



# SUMMARY OF WORK BY INTERSECTION

Reference Information					Signal Items																											
NCDOT / CITY SIGNAL INV. NO.	Intersection Name	Cable Layout Sheet Number	Signal Design Sheet Number	In / near historically significant area (see box note at bottom of page)	16-inch Countdown Pedestrian Signal Head	12-inch 3-Section Signal Head	12-inch 4-Section Signal Head	12-inch 5-Section Signal Head	Signal Cable	Adjust Span Attachment	Messenger Cable (3/8")	Underground Conduit (1, 2")	Underground Conduit (2, 2")	Directional Drill	Inductive Loop Sawcut	Loop Lead-in Cable	Sign	Wood Pole	Metal Strain Pole	Standard Down Guy Assembly	Sidewalk Guy Assembly	Type I Post with Foundation	Junction Box	Remove existing pedestrian signal	Louvers	Backplates	Remove Line 4"	Remove Line 24"	Thermoplastic Pavement Marking Line 24", 120 MILS	Thermoplastic Pavement Marking Lines (8", 120 MILS)	Thermoplastic White yield lines, 90 MILS	
193	B8027	Graham Street at Queen Ann Street	6.190	195.0		8			850	2	740		20			1140				3												
194	B8451	N. Beaumont Avenue at Vaughn Road	6.162	196.0																												
195	B8453	Graham Street at Beaumont Avenue	6.191	197.0		8			620	2	320					410				3	1											
196	B8454	E. Front Street at S. Spring Street	6.117	198.0																												
197	B8455	E. Davis Street at S. Spring Street	6.117	199.0	Y																											
198	B8456	S. Lexington Avenue at E. Davis Street	6.118	200.0	Y																											
199	B8457	Maple Avenue at S. Lexington Avenue	6.118	201.0	Y																											
200	B8458	S. Worth Street at W. Front Street	6.127	202.0					20																							
201	B9024	Boone Station Drive at Glidewell Drive/Tiki Lane	6.058	203.0		2	1		580																							
202	B9025	Boone Station Drive at Waltham Boulevard	6.059	204.0																												
203	G0100	Marshall Street at E. Elm Street	6.180	205.0																												
204	G0101	E. Pine Street at S. Marshall Street	6.180	206.0	Y															3												
205	G0102	E. Pine Street at S. Melville Street	6.180	207.0																												
206	G0103	N. Marshall Street at Albright Avenue	6.181	208.0					420		60							1		1												
<b>Total</b>					4	285	97	8	53020	63	5637	4756	200	550	6360	66985	13	6	2	117	27	2	69	2	4	2	90	54	66	170	50	


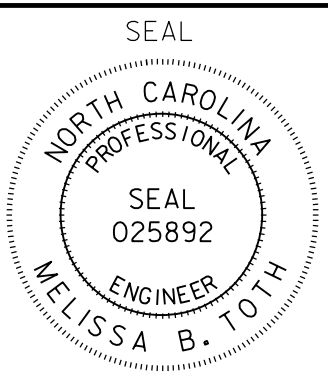
10-1111-2018\_17:38  
 \*\*\*sht:ins:com:project:GISRLA\*\*transportation\*Traffic\*Cur\*100056469 U-6015 B-G Sig. Sys\*Task 05\_11\_Signal\*Vol. III Front Sheets\*Sig. 2.26.dgn  
 ALEX3361 AT LUS340649

- Work shown on this sheet is for the upgrade of the traffic signals, including installation of new controllers and cabinets, new or modified foundations, electrical service and miscellaneous signal related items. Additional information can be found in the signal plans in this Volume. Work to be done for fiber-optic cable routing and interconnection is shown on the cable layout plans and on the sheets entitled "Summary of Work by Cable Layout Plans" in Volume I of III.
- The items listed above are for informational purposes only and represent work that is necessary to complete the contract and are not necessarily pay items. See Summary of Quantities and the Project Special Provisions for defined Pay Items for this contract.

Areas within this project have been determined to contain properties with documented historical significance. If it is necessary to deviate from the plans in an area identified to contain properties with historic significance, alert the engineer to contact Environmental Analysis Unit - Historic Architecture Group of North Carolina Department of Transportation for an effects determination before proceeding.

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

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

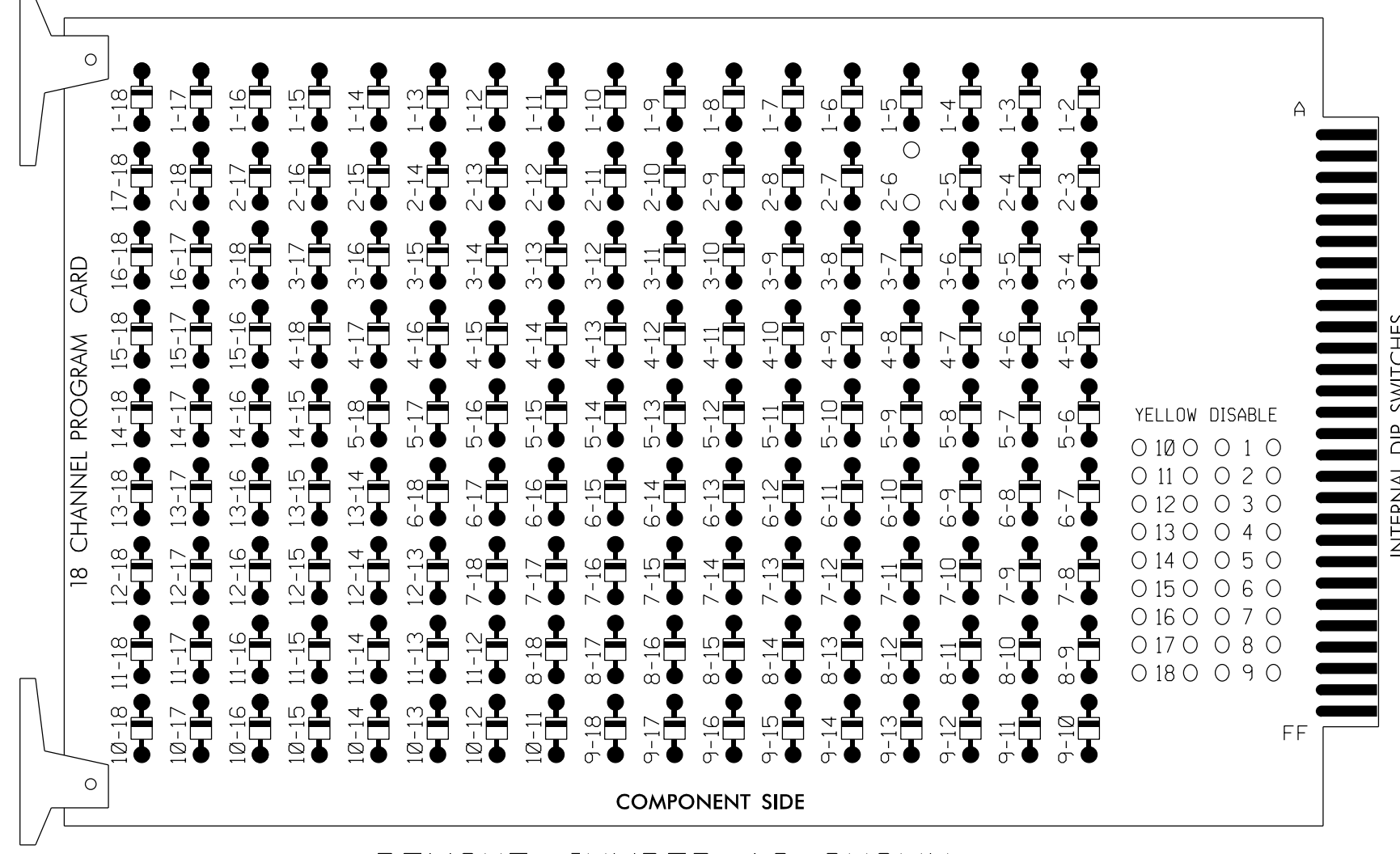
 Prepared for the Offices of: Department of Transportation, State of North Carolina 750 Greenfield Parkway, Garner, NC 27529	Burlington-Graham Signal System Summary of Work by Intersection (Sheet 3 of 3)		
	Division 7 Alamance County PLAN DATE: May 2018 PREPARED BY: PL Alexander	Burlington & Graham REVIEWED BY: MB Toth REVIEWED BY:	
REVISIONS INIT. DATE		Designed by: <u>Melissa B. Toth</u> 7/11/2018 CADD File name: Sig 2.26.dgn	



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

(remove jumper and set switches as shown)

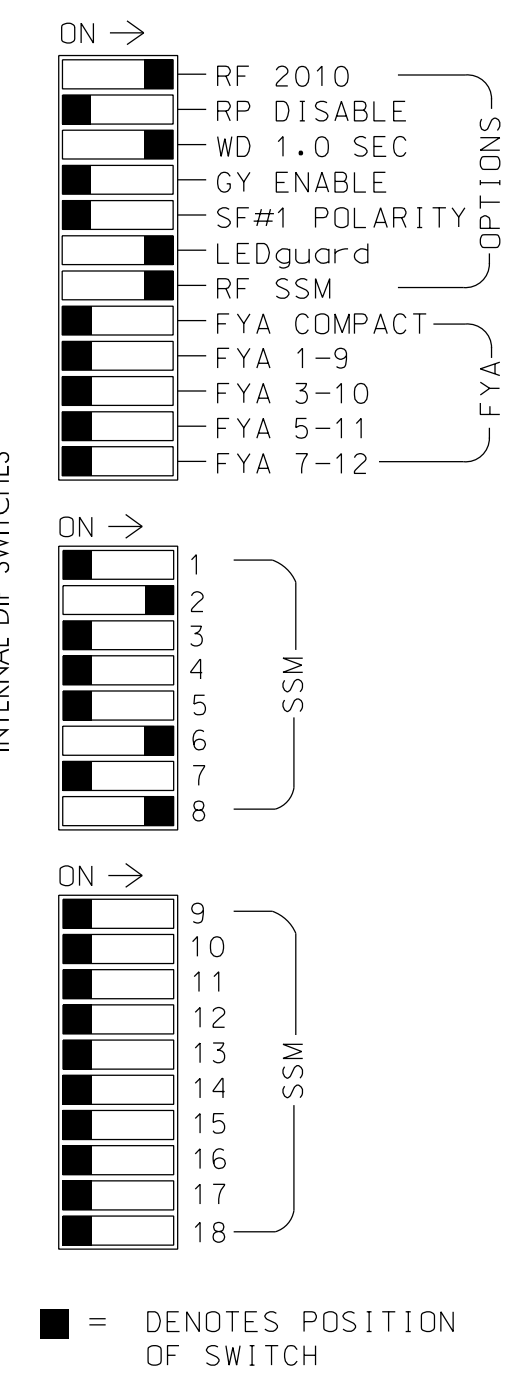
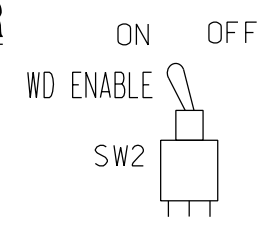
REMOVE DIODE JUMPER 2-6.



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

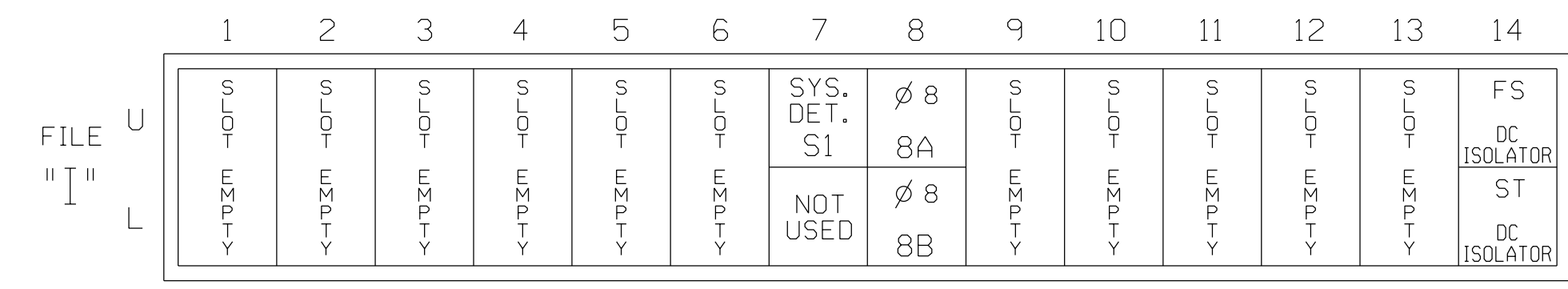
### SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



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

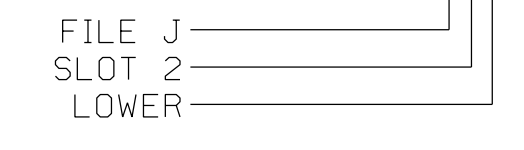
FS = FLASH SENSE  
 ST = STOP TIME

### 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
* S1	TB21-13,14	I7U	57	7	SYS	No				N
8A	TB22-1,2	I8U	42	8	8	YES		3		S
8B	TB24-1,2	I8L	46	18	8	YES		15		S

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

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0001  
 DESIGNED: January 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 87-100 (W. Webb Avenue) at SR 1352 (W. Davis Street)	
Division 7	Alamance County
PLAN DATE: January 2018	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

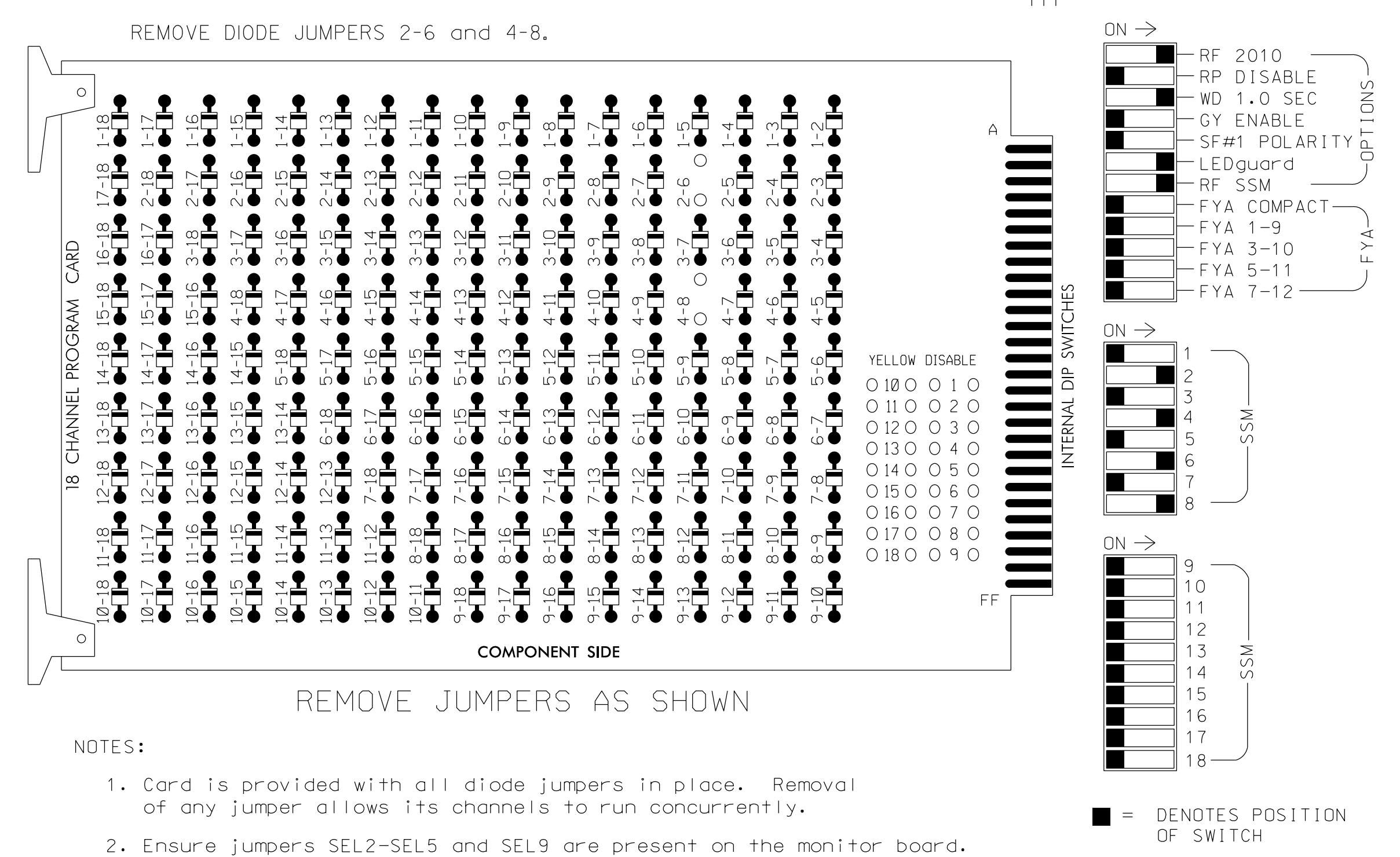
6/9/2018

SIG. INVENTORY NO. 07-0001



### 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.

### 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												

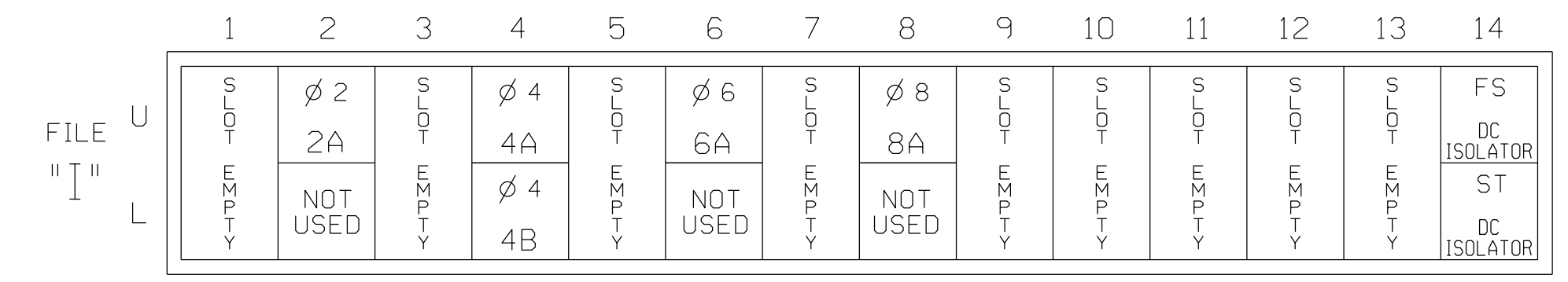
NU = Not Used

### 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

### INPUT FILE POSITION LAYOUT

(front view)



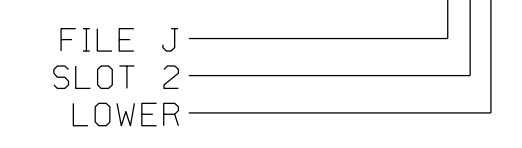
EX.: 1A, 2A, ETC. = LOOP NO.'S

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		3		S
4B	TB23-7,8	14L	45	14	4	YES		10		S
6A	TB21-11,12	16U	40	6	6	YES				S
8A	TB2-11,12	18L	42	8	8	YES		5		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0003  
 DESIGNED: SEPT-2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-UNA-2018-17-12  
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 7/11/2018 10:47:11 AM AT CAR-RLANDON-W7

Plans Prepared By:

DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27518  
 NC License No. C-2213 (919) 650-1038

### Electrical Detail

Electrical and Programming Details For:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1323 (W. Front Street) at W. Davis Street

Division 7 Alamance County Burlington

PLAN DATE: August 2017 REVIEWED BY: LM Moon

PREPARED BY: AJ Davis REVIEWED BY:

REVISIONS INIT. DATE

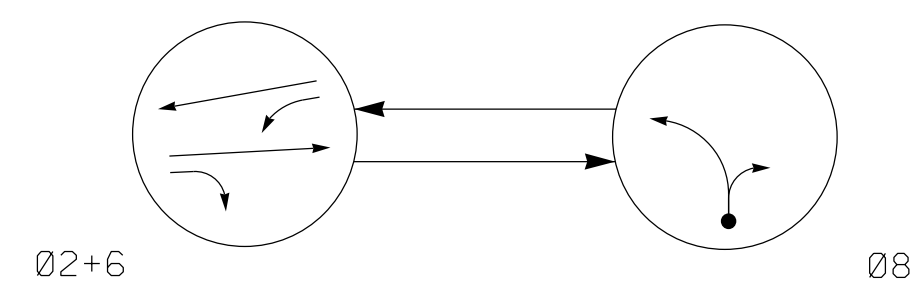
DocuSigned by: Lisa M. Moon 6/13/2018

SIG. INVENTORY NO. 07-0003

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 LISA M. MOON  
 022516

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

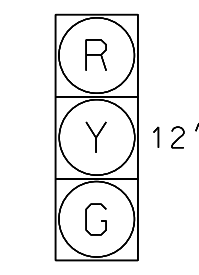
- ◄● DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄... UNSIGNALIZED MOVEMENT
- ◄... PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø2+6	Ø8	FLASH
21,22,23	G	R	Y
61,62	G	R	Y
81,82	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.



21,22,23  
61,62  
81,82

**ASC/3 DETECTOR INSTALLATION CHART**

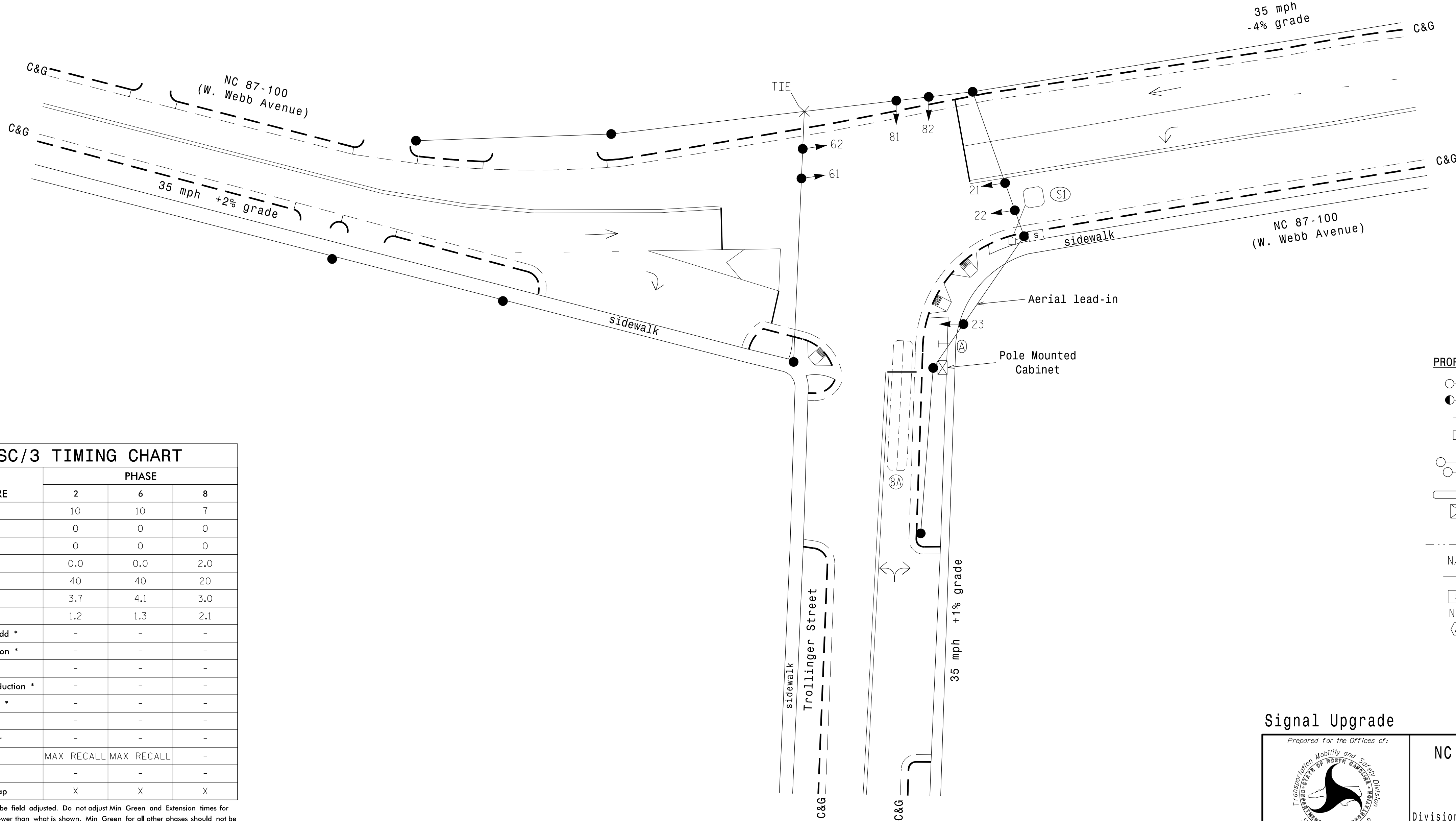
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
8A	6x40	+10	2-4-2	-	8	Yes	-	5	-	S	-	X
S1	6X6	+95	3	X	8	No	-	-	-	S	X	X

Remove Existing Pedestrian Signals and associated equipment

**2 Phase Semi-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. Set all detector units to presence mode.
4. 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.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE		
	2	6	8
Min Green *	10	10	7
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	0.0	0.0	2.0
Max 1 *	40	40	20
Yellow	3.7	4.1	3.0
Red Clear	1.2	1.3	2.1
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	MAX RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

**LEGEND**

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
◐ → Modified Signal Head	◐ → N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & 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
⊠ Terminal Splice Box	⊠ Terminal Splice Box
N/A Curb Ramp	⊠ Curb Ramp
⊠ Right-turn "ONLY" Sign (R3-5R)	⊠ Right-turn "ONLY" Sign (R3-5R)

**Signal Upgrade**

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 SCALE: 1"=20'

**NC 87-100 (W. Webb Avenue) at Trolinger Street**

Division 7 Alamance County Burlington  
 PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion  
 PREPARED BY: NA Ptak REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 025892  
 MELISSA B. TOTH

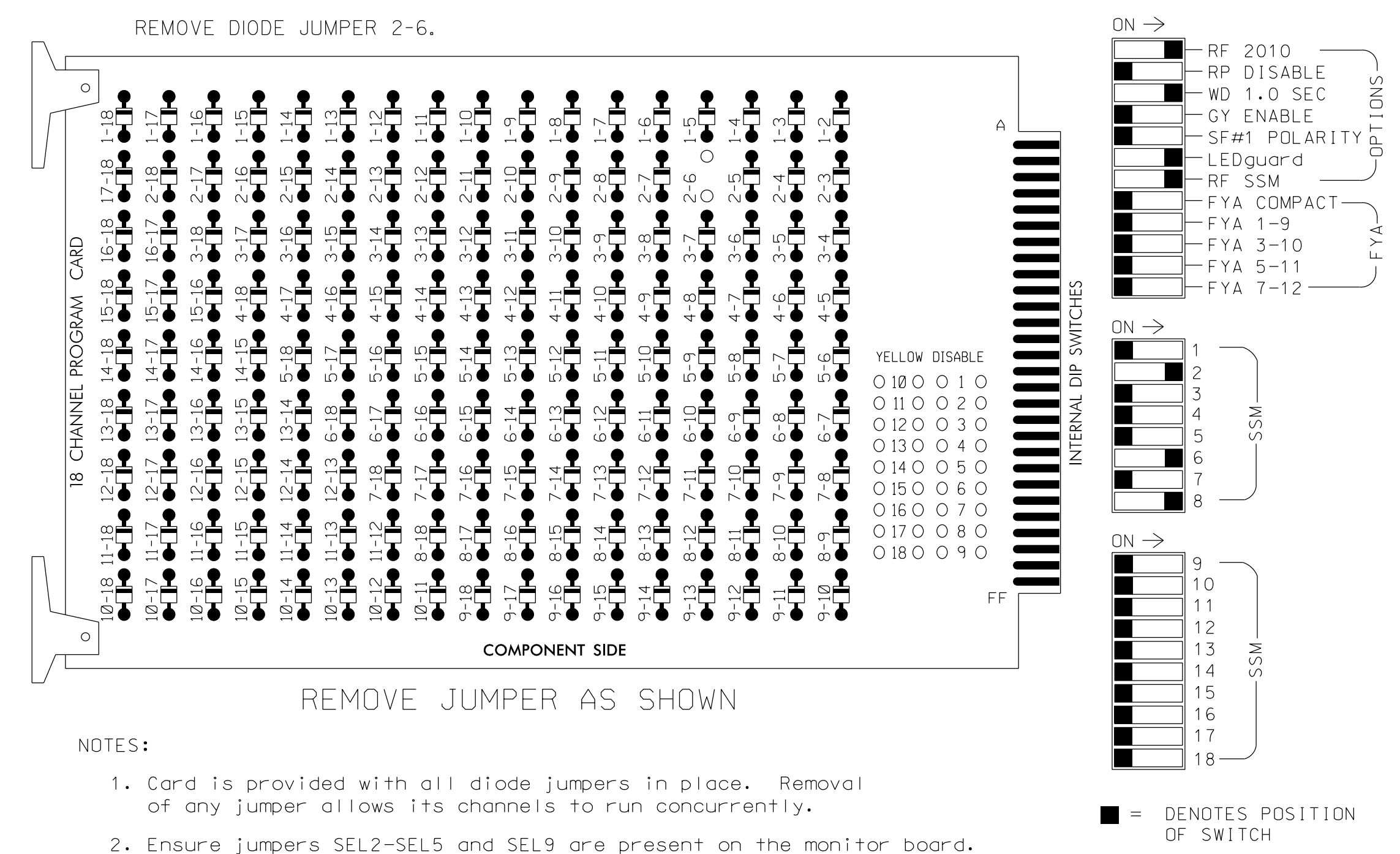
6/7/2018  
 DATE  
 SIG. INVENTORY NO. 07-0005

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 ALEX3361 AT LUS340649

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

(remove jumper 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
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 23	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

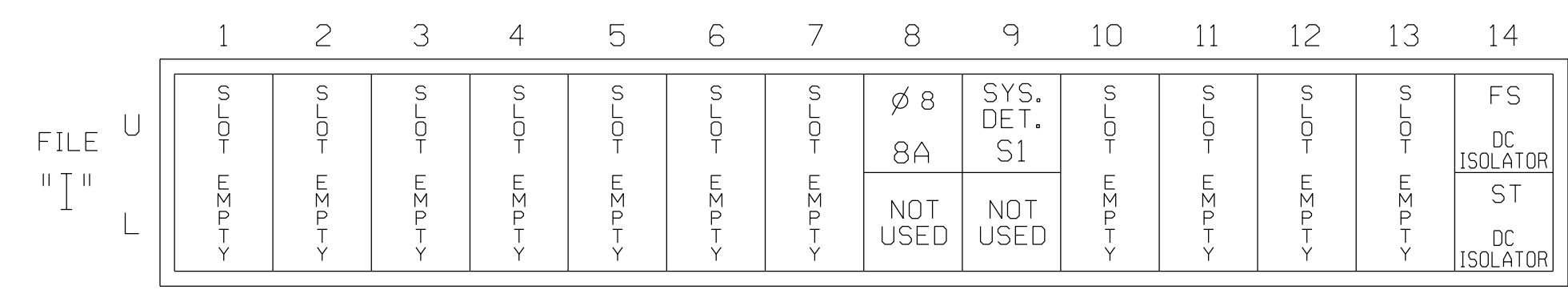
NU = Not Used

### EQUIPMENT INFORMATION

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

### INPUT FILE POSITION LAYOUT

(front view)



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

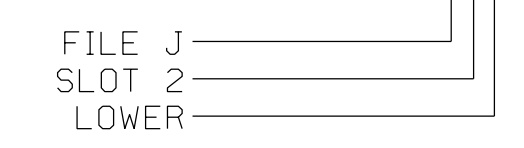
FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
8A	TB22-1,2	18U	42	8	8	YES		5		S
* S1	TB6-9,10	19U	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: 07-0005  
 DESIGNED: October 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

### Electrical Detail

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

ELECTRICAL AND PROGRAMMING DETAILS FOR:			
NC 87-100 (W. Webb Avenue) at Trollinger Street			
Division 7	Alamance County	Burlington	
PLAN DATE: October 2017	REVIEWED BY: AM Encarnacion		
PREPARED BY: NA Ptak	REVIEWED BY: MB Toth		
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

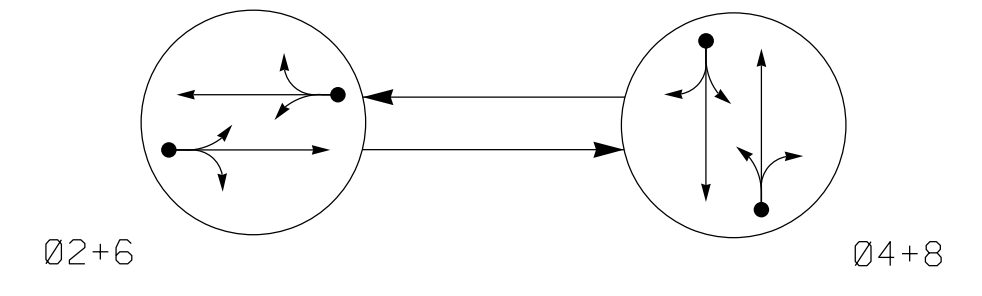
SEAL

6/11/2018

SIG. INVENTORY NO. 07-0005



**PHASING DIAGRAM**



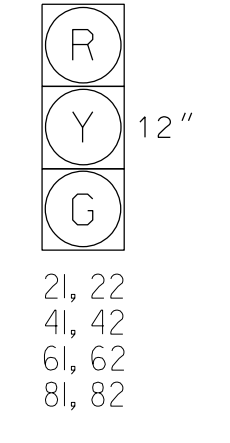
**PHASING DIAGRAM DETECTION LEGEND**  
 ● ————— DETECTED MOVEMENT  
 ————— UNDETECTED MOVEMENT (OVERLAP)  
 - - - - - UNSIGNALIZED MOVEMENT  
 - - - - - PEDESTRIAN MOVEMENT

**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.



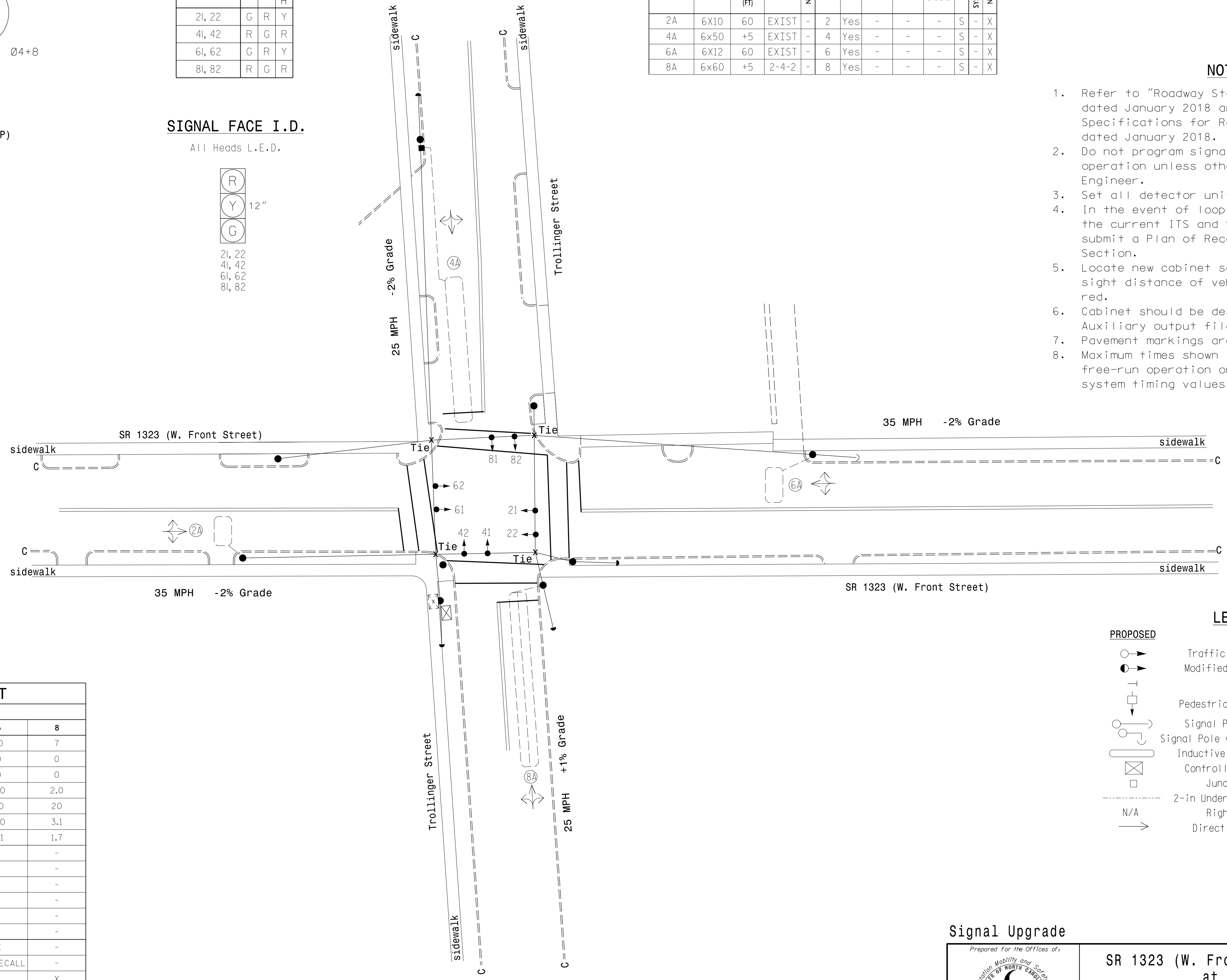
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A	6x10	60	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6x50	+5	EXIST	-	4	Yes	-	-	-	S	-	X
6A	6x12	60	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6x60	+5	2-4-2	-	8	Yes	-	-	-	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. Set all detector units to presence mode.
4. 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.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Cabinet should be designed to include an Auxiliary output file for future use.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	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 *	30	20	30	20
Yellow	4.0	3.3	4.0	3.1
Red Clear	1.1	1.5	1.1	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	-	X	-	X
Simultaneous Gap	X	X	X	X

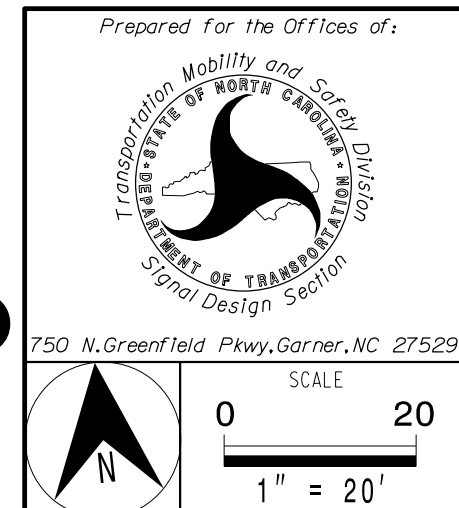
\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**LEGEND**

PROPOSED	EXISTING
	N/A

**Signal Upgrade**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



**SR 1323 (W. Front Street) at Trollinger Street**

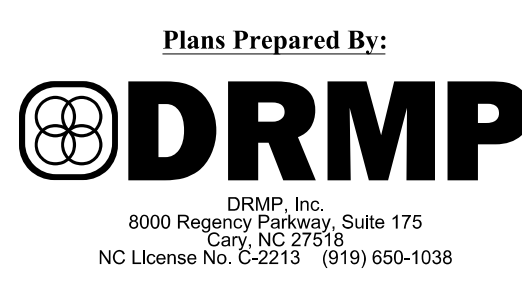
Division 7 Alamance County Burlington

PLAN DATE: Sept 2017 REVIEWED BY: AJ Davis

PREPARED BY: RD Lawton REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

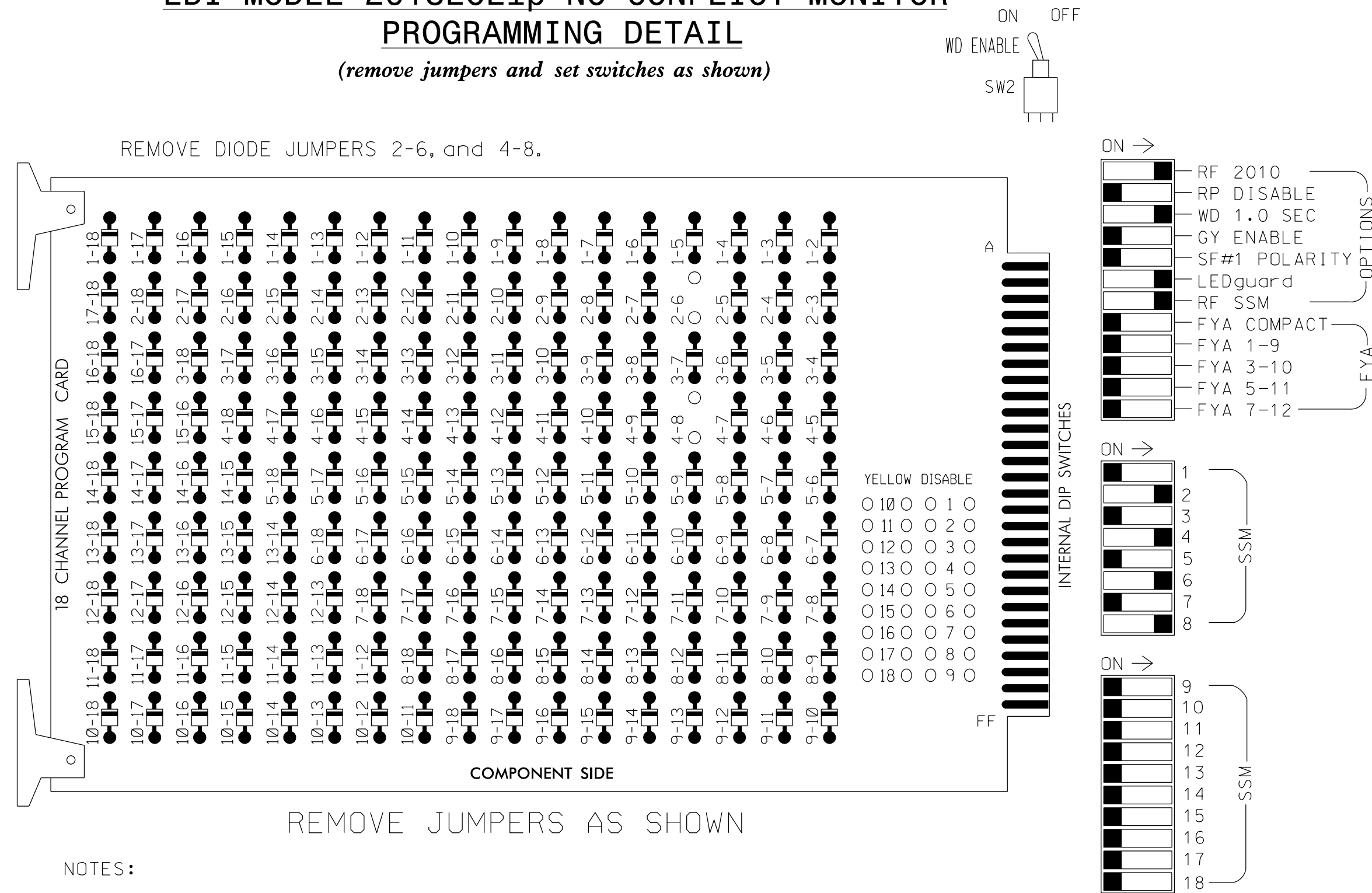
DocuSigned by:  
 Lisa M. Moon 6/13/2018  
 51C658B030D421  
 SIGNATURE DATE  
 SIG. INVENTORY NO. 07-0006



13-JUN-2018 1:50 R:\66015\17\Proj\cals\signal\signal\07-0006.dgn L. Lawton AT CAR-RALTON-W7

### 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.

### 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																		

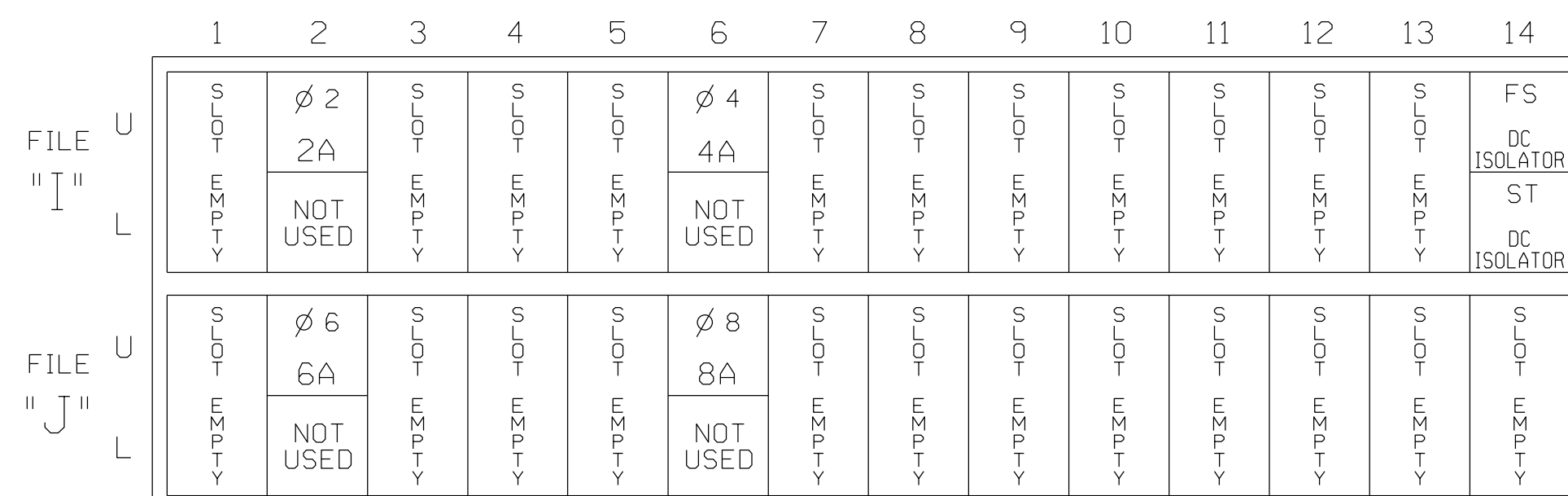
NU = Not Used

### 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

### INPUT FILE POSITION LAYOUT

(front view)

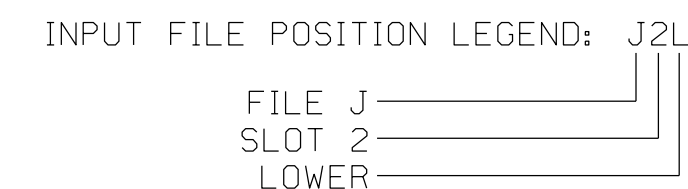


EX.: 1A, 2A, ETC. = LOOP NO.'S

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				S
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0006  
 DESIGNED: Sept-2017  
 SEALED: 06-13-2018  
 REVISED: N/A

### Electrical Detail

Electrical and Programming Details For:  
 Prepared for the Offices of:  
  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27518  
 NC License No. C-2213 (919) 650-1038

SR 1323 (W. Front Street) at Trollering Street

Division 7 Alamance County Burlington

PLAN DATE: September 2017 REVIEWED BY: LM Moon

PREPARED BY: AJ Davis REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

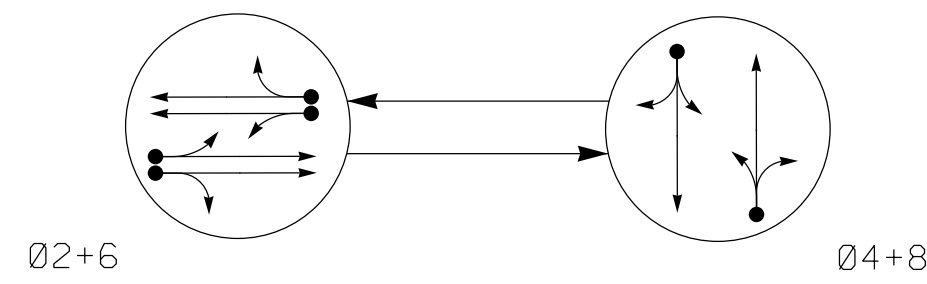
SEAL  
  
 SEAL 022516  
 ENGINEER  
 LISA M. MOON

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

SIG. INVENTORY NO. 07-0006

13-UNA-2018-17-12  
 R:\66015\17\off\c\k\sign\018\des\gn\w\ir\mg\07-0006e.dgn  
 7/1/2018 10:41:15 AM AT CAR-RLANTON-W7

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

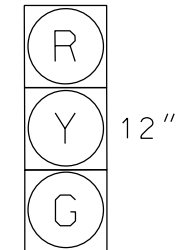
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**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

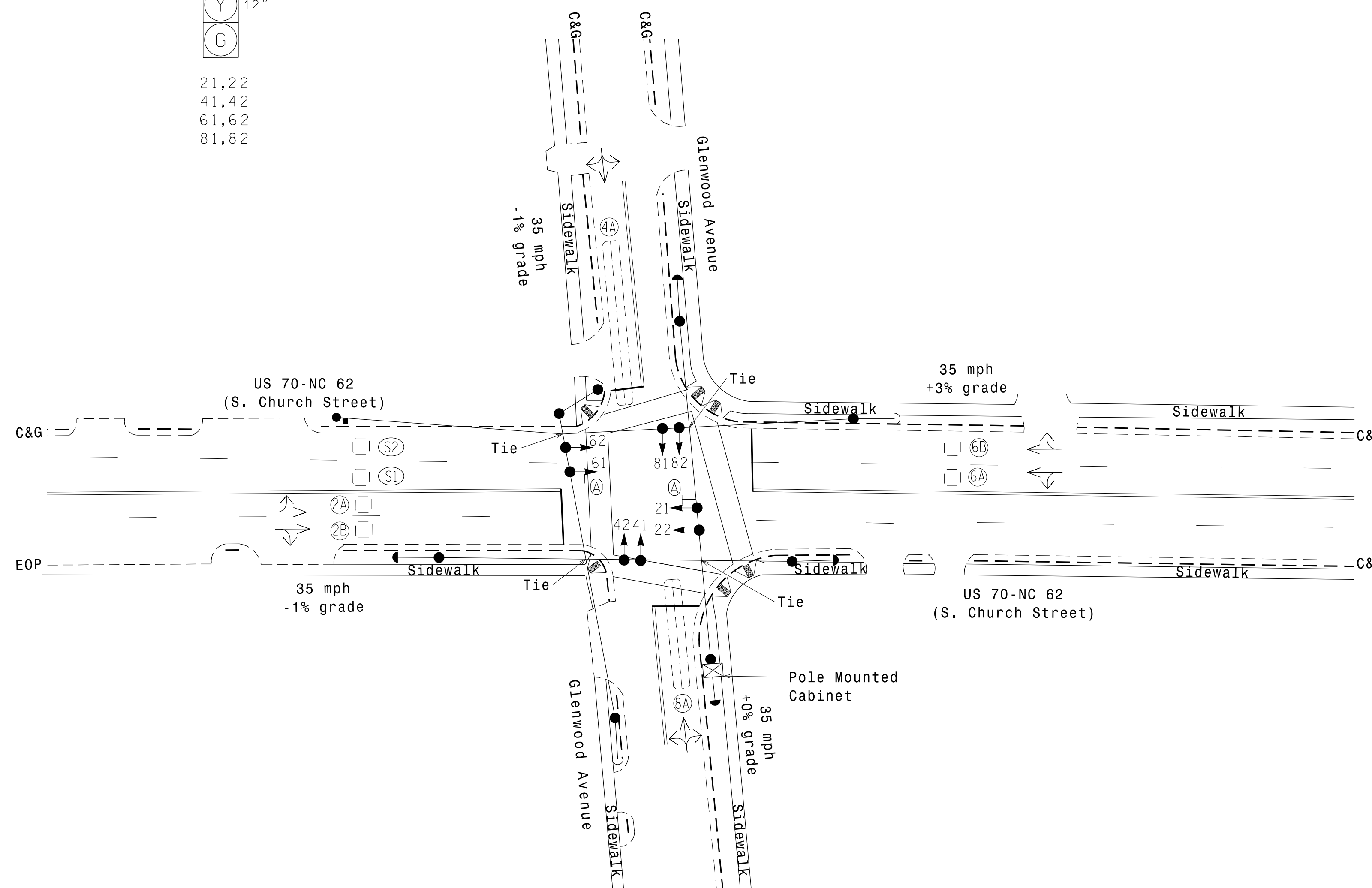
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	PROGRAMMING									
			DETECTOR	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD		
2A,2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	+6	2-4-2	-	4	Yes	-	3	-	S	-	X
6A,6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X40	+10	2-4-2	-	8	Yes	-	3	-	S	-	X
S1	6X6	+140	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+140	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.
- 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 I *	40	20	40	20
Yellow	3.9	3.9	3.7	3.8
Red Clear	1.2	1.3	1.2	1.4
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 Traffic Signal Head                          |     | EXISTING Traffic Signal Head                          |
|  | PROPOSED Modified Signal Head                         | N/A | N/A   |
|  | PROPOSED Pedestrian Signal Head                       |     | EXISTING Pedestrian Signal Head                       |
|  | PROPOSED Signal Pole with Guy                         |     | EXISTING Signal Pole with Guy                         |
|  | PROPOSED Signal Pole with Sidewalk Guy                |     | EXISTING Signal Pole with Sidewalk Guy                |
|  | PROPOSED Inductive Loop Detector                      |     | EXISTING Inductive Loop Detector                      |
|  | PROPOSED Controller & Cabinet                         |     | EXISTING Controller & Cabinet                         |
|  | PROPOSED Junction Box                                 |     | EXISTING Junction Box                                 |
|  | PROPOSED 2-in Underground Conduit                     |     | EXISTING 2-in Underground Conduit                     |
|  | N/A Right of Way                                      |     | EXISTING Right of Way                                 |
|  | N/A Directional Arrow                                 |     | EXISTING Directional Arrow                            |
|  | N/A Curved Ramp                                       |     | EXISTING Curved Ramp                                  |
|  | PROPOSED Combined Through and Left Arrow Sign (R3-6L) |     | EXISTING Combined Through and Left Arrow Sign (R3-6L) |

**Signal Upgrade**

**US 70-NC 62 (S. Church Street) at Glenwood Avenue**

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

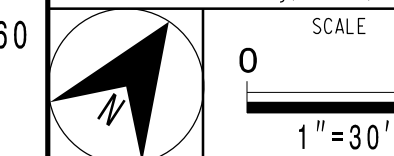
REVISIONS: INIT. DATE

Signature: Pamela L. Alexander DATE: 6/7/2018

SIG. INVENTORY NO. 07-0007

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

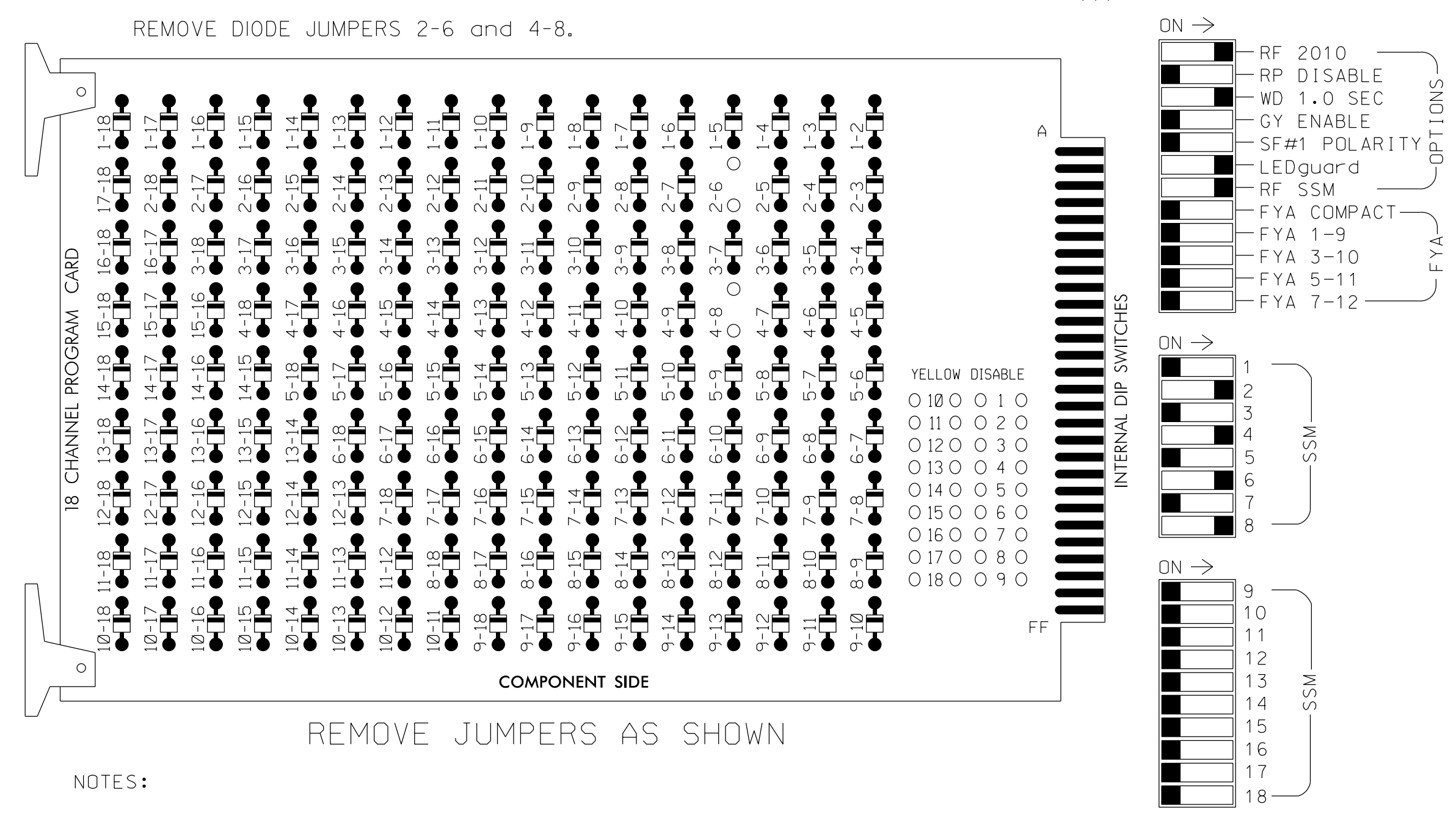
**ATKINS** 1616 EAST MILLBROOK ROAD, SUITE 160  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBEES #F-0326



07-JUN-2018 11:11:01  
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 ALEX3361 AT LUS336069

### 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.....336  
 SOFTWARE.....ECONOLITE 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

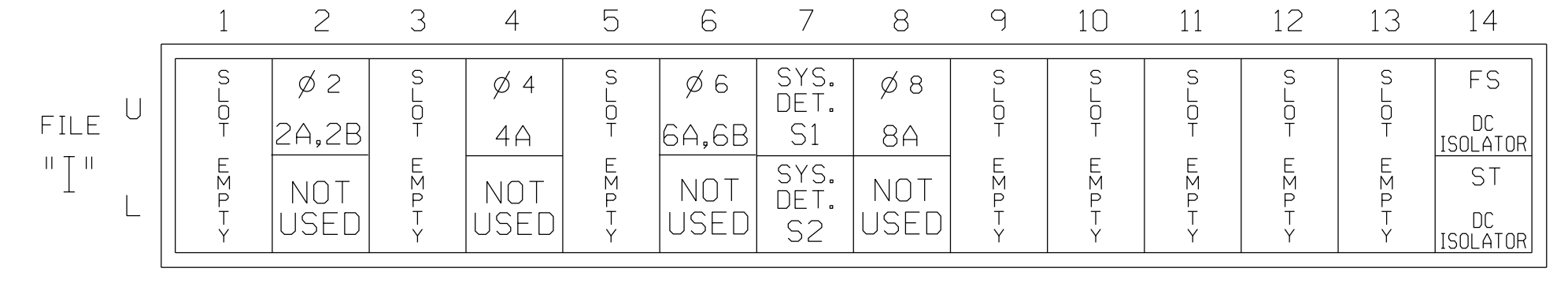
### SIGNAL HEAD HOOK-UP CHART

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

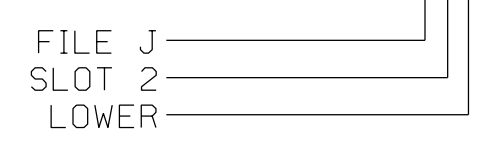
FS = FLASH SENSE  
 ST = STOP TIME

### 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,2B	TB21-3,4	I2U	39	2	2	YES				S
4A	TB21-7,8	I4U	41	4	4	YES		3		S
6A,6B	TB21-11,12	I6U	40	6	6	YES				S
* S1	TB21-13,14	I7U	57	7	SYS	NO				N
* S2	TB23-13,14	I7L	50	28	SYS	NO				N
8A	TB22-1,2	I8U	42	8	8	YES		3		S

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

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0007  
 DESIGNED: NOVEMBER 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared For the Offices of:

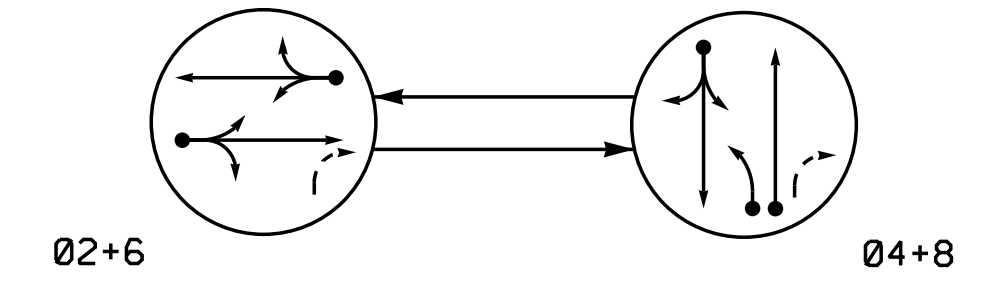
US 70-NC 62 (S. Church Street) at Glenwood Avenue	
Division 7	Alamance County Burlington
PLAN DATE: November 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: VJ Paul	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/9/2018

SIG. INVENTORY NO. 07-0007

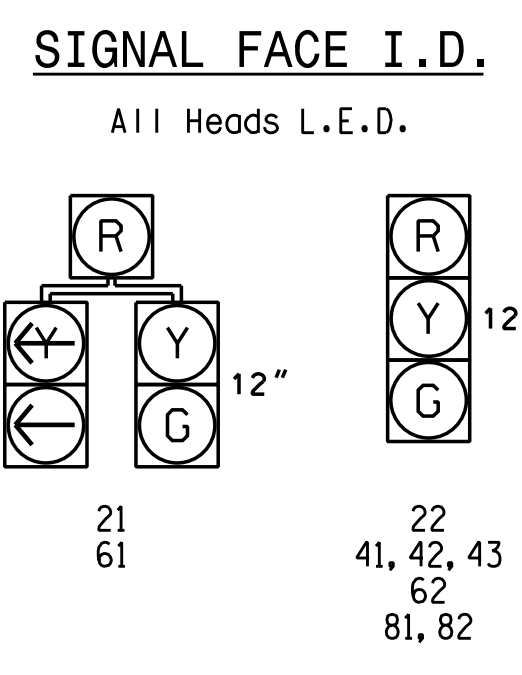
**DEFAULT PHASING DIAGRAM**



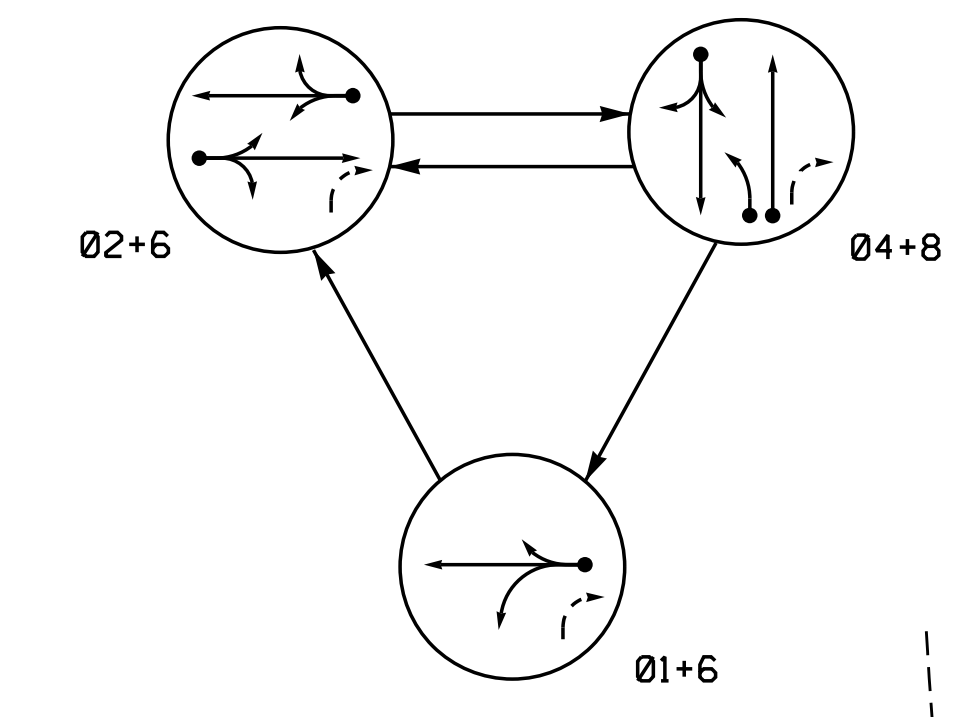
**PHASING DIAGRAM DETECTION LEGEND**  
 ● DETECTED MOVEMENT  
 ◐ UNDETECTED MOVEMENT (OVERLAP)  
 - - - UNSIGNALIZED MOVEMENT  
 - - - PEDESTRIAN MOVEMENT

**DEFAULT TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
21	G	R	Y
22	G	R	Y
41, 42, 43	R	G	R
61	G	R	Y
62	G	R	Y
81, 82	R	G	R



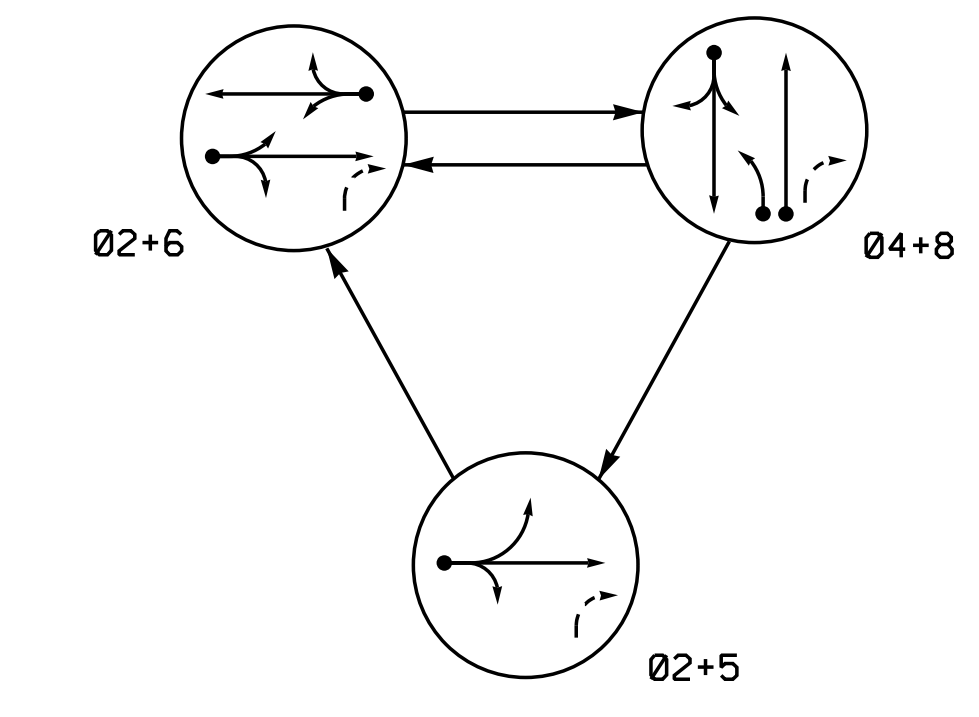
**ALTERNATE 1 PHASING DIAGRAM**



**ALTERNATE 1 TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø4+8	FLASH
21	R	G	R	Y
22	R	G	R	Y
41, 42, 43	R	R	G	R
61	G	G	R	Y
62	G	G	R	Y
81, 82	R	R	G	R

**ALTERNATE 2 PHASING DIAGRAM**



**ALTERNATE 2 TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø2+5	Ø2+6	Ø4+8	FLASH
21	G	R	Y	
22	G	R	Y	
41, 42, 43	R	R	G	R
61	R	G	R	Y
62	R	G	R	Y
81, 82	R	R	G	R

**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. Omit phase 1 during phase 2 on.
4. Omit phase 5 during phase 6 on.
5. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8 (see Electrical Details).
6. Reposition existing signal head numbered 22.
7. Set all detector units to presence mode.
8. 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.
9. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
10. The City Traffic Engineer will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**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 *	0.0	0.0	0.0	0.0	0.0	0.0		
Max 1 *	15	60	30	15	60	30		
Yellow	3.0	4.4	3.8	3.0	4.6	3.8		
Red Clear	1.8	1.3	1.0	2.3	1.0	1.6		
Actuations B4 Add *	-	0	-	-	0	-		
Seconds / Actuation *	-	2.5	-	-	2.5	-		
Max Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	20	-	-	20	-		
Time To Reduce *	-	20	-	-	20	-		
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		

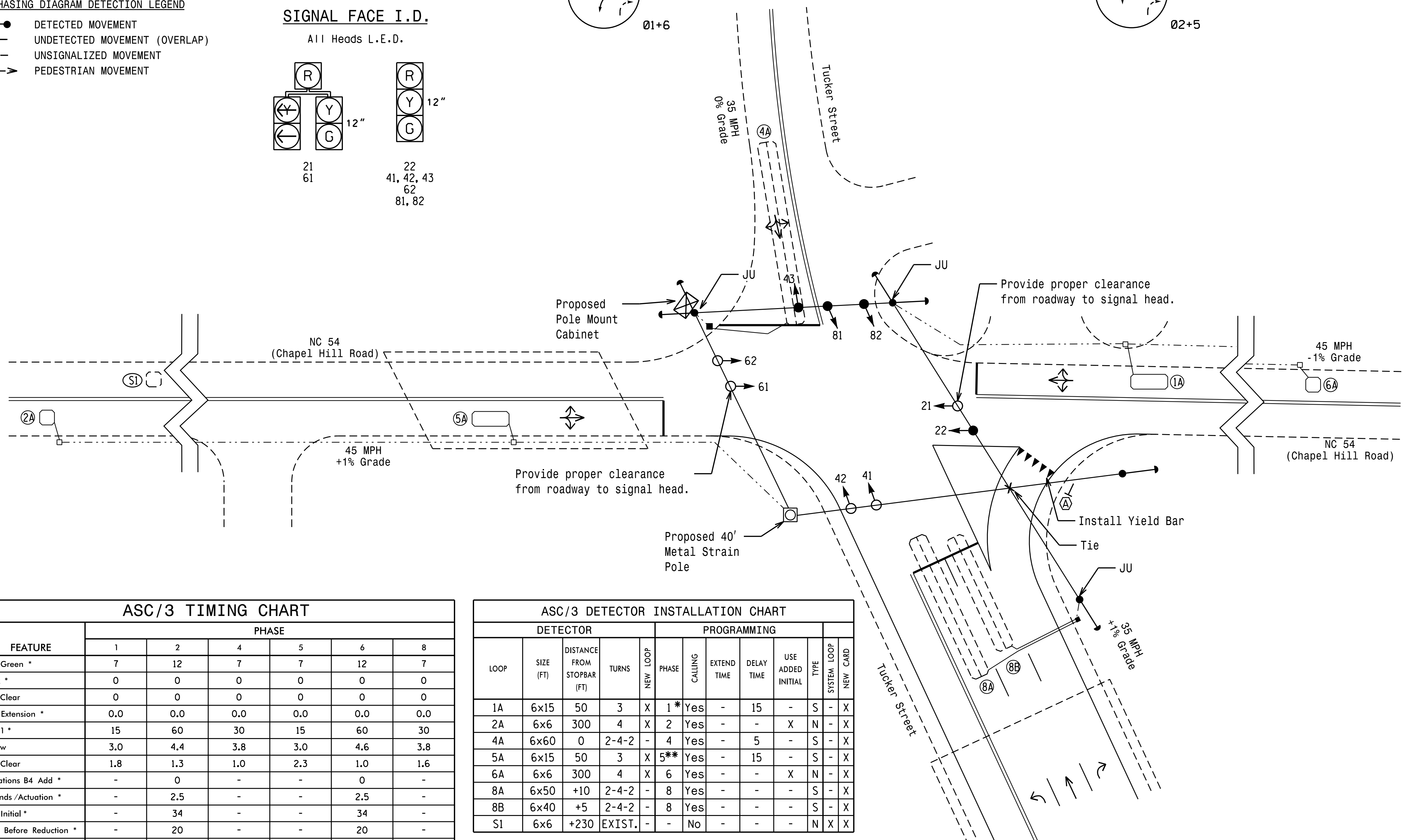
\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**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	SYSTEM LOOP	LOOP NEW CARD	
1A	6x15	50	3	X	1*	Yes	-	15	-	S	-	X
2A	6x6	300	4	X	2	Yes	-	-	-	X	N	-
4A	6x60	0	2-4-2	-	4	Yes	-	5	-	S	-	X
5A	6x15	50	3	X	5**	Yes	-	15	-	S	-	X
6A	6x6	300	4	X	6	Yes	-	-	-	X	N	-
8A	6x50	+10	2-4-2	-	8	Yes	-	-	-	S	-	X
8B	6x40	+5	2-4-2	-	8	Yes	-	-	-	S	-	X
S1	6x6	+230	EXIST.	-	-	No	-	-	-	N	X	X

\* Enable Loop 1A During Alternate 1 Phasing Operation Only.  
 \*\* Enable Loop 5A During Alternate 2 Phasing Operation Only.

10:38:25 AM  
 I:\Projects\Burlington-Graham Signal System\06 Working Folders with NCDOT File Structure if Working on NCDOT Project\DWG or Dgn\07-0008-070008.sig.dwg\_20110808.dgn  
 jvoso



**LEGEND**

PROPOSED	EXISTING
○ Traffic Signal Head	● Traffic Signal Head
◐ Modified Signal Head	N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head With Push Button & Sign
⊥ Signal Pole with Guy	⊥ Signal Pole with Guy
⊥ Signal Pole with Sidewalk Guy	⊥ Signal Pole with Sidewalk Guy
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Controller & Cabinet
⊥ Junction Box	⊥ Junction Box
- - - 2-in Underground Conduit	- - - 2-in Underground Conduit
N/A Right of Way	→ Right of Way
→ Directional Arrow	→ Directional Arrow
⊙ Metal Strain Pole	⊙ Metal Strain Pole
⊙ "YIELD" Sign (R1-2)	⊙ "YIELD" Sign (R1-2)

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

**Signal Upgrade**

Division 7 Alamance County Burlington

NC 54 (Chapel Hill Road) at Tucker Street

PLANNED BY: SE Greene REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY: JB Voso

REVISIONS

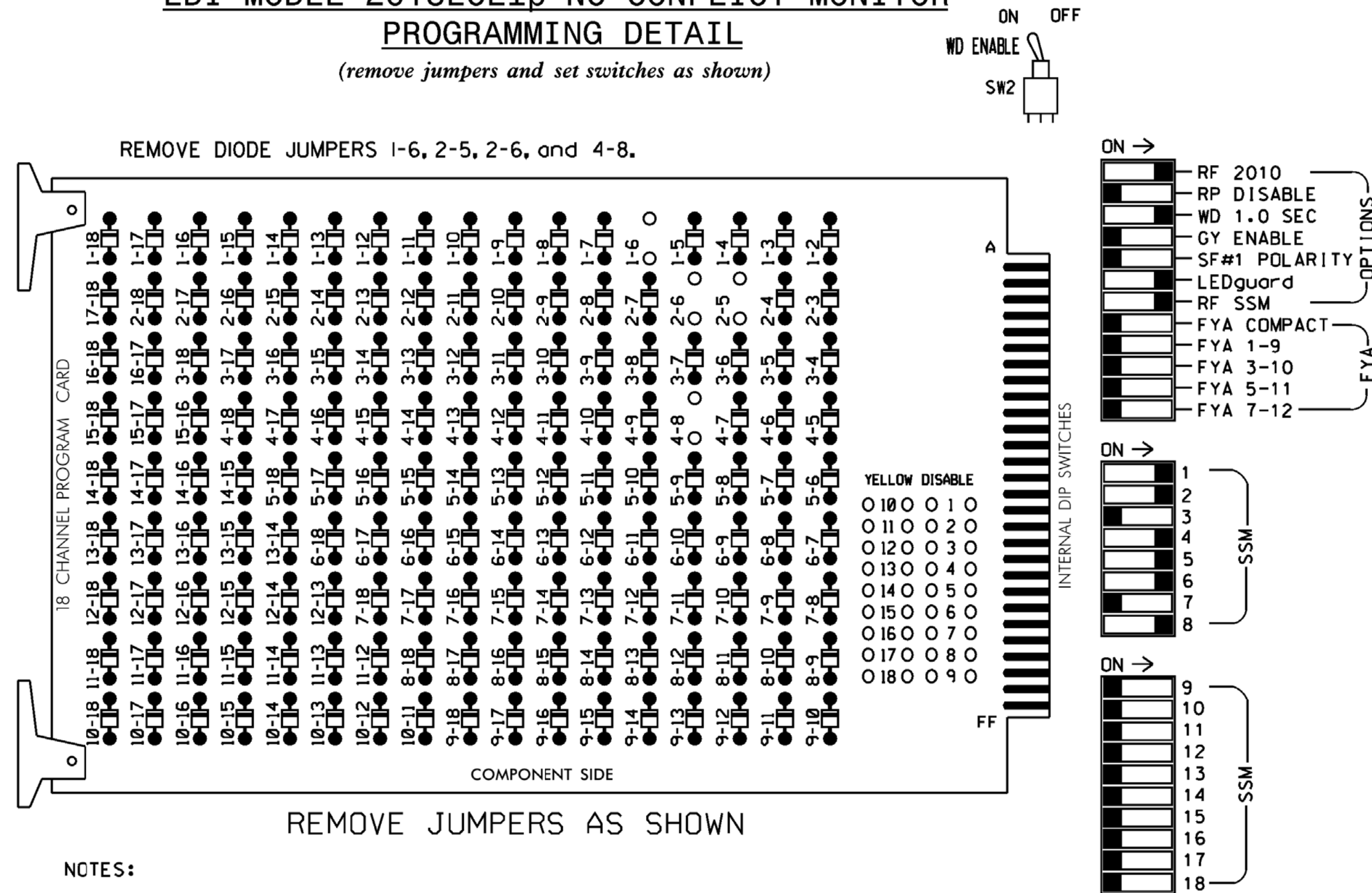
INIT. DATE

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022599  
 JAMES VOSO  
 7/2/2018  
 SIGNATURE DATE  
 SIG. INVENTORY NO. 07-0008

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

**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.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11  
 PHASES USED.....1,2,4,5,6,8  
 OVERLAPS.....NONE

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42,43	NU	21	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	126						132					
GREEN ARROW	127						133					

NU = Not Used

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

**INPUT FILE POSITION LAYOUT**

(front view)

FILE U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
∅ 1	∅ 2	S	∅ 4	∅ 5	∅ 6	S	∅ 8	S	S	S	S	S	S	FS
1A	2A	STOP	4A	5A	6A	STOP	8A	STOP	STOP	STOP	STOP	STOP	STOP	DC ISOLATOR
NOT USED	NOT USED	←	NOT USED	NOT USED	SYS. DET. S1	←	∅ 8	←	←	←	←	←	←	ST
							8B							DC ISOLATOR

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

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB21-1,2	11U	56	1★	-	YES		15		S
2A	TB21-3,4	12U	39	2	2	YES			X	N
4A	TB21-7,8	14U	41	4	4	YES		5		S
5A	TB21-9,10	15U	55	5★	-	YES		15		S
6A	TB21-11,12	16U	40	6	6	YES			X	N
* S1	TB23-11,12	16L	44	16	SYS	NO				N
8A	TB22-1,2	18U	42	8	8	YES				S
8B	TB24-1,2	18L	46	18	8	YES				S

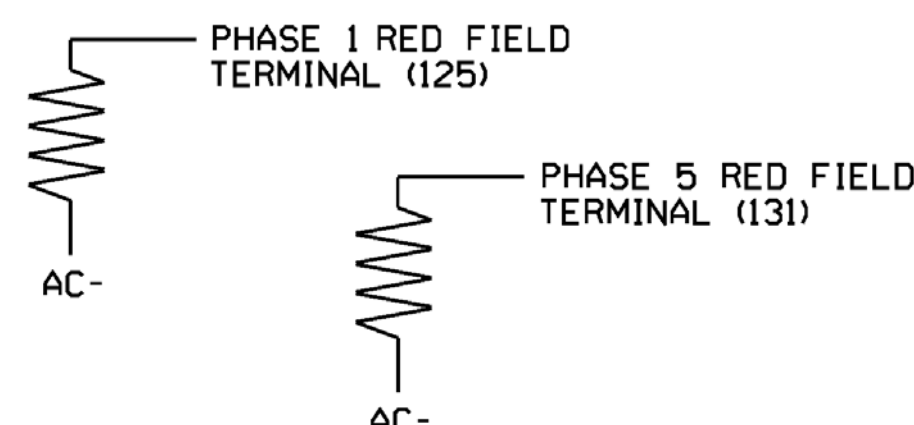
★ There is no assigned vehicle phase for detectors 1 and 5 during default phasing operation. For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 3.

\* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

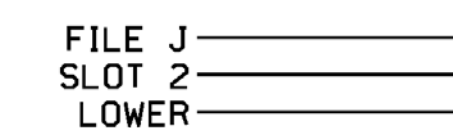
**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)

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



INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0008  
 DESIGNED: April 2018  
 SEALED: 7/2/2018  
 REVISED: NA

Electrical Detail - Sheet 1 of 5

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

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 (828) 254-2201  
 FAX (828) 254-4562  
 NC LIC. NO. C-1154

Prepared for the Offices of:  
 North Carolina Department of Transportation  
 Signal Management

750 N. Greenfield Pkwy, Corner, NC 27529

NC 54 (Chapel Hill Road) at Tucker Street

Division 7 Alamance County Burlington

PLAN DATE: April 2018 REVIEWED BY: JB Voso  
 PREPARED BY: SE Greene REVIEWED BY:

REVISIONS

REVISIONS	INIT.	DATE

DocuSigned by: James Voso 7/2/2018

SIG. INVENTORY NO. 07-0008

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*D\*\*\*\*\*  
 \*\*\*\*\*USER\*\*\*\*\*

**ECONOLITE ASC/3-2070 BACKUP  
PREVENT ENABLE PROGRAMMING**  
*(program controller as shown)*

- From Main Menu select 1. CONFIGURATION
- From CONFIGURATION Submenu select 1. CONTROLLER SEQ
- From CONTROLLER SEQUENCE Submenu select 3. BACKUP PREVENT PHASES

Follow programming as shown below. On the 'ENABLE BACKUP PREVENT' screen move cursor to the appropriate field and press 'YES/NO' on the controller keypad to toggle field value between 'X', 'B', 'C' and 'OFF'.

ENABLE	BACKUP	PREVENT														
TMG/BKUP	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	B	.	C	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	C	B	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

END PROGRAMMING

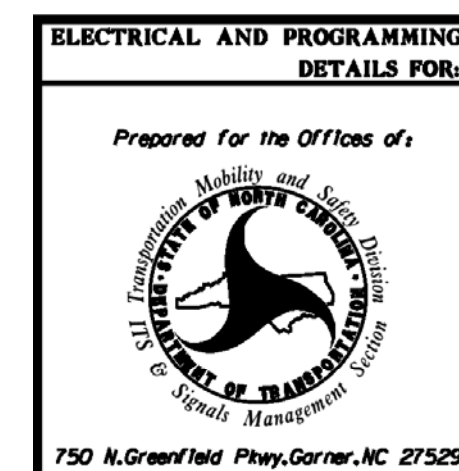
**NOTE**

- 'B' with a 'C' programmed for the 'TIMING' (row) phase places a demand on that 'BACKUP' (column) phase. The controller will then service the called phase and proceed normally.

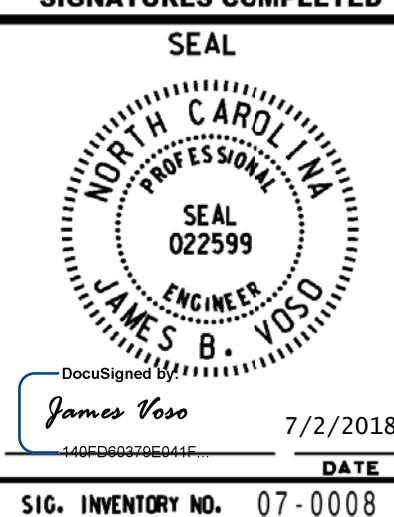
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-0008  
DESIGNED: April 2018  
SEALED: 7/2/2018  
REVISED: NA



12 BROAD STREET  
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NC LIC. NO. C-1154



ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 54 (Chapel Hill Road) at Tucker Street	
Prepared For the Offices of:	Division 7	Alamance County	Burlington
PLAN DATE: April 2018	REVIEWED BY: JB Voso		
PREPARED BY: SE Greene	REVIEWED BY:		
REVISIONS	INIT.	DATE	



James Voso  
7/2/2018  
DATE  
SIG. INVENTORY NO. 07-0008

\*\*\*\*\*SYTIME\*\*\*\*\*  
\*\*\*\*\*DONES\*\*\*\*\*  
\*\*\*\*\*USERNAME\*\*\*\*\*

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

(program controller as shown)

ALTERNATE PHASING 1

**IMPORTANT!**

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

1. From Main Menu select **8. UTILITIES**
2. From UTILITIES Submenu select **1. COPY/CLEAR**
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

COPY / CLEAR UTILITY	
FROM	TO
PHASE TIMING....	> PHASE TIMING....
TIMING PLAN....	> TIMING PLAN....
PH DET OPT PLAN. .	> PH DET OPT PLAN. .
DETECTOR PLAN... 1	> DETECTOR PLAN... 2
TOGGLE TO SELECT A "FROM" AND A "TO" THEN PRESS ENTER	

4. From Main Menu select **6. DETECTORS**
5. From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
  - Place cursor in VEH DETECTOR [ ] position and enter "1".
  - Ensure delay time to set to "15".

ENSURE PHASE IS SET TO "1" →

VEH DETECTOR [ 1 ]	VEH DET PLAN [ 2 ]	← NOTICE VEH DET PLAN 2
TYPE: S-STANDARD		
TS2 DETECTOR..... ECPI LOG..... NO		
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6		
1 1 . . . . .		
EXTEND TIME... 0.0 DELAY TIME... 15.0 ← ENSURE DELAY IS SET TO '15'		
USE ADDED INITIAL . CROSS SWITCH PH.. 0		
LOCK IN..... NONE NTCIP VOL . OR OCC .		
PMT QUEUE DELAY. NO		
END PROGRAMMING		

ALTERNATE PHASING 2

**IMPORTANT!**

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

1. From Main Menu select **8. UTILITIES**
2. From UTILITIES Submenu select **1. COPY/CLEAR**
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "3".

COPY / CLEAR UTILITY	
FROM	TO
PHASE TIMING....	> PHASE TIMING....
TIMING PLAN....	> TIMING PLAN....
PH DET OPT PLAN. .	> PH DET OPT PLAN. .
DETECTOR PLAN... 1	> DETECTOR PLAN... 3
TOGGLE TO SELECT A "FROM" AND A "TO" THEN PRESS ENTER	

4. From Main Menu select **6. DETECTORS**
5. From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
6. Place cursor in VEH DET PLAN [ ] position and enter "3".
  - Place cursor in VEH DETECTOR [ ] position and enter "5".
  - Ensure delay time is set to "15".


ENSURE PHASE IS SET TO "5" →

VEH DETECTOR [ 5 ]	VEH DET PLAN [ 3 ]	← NOTICE VEH DET PLAN 3
TYPE: S-STANDARD		
TS2 DETECTOR..... ECPI LOG..... NO		
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6		
5 5 . . . . .		
EXTEND TIME... 0.0 DELAY TIME... 15.0 ← ENSURE DELAY IS SET TO '15'		
USE ADDED INITIAL . CROSS SWITCH PH.. 0		
LOCK IN..... NONE NTCIP VOL . OR OCC .		
PMT QUEUE DELAY. NO		
END PROGRAMMING		

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 NC LIC. NO. C-1154

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0008  
 DESIGNED: April 2018  
 SEALED: 7/2/2018  
 REVISED: NA

Electrical Detail - Sheet 3 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  1750 N. Greenfield Pkwy. Garner, NC 27529	NC 54 (Chapel Hill Road) at Tucker Street	
	Division 7 Alamance County Burlington PLAN DATE: April 2018 PREPARED BY: SE Greene	REVIEWED BY: JB Voso REVIEWED BY:
	REVISIONS	INIT. DATE

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 SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL  
 SEAL  
 022599  
 ENGINEER  
 JAMES B. VOSO

DocuSigned by:  
 James Voso 7/2/2018  
 DATE  
 SIG. INVENTORY NO. 07-0008

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*DORIS\*\*\*\*\*  
 \*\*\*\*\*USERNAME\*\*\*\*\*





### ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 FOR ALTERNATE 1 PHASING OPERATION AND VEH DET PLAN 3 FOR ALTERNATE 2 PHASING OPERATION.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 FOR ALTERNATE 1 PHASING OPERATION AND VEH DET PLAN 3 FOR ALTERNATE 2 PHASING OPERATION.

PHASING	VEH DET PLAN
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1
ACTIONS REQUIRED TO RUN <u>ALTERNATE 1 PHASING</u>	2
ACTIONS REQUIRED TO RUN <u>ALTERNATE 2 PHASING</u>	3

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

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN VEH DET PLAN 2 OR VEH DET PLAN 3 ACTIVATE TO CALL THE "ALTERNATE PHASING":

VEH DET PLAN 2: Enables phase 1 call on loop 1A.

VEH DET PLAN 3: Enables phase 5 call on loop 5A.

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

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

```

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

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

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

```

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

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NC LIC. NO. C-1154

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-0008  
DESIGNED: April 2018  
SEALED: 7/2/2018  
REVISED: NA

Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Division 7 Alamance County Burlington

PLAN DATE: April 2018 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS

INIT. DATE

James Voso 7/2/2018

SIG. INVENTORY NO. 07-0008

\*\*\*\*\*SYTIME\*\*\*\*\*  
\*\*\*\*\*D\*\*\*\*\*  
\*\*\*\*\*USER\*\*\*\*\*

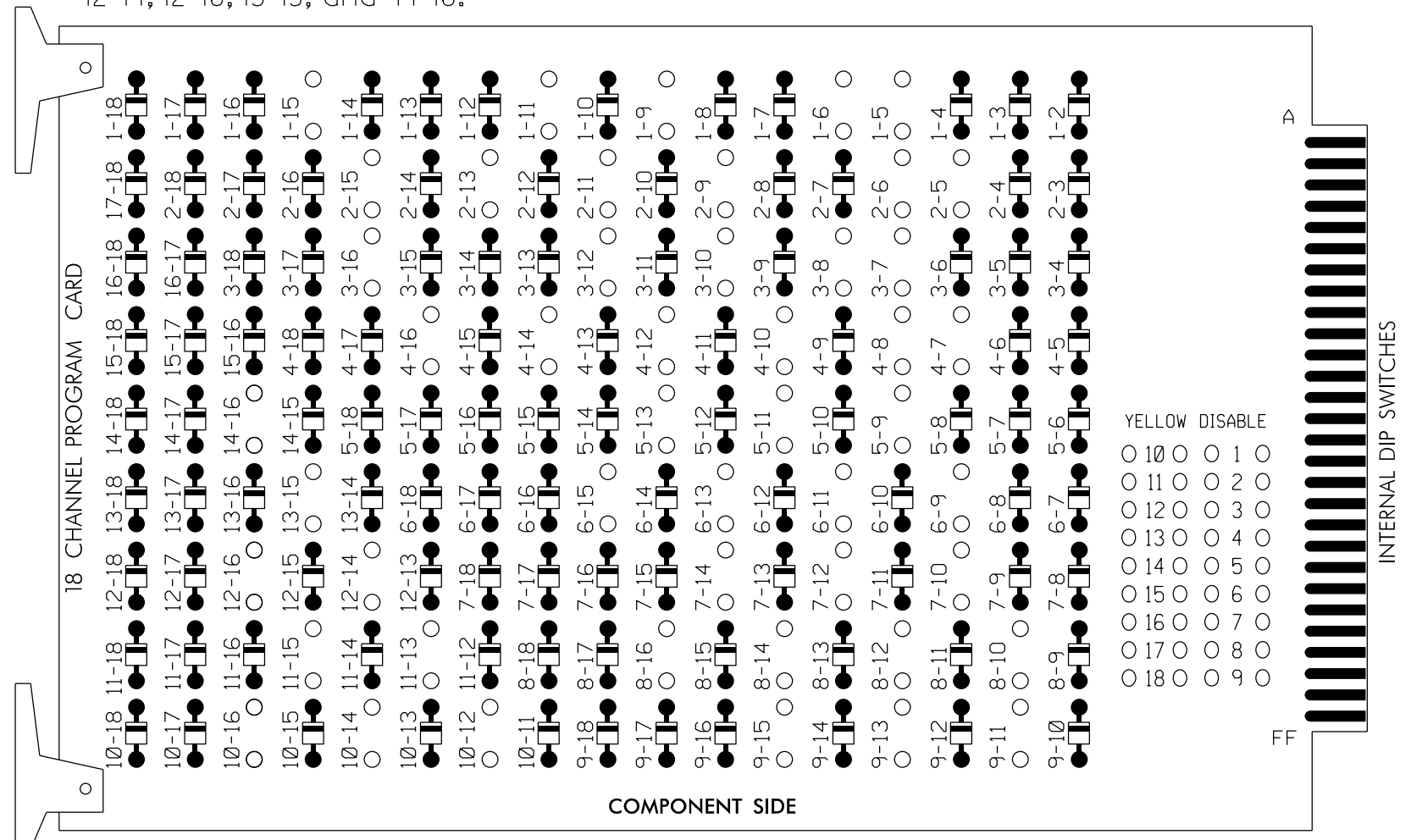




### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

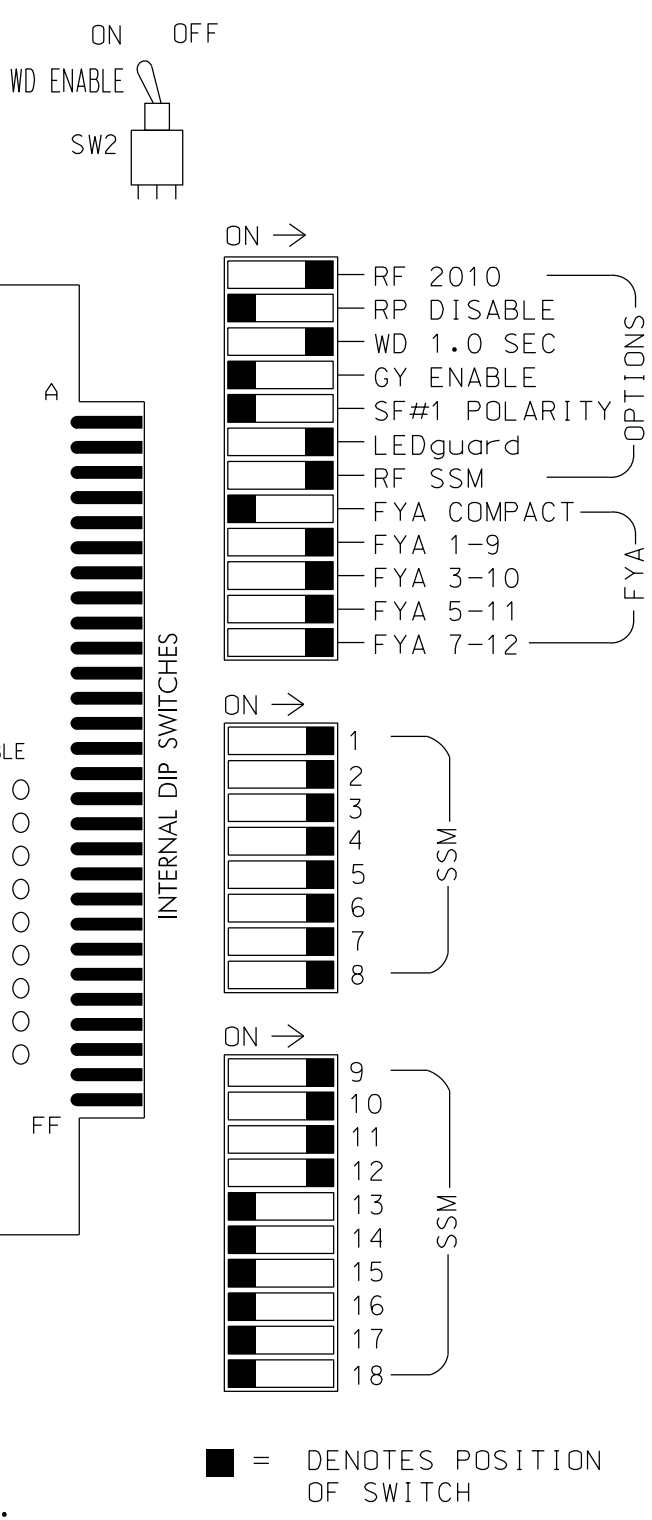
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-10, 3-12, 3-16, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- 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.
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,S4,S5,S6,S7,S8,S9, S10,S11,S12,AUX S1,AUX S2, AUX S4,AUX S5
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED, 7,8,8PED

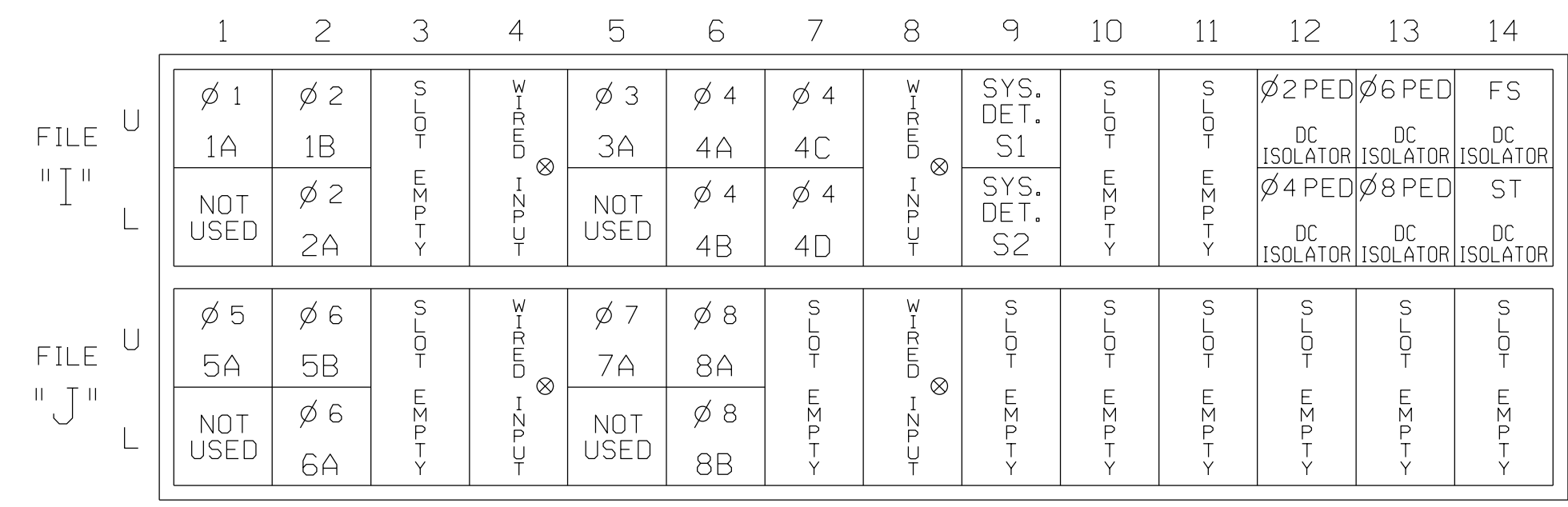
OVERLAP "A".....\*
OVERLAP "B".....\*
OVERLAP "C".....\*
OVERLAP "D".....\*
\* See overlap programming detail on sheet 2

### SIGNAL HEAD HOOK-UP CHART

Table with columns for Load Switch No., S1-S12, AUX S1-S6, and Signal Head No. (RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, FLASHING YELLOW ARROW, GREEN ARROW). Includes a legend for NU (Not Used) and symbols for load resistor and wiring detail.

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

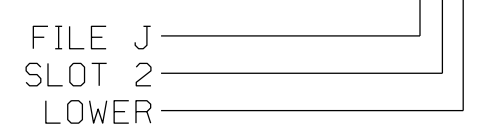
Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns: LOOP NO., LOOP TERMINAL, INPUT FILE POS., PIN NO., DETECTOR NO., NEMA PHASE, CALL, EXTEND TIME, DELAY TIME, ADDED INITIAL, DETECTOR TYPE. Includes a note about installing DC isolators in input file slots 112 and 113.

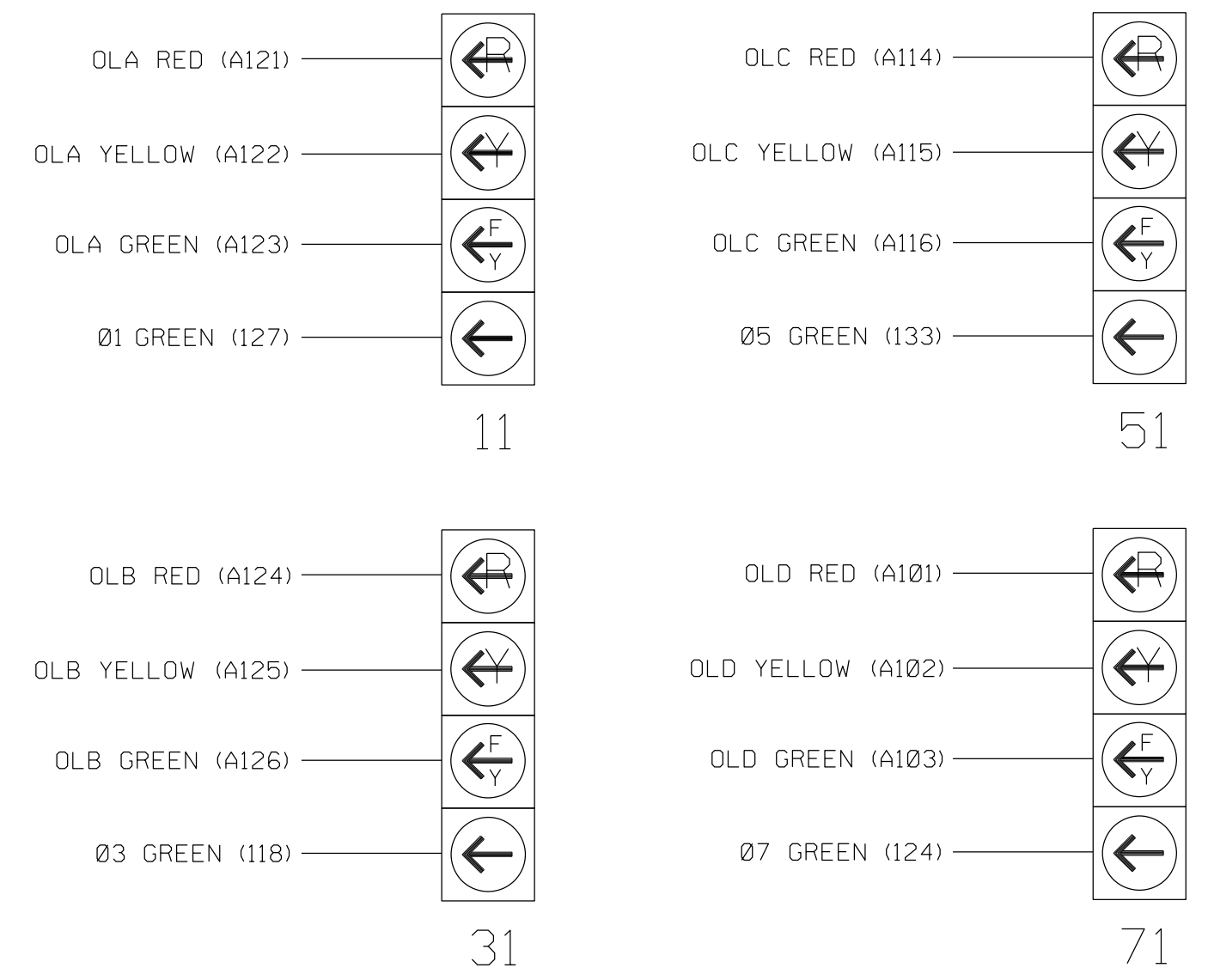
- \* System detector only. Remove any assigned vehicle phase.
1 Add jumper from I1-W to J4-W, on rear of input file.
2 Add jumper from I5-W to J8-W, on rear of input file.
3 Add jumper from J1-W to I4-W, on rear of input file.
4 Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

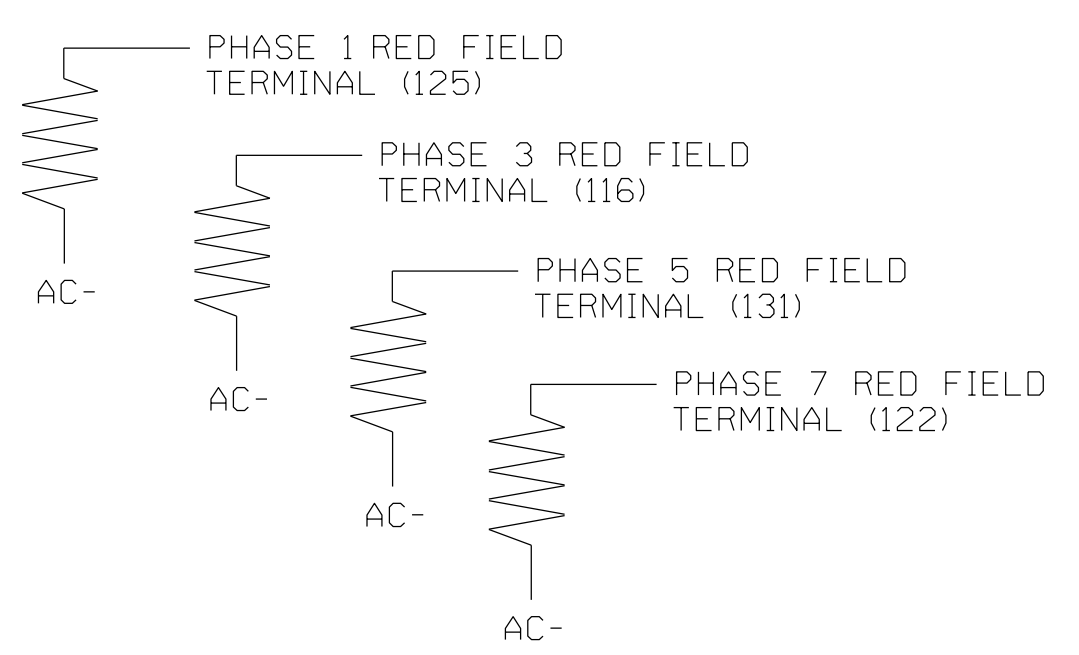
(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

Table with columns: VALUE (ohms), WATTAGE. Values: 1.5K - 1.9K, 25W (min); 2.0K - 3.0K, 10W (min).



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0009
DESIGNED: SEPT-2017
SEALED: 06-13-2018
REVISED:

Electrical Detail - Sheet 1 of 2

Professional seal and signature block for Lisa M. Moon, Engineer, License No. 22516, dated 6/13/2018. Includes project details for NC 54 (Chapel Hill Road) at SR 1363 (S. Mebane Street).

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

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

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

*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 Once

*OVERLAP B*

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

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

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: ....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

Toggle Once

*OVERLAP D*

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

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

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:

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

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

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-0009  
DESIGNED: SEPT-2017  
SEALED: 06-13-2018  
REVISED:

Electrical Detail - Sheet 2 of 2

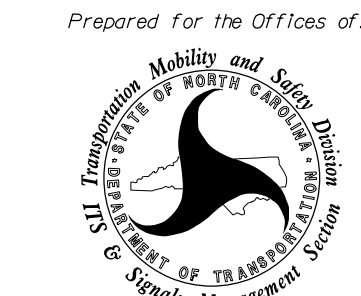
Plans Prepared By:



DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27518  
NC License No. C-2213 (919) 650-1038

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 54 (Chapel Hill Road) at SR 1363 (S. Mebane Street)	
Division 7	Alamance County
PLAN DATE: September 2017	REVIEWED BY: LM Moon
PREPARED BY: AJ Davis	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

SEAL



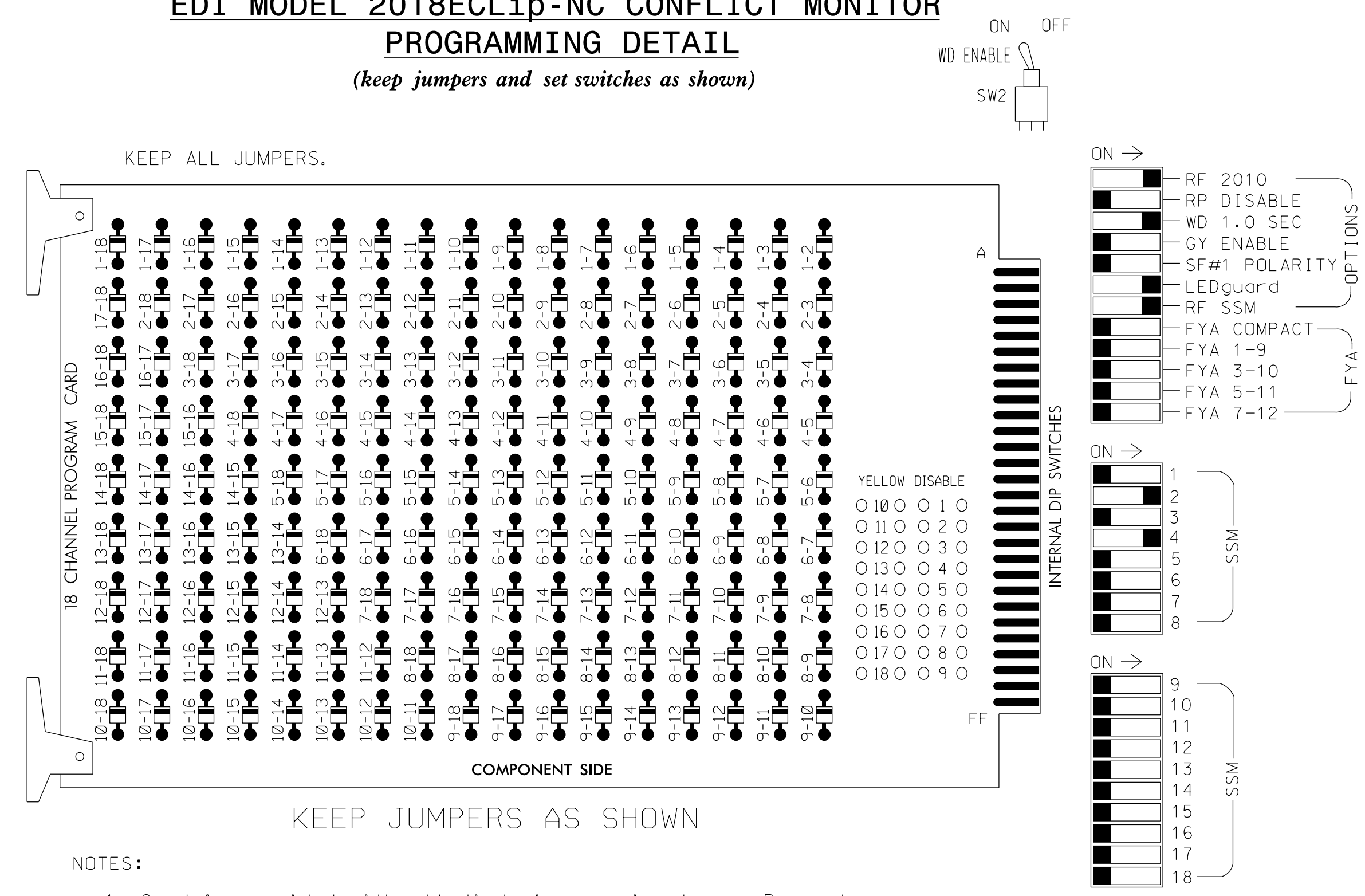
DocuSigned by:  
*Lisa M. Moon* 6/13/2018

SIG. INVENTORY NO. 07-0009



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

(keep jumpers and set switches as shown)



NOTES:

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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green.
3. 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  
 PHASES USED.....2,4  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

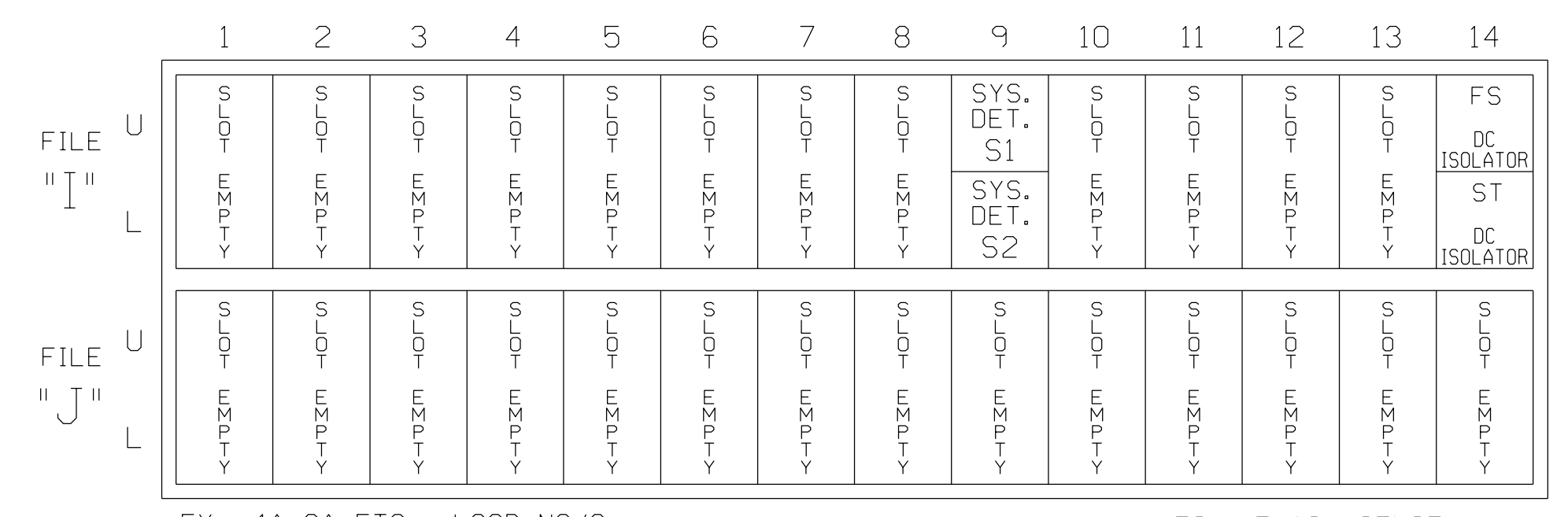
### SIGNAL HEAD HOOK-UP CHART

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 23,24,25	NU	NU	41,42 43,44	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101													
YELLOW		129			102													
GREEN		130			103													
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

### INPUT FILE POSITION LAYOUT

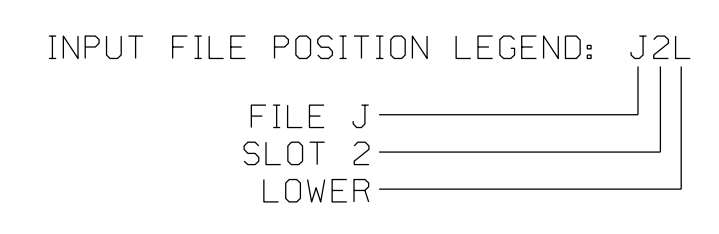
(front view)



### 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
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N

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



THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0011  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-Jul-2018 17:13  
 R:\66015\17\off\ek\sign\des\gn\w\ir\ing\07-0011e.dgn  
 Lawton AT CAR-RLAWTON-W7



### Electrical Detail

Electrical and Programming Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 70 - NC 62 (S. Church Street) at W. Fifth 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



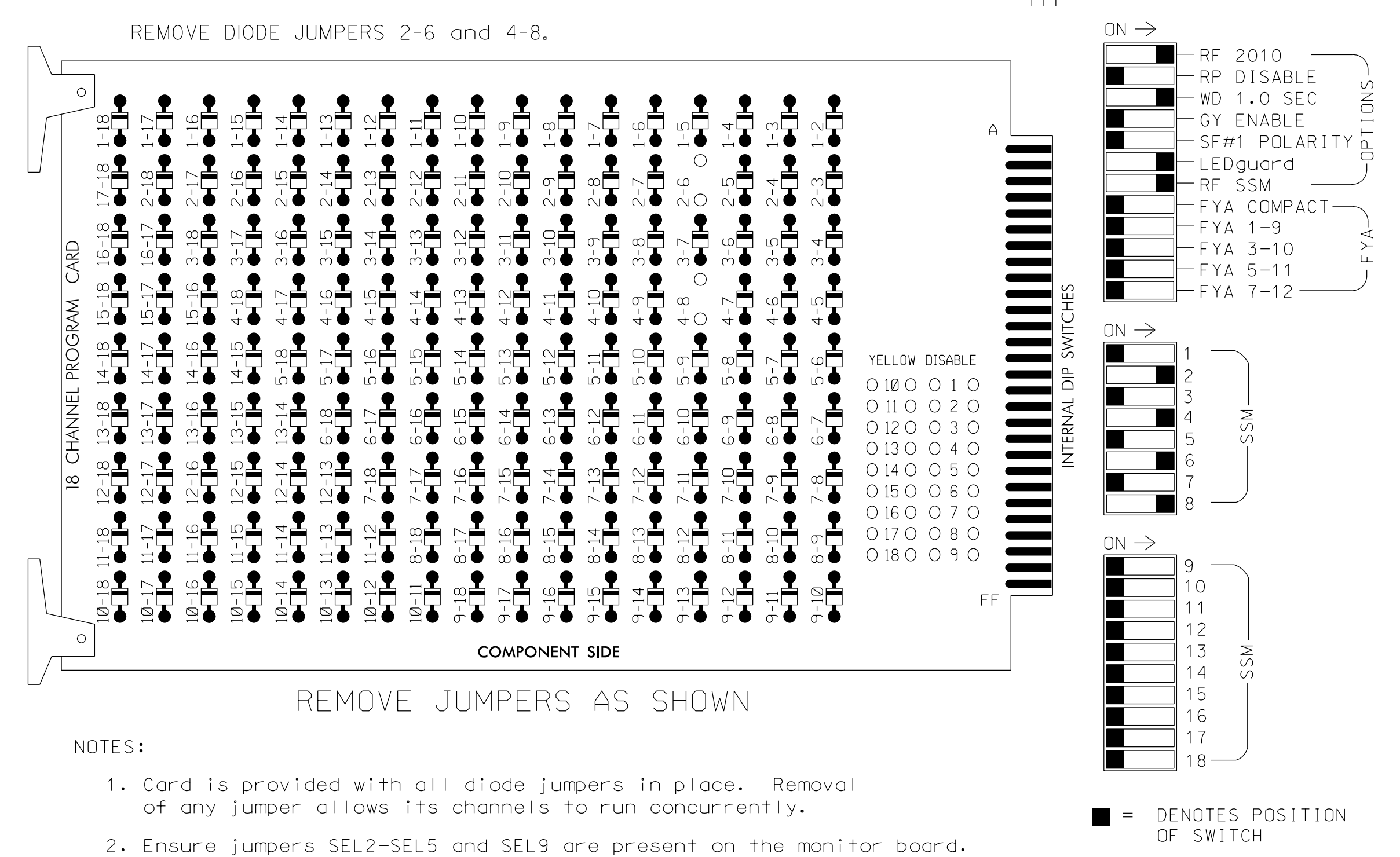
DocuSigned by:  
 Lisa M. Moon 6/13/2018  
 sig. INVENTORY NO. 07-0011





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

(remove jumpers and set switches as shown)



### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- 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
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												

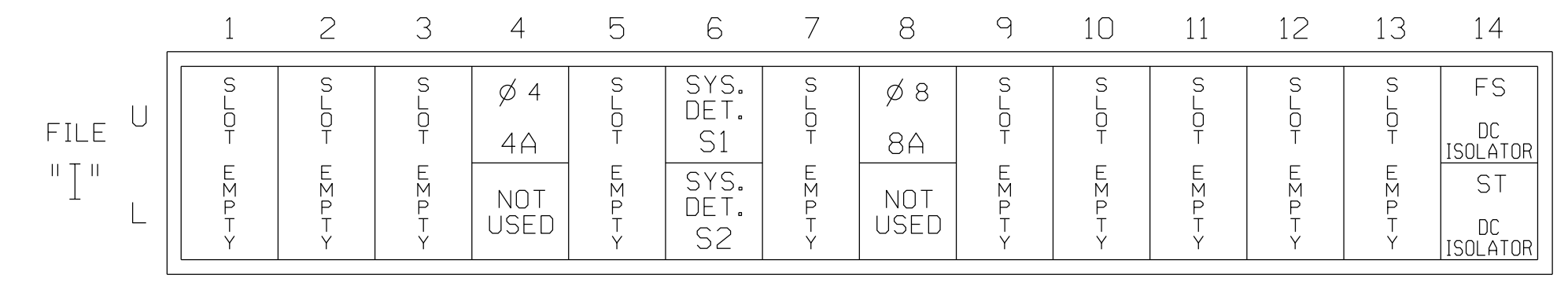
NU = Not Used

### 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

### INPUT FILE POSITION LAYOUT

(front view)



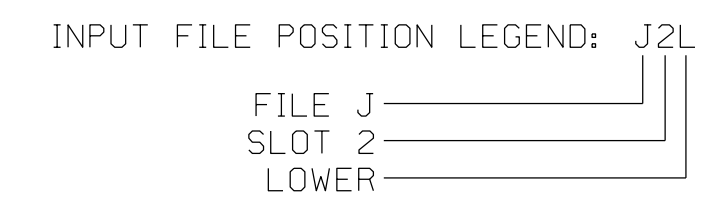
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB21-7,8	14U	41	4	4	YES		5		S
* S1	TB21-11,12	16U	40	6	SYS	NO				N
* S2	TB23-11,12	16L	44	16	SYS	NO				N
8A	TB22-1,2	18U	42	8	8	YES		5		S

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0012  
 DESIGNED: August-2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-UNA-2018-17-13  
 R:\66015\17\off\ek\sign\design\w\ir\img\07-0012a.dgn  
 C:\ewton AT CAR-RLANDON-W7



### Electrical Detail

Electrical and Programming Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 87 (E. Webb Avenue) at Williamson Street

Division 7 Alamance County Burlington

PLAN DATE: August 2017 REVIEWED BY: LM Moon

PREPARED BY: AJ Davis REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

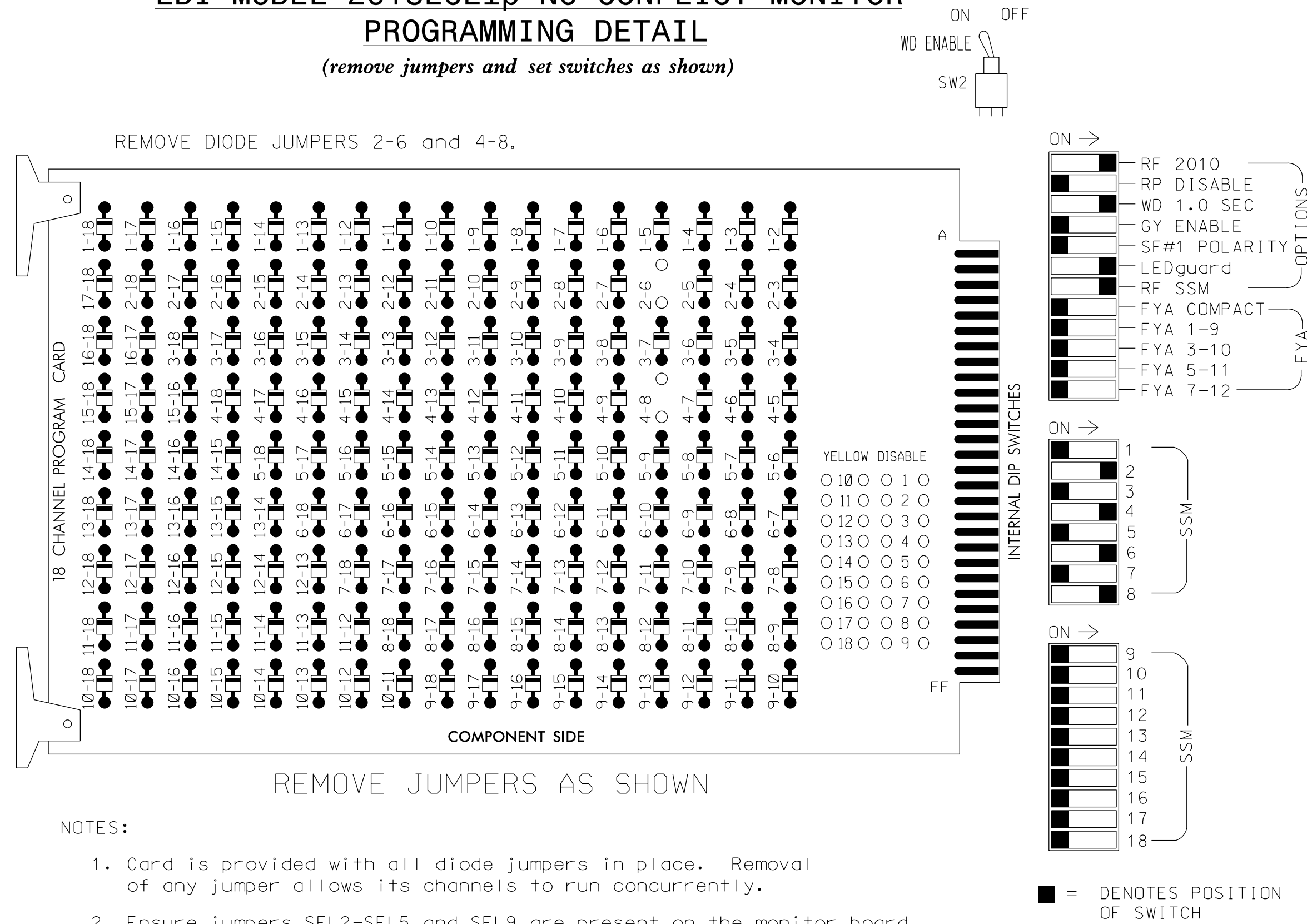


DocuSigned by: Lisa M. Moon 6/13/2018  
 DATE: 6/13/2018  
 SIG. INVENTORY NO. 07-0012



### 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.

### 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												

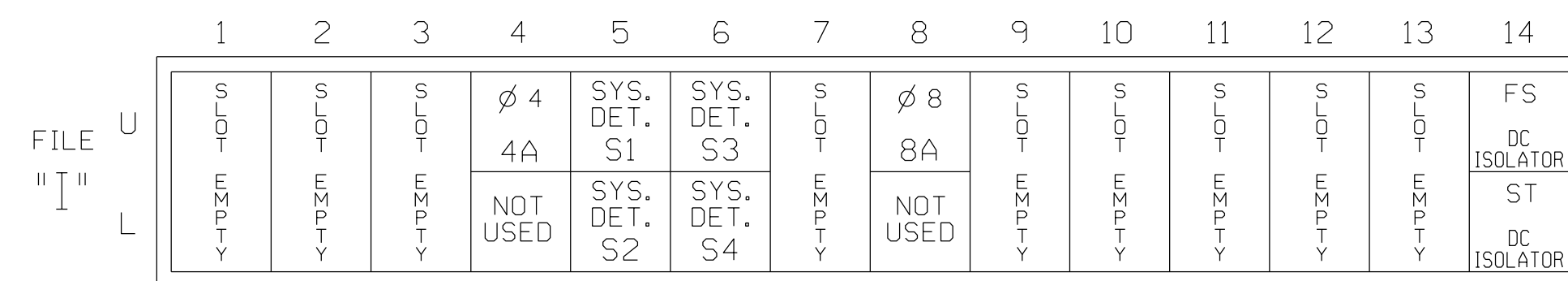
NU = Not Used

### 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

### INPUT FILE POSITION LAYOUT

(front view)



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

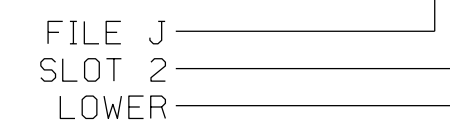
FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB21-7,8	I4U	41	4	4	YES		5		S
* S1	TB21-9,10	I5U	55	5	SYS	NO				N
* S2	TB23-9,10	I5L	48	26	SYS	NO				N
* S3	TB21-11,12	I6U	40	6	SYS	NO				N
* S4	TB23-11,12	I6L	44	16	SYS	NO				N
8A	TB22-1,2	I8U	42	8	8	YES		5		S

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

INPUT FILE POSITION LEGEND: J2L

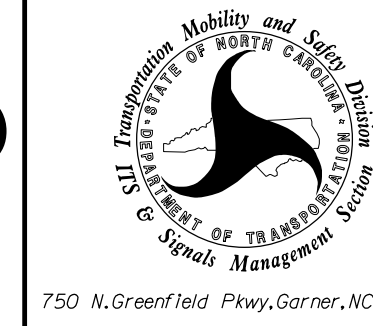
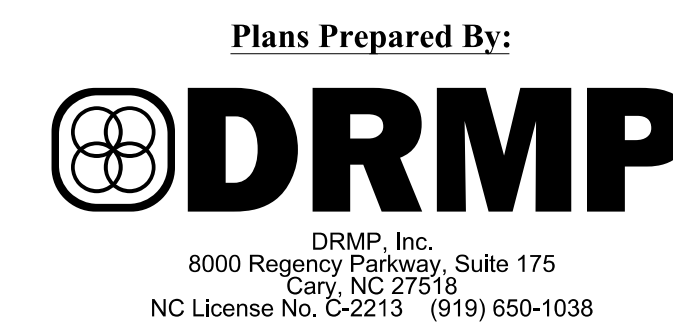


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0013  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

### Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

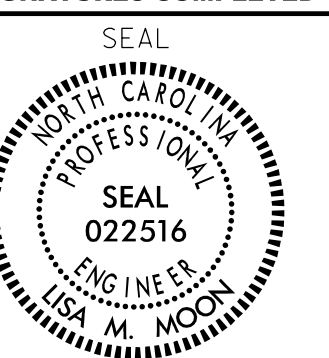
Prepared for the Offices of:



NC 87-100 (E. Webb Ave.)  
 at  
 Flanner Street

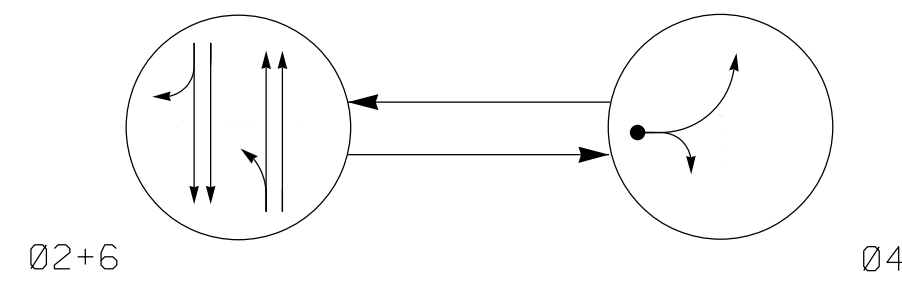
Division 7	Alamance County	Burlington
PLAN DATE: November 2017	REVIEWED BY: AJ Davis	
PREPARED BY: DJ White	REVIEWED BY: LM Moon	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 6/13/2018  
 DATE: 6/13/2018  
 SIG. INVENTORY NO. 07-0013

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

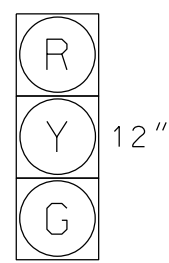
- DETECTED MOVEMENT
- - -●- - - UNDETECTED MOVEMENT (OVERLAP)
- - - UNSIGNALIZED MOVEMENT
- - -> PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



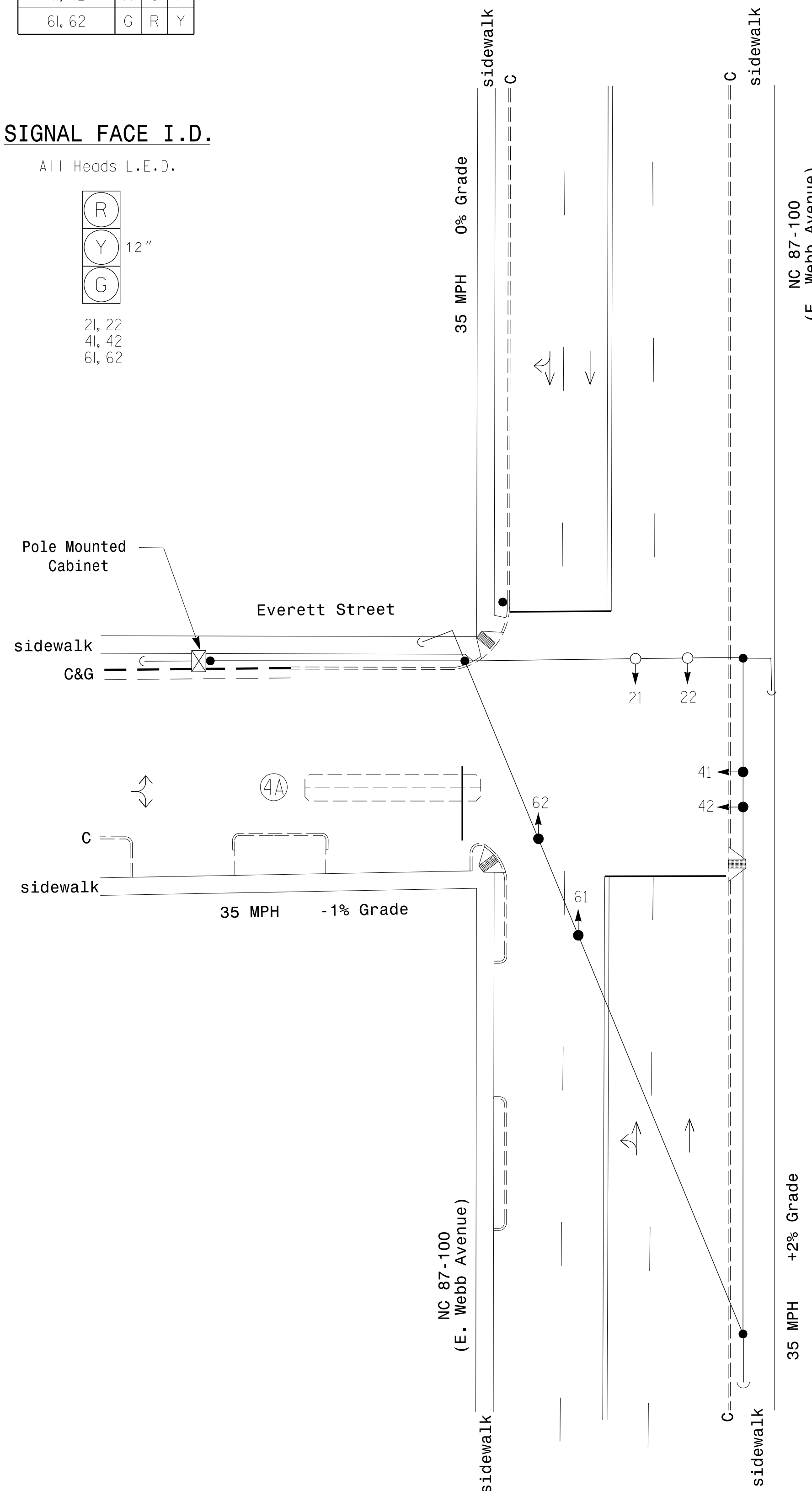
21, 22  
41, 42  
61, 62

ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
4A	6x40	+5	2-4-2	-	4	Yes	-	5	-	S	-	X

**2 Phase Semi-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.
- Install new messenger for signal heads 21 and 22. Install to obtain a minimum clearance distance over roadway.
- Install new signal cable for signal heads 21, 22, 41 and 42.
- 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	6
Min Green *	10	7	10
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	0.0	2.0	0.0
Max 1 *	54	22	54
Yellow	3.7	3.0	3.8
Red Clear	1.0	1.9	1.1
Actuations B4 Add *	-	-	-
Seconds /Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	-	MAX RECALL
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

LEGEND		
PROPOSED		EXISTING
○→	Traffic Signal Head	●→
○→	Modified Signal Head	N/A
○→	Sign	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	Wheelchair Ramp	↗

**Signal Upgrade**

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

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**NC 87-100 (E. Webb Avenue) at Everett Street**

Divison 7 Alamance County Burlington

PLAN DATE: Sept 2017 REVIEWED BY: AJ Davis

PREPARED BY: RD Lawton REVIEWED BY: LM Moon

SEAL

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

Plans Prepared By:

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

SCALE

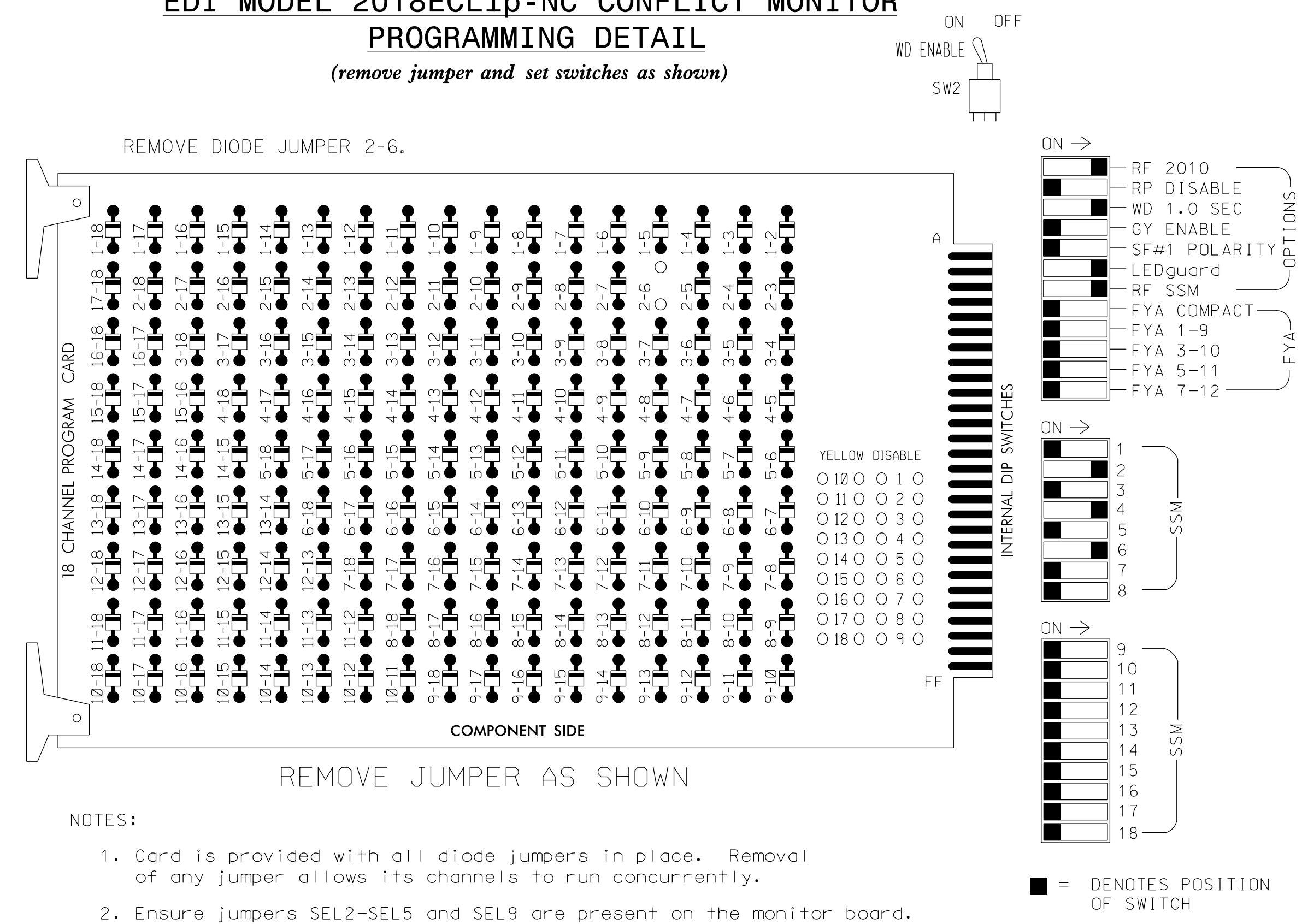
0 20

1" = 20'

REVISIONS	INIT.	DATE

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

(remove jumper and set switches as shown)



NOTES:

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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. 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
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

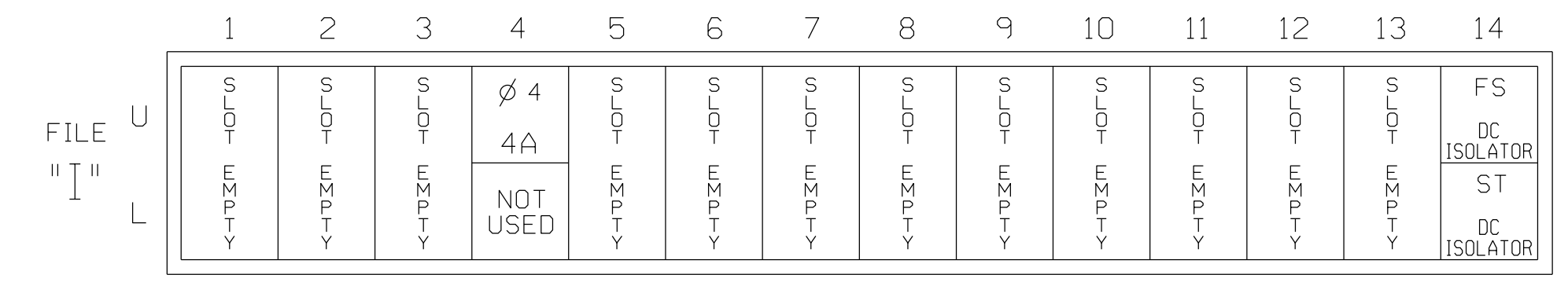
NU = Not Used

### EQUIPMENT INFORMATION

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

### INPUT FILE POSITION LAYOUT

(front view)



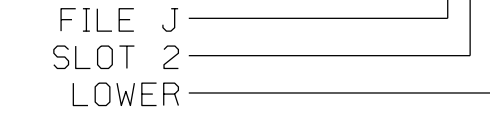
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB21-7,8	14U	41	4	4	YES		5		S

INPUT FILE POSITION LEGEND: J2L

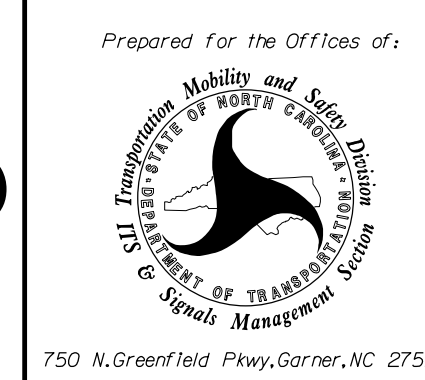


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0014  
 DESIGNED: SEPT-2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-UNA-2018-17-14  
 R:\66015\17\off\ek\sig\mon\edi\gn\w\ir\ing\07-0014e.dgn  
 C:\lowton AT CAR-RLANTON-W7

### Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

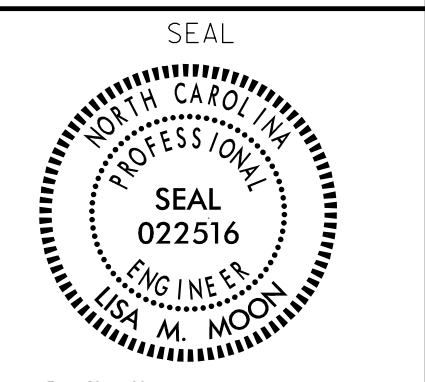


Plans Prepared By:  
**DRMP**  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27518  
 NC License No. C-2213 (919) 650-1038

NC 87-100 (E. Webb Avenue)  
 at  
 Everett Street

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

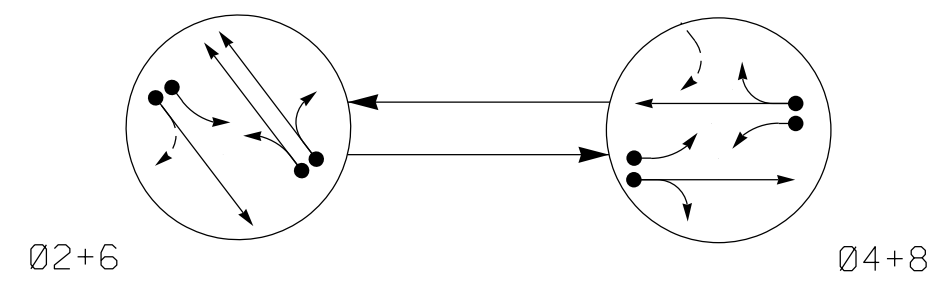
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:  
 Lisa M. Moon  
 6/13/2018  
 DATE  
 SIG. INVENTORY NO. 07-0014

2 Phase Fully Actuated (Burlington-Graham Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

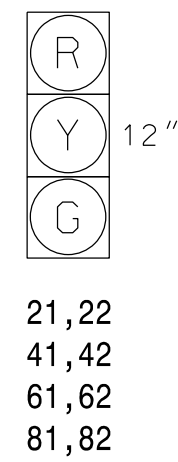
- DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UNSIGNALIZED MOVEMENT
- ◄ PEDESTRIAN MOVEMENT

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.

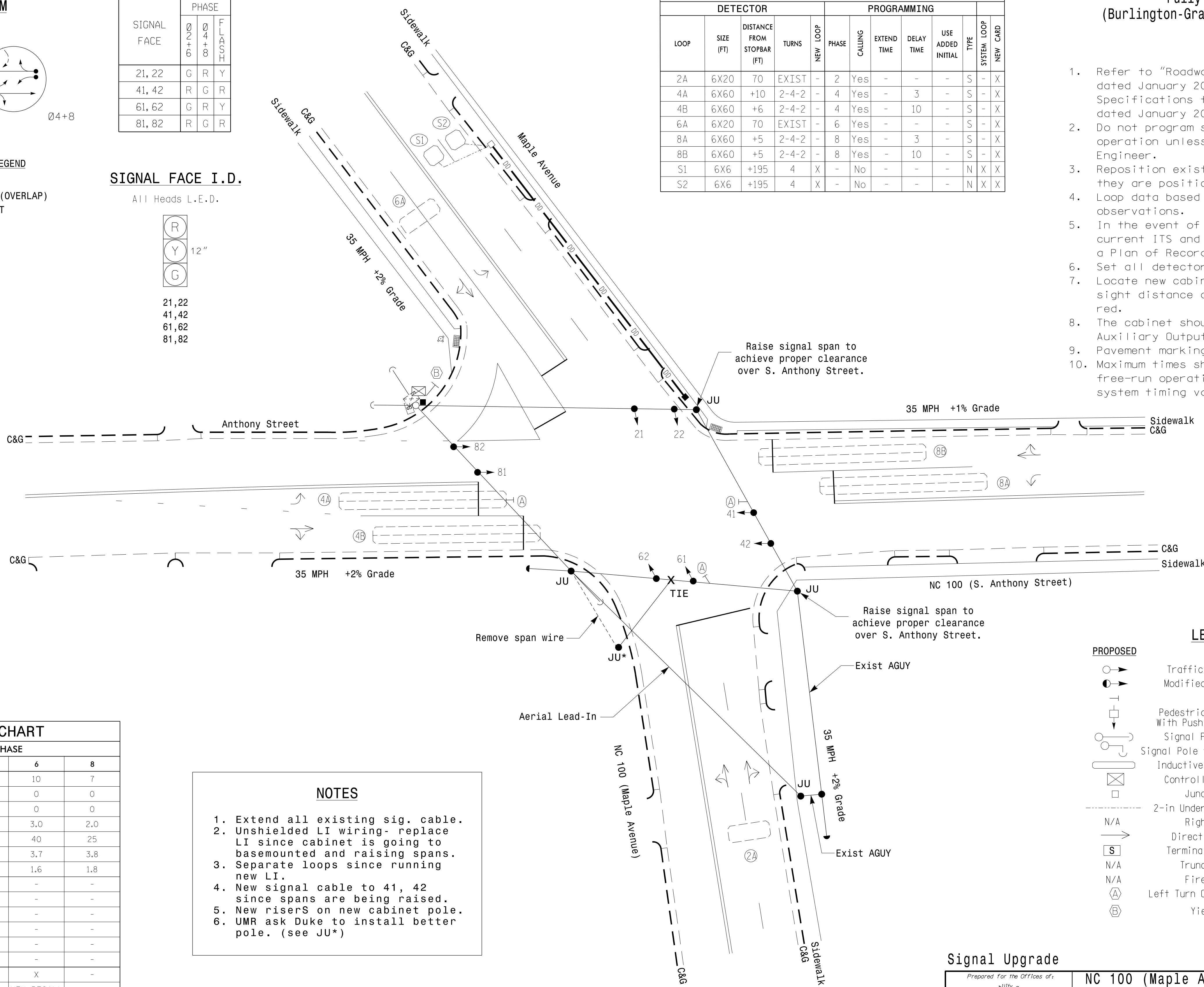


ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP NEW CARD	
2A	6X20	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	+10	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X60	+6	2-4-2	-	4	Yes	-	10	-	S	-	X
6A	6X20	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	10	-	S	-	X
S1	6X6	+195	4	X	-	No	-	-	-	N	X	X
S2	6X6	+195	4	X	-	No	-	-	-	N	X	X

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 so they are positioned in front of thru lane.
- Loop data based on previous plan and/or field observations.
- 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.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	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 *	40	25	40	25
Yellow	3.7	3.7	3.7	3.8
Red Clear	1.5	2.1	1.6	1.8
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

- NOTES
- Extend all existing sig. cable.
  - Unshielded LI wiring- replace LI since cabinet is going to basemounted and raising spans.
  - Separate loops since running new LI.
  - New signal cable to 41, 42 since spans are being raised.
  - New riserS on new cabinet pole.
  - UMR ask Duke to install better pole. (see JU\*)

LEGEND

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

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:  
 Transportation Mobility and Safety Division  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

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

NC 100 (Maple Ave)/Maple Ave at Anthony St

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis

PREPARED BY: J Le REVIEWED BY: LM Moon

REVISIONS INIT. DATE

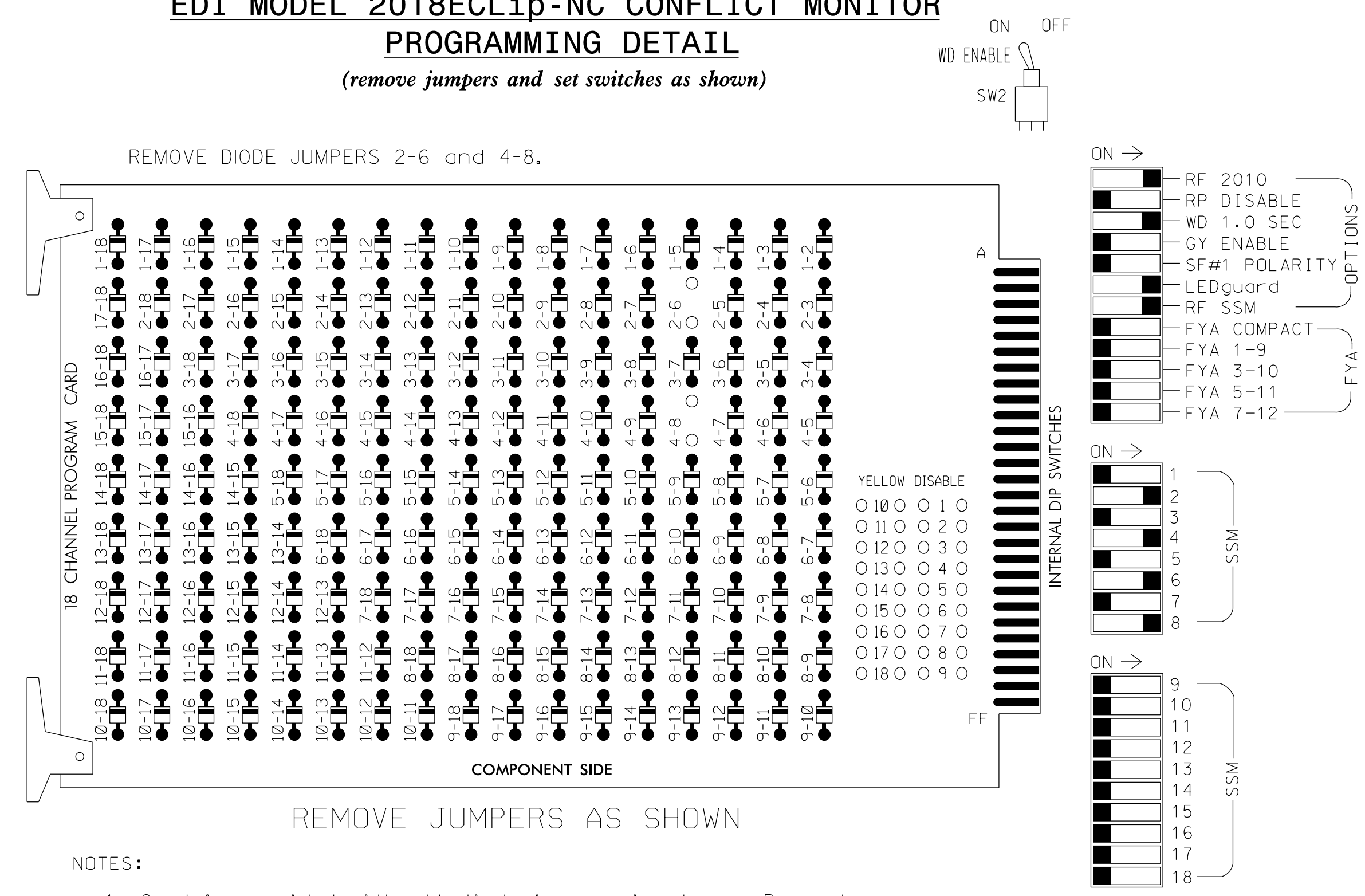
SCALE 0 20 1"=20'

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022516  
 LISA M. MOON  
 6/13/2018  
 SIG. INVENTORY NO. 07-0015

13-UNA-2018-16-57  
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 7/1/2018 10:10:17 AM AT CAR-PLANTON-W7

### 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

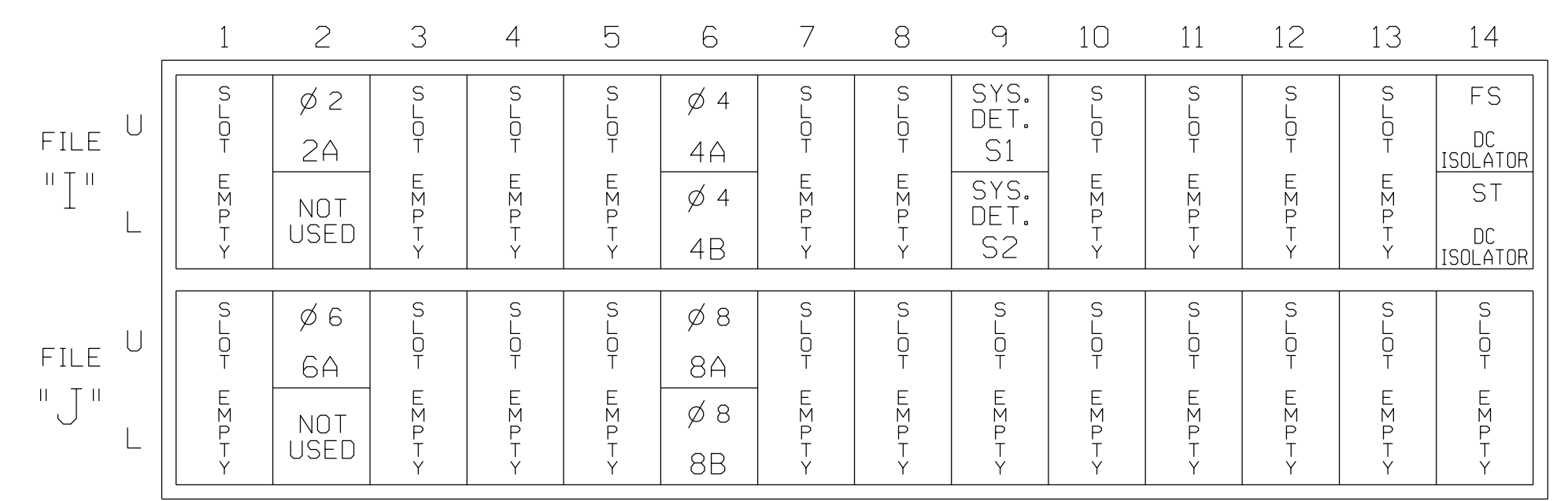
### SIGNAL HEAD HOOK-UP CHART

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)



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

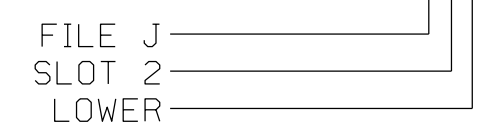
FS = FLASH SENSE  
 ST = STOP TIME

### 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
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: 07-0015  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

13-UNA-2018-17-14  
 R:\66015\17\off\ek\sig\nc\edi\mon\ir\img\07-0015e.dgn  
 7/1/2018 10:41:17 AM AT CAR-RLAWTON-W7

### Electrical Detail

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:




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

**NC 100 (Maple Ave)/Maple Ave**  
 at  
**NC 100 (S. Anthony St)/**  
**Anthony St**

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon



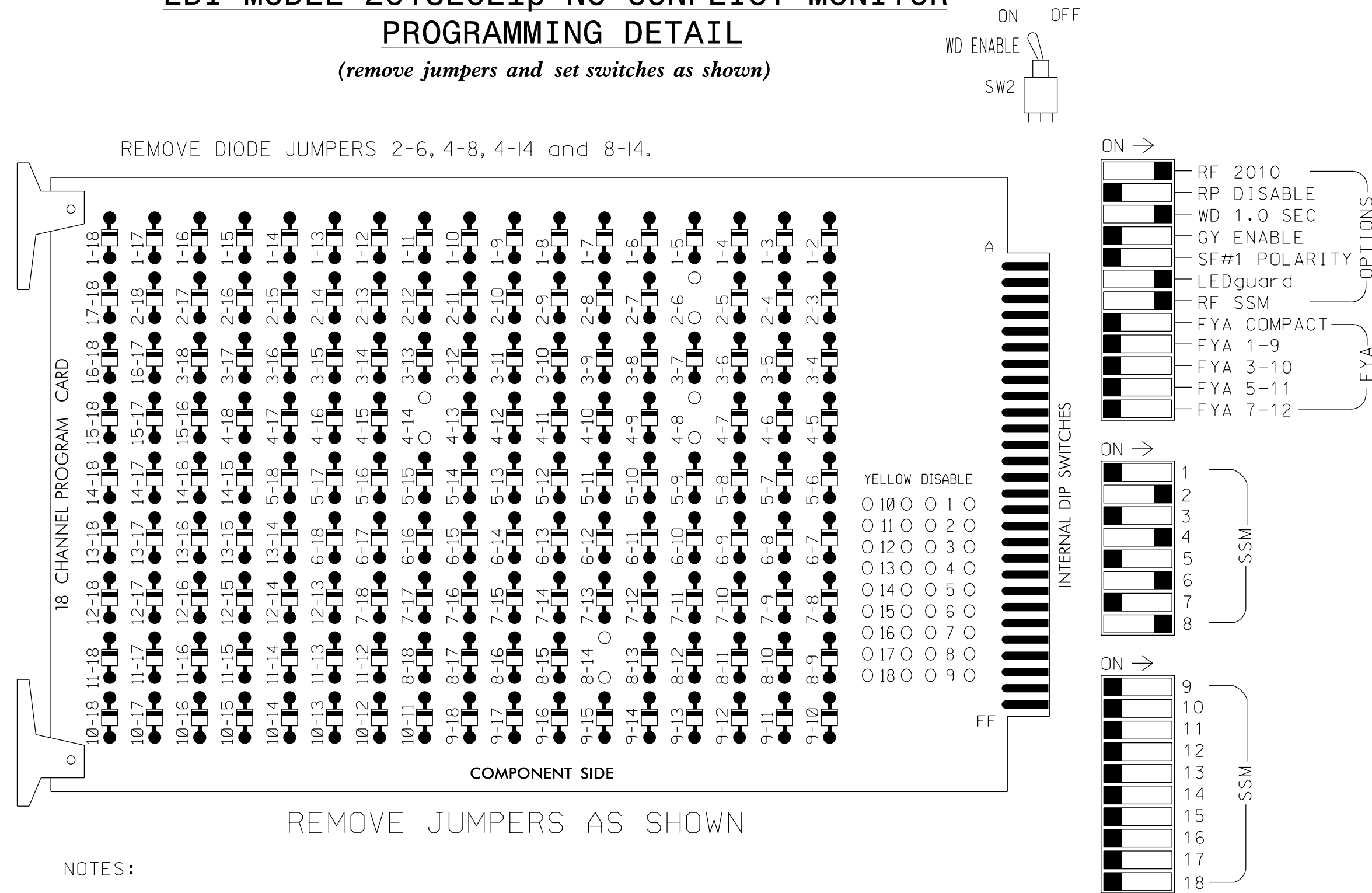
DocuSigned by:  
*Lisa M. Moon* 6/13/2018  
 DATE: \_\_\_\_\_  
 SIG. INVENTORY NO. 07-0015





### 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.....332 w/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 w/AUX OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S6,S8,S11  
 PHASES USED.....2,4,4PED,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	P41, P42	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																		
Hand icon													104					
Person icon																		106

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)

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

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

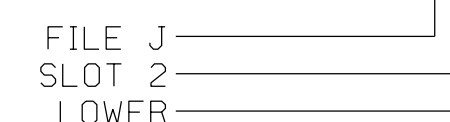
FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S
PED PUSH BUTTONS										
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					

NOTE:  
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 112.

INPUT FILE POSITION LEGEND: J2L



### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0016  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

### Electrical Detail

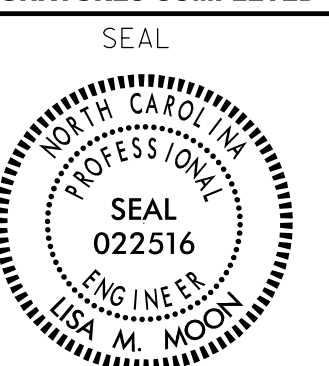
ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



NC 87-100 (E. Webb Avenue) at NC 100 (Anthony 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

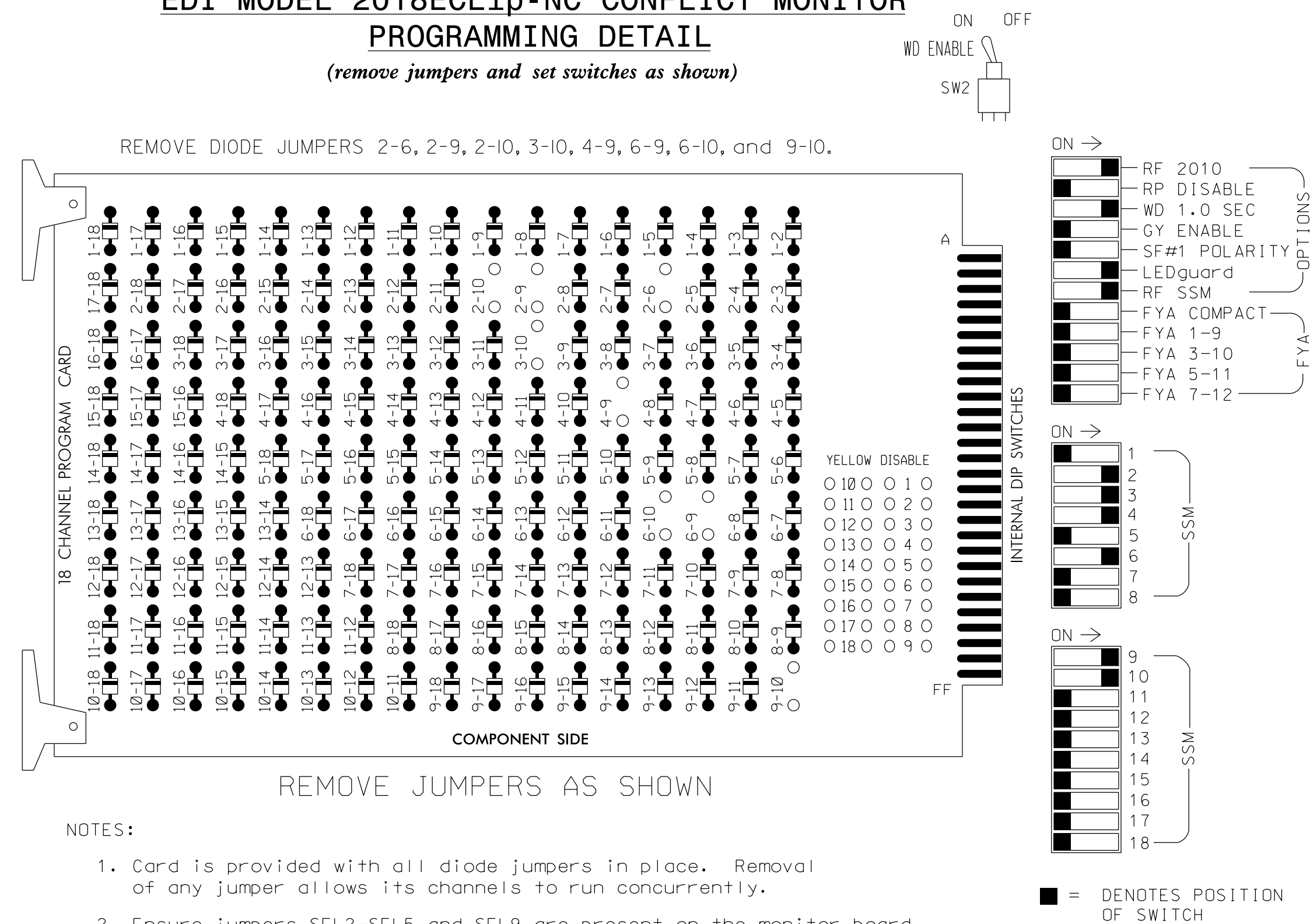


DocuSigned by: Lisa M. Moon 6/13/2018  
 DATE: 6/13/2018  
 SIG. INVENTORY NO. 07-0016



### 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
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	DLB	SPARE	SPARE	SPARE	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	31,32	41,42, 43	NU	NU	61,62	NU	NU	NU	NU	23,24	63,64	NU	NU	NU	NU
RED		128		116	101			134					A121	A124				
YELLOW		129		117	102			135					A122	A125				
GREEN		130		118	103			136					A123	A126				
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

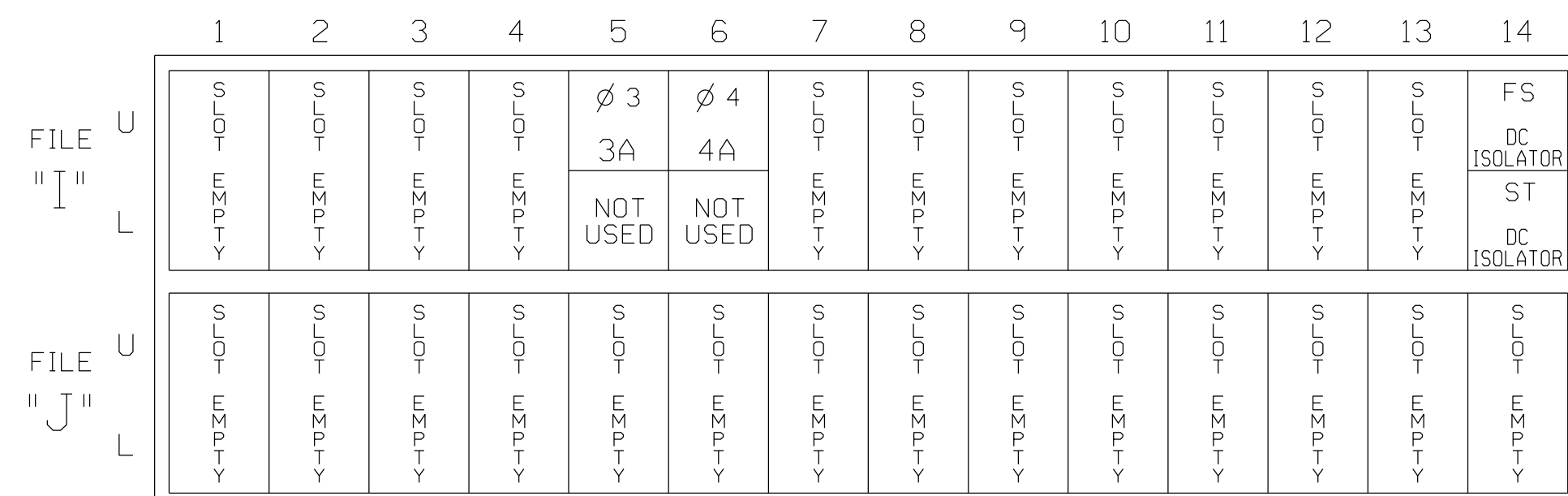
NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S4,S5,S8,AUXS1,AUXS2  
 PHASES USED.....2,3,4,6  
 OVERLAP "A".....2+4 TOL  
 OVERLAP "B".....3+6 TOL  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

### INPUT FILE POSITION LAYOUT

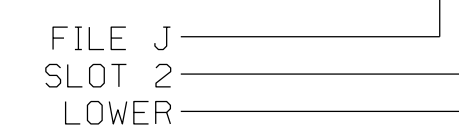
(front view)



### 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
3A	TB4-5,6	15U	58	3	3	YES				S
4A	TB4-9,10	16U	41	4	4	YES		10		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0017  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



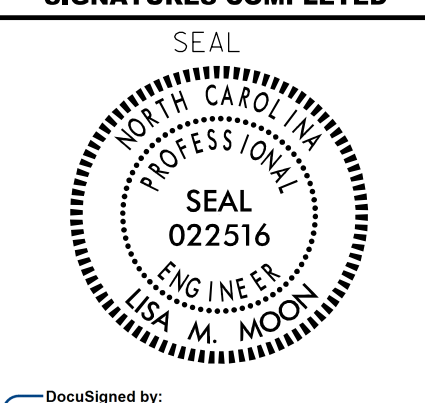
NC 87 (E. Webb Avenue) at Whitsett Street/Sidney Avenue

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  
 SECES88D3100421 DATE  
 SIG. INVENTORY NO. 07-0017

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

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

*OVERLAP A*

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

```

TMG VEH OVLP...[A] TYPE: OTHER/ECONLITE

  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . . .
LAG X PH . X . . . . .
LAG 2 PH . . . . .

LAG GRN 2.0 YEL 3.8 RED 2.1 ADV GRN 0.0
    
```

Toggle Once

*OVERLAP B*

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

```

TMG VEH OVLP...[B] TYPE: OTHER/ECONLITE

  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . X . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . . .
LAG X PH . . X . . X . . . . .
LAG 2 PH . . . . .

LAG GRN 5.0 YEL 3.8 RED 1.4 ADV GRN 0.0
    
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0017  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

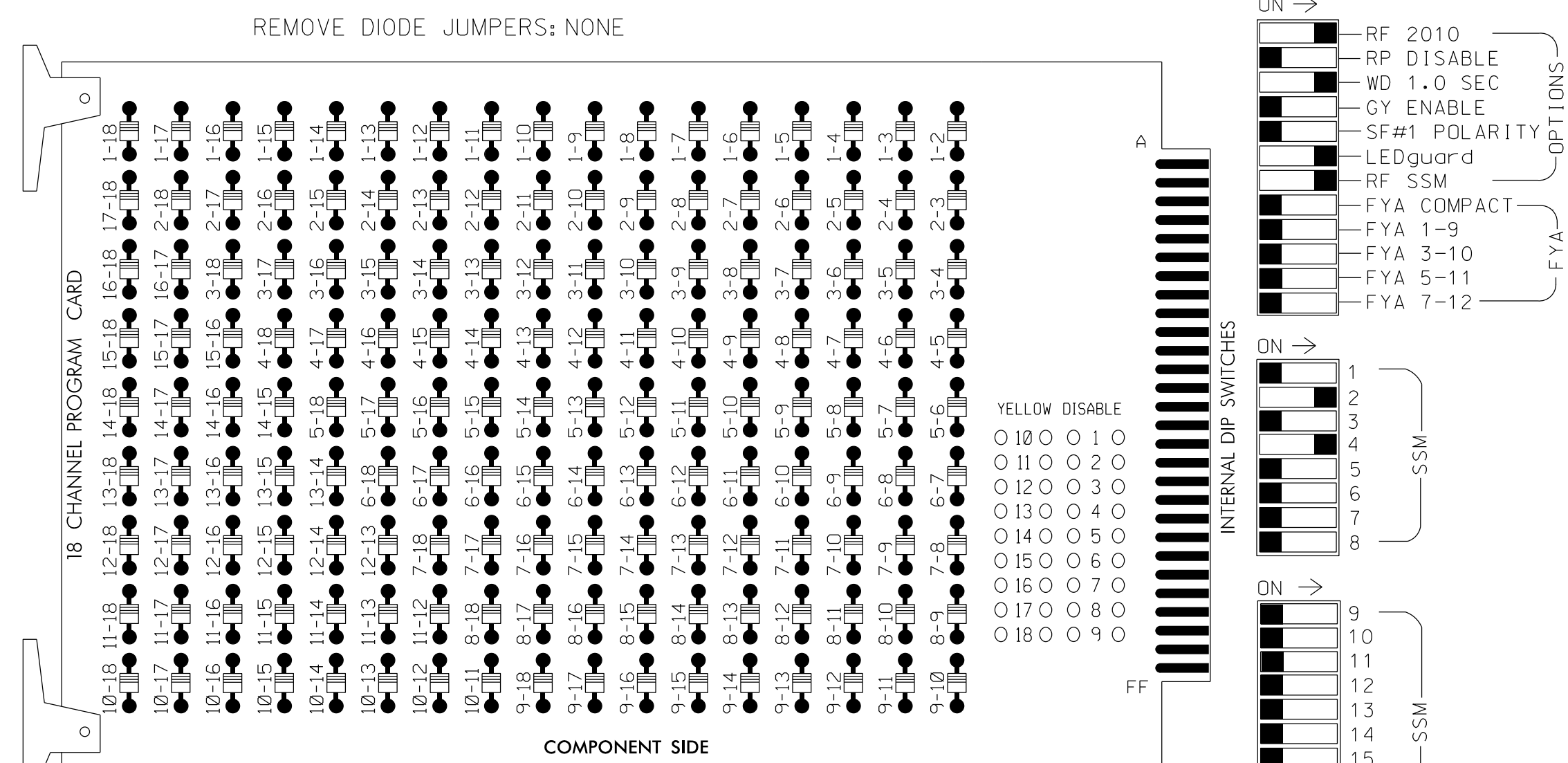
<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>NC 87 (E. Webb Avenue) at Whitsett Street/Sidney Avenue</b></p> <p>Division 7    Alamance County    Burlington</p> <p>PLAN DATE: <b>December 2017</b>    REVIEWED BY: <b>AJ Davis</b></p> <p>PREPARED BY: <b>J Le</b>    REVIEWED BY: <b>LM Moon</b></p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <b>Lisa M. Moon</b>    6/13/2018</p> <p style="font-size: x-small;">SIC#58808300421    DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-0017</p>
REVISIONS	INIT.	DATE												





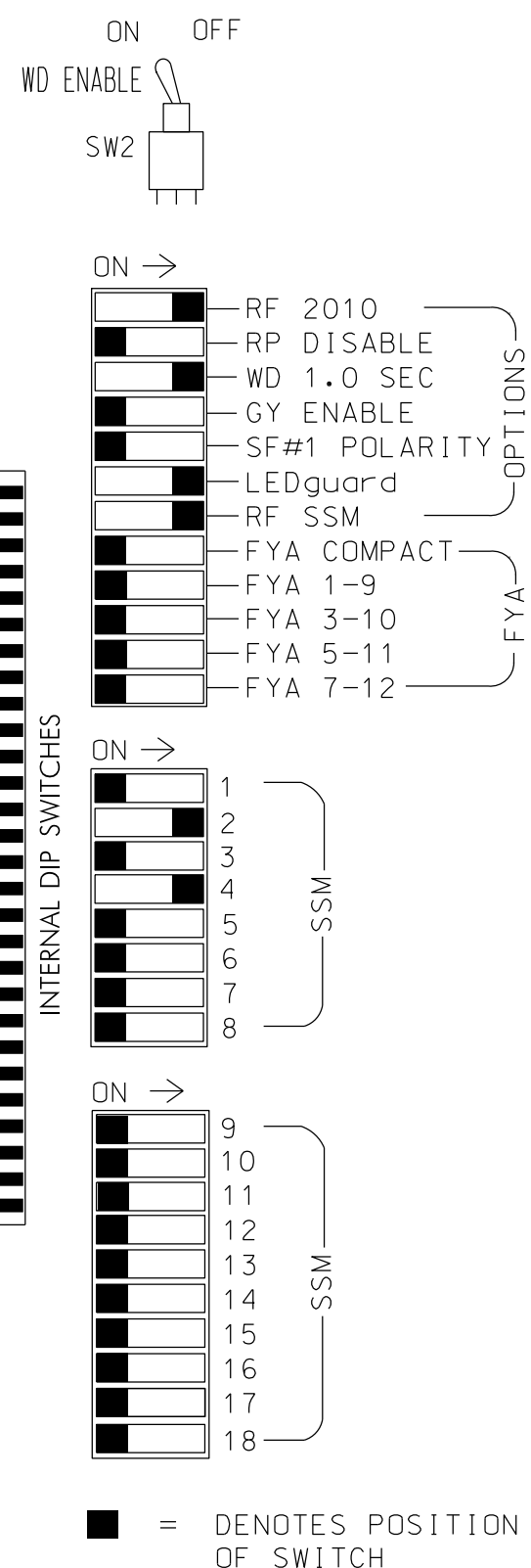
**EDI MODEL 2018ECLip-NC CONFLICT MONITOR  
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

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



**NOTES**

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

**EQUIPMENT INFORMATION**

CONTROLLER.....2070LX  
 CABINET.....336  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S5  
 PHASES USED.....2,4  
 OVERLAPS.....NONE

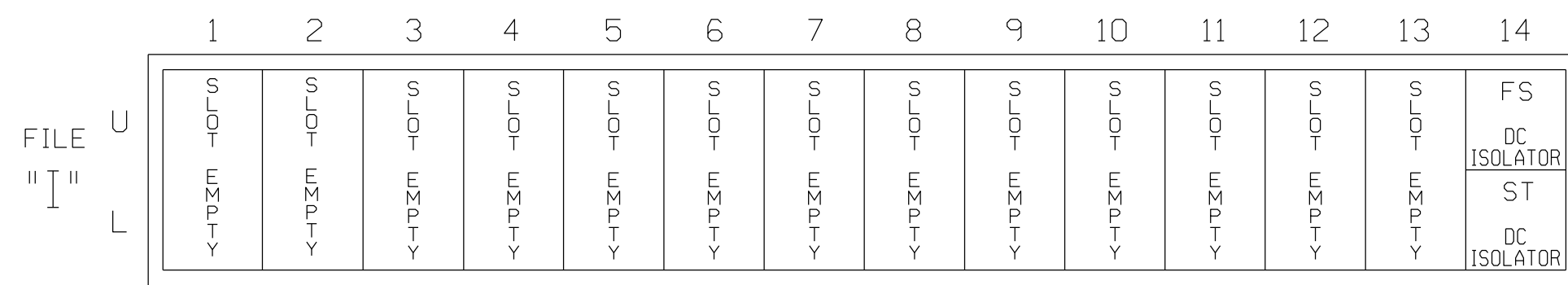
**SIGNAL HEAD HOOK-UP CHART**

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, 43,44	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
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

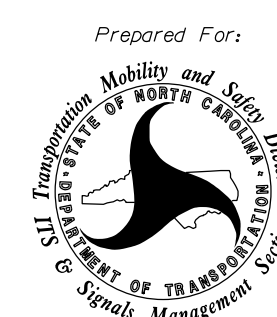
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0018  
 PREPARED: October 2017  
 SEALED: 5/16/2018  
 REVISED: N/A

Prepared in the Office of:

NC FIRM LICENSE No: P-0339  
 504 Meadowlands Drive  
 Hillsborough, NC 27278  
 (919) 732-3883  
 (919) 732-6676 (FAX)

**Electrical Detail**

ELECTRICAL AND PROGRAMMING DETAILS FOR:



US 70/NC 62 (Church Street)  
 At  
 Front Street

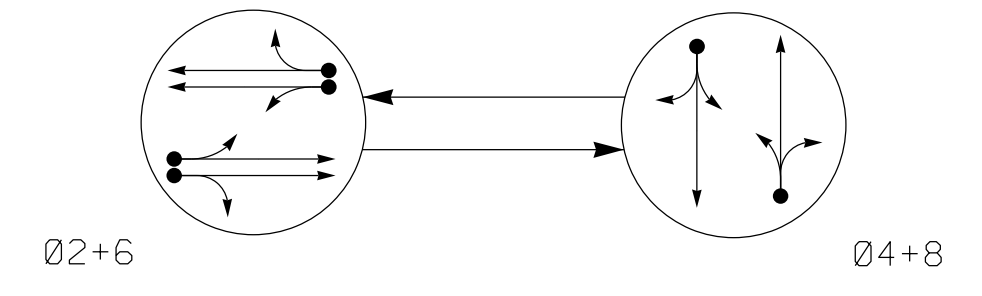
Division 7	Alamance County	Burlington
PLAN DATE: October 2017	REVIEWED BY: E. W. Sirgany	
PREPARED BY: J. Smith	R/A PROJ. NO:	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Seal of Edward W. Sirgany, Professional Engineer, License No. 018174, State of North Carolina.

DocuSigned by:  
 Edward W. Sirgany 5/16/2018  
 DATE  
 SIG. INVENTORY NO. 07-0018

**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, 83	R	G	R

**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X20	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	+10	2-4-2	-	4	Yes	-	5	-	S	-	X
6A	6X20	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	5	-	S	-	X
8B	6X20	+5	EXIST	-	8	Yes	-	15	-	S	-	X

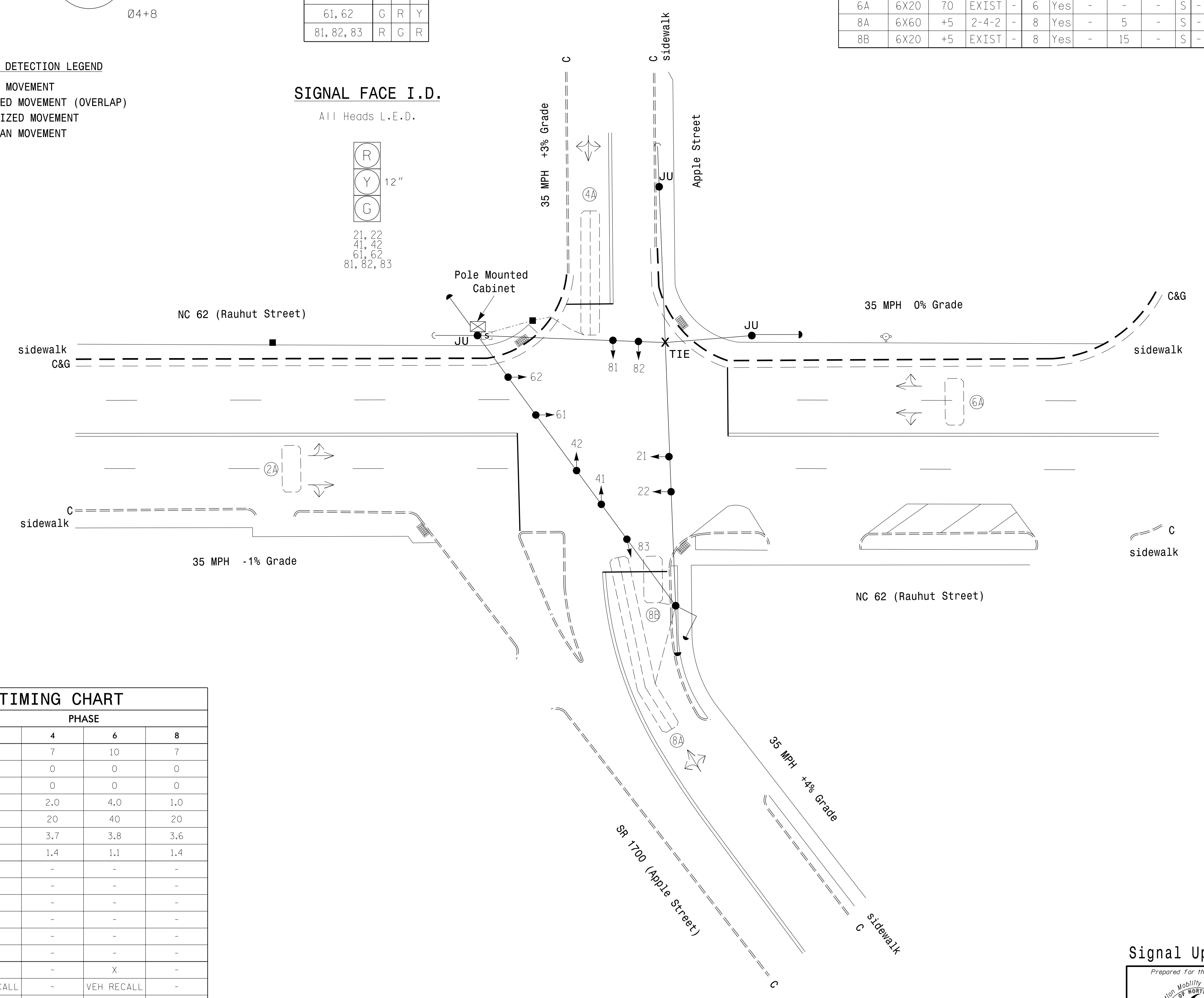
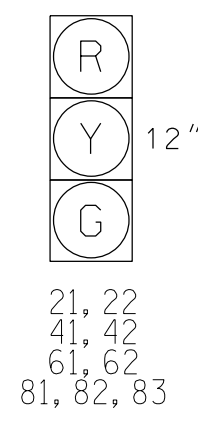
**2 Phase Fully Actuated (Burlington-Graham Signal System)**

**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.
- Remove existing "Left Turn Only" sign-(R3-5L) for the WB approach.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**SIGNAL FACE I.D.**

All Heads L.E.D.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	4.0	2.0	4.0	1.0
Max 1 *	40	20	40	20
Yellow	3.9	3.7	3.8	3.6
Red Clear	1.0	1.4	1.1	1.4
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                                   |
| ◘ → Terminal Splice Box                            | ◘ → Terminal Splice Box                            |
| ◙ → 2-in Underground Conduit                       | ◙ → 2-in Underground Conduit                       |
| N/A → Right of Way                                 | → → Right of Way                                   |
| N/A → Directional Arrow                            | → → Directional Arrow                              |
| N/A → Fire Hydrant                                 | → → Fire Hydrant                                   |
| N/A → Truncated Domes                              | → → Truncated Domes                                |

13-JUN-2018 16:59 R:\6015\18\Traf\c\k\signal\asc3\gms\signal\k07-0020.dgn F:\DWG\AT\_CAR-RLANTON-WT

Plans Prepared By:

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

**Signal Upgrade**

Prepared for the Offices of:

**NC 62 (Rauhut Street) at SR 1700 (Apple Street) / Apple Street**

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: J Le REVIEWED BY: LM Moon

SCALE: 1"=20'

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL

PROFESSIONAL ENGINEER

LISA M. MOON

6/13/2018

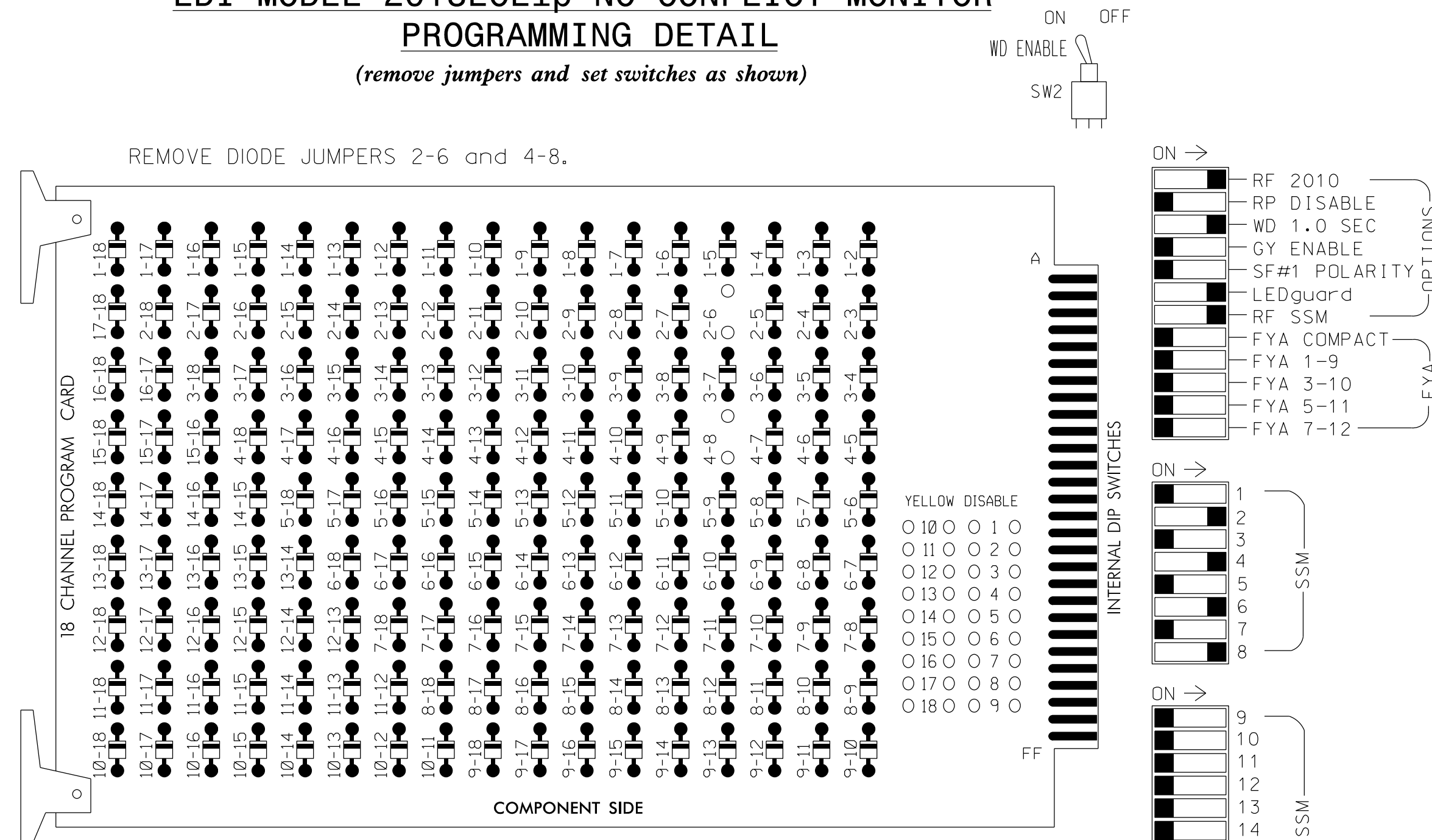
SIG. INVENTORY NO. 07-0020

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



### 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.....ECONOLITE 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	81,82,83	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)

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

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

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

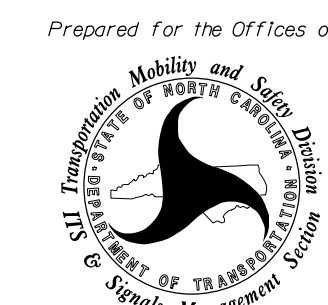
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB21-3,4	I2U	39	2	2	YES				S
4A	TB21-7,8	I4U	41	4	4	YES		5		S
6A	TB21-11,12	I6U	40	6	6	YES				S
8A	TB22-1,2	I8U	42	8	8	YES		5		S
8B	TB24-1,2	I8L	46	18	8	YES		15		S

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0020  
 DESIGNED: DECEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

### Electrical Detail

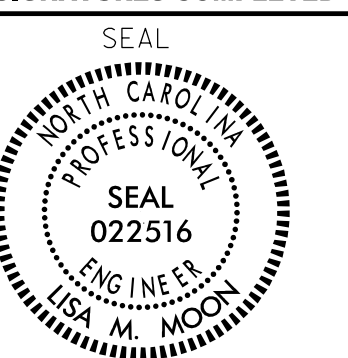
DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING  
 DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 62 (Rauhut Street) at SR 1700 (Apple Street) / Apple Street	
Division 7	Alamance County Burlington
PLAN DATE: December 2017	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

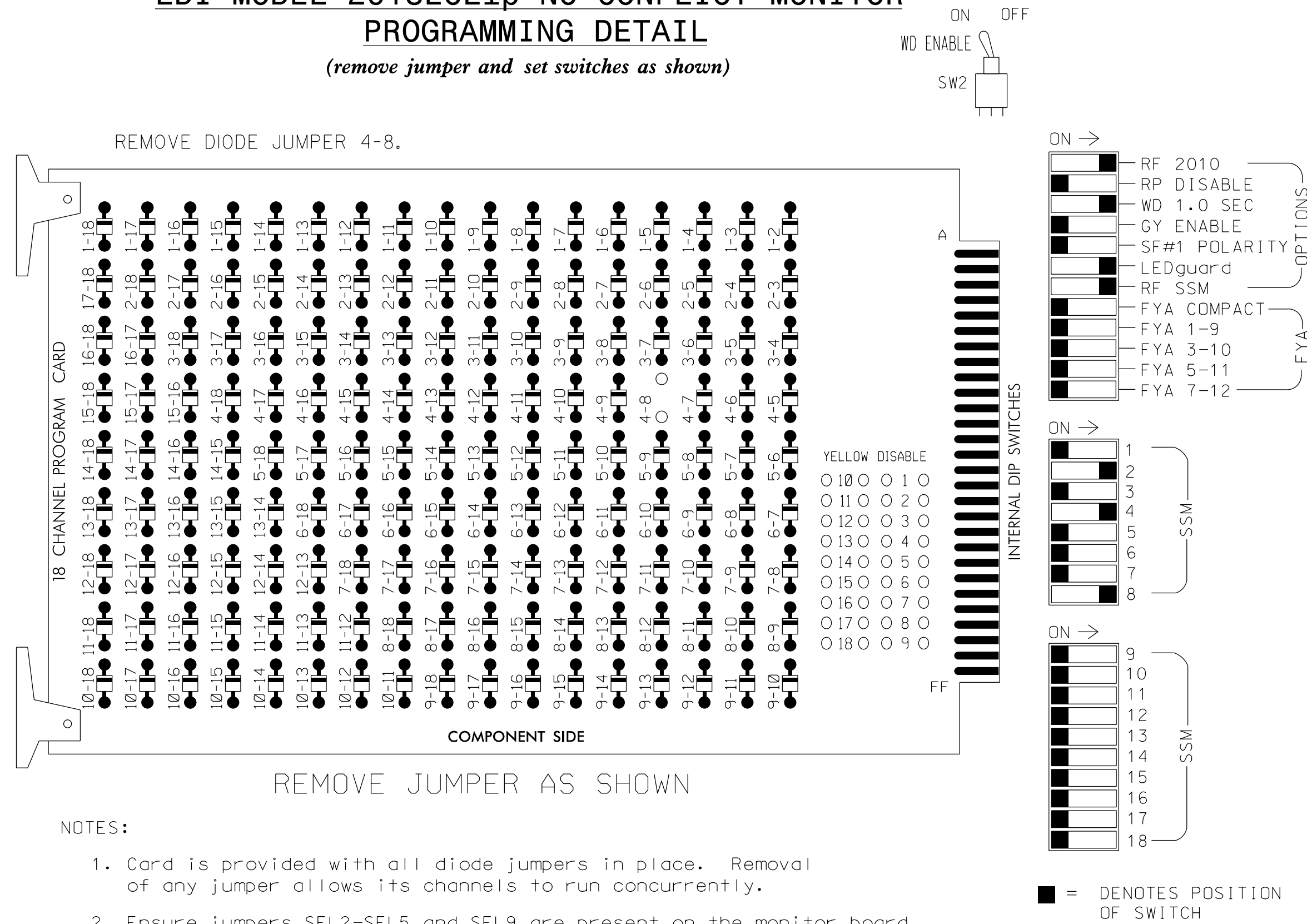


DocuSigned by:  
 Lisa M. Moon  
 6/13/2018  
 DATE  
 SIG. INVENTORY NO. 07-0020



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

(remove jumper and set switches as shown)



NOTES:

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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green.
3. 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, 23	NU	NU	41,42	NU	NU	NU	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101						107							
YELLOW		129			102						108							
GREEN		130			103						109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

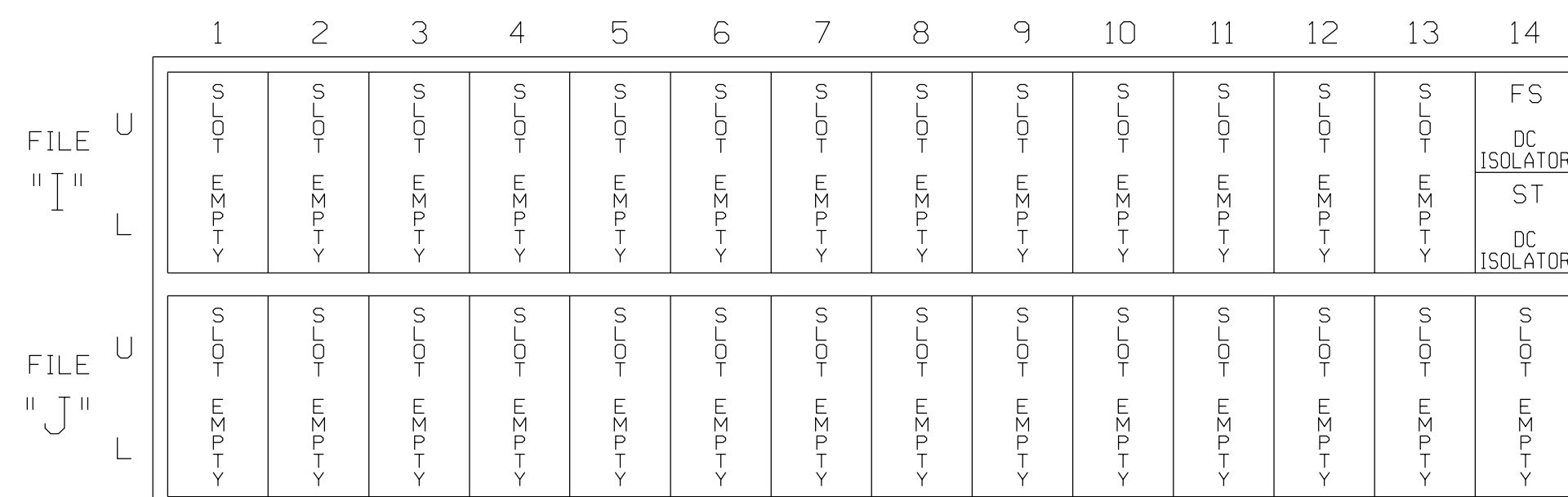
NU = Not Used

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX.OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S11  
 PHASES USED.....2,4,8  
 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0021  
 DESIGNED: NOVEMBER 2017  
 SEALED: 06-13-2018  
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70-NC 62 (N. Church Street)

at  
 NC 62 (W. Holt Street) /  
 W. Holt Street  
 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

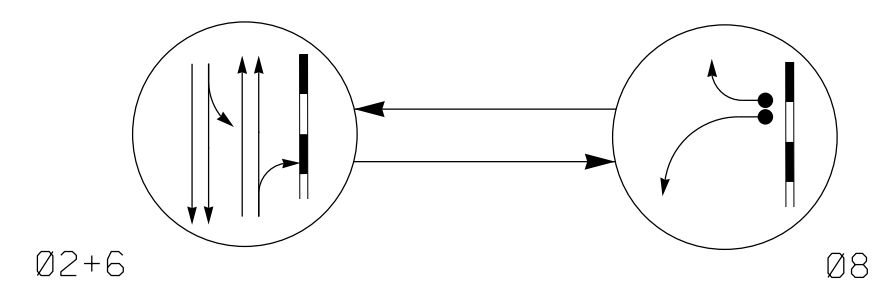


DocuSigned by:  
 Lisa M. Moon  
 6/13/2018  
 DATE  
 SIG. INVENTORY NO. 07-0021



750 N. Greenfield Pkwy, Garner, NC 27529

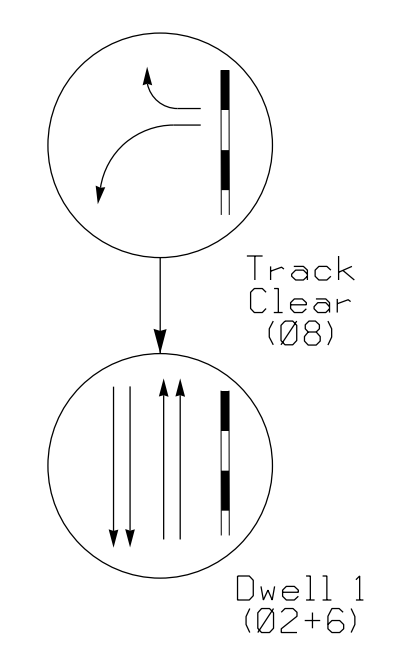
### PHASING DIAGRAM



#### PHASING DIAGRAM DETECTION LEGEND

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

### RAIL PREEMPT PHASES (High Priority)



SIGNAL FACE	PHASE				
	0 + N	0 S	0 R	0 G	0 Y
21, 22	G	R	R	G	Y
61, 62	G	R	R	G	Y
81, 82	R	G	G	R	R
SIGN A	OFF	OFF	ON	ON	*
SIGN B	OFF	OFF	ON	ON	*

\* SEE NOTE 7

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
8A	6X40	+5	2-4-2	-	8	Yes	-	3	-	S
8B	6X40	+5	2-4-2	-	8	Yes	-	15	-	S

### 2 Phase w/ RR Preemption Semi-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. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The cabinet should be designed to include an Auxiliary Output File for future use.
6. Pavement markings are existing.
7. Ensure flashing operation does not alter operation of blankout signs.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system supersede these values.

### ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	2, 6
Preempt Override	ON
Delay Time	0
Ped Clear Through Yellow	N
Terminate Phases	N
Track Clear Reserve	Y
Entrance Walk	-
Entrance Ped Clear	-
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Track Clear Min Green	18
Track Clear Yellow Change	3.1
Track Clear Red Clear	2.6
Min Dwell Time	10
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

\* Allows normal phase times to be used.

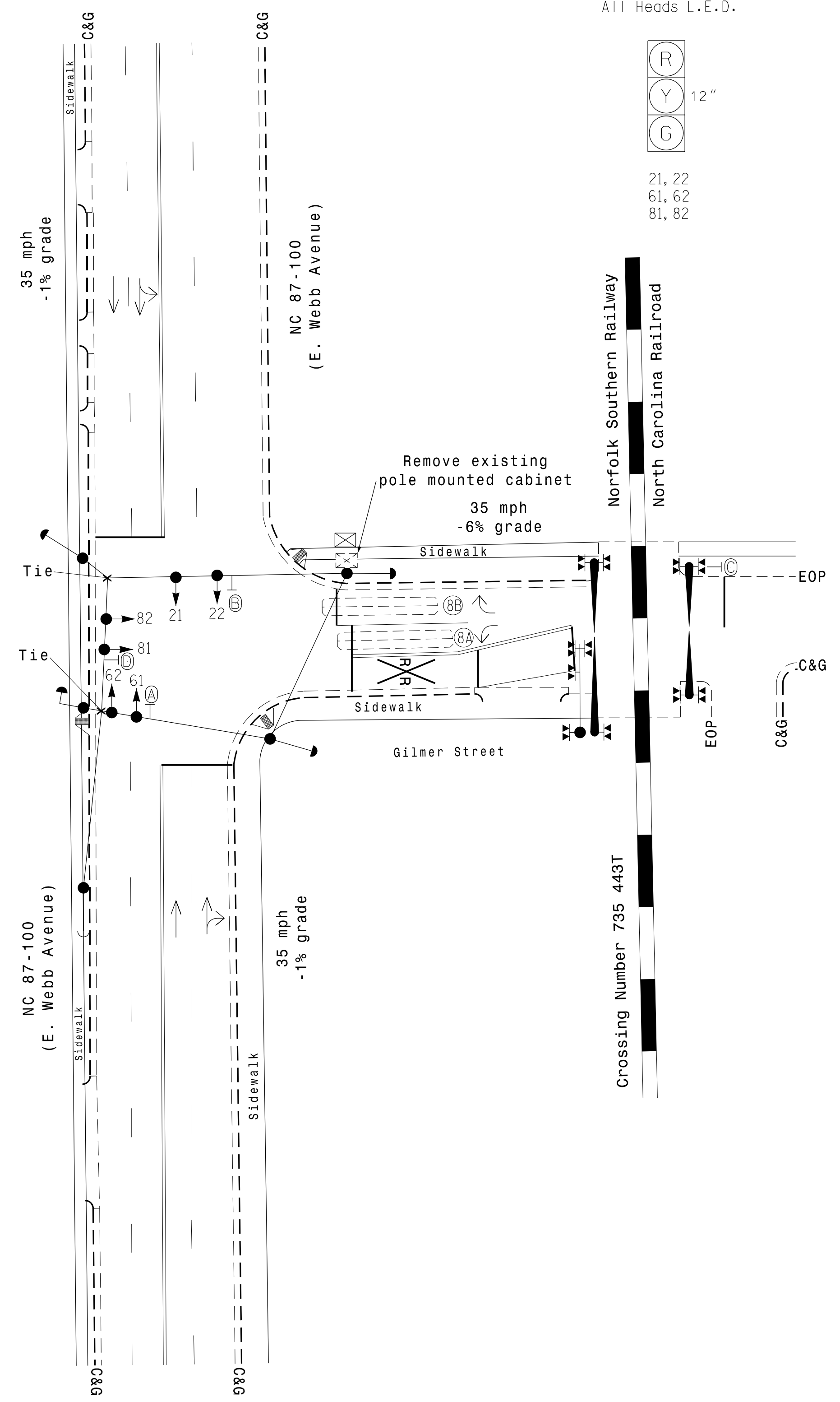
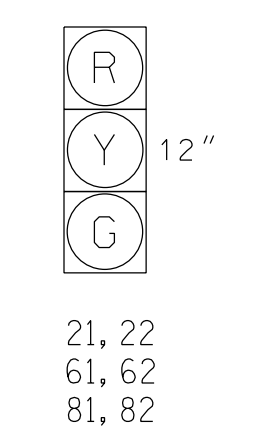
### SIMULTANEOUS PREEMPT

FEATURE	PHASE		
	2	6	8
Min Green *	10	10	7
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	0.0	0.0	2.0
Max 1 *	40	40	25
Yellow	3.9	3.9	3.1
Red Clear	1.3	1.2	2.6
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	MAX RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

### SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND			
PROPOSED	EXISTING		
○	●	Traffic Signal Head	N/A
○	○	Modified Signal Head Sign	N/A
□	□	Pedestrian Signal Head	N/A
○	○	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	→
N/A	→	Directional Arrow	→
N/A		Railroad Cantilever	
N/A		Railroad Gate and Flasher	
N/A		Railroad Tracks	
N/A	▲	Curb Ramp	▲
Ⓐ	Ⓐ	"NO LEFT TURN - TRAIN" LED Blankout Sign	Ⓐ
Ⓑ	Ⓑ	"NO RIGHT TURN - TRAIN" LED Blankout Sign	Ⓑ
Ⓒ	Ⓒ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓒ
Ⓓ	Ⓓ	Left Arrow "ONLY" Sign (R3-5L)	Ⓓ

### Signal Upgrade

Prepared for the Offices of:  
  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 STATE OF NORTH CAROLINA  
 SIGNAL DESIGN SECTION  
 750 N. Greenfield Pkwy, Garner, NC 27529

**NC 87-100 (E. Webb Avenue) at Gilmer Street**

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: PL Alexander

PREPARED BY: AM Encarnacion REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 PAMELA L. ALEXANDER  
 023489

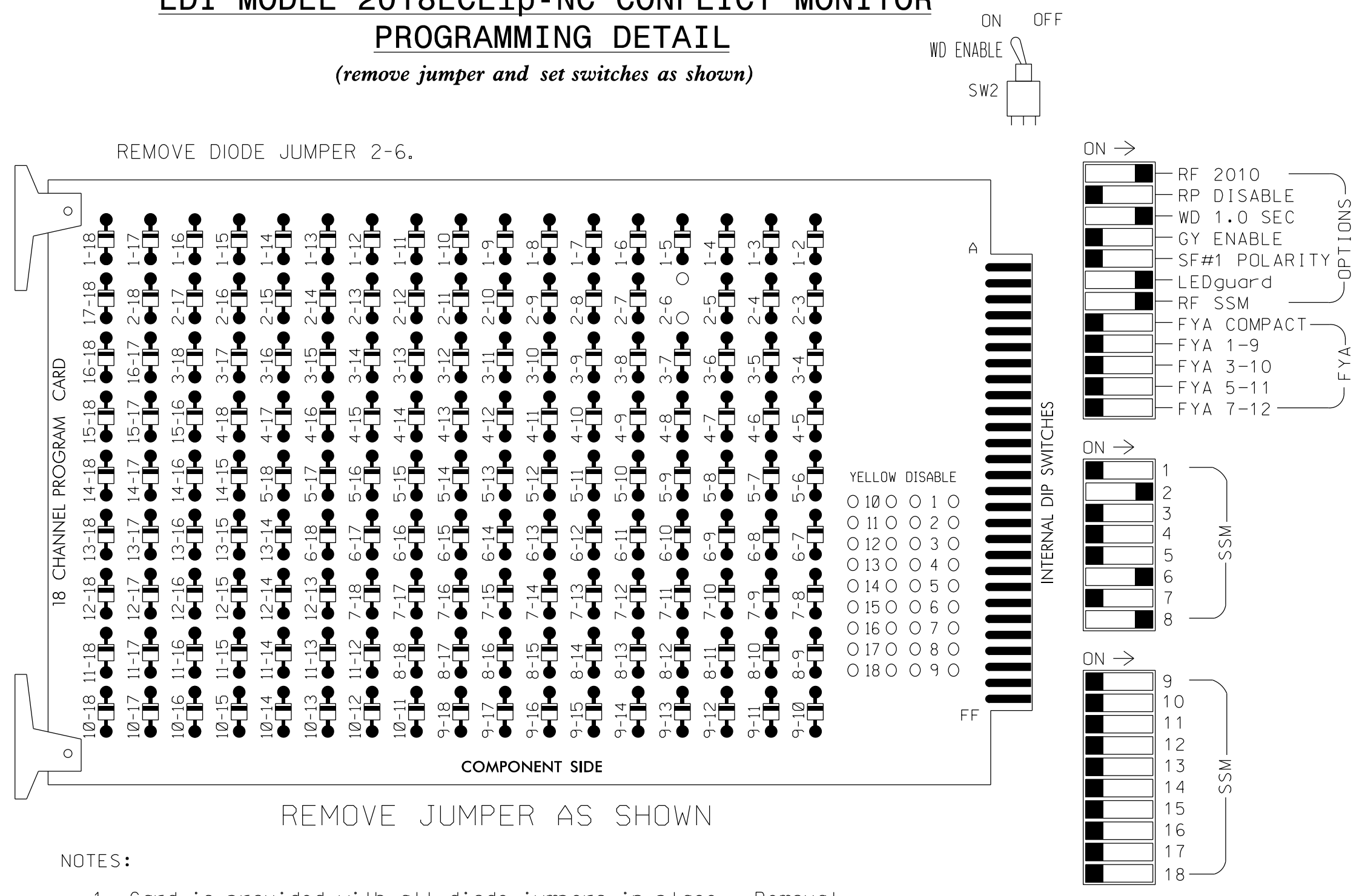
6/7/2018  
 DATE  
 SIGNATURE  
 SIG. INVENTORY NO. 07-0022

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

07-JUN-2018 11:10  
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 ALEX3361 AT LUS336069

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

(remove jumper and set switches as shown)



**NOTES:**

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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 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.....ECONDLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S8,S11  
 PHASES USED.....2,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

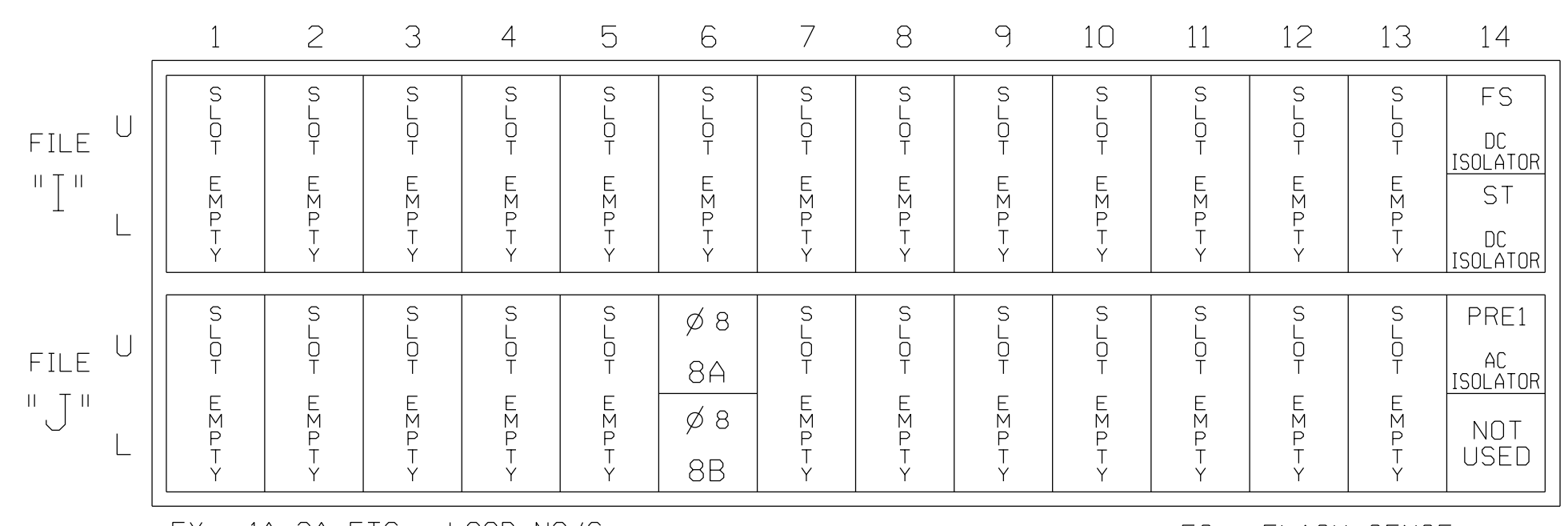
### SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



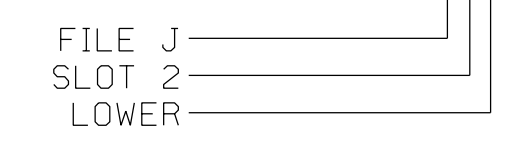
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME  
 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
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		15		S

#### INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0022  
 DESIGNED: January 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

09-JUN-2018 13:38  
 \*\*\*DOTKINS.COM\*\*\*\projects\1818\A\Transportation\Traffic\Currr#100056469 U-6015 B-G Sig Sys\*Task 05\_11\_15\Signal#04as\gn\W\Frog07-0022E.dgn  
 ALEX3361 AT LUS510649

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 87-100 (E. Webb Avenue)  
 at  
 Gilmer Street

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: PL Alexander

PREPARED BY: AM Encarnacion REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Developed by: Melissa B. Toth DATE: 6/11/2018

SIG. INVENTORY NO. 07-0022

# ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

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

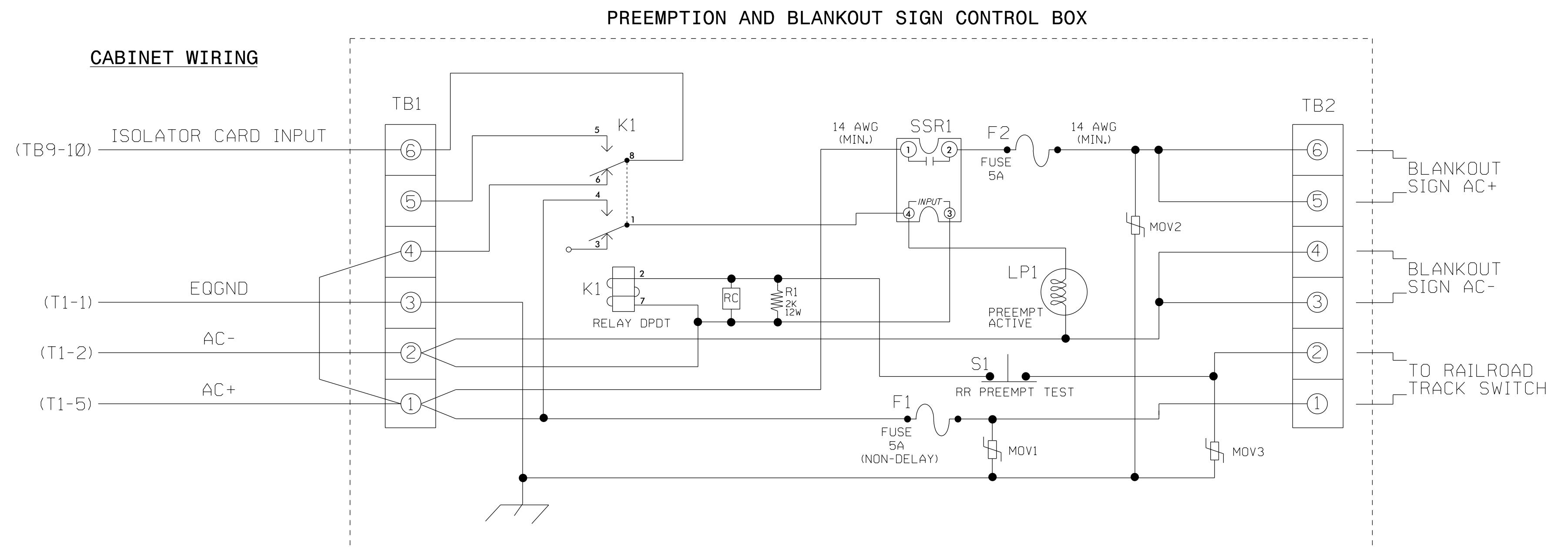
Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

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

ENABLE... YES	IPMT	OVRIDE.XI	INTERLOCK. NO
DET LOCK... X	IDELAY..	OINHIBIT... 0	
OVERIDE FL. .	IDURATION	OICLR=GRN... NO	
TERM OLP. NO	IPC>YEL	NOITERM PH NO	
PED DARK.. NO	ITC RESRV	YESIDWELL FL OFF	
LINK PMT....O	IX FLCOLR	REDIEXIT OPT. OFF	
X TMG PLN...O	IRE-SERV..	OIFLT TYPE.HARD	
FREE DUR PMT	IR1 NOIR2	NOIR3 NOIR4 NO	
--TIMING----	WALKIPED	CLIMN GRI YELI RED	
ENTRANCE TM. 255	1 2551	1125.5125.5	
-----MIN	GRIEXT GRIMX	GRI YELI RED	
TRACK CLEAR 181	01 01	3.11 2.6	
-----MIN	DLIPMTEXTIMX	TMI YELI RED	
DWL/CYC-EXIT 101	0.01	0125.5125.5	
PMT ACTIVE OUT..ON	PMT ACT	DWELL...NO	
OTHER - PRI	PMT.OFF	NON-PRI	PMT.....OFF
INH EXT TIME... 0.0	PED PR	RETURN...OFF	
PRIORITY RETURN.OFF	QUEUE	DELAY.... OFF	
COND DELAY.....OFF			
PHASES 1 2 3 4 5 6 7 8			
PR RTN% 0 0 0 0 0 0 0 0			
PHASES 9 10 11 12 13 14 15 16			
PR RTN% 0 0 0 0 0 0 0 0			

# RAILROAD PREEMPTION WIRING DETAIL

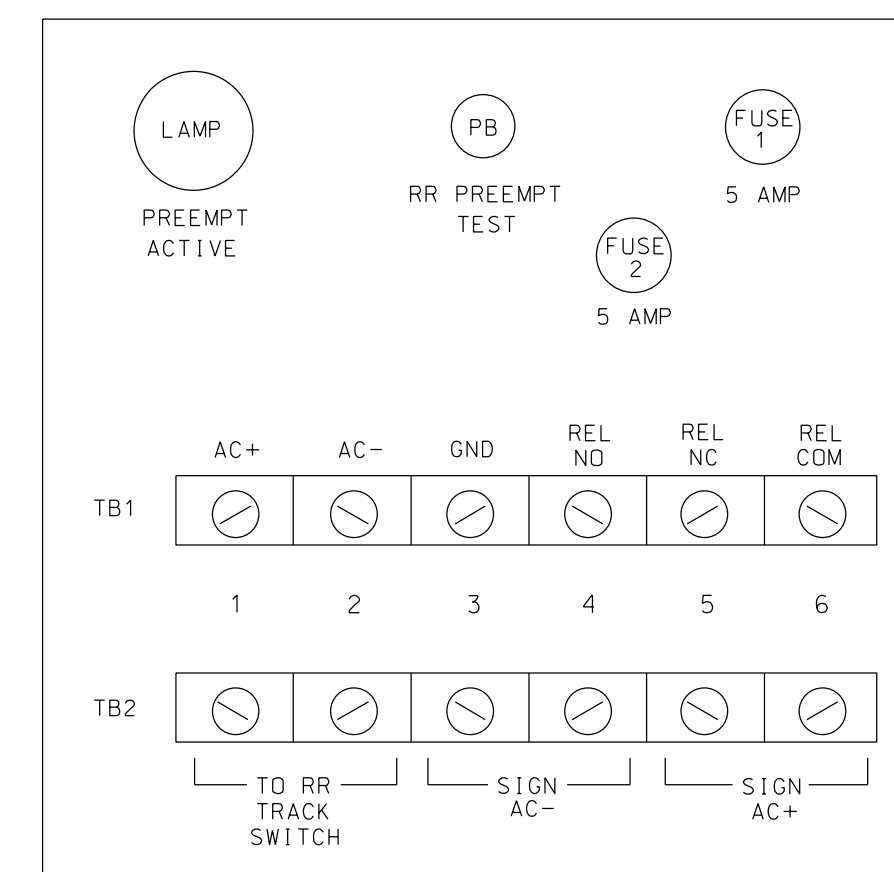
(wire as shown below)



### NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
- IMPORTANT!! Terminal TB22-4 (on input panel) shall be connected to AC- (jumper may have to be added).

### FRONT VIEW



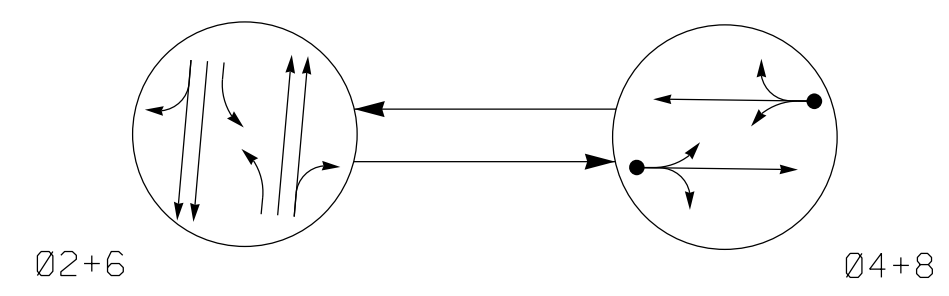
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0022  
 DESIGNED: January 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

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

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Office of Traffic Management Systems	NC 87-100 (E. Webb Avenue) at Gilmer Street		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  SEAL  SEAL MELISSA B. TOTH
	Division 7 PLAN DATE: January 2018 PREPARED BY: AM Encarnacion	Alamance County Burlington REVIEWED BY: PL Alexander REVIEWED BY: MB Toth	

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

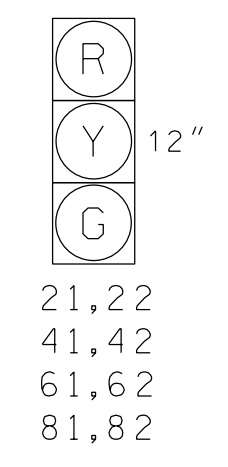
- ◄●► DETECTED MOVEMENT
- ◄◄◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄◄◄ UNSIGNALIZED MOVEMENT
- ◄◄◄ PEDESTRIAN MOVEMENT

**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.



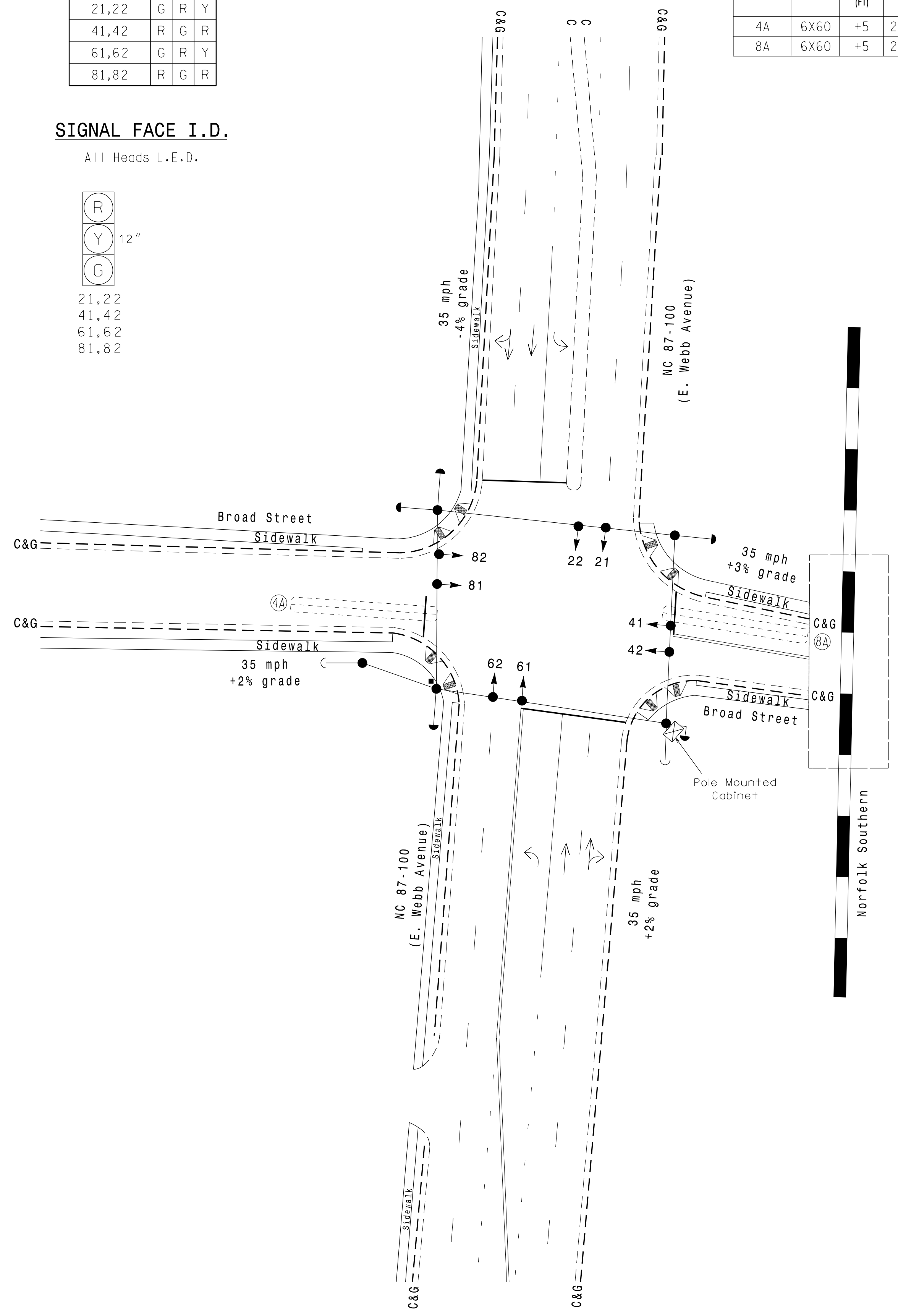
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X60	+5	2-4-2	-	4	Yes	-	5	-	S	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	5	-	S	-	X

**2 Phase Semi-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. 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.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Pavement markings are existing.
6. Set all detector units to presence mode.
7. 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 *	0.0	1.0	0.0	1.0
Max 1 *	45	20	45	20
Yellow	3.7	3.7	4.1	3.7
Red Clear	1.4	1.7	1.4	1.7
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX. RECALL	-	MAX. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

**LEGEND**

- | PROPOSED | EXISTING |
|----------|----------|
|          |          |
|          | N/A      |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
| N/A      |          |
|          |          |
| N/A      |          |

**Signal Upgrade**

Prepared for the Offices of:

**NC 87-100 (E. Webb Avenue) at Broad Street**

Division 7 Alamance County Burlington

PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: MB Toth

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 30 1"=30'

REVISIONS: INIT. DATE

Seal: MELISSA B. TOOTH, ENGINEER, SEAL 025892

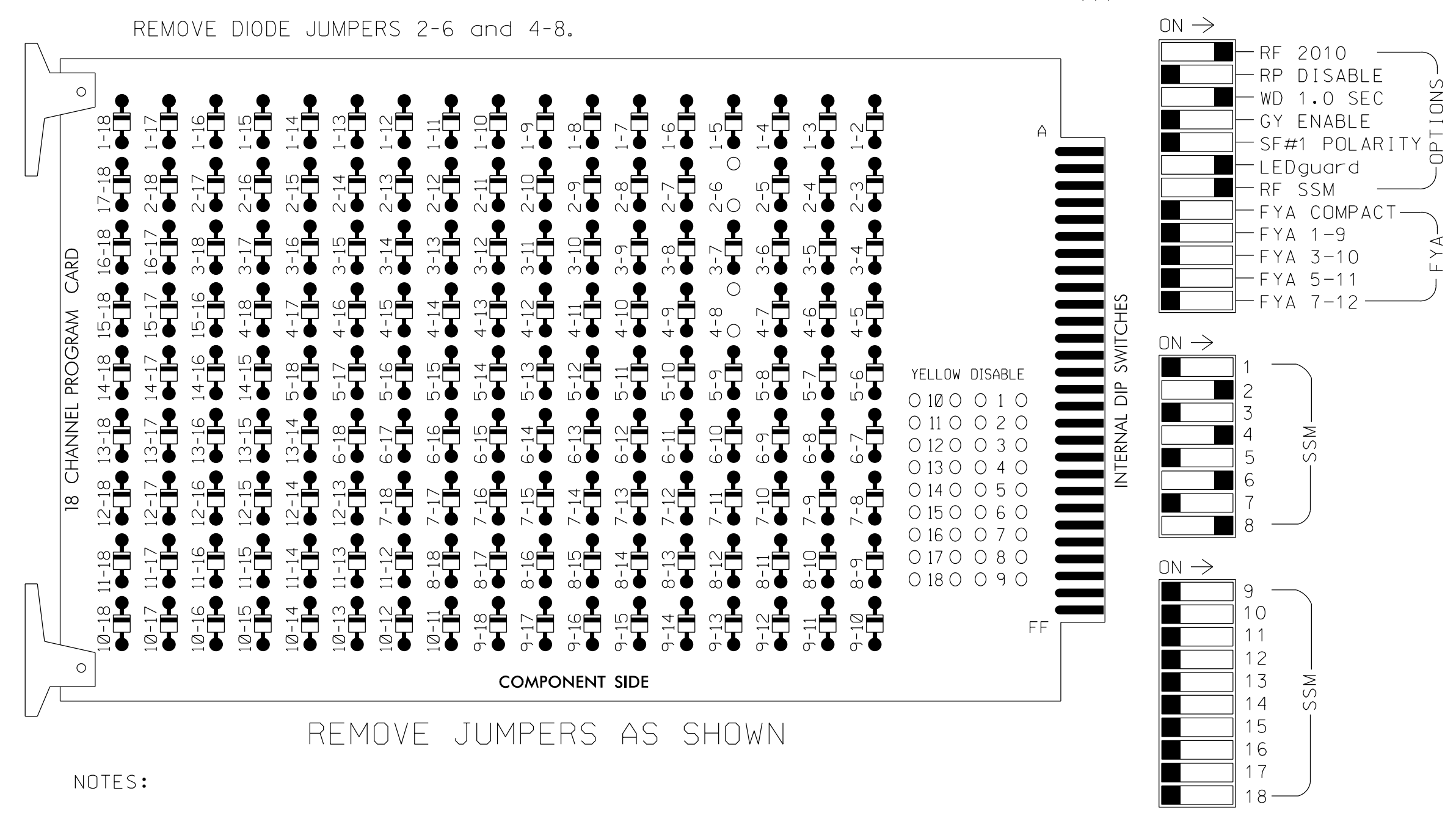
6/7/2018

SIG. INVENTORY NO. 07-0023

07-JUN-2018 11:11:01 D:\Projects\atkins\work\Projects\00056469 U-6015 B-G S19 SystemTask 05\_11\_Signal\Des\gpm07-0023.dgn ALEX3361 AT LUS310649

### 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.....336  
 SOFTWARE.....ECONOLITE 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

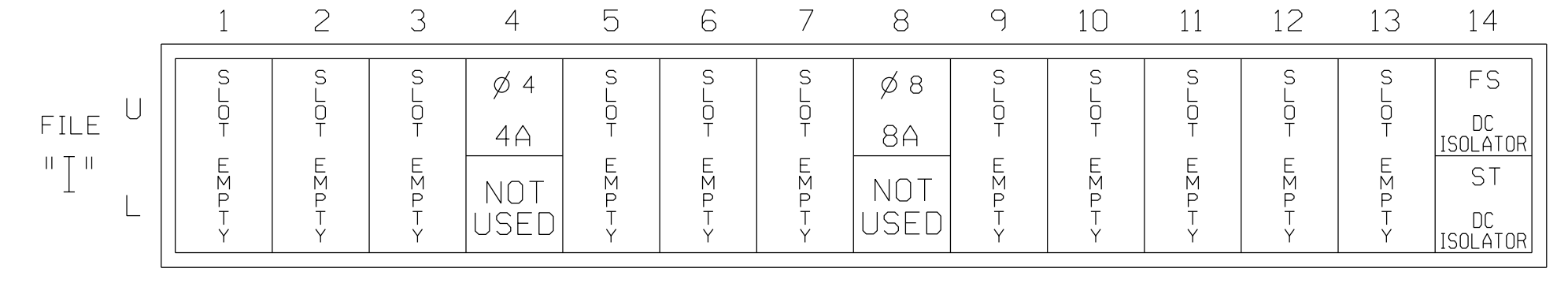
### SIGNAL HEAD HOOK-UP CHART

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

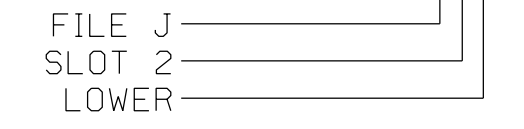
(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A	TB21-7,8	14U	41	4	4	YES		5		S
8A	TB22-1,2	18U	42	8	8	YES		5		S

### INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0023  
 DESIGNED: OCTOBER 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

### Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 87-100 (E. Webb Avenue) at Broad Street	
Division 7	Alamance County Burlington
PLAN DATE: October 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: VJ Paul	REVIEWED BY: MB Toth
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Melissa B. Toth  
 6/11/2018  
 DATE

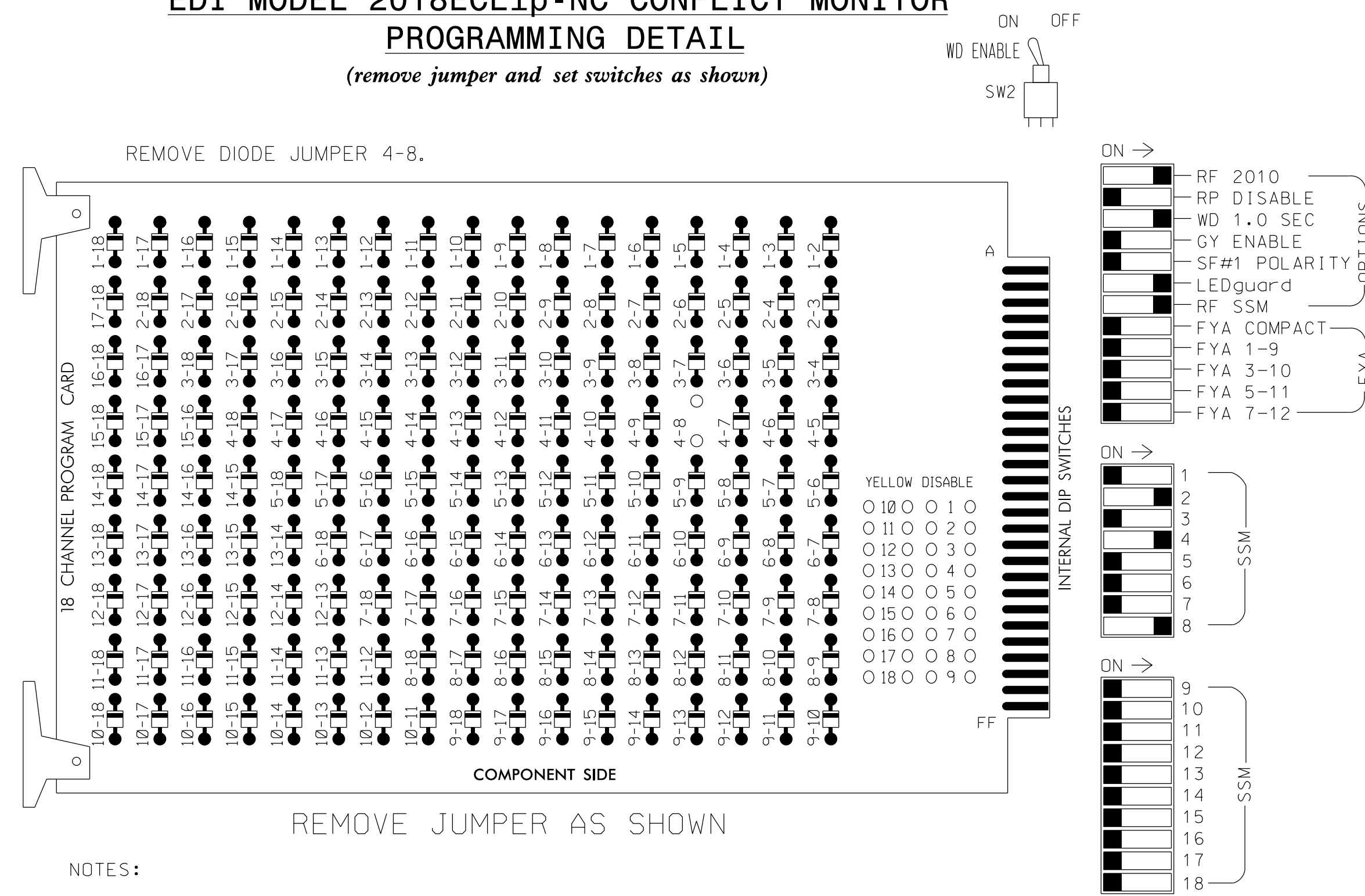
SIG. INVENTORY NO. 07-0023





# EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



**NOTES:**

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

## NOTES

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

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 22.1

## 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	41,42,43	NU	NU	NU	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101							107						
YELLOW		129			102							108						
GREEN		130			103							109						
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

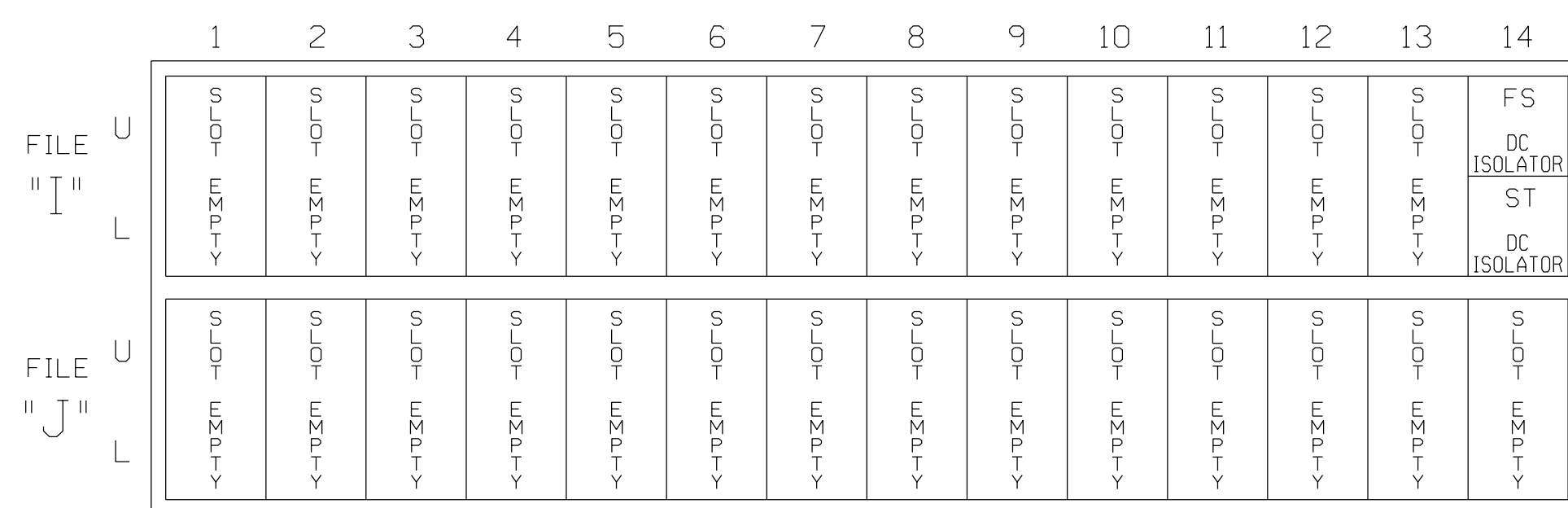
NU = Not Used

## EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S11  
 PHASES USED.....2,4,8  
 OVERLAPS.....NONE

## INPUT FILE POSITION LAYOUT

(front view)



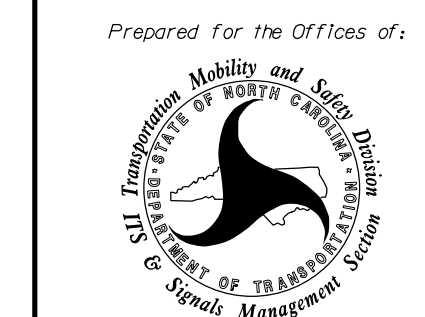
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0027  
 DESIGNED: September 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

## Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

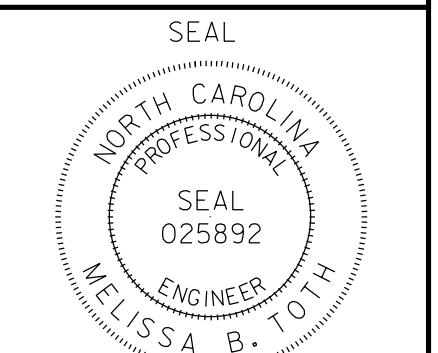


US 70-NC 62 (S. Church Street) at NC 87-100 (W. Webb Avenue)

Division 7 Alamance County Burlington  
 PLAN DATE: September 2017 REVIEWED BY: AM Encarnacion  
 PREPARED BY: NA Ptak REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Prepared by: Melissa B. Toth DATE: 6/11/2018  
 Checked by: DATE:   
 SIG. INVENTORY NO. 07-0027

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

750 N. Greenfield Pkwy, Garner, NC 27529

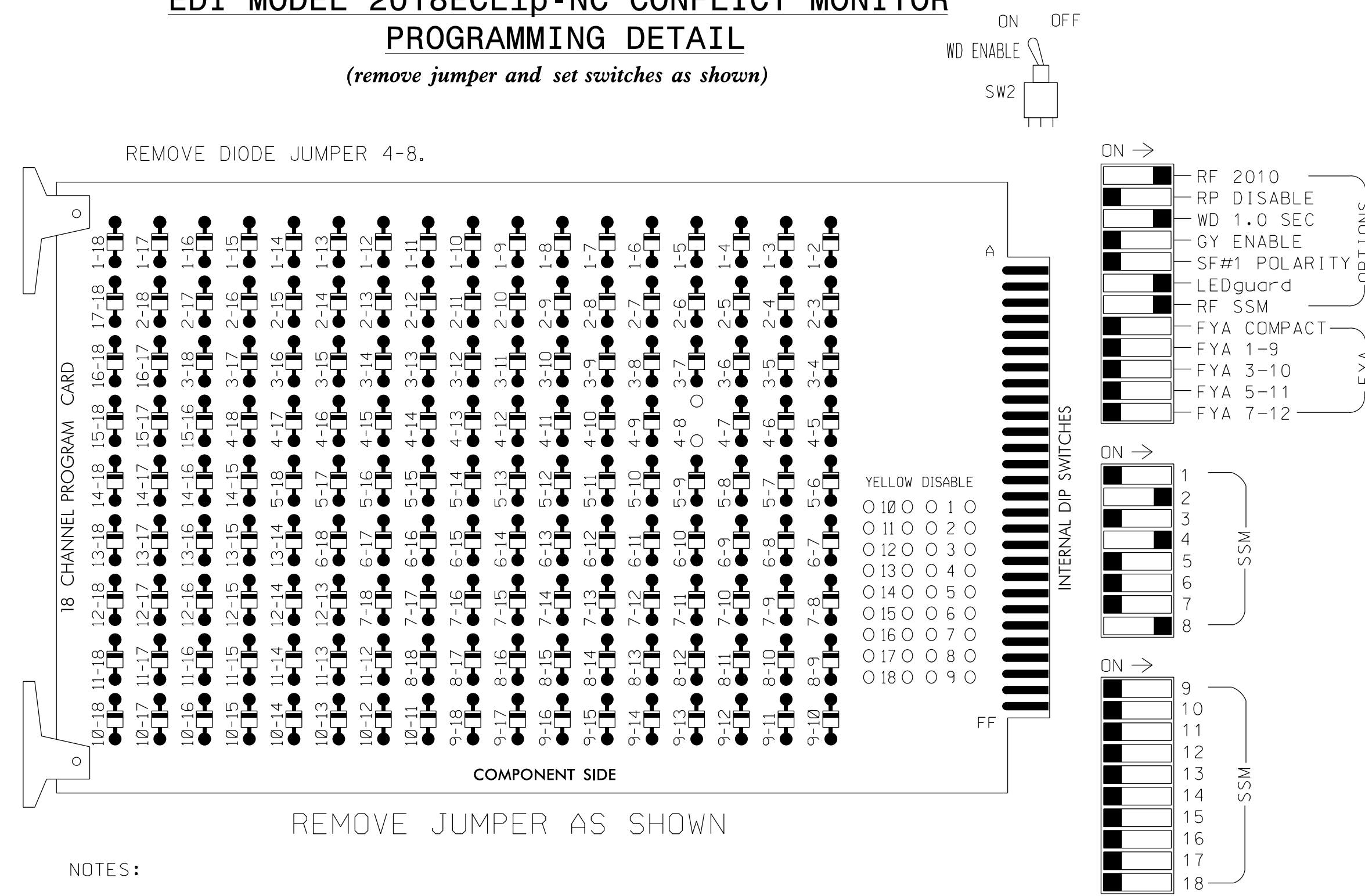






### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



**NOTES:**

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

### NOTES

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

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 24.1

### 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	NU	NU	NU	81,82	NU
RED		128			101						107	
YELLOW		129			102						108	
GREEN		130			103						109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

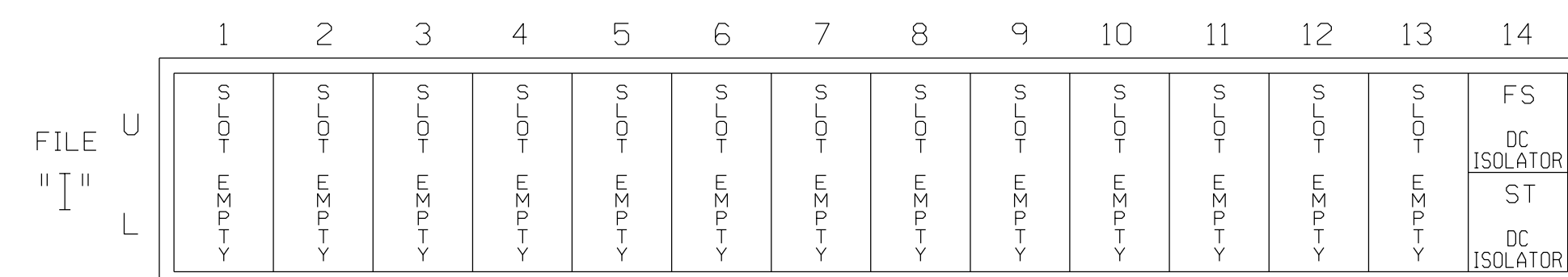
NU = Not Used

### EQUIPMENT INFORMATION

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

### INPUT FILE POSITION LAYOUT

(front view)



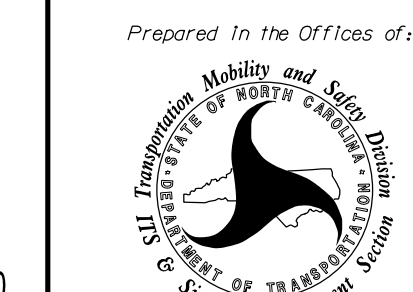
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0029  
 DESIGNED: October 2017  
 SEALED: 6/7/2018  
 REVISED: N/A

### Electrical Detail

ELECTRICAL AND PROGRAMMING  
 DETAILS FOR:

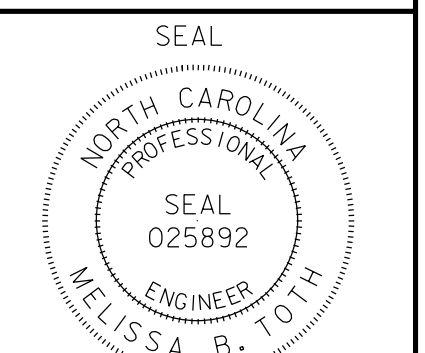


US 70-NC 62 (S. Church Street)  
 at  
 Morehead Street

Division 7 Alamance County Burlington  
 PLAN DATE: October 2017 REVIEWED BY: MB Toth  
 PREPARED BY: AM Encarnacion REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED

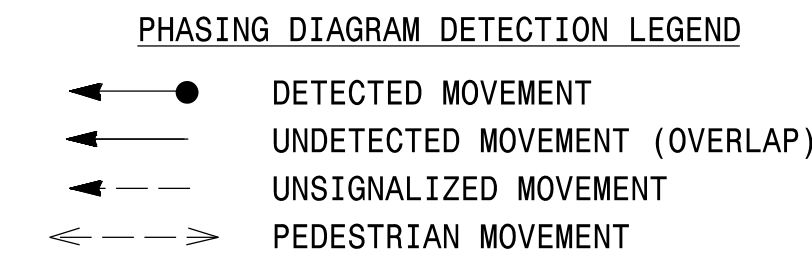
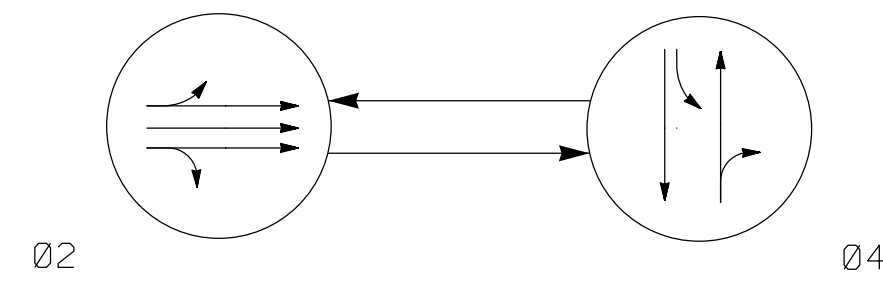


Developed by: Melissa B. Toth 6/11/2018  
 DATE  
 SIG. INVENTORY NO. 07-0029

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

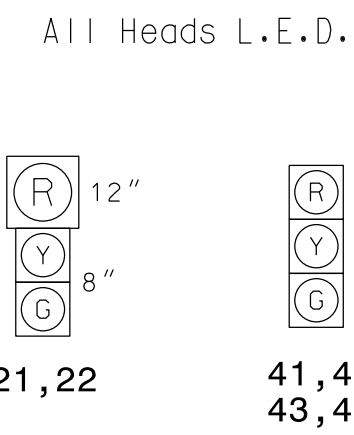
750 N. Greenfield Pkwy, Garner, NC 27529

**PHASING DIAGRAM**



SIGNAL FACE	PHASE		
	Ø2	Ø4	FLASH
21,22	G	R	Y
41,42,43,44	R	G	R

**SIGNAL FACE I.D.**



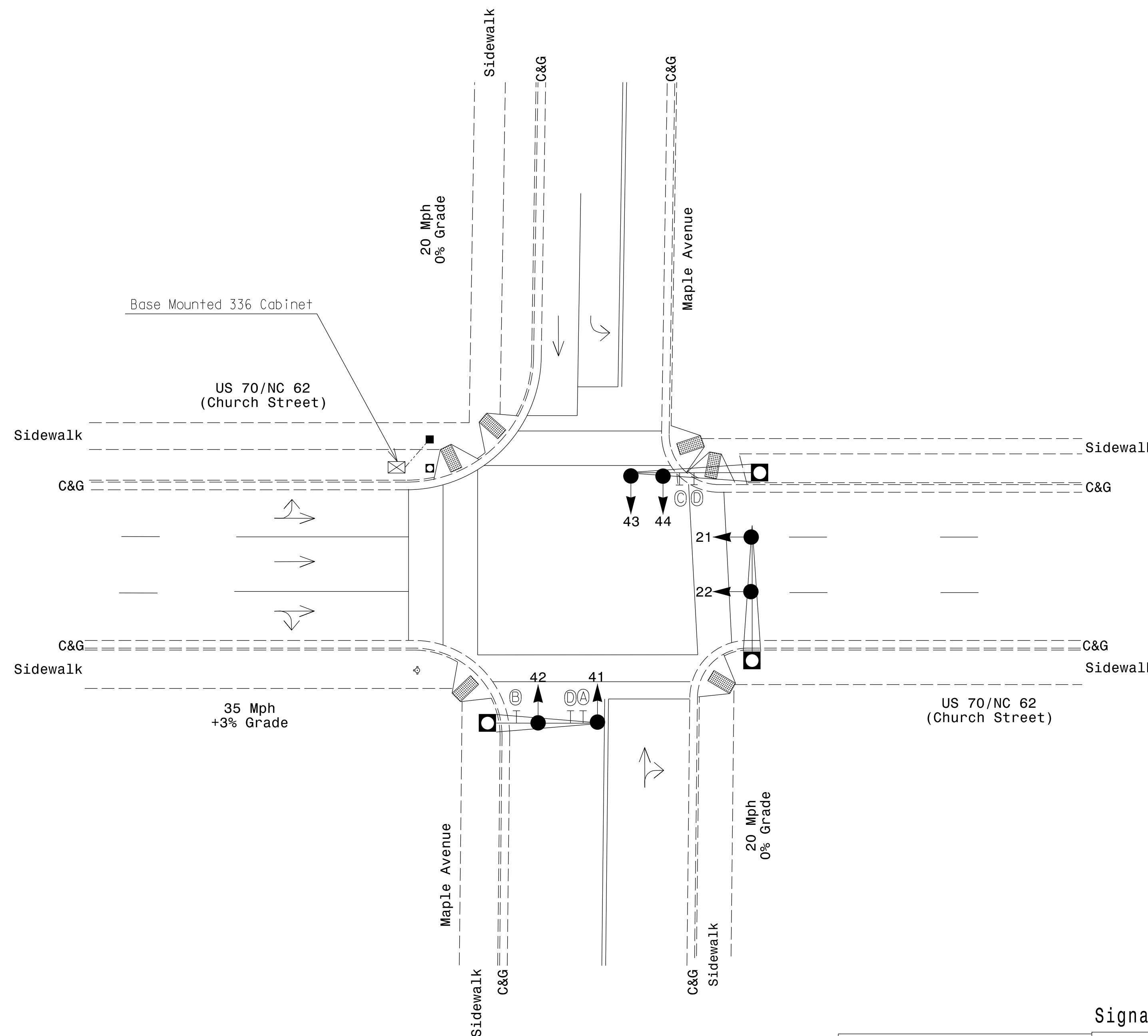
**2 Phase Pre-Timed**  
(Burlington-Graham Signal System)

**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. Locate new cabinet so as not to obstruct sign distance of vehicles turning right on red.
4. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

FEATURE	PHASE	
	2	4
Min Green *	10	7
Walk *	-	-
Ped Clear	-	-
Veh. Extension *	0.0	0.0
Max I *	38	30
Yellow	3.7	3.0
Red Clear	1.5	2.3
Actuations B4 Add *	-	-
Seconds /Actuation *	-	-
Max Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Locking Detector	-	-
Recall Position	MAX RECALL	MAX RECALL
Dual Entry	-	-
Simultaneous Gap	X	X

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 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	□ → Pedestrian Signal Head With Push Button & Sign
□ → Pedestrian Signal Head With Push Button & Sign	□ → Metal Pole with Mastarm
□ → Metal Pole with Mastarm	□ → Inductive Loop Detector
□ → Inductive Loop Detector	□ → Controller & Cabinet
□ → Controller & Cabinet	□ → Pull Box
□ → Pull Box	□ → 2-in Underground Conduit
□ → 2-in Underground Conduit	□ → Right of Way
□ → Right of Way	□ → Directional Arrow
□ → Directional Arrow	□ → Curb Ramp
□ → Curb Ramp	□ → Left Arrow "ONLY" Sign (R3-5L)
□ → Left Arrow "ONLY" Sign (R3-5L)	□ → "No Right Turn" Sign (R3-1)
□ → "No Right Turn" Sign (R3-1)	□ → "No Left Turn" Sign (R3-2)
□ → "No Left Turn" Sign (R3-2)	□ → "ONE WAY" Sign (R6-1)
□ → "ONE WAY" Sign (R6-1)	

**Signal Upgrade**

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

Prepared in the Office of:  
  
 NC FIRM LICENSE No: P-0339  
 504 Meadowlands Drive  
 Hillsborough, NC 27278  
 (919) 732-3883  
 (919) 732-6676 (FAX)

Prepared For:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 SCALE  
 0 20  
 1" = 20'

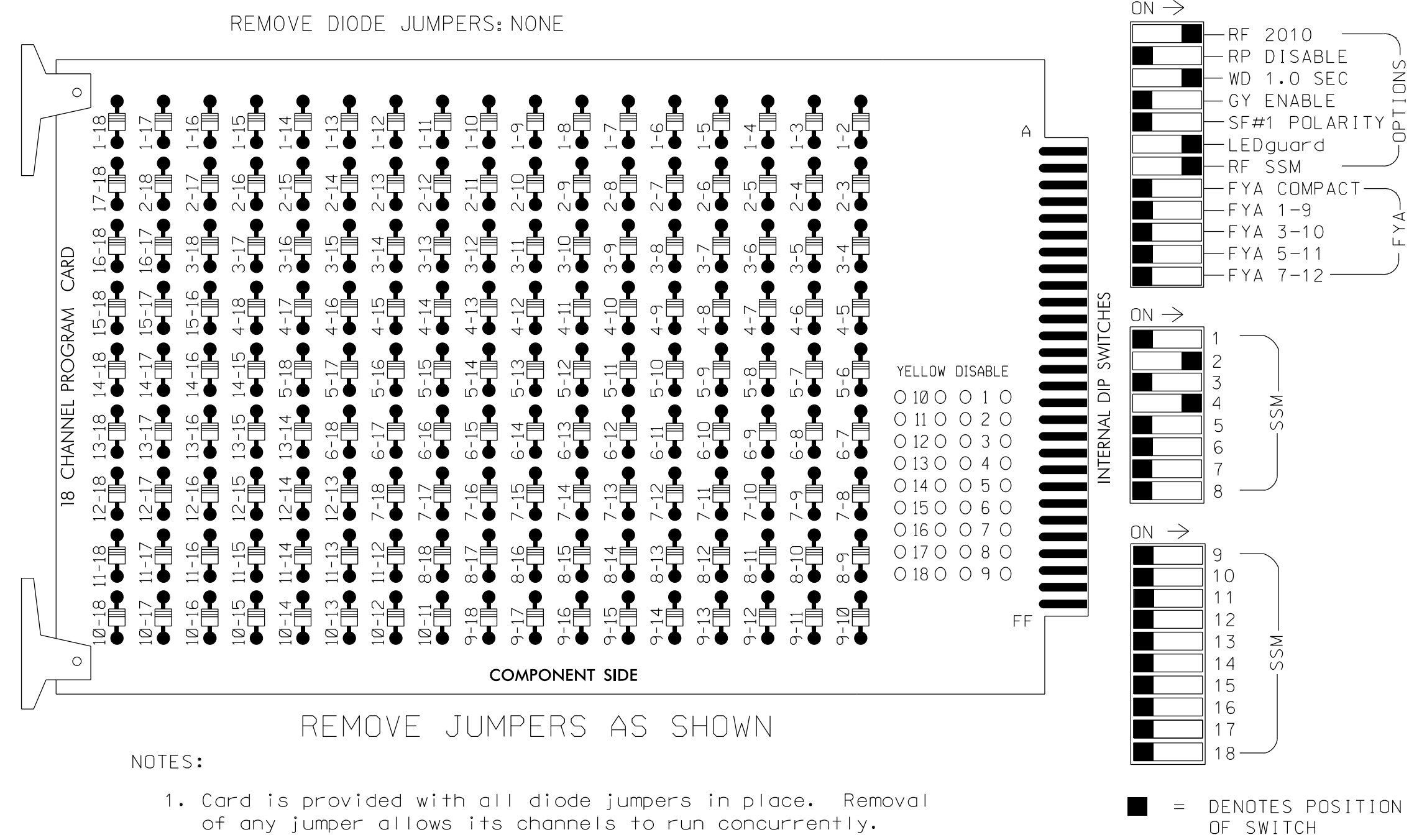
**US 70/NC 62 (Church Street)**  
**At**  
**Maple Avenue**  
 Division 7 Alamance County Burlington  
 PLAN DATE: October 2017 REVIEWED BY: E. W. Sirgany  
 PREPARED BY: M. Parker REVIEWED BY:

SEAL  
  
 SEAL  
 018174  
 ENGINEER  
 EDWARD W. SIRGANY  
 DocuSigned by:  
 Edward W Sirgany 5/16/2018  
 DATE  
 SIG. INVENTORY NO. 07-0030

REVISIONS	INIT.	DATE

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

(remove jumpers and set switches as shown)



**NOTES:**

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

### NOTES

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

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....336  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S5  
 PHASES USED.....2,4  
 OVERLAPS.....NONE

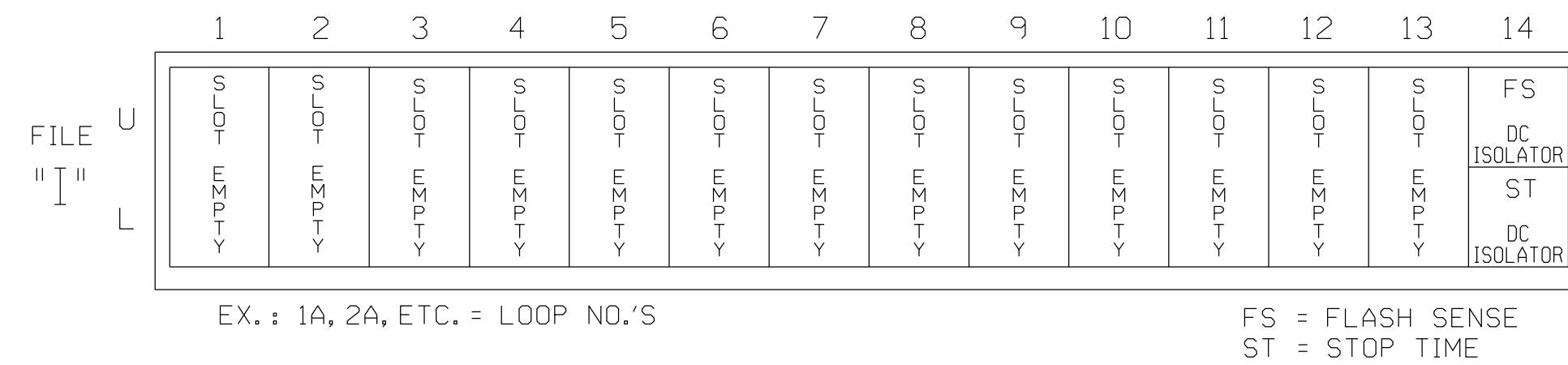
### SIGNAL HEAD HOOK-UP CHART

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	41,42,43,44	NU	NU	NU	NU	NU	NU	NU
RED		128			101							
YELLOW		129			102							
GREEN		130			103							
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



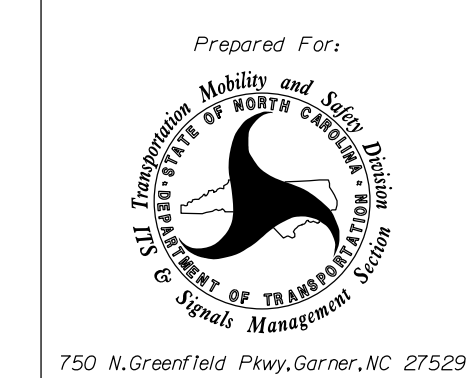
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0030  
 PREPARED: October 2017  
 SEALED: 5/16/2018  
 REVISED: N/A

Electrical Detail

Prepared in the Office of:

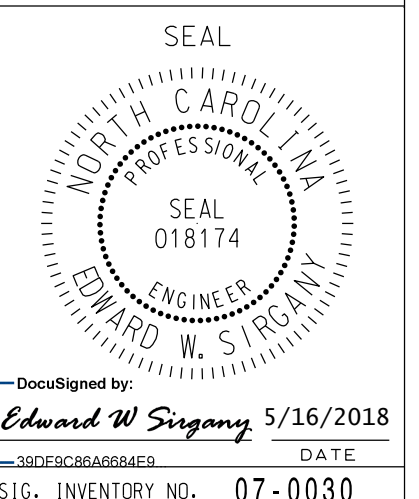


NC FIRM LICENSE No: P-0339  
 504 Meadowlands Drive  
 Hillsborough, NC 27278  
 (919) 732-3883  
 (919) 732-6676 (FAX)



US 70/NC 62 (Church Street)  
 At  
 Maple Avenue  
 Division 7 Alamance County Burlington  
 PLAN DATE: October 2017 REVIEWED BY: E. W. Sirgany  
 PREPARED BY: J. Smith RKA PROJ. NO:  
 REVISIONS INIT. DATE

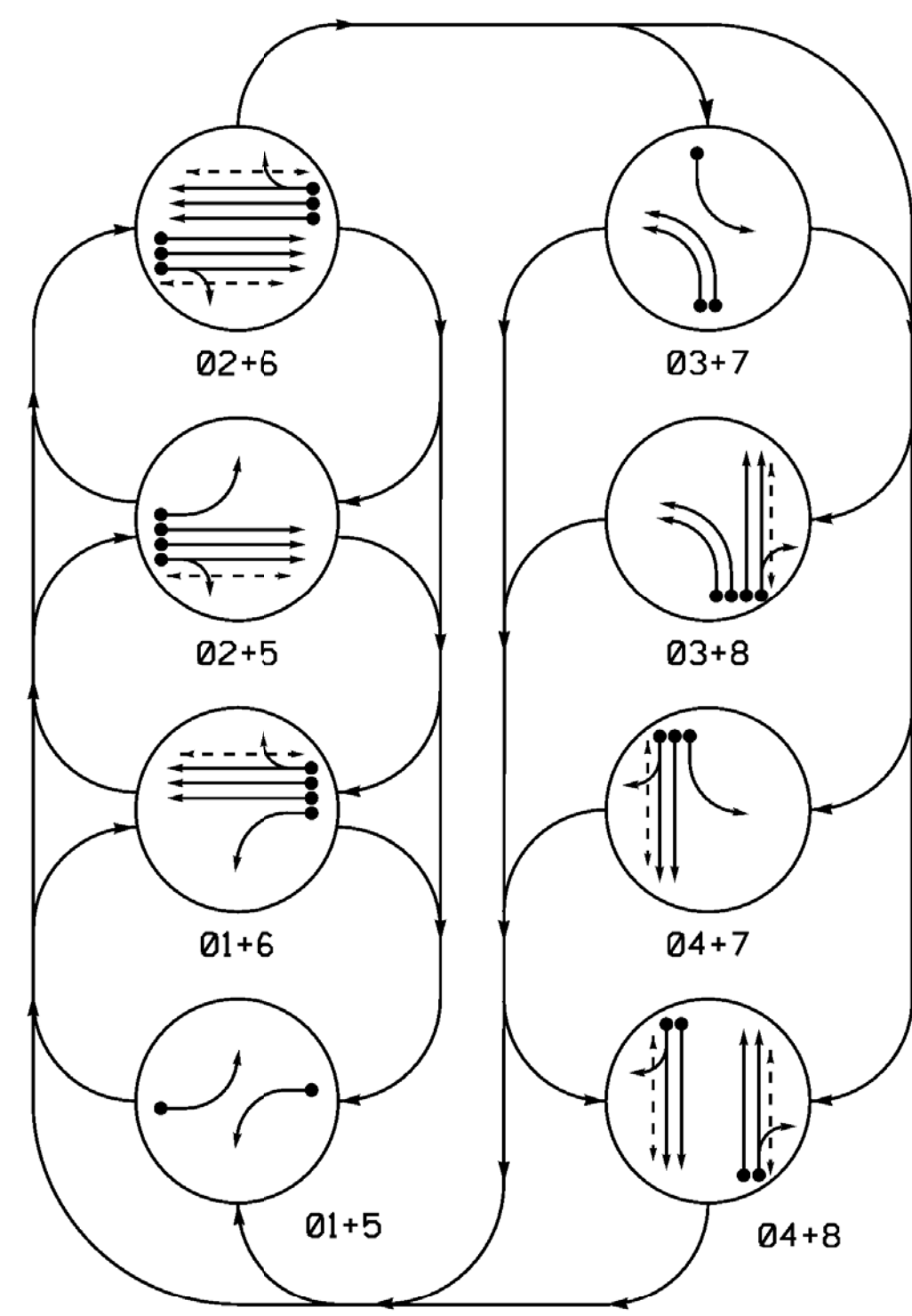
DOCUMENT NOT CONSIDERED  
 FINAL UNLESS ALL  
 SIGNATURES COMPLETED



DocuSigned by:  
 Edward W Sirgany 5/16/2018  
 DATE  
 SIG. INVENTORY NO. 07-0030



PHASING DIAGRAM



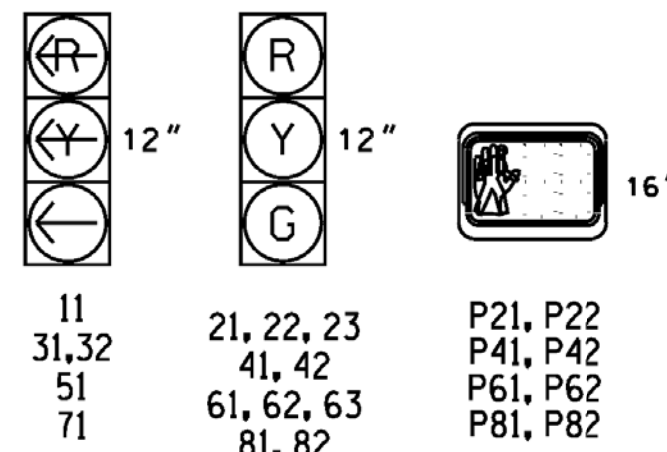
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE								F
	01+5	02+6	03+7	04+8	01+6	02+5	03+8	04+7	
11	---	---	---	---	---	---	---	---	Y
21,22,23	R	R	G	G	R	R	R	R	Y
31,32	R	R	R	R	---	---	---	---	---
41, 42	R	R	R	R	R	G	G	R	---
51	---	---	---	---	---	---	---	---	Y
61,62,63	R	G	R	G	R	R	R	R	Y
71	R	R	R	R	---	---	---	---	---
81,82	R	R	R	R	G	R	G	R	---
P21, P22	DW	DW	W	W	DW	DW	DW	DRK	---
P41, P42	DW	DW	DW	DW	DW	W	W	DRK	---
P61, P62	DW	W	DW	W	DW	DW	DW	DRK	---
P81, P82	DW	DW	DW	DW	W	DW	W	DRK	---

SIGNAL FACE I.D.

All Heads L.E.D.

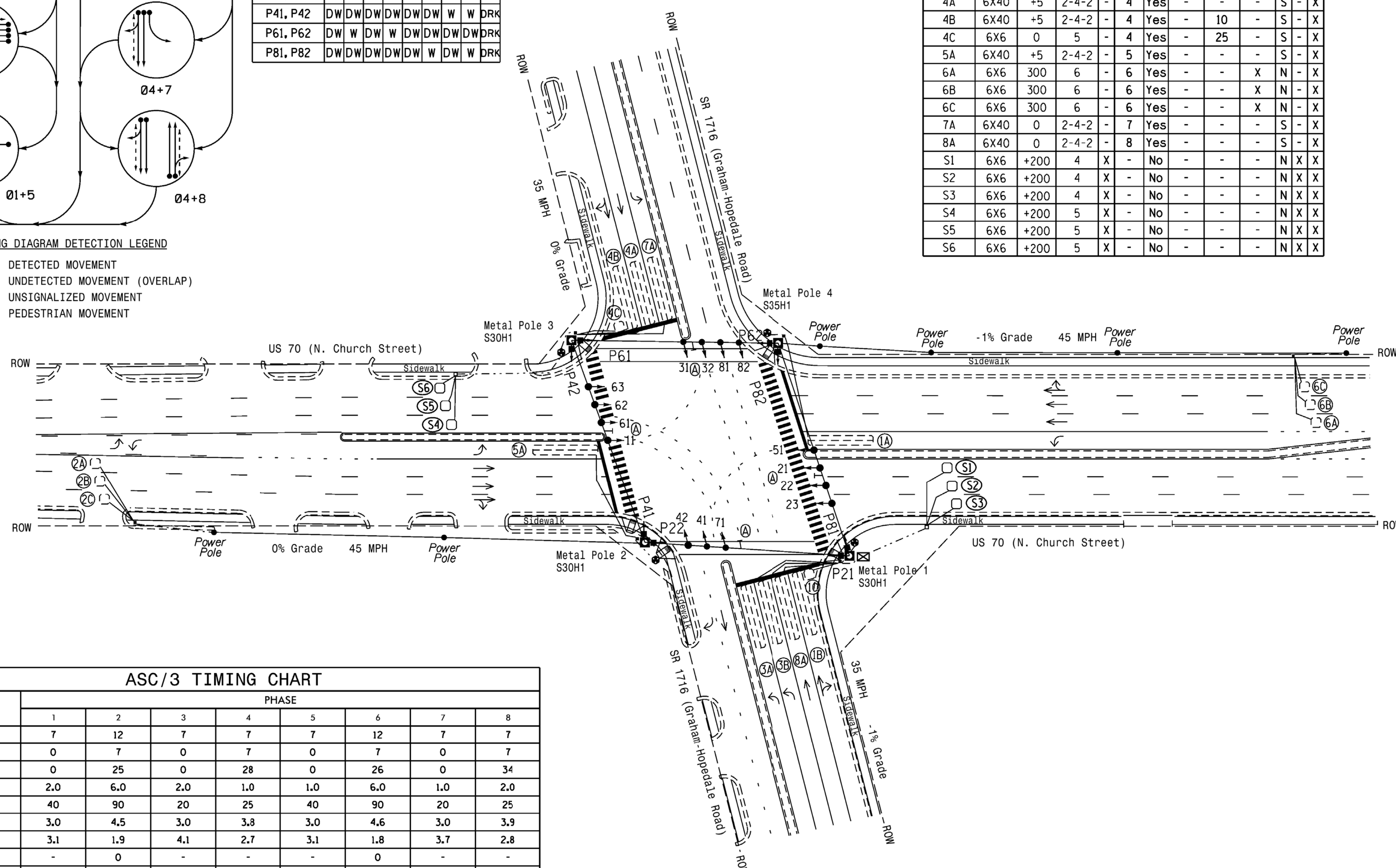


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	10	-	S	-	X
1C	6X6	0	3	-	1	Yes	-	25	-	S	-	X
2A	6X6	300	6	-	2	Yes	-	-	X	N	-	X
2B	6X6	300	6	-	2	Yes	-	-	X	N	-	X
2C	6X6	300	6	-	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	-	S	-	X
3B	6X40	0	2-4-2	-	3	Yes	-	-	-	S	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
4C	6X6	0	5	-	4	Yes	-	25	-	S	-	X
5A	6X40	+5	2-4-2	-	5	Yes	-	-	-	S	-	X
6A	6X6	300	6	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	6	-	6	Yes	-	-	X	N	-	X
6C	6X6	300	6	-	6	Yes	-	-	X	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	-	X
S1	6X6	+200	4	X	-	No	-	-	-	N	X	X
S2	6X6	+200	4	X	-	No	-	-	-	N	X	X
S3	6X6	+200	4	X	-	No	-	-	-	N	X	X
S4	6X6	+200	5	X	-	No	-	-	-	N	X	X
S5	6X6	+200	5	X	-	No	-	-	-	N	X	X
S6	6X6	+200	5	X	-	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. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	0	7	0	7	0	7	0	7
Ped Clear	0	25	0	28	0	26	0	34
Veh. Extension *	2.0	6.0	2.0	1.0	1.0	6.0	1.0	2.0
Max 1 *	40	90	20	25	40	90	20	25
Yellow	3.0	4.5	3.0	3.8	3.0	4.6	3.0	3.9
Red Clear	3.1	1.9	4.1	2.7	3.1	1.8	3.7	2.8
Actuations B4 Add *	-	0	-	-	-	0	-	-
Seconds / Actuation *	-	2.5	-	-	-	2.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	30	-	-	-	30	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	-	X	X	X	X	X	X

\* 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               |
| □ → Pedestrian Signal Head With Push Button & Sign | ■ → Pedestrian Signal Head            |
| □ → Metal Strain Pole                              | □ → Metal Strain Pole                 |
| ⊗ → Inductive Loop Detector                        | ⊗ → Inductive Loop Detector           |
| ⊠ → Controller & Cabinet Junction Box              | ⊠ → Controller & Cabinet Junction Box |
| - - - → 2-in Underground Conduit                   | - - - → 2-in Underground Conduit      |
| N/A → Right of Way                                 | N/A → Right of Way                    |
| → → Directional Arrow                              | → → Directional Arrow                 |
| - - - → Directional Drill                          | N/A → Directional Drill               |
| ⊕ → Type I Pushbutton Post                         | ⊕ → Type I Pushbutton Post            |
| ○ → Type II Signal Pedestal                        | ● → Type II Signal Pedestal           |
| Ⓐ → Street Name Sign (D3-1)                        | Ⓐ → Street Name Sign (D3-1)           |
| ⌒ → Curb Ramp                                      | ⌒ → Curb Ramp                         |



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:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 SCALE 0 40  
 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

US 70 (N. Church Street) at SR 1716 (Graham-Hopedale Road)

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS	INIT.	DATE

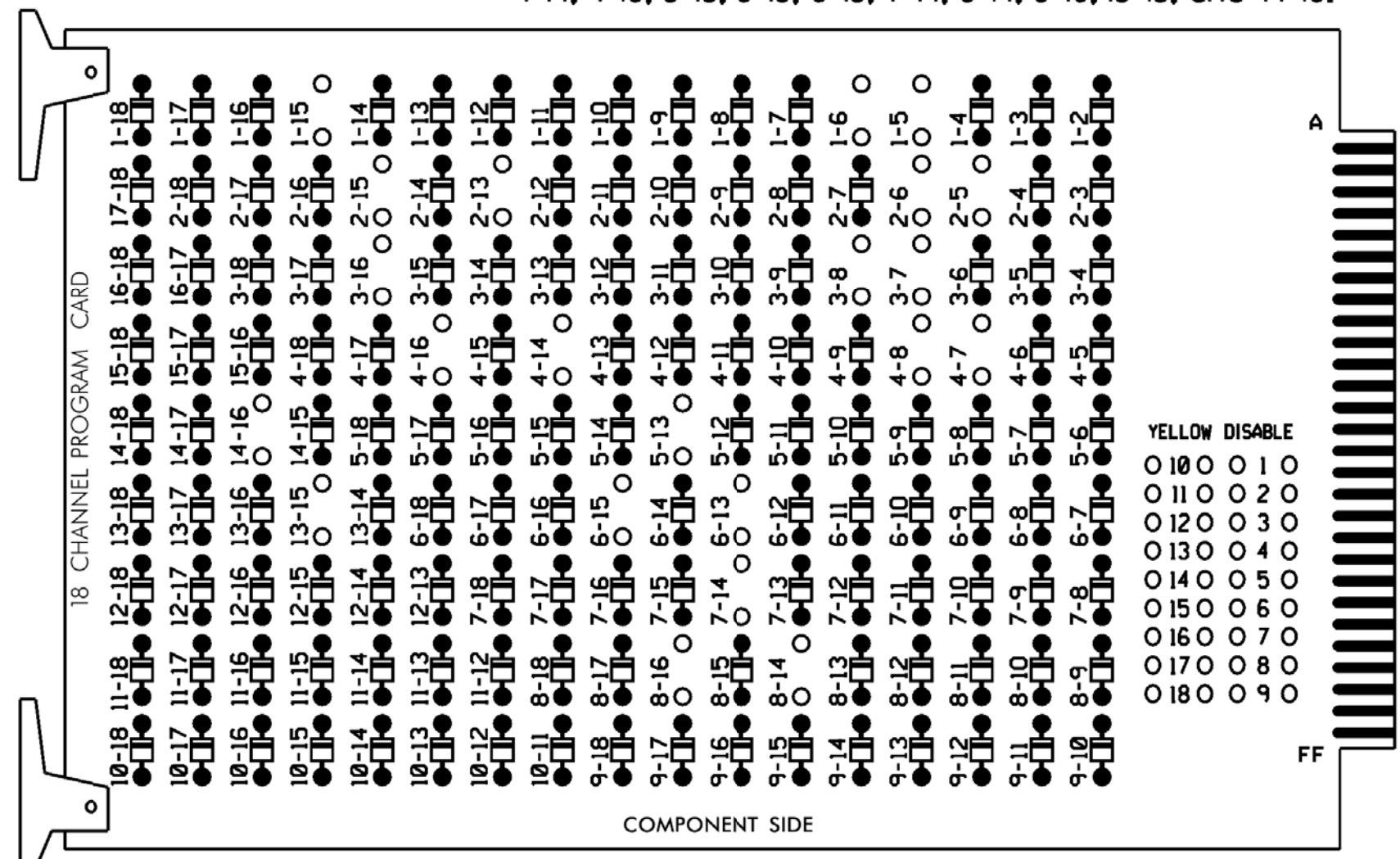
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 JAMES B. VOSO  
 022599  
 6/13/2018  
 DATE  
 SIGNATURE  
 SIG. INVENTORY NO. 07-0032

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*BUSINESS\*\*\*\*\*

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

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that 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 Walk 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.S3.S4.S5.S6.S7.S8.S9.  
 S10.S11.S12  
 PHASES USED.....1.2.2PED.3.4.4PED.5.6.6PED.7.8.8PED  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22, 23	P21, P22	31,32	41,42	P41, P42	51	61,62, 63	P61, P62	71	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123								
GREEN ARROW	127			118			133			124								
Hand			113			104			119			110						
Walking			115			106			121			112						

NU = Not Used

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**INPUT FILE POSITION LAYOUT**

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅ 2	∅ 2	∅ 3	∅ 4	∅ 4	S	SYS. DET. S1	S	S	∅ 2PED	∅ 6PED	FS
L	NOT USED	∅ 1	∅ 2	NOT USED	∅ 3	∅ 4	NOT USED	S	SYS. DET. S2	S	S	∅ 4PED	∅ 8PED	ST
U	∅ 5	∅ 6	∅ 6	S	∅ 7	∅ 8	SYS. DET. S5	S	SYS. DET. S3	S	S	S	S	S
L	NOT USED	∅ 6	NOT USED	S	NOT USED	NOT USED	SYS. DET. S6	S	SYS. DET. S4	S	S	S	S	S

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

FS = FLASH SENSE  
 ST = STOP TIME

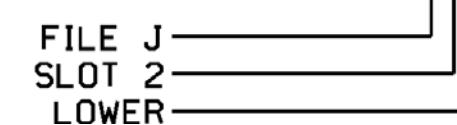
**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-5,6	I2U	39	2	1	YES		10		S
1C	TB2-7,8	I2L	43	12	1	YES		25		S
2A	TB2-9,10	I3U	63	32	2	YES			X	N
2B	TB2-11,12	I3L	76	42	2	YES			X	N
2C	TB4-1,2	I4U	47	22	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES				S
3B	TB4-5,6	I5L	58	3	3	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
4C	TB6-1,2	I7U	65	34	4	YES		25		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A	TB3-1,2	J1U	55	5	5	YES				S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
7A	TB5-5,6	J5U	57	7	7	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S
* S5	TB7-1,2	J7U	66	38	SYS	NO				N
* S6	TB7-3,4	J7L	79	48	SYS	NO				N
* S3	TB7-9,10	J9U	59	15	SYS	NO				N
* S4	TB7-11,12	J9L	61	17	SYS	NO				N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

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

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

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0032  
 DESIGNED: December 2017  
 SEALED: 6/13/2018  
 REVISED: NA



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

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical AND PROGRAMMING DETAILS FOR: SR 1716 (Graham-Hopedale Road) at 750 N. Greenfield Pkwy, Corner, NC 27529

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS: \_\_\_\_\_

INIT. DATE

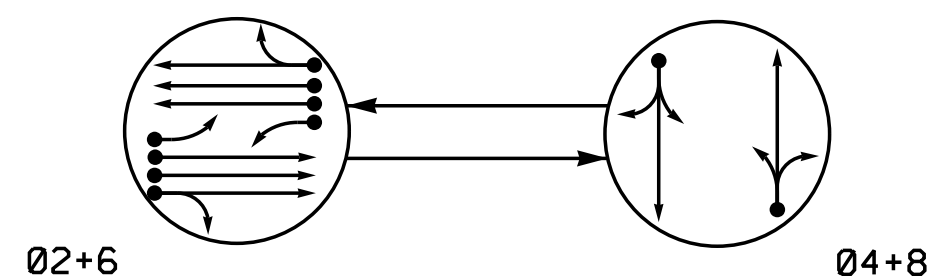
James Voso 6/13/2018

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022599 JAMES B. VOSO

SIG. INVENTORY NO. 07-0032

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*D\*\*\*\*\*  
 \*\*\*\*\*USER\*\*\*\*\*

PHASING DIAGRAM

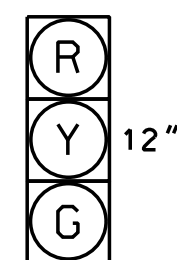


PHASING DIAGRAM DETECTION LEGEND  
 ● ← DETECTED MOVEMENT  
 ○ ← UNDETECTED MOVEMENT (OVERLAP)  
 - - ← UNSIGNALIZED MOVEMENT  
 - - ← PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		
	02+6	04+8	F L R
21, 22, 23	G	R	Y
41, 42	R	G	R
61, 62, 63	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22, 23  
41, 42  
61, 62, 63  
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	SYSTEM LOOP	NEW CARD
2A	6x6	300	4	X	2	Yes	-	-	X	N	-	X
2B	6x6	300	4	X	2	Yes	-	-	X	N	-	X
2C	6x6	300	4	X	2	Yes	-	-	X	N	-	X
4A	6x60	0	2-4-2	-	4	Yes	-	5	-	S	-	X
6A	6x6	300	4	X	6	Yes	-	-	X	N	-	X
6B	6x6	300	4	X	6	Yes	-	-	X	N	-	X
6C	6x6	300	4	X	6	Yes	-	-	X	N	-	X
8A	13x35	+5	2-4-2	-	8	Yes	-	5	-	S	-	X

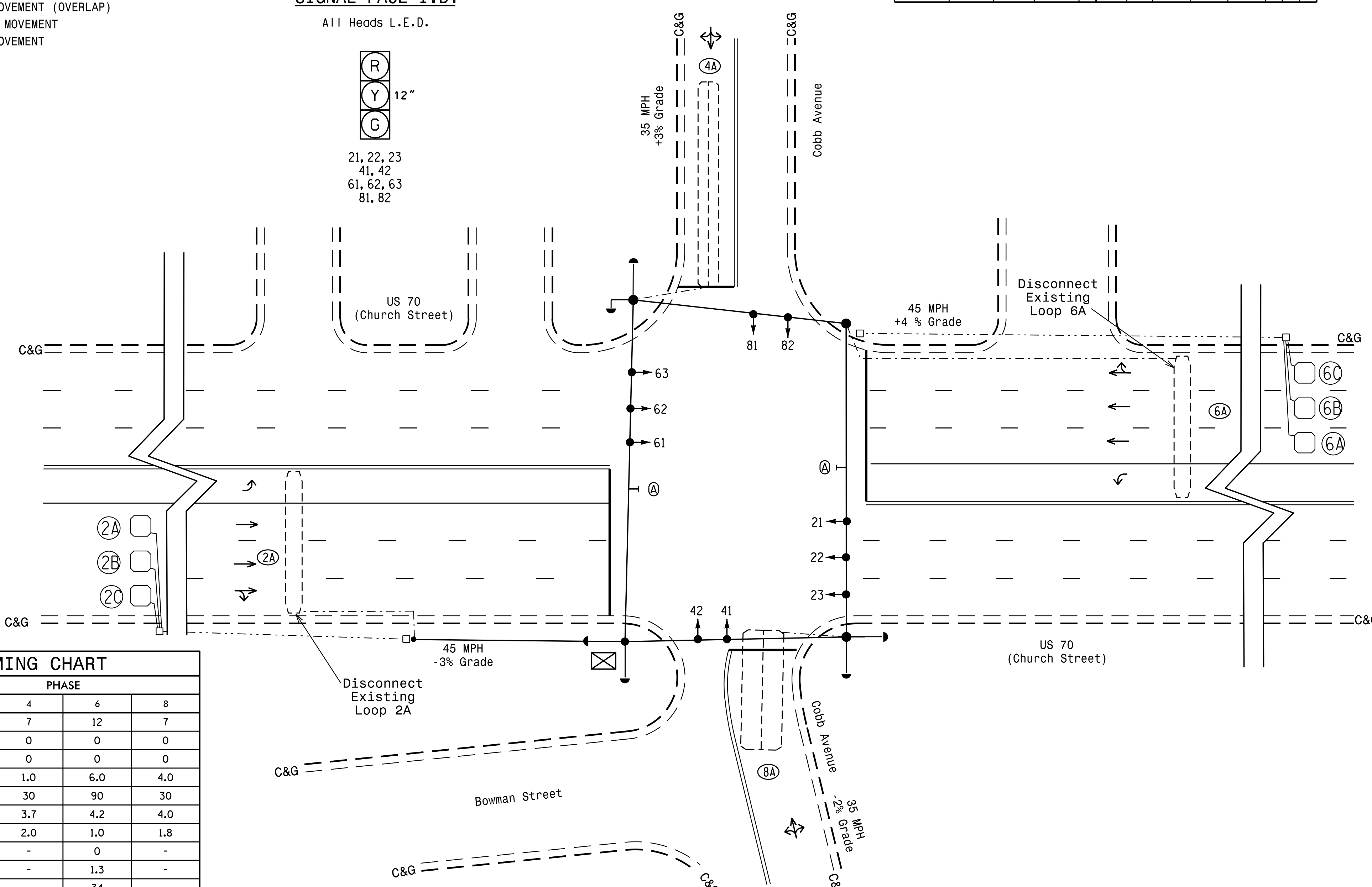
2 Phase Fully Actuated (Burlington-Graham Signal System)

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 numbered 21, 22, 23, 61, 62, and 63.
- 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.
- Existing Left Turn "ONLY" signs-(R3-5L) may be removed at the discretion of the Regional Traffic Engineer.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- The cabinet should be designed to include an Auxiliary Output File for future use.

FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	1.0	6.0	4.0
Max I *	90	30	90	30
Yellow	4.8	3.7	4.2	4.0
Red Clear	1.0	2.0	1.0	1.8
Actuations B4 Add *	0	-	0	-
Seconds /Actuation *	1.3	-	1.3	-
Max Initial *	34	-	34	-
Time Before Reduction *	30	-	30	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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



PROPOSED		EXISTING	
○	Traffic Signal Head	●	N/A
○	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	- - -	
N/A	Right of Way	- - -	
→	Directional Arrow	→	
(A)	Left Turn "ONLY" Sign (R3-5L)	(A)	

Signal Upgrade

US 70 (Church Street) at Cobb Avenue

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS: INIT. DATE

SCALE: 1"=20'

6/13/2018

James B. Voso

SIG. INVENTORY NO. 07-0033

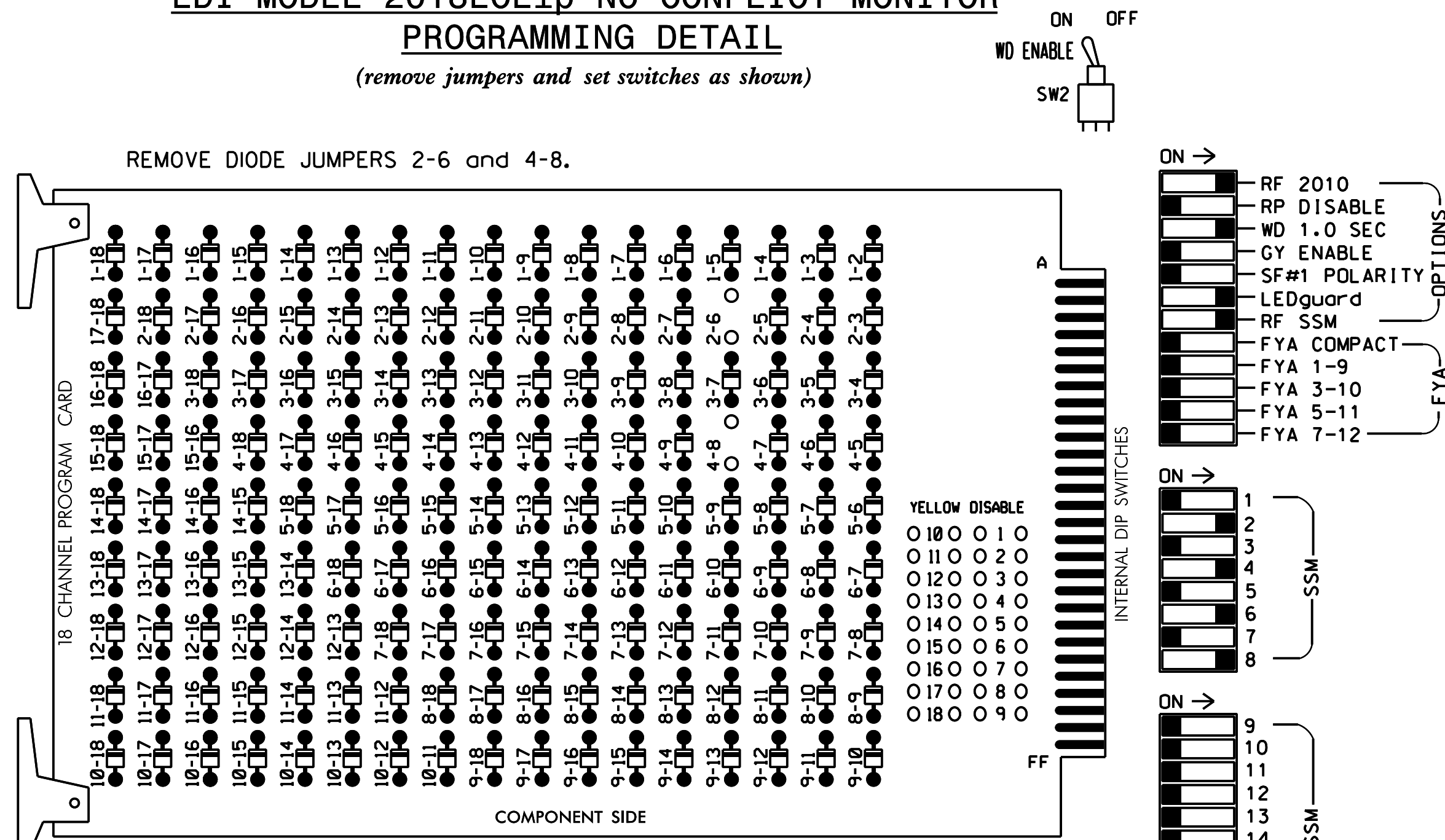
Mattern & Craig ENGINEERS-SURVEYORS

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

12:43:58 PM 11-14-2017 - Burlington-Graham Signal System06 Working Folders (Replace Sub-folders with NCDOT File Structure if Working on NCDOT Project)Mhw or Dgnm07-0033-00033.dgn

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

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6 and 4-8.

REMOVE JUMPERS AS SHOWN

**NOTES:**

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

**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.....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 23	NU	NU	41,42	NU	NU	61,62 63	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)

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

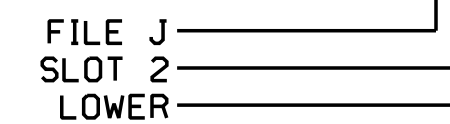
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	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
2C	TB2-9,10	I3U	63	32	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		5		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		5		S

INPUT FILE POSITION LEGEND: J2L

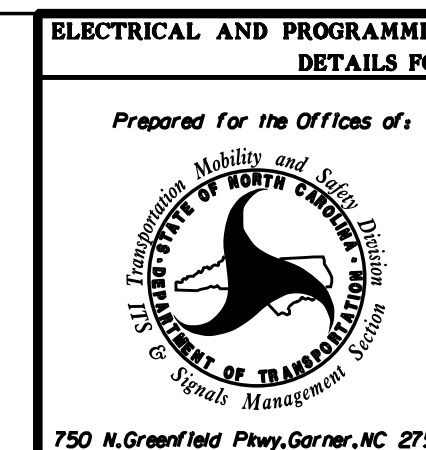


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0033  
 DESIGNED: December 2017  
 SEALED: 6/13/2018  
 REVISED: NA

Electrical Detail



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



US 70 (Church Street)  
 at  
 Cobb Avenue

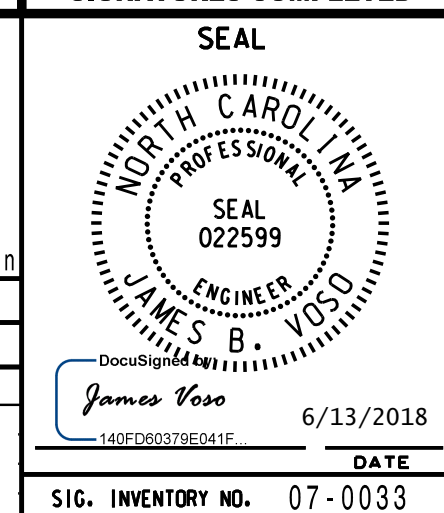
Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS	INIT.	DATE

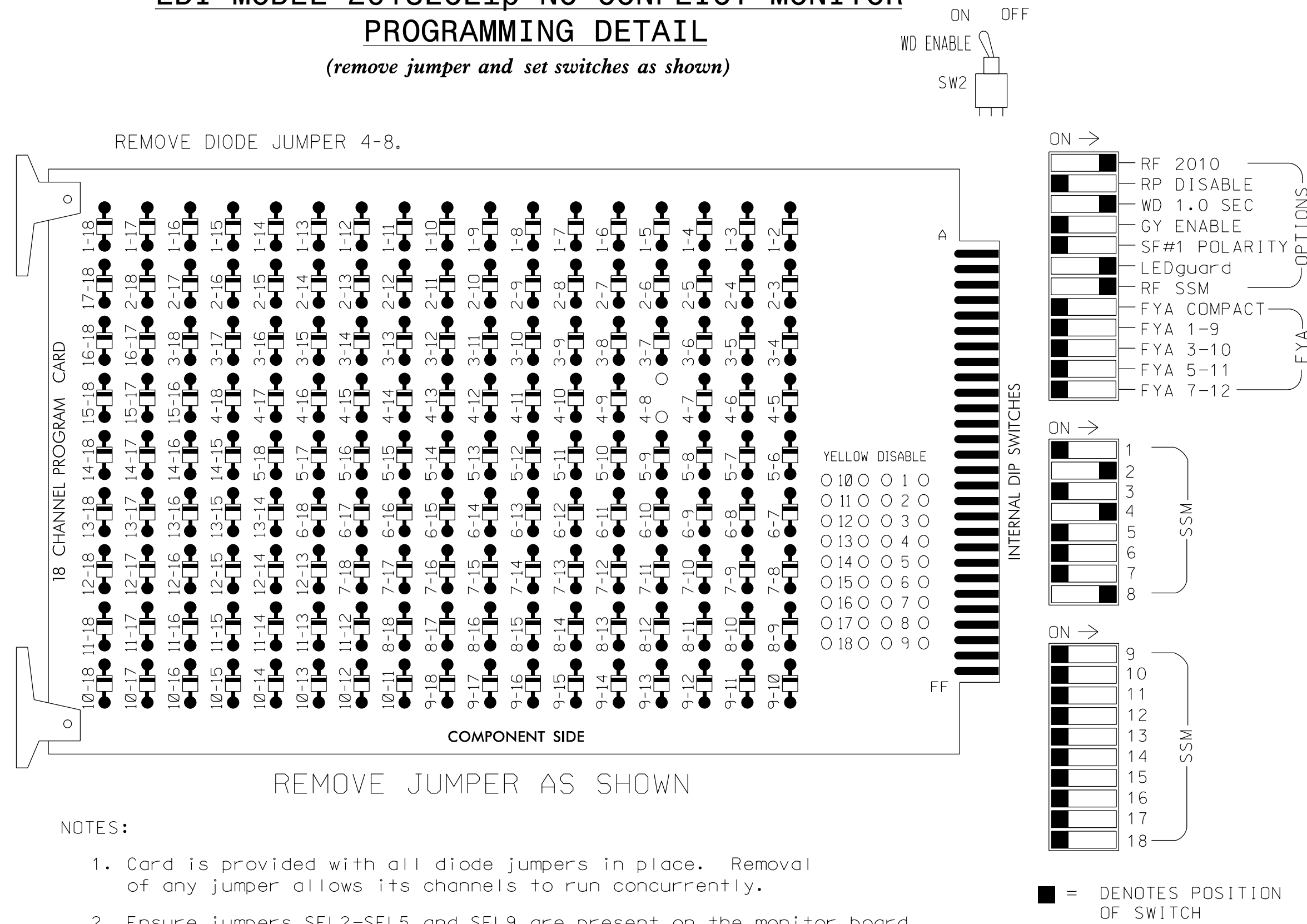
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





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

(remove jumper and set switches as shown)



NOTES:

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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green.
3. 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
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, 23	NU	NU	41,42	NU	NU	NU	NU	NU	81,82	NU
RED		128			101						107	
YELLOW		129			102						108	
GREEN		130			103						109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

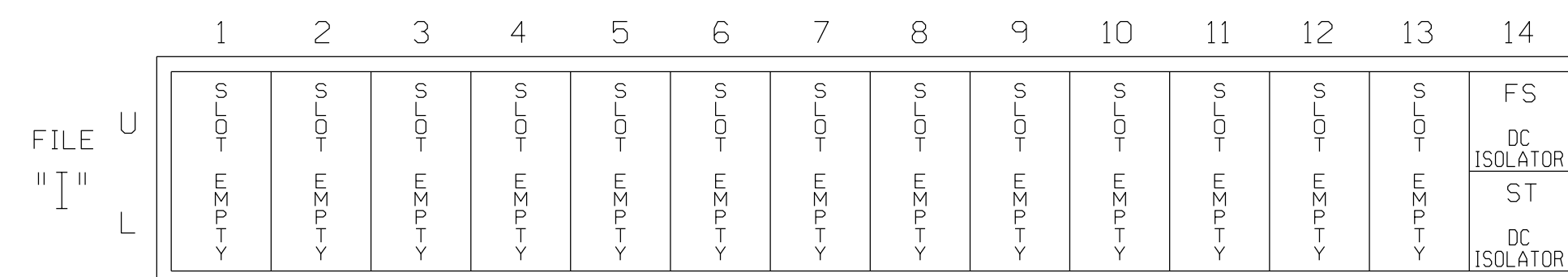
NU = Not Used

### EQUIPMENT INFORMATION

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

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0034  
 DESIGNED: SEPT-2017  
 SEALED: 06-13-2018  
 REVISED: N/A

### Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 70-NC 62 (N. Church Street) at W. Trade Street

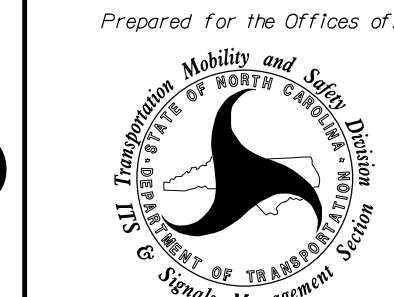
Division 7 Alamance County Burlington

PLAN DATE: September 2017 REVIEWED BY: LM Moon

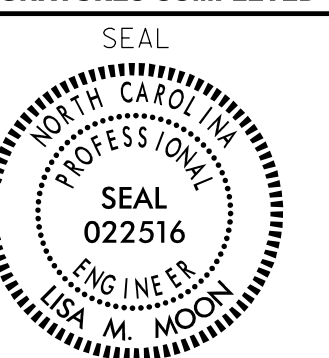
PREPARED BY: AJ Davis REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

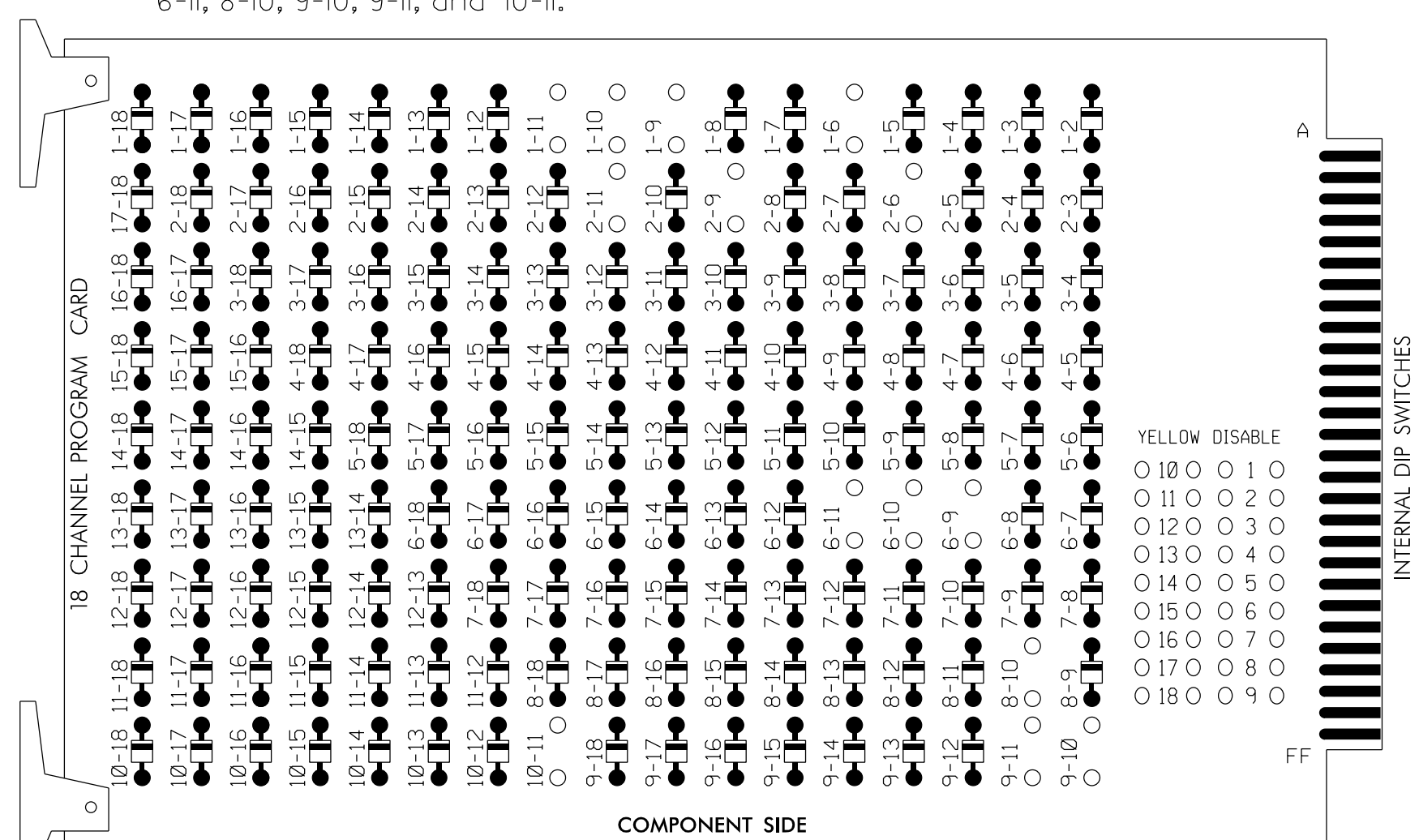
SIG. INVENTORY NO. 07-0034



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

(remove jumpers and set switches as shown)

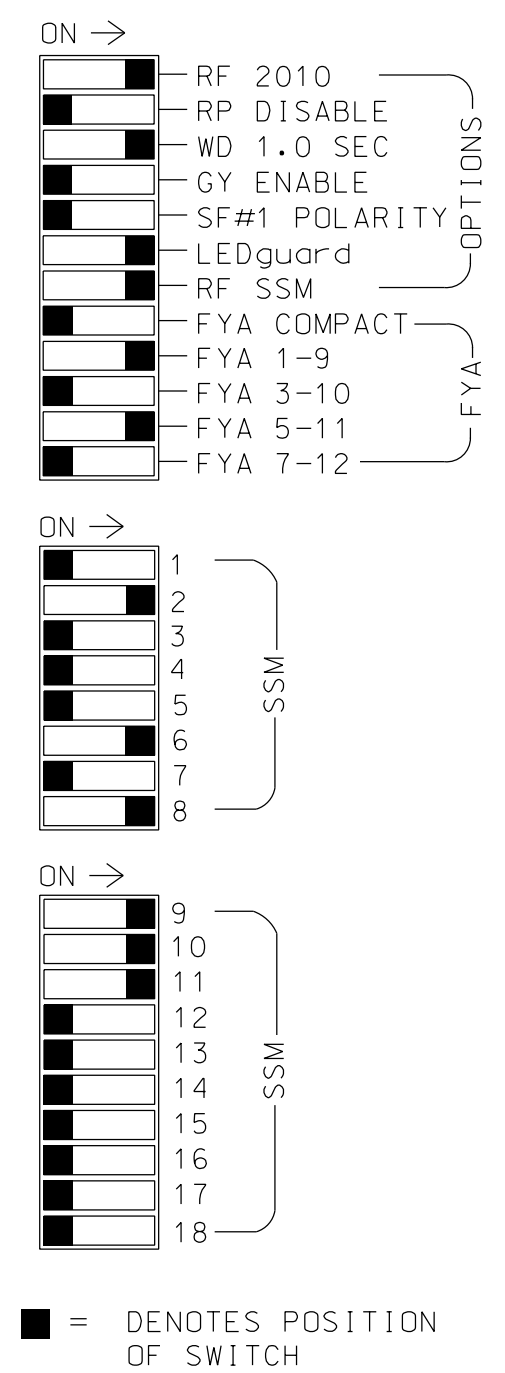
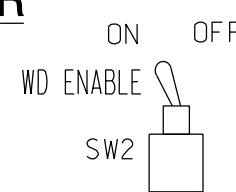
REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 1-11, 2-6, 2-9, 2-11, 6-9, 6-10, 6-11, 8-10, 9-10, 9-11, and 10-11.



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 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.....ECONDLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1,AUX S2,  
 AUX S4  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....1+8  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 \* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Fig. 29.1

### 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	22,23	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	11	83,84	NU	21	NU	NU
RED		128						134			107							
YELLOW	*	129						135			108							
GREEN		130						136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127													A126				

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2 2A	∅ 3 TOP	∅ 4 TOP	∅ 5 TOP	∅ 6 TOP	∅ 7 TOP	∅ 8 TOP	SYS. DET. S1	∅ 9 TOP	∅ 10 TOP	∅ 11 TOP	∅ 12 TOP	FS DC ISOLATOR
L	NOT USED	NOT USED	∅ 3 TOP	∅ 4 TOP	∅ 5 TOP	∅ 6 TOP	∅ 7 TOP	∅ 8 TOP	SYS. DET. S2	∅ 9 TOP	∅ 10 TOP	∅ 11 TOP	∅ 12 TOP	ST DC ISOLATOR
U	∅ 3 TOP	∅ 6 6A	∅ 7 TOP	∅ 8 TOP	∅ 9 TOP	∅ 10 TOP	∅ 11 TOP	∅ 12 TOP	SYS. DET. S3	∅ 13 TOP	∅ 14 TOP	∅ 15 TOP	∅ 16 TOP	∅ 17 TOP
L	∅ 3 TOP	NOT USED	∅ 7 TOP	∅ 8 TOP	∅ 9 TOP	∅ 10 TOP	∅ 11 TOP	∅ 12 TOP	SYS. DET. S4	∅ 13 TOP	∅ 14 TOP	∅ 15 TOP	∅ 16 TOP	∅ 17 TOP

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

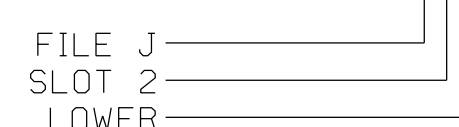
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1 ★	1	YES		15		S
		J4U	48	26 ★	6	YES				S
2A	TB2-5,6	I2U	39	2	2	YES				S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES				S
8C	TB7-1,2	J7U	66	38	8	YES				S
* S3	TB7-9,10	J9U	59	15	SYS	NO				N
* S4	TB7-11,12	J9L	61	17	SYS	NO				N

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

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

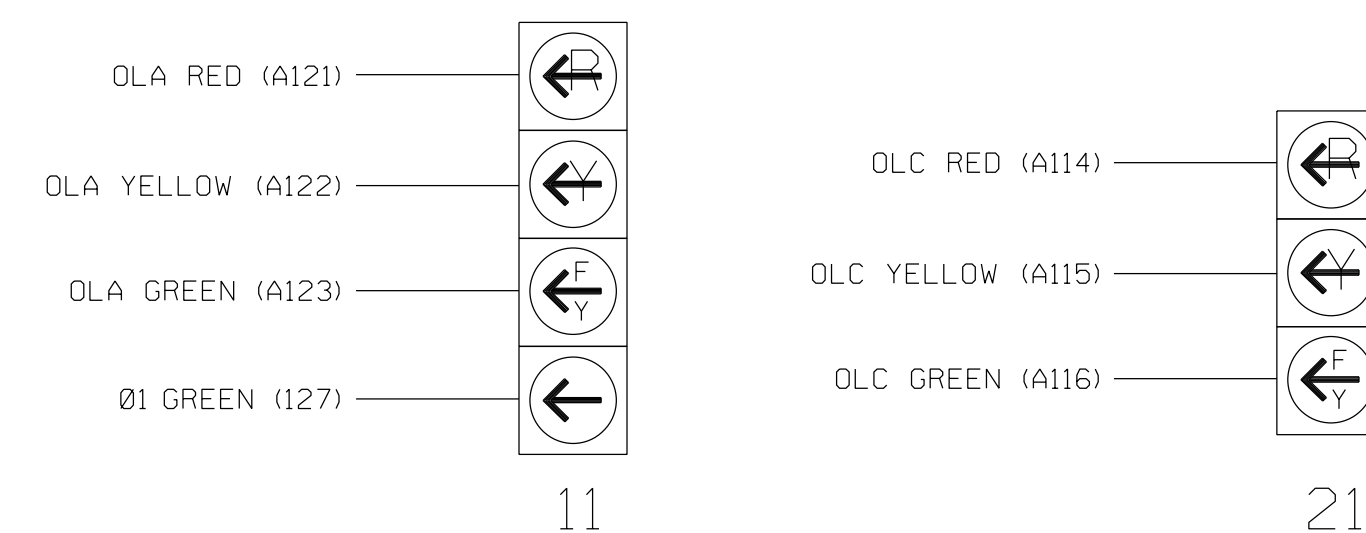
★ See the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

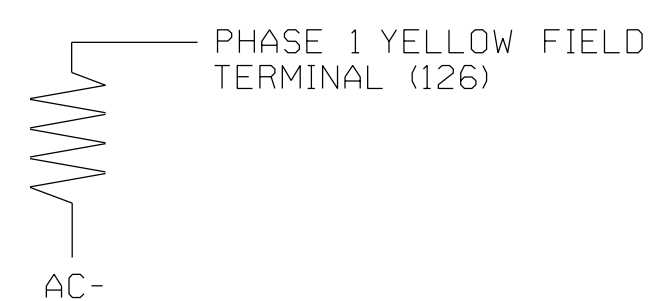


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0035  
 DESIGNED: March 2018  
 SEALED: 6/7/2018  
 REVISED: N/A

### 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 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of: 	<b>US 70/US 70-NC 62</b> (S. Church Street) at <b>NC 62 (Alamance Road)</b>		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489
	Division 7 Alamance County Burlington		
PLAN DATE: March 2018	REVIEWED BY: PL Alexander		DATE: 6/9/2018
PREPARED BY: NA Ptak	REVIEWED BY: AM Encarnacion		
REVISIONS	INIT.	DATE	DATE
Signature: Pamela Alexander			DATE: 6/9/2018
SIG. INVENTORY NO. 07-0035			



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

(program controller as shown)

# IMPORTANT!

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

1. From Main Menu select 8. UTILITIES
2. From UTILITIES Submenu select 1. COPY/CLEAR
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```

COPY / CLEAR UTILITY
FROM          TO
PHASE TIMING... > PHASE TIMING...
TIMING PLAN... > TIMING PLAN...
PH DET OPT PLAN. > PH DET OPT PLAN.
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
TOGGLE TO SELECT A "FROM" AND A "TO"
THEN PRESS ENTER
    
```

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

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

```

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

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '0'

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

```

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

← NOTICE VEH DET PLAN 2

→ ENSURE PHASE IS SET TO "0"

END PROGRAMMING

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

### OVERLAP A

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

```

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

FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 1
    
```

← NOTICE ACTION PLAN SF BIT "1"

Toggle Once

### OVERLAP B

Select TMG VEH OVLP [B] and 'NORMAL'

```

TMG VEH OVLP...[B] TYPE: .....NORMAL
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
    
```

Toggle Once

### 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: 07-0035  
DESIGNED: March 2018  
SEALED: 6/7/2018  
REVISED: N/A

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>US 70/US 70-NC 62</b> <b>(S. Church Street)</b> <b>at</b> <b>NC 62 (Alamance Road)</b></p> <p style="font-size: x-small;">Division 7 Alamance County Burlington</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: March 2018</td> <td>REVIEWED BY: PL Alexander</td> </tr> <tr> <td>PREPARED BY: NA Ptak</td> <td>REVIEWED BY: AM Encarnacion</td> </tr> </table> <table style="width: 100%; font-size: x-small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	PLAN DATE: March 2018	REVIEWED BY: PL Alexander	PREPARED BY: NA Ptak	REVIEWED BY: AM Encarnacion	REVISIONS	INIT.	DATE				<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">PAMELA L. ALEXANDER ENGINEER</p> <p style="font-size: x-small;">6/9/2018</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-0035</p>
PLAN DATE: March 2018	REVIEWED BY: PL Alexander											
PREPARED BY: NA Ptak	REVIEWED BY: AM Encarnacion											
REVISIONS	INIT.	DATE										

09-JUN-2018 13:14  
D:\Transpor\at\off\c\cur\100056469 U-6015 B-G S1g Sys\Task 05\_11\_Signal\Des\g\m\tr\ing\07-0035E.dgn  
ALEX3361 AT LUS210649

### ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

**ALTERNATE PHASING CHANGE SUMMARY**

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

SF BIT 1: Modifies overlap parent phases for head 11 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

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

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

```


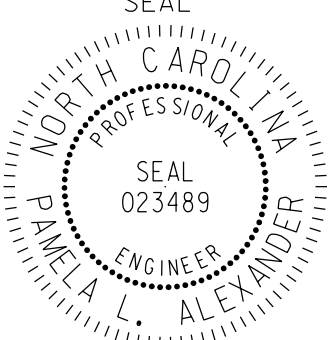

ACTION PLAN...[ 1]
PATTERN.....AUTO  SYS OVERRIDE.... NO
TIMING PLAN..... 0  SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --  RED REST..... NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE.. 0  PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND DELAY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

```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0035  
DESIGNED: March 2018  
SEALED: 6/7/2018  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	<b>ELECTRICAL AND PROGRAMMING DETAILS FOR:</b> US 70/US 70-NC 62 (S. Church Street) at NC 62 (Alamance Road)		
	Prepared for the Offices of: 	Division 7 Alamance County Burlington PLAN DATE: March 2018 REVIEWED BY: AM Encarnacion PREPARED BY: NA Ptak REVIEWED BY: PL Alexander	

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

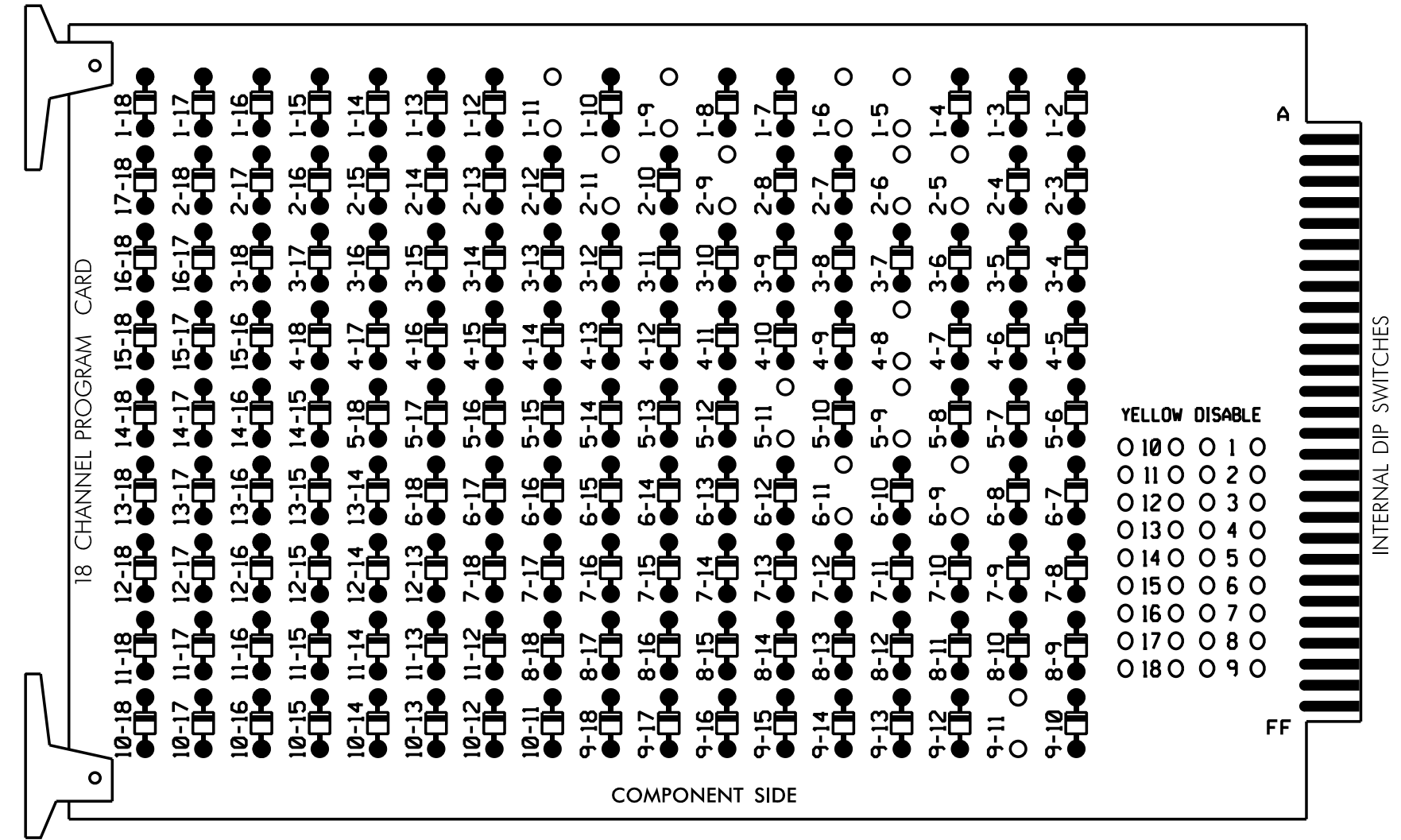
09-JUN-2018 13:14 D:\Consolidation\Projects\00056469 U-6015 B-G Sig SystemTask 05\_11\_Signal\Des\gn\mtr\mg07-0035E.dgn ALEX3361 AT LUS33069



### 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.

■ = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- 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	
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.	11	21,22,23	NU	NU	41,42	NU	51	61,62,63	NU	NU	81,82	NU	11	NU	NU	51	NU	NU	
RED	128			101			134			107									
YELLOW	*	129		102			* 135			108									
GREEN		130		103			136			109									
RED ARROW													A121					A114	
YELLOW ARROW														A122					A115
FLASHING YELLOW ARROW														A123					A116
GREEN ARROW	127						133												

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

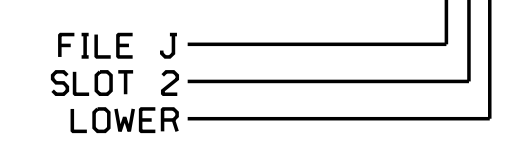
### INPUT FILE CONNECTION & PROGRAMMING CHART

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
2A,2B,2C	TB2-5,6	I2U	39	2	2	YES	1.6			S
2D,2E,2F	TB2-7,8	I2L	43	12	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES				S
6A,6B,6C	TB3-5,6	J2U	40	6	6	YES	1.6			S
6D,6E,6F	TB3-7,8	J2L	44	16	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

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

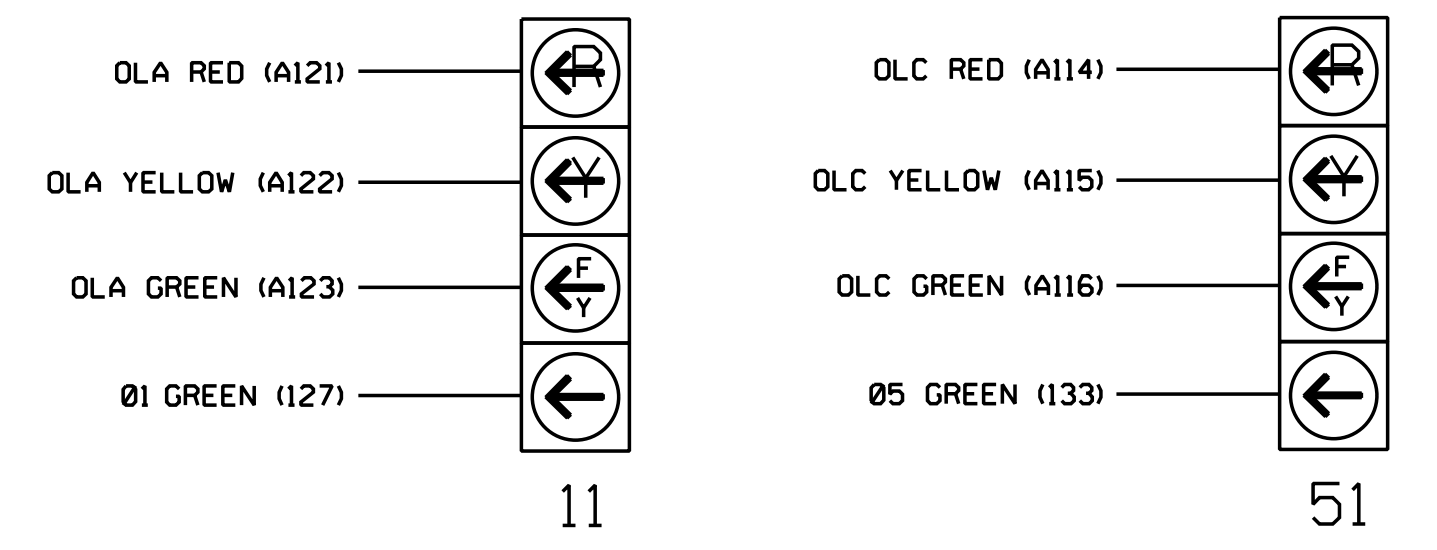
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

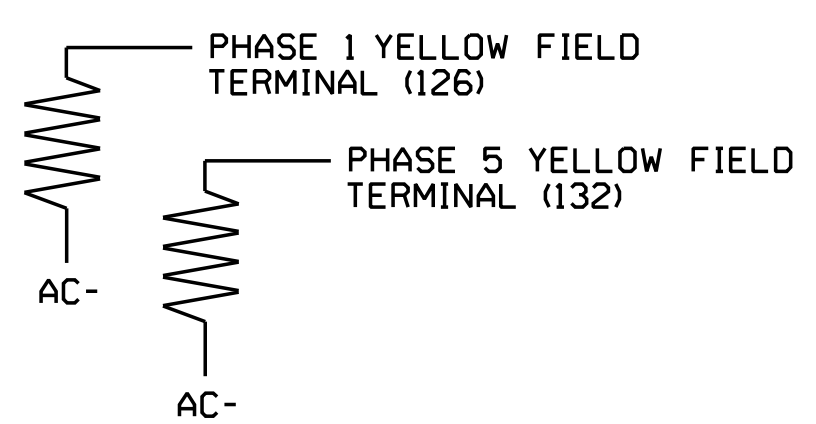
(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

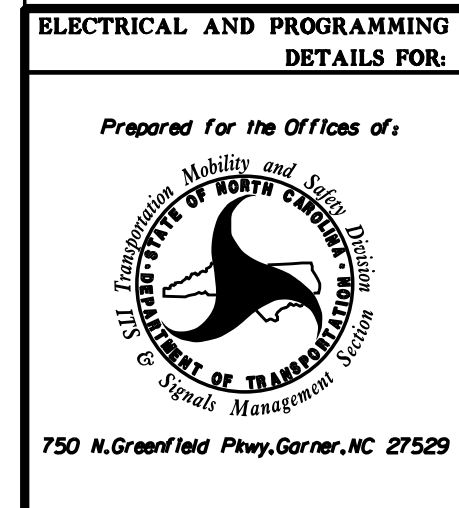
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Electrical Detail - Sheet 1 of 2



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



US 70 (N. Church Street) at Beaumont Avenue	
Division 7	Alamance County
PLAN DATE: December 2017	REVIEWED BY: JB Voso
PREPARED BY: SE Greene	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL	DATE
SIG. INVENTORY NO. 07-0036	

## 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'

```

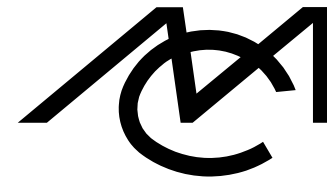
TMG VEH OVLP...[C] TYPE: ....PPLT FYA
PROTECTED LEFT TURN.... PHASE 5
OPPOSING THROUGH..... PHASE 6

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: 07-0036  
 DESIGNED: December 2017  
 SEALED: 6/13/2018  
 REVISED: NA

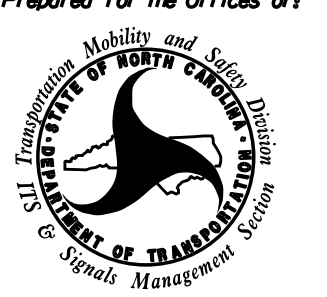

1:47:00 PM  
 I:\3789 - Burlington Graham Signal System\06 Working Folders\Replace Sub-folders with NCDOT File Structure if Working on NCDOT Project\HWg or Dgn\07-0036\070036-sm.ele\_20131223.dgn  
 Local User



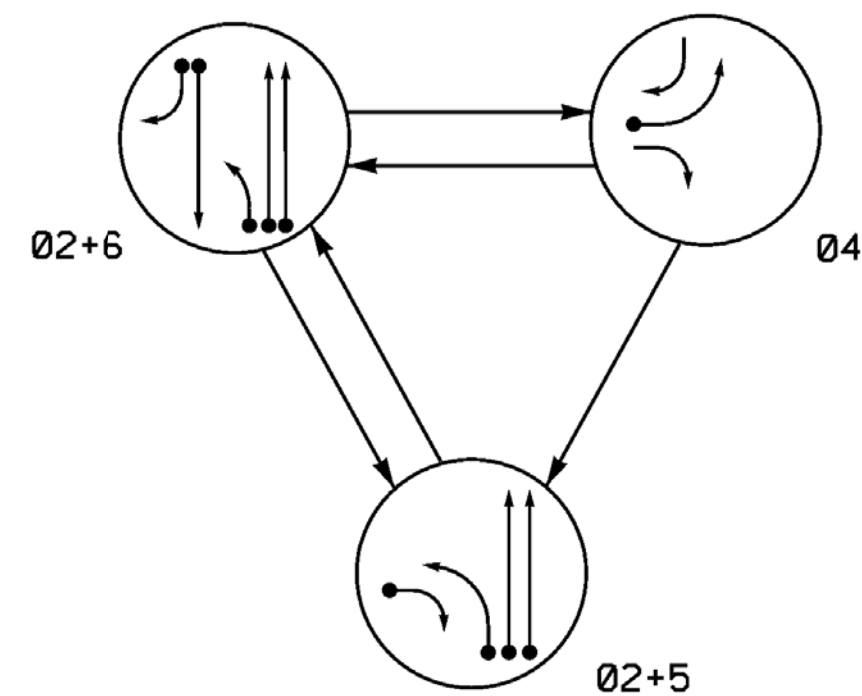
**Mattern & Craig**  
 ENGINEERS & SURVEYORS

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

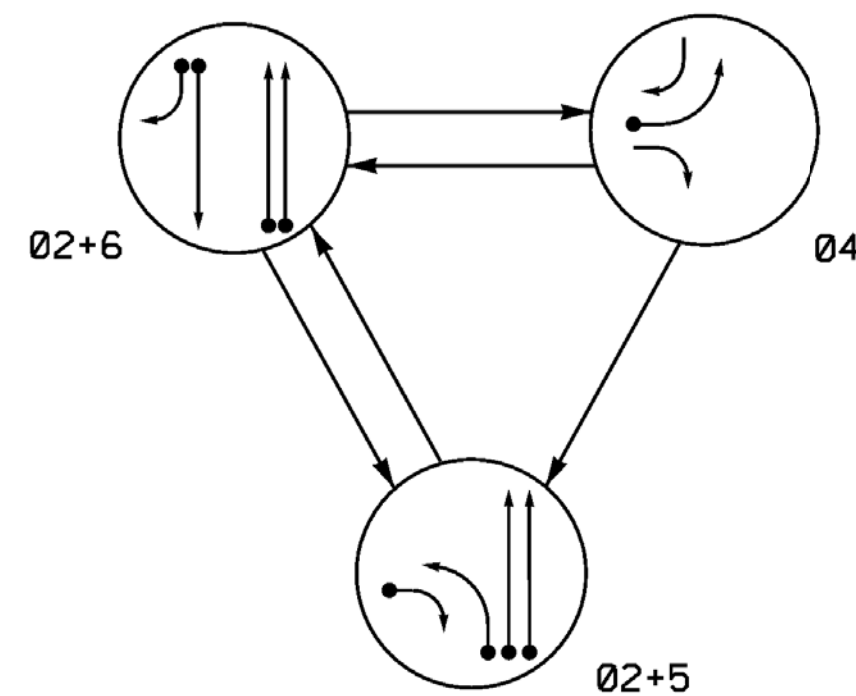
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of:  750 N. Greenfield Pkwy, Corner, NC 27529	US 70 (N. Church Street) at Beaumont Avenue  Division 7      Alamance County      Burlington PLAN DATE: December 2017      REVIEWED BY: JB Voso PREPARED BY: SE Greene      REVIEWED BY:	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  SEAL  JAMES B. VOSO ENGINEER SEAL 022599 6/13/2018 DATE
REVISIONS INIT.      DATE	REVISIONS INIT.      DATE	SIG. INVENTORY NO. 07-0036

DEFAULT PHASING DIAGRAM



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

ALTERNATE PHASING DIAGRAM



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

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	LOOP TYPE	NEW CARD
2A	6x20	70	EXIST.	-	2	Yes	-	-	-	S	X
4A	6x60	+5	2-4-2	-	4	Yes	-	3	-	S	X
5A	6x60	+5	2-4-2	-	5	Yes	-	15*	-	S	X
5B	6x60	+5	2-4-2	-	5	Yes	-	15	-	S	X
6A	6x20	70	2-4-2	-	6	Yes	-	-	-	S	X
S1	6x6	+150	4	X	-	No	-	-	-	N	X
S2	6x6	+150	4	X	-	No	-	-	-	N	X

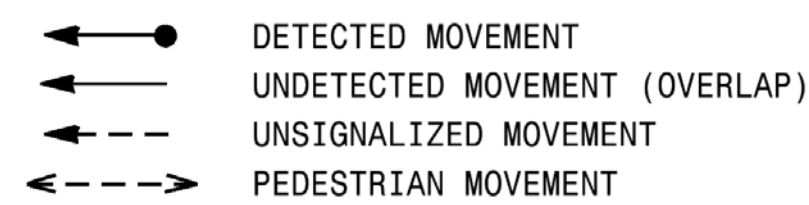
\* Disable Delay During Alternate Phasing Operation.  
 \*\* Disable Phase 2 Call for Loop 5A during Alternate Phasing Operation.

3 Phase Fully Actuated (Burlington-Graham Signal System)

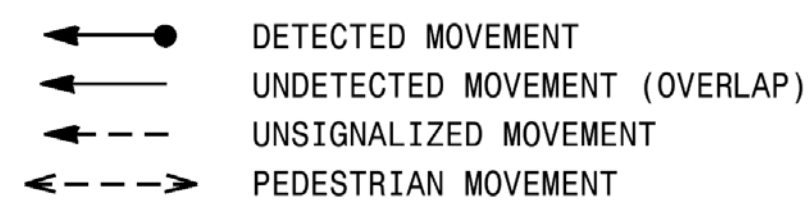
NOTES

- 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.
- 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.
- The City Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Proposed cabinet shall accommodate existing school flashers.

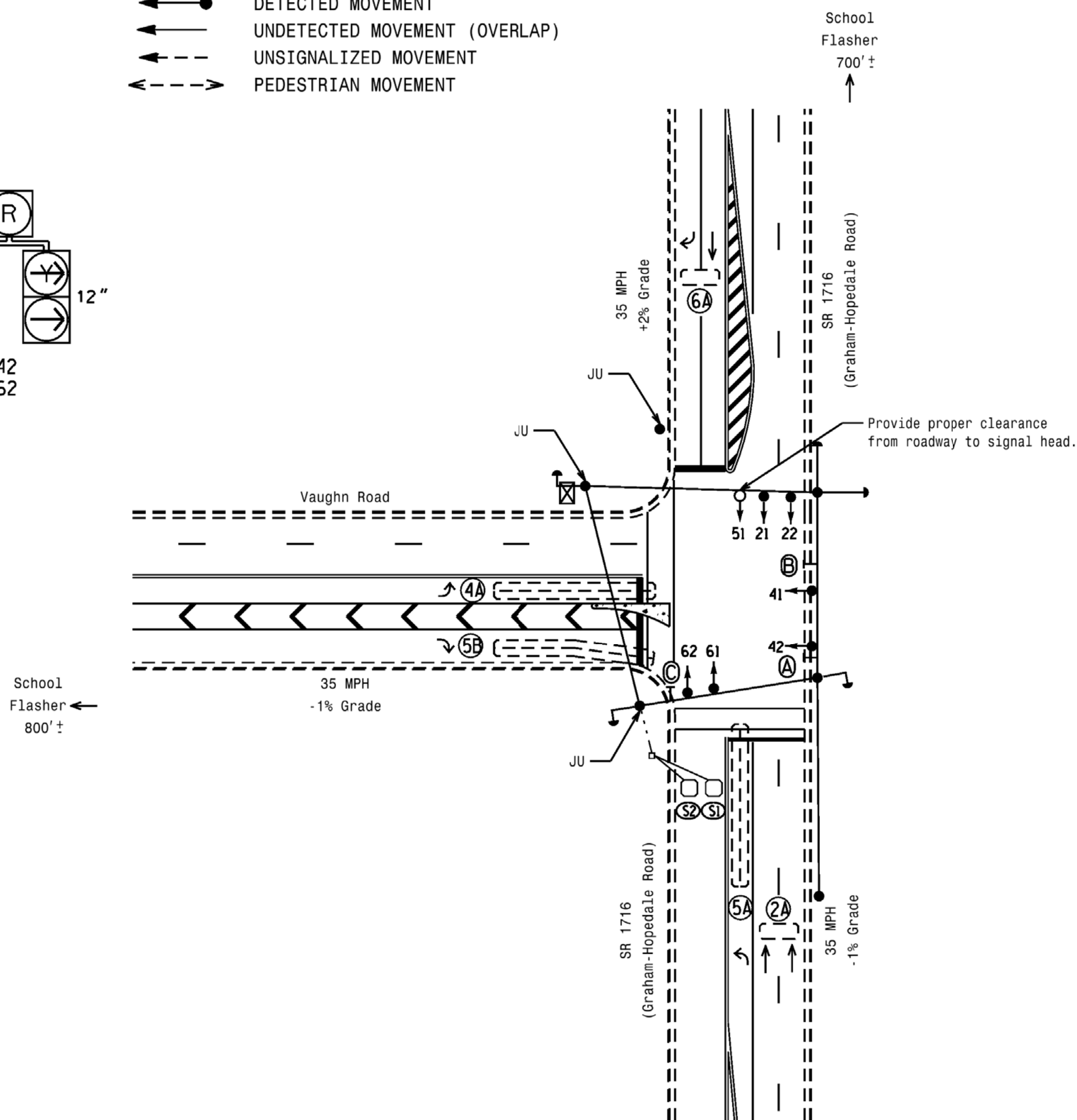
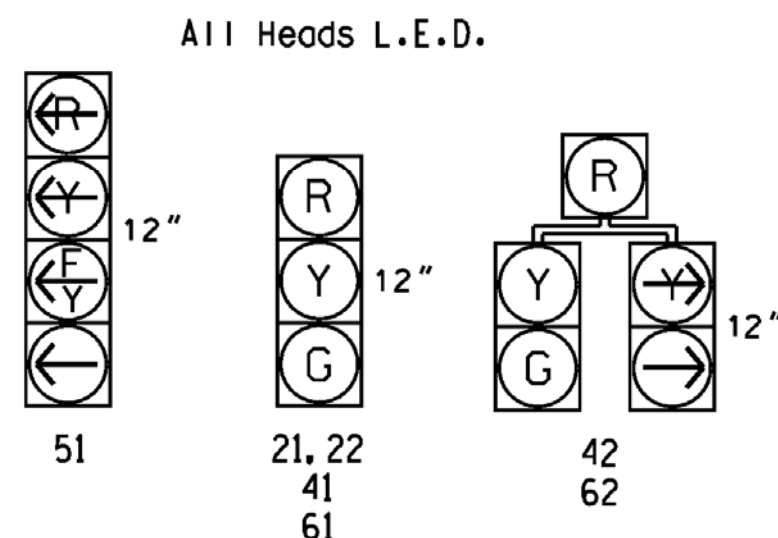
PHASING DIAGRAM DETECTION LEGEND



PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.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	1.0	1.0	3.0
Max 1 *	30	20	20	30
Yellow	3.9	3.0	3.0	3.9
Red Clear	2.3	1.9	2.6	2.3
Actuations 34 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
	Pedestrian Signal Head		N/A
	Signal Pole with Guy		N/A
	Signal Pole with Sidewalk Guy		N/A
	Inductive Loop Detector		N/A
	Controller & Cabinet		N/A
	Junction Box		N/A
	2-in Underground Conduit		N/A
	Right of Way		N/A
	Directional Arrow		N/A
	Right Arrow "ONLY" Sign (R3-5R)		N/A
	Left Arrow "ONLY" Sign (R3-5L)		N/A
	"NO TURN ON RED" Sign (R10-11)		N/A

\*\*\*\*\*SYTIME\*\*\*\*\*  
 \*\*\*\*\*USERNAME\*\*\*\*\*

**Mattern & Craig**  
 ENGINEERS • SURVEYORS

12 BROAD STREET  
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 NC LIC. NO. C-1154

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SR 1716 (Graham-Hopedale Road) at Vaughn Road

Division 7 Alamance County Burlington

PLAN DATE: March 2018 REVIEWED BY: JB Vosso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS	INIT.	DATE

SIGNATURE: James B. Vosso DATE: 6/13/2018

SIG. INVENTORY NO. 07-0037