

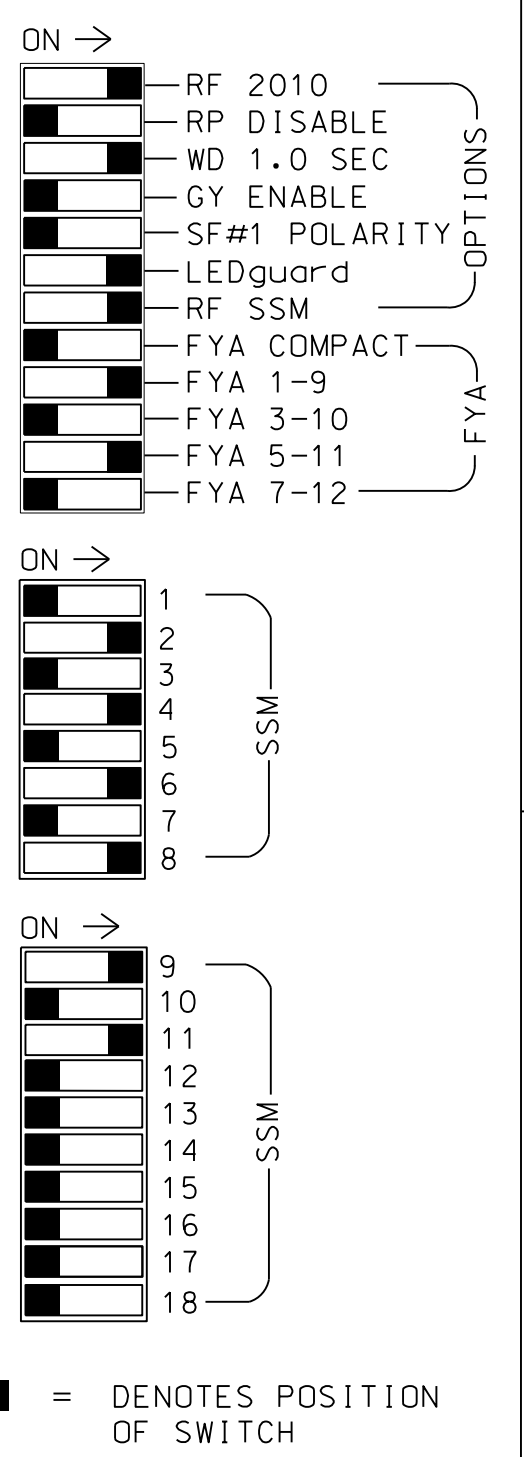
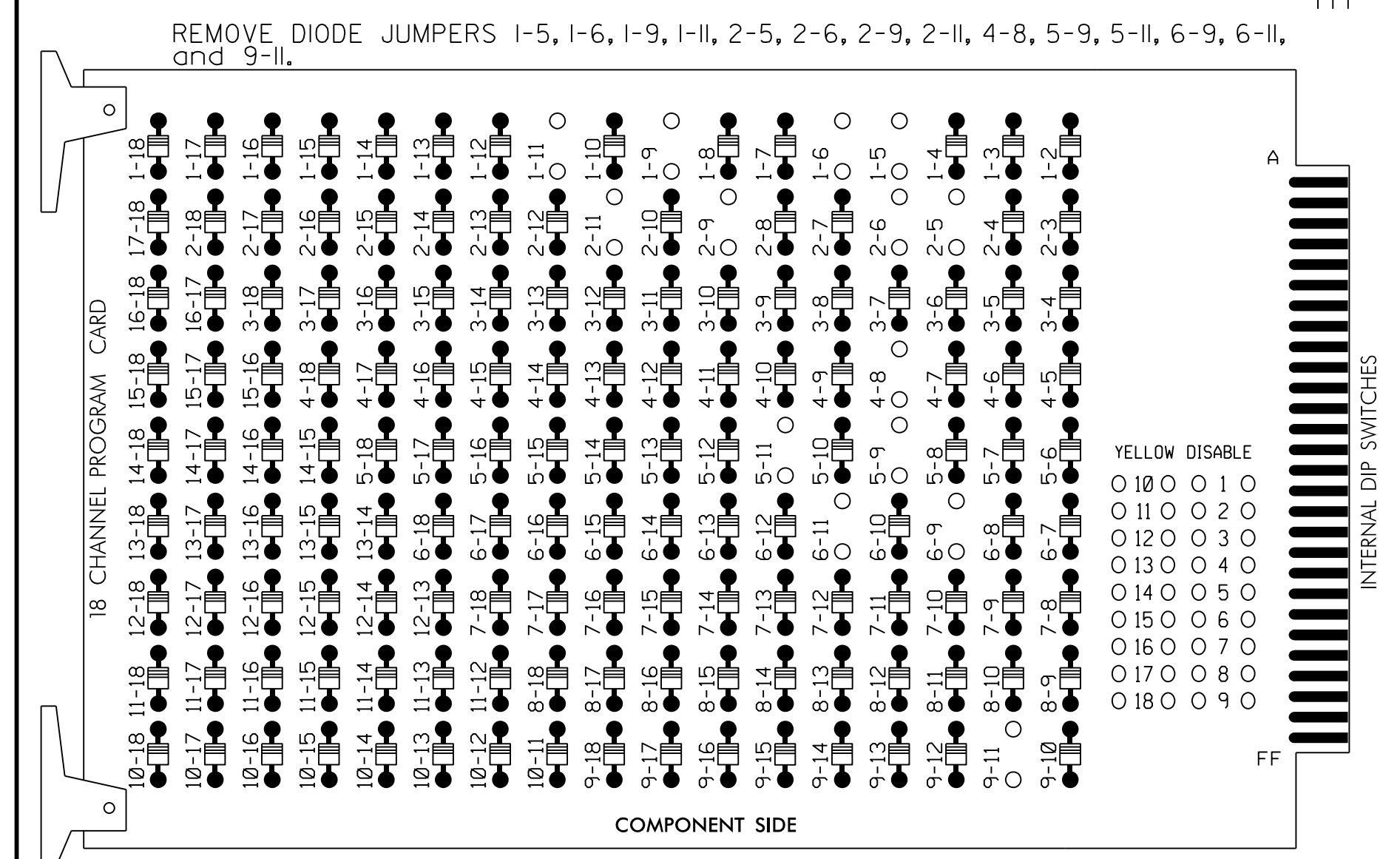
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### EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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.

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S11,AUX S1,AUX S4  
 PHASES USED.....1,2,4,5,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

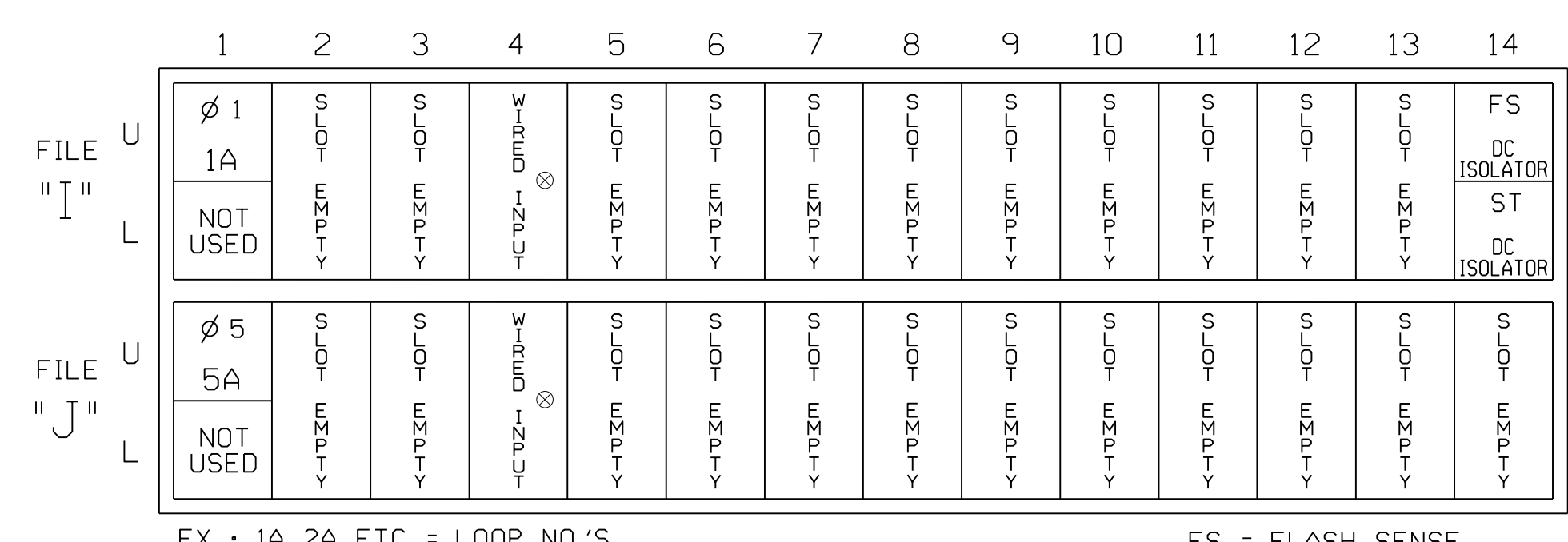
### SIGNAL HEAD HOOK-UP CHART

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
CHU 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	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	11	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	127							133										

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

### INPUT FILE POSITION LAYOUT

(front view)



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

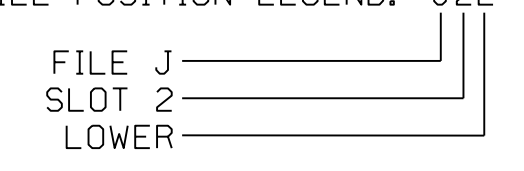
⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES		3		G
5A <sup>2</sup>	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES		3		G

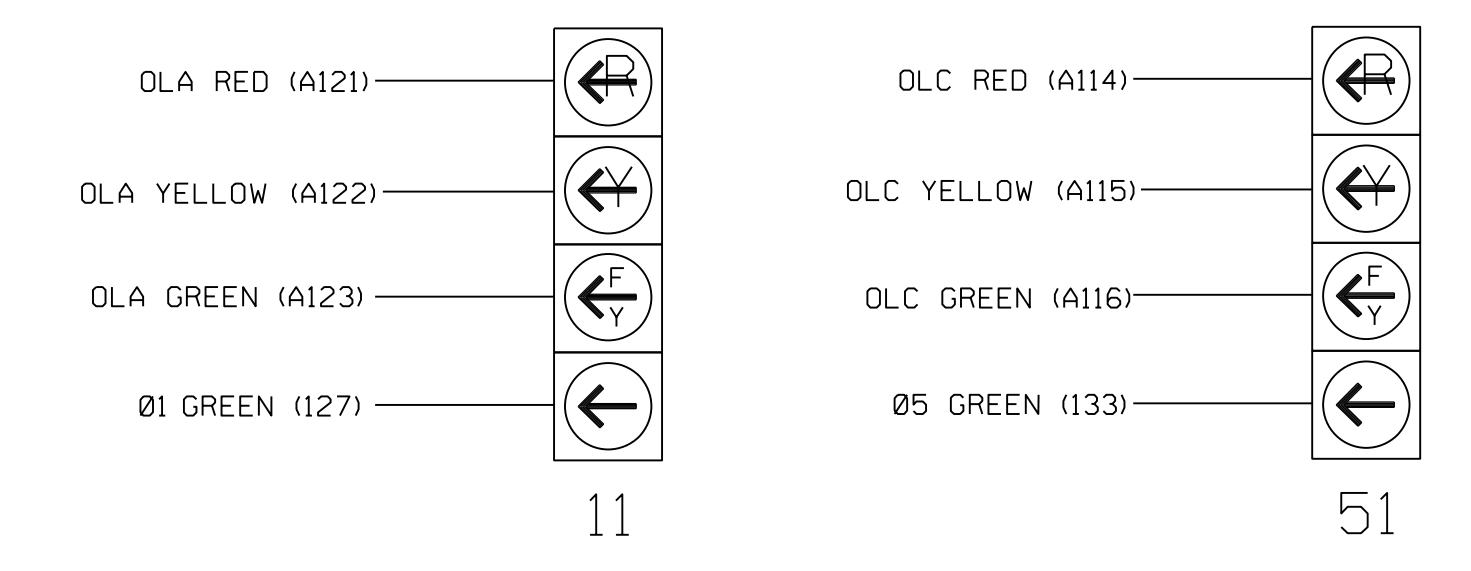
- <sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.
  - <sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.

#### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

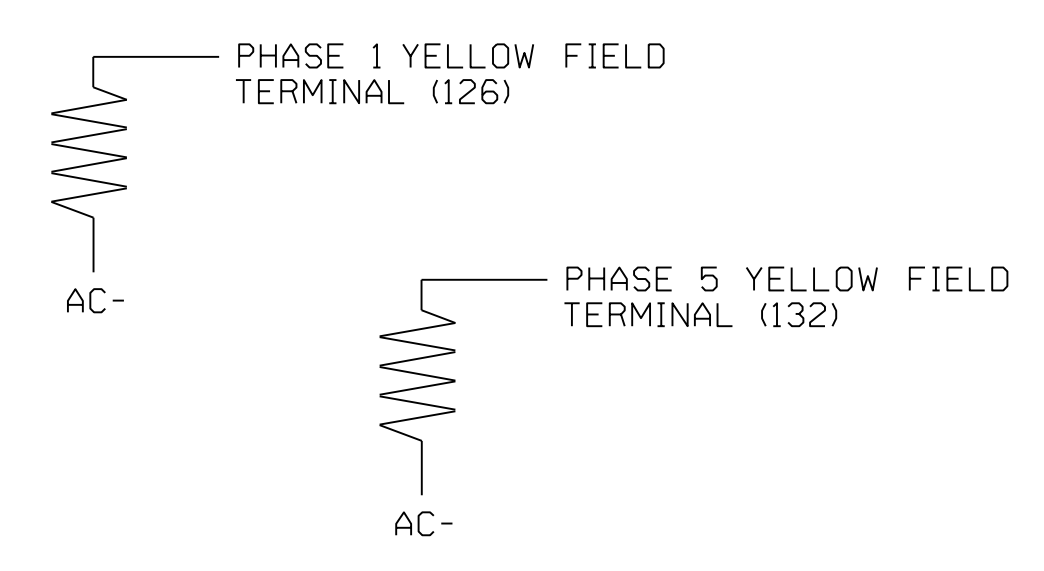
(wire signal heads as shown)



### 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)



### DETECTOR NOTES

1. For all loops, install a video 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.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 2 and 3 of this electrical detail.

### Temporary Design 2 - TMP Phase II Electrical Detail - Sheet 1 of 3

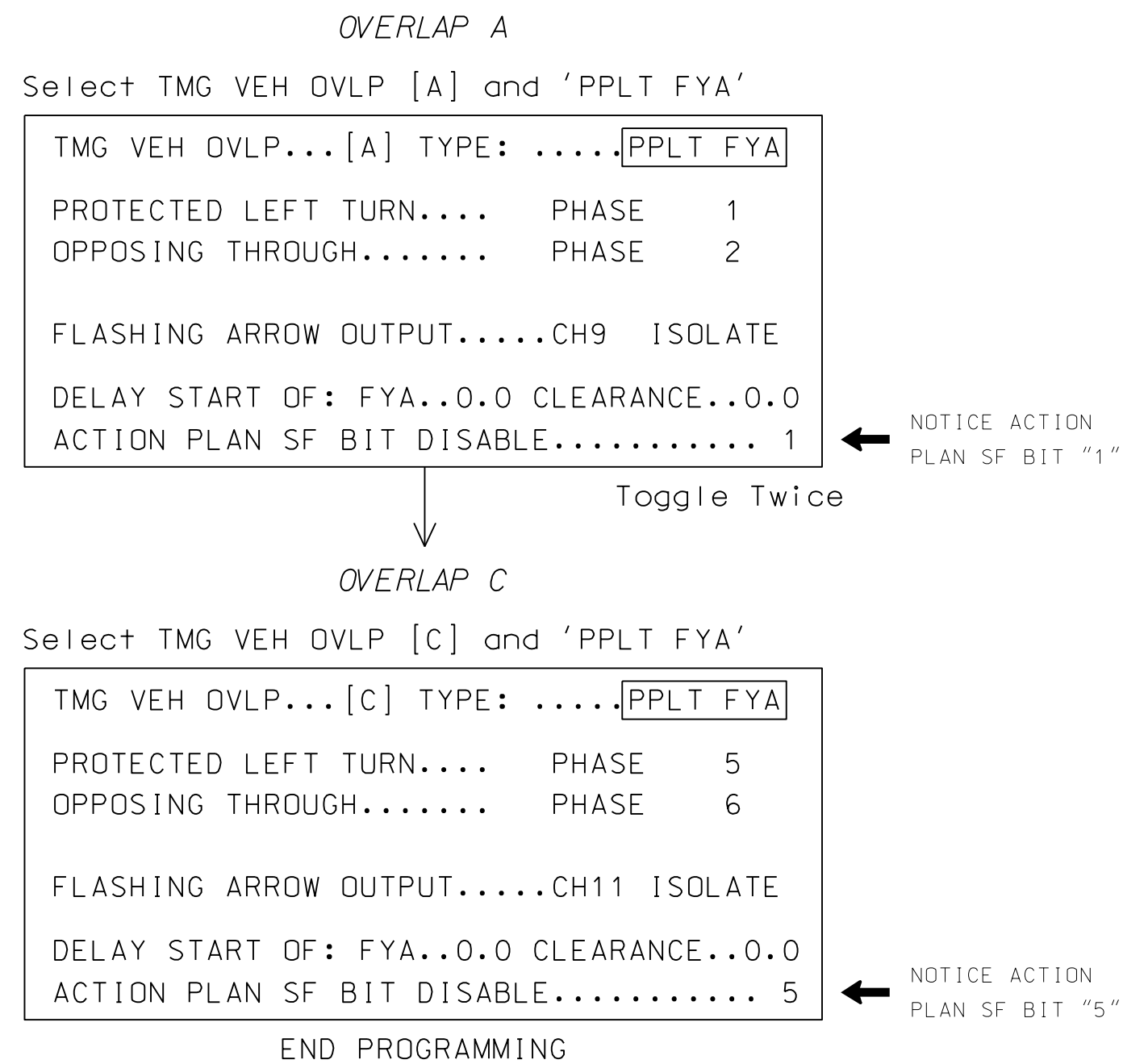
US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: R W Muncey REVIEWED BY:  
 REVISIONS: INIT. DATE

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 SIG. INVENTORY NO. 06-032812

## 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



## 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.

PHASING	VEH DET PLAN	SF BITS ENABLED
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, AND 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 3 seconds.
- Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0328T2  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Temporary Design 2 - TMP Phase II  
Electrical Detail - Sheet 2 of 3

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 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan Division 6 Cumberland County Fayetteville	SEAL  LAWRENCE E. OVERN ENGINEER 045933 3/29/2018
	PLAN DATE: March 2018      REVIEWED BY: L Overn PREPARED BY: R M Muncey      REVIEWED BY:		REVISIONS      INIT.      DATE



# ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP

## PROGRAMMING DETAIL FOR ALTERNATE PHASING

# IMPORTANT!

### LOOPS 1A, 5A

(program controller as shown)

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

- From Main Menu select **8. UTILITIES**
- From UTILITIES Submenu select **1. COPY/CLEAR**
- 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
  
```

- From Main Menu select **6. DETECTORS**
- From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
- Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".  
- Set delay time to "3.0".

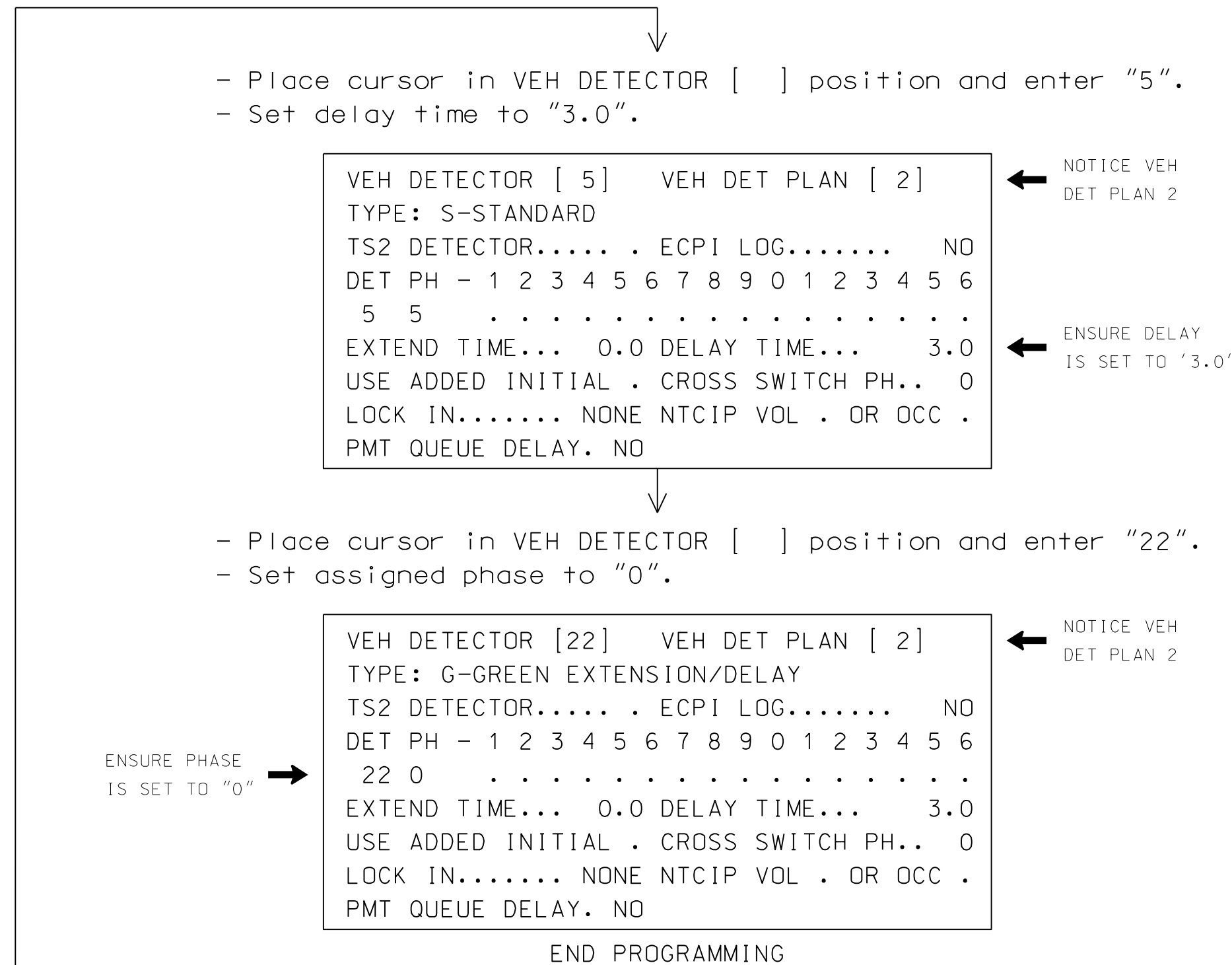
```

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... 3.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
  
```

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

```

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... 3.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
  
```



# ECONOLITE ASC/3-2070 ACTION PLAN

## PROGRAMMING DETAIL

- From Main Menu select **5. TIME BASE**
- 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 . . . (1-8)
AUX FCT  . . . (1-3)
  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 . . . . .
  
```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0328T2  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

DATE: U:\Traffic\Signal\Signal\Temporary Signal\Phase 2\U-4405.sig.ele.06-0328T2.dgn User: rlmuncey

Temporary Design 2 - TMP Phase II  
Electrical Detail - Sheet 3 of 3

**Stantec**  
Stantec Consulting Services Inc.  
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Prepared in the Offices of:  
**North Carolina State Department of Transportation**  
750 N. Greenfield Pkwy, Garner, NC 27529

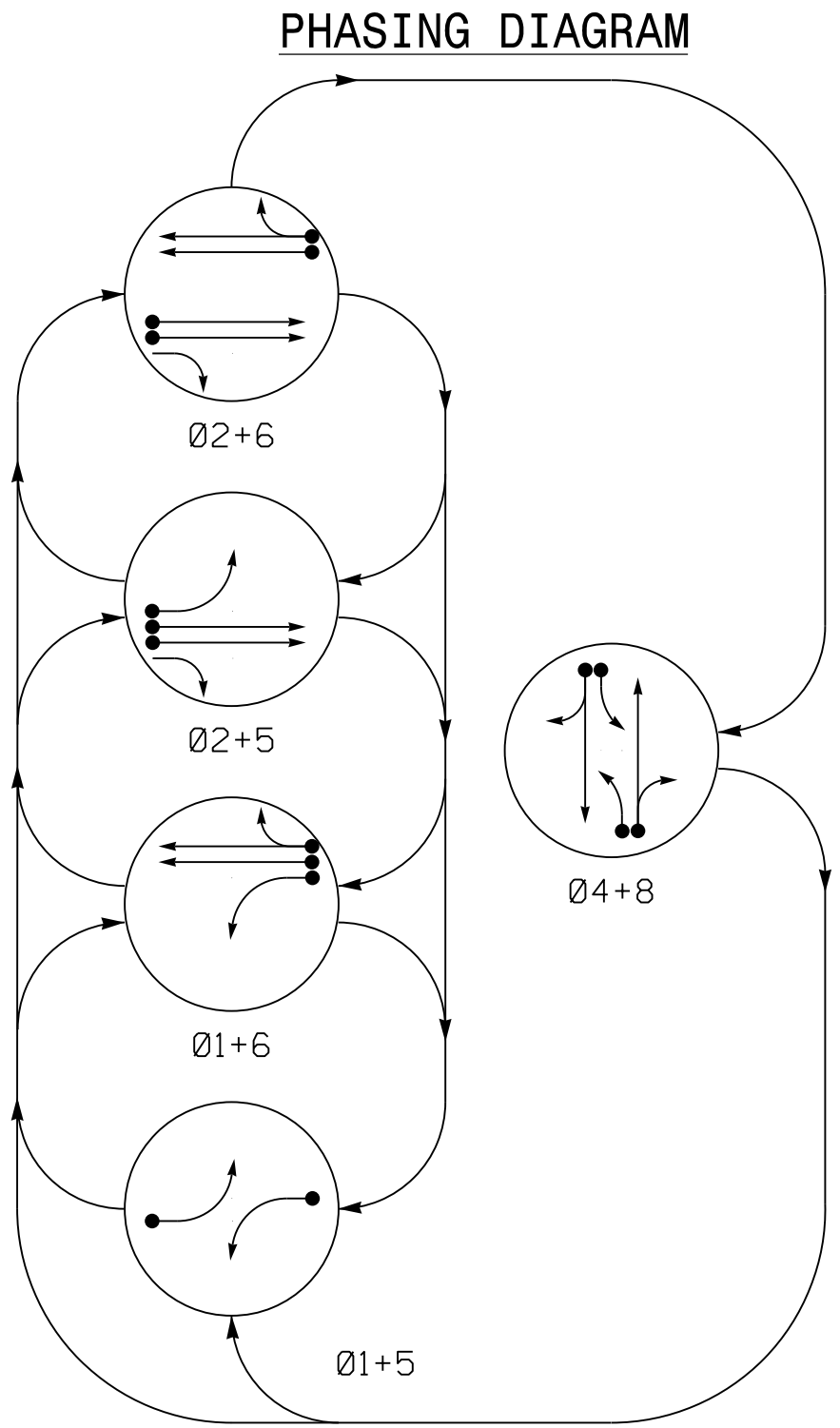
**US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan**  
Division 6 Cumberland County Fayetteville  
PLAN DATE: March 2018 REVIEWED BY: L Overn  
PREPARED BY: R M Muncey REVIEWED BY:

REVISIONS	INIT.	DATE

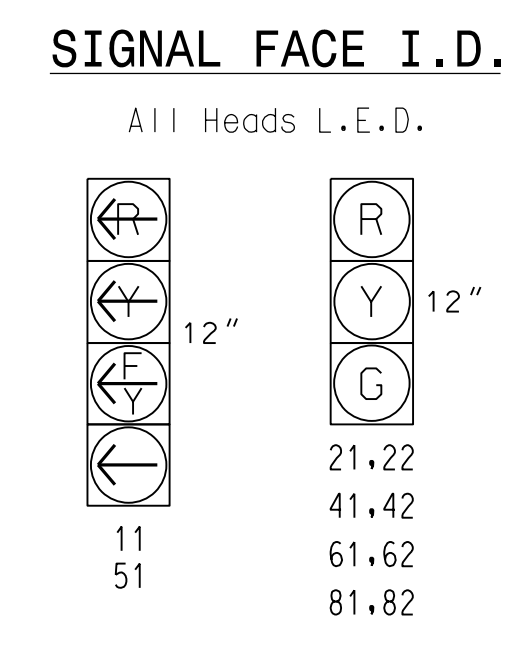
SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
LAURENCE E. OVERN  
045933  
3/29/2018  
SIG. INVENTORY NO. 06-0328T2

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SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	FLASH
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



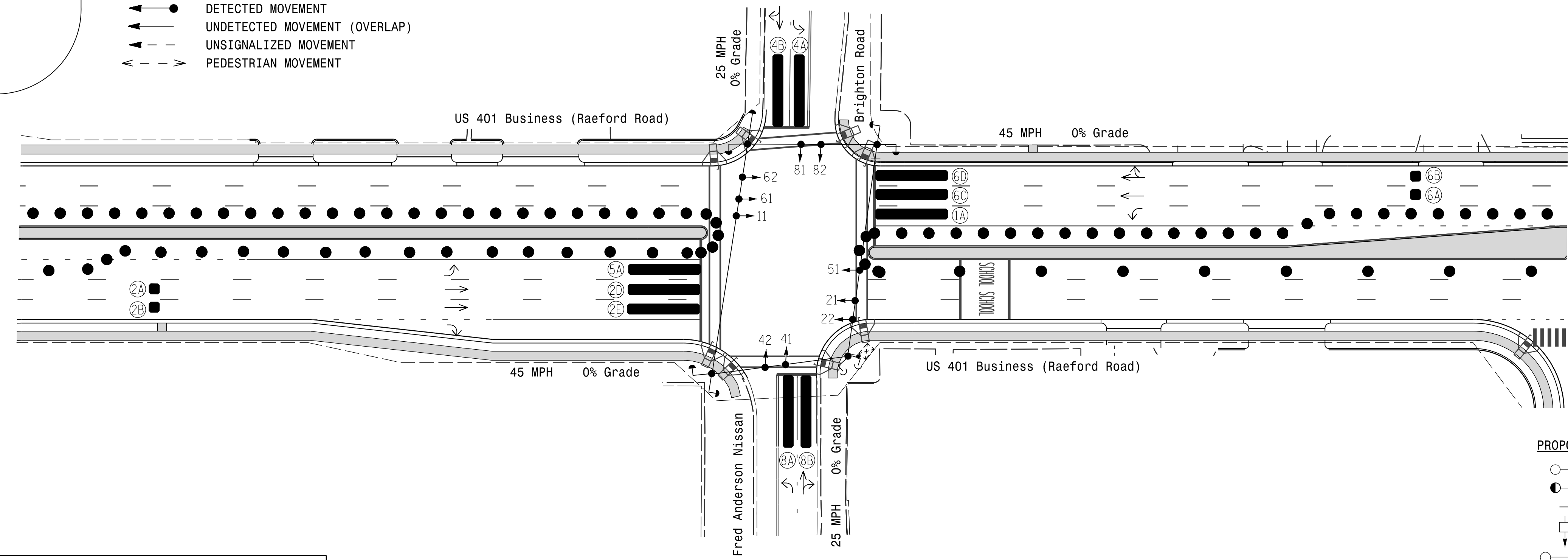
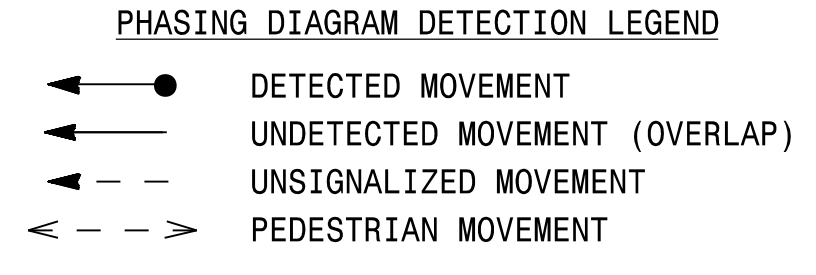
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	*	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	*	-	4	Yes	-	10	-	S	-	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
8A	6X40	0	*	-	8	Yes	-	3	-	S	-	-
8B	6X40	0	*	-	8	Yes	-	10	-	S	-	-

\*Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

5 Phase Fully Actuated Fayetteville Signal System

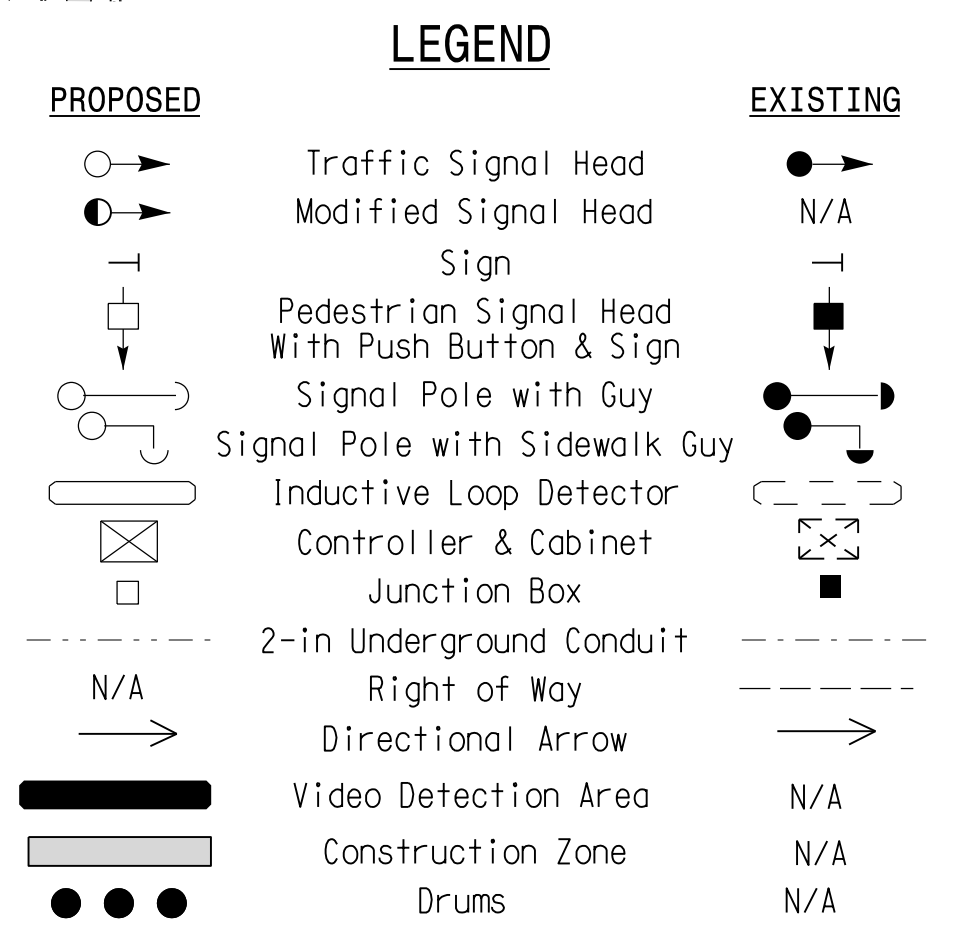
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered #11, 21, 22, 51, 61, and 62.
- 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	4	5	6	8	
Min Green *	7	12	7	7	12	7	
Walk *	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0	
Max 1 *	15	90	25	15	90	25	
Yellow	3.0	4.5	3.2	3.0	4.5	3.2	
Red Clear	3.2	1.0	3.2	3.1	1.0	3.1	
Red Revert	-	-	-	-	-	-	
Actuations B4 Add *	-	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	-	
Max Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	15	-	-	15	-	
Time To Reduce *	-	45	-	-	45	-	
Minimum Gap	-	3.0	-	-	3.0	-	
Locking Detector	-	-	-	-	-	-	
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 Temporary Design 3 - TMP Phase III

US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan

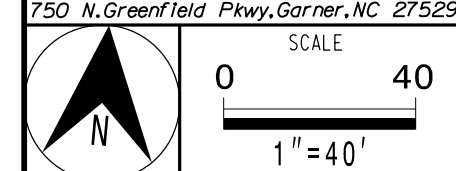
Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: B L Watson

3/29/2018 10:41:11 AM  
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 User: rlmuncey

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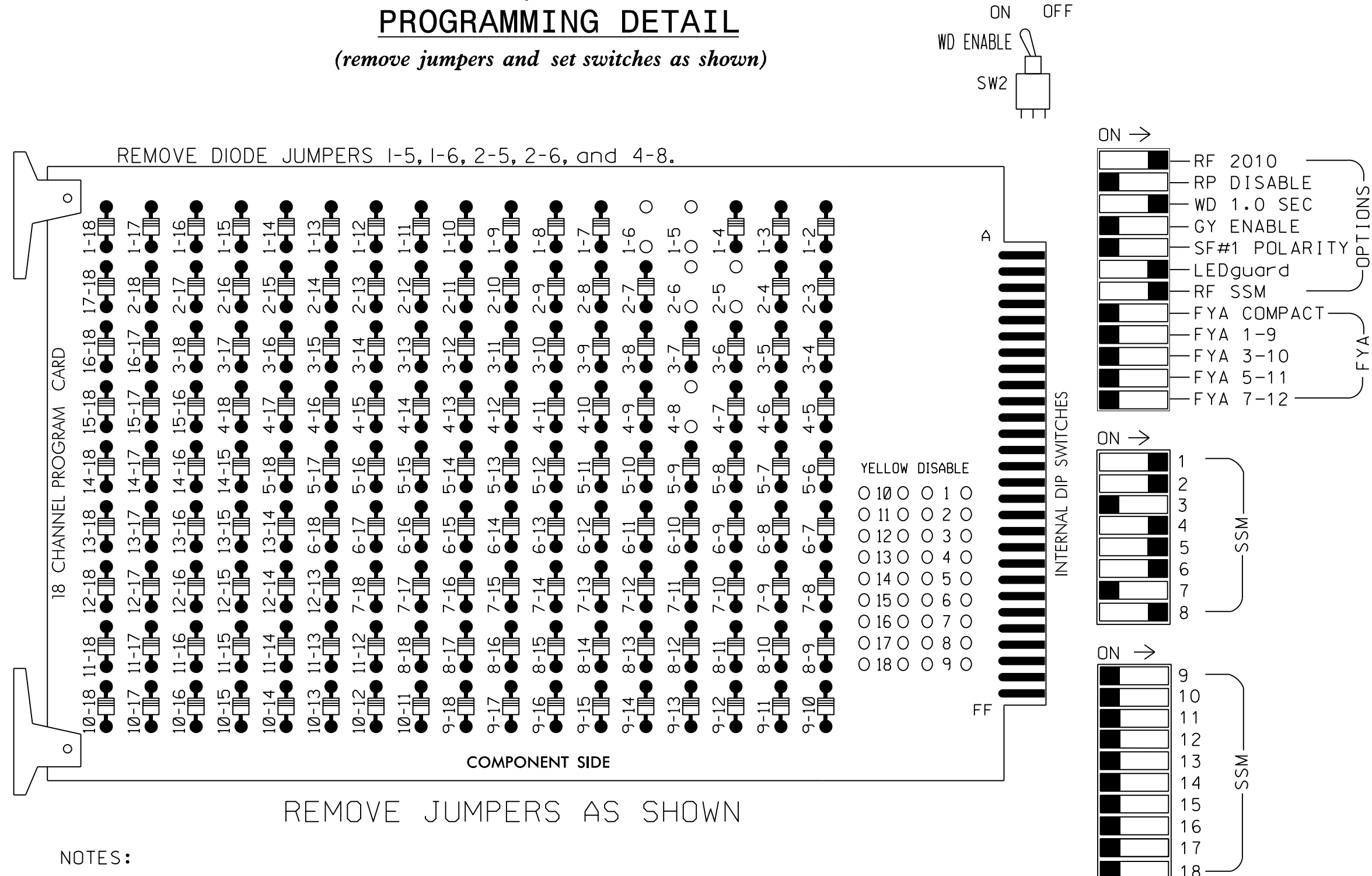


REVISIONS	INITI.	DATE

3/29/2018  
DATE  
SIG. INVENTORY NO. 06-032813

# EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

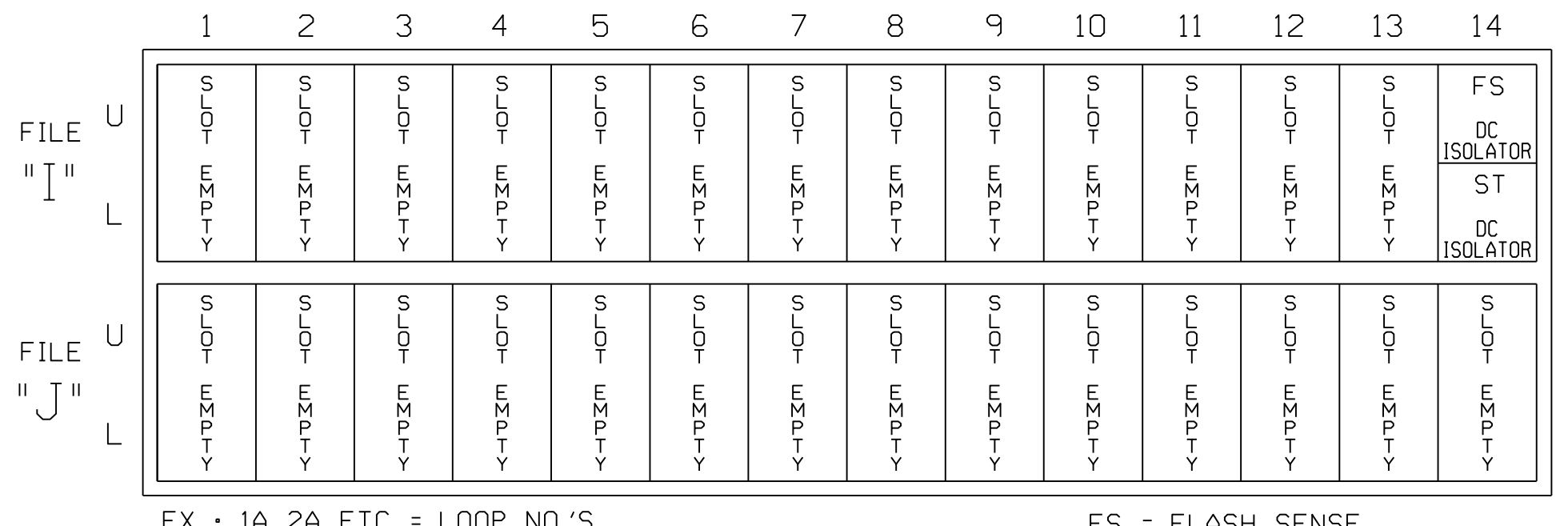


### NOTES:

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.

### INPUT FILE POSITION LAYOUT

(front view)



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

### DETECTOR NOTES

1. For all loops install a video 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.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phases 2 and 6.

### 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. Return Controller to Factory Defaults before programming per this electrical detail.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S11  
 PHASES USED.....1,2,4,5,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### SIGNAL HEAD HOOK-UP CHART

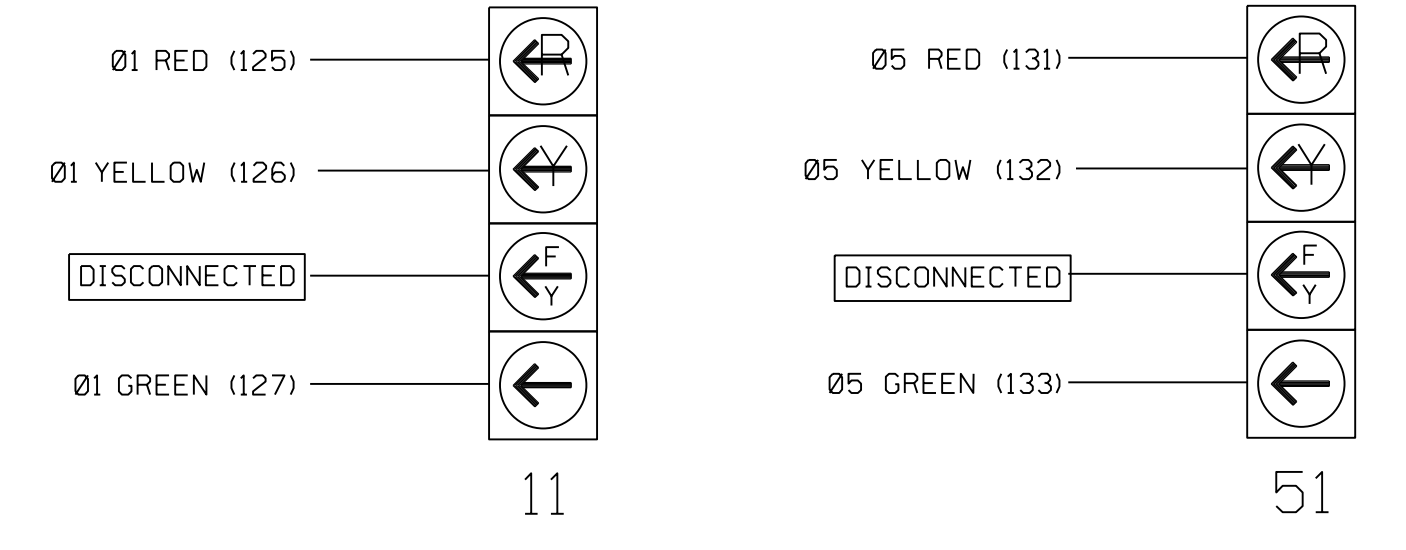
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125							131										
YELLOW ARROW	126							132										
GREEN ARROW	127							133										

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

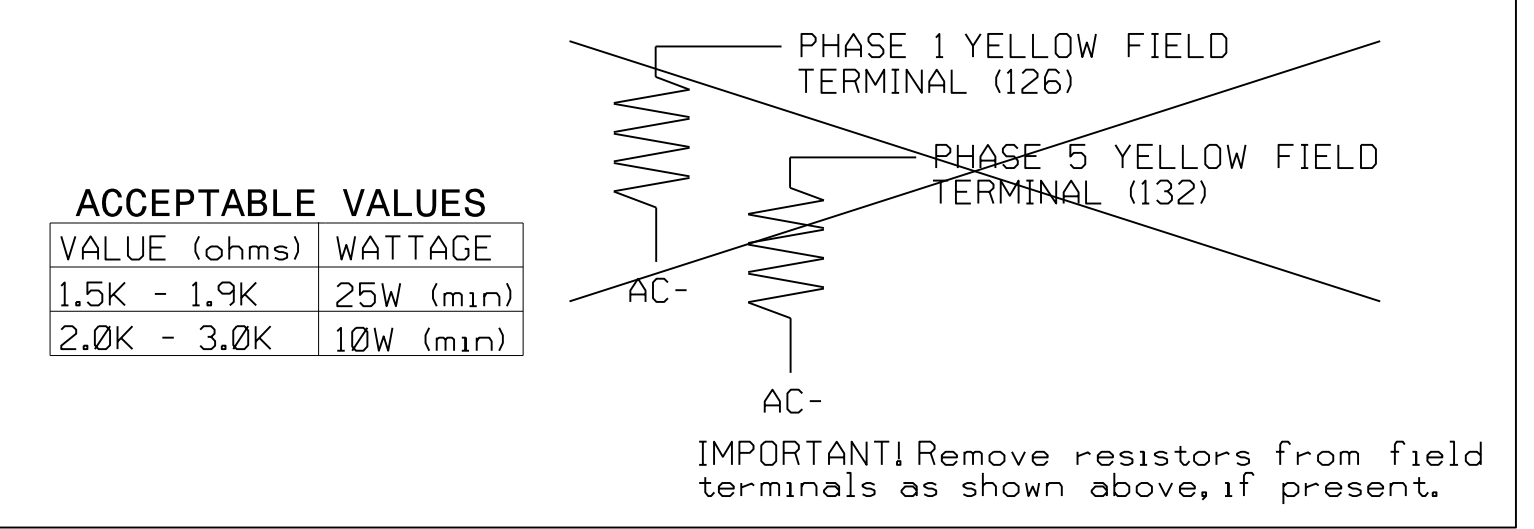
### SIGNAL WIRING DETAIL

(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)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0328T3  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 3 - TMP Phase III  
 Electrical Detail - Sheet 1 of 1

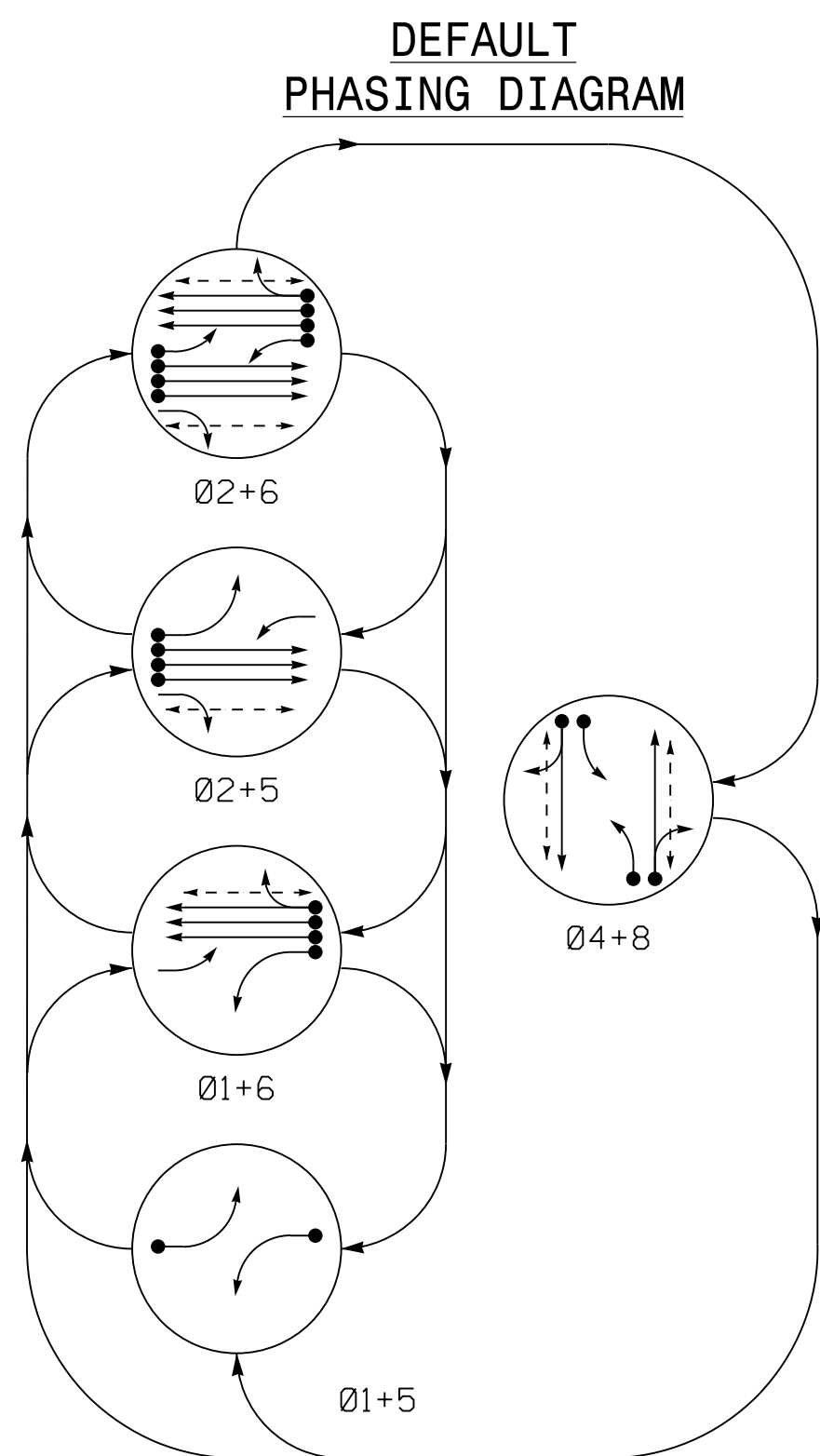
<p>Stantec Consulting Services Inc.                  801 Jones Franklin Road-Suite 300                  Raleigh, NC 27606                  Tel. (919) 851-6866                  Fax. (919) 851-7024                  www.stantec.com                  License No. F-0672</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 	US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan Division 6 Cumberland County Fayetteville	SEAL 
	PLAN DATE: March 2018 PREPARED BY: R M Muncy	REVIEWED BY: L Overn REVIEWED BY:	DATE: 3/29/2018 INVENTORY NO. 06-0328T3



5 Phase Fully Actuated Fayetteville Signal System

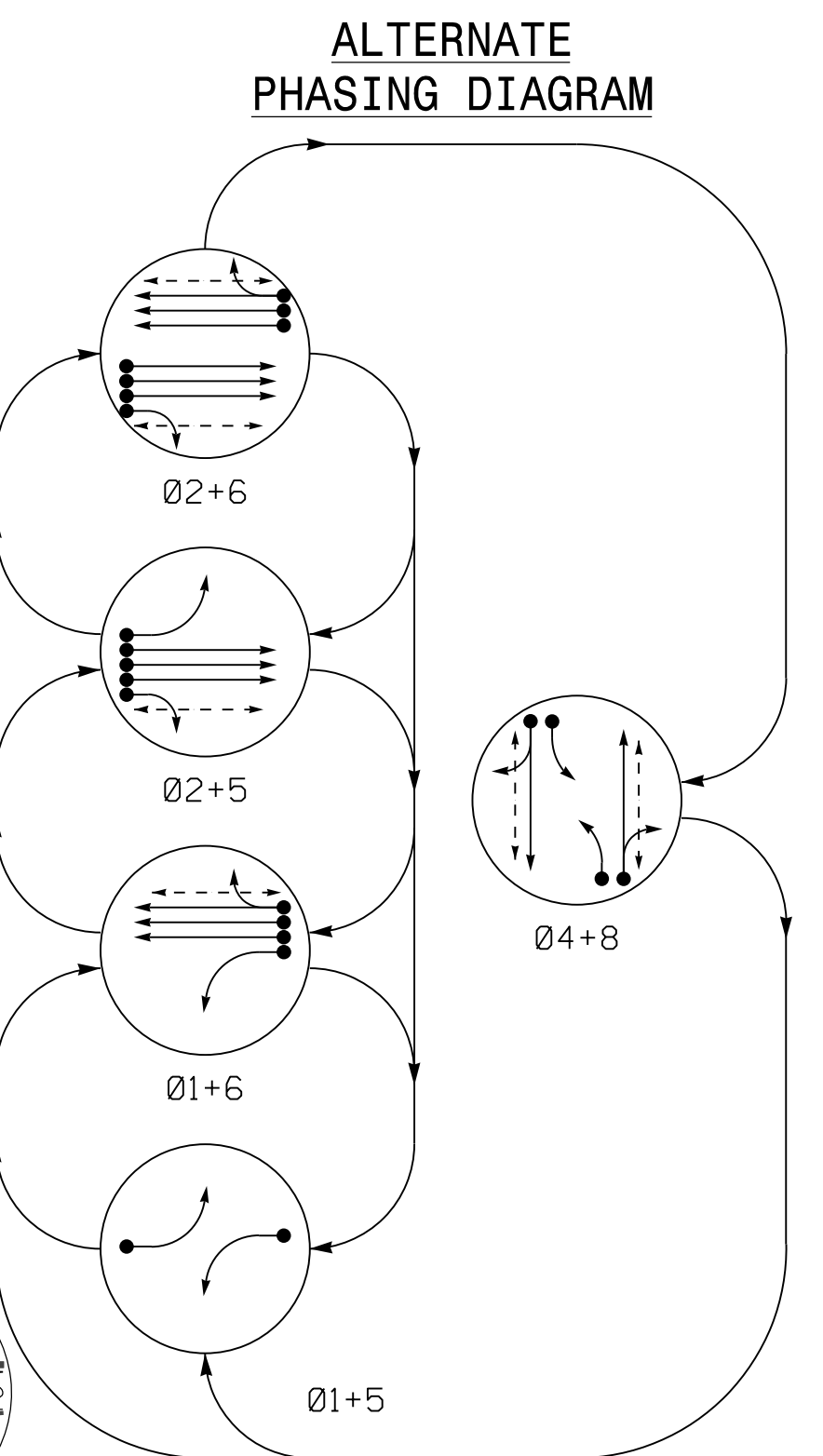
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
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. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



**DEFAULT TABLE OF OPERATION**

SIGNAL FACE	PHASE					FLASH
	01+5	02+6	02+5	04+8	01+6	
11						
21,22,23	R	R	G	R	Y	
41,42	R	R	R	G	R	
51						
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	G	R	
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	W	DRK	



**ALTERNATE TABLE OF OPERATION**

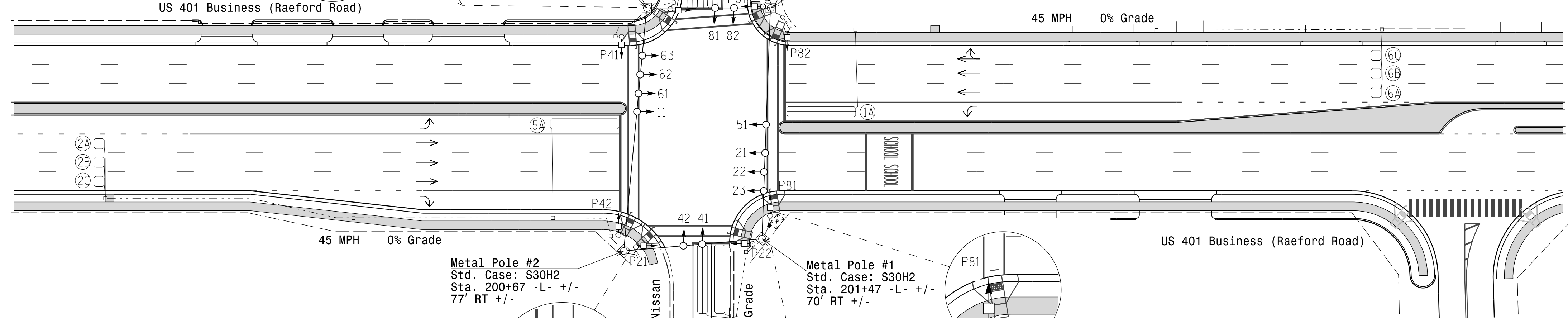
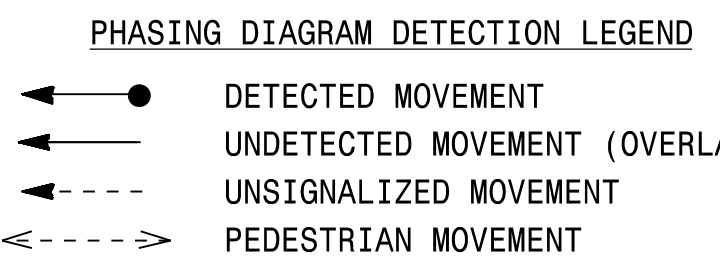
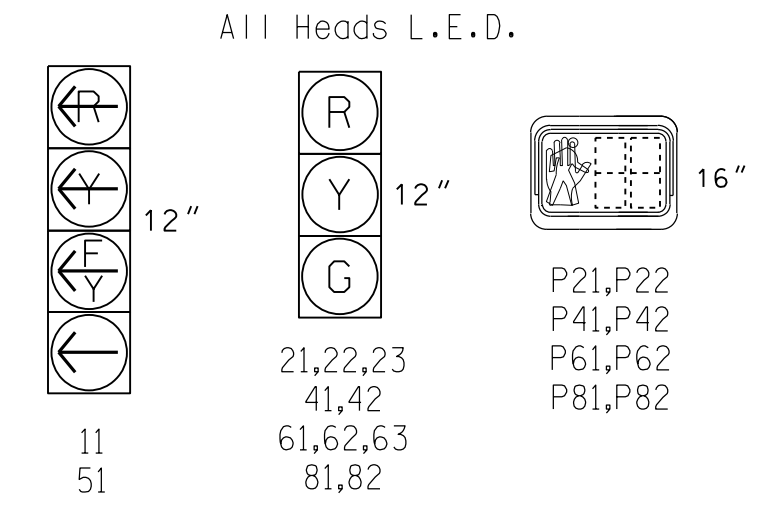
SIGNAL FACE	PHASE					FLASH
	01+5	02+6	02+5	04+8	01+6	
11						
21,22,23	R	R	G	R	Y	
41,42	R	R	R	G	R	
51						
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	G	R	
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	W	DRK	

**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	5	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
6A	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	6	X	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	3	-	S	-	X
8B	6X40	0	2-4-2	X	8	Yes	-	10	-	S	-	X

# Disable Phase(s) call during Alternate Phasing Operation.  
 ★ Disable delay during Alternate Phasing Operation.

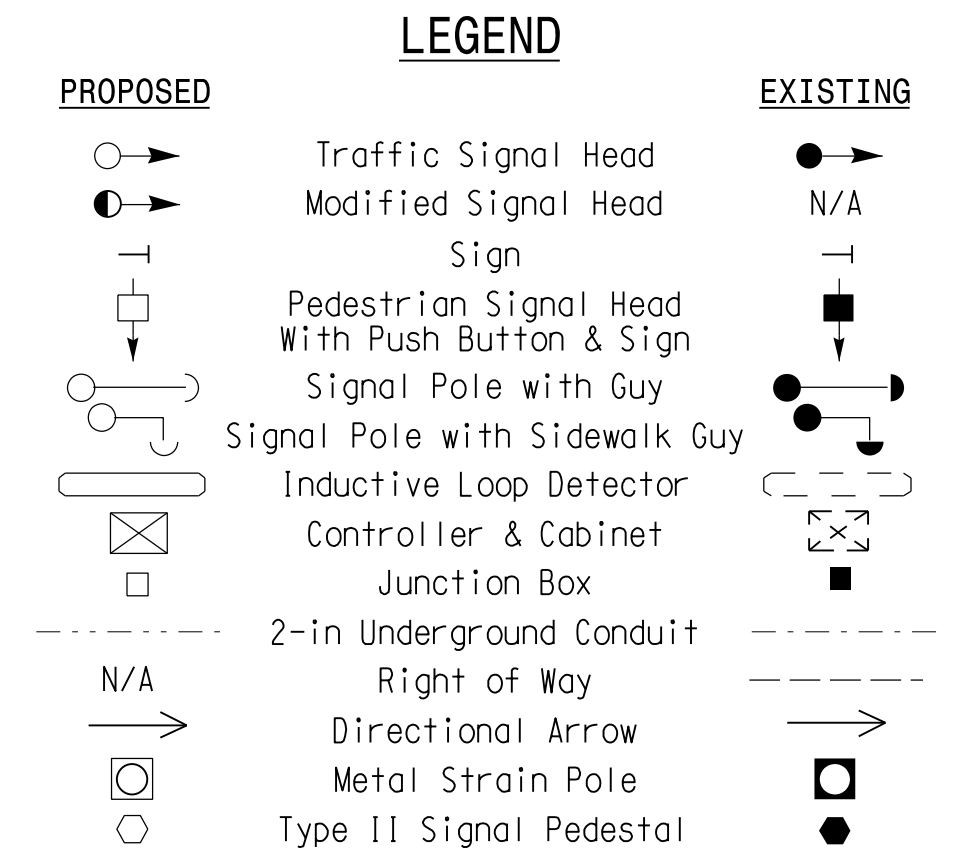
**SIGNAL FACE I.D.**



**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	4	5	6	8		
Min Green *	7	12	7	7	12	7		
Walk *	-	7	7	-	7	7		
Ped Clear	-	9	26	-	10	23		
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0		
Max 1 *	15	90	25	15	90	25		
Yellow	3.0	4.5	3.2	3.0	4.5	3.2		
Red Clear	3.3	1.8	3.3	3.3	1.8	3.3		
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 *	-	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 - Final Design

**Stantec**  
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 www.stantec.com  
 License No. F-0672

Prepared for the Offices of:  
 Transportation Mobility and Safety Division  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 STATE OF NORTH CAROLINA  
 Signal Design Section  
 750 N. Greenfield Pkwy, Garner, NC 27526

US 401 Business (Raeford Road)  
 at  
 Brighton Road/  
 Fred Anderson Nissan  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: R M Muncey REVIEWED BY: B L Watson

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL 29449  
 PROFESSIONAL ENGINEER  
 JEFFREY L. WATSON

3/29/2018  
 DATE

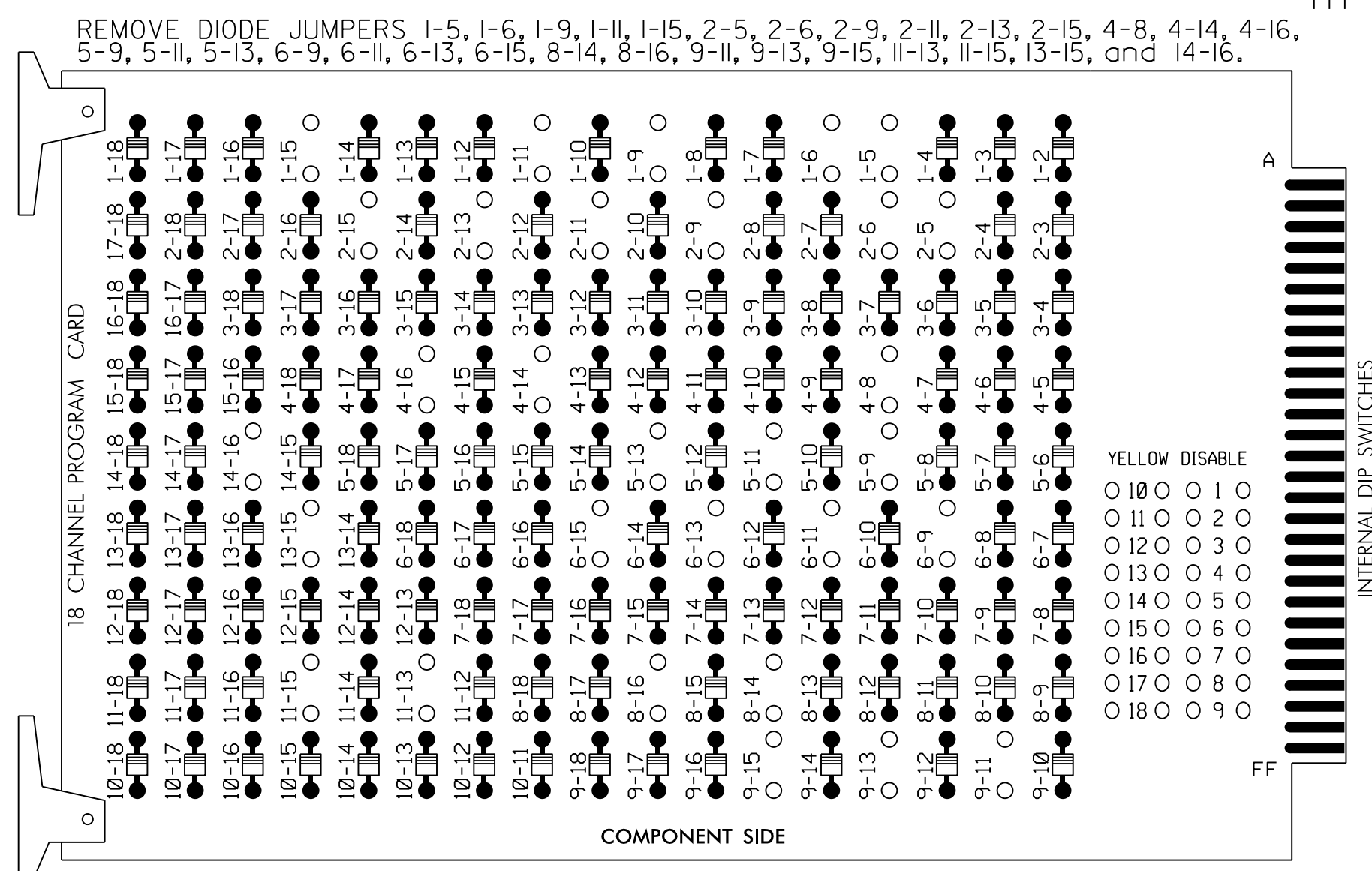
SIG. INVENTORY NO. 06-0328

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

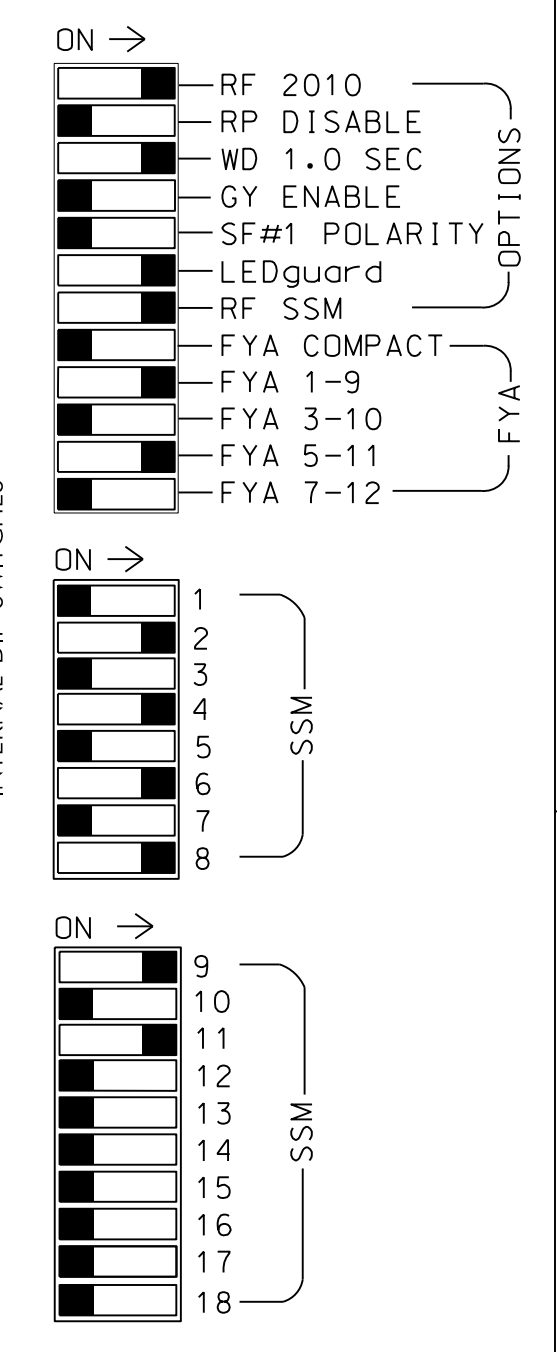
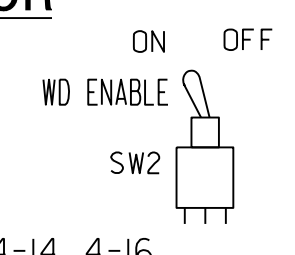
(remove jumpers and set switches as shown)



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. Program controller to start up in phase 2 Walk and 6 Walk.
3. The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S12,  
 AUX S1,AUX S4  
 PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,8,8PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

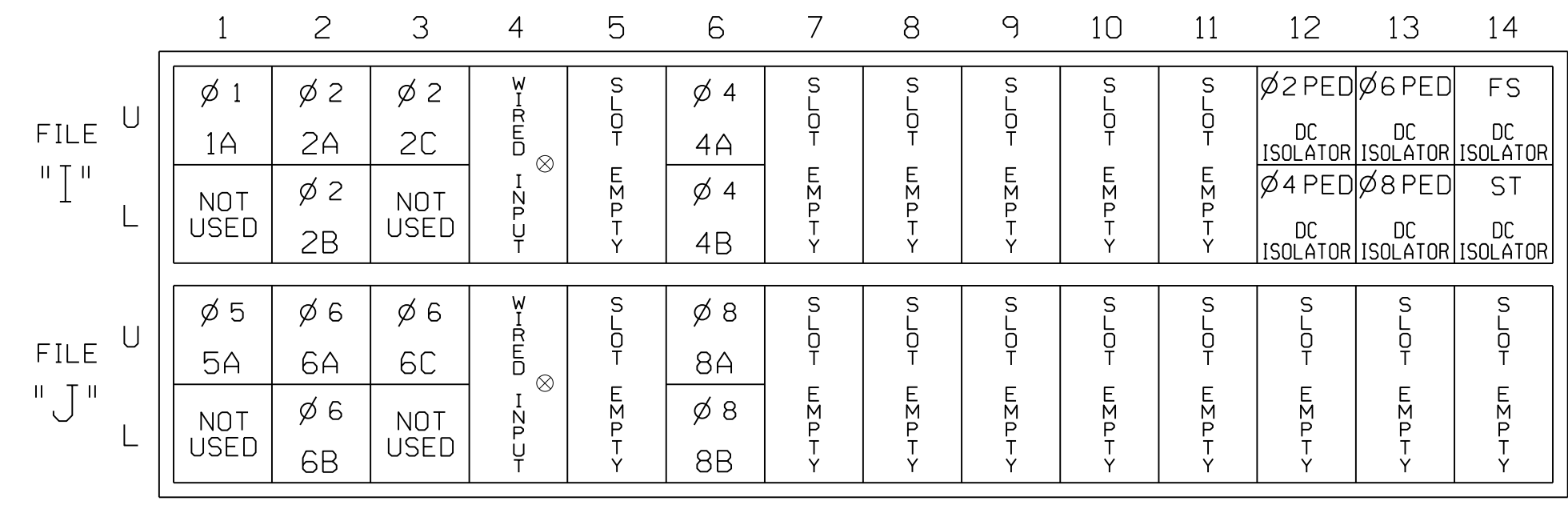
### SIGNAL HEAD HOOK-UP CHART

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.	11	21,22,23	P21,P22	NU	41,42	P41,P42	51	61,62,63	P61,P62	NU	81,82	P81,P82	11	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	127							133										
Hand icon			113			104			119			110						
Person icon			115			106			121			112						

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

### INPUT FILE POSITION LAYOUT

(front view)



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

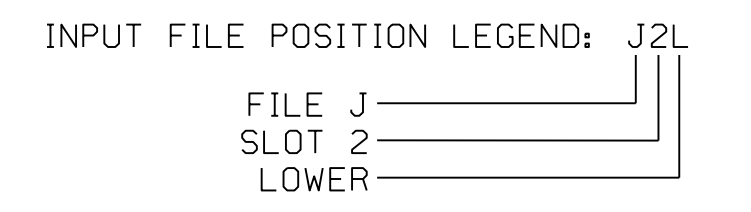
⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	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			X	N
	TB2-7,8	I2L	43	12	2	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES			X	N
	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
	TB3-1,2	J1U	55	5 ★	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
	TB5-9,10	J6U	42	8	8	YES		3		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					
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					

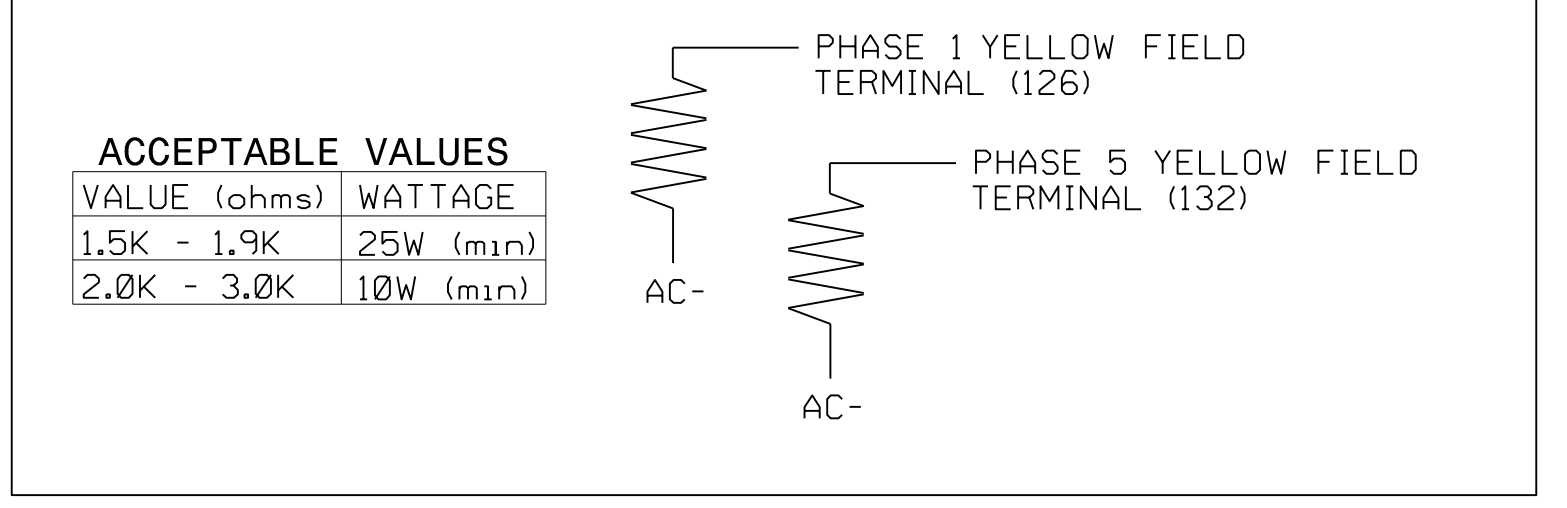
NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

- <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.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.



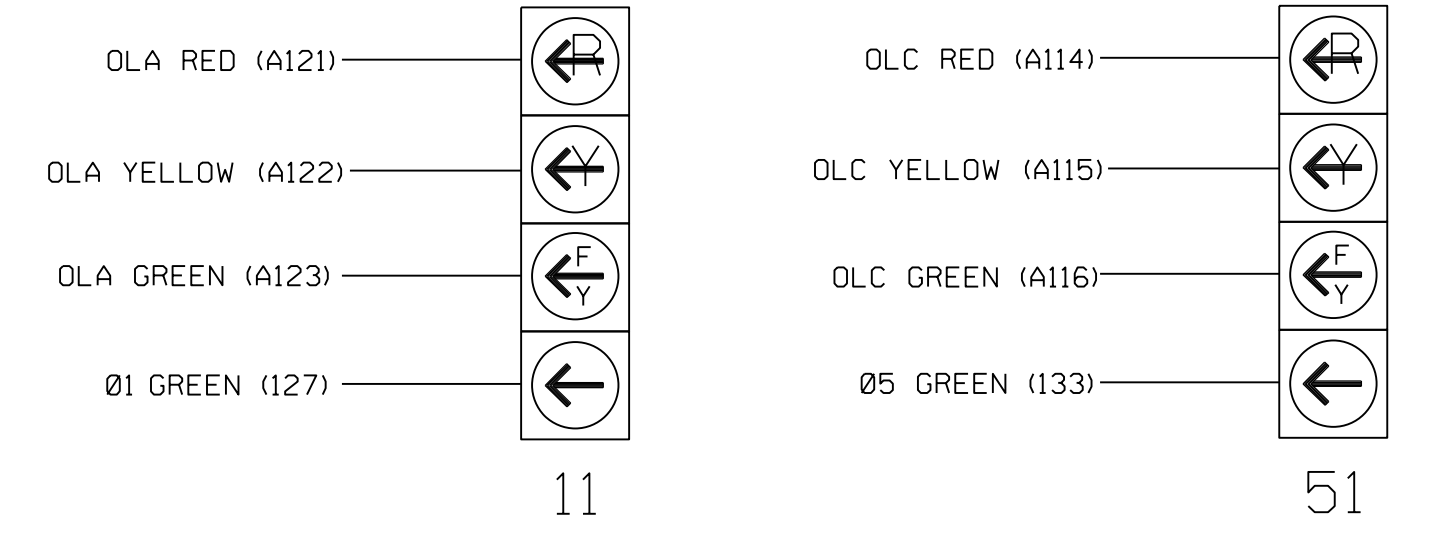
### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



Final Design  
 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan  
 Division 6 Cumberland County Fayetteville

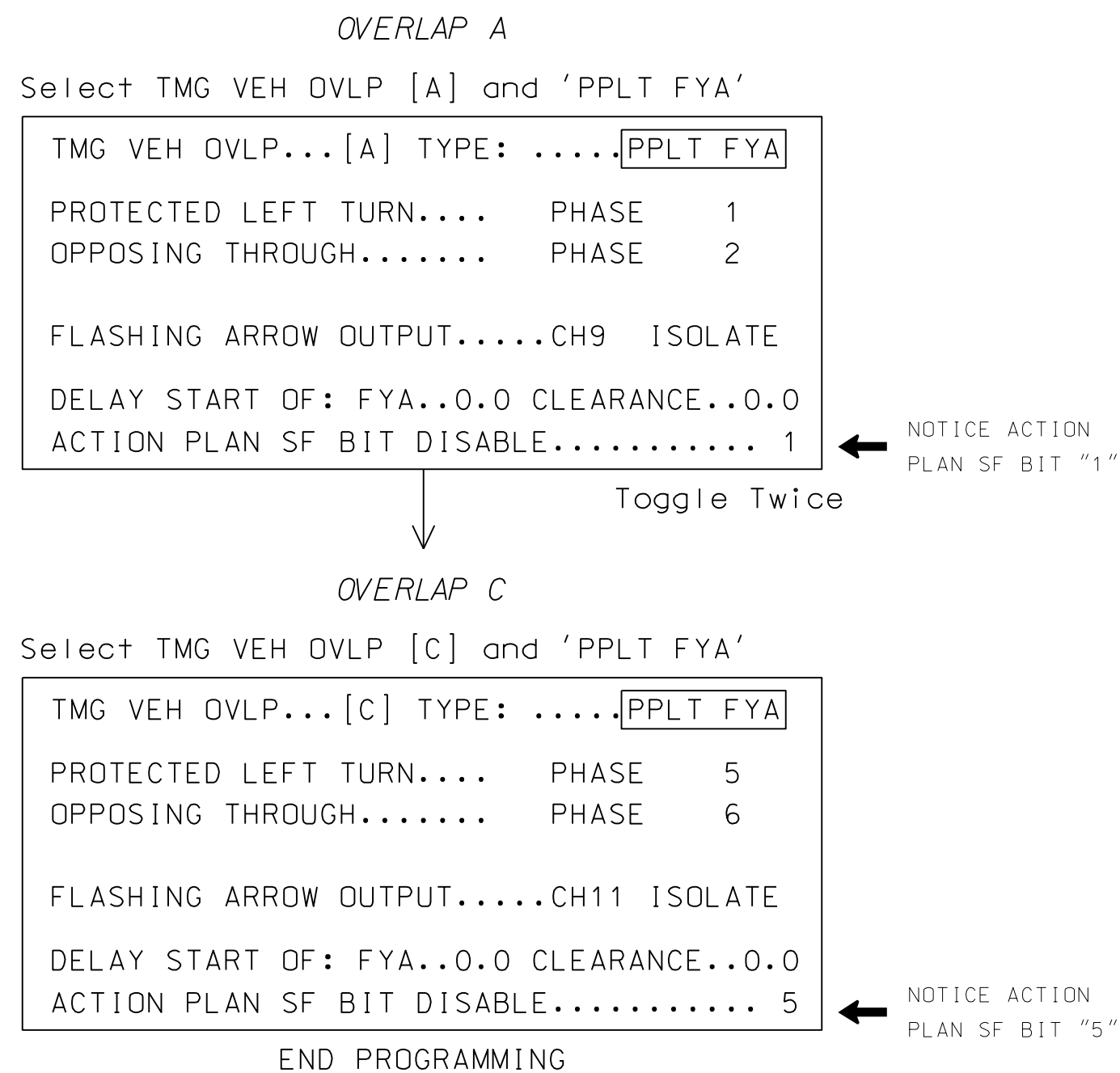
PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: R M Muncy REVIEWED BY:

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER LAURENCE E. OVERN 045933  
 3/29/2018

# ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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



# 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.

PHASING	VEH DET PLAN	SF BITS ENABLED
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, AND 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: 06-0328  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

## 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.

Final Design  
Electrical Detail - Sheet 2 of 3

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

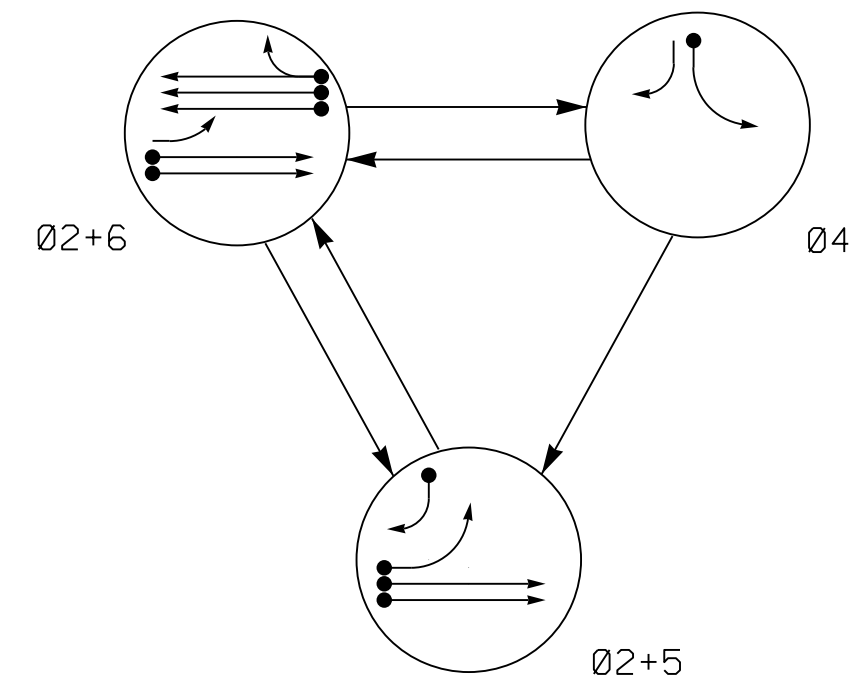
<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>		ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 401 Business (Raeford Road) at Brighton Road/ Fred Anderson Nissan	
		Prepared in the Offices of:		Division 6 Cumberland County Fayetteville	
PLAN DATE: March 2018		REVIEWED BY: L Overn		PREPARED BY: R M Muncey	
REVISIONS		INIT.	DATE	3/29/2018	
SIG. INVENTORY NO. 06-0328					







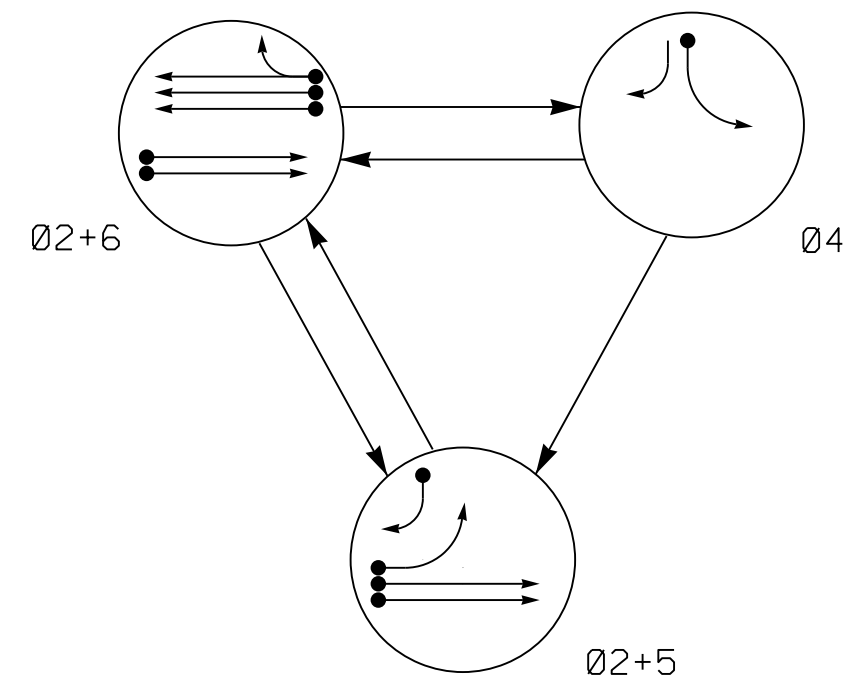
**DEFAULT PHASING DIAGRAM**



**DEFAULT TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	-	-	-	-
61,62,63	R	G	R	Y

**ALTERNATE PHASING DIAGRAM**



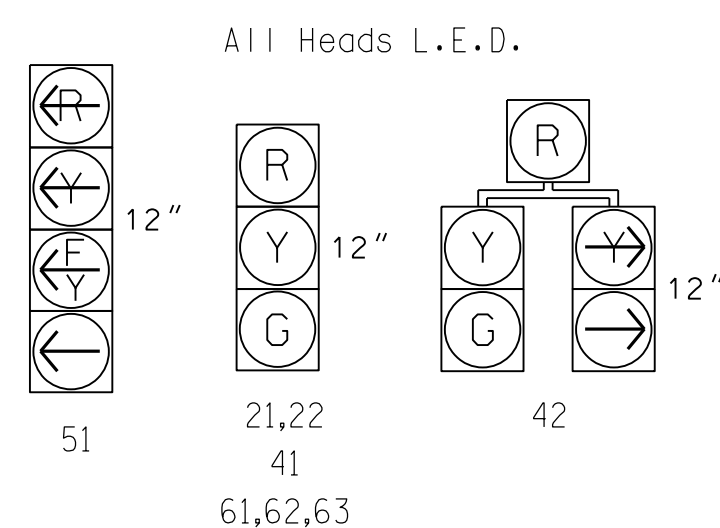
**ALTERNATE TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	-	-	-	-
61,62,63	R	G	R	Y

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**



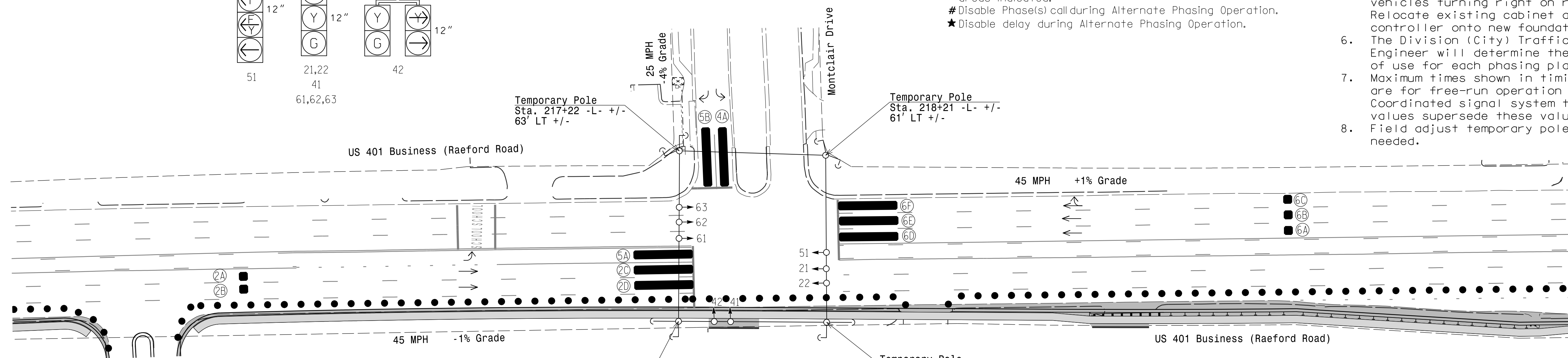
ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	*	-	5	Yes	-	15	-	S	-	X
					2#	Yes	-	3	-	G	-	X
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X

\* Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.  
 # Disable Phase(s) call during Alternate Phasing Operation.  
 ★ Disable delay during Alternate Phasing Operation.

**3 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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 foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Field adjust temporary poles as needed.



ASC/3 TIMING CHART				
FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	1.0	1.0	6.0
Max 1 *	90	25	15	90
Yellow	4.6	3.0	3.0	4.6
Red Clear	1.5	2.8	2.4	1.5
Red Revert	-	-	-	-
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Lacking Detector	-	-	-	-
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 |
|----------|----------|
| ○        | ●        |
| ◄        | N/A      |
| +        | +        |
| □        | □        |
| ○        | ○        |
| ○        | ○        |
| ⊗        | ⊗        |
| □        | □        |
| ---      | ---      |
| N/A      | N/A      |
| →        | →        |
| ▬        | N/A      |
| ▬        | N/A      |
| ●●●      | N/A      |

**Signal Upgrade Temporary Design 1 - TMP Phase I**

**Stantec**  
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 www.stantec.com  
 License No. F-0672

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27526  
 SCALE: 0 40  
 1" = 40'

**US 401 Business (Raeford Road) at Montclair Drive**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: R M Muncey REVIEWED BY: B L Watson

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

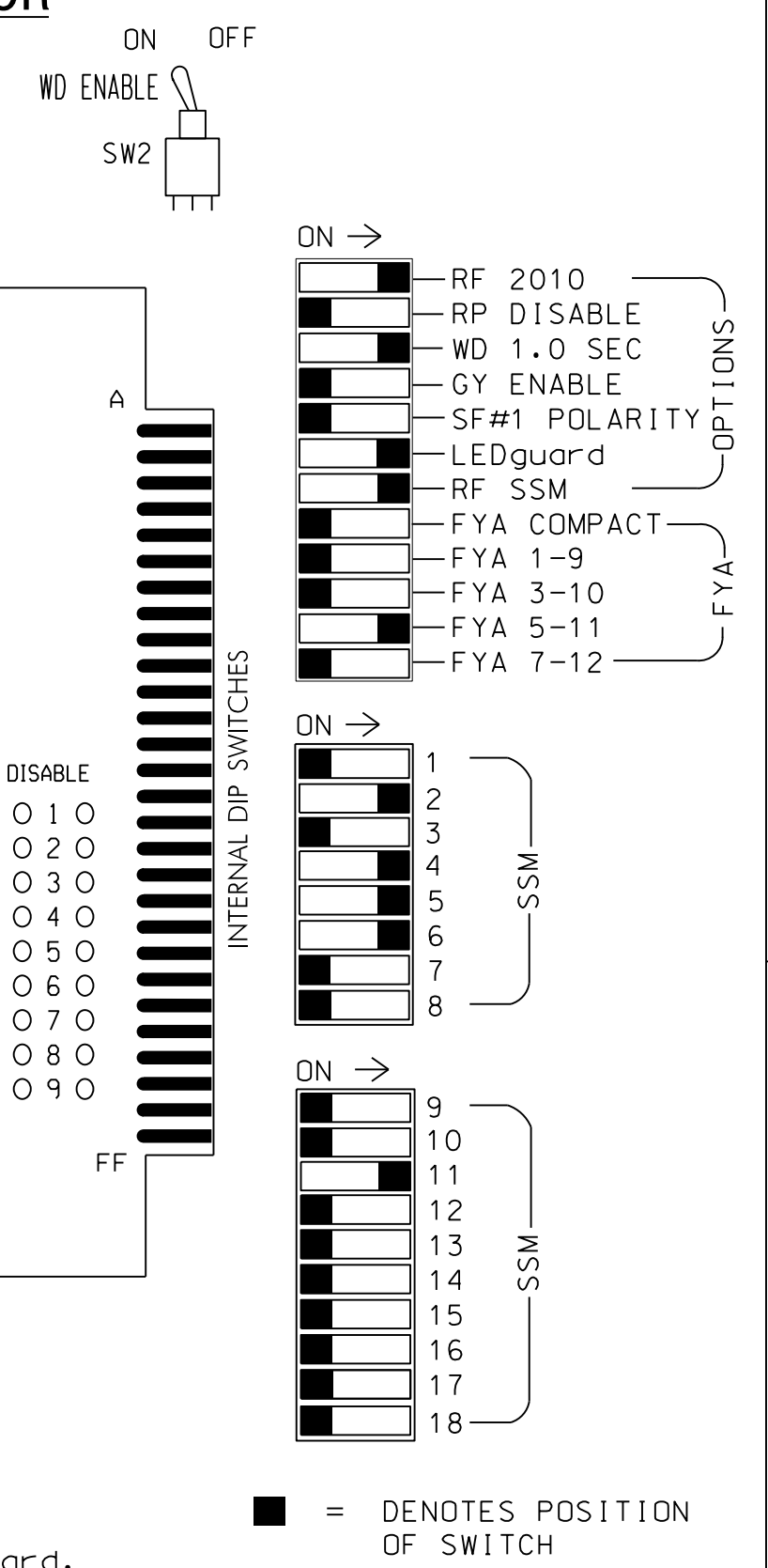
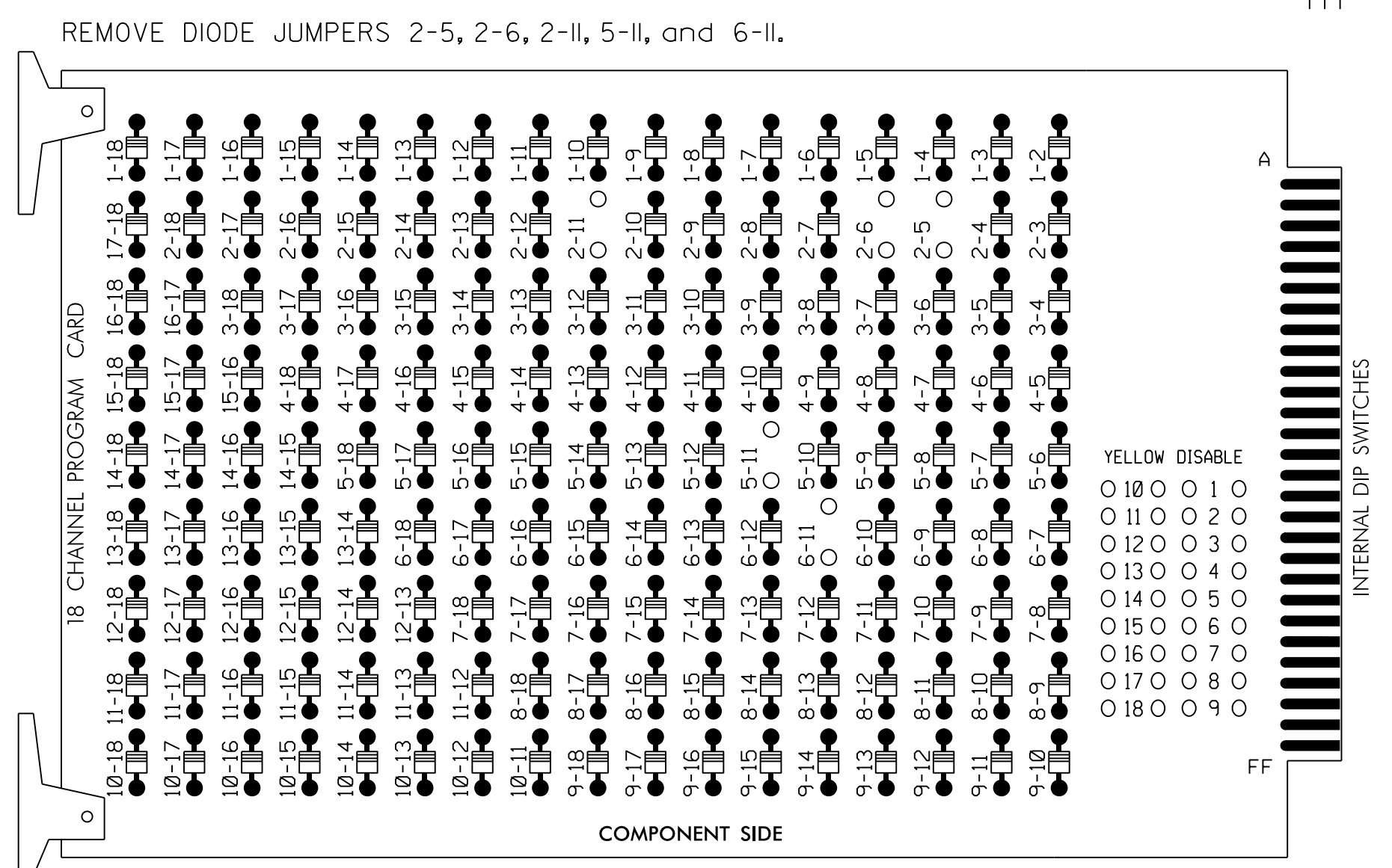
Professional Engineer Seal 29449  
 FAYETTEVILLE, NC  
 Betsy L. Watson  
 DATE: 3/29/2018  
 SIG. INVENTORY NO. 06-033411

3/29/2018 10:41:00 AM User: rmmuncey  
 C:\Users\rmmuncey\Documents\Signal Design\Temporary 1\U-4405\_Sig\_Design\_06-033411.dgn



### 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 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.....2070  
 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 "B".....NOT USED  
 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	42	51	61,62,63	NU	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								132											A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW							133	133											

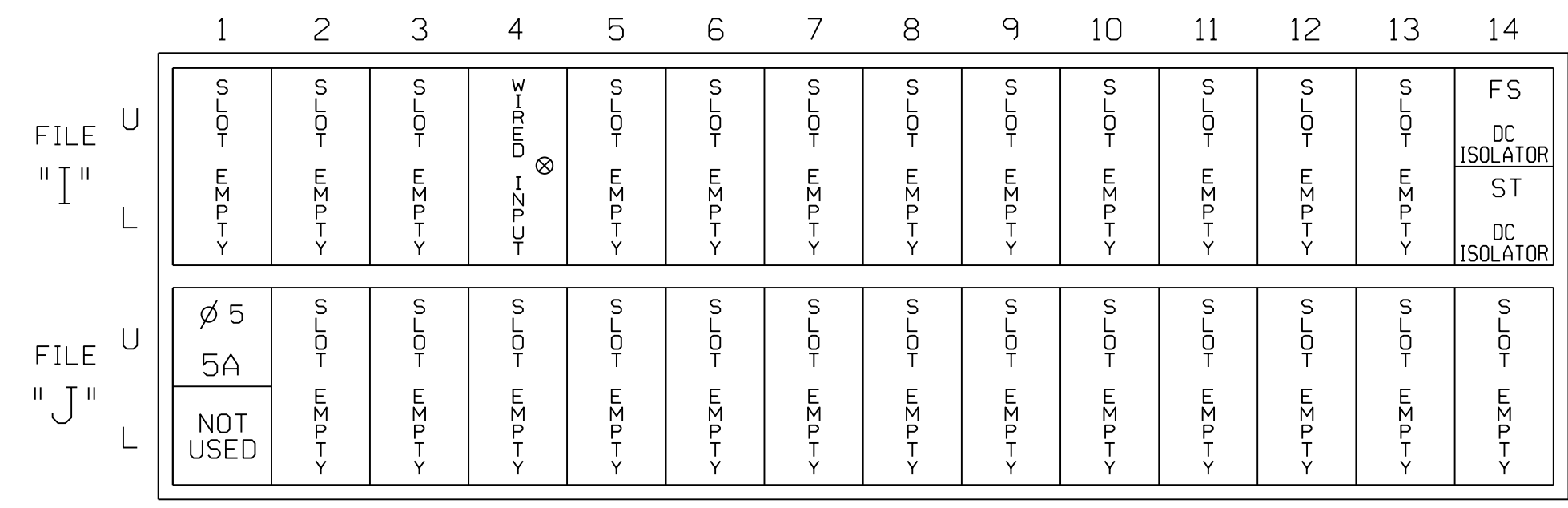
NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 ★ See pictorial of head wiring in detail this sheet.

### DETECTOR NOTES

- For all loops, install a video 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.
- For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

### INPUT FILE POSITION LAYOUT

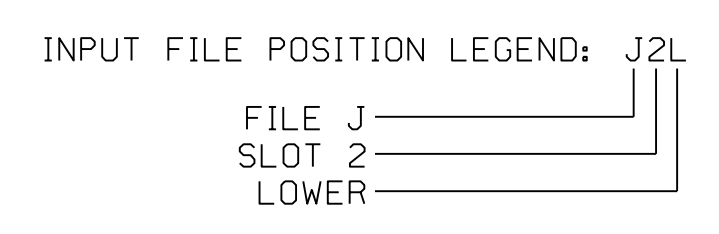
(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

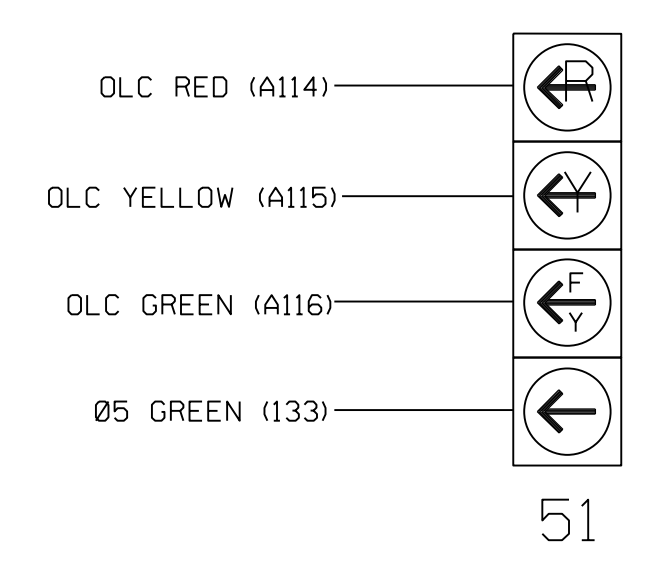
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A <sup>1</sup>	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES		3		G

<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.  
 ★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.



### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

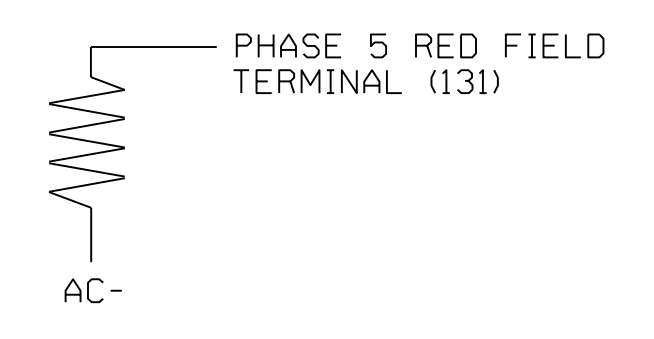


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0334T1  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Temporary Design 1 - TMP Phase I  
 Electrical Detail - Sheet 1 of 3

Stantec Consulting Services Inc.  
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Prepared in the Offices of:  
 R. M. Muncey  
 Professional Engineer  
 License No. 045933

US 401 Business (Raeford Road)  
 at  
 Montclair Drive

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: R M Muncey REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 R. M. MUNCHEY  
 License No. 045933  
 3/29/2018

DATE: U:\Projects\Signal\Temp\Temp\Detail\SignalPhase 1\U-4405-sig.ele.06-0334T1.dgn User: rlmuncy

## ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 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 "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".

```

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... 3.0
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

## 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 TWO TIMES

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0334T1  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Temporary Design 1 - TMP Phase I  
Electrical Detail - Sheet 2 of 3

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			REVISIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DESCRIPTION	INIT.	DATE			
NO.	DESCRIPTION	INIT.	DATE							



## ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

### 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 BIT 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 BIT 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	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 BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BIT 5:           Modifies overlap parent phases for head 51 to run protected turns only.

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

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


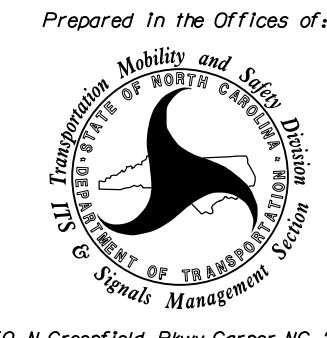
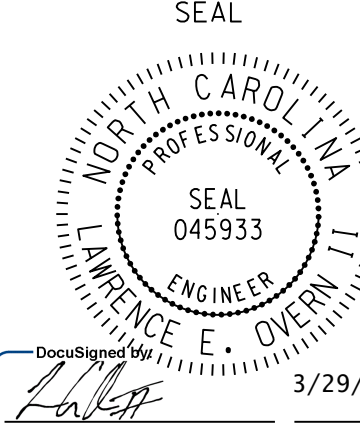
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ACTION PLAN...[ 1]
PATTERN.....AUTO  SYS OVERRIDE.... NO
TIMING PLAN..... 0  SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --  RED REST..... NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE.. NO  PRIORITY RETURN. NO
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  .  .  .  .  .  .  .  .  .  .  .
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 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    
```

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-0334T1  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

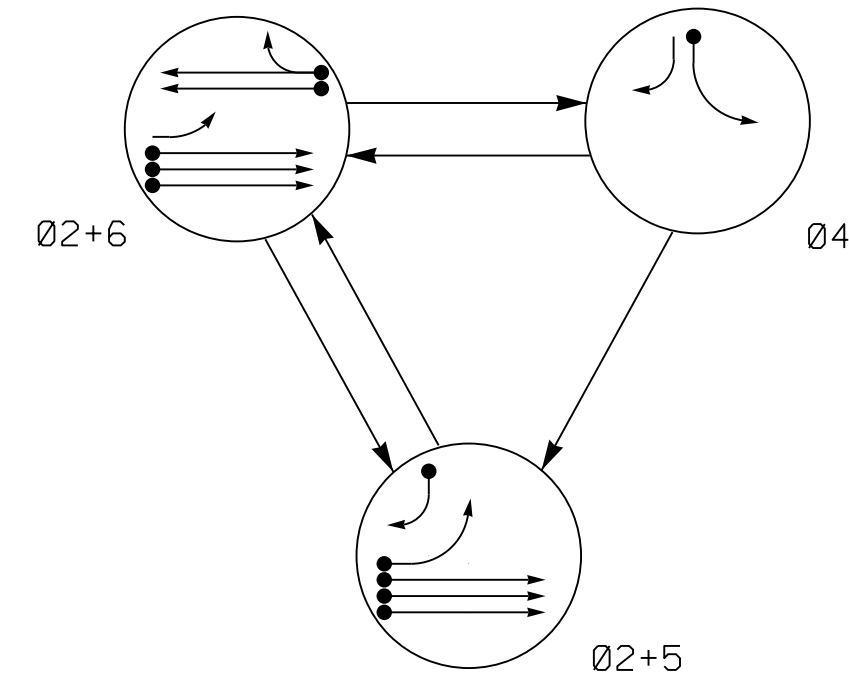
Temporary Design 1 - TMP Phase I  
Electrical Detail - Sheet 3 of 3

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REVISIONS	INIT.	DATE										

DATE: U:\Projects\Signal\Signal\Detail\Signal\Phase 1\U-4405\Sig.ele\_06-0334T1.dgn User: rlmuncey

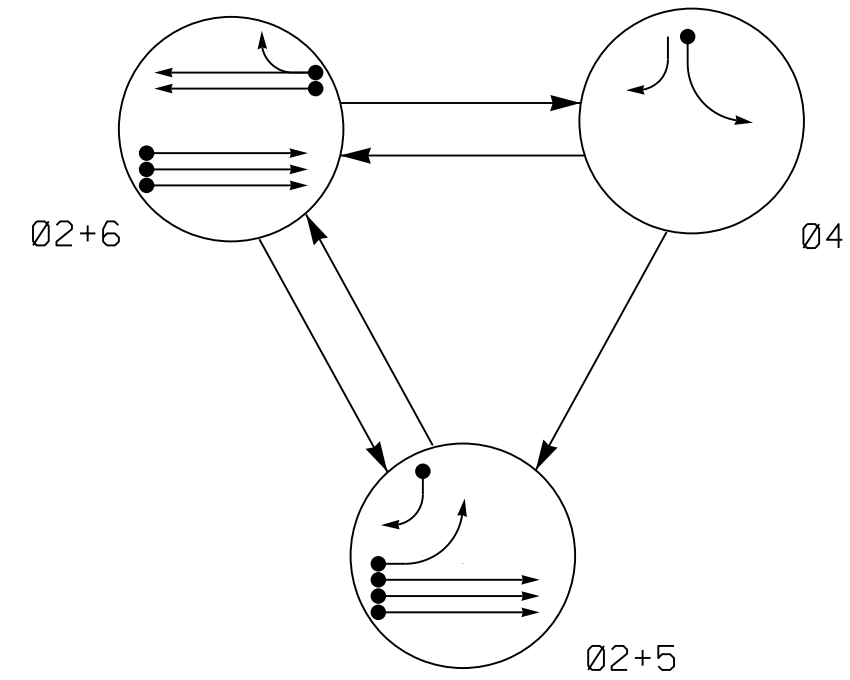
**DEFAULT PHASING DIAGRAM**



**DEFAULT TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	FLASH
21,22,23	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	←	←	←	←
61,62	R	G	R	Y

**ALTERNATE PHASING DIAGRAM**



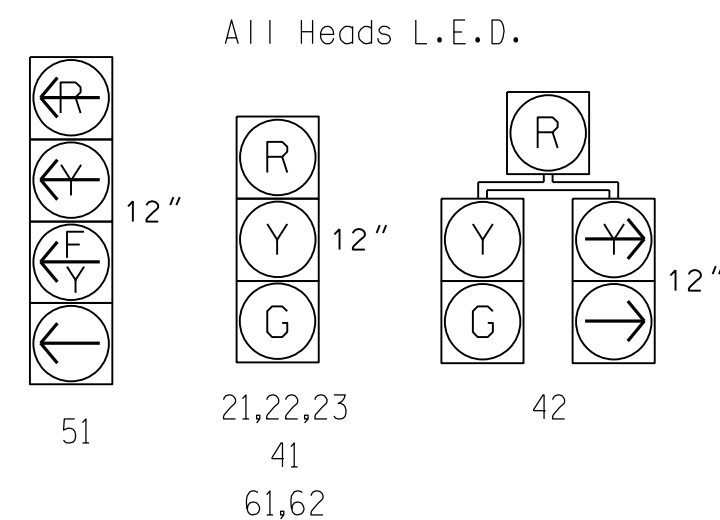
**ALTERNATE TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	FLASH
21,22,23	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	←	←	←	←
61,62	R	G	R	Y

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**



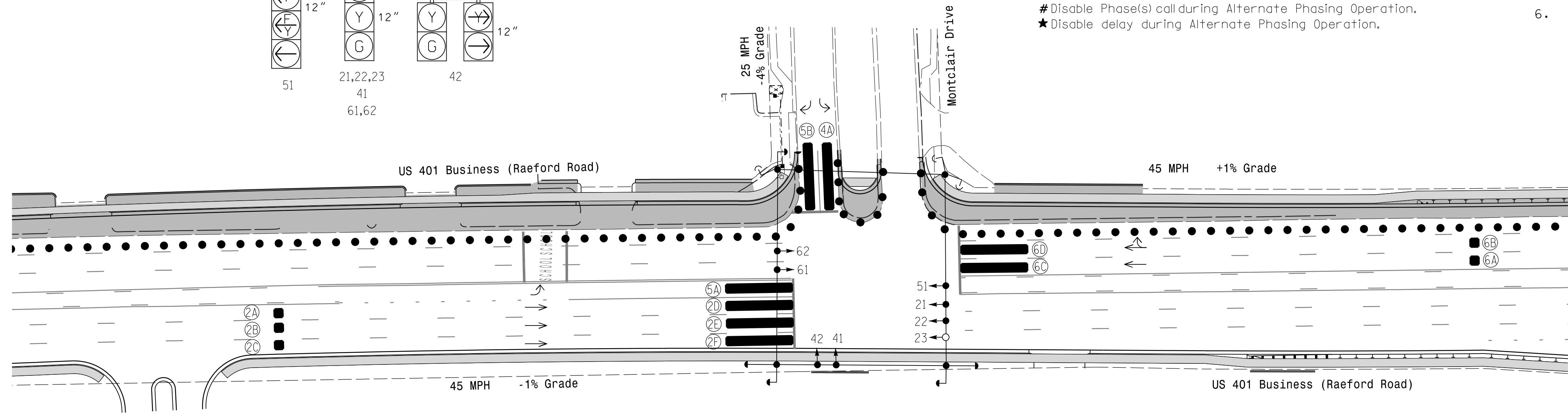
ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2C	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2E	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2F	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	*	-	5	Yes	-	15	-	S	-	-
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-

- \*Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
- #Disable Phases) calling during Alternate Phasing Operation.
- ★Disable delay during Alternate Phasing Operation.

**3 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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.
- The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	1.0	1.0	6.0
Max 1 *	90	25	15	90
Yellow	4.6	3.0	3.0	4.6
Red Clear	1.5	2.8	2.4	1.5
Red Revert	-	-	-	-
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Locking Detector	-	-	-	-
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                            | ● 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                              |
| ■ Video Detection Area                           | N/A  |
| ■ Construction Zone                              | N/A  |
| ● Drums  | N/A  |

**Signal Upgrade Temporary Design 2 - TMP Phase II**

**Stantec**  
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Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27526  
 SCALE: 0 40  
 1" = 40'

**US 401 Business (Raeford Road) at Montclair Drive**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: R M Muncey REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

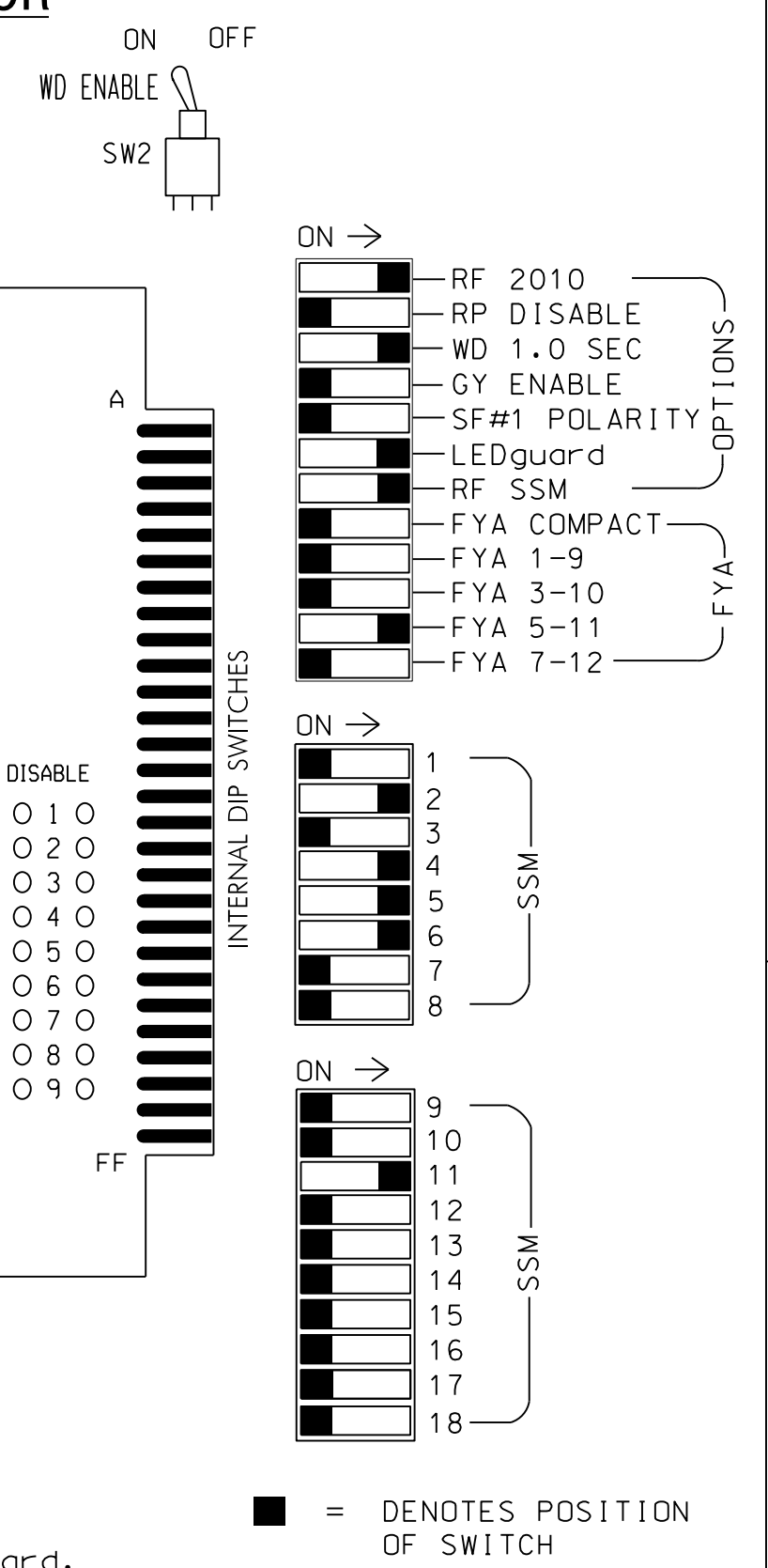
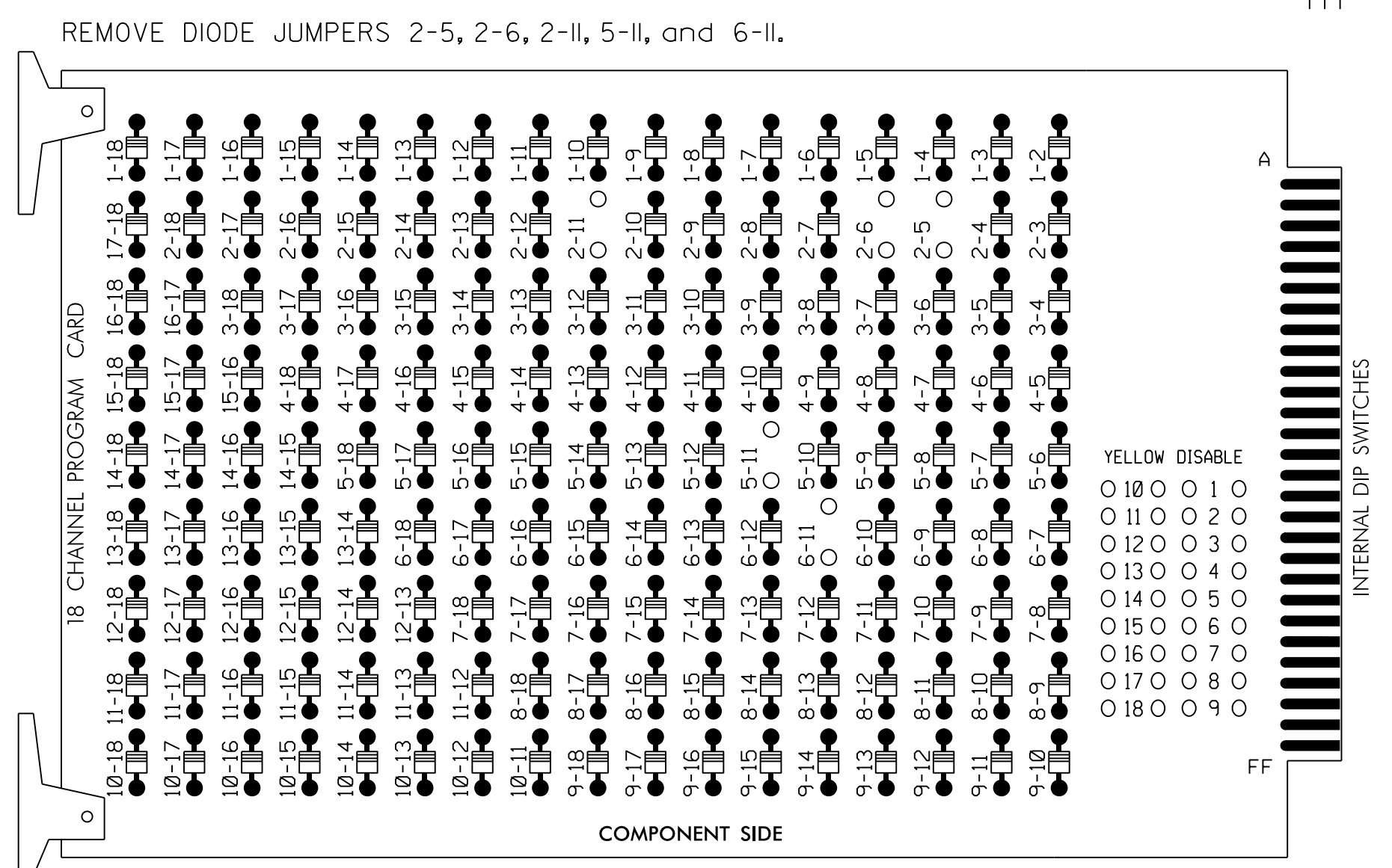
**Professional Engineer Seal**  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 29449  
 Betsy L. Watson  
 3/29/2018  
 SIG. INVENTORY NO. 06-033412

3/29/2018 10:44:11 AM  
 User: rfmuncey  
 C:\Users\rfmuncey\Documents\Signal Design\Phase 2\U-4405\_Sig\_Design\_06-0334-T2.dgn



### 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.
- 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

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 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
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 LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4  
 PHASES USED.....2,4,5,6  
 OVERLAP "B".....NOT USED  
 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	21,22,23	NU	NU	41,42	NU	42	51*	61,62	NU	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							132											A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW							133	133										

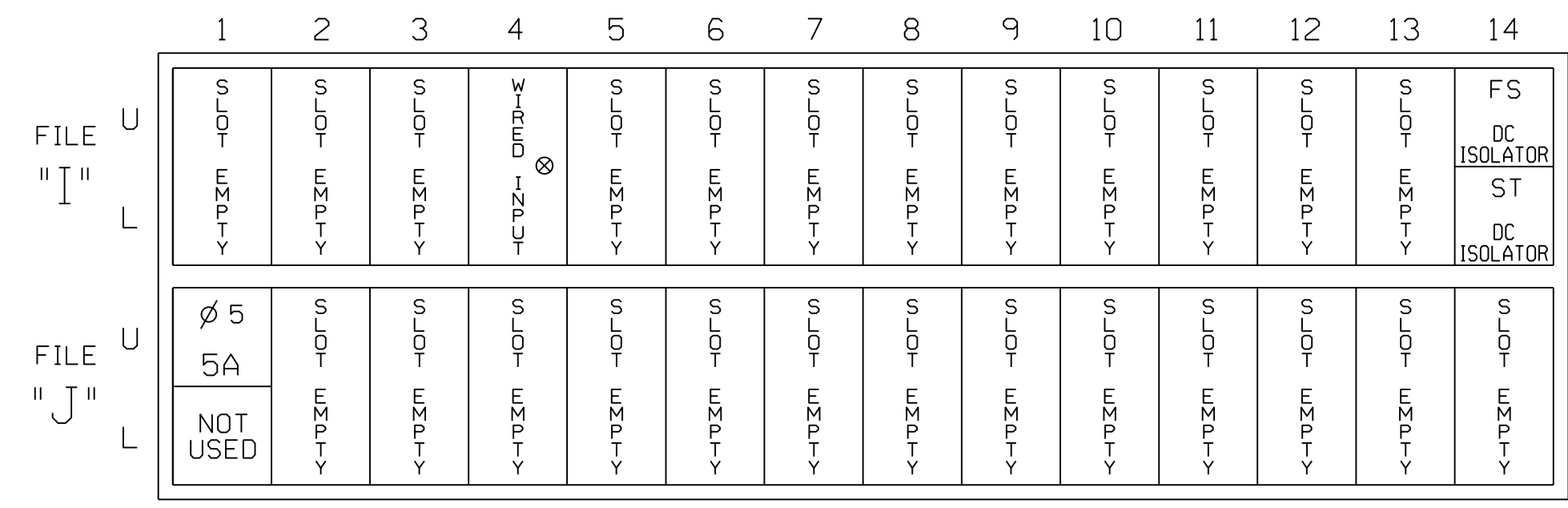
NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 ★ See pictorial of head wiring in detail this sheet.

### DETECTOR NOTES

- For all loops, install a video 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.
- For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

### INPUT FILE POSITION LAYOUT

(front view)

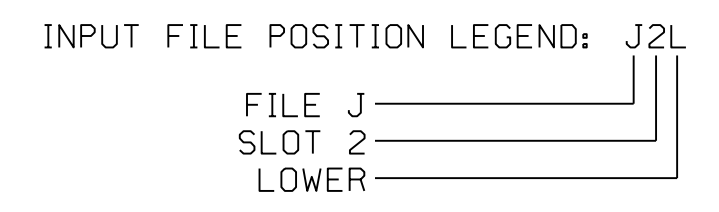


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A <sup>1</sup>	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES		3		G

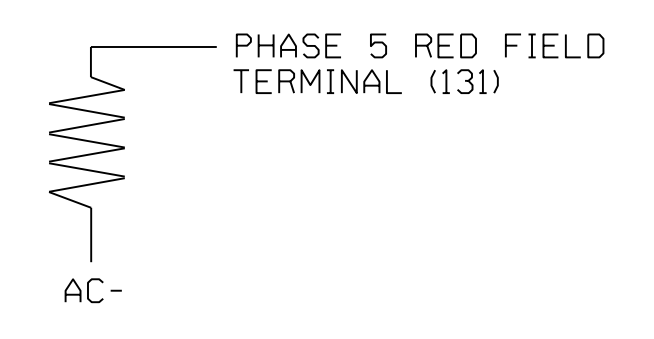
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.  
 ★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.



### LOAD RESISTOR INSTALLATION DETAIL

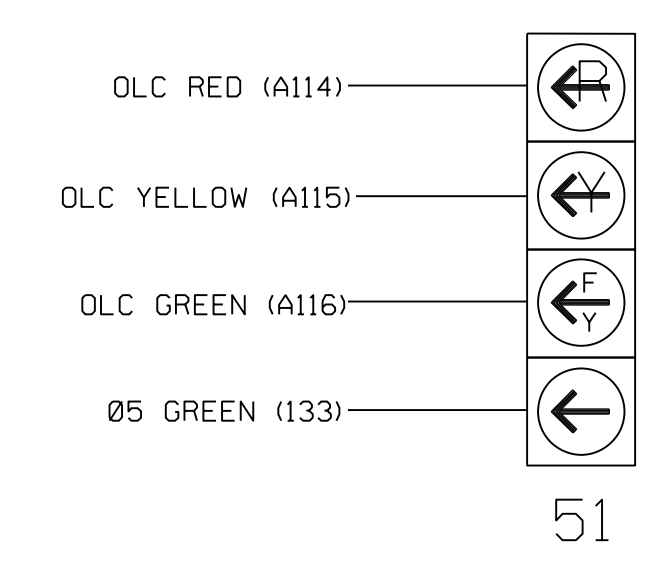
(install resistor as shown)

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



### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0334T2  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 2 - TMP Phase II  
 Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 401 Business (Raeford Road) at Montclair Drive	
Prepared in the Offices of:	Division 6	Cumberland County	Fayetteville
PLAN DATE: March 2018	REVIEWED BY: L Overn	PREPARED BY: R W Muncy	REVIEWED BY:
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/29/2018

SIG. INVENTORY NO. 06-0334T2



# ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

## IMPORTANT!

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

- From Main Menu select **8. UTILITIES**
- From UTILITIES Submenu select **1. COPY/CLEAR**
- 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
  
```

- From Main Menu select **6. DETECTORS**
- From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
- Place cursor in VEH DET PLAN [ ] position and enter "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".

```

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... 3.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
  
```

→ ENSURE PHASE IS SET TO "0"

← NOTICE VEH DET PLAN 2

END PROGRAMMING

# 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 TWO TIMES  
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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0334T2  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Temporary Design 2 - TMP Phase II  
Electrical Detail - Sheet 2 of 3

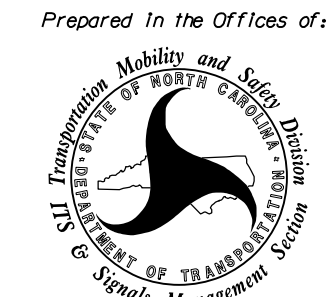
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Business (Raeford Road)  
at  
Montclair Drive

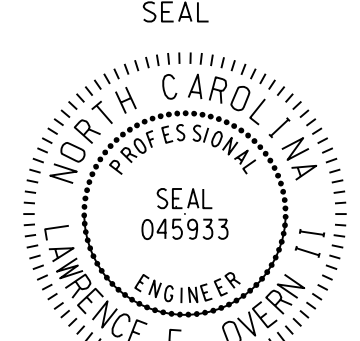
Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: R W Muncey REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL



3/29/2018

DATE

SIG. INVENTORY NO. 06-0334T2

DATE: 03/29/2018 10:45:11 AM  
User: rfmuncy

## ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

### 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 BIT 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 BIT 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	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 BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BIT 5:               Modifies overlap parent phases for head 51 to run protected turns only.

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

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  .  .  .  .  .  .  .  .  .  .  .
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 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    
```

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-0334T2  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Temporary Design 2 - TMP Phase II  
Electrical Detail - Sheet 3 of 3

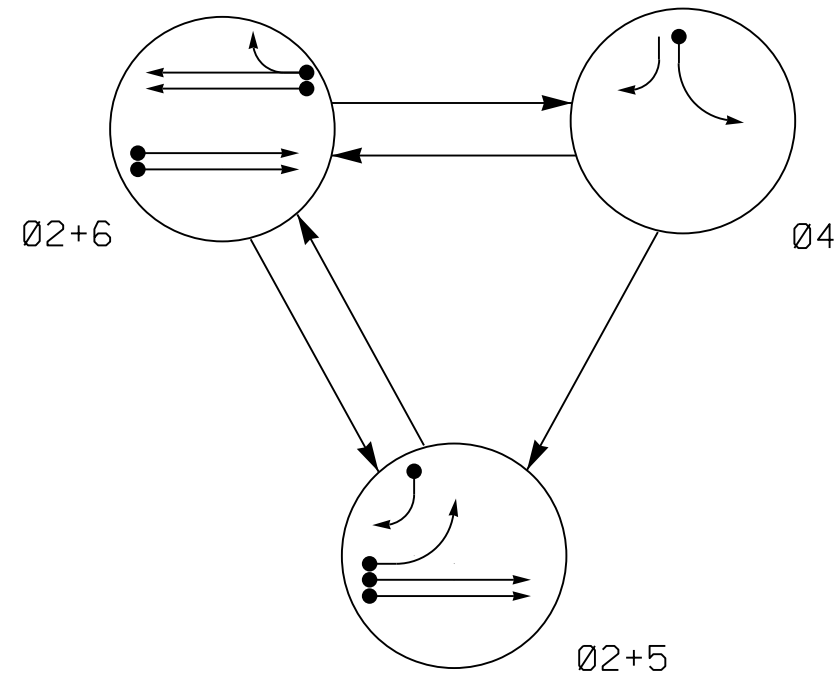
**DOCUMENT NOT CONSIDERED FINAL  
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 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>US 401 Business (Raeford Road) at Montclair Drive</b>  Division 6    Cumberland County    Fayetteville PLAN DATE:    March 2018                      REVIEWED BY:    L Overn PREPARED BY:    R M Muncey                      REVIEWED BY:	SEAL  LAWRENCE E. OVERN ENGINEER 045933 3/29/2018
	REVISIONS                      INIT.                      DATE		DATE: 3/29/2018 SIG. INVENTORY NO. 06-0334T2

DATE: U:\Projects\Signal\Signal\Detail\Signal\Phase 2\U-4405\Sig\ele\_06-0334T2.dgn User: rlmuncey



**PHASING DIAGRAM**

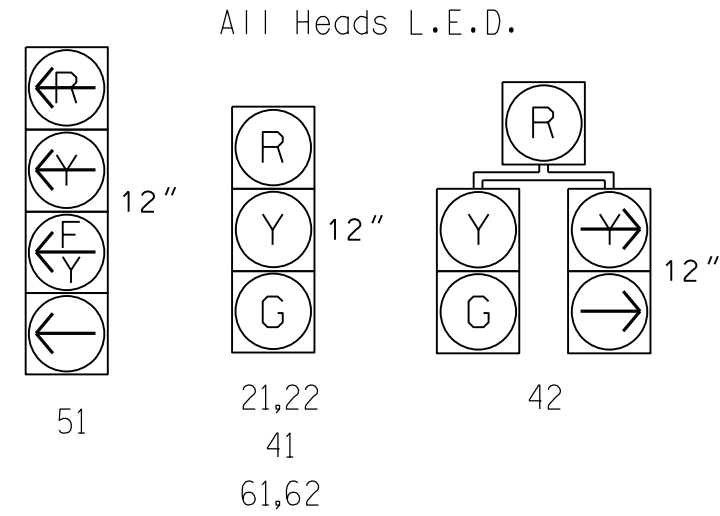


**PHASING DIAGRAM DETECTION LEGEND**

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

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

**SIGNAL FACE I.D.**



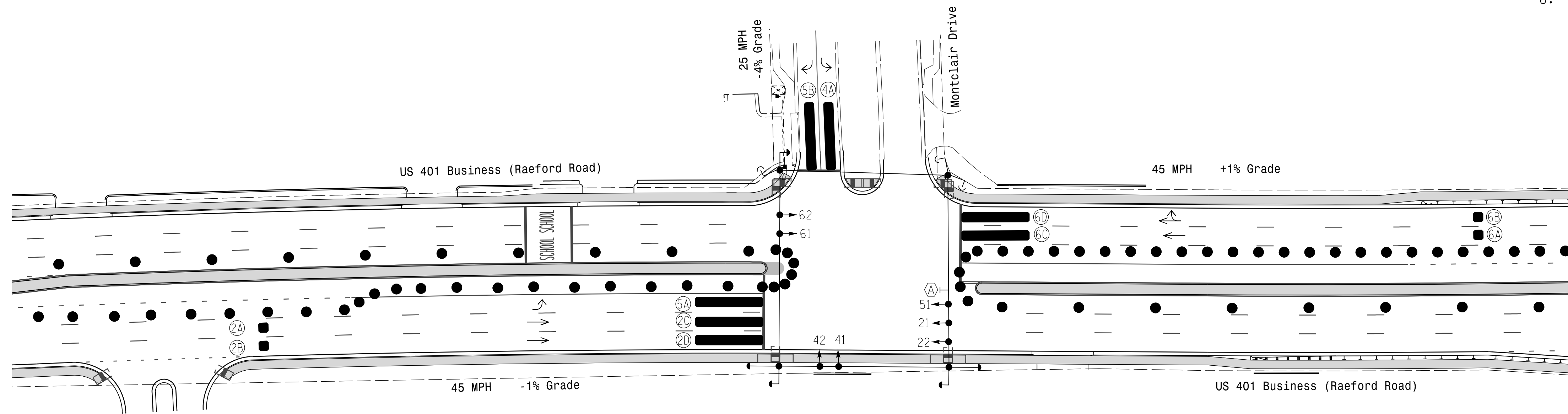
ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2E	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-

\*Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

**3 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer. Phase 5 may be lagged.
3. Reposition existing signal heads numbered #21, 22, 51, 61, and 62.
4. Set all detector units to presence mode.
5. 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 *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	1.0	1.0	6.0
Max 1 *	90	25	15	90
Yellow	4.6	3.0	3.0	4.6
Red Clear	1.6	3.3	3.2	1.6
Red Revert	-	-	-	-
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Locking Detector	-	-	-	-
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	LEGEND	EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Pedestrian Signal Head	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	
	Video Detection Area	N/A
	Construction Zone	N/A
	Drums	N/A
	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	

**Signal Upgrade Temporary Design 3 - TMP Phase III**

Stantec Consulting Services Inc.  
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Prepared for the Offices of:  
750 N. Greenfield Pkwy, Garner, NC 27526  
SCALE: 0 40  
1" = 40'

**US 401 Business (Raeford Road) at Montclair Drive**

Division 6 Cumberland County Fayetteville  
PLAN DATE: March 2018 REVIEWED BY: E D Harris  
PREPARED BY: R M Muncey REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

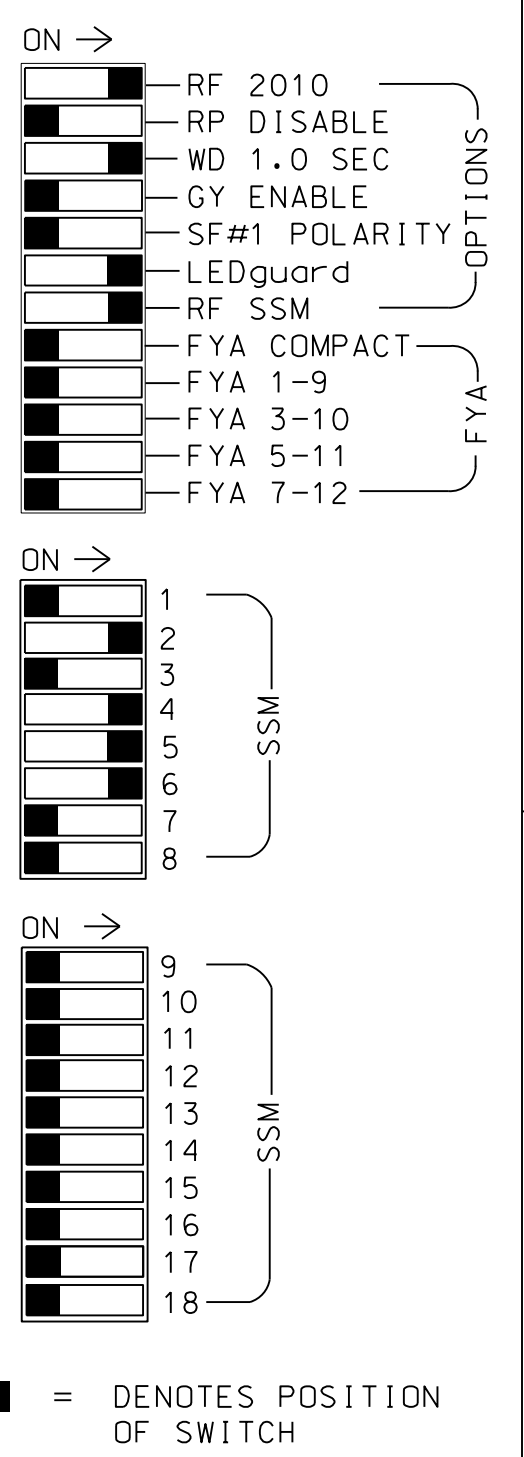
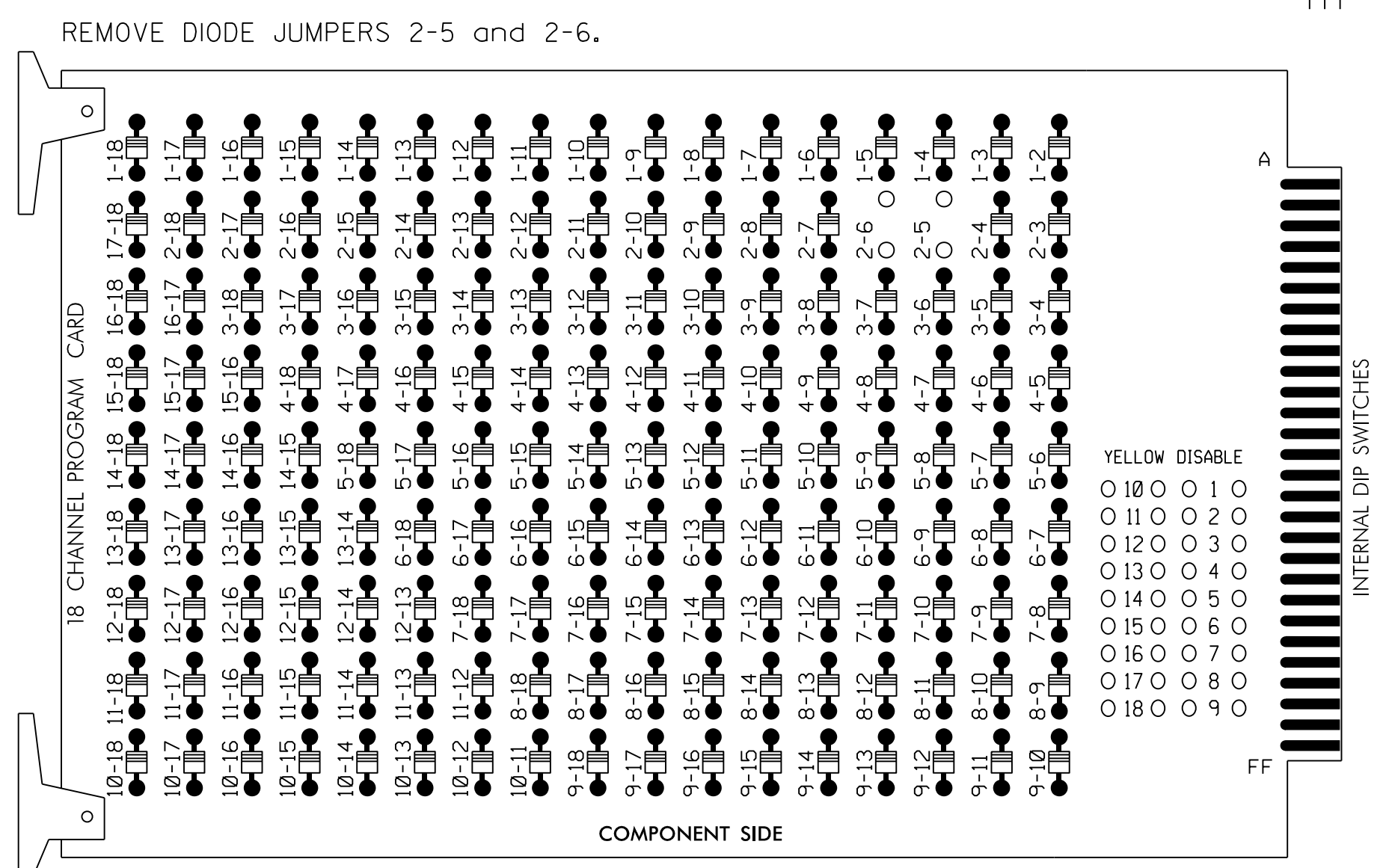
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3/29/2018  
DATE: 3/29/2018  
SIG. INVENTORY NO. 06-033413

3/29/2018 11:41 AM User: rfmuncy

### 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.

### 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. Return controller to Factory Defaults before programming per this electrical detail.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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  
 PHASES USED.....2,4,5,6  
 OVERLAP "A".....NOT USED  
 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	NU	NU	41,42	NU	42	51★	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101				134									
YELLOW		129			102				135									
GREEN		130			103				136									
RED ARROW								131										
YELLOW ARROW							132	132										
GREEN ARROW							133	133										

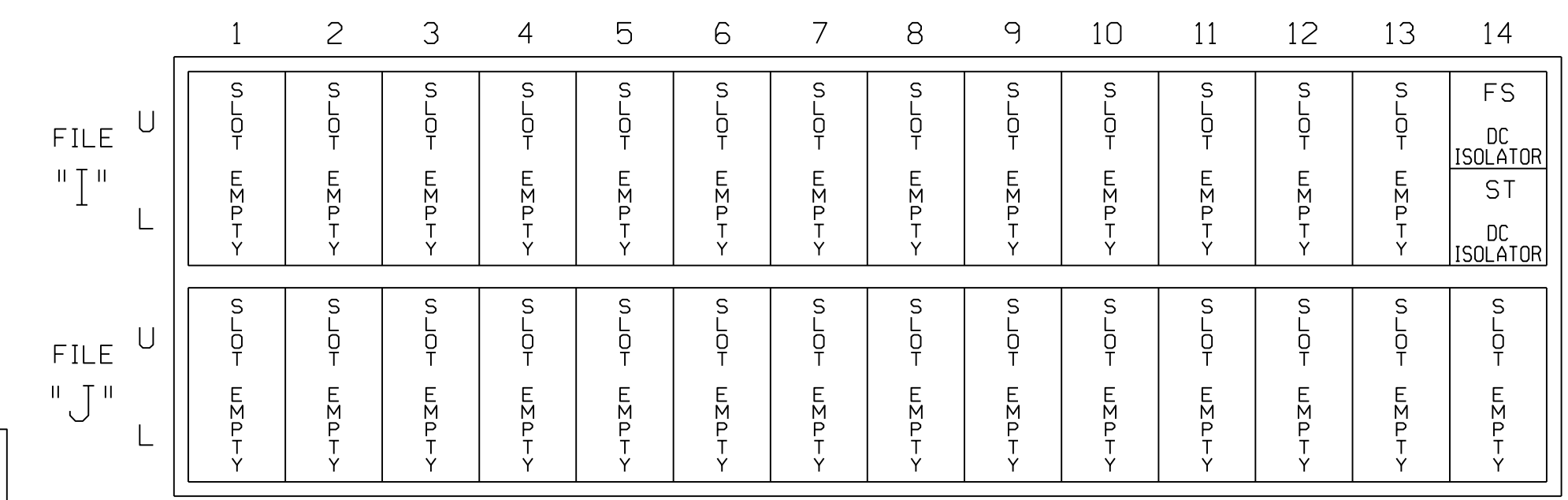
NU = Not Used  
 ★ See pictorial of head wiring in detail this sheet.

### DETECTOR NOTES

1. For all loops, install a video 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.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phase 2.

### INPUT FILE POSITION LAYOUT

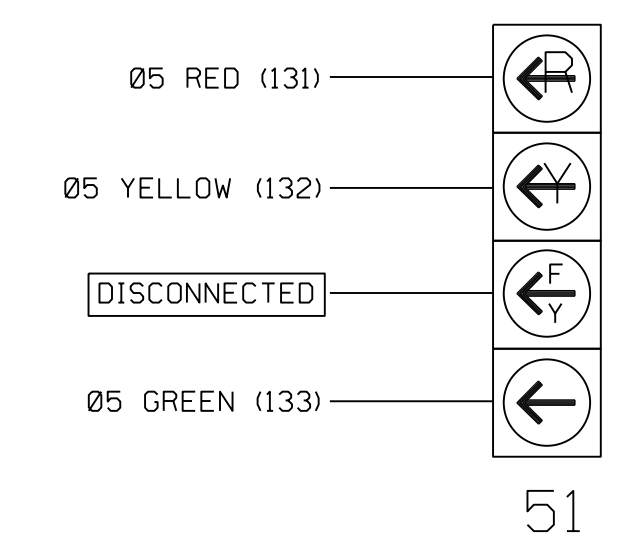
(front view)



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

### SIGNAL WIRING DETAIL

(wire signal head as shown)

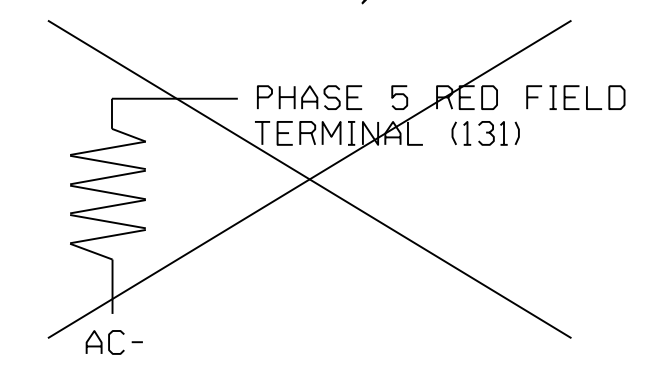


THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 06-0334T3  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



IMPORTANT! Remove resistor from field terminal as shown above, if present.

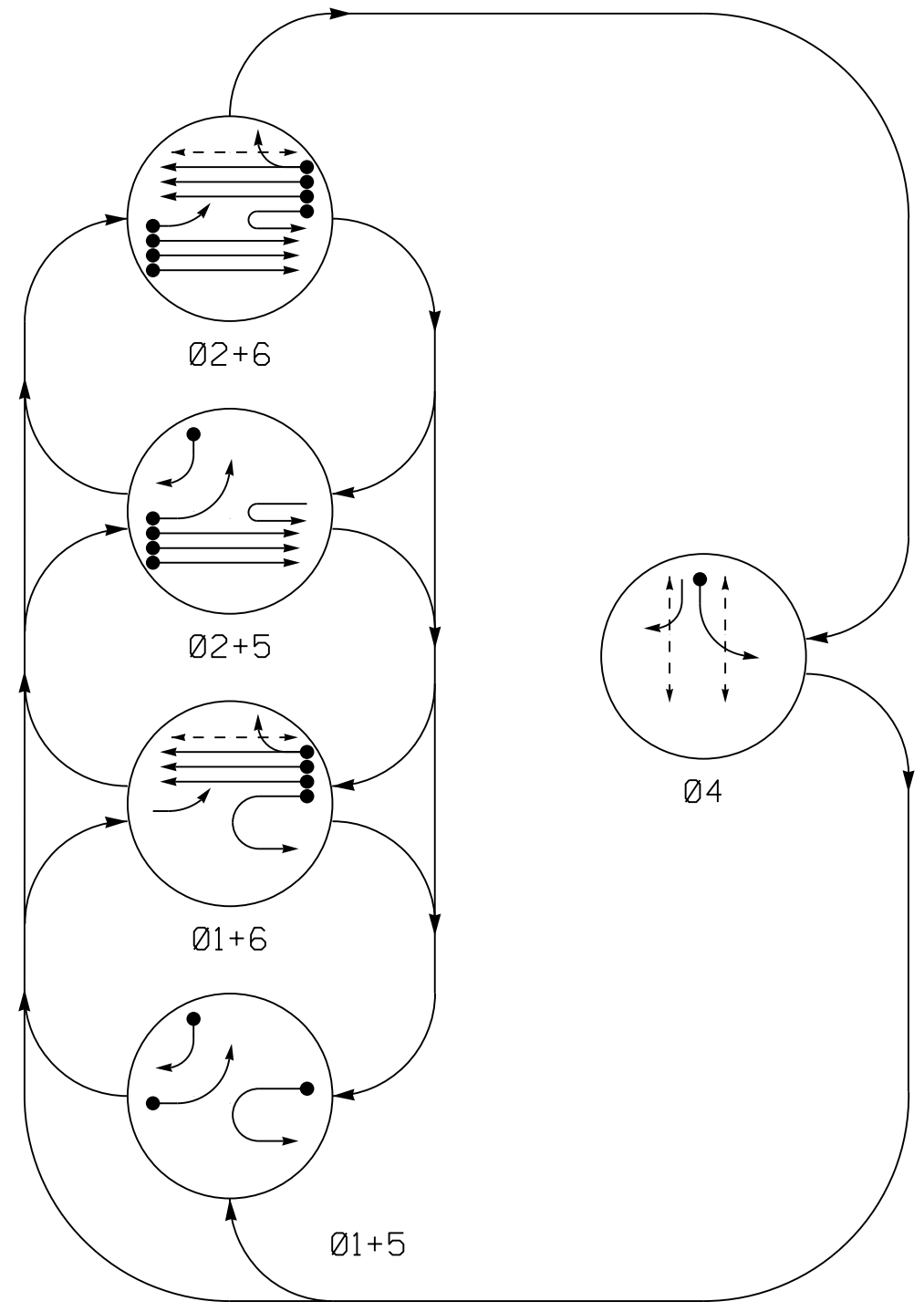
Temporary Design 3 - TMP Phase III  
 Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 401 Business (Raeford Road) at Montclair Drive	
Prepared in the Offices of:		Division 6 Cumberland County Fayetteville	
PLAN DATE: March 2018	REVIEWED BY: L Overn	PREPARED BY: R M Muncey	REVIEWED BY:
REVISIONS	INIT.	DATE	

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 License No. 045933  
 3/29/2018  
 SIG. INVENTORY NO. 06-0334T3



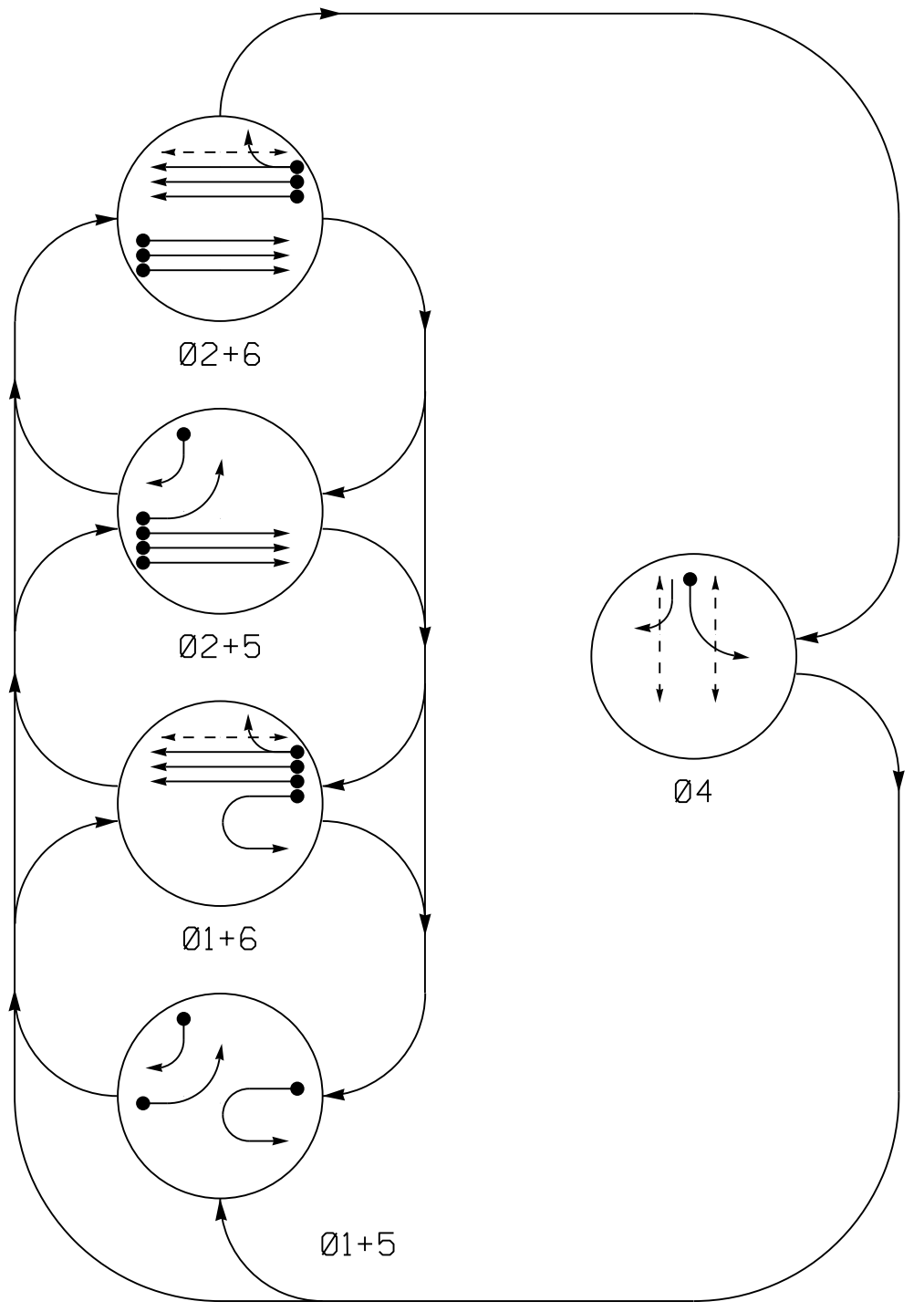
**DEFAULT PHASING DIAGRAM**



**DEFAULT TABLE OF OPERATION**

SIGNAL FACE	PHASE					FLASH
	01+5	02+5	02+6	04	Y	
11	R	R	G	R	Y	
21,22,23	R	R	G	R	Y	
41	R	R	R	G	R	
42	R	R	R	R	G	
51	R	R	R	R	Y	
61,62,63	R	G	R	G	R	Y
P41,P42,P43,P44	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

**ALTERNATE PHASING DIAGRAM**



**ALTERNATE TABLE OF OPERATION**

SIGNAL FACE	PHASE					FLASH
	01+5	02+5	02+6	04	Y	
11	R	R	R	R	Y	
21,22,23	R	R	G	R	Y	
41	R	R	R	R	G	
42	R	R	R	R	G	
51	R	R	R	R	Y	
61,62,63	R	G	R	G	R	Y
P41,P42,P43,P44	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

**ASC/3 DETECTOR INSTALLATION CHART**

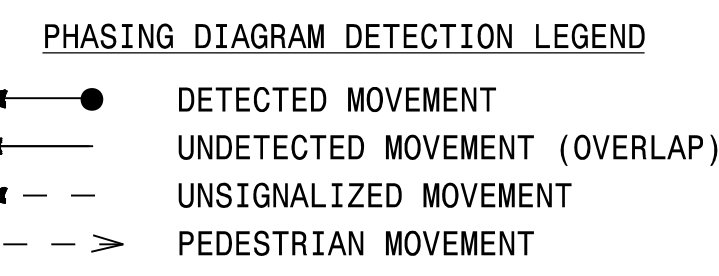
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
2A	6X6	300	5	X	2	Yes	-	-	-	X	N	-
2B	6X6	300	5	X	2	Yes	-	-	-	X	N	-
2C	6X6	300	5	X	2	Yes	-	-	-	X	N	-
4A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

★ Disable delay during Alternate Phasing Operation.  
 # Disable Phase(s) calling during Alternate Phasing Operation.

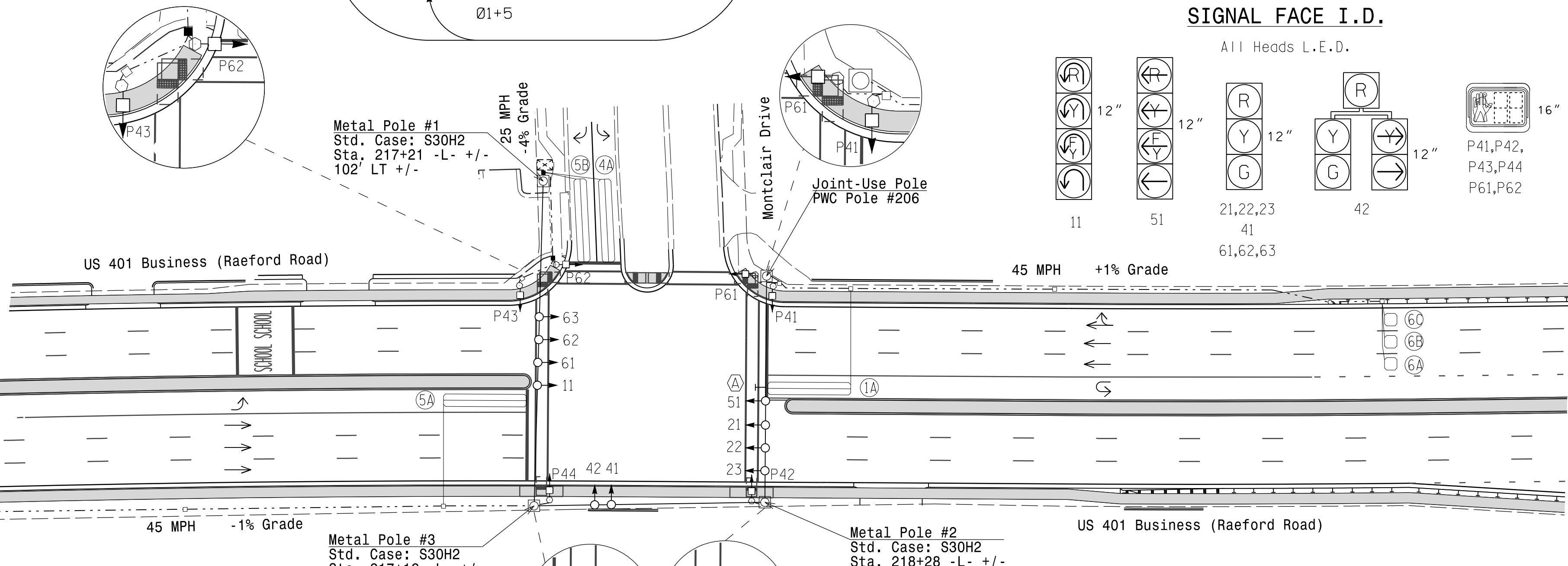
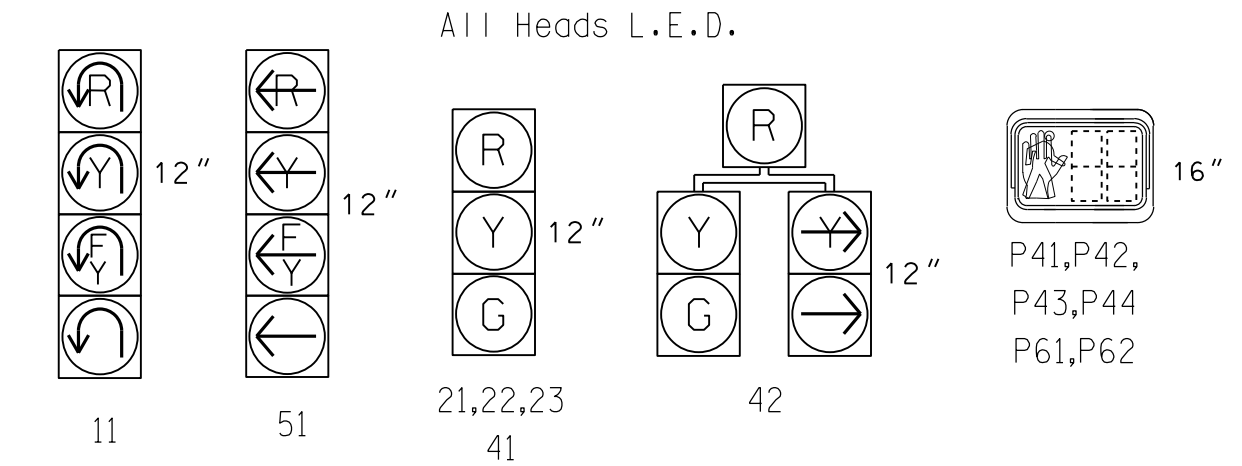
**5 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



**SIGNAL FACE I.D.**

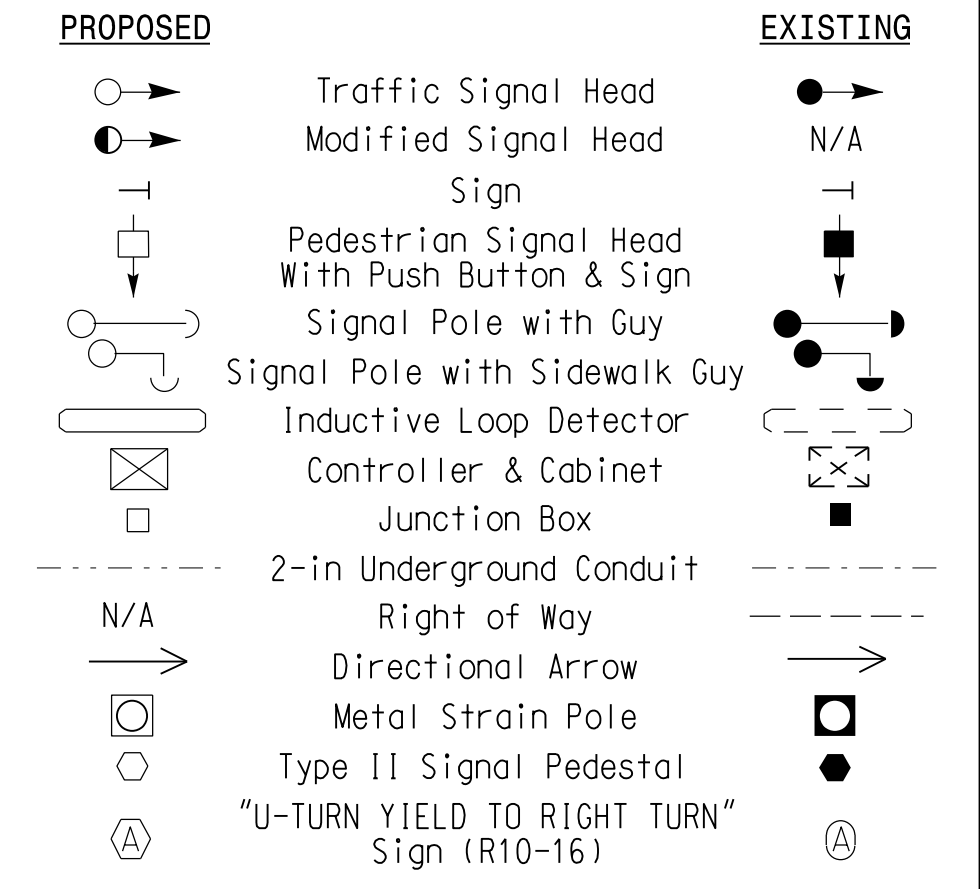


**ASC/3 TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	
Min Green *	7	12	7	7	12	
Walk *	-	-	7	-	7	
Ped Clear	-	-	23	-	20	
Veh. Extension *	1.0	6.0	1.0	1.0	6.0	
Max I *	15	90	25	15	90	
Yellow	3.0	4.6	3.0	3.0	4.6	
Red Clear	3.5	2.1	1.0	3.2	2.1	
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	

\* 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**



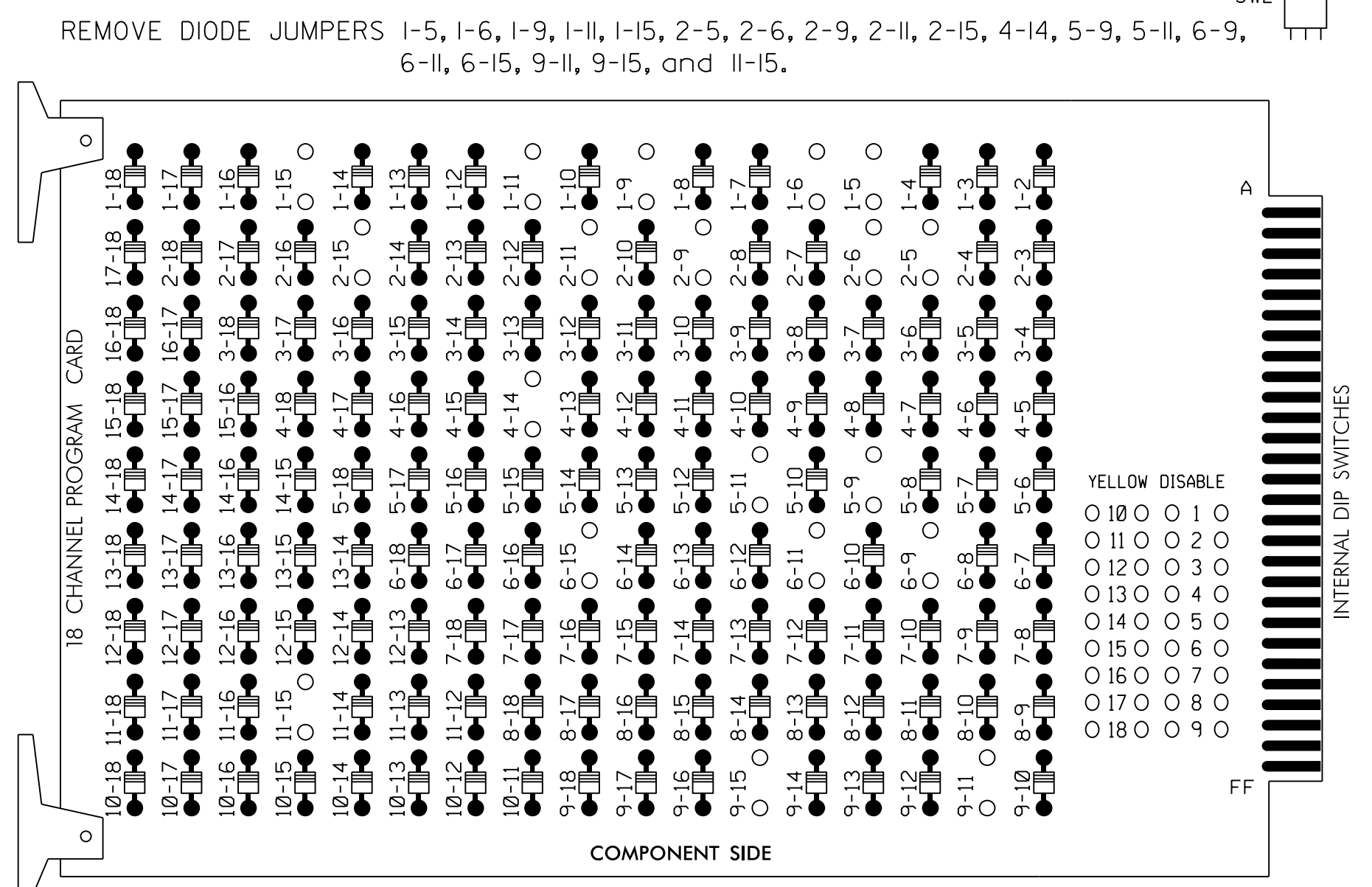
**Signal Upgrade - Final Design**

<p>Stantec Consulting Services Inc.                  801 Jones Franklin Road-Suite 300                  Raleigh, NC 27606                  Tel. (919) 851-6866                  Fax. (919) 851-7024                  www.stantec.com                  License No. F-0672</p>	<p>Prepared for the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27526</p>	<p><b>US 401 Business (Raeford Road) at Montclair Drive</b></p>		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: E D Harris</p> <p>PREPARED BY: R M Muncy REVIEWED BY: B L Watson</p>						
		<p>Scale: 1" = 40'</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>		NO.	DATE	INIT.	DATE		
NO.	DATE	INIT.	DATE							



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

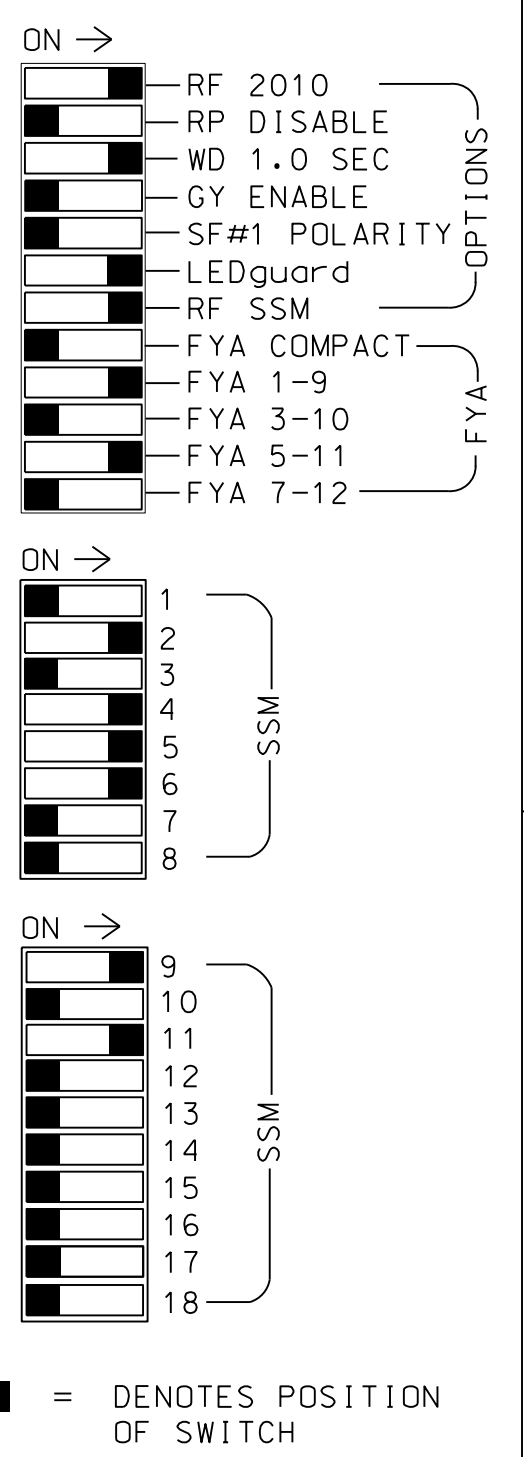
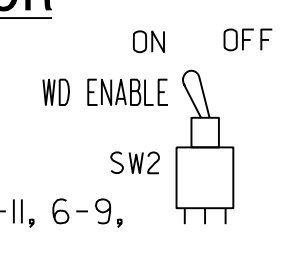
(remove jumpers and set switches as shown)



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.
- Return controller to Factory Defaults before programming per this electrical detail.
- 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.....2070  
 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

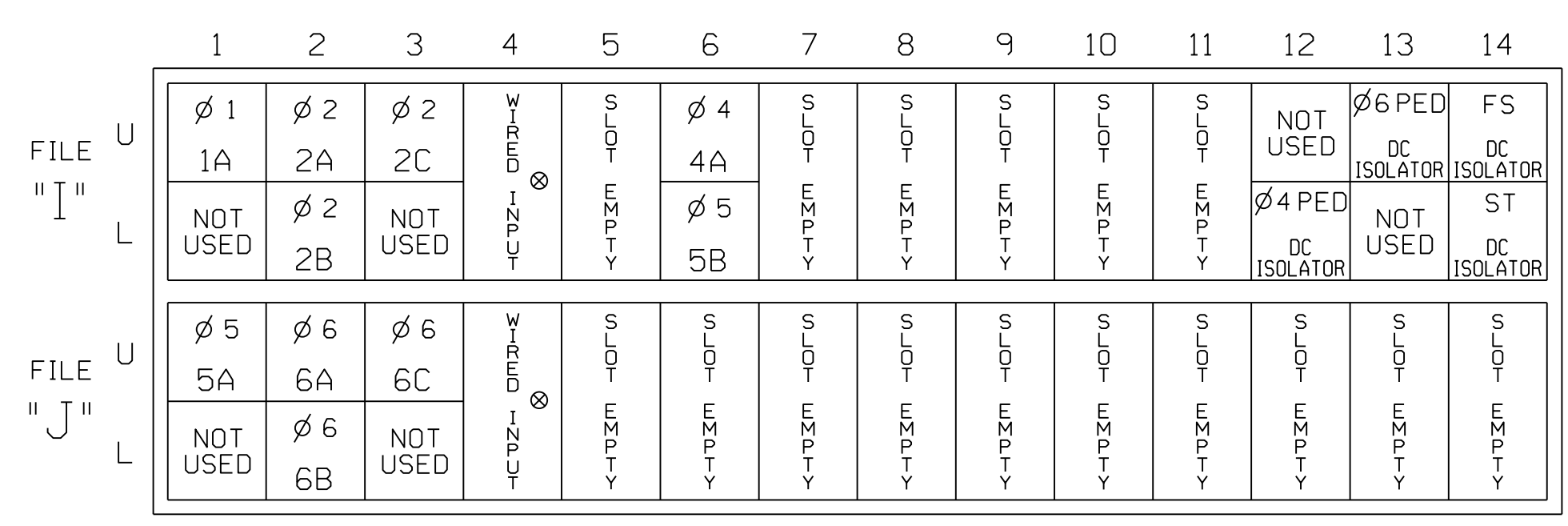
### SIGNAL HEAD HOOK-UP CHART

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	21,22,23	NU	NU	41,42	P41, P42, P43, P44	42	51	61,62,63	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							132						A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133	133										
Hand icon							104					119						
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.

### INPUT FILE POSITION LAYOUT

(front view)



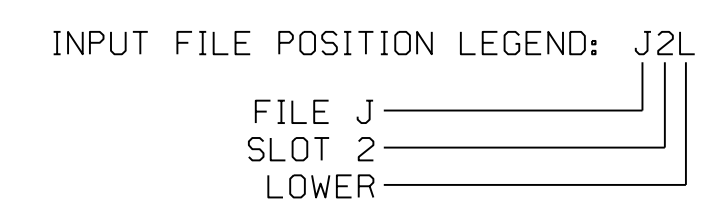
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	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			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES			X	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	TB4-11,12	I6L	45	14	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
PED PUSH BUTTONS										
P41,P42, P43,P44	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

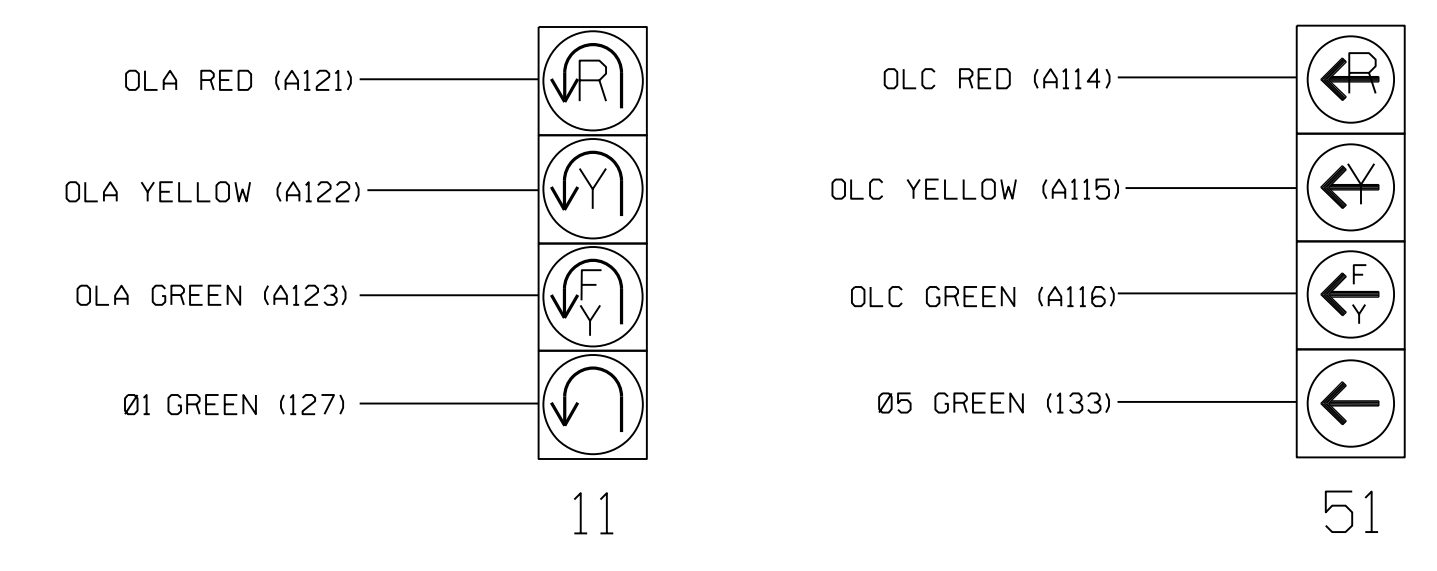
NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

- 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.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 2.



### FYA SIGNAL WIRING DETAIL

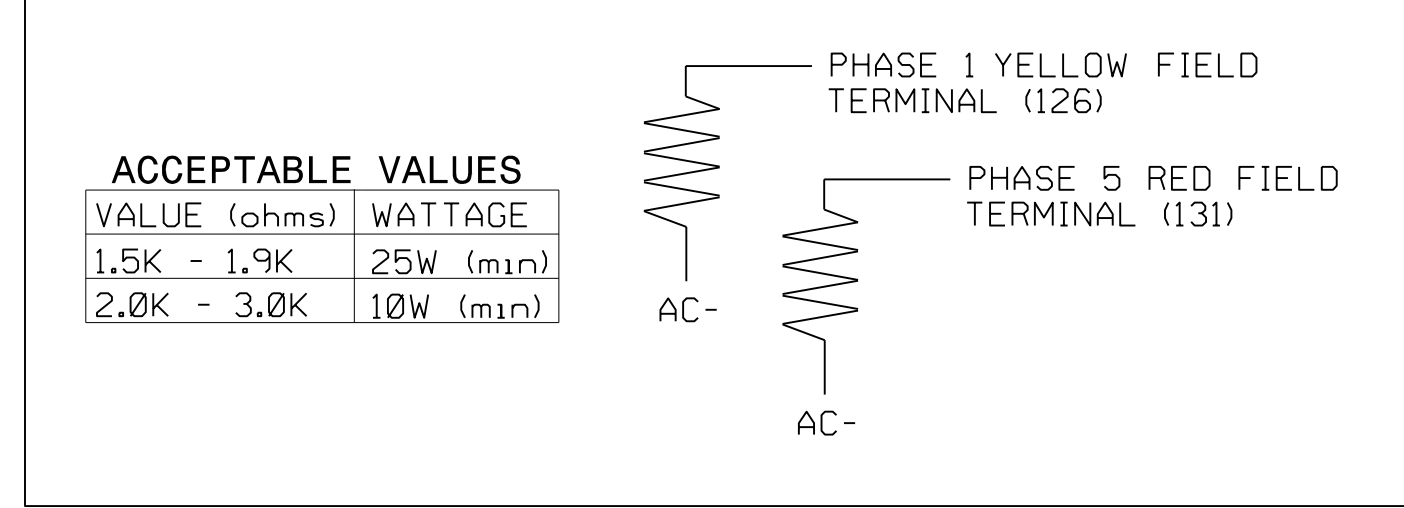
(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0334  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



Final Design  
 Electrical Detail - Sheet 1 of 3

US 401 Business (Raeford Road) at Montclair Drive	
Division 6	Cumberland County Fayetteville
PLAN DATE: March 2018	REVIEWED BY: L Overn
PREPARED BY: R W Muncy	REVIEWED BY:
REVISIONS	INIT. DATE

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SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0334



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

- From Main Menu select **2. CONTROLLER**
- 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..... 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 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..... 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.

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

## IMPORTANT!

(program controller as shown)

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

- From Main Menu select **8. UTILITIES**
- From UTILITIES Submenu select **1. COPY/CLEAR**
- 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

```

- From Main Menu select **6. DETECTORS**
- From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
- 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".

```

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... 3.0
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".

```

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... 3.0
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: 06-0334  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

DATE: U:\Projects\Signal\Signal\electrical\Detail\sig\4405.sig.dwg User: rlmuncey

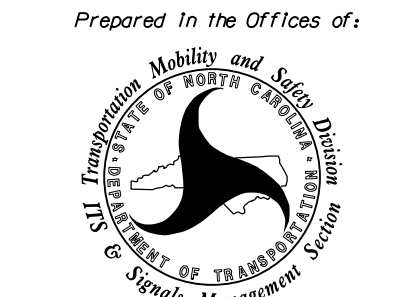
Final Design  
Electrical Detail - Sheet 2 of 3



Stantec Consulting Services Inc.  
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

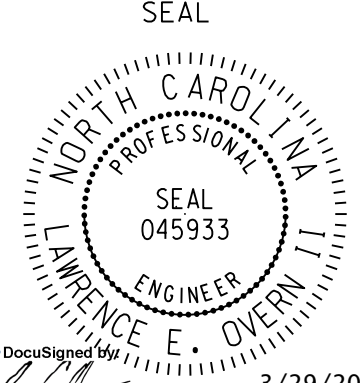
Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Business (Raeford Road) at Montclair Drive	
Division 6	Cumberland County Fayetteville
PLAN DATE: March 2018	REVIEWED BY: L Overn
PREPARED BY: R M Muncey	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL



3/29/2018

SIG. INVENTORY NO. 06-0334

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

## ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

### 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.

PHASING	VEH DET PLAN	SF BITS ENABLED
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 AND 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.

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  .  .  .  (1-8)
AUX FCT  .  .  .  (1-3)
          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 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    
```

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-0334  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED:

Final Design  
Electrical Details - Sheet 3 of 3

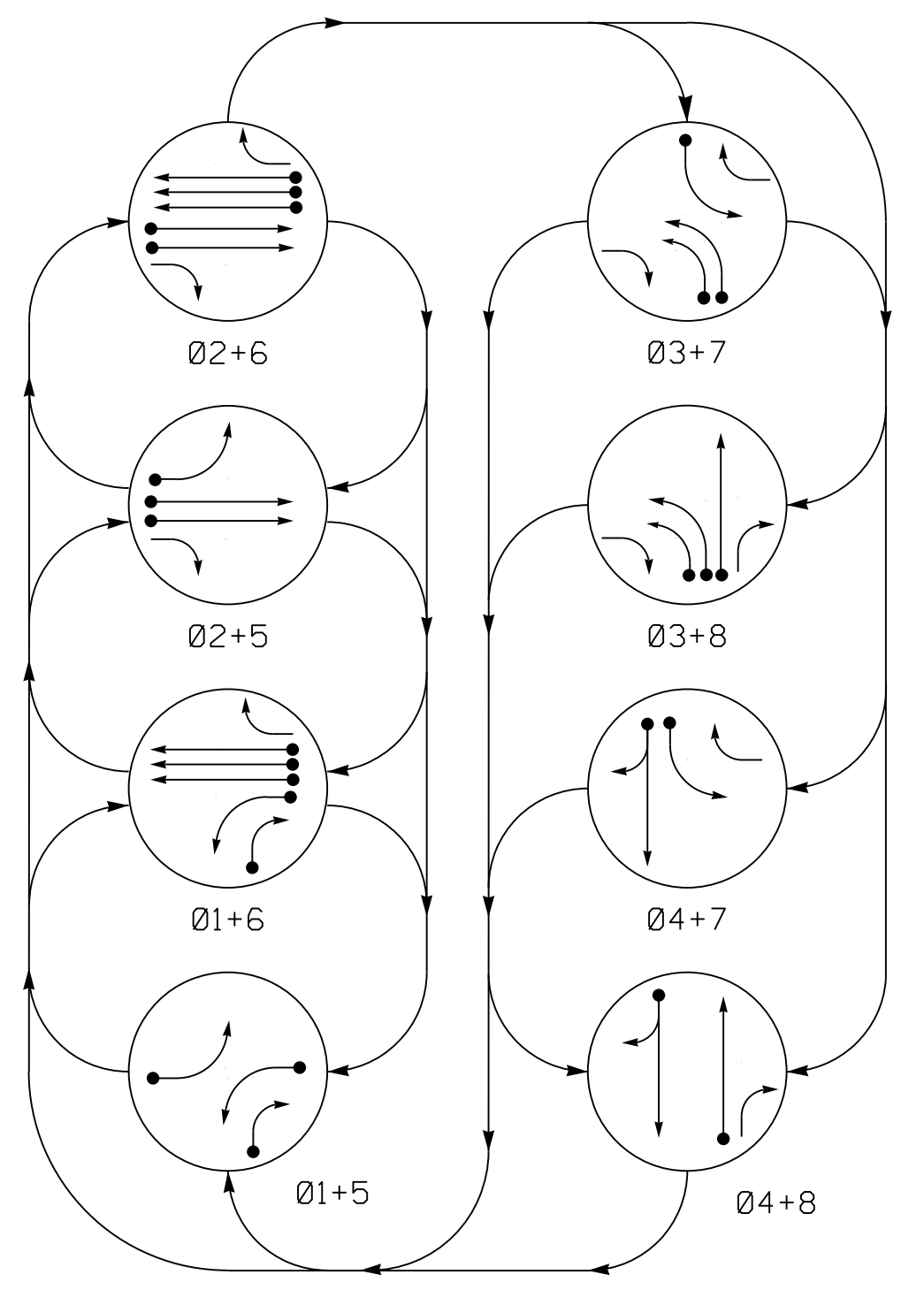
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	Prepared in the Offices of:  LAWRENCE E. OVERN PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA License No. 45933	US 401 Business (Raeford Road) at Montclair Drive	
		Division 6    Cumberland County    Fayetteville PLAN DATE:    March 2018                      REVIEWED BY:    L Overn PREPARED BY:    R M Muncey                      REVIEWED BY:	
REVISIONS		INIT.	DATE
3/29/2018		DATE	
License No. F-0672		SIG. INVENTORY NO.    06-0334	

DATE: 03/29/2018 10:45:11 AM User: rlmuncey



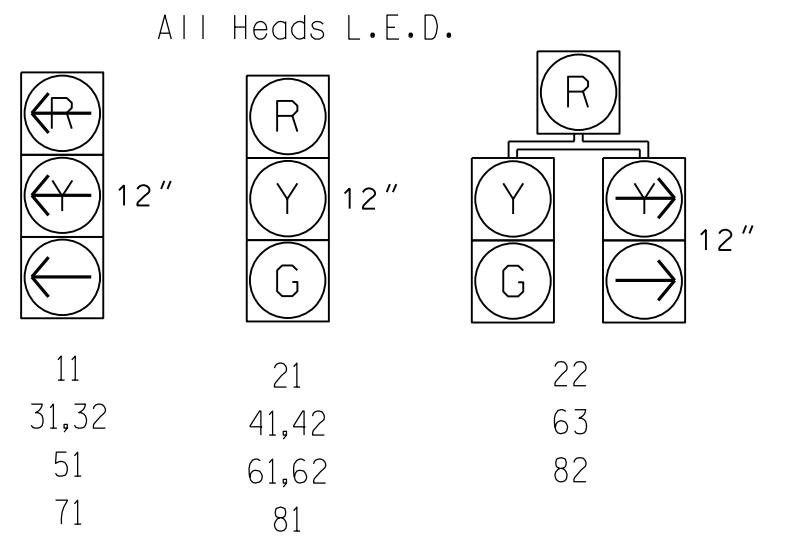
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	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
63	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	R	G
82	R	R	R	R	R	G	R	G

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

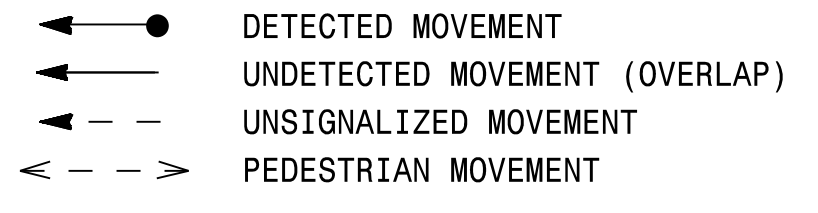
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	3	-	S	-	X
1B	6X40	0	*	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
3A	6X40	0	*	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	*	-	3	Yes	-	-	-	S	-	X
4A	6X40	0	*	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	*	-	5	Yes	-	3	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6E	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	3	-	S	-	X
8A	6X40	0	*	-	8	Yes	-	-	-	S	-	X

**8 Phase Fully Actuated Fayetteville Signal System**

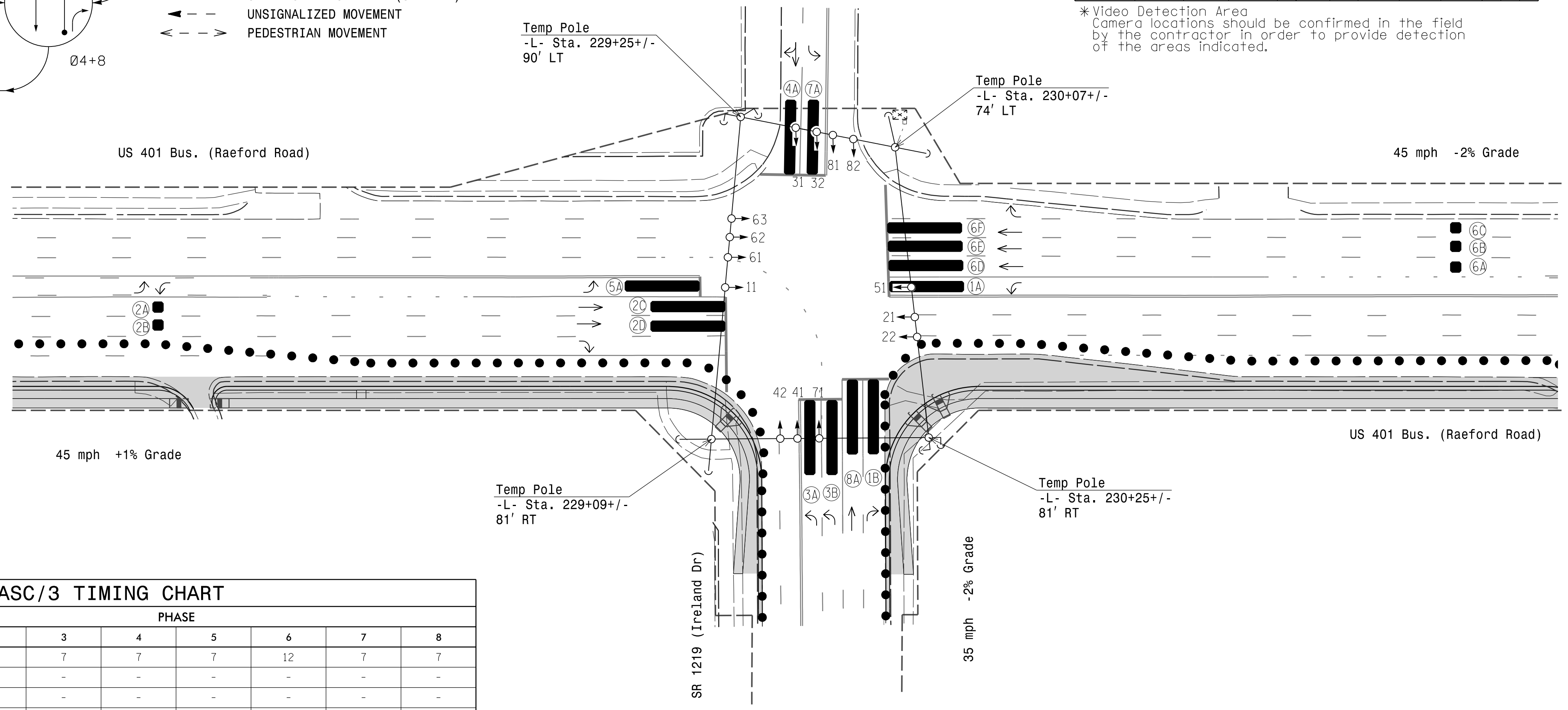
**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and Phase 5 may be lagged.
- Phase 3 and Phase 7 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Field adjust temporary poles as needed.

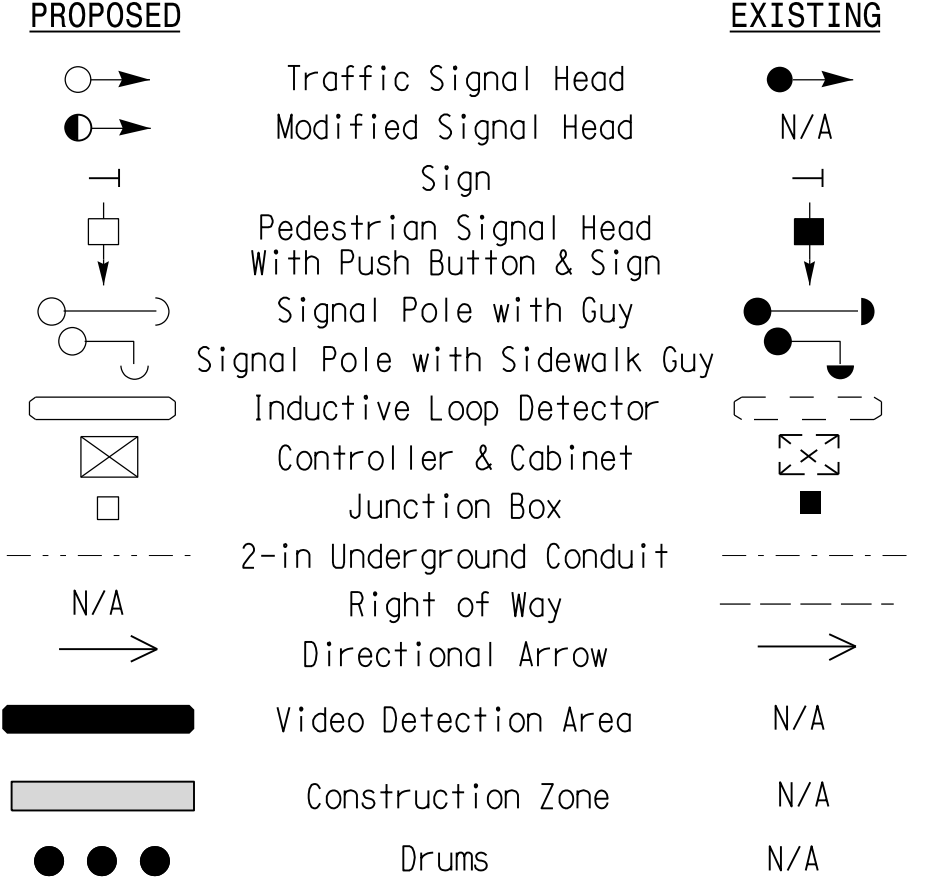
**PHASING DIAGRAM DETECTION LEGEND**



Entrance to Shopping Center  
Speed Unposted (Design) 35 mph  
+2% Grade



**LEGEND**



**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 *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	15	60	15	15	15	60	15	15
Yellow	3.0	4.4	3.0	3.7	3.0	4.7	3.0	4.0
Red Clear	2.3	1.3	2.9	2.0	2.9	1.0	2.8	2.0
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	-	-	-	-	-	-	-
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.

**Signal Upgrade  
Temporary Design 1 - TMP Phase I**

US 401 Bus. (Raeford Road)  
at  
SR 1219 (Ireland Drive) /  
Shopping Center Drive

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: J Hambricht REVIEWED BY: B L Watson

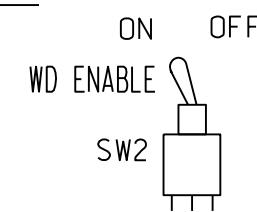
REVISIONS	INIT.	DATE

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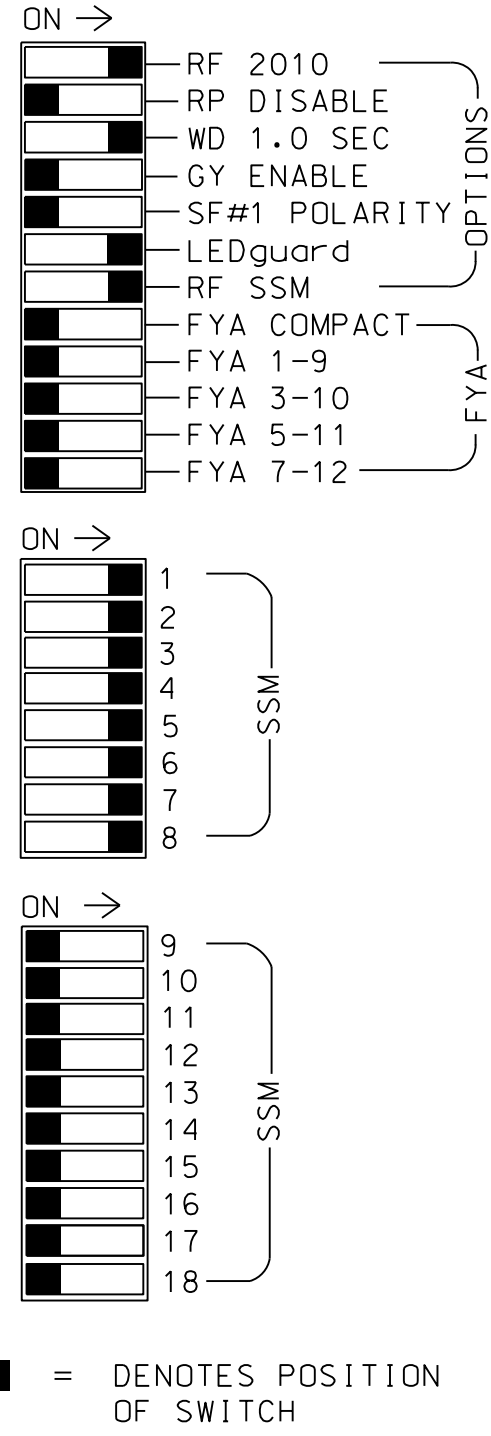
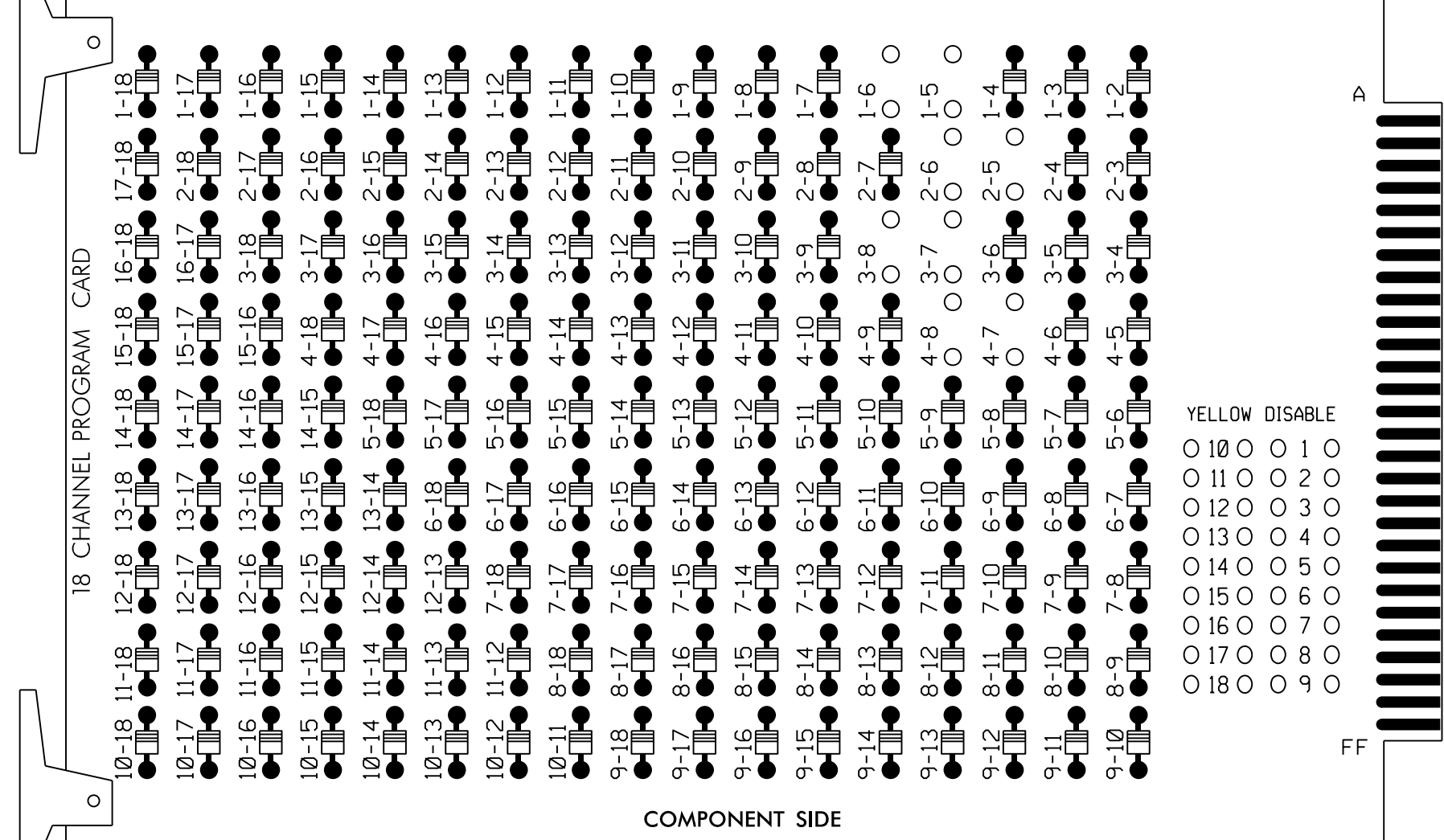
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

### 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, 3-7, 3-8, 4-7, and 4-8.



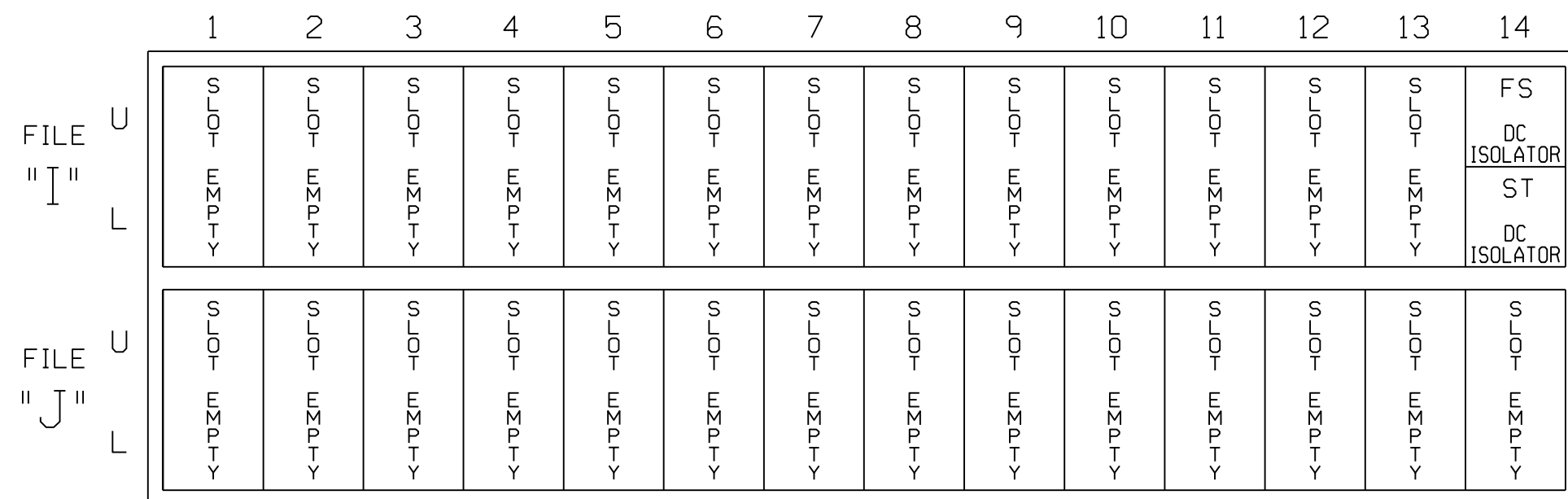
REMOVE JUMPERS AS SHOWN

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.

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

### SPECIAL DETECTOR NOTE

Install a video 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.

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. 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	82	21,22	NU	31,32	22	41,42	NU	51	61,62,63	NU	71	63	81,82	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	126		117	117		132		123	123								
GREEN ARROW	127	127		118	118		133		124	124								

NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S10,S11  
 PHASES USED.....1,2,3,4,5,6,7,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0422T1  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

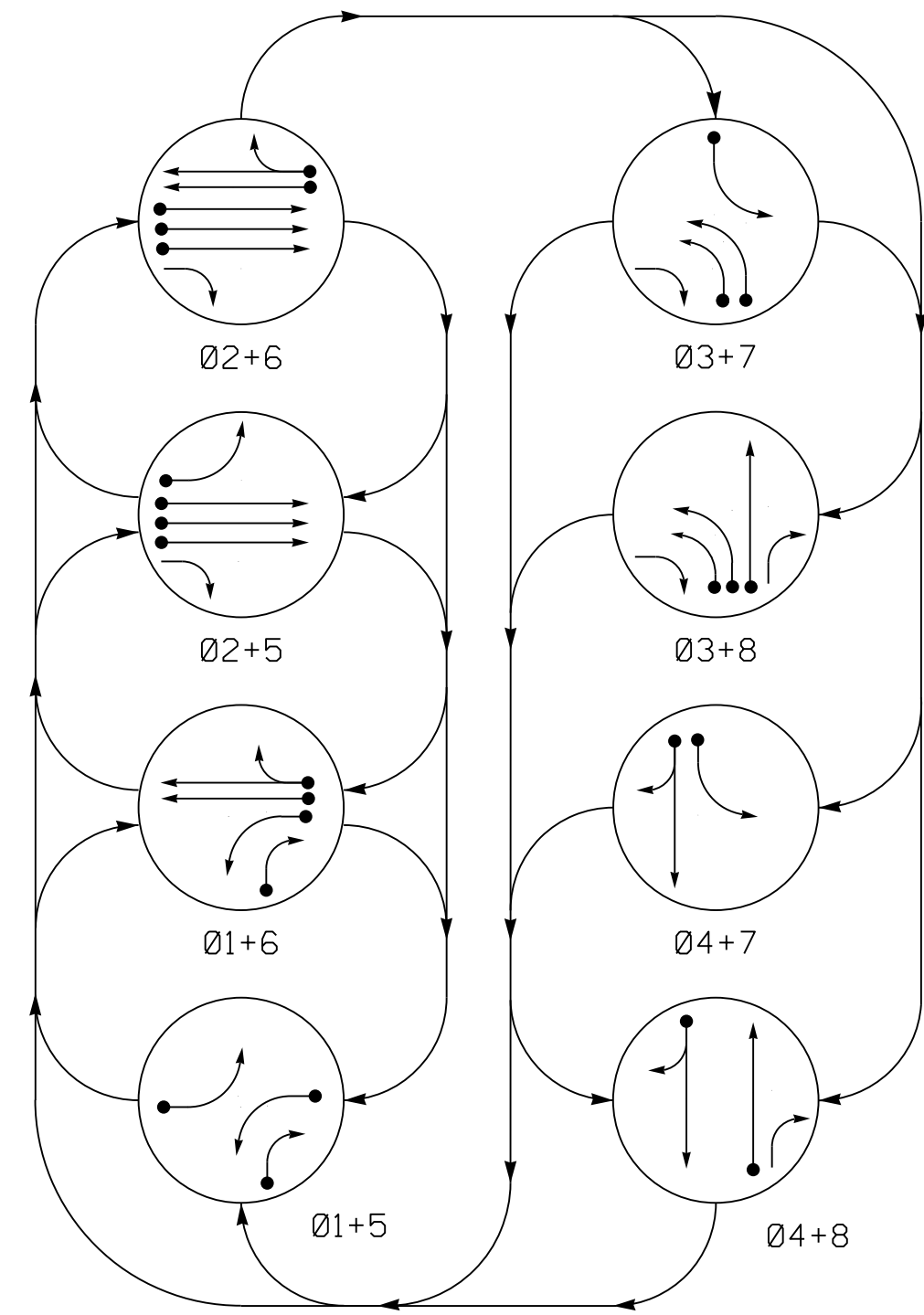
Temporary Design 1 - TMP Phase I  
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 401 Bus. (Raeford Road) at SR 1219 (Ireland Drive) / Shopping Center Drive		<p>SEAL 045933 LAWRENCE E. OVERN ENGINEER</p>	
		Prepared in the Offices of:		Division 6 Cumberland County Fayetteville			
PLAN DATE: March 2018		REVIEWED BY: L Overn		PREPARED BY: G B Spell		REVIEWED BY:	
REVISIONS		INIT.		DATE		3/29/2018	



**PHASING DIAGRAM**

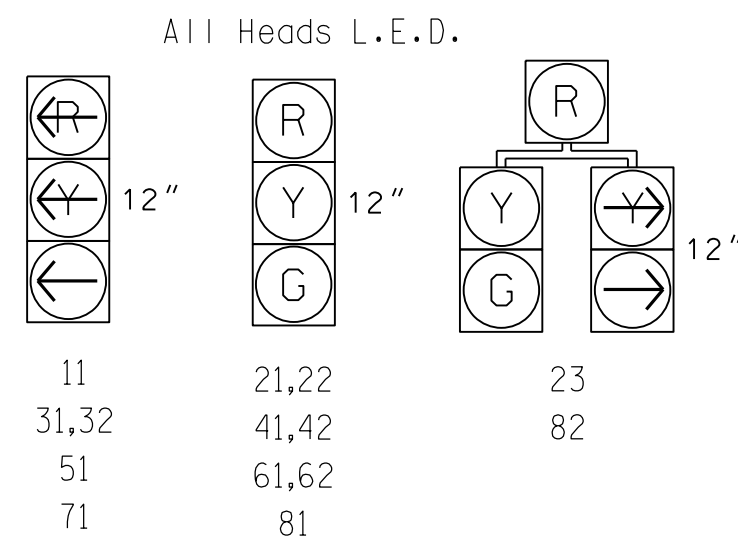


SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 2 + 5	Ø 3 + 7	Ø 4 + 7	Ø 4 + 8	FL	PS	H
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	Y
23	R	R	G	G	R	R	R	Y
31,32	←	←	←	←	←	←	←	←
41,42	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81	R	R	R	R	G	R	G	R
82	R	R	R	R	G	R	G	R

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**



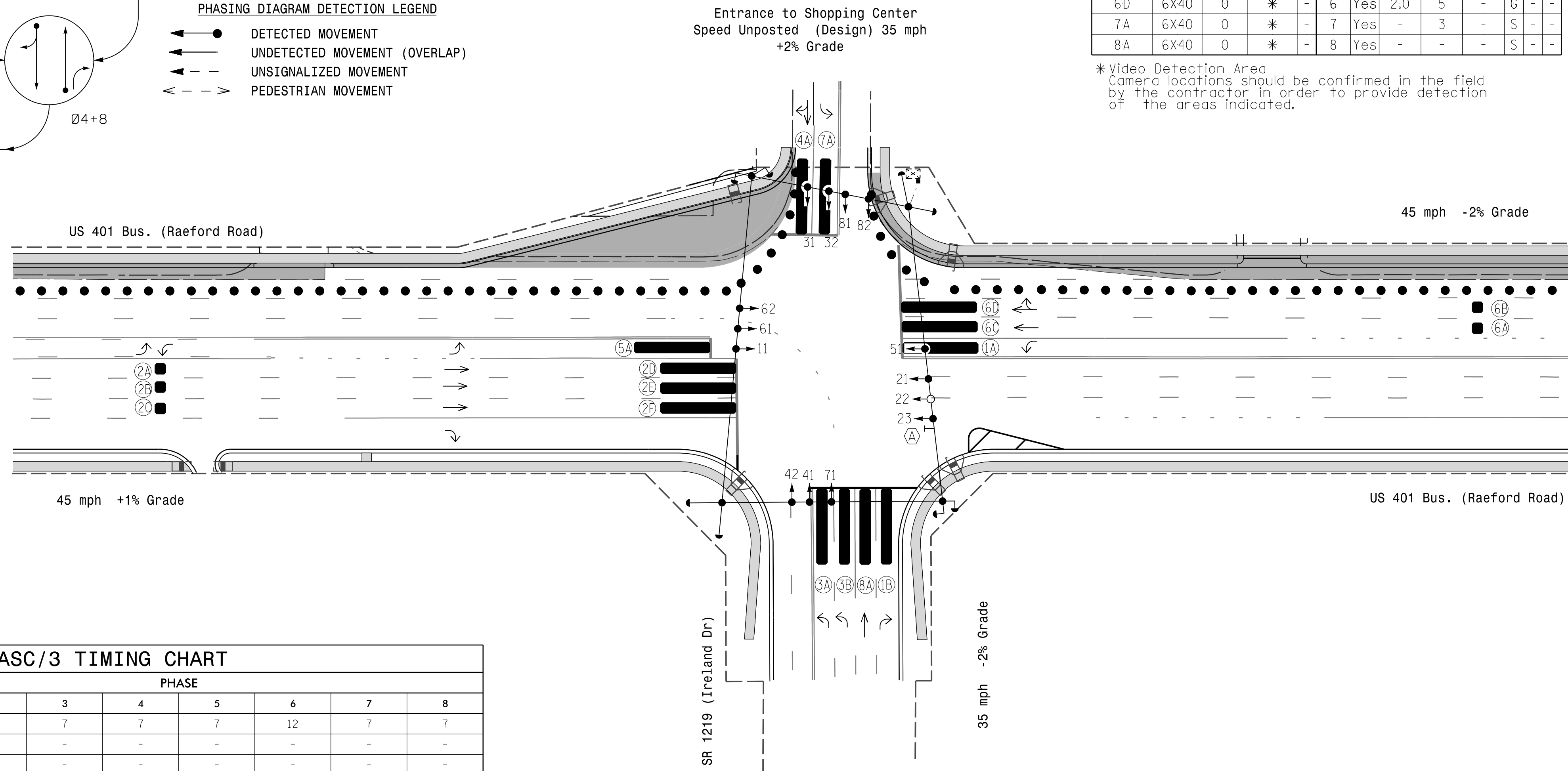
ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE
1A	6X40	0	*	-	1	Yes	-	3	-	S
1B	6X40	0	*	-	1	Yes	-	15	-	S
2A	6X6	300	*	-	2	Yes	-	-	-	N
2B	6X6	300	*	-	2	Yes	-	-	-	N
2C	6X6	300	*	-	2	Yes	-	-	-	N
2D	6X40	0	*	-	2	Yes	2.0	5	-	G
2E	6X40	0	*	-	2	Yes	2.0	5	-	G
2F	6X40	0	*	-	2	Yes	2.0	5	-	G
3A	6X40	0	*	-	3	Yes	-	3	-	S
3B	6X40	0	*	-	3	Yes	-	-	-	S
4A	6X40	0	*	-	4	Yes	-	10	-	S
5A	6X40	0	*	-	5	Yes	-	3	-	S
6A	6X6	300	*	-	6	Yes	-	-	-	N
6B	6X6	300	*	-	6	Yes	-	-	-	N
6C	6X40	0	*	-	6	Yes	2.0	5	-	G
6D	6X40	0	*	-	6	Yes	2.0	5	-	G
7A	6X40	0	*	-	7	Yes	-	3	-	S
8A	6X40	0	*	-	8	Yes	-	-	-	S

\*Video Detection Area  
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

**8 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and Phase 5 may be lagged.
- Phase 3 and Phase 7 may be lagged.
- Reposition existing signal heads numbered 23,61,62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run timing 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 *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	15	60	15	15	15	60	15	15
Yellow	3.0	4.4	3.0	3.7	3.0	4.7	3.0	4.0
Red Clear	2.8	1.3	3.3	2.3	2.9	1.8	2.8	2.4
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	-	-	-	-	-	-	-
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		
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	→
■	Video Detection Area	N/A
■	Construction Zone	N/A
●	Drums	N/A
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ

**Signal Upgrade Temporary Design 2 - TMP Phase-II**

**Stantec**  
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www.stantec.com  
License No. F-0672

Prepared for the Offices of:  
Transportation Mobility and Safety Division  
STATE OF NORTH CAROLINA  
Signal Design Section  
750 N. Greenfield Pkwy, Garner, NC 27526  
SCALE: 0 40  
1" = 40'

**US 401 Bus. (Raeford Road) at SR 1219 (Ireland Drive) / Shopping Center Drive**  
Division 6 Cumberland County Fayetteville  
PLAN DATE: March 2018 REVIEWED BY: E D Harris  
PREPARED BY: J Hambricht REVIEWED BY: B L Watson

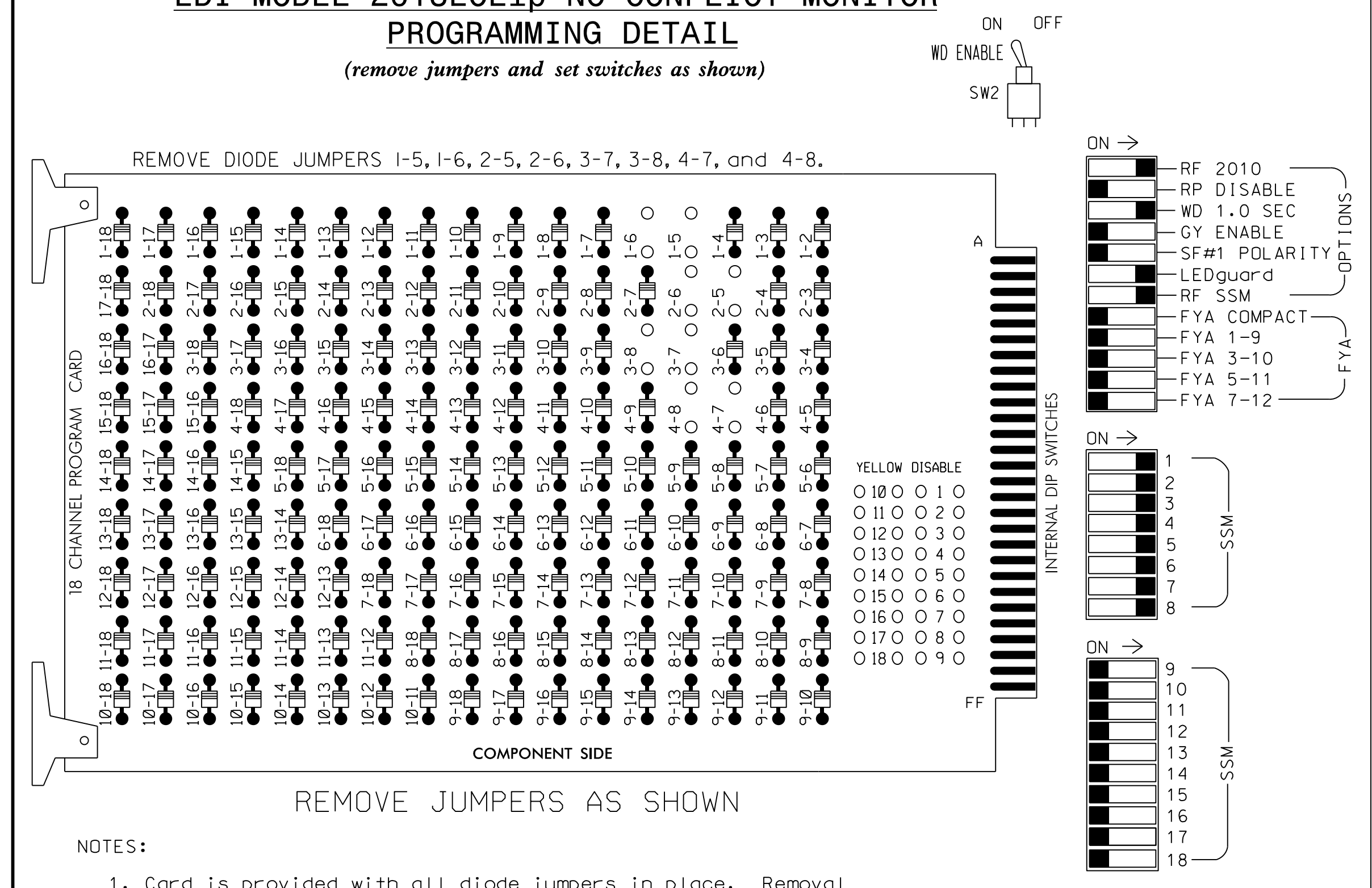
REVISIONS	INIT.	DATE

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

SEAL 29449  
REGISTERED PROFESSIONAL ENGINEER  
Betsy L. Watson  
3/29/2018  
SIG. INVENTORY NO. 06-0422T2

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

(remove jumpers and set switches as shown)



#### 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	21,22,23	NU	31,32	23	41,42	NU	51	61,62	NU	71	81,82	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	126		117			132			123								
GREEN ARROW	127	127		118	118		133			124								

NU = Not Used

#### NOTES

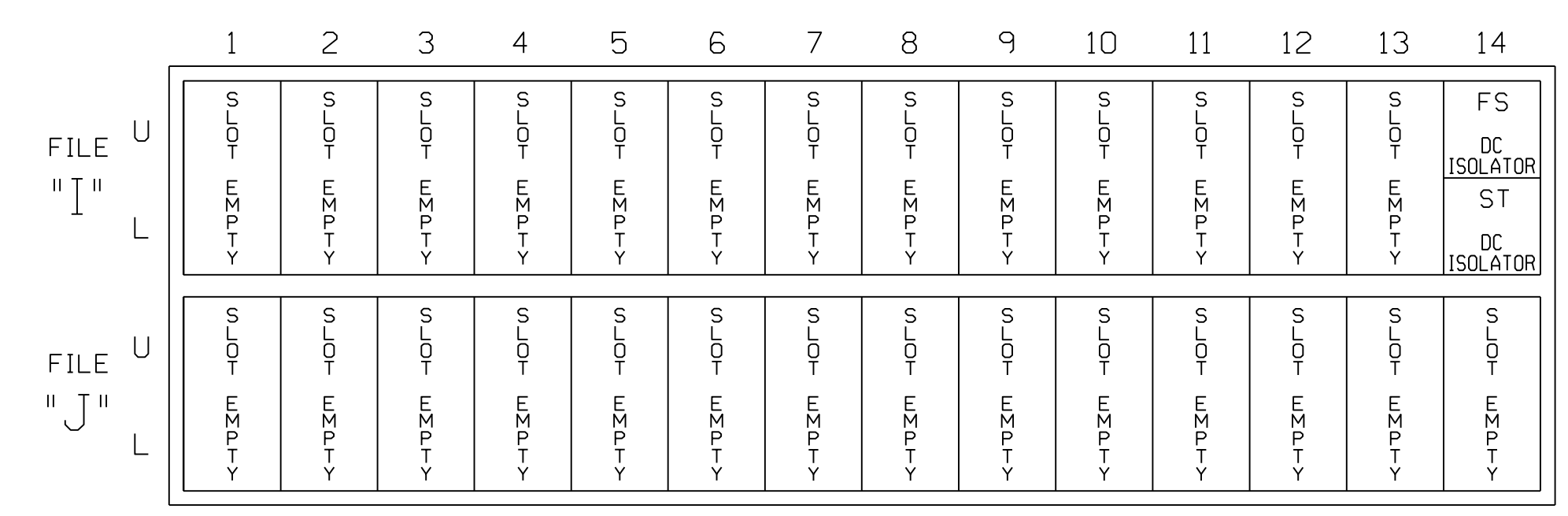
- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller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

#### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S10,S11  
 PHASES USED.....1,2,3,4,5,6,7,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

#### INPUT FILE POSITION LAYOUT

(front view)



#### SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0422T2  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

#### Temporary Design 2 - TMP Phase II Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

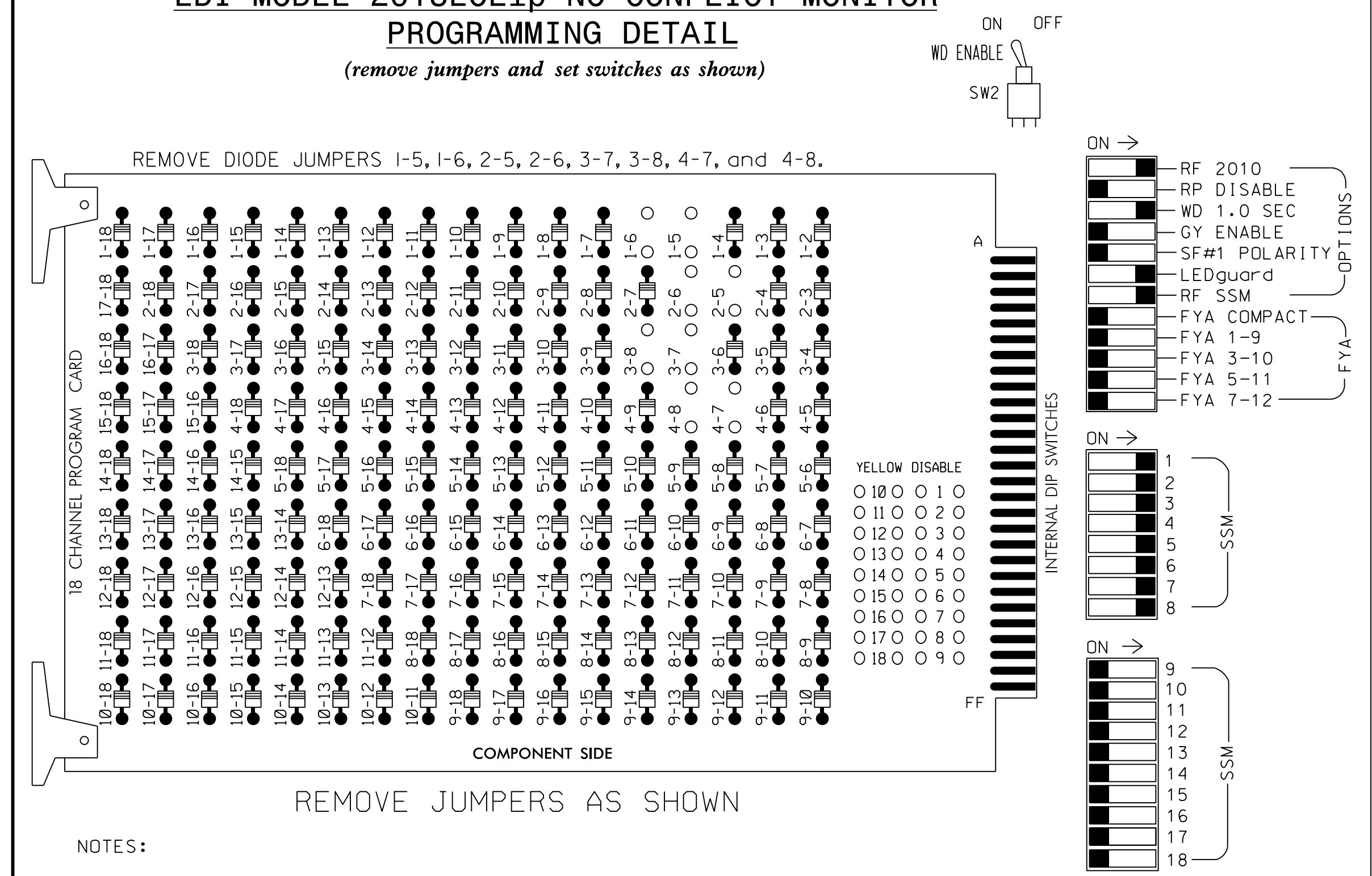
<p>Stantec Consulting Services Inc.                  801 Jones Franklin Road-Suite 300                  Raleigh, NC 27606                  Tel. (919) 851-6866                  Fax. (919) 851-7024                  www.stantec.com                  License No. F-0672</p>	<p>Prepared in the Offices of:                  Mobility and Traffic Division                  STATE OF NORTH CAROLINA                  DEPARTMENT OF TRANSPORTATION                  Signal Management Section                  750 N. Greenfield Pkwy, Garner, NC 27529</p>	US 401 Bus. (Raeford Road) at SR 1219 (Ireland Drive) / Shopping Center Drive Division 6 Cumberland County Fayetteville		<p>SEAL                  NORTH CAROLINA                  PROFESSIONAL ENGINEER                  LAWRENCE E. OVERN                  045933                  3/29/2018</p>
		PLAN DATE: March 2018 PREPARED BY: G B Spell	REVIEWED BY: L Overn REVIEWED BY:	





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

(remove jumpers and set switches as shown)



#### 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	NU	31,32	22	41,42	NU	51	61,62	NU	71	81,82	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	126		117	117			132			123							
GREEN ARROW	127	127		118	118			133			124							

NU = Not Used

#### NOTES

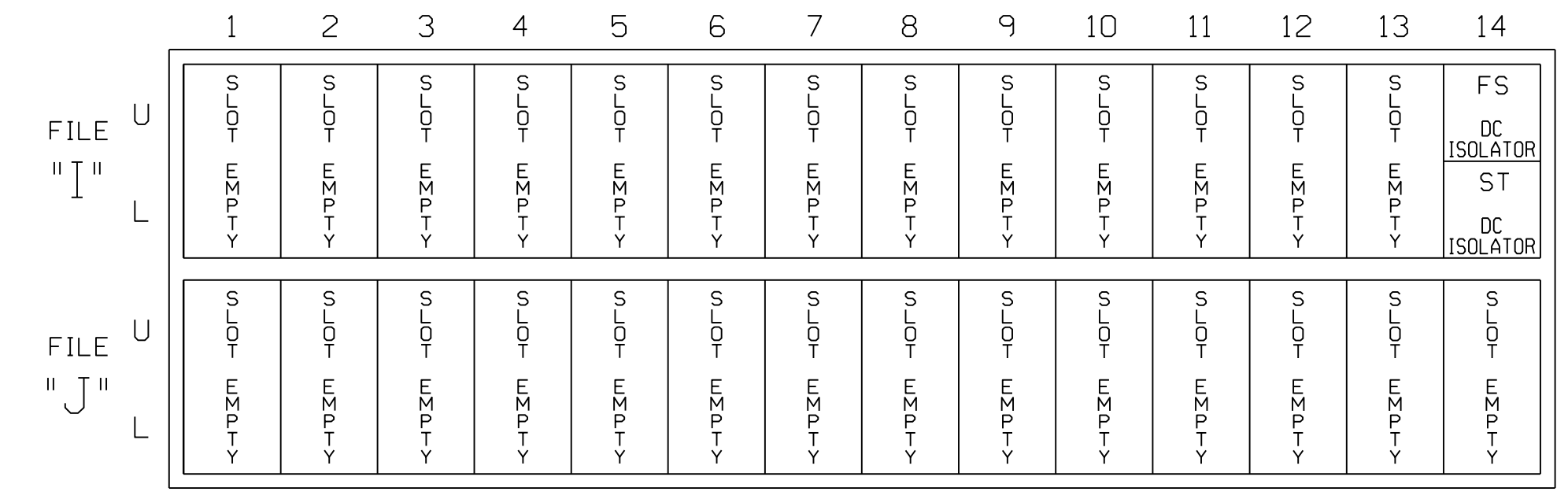
- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller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

#### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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,S10,S11  
 PHASES USED.....1,2,3,4,5,6,7,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

#### INPUT FILE POSITION LAYOUT

(front view)



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

#### SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0422T3  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

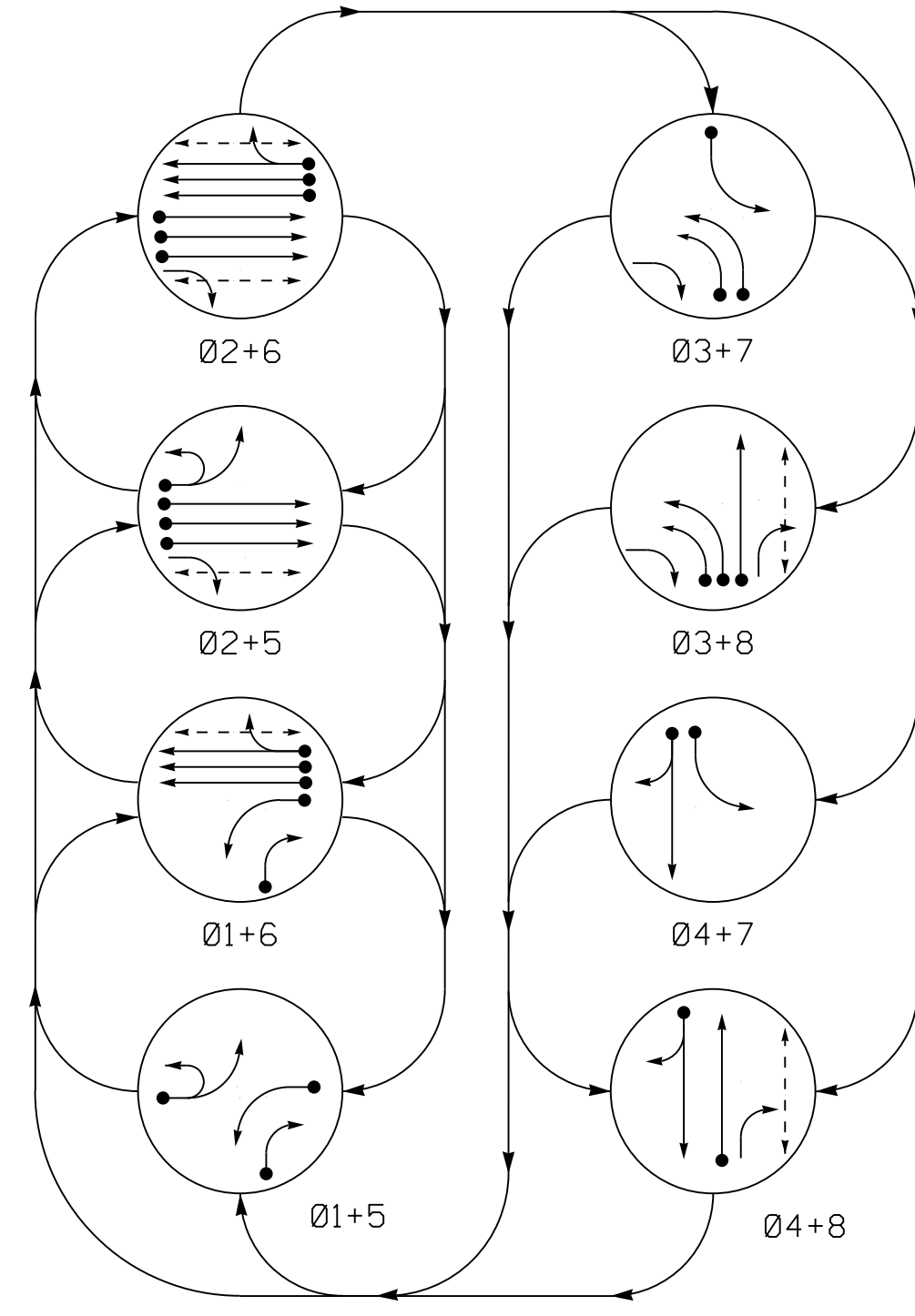
#### Temporary Design 3 - TMP Phase III Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

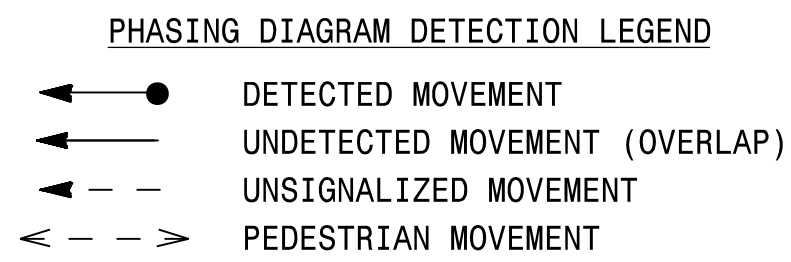
<p>Stantec Consulting Services Inc.                  801 Jones Franklin Road-Suite 300                  Raleigh, NC 27606                  Tel. (919) 851-6866                  Fax. (919) 851-7024                  www.stantec.com                  License No. F-0672</p>	<p>Prepared in the Offices of:                  Mobility and Traffic Division                  STATE OF NORTH CAROLINA                  DEPARTMENT OF TRANSPORTATION                  Signal Management Section                  750 N. Greenfield Pkwy, Garner, NC 27529</p>	US 401 Bus. (Raeford Road) at SR 1219 (Ireland Drive) / Shopping Center Drive Division 6 Cumberland County Fayetteville		<p>SEAL                  NORTH CAROLINA                  PROFESSIONAL ENGINEER                  LAWRENCE E. OVERN                  045933                  3/29/2018</p>
		ELECTRICAL AND PROGRAMMING DETAILS FOR:	PREPARED BY: G B Spell REVIEWED BY: L Overn	



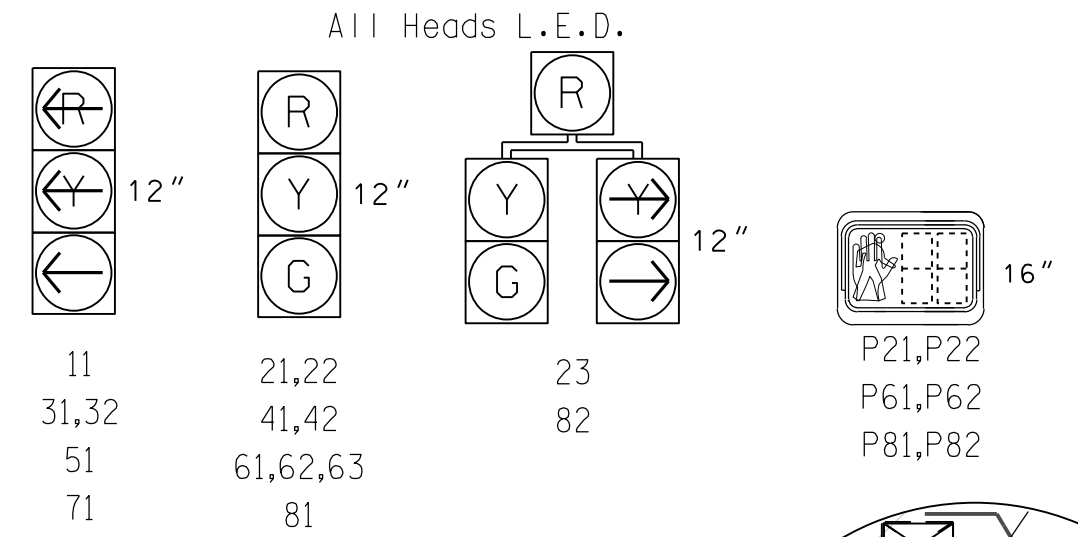
**PHASING DIAGRAM**



SIGNAL FACE	PHASE								E/O
	Ø1+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	Ø1+6	Ø2+5	
11	←	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	R	Y
23	R	R	G	G	R	R	R	R	Y
31,32	←	←	←	←	←	←	←	←	←
41,42	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61,62,63	R	G	R	G	R	R	R	R	Y
71	←	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	W	DW	W	DRK	



**SIGNAL FACE I.D.**

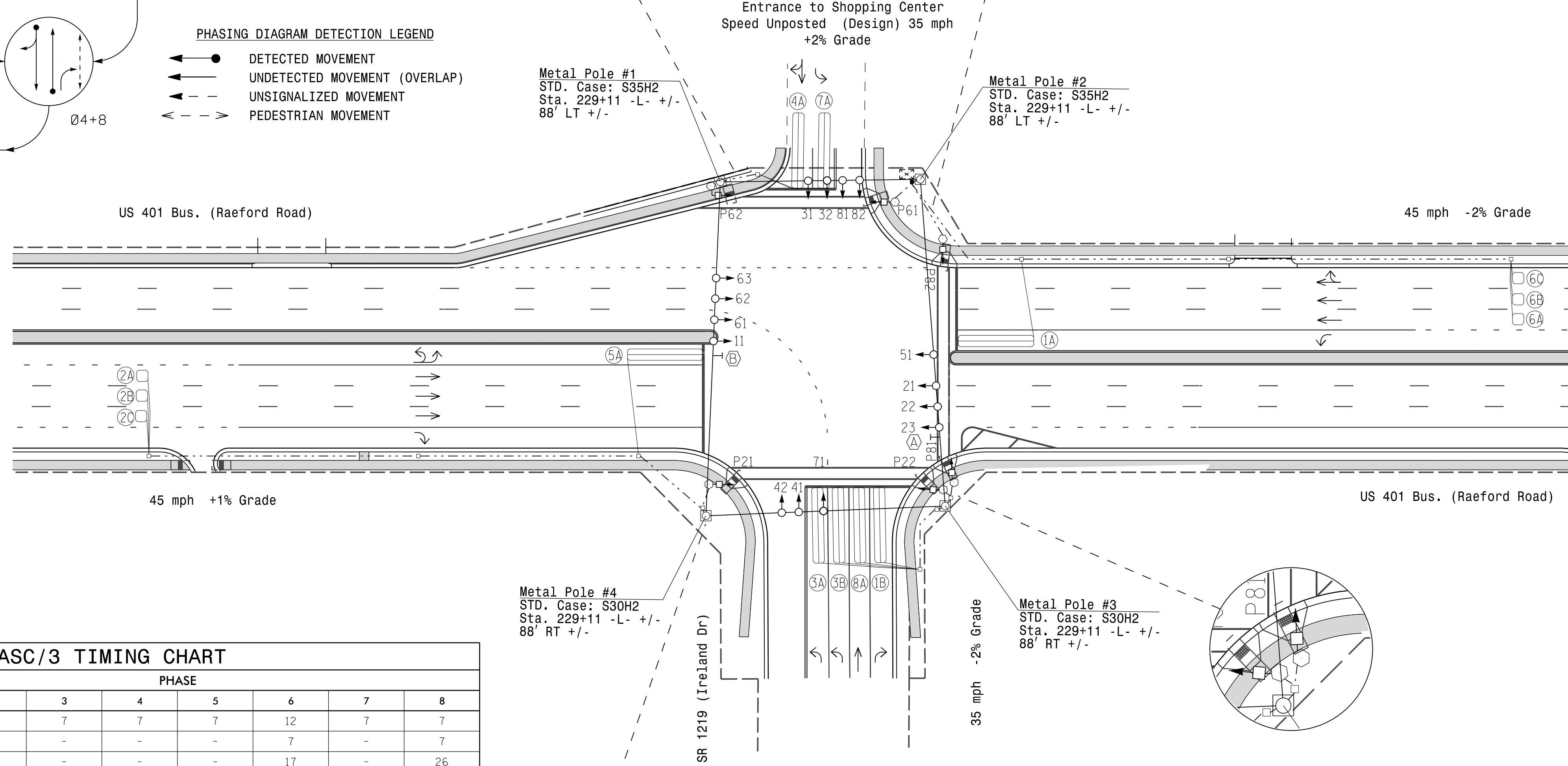


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	6	X	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
6A	6X6	300	5	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	5	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	5	X	6	Yes	-	-	X	N	-	X
7A	6X40	0	2-4-2	X	7	Yes	-	3	-	S	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	-	-	S	-	X

**8 Phase Fully Actuated Fayetteville Signal System**

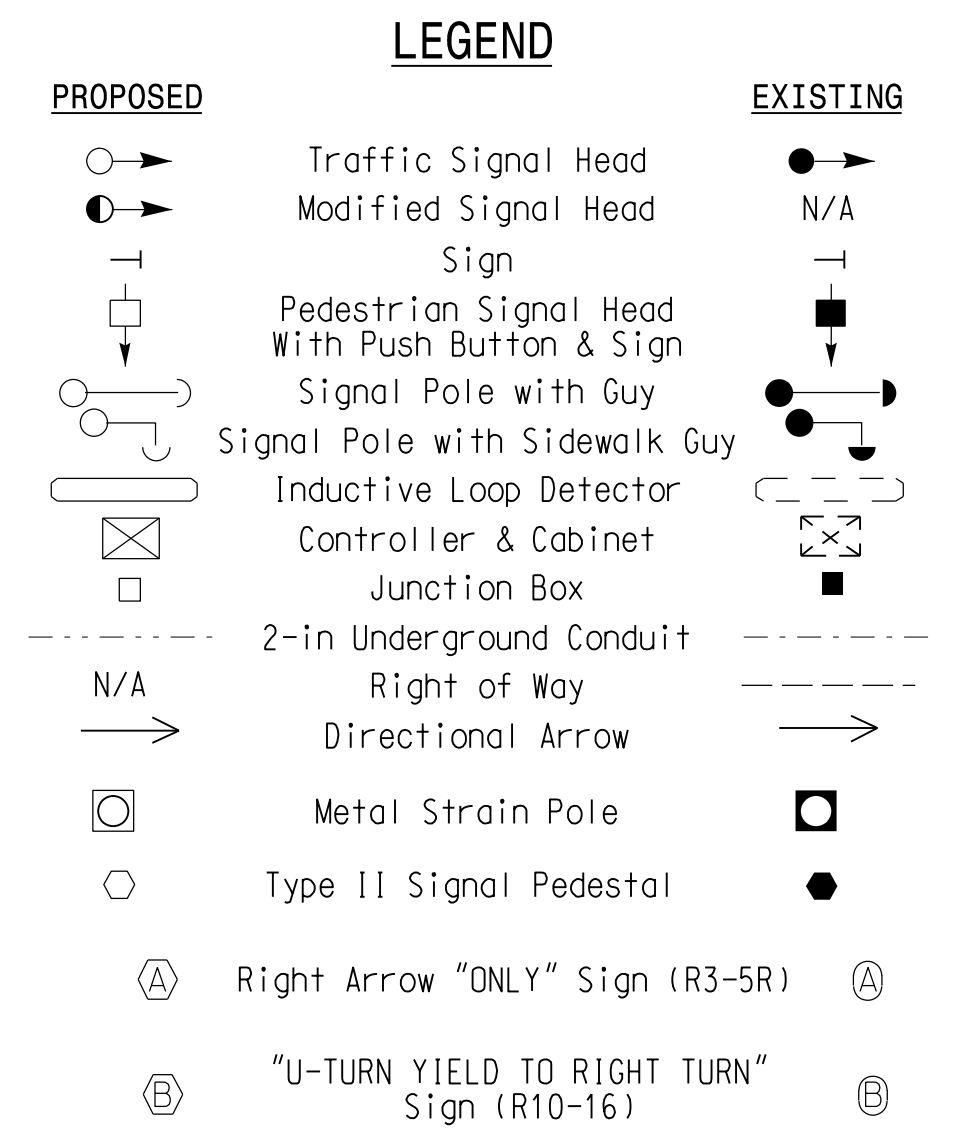
**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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.
- 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.
- Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



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
Ped Clear	-	25	-	-	-	17	-	26
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	15	60	15	15	15	60	15	15
Yellow	3.0	4.4	3.0	3.7	3.0	4.7	3.0	4.0
Red Clear	3.4	1.9	3.3	3.0	3.4	1.4	3.5	3.0
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	X	X

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



**Signal Upgrade - Final Design**

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		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: E D Harris</p> <p>PREPARED BY: J Hambricht REVIEWED BY: B L Watson</p>	<p>3/29/2018</p>

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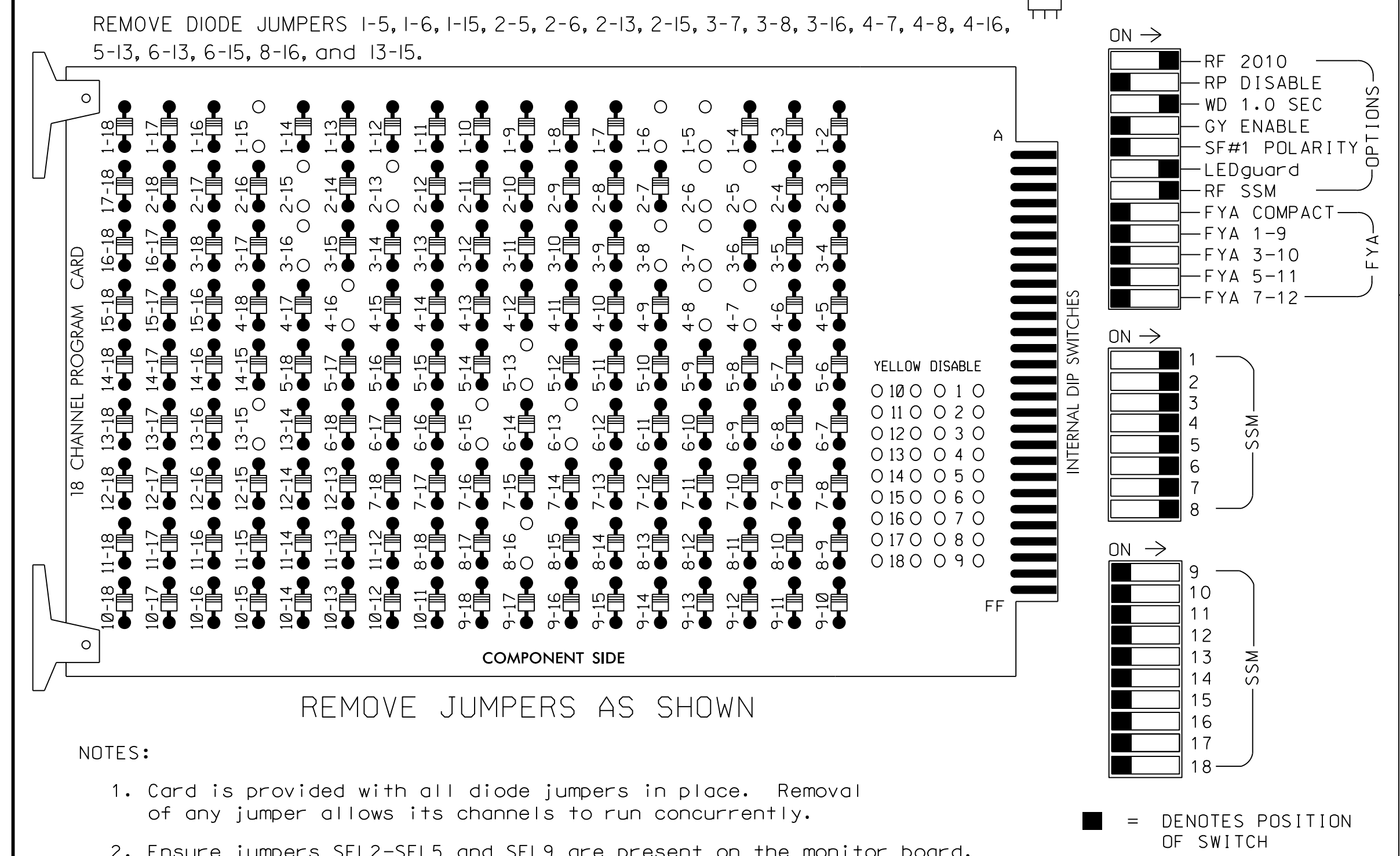
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REVISIONS: INIT. DATE



### 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 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.....2070  
 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,S9,  
 S10,S11,S12  
 PHASES USED.....1,2,2PED,3,4,5,6,6PED,7,  
 8,8PED  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### SIGNAL HEAD HOOK-UP CHART

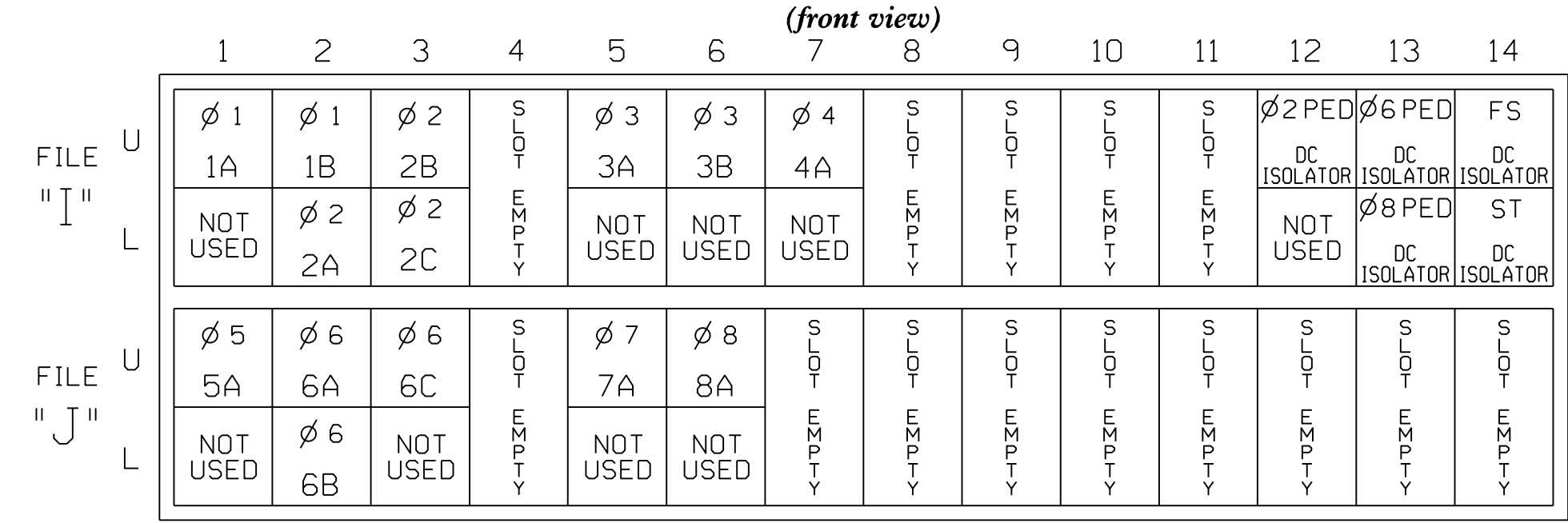
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22, 23	P21, P22	31,32	23	41,42	NU	51	61,62, 63	P61, P62	71	81,82	P81, P82	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	126		117	117			132			123							
GREEN ARROW	127	127		118	118			133			124							
Hand icon				113						119			110					
Walking person icon				115						121			112					

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



### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-7,8	I2L	43	12	2	YES			X	N
2B	TB2-9,10	I3U	63	32	2	YES			X	N
2C	TB2-11,12	I3L	76	42	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES		10		S
5A	TB3-1,2	J1U	55	5	5	YES				S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
7A	TB5-5,6	J5U	57	7	7	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES				S

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

INPUT FILE POSITION LEGEND: J2L  
 FILE J  
 SLOT 2  
 LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0422  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Final Design  
 Electrical Detail

Stantec Consulting Services Inc.  
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 License No. F-0672

Lawrence E. Overn  
 Professional Engineer  
 License No. 045933

US 401 Bus. (Raeford Road) at SR 1219 (Ireland Drive) / Shopping Center Drive

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018	REVIEWED BY: L Overn
PREPARED BY: G B Spell	REVIEWED BY:
REVISIONS	INIT. DATE

DocuSign	3/29/2018
DATE	
SIG. INVENTORY NO.	06-0422

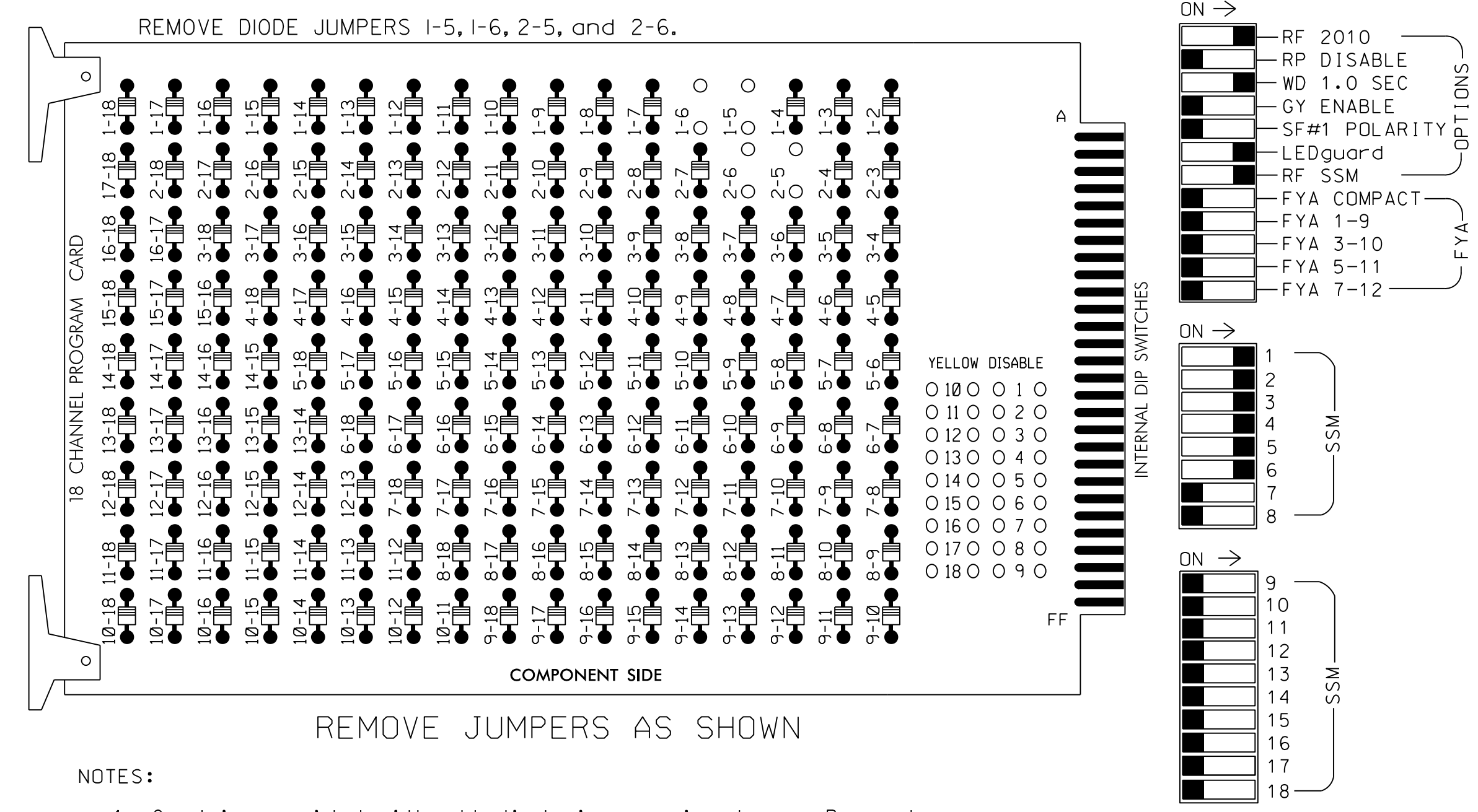
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### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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.

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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.....NONE

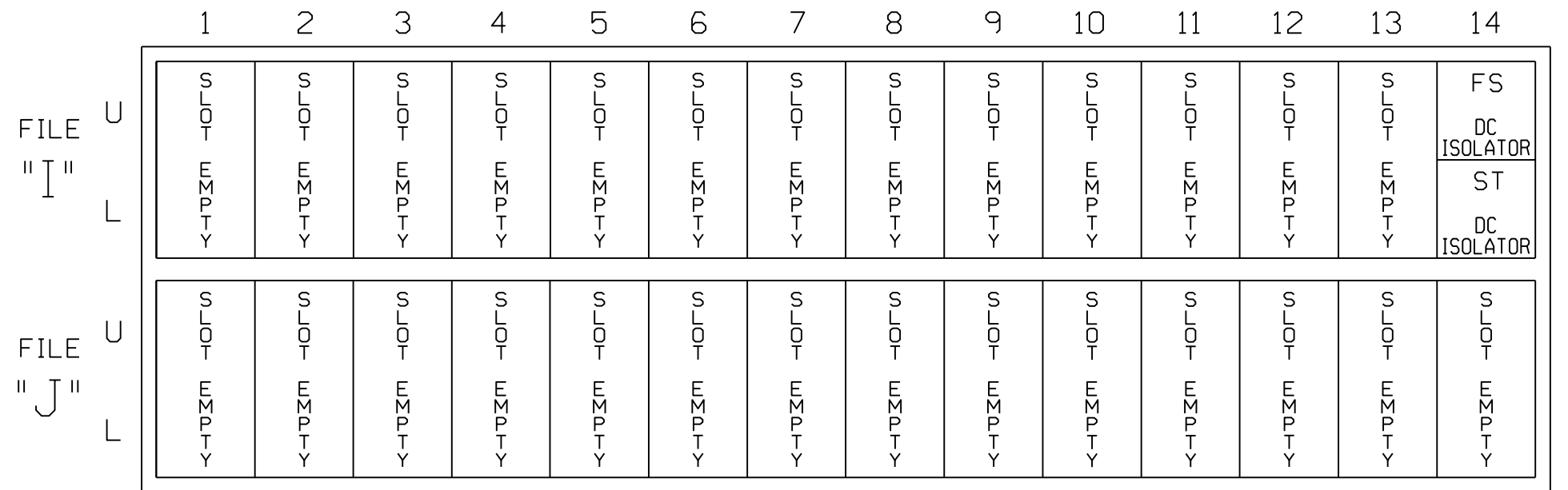
### SIGNAL HEAD HOOK-UP CHART

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	32	21,22,23	31	32	41	42	43	63	51	43	61,62,63
RED		128		116	116	101	101					134
YELLOW		129		117	117	102	102					135
GREEN		130		118	118	103	103					136
RED ARROW	125					101						131
YELLOW ARROW	126	126			102		102		132	132		
GREEN ARROW	127	127		118	103	103	103		133	133		

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



### SPECIAL DETECTOR NOTE

Install a video 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.

Temporary Design 1 - TMP Phase I  
Electrical Detail

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www.stantec.com  
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ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Bus. (Raeford Road)  
at  
Ferncreek Drive / Roxie Avenue

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: G B Spell REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

3/29/2018

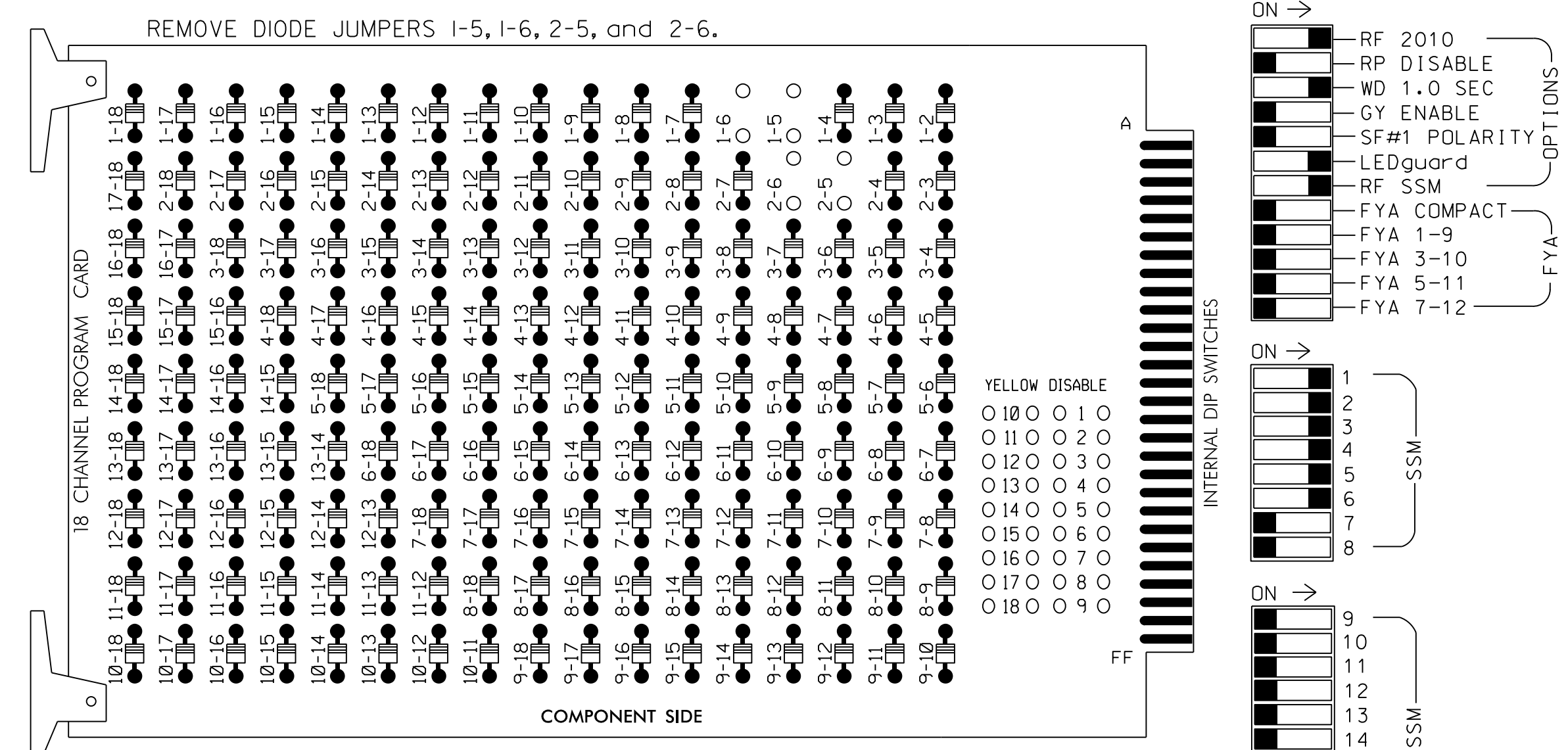
SIG. INVENTORY NO. 06-0327T1





### 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.

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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.....NONE

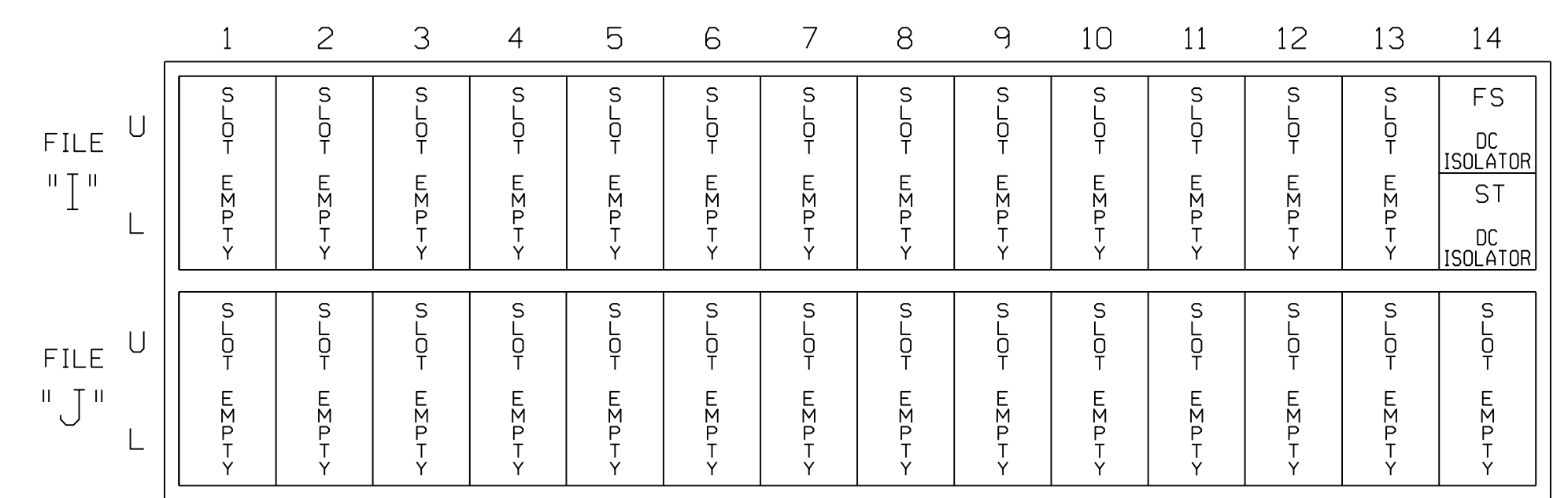
### SIGNAL HEAD HOOK-UP CHART

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	32	21,22,23	NU	31	32	41	42	43	NU	51	43	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					101					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)



**SPECIAL DETECTOR NOTE**  
 Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-032712  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### Temporary Design 2 - TMP Phase II Electrical Detail

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 License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**US 401 Bus. (Raeford Road)  
at  
Ferncreek Drive / Roxie Avenue**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: G B Spell REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

3/29/2018

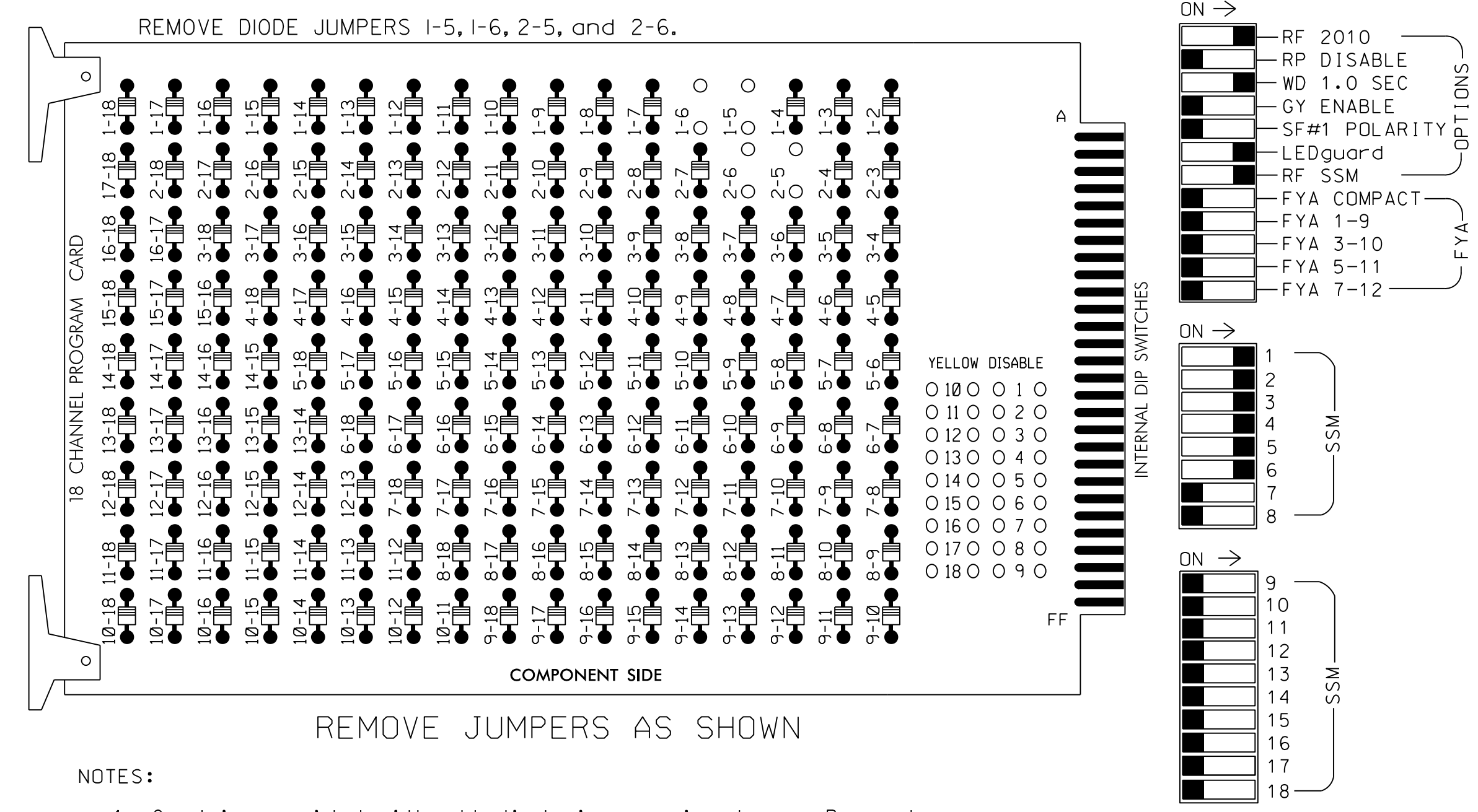
SIG. INVENTORY NO. 06-032712





### 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

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 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.....NONE

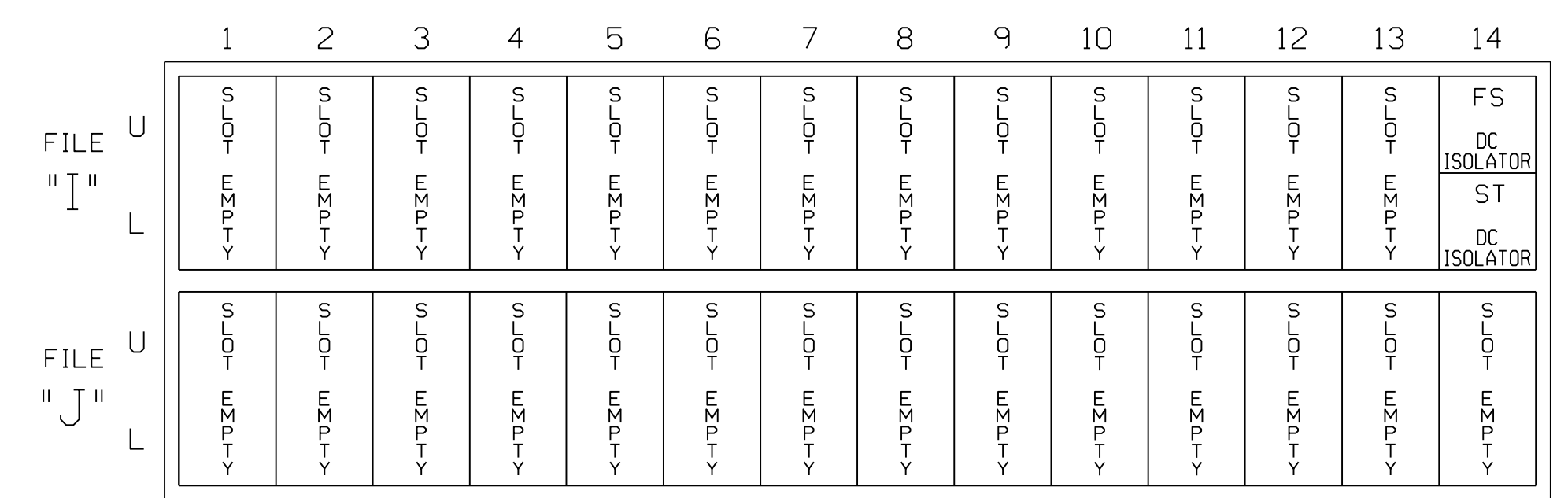
### SIGNAL HEAD HOOK-UP CHART

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	32	21,22,23	31	32	41	42	43	62	51	43	61,62
RED			128	116	116	101	101					134
YELLOW			129	117	117	102	102					135
GREEN			130	118	118	103	103					136
RED ARROW	125				101					131		
YELLOW ARROW	126	126			102			102		132	132	
GREEN ARROW	127	127		118	103	103	103		133	133		

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

### SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0327T3  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### Temporary Design 3 - TMP Phase III Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec Consulting Services Inc.  
 801 Jones Franklin Road-Suite 300  
 Raleigh, NC 27606  
 Tel. (919) 851-6866  
 Fax. (919) 851-7024  
 www.stantec.com  
 License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Bus. (Raeford Road)  
 at  
 Ferncreek Drive / Roxie Avenue

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: G B Spell REVIEWED BY:

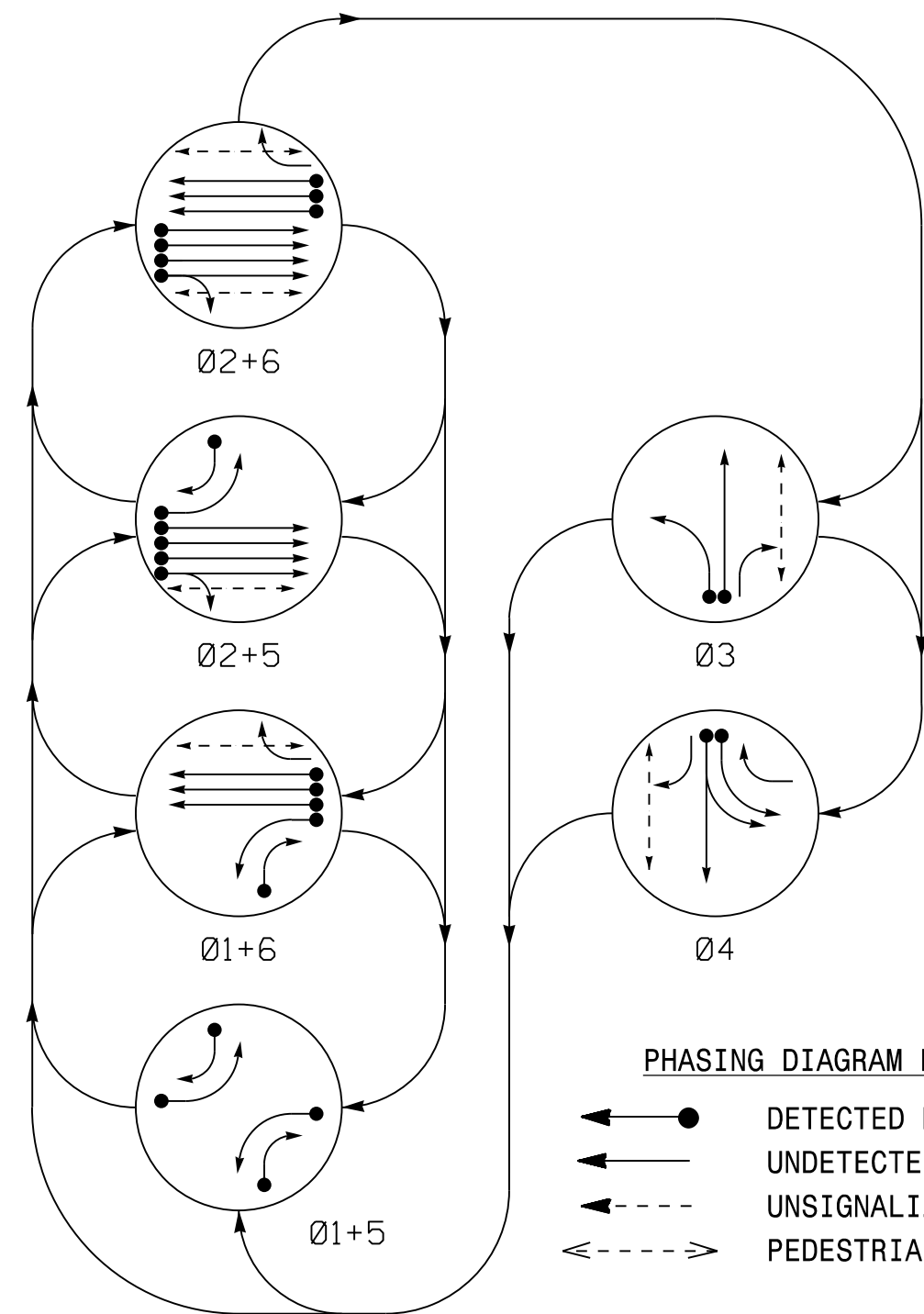
REVISIONS	INIT.	DATE

3/29/2018

SIG. INVENTORY NO. 06-0327T3



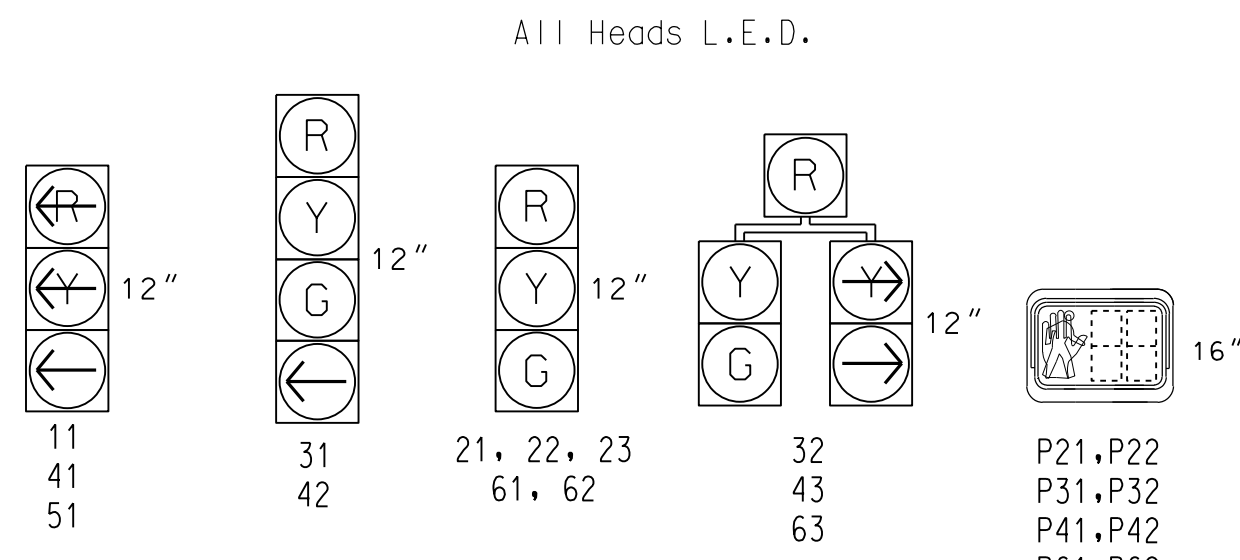
PHASING DIAGRAM



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

SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4
11	←	←	←	←	←	←
21,22,23	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	←	←	←	←	←	←
42	R	R	R	R	G	R
43	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	Y
63	R	G	R	G	R	Y
P21,P22	DW	DW	W	W	DW	DRK
P31,P32	DW	DW	DW	DW	W	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

SIGNAL FACE I.D.



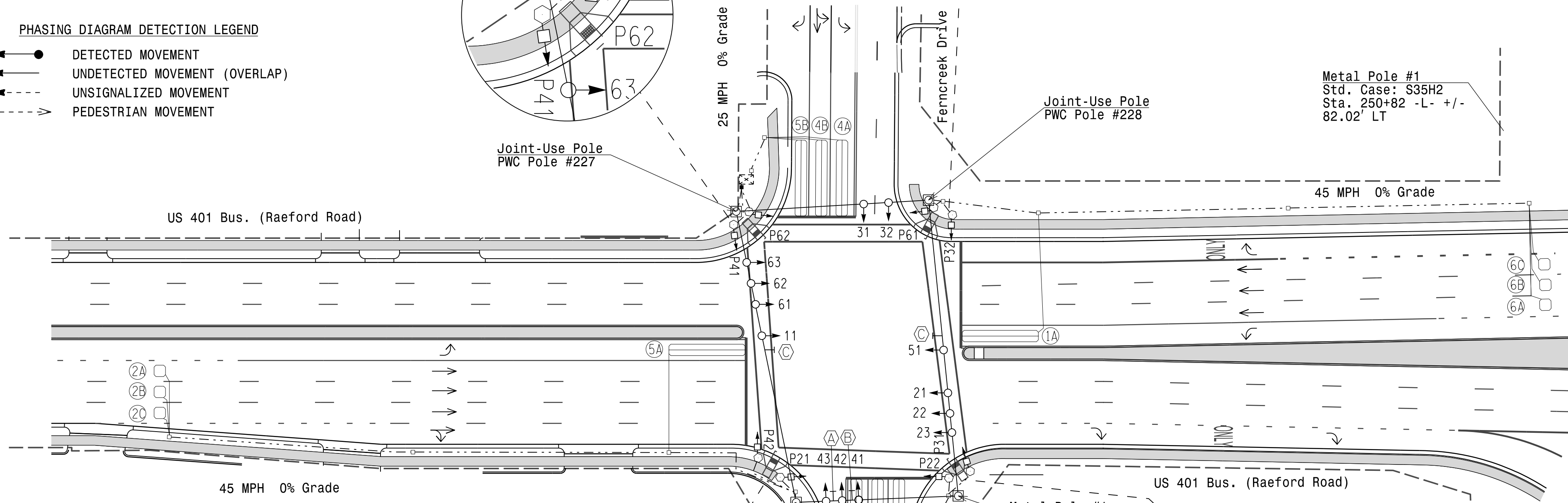
ASC/3 DETECTOR INSTALLATION CHART

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

6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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.
- 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.
- Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	7	7	7	-	7
Ped Clear	-	23	31	30	-	20
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	15	60	25	25	15	60
Yellow	3.0	4.5	3.8	3.2	3.0	4.5
Red Clear	3.1	1.6	2.5	3.3	2.9	1.6
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.

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
⊕ Combined Through and Left Arrow Sign (R3-6L)	⊕ Combined Through and Left Arrow Sign (R3-6L)
⊖ Left Arrow "ONLY" Sign (R3-5L)	⊖ Left Arrow "ONLY" Sign (R3-5L)
⊙ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	⊙ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)

Signal Upgrade - Final Design

**Stantec**  
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Prepared for the Offices of:  
 Transportation Mobility and Safety Division  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 STATE OF NORTH CAROLINA  
 Signal Design Section  
 750 N. Greenfield Pkwy, Garner, NC 27526  
 SCALE: 0 40  
 1" = 40'

**US 401 Business (Raeford Road) at Ferncreek Drive/Roxie Avenue**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: J HAMBRIGHT REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

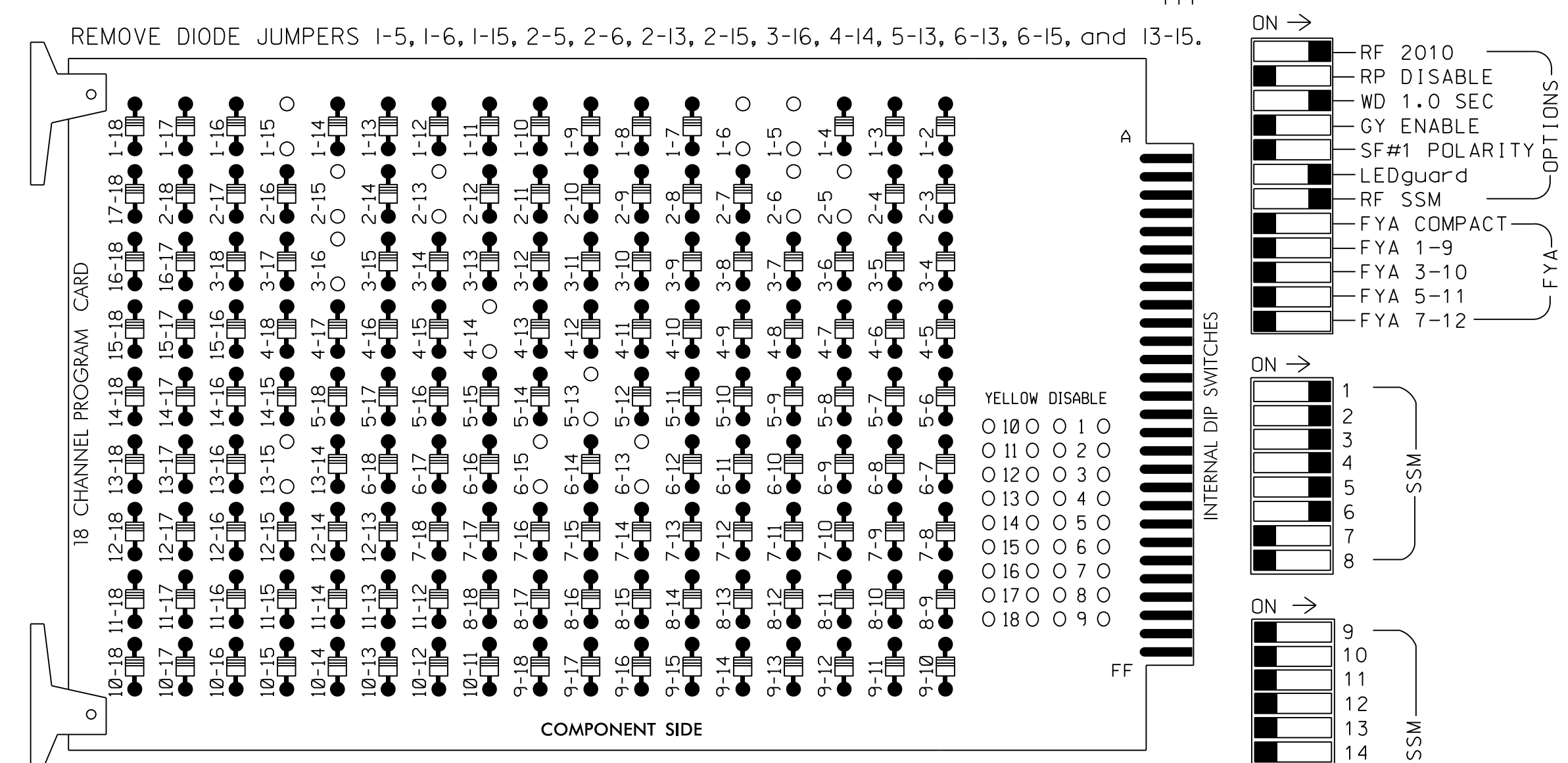
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 PROFESSIONAL ENGINEER  
 Betsy L. Watson  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0327

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 User: rfmuncy



### 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.

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,  
 S8,S9,S12  
 PHASES USED.....1,2,2PED,3,3PED,4,  
 4PED,5,6,6PED  
 OVERLAPS.....NONE

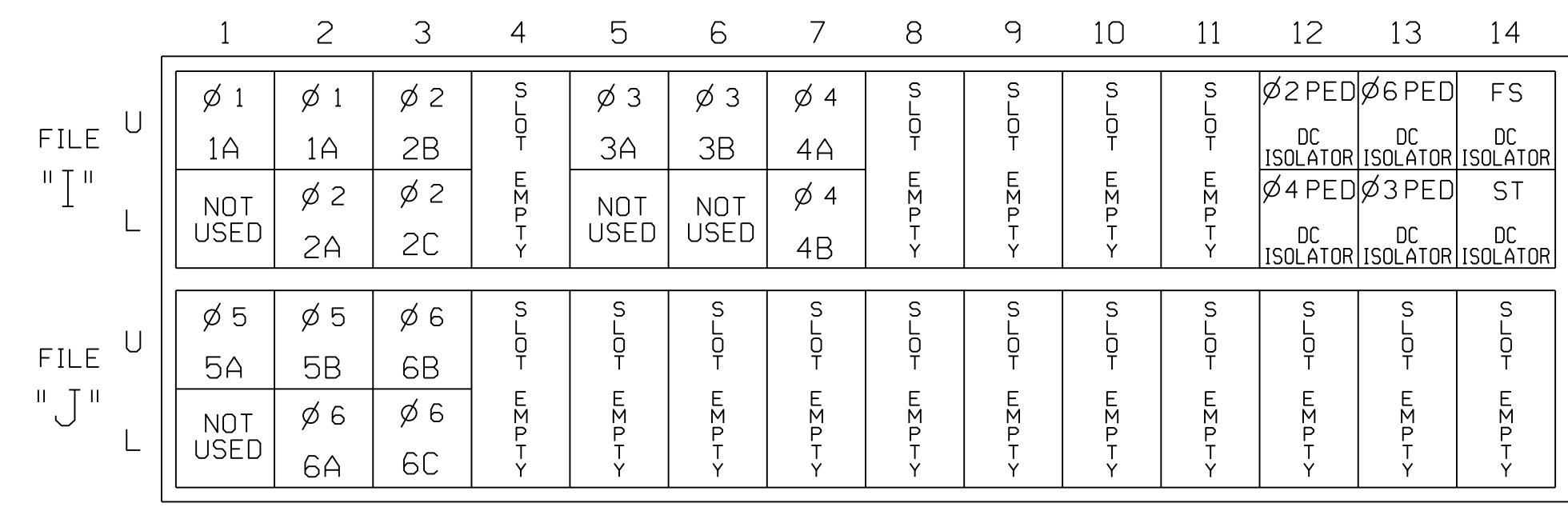
### SIGNAL HEAD HOOK-UP CHART

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	3 PED							
SIGNAL HEAD NO.	11	32	21,22, 23	P21, P22	31	32	41	42	43	63	P41, P42	51	43	61,62, 63	P61, P62	NU	NU	P31, P32	
RED			128	116	116	101	101							134					
YELLOW			129	117	117	102	102							135					
GREEN			130	118	118	103	103							136					
RED ARROW	125					101							131						
YELLOW ARROW	126	126				102			102				132	132					
GREEN ARROW	127	127				118	103	103	103				133	133					
Hand icon											113						119		110
Walking person icon												115					121		

NU = Not Used

### INPUT FILE POSITION LAYOUT

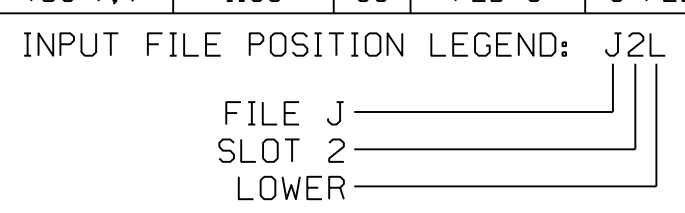
(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-5,6	I2U	39	1	1	YES		15		S
2A	TB2-7,8	I2L	43	2	2	YES			X	N
2B	TB2-9,10	I3U	63	12	2	YES			X	N
2C	TB2-11,12	I3L	76	32	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES		3		S
4B	TB6-3,4	I7L	78	44	4	YES				S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-5,6	J2U	40	5	5	YES		15		S
6A	TB3-7,8	J2L	44	6	6	YES			X	N
6B	TB3-9,10	J3U	64	16	6	YES			X	N
6C	TB3-11,12	J3L	77	36	6	YES			X	N

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



### 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: 06-0327  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Final Design  
 Electrical Detail - Sheet 1 of 2

US 401 Bus. (Raeford Road) at Ferncreek Drive / Roxie Avenue

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: G B Spell REVIEWED BY:

REVISIONS	INIT.	DATE

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3/29/2018

SIG. INVENTORY NO. 06-0327



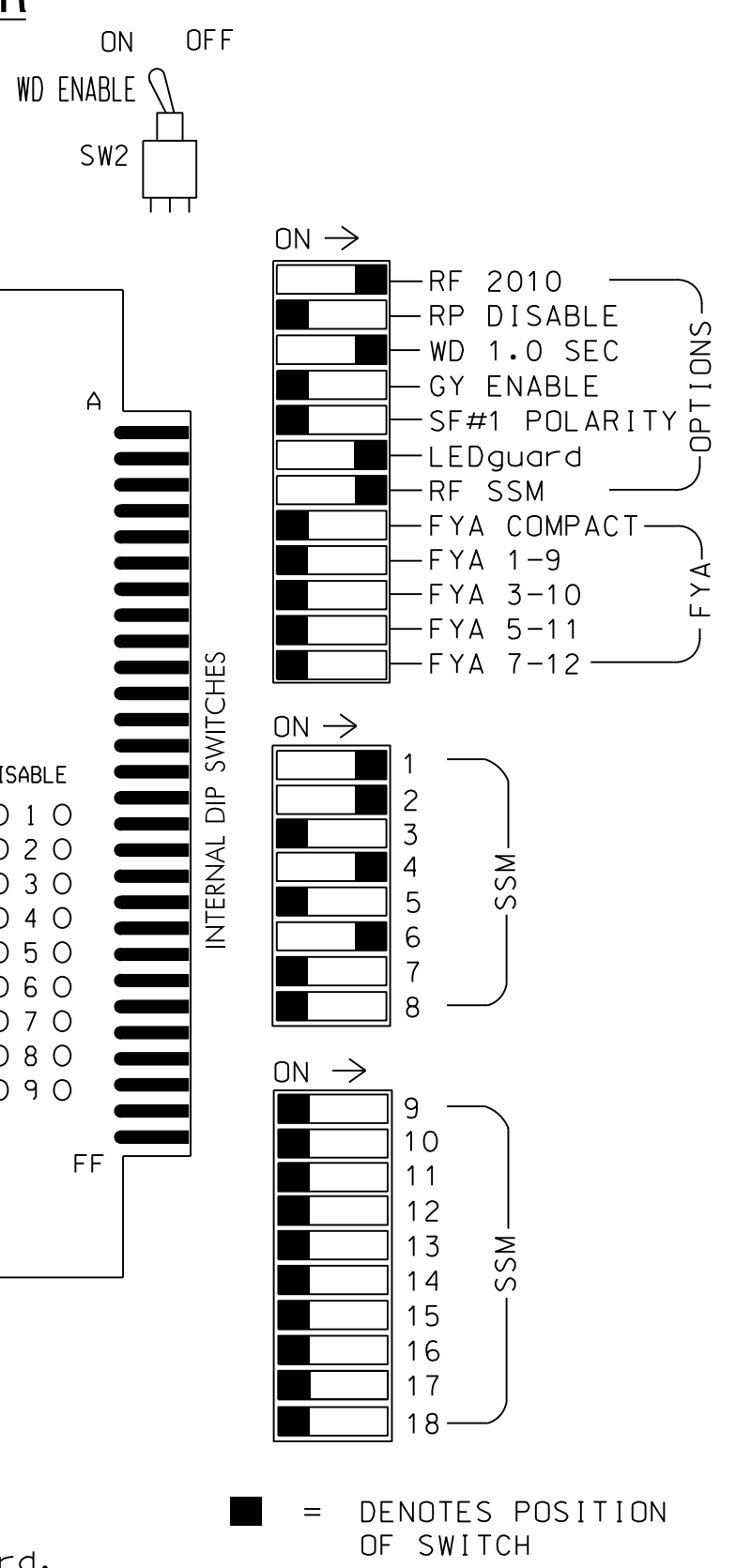
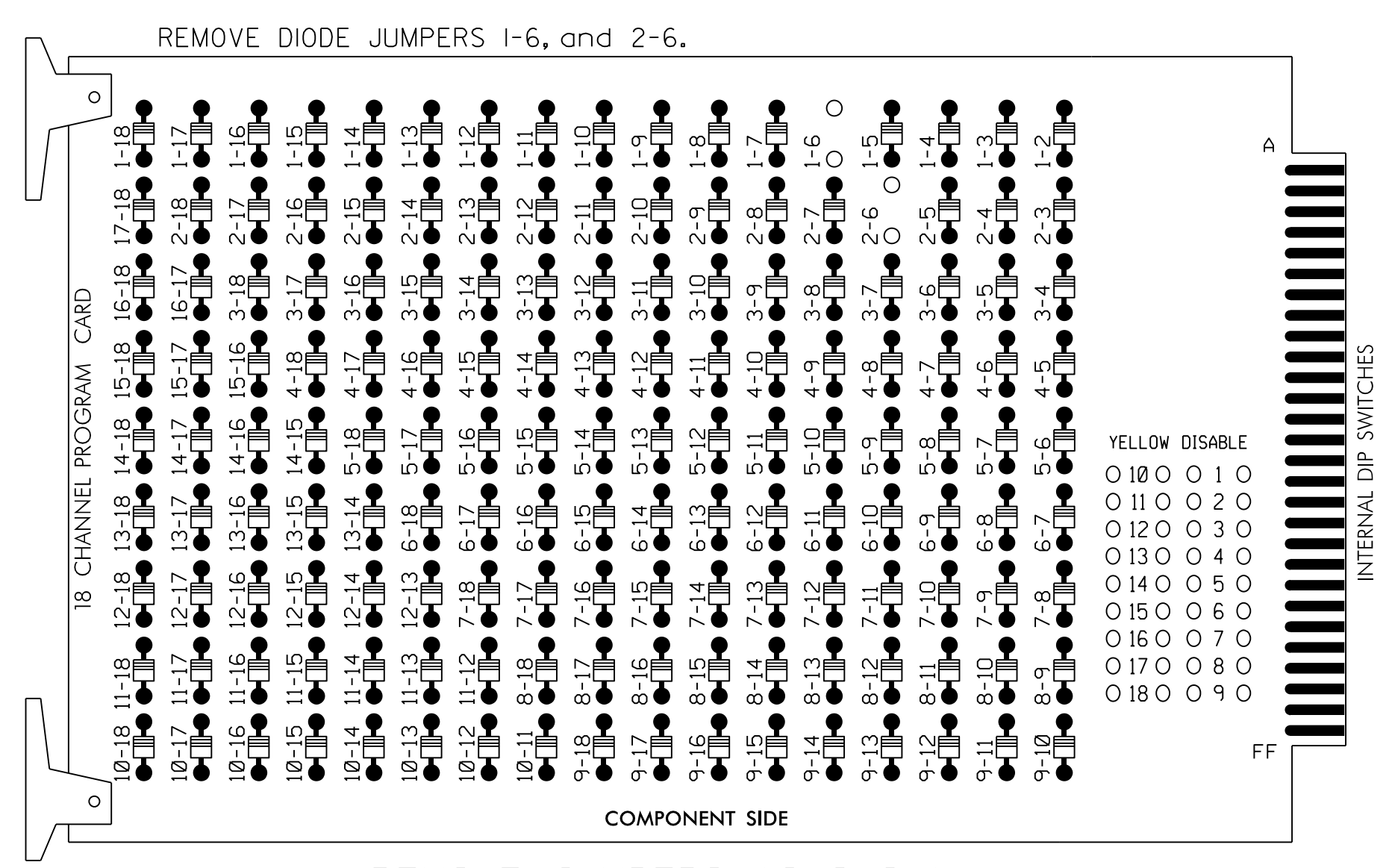






### EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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.
- 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.....2070  
 CABINET.....332  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S5,S8  
 PHASES USED.....1,2,4,6  
 OVERLAPS.....NONE

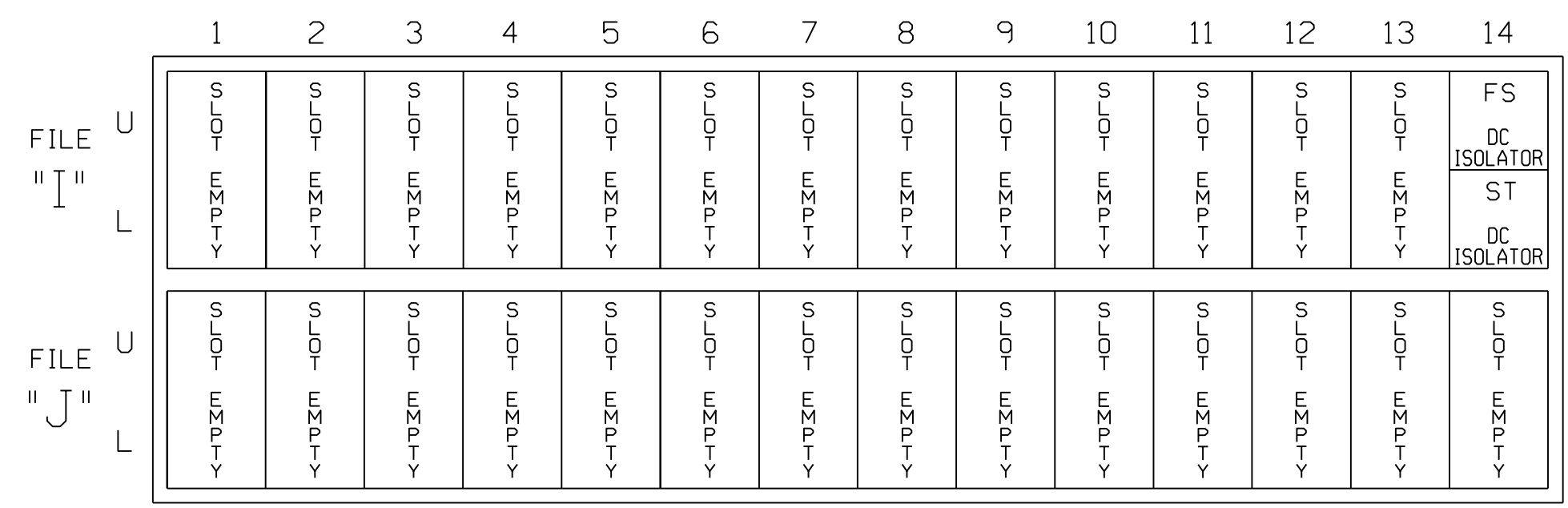
**SIGNAL HEAD HOOK-UP CHART**

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, 23	NU	NU	41,42, 43	NU	NU	61,62, 63	NU	NU	NU	NU
RED		128						134				
YELLOW		129						135				
GREEN		130						136				
RED ARROW	125				101							
YELLOW ARROW	126				102							
GREEN ARROW	127				103							

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

**SPECIAL DETECTOR NOTE**

Install a video 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.

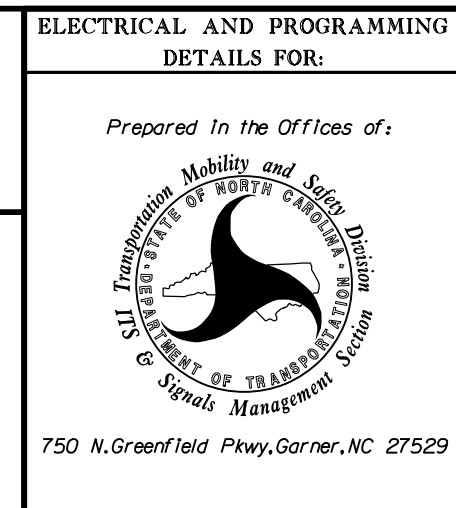
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 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 1 - TMP Phase I  
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL  
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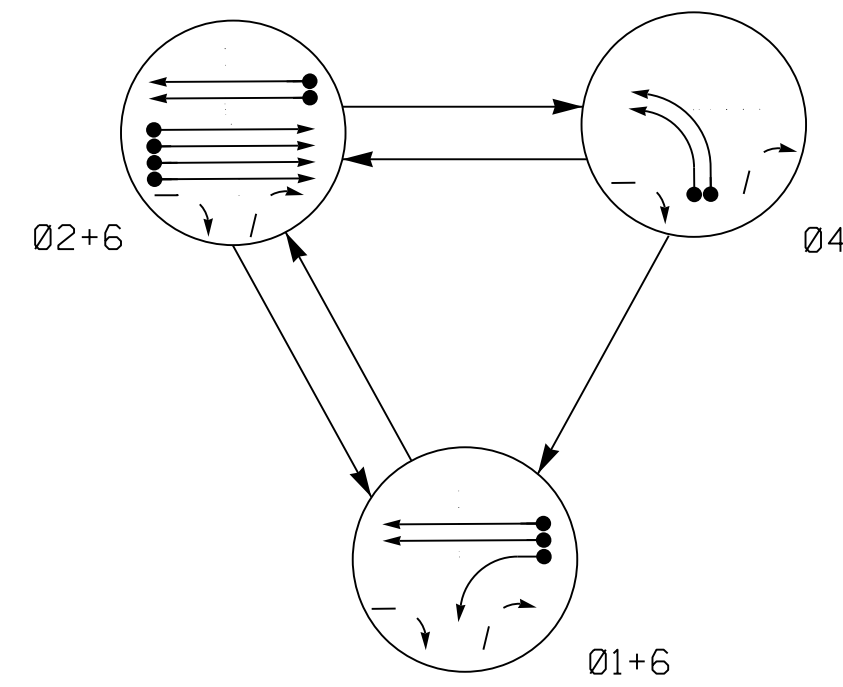
Stantec Consulting Services Inc.  
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 License No. F-0672



**US 401 Bus. (Raeford Road)**  
 at  
**SR 1007 (All American Freeway)**  
**Southbound Ramps**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: G B Spell REVIEWED BY:

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0320T1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

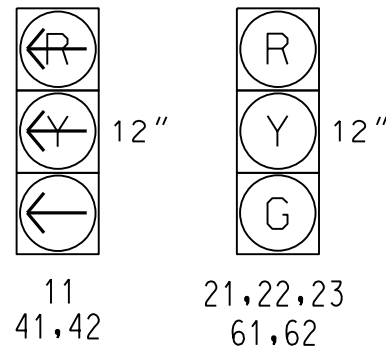
- → DETECTED MOVEMENT
- → UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 4	FLASH
11	←	←	←	←
21,22,23	R	G	R	Y
41,42	←	←	←	←
61,62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



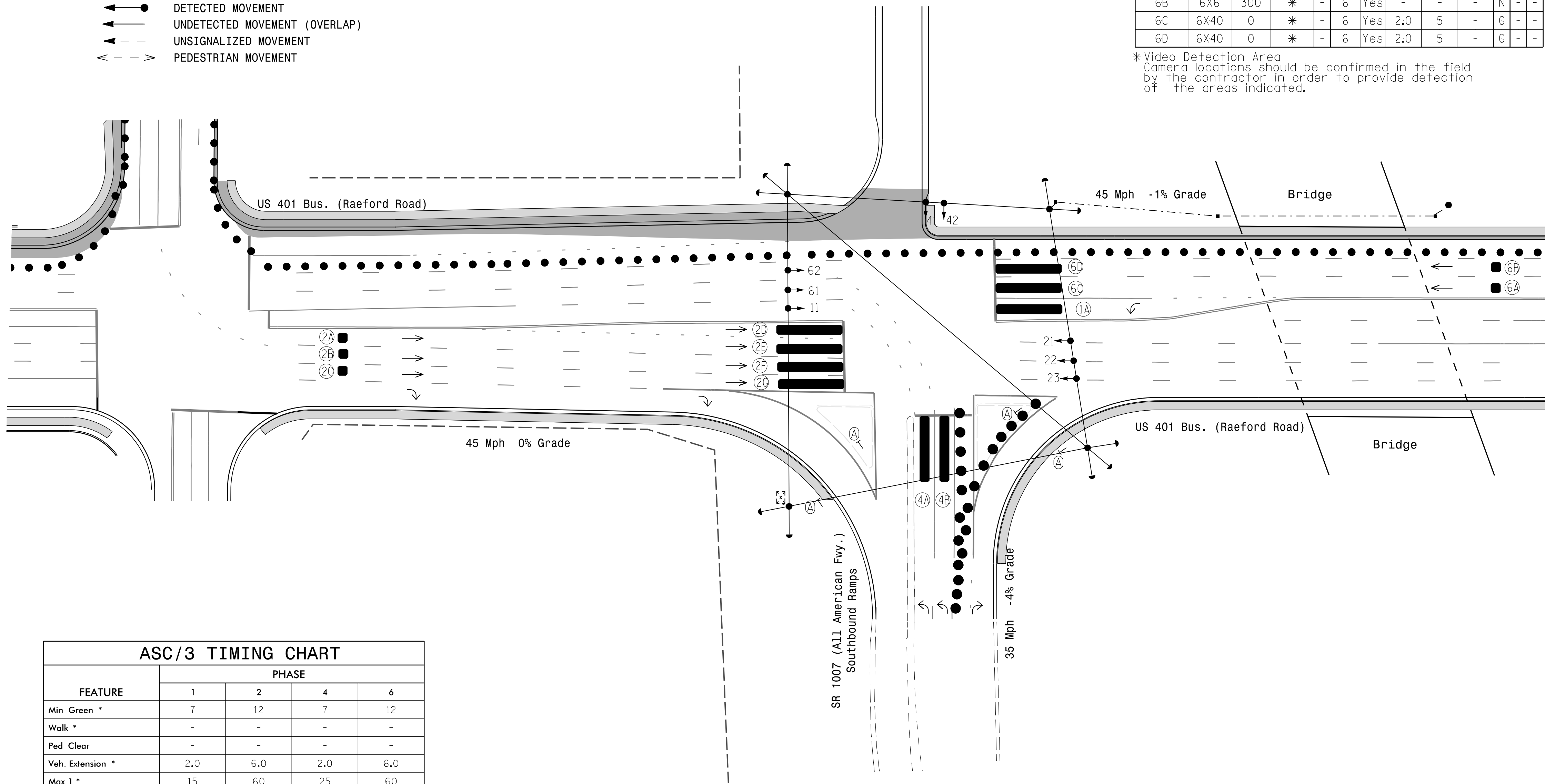
ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM
1A	6X40	0	*	-	1	Yes	-	-	-	S	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-
2C	6X6	300	*	-	2	Yes	-	-	-	N	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-
2E	6X40	0	*	-	2	Yes	2.0	5	-	G	-
2F	6X40	0	*	-	2	Yes	2.0	5	-	G	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-
4B	6X40	0	*	-	4	Yes	-	-	-	S	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-
6B	6X6	300	*	-	6	Yes	-	-	-	N	-
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-

\*Video Detection Area Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

3 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal heads numbered 21,22,23,61, and 62.
- 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.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	12	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	6.0
Max I *	15	60	25	60
Yellow	3.0	4.5	3.0	4.6
Red Clear	2.8	1.1	3.1	1.2
Red Revert	-	-	-	-
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Locking Detector	-	-	-	-
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   | ○ → 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   |
| N/A → Right of Way                                 | --- N/A   |
| → Directional Arrow                                | → N/A     |
| ▬ Video Detection Area                             | ▬ N/A     |
| ▬ Construction Zone                                | ▬ N/A     |
| ● ● ● Drums  | ● ● ● N/A |
| ⓐ "YIELD" Sign (R1-2)                              | ⓐ N/A     |

Signal Upgrade Temporary Design 2 - TMP Phase II

**Stantec**  
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 www.stantec.com  
 License No. F-0672

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27526  
 SCALE: 0 40  
 1" = 40'

US 401 Bus. (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramps  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: J. Hambright REVIEWED BY: B L Watson

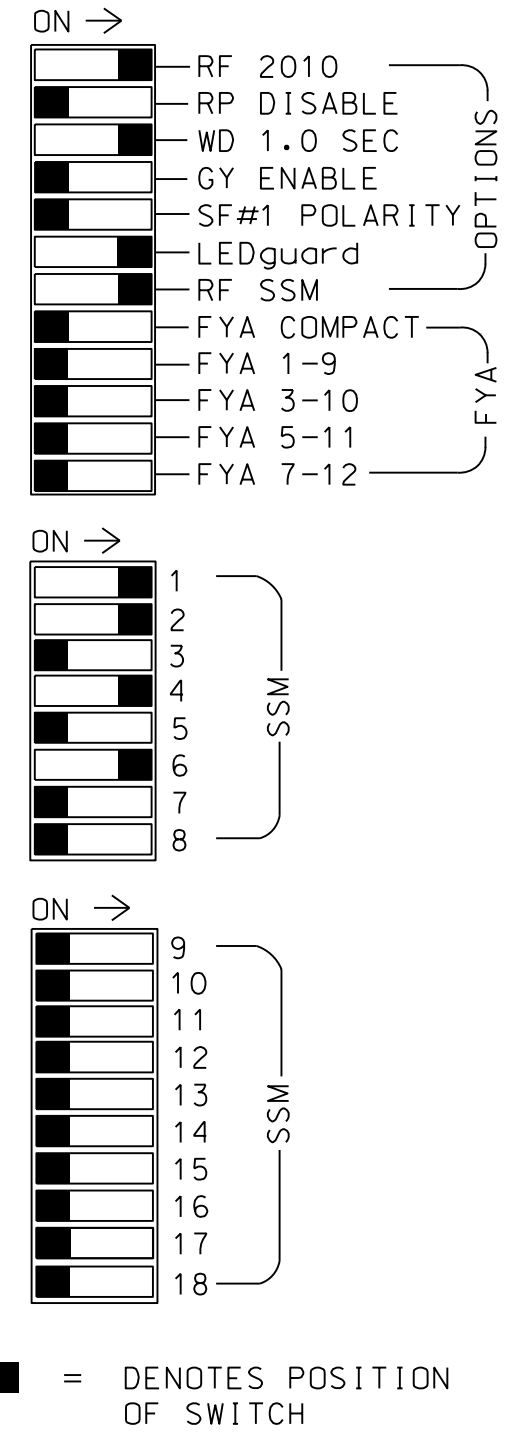
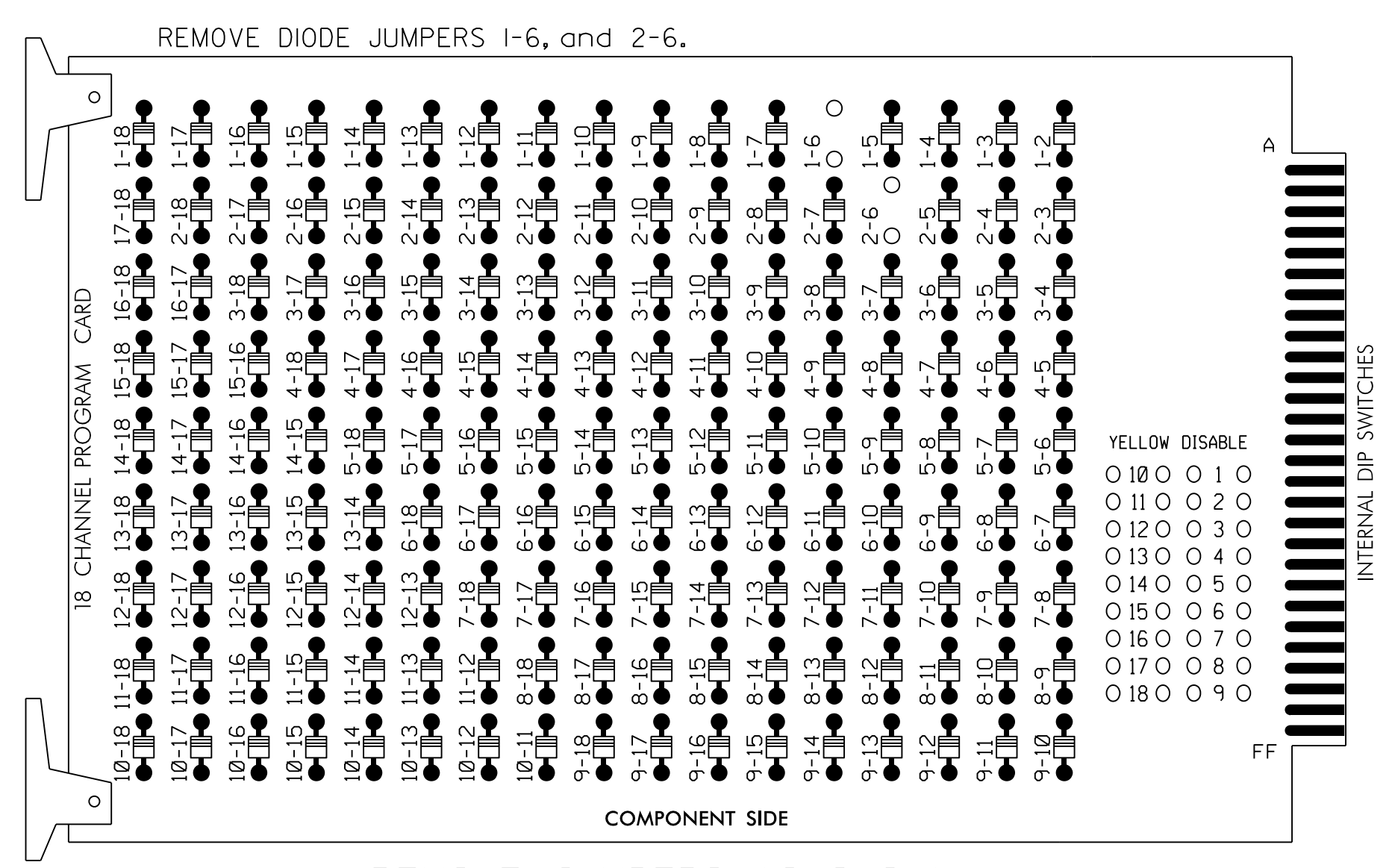
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 SIG. INVENTORY NO. 06-032012

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 User: rmlunicy



### 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.

**NOTES**

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

**EQUIPMENT INFORMATION**

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

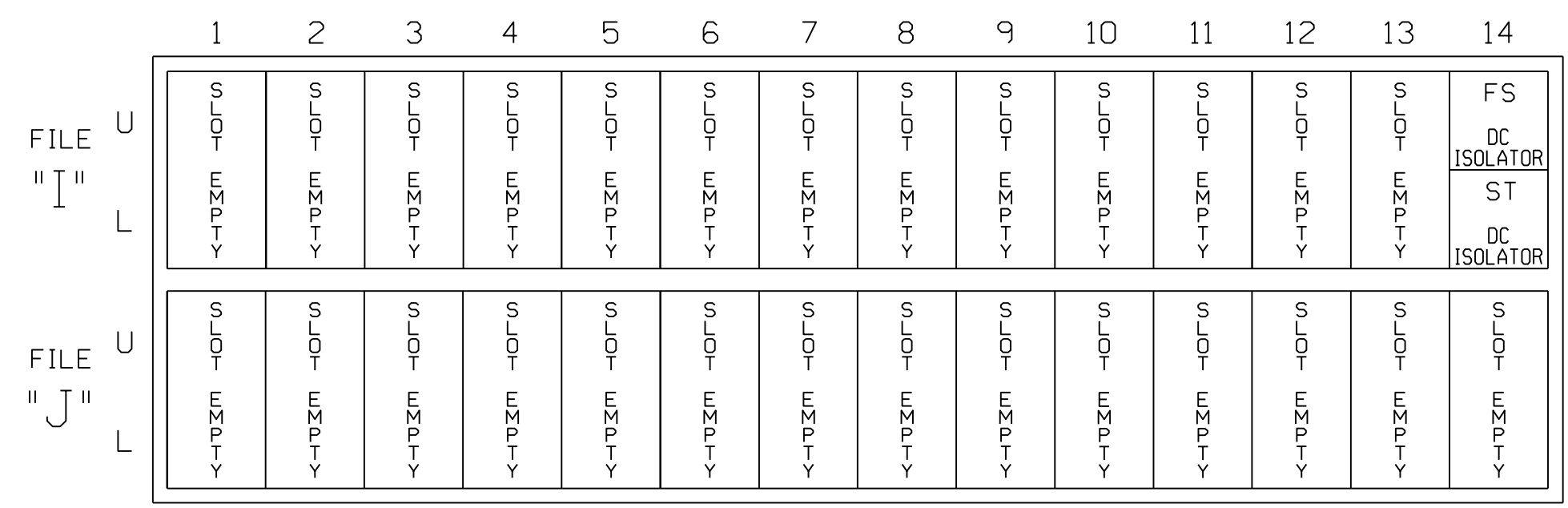
**SIGNAL HEAD HOOK-UP CHART**

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	21,22,23	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU
RED		128						134				
YELLOW		129						135				
GREEN		130						136				
RED ARROW	125				101							
YELLOW ARROW	126				102							
GREEN ARROW	127				103							

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

**SPECIAL DETECTOR NOTE**

Install a video 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.

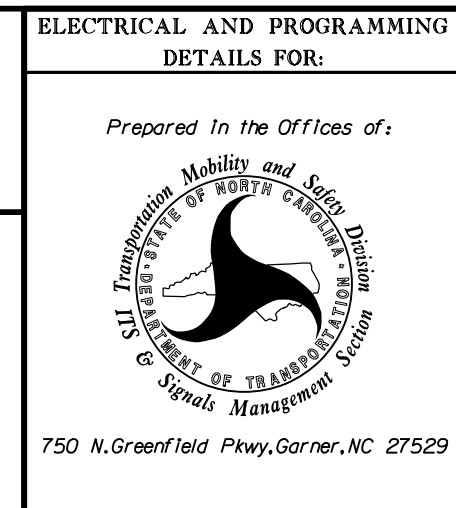
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0320T2  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 2 - TMP Phase II  
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



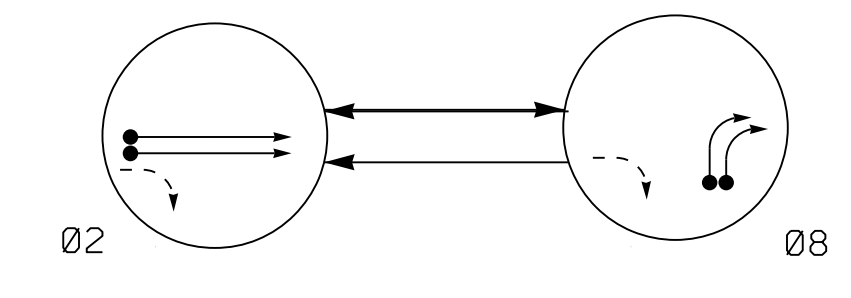
Stantec Consulting Services Inc.  
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 Fax. (919) 851-7024  
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**US 401 Bus. (Raeford Road)**  
 at  
**SR 1007 (All American Freeway)**  
 Southbound Ramps  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: G B Spell REVIEWED BY:  
 REVISIONS INIT. DATE

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0320T2

**PHASING DIAGRAM**

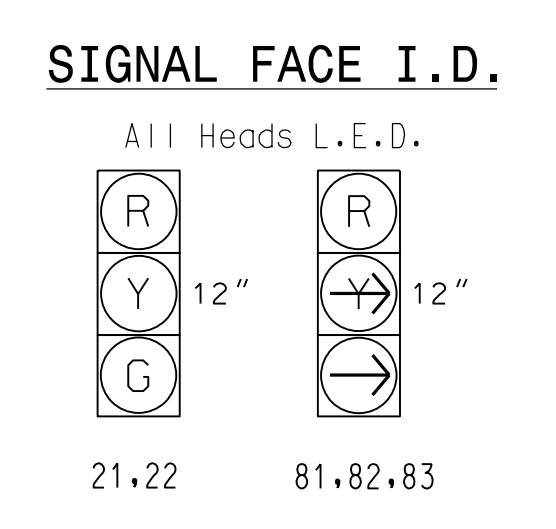


**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø2	Ø8	FLIGHTS
21,22	G	R	Y
81,82,83	R	→	R



**ASC/3 DETECTOR INSTALLATION CHART**

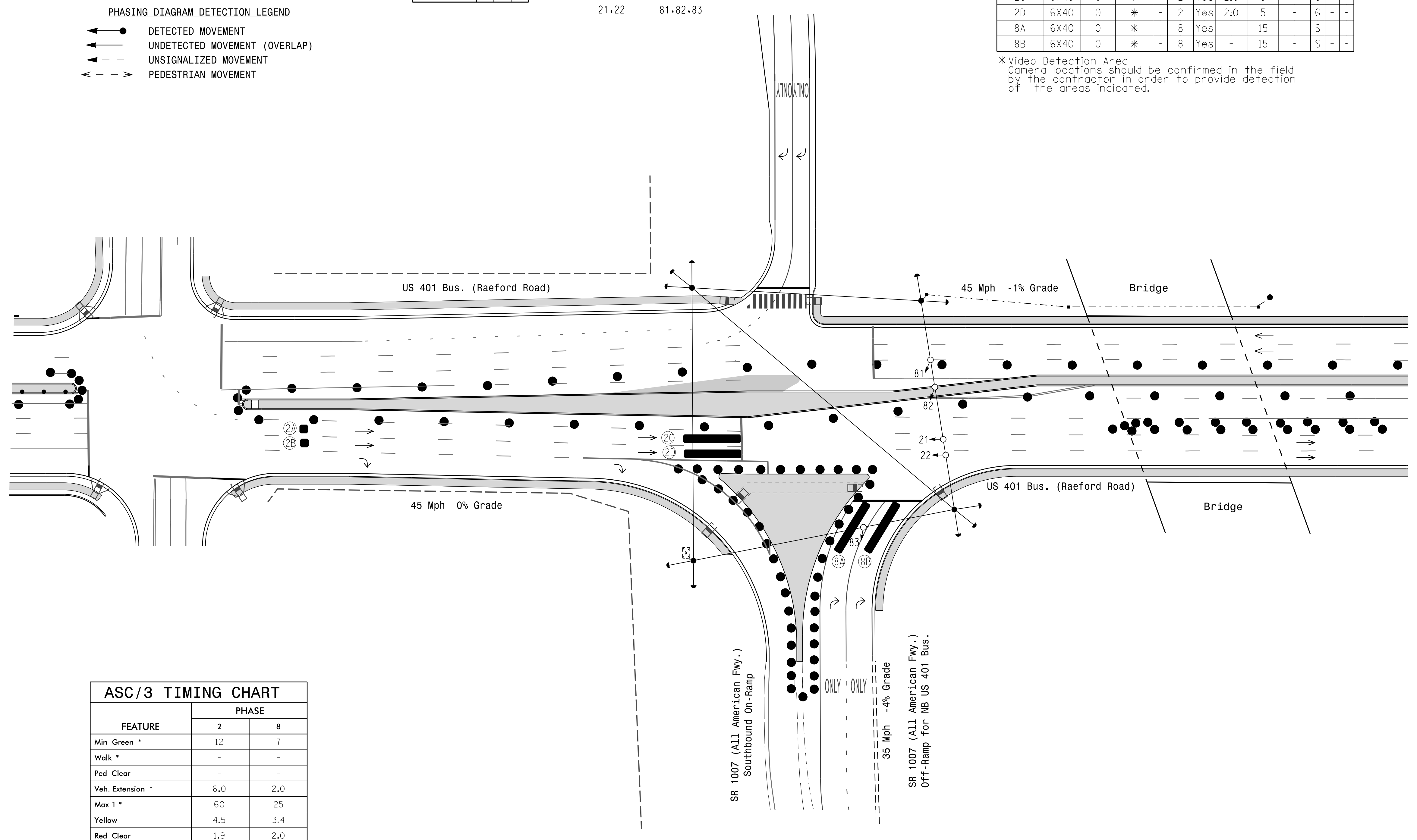
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM
2A	6X6	300	*	-	2	Yes	-	-	-	N	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-
8A	6X40	0	*	-	8	Yes	-	15	-	S	-
8B	6X40	0	*	-	8	Yes	-	15	-	S	-

\*Video Detection Area  
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

**2 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
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. 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	8
Min Green *	12	7
Walk *	-	-
Ped Clear	-	-
Veh. Extension *	6.0	2.0
Max I *	60	25
Yellow	4.5	3.4
Red Clear	1.9	2.0
Red Revert	-	-
Actuations B4 Add *	-	-
Seconds /Actuation *	-	-
Max Initial *	-	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.0	-
Locking Detector	-	-
Recall Position	VEH. RECALL	-
Dual Entry	-	-
Simultaneous Gap	-	-

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 8 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	● Signal Pole with Sidewalk Guy
⊠ Inductive Loop Detector	⊠ N/A
⊠ Controller & Cabinet	⊠ N/A
⊠ Junction Box	⊠ N/A
--- 2-in Underground Conduit	--- N/A
N/A Right of Way	→ N/A
→ Directional Arrow	→ N/A
▬ Video Detection Area	▬ N/A
▬ Construction Zone	▬ N/A
●●● Drums	●●● N/A

**Signal Upgrade Temporary Design 3 - TMP Phase III**

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801 Jones Franklin Road-Suite 300  
Raleigh, NC 27606  
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www.stantec.com  
License No. F-0672

Prepared for the Offices of:  
Transportation Mobility and Safety Division  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
Signal Design Section  
750 N. Greenfield Pkwy, Garner, NC 27526  
SCALE: 0 40  
1" = 40'

**US 401 Bus. (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramps**  
Division 6 Cumberland County Fayetteville  
PLAN DATE: March 2018 REVIEWED BY: E D Harris  
PREPARED BY: J. Hambricht REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

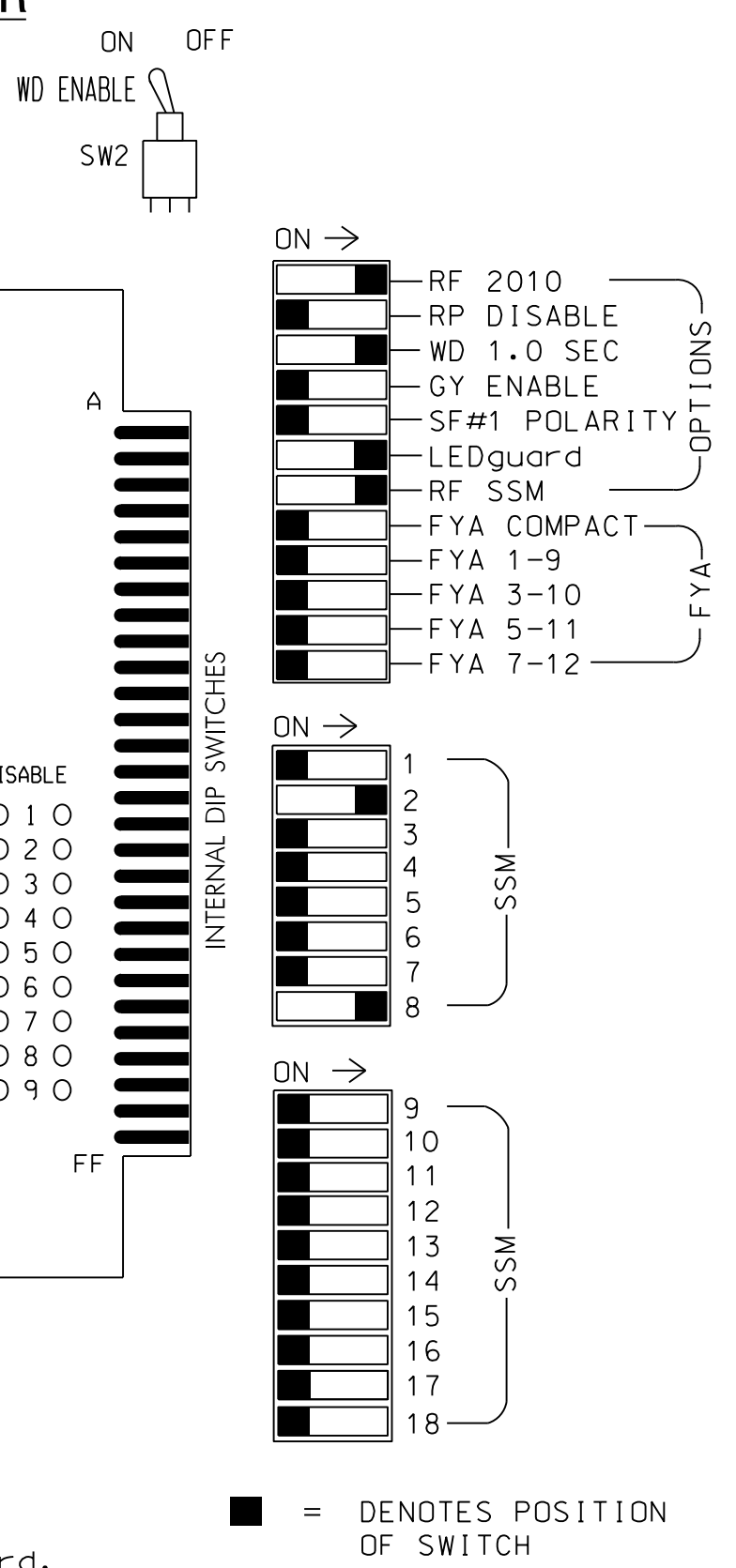
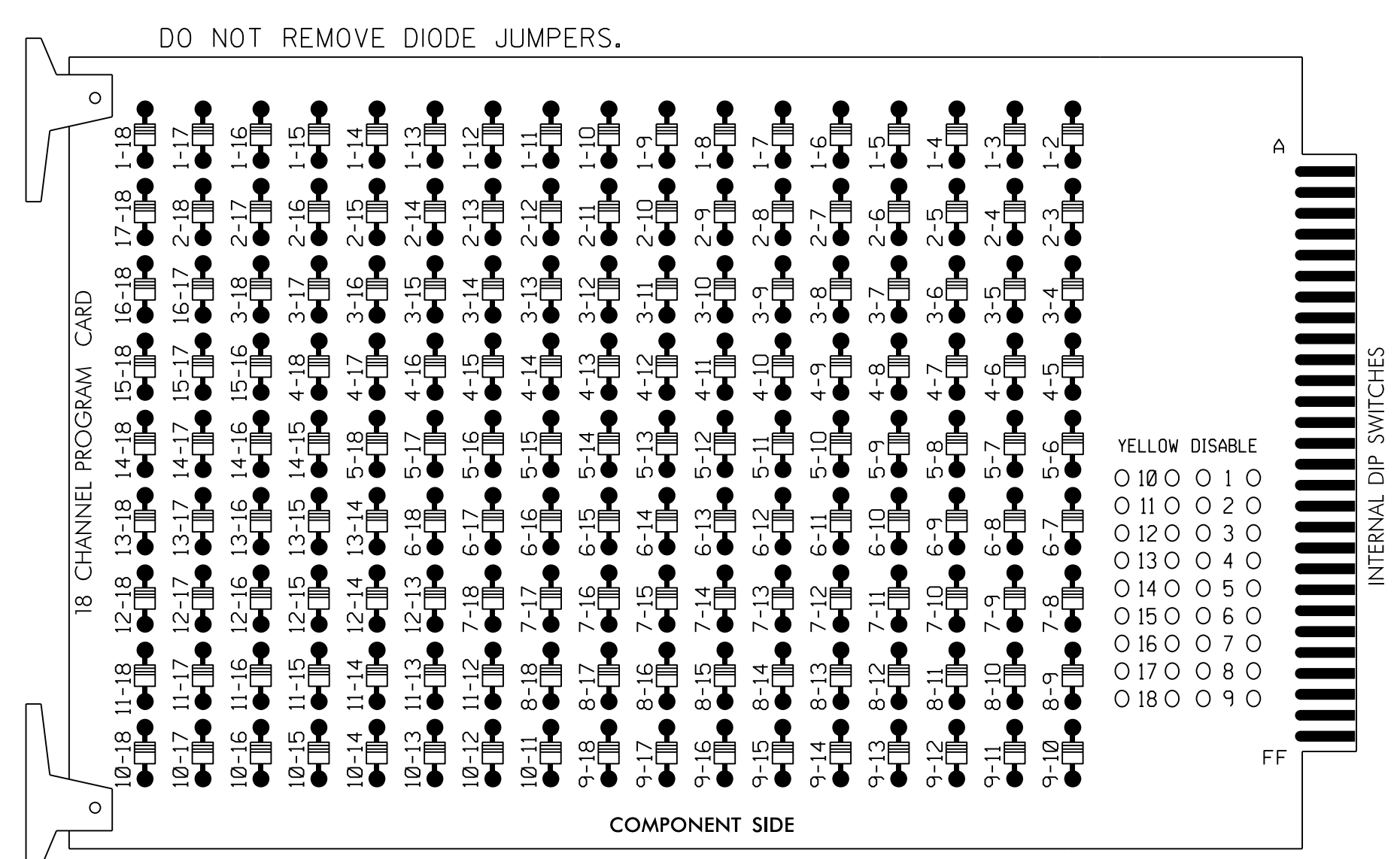
**Professional Engineer Seal**  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 29449  
Betsy L. Watson  
3/29/2018  
SIG. INVENTORY NO. 06-032013

3/29/2018 10:45:11 AM User: rmluncey



### 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.

### NOTES

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

### EQUIPMENT INFORMATION

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

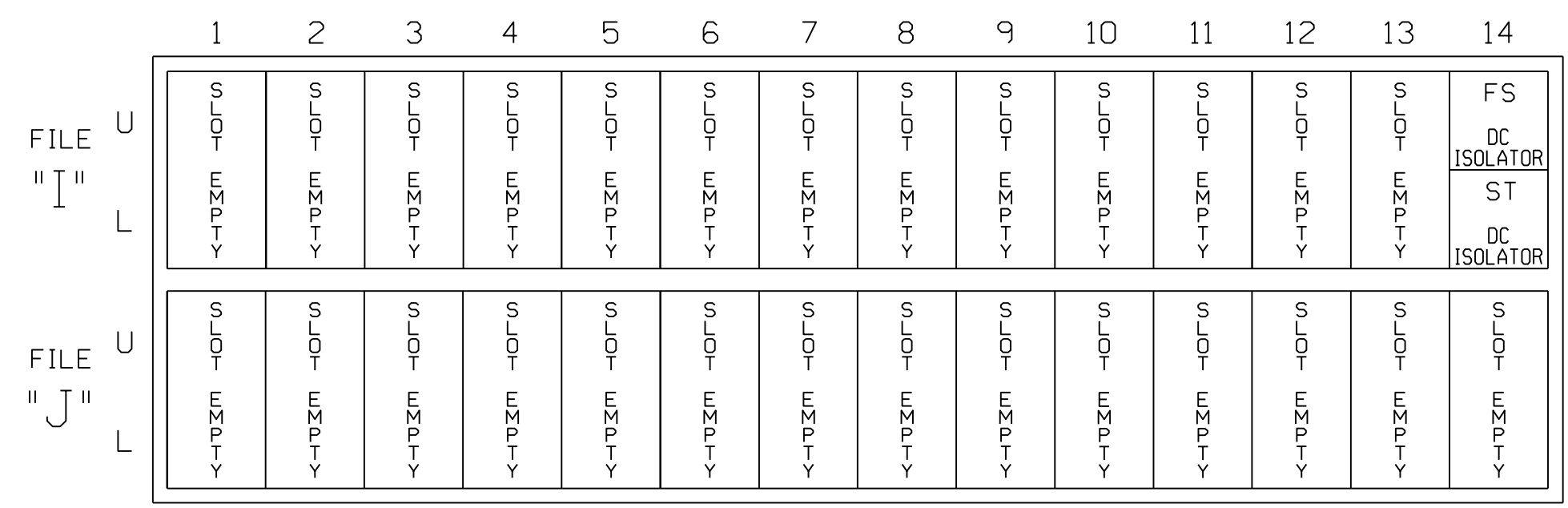
### SIGNAL HEAD HOOK-UP CHART

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.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	NU	81,82, 83	NU
RED		128										107
YELLOW		129										
GREEN		130										
RED ARROW												
YELLOW ARROW											108	
GREEN ARROW											109	

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



### SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0320T3  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 3 - TMP Phase III  
 Electrical Detail

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Bus. (Raeford Road)  
 at  
 SR 1007 (All American Freeway)  
 Southbound Ramps  
 Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: G B Spell REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

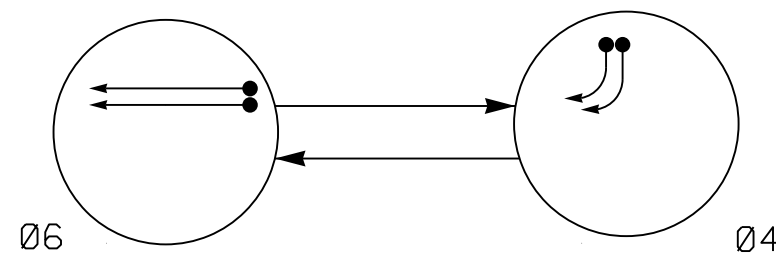
3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0320T3







**PHASING DIAGRAM**



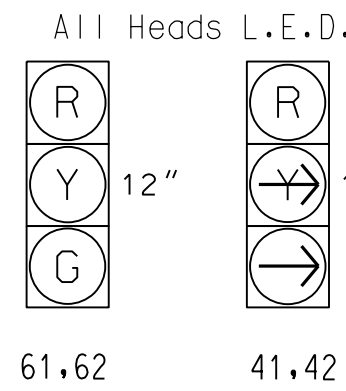
**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø 6	Ø 4	FLASH
41,42	R	→ R	R
61,62	G	R	Y

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

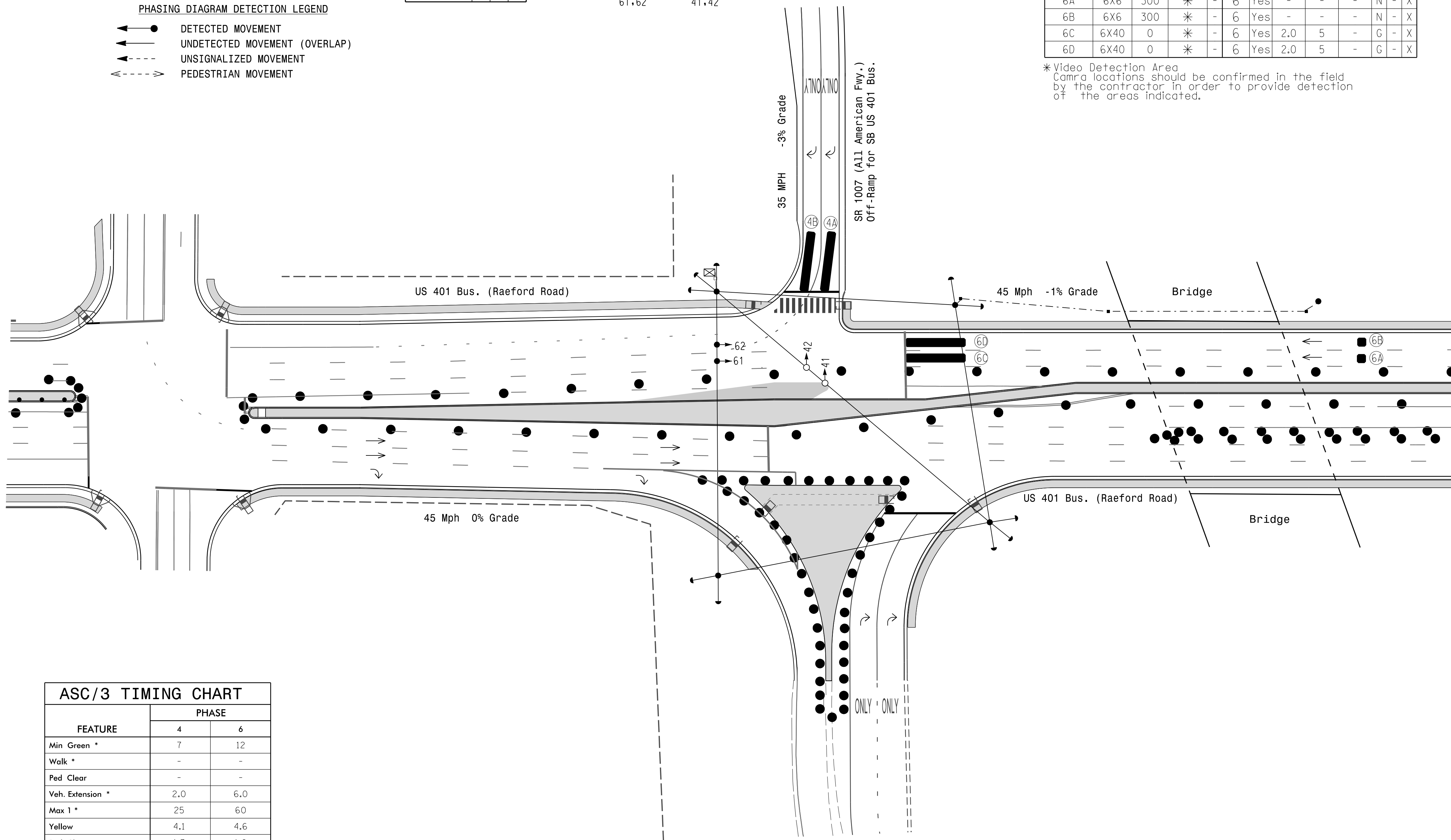
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X40	0	*	-	4	Yes	-	15	-	S	-	X
4B	6X40	0	*	-	4	Yes	-	15	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X

\* Video Detection Area  
 Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

**2 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 61,62.
- 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.
- 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	
	4	6
Min Green *	7	12
Walk *	-	-
Ped Clear	-	-
Veh. Extension *	2.0	6.0
Max 1 *	25	60
Yellow	4.1	4.6
Red Clear	1.3	1.0
Red Revert	-	-
Actuations B4 Add *	-	-
Seconds / Actuation *	-	-
Max Initial *	-	-
Time Before Reduction *	-	15
Time To Reduce *	-	30
Minimum Gap	-	3.0
Locking Detector	-	-
Recall Position	-	VEH. RECALL
Dual Entry	-	-
Simultaneous Gap	-	-

\* 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                              |
| ■ Video Detection Area                           | N/A  |
| ■ Construction Zone                              | N/A  |
| ●●● Drums  | N/A  |

**Signal Upgrade Temporary Design 1 - TMP Phase III**

**Stantec**  
 Stantec Consulting Services Inc.  
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Prepared For the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27526  
 SCALE: 0 40  
 1" = 40'

**US 401 Bus. SB (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramp**  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: E D Harris  
 PREPARED BY: J. Hambricht REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

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

3/29/2018  
 User: rfmuncy

3/29/2018  
 User: E D Harris

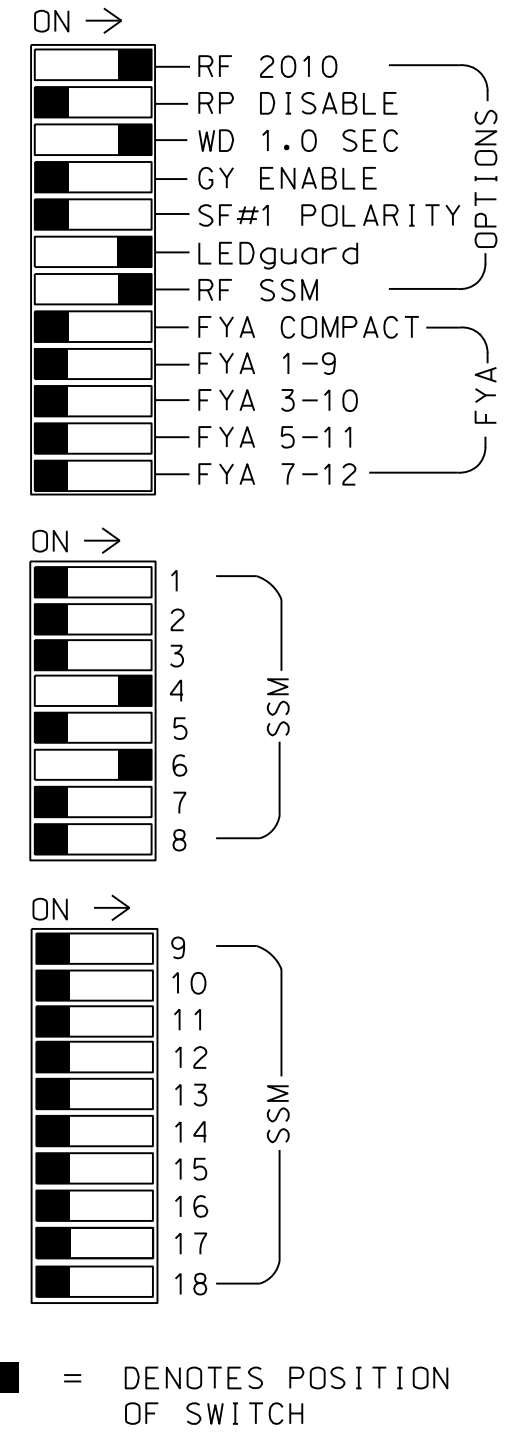
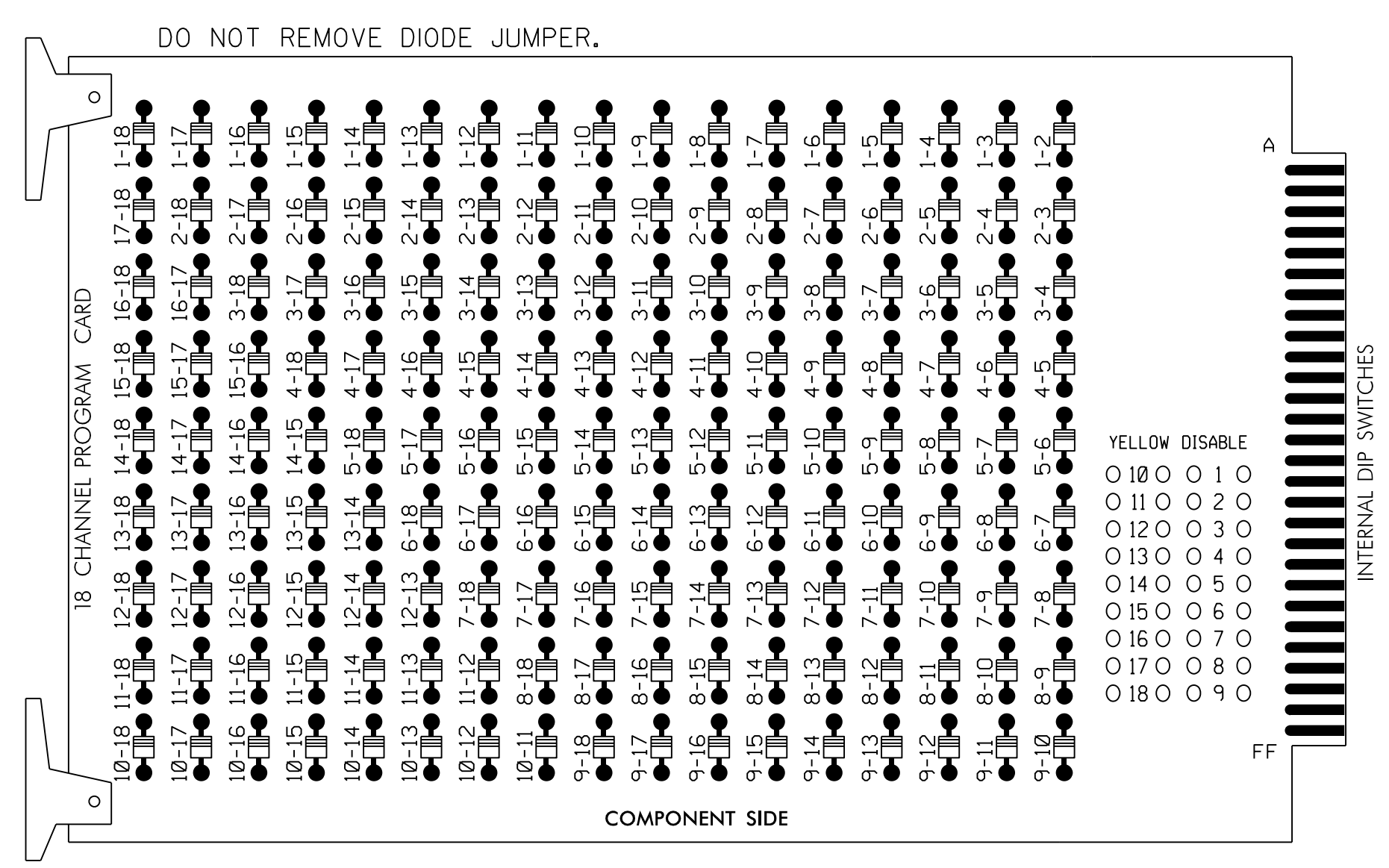
3/29/2018  
 User: B L Watson

SIG. INVENTORY NO. 06-1376-11



### 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. Program controller to start up in phase 6 Green.
3. Program phase 2 for Red Flash.
4. The cabinet and controller are part of the Fayetteville Signal System.

### EQUIPMENT INFORMATION

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

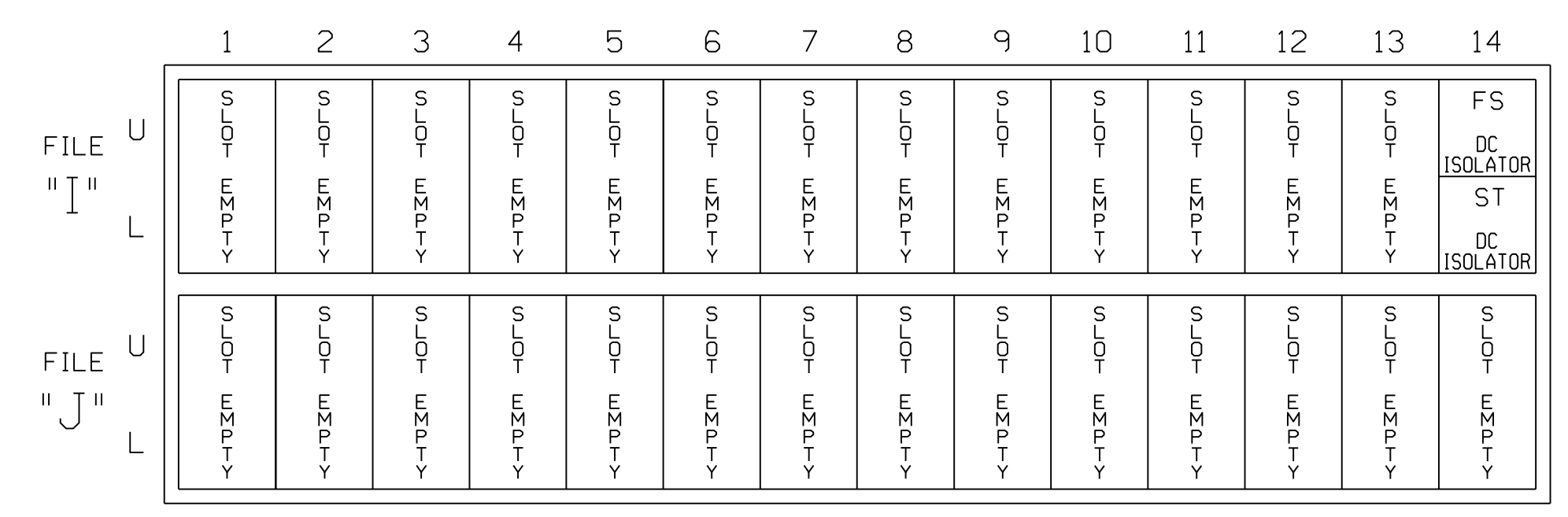
### SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED					101			134										
YELLOW								135										
GREEN								136										
RED ARROW																		
YELLOW ARROW					102													
GREEN ARROW					103													

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

### SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1376T1  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Temporary Design 1 - TMP Phase III  
Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 401 Bus. SB (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramp

Division 6 Cumberland County Fayetteville

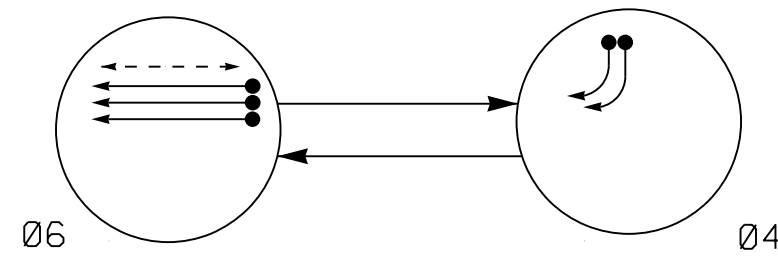
PLAN DATE: March 2018	REVIEWED BY: L Overn
PREPARED BY: G B Spell	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
LAWRENCE E. OVERN  
3/29/2018  
SIG. INVENTORY NO. 06-1376T1

**PHASING DIAGRAM**



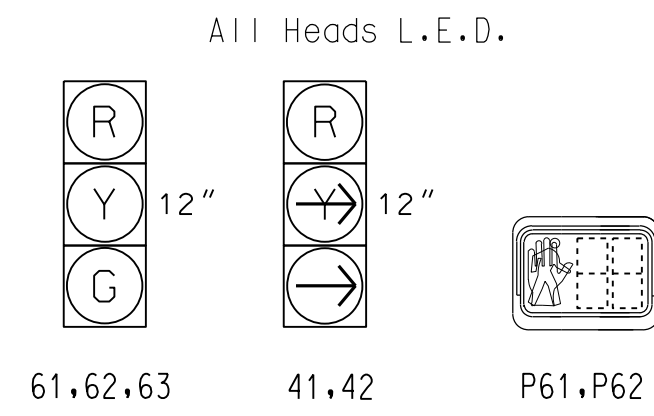
**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	06	04	F
41,42	R	→	R
61,62,63	G	R	Y
P61,P62	W	DW	DRK

**SIGNAL FACE I.D.**



All Heads L.E.D. Type II Pedestal

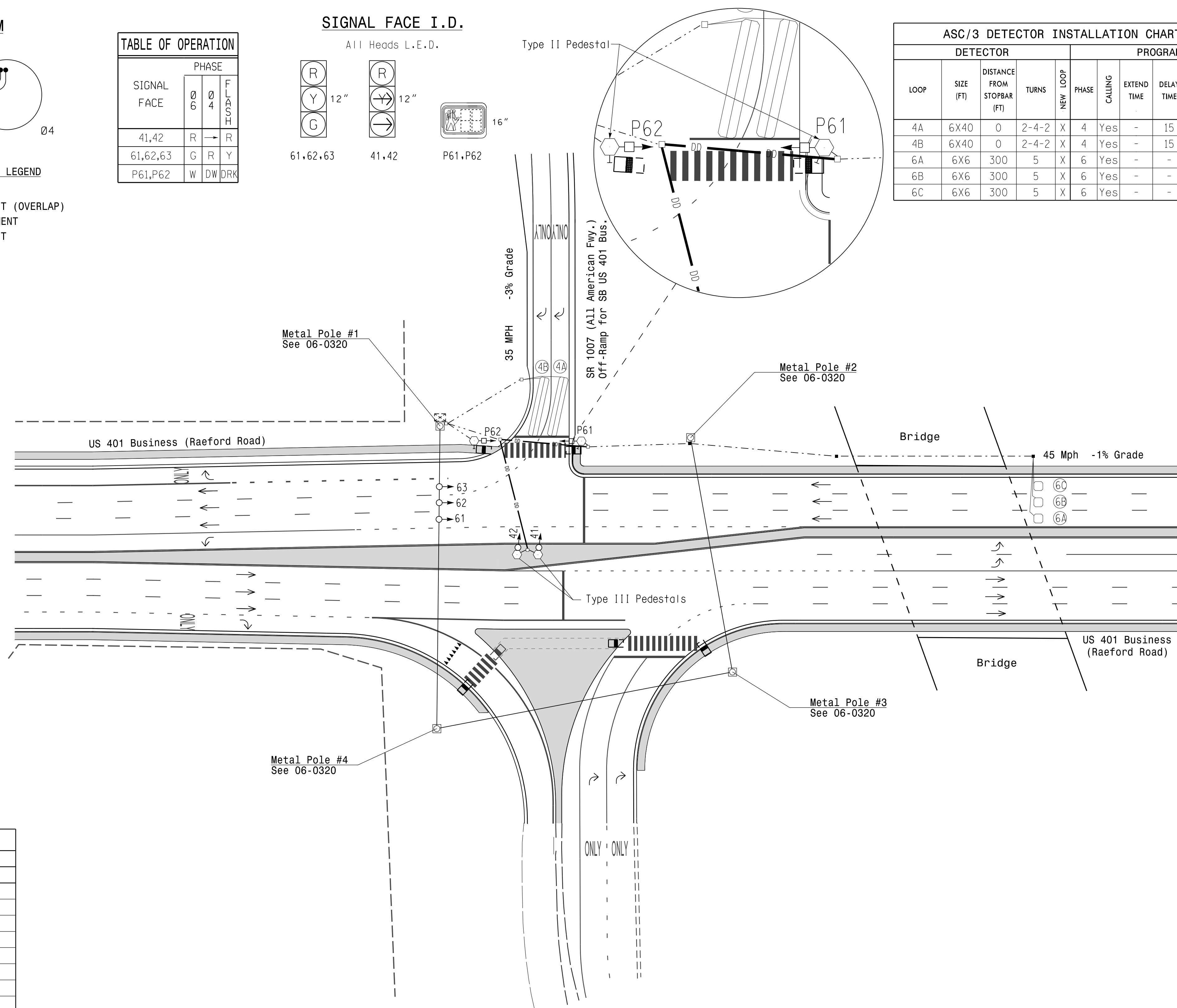
**ASC/3 DETECTOR INSTALLATION CHART**

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

**2 Phase Fully Actuated Fayetteville Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



**ASC/3 TIMING CHART**

FEATURE	PHASE	
	4	6
Min Green *	7	12
Walk *	-	7
Ped Clear	-	10
Veh. Extension *	2.0	6.0
Max 1 *	25	60
Yellow	4.1	4.6
Red Clear	1.3	1.0
Red Revert	-	-
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	-	-

\* 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        | ○ → N/A   |
| ○ → 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   |
| N/A → Right of Way                | N/A → N/A |
| → Directional Arrow               | → N/A     |
| ○ → Directional Drill             | ○ → N/A   |
| ○ → Metal Strain Pole             | ○ → N/A   |

**Signal Upgrade - Final Design**

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>		<p>US 401 Bus. SB (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramp</p>	
		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: E D Harris</p> <p>PREPARED BY: J. Hambricht REVIEWED BY: B L Watson</p>	<p>3/29/2018</p> <p>DATE</p>

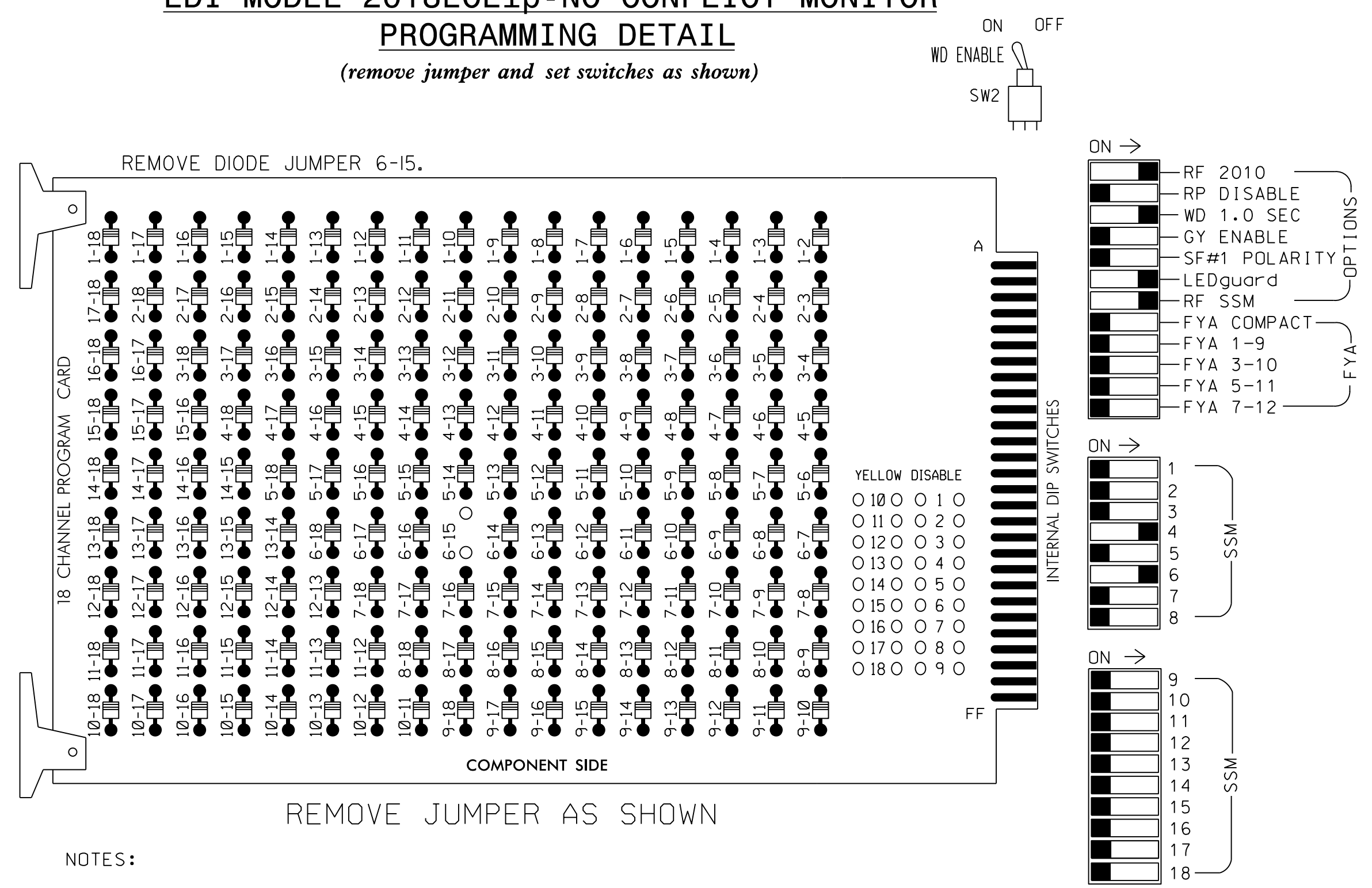
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/29/2018 10:41:00 AM C:\Users\jhambricht\Documents\Signal Design\4405\Sig-61.0.dgn  
 User: jhambricht



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

(remove jumper 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.

**NOTES**

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

**EQUIPMENT INFORMATION**

CONTROLLER.....Contractor Supplied  
Econolite 2070LX  
CABINET.....332 W/AUX  
SOFTWARE.....ECONOLITE ASC/3-2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
LOAD SWITCHES USED.....S5,S8,S9  
PHASES USED.....4,6,6PED  
OVERLAP "A".....NOT USED  
OVERLAP "B".....NOT USED  
OVERLAP "C".....NOT USED  
OVERLAP "D".....NOT USED

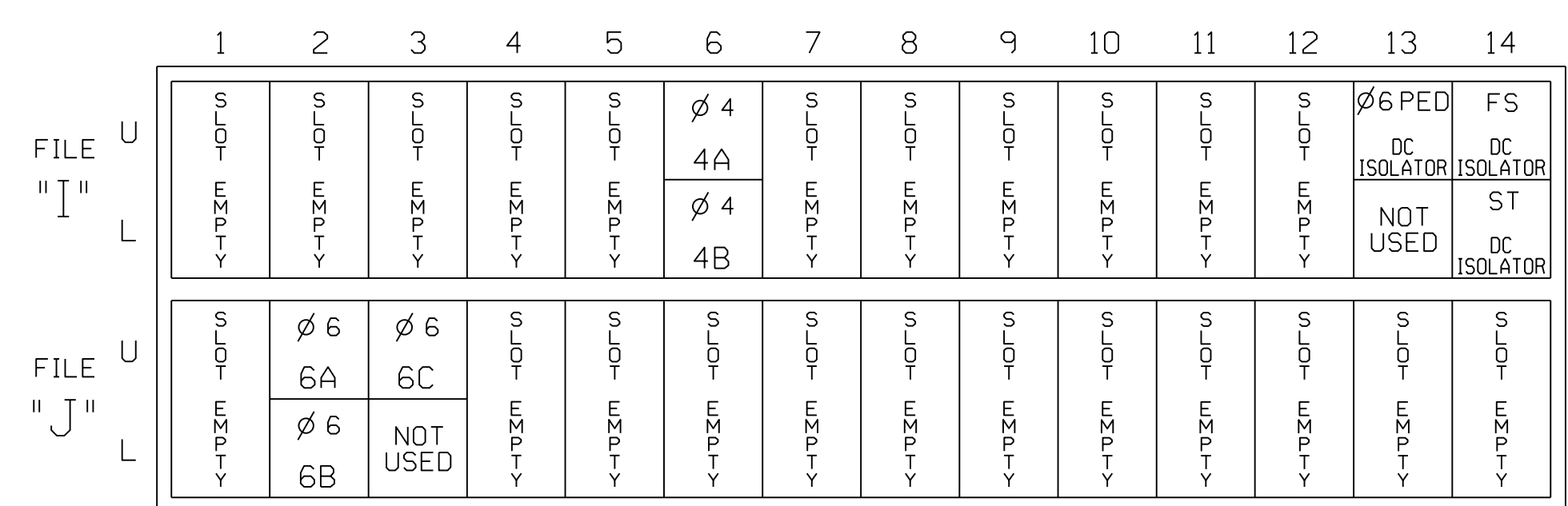
**SIGNAL HEAD HOOK-UP CHART**

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	NU	NU	NU	41,42	NU	NU	61,62, 63	P61, P62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED					101			134										
YELLOW								135										
GREEN								136										
RED ARROW																		
YELLOW ARROW					102													
GREEN ARROW					103													
Hand icon									119									
Person icon									121									

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)



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

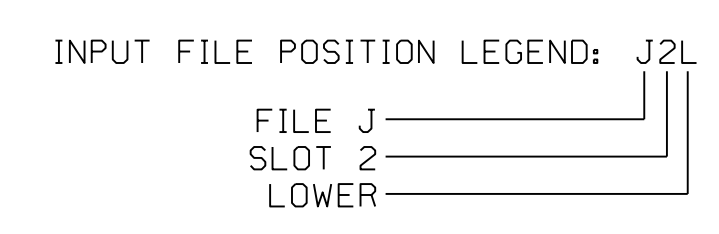
FS = FLASH SENSE  
ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB4-9,10	I6U	41	4	4	YES		15		S
4B	TB4-11,12	I6L	45	14	4	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
PED PUSH BUTTONS										
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

**NOTE:**

INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1376  
DESIGNED: March 2018  
SEALED: 03-29-2018  
REVISED: N/A

Final Design  
Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:  
**US 401 Bus. SB (Raeford Road) at SR 1007 (All American Freeway) Southbound Ramp**  
Division 6 Cumberland County Fayetteville  
PLAN DATE: March 2018 REVIEWED BY: L Overn  
PREPARED BY: G B Spell REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

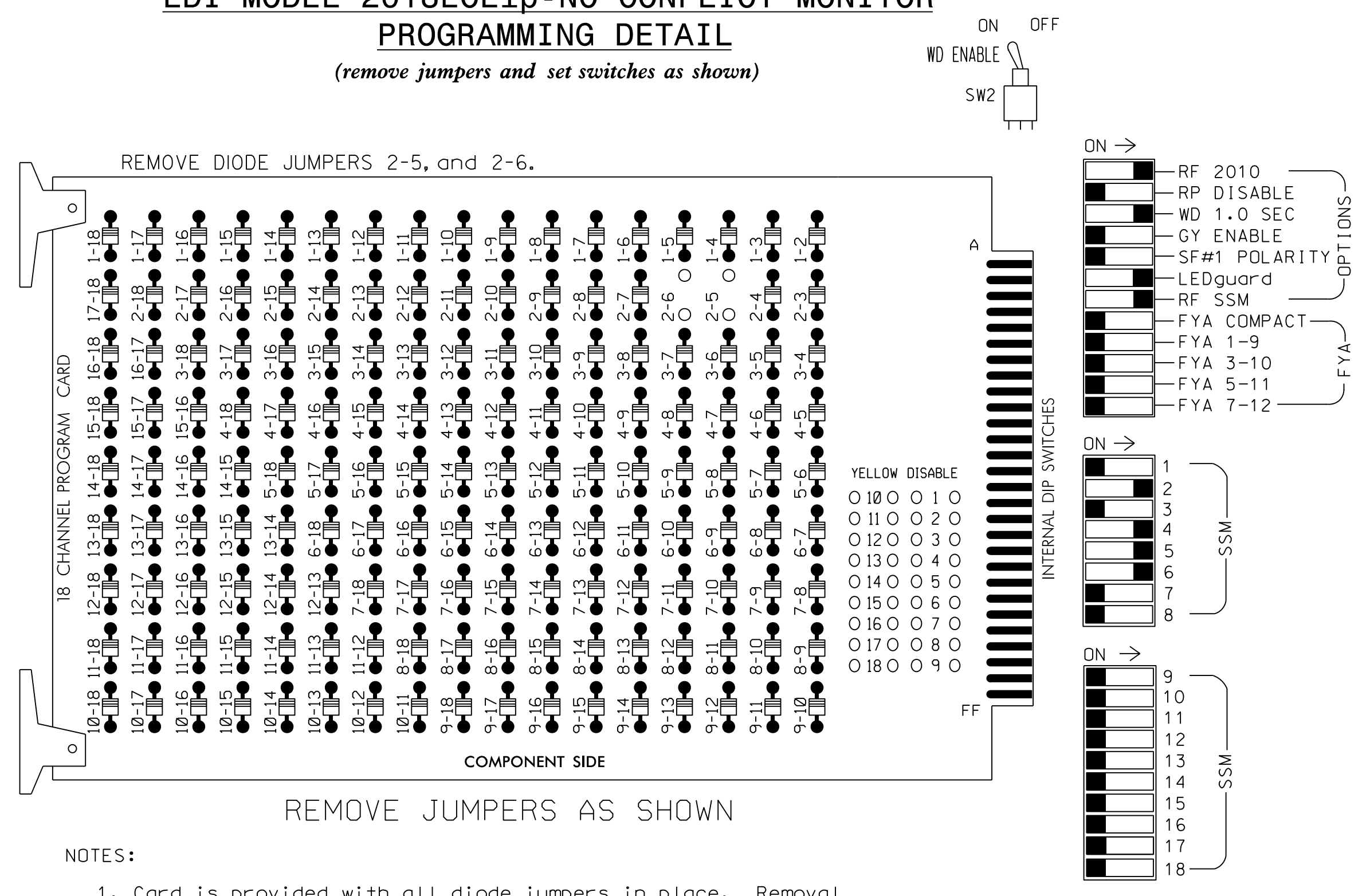
3/29/2018  
DATE  
SIG. INVENTORY NO. 06-1376





### 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.

NOTES

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

EQUIPMENT INFORMATION

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

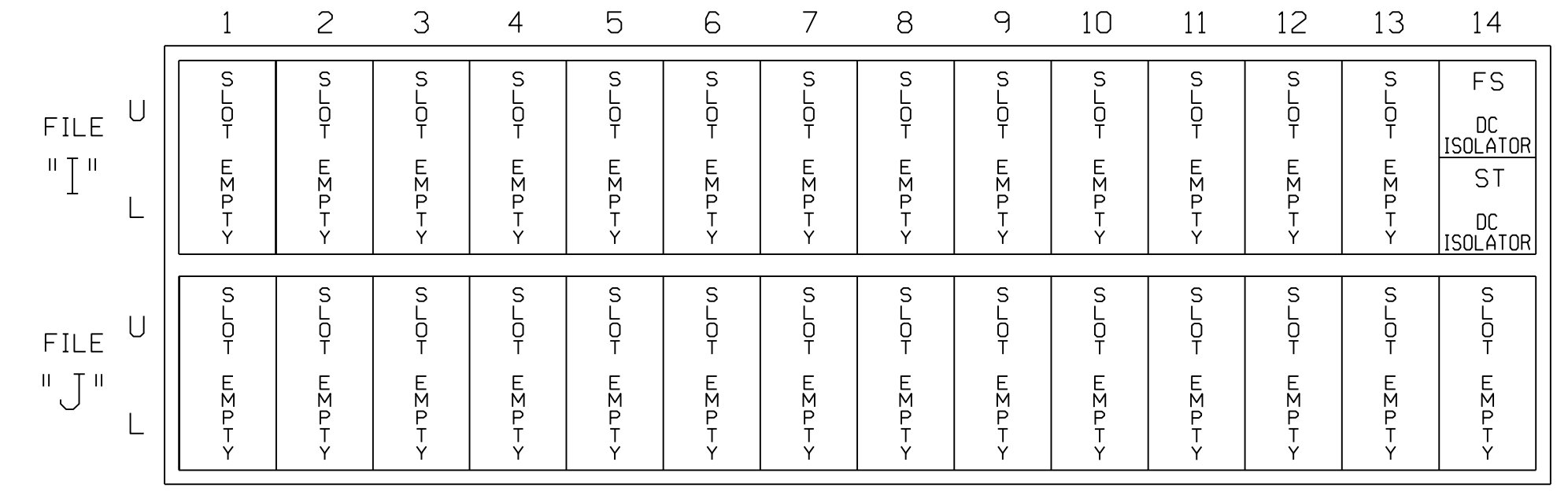
SIGNAL HEAD HOOK-UP CHART

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.	NU	21,22	NU	NU	41,42	NU	51,52	61,62,63	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW								131				
YELLOW ARROW								132				
GREEN ARROW								133				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video 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.

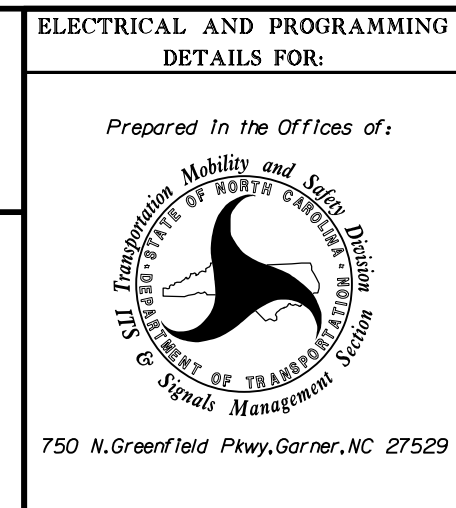
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0323T1  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

Temporary Design 1 - TMP Phase I  
Electrical Detail

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ELECTRICAL AND PROGRAMMING DETAILS FOR:  
 US 401 Business (Raeford Road) at SR 1007 (All American Freeway) Northbound Ramps  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: G B Spell REVIEWED BY:  
 REVISIONS INIT. DATE

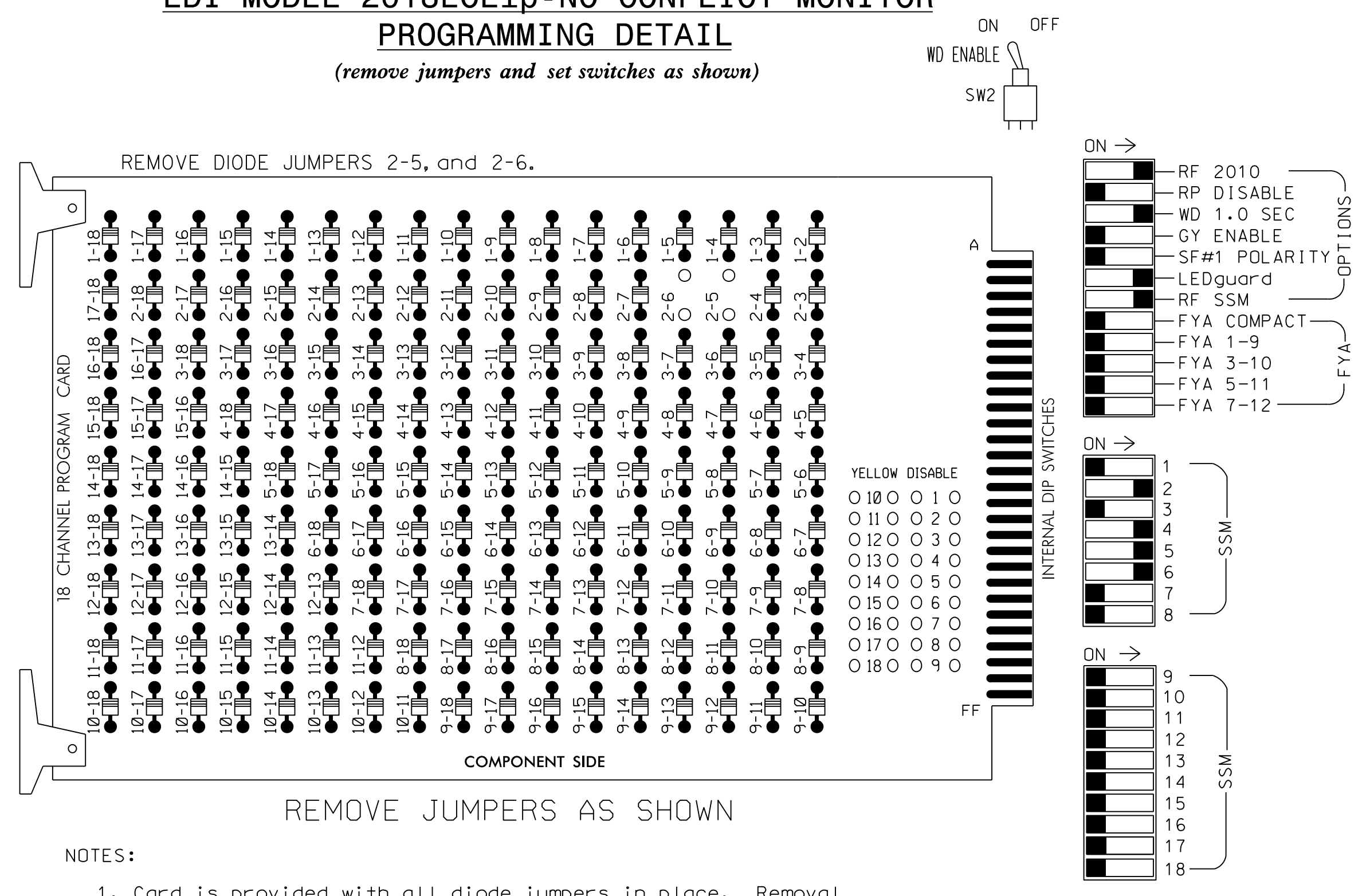
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0323T1





### 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.

### NOTES

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

### EQUIPMENT INFORMATION

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

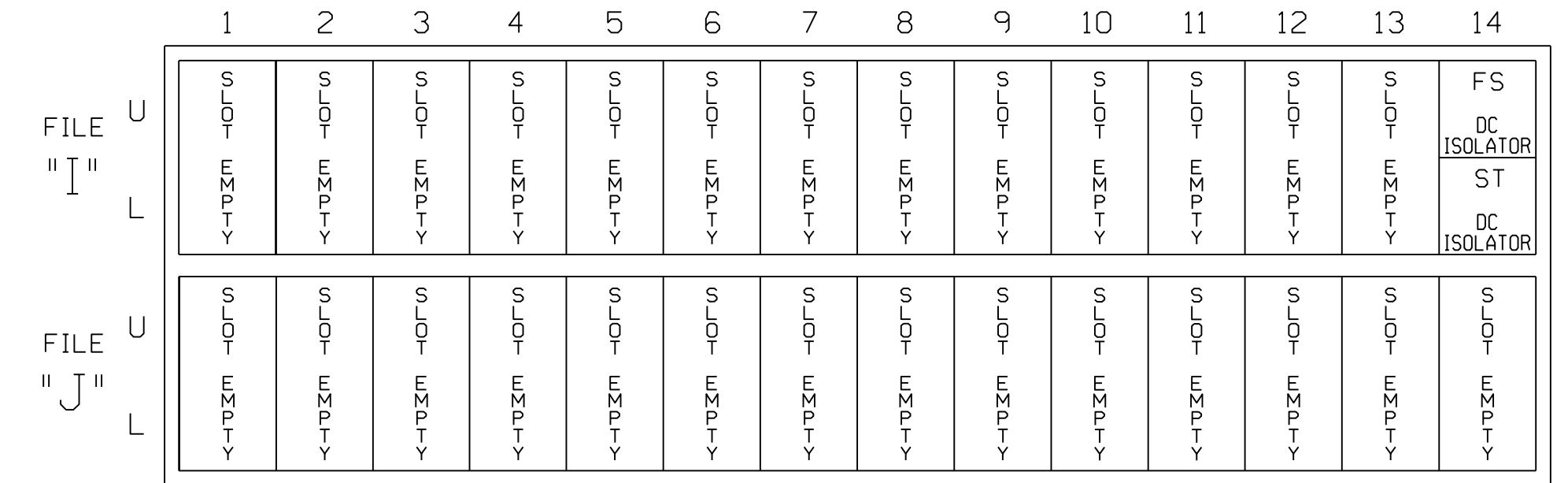
### SIGNAL HEAD HOOK-UP CHART

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.	NU	21,22	NU	NU	41,42	NU	51,52	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW								131				
YELLOW ARROW								132				
GREEN ARROW								133				

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



### SPECIAL DETECTOR NOTE

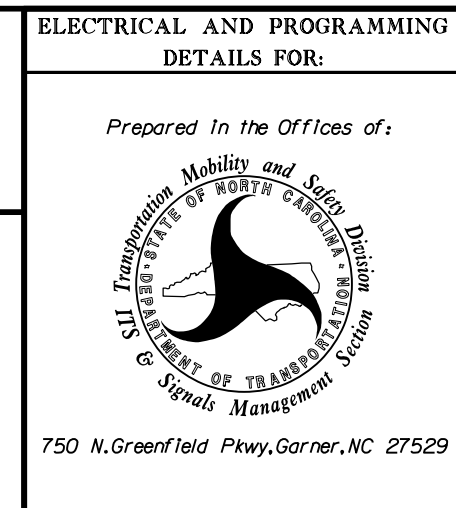
Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0323T2  
 DESIGNED: March 2018  
 SEALED: 03-29-2018  
 REVISED: N/A

### Temporary Design 2 - TMP Phase II Electrical Detail



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ELECTRICAL AND PROGRAMMING DETAILS FOR:  
 US 401 Business (Raeford Road) at SR 1007 (All American Freeway) Northbound Ramps  
 Division 6 Cumberland County Fayetteville  
 PLAN DATE: March 2018 REVIEWED BY: L Overn  
 PREPARED BY: G B Spell REVIEWED BY:  
 REVISIONS INIT. DATE

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LAWRENCE E. OVERN  
 3/29/2018  
 DATE  
 SIG. INVENTORY NO. 06-0323T2

