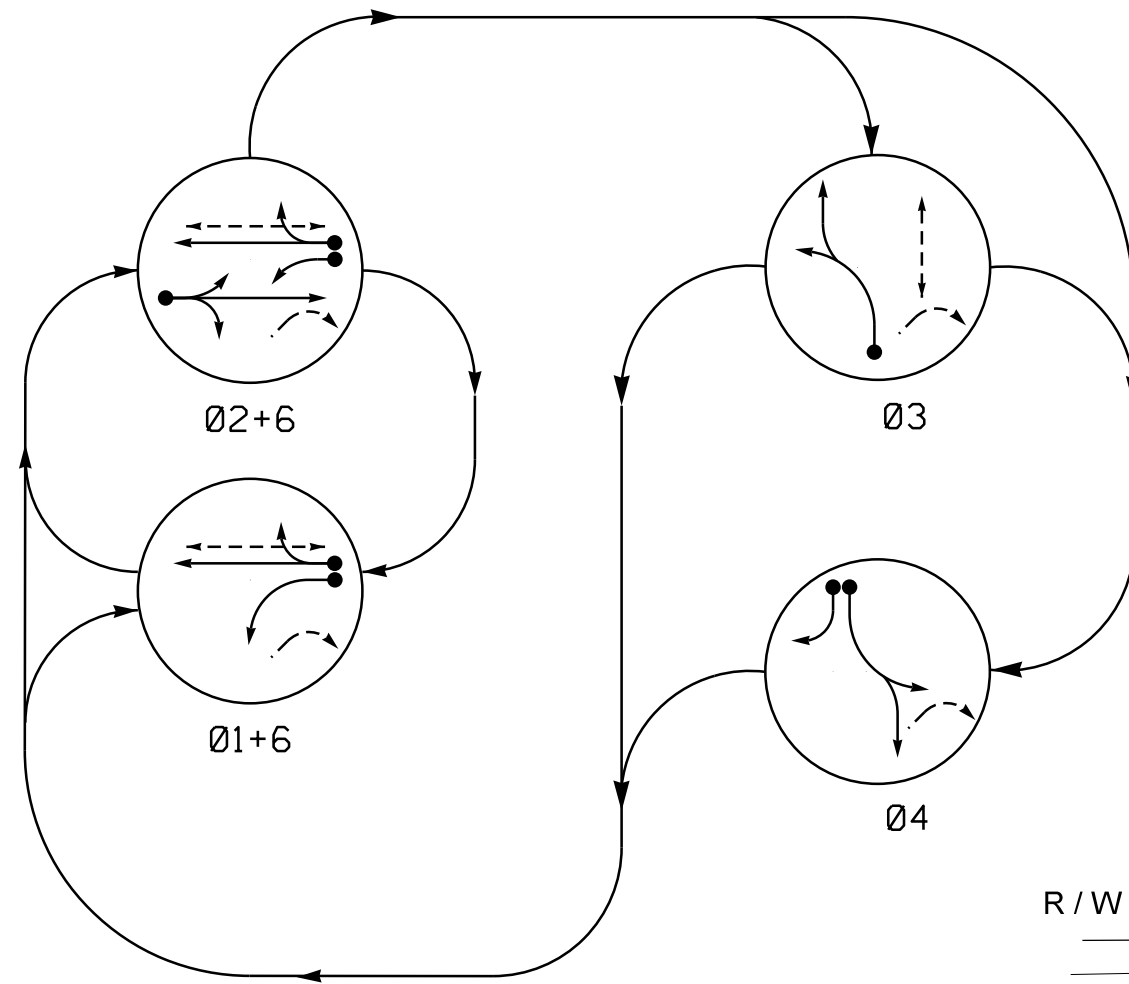


PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

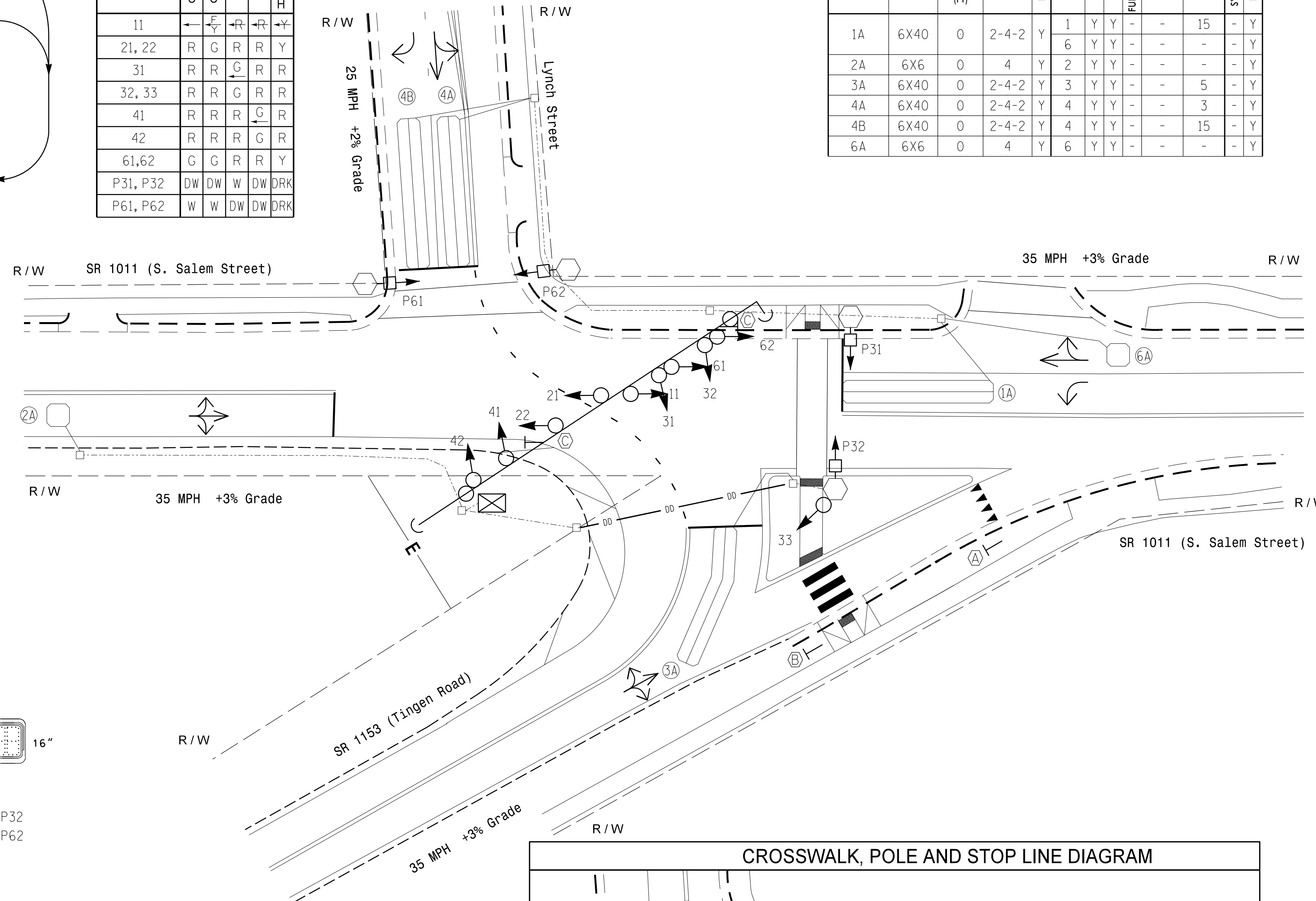
SIGNAL FACE	PHASE					
	Ø1+6	Ø2+6	Ø3	Ø4	F	H/O
11	←	→	→	→	→	→
21, 22	R	G	R	R	Y	
31	R	R	G	R	R	
32, 33	R	R	G	R	R	
41	R	R	R	G	R	
42	R	R	R	G	R	
61, 62	G	G	R	R	Y	
P31, P32	DW	DW	W	DW	DRK	
P61, P62	W	W	DW	DW	DRK	

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING						SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME		
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6X6	0	4	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	5	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	6X6	0	4	Y	6	Y	Y	-	-	-	-	Y

4 Phase Fully Actuated (Isolated)

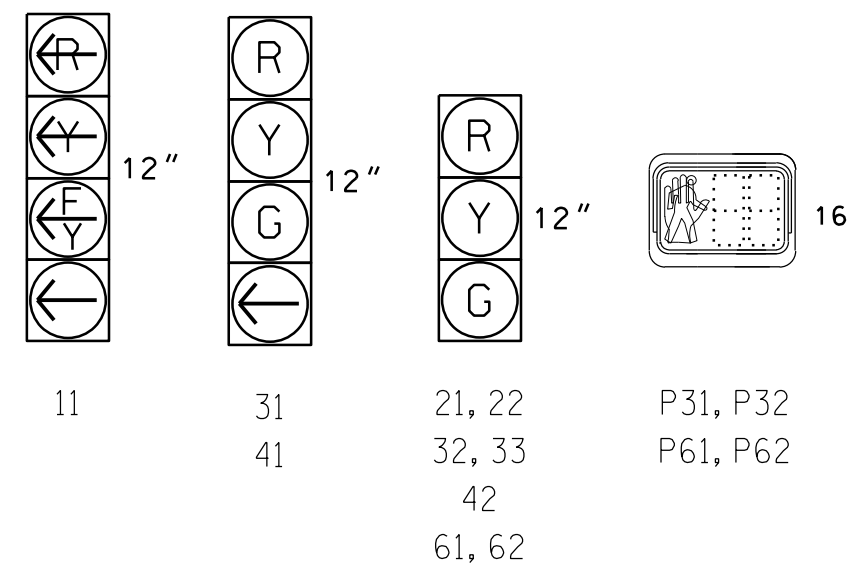
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018, "Standard Specifications for Roads and Structures" dated January 2018 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: connect.ncdot.gov/resources/safety/pages/ITS-Design-Resources.aspx
- 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 phase 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.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.



SIGNAL FACE I.D.

All Heads L.E.D.



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Division of Highways
Final Drawing Date: 5/22/2020
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William J. Hamilton
ITS & Signal Unit

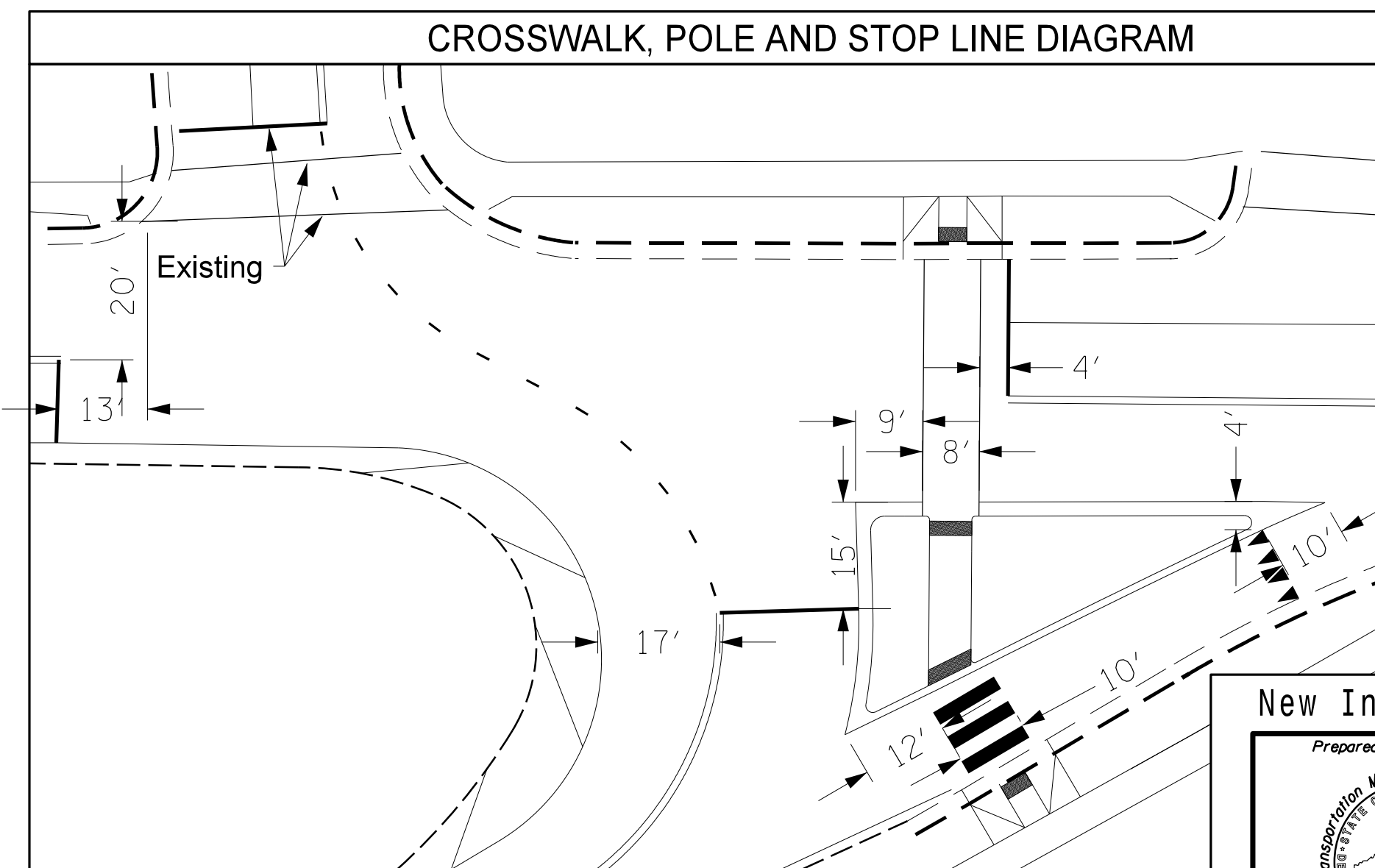
LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

FEATURE	PHASE					
	1	2	3	4	6	
Min Green 1 *	7	10	7	7	10	
Extension 1 *	2.0	3.0	2.0	2.0	3.0	
Max Green 1 *	20	35	20	20	35	
Yellow Clearance	3.0	3.7	3.7	3.1	3.7	
Red Clearance	1.9	2.5	2.7	3.4	2.5	
Red Revert	2.0	2.0	2.0	2.0	5.0	
Walk 1 *	-	-	7	-	7	
Don't Walk 1	-	-	8	-	8	
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	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.

CROSSWALK, POLE AND STOP LINE DIAGRAM



New Installation

SR 1011 (S. Salem Street)
at
SR 1153 (Tingen Road)/
Lynch Street

Division 5 Wake County Apex

PLAN DATE: May 2020 REVIEWED BY: WJ Hamilton

PREPARED BY: JT Stiff RKA PROJ. NO.: 20020 (040)

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
WILLIAM J. HAMILTON
PROFESSIONAL ENGINEER
32396

DocuSigned by:
William J. Hamilton
5/18/2020

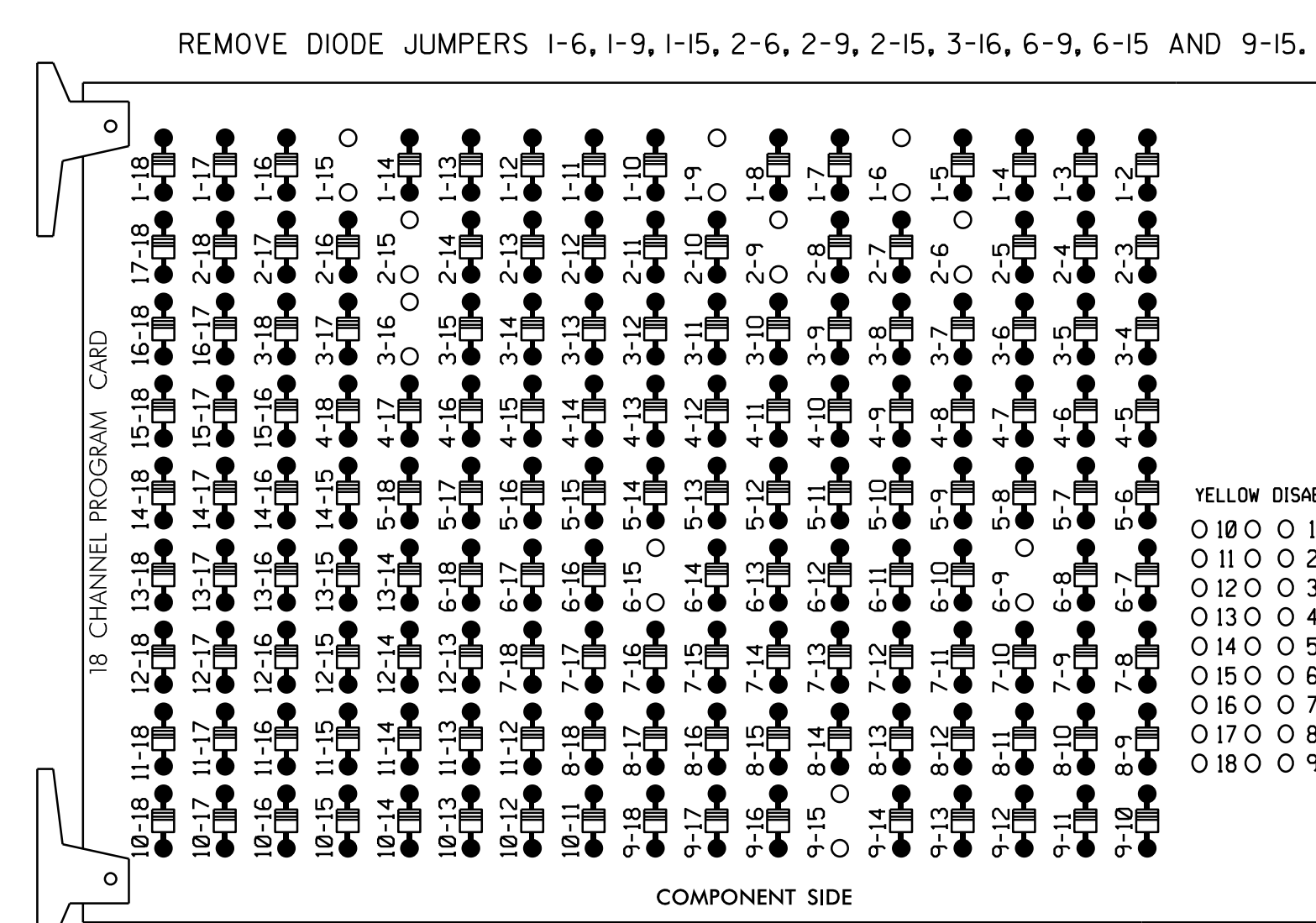
SIG. INVENTORY NO. 05-1564

RKA
RAMEY KEMP ASSOCIATES
5808 Farringdon Place Raleigh, North Carolina 27609
Phone: 919-872-6116 | www.rameykemp.com | NC License No. C-0910

SCALE
0 20
1"=20'

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. part 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Startup in Green.
- Program phases 3 and 6 for Startup Ped Call.
- Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S8,S9,S12,AUX S1
 PHASES USED.....1,2,3,3PED,4,6,6PED
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	31	32,33	41	42	NU	NU	61,62	P61, P62	NU	NU	P31, P32	11	NU	NU	NU	NU
RED		128		116	116	101	101			134									
YELLOW	*	129		117	117	102	102			135									
GREEN		130		118	118	103	103			136									
RED ARROW															A121				
YELLOW ARROW															A122				
FLASHING YELLOW ARROW															A123				
GREEN ARROW	127			118		103													
Hand										119			110						
Walking										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)

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

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

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

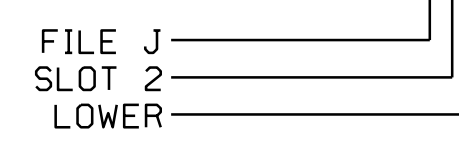
INPUT FILE CONNECTION & PROGRAMMING CHART

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
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			5
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P31,P32	TB8-8,9	I13L	70	32	PED 8	3 PED					

NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 113.

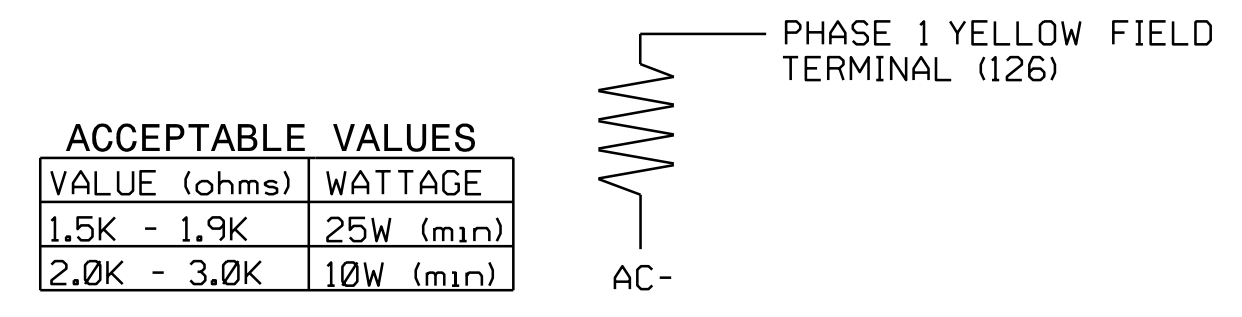
† Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



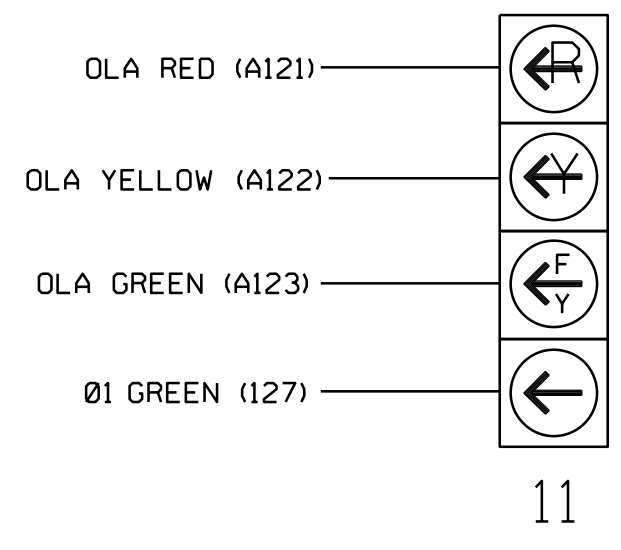
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

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.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

- The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

NC Dept of Transportation
 Division of Highways
 Final Drawing Date: 5/22/2020
 Documented by: [Signature]
 ITS & Signal Unit

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1564
 DESIGNED: May 2020
 SEALED: 5-18-2020
 REVISED: N/A

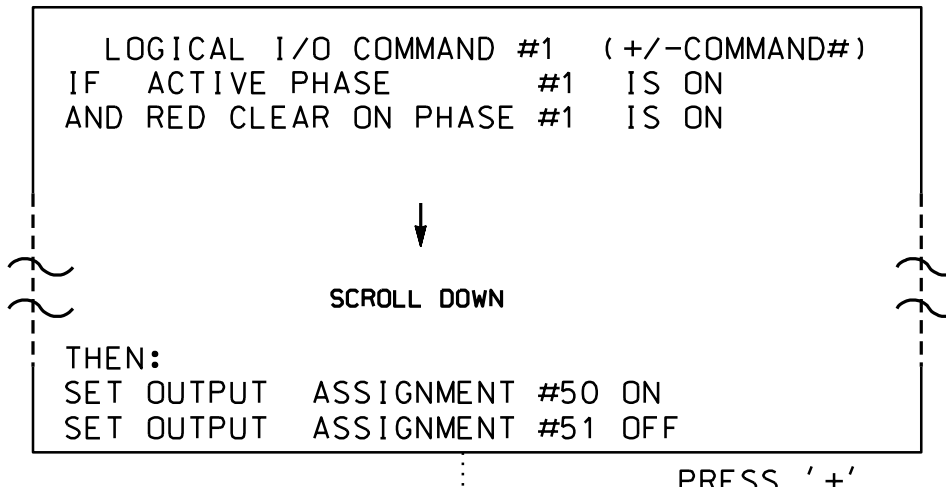
Electrical Detail - Sheet 1 of 2

	ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1011 (S. Salem Street) at SR 1153 (Tingen Road) / Lynch Street Division 5 Wake County Apex	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL
	PLAN DATE: May 2020 PREPARED BY: JT Stiff REVISIONS: _____ DATE: _____	

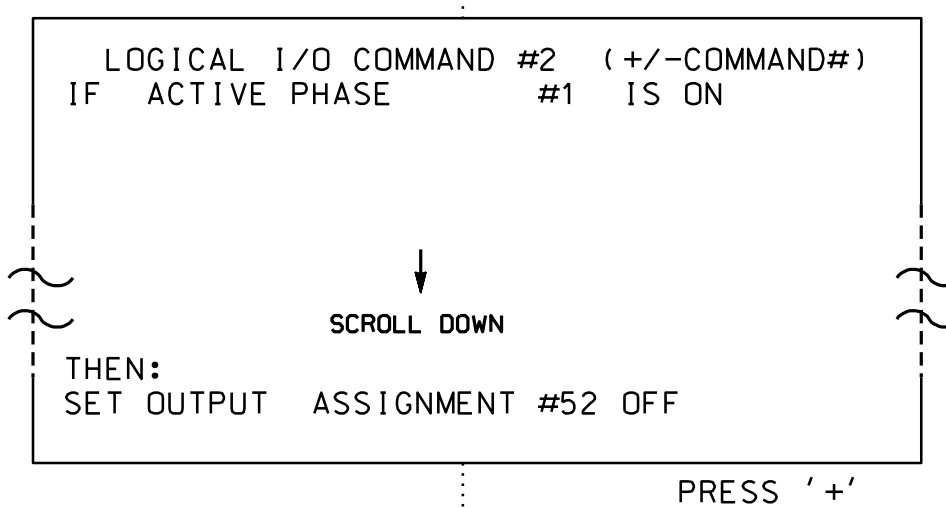
**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

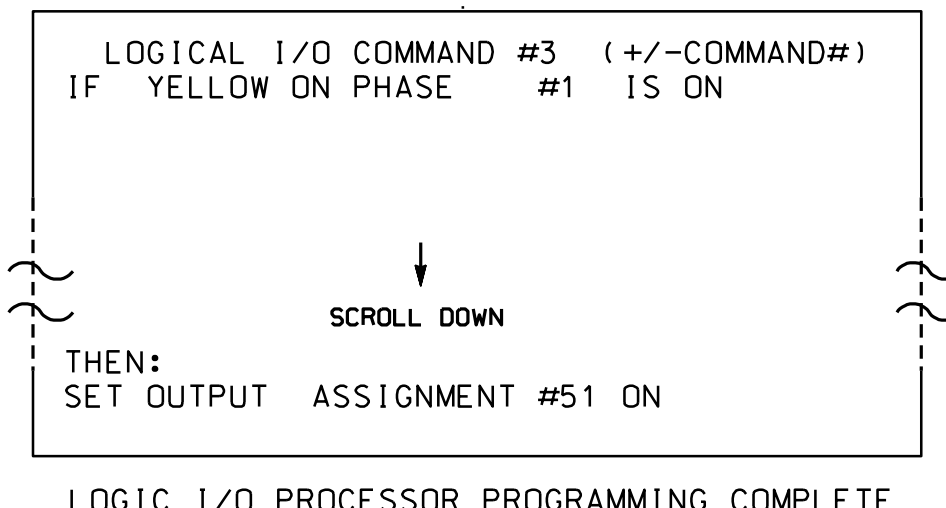
1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).



NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).



NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A Green

PED 3 PROGRAMMING DETAIL

(program controller as shown below)

CHANGING OUTPUT ASSIGNMENTS

1. FROM MAIN MENU SELECT '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS)
2. ENTER 17 (PHASE 8 DW) FOR OUTPUT ASSIGNMENT #.
3. SCROLL DOWN TO 'PEDESTRIAN PHASE' AND ENTER 'Y' **REGARDLESS OF DEFAULT PROGRAMMING**
4. ENTER '3' FOR 'SELECT PEDESTRIAN PHASE'. NO CHANGE NEEDED FOR 'SELECT COLOR'
5. BACKUP TO 'OUTPUT ASSIGNMENTS AND SETTINGS MENU:' BY PRESSING THE 'ESC' BUTTON ON KEYBOARD.
6. SELECT '1' (OUTPUT ASSIGNMENTS)
7. ENTER 18 (PHASE 8 W) FOR OUTPUT ASSIGNMENT #.
8. REPEAT STEPS # 3 AND # 4.

CHANGING INPUT ASSIGNMENTS

1. FROM MAIN MENU SELECT '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS)
2. CYCLE TO PED DETECTOR #8 BY REPEATEDLY DEPRESSING '+' KEY
3. MODIFY PHASE ASSIGNED TO PED DETECTOR # 8 FROM PHASE 8 TO PHASE 3

PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```

    PAGE 1: VEHICLE OVERLAP 'A' 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

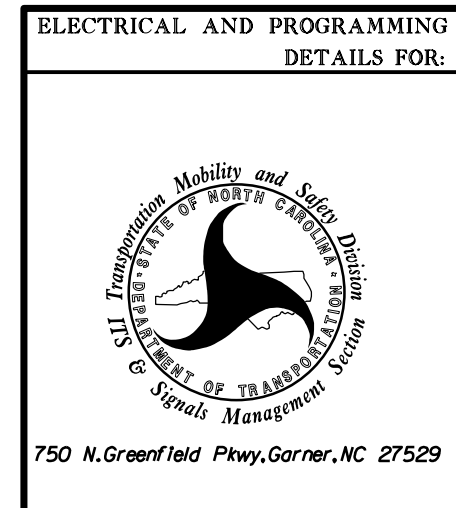
OVERLAP PROGRAMMING COMPLETE

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/22/2020
DocuSigned by:
ITS & Signals Unit

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1564
DESIGNED: May 2020
SEALED: 5-18-2020
REVISED: N/A

Electrical Detail - Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1011 (S. Salem Street) at SR 1153 (Tingen Road) / Lynch Street Wake County Apex	
PLAN DATE:	May 2020	REVIEWED BY:	WJ Hamilton
PREPARED BY:	JT Stiff	RKA PROJ. NO.:	20020 (040)
REVISIONS	INIT.	DATE	

SEAL	DATE
William J. Hamilton	5/18/2020
SIGNATURE	DATE
SIG. INVENTORY NO.	05-1564