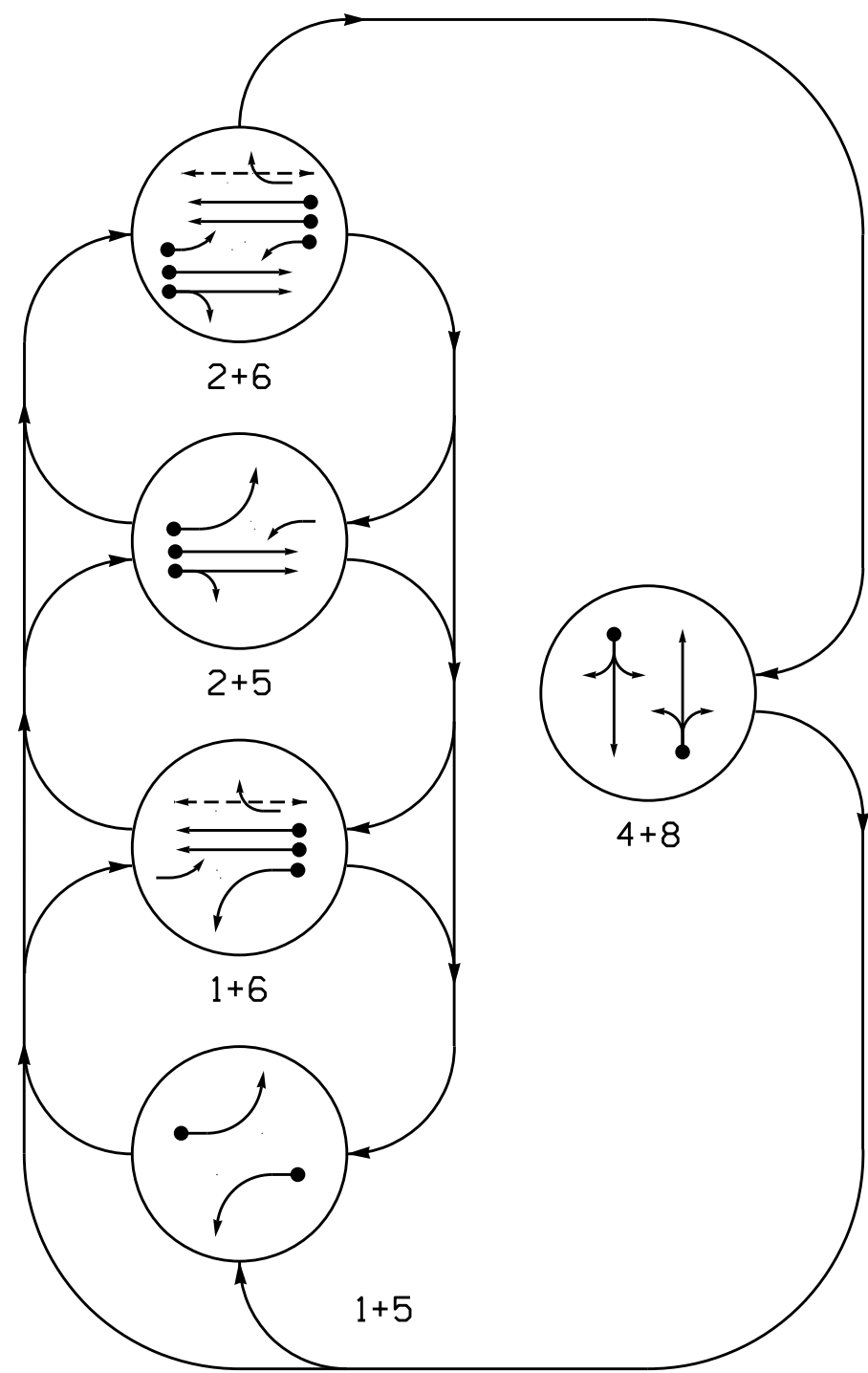
CONTRACT:

5 Phase Fully Actuated w/ Alternate Phasing Operation Signal System #: D10-43_Huntersville

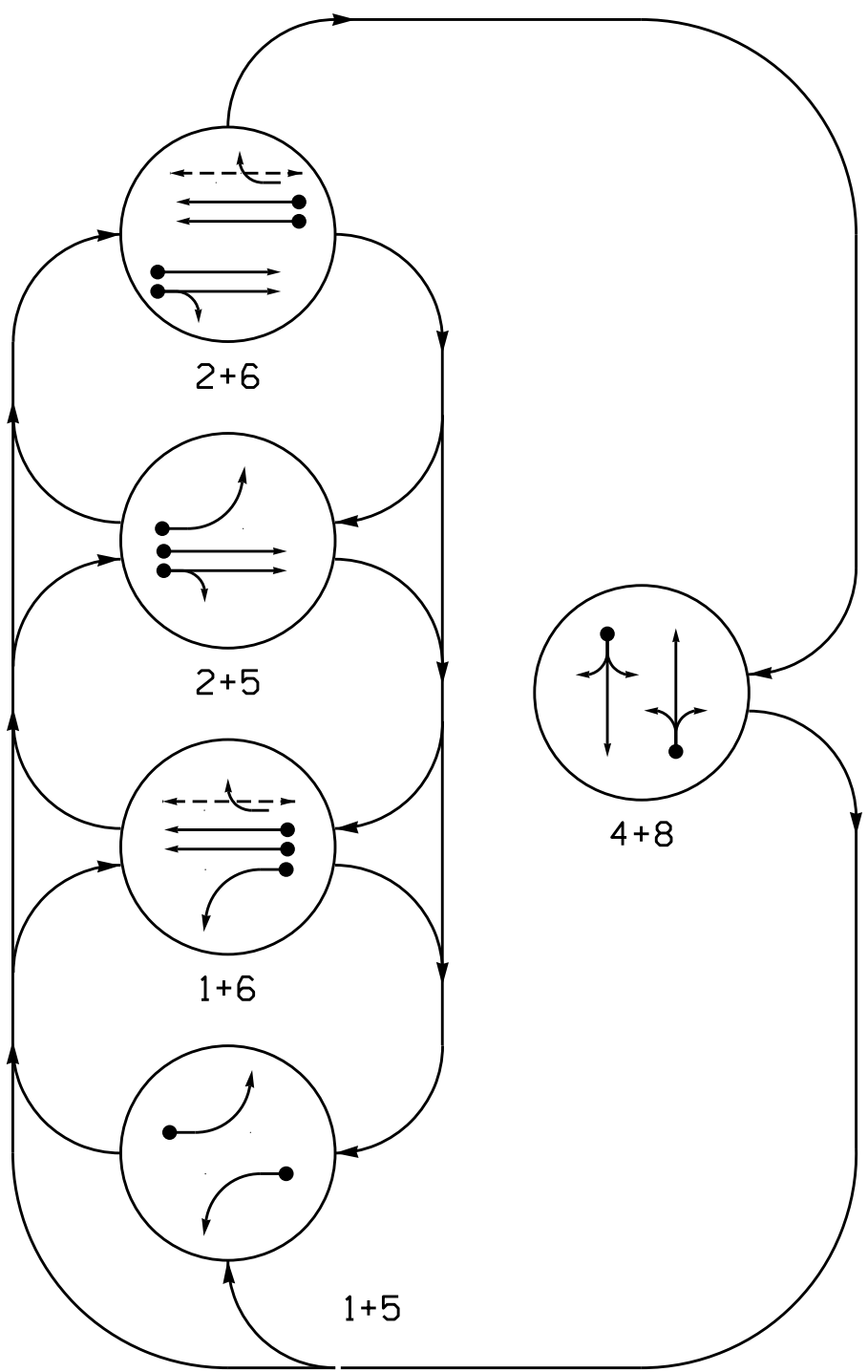
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See traffic control plans for stop line and crosswalk placement.

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASE		TABLE OF OPERATION					
SIGNAL FACE		PHASE					
		1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F
11							
21,22	R	R	G	G	R	R	
41,42	R	R	R	R	G	R	
51							
61,62	R	G	R	G	R	R	
63	R						
81,82,83	R	R	R	R	G	R	
P61,P62	DW	W	DW	W	DW	DRK	

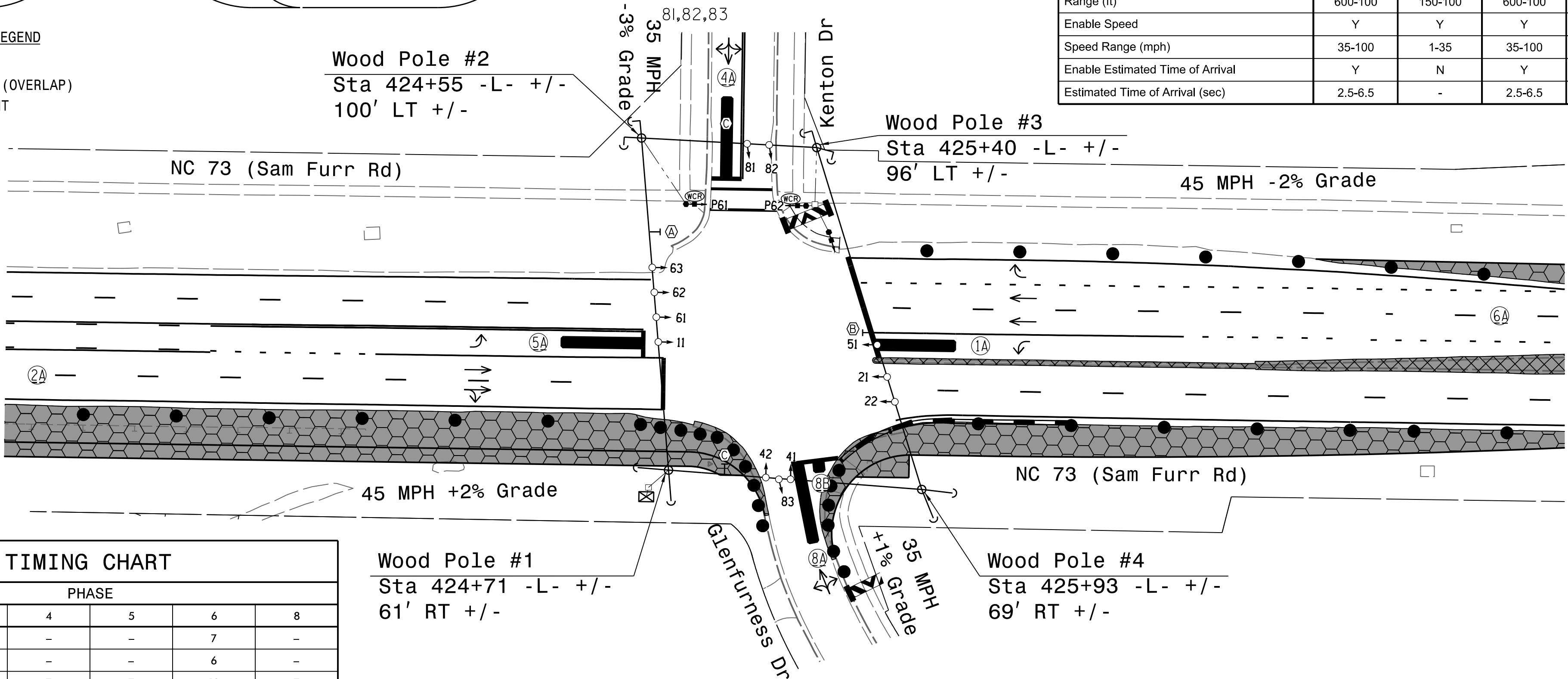
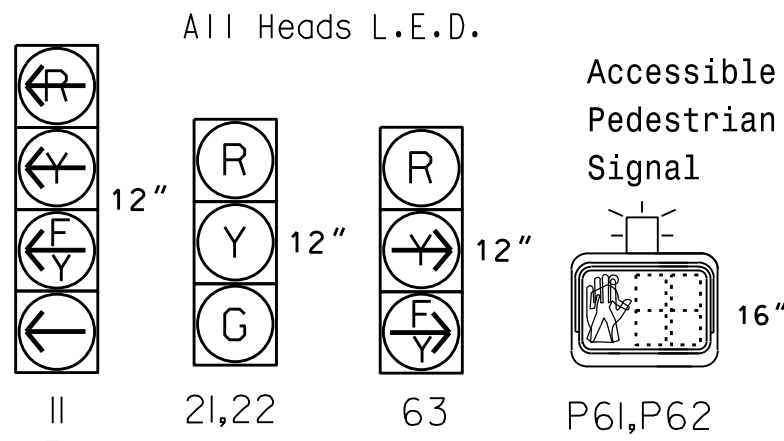
ALTERNATE PHASE		TABLE OF OPERATION					
SIGNAL FACE		PHASE					
		1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F
11							
21,22	R	R	G	G	R	R	
41,42	R	R	R	R	G	R	
51							
61,62	R	G	R	G	R	R	
63	R						
81,82,83	R	R	R	R	G	R	
P61,P62	DW	W	DW	W	DW	DRK	

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL	CALL	NEW CARD
1A	*	*	*	X	1	15.0**	-	X	-	X	*
2A	*	*	*	X	2	-	-	X	-	X	*
4A	*	*	*	X	4	-	-	X	-	X	*
5A	*	*	*	X	5	15.0**	-	X	-	X	*
6A	*	*	*	X	6	-	-	X	-	X	*
8A	*	*	*	X	8	10.0	-	X	-	X	*
8B	*	*	*	X	8	15.0	-	X	-	X	*

* Multi-zone Microwave Detection.
** Reduce Delay to 3 Seconds During Alternative Phasing Operation.
Disable Delay During Alternate Phasing Operation.

Microwave Detection System				
FUNCTION	Sensor 1 (2A)	Sensor 2 (6A)		
Channel	1	2		
Phase	2	6		
Direction of Travel	EB	WB		
Type	Priority	Priority		
Level	2	2	QUEUE	QUEUE
Discovery Zone (ft)	<750	<750	-	-
Range (ft)	600-100	150-100	600-100	150-100
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	-

SIGNAL FACE I.D.



MAXTIME TIMING CHART							
FEATURE	PHASE						
	1	2	4	5	6	8	
Walk *	-	-	-	-	7	-	
Ped Clear	-	-	-	-	6	-	
Min Green *	7	12	7	7	12	7	
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	
Max 1 *	25	90	25	25	90	25	
Yellow Change	3.3	4.7	4.1	3.3	4.7	4.1	
Red Clear	1.7	1.2	2.5	2.4	1.2	2.5	
Added Initial *	-	-	-	-	-	-	
Maximum Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	
Advance Walk	-	-	-	-	6	-	
Non Lock Detector	X	-	X	X	-	X	
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	
Dual Entry	-	-	X	-	-	X	

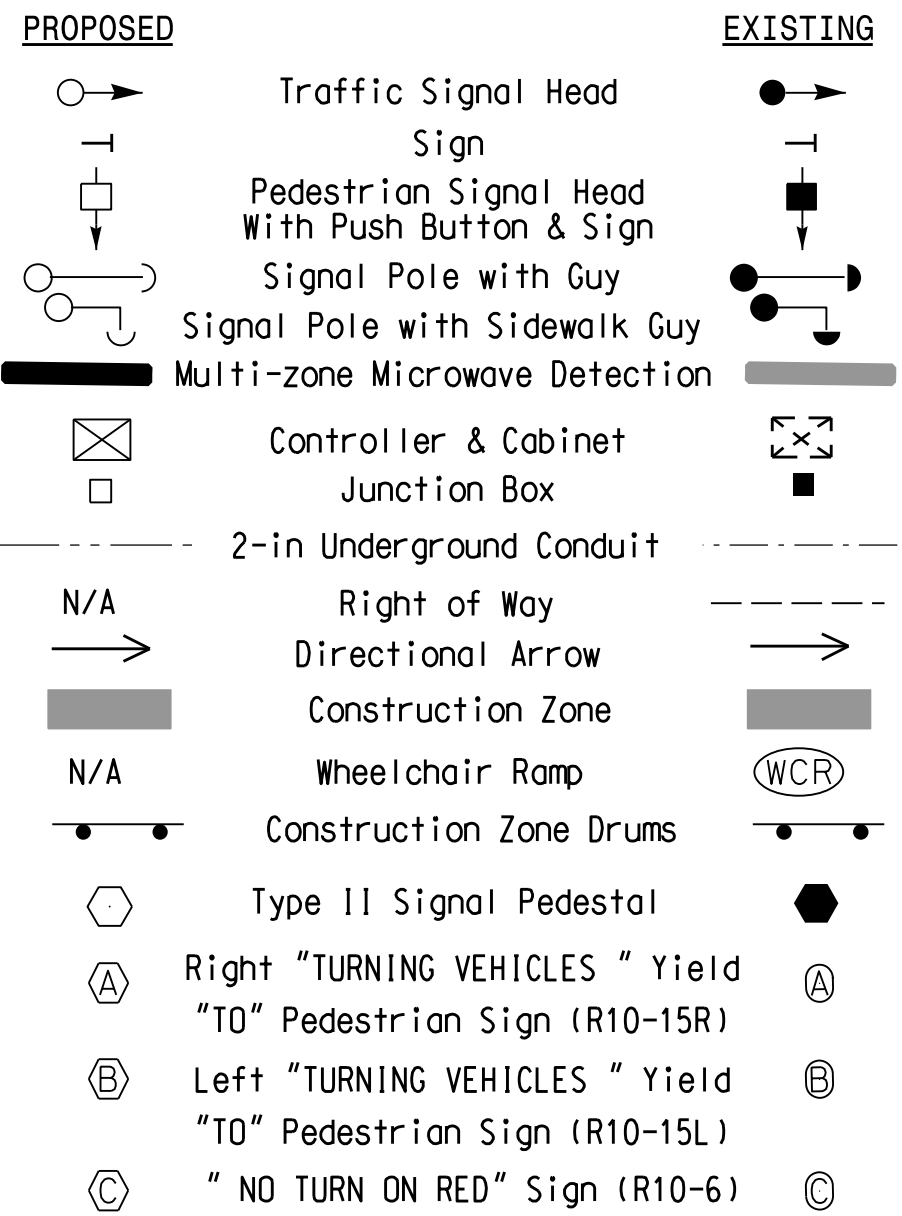
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Wood Pole #1
Sta 424+71 -L- +/-
61' RT +/-

Wood Pole #4
Sta 425+93 -L- +/-
69' RT +/-

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton

LEGEND

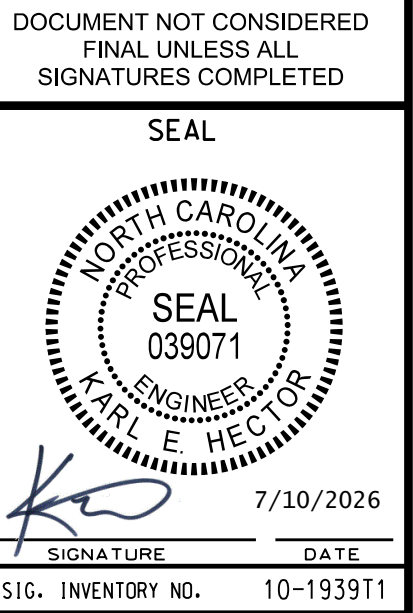


Temporary Design #1
(TMP Phase 1 Step 1)



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NC 73 (Sam Furr Rd) at Kenton Dr/Glenfurness Dr	
Division 10 Mecklenburg County Huntersville	
PLAN DATE: July 2026	REVIEWED BY: Z Wang
PREPARED BY: K Hector	RKA PROJ. No.:
REVISIONS	INIT. DATE



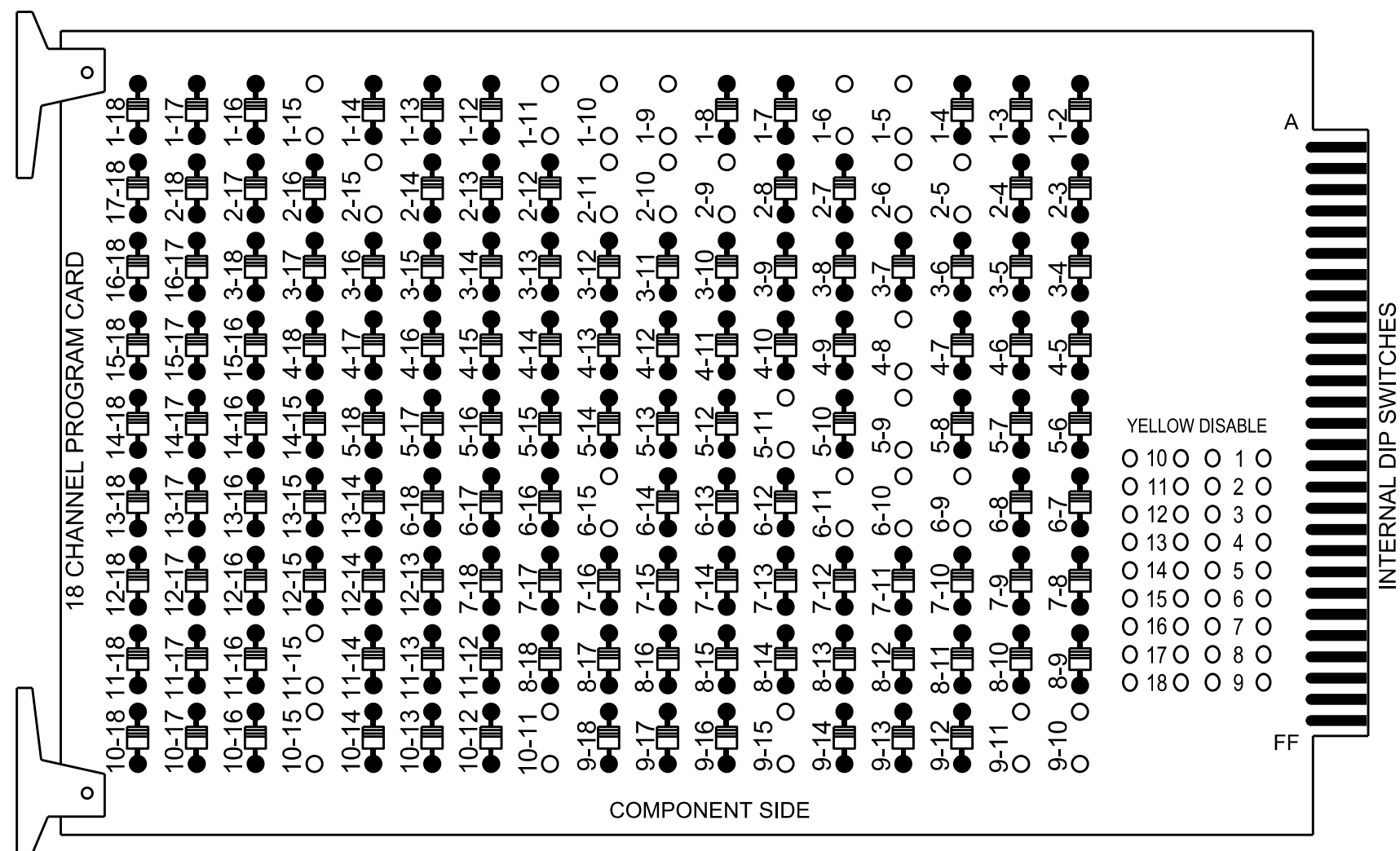
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18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

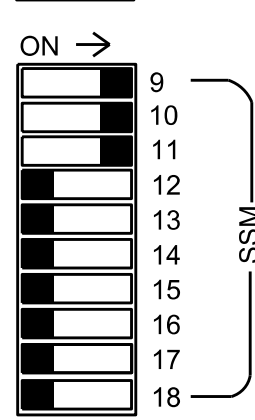
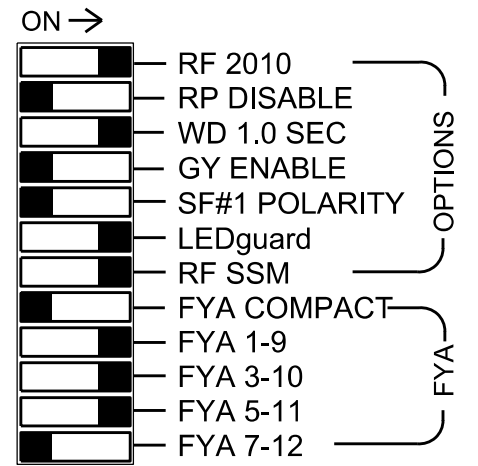
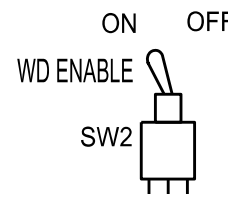
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-10, 1-11, 1-15, 2-5, 2-6, 2-9, 2-10, 2-11, 2-15, 4-8, 5-9, 5-11, 6-9, 6-10, 6-11, 6-15, 9-10, 9-11, 9-15, 10-11, 10-15, and 11-15



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

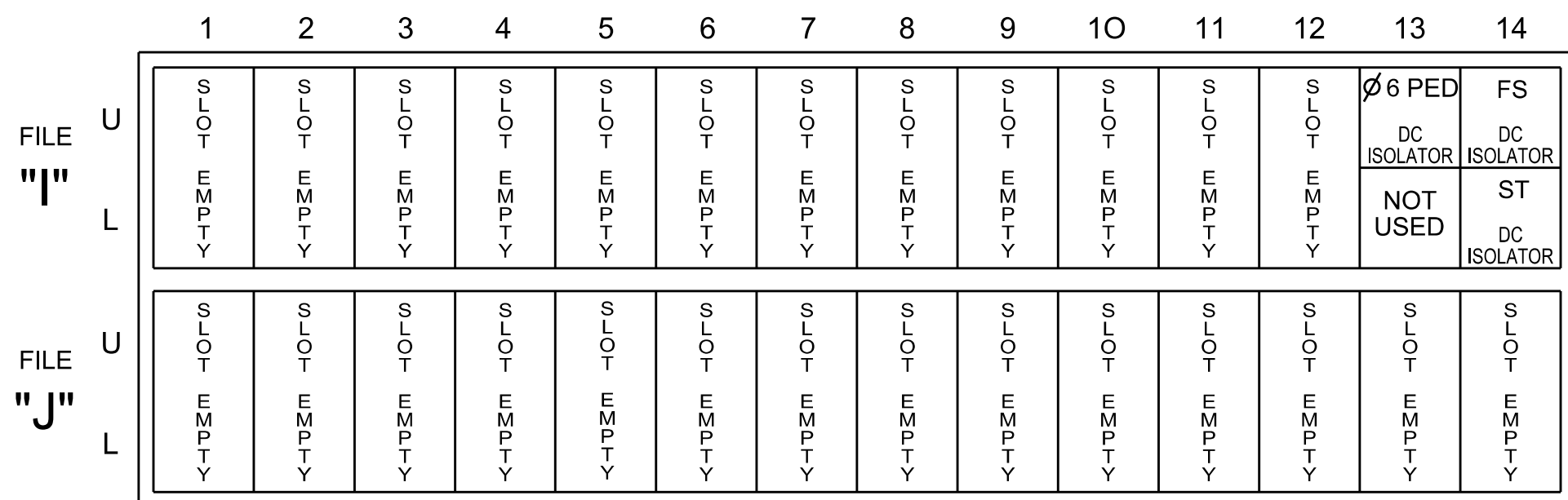
EQUIPMENT INFORMATION

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, S5, S7, S8, S9, S11, AUX S1 , AUX S2 , AUX S4
Phases Used.....1, 2, 4, 5, 6, 6PED, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

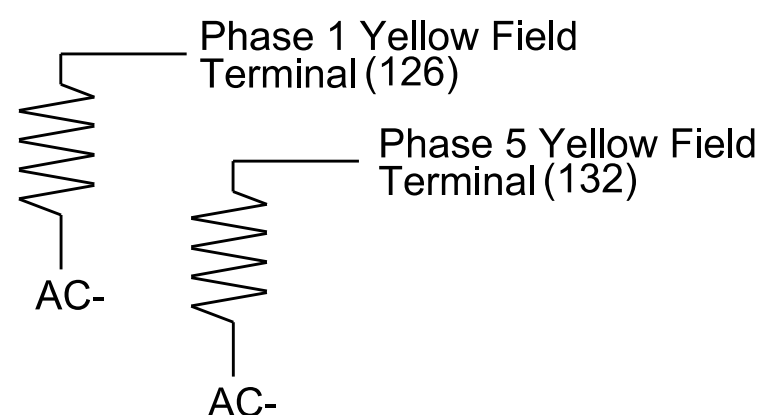
SPECIAL DETECTOR NOTE

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.

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)



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	-	-	-	*	33*	1	15.0		X		X	
2A	-	-	-	*	125*	6	3.0		X		X	X
4A	-	-	-	*	38	2			X		X	
5A	-	-	-	*	44	4			X		X	
6A	-	-	-	*	35*	5	15		X		X	
8A	-	-	-	*	127*	2	3.0		X		X	X
8B	-	-	-	*	54	6			X		X	
PED PUSH BUTTONS					60	8	10.0		X		X	
P61,P62	TB8-7,9	I13U	68	34	61	8	15.0		X		X	
							NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I13.					

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

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

SDLC NON-INTRUSIVE DETECTION CHART

Input Point	Detector Rack #3		Detector Rack #4	
	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	NU	50	NU
3	35	5A	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	NU	41,42	NU	51*	61,62	P61, P62	NU	81,82	83	NU	11*	63*	NU	51*	NU
RED		128			101			134			107			A124				
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
Hand icon									119									
Walking person icon									121									

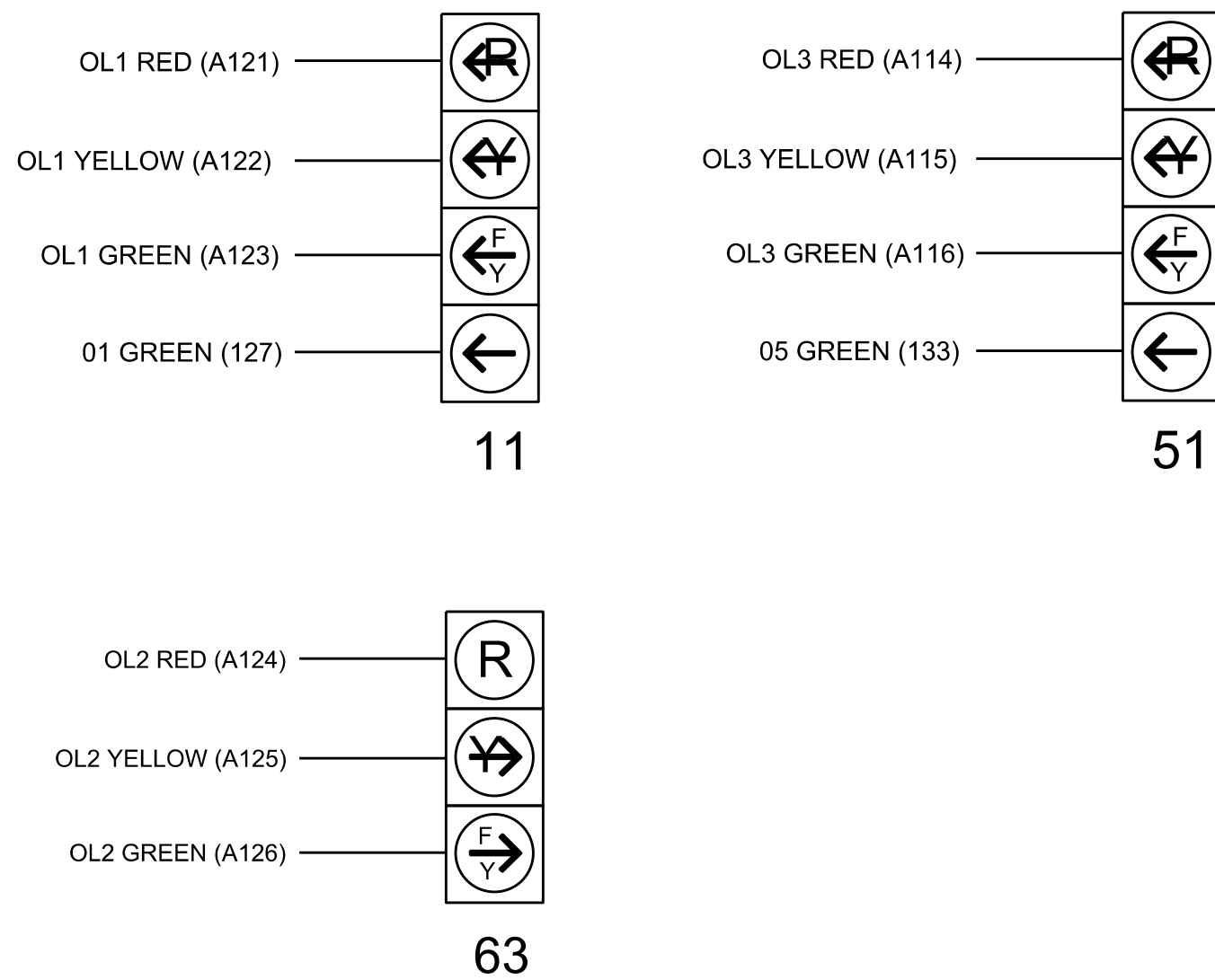
NU = Not Used

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

*See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

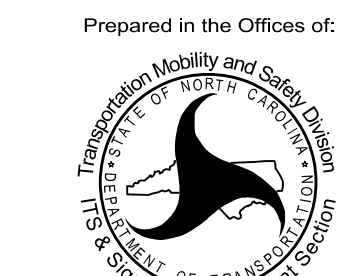
(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-1939T1
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 1 of 3

Electrical and Programming Details For:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Kenton Drive / Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS INIT. DATE

DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



7/10/2026

SIG. INVENTORY NO. 10-1939T1



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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 2.3

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 6	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.

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	125	Is Module A input B ON	Number	2	Number	1	0.0	0.0
2	Veh Detector Call	127	Is Module A input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

Statement 2 Description: Mirrors vehicle detector 35 to vehicle detector 127

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T1
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 3 of 3

Electrical and Programming Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Kenton Drive / Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026REVIEWED BY: Z Wang

PREPARED BY: K HectorREVIEWED BY:

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



7/10/2026

DATE

SIG. INVENTORY NO. 10-1939T1



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

5 Phase Fully Actuated w/ Alternate Phasing Operation Signal System #: D10-43_Huntersville

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered # 11,21,22,51, 61,62,63.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See traffic control plans for stop line and crosswalk placement.

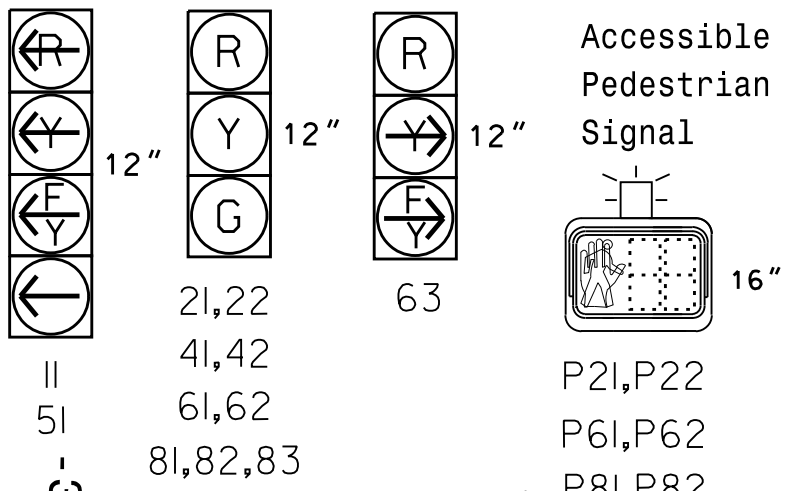
MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL	CALL	NEW CARD
1A	*	*	*	X	1 15.0**	-	-	X	-	X	*
2A	*	*	*	X	2 -	-	-	X	-	X	*
4A	*	*	*	X	4 -	-	-	X	-	X	*
5A	*	*	*	X	5 15.0**	-	-	X	-	X	*
6A	*	*	*	X	6 -	-	-	X	-	X	*
8A	*	*	*	X	8 10.0	-	-	X	-	X	*
8B	*	*	*	X	8 15.0	-	-	X	-	X	*

* Multi-zone Microwave Detection.
** Reduce Delay to 3 Seconds During Alternative Phasing Operation.
Disable Delay During Alternate Phasing Operation.

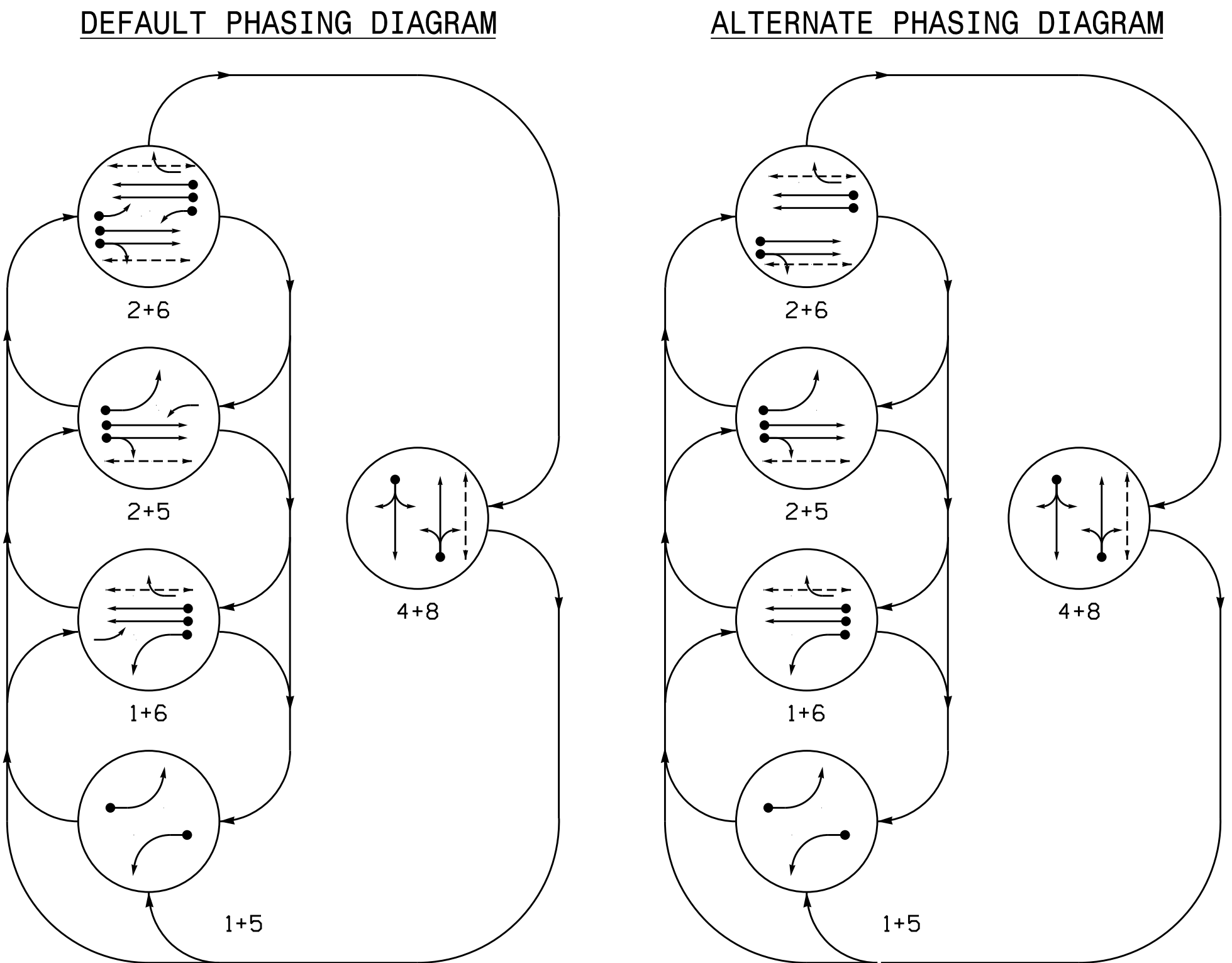
ALTERNATE PHASE TABLE OF OPERATION							
SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F L	5 6
11	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	
41,42	R	R	R	R	G	R	
51	←	←	←	←	←	←	
61,62	R	G	R	G	R	R	
63	R	←	←	←	←	←	
81,82,83	R	R	R	R	G	R	
P21,P22	DW	DW	W	W	DW	DRK	
P61,P62	DW	W	DW	W	DW	DRK	
P81,P82	DW	DW	DW	DW	W	DRK	

DEFAULT PHASE TABLE OF OPERATION							
SIGNAL FACE	PHASE						
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F L	5 6
11	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	
41,42	R	R	R	R	G	R	
51	←	←	←	←	←	←	
61,62	R	G	R	G	R	R	
63	R	←	←	←	←	←	
81,82,83	R	R	R	R	G	R	
P21,P22	DW	DW	W	W	DW	DRK	
P61,P62	DW	W	DW	W	DW	DRK	
P81,P82	DW	DW	DW	DW	W	DRK	

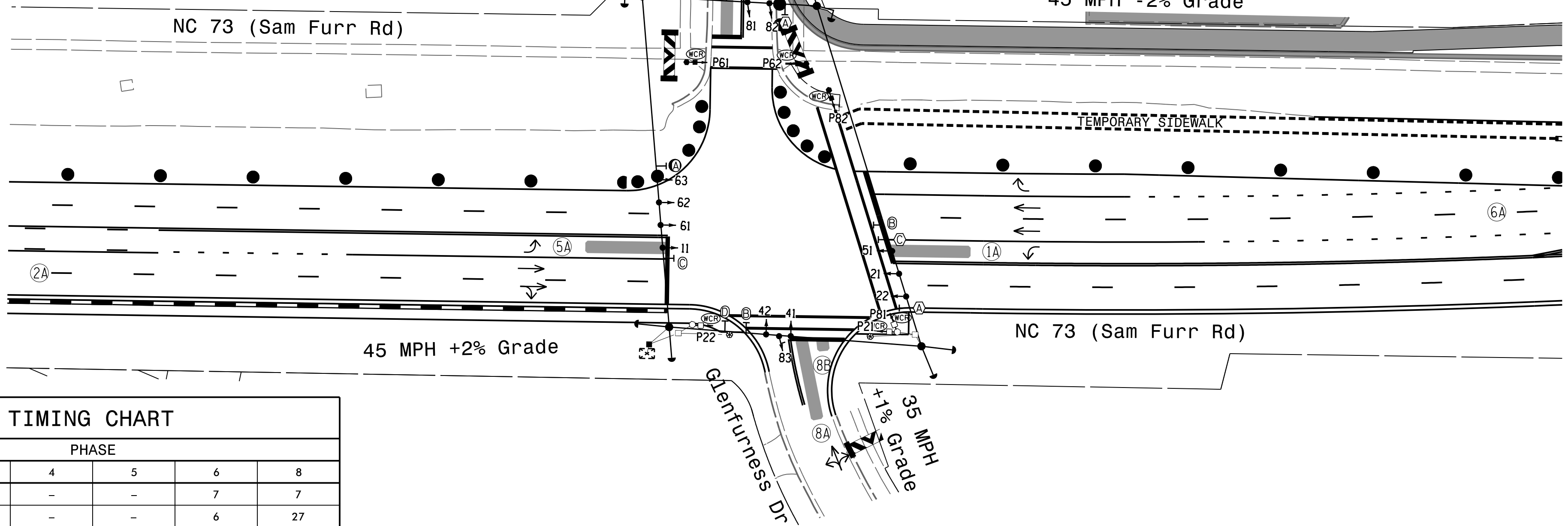
SIGNAL FACE I.D. All Heads L.E.D.



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



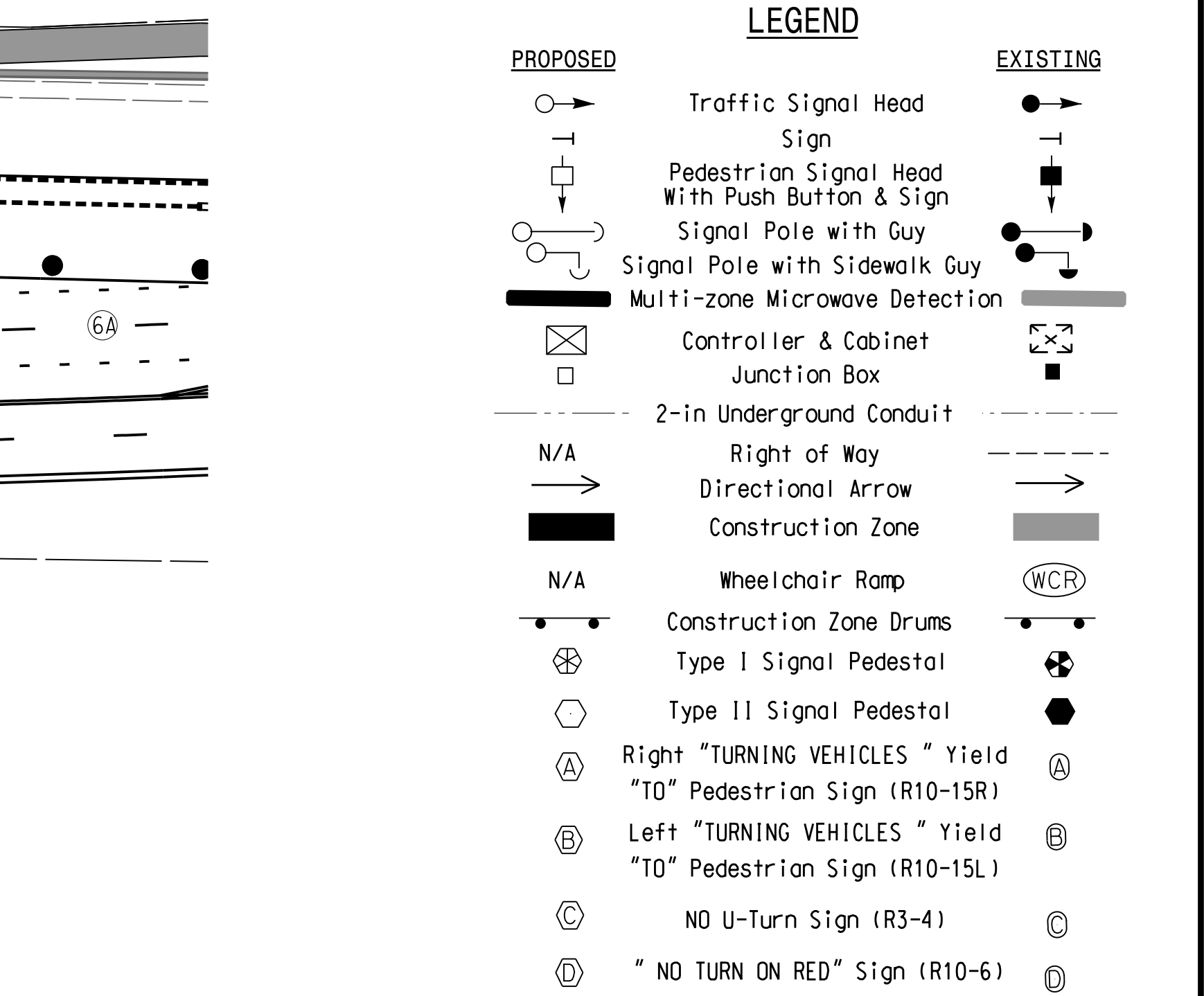
PHASING DIAGRAM DETECTION LEGEND
← DETECTED MOVEMENT
← UNDETECTED MOVEMENT (OVERLAP)
← UNSIGNALIZED MOVEMENT
← PEDESTRIAN MOVEMENT



MAXTIME TIMING CHART						
FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	-	7	-	-	7	7
Ped Clear	-	13	-	-	6	27
Min Green *	7	12	7	7	12	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	25	90	25	25	90	25
Yellow Change	3.3	4.7	4.1	3.1	4.7	4.1
Red Clear	1.7	1.6	2.8	2.8	1.6	2.8
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	7	-	-	6	4
Non Lock Detector	X	-	X	X	-	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X

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

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION			
SIGNAL FACE	VOICE	TONES	SPEECH MESSAGE
P21	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Glenfurness
P22	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Glenfurness
P61	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Kenton
P62	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Kenton
P81	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Sam Furr
P82	-	X	Walk (Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk Wait, wait to cross Sam Furr



Temporary Design #2 (TMP Phase 1 Step 2)

750 N. Greenfield Hwy, Garner, NC 27529

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900, Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NC 73 (Sam Furr Rd) at Kenton Dr/Glenfurness Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector RKA PROJ. No.:

REVISIONS

INIT. DATE

7/10/2026

SIG. INVENTORY NO. 10-1939T2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039071

7/10/2026

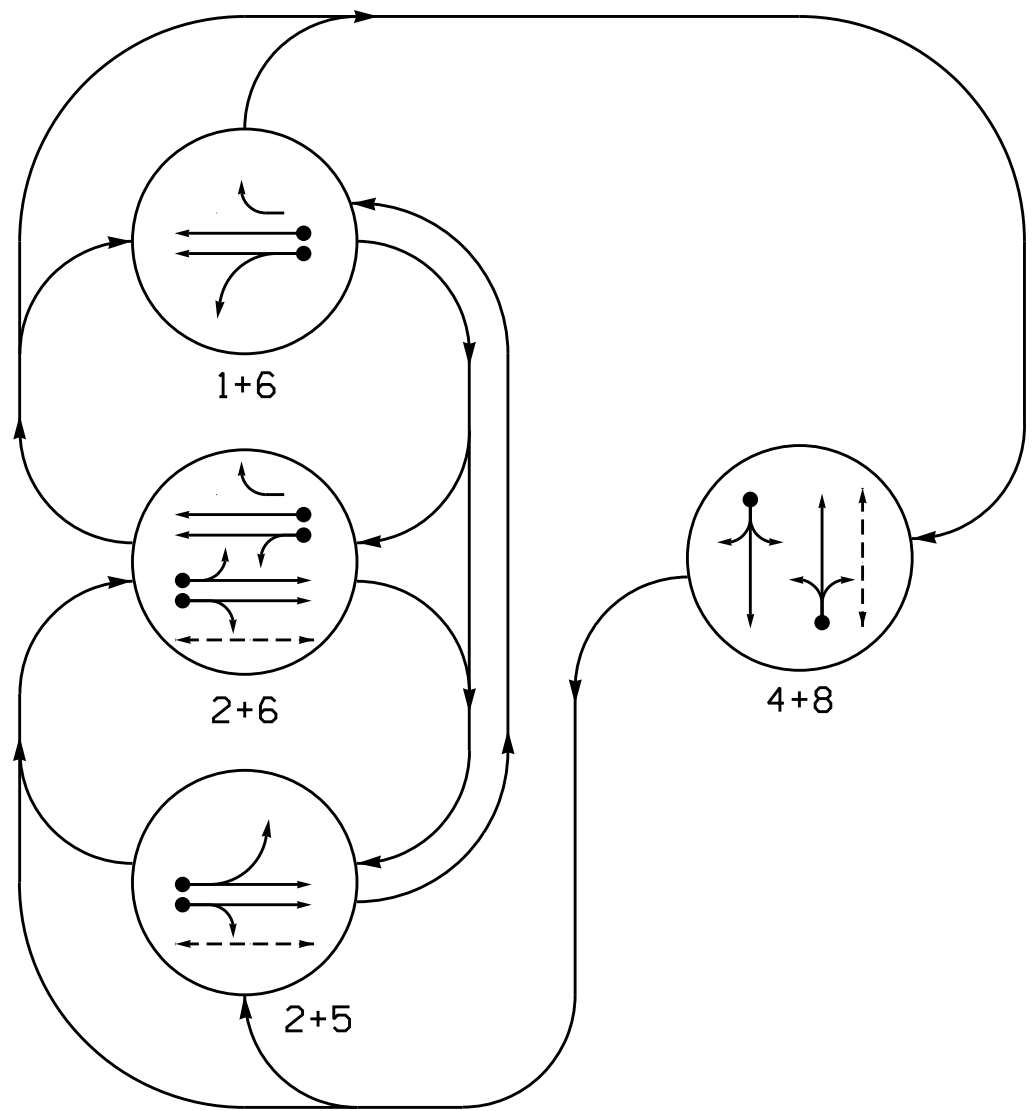
5 Phase
Fully Actuated
Signal System #: D10-43_Huntersville
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered # 21,22, 62,63.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See traffic control plans for stop line and crosswalk placement.

LEGEND

PROPOSED	EXISTING
N/A	
N/A	

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

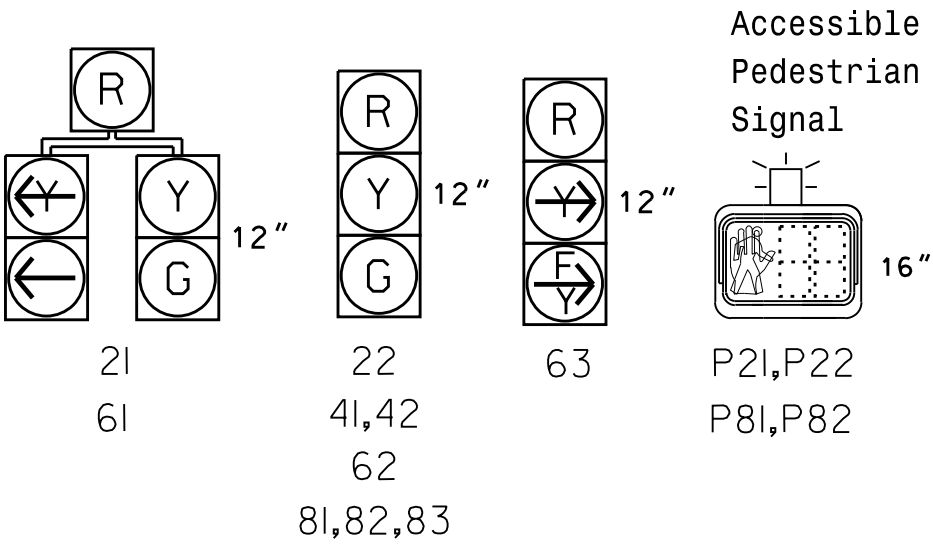
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE				
	1+6	2+5	2+6	4+8	FLASH
21	R	G	G	R	R
22	R	G	G	R	R
41,42	R	R	R	G	R
61	G	R	R	G	R
62	G	R	R	G	R
63	G	R	R	G	R
81,82,83	R	R	R	G	R
P21,P22	DW	W	W	DW	DRK
P81,P82	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



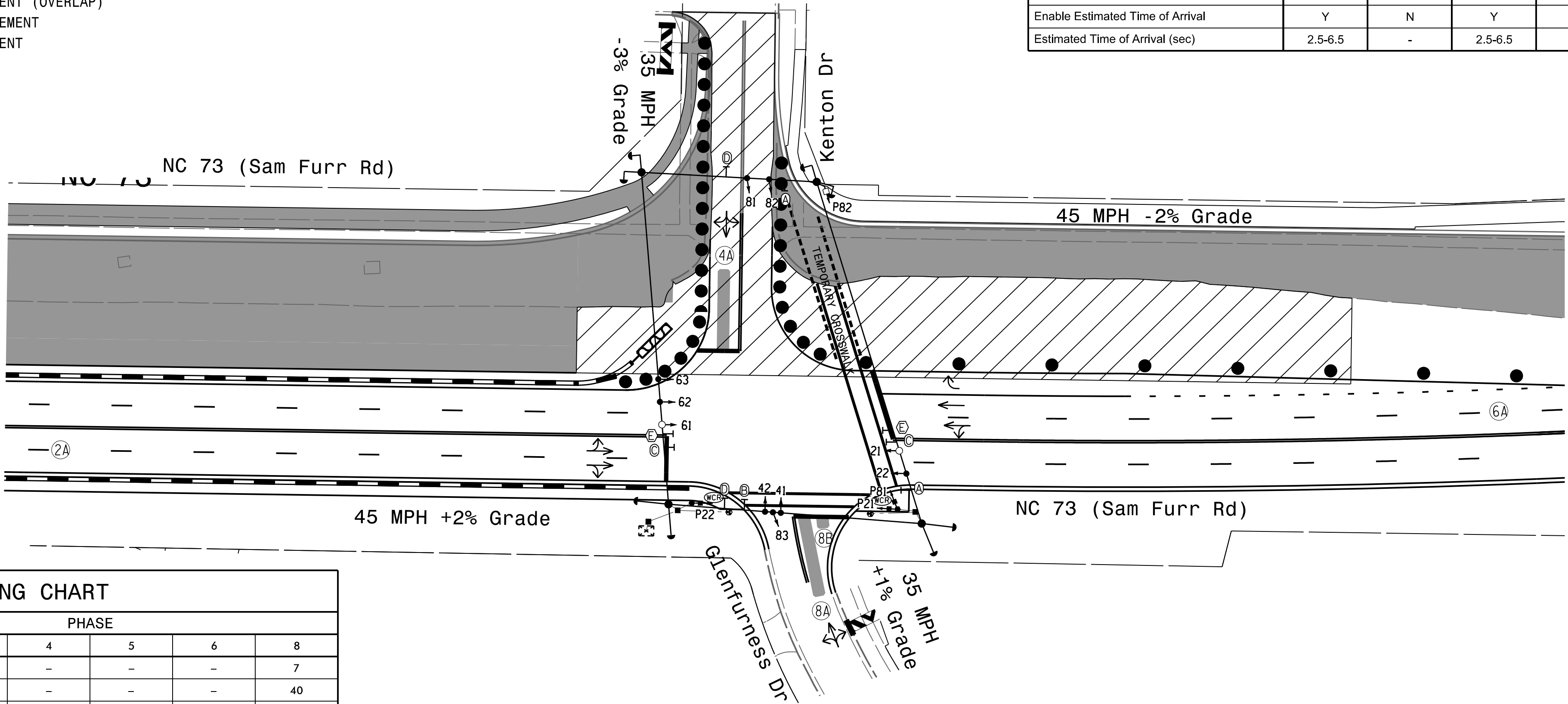
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN	NEW CARD
2A	*	*	*	*	2	-	-	X	-	X	-
4A	*	*	*	*	4	-	-	X	-	X	-
6A	*	*	*	*	6	-	-	X	-	X	-
8A	*	*	*	*	8	10.0	-	X	-	X	-
8B	*	*	*	*	8	15.0	-	X	-	X	-

* Multi-zone Microwave Detection.

Microwave Detection System

FUNCTION	Sensor 1 (2A)	Sensor 2 (6A)
Channel	1	2
Phase	2	6
Direction of Travel	EB	WB
Type	Priority	Priority
Level	2	2
Discovery Zone (ft)	<750	<750
Range (ft)	600-100	150-100
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	2.5-6.5



MAXTIME TIMING CHART

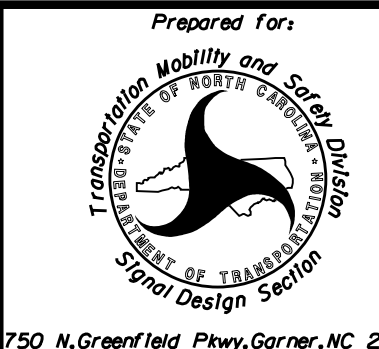
FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	-	7	-	-	-	7
Ped Clear	-	13	-	-	-	40
Min Green *	7	12	7	7	12	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	25	90	25	25	90	25
Yellow Change	3.3	4.7	4.1	3.1	4.7	4.1
Red Clear	1.8	1.6	1.5	1.7	1.6	1.5
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	7	-	-	-	5
Non Lock Detector	X	-	X	X	-	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X

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

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Glenfurness
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Glenfurness
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Sam Furr
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Sam Furr

Temporary Design #3
(TMP Phase 1 Step 3)



NC 73 (Sam Furr Rd)
at
Kenton Dr/Glenfurness Dr

Division 10 Mecklenburg County Huntersville
PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector RKA PROJ. No.:
REVISIONS
INIT. DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



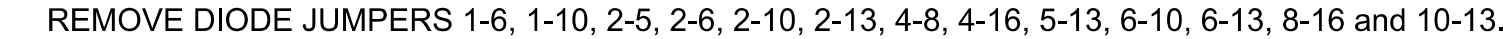
7/10/2026
SIGNATURE DATE
SIG. INVENTORY NO. 10-193973



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

(remove jumpers and set switches as shown)

(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.

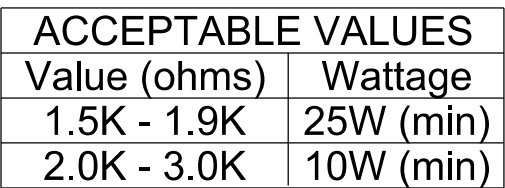
(front view)

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

FS = FLASH SENSE
ST = STOP TIME

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.

(install resistors as shown)



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 and Simultaneous Start.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

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, S3, S5, S7, S8, S11, S12, AUX S2
Phases Used.....	1, 2, 2PED, 4, 5, 6, 8, 8PED
Overlap "1".....	NOT USED
Overlap "2".....	*
Overlap "3".....	NOT USED
Overlap "4".....	NOT USED

*See overlap programming detail on sheet 2

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
2A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	44	4			X		X	
6A	-	-	-	*	54	6			X		X	
8A	-	-	-	*	60	8	10.0		X		X	
8B	-	-	-	*	61	8	15.0		X		X	
PED PUSH BUTTONS							NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.					
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P11,P82	TB8-8,9	I13L	70	36	8	PED 8						

INPUT FILE POSITION LEGEND: J2

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

FILE J _____
SLOT 2 _____
LOWER _____

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used



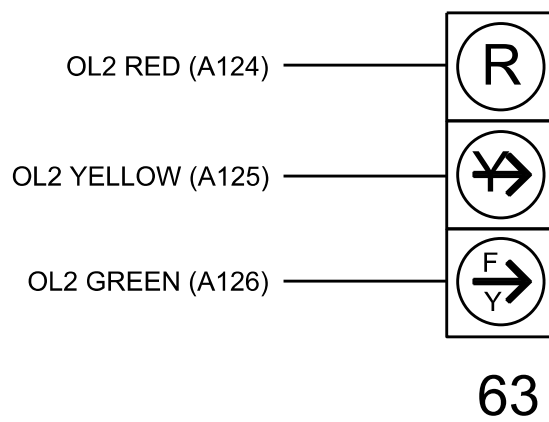
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	61	21,22	P21, P22	NU	41,42	NU	21	61,62	NU	NU	81,82 83	P81, P82	NU	63★	NU	NU	NU	NU
RED	★	128			101		★	134			107			A124				
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW	126						132							A125				
FLASHING YELLOW ARROW														A126				
GREEN ARROW	127						133											
			113									110						
			115									112						

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



63

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T2
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 1 of 2

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Drive / Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026	REVIEWED BY:	Z Wang
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PREPARED BY:	K Hector	REVIEWED BY:
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REVISIONS	INIT.	
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEA



7/10/2020

SIG. INVENTORY NO. 10-19391

7/9/2026 12:46:20 PM P:***Hector\users001\HQR_ILS_East_01\Documents\3322*10323293*46_0_CAD_E\MM6_2_W\IP\Trcf\le5\gnd\85\sheet8\Kenton_Glenfurness*10-1939T3_ NC 73 _Kenton Dr_Glenfurness Dr_ELE.dgn

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

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

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T2
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

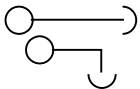
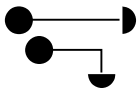
Electrical Detail - Sheet 2 of 2

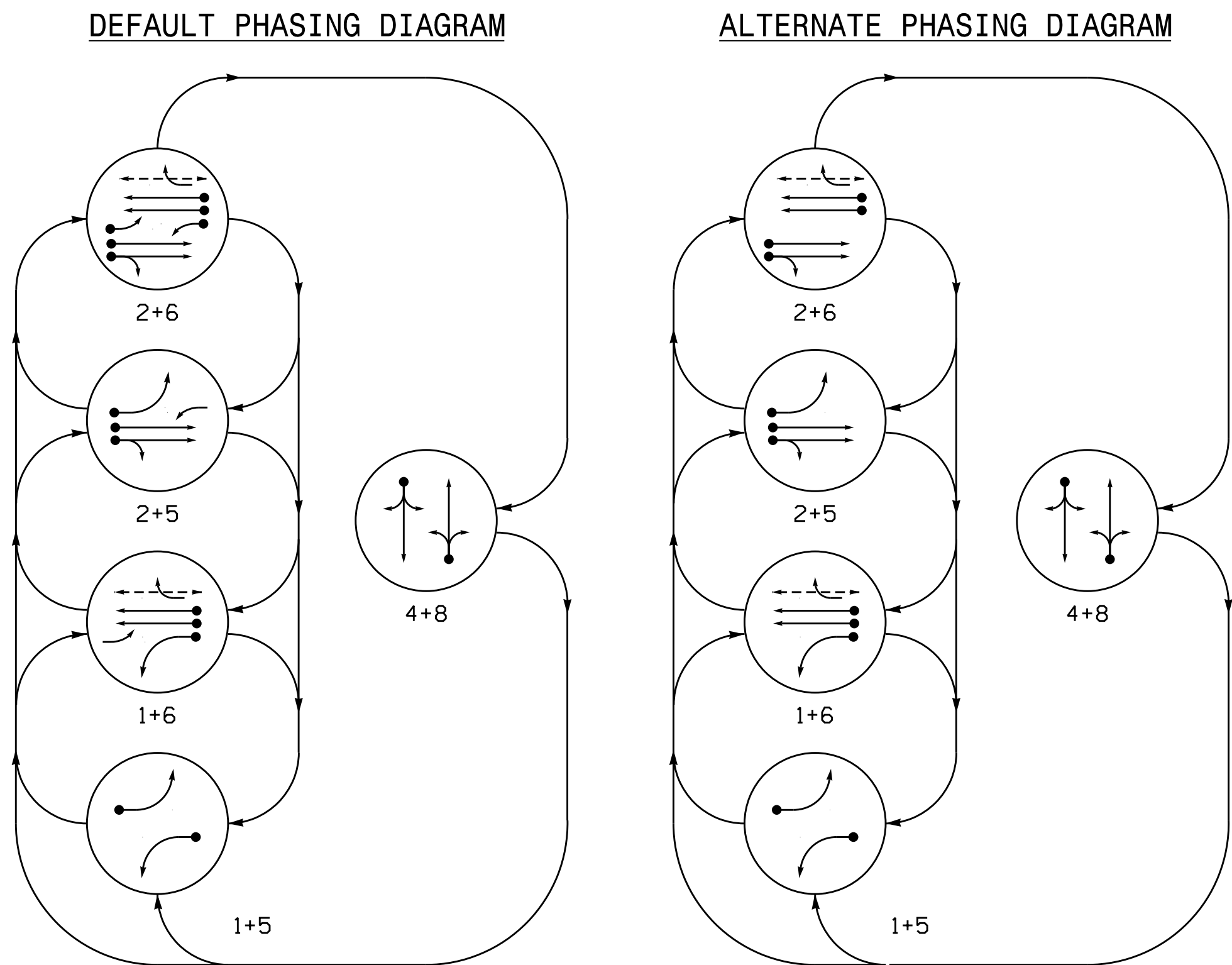
Electrical and Programming Details For:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		NC 73 (Sam Furr Rd) at Kenton Drive / Glenfurness Drive Division 10 Mecklenburg County Huntersville PLAN DATE: July 2026 REVIEWED BY: Z Wang PREPARED BY: K Hector REVIEWED BY: REVISIONS INIT. DATE DATE 7/10/2026 DATE 10-1939T3	

5 Phase
Fully Actuated
Signal System #: D10-43_Huntersville
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 operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered # 21,22, 61,62,63.
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 features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
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. See traffic control plans for stop line and crosswalk placement.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Signal	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Multi-zone Microwave Detection	
	Controller & Cabinet	
	Junction Box	
N/A	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Construction Zone	
	Type I Signal Pedestal	
	Type II Signal Pedestal	
	Right "TURNING VEHICLES " Yield "T0" Pedestrian Sign (R10-15R)	
	Left "TURNING VEHICLES " Yield "T0" Pedestrian Sign (R10-15L)	
	No U-Turn Sign (R3-4)	
	" NO TURN ON RED " Sign (R10-6)	



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASE TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F L A S H
11	←	←	←	←	←	←
21,22	R	R	G	G	R	R
41,42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	R
63	R	←	←	←	R	R
81,82,83	R	R	R	R	G	R
P61,P62	DW	W	DW	W	DW	DR

SIGNAL FACE I.D.

All Heads L.E.D.

ALTERNATE PHASE
TABLE OF OPERATION

SIGNAL FACE	PHASE					
	1 + 5	1 + 6	2 + 5	2 + 6	4 + 8	F ASH
11	←	←	←	←	←	←
21,22	R	R	G	G	R	R
41,42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	R
63	R	$\frac{F}{Y}$	R	$\frac{F}{Y}$	R	R
81,82,83	R	R	R	R	G	R
P61,P62	DW	W	DW	W	DW	DR

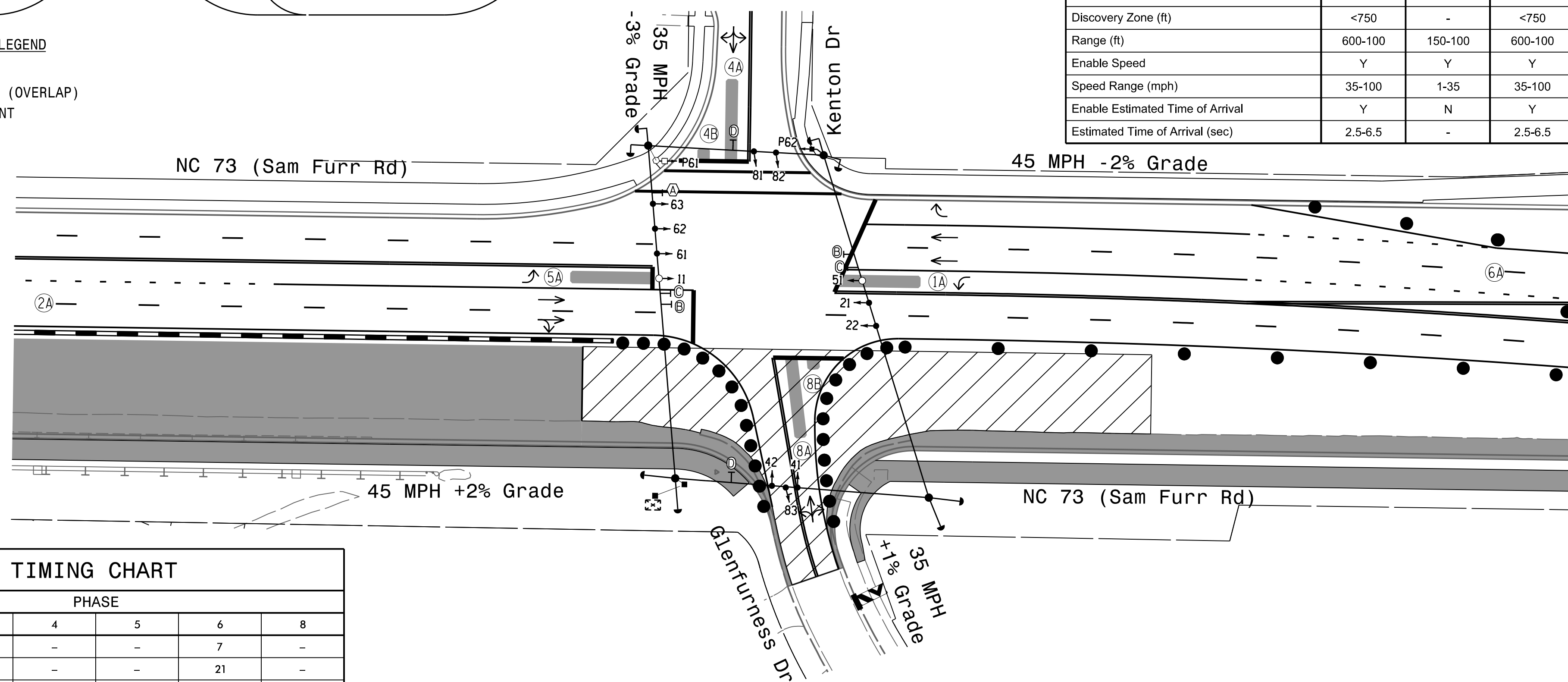
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
DETECTOR 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	*	*	*	*	1	15.0 ^{**}	-	X	-	X	-	*
					6 [#]	3.0	-	X	-	X	X	*
2A	*	*	*	*	2	-	-	X	-	X	-	*
4A	*	*	*	*	4	-	-	X	-	X	-	*
4B	*	*	*	*	4	-	-	X	-	X	-	*
5A	*	*	*	*	5	15.0 ^{**}	-	X	-	X	-	*
					2 [#]	3.0	-	X	-	X	X	*
6A	*	*	*	*	6	-	-	X	-	X	-	*
8A	*	*	*	*	8	10.0	-	X	-	X	-	*
8B	*	*	*	*	8	15.0	-	X	-	X	-	*

- * Multi-zone Microwave Detection.
- ** Reduce Delay to 3 Seconds During Alternative Phasing Operation
- # Disable Delay During Alternate Phasing Operation.

Microwave Detection System

FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		2	
Phase	2		6	
Direction of Travel	EB		WB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	<750	-	<750	-
Range (ft)	600-100	150-100	600-100	150-100
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	-



MAXTIME TIMING CHART

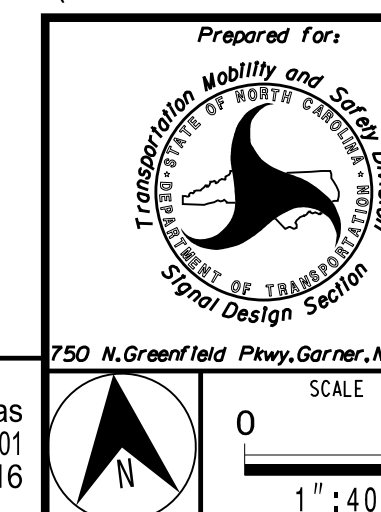
FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	–	–	–	–	7	–
Ped Clear	–	–	–	–	21	–
Min Green *	7	12	7	7	12	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	25	90	25	25	90	25
Yellow Change	3.3	4.7	4.1	3.1	4.7	4.1
Red Clear	1.4	1.0	1.7	2.0	1.0	1.7
Added Initial *	–	–	–	–	–	–
Maximum Initial *	–	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–	–
Time To Reduce *	–	–	–	–	–	–
Minimum Gap	–	–	–	–	–	–
Advance Walk	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	–	X
Vehicle Recall	–	MIN RECALL	–	–	MIN RECALL	–
Dual Entry	–	–	X	–	–	X

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

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

ASSOCIATED PERSPECTIVE SCHEME OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton

Temporary Design #4
(TMP Phase 1 Step 4)



NC 73 (Sam Furr Rd)
at
Kenton Dr/Glenfurness Dr

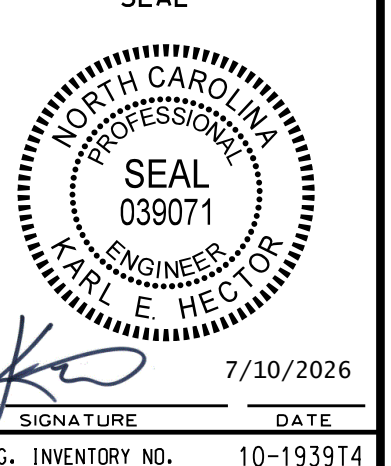
Division 10 Mecklenburg County		Huntersville
PLAN DATE:	July 2026	REVIEWED BY: Z Wang

529	PREPARED BY: K Hector	RKA PROJ. No.:
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	REVISIONS	INIT.	DATE
0			

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FINAL UNLESS ALL
SIGNATURES COMPLETED

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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 11 and 51 to run protected turns only.

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

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

OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

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

← NOTICE INCLUDED PHASE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-1939T4
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING DETECTION ZONES 1A & 5A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

1A	Plan 2		
	Detector	Call Phase	Delay
	33	1	3.0
5A	Plan 2		
	Detector	Call Phase	Delay
	125	0	0.0

5A	Plan 2		
	Detector	Call Phase	Delay
	127	0	0.0

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared in the Offices of:

Seal of the State of North Carolina

NC 73 (Sam Furr Rd)
at
Kenton Drive / Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS

INIT. DATE

7/10/2026

DATE

SIG. INVENTORY NO. 10-1939T4

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

750 N. Greenfield Pkwy, Garner, NC 27529

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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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 5.3

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 6	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.

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	125	Is Module A input B ON	Number	2	Number	1	0.0	0.0
2	Veh Detector Call	127	Is Module A input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

Statement 2 Description: Mirrors vehicle detector 35 to vehicle detector 127

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T4
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 3 of 3

Electrical and Programming Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Kenton Drive / Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026
REVIEWED BY: Z Wang

PREPARED BY: K Hector
REVIEWED BY:

REVISIONS
INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

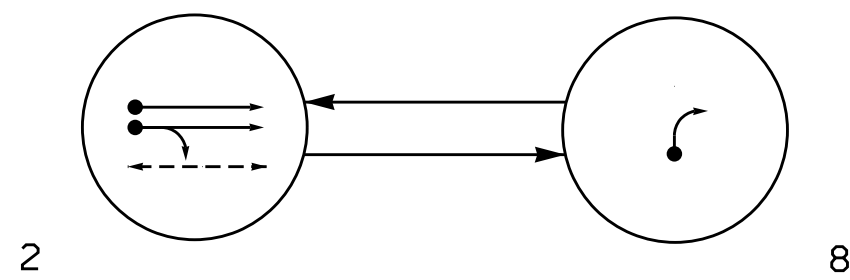
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 039071
KARL E. HECOT
7/10/2026
DATE
SIG. INVENTORY NO. 10-1939T4

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2 Phase
Fully Actuated
Signal System #: D10-43_Huntersville
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 operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered # 21,22,
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 features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
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. See traffic control plans for stop line and crosswalk placement.

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- | | |
|-------|-------------------------------|
| ←● | DETECTED MOVEMENT |
| ← | UNDETECTED MOVEMENT (OVERLAP) |
| ←--- | UNSIGNALIZED MOVEMENT |
| ←---→ | PEDESTRIAN MOVEMENT |

SIGNAL FACE I.D.

All Heads L.E.D.

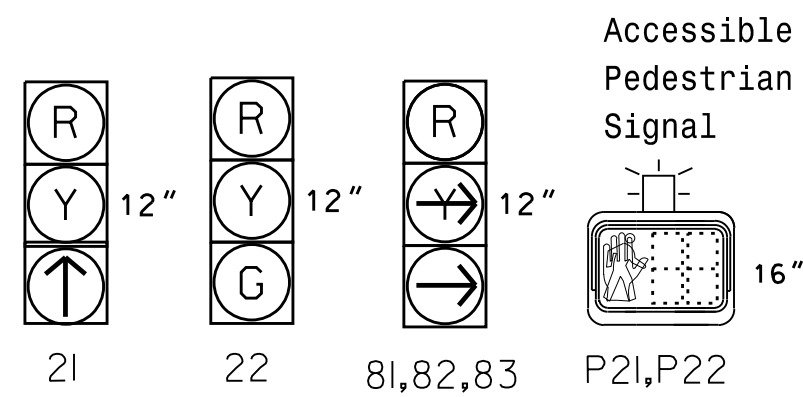
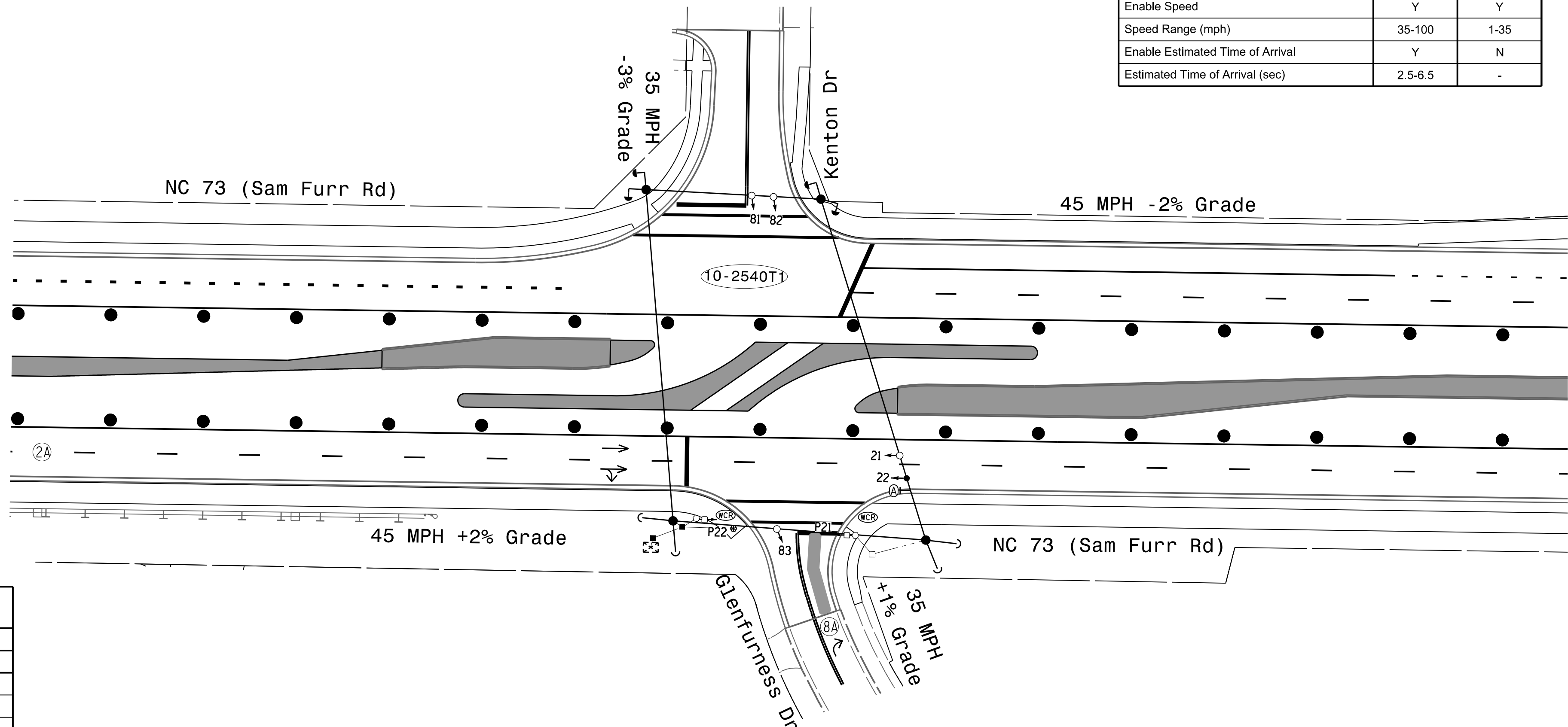


TABLE OF OPERATION			
SIGNAL FACE	PHASE		
	2	8	FLASH
21	↑	R	R
22	G	R	R
81,82,83	R	→	R
P21,P22	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							NEW CARD
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	
2A	*	*	*	*	2	-	-	X	-	X	-	*
8A	*	*	*	*	8	10.0	-	X	-	X	-	*

* Multi-zone Microwave Detection.

Microwave Detection System		
FUNCTION	Sensor 1 (2A)	
Channel	1	
Phase	2	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	-
Range (ft)	600-100	150-100
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	-



MAXTIME TIMING CHART

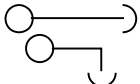
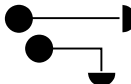
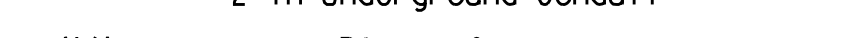
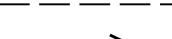
FEATURE	PHASE	
	2	8
Walk *	7	–
Ped Clear	13	–
Min Green *	12	7
Passage *	2.0	2.0
Max 1 *	90	25
Yellow Change	4.3	3.8
Red Clear	1.4	1.0
Added Initial *	–	–
Maximum Initial *	–	–
Time Before Reduction *	–	–
Time To Reduce *	–	–
Minimum Gap	–	–
Advance Walk	7	–
Non Lock Detector	–	X
Vehicle Recall	MIN RECALL	–
Dual Entry	–	–

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

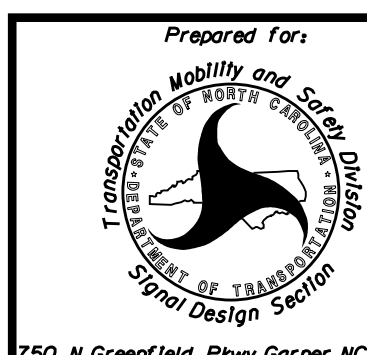
ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Glenfurness
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Glenfurness

LEGEND

- | PROPOSED | | EXISTING |
|---|---|---|
|  | Traffic Signal Head |  |
|  | Modified Signal Head | N/A |
|  | Signal |  |
|  | Pedestrian Signal Head |  |
|  | Signal Pole With Push Button & Sign |  |
|  | Signal Pole with Sidewalk Guy |  |
|  | Multi-zone Microwave Detection |  |
|  | Controller & Cabinet |  |
|  | Junction Box |  |
|  | 2-in Underground Conduit |  |
| N/A | Right of Way |  |
|  | Directional Arrow |  |
|  | Construction Zone |  |
| N/A | Wheelchair Ramp |  |
|  | Construction Zone Drums |  |
|  | Type I Signal Pedestal |  |
|  | Type II Signal Pedestal |  |
|  | Right "TURNING VEHICLES " Yield
"TO" Pedestrian Sign (R10-15R) |  |

Temporary Design #5
(TMP Phase 2)



SCALE

NC 73 (Sam Furr Rd)
at
Glenfurness Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026
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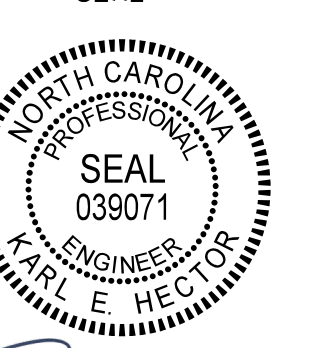
PREPARED BY:	K Hector	RKA PROJ. No.:
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REVISIONS

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SIGNATURES COMPLETED

REAL



/10/2026

SIGNATURE _____ DATE _____

INVENTORY NO. 10-1939T5

(remove jumper and set switches as shown)

(remove jumper and set switches as shown)



- ## INPUT FILE POSITION LAYOUT

(front view)

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

FS = FLASH SENSE
ST = STOP TIME

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.

(install resistors as shown)

If present, remove load resistor below.

Phase 1 Yellow Field Terminal (126)

Phase 5 Yellow Field Terminal (132)

AC-

AC-

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

[illegible]

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	2A	54	NU
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	NU	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

[illegible]

NU = Not Used

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T5
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:

Prepared in the Offices of:

NC 73 (Sam Furr Rd)
at
Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026
------------	-----------

PREPARED BY: K Hector

REVISIONS

.....

.....

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

7/10/20

_____ DA _____

SIG. INVENTORY NO.	10-1
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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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

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

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939T5
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

Electrical Detail - Sheet 2 of 2



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Glenfurness Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS

INIT. DATE

7/10/2026

SIG. INVENTORY NO. 10-1939T5

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

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SEAL
039071
KARL E. HEC

7/10/2026

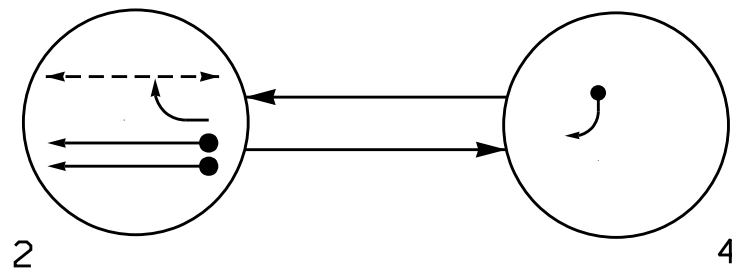
DATE

SIG. INVENTORY NO. 10-1939T5

2 Phase
Fully Actuated
Signal System #: D10-43_Huntersville
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered # 41,42, 62,63
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See traffic control plans for stop line and crosswalk placement.

PHASING DIAGRAM

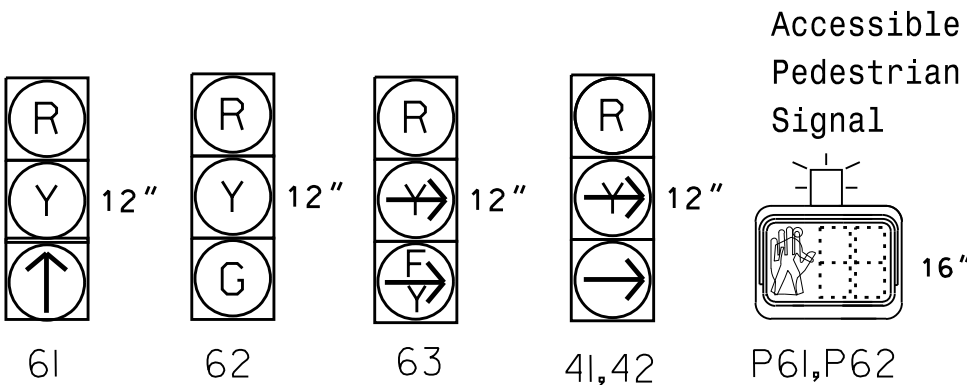


- PHASING DIAGRAM DETECTION LEGEND
- DETECTED MOVEMENT
 - UNDETECTED MOVEMENT (OVERLAP)
 - UNSIGNALIZED MOVEMENT
 - PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		FLASH
	6	4	
41,42	R	→	R
61	↑	R	R
62	G	R	R
63	↓	R	R
P61,P62	W	DW	DRK

SIGNAL FACE I.D.

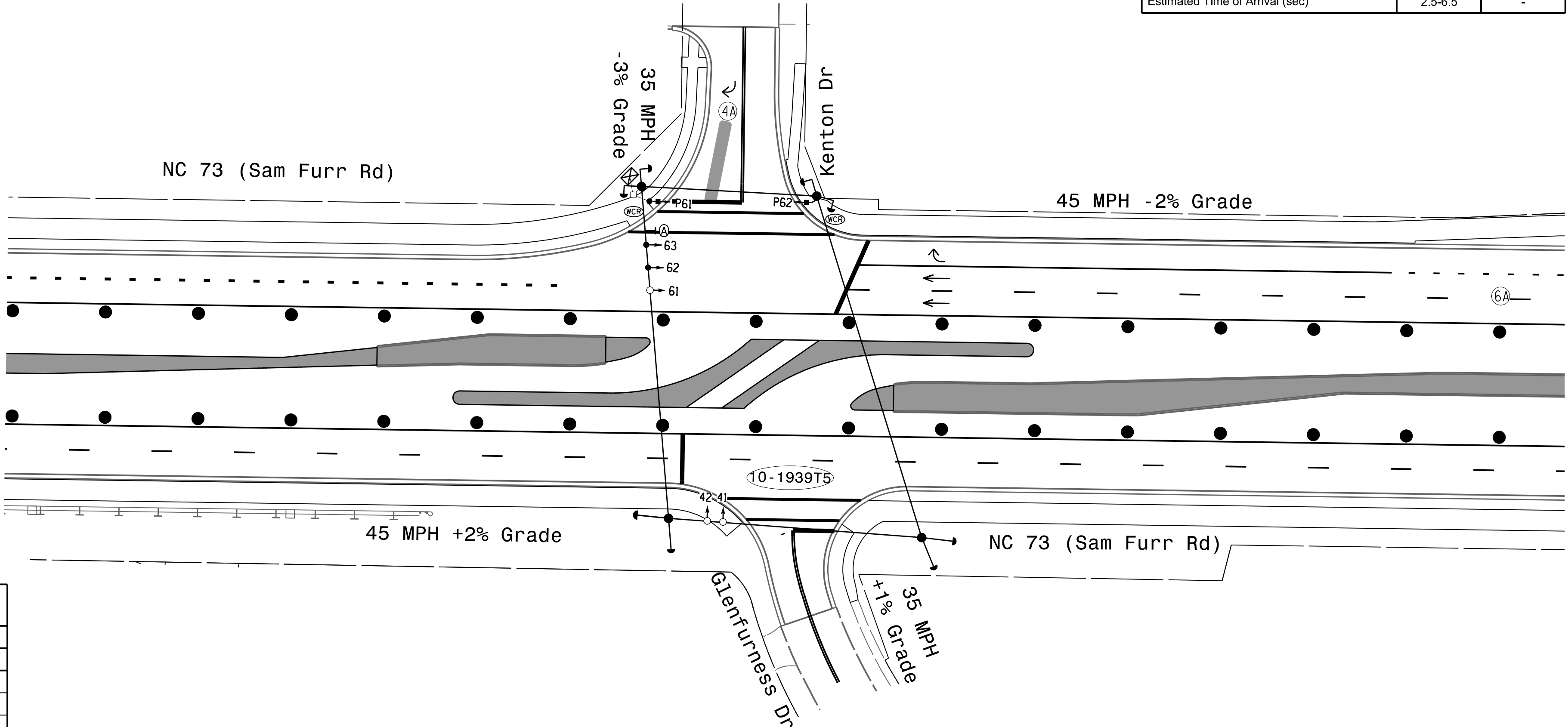
All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN
4A	*	*	*	*	4	10.0	-	X	-	X
6A	*	*	*	*	6	-	-	X	-	X

* Multi-zone Microwave Detection.

Microwave Detection System		
FUNCTION		Sensor 1 (6A)
Channel	2	
Phase	6	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	-
Range (ft)	600-100	150-100
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	-

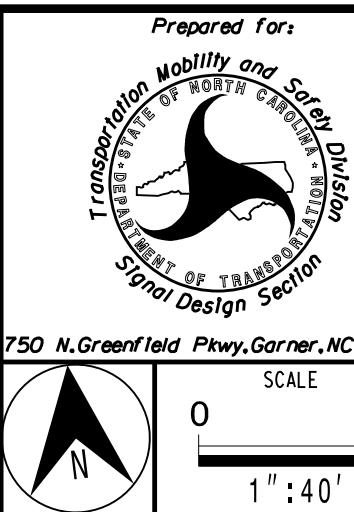


MAXTIME TIMING CHART		
FEATURE	PHASE	
	4	6
Walk *	-	7
Ped Clear	-	21
Min Green *	7	12
Passage *	2.0	2.0
Max I *	25	90
Yellow Change	4.1	4.7
Red Clear	1.4	1.7
Added Initial *	-	-
Maximum Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Advance Walk	-	7
Non Lock Detector	X	-
Vehicle Recall	-	MIN RECALL
Dual Entry	-	-

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

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton

New Installation
Temporary Design # 1
(TMP Phase 2)



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555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

NC 73 (Sam Furr Rd) at Kenton Dr	
Division 10 Mecklenburg County	Huntersville
PLAN DATE: July 2026	REVIEWED BY: Z Wang
PREPARED BY: K Hector	RKA PROJ. No.:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039071

7/10/2026

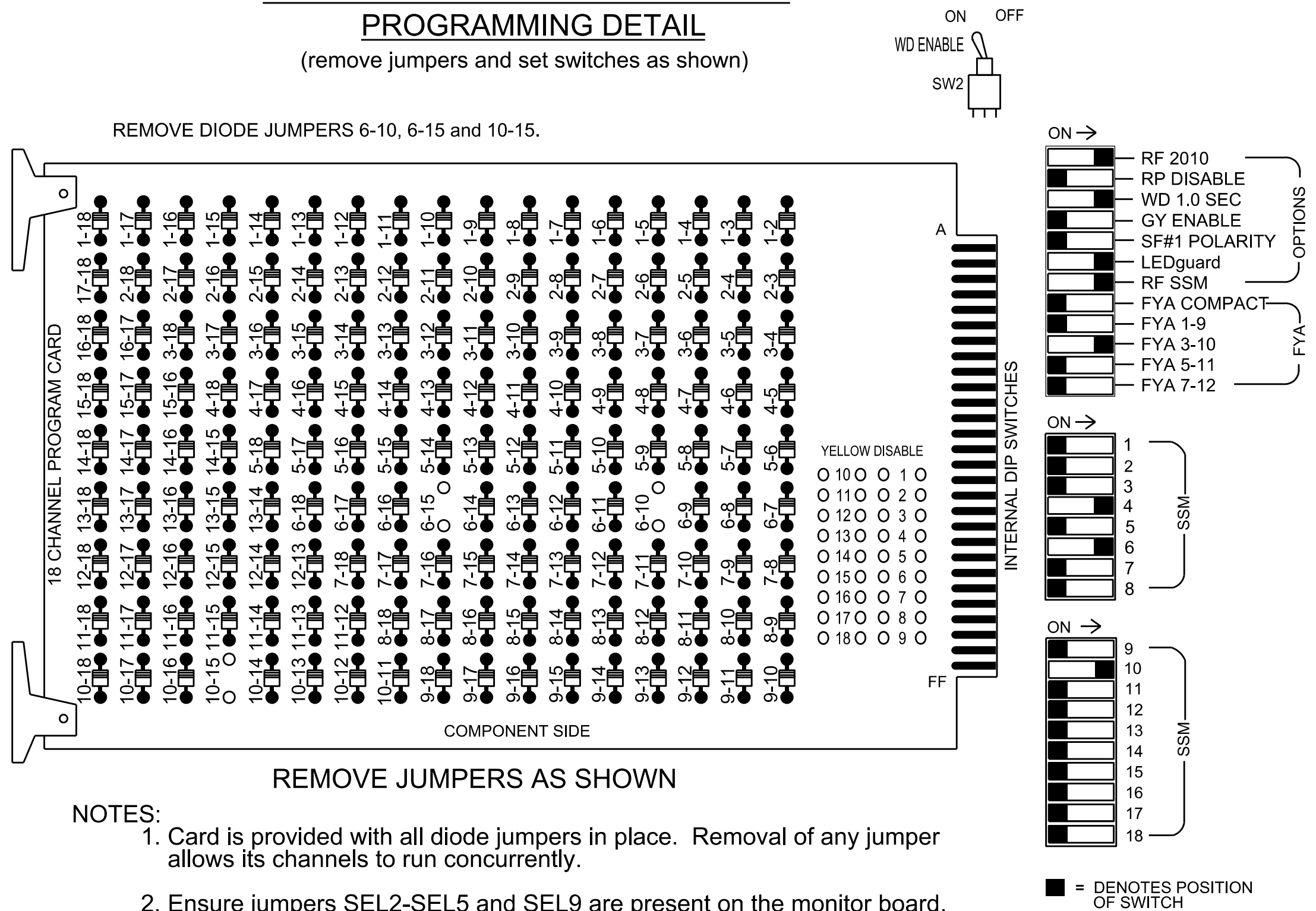
SIGNATURE DATE

SIG. INVENTORY NO. 10-2540T1

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3:15:12:1 PM

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 6 Green No Walk and 2 Phase Not On.
- Remove Min Vehicle Recall on phase 2.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

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.....S5, S8, S9, AUX S2
Phases Used.....4, 6, 6PED
Overlap "1".....NOT USED
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 7.1

SIGNAL HEAD HOOK-UP CHART

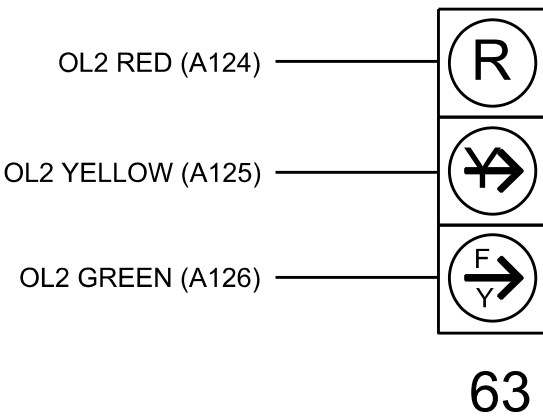
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	NU	NU	61	62	P61, P62	NU	NU	NU	63	NU	NU	NU	NU
RED					101			134	134					A124				
YELLOW								135	135									
GREEN								136										
RED ARROW																		
YELLOW ARROW					102									A125				
FLASHING YELLOW ARROW														A126				
GREEN ARROW					103			136										
Hand icon										119								
Walking person icon										121								

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head 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	U	U	U	U	U	U	U	U	U	U	U	U	U
FILE "J"	U	U	U	U	U	U	U	U	U	U	U	U	U	U

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

FS = FLASH SENSE
ST = STOP TIME

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.

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
4A	-	-	-	*	44	4	10.0		X		X	
6A	-	-	-	*	54	6			X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
I13.

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	NU	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	UN
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2540T1
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared in the Offices of:		SEAL	
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039071		7/10/2026	
750 N. Greenfield Pkwy, Garner, NC 27529		DATE	
10-2540T1		SIG. INVENTORY NO.	



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

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 6	All Red Flash Exit Time 6

OUTPUT CHANNEL CONFIGURATION

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

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

Channel Configuration

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

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2540T1
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Electrical Detail - Sheet 2 of 2

Electrical and Programming Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Kenton Drive

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026REVIEWED BY: Z Wang

PREPARED BY: K HectorREVIEWED BY:

REVISIONS

INIT. DATE

SEAL



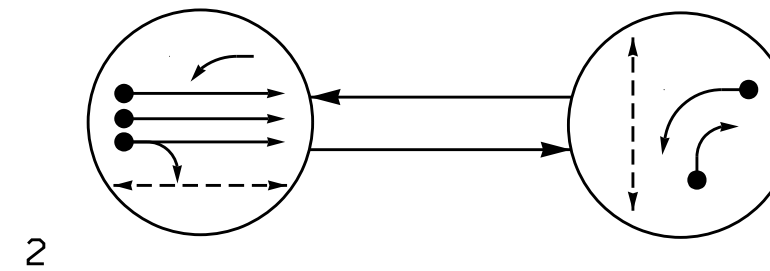
7/10/2026

SIG. INVENTORY NO. 10-2540T1

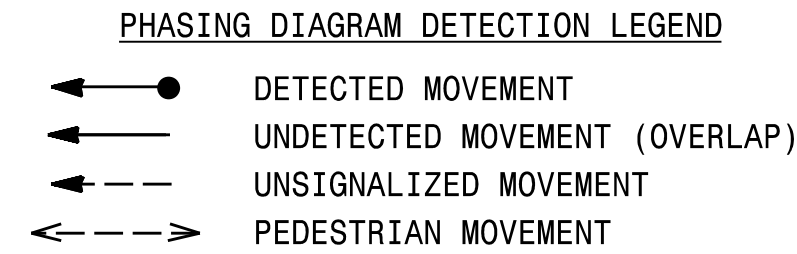
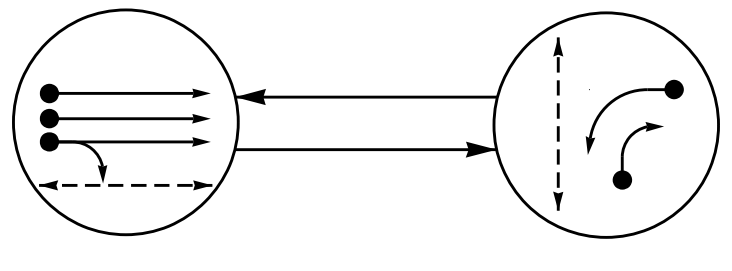
2 Phase
Fully Actuated
w/ Alternate Phasing Operation
Signal System #: D10-43_Huntersville
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- All signal heads shall have backplates with retro-reflective sheeting.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See pavement markings plans for stop line and crosswalk placement.

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



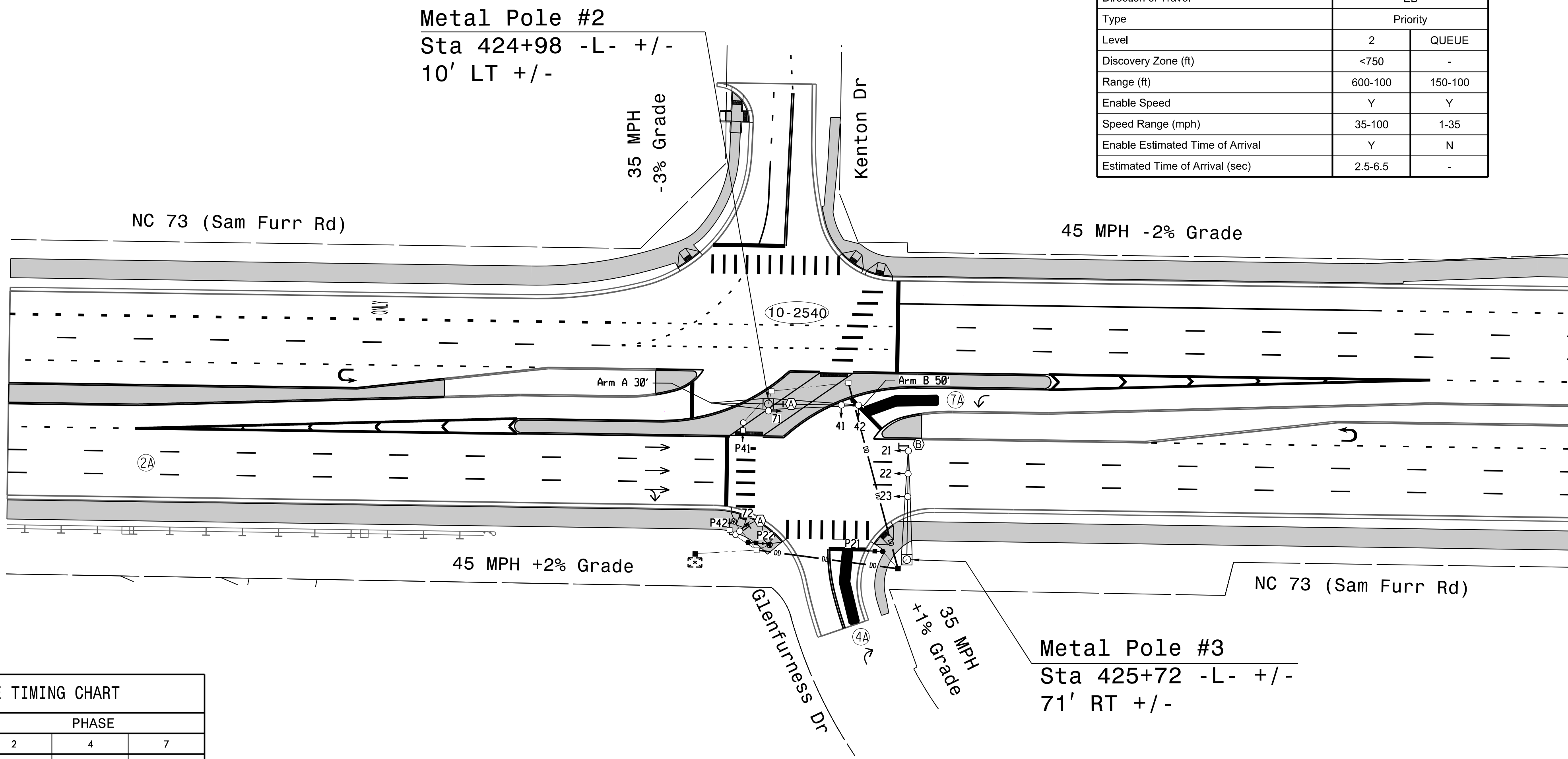
DEFAULT PHASE TABLE OF OPERATION				
SIGNAL FACE	PHASE		FLASH	
	2	4+7	F	L
21	↑	R	R	
22,23	G	R	R	
41,42	R	→	R	
71,72	←	←	←	←
P21,P22	W	DW	DRK	
P41,P42	DW	W	DRK	

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

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURN	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
2A	*	*	*	*	2	-	-	X	-	X	*
4A	*	*	*	*	4	15.0	-	X	-	X	*
7A	*	*	*	*	7	15.0#	-	X	-	X	*

* Multi-zone Microwave Detection.
Disable Delay During Alternate Phasing Operation.

Microwave Detection System		
FUNCTION		Sensor 1 (2A)
Channel	1	
Phase	2	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	-
Range (ft)	600-100	150-100
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	-



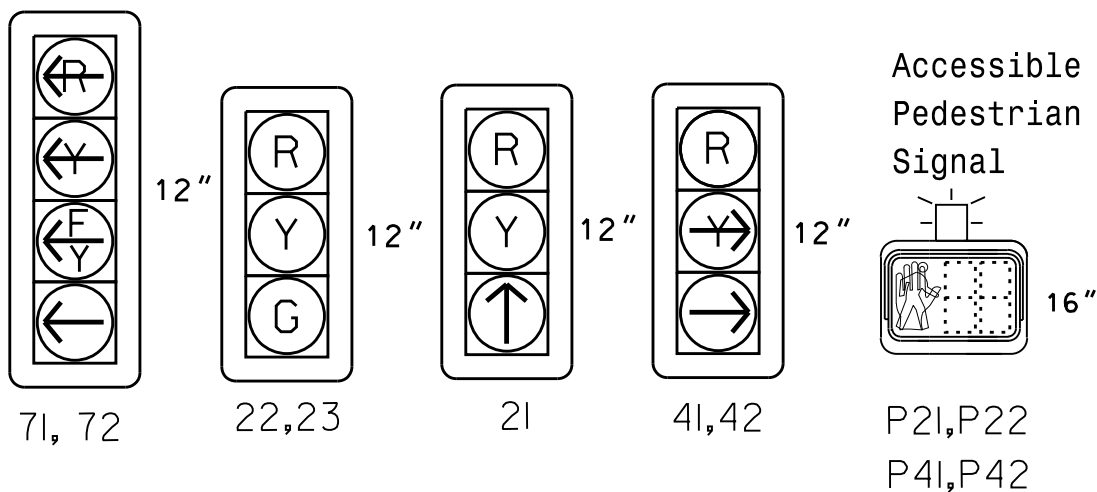
MAXTIME TIMING CHART			
FEATURE	PHASE		
	2	4	7
Walk *	7	7	-
Ped Clear	12	8	-
Min Green *	12	7	7
Passage *	2.0	2.0	2.0
Max 1 *	90	25	25
Yellow Change	4.3	3.8	3.0
Red Clear	1.3	1.0	2.4
Added Initial *	-	-	-
Maximum Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Advance 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 Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk /Don't Walk	Wait, wait to cross Glenfurness
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk /Don't Walk	Wait, wait to cross Glenfurness
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk /Don't Walk	Wait, wait to cross Sam Furr
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk /Don't Walk	Wait, wait to cross Sam Furr

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND	
PROPOSED	EXISTING
	N/A
	N/A
	N/A

Signal Upgrade - Final Design

Prepared for:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
DEPARTMENT OF TRANSPORTATION
SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd) EB
at
Glenfurness Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector RKA PROJ. No.:

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 039071

7/10/2026

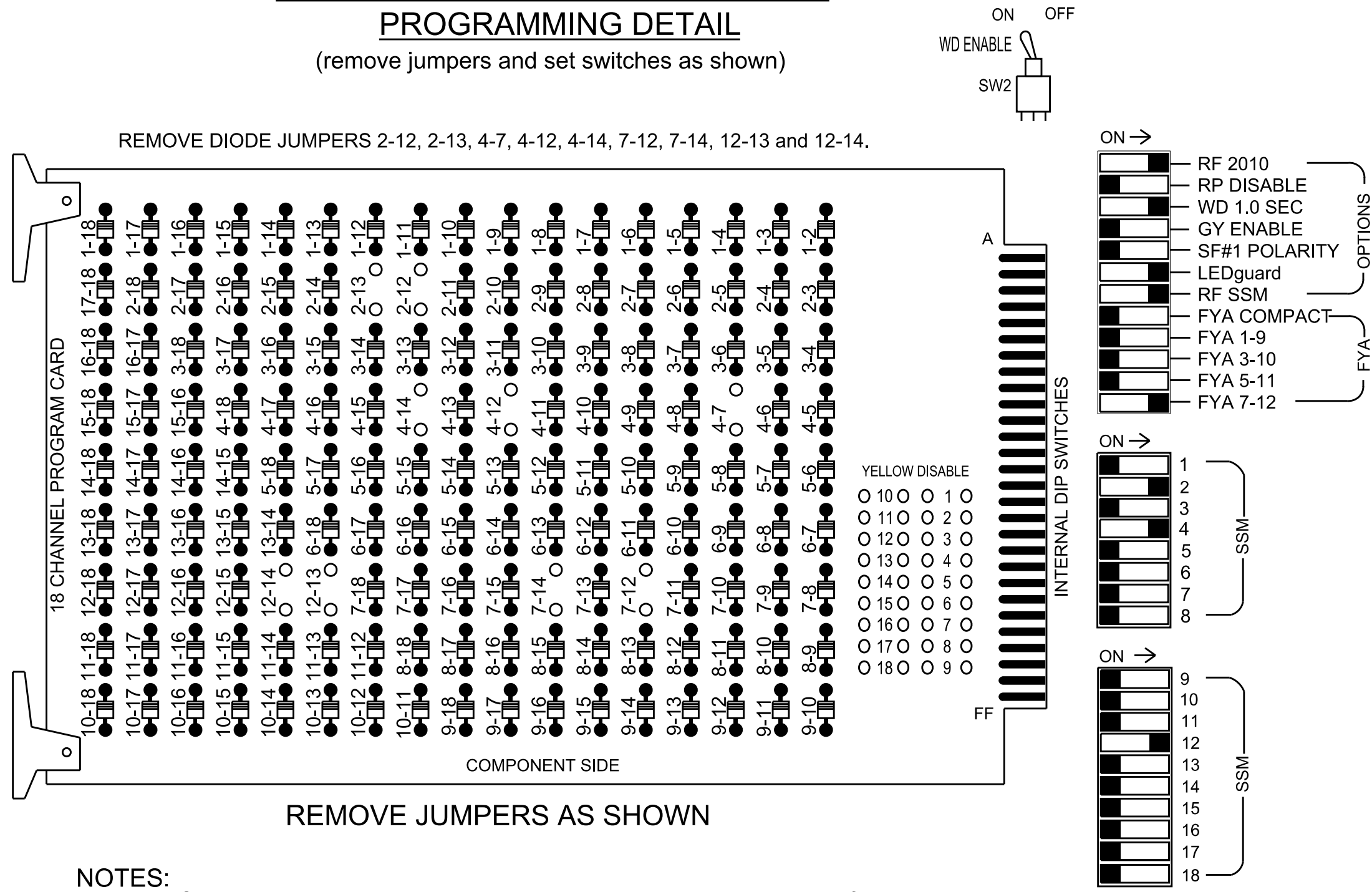
SIGNATURE DATE

SIG. INVENTORY NO. 10-1939

7/9/2026
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18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 7 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Phase Not On.
- Remove Min Vehicle Recall on phase 6.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

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, S10, AUX S5
Phases Used.....2, 2PED, 4, 4PED, 7
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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

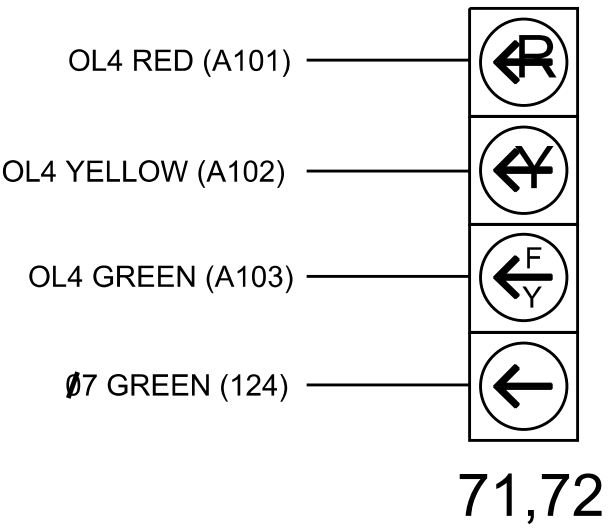
NU = Not Used

* 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 head as shown)



INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	44	4	15.0		X		X	
7A	-	-	-	*	36	7	15.0		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						

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

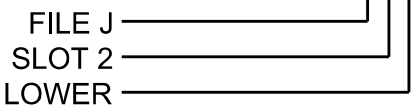
* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

SDLC NON-INTRUSIVE DETECTION CHART

Input Point	Detector Rack #3		Detector Rack #4	
	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	7A	52	NU
5	37	NU	53	NU
6	38	2A	54	NU
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	NU
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

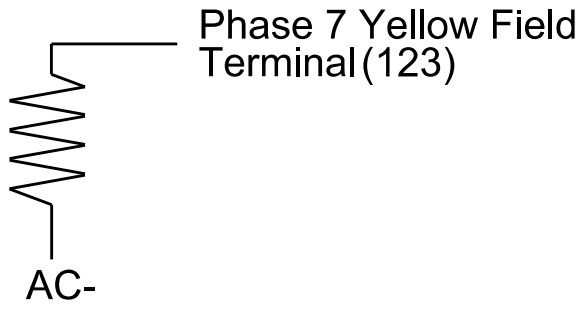
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Electrical and Programming Details For:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Glenfurness Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



7/10/2026

DATE

SIG. INVENTORY NO. 10-1939

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OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

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

NOTICE INCLUDED PHASE

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 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 7 call on detection zone 7A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING DETECTION ZONE 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.

Detector	Call Phase	Delay
36	7	0.0

7A

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: NA

Electrical Detail - Sheet 2 of 3

HDR HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Glenfurness Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



7/10/2026

DATE

SIG. INVENTORY NO. 10-1939

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment.
Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

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.

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

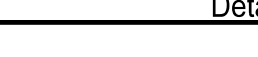
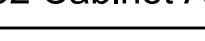
IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1939
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: NA

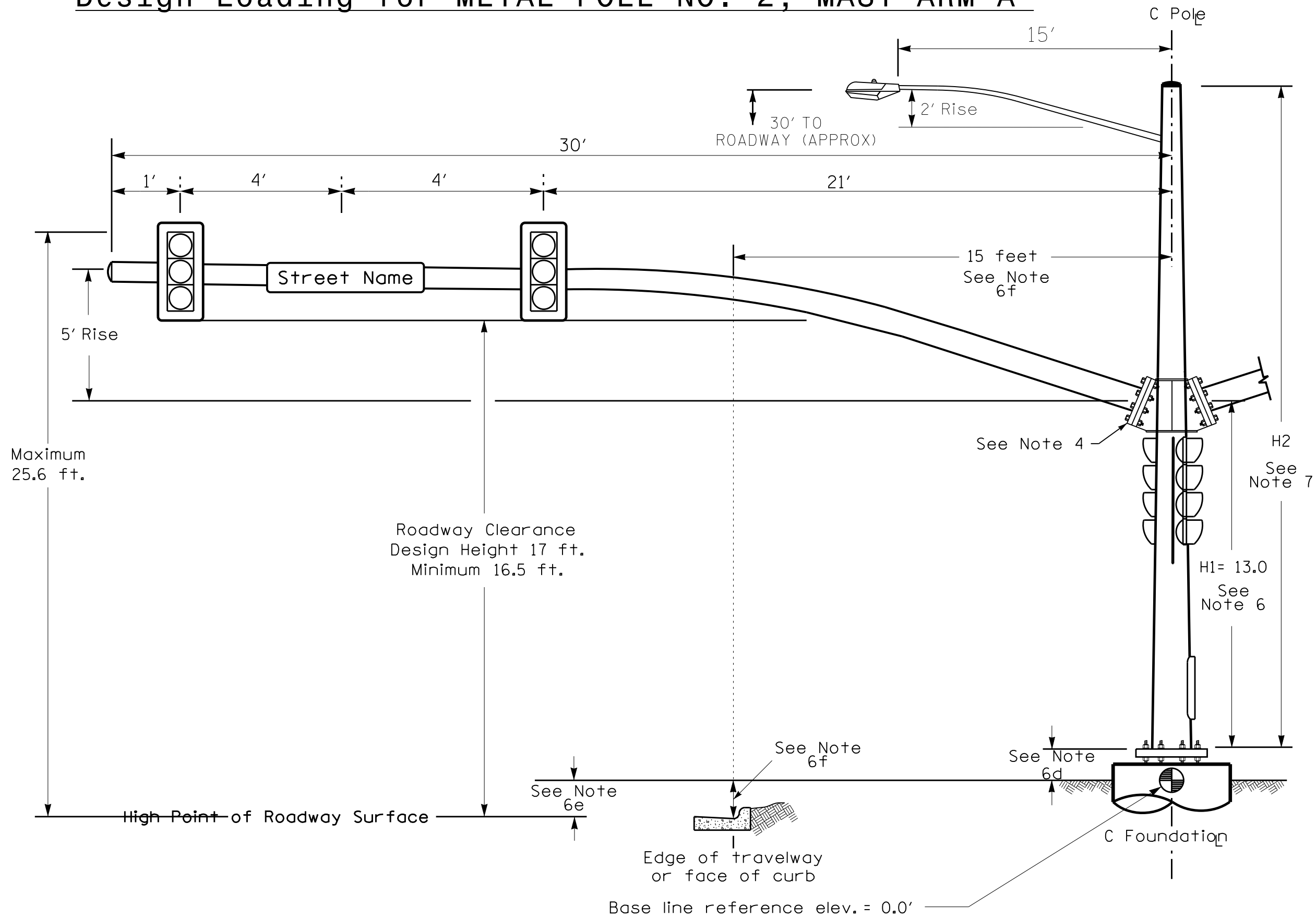
Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

Electrical Detail - Sheet 3 of 3

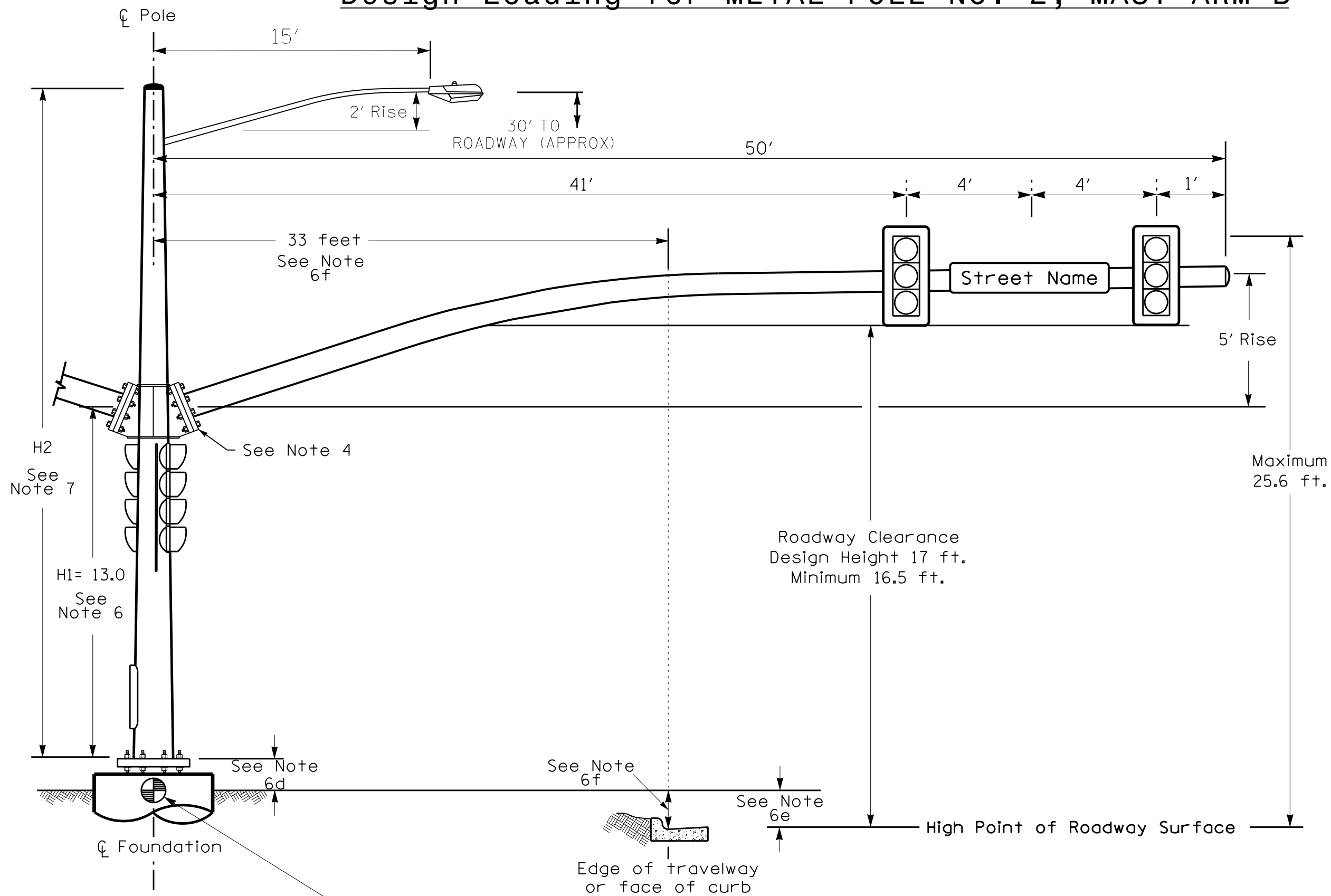
☒ Disable TS2 Cabinet Alarms	Electrical and Programming Details For:	NC 73 (Sam Furr Rd) at Glenfurness Dr	SEAL 																																	
Prepared in the Offices of: 		Division 10 Mecklenburg County Huntersville																																		
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">PLAN DATE: July 2026</td> <td style="width: 50%;">REVIEWED BY: Z Wang</td> </tr> <tr> <td>PREPARED BY: K Hector</td> <td>REVIEWED BY:</td> </tr> </table>		PLAN DATE: July 2026	REVIEWED BY: Z Wang	PREPARED BY: K Hector	REVIEWED BY:																													
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Design Loading for METAL POLE NO. 2, MAST ARM A



Elevation View

Design Loading for METAL POLE NO. 2, MAST ARM B



Elevation View



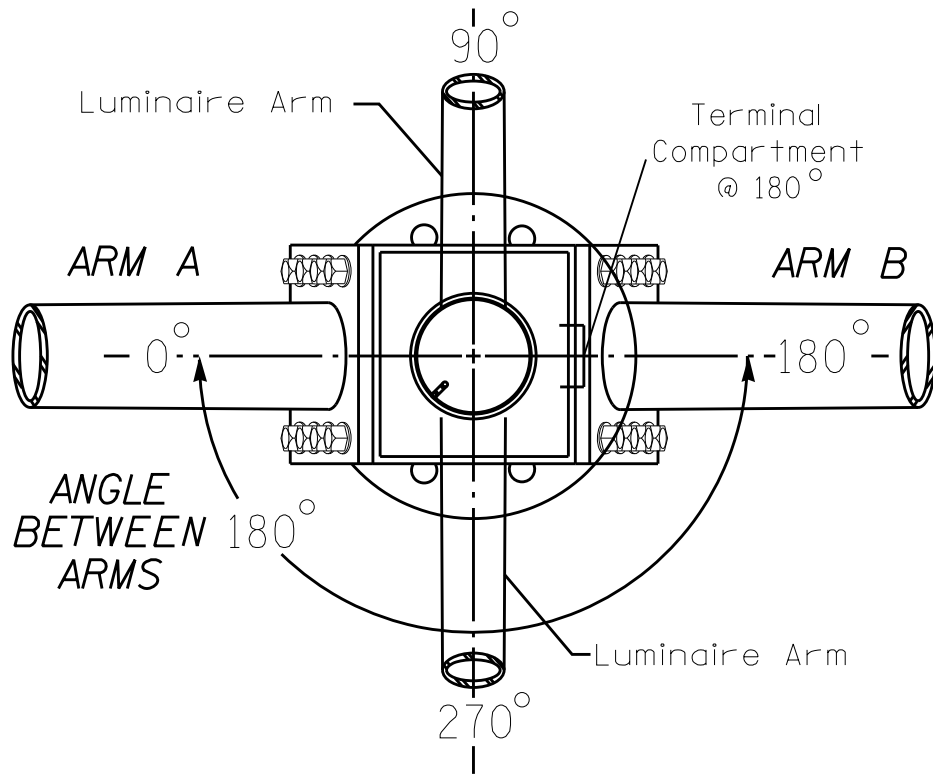
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N.C.B.E.L.S. License Number: F-0116

SPECIAL NOTE

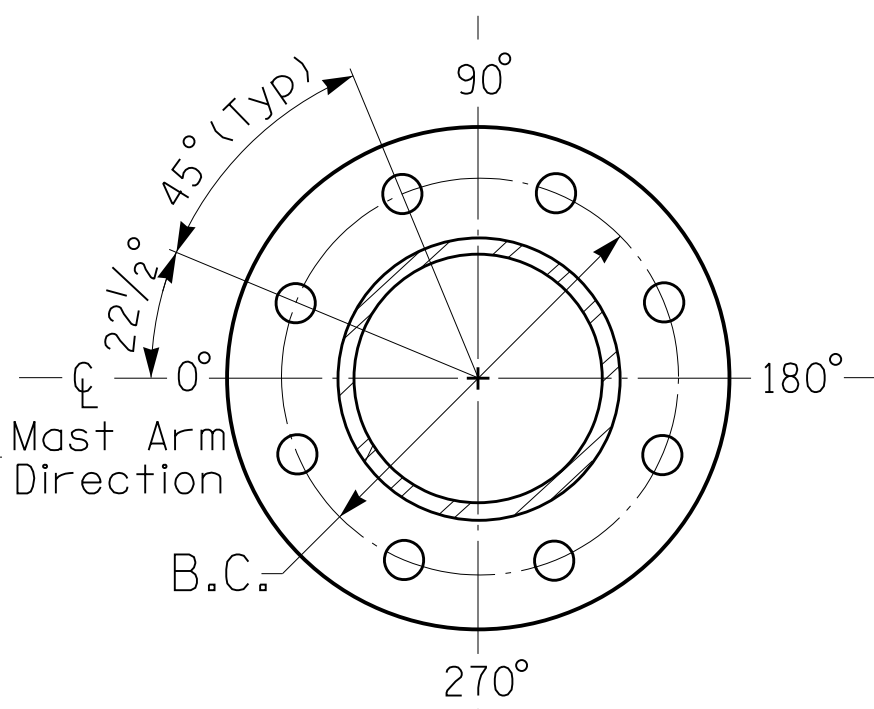
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at C Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.5 ft.	-0.5 ft.
Elevation difference at Edge of travelway or face of curb	-0.5 ft.	-0.5 ft.

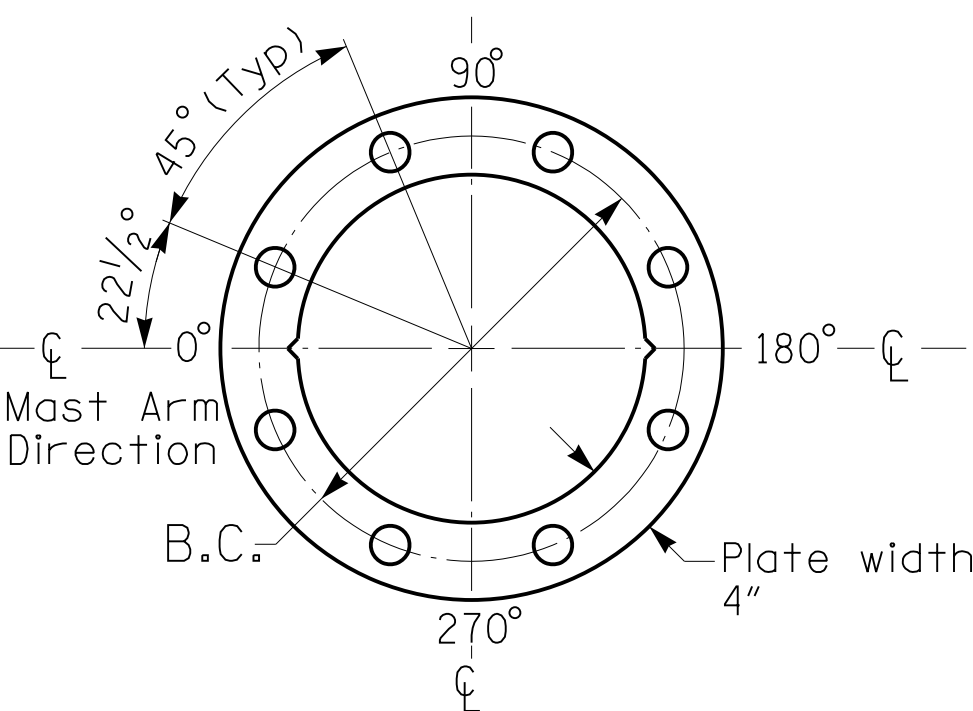


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 8.4

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
	LUMINAIRE	EPA 0.87 S.F.	13.25"W X 26.25"L	35 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

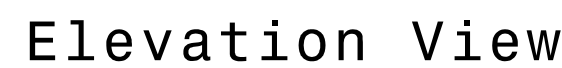
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using force ratios that do not exceed 0.9.
- 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.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
 - Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
- The pole manufacturer will determine the total height (H2) of each pole based on the luminaire height requirement of 30 ft.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
- Comply with NEC code 230.2(E) concerning service equipment disconnect.
- Lighting fixture and luminaire arm represent a load condition to the pole and may not represent exactly how the fixtures will be mounted. The contractor is responsible for ensuring that any required factory preps for mounting fixtures to the pole are included on the shop drawings.
- Design the luminaire support arm using design dimensions as shown on elevations views. Refer to the Radial Orientation Detail for attachment to the signal pole. Design arm end for a nominal 2 inch slip fit socket connection for light assembly.

ALL METAL POLES AND ARMS, PEDESTRIAN PEDESTALS, POSTS, BACKPLATES, LUMINAIRES AND SIGNAL HEADS SHOULD BE BLACK IN COLOR RAL-9005 (JET BLACK) OR EQUIVALENT IN COLOR. LUMINAIRES AS SPECIFIED IN THE PROJECT SPECIAL PROVISIONS.

NCDOT Wind Zone 5 (110 mph)

Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		NC 73 (Sam Furr Rd) at Glenfurness Dr Division 10 Mecklenburg County Huntersville PLAN DATE: July 2026 REVIEWED BY: Z Wang PREPARED BY: K Hector REVIEWED BY:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL 7/10/2026 DATE Sig. INVENTORY NO. 10-1939	
SCALE 0 N/A N/A		REVISIONS		INIT. DATE	

1



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 Differences for:		Pole 3
Baseline reference point at ① Foundation ② ground level		0.0 ft.
Elevation difference at High point of roadway surface		+0.9 ft.
Elevation difference at Edge of travelway or face of curb		-0.3 ft.



See Note 5



LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"×3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	LUMINAIRE	EPA 0.87 S.F.	13.25" W X 26.25" L	35 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
	SIGN RIGID MOUNTED	5.0 S.F.	24.0" W X 30.0" L	11 LBS

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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 force ratios that do not exceed 0.9.
4. 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.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
 - a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
 - 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.
 - f. Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
7. The pole manufacturer will determine the total height (H2) of each pole based on the luminaire height requirement of 30 ft.
8. 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.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
11. Comply with NEC code 230.2(E) concerning service equipment disconnect.
12. Lighting fixture and luminaire arm represent a load condition to the pole and may not represent exactly how the fixtures will be mounted. The contractor is responsible for ensuring that any required factory preps for mounting fixtures to the pole are included on the shop drawings.
13. Design the luminaire support arm using design dimensions as shown on elevations views. Refer to the Radial Orientation Detail for attachment to the signal pole. Design arm end for a nominal 2 inch slip fit socket connection for light assembly.

ALL METAL POLES AND ARMS, PEDESTRIAN PEDESTALS, POSTS, BACKPLATES, LUMINAIRES AND SIGNAL HEADS SHOULD BE BLACK IN COLOR RAL-9005 (JET BLACK) OR EQUIVALENT IN COLOR. LUMINAIRES AS SPECIFIED IN THE PROJECT SPECIAL PROVISIONS.

NCDOT Wind Zone 5 (110 mph)

SCALE

N/A.

Al / A

N/A

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026	REVIEWED BY:	Z Wang
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29	PREPARED BY: K Hector	REVIEWED BY:
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REVISIONS	INIT.	DATE
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FINAL UNLESS ALL
SIGNATURES COMPLETED

REAL



7/10/2026

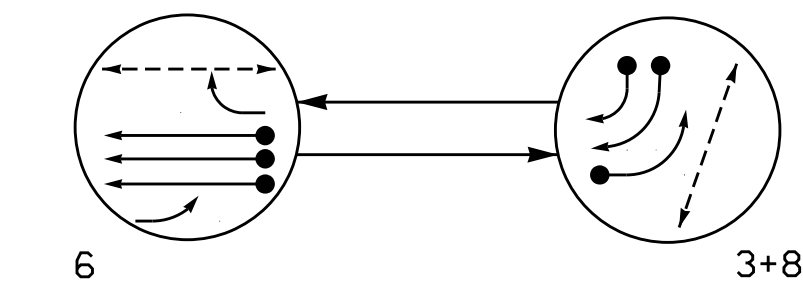
		DATE
10	JANUARY 1970	10 1970

FIG. INVENTORY NO. 10-1939

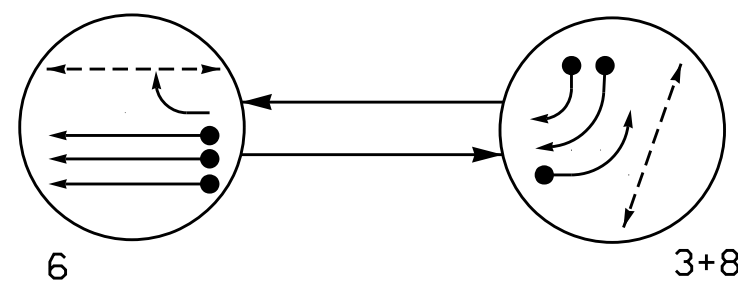
2 Phase
Fully Actuated
w/ Alternate Phasing Operation
Signal System #: D10-43_Huntersville
NOTES

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 operation unless otherwise directed by the Engineer.
3. All signal heads shall have backplates with retro-reflective sheeting.
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 features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
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. See pavement markings plans for stopline and crosswalk placement.

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASE TABLE OF OPERATION

SIGNAL FACE	PHASE		
	6	3 + 8	FLASH
31,32			
61		R	R
62,63	G	R	R
64		R	R
81,82	R		R
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

ALTERNATE PHASE TABLE OF OPERATION	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

SIGNAL FACE	PHASE		
	6	3 + 8	F L A S H
31,32	←	←	←
61	↑	R	R
62,63	G	R	R
64	↱	R	R
81,82	R	→	R
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

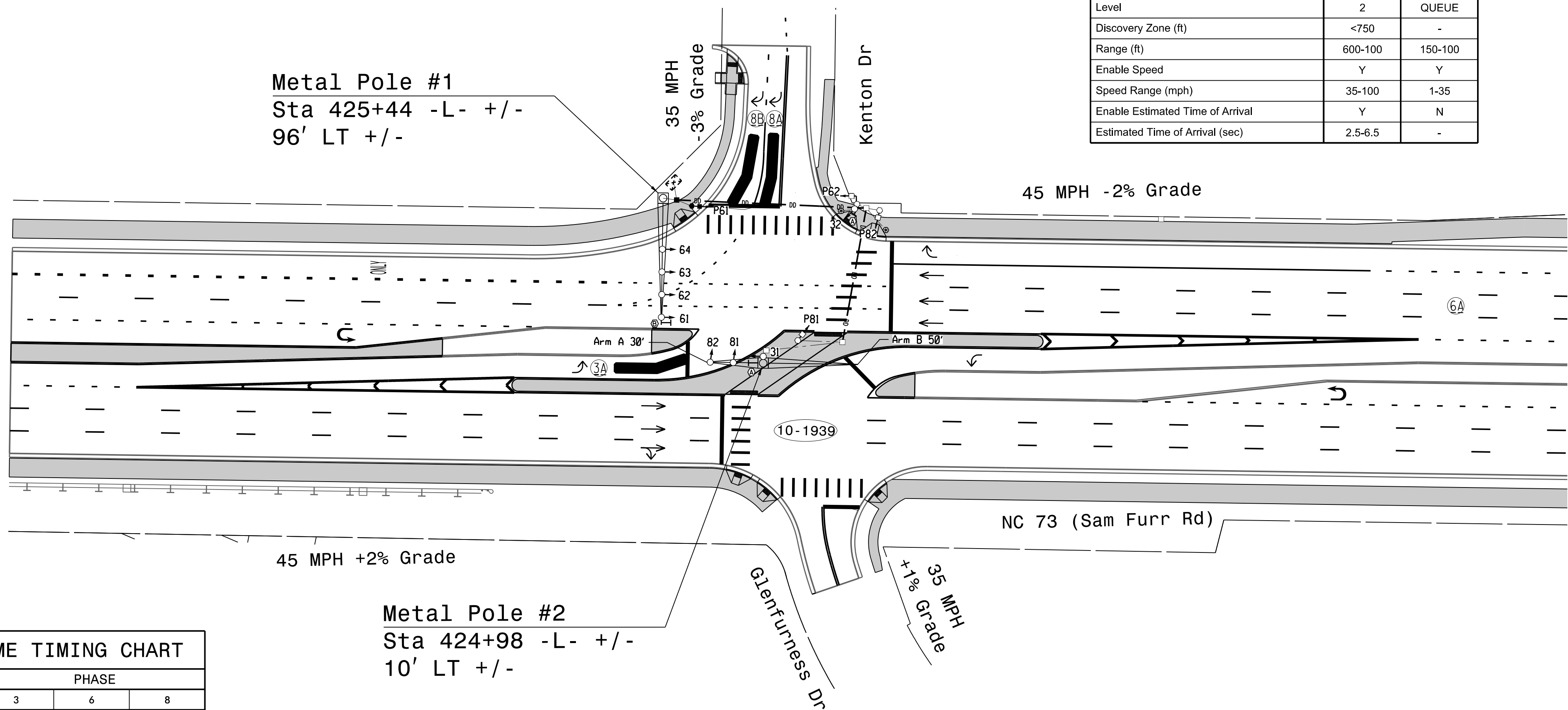
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
DETECTOR 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	*	*	*	-	3	15.0#	-	X	-	X	-	*
6A	*	*	*	-	6	-	-	X	-	X	-	*
8A	*	*	*	-	8	15.0	-	X	-	X	-	*
8B	*	*	*	-	8	15.0	-	X	-	X	-	*

* Multi-zone Microwave Detection.
Disable Delay During Alternate Phasing Operation.

Microwave Detection System

FUNCTION	Sensor 1 (6A)	
Channel	2	
Phase	6	
Direction of Travel	WB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	-
Range (ft)	600-100	150-100
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	-



MAXTIME TIMING CHART

FEATURE	PHASE		
	3	6	8
Walk *	–	7	7
Ped Clear	–	20	12
Min Green *	7	12	7
Passage *	2.0	2.0	2.0
Max 1 *	25	90	25
Yellow Change	3.0	4.7	4.1
Red Clear	3.1	1.6	1.2
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 Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

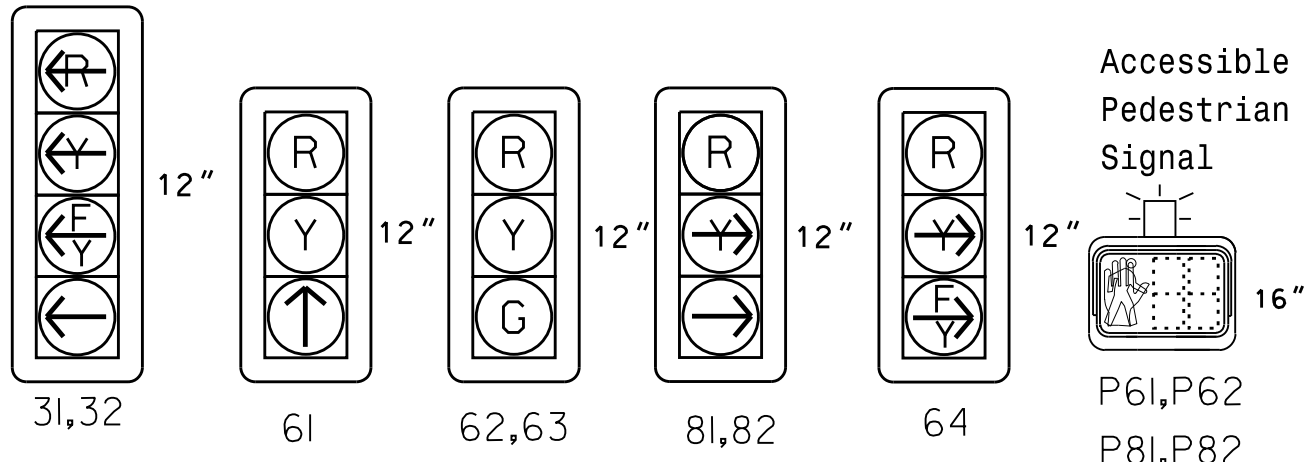
Metal Pole #2
Sta 424+98 -L- +/-
10' LT +/-

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Kenton
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Sam Furr
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Sam Furr

SIGNAL FACE I.D.

All Heads L.E.D.



Signal Upgrade - Final Design

NC 73 (Sam Furr Rd)
at
Kenton Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026	REVIEWED BY: Z Wang
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PREPARED BY:	K Hector	RKA PROJ. No.:
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REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



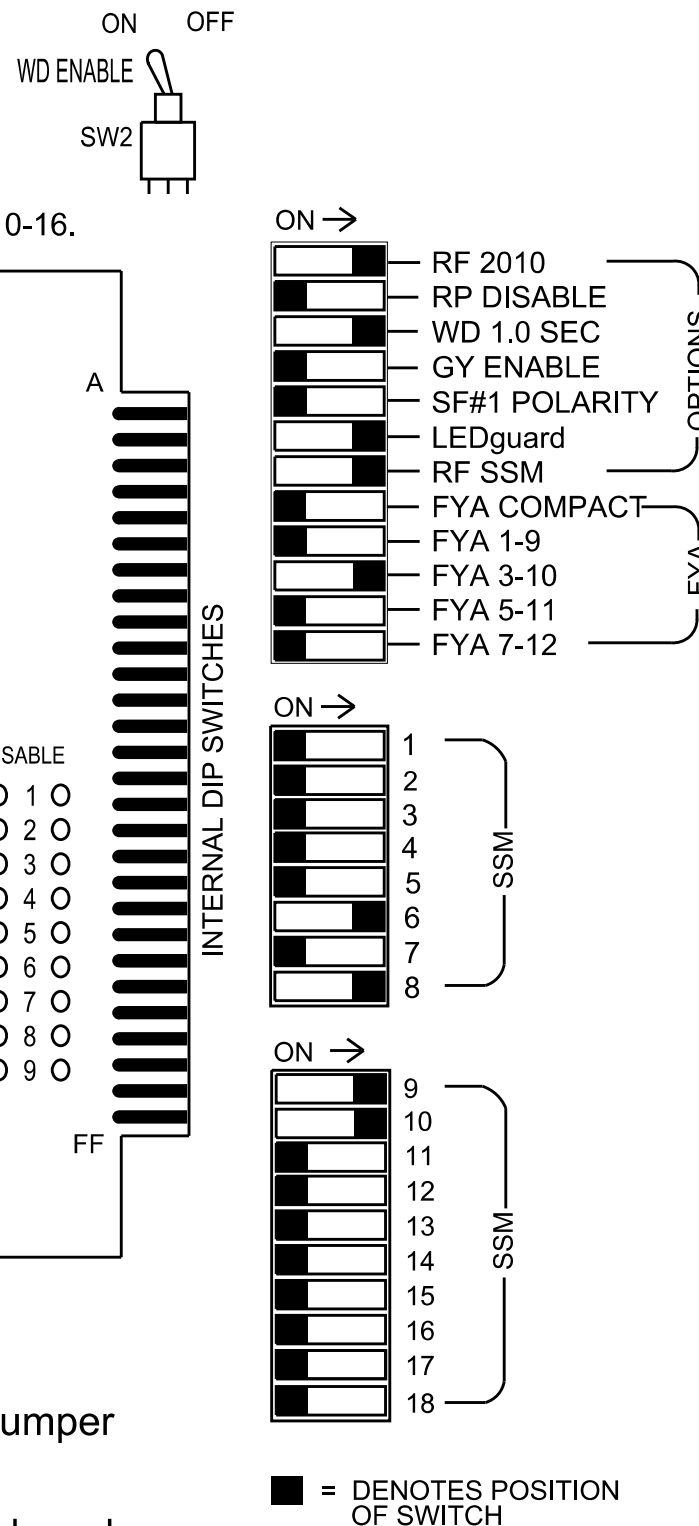
SIG. INVENTORY NO. 10-2540

(remove jumpers and set switches as shown)

The diagram shows the back of a 16mm film frame. On the left edge, frame numbers 10 through 18 are printed. The sprocket holes are arranged in two rows. The top row of sprocket holes is labeled with frame numbers 10-18. The bottom row of sprocket holes is labeled with frame numbers 10-18. The sprocket holes are arranged in a regular pattern. The text 'COMPONENT SIDE' is printed on the left edge, and 'YELLOW DISABLE' is printed on the right edge. The frame numbers 10-18 are printed on the left edge, and the sprocket holes are arranged in two rows.

REMOVE JUMPERS AS SHOWN

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.



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 3 and 8 for Dual Entry.
3. Program controller to start up in phase 6 Green No Walk and 2 Phase Not On.
4. Remove Min Vehicle Recall on phase 2.
5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
6. The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

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, S12, AUX S1, AUX S2
Phases Used.....	3, 6, 6PED, 8, 8PED
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	NOT USED
Overlap "4".....	NOT USED

*See overlap programming detail on sheet 2

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NU	NU	★ 31,32	NU	NU	NU	61	62,63	P61, P62	NU	81,82	P81, P82	64★ 31,32★	NU	NU	NU	NU
RED								134	134			107		A121				
YELLOW				★				135	135									
GREEN									136									
RED ARROW														A124				
YELLOW ARROW											108		A122	A125				
FLASHING YELLOW ARROW													A123	A126				
GREEN ARROW				118				136				109						
									119			110						
									121			112						

* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

(front view)

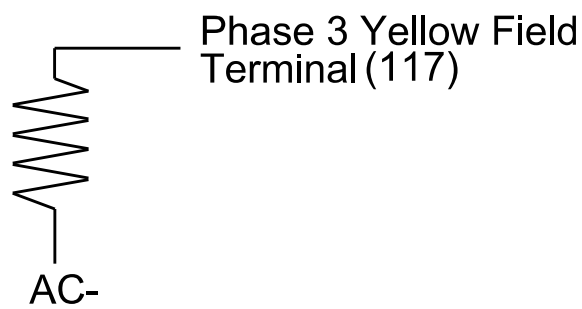
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FS = FLASH SENSE
ST = STOP TIME

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.

(install resistor as shown)

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



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	-	-	-	*	34	*	3	15.0	X		X	
6A	-	-	-	*	54		6		X		X	
8A	-	-	-	*	60		8	15.0	X		X	
8B	-	-	-	*	61		8	15.0	X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6		NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I13.				
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

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

* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

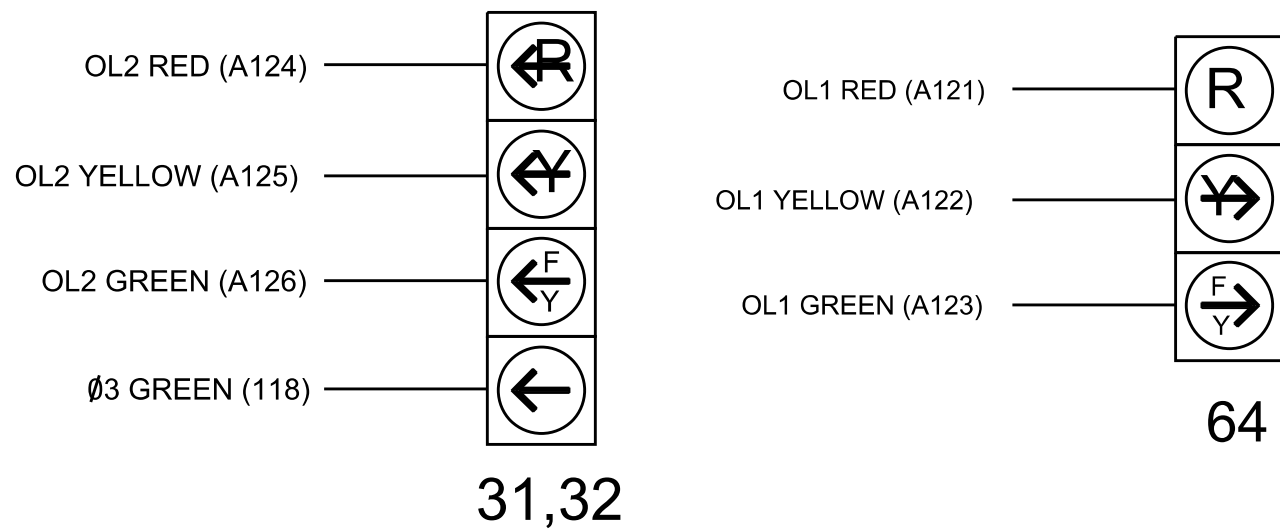
	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	3A	50	NU
3	35	NU	51	NU
4	36	NU	52	NU
5	37	NU	53	NU
6	38	NU	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	NU	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

INPUT FILE POSITION LEGEND: J2L

FILE J _____

SLOT 2 _____

LOWER _____

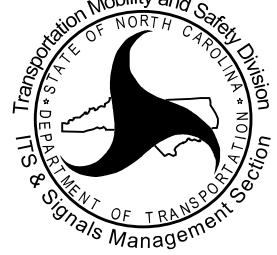


THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2540
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: NA

Electrical Detail - Sheet 1 of 3

Electrical and Programming Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Kenton Dr

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026	REVIEWED BY:	Z Wang
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PREPARED BY:	K Hector	REVIEWED BY:
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REVISIONS	INIT.
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SIGNATURES COMPLETED

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7/10/2

_____ DA _____

SIG. INVENTORY NO. 10-2

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OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

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

← NOTICE INCLUDED PHASE

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 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 3 call on detection zone 3A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING DETECTION ZONE 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.

Detector	Call Phase	Delay
3A	3	0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2540
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: NA

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:	NC 73 (Sam Furr Rd) at Kenton Dr	SEAL	
Prepared in the Offices of:	Division 10 Mecklenburg County Huntersville		
	PLAN DATE: July 2026		REVIEWED BY: Z Wang
	PREPARED BY: K Hector		REVIEWED BY:
	REVISIONS		
	INIT. DATE		
750 N. Greenfield Pkwy, Garner, NC 27529		DATE	
		SIG. INVENTORY NO.	

 HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

7/10/2026

DATE

10-2540

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment.
Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

FLASHER CIRCUIT MODIFICATION DETAIL

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

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
 2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
 3. REMOVE FLASHER UNIT 2.
- THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

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.

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

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

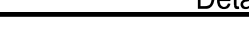
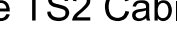
IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2540
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: NA

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

Electrical Detail - Sheet 3 of 3

☒ Disable TS2 Cabinet Alarms	Electrical and Programming Details For:  Prepared in the Offices of:	NC 73 (Sam Furr Rd) at Kenton Dr Division 10 Mecklenburg County Huntersville <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">PLAN DATE: July 2026</td> <td style="width: 50%;">REVIEWED BY: Z Wang</td> </tr> <tr> <td>PREPARED BY: K Hector</td> <td>REVIEWED BY:</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">REVISIONS</th> <th style="width: 15%;">INIT.</th> <th style="width: 15%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	PLAN DATE: July 2026	REVIEWED BY: Z Wang	PREPARED BY: K Hector	REVIEWED BY:	REVISIONS	INIT.	DATE												
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 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	750 N. Greenfield Pkwy, Garner, NC 27529	SEAL  7/10/2026 DATE _____ SIG. INVENTORY NO. 10-2540																			

Design Loading for METAL POLE NO. 1

This diagram illustrates the elevation view of a street lighting pole and fixture assembly, showing dimensions and design requirements.

Dimensions and Spacing:

- Horizontal spacing between fixture centers: 1', 3', 4', 4', 8', 8', 39'.
- Total horizontal distance from the first fixture to the pole: 67'.
- Horizontal distance from the pole to the end of the arm: 15'.
- Vertical rise of the arm at the pole: 2'.
- Vertical rise of the first fixture: 5'.
- Horizontal distance from the pole to the center of the fixture arm: 19 feet (See Note 6f).

Clearance and Height Requirements:

- Roadway Clearance Design Height: 17 ft. (Minimum 16.5 ft.).
- Maximum height of the fixture: 25.6 ft.
- Height of the pole above the foundation: H1 = 12.0 (See Note 6).
- Height of the pole above the roadway surface: H2 (See Note 7).

Labels and Notes:

- High Point of Roadway Surface
- Edge of travelway or face of curb
- Base line reference elev. = 0.0'
- See Note 4
- See Note 6e
- See Note 6d
- See Note 6f
- See Note 6g
- See Note 6h
- See Note 6i
- See Note 6j
- See Note 6k
- See Note 6l
- See Note 6m
- See Note 6n
- See Note 6o
- See Note 6p
- See Note 6q
- See Note 6r
- See Note 6s
- See Note 6t
- See Note 6u
- See Note 6v
- See Note 6w
- See Note 6x
- See Note 6y
- See Note 6z

Elevation View

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 Differences for:	Pole 1
Baseline reference point at C Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	-1.6 ft.
Elevation difference at Edge of travelway or face of curb	-2.7 ft.



PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 9.4

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"x-3" SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	LUMINAIRE	EPA 0.87 S.F.	13.25" W X 26.25" L	35 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
	SIGN RIGID MOUNTED	5.0 S.F.	24.0" W X 30.0" L	11 LBS

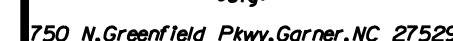
DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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 force ratios that do not exceed 0.9.
4. 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.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
 - a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
 - 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.
 - f. Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
7. The pole manufacturer will determine the total height (H2) of each pole based on the luminaire height requirement of 30 ft.
8. 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.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
11. Comply with NEC code 230.2(E) concerning service equipment disconnect.
12. Lighting fixture and luminaire arm represent a load condition to the pole and may not represent exactly how the fixtures will be mounted. The contractor is responsible for ensuring that any required factory preps for mounting fixtures to the pole are included on the shop drawings.
13. Design the luminaire support arm using design dimensions as shown on elevations views. Refer to the Radial Orientation Detail for attachment to the signal pole. Design arm end for a nominal 2 inch slip fit socket connection for light assembly.

NCDOT Wind Zone 5 (110 mph)



PLAN DATE:	July 2026	REVIEWED BY:	Z Wang
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PLAN DATE:	July 2020	REVIEWED BY:	Z Wang
PREPARED BY:	K Hector	REVIEWED BY:	

29	PREPARED BY: R. HECOT	REVIEWED BY:		
	REVISIONS	INIT.	D	

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

REAL



7/10/2026

SIG. INVENTORY NO. 10-2540

[illegible]

Elevation View

Design Loading for METAL POLE NO. 2, WAST

15'

2' Rise

30' TO ROADWAY (APPROX)

50'

41'

33 feet
See Note 6f

4'

4'

1'

Street Name

5' Rise

Maximum 25.6 ft.

Roadway Clearance
Design Height 17 ft.
Minimum 16.5 ft.

H2
See Note 7

H1= 13.0
See Note 6

See Note 4

See Note 6d

Foundation

See Note 6f

See Note 6e

Edge of travelway or face of curb

High Point of Roadway Surface

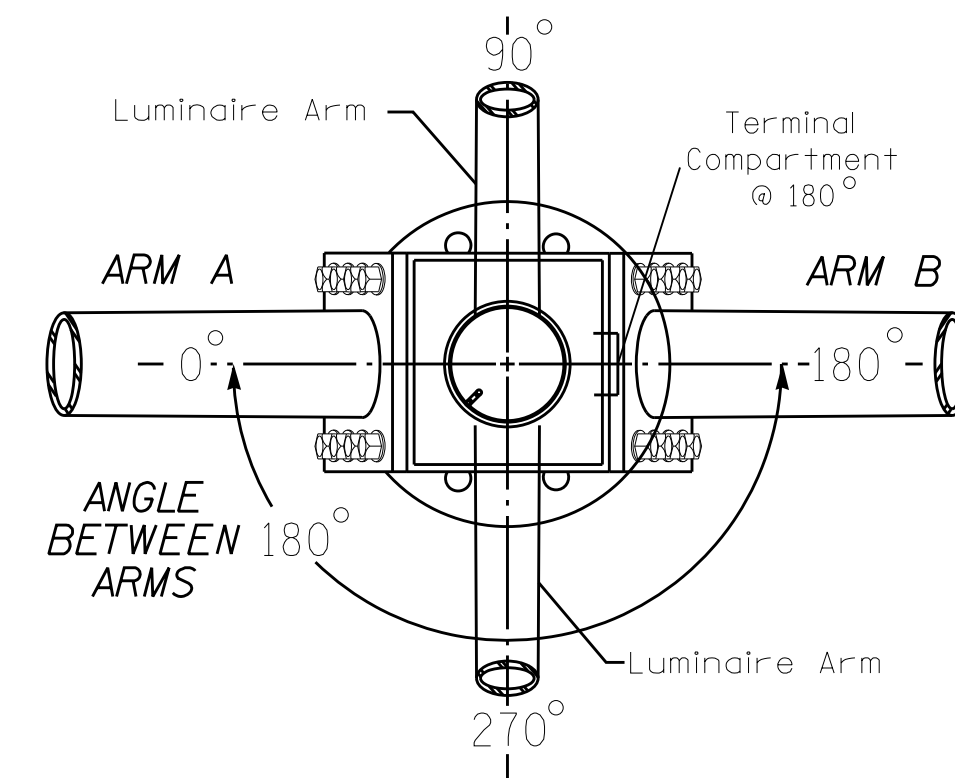
Base line reference elev. = 0.0'

Elevation View

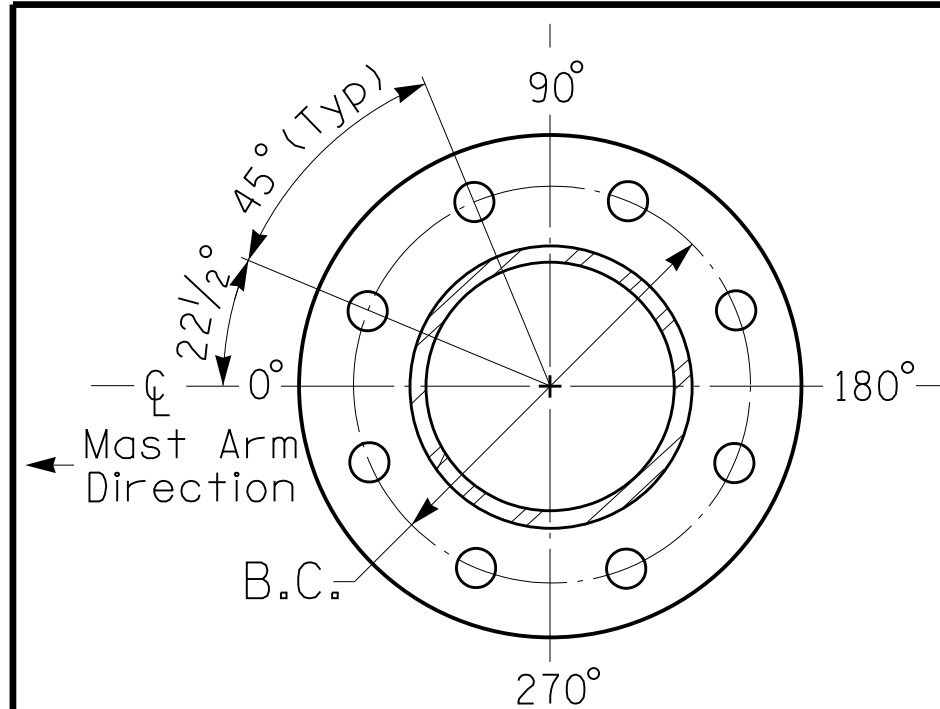


The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation 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	-0.5 ft.	-0.5 ft.
Elevation difference at Edge of travelway or face of curb	-0.5 ft.	-0.5 ft.

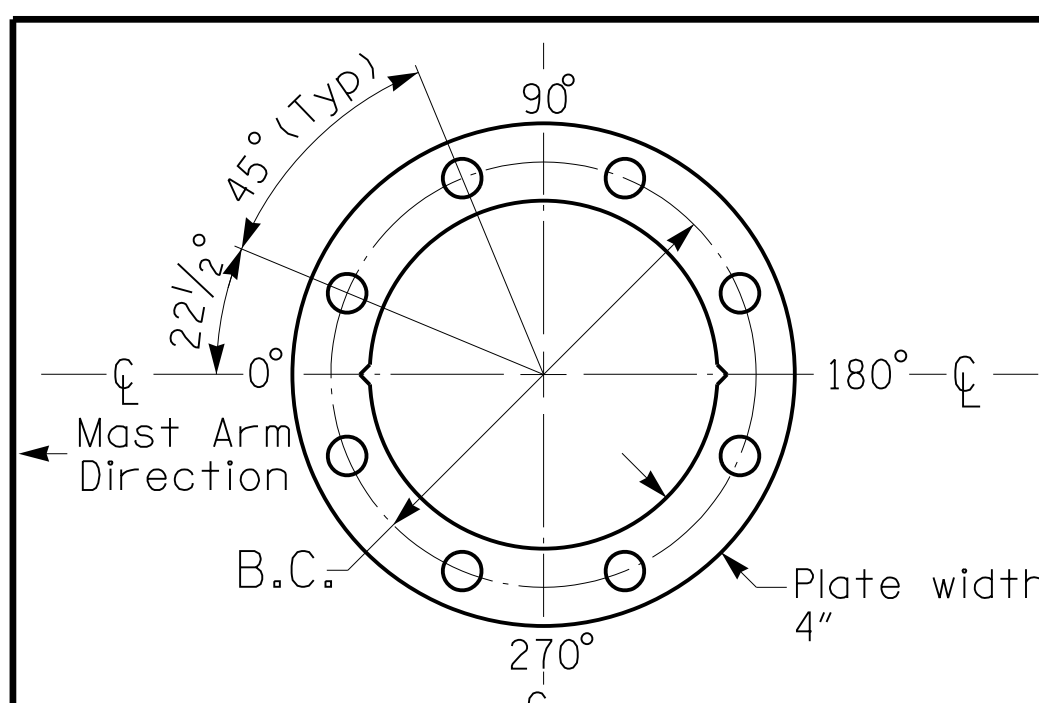


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"x3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	LUMINAIRE	EPA 0.87 S.F.	13.25" W X 26.25" L	35 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

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 - 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.
 - f. Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
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13. Design the luminaire support arm using design dimensions as shown on elevations views. Refer to the Radial Orientation Detail for attachment to the signal pole. Design arm end for a nominal 2 inch slip fit socket connection for light assembly.

ALL METAL POLES AND ARMS, PEDESTRIAN PEDESTALS, POSTS, BACKPLATES, LUMINAIRES AND SIGNAL HEADS SHOULD BE BLACK IN COLOR RAL-9005 (JET BLACK) OR EQUIVALENT IN COLOR. LUMINAIRES AS SPECIFIED IN THE PROJECT SPECIAL PROVISIONS.

NCDOT Wind Zone 5 (110 mph)



NC 73 (Sam Furr Rd)
at
Kenton Dr
Division 10 Mecklenburg County Huntersville
PLAN DATE: July 2026 REVIEWED BY: Z Wang

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

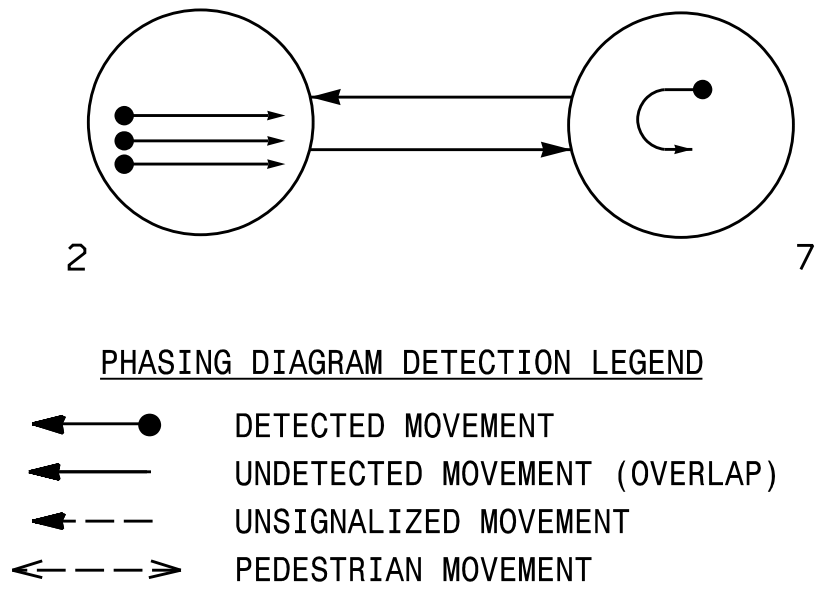


SIG. INVENTORY NO. 10-2540

2 Phase
Fully Actuated
Signal System #: D10-43_Huntersville
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night operation unless otherwise directed by the Engineer.
- All signal heads shall have backplates with retro-reflective sheeting.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- See pavement markings plans for stop bar and crosswalk placement.

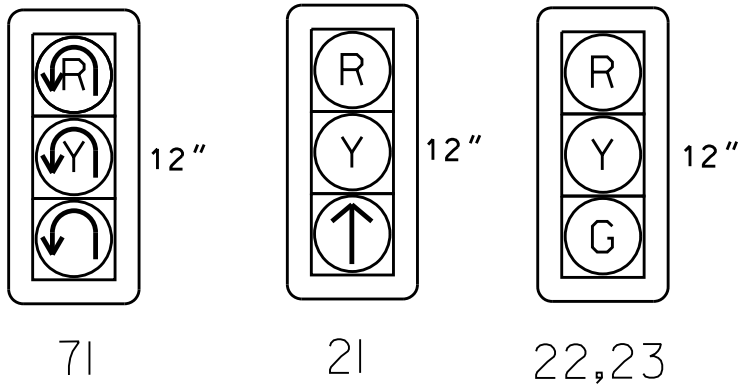
PHASING DIAGRAM



SIGNAL FACE	PHASE		
	2	7	FLASH
21	↑	R	R
22,23	G	R	R
71	(R)	(R)	(R)

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
DETECTOR ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
2A	*	*	*	*	2	-	-	X	-	X	*
7A	*	*	*	*	7	-	-	X	-	X	*

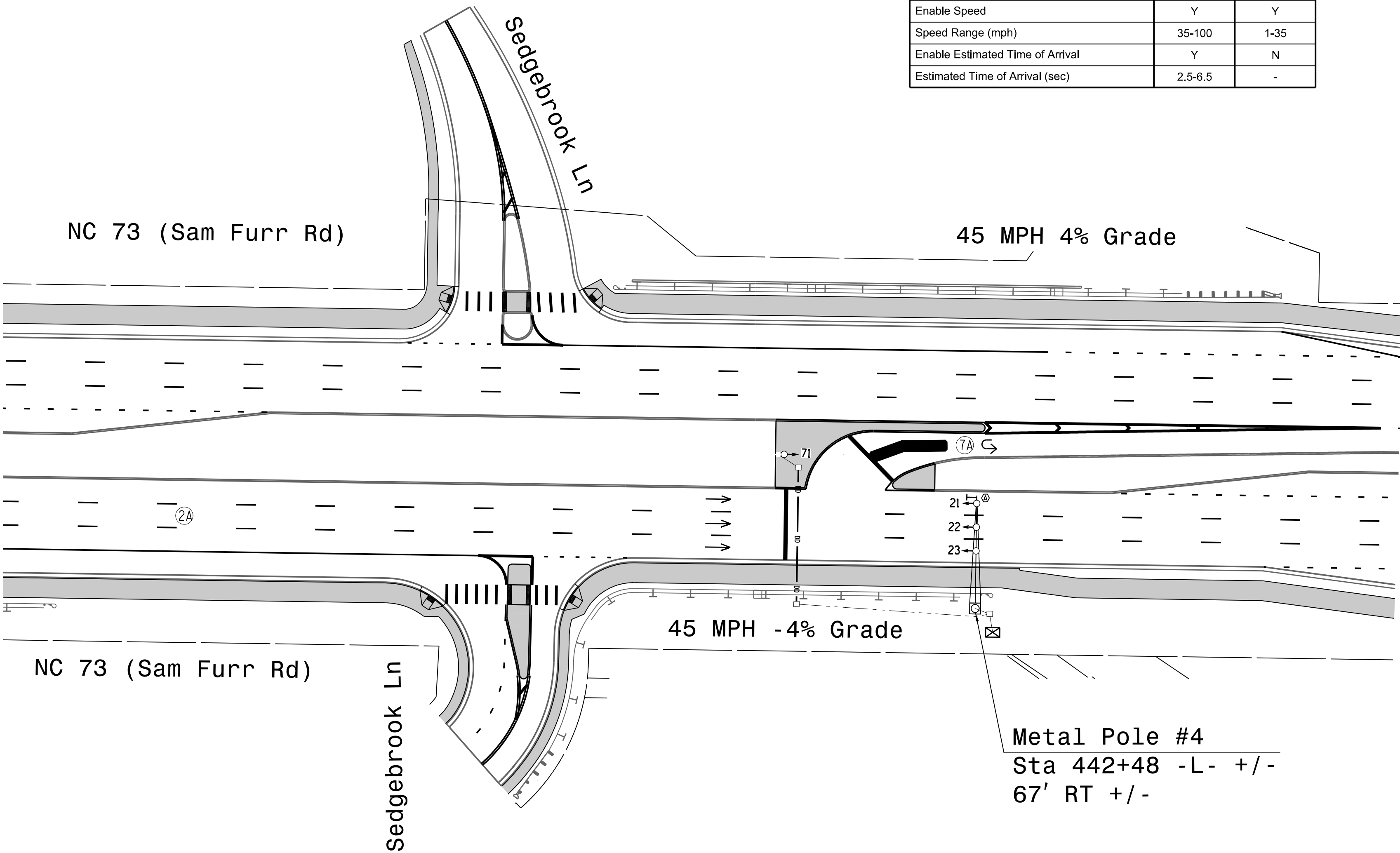
* Multi-zone Microwave Detection.

Microwave Detection System		
FUNCTION		Sensor 1 (2A)
Channel	1	
Phase	2	
Direction of Travel	EB	
Type	Priority	
Level	2	QUEUE
Discovery Zone (ft)	<750	-
Range (ft)	600-100	150-100
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	-

MAXTIME TIMING CHART

FEATURE	PHASE	
	2	7
Walk *	-	-
Ped Clear	-	-
Min Green *	12	7
Passage *	2.0	2.0
Max 1 *	90	25
Yellow Change	4.9	3.0
Red Clear	1.0	3.6
Added Initial *	-	-
Maximum Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Advance Walk	-	-
Non Lock Detector	-	X
Vehicle Recall	MIN RECALL	-
Dual Entry	-	-

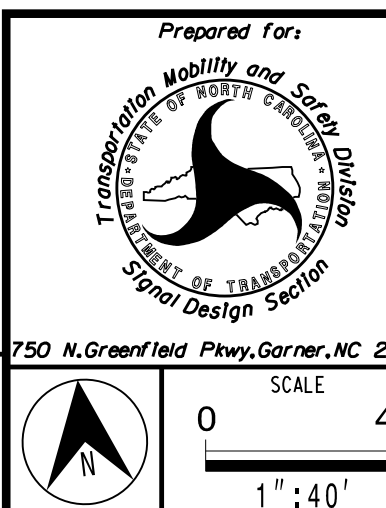
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



LEGEND

PROPOSED	EXISTING
	N/A

New Installation



NC 73 (Sam Furr Rd) at U-Turn East of Sedgebrook lane	
Division 10 Mecklenburg County	Huntersville
PLAN DATE: July 2026	REVIEWED BY: Z Wang
PREPARED BY: K Hector	RKA PROJ. No.:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SEAL	SEAL
SIGNATURE	DATE
SIG. INVENTORY NO.	10-2453

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900, Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

(set switches as shown)



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.

1. To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Phase Not On.
3. Remove Min Vehicle Recall on phase 6.
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 Signal System #: D10-43 Huntersville.

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, S10
Phases Used.....	2, 7
Overlap "1".....	NOT USED
Overlap "2".....	NOT USED
Overlap "3".....	NOT USED
Overlap "4".....	NOT USED

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.

NU = Not Used

Web Interface
Home >Controller >Advanced IO>Channels>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

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	NU	49	NU
2	34	NU	50	NU
3	35	NU	51	NU
4	36	7A	52	NU
5	37	NU	53	NU
6	38	2A	54	NU
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	NU	60	NU
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

Modify parameters as shown below and save changes.

StartUp Clearance Hold
6

All Red Flash Exit Time
6

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Main Menu >Controller >More >Advanced IO >IO Modules

Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

☒ Disable TS2 Cabinet Alarms

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
2A	-	-	-	★	38	2			X		X	
7A	-	-	-	★	36	7			X		X	

*For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

FILE J _____
SLOT 2 _____
LOWER _____

(front view)

[illegible]

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

FS = FLASH SENSE
ST = STOP TIME

Electrical Detail

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
U-Turn East of
Sedgebrook lane

Division 10 Mecklenburg County Huntersville

PLAN DATE:	July 2026	REVIEWED BY:	Z Wang
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PREPARED BY:	K Hector	REVIEWED BY:
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REVISIONS	INIT.	DATE
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FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



7/10/202

SIG. INVENTORY NO.

10-2453

Design Loading for METAL POLE NO. 4

The diagram illustrates the elevation view of a metal pole assembly. Key dimensions and features include:

- Horizontal Dimensions:**
 - 57' total length from the first fixture to the pole.
 - 37' length from the last fixture to the pole.
 - 15' height from the pole top to the roadway level.
 - 1' and 3' spacing between the first two fixtures.
 - 8' spacing between subsequent fixtures.
- Vertical Dimensions:**
 - 5' Rise from the roadway surface to the first fixture.
 - 19 feet from the roadway surface to the pole top (See Note 6f).
 - 2' Rise from the roadway surface to the pole top.
 - Maximum 25.6 ft. total height.
 - 17 ft. Design Height for Roadway Clearance (Minimum 16.5 ft.).
 - H1 = 14.0 (See Note 6).
 - H2 (See Note 7).
- Notes and Labels:**
 - See Note 4: Points to the pole top.
 - See Note 6e: Points to the edge of travelway or face of curb.
 - See Note 6d: Points to the foundation.
 - See Note 6f: Points to the pole top.
 - High Point of Roadway Surface.
 - Edge of travelway or face of curb.
 - Base line reference elev. = 0.0'.
 - Foundation.

Elevation View

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 Differences for:	Pole 4	
Baseline reference point at ④ Foundation ② ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+0.5 ft.	
Elevation difference at Edge of travelway or face of curb	-0.3 ft.	



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

PROJECT REFERENCE NO.	SHEET NO.
U-5765	Sig. 10.2

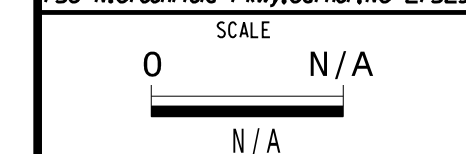
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
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	LUMINAIRE	EPA 0.87 S.F.	13.25" W X 26.25" L	35 LBS
	SIGN RIGID MOUNTED	5.0 S.F.	24.0" W X 30.0" L	11 LBS

DESIGN REFERENCE MATERIAL

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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.
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5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
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 - 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.
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 - f. Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
7. The pole manufacturer will determine the total height (H2) of each pole based on the luminaire height requirement of 30 ft.
8. 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.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.
11. Comply with NEC code 230.2(E) concerning service equipment disconnect.
12. Lighting fixture and luminaire arm represent a load condition to the pole and may not represent exactly how the fixtures will be mounted. The contractor is responsible for ensuring that any required factory preps for mounting fixtures to the pole are included on the shop drawings.
13. Design the luminaire support arm using design dimensions as shown on elevations views. Refer to the Radial Orientation Detail for attachment to the signal pole. Design arm end for a nominal 2 inch slip fit socket connection for light assembly.

NCDOT Wind Zone 5 (110 mph)



REVISIONS	INIT.	DATE
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7/10/2026
DATE
IG. INVENTORY NO. 10-2453

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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 11 and 51 to run protected turns only.

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

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

OVERLAP PROGRAMMING

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

NOTICE INCLUDED PHASE

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING DETECTION ZONES 1A & 5A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

1A	Plan 2			5A	Plan 2		
	Detector	Call Phase	Delay		Detector	Call Phase	Delay
	33	1	3.0		35	5	3.0
	125	0	0.0		127	0	0.0

SEQUENCE DETAIL

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

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	1,2,a,4,3,b
2	5,6,a,7,8,b

NO SERVICE PHASE PLANS

Front Panel
Main Menu >Controller >Sequence & Phs Config>No Served Phase Plans

Web Interface
Home >Controller >Phase Configuration>No Served Phase Plans

Sequence 1

Phase	No Serve Phase
3	7

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N.C.B.E.L.S. License Number: F-0116

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1774T1
DESIGNED: June 2026
SEALED: 06-XX-2026
REVISED: N/A

Electrical Detail - Sheet 2 of 3

Electrical and Programming Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Brickdale Commons Pkwy

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



7/10/2026

DATE

SIG. INVENTORY NO. 10-1774T1

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

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.

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition

Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Veh Detector Call	125	Is Module A input B ON	Number	2	Number	1	0.0	0.0
2	Veh Detector Call	127	Is Module A input B ON	Number	2	Number	3	0.0	0.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: Mirrors vehicle detector 33 to vehicle detector 125

Statement 2 Description: Mirrors vehicle detector 35 to vehicle detector 127

SPECIAL DETECTION IO MODULE PROGRAMMING

The Enhanced Out of Pavement Detection requires adjustments to the IO Modules in use. Follow the programming instructions below to ensure desired operation.

Front Panel
Main Menu >Controller >More >Advanced IO >IO Modules

Web Interface
Home >Controller >Advanced IO >Cabinet Configuration >IO Modules

IO Module	Type	Fault Response
1	Caltrans 332	Default
2	TS2 DR3 BIU	Default
3	TS2 DR4 BIU	Default
4	TS2 MMU	Default

Advanced Cabinet Options

☒ Disable TS2 Cabinet Alarms

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1774T1
DESIGNED: June 2026
SEALED: 06-XX-2026
REVISED: N/A

Electrical Detail - Sheet 3 of 3

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 73 (Sam Furr Rd)
at
Brickdale Commons Pkwy

Division 10 Mecklenburg County Huntersville

PLAN DATE: July 2026REVIEWED BY: Z Wang

PREPARED BY: K HectorREVIEWED BY:

REVISIONS

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7/10/2026

DATE

SIG. INVENTORY NO. 10-1774T1



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- * Multi-zone Microwave Detection.
- ** Reduce Delay to 3 Seconds During Alternative Phasing Operation.
- # Disable Delay During Alternate Phasing Operation.

HDR

PROPOSED		EXISTING
	Traffic Signal Head Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Multi-zone Microwave Detection	
	Controller & Cabinet Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Construction Zone	
	Construction Zone Drums	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Right "TURNING VEHICLES" Yield "TO" Pedestrian Sign (R10-15R)	

REAL

SIG. INVENTORY NO. 10-1774T2

25 MPH

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

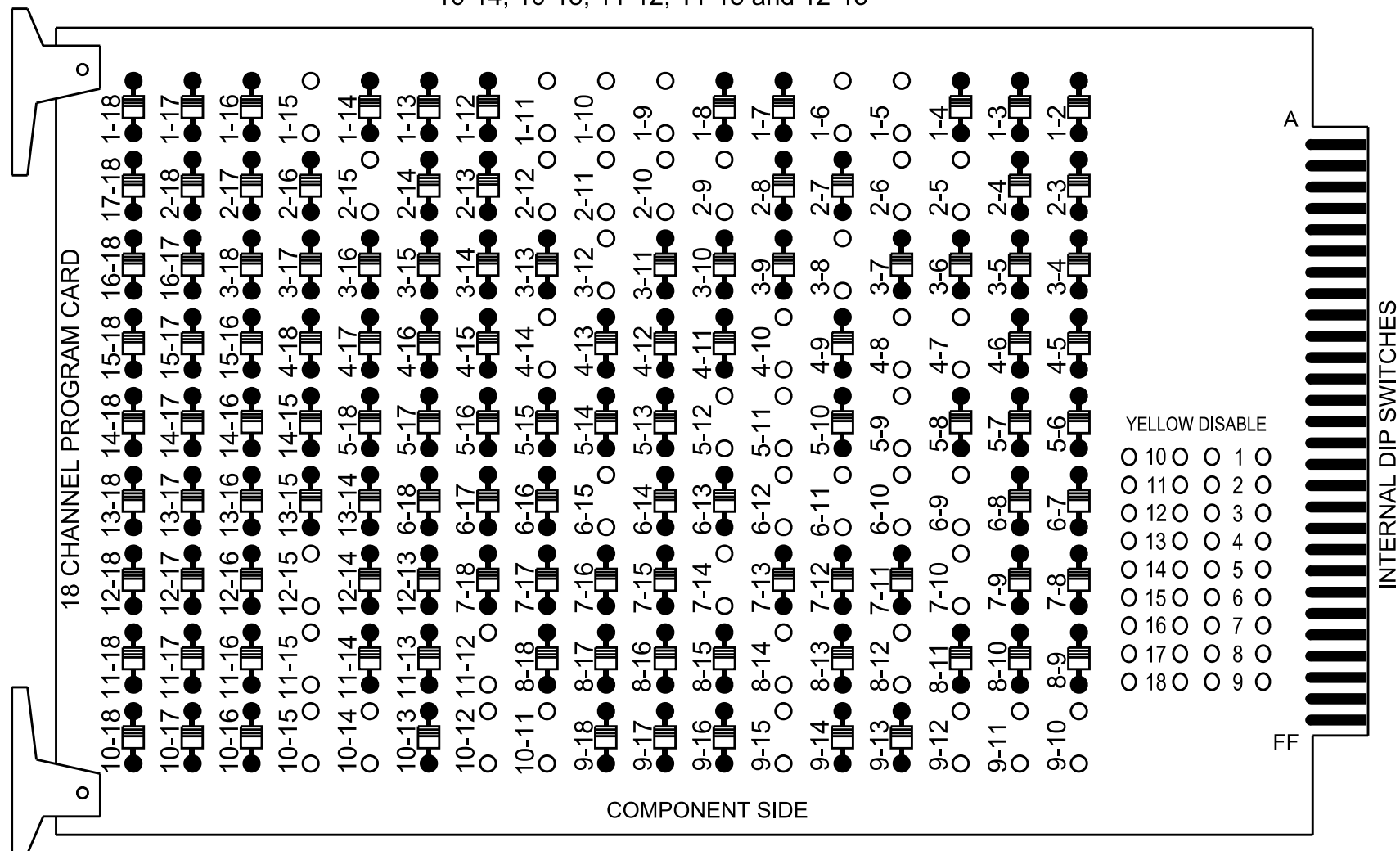
Temporary Design #2
(TMP Phase 1 Step 2)

REVISIONS	INIT.	DATE
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[illegible]

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-10, 1-11, 1-15, 2-5, 2-6, 2-9, 2-10, 2-11, 2-12, 2-15, 3-8, 3-12, 4-7, 4-8, 4-10, 4-14, 5-9, 5-11, 5-12, 6-9, 6-10, 6-11, 6-12, 8-15, 7-10, 7-14, 8-12, 8-14, 9-10, 9-11, 9-12, 9-15, 10-11, 10-12, 10-14, 10-15, 11-12, 11-15 and 12-15



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the Signal System #: D10-43_Huntersville.

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, S6, S7, S8, S9, S10, S11, AUX S1, AUX S2, AUX S4, AUX S5
Phases Used.....1, 2, 3, 4, 4PED, 5, 6, 6PED, 7, 8
Overlap "1".....*
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

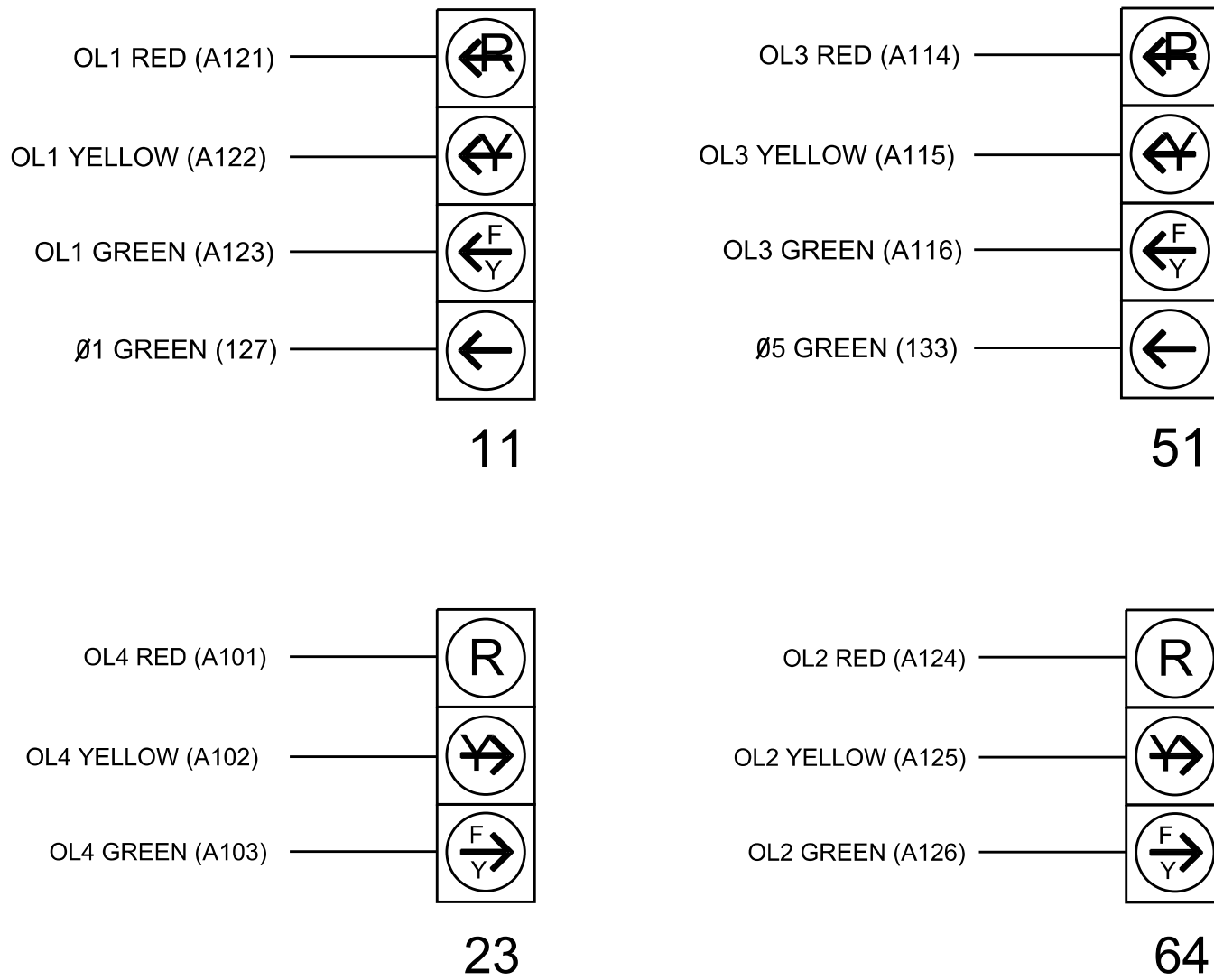
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41	NU	42	51	61,62 63	P61, P62	71,72	81,82	P81, P82	11	64	NU	51	23
RED		128			101			*	134		107			A124			A101	
YELLOW	*	129			102				135		108							
GREEN		130			103				136		109							
RED ARROW				116							122			A121			A114	
YELLOW ARROW				117			132			123				A122	A125		A115	A102
FLASHING YELLOW ARROW														A123	A126		A116	A103
GREEN ARROW	127			118			133	133		124								
										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 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	-	-	-	*	33*	1	15.0		X		X	
2A	-	-	-	*	125*	6	3.0		X		X	X
3A	-	-	-	*	38	2			X		X	
4A	-	-	-	*	34	3			X		X	
5A	-	-	-	*	44	4			X		X	
5B	-	-	-	*	35*	5	15.0		X		X	
6A	-	-	-	*	127*	2	3.0		X		X	X
6B	-	-	-	*	51	5	15.0		X		X	
7A	-	-	-	*	54	6			X		X	
7B	-	-	-	*	36	7			X		X	
8A	-	-	-	*	52	7			X		X	
8B	-	-	-	*	60	8			X		X	
	-	-	-	*	61	8	15.0		X		X	
PED PUSH BUTTONS												
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

* For the detectors to work as shown on the signal plan see the Detector Programming Detail for Alternate Phasing on Sheet 2 of this plan.
* For Input Point numbers, see SDLC Non-Intrusive Detection Chart detail on this sheet.

INPUT FILE POSITION LAYOUT

(front view)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"
FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"	FILE "I"	FILE "J"

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

FS = FLASH SENSE
ST = STOP TIME

SDLC NON-INTRUSIVE DETECTION CHART

	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	3A	50	NU
3	35	5A	51	5B
4	36	7A	52	7B
5	37	NU	53	NU
6	38	2A	54	6A
7	39	NU	55	NU
8	40	NU	56	NU
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	8B
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

SPECIAL DETECTOR NOTE

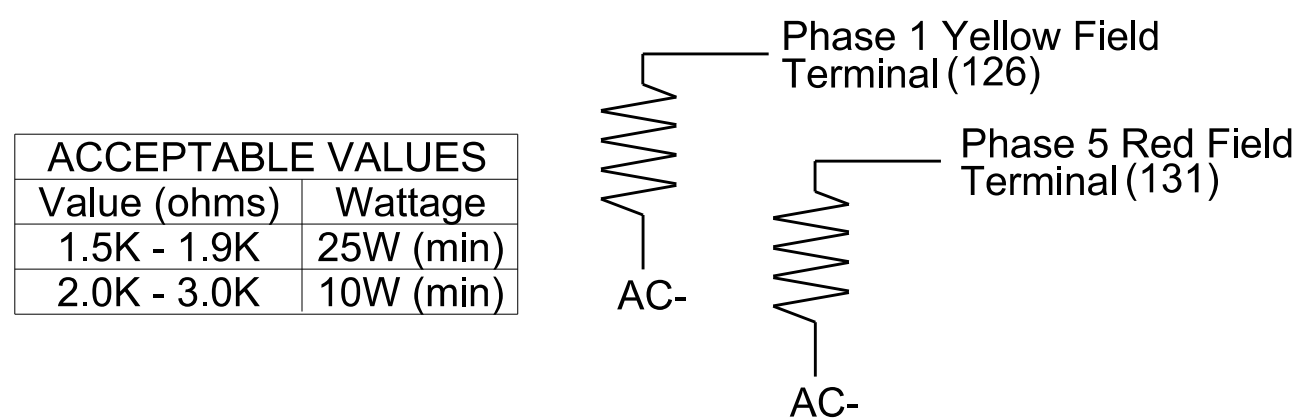
Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

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)

Electrical Detail - Sheet 1 of 3



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1774T2
DESIGNED: June 2026
SEALED: 07-10-2026
REVISED: N/A

Division 10 Mecklenburg County Huntersville

PLAN DATE: July, 2026 REVIEWED BY: Z Wang

PREPARED BY: K Hector REVIEWED BY:

REVISIONS INIT. DATE

DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



7/10/2026

SIG. INVENTORY NO. 10-1774T2