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## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

OVERLAP A

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

```

TMG VEH OVLP...[A] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 1
OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
        
```

Toggle Twice

OVERLAP C

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

```

TMG VEH OVLP...[C] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 5
OPPOSING THROUGH..... PHASE 6

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

END PROGRAMMING


THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-2070  
 DESIGNED: March 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Details - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

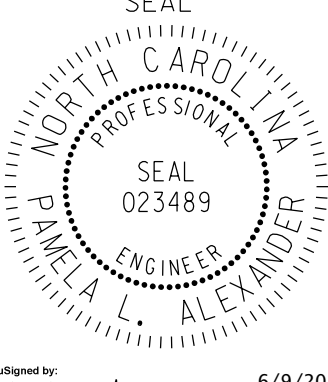
ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

SR 1226 (University Drive) at SR 1300 (Rural Retreat Road)	
Division 7	Alamance County Burlington
PLAN DATE: March 2018	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE



Sealed by  
**Pamela Alexander** 6/9/2018  
DATE

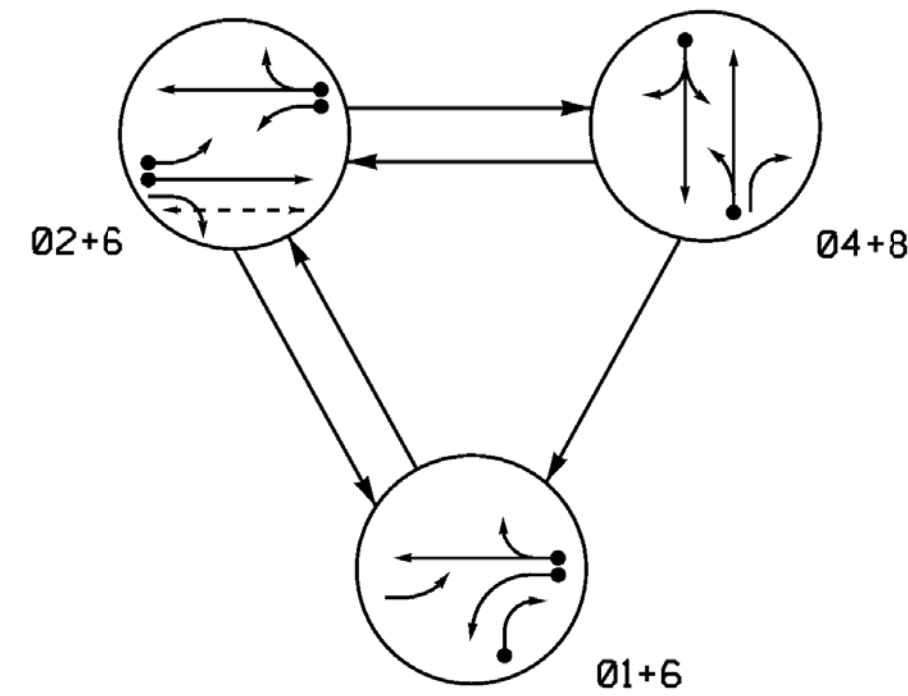
SIG. INVENTORY NO. 07-2070

ATKINS

1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEEES #F-0326

09-JUN-2018 14:15  
 D:\Consolidation\Facilities\00056469 U-6015 B-G S19 SysTask 05\_11\_Signal\Des\gn\07-2070E.dgn  
 ALEX3361 AT LUS210649

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	01+6	02+6	04+8	FLASH
11	-	F	R	-
21, 22	R	G	R	Y
23	F	F	R	-
41, 42	R	R	G	R
61, 62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R
P21, P22	DW	W	DW	DRK

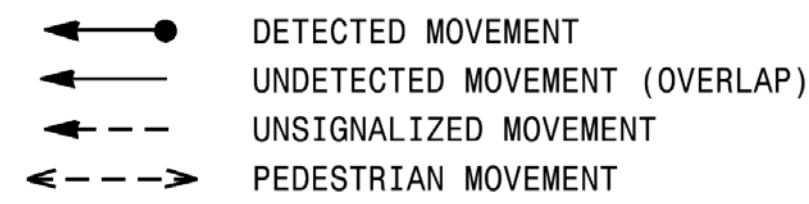
ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6x40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	S	-	X
1B	6x40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6x6	70	EXIST.	-	2	Yes	-	-	-	S	-	X
2B	6x40	0	2-4-2	-	2	Yes	-	-	-	S	-	X
4A	6x40	0	2-4-2	-	4	Yes	-	5	-	S	-	X
6A	6x6	70	EXIST.	-	6	Yes	-	-	-	S	-	X
8A	6x40	0	2-4-2	-	8	Yes	-	3	-	S	-	X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

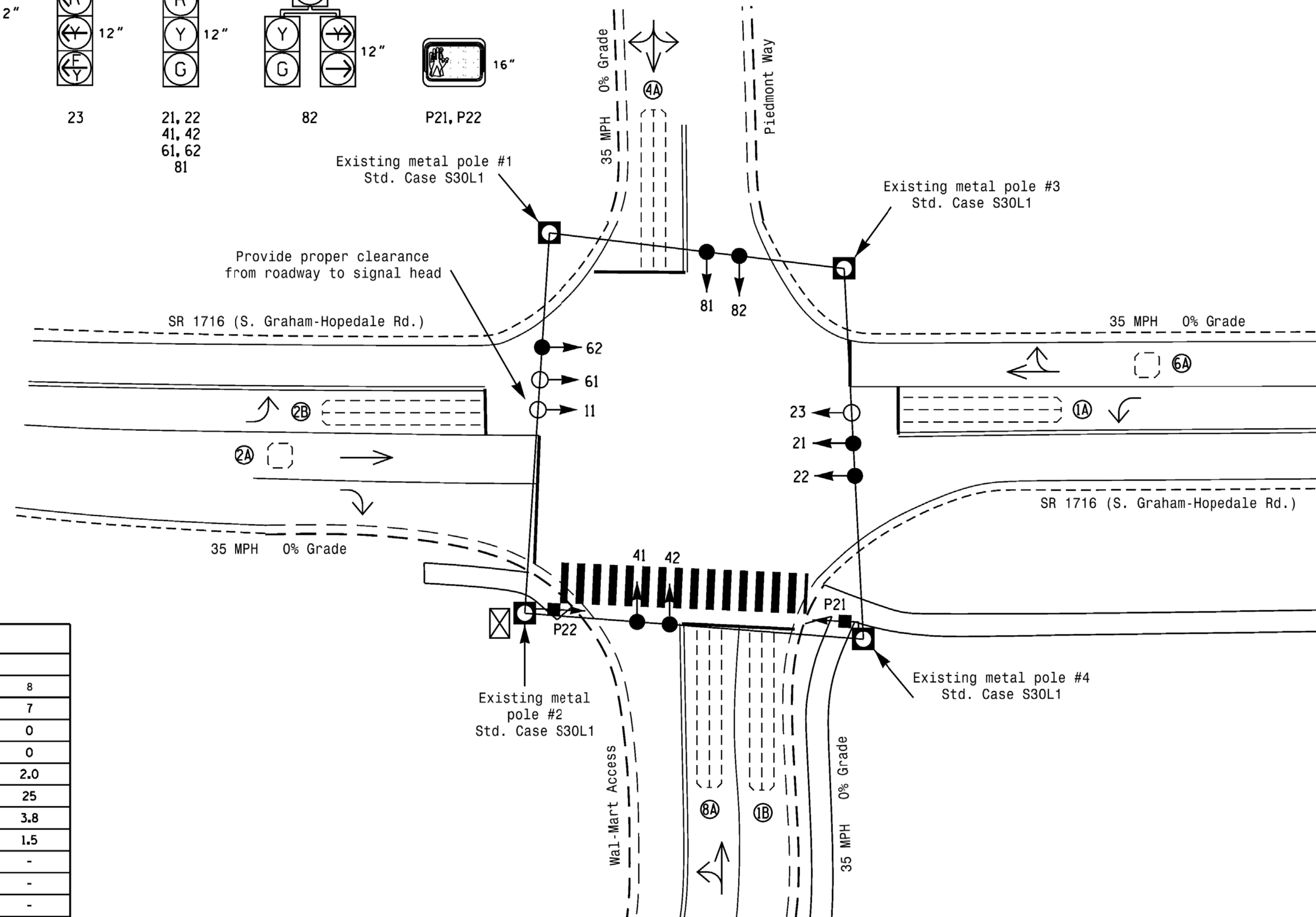
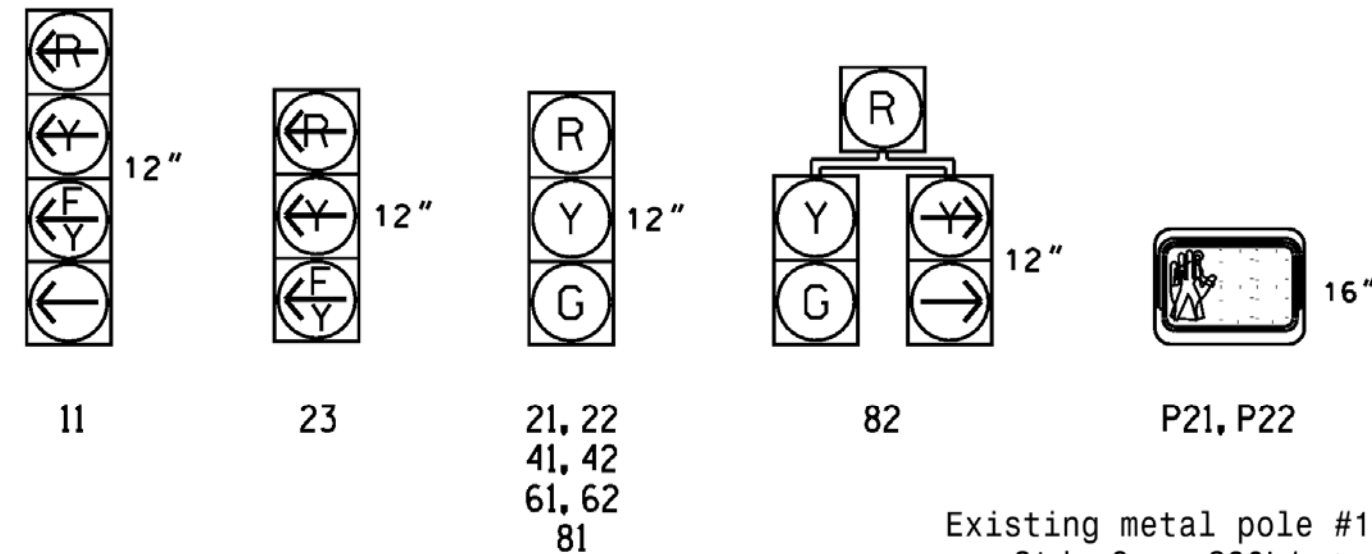
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal heads numbered 21, 22, and 62.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

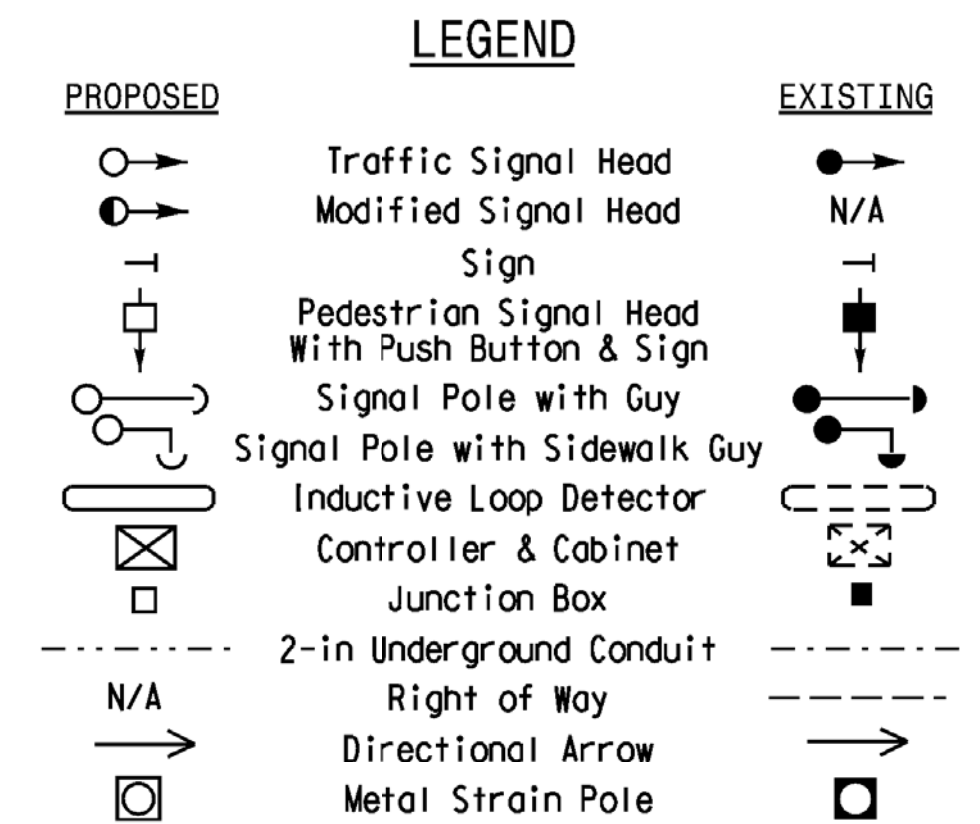
All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	10	7	10	7
Walk *	0	4	0	0	0
Ped Clear	0	15	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0	2.0
Max 1 *	15	45	25	45	25
Yellow	3.0	3.8	3.8	3.8	3.8
Red Clear	2.4	1.6	1.5	1.6	1.5
Actuations B4 Add *	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	X	-
Recall Position	-	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	X	-	X
Simultaneous Gap	X	X	X	X	X

\* 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.



\*\*\*\*\*SYTIME\*\*\*\*\*  
\*\*\*\*\*BUSRNAME\*\*\*\*\*



12 BROAD STREET  
ASHEVILLE, NORTH CAROLINA 28801  
(828) 254-2201  
FAX (828) 254-4562  
NC LIC. NO. C-1154

Signal Upgrade

Prepared for the Offices of:  
TRANSPORTATION MOBILITY AND SAFETY DIVISION  
DEPARTMENT OF TRANSPORTATION  
Signal Design Section  
750 N. Greenfield Pkwy, Garner, NC 27529  
SCALE 1"=20'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SR 1716 (S. Graham-Hopedale Rd.) at Piedmont Way

Division 7 Alamance County Burlington

PLAN DATE: September 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Wilson REVIEWED BY:

REVISIONS

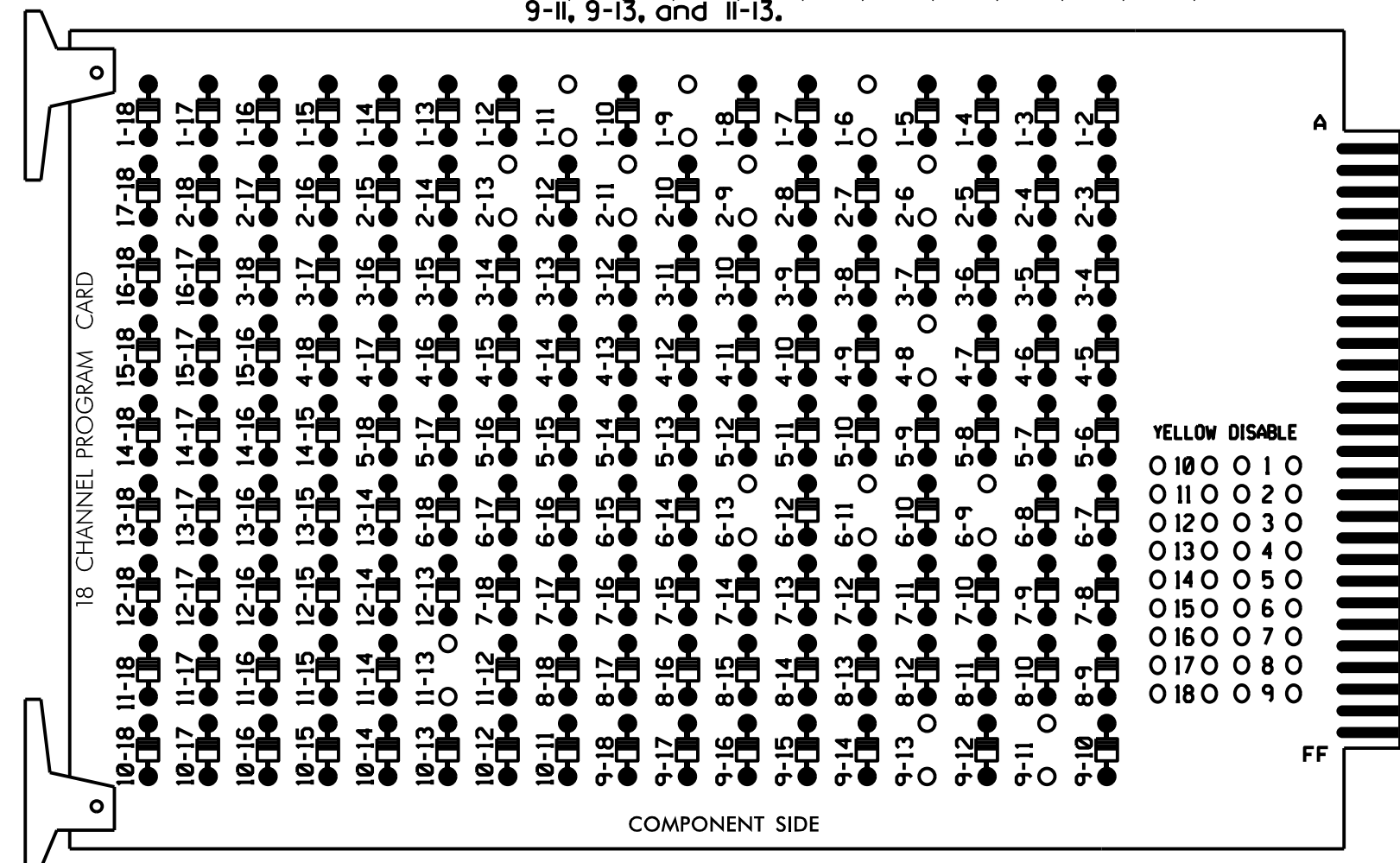
INIT. DATE

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
JAMES B. VOSO  
6/13/2018  
SIG. INVENTORY NO. 07-2073

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

(remove jumpers and set switches as shown)

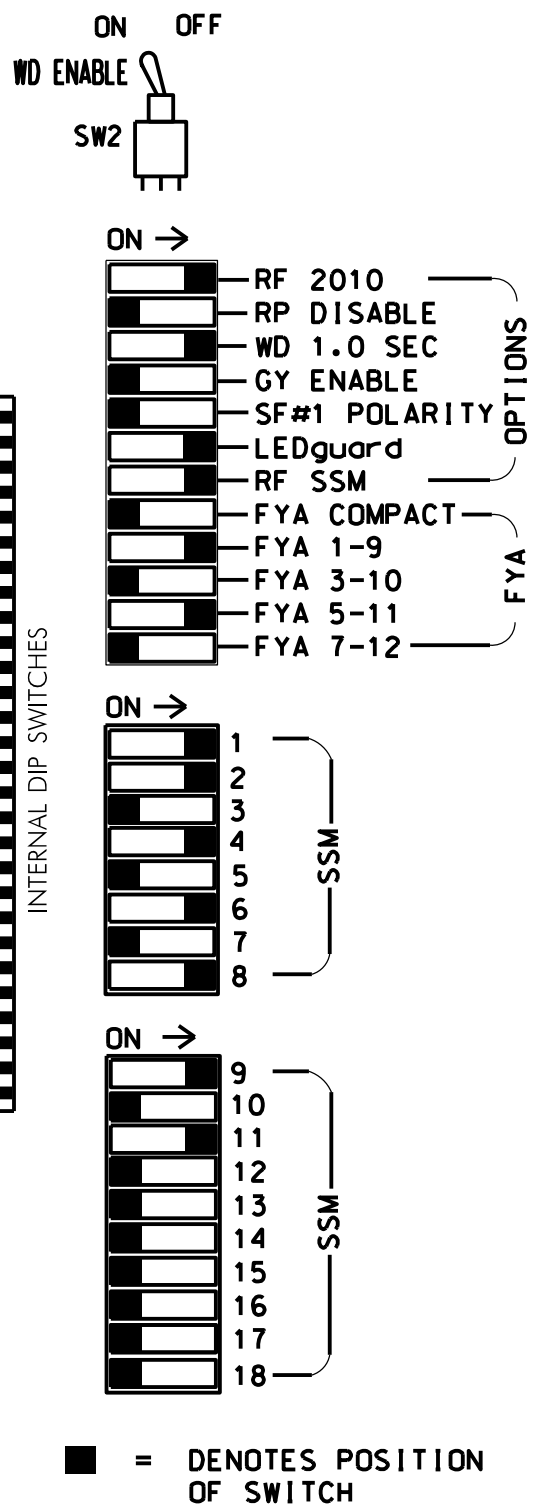
REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-6, 2-9, 2-11, 2-13, 4-8, 6-9, 6-11, 6-13, 9-11, 9-13, and 11-13.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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



**NOTES**

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

**EQUIPMENT INFORMATION**

CONTROLLER.....2070LX  
 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,S8,S11,AUX S1,AUX S4  
 PHASES USED.....1,2,2PED,4,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED

\* See overlap programming detail on sheet 2

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	21,22	P21, P22	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	11	NU	NU	23	NU	
RED	*	128			101				134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW													A121				A114		
YELLOW ARROW		126											A122				A115		
FLASHING YELLOW ARROW													A123				A116		
GREEN ARROW	127	127																	
Hand																		113	
Person																			115

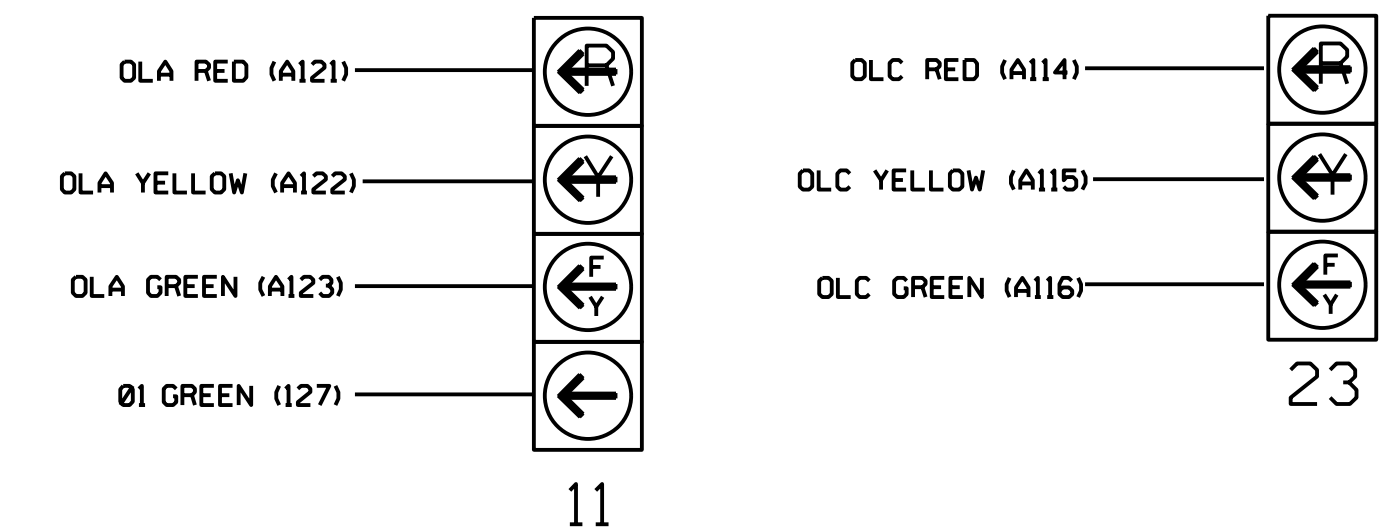
NU = Not Used

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

★ See pictorial of head wiring in detail below.

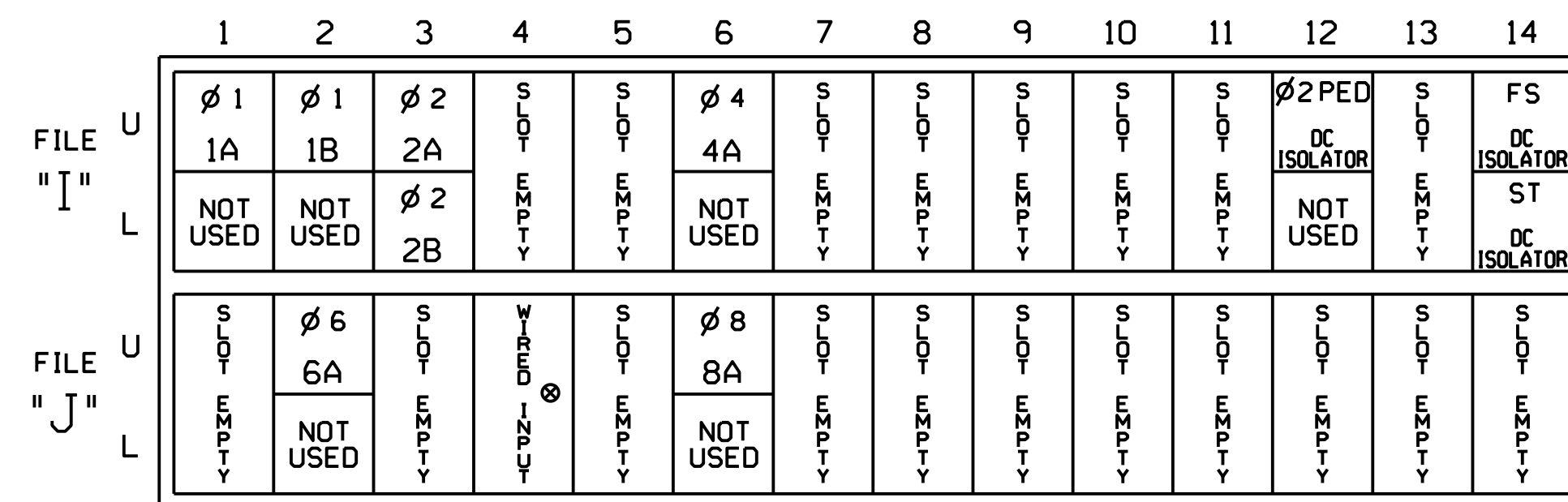
**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

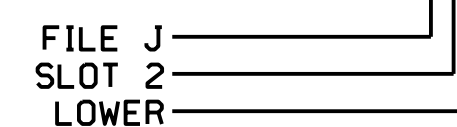
**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES		3		S
1B	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES				S
2B	TB2-11,12	I3L	76	42	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		5		S
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 112.

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

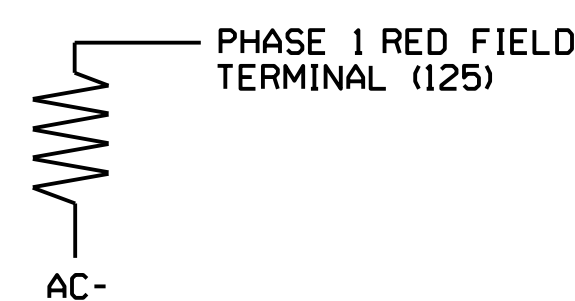
INPUT FILE POSITION LEGEND: J2L



**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)

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



**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2073  
 DESIGNED: September 2017  
 SEALED: 6/13/2018  
 REVISED: NA

Electrical Detail - Sheet 1 of 2

**Mattern & Craig**  
 ENGINEERS • SURVEYORS

12 BROAD STREET  
 ASHEVILLE, NORTH CAROLINA 28801  
 (828) 254-2201  
 FAX (828) 254-4562  
 NC LIC. NO. C-1154

Electrical and Programming Details For: SR 1716 (S.Graham-Hopedale Rd.) at Piedmont Way

Division 7 Alamance County Burlington

PLAN DATE: September 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Wilson REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Corner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 JAMES B. VOSO  
 022599

6/13/2018

SIG. INVENTORY NO. 07-2073

# ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

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

Toggle Twice

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

```
TMG VEH OVLP...[C] TYPE: OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2073  
DESIGNED: September 2017  
SEALED: 6/13/2018  
REVISED: NA

\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$DOCS\$\$\$\$\$  
\$\$\$\$\$SERNAME\$\$\$\$\$

**Mattern & Craig**  
ENGINEERS • SURVEYORS  
12 BROAD STREET  
ASHEVILLE, NORTH CAROLINA 28801  
(828) 254-2201  
FAX (828) 254-4562  
NC LIC. NO. C-1154

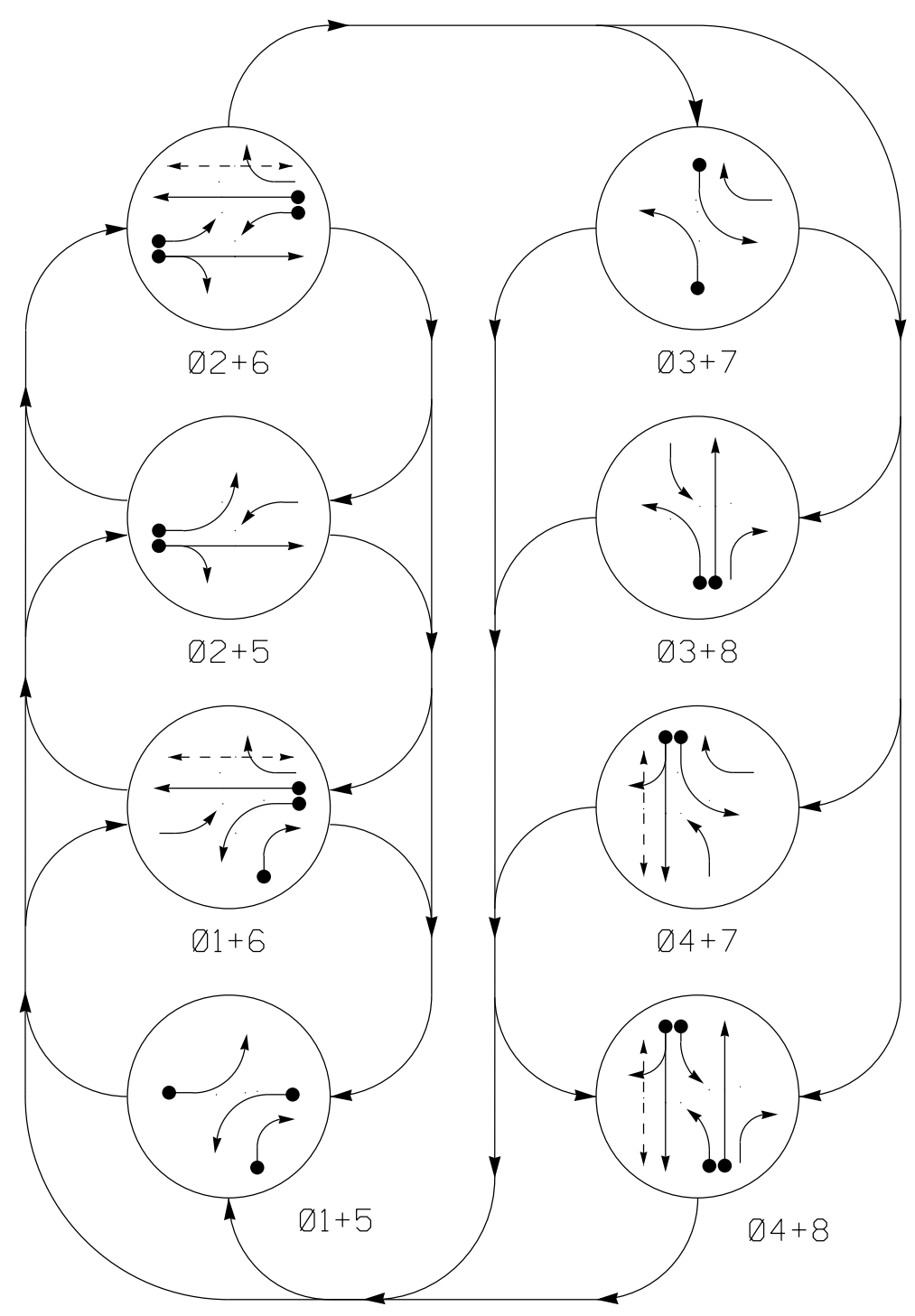
Electrical Detail - Sheet 2 of 2

	SR 1716 (S.Graham-Hopedale Rd.) at Piedmont Way
	Division 7 Alamance County Burlington
PLAN DATE: September 2017 PREPARED BY: SE Wilson	REVIEWED BY: JB Voso
REVISIONS	INIT. DATE

Document signed by: James Voso, 6/13/2018  
SIG. INVENTORY NO. 07-2073

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

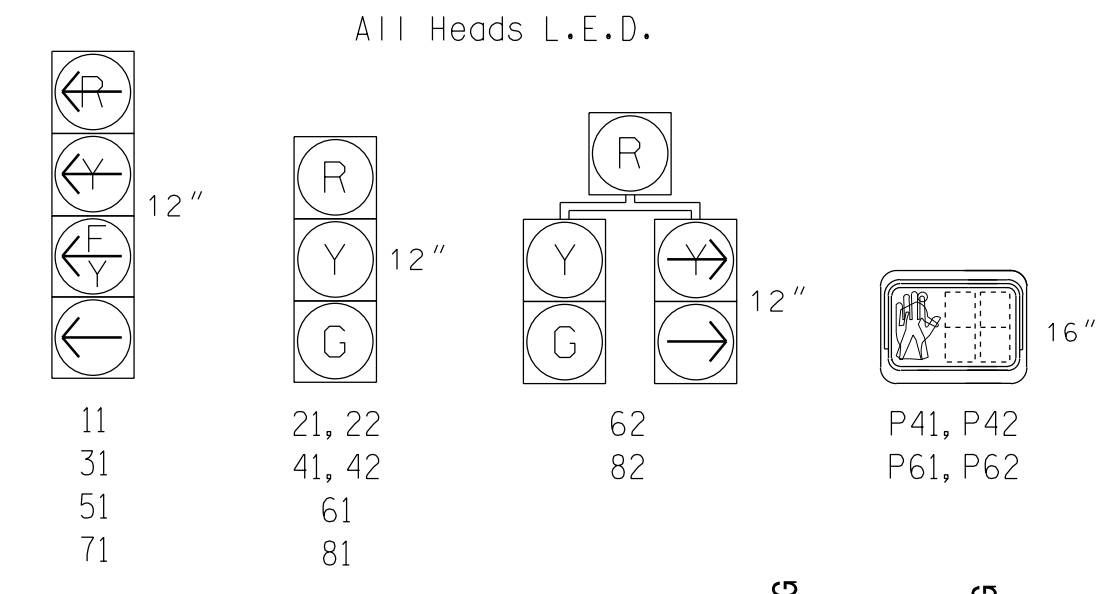
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41, 42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	R	G	G	R
P41, P42	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK	DRK

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

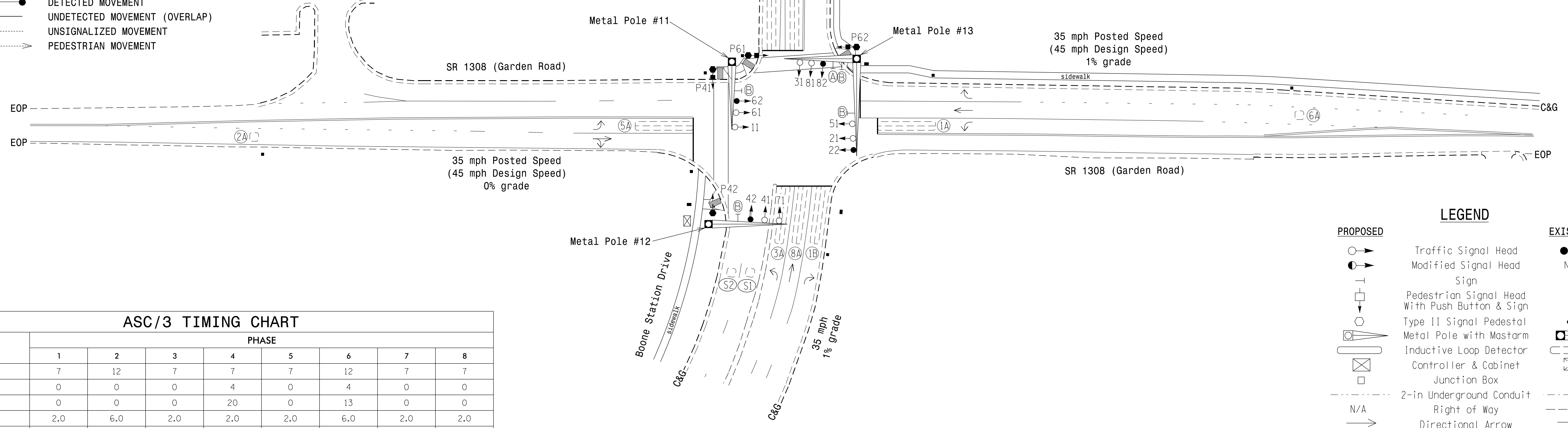
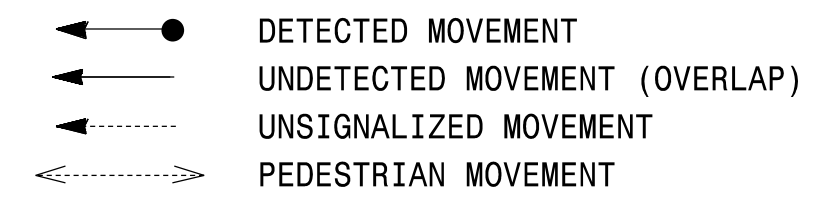
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6x40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
1B	6x40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6x6	300	EXIST	-	2	Yes	-	-	-	X	N	-
3A	6x40	0	2-4-2	-	3	Yes	-	15	-	S	-	X
					8	Yes	-	-	-	S	-	X
4A	6x40	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6x40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6x6	300	EXIST	-	6	Yes	-	-	-	X	N	-
7A	6x40	0	2-4-2	-	7	Yes	-	15	-	S	-	X
					4	Yes	-	3	-	S	-	X
8A	6x40	0	2-4-2	-	8	Yes	-	-	-	S	-	X
S1	6x6	+150	EXIST	-	-	No	-	-	-	N	X	X
S2	6x6	+150	EXIST	-	-	No	-	-	-	N	X	X

**8 Phase Fully Actuated (Burlington-Graham 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. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 22 and 42.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system supersede these values.

**PHASING DIAGRAM DETECTION LEGEND**

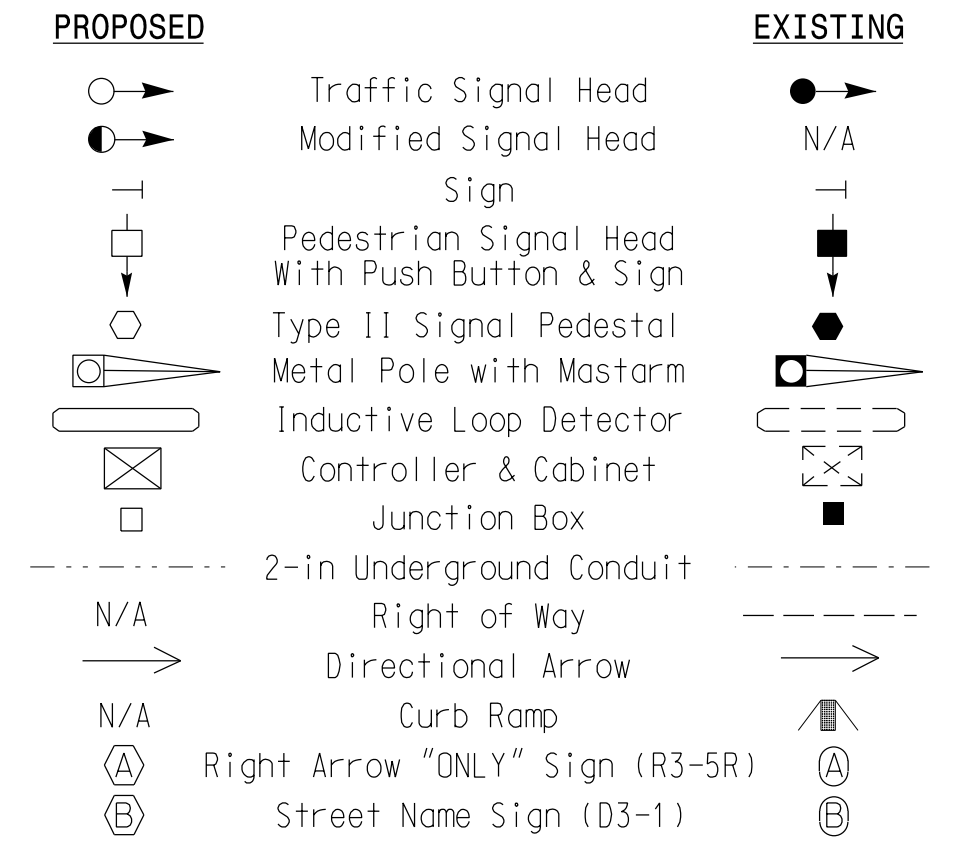


**ASC/3 TIMING CHART**

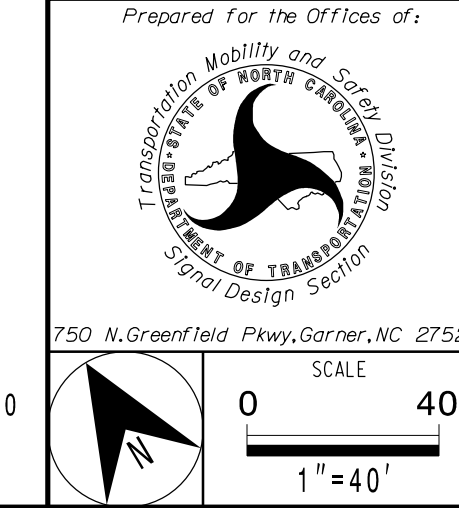
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	0	0	0	4	0	4	0	0
Ped Clear	0	0	0	20	0	13	0	0
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	40	20	90	20	40
Yellow	3.0	4.5	3.0	4.1	3.0	4.5	3.0	4.1
Red Clear	2.8	1.6	2.4	1.7	3.1	1.6	2.3	1.7
Actuations B4 Add *	-	0	-	-	-	0	-	-
Seconds /Actuation *	-	2.5	-	-	-	2.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X	X	X

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

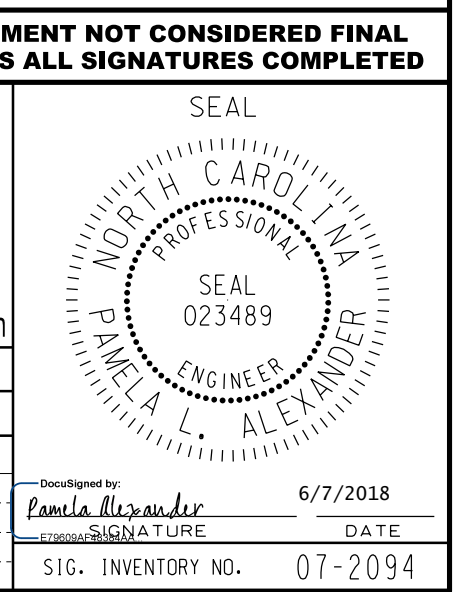
**LEGEND**



**Signal Upgrade**

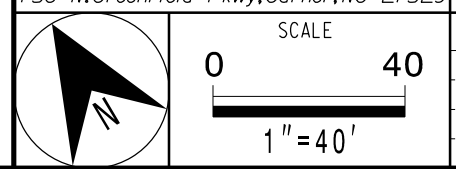


<b>SR 1308 (Garden Road) at Boone Station Drive</b>		
Division 7	Alamance County	Burlington
PLAN DATE: March 2018	REVIEWED BY: PL Alexander	
PREPARED BY: AM Encarnacion	REVIEWED BY:	
REVISIONS	INIT.	DATE



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

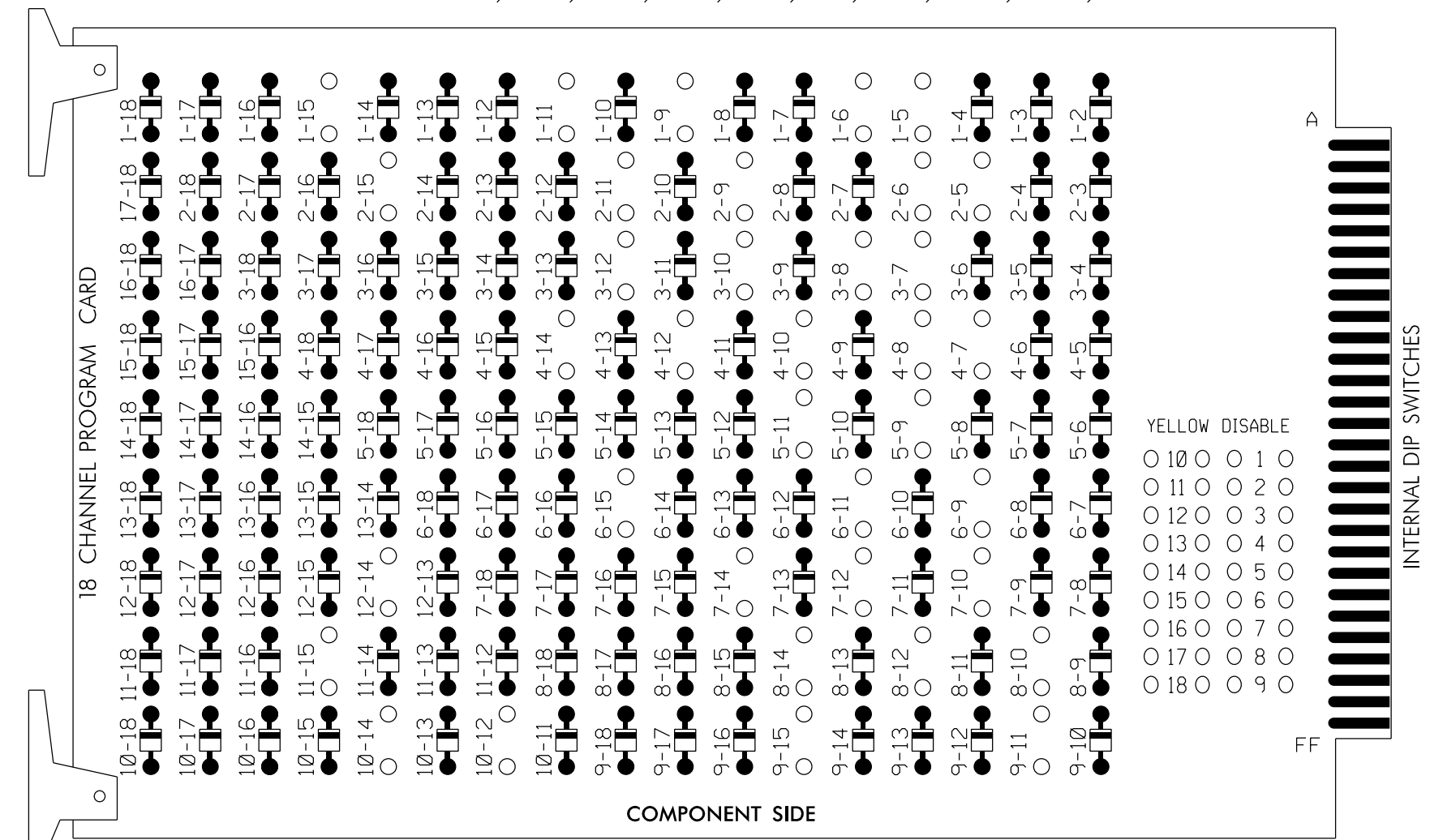
**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326



07-JUN-2018 11:15 D:\Projects\atkins\Traffic\00056469 U-6015 B-G S19 SysteTask 05\_11\_Signal\Des\gpm07-2014.dgn ALEX3361 AT LUS510649

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

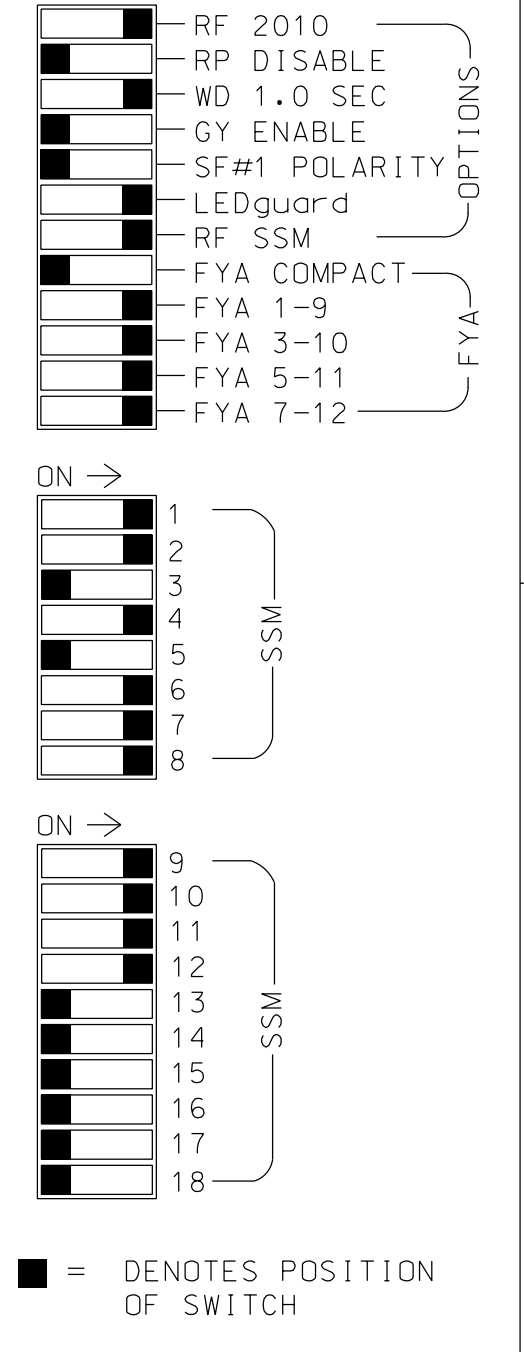
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-15, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 4-14, 5-9, 5-11, 6-9, 6-11, 6-15, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 9-11, 9-15, 10-12, 10-14, 11-15 and 12-14.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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



### NOTES

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

### EQUIPMENT INFORMATION

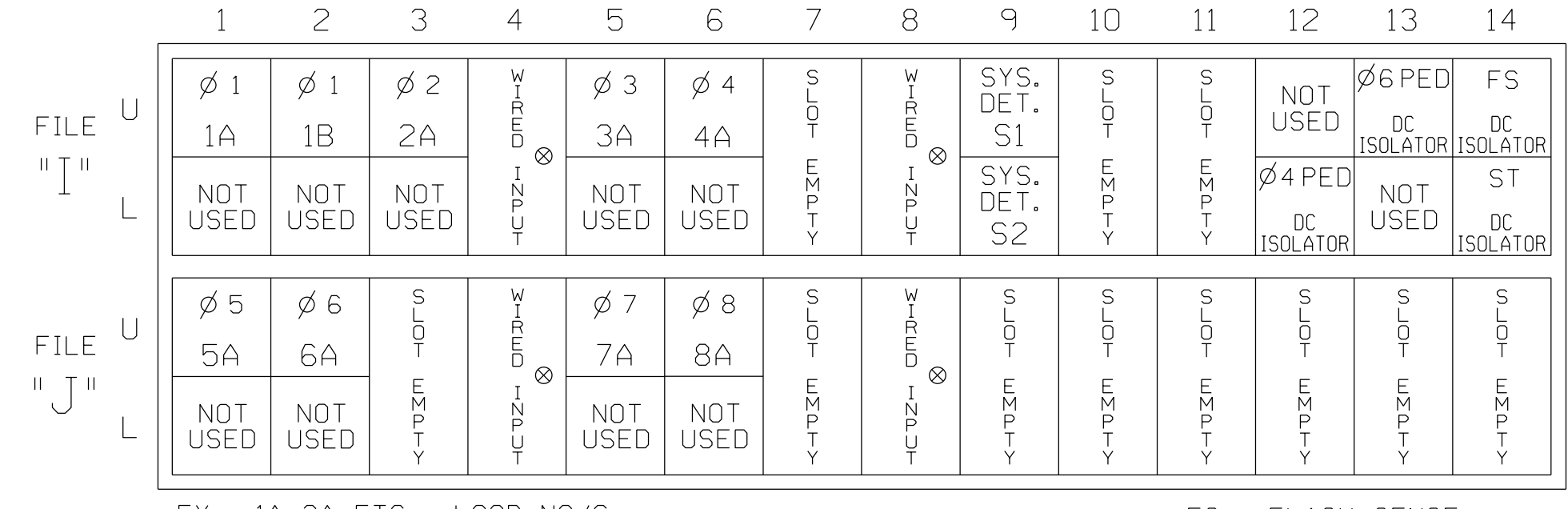
CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S7,S8,S9,S10,S11,  
 AUX S1,AUX S2,AUX S4,AUX S5  
 PHASES USED.....1,2,3,4,4PED,5,6,6PED,7,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*  
 \* See overlap programming detail on sheet 2

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

### 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

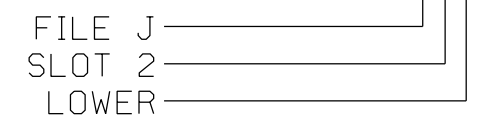
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
1B	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES			X	N
	TB4-5,6	I5U	58	3	3	YES		15		S
3A <sup>2</sup>	-	J8U	50	28	8	YES				S
	4A	TB4-9,10	I6U	41	4	4	YES	10		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A <sup>3</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
7A <sup>4</sup>	TB5-5,6	J5U	57	7	7	YES		15		S
	-	I8U	49	24	4	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES				S

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

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

- <sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.
- <sup>2</sup>Add jumper from I5-W to J8-W, on rear of input file.
- <sup>3</sup>Add jumper from J1-W to I4-W, on rear of input file.
- <sup>4</sup>Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	21,22	NU	31	41,42	P41, P42	51	61,62	P61, P62	62	71	81,82	NU	11	31	NU	51	71
RED	*	128			101			134		* 107									
YELLOW		129		*	102		*	135			108								
GREEN			130		103			136			109								
RED ARROW													A121	A124		A114	A101		
YELLOW ARROW		126								123			A122	A125		A115	A102		
FLASHING YELLOW ARROW													A123	A126		A116	A103		
GREEN ARROW	127	127			118			133		124	124								
Hand							104				119								
Walker							106			121									

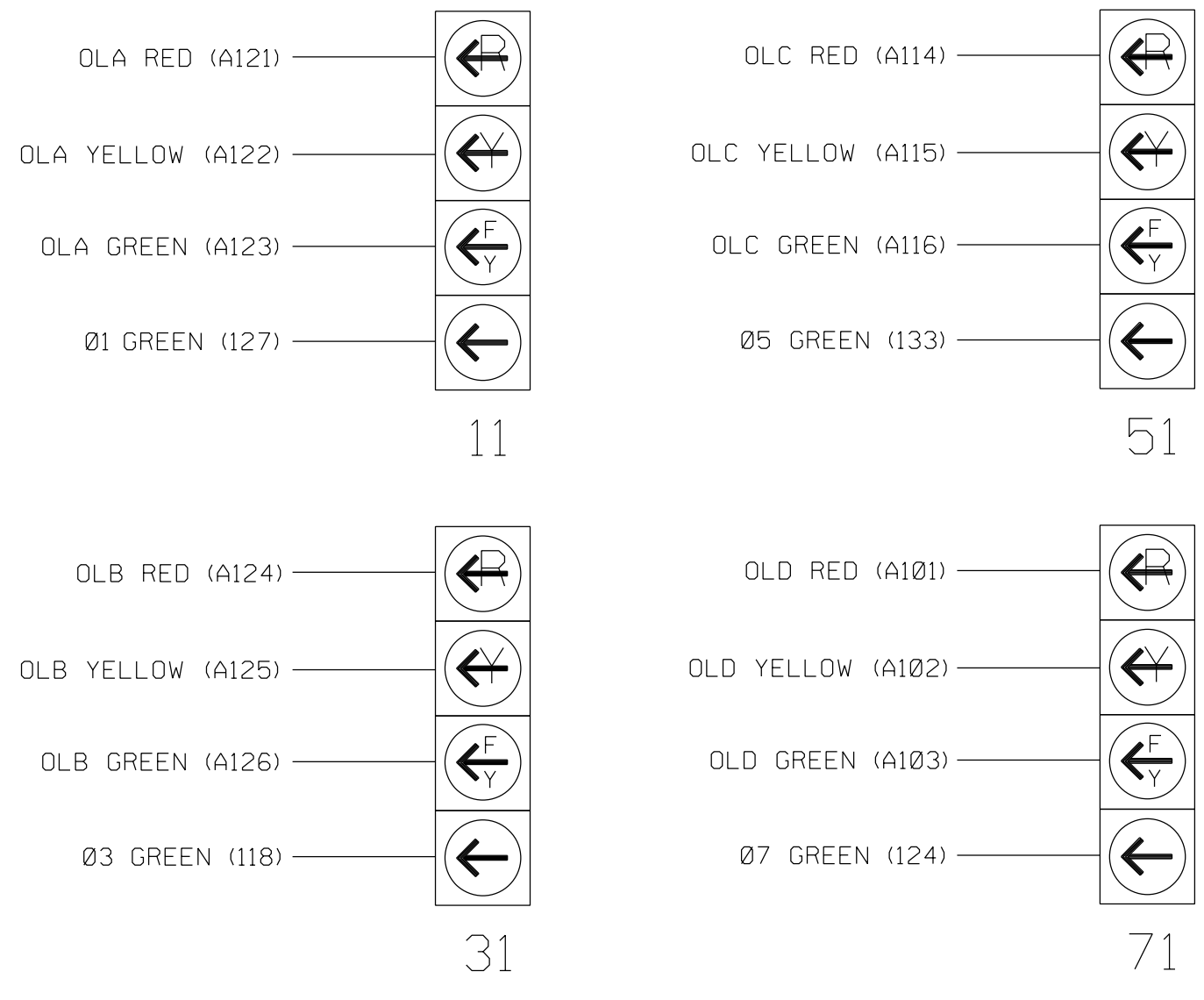
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

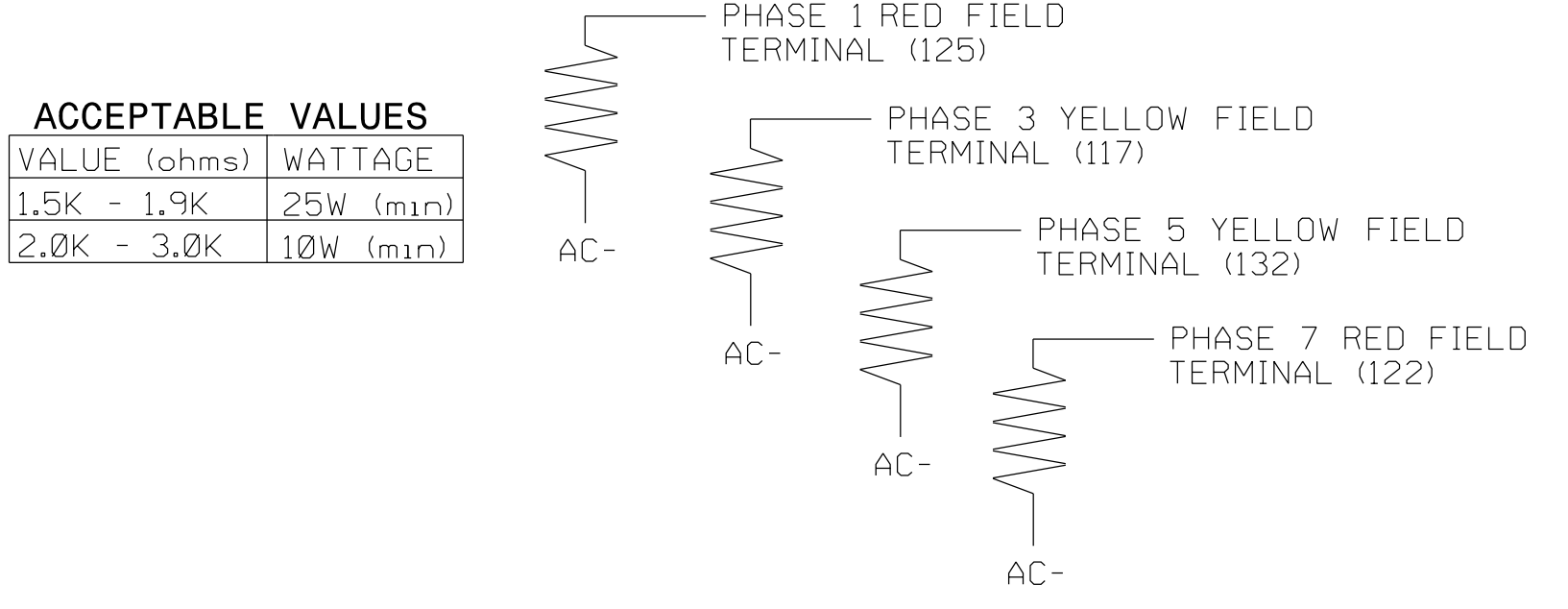
### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:

**SR 1308 (Garden Road) at Boone Station Drive**

Division 7 Alamance County Burlington

Plan Date: March 2018 REVIEWED BY: PL Alexander

PREPARED BY: AM Encarnacion REVIEWED BY:

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy, Garner, NC 27529

Checked by: Pamela Alexander DATE: 6/9/2018

Signature: Pamela Alexander

SIG. INVENTORY NO. 07-2094

09-JUN-2018 14:16 D:\Transpor\atlat\work\Project\Cur\00056469 U-6015 B-G S1g SysTask 05-11\_Signal\Design\Draw\ing\07-2094E.dgn ALEX3361 AT LUS210649

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

TMG VEH OVLP... [A] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 1
OPPOSING THROUGH.....	PHASE 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE	
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE..... 0	

Toggle Once

OVERLAP B

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

TMG VEH OVLP... [B] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 3
OPPOSING THROUGH.....	PHASE 4
FLASHING ARROW OUTPUT.....CH10 ISOLATE	
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE..... 0	

Toggle Once

OVERLAP C

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

TMG VEH OVLP... [C] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 5
OPPOSING THROUGH.....	PHASE 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE	
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE..... 0	

Toggle Once

OVERLAP D

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

TMG VEH OVLP... [D] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 7
OPPOSING THROUGH.....	PHASE 8
FLASHING ARROW OUTPUT.....CH12 ISOLATE	
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE..... 0	

END PROGRAMMING

## FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-2094  
DESIGNED: March 2018  
SEALED: 6/7/2018  
REVISED: N/A

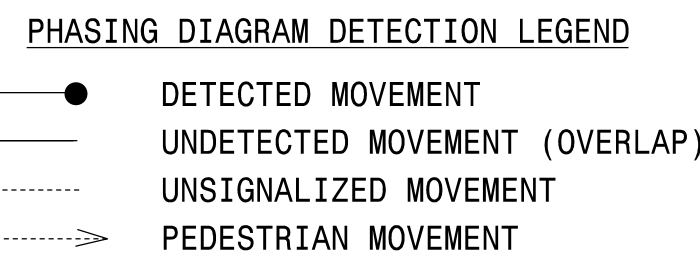
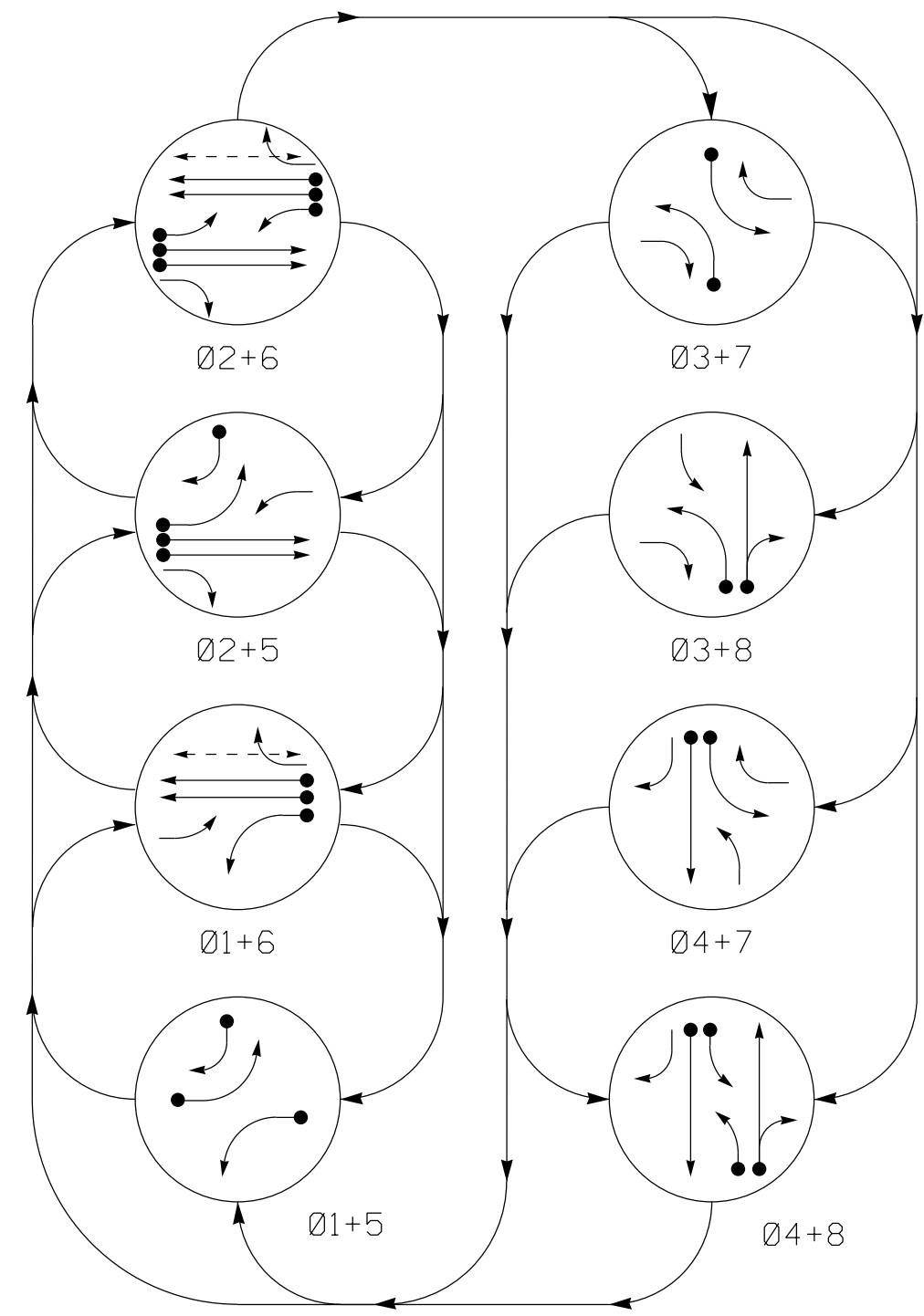
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>SR 1308 (Garden Road)</b> <b>at</b> <b>Boone Station Drive</b></p> <p style="font-size: x-small;">Division 7      Alamance County      Burlington</p> <p style="font-size: x-small;">PLAN DATE: March 2018      REVIEWED BY: PL Alexander</p> <p style="font-size: x-small;">PREPARED BY: AM Encarnacion      REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">6/9/2018</p> <p style="font-size: x-small;">Pamela Alexander</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-2094</p>
REVISIONS	INIT.	DATE									



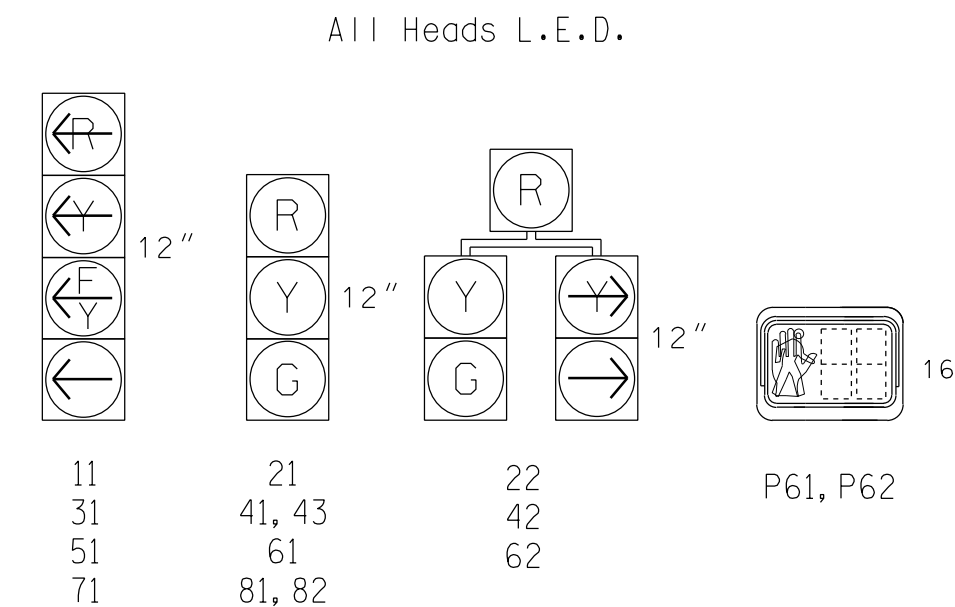
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8
11	←	←	→	→	→	→	→	→
21	R	R	G	G	R	R	R	R
22	R	R	G	G	R	R	R	R
31	←	←	→	→	→	→	→	→
41, 43	R	R	R	R	R	R	G	G
42	←	←	→	→	→	→	R	R
51	←	←	→	→	→	→	→	→
61	R	G	R	G	R	R	R	R
62	R	G	R	G	R	R	R	R
71	←	←	→	→	→	→	→	→
81, 82	R	R	R	R	R	G	R	R
P61, P62	DW	W	DW	W	DW	W	DW	W

**SIGNAL FACE I.D.**

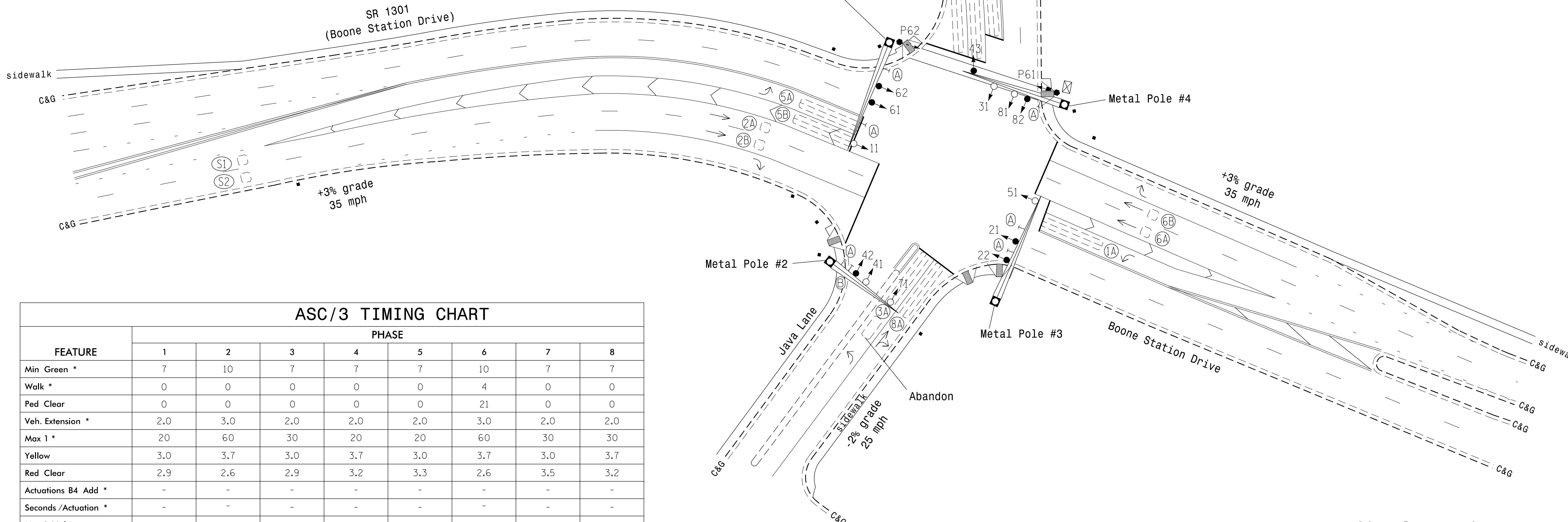


**ASC/3 DETECTOR INSTALLATION CHART**

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	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	-	-	S	-	X
2A,2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	EXIST	-	3	Yes	-	15	-	S	-	X
					8	Yes	-	3	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
					5	Yes	-	15	-	S	-	X
5A	6X40	0	2-4-2	-	2	Yes	-	-	-	S	-	X
					5	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	-	-	S	-	X
					5	Yes	-	15	-	S	-	X
5C	6X40	0	2-4-2	-	5	Yes	-	-	-	S	-	X
6A,6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	15	-	S	-	X
					4	Yes	-	3	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X
					8	Yes	-	-	-	S	-	X
S1	6X6	400	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	400	EXIST	-	-	No	-	-	-	N	X	X

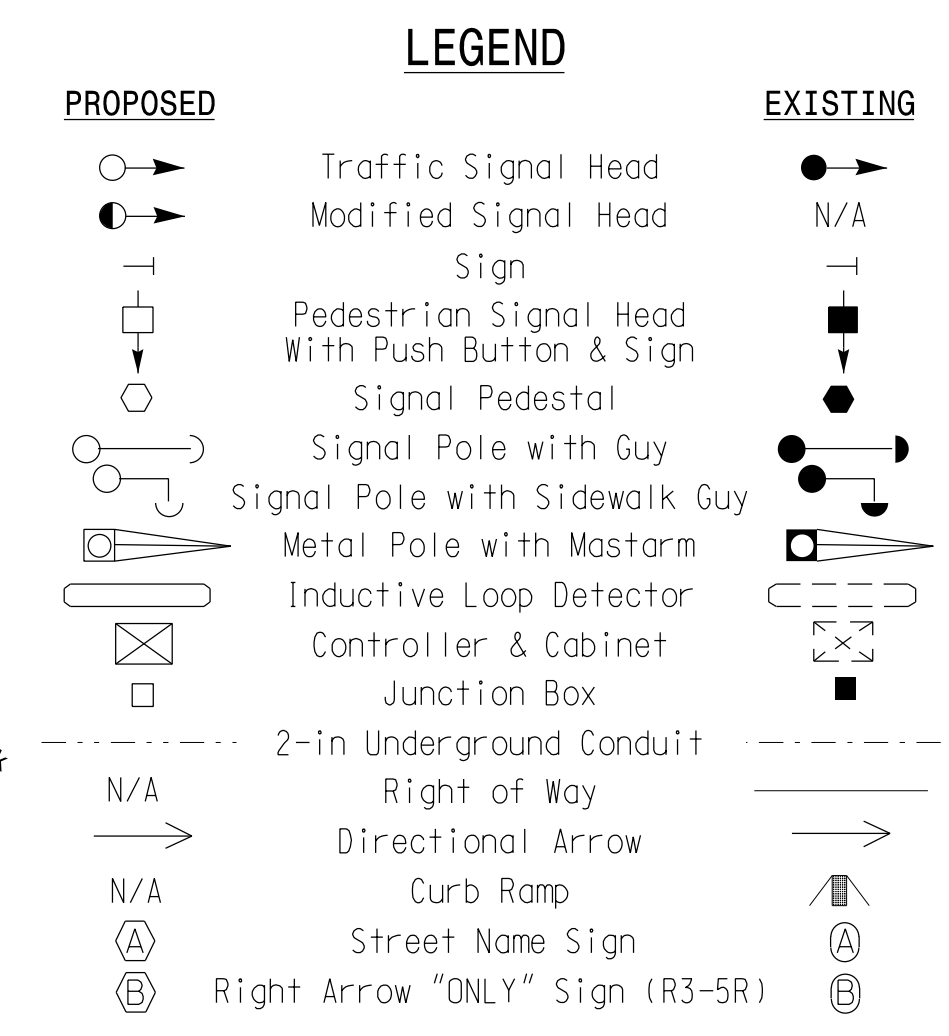
**8 Phase Fully Actuated (Burlington-Graham Signal System)**

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. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 42 and 82.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Remove existing Left Arrow "ONLY" Signs (R3-5L).
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	0	0	0	0	0	4	0	0
Ped Clear	0	0	0	0	0	21	0	0
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	20	60	30	20	20	60	30	30
Yellow	3.0	3.7	3.0	3.7	3.0	3.7	3.0	3.7
Red Clear	2.9	2.6	2.9	3.2	3.3	2.6	3.5	3.2
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X



07-JUN-2018 11:15 #W801K175-COMM-F01-CP-RW-MUSLAWLAW-CONSPORTATION-TRAFFIC-DESIGN-05-11-11-SIGNAL-DESIGN-2015.dgn ALE82301 AL L1534043

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

**Signal Upgrade**

Prepared for the Offices of:

**SR 1301 (Boone Station Drive) / Boone Station Drive at SR 1301 (St. Marks Church Road) / Java Lane**

SEAL  
NORTH CAROLINA  
PROFESSIONAL  
ENGINEER  
023489  
PAUL L. ALEXANDER

Division 7 Alamance County Burlington	
PLAN DATE: February 2018	REVIEWED BY: AM Encarnacion
PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander

REVISIONS	INIT.	DATE

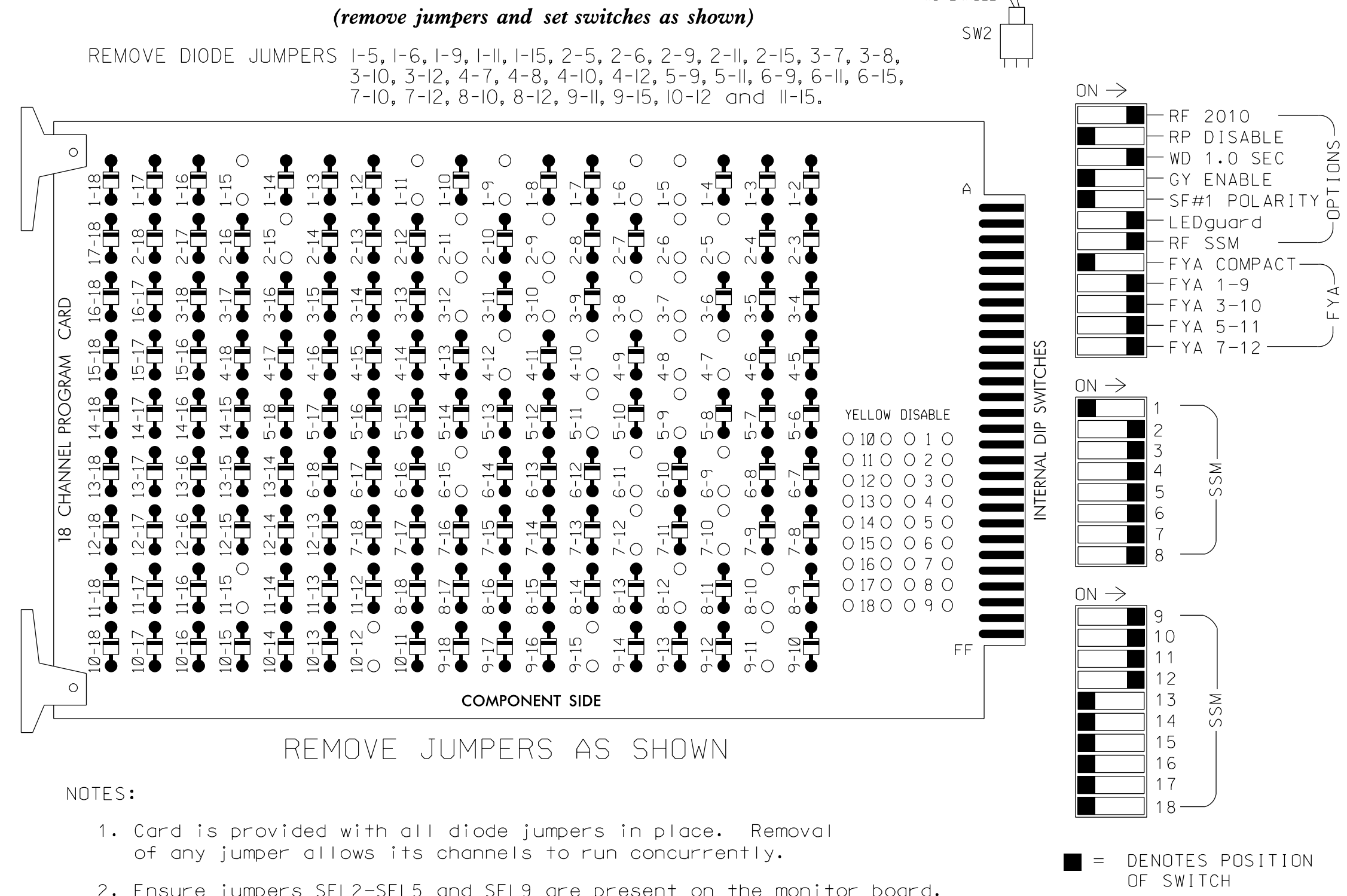
SCALE 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/7/2018  
DATE  
Signature  
DATE  
SIG. INVENTORY NO. 07-2095

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

(remove jumpers and set switches as shown)



- REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-15, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 6-15, 7-10, 7-12, 8-10, 8-12, 9-11, 9-15, 10-12 and 11-15.
- REMOVE JUMPERS AS SHOWN
- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
  - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
  - Ensure that Red Enable is active at all times during normal operation.
  - Integrate monitor with Ethernet network in cabinet.

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 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,S9,S10,S11,  
 AUX S1,AUX S2,AUX S4,AUX S5

PHASES USED.....1,2,3,4,5,6,6PED,7,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*

\* See overlap programming detail on sheet 2

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

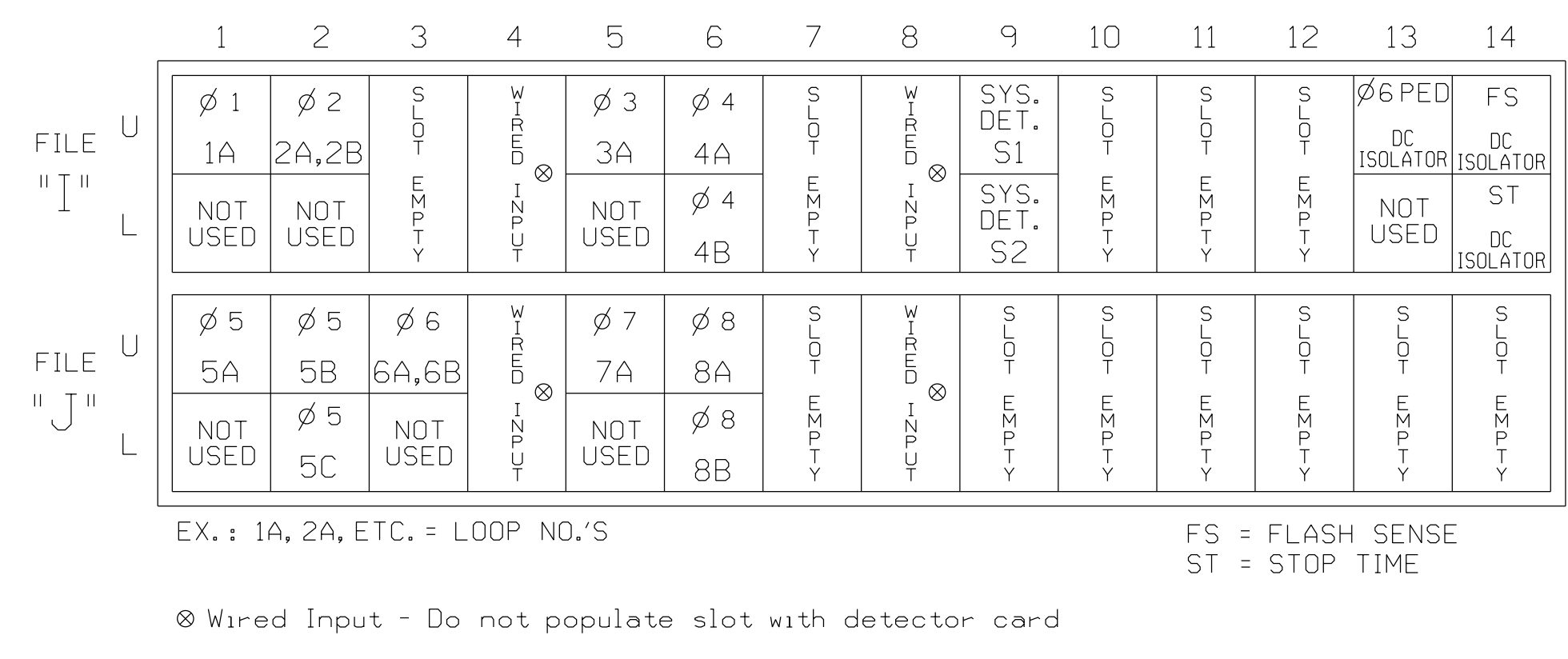
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6				
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18				
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE				
SIGNAL HEAD NO.	11	21,22	NU	22	31	41,42,43	NU	42	51	61,62	P61, P62	62	71	81,82	NU	11	31	NU	51	71	NU	
RED		128			*	101			*	134			*	107								
YELLOW	*	129				102				135				108								
GREEN		130				103				136				109								
RED ARROW																A121	A124		A114	A101		
YELLOW ARROW						117				132				123		A122	A125		A115	A102		
FLASHING YELLOW ARROW																A123	A126		A116	A103		
GREEN ARROW	127					118	118			133	133			124	124							
Hand													119									
Walking														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)



### INPUT FILE CONNECTION & PROGRAMMING CHART

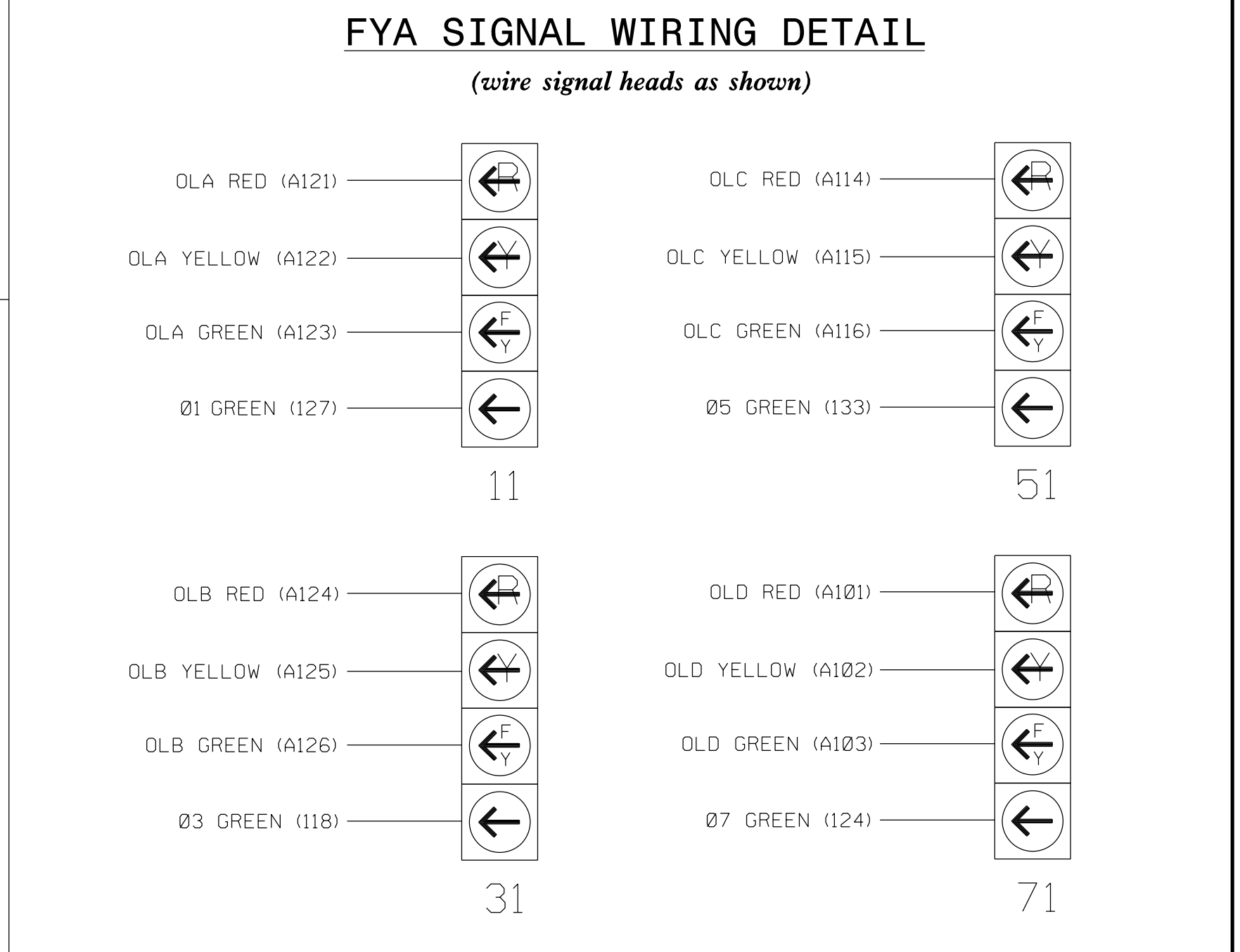
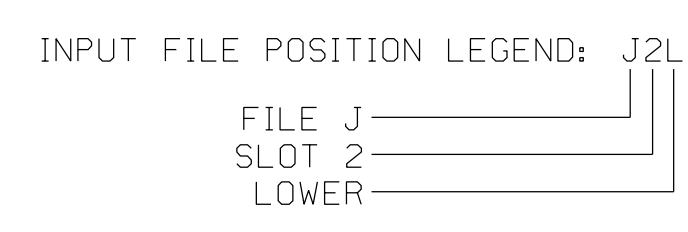
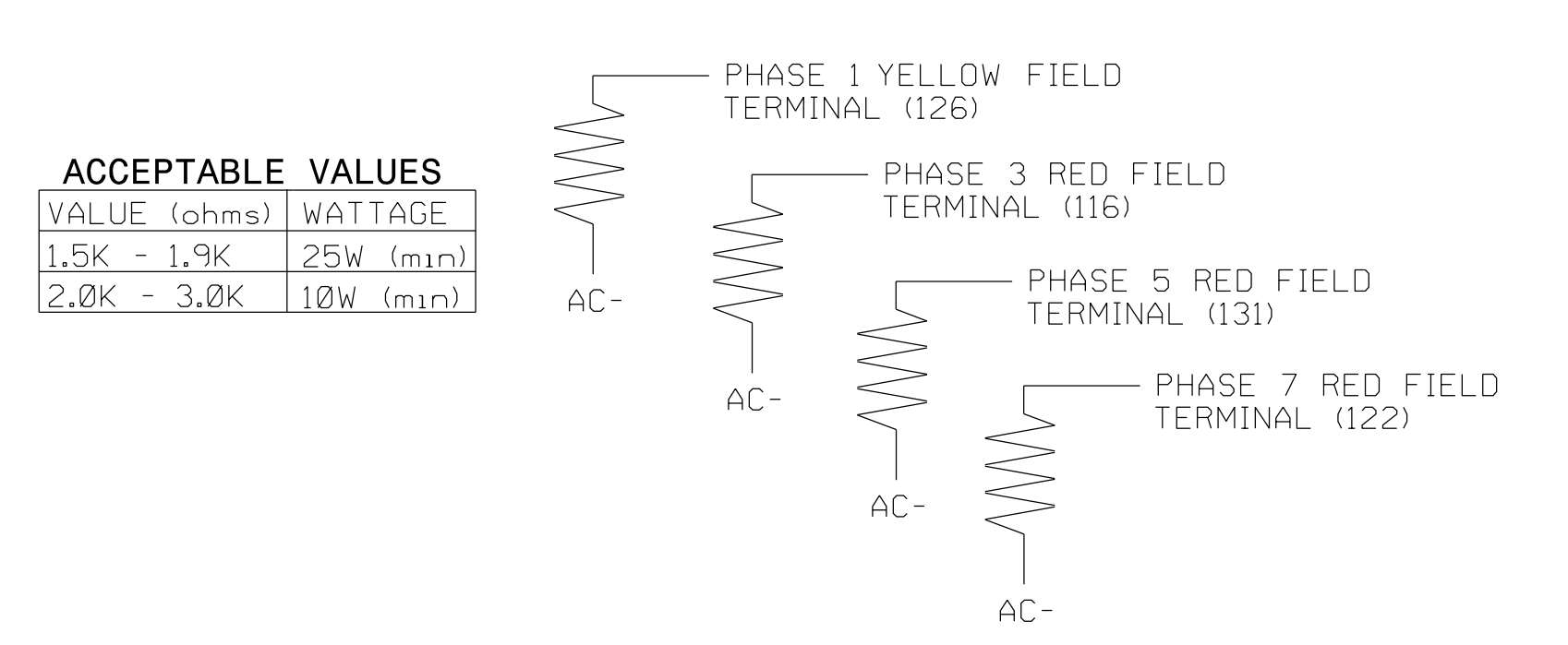
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES				S
2A,2B	TB2-5,6	I2U	39	2	2	YES				S
3A <sup>2</sup>	TB4-5,6	I5U	58	3	3	YES		15		S
	-	J8U	50	28	8	YES		3		S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
*S1	TB6-9,10	I9U	60	11	SYS	NO				N
*S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES				S
5B	TB3-5,6	J2U	40	6	5	YES				S
5C	TB3-7,8	J2L	44	16	5	YES		15		S
6A,6B	TB3-9,10	J3U	64	36	6	YES				S
7A <sup>4</sup>	TB5-5,6	J5U	57	7	7	YES		15		S
	-	I8U	49	24	4	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
PED PUSH BUTTONS										
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

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

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
<sup>2</sup>Add jumper from I5-W to J8-W, on rear of input file.  
<sup>3</sup>Add jumper from J1-W to I4-W, on rear of input file.  
<sup>4</sup>Add jumper from J5-W to I8-W, on rear of input file.

### LOAD RESISTOR INSTALLATION DETAIL (install resistors as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2095  
 DESIGNED: February 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: SR 1301 (Boone Station Drive)/ Boone Station Drive at SR 1301 (St. Marks Church Road)/ Java Lane

Division 7 Alamance County Burlington

PLAN DATE: February 2018 REVIEWED BY: PL Alexander

PREPARED BY: JA Wiles REVIEWED BY:

REVISIONS

INIT. DATE

6/9/2018

PANELA L. ALEXANDER

SIG. INVENTORY NO. 07-2095

09-JUN-2018 14:16  
 D:\transp\at\atm\proj\atm\00056469 U-6015 B-C S1g Sys\Task 05\_11\_Signal\Des\gmr\1r\Inq07-2095E.dgn  
 ALEX3361 AT LUS210649

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP A*

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

TMG VEH OVLP...[A] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 1
OPPOSING THROUGH.....	PHASE 2
FLASHING ARROW OUTPUT.....	CH9 ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

Toggle Once

*OVERLAP B*

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

TMG VEH OVLP...[B] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 3
OPPOSING THROUGH.....	PHASE 4
FLASHING ARROW OUTPUT.....	CH10 ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

Toggle Once

*OVERLAP C*

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

TMG VEH OVLP...[C] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 5
OPPOSING THROUGH.....	PHASE 6
FLASHING ARROW OUTPUT.....	CH11 ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

Toggle Once

*OVERLAP D*

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

TMG VEH OVLP...[D] TYPE: ....	<span style="border: 1px solid black; padding: 2px;">PPLT FYA</span>
PROTECTED LEFT TURN....	PHASE 7
OPPOSING THROUGH.....	PHASE 8
FLASHING ARROW OUTPUT.....	CH12 ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

END PROGRAMMING

## FLASHER CIRCUIT MODIFICATION DETAIL

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

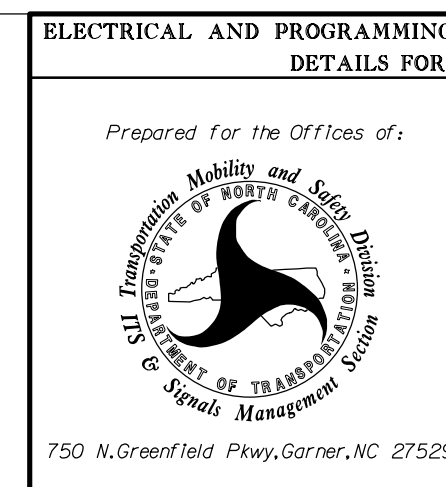
1. ON REAR OF PDA – REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA – REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2095  
 DESIGNED: February 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

09-JUN-2018 14:16 D:\Transportation\Projects\00056469 U-6015 B-6 Sig Sys\Task 05\_11\_Signal\asdas\gnw\Tring\07-2095E.dgn

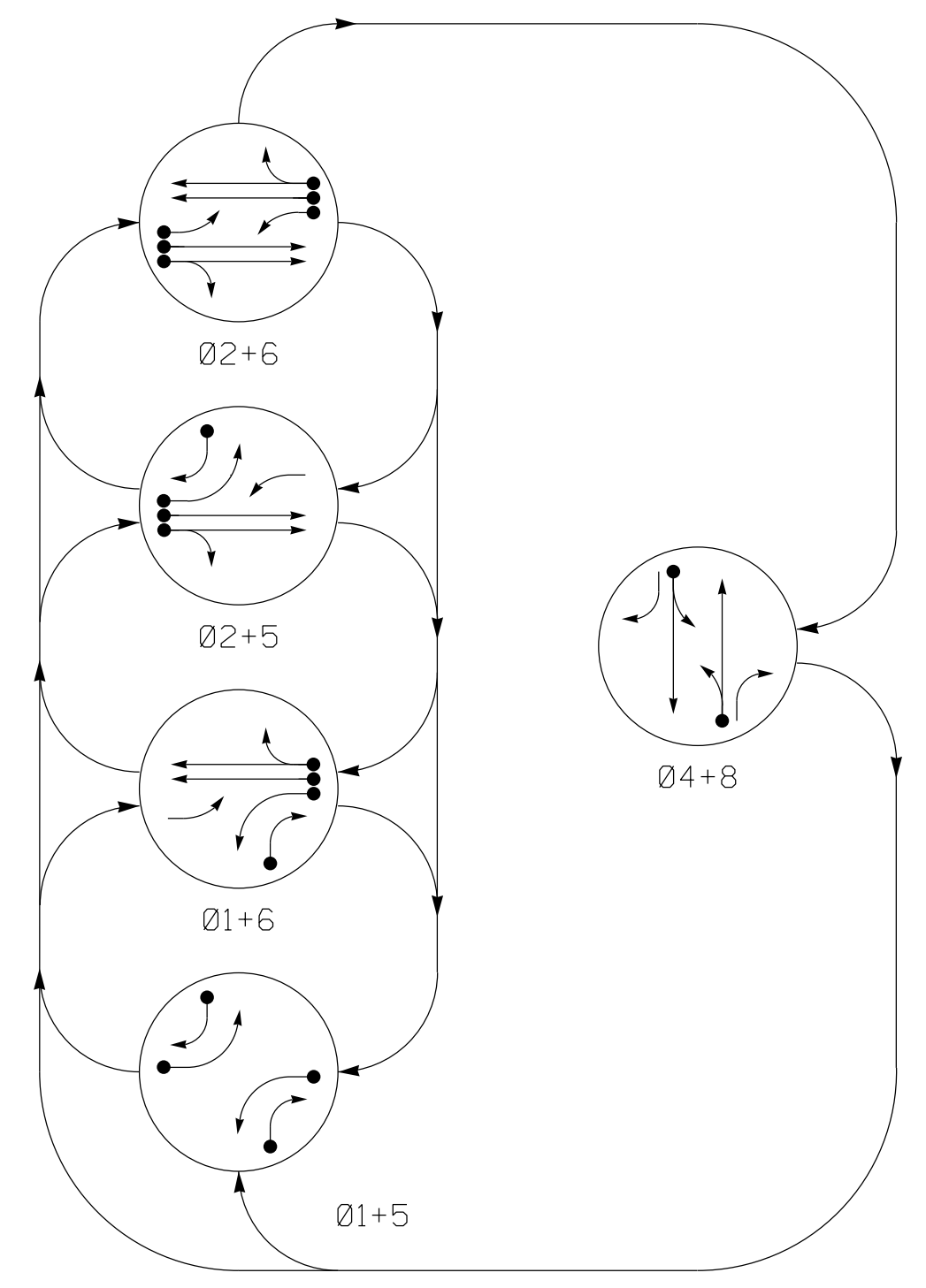


ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1301 (Boone Station Drive)/ Boone Station Drive at SR 1301 (St. Marks Church Road)/ Java Lane	
Prepared for the Offices of:		Division 7 Alamance County Burlington	
PLAN DATE: February 2018	REVIEWED BY: PL Alexander		
PREPARED BY: JA Wiles	REVIEWED BY:		
REVISIONS	INIT.	DATE	

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

SEAL	6/9/2018
	DATE
Designed by: <u>Pamela Alexander</u>	DATE
Signature: _____	DATE
SIG. INVENTORY NO. 07-2095	

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

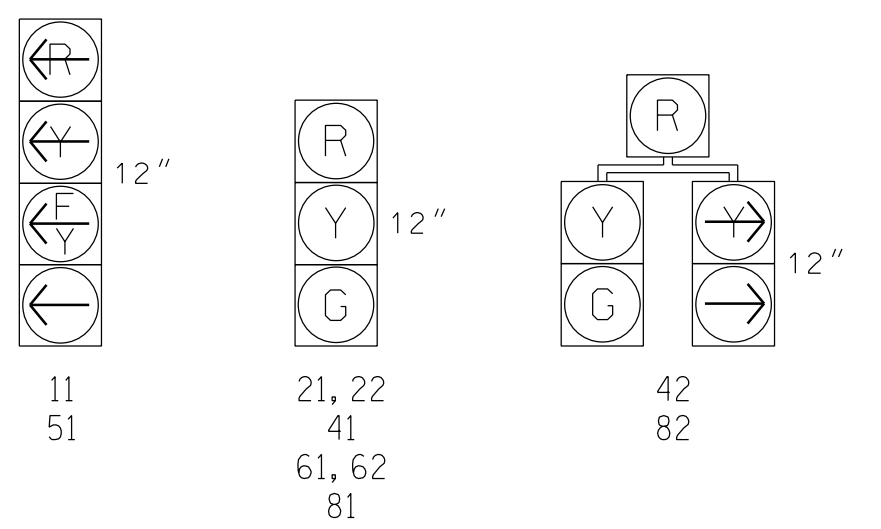
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE					
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 8	F
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61, 62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.



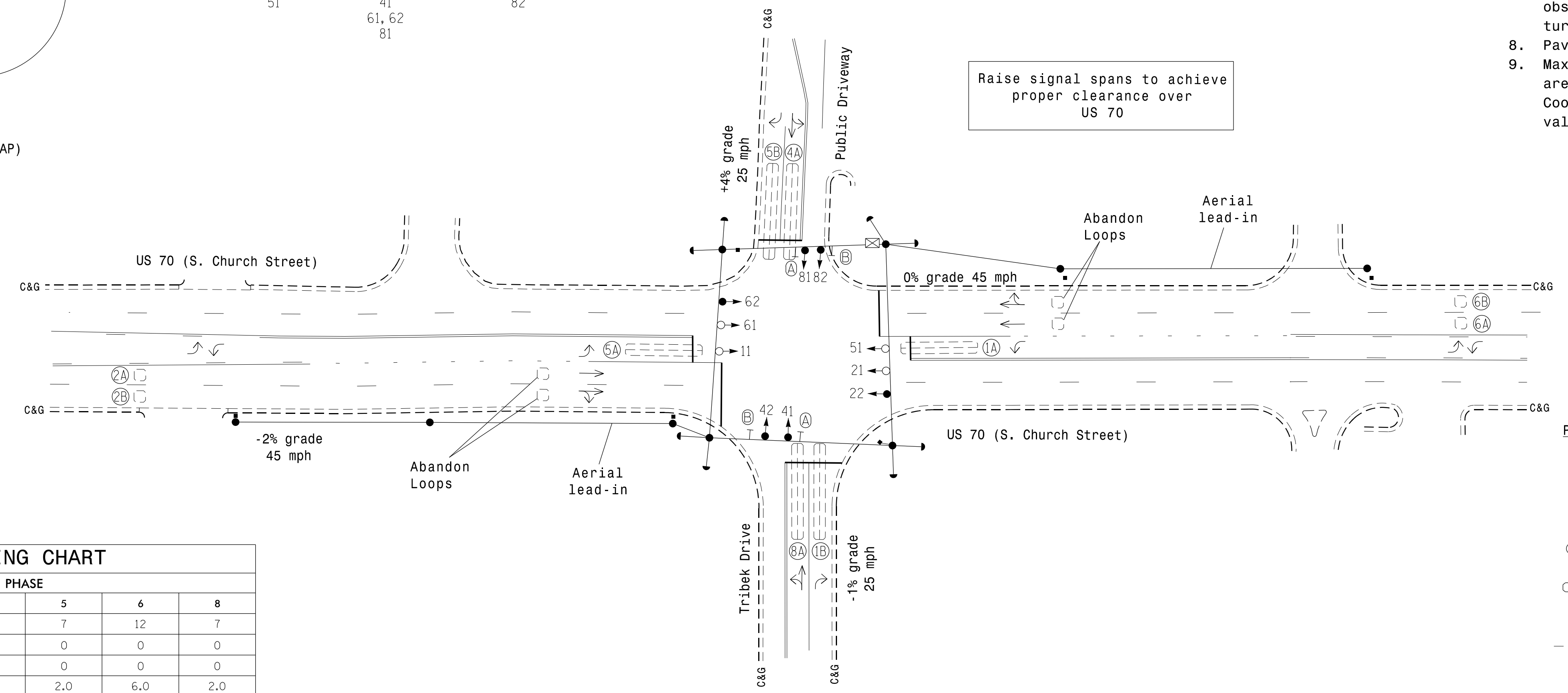
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
1B	6X50	+10	2-4-2	-	1	Yes	-	15	-	S	-	X
2A,2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
4A	6X50	+10	2-4-2	-	4	Yes	-	3	-	S	-	X
5A	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
5B	6X50	+10	2-4-2	-	5	Yes	-	15	-	S	-	X
6A,6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X50	+10	2-4-2	-	8	Yes	-	3	-	S	-	X

**5 Phase Fully Actuated (Burlington-Graham 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 22 and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



Raise signal spans to achieve proper clearance over US 70

**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	4	5	6	8		
Min Green *	7	12	7	7	12	7		
Walk *	0	0	0	0	0	0		
Ped Clear	0	0	0	0	0	0		
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0		
Max 1 *	20	90	20	20	90	20		
Yellow	3.0	4.7	3.0	3.0	4.7	3.2		
Red Clear	2.4	1.0	2.5	2.4	1.0	2.5		
Actuations B4 Add *	-	0	-	-	0	-		
Seconds / Actuation *	-	2.0	-	-	2.0	-		
Max Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Locking Detector	-	X	-	-	X	-		
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-		
Dual Entry	-	-	X	-	-	X		
Simultaneous Gap	X	X	X	X	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                           |
|          | Sign   |
|          | Pedestrian Signal Head With Push Button & Sign |
|          | Signal Pole with Guy                           |
|          | Signal Pole with Sidewalk Guy                  |
|          | Inductive Loop Detector                        |
|          | Controller & Cabinet                           |
|          | Junction Box                                   |
|          | 2-in Underground Conduit                       |
|          | Right of Way                                   |
|          | Directional Arrow                              |
|          | Combined Through and Left Arrow Sign (R3-6)    |
|          | Right Arrow "ONLY" Sign (R3-5R)                |

**Signal Upgrade**

Prepared for the Offices of:

**US 70 (S. Church Street) at Tribek Drive**

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

SCALE 0 40 1"=40'

REVISIONS

INIT.	DATE

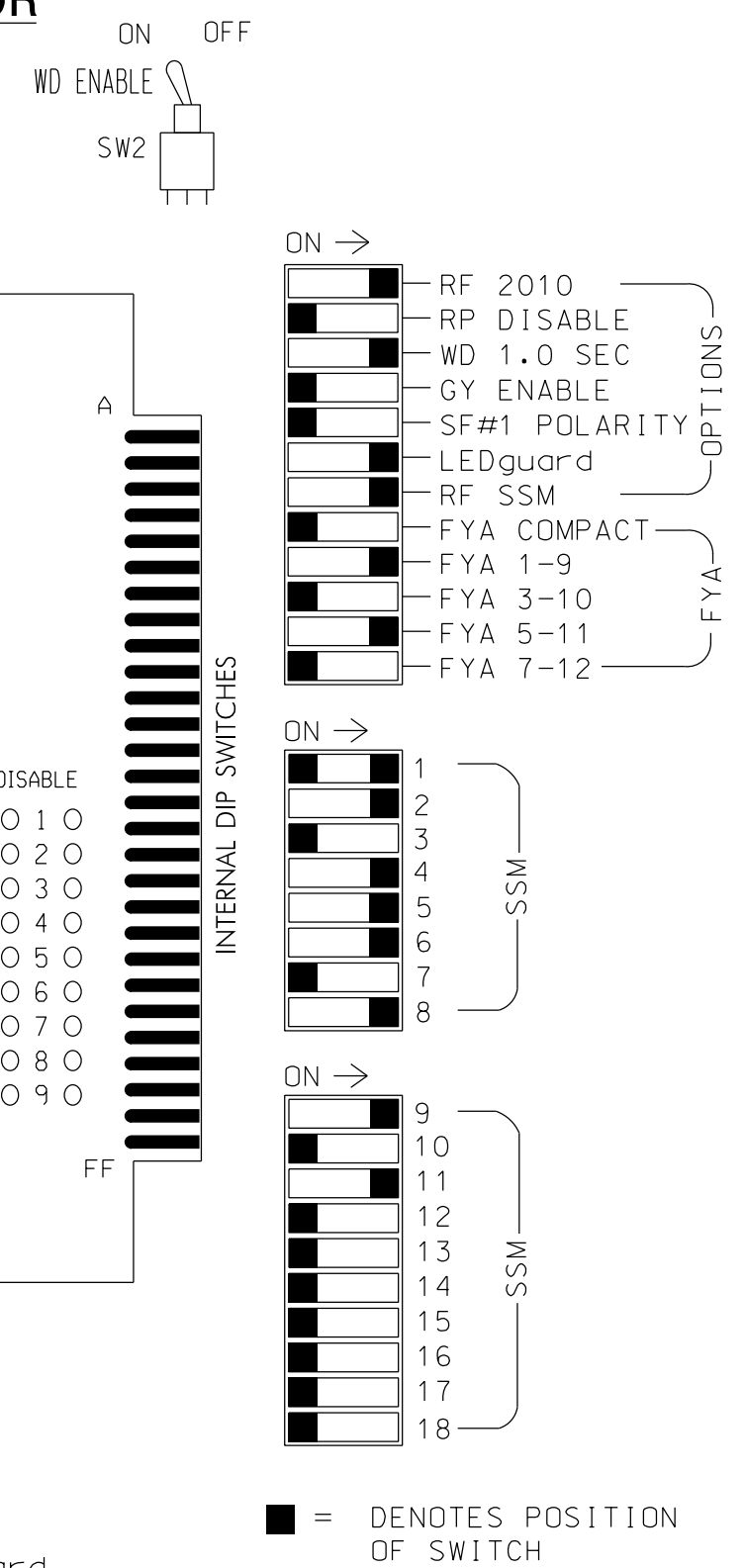
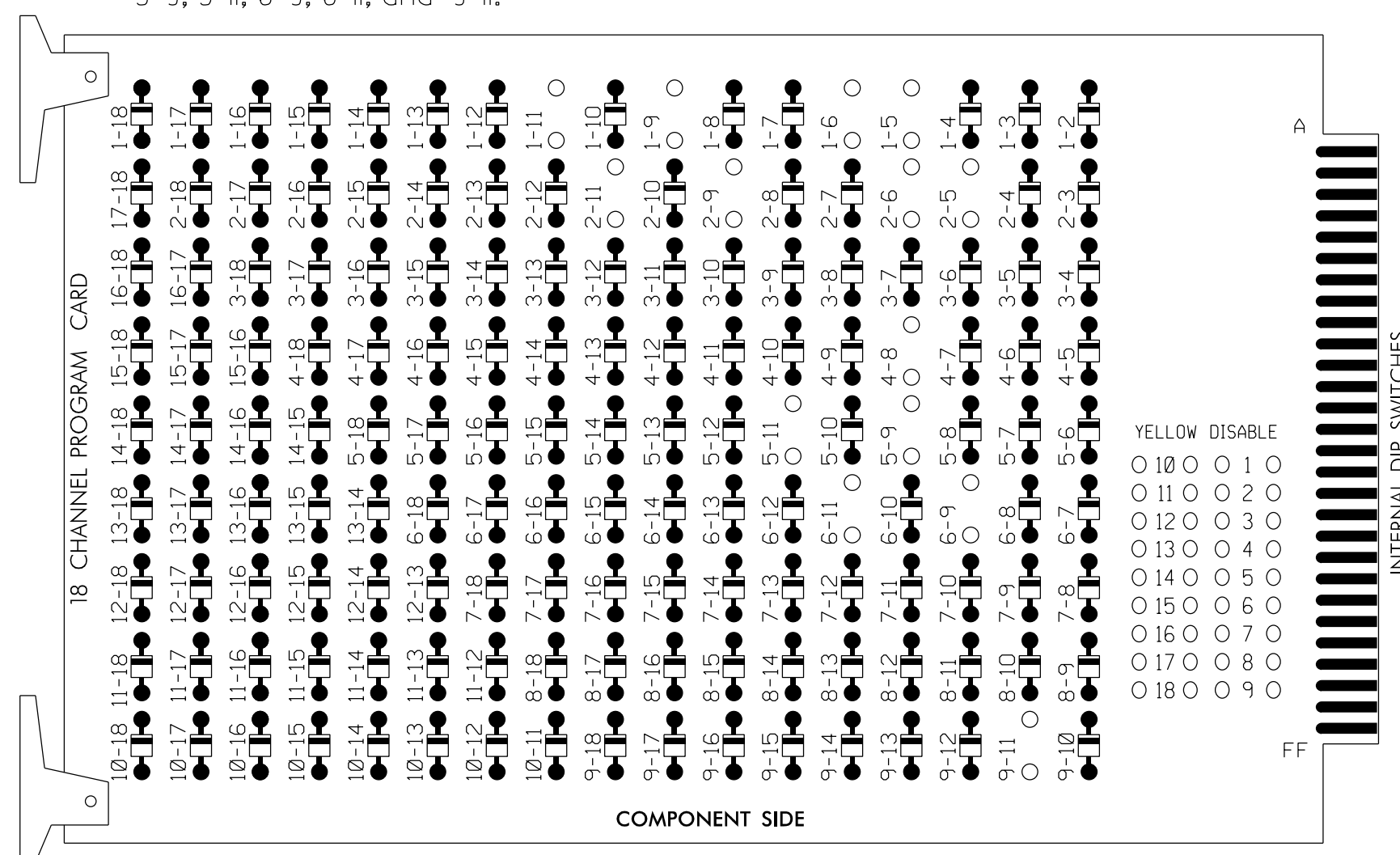
6/7/2018

SIG. INVENTORY NO. 07-2096

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

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 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	
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	NU	41,42	NU	42	51	61,62	NU	NU	81,82	NU	11	NU	NU	51	NU
RED	*	128				101			*	134			107						
YELLOW		129				102				135			108						
GREEN		130				103				136			109						
RED ARROW													A121					A114	
YELLOW ARROW	126								132										A115
FLASHING YELLOW ARROW													A123						A116
GREEN ARROW	127	127								133	133								

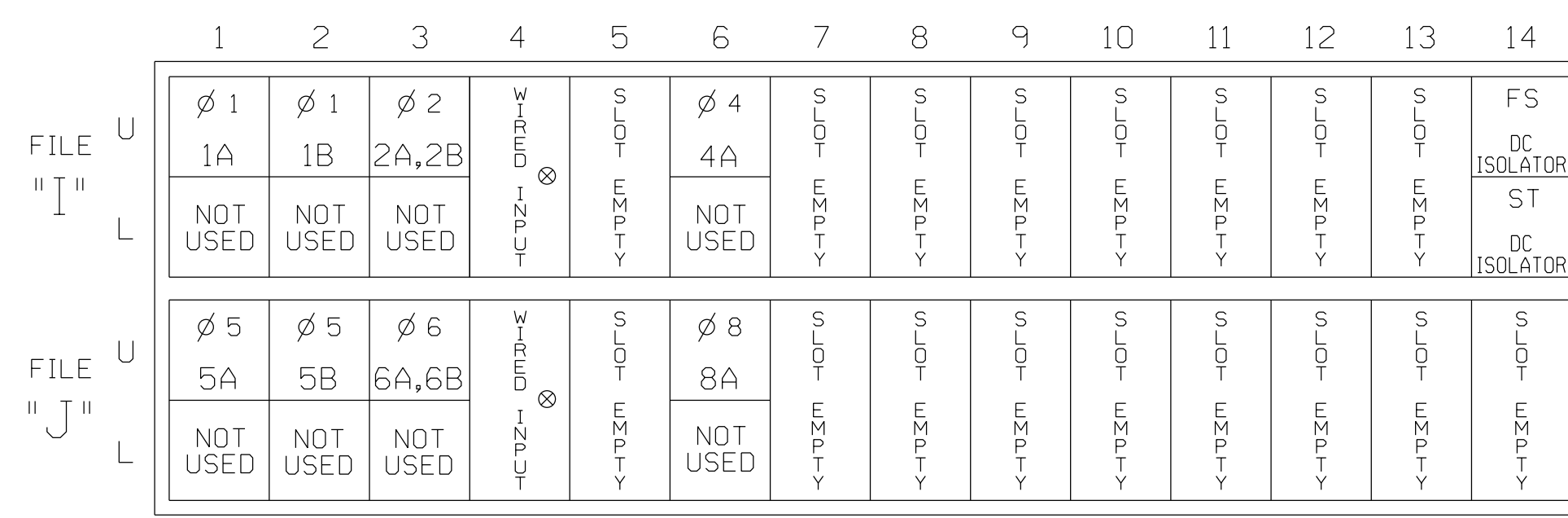
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)



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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE  
 ST = STOP TIME

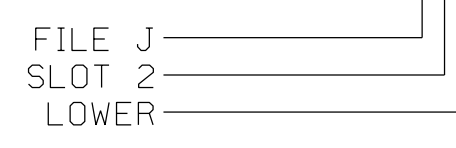
### INPUT FILE CONNECTION & PROGRAMMING CHART

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

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

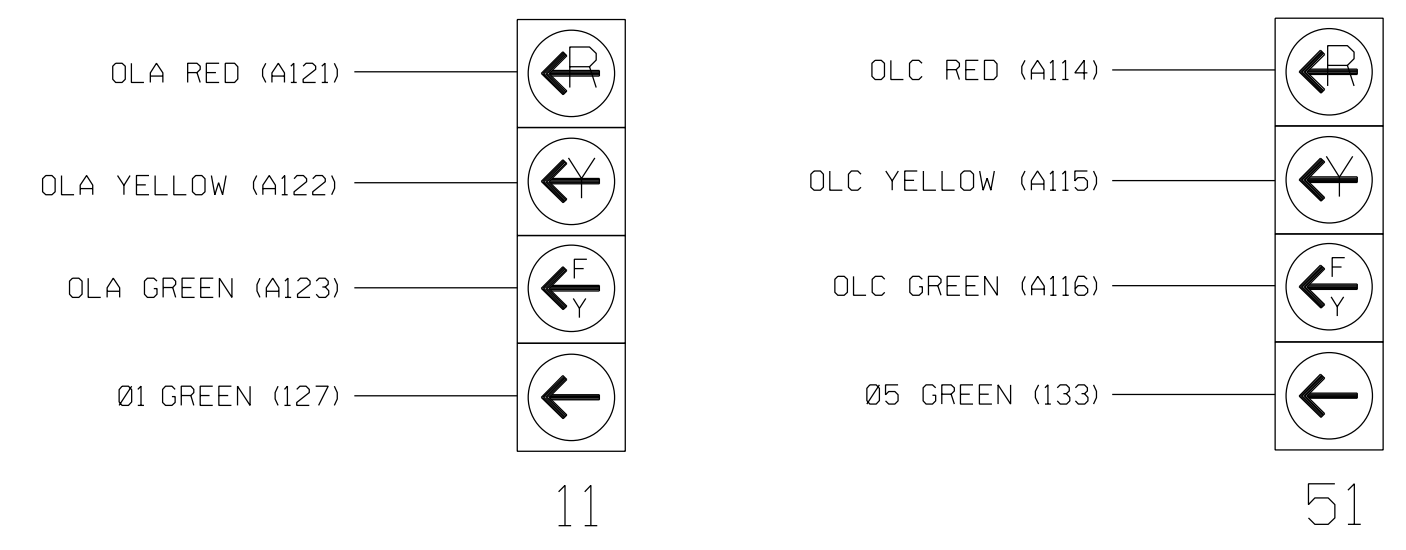
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

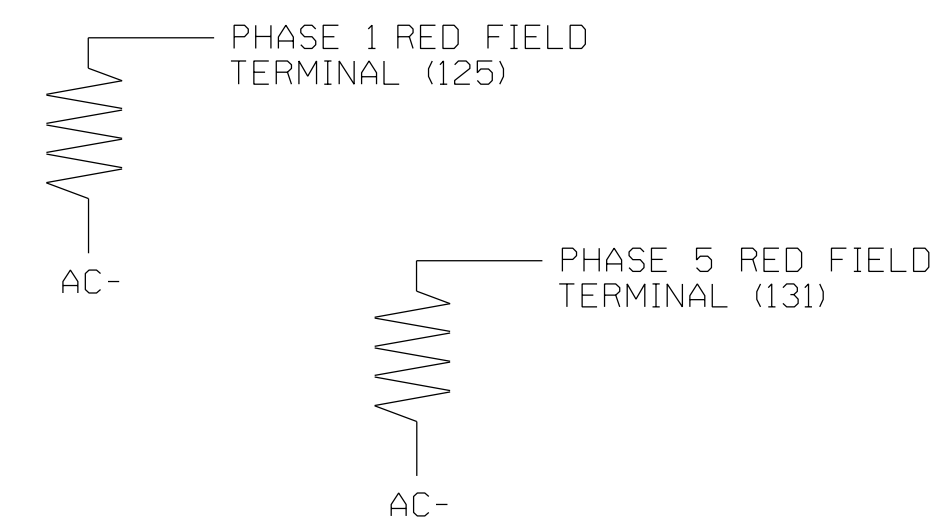


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2096  
 DESIGNED: January 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of: DEPARTMENT OF TRANSPORTATION AND SAFETY STATE OF NORTH CAROLINA	<b>US 70 (S. Church Street) at Tribek Drive</b>		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489
	Division 7 PLAN DATE: January 2018 PREPARED BY: JA Wiles	Alamance County REVIEWED BY: PL Alexander REVIEWED BY:	
REVISIONS:			DATE:
750 N. Greenfield Pkwy, Garner, NC 27529			6/11/2018 DATE:

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP A*

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

```

TMG VEH OVLP...[A] TYPE: .....PPLT FYA
PROTECTED LEFT TURN.... PHASE 1
OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
```

Toggle Twice

*OVERLAP C*

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

```

TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED LEFT TURN.... PHASE 5
OPPOSING THROUGH..... PHASE 6

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

END PROGRAMMING

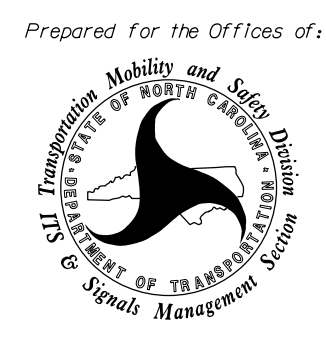
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-2096  
 DESIGNED: January 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

09-JUN-2018 14:16  
 \*\*\*SIGNALS-COMPOJECT\KLSRLA\Transportation\Traffic\Curr\*00056469 U-6015 B-s Sig Sys\*Task 05-11-SIGNALS\08as\gn\WIF.rng\07-2096E.dgn  
 ALEX3361 AT LUS2\0849

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:


Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

<b>US 70 (S. Church Street) at Tribek Drive</b>	
Division 7	Alamance County
Burlington	
PLAN DATE: January 2018	REVIEWED BY: PL Alexander
PREPARED BY: JA Wiles	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



Seal of Pamela L. Alexander, Professional Engineer, State of North Carolina, License No. 023489

Designed by: Pamela Alexander DATE: 6/11/2018

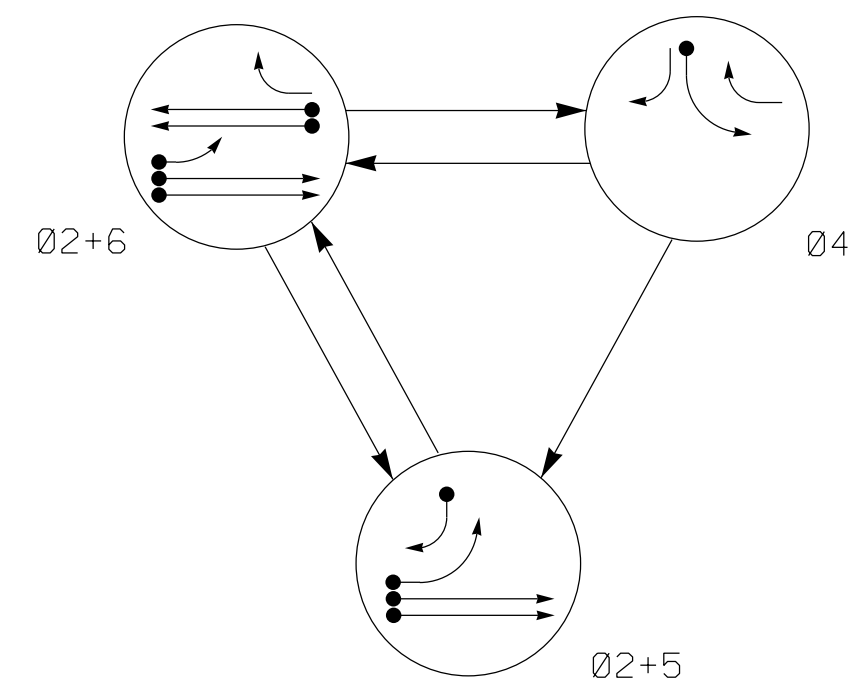
SIGNED: \_\_\_\_\_ DATE: \_\_\_\_\_

SIG. INVENTORY NO. 07-2096

ATKINS

1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEES #F-0326

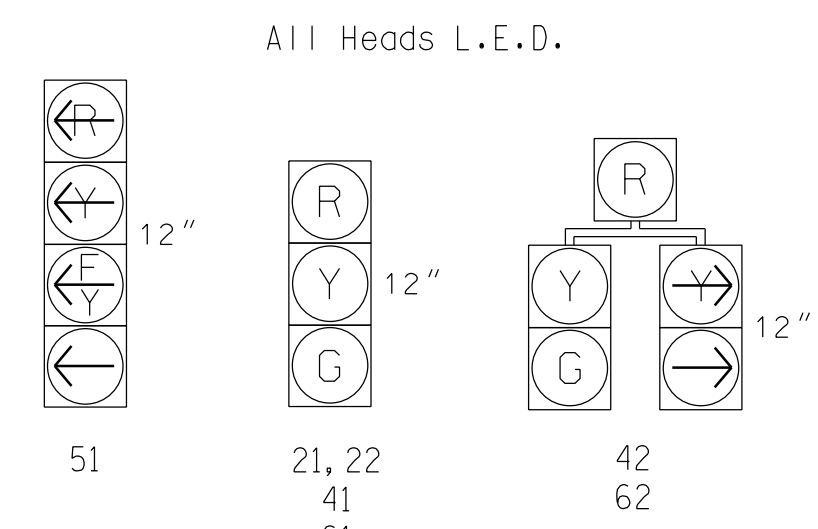
**PHASING DIAGRAM**



**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

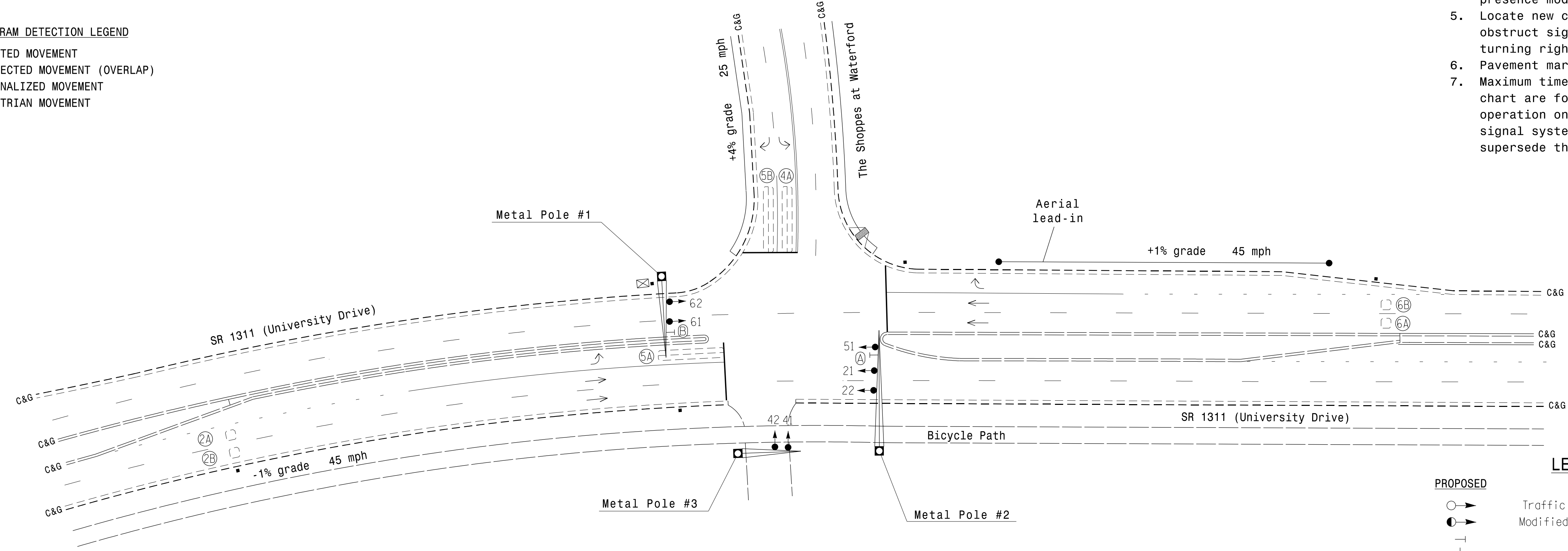
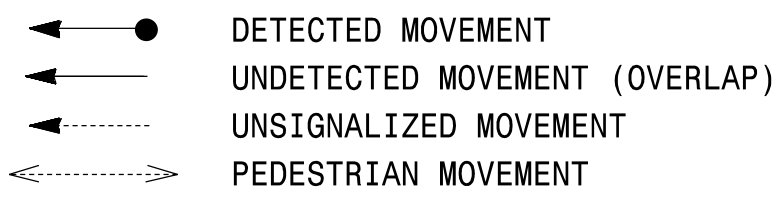
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING							
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP
2A	6X6	300	EXIST	2	Yes	-	-	X	N	-	X
2B	6X6	300	EXIST	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-
5B	6X40	0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

**3 Phase Fully Actuated (Burlington-Graham 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 so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**PHASING DIAGRAM DETECTION LEGEND**

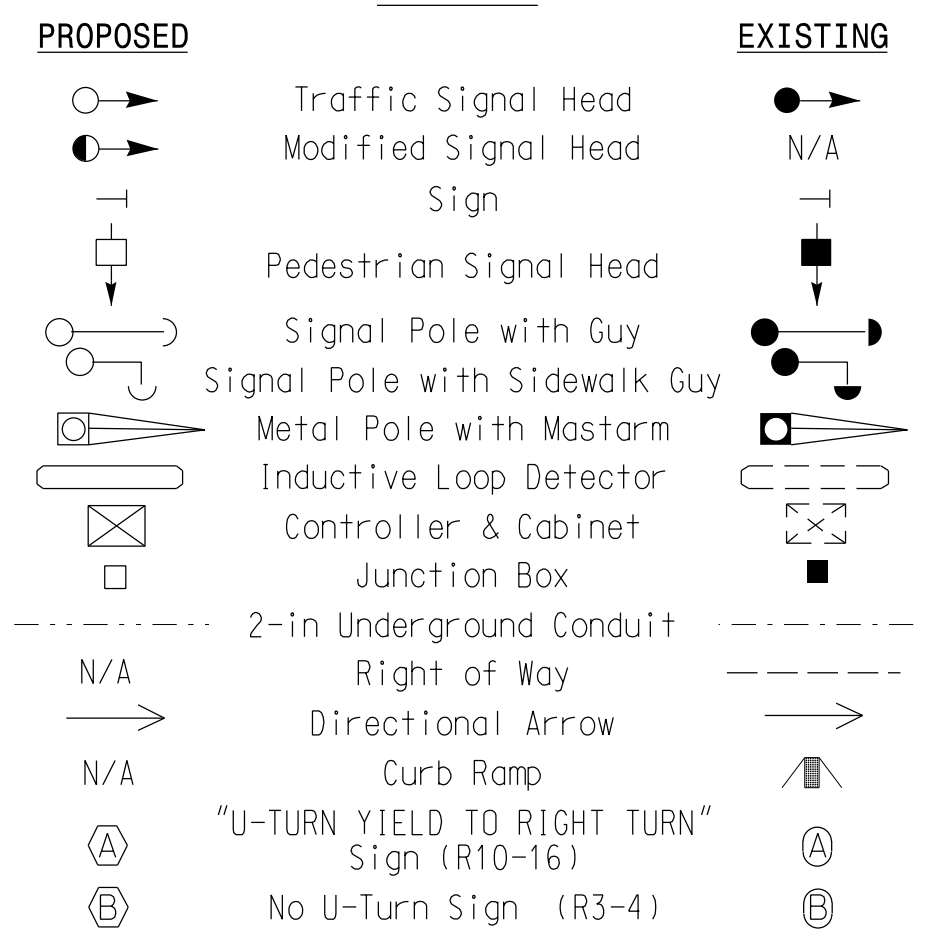


**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	20	20	90
Yellow	4.6	3.0	3.0	4.6
Red Clear	1.4	2.8	2.6	1.4
Actuations B4 Add *	0	-	-	0
Seconds / Actuation *	1.8	-	-	1.8
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH, RECALL	-	-	VEH, RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

**LEGEND**



**Signal Upgrade**

1616 EAST MILLBROOK ROAD, SUITE 160  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBES #F-0326

**SR 1311 (University Drive) at The Shoppes at Waterford**

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

SCALE: 1"=40'

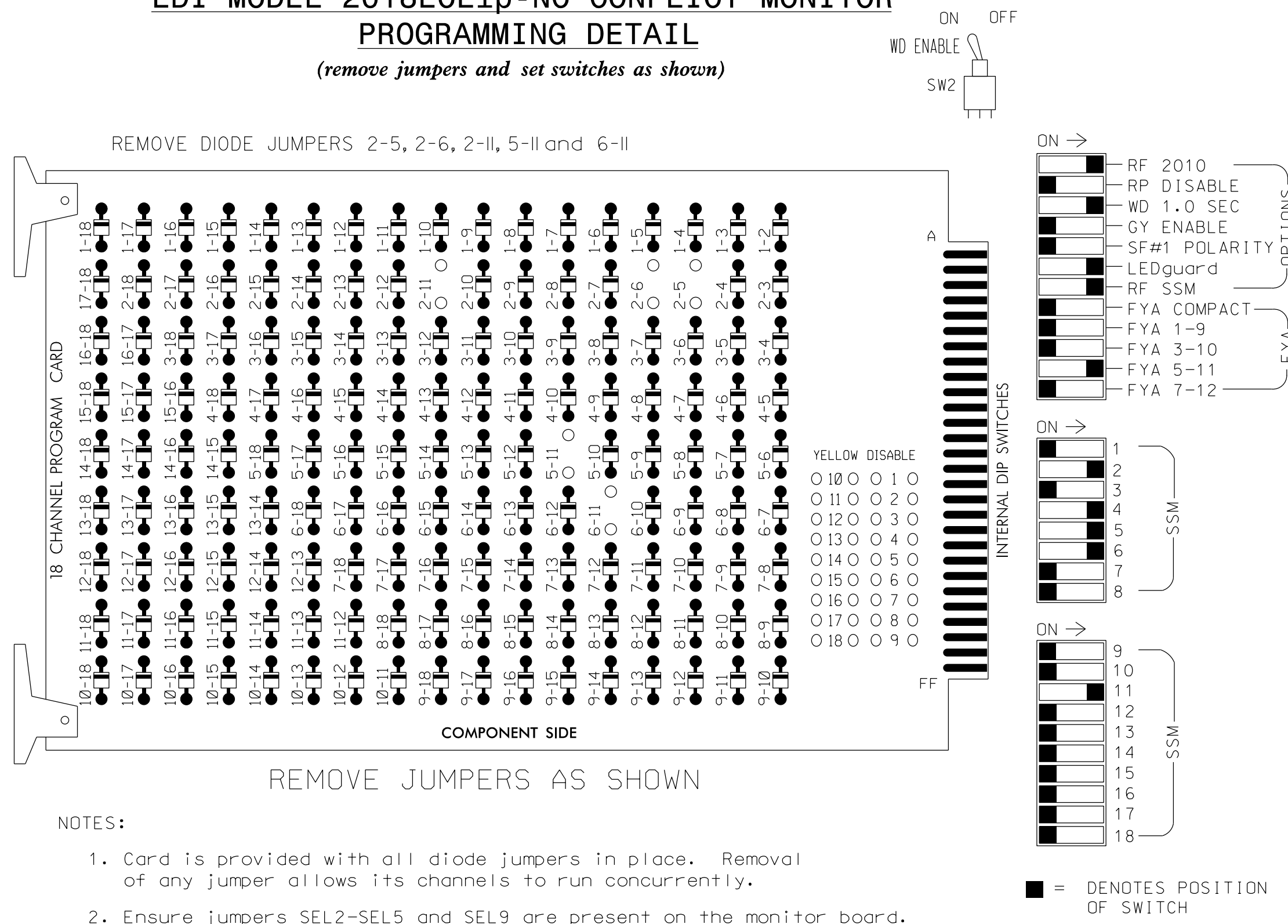
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

SEAL  
PANELA ALEXANDER  
ENGINEER  
DATE: 6/7/2018

07-JUN-2018 11:15 C:\Users\raht\OneDrive\Work\Projects\U-6015 B-C Sig Sys\Task 05\_11\_Signal\Signal\07-2115.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 Burlington-Graham Signal System.

### SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

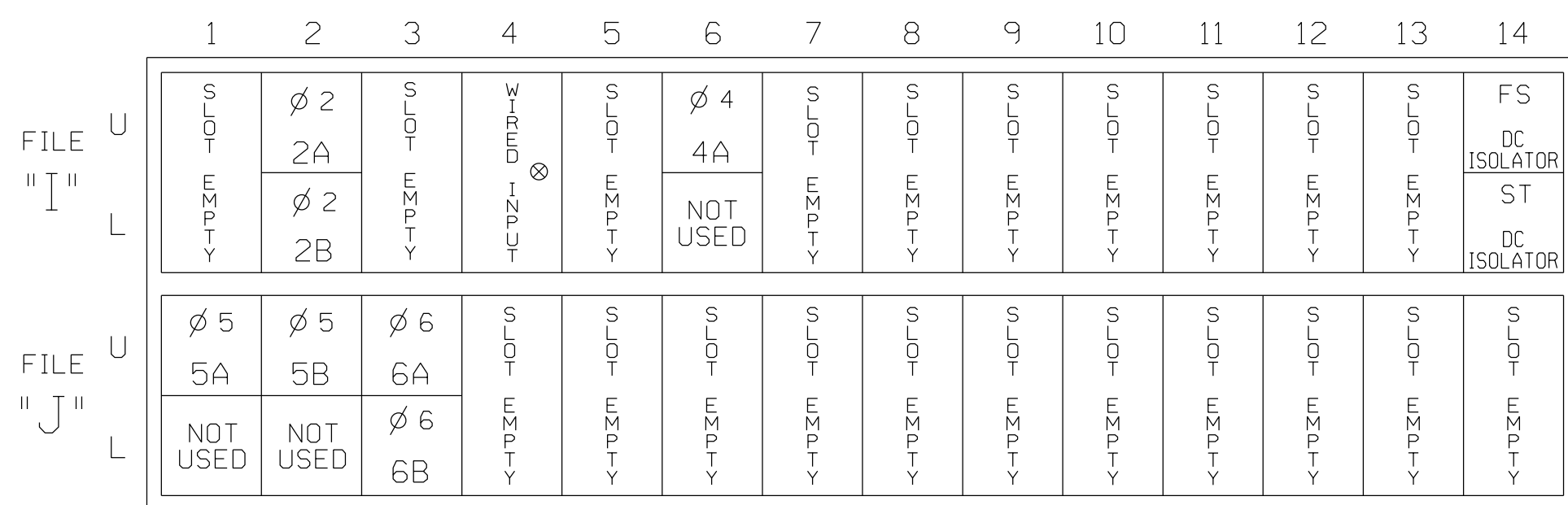
### EQUIPMENT INFORMATION

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

\* See overlap programming detail on sheet 2

### INPUT FILE POSITION LAYOUT

(front view)



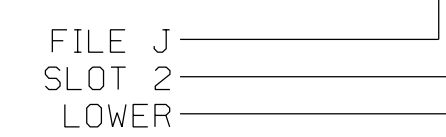
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

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

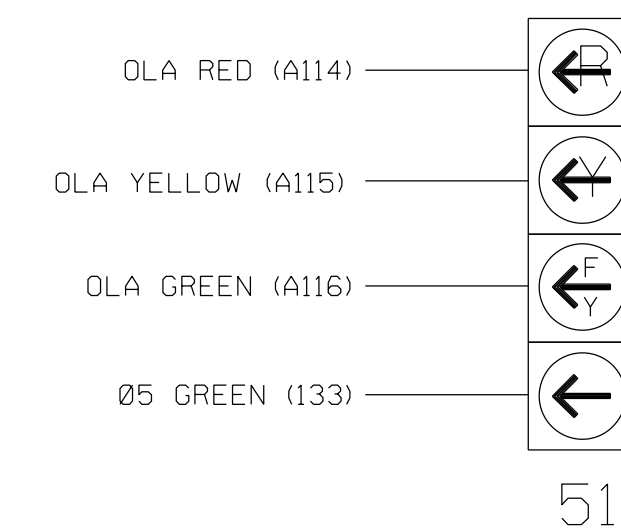
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.

### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

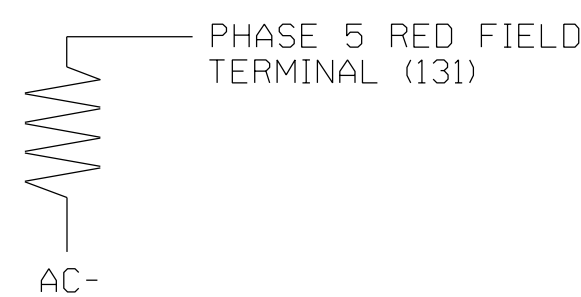
(wire signal head as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:  
 Prepared for the Offices of:

SR 1311 (University Drive)  
 at  
 The Shoppes at Waterford

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion  
 PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

REVISIONS	INIT.	DATE

SEAL

750 N. Greenfield Pkwy, Garner, NC 27529

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEES #F-0326

6/9/2018  
 DATE

SIG. INVENTORY NO. 07-2115



## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 2. CONTROLLER
  2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS
- Toggle Twice

*OVERLAP C*

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

```

TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 5
PERMISSIVE PHASE (OPPOSING TURN)... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-2115  
 DESIGNED: December 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

09-JUN-2018 14:16  
 D:\Transportation\Traffic\Current\0006469 U-6015 B-s Sig Sys\Task 05-11-Signal\00as\gn\WIF.rng\07-2115E.dgn  
 ALEX3561 AT LUS240619

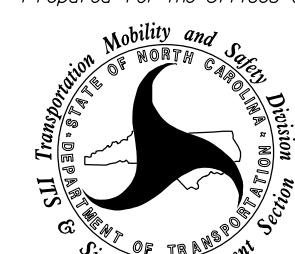
Electrical Detail - Sheet 2 of 2

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

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEE5 #F-0326

ELECTRICAL AND PROGRAMMING  
 DETAILS FOR:

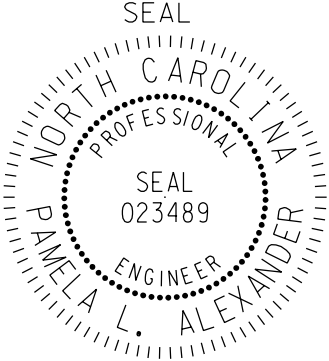
Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

<b>SR 1311 (University Drive) at The Shoppes at Waterford</b>	
Division 7	Alamance County Burlington
PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

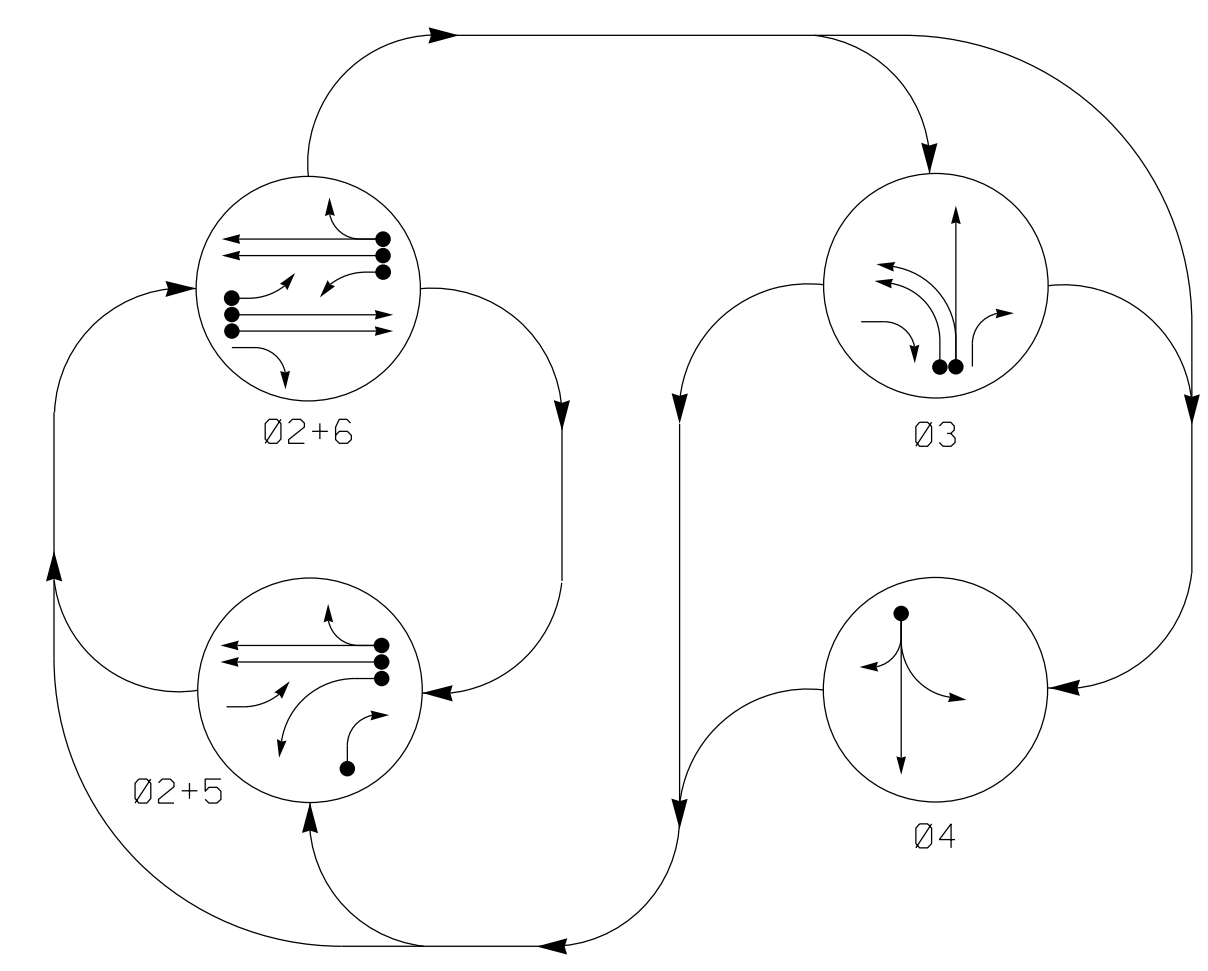
SEAL



SEAL  
023489  
ENGINEER  
PAMELA L. ALEXANDER

Designed by: Pamela Alexander 6/9/2018  
 DATE  
 SIG. INVENTORY NO. 07-2115

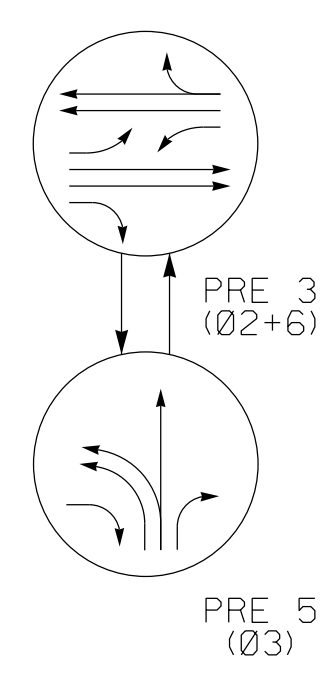
**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

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

**EV PREEMPT PHASES**  
(Medium Priority)



**TABLE OF OPERATION**

SIGNAL FACE	PHASE									
	02+5	02+6	03	04	PRE 3 (02+6)	PRE 5 (03)	FLASH	FLUSH	Y	R
21,22	G	G	R	R	G	R	Y			
31	R	R	G	R	R	G	R			
32	R	R	G	R	R	G	R			
41	R	R	R	G	R	R	R			
42	R	R	R	G	R	R	R			
51	←	←	←	←	←	←	←			
61	←	←	←	←	←	←	←			
62	R	G	R	R	G	R	Y			
63	R	G	R	R	G	R	Y			

**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	NEW CARD
2A	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	-	S	-	X
4A	6X15	0	EXIST	-	4	Yes	-	5	-	S	-	X
5A	6X40	0	2-4-2	-	2	Yes	-	3	-	G	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6C	6X40	0	2-4-2	-	6	Yes	-	3	-	G	-	X

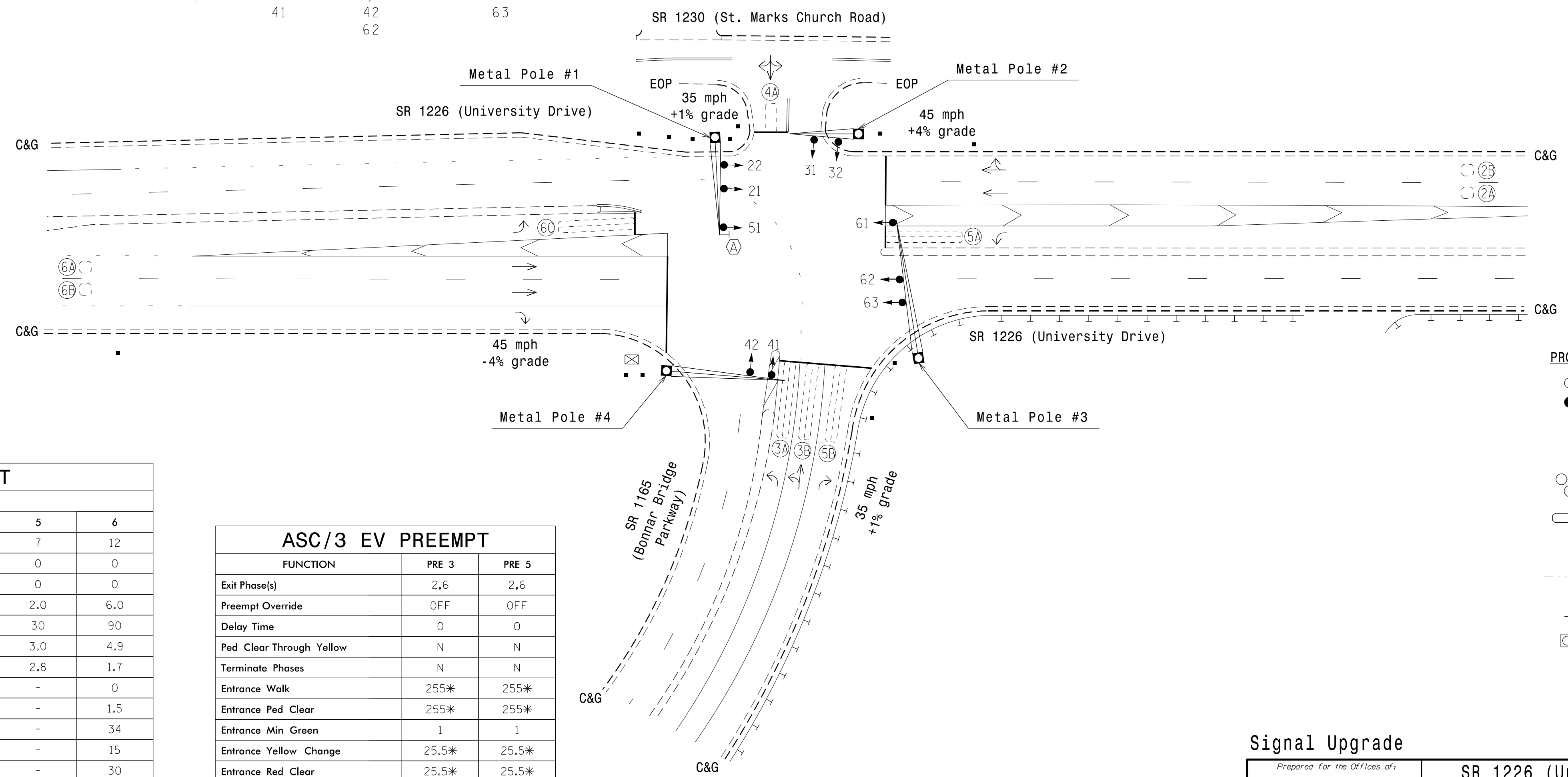
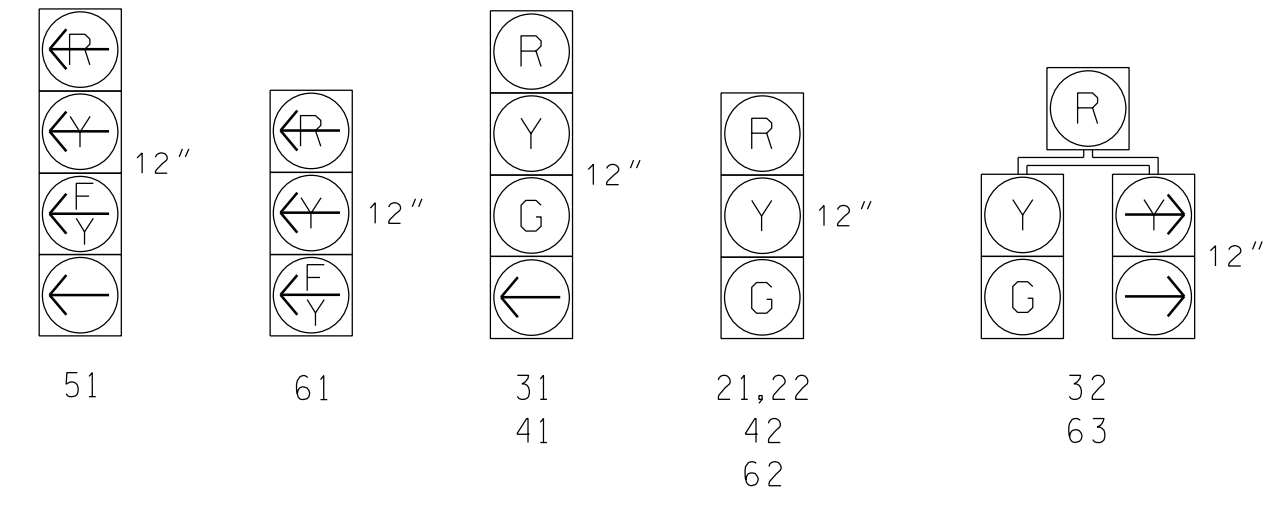
**4 Phase Fully Actuated w/ EV Preemption (Burlington-Graham Signal System)**

**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 Engineer.
- Phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- This intersection features an optical GPS preemption system.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**SIGNAL FACE I.D.**

All Heads L.E.D.



**ASC/3 TIMING CHART**

FEATURE	PHASE				
	2	3	4	5	6
Min Green *	12	7	7	7	12
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	2.0	6.0
Max I *	90	30	15	30	90
Yellow	4.9	3.8	3.8	3.0	4.9
Red Clear	1.7	2.5	2.3	2.8	1.7
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

**ASC/3 EV PREEMPT**

FUNCTION	PRE 3	PRE 5
Exit Phase(s)	2,6	2,6
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	N	N
Terminate Phases	N	N
Entrance Walk	255*	255*
Entrance Ped Clear	255*	255*
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	12	7
Preempt Input Extension Time	2	2
Preempt Max Time	30	30
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

**LEGEND**

- | PROPOSED                                     | EXISTING                                     |
|--|--|
| ○→ Traffic Signal Head                       | ●→ N/A                                       |
| ○→ Modified Signal Head                      | ○→ N/A                                       |
| ⊥ Sign                                       | ⊥  |
| ⊥ Pedestrian Signal Head                     | ⊥  |
| ○→ Signal Pole with Guy                      | ●→ Signal Pole with Guy                      |
| ○→ Signal Pole with Sidewalk Guy             | ●→ Signal Pole with Sidewalk Guy             |
| □ Inductive Loop Detector                    | □ Inductive Loop Detector                    |
| □ Controller & Cabinet                       | □ Controller & Cabinet                       |
| □ Junction Box                               | □ Junction Box                               |
| --- 2-in Underground Conduit                 | --- 2-in Underground Conduit                 |
| N/A Right of Way                             | --- Right of Way                             |
| → Directional Arrow                          | → Directional Arrow                          |
| ○→ Metal Pole with Mastarm                   | ○→ Metal Pole with Mastarm                   |
| ⊙ "U-Turn Yield to Right Turn" Sign (R10-16) | ⊙ "U-Turn Yield to Right Turn" Sign (R10-16) |

**Signal Upgrade**

Prepared for the Offices of:

**SR 1226 (University Drive) at SR 1165 (Bonnar Bridge Parkway) / SR 1230 (St. Marks Church Road)**

Division 7 Alamance County Burlington

PLANNED BY: March 2018 REVIEWED BY: PL Alexander

PREPARED BY: NA Ptak REVIEWED BY: AM Encarnacion

SCALE: 1"=40'

DATE: 6/7/2018

SIGNATURE: Pamela Alexander

SIG. INVENTORY NO. 07-2117

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326

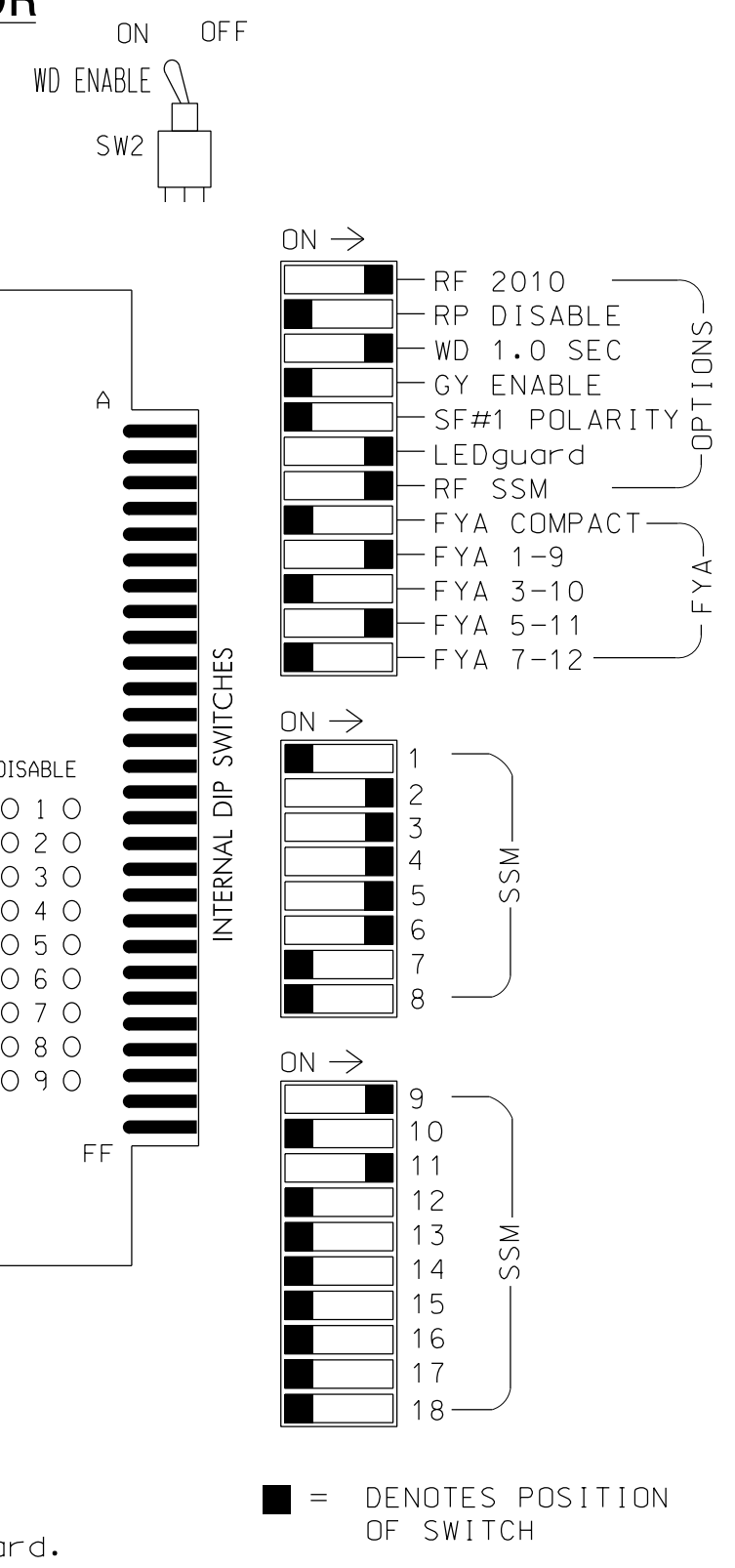
07-JUN-2018 11:15 U:\Projects\Traffic\Task\00056469 U-6015 B-G Sig Sys\Task 05\_11\_Signals\Des\gn\*07-2117.dgn ALEX3361 AT LUS340649

### 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 Burlington-Graham Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONDLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S4,S5,S7,S8,AUX S1,  
 AUX S4  
 PHASES USED.....2,3,4,5,6  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED

\* See overlap programming detail on sheet 2

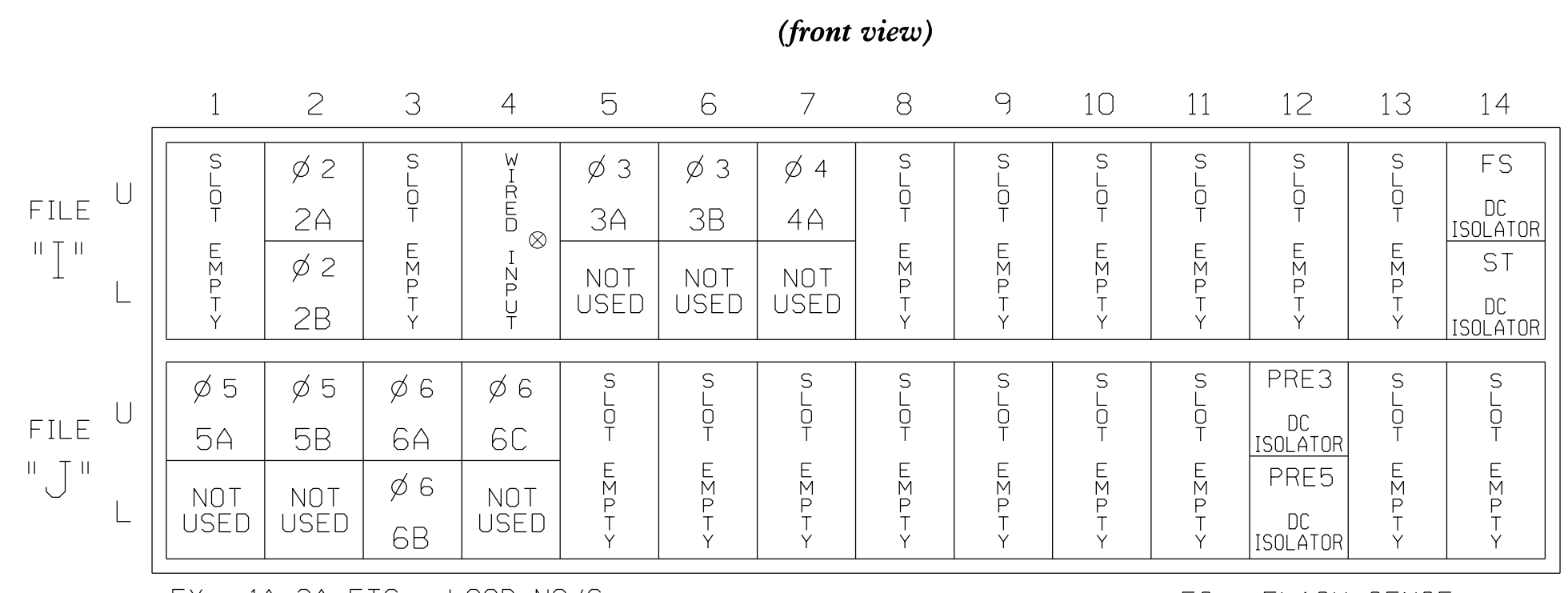
PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 162.1

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6		
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.	NU	21,22	NU	31	32	63	41	42	NU	32	51	62,63	NU	NU	NU	61	NU	51	NU	
RED		128		116	116		101	101		*		134								
YELLOW		129		117	117		102	102				135								
GREEN		130		118	118		103	103				136								
RED ARROW																			A121	A114
YELLOW ARROW							117					132							A122	A115
FLASHING YELLOW ARROW																			A123	A116
GREEN ARROW				118	118	103				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.

### INPUT FILE POSITION LAYOUT

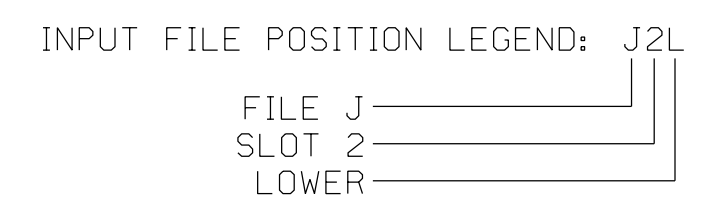


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 PRE = PREEMPT

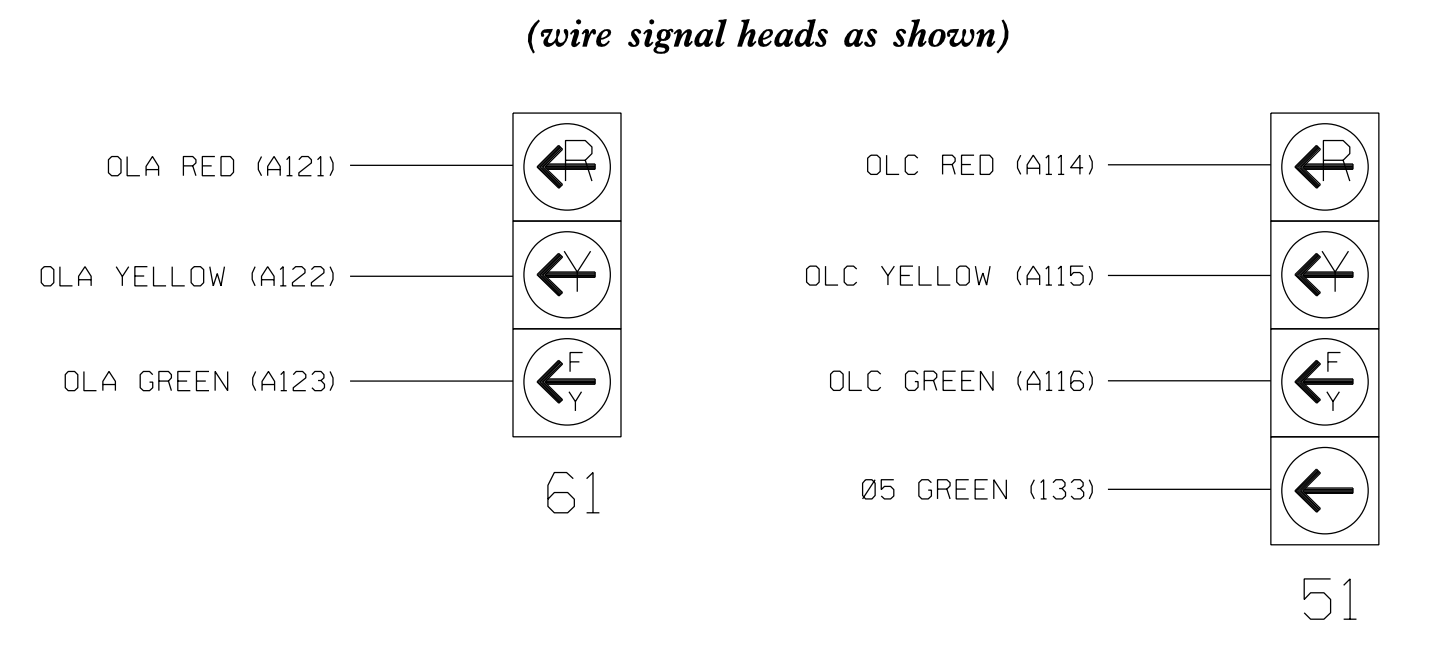
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	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		5		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES			X	N
6B	TB3-11,12	J3L	77	46	6	YES			X	N
6C	TB5-1,2	J4U	48	26	6	YES				G

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



### FYA SIGNAL WIRING DETAIL

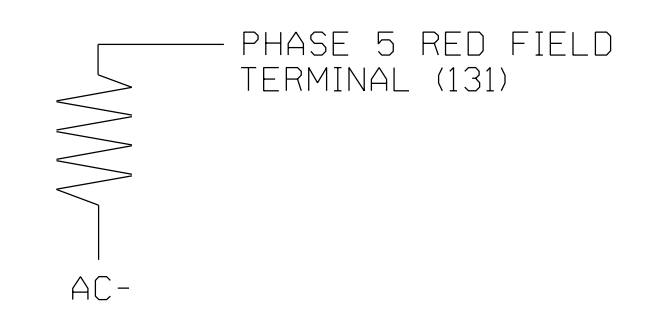


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2117  
 DESIGNED: March 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

### 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)



Electrical Details - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	SR 1226 (University Drive) at SR 1165 (Bonnar Bridge Parkway) / SR 1230 (St. Marks Church Road)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED 
	Division 7 Alamance County Burlington PLAN DATE: March 2018 REVIEWED BY: PL Alexander PREPARED BY: NA Ptak REVIEWED BY: AM Encarnacion	

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEEES #F-0326

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 07-2117

## ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL *(program controller as shown)*

- From Main Menu select 4. PREEMPTOR/TSP
- From PREEMPTOR/TSP/SCP Submenu select 1. PREEMPT PLAN 1-10

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #3.

```

PREEMPT PLAN [ 3]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . . X . . . . .
DWEL PED . . . . .
DWEL OLP . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .
    
```

```

ENABLE... YESIPMT OVRIDE...INTERLOCK. NO
DET LOCK... XIDELAY.. OINHIBIT... 0
OVERIDE FL. IDURATION OICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....OIX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1I25.5I25.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5I25.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 30I25.5I25.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0
    
```

PROGRAM EXTEND TIME ON OPTICAL DETECTOR UNITS FOR 2.0 SEC.

Place cursor in [ ] next to Preempt Plan and press 5. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #5.

```

PREEMPT PLAN [ 5]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . . . .
DWEL PED . . . . .
DWEL OLP . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .
    
```

```

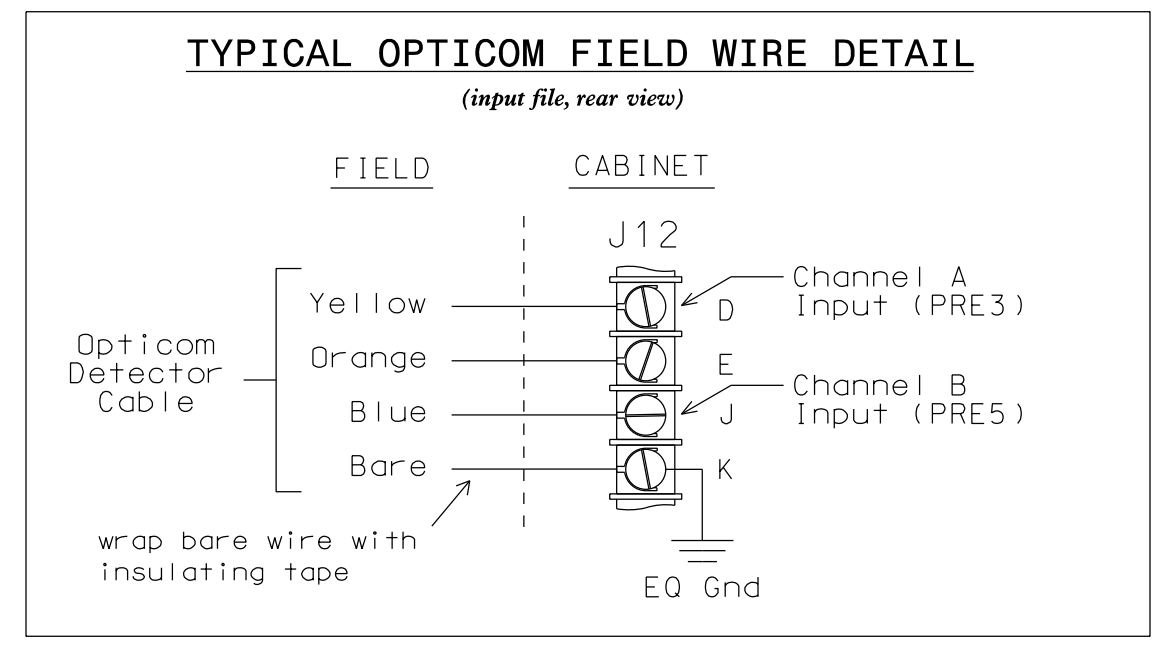
ENABLE... YESIPMT OVRIDE...INTERLOCK. NO
DET LOCK... XIDELAY.. OINHIBIT... 0
OVERIDE FL. IDURATION OICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....OIX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1I25.5I25.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5I25.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 7I 2.0I 30I25.5I25.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0
    
```

## ECONOLITE ASC/3-2070 PREEMPT FILTERING PROGRAMMING DETAIL

- (program controller as shown)*
- From Main Menu select 4. PREEMPTOR/TSP
  - From PREEMPT/TSP/SCP Submenu select 2. ENABLE PREEMPT FILTERING & TSP/SCP

```

ENABLE PREEMPT FILTERING & TSP/SCP
FILTERED SOLID PULSING
INPUT 1 ...BYPASSED...BYPASSED..
2 ...BYPASSED...BYPASSED..
3 ..PREEMPT 3. ...BYPASSED..
4 ...BYPASSED...BYPASSED..
5 ..PREEMPT 5. ...BYPASSED..
6 ...BYPASSED...BYPASSED..
7 ..BYPASSED...BYPASSED..
8 ...BYPASSED...BYPASSED..
9 ...BYPASSED...BYPASSED..
10 ...BYPASSED...BYPASSED..
    
```



## 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 'OTHER/ECONOLITE'

```

TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
    
```

↓ Toggle Twice

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

```

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

END PROGRAMMING

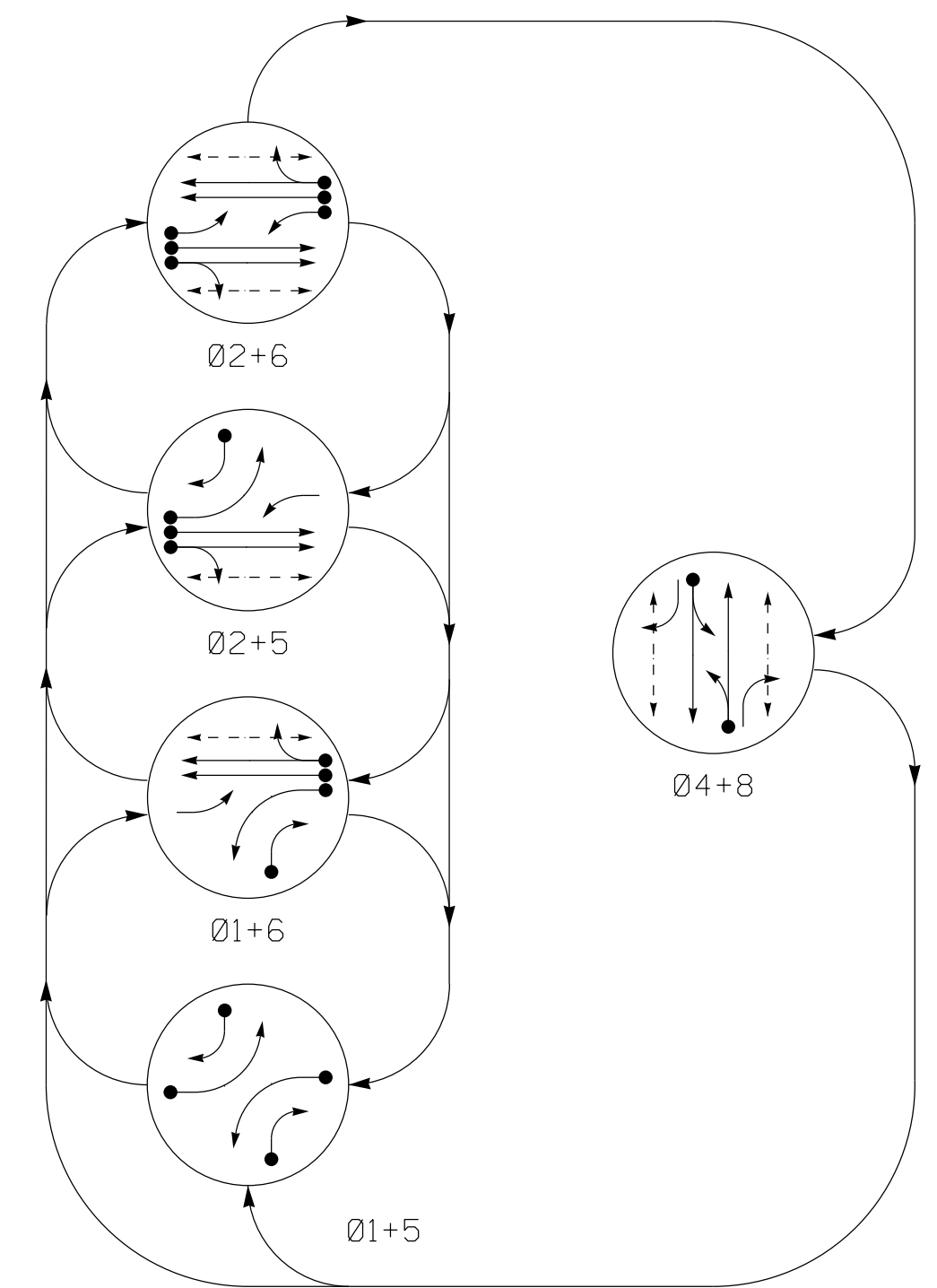
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-2117  
DESIGNED: March 2018  
SEALED: 6/7/2018  
REVISED: N/A

09-JUN-2018 14:16 D:\P\consort\at\work\off\c\curr\100056469 U-6015 B-G Sig Sys\Task 05\_11\_Signal\Des\g\m\ir\ing\07-2117E.dgn ALEX3361 AT LUS210649

Electrical Details - Sheet 2 of 2

<p>Electrical AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">SR 1226 (University Drive) at SR 1165 (Bonnar Bridge Parkway)/ SR 1230 (St. Marks Church Road)</p> <p>Division 7 Alamance County Burlington</p> <p>PLANNED BY: NA Ptak REVIEWED BY: AM Encarnacion</p> <p>PREPARED BY: NA Ptak REVIEWED BY: PL Alexander</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p style="text-align: center;"><b>ATKINS</b> 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEEES #F-0326</p>	<p style="text-align: center;"><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <p style="text-align: center;">SEAL NORTH CAROLINA PROFESSIONAL SEAL 023489 ENGINEER PAMELA L. ALEXANDER</p> <p style="text-align: center;">6/9/2018 DATE</p> <p style="text-align: center;">SIG. INVENTORY NO. 07-2117</p>
--	---	---

**PHASING DIAGRAM**



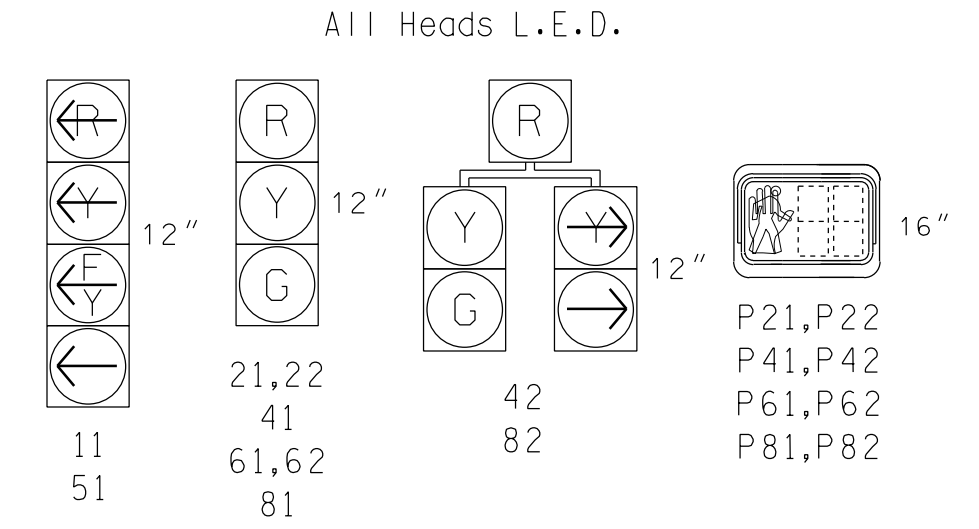
**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE				
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8
11	←	←	←	←	←
21,22	R	R	G	G	R
41	R	R	R	R	G
42	R	R	R	R	G
51	←	←	←	←	←
61,62	R	G	R	G	R
81	R	R	R	R	G
82	R	R	R	R	G
P21,P22	DW	DW	W	W	DRK
P41,P42	DW	DW	DW	DW	DRK
P61,P62	DW	W	DW	W	DRK
P81,P82	DW	DW	DW	W	DRK

**SIGNAL FACE I.D.**



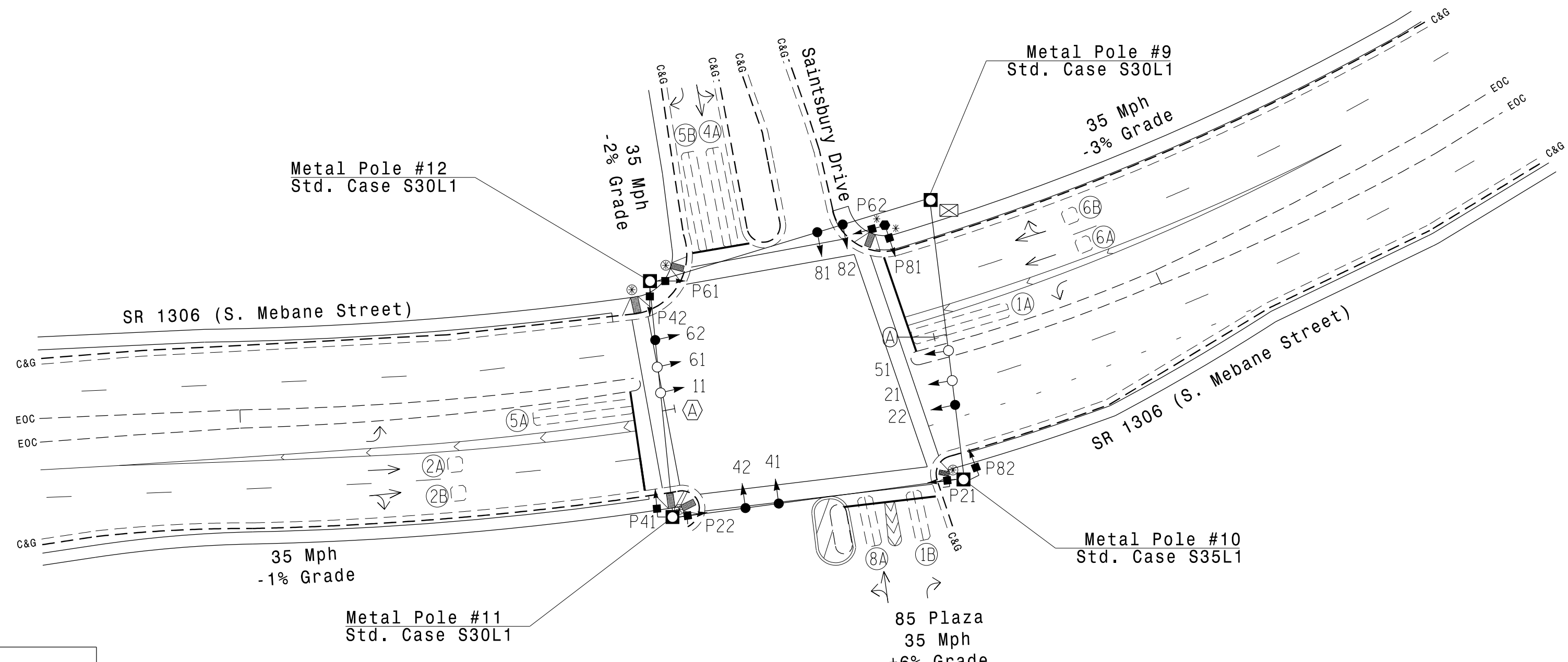
**ASC/3 DETECTOR INSTALLATION CHART**

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	-	1	Yes	-	15	-	S	-	X
1B	6X20	+3	2-4-2	-	6	Yes	-	-	-	S	-	X
2A	6X6	70	EXIST	-	2	Yes	-	15	-	S	-	X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	-	2	Yes	-	15	-	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	-	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X20	+3	2-4-2	-	8	Yes	-	-	-	S	-	X

**5 Phase Fully Actuated (Burlington-Graham 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 22 and 62.
- 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.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

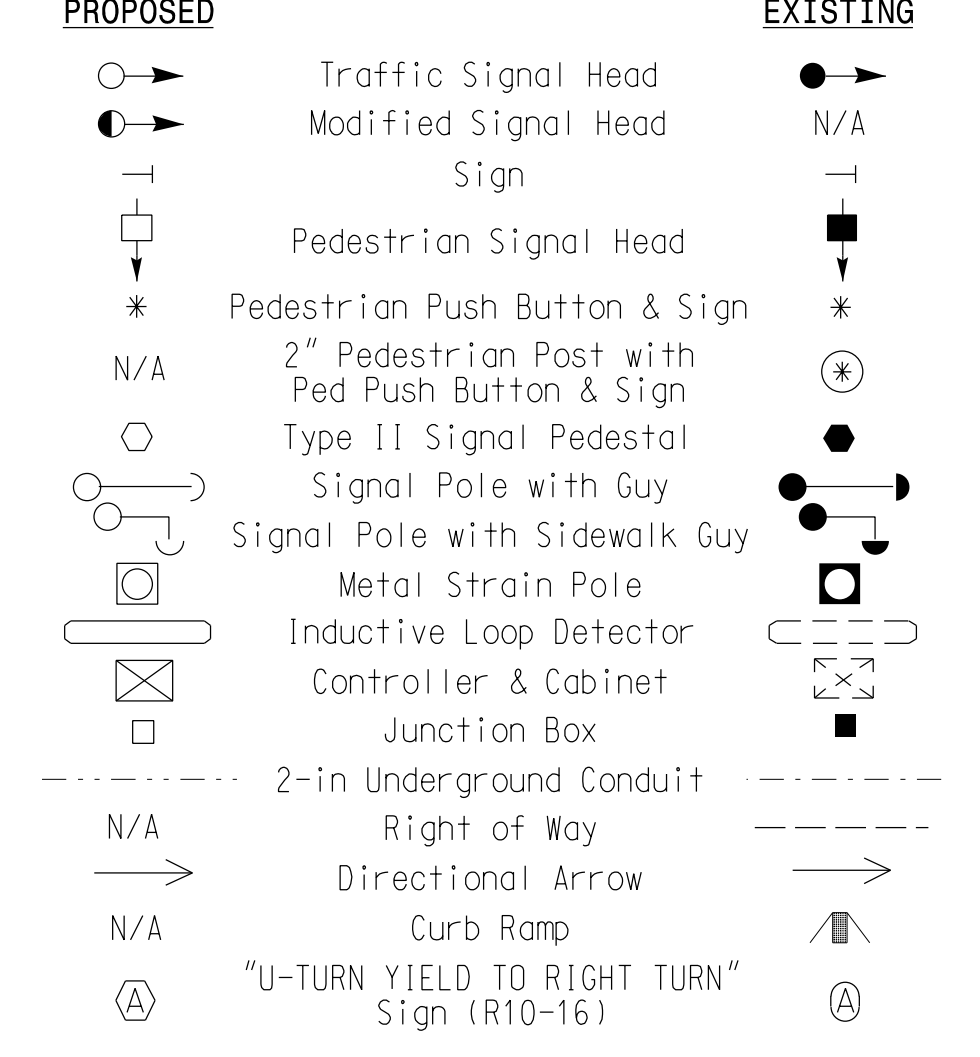


**ASC/3 TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	0	4	4	0	4	4
Ped Clear	0	23	17	0	16	23
Veh. Extension *	3.0	5.0	3.0	3.0	5.0	3.0
Max 1 *	20	45	30	20	45	30
Yellow	3.0	4.1	4.0	3.0	4.1	3.5
Red Clear	2.6	2.2	2.0	3.1	2.2	2.8
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

**LEGEND**



**Signal Upgrade**

Prepared for the Offices of:  
**SR 1306 (S. Mebane Street) at 85 Plaza/Saintsbury Drive**

Division 7 Alamance County Burlington  
 PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion  
 PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

750 N. Greenfield Pkwy, Garner, NC 27529  
 SCALE: 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

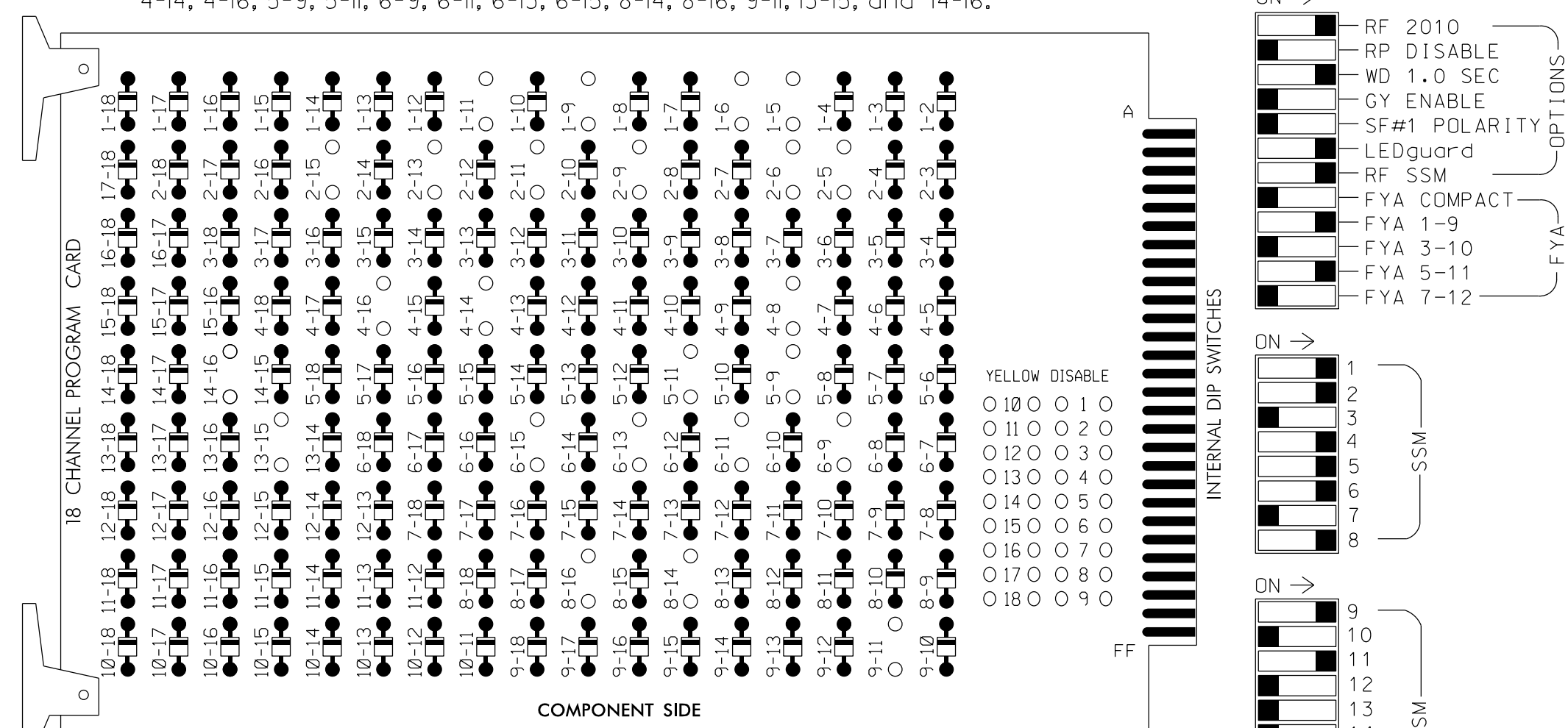
SEAL: PAMELA L. ALEXANDER, PROFESSIONAL ENGINEER, NO. 023489, DATE 6/7/2018

07-JUN-2018 11:15 D:\working\atkins\proj\off\c\cur\100056469 U-6015 B-G S1g Sys\Task 05-11\_Signal\Design\07-2128.dgn ALEX3561 AT LUS310649

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

*(remove jumpers and set switches as shown)*

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



REMOVE JUMPERS AS SHOWN

**NOTES:**

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

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 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

PROJECT REFERENCE NO. U-6015	SHEET NO. Sig. 163.1
---------------------------------	-------------------------

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	P21/P22	NU	41,42	P41/P42	42	51★	61,62	P61/P62	NU	81,82	P81/P82	11★	41	NU	51★
RED	*	128			101			*	134		107							
YELLOW		129			102				135		108							
GREEN		130			103				136		109							
RED ARROW															A121			A114
YELLOW ARROW		126					132								A122			A115
FLASHING YELLOW ARROW															A123			A116
GREEN ARROW	127	127					133	133										
Hand icon				113		104			119		110							
Person icon				115		106			121		112							

NU = Not Used

\* 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)*

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

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

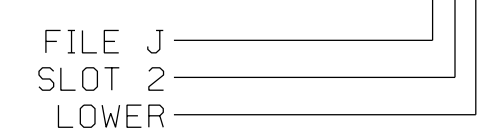
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES			15	S
	-	J4U	48	26	6	YES				S
	1B	TB2-5,6	I2U	39	2	1	YES		15	S
2A	TB2-9,10	I3U	63	32	2	YES				S
2B	TB2-11,12	I3L	76	42	2	YES				S
4A	TB4-9,10	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				S
	5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A	TB3-9,10	J3U	64	36	6	YES				S
6B	TB3-11,12	J3L	77	46	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2	PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4	PED				
P61,P62	TB8-7,9	I13U	68	PED 6	6	PED				
P81,P82	TB8-8,9	I13L	70	PED 8	8	PED				

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

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

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

INPUT FILE POSITION LEGEND: J2L

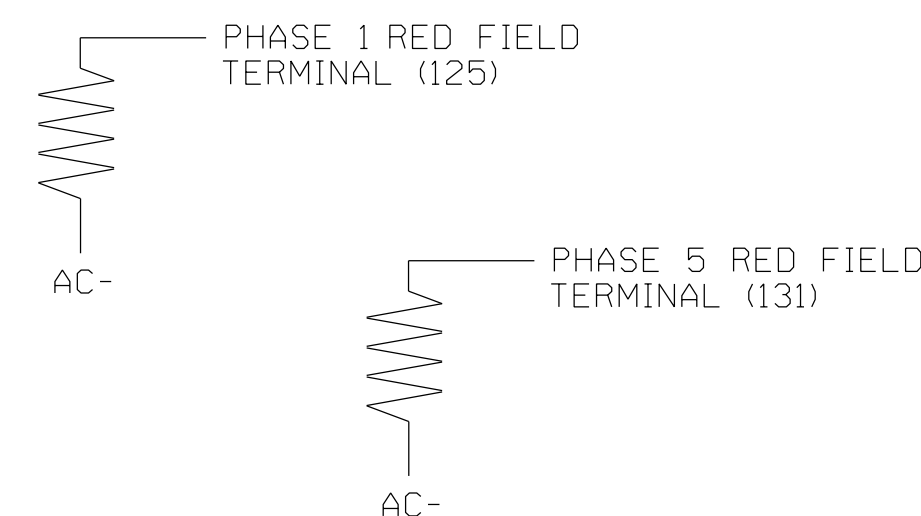


### LOAD RESISTOR INSTALLATION DETAIL

*(install resistors as shown)*

**ACCEPTABLE VALUES**

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

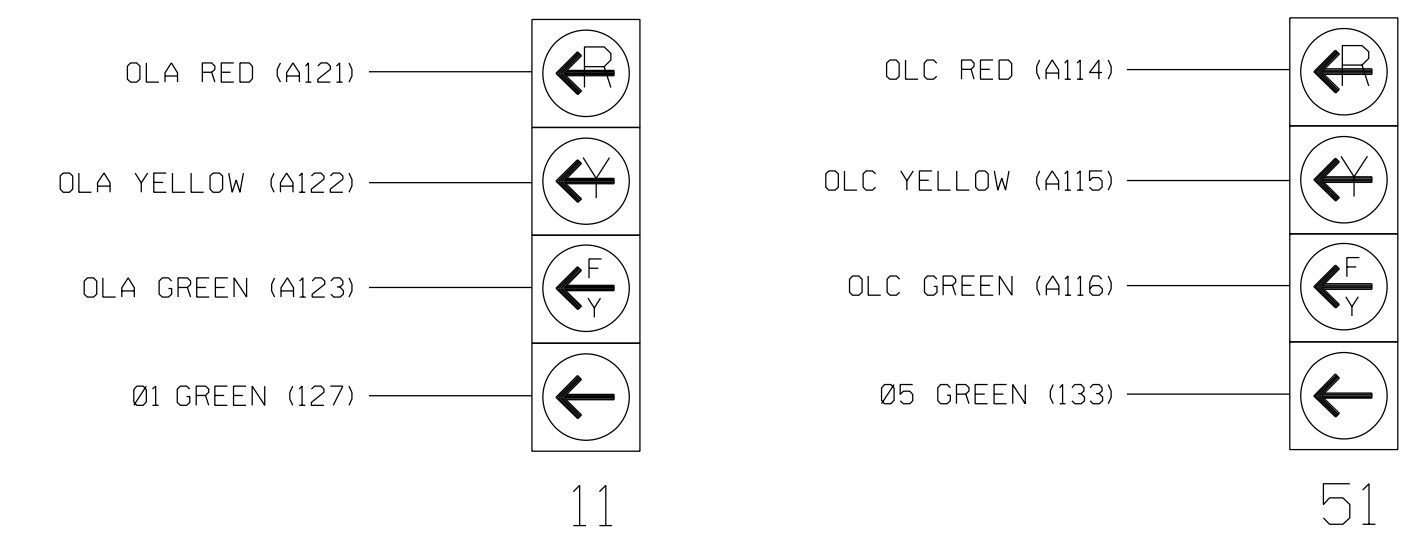


### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

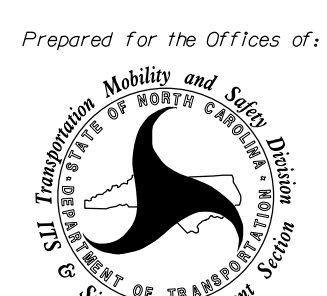
### FYA PPLT SIGNAL WIRING DETAIL

*(wire signal heads as shown)*



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-2128  
 DESIGNED: December 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of:    750 N. Greenfield Pkwy, Garner, NC 27529	SR 1306 (S. Mebane Street) at 85 Plaza/Saintsbury Drive	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489
Division 7 Alamance County Burlington		6/9/2018
PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion		DATE
PREPARED BY: NA Ptak REVIEWED BY: PL Alexander		DATE
REVISIONS INIT. DATE		DATE
SIG. INVENTORY NO. 07-2128		

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP A*

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

```

TMG VEH OVLP...[A] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 1
OPPOSING THROUGH..... PHASE 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0
    
```

Toggle Twice

*OVERLAP C*

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

```

TMG VEH OVLP...[C] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 5
OPPOSING THROUGH..... PHASE 6


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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-2128  
DESIGNED: December 2017  
SEALED: 6/7/2018  
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:  
  
 North Carolina Department of Transportation  
 Statewide Management System

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1306 (S. Mebane Street) at 85 Plaza/Saintsbury Drive	
Division 7	Alamance County
Burlington	
PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL  
NORTH CAROLINA  
PROFESSIONAL  
ENGINEER  
PAMELA L. ALEXANDER  
SEAL  
023489

6/9/2018

PAMELA L. ALEXANDER

DATE

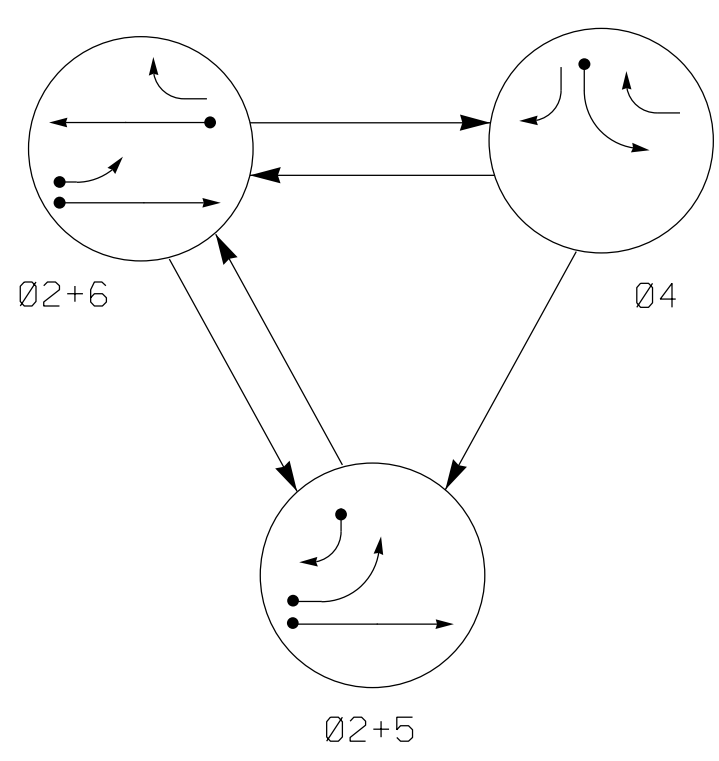
SIG. INVENTORY NO. 07-2128

ATKINS

1616 EAST MILLBROOK ROAD, SUITE 160  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBEES #F-0326

09-JUN-2018 14:16  
D:\Consolidation\Projects\00056469 U-6015 B-G S1g SysTask 05\_11\_Signal\Des\gn\wlr\Inq07-2128.dgn  
ALEX3361 AT LUS24069

**PHASING DIAGRAM**



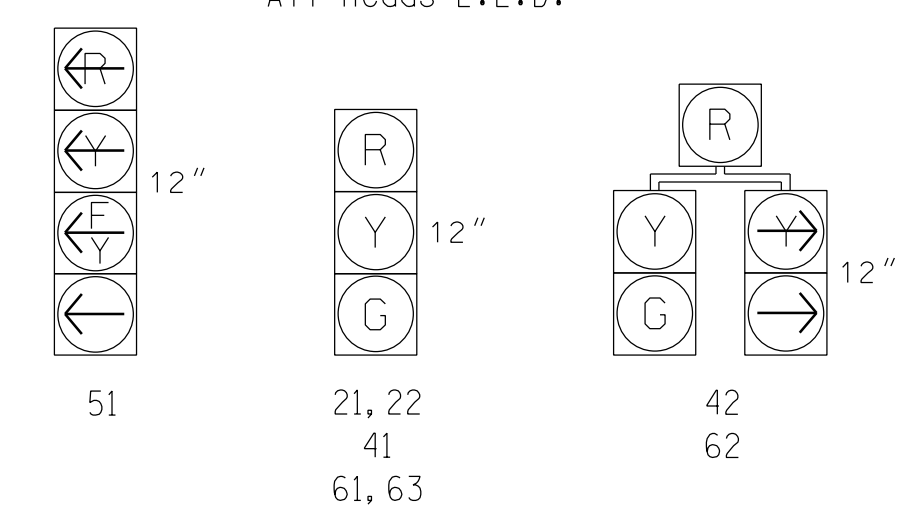
**PHASING DIAGRAM DETECTION LEGEND**

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

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

**SIGNAL FACE I.D.**

All Heads L.E.D.

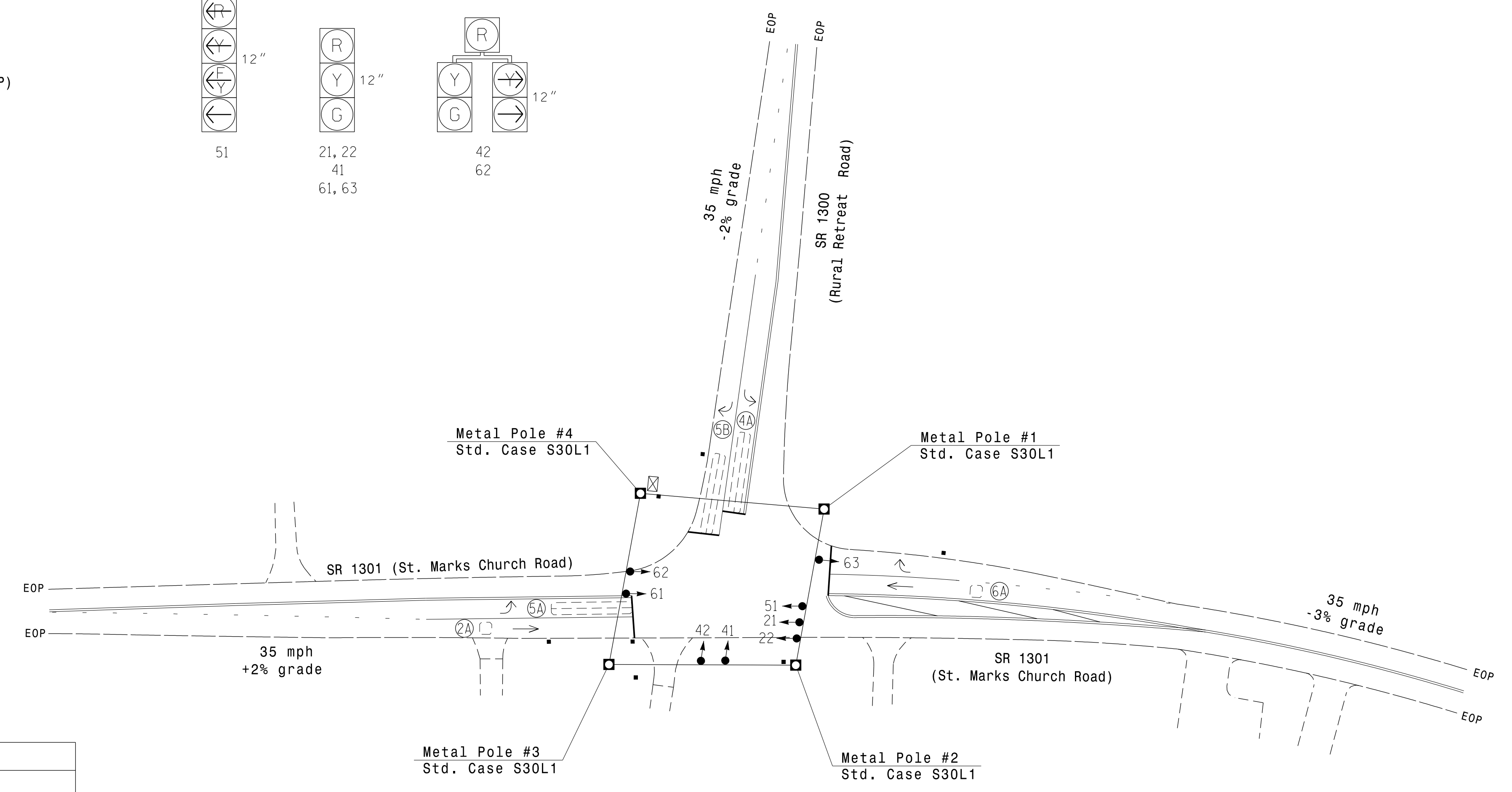


LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X

**3 Phase Fully Actuated (Burlington-Graham 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 so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	2	4	5	6
Min Green *	10	7	7	10
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	2.0	2.0	3.0
Max 1 *	50	30	20	50
Yellow	4.1	3.0	3.0	4.1
Red Clear	1.7	2.1	2.4	1.7
Actuations B4 Add *	-	-	-	-
Seconds/Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
◐→ Modified Signal Head	◐→ N/A
◑→ Sign	◑→ N/A
◒→ Pedestrian Signal Head	◒→ N/A
○→ Signal Pole with Guy	●→ Signal Pole with Sidewalk Guy
◑→ Metal Strain Pole	◑→ Metal Strain Pole
◑→ 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
→	→ Directional Arrow

**Signal Upgrade**

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

	SR 1301 (St. Marks Church Road) at SR 1300 (Rural Retreat Road)		
	Division 7 Alamance County Burlington	PREPARED BY: JA Wiles REVIEWED BY: PL Alexander	
SCALE: 1"=40'	REVISIONS:	INIT. DATE	DATE: 6/7/2018

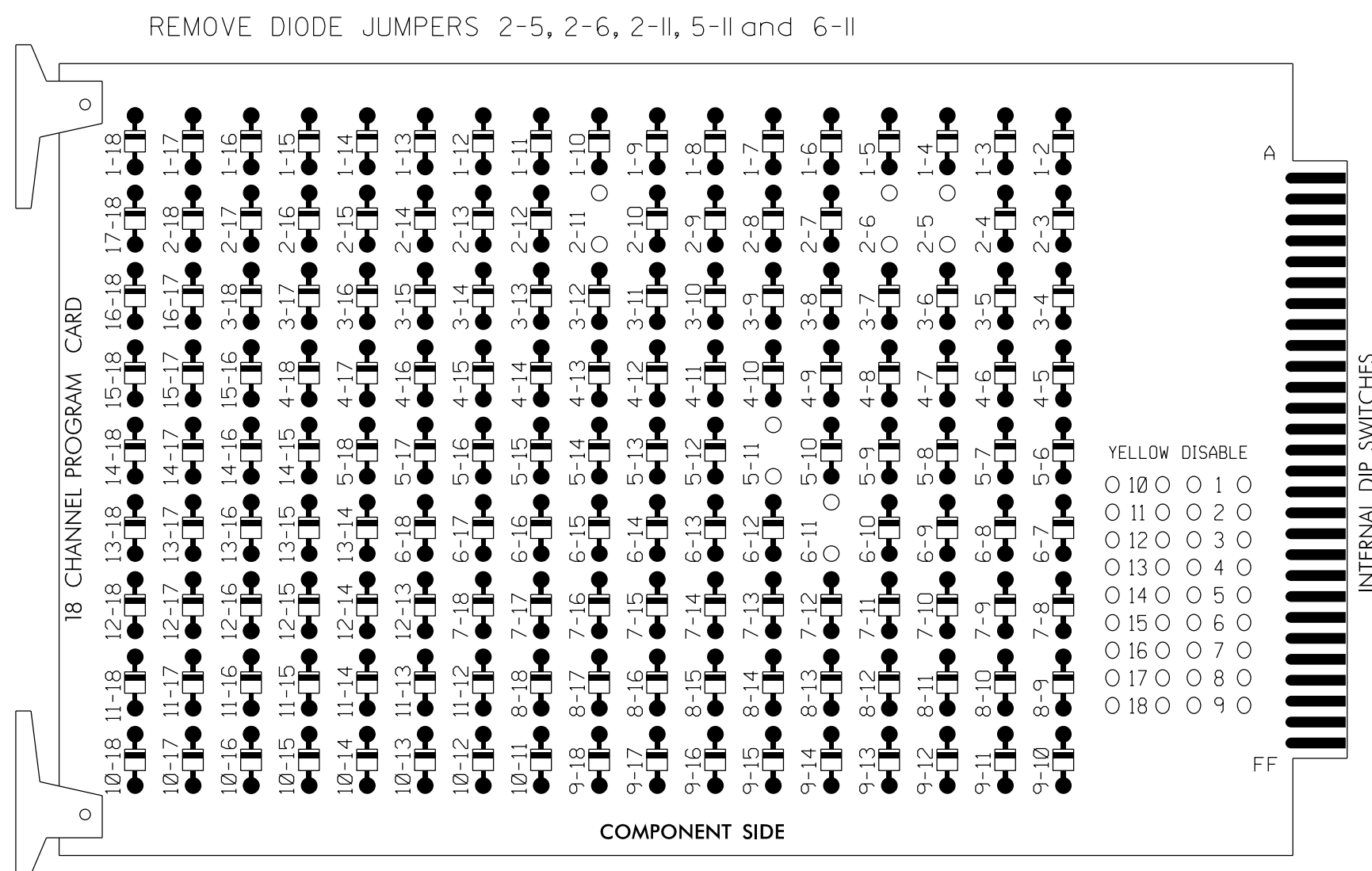
**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326

07-JUN-2018 11:15 C:\Users\raht\OneDrive\Traffic\Curran\00006469 U-6015 B-C 51g Sys\Task 05\_11\_15\Signal\as\00006469-2203.dgn

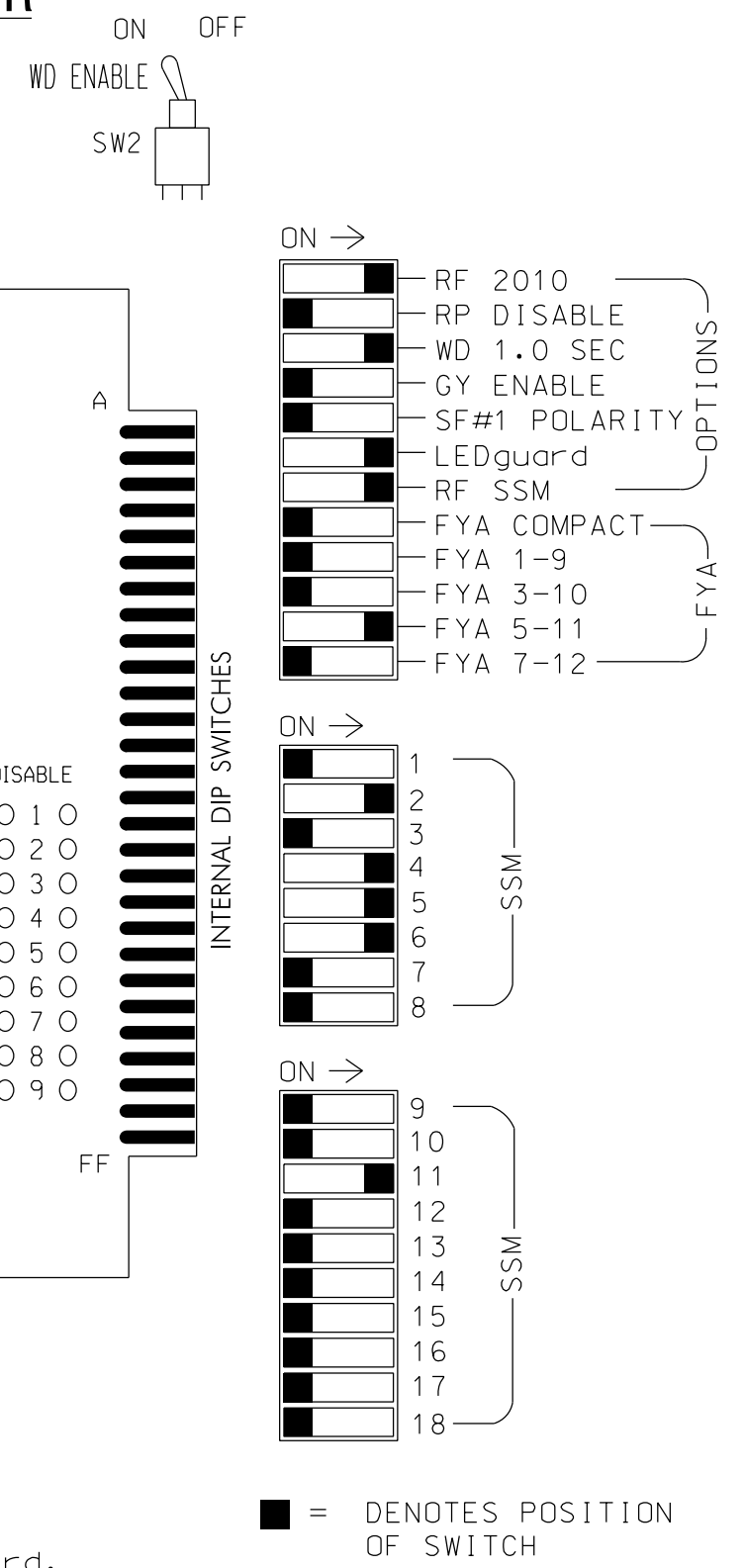


### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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 Burlington-Graham Signal System.

### EQUIPMENT INFORMATION

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

\* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig.164.1

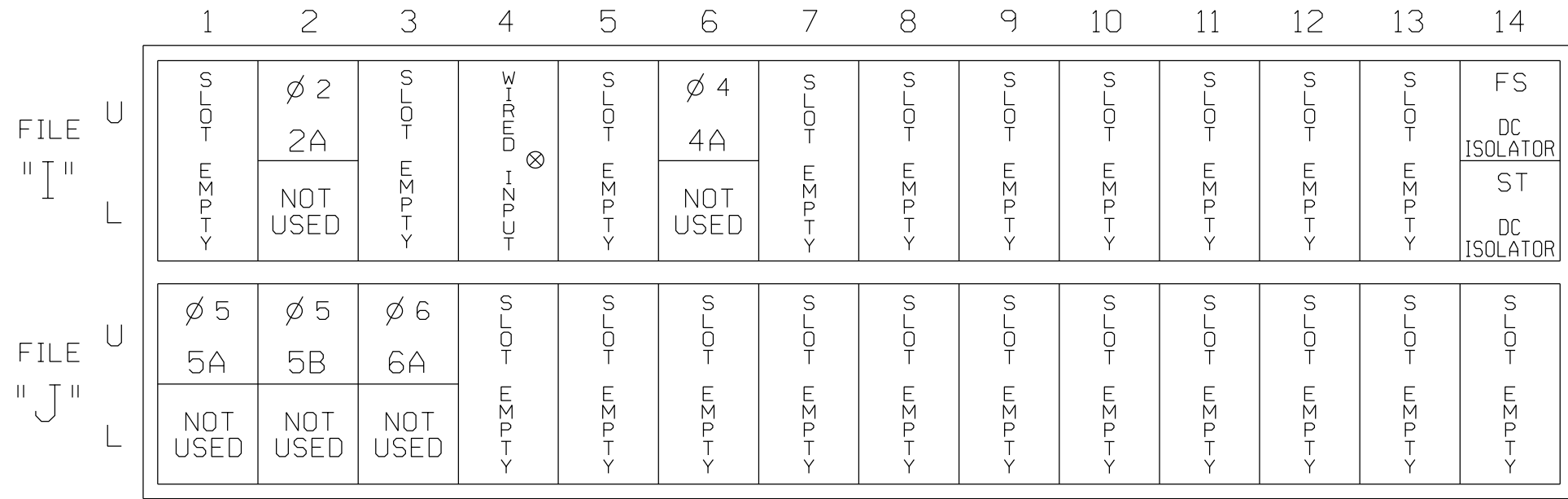
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	42	51	61,62,63	NU	NU	NU	NU	NU	51	NU	NU
RED		128			101			*		134								
YELLOW		129			102					135								
GREEN		130			103					136								
RED ARROW																		A114
YELLOW ARROW					102		132											A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW					103		133	133										

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

### INPUT FILE POSITION LAYOUT

(front view)

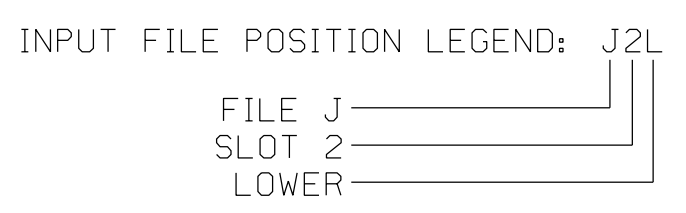


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

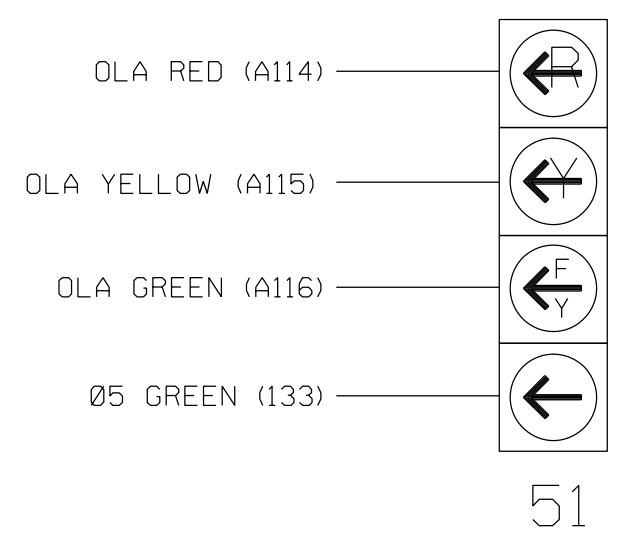
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES			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

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



### FYA SIGNAL WIRING DETAIL

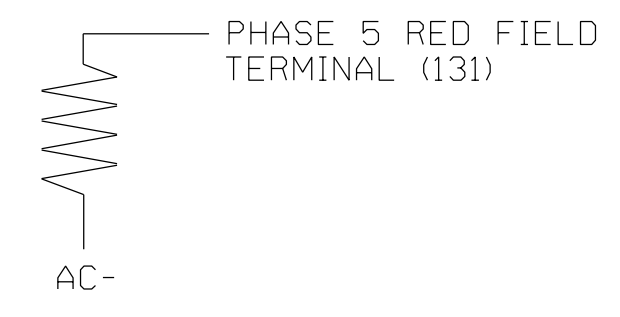
(wire signal head as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	SR 1301 (St. Marks Church Road) at SR 1300 (Rural Retreat Road)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489 6/9/2018 DATE SIG. INVENTORY NO. 07-2203
	Division 7 Alamance County Burlington	PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion PREPARED BY: JA Wiles REVIEWED BY: PL Alexander	
REVISIONS	INIT.	DATE	

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEEES #F-0326

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP C*

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

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

PROTECTED PHASE (LEFT TURN)..... 5  
 PERMISSIVE PHASE (OPPOSING TURN)... 6  
 FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-2203  
 DESIGNED: December 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="font-size: large; font-weight: bold;">SR 1301 (St. Marks Church Road) at SR 1300 (Rural Retreat Road)</p> <p style="font-size: small;">Division 7    Alamance County    Burlington</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: December 2017</td> <td>REVIEWED BY: AM Encarnacion</td> </tr> <tr> <td>PREPARED BY: JA Wiles</td> <td>REVIEWED BY: PL Alexander</td> </tr> </table> <table style="width: 100%; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion	PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander	REVISIONS	INIT.	DATE										<p style="font-size: small; text-align: center;"><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <div style="text-align: center;"> <p style="font-size: x-small;">Seal of Pamela L. Alexander, Professional Engineer, State of North Carolina, License No. 023489</p> </div> <table style="width: 100%; font-size: x-small;"> <tr> <td style="width: 60%;">Prepared by: Pamela Alexander</td> <td style="width: 40%;">DATE: 6/9/2018</td> </tr> <tr> <td> </td> <td> </td> </tr> </table> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-2203</p>	Prepared by: Pamela Alexander	DATE: 6/9/2018		
PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion																					
PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander																					
REVISIONS	INIT.	DATE																				
Prepared by: Pamela Alexander	DATE: 6/9/2018																					

ATKINS

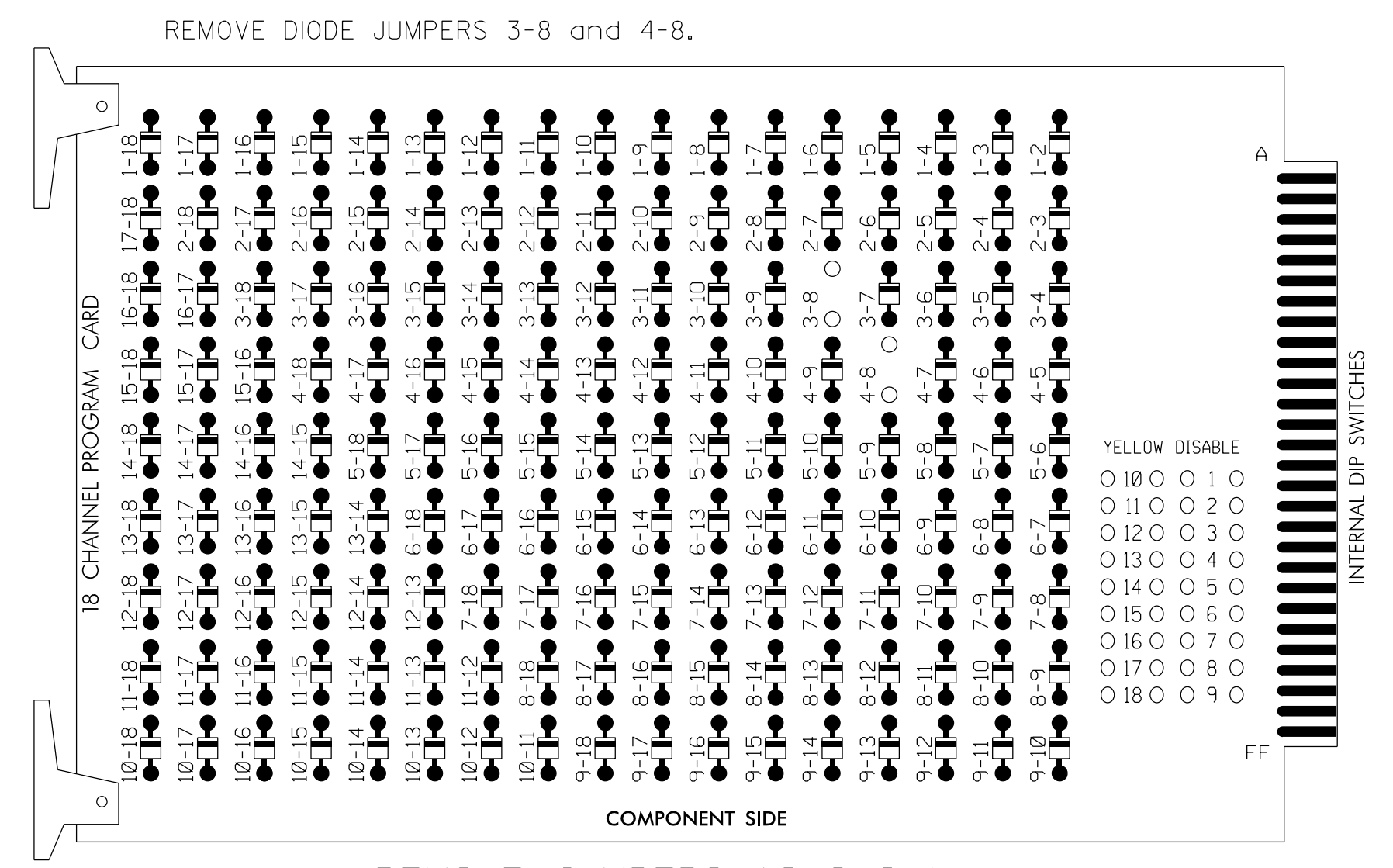
1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888    NCBES #F-0326

09-JUN-2018 14:16  
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 ALX381 AT LUS48649



### 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 phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 6 Green.
- The cabinet and controller are part of the Burlington-Graham Signal System.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	81	41,42	NU	NU	61,62,63	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED				*	101			134			107							
YELLOW					102			135			108							
GREEN					103			136			109							
RED ARROW																		
YELLOW ARROW					117													
GREEN ARROW					118													

NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.

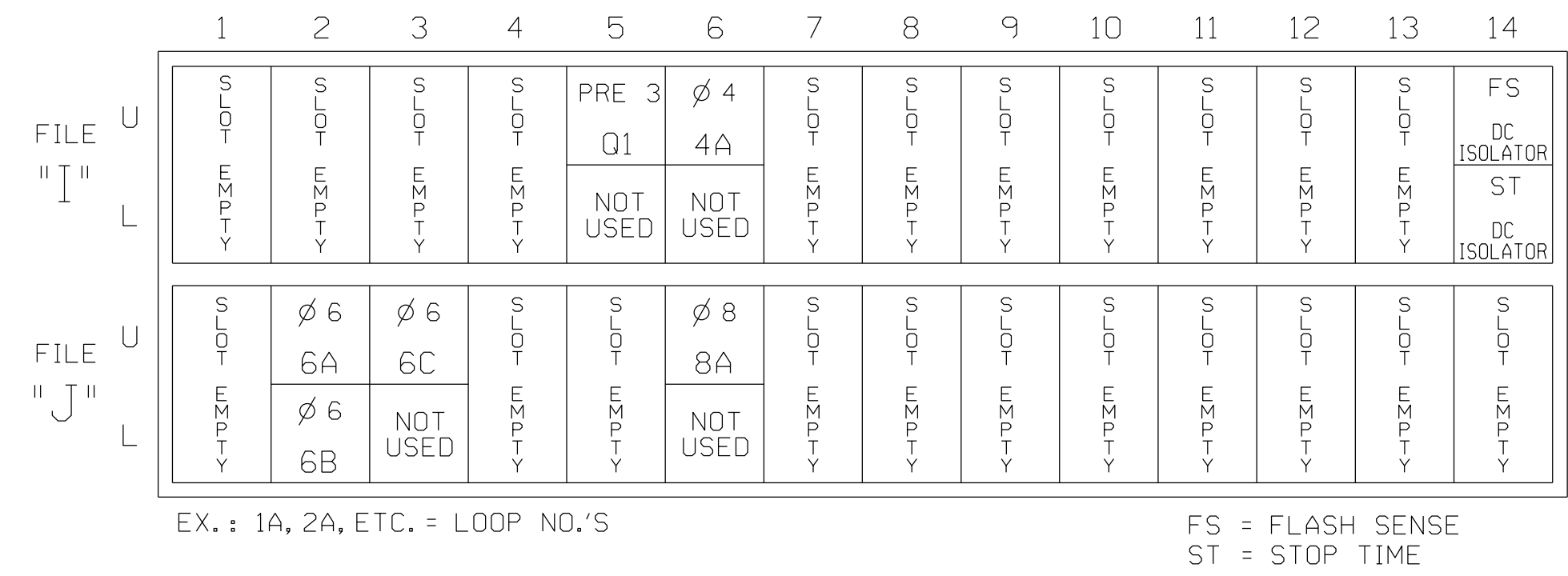
### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S4,S5,S8,S11  
 PHASES USED.....3\*,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* PHASE USED DURING BACKUP PREEMPT ONLY.

### INPUT FILE POSITION LAYOUT

(front view)

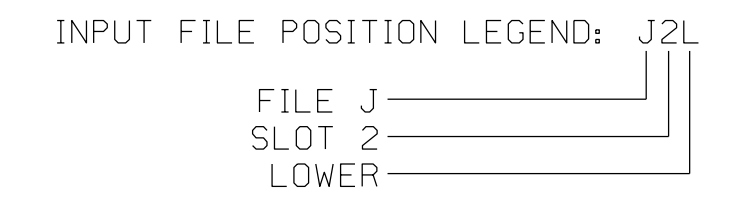


EX. : 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

### 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
** 01	TB4-5,6	I5U	58	3	PRE 3	NO				N
4A	TB4-9,10	I6U	41	4	4	YES		10		S
6A	TB3-5,6	J2U	40	6	6	YES			X	S
6B	TB3-7,8	J2L	44	16	6	YES			X	S
6C	TB3-9,10	J3U	64	6	6	YES			X	S
8A	TB5-9,10	J6U	42	8	8	YES		3		S

\*\* Queue backup detector, see programming on sheet 2.



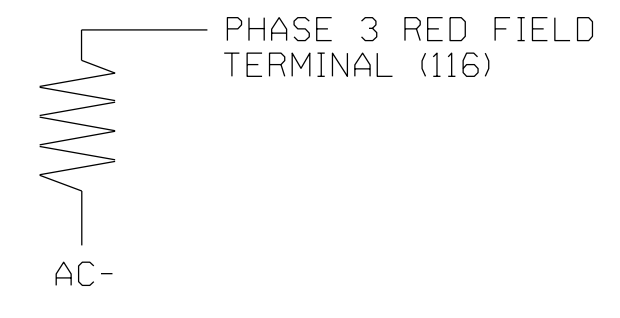
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2204  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED:

### 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)



Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:

DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27519  
 NC License No. C-2213 (919) 650-1038

US 70 (N. Fisher Street) at Fulton Street

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis

PREPARED BY: RD Lawton REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

SEAL

DocuSigned by: Lisa M. Moon 6/13/2018

SIG. INVENTORY NO. 07-2204

13-JUN-2018 17:49 R:\66015\T\off\ck\sign\06sig\m\w\ir\img\07-2204e.dgn KANDERSON AT CHA-KANDERSON

## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR BACKUP PREEMPT AND PREEMPT ONLY PHASE OMIT

*(program controller as shown)*

### ECONOLITE ASC/3-2070 BACKUP PREEMPT PROGRAMMING DETAIL

*(program controller as shown)*

- From Main Menu select 4. PREEMPTOR/TSP
- From PREEMTOR/TSP/SCP Submenu select 1. PREEMPT PLAN 1-10

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #3.

```

PREEMPT PLAN [ 3]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . . X . . . . X . . . . .
DWEL PED . . . . .
DWEL OLP . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . . . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .
    
```

```

ENABLE... YESIPMT OVRIDE. IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1I25.5I25.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5I25.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 10I 0.0I 35I25.5I25.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
    
```

PHASES	1	2	3	4	5	6	7	8
PR RTN%	0	0	0	0	0	0	0	0
PHASES	9	10	11	12	13	14	15	16
PR RTN%	0	0	0	0	0	0	0	0

- From Main Menu select 1. CONFIGURATION
- From CONFIGURATION Submenu select 8. LOGIC PROCESSOR
- From LOGIC PROCESSOR Submenu select 2. LOGIC STATEMENTS

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#: 1 COPY FROM: 1 ACTIVE: M (T/F)
IF DET 3 IS ON
THEN LP DELAY FOR 5.0 SECONDS
PMT CALL PMT SEQ 3 ON
ELSE
    
```

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#: 2 COPY FROM: 2 ACTIVE: M (T/F)
IF PMT PREEMPT ACTIVE 3 IS OFF
THEN CTR OMIT PHASE 3 ON
ELSE
    
```

LOGIC FOR OMITTING PHASE 3 AT STARTUP AND/OR WHEN NOT IN PREEMPT

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2204  
DESIGNED: NOVEMBER 2017  
SEALED: 06-13-2018  
REVISED:

- From LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

ENABLE LOGIC PROCESSOR STATEMENTS 1 AND 2 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```

LOGIC STATEMENT CONTROL
1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15 E E . . . . .
LP 16-30 . . . . .
LP 31-45 . . . . .
LP 46-60 . . . . .
LP 61-75 . . . . .
LP 76-90 . . . . .
    
```

END PROGRAMMING

### ECONOLITE ASC/3-2070 PREEMPT FILTERING PROGRAMMING DETAIL

*(program controller as shown)*

- From Main Menu select 4. PREEMTOR/TSP
- From PREEMPT/TSP/SCP Submenu select 2. ENABLE PREEMPT FILTERING & TSP/SCP

```

ENABLE PREEMPT FILTERING & TSP/SCP
FILTERED SOLID PULSING
INPUT 1 ...BYPASSED...BYPASSED..
2 ...BYPASSED...BYPASSED..
3 ..PREEMPT 3. ...BYPASSED..
4 ..PREEMPT 4. ...BYPASSED..
5 ..PREEMPT 5. ...BYPASSED..
6 ..PREEMPT 6. ...BYPASSED..
7 ...BYPASSED...BYPASSED..
8 ...BYPASSED...BYPASSED..
9 ...BYPASSED...BYPASSED..
10 ...BYPASSED...BYPASSED..
    
```


Electrical Detail - Sheet 2 of 2

<p><b>ELECTRICAL AND PROGRAMMING DETAILS FOR:</b></p> <p style="font-size: small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27519 NC License No. C-2213 (919) 650-1038</p>	<p><b>US 70 (N. Fisher Street) at Fulton Street</b></p> <p>Division 7 Alamance County Burlington</p> <p>PLAN DATE: November 2017 REVIEWED BY: AJ Davis</p> <p>PREPARED BY: RD Lawton REVIEWED BY: LM Moon</p>	<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p> <p>DocuSigned by: <i>Lisa M. Moon</i> 6/13/2018 SIC:ESMBD300421 DATE</p>								
<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DESCRIPTION	INIT.	DATE						
NO.	DESCRIPTION	INIT.	DATE							
<p>SIG. INVENTORY NO. 07-2204</p>										

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18-JUN-2018 15:12  
 \*\*\*work in progress\*\*\*  
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 P183836 - AT US40478

Signal Upgrade

 Prepared for the Offices of: TRANSPORTATION DEPARTMENT OF NORTH CAROLINA STATE OF NORTH CAROLINA Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1158 (Huffman Mill Road)	
	at Alamance Regional Medical Center Entrance (Future)	
	Division 7	Alamance County
	Burlington	
PLAN DATE:	June 2018	REVIEWED BY:
PREPARED BY:	NAP	REVIEWED BY:
		AME
SCALE	NTS	
REVISIONS	INIT.	DATE

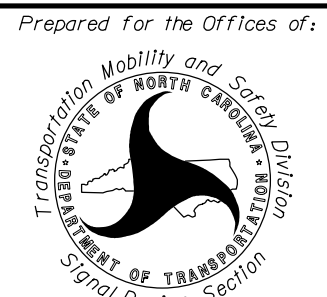
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SIGNATURE _____ DATE _____
SIG. INVENTORY NO. 07-XXXX

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEE #F-0326

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 P183836 AT US40718


**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEE #F-0326

Signal Upgrade		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
 <small>Prepared for the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION DEPARTMENT OF TRANSPORTATION STATE OF NORTH CAROLINA Signal Design Section</small> <small>750 N. Greenfield Pkwy, Garner, NC 27529</small>	SR 1213 (Grand Oaks Blvd) at Alamance Regional Medical Center Entrance (Future)		SEAL
	Division 7 Alamance County Burlington		
	PLAN DATE: June 2018	REVIEWED BY: MBT	
	PREPARED BY: NAP	REVIEWED BY: AME	
SCALE	NTS	REVISIONS	INIT. DATE
		SIGNATURE DATE	
		SIG. INVENTORY NO. 07-XXXX	

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 P183836 AT US40718

Signal Upgrade

 <small>750 N. Greenfield Pkwy, Garner, NC 27529</small>	Prepared for the Offices of: <b>US 70 (S. Church Street/ Burlington Road) at Ashley Woods Drive</b>		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
	Division 7    Alamance County    Burlington		
	PLAN DATE:    June 2018	REVIEWED BY:    MBT	
	PREPARED BY:    NAP	REVIEWED BY:    AME	
SCALE <b>NTS</b>	REVISIONS	INIT.    DATE	SEAL
		SIGNATURE    DATE	SIG. INVENTORY NO.    07-XXXX

**ATKINS**    1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888    NCBEES #F-0326



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 P183636 AT US40718

Signal Upgrade



750 N. Greenfield Pkwy, Garner, NC 27529

NC 87-100 (W. Webb Avenue)  
 at  
 SR 1515 (Flora Avenue)  
 Division 7 Alamance County Burlington  
 PLAN DATE: June 2018 REVIEWED BY: MBT  
 PREPARED BY: NAP REVIEWED BY: AME

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

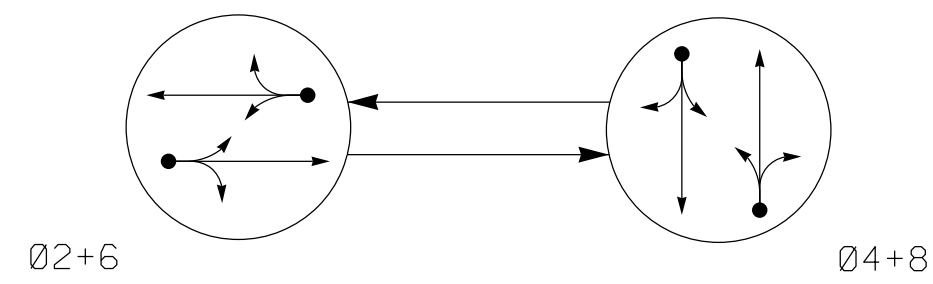
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SIG. INVENTORY NO. 07-XXXX

**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBEE #F-0326

SCALE  
NTS

**PHASING DIAGRAM**



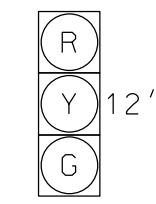
**PHASING DIAGRAM DETECTION LEGEND**

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

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.



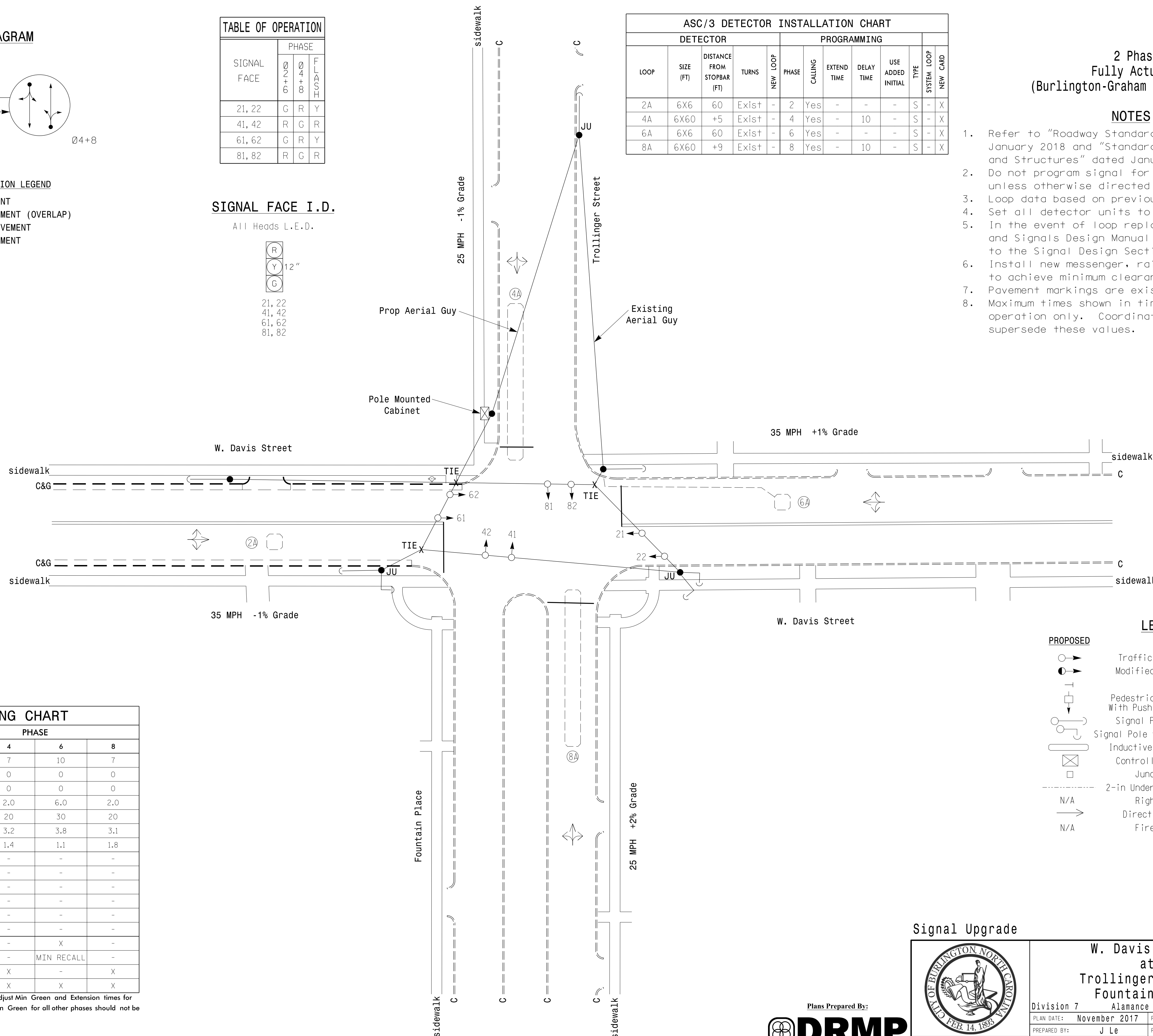
21, 22  
41, 42  
61, 62  
81, 82

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
2A	6X6	60	Exist	-	2	Yes	-	-	-	S	X
4A	6X60	+5	Exist	-	4	Yes	-	10	-	S	X
6A	6X6	60	Exist	-	6	Yes	-	-	-	S	X
8A	6X60	+9	Exist	-	8	Yes	-	10	-	S	X

**2 Phase Fully Actuated (Burlington-Graham 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. Loop data based on previous plan and field observations.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Install new messenger, raise and tighten existing messenger to achieve minimum clearance for the new signal heads.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	6.0	2.0
Max 1 *	30	20	30	20
Yellow	3.9	3.2	3.8	3.1
Red Clear	1.2	1.4	1.1	1.8
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

PROPOSED	LEGEND	EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
◑→	Sign	N/A
◒→	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	→
N/A	Fire Hydrant	⊕

**Signal Upgrade**

DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2213 (919) 650-1038

**W. Davis Street at Trollingler Street/ Fountain Place**

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis

PREPARED BY: J Le REVIEWED BY: LM Moon

SEAL

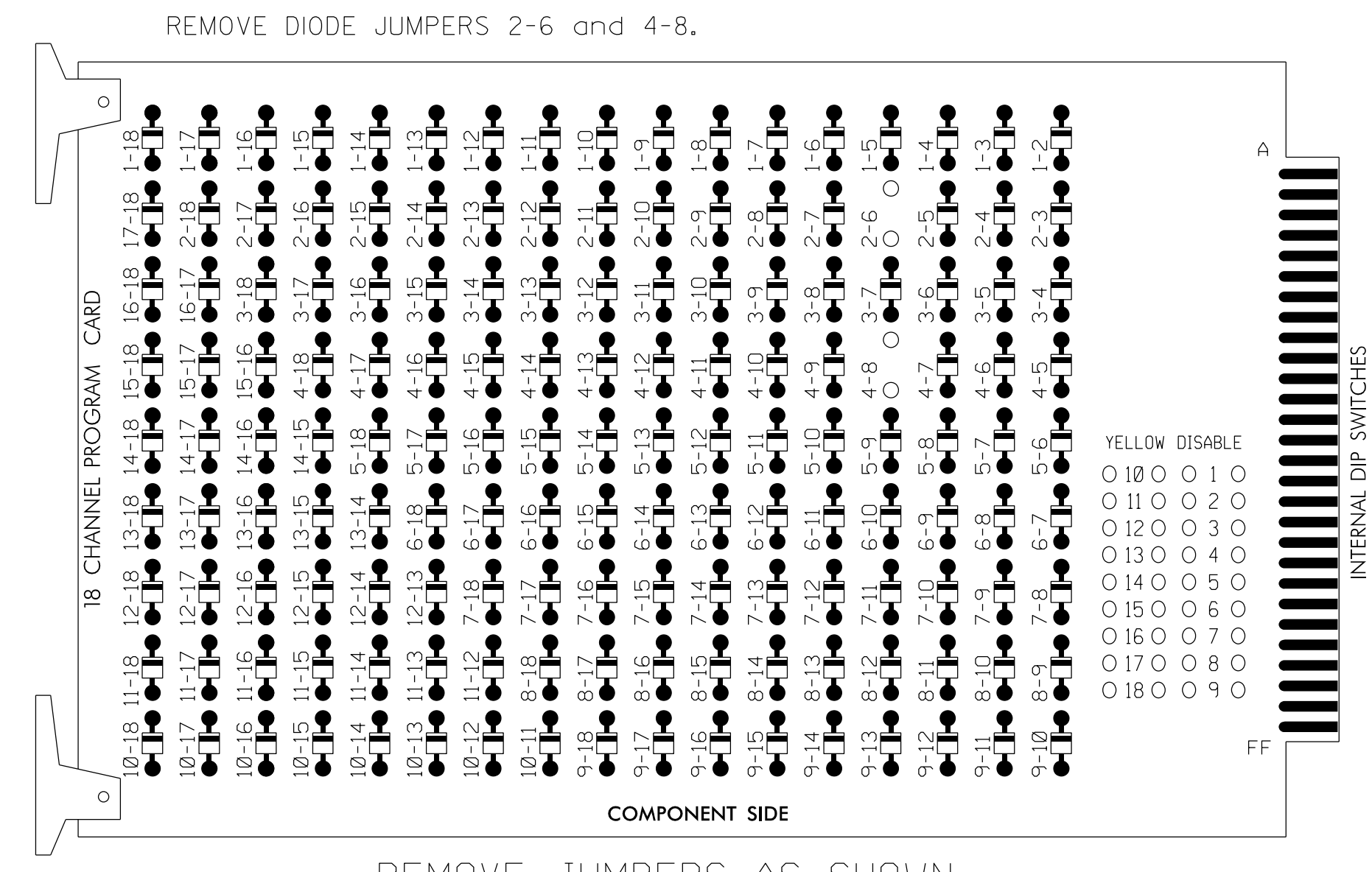
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Lisa M. Moon 6/13/2018

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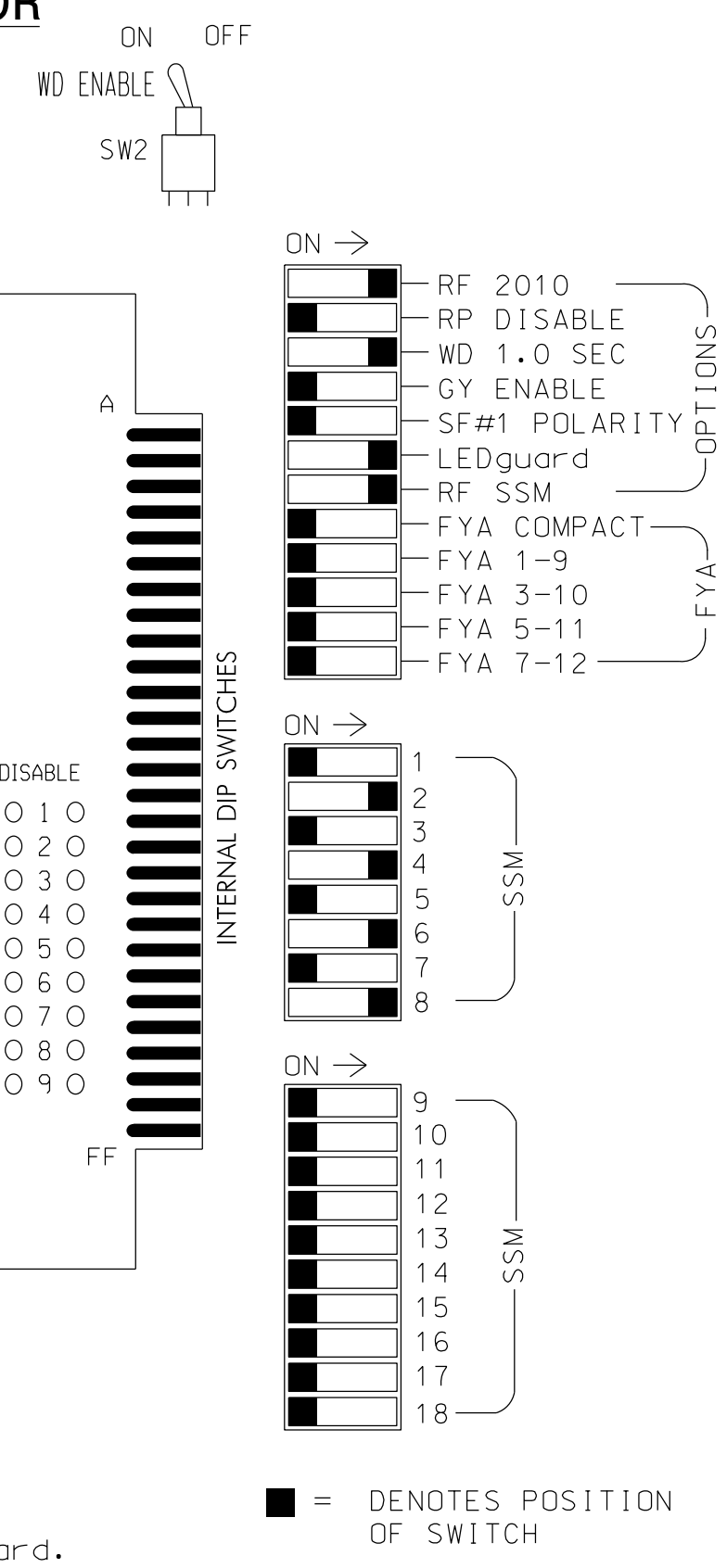
### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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 phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Burlington-Graham Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....336  
 SOFTWARE.....ECONDLITE ASC/3-2070  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S5,S8,S11  
 PHASES USED.....2,4,6,8  
 OVERLAPS.....NONE

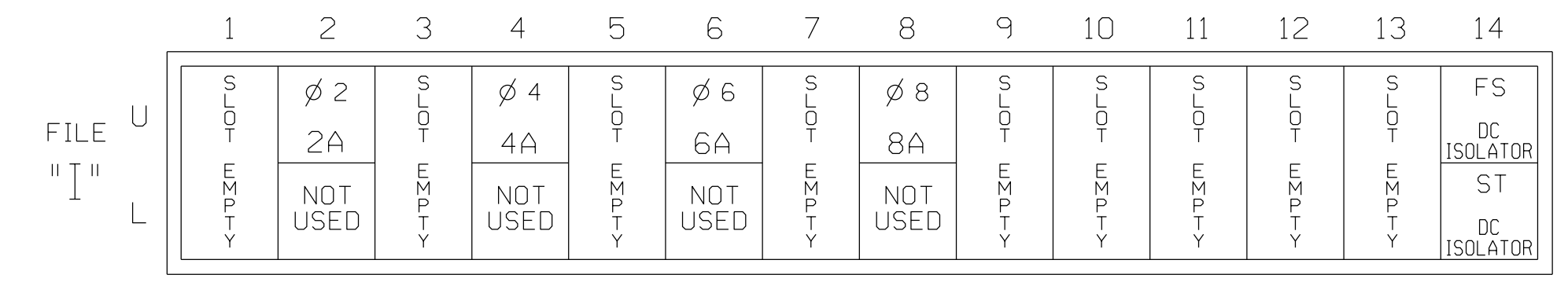
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



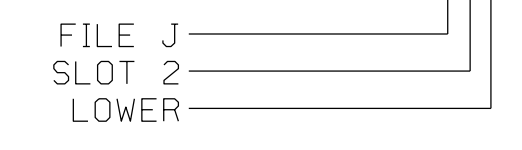
EX.: 1A, 2A, ETC. = LOOP NO.'S

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
2A	TB21-3,4	12U	39	2	2	YES				S
4A	TB21-7,8	14U	41	4	4	YES		10		S
6A	TB21-11,12	16U	40	6	6	YES				S
8A	TB22-1,2	18U	42	8	8	YES		10		S

INPUT FILE POSITION LEGEND: J2L

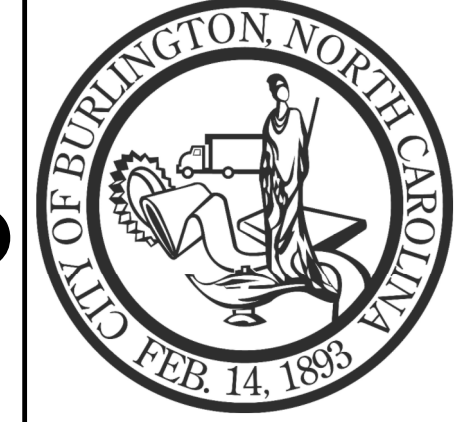


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: B0001  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2108  
 REVISED: N/A

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Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:



W. Davis Street  
 at  
 Trollinger Street/  
 Fountain Place

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

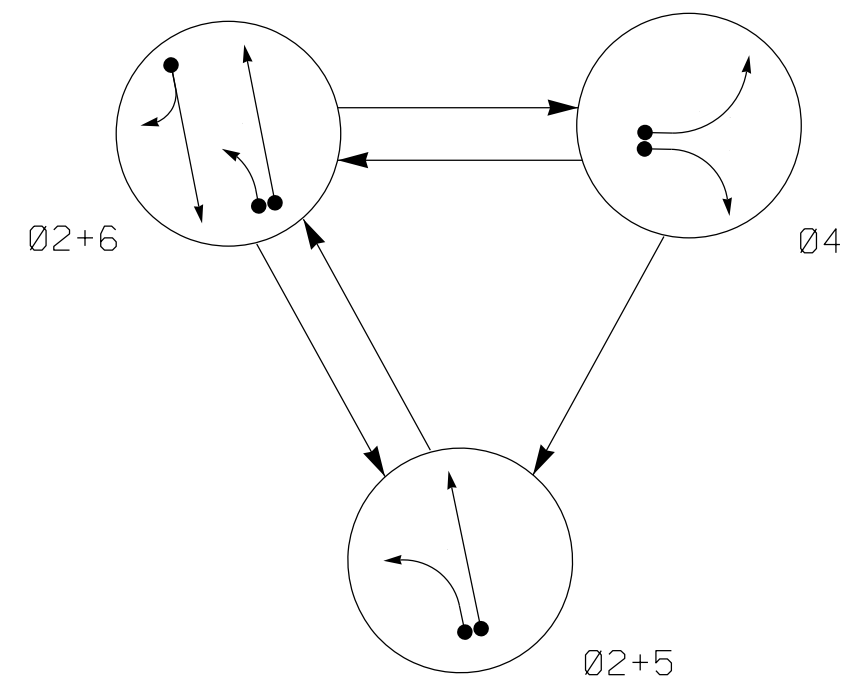
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022516  
 LISA M. MOON

DocuSigned by:  
 Lisa M. Moon 6/13/2018

SIG. INVENTORY NO. B0001

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

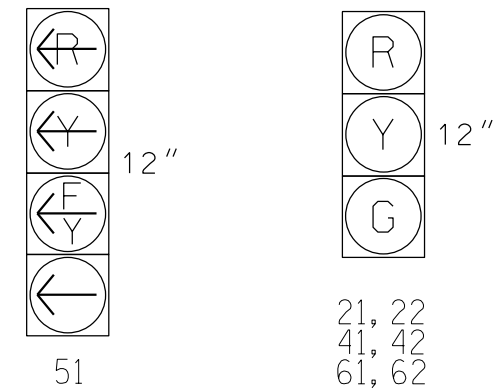
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- - - UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



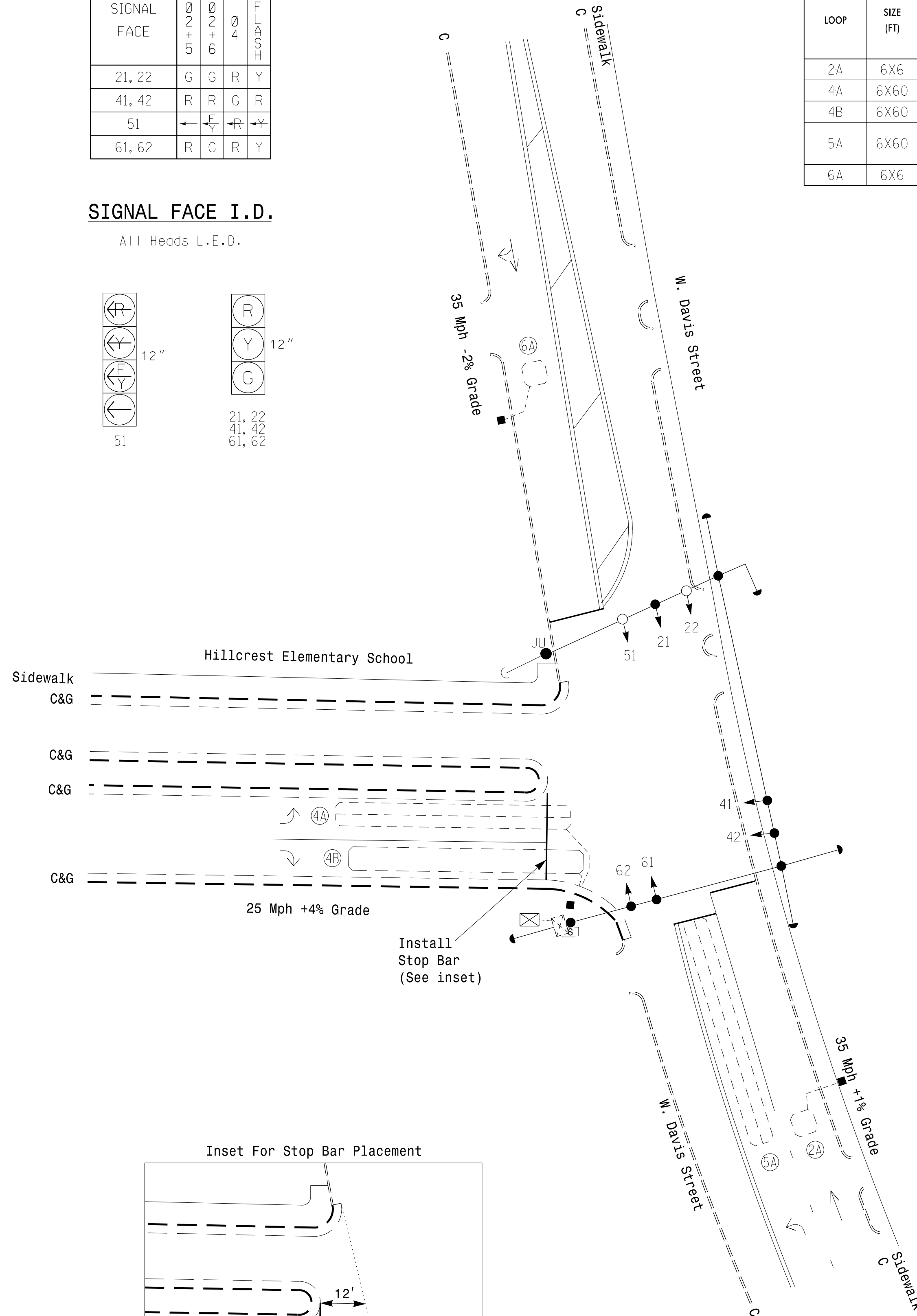
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A	6X6	60	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X60	+5	EXIST	-	4	Yes	-	10	-	S	-	X
5A	6X60	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	60	EXIST	-	2	Yes	-	-	-	S	-	X
					6	Yes	-	-	-	S	-	X

**3 Phase Fully Actuated (Burlington-Graham Signal System)**

**NOTES**

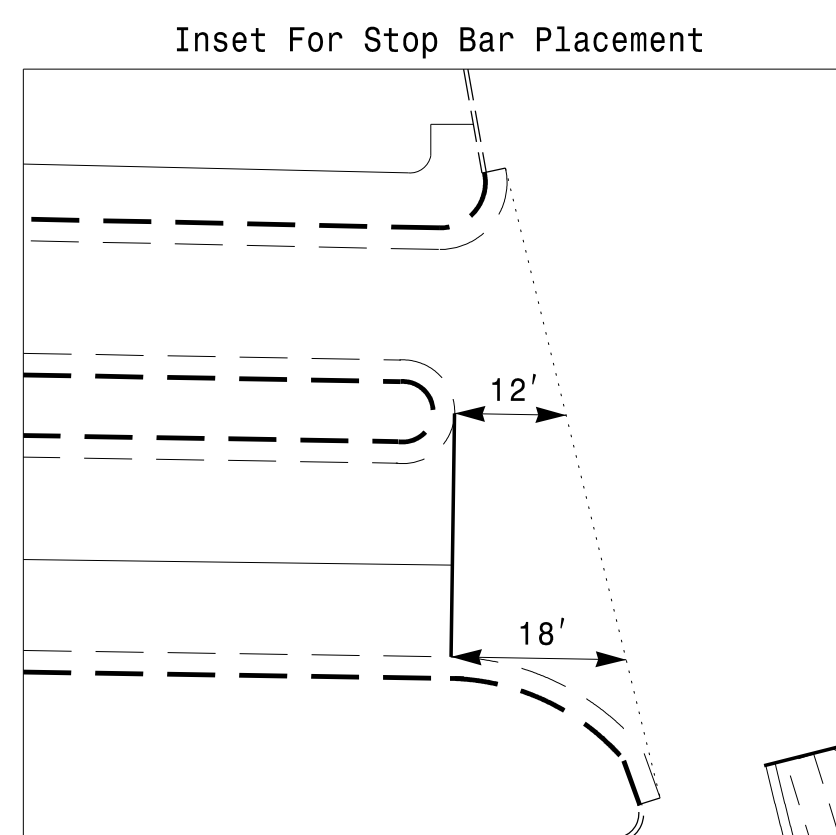
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Reposition signal head 21 as shown, maintaining 8' minimum separation between heads.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing except where noted on 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 *	10	7	7	10
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	4.0	2.0	1.0	4.0
Max 1 *	40	35	30	40
Yellow	4.0	2.0	3.0	4.0
Red Clear	1.5	1.6	1.9	1.5
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	VEH RECALL	-	-	VEH RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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



**LEGEND**

- | PROPOSED   | EXISTING   |
|--|--|
| ○ → Traffic Signal Head                            | ● → N/A  |
| ○ → Modified Signal Head                           | N/A  |
| — Sign   | — Sign   |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → Pedestrian Signal Head With Push Button & Sign |
| ○ → Signal Pole with Guy                           | ○ → Signal Pole with Guy                           |
| ○ → Signal Pole with Sidewalk Guy                  | ○ → Signal Pole with Sidewalk Guy                  |
| ⊠ → Inductive Loop Detector                        | ⊠ → Inductive Loop Detector                        |
| ⊠ → Controller & Cabinet                           | ⊠ → Junction Box                                   |
| □ → Junction Box                                   | □ → Junction Box                                   |
| - - - 2-in Underground Conduit                     | - - - Right of Way                                 |
| N/A → Directional Arrow                            | → Directional Arrow                                |
| [S] Terminal Splice Box                            | [S] Terminal Splice Box                            |

**Signal Upgrade**

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

	<b>W. Davis Street at Hillcrest Elementary School</b>			
	Division 7 Alamance County Burlington PLAN DATE: December 2017 PREPARED BY: J Le	REVIEWED BY: AJ Davis REVIEWED BY: LM Moon		REVISIONS INIT. DATE
	SCALE: 1" = 20' 			SIGNATURE: Lisa M. Moon DATE: 6/13/2018 SIG. INVENTORY NO. B0002

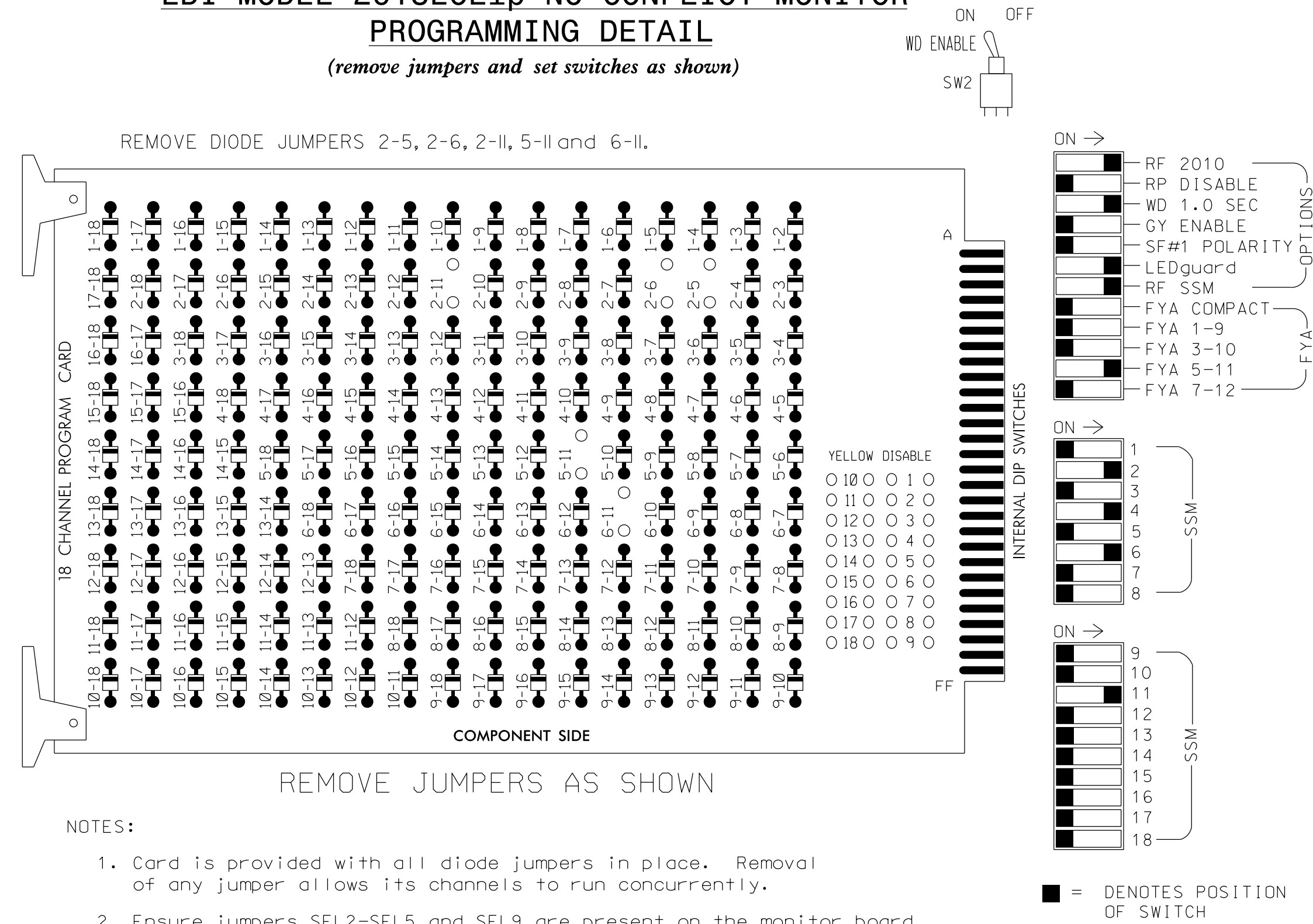
Plans Prepared By:

DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2213 (919) 650-1038

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 KANDERSON AT CHA-Y-ANDERSON

### 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 Burlington-Graham 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	
CNU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51★	61,62	NU	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																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

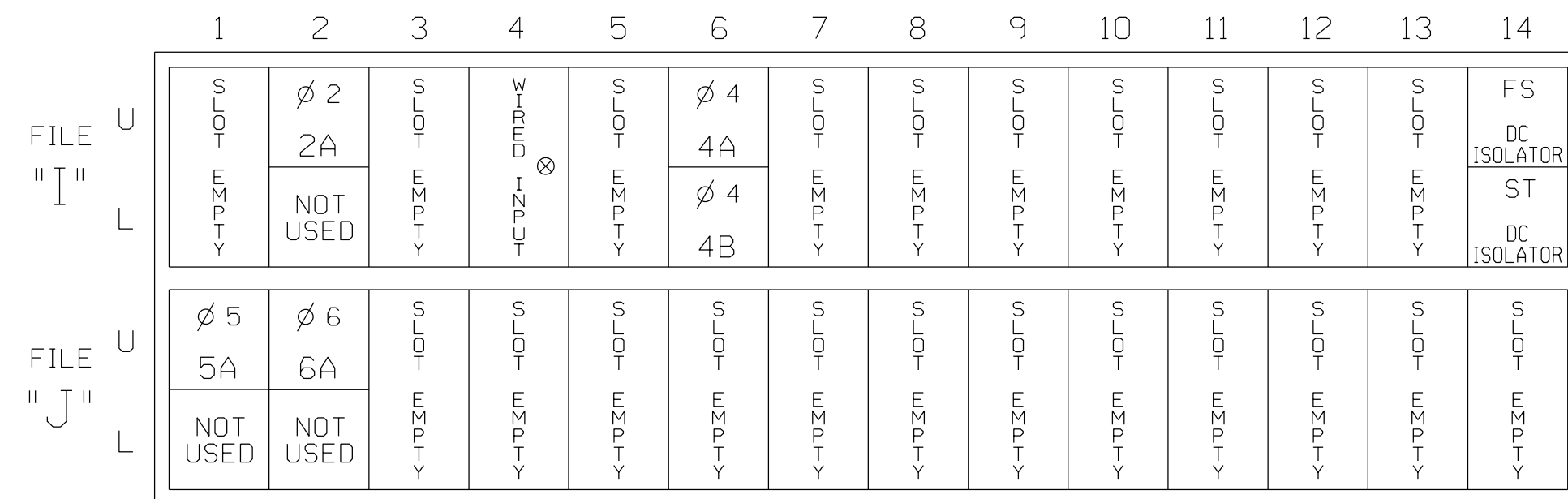
### EQUIPMENT INFORMATION

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

\* See overlap programming detail on sheet 2

### INPUT FILE POSITION LAYOUT

(front view)

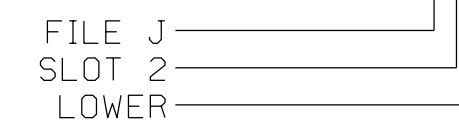


### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S

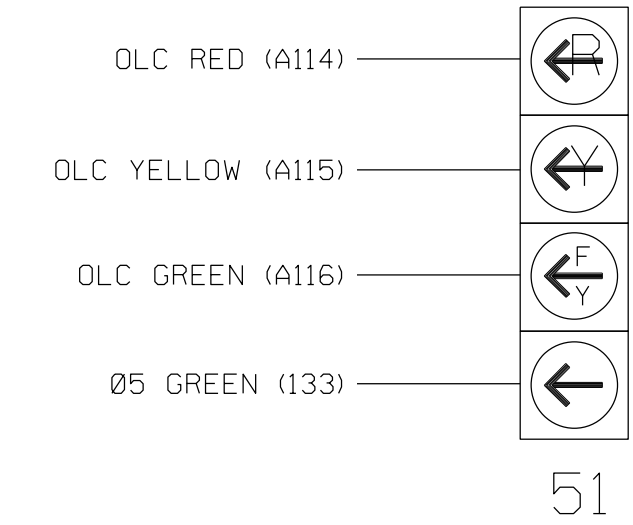
<sup>1</sup>Add jumper from J1-W to 14-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

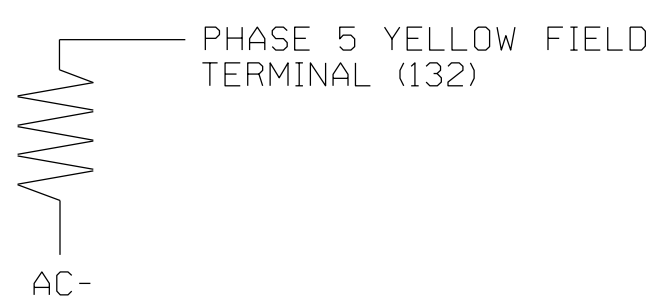
(wire signal head as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



W. Davis Street  
at  
Hillcrest Elementary School

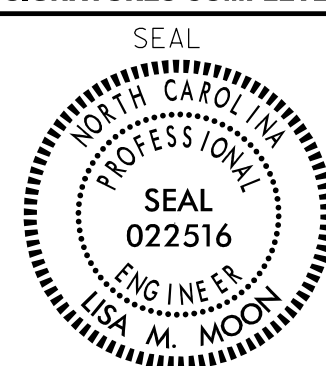
Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 6/13/2018

SIG. INVENTORY NO. B0002

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP C*

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

```

TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED LEFT TURN.... PHASE 5
OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

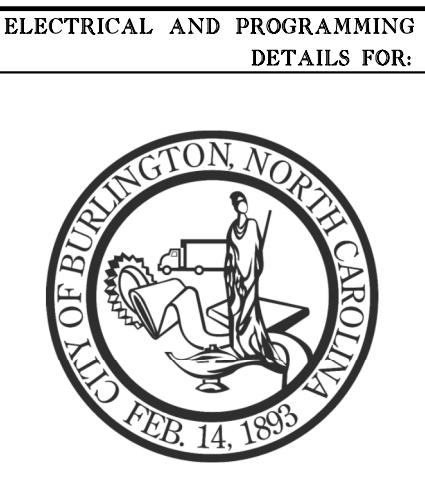
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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: B0002  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-JUN-2018 17:52  
 R:\66015\Prof\esignals\des\gn\wlr\ing\B0002e.dgn  
 KANDERSON AT CHA-KANDERSON

Electrical Detail - Sheet 2 of 2



<b>W. Davis Street at Hillcrest Elementary School</b>	
Division 7	Alamance County Burlington
PLAN DATE: December 2017	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA  
PROFESSIONAL  
ENGINEER

SEAL  
022516

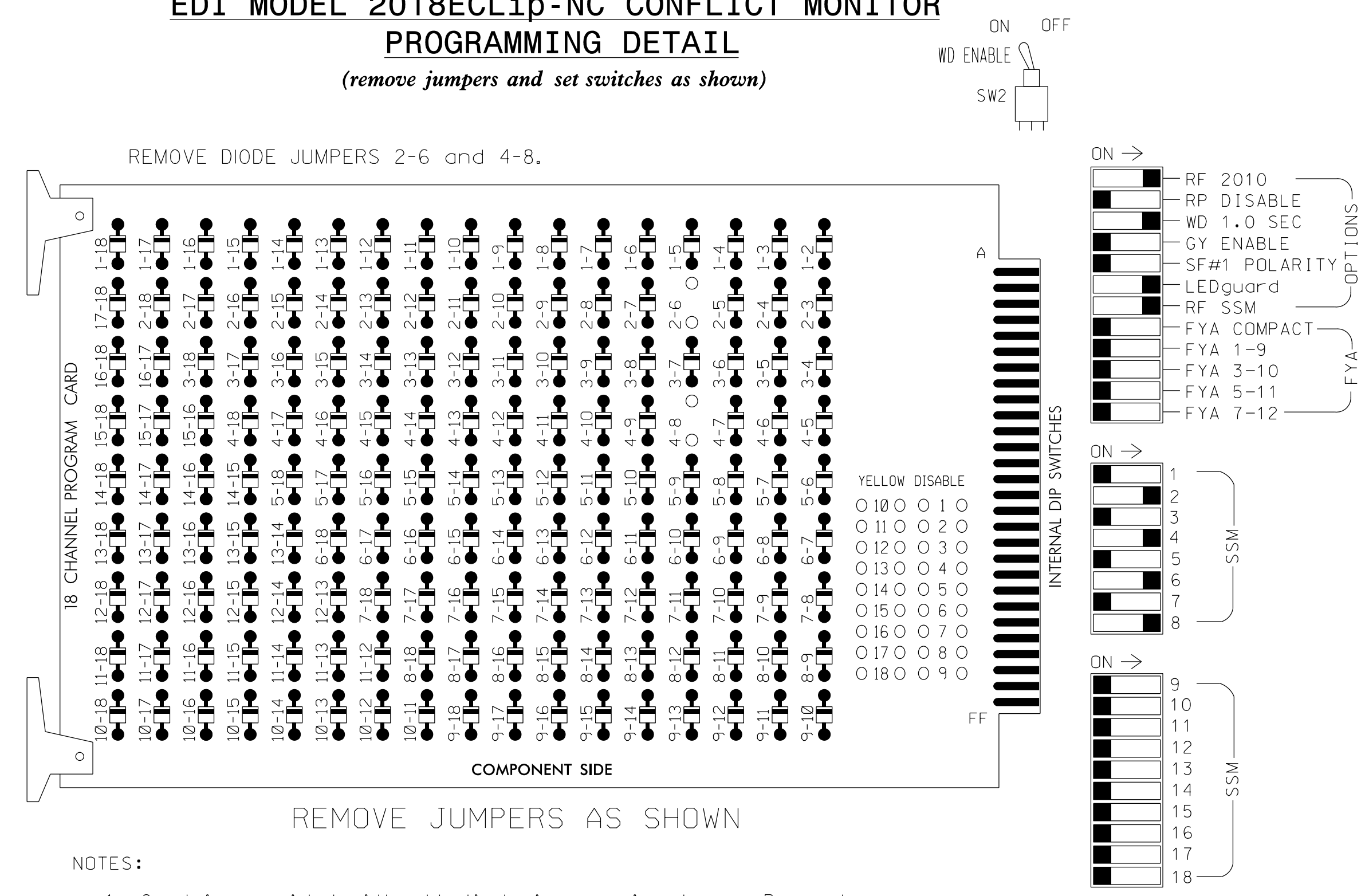
LISA M. MOON

DocuSigned by:  
 6/13/2018  
 DATE  
 SIG. INVENTORY NO. B0002



### 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 Burlington-Graham 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	21,22	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																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

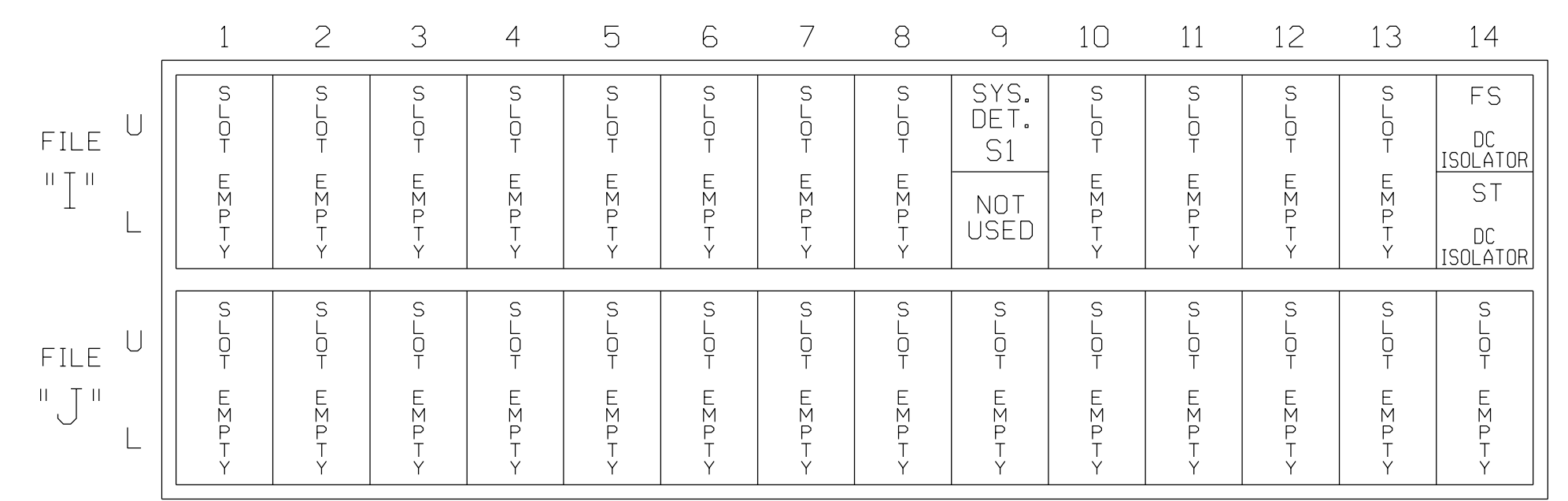
NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S5,S8,S11  
 PHASES USED.....2,4,6,8  
 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

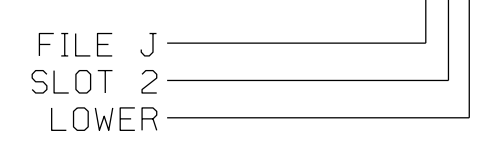
FS = FLASH SENSE  
 ST = STOP TIME

### 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
* S1	TB6-9,10	I9U	60	11	SYS	NO				N

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

#### INPUT FILE POSITION LEGEND: J2L

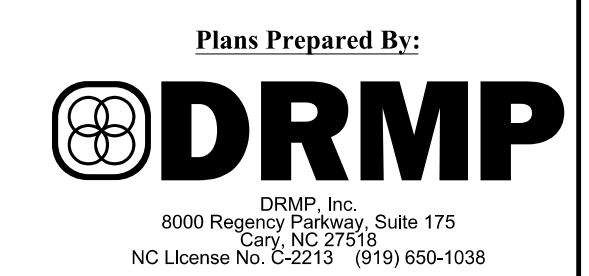


THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: B0003  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

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### Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Division 7 Alamance County Burlington

E. Davis Street at Everett Street

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

Division 7 Alamance County Burlington

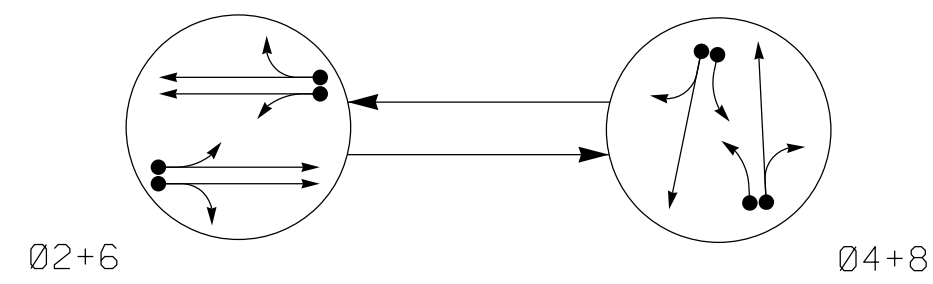
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER LISA M. MOON 022516

DocuSigned by: Lisa M. Moon 6/13/2018

SIG. INVENTORY NO. B0003



**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

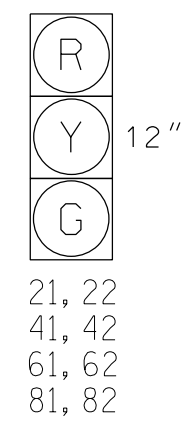
- ← DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.



**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM NEW CARD	
2A	6X20	60	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
6A	6X20	60	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X40	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X40	+5	2-4-2	-	8	Yes	-	10	-	S	-	X
S1	6X6	+205	4	X	-	No	-	-	-	N	X	X
S2	6X6	+205	4	X	-	No	-	-	-	N	X	X

**2 Phase Fully Actuated (Burlington-Graham Signal System)**

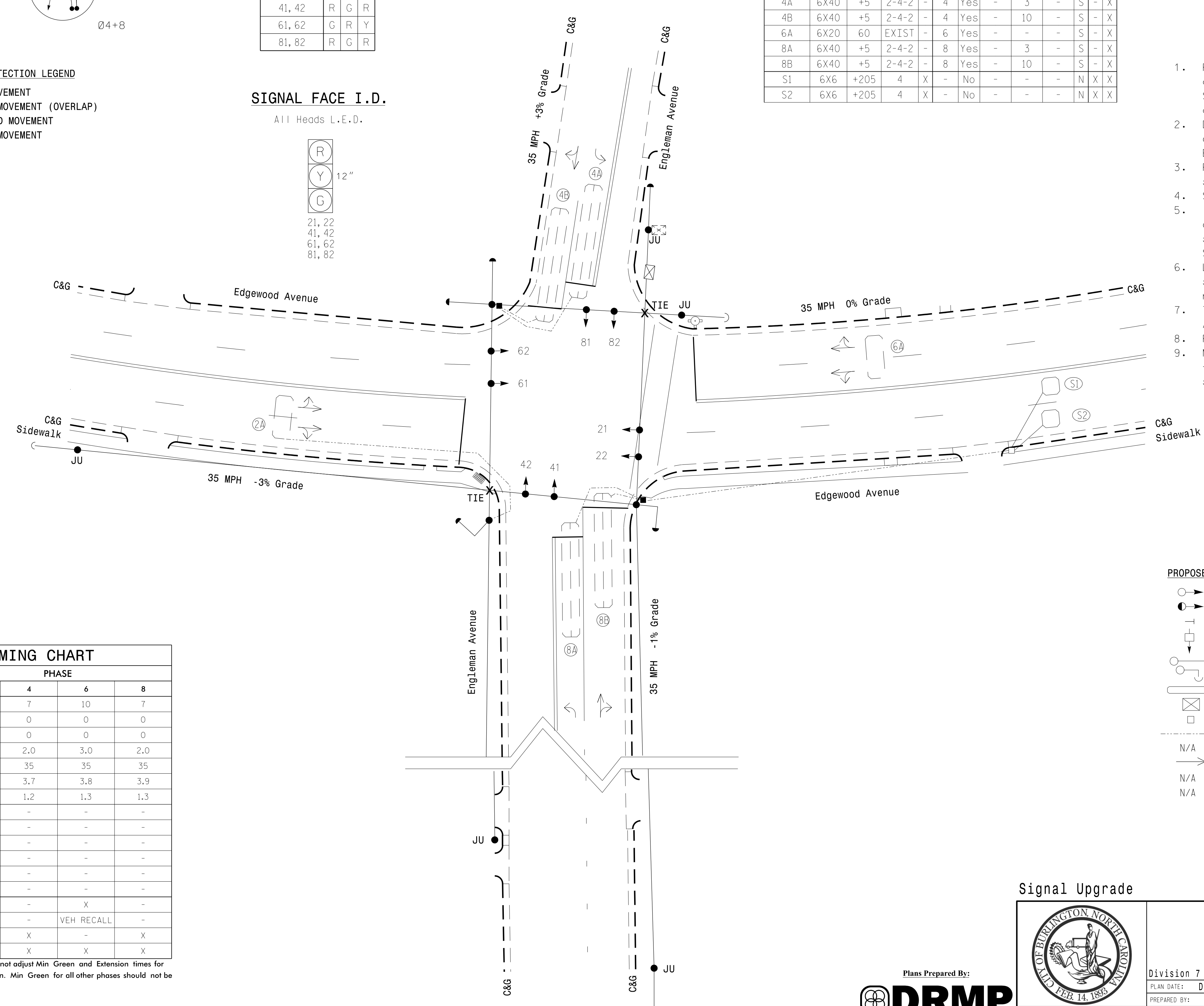
**NOTES**

- 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 81 and 82 as shown on plan.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	35	35	35	35
Yellow	4.1	3.7	3.8	3.9
Red Clear	1.3	1.2	1.3	1.3
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH RECALL	-	VEH RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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



**LEGEND**

PROPOSED	EXISTING
○ → Traffic Signal Head	● → Traffic Signal Head
○ → Modified Signal Head	N/A
□ → Sign	N/A
○ → 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	N/A Right of Way
→ Directional Arrow	→ Directional Arrow
N/A Fire Hydrant	⊕ → Fire Hydrant
N/A Truncated Domes	▒ → Truncated Domes

**Signal Upgrade**

**Edgewood Avenue at Engleman Avenue**

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: J Le REVIEWED BY: LM Moon

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

DocuSigned by: **Lisa M. Moon** 6/13/2018

SIG. INVENTORY NO. B0004

Plans Prepared By:

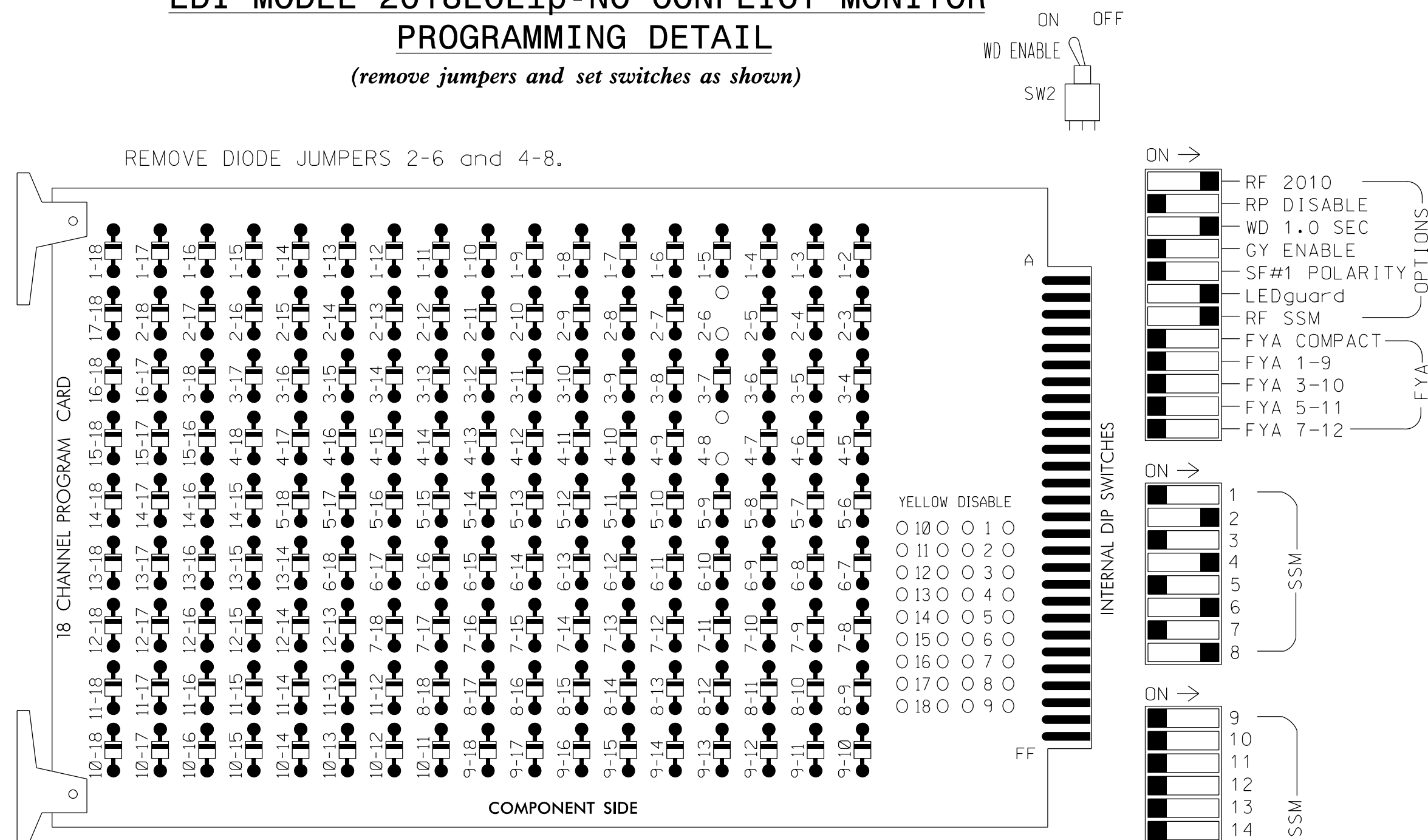
**DRMP**

DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2213 (919) 650-1038

13-JUN-2018 11:54 R:\6015\Fr\173\0173\0173.dwg AT: CHA-K.ANDERSON

### 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 phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Burlington-Graham Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S8,S11  
 PHASES USED.....2,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

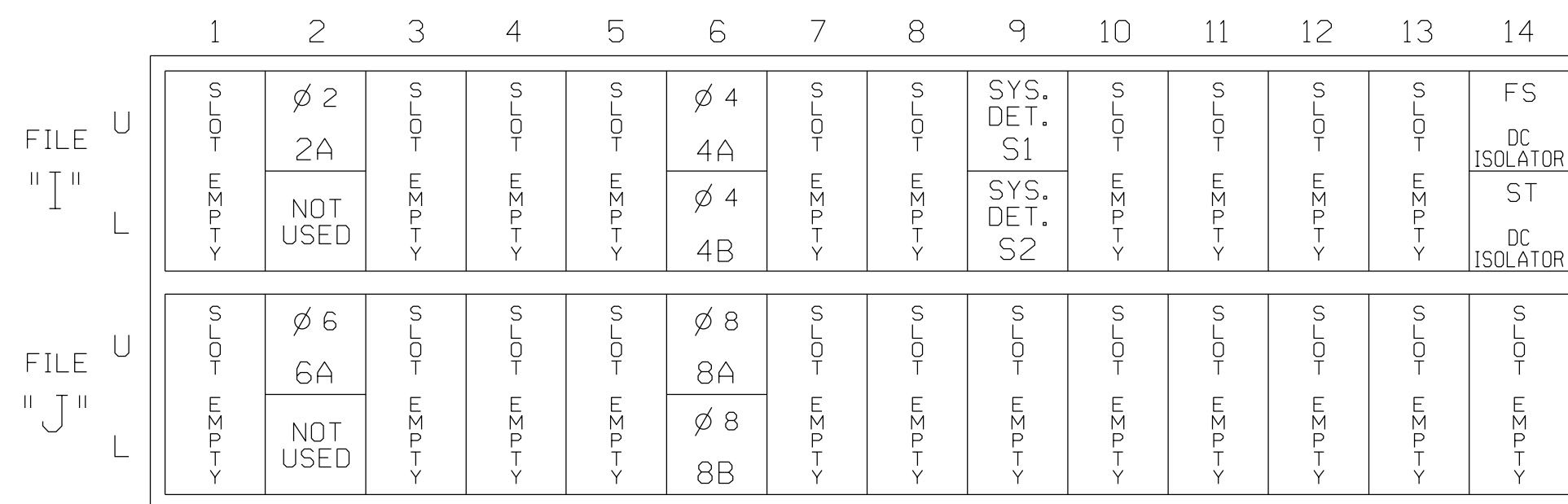
### SIGNAL HEAD HOOK-UP CHART

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
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	NU	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																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)

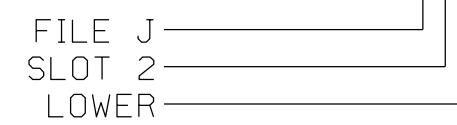


### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

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

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: B0004  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-JUN-2018 17:55  
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 KANDERSON AT CHA-KANDERSON

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED



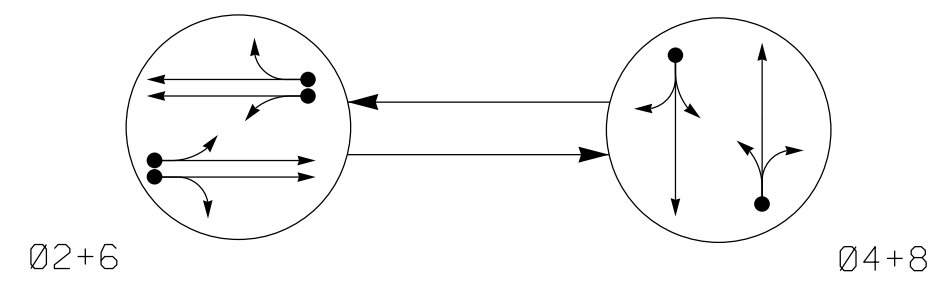
Edgewood Avenue  
 at  
 Engleman Avenue

Division 7	Alamance County	Burlington
PLAN DATE: December 2017	REVIEWED BY: AJ Davis	
PREPARED BY: DJ White	REVIEWED BY: LM Moon	
REVISIONS	INIT.	DATE



DocuSigned by:  
 Lisa M. Moon  
 6/13/2018  
 DATE  
 SIG. INVENTORY NO. B0004

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

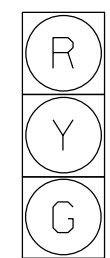
- DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UNSIGNALIZED MOVEMENT
- ◄ PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.



21, 22  
41, 42  
61, 62  
81, 82

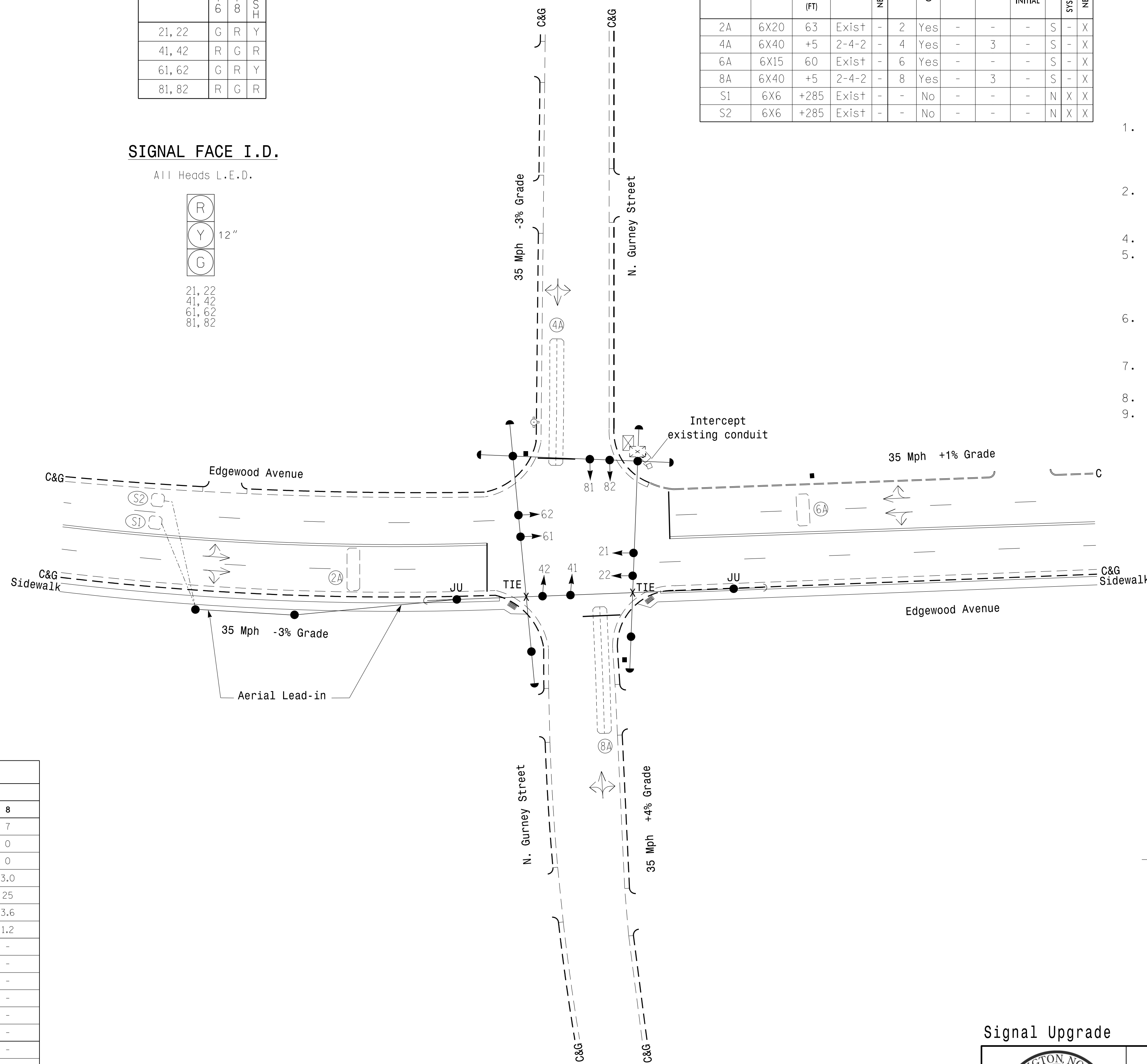
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP NEW CARD	
2A	6X20	63	Exist	-	2	Yes	-	-	-	S	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	3	-	S	-	X
6A	6X15	60	Exist	-	6	Yes	-	-	-	S	-	X
8A	6X40	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
S1	6X6	+285	Exist	-	-	No	-	-	-	N	X	X
S2	6X6	+285	Exist	-	-	No	-	-	-	N	X	X

**2 Phase Fully Actuated (Burlington-Graham 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.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	3.0	6.0	3.0
Max 1 *	35	25	35	25
Yellow	4.1	4.1	3.8	3.6
Red Clear	1.2	1.3	1.2	1.2
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH RECALL	-	VEH RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

**LEGEND**

- |  |  |
|--|--|
| <b>PROPOSED</b>                                  | <b>EXISTING</b>                                  |
| ○ Traffic Signal Head                            | ● Traffic Signal Head                            |
| ◐ Modified Signal Head                           | N/A  |
| ◑ Sign   | N/A  |
| ◒ Pedestrian Signal Head With Push Button & Sign | ◒ Pedestrian Signal Head With Push Button & Sign |
| ◓ Signal Pole with Guy                           | ◓ Signal Pole with Guy                           |
| ◔ Signal Pole with Sidewalk Guy                  | ◔ Signal Pole with Sidewalk Guy                  |
| ▭ Inductive Loop Detector                        | ▭ Inductive Loop Detector                        |
| ▭ Controller & Cabinet                           | ▭ Controller & Cabinet                           |
| ▭ Junction Box                                   | ▭ Junction Box                                   |
| --- 2-in Underground Conduit                     | --- 2-in Underground Conduit                     |
| N/A Right of Way                                 | --- Right of Way                                 |
| → Directional Arrow                              | → Directional Arrow                              |
| N/A Fire Hydrant                                 | ⊕ Fire Hydrant                                   |
| N/A Wheelchair Ramp                              | ▭ Wheelchair Ramp                                |
| ▭ Terminal Splice Box                            | ▭ Terminal Splice Box                            |

**Signal Upgrade**

City of Burlington, North Carolina  
FEB. 14, 1888

**Edgewood Avenue at N. Gurney Street**

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: J Le REVIEWED BY: LM Moon

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL 022516

LISA M. MOON

6/13/2018

DRMP

DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. 6-2213 (919) 650-1038

SCALE 0 30

1"=30'

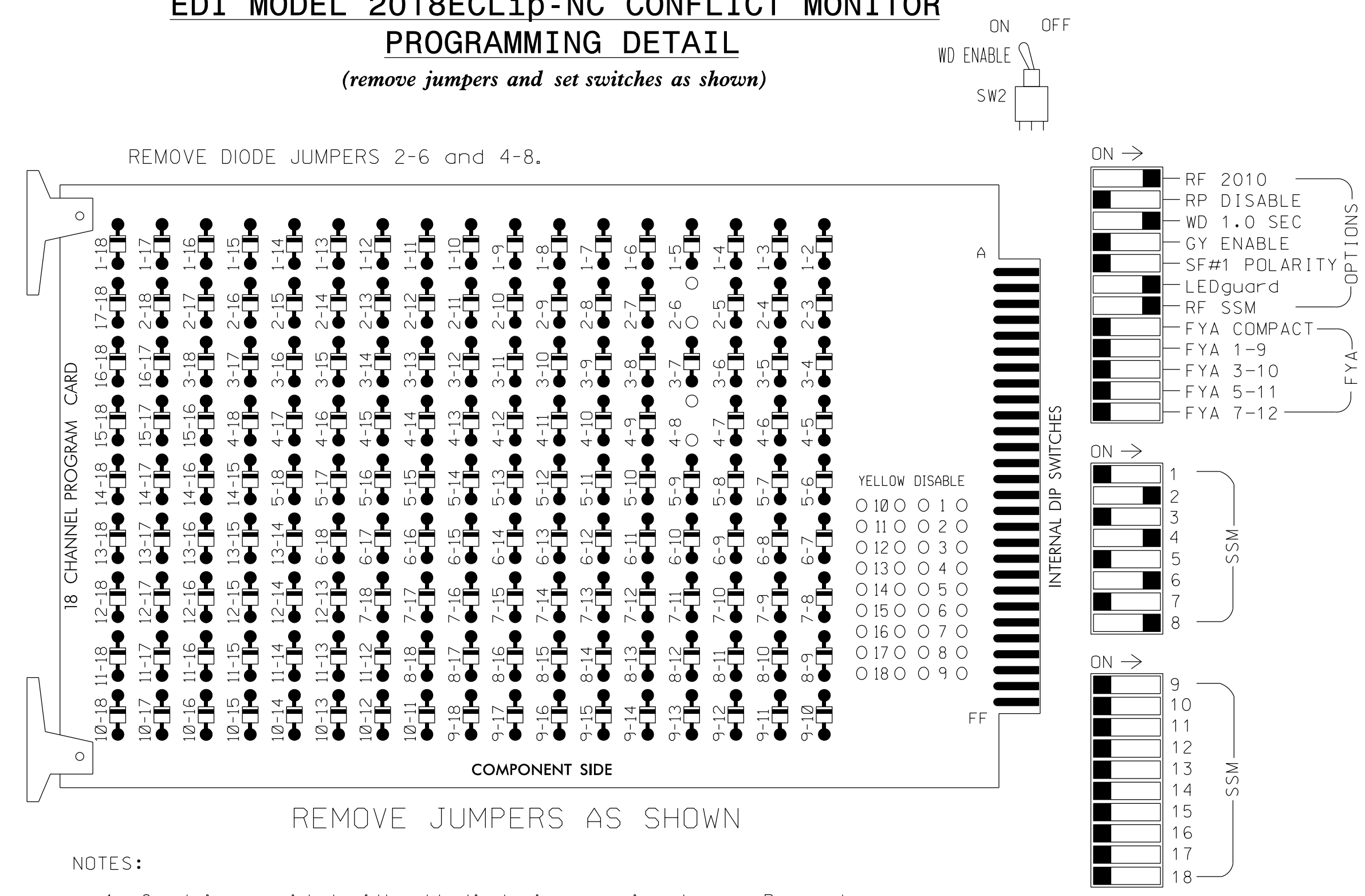
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. B0005

13-JUN-2018 17:55  
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 KANDERSON AT CHA-Y.ANDERSON

### 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 phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Burlington-Graham Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S8,S11  
 PHASES USED.....2,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

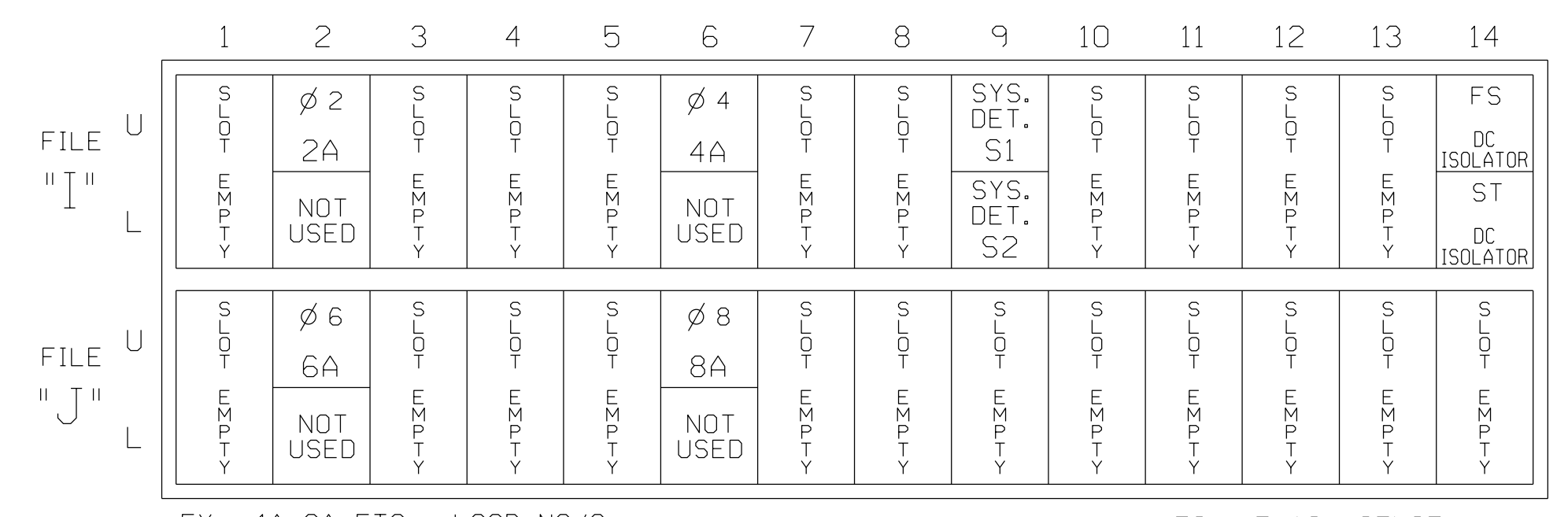
### SIGNAL HEAD HOOK-UP CHART

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
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	NU	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																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

### INPUT FILE POSITION LAYOUT

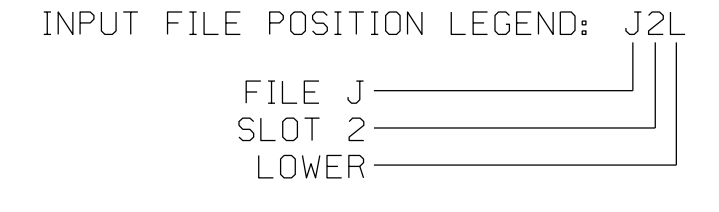
(front view)



### 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
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: B0005  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

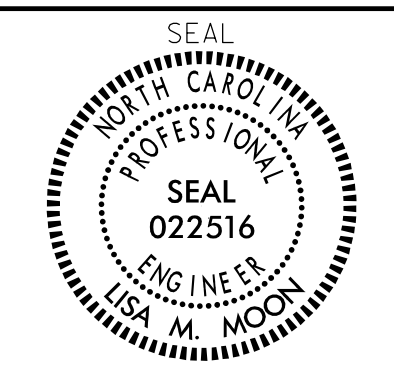
13-JUN-2018 17:55 R:\66015\Prof\ek\signal\design\wiring\B0005a.dgn KANDERSON AT CHA-YANDERSON

### Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

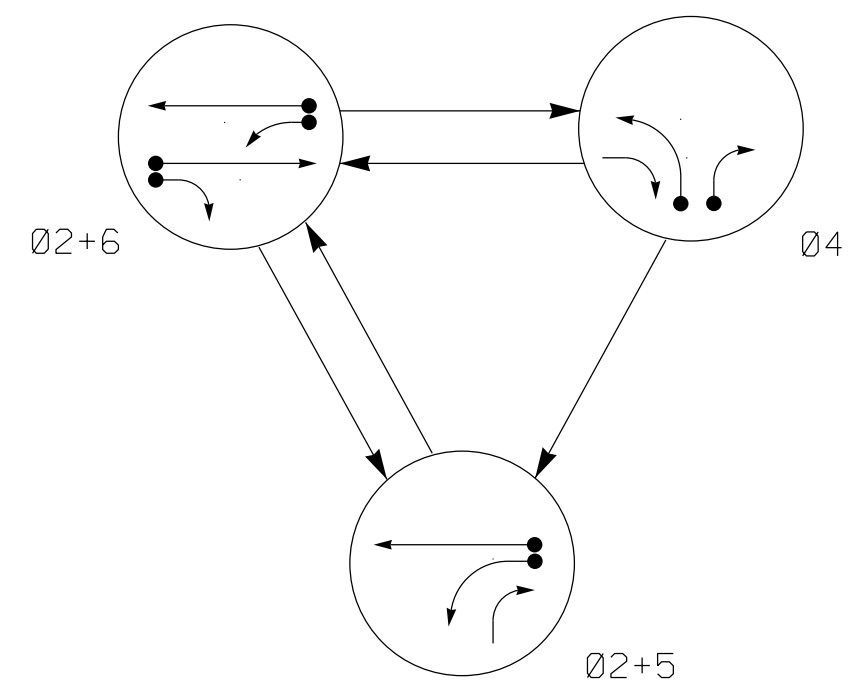


Edgewood Avenue at N. Gurney Street  
 Division 7 Alamance County Burlington  
 PLAN DATE: December 2017 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon



DocuSigned by: Lisa M. Moon 6/13/2018  
 SIG. INVENTORY NO. B0005

**PHASING DIAGRAM**



**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	R	G	R	Y
61	R	G	R	Y
62	R	G	R	Y

**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DETECTOR			PROGRAMMING							
		DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A	6X20	60	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	15	-	S	-	X
5A	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X20	60	EXIST	-	6	Yes	-	-	-	S	-	X

**3 Phase Fully Actuated (Burlington-Graham Signal System)**

**NOTES**

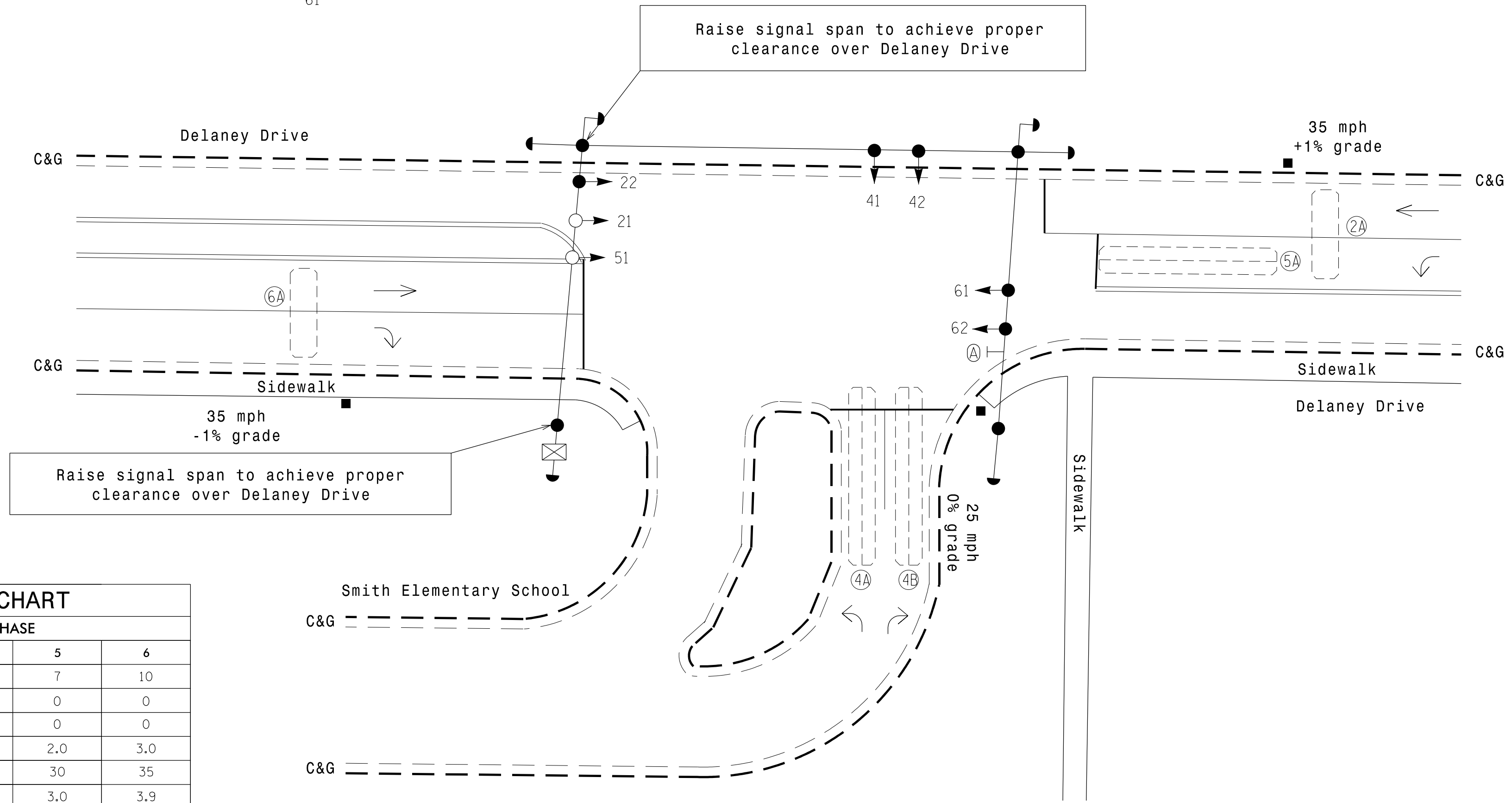
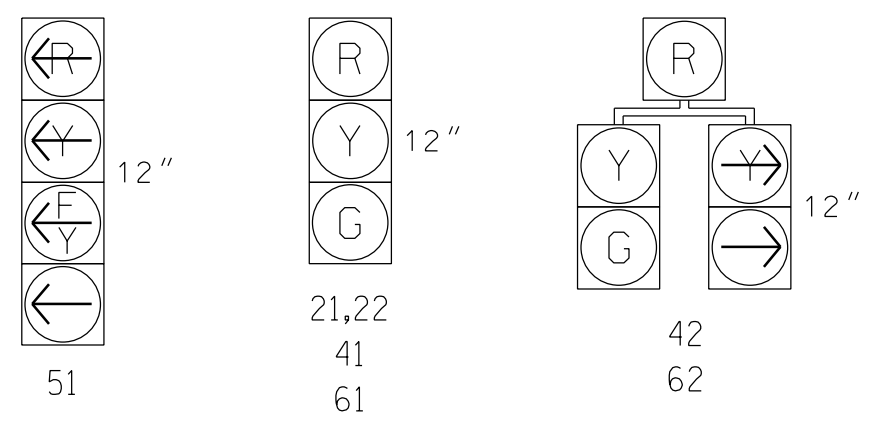
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal head numbered 22.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distances of vehicles turning right on red.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supercedes these values.

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	5	6
Min Green *	10	7	7	10
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	2.0	2.0	3.0
Max 1 *	35	50	30	35
Yellow	3.9	3.0	3.0	3.9
Red Clear	2.0	2.4	2.9	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

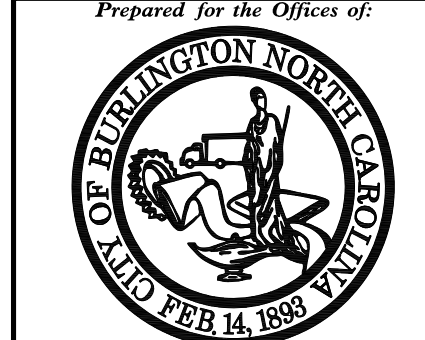
\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**LEGEND**

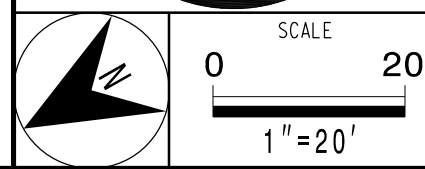
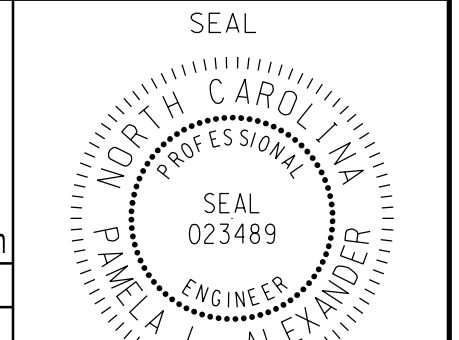
- | PROPOSED   | EXISTING   |
|--|--|
| ○ → Traffic Signal Head                            | ● → Traffic Signal Head                            |
| ○ → Modified Signal Head                           | N/A  |
| □ → Sign   | □ → Sign   |
| □ → Pedestrian Signal Head With Push Button & Sign | □ → Pedestrian 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                                |
| ⊙ "NO TURN ON RED" Sign (R10-11)                   | ⊙ "NO TURN ON RED" Sign (R10-11)                   |

**Signal Upgrade**

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



**Delaney Drive at Smith Elementary School**  
 Division 7 Alamance County Burlington  
 PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion  
 PREPARED BY: NA Ptak REVIEWED BY: PL Alexander



REVISIONS	INIT.	DATE

Signature: Pamela L. Alexander  
 Date: 6/7/2018  
 Sig. Inventory No.: B-0007

07-JUN-2018 11:15  
 D:\Projects\2018\Traffic\00056469 U-6015 B-G S19 SysteTask 05\_11\_Signal\Des\gpmB-0007.dgn  
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