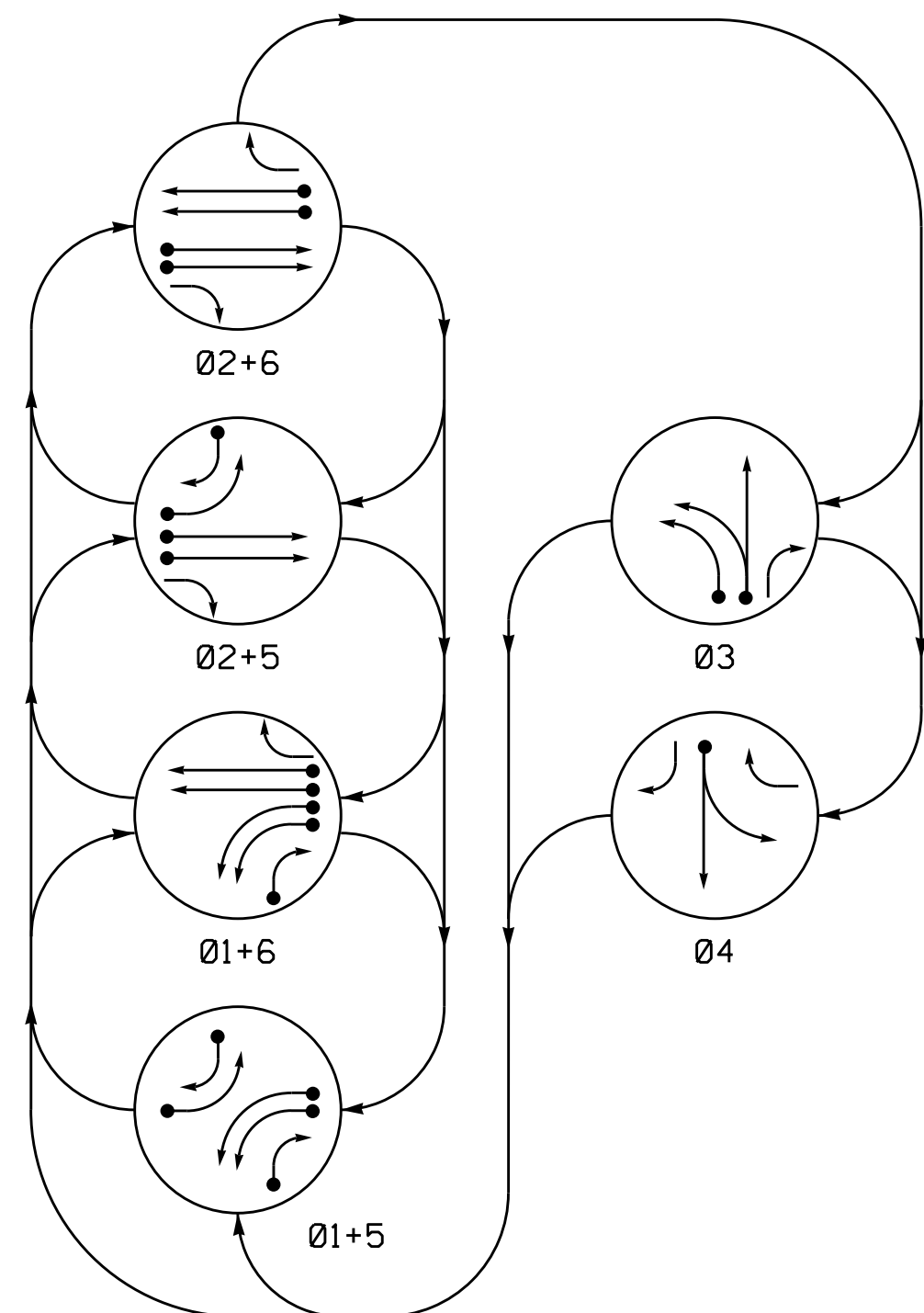


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**PHASING DIAGRAM**

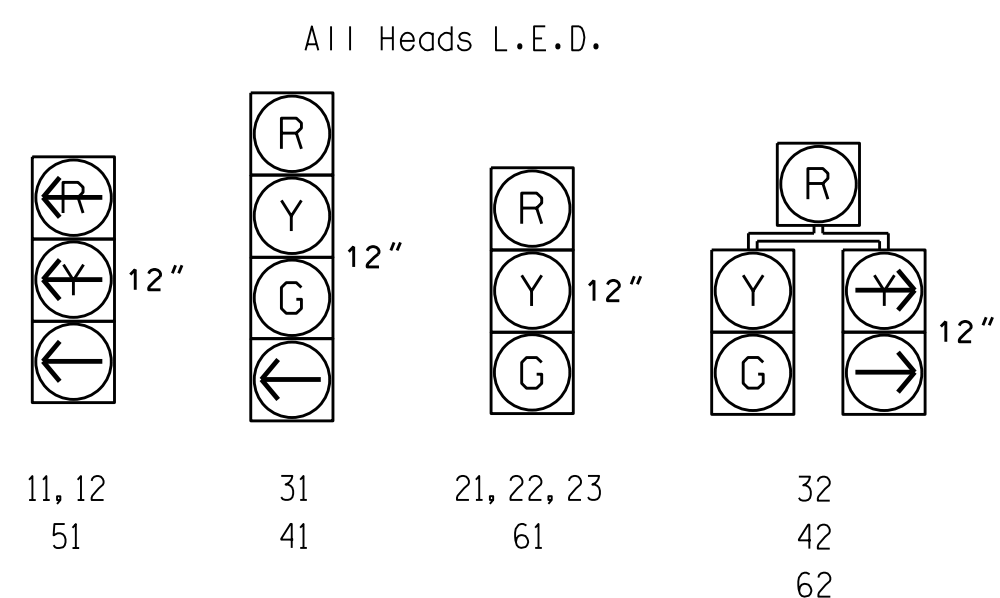


**PHASING DIAGRAM DETECTION LEGEND**

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

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11,12	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

**SIGNAL FACE I.D.**

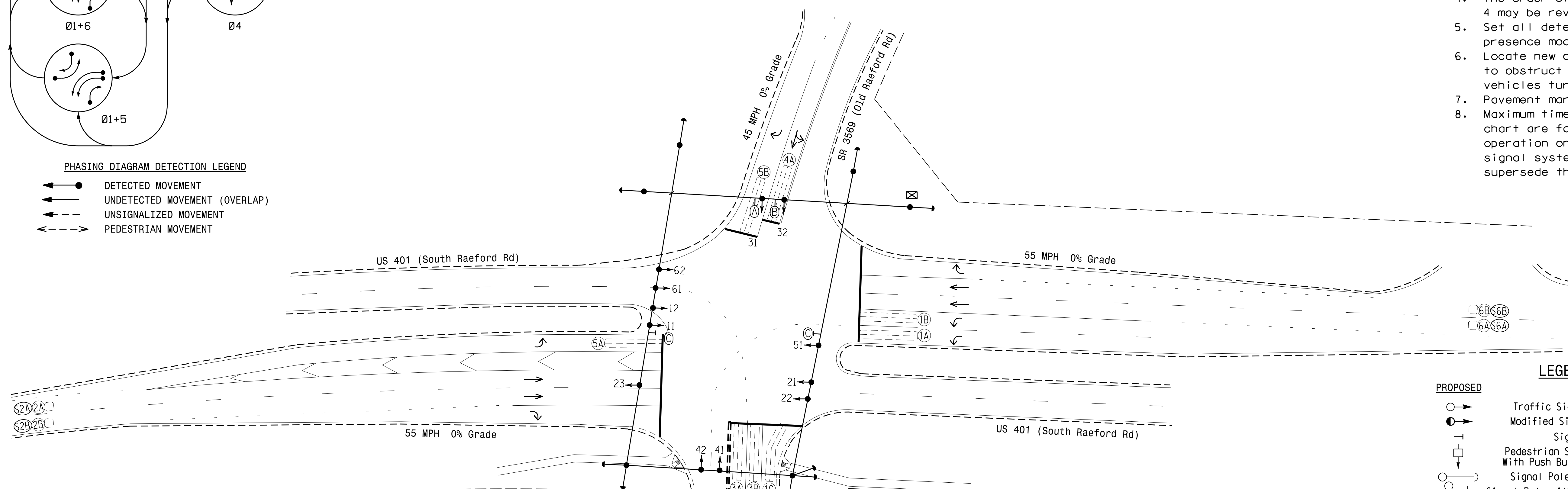


ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR						PROGRAMMING				
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	LOOP NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	X
1B	6X40	0	2-4-2	-	1	Yes	-	-	S	X
1C	6X40	0	2-4-2	-	1	Yes	-	15	S	X
2A/S2A	6X6	420	6	-	2	Yes	-	-	N	X
2B/S2B	6X6	420	6	-	2	Yes	-	-	N	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	S	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	S	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	S	X
6A/S6A	6X6	420	6	-	6	Yes	-	-	N	X
6B/S6B	6X6	420	6	-	6	Yes	-	-	N	X

**6 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART						
FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	14	7	7	7	14
Walk *	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max 1 *	20	90	30	20	25	90
Yellow	3.0	5.2	3.8	4.5	3.0	5.2
Red Clear	3.7	1.3	2.5	2.2	3.3	1.3
Actuations B4 Add *	-	0	-	-	-	0
Seconds / Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	46	-	-	-	46
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.4	-	-	-	3.4
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ Traffic Signal Head
○→ Modified Signal Head	N/A
↑ Sign	↑ Sign
□ Pedestrian Signal Head	□ Pedestrian Signal Head
□ Sign Pole with Guy	□ Sign Pole with Guy
□ Signal Pole with Sidewalk Guy	□ Signal Pole with Sidewalk Guy
□ Inductive Loop Detector	□ Inductive Loop Detector
□ Controller & Cabinet	□ Controller & Cabinet
□ Junction Box	□ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
--- Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
N/A Wheel Chair Ramp	→ Wheel Chair Ramp
(A) Left Arrow "ONLY" Sign (R3-5L)	(A) Left Arrow "ONLY" Sign (R3-5L)
(B) Combined Through and Left Arrow Sign (R3-6L)	(B) Combined Through and Left Arrow Sign (R3-6L)
(C) "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	(C) "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)

**Signal Upgrade**

US 401 (South Raeford Road) at SR 3569 (Old Raeford Road) / Two Bale Lane

Division 6 Cumberland County Fayetteville

PLAN DATE: January 2016 REVIEWED BY: PLA, PE

PREPARED BY: EM Minshew REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 1" = 40'

REVISIONS: INIT. DATE

SEAL: PROFESSIONAL ENGINEER, N.C. STATE BOARD OF EXAMINERS, NAME: ALEXANDER, SEAL NO. 023489, DATE: 4/28/2016

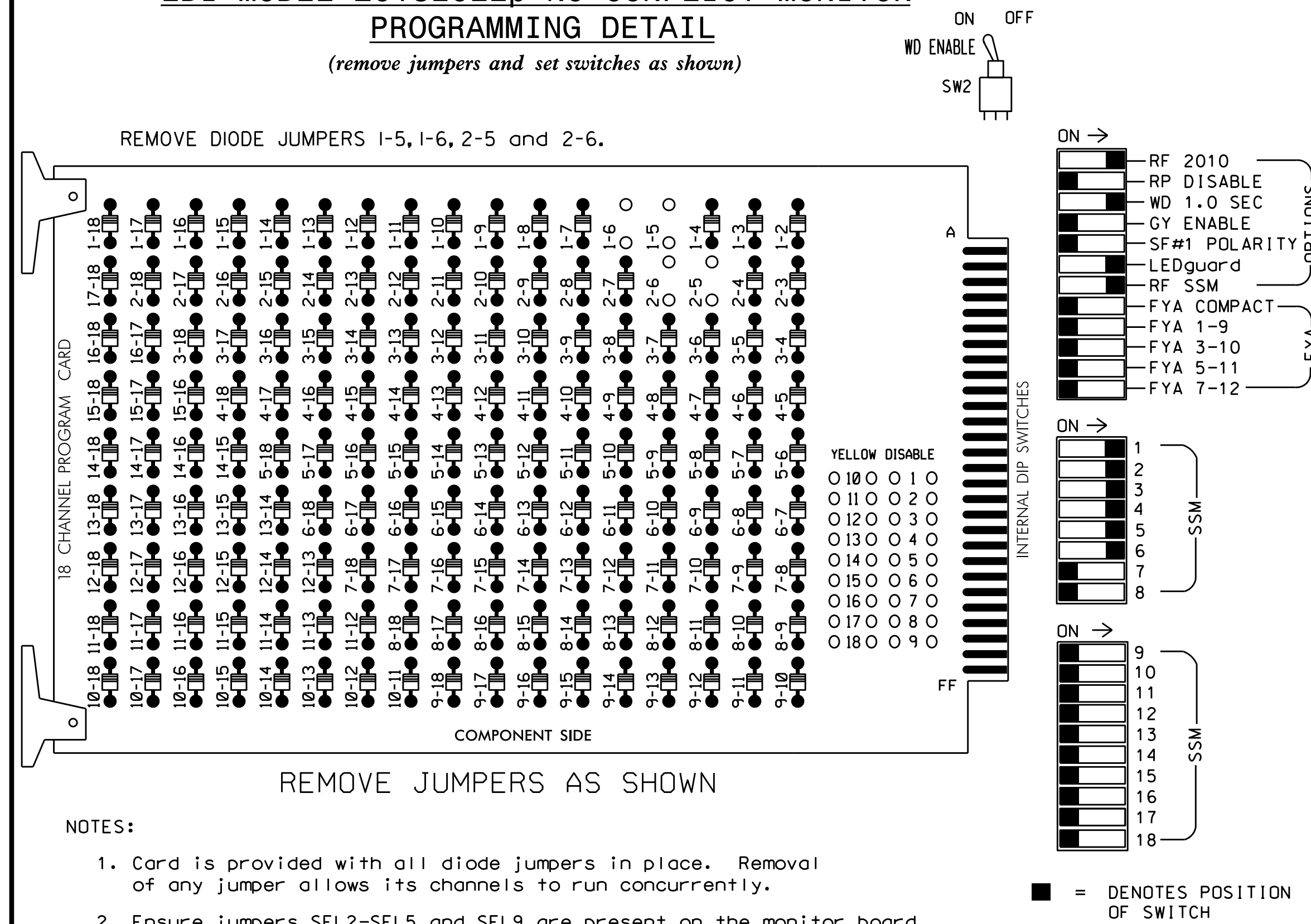
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 06-1277

S:\4\154-2016-16-37  
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 7:00:11 AM

**EDI MODEL 2018ECLIP-NC 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8  
 PHASES USED.....1,2,3,4,5,6  
 OVERLAPS.....NOT USED

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12					
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16					
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED					
SIGNAL HEAD NO.	11,12	32	21,22 23	NU	31	32	41	42	62	NU	42	51	61,62	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	125													131			
YELLOW ARROW	126	126						102		132	132						
GREEN ARROW	127	127			118	103	103		133	133							

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅2/SYS	S	∅ 3	∅ 4	S	S	S	S	S	S	S	FS
L	1A	1B	2A/S1	∅	3A	4A	∅	∅	∅	∅	∅	∅	∅	DC ISOLATOR
U	NOT USED	∅ 1	∅2/SYS	∅	∅ 3	NOT USED	∅	∅	∅	∅	∅	∅	∅	ST
L		1C	2B/S2	∅	3B		∅	∅	∅	∅	∅	∅	∅	DC ISOLATOR
U	∅ 5	∅ 5	∅6/SYS	S	S	S	S	S	S	S	S	S	S	S
L	5A	5B	6A/S3	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
U	NOT USED	NOT USED	∅6/SYS	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅
L			6B/S4	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅	∅

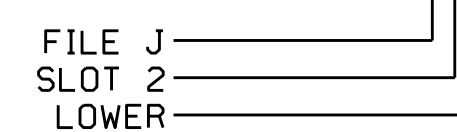
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
1B	TB2-5,6	I2U	39	2	1	YES			S
1C	TB2-7,8	I2L	43	12	1	YES		15	S
2A/S1	TB2-9,10	I3U	63	32	2	YES			N
2B/S2	TB2-11,12	I3L	76	42	2	YES			N
3A	TB4-5,6	I5U	58	3	3	YES			S
3B	TB4-7,8	I5L	58	3	3	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A/S3	TB3-9,10	J3U	64	36	6	YES			N
6B/S4	TB3-11,12	J3L	77	46	6	YES			N

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1277  
 DESIGNED: January 2016  
 SEALED: 4-28-16  
 REVISED: N/A

**Electrical Detail**

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

US 401 (South Raeford Road) at SR 3569 (Old Raeford Road) / Two Bale Lane

Division 6 Cumberland County Fayetteville

PLAN DATE: April 2016 REVIEWED BY: DTJ

PREPARED BY: James Peterson REVIEWED BY:

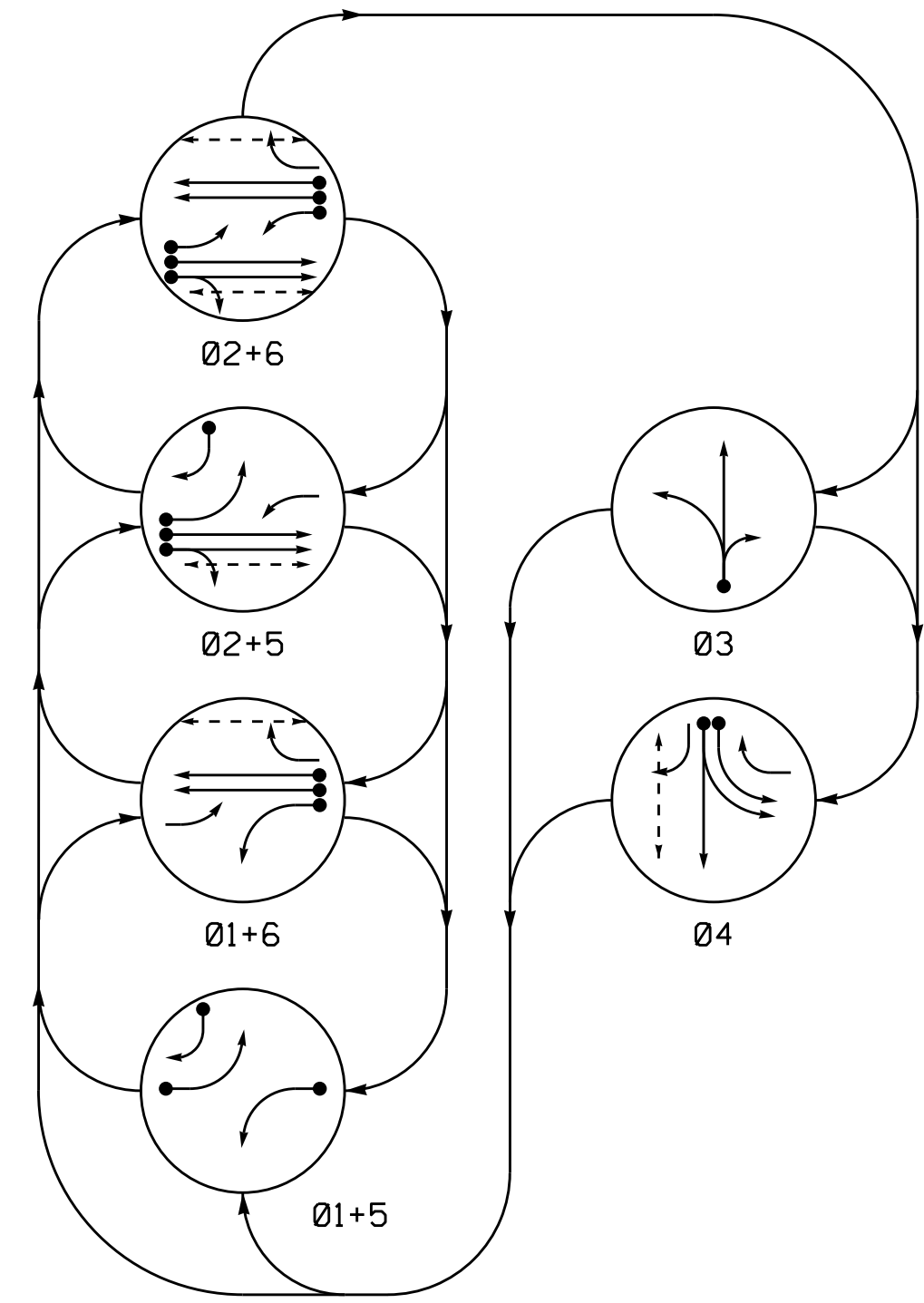
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

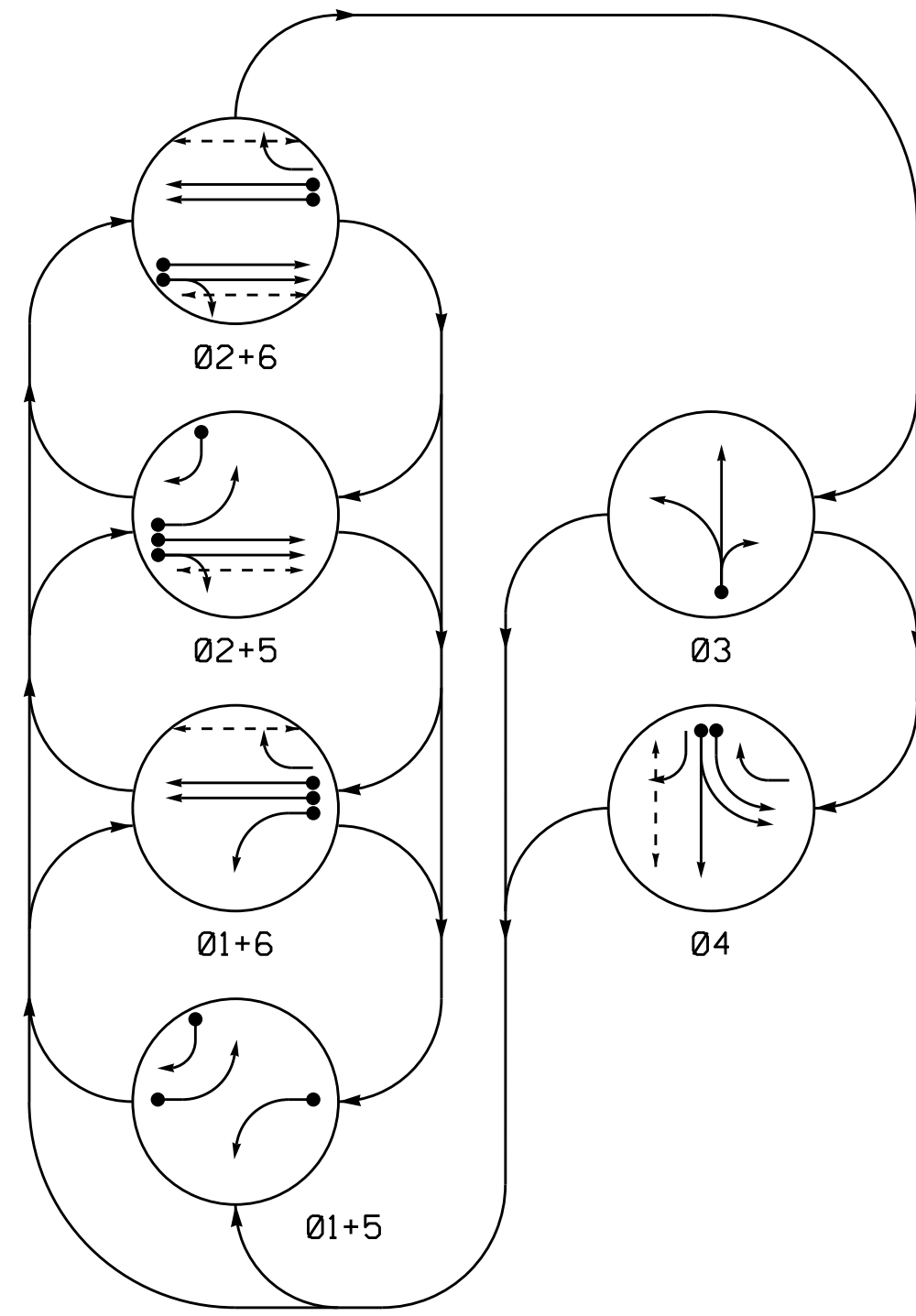
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 KEITH M. MINS  
 036880  
 Date Signed: 5/24/2016  
 DATE

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 J.peterson

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	02+6	03	04	F	Y
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	R
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK

ALTERNATIVE PHASING TABLE OF OPERATION

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

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME		
1A	6X40	0	2-4-2	-	1	Yes	-	15*	S	-
2A/S2A	6X6	300	5	-	2	Yes	-	-	N	X
2B/S2B	6X6	300	5	-	2	Yes	-	-	N	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	S	-
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-
5A	6X40	0	2-4-2	-	5	Yes	-	15*	S	-
5B	6X40	0	2-4-2	-	5	Yes	-	15	S	-
6A/S6A	6X6	300	5	-	6	Yes	-	-	N	X
6B/S6B	6X6	300	5	-	6	Yes	-	-	N	X

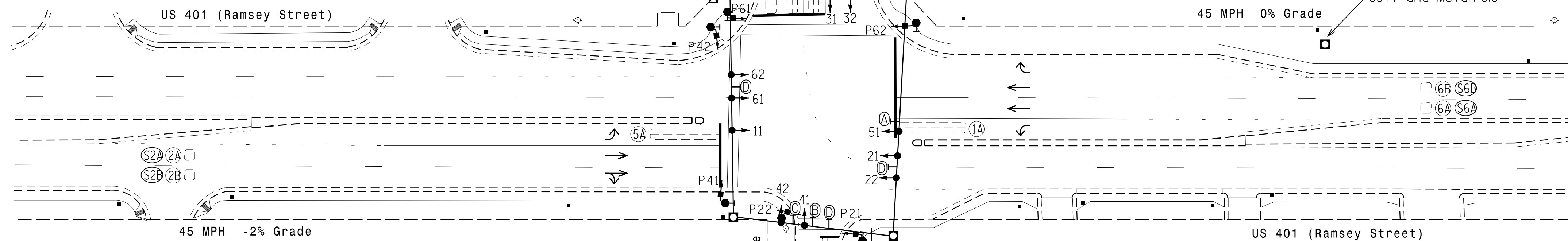
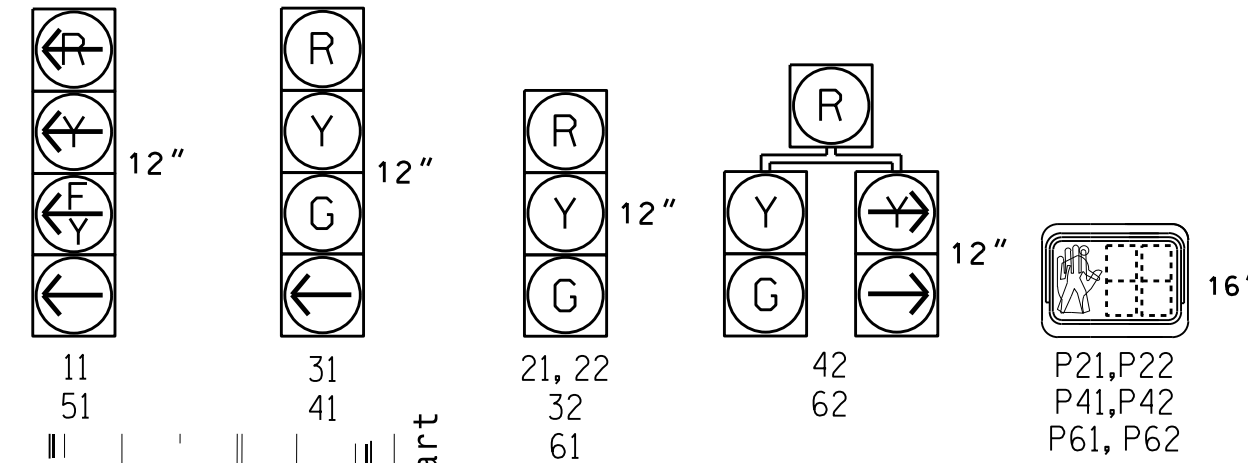
\* Disable Delay During Alternate Phasing Operation.  
 \*\* Disable Phase 2/6 CallFor Loops 1A and 5A During Alternate Phasing Operation.

6 Phase Fully Actuated Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. The Division Traffic Engineer will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

SIGNAL FACE I.D.



ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	7	-	7	-	7
Ped Clear	-	7	-	23	-	21
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	20	70	30	30	20	70
Yellow	3.0	4.7	3.1	3.2	3.0	4.7
Red Clear	2.6	1.4	3.1	3.1	3.1	1.4
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	-	0
Seconds /Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

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

Signal Upgrade

US 401 (Ramsey Street) at Meadowcroft Drive/ North Walmart Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016 REVIEWED BY: JPG

PREPARED BY: KGP, Jr. REVIEWED BY:

SCALE: 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

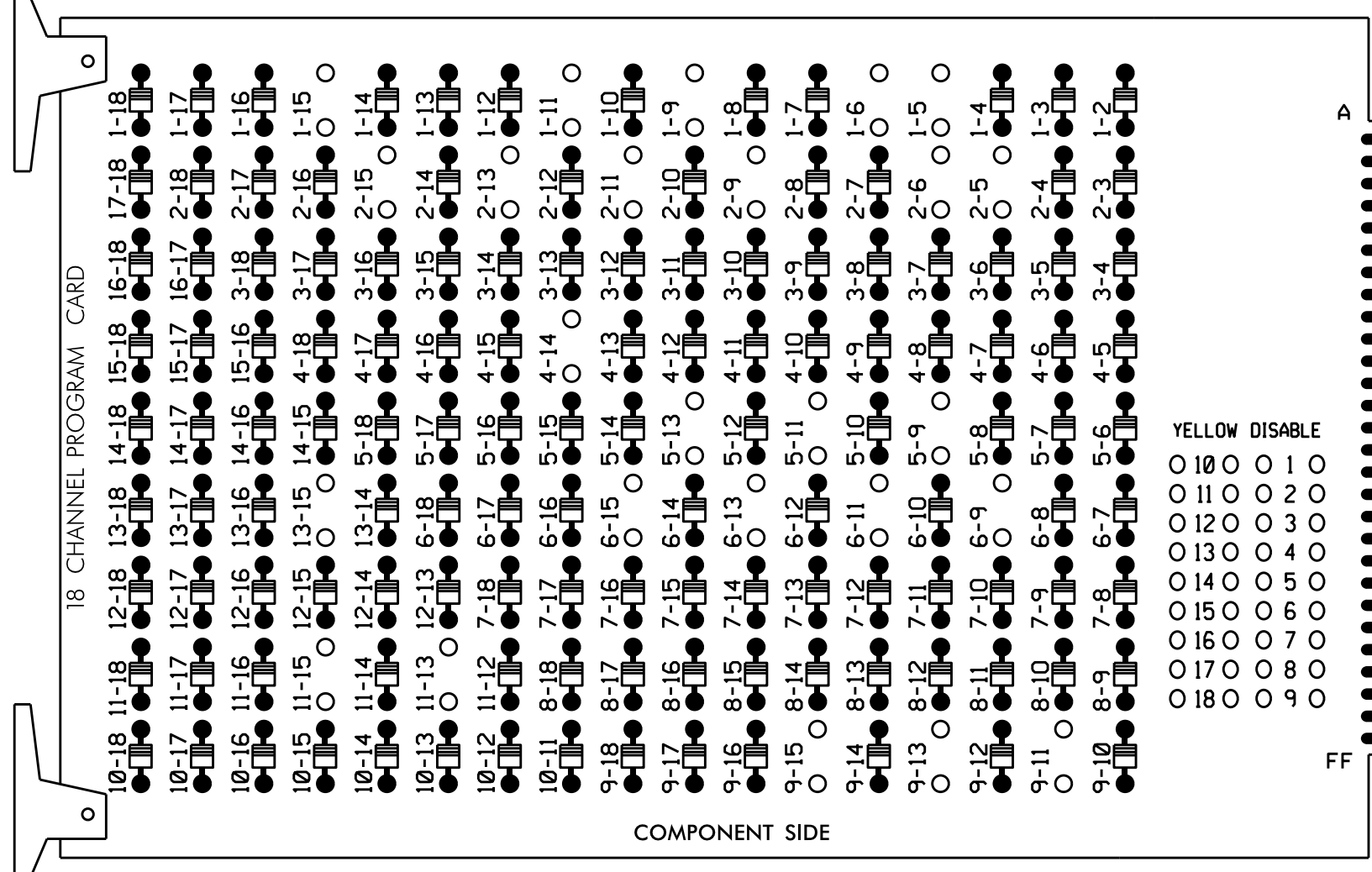
Jason P. Calloway 10/15/2016

SIG. INVENTORY NO. 06-1280

### EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

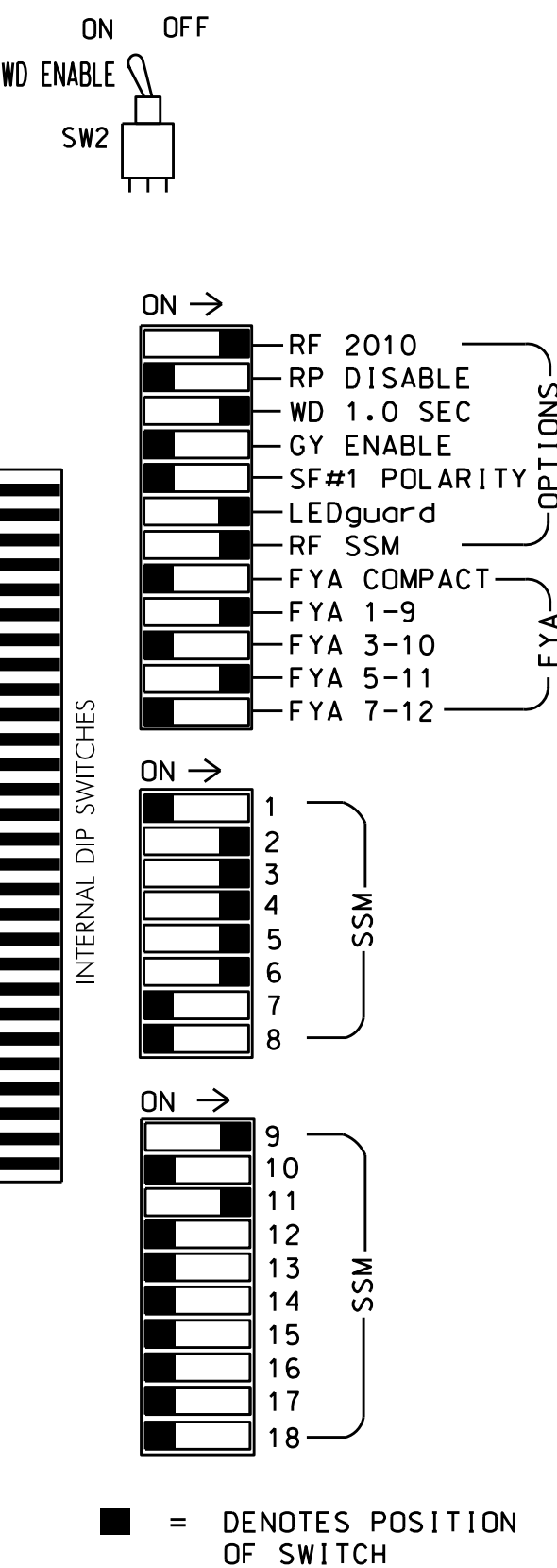
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15.



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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,  
 AUX S1,AUX S4  
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

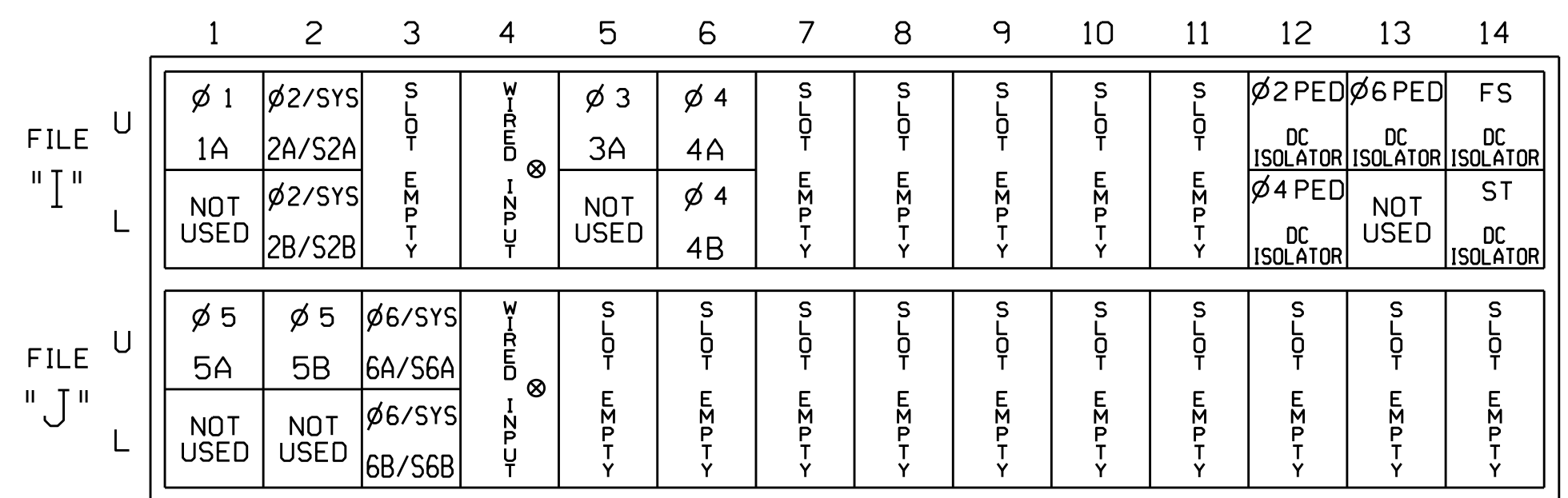
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE			
SIGNAL HEAD NO.	11	21,22	P21, P22	31	32	41	42	62	P41, P42	42	51	61,62	P61, P62	NU	NU	NU	11	51	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	A114	
YELLOW ARROW								102		132										A122	A115
FLASHING YELLOW ARROW																				A123	A116
GREEN ARROW	127			118		103		103		133	133										
Hand icon				113						104			119								
Person icon				115						106			121								

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

### INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

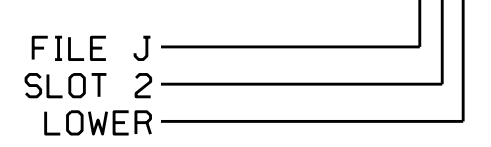
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	★ 1	1	YES		15	S
		J4U	48	★ 26	6	YES		3	G
2A/S2A	TB2-5,6	I2U	39	2	2/SYS	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2/SYS	YES			N
3A	TB4-5,6	I5U	58	3	3	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A <sup>2</sup>	TB3-1,2	J1U	55	★ 5	5	YES		15	S
		J4U	47	★ 22	2	YES		3	G
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A/S6A	TB3-9,10	J3U	64	36	6/SYS	YES			N
6B/S6B	TB3-11,12	J3L	77	46	6/SYS	YES			N
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				

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

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 3.

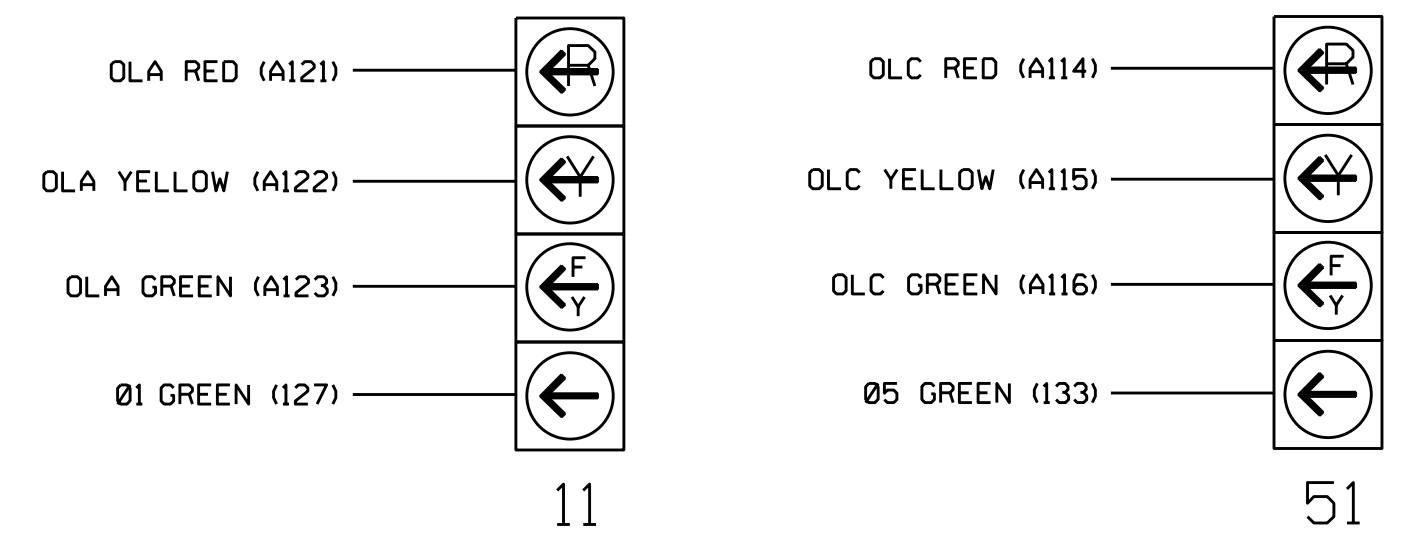
- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.

#### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

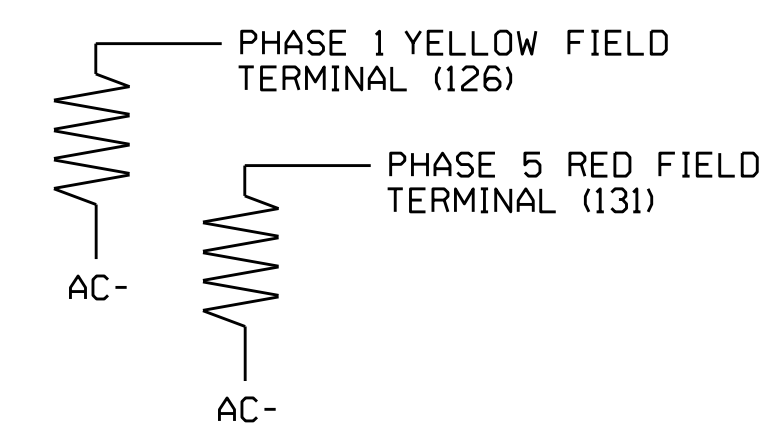


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1280  
 DESIGNED: August 2016  
 SEALED: 10/15/2016  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



17-007-2016 13-13 S:\MIS\Signal\work\hgr\oups\g\Map\hgr\strong\061280\_sml.e.xxx.dgn somstrong

Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 401 (Ramsey Street) at Meadowcroft Drive/ North Walmart Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

Sealed by:   
 Keith M. Mims 10/28/2016  
 DATE

SIG. INVENTORY NO. 06-1280

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

### OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

TMG VEH OVLP...[A] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 1  
 OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0  
 ACTION PLAN SF BIT DISABLE..... 1

← NOTICE ACTION  
PLAN SF BIT "1"

Toggle Twice

### OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 5  
 OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0  
 ACTION PLAN SF BIT DISABLE..... 5

← NOTICE ACTION  
PLAN SF BIT "5"

END PROGRAMMING


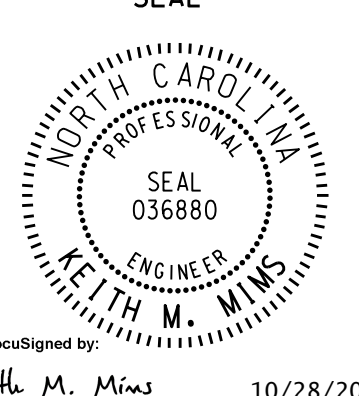
### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1280  
 DESIGNED: August 2016  
 SEALED: 10/15/2016  
 REVISED: N/A

Electrical Detail - Sheet 2 of 4

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

 <p style="font-size: 8px;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>ELECTRICAL AND PROGRAMMING DETAILS FOR:</b></p> <p><b>US 401 (Ramsey Street) at Meadowcroft Drive/ North Walmart Entrance</b></p>	<p>SEAL</p> 									
	<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: October 2016 REVIEWED BY: BAS</p> <p>PREPARED BY: S. Armstrong REVIEWED BY:</p>	<p>DocuSigned by: <i>Keith M. Mims</i> 10/28/2016</p> <p>SIG. INVENTORY NO. 06-1280</p>									
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REVISIONS	INIT.	DATE									

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sarmstrong

# ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING (FOR LOOPS 1A AND 5A)

(program controller as shown)

## IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select **8. UTILITIES**
  2. From UTILITIES Submenu select **1. COPY/CLEAR**
  3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".
- COPY / CLEAR UTILITY  
FROM TO  
PHASE TIMING.... > PHASE TIMING....  
TIMING PLAN.... > TIMING PLAN....  
PH DET OPT PLAN. > PH DET OPT PLAN.  
DETECTOR PLAN.. 1 > DETECTOR PLAN.. 2  
TOGGLE TO SELECT A "FROM" AND A "TO"  
THEN PRESS ENTER
4. From Main Menu select **6. DETECTORS**
  5. From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
  6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".  
- Set delay time to "0".

```

VEH DETECTOR [ 1]  VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 1 .....
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "26".  
- Set assigned phase to "0".

← NOTICE VEH DET PLAN 2

```

VEH DETECTOR [26]  VEH DET PLAN [ 2]
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
26 0 .....
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
    
```

← NOTICE VEH DET PLAN 2

- Place cursor in VEH DETECTOR [ ] position and enter "5".  
- Set delay time to "0".

```

VEH DETECTOR [ 5]  VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
5 5 .....
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "22".  
- Set assigned phase to "0".

← NOTICE VEH DET PLAN 2

```

VEH DETECTOR [22]  VEH DET PLAN [ 2]
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
22 0 .....
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
    
```

← NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0" →

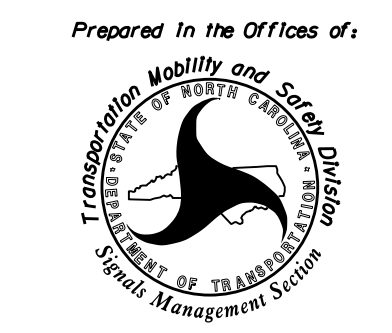
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1280  
DESIGNED: August 2016  
SEALED: 10/15/2016  
REVISED: N/A

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 sarmstrong

Electrical Detail - Sheet 3 of 4

Prepared In the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

**US 401 (Ramsey Street)  
at  
Meadowcroft Drive/  
North Walmart Entrance**

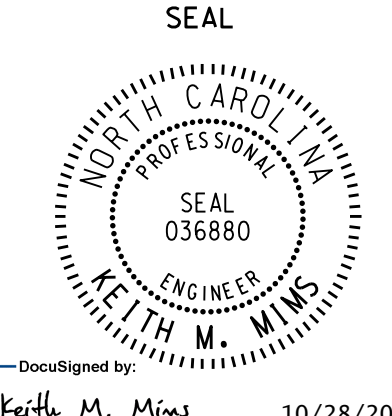
Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

SEAL



DocuSigned by:  
**Keith M. Mims** 10/28/2016

SIG. INVENTORY NO. 06-1280

REVISIONS	INIT.	DATE

### ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 AND 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 AND 5.

<u>PHASING</u>	<u>VEH DET PLAN</u>	<u>SF BITS ENABLED</u>
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	1,5

**IMPORTANT:** IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

#### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1,5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- SF BITS 1,5:           Modifies overlap parent phases for heads 11 and 51 to run protected turns only.
  
- VEH DET PLAN 2:    Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.
  
- Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1280  
DESIGNED: August 2016  
SEALED: 10/15/2016  
REVISED: N/A

### ECONOLITE ASC/3-2070 ACTION PLAN

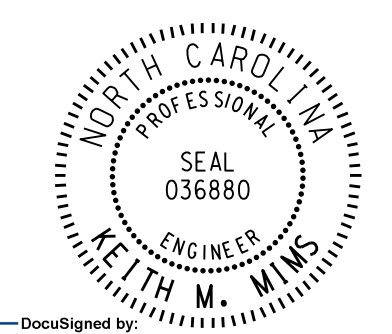
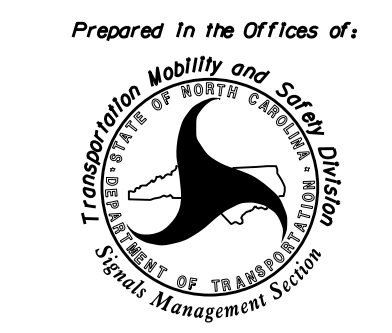
#### PROGRAMMING DETAIL

1. From Main Menu select 5. TIME BASE
2. From TIME BASE Submenu select 2. ACTION PLAN

```

ACTION PLAN...[ 1]
PATTERN.....AUTO  SYS OVERRIDE.... NO
TIMING PLAN..... 0  SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --  RED REST..... NO
VEH DET DIAG PLN.. 0  PED DET DIAG PLN..0
DIMMING ENABLE.. NO  PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND DELAY  NO
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT  X  .  .  .  X  .  .  .  .  .  .  .  .  .  .  .
AUX FCT  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .

```

Electrical Detail - Sheet 4 of 4		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ELECTRICAL AND PROGRAMMING DETAILS FOR:	<b>US 401 (Ramsey Street)</b> at <b>Meadowcroft Drive/          North Walmart Entrance</b>	SEAL 
Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Division 6    Cumberland County    Fayetteville PLAN DATE: October 2016    REVIEWED BY: BAS PREPARED BY: S. Armstrong    REVIEWED BY:	DocuSigned by: Keith M. Mims    10/28/2016 DATE SIG. INVENTORY NO. 06-1280

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sarmstrong

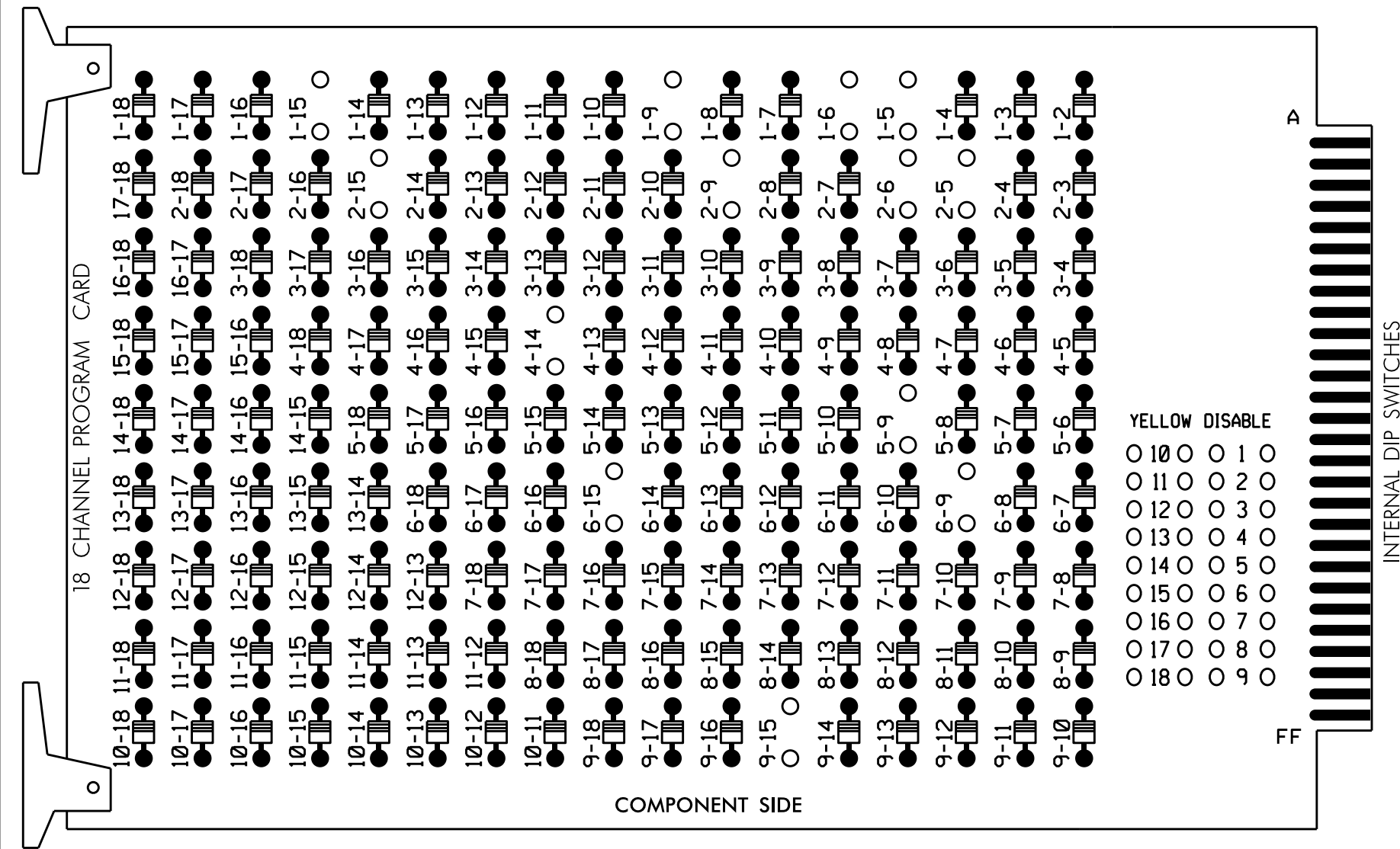




**EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-15, 2-5, 2-6, 2-9, 2-15, 4-14, 5-9, 6-9, 6-15 and 9-15.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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

■ = DENOTES POSITION OF SWITCH

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Walk.
5. The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8,S9,AUX S1  
 PHASES USED.....1,2,4,4 PED,5,6,6 PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail this sheet

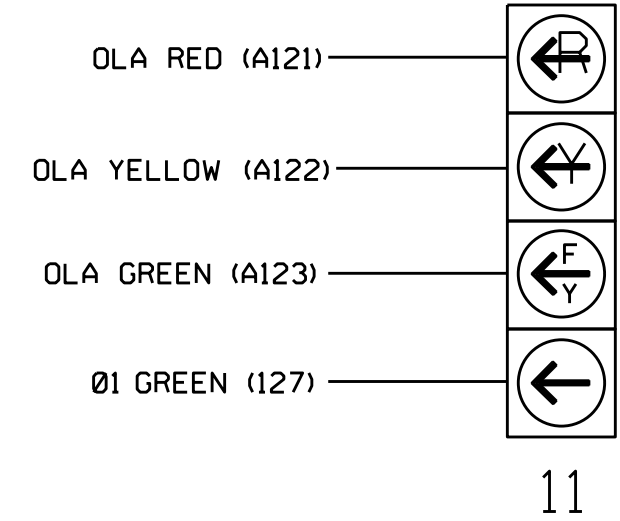
**SIGNAL HEAD HOOK-UP CHART**

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	62	P41, P42	42	51,52	61,62	P61, P62	NU	NU	NU	11	NU	NU	NU
RED		128			101					134								
YELLOW	*	129			102					135								
GREEN		130			103					136								
RED ARROW										131						A121		
YELLOW ARROW						102	132	132								A122		
FLASHING YELLOW ARROW																A123		
GREEN ARROW	127					103	133	133										
Hand icon							104						119					
Walking person icon							106						121					

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

**4 SECTION FYA PPLT SIGNAL WIRING DETAIL**

(wire signal head as shown)



**INPUT FILE POSITION LAYOUT**

(front view)

FILE	U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14
	L	1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A
"J"	U	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18
	L	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	15A	16A	17A	18A

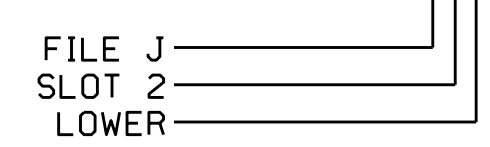
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
		J4U	48	26	6	YES		3	G
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-5,6	J2U	40	6	5	YES			S
5C	TB3-7,8	J2L	44	16	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES			N
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				

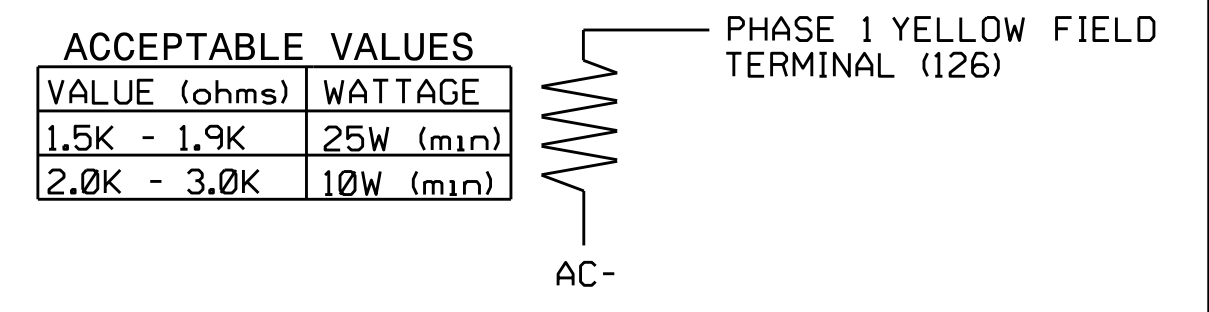
NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
 INPUT FILE POSITION LEGEND: J2L



**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)



**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

1. From Main Menu select **2. CONTROLLER**
2. From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

**OVERLAP A**

Select TMG VEH OVLP [A] and 'PPLT FYA'

TMG VEH OVLP... [A] TYPE: .... [PPLT FYA]

PROTECTED LEFT TURN.... PHASE 1  
 OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0  
 ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

**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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:  
 Transportation Mobility and Safety Solutions  
 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Ramsey Street) at Walmart Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

Seal of Zachary M. Little, Professional Engineer, License No. 030530, State of North Carolina.

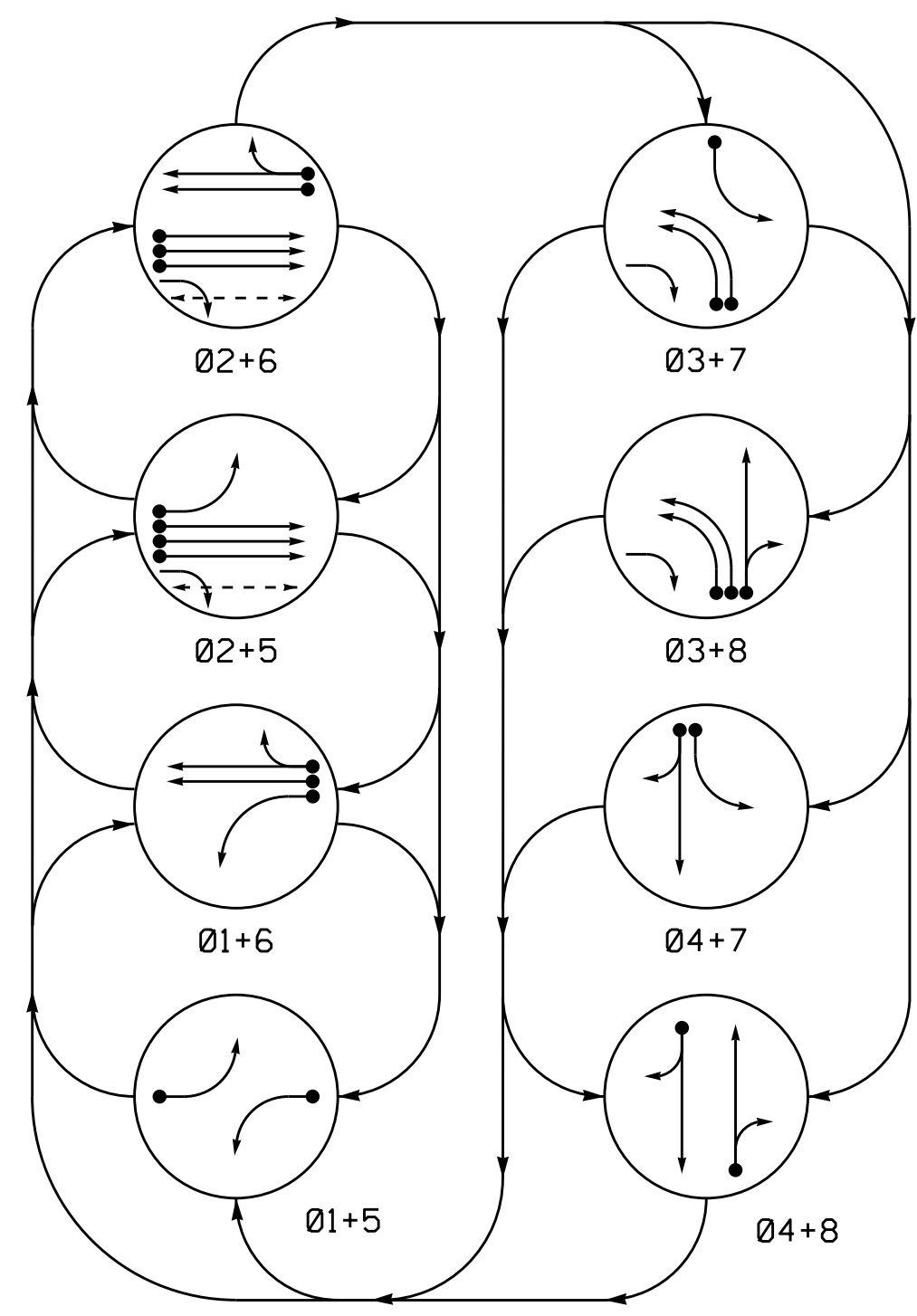
DocuSigned by: Zachary M. Little 10/12/2016

SIG. INVENTORY NO. 06-1281

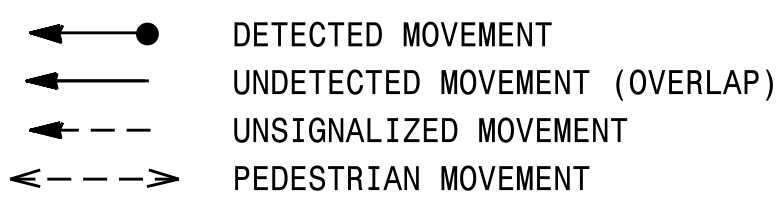
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1281  
 DESIGNED: August 2016  
 SEALED: 10/6/2016  
 REVISED:

07-007-2016 15:19 S:\IT\ASIS\115\Sigal\work\hgr\oups\g\_Maps\Trk\lnd\061281\_Lsm\_ele\_xxx\_asc3.dgn CASH:CKL:and

**PHASING DIAGRAM**



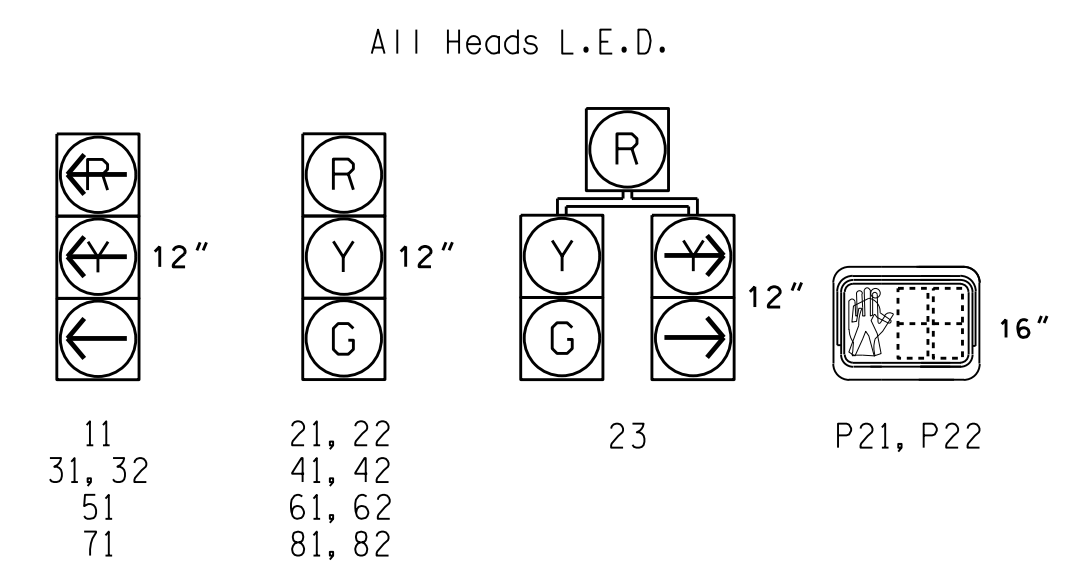
**PHASING DIAGRAM DETECTION LEGEND**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	—	—	—	—	—	—	—	—
21, 22	R	R	G	G	R	R	R	Y
23	R	R	G	G	R	R	R	Y
31, 32	—	—	—	—	—	—	—	—
41, 42	R	R	R	R	R	R	G	G
51	—	—	—	—	—	—	—	—
61, 62	R	G	R	G	R	R	R	Y
71	—	—	—	—	—	—	—	—
81, 82	R	R	R	R	R	G	R	G
P21, P22	DW	DW	W	W	DW	DW	DW	DRK

**SIGNAL FACE I.D.**



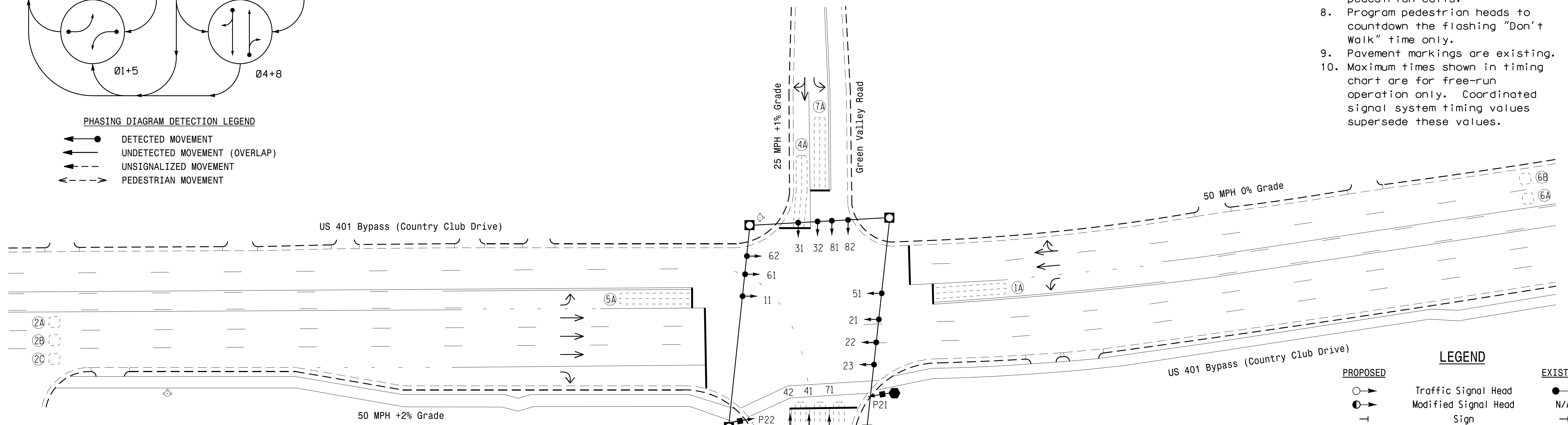
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE		
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
2A	6X6	355	5	-	2	Yes	-	-	N	-	X
2B	6X6	355	5	-	2	Yes	-	-	N	-	X
2C	6X6	355	5	-	2	Yes	-	-	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	S	-	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	10	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
6A	6X6	355	6	-	6	Yes	-	-	N	-	X
6B	6X6	355	6	-	6	Yes	-	-	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	10	S	-	X

**8 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

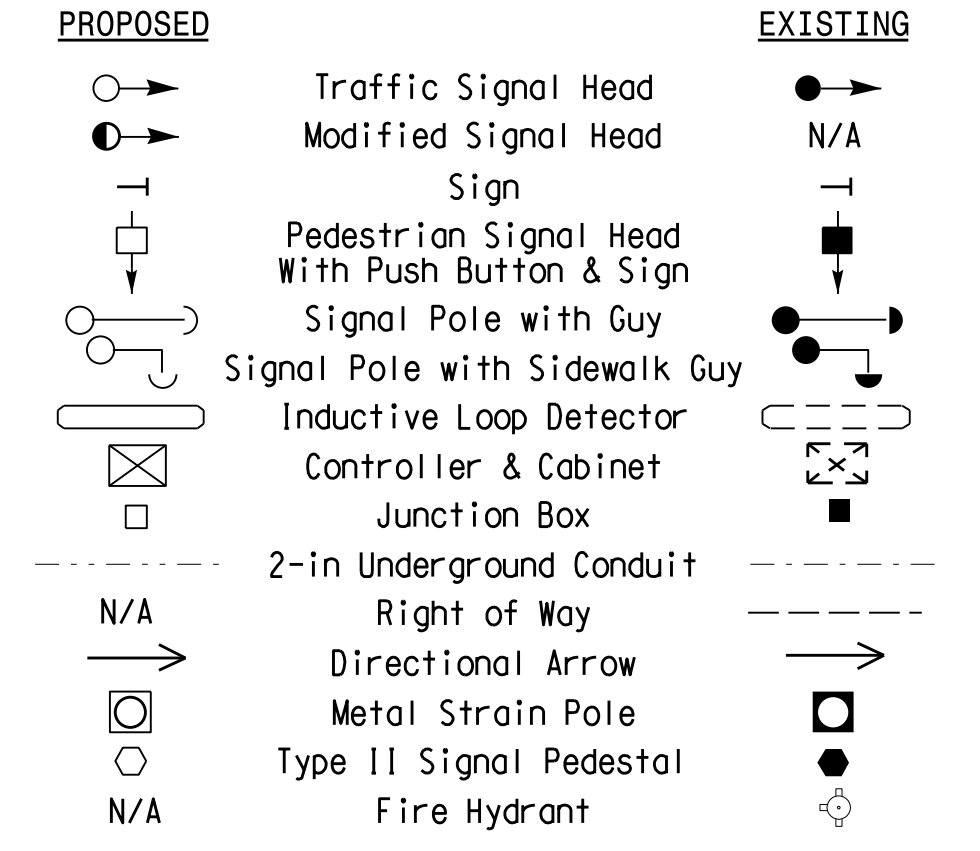


**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Walk *	-	7	-	-	-	-	-	-
Ped Clear	-	18	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	15	90	15	20	15	90	20	20
Yellow	3.0	4.8	3.0	3.8	3.0	4.8	3.0	3.8
Red Clear	3.3	1.1	2.9	1.8	2.9	1.1	2.4	1.8
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	-	0	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	40	-	-	-	40	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	45	-	-	-	45	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

**LEGEND**



**Signal Upgrade**

Prepared In the Offices of:  
  
 TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC.  
 ENGINEERS OF TRANSPORTATION SIGNAL DESIGN SECTION  
 750 N. Greenfield Pkwy, Garner, NC 27529

**US 401 Bypass (Country Club Drive) at Green Valley Road**

Division 6 Cumberland County Fayetteville  
 PLAN DATE: December 2015 REVIEWED BY: JG  
 PREPARED BY: Devin Smith REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE \_\_\_\_\_

SCALE: 1"=30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 JASON P. GALLAGHER  
 PROFESSIONAL ENGINEER  
 No. 029904  
 State of North Carolina  
 4/15/2016

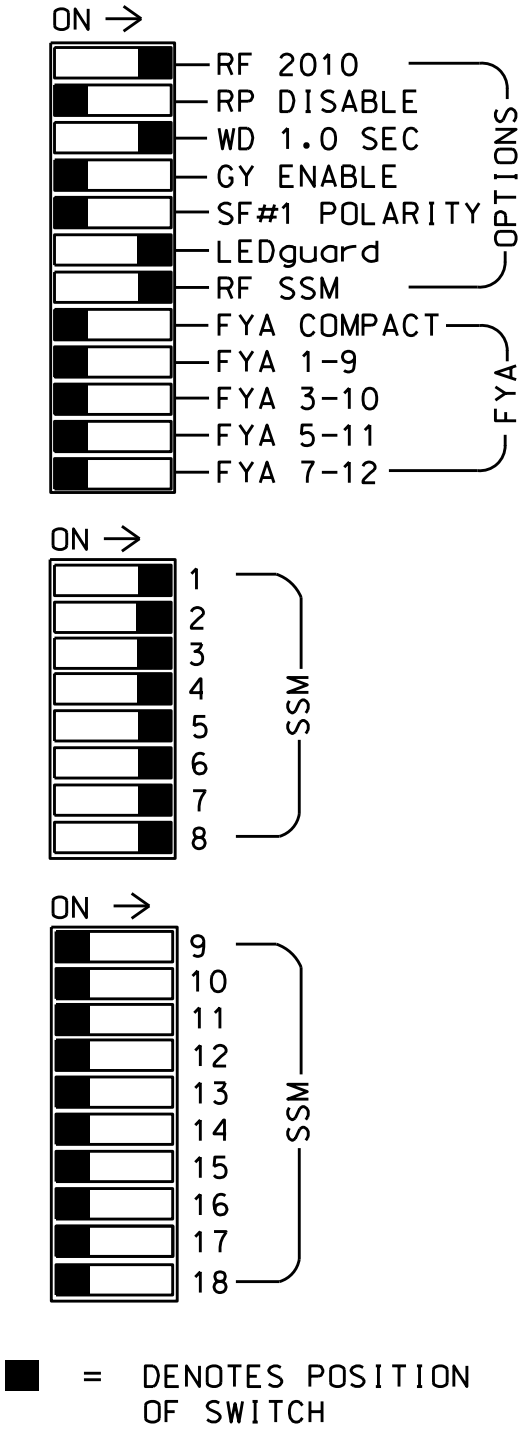
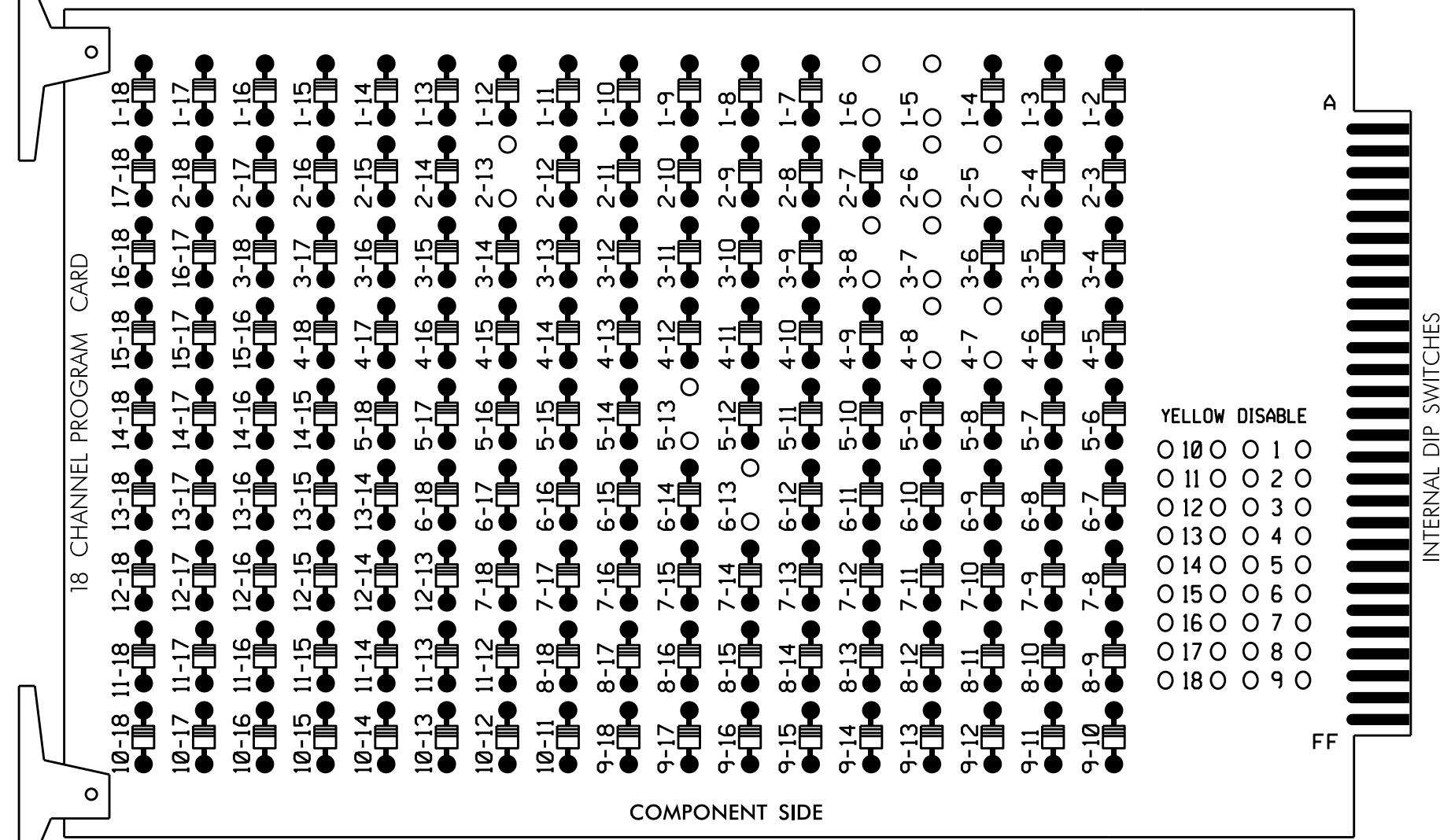
SIG. INVENTORY NO. 06-1286

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 dj smh:tlh

**EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 2-13, 3-7, 3-8, 4-7, 4-8, 5-13 and 6-13.



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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8,S10,S11  
 PHASES USED.....1,2,3,4,5,6,7,8,2 PED  
 OVERLAPS.....NOT USED

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22,23	P21, P22	23	31,32	41,42	NU	51	61,62	NU	71	81,82	NU	NU	NU	NU	NU	NU
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	117			132			123							
GREEN ARROW	127			118	118			133			124							
Hand icon				113														
Walking person icon				115														

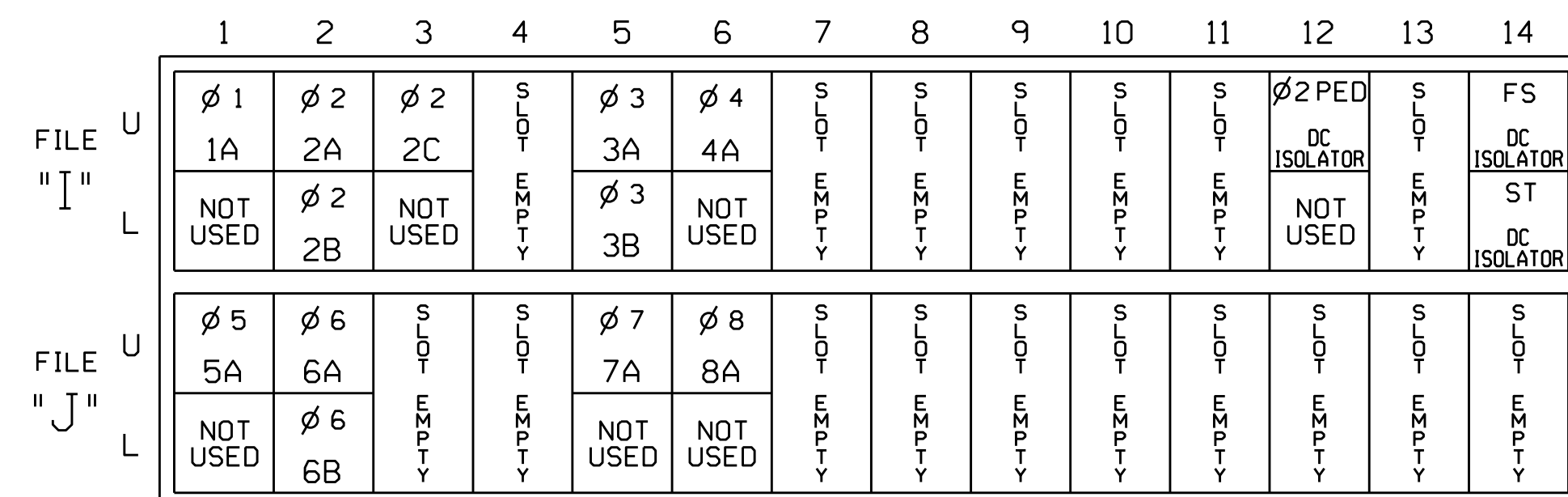
NU = Not Used

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

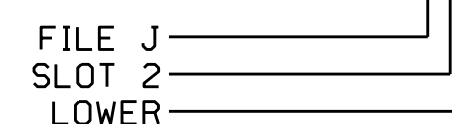
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
2C	TB2-9,10	I3U	63	32	2	YES			N
3A	TB4-5,6	I5U	58	3	3	YES			S
3B	TB4-7,8	I5L	58	3	3	YES			S
4A	TB4-9,10	I6U	41	4	4	YES		10	S
5A	TB3-1,2	J1U	55	5	5	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
7A	TB5-5,6	J5U	57	7	7	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		10	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

**INPUT FILE POSITION LEGEND: J2L**



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1286  
 DESIGNED: December 2015  
 SEALED: 4-15-16  
 REVISED: N/A

**Electrical Detail**

Electrical and Programming Details for: **US 401 Bypass (Country Club Drive) at Green Valley Road**

Division 6 Cumberland County Fayetteville

PLAN DATE: April 2016 REVIEWED BY: DTJ

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER KEITH M. MIMS

DocuSigned by: Keith M. Mims 5/19/2016

SIG. INVENTORY NO. 06-1286

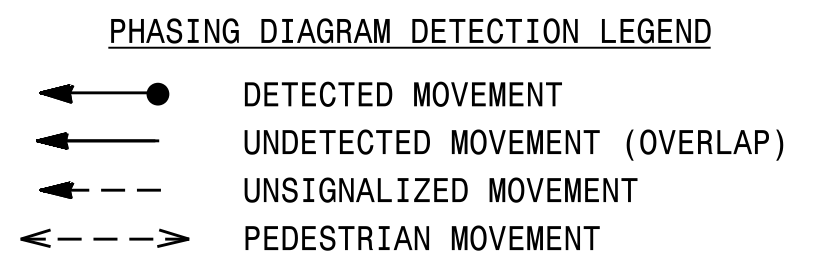
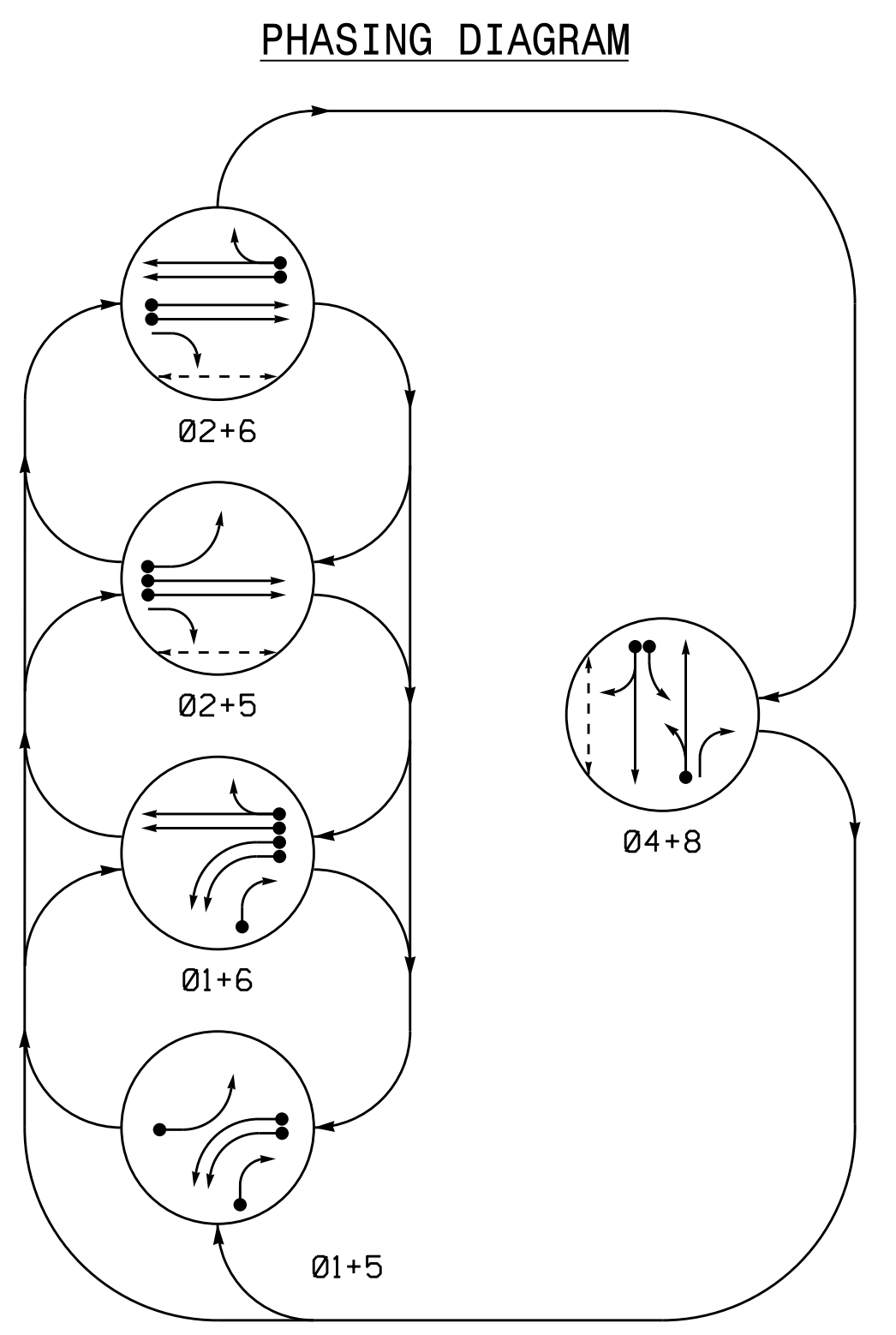
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5 Phase Fully Actuated Fayetteville Signal System

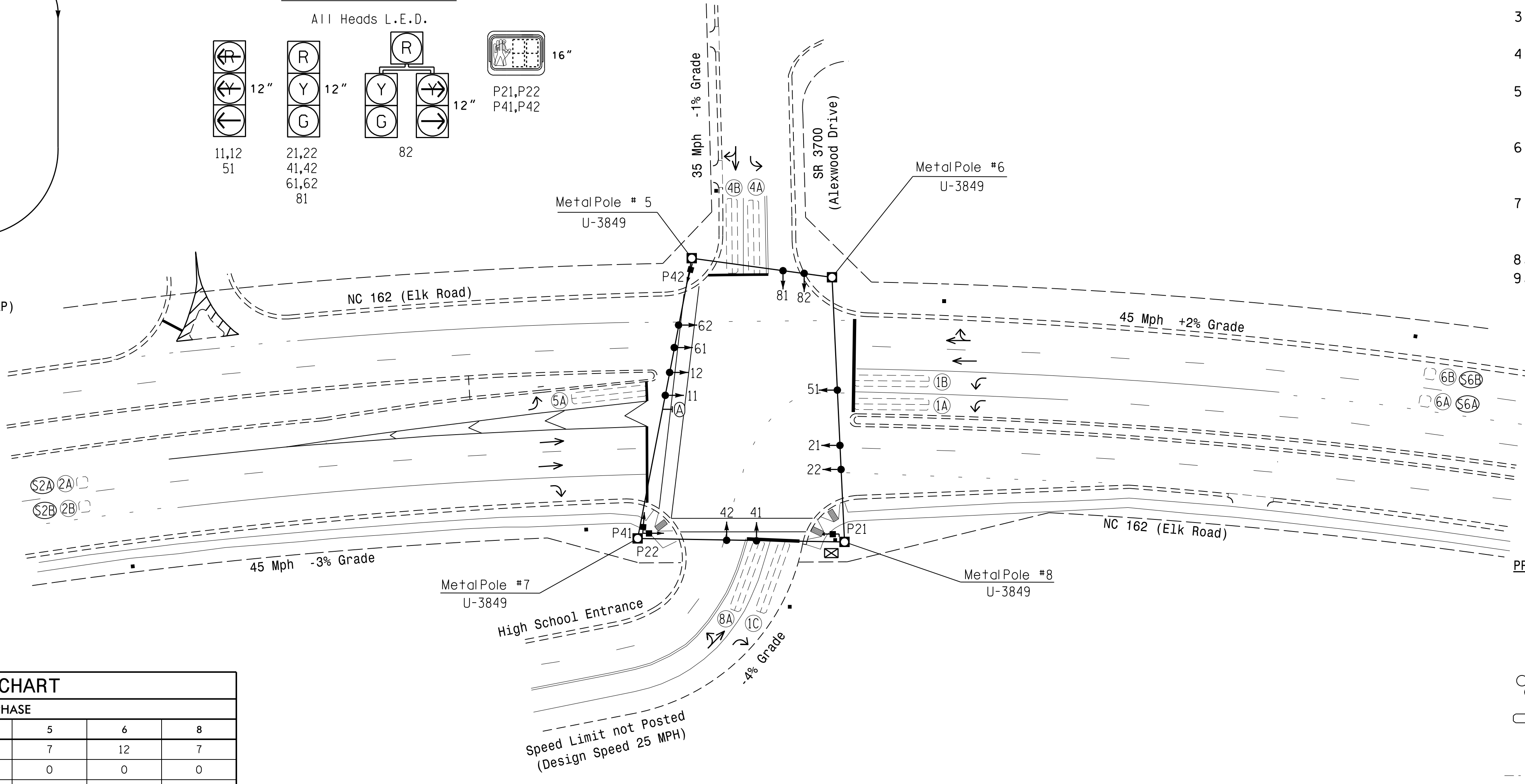
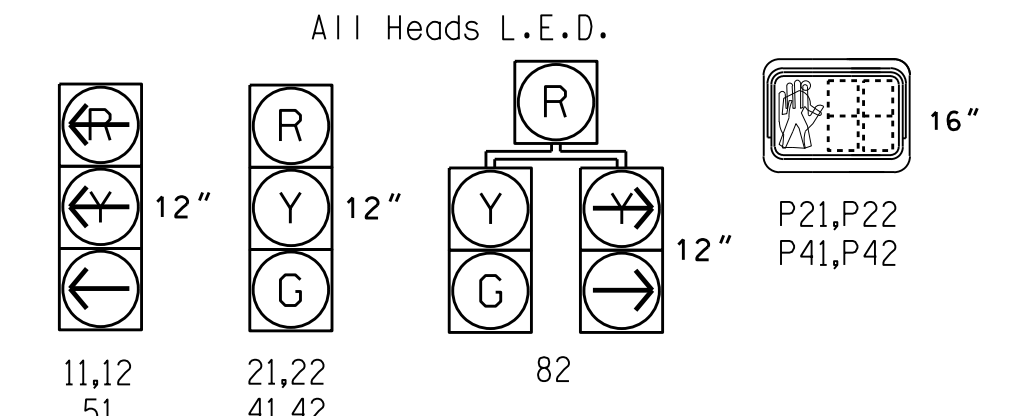
SIGNAL FACE	PHASE					FLASH
	01+5	01+6	02+5	02+6	04+8	
11, 12	R	R	G	R	R	R
21, 22	R	R	G	R	R	Y
41, 42	R	R	R	R	G	R
51	R	R	R	R	R	R
61, 62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-
1B	6X40	0	2-4-2	-	1	Yes	-	-	S	-
1C	6X40	0	2-4-2	-	1	Yes	-	15	S	-
2A/S2A	6X6	300	5	-	2	Yes	-	-	N	X
2B/S2B	6X6	300	5	-	2	Yes	-	-	N	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	S	-
4B	6X40	0	2-4-2	-	4	Yes	-	10	S	-
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-
6A/S6A	6X6	300	5	-	6	Yes	-	-	N	X
6B/S6B	6X6	300	5	-	6	Yes	-	-	N	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	S	-

- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
  - 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.
  - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

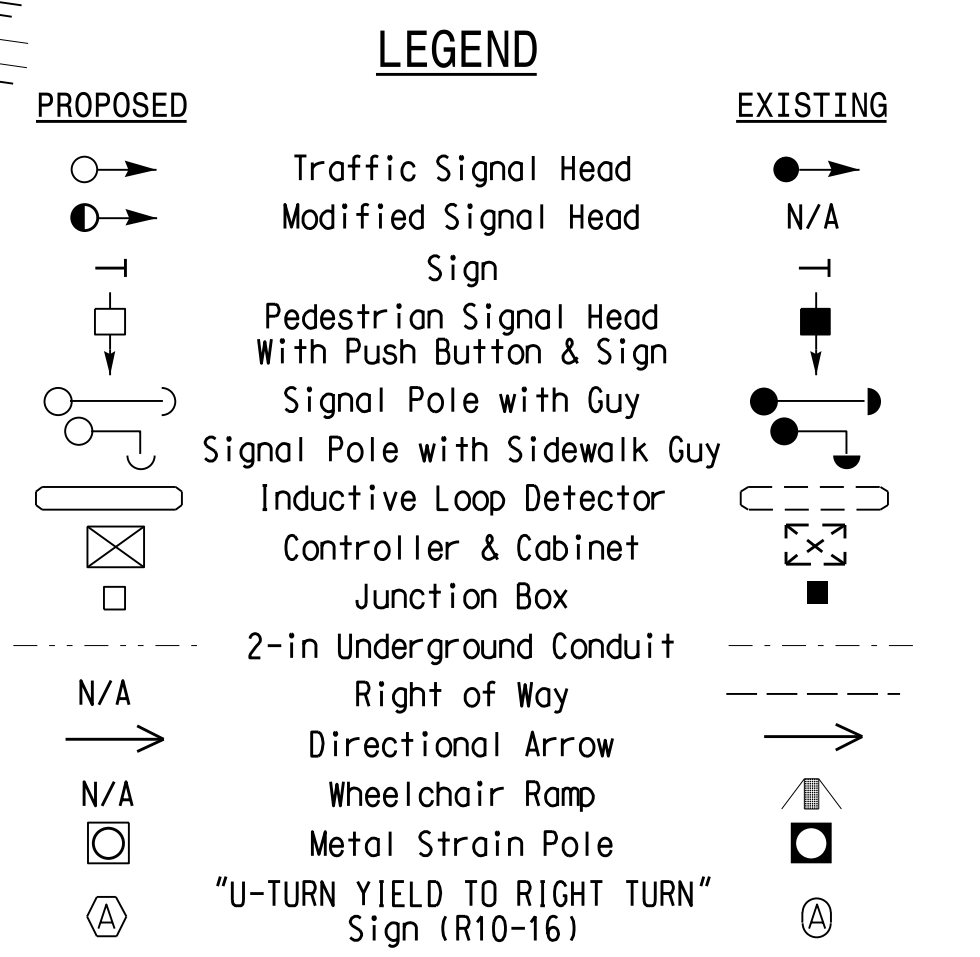


**SIGNAL FACE I.D.**



FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	0	7	7	0	0	0
Ped Clear	0	19	33	0	0	0
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max I *	20	90	25	20	90	25
Yellow	3.0	4.8	3.9	3.0	4.8	3.4
Red Clear	3.3	1.4	3.2	2.9	1.4	3.2
Actuations B4 Add *	-	0	-	-	0	-
Seconds / Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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



Signal Upgrade

Prepared in the Offices of:

TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS  
 DIVISION OF TRANSPORTATION  
 SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

0 SCALE 40  
1"=40'

NC 162 (Elk Road) at SR 3700 (Alexwood Drive) / High School Entrance

Division 6 Cumberland County Hope Mills

PLAN DATE: June 2016 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

REVISIONS: INIT. DATE

Documented by: Jason P. Gallaway 6/21/2016

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029904 P. GALLAWAY

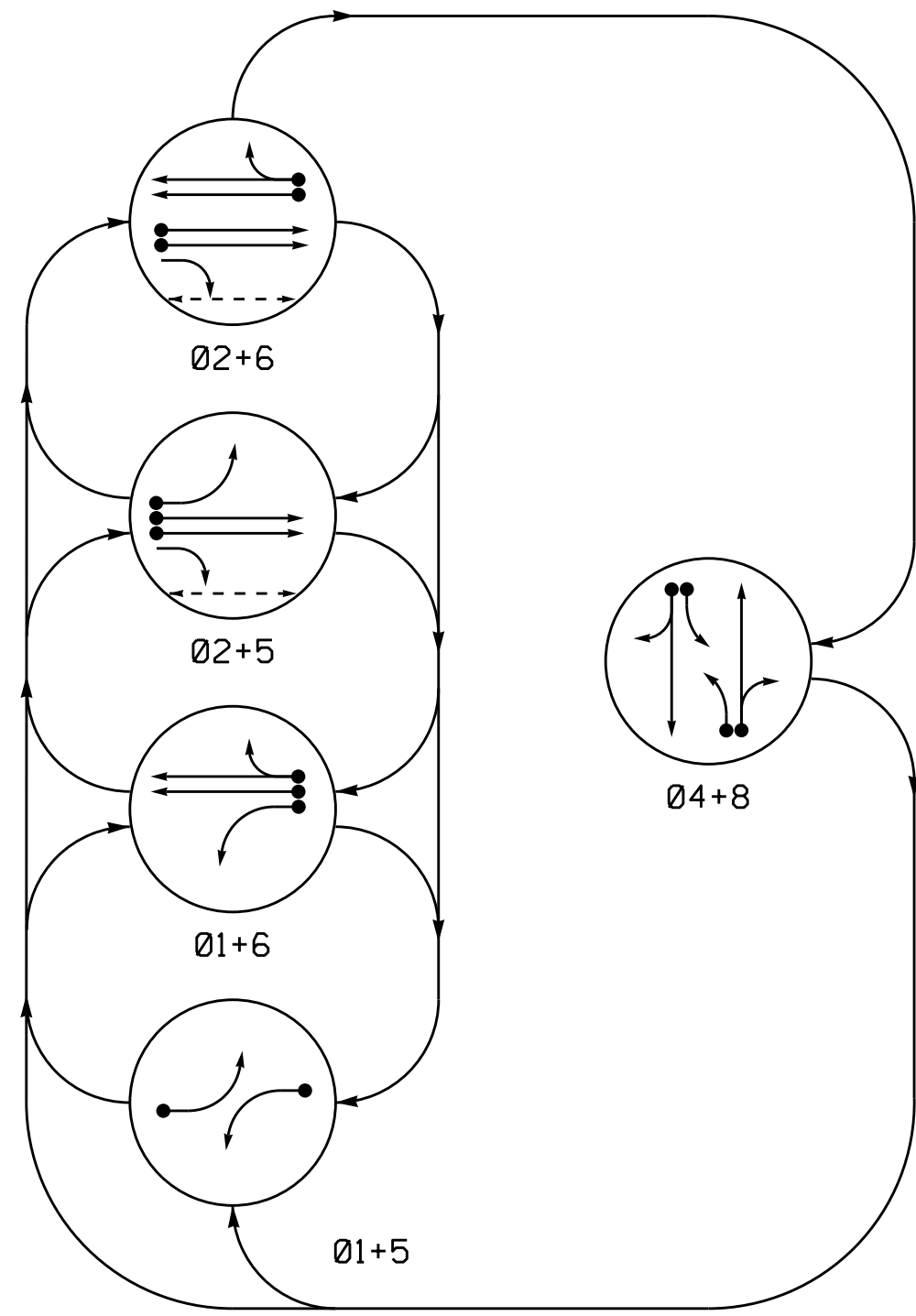
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SIG. INVENTORY NO. 06-1287

24 Jun 2016 08:17  
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 J. Spence



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

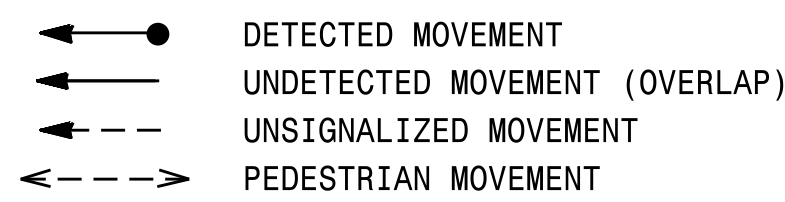
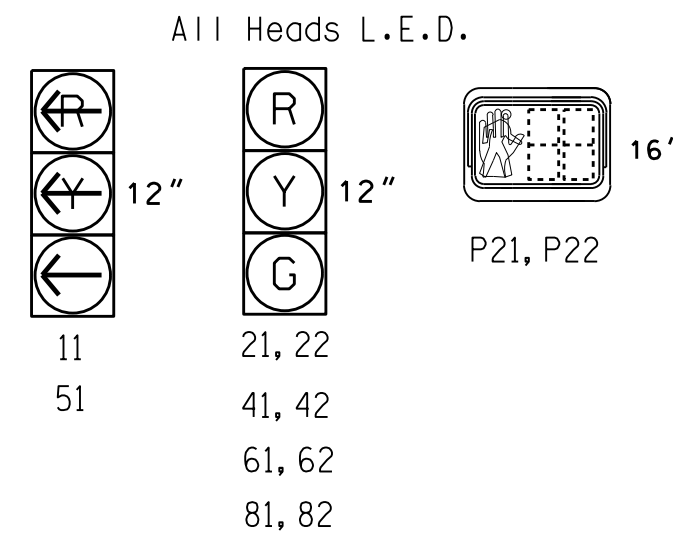


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	TRUCK
11	←	←	→	→	→	→
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	←	→	→	→	→
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK

SIGNAL FACE I.D.



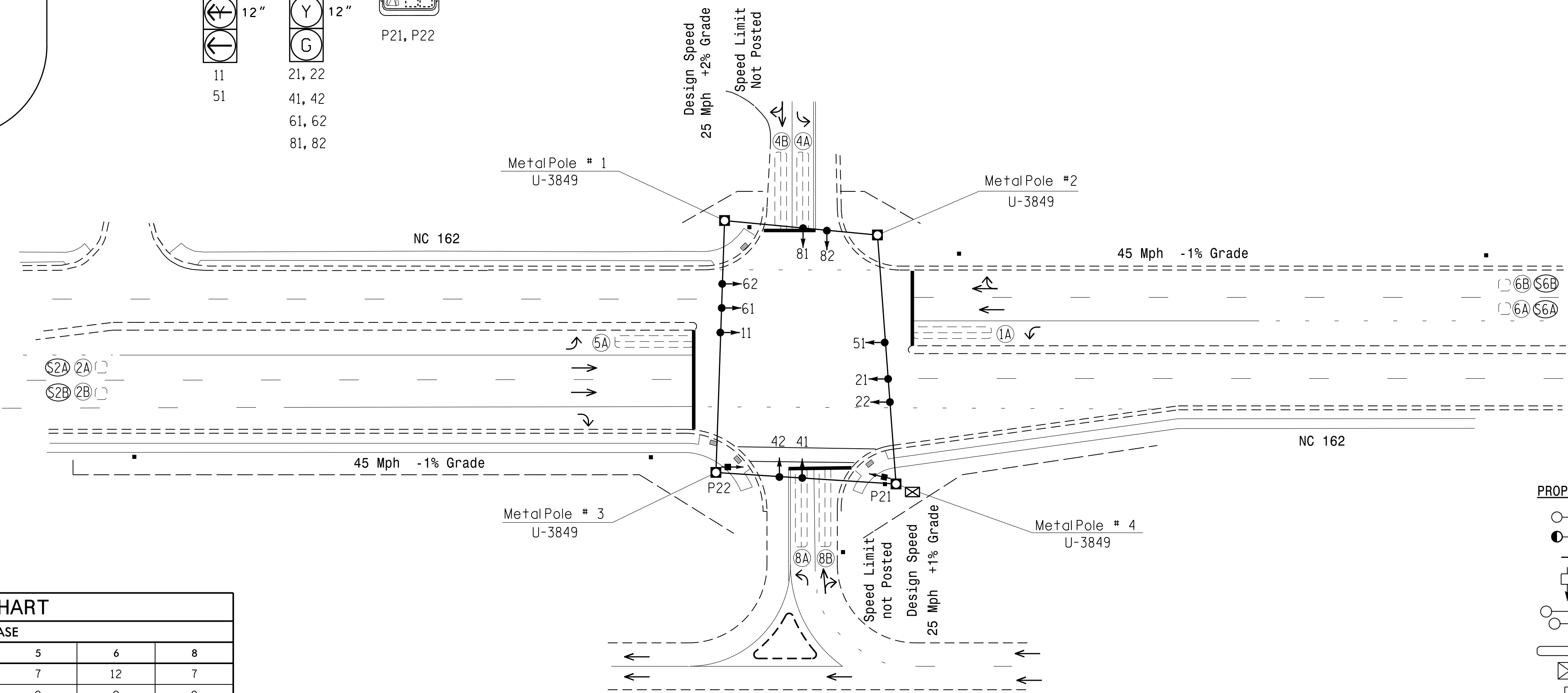
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	LOOP SYSTEM	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
2A /S2A	6X6	300	5	-	2	Yes	-	-	N	X	X
2B /S2B	6X6	300	5	-	2	Yes	-	-	N	X	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	10	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
6A /S6A	6X6	300	5	-	6	Yes	-	-	N	X	X
6B /S6B	6X6	300	5	-	6	Yes	-	-	N	X	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	10	S	-	X

5 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

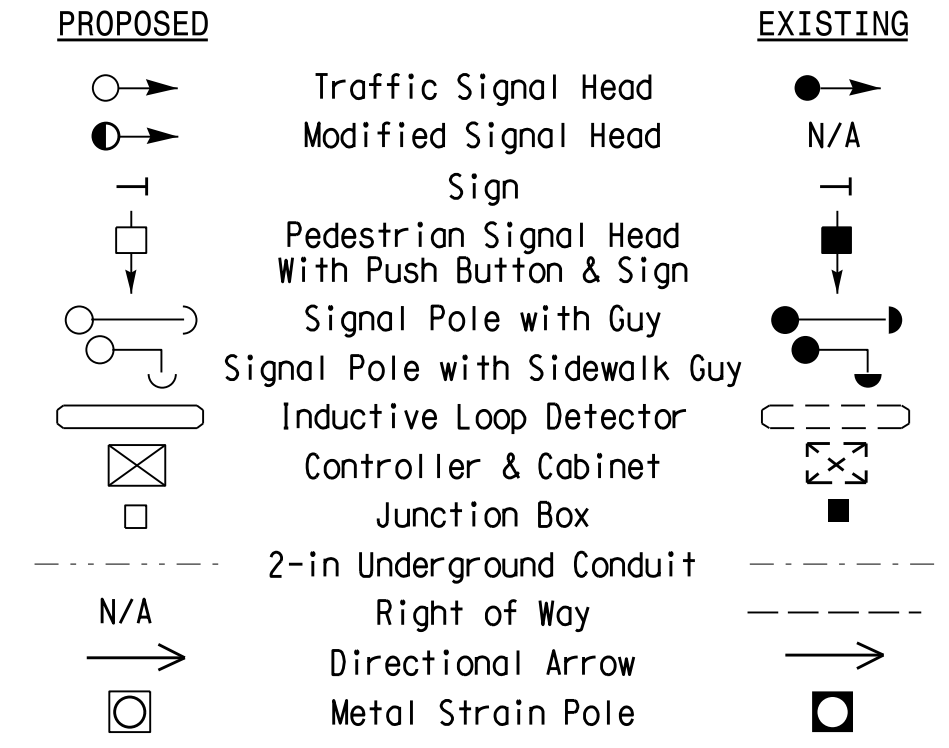


ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	0	7	0	0	0	0
Ped Clear	0	14	0	0	0	0
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	25	20	90	25
Yellow	3.0	4.6	3.2	3.0	4.6	3.2
Red Clear	3.1	1.3	3.0	2.8	1.3	3.0
Actuations B4 Add *	-	0	-	-	0	-
Seconds /Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND



Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 162 at South View Middle School

Division 6 Cumberland County Hope Mills

PLAN DATE: June 2016 PREPARED BY: Jeff Spence REVIEWED BY: JPG

SCALE: 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

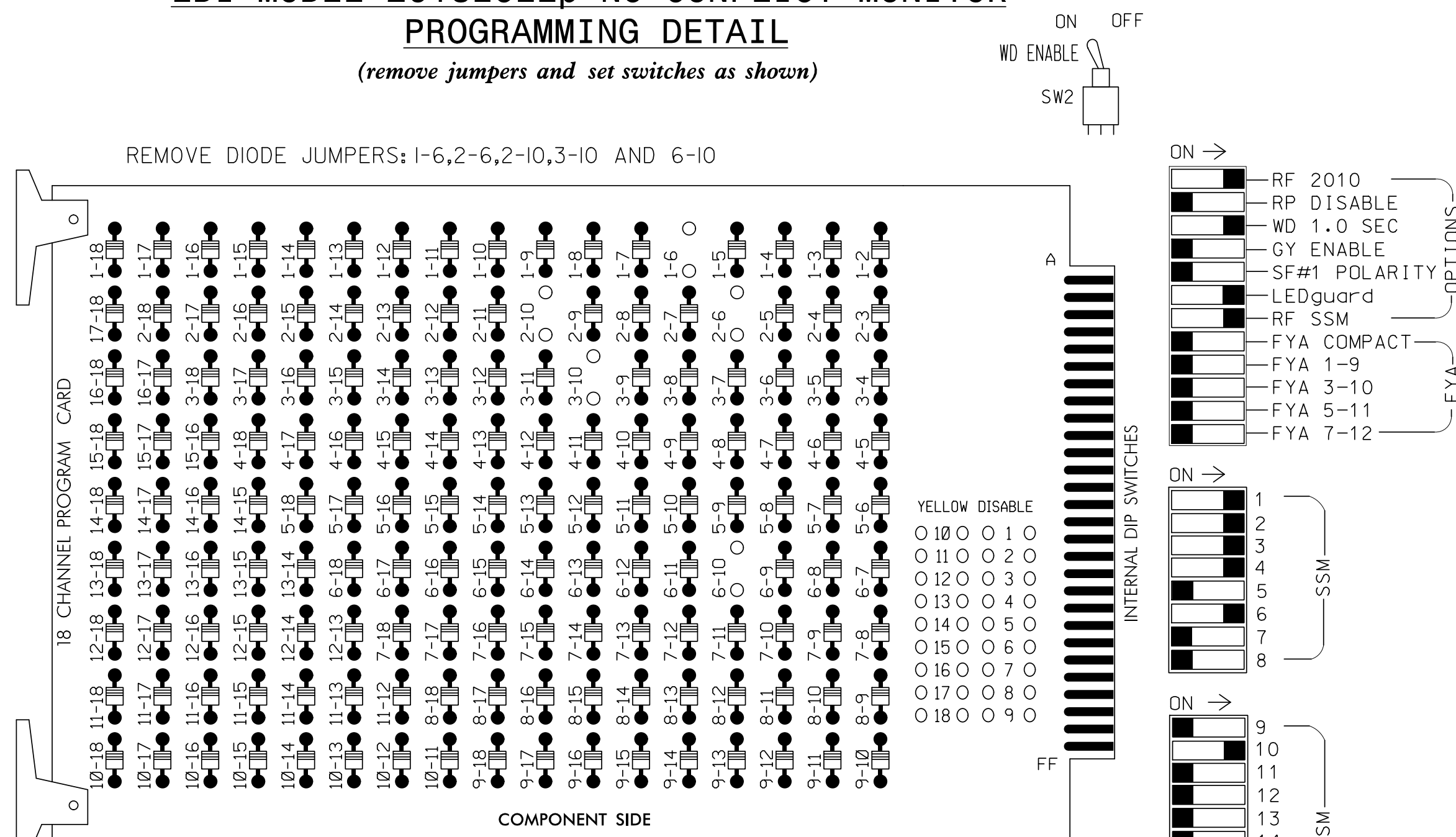
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029904 JASON P. GALLAGHER 6/8/2016

SIG. INVENTORY NO. 06-1288

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**EDI MODEL 2018ECLIP-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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S8,AUX S2  
 PHASES USED.....1,2,3,4,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....2+3  
 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	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22 23	NU	31,32	41	42,43	NU	NU	61,62 63,64	NU	NU	NU	NU	NU	NU	24,25	NU	NU
RED	128			101	101				134							A124		
YELLOW	129			102	102				135									
GREEN	130			103	103				136									
RED ARROW	125			116														
YELLOW ARROW	126			117												A125		
GREEN ARROW	127			118	103											A126		

NU = Not Used

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

- From Main Menu select 2. CONTROLLER
- From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

TOGGLE ONCE

OVERLAP C

Select TMG VEH OVLP [C] and 'NORMAL'

TMG VEH OVLP...[C] TYPE: .....NORMAL  
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6  
 INCLUDED . X X . . . . .  
 LAG GRN 0.0 YEL 0.0 RED 0.0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1301  
 DESIGNED: January 2016  
 SEALED: 5/6/2016  
 REVISED:

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅ 2/SYS	∅ 2/SYS	∅ 3	∅ 3	∅ 4	∅ 4	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
L	1A	1B	2A/S2A	2C/S2C	3A	3B	4B	4D	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
U	NOT USED	NOT USED	∅ 2/SYS	NOT USED	NOT USED	∅ 4	∅ 4	NOT USED	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
L			2B/S2B			4A	4C		T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
U	T-O/S	∅ 6	∅ 6	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
L		6A	6C	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
U	T-O/S	∅ 6	∅ 6	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S
L		6B	6D	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S	T-O/S

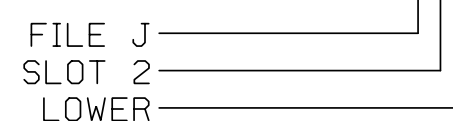
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
1B	TB2-5,6	I2U	39	2	1	YES			S
2A/S2A	TB2-9,10	I3U	63	32	2	YES			N
2B/S2B	TB2-11,12	I3L	76	42	2	YES			N
2C/S2C	TB4-1,2	I4U	47	22	2	YES			N
3A	TB4-5,6	I5U	58	3	3	YES			S
3B	TB4-9,10	I6U	41	4	3	YES			S
4A	TB4-11,12	I6L	45	14	4	YES			S
4B	TB6-1,2	I7U	65	34	4	YES			S
4C	TB6-3,4	I7L	78	44	4	YES			S
4D	TB6-5,6	I8U	49	24	4	YES		15	S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES			N
6D	TB3-11,12	J3L	77	46	6	YES			N

INPUT FILE POSITION LEGEND: J2L



**Electrical Detail**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical AND PROGRAMMING DETAILS FOR: **NC 24 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) Eastbound (Ramp C/Loop D)**

Prepared For: **Kimley Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

Division 6 Cumberland County Fayetteville  
 PLAN DATE: July 2016 REVIEWED BY: KP Baumann  
 PREPARED BY: SP Pennington REVIEWED BY: SL Phillips

REVISIONS	INIT.	DATE

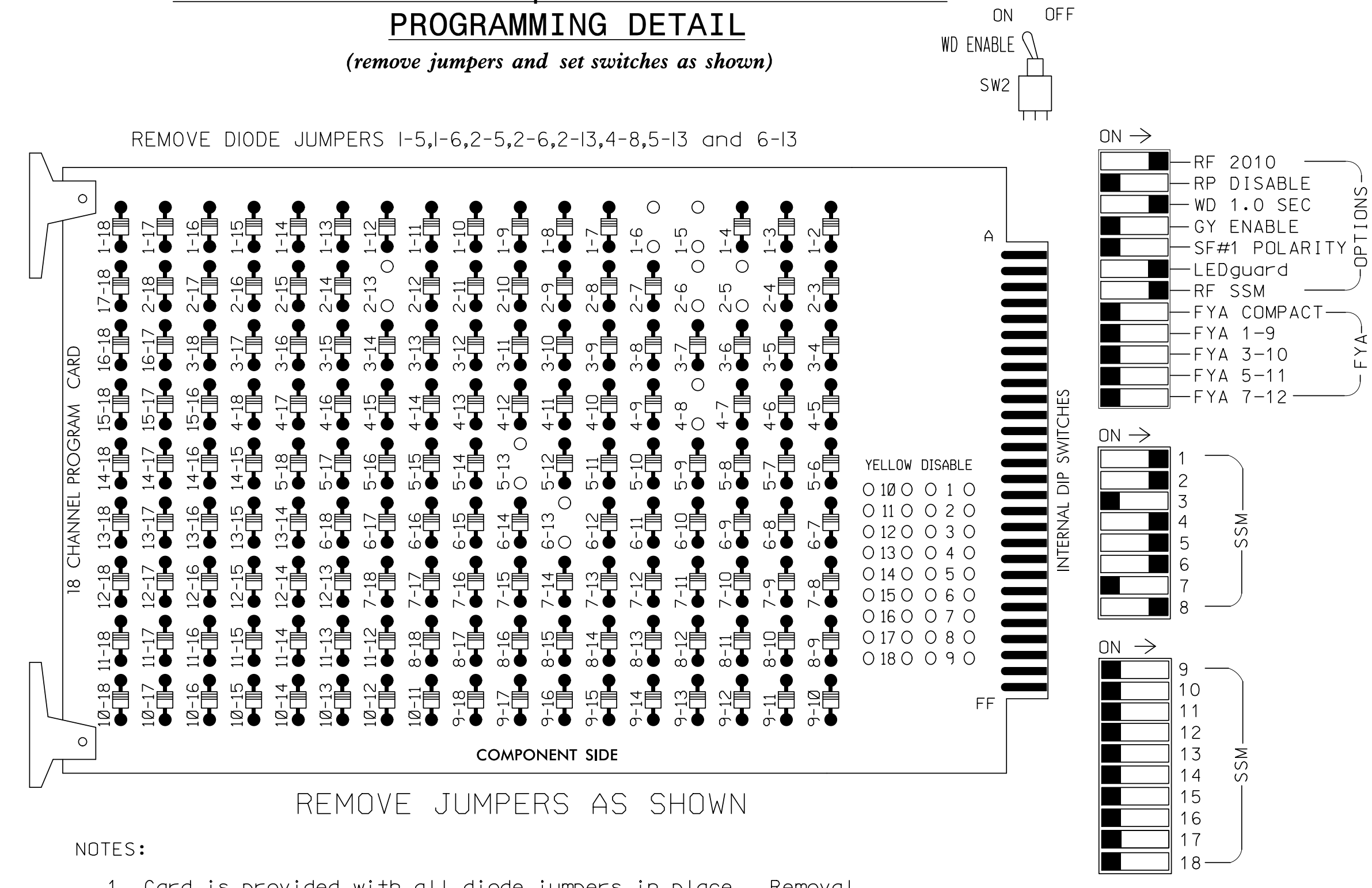
750 N. Greenfield Pkwy, Garner, NC 27529

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SL PHILLIPS  
 SEAL 032607  
 DATE: 9/1/2016  
 SIG. INVENTORY NO. 06-1301



**EDI MODEL 2018ECLIP-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.
- Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S3,S5,S7,S8,S11  
 PHASES USED.....1,2,2PED,4,5,6,8  
 OVERLAPS.....NONE

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42	NU	51	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW	125							131				
YELLOW ARROW	126							132				
GREEN ARROW	127							133				
Hand icon									113			
Walking person icon										115		

NU = Not Used

**INPUT FILE POSITION LAYOUT**

*(front view)*

FILE U "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	∅ 1 1A	∅ 2/SYS 2A/S2A	∅ 3 NOT USED	∅ 4 4A	∅ 5 5A	∅ 6/SYS 6A/S6A	∅ 7 NOT USED	∅ 8 8A	∅ 9 NOT USED	∅ 10 NOT USED	∅ 11 NOT USED	∅ 12 NOT USED	∅ 13 NOT USED	∅ 14 NOT USED
FILE U "J"														

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

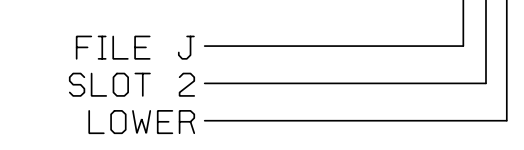
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
2A/S2A	TB2-5,6	I2U	39	2	2	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES		10	S
5A	TB3-1,2	J1U	55	5	5	YES			S
6A/S6A	TB3-5,6	J2U	40	6	6	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6	YES			N
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				

NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L



**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1288  
 DESIGNED: June 2016  
 SEALED: 6/8/2016  
 REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: **Kimley-Horn**

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

NC 162 at South View Middle School

Division 6 Cumberland County Hope Mills

PLAN DATE: July 2016 REVIEWED BY: KP Baumann

PREPARED BY: SP Pennington REVIEWED BY: SL Phillips

REVISIONS	INIT.	DATE

9/1/2016

SIG. INVENTORY NO. 06-1288

8/21/2016 K:\MAIL\_TPD\SIGNALS\4011036345\_Foyetteville Electrical\061288-2016e.dgn  
 Susan Pennington

PHASING DIAGRAM

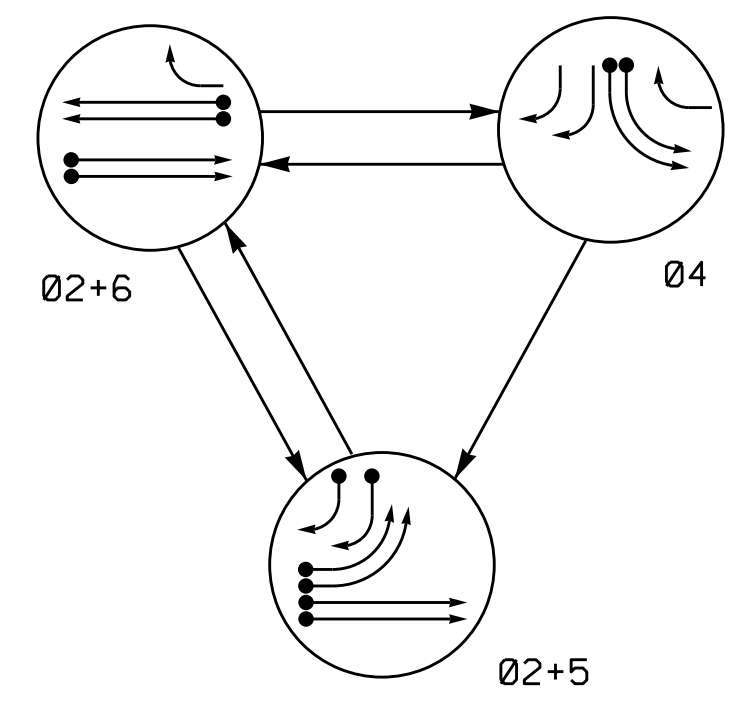


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04	FLSH
21, 22	G	G	R	Y
41, 42	R	R	Y	R
43, 44	Y	R	Y	R
51, 52	Y	R	R	R
61	R	G	R	Y
62	R	G	R	Y

ASC/3 DETECTOR INSTALLATION CHART

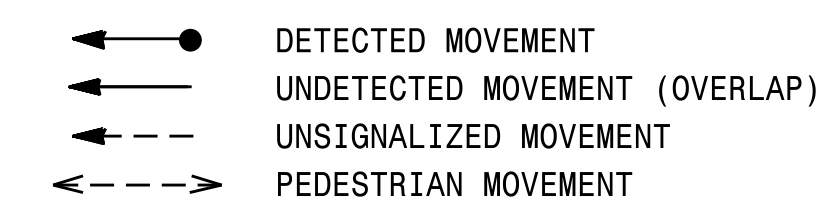
LOOP	DETECTOR				PROGRAMMING						
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A/S2A	6X6	420	6	-	2	Yes	-	-	N	X	X
2B/S2B	6X6	420	6	-	2	Yes	-	-	N	X	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
5C	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
5D	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
6A/S6A	6X6	420	5	-	6	Yes	-	-	N	X	X
6B/S6B	6X6	420	5	-	6	Yes	-	-	N	X	X

3 Phase Fully Actuated Fayetteville Signal System

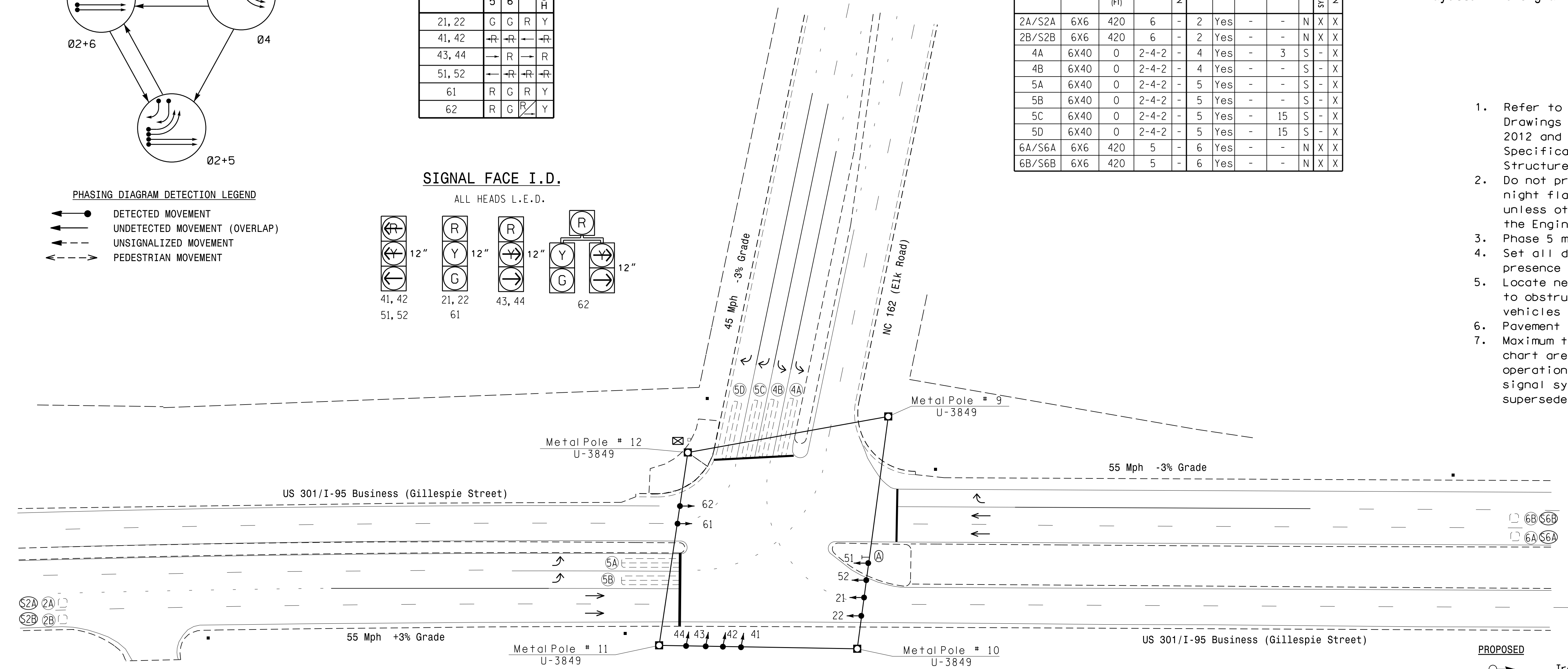
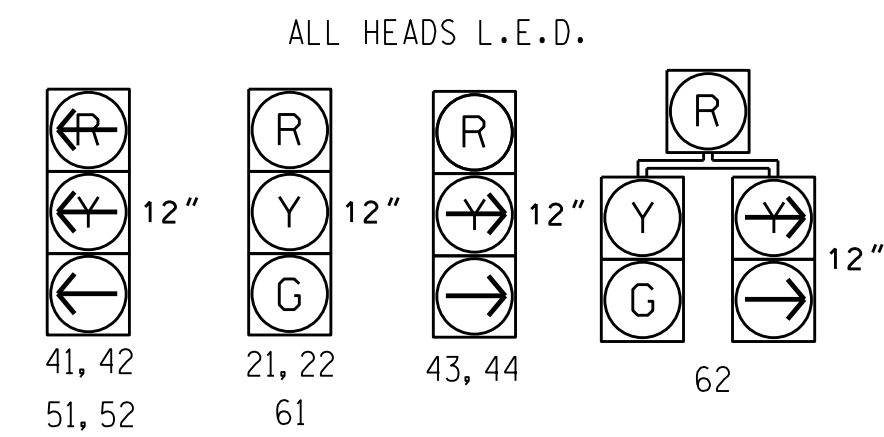
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

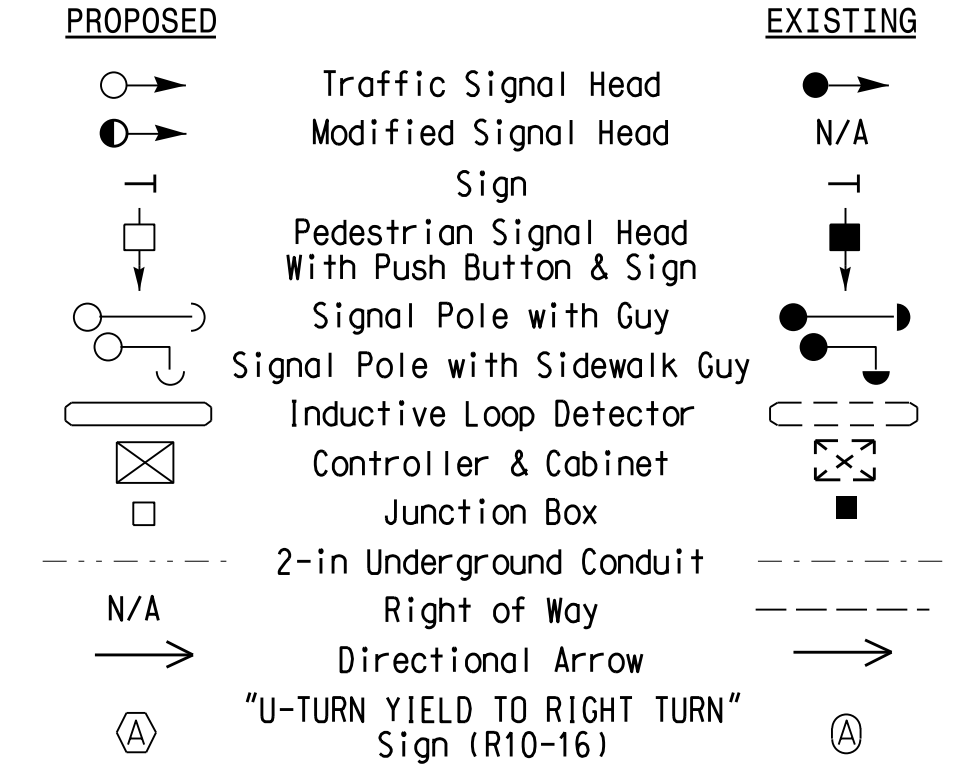


ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	14	7	7	14
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	25	30	90
Yellow	5.5	3.0	3.0	5.5
Red Clear	1.8	3.5	3.6	1.8
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	1.5	-	-	1.5
Max Initial *	46	-	-	46
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.4	-	-	3.4
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND



Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Division 6 Cumberland County Fayetteville

I-95 Bus-US 301 (Gillespie St) at SR 1363 (Elk Road)

PLAN DATE: July 2016 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

REVISIONS: INIT. DATE

SCALE: 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029904 JASON P. GALLAGHER

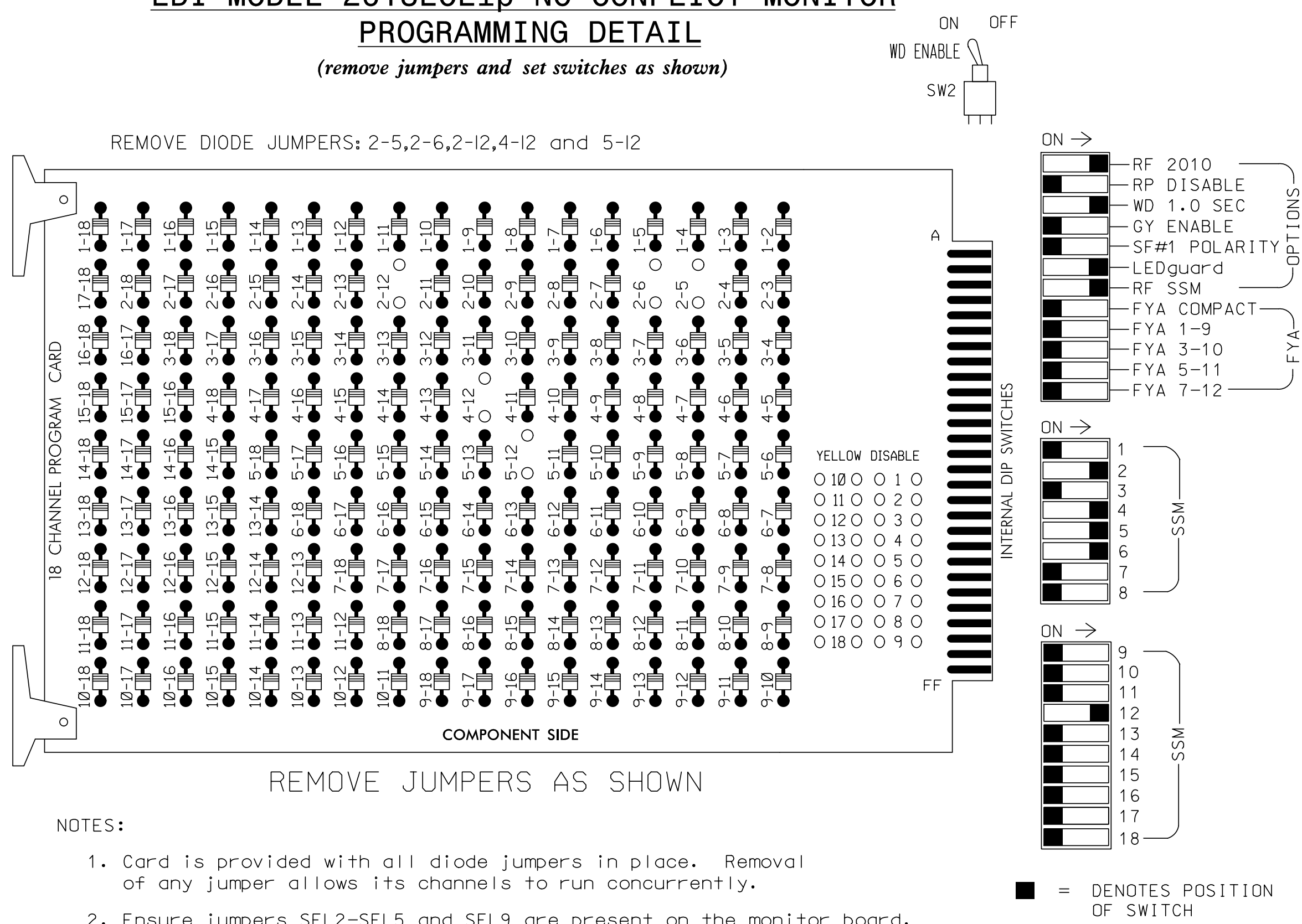
DocuSigned by: Jason P. Gallagher 8/3/2016

SIG. INVENTORY NO. 06-1289

03-10-2016 08:41  
 S:\TSSU\TSS\Signal\Signal Design\Section\Eastern Region\U-5742 Fayetteville ASC3\06-1289\061289\_s1a.dsn\_2016mmds.dgn  
 T:\reference

### EDI MODEL 2018EClip-NC 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S5  
 PHASES USED.....2,4,5,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....4+5

### SIGNAL HEAD HOOK-UP CHART

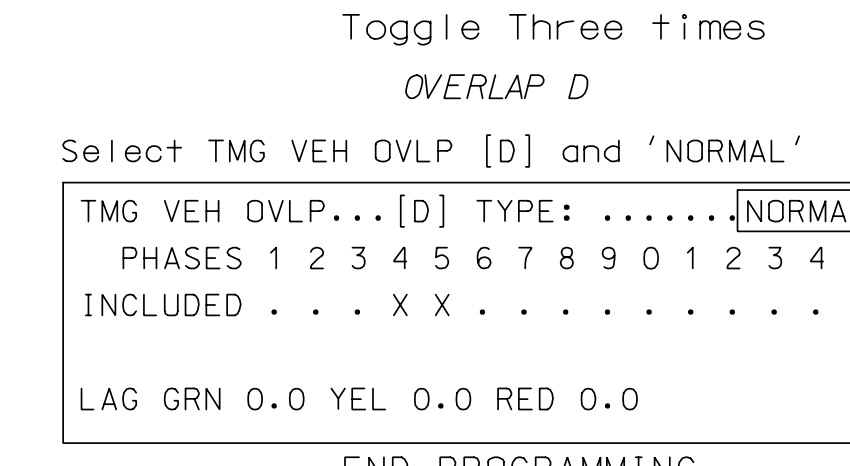
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2	3	4	4	5	6	6	7	8	8	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51,52	61,62	NU	NU	NU	NU	NU	NU	NU	43,44	NU
RED		128							134									A101
YELLOW			129							135								
GREEN			130							136								
RED ARROW					101				131									
YELLOW ARROW					102	102			132									A102
GREEN ARROW					103	103			133									A103

NU = Not Used

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**



### INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S	2/SYS	2A/S2A	S	4	4A	S	S	S	S	S	S	S	FS
L	2/SYS	2B/S2B	S	4	S	S	S	S	S	S	S	S	S	DC ISOLATOR
U	5	5	5	6/SYS	S	S	S	S	S	S	S	S	S	S
L	5A	5B	5D	6B/S6B	S	S	S	S	S	S	S	S	S	ST
U	NOT USED	5	6/SYS	6A/S6A	S	S	S	S	S	S	S	S	S	S
L	5C	S	NOT USED	S	S	S	S	S	S	S	S	S	S	S

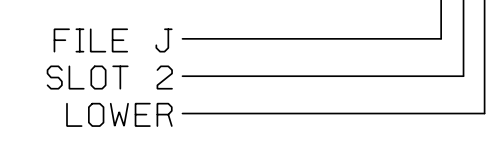
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2/SYS	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2/SYS	YES			N
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-5,6	J2U	40	6	5	YES			S
5C	TB3-7,8	J2L	44	16	5	YES		15	S
5D	TB3-9,10	J3U	64	36	5	YES		15	S
6A/S6A	TB3-11,12	J3L	77	46	6/SYS	YES			N
6B/S6B	TB5-1,2	J4U	48	26	6/SYS	YES			N

INPUT FILE POSITION LEGEND: J2L



### FLASHER CIRCUIT MODIFICATION DETAIL

In order to ensure 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.

9/21/2016 K:\REAL\_PFD\SI\DWALS\4011036345 - Fayetteville - Signal Design\Edh.Submitt\42311\_061289-016e.dgn Susan Pennington

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: **Kimley-Horn**  
 PLANS PREPARED IN THE OFFICE OF: **Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

750 N. Greenfield Pkwy, Garner, NC 27529

**I-95 Bus-US 301 (Gillespie St.) at SR 1363 (Elk Road)**

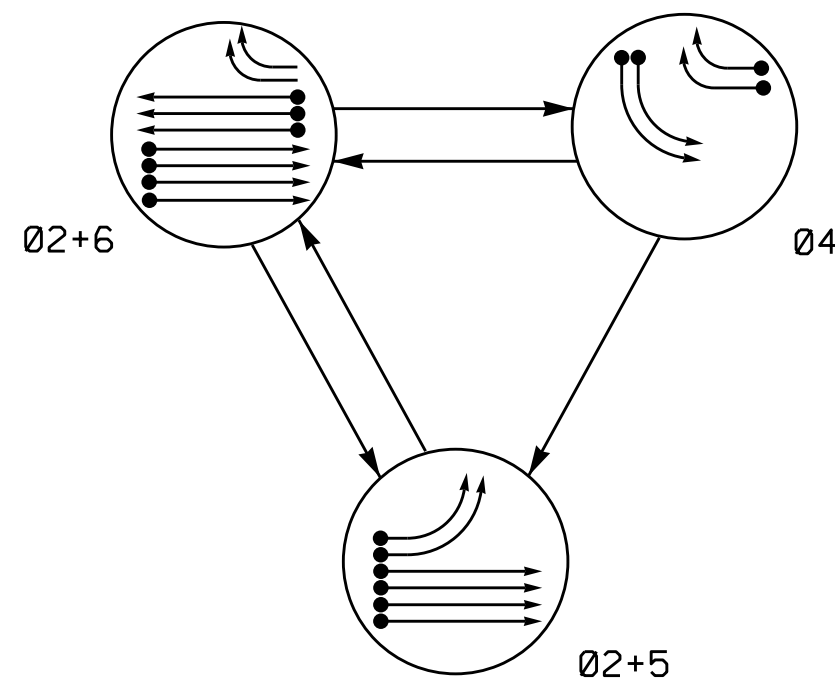
Division 6 Cumberland County Fayetteville  
 PLAN DATE: August 2016 REVIEWED BY: SL Phillips  
 PREPARED BY: SP Pennington REVIEWED BY: KP Baumann

REVISIONS	INIT.	DATE

DocSignedBy: *[Signature]* 9/22/2016  
 DCB7AS6ED068437

SIG. INVENTORY NO. 06-1289

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

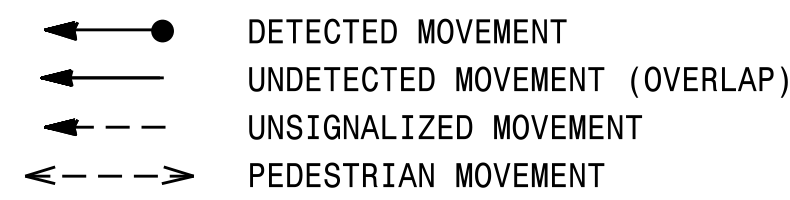
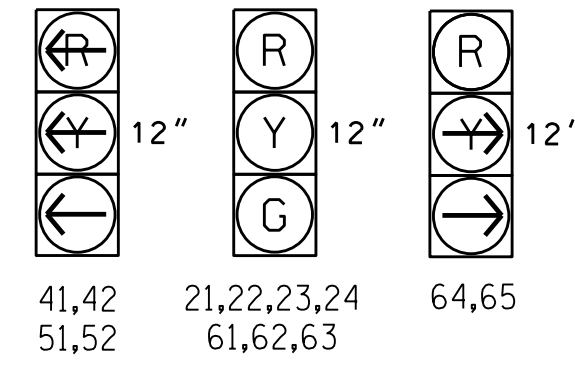


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04	F
21,22,23,24	G	G	R	Y
41,42	R	R	-	R
51,52	-	R	R	R
61,62,63	G	G	R	Y
64,65	R	-	-	Y

SIGNAL FACE I.D.

All Heads L.E.D.



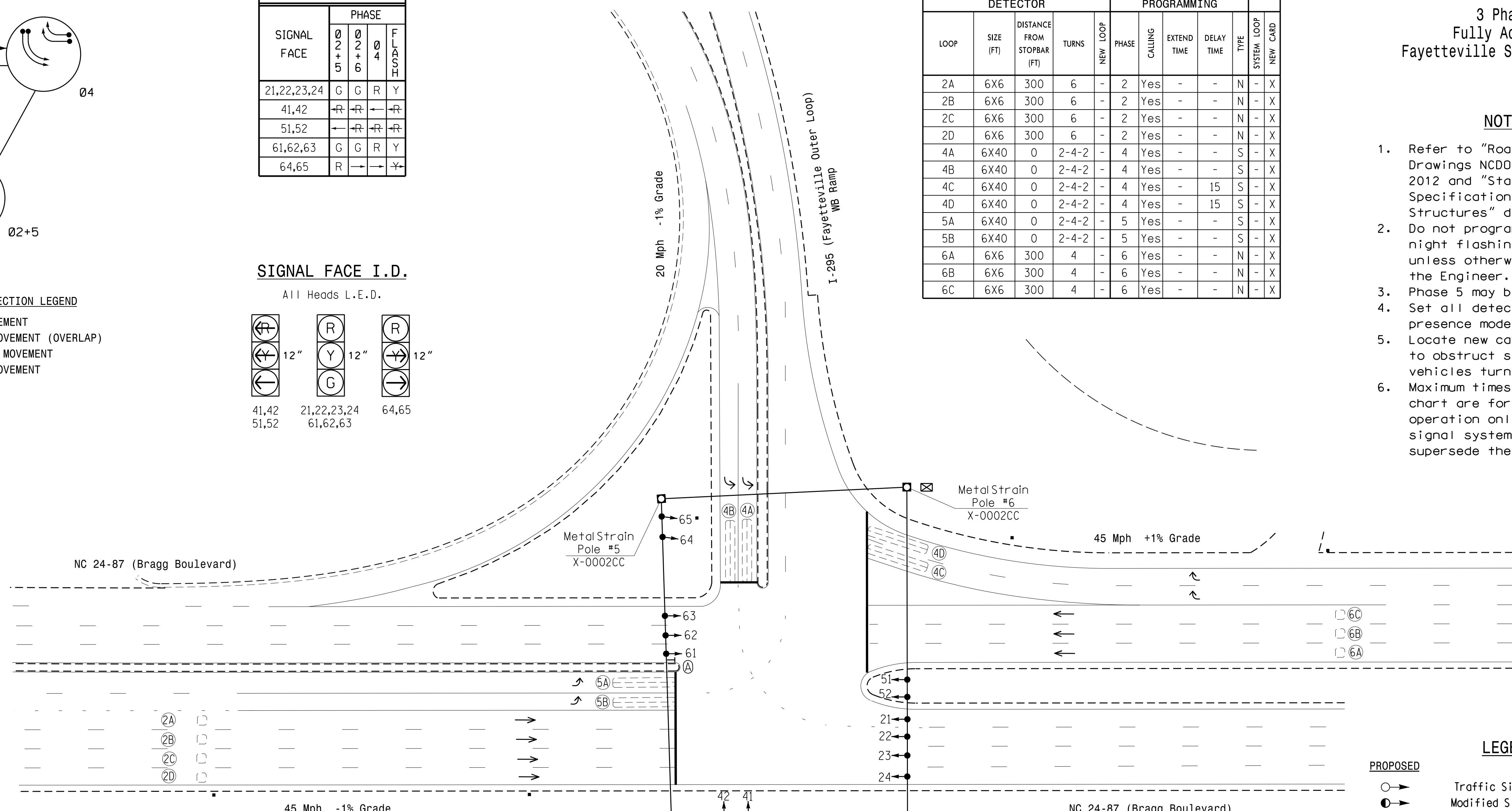
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP NEW CARD	
2A	6X6	300	6	-	2	Yes	-	-	N	-	X
2B	6X6	300	6	-	2	Yes	-	-	N	-	X
2C	6X6	300	6	-	2	Yes	-	-	N	-	X
2D	6X6	300	6	-	2	Yes	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4C	6X40	0	2-4-2	-	4	Yes	-	15	S	-	X
4D	6X40	0	2-4-2	-	4	Yes	-	15	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
6A	6X6	300	4	-	6	Yes	-	-	N	-	X
6B	6X6	300	4	-	6	Yes	-	-	N	-	X
6C	6X6	300	4	-	6	Yes	-	-	N	-	X

3 Phase Fully Actuated Fayetteville Signal System

NOTES

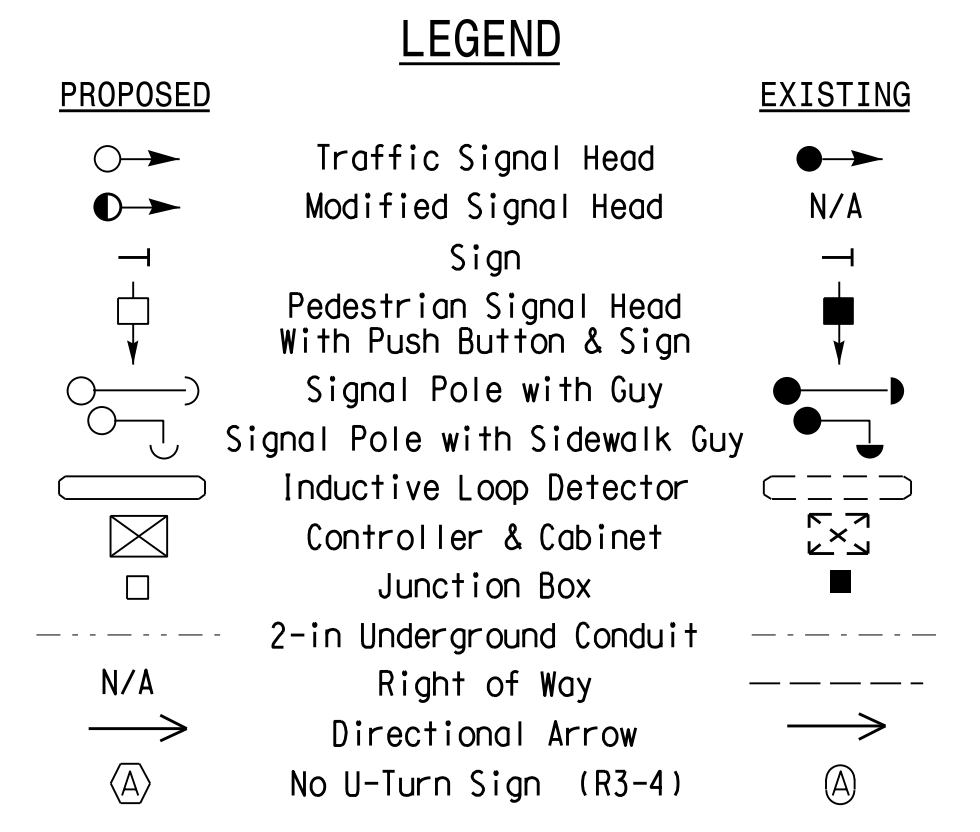
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be logged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	30	30	90
Yellow	4.6	3.0	3.0	4.6
Red Clear	1.8	3.7	3.7	1.8
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	1.0	-	-	1.0
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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



Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 24-87 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) WB Ramp

Division 6 Cumberland County Fayetteville

PLAN DATE: January 2016 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

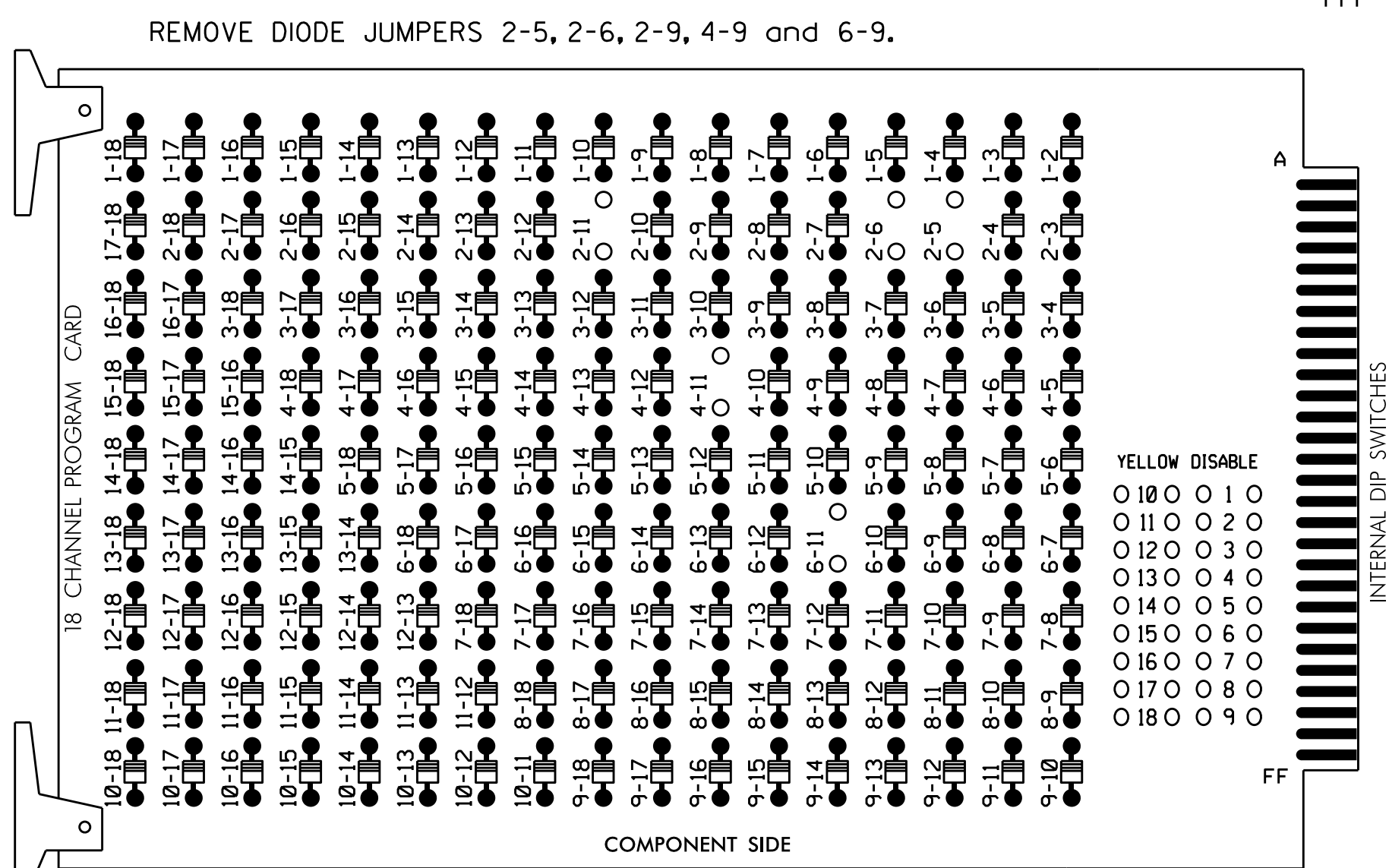
DocuSigned by: Jason P. Galloway 5/24/2016

SIG. INVENTORY NO. 06-1300

24-May-2016 11:41  
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 J:\gallaway

**EDI MODEL 2018EClip-NC CONFLICT MONITOR**  
**PROGRAMMING DETAIL**

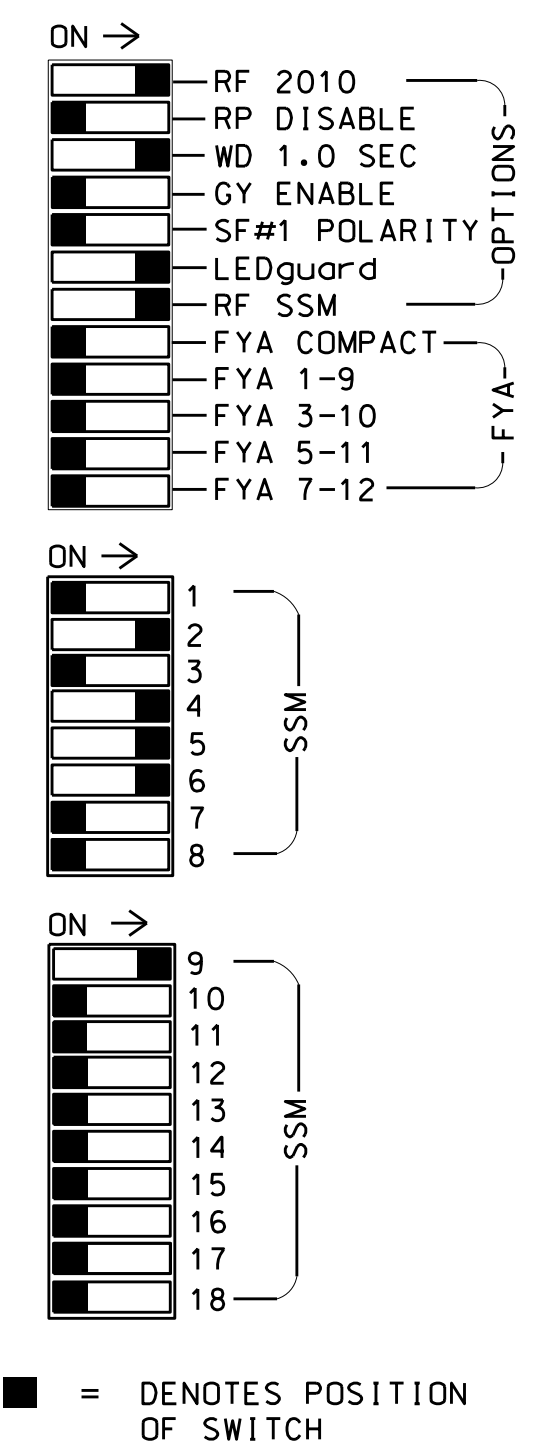
(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

**NOTES:**

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



■ = DENOTES POSITION OF SWITCH

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Green.
5. The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S1  
 PHASES USED.....2,4,5,6  
 OVERLAP "A".....4+6  
 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	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23,24	NU	NU	41,42	NU	51,52	61,62 63	NU	NU	NU	NU	64,65	NU	NU	NU	NU	NU
RED		128						134					A121					
YELLOW		129						135										
GREEN		130						136										
RED ARROW					101		131											
YELLOW ARROW					102		132						A122					
GREEN ARROW					103		133						A123					

NU = Not Used

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

1. From Main Menu select
2. From CONTROLLER Submenu select

**OVERLAP A**

Select TMG VEH OVLP [A] and 'NORMAL'

TMG VEH OVLP...[A] TYPE: .....

PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6  
 INCLUDED . . . X . X . . . . .

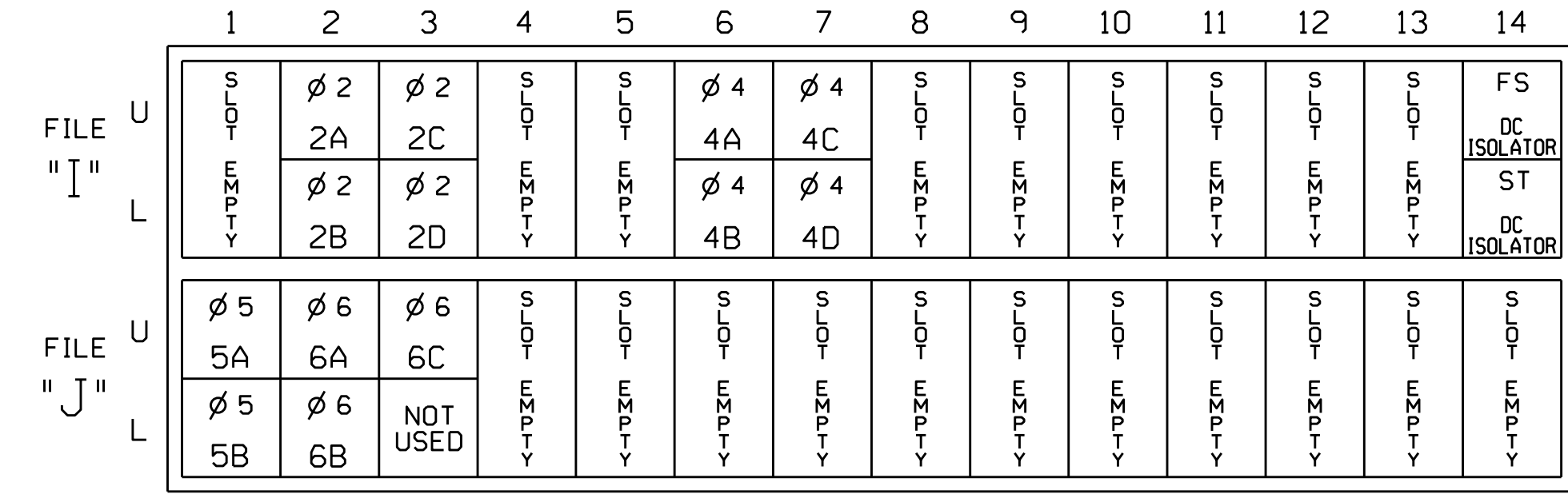
LAG GRN 0.0 YEL 0.0 RED 0.0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1300  
 DESIGNED: January 2016  
 SEALED: 5/24/2016  
 REVISED:

**INPUT FILE POSITION LAYOUT**

(front view)



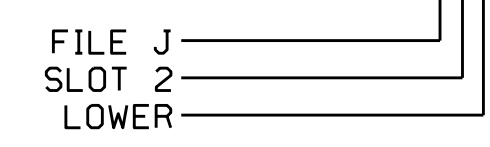
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
2C	TB2-9,10	I3U	63	32	2	YES			N
2D	TB2-11,12	I3L	76	42	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S
4D	TB6-3,4	I7L	78	44	4	YES		15	S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-3,4	J1L	55	5	5	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES			N

**INPUT FILE POSITION LEGEND: J2L**



**Electrical Detail**

Electrical and Programming Details for: **NC 24-87 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) WB Ramp**

Division 6 Cumberland County Fayetteville

PLAN DATE: May 2016 REVIEWED BY: K. Mims

PREPARED BY: Z.M. Little REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

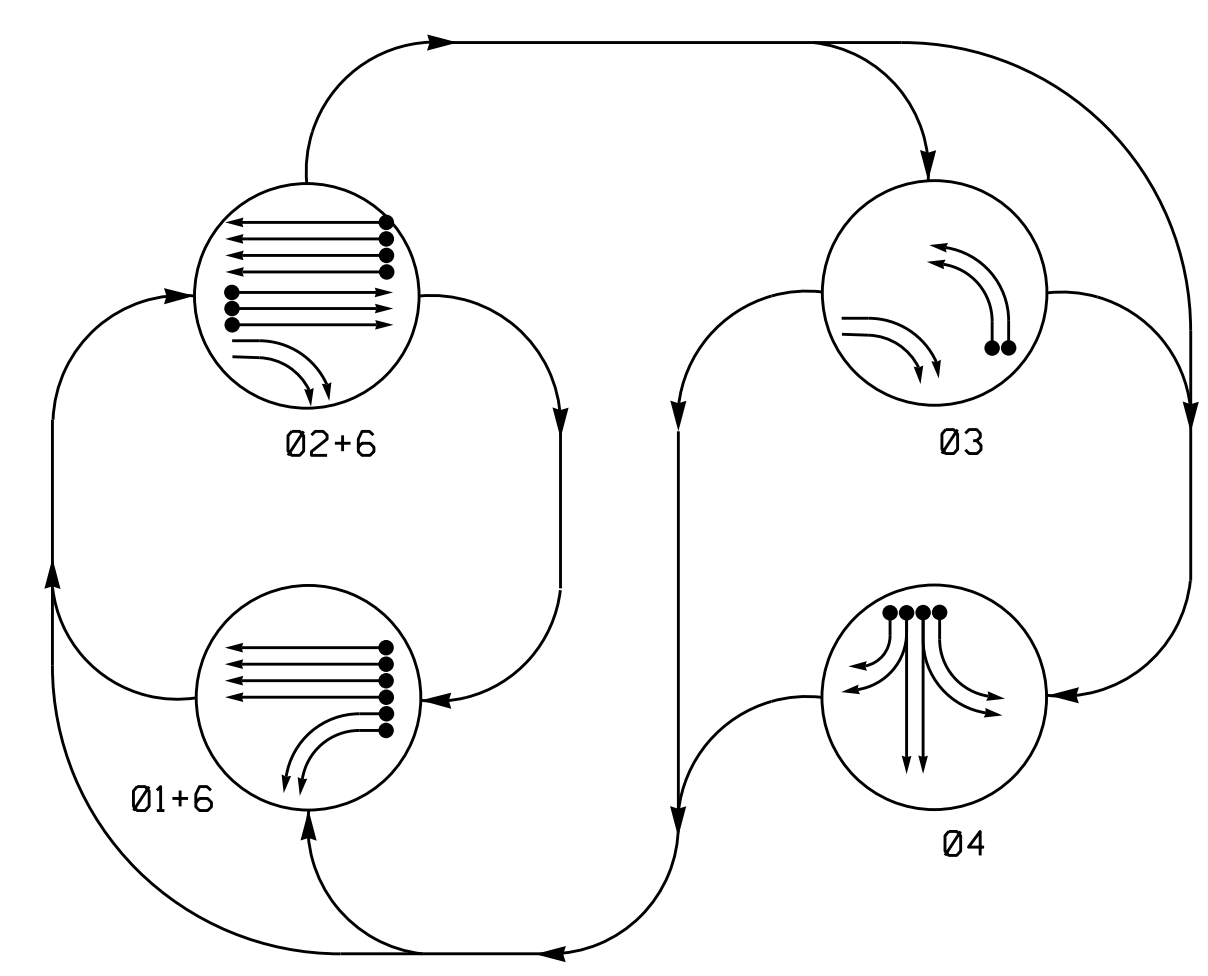
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 KEITH M. MIMS  
 036880

DocuSigned by: Keith M. Mims 5/25/2016  
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SIG. INVENTORY NO. 06-1300

05-MAY-2016 08:49  
 C:\Users\zmlittle\OneDrive\Documents\61300\_sigs\_m\_2016mmd-dgn  
 zmlittle

**PHASING DIAGRAM**



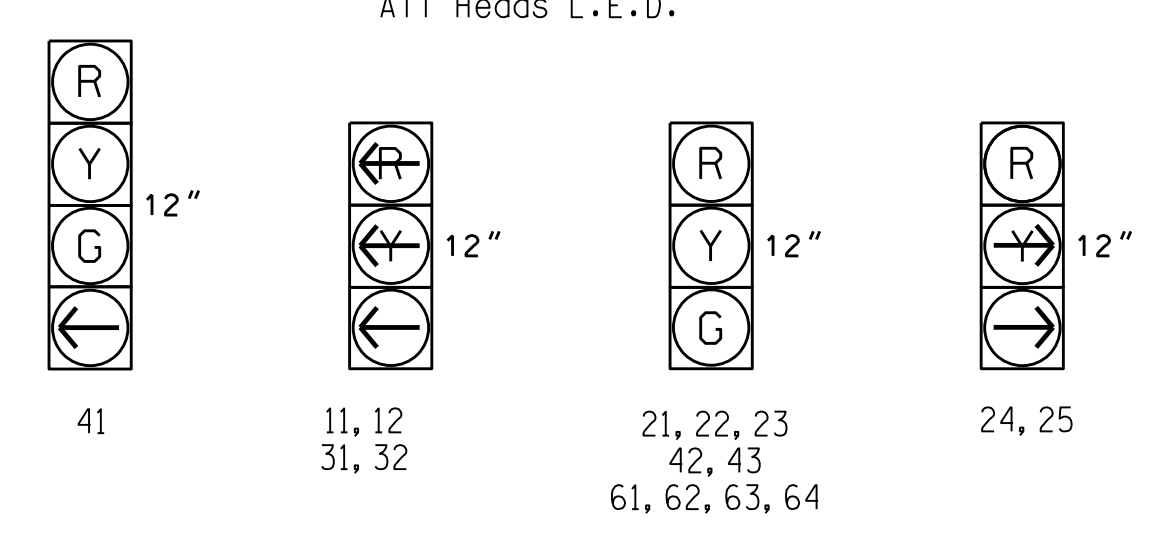
**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE				
	01+6	02+6	03	04	PEDESTRIAN
11, 12	+	-	-	-	-
21, 22, 23	R	G	R	R	Y
24, 25	R	-	-	-	Y
31, 32	-	-	-	-	Y
41	R	R	R	G	R
42, 43	R	R	R	G	R
61, 62, 63, 64	G	G	R	R	Y

**SIGNAL FACE I.D.**



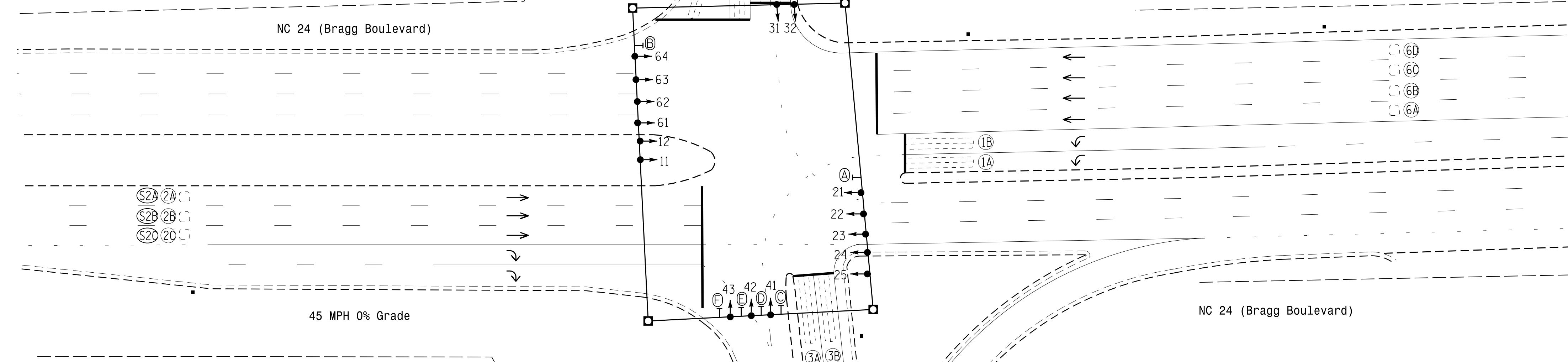
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME		
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	X
1B	6X40	0	2-4-2	-	1	Yes	-	-	S	X
2A/S2A	6X6	300	6	-	2	Yes	-	-	N	X
2B/S2B	6X6	300	6	-	2	Yes	-	-	N	X
2C/S2C	6X6	300	6	-	2	Yes	-	-	N	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	S	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	S	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	X
4C	6X40	0	2-4-2	-	4	Yes	-	-	S	X
4D	6X40	0	2-4-2	-	4	Yes	-	15	S	X
6A	6X6	300	6	-	6	Yes	-	-	N	X
6B	6X6	300	6	-	6	Yes	-	-	N	X
6C	6X6	300	6	-	6	Yes	-	-	N	X
6D	6X6	300	6	-	6	Yes	-	-	N	X

**4 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE				
	1	2	3	4	6
Min Green *	7	12	7	7	12
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	6.0
Max 1 *	20	90	30	30	90
Yellow	3.0	4.5	3.0	4.5	4.5
Red Clear	3.6	1.6	3.6	2.5	1.6
Red Revert	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	0
Seconds /Actuation *	-	1.0	-	-	1.0
Max Initial *	-	34	-	-	34
Time Before Reduction *	-	15	-	-	15
Time To Reduce *	-	45	-	-	45
Minimum Gap	-	3.0	-	-	3.0
Locking Detector	-	X	-	-	X
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X

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

**LEGEND**

- |  |   |  |   |
|--|---|--|---|
|  | Proposed Traffic Signal Head                          |  | Existing Traffic Signal Head                          |
|  | Proposed Modified Signal Head                         |  | Existing Modified Signal Head                         |
|  | Proposed Pedestrian Signal Head                       |  | Existing Pedestrian Signal Head                       |
|  | Proposed Signal Pole with Guy                         |  | Existing Signal Pole with Guy                         |
|  | Proposed Signal Pole with Sidewalk Guy                |  | Existing Signal Pole with Sidewalk Guy                |
|  | Proposed Metal Strain Pole                            |  | Existing Metal Strain Pole                            |
|  | Proposed Inductive Loop Detector                      |  | Existing Inductive Loop Detector                      |
|  | Proposed Controller & Cabinet                         |  | Existing Controller & Cabinet                         |
|  | Proposed Junction Box                                 |  | Existing Junction Box                                 |
|  | Proposed 2-in Underground Conduit                     |  | Existing 2-in Underground Conduit                     |
|  | Proposed Right of Way                                 |  | Existing Right of Way                                 |
|  | Proposed Directional Arrow                            |  | Existing Directional Arrow                            |
|  | Proposed No Left Turn Sign (R3-2)                     |  | Existing No Left Turn Sign (R3-2)                     |
|  | Proposed No Right Turn Sign (R3-1)                    |  | Existing No Right Turn Sign (R3-1)                    |
|  | Proposed Left Arrow "ONLY" Sign (R3-5L)               |  | Existing Left Arrow "ONLY" Sign (R3-5L)               |
|  | Proposed Combined Through and Left Arrow Sign (R3-6L) |  | Existing Combined Through and Left Arrow Sign (R3-6L) |
|  | Proposed Combined Through and Left Arrow Sign (R3-6L) |  | Existing Combined Through and Left Arrow Sign (R3-6L) |
|  | Proposed Right Arrow "ONLY" Sign (R3-5R)              |  | Existing Right Arrow "ONLY" Sign (R3-5R)              |

**Signal Upgrade**

**NC 24 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) Eastbound (Ramp C/Loop D)**

Division 6 Cumberland County Fayetteville

PLAN DATE: January 2016 REVIEWED BY: JG

PREPARED BY: Devin Smith REVIEWED BY:

REVISIONS: INIT. DATE

SCALE: 0 40 1"=40'

SEAL: Jason P. Galloway 5/6/2016

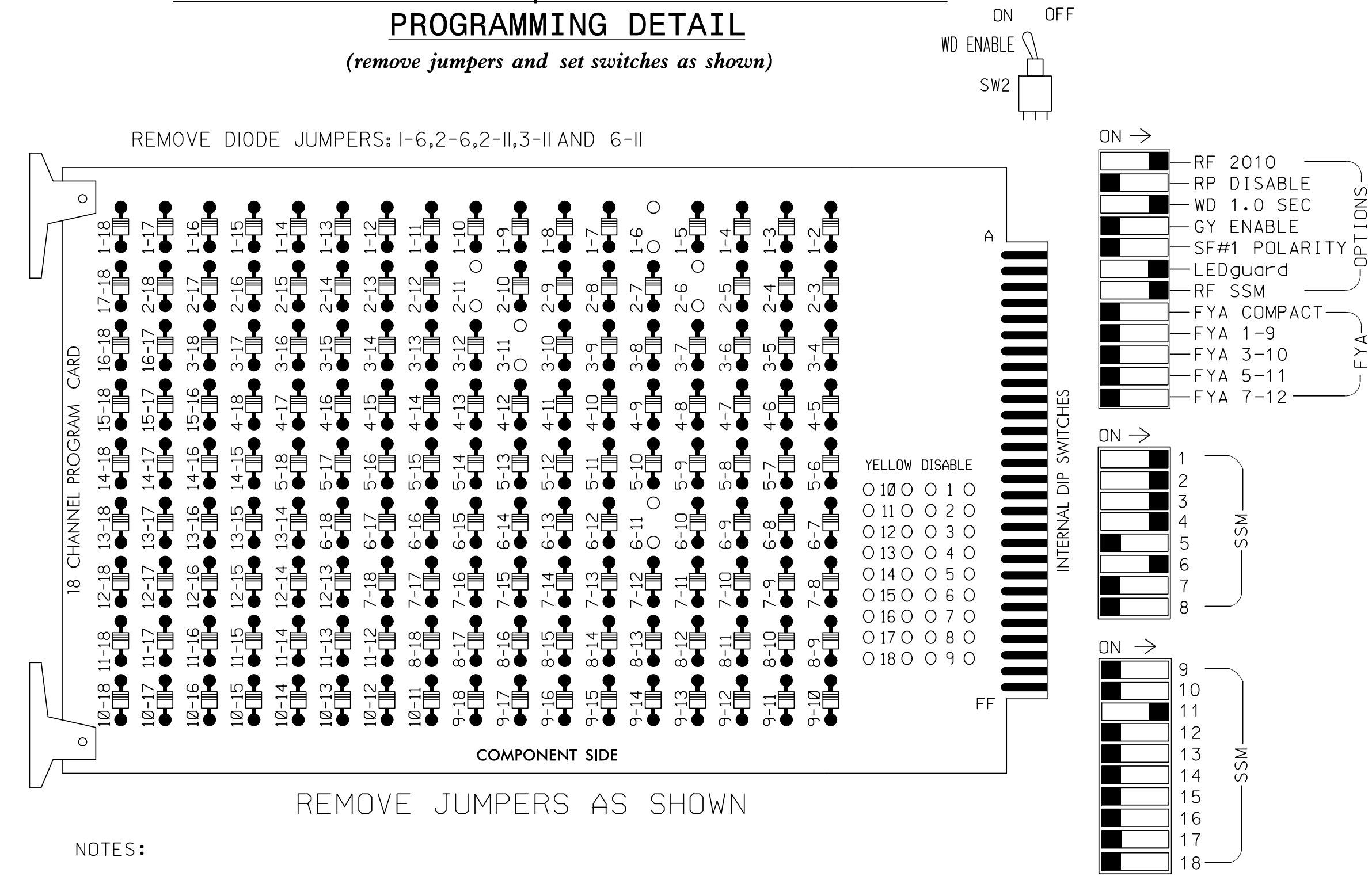
SIG. INVENTORY NO. 06-1301

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

06-MAY-2016 10:05 S:\MIS\GIS\15\_Signal\Signal\_Design\_Section\Eastern\_Region\01-06\U-5742\_Fayetteville\_ASC3\66-1301\661301\_51a\_dsn\_2016mads.dgn J:\GIS\JPG

### EDI MODEL 2018ECLIP-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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S8,AUX S4  
 PHASES USED.....1,2,3,4,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....2+3  
 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	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22 23	NU	31,32	41	42,43	NU	NU	61,62 63,64	NU	NU	NU	NU	NU	NU	24,25	NU	NU
RED	128			101	101				134									A114
YELLOW	129			102	102				135									
GREEN	130			103	103				136									
RED ARROW	125			116														
YELLOW ARROW	126			117														A115
GREEN ARROW	127			118	103													A116

NU = Not Used

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select 2. CONTROLLER
- From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

TOGGLE TWICE

OVERLAP C

Select TMG VEH OVLP [C] and 'NORMAL'

TMG VEH OVLP...[C] TYPE: ..... NORMAL

PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

INCLUDED . X X . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1301  
 DESIGNED: January 2016  
 SEALED: 5/6/2016  
 REVISED:

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅2/SYS	∅2/SYS	∅ 3	∅ 3	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	1A	1B	2A/S2A	2C/S2C	3A	3B	4B	4D	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
U	NOT USED	NOT USED	∅2/SYS	∅2/SYS	NOT USED	∅ 4	∅ 4	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
L	∅ 6	∅ 6	2B/S2B	2C/S2C	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
U	6A	6C	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
L	6B	6D	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6

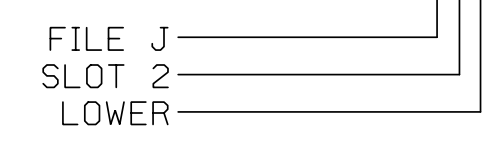
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
1B	TB2-5,6	I2U	39	2	1	YES			S
2A/S2A	TB2-9,10	I3U	63	32	2	YES			N
2B/S2B	TB2-11,12	I3L	76	42	2	YES			N
2C/S2C	TB4-1,2	I4U	47	22	2	YES			N
3A	TB4-5,6	I5U	58	3	3	YES			S
3B	TB4-9,10	I6U	41	4	3	YES			S
4A	TB4-11,12	I6L	45	14	4	YES			S
4B	TB6-1,2	I7U	65	34	4	YES			S
4C	TB6-3,4	I7L	78	44	4	YES			S
4D	TB6-5,6	I8U	49	24	4	YES		15	S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES			N
6D	TB3-11,12	J3L	77	46	6	YES			N

INPUT FILE POSITION LEGEND: J2L



9/16/2016 K:\REAL\_T\WORK\SI\DNALS\4011036345 Fayetteville File Electrical\061301-2016e.dgn Susan Pennington

Electrical Detail

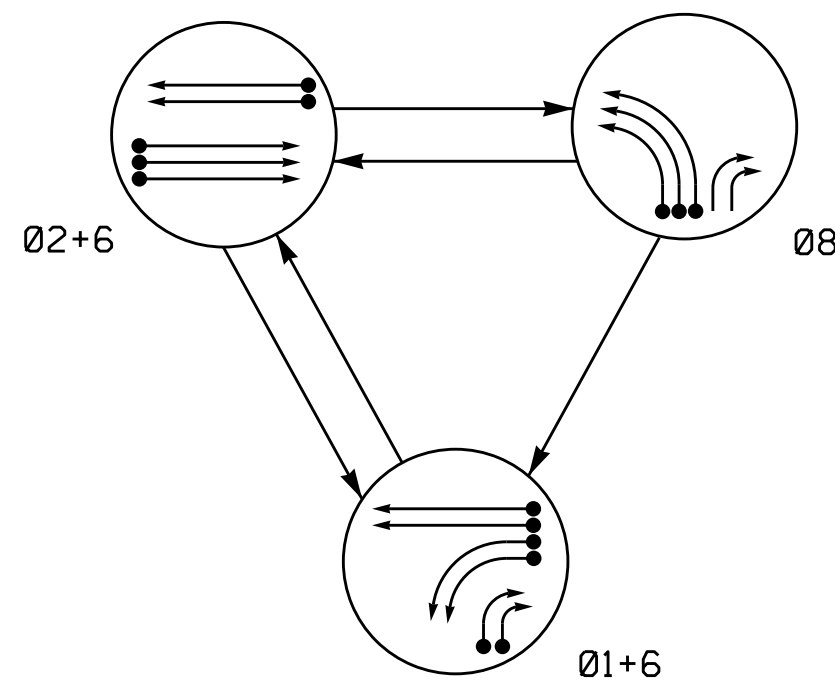
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

Prepared For: 	<b>NC 24 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) Eastbound (Ramp C/Loop D)</b>	SEAL 
Division 6 PLAN DATE: July 2016 PREPARED BY: SP Pennington	Cumberland County REVIEWED BY: KP Baumann REVIEWED BY: SL Phillips	Fayetteville REVISIONS INIT. DATE

PLANS PREPARED IN THE OFFICE OF:  
**Kimley Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

750 N. Greenfield Pkwy, Garner, NC 27529  
 0687AS9ED068437  
 DATE: 9/16/2016  
 SIG. INVENTORY NO. 06-1301

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	01+6	02+6	08	FL
11, 12	←	←	←	←
13, 14	←	←	←	←
21, 22, 23	R	G	R	Y
61, 62	G	G	R	Y
81, 82, 83	←	←	←	←

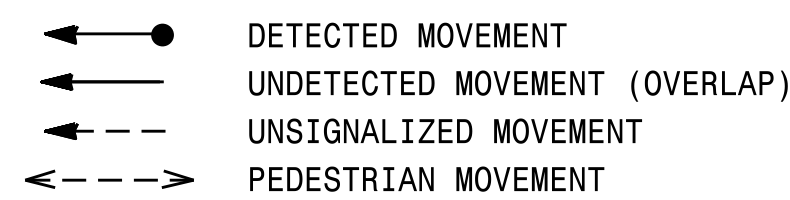
ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
1C	6X40	0	2-4-2	-	1	Yes	-	10	S	-	X
1D	6X40	0	2-4-2	-	1	Yes	-	10	S	-	X
2A/S2A	6X6	300	5	-	2	Yes	-	-	N	X	X
2B/S2B	6X6	300	5	-	2	Yes	-	-	N	X	X
2C/S2C	6X6	300	5	-	2	Yes	-	-	N	X	X
6A/S6A	6X6	300	6	-	6	Yes	-	-	N	X	X
6B/S6B	6X6	300	6	-	6	Yes	-	-	N	X	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X
8C	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X

3 Phase Fully Actuated Fayetteville Signal System

NOTES

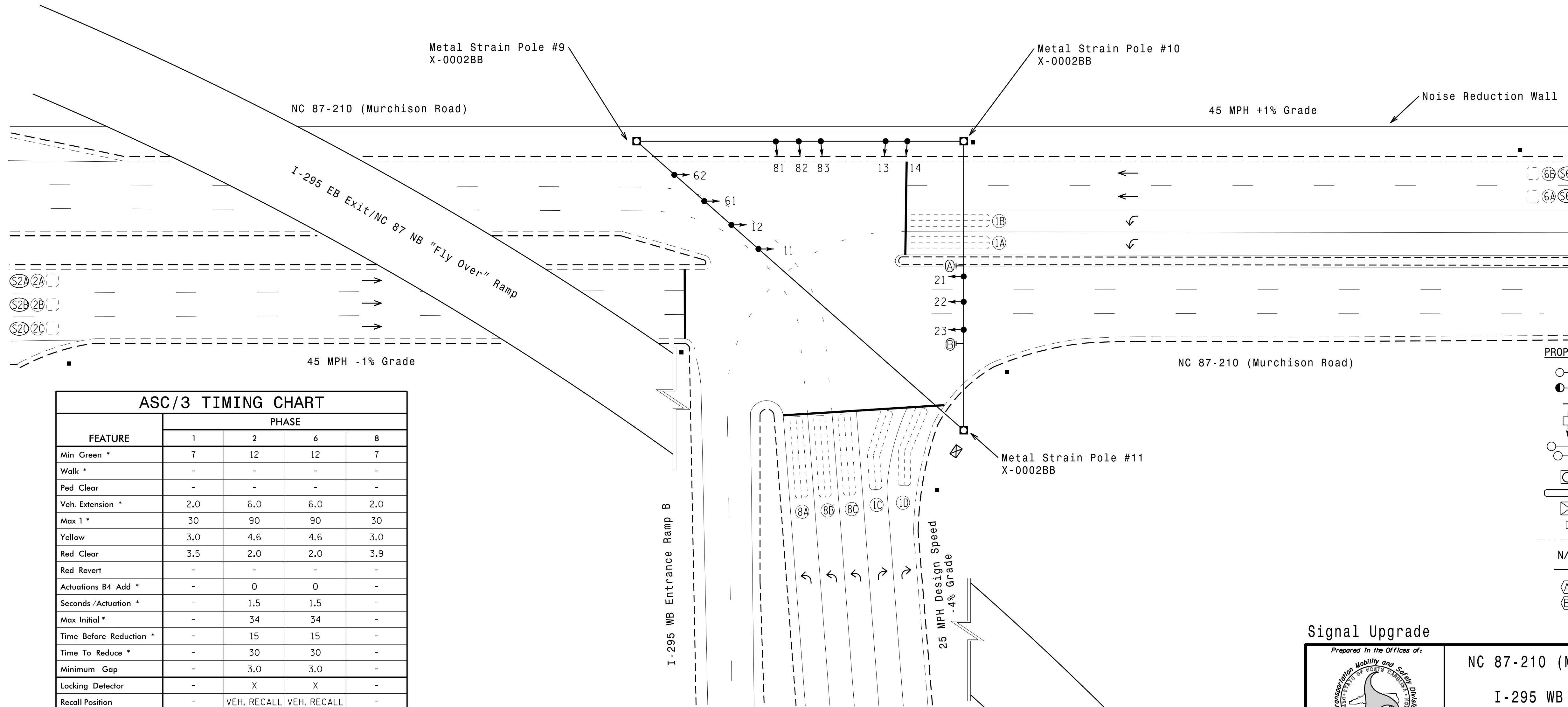
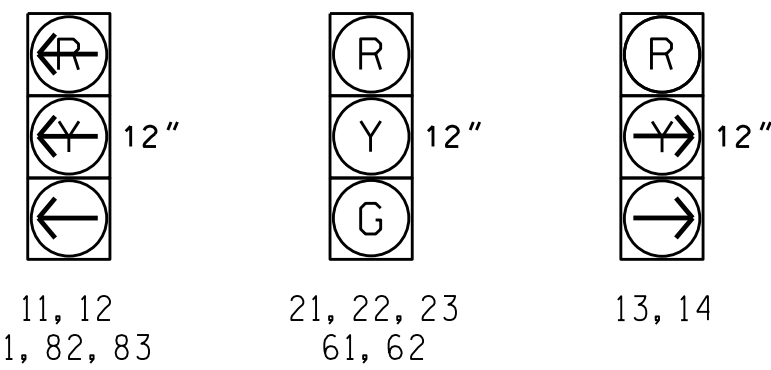
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



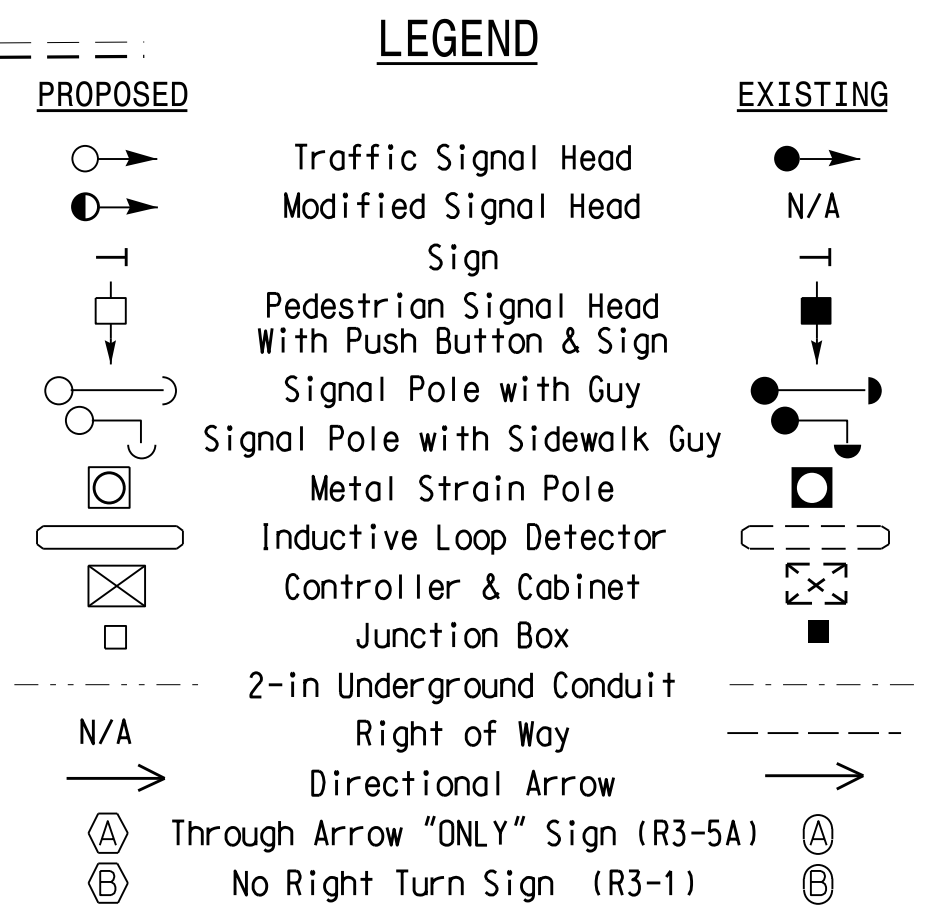
SIGNAL FACE I.D.

All Heads L.E.D.



FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	6.0	6.0	2.0
Max I *	30	90	90	30
Yellow	3.0	4.6	4.6	3.0
Red Clear	3.5	2.0	2.0	3.9
Red Revert	-	-	-	-
Actuations B4 Add *	-	0	0	-
Seconds / Actuation *	-	1.5	1.5	-
Max Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.0	3.0	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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



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

Signal Upgrade

Prepared in the Offices of:  
  
 TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC.  
 ENGINEERS OF TRANSPORTATION SIGNAL DESIGN SECTION  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 87-210 (Murchison Road) at I-295 WB Ramp/Loop B

Division 6 Cumberland County Fayetteville

PLAN DATE: May 2016 REVIEWED BY: JPG

PREPARED BY: Devin Smith REVIEWED BY:

REVISIONS INIT. DATE

Seal: JASON P. GALLAGHER, PROFESSIONAL ENGINEER, No. 029904, State of North Carolina.

Documented by: Jason P. Gallagher, DATE: 5/20/2016

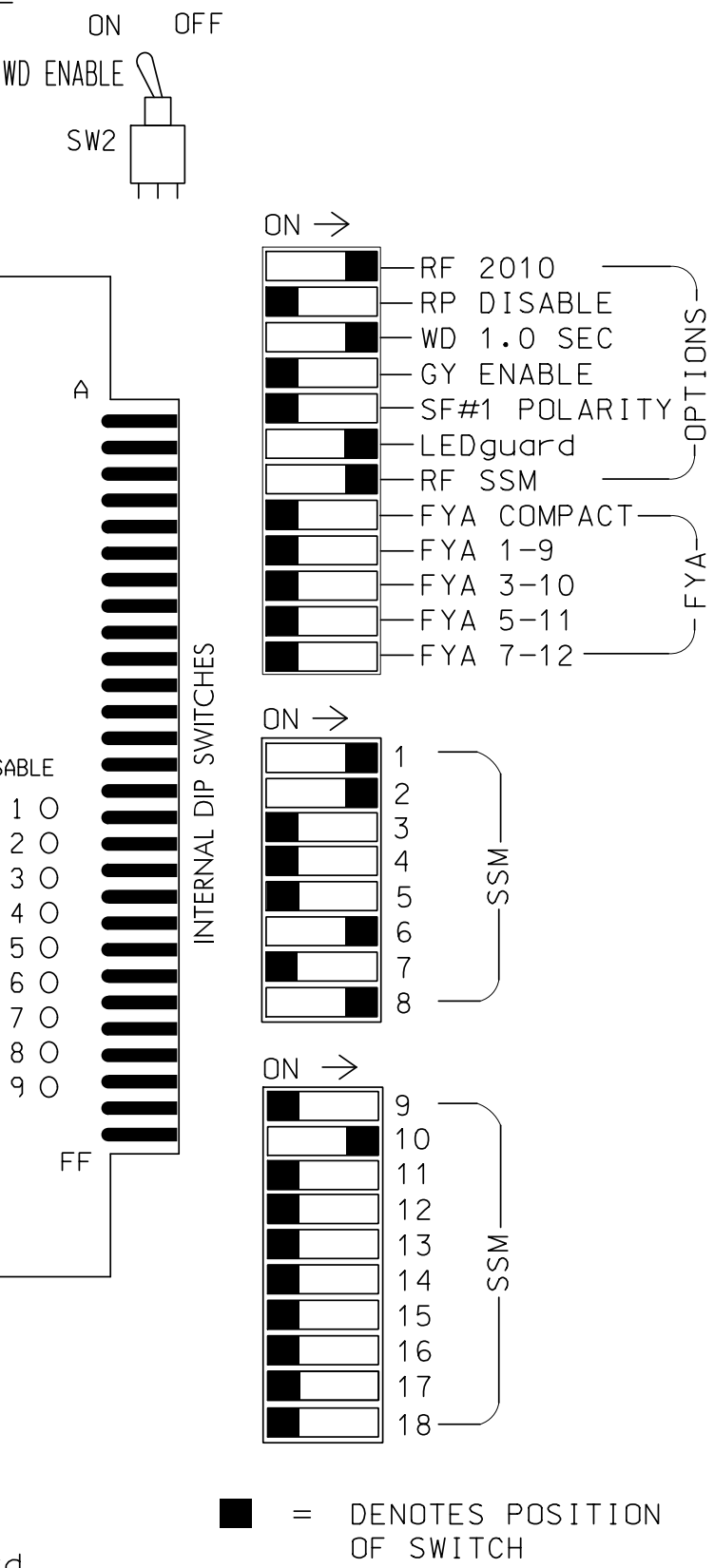
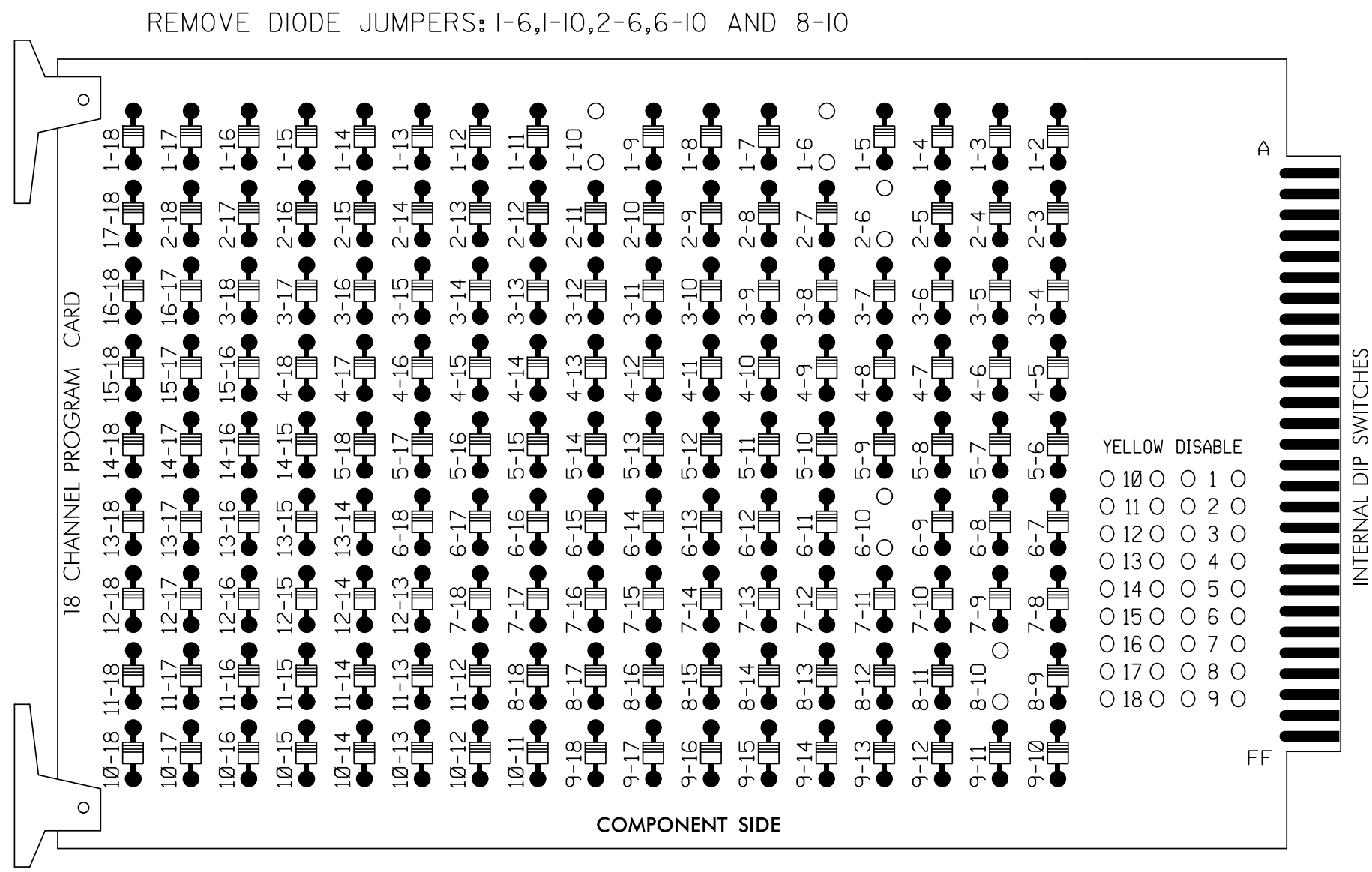
SIG. INVENTORY NO. 06-1302

20-0415-2016-16-13  
 S:\MITSU\15\SIGNAL\SIGNAL Design\_Section\Eastern Region\01\5742 Fayetteville ASC3\06-1302\061302\_s1a.dsn\_2016mmds.dgn  
 [J] smh:118



### EDI MODEL 2018ECLip-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.
  - 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### 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.	11,12	21,22,23	NU	NU	NU	NU	NU	61,62	NU	NU	81,82,83	NU	13,14	NU	NU	NU	NU	NU
RED		128						134					A124					
YELLOW		129						135										
GREEN		130						136										
RED ARROW	125											107						
YELLOW ARROW	126											108		A125				
GREEN ARROW	127											109		A126				

NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S2  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....1+8  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select
- From CONTROLLER Submenu select

TOGGLE ONCE

### OVERLAP B

Select TMG VEH OVLP [B] and 'NORMAL'

TMG VEH OVLP...[B] TYPE: .....	<input type="text" value="NORMAL"/>
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
INCLUDED X . . . . . X . . . . .	
LAG GRN 0.0 YEL 0.0 RED 0.0	

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1302  
 DESIGNED: May 2016  
 SEALED: 5/20/2016  
 REVISED:

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I" L	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	∅ 1 1A	∅ 1 1B	∅ 1 1D	∅ 1 1C	∅ 2/SYS 2A/S2A	∅ 2/SYS 2C/S2C	∅ 2/SYS 2B/S2B	∅ 8 8A	∅ 8 8C	∅ 8 8B	FS	ST	FS	ST
FILE "U" L	NOT USED	∅ 1 1C	NOT USED	∅ 6/SYS 6A/S6A	∅ 2/SYS 6B/S6B	∅ 8 8A	∅ 8 8C	∅ 8 8B	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

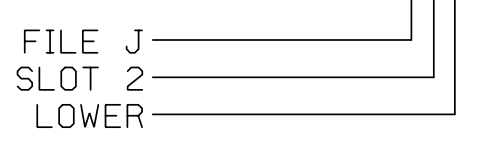
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
1B	TB2-5,6	I2U	39	2	1	YES			S
1C	TB2-7,8	I2L	43	12	1	YES		10	S
1D	TB2-9,10	I3U	63	32	1	YES		10	S
2A/S2A	TB4-9,10	I6U	41	4	2	YES			N
2B/S2B	TB4-11,12	I6L	45	14	2	YES			N
2C/S2C	TB6-1,2	I7U	65	34	2	YES			N
6A/S6A	TB3-5,6	J2U	40	6	6	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6	YES			N
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES			S
8C	TB7-1,2	J7U	66	38	8	YES			S

### INPUT FILE POSITION LEGEND: J2L



### FLASHER CIRCUIT MODIFICATION DETAIL

In order to ensure 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.

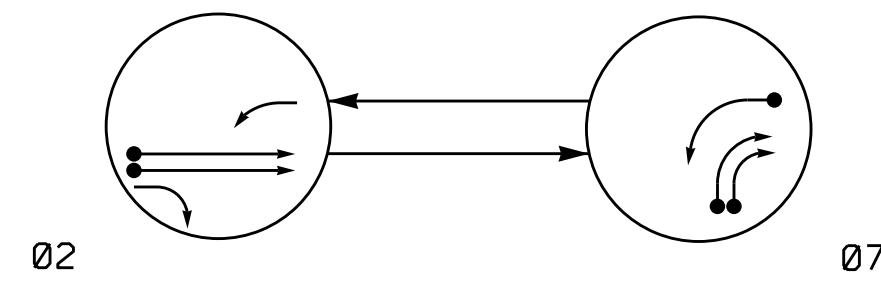
### Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: 	NC 87-210 (Murchison Road) at I-295 WB Ramp/Loop B		SEAL 	
	Division 6 PLAN DATE: July 2016	Cumberland County REVIEWED BY: KP Baumann		Fayetteville REVIEWED BY: SL Phillips
	PREPARED BY: SP Pennington	REVISIONS		DATE
	750 N. Greenfield Pkwy, Garner, NC 27529 PLANS PREPARED IN THE OFFICE OF: <b>Kimley Horn</b> NC License #F-0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	INVENTORY NO. 06-1302		DATE 9/1/2016

8/21/2016 K:\REAL\_TPO\SI\DNALS\4011036345 Fayetteville Electrical\Coals\654 - Signal Design\3rd Submit\Final\42341\_061302-2016e.dgn Susan Pennington

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

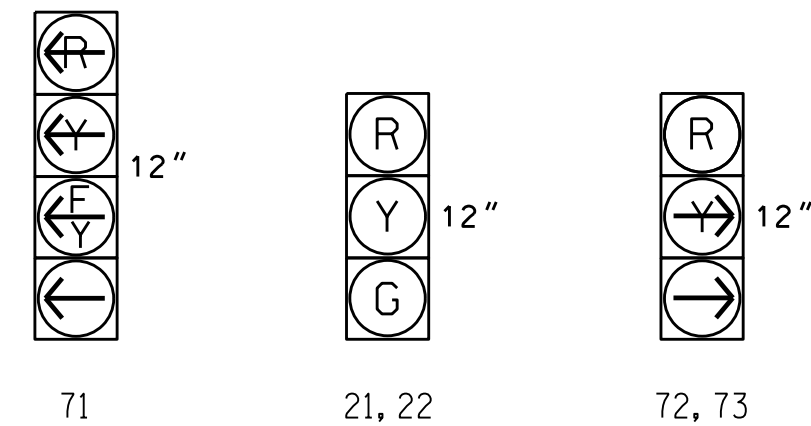
- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02	07	Foot C
21, 22	G	R	Y
71	F	---	---
72, 73	R	---	R

SIGNAL FACE I.D.

All Heads L.E.D.

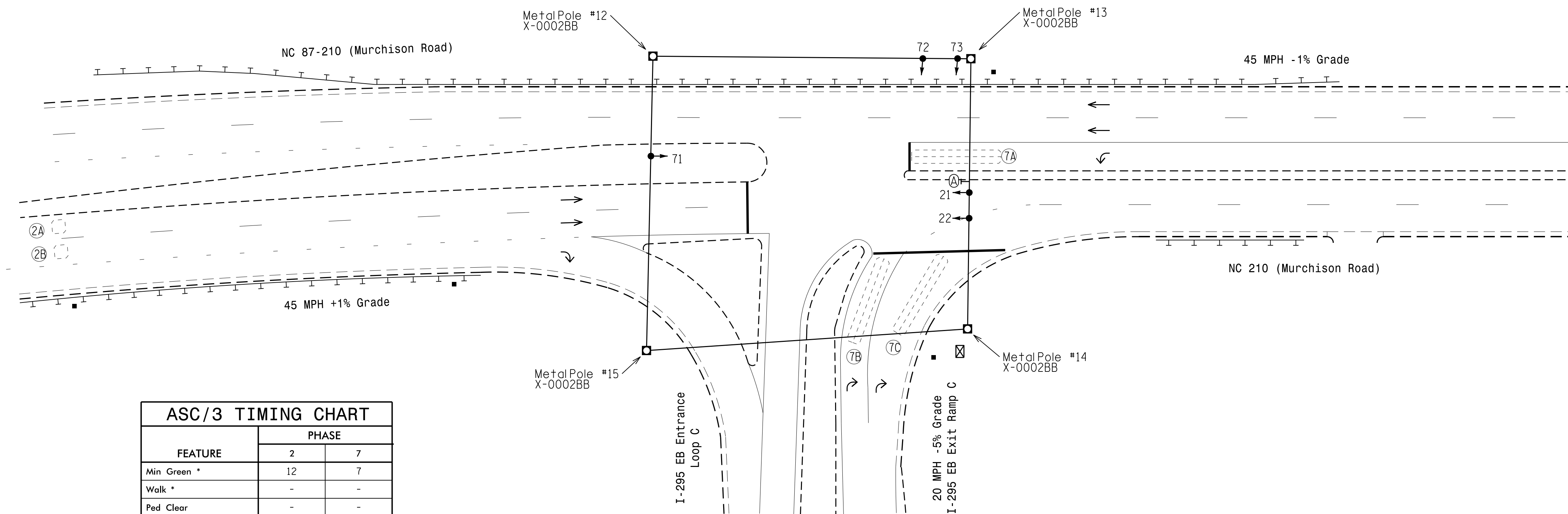


ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	-	2	Yes	-	-	N	-	X
2B	6X6	300	5	-	2	Yes	-	-	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	15	S	-	X
7B	6X40	0	2-4-2	-	7	Yes	-	10	S	-	X
7C	6X40	0	2-4-2	-	7	Yes	-	10	S	-	X

2 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE	
	2	7
Min Green *	12	7
Walk *	-	-
Ped Clear	-	-
Veh. Extension *	6.0	2.0
Max 1 *	90	30
Yellow	4.4	3.1
Red Clear	1.3	2.6
Red Revert	-	-
Actuations B4 Add *	0	-
Seconds / Actuation *	1.0	-
Max Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	45	-
Minimum Gap	3.0	-
Locking Detector	X	-
Recall Position	VEH. RECALL	-
Dual Entry	-	-
Simultaneous Gap	X	X

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

LEGEND

- | PROPOSED   | EXISTING                     |
|--|------------------------------|
| ○ → 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                      |
| □ → Metal Strain Pole                              | □ → N/A                      |
| □ → Inductive Loop Detector                        | □ → N/A                      |
| □ → Controller & Cabinet                           | □ → N/A                      |
| □ → Junction Box                                   | □ → N/A                      |
| --- 2-in Underground Conduit                       | --- 2-in Underground Conduit |
| N/A Right of Way                                   | N/A Right of Way             |
| N/A Guardrail                                      | N/A Guardrail                |
| → Directional Arrow                                | → Directional Arrow          |
| (A) No Left Turn Sign (R3-2)                       | (A) No Left Turn Sign (R3-2) |

Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**NC 87-210 (Murchison Road) at I-295 EB Ramp/Loop C**

Division 6 Cumberland County Fayetteville

PLAN DATE: May 2016 REVIEWED BY: JPG

PREPARED BY: Devin Smith/emm REVIEWED BY:

SEAL

DocuSigned by: Jason P. Gallaway 8/23/2016

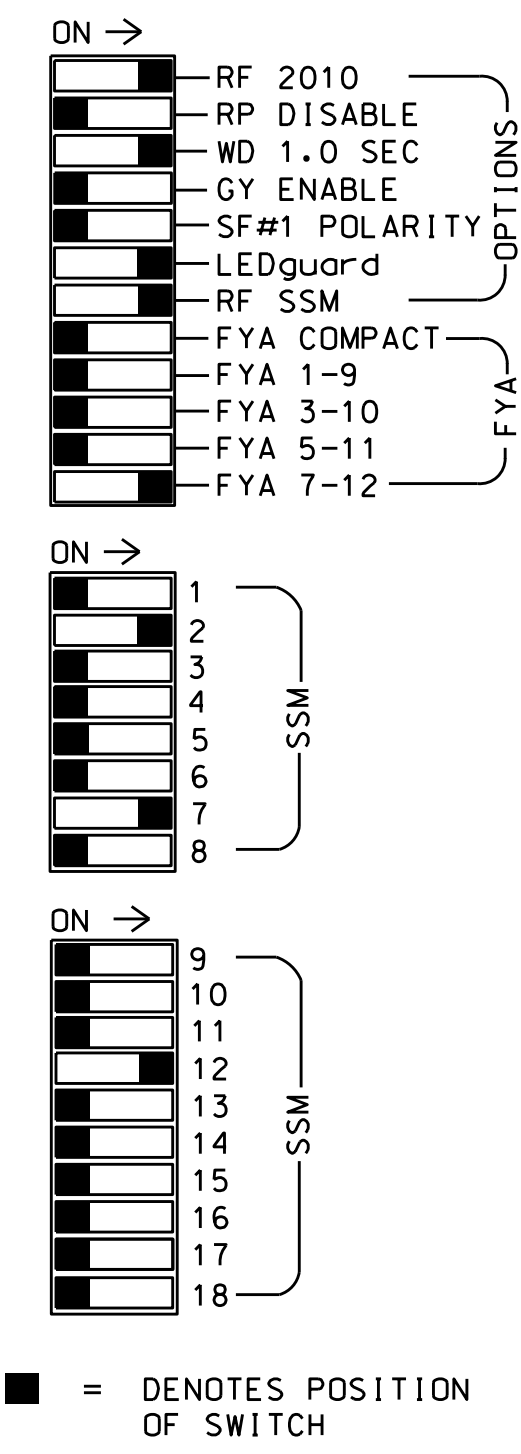
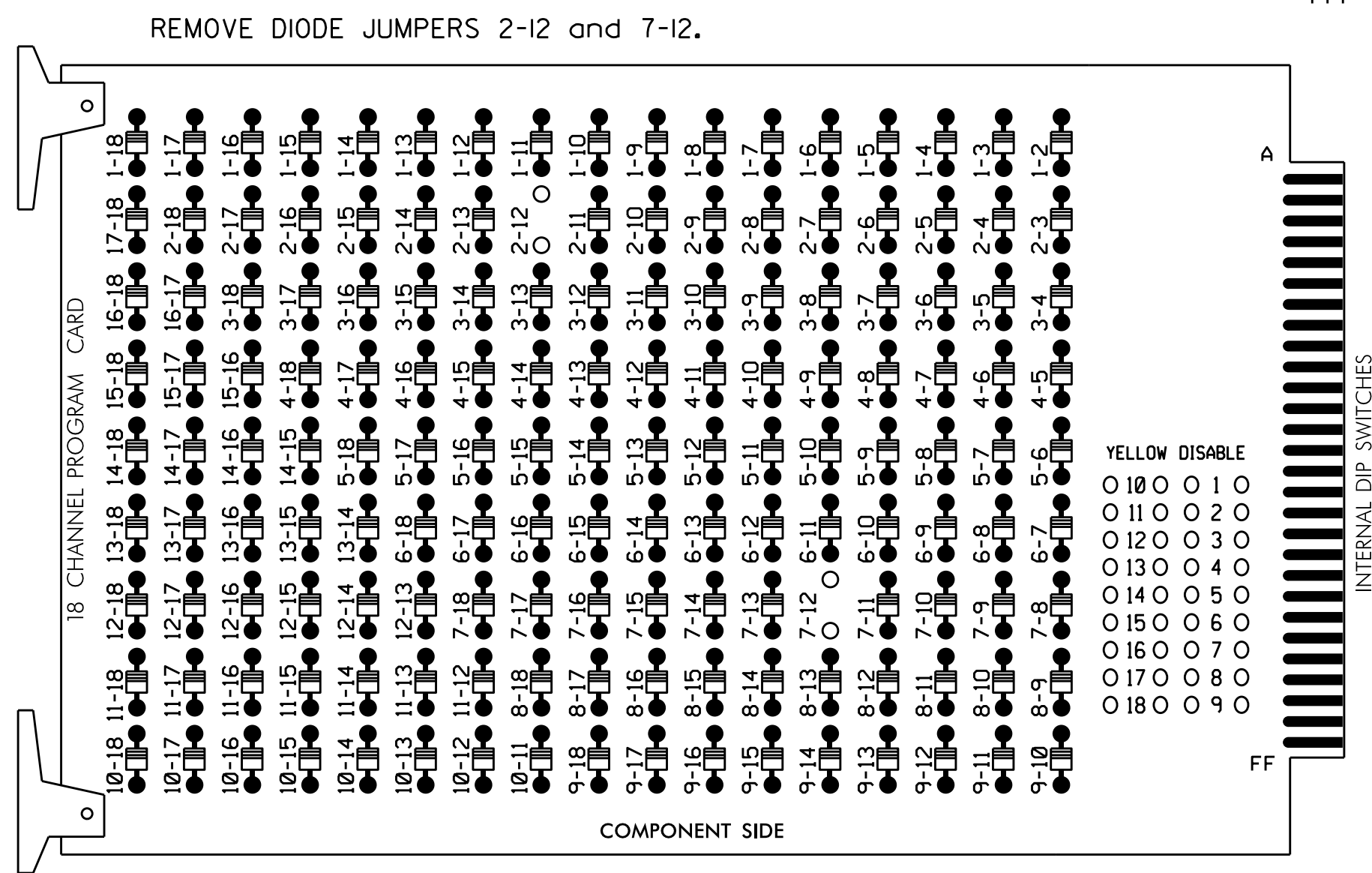
SIG. INVENTORY NO. 06-1303

REVISIONS	INIT.	DATE

23-AUG-2016 15:10 S:\TDS\Signal Design\Section\Eastern Region\04\U-5742 Fayetteville\11e ASC3\606-1303\6061303\_s1a.dsn\_2016mmds.dgn emm\jshew

**EDI MODEL 2018ECLIP-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.
  - 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for volume density operation.
- Program controller to start up in phase 2 Green.
- Program phase 6 for Red Flash.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S10,AUX S5  
 PHASES USED.....2,7  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....\*  
 OVERLAP "M".....7

\* See overlap programming detail on sheet 2.

**SIGNAL HEAD HOOK-UP CHART**

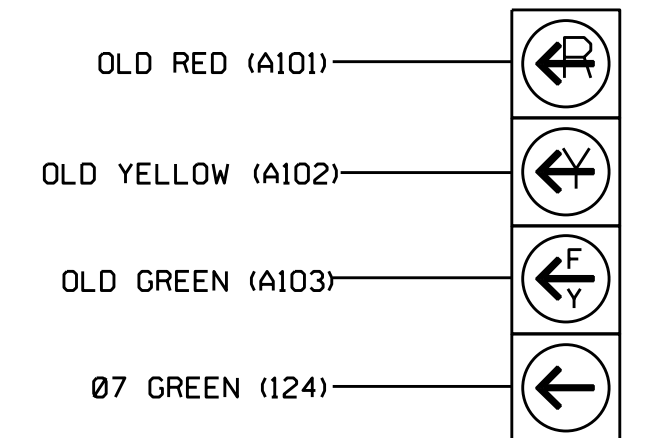
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7/DLM	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	71*	72,73	NU	NU	NU	NU	NU	71*	NU
RED		128									122							
YELLOW		129																
GREEN		130																
RED ARROW																		A101
YELLOW ARROW											123							A102
FLASHING YELLOW ARROW																		A103
GREEN ARROW										124	124							

NU = Not Used

\* See pictorial of head wiring in detail this sheet.

**FYA SIGNAL WIRING DETAIL**

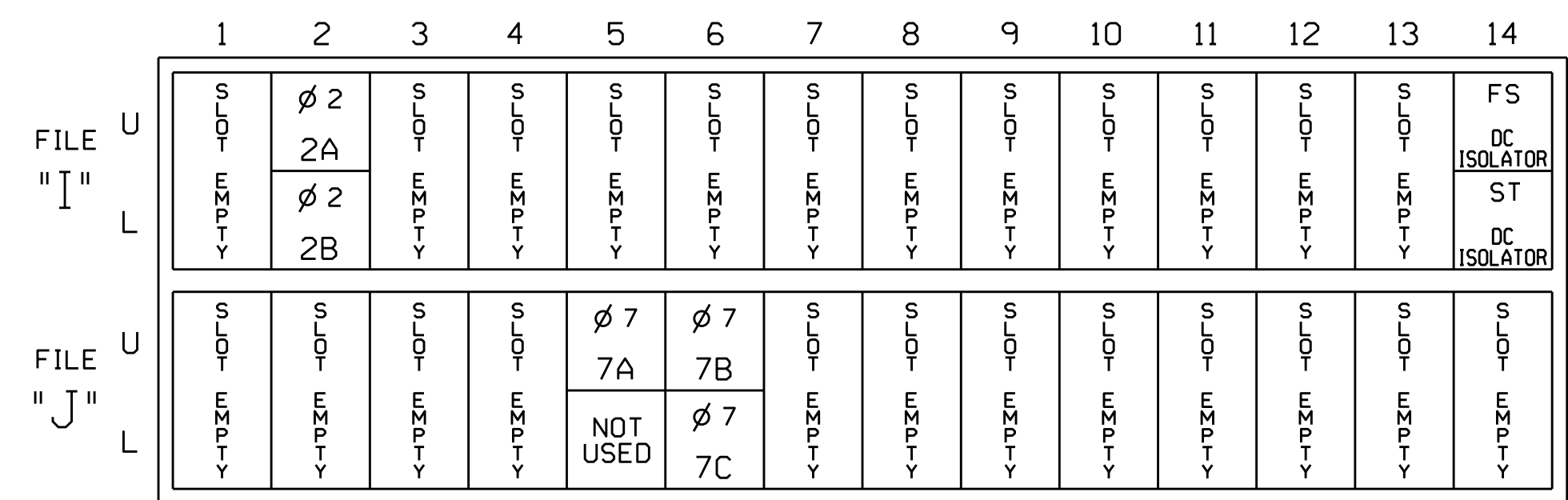
(wire signal head as shown)



71

**INPUT FILE POSITION LAYOUT**

(front view)

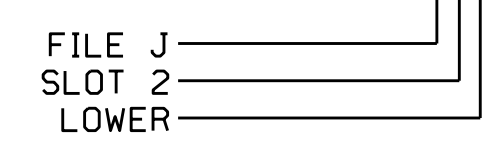


EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
7A	TB5-5,6	J5U	57	7	7	YES		15	S
7B	TB5-9,10	J6U	42	8	7	YES		10	S
7C	TB5-11,12	J6L	46	18	7	YES		10	S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1303  
 DESIGNED: May 2016  
 SEALED: 8-23-16  
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 87-210 (Murchison Road) at I-295 EB Ramp/Loop C

Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016 REVIEWED BY: BAS

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: Keith M. Mins 10/7/2016

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER KEITH M. MINS SEAL 036880

SIG. INVENTORY NO. 06-1303

07-001-2016\_08-30 S:\IT\531\15-Signal\work\gpc\061303\_sml.ele...xxx.dgn J.peterson

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

Toggle Three Times

*OVERLAP D*

Select TMG VEH OVLP [D] and 'PPLT FYA'

TMG VEH OVLP...[D] TYPE: .....PPLT FYA

PROTECTED LEFT TURN.... PHASE M

OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH12 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

↓ Toggle to advance  
to Overlap 'M'

*OVERLAP M*

Select TMG VEH OVLP [M] and 'NORMAL'

TMG VEH OVLP...[M] TYPE: .....NORMAL

PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

INCLUDED . . . . . X . . . . .

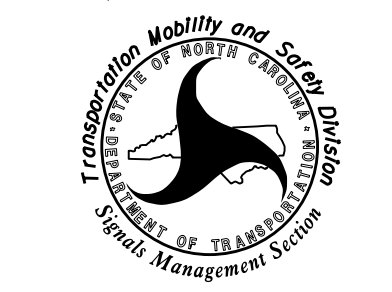
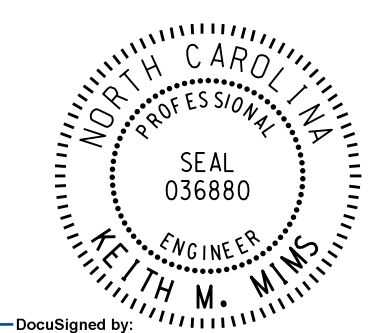
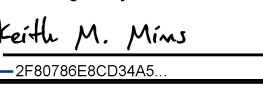
LAG GRN 0.0 YEL 0.0 RED 0.0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-1303  
DESIGNED: May 2016  
SEALED: 8-23-16  
REVISED: N/A

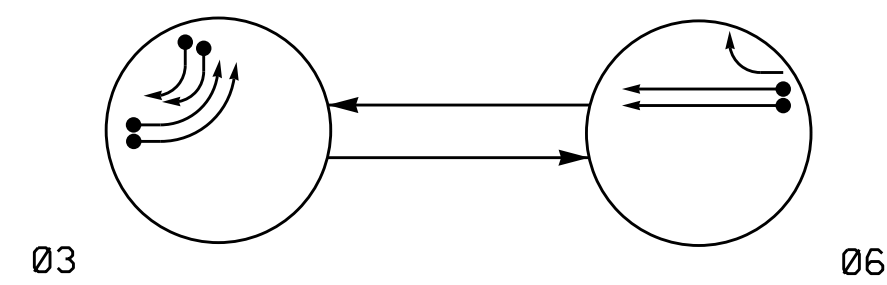
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>NC 87-210 (Murchison Road) at I-295 EB Ramp/Loop C</b>  Division 6    Cumberland County    Fayetteville PLAN DATE: August 2016    REVIEWED BY: BAS PREPARED BY: James Peterson    REVIEWED BY:	SEAL  ENGINEER <b>KEITH M. MINS</b>									
<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REVISIONS	INIT.	DATE							DocuSigned by:  10/7/2016 DATE SIG. INVENTORY NO. 06-1303
REVISIONS	INIT.	DATE									

07-001-2016\_1059  
S:\IT\ASSETS\Sigma\workgroups\sig\Mar\Peterson\061303\_sml.ele\_xxx.dgn  
J. Peterson

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

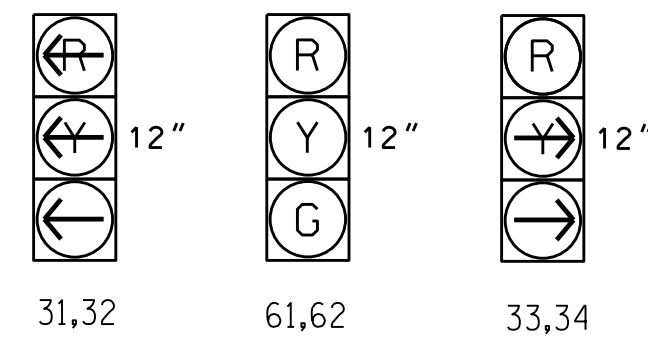
- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←---→ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø3	Ø6	F L
31,32	← R	→ R	← R
33,34	← R	→ R	→ R
61,62	R	G	Y

SIGNAL FACE I.D.

All Heads L.E.D.

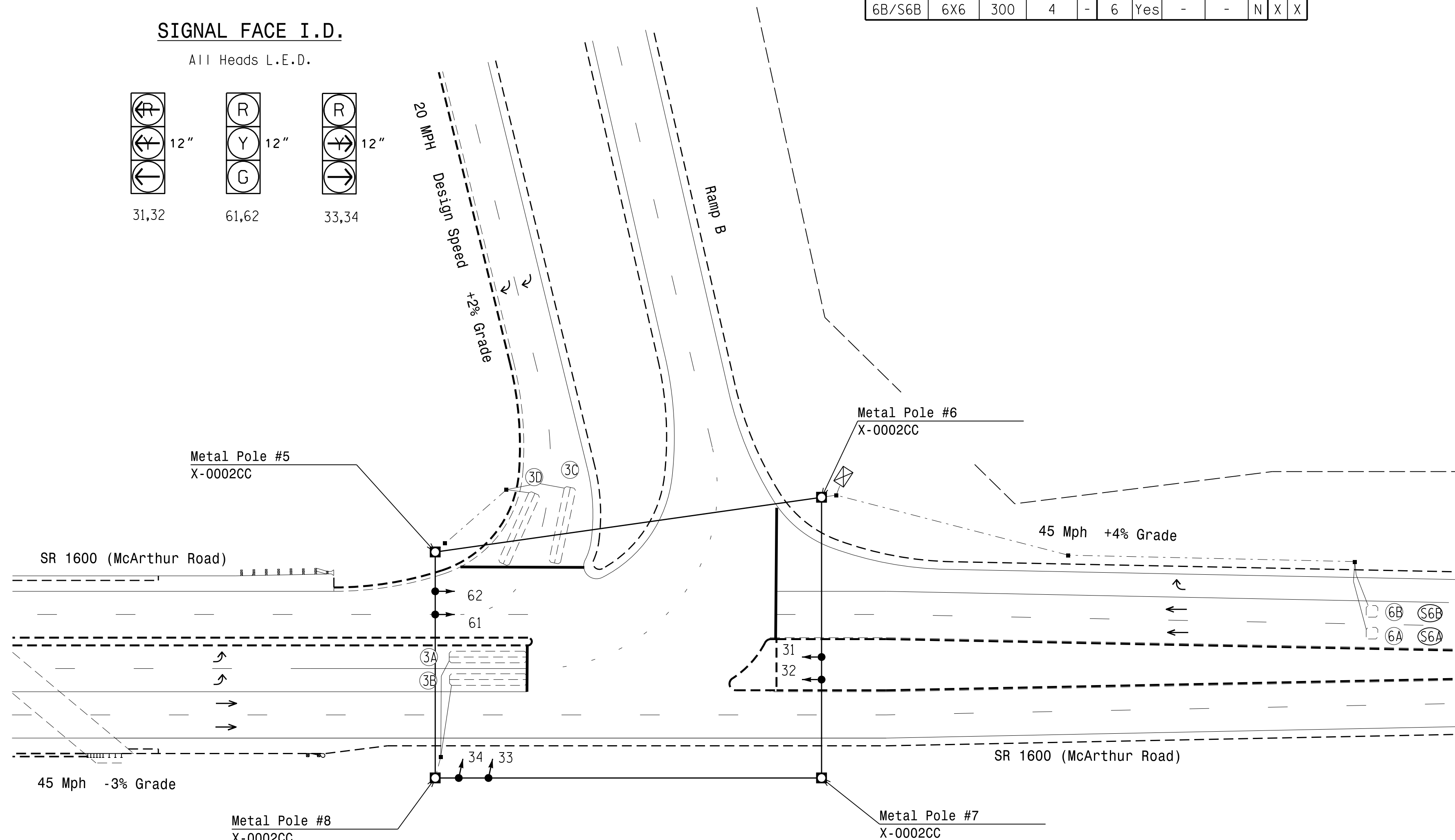


ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	NEW CARD
3A	6X40	0	2-4-2	-	3	Yes	-	-	S	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	S	X
3C	6X40	0	2-4-2	-	3	Yes	-	10	S	X
3D	6X40	0	2-4-2	-	3	Yes	-	10	S	X
6A/S6A	6X6	300	4	-	6	Yes	-	-	N	X
6B/S6B	6X6	300	4	-	6	Yes	-	-	N	X

2 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE	
	3	6
Min Green *	7	12
Walk *	0	0
Ped Clear	0	0
Veh. Extension *	2.0	6.0
Max 1 *	30	90
Yellow	3.0	4.2
Red Clear	3.6	2.5
Actuations B4 Add *	-	0
Seconds / Actuation *	-	1.5
Max Initial *	-	34
Time Before Reduction *	-	15
Time To Reduce *	-	45
Minimum Gap	-	3.0
Locking Detector	-	X
Recall Position	-	VEH. RECALL
Dual Entry	-	-
Simultaneous Gap	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.

PROPOSED	EXISTING
○→ Traffic Signal Head	●→
●→ Modified Signal Head	N/A
↑ Sign	↑
⊥ Pedestrian Signal Head	⊥
⊥ With Push Button & Sign	⊥
○→ Signal Pole with Sidewalk Guy	●→
⊥ Metal Strain Pole	⊥
⊥ Inductive Loop Detector	⊥
⊥ Controller & Cabinet	⊥
⊥ Junction Box	⊥
--- 2-in Underground Conduit	---
N/A Right of Way	→
→ Directional Arrow	→

Signal Upgrade

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**SR 1600 (McArthur Road) at I-295 EB Ramp/Loop B**

Division 6 Cumberland County Fayetteville

PLAN DATE: JUNE 2016 REVIEWED BY: JPG

PREPARED BY: KGP, Jr. REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 1" = 40'

SEAL

Jason P. Galloway 6/3/2016

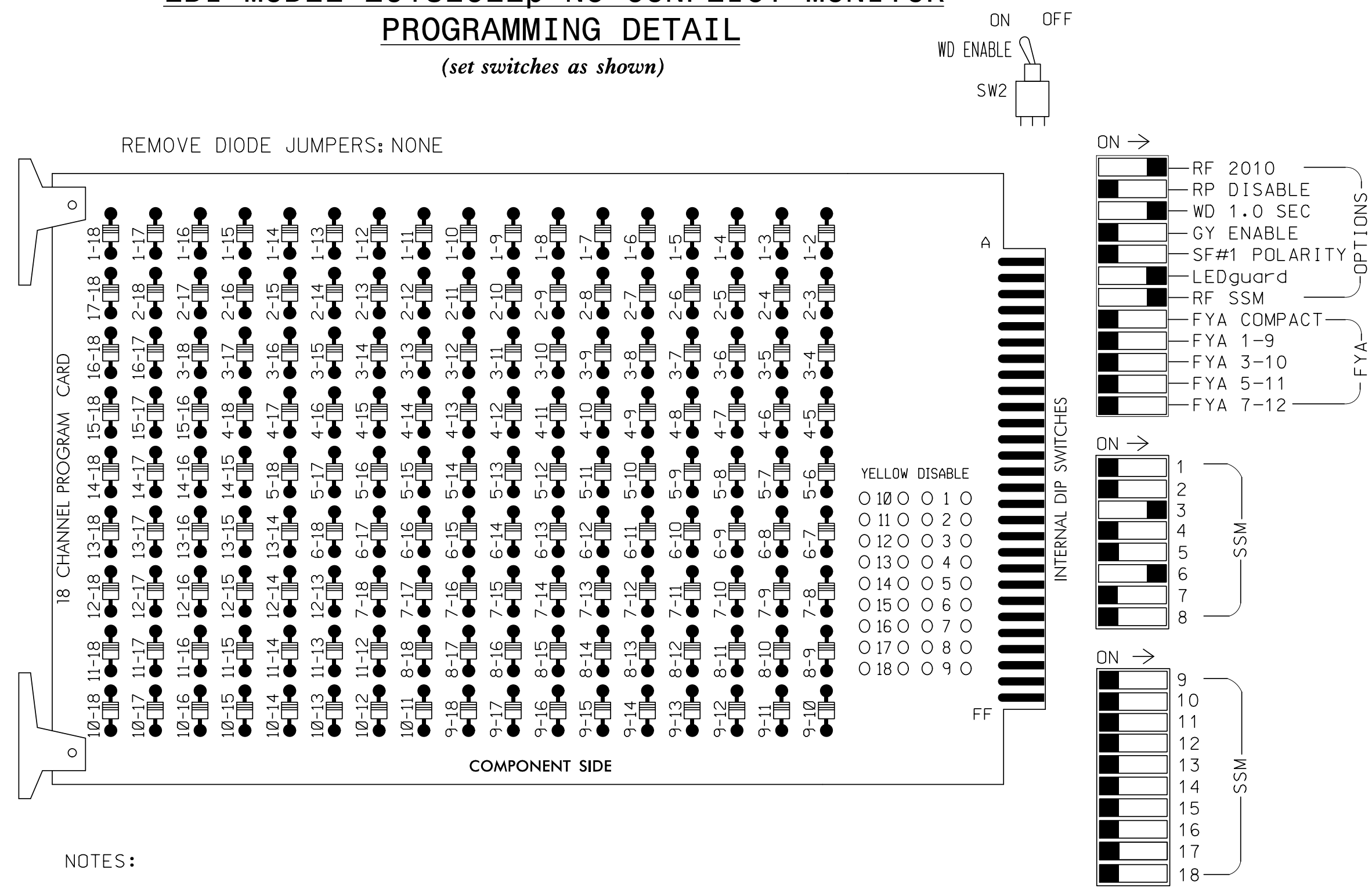
SIG. INVENTORY NO. 06-1304

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

03-jul-2016 15:11 S:\ITS\ASU\ITS\_Signal\esignal\_Section\Eastern Region\01\06\U-5742 Fayetteville ASC3\06-1304\061304\_sigs.dsn\_2016mmds.dgn kgspeed

### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



**NOTES:**

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

■ = DENOTES POSITION OF SWITCH

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for volume density operation.
4. Program controller to start up in 6 Green.
5. Program phase 2 for Red Flash.
- 6 The cabinet and controller are part of the Fayetteville Signal System.

### 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	NU	NU	31,32	33,34	NU	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED					116							134						
YELLOW												135						
GREEN												136						
RED ARROW					116													
YELLOW ARROW					117	117												
GREEN ARROW					118	118												

NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S4,S8  
 PHASES USED.....3,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### INPUT FILE POSITION LAYOUT (front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S	S	S	S	S	∅ 3	∅ 3	S	S	S	S	S	S	FS
I	S	S	S	S	S	3A	3C	S	S	S	S	S	S	DC ISOLATOR
L	S	S	S	S	S	∅ 3	∅ 3	S	S	S	S	S	S	ST
U	S	∅ 6/SYS	S	S	S	S	S	S	S	S	S	S	S	DC ISOLATOR
J	S	6A/S6A	S	S	S	S	S	S	S	S	S	S	S	S
L	S	∅ 6/SYS	S	S	S	S	S	S	S	S	S	S	S	S
	S	6B/S6B	S	S	S	S	S	S	S	S	S	S	S	S

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	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
3A	TB4-9,10	I6U	41	4	3	YES			S
3B	TB4-11,12	I6L	45	14	3	YES			S
3C	TB6-1,2	I7U	65	34	3	YES		10	S
3D	TB6-3,4	I7L	78	44	3	YES		10	S
6A/S6A	TB3-5,6	J2U	40	6	6	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6	YES			N

INPUT FILE POSITION LEGEND: J2L  
 FILE J  
 SLOT 2  
 LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1304  
 DESIGNED: June 2016  
 SEALED: 6/3/2016  
 REVISED:

9/16/2016 K:\MAIL\_TPT\K:\SIGNALS\4011036345 Fayetteville File Electrical\061304-2016e.dgn Susan Pennington

### Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For:

**SR 1600 (McArthur Road) at I-295 EB Ramp/Loop B**

SEAL

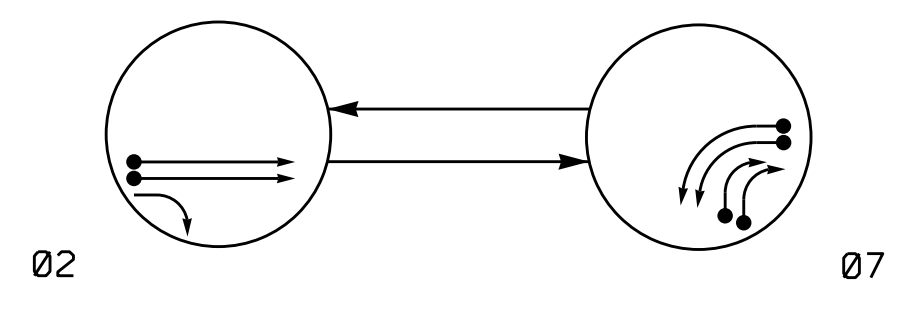
Division 6		Cumberland County		Fayetteville	
PLAN DATE: July 2016	REVIEWED BY: KP Baumann	PREPARED BY: SP Pennington		REVIEWED BY: SL Phillips	
REVISIONS	INIT.	DATE			

PLANS PREPARED IN THE OFFICE OF:  
**KimleyHorn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

750 N. Greenfield Pkwy, Garner, NC 27529  
 DATE: 9/16/2016  
 SIG. INVENTORY NO. 06-1304

2 Phase Fully Actuated Fayetteville Signal System

PHASING DIAGRAM

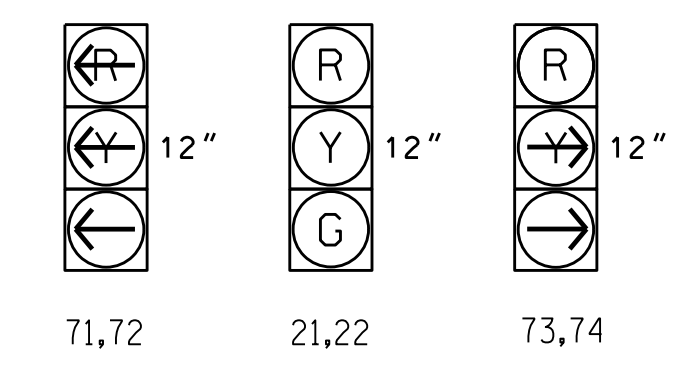


**PHASING DIAGRAM DETECTION LEGEND**  
 ● DETECTED MOVEMENT  
 ○ UNDETECTED MOVEMENT (OVERLAP)  
 - - - UNSIGNALIZED MOVEMENT  
 - - - PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	2	7	F
21,22	G	R	Y
71,72	R	-	R
73,74	R	-	R

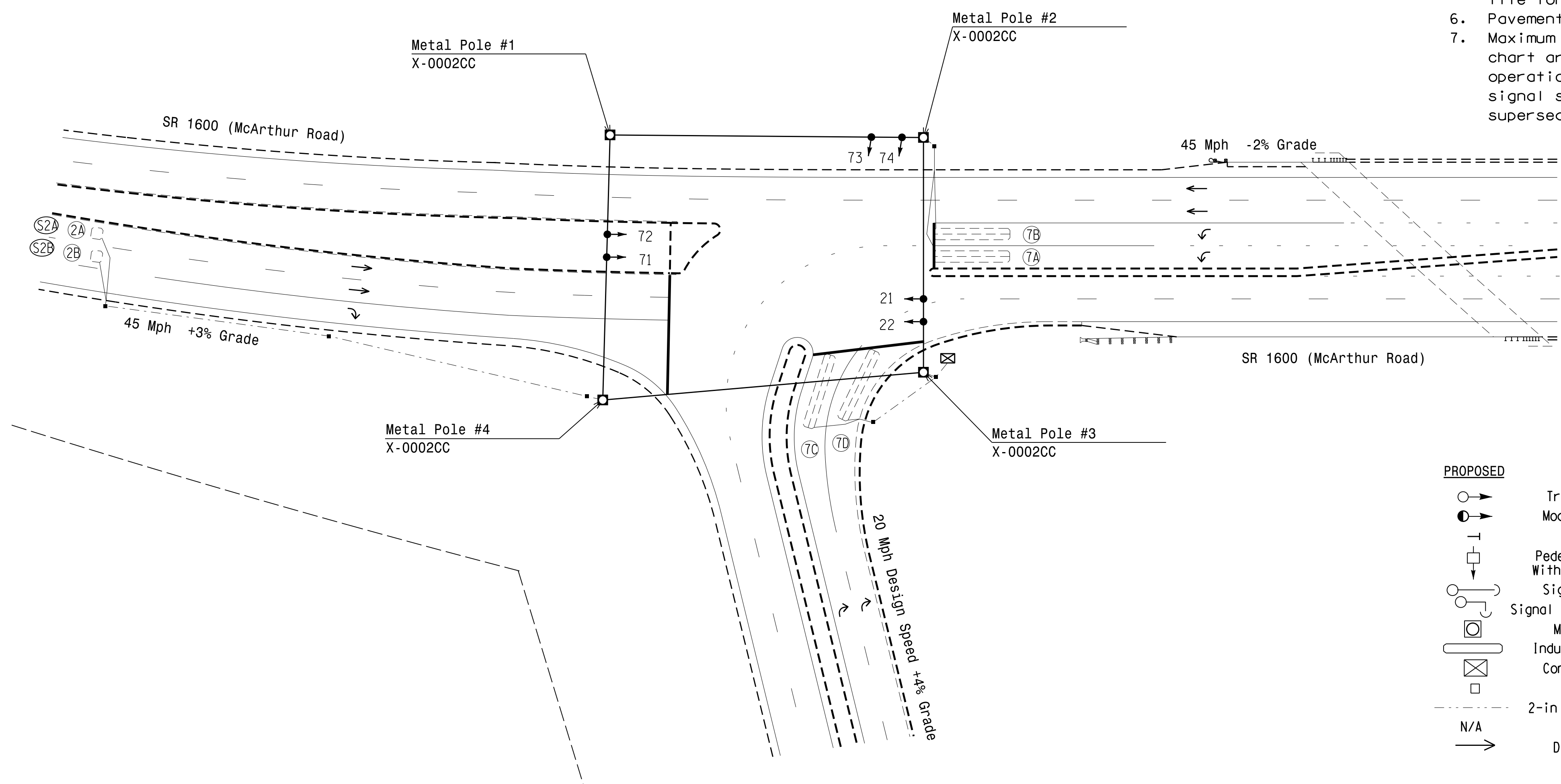
**SIGNAL FACE I.D.**  
All Heads L.E.D.



**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A/S2A	6X6	300	4	-	2	Yes	-	-	N	X	X
2B/S2B	6X6	300	4	-	2	Yes	-	-	N	X	X
7A	6X40	0	2-4-2	-	7	Yes	-	-	S	-	X
7B	6X40	0	2-4-2	-	7	Yes	-	-	S	-	X
7C	6X40	0	2-4-2	-	7	Yes	-	10	S	-	X
7D	6X40	0	2-4-2	-	7	Yes	-	10	S	-	X

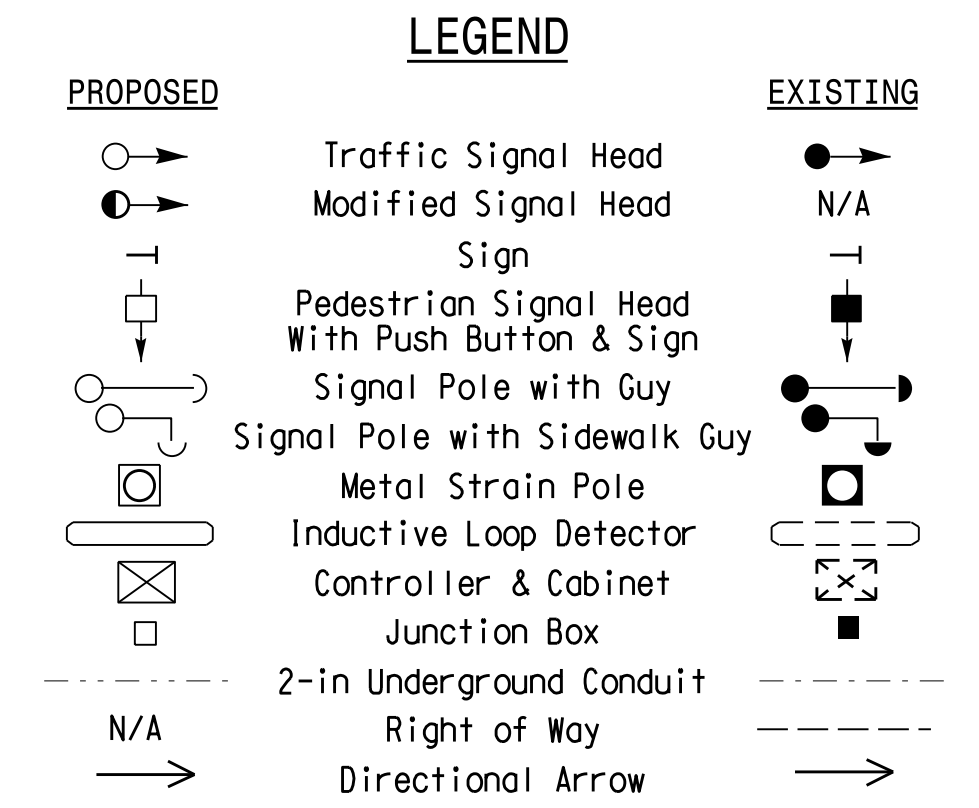
- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
  - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
  - Set all detector units to presence mode.
  - Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
  - The cabinet should be designed to include an Auxiliary Output file for future use.
  - Pavement markings are existing.
  - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE	
	2	7
Min Green *	12	7
Walk *	0	0
Ped Clear	0	0
Veh. Extension *	6.0	2.0
Max 1 *	90	30
Yellow	4.3	3.0
Red Clear	2.1	3.7
Actuations B4 Add *	0	-
Seconds / Actuation *	1.5	-
Max Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	45	-
Minimum Gap	3.0	-
Locking Detector	X	-
Recall Position	VEH. RECALL	-
Dual Entry	-	-
Simultaneous Gap	X	X

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



Signal Upgrade

SR 1600 (McArthur Road) at I-295 WB Ramp/Loop D

Division 6 Cumberland County Fayetteville

PLAN DATE: June 2016 REVIEWED BY: JPG

PREPARED BY: KPG, Jr. REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JASON P. GALLOWAY

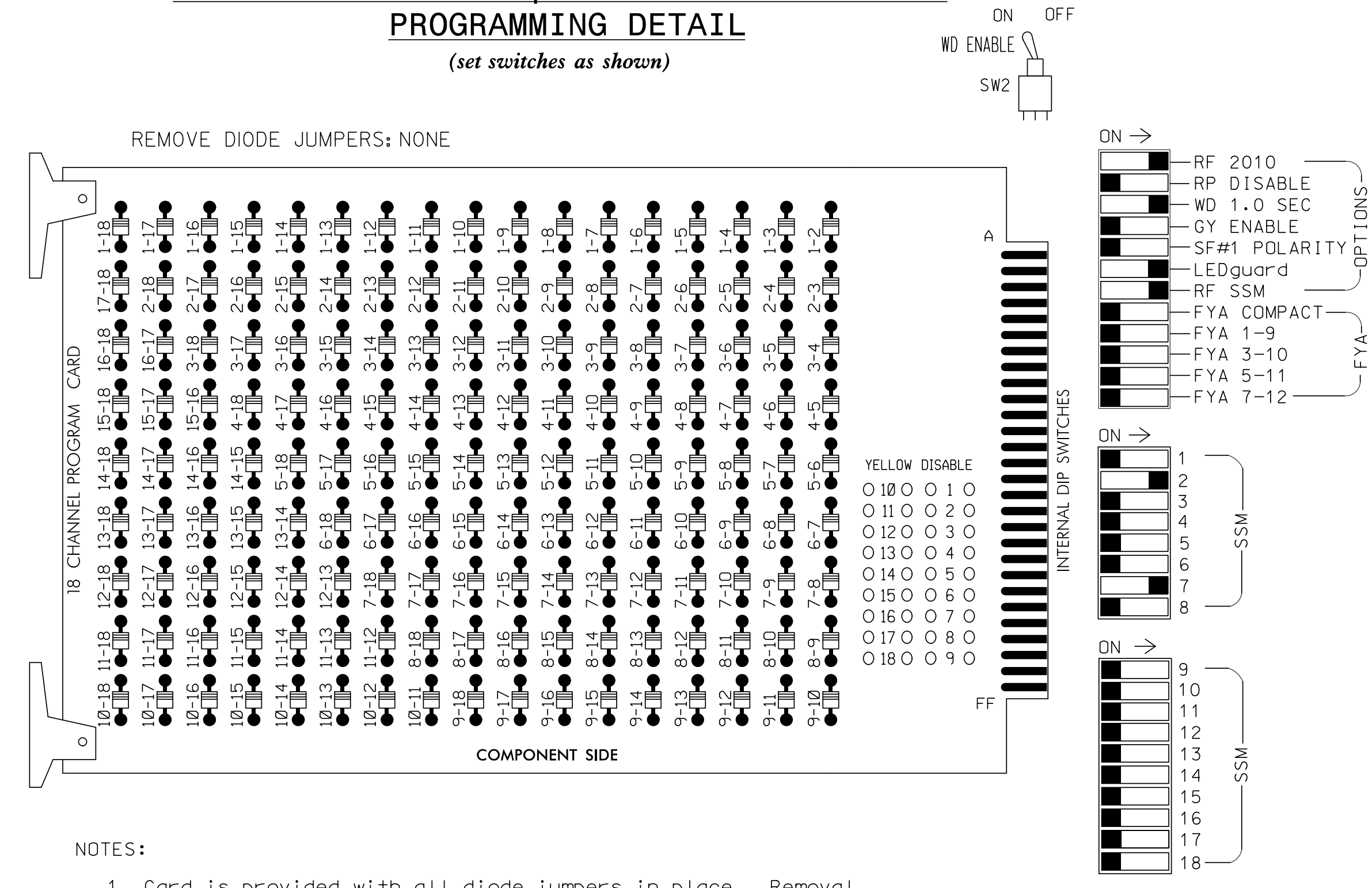
Jason P. Galloway 6/3/2016

SIG. INVENTORY NO. 06-1305

Q3-1016-2016-16-03  
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 kpgreed.in

### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



**NOTES:**

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

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for volume density operation.
4. Program controller to start up in 2 Green.
5. Program phase 6 for Red Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.

**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	NU	NU	NU	NU	NU	NU	NU	71,72	73,74	NU	NU	NU	33,34	NU	NU	NU
RED		128									122							
YELLOW		129																
GREEN		130																
RED ARROW										122								
YELLOW ARROW										123	123							
GREEN ARROW										124	124							

NU = Not Used

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S10  
 PHASES USED.....2,7  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

**INPUT FILE POSITION LAYOUT**

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L	2A/S2A	2A/S2A	2B/S2B											
L	∅2/SYS	∅2/SYS												
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L						7A	7C							
L						7B	7D							

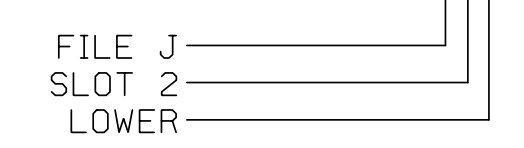
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2	YES			N
7A	TB5-9,10	J6U	42	8	7	YES			S
7B	TB5-11,12	J6L	46	18	7	YES			S
7C	TB7-1,2	J7U	66	38	7	YES		10	S
7D	TB7-3,4	J7L	79	48	7	YES		10	S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1305  
 DESIGNED: June 2016  
 SEALED: 6/3/2016  
 REVISED:

9/19/2016 K:\MAIL\_TPT\K\SIGNALS\4011036345 Fayetteville File Electrical\061305-2016e.dgn Susan Pennington

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: **Kimley-Horn**

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

SR 1600 (McArthur Road) at I-295 WB Ramp/Loop D

Division 6 Cumberland County Fayetteville

PLAN DATE: July 2016 REVIEWED BY: KP Baumann

PREPARED BY: SP Pennington REVIEWED BY: SL Phillips

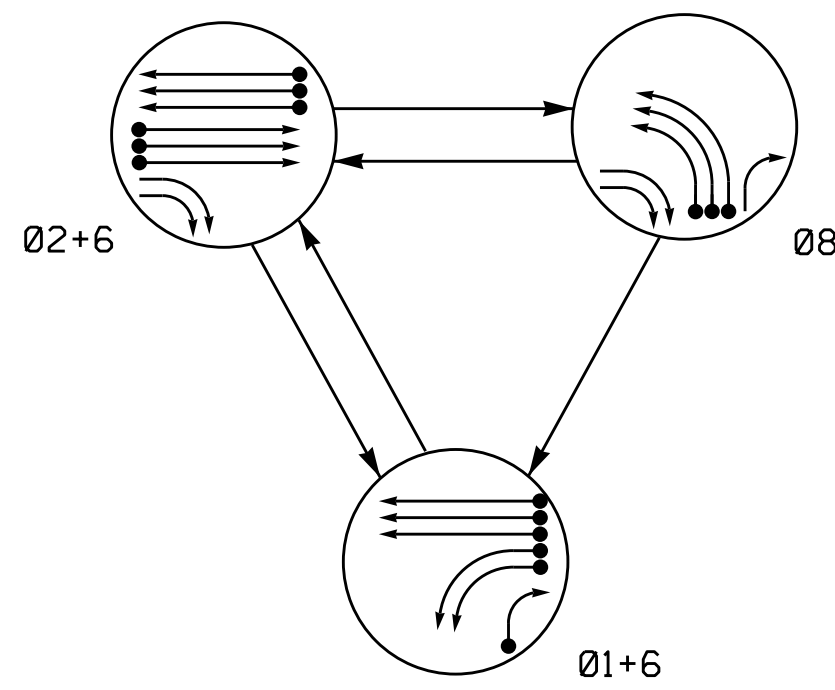
REVISIONS: INIT. DATE

9/19/2016

SIG. INVENTORY NO. 06-1305



PHASING DIAGRAM



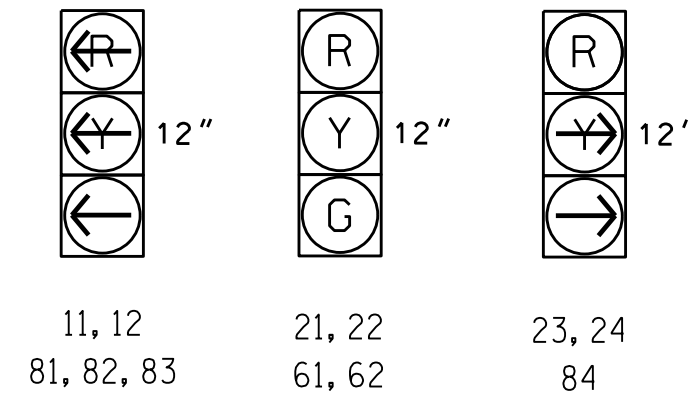
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE			
	01+6	02+6	08	F L
11,12	←	←	←	←
21,22	R	G	R	Y
23,24	R	←	←	←
61,62	G	G	R	Y
81,82,83	←	←	←	←
84	←	R	←	R

SIGNAL FACE I.D.

All Heads L.E.D.

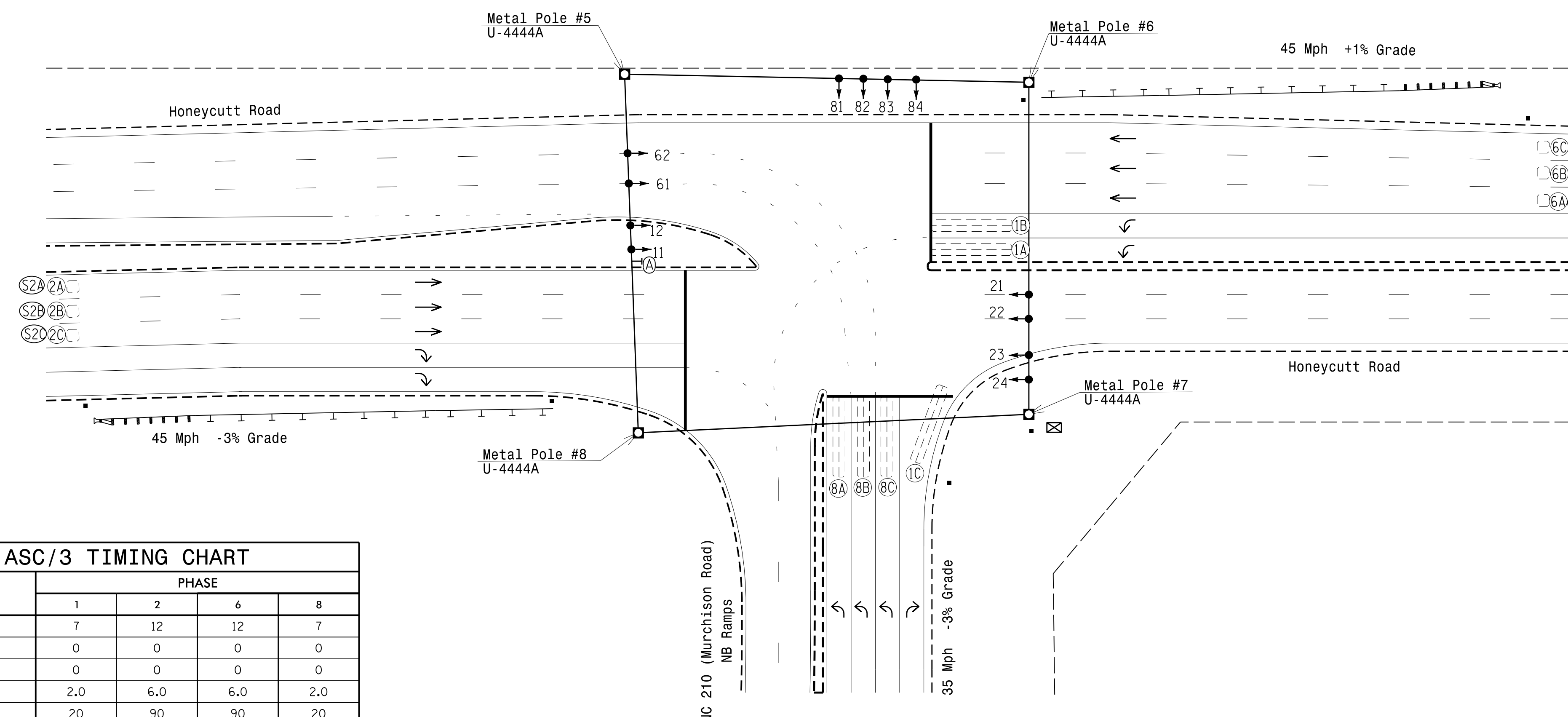


ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
1C	6X40	+5	2-4-2	-	1	Yes	-	15	S	-	X
2A/S2A	6X6	300	5	-	2	Yes	-	-	N	-	X
2B/S2B	6X6	300	5	-	2	Yes	-	-	N	-	X
2C/S2C	6X6	300	5	-	2	Yes	-	-	N	-	X
6A/S6A	6X6	300	5	-	6	Yes	-	-	N	-	X
6B/S6B	6X6	300	5	-	6	Yes	-	-	N	-	X
6C/S6C	6X6	300	5	-	6	Yes	-	-	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X
8C	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X

3 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	6.0	6.0	2.0
Max 1 *	20	90	90	20
Yellow	3.0	4.8	4.8	3.0
Red Clear	3.8	2.1	2.1	4.0
Actuations B4 Add *	-	0	0	-
Seconds / Actuation *	-	1.5	1.5	-
Max Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

- |     |   |     |   |
|-----|---|-----|---|
| ○   | PROPOSED Traffic Signal Head                            | ●   | EXISTING Traffic Signal Head                            |
| ◐   | PROPOSED Modified Signal Head                           | N/A | EXISTING Modified Signal Head                           |
| ⊥   | PROPOSED Sign   | ⊥   | EXISTING Sign   |
| ⊥   | PROPOSED Pedestrian Signal Head With Push Button & Sign | ⊥   | EXISTING Pedestrian Signal Head With Push Button & Sign |
| ⊥   | PROPOSED Signal Pole with Guy                           | ⊥   | EXISTING Signal Pole with Guy                           |
| ⊥   | PROPOSED Signal Pole with Sidewalk Guy                  | ⊥   | EXISTING Signal Pole with Sidewalk Guy                  |
| ⊥   | PROPOSED Metal Strain Pole                              | ⊥   | EXISTING Metal Strain Pole                              |
| ⊥   | PROPOSED Inductive Loop Detector                        | ⊥   | EXISTING Inductive Loop Detector                        |
| ⊥   | PROPOSED Controller & Cabinet                           | ⊥   | EXISTING Controller & Cabinet                           |
| ⊥   | PROPOSED Junction Box                                   | ⊥   | EXISTING Junction Box                                   |
| ⊥   | PROPOSED 2-in Underground Conduit                       | ⊥   | EXISTING 2-in Underground Conduit                       |
| N/A | PROPOSED Right of Way                                   | --- | EXISTING Right of Way                                   |
| N/A | PROPOSED Directional Arrow                              | →   | EXISTING Directional Arrow                              |
| N/A | PROPOSED Guard Rail                                     | --- | EXISTING Guard Rail                                     |
| ⊥   | PROPOSED "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)     | ⊥   | EXISTING "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)     |

Signal Upgrade

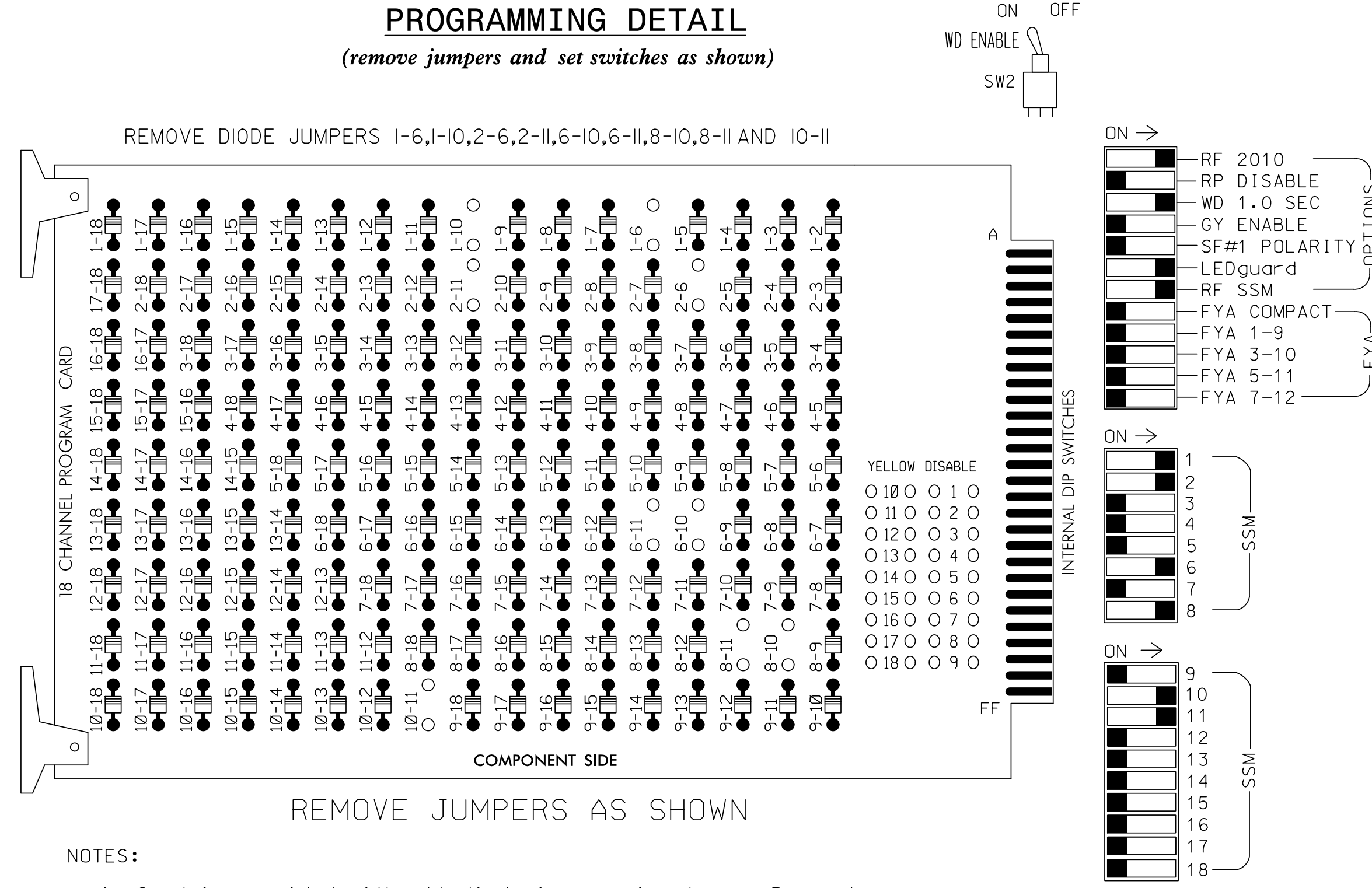
	<p>Honeycutt Road at NC 210 (Murchison Road) NB Ramps</p>		
	<p>Division 6 Cumberland County Fort Bragg</p>	<p>PLANNED BY: May 2016 REVIEWED BY: JPG</p>	
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>PREPARED BY: KGP, Jr. REVIEWED BY:</p>	<p>REVISIONS</p>	<p>INIT. DATE</p>
<p>SCALE 0 40 1"=40'</p>	<p>DocuSigned by: Jason P. Gallaway 7/20/2016</p>		
<p>SIG. INVENTORY NO. 06-1312</p>			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

2016-07-20 10:12:58 S:\Projects\Signal Design\Section\Eastern Region\01\U-5742 Fayetteville ASC\3\06-1312-06\1312\_s1a.dsn\_2016mmds.dgn kgpae@f

**EDI MODEL 2018ECLIP-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.
  - 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S2,  
 AUX S4  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....1+8  
 OVERLAP "C".....2+8  
 OVERLAP "D".....NOT USED

**SIGNAL HEAD HOOK-UP CHART**

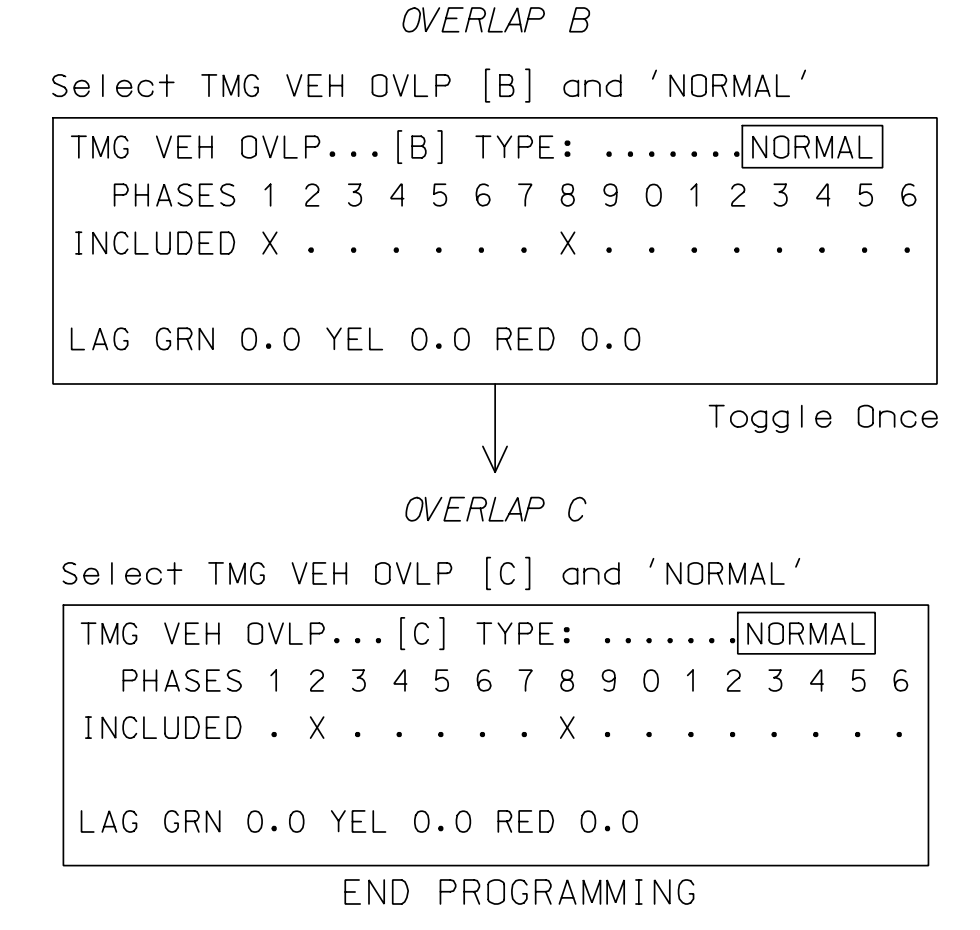
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
DMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	PED	3	4	PED	5	6	PED	7	8	PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82,83	NU	NU	84	NU	23,24	NU	NU
RED		128						134						A124		A114		
YELLOW		129						135										
GREEN		130						136										
RED ARROW	125										107							
YELLOW ARROW	126										108			A125		A115		
GREEN ARROW	127										109			A126		A116		

NU = Not Used

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**



**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1B	∅ 2/SYS	∅ 2C/S2C	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	FS
L	NOT USED	1C	∅ 2B/S2B	NOT USED	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	DC ISOLATOR
U	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	ST
L	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	DC ISOLATOR

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

**INPUT FILE CONNECTION & PROGRAMMING CHART**

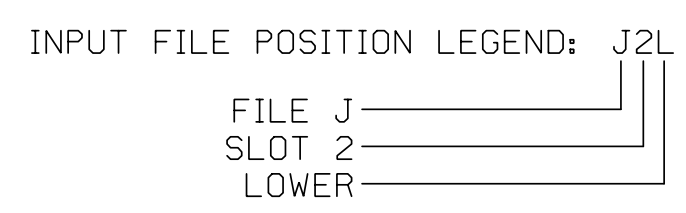
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
1B	TB2-5,6	I2U	39	2	1	YES			S
1C	TB2-7,8	I2L	43	12	1	YES		15	S
2A/S2A	TB2-9,10	I3U	63	32	2/SYS	YES			N
2B/S2B	TB2-11,12	I3L	76	42	2/SYS	YES			N
2C/S2C	TB4-1,2	I4U	47	22	2/SYS	YES			N
6A/S6A	TB3-5,6	J2U	40	6	6/SYS	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6/SYS	YES			N
6C/S6C	TB3-9,10	J3U	64	36	6/SYS	YES			N
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES			S
8C	TB7-1,2	J7U	66	38	8	YES			S

**FLASHER CIRCUIT MODIFICATION DETAIL**

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

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

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1312  
 DESIGNED: May 2016  
 SEALED: 7/20/2016  
 REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: **Kimley-Horn**

PLANS PREPARED IN THE OFFICE OF: **Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

Honeycutt Road at NC 210 (Murchison Road) NB Ramps

Division 6 Cumberland County Fort Bragg

PLAN DATE: August 2016 REVIEWED BY: SL Phillips  
 PREPARED BY: SP Pennington REVIEWED BY: KP Baumann

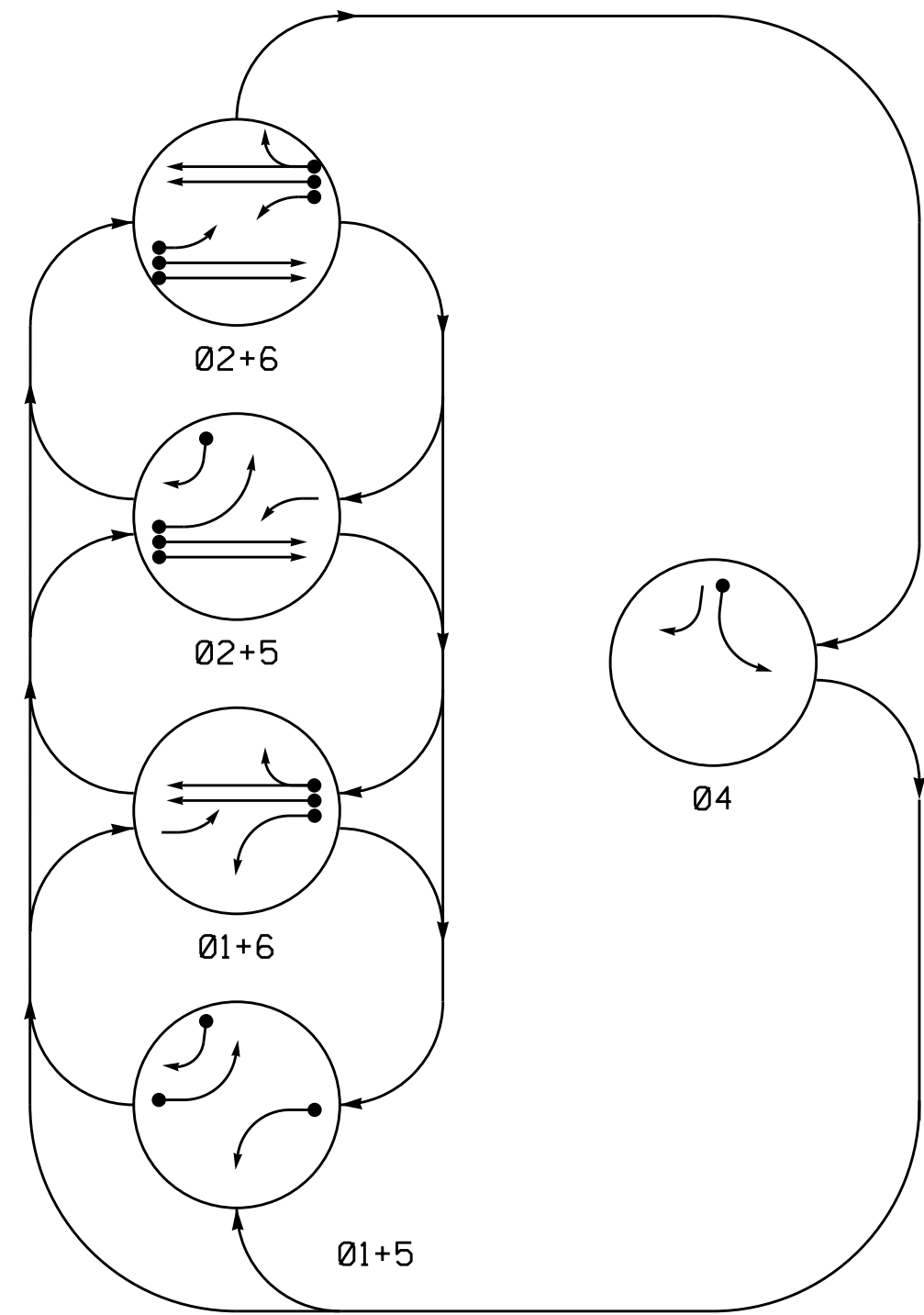
REVISIONS INIT. DATE

9/22/2016

SIG. INVENTORY NO. 06-1312

9/22/2016 K:\REAL\_T\10K-SIGNALS\4011036345\_Foyeh\ev\11le\_Electr\Coals\654 - Signal\_Design\5th\_Submit\Hoi\42381\_061312-2016e.dgn Susan Pennington

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

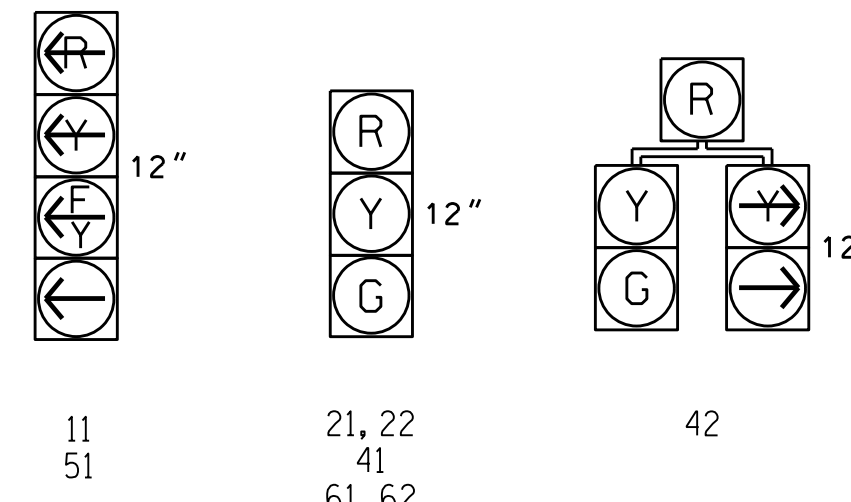
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- ⊖ UNSIGNALIZED MOVEMENT
- ⊕ PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE					FLTS
	01+5	01+6	02+5	02+6	04	
11	←	←	←	←	←	Y
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	Y
61, 62	R	G	R	G	R	Y

**SIGNAL FACE I.D.**

All Heads L.E.D.

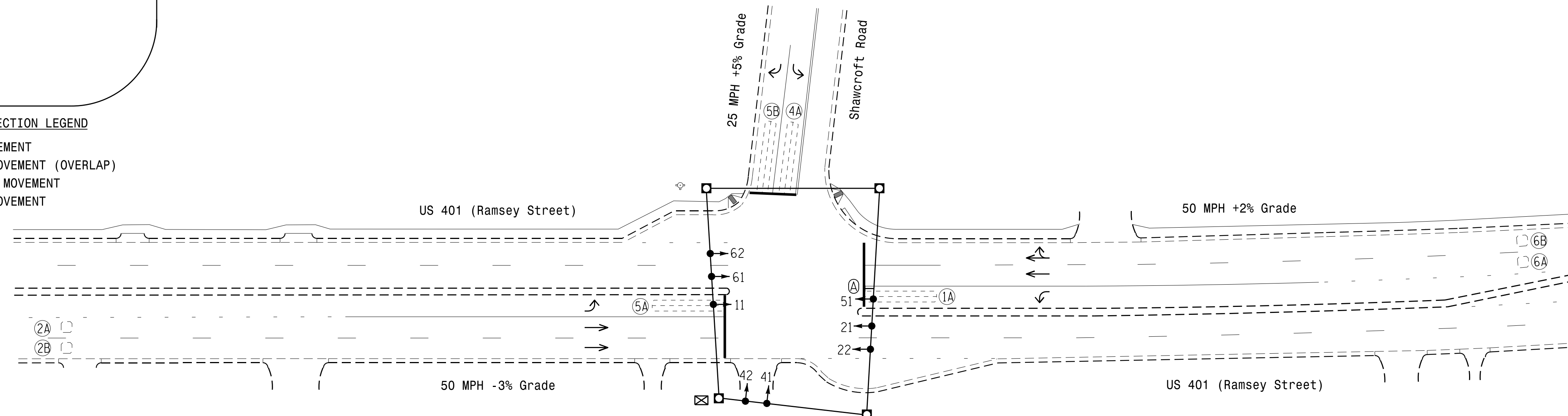


ASC/3 DETECTOR INSTALLATION CHART										
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	- X
2A	6X6	355	4	-	2	Yes	-	3	G	- X
2B	6X6	355	4	-	2	Yes	-	-	N	- X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	- X
5A	6X40	0	2-4-2	-	5	Yes	-	15	S	- X
5B	6X40	0	2-4-2	-	5	Yes	-	15	S	- X
6A	6X6	355	6	-	6	Yes	-	-	N	- X
6B	6X6	355	6	-	6	Yes	-	-	N	- X

**5 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- 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.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART					
FEATURE	PHASE				
	1	2	4	5	6
Min Green *	7	12	7	7	12
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	6.0
Max I *	15	60	20	15	60
Yellow	3.0	5.1	3.0	3.0	5.1
Red Clear	3.5	1.9	2.6	2.3	1.9
Red Revert	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	1.5	-	-	1.5
Max Initial *	-	34	-	-	34
Time Before Reduction *	-	15	-	-	15
Time To Reduce *	-	30	-	-	30
Minimum Gap	-	3.0	-	-	3.0
Locking Detector	-	X	-	-	X
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X

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

**LEGEND**

- | PROPOSED |  | EXISTING |
|----------|--|----------|
| ○        | Traffic Signal Head                            | ●        |
| ○        | Modified Signal Head                           | N/A      |
| □        | Sign   | □        |
| ○        | Pedestrian Signal Head With Push Button & Sign | ○        |
| ○        | Signal Pole with Guy                           | ○        |
| ○        | Signal Pole with Sidewalk Guy                  | ○        |
| □        | Inductive Loop Detector                        | □        |
| □        | Controller & Cabinet                           | □        |
| □        | Junction Box                                   | □        |
| ---      | 2-in Underground Conduit                       | ---      |
| N/A      | Right of Way                                   | ---      |
| →        | Directional Arrow                              | →        |
| --->     | Directional Drill                              | N/A      |
| N/A      | Wheelchair Ramp                                | ▧        |
| N/A      | Fire Hydrant                                   | ⊕        |
| ⊕        | "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)     | ⊕        |

**Signal Upgrade**

**US 401 (Ramsey Street) at Shawcroft Road**

Division 6 Cumberland County Fayetteville

PLAN DATE: December 2015 REVIEWED BY: JG

PREPARED BY: Devin Smith REVIEWED BY:

SEAL

STATE OF NORTH CAROLINA

PROFESSIONAL ENGINEER

029904

Jason P. Callaway

6/3/2016

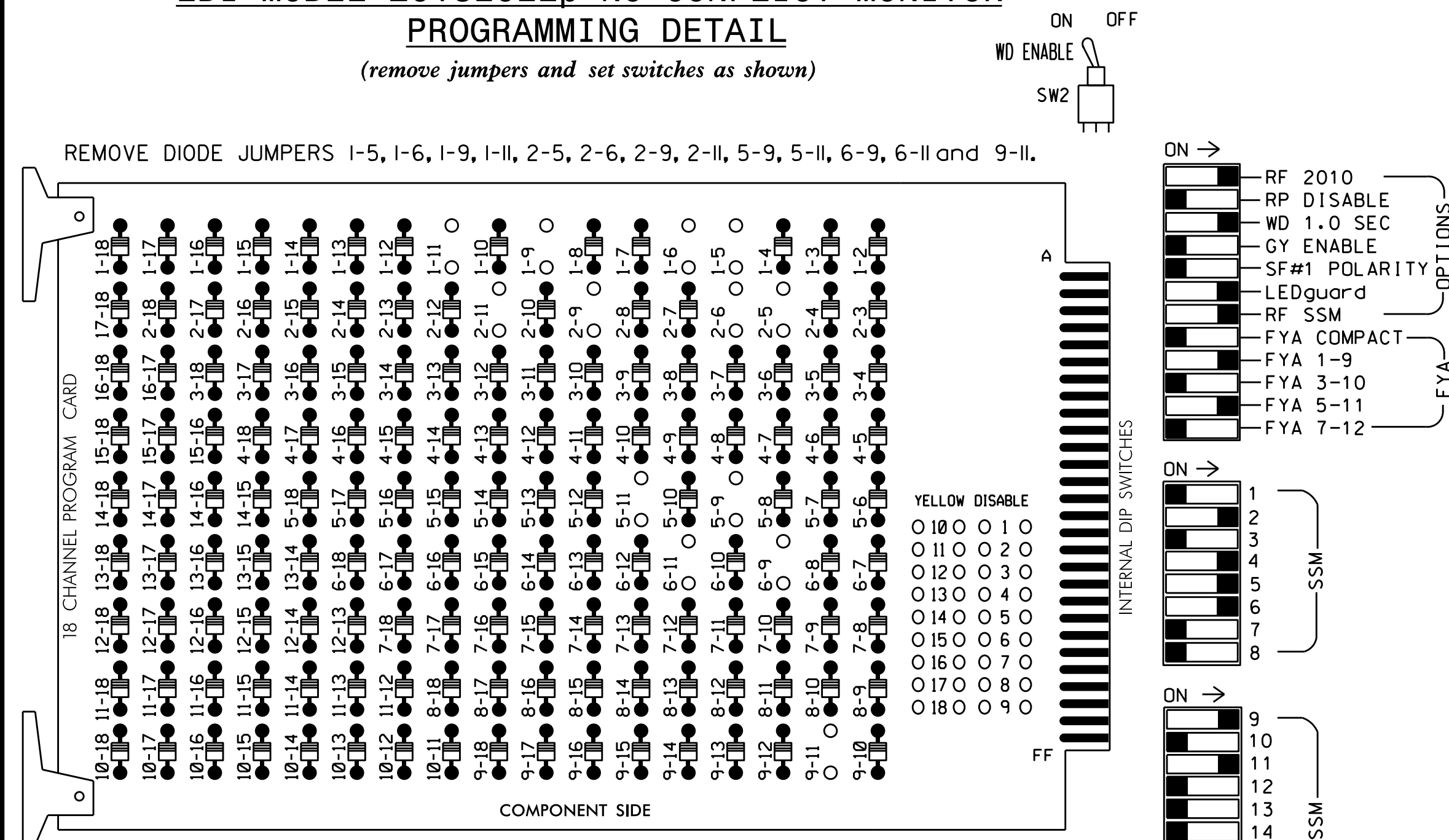
SIG. INVENTORY NO. 06-1313

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 J:\Callaway

# EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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.

■ = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S5,S7,S8,AUX S1,AUX S4  
 PHASES USED.....1,2,4,5,6  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	42	51	61,62	NU	NU	NU	11	NU	NU	51	NU	NU
RED		128			101			*	134									
YELLOW	*	129			102				135									
GREEN		130			103				136									
RED ARROW													A121			A114		
YELLOW ARROW							132						A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133	133										

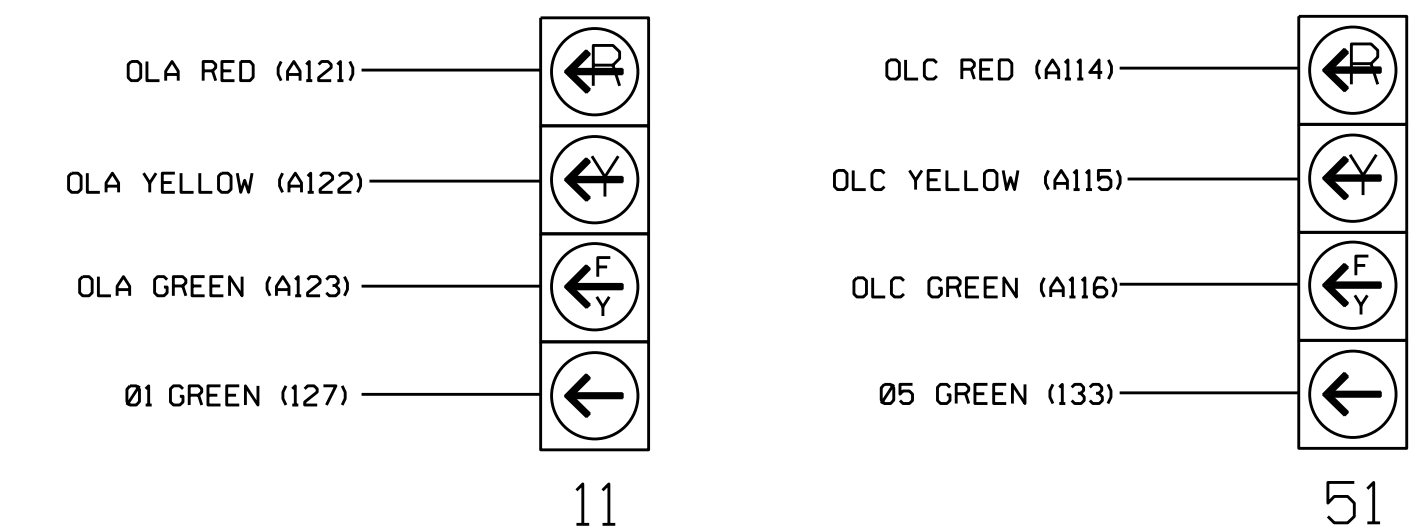
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

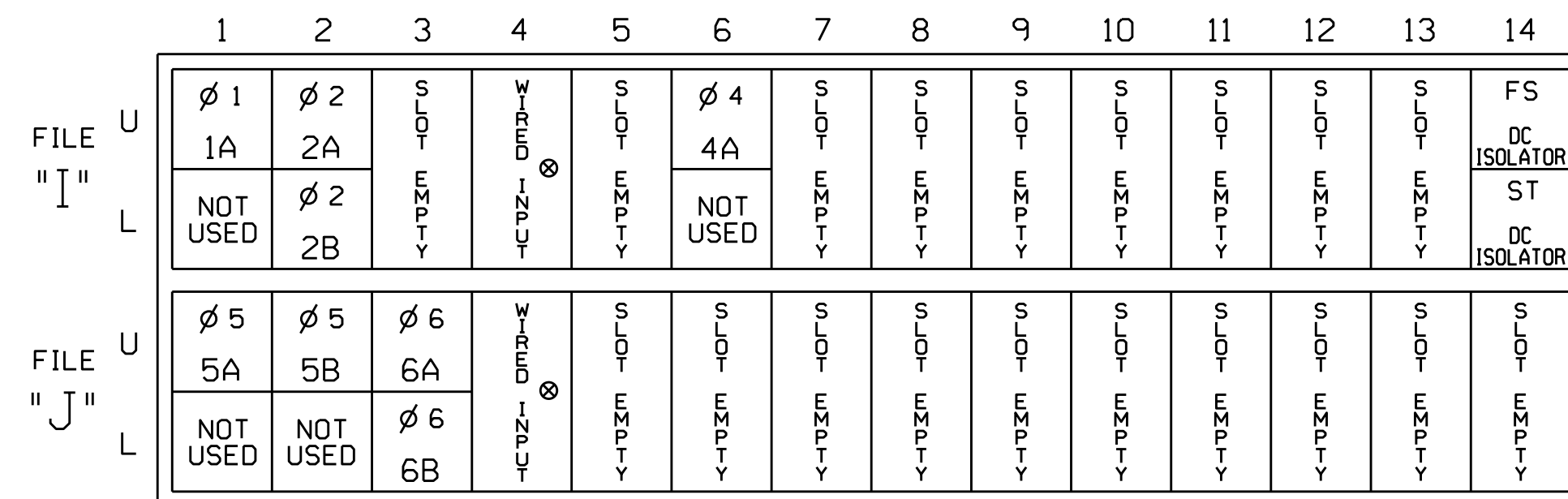
### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

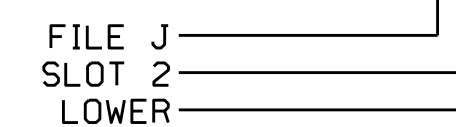
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
	-	J4U	48	26	6	YES		3	G
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15	S
	-	I4U	47	22	2	YES		3	G
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES			N

<sup>1</sup>Add jumper from I1-W to J4-W. on rear of input file.

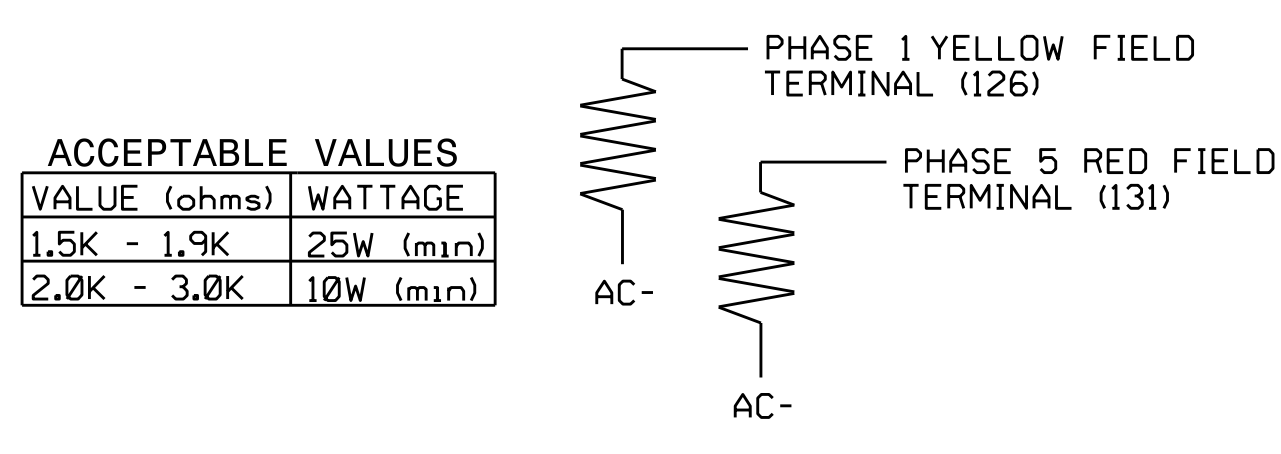
<sup>2</sup>Add jumper from J1-W to I4-W. on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:  
 Transporatio Mobility and Safety Solutions  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 KEITH M. MINAS  
 SEAL 036880  
 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Ramsey Street) at Shawcroft Road  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: May 2016 REVIEWED BY: DTJ  
 PREPARED BY: James Peterson REVIEWED BY:  
 REVISIONS INIT. DATE  
 DocuSigned by: Keith M. Minas 6/7/2016  
 SIG. INVENTORY NO. 06-1313

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

*OVERLAP A*

Select TMG VEH OVLP [A] and 'PPLT FYA'

TMG VEH OVLP...[A] TYPE: ....PPLT FYA

PROTECTED PHASE (LEFT TURN)..... 1

PERMISSIVE PHASE (OPPOSING THRU)... 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

↓ Toggle Twice

*OVERLAP C*

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED PHASE (LEFT TURN)..... 5

PERMISSIVE PHASE (OPPOSING THRU)... 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

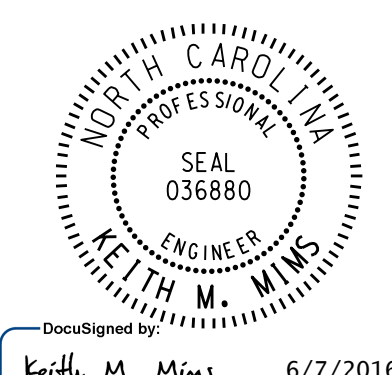

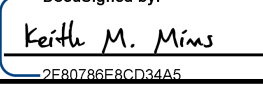
ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

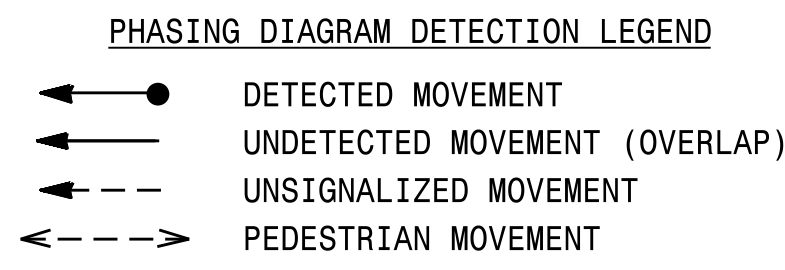
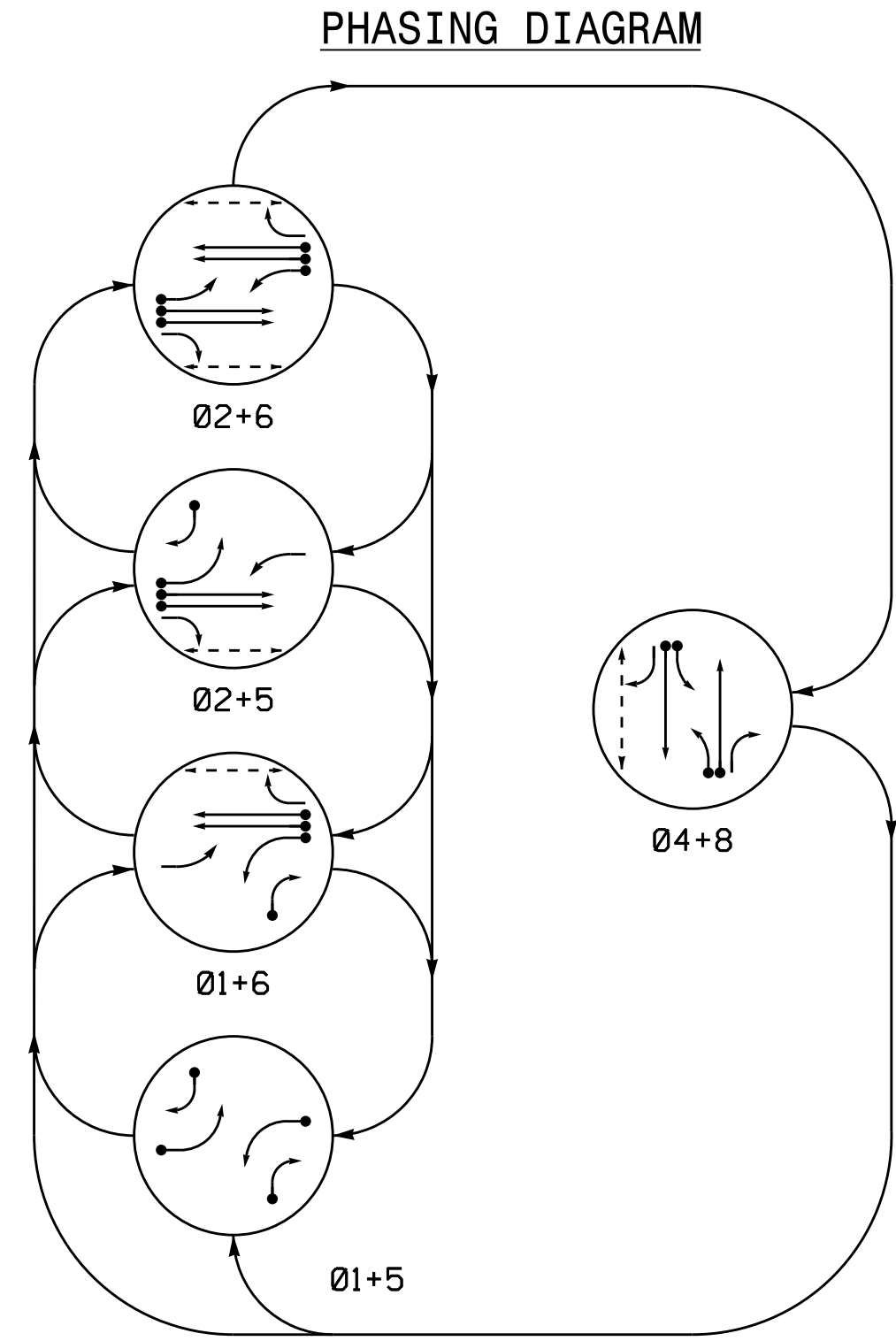
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-1313  
DESIGNED: December 2015  
SEALED: 6-03-16  
REVISED: N/A

Electrical Detail - Sheet 2 of 2

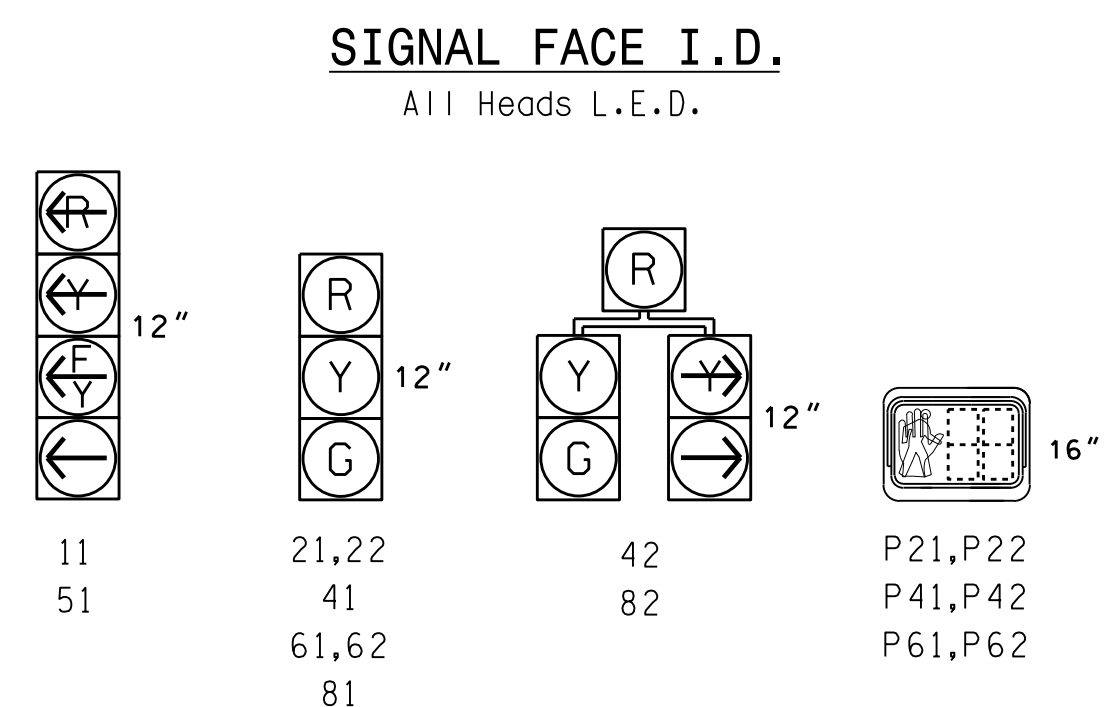
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:	<p style="font-size: large; font-weight: bold;">US 401 (Ramsey Street) at Shawcroft Road</p> <p style="font-size: x-small;">Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: <u>May 2016</u> REVIEWED BY: <u>DTJ</u></p> <p>PREPARED BY: <u>James Peterson</u> REVIEWED BY:</p>	SEAL  KEITH M. MIRAS ENGINEER												
Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;">REVISIONS</th> <th style="width: 10%;">INIT.</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										DocuSigned by:  Keith M. Miras 6/7/2016 DATE SIG. INVENTORY NO. 06-1313
REVISIONS	INIT.	DATE												

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J.peterson



SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	F L S H
11	→	→	←	←	→	→
21,22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	→	→	←	←	→	→
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	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

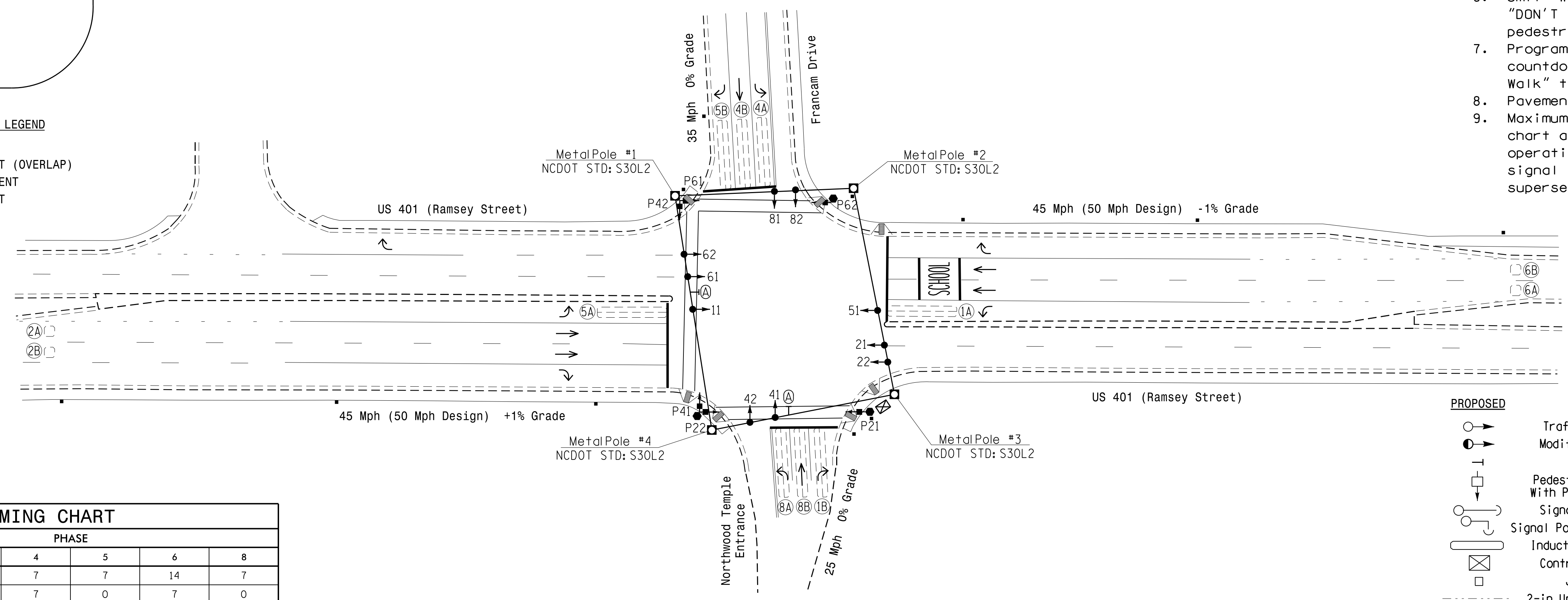


LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	-	X
6					6	Yes	-	3	G	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	15	S	-	X
2A	6X6	355	5	-	2	Yes	-	-	N	-	X
2B	6X6	355	5	-	2	Yes	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
2					2	Yes	-	3	G	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
6A	6X6	355	5	-	6	Yes	-	-	N	-	X
6B	6X6	355	5	-	6	Yes	-	-	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X

**5 Phase Fully Actuated Fayetteville Signal System**

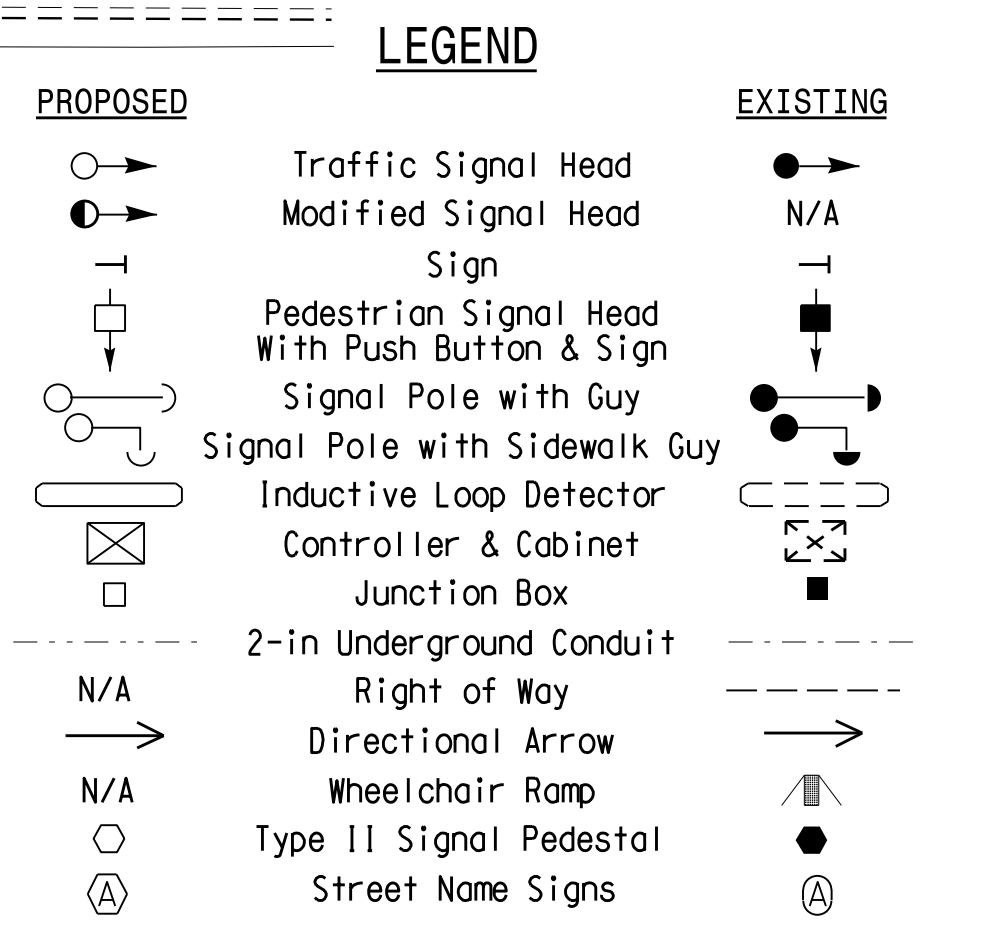
**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- 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	14	7	7	14	7
Walk *	0	7	7	0	7	0
Ped Clear	0	19	28	0	18	0
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max I *	20	90	30	20	90	30
Yellow	3.0	4.9	3.8	3.0	4.9	3.8
Red Clear	3.3	1.5	3.2	3.3	1.5	3.2
Actuations B4 Add *	-	0	-	-	0	-
Seconds / Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	40	-	-	40	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.1	-	-	3.1	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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



**Signal Upgrade**

US 401 (Ramsey Street) at Francam Drive / Northwood Temple Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE: December 2015 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Seal: JASON P. GALLAWAY, PROFESSIONAL ENGINEER, No. 029904

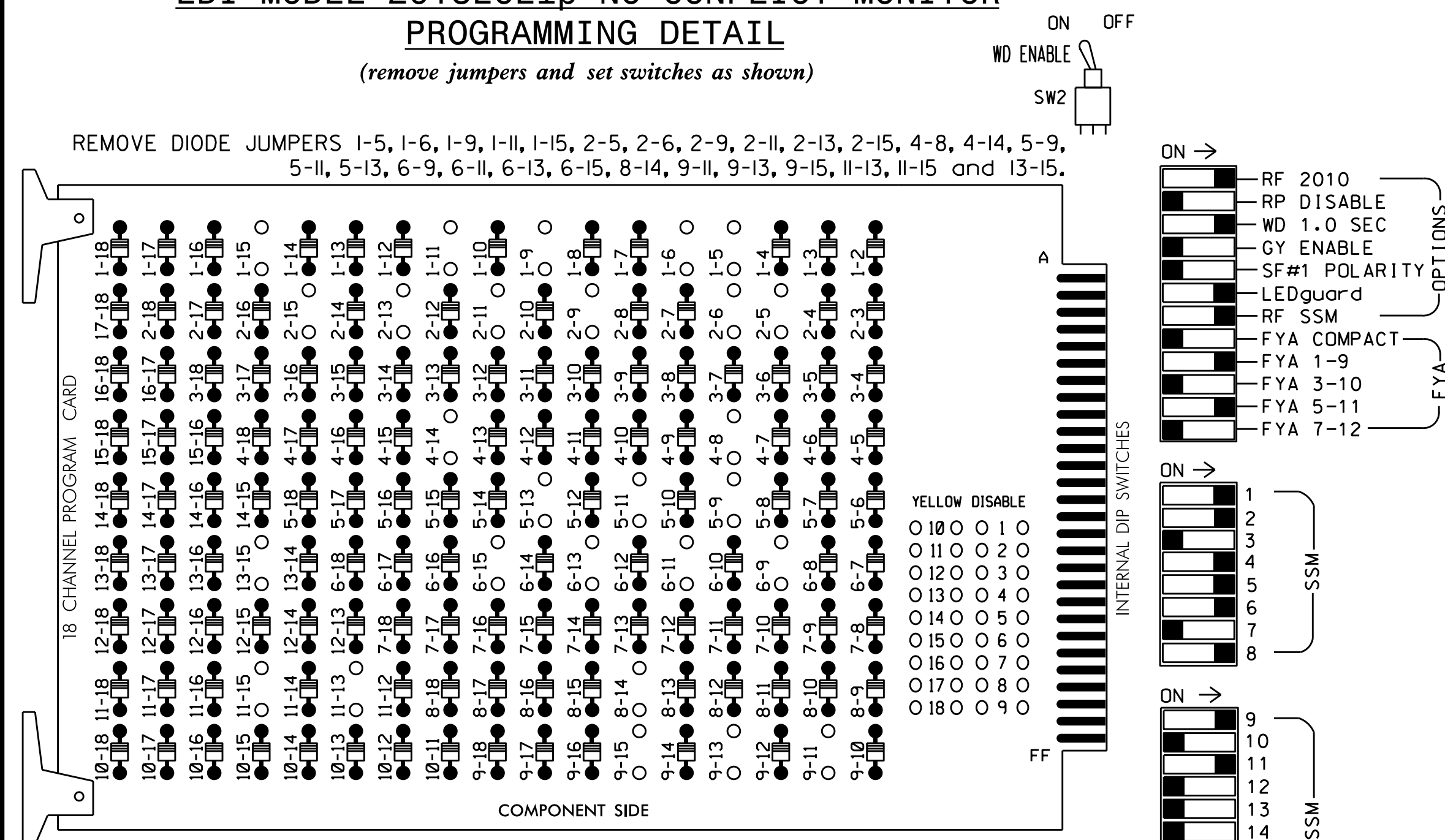
6/14/2016

SIG. INVENTORY NO. 06-1314

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# EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,  
 AUX S1, AUX S4  
 PHASES USED.....1,2,4,5,6,8,2 PED,4 PED,6 PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	P21, P22	NU	41,42	P41, P42	42	51★	61,62	P61, P62	NU	81,82	NU	11★	NU	51★	NU
RED	*	128			101		*	134		107								
YELLOW		129			102			135		108								
GREEN		130			103			136		109								
RED ARROW													A121			A114		
YELLOW ARROW		126					132						A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127	127					133	133										
Hand				113		104			119									
Walker				115		106			121									

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 1 1B	∅ 2 2A	∅ 2 2B	∅ 3 3A	∅ 4 4A	∅ 4 4B	∅ 5 5A	∅ 5 5B	∅ 6 6A	∅ 6 6B	∅ 7 7A	∅ 8 8A	∅ 8 8B
L	NOT USED	NOT USED	∅ 2	∅ 2	∅ 3	∅ 4	∅ 4	∅ 5	∅ 5	∅ 6	∅ 6	∅ 7	∅ 8	∅ 8
U	∅ 5 5A	∅ 5 5B	∅ 6 6A	∅ 6 6B	∅ 7 7A	∅ 8 8A	∅ 8 8B	∅ 9 9A	∅ 9 9B	∅ 10 10A	∅ 10 10B	∅ 11 11A	∅ 12 12A	∅ 12 12B
L	NOT USED	NOT USED	∅ 6	∅ 6	∅ 7	∅ 8	∅ 8	∅ 9	∅ 9	∅ 10	∅ 10	∅ 11	∅ 12	∅ 12

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

FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

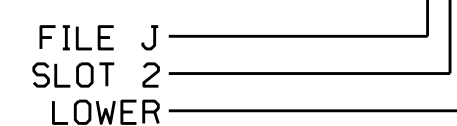
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
		J4U	48	26	6	YES		3	G
1B	TB2-5,6	I2U	39	2	1	YES		15	S
2A	TB2-9,10	I3U	63	32	2	YES			N
2B	TB2-11,12	I3L	76	42	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15	S
		I4U	47	22	2	YES		3	G
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES			N
8A	TB5-9,10	J6U	42	8	8	YES		3	S
8B	TB5-11,12	J6L	46	18	8	YES			S
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				

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

- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.

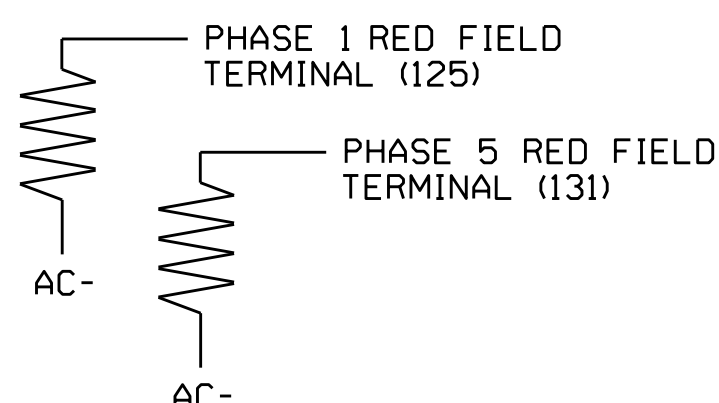
INPUT FILE POSITION LEGEND: J2L



### LOAD RESISTOR INSTALLATION DETAIL

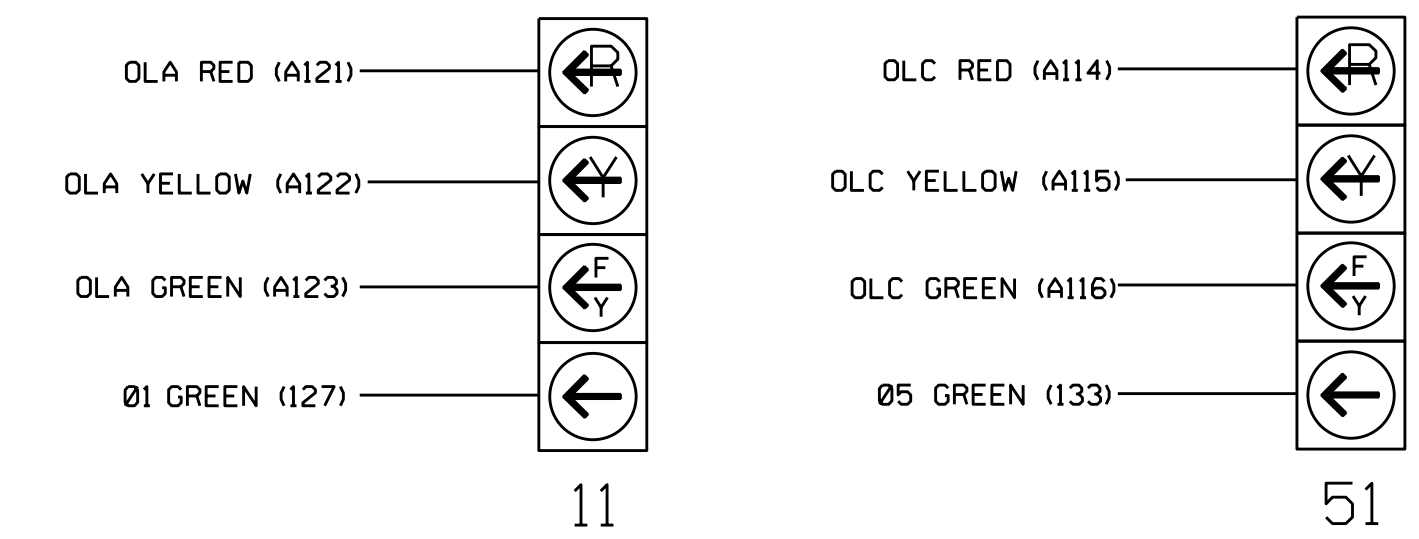
(install resistors as shown)

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



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1314  
 DESIGNED: December 2015  
 SEALED: 6-14-16  
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 401 (Ramsey Street) at Francam Drive / Northwood Temple Entrance		SEAL KEITH M. MIMS ENGINEER
	PLAN DATE: June 2016 PREPARED BY: James Peterson	REVIEWED BY: DTJ REVIEWED BY:	

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

### OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```

TMG VEH OVLP...[A] TYPE: ....PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 1
PERMISSIVE PHASE (OPPOSING THRU)... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
    
```

↓ Toggle Twice

### OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```

TMG VEH OVLP...[C] TYPE: ....PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 5
PERMISSIVE PHASE (OPPOSING THRU)... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
    
```

END PROGRAMMING

## COUNTDOWN PEDESTRIAN SIGNAL OPERATION

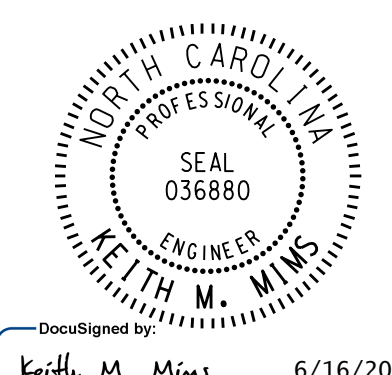
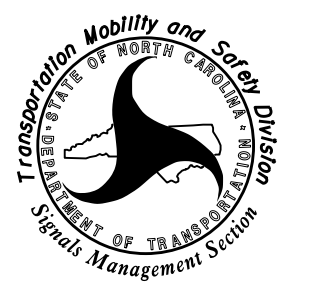
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1314  
 DESIGNED: December 2015  
 SEALED: 6-14-16  
 REVISED: N/A

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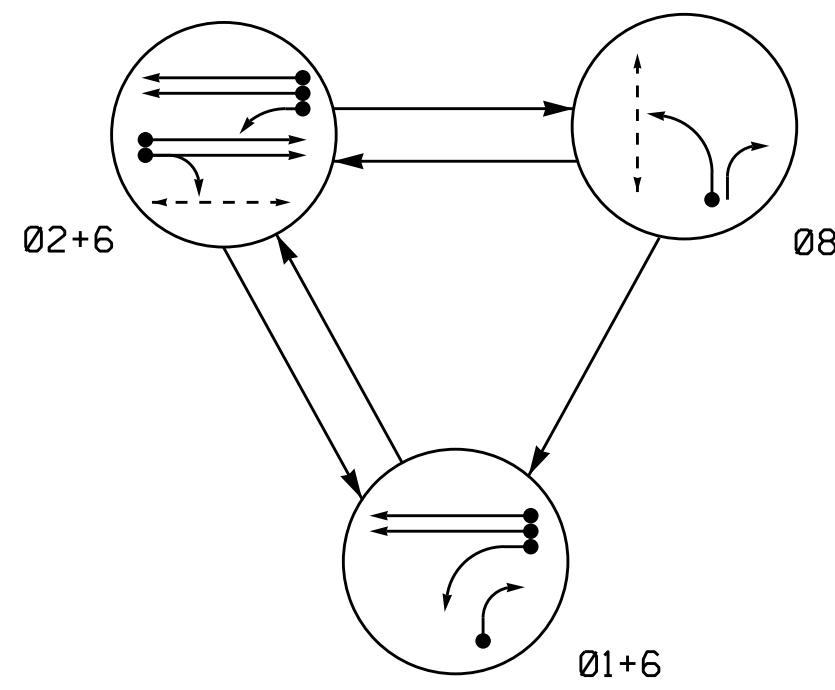
Electrical Detail - Sheet 2 of 2

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

<p>Electrical and Programming Details For:</p> <p style="text-align: center;">US 401 (Ramsey Street) at Francam Drive / Northwood Temple Entrance</p> <p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: June 2016 REVIEWED BY: DTJ</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p>	<p>SEAL</p> 									
 <p style="font-size: small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>DocuSigned by: Keith M. Mins 6/16/2016</p>									
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REVISIONS	INIT.	DATE								



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

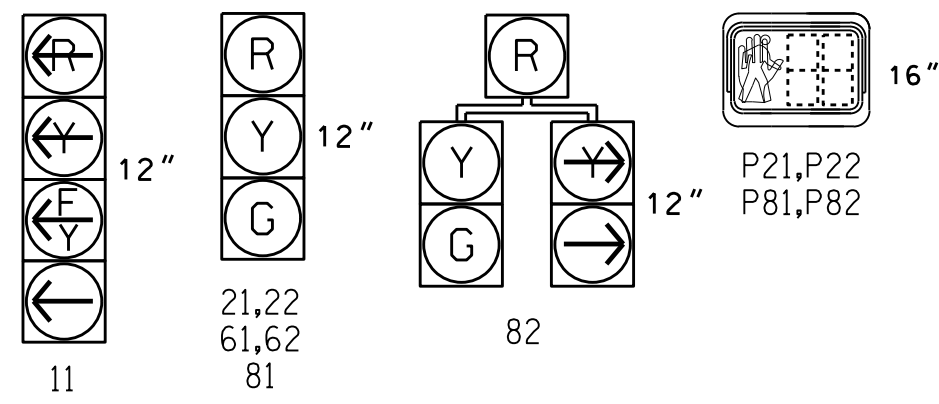
- ◄● DETECTED MOVEMENT
- ◄- UNDETECTED MOVEMENT (OVERLAP)
- ◄--- UNSIGNALIZED MOVEMENT
- ◄--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø8	F L S A
11	←	←	←	←
21,22	R	G	R	Y
61,62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R
P21,P22	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

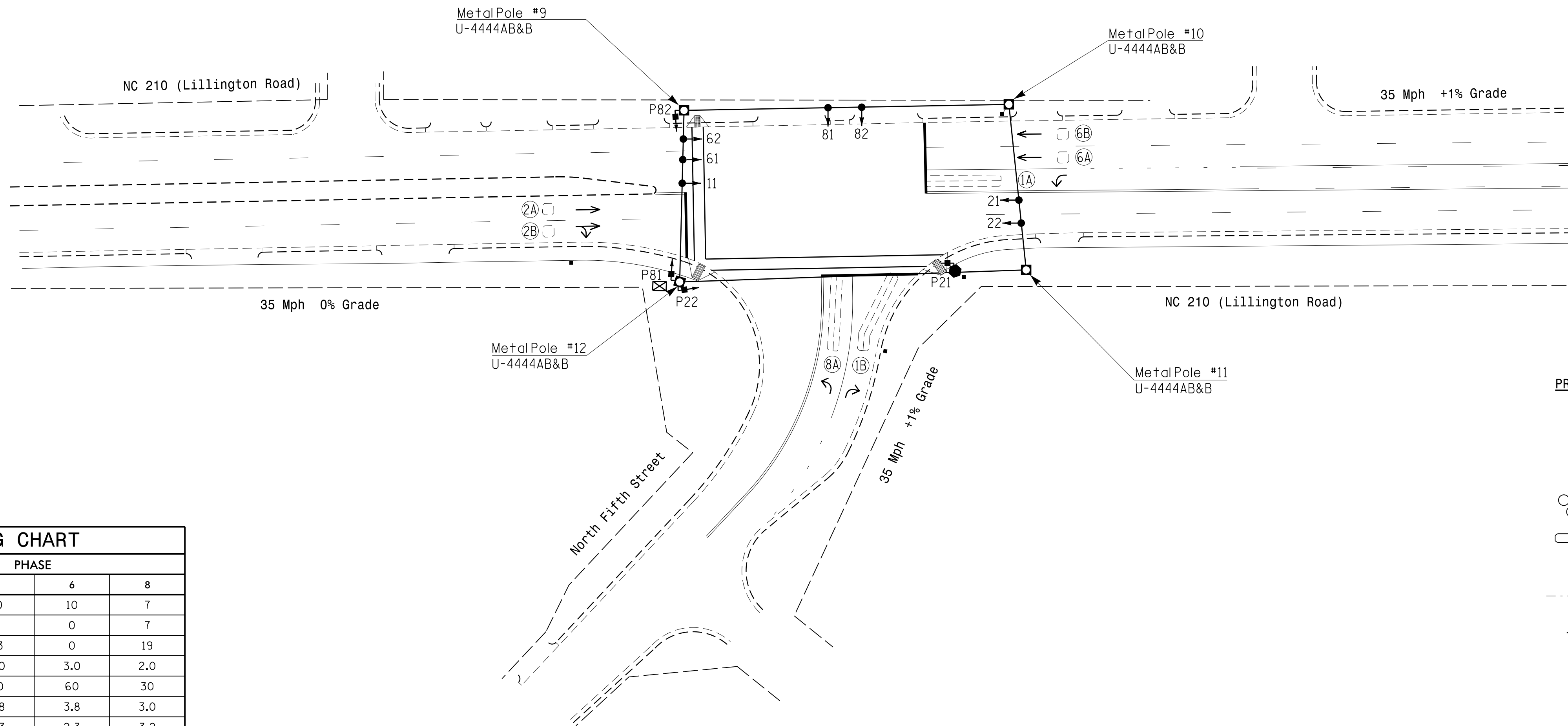


ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	LOOP SYSTEM NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	- X
1B	6X40	0	2-4-2	-	6	Yes	-	-	S	- X
2A,2B	6X6	70	3	-	2	Yes	-	-	S	- X
6A,6B	6X6	70	4	-	6	Yes	-	-	S	- X
8A	6X40	0	2-4-2	-	8	Yes	-	3	S	- X

3 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green *	7	10	10	7
Walk *	0	7	0	7
Ped Clear	0	33	0	19
Veh. Extension *	2.0	3.0	3.0	2.0
Max I *	15	60	60	30
Yellow	3.0	3.8	3.8	3.0
Red Clear	2.6	2.3	2.3	3.2
Actuations B4 Add *	-	-	-	-
Seconds/Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

- | PROPOSED   | EXISTING   |
|--|--|
| ○→ Traffic Signal Head                           | ●→ N/A   |
| ○→ Modified Signal Head                          | ○→ N/A   |
| ⊥ Sign   | ⊥ Sign   |
| □ Pedestrian Signal Head With Push Button & Sign | □ Pedestrian Signal Head With Push Button & Sign |
| ○ Signal Pole with Guy                           | ● Signal Pole with Guy                           |
| ○ Signal Pole with Sidewalk Guy                  | ● Signal Pole with Sidewalk Guy                  |
| ⊠ Inductive Loop Detector                        | ⊠ Inductive Loop Detector                        |
| ⊠ Controller & Cabinet                           | ⊠ Controller & Cabinet                           |
| ⊠ Junction Box                                   | ⊠ Junction Box                                   |
| --- 2-in Underground Conduit                     | --- 2-in Underground Conduit                     |
| --- Right of Way                                 | --- Right of Way                                 |
| → Directional Arrow                              | → Directional Arrow                              |
| ○ Metal Strain Pole                              | ● Metal Strain Pole                              |
| ○ Type II Signal Pedestal                        | ● Type II Signal Pedestal                        |
| N/A Wheelchair Ramp                              | ▤ Wheelchair Ramp                                |

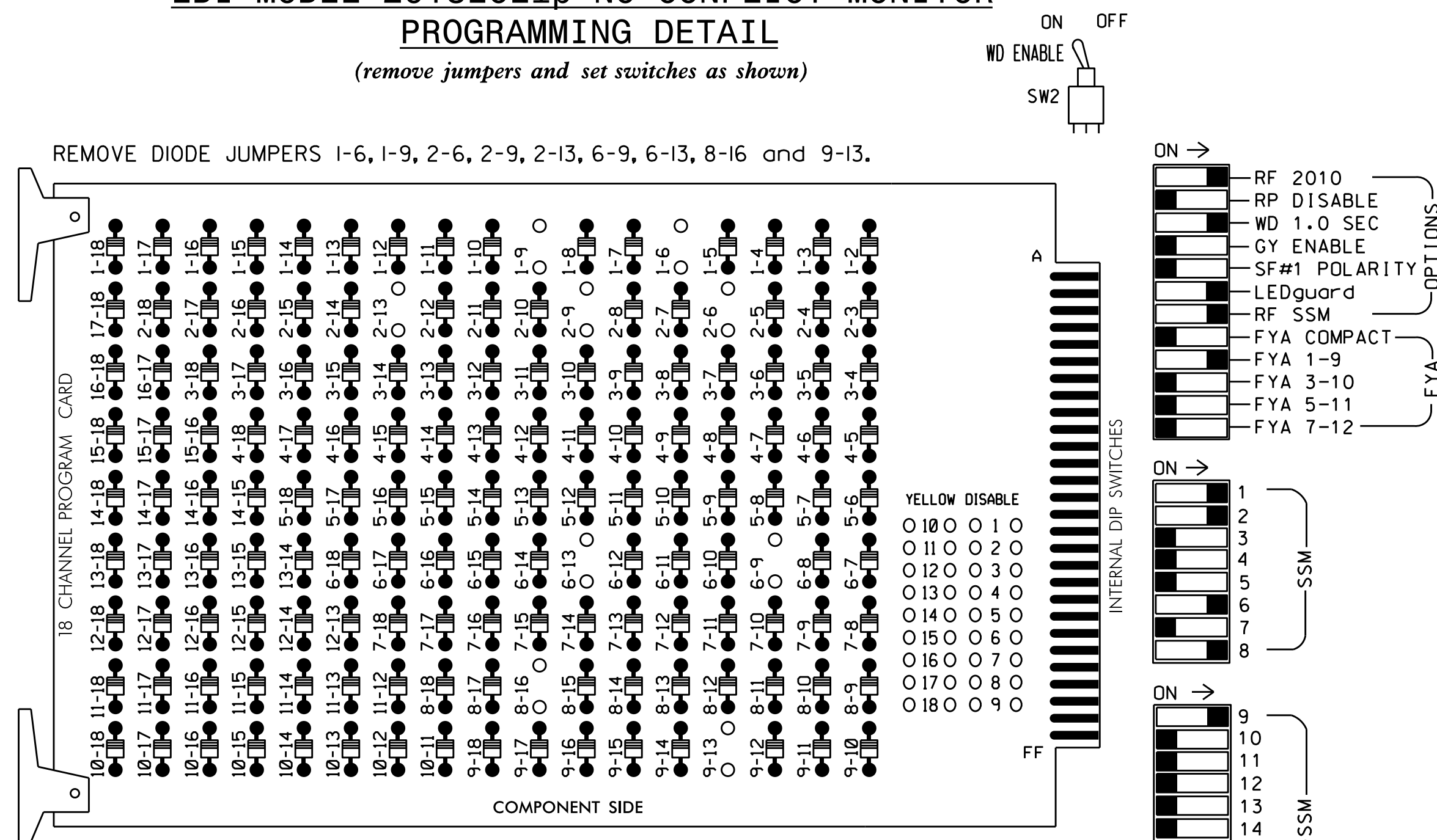
Signal Upgrade

	<p>NC 210 (Lillington Road) at North Fifth Street</p>		<p>Division 6 Cumberland County Spring Lake</p> <p>PLAN DATE: October 2016 REVIEWED BY: JPG</p> <p>PREPARED BY: JRS/JPG REVIEWED BY:</p>
	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>SCALE 0 40 1" = 40'</p>		
	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		

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# EDI MODEL 2018EClip-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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program controller to start up in phase 2 Walk and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S8,S11,S12,AUX S1  
 PHASES USED.....1,2,2 PED,6,8,8 PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* See overlap programming detail on this sheet

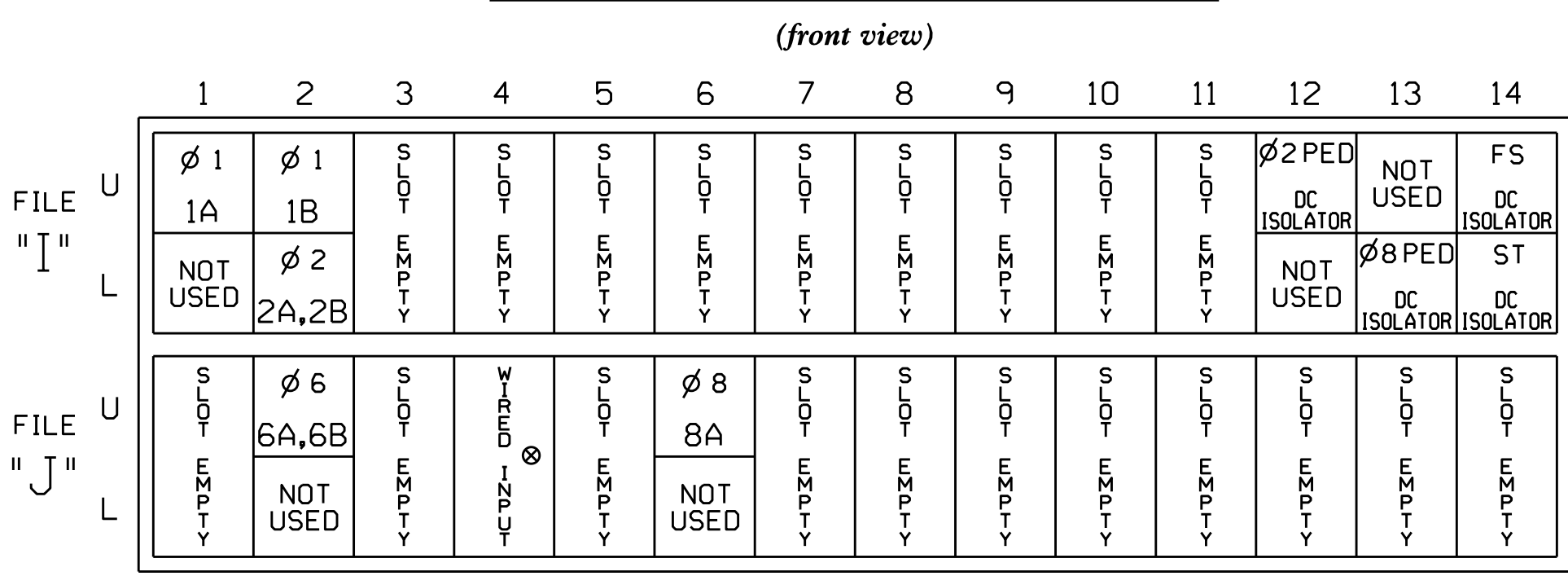
PROJECT REFERENCE NO.		SHEET NO.	
U-5742		Sig.241.1	

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	82	21,22	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	P81, P82	11	NU	NU	NU	NU	
RED		*	128						134			107							
YELLOW			129						135			108							
GREEN			130						136			109							
RED ARROW																		A121	
YELLOW ARROW			126																A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127	127																	110
Hand																			115
Figure																			112

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

### INPUT FILE POSITION LAYOUT



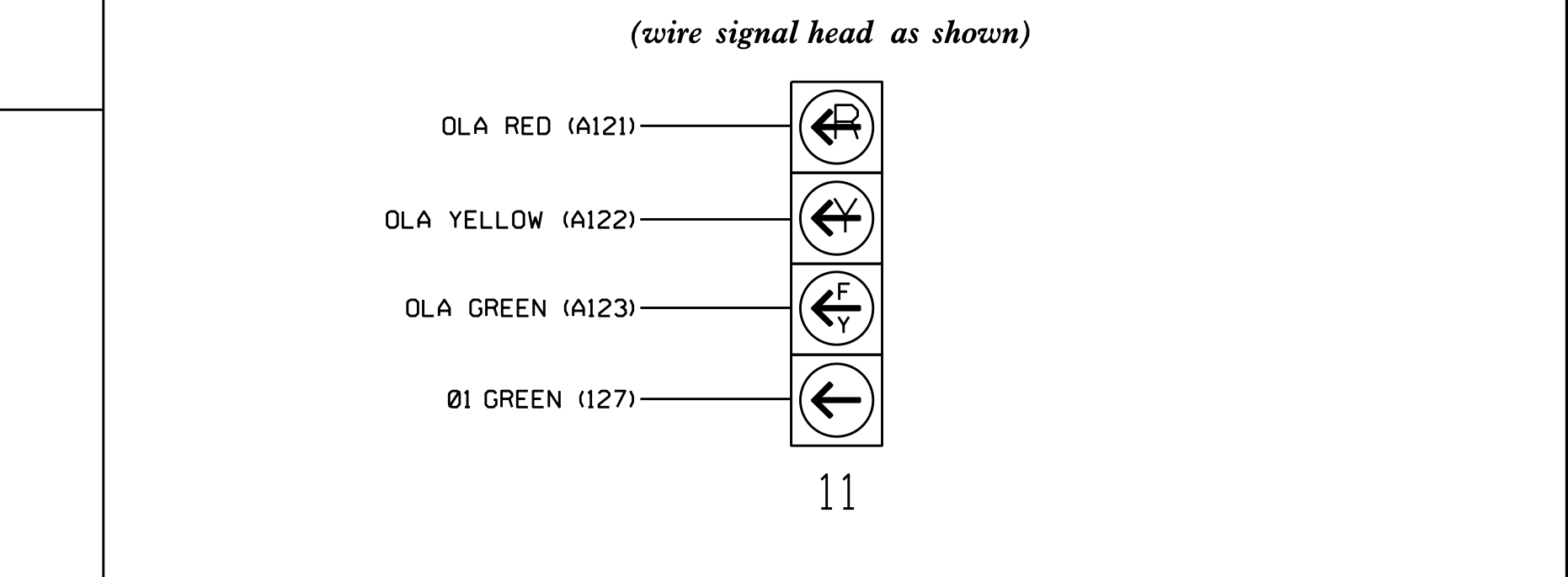
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
	-	J4U	48	26	6	YES			S
1B	TB2-5,6	I2U	39	2	1	YES		10	S
2A,2B	TB2-7,8	I2L	43	12	2	YES			S
6A,6B	TB3-5,6	J2U	40	6	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		3	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED				

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.  
<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
 \* System detector only. Remove any assigned vehicle phase.

### FYA SIGNAL WIRING DETAIL



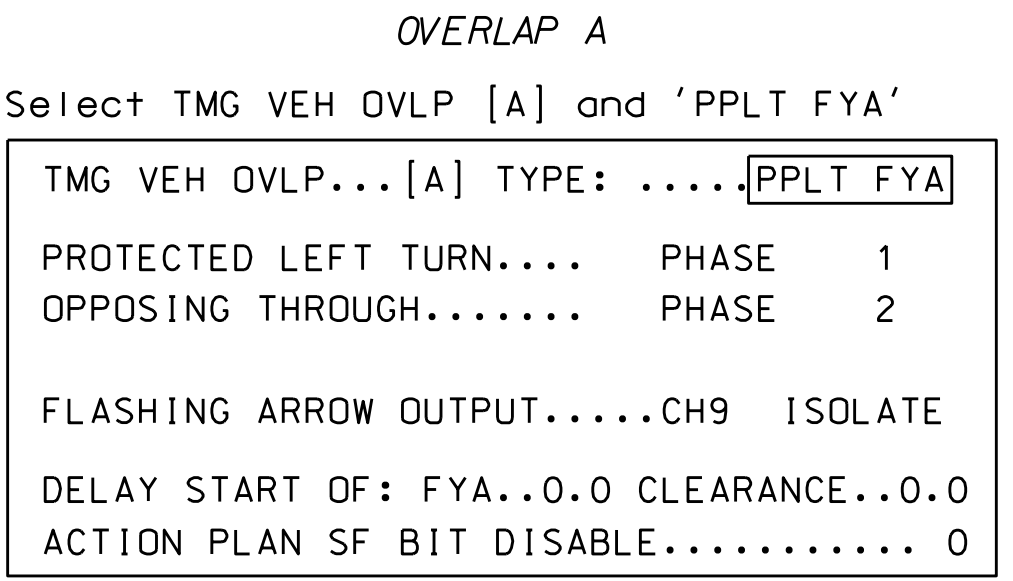
### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

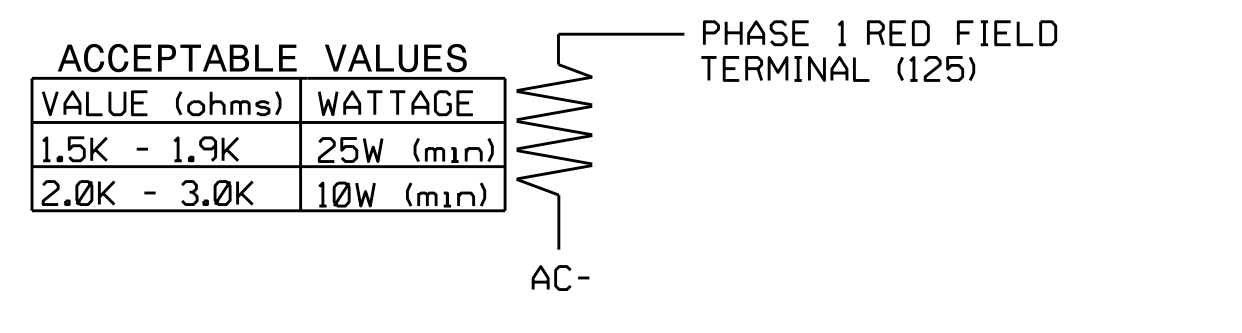
- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**



END PROGRAMMING

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1319  
 DESIGNED: October 2016  
 SEALED: 10/11/2016  
 REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 Signal Management Section  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 210 (Lillington Road) at North Fifth Street

Division 6 Cumberland County Spring Lake

PLAN DATE: October 2016 REVIEWED BY: T. Joyce

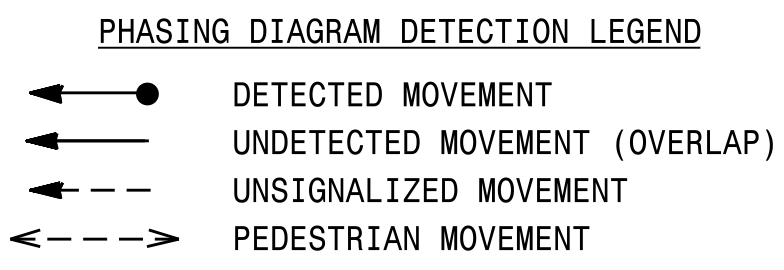
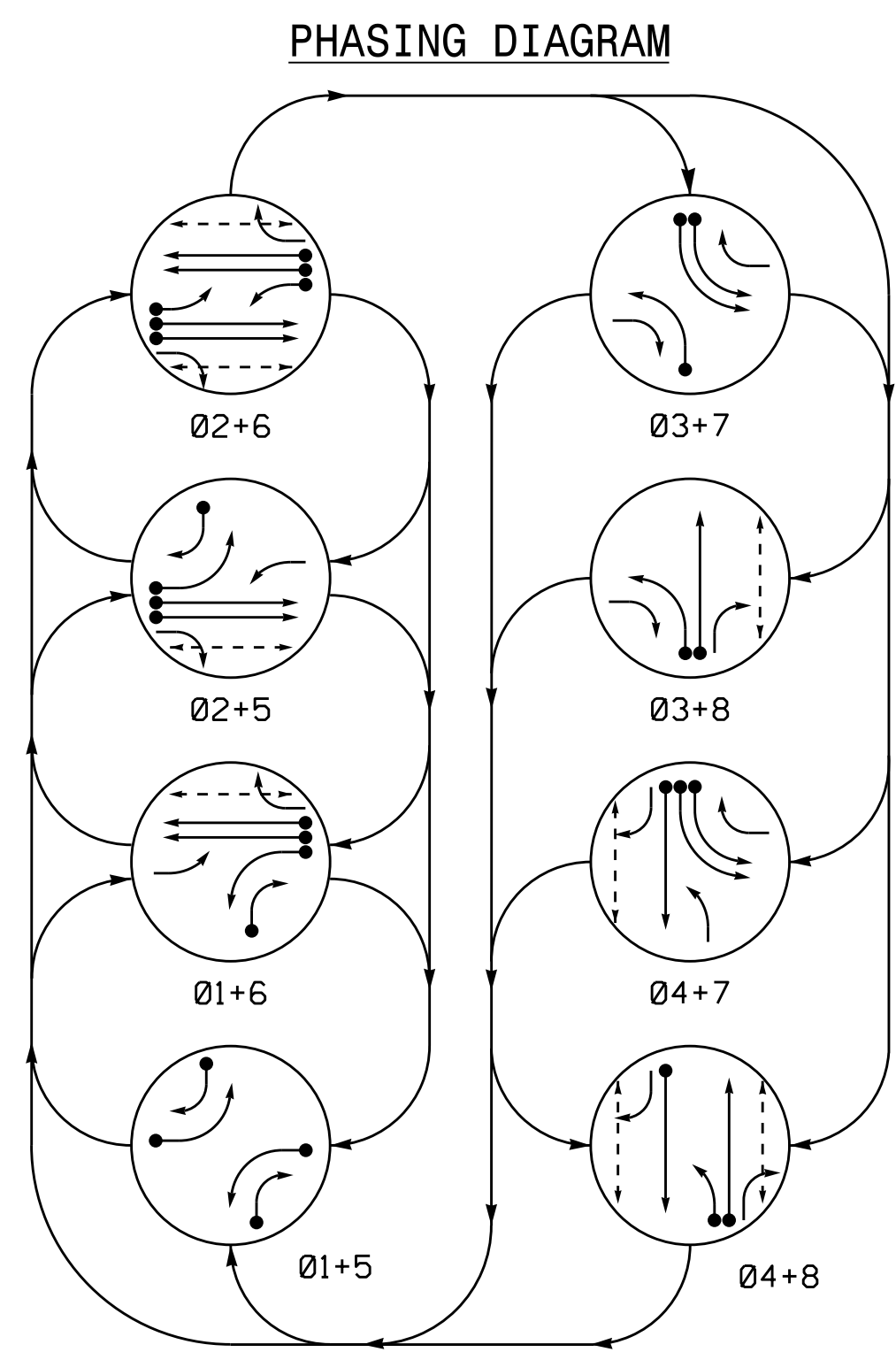
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

Sealed by: *Elizabeth M. Little* 10/17/2016  
 SEAL 030530  
 ENGINEER JACQUELYN M. LITTLE  
 DATE  
 SIG. INVENTORY NO. 06-1319

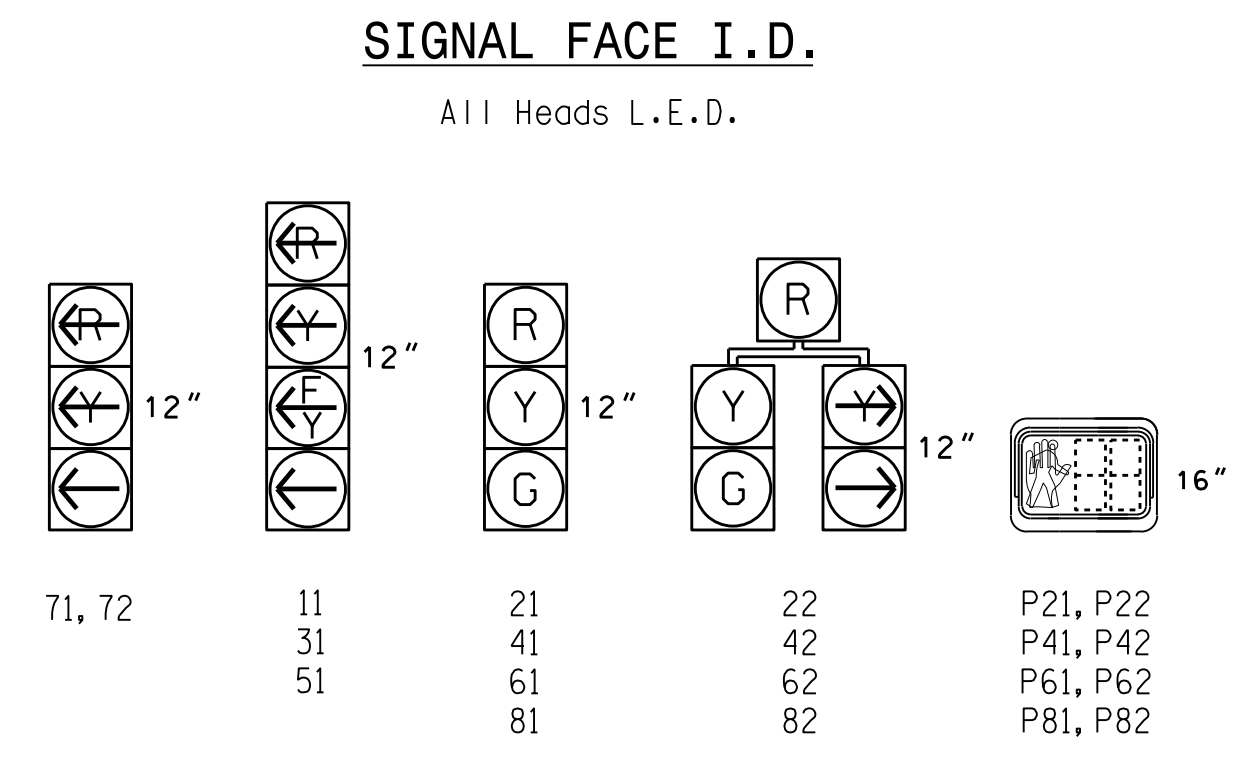
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 C:\Users\ckland

8 Phase Fully Actuated Fayetteville Signal System



**TABLE OF OPERATION**

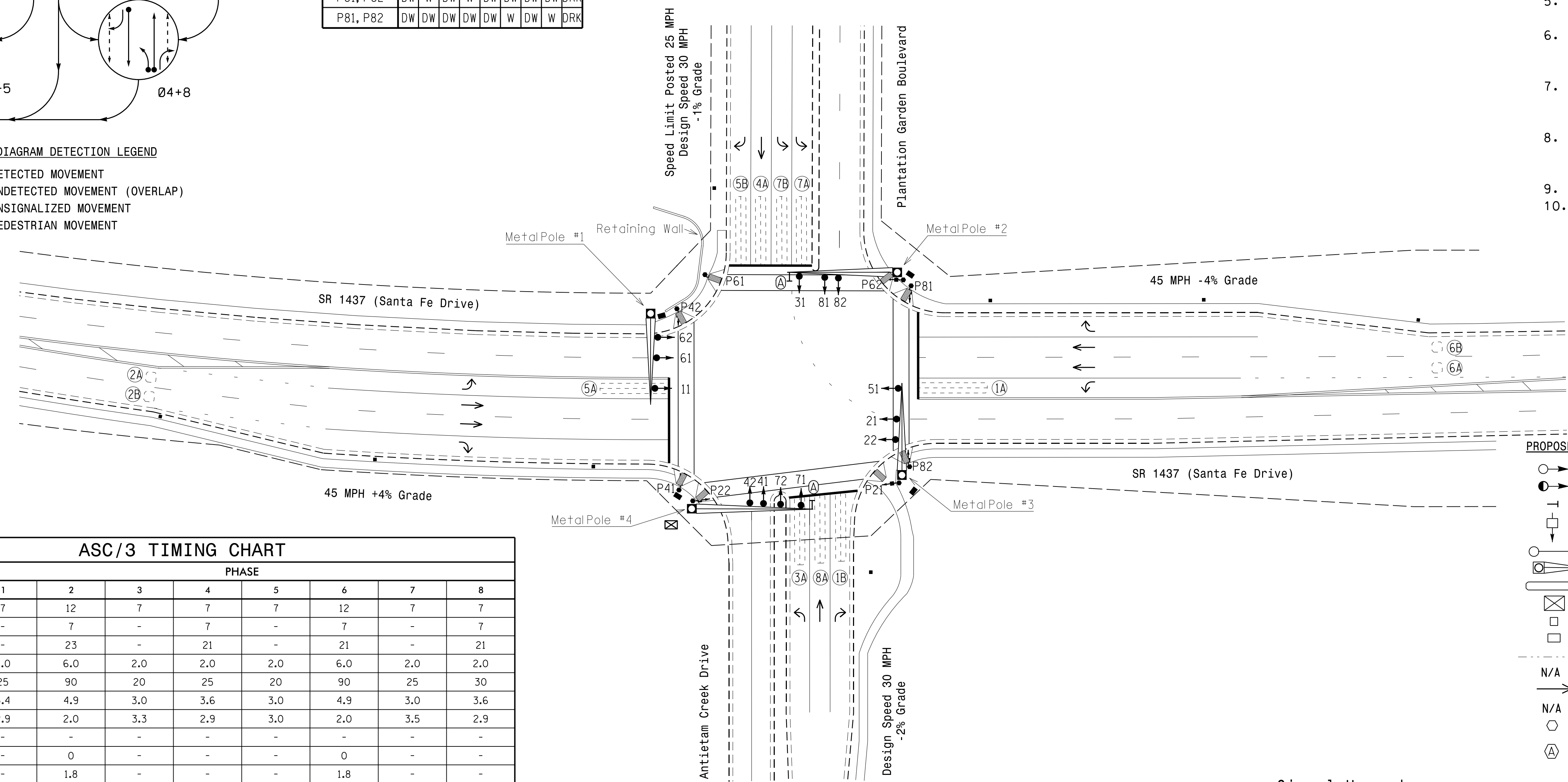
SIGNAL FACE	PHASE							
	01+5	02+5	03+5	04+5	01+6	02+6	03+6	04+6
11	---	---	---	---	---	---	---	---
21	R	R	G	R	R	R	R	Y
22	R	R	G	R	R	R	R	Y
31	---	---	---	---	---	---	---	---
41	R	R	R	R	R	G	G	R
42	R	R	R	R	R	G	G	R
51	---	---	---	---	---	---	---	---
61	R	G	R	R	R	R	R	Y
62	R	G	R	R	R	R	R	Y
71, 72	---	---	---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



**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	-	X
1B	6X40	0	2-4-2	-	6	Yes	-	3	G	-	X
2A	6X6	300	5	-	2	Yes	-	-	N	-	X
2B	6X6	300	5	-	2	Yes	-	-	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	15	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
5B	6X40	0	2-4-2	-	2	Yes	-	3	G	-	X
6A	6X6	300	5	-	6	Yes	-	-	N	-	X
6B	6X6	300	5	-	6	Yes	-	-	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	-	S	-	X
7B	6X40	0	2-4-2	-	7	Yes	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	-	X

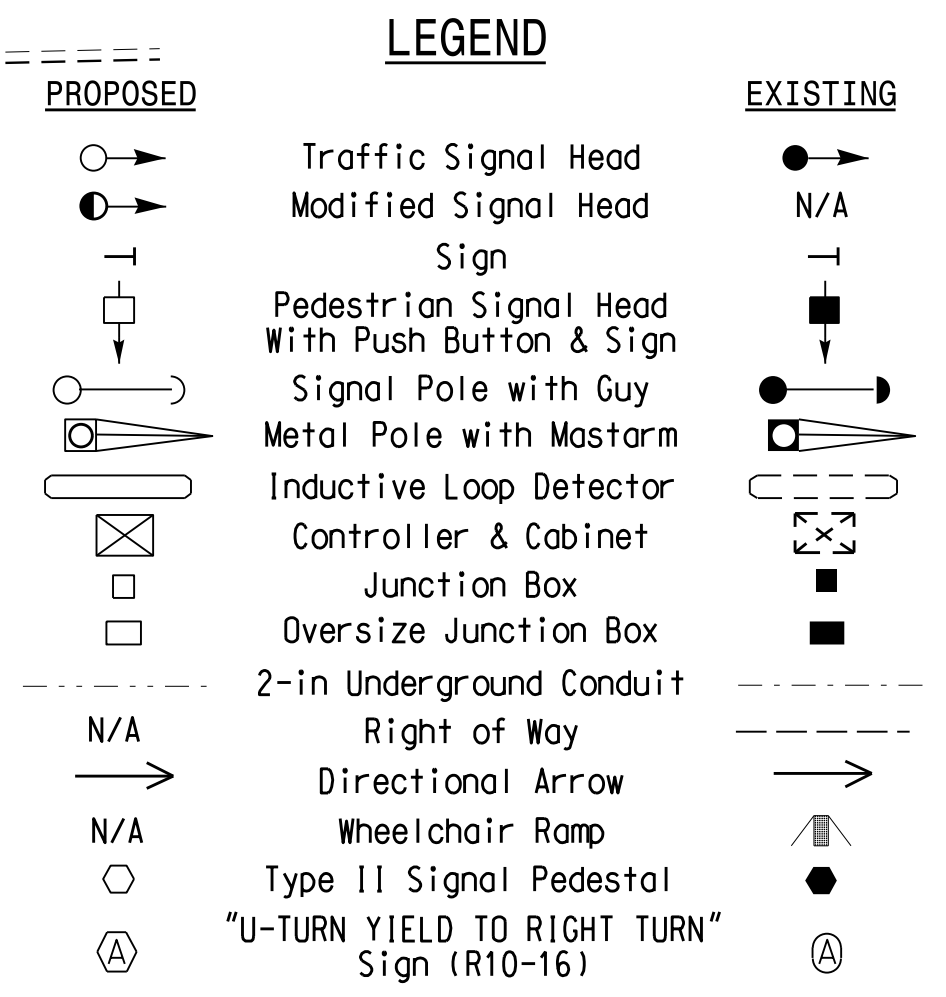
- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
  - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
  - Phase 1 and/or phase 5 may be lagged.
  - Phase 3 and/or phase 7 may be lagged.
  - Set all detector units to presence mode.
  - 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.
  - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	23	-	21	-	21	-	21
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	25	90	20	25	20	90	25	30
Yellow	3.4	4.9	3.0	3.6	3.0	4.9	3.0	3.6
Red Clear	2.9	2.0	3.3	2.9	3.0	2.0	3.5	2.9
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	-	0	-	-
Seconds / Actuation *	-	1.8	-	-	-	1.8	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	45	-	-	-	45	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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



Signal Upgrade

SR 1437 (Santa Fe Drive) at Antietam Creek Drive/Plantation Garden Boulevard

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG

PREPARED BY: Devin Smith REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 1" = 40'

SEAL: JASON P. GALLAGHER, PROFESSIONAL ENGINEER, No. 029904

DATE: 5/31/2016

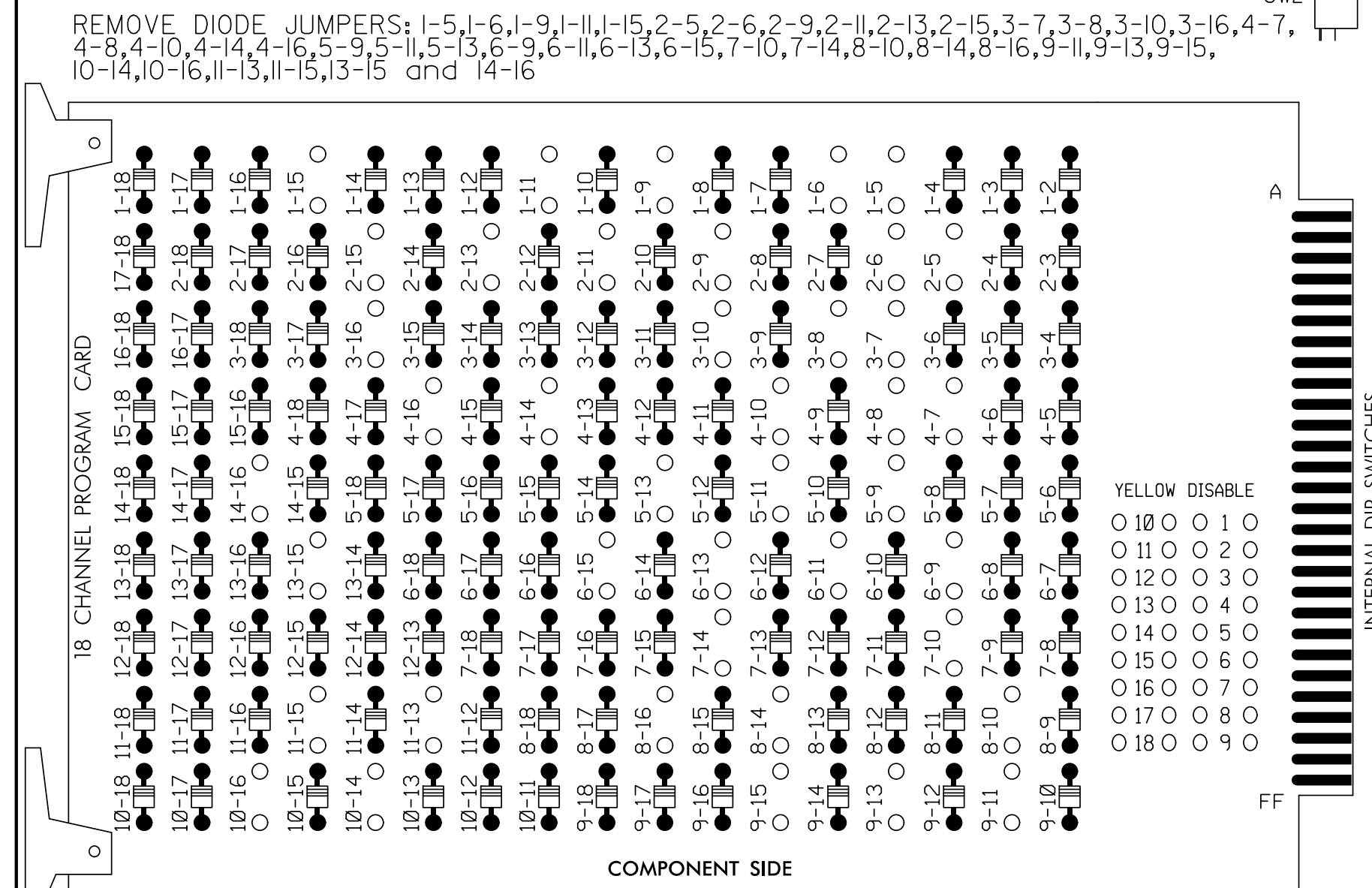
SIG. INVENTORY NO. 06-1325

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

31-MAY-2016 10:50  
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### EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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 phase 4 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,  
 S11,S12,AUX S1,AUX S2,AUX S4  
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,  
 8,8PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

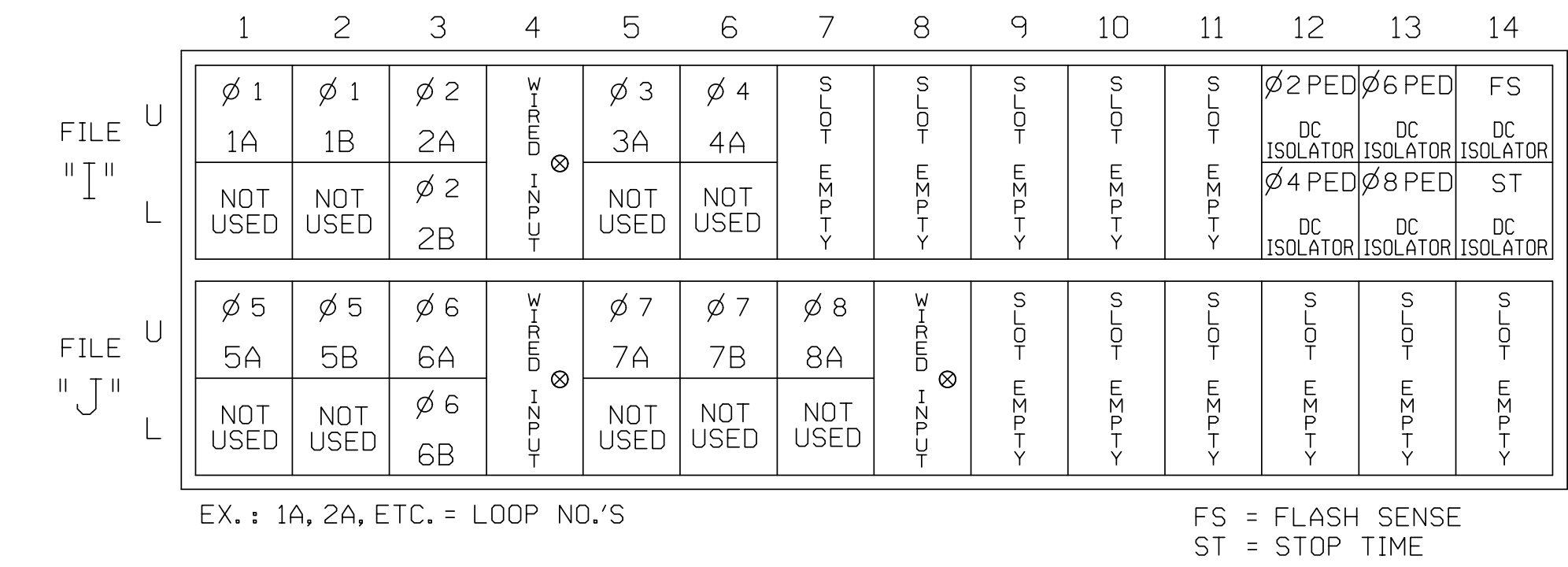
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6					
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18					
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE					
SIGNAL HEAD NO.	11*	82	21,22	P21, P22	22	31*	41,42	P41, P42	42	51*	61,62	P61, P62	62	71,72	81,82	P81, P82	11*	31*	NU	51*	NU	NU	
RED	*	128			*	101		*	134		107												
YELLOW		129				102			135		108												
GREEN		130				103			136		109												
RED ARROW											122					A121	A124		A114				
YELLOW ARROW		126				117			132		123	123				A122	A125		A115				
FLASHING YELLOW ARROW																A123	A126		A116				
GREEN ARROW	127	127				118	118		133	133		124	124										
Hand icon									104				119						110				
Person icon									106				121						112				

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

### INPUT FILE POSITION LAYOUT

(front view)



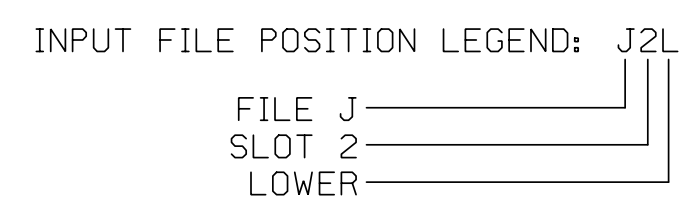
⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
1B	TB2-5,6	I2U	48	26	6	YES		3	G
2A	TB2-9,10	I3U	39	2	1	YES			S
2B	TB2-11,12	I3L	63	32	2	YES			N
3A <sup>2</sup>	TB4-5,6	I5U	76	42	2	YES		15	S
		J8U	58	3	3	YES		15	S
4A	TB4-9,10	I6U	50	28	8	YES			S
		J8U	41	4	4	YES			S
5A <sup>3</sup>	TB3-1,2	J1U	76	42	2	YES		15	S
		I4U	47	22	2	YES		3	G
5B	TB3-5,6	J2U	76	42	2	YES		15	S
6A	TB3-9,10	J3U	40	6	5	YES		15	S
6B	TB3-11,12	J3L	64	36	6	YES			N
7A	TB5-5,6	J5U	77	46	6	YES			N
7B	TB5-9,10	J6U	57	7	7	YES			S
8A	TB7-1,2	J7U	42	8	7	YES			S
		J7U	66	38	8	YES			S
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			

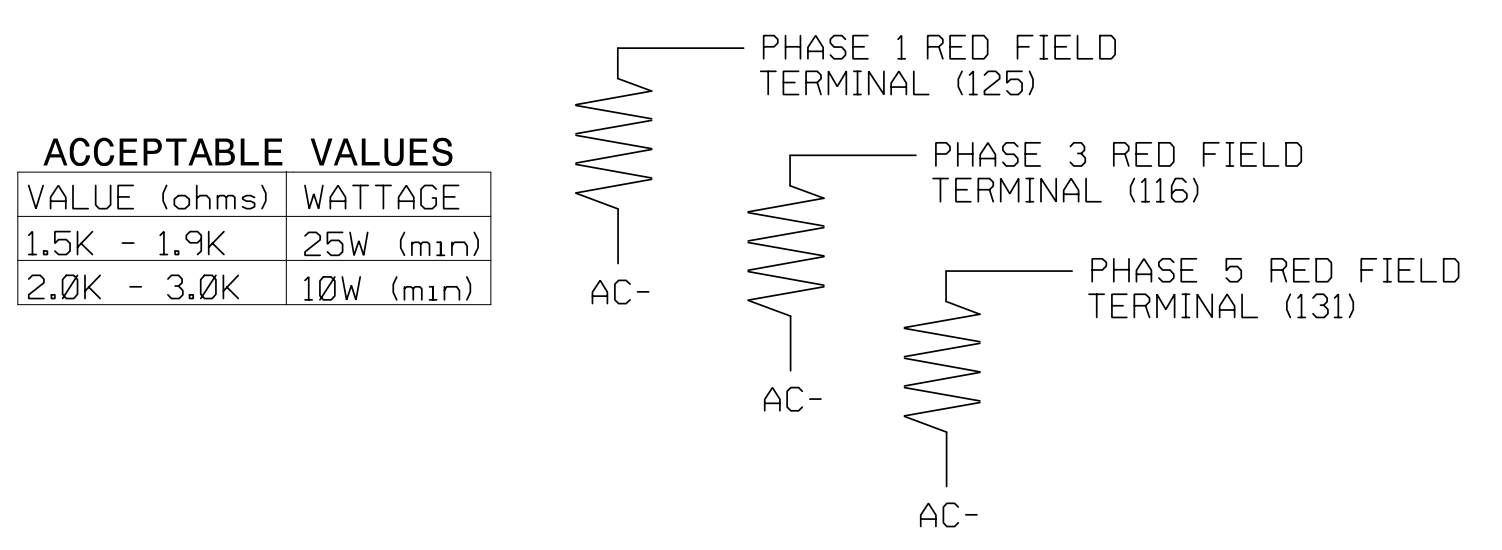
NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from I5-W to J8-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.



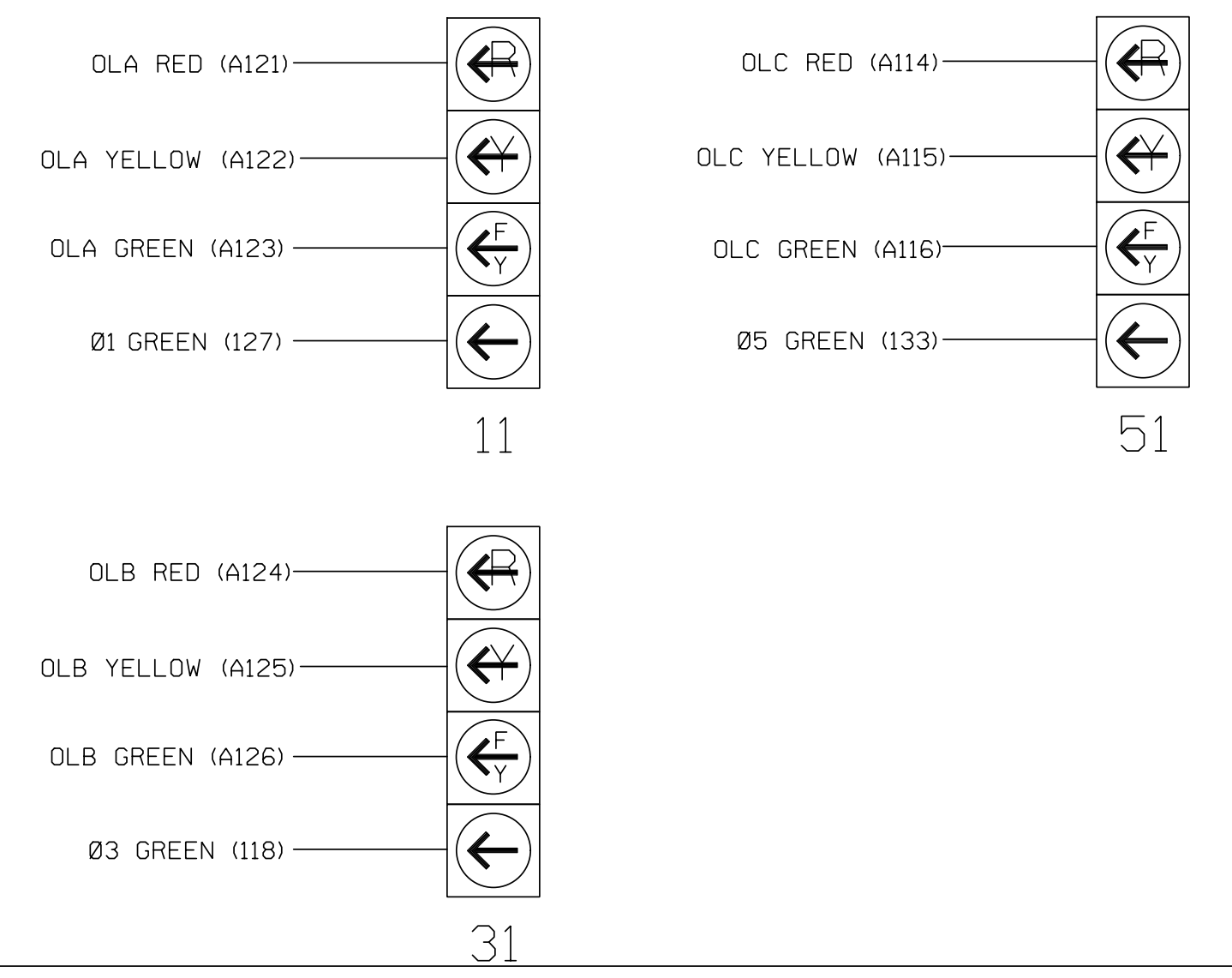
### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1325  
 DESIGNED: March 2016  
 SEALED: 5/31/2016  
 REVISED:

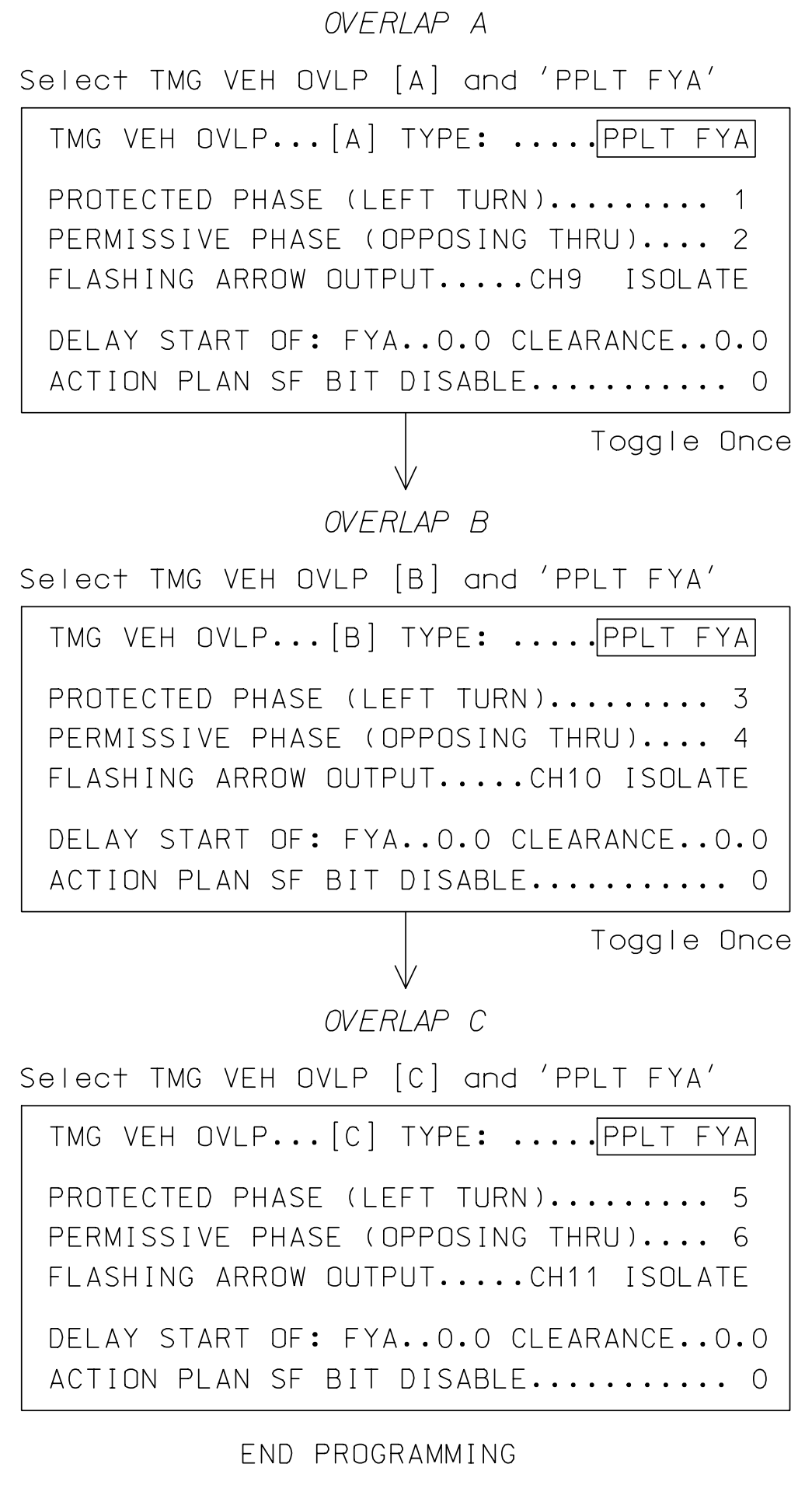
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared For: Transportation Mobility and Safety Division STATE OF NORTH CAROLINA Department of Transportation Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529 PLANS PREPARED IN THE OFFICE OF: <b>Kimley-Horn</b> NC License #F-0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	SR 1437 (Santa Fe Drive) at Antietam Creek Drive/ Plantation Garden Boulevard		SEAL 
	Division 6 PLAN DATE: July 2016 PREPARED BY: SP Pennington	Cumberland County REVIEWED BY: KP Baumann REVIEWED BY: SL Phillips	Fayetteville DATE: 9/1/2016 DATE:
	REVISIONS:	INIT. DATE:	DATE:
	SIG. INVENTORY NO. 06-1325		

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS



## FLASHER CIRCUIT MODIFICATION DETAIL

In order to ensure that signals flash concurrently on the Same approach, make the following flasher circuit changes:

1. On rear of PDA - remove wire from Term. T2-4 and terminate on T2-2.
2. On rear of PDA - remove wire from Term. T2-5 and terminate on T2-3.
3. Remove flasher unit 2.

The changes listed above ties all phases and overlaps to flasher unit 1.

## COUNTDOWN PEDESTRIAN SIGNAL OPERATION

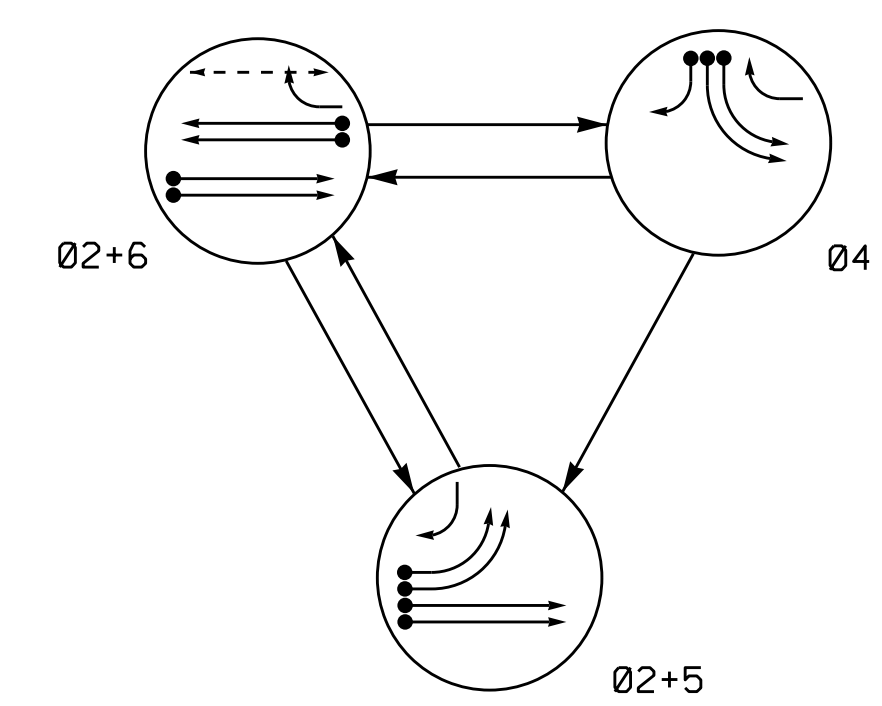
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1325  
 DESIGNED: March 2016  
 SEALED: 5/31/2016  
 REVISED:

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Prepared For:</p> <p><b>SR 1437 (Santa Fe Drive)</b>  <b>at</b>  <b>Antietam Creek Drive/        Plantation Garden Boulevard</b></p> <p style="font-size: x-small;">Division 6      Cumberland County      Fayetteville</p> <p>PLAN DATE: <b>July 2016</b>      REVIEWED BY: <b>KP Baumann</b></p> <p>PREPARED BY: <b>SP Pennington</b>      REVIEWED BY: <b>SL Phillips</b></p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by:          0CB7A5EDD80B437</p> <p style="font-size: x-small;">9/1/2016 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 06-1325</p>
REVISIONS	INIT.	DATE												

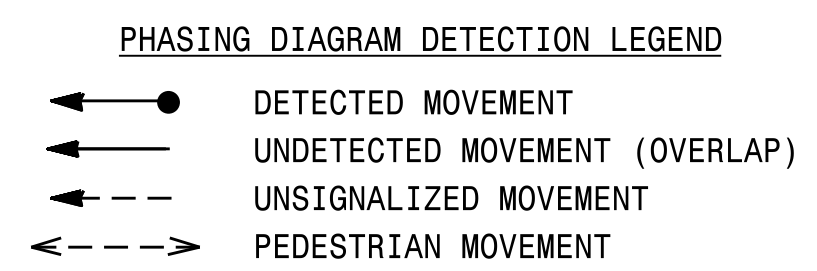
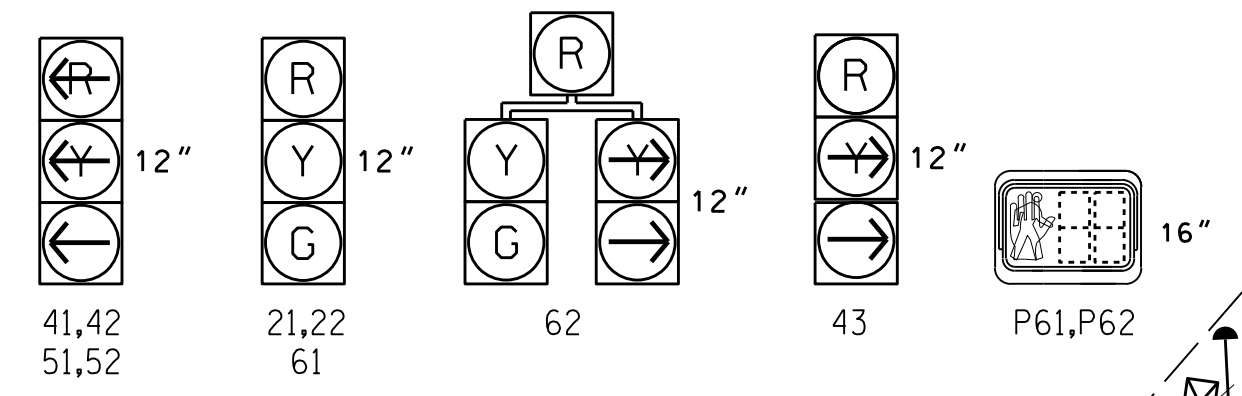
3 Phase Fully Actuated Fayetteville Signal System

PHASING DIAGRAM



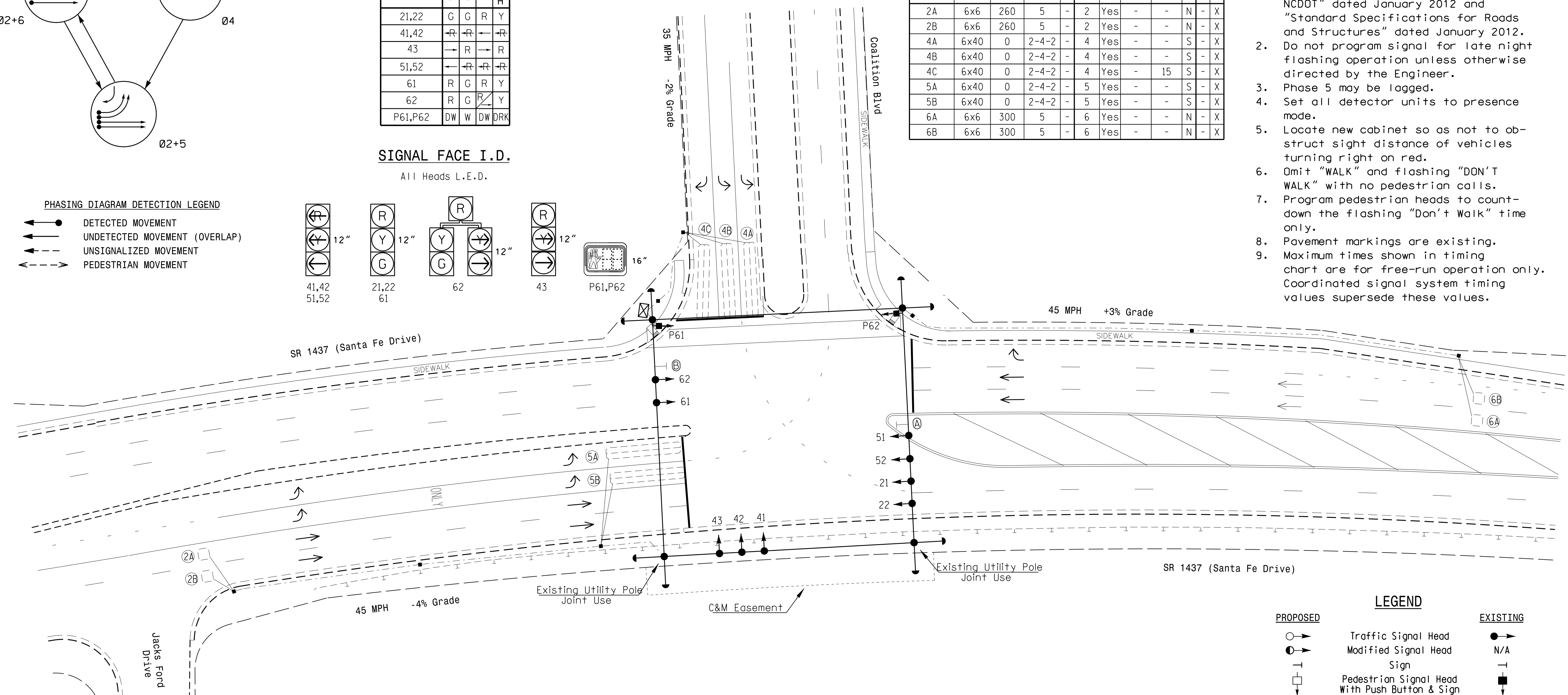
SIGNAL FACE	PHASE				
	02+5	02+6	04	F L S H	Y
21,22	G	G	R	Y	
41,42	R	R	Y	R	
43		R	R		
51,52	Y	R	R	R	
61	R	G	R	Y	
62	R	G	Y		
P61,P62	DW	W	DW	DRK	

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



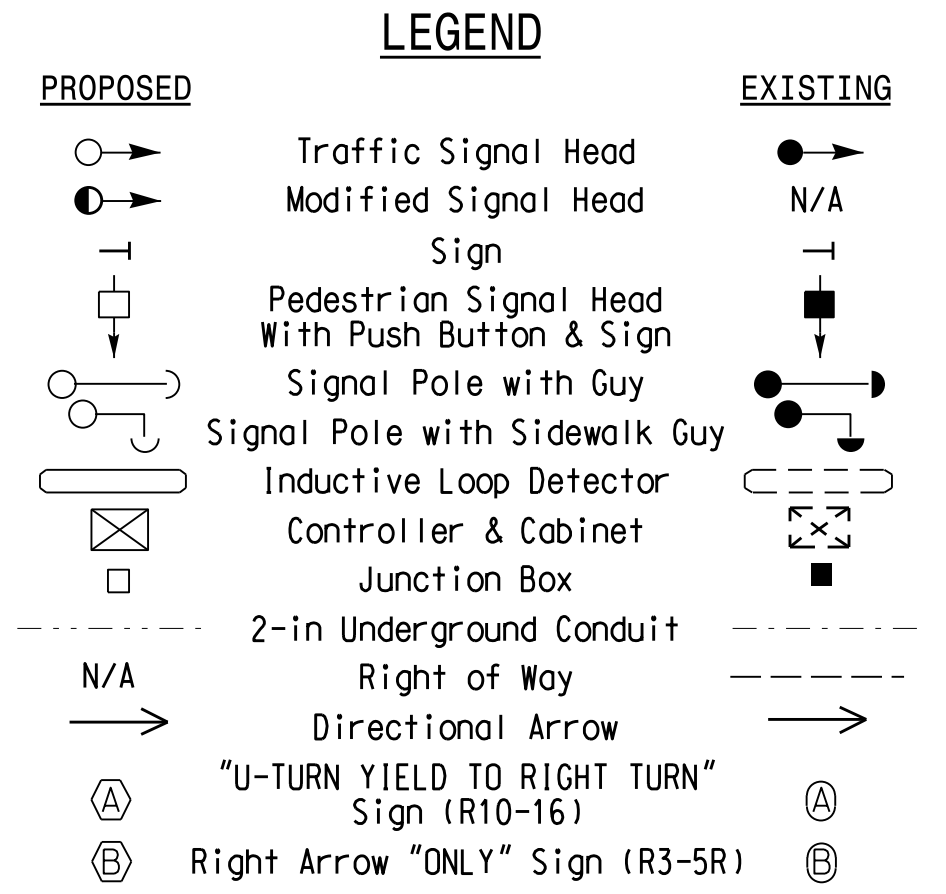
ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP NEW CARD
2A	6x6	260	5	-	2	Yes	-	-	N	X
2B	6x6	260	5	-	2	Yes	-	-	N	X
4A	6x40	0	2-4-2	-	4	Yes	-	-	S	X
4B	6x40	0	2-4-2	-	4	Yes	-	-	S	X
4C	6x40	0	2-4-2	-	4	Yes	-	15	S	X
5A	6x40	0	2-4-2	-	5	Yes	-	-	S	X
5B	6x40	0	2-4-2	-	5	Yes	-	-	S	X
6A	6x6	300	5	-	6	Yes	-	-	N	X
6B	6x6	300	5	-	6	Yes	-	-	N	X

- NOTES
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
  - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
  - 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 count-down the flashing "Don't Walk" time only.
  - Pavement markings are existing.
  - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	0	0	0	7
Ped Clear	0	0	0	32
Veh. Extension *	4.5	2.0	2.0	6.0
Max I *	90	45	45	90
Yellow	4.9	3.0	3.0	4.9
Red Clear	1.9	3.8	3.4	1.9
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	1.8	-	-	1.8
Max Initial *	30	-	-	30
Time Before Reduction *	30	-	-	30
Time To Reduce *	45	-	-	45
Minimum Gap	2.5	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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



Signal Upgrade

SR 1437 (Santa Fe Drive) at Coalition Boulevard

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG

PREPARED BY: KGP, Jr. REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 1"=30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JASON P. GALLOWAY 029904

6/16/2016

SIG. INVENTORY NO. 06-1326

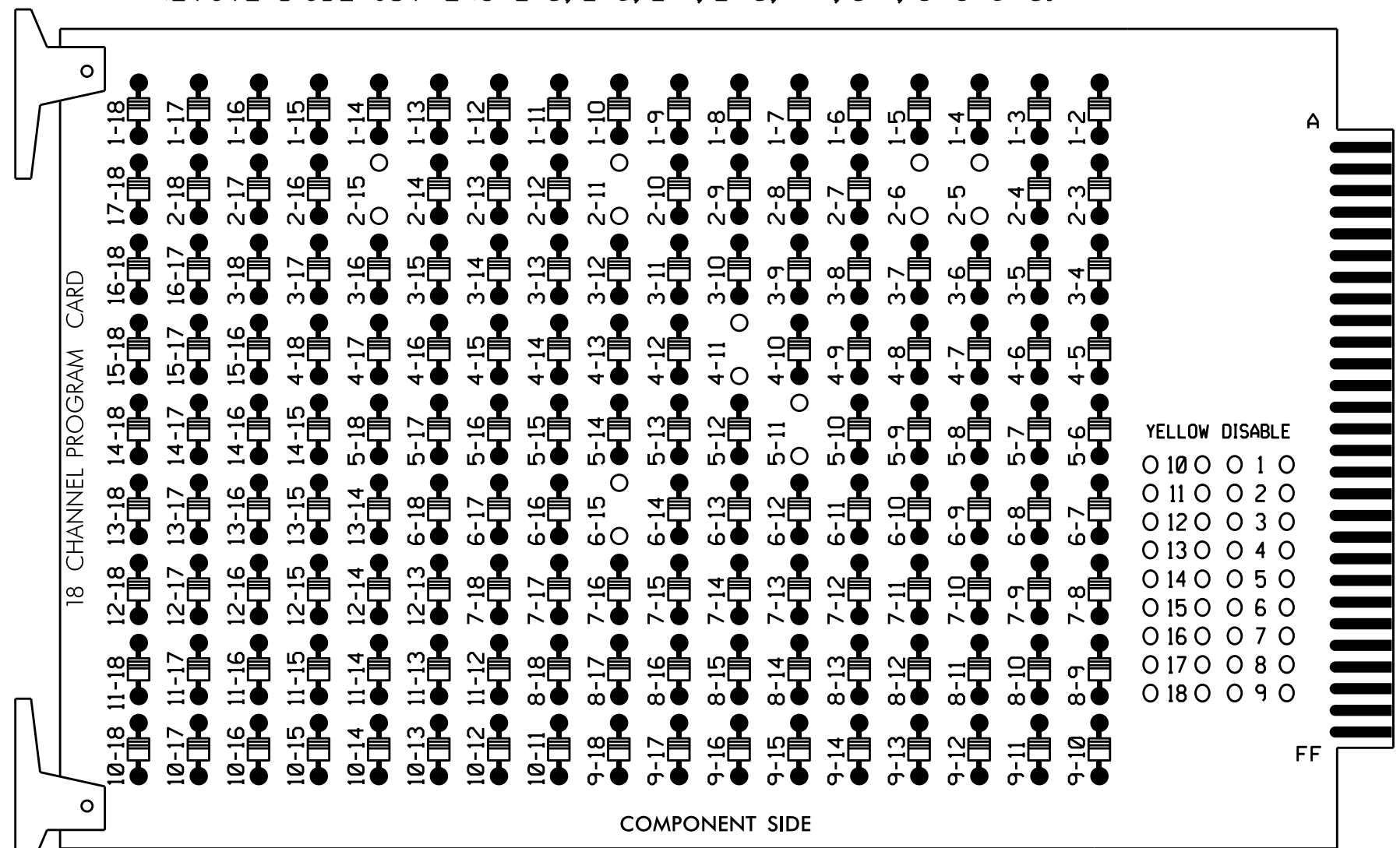
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 kgpae@ncd.com

**EDI MODEL 2018EClip-NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

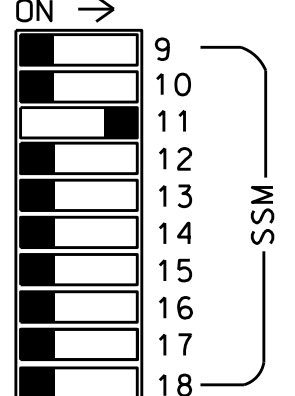
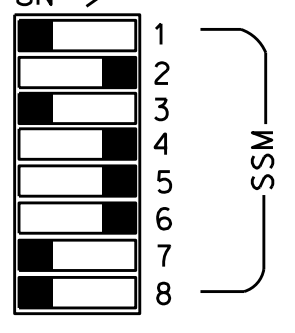
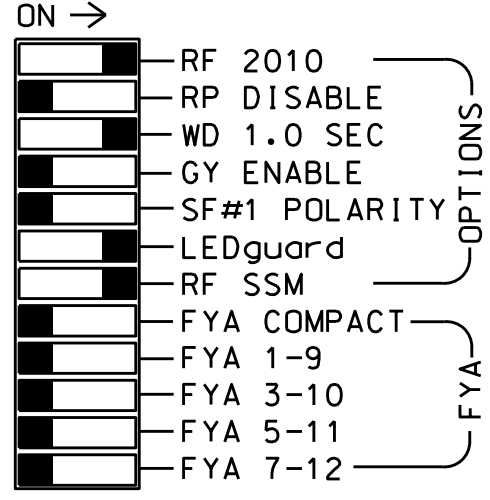
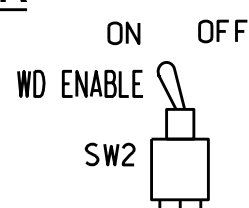
REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-15, 4-11, 5-11, and 6-15.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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



■ = DENOTES POSITION OF SWITCH

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Walk.
5. The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,S9,AUX S4  
 PHASES USED.....2,4,5,6,6 PED  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....4+5  
 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	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51,52	61,62	NU	NU	NU	NU	NU	NU	43	NU	NU
RED		128							134							A114		
YELLOW		129							135									
GREEN		130							136									
RED ARROW					101				131									
YELLOW ARROW					102	102			132							A115		
FLASHING YELLOW ARROW																		
GREEN ARROW					103	103			133							A116		
Hand icon									119									
Person icon									121									

NU = Not Used

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

1. From Main Menu select **2. CONTROLLER**
2. From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'NORMAL'

TMG VEH OVLP...[C] TYPE: ..... [NORMAL]  
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6  
 INCLUDED . . . X X . . . . .  
 LAG GRN 0.0 YEL 0.0 RED 0.0

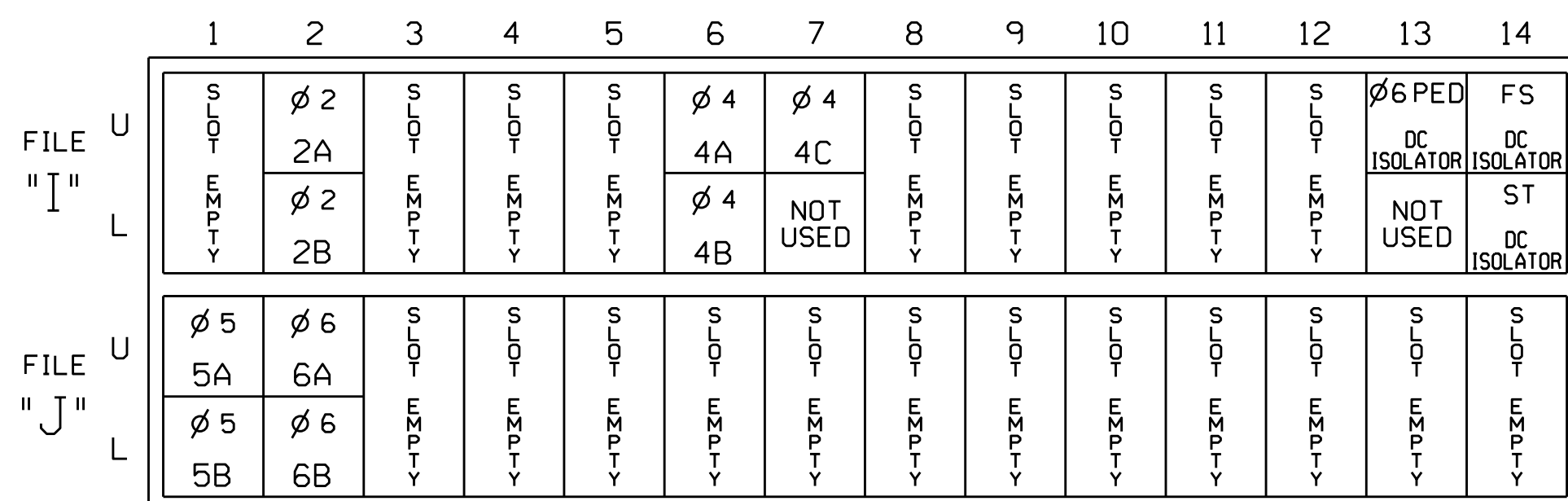
END PROGRAMMING

**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.

**INPUT FILE POSITION LAYOUT**

(front view)



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

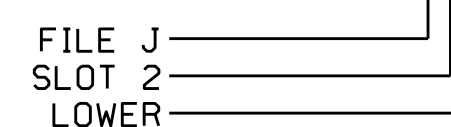
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-3,4	J1L	55	5	5	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L



**FLASHER CIRCUIT MODIFICATION DETAIL**

In order to ensure that signals flash concurrently on the same approach, make the following flasher circuit changes:

1. On rear of PDA - remove wire from Term. T2-4 and terminate on T2-2.
2. On rear of PDA - remove wire from Term. T2-5 and terminate on T2-3.
3. Remove flasher unit 2.

The changes listed above ties all phases and overlaps to flasher unit 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1326  
 DESIGNED: March 2016  
 SEALED: 6/16/2016  
 REVISED: N/A

**Electrical Detail**

Electrical AND PROGRAMMING DETAILS FOR: SR 1437 (Santa Fe Drive) at Coalition Boulevard

Division 6 Cumberland County Fayetteville

PLAN DATE: June 2016 REVIEWED BY:

PREPARED BY: Keith Mims REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

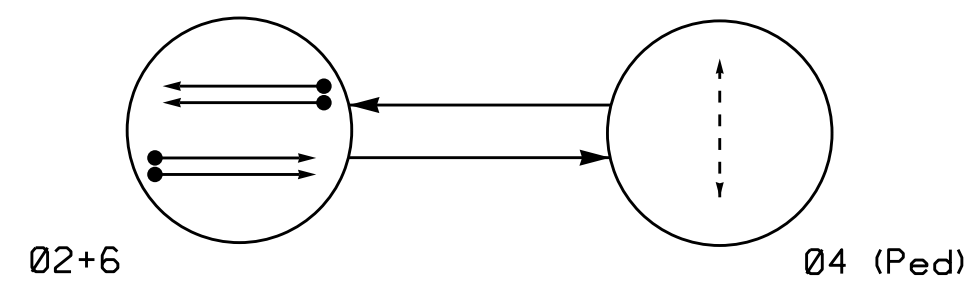
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JACOBARY M. LITTLE

DocuSigned by: Zephania M. Little 6/20/2016

SIG. INVENTORY NO. 06-1326

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

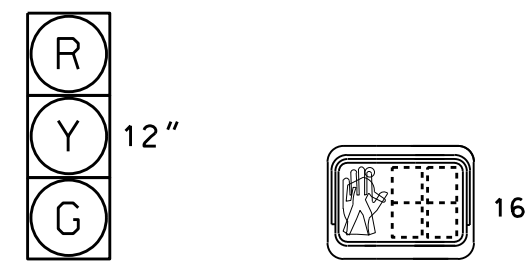
- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø2+6	Ø4	F L
21, 22	G	R	Y
61, 62	G	R	Y
P41, P42	DW	W	DRK

**SIGNAL FACE I.D.**

All Heads L.E.D.  
\* Accessible Pedestrian Signal



21, 22  
61, 62  
P41\* P42\*

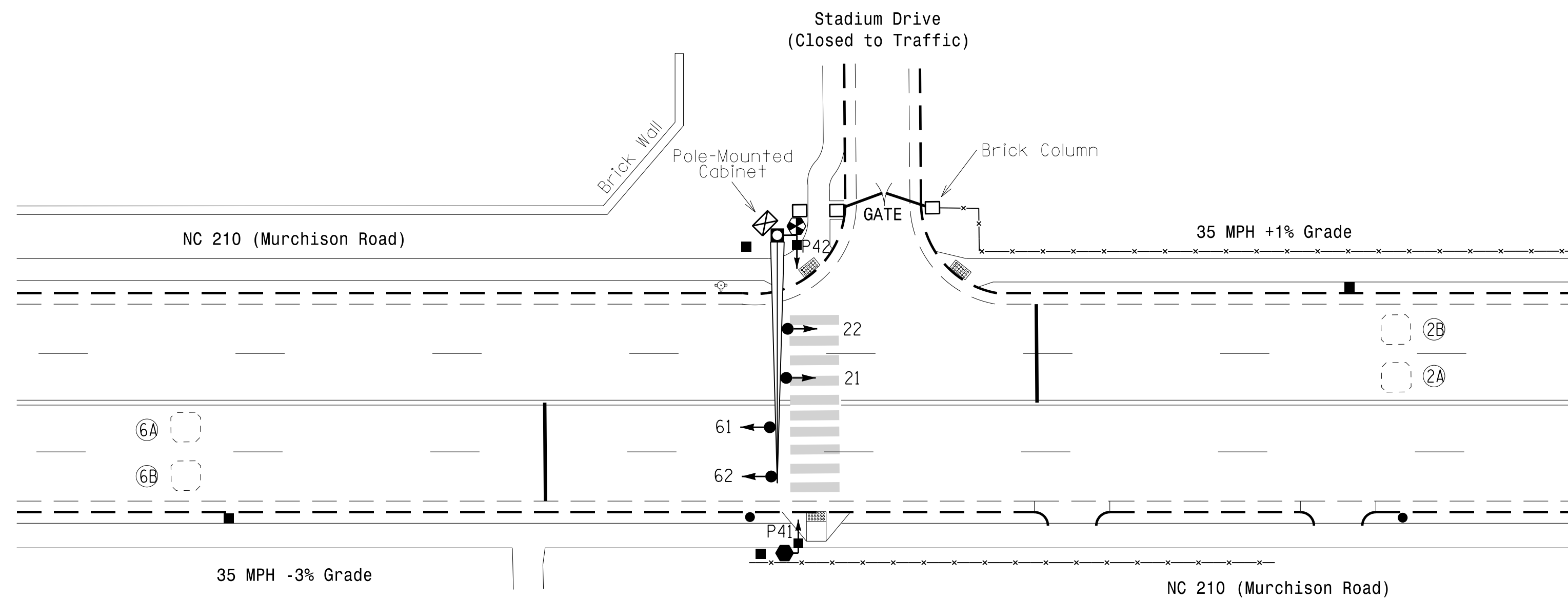
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					TYPE	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME				
2A, 2B	6X6	70	3	-	2	Yes	-	-	-	S	-	X
6A, 6B	6X6	70	3	-	6	Yes	-	-	-	S	-	X

**2 Phase Actuated Ped Signal Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Program the Walk Mode Sound on APS for the Default Standard (Walk) Message.
- Program the Walk Sound Trigger on the APS for the Default Any Push.
- Program the Sound/Vibration Timer on the APS for 7 seconds.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE		
	2	4	6
Min Green *	10	7	10
Walk *	-	7	-
Ped Clear	-	11	-
Veh. Extension *	3.0	0.0	3.0
Max I *	30	-	30
Yellow	4.1	3.0	4.1
Red Clear	1.2	1.0	1.2
Red Revert	-	-	-
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	X	-	X
Recall Position	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

**LEGEND**

- | PROPOSED |  | EXISTING |
|----------|--|----------|
| ○→       | Traffic Signal Head                            | ●→       |
| ●→       | Modified Signal Head                           | N/A      |
| ↑        | Sign   | ↑        |
| ○→       | Pedestrian Signal Head With Push Button & Sign | ○→       |
| ○→       | Signal Pole with Guy                           | ○→       |
| ○→       | Signal Pole with Sidewalk Guy                  | ○→       |
| ⊗        | Inductive Loop Detector                        | ⊗        |
| □        | Controller & Cabinet Junction Box              | □        |
| ---      | 2-in Underground Conduit                       | ---      |
| N/A      | Right of Way                                   | ---      |
| →        | Directional Arrow                              | →        |
| ⊗        | Metal Pole with Mastarm Pushbutton Post        | ⊗        |
| ○        | Pedestrian Pedestal                            | ●        |

**Signal Upgrade**

Prepared in the Offices of:

**NC 210 (Murchison Road) at Stadium Drive**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG

PREPARED BY: Devin Smith REVIEWED BY:

SCALE: 1"=20'

REVISIONS: \_\_\_\_\_ INIT. DATE

DocuSigned by: Jason P. Gallaway 7/7/2016

SIG. INVENTORY NO. 06-1329

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

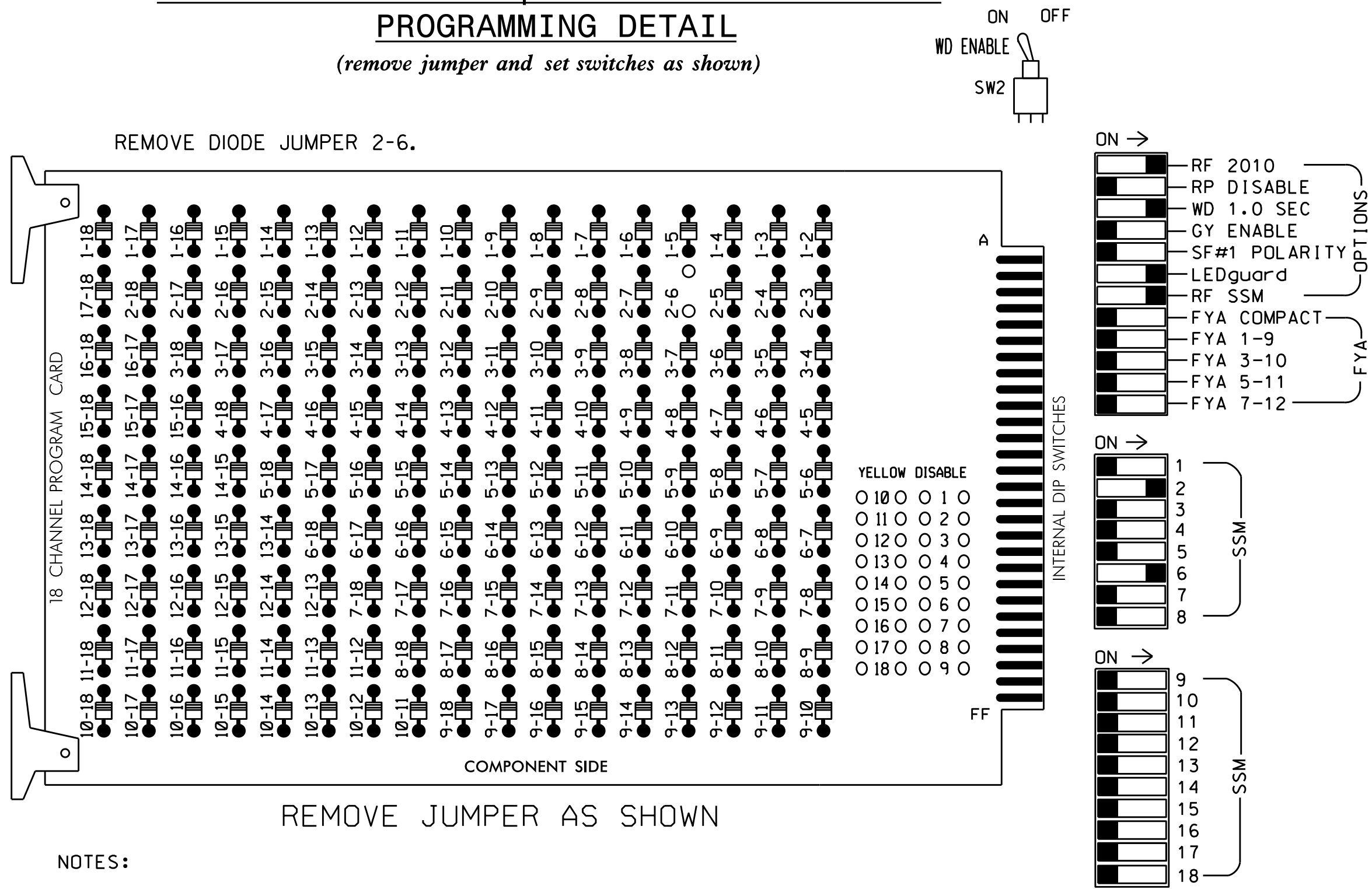
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 ksp@edf.in



## EDI MODEL 2018EClip-NC CONFLICT MONITOR

### PROGRAMMING DETAIL

(remove jumper 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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....336  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S6,S8  
 PHASES USED.....2,4\*,4 PED,6  
 OVERLAPS.....NONE

\* Used for timing purposes only.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NC	P41, P42	NU	61,62	NU	NU	NU	NU
RED		128						134				
YELLOW		129						135				
GREEN		130						136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
							104					
							106					

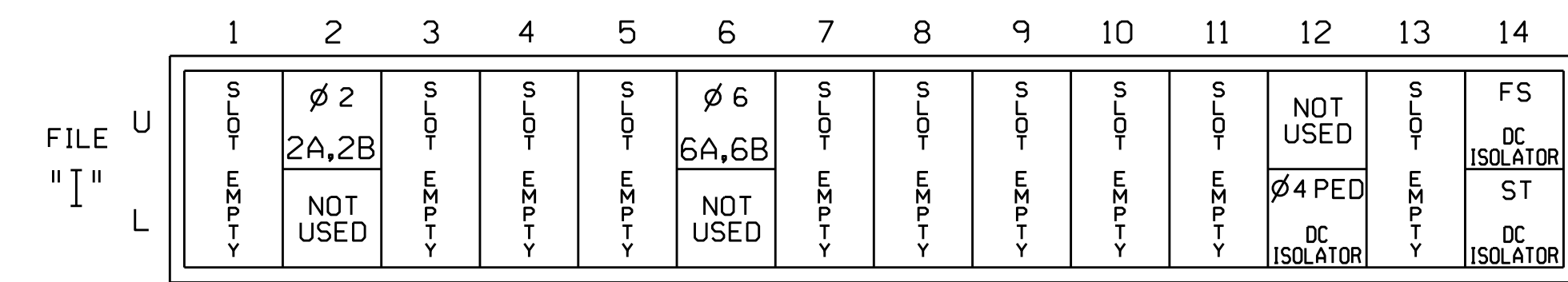
NU = Not Used  
 NC = Not Connected

### 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.

### INPUT FILE POSITION LAYOUT

(front view)



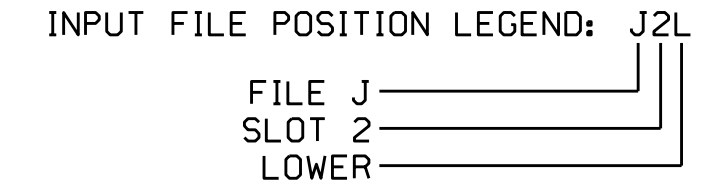
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A,2B	TB21-3,4	I2U	39	2	2	YES			S
6A,6B	TB21-11,12	I6U	40	6	6	YES			S
PED PUSH BUTTONS									
P41,P42	TB24-9,10	I12L	69	PED 4	4 PED				

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 112



### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

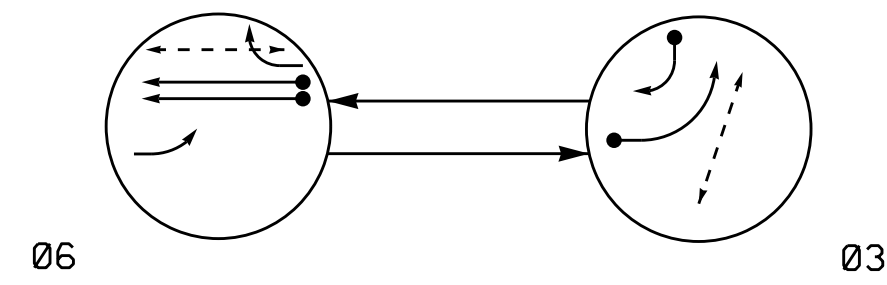
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

14-Jul-2016 16:15  
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 kmmfms

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1329  
 DESIGNED: March 2016  
 SEALED: 7/7/2016  
 REVISED: N/A

Electrical Detail		<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared In the Offices of:  TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC. Signal Management System 750 N. Greenfield Pkwy, Garner, NC 27529		NC 210 (Murchison Road) at Stadium Drive  Division 6 Cumberland County Fayetteville PLAN DATE: June 2016 REVIEWED BY: PREPARED BY: Keith Mims REVIEWED BY: REVISIONS: _____ INIT. DATE: _____ DocuSigned by:  7/18/2016 DATE: _____ SIG. INVENTORY NO. 06-1329	

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

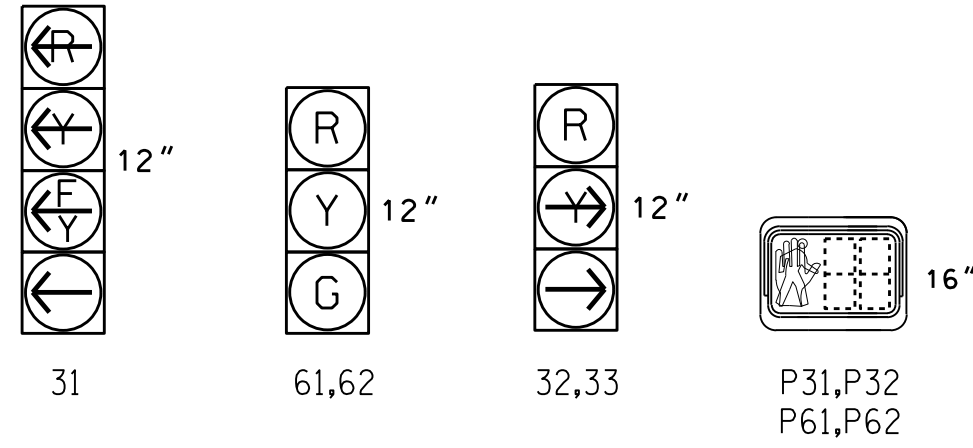
- ● DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	03	06	F
31	←	←	←
32,33	→	R	R
61,62	R	G	Y
P31,P32	W	DW	DRK
P61,P62	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

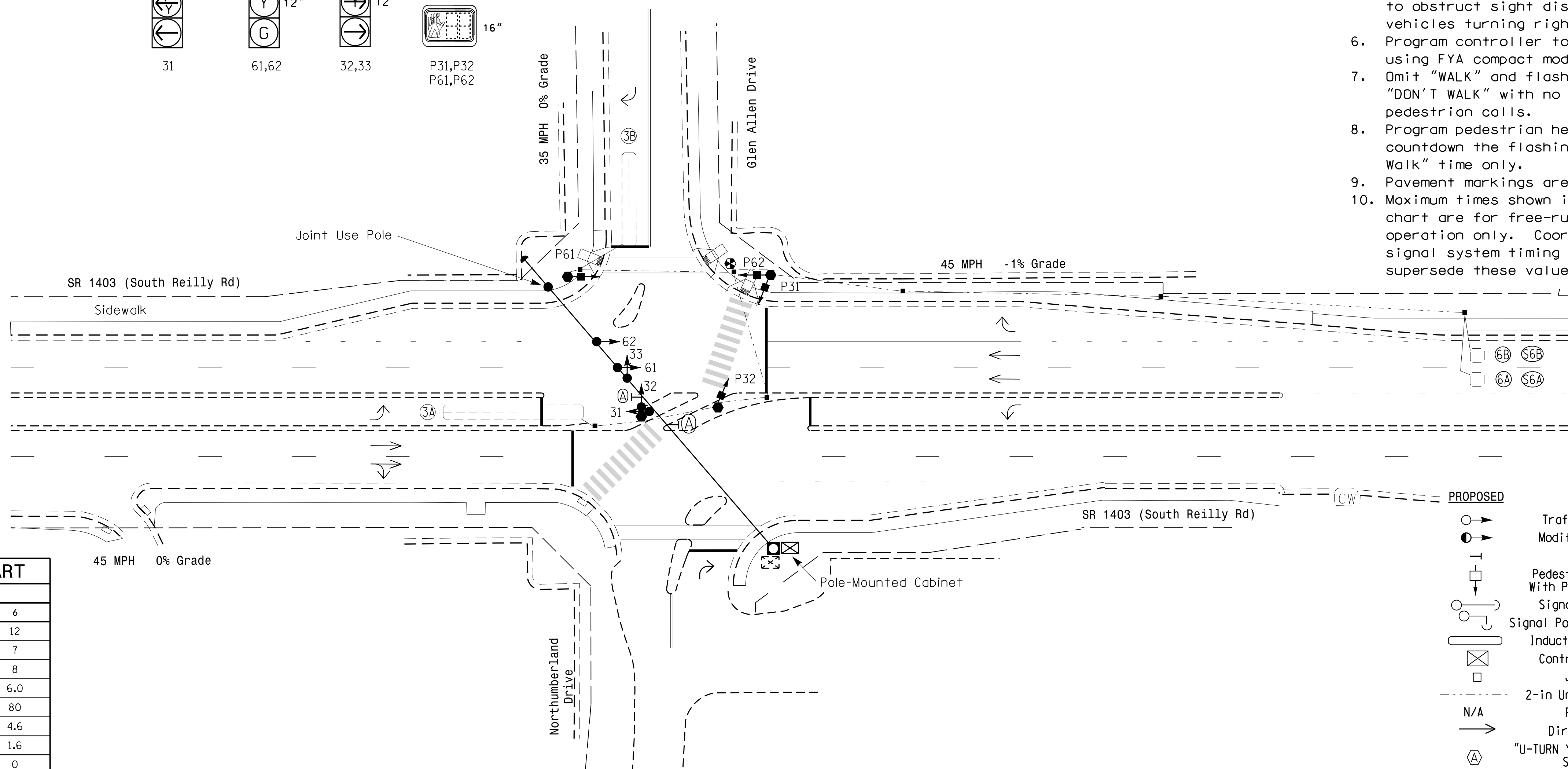
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	LOOP	NEW CARD
3A	6X60	+20	2-4-2	-	3	Yes	-	15	S	-	X
3B	6X40	0	2-4-2	-	3	Yes	-	15	S	-	X
6A/S6A	6X6	300	4	-	6	Yes	-	-	N	X	X
6B/S6B	6X6	300	4	-	6	Yes	-	-	N	X	X

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.
- Program controller to operate using FYA compact mode.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

FEATURE	PHASE	
	3	6
Min Green *	7	12
Walk *	7	7
Ped Clear	10	8
Veh. Extension *	2.0	6.0
Max 1 *	20	80
Yellow	3.0	4.6
Red Clear	2.8	1.6
Actuations B4 Add *	-	0
Seconds / Actuation *	-	1.5
Max Initial *	-	34
Time Before Reduction *	-	15
Time To Reduce *	-	30
Minimum Gap	-	3.0
Locking Detector	-	X
Recall Position	-	VEH. RECALL
Dual Entry	-	-
Simultaneous Gap	X	X

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



LEGEND

- | PROPOSED                                     | EXISTING |
|--|----------|
| ○ → Traffic Signal Head                      | ● →      |
| ● → Modified Signal Head                     | N/A      |
| ⊥ Sign                                       | ⊥        |
| ⊥ Pedestrian Signal Head                     | ⊥        |
| ⊥ With Push Button & Sign                    | ⊥        |
| ⊥ Signal Pole with Guy                       | ⊥        |
| ⊥ Signal Pole with Sidewalk Guy              | ⊥        |
| ⊥ Inductive Loop Detector                    | ⊥        |
| ⊥ Controller & Cabinet                       | ⊥        |
| ⊥ Junction Box                               | ⊥        |
| ⊥ 2-in Underground Conduit                   | ⊥        |
| N/A Right of Way                             | ---      |
| → Directional Arrow                          | →        |
| ⊙ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | ⊙        |
| N/A Curb Ramp                                | ⊙        |
| ⊙ Type I Pushbutton Post                     | ⊙        |
| ○ Type II Signal Pedestal                    | ○        |

Signal Upgrade

SR 1403 (South Reilly Road) at Glen Allen Street

Division 6 Cumberland Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG

PREPARED BY: KGP, Jr. REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 30 1"=30'

SEAL

JASON P. GALLAWAY ENGINEER

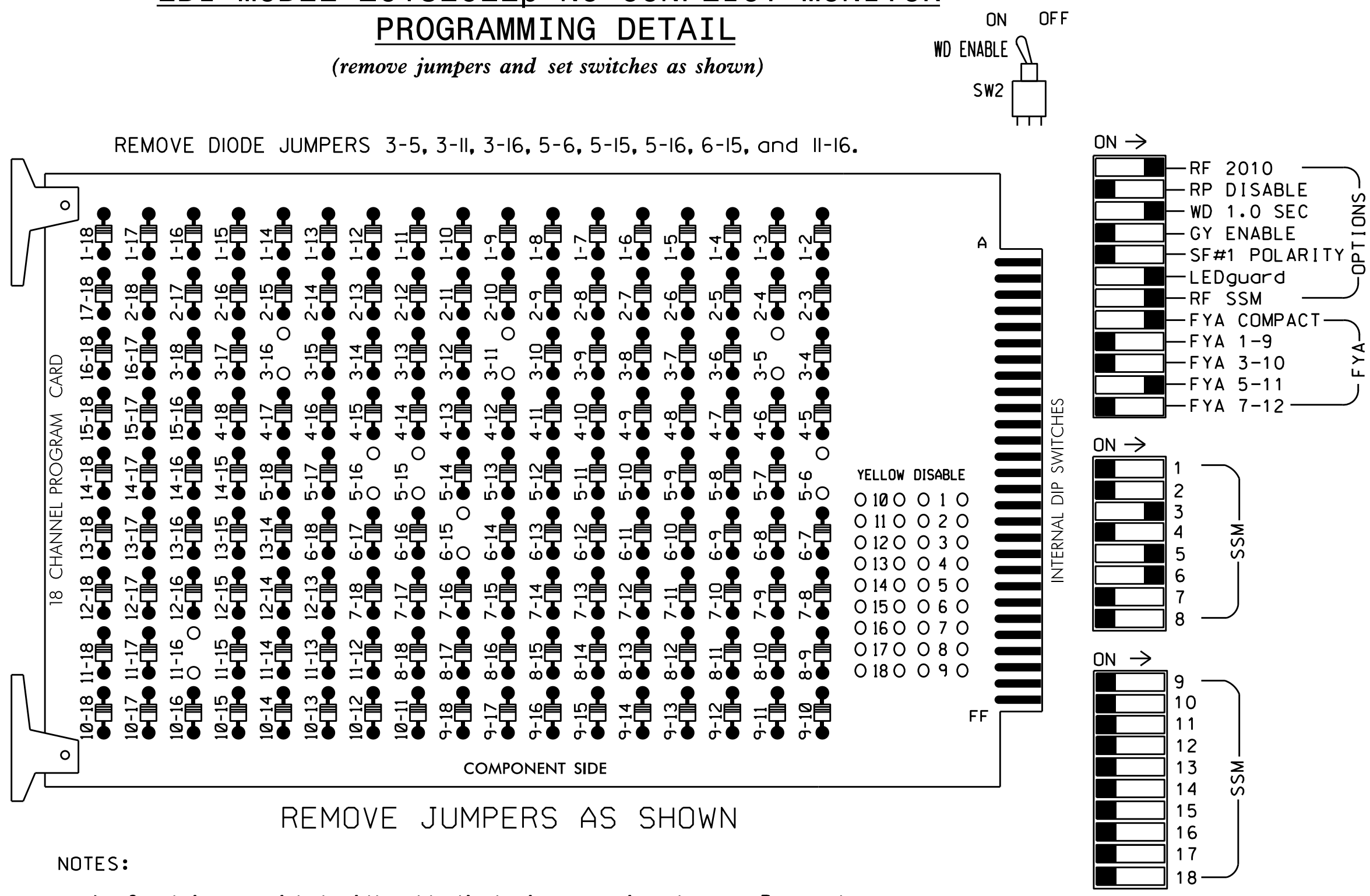
8/31/2016

SIG. INVENTORY NO. 06-1337

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 kgpae@ncdot.gov

### EDI MODEL 2018ECLip-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.
- Integrate monitor with Ethernet network in cabinet.
- Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.

■ = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for volume density operation.
- Program controller to start up in phase 6 Walk.
- Program phase 2 for Red flash.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....336  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S4,S7,S8,S9,S12  
 PHASES USED.....3,3PED,6,6PED  
 OVERLAP A.....NOT USED  
 OVERLAP B.....NOT USED  
 OVERLAP C.....\*  
 OVERLAP D.....NOT USED  
 OVERLAP M.....3  
 \* See ASC/3-2070 Overlap Programming Detail on sheet 2.

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

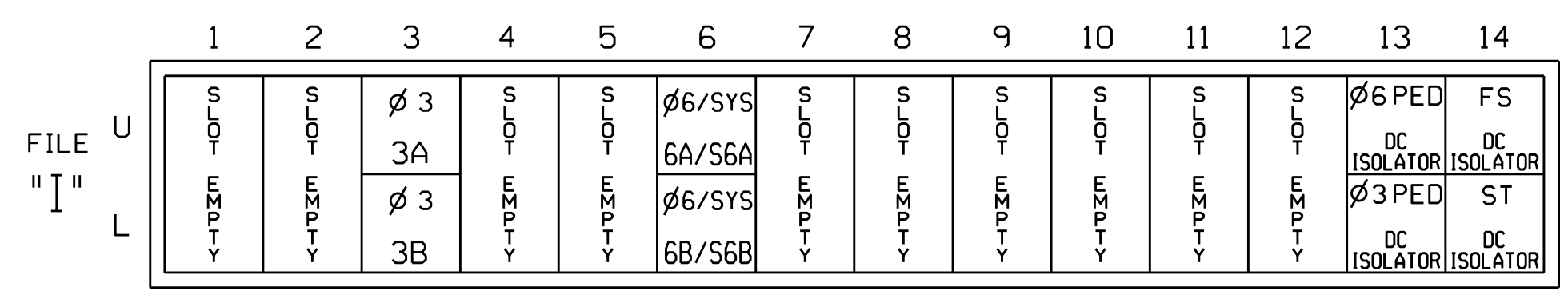
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	11	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	OLC	6	OLM	6 PED	7	8	3 PED
SIGNAL HEAD NO.	NU	NU	NU	32,33	NU	NU	31	61,62	31	61,62	NU	NU	P31, P32
RED				116				134					
YELLOW								135					
GREEN								136					
RED ARROW								131					
YELLOW ARROW				117				132					
FLASHING YELLOW ARROW								133					
PED YELLOW									119				110
GREEN ARROW				118				120					111
									121				112

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

### INPUT FILE POSITION LAYOUT

(front view)

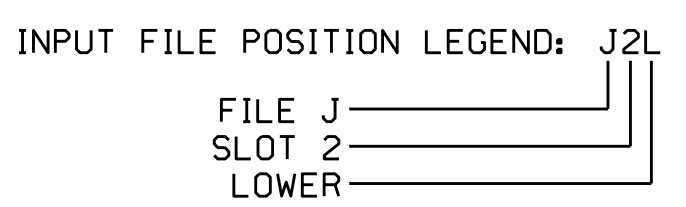


EX. : 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
3A	TB21-5,6	I3U	58	3	3	YES		15	S
3B	TB23-5,6	I3L	49	24	3	YES		15	S
6A/S6A	TB21-11,12	I6U	40	6	6/SYS	YES			N
6B/S6B	TB23-11,12	I6L	44	16	6/SYS	YES			N
PED PUSH BUTTONS									
P31,P32	TB24-11,12	I13L	70	PED 8	3 PED				
P61,P62	TB22-11,12	I13U	68	PED 6	6 PED				

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

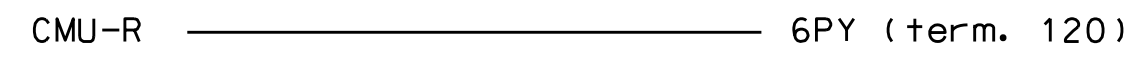


### PED YELLOW CONFLICT MONITOR WIRING DETAIL

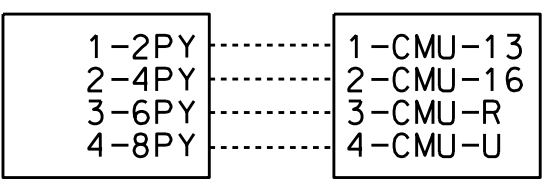
(make cabinet wiring changes as shown below)

In order to use FYA COMPACT mode with the 2018ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 6 PY (field term. 120) to Channel 10 Green (monitor pin R).

- Follow the instructions below to make the appropriate connections:
- STEP 1: Fold down rear panel of output file.
  - STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).
  - STEP 3: Find the conductors that correspond to the following conflict monitor card edge pins and solder wire to the appropriate terminal on the rear of the output file as shown below:



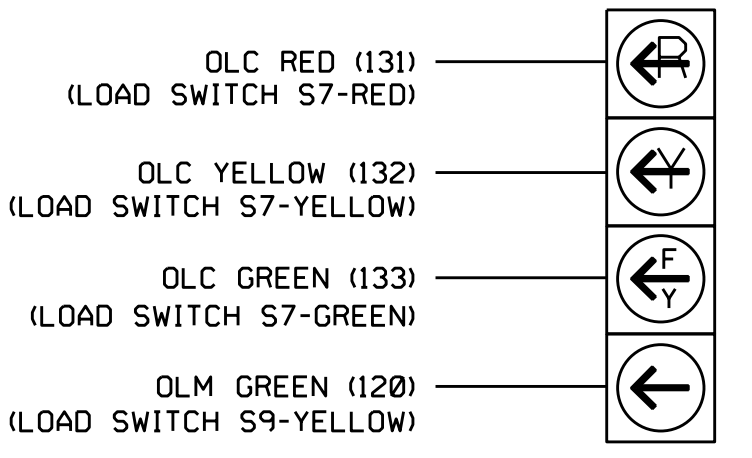
NOTE: Some cabinet manufacturers use keyed connectors to accomplish this wiring configuration. If connectors are used, fold down the rear panel of the output file and find the set of 3 keyed connectors and connect them as shown below:



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1337  
 DESIGNED: March 2016  
 SEALED: 8/31/2016  
 REVISED: N/A

### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

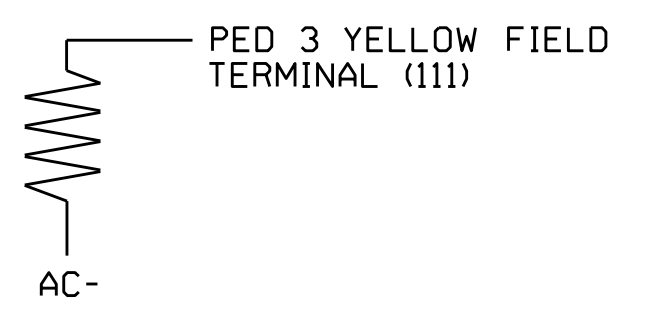


31

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details for: SR 1403 (South Reilly Road) at Glen Allen Street

Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016 REVIEWED BY:

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

Seal: Keith M. Mims, Professional Engineer, No. 036880, State of North Carolina

DocuSigned by: Keith M. Mims 10/10/2016

SIG. INVENTORY NO. 06-1337

07-001-2016-08-18  
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 S:\115451\115\_Signal\work\hgr\docs\sig\_Maps\hgr\strong\061337\_sml.ele.xxx.dgn  
 S:\115451\115\_Signal\work\hgr\docs\sig\_Maps\hgr\strong\061337\_sml.ele.xxx.dgn

### ECONOLITE ASC/3-2070 OUTPUT PIN REMAPPING TO PRODUCE THE FYA 31 COMPACT MODE SEQUENCE

The ASC/3 Configurator utility program must be used to remap the output pins as shown below. Consult the ASC/3 Configurator User Guide for specific instructions on software use.

1. Run the Configurator utility. Load a file as the Current DB.
2. Choose the C1-out tab to change the Output mapping. Use the drop down list within the program to select the assigned function for the pins shown below.
3. Save the database file and download it to the controller.

C1	DEFAULT	ASSIGNED FUNCTION
PIN #	FUNCTION	

PIN 34-PHASE 5 GREEN	→	LS 15 YELLOW PC	▼
PIN 36-PED 6 YELLOW	→	LS 5 GREEN WALK	▼

NOTE: FOR FYA 5-11 COMPACT MODE

NOTE: The steps below can be used to view changes to Output pins within the controller. Any Output pins that have been remapped will display and show their default function in addition to the current assigned function.

1. From Main Menu select 7. STATUS DISPLAY
2. From STATUS DISPLAY Submenu select 8. INPUTS/OUTPUTS
3. From INPUT/OUTPUT Submenu select 9. I/O DIFFERENCES

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL (program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

Toggle Twice

OVERLAP C  
 Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP... [C] TYPE: ....	PPLT FYA
PROTECTED LEFT TURN....	OVERLAP M
OPPOSING THROUGH.....	PHASE 6
FLASHING ARROW OUTPUT....	CH15 YEL PED
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

Toggle to advance to Overlap 'M'

OVERLAP M  
 Select TMG VEH OVLP [M] and 'NORMAL'

TMG VEH OVLP... [M] TYPE: .....	NORMAL
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	INCLUDED . . X . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0	

END PROGRAMMING

### ECONOLITE ASC/3-2070 PED 3 DETECTOR PROGRAMMING AND LOAD SWITCH PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 6. DETECTORS
2. From DETECTOR Submenu select 3. PED DETECTOR INPUT ASSIGNMENT

PED DET PHASE ASSIGNMENT MODE: NTCIP								
PHASE	1	2	3	4	5	6	7	8
DETECTOR	0	2	8	4	0	6	0	0
PHASE	9	10	11	12	13	14	15	16
DETECTOR	0	0	0	0	0	0	0	0

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

Program LD SWITCH 5 as OVLP '13' TYPE 'O' and LD SWITCH 16 as PHASE '3' TYPE 'P' as shown below.

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 3. LOAD SW ASSIGN

LD SWITCH ASSIGN										
PHASE		DIMMING			---FLASH---					
/OVLP	TYPE	R	Y	G	D	PWR	AUT	TGR		
1	1	V	. . . .	+	A	R	X			
2	2	V	. . . .	+	A	R	.			
3	3	V	. . . .	+	A	R	X			
4	4	V	. . . .	+	A	R	.			
5	13	O	. . . .	-	A	Y	.			
6	6	V	. . . .	-	A	Y	X			
7	7	V	. . . .	-	A	R	.			
8	8	V	. . . .	-	A	R	X			
9	1	O	. . . .	+	A	R	X			
10	2	O	. . . .	+	A	R	X			
11	3	O	. . . .	-	A	R	.			
12	4	O	. . . .	-	A	R	.			
13	2	P	. . . .	+	A	.	.			
14	4	P	. . . .	-	A	.	.			
15	6	P	. . . .	+	A	.	.			
16	3	P	. . . .	-	A	.	.			

→ NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16

END PROGRAMMING

07-2016-2016-08-24  
 S:\IT\AS31\15\Sig\m\work\hgr\oups\Sig\_MonHArmsTronp061337\_sm.ele.xxx.dgn  
 somstronp

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1337  
 DESIGNED: March 2016  
 SEALED: 8/31/2016  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

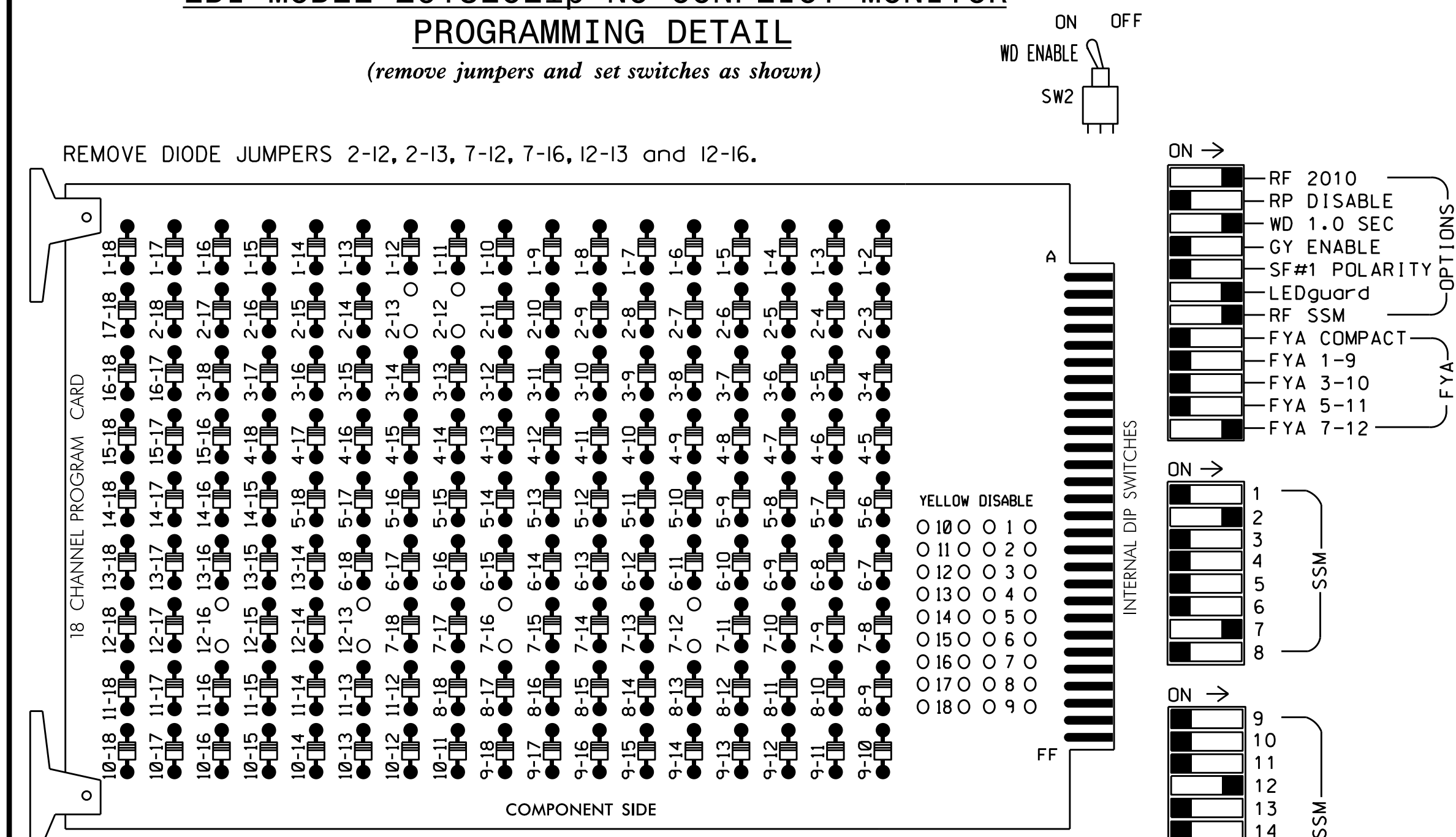
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	<p>SR 1403 (South Reilly Road)          at          Glen Allen Street</p> <p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: August 2016 REVIEWED BY:</p> <p>PREPARED BY: S. Armstrong REVIEWED BY:</p> <p>REVISIONS</p> <p>INIT. DATE</p> <p>Keith M. Minns 10/10/2016</p> <p>SIG. INVENTORY NO. 06-1337</p>
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**EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-12, 2-13, 7-12, 7-16, 12-13 and 12-16.

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 Red Enable is active at all times during normal operation.
- Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for volume density operation.
- Program controller to start up in phase 2 Walk.
- Program phase 6 for Red Flash.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S3,S10,S12,AUX S5  
 PHASES USED.....2,2 PED,7,7 PED  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....\*  
 OVERLAP "E".....NOT USED  
 OVERLAP "F".....NOT USED  
 OVERLAP "G".....\*

\* See overlap programming detail on sheet 2

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	OLG	8	7 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	NU	NU	NU	NU	NU	71*	72,73	NU	P71, P72	NU	NU	NU	71*	NU
RED		128									122							
YELLOW		129																
GREEN		130																
RED ARROW																		A101
YELLOW ARROW											123							A102
FLASHING YELLOW ARROW																		A103
GREEN ARROW										124	124							
Hand icon			113										110					
Walking person icon			115										112					

NU = Not Used

\* 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
"I"	U	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2 PED DC ISOLATOR	NOT USED	FS DC ISOLATOR
		2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A	2A/S2A
"J"	U	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 2/SYS	∅ 7 PED DC ISOLATOR	ST DC ISOLATOR
		2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B	2B/S2B
"U"	U	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7
		7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A
		7B	7B	7B	7B	7B	7B	7B	7B	7B	7B	7B	7B	7B	7B

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

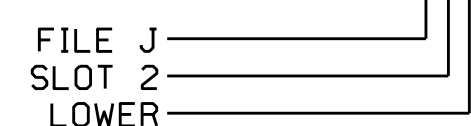
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2/SYS	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2/SYS	YES			N
7A	TB5-9,10	J6U	42	8	7	YES		15	S
7B	TB5-11,12	J6L	46	18	7	YES		15	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P71,P72	TB8-8,9	I13L	70	PED 8	7 PED				

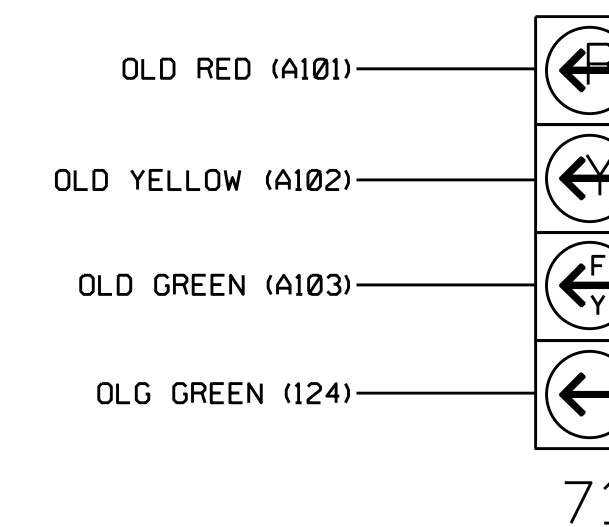
NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

INPUT FILE POSITION LEGEND: J2L



**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**FLASHER CIRCUIT MODIFICATION DETAIL**

In order to ensure 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:  
 TRANSPORTATION MOBILITY AND SAFETY CONSULTANTS  
 NORTH CAROLINA PROFESSIONAL ENGINEERS  
 750 N. Greenfield Pkwy, Garner, NC 27529

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEERS  
 KEITH M. MIMS  
 10/26/2016  
 DATE

Division 6 Cumberland County Fayetteville  
 PLAN DATE: October 2016 REVIEWED BY: T. Joyce  
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS	INIT.	DATE

SIG. INVENTORY NO. 06-1338

26-007-2016-1119  
 S:\IT\ASIS\1119\SIG\1119\ED\1119\EDI Model 2018ECLIP-NC Conflict Monitor Program Detail.dgn

## ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switches S10 and S12 as OLG and PED 7 program LD SWITCH 7 as OVLP '7' TYPE 'O' and LD SWITCH 16 as PHASE '7' as shown below.

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 3. LOAD SW ASSIGN

LD SWITCH	ASSIGN PHASE	TYPE	DIMMING	FLASH	PWR	AUT	TGR
1	1	V	. . . +	A R X			
2	2	V	. . . +	A Y .			
3	3	V	. . . +	A R X			
4	4	V	. . . +	A R .			
5	5	V	. . . -	A R .			
6	6	V	. . . -	A R X			
7	7	O	. . . -	A R .			
8	8	V	. . . -	A R X			
9	1	O	. . . +	A R X			
10	2	O	. . . +	A R X			
11	3	O	. . . -	A R .			
12	4	O	. . . -	A Y .			
13	2	P	. . . +	A . .			
14	4	P	. . . -	A . .			
15	6	P	. . . +	A . .			
16	7	P	. . . -	A . .			

NOTICE OVLP 7 ASSIGNED TO LD SWITCH 7 →

NOTICE PHASE 7 PED ASSIGNED TO LD SWITCH 16 →

← ALSO ENSURE LD SWITCH 6 AUT SET TO 'R'

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS
3. Press 'Toggle' 3 times

### OVERLAP D

Select TMG VEH OVLP [D] and 'PPLT FYA'

TMG VEH OVLP...[D] TYPE: ..... PPLT FYA

PROTECTED LEFT TURN.... OVERLAP G

OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH12 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

Toggle 3 times

### OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

TMG VEH OVLP...[G] TYPE: ..... NORMAL

PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

INCLUDED . . . . . X . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0

END PROGRAMMING

## ECONOLITE ASC/3-2070 PED 7 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select 6. DETECTORS
2. From DETECTOR Submenu select 3. PED DETECTOR INPUT ASSIGNMENT

PED DET PHASE ASSIGNMENT MODE: NTCIP								
PHASE	1	2	3	4	5	6	7	8
DETECTOR	0	2	0	4	0	6	8	0
PHASE	9	10	11	12	13	14	15	16
DETECTOR	0	0	0	0	0	0	0	0

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 7

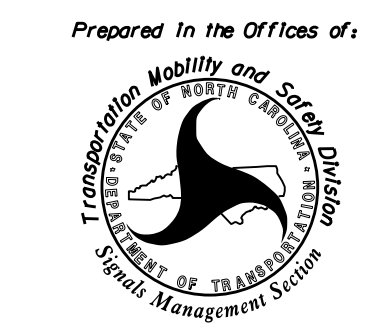
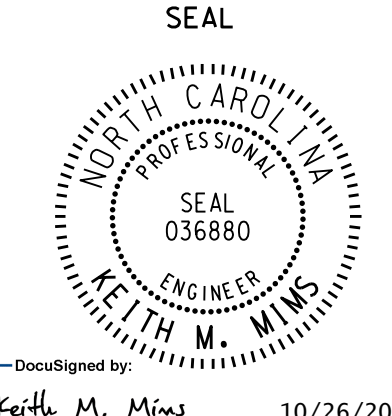
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1338

DESIGNED: March 2016

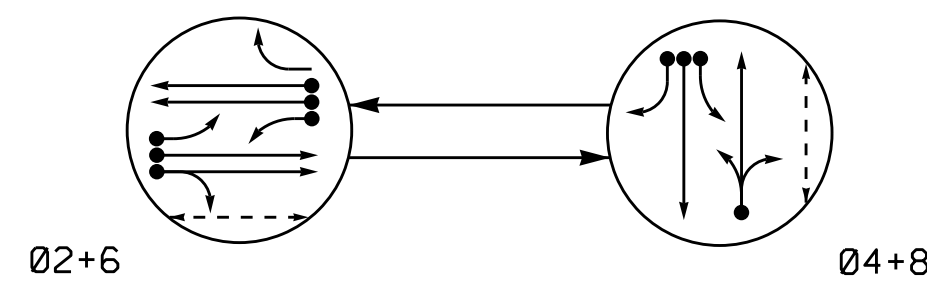
SEALED: 10/21/2016

REVISED:

26-1027-2016-11-27  
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Electrical Detail - Sheet 2 of 2		<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>						
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared In the Offices of:   750 N. Greenfield Pkwy, Garner, NC 27529	<b>SR 1403 (South Reilly Road) at Northumberland Street</b>  Division 6 Cumberland County Fayetteville PLAN DATE: October 2016 REVIEWED BY: T. Joyce PREPARED BY: C. Strickland REVIEWED BY:  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE				SEAL   Keith M. Mims ENGINEER 10/26/2016 DATE SIG. INVENTORY NO. 06-1338
REVISIONS	INIT.	DATE						

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A/S2A	6X6	300	5	-	2	Yes	-	-	N	X	X
2B/S2B	6X6	300	5	-	2	Yes	-	-	N	X	X
2C	6X40	0	2-4-2	-	2	Yes	-	3	G	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4C	6X40	0	2-4-2	-	4	Yes	-	15	S	-	X
6A/S6A	6X6	300	5	-	6	Yes	-	-	N	X	X
6B/S6B	6X6	300	5	-	6	Yes	-	-	N	X	X
6C	6X40	0	2-4-2	-	6	Yes	-	3	G	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	10	S	-	X

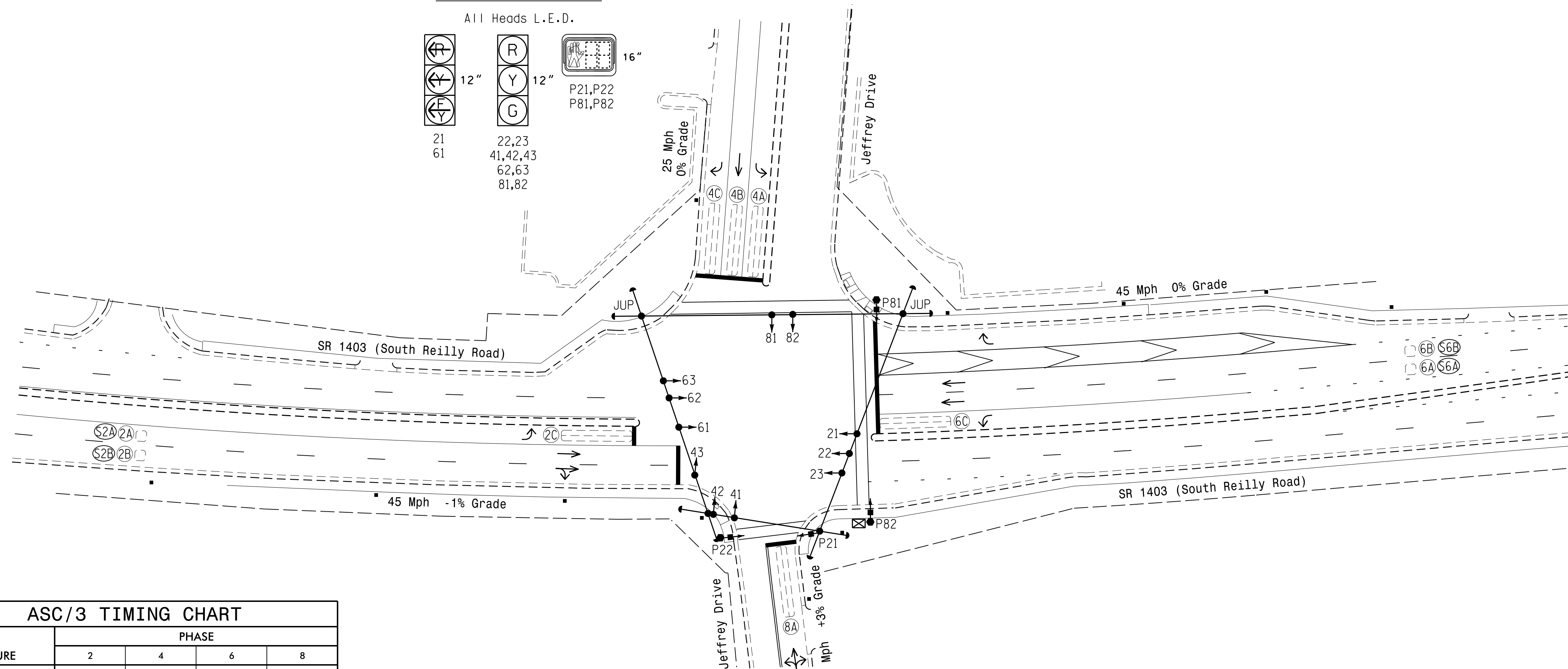
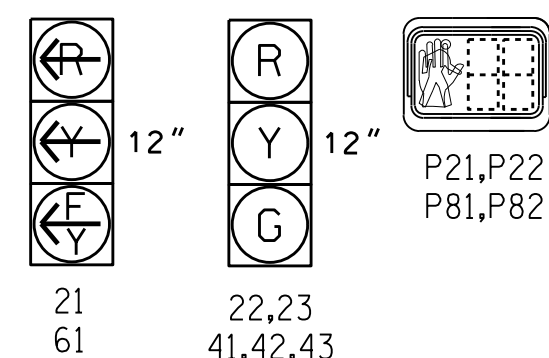
2 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	7	0	0	7
Ped Clear	7	0	0	29
Veh. Extension *	6.0	2.0	6.0	2.0
Max I *	80	20	80	20
Yellow	4.6	3.2	4.6	3.1
Red Clear	1.8	3.5	1.8	3.4
Actuations B4 Add *	0	-	0	-
Seconds / Actuation *	1.5	-	1.5	-
Max Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

- | PROPOSED   | EXISTING   |
|--|--|
| ○ → Traffic Signal Head                          | ● → Traffic Signal Head                          |
| ● → Modified Signal Head                         | N/A  |
| ⊥ Sign   | ⊥ Sign   |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ○ Signal Pole with Guy                           | ● Signal Pole with Guy                           |
| ⊥ Signal Pole with Sidewalk Guy                  | ⊥ Signal Pole with Sidewalk Guy                  |
| ⊥ Inductive Loop Detector                        | ⊥ Inductive Loop Detector                        |
| ⊥ Controller & Cabinet                           | ⊥ Controller & Cabinet                           |
| ⊥ Junction Box                                   | ⊥ Junction Box                                   |
| --- 2-in Underground Conduit                     | --- 2-in Underground Conduit                     |
| N/A Right of Way                                 | --- Right of Way                                 |
| → Directional Arrow                              | → Directional Arrow                              |
| ○ Type II Signal Pedestal                        | ● Type II Signal Pedestal                        |

Signal Upgrade

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

SR 1403 (South Reilly Road) at Jeffrey Drive

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG  
 PREPARED BY: Jeff Spence REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 0 40  
 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: JASON P. GALLOWAY, PROFESSIONAL ENGINEER, NO. 029904, DATE 5/6/2016

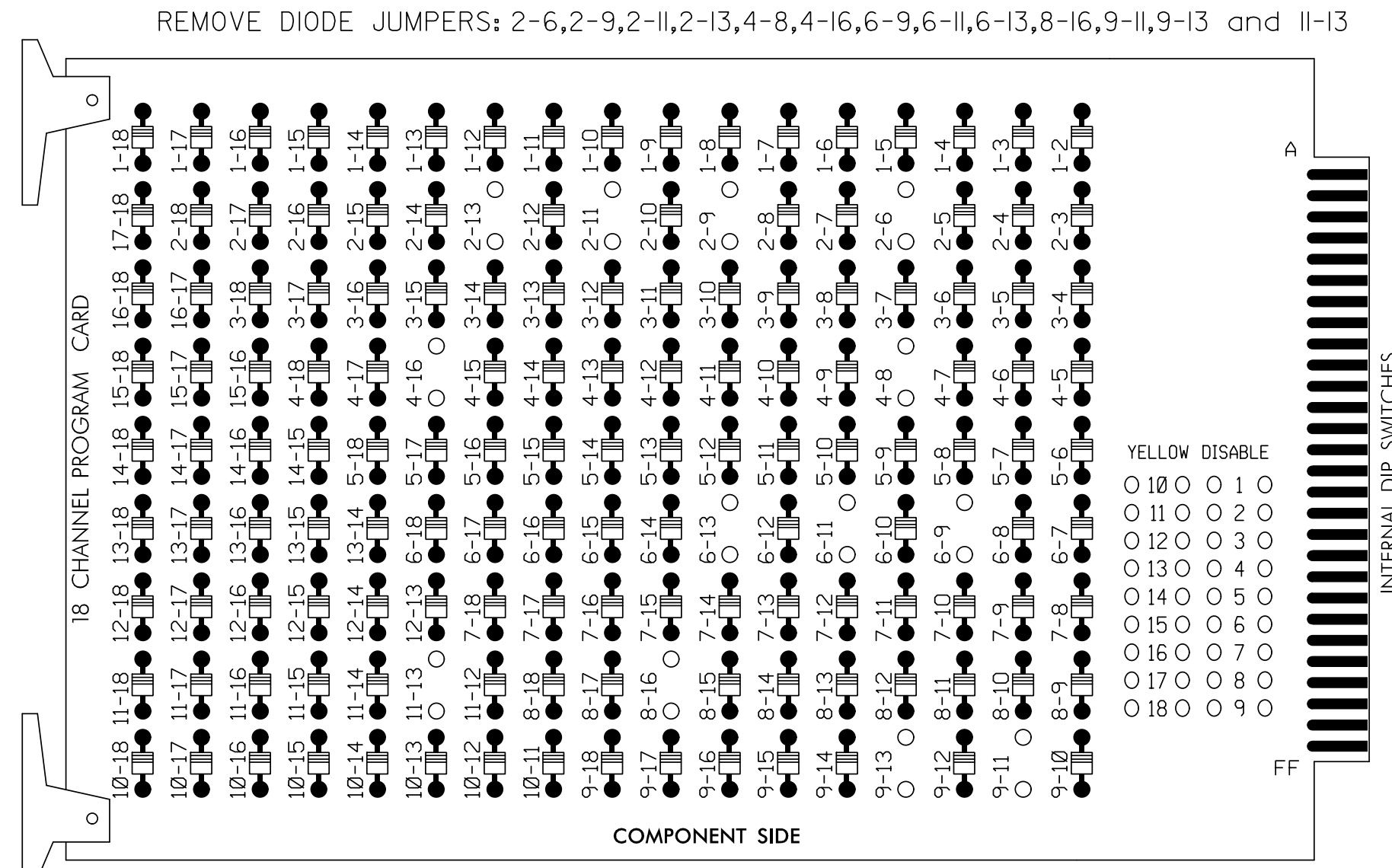
SIG. INVENTORY NO. 06-1339

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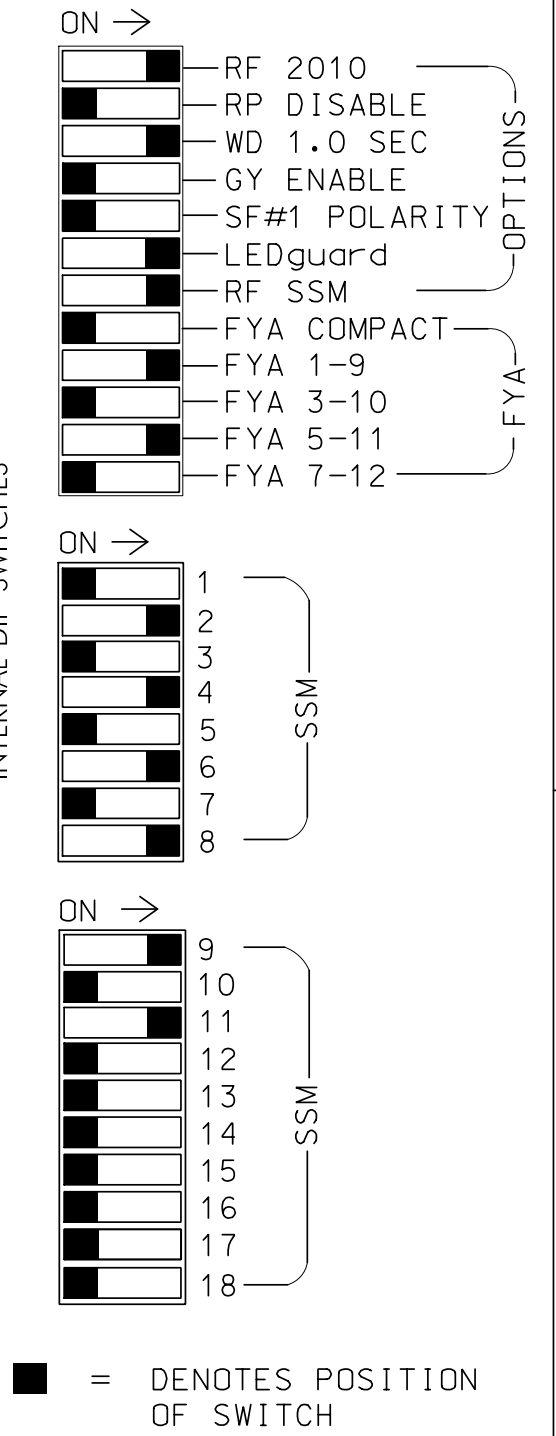
**EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S3,S5,S8,S11,S12,AUX S1, AUX S4  
 PHASES USED.....2,2PED,4,6,8,8PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

**SIGNAL HEAD HOOK-UP CHART**

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

NU = Not Used  
 ★ 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
"I"	S	ø2/SYS	ø 2	S	S	S	ø 4	ø 4	S	S	S	S	ø 2 PED	NOT USED	FS
	I	2A/S2A	2C	I	I	I	4A	4C	I	I	I	I	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
"J"	S	ø6/SYS	ø 6	S	S	S	ø 8	S	S	S	S	S	S	S	S
	J	6A/S6A	6C	J	J	J	8A	NOT USED	J	J	J	J	J	J	J
		ø6/SYS	NOT USED												
		6B/S6B													

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

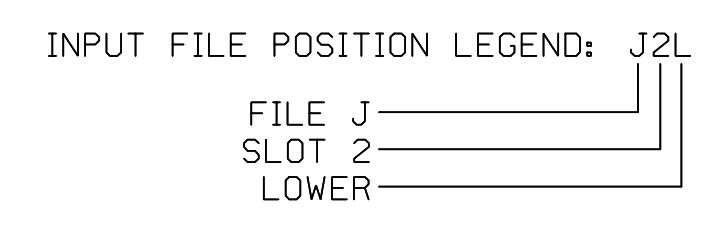
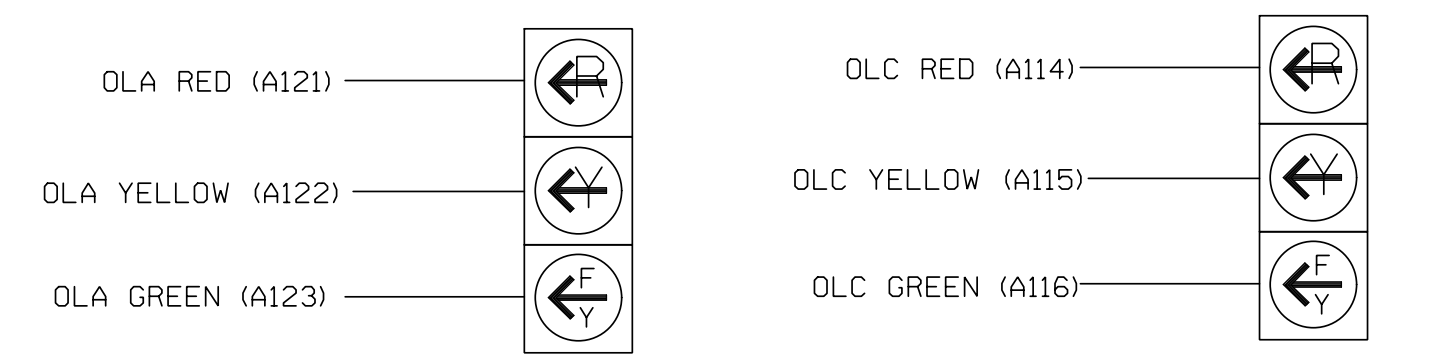
**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2	YES			N
2C	TB2-9,10	I3U	63	32	2	YES		3	G
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S
6A/S6A	TB3-5,6	J2U	40	6	6	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES		3	G
8A	TB5-9,10	J6U	42	8	8	YES		10	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED				

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

**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared For: Cumberland County 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	SR 1403 (South Reilly Road) at Jeffery Drive		SEAL SL PHILLIPS PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA LICENSE NO. 032607	
	Division 6 PLAN DATE: July 2016 PREPARED BY: SP Pennington	Cumberland County REVIEWED BY: KP Baumann REVIEWED BY: SL Phillips		Fayetteville DATE: 9/16/2016
	REVISIONS:	INIT. DATE:		DATE:

9/16/2016 K:\REAL\_TPO\SIGNALS\4011036345\_Foyehv111.electr.Coal.s64 - Signal Desi.gm3rd.Submi.Hoi.42171\_061339-2016e1.dgn Susan Pennington

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 INCLUDED . X . . . . .
 PROTECT . . . . .
 PED PRTC . . . . .
 NOT OVLP . . . . .
 FLSH GRN . 1 . . . . .
 LAG X PH . . . . .
 LAG 2 PH . . . . .

 LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

↓ Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[C] TYPE:OTHER/ECONOLITE
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 INCLUDED . . . . . X . . . . .
 PROTECT . . . . .
 PED PRTC . . . . .
 NOT OVLP . . . . .
 FLSH GRN . . . . . 1 . . . . .
 LAG X PH . . . . .
 LAG 2 PH . . . . .

 LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

END PROGRAMMING

## COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1339  
 DESIGNED: March 2016  
 SEALED: 5/6/2016  
 REVISED:

Electrical Detail Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

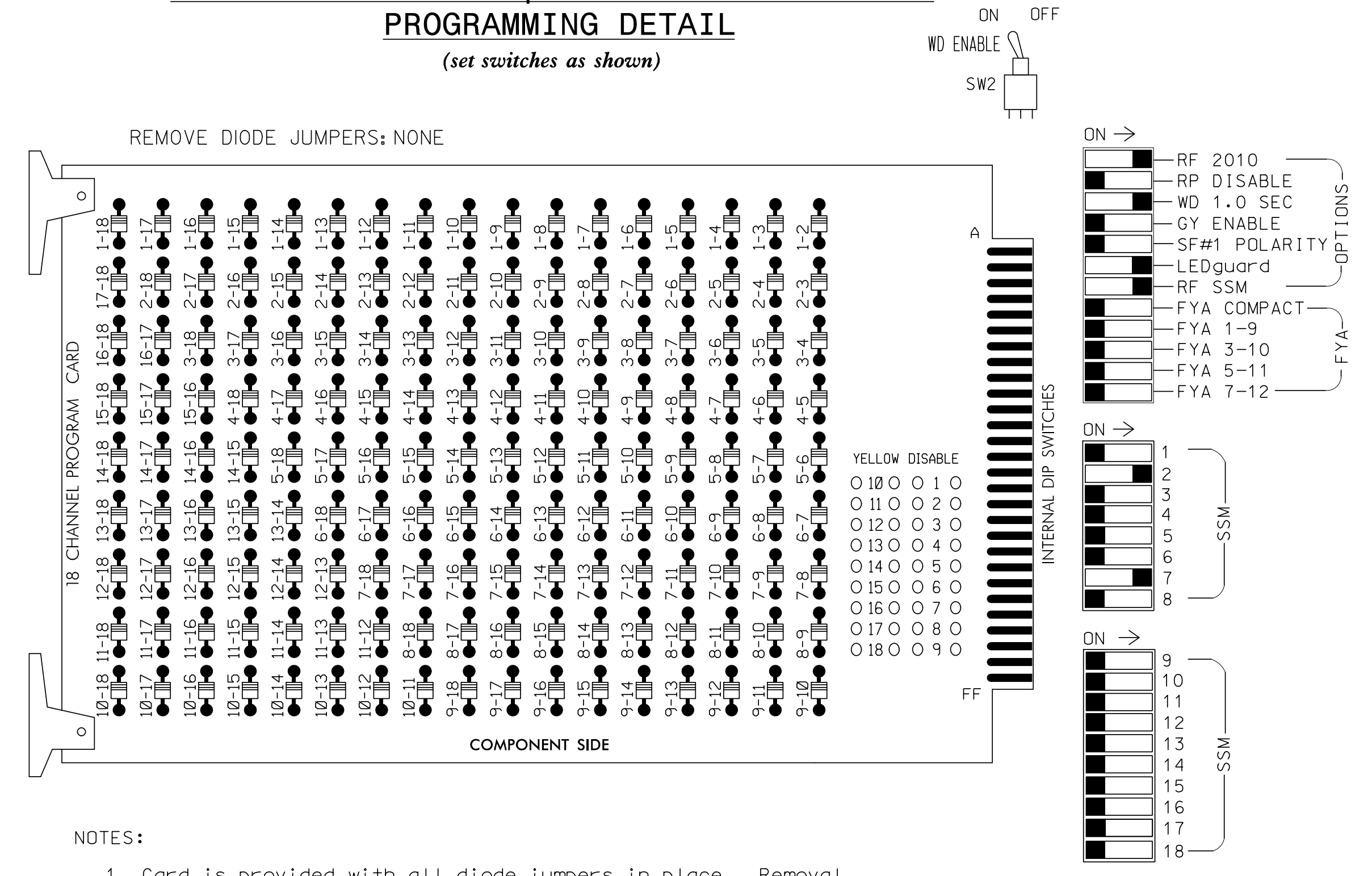
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REVISIONS	INIT.	DATE												

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

9/16/2016 K:\REAL\_T\PROJECTS\IGNALS\4011036345\_Fayetteville\_Electrical\42472\_061339-2016e2.dgn Susan Penn Factor

### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



**NOTES:**

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

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for volume density operation.
4. Program controller to start up in 2 Green.
5. Program phase 6 for Red Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.

**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	NU	NU	NU	NU	NU	NU	NU	71,72	73,74	NU	NU	NU	33,34	NU	NU	NU
RED		128																
YELLOW		129																
GREEN		130																
RED ARROW										122								
YELLOW ARROW										123	123							
GREEN ARROW										124	124							

NU = Not Used

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S10  
 PHASES USED.....2,7  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

**INPUT FILE POSITION LAYOUT**

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L	2A/S2A	2A/S2A	2B/S2B											
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L	2B/S2B													
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L					7A	7C								
U	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS	∅2/SYS
L					7B	7D								

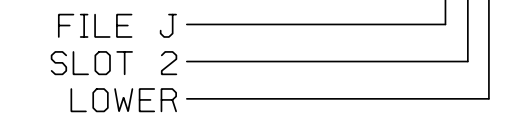
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2	YES			N
7A	TB5-9,10	J6U	42	8	7	YES			S
7B	TB5-11,12	J6L	46	18	7	YES			S
7C	TB7-1,2	J7U	66	38	7	YES		10	S
7D	TB7-3,4	J7L	79	48	7	YES		10	S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1305  
 DESIGNED: June 2016  
 SEALED: 6/3/2016  
 REVISED:

9/16/2016  
 K:\MAIL\_TPT\K\SIGNALS\4011036345 Fayetteville File Electrical\061305-2016e.dgn  
 Susan Pennington

Electrical Detail

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: 		SR 1600 (McArthur Road) at I-295 WB Ramp/Loop D	
Prepared For:	Division 6	Cumberland County	Fayetteville
PLAN DATE: July 2016	REVIEWED BY: KP Baumann		
PREPARED BY: SP Pennington	REVIEWED BY: SL Phillips		
REVISIONS	INIT.	DATE	

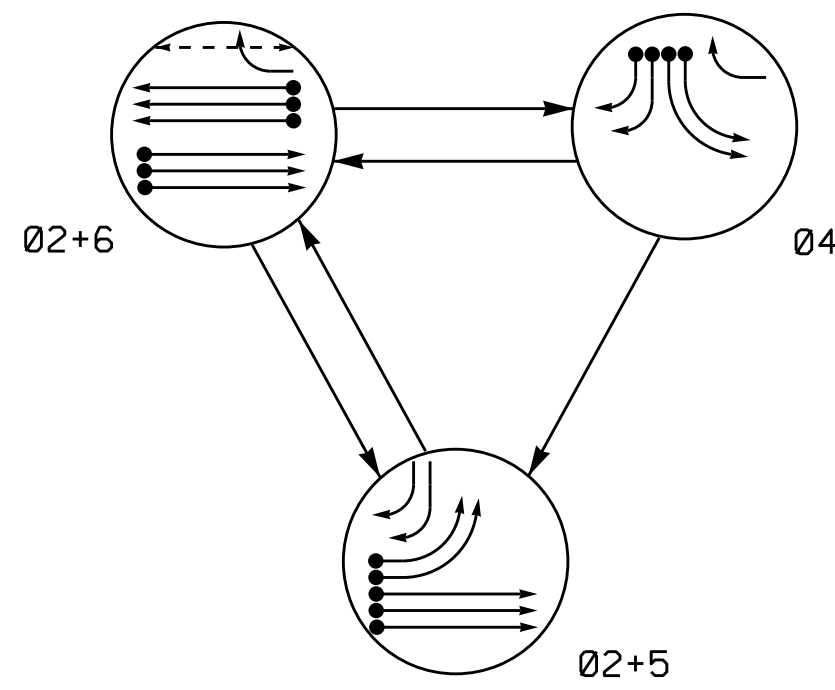
750 N. Greenfield Pkwy, Garner, NC 27529  
 (919) 677-2000

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 032607  
 STACIE L. PHILLIPS

DocuSign  
 0687A98ED068437  
 9/16/2016  
 DATE  
 SIG. INVENTORY NO. 06-1305

### PHASING DIAGRAM



SIGNAL FACE	PHASE			
	Ø 2 + 5	Ø 2 + 6	Ø 4	F L
21,22,23	G	G	R	Y
41,42	R	R	L	R
43,44	L	R	R	R
51,52	L	R	R	R
61,62	R	G	R	Y
63	R	G	R	Y
P61,P62	DW	W	DW	DRK

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP
2A	6X6	300	5	-	2	Yes	-	-	N	- X
2B	6X6	300	5	-	2	Yes	-	-	N	- X
2C	6X6	300	5	-	2	Yes	-	-	N	- X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	- X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	- X
4C	6X40	0	2-4-2	-	4	Yes	-	15	S	- X
4D	6X40	0	2-4-2	-	4	Yes	-	15	S	- X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	- X
5B	6X40	0	2-4-2	-	5	Yes	-	-	S	- X
6A	6X6	300	6	-	6	Yes	-	-	N	- X
6B	6X6	300	6	-	6	Yes	-	-	N	- X
6C	6X6	300	6	-	6	Yes	-	-	N	- X

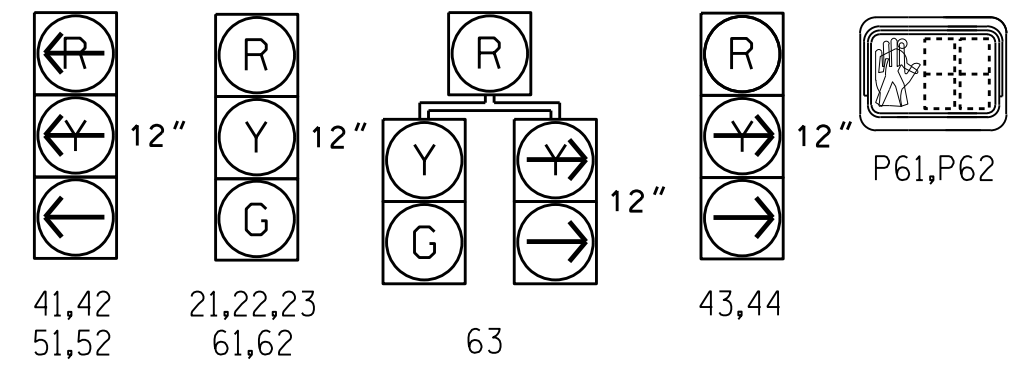
### 3 Phase Fully Actuated Fayetteville Signal System

#### NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

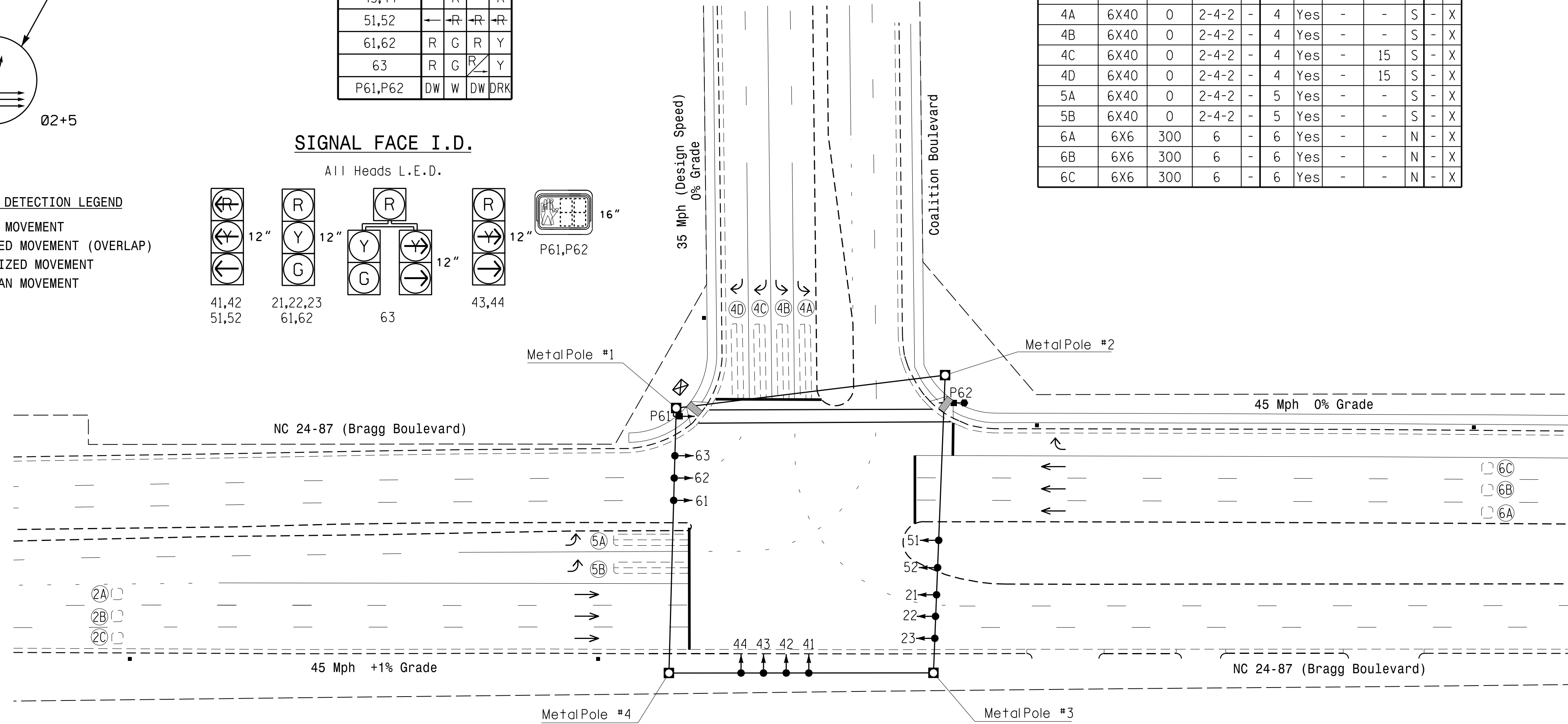
### SIGNAL FACE I.D.

All Heads L.E.D.



#### PHASING DIAGRAM DETECTION LEGEND

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



### ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	0	0	0	7
Ped Clear	0	0	0	32
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	45	45	90
Yellow	4.4	3.0	3.0	4.5
Red Clear	1.7	3.7	3.8	1.6
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	1.8	-	-	1.8
Max Initial *	34	-	-	34
Time Before Reduction *	30	-	-	30
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

#### LEGEND

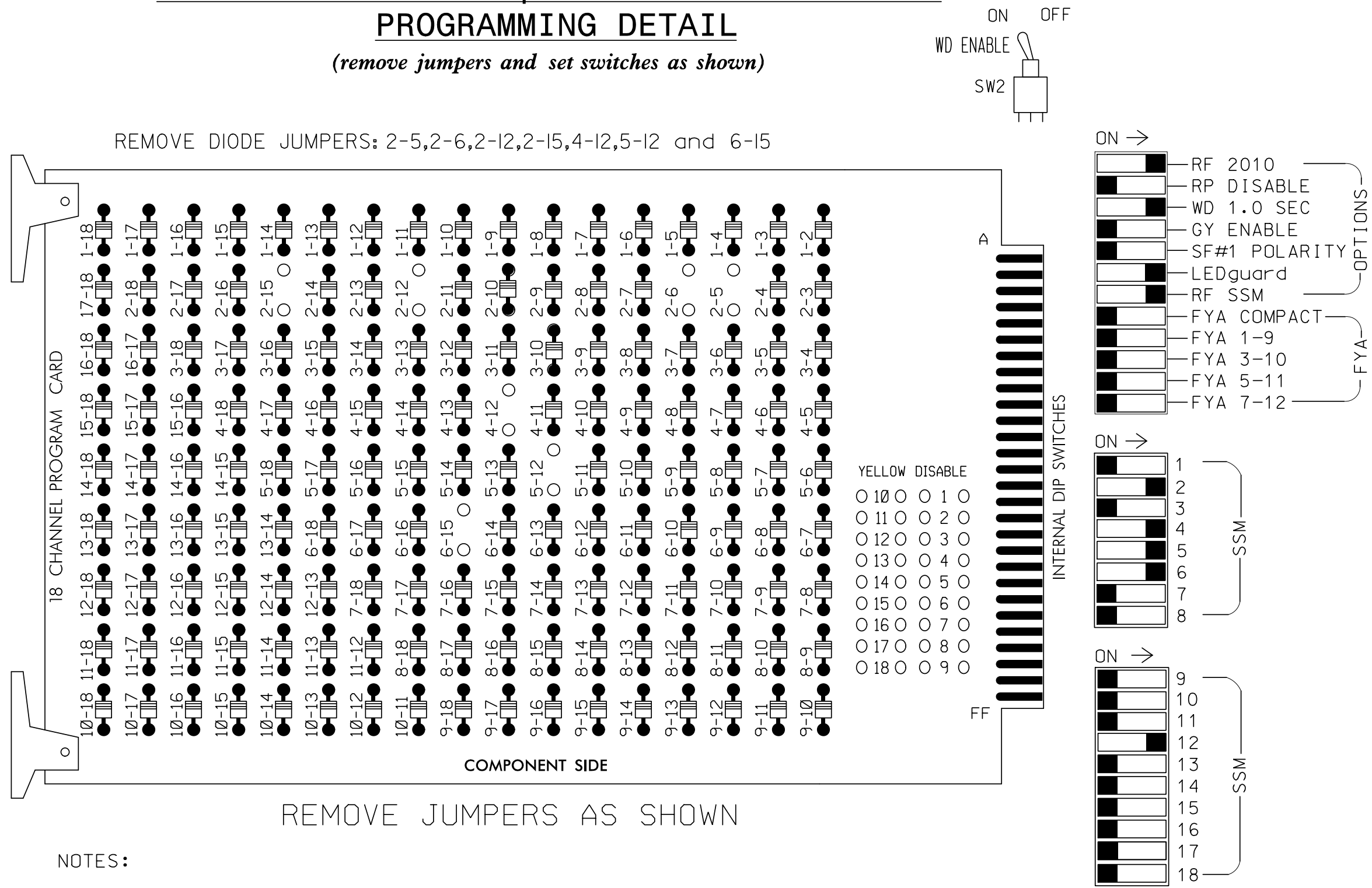
- | PROPOSED | EXISTING |
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### Signal Upgrade

	<p>NC 24-87 (Bragg Boulevard) at Coalition Boulevard</p> <p>Division 6 Cumberland County Fayetteville</p>		<p>SEAL JASON P. GALLAWAY ENGINEER 029904</p>
	<p>PLAN DATE: January 2016</p> <p>PREPARED BY: Jeff Spence</p>	<p>REVIEWED BY: PLA</p> <p>REVIEWED BY:</p>	
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>SCALE: 1"=40'</p>		<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>SIG. INVENTORY NO. 06-1341</p>	

16-MAY-2016 10:39  
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**EDI MODEL 2018ECLip-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.
  - 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,S9,AUX S5  
 PHASES USED.....2,4,5,6,6PED  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....4+5

**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 23	NU	NU	41,42 63	NU	51,52	61,62 63	P61, P62	NU	NU	NU	NU	NU	NU	NU	43,44	NU
RED		128							134									A101
YELLOW		129							135									
GREEN		130							136									
RED ARROW					101				131									
YELLOW ARROW					102	102			132									A102
GREEN ARROW					103	103			133									A103
Hand icon													119					
Walking person icon													121					

NU = Not Used

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**  
(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

TOGGLE THREE TIMES  
 OVERLAP D  
 Select TMG VEH OVLP [D] and 'NORMAL'  
 TMG VEH OVLP...[D] TYPE: .....[NORMAL]  
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6  
 INCLUDED . . . X X . . . . .  
 LAG GRN 0.0 YEL 0.0 RED 0.0  
 END PROGRAMMING

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

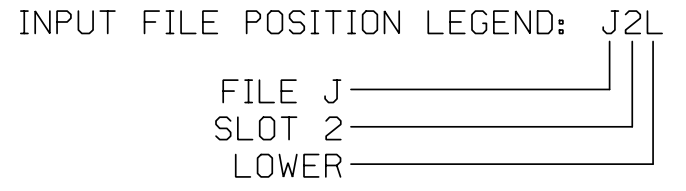
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1341  
 DESIGNED: January 2016  
 SEALED: 5/16/2016  
 REVISED:

**INPUT FILE POSITION LAYOUT**  
(front view)

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

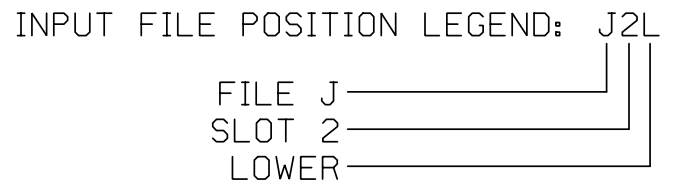
EX. : 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME



**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
2C	TB2-9,10	I3U	63	32	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S
4D	TB6-3,4	I7L	78	44	4	YES		15	S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-5,6	J2U	40	6	5	YES			S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES			N
6C	TB5-1,2	J4U	48	26	6	YES			N
PED PUSH BUTTONS									
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED				

NOTE:  
 INSTALL DC ISOLATORS  
 IN INPUT FILE SLOT  
 113.



**FLASHER CIRCUIT MODIFICATION DETAIL**

In order to ensure 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**

Electrical AND PROGRAMMING DETAILS FOR:

Prepared For: **Kimley Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

**NC 24-87 (Bragg Boulevard) at Coalition Boulevard**

Division 6 Cumberland County Fayetteville  
 PLAN DATE: July 2016 REVIEWED BY: KP Baumann  
 PREPARED BY: SP Pennington REVIEWED BY: SL Phillips

REVISIONS INIT. DATE

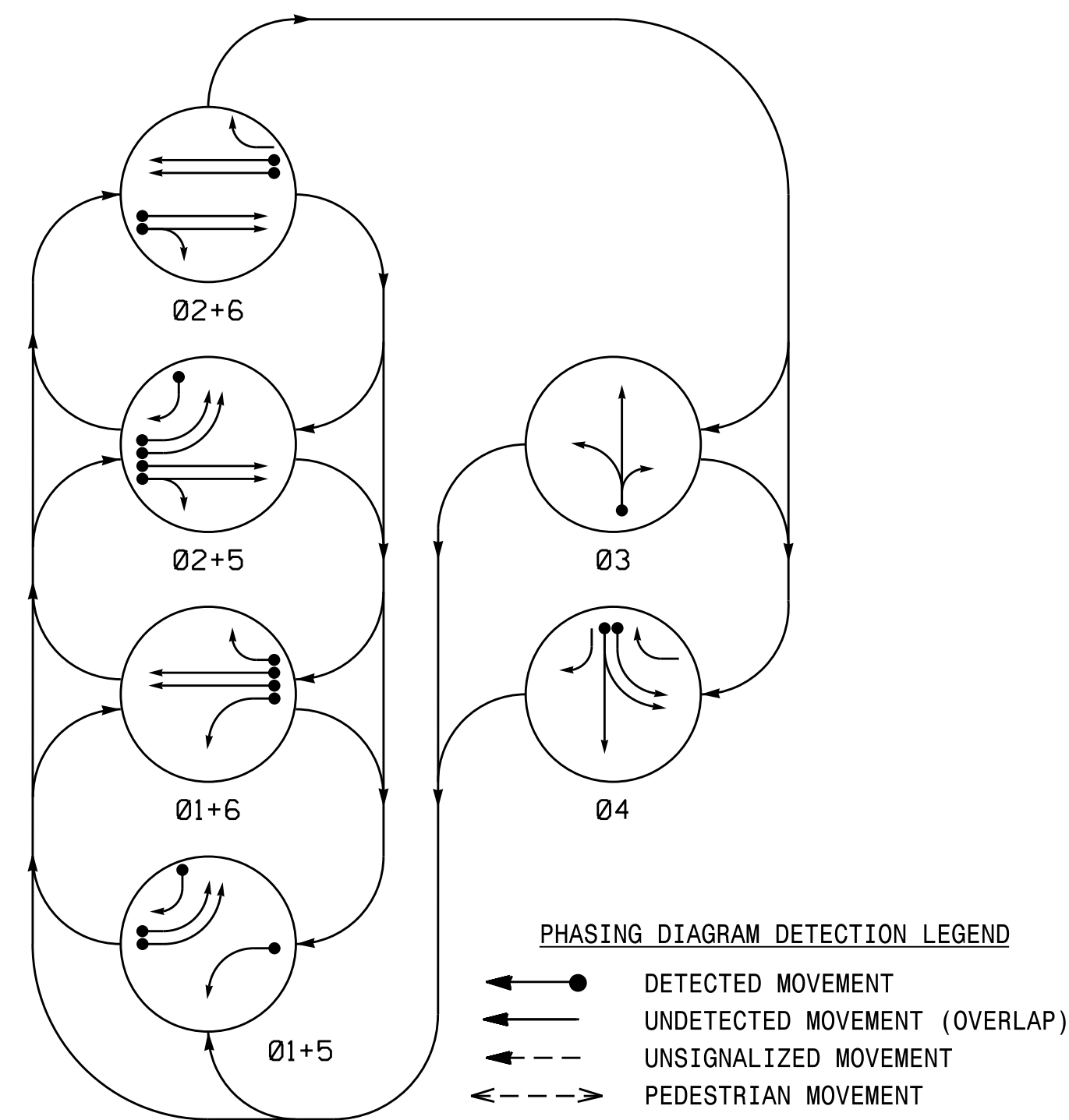
Seal: NORTH CAROLINA PROFESSIONAL ENGINEER STACIE L. PHILLIPS SEAL 032607

9/1/2016  
 DATE  
 SIG. INVENTORY NO. 06-1341

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

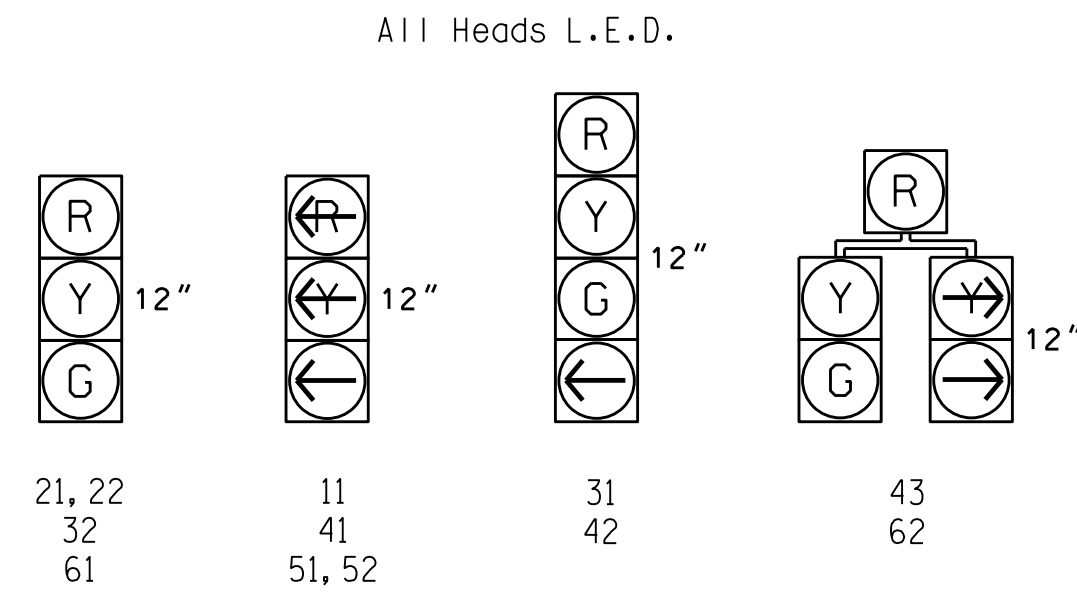
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**PHASING DIAGRAM**



SIGNAL FACE	PHASE						F L H S
	01+5	01+6	02+5	02+6	03	04	
11	→	→	→	→	→	→	→
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	→	→	→	→	→	→	→
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51, 52	→	→	→	→	→	→	→
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y

**SIGNAL FACE I.D.**



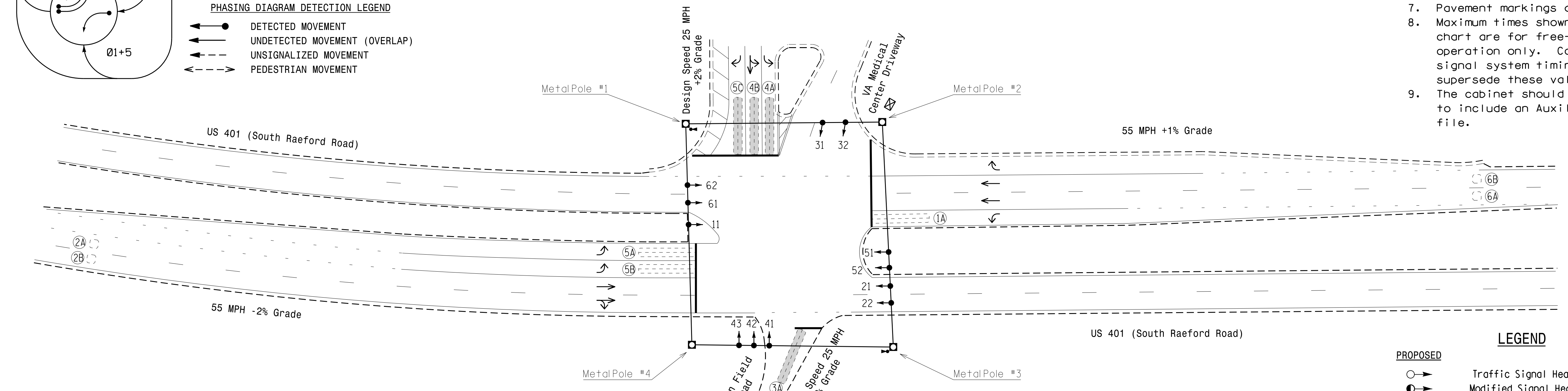
ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	- X
2A	6X6	420	5	-	2	Yes	-	-	N	- X
2B	6X6	420	5	-	2	Yes	-	-	N	- X
3A	6X40	0	*	-	3	Yes	-	5	S	- X
4A	6X40	0	*	-	4	Yes	-	-	S	- X
4B	6X40	0	*	-	4	Yes	-	-	S	- X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	- X
5B	6X40	0	2-4-2	-	5	Yes	-	-	S	- X
5C	6X40	0	*	-	5	Yes	-	15	S	- X
6A	6X6	420	5	-	6	Yes	-	-	N	- X
6B	6X6	420	5	-	6	Yes	-	-	N	- X

\* Multizone Microwave Detection

**6 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

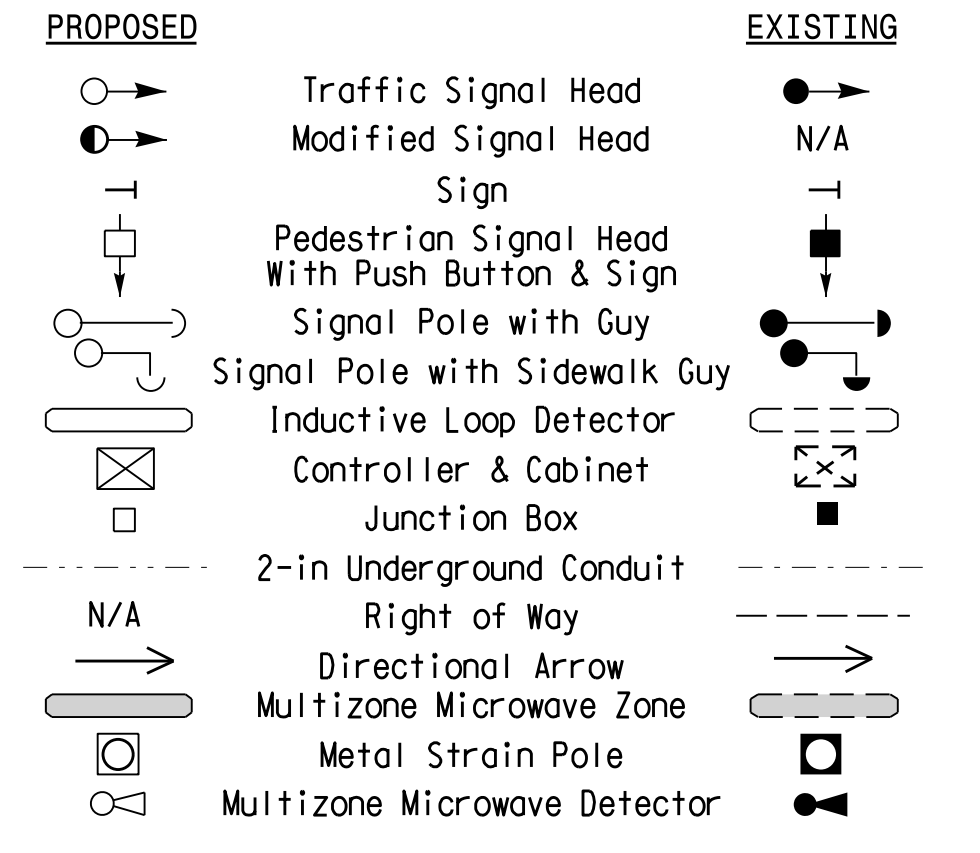
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- The cabinet should be designed to include an Auxiliary Output file.



FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	14	7	7	7	14
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max 1 *	15	90	15	15	15	90
Yellow	3.0	5.4	3.1	3.1	3.0	5.4
Red Clear	3.1	1.3	3.2	3.4	3.6	1.3
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	-	0
Seconds / Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	46	-	-	-	46
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	45	-	-	-	45
Minimum Gap	-	3.4	-	-	-	3.4
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

**LEGEND**



**Signal Upgrade**

750 N. Greenfield Pkwy, Garner, NC 27529

**US 401 (South Raeford Road) at VA Medical Center Driveway/ Cabin Field Road**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2016 REVIEWED BY: JPG

PREPARED BY: Devin Smith REVIEWED BY:

SEAL

SEAL 029904

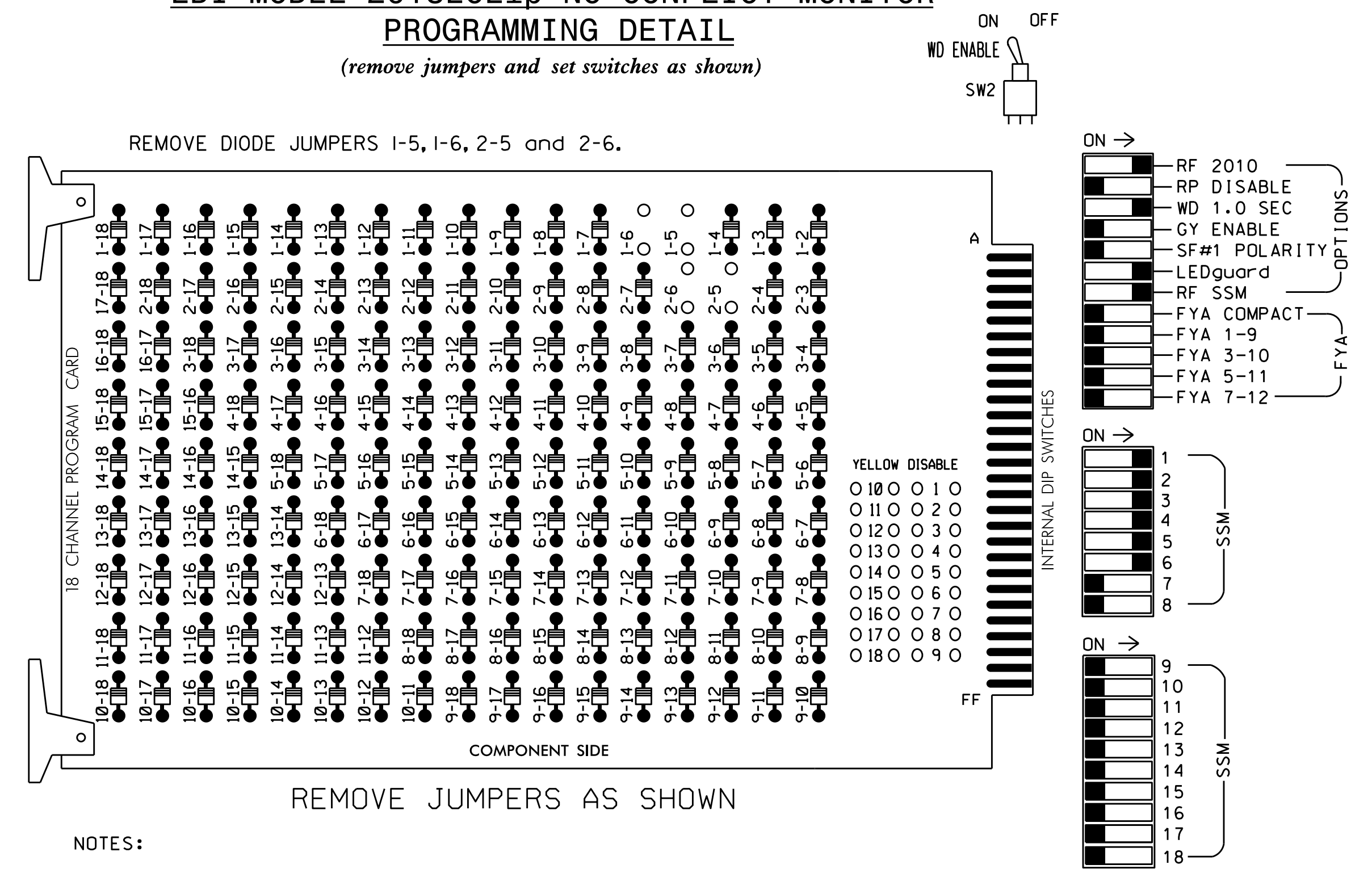
DATE 5/6/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 06-1345

### EDI MODEL 2018EClip-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.
  - Integrate monitor with Ethernet network in cabinet.

### 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	31	32	41	42	43	62	NU	43	51,52	61,62	NU	NU	NU	NU	NU	
RED		128		116	116		101	101											
YELLOW		129		117	117		102	102											
GREEN		130		118	118		103	103											
RED ARROW	125						101					131							
YELLOW ARROW	126						102			102	132	132							
GREEN ARROW	127						103	103		103	133	133							

NU = Not Used

### EQUIPMENT INFORMATION

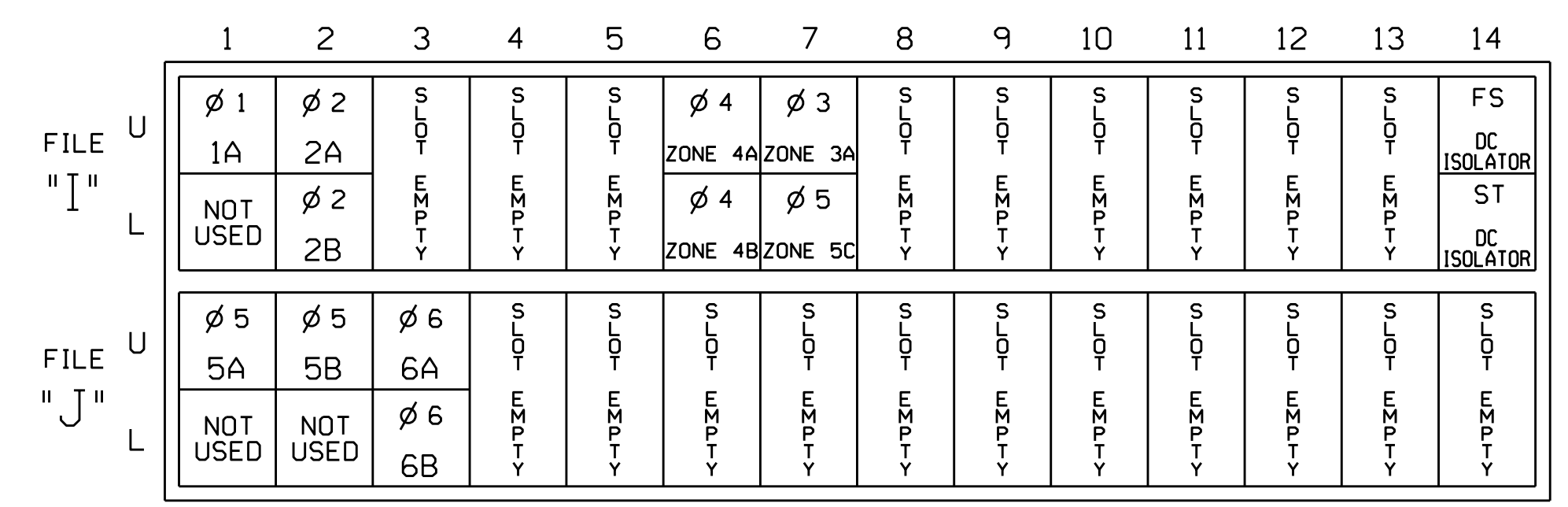
CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8  
 PHASES USED.....1,2,3,4,5,6  
 OVERLAPS.....NONE

### 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 volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### INPUT FILE POSITION LAYOUT

(front view)



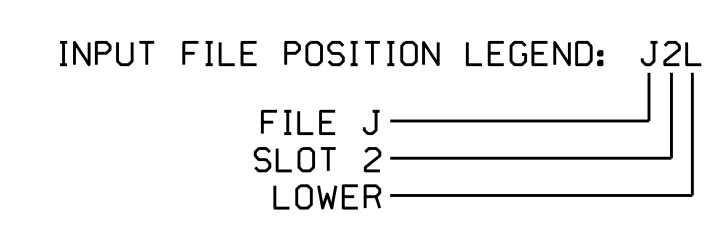
EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	11U	56	1	1	YES			S
2A	TB2-5,6	12U	39	2	2	YES			N
2B	TB2-7,8	12L	43	12	2	YES			N
3A	★	17U	65	34	3	YES		5	S
4A	★	16U	41	4	4	YES			S
4B	★	16L	45	14	4	YES			S
5A	TB3-1,2	J1U	55	5	5	YES			S
5B	TB3-5,6	J2U	40	6	5	YES			S
5C	★	17L	78	44	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N
6B	TB3-11,12	J3L	77	46	6	YES			N

### ★ SPECIAL DETECTOR NOTE

For Zones 3A, 4A, 4B & 5C install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plan.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1345 DESIGNED: March 2016 SEALED: 5/6/2016 REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (South Raeford Road) at VA Medical Center Driveway/ Cabin Field Road

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

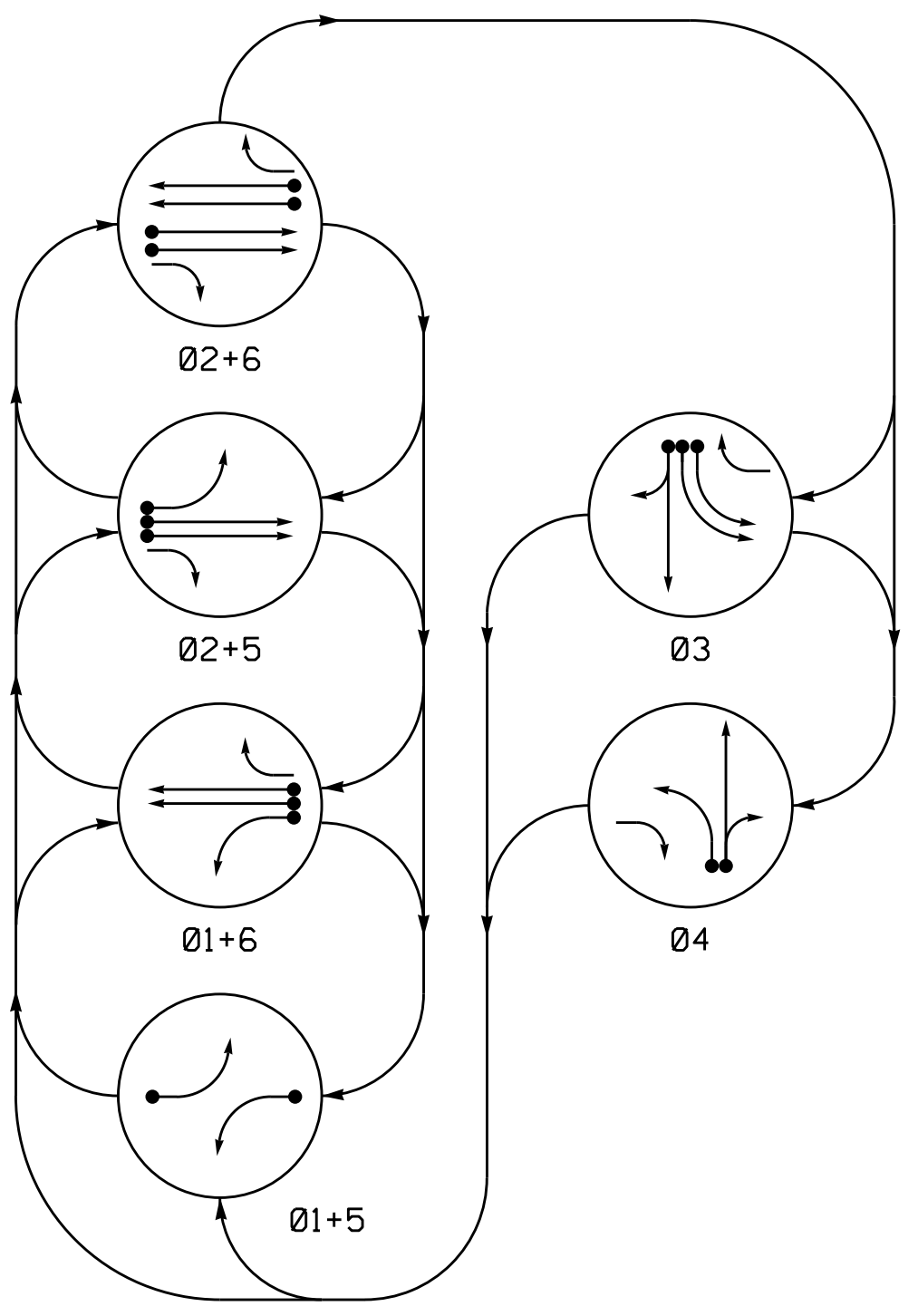
REVISIONS INIT. DATE

DocuSigned by: Zachary M. Little 10/12/2016 0021EFD04F5341F DATE

SIG. INVENTORY NO. 06-1345

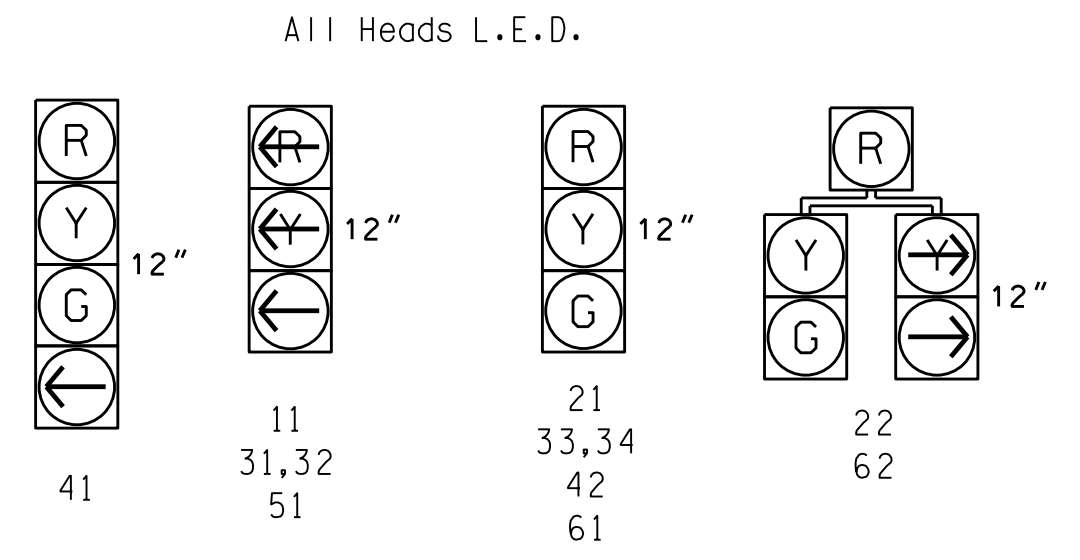
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PHASING DIAGRAM



SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11	—	—	—	—	—	—
21	R	R	G	G	R	R
22	R	R	G	G	R	Y
31,32	—	—	—	—	—	—
33,34	R	R	R	R	G	R
41	R	R	R	R	R	G
42	R	R	R	R	R	G
51	—	—	—	—	—	—
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

SIGNAL FACE I.D.



LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	S	-	X
2A	6X6	420	5	-	2	Yes	-	-	N	-	X
2B	6X6	420	5	-	2	Yes	-	-	N	-	X
3A	6X40	0	*	-	3	Yes	-	3	S	-	X
3B	6X40	0	*	-	3	Yes	-	3	S	-	X
3C	6X40	0	*	-	3	Yes	-	10	S	-	X
4A	6X30	0	2-4-2	-	4	Yes	-	-	S	-	X
4B	6X30	0	2-4-2	-	4	Yes	-	3	S	-	X
4C	6X15	+5	2-4-2	-	4	Yes	-	15	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	-	S	-	X
6A	6X6	420	6	-	6	Yes	-	-	N	-	X
6B	6X6	420	6	-	6	Yes	-	-	N	-	X
S6A	6X6	420	6	-	-	No	-	-	N	X	X
S6B	6X6	420	6	-	-	No	-	-	N	X	X

\* Multizone Microwave Detection

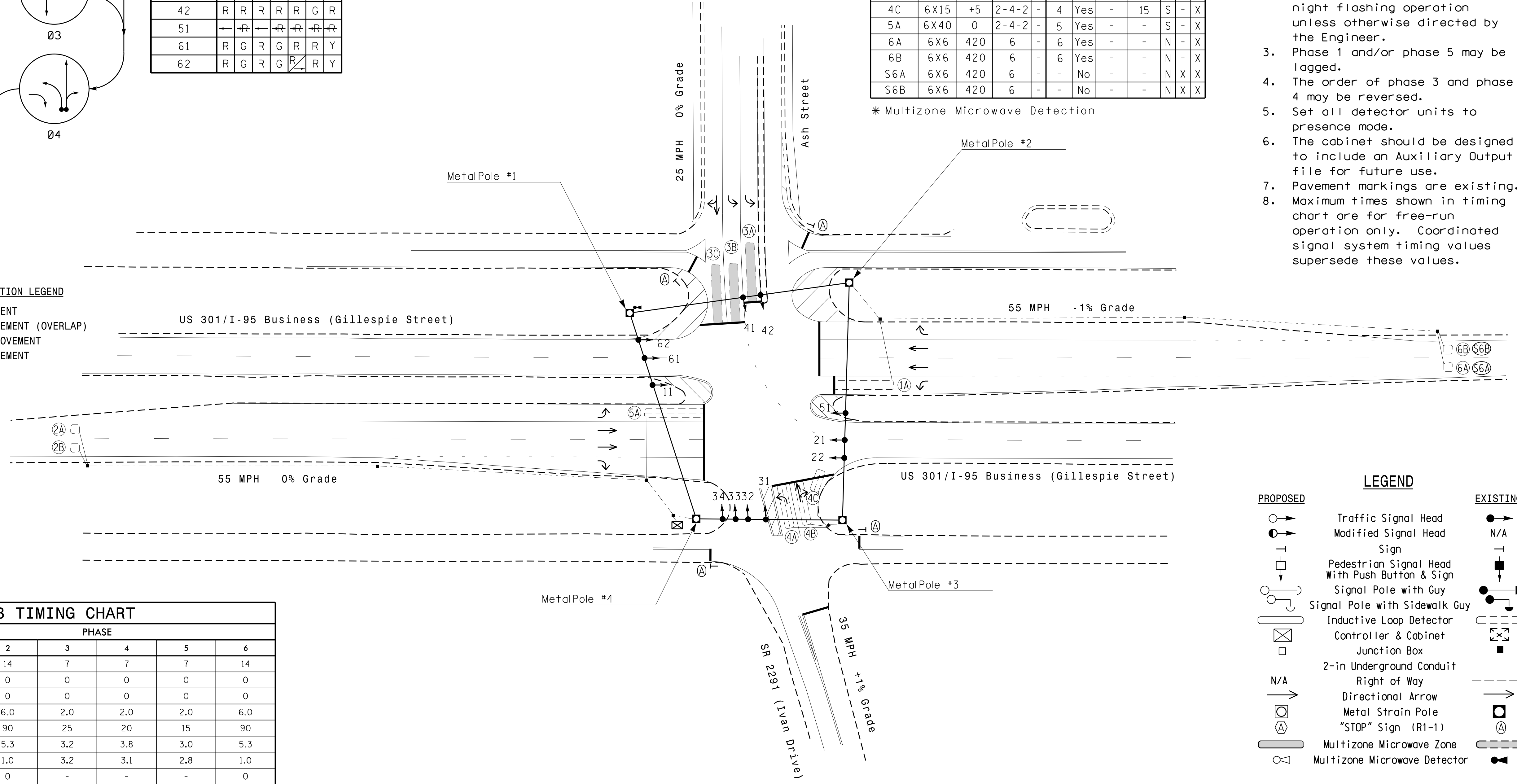
6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- Set all detector units to presence mode.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	14	7	7	7	14
Walk *	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	15	90	25	20	15	90
Yellow	3.0	5.3	3.2	3.8	3.0	5.3
Red Clear	2.9	1.0	3.2	3.1	2.8	1.0
Actuations B4 Add *	-	0	-	-	-	0
Seconds / Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	46	-	-	-	46
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.4	-	-	-	3.4
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○→	●→
○→	N/A
⊥	⊥
⊥	⊥
⊥	⊥
⊥	⊥
⊥	⊥
⊥	⊥
N/A	N/A
→	→
○	○
○	○
○	○

Signal Upgrade

Prepared in the Office of:  
  
 US 301/I-95 Bus. (Gillespie St.)  
 at  
 Ash Street/SR 2291 (Ivan Drive)  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: July 2016 REVIEWED BY: JPG  
 PREPARED BY: KGP, Jr. REVIEWED BY:  
 SCALE 1"=40'  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 029904  
 J. J. JENSEN P. E. GALLIOWAY  
 DATE 10/12/2016  
 SIG. INVENTORY NO. 06-1346

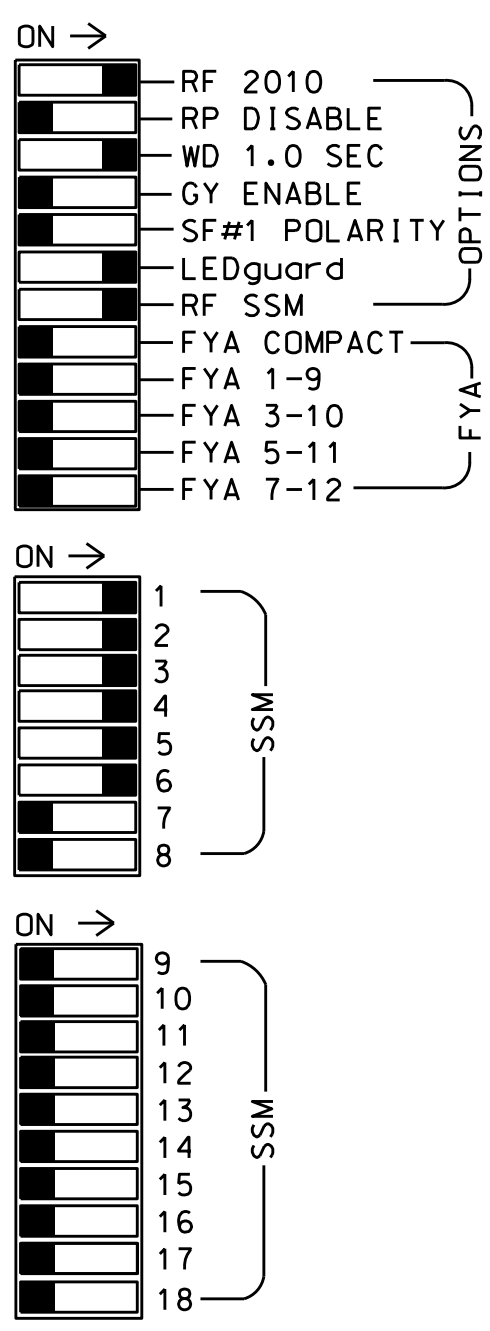
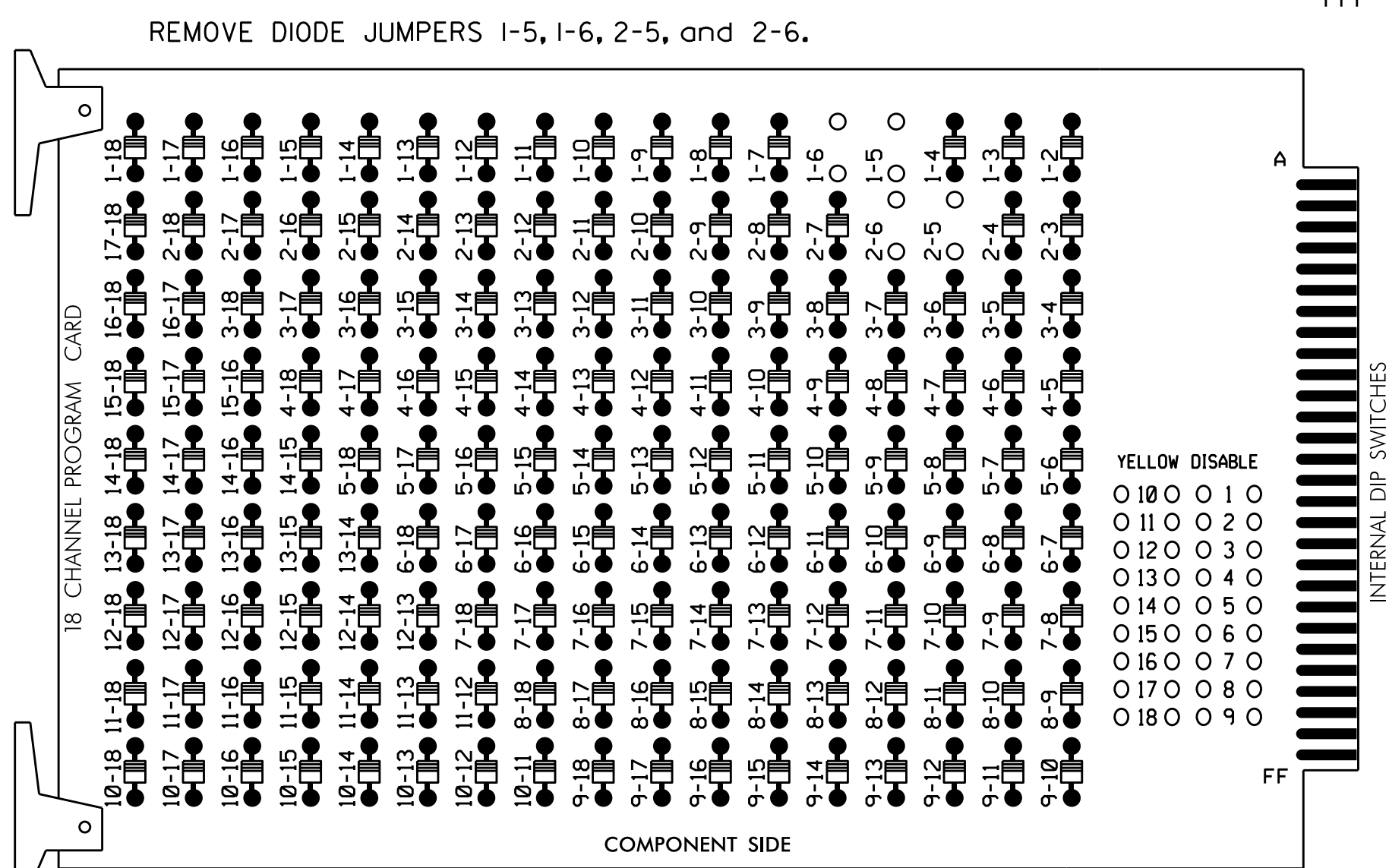
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 7/25/2016 11:55 AM



**EDI MODEL 2018EClip-NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

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

**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	31,32	33,34	62	22	41	42	NU	51	61,62	NU	NU	NU	NU	NU	NU
RED		128		116		101	101		134									
YELLOW		129		117		102	102		135									
GREEN		130		118		103	103		136									
RED ARROW	125			116					131									
YELLOW ARROW	126			117		117	102		132									
GREEN ARROW	127			118		118	103	103	133									

NU = Not Used

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8  
 PHASES USED.....1,2,3,4,5,6  
 OVERLAPS.....NONE

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Green.
5. The cabinet and controller are part of the Fayetteville Signal System.

**INPUT FILE POSITION LAYOUT**

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	-OR-S	-OR-S	-OR-S	-OR-S	∅ 4	∅ 4	-OR-S	-OR-S	-OR-S	-OR-S	-OR-S	FS
I	1A	2A					4A	4C						DC ISOLATOR
L	NOT USED	2B	<-VZM	<-VZM	<-VZM	<-VZM	4B	NOT USED	<-VZM	<-VZM	<-VZM	<-VZM	<-VZM	ST
U	∅ 5	∅ 6	-OR-S	-OR-S	-OR-S	-OR-S	-OR-S	-OR-S	SYS. DET. S6A	-OR-S	-OR-S	-OR-S	-OR-S	S
I	5A	6A												TO L
L	NOT USED	6B	<-VZM	<-VZM	<-VZM	<-VZM	<-VZM	<-VZM	SYS. DET. S6B	<-VZM	<-VZM	<-VZM	<-VZM	T

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

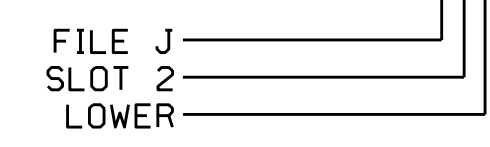
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES			S
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB6-1,2	I7U	65	34	4	YES			S
4B	TB6-3,4	I7L	78	44	4	YES		3	S
4C	TB6-5,6	I8U	49	24	4	YES		15	S
5A	TB3-1,2	J1U	55	5	5	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
*S6A	TB7-9,10	J9U	59	15	SYS	NO			N
*S6B	TB7-11,12	J9L	61	17	SYS	NO			N

\* System detector only. Remove any assigned vehicle phase.

**INPUT FILE POSITION LEGEND: J2L**



**SPECIAL DETECTOR NOTE**

For detection zones 3A, 3B & 3C install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1346  
 DESIGNED: July 2016  
 SEALED: 10/12/2016  
 REVISED: N/A

**Electrical Detail**

US 301/I-95 Bus. (Gillespie St.) at Ash Street/SR 2291 (Ivan Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

Seal of Keith M. Mims, Professional Engineer, No. 036880

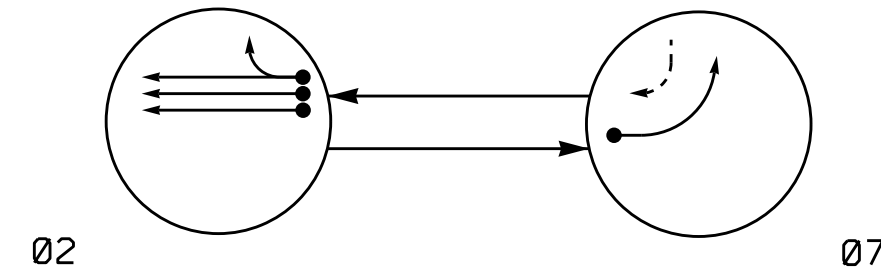
DocuSigned by: Keith M. Mims 10/17/2016 2:30:08 PM

SIG. INVENTORY NO. 06-1346

10-001-2016 12:26 S:\IT\SS\15\_Signal\work\hgr\061346\_sm.elec.xxx.dgn sarmstrong

2 Phase  
Fully Actuated  
Fayetteville Signal System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

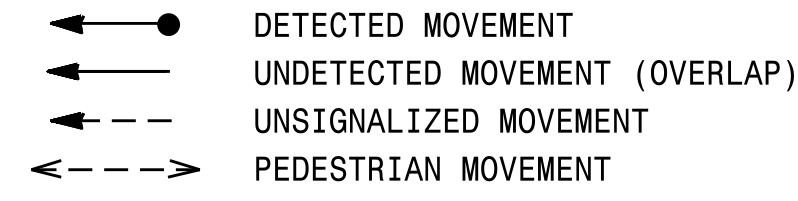
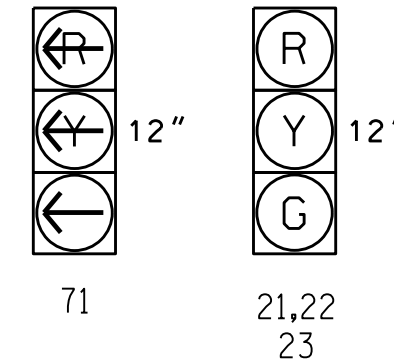


TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02	07	Footc
21,22,23	G	R	Y
71	R	L	R

SIGNAL FACE I.D.

All Heads L.E.D.

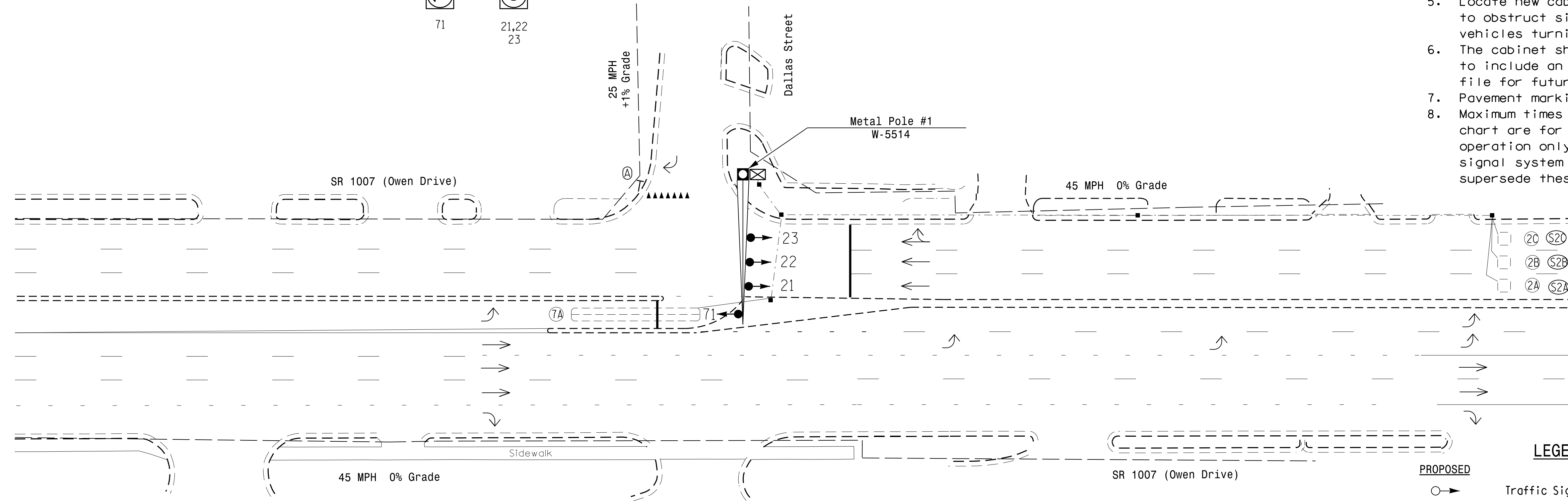


ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	
2A/S2A	6X6	300	4	-	2	Yes	-	-	N	X	X
2B/S2B	6X6	300	4	-	2	Yes	-	-	N	X	X
2C/S2C	6X6	300	4	-	2	Yes	-	-	N	X	X
7A	6X60	+20	2-4-2	-	7	Yes	-	-	S	-	X

NOTES

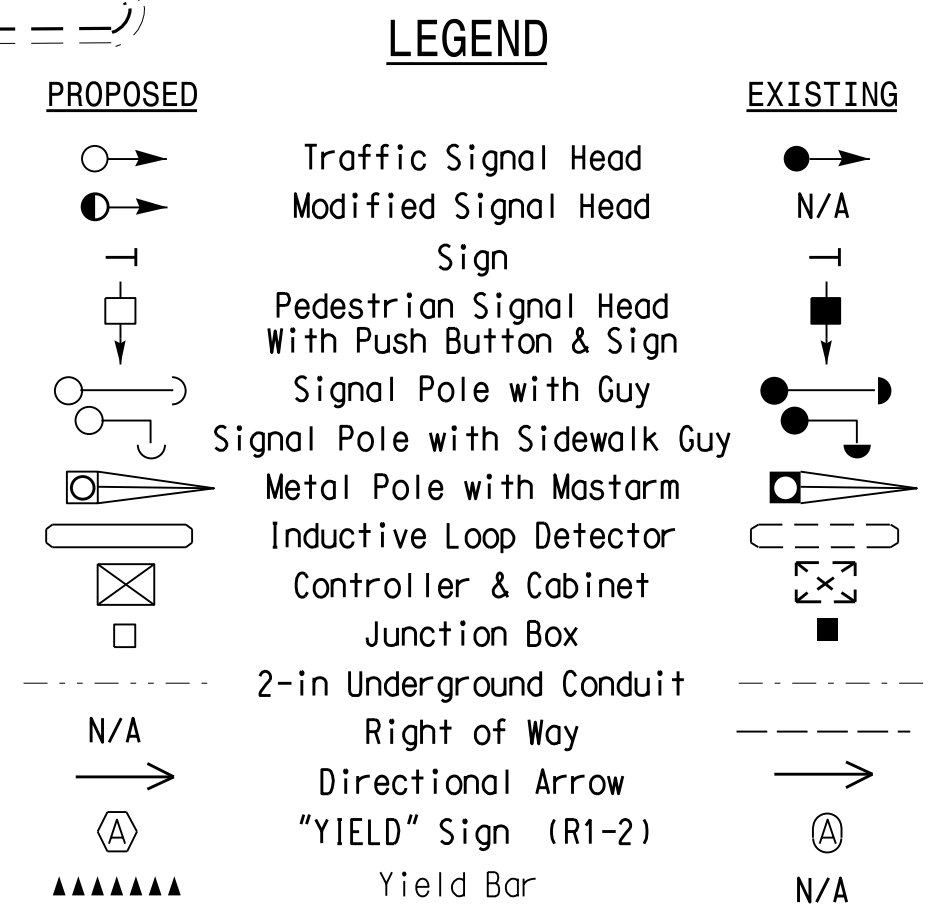
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE	
	2	7
Min Green *	12	7
Walk *	0	0
Ped Clear	0	0
Veh. Extension *	6.0	2.0
Max I *	80	20
Yellow	4.5	3.0
Red Clear	1.6	2.1
Actuations B4 Add *	0	-
Seconds /Actuation *	1.0	-
Max Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.0	-
Locking Detector	X	-
Recall Position	VEH. RECALL	-
Dual Entry	-	-
Simultaneous Gap	X	X

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



Signal Upgrade

750 N. Greenfield Pkwy, Garner, NC 27529

**SR 1007 (Owen Drive)  
at  
Dallas Street**

Division 6 Cumberland County Fayetteville

PLAN DATE: JUNE 2016 REVIEWED BY: JPG

PREPARED BY: KGP, Jr. REVIEWED BY:

SEAL

8/25/2016

SIG. INVENTORY NO. 06-1351

SCALE 0 30  
1"=30'

REVISIONS

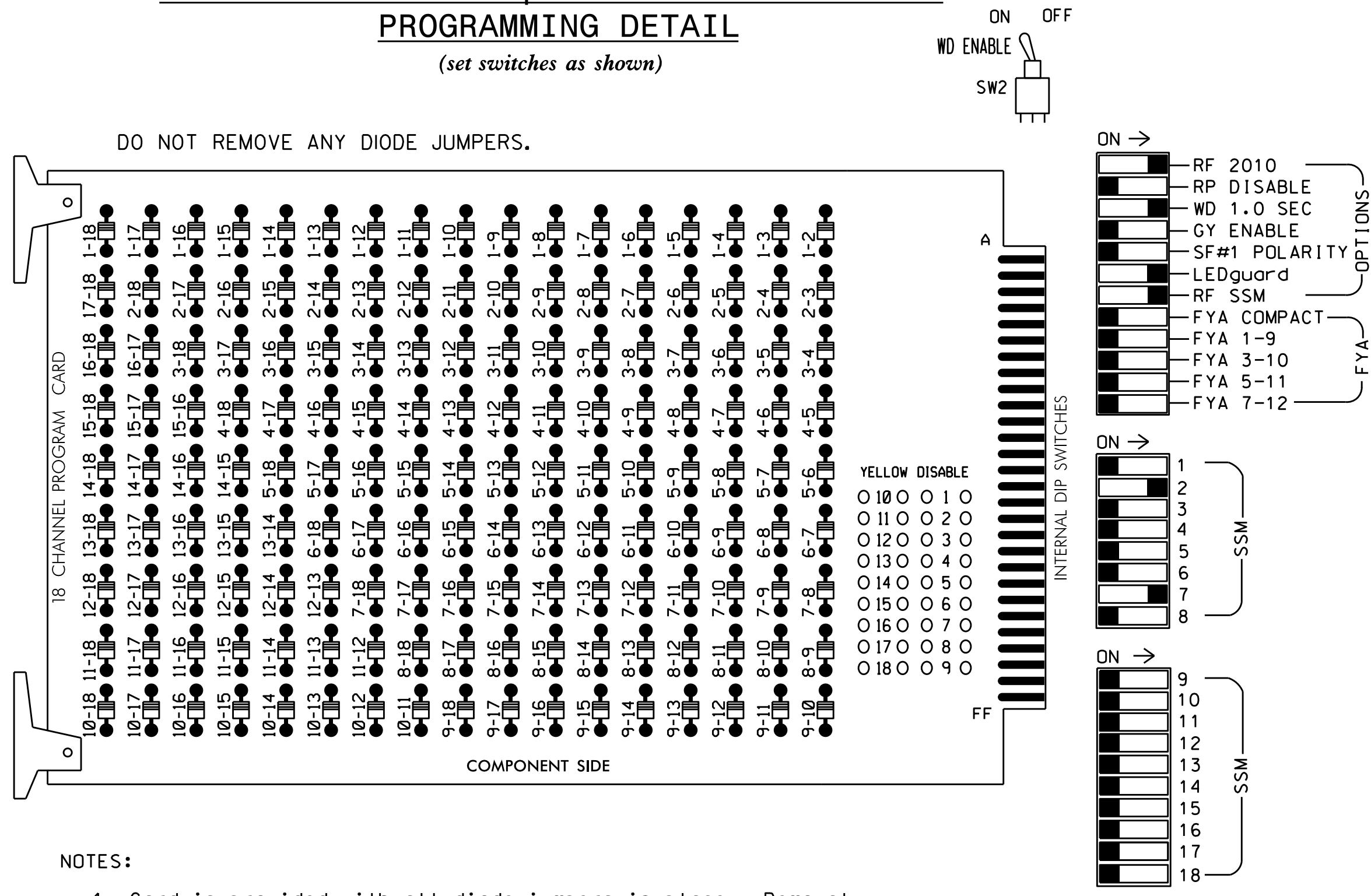
NO.	DESCRIPTION	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 kgpae@itn

# EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for volume density operation.
- Program controller to start up in phase 2 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S10  
 PHASES USED.....2,7  
 OVERLAPS.....NOT USED

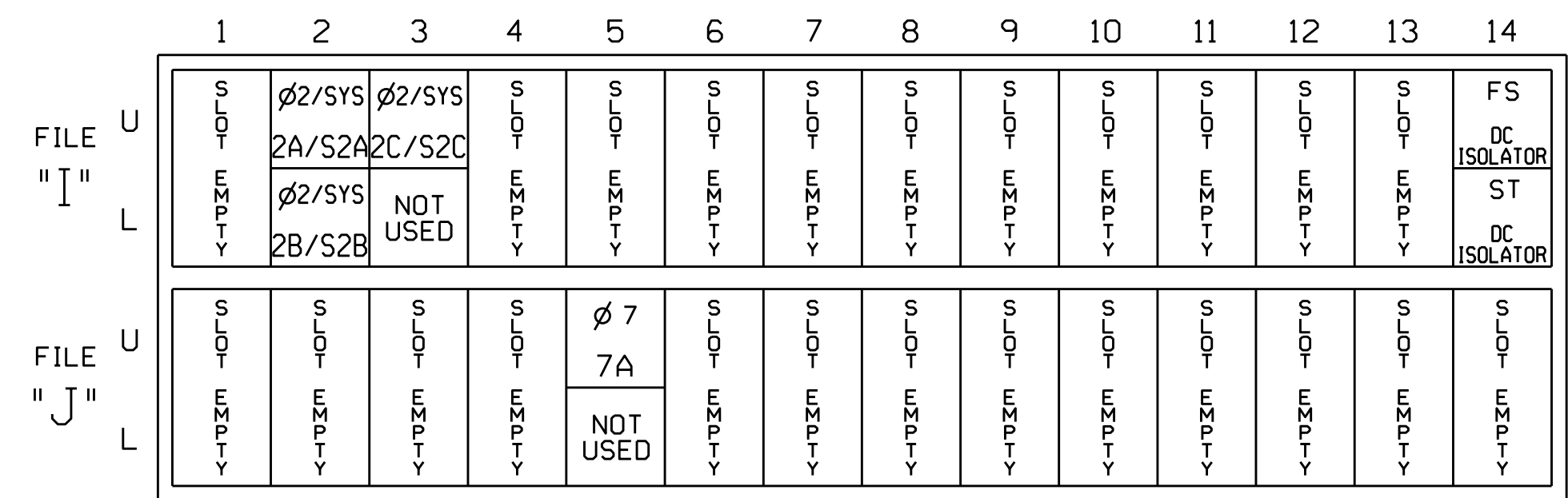
**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	NU	NU	NU	NU	NU	71	NU	NU	NU	NU	NU	NU	NU	NU
RED		128																
YELLOW		129																
GREEN		130																
RED ARROW										122								
YELLOW ARROW										123								
GREEN ARROW										124								

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)



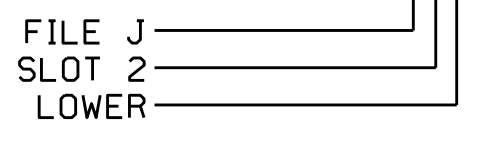
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A/S2A	TB2-5,6	I2U	39	2	2/SYS	YES			N
2B/S2B	TB2-7,8	I2L	43	12	2/SYS	YES			N
2C/S2C	TB2-9,10	I3U	63	32	2/SYS	YES			N
7A	TB5-5,6	J5U	57	7	7	YES			S

**INPUT FILE POSITION LEGEND: J2L**



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1351  
 DESIGNED: June 2016  
 SEALED: 8-25-16  
 REVISED: N/A

06-SEP-2016 07:07 S:\ITS\511\ITS\_Sigma\work\gpc\sig\_Mon\eter\_som\61351\_sml.ele...xxx.dgn T.peterson

Electrical Detail Sheet

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1007 (Owen Drive) at Dallas Street

Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS

INIT. DATE

DocuSigned by: Keith M. Mins 9/19/2016

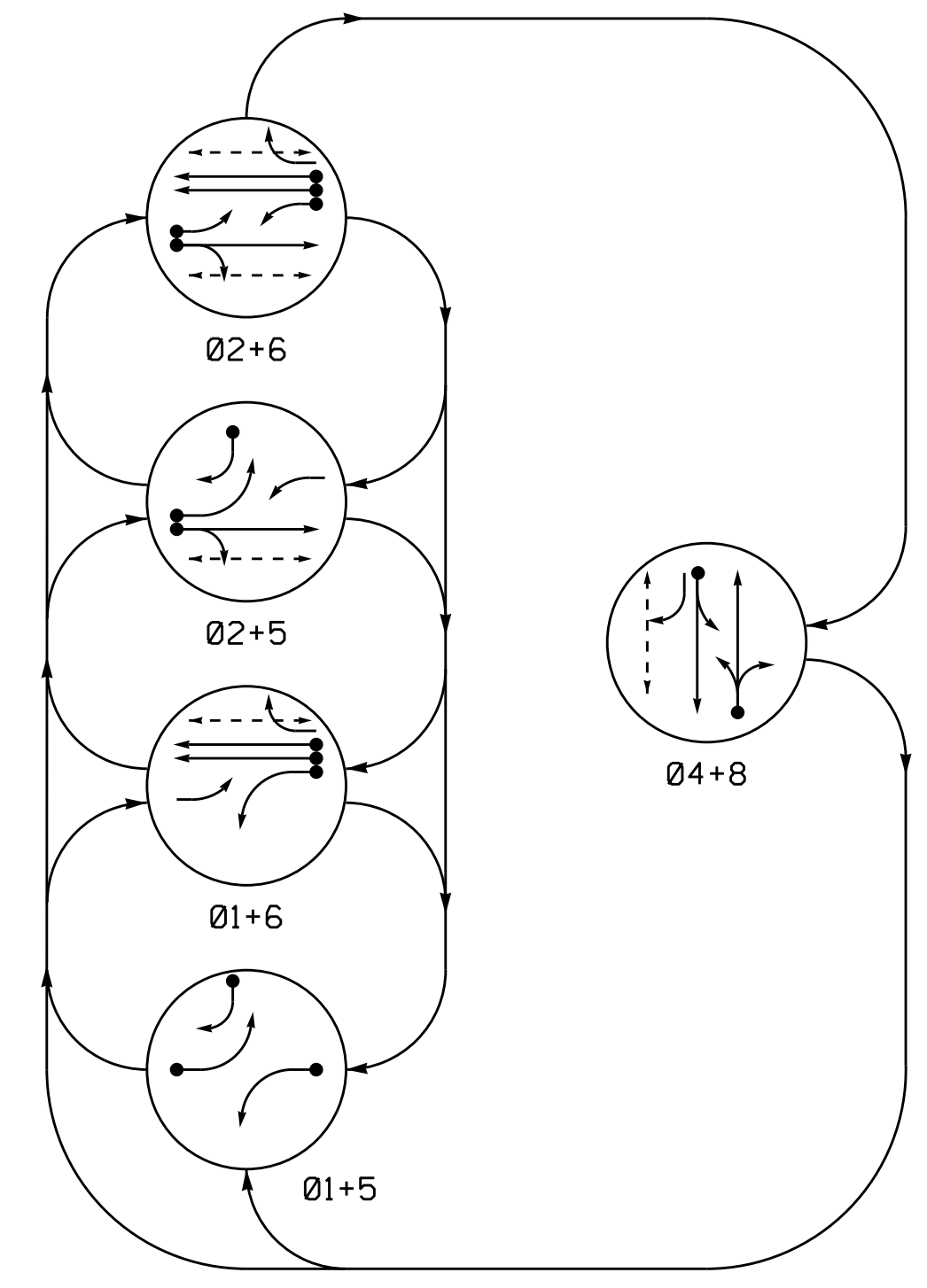
SEAL

SEAL 036880

ENGINEER KEITH M. MINS

SIG. INVENTORY NO. 06-1351

**PHASING DIAGRAM**



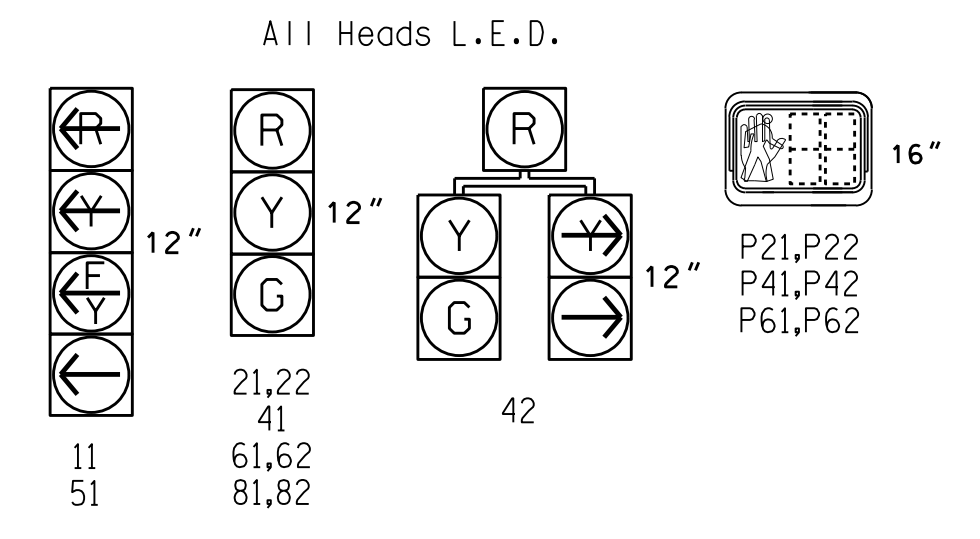
**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

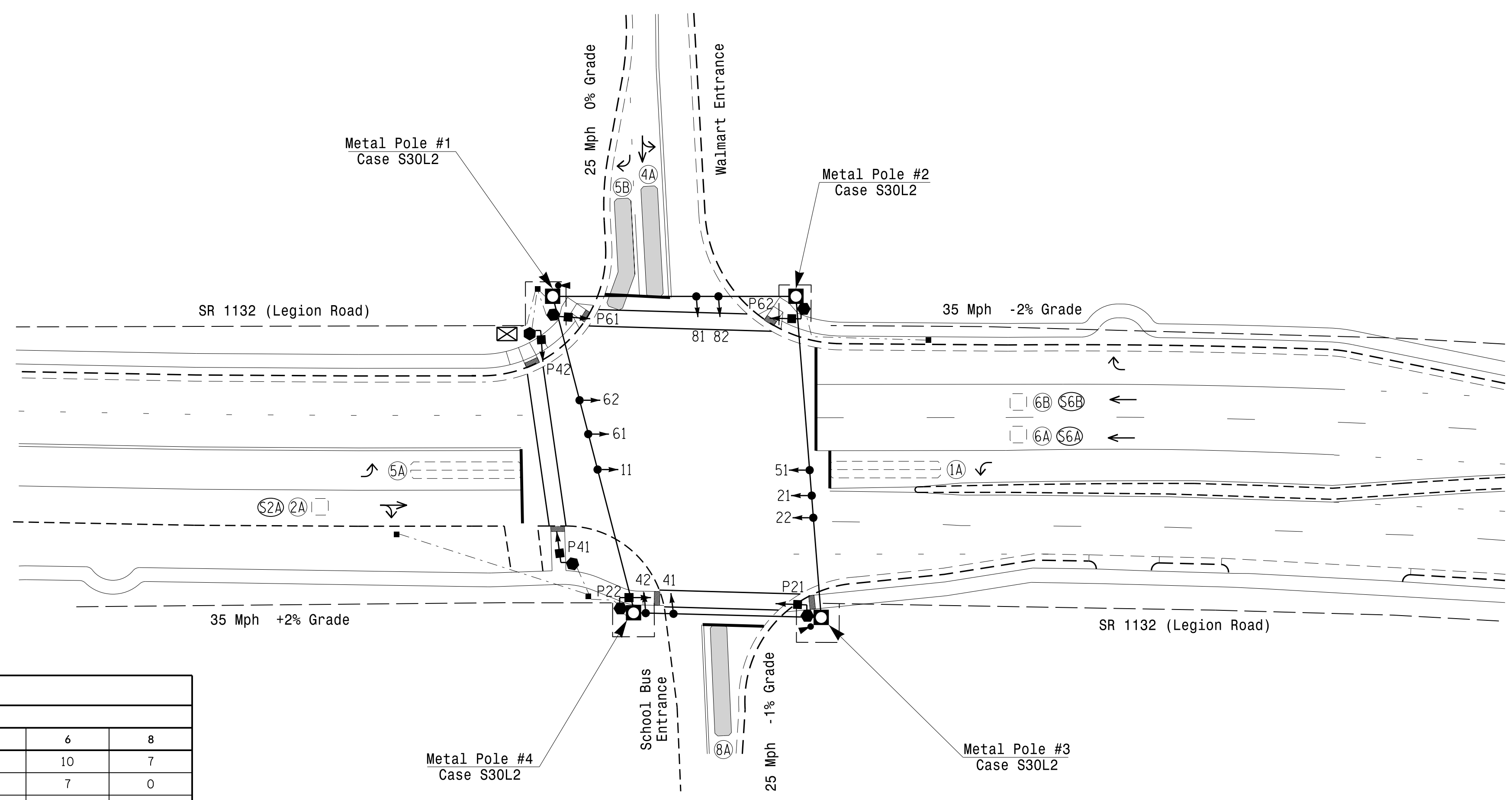
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTEND TIME	DELAY TIME			
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	-	X
2A/S2A	6X6	70	4	-	2	Yes	-	-	N	X	X
4A	6X40	0	*	-	4	Yes	-	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
5B	6X40	+5	*	-	5	Yes	-	15	S	-	X
6A/S6A	6X6	70	4	-	6	Yes	-	-	N	X	X
6B/S6B	6X6	70	4	-	6	Yes	-	-	N	X	X
8A	6X40	0	*	-	8	Yes	-	3	S	-	X

\* Multizone Microwave Detection

**5 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	0	7	7	0	7	0
Ped Clear	0	11	14	0	15	0
Veh. Extension *	2.0	3.0	2.0	2.0	3.0	2.0
Max I *	15	90	20	20	90	20
Yellow	3.0	4.0	3.2	3.0	4.0	3.2
Red Clear	2.4	2.1	3.0	2.8	2.1	3.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

**LEGEND**

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ Traffic Signal Head
●→ Modified Signal Head	N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head With Push Button & Sign
⊥ Signal Pole with Guy	⊥ Signal Pole with Guy
⊥ Signal Pole with Sidewalk Guy	⊥ Signal Pole with Sidewalk Guy
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Controller & Cabinet
⊥ Junction Box	⊥ Junction Box
⊥ 2-in Underground Conduit	⊥ 2-in Underground Conduit
N/A Right of Way	Right of Way
→ Directional Arrow	→ Directional Arrow
N/A Multizone Microwave Zone	Multizone Microwave Zone
○ Metal Strain Pole	○ Metal Strain Pole
○ Multizone Microwave Detector	○ Multizone Microwave Detector
○ Type II Signal Pedestal	○ Type II Signal Pedestal

**Signal Upgrade**

Prepared In the Offices of:

**SR 1132 (Legion Road) at Walmart Entrance / School Bus Entrance**

Division 6 Cumberland County Hope Mills

PLAN DATE: May 2016 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 30 1"=30'

REVISIONS: INIT. DATE

DocuSigned by: Jason P. Gallaway 5/25/2016

SIG. INVENTORY NO. 06-1354

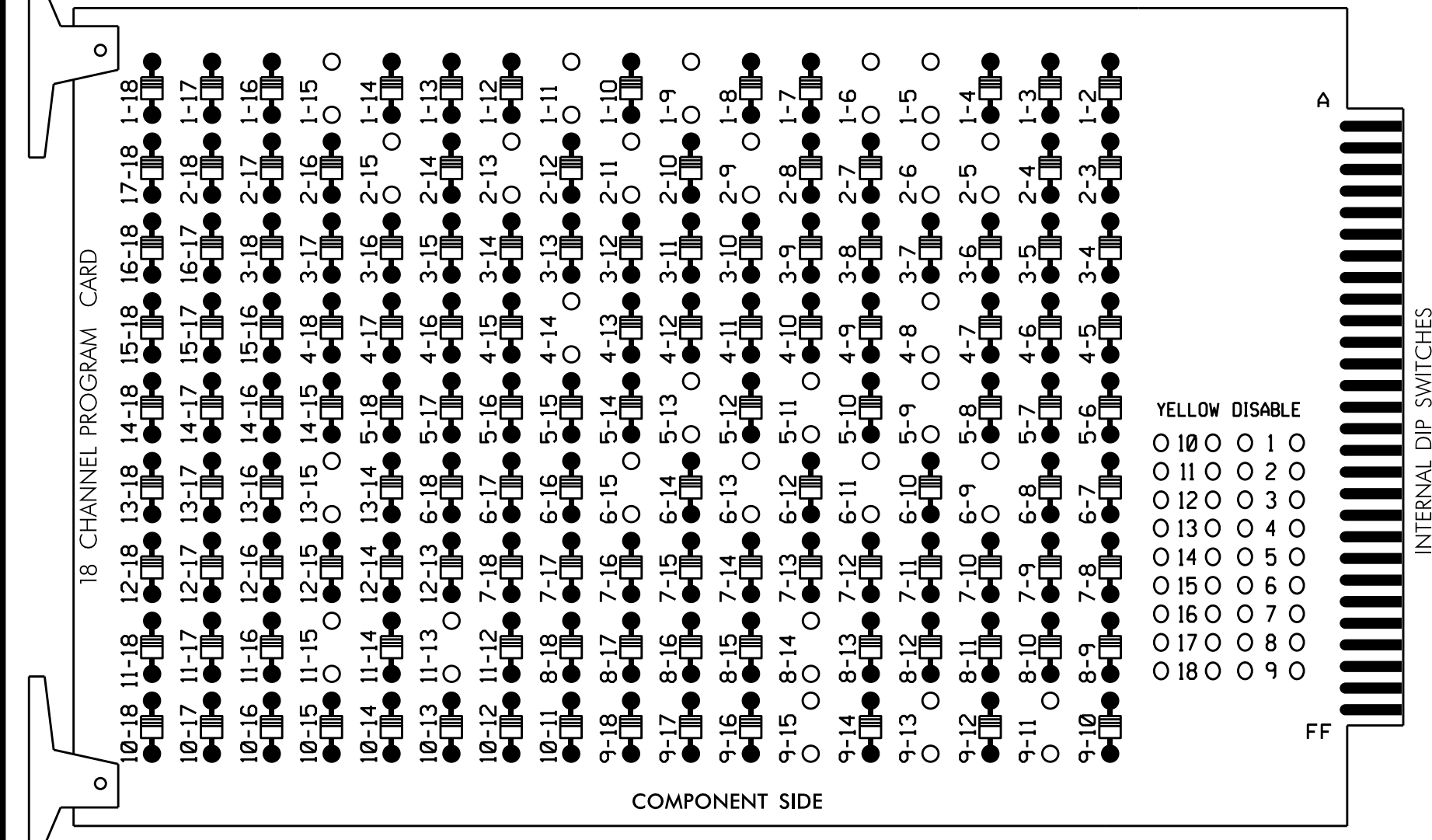
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

18-0075-2016-1441  
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 J. Spence

# EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

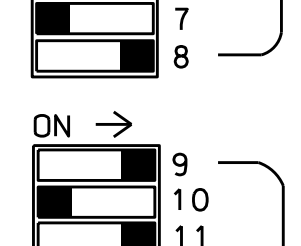
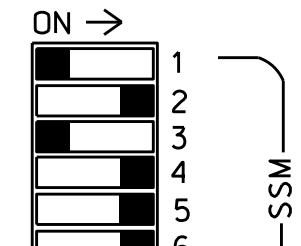
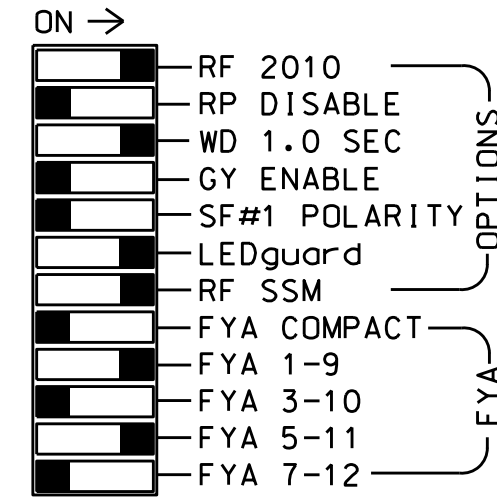
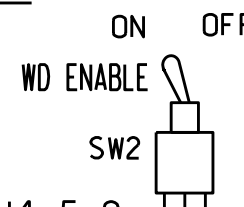
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-14, 9-11, 9-13, 9-15, 11-13, 11-15, AND 13-15.



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.
- Integrate monitor with Ethernet network in cabinet.



■ = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program controller to start up in phase 2 Walk and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,  
 AUX S1,AUX S4  
 PHASES USED.....1,2,4,5,6,8,2 PED,4 PED,6 PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	P21, P22	NU	41,42	P41, P42	42	51*	61,62	P61, P62	NU	81,82	NU	11*	NU	51*	NU	NU
RED		128			101			*	134			107						
YELLOW	*	129			102				135			108						
GREEN		130			103				136			109						
RED ARROW													A121			A114		
YELLOW ARROW							132						A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133	133										
Hand icon			113		104				119									
Walking person icon			115		106				121									

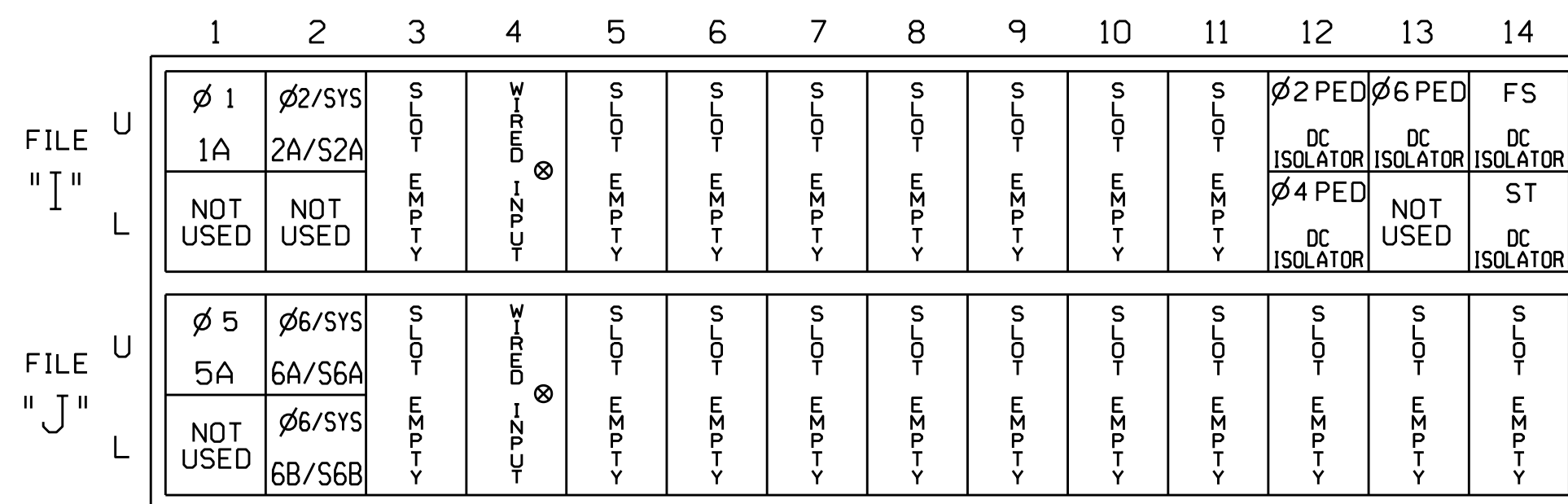
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

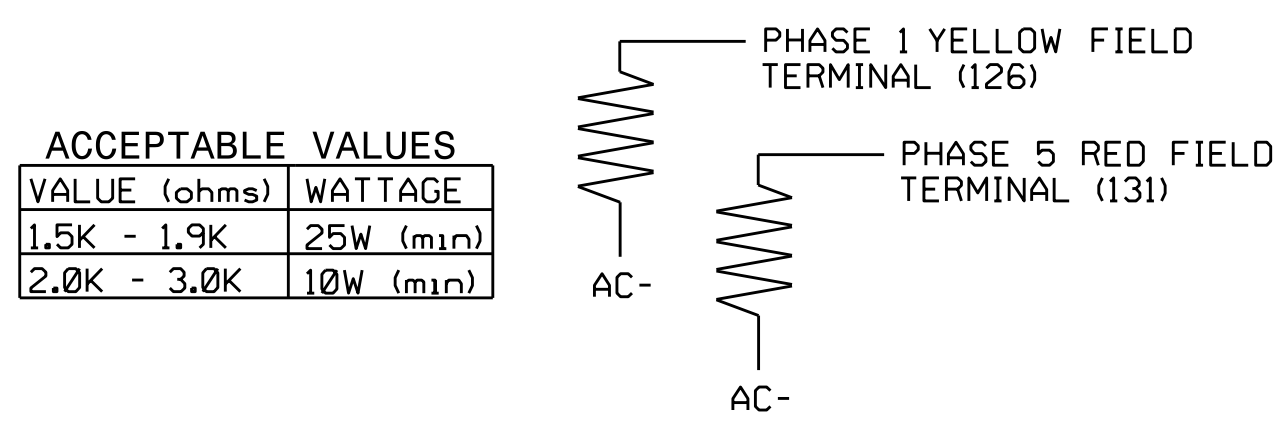
⊗ Wired Input - Do not populate slot with detector card

### SPECIAL DETECTOR NOTE

For detector zones 4A, 5B and 8A install a multizone microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



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

### INPUT FILE CONNECTION & PROGRAMMING CHART

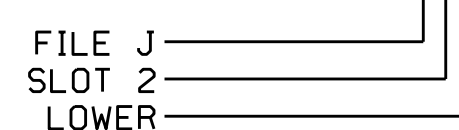
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15	S
	-	J4U	48	26	6	YES			S
2A/S2A	TB2-5,6	I2U	39	2	2/SYS	YES			N
	TB3-1,2	J1U	55	5	5	YES		15	S
5A <sup>2</sup>	TB3-1,2	I4U	47	22	2	YES			S
	-	-	-	-	-	-	-	-	-
6A/S6A	TB3-5,6	J2U	40	6	6/SYS	YES			N
6B/S6B	TB3-7,8	J2L	44	16	6/SYS	YES			N
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				

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

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.

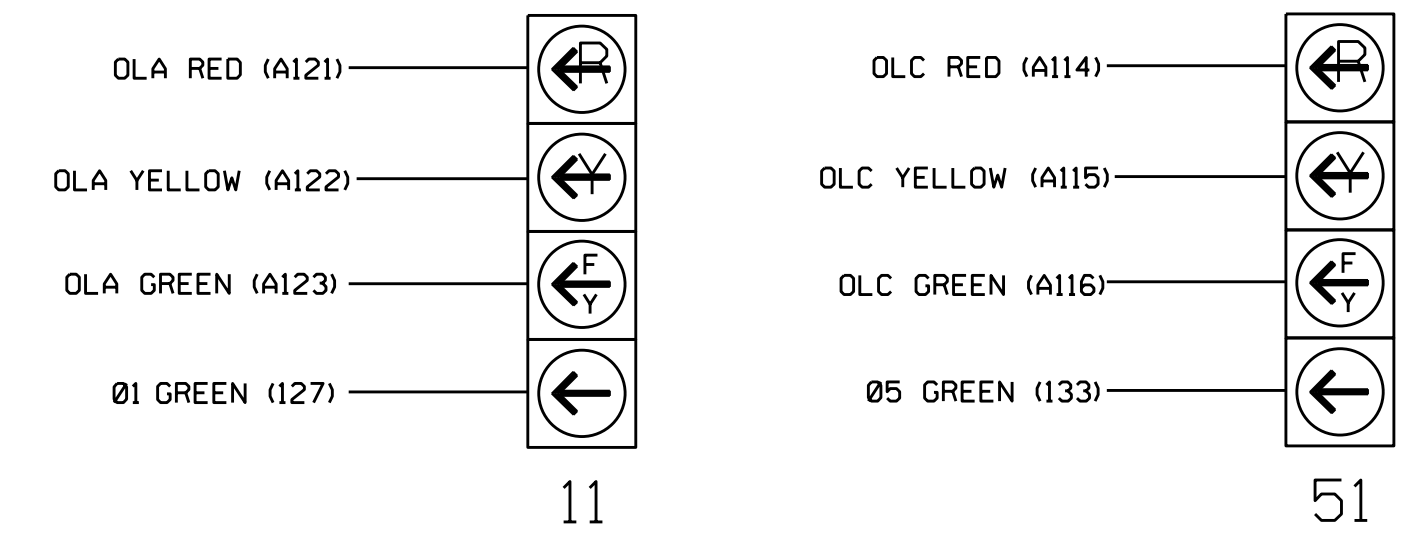
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details for: SR 1132 (Legion Road) at Walmart Entrance / School Bus Entrance

Division 6 Cumberland County Hope Mills

PLAN DATE: October 2016 REVIEWED BY: [Signature]

PREPARED BY: James Peterson REVIEWED BY: [Signature]

REVISIONS: [Table]

750 N. Greenfield Pkwy, Garner, NC 27529

Seal: Keith M. Mims, Professional Engineer, License No. 036880

DocuSigned by: Keith M. Mims 10/17/2016

SIG. INVENTORY NO. 06-1354

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

*OVERLAP A*

Select TMG VEH OVLP [A] and 'PPLT FYA'

TMG VEH OVLP...[A] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 1

OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

Toggle Twice

*OVERLAP C*

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 5

OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

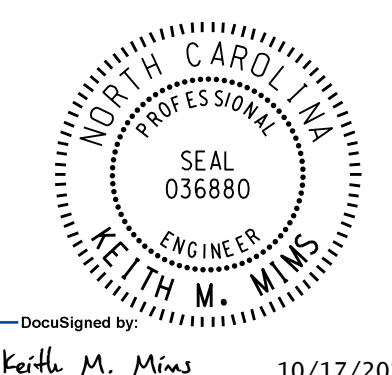
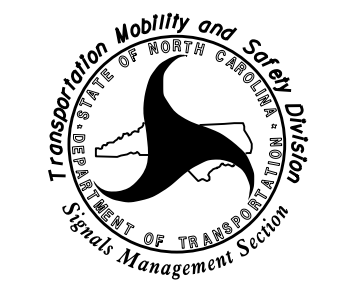
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1354  
 DESIGNED: May 2016  
 SEALED: 5-25-16  
 REVISED: N/A

I:\2016-2017\1312  
 S:\MITS\SIG\SIG\Signal\work\hgr\pou\sig\_Mon\ Peterson\061354\_sic.ele...xxx.dgn  
 Peterson

Electrical Detail Sheet 2 of 2

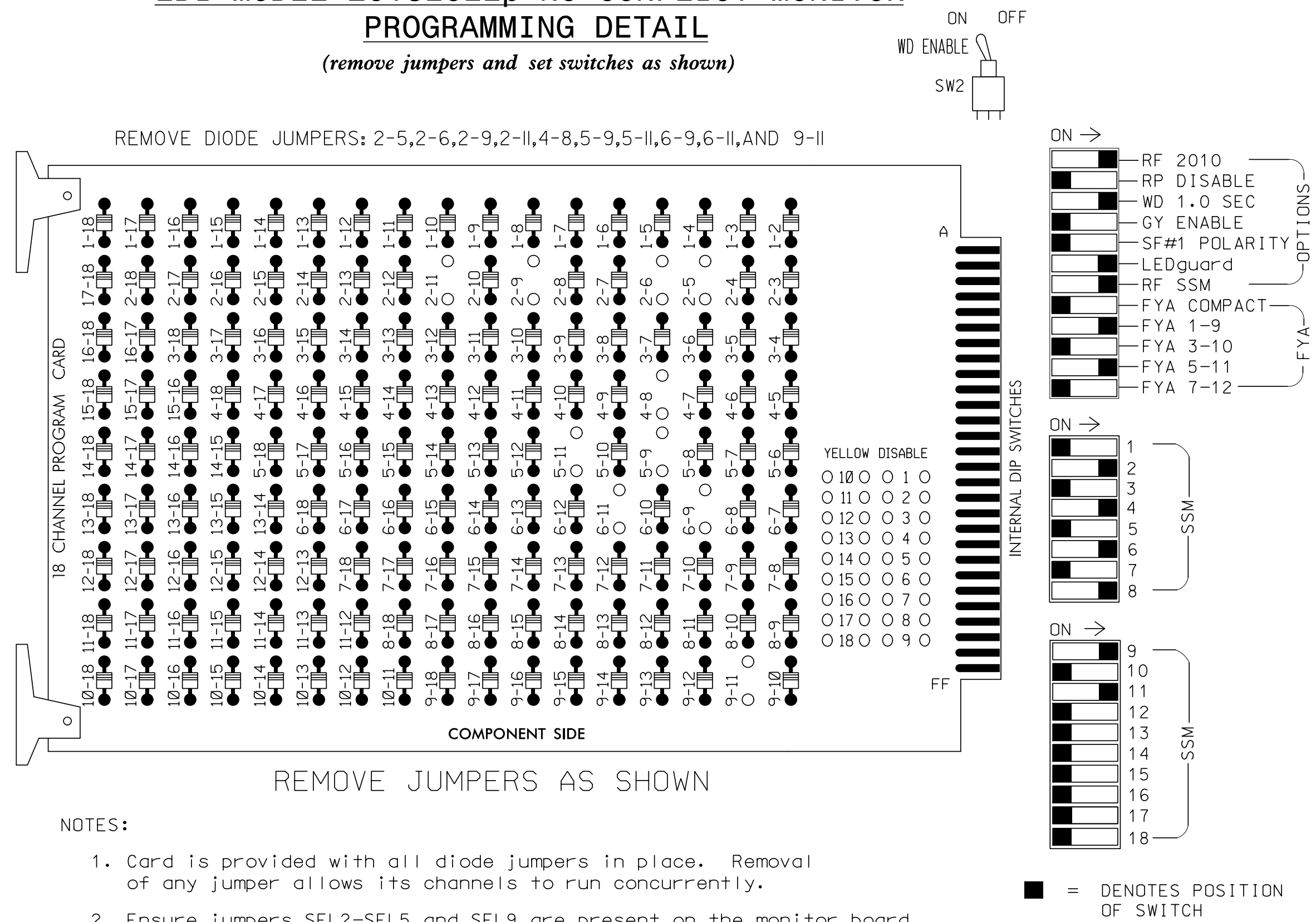
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1132 (Legion Road) at Walmart Entrance / School Bus Entrance	SEAL 									
 <p style="font-size: 8px;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	Division 6 Cumberland County Hope Mills PLAN DATE: October 2016 REVIEWED BY: PREPARED BY: James Peterson REVIEWED BY:	DocuSigned by: Keith M. Mims 10/17/2016 DATE SIG. INVENTORY NO. 06-1354									
<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <thead> <tr> <th style="width: 80%;">REVISIONS</th> <th style="width: 10%;">INIT.</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			REVISIONS	INIT.	DATE						
REVISIONS	INIT.	DATE									



### EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,S11,AUX S1,  
 AUX S4  
 PHASES USED.....2,4,5,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51*	62,63	NU	NU	81,82	NU	61*	NU	NU	51*	NU	NU
RED		128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							133											

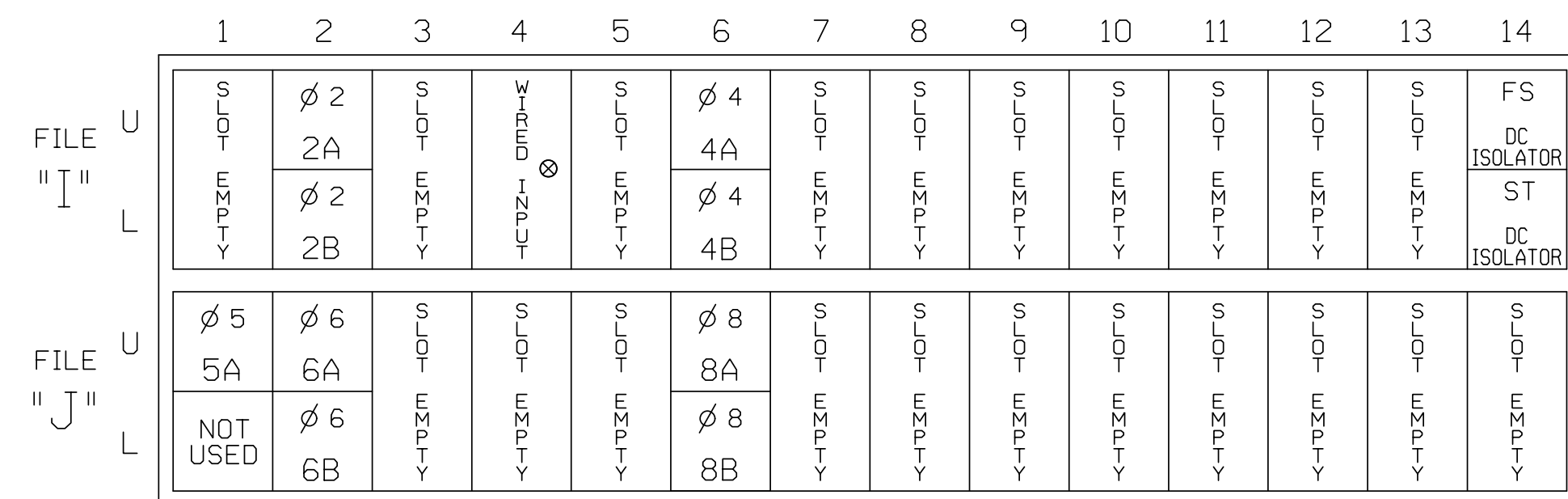
NU = Not Used

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

\* See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)

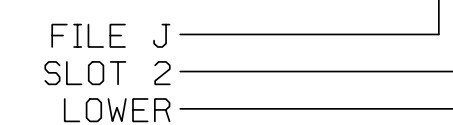


### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15	S
		I4U	47	22	2	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		3	S
8B	TB5-11,12	J6L	46	18	8	YES			S

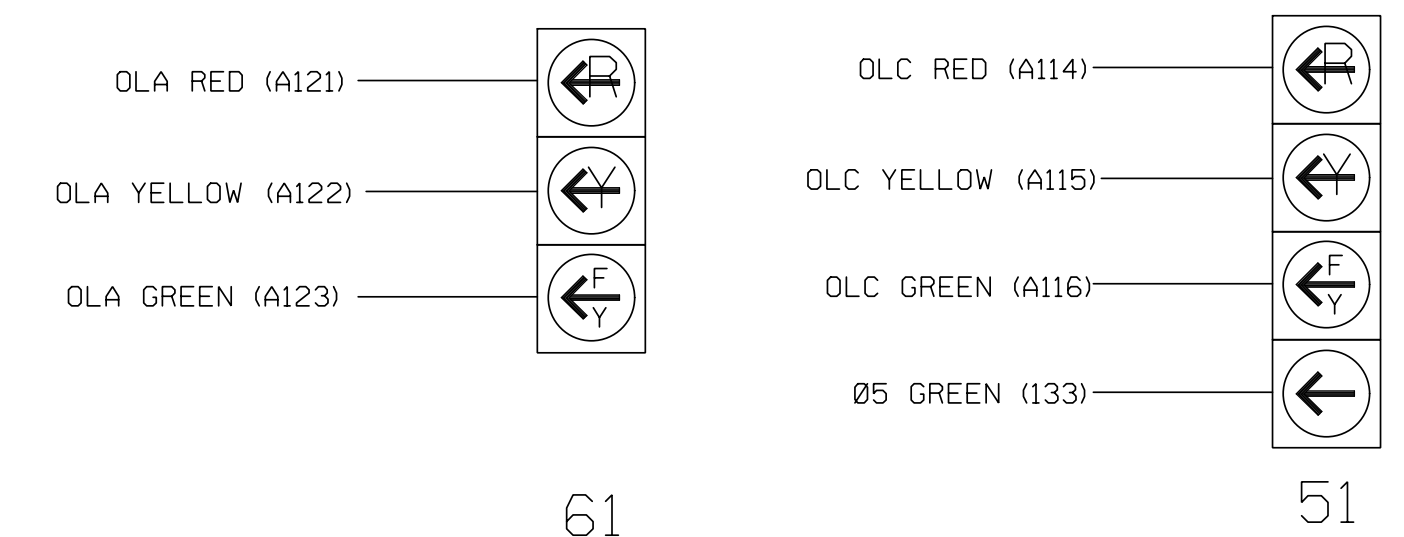
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

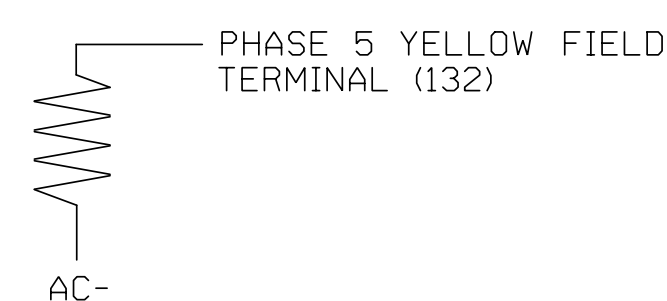


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0047  
 DESIGNED: March 2016  
 SEALED: 5/26/2016  
 REVISED:

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For:  PLANS PREPARED IN THE OFFICE OF: <b>Kimley»Horn</b> NC License #F-0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	SR 1404 (Morganton Road) at Churchill Drive		SEAL  SEAL 032607 ENGINEER STACIE L. PHILLIPS	
	Division 6 PLAN DATE: July 2016 PREPARED BY: SP Pennington	Cumberland County REVIEWED BY: KP Baumann REVIEWED BY: SL Phillips		Fayetteville DATE: 9/1/2016
	REVISIONS	INIT. DATE		DATE
	SIG. INVENTORY NO. 06-0047			



## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[A] TYPE: OTHER/ECONOLITE
 PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

↓ Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```

TMG VEH OVLP...[C] TYPE: . . . . . PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0

```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-0047  
 DESIGNED: March 2016  
 SEALED: 5/26/2016  
 REVISED:

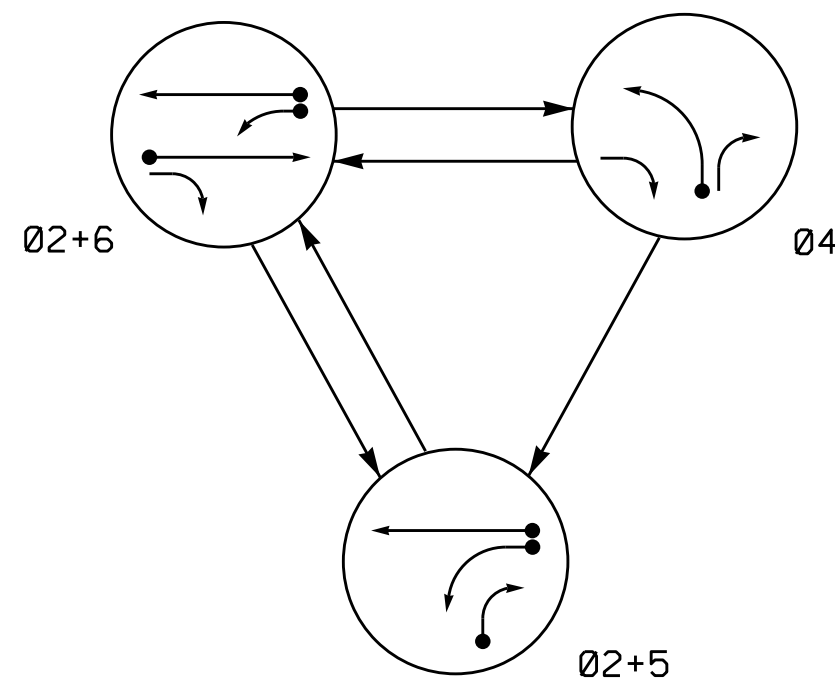
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared For:                    750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>SR 1404 (Morganton Road) at Churchill Drive</b></p> <p style="font-size: x-small;">Division 6      Cumberland County      Fayetteville</p> <p style="font-size: x-small;">PLAN DATE: July 2016      REVIEWED BY: KP Baumann</p> <p style="font-size: x-small;">PREPARED BY: SP Pennington      REVIEWED BY: SL Phillips</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <div style="border: 1px solid black; border-radius: 50%; width: 60px; height: 60px; margin: 0 auto; display: flex; align-items: center; justify-content: center;"> <p style="font-size: 8px; text-align: center;">NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS</p> </div> <p style="font-size: x-small;">DocuSigned By:                    9/1/2016                  DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 06-0047</p>
REVISIONS	INIT.	DATE												

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

8/21/2016  
 K:\REAL\_T\PROJECTS\IGNALS\4011036345\_FoyetHevi\11e\_Electr\Coals\654 - Signal\_Desi\gn\3rd\_Submit\10142532\_060047-2016e2.dgn  
 Susan\_Penn\_Factor

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	04	F L
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	-	F	R	Y
61	R	G	R	Y
62	R	G	R	Y

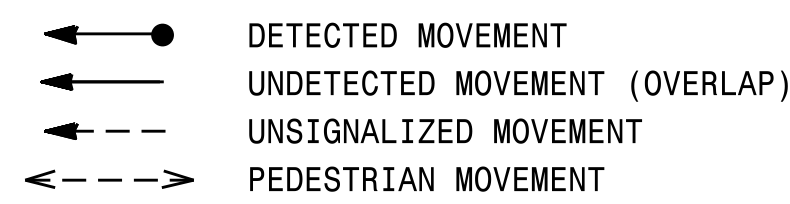
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	-	2	Yes	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	S	-	X
6A	6X6	300	4	-	6	Yes	-	-	N	-	X

3 Phase Fully Actuated Fayetteville Signal System

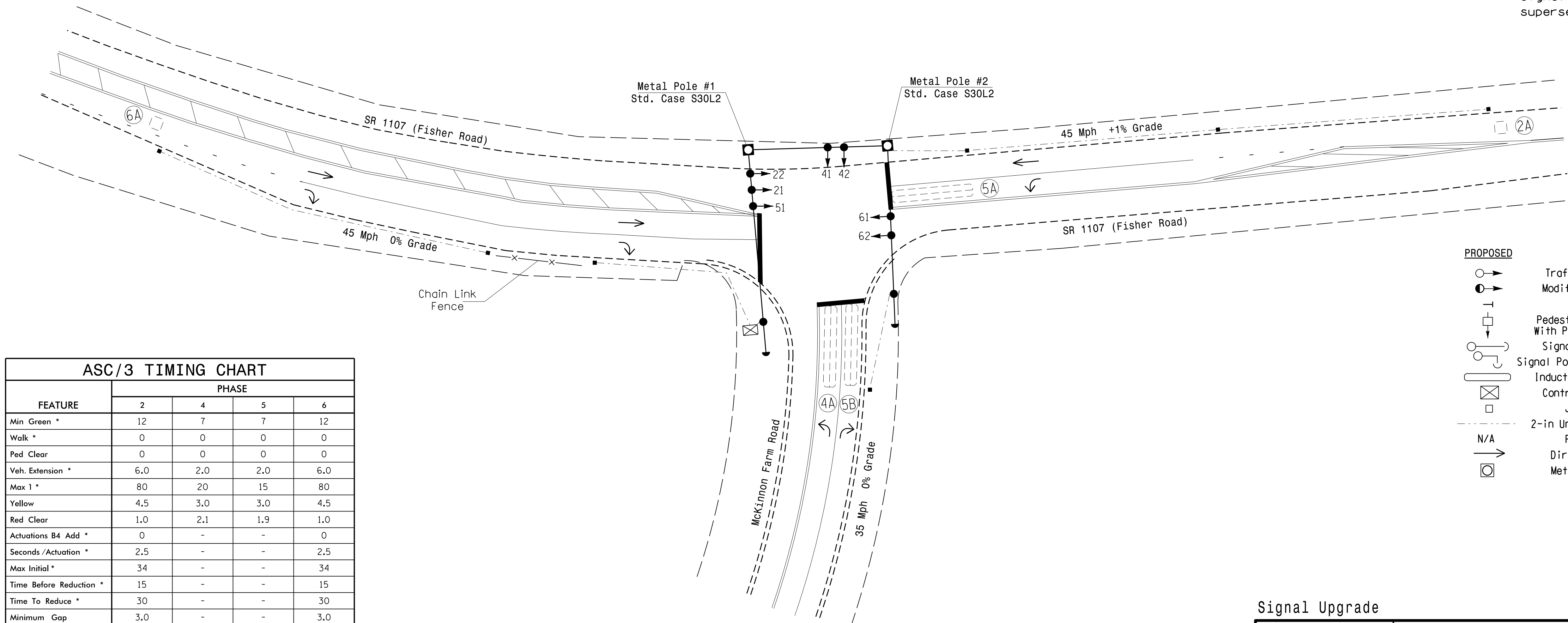
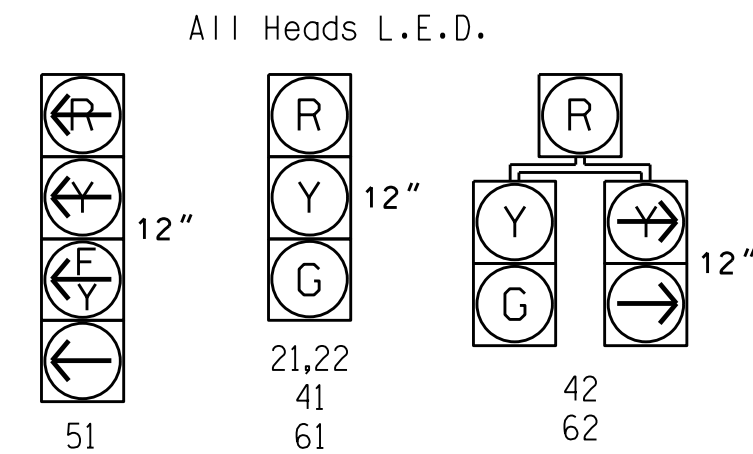
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be logged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



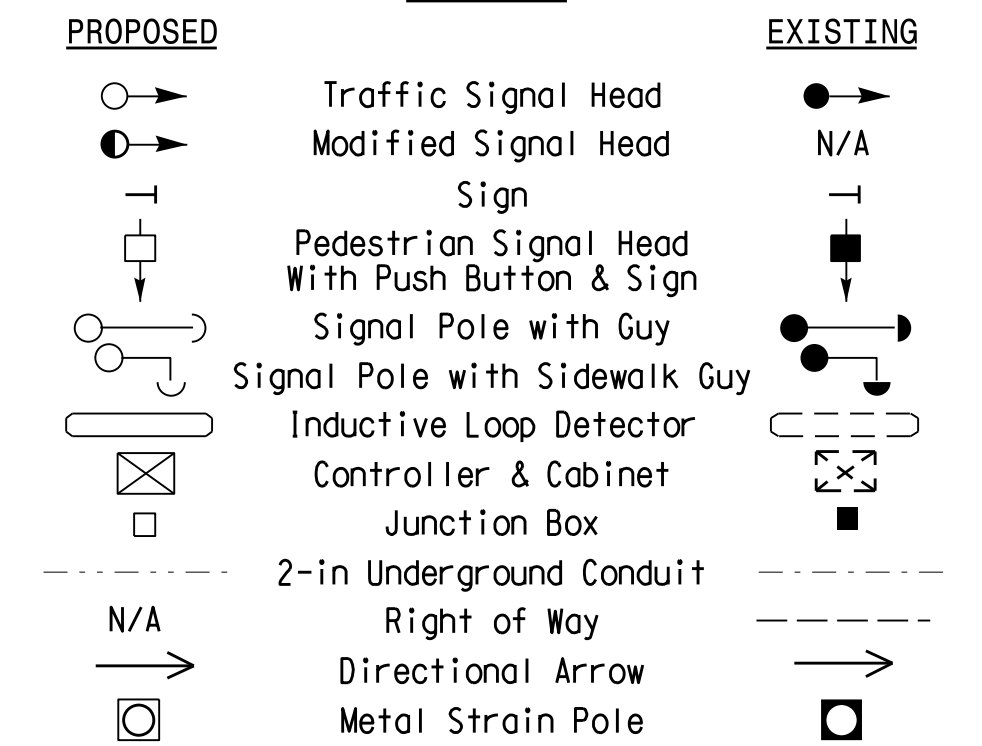
SIGNAL FACE I.D.



FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	80	20	15	80
Yellow	4.5	3.0	3.0	4.5
Red Clear	1.0	2.1	1.9	1.0
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	2.5	-	-	2.5
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND



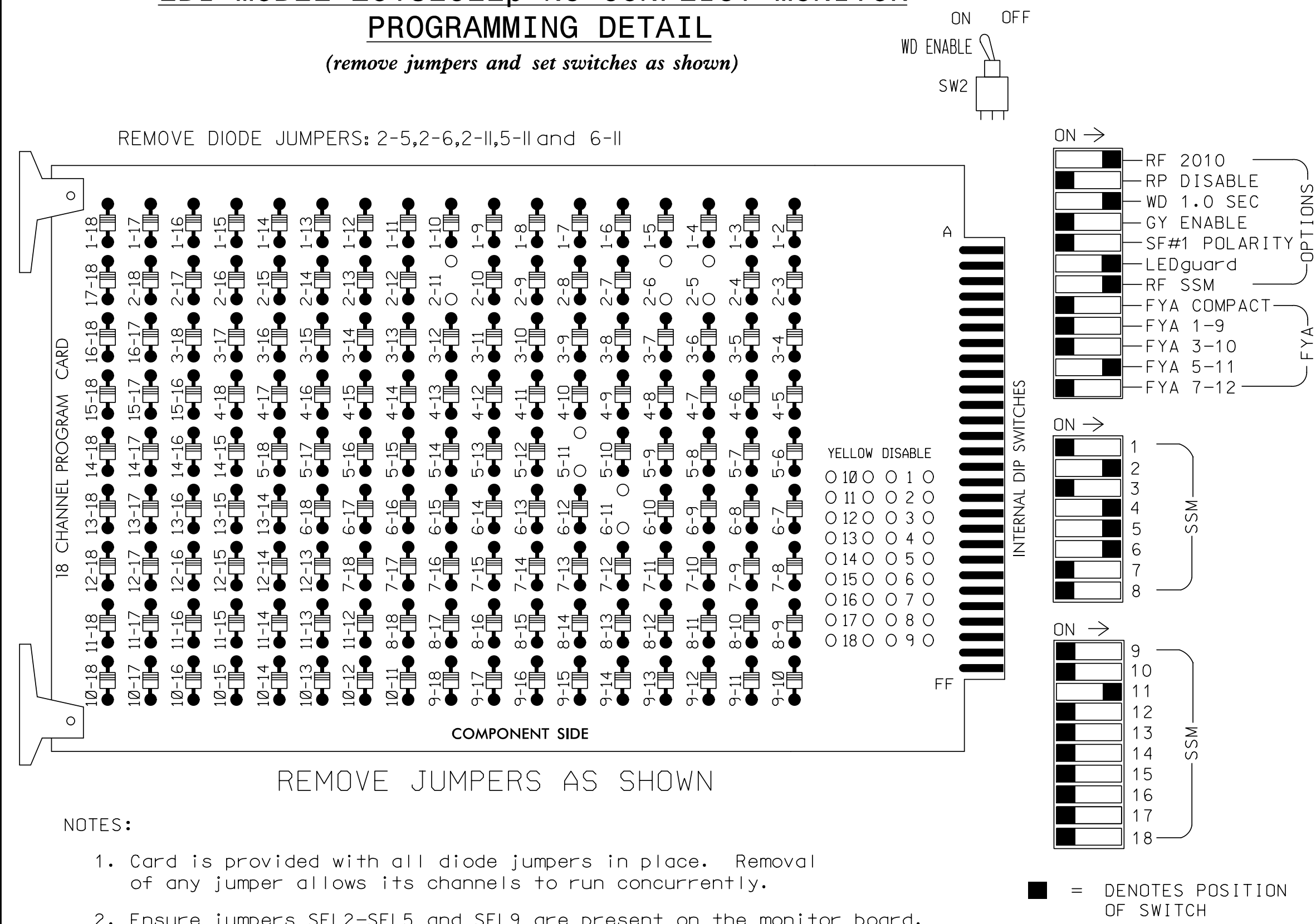
Signal Upgrade

Prepared in the Offices of:  
  
**SR 1107 (Fisher Road) at McKinnon Farm Road**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: June 2016 REVIEWED BY: JPG  
 PREPARED BY: Jeff Spence REVIEWED BY:  
 REVISIONS: \_\_\_\_\_ INIT. DATE: \_\_\_\_\_  
 SCALE: 1"=30'  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SIG. INVENTORY NO. 06-1352

09-july-2016 1:45:01  
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 Design Section\Eastern Region\04\U-5742 Fayetteville ASC\3\06-1352\061352\_s1a.dsn\_2016mmds.dgn  
 J. Spence

**EDI MODEL 2018ECLIP-NC 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4  
 PHASES USED.....2,4,5,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* See overlap programming detail on this sheet

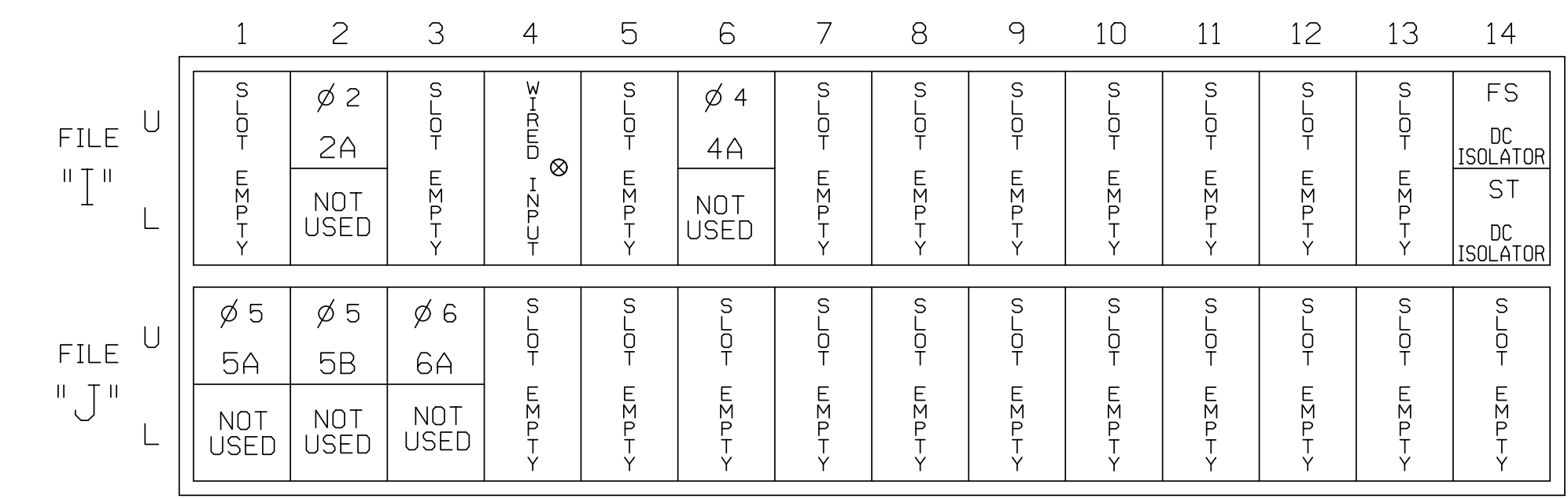
**SIGNAL HEAD HOOK-UP CHART**

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	PED	3	4	PED	5	6	PED	7	8	PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	42	51*	61,62	NU	NU	NU	NU	NU	51	NU	NU	
RED	128				101				*	134									
YELLOW	129				102					135									
GREEN	130				103					136									
RED ARROW																		A114	
YELLOW ARROW						102		132											A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW						103		133	133										

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)

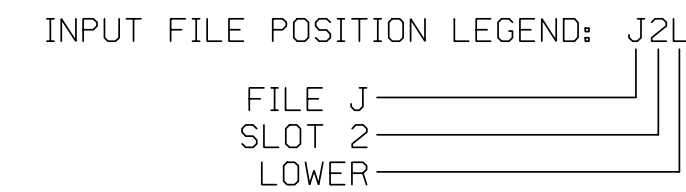


⊗ Wired Input - Do not populate slot with detector card

**INPUT FILE CONNECTION & PROGRAMMING CHART**

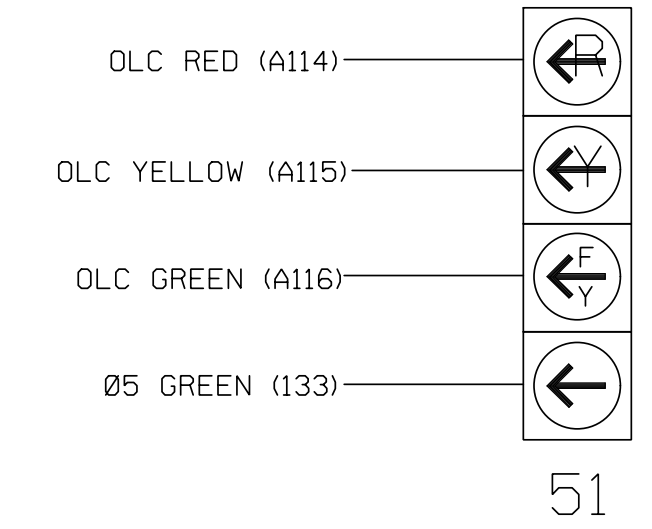
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15	S
		I4U	47	22	2	YES		3	G
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES			N

<sup>1</sup>Add jumper from J1-W to 14-W, on rear of input file.



**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**  
TOGGLE TWICE  
OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE: ....[PPLT FYA]

PROTECTED LEFT TURN.... PHASE 5  
 OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE  
 DELAY START OF: FYA..0.0 CLEARANCE..0.0  
 ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

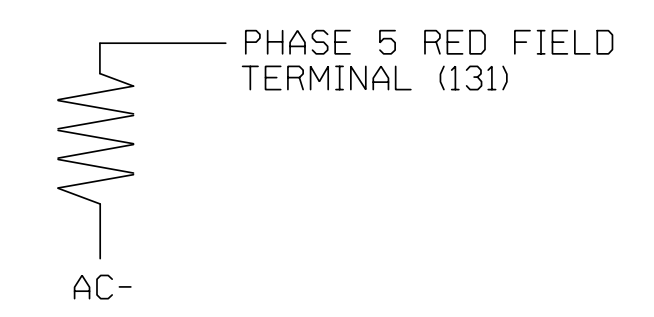
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1352  
 DESIGNED: June 2016  
 SEALED: 7/5/2016  
 REVISED:

**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)

ACCEPTABLE VALUES

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



**Electrical Detail**

ELECTRICAL AND PROGRAMMING DETAILS FOR:



SR 1107 (Fisher Road) at McKinnon Farm Road

REVISIONS	INIT.	DATE

PLANNED BY	DESIGNED BY	CHECKED BY	DATE
SP Pennington	SL Phillips	KB Baumann	9/16/2016

SIG. INVENTORY NO. 06-1352

9/16/2016 K:\REAL\_TPT\K\SIGNALS\4011036345 Fayetteville Electrical Detail.dwg - Signal Design\4th Submit\Final\2541\_061352-2016e.dgn Susan Pennington

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

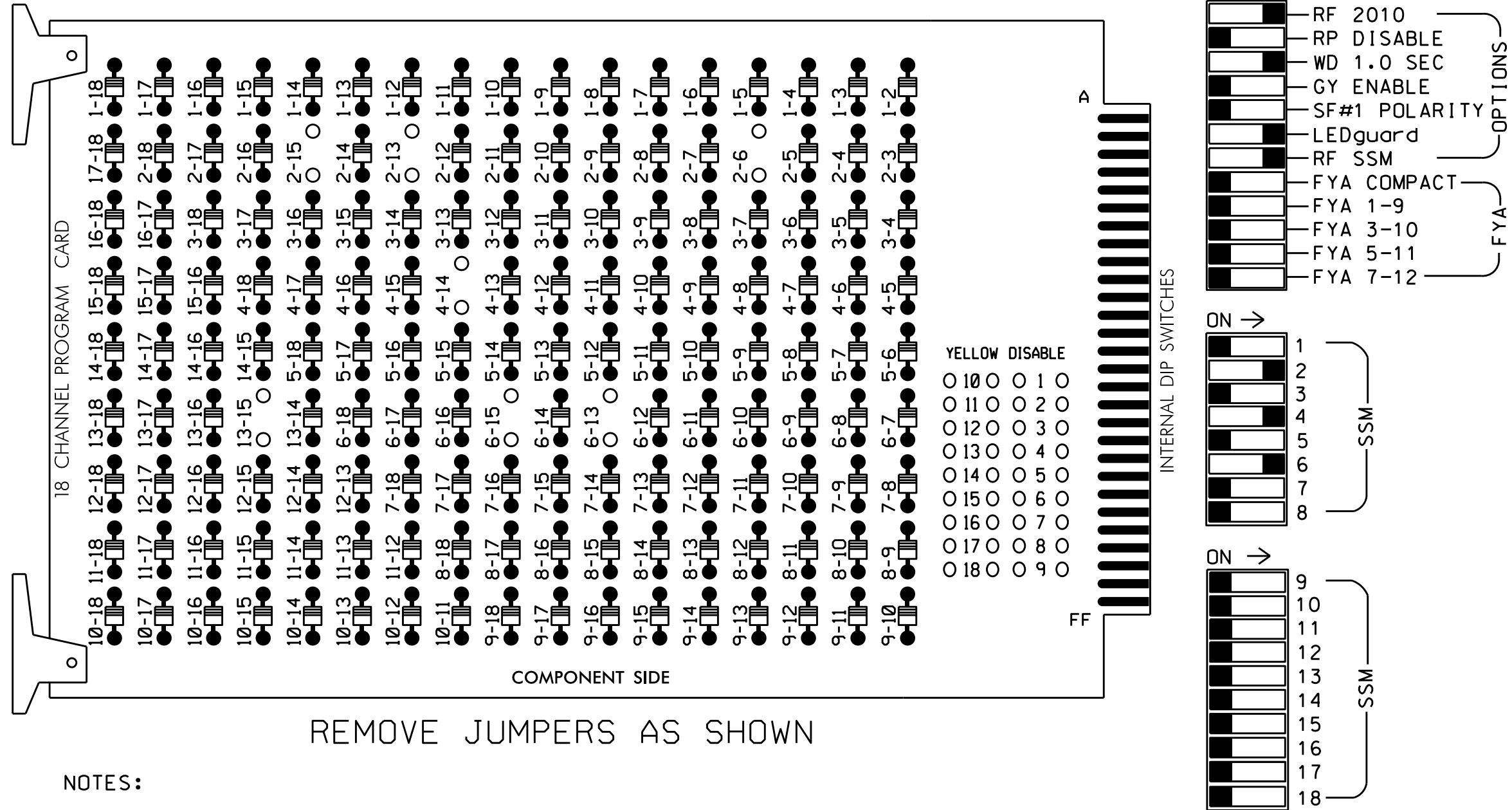


**EDI MODEL 2018EClip-NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-14, 6-13, 6-15, 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.
- Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Walk and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
			113			104			119			
			115			106			121			

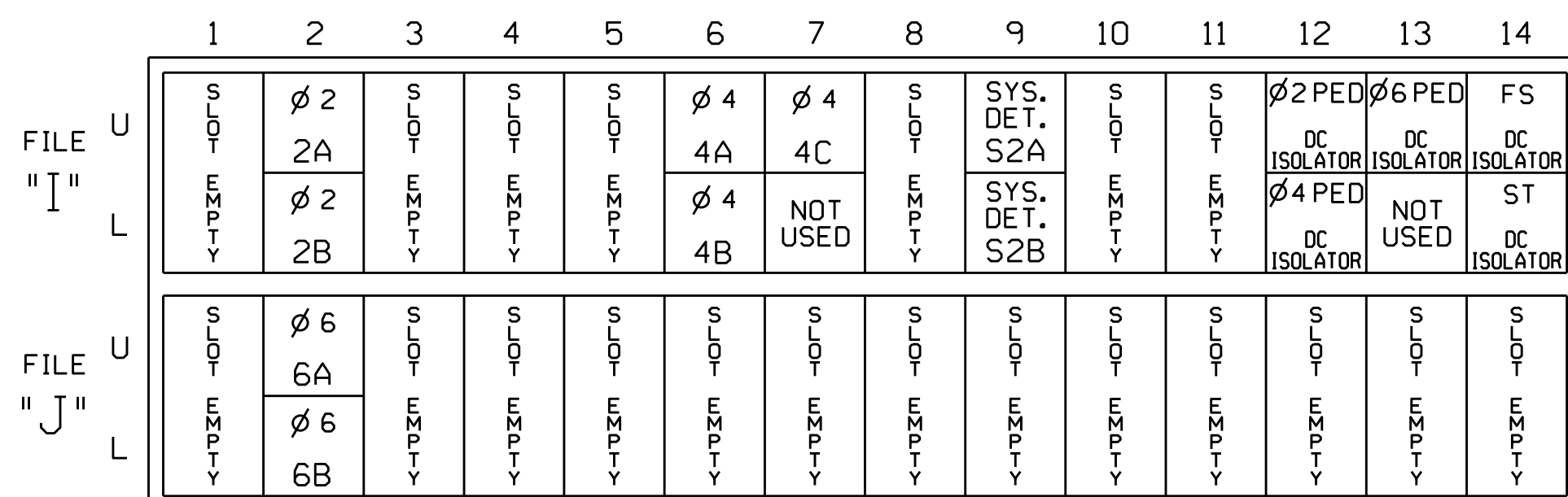
NU = Not Used

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9  
 PHASES USED.....2,2 PED,4,4 PED,6,6 PED  
 OVERLAPS.....NONE

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

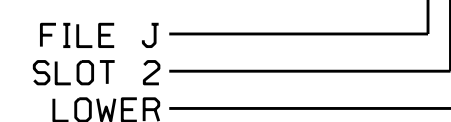
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
*S2A	TB6-9,10	I9U	60	11	SYS	NO			N
*S2B	TB6-11,12	I9L	62	13	SYS	NO			N

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

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

\* System detector only. Remove any assigned vehicle phase.

**INPUT FILE POSITION LEGEND: J2L**



**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1330  
 DESIGNED: July 2016  
 SEALED: 10/11/2016  
 REVISED:

**Electrical Detail**

Electrical and Programming Details for: **SR 1400 (Cliffdale Road) at I-295 SB Ramps**

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530

DocuSigned by: *Carly M. Little* 10/13/2016

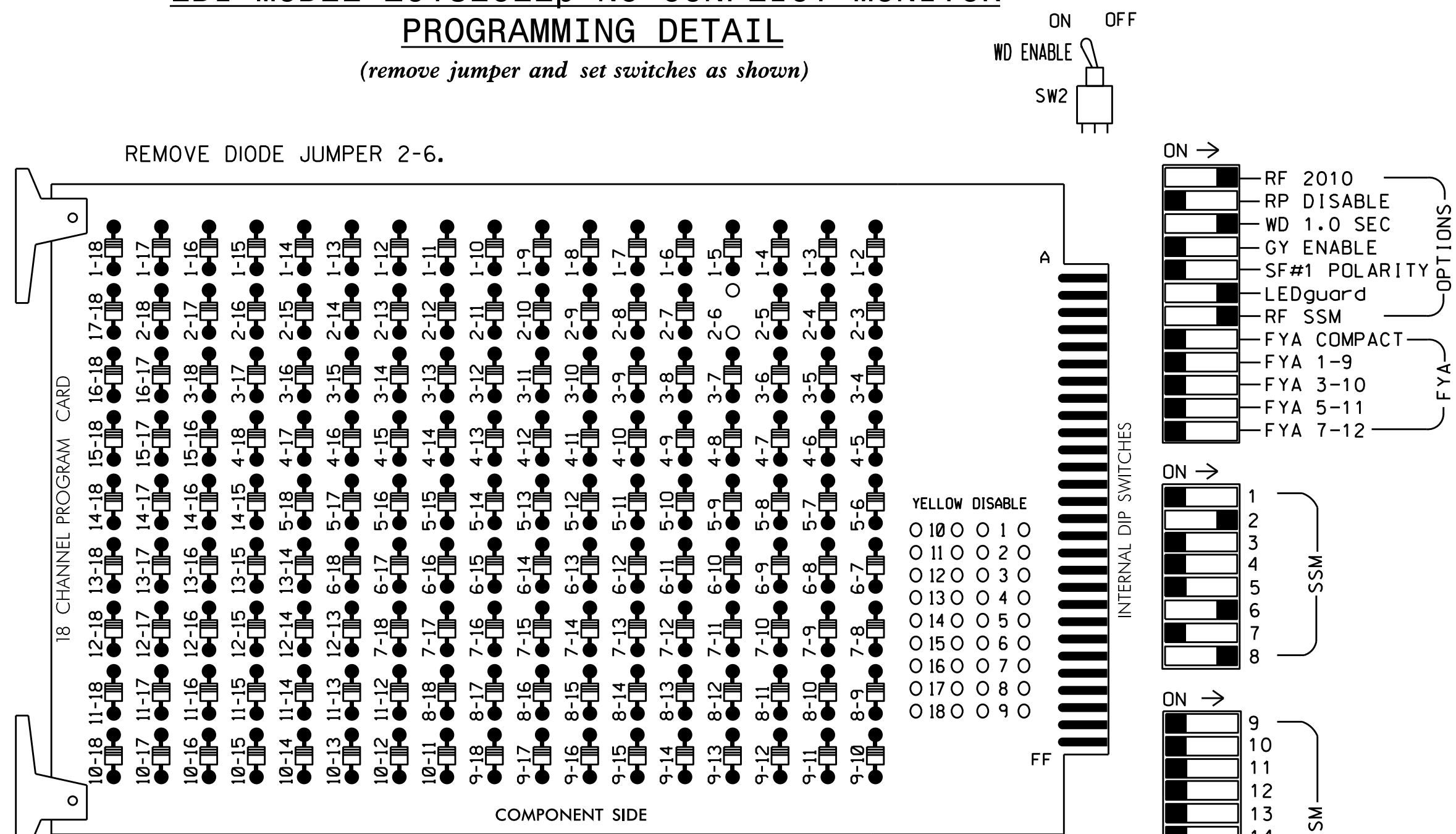
SIG. INVENTORY NO. 06-1330



**EDI MODEL 2018EClip-NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumper 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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62 63	NU	NU	81,82	83,84
RED		128						134				107
YELLOW		129						135				
GREEN		130						136				
RED ARROW											107	
YELLOW ARROW											108	108
GREEN ARROW											109	109

NU = Not Used

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S8,S11  
 PHASES USED.....2,6,8  
 OVERLAPS.....NONE

**INPUT FILE POSITION LAYOUT**

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
FILE L	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
FILE U	FS	∅ 6	∅ 6	FS	FS	∅ 8	∅ 8	FS	FS	FS	FS	FS	FS	FS
FILE L	FS	6A	6C	FS	FS	∅ 8	∅ 8	FS	FS	FS	FS	FS	FS	FS
		6B	NOT USED			8B	8D							

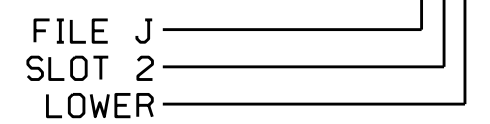
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES			N
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES			S
8C	TB7-1,2	J7U	66	38	8	YES		10	S
8D	TB7-3,4	J7L	79	48	8	YES		15	S

**INPUT FILE POSITION LEGEND: J2L**



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1332  
 DESIGNED: July 2016  
 SEALED: 10/11/2016  
 REVISED: N/A

**SPECIAL DETECTOR NOTE**

For detection zone 2A, install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

**Electrical Detail**

Electrical and Programming Details For: **Canopy Lane at I-295 SB Ramps**

Prepared in the Offices of: **Transportation Mobility and Safety Solutions**

Division 6 Cumberland County Fayetteville

PLAN DATE: October 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

DocuSigned by: **Keith M. Mins** 10/12/2016

750 N. Greenfield Pkwy, Garner, NC 27529

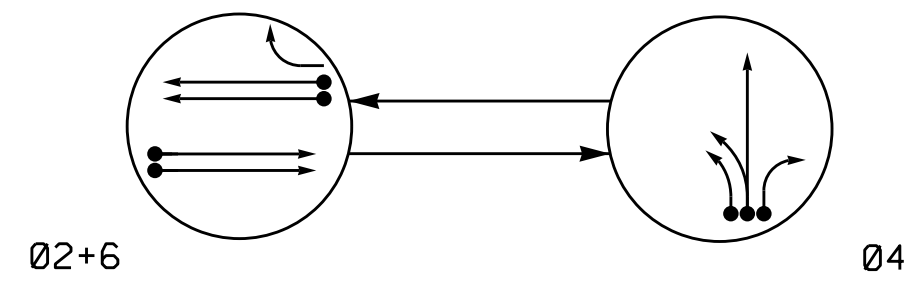
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 KEITH M. MINS  
 036880

SIG. INVENTORY NO. 06-1332

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

10-2017-2016 06-18 S:\115551\15 Signal\work\hgr\oups\Sig\_Monitor\strmstrng\061332\_sm.elec.xxx.dgn sarmstrng

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

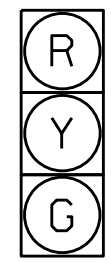
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



21,22  
61,62  
41,42

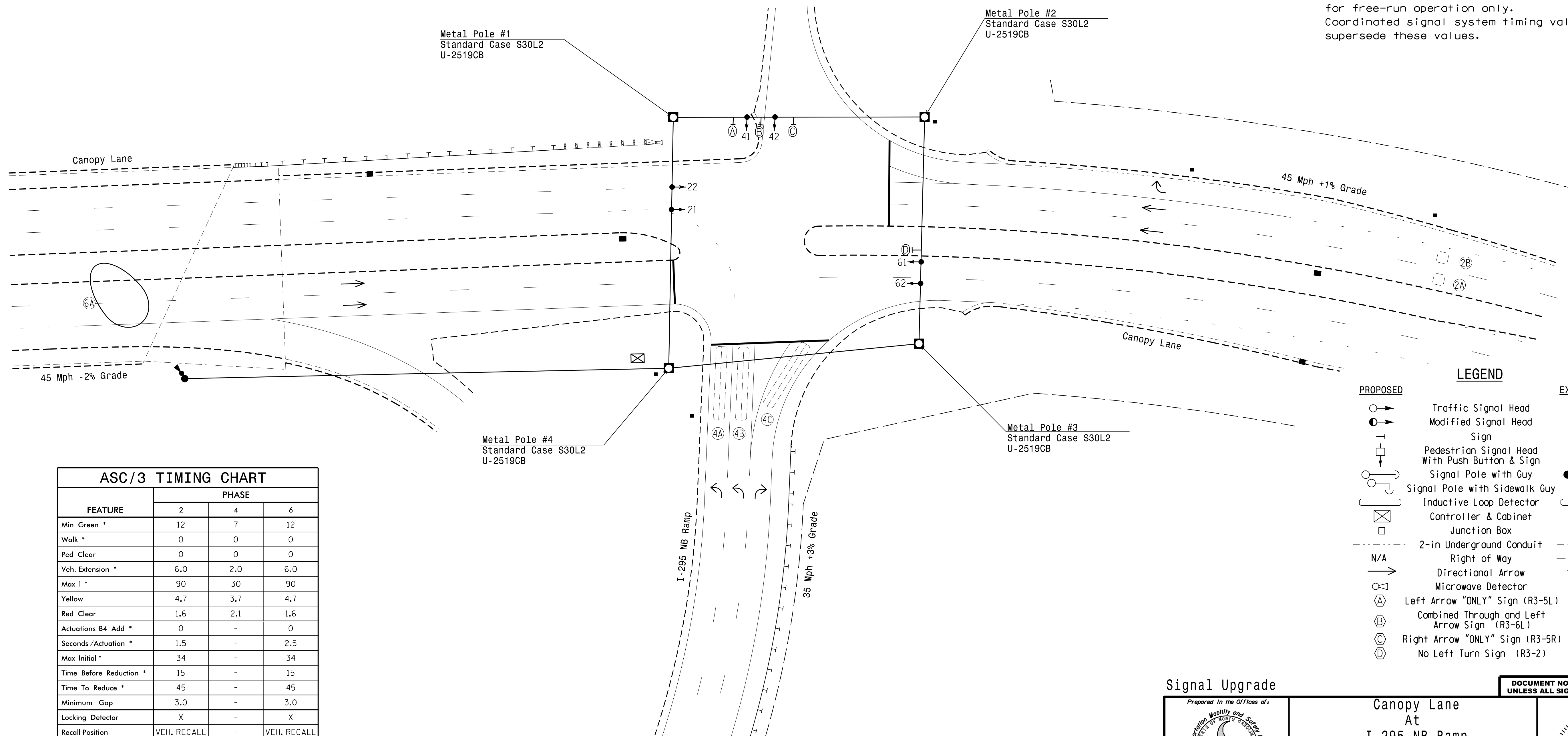
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE		
2A	6X6	300	6	-	2	Yes	-	-	N	-	X
2B	6X6	300	6	-	2	Yes	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	X
4C	6X40	0	2-4-2	-	4	Yes	-	15	S	-	X
6A	*	300	*	-	6	Yes	-	-	N	-	X

\* Microwave Detection Zone

**2 Phase Fully Actuated Fayetteville Signal System**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE		
	2	4	6
Min Green *	12	7	12
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	6.0	2.0	6.0
Max 1 *	90	30	90
Yellow	4.7	3.7	4.7
Red Clear	1.6	2.1	1.6
Actuations B4 Add *	0	-	0
Seconds / Actuation *	1.5	-	2.5
Max Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	45	-	45
Minimum Gap	3.0	-	3.0
Locking Detector	X	-	X
Recall Position	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

**LEGEND**

- | PROPOSED | EXISTING |
|----------|----------|
|          |          |
|          | N/A      |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
| N/A      |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |

**Signal Upgrade**

	<p><b>Canopy Lane At I-295 NB Ramp</b></p>		<p>SEAL 29904</p>
	<p>Division 6 Cumberland County Fayetteville</p>		
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>PLAN DATE: July 2016</p>	<p>REVIEWED BY: JPG</p>	<p>DATE: 10/11/2016</p>
<p>PREPARED BY: Jeff Spence</p>	<p>REVIEWED BY:</p>	<p>INIT. DATE</p>	<p>DATE</p>
<p>SCALE: 0 30 1"=30'</p>	<p>REVISIONS</p>	<p>INIT. DATE</p>	<p>DATE</p>
<p>SIG. INVENTORY NO. 06-1333</p>	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>	<p>DocuSigned by: Jason P. Galloway</p>	<p>DATE: 10/11/2016</p>

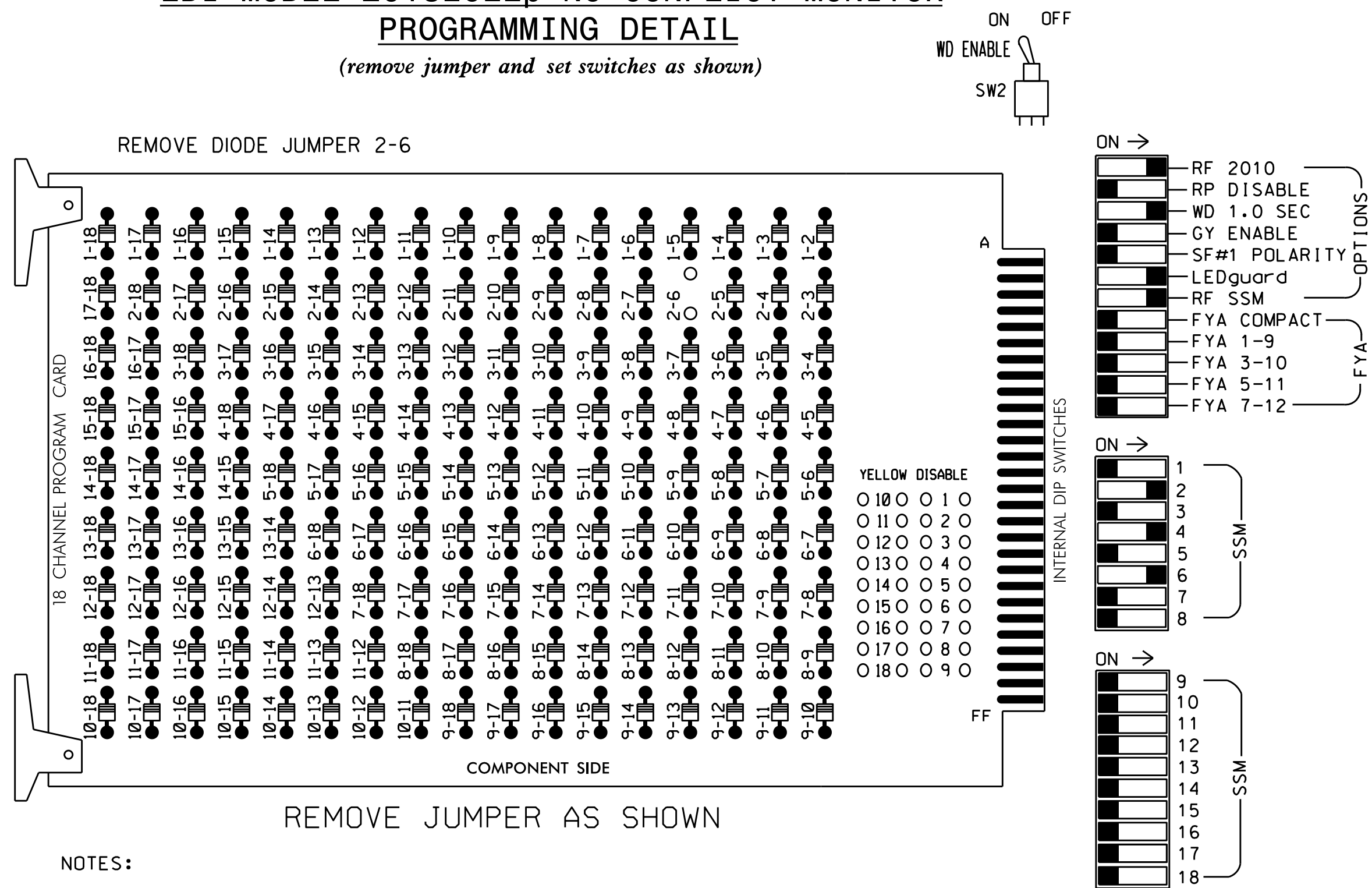
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 J:\0111000



# EDI MODEL 2018EClip-NC CONFLICT MONITOR

## PROGRAMMING DETAIL

(remove jumper 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.
- Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

## NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

## SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

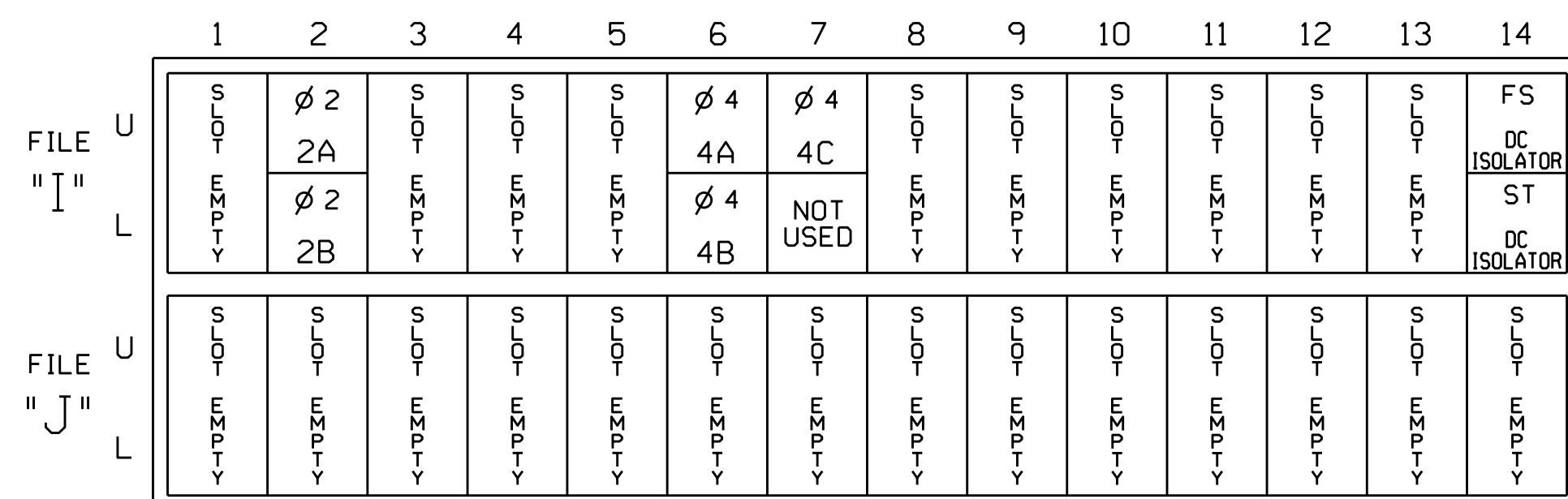
NU = Not Used

## EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S5,S8  
 PHASES USED.....2,4,6  
 OVERLAPS.....NONE

## INPUT FILE POSITION LAYOUT

(front view)



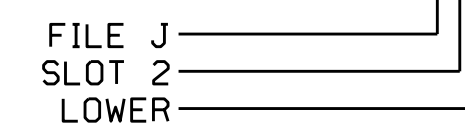
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

## INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
4C	TB6-1,2	I7U	65	34	4	YES		15	S

### INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1333  
 DESIGNED: July 2016  
 SEALED: 10/11/2016  
 REVISED: N/A

## SPECIAL DETECTOR NOTE

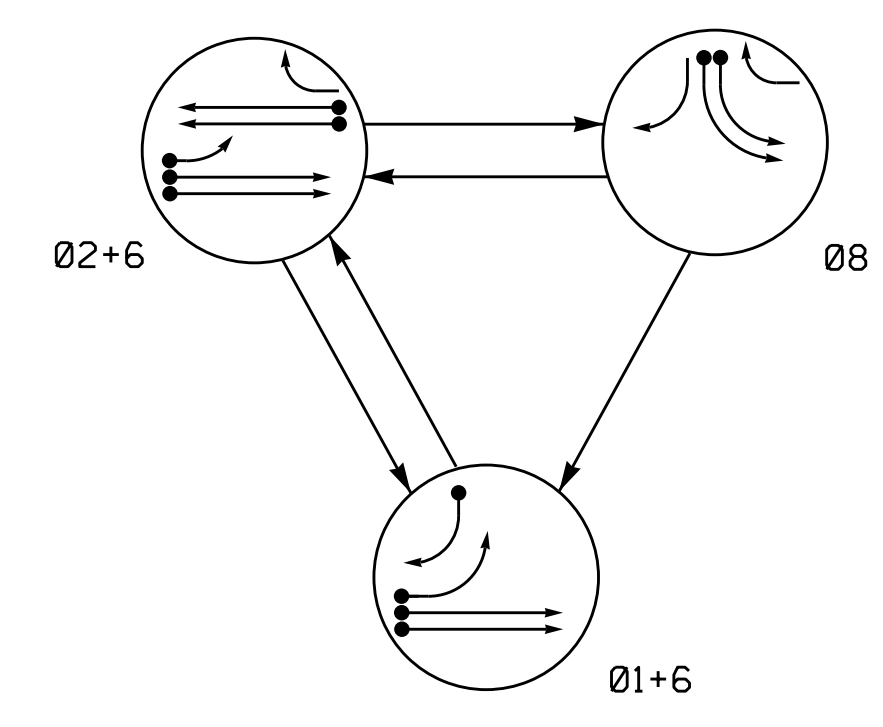
For detection zone 6A, install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

## Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Canopy Lane at I-295 NB Ramp		SEAL 
	Division 6 PLAN DATE: October 2016 PREPARED BY: S. Armstrong	Cumberland County REVIEWED BY: BAS REVIEWED BY:	Fayetteville REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

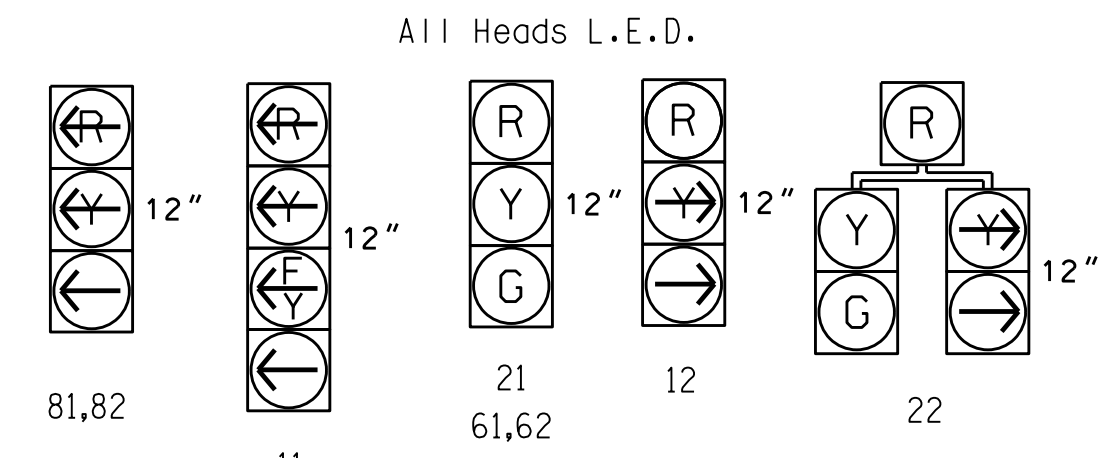
PHASING DIAGRAM



**PHASING DIAGRAM DETECTION LEGEND**  
 ● DETECTED MOVEMENT  
 ○ UNDETECTED MOVEMENT (OVERLAP)  
 - - - UNSIGNALIZED MOVEMENT  
 ← - - - PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	01+6	02+6	08	F.L.O.P.L.
11	←	→	←	→
12	→	←	←	→
21	R	G	R	Y
22	R	G	R	Y
61,62	G	G	R	Y
81,82	←	←	←	←

SIGNAL FACE I.D.

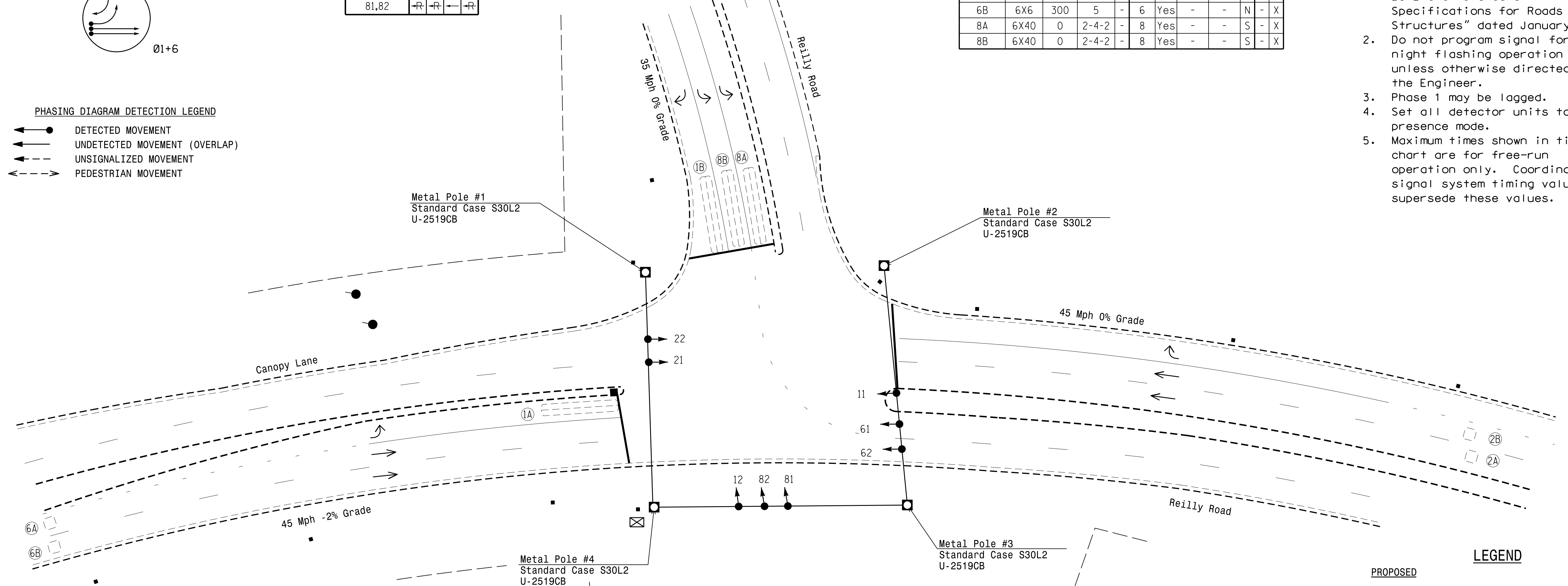


ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	S	- X
1B	6X40	0	2-4-2	-	6	Yes	-	3	G	- X
2A	6X6	300	5	-	2	Yes	-	-	N	- X
2B	6X6	300	5	-	6	Yes	-	-	N	- X
6A	6X6	300	5	-	6	Yes	-	-	N	- X
6B	6X6	300	5	-	6	Yes	-	-	N	- X
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	- X
8B	6X40	0	2-4-2	-	8	Yes	-	-	S	- X

3 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	6.0	6.0	2.0
Max I *	20	90	90	20
Yellow	3.0	4.7	4.7	3.8
Red Clear	3.3	1.9	1.9	2.3
Actuations B4 Add *	-	0	0	-
Seconds /Actuation *	-	1.5	1.5	-
Max Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

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

Signal Upgrade

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**Canopy Lane/Reilly Road At Reilly Road**

Division 6 Cumberland County Fayetteville

PLAN DATE: July 2016 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

SEAL

DATE: 10/11/2016

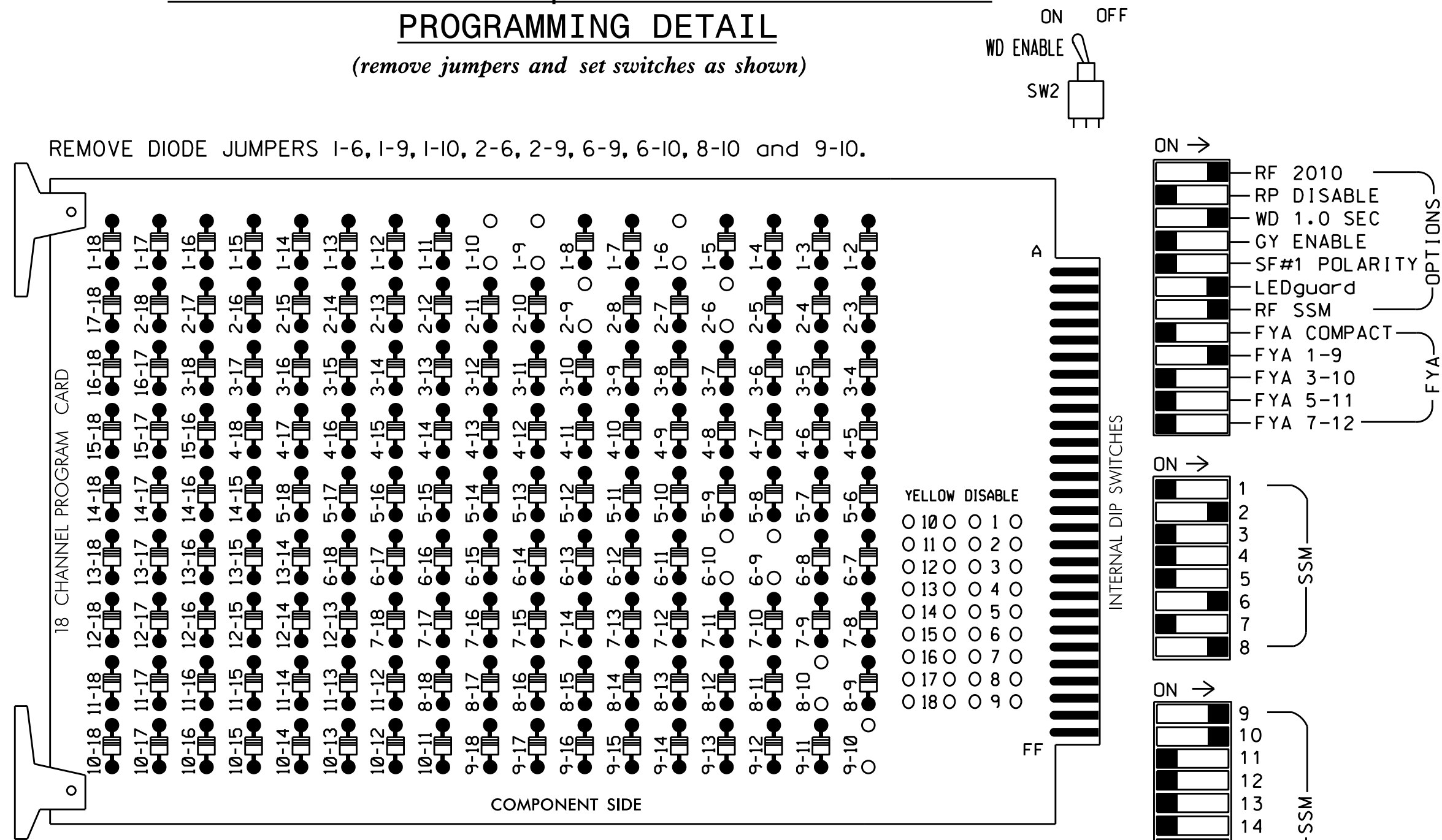
SCALE 0 30  
1"=30'

SIG. INVENTORY NO. 06-1334

13-0074-2016\_1334  
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 J:\011000

EDI MODEL 2018ECLIP-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.
- 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.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for volume density operation.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1,AUX S2  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail sheet 2.

PROJECT REFERENCE NO.	SHEET NO.
U-5742	Fig.258.1

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	NU	NU	NU	61,62	NU	NU	22	81,82	NU	11	12	NU	NU	NU
RED		128						134						A124				
YELLOW	*	129						135										
GREEN		130						136										
RED ARROW											107		A121					
YELLOW ARROW											108	108	A122	A125				
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127										109	109		A126				

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

INPUT FILE POSITION LAYOUT

(front view)

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

EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

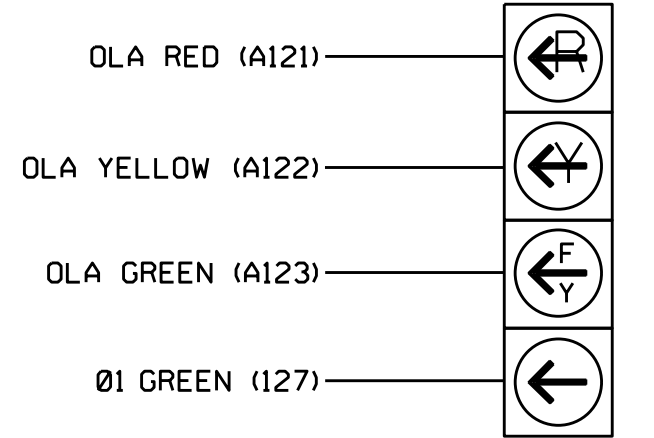
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	J1U	56	1	1	YES		15	S
1B	TB2-5,6	J2U	48	26	6	YES		3	G
2A	TB2-9,10	J3U	63	32	2	YES			N
2B	TB2-11,12	J3L	76	42	2	YES			N
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES			S

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
 INPUT FILE POSITION LEGEND: J2L  
 FILE J  
 SLOT 2  
 LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

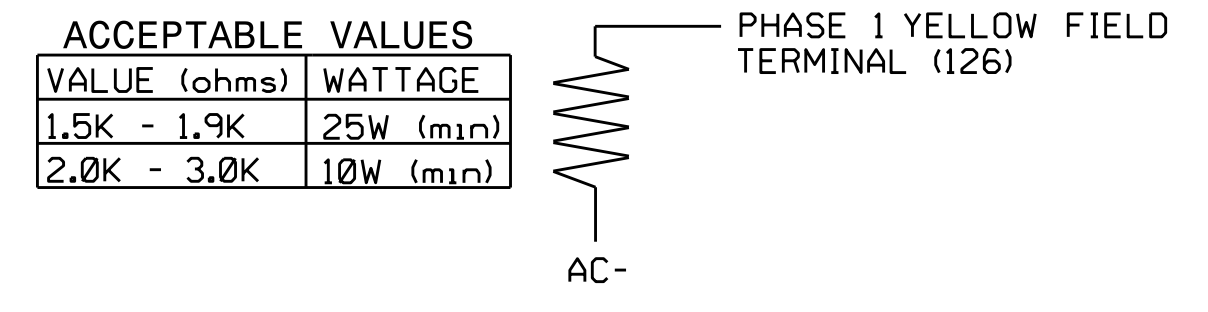
(wire signal head as shown)



11

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1334  
 DESIGNED: July 2016  
 SEALED: 10/11/2016  
 REVISED:

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	Canopy Lane/Reilly Road at Reilly Road		SEAL  SEAL 030530 ZACHARY M. LITTLE ENGINEER
	Division 6 PLAN DATE: October 2016 PREPARED BY: C. Strickland	Cumberland County Fayetteville REVIEWED BY: T. Joyce REVIEWED BY:	

10-007-2016-1P-03  
 S:\IT\ASST\TIS\SIGNAL\work\hgr\oups\g\Map\511\ck\lanc\061334\_sm\_e.le.xxx.dgn  
 cbs1r\ckland

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

### OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```

TMG VEH OVLP...[A] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 1
OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START DF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
    
```

Toggle Once

### OVERLAP B

Select TMG VEH OVLP [B] and 'NORMAL'

```

TMG VEH OVLP...[B] TYPE: .....NORMAL
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0
    
```

END PROGRAMMING

## FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

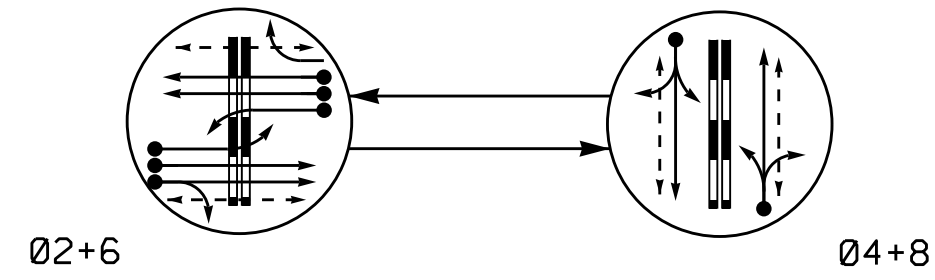
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-1334  
DESIGNED: July 2016  
SEALED: 10/11/2016  
REVISED:

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared In the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<h3 style="margin: 0;">Canopy Lane/Reilly Road at Reilly Road</h3> <p style="font-size: x-small;">Division 6 Cumberland County Fayetteville</p> <p style="font-size: x-small;">PLAN DATE: October 2016 REVIEWED BY: T. Joyce</p> <p style="font-size: x-small;">PREPARED BY: C. Strickland REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">SEAL 030530 ENGINEER CARY M. LITTLE</p>
REVISIONS	INIT.	DATE									
<p style="font-size: x-small;">DocuSigned by: <i>Cary M. Little</i> 10/13/2016</p> <p style="font-size: x-small;">0021EFD8F5341F DATE</p>		<p style="font-size: x-small;">SIG. INVENTORY NO. 06-1334</p>									

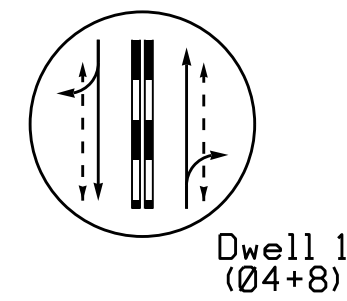
**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

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

**RAIL PREEMPT PHASES**  
(High Priority)



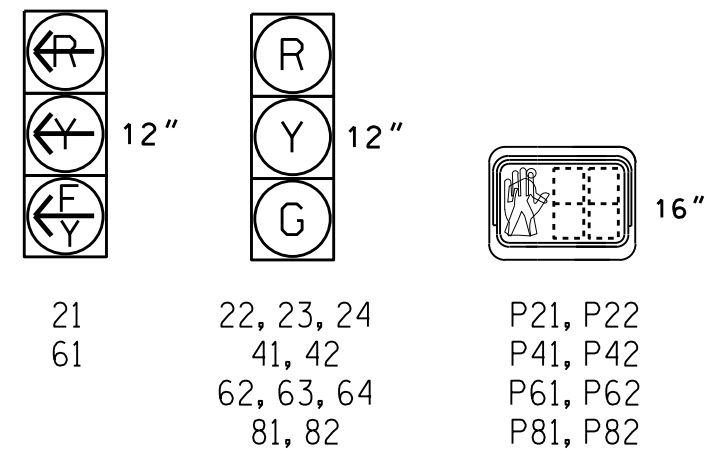
**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	02+6	04+8	Dwell 1	FLASH
21	F	R	R	R
22, 23, 24	G	R	R	R
41, 42	R	G	G	R
61	F	R	R	R
62, 63, 64	G	R	R	R
81, 82	R	G	G	R
P21, P22	W	DW	DW	DRK
P41, P42	DW	W	W	DRK
P61, P62	W	DW	DW	DRK
P81, P82	DW	W	W	DRK
Sign C	OFF	OFF	ON	*

\* See Note 8.

**SIGNAL FACE I.D.**

All Heads L.E.D.



FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	18	17	18	20
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	30	20	30	20
Yellow	4.0	3.8	4.0	3.8
Red Clear	1.8	2.1	1.8	2.1
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Lacking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

ASC/3 RR PREEMPT	
FUNCTION	PRE 1
Exit Phase(s)	2,6
Preempt Override	ON
Delay Time	0
Ped Clear Trough Yellow	Y
Terminate Phases	N
Track Clear Reserve	Y
Entrance Walk	1
Entrance Ped Clear	10
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Track Clear Min Green	0
Track Clear Yellow Change	-
Track Clear Red Clear	-
Min Dwell Time	7
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

\* Allows normal phase times to be used.

This signal was designed for Simultaneous Preemption

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	NEW CARD
2A, 2B	6X6	70	4	-	2	Yes	-	-	S	- X
2C	6X40	0	2-4-2	-	2	Yes	-	-	S	- X
4A	6X40	0	2-4-2	-	4	Yes	-	10	S	- X
6A, 6B	6X6	70	4	-	6	Yes	-	-	S	- X
6C	6X40	0	2-4-2	-	6	Yes	-	-	S	- X
8A	6X40	0	2-4-2	-	8	Yes	-	10	S	- X

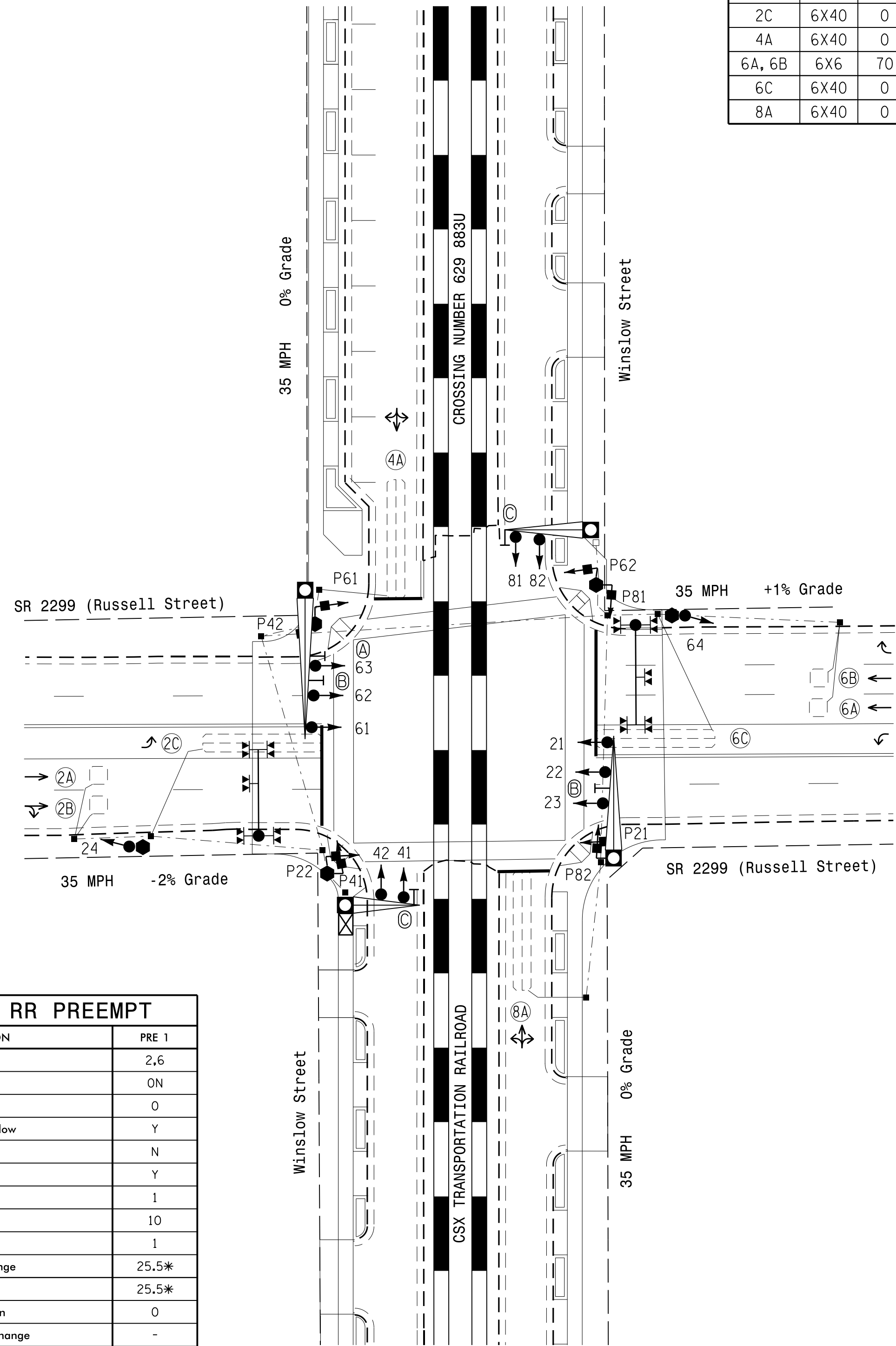
2 Phase Fully Actuated w/Railroad Preemption Fayetteville Signal System

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
- 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.
- Ensure flashing operation does not alter operation of blankout signs.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Program phase 4 and 8 for Startup Red Clr.

**LEGEND**

- | PROPOSED   | EXISTING   |
|--|--|
| ○ → Traffic Signal Head                          | ● → Traffic Signal Head                          |
| ○ → Modified Signal Head                         | ○ → N/A  |
| ⊥ Sign   | ⊥ Sign   |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ⊥ Signal Pole with Guy                           | ⊥ Signal Pole with Guy                           |
| ⊥ Signal Pole with Sidewalk Guy                  | ⊥ Signal Pole with Sidewalk Guy                  |
| ⊠ Inductive Loop Detector                        | ⊠ Inductive Loop Detector                        |
| □ Controller & Cabinet                           | □ Controller & Cabinet                           |
| □ Junction Box                                   | □ Junction Box                                   |
| ⊠ 2-in Underground Conduit                       | ⊠ 2-in Underground Conduit                       |
| N/A Right of Way                                 | ⊠ Right of Way                                   |
| → Directional Arrow                              | → Directional Arrow                              |
| ○ Metal Pole with Mastarm                        | ○ Metal Pole with Mastarm                        |
| ○ Type II Signal Pedestal                        | ○ Type II Signal Pedestal                        |
| N/A Railroad Cantilever                          | ⊠ Railroad Cantilever                            |
| ⊠ Right Arrow "ONLY" Sign (R3-5R)                | ⊠ Right Arrow "ONLY" Sign (R3-5R)                |
| ⊠ "DO NOT STOP ON TRACKS" Sign (R8-8)            | ⊠ "DO NOT STOP ON TRACKS" Sign (R8-8)            |
| ⊠ "NO LEFT TURN - TRAIN" L.E.D. Blankout Sign    | ⊠ "NO LEFT TURN - TRAIN" L.E.D. Blankout Sign    |



Signal Upgrade

Prepared In the Offices of:  
  
**SR 2299 (Russell Street) at Winslow Street**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: August 2016 REVIEWED BY: JPG  
 PREPARED BY: KGP, Jr. REVIEWED BY:  
 REVISIONS INIT. DATE  
 SCALE 0 30 1"=30'  
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 JASON P. GALLON  
 9/26/2016  
 SIG. INVENTORY NO. 06-0011

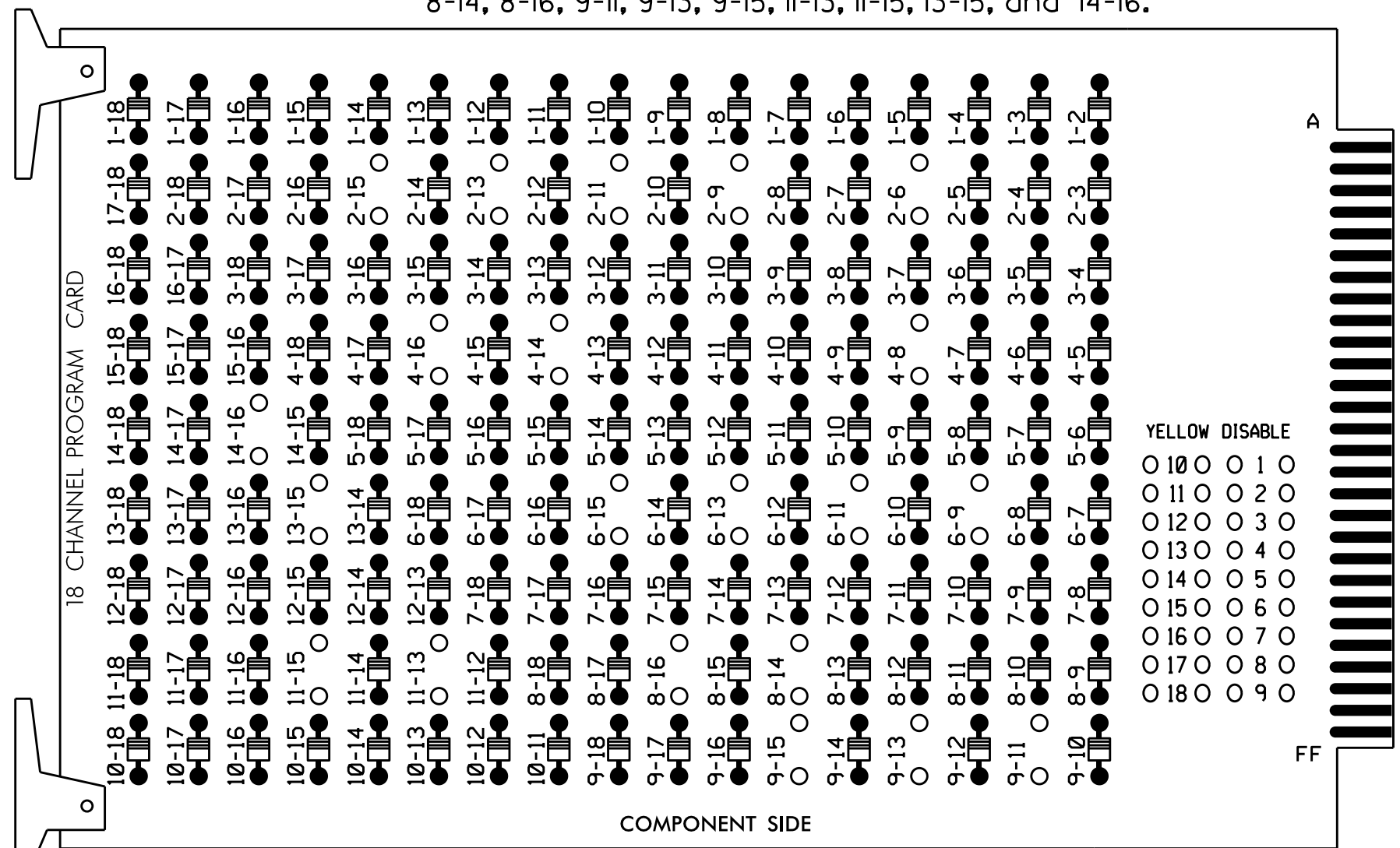
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 7:residence

**EDI MODEL 2018EClip-NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

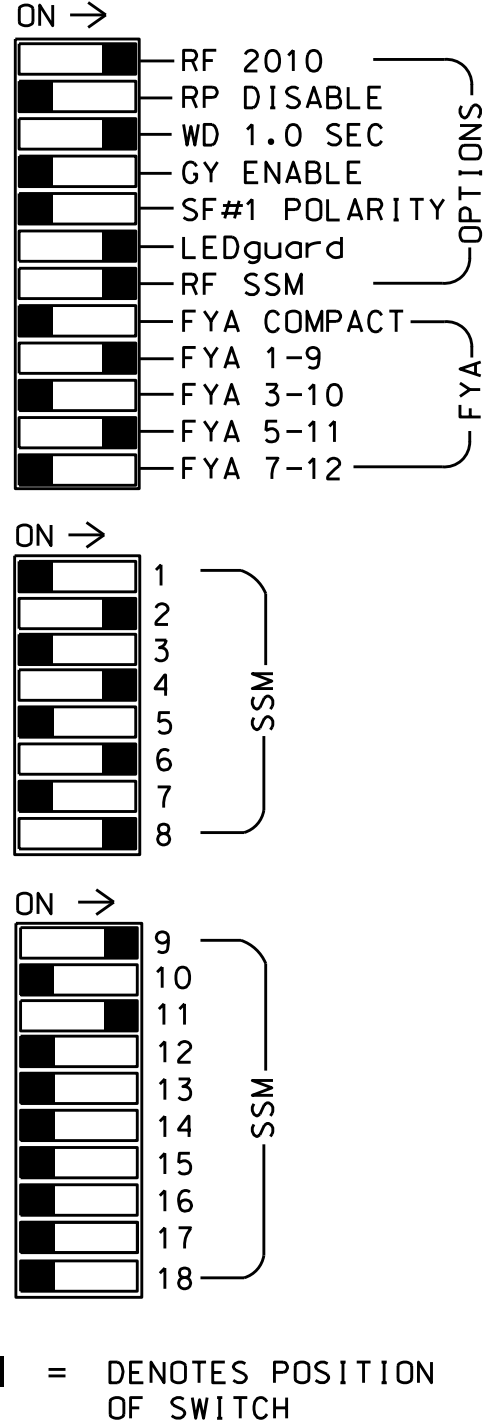
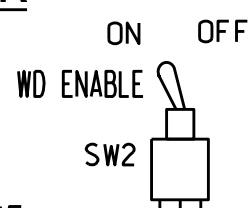
REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-14, 4-16, 6-9, 6-11, 6-13, 6-15, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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



**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program controller to start up in phase 4 Red and 8 Red.
5. Program phases 2 and 6 for Red Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12,  
 AUX S1,AUX S4  
 PHASES USED.....2,2PED,4,4PED,6,6PED,8,8PED  
 OVERLAP A.....2  
 OVERLAP B.....NOT USED  
 OVERLAP C.....6  
 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	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23 24	P21, P22	NU	41,42	P41, P42	NU	62,63 64	P61, P62	NU	81,82	P81, P82	61★	NU	NU	21★	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW																		
Hand icon				113			104			119		110						
Walking person icon				115			106			121		112						

NU = Not Used

★ See pictorial of head wiring in detail below.

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S	∅ 2	S	S	S	∅ 4	S	S	S	S	S	∅ 2 PED	∅ 6 PED	FS
L	2A,2B	2C	NOT USED	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
U	S	∅ 6	S	S	S	∅ 8	S	S	S	S	S	S	S	PRE1
L	6A,6B	6C	NOT USED	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR	AC ISOLATOR

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

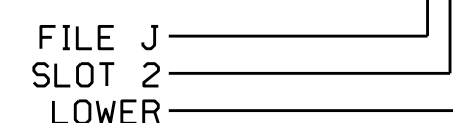
FS = FLASH SENSE  
 ST = STOP TIME  
 PRE1 = RR PREEMPT

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A,2B	TB2-5,6	I2U	39	2	2	YES			S
2C	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES		10	S
6A,6B	TB3-5,6	J2U	40	6	6	YES			S
6C	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		10	S
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				

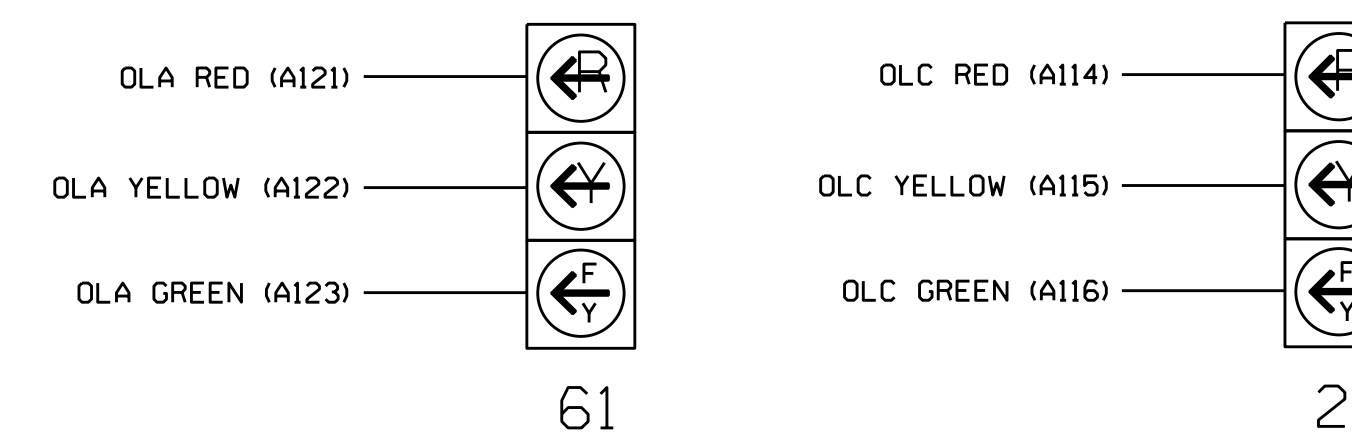
NOTE:  
 INSTALL DC ISOLATORS  
 IN INPUT FILE SLOTS  
 112 AND 113.

INPUT FILE POSITION LEGEND: J2L



**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-0011  
 DESIGNED: August 2016  
 SEALED: 9/26/2016  
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical AND PROGRAMMING DETAILS FOR: SR 2299 (Russell Street) at Winslow Street

Prepared In the Offices of:

Division 6 Cumberland County Fayetteville

PLAN DATE: September 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS	INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER KEITH M. MINES 036880

DocuSigned by: Keith M. Mines 10/6/2016 DATE

SIG. INVENTORY NO. 06-0011

06-0011-2016-14-33 S:\IT\SSM\15\_Signal\work\hgr\oups\g\_Mark\msfrong\60011\_sm\_elec\_xxx.dgn sarmsfrong

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[A] TYPE: OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
  
```

↓ Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[C] TYPE: OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

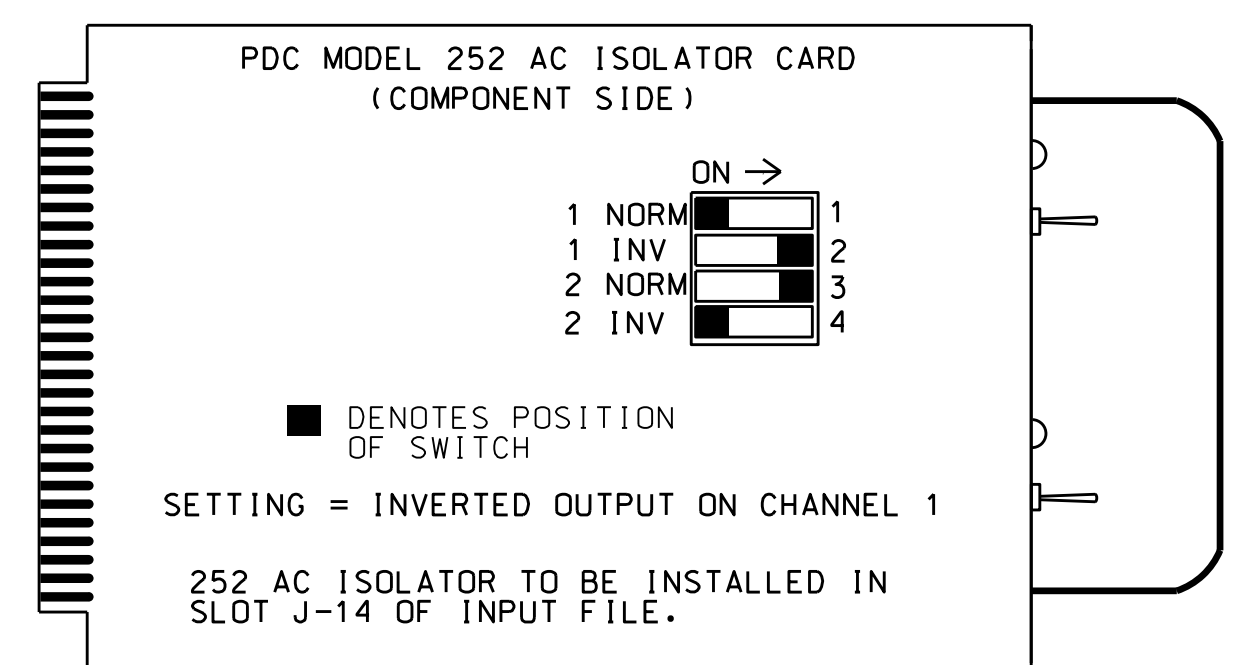
LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
  
```

END PROGRAMMING

## PREEMPT 1 AC ISOLATOR (MODEL 252)

### OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

## COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-0011  
 DESIGNED: August 2016  
 SEALED: 9/26/2016  
 REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAILS FOR:	<b>SR 2299 (Russell Street)</b> at <b>Winslow Street</b>	SEAL 
	Division 6 Cumberland County Fayetteville PLAN DATE: September 2016 REVIEWED BY: BAS PREPARED BY: S. Armstrong REVIEWED BY:	Documented by: Keith M. Mims 10/6/2016 DATE
REVISIONS      INIT.      DATE		SIG. INVENTORY NO. 06-0011

26-SEP-2016 16:30  
 C:\PITS\ASST\S\Sig\asc\work\groups\Sig\_Mon\Arms\strng\060011\_sm.ele.xxx.dgn  
 sarmstrong

# ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select 4. PREEMPTOR/TSP
- From PREEMPTOR/TSP/SCP Submenu select 1. PREEMPT PLAN 1-10

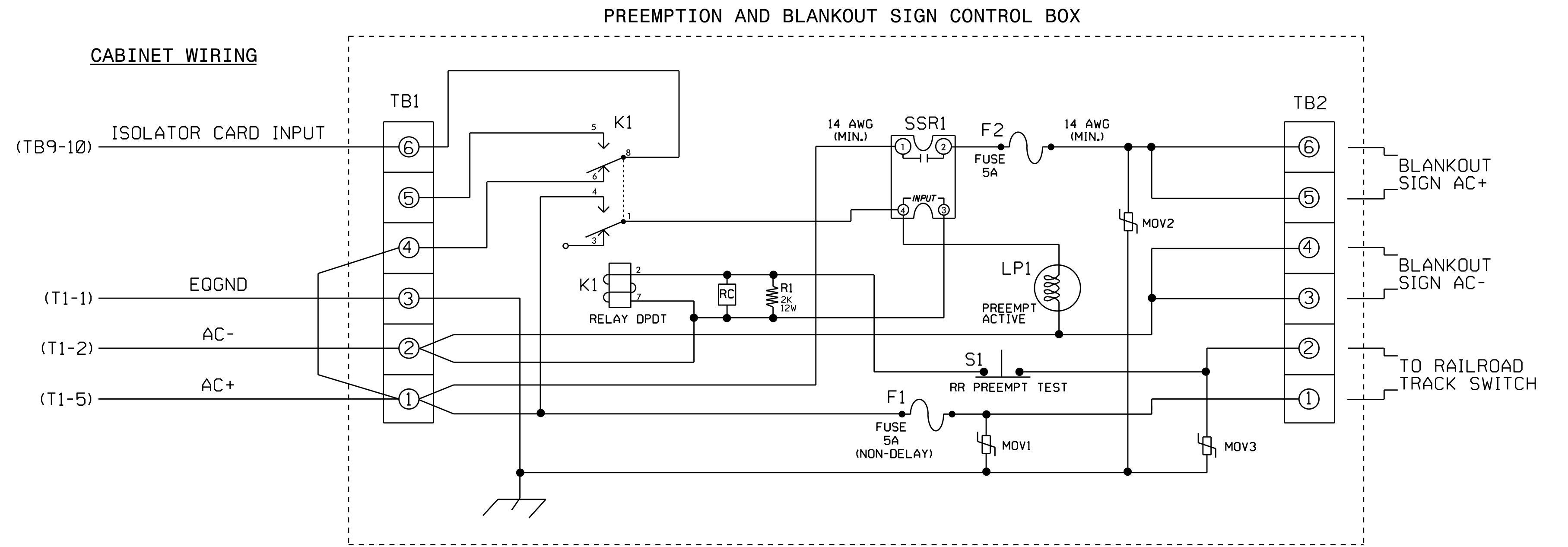
Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

PREEMPT PLAN [ 1 ]	ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
OVERLAP A B C D E F G H I J K L M N O P	
TRKCLR V . . . . .	
TRKCLR O . . . . .	
ENA TRL . . . . .	
DWEL VEH . . . . X . . . . X . . . . .	
DWEL PED . . . . .	
DWEL OLP . . . . .	
CYC VEH . . . . .	
CYC PED . . . . .	
CYC OLP . . . . .	
EXIT PH . X . . . . X . . . . .	
EXIT CAL . . . . .	
SP FUNC . . . . .	

ENABLE... YES	IPMT	OVRIDE..XI	INTERLOCK..NO
DET LOCK... X	IDELAY..	OINHIBIT... 0	
VERRIDE FL. .	IDURATION	OICLR-GRN... NO	
TERM OLP. NO	IPC>YEL	YES	ITERM PH NO
PED DARK.. NO	ITC RESRV	YES	IDWELL FL OFF
LINK PMT....O	IX FLCOLR	RED	EXIT OPT. OFF
X TMG PLN...O	IRE-SERV..	O	FLT TYPE.HARD
FREE DUR PMT	IR1 NOIR2	NOIR3	NOIR4 NO
--TIMING----	WALKIPED	CLIMN	GRI YELI RED
ENTRANCE TM. 11	101	1125.5	125.5
-----MIN	GRIEXT	GRIMX	GRI YELI RED
TRACK CLEAR 01	01	0125.5	125.5
-----MIN	DLIPMTEXT	IMX TMI	YELI RED
DWL/CYC-EXIT 71	0.01	0125.5	125.5
PMT ACTIVE OUT..ON	PMT ACT	DWELL...NO	
OTHER - PRI	PMT.OFF	NON-PRI	PMT....OFF
INH EXT TIME... 0.0	PED PR	RETURN...OFF	
PRIORITY RETURN.OFF	QUEUE	DELAY.... OFF	
COND DELAY.....OFF			
PHASES 1 2 3 4 5 6 7 8			
PR RTN% 0 0 0 0 0 0 0 0			
PHASES 9 10 11 12 13 14 15 16			
PR RTN% 0 0 0 0 0 0 0 0			

# RAILROAD PREEMPTION WIRING DETAIL

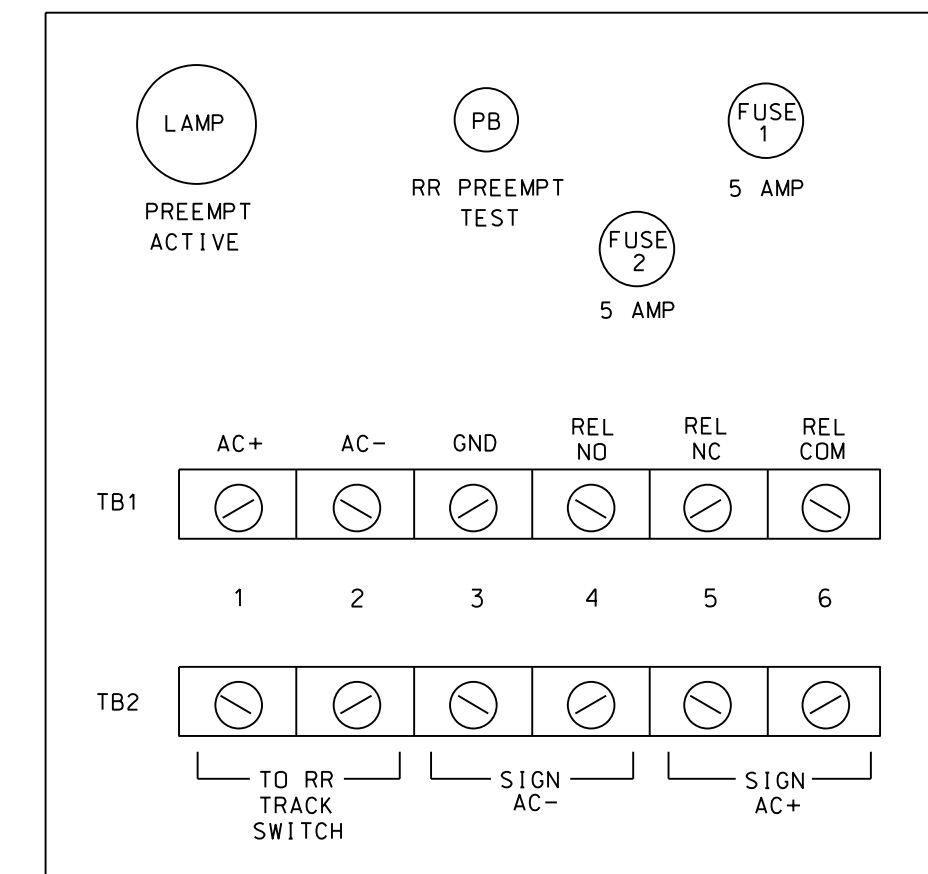
(wire as shown below)



### NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See sheet 2 for details.
- IMPORTANT!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

### FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0011  
DESIGNED: August 2016  
SEALED: 9/26/2016  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

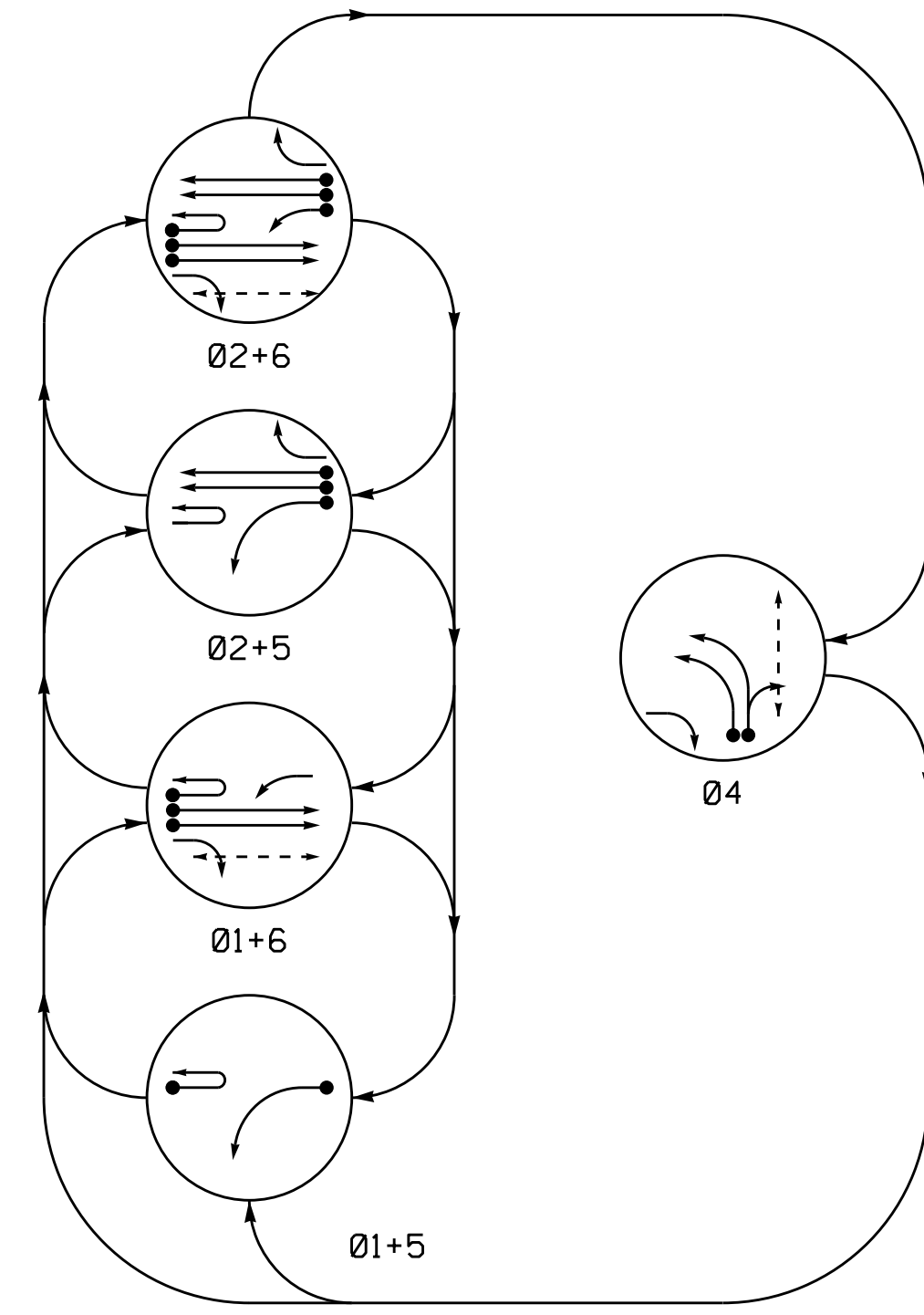
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 2299 (Russell Street) at Winslow Street		SEAL  Keith M. Mins ENGINEER
	Division 6 PLAN DATE: September 2016 PREPARED BY: S. Armstrong	Cumberland County REVIEWED BY: BAS REVIEWED BY:	

06-SEP-2016 16:30  
 S:\IT\SSM\TSS\Sig\asc\work\groups\sig\Mon\strmstrng\060011\_sml.ele.xxx.dgn  
 sarmstrng



### PHASING DIAGRAM

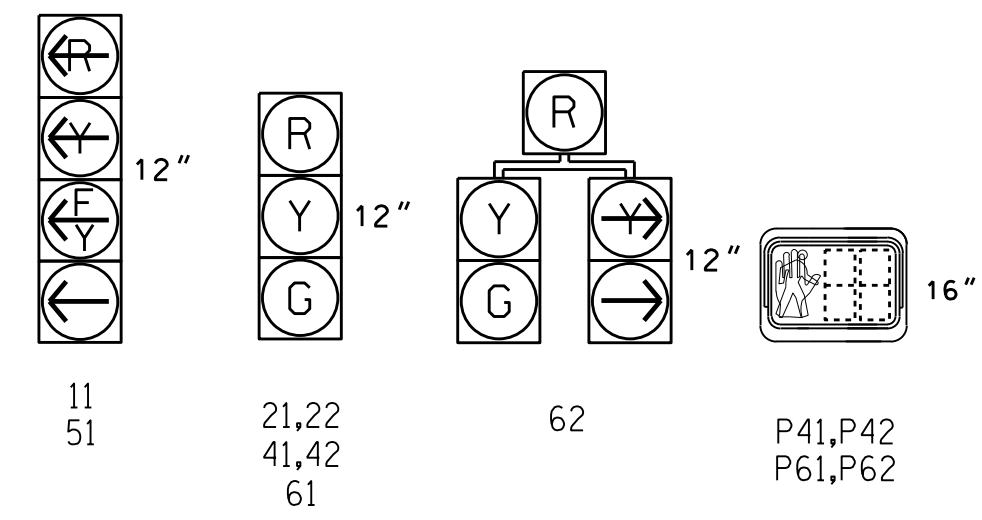


#### PHASING DIAGRAM DETECTION LEGEND

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

### SIGNAL FACE I.D.

All Heads L.E.D.



### TABLE OF OPERATION

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

### ASC/3 DETECTOR INSTALLATION CHART

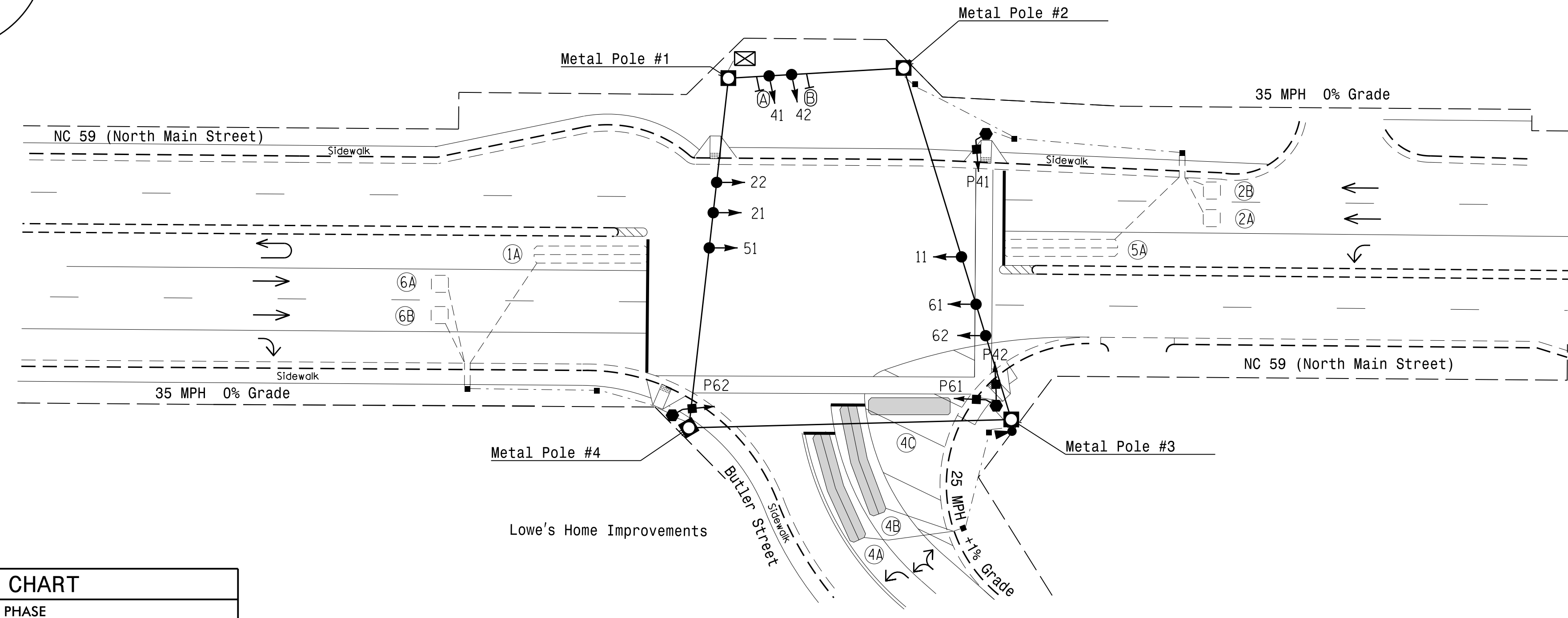
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	10	S	-	X
2A, 2B	6X6	70	4	-	2	Yes	-	-	S	-	X
4A	6X40	0	*	-	4	Yes	-	3	S	-	X
4B	6X40	0	*	-	4	Yes	-	10	S	-	X
4C	6X40	0	*	-	4	Yes	-	20	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	10	S	-	X
6A,6B	6X6	70	4	-	6	Yes	-	-	S	-	X

\* Multizone Microwave Detection

### 6 Phase Fully Actuated Fayetteville Signal System

#### NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- 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.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



### ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	
Min Green *	7	10	7	7	10	
Walk *	0	0	7	0	7	
Ped Clear	0	0	19	0	29	
Veh. Extension *	2.0	3.0	2.0	2.0	3.0	
Max 1 *	25	45	20	25	45	
Yellow	3.0	3.8	3.0	3.0	3.8	
Red Clear	3.1	2.3	3.1	3.1	2.3	
Actuations B4 Add *	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	
Max Initial *	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	
Locking Detector	-	X	-	-	X	
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	
Dual Entry	-	-	-	-	-	
Simultaneous Gap	X	X	X	X	X	

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

### LEGEND

- | PROPOSED   | EXISTING    |
|--|-------------|
| ○ → 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     |
| ○ → Metal Strain Pole                              | ○ → 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 II Signal Pedestal                        | ○ → N/A     |
| N/A → Curb Ramp                                    | N/A → N/A   |
| ○ → Multizone Microwave Zone                       | ○ → N/A     |
| ○ → Multizone Microwave Detector                   | ○ → N/A     |
| (A) → Left Arrow "ONLY" Sign (R3-5L)               | (A) → N/A   |
| (B) → Combined Left and Right Arrow Sign (R3-6LR)  | (B) → N/A   |

### Signal Upgrade

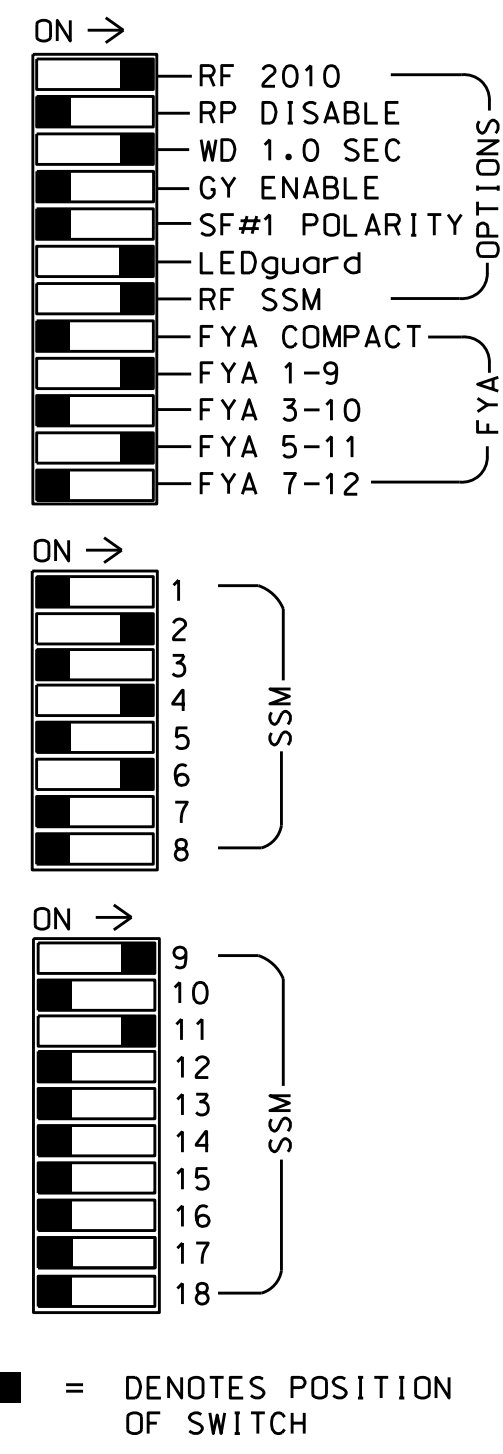
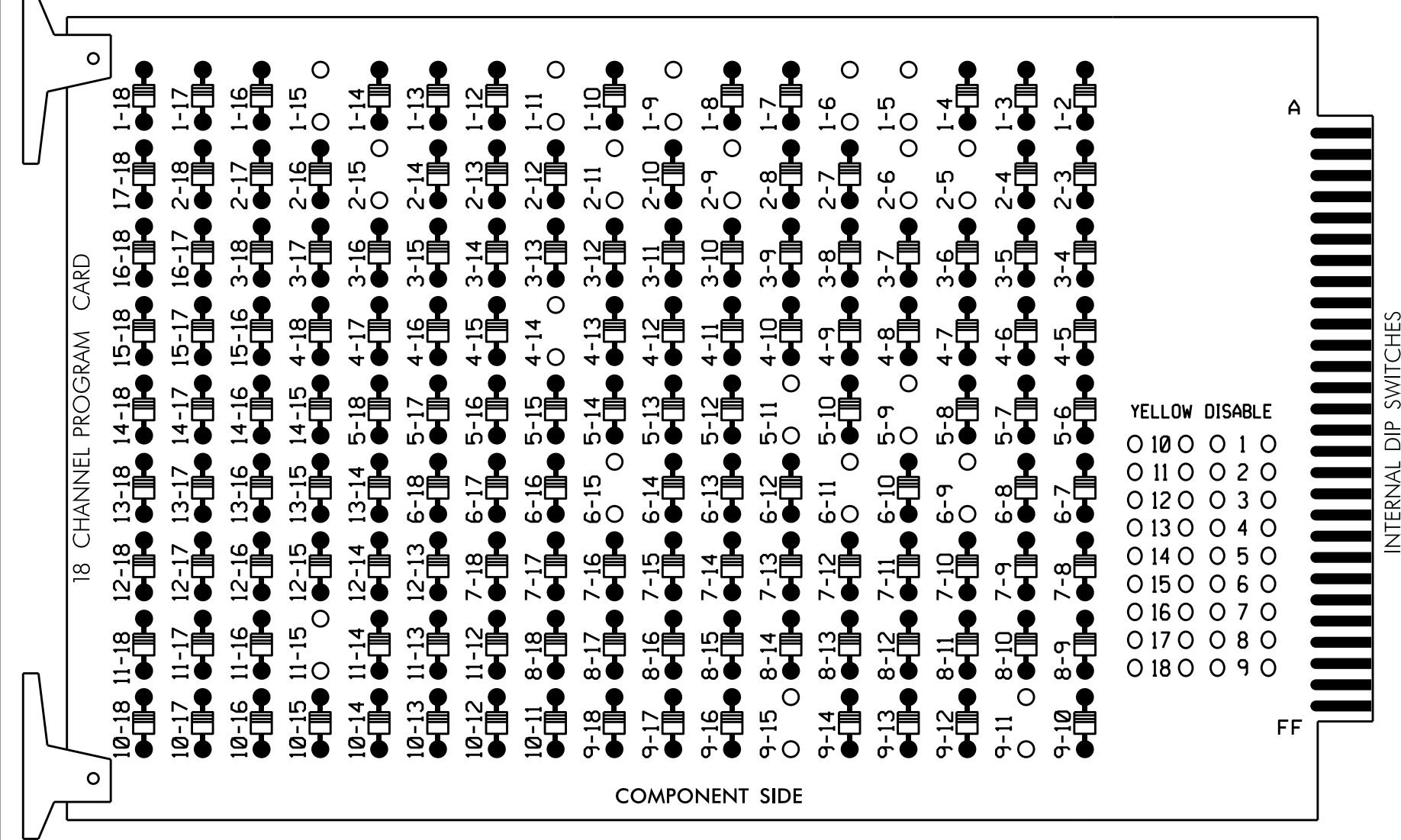
	<b>NC 59 (N. Main Street) at Butler Street</b>		
	Division 6 Cumberland County Hope Mills		
	PLAN DATE: October 2016 PREPARED BY: KGP/JPG	REVIEWED BY: JPG REVIEWED BY:	
SCALE: 1"=30' 	REVISIONS:	INIT. DATE:	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED Date: 10/24/2016 Signature: Jason P. Galloway SIG. INVENTORY NO. 06-1368

24-0017-2016\_09-152  
 S:\MIS\GIS\GIS\Sig\Signal\Design\Section\Eastern\Region\01\U-5742 Fayetteville\11e ASC\3\606-1368\6061368.s1a.dsn\_20161020.dgn  
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**EDI MODEL 2018ECLIP-NC 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, 4-14, 5-9, 5-11, 6-9, 6-11, 6-15, 9-11, 9-15, and 11-15.



REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that 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.
- Enable Simultaneous Gap-Out for all phases.
- Program controller to start up in phase 2 Green and 6 Walk.
- The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8,S9, AUX S1,AUX S4  
 PHASES USED.....1,2,4,4PED,5,6,6PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

**SIGNAL HEAD HOOK-UP CHART**

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

NU = Not Used

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

\* See pictorial of head wiring in detail below.

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	∅ 1 1A	∅ 2 2A,2B	-	-	-	-	-	-	-	-	-	-	-	-
FILE "J"	∅ 5 5A	∅ 6 6A,6B	-	-	-	-	-	-	-	-	-	-	-	-

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**

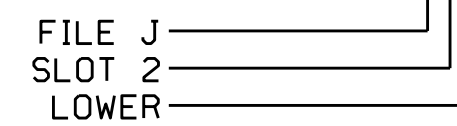
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		10	S
2A,2B	TB2-5,6	I2U	48	26	6	YES			S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		10	S
6A,6B	TB3-5,6	J2U	40	6	6	YES			S
PED PUSH BUTTONS									
P41,P42	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.

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.

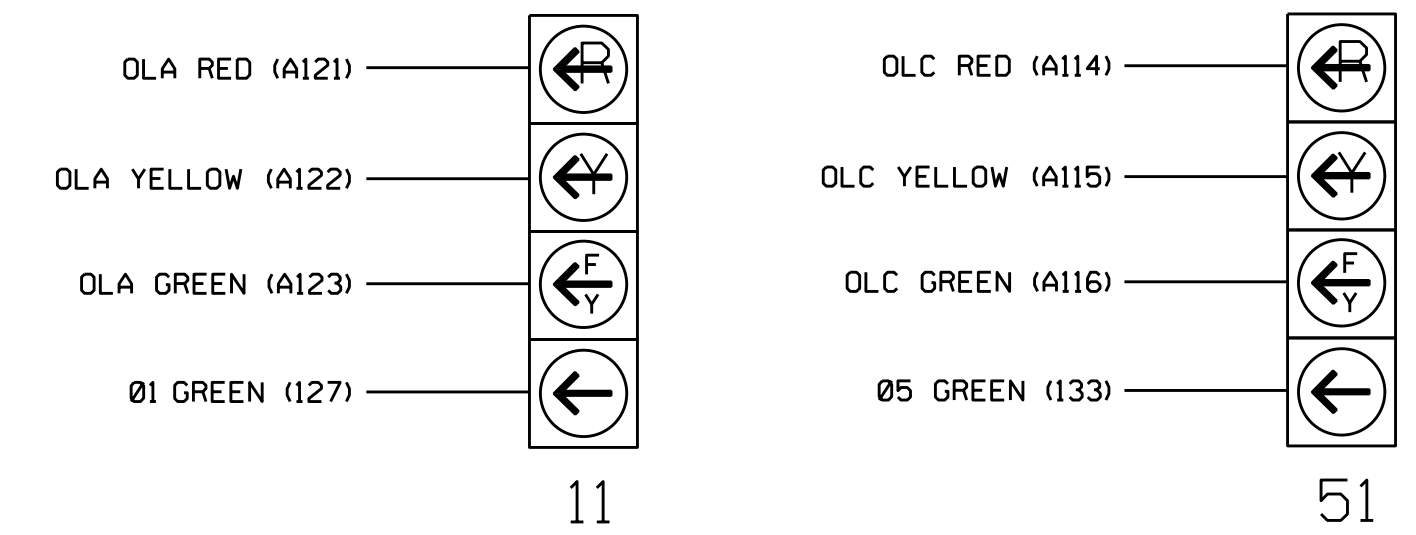
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



**FYA SIGNAL WIRING DETAIL**

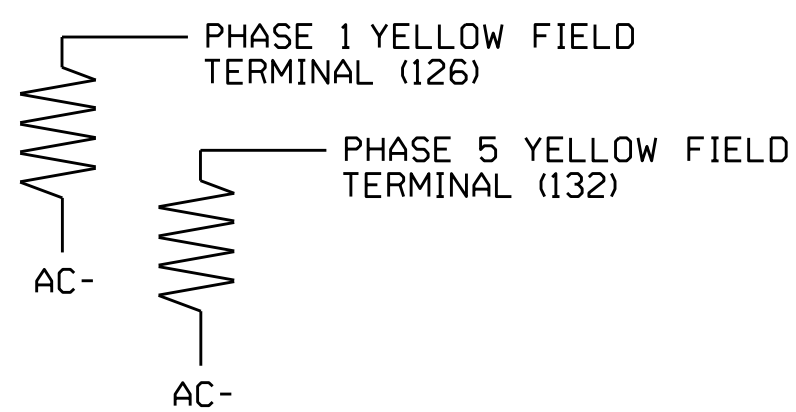
(wire signal heads as shown)



**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)

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



**SPECIAL DETECTOR NOTE**

For detection zones 4A, 4B, and 4C, install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details for: NC 59 (N. Main Street) at Butler Street

Prepared In the Offices of: *Transporatio Mobility and Safety Solutions*

Division 6 Cumberland County Hope Mills

PLAN DATE: October 2016 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

DocuSigned by: *Keith M. Mins* 10/24/2016

SIG. INVENTORY NO. 06-1368

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

*OVERLAP A*

Select TMG VEH OVLP [A] and 'PPLT FYA'

TMG VEH OVLP...[A] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 1

OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

Toggle Twice

*OVERLAP C*

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE: ....PPLT FYA

PROTECTED LEFT TURN.... PHASE 5

OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0

ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

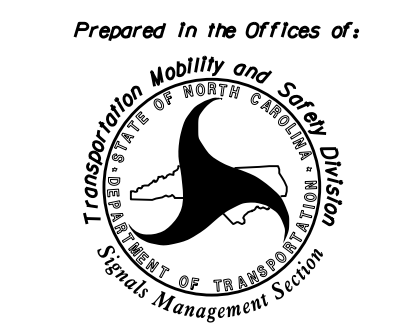
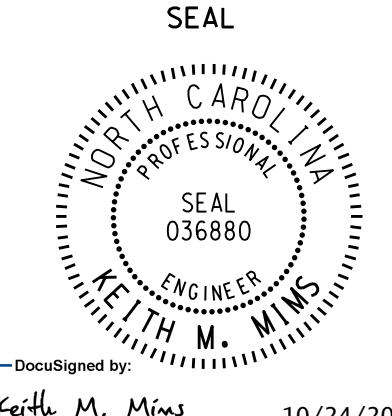
### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

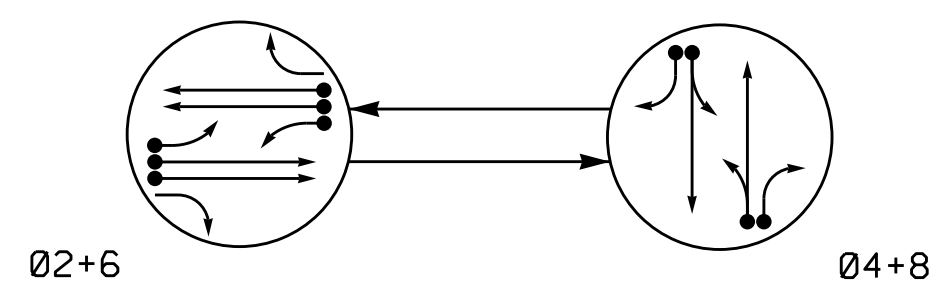
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1368  
 DESIGNED: October 2016  
 SEALED: 10/24/2016  
 REVISED: N/A

Electrical Detail Sheet 2 of 2

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

<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">Prepared In the Offices of:</p>  <p style="font-size: 8px;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>NC 59 (N. Main Street) at Butler Street</b></p> <p>Division 6 Cumberland County Hope Mills</p> <p>PLAN DATE: October 2016 REVIEWED BY: BAS</p> <p>PREPARED BY: S. Armstrong REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="text-align: center;">SEAL</p>  <p style="font-size: 8px;">DocuSigned by: Keith M. Mins 10/24/2016 2780788EBCD38A5 DATE</p> <p style="font-size: 8px;">SIG. INVENTORY NO. 06-1368</p>
REVISIONS	INIT.	DATE									

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

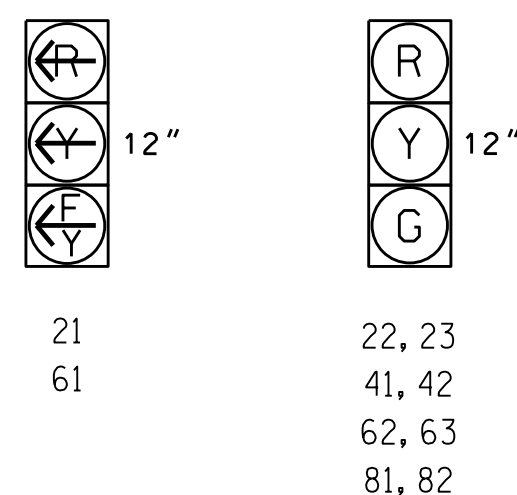
- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- ←--- UN SIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	F L
21	F	R	Y
22,23	G	R	Y
41,42	R	G	R
61	F	R	Y
62,63	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

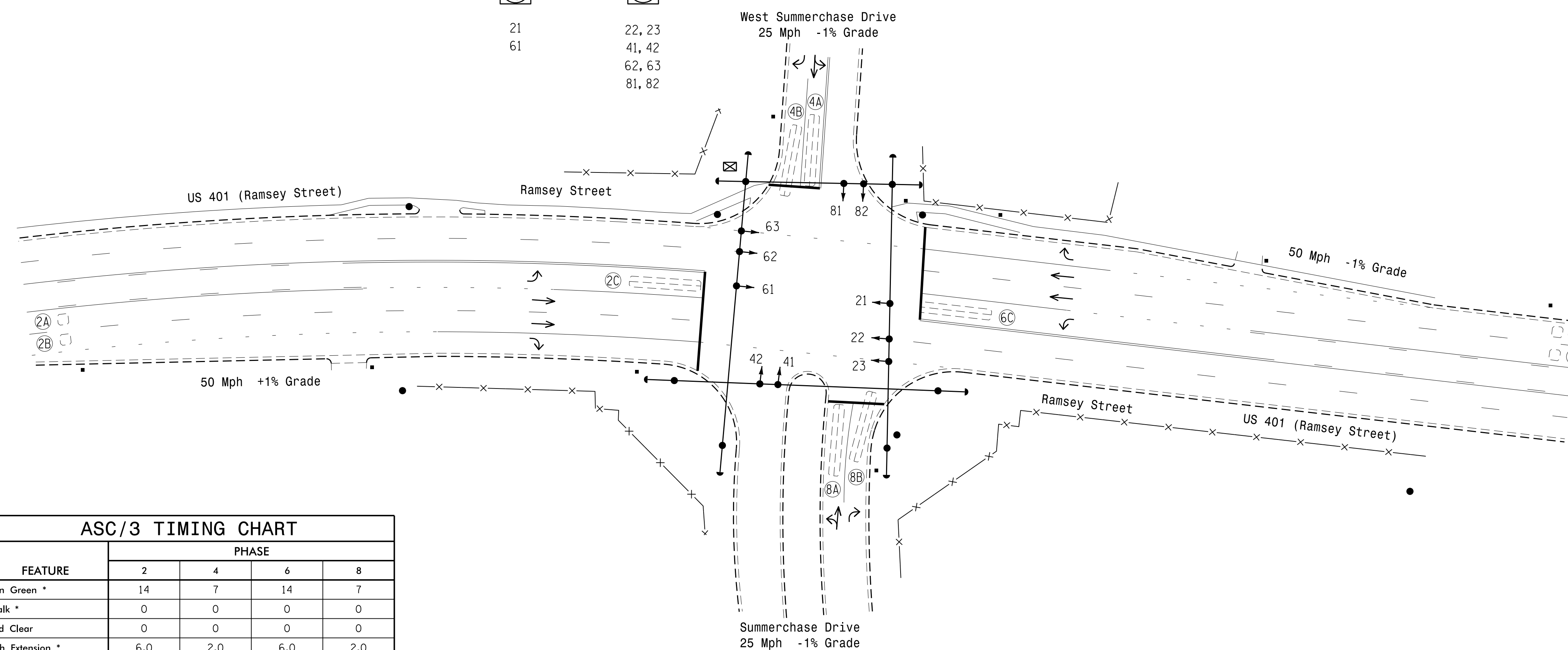


ASC/3 DETECTOR INSTALLATION CHART 332 CABINET										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP NEW CARD
2A	6x6	355	6	-	2	Yes	-	-	N	X
2B	6x6	355	6	-	2	Yes	-	-	N	X
2C	6x40	0	2-4-2	-	2	Yes	-	3	G	X
4A	6x40	0	2-4-2	-	4	Yes	-	3	S	X
4B	6x40	+5	2-4-2	-	4	Yes	-	15	S	X
6A	6x6	355	6	-	6	Yes	-	-	N	X
6B	6x6	355	6	-	6	Yes	-	-	N	X
6C	6x40	0	2-4-2	-	6	Yes	-	3	G	X
8A	6x40	0	2-4-2	-	8	Yes	-	-	S	X
8B	6x40	+5	2-4-2	-	8	Yes	-	15	S	X

2 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	2	4	6	8
Min Green *	14	7	14	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	6.0	2.0
Max 1 *	90	20	90	20
Yellow	4.9	3.2	4.9	3.2
Red Clear	1.4	2.9	1.4	2.9
Actuations B4 Add *	0	-	0	-
Seconds / Actuation *	1.5	-	1.5	-
Max Initial *	39	-	39	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	45	-	45	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND	
PROPOSED	EXISTING
○ →	● →
● →	N/A
⊥	⊥
○ ⊥	○ ⊥
○ ⊥	○ ⊥
⊗	⊗
□	□
N/A	N/A
→	→

Signal Upgrade

**US 401 (Ramsey Street) At Summerchase Drive**

Division 6 Cumberland County Fayetteville

PLAN DATE: August 2016 REVIEWED BY: JPG

PREPARED BY: EMM/JPG REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

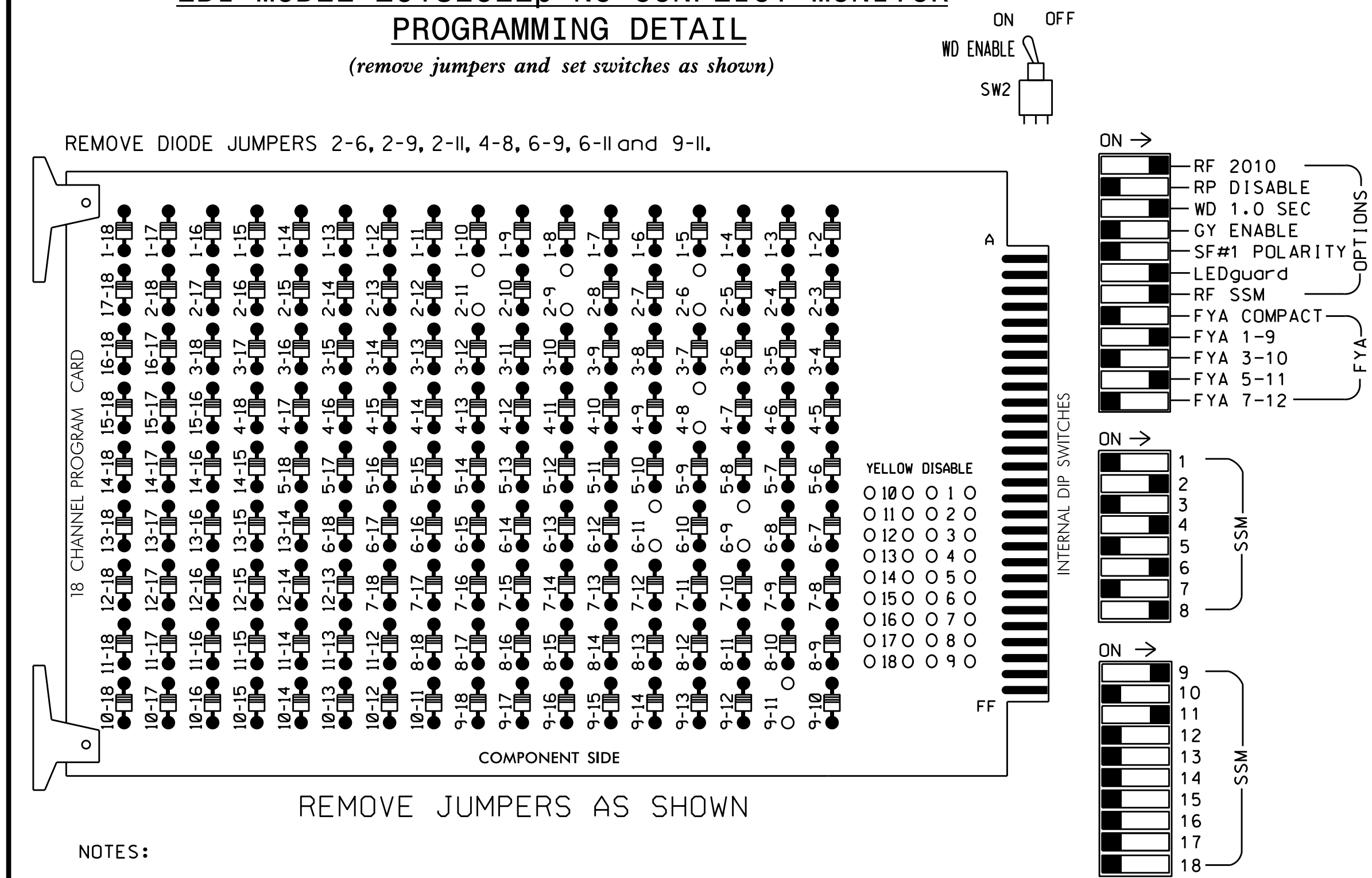
Jason P. Gallaway 10/22/2016

SIG. INVENTORY NO. 06-1369

27-001-2016-08-24  
 S:\IT\ASU\15\_Signal\Signal Design\_Section\Eastern Region\04\1-06#06-1369#061369.sig.dsn\ASU3\_2016mads.dgn  
 7:resence

**EDI MODEL 2018ECLIP-NC CONFLICT MONITOR  
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

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

■ = DENOTES POSITION OF SWITCH

**INPUT FILE POSITION LAYOUT**

(front view)

FILE	U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	S	∅ 2	∅ 2	-OFS	S	∅ 4	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	FS
	L	2A	2C	-OFS	4A	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	DC ISOLATOR
"J"	S	∅ 6	∅ 6	-OFS	S	∅ 8	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	FS
	L	6A	6C	-OFS	8A	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	-OFS	DC ISOLATOR

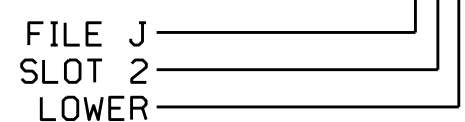
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			N
2B	TB2-7,8	I2L	43	12	2	YES			N
2C	TB2-9,10	I3U	63	32	2	YES		3	G
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES		15	S
6A	TB3-5,6	J2U	40	6	6	YES			N
6B	TB3-7,8	J2L	44	16	6	YES			N
6C	TB3-9,10	J3U	64	36	6	YES		3	G
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		15	S

INPUT FILE POSITION LEGEND: J2L



**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....2070E  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S8,S11,AUX S1,AUX S4  
 PHASES USED.....2,4,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail this sheet

**ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL**

(program controller as shown)

1. From Main Menu select **2. CONTROLLER**
2. From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

**OVERLAP A**

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
    
```

Toggle Twice

**OVERLAP C**

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[C] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
    
```

END PROGRAMMING

**SIGNAL HEAD HOOK-UP CHART**

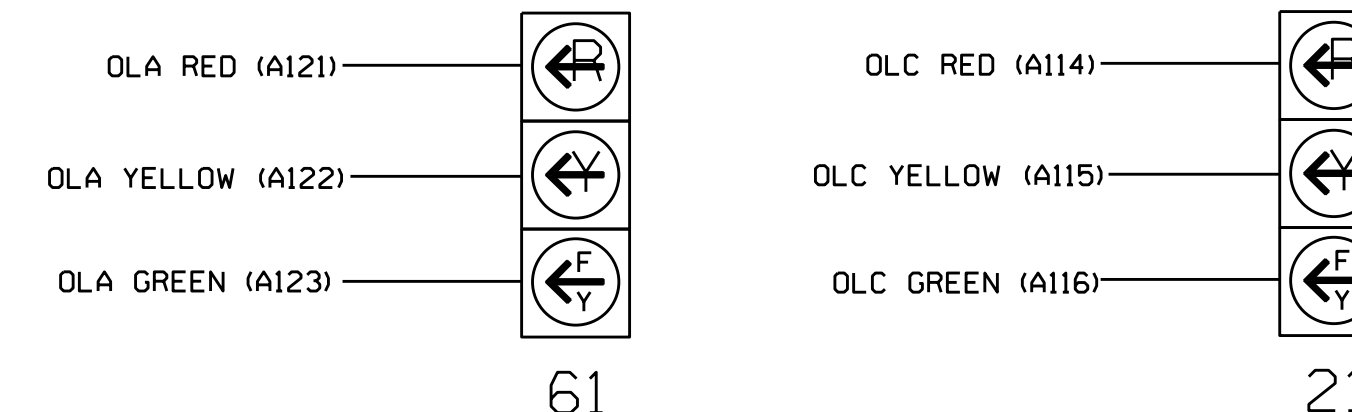
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23	NU	NU	41,42	NU	NU	62,63	NU	NU	81,82	NU	61	NU	NU	21	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW																		

NU = Not Used

\* See pictorial of head wiring in detail below.

**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-1369  
 DESIGNED: August 2016  
 SEALED: 10/21/2016  
 REVISED:

Electrical Detail

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

US 401 (Ramsey Street)  
 at  
 Summerchase Drive

Division 6 Cumberland County Fayetteville  
 PLAN DATE: October 2016 REVIEWED BY: T. Joyce  
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE  
 10/25/2016

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 ZACHARY M. LITTLE  
 030530

SIG. INVENTORY NO. 06-1369

24-007-2016\_08-11  
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