

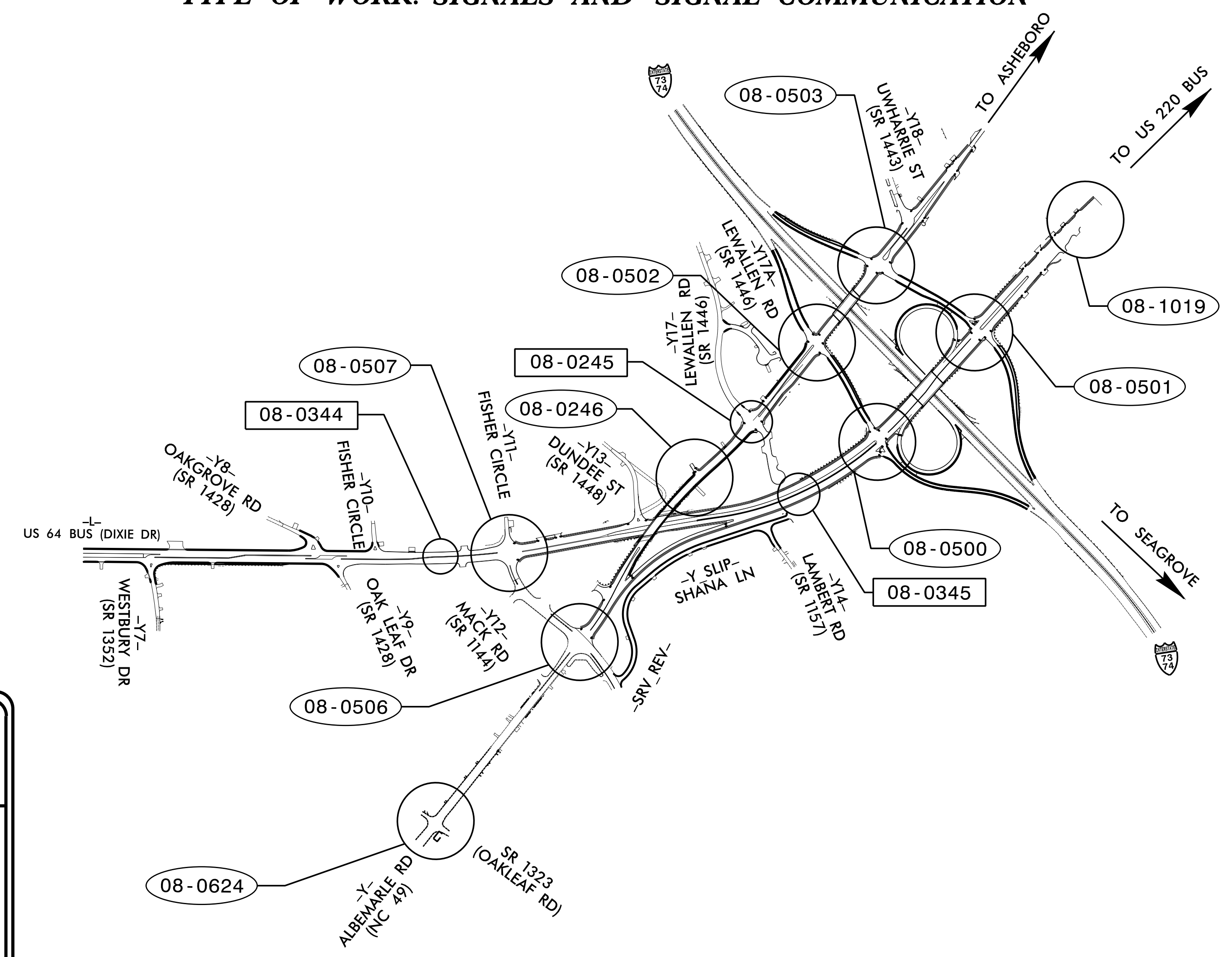
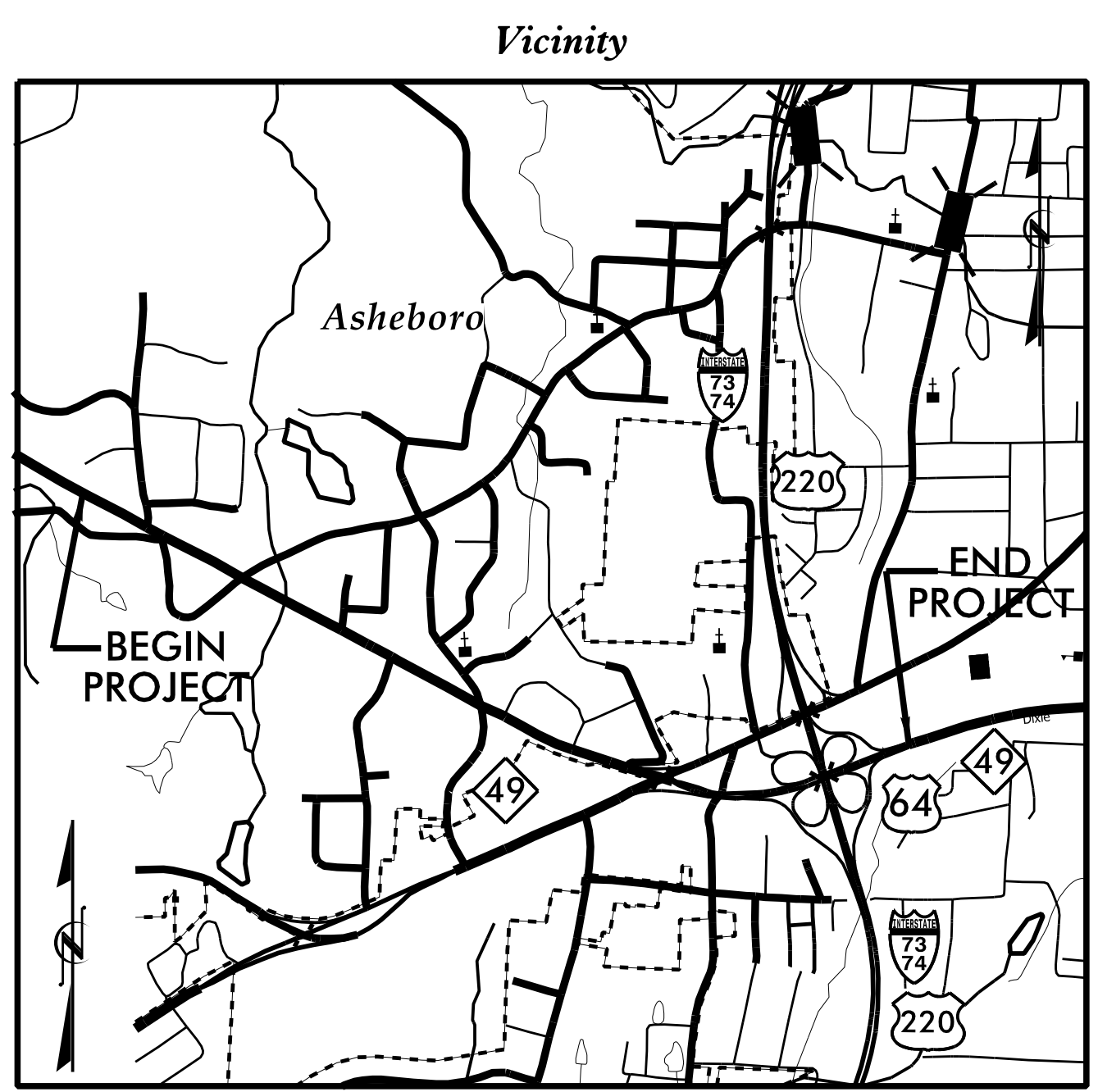
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

RANDOLPH COUNTY

LOCATION: US 64 BUS (DIXIE DRIVE) FROM US 64 (ASHEBORO BYPASS) TO EAST OF I-73/I-74/US 220 IN ASHEBORO

TYPE OF WORK: SIGNALS AND SIGNAL COMMUNICATION

Project: U-5813



PLANS PREPARED BY:
HNTB
 HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554
 (919) 546-8997

Natasha R. Simmons, P.E., PTOE - Project Engineer
 J. Andrew Wagner, PE - Design Engineer
 Nicole K. Vlanich, PE - Design Engineer
 Emily E. Tiller - Design Engineer
 Tracey R. Terrell - Senior Design Technician

KEY

08-XXXX	New or Upgraded Signal
08-XXXX	Signal Removal

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

Contract: C204843

Sheet #	Reference #	Location/Description
Sig. 1.0		Title Sheet
Sig. 2.0-4.5	08-0506	NC 49 (Albemarle Road) at SR 1144 (Mack Road)
Sig. 5.0-7.3	08-0507	US 64 Bus. (Dixie Road) at SR 1144 (Mack Road)/Fisher Circle
Sig. 8.0-8.3	08-0245	NC 49 (Albemarle Road) at SR 1446 (Lewallen Road)
Sig. 9.0-12.4	08-0246	NC 49 (Albemarle Road) at SR 1446 (Lewallen Road)/SR 1450 (Brookway Road)
Sig. 13.0-15.3	08-0502	NC 49 (Albemarle Road) at I-73-US 220 SB Ramps/I-74 EB Ramps
Sig. 16.0-17.3	08-0503	NC 49/SR 1713 (Albemarle Road) at I-73-US 220 NB/I-74 WB Ramps
Sig. 18.0-22.3	08-0500	US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 SB/I-74 EB Ramps
Sig. 23.0-26.3	08-0501	US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB Ramps
Sig. 27.0	08-0345	US 64 Bus./NC 49 (Dixie Drive) at NC 49/SR 1713 (Albemarle Road)
Sig. M1A-M9	-----	Standard Drawings for Metal Poles
SCP. 1-14	-----	Signal Communication Plans

LEGEND
 ##-#### SIGNAL INVENTORY NUMBER

TRANSPORTATION SYSTEMS MOBILITY AND OPERATIONS UNIT

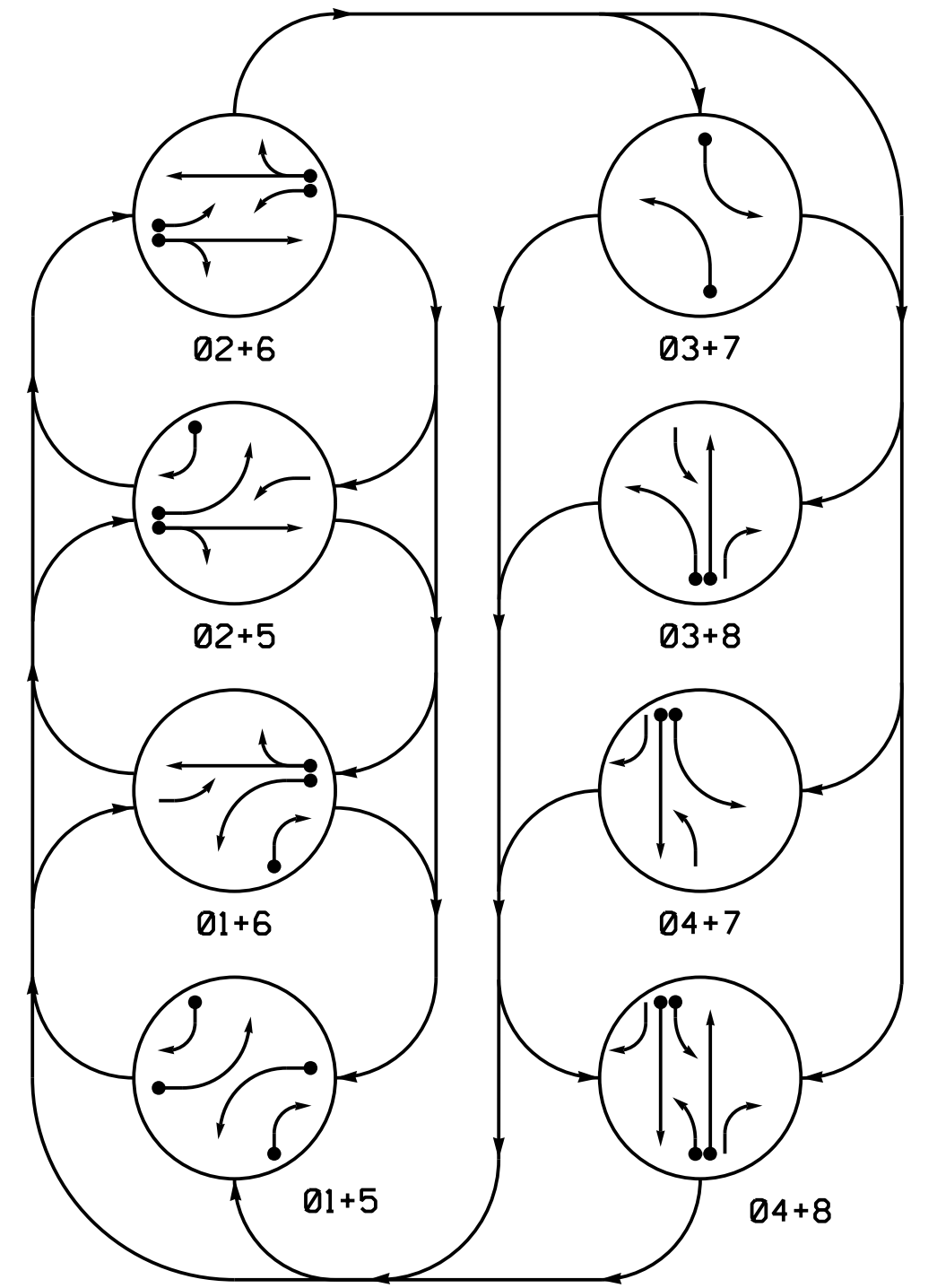
Contacts:

Robert J. Ziembra, PE, CPM - Central Region Signals Engineer
 Ryan W. Hough, PE - Signal Equipment Project Engineer
 Gregory A. Green - Signal Communications Project Engineer

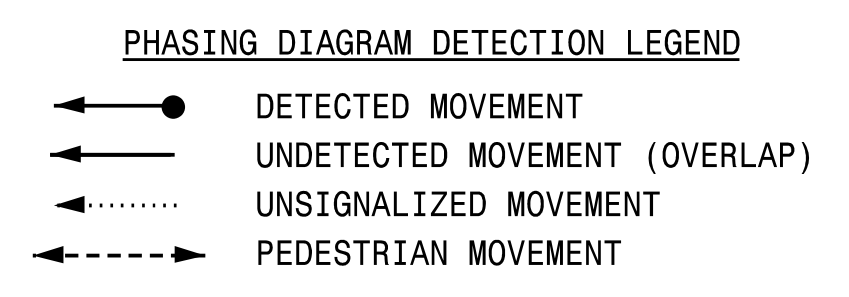
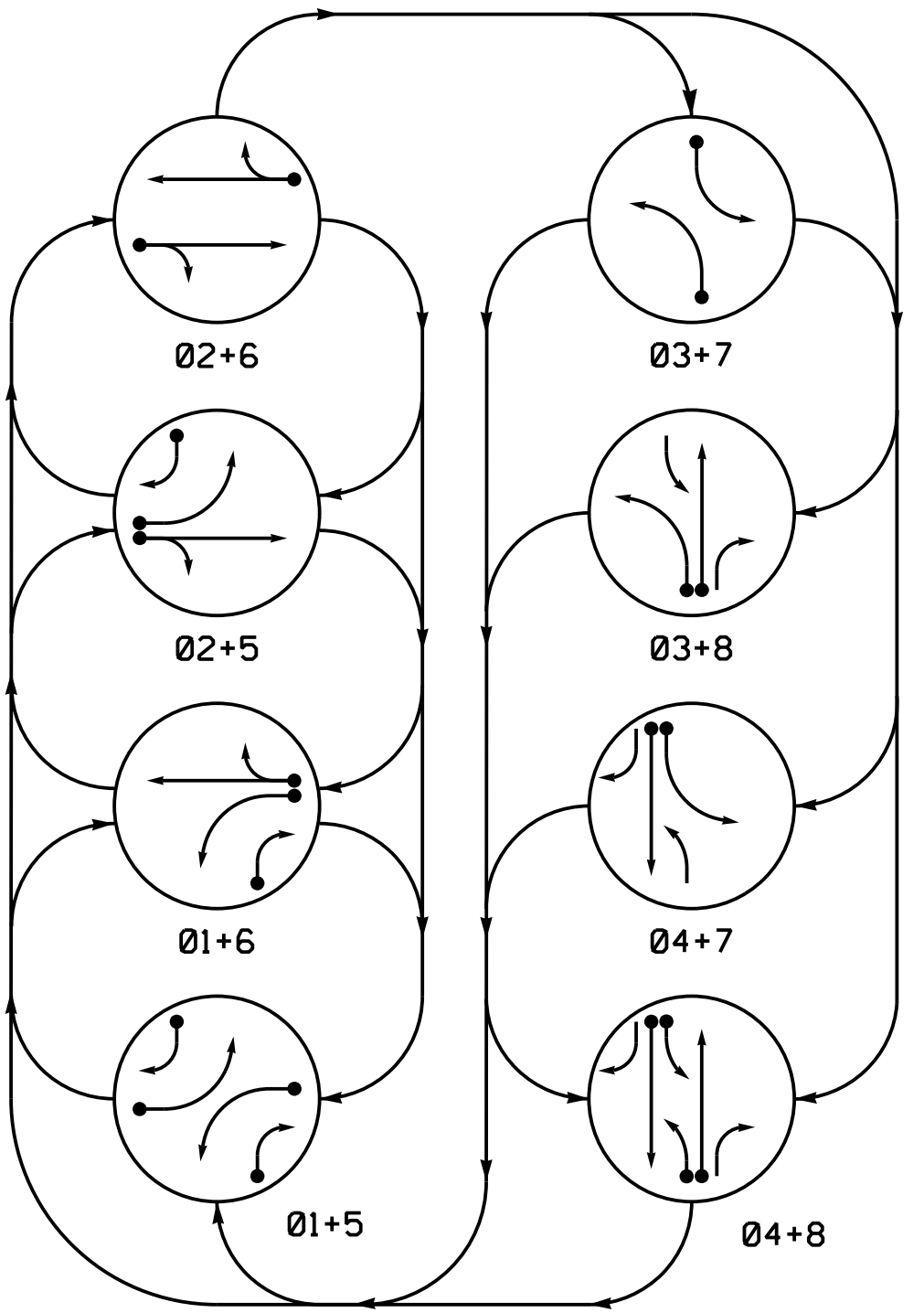
Prepared for the Office of:
 DIVISION OF HIGHWAYS
 TRANSPORTATION MOBILITY AND SAFETY
 DIVISION

750 N. Greenfield Parkway, Garner, NC 27529

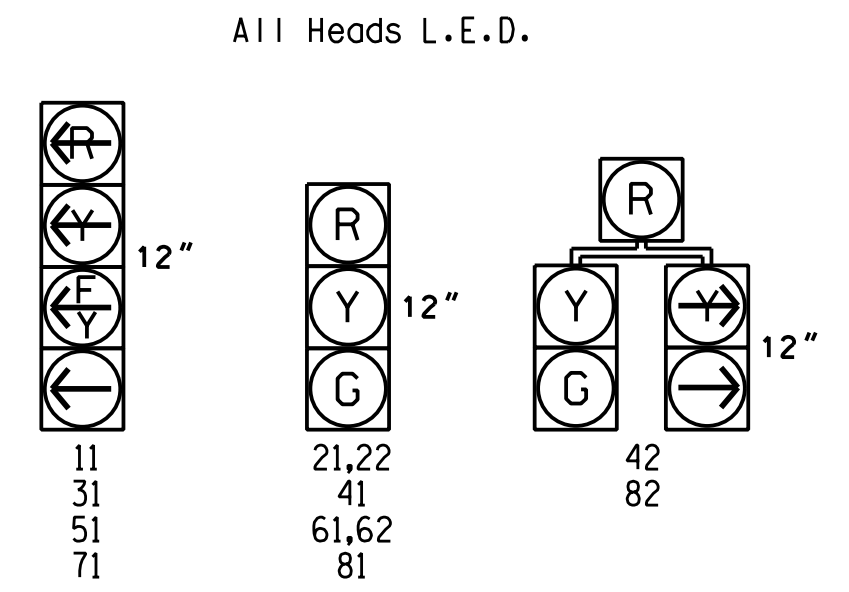
DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.



DEFAULT PHASING TABLE OF OPERATION

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

ALTERNATE PHASING TABLE OF OPERATION

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

MAXTIME DETECTOR INSTALLATION CHART

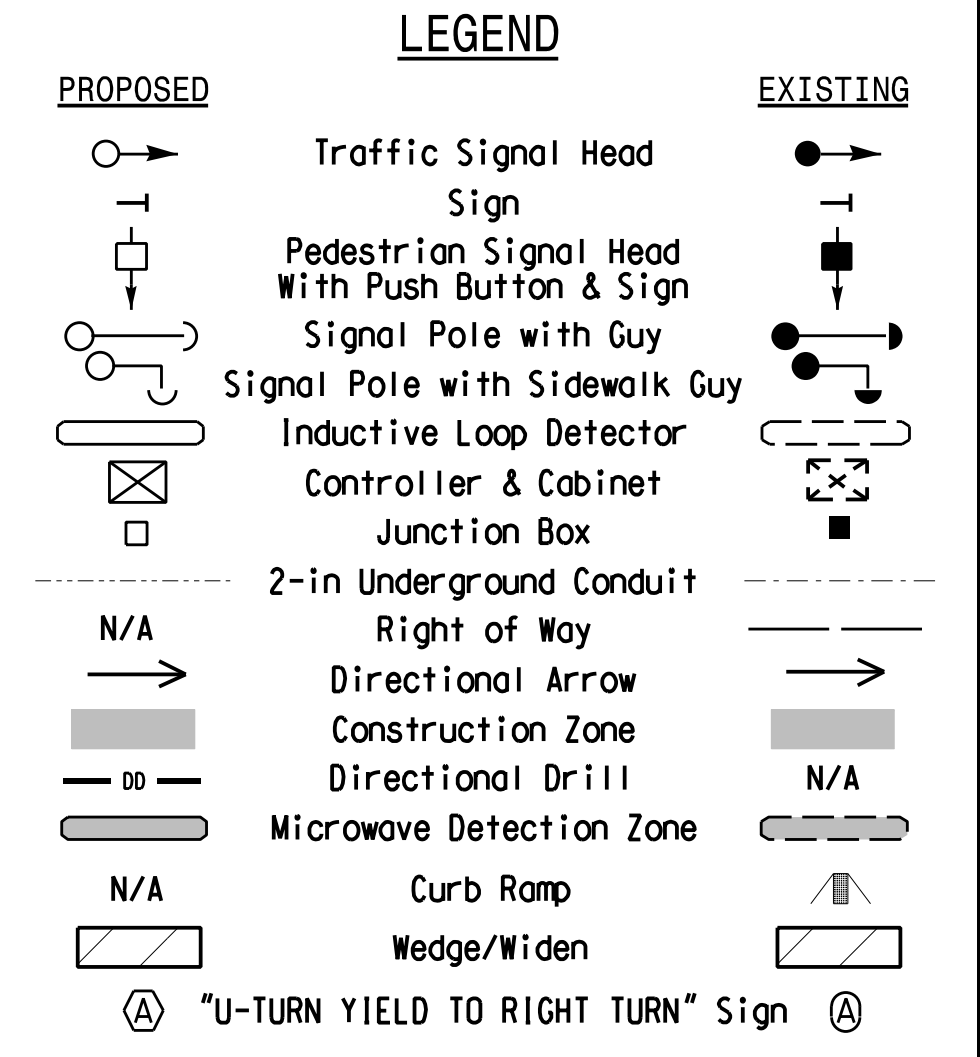
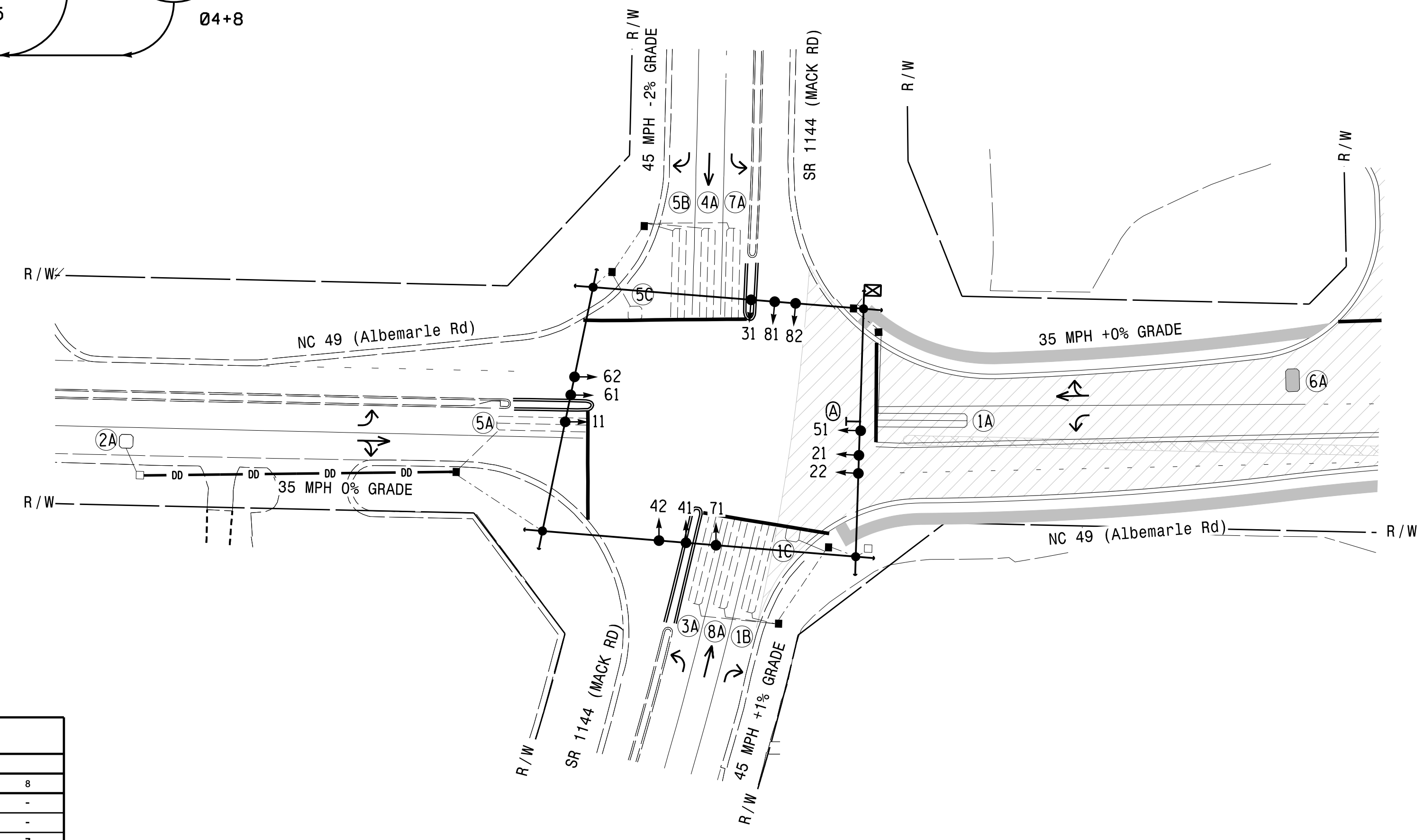
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD	
1A	6X40	0	2-4-2	X	2	**15	-	-	X	X	X	X
1B	6X40	0	2-4-2	-	1	15	-	-	X	X	X	X
1C	6X6	0	4	X	1	15	-	-	X	X	X	X
2A	6X6	200	4	X	2	-	-	-	X	X	X	X
3A	6X40	0	2-4-2	-	3	15	-	-	X	X	X	X
4A	6X40	0	2-4-2	-	4	-	-	-	X	X	X	X
5A	6X40	0	2-4-2	-	5	**15	-	-	X	X	X	X
5B	6X40	0	2-4-2	-	5	15	-	-	X	X	X	X
5C	6X6	0	4	-	5	15	-	-	X	X	X	X
6A*	6X10	180	*	*	6	-	-	-	X	X	X	*
7A	6X40	0	2-4-2	-	7	15	-	-	X	X	X	X
8A	6X40	0	2-4-2	-	8	-	-	-	X	X	X	X

* Microwave Detection
 ** Reduce Delay to 3 seconds During Alternate Phasing Operation.
 * Disable phase call during Alternate Phasing operation.

8 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Renumber existing loops 4B as 4A and 8B as 8A.
- Reposition existing signal heads numbered 11, 61, and 62.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- 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 single-zone microwave detection. Install detector 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 shall supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	-	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-	-	-
Min Green	7	10	7	7	7	10	7	7
Passage *	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
Max I *	15	50	20	20	30	50	20	20
Yellow Change	3.0	3.8	3.0	4.7	3.0	3.8	3.0	4.7
Red Clear	3.1	2.4	2.4	1.3	2.8	2.4	2.4	1.3
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum Initial *	-	24	-	-	-	22	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X

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

Signal Upgrade - Temporary Design 1 (Construction Phase I)

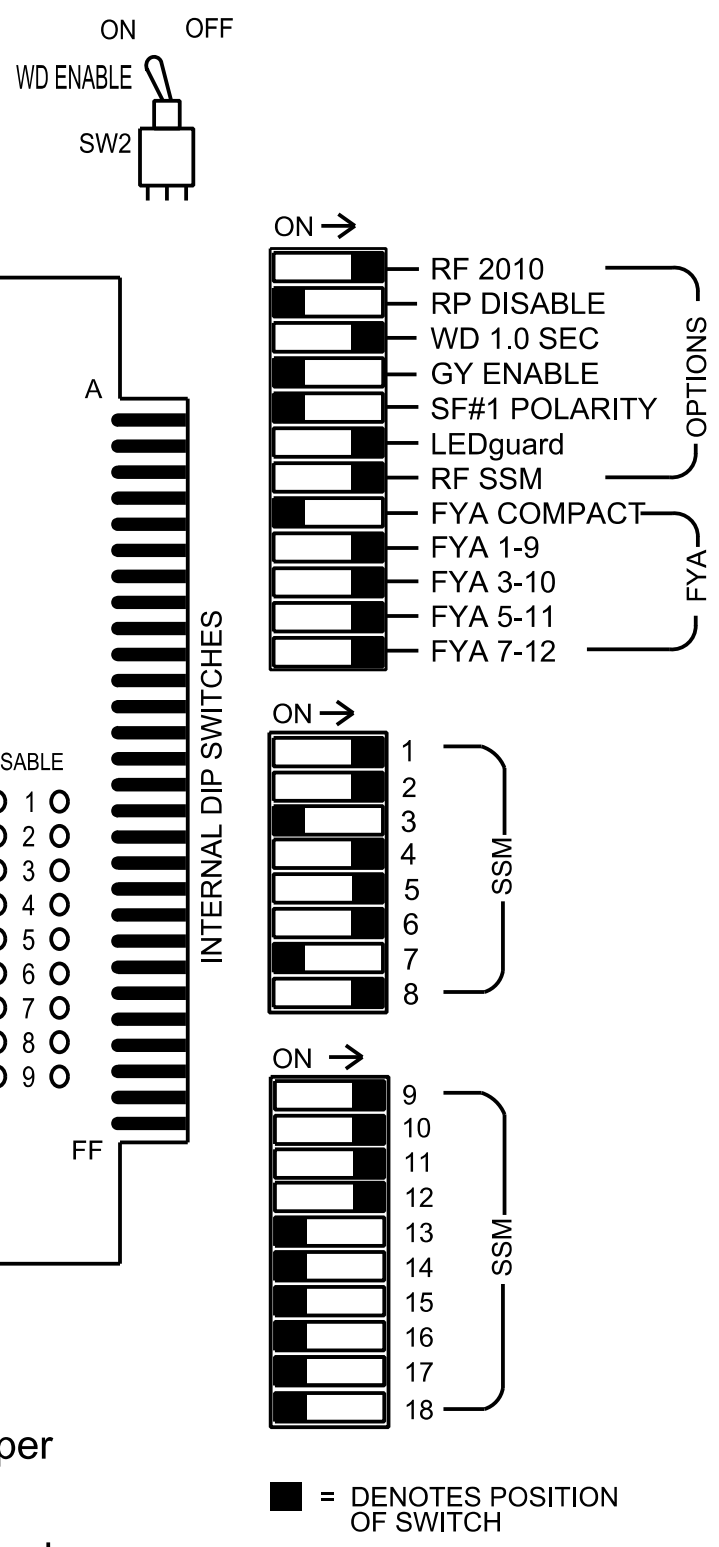
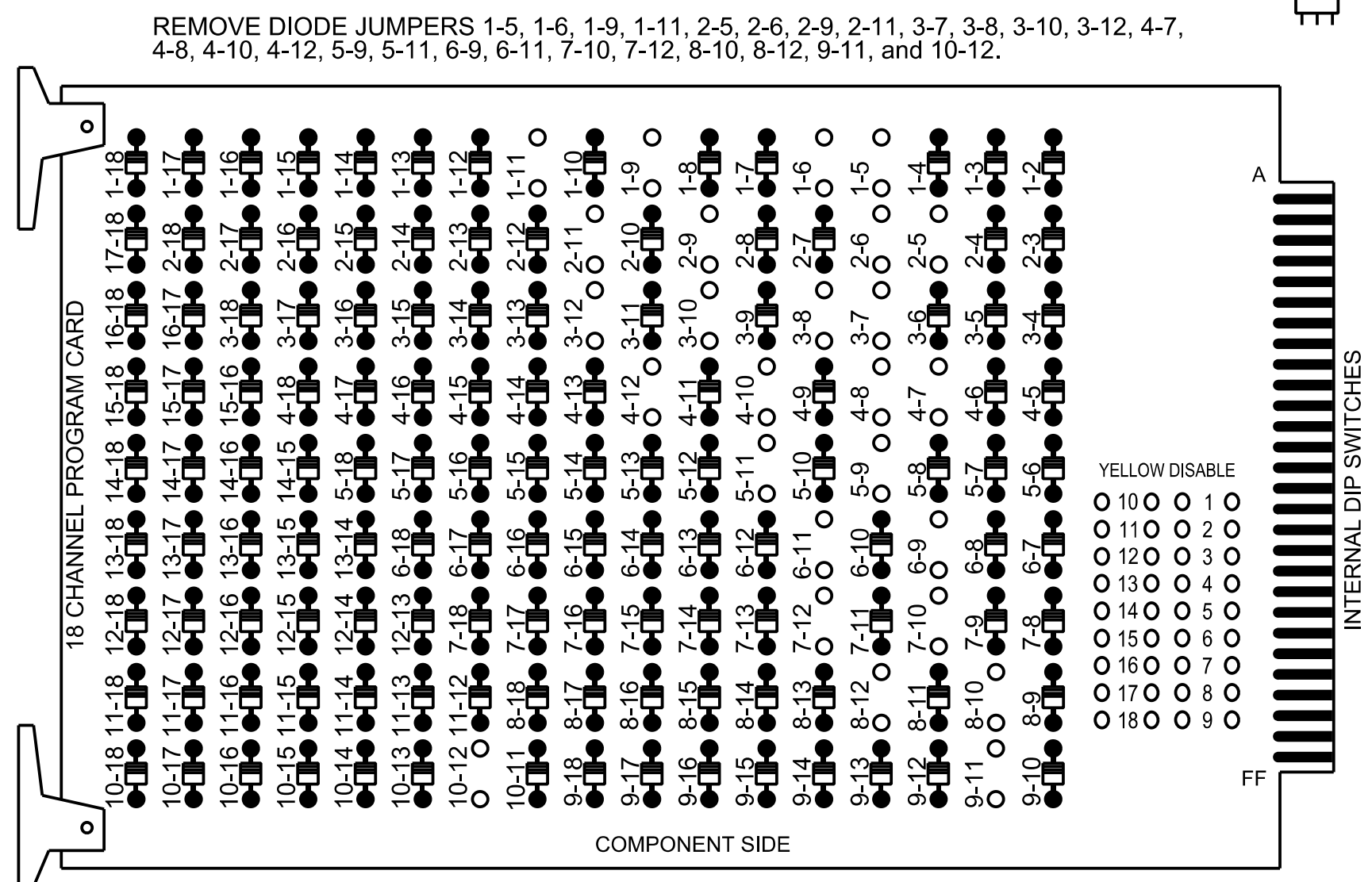
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)		
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021	
PREPARED BY: N.K. Vlanich	REVIEWED BY: N.R. Simmons	REVISIONS:	DATE:
0 40 1"=40'	5/21/2024	08-050611	5/21/2024

HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

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 unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
- 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 Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S1,S2,S4,S5,S7,S8,S10,S11,
 AUX S1,AUX S2,AUX S4,AUX S5

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

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18		
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE		
SIGNAL HEAD NO.	11	82	21,22	NU	31	41,42	NU	42	51	61,62	NU	71	81,82	NU	11	31	NU	51	71	NU
RED	*		128		101			*	134			107								
YELLOW			129	*	102				135		*	108								
GREEN			130		103				136			109								
RED ARROW													A121	A124		A114	A101			
YELLOW ARROW	126							132					A122	A125		A115	A102			
FLASHING YELLOW ARROW													A123	A126		A116	A103			
GREEN ARROW	127	127			118			133	133			124								
Hand																				
Person																				

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

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
∅ 1	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	FS
1A	1B	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	DC ISOLATOR
NOT USED	∅ 1	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	ST
	1C													DC ISOLATOR
FILE "J"	∅ 5	∅ 5	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18
	5A	5B	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A	17A	18A
	NOT USED	∅ 5	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

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

FS = FLASH SENSE
 ST = STOP TIME

SPECIAL DETECTOR NOTE

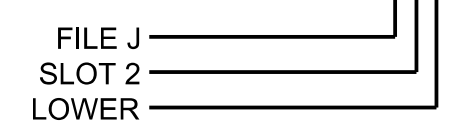
Install a single-zone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1	15		X		X	
1B	TB2-5,6	I2U	39	1	2	6	3		X		X	X
1C	TB2-7,8	I2L	43	5	3	1	15		X		X	
2A	TB2-9,10	I3U	63	29	4	2			X	X	X	
3A	TB4-5,6	I5U	58	20	7	3	15		X		X	
4A	TB4-9,10	I6U	41	3	8	4			X		X	
5A	TB3-1,2	J1U	55	17	15	5	15		X		X	
5B	TB3-5,6	J2U	40	2	16	5	15		X		X	
5C	TB3-7,8	J2L	44	6	17	5	15		X		X	
7A	TB5-5,6	J5U	57	19	21	7	15		X		X	
8A	TB5-9,10	J6U	42	4	22	8			X		X	

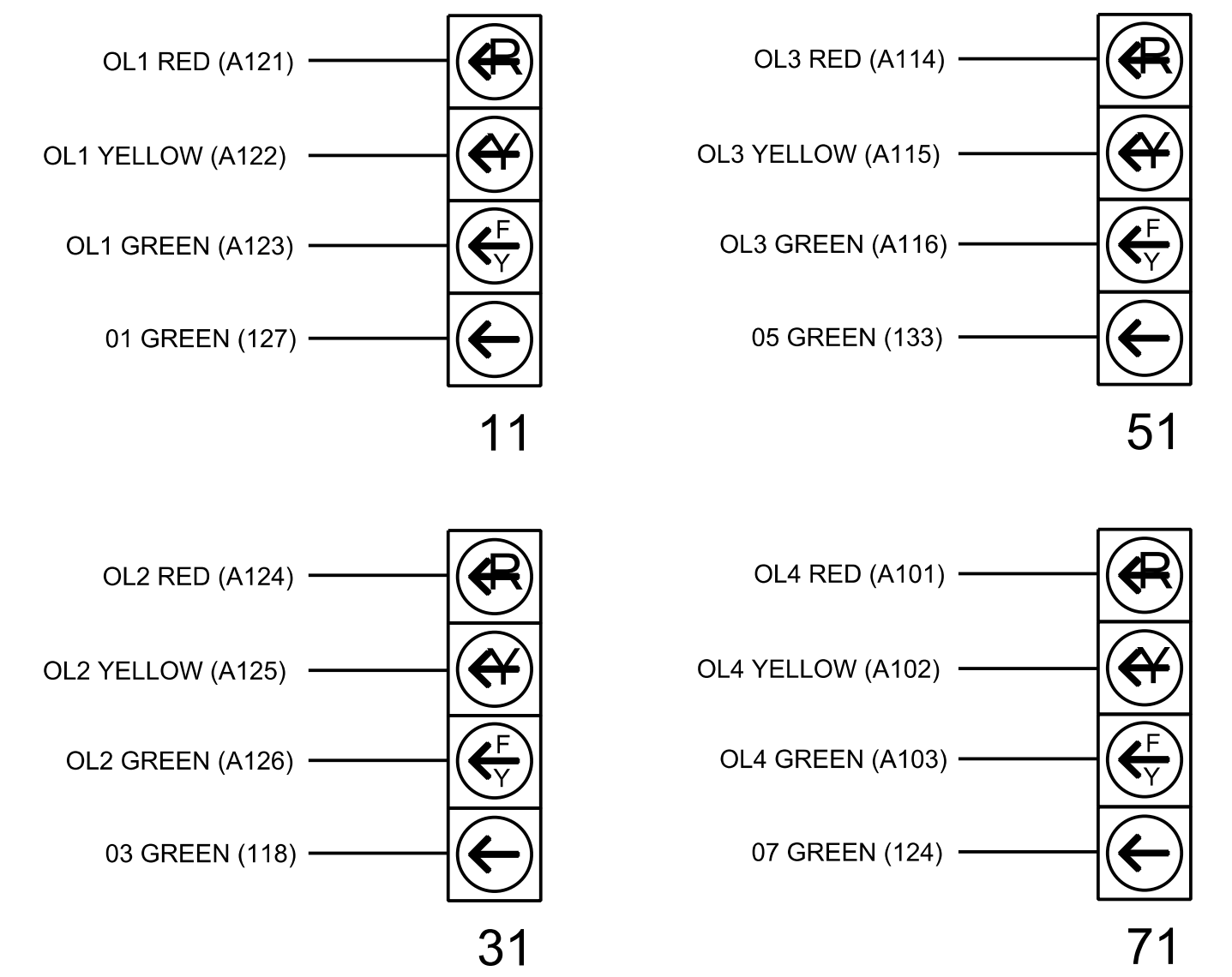
* For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L



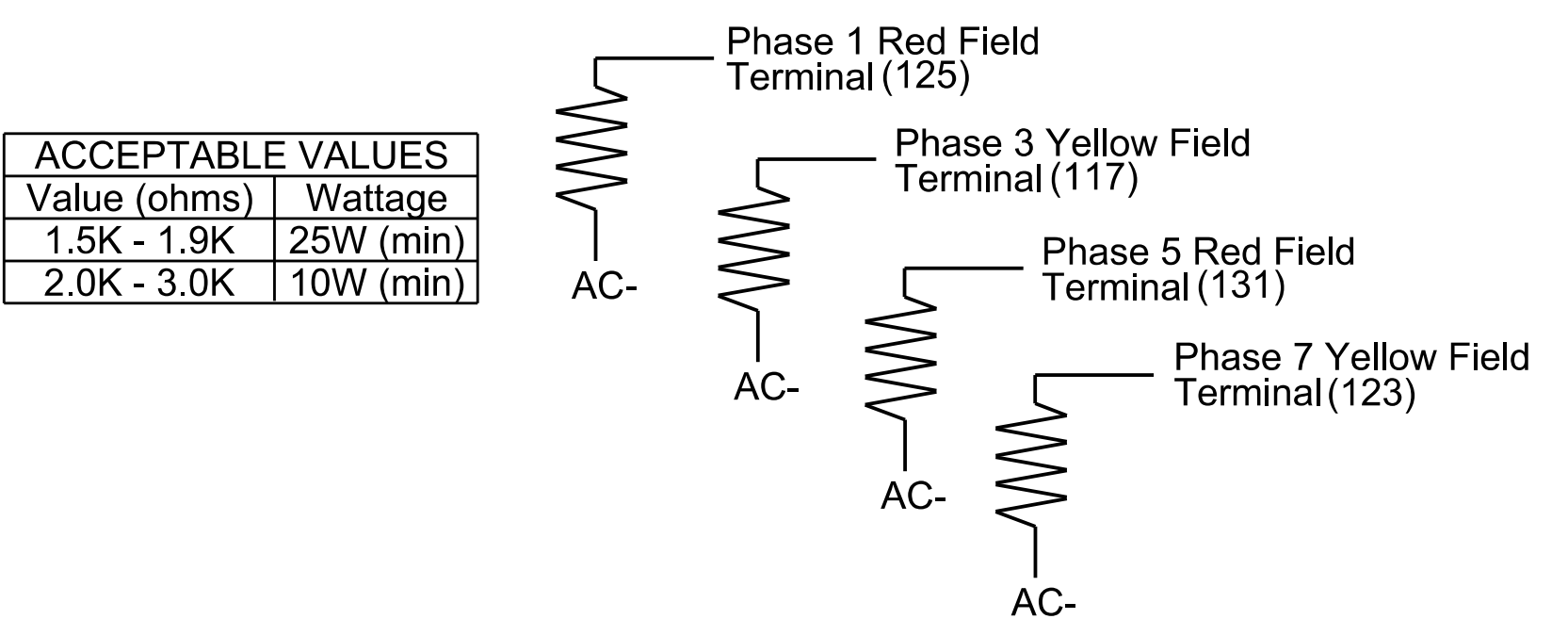
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0506T1
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554
 (919) 546-8997

Signal Upgrade
 Temporary Design 1
 Electrical Detail - Sheet 1 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:
 NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)

Division 8 Randolph County Asheboro

Prepared for the Offices of:
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF ROAD AND SAFETY DESIGN
 SIGNALS MANAGEMENT SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

PLAN DATE: August 2021
 REVIEWED BY: A.D. Klinskiesk

PREPARED BY: N.K. Vlanich
 REVIEWED BY: N.R. Simmons

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 031464
 N.T. SIMMONS

DocuSigned by:
 Natasha R. Simmons 5/21/2024

SIG. INVENTORY NO. 08-0506T1

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME 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	-	4	-	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE REMOVED INCLUDED PHASES FOR OL1 AND OL3

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

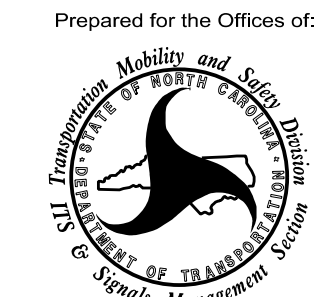
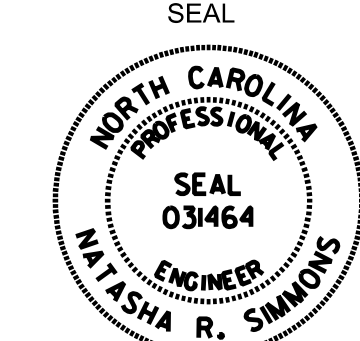

	Detector	Call Phase	Delay
1A	1	1	3
	29	0	3

	Detector	Call Phase	Delay
5A	15	5	3
	31	0	3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0506T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 1
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)	SEAL  MELISSA R. SIMMONS
Division 8 Randolph County Asheboro		
PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	DocuSigned by:  5/21/2024 DATE SIG. INVENTORY NO. 08-0506T1

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0506T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

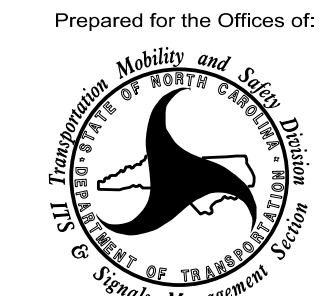
Signal Upgrade
Temporary Design 1
Electrical Detail - Sheet 3 of 3

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HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529


**NC 49 (Albemarle Rd)
at
SR 1144 (Mack Rd)**

Division 8 Randolph County Asheboro

PLAN DATE:	August 2021	REVIEWED BY:	A.D. Klinksiek
PREPARED BY:	N.K. Vianich	REVIEWED BY:	N.R. Simmons

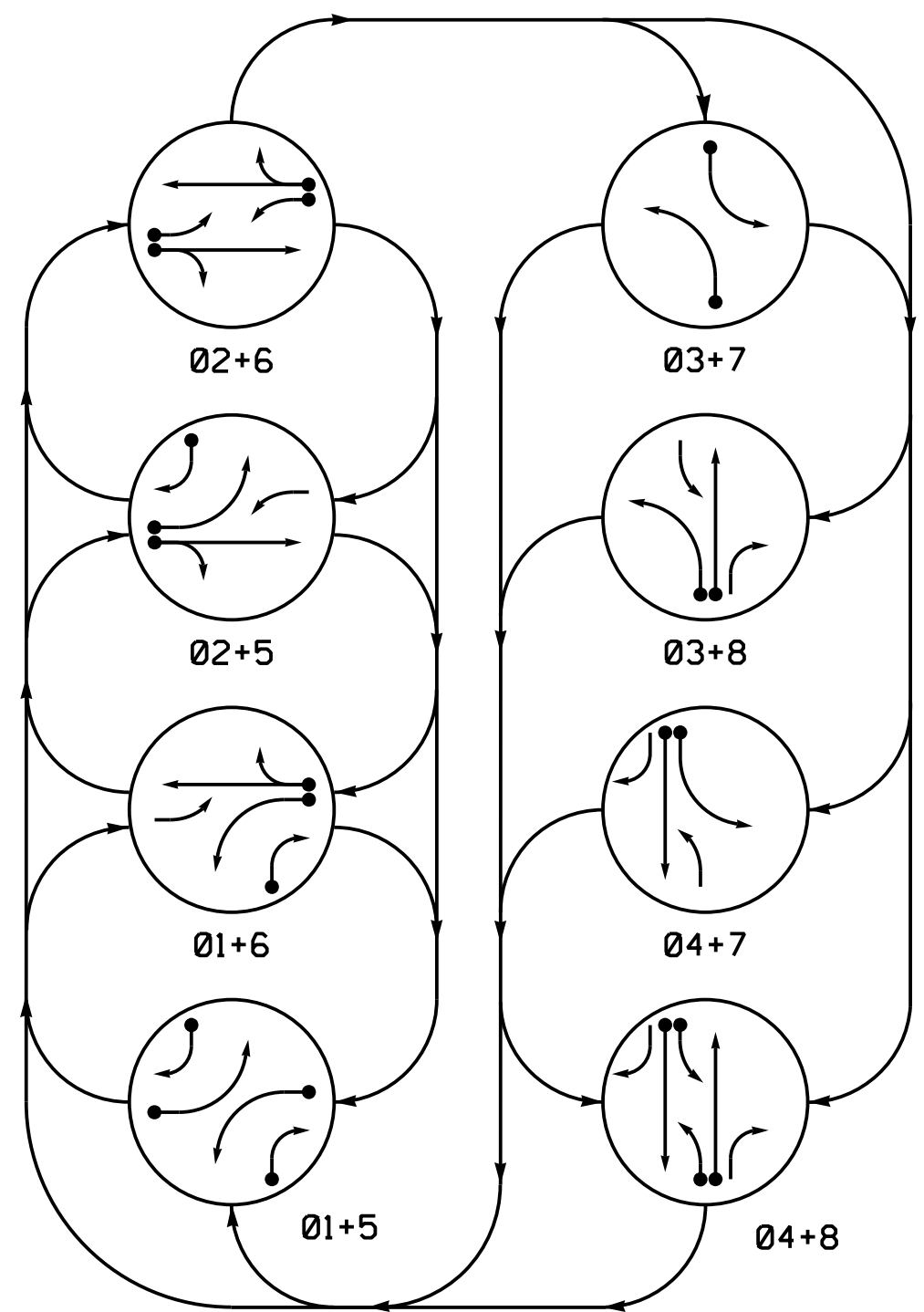
REVISIONS	INIT.	DATE

SEAL

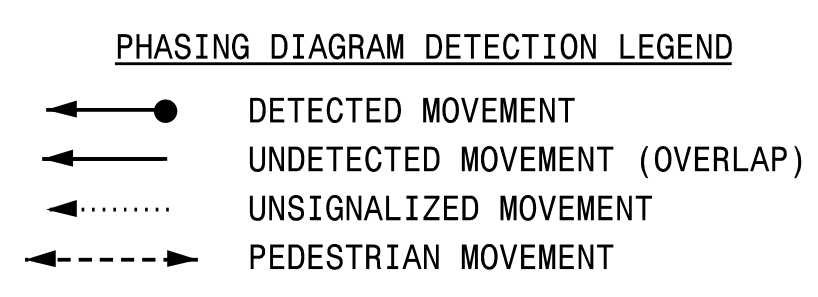
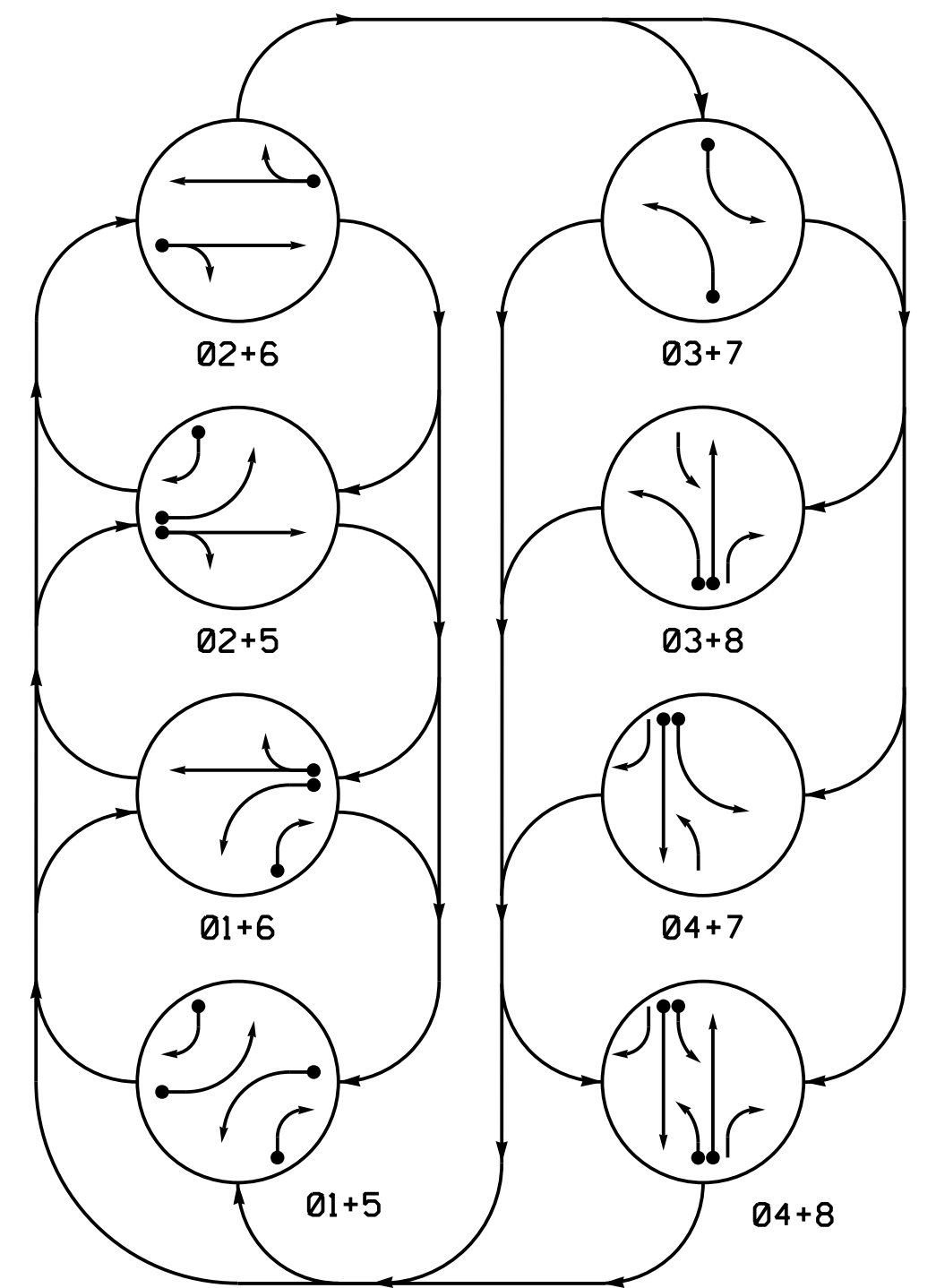


DocuSigned by:
Melissa R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0506T1

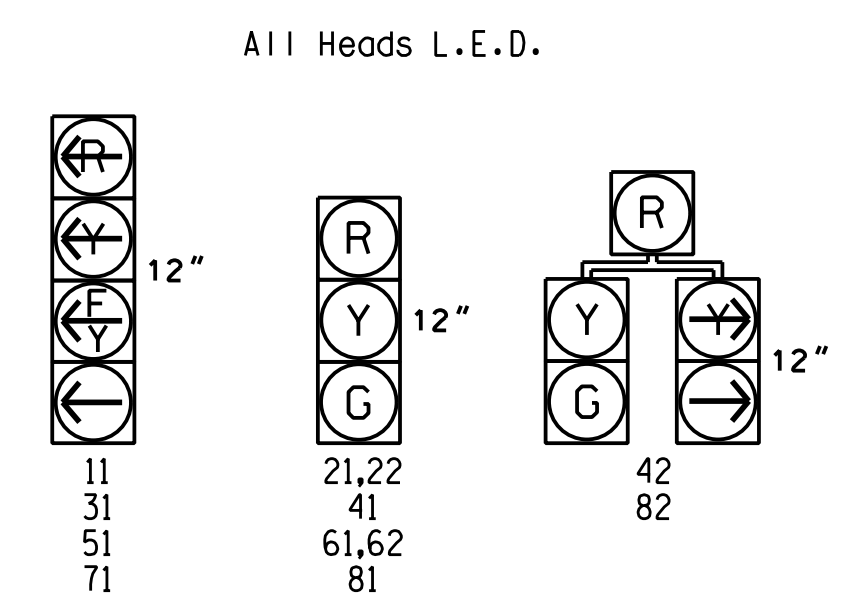
DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.



DEFAULT PHASING TABLE OF OPERATION

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

ALTERNATE PHASING TABLE OF OPERATION

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

MAXTIME DETECTOR INSTALLATION CHART

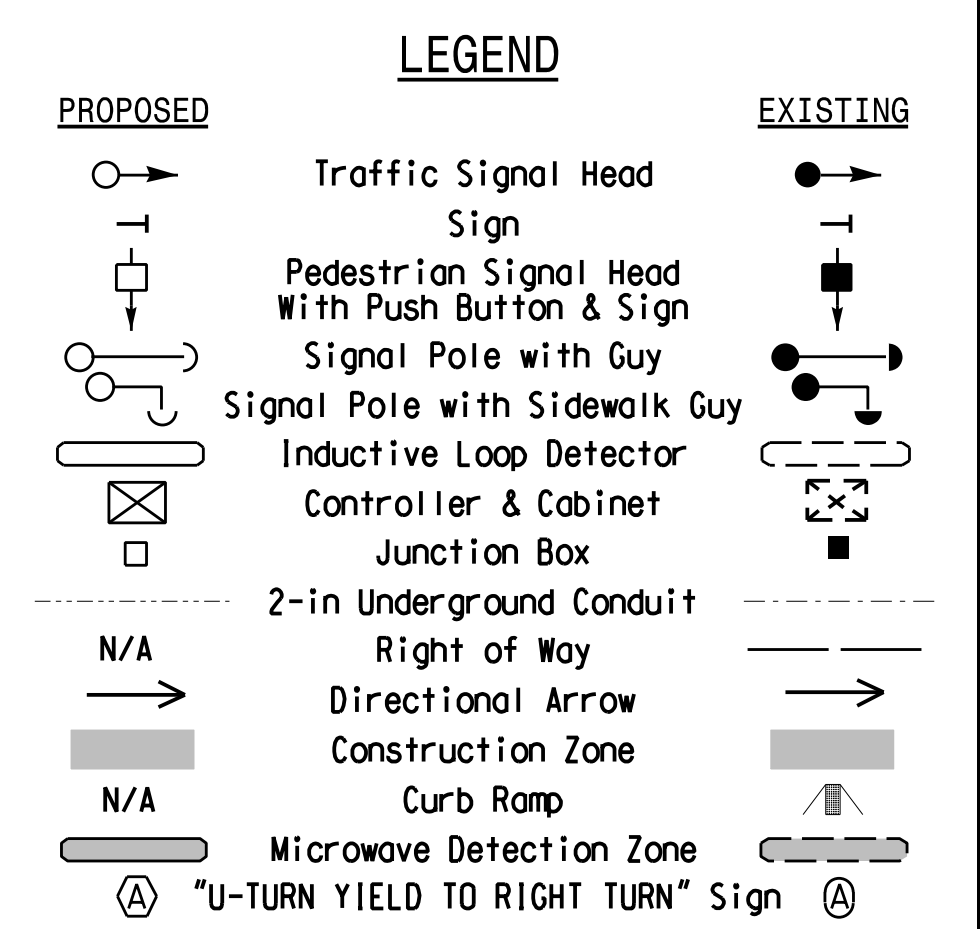
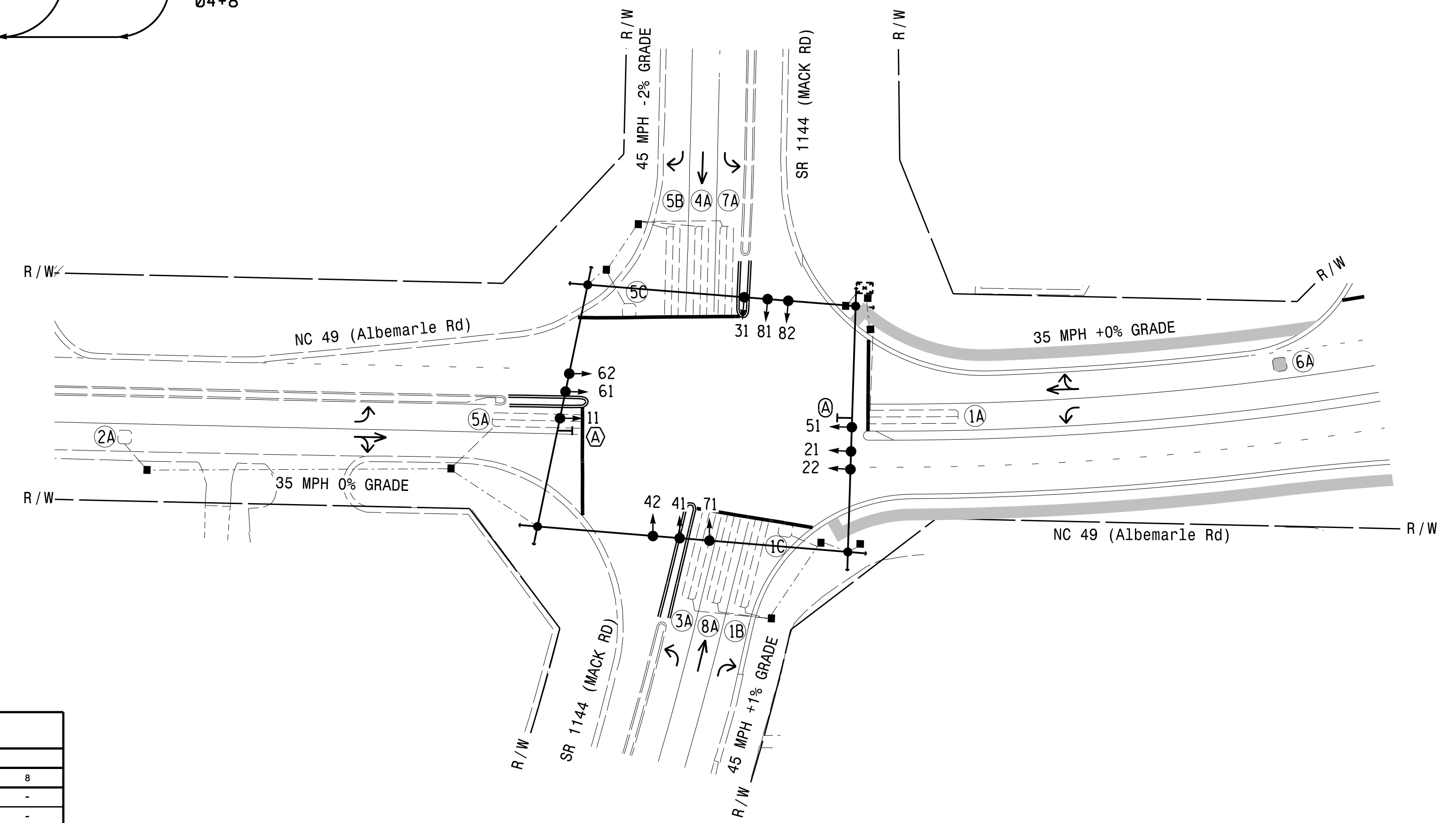
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL	CALL	NEW CARD
1A	6X40	0	2-4-2	-	1	**15	-	X	X	X	-
1B	6X40	0	2-4-2	-	1	15	-	X	X	X	-
1C	6X6	0	4	-	1	15	-	X	X	X	-
2A	6X6	200	4	-	2	-	-	X	X	X	-
3A	6X40	0	2-4-2	-	3	15	-	X	X	X	-
4A	6X40	0	2-4-2	-	4	3	-	X	X	X	-
5A	6X40	0	2-4-2	-	5	**15	-	X	X	X	-
5B	6X40	0	2-4-2	-	5	15	-	X	X	X	-
5C	6X6	0	4	-	5	15	-	X	X	X	-
6A*	6X6	180	*	*	6	-	-	X	X	X	*
7A	6X40	0	2-4-2	-	7	15	-	X	X	X	-
8A	6X40	0	2-4-2	-	8	3	-	X	X	X	-

* Microwave Detection
 ** Reduce Delay to 3 seconds During Alternate Phasing Operation
 * Disable phase call during Alternate Phasing operation.

8 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 11, 61, and 62.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses single-zone microwave detection. Install detector 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 shall supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	-	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-	-	-
Min Green	7	10	7	7	7	10	7	7
Passage *	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
Max I *	15	50	20	20	30	50	20	20
Yellow Change	3.0	3.8	3.0	4.7	3.0	3.8	3.0	4.7
Red Clear	3.1	2.4	2.4	1.3	2.8	2.4	2.4	1.3
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum Initial *	-	24	-	-	-	22	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	X	X	X
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X

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

Signal Upgrade - Temporary Design 2 (Construction Phase IIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)		
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek	
750 N. Greenfield Pkwy, Garner, NC 27529		HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	
REVISIONS		INIT. DATE	
DocuSigned by: <i>Natasha R. Simmons</i> 5/21/2024		SIGNATURE DATE	
0 40 1"=40'		SIG. INVENTORY NO. 08-0506T2	

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME 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	-	4	-	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE REMOVED INCLUDED PHASES FOR OL1 AND OL3

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

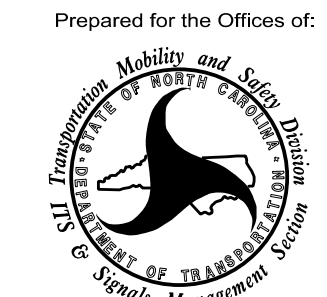
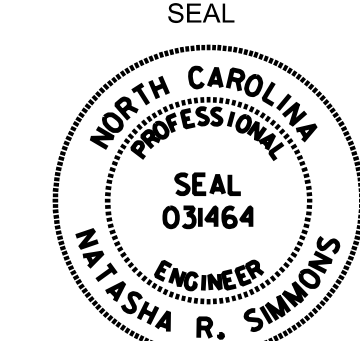

	Detector	Call Phase	Delay
1A	1	1	3
	29	0	3

	Detector	Call Phase	Delay
5A	15	5	3
	31	0	3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0506T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 2
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)	SEAL  MELISSA R. SIMMONS ENGINEER SEAL 031464
Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons	REVISIONS INIT. DATE _____ _____ _____
DocuSigned by:  SIGNATURE DATE 5/21/2024		SIG. INVENTORY NO. 08-0506T2

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

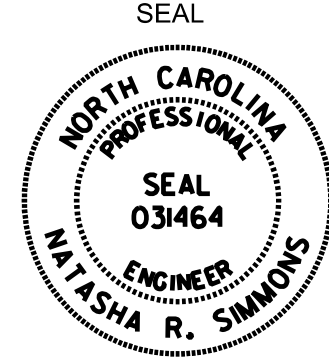
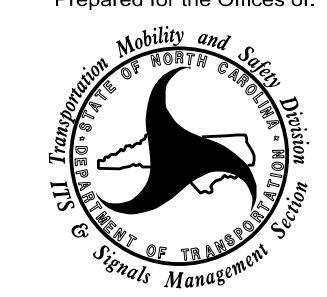

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0506T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 2
Electrical Detail - Sheet 3 of 3

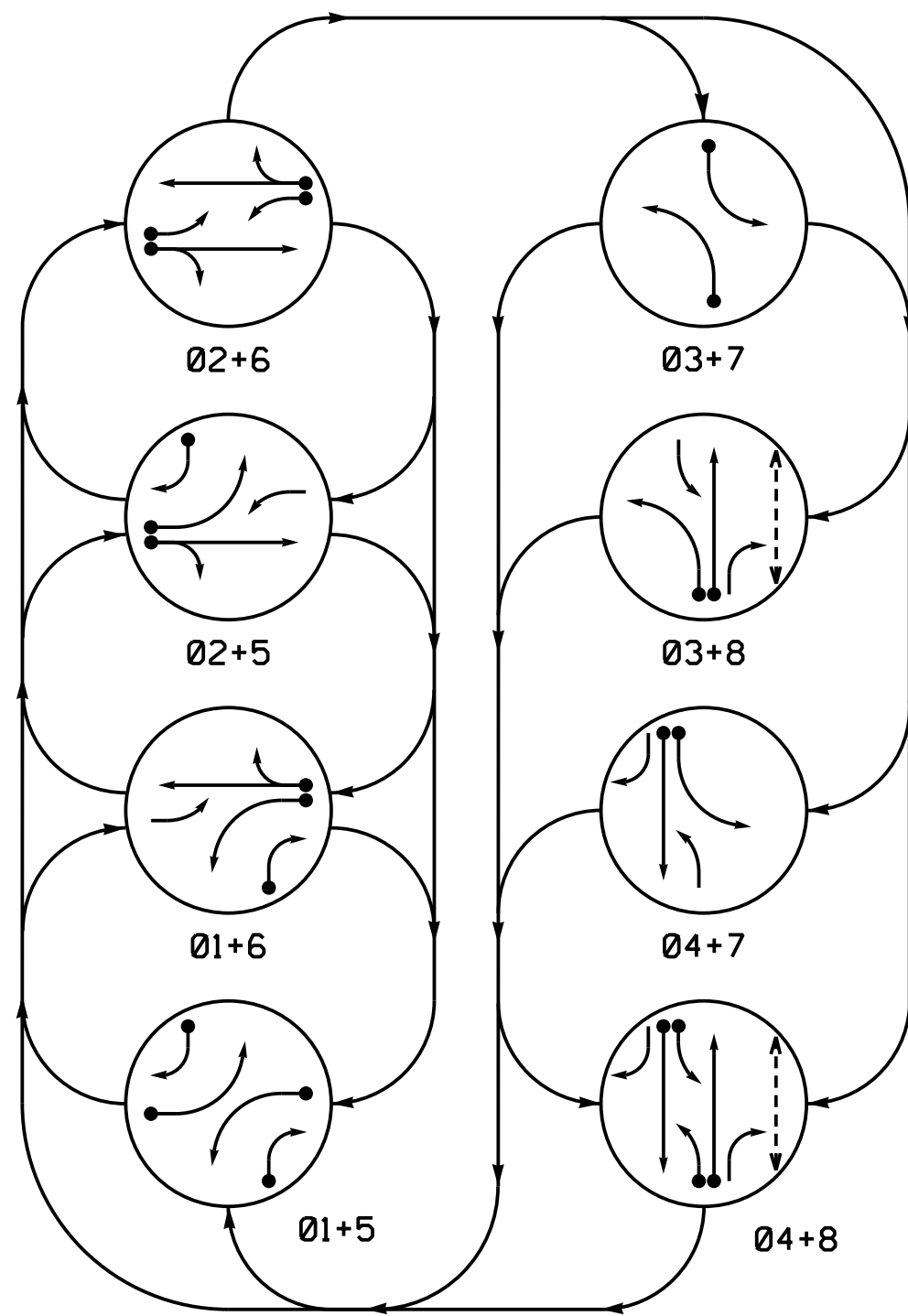
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HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

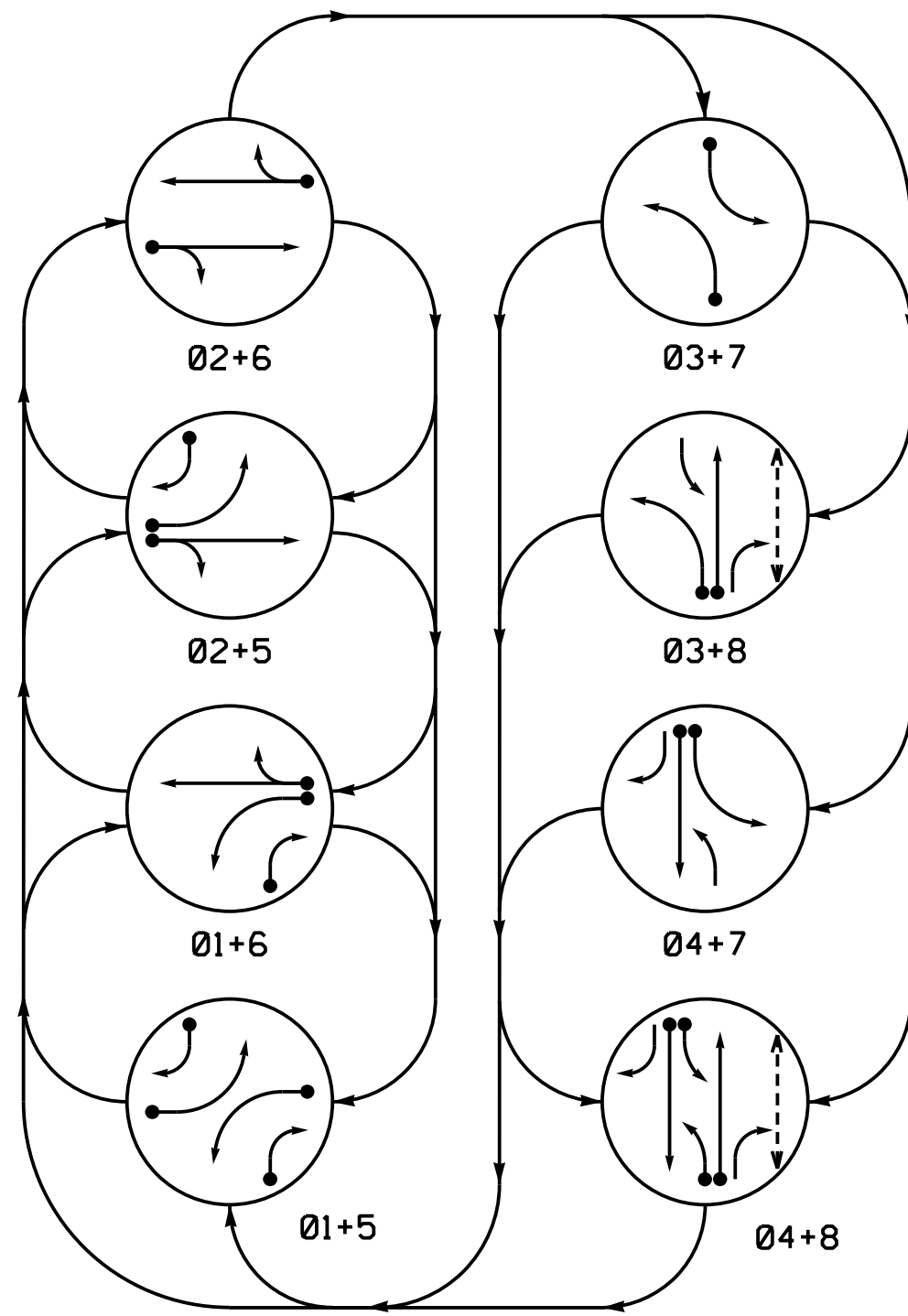
ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)	SEAL 
Prepared for the Offices of: 	Division 8 Randolph County Asheboro	
	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons	
	REVISIONS INIT. DATE	
		DocuSigned by:  5/21/2024 SIGNATURE DATE SIG. INVENTORY NO. 08-0506T2

750 N. Greenfield Pkwy, Garner, NC 27529

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM

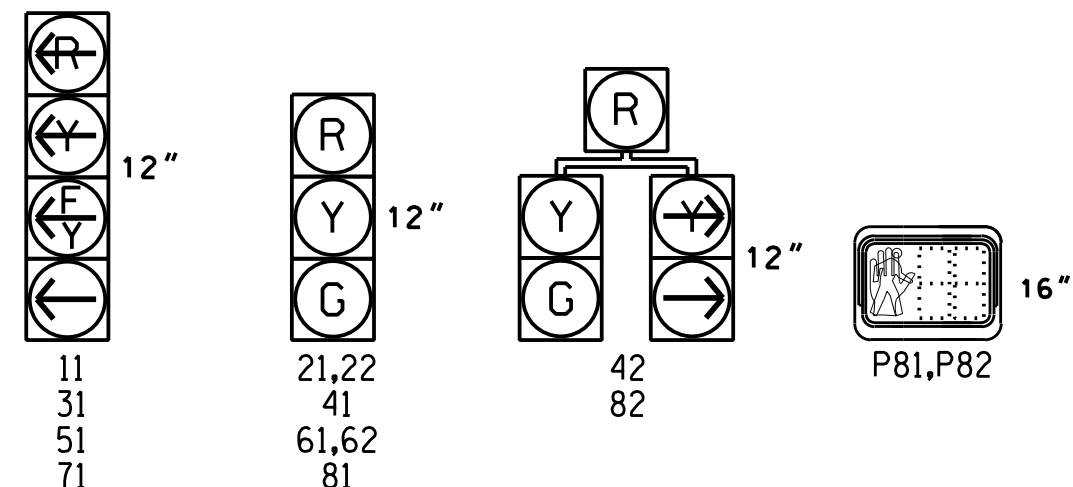


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	---	---	F	F	R	R	R	Y
21,22	R	R	G	G	R	R	R	Y
31	R	R	R	R	---	---	F	F
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51	---	F	F	F	R	R	R	Y
61,62	R	G	R	G	R	R	R	Y
71	R	R	R	R	---	---	F	F
81	R	R	R	R	R	R	G	G
82	R	R	R	R	R	R	G	G
P81,P82	DW	DW	DW	DW	W	W	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	---	---	R	R	R	R	R	Y
21,22	R	R	G	G	R	R	R	Y
31	R	R	R	R	---	---	F	F
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51	---	R	R	R	R	R	R	Y
61,62	R	G	R	G	R	R	R	Y
71	R	R	R	R	---	---	F	F
81	R	R	R	R	R	R	G	G
82	R	R	R	R	R	R	G	G
P81,P82	DW	DW	DW	DW	W	W	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

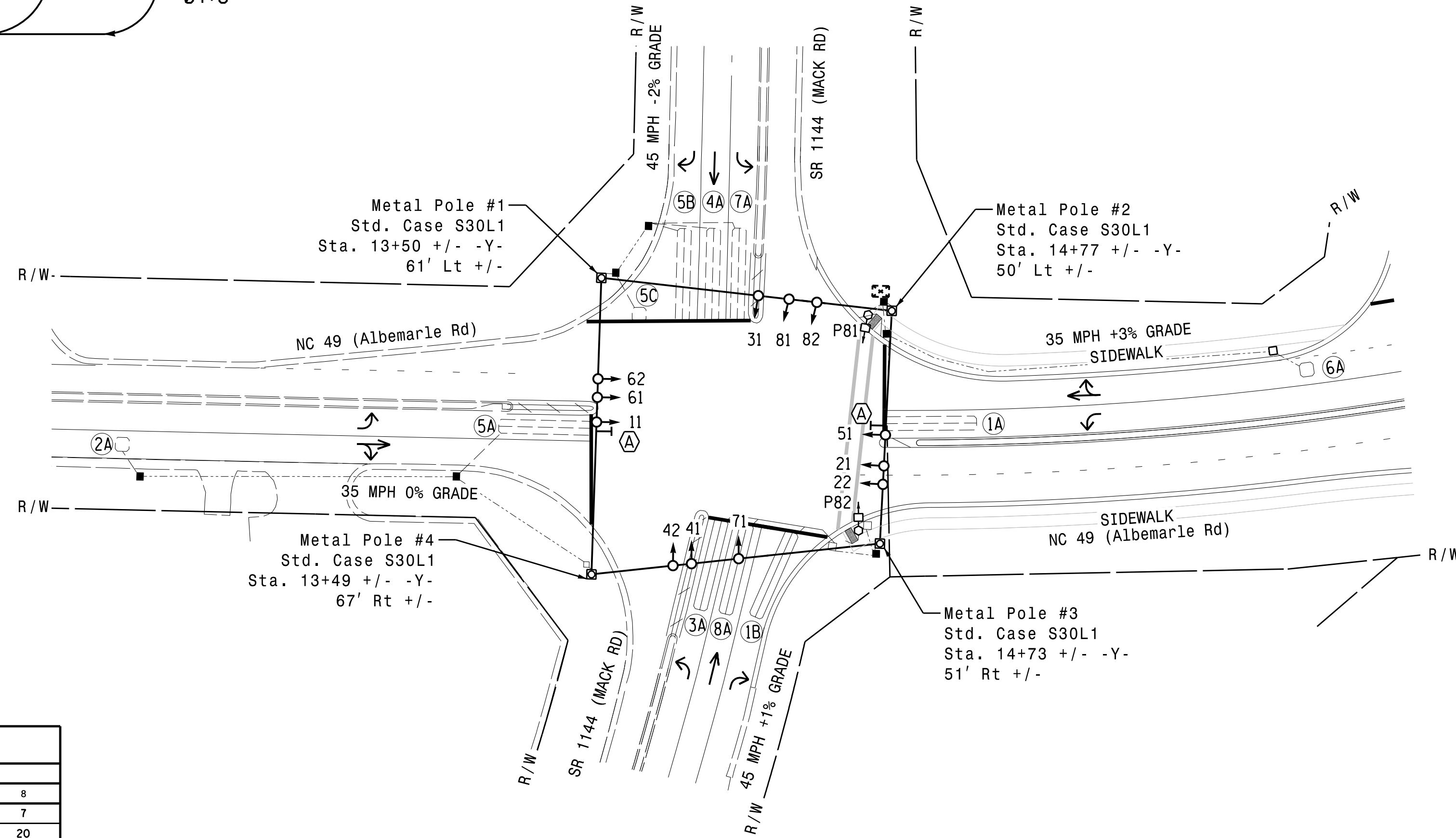
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING								
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND INITIAL	CALL	CALL	CALL	NEW CARD	
1A	6X40	0	2-4-2	-	1	*15	-	X	-	X	-	-	-
1B	6X40	0	2-4-2	X	1	15	-	X	-	X	-	-	-
2A	6X6	200	4	-	2	-	-	X	X	X	-	-	-
3A	6X40	0	2-4-2	X	3	15	-	X	-	X	-	-	-
4A	6X40	0	2-4-2	-	4	-	-	X	-	X	-	-	-
5A	6X40	0	2-4-2	-	5	*15	-	X	-	X	-	-	-
5B	6X40	0	2-4-2	-	5	15	-	X	-	X	-	-	-
5C	6X6	0	4	-	5	15	-	X	-	X	-	-	-
6A	6X6	180	3	-	6	-	-	X	X	X	-	-	-
7A	6X40	0	2-4-2	-	7	15	-	X	-	X	-	-	-
8A	6X40	0	2-4-2	X	8	-	-	X	-	X	-	-	-

* Reduce Delay to 3 seconds During Alternate Phasing Operation.
 ▪ Disable phase call during Alternate Phasing operation.

8 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.



LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
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MAXTIME TIMING CHART

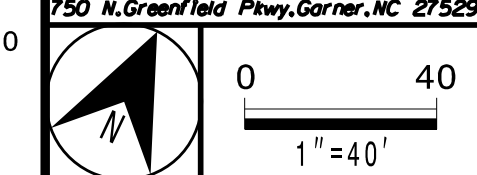
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	-	-	-	-	-	-	7
Ped Clear *	-	-	-	-	-	-	-	20
Min Green	7	10	7	7	7	10	7	7
Passage *	2.0	5.0	2.0	2.0	2.0	5.0	2.0	2.0
Max 1 *	15	50	20	20	30	50	20	20
Yellow Change	3.0	3.8	3.0	4.7	3.0	3.8	3.0	4.7
Red Clear	2.9	2.2	2.4	1.3	2.9	2.2	2.8	1.3
Added Initial *	-	2.5	-	-	-	2.5	-	-
Maximum Initial *	-	24	-	-	-	22	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X

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

Signal Upgrade-Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 N.K. VIANICH, P.E.
	Division 8 Randolph County Asheboro		
	PLAN DATE: August 2021 PREPARED BY: N.K. Vianich REVISIONS:	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons DATE:	



DocuSigned by:
 Natasha R. Simmons 5/21/2024
 SIGNATURE DATE
 SIG. INVENTORY NO. 08-0506

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME 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	-	4	-	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE REMOVED INCLUDED PHASES FOR OL1 AND OL3

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

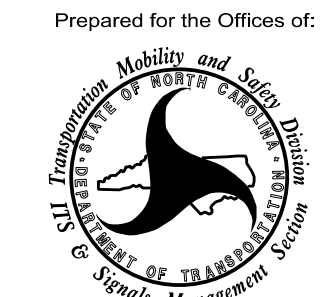
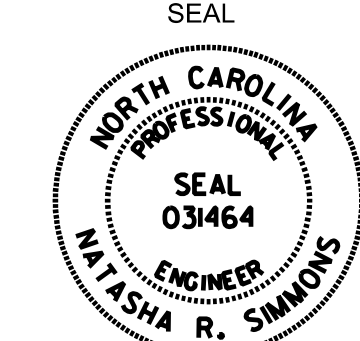

Detector	Call Phase	Delay
1	1	3
29	0	3

Detector	Call Phase	Delay
15	5	3
31	0	3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0506
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 3

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Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 49 (Albemarle Rd) at SR 1144 (Mack Rd)		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 MELISSA R. SIMMONS
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	
REVISIONS:			DocuSigned by:  SIGNATURE: <i>Melissa R. Simmons</i> DATE: 5/21/2024 SIG. INVENTORY NO. 08-0506

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

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: 08-0506
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

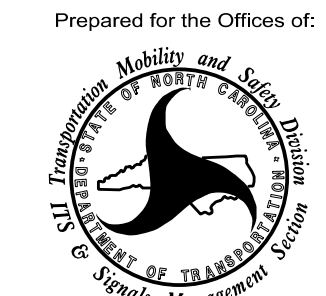
Signal Upgrade - Final Design
Electrical Detail - Sheet 3 of 3

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ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529


**NC 49 (Albemarle Rd)
at
SR 1144 (Mack Rd)**

Division 8 Randolph County Asheboro

PLAN DATE:	August 2021	REVIEWED BY:	A.D. Klinksiek
PREPARED BY:	N.K. Vianich	REVIEWED BY:	N.R. Simmons

REVISIONS	INIT.	DATE

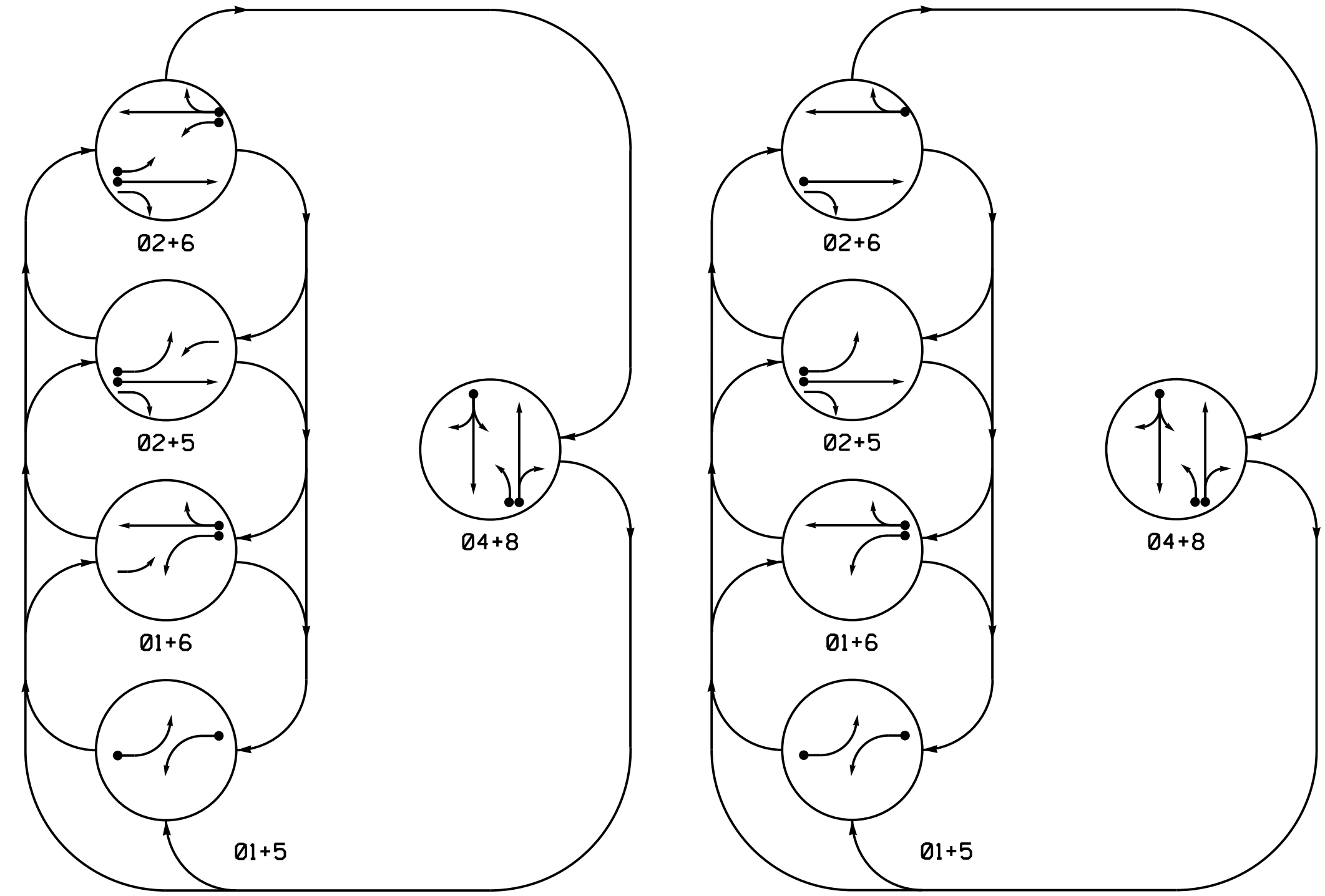
SEAL



DocuSigned by:
Natasha R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0506

DEFAULT PHASING DIAGRAM

ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	04+8	F	H	S
11	-	-	F	F	F	F	F	F
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51	-	F	-	-	F	F	F	F
61,62	R	G	R	G	R	Y		
81	F	F	F	F	F	F	F	F
82,83,84	R	R	R	R	G	R		

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+6	02+5	04+8	F	H	S
11	-	-	F	F	F	F	F	F
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51	-	F	-	-	F	F	F	F
61,62	R	G	R	G	R	Y		
81	F	F	F	F	F	F	F	F
82,83,84	R	R	R	R	G	R		

MAXTIME DETECTOR INSTALLATION CHART

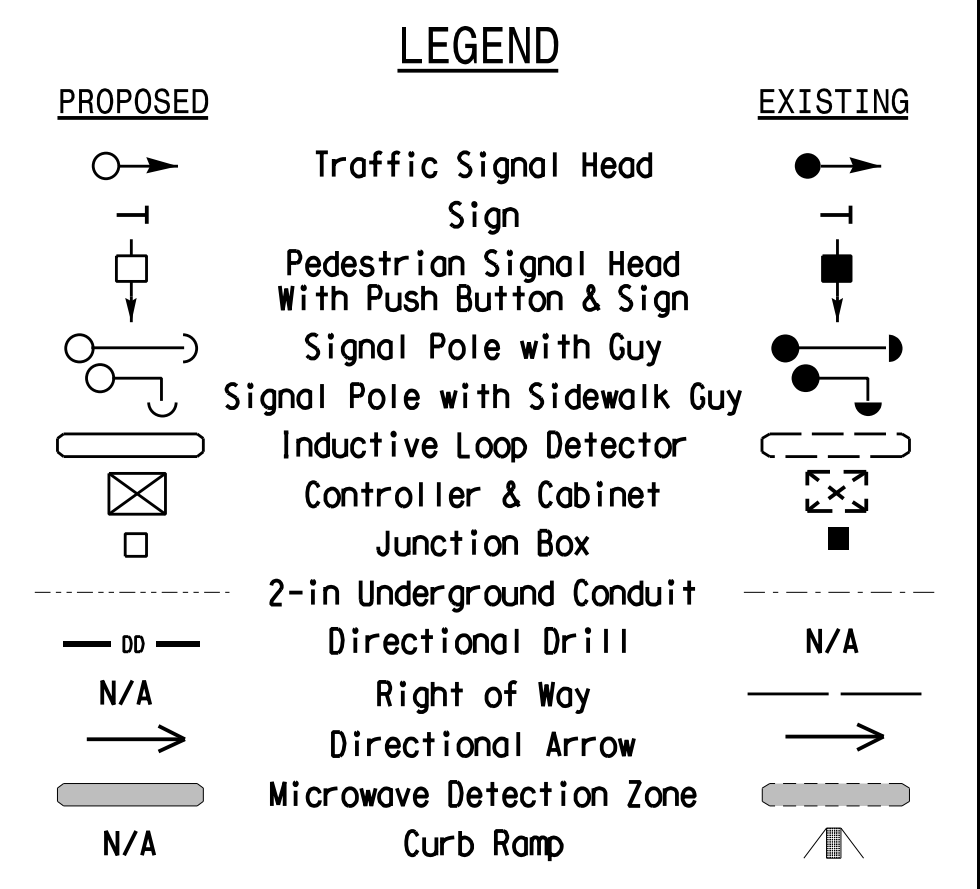
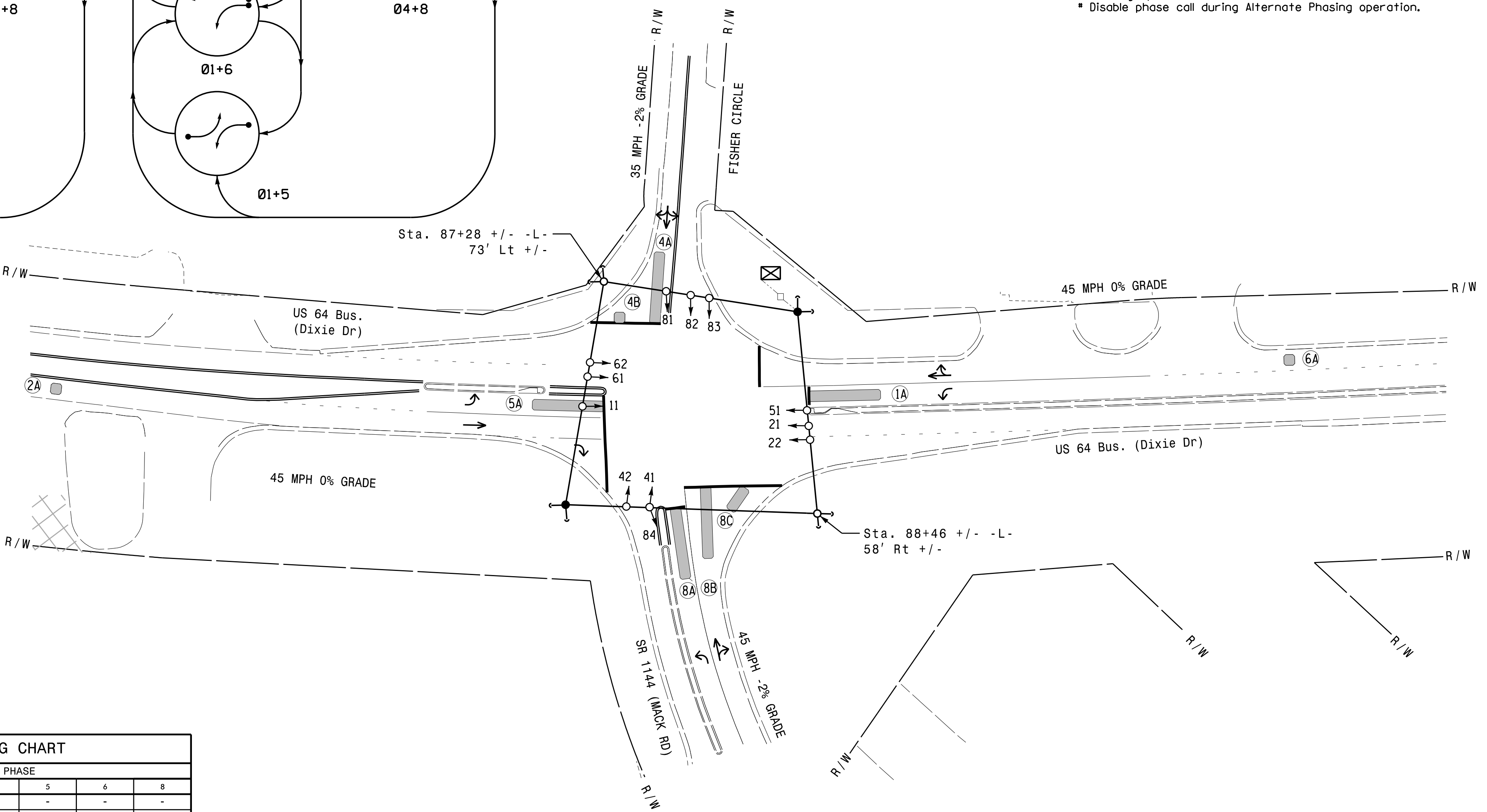
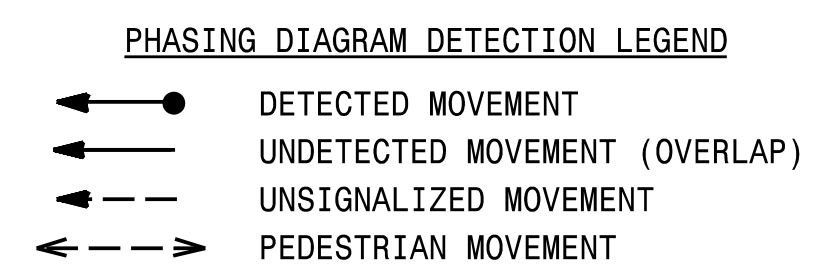
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING								
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD	
1A*	6X40	0	*	*	1	**15	-	X	-	X	-	X	*
2A*	6X6	300	*	*	2	-	-	X	X	X	-	X	*
4A*	6X40	0	*	*	4	3	-	X	-	X	-	X	*
4B*	6X6	0	*	*	4	15	-	X	-	X	-	X	*
5A*	6X6	0	*	*	5	**15	-	X	-	X	-	X	*
6A*	6X6	300	*	*	6	-	-	X	X	X	-	X	*
8A*	6X40	0	*	*	8	3	-	X	-	X	-	X	*
8B*	6X40	0	*	*	8	10	-	X	-	X	-	X	*
8C*	6X15	0	*	*	8	15	-	X	-	X	-	X	*

* Microwave Detection
 ** Reduce Delay to 3 seconds for loop during Alternate Phasing Operation.
 * Disable phase call during Alternate Phasing operation.

5 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

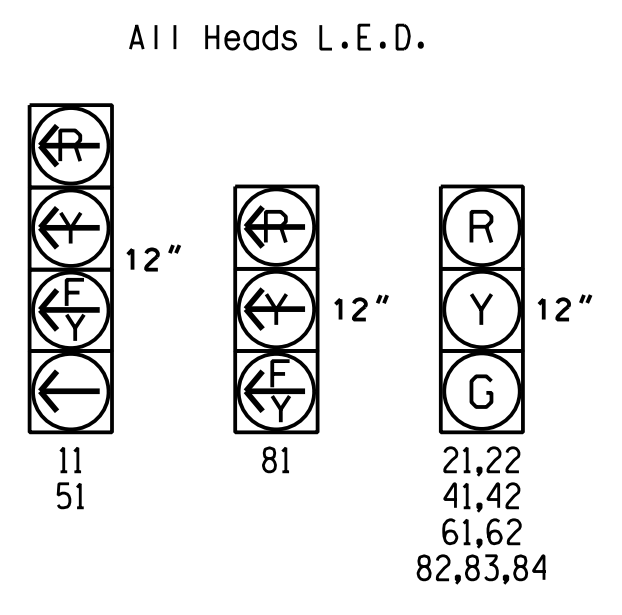
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	8		
Walk *	-	-	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-	-	-
Min Green	7	12	7	7	12	7		
Passage *	2.0	6.0	2.0	2.0	6.0	2.0		
Max 1 *	35	90	25	20	90	25		
Yellow Change	3.0	4.5	4.4	3.0	4.5	4.4		
Red Clear	3.3	1.9	1.8	1.8	1.9	1.8		
Added Initial *	-	2.5	-	-	2.5	-		
Maximum Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Advance Walk	-	-	-	-	-	-		
Non Lock Detector	X	-	X	X	-	X		
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-		
Dual Entry	-	-	X	-	-	X		

SIGNAL FACE I.D.



Signal Upgrade - Temporary Design 1 (Construction Phase I)

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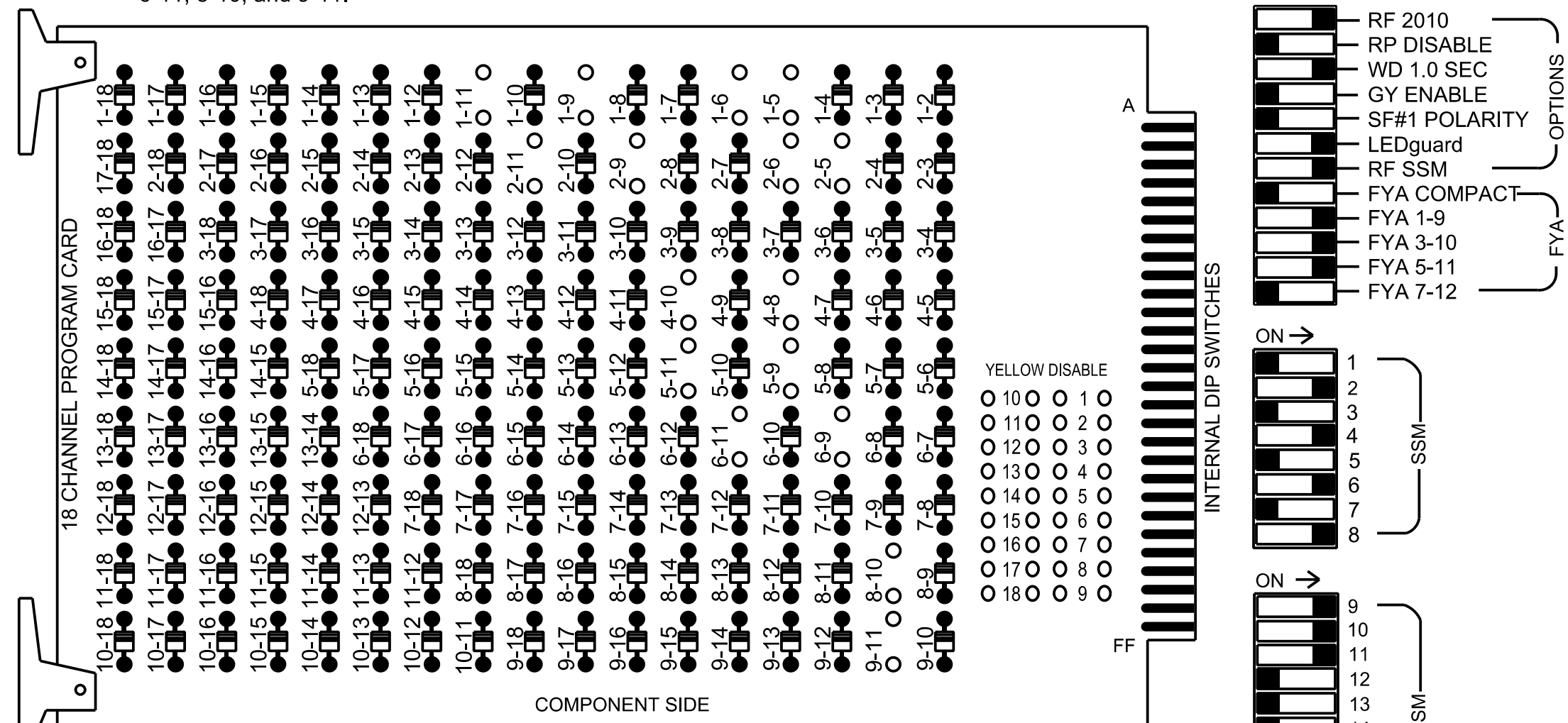
 HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	Prepared for: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir Division 8 Randolph County Asheboro PLAN DATE: August 2021 REVIEWED BY: A.D. Klinsky PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 N. R. SIMMONS
	0 40 1"=40'	REVISIONS INIT. DATE DocuSigned by: N. R. Simmons 5/21/2024 SIGNATURE DATE SIG. INVENTORY NO. 08-050771	

18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
5. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

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,S11
 AUX S1,AUX S2,AUX S4

Phases Used.....1,2,4,5,6,8
 Overlap "1".....*
 Overlap "2".....*
 Overlap "3".....*
 Overlap "4".....NOT USED

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

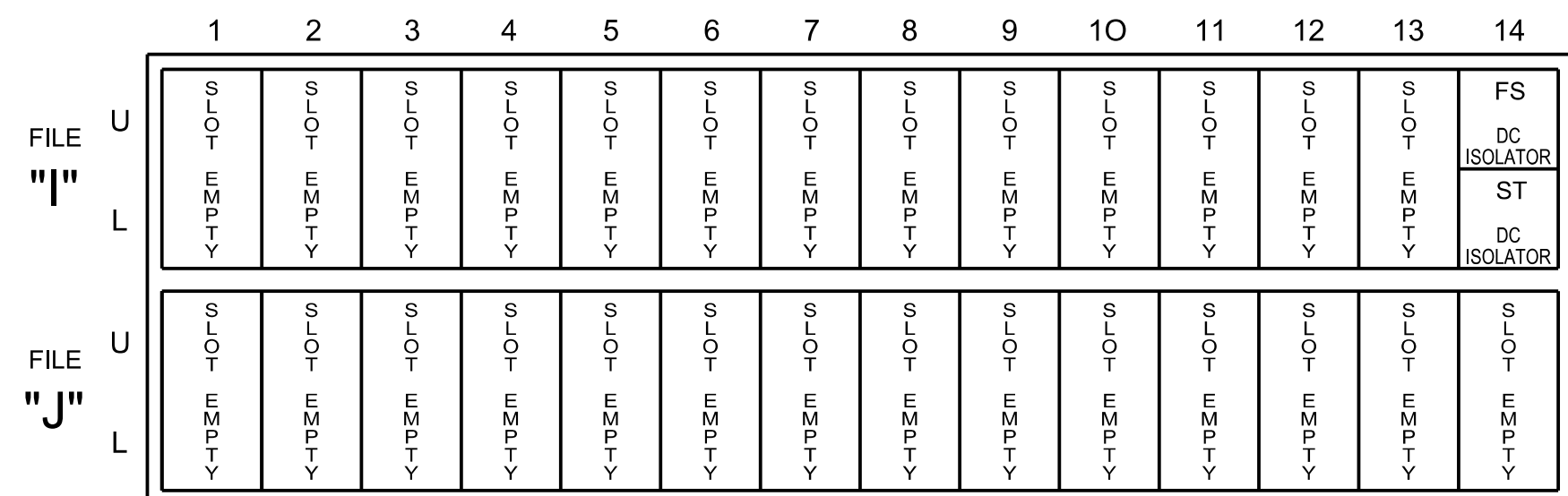
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	82,83,84	NU	11	81	NU	51	NU	NU
RED	128				101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW														A121	A124		A114	
YELLOW ARROW														A122	A125		A115	
FLASHING YELLOW ARROW														A123	A126		A116	
GREEN ARROW	127							133										
Hand																		
Walking																		

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)



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

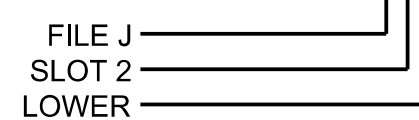
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	11U	56	18	1	★	1	15		X		
				-	29	★	6		X		X	
5A	TB3-1,2	J1U	55	17	15		5	15		X		
				-	31		2	3		X	X	X

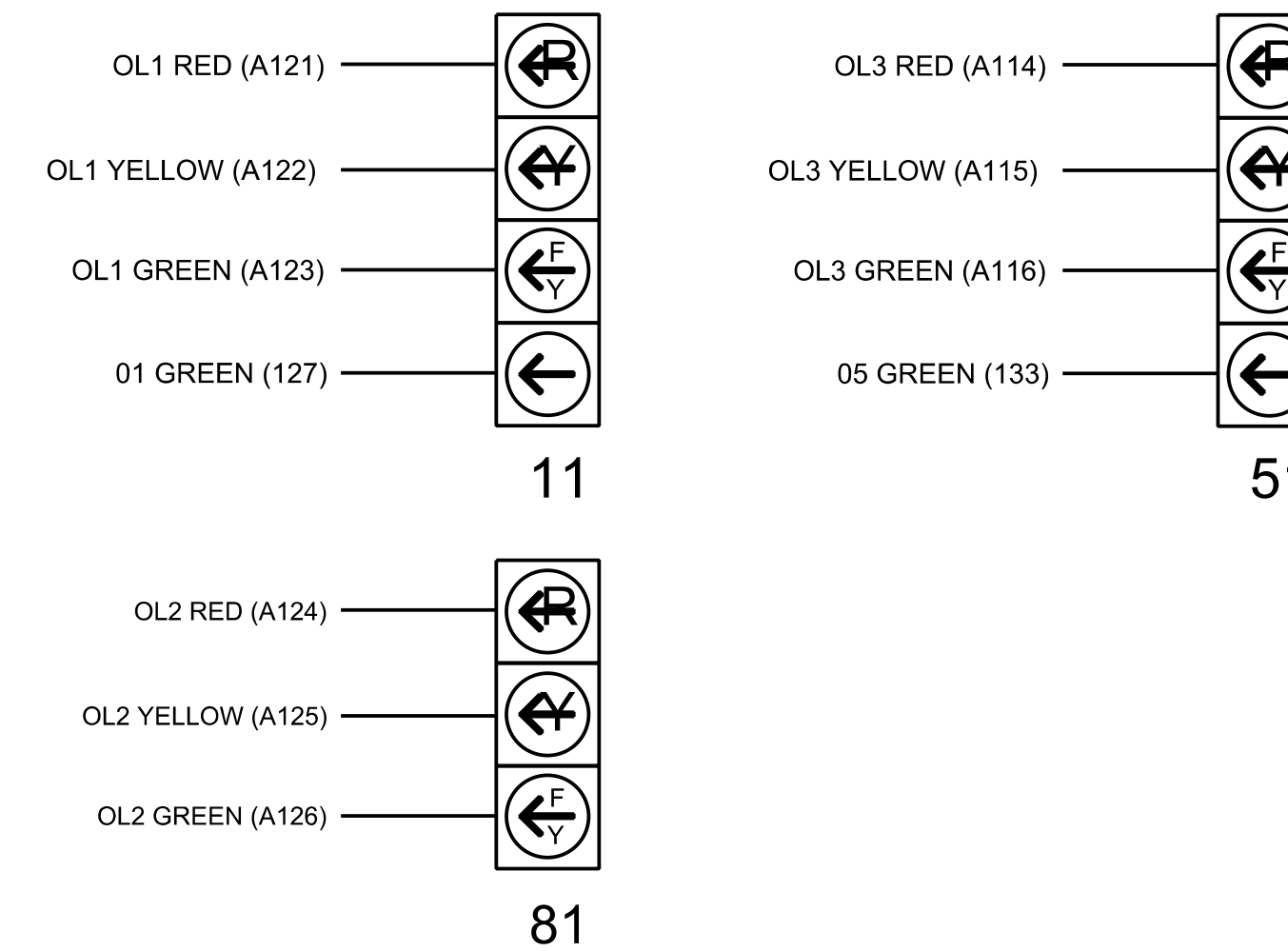
★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



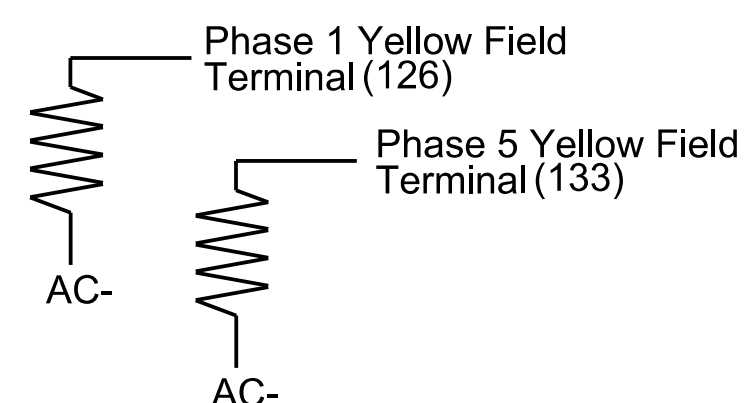
SPECIAL DETECTOR NOTE

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.

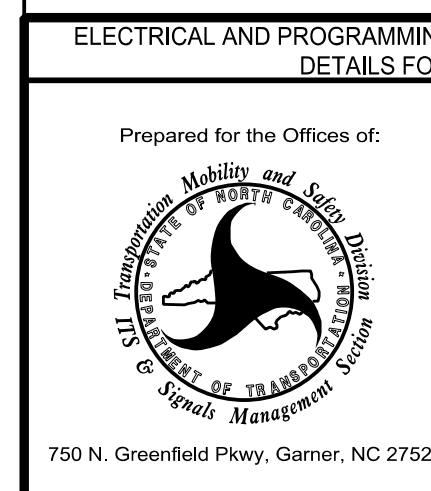
LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Signal Upgrade
 Temporary Design 1
 Electrical Detail - Sheet 1 of 3



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0507T1
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

Prepared for the Offices of:
 Mobility and Safety Division
 of North Carolina
 Signal Management System

750 N. Greenfield Pkwy, Garner, NC 27529

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 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554
 (919) 546-8997

REVISIONS	INIT.	DATE

DocuSigned by:
 Melisha R. Simmons 5/21/2024
 SIGNATURE DATE
 SIG. INVENTORY NO. 08-0507T1

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 031464
 W.T. SIMMONS

Division 8 Randolph County Asheboro
 PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons

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MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	2	4	6	-
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 DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

Detector	Call Phase	Delay
1	1	3
29	0	3

Detector	Call Phase	Delay
15	5	3
31	0	3

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	-
Included Phases	-	4	-	-
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

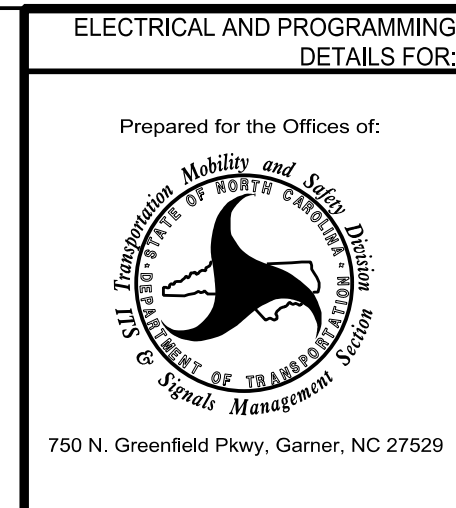
← NOTICE REMOVED INCLUDED PHASES FOR OL1 AND OL3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0507T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 1
Electrical Detail - Sheet 2 of 3

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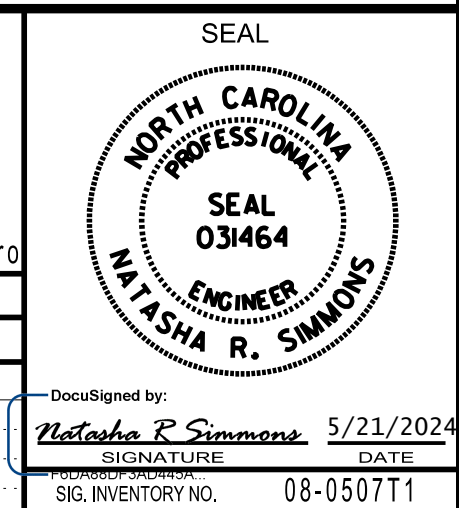


**US 64 Bus. (Dixie Dr)
at
SR 1144 (Mack Rd)/Fisher Cir**

Division 8 Randolph County Asheboro

PLAN DATE: August 2021	REVIEWED BY: A.D. Klinksiek
PREPARED BY: N.K. Vianich	REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE



DocuSigned by:
Natasha R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0507T1

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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

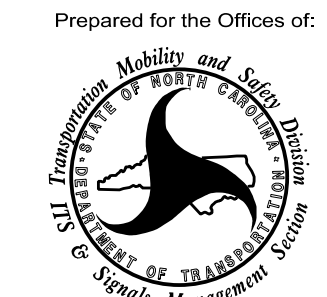
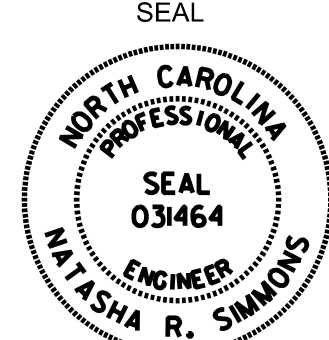

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0507T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 1
Electrical Detail - Sheet 3 of 3

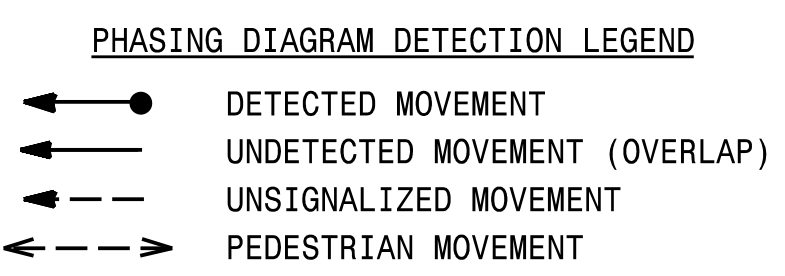
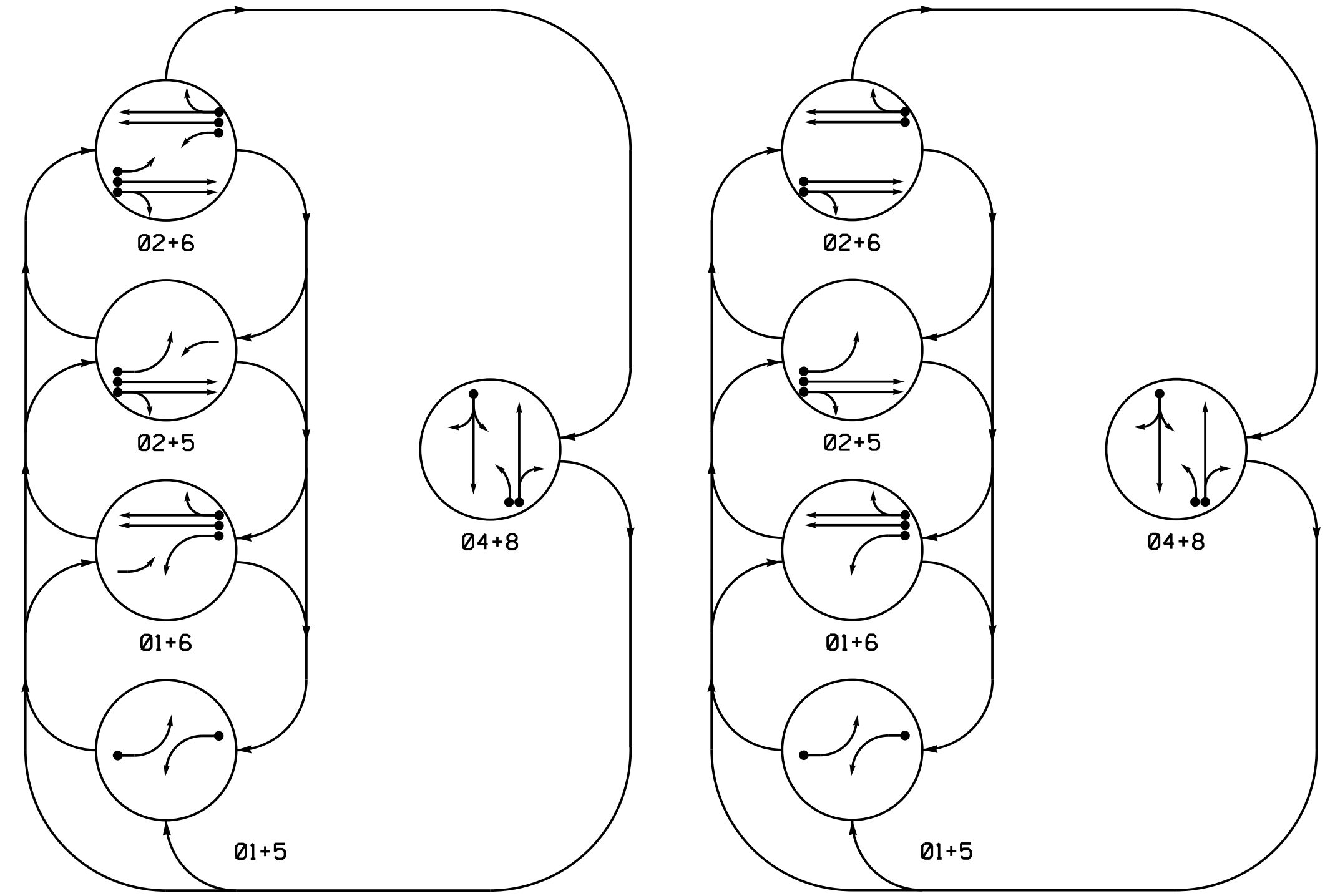
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NC License No: C-1554
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ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 MELISSA R. SIMMONS
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons	
REVISIONS _____ _____ _____	INIT. _____ _____ _____	DATE _____ _____ _____	DocuSigned by:  SIGNATURE DATE 5/21/2024 SIG. INVENTORY NO. 08-0507T1

DEFAULT PHASING DIAGRAM

ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	04+8	F	H	S
11			F	F	F			
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51		F		F	F			
61,62	R	G	R	G	R	Y		
81	F	F	F	F	F			
82,83,84	R	R	R	R	G	R		

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+6	02+6	04+8	F	H	S
11			F	F	F			
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51		F		F	F			
61,62	R	G	R	G	R	Y		
81	F	F	F	F	F			
82,83,84	R	R	R	R	G	R		

MAXTIME DETECTOR INSTALLATION CHART

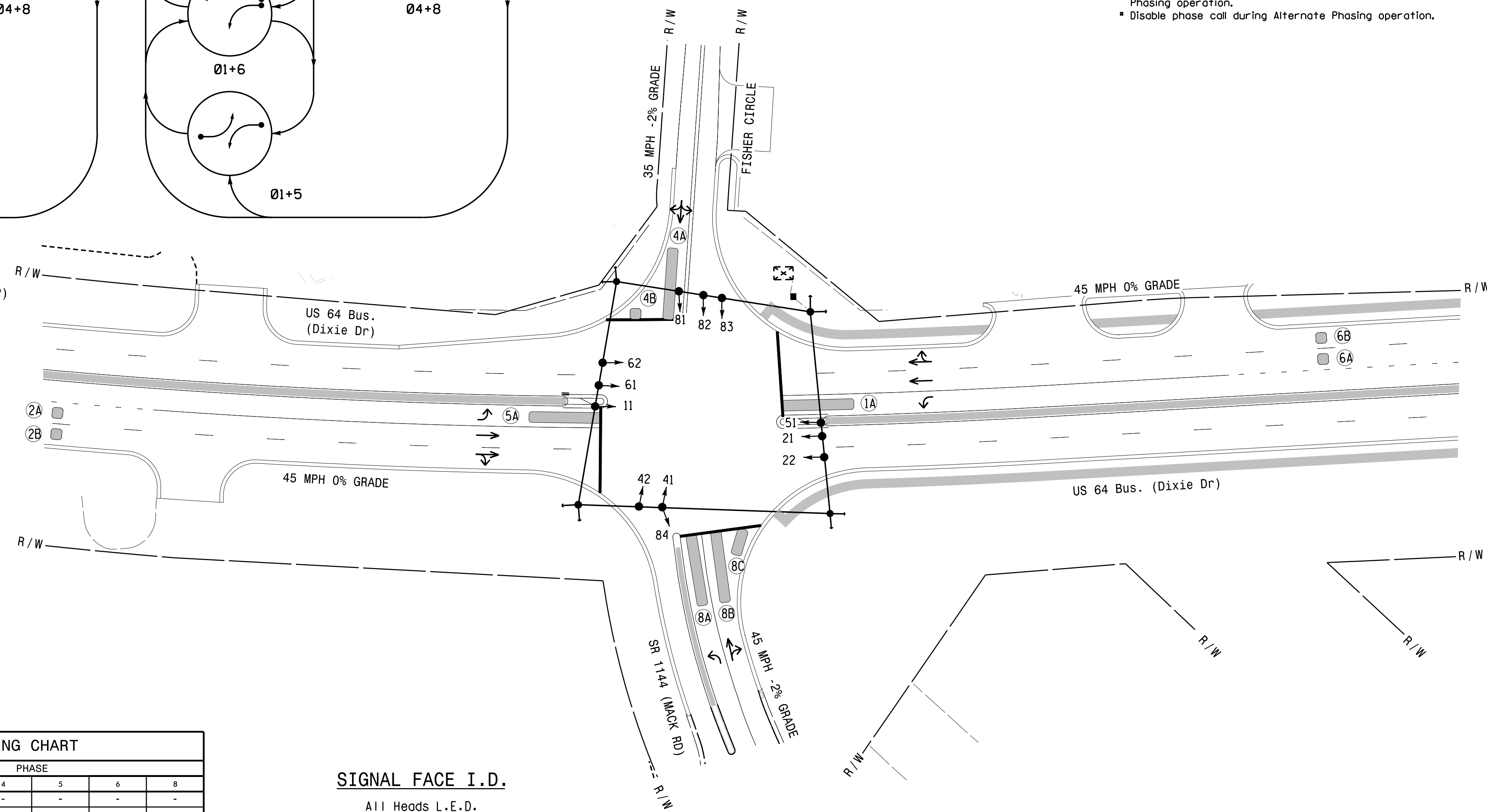
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	
1A*	6X40	0	*	*	1	**15	-	X	X	X	*	*
2A*	6X6	300	*	*	2	-	-	X	X	X	*	*
2B*	6X6	300	*	*	2	-	-	X	X	X	*	*
4A*	6X40	0	*	*	4	3	-	X	X	X	*	*
4B*	6X6	0	*	*	4	15	-	X	X	X	*	*
5A*	6X40	0	*	*	5	**15	-	X	X	X	*	*
6A*	6X6	300	*	*	6	-	-	X	X	X	*	*
6B*	6X6	300	*	*	6	-	-	X	X	X	*	*
8A*	6X40	0	*	*	8	3	-	X	X	X	*	*
8B*	6X40	0	*	*	8	10	-	X	X	X	*	*
8C*	6X15	0	*	*	8	15	-	X	X	X	*	*

* Microwave Detection
 ** Reduce Delay to 3 seconds for loop during Alternate Phasing operation.
 * Disable phase call during Alternate Phasing operation.

5 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

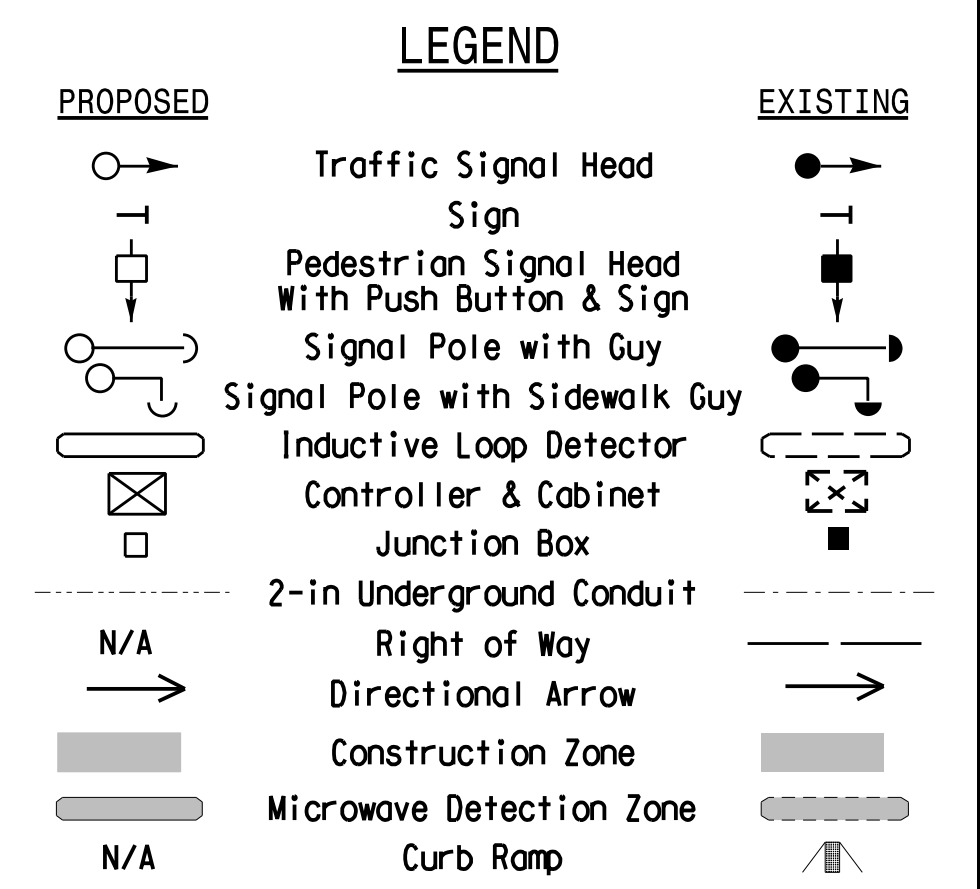
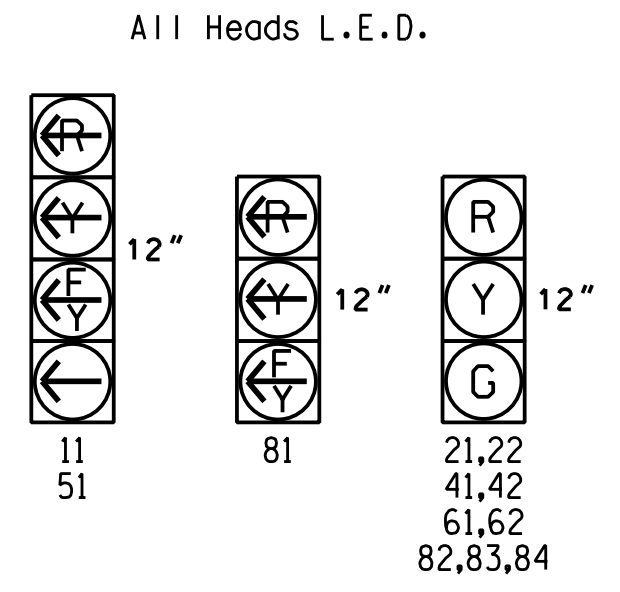
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Reposition existing signal heads numbered 11, 21, 22, 51, 61, and 62.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	8		
Walk *	-	-	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-	-	-
Min Green	7	12	7	7	12	7		
Passage *	2.0	6.0	2.0	2.0	6.0	2.0		
Max I *	35	90	25	20	90	25		
Yellow Change	3.0	4.5	4.4	3.0	4.5	4.4		
Red Clear	2.8	1.4	1.8	2.3	1.4	1.8		
Added Initial *	-	1.5	-	-	1.5	-		
Maximum Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Advance Walk	-	-	-	-	-	-		
Non Lock Detector	X	-	X	X	-	X		
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-		
Dual Entry	-	-	X	-	-	X		

SIGNAL FACE I.D.



Signal Upgrade - Temporary Design 2 (Construction Phase IIIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir		
	Division 8 Randolph County Asheboro PLAN DATE: August 2021 PREPARED BY: N.K. Vlanich	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	

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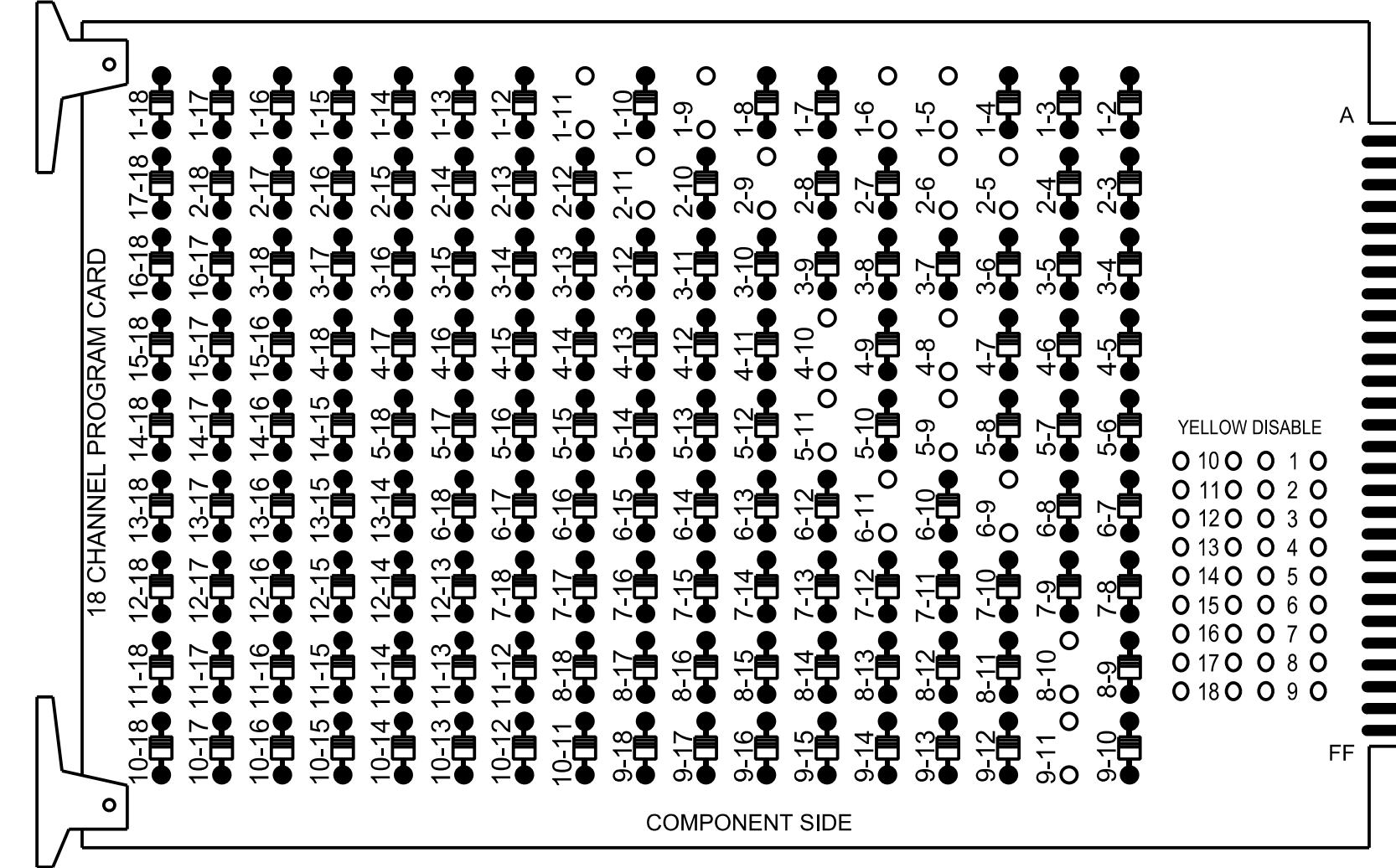
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

DocuSigned by: *Nelasha R. Simmons* 5/21/2024
 SIGNATURE DATE
 SIG. INVENTORY NO. 08-05072

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

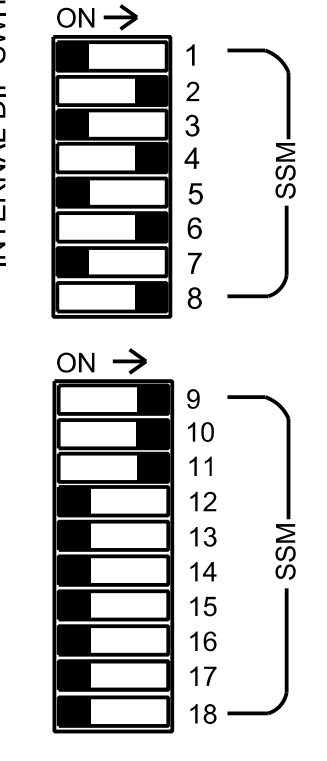
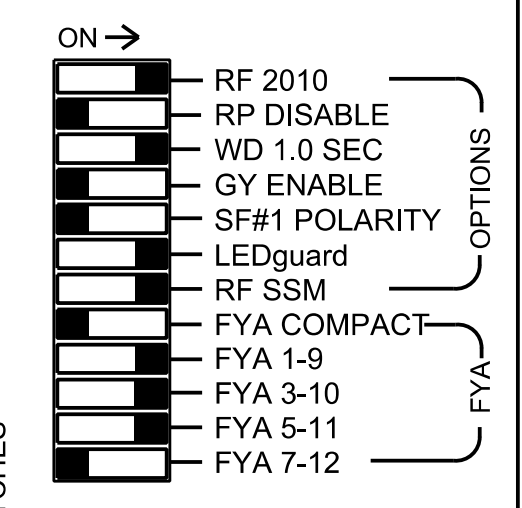
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 4-10, 5-9, 5-11, 6-9, 6-11, 8-10, and 9-11.



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 unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
- 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 enabled detectors used at this location.
- The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

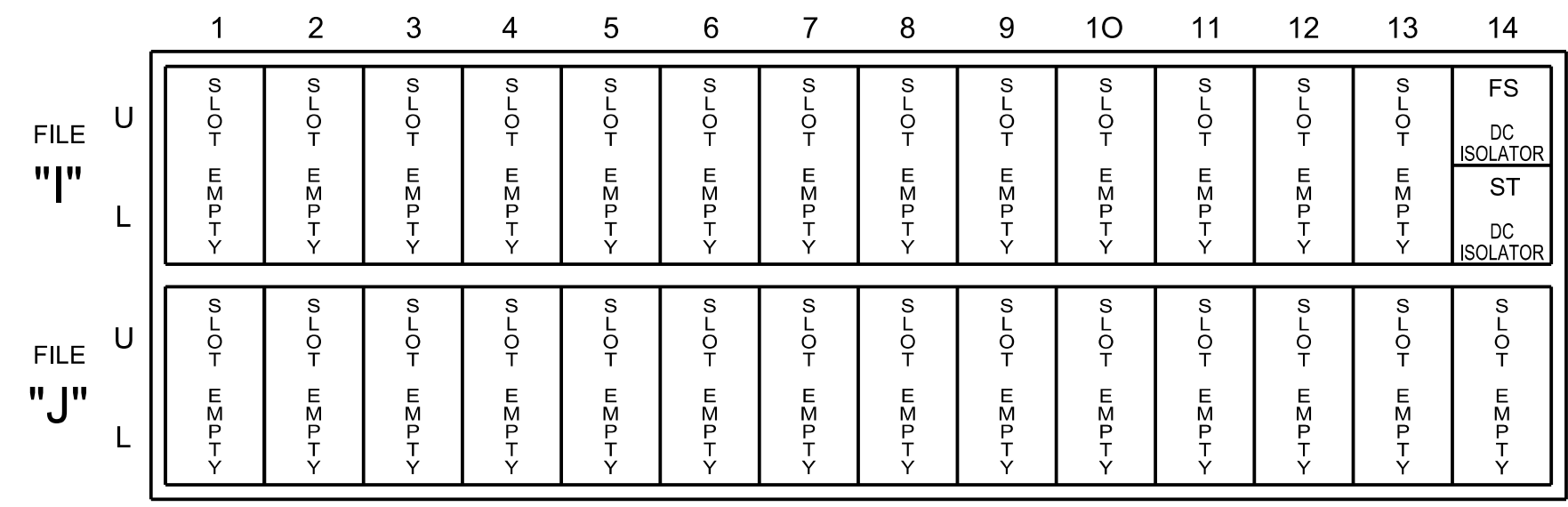
EQUIPMENT INFORMATION

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,S11
 AUX S1,AUX S2,AUX S4
 Phases Used.....1,2,4,5,6,8
 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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	1IU	56	18	1	1	15		X		X	
				-	29	6	3		X		X	X
5A	TB3-1,2	J1U	55	17	15	5	15		X		X	
				-	31	2	3		X		X	X

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

INPUT FILE POSITION LEGEND: J2L



SIGNAL HEAD HOOK-UP CHART

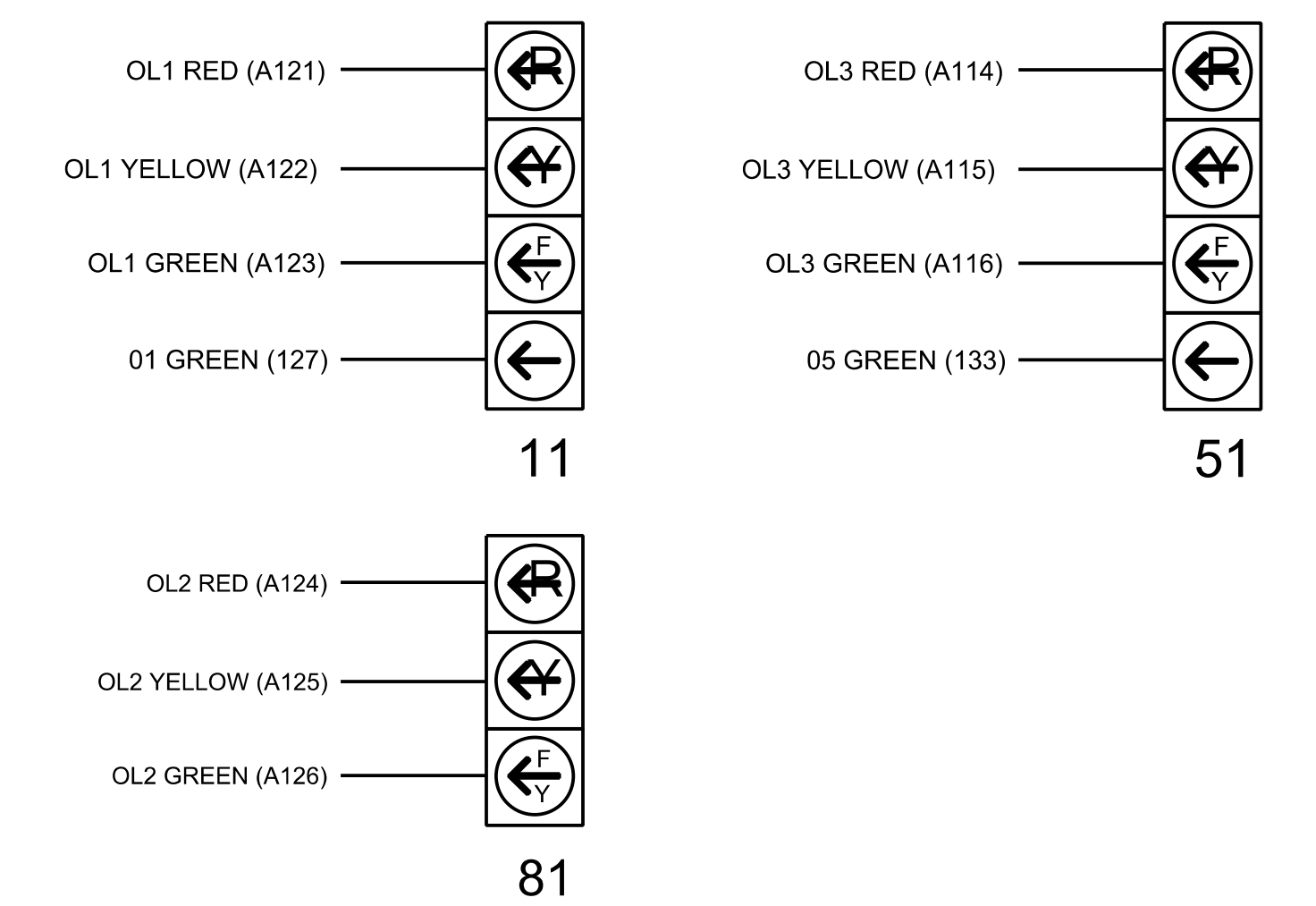
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	82,83,84	NU	11	81	NU	51	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127							133										

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)

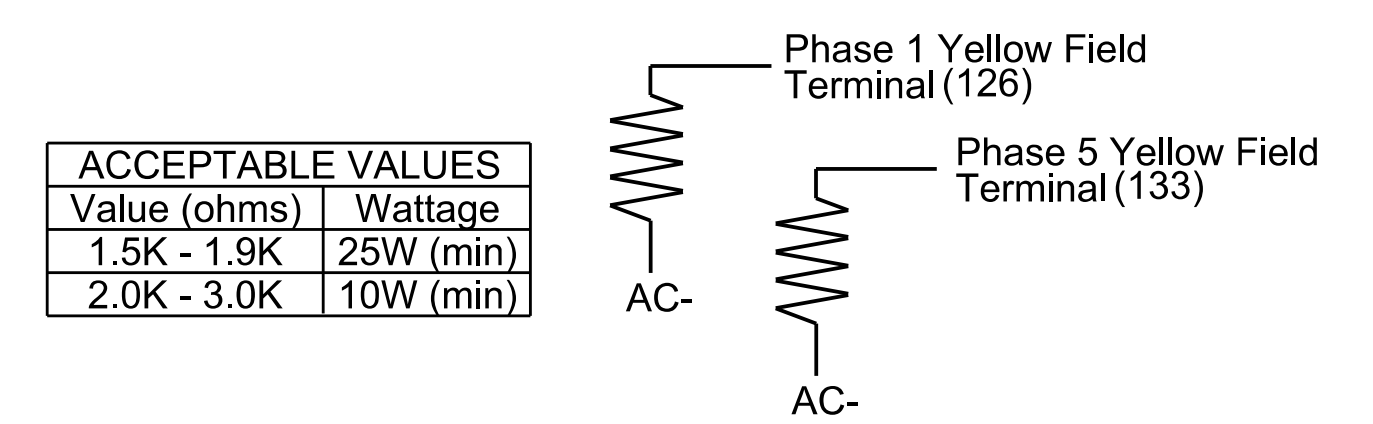


SPECIAL DETECTOR NOTE

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)

Signal Upgrade
Temporary Design 2
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir

Division 8 Randolph County Asheboro

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek

PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons

750 N. Greenfield Pkwy, Garner, NC 27529

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 W.T. SHA R. SIMMONS

DocuSigned by: Melissa R. Simmons 5/21/2024

SIG. INVENTORY NO. 08-0507T2

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	2	4	6	-
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 DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	3

5A

Detector	Call Phase	Delay
15	5	3
31	0	3

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	-
Included Phases	-	4	-	-
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 REMOVED INCLUDED PHASES FOR OL1 AND OL3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0507T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

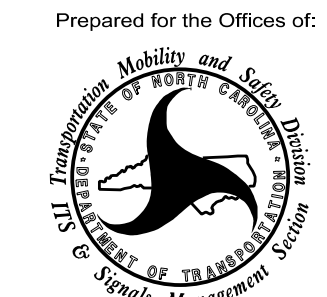
Signal Upgrade
Temporary Design 2
Electrical Detail - Sheet 2 of 3

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NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

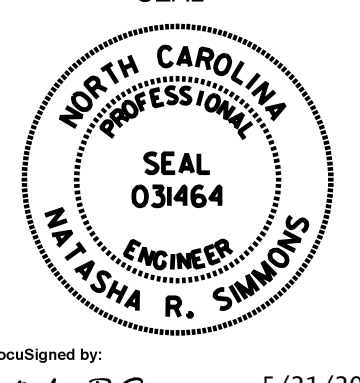
**US 64 Bus. (Dixie Dr)
at
SR 1144 (Mack Rd)/Fisher Cir**

Division 8 Randolph County Asheboro

PLAN DATE: August 2021	REVIEWED BY: A.D. Klinksiek
PREPARED BY: N.K. Vlanich	REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

SEAL



DocuSigned by:
Melissa R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0507T2

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

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.


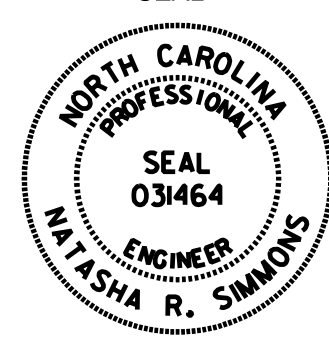

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0507T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

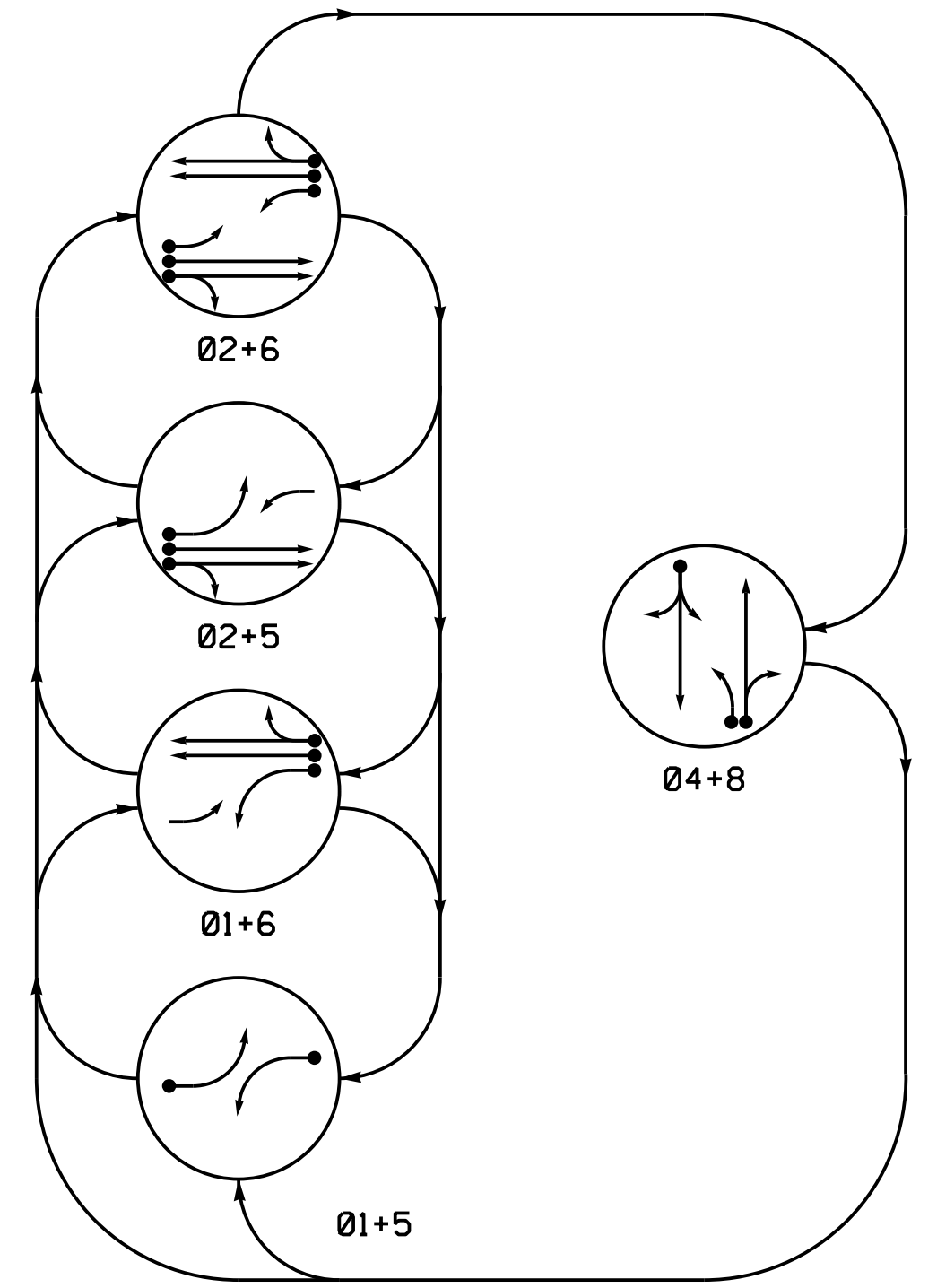
Signal Upgrade
Temporary Design 2
Electrical Detail - Sheet 3 of 3

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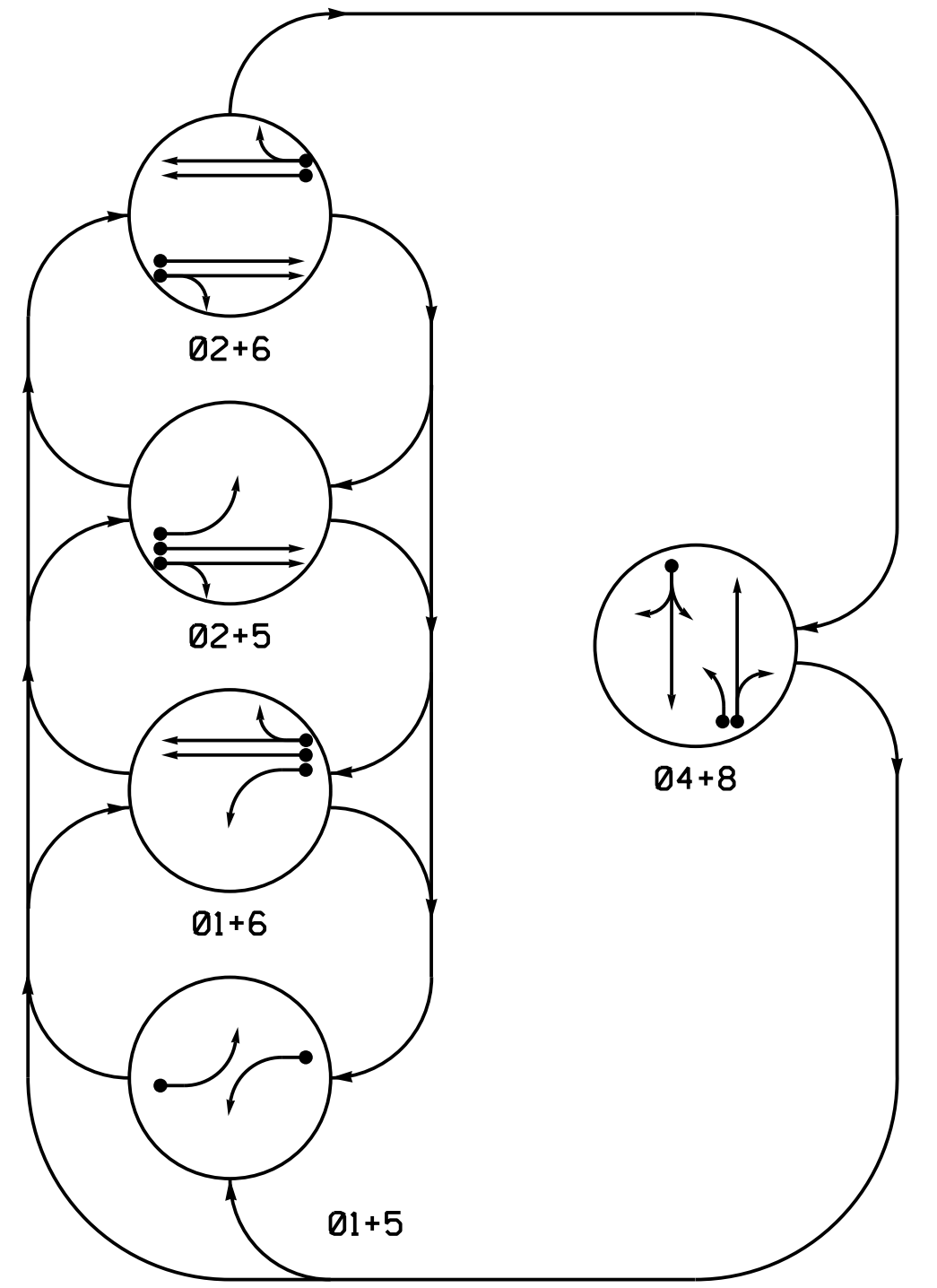
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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir		SEAL  MELISSA R. SIMMONS
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek	
REVISIONS _____ _____ _____	INIT. _____ _____ _____	DATE _____ _____ _____	DocuSigned by:  SIGNATURE DATE: 5/21/2024 SIG. INVENTORY NO. 08-0507T2

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					FLASH
	01+5	01+6	02+5	02+6	04+8	
11	-	-	F	F	R	Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	-	F	-	-	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	F	R
82,83,84	R	R	R	R	G	R
P81,P82	DW	DW	DW	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					FLASH
	01+5	01+6	02+5	02+6	04+8	
11	-	-	R	R	R	Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	-	R	-	-	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	F	R
82,83,84	R	R	R	R	G	R
P81,P82	DW	DW	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	RELAY OUTPUTS (YES)	
1A	6X40	0	2-4-2	X	1	*15	-	-	X	-	X	X
2A	6X6	300	6	X	2	3	-	-	X	X	X	X
2B	6X6	300	6	X	2	-	-	-	X	X	X	X
4A	6X40	0	2-4-2	X	4	3	-	-	X	-	X	X
4B	6X6	300	4	X	4	15	-	-	X	X	X	X
5A	6X40	0	2-4-2	X	5	*15	-	-	X	-	X	X
6A	6X6	300	4	X	6	-	-	-	X	X	X	X
6B	6X6	300	4	X	6	-	-	-	X	X	X	X
8A	6X40	0	2-4-2	X	8	3	-	-	X	-	X	X
8B	6X40	0	2-4-2	X	8	10	-	-	X	-	X	X
8C	6X15	0	4	X	8	5	-	-	X	-	X	X

* Reduce Delay to 3 seconds for loop during Alternate Phasing operation.
 * Disable phase call during Alternate Phasing operation.

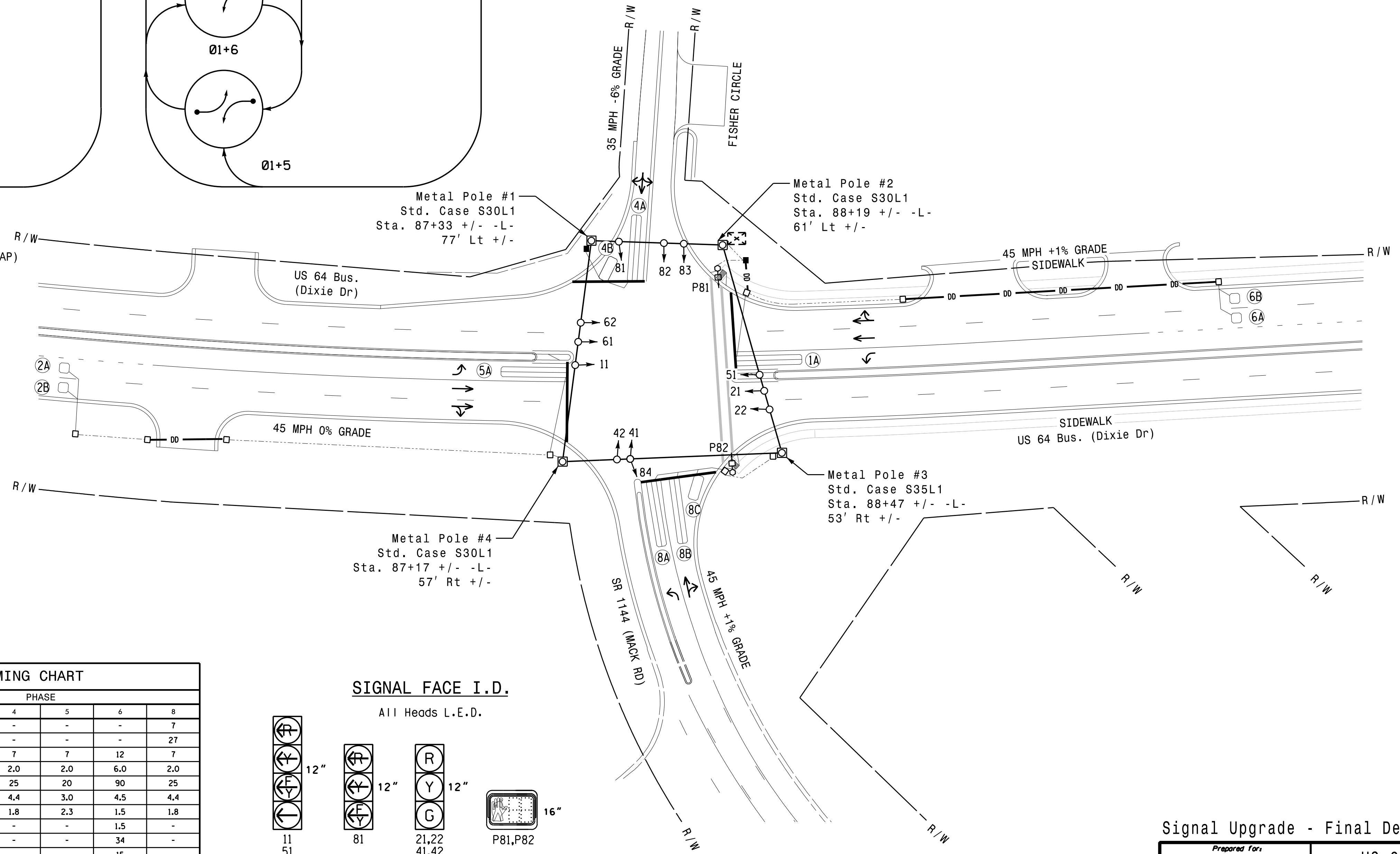
5 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.

PHASING DIAGRAM DETECTION LEGEND

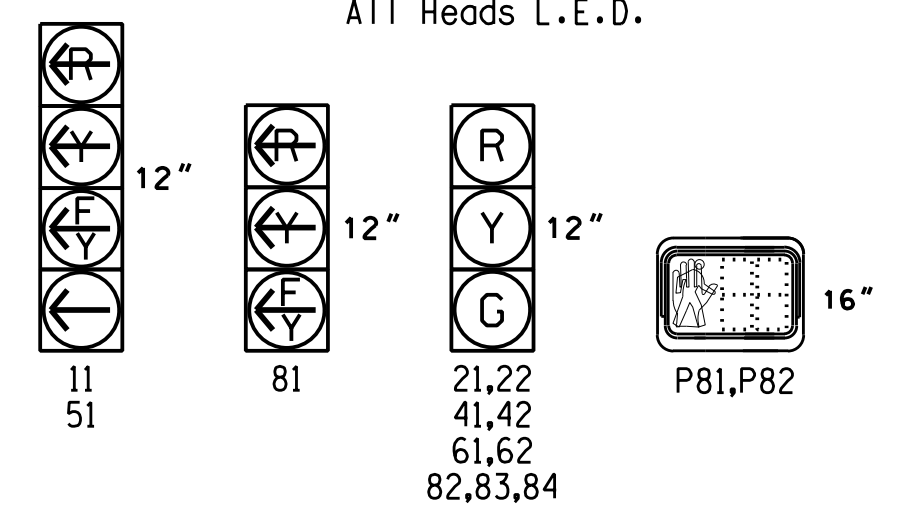
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Walk *	-	-	-	-	-	-	7	
Ped Clear *	-	-	-	-	-	-	27	
Min Green	7	12	7	7	12	7		
Passage *	2.0	6.0	2.0	2.0	6.0	2.0		
Max I *	35	90	25	20	90	25		
Yellow Change	3.0	4.5	4.4	3.0	4.5	4.4		
Red Clear	2.8	1.5	1.8	2.3	1.5	1.8		
Added Initial *	-	1.5	-	-	1.5	-		
Maximum Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Advance Walk	-	-	-	-	-	-		
Non Lock Detector	X	-	X	X	-	X		
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-		
Dual Entry	-	-	X	-	-	X		

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



LEGEND

PROPOSED	EXISTING
	N/A

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir		
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek	
REVISIONS		INIT. DATE	DocuSigned by: <i>Nelasha R. Simmons</i> 5/21/2024 SIGNATURE DATE SIG. INVENTORY NO. 08-0507

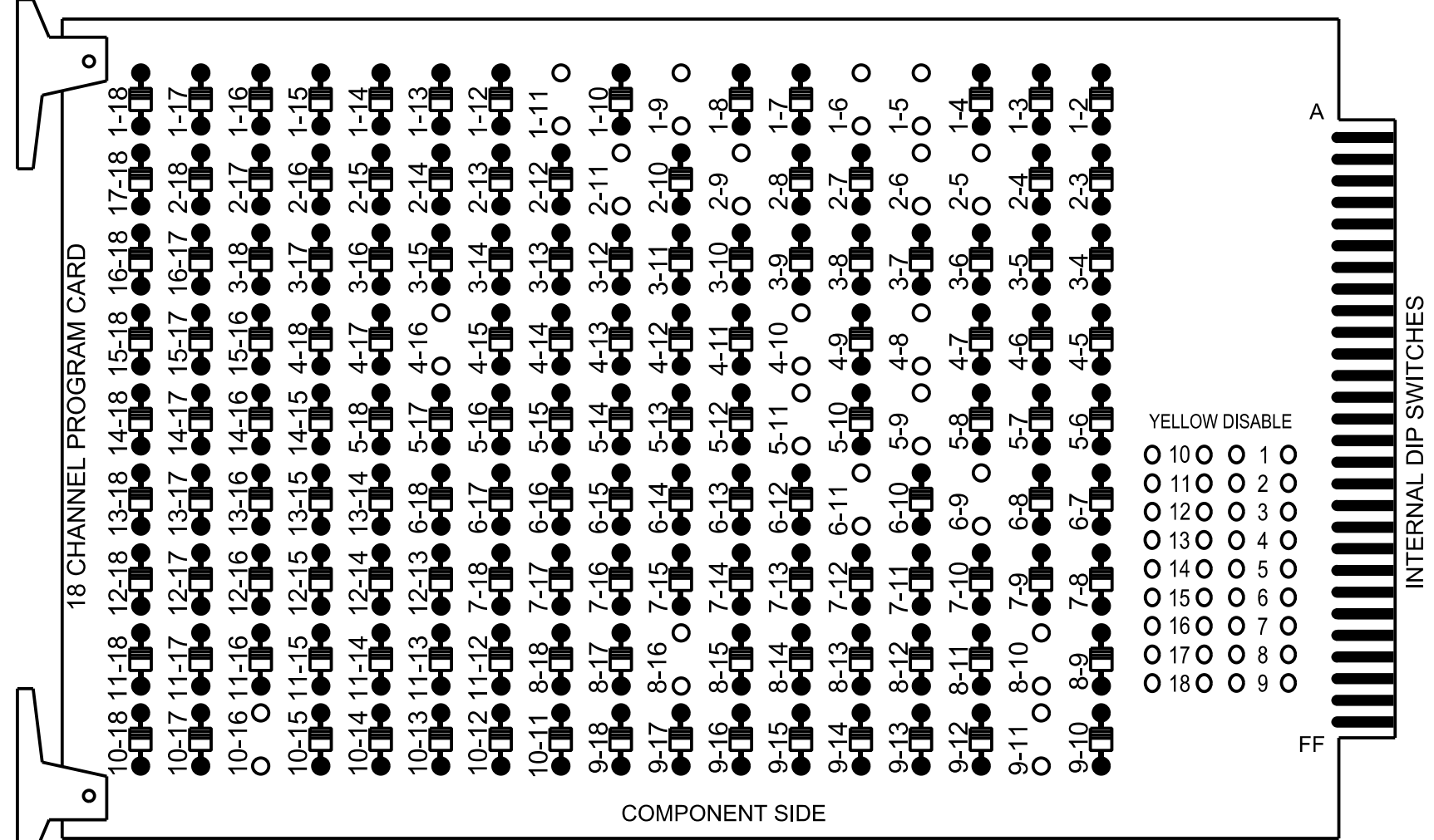
HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 4-10, 4-16, 5-9, 5-11, 6-9, 6-11, 8-10, 8-16, 9-11, and 10-16



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
- 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 enabled detectors used at this location.
- The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

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,S11,S12
 AUX S1,AUX S2,AUX S4
 Phases Used.....1,2,4,5,6,8,8 PED
 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		SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	82,83,84	P81,P82	11	81	NU	51	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
Hand													110					
Walking Person													112					

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2 2A	S T	S T	S T	∅ 4 4A	S T	S T	S T	S T	S T	S T	NOT USED	FS DC ISOLATOR
L	NOT USED	∅ 2 2B	T Y	T Y	T Y	∅ 4 4B	T Y	T Y	T Y	T Y	T Y	T Y	∅ 8 PED DC ISOLATOR	ST DC ISOLATOR
U	∅ 5 5A	∅ 6 6A	T Y	T Y	T Y	∅ 8 8A	∅ 8 8C	T Y	T Y	T Y	T Y	T Y	T Y	T Y
L	NOT USED	∅ 6 6B	T Y	T Y	T Y	∅ 8 8B	NOT USED	T Y	T Y	T Y	T Y	T Y	T Y	T Y

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

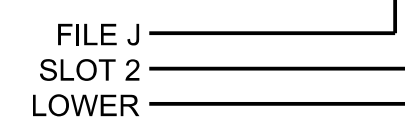
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		X		X	
2A	TB2-5,6	I2U	39	1	29 ★	6	3		X	X	X	X
2B	TB2-7,8	I2L	43	5	3	2			X	X	X	
4A	TB4-9,10	I6U	41	3	8	4	3		X	X	X	
4B	TB4-11,12	I6L	45	7	9	4	15		X	X	X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15		X	X	X	
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
6B	TB3-7,8	J2L	44	6	17	6			X	X	X	
8A	TB5-9,10	J6U	42	4	22	8	3		X	X	X	
8B	TB5-11,12	J6L	46	8	23	8	10		X	X	X	
8C	TB7-1,2	J7U	66	32	24	8	15		X	X	X	
PED PUSH BUTTONS												
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

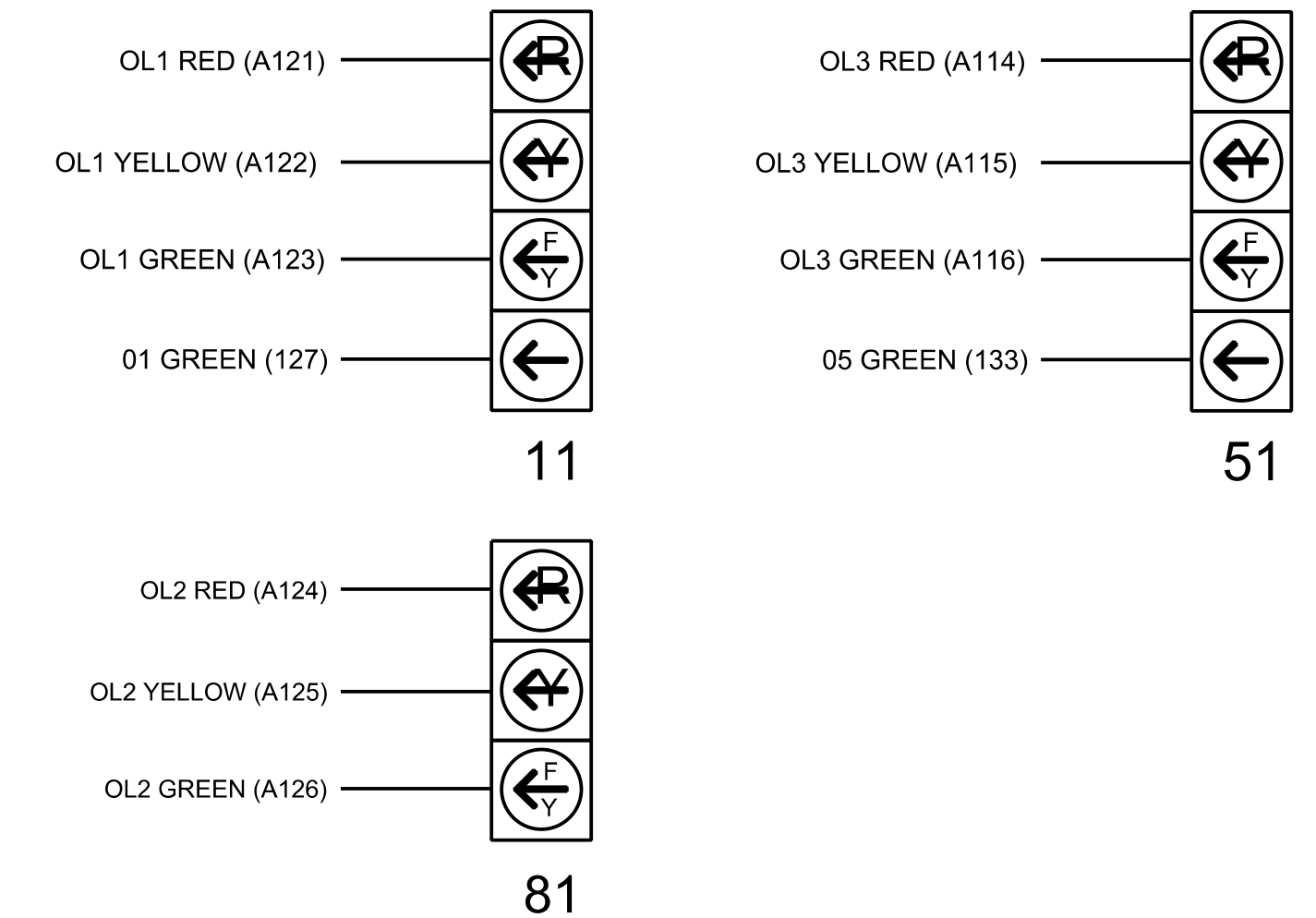
★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L



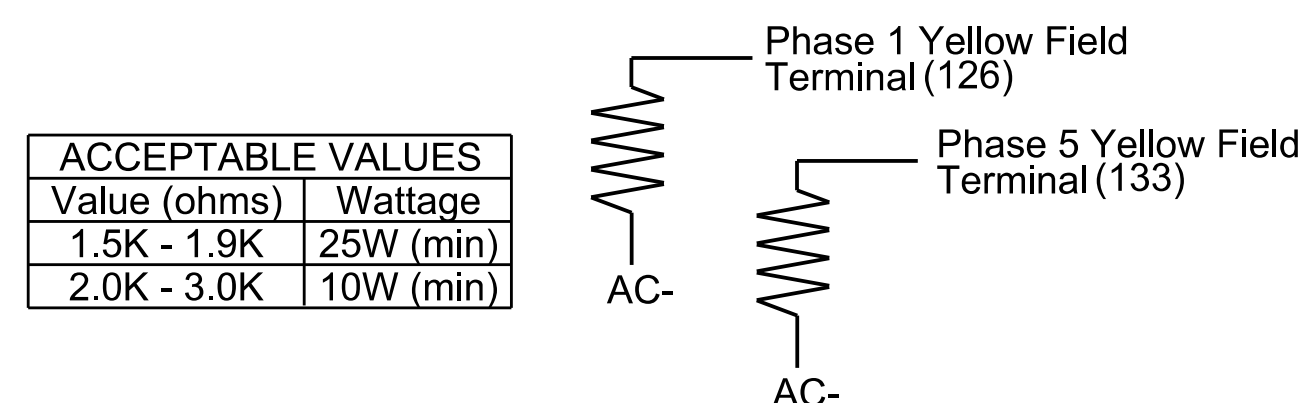
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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.

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 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
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Signal Upgrade - Final Design
 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

US 64 Bus. (Dixie Dr)
 at
 SR 1144 (Mack Rd)/Fisher Cir

Division 8 Randolph County Asheboro

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons

REVISIONS: _____ INT. DATE: _____

DocuSigned by:

 5/21/2024

SIG. INVENTORY NO. 08-0507

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	2	4	6	-
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 DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

Detector	Call Phase	Delay
1	1	3
29	0	3

Detector	Call Phase	Delay
15	5	3
31	0	3

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	-
Included Phases	-	4	-	-
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

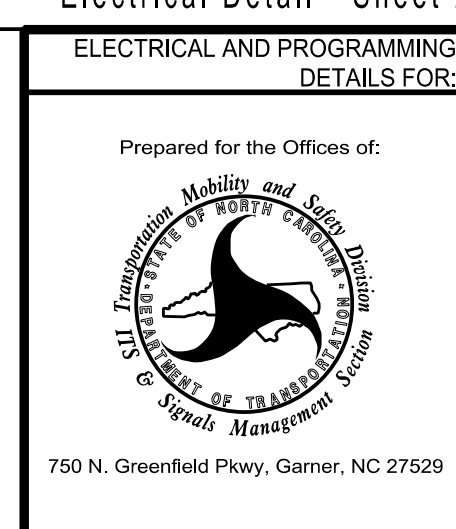
← NOTICE REMOVED INCLUDED
PHASE FORS OL1 AND OL3

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0507
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 3

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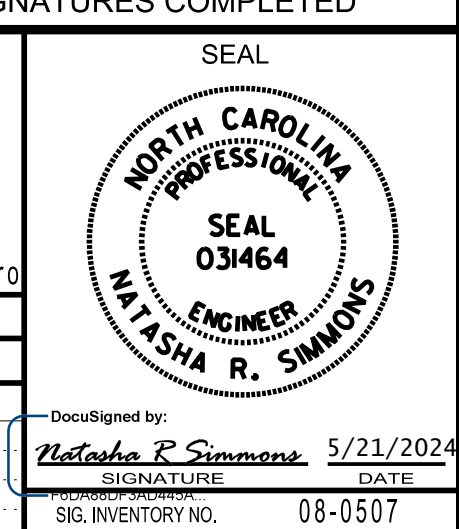


US 64 Bus. (Dixie Dr)
at
SR 1144 (Mack Rd)/Fisher Cir

Division 8 Randolph County Asheboro

PLAN DATE: August 2021	REVIEWED BY: A.D. Klinksiek
PREPARED BY: N.K. Vianich	REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE



DocuSigned by:
Melissa R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0507

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 <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

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

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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


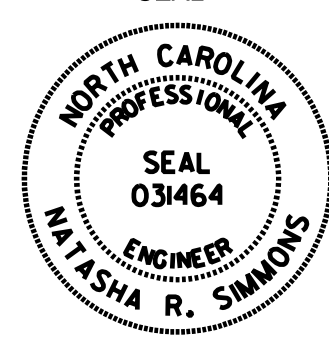

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0507
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

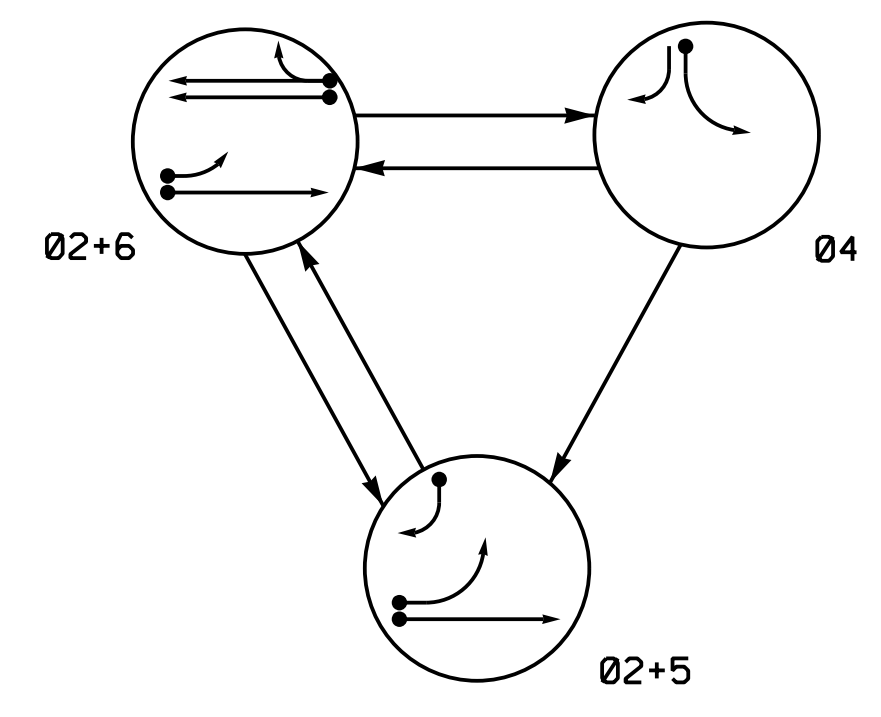
Signal Upgrade - Final Design
Electrical Detail - Sheet 3 of 3

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343 E. Six Forks Road, Suite 200
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ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 64 Bus. (Dixie Dr) at SR 1144 (Mack Rd)/Fisher Cir		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 NATASHA R. SIMMONS
	Division 8 Randolph County Asheboro	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek	
REVISIONS _____ INIT. DATE	DocuSigned by:  NATASHA R. SIMMONS 5/21/2024		SIG. INVENTORY NO. 08-0507

PHASING DIAGRAM

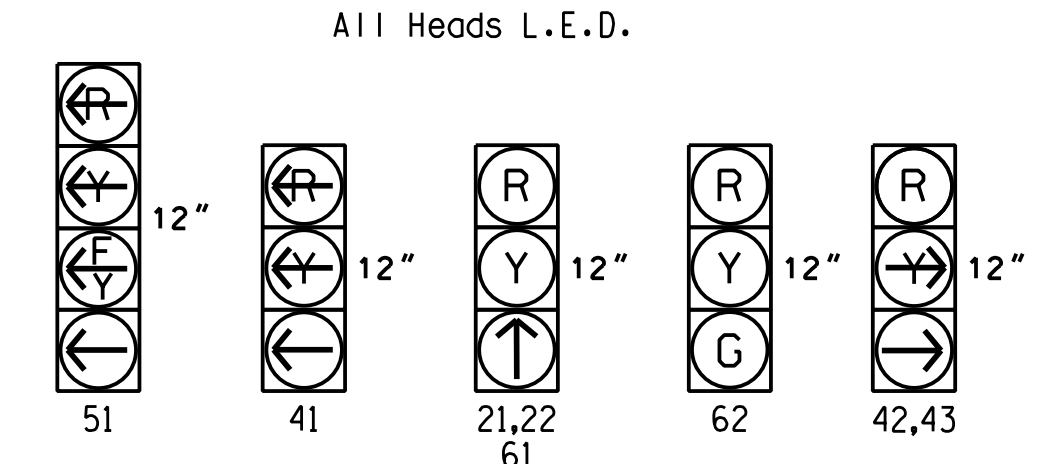


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21,22			R	Y
41	←	←	←	←
42,43	←	R	←	R
51	←	←	←	←
61	R		R	Y
62	R	G	R	Y

SIGNAL FACE I.D.

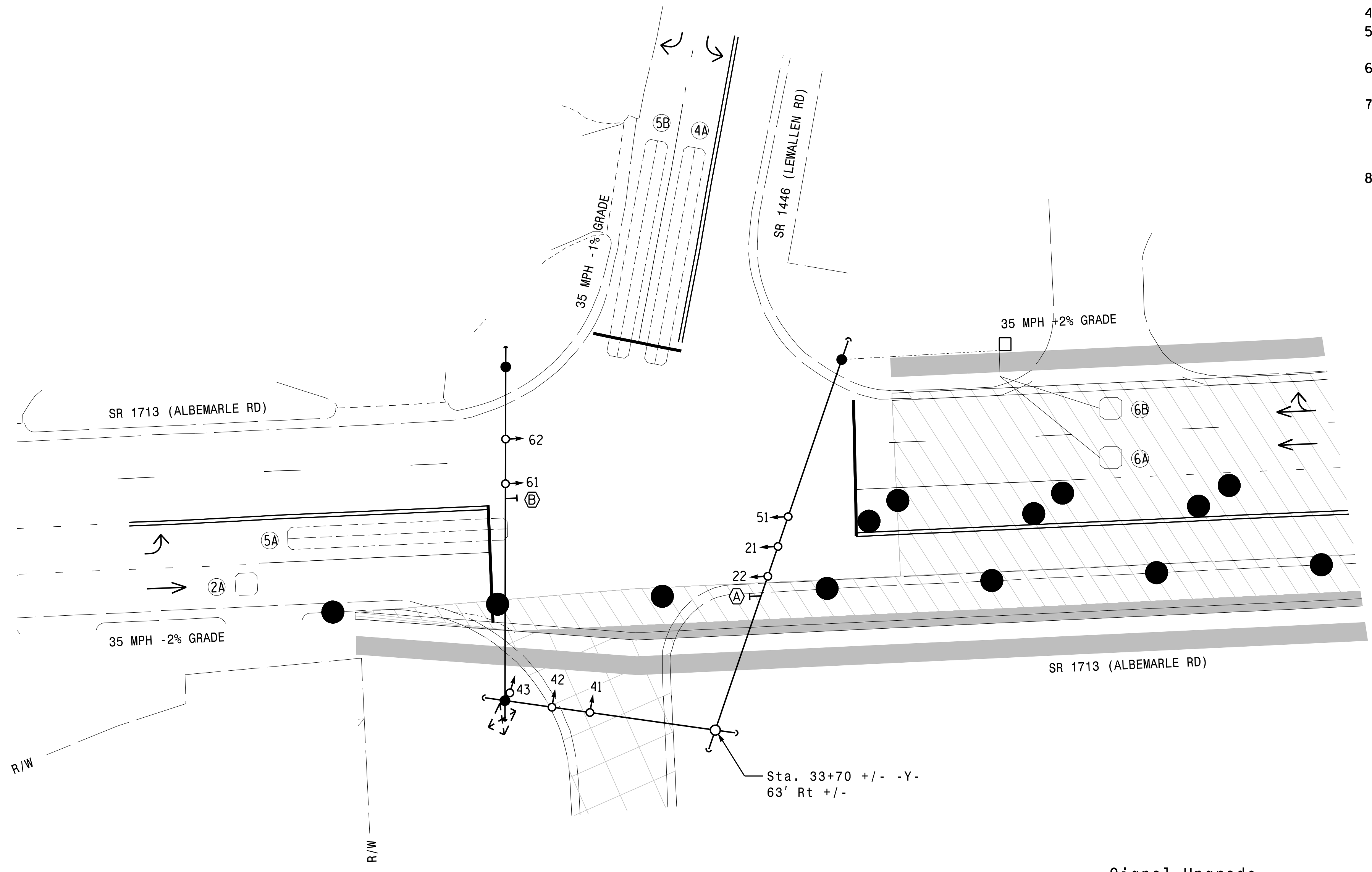


OASIS 2070 DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS						DETECTOR PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING EXTENSION	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	5	-	2	Y	Y	-	-	-	-
4A	6X60	+5	2-4-2	-	4	Y	Y	-	-	-	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	15	-
5B	6X60	+5	2-4-2	-	5	Y	Y	-	-	10	-
6A,6B	6X6	70	5	Y	6	Y	Y	-	-	-	-

3 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Remove existing backup protect.
5. Set all detector units to presence mode.
6. Program controller to operate using FYA compact mode.
7. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
8. Install new conflict monitor in existing cabinet.



OASIS 2070 TIMING CHART				
FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	60	30	20	60
Yellow Clearance	4.0	3.1	3.0	4.0
Red Clearance	1.6	2.1	2.3	1.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time to Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND	
PROPOSED	EXISTING
N/A	
N/A	
(A)	No Right Turn Sign (R3-1) (A)
(B)	No Left Turn Sign (R3-2) (B)

Signal Upgrade -
Temporary Design
(Construction Phase IA)

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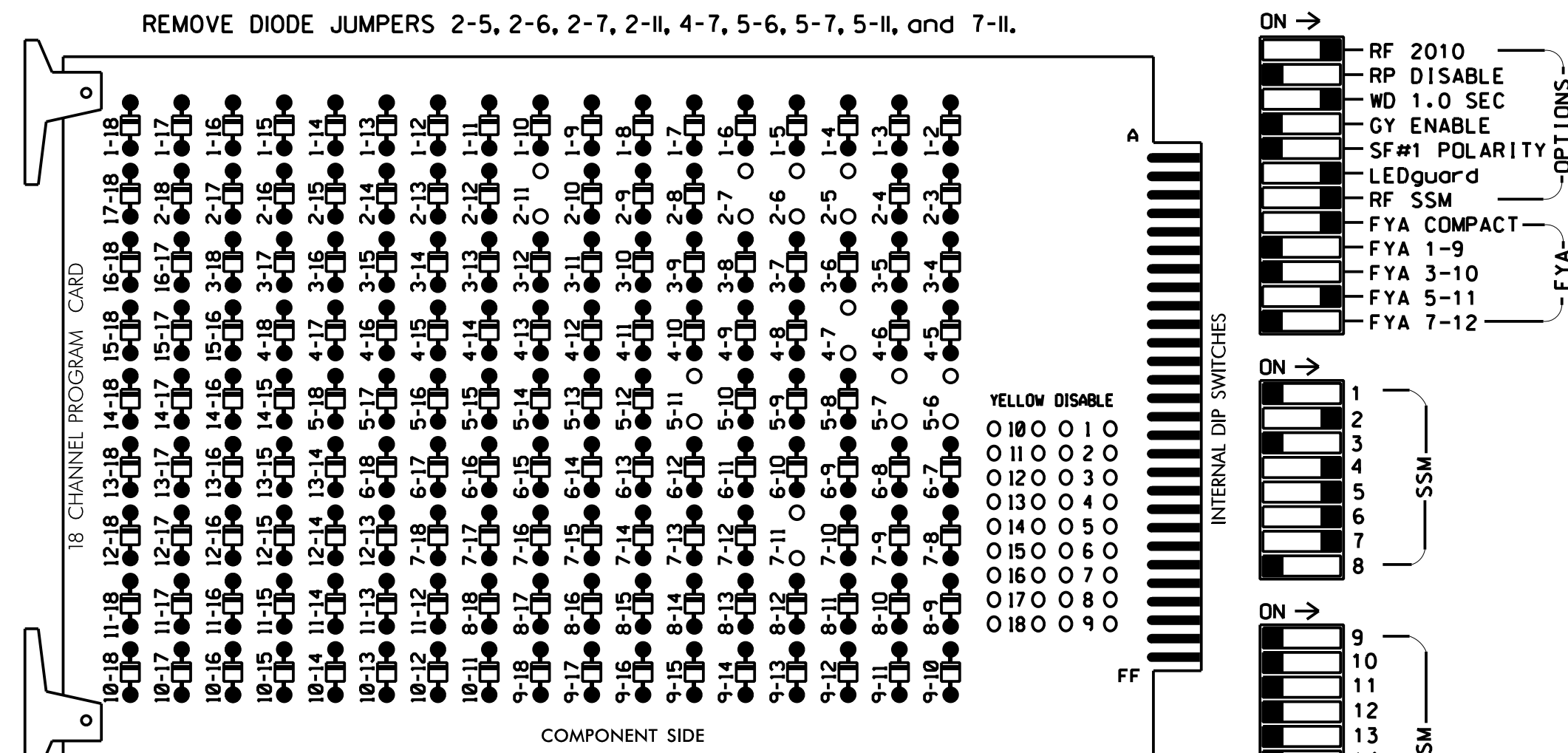
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Raleigh, North Carolina 27609
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 Prepared for: Transportation Mobility and Safety Division DEPARTMENT OF TRANSPORTATION Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd)		SEAL N. R. SIMMONS ENGINEER 031464
	Division 8 Randolph County Asheboro PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons	REVISIONS INIT. DATE _____ _____ _____	

DocuSigned by:
Natalia R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0245T

16 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.
3. Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on sheet 2.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up in Green.
4. Program phases 2 and 6 for Yellow Flash.
5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE MOUNTED
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S5,S7,S8,S9,S10
 PHASES USED.....2,4,5,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....4+5

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	11	15	7	16
PHASE	1	2	2 PED	3	4	4 PED	OLC	6	5 GRN	6 PED	8	8 PED
SIGNAL HEAD NO.	NU	21	NU	NU	41	NU	51	61	62	51	42,43	NU
RED		128						134	134			122
YELLOW		129							135	135		
GREEN									136			
RED ARROW					101			131				
YELLOW ARROW					102			132			123	
FLASHING YELLOW ARROW								133				
PED YELLOW												
GREEN ARROW		130			103			136	120		124	
											*	

NU = Not Used

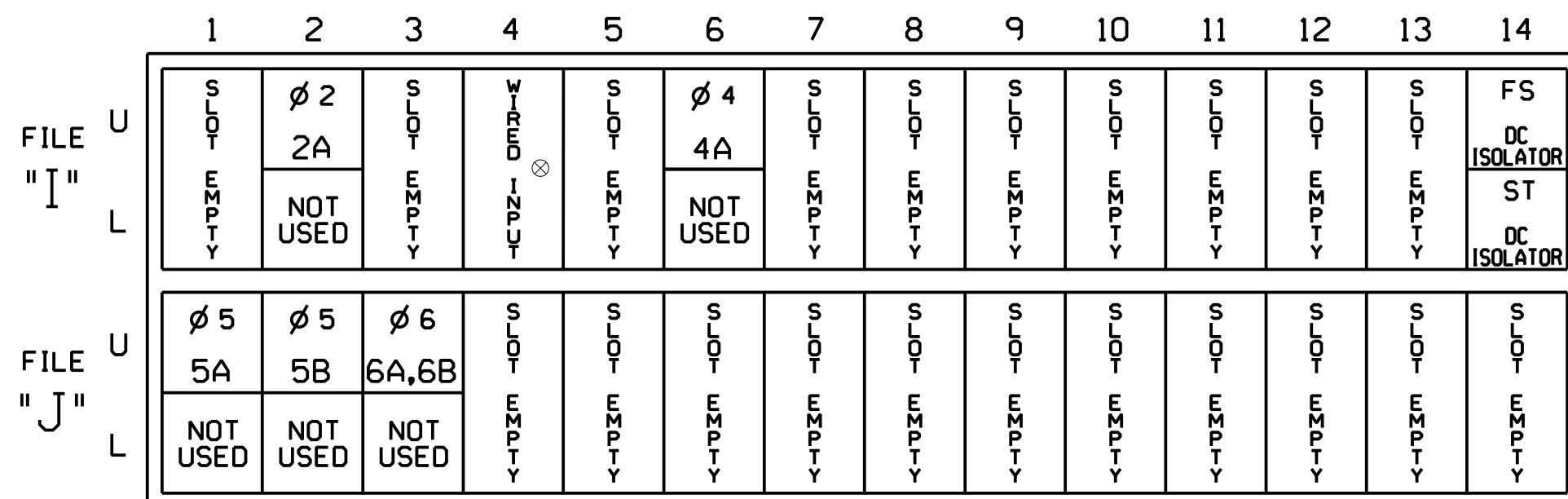
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

Note: Load switches S7, S9, and S10 require output remapping. See sheets 2 and 3 for details.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

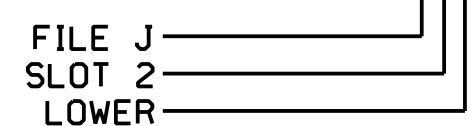
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9 ★	22	2	Y	Y	Y		
5B	TB3-5,6	J2U	40	2	5	5	Y	Y			10
6A,6B	TB3-9,10	J3U	64	26	36	6	Y	Y			

*Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



PED YELLOW CONFLICT MONITOR WIRING DETAIL

(make cabinet wiring changes as shown below)

In order to use FYA COMPACT mode on the 2010ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 2 PY (field term. 114) to Channel 9 Green (monitor pin 13), from 4 PY (field term. 105) to Channel 9 Yellow (monitor pin 16), from 6 PY (field term. 120) to Channel 10 Green (monitor pin R), and from 8 PY (field term. 111) to Channel 10 Yellow (monitor pin U).

Follow the instructions below to make the appropriate connections:

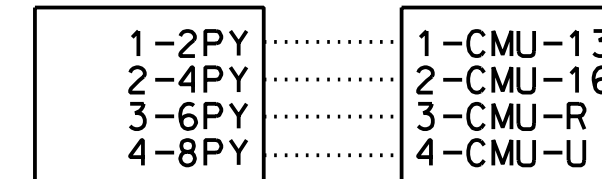
STEP 1: Fold down rear panel of output file.

STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).

STEP 3: Find the conductors that correspond to the following conflict monitor card edge pins and solder wire to the appropriate terminal on the rear of the output file as shown below:

CMU-R _____ 6PY (term. 120)

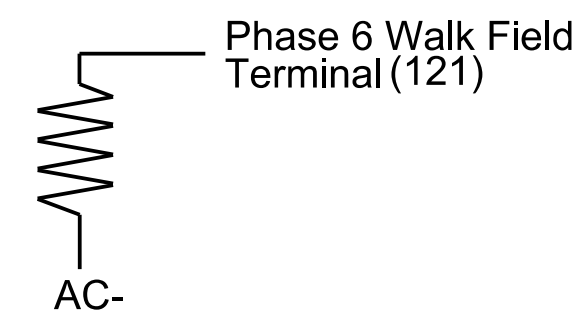
NOTE: Some cabinet manufacturers use keyed connectors to accomplish this wiring configuration. If connectors are used, fold down the rear panel of the output file and find the set of 3 keyed connectors and connect them as shown below:



LOAD RESISTOR INSTALLATION DETAIL

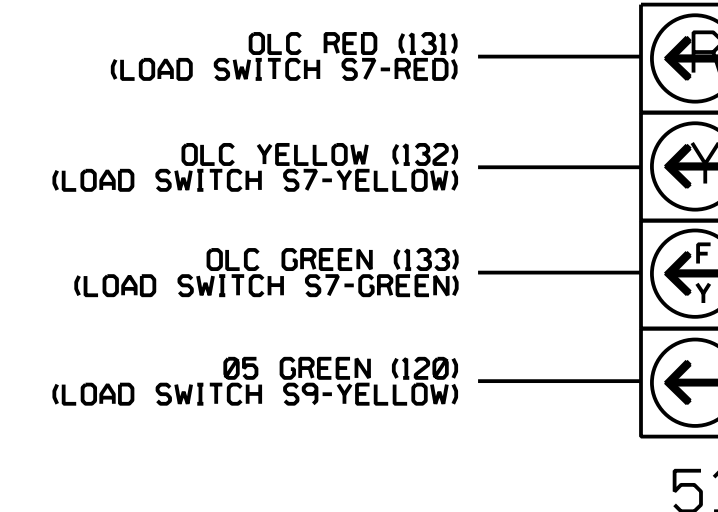
(install resistor as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



51

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0245T
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

Signal Upgrade
 Temporary Design
 Electrical Detail - Sheet 1 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd)	SEAL N. R. SIMMONS ENGINEER SEAL 031464 N.C. 17153A R. SIMMONS
	Division 8 Randolph County Asheboro PLAN DATE: August 2021 REVIEWED BY: A.D. Klinskiesk PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons	REVISIONS INT. DATE DocuSigned by: 5/21/2024 SIGNATURE DATE SIG. INVENTORY NO. 08-0245T

FFYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR LOADSWITCH S10 (SIGNAL HEADS 42 & 43)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "22"

(program controller as shown below)

```

PAGE:1 C1 PIN:24 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:24 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...4
SELECT COLOR(0=RED,1=YEL,2=GRN)...0

```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```

PAGE:1 C1 PIN:24 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

PRESS "+" KEY FOR OUTPUT 23

LOAD SWITCH S10 YEL (HEADS 42 & 43 YEL)

```

PAGE:1 C1 PIN:25 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:25 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...4
SELECT COLOR(0=RED,1=YEL,2=GRN)...1

```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```

PAGE:1 C1 PIN:25 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

PRESS "+" KEY FOR OUTPUT 24

LOAD SWITCH S10 GRN (HEADS 42 & 43 GRN)

```

PAGE:1 C1 PIN:26 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:26 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...4
SELECT COLOR(0=RED,1=YEL,2=GRN)...2

```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA. THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```

PAGE:1 C1 PIN:26 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SQL ID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....

```

OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS), SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

```

SCROLL DOWN

```

THEN:
SET OUTPUT ASSIGNMENT #30 ON
SET OUTPUT ASSIGNMENT #31 OFF

```

PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

```

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

```

SCROLL DOWN

```

THEN:
SET OUTPUT ASSIGNMENT #32 OFF

```

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

```

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

```

SCROLL DOWN

```

THEN:
SET OUTPUT ASSIGNMENT #31 ON

```

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 30	= Overlap C Red
OUTPUT 31	= Overlap C Yellow
OUTPUT 32	= Overlap C Green
OUTPUT 34	= Phase 5 Green

Note: The outputs shown above have been remapped. See sheet 3 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0245T
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

HNTB
 HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554
 (919) 546-8997

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: |12345678910111213141516
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: | _ RED _ YELLOW _ GREEN
FLASH COLORS: | _ RED _ YELLOW X GREEN

```

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

NOTICE GREEN FLASH

PRESS '+' ONCE

```

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE: |12345678910111213141516
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: | _ RED _ YELLOW _ GREEN
FLASH COLORS: | _ RED _ YELLOW _ GREEN

```

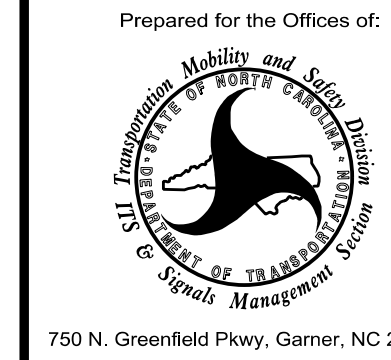
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...N
 GREEN EXTENSION (0-255 SEC)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

Signal Upgrade
Temporary Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER W. T. SIMMONS SEAL 031464
Prepared for the Offices of:	Division 8 Randolph County Asheboro			
PLAN DATE: August 2021	REVIEWED BY: A.D. Klinksiek	PREPARED BY: N.K. Vianich	REVIEWED BY: N.R. Simmons	
REVISIONS	INIT.	DATE		
DocuSigned by: <i>Nelasha R. Simmons</i>		5/21/2024		
SIGNATURE		DATE		
SIG. INVENTORY NO.		08-0245T		



FFYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR LOADSWITCHES S7 & S9 (SIGNAL HEAD 51)

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

PAGE:1 C1 PIN:32 VEHICLE PHASE OUTPUT ASSIGNMENT #.....30 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

LOAD SWITCH S7 RED (HEAD 51 RED)

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:33 VEHICLE PHASE SELECT VEHICLE OVERLAP (A=1,P=16)...3 SELECT COLOR(O=RED,1=YEL,2=GRN).....0

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

PAGE:1 C1 PIN:32 VEHICLE OVERLAP OUTPUT ASSIGNMENT #.....30 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

PRESS "+" KEY FOR OUTPUT 31

PAGE:1 C1 PIN:33 VEHICLE PHASE OUTPUT ASSIGNMENT #.....31 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

LOAD SWITCH S7 YEL (HEAD 51 YEL)

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:33 VEHICLE PHASE SELECT VEHICLE OVERLAP (A=1,P=16)...3 SELECT COLOR(O=RED,1=YEL,2=GRN).....1

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

PAGE:1 C1 PIN:33 VEHICLE OVERLAP OUTPUT ASSIGNMENT #.....31 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

PRESS "+" KEY FOR OUTPUT 31

PAGE:1 C1 PIN:34 VEHICLE PHASE OUTPUT ASSIGNMENT #.....32 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

LOAD SWITCH S7 GRN (HEAD 51 FYA)

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:34 VEHICLE PHASE SELECT VEHICLE OVERLAP (A=1,P=16)...3 SELECT COLOR(O=RED,1=YEL,2=GRN).....2

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

PAGE:1 C1 PIN:34 VEHICLE OVERLAP OUTPUT ASSIGNMENT #.....32 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

PRESS "+" TWICE TO REACH OUTPUT 34

PAGE:1 C1 PIN:36 NOT ENABLED OUTPUT ASSIGNMENT #.....34 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

LOAD SWITCH S9 PED YEL (HEAD 51 GRN ARROW)

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:36 NOT ENABLED SELECT VEHICLE OVERLAP (A=1,P=16)...5 SELECT COLOR(O=RED,1=YEL,2=GRN).....2

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER AFTER INPUTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

PAGE:1 C1 PIN:36 VEHICLE PHASE OUTPUT ASSIGNMENT #.....34 FREQUENCY (O=DEFAULT) (O-25.5 HZ)...0.0 DUTY CYCLE (O=DEFAULT) (O - 100%)...0 MODE (O=SOLID,1=FLASH)...0.0 SELECT ASSIGNMENT: NOT ENABLED..... VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP..... Y PEDESTRIAN OVERLAP..... WATCHDOG..... DETECTOR RESET..... ADVANCE BEACON..... OUT OF PHASE FLASHER..... CONTROLLER FLASH..... RUN FREE..... RESERVED..... PREEMPT..... SOFT PREEMPT..... ANY PREEMPT..... COORDINATION PLAN..... OFFSET..... PHASE CHECK..... PHASE ON..... PHASE NEXT.....

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0245T DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

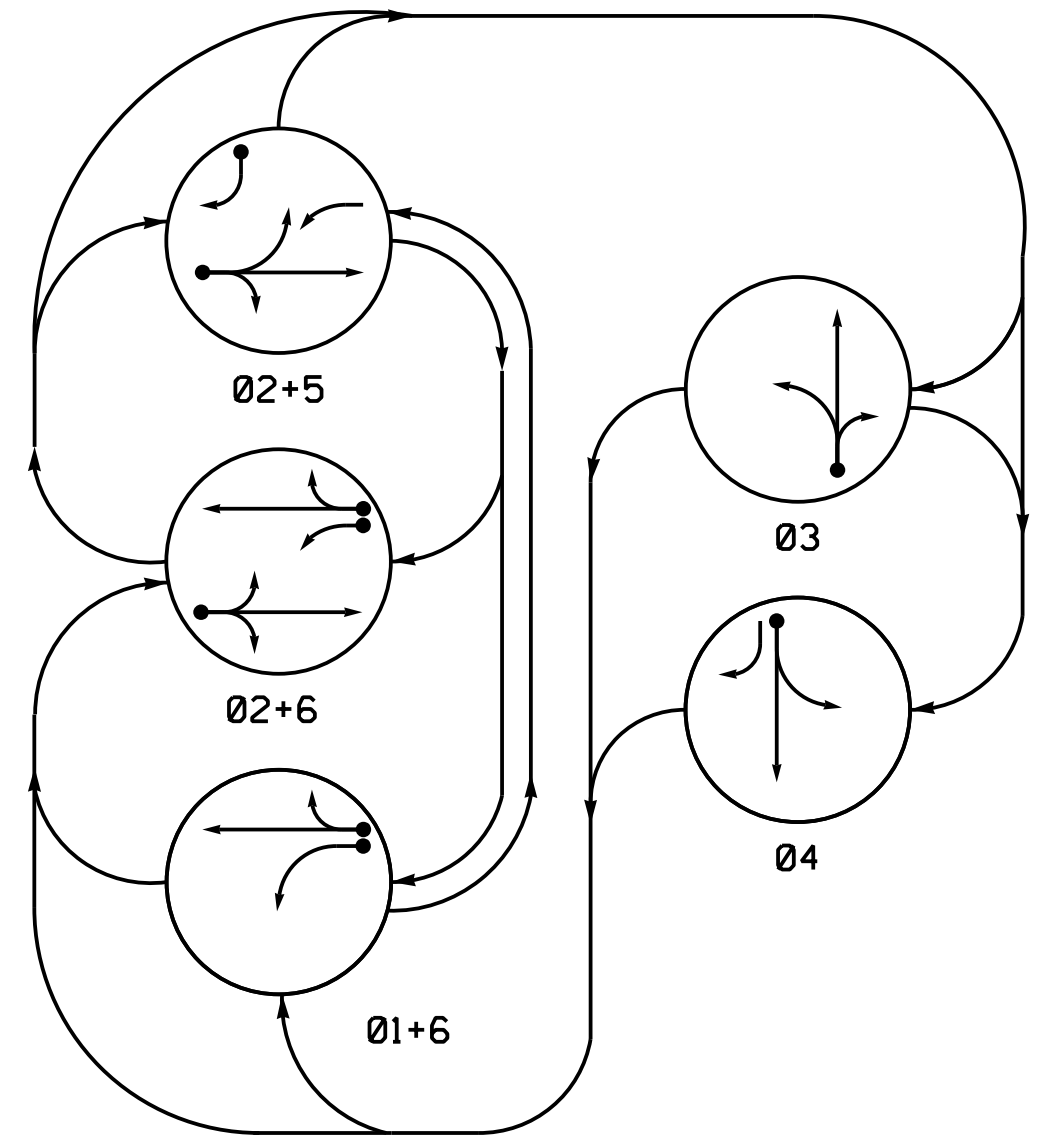
Signal Upgrade Temporary Design Electrical Detail - Sheet 3 of 3

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HNTB HNTB NORTH CAROLINA, P. C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

Professional Engineer Seal for N.K. Vianich, License No. 031464, State of North Carolina. Includes project details for SR 1713 and SR 1446, prepared by N.K. Vianich, reviewed by A.D. Klinksiek and N.R. Simmons, dated August 2021.

PHASING DIAGRAM



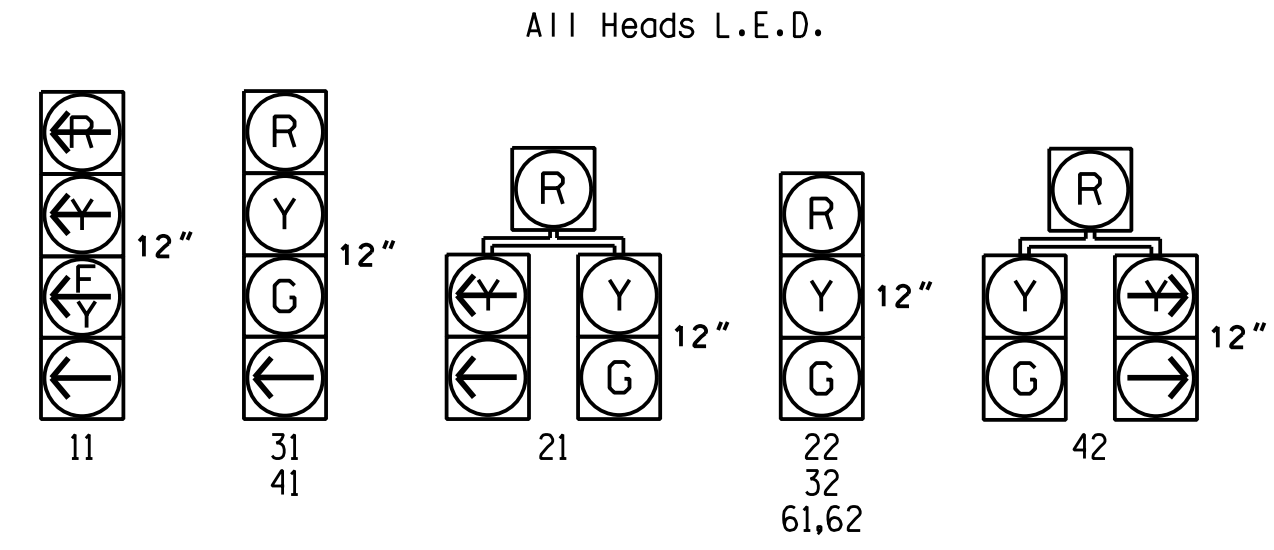
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ⋯ UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+6	02+6	02+5	03	04	FLASH
11	—	F	F	—	—	—
21	R	G	G	R	R	Y
22	R	G	G	R	R	Y
31	R	R	R	G	R	R
32	R	R	R	G	R	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
61,62	G	G	R	R	R	Y

SIGNAL FACE I.D.



MAXTIME DETECTOR INSTALLATION CHART

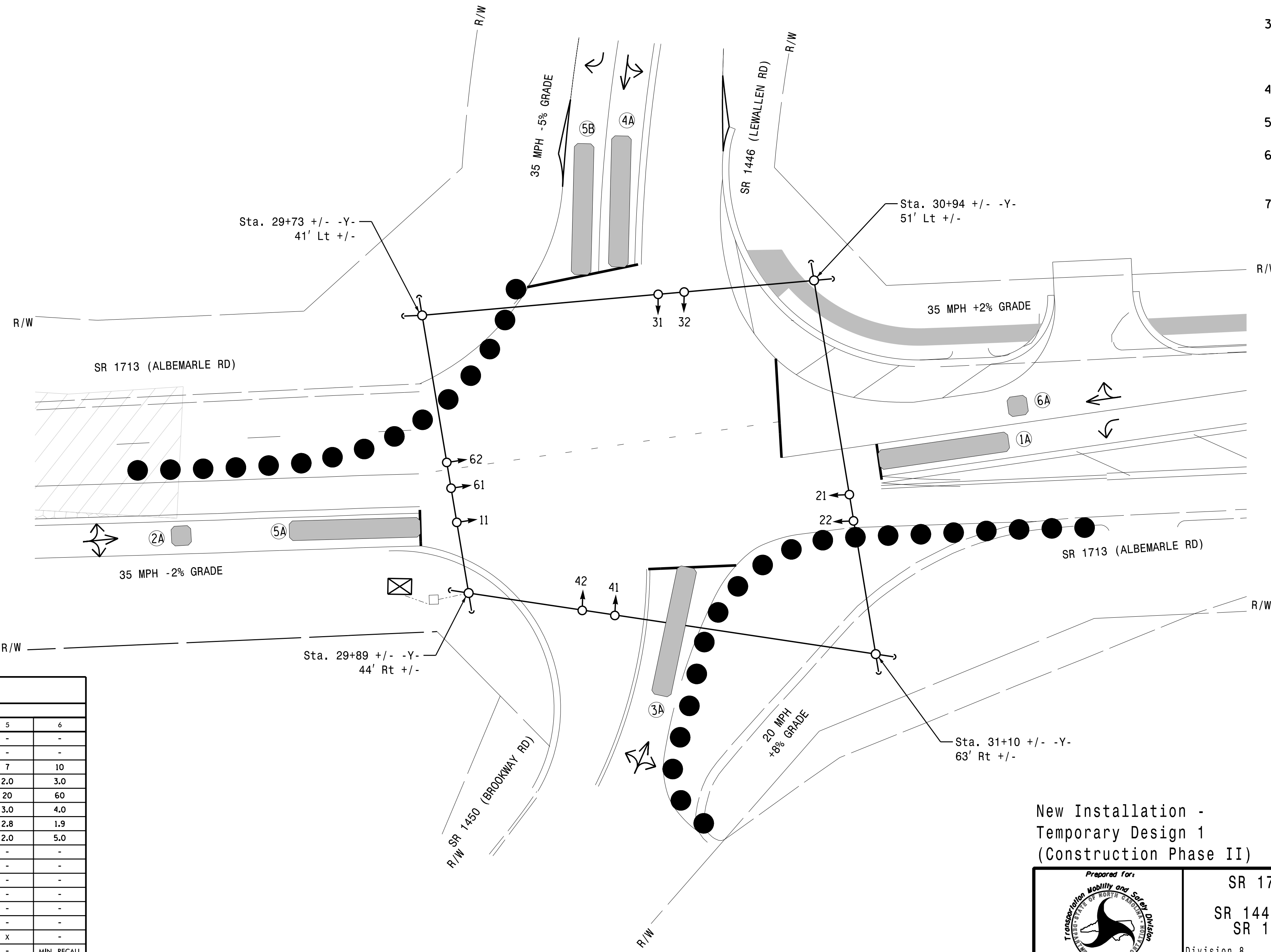
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR		PROGRAMMING								
			TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	RECALL	NEW CARD	
1A*	6X40	0	*	*	1	15	-	X	-	X	-	-	*
2A*	6X6	70	*	*	2	-	-	X	-	X	-	-	*
3A*	6X40	0	*	*	3	10	-	X	-	X	-	-	*
4A*	6X40	0	*	*	4	3	-	X	-	X	-	-	*
5A*	6X40	0	*	*	5	15	-	X	-	X	-	-	*
5B*	6X40	0	*	*	5	15	-	X	-	X	-	-	*
6A*	6X6	70	*	*	6	-	-	X	-	X	-	-	*

* Microwave Detection

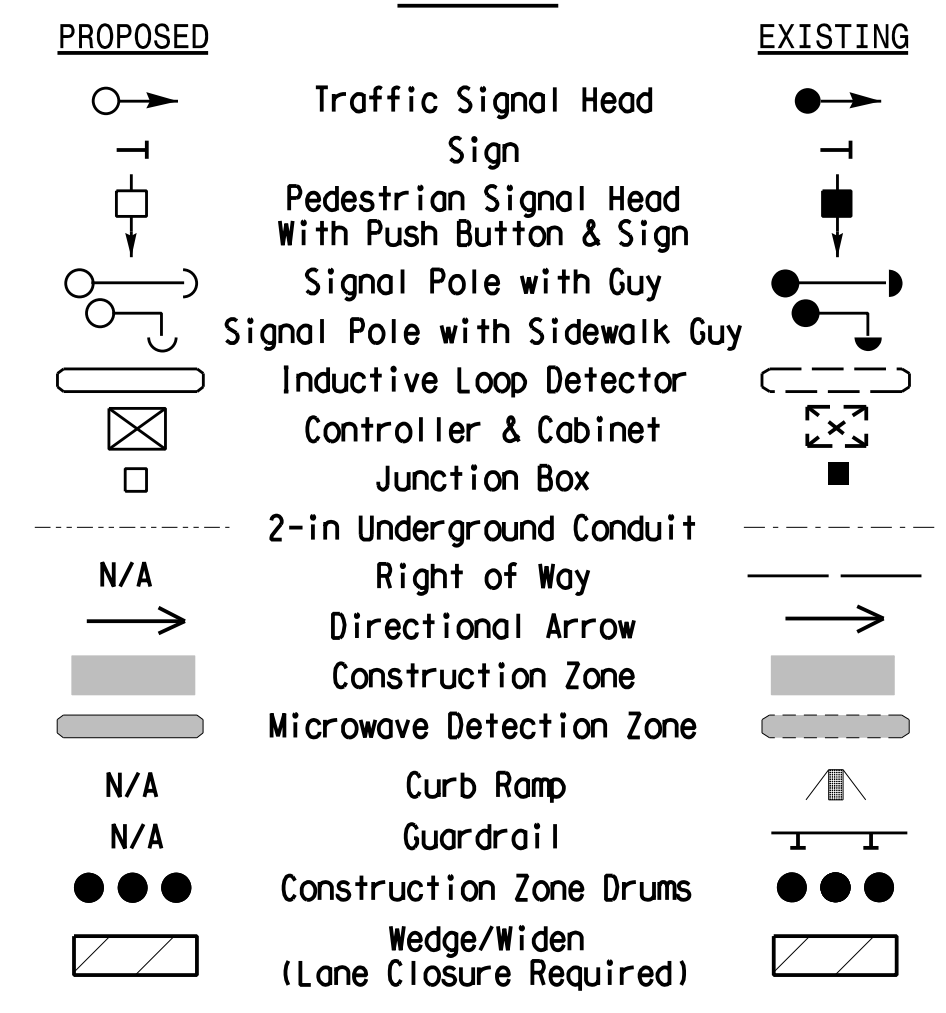
5 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 6 to allow the controller to clear from Phase 2+6 to Phase 1+6 by progressing through an all red display.
- The order of phase 3 and 4 may be reversed.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.



LEGEND



MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-
Min Green	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max I *	20	60	20	30	20	60
Yellow Change	3.0	4.0	3.0	4.2	3.0	4.0
Red Clear	2.6	1.9	1.9	1.7	2.8	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	5.0
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	-	-	-	-	-	-

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

New Installation - Temporary Design 1 (Construction Phase II)

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	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd)		
	Division 8 Randolph County Asheville PLAN DATE: August 2021 PREPARED BY: N.K. Vlanich	REVIEWED BY: A.D. Klinskiak REVIEWED BY: N.R. Simmons	
HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		750 N. Greenfield Pkwy, Garner, NC 27526 REVISIONS: _____ INITI. _____ DATE _____ DocuSigned by: <i>Nelasha R. Simmons</i> 5/21/2024 SIGNATURE DATE SIG. INVENTORY NO. 08-024611	SCALE: 1"=20' 0 20

MAXTIME OVERLAP PROGRAMMING DETAIL

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	-	-	-
Included Phases	2	-	-	-
Modifier Phases	1	-	-	-
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

ALL RED BACKUP PROGRAMMING

Front Panel
Main Menu >Controller >Sequence & Phs Config>Backup Prevention > Backup Through Red

Web Interface
Home >Controller >Backup Prevention >Backup Calls Phase Plans > (scroll down) to Backup Through Red

Backup Through All Red

Sequence	Backup Through All Red
1	YES

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,3,4,b
2	6,5,a,b

COMPATIBILITY

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

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

Sequence 1

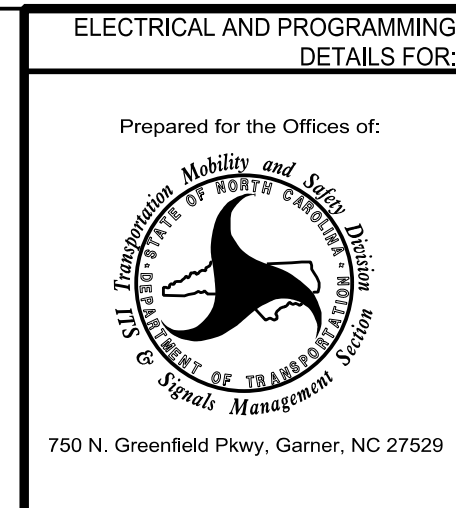
Phase	No Serve Phase
1	5
2	
3	
4	
5	
6	
7	
8	

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0246T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

New Installation
Temporary Design 1
Electrical Detail - Sheet 2 of 2

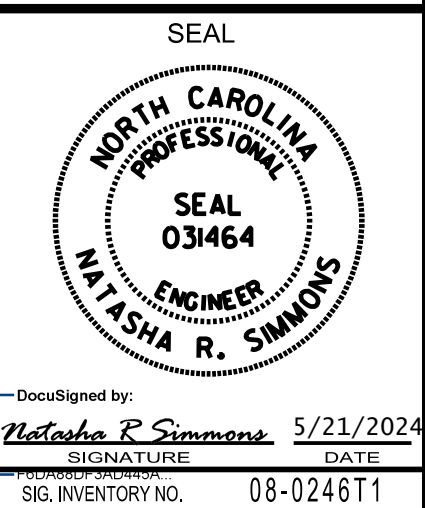
DOCUMENT NOT CONSIDERED FINAL
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Prepared for the Offices of:
SR 1713 (Albemarle Rd)
at
SR 1446 (Lewallen Rd) and
SR 1450 (Brookway Rd)
Division 8 Randolph County Asheboro

PLAN DATE: August 2021	REVIEWED BY: A.D. Klinskies
PREPARED BY: N.K. Vianich	REVIEWED BY: N.R. Simmons



REVISIONS	INIT.	DATE

DocuSigned by:
Natasha R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0246T1

PHASING DIAGRAM

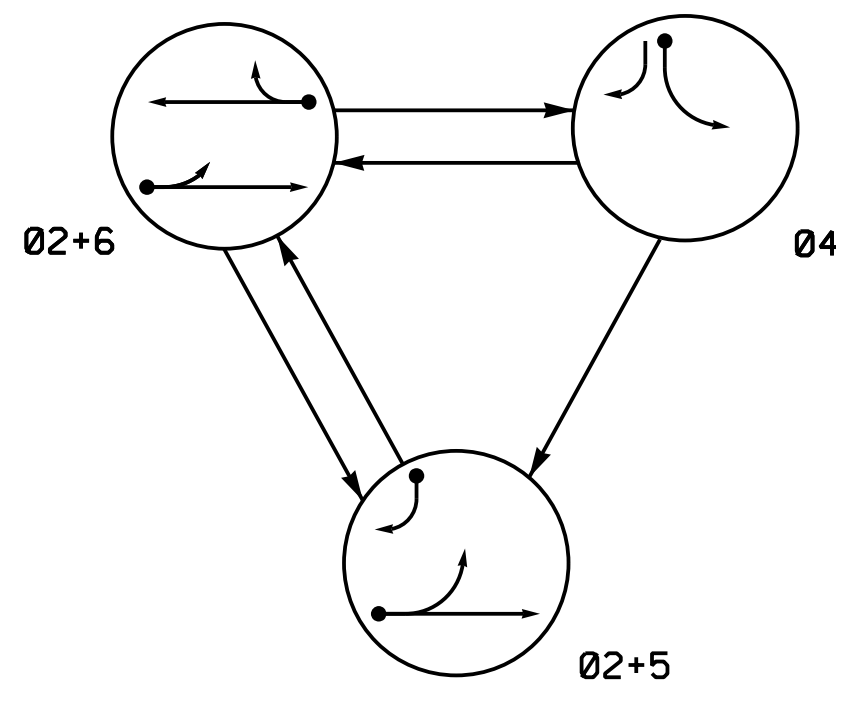
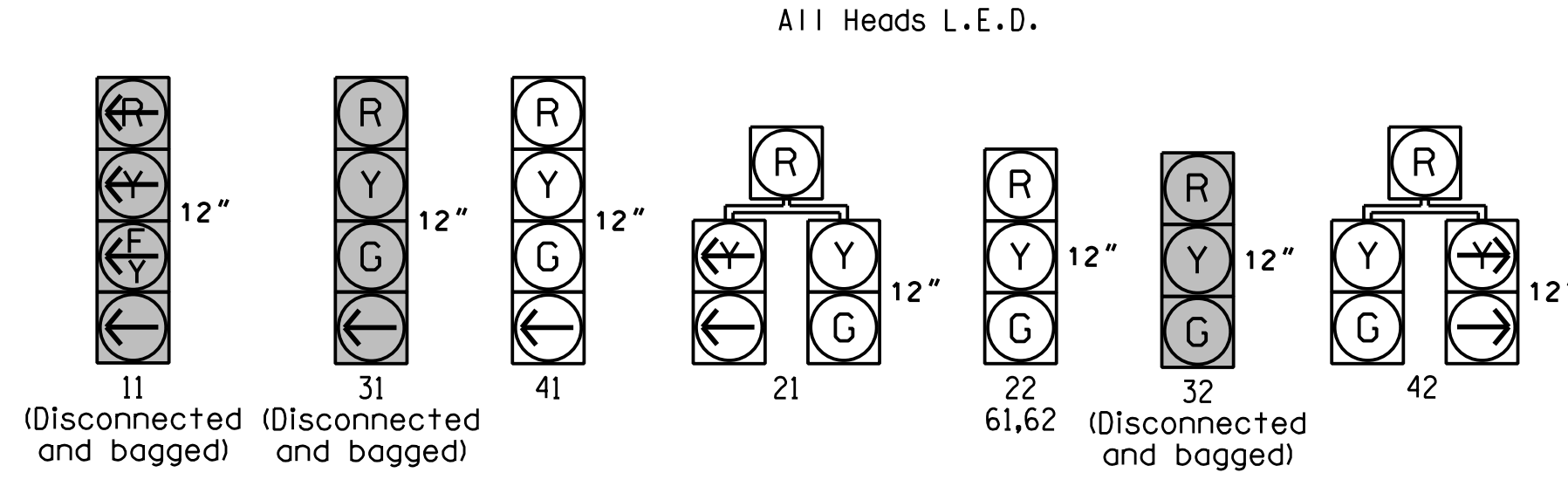


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21	G	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
61,62	R	G	R	Y

SIGNAL FACE I.D.



MAXTIME DETECTOR INSTALLATION CHART

ZONE	DETECTOR				PROGRAMMING							
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND INITIAL	ADDED INITIAL	CALL	RECALL	NEW CARD
2A*	6X6	70	*	*	2	-	-	X	-	X	-	*
4A*	6X40	0	*	*	4	3	-	X	-	X	-	*
5A*	6X40	0	*	*	5	15	-	X	-	X	-	*
5B*	6X40	0	*	*	5	15	-	X	-	X	-	*
6A*	6X6	70	*	*	6	-	-	X	-	X	-	*

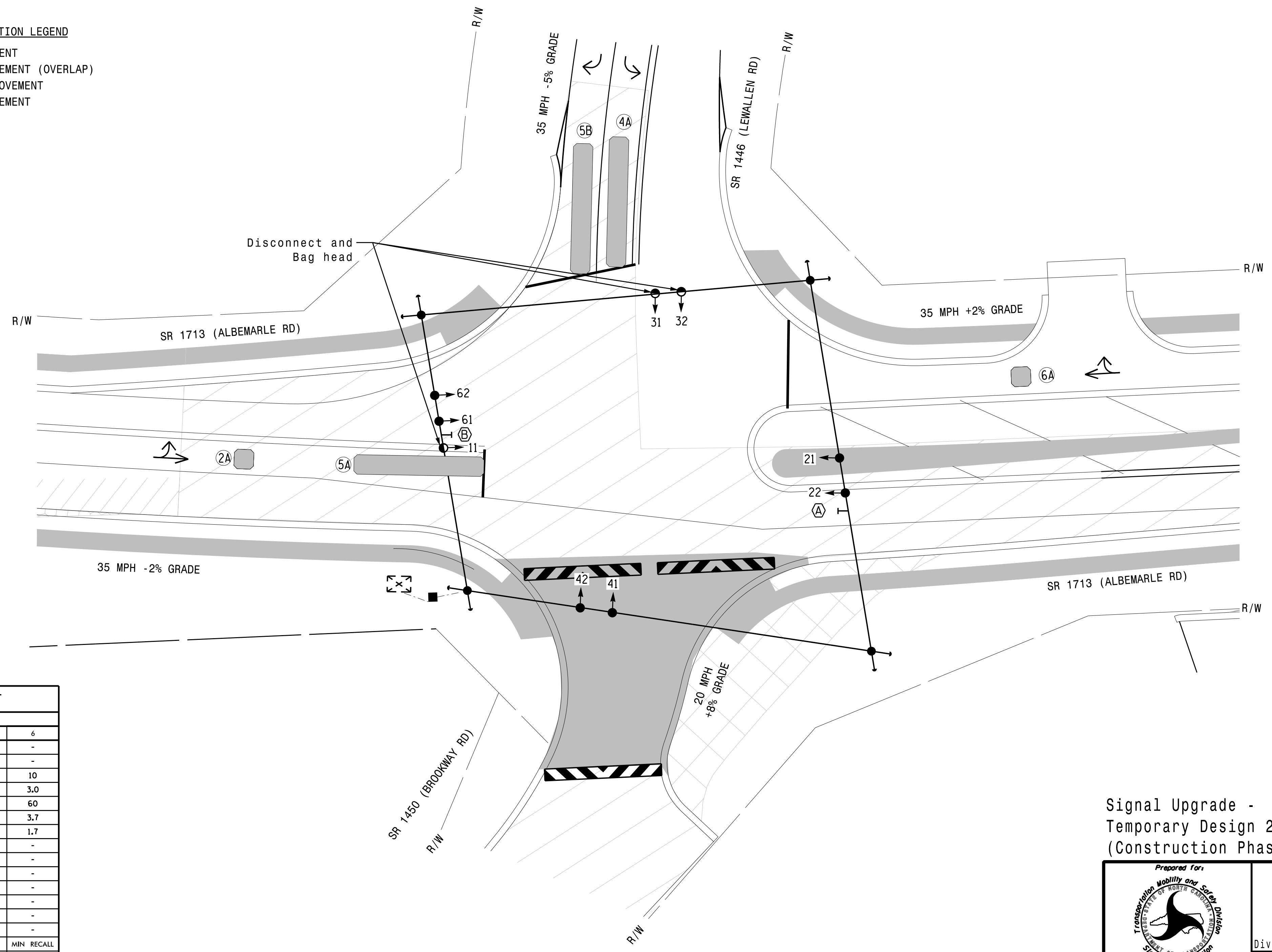
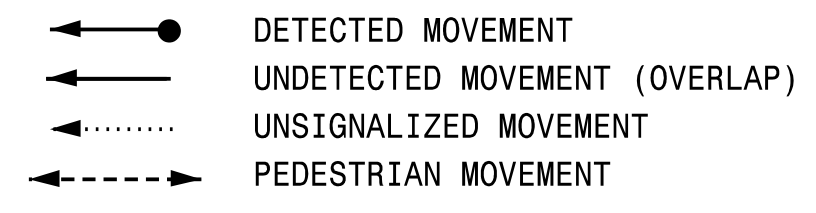
*Microwave Detection

3 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 21, 22, 61, and 62.
5. Disconnect and bag existing signal heads 11, 31 and 32.
6. Set all detector units to presence mode.
7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

PHASING DIAGRAM DETECTION LEGEND



MAXTIME TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Walk *	-	-	-	-
Ped Clear *	-	-	-	-
Min Green	10	7	7	10
Passage *	3.0	2.0	2.0	3.0
Max I *	60	30	20	60
Yellow Change	4.0	3.1	3.0	3.7
Red Clear	1.7	2.9	2.1	1.7
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	-	X	X	-
Vehicle Recall	MIN RECALL	-	-	MIN RECALL
Dual Entry	-	-	-	-

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

LEGEND

PROPOSED	EXISTING

Signal Upgrade -
Temporary Design 2
(Construction Phase IIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

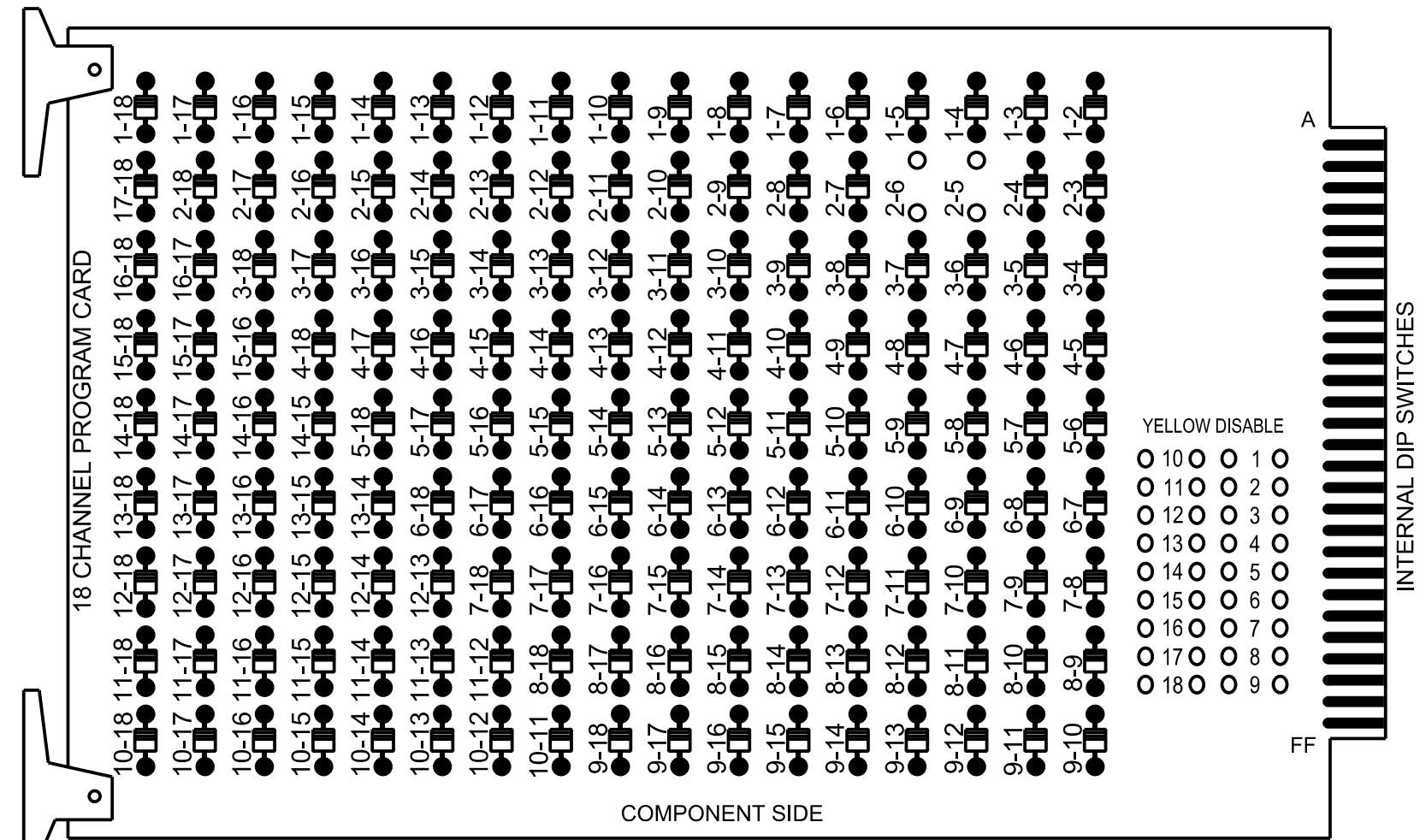
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	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd)		
	Division 8 Randolph County Asheville	PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek	
REVISIONS		INIT. DATE	DocuSigned by: N. R. Simmons 5/21/2024 DATE SIG. INVENTORY NO. 08-0246T2

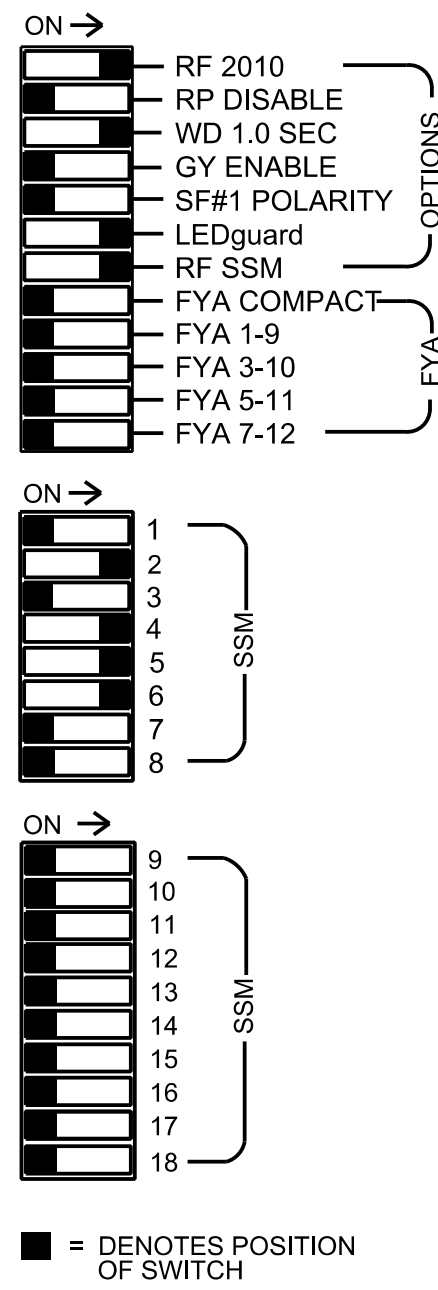
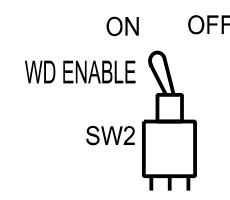
18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5 and 2-6.



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 unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Return controller to Factory Defaults before programming per this electrical detail.
- 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 enabled detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S2,S5,S7,S8
 Phases Used.....2,4,5,6
 Overlap "1".....NOT USED
 Overlap "2".....NOT USED
 Overlap "3".....NOT USED
 Overlap "4".....NOT USED

*See overlap programming detail on sheet 2

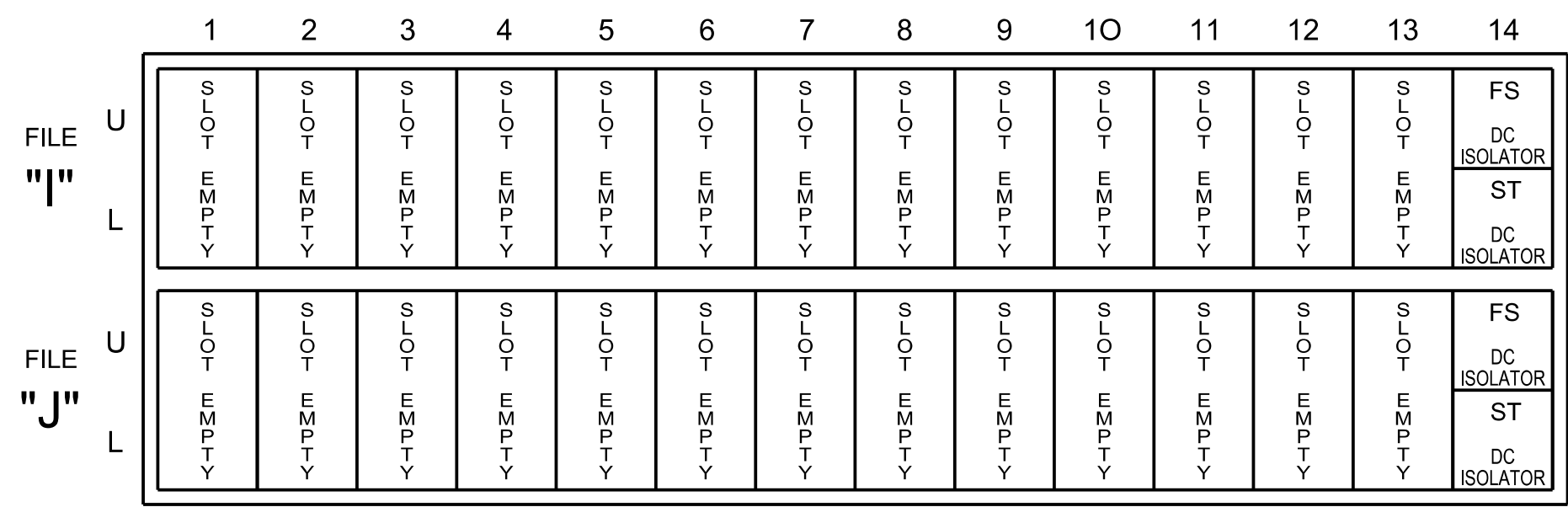
SIGNAL HEAD HOOK-UP CHART

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	3 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41	42	NU	21,42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101	101		*	134									
YELLOW		129			102	102			135									
GREEN		130			103	103			136									
RED ARROW																		
YELLOW ARROW								132										
FLASHING YELLOW ARROW																		
GREEN ARROW					103			133										

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

INPUT FILE POSITION LAYOUT

(front view)



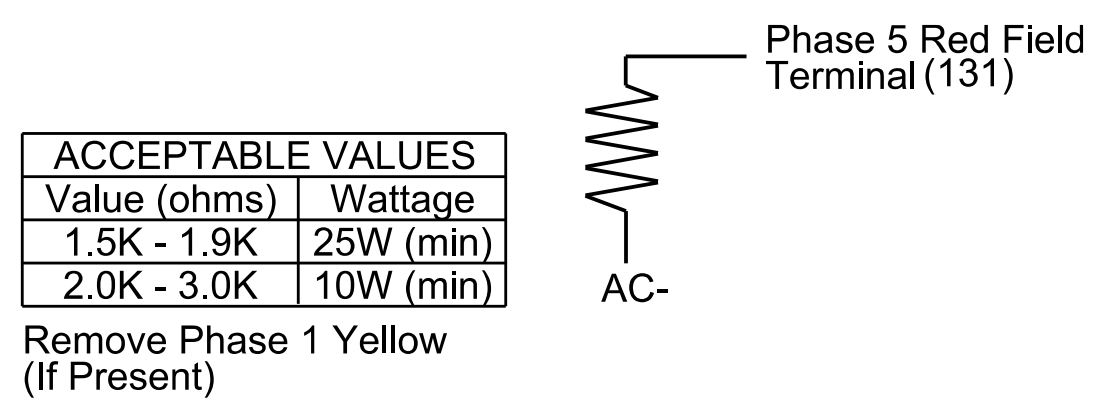
EX. : 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

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 resistor as shown)



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

Remove Phase 1 Yellow (If Present)

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Signal Upgrade - Temporary Design 2 Electrical Detail

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0246T2
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

 Division 8

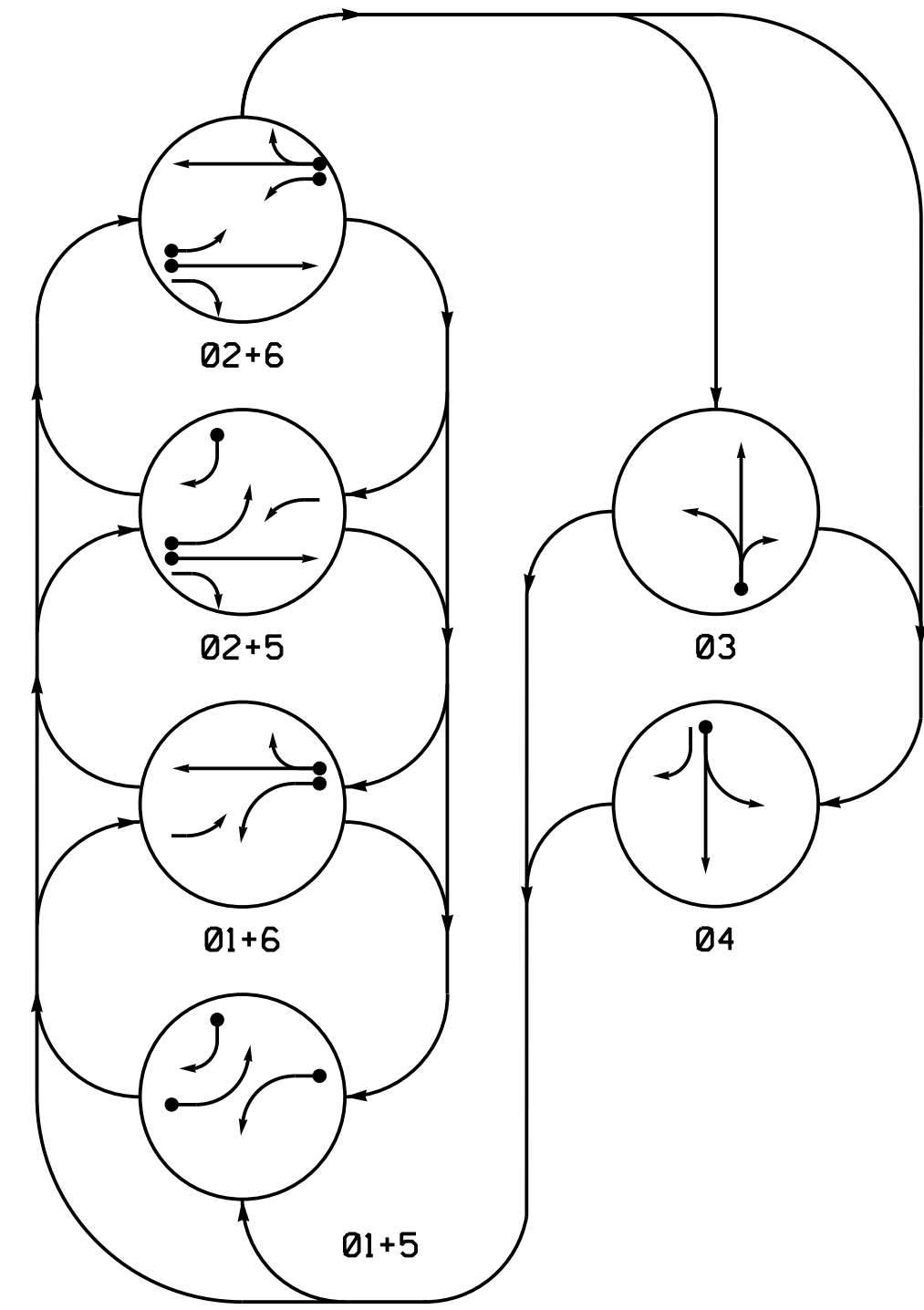
SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd) Randolph County Asheboro

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons

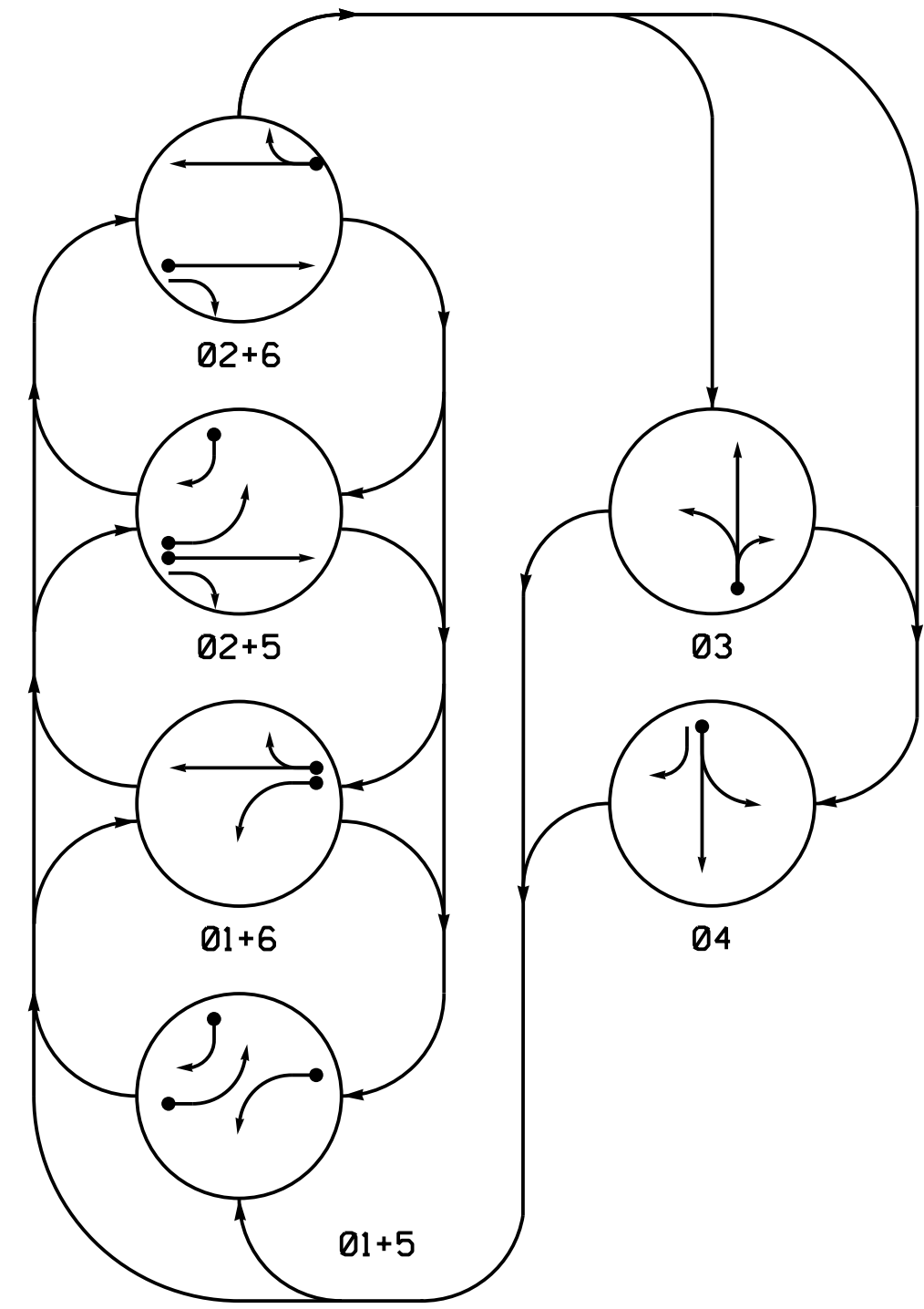
REVISIONS INIT. DATE

DocuSigned by: **Natasha R. Simmons** 5/21/2024
 SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464
 W.T. SHAW R. SIMMONS
 SIG. INVENTORY NO. 08-0246T2

DEFAULT PHASING DIAGRAM



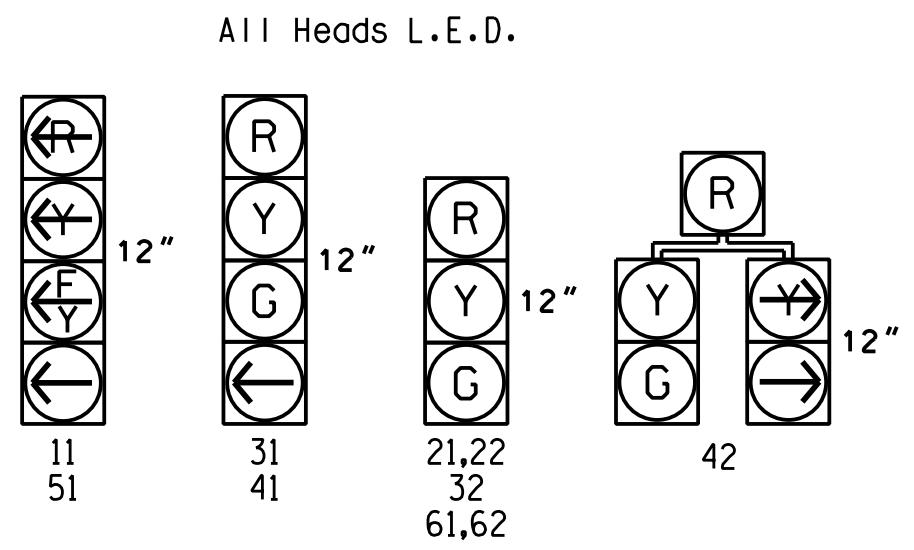
ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	FLASH
11						
21,22	R	R	G	G	R	Y
31	R	R	R	R	C	R
32	R	R	R	R	C	R
41	R	R	R	R	C	R
42	R	R	R	R	C	R
51						
61,62	R	G	R	G	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	FLASH
11						
21,22	R	R	G	G	R	Y
31	R	R	R	R	C	R
32	R	R	R	R	C	R
41	R	R	R	R	C	R
42	R	R	R	R	C	R
51						
61,62	R	G	R	G	R	Y

MAXTIME DETECTOR INSTALLATION CHART

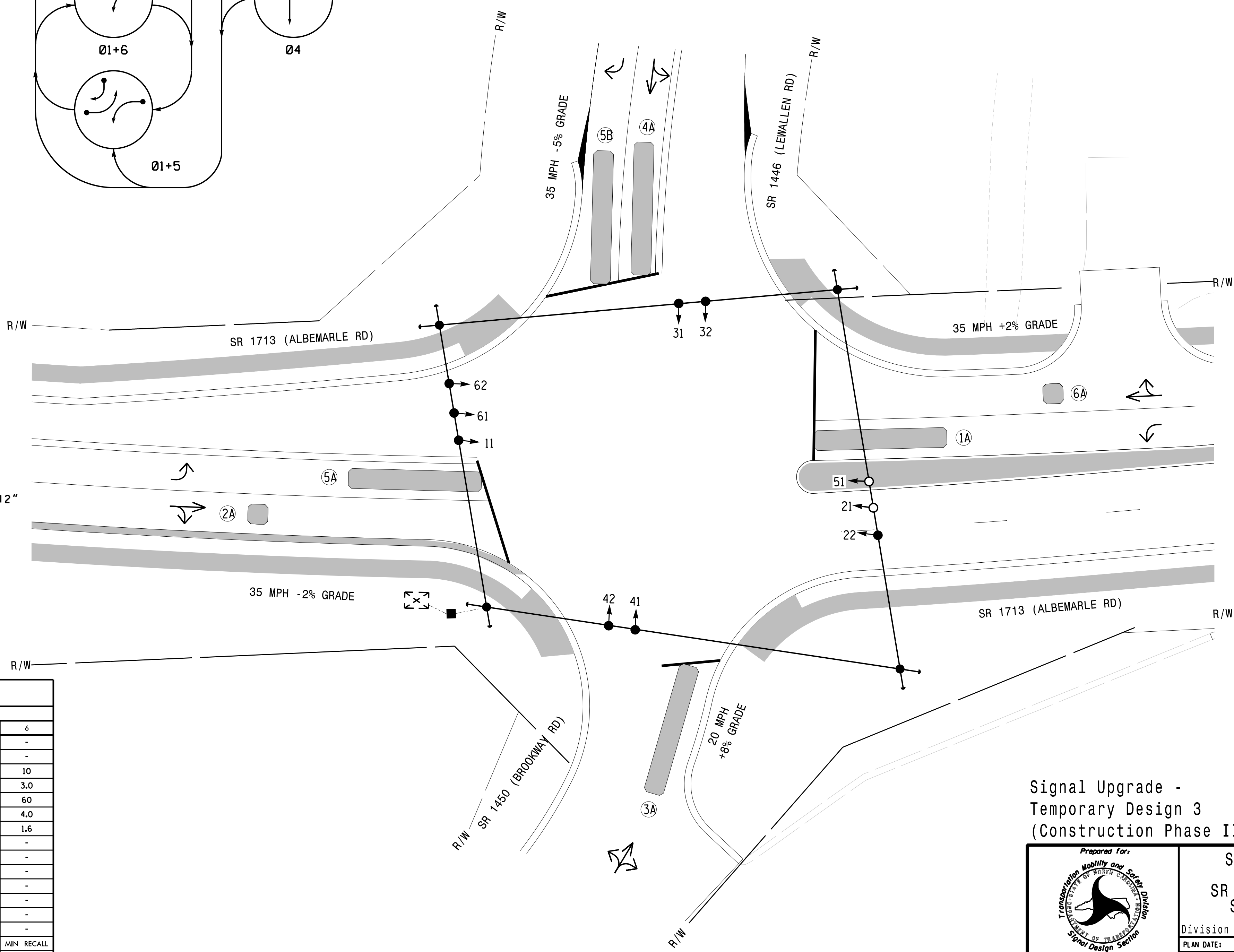
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND INITIAL	CALL	NEW CARD		
1A*	6X40	0	*	*	1	**15	-	X	-	X	-	*
2A*	6X6	70	*	*	2	-	-	X	-	X	-	*
3A*	6X40	0	*	*	3	10	-	X	-	X	-	*
4A*	6X40	0	*	*	4	3	-	X	-	X	-	*
5A*	6X40	0	*	*	5	**15	-	X	-	X	-	*
5B*	6X40	0	*	*	5	15	-	X	-	X	-	*
6A*	6X6	70	*	*	6	-	-	X	-	X	-	*

* Microwave Detection
 ** Disable Delay during Alternate Phasing Operation.
 * Disable phase call during Alternate Phasing operation.

6 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- The order of phase 3 and 4 may be reversed.
- Reconnect and unbag existing signal heads 11,31 and 32.
- Set all detector units to presence mode.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.



LEGEND

PROPOSED	EXISTING

MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-
Min Green	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max I *	20	60	20	30	20	60
Yellow Change	3.0	4.0	3.0	4.2	3.0	4.0
Red Clear	2.1	1.6	3.1	1.7	2.3	1.6
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	-	-	-	-	-	-

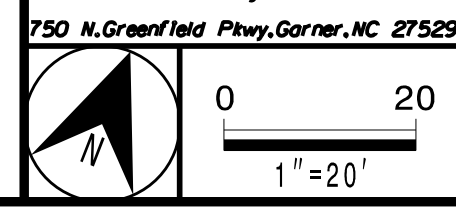
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade -
 Temporary Design 3
 (Construction Phase III)

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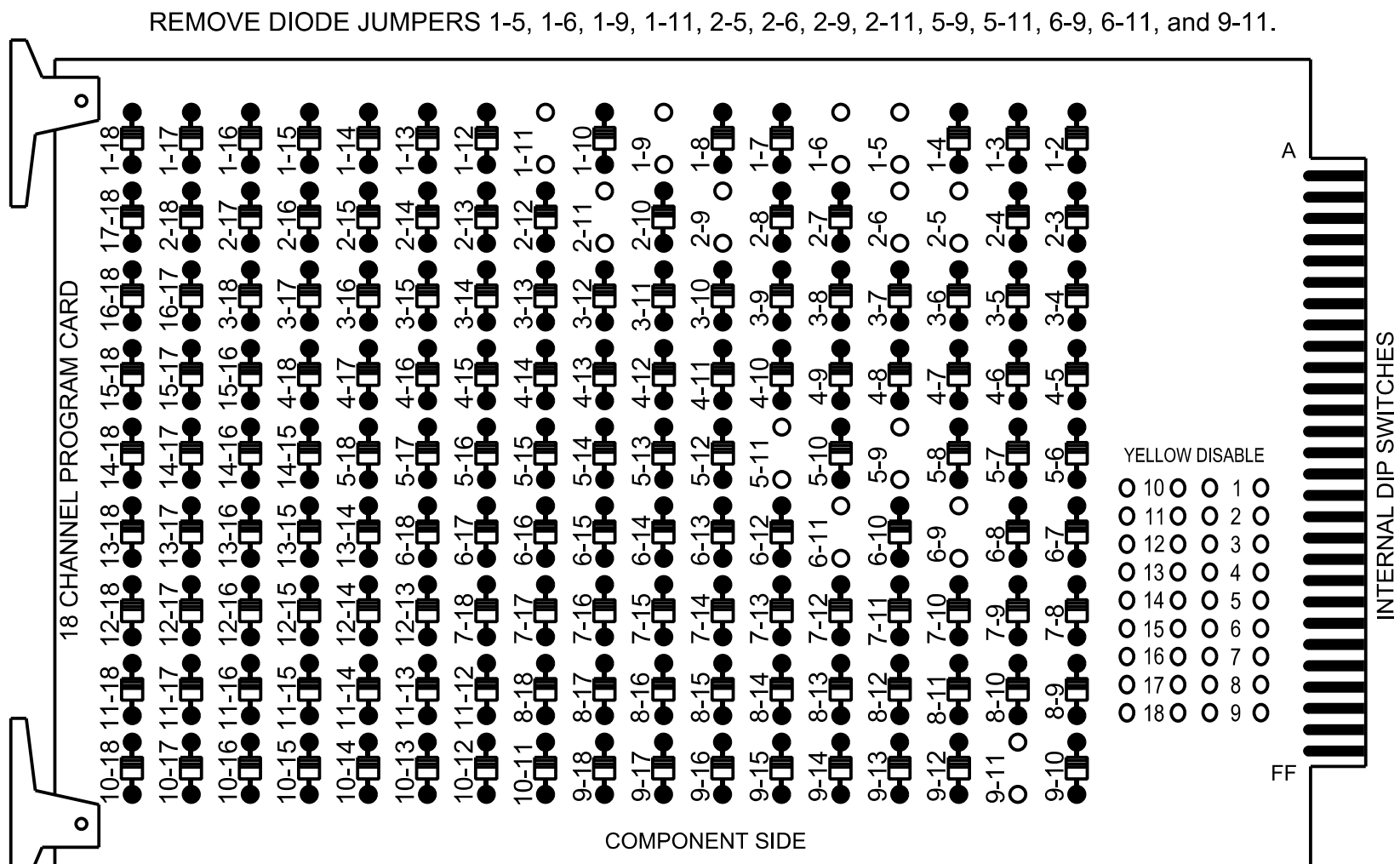
	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd)		SEAL
	Division 8 Randolph County Asheville PLAN DATE: August 2021 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	

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18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

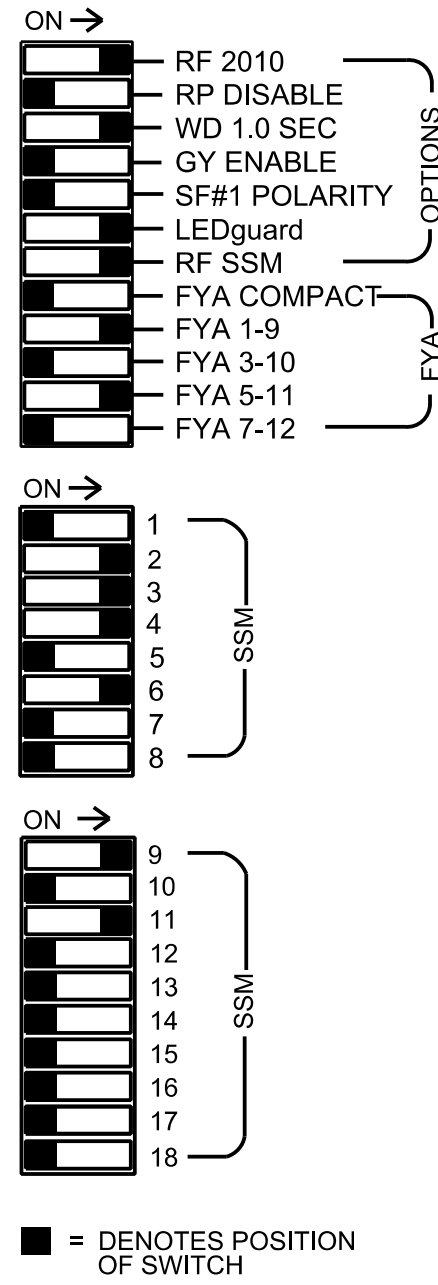
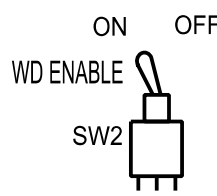
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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



NOTES

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

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1,S2,S4,S5,S7,S8,AUX S1,AUX S4
Phases Used.....1,2,3,4,5,6
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....*
Overlap "4".....NOT USED

*See overlap programming detail on sheet 2

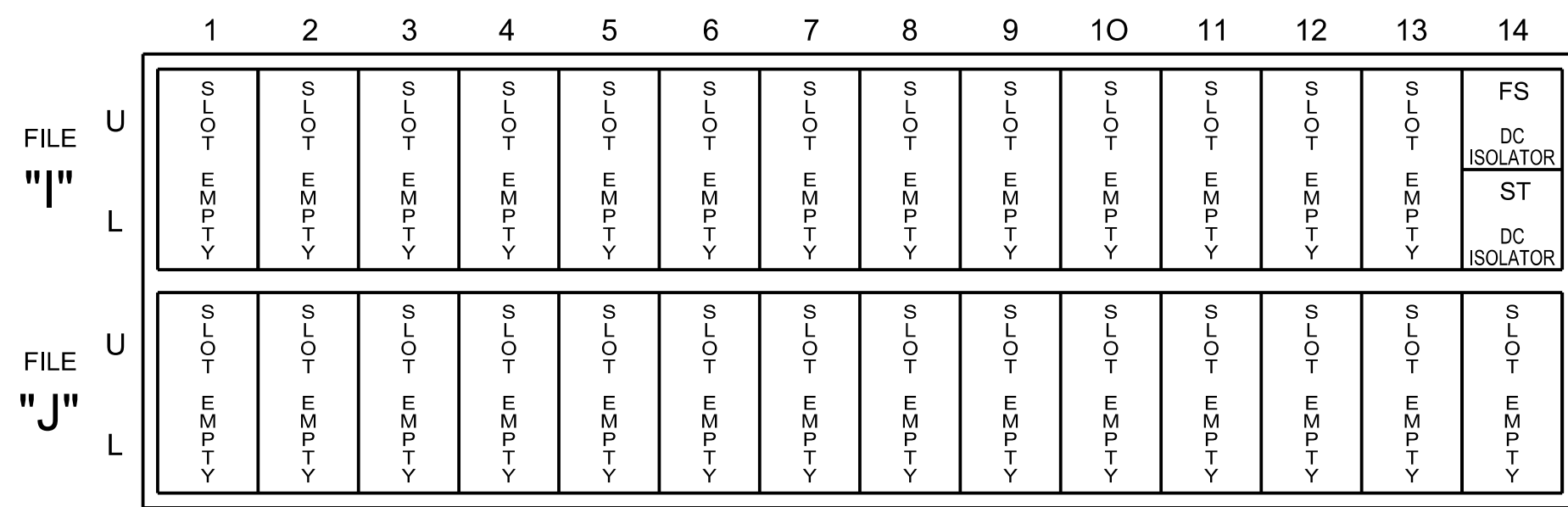
SIGNAL HEAD HOOK-UP CHART

Table with columns for Load Switch No., Phase, Signal Head No., and various signal types (Red, Yellow, Green, Arrow) mapped to terminals S1-S18 and AUX S1-S6.

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

INPUT FILE POSITION LAYOUT

(front view)



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

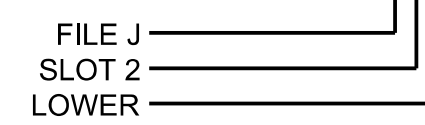
FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns: 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.

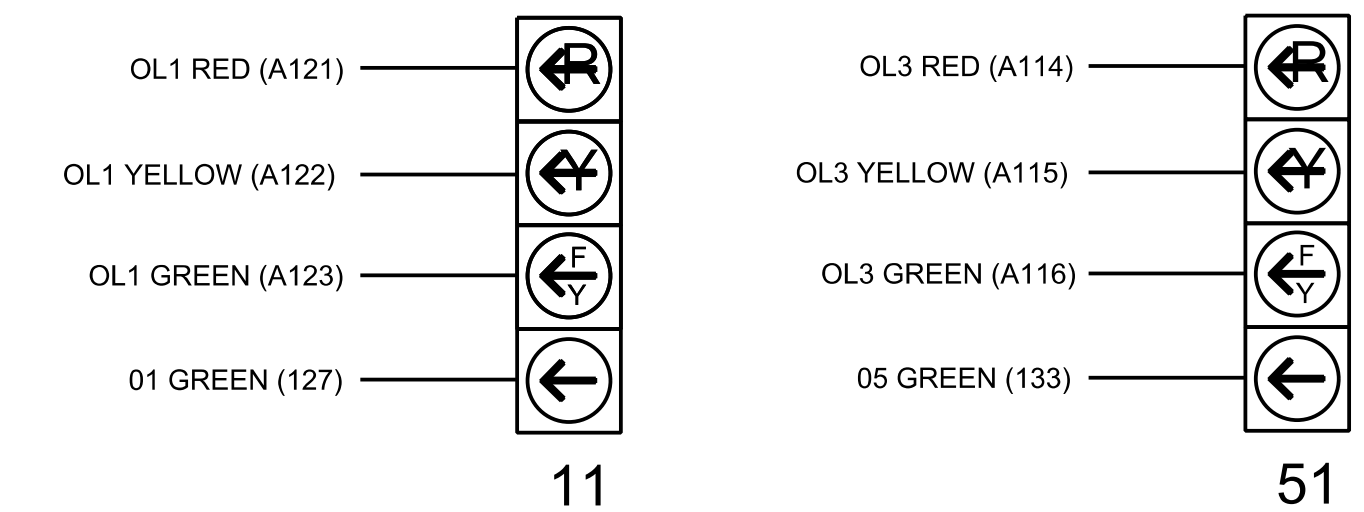
* For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



SPECIAL DETECTOR NOTE

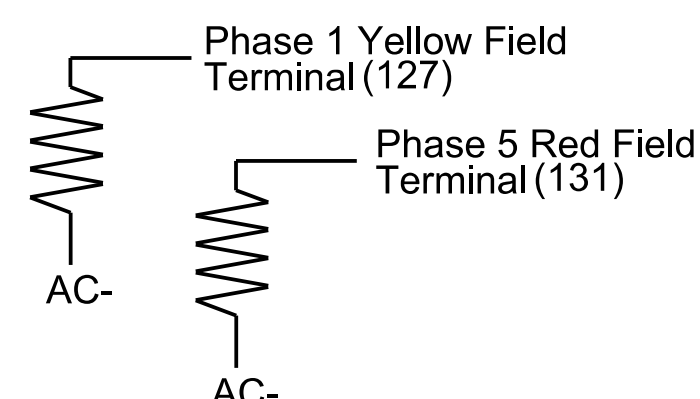
Install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

Table with columns: ACCEPTABLE VALUES, Value (ohms), Wattage. Values include 1.5K-1.9K (25W min) and 2.0K-3.0K (10W min).

Remove Phase 5 Red (if Present)



Signal Upgrade
Temporary Design 3
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Professional Engineer seal for N. R. Simmons, Project information for SR 1713 and SR 1446/1450, and signature block.

**MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING**

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	-	FYA 4 - Section	-
Included Phases	2	-	6	-
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	-
Included Phases	-	-	-	-
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 REMOVED INCLUDED PHASES FOR OL1 AND OL3

**MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

1A

Detector	Call Phase	Delay
1	1	0
29	0	-

5A

Detector	Call Phase	Delay
15	5	0
31	0	-

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0246T3
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 3
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME ALTERNATE PHASING 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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

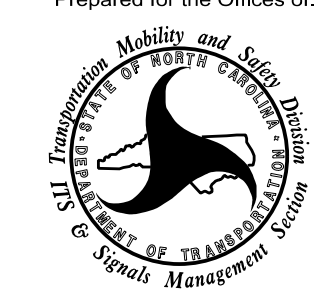

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

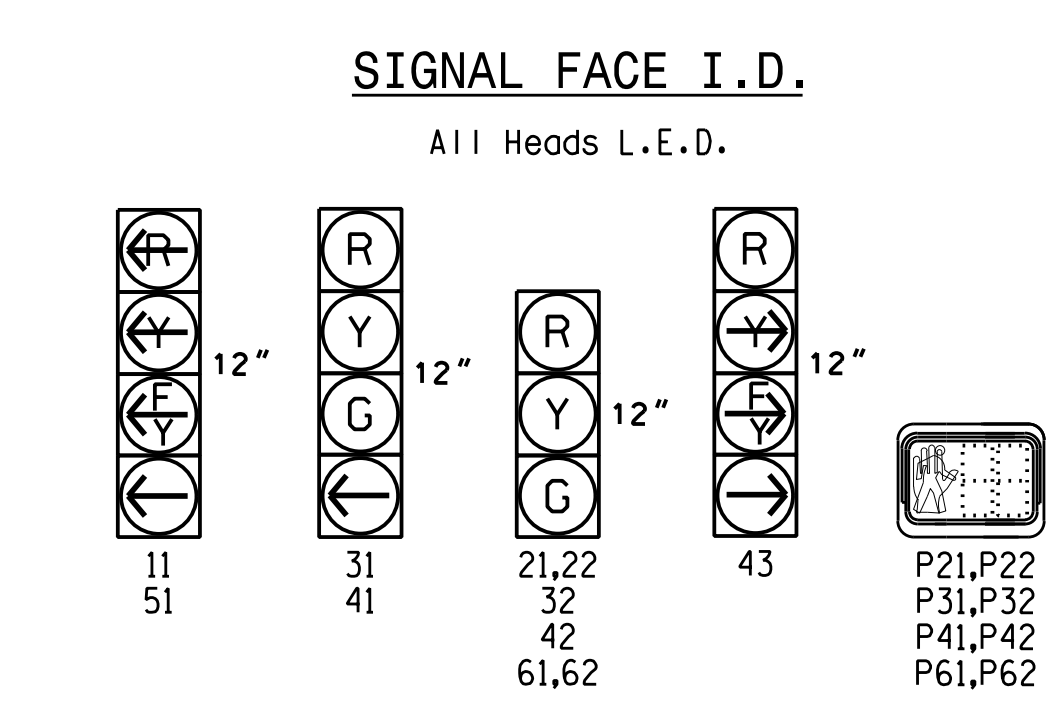
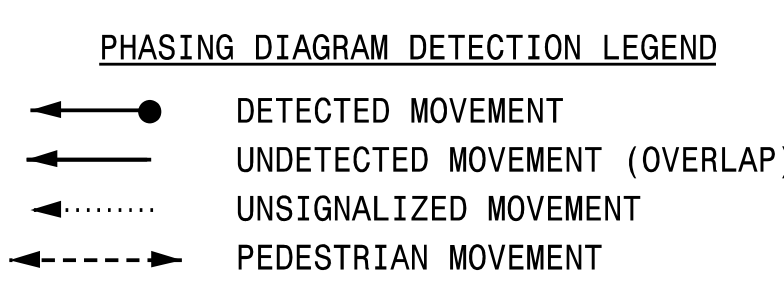
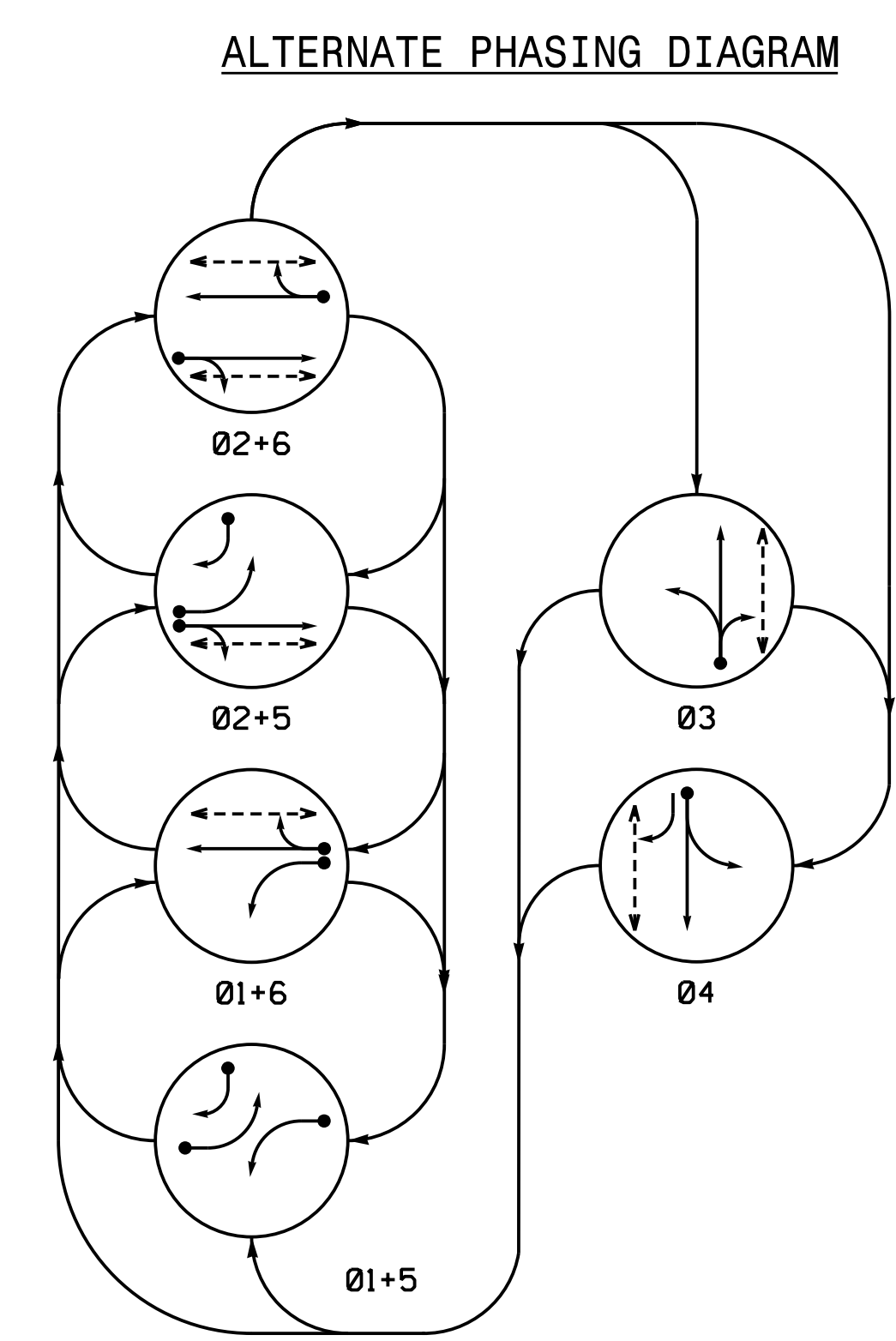
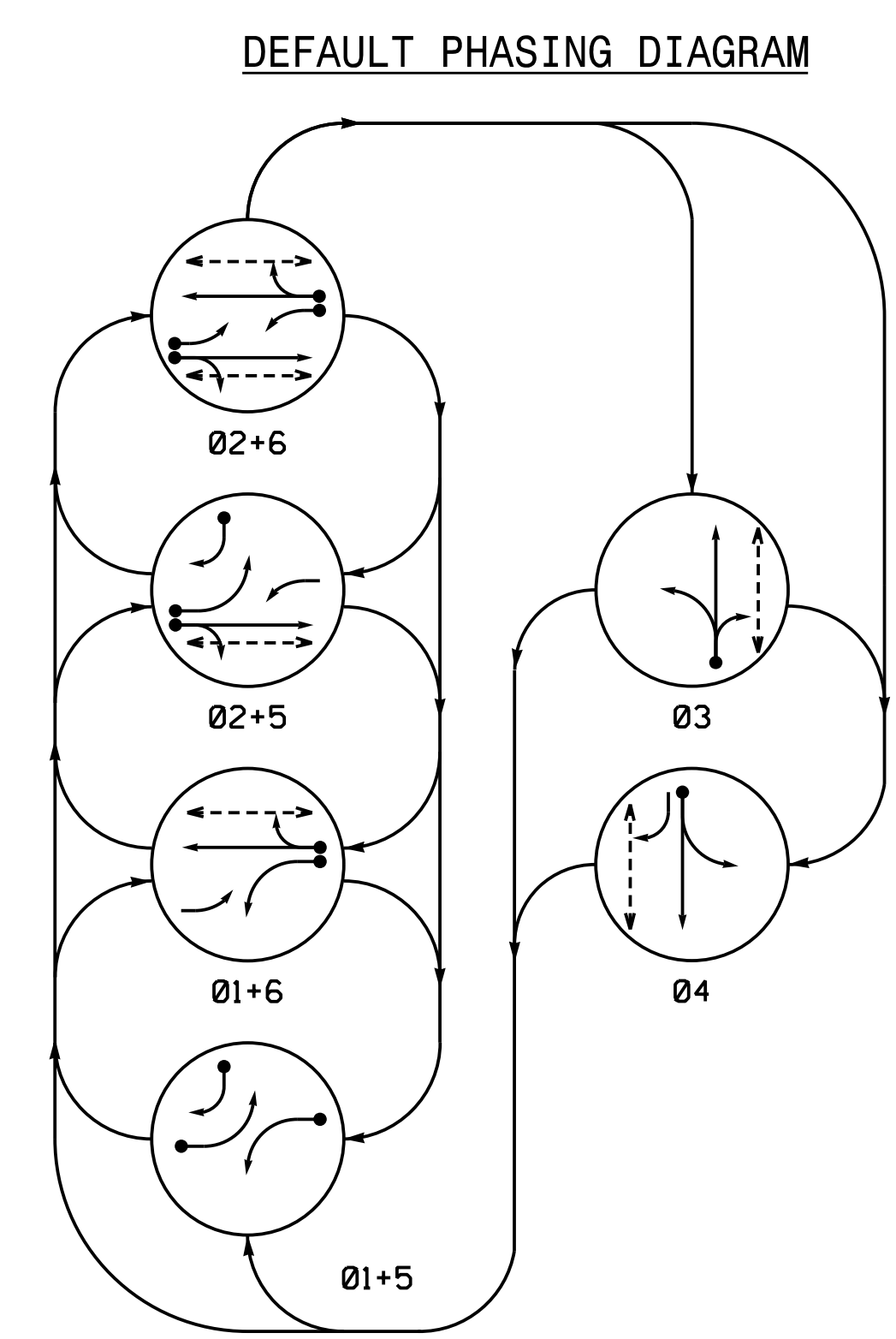
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0246T3
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade
Temporary Design 3
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd) Randolph County	SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 MELISSA R. SIMMONS
	Division 8 PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	ASHEBORO REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	02+5	02+6	03	04	FLASH
11	—	—	F	F	R	R
21,22	R	R	G	G	R	R
31	R	R	R	R	C	R
32	R	R	R	R	G	R
41	R	R	R	R	C	R
42	R	R	R	R	G	R
43	—	R	—	R	F	R
51	—	F	—	F	R	R
61,62	R	G	R	G	R	R
P21,P22	DW	DW	W	W	DW	DRK
P31,P32	DW	DW	DW	DW	W	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	02+5	02+6	03	04	FLASH
11	—	—	R	R	R	R
21,22	R	R	G	G	R	R
31	R	R	R	R	C	R
32	R	R	R	R	G	R
41	R	R	R	R	C	R
42	R	R	R	R	G	R
43	—	R	—	R	F	R
51	—	R	—	R	F	R
61,62	R	G	R	G	R	R
P21,P22	DW	DW	W	W	DW	DRK
P31,P32	DW	DW	DW	DW	W	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

MAXTIME DETECTOR INSTALLATION CHART

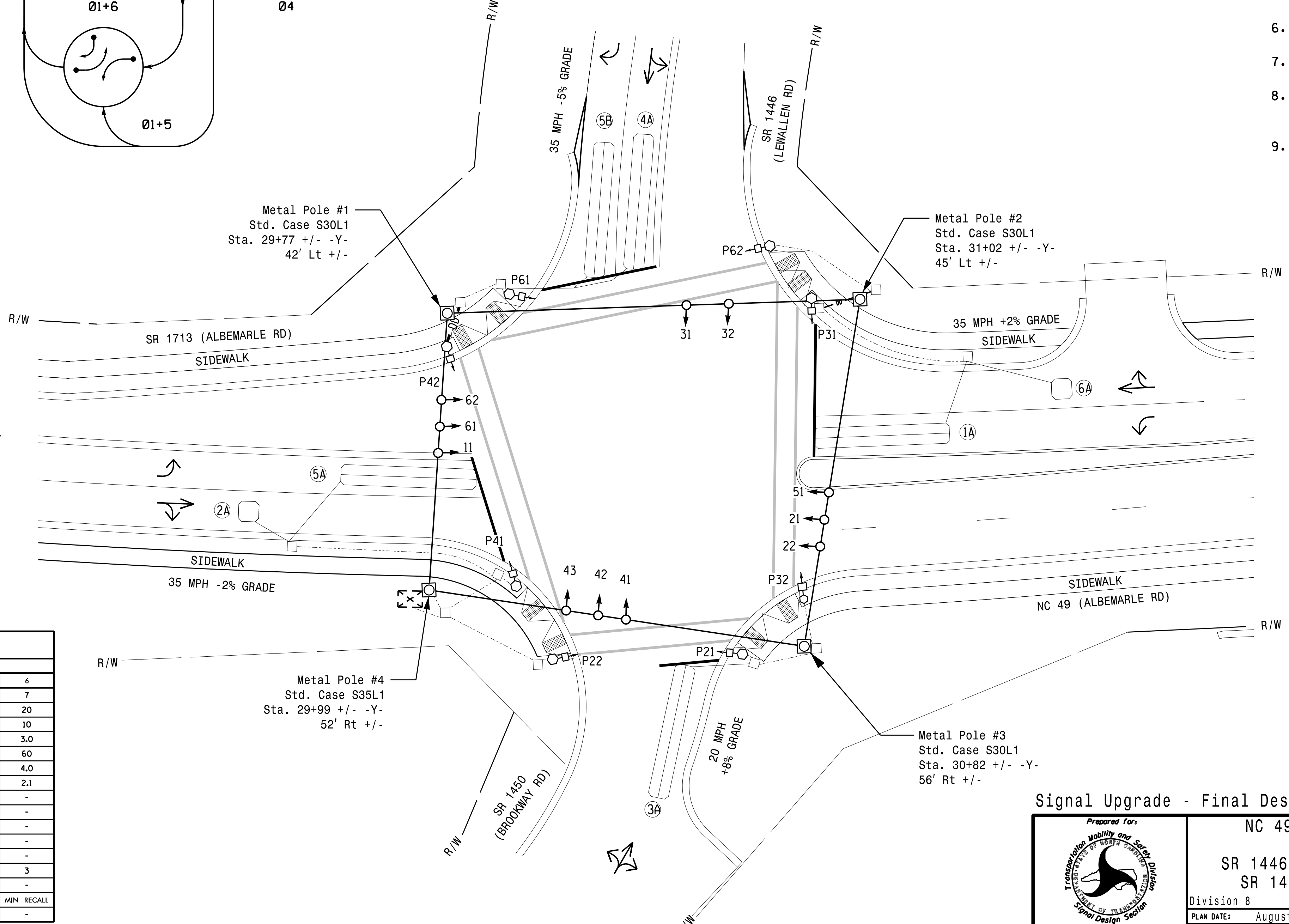
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING							
				NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND INITIAL	CALL	NEW CARD	
1A	6X40	0	2-4-2	X	1	*15	-	-	X	X	X
2A	6X6	70	4	X	2	-	-	-	X	X	X
3A	6X40	0	2-4-2	X	3	10	-	-	X	X	X
4A	6X40	0	2-4-2	X	4	3	-	-	X	X	X
5A	6X40	0	2-4-2	X	5	*15	-	-	X	X	X
5B	6X40	0	2-4-2	X	5	15	-	-	X	X	X
6A	6X6	70	3	X	6	-	-	-	X	X	X

* Disable Delay for Alternate Phasing Operation.
* Disable phase call during Alternate Phasing operation.

6 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

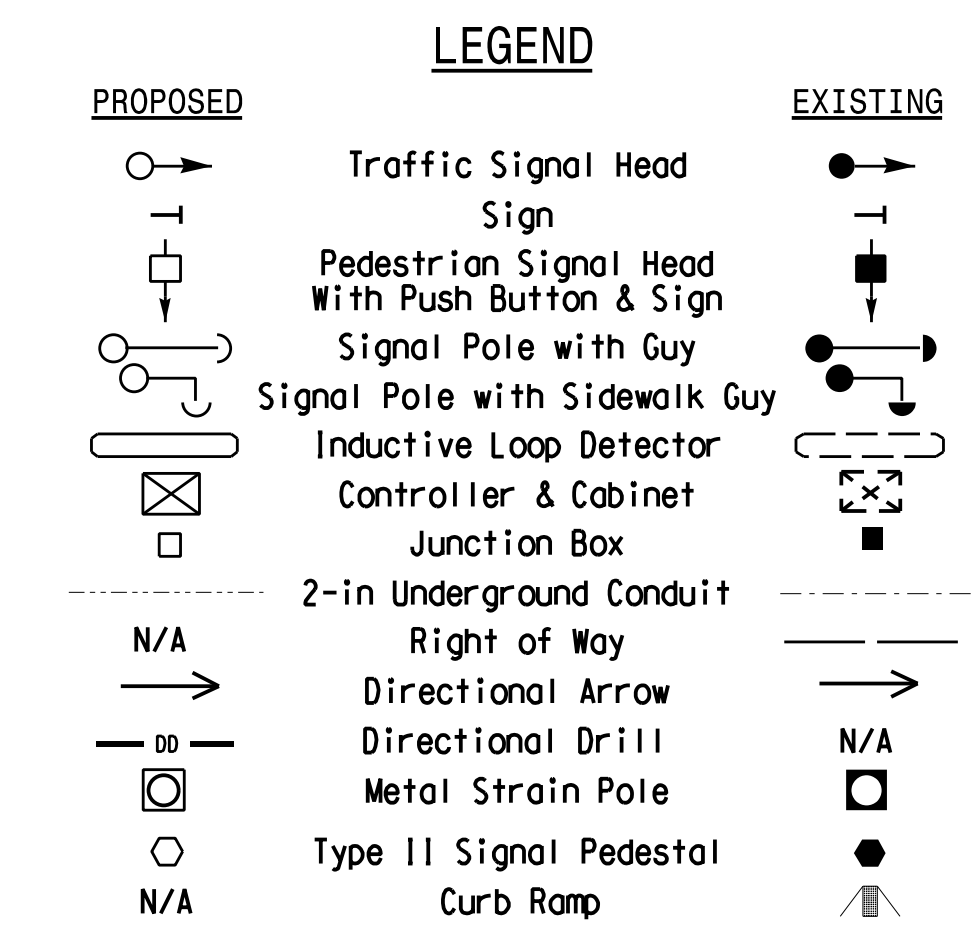
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- The order of phase 3 and 4 may be reversed.
- 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.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.



MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	7	7	7	-	7
Ped Clear *	-	10	23	18	-	20
Min Green	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max I *	20	60	20	30	20	60
Yellow Change	3.0	4.0	3.0	4.2	3.0	4.0
Red Clear	2.8	2.1	3.4	2.2	2.8	2.1
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	3	3	3	-	3
Non Lock Detector	X	-	X	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-



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

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: **NC 49 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd)**

Division 8 Randolph County Asheboro

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinsky

PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

750 N. Greenfield Pkwy, Garner, NC 27529

REVISIONS: INITI. DATE

DocuSigned by: **Nelasha R. Simmons** 5/21/2024

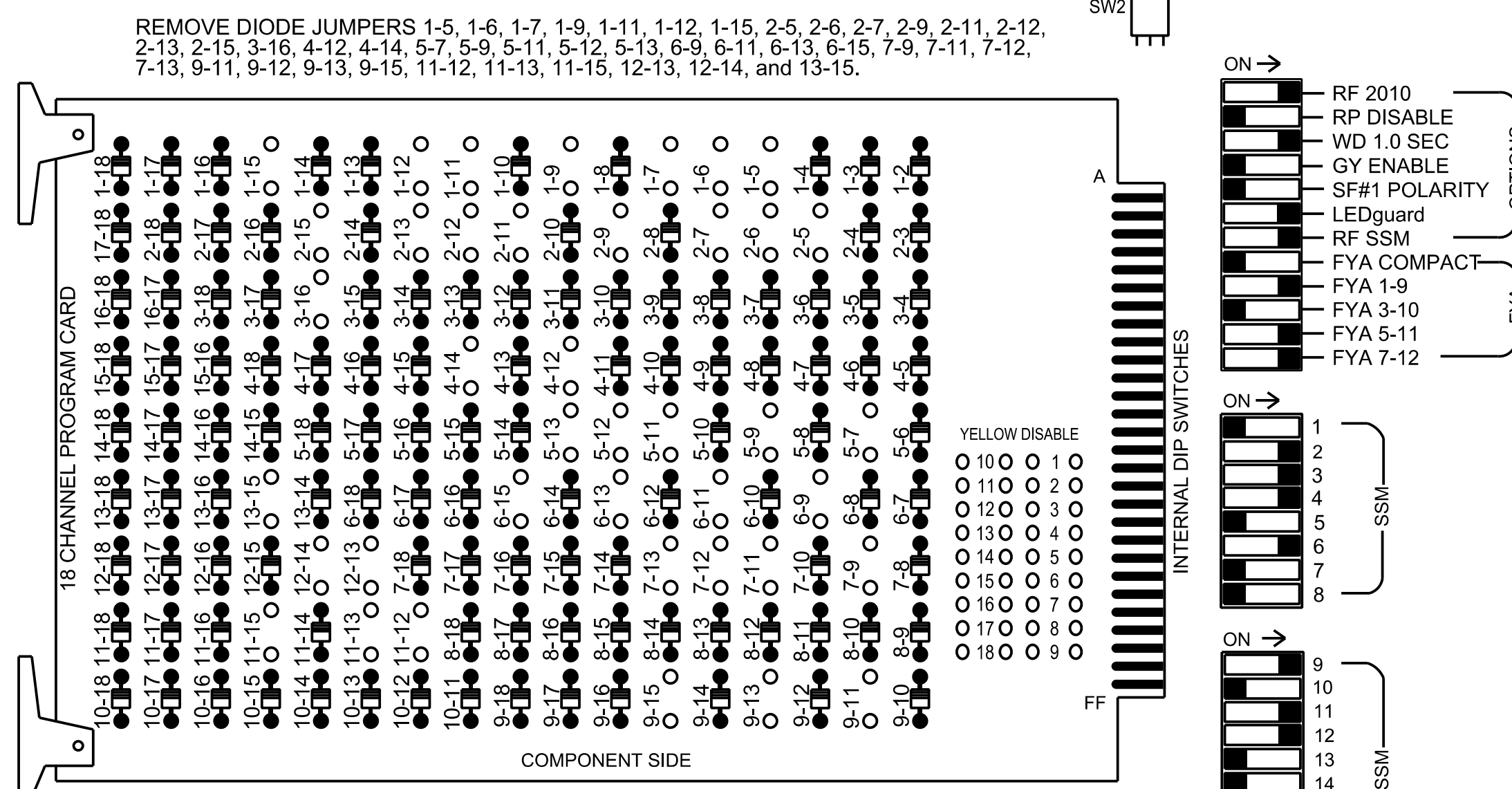
SIGNATURE DATE

SIG. INVENTORY NO. 08-0246

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
4. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

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,S3,S4,S5,S6,S7,S8,S9,S10,S12
 AUX S1,AUX S4,AUX S5
 Phases Used.....1,2,2 PED,3,3 PED,4,4 PED,5,6,6 PED
 Overlap "1".....
 Overlap "2".....Not Used
 Overlap "3".....
 Overlap "4".....
 Overlap "5".....Not Used
 Overlap "6".....Not Used
 Overlap "7".....Not Used
 Overlap "8".....

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

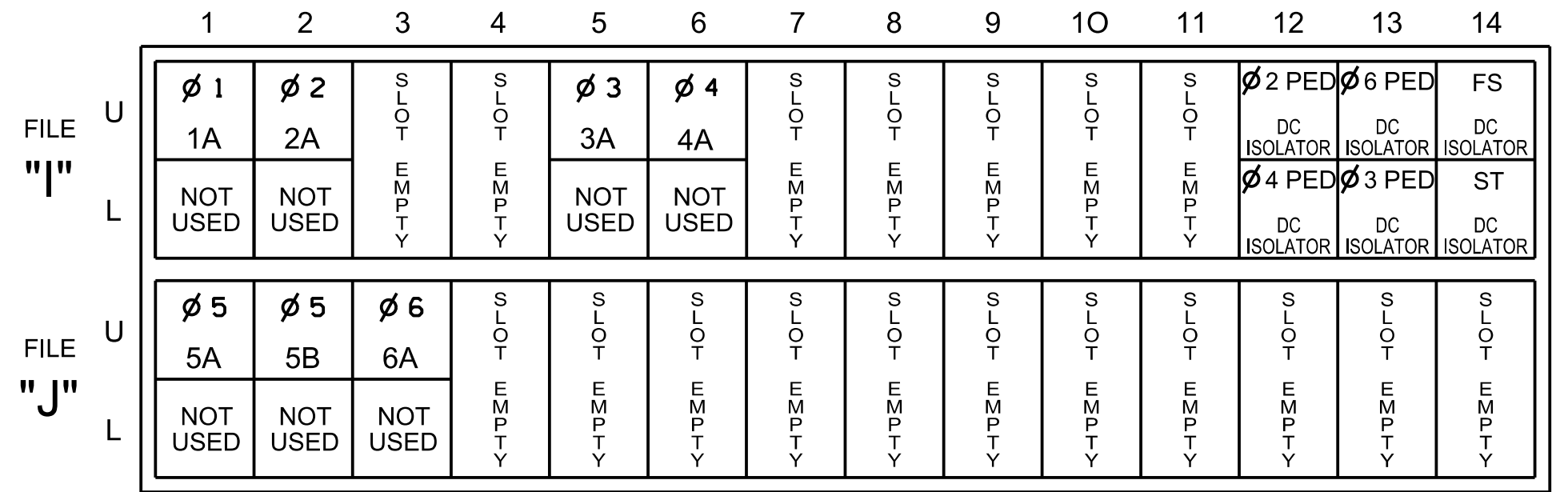
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6				
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18				
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	OL8	8	3 PED	OL1	OL2	SPARE	OL3	OL4	SPARE				
SIGNAL HEAD NO.	11	21,22	P21, P22	31	32	41	42	P41, P42	51	61,62	P61, P62	43	NU	P31, P32	11	NU	NU	51	43	NU		
RED		128		116	116	101	101				134									A101		
YELLOW	*	129		117	117	102	102		*	135		*										
GREEN		130		118	118	103	103			136												
RED ARROW																				A121	A114	
YELLOW ARROW																				A122	A115	A102
FLASHING YELLOW ARROW													A123							A116	A103	
GREEN ARROW	133			118	103			133		124												
Hand with Green Arrow			113					104		119		110										
Hand with Yellow Arrow			115					106		121		112										

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

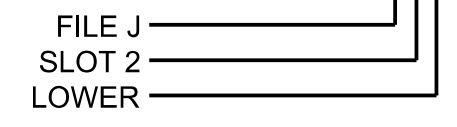
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		X		X	
2A	TB2-5,6	I2U	39	1	29 ★	6			X		X	
3A	TB4-5,6	I5U	58	20	7	3	10		X		X	
4A	TB4-9,10	I6U	41	3	8	4	3		X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15		X		X	
5B	TB3-5,6	J2U	40	2	16	5	15		X		X	
6A	TB3-9,10	J3U	64	30	18	6			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						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P31,P32	TB8-8,9	I13L	70	36	8	PED 3						

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

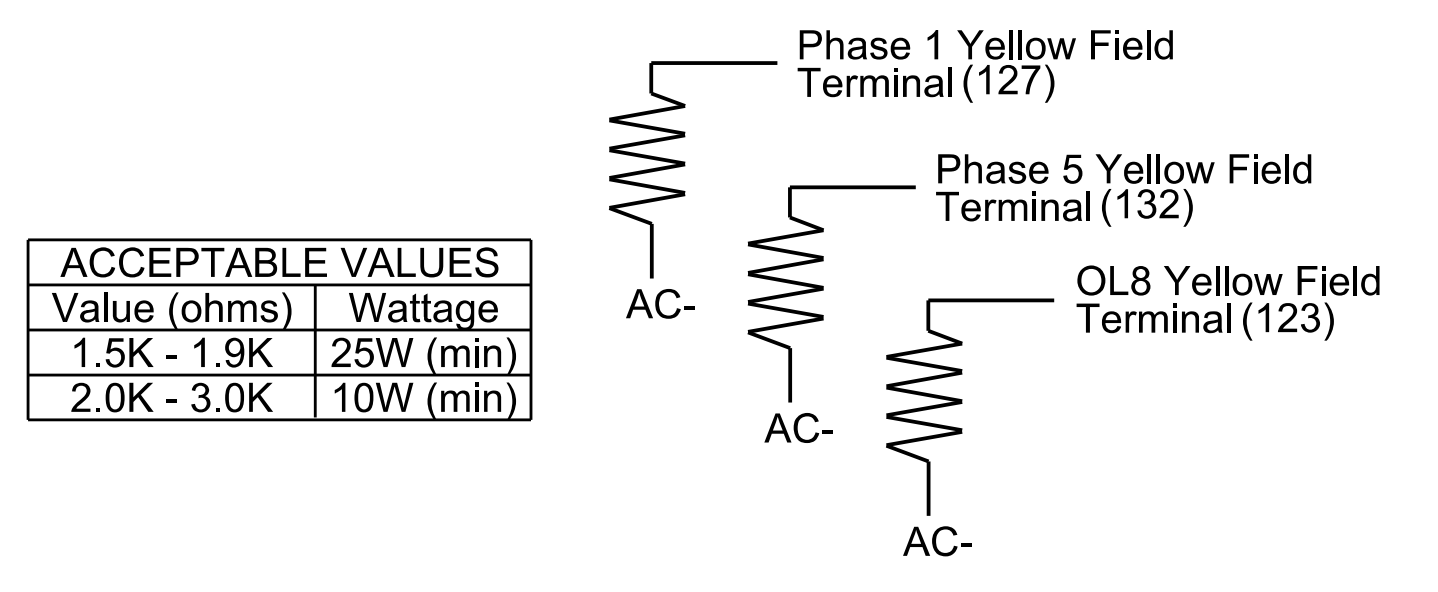
★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

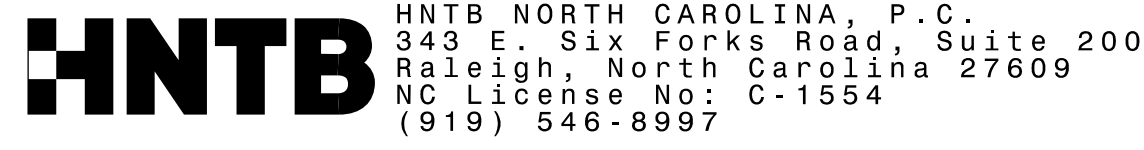
(install resistors as shown)



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

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: 08-0246
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 1 of 3

Document NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Division 8 SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd) Randolph County Asheboro

Prepared for the Offices of: HNTB NORTH CAROLINA, P.C. (919) 546-8997

PLANNED BY: N.K. Vianich REVIEWED BY: A.D. Klinskiesk
 PREPARED BY: N.K. Vianich REVIEWED BY: N.R. Simmons

REVISIONS: _____ DATE: _____

INITIALS: _____ DATE: _____

DocuSigned by: **Nelasha R. Simmons** 5/21/2024

SIG. INVENTORY NO. 08-0246

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	-	FYA 4 - Section	FYA 4 - Section
Included Phases	2	-	6	4
Modifier Phases	1	-	5	-
Modifier Overlaps	-	-	-	8
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 OUTPUT CHANNEL CONFIGURATION AND PED 3 PROGRAMMING DETAIL

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

Web Interface
Home >Controller >Detector Configuration >Pedestrian Detector

Plan 1

Detector	Description	Call Phase	Call Overlap
2		2	0
4		4	0
6		6	0
8		3	0

NOTICE PHASE 3 PED
ASSIGNED TO
DETECTOR 8 PED →

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

Web Interface
Home >Controller >Advanced IO>Channels>Channels 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	Overlap	8		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1	X		X	9
10	Overlap	2		X	X	10
11	Overlap	3	X			11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	3				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE OVERLAP 8
ASSIGNED TO
CHANNEL 7 →

NOTICE PHASE 3 PED
ASSIGNED TO CHANNEL 16 →

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

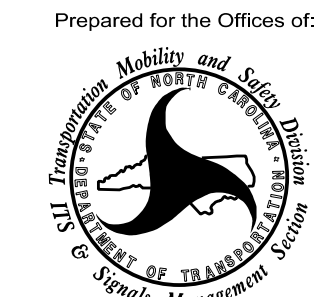
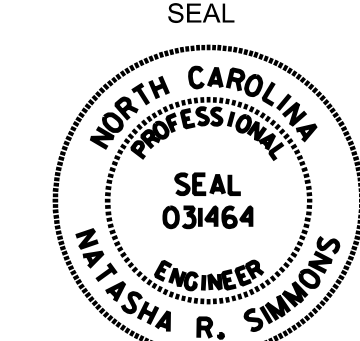

Overlap	1	2	3	4
Type	FYA 4 - Section	-	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	4
Modifier Phases	1	-	5	-
Modifier Overlaps	-	-	-	8
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE REMOVED INCLUDED
PHASES FOR OL1 AND OL3

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0246
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd) Randolph County Asheboro	SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 MELISSA R. SIMMONS
Division 8		
PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	DocuSigned by:  5/21/2024 DATE SIG. INVENTORY NO. 08-0246

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A AND 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.

Plan 2

Detector	Call Phase	Delay
1	1	0
29	0	-

5A

Detector	Call Phase	Delay
15	5	0
31	0	-

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

MAXTIME ALTERNATE PHASING 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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

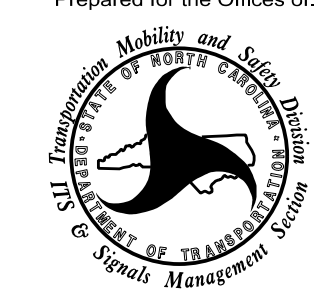
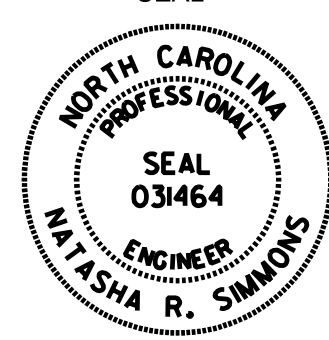
Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

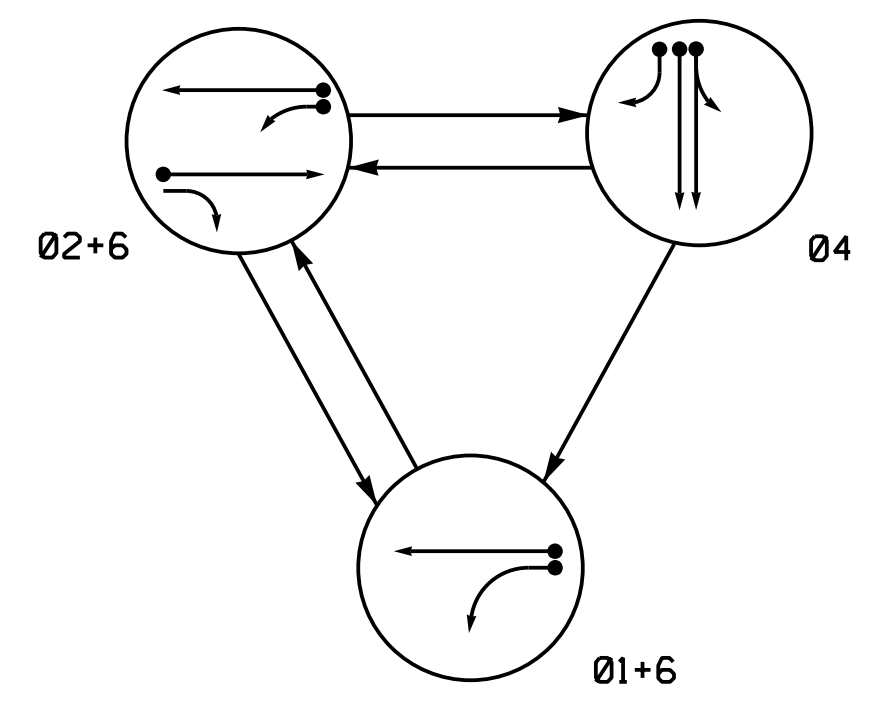
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0246
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design
Electrical Detail - Sheet 3 of 3

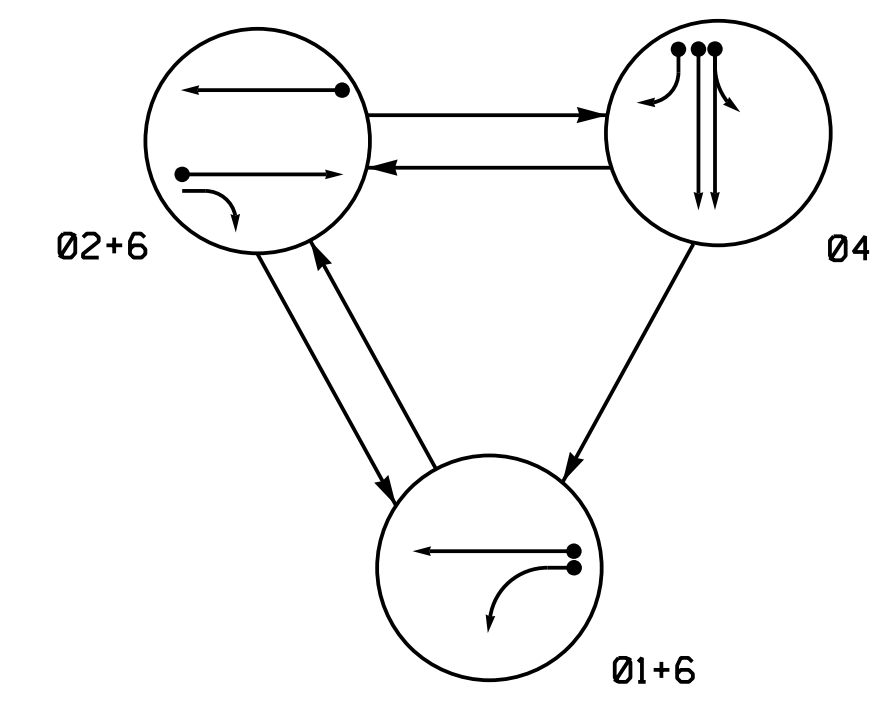
DOCUMENT NOT CONSIDERED FINAL
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ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1713 (Albemarle Rd) at SR 1446 (Lewallen Rd) and SR 1450 (Brookway Rd) Randolph County	SEAL  MELISSA R. SIMMONS
	Division 8 PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	ASHEBORO REVIEWED BY: A.D. Klinskiesk REVIEWED BY: N.R. Simmons

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
11	←	←	←	←
21	R	↑	R	Y
22	R	G	R	Y
23	R	←	R	←
41,42	R	R	G	R
43	R	R	←	R
61	G	G	R	Y
62	↑	↑	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
11	←	←	←	←
21	R	↑	R	Y
22	R	G	R	Y
23	R	←	R	←
41,42	R	R	G	R
43	R	R	←	R
61	G	G	R	Y
62	↑	↑	R	Y

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	RELAY DURING GREEN
1A*	6X40	0	*	*	1	**15	-	X	X	X	*
2A*	6X6	70	*	*	2	-	-	X	X	X	*
4A*	6X40	0	*	*	4	-	-	X	X	X	*
4B*	6X40	0	*	*	4	-	-	X	X	X	*
4C*	6X40	0	*	*	4	15	-	X	X	X	*
6A*	6X40	70	*	*	6	-	-	X	X	X	*

* Microwave Detection
 ** Disable Delay During Alternate Phasing Operation.
 * Disable phase call during Alternate Phasing operation.

3 Phase Fully Actuated (Isolated)

NOTES

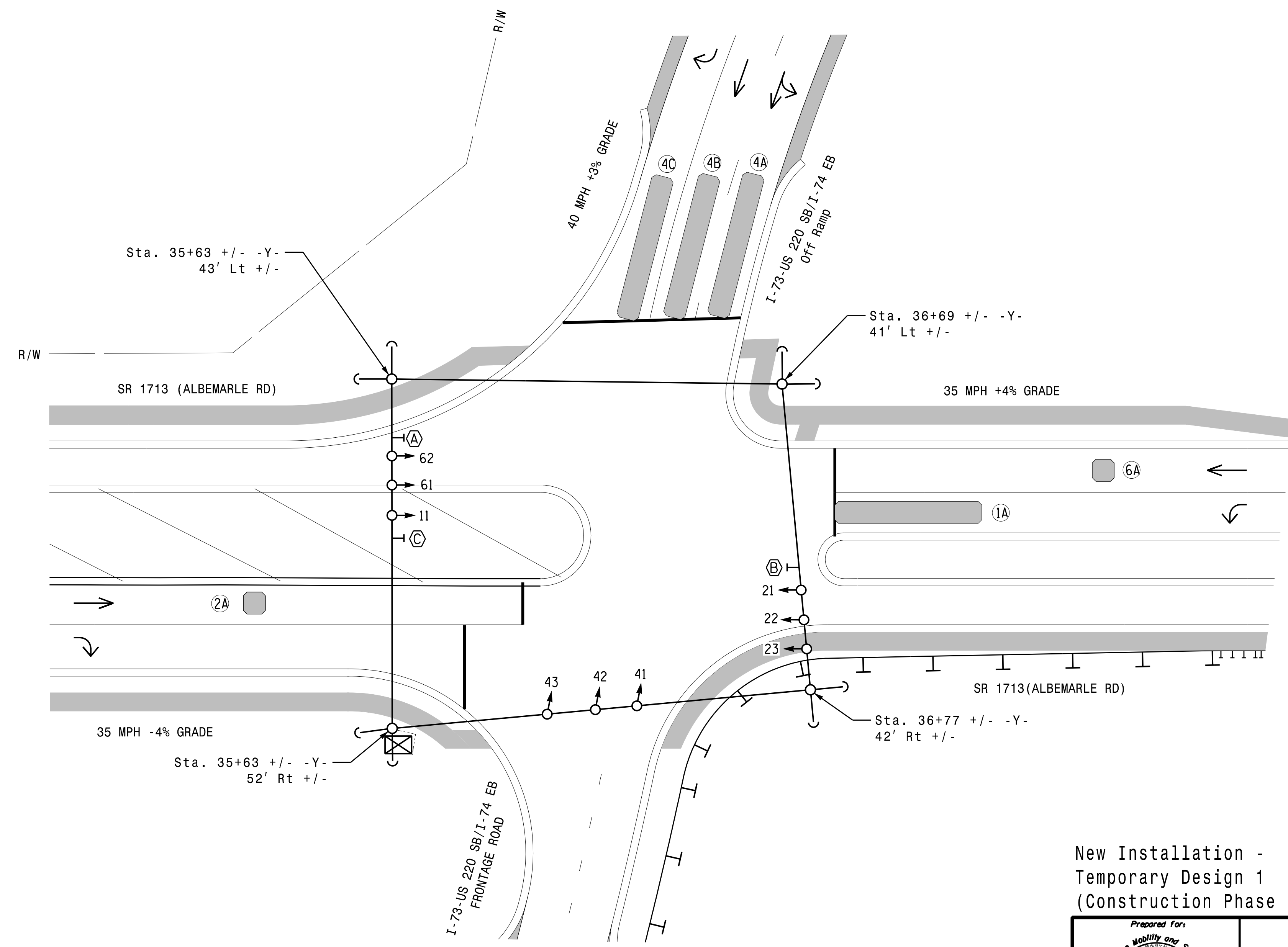
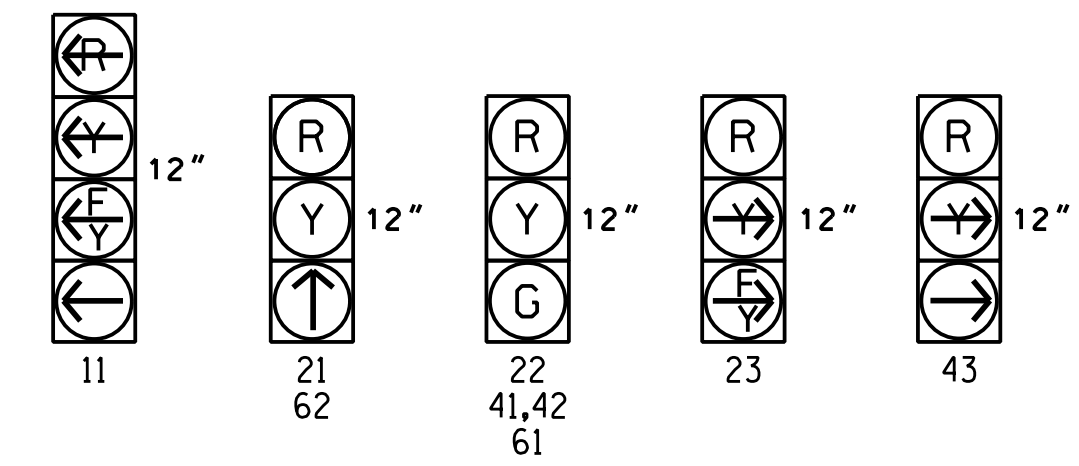
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence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

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



FEATURE	PHASE			
	1	2	4	6
Walk *	-	-	-	-
Ped Clear *	-	-	-	-
Min Green	7	10	7	10
Passage *	2.0	3.0	2.0	3.0
Max I *	20	60	30	60
Yellow Change	3.0	4.1	4.0	4.1
Red Clear	2.3	1.7	1.9	1.7
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	X	-	X	-
Vehicle Recall	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-

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

PROPOSED	LEGEND	EXISTING
	Traffic Signal Head	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Construction Zone	
	Microwave Detection Zone	
	Guardrail	
	Curb Ramp	
	No Right Turn Sign (R3-1)	
	No U-Turn/No Left Turn Sign (R3-18)	
	Left Turn Sign (R3-L)	

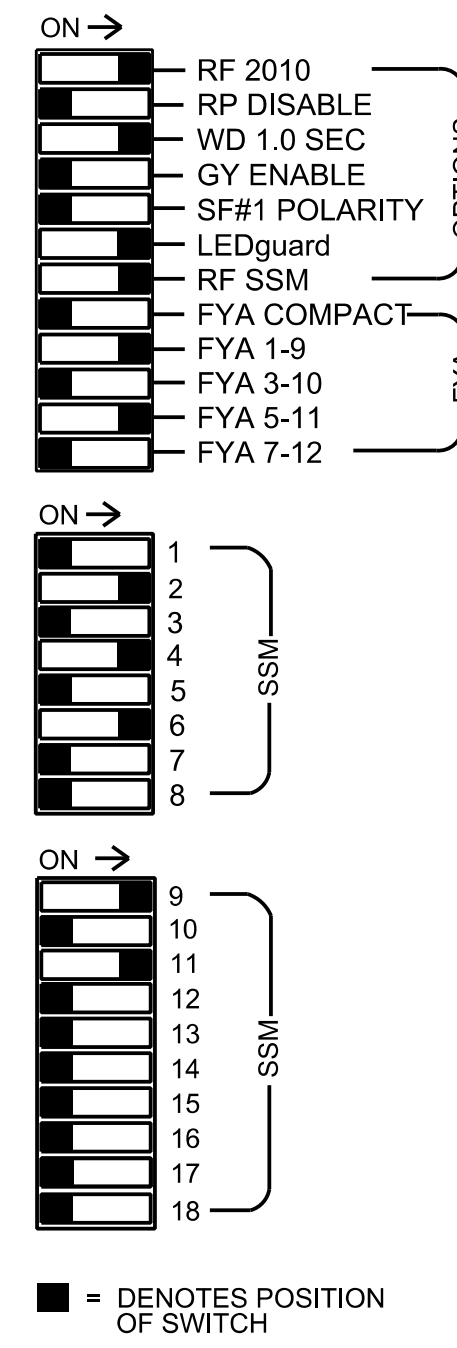
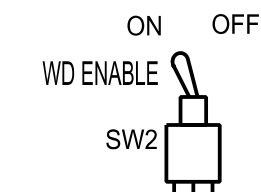
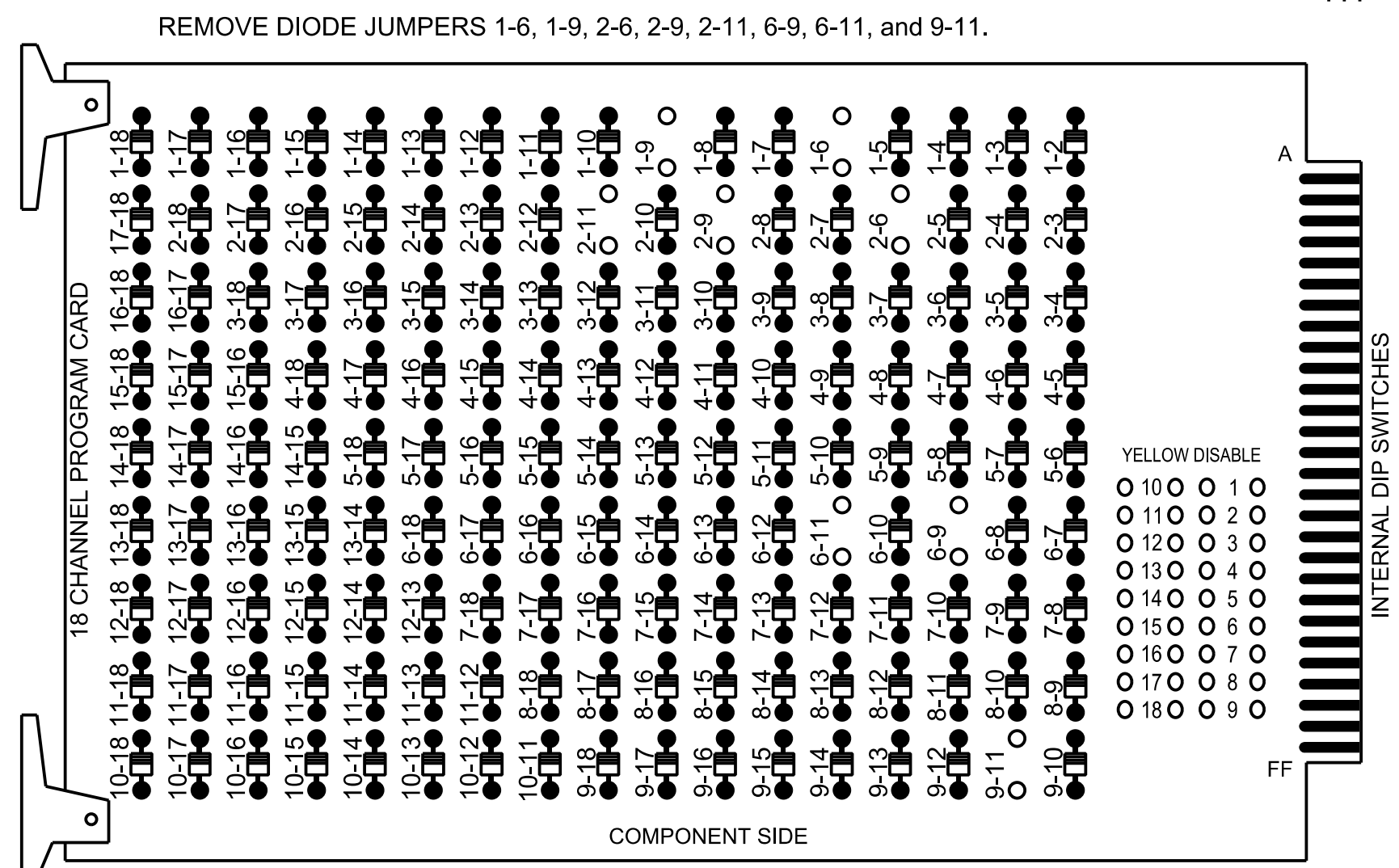
New Installation - Temporary Design 1 (Construction Phase II)

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	Prepared for: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27526	NC 49 (Albemarle Rd) at I-73-US 220 SB Ramps/ I-74 EB Ramps Division 8 Randolph County Asheboro PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons	SEAL
	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	REVISIONS INIT. DATE DocuSigned by: DATE: 5/21/2024 SIGNATURE: N. R. Simmons DATE: 5/21/2024 SIG. INVENTORY NO. 08-0502T1	SCALE: 1"=20' 0 20

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S1,S2,S5,S8,AUX S1,AUX S4
 Phases Used.....1,2,4,6
 Overlap "1".....*
 Overlap "2".....Not Used
 Overlap "3".....*
 Overlap "4".....Not Used

*See overlap programming detail on sheet 2

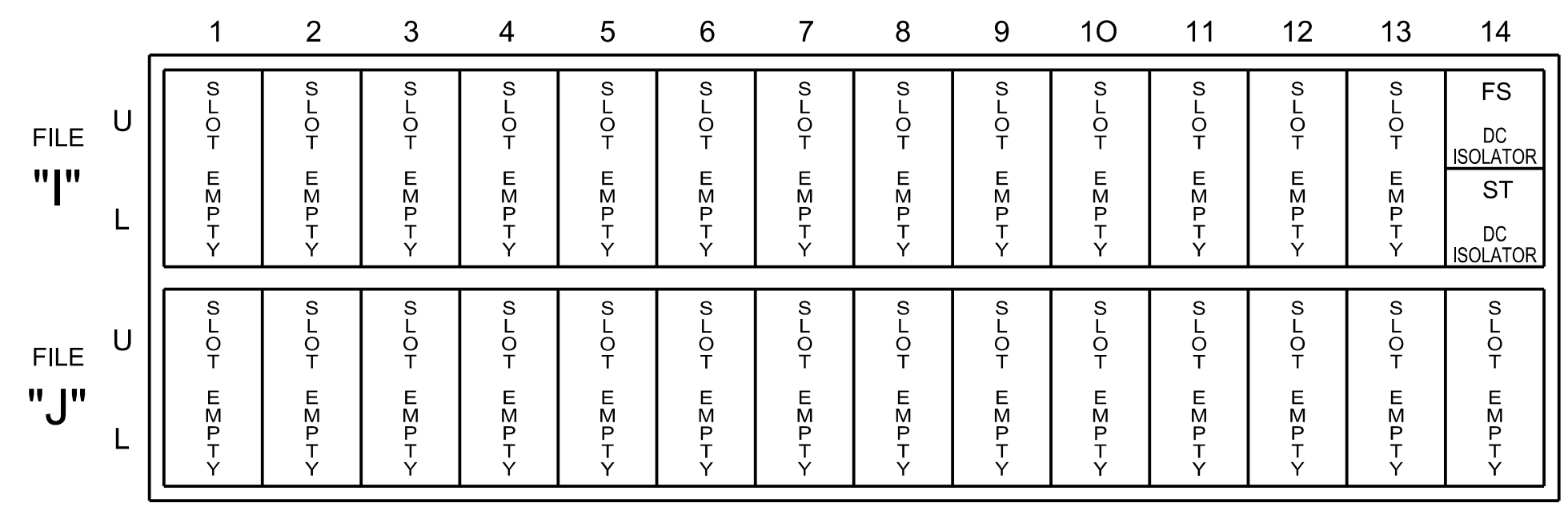
SIGNAL HEAD HOOK-UP CHART

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	NU	41,42	43	NU	NU	61	62	NU	NU	NU	11	NU	NU	23
RED		128	128			101	101			134	134							A114
YELLOW	*	129	129			102				135	135							
GREEN			130			103				136								
RED ARROW													A121					
YELLOW ARROW							102						A122				A115	
FLASHING YELLOW ARROW													A123				A116	
GREEN ARROW	127	130				103				136								
HAND																		
PEDESTRIAN																		

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

INPUT FILE POSITION LAYOUT

(front view)



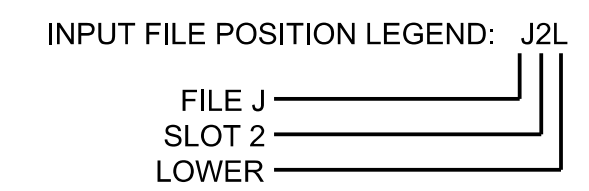
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

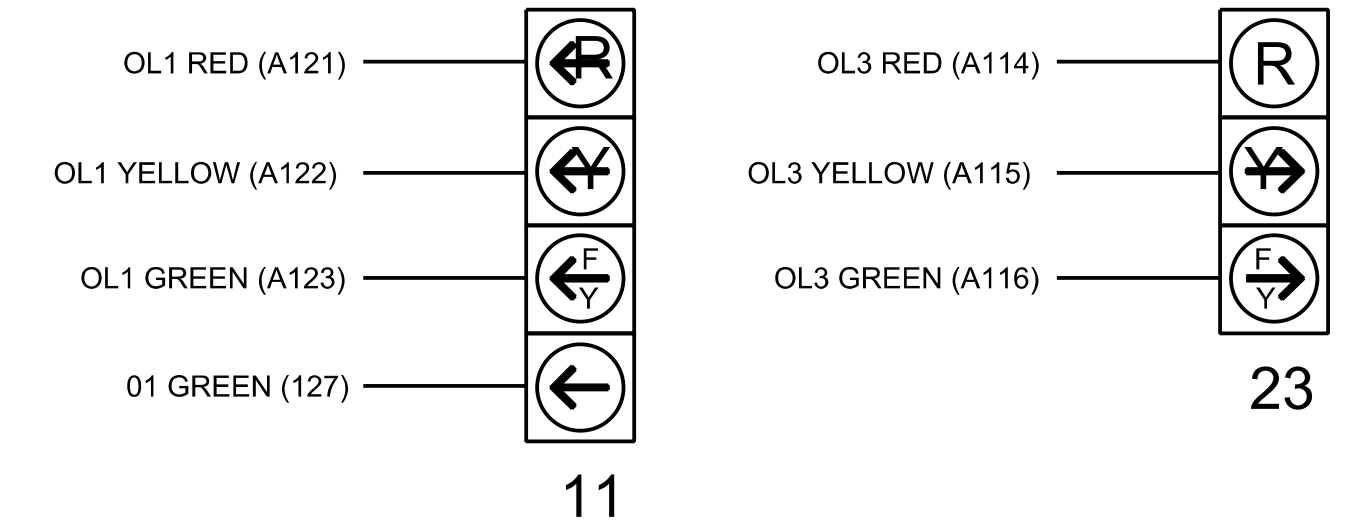
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		X		X	
				-	29 ★	6			X		X	

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



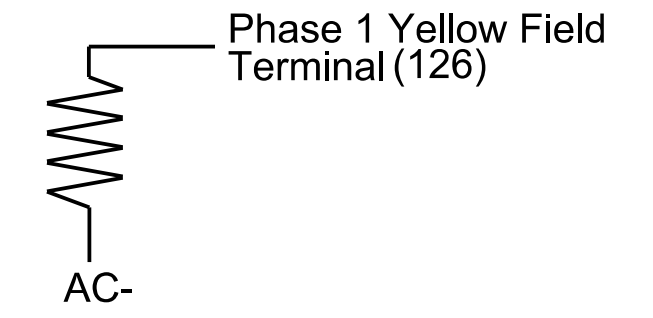
SPECIAL DETECTOR NOTE

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 resistor as shown)

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



New Installation
 Temporary Design 1
 Electrical Detail - Sheet 1 of 3

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 08-0502T1
 DESIGNED: AUGUST 2021
 SEALED: 05/21/2024
 REVISED:

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: 	NC 49 (Albemarle Rd) at I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County, Asheville		SEAL
	Prepared for the Offices of: 	Division 8 PLAN DATE: August 2021 PREPARED BY: N.K. Vianich	ASHEBORO REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons
HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		DocuSigned by: DATE: 5/21/2024 SIG. INVENTORY NO.: 08-0502T1	

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

1A

Plan 2		
Detector	Call Phase	Delay
1	1	0
29	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	-	FYA 4 - Section	-
Included Phases	2	-	2	-
Modifier Phases	1	-	-	-
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	-
Included Phases	-	-	2	-
Modifier Phases	1	-	-	-
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 REMOVED INCLUDED PHASE FOR OL1

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0502T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

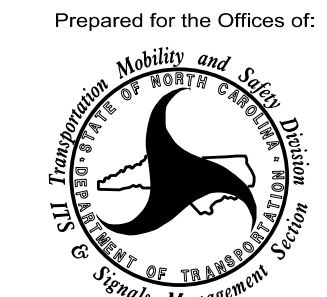
New Installation
Temporary Design 1
Electrical Detail - Sheet 2 of 3

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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

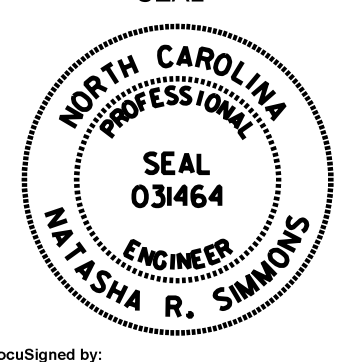
NC 49 (Albemarle Rd)
at
I-73-US 220 SB Ramps/
I-74 EB Ramps

Division 8 Randolph County Asheboro

PLAN DATE: August 2021	REVIEWED BY: A.D. Klinksiek
PREPARED BY: N.K. Vianich	REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

SEAL



DocuSigned by:
Melissa R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0502T1

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.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	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 head 11 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0502T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

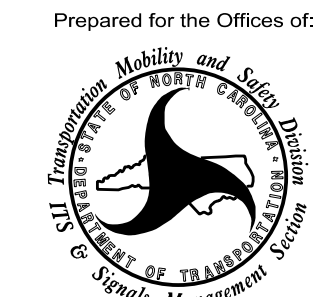
New Installation
Temporary Design 1
Electrical Detail - Sheet 3 of 3

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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529


NC 49 (Albemarle Rd)
at
I-73-US 220 SB Ramps/
I-74 EB Ramps
Randolph County

Division 8 Asheboro

PLAN DATE:	August 2021	REVIEWED BY:	A.D. Klinksiek
PREPARED BY:	N.K. Vianich	REVIEWED BY:	N.R. Simmons

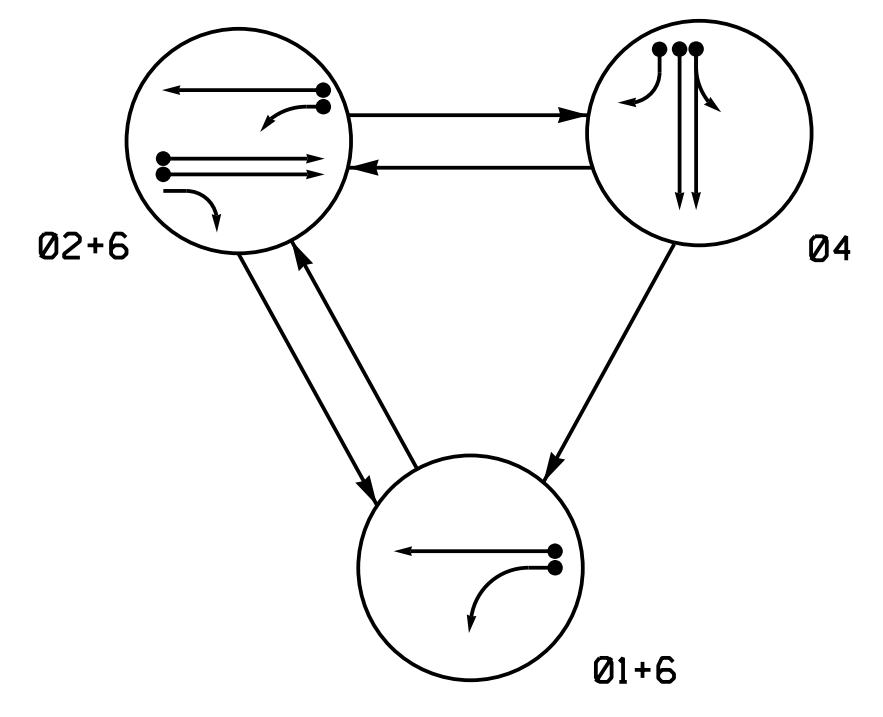
REVISIONS	INIT.	DATE

SEAL

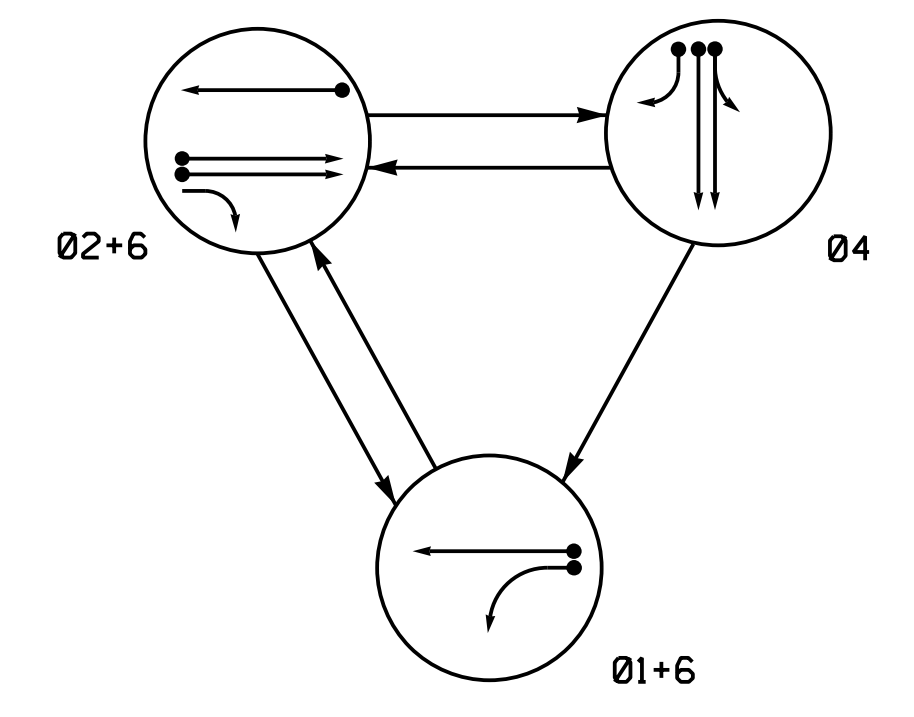


DocuSigned by:
Natasha R. Simmons 5/21/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0502T1

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
11	+	-	-	-
21	R	↑	R	Y
22	R	G	R	Y
23	R	↓	R	Y
41,42	R	R	G	R
43	R	R	-	R
61	G	G	R	Y
62	↑	↑	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
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41,42	R	R	G	R
43	R	R	-	R
61	G	G	R	Y
62	↑	↑	R	Y

MAXTIME DETECTOR INSTALLATION CHART												
DETECTOR						PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	RELAY DURING GREEN	NEW CARD
1A*	6X40	0	*	*	1	**15	-	X	-	X	-	*
2A*	6X6	70	*	*	2	-	-	X	-	X	-	*
2B*	6X6	70	*	*	2	-	-	X	-	X	-	*
4A*	6X40	0	*	*	4	-	-	X	-	X	-	*
4B*	6X40	0	*	*	4	-	-	X	-	X	-	*
4C*	6X40	0	*	*	4	15	-	X	-	X	-	*
6A*	6X40	70	*	*	6	-	-	X	-	X	-	*

* Microwave Detection
 ** Disable Delay During Alternate Operation.
 * Disable phase call during Alternate Phasing operation.

3 Phase Fully Actuated (Isolated)

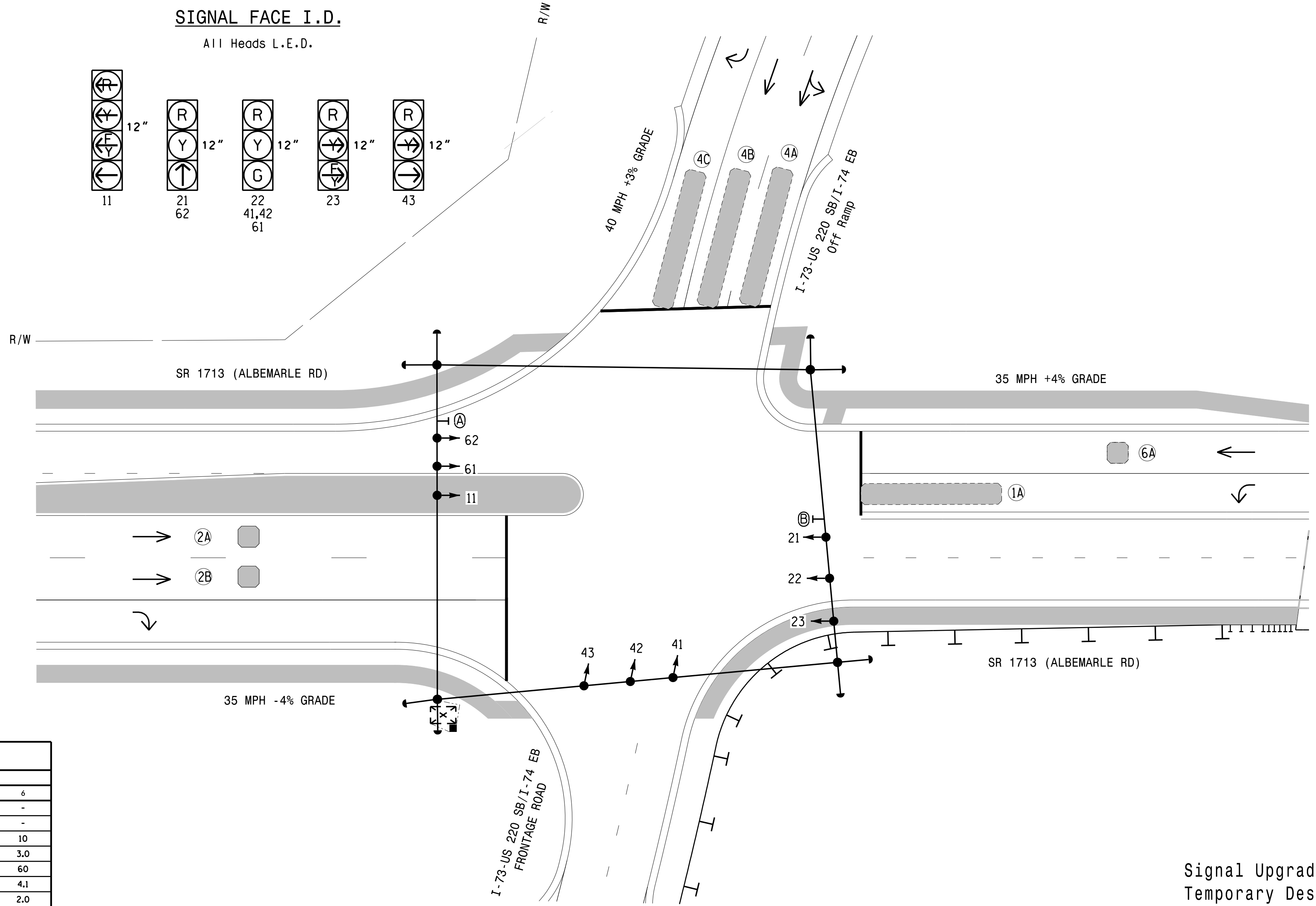
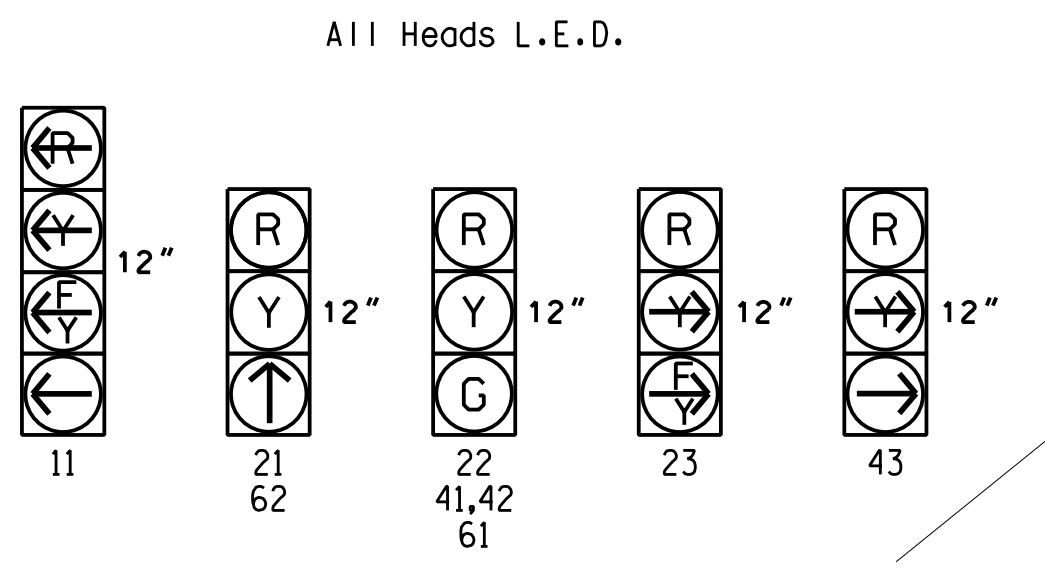
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal heads numbered 21 and 22.
5. Set all detector units to presence mode.
6. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. The Division Traffic Engineer will determine the hours of use for each phasing plan.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.



FEATURE	PHASE			
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Red Clear	2.4	2.0	1.8	2.0
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	-	-	-	-
Non Lock Detector	X	-	X	-
Vehicle Recall	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-

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

PROPOSED	LEGEND	EXISTING
	Traffic Signal Head	
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Microwave Detection Zone	
	Construction Zone	
	Type II Signal Pedestal	
	Guardrail	
	Curb Ramp	
	No Right Turn Sign (R3-1)	
	No U-Turn/No Left Turn Sign (R3-18)	

Signal Upgrade -
 Temporary Design 2
 (Construction Phase III)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 Raleigh, North Carolina 27609
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 Prepared For: TRANSPORTATION MOBILITY AND SAFETY ADMINISTRATION STATE OF NORTH CAROLINA Signal Design Section	SR 1713 (Albemarle Rd) at I-73-US 220 SB Ramps/ I-74 EB Ramps	SEAL N.R. SIMMONS ENGINEER
	Division 8 Randolph County Asheboro PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons	REVISIONS INITI. DATE DocuSigned by: N.R. Simmons 5/21/2024 DATE SIG. INVENTORY NO. 08-0502T2

