

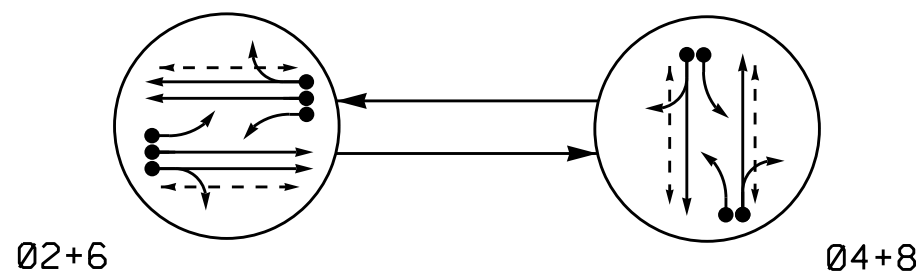
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PHASING DIAGRAM



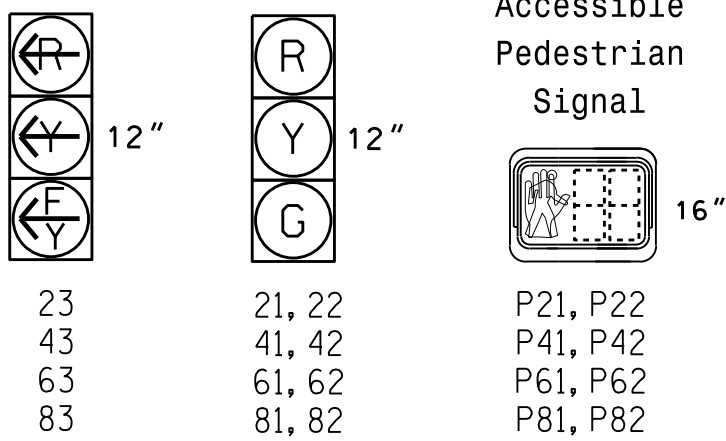
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
23	F	R	Y
41, 42	R	G	R
43	R	F	R
61, 62	G	R	Y
63	F	R	Y
81, 82	R	G	R
83	R	F	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS				DETECTOR PROGRAMMING												
				ASSIGNED PHASE	TIMING		VEHICLE	OPERATION MODE							STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)		DELAY	EXTEND (STRETCH)		1	2	3	4	5	6	7		
2A	6X6	EXIST	290	- X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
2B	6X6	EXIST	290	- X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
2C	6X40	2-4-2	+8	- X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
4A	6X60	2-4-2	+9	- X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
4B	6X60	2-4-2	+9	- X	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	X	-
6A	6X6	EXIST	295	- X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
6B	6X6	EXIST	295	- X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
6C	6X40	2-4-2	+5	- X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
8A	6X40	2-4-2	+4	- X	8	- SEC.	- SEC.	X	-	-	-	-	-	-	X	-
8B	6X40	2-4-2	+4	- X	8	10 SEC.	- SEC.	X	-	-	-	-	-	-	X	-

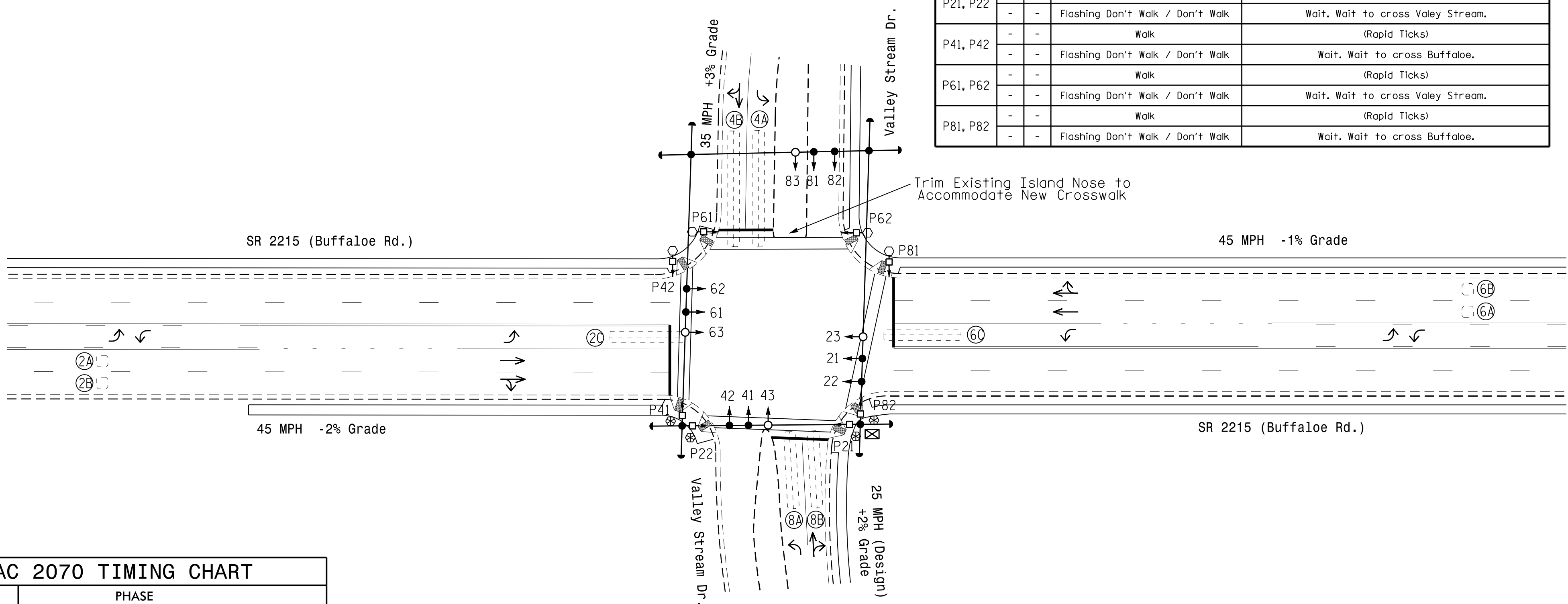
2 Phase  
Fully Actuated  
(Raleigh Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads as shown.
- 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.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Pavement markings are existing unless otherwise shown.
- Repaint stopbars and/or crosswalks.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

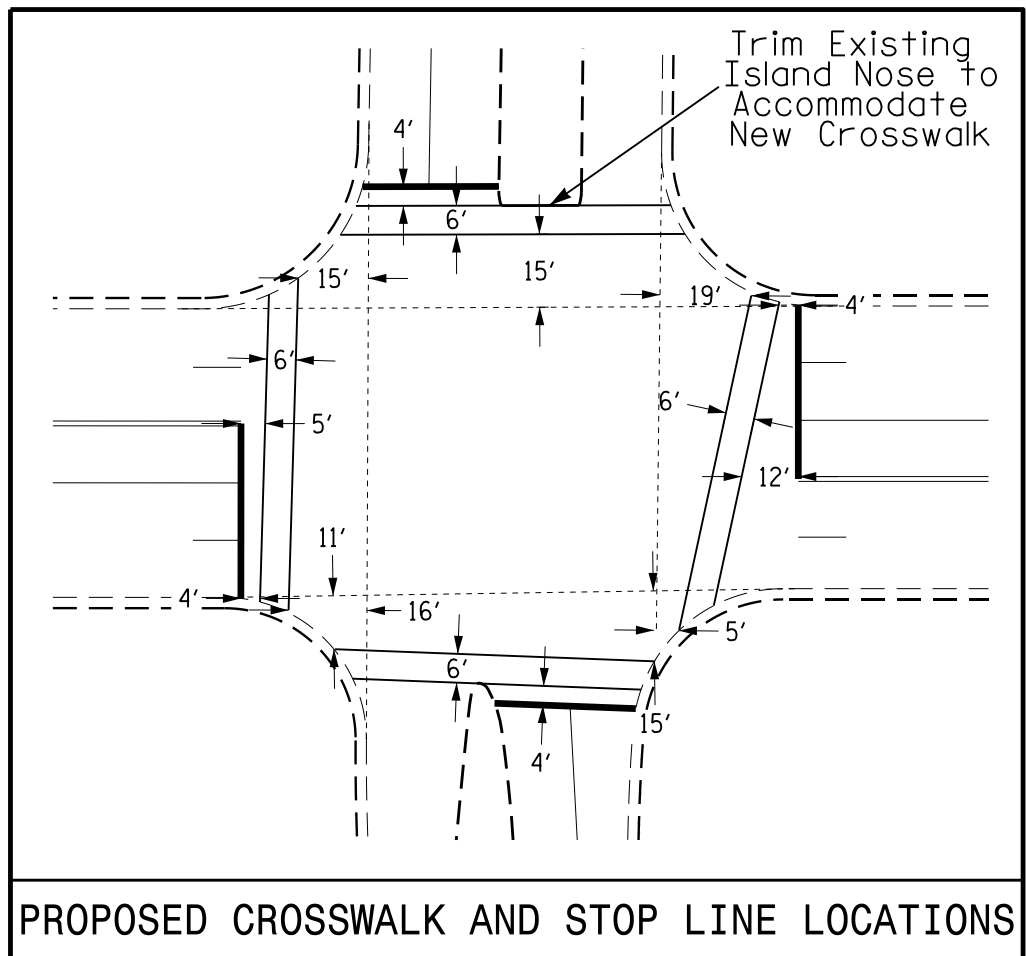
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21, P22	-	-	Walk	(Rapid Ticks)
	-	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Valey Stream.
P41, P42	-	-	Walk	(Rapid Ticks)
	-	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Buffaloe.
P61, P62	-	-	Walk	(Rapid Ticks)
	-	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Valey Stream.
P81, P82	-	-	Walk	(Rapid Ticks)
	-	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Buffaloe.



SE-PAC 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Passage Gap *	6.0	1.0	6.0	2.0
Maximum Green *	90	20	90	20
Yellow Change	4.7	3.7	4.6	3.1
Red Clear	1.6	2.2	1.6	2.8
Advance Walk *	5	4	5	4
Walk *	7	7	7	7
Pedestrian Clear	14	16	15	17
Added Initial *	1.5	-	1.5	-
Maximum Initial *	33	-	33.5	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

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



This plan supersedes the plan signed and sealed on 5/20/21.

LEGEND

PROPOSED	EXISTING
	N/A

Signal Upgrade

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 2215 (Buffaloe Road)  
at  
Valley Stream Drive

Division 05 Wake County Raleigh

PLAN DATE: February 2024 REVIEWED BY:

PREPARED BY: J.A. Lohr REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

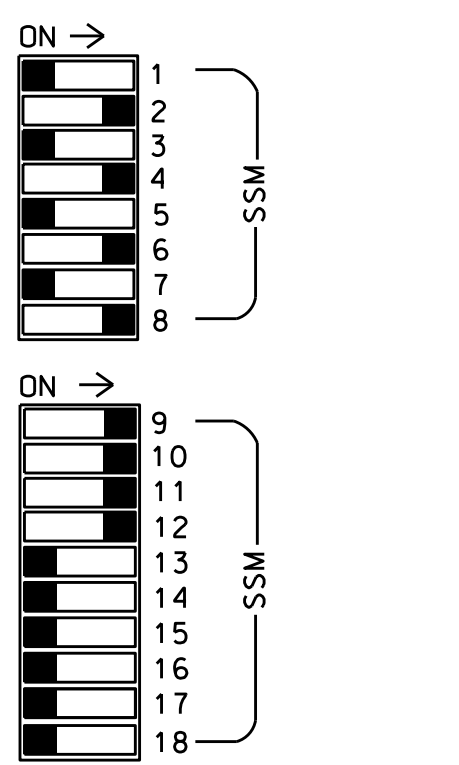
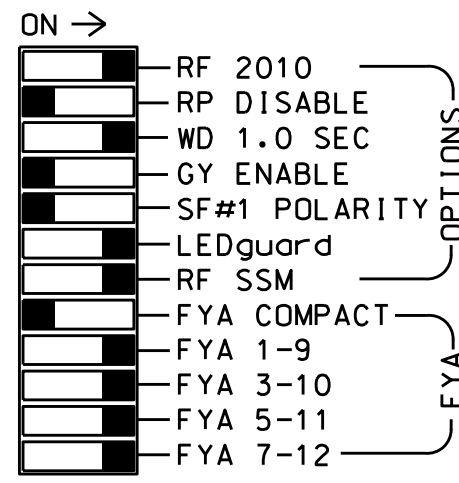
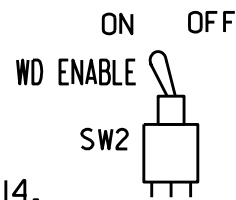
02/27/2024

SIG. INVENTORY NO. 05-2247



*(remove jumpers and set switches as shown)*

REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-10, 4-12, 4-14, 4-16, 6-9, 6-11, 6-13, 6-15, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15 and 14-16.



■ = DENOTES POSITION  
OF SWITCH

NOTES:

- ## NOTES



- ### EQUIPMENT INFORMATION

```

PHASES USED.....2,2PED,4,4PED,6,6PED,8,8PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

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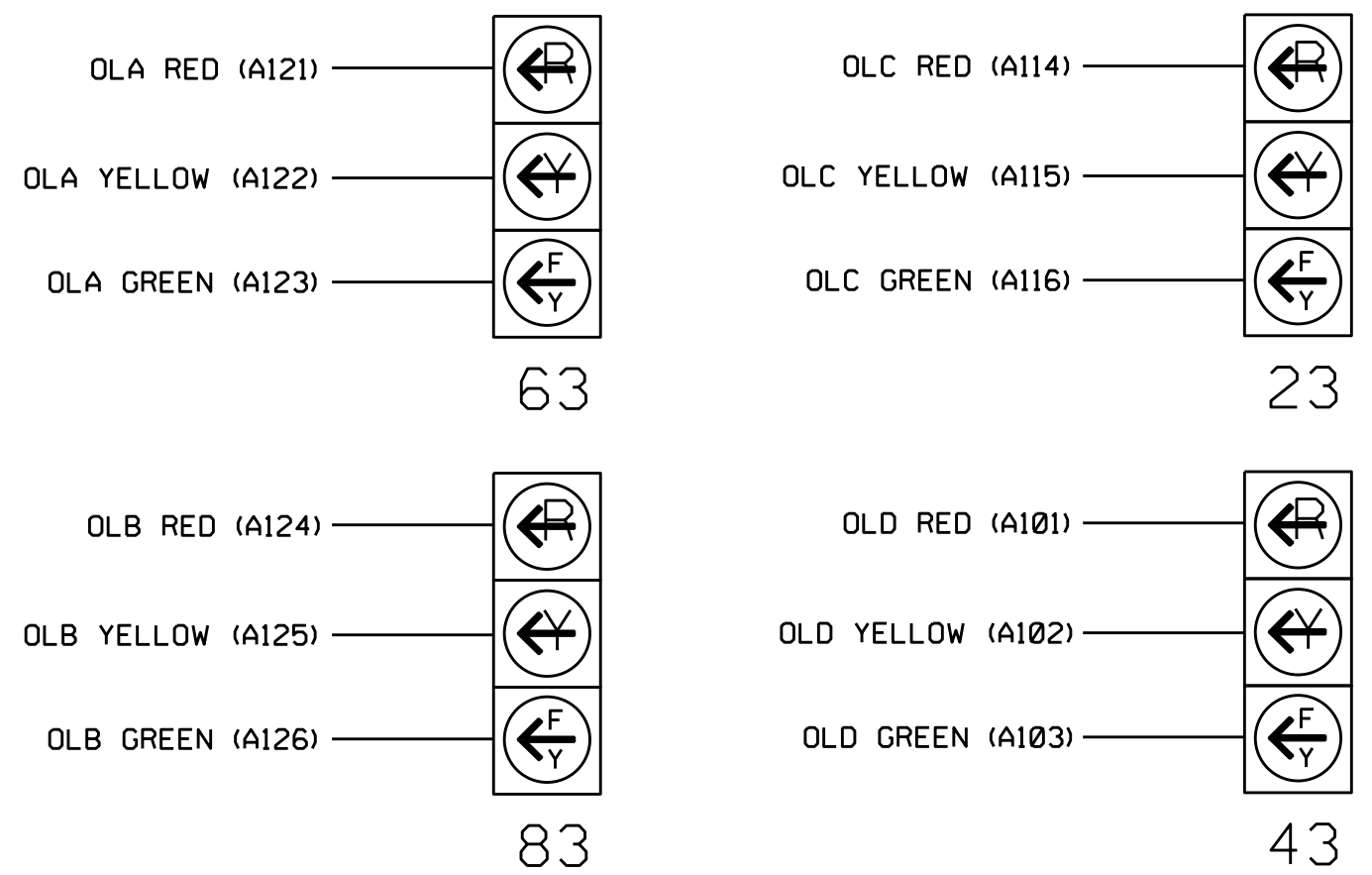
# SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82	63★	83★	NU	23★	43★	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
			113			104			119			110						
			115			106			121			112						

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



(front view)

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

FS = FLASH SENSE  
ST = STOP TIME

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
2C	TB2-9,10	I3U	63	5	2		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4	10	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
6C	TB3-9,10	J3U	64	23	6		
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8	10	
PED PUSH BUTTONS						NOTE: INSTALL IN INPUT 112 AND	
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

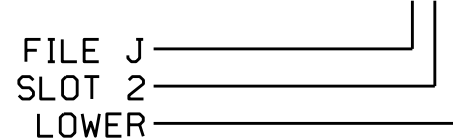
NOTE:  
INSTALL DC ISOLATORS  
IN INPUT FILE SLOTS  
I12 AND I13.

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.

INPUT FILE POSITION LEGEND: J2L



Electrical Detail - Sheet 1 of 2

This plan supersedes the plan signed and sealed on 5/24/2021.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-2247  
DESIGNED: February 2024  
SEALED: 02/27/2024  
REVISED: N/A

**DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED**

SEAL

SR 2215 (Buffaloe Road)  
at  
Valley Stream Drive

Division 5 Wake County Raleigh

PLAN DATE: February 2024	REVIEWED BY:
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REVISIONS	INIT.	DATE
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.....	.....

SEAL

NORTH CAROLINA

PROFESSIONAL

SEAL

036833

ENGINEER

RYAN W. HOUGH

DocuSigned by:

Ryan W. Hough 02/27/2024

430320FAA2654C3...	DATE
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SIG. INVENTORY NO. 05-2247



OVERLAP PROGRAMMING DETAIL

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

OVERLAP DATA

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

PREV/NEXT TO CYCLE

Press ESC

OVERLAP A

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

FYA OVERLAP - A                      DELAY/10:    0

PHASES..12345678 90123456  
PERM PHASES: 01000000 00000000  
PROT PHASES: 10000000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: x0000000 00000000  
PROT OVERLAPS: x0000000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP B

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

FYA OVERLAP - B                      DELAY/10:    0

PHASES..12345678 90123456  
PERM PHASES: 00010000 00000000  
PROT PHASES: 00100000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 0x000000 00000000  
PROT OVERLAPS: 0x000000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP C

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

FYA OVERLAP - C                      DELAY/10:    0

PHASES..12345678 90123456  
PERM PHASES: 00000100 00000000  
PROT PHASES: 00001000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 00x00000 00000000  
PROT OVERLAPS: 00x00000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP D

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

FYA OVERLAP - D                      DELAY/10:    0

PHASES..12345678 90123456  
PERM PHASES: 00000001 00000000  
PROT PHASES: 00000010 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 000x0000 00000000  
PROT OVERLAPS: 000x0000 00000000

NOTICE  
DELAY/10 = 0

END OVERLAP PROGRAMMING

ADVANCE WALK PED PROGRAMMING DETAIL

(program controller as shown below)

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

PHASE.....1...2...3...4...5...6...7...8  
WOFF/10    0    50    0    40    0    50    0    40  
MODE        0    0    0    0    0    0    0    0    0

CODES: \* 0-ADVANCE    1-DELAY

Advance Walk PED programming complete.

INIT & N.A. RESP PROGRAMMING DETAIL

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

Note Phases 1,3,5 and 7 NOT used!

PHASE.....1...2...3...4...5...6...7...8...  
INITIAL    0    6    0    1    0    6    0    1  
NA RESP    0    1    0    2    0    1    0    2

CODES.....0....1....2....3....4....5....6  
INITL NONE INACT RED YEL GRN DRK G/DW  
NA RSP NONE NA1 NA2 1&2 --- --- ---  
\*\*\*

INIT & N.A. RESP PROGRAMMING COMPLETE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)  
INSTALLATION NOTES

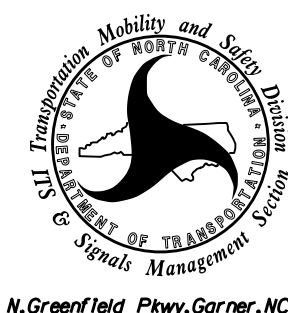
1. Install push buttons and APS equipment per manufacturer's instructions.
2. Provide a dedicated cable to each push button per manufacturer's instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle,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

This plan supersedes the plan signed and sealed on 5/24/2021.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-2247  
DESIGNED: February 2024  
SEALED: 02/27/2024  
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared in the Offices of:  
  
750 N. Greenfield Pkwy, Garner, NC 27529

SR 2215 (Buffaloe Road)  
at  
Valley Stream Drive

Division 5                      Wake County                      Raleigh

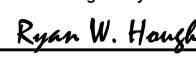
PLAN DATE: February 2024                      REVIEWED BY:

PREPARED BY: S.Kirkpatrick                      REVIEWED BY:

REVISIONS                      INIT.                      DATE

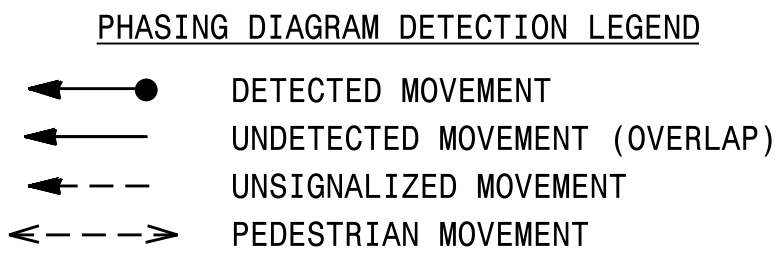
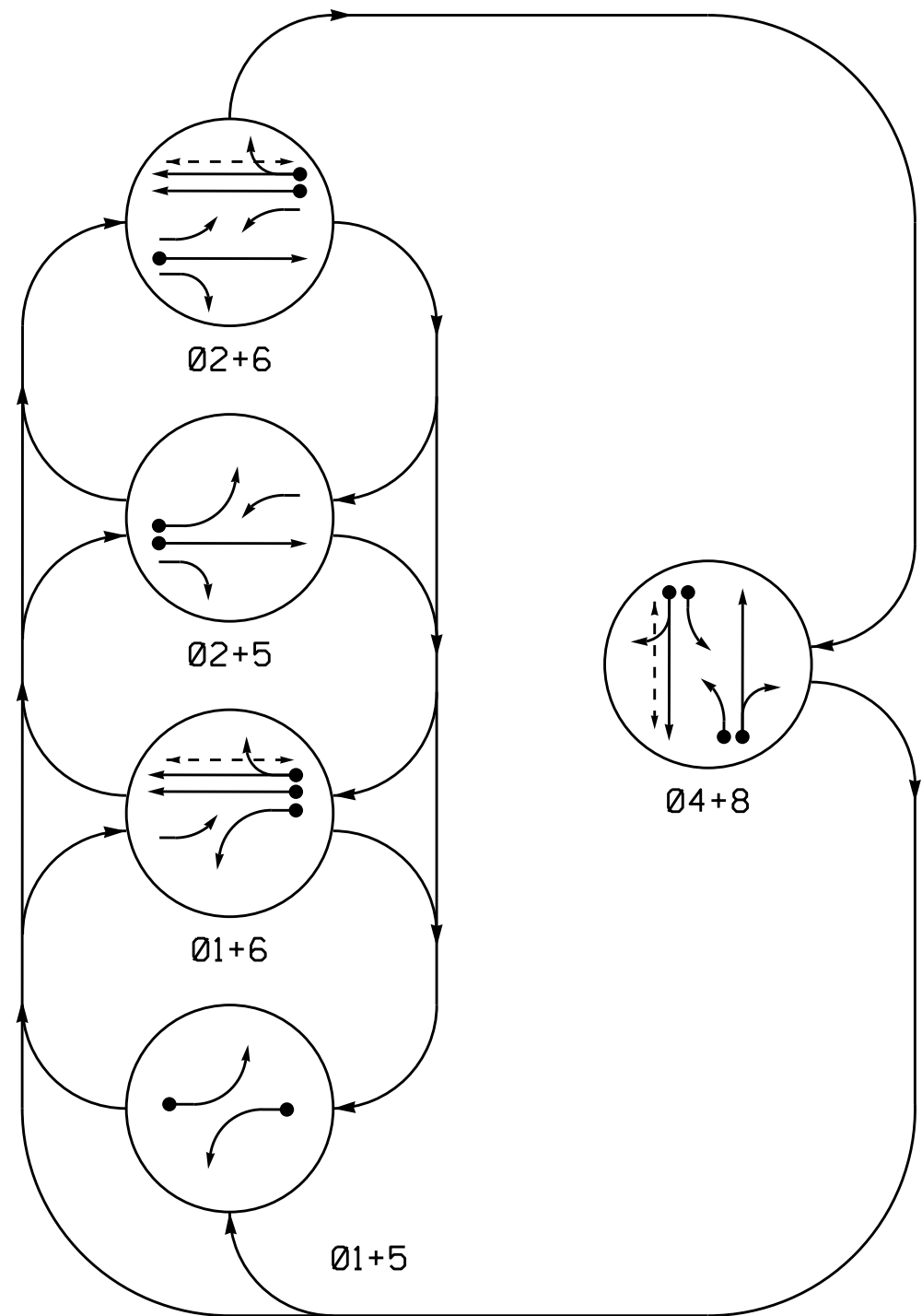
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PROFESSIONAL  
ENGINEER  
SEAL  
036833  
RYAN W. HOUGH

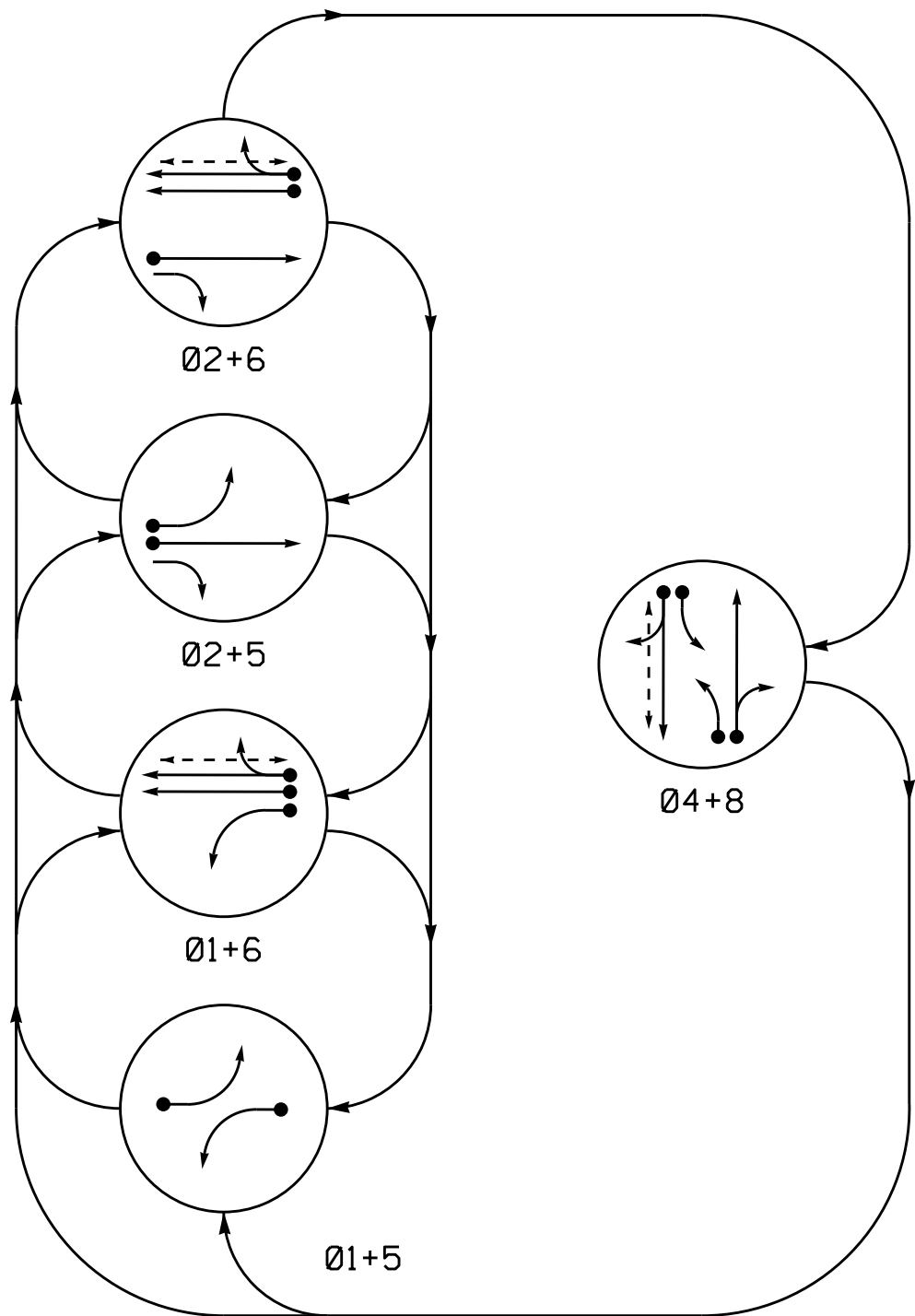
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 02/27/2024  
DATE  
SIG. INVENTORY NO. 05-2247



DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



LOOP & DETECTOR UNIT INSTALLATION CHART  
SE-PAC 2070 CONTROLLER WITH 170 CABINET

INDUCTIVE LOOPS				DETECTOR PROGRAMMING													
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	TIMING		OPERATION MODE								STATUS
							DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROTECTOR	LEFT TURN	THROUGH	
1A	6X40	2-4-2	0	-	X	1	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
2A	6X6	EXIST	284	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
4A	6X40	2-4-2	+7	-	X	4	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
4B	6X40	2-4-2	+7	-	X	4	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
5A	6X40	2-4-2	0	-	X	5	5 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
6A	6X6	5	300	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
6B	6X6	5	300	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
8A	6X60	EXIST	0	-	X	8	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -
8B	6X60	EXIST	+5	-	X	8	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	X -

DEFAULT PHASING  
TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	←	←	←	Y
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
43	←	←	←	←	←	Y
51	←	←	←	←	←	Y
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
83	←	←	←	←	←	Y
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	01+6	02+5	02+6	04+8	FLASH
11	←	←	←	←	←	Y
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
43	←	←	←	←	←	Y
51	←	←	←	←	←	Y
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
83	←	←	←	←	←	Y
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK

5 Phase  
Fully Actuated  
(Raleigh Signal System)

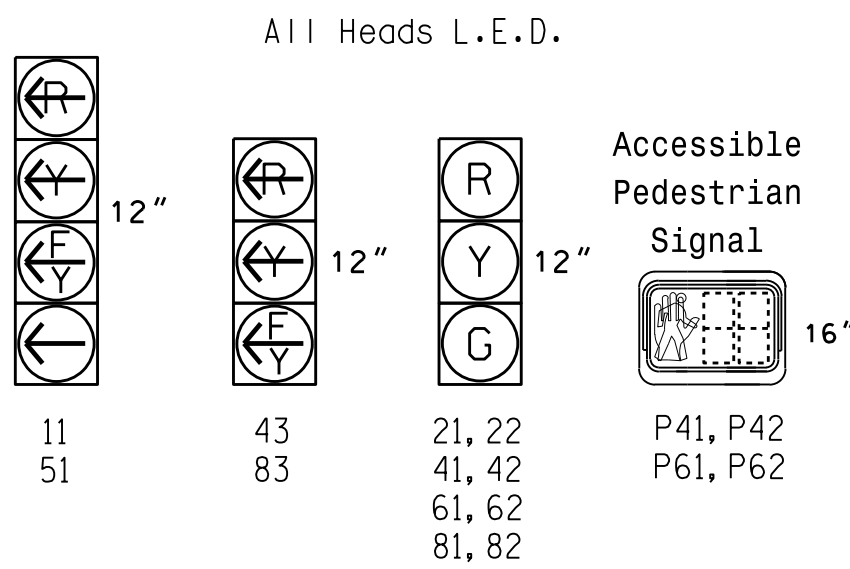
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads as shown.
- 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.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Pavement markings are existing unless otherwise shown.
- The Division (City) 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 supersede these values.

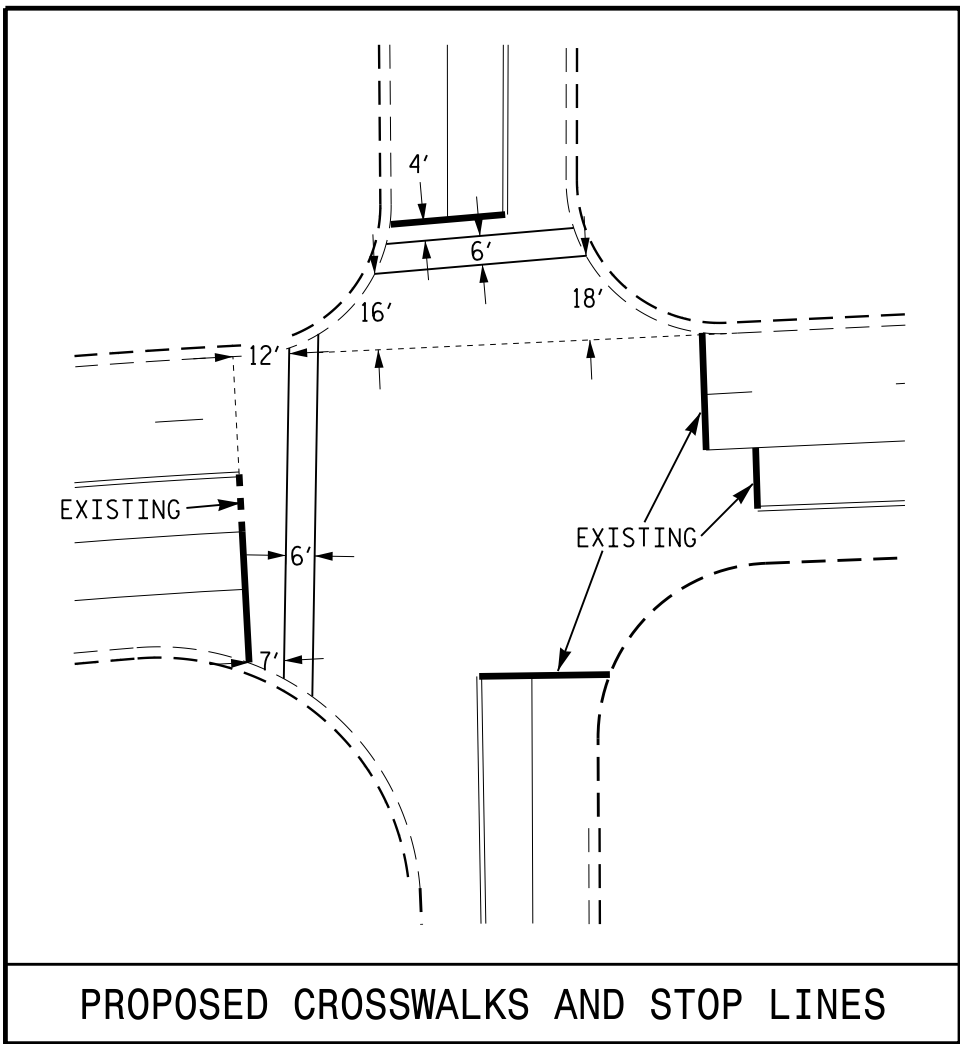
FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Passage Gap *	2.0	6.0	2.0	2.0	6.0	2.0
Maximum Green *	15	120	25	15	120	25
Yellow Change	3.0	4.8	4.3	3.0	4.8	4.3
Red Clear	2.4	1.3	1.7	2.8	1.3	1.7
Advance Walk *	-	-	6	-	4	-
Walk *	-	-	7	-	7	-
Pedestrian Clear	-	-	17	-	8	-
Added Initial *	-	2.5	-	-	1.5	-
Maximum Initial *	-	32	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	NONLOCK	LOCK	NONLOCK	NONLOCK	LOCK	NONLOCK
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

SIGNAL FACE I.D.

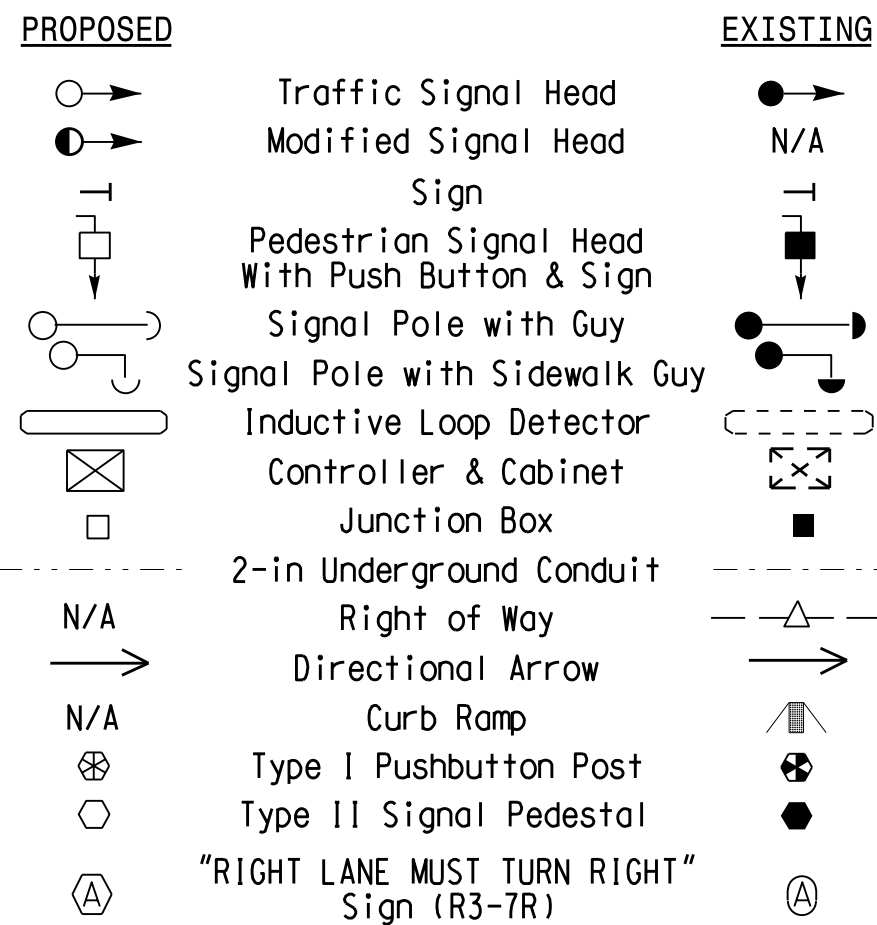


This plan supersedes the plan signed and sealed on 5/25/21.



PROPOSED CROSSWALKS AND STOP LINES

LEGEND



Signal Upgrade

Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION UNIVERSITY OF NORTH CAROLINA SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529	SR 2215 (Buffaloe Road) at SR 2214 (Southall Road)/ Brintons Cottage Street Division 5 Wake County Raleigh PLAN DATE: February 2024 PREPARED BY: J.A. Lohr REVIEWED BY:	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIMMERMAN DATE 02/27/2024 SIC. INVENTORY NO. 05-1780
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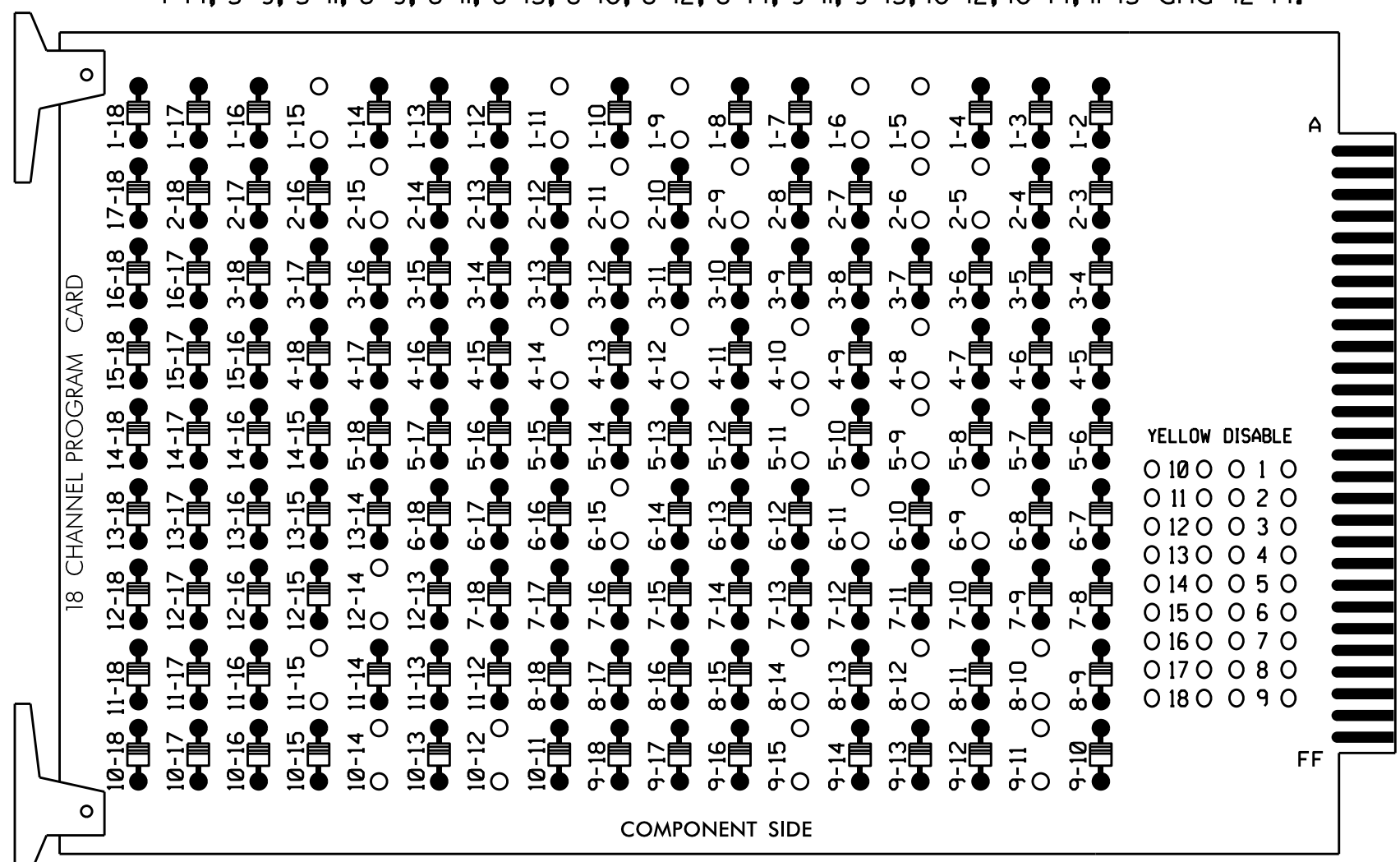


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S:\IT&S\ITS Signal\Workgroups\Signal Design\Active Projects\ck-05-1780 & 05-2247 (HS-2005G)\051780\_sml.eia.20240227.dgn  
sgk:rschtr:ck

## 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

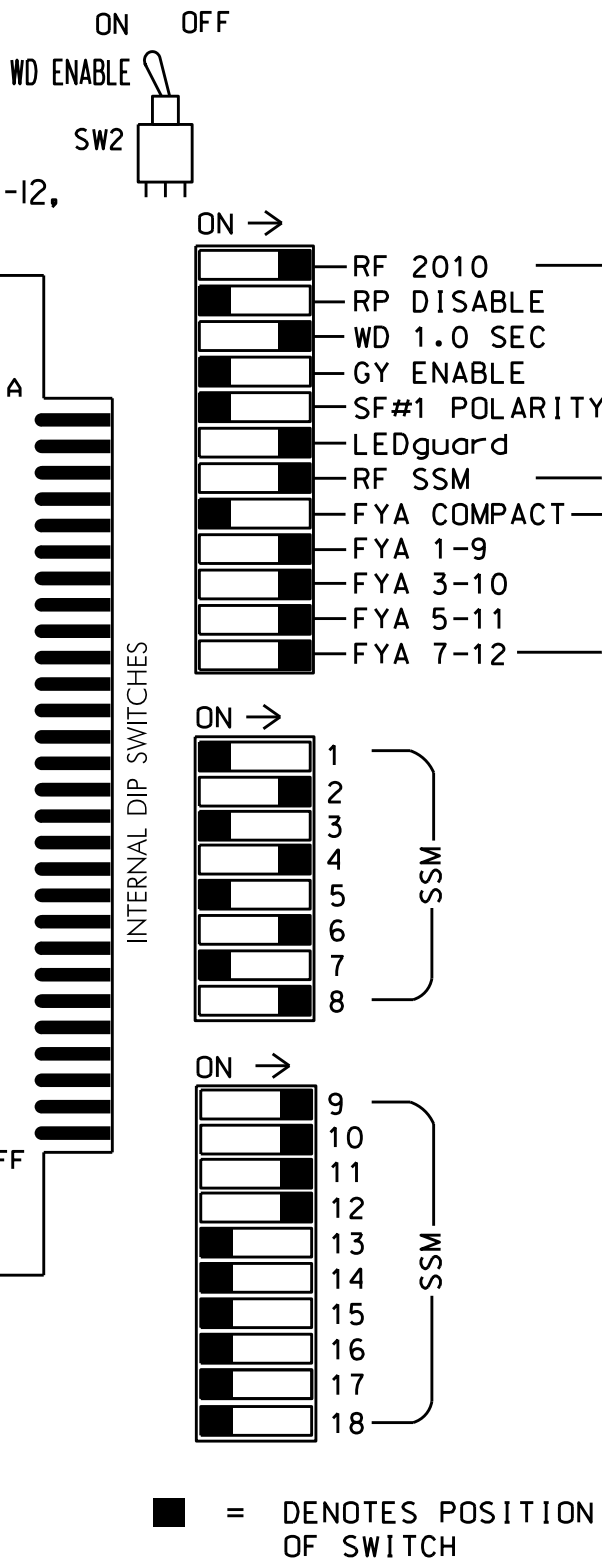
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-15, 4-8, 4-10, 4-12,  
4-14, 5-9, 5-11, 6-9, 6-11, 6-15, 8-10, 8-12, 8-14, 9-11, 9-15, 10-12, 10-14, 11-15 and 12-14.



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 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 controller to start up in phases 2 and 6 Green/Don't Walk.
- Enable simultaneous gap-out feature for all phases.
- Program phases 2 and 6 for volume density operation.
- Program phases 4 and 8 for dual entry.
- The cabinet and controller are part of the Raleigh Signal System.

## EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
CABINET.....332 W/ AUX  
SOFTWARE.....SE-PAC2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8,S9,S11,AUX S1,  
AUX S2,AUX S4,AUX S5  
PHASES USED.....1,2,4,4PED,5,6,6PED,8  
OVERLAP "A".....\*  
OVERLAP "B".....\*  
OVERLAP "C".....\*  
OVERLAP "D".....\*

\* See sheet 2 for Overlap Programming Detail

## INPUT FILE POSITION LAYOUT

(front view)

FILE	U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	L	Ø 1 1A	Ø 2 2A	Ø 3 3A	Ø 4 4A	Ø 5 5A	Ø 6 6A	Ø 7 7A	Ø 8 8A	Ø 9 9A	Ø 10 10A	Ø 11 11A	Ø 12 12A	Ø 13 13A	Ø 14 14A
		NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
"J"	L	Ø 5 5A	Ø 6 6A	Ø 7 7A	Ø 8 8A	Ø 9 9A	Ø 10 10A	Ø 11 11A	Ø 12 12A	Ø 13 13A	Ø 14 14A	Ø 15 15A	Ø 16 16A	Ø 17 17A	Ø 18 18A
		NOT USED	Ø 6 6B	Ø 7 7B	Ø 8 8B	Ø 9 9B	Ø 10 10B	Ø 11 11B	Ø 12 12B	Ø 13 13B	Ø 14 14B	Ø 15 15B	Ø 16 16B	Ø 17 17B	Ø 18 18B

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

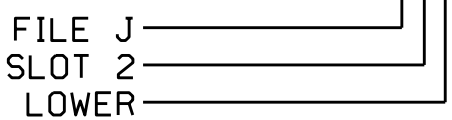
FS = FLASH SENSE  
ST = STOP TIME

## INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1	5	
2A	TB2-5,6	I2U	39	3	2		
4A	TB4-9,10	I6U	41	11	4	3	
4B	TB4-11,12	I6L	45	12	4	10	
5A	TB3-1,2	J1U	55	19	5	5	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
8A	TB5-9,10	J6U	42	31	8	3	
8B	TB5-11,12	J6L	46	32	8	10	
PED PUSH BUTTONS							
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		

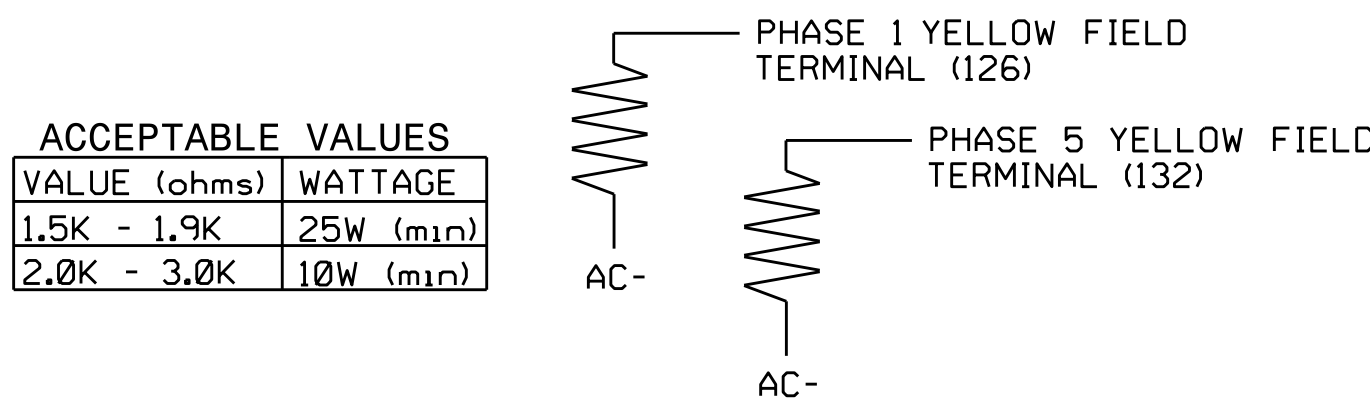
NOTE:  
INSTALL DC ISOLATORS  
IN INPUT FILE SLOTS  
112 AND 113.

INPUT FILE POSITION LEGEND: J2L



## LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



## FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

PROJECT REFERENCE NO.	SHEET NO.
HS-2005G	Sig. 2.1

## SIGNAL HEAD HOOK-UP CHART

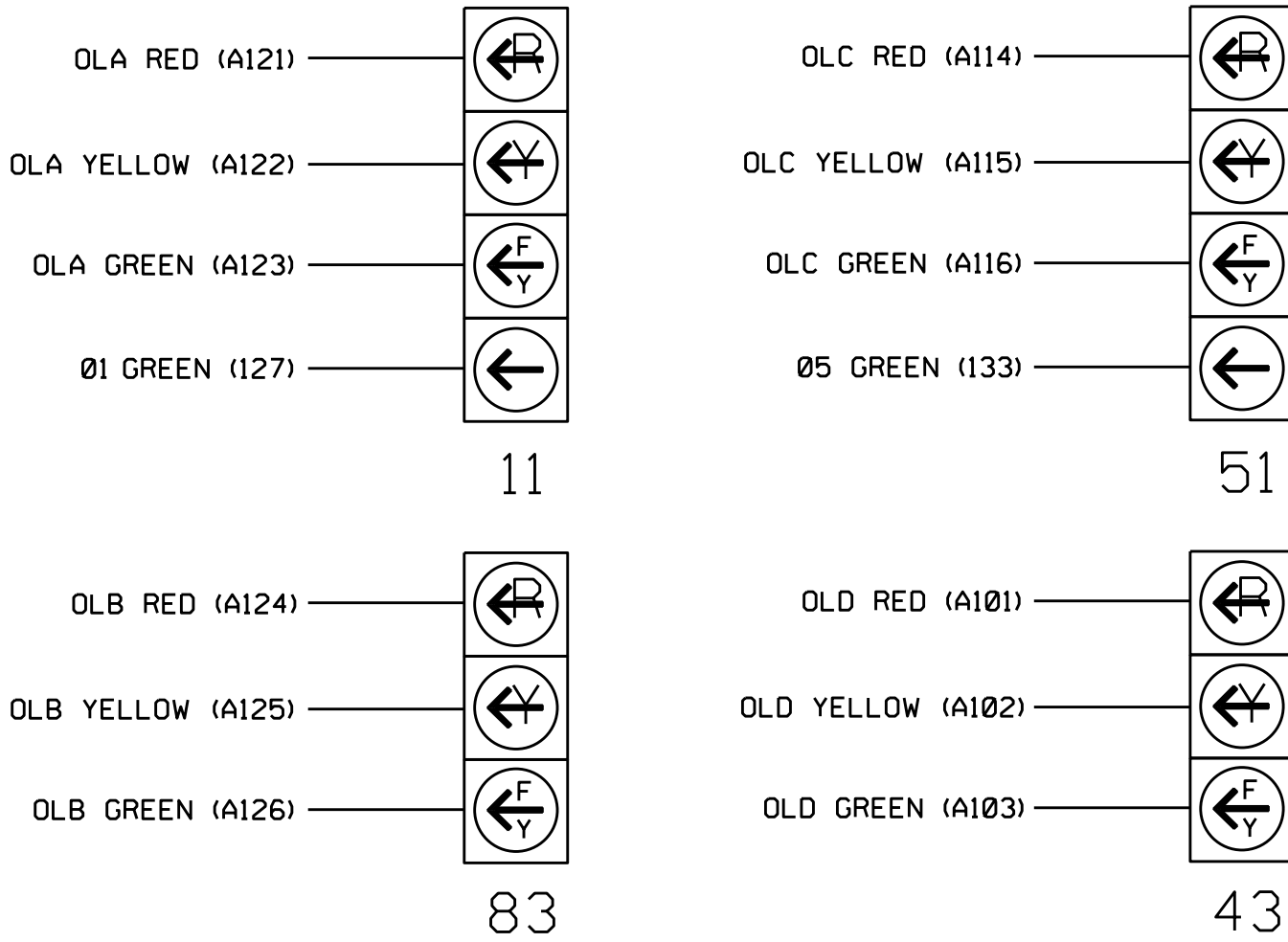
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	P41, P42	51	61,62	P61, P62	NU	81,82	NU	11	83	NU	51	43	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127						133											
Hand icon						104			119									
Walking person icon						106			121									

NU = Not Used

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

## FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



This plan supersedes the plan signed and sealed on 6/1/2021.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1780  
DESIGNED: February 2024  
SEALED: 02/27/2024  
REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared in the Offices of:  
Signal Management  
750 N. Greenfield Pkwy, Garner, NC 27529

SR 2215 (Buffaloe Road)  
at  
SR 2214 (Southall Road)/  
Brintons Cottage Street

Division 5	Wake County	Raleigh
PLAN DATE: February 2024	REVIEWED BY:	
PREPARED BY: S.Kirkpatrick	REVIEWED BY:	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL  
NORTH CAROLINA  
PROFESSIONAL  
ENGINEER  
SEAL  
036833  
RYAN W. HOUGH  
DocuSigned By:  
Ryan W. Hough  
02/27/2024  
DATE  
SIG. INVENTORY NO. 05-1780



OVERLAP PROGRAMMING DETAIL

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

OVERLAP DATA

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

PREV/NEXT TO CYCLE

Press ESC

OVERLAP A

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

FYA OVERLAP - A DELAY/10: 0

PHASES..12345678 90123456  
PERM PHASES: 01000000 00000000  
PROT PHASES: 10000000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: x0000000 00000000  
PROT OVERLAPS: x0000000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP B

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

FYA OVERLAP - B DELAY/10: 0

PHASES..12345678 90123456  
PERM PHASES: 00010000 00000000  
PROT PHASES: 00100000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 0x000000 00000000  
PROT OVERLAPS: 0x000000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP C

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

FYA OVERLAP - C DELAY/10: 0

PHASES..12345678 90123456  
PERM PHASES: 00000100 00000000  
PROT PHASES: 00001000 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 00x00000 00000000  
PROT OVERLAPS: 00x00000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP D

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

FYA OVERLAP - D DELAY/10: 0

PHASES..12345678 90123456  
PERM PHASES: 00000001 00000000  
PROT PHASES: 00000010 00000000  
-PED PHASES: 00000000 00000000  
OVERLAPS..ABCDEFGH IJKLMNOP  
PERM OVERLAPS: 000x0000 00000000  
PROT OVERLAPS: 000x0000 00000000

NOTICE  
DELAY/10 = 0

END OVERLAP PROGRAMMING

ADVANCE WALK PED PROGRAMMING DETAIL

(program controller as shown below)

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

PHASE.....1...2...3...4...5...6...7...8  
WOFF/10 0 0 0 60 0 40 0 0  
MODE 0 0 0 0 0 0 0 0

CODES: \* 0-ADVANCE 1-DELAY

Advance Walk PED programming complete.

INIT & N.A. RESP PROGRAMMING DETAIL

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

Note Phases 3  
and 7 NOT used!

PHASE.....1...2...3...4...5...6...7...8...  
INITIAL 1 6 0 1 1 6 0 1  
NA RESP 0 1 0 2 0 1 0 2

CODES.....0....1....2....3....4....5....6  
INITL NONE INACT RED YEL GRN DRK G/DW  
NA RSP NONE NA1 NA2 1&2 --- --- ---  
\*\*\*

INIT & N.A. RESP PROGRAMMING COMPLETE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ACCESSIBLE PEDESTRIAN SIGNAL (APS)  
INSTALLATION NOTES

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

This plan supersedes the plan signed and sealed on 6/1/2021.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1780  
DESIGNED: February 2024  
SEALED: 02/27/2024  
REVISED: N/A

Electrical Detail - Sheet 2 of 3

Electrical and Programming Details For:

SR 2215 (Buffaloe Road)  
at  
SR 2214 (Southall Road)/  
Brintons Cottage Street

Division 5Wake CountyRaleigh

PLAN DATE: February 2024REVIEWED BY:

PREPARED BY: S.KirkpatrickREVIEWED BY:

REVISIONS

INIT.

DATE

Prepared in the Offices of:

Transportation Mobility and Safety Division

Wake County

Signal Management

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL

NORTH CAROLINA

PROFESSIONAL

SEAL

036833

RYAN W. HOUGH

ENGINEER

DocuSigned by:  
Ryan W. Hough02/27/2024

SIG. INVENTORY NO. 05-1780

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sgk:iraport:ck



PROGRAMMING DETAILS TO CALL ALTERNATE PHASING

To run the Alternate phasing, schedule a Day Plan that calls an Action that is programmed to enable Phase Function 1.

Actions can be programmed to run free run or call a coordination pattern.

PHASE FUNCTION MAPPING  
PROGRAMMING DETAIL

Step 1 - Assign OMIT OVERLAPS A & C to Phase Function 1.

1. From Main Menu select 6 - TIME BASE DATA
2. From TIME BASE DATA Submenu select 9 - PHS FUNC MAPPING

Use Up/Dn Keys to position cursor on NUM 1

TIME BASE PHS FUNC MAPING			
PHS FUNC SEL(0-OFF/1-ON)			
NUM..	P-FUNCT NAME.....	123456789	0123456
1	PHS-01 MAX # 2	000000000	0000000
2	PHS-02 MAX # 2	000000000	0000000
3	PHS-03 MAX # 2	000000000	0000000
4	PHS-04 MAX # 2	000000000	0000000
UP/DOWN TO SCROLL		E-EDIT	

BEFORE PROCEEDING,  
SCROLL THRU ENTIRE  
RANGE OF FUNCTIONS TO  
ENSURE ALL P-FUNCT 1  
NUM x VALUES ARE SET  
TO '0' (OFF)

Use Up/Dn/Left/Right keys to position cursor on NUM 145 and program P-FUNCT 1 as shown.

TIME BASE PHS FUNC MAPING			
PHS FUNC SEL(0-OFF/1-ON)			
NUM..	P-FUNCT NAME.....	123456789	0123456
145	OVERLAP A OMIT	100000000	0000000
146	OVERLAP B OMIT	000000000	0000000
147	OVERLAP C OMIT	100000000	0000000
148	OVERLAP D OMIT	000000000	0000000
UP/DOWN TO SCROLL		E-EDIT	

SET P-FUNCT 1 VALUES  
TO '1' (ON) AS SHOWN  
FOR OVERLAP A OMIT  
FOR OVERLAP C OMIT

PHASE FUNCTION PROGRAMMING COMPLETE

TIME BASE ACTIONS PROGRAMMING

Step 2 - Set up Action numbers to run Phase Function 1.

1. From Main Menu select 6 - TIME BASE DATA
2. From TIME BASE DATA Submenu select 5 - ACTIONS

TIME BASE ACTION # ***			
12345678 90123456			
PATN:001	PHS: 10000000	00000000	
0=I'CONN	AUX: 000-----		
1-253=PATN	SPC: 0000000-	0=NO	
254=FREE	DIM: 0-----	1=YES	
255=FLASH	DET: 000-----		
UP/DOWN TO SCROLL			

NOTICE  
PHS 1

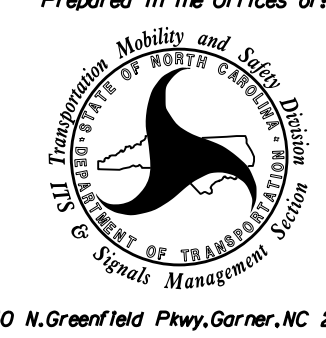
SPECIAL FUNCTION PROGRAMMING COMPLETE

\*\*\* Action #(s) are to be determined by the  
Division and/or City Traffic Engineer and  
are scheduled to run in Day Plan(s).

This plan supersedes the plan  
signed and sealed on 6/1/2021.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1780  
DESIGNED: February 2024  
SEALED: 02/27/2024  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 2215 (Buffaloe Road) at SR 2214 (Southall Road)/ Brintons Cottage Street		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529		Division 5Wake CountyRaleigh		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER RYAN W. HOUGH 036833	
PLAN DATE: February 2024		REVIEWED BY:		DocuSigned by: Ryan W. Hough02/27/2024	
PREPARED BY: S.Kirkpatrick		REVIEWED BY:		430320FAA2654C3DATE	
REVISIONS		INIT.		DATE	
				SIG. INVENTORY NO. 05-1780	



8 Phase Fully Actuated (Raleigh Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 21, 22, 41, 61, 62, and 81.
- 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.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Pavement markings are existing unless otherwise shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

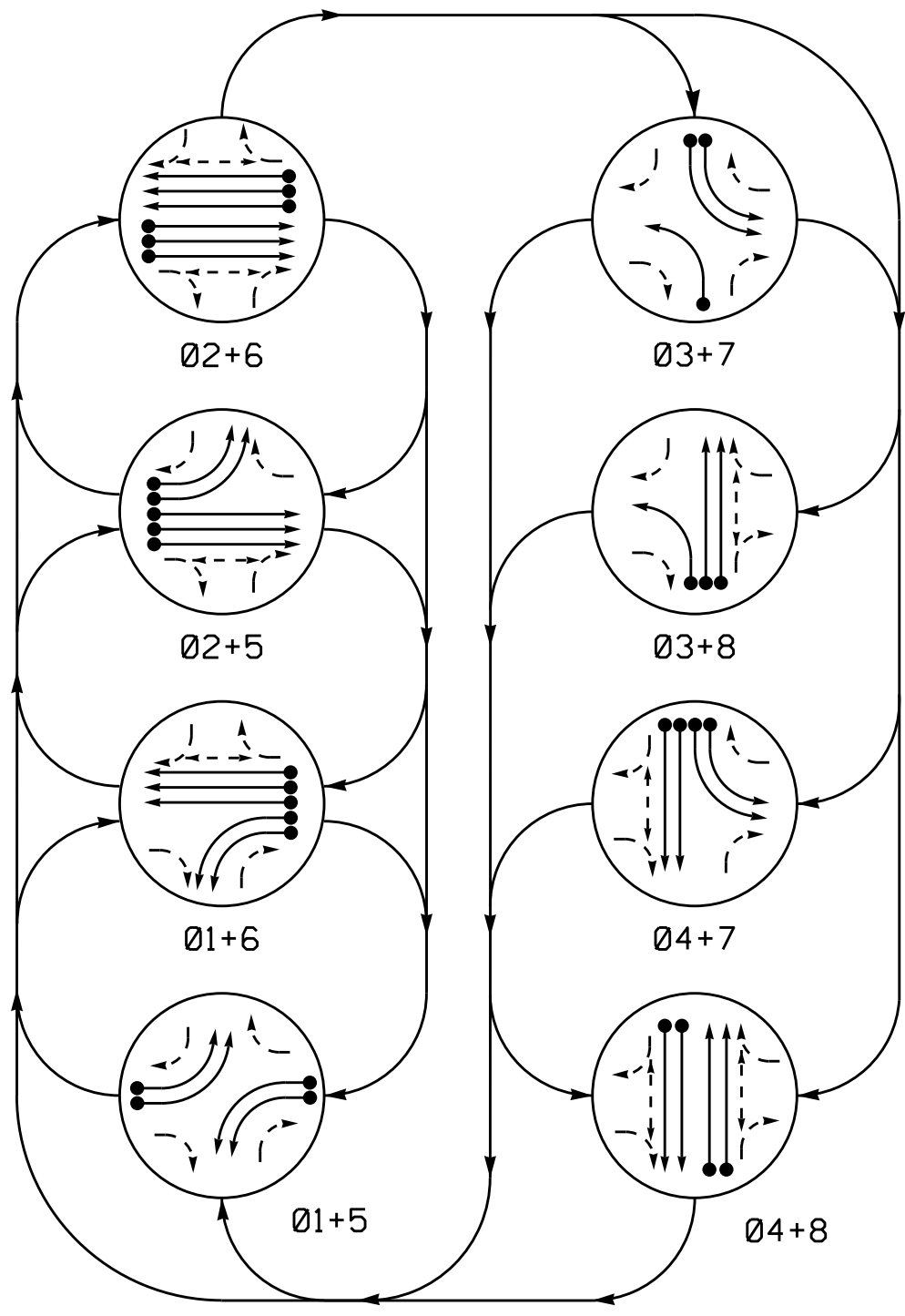
LEGEND

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

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING													
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW EXISTING	ASSIGNED PHASE	TIMING		OPERATION MODE										STATUS
						DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	2	3	4	5	6	7	SWITCH	
1A	6X40	2-4-2	0	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
1B	6X40	2-4-2	0	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
1C	6X60	2-4-2	0	- X	-	- SEC.	- SEC.	-	-	-	-	-	-	-	-	-	-	-
2A, 2B	6X6	5	330	- X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
2C, 2D	6X6	5	330	- X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
3A	6X60	2-4-2	0	- X	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
4A, 4B, 4C	6X6	4	270	- X	4	- SEC.	3.1 SEC.	X	-	-	-	-	-	-	-	-	-	X
4D	6X40	2-4-2	0	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
4E	6X40	2-4-2	0	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
5A	6X60	2-4-2	0	- X	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
5B	6X60	2-4-2	0	- X	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
5C	6X60	2-4-2	0	- X	-	- SEC.	- SEC.	-	-	-	-	-	-	-	-	-	-	-
6A, 6B	6X6	4	335	- X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
6C, 6D	6X6	4	335	- X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
7A	6X60	2-4-2	0	- X	7	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
7B	6X60	2-4-2	0	- X	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
8A, 8B, 8C	6X6	5	325	- X	8	- SEC.	3.1 SEC.	X	-	-	-	-	-	-	-	-	-	X
8D	6X40	2-4-2	0	X	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X
8E	6X40	2-4-2	0	X	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	X

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

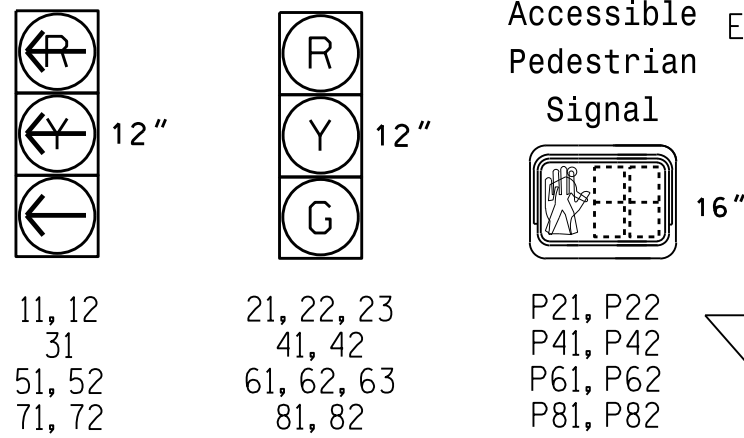
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE								F LASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
11, 12	-	-	-	-	-	-	-	-	-
21, 22, 23	R	R	G	G	R	R	R	R	Y
31	-	-	-	-	-	-	-	-	-
41, 42	R	R	R	R	R	R	G	G	R
51, 52	-	-	-	-	-	-	-	-	-
61, 62, 63	R	G	R	G	R	R	R	R	Y
71, 72	-	-	-	-	-	-	-	-	-
81, 82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DRK	
P41, P42	DW	DW	DW	DW	DW	DW	W	DRK	
P61, P62	DW	W	DW	W	DW	DW	DW	DRK	
P81, P82	DW	DW	DW	DW	DW	W	DW	DRK	

SIGNAL FACE I.D.

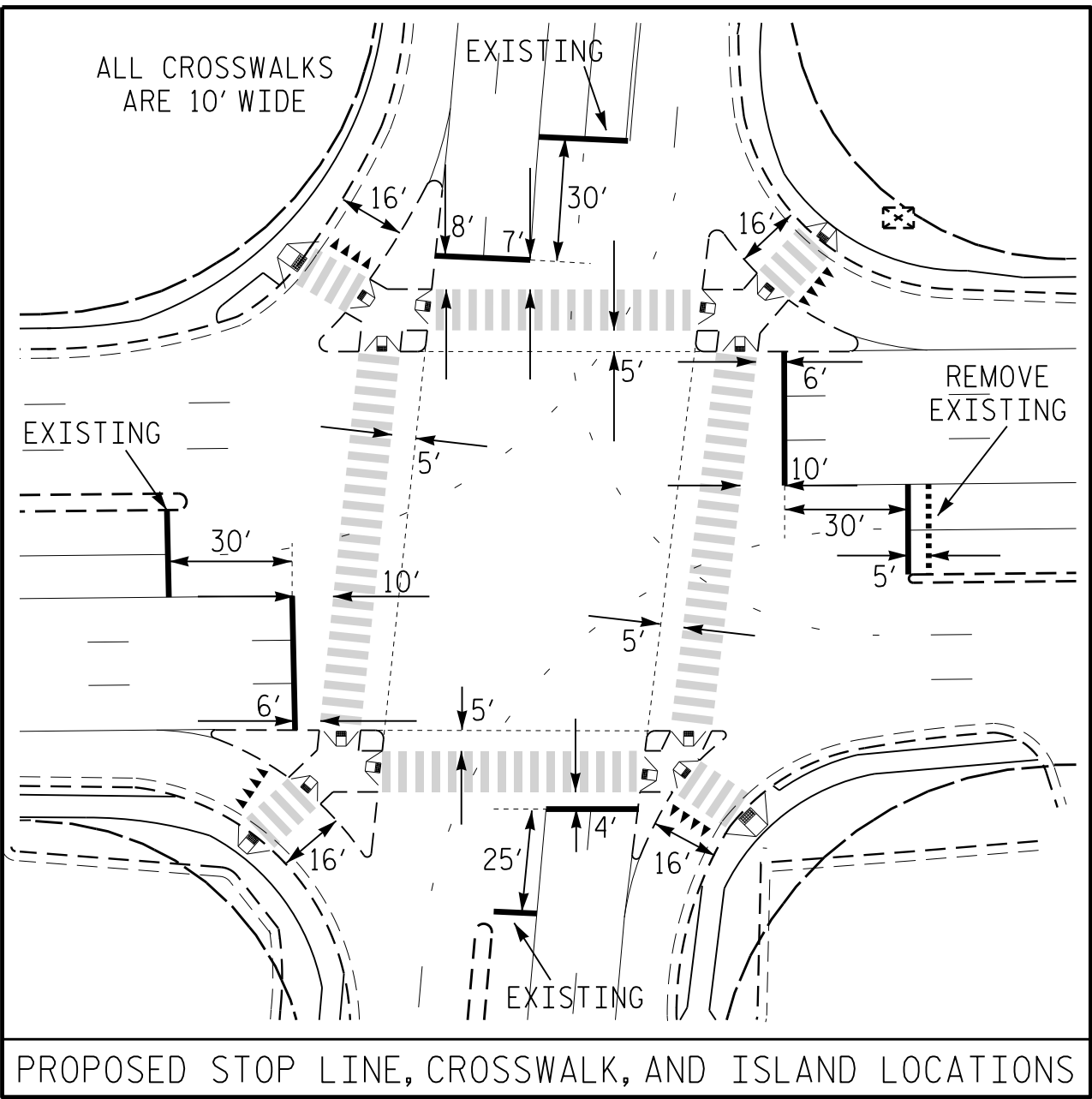
All Heads L.E.D.



SE-PAC 2070 TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Maximum Green *	30	60	20	40	20	60	20	40
Yellow Change	3.0	4.7	3.0	4.9	3.0	4.7	3.0	4.9
Red Clear	3.9	2.4	3.4	2.1	3.9	2.4	3.7	2.1
Walk *	-	7	-	7	-	7	-	7
Pedestrian Clear	-	14	-	22	-	15	-	23
Added Initial *	-	1.0	-	-	-	1.0	-	-
Maximum Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

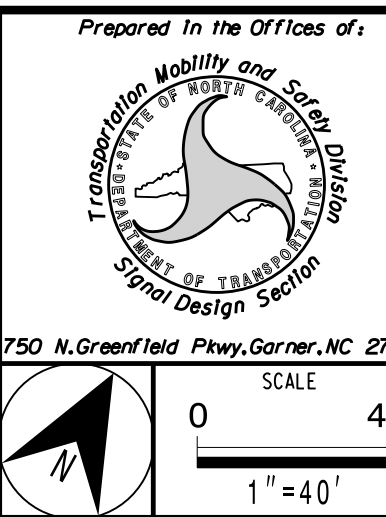
This plan supersedes the plan signed and sealed on 10/7/22.



ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21, P22	X	-	Walk	New Hope. Walk sign is on to cross New Hope.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross New Hope.
P41, P42	X	-	Walk	Louisburg. Walk sign is on to cross Louisburg.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisburg.
P61, P62	X	-	Walk	New Hope. Walk sign is on to cross New Hope.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross New Hope.
P81, P82	X	-	Walk	Louisburg. Walk sign is on to cross Louisburg.
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisburg.

Signal Upgrade



US 401 (Louisburg Road)  
at  
SR 2036/2108 (N. New Hope Road)

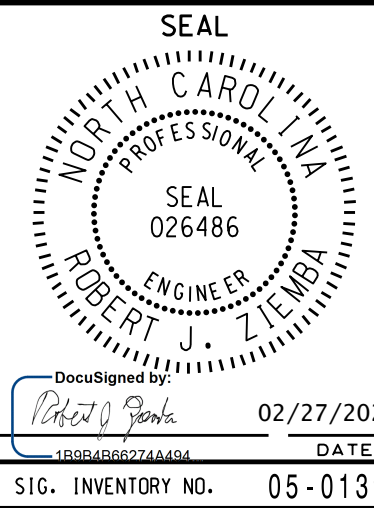
Division 5 Wake County Raleigh

PLAN DATE: February 2024 REVIEWED BY:

PREPARED BY: J.A. Lohr REVIEWED BY:

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



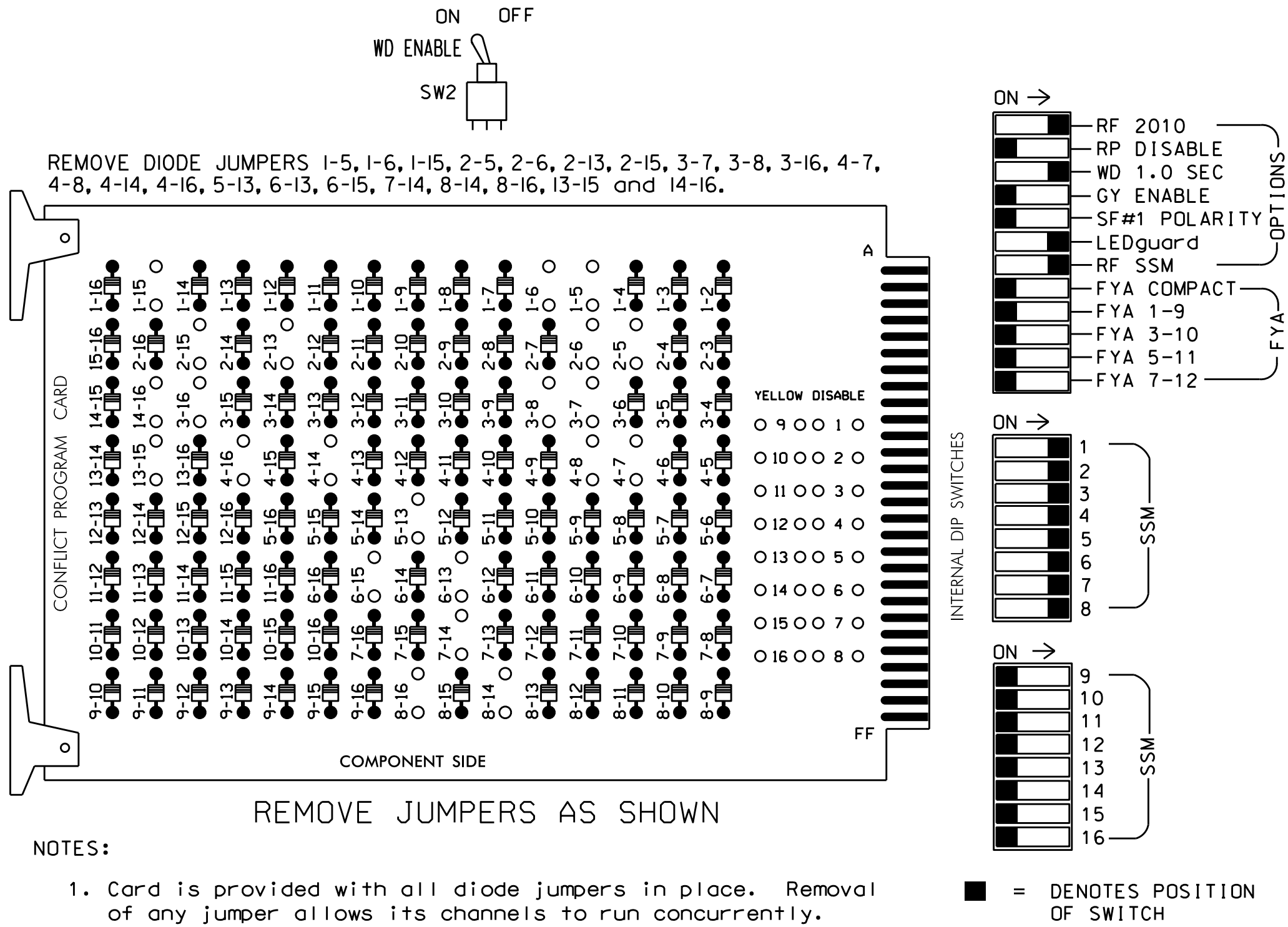
02/27/2024 DATE

SIG. INVENTORY NO. 05-0139



16 CHANNEL 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.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature for all phases.
- Program phases 2 and 6 for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070  
CABINET.....332  
SOFTWARE.....SE-PAC2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...12  
LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P,S7,S8,S8P  
PHASES USED.....1,2,3,4,5,6,7,8,2 PED,4 PED,6 PED,8 PED  
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21,22	P21, P22	31	41,42	P41, P42	51,52	61,62	P61, P62	71,72	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW	125			116			131			122		
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
			113			104			119			110
			115			106			121			112

NU = Not Used

ACCESSIBLE PEDESTRIAN SIGNAL (APS)  
INSTALLATION NOTES

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

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø 1 1A	Ø 1 1B	Ø 2 2A,2B	S -OT	Ø 3 3A	Ø 4 4A,4C	Ø 4 4E	S -OT	S -OT	S -OT	S -OT	Ø 2 PED DC ISOLATOR	Ø 6 PED DC ISOLATOR	FS DC ISOLATOR
L	NOT USED	NOT USED	Ø 2 2C,2D	NOT USED	Ø 4 4D	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	Ø 4 PED DC ISOLATOR	Ø 8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø 5 5A	Ø 5 5B	Ø 6 6A,6B	S -OT	S -OT	Ø 7 7A	Ø 8 8A,8C	Ø 8 8E	S -OT	S -OT	S -OT	S -OT	S -OT	S -OT
L	NOT USED	NOT USED	Ø 6 6C,6D	NOT USED	NOT USED	Ø 7 7B	Ø 8 8D	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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1		
1B	TB2-5,6	I2U	39	3	1		
2A,2B	TB2-9,10	I3U	63	5	2		
2C,2D	TB2-11,12	I3L	76	6	2		
3A	TB4-5,6	I5U	58	9	3		
4A,4B,4C	TB4-9,10	I6U	41	11	4		3.1
4D	TB4-11,12	I6L	45	12	4		
4E	TB6-1,2	I7U	65	13	4		
5A	TB3-1,2	J1U	55	19	5		
5B	TB3-5,6	J2U	40	21	5		
6A,6B	TB3-9,10	J3U	64	23	6		
6C,6D	TB3-11,12	J3L	77	24	6		
7A	TB5-9,10	J6U	42	31	7	3	
7B	TB5-11,12	J6L	46	32	7		
8A,8B,8C	TB7-1,2	J7U	66	33	8		3.1
8D	TB7-3,4	J7L	79	34	8		
8E	TB7-5,6	J8U	50	35	8		
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

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

INPUT FILE POSITION LEGEND: J2L

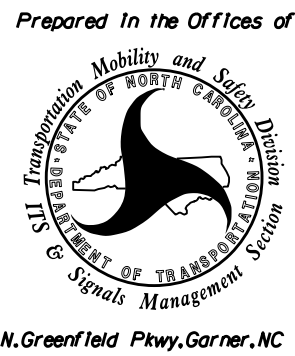
FILE J  
SLOT 2  
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:



US 401 (Louisburg Rd.)  
at  
SR 2036/2108 (N. New Hope Road)

Division 5 Wake County Raleigh

PLAN DATE: February 2024 REVIEWED BY:

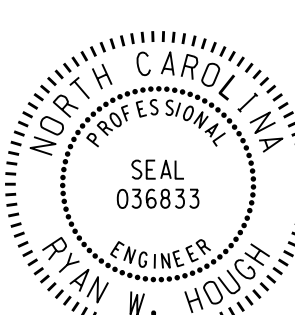
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

DATE

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SIGNATURES COMPLETED

SEAL



DocuSigned by: Ryan W. Haugh

02/29/2024

DATE

SIG. INVENTORY NO. 05-0139

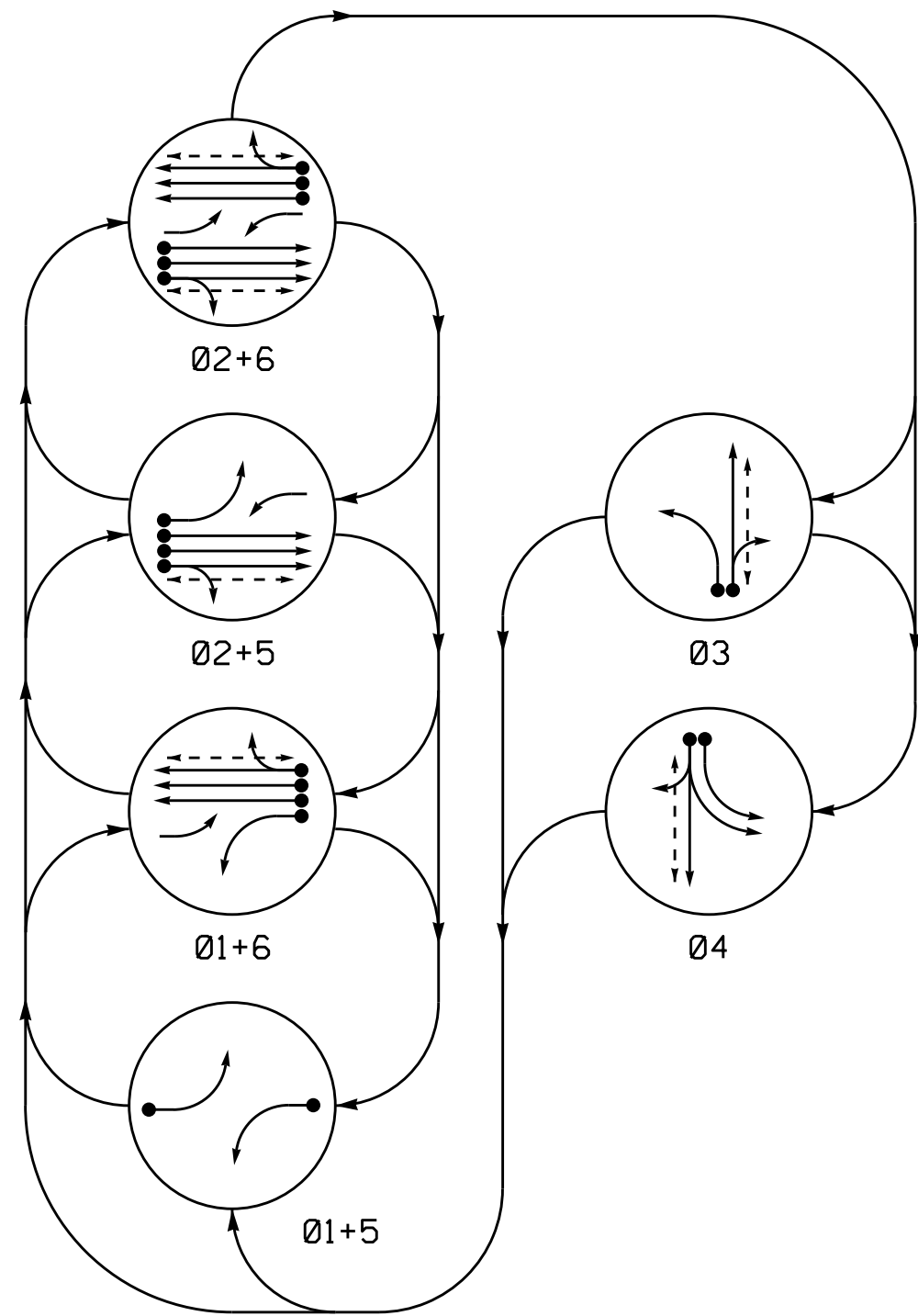


6 Phase  
Fully Actuated  
(Raleigh Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Reposition existing signal heads numbered 21, 22, 61, and 62.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Install backplates for signal heads numbered 11 and 63.
- Pavement markings are existing unless otherwise noted.
- Restripe existing crosswalks for high visibility markings.
- The Division (City) 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 supersede these values.
- Run separate lead-in to loops 2A, 2B, 2C, 6A, 6B, and 6C.

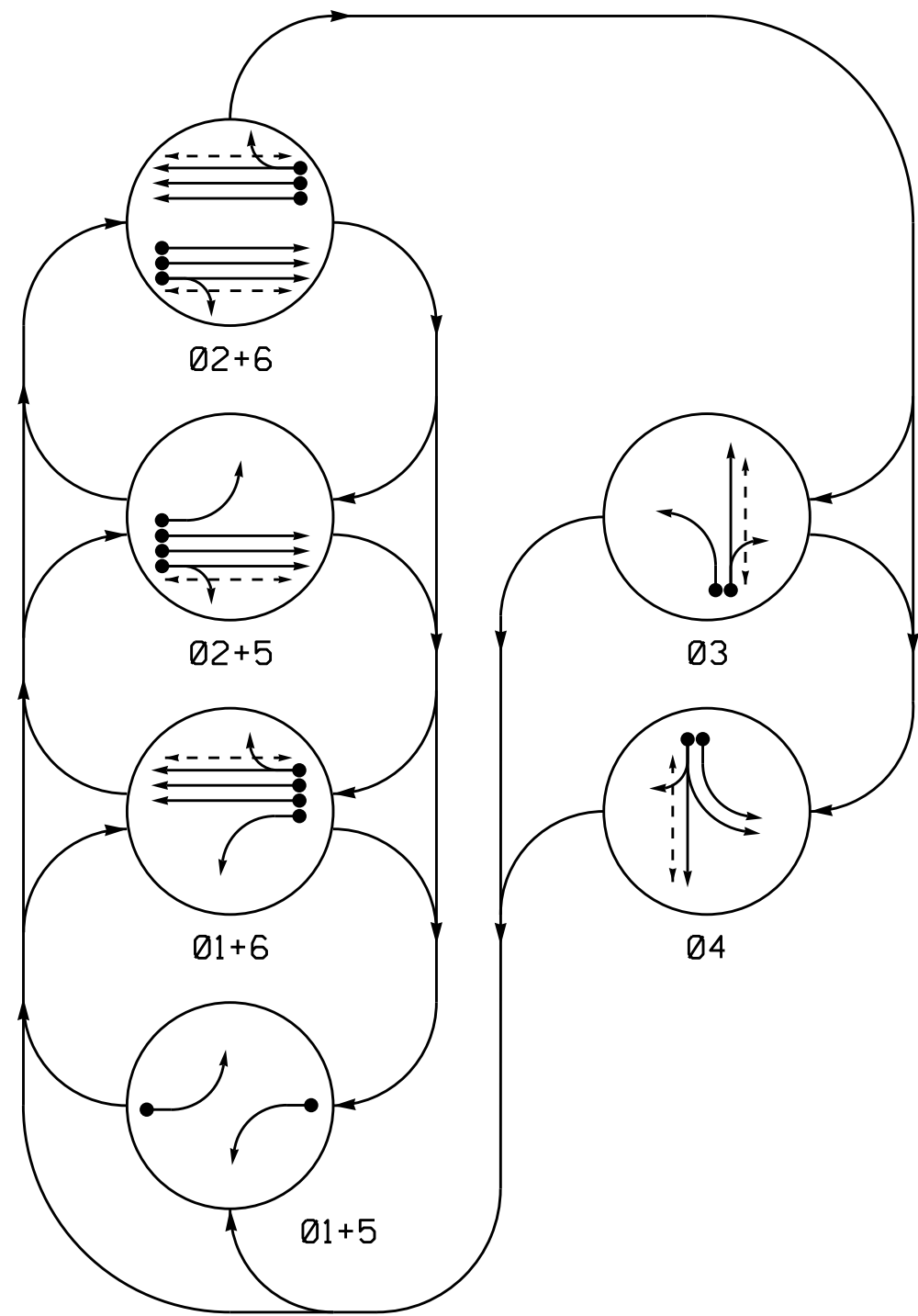
DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

ALTERNATE PHASING DIAGRAM



DEFAULT PHASING  
TABLE OF OPERATION

SIGNAL FACE	PHASE						
	0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3	0 4	F L O O P
11	←	←	←	←	←	←	Y
21, 22, 23	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	←	←	←	←	←	←	Y
42	R	R	R	R	G	R	R
43	R	R	R	R	G	R	R
51	←	←	←	←	←	←	Y
61, 62, 63	R	G	R	G	R	R	Y
P21, P22	DW	DW	W	W	DW	DW	DRK
P31, P32	DW	DW	DW	DW	W	DW	DRK
P41, P42	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING  
TABLE OF OPERATION

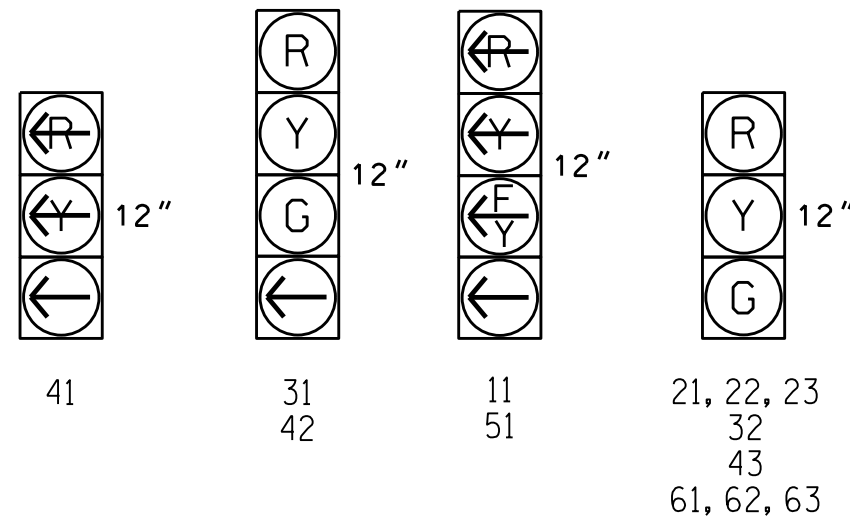
SIGNAL FACE	PHASE						
	0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3	0 4	F L O O P
11	←	←	←	←	←	←	Y
21, 22, 23	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	←	←	←	←	←	←	Y
42	R	R	R	R	G	R	R
43	R	R	R	R	G	R	R
51	←	←	←	←	←	←	Y
61, 62, 63	R	G	R	G	R	R	Y
P21, P22	DW	DW	W	W	DW	DW	DRK
P31, P32	DW	DW	DW	DW	W	DW	DRK
P41, P42	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

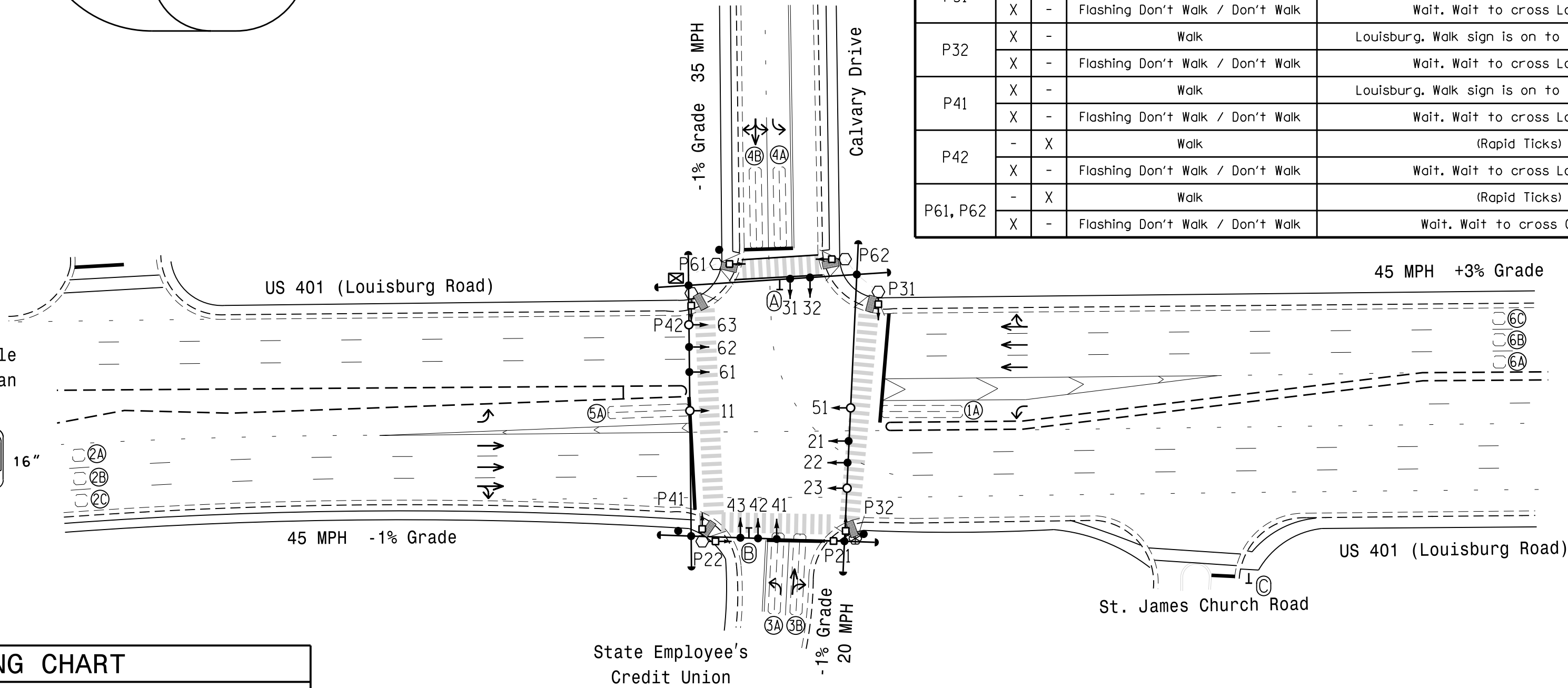
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21, P22	X	-	Walk	Credit Union. Walk sign is on to cross Credit Union.
	-	X	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Credit Union.
P31	-	X	Walk	(Rapid Ticks)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisville.
P32	X	-	Walk	Louisburg. Walk sign is on to cross Louisville.
	-	X	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisville.
P41	X	-	Walk	Louisburg. Walk sign is on to cross Louisville.
	-	X	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisville.
P42	-	X	Walk	(Rapid Ticks)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Louisville.
P61, P62	-	X	Walk	(Rapid Ticks)
	X	-	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Calvary.

SIGNAL FACE I.D.

All Heads L.E.D.



Accessible  
Pedestrian  
Signal  
16"



SE-PAC 2070 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0
Maximum Green *	15	90	20	40	20	90
Yellow Change	3.0	4.6	3.0	3.9	3.0	4.6
Red Clear	2.8	2.5	3.9	2.7	3.1	2.5
Advance Walk *	-	7	4	6	-	4
Walk *	-	7	7	7	-	7
Pedestrian Clear	-	15	29	28	-	9
Added Initial *	-	2.0	-	-	-	2.0
Maximum Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	20	-	-	-	20
Minimum Gap	-	3.2	-	-	-	3.2
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

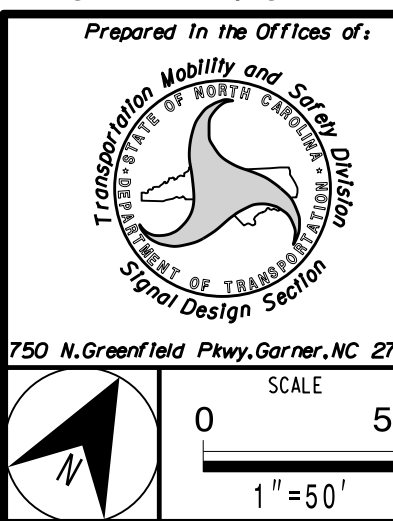
INDUCTIVE LOOPS				ASSIGNED PHASE	DETECTOR PROGRAMMING													
					TIMING		OPERATION MODE											
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DELAY	EXTEND (STRETCH)	VEHICLE	1 PEDESTRIAN	2 STOP A	3 STOP B	4 PROTECTOR LEFT	5 PROTECTOR THROUGH	6 AND	7 SWITCH	SYSTEM	LOOPS	STATUS
1A	6X40	2-4-2	0	-	X	1	5 SEC.	-	X	-	-	-	-	-	-	-	-	X
2A	6X6	EXIST	300	-	X	2	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X
2B	6X6	EXIST	300	-	X	2	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X
2C	6X6	EXIST	300	-	X	2	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X
3A	6X40	2-4-2	0	-	X	3	3 SEC.	-	SEC.	X	-	-	-	-	-	-	-	X
3B	6X40	2-4-2	0	-	X	3	10 SEC.	-	SEC.	X	-	-	-	-	-	-	-	X
4A	6X40	2-4-2	0	-	X	4	3 SEC.	-	SEC.	X	-	-	-	-	-	-	-	X
4B	6X40	2-4-2	0	-	X	4	10 SEC.	-	SEC.	X	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	0	-	X	5	5 SEC.	-	SEC.	X	-	-	-	-	-	-	-	X
6A	6X6	EXIST	300	-	X	6	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X
6B	6X6	EXIST	300	-	X	6	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X
6C	6X6	EXIST	300	-	X	6	-	SEC.	-	SEC.	X	-	-	-	-	-	-	X

This plan supersedes the plan  
signed and sealed on 10/7/22.

LEGEND

- | PROPOSED                                       | EXISTING |
|--|----------|
| Traffic Signal Head                            | N/A      |
| Modified Signal Head                           | N/A      |
| Sign   | N/A      |
| Pedestrian Signal Head With Push Button & Sign | N/A      |
| Signal Pole with Guy                           | N/A      |
| Signal Pole with Sidewalk Guy                  | N/A      |
| Inductive Loop Detector                        | N/A      |
| Controller & Cabinet                           | N/A      |
| Junction Box                                   | N/A      |
| 2-in Underground Conduit                       | N/A      |
| Right of Way                                   | N/A      |
| Directional Arrow                              | N/A      |
| Type I Pushbutton Post                         | N/A      |
| Type II Signal Pedestal                        | N/A      |
| Left Arrow "ONLY" Sign (R3-5L)                 | N/A      |
| Dual Turn and Through Arrows Sign              | N/A      |
| "STOP" Sign (R1-1)                             | N/A      |

Signal Upgrade



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Louisburg Road)  
at  
Calvary Drive and  
State Employee's Credit Union

Division 5 Wake County Raleigh

PLAN DATE: February 2024 REVIEWED BY: J.A. Lohr

PREPARED BY: J.A. Lohr

REVISIONS: INIT. DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL  
NORTH CAROLINA  
PROFESSIONAL ENGINEER  
ROBERT J. ZIEMBA  
026486

02/27/2024  
DATE

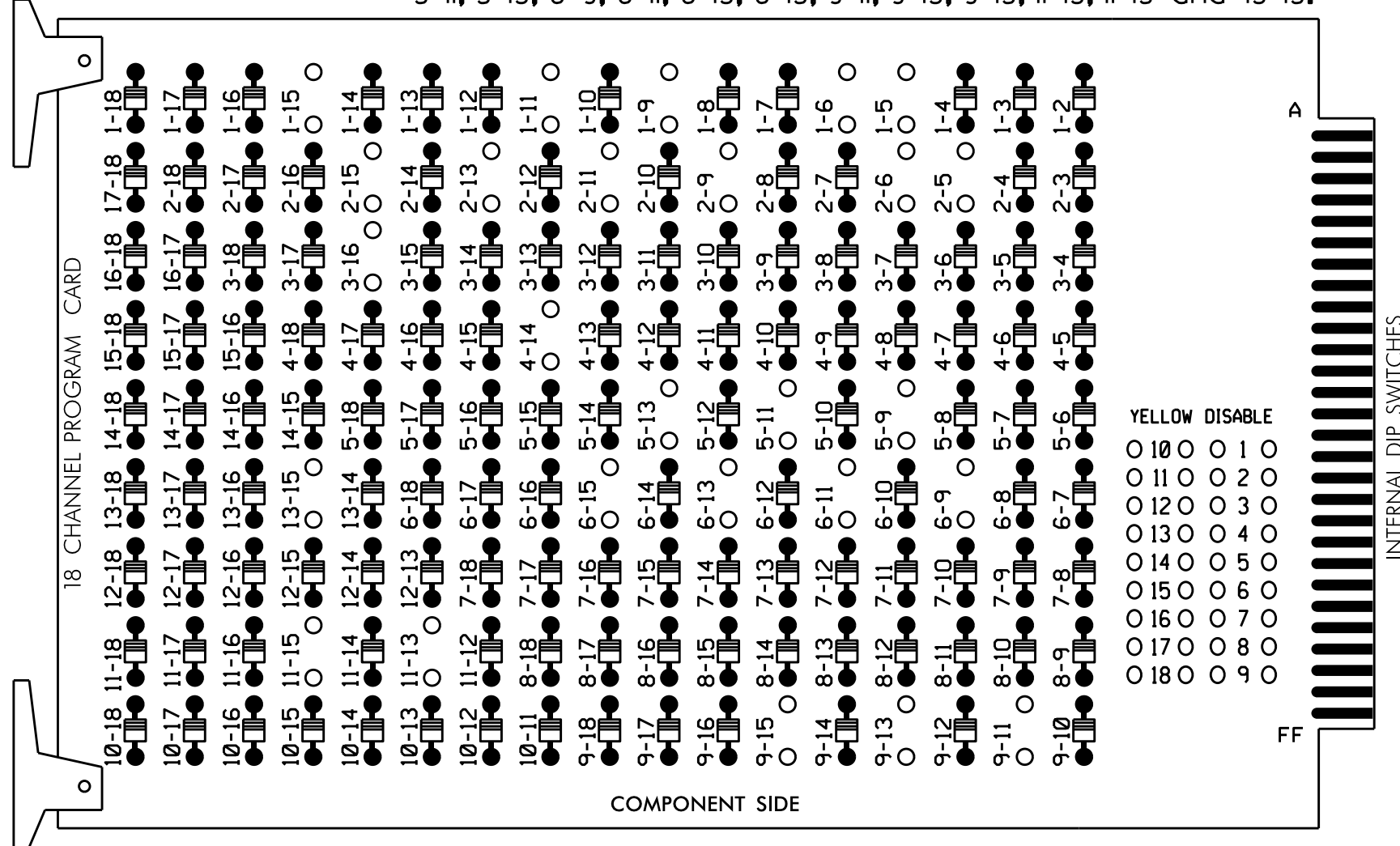
SIG. INVENTORY NO. 05-1902



18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-16, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15 and 13-15.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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 controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature for all phases.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070  
CABINET.....332 W/ AUX  
SOFTWARE.....SE-PAC2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...18 WITH AUX FILE  
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S8,S12,  
AUX S1,AUX S2,AUX S3  
PHASES USED.....1,2,2PED,3,3PED,4,4PED,6,6PED  
OVERLAP A.....\*  
OVERLAP B.....\*  
OVERLAP C.....NOT USED  
OVERLAP D.....NOT USED  
OVERLAP E.....\*  
OVERLAP F.....NOT USED  
OVERLAP G.....1+4

\* SEE SHEET 2 FOR OVERLAP PROGRAMMING

SIGNAL HEAD HOOK-UP CHART

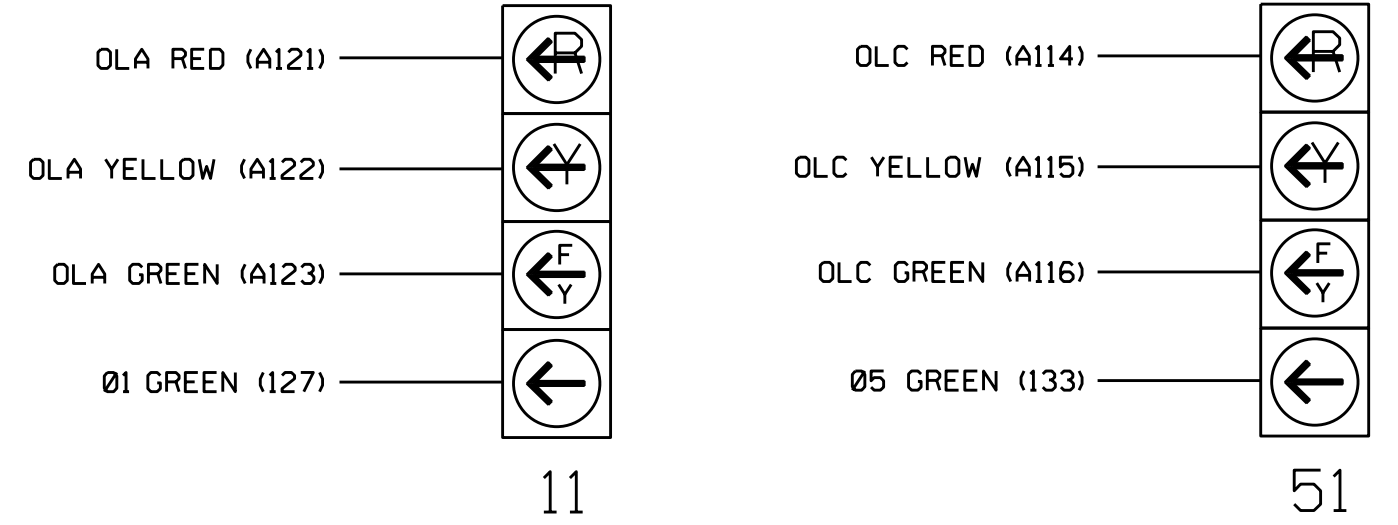
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	OLG	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	33	41,42	P41, P42	NU	61,62	NU	NU	NU	P31, P32	11	33	31,32	NU	NU	NU
RED		128			101			134						A124				
YELLOW	*	129		*	102			135										
GREEN		130			103			136										
RED ARROW													A121		A111			
YELLOW ARROW													A122	A125	A112			
FLASHING YELLOW ARROW													A123	A126				
GREEN ARROW	127			118											A113			
Hand icon			113		104							110						
Walking person icon			115		106							112						

NU = Not Used

- \* Denotes install load resistor. See load resistor installation detail this sheet.
- \*\* See Phase 3 PED output programming detail on sheet 2.
- \* See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE: See sheet 2 for Protected & Permitted Phases programming.

INPUT FILE POSITION LAYOUT

(front view)

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

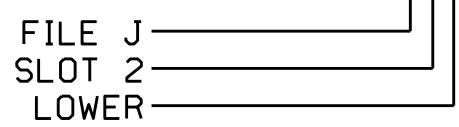
FS = FLASH SENSE  
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1	5	
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
1B	TB2-9,10	I3U	63	5	2		
3A	TB4-5,6	I5U	58	9	3	3	
3B	TB4-9,10	I6U	41	11	3	10	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED		

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

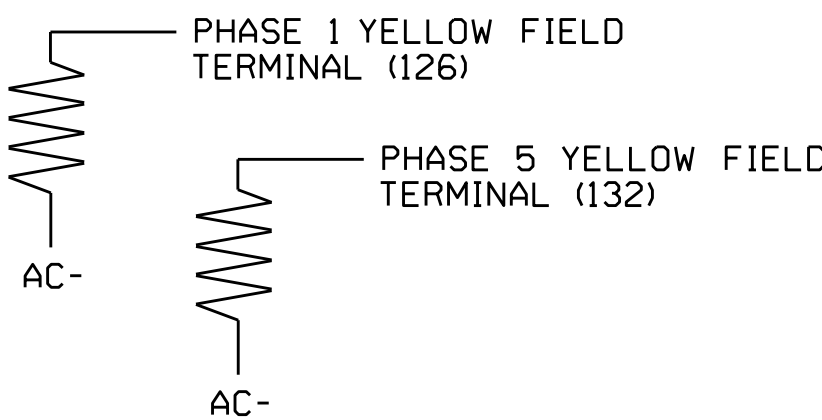
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

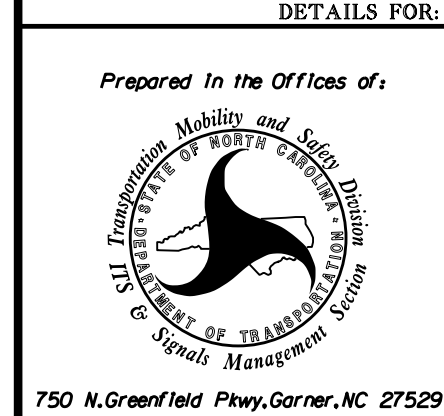
(install resistors as shown below)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:



US 401 (Louisburg Road)  
at  
Calvary Drive and  
State Employee's Credit Union

Division 5 Wake County Raleigh

PLAN DATE: February 2024 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL 036833

RYAN W. HOUGH

DocuSigned by: Ryan W. Hough 02/29/2024

430320FAA205463 DATE

SIG. INVENTORY NO. 05-1902



OVERLAP PROGRAMMING DETAIL

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

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

OVERLAP DATA

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

PREV/NEXT TO CYCLE

OVERLAP A

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

FYA OVERLAP - A      DELAY/10: 0

PHASES..12345678 90123456

PERM PHASES: 01000000 00000000

PROT PHASES: 10000000 00000000

-PED PHASES: 00000000 00000000

OVERLAPS..ABCDEFGH IJKLMNOP

PERM OVERLAPS: x0000000 00000000

PROT OVERLAPS: x0000000 00000000

NOTICE  
DELAY/10 = 0

Press ESC

OVERLAP C

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

FYA OVERLAP - C      DELAY/10: 0

PHASES..12345678 90123456

PERM PHASES: 00000100 00000000

PROT PHASES: 00001000 00000000

-PED PHASES: 00000000 00000000

OVERLAPS..ABCDEFGH IJKLMNOP

PERM OVERLAPS: 00x00000 00000000

PROT OVERLAPS: 00x00000 00000000

NOTICE  
DELAY/10 = 0

END OVERLAP PROGRAMMING

PED DETECTOR ASSIGNMENT PROGRAMMING  
TO ASSIGN PHASE 3 TO PED DETECTOR 8

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

ASSIGN PHASE 3  
TO DETECTOR 8

PED DET 8      PHASE 12345678 90123456

ASSIGNED PHASES....00100000 00000000

SWITCH PHASES.....00000000 00000000

MODE 1      CALL 1      EXT/10 0

VOLUME 0      PASS 0      DLY/10 0

OCCUPY 0      ADDED 0      FAIL 255

LOCK 0      QUEUE 0      QLIMIT 0

[1]

PED DETECTOR PROGRAMMING COMPLETE

ACCESSIBLE PEDESTRIAN SIGNAL (APS)  
INSTALLATION NOTES

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

LOAD SWITCH MAPPING DETAIL  
(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

UNIT DATA

1-STARTUP & MISC.      6-SEQUENCES

2-REMOTE FLASH      7-PORT 1/ITS DATA

3-OVERLAP DATA      8-I/O MISC

4-PEER-TO-PEER      9-OUTPUT MAPPING

5-RING STRUCTURE      B-BANK SELECTION

C-COPY BANK

'+' DENOTES BANKABLE UNIT DATA      [1]

SELECT 9 - OUTPUT MAPPING

OUTPUT MAPPING      EDIT MODE: LDSW

E-TOGGLE MODE

LDSW ..7.. ..8.. ..9.. .10.. .11.. .12..

RED PH5    PH6    PD6    PH7    PH8    PD3

YEL -      -      -      -      -      -

GRN -      -      -      -      -      -

F10 7      8      9      10    11    12

PREV/NEXT TO CYCLE      D-DISPLAY COMPAT

USE ENTER AND NEXT KEYS TO  
MAP 'LDSW 12' AS 'PD3'

LOAD SWITCH MAPPING COMPLETE

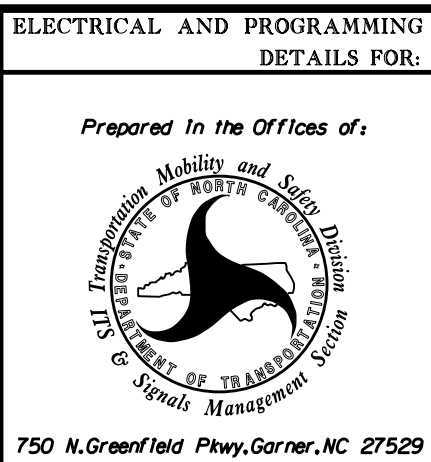
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

This Electrical Detail supersedes  
the detail sealed on 10-18-22

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1902  
DESIGNED: February 2024  
SEALED: 02-27-24  
REVISED: N/A

Electrical Detail - Sheet 2 of 3



US 401 (Louisburg Road)  
at  
Calvary Drive and  
State Employee's Credit Union

Division 5      Wake County      Raleigh

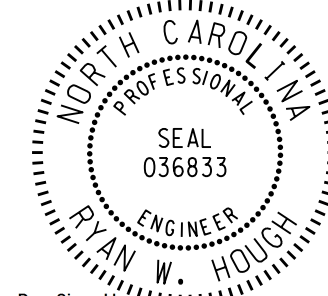
PLAN DATE: February 2024      REVIEWED BY:

PREPARED BY: James Peterson      REVIEWED BY:

REVISIONS      INIT.      DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL



DocuSigned by  
Ryan W. Hough      02/29/2024

SIG. INVENTORY NO. 05-1902



PROGRAMMING DETAILS TO CALL ALTERNATE PHASING

To run the Alternate phasing, schedule a Day Plan that calls an Action that is programmed to enable Phase Function 1.

Actions can be programmed to run free run or call a coordination pattern.

PHASE FUNCTION MAPPING  
PROGRAMMING DETAIL

Step 1 - Assign OMIT OVERLAPS A & C to Phase Function 1.

1. From Main Menu select 6 - TIME BASE DATA
2. From TIME BASE DATA Submenu select 9 - PHS FUNC MAPPING

Use Up/Dn Keys to position cursor on NUM 1

TIME BASE PHS FUNC MAPING  
PHS FUNC SEL(0-OFF/1-ON)  
NUM..P-FUNCT NAME.....123456789 0123456  
1 PHS-01 MAX # 2 000000000 0000000  
2 PHS-02 MAX # 2 000000000 0000000  
3 PHS-03 MAX # 2 000000000 0000000  
4 PHS-04 MAX # 2 000000000 0000000  
UP/DOWN TO SCROLL E-EDIT

BEFORE PROCEEDING,  
SCROLL THRU ENTIRE  
RANGE OF FUNCTIONS TO  
ENSURE ALL P-FUNCT 1  
NUM x VALUES ARE SET  
TO '0' (OFF)

Use Up/Dn/Left/Right keys to position cursor on NUM 145 and program P-FUNCT 1 as shown.

TIME BASE PHS FUNC MAPING  
PHS FUNC SEL(0-OFF/1-ON)  
NUM..P-FUNCT NAME.....123456789 0123456  
145 OVERLAP A OMIT 100000000 0000000  
146 OVERLAP B OMIT 000000000 0000000  
147 OVERLAP C OMIT 100000000 0000000  
148 OVERLAP D OMIT 000000000 0000000  
UP/DOWN TO SCROLL E-EDIT

SET P-FUNCT 1 VALUE  
TO '1' (ON) AS SHOWN  
FOR OVERLAP A OMIT  
FOR OVERLAP C OMIT

PHASE FUNCTION PROGRAMMING COMPLETE

TIME BASE ACTIONS PROGRAMMING

Step 2 - Set up an Action to run Phase Function 1.

1. From Main Menu select 6 - TIME BASE DATA
2. From TIME BASE DATA Submenu select 5 - ACTIONS

TIME BASE ACTION # \*\*\*  
  
PATN:001 PHS: 12345678 90123456  
0=1'CONN AUX: 10000000 00000000  
1-253=PATN SPC: 0000000- 0=NO  
254=FREE DIM: 0----- 1=YES  
255=FLASH DET: 000-----  
UP/DOWN TO SCROLL

NOTICE  
PHS 1

SPECIAL FUNCTION PROGRAMMING COMPLETE

\*\*\* Action #(s) are to be determined by the Division and/or City Traffic Engineer and are scheduled to run in Day Plan(s).

This Electrical Detail supersedes the detail sealed on 10-18-22

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1902  
DESIGNED: February 2024  
SEALED: 02-27-24  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

Electrical and Programming Details For:

US 401 (Louisburg Road)  
at  
Calvary Drive and  
State Employee's Credit Union

Division 5Wake CountyRaleigh

PLAN DATE: February 2024REVIEWED BY:

PREPARED BY: James PetersonREVIEWED BY:


REVISIONS

INIT.

DATE

Prepared in the Offices of:

Transportation Mobility and Safety Division  
Department of North Carolina  
State of North Carolina  
Signal Management



750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL

North Carolina  
Professional Engineer  
Ryan W. Haugh  
SEAL  
036833

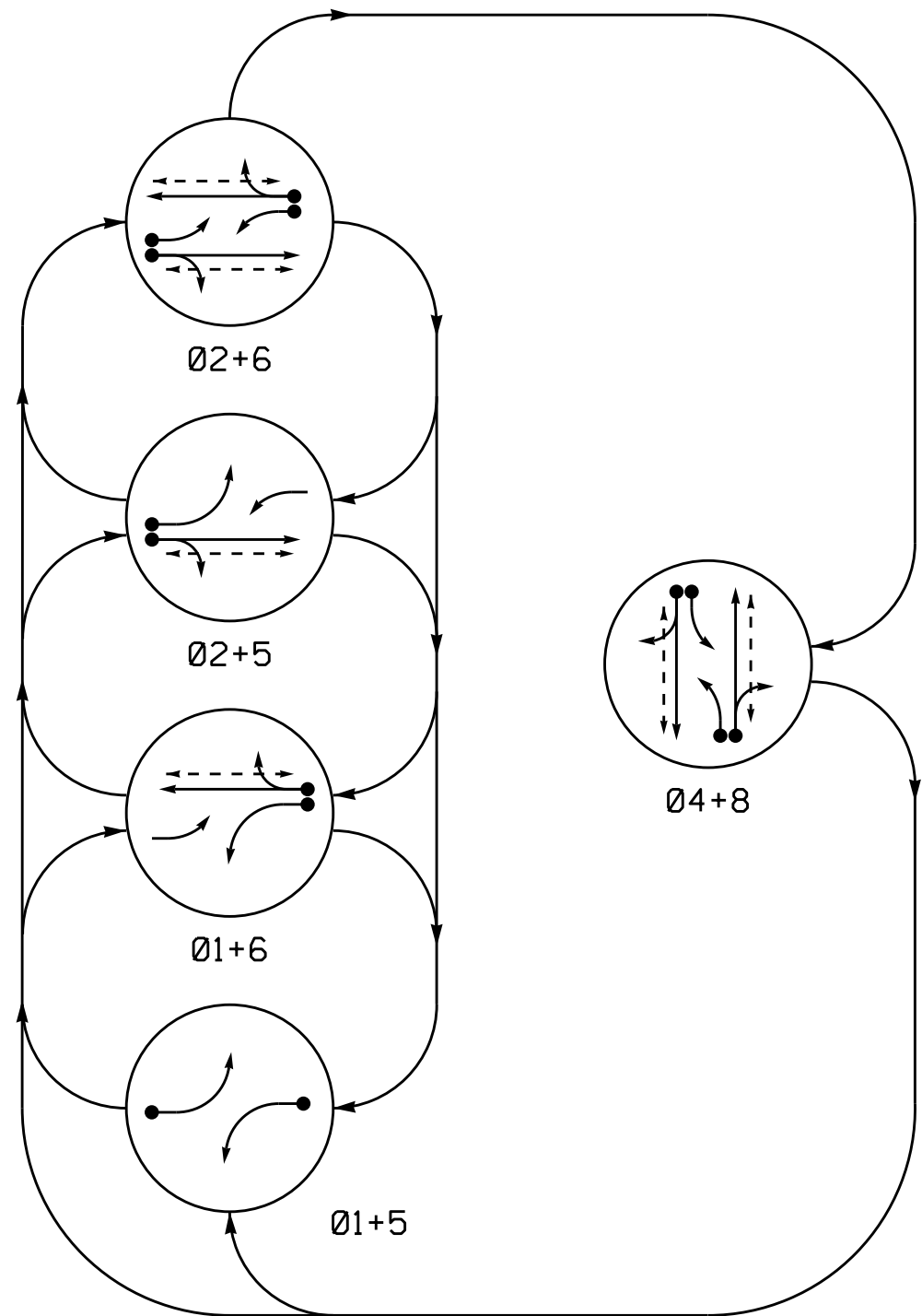
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Ryan W. Haugh  
02/29/2024  
430320FAA2654C3  
DATE

SIG. INVENTORY NO. 05-1902

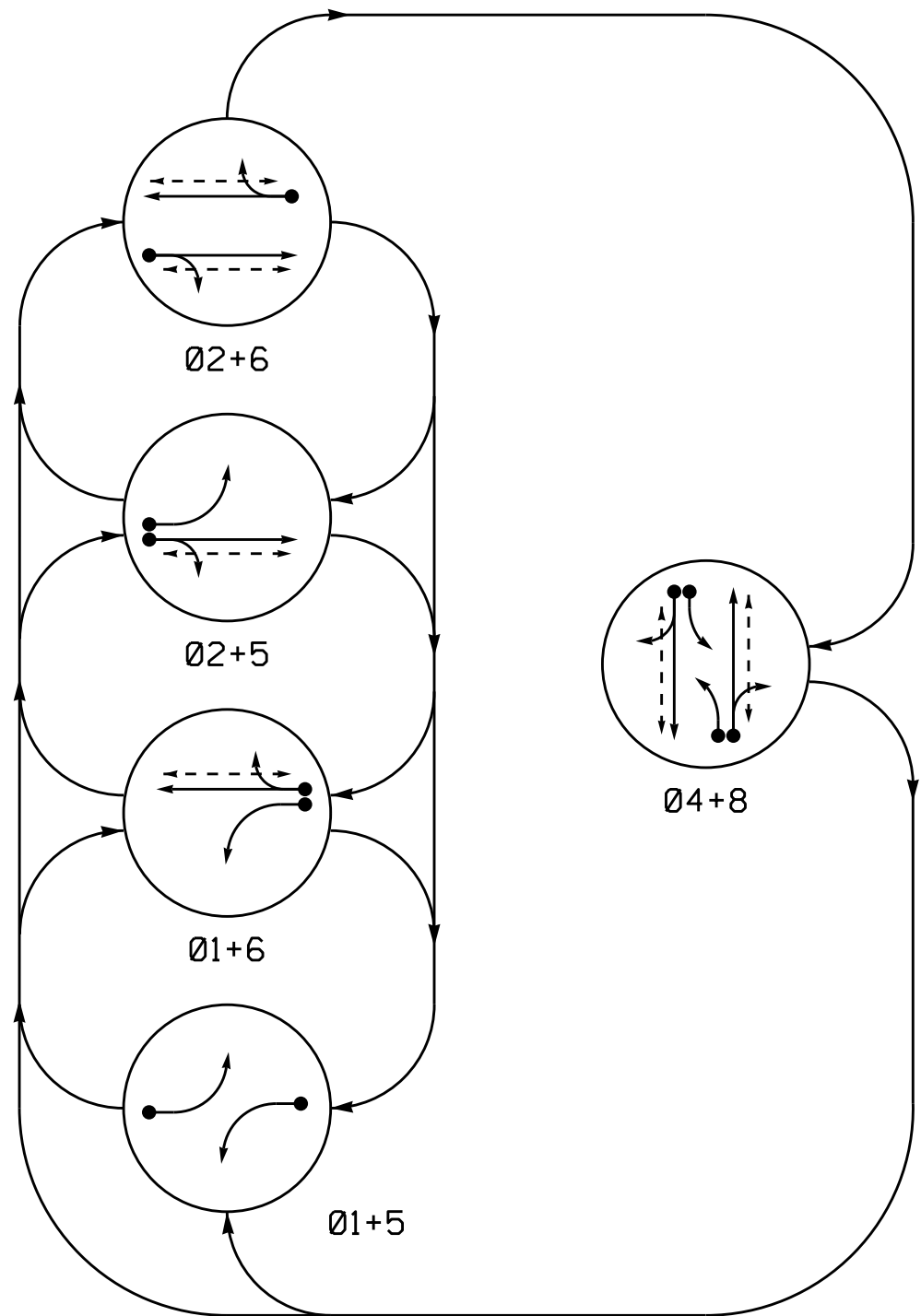
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JTPeterson



DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	FLASH
11						
21, 22	R	R	G	G	R	Y
41	R	R	R	R	F	R
42, 43	R	R	R	R	G	R
51						
61, 62	R	G	R	G	R	Y
81	R	R	R	R	F	R
82, 83	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	FLASH
11						
21, 22	R	R	G	G	R	Y
41	R	R	R	R	F	R
42, 43	R	R	R	R	G	R
51						
61, 62	R	G	R	G	R	Y
81	R	R	R	R	F	R
82, 83	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

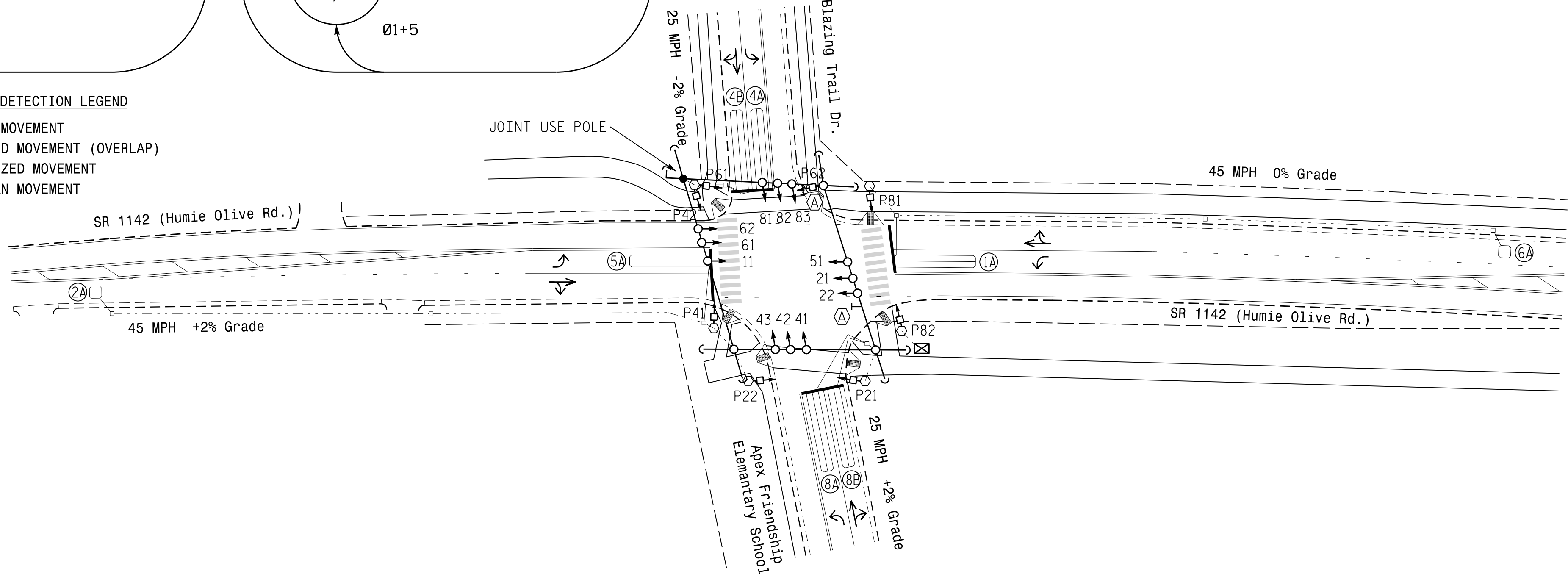
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN	NEW CARD
1A	6X40	0	2-4-2	X	1 6 #	15 *	-	X	-	X	X
2A	6X6	300	5	X	2	-	-	X	X	X	-
4A	6X40	0	2-4-2	X	4	3	-	X	-	X	-
4B	6X40	0	2-4-2	X	4	10	-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

\* Reduce Delay to 3 seconds during Alternate Phasing Operation.  
# Disable call for loop during Alternate Phasing Operation.

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.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing unless otherwise shown.
- 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 supersede these values.



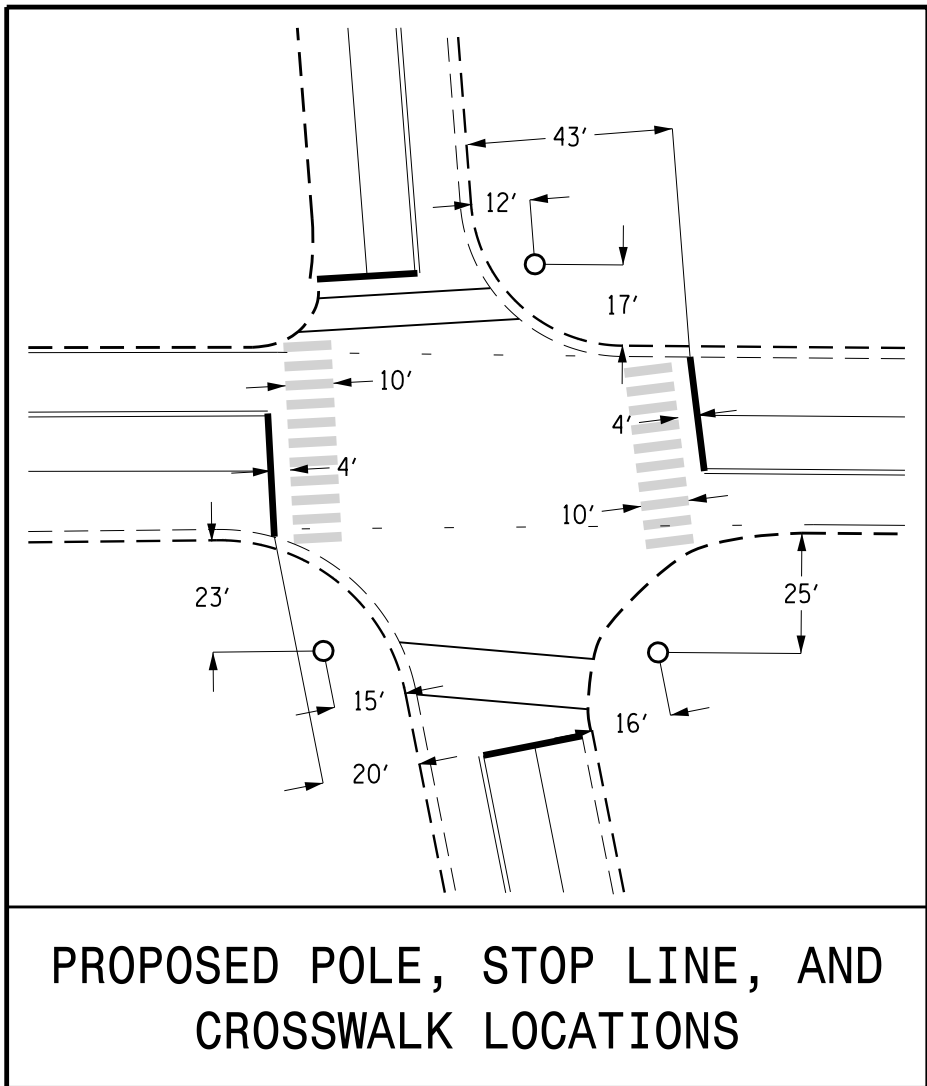
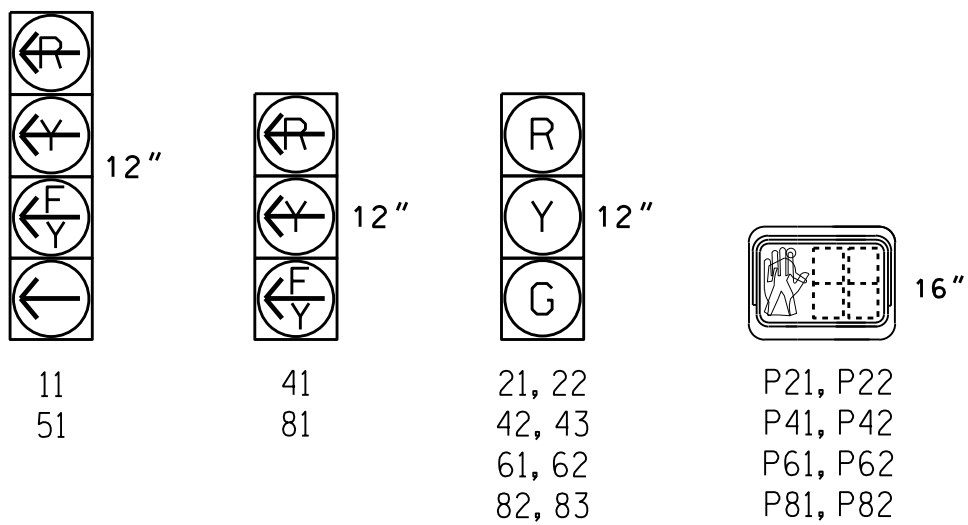
MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Walk *	-	12	12	-	11	11
Ped Clear	-	7	11	-	7	10
Min Green	7	12	7	7	12	7
Passage *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	30	60	30	20	60	30
Yellow Change	3.0	4.5	3.3	3.0	4.5	3.3
Red Clear	2.4	1.3	2.8	1.6	1.3	2.8
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	-	5	-	-	4	4
Non Lock Detector	X	-	X	X	-	X
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X

\* These values may be field adjusted. Do not adjust Min Green and 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 FACE I.D.

All Heads L.E.D.



LEGEND

- PROPOSED: Traffic Signal Head, Modified Signal Head, Sign, 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, Type II Signal Pedestal, "TURNING TRAFFIC MUST YIELD TO" PEDESTRIANS Sign (R10-15).
- EXISTING: N/A

New Installation

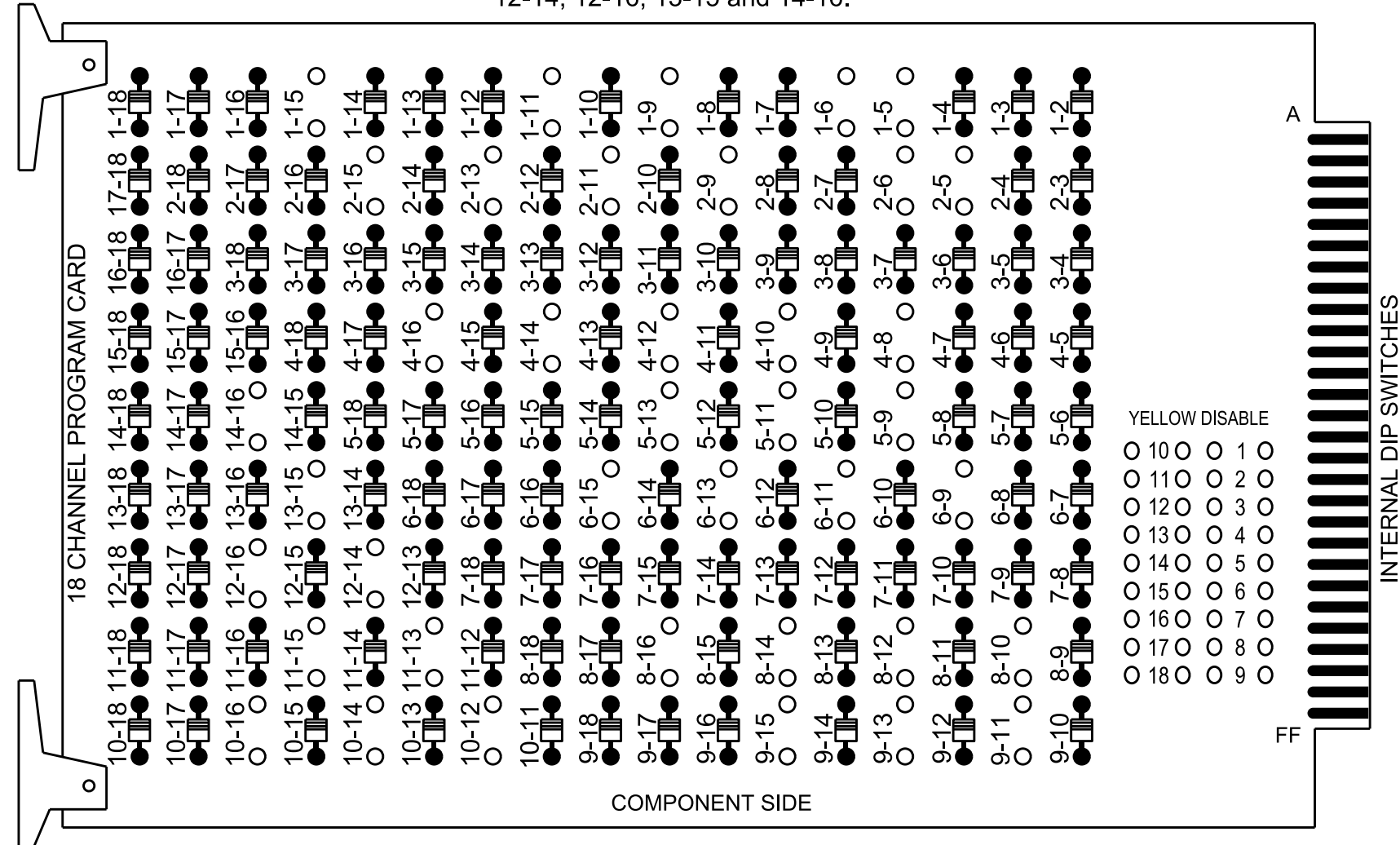
Prepared in the Offices of: SR 1142 (Humie Olive Road) at Blazing Trail Drive and Apex Friendship Elementary School. Division 5 Wake County Apex. PLAN DATE: March 2023 REVIEWED BY: J.A. Lohr. PREPARED BY: J.A. Lohr. REVISIONS: INIT. DATE. SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER. SEAL 026486. ROBERT J. ZIEMBA. DATE: 04/13/2023. SIG. INVENTORY NO. 05-1319.



18 CHANNEL CONFLICT MONITOR  
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that the Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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 plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX  
Cabinet.....332 w/ Aux  
Software.....Q-Free MAXTIME  
Cabinet Mount.....18 With Aux. Output File  
Load Switches Used.....S1, S2, S3, S5, S6, S7, S8, S9, S11,  
S12, AUX S1, AUX S2, AUX S4, AUX S5  
Phases Used.....1, 2, 2PED, 4, 4PED, 5, 6, 6PED, 8, 8PED  
Overlap "1".....\*  
Overlap "2".....\*  
Overlap "3".....\*  
Overlap "4".....\*

\*See overlap programming detail on sheet 2

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	42,43	P41, P42	51	61,62	P61, P62	NU	82,83	P81, P82	11	81	NU	51	41	NU
RED		128			101			134		107								
YELLOW	*	129			102		*	135		108								
GREEN		130			103			136		109								
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127							133										
Hand icon			113			104			119		110							
Walking person icon			115			106			121		112							

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

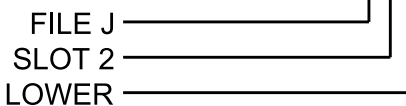
FS = FLASH SENSE  
ST = STOP TIME

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	2	2			X	X	X	
4A	TB4-9,10	I6U	41	3	8	4	3		X		X	
4B	TB4-11,12	I6L	45	7	9	4	10		X		X	
5A	TB3-1,2	J1U	55	17	15	5 ★	15		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
8A	TB5-9,10	J6U	42	4	22	8	3		X		X	
8B	TB5-11,12	J6L	46	8	23	8	10		X		X	

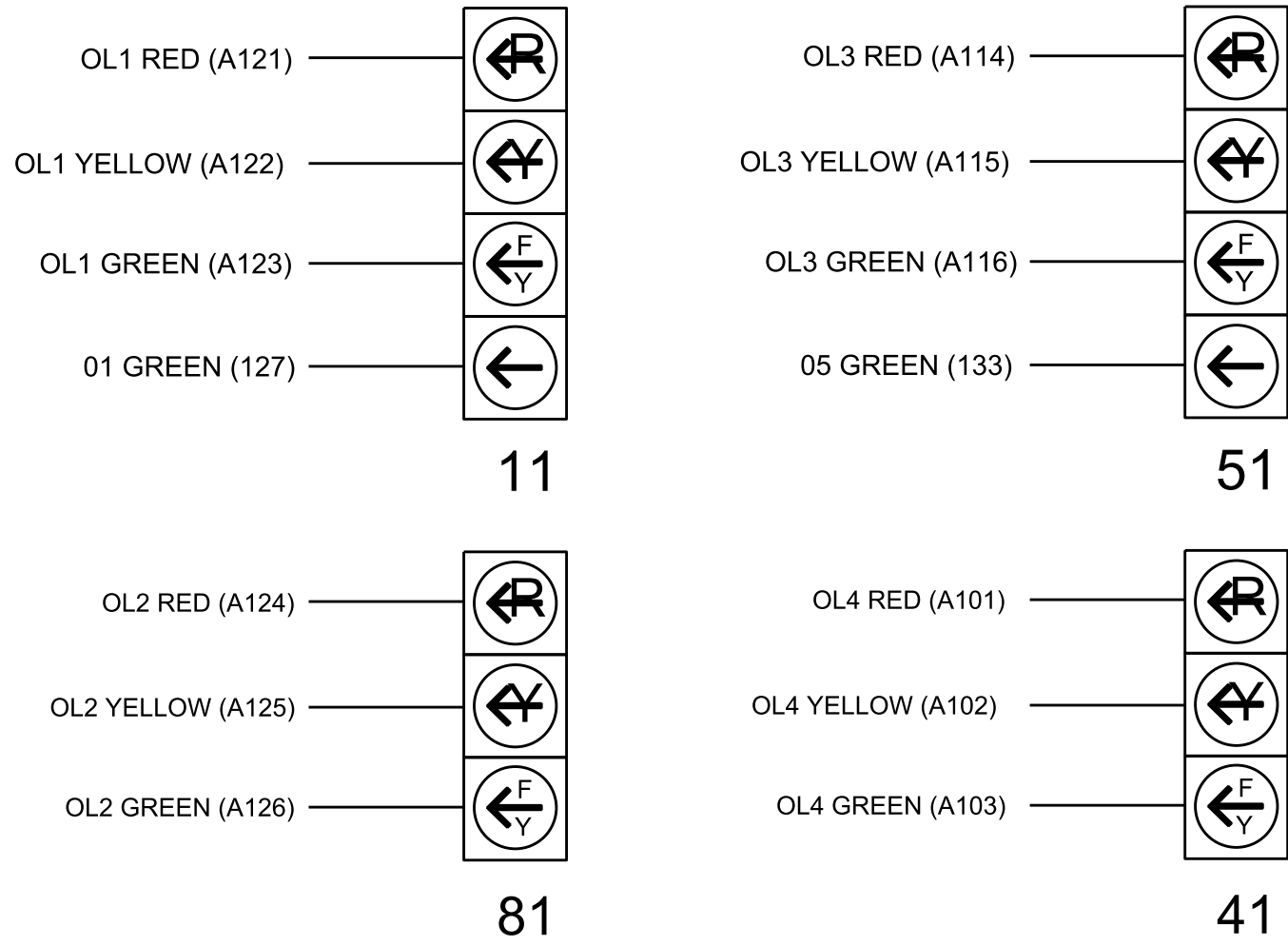
\*For the detectors to work as shown on the signal plan see the Detector Programming Detail for Alternate Phasing on sheet 2 of this plan.

INPUT FILE POSITION LEGEND: J2L



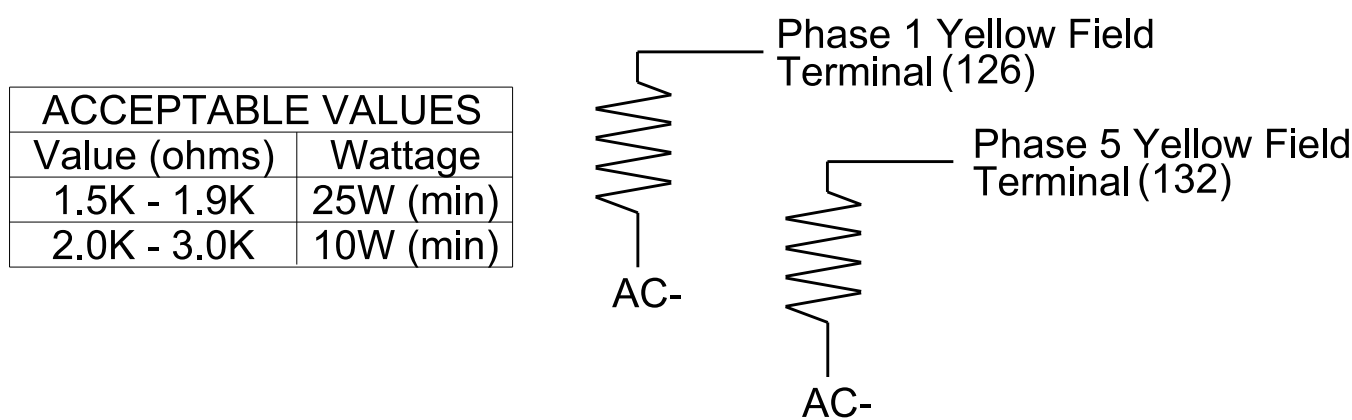
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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.

Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For:  
Prepared in the Offices of:  
Wake County  
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1142 (Humie Olive Road)  
at  
Blazing trail Drive and  
Apex Friendship Elementary School  
Division 5  
PLAN DATE: April 2023  
PREPARED BY: D.J. Craddock  
REVIEWED BY: DTJ  
REVISIONS  
INIT. DATE

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1319  
DESIGNED: March 2023  
SEALED: 4/13/23  
REVISED:  
DocuSigned by:  
D. Todd Joyce  
04/13/2023  
DATE  
SIG. INVENTORY NO. 05-1319



## 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 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 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		5	
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

## MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface  
Home >Controller >Overlap Configuration >Overlaps

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

## Overlap Plan 2

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

← NOTICE INCLUDED PHASES

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 05-1319  
DESIGNED: March 2023  
SEALED: 4/13/23  
REVISED:

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

## Electrical and Programming Details For:

SR 1142 (Humie Olive Road)

at  
Blazing trail Drive and

Division 5 Wake County Apex

PLAN DATE:	April 2023	REVIEWED BY:	DTJ
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PREPARED BY: D.J. Craddock	REVIEWED BY:
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REVISIONS	INIT.	DATE
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[illegible]

SEAL

DocuSigned by:  
D. Todd Joyce 04/13/202

SIG. INVENTORY NO. 05-1319