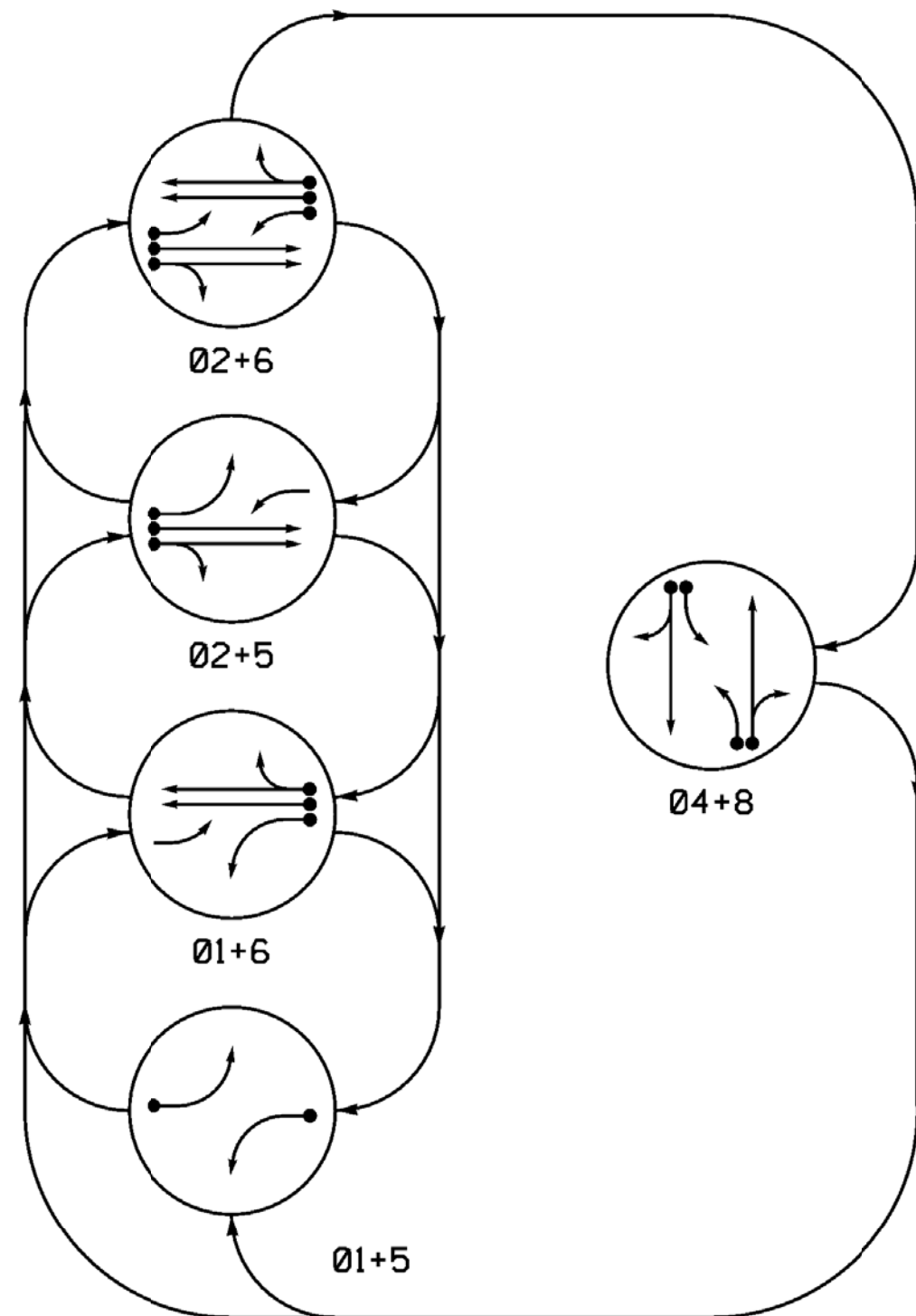


PHASING DIAGRAM



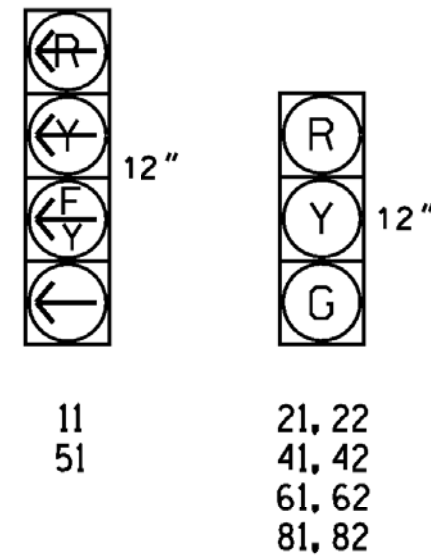
PHASING DIAGRAM DETECTION LEGEND

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

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

SIGNAL FACE I.D.

All Heads L.E.D.

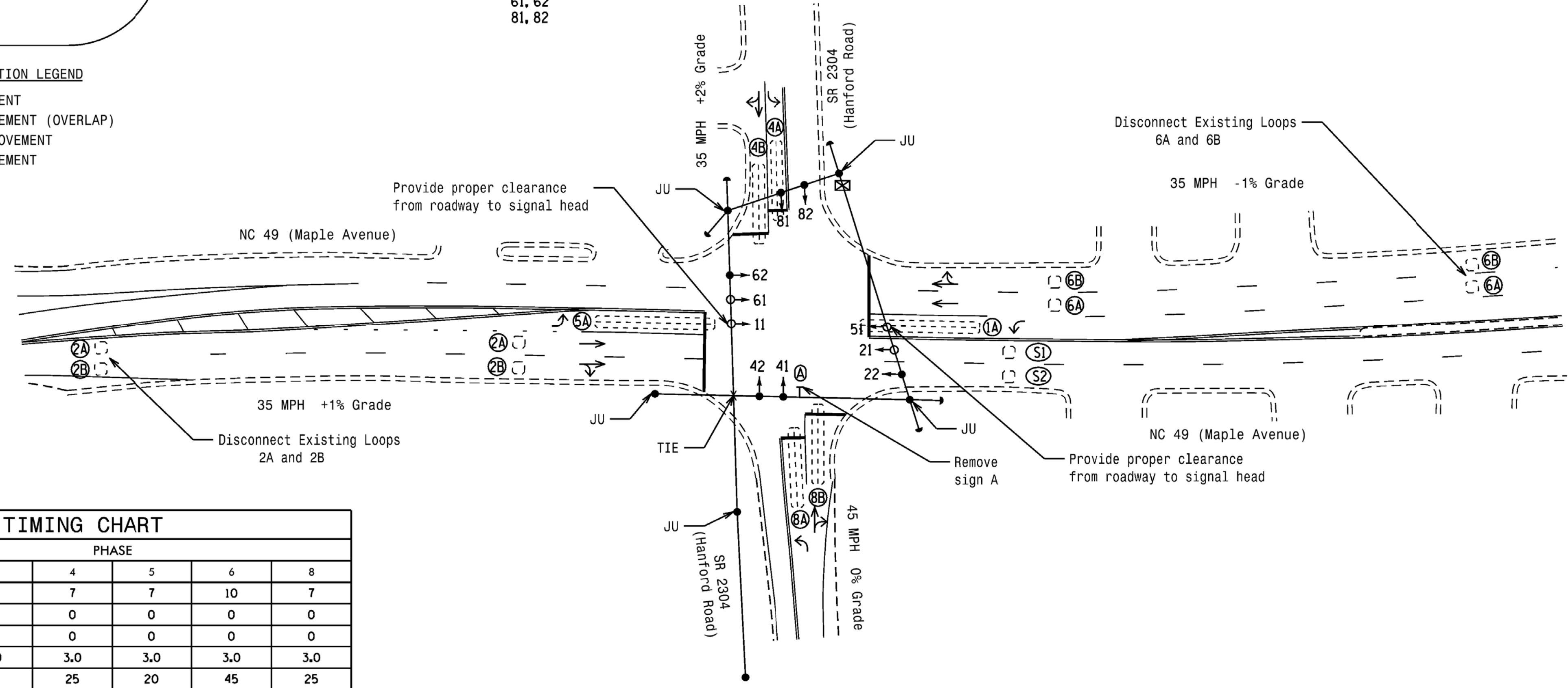


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6x60	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	-	-	S	-	X
2A,2B	6x6	90	EXIST.	-	2	Yes	-	-	-	S	-	X
4A	6x40	+5	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6x40	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6x60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
					2	Yes	-	-	-	S	-	X
6A,6B	6x6	90	EXIST.	-	6	Yes	-	-	-	S	-	X
8A	6x40	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6x40	+5	2-4-2	-	8	Yes	-	10	-	S	-	X
S1	6x6	+150	EXIST.	-	-	No	-	-	-	N	X	X
S2	6x6	+150	EXIST.	-	-	No	-	-	-	N	X	X

5 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 22 and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Remove existing "Left Turn Yield on Green" ball signs (R10-10R).
- Existing Left Arrow "ONLY" sign may be removed at the discretion of the City 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.



ASC/3 TIMING CHART							
FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	10	7	7	10	7	
Walk *	0	0	0	0	0	0	
Ped Clear	0	0	0	0	0	0	
Veh. Extension *	3.0	3.0	3.0	3.0	3.0	3.0	
Max I *	20	45	25	20	45	25	
Yellow	3.0	3.9	3.7	3.0	3.9	4.5	
Red Clear	2.1	1.3	1.7	2.1	1.3	1.2	
Actuations B4 Add *	-	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	-	
Max Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	
Locking Detector	-	X	-	-	X	-	
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Gap	X	X	X	X	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 Sign | ○ → N/A |
| □ → Pedestrian Signal Head With Push Button & Sign | □ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| □ → Inductive Loop Detector | □ → N/A |
| □ → Controller & Cabinet | □ → N/A |
| □ → Junction Box | □ → N/A |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A → Right of Way | N/A → Right of Way |
| → Directional Arrow | → Directional Arrow |
| (A) Left Arrow "ONLY" Sign (R3-5L) | (A) Left Arrow "ONLY" Sign (R3-5L) |

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12 BROAD STREET
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NC LIC. NO. C-1154

Signal Upgrade

Prepared for the Offices of:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
SIGNAL DESIGN SECTION

NC 49 (Maple Avenue)
at
SR 2304 (Hanford Road)

Division 7 Alamance County Burlington

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

SCALE 0 40
1"=40'

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

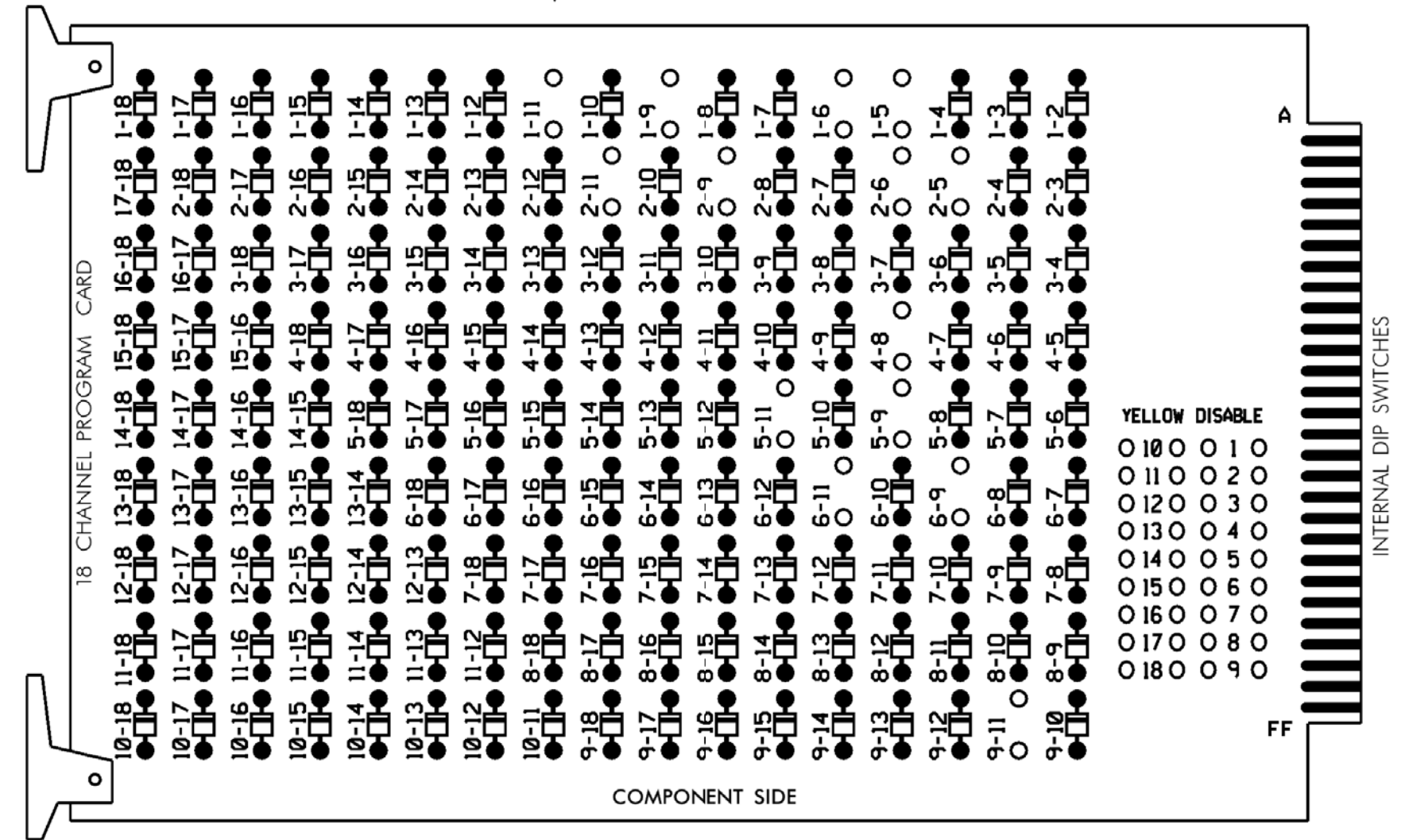
SEAL
JAMES B. VOSO
ENGINEER
022599
6/13/2018
DATE

SIG. INVENTORY NO. 07-0159

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

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

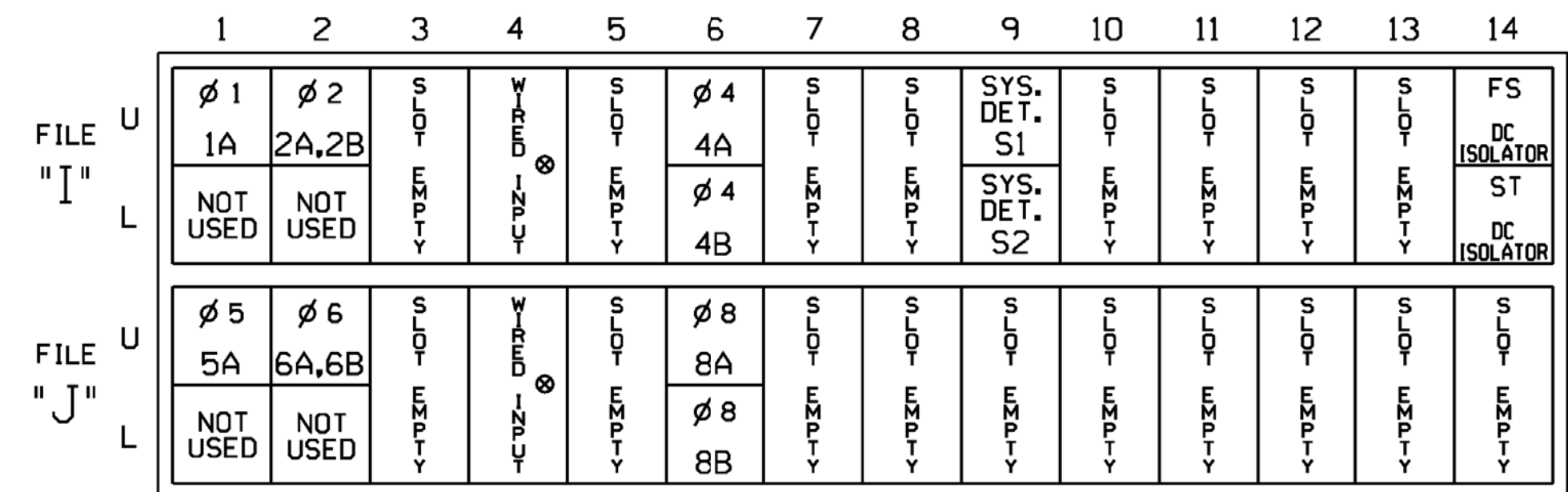
NU = Not Used

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

* See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

Wired Input - Do not populate slot with detector card

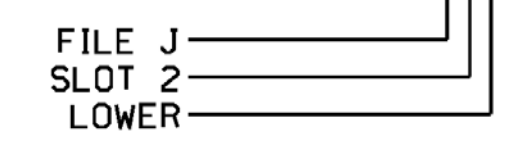
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES				S
2A, 2B	TB2-5,6	I2U	39	2	2	YES				S
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	YES				N
* S2	TB6-11,12	I9L	62	13	SYS	YES				N
5A ²	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES				S
6A, 6B	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

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

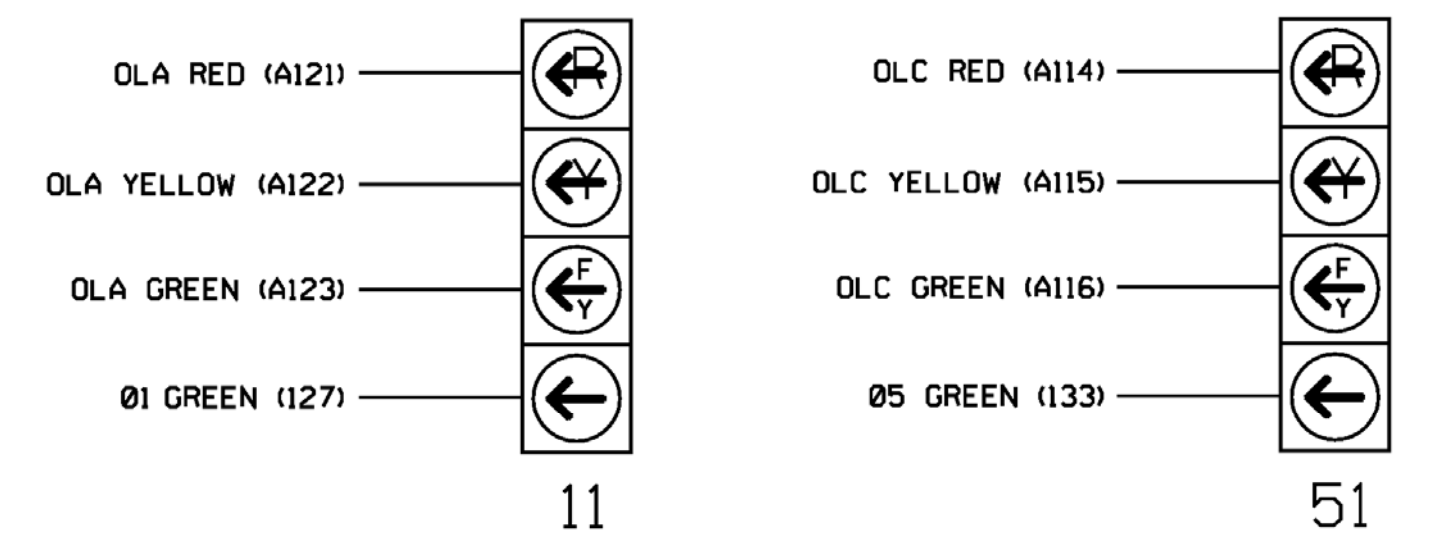
* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

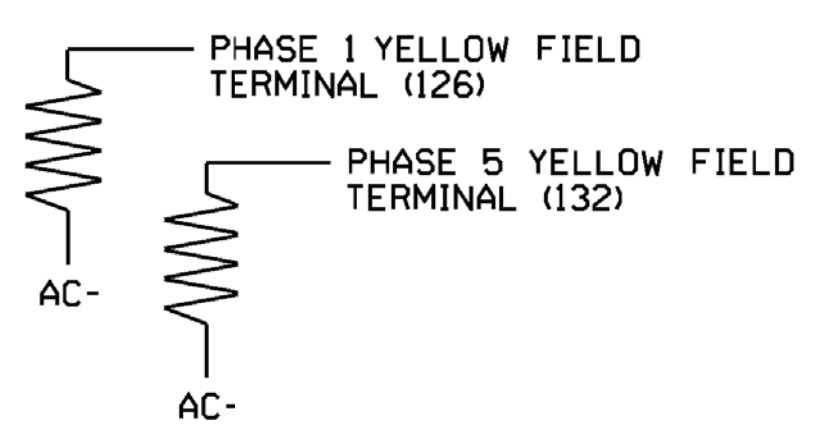
(wire signal heads as shown)



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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management

Mattern & Craig
 ENGINEERS • SURVEYORS

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

NC 49 (Maple Avenue)
 at
 SR 2304 (Hanford Road)

Division 7 Alamance County Burlington

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

REVISIONS: INIT. DATE

James Voso
 6/13/2018

SIG. INVENTORY NO. 07-0159

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

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 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

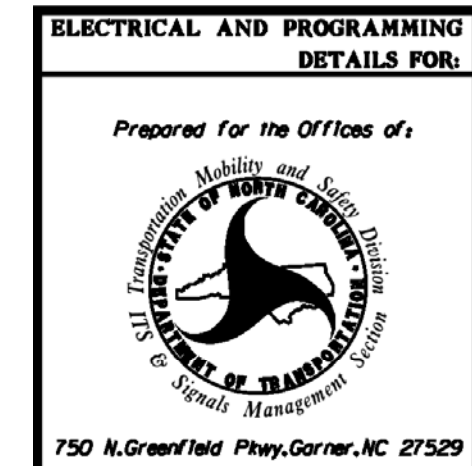
THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0159
 DESIGNED: January 2018
 SEALED: 6/13/2018
 REVISED: NA

 SYSTEM TIME *****

 USER NAME *****



12 BROAD STREET
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 NC LIC. NO. C-1154



Electrical Detail - Sheet 2 of 2

NC 49 (Maple Avenue) at SR 2304 (Hanford Road)	
Division 7 PLAN DATE: January 2018 PREPARED BY: SE Greene	Alamance County REVIEWED BY: JB Voso REVIEWED BY:
REVISIONS	INIT. DATE

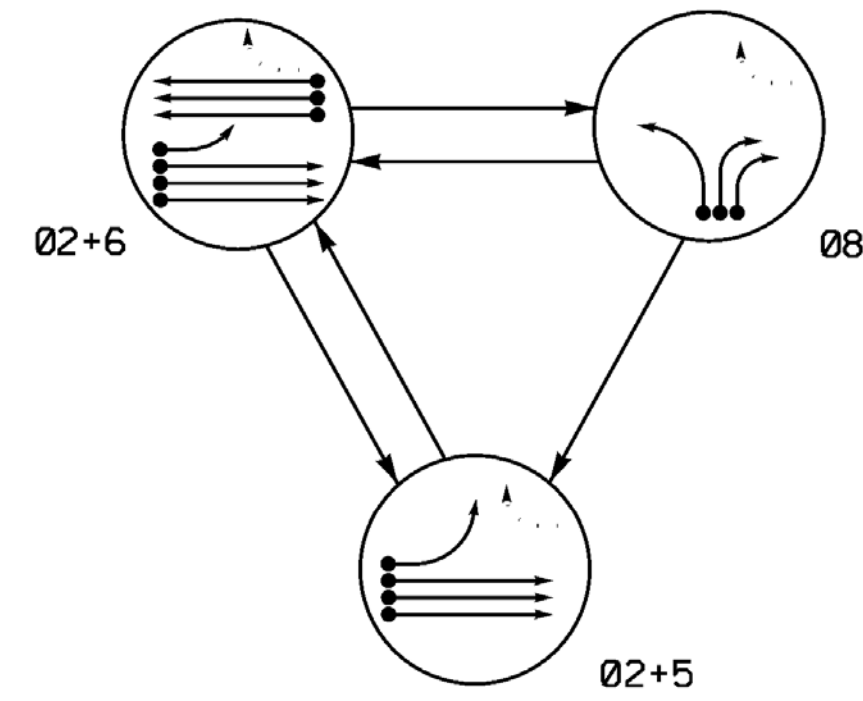
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SEAL

James Voso
 6/13/2018
 DATE

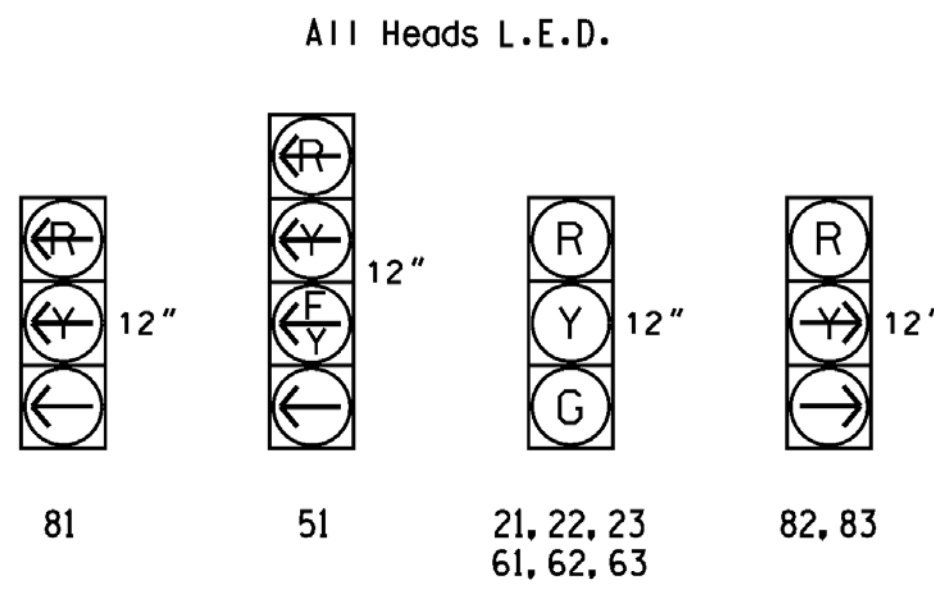
SIG. INVENTORY NO. 07-0159

DEFAULT PHASING DIAGRAM

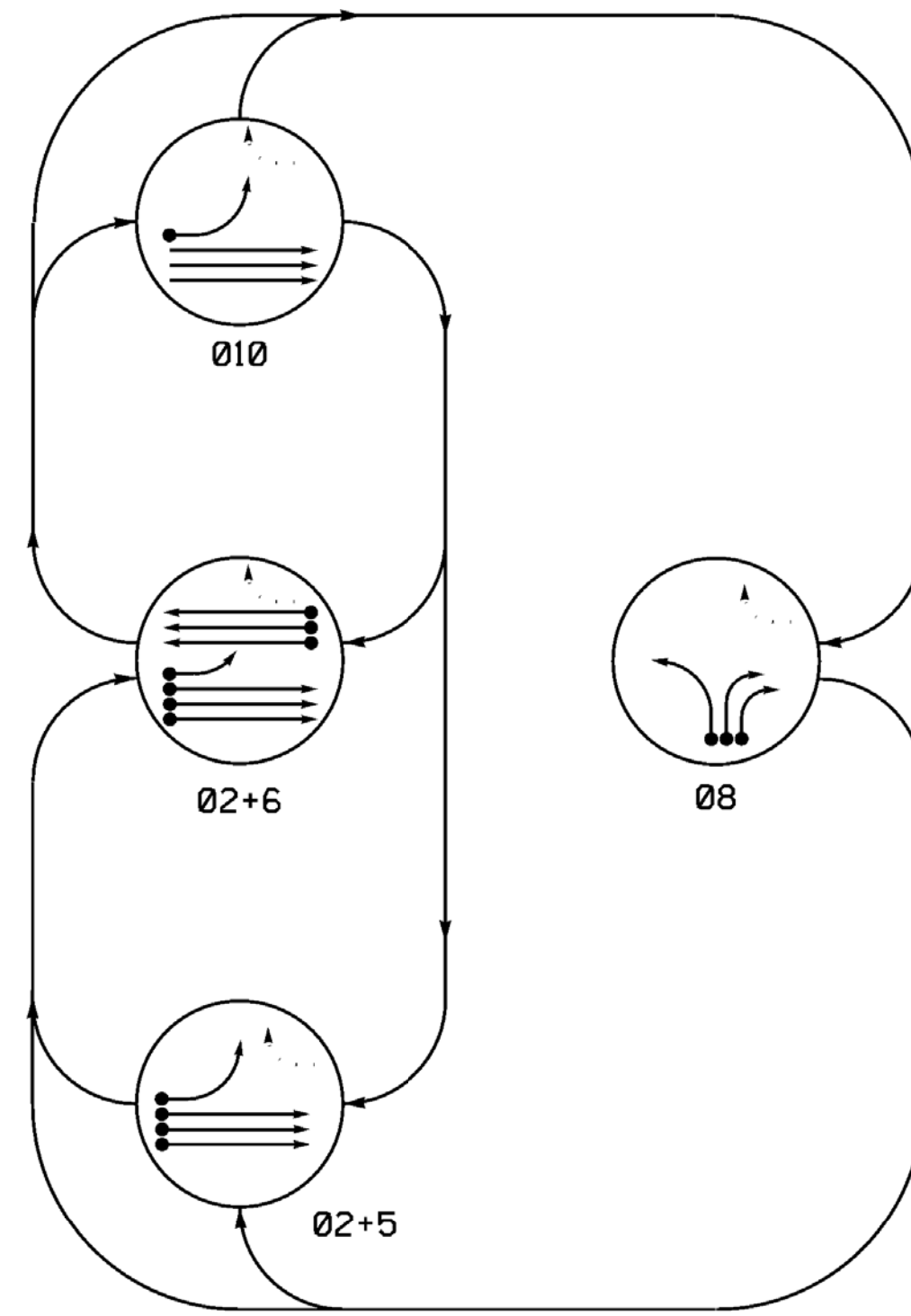


SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22, 23	G	G	R	Y
51	-	F	R	Y
61, 62, 63	R	G	R	Y
81	R	R	-	R
82, 83	R	R	-	R

SIGNAL FACE I.D.



ALTERNATE PHASING DIAGRAM



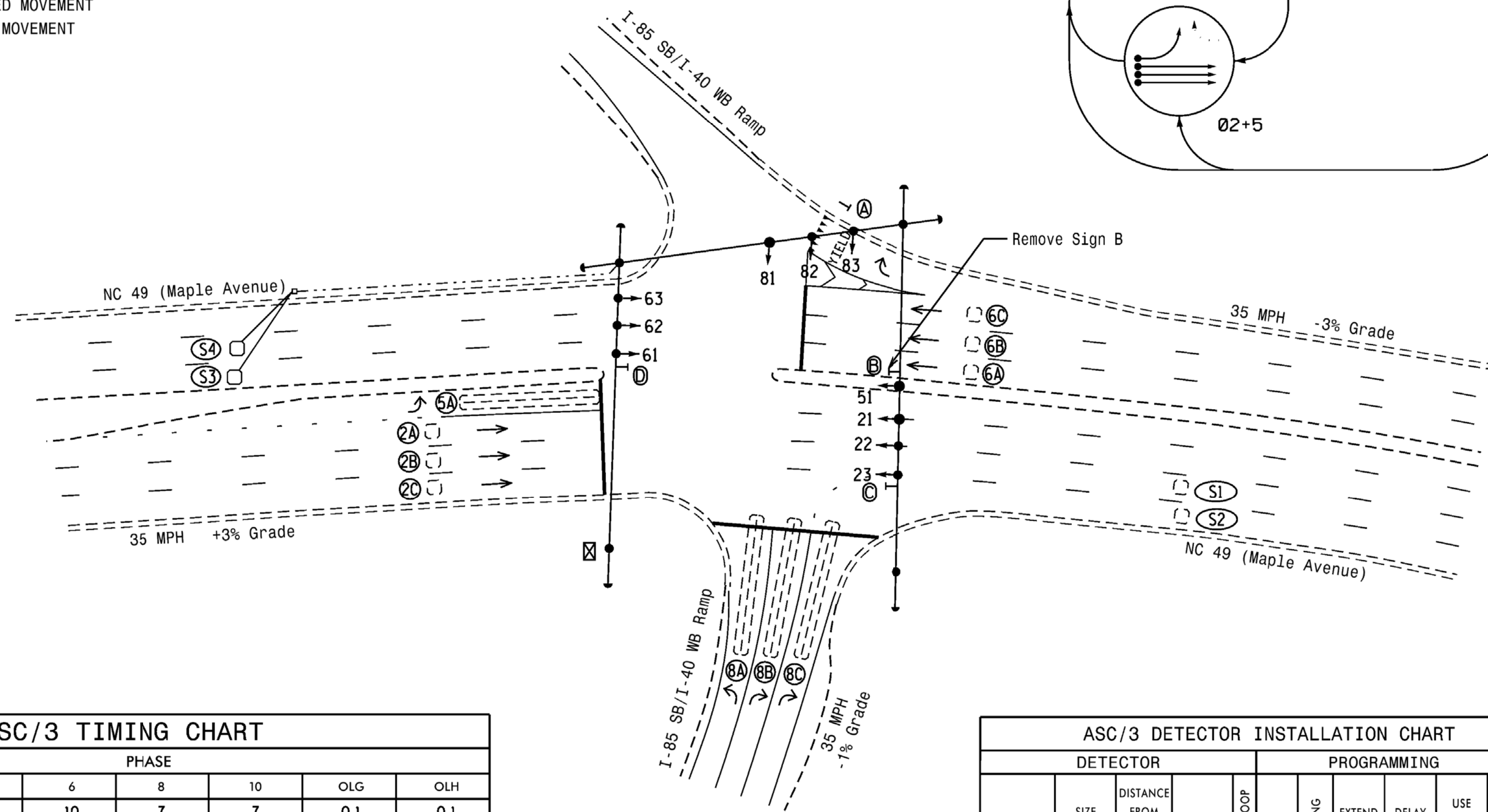
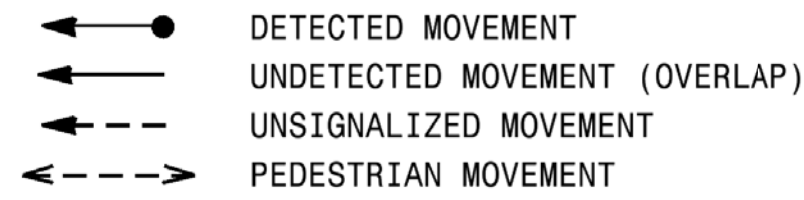
SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22, 23	G	G	R	Y
51	-	F	R	Y
61, 62, 63	R	G	R	Y
81	R	R	-	R
82, 83	R	R	-	R

3 Phase Fully Actuated (Burlington-Graham Signal System)

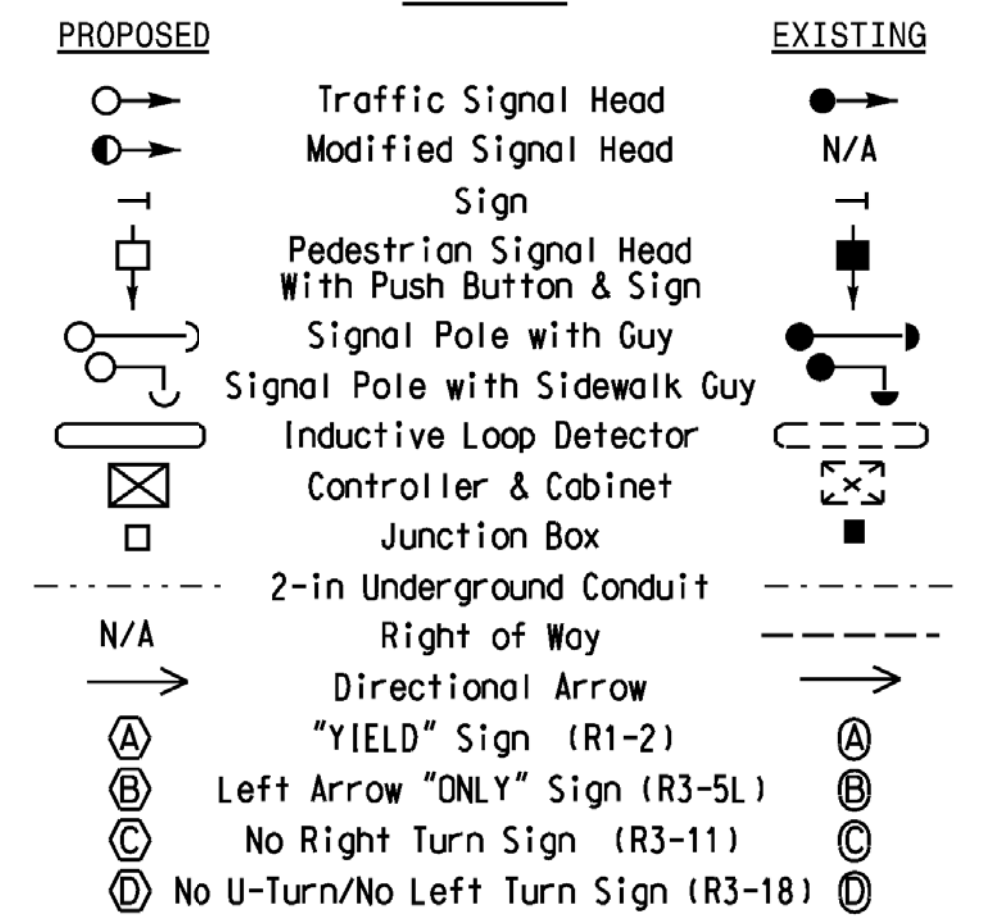
NOTES

- 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.

PHASING DIAGRAM DETECTION LEGEND



LEGEND



ASC/3 TIMING CHART

FEATURE	PHASE					OLG	OLH
	2	5	6	8	10		
Min Green *	10	7	10	7	7	0.1	0.1
Walk *	0	0	0	0	0		
Ped Clear	0	0	0	0	0		
Veh. Extension *	3.0	1.0	3.0	1.0	1.0		
Max I *	45	15	45	30	15		
Yellow	4.1	3.0	4.1	3.0	3.0	4.1	3.0
Red Clear	2.3	2.8	2.3	2.8	2.8	2.3	2.8
Actuations B4 Add *	-	-	-	-	-		
Seconds / Actuation *	-	-	-	-	-		
Max Initial *	-	-	-	-	-		
Time Before Reduction *	-	-	-	-	-		
Time To Reduce *	-	-	-	-	-		
Minimum Gap	-	-	-	-	-		
Locking Detector	X	-	X	-	-		
Recall Position	VEH. RECALL	-	VEH. RECALL	-	-		
Dual Entry	-	-	-	-	-		
Simultaneous Gap	X	X	X	X	X		

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

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						TYPE	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL				
2A	6x6	70	EXIST.	-	2	Yes	-	-	-	S	-	X	
2B	6x6	70	EXIST.	-	2	Yes	-	-	-	S	-	X	
2C	6x6	70	EXIST.	-	2	Yes	-	-	-	S	-	X	
5A	6x60	0	2-4-2	-	5/10	Yes	-	15	-	S	-	X	
6A	6x6	70	EXIST.	-	6	Yes	-	-	-	S	-	X	
6B	6x6	70	EXIST.	-	6	Yes	-	-	-	S	-	X	
6C	6x6	70	EXIST.	-	6	Yes	-	-	-	S	-	X	
8A	6x60	+5	2-4-2	-	8	Yes	-	-	-	S	-	X	
8B	6x60	+5	2-4-2	-	8	Yes	-	15	-	S	-	X	
8C	6x60	+5	2-4-2	-	8	Yes	-	15	-	S	-	X	
S1	6x6	+245	EXIST.	-	-	No	-	-	-	N	X	X	
S2	6x6	+245	EXIST.	-	-	No	-	-	-	N	X	X	
S3	6x6	+245	4	X	-	No	-	-	-	N	X	X	
S4	6x6	+245	4	X	-	No	-	-	-	N	X	X	

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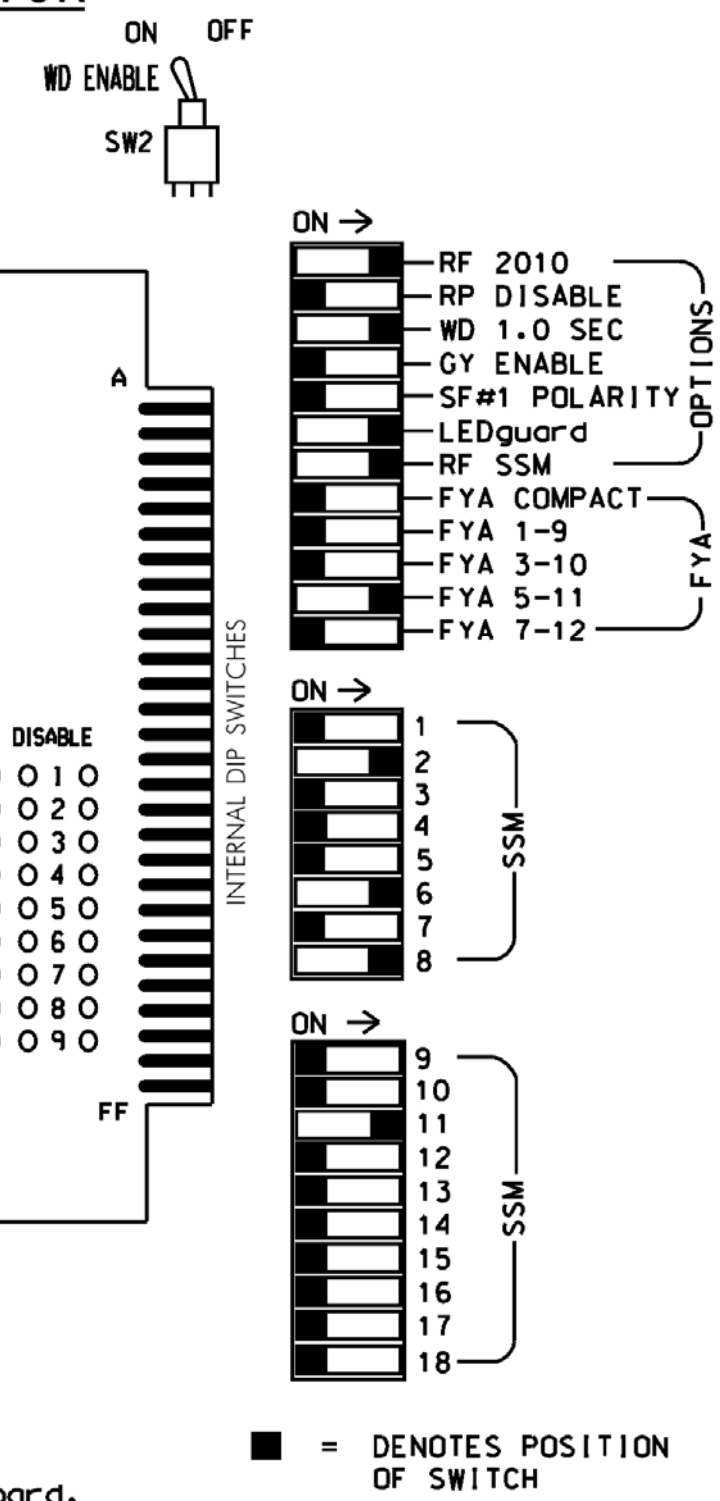
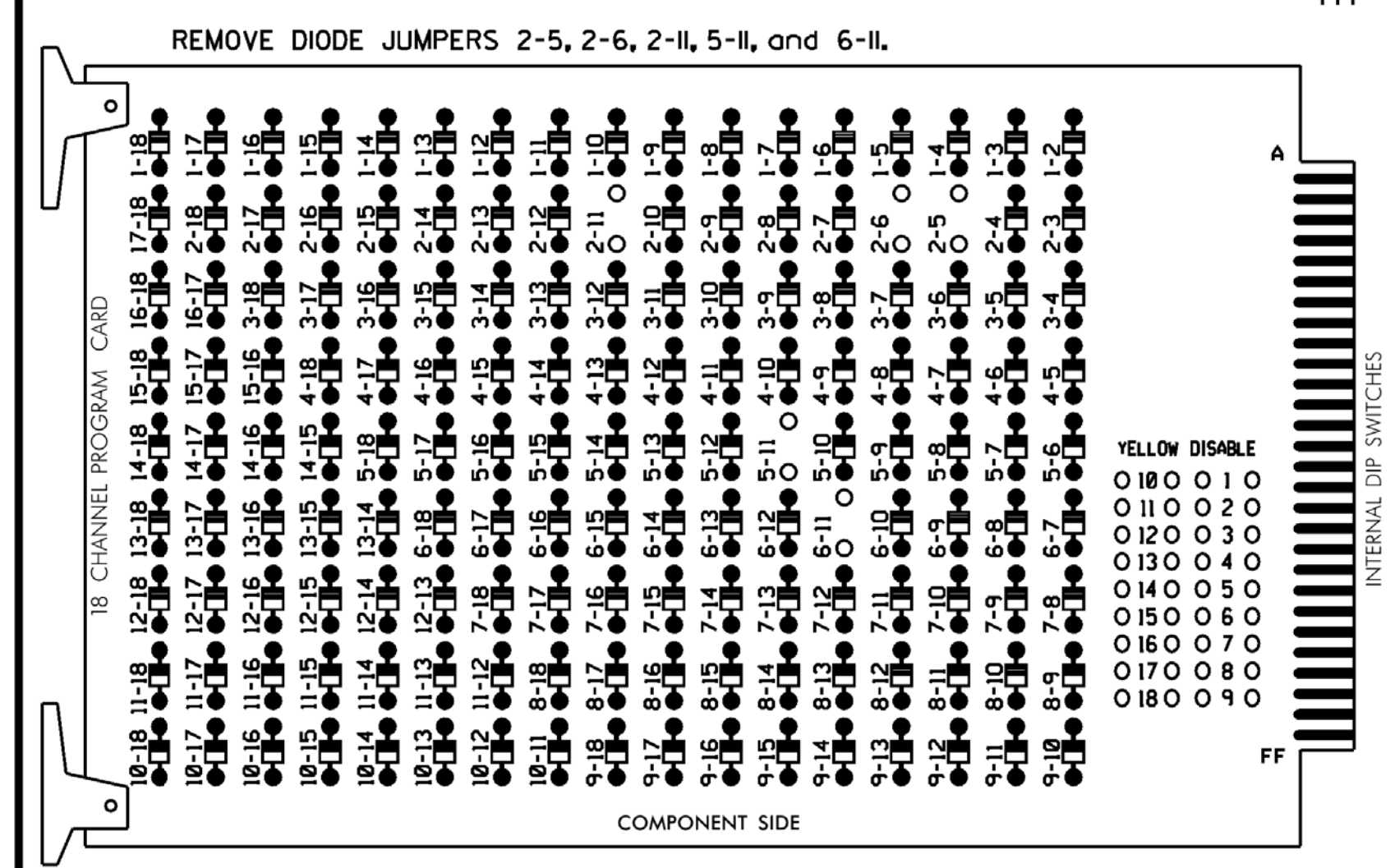
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

Signal Upgrade

	NC 49 (Maple Avenue) at I-85 SB / I-40 WB Ramps		SEAL 022599 JAMES B. VOSO ENGINEER 6/13/2018
	Division 7 Alamance County Burlington PLAN DATE: April 2018 REVIEWED BY: JB Voso PREPARED BY: SE Greene REVIEWED BY:	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SCALE 0 40 1"=40'	REVISIONS	INIT. DATE	SIG. INVENTORY NO. 07-0162

EDI MODEL 2018EClip-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and phase 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,S7,S8,S11,AUX S4
 PHASES USED.....2,5,6,8,10**
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED
 OVERLAP "G".....2+10
 OVERLAP "H".....5+10

* See overlap programming detail on sheet 2
 ** Used for timing purposes only

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	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	DLG	2 PED	3	4	4 PED	OLH	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22,23	NU	NU	NU	NU	51*	61,62,63	NU	NU	81	82,83	NU	NU	NU	51*	NU	NU
RED		128						134			107							
YELLOW		129					*	135										
GREEN		130						136										
RED ARROW											107					A114		
YELLOW ARROW											108	108				A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133			109	109							

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail below.
 NOTE: outputs for loadswitches S2 and S7 have been remapped. See sheet 2.

INPUT FILE POSITION LAYOUT

(front view)

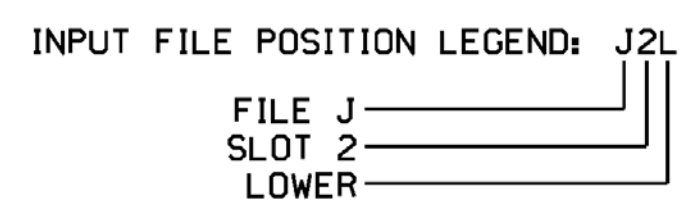
FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S-01	ø 2	ø 2	ø 2	S-01	S-01	S-01	S-01	SYS. DET. S1	S-01	S-01	S-01	S-01	FS
L	2A	2C	2B	NOT USED	2B	2B	2B	2B	SYS. DET. S2	2B	2B	2B	2B	DC ISOLATOR
U	ø 5/10	ø 6	ø 6	S-01	S-01	ø 8	ø 8	S-01	SYS. DET. S3	S-01	S-01	S-01	S-01	DC ISOLATOR
L	5A	6A	6C	6B	6B	8A	8C	8B	SYS. DET. S4	8B	8B	8B	8B	DC ISOLATOR

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

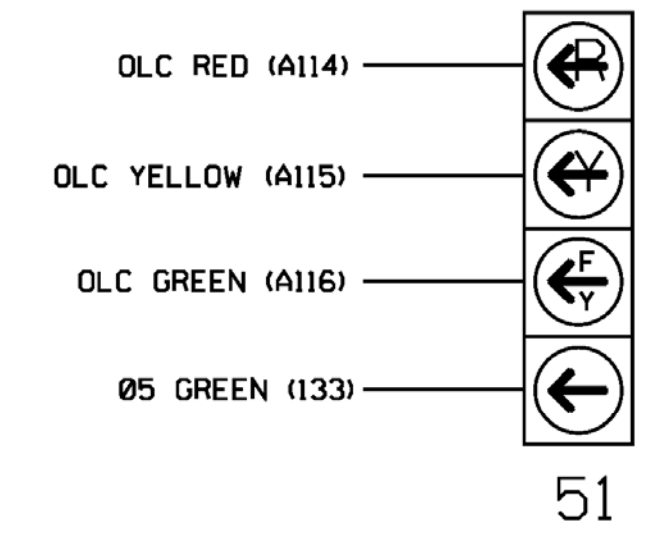
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
2B	TB2-7,8	I2L	43	12	2	YES				S
2C	TB2-9,10	I3U	63	32	2	YES				S
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES		15		S
8C	TB7-1,2	J7U	66	39	8	YES		15		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
* S3	TB7-9,10	J9U	59	15	SYS	NO				N
* S4	TB7-11,12	J9L	61	17	SYS	NO				N

¹Add jumper from J1-W to I4-W. on rear of input file.
 * System detector only. Remove any assigned vehicle phase.



FYA SIGNAL WIRING DETAIL

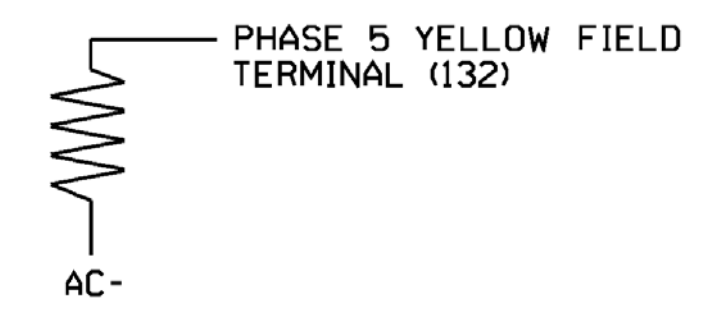
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 5

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:
 NC 49 (Maple Avenue) at I-85 SB / I-40 WB Ramps

Division 7 Alamance County Burlington

PLAN DATE: April 2018 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. 07-0162

*****SYTIME*****
 *****D*****

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**
Toggle 4 Times

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

```

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

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

Toggle Twice

OVERLAP G
Select TMG VEH OVLP [E] AND "NORMAL"

```

TMG VEH OVLP...[E] TYPE: .....NORMAL
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . X . . . . .
LAG GRN 0.1 YEL 4.1 RED 2.3
    
```

Toggle Once

OVERLAP H
Select TMG VEH OVLP [F] AND "NORMAL"

```

TMG VEH OVLP...[F] TYPE: .....NORMAL
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . X . . . . .
LAG GRN 0.1 YEL 3.0 RED 2.8
    
```

END PROGRAMMING

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switches S2 and S7 as OLE and OLF, program LD SWITCH 2 as OVLP '5' TYPE 'O' and LD SWITCH 5 as OVLP '6' TYPE 'O' as shown below.

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

LD SWITCH ASSIGN


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

NOTICE OVLP 5 ASSIGNED TO LD SWITCH 2 →


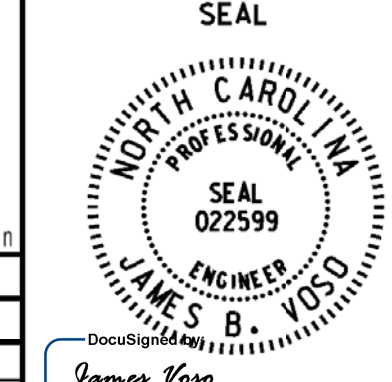
NOTICE OVLP 6 ASSIGNED TO LD SWITCH 5 →

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0162
DESIGNED: April 2018
SEALED: 6/13/2018
REVISED: NA

Electrical Detail - Sheet 2 of 5



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ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 49 (Maple Avenue) at I-85 SB / I-40 WB Ramps		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  SEAL 022599 JAMES B. VOSO ENGINEER 6/13/2018
	Division 7 Alamance County Burlington PLAN DATE: April 2018 REVIEWED BY: JB Voso PREPARED BY: SE Greene REVIEWED BY:	REVISIONS INIT. DATE		DATE SIG. INVENTORY NO. 07-0162

*****SYTIME*****
*****D*****
*****USERNAME*****

ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE [1] - DEFAULT PHASING PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 1. CONTROLLER SEQ
3. From CONTROLLER SEQUENCE Submenu select 1. PHASE RING SEQUENCE AND ASSIGNMENT

NOTICE PHASE 10 IN SEPARATE BARRIER →

```

CONTROLLER SEQUENCE [ 1 ]
SEQUENCE COMMANDS . HW ALT SEQ ENA. NO
 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC-B - B - B - B - B - - - - - - - - -
R1-1 . 21 . 101 . .1 . .1 . . . . . . . . . .
R2-1 5 61 . .1 . 81 . .1 . . . . . . . . . .
R3-1 . .1 . .1 . .1 . .1 . . . . . . . . . .
R4-1 . .1 . .1 . .1 . .1 . . . . . . . . . .

R1-R4=RING 1-4. DATA ENTRY. PHASES 1-16
BC=BARRIER CONTROL. VALUES: B.C
B=BARRIER MODE
C=COMPATIBILITY MODE
    
```

END PROGRAMMING

ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE [2] - ALTERNATE PHASING PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 1. CONTROLLER SEQ
3. From CONTROLLER SEQUENCE Submenu select 1. PHASE RING SEQUENCE AND ASSIGNMENT

NOTICE CONTROLLER SEQUENCE "2" →

NOTICE PHASE 10 IN SEPARATE BARRIER →

```

CONTROLLER SEQUENCE [ 2 ]
SEQUENCE COMMANDS . HW ALT SEQ ENA. NO
 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC-B - B - B - B - B - - - - - - - - -
R1-1 . 21 . 101 . .1 . .1 . . . . . . . . . .
R2-1 5 61 . .1 . 81 . .1 . . . . . . . . . .
R3-1 . .1 . .1 . .1 . .1 . . . . . . . . . .
R4-1 . .1 . .1 . .1 . .1 . . . . . . . . . .

R1-R4=RING 1-4. DATA ENTRY. PHASES 1-16
BC=BARRIER CONTROL. VALUES: B.C
B=BARRIER MODE
C=COMPATIBILITY MODE
    
```

END PROGRAMMING

ECONOLITE ASC/3-2070 "PHASES IN USE" PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION

```

CONFIGURATION SUBMENU
1. CONTROLLER SEQ      5. COMMUNICATIONS
2. PHASES IN USE/PED  6. ENABLE LOGGING
3. LOAD SW ASSIGN      7. DISPLAY/ACCESS
4. PORT 1 (SDLC)      8. LOGIC PROCESSOR


PRESS KEYS 1..8 TO SELECT
    
```

PHASES IN USE / EXCLUSIVE PED		PHASE 1 2 3 4 5 6 7 8							
IN USE.....			X			X	X		X
EXCLUSIVE PED									
PHASES IN USE / EXCLUSIVE PED		PHASE 9 10 11 12 13 14 15 16							
IN USE.....			X						
EXCLUSIVE PED									

 SYSTEM TIME *****

 USER NAME *****

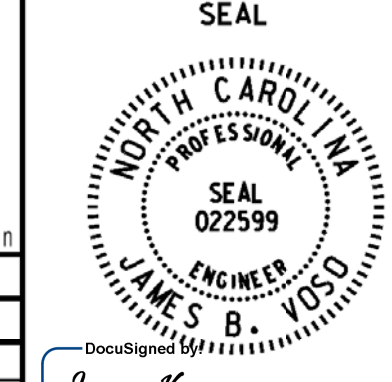

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0162
 DESIGNED: April 2018
 SEALED: 6/13/2018
 REVISED: NA



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Electrical Detail - Sheet 3 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 49 (Maple Avenue) at I-85 SB / I-40 WB Ramps		SEAL  SEAL 022599 JAMES B. VOSS
	Prepared for the Offices of:  Division 7 Alamance County Burlington	PLAN DATE: April 2018 REVIEWED BY: JB Voso PREPARED BY: SE Greene REVIEWED BY:		DocuSign James Voss 6/13/2018 DATE
750 N. Greenfield Pkwy, Garner, NC 27529	REVISIONS	INIT. DATE	SIG. INVENTORY NO. 07-0162

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ECONOLITE ASC/3-2070 ACTION PLAN FOR ALTERNATE PHASING PROGRAMMING DETAIL

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT CONTROLLER SEQUENCE PLAN 2.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT CONTROLLER SEQUENCE PLAN 2.

Table with 2 columns: PHASING, CONTROLLER SEQUENCE. Rows: ACTIONS REQUIRED TO RUN DEFAULT PHASING (1), ACTIONS REQUIRED TO RUN ALTERNATE PHASING (2).

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 CONTROLLER SEQUENCE PLAN 2 ACTIVATES TO CALL THE "ALTERNATE PHASING":
CONTROLLER SEQUENCE PLAN 2: LOGIC PROCESSOR STATEMENT # 1 OMITTS PHASE 10 DURING PHASE SEQUENCE # 1. PHASE 10 WILL NOT BE OMITTED WHEN USING PHASE SEQUENCE # 2.

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

```
ACTION PLAN...[ 1]
PATTERN.....AUTO SYS OVERRIDE.... NO
TIMING PLAN..... 0 SEQUENCE..... 2
VEH DETECTOR PLAN.. 1 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 . . . . .
```

← NOTICE CONTROLLER SEQUENCE "2"

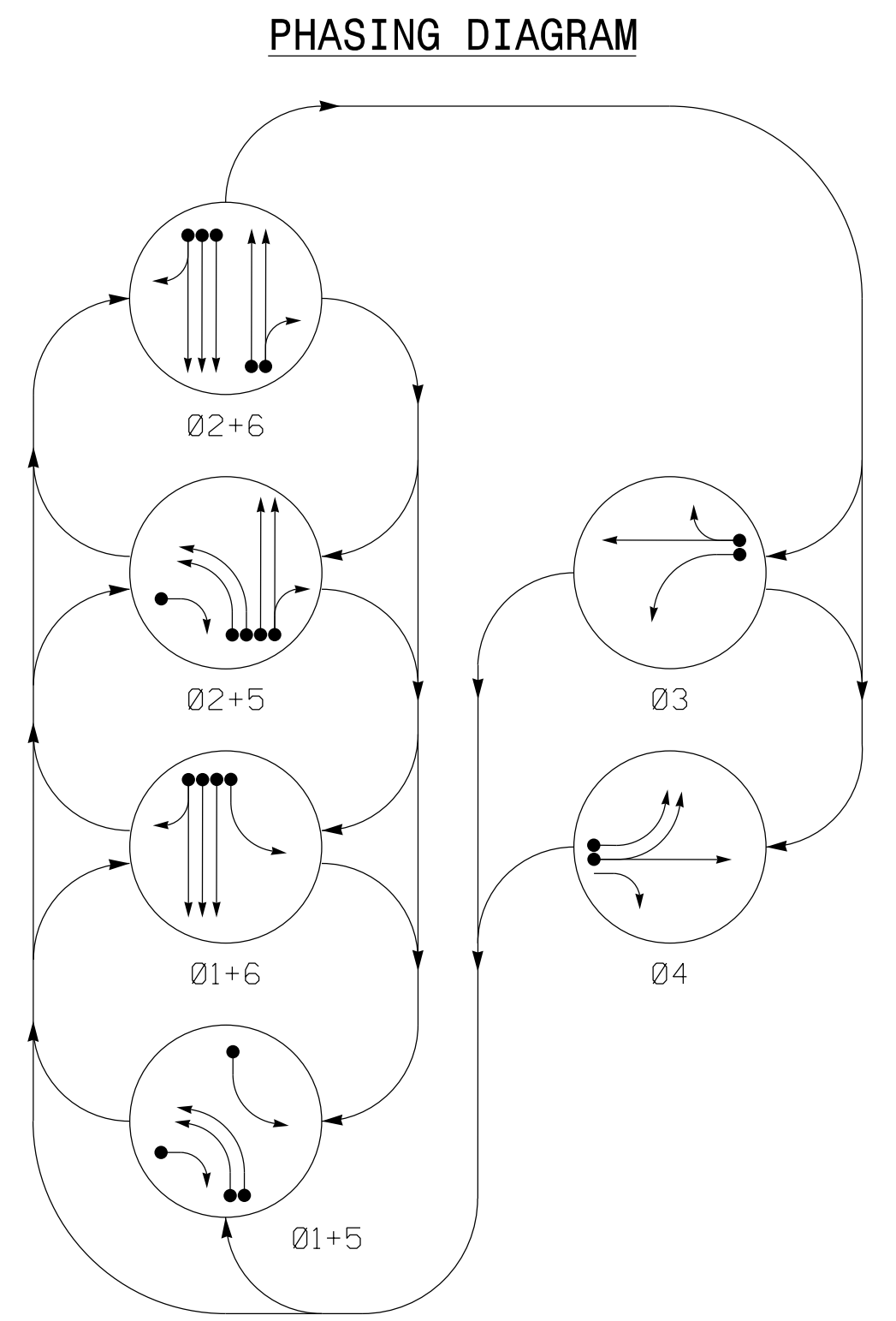
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0162
DESIGNED: April 2018
SEALED: 6/13/2018
REVISED: NA

*****SYSTEM *****
*****DATE *****
*****JOB *****
*****USER *****

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Electrical Detail - Sheet 5 of 5
ELECTRICAL AND PROGRAMMING DETAILS FOR:
Prepared for the Offices of:
Seal of North Carolina Professional Engineer James B. Voso
Division 7 Alamance County Burlington
PLAN DATE: April 2018 REVIEWED BY: JB Voso
PREPARED BY: SE Greene REVIEWED BY:
REVISIONS INIT. DATE
6/13/2018
SIG. INVENTORY NO. 07-0162

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SIGNAL FACE	PHASE					
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3	Ø 4
11	←	←	←	←	←	←
21,22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	←	←	←	←	←	←
42	R	R	R	R	G	R
43	R	R	R	R	G	R
51,52	←	←	←	←	←	←
61,62	R	G	R	G	R	Y

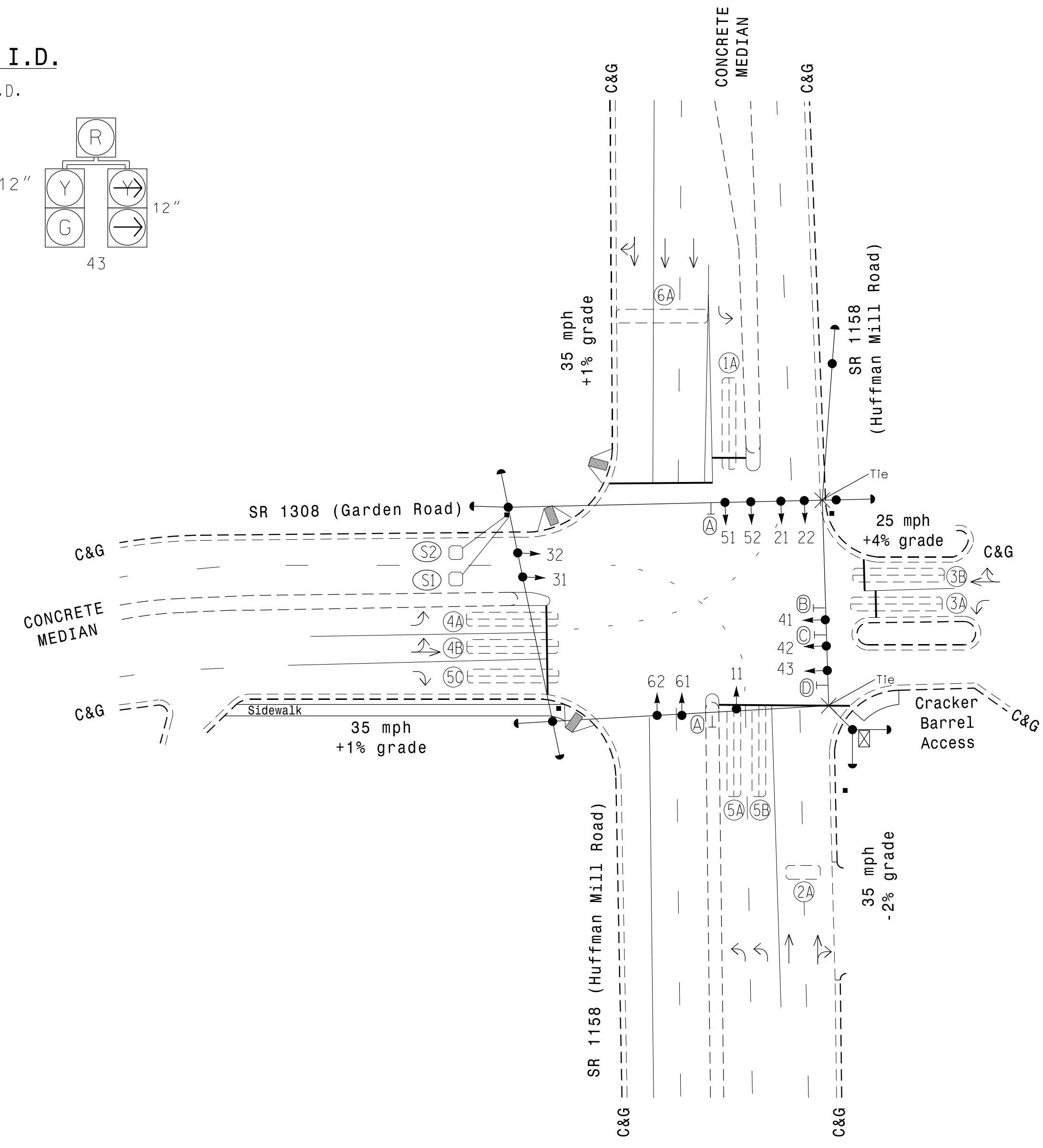
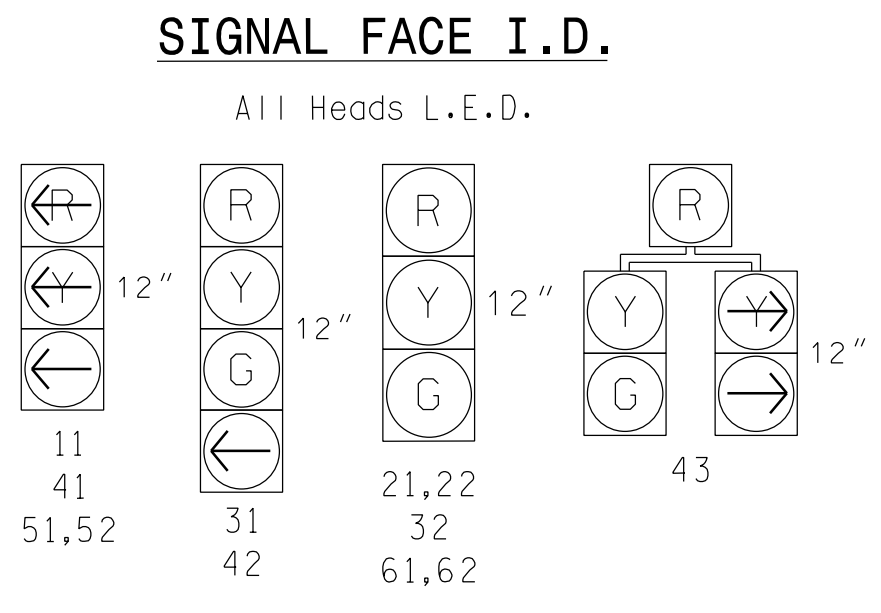
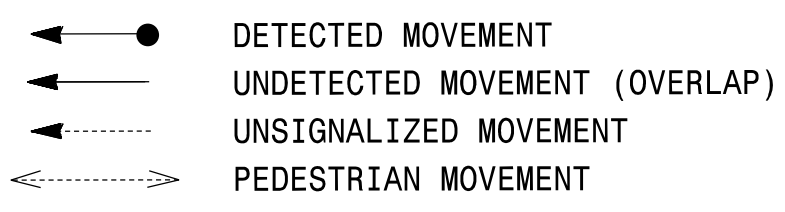
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM NEW CARD
1A	6X40	+5	2-4-2	-	1	Yes	-	-	-	S	- X
2A	6X15	70	EXIST	-	2	Yes	-	-	-	S	- X
3A,3B	6X40	+11,+5	2-4-2	-	3	Yes	-	-	-	S	- X
4A,4B	6X40	+5	2-4-2	-	4	Yes	-	-	-	S	- X
5A,5B	6X40	0	2-4-2	-	5	Yes	-	-	-	S	- X
5C	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	- X
6A	6X40	70	EXIST	-	6	Yes	-	-	-	S	- X
S1	6X6	+175	4	X	-	No	-	-	-	N	X X
S2	6X6	+175	4	X	-	No	-	-	-	N	X X

6 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

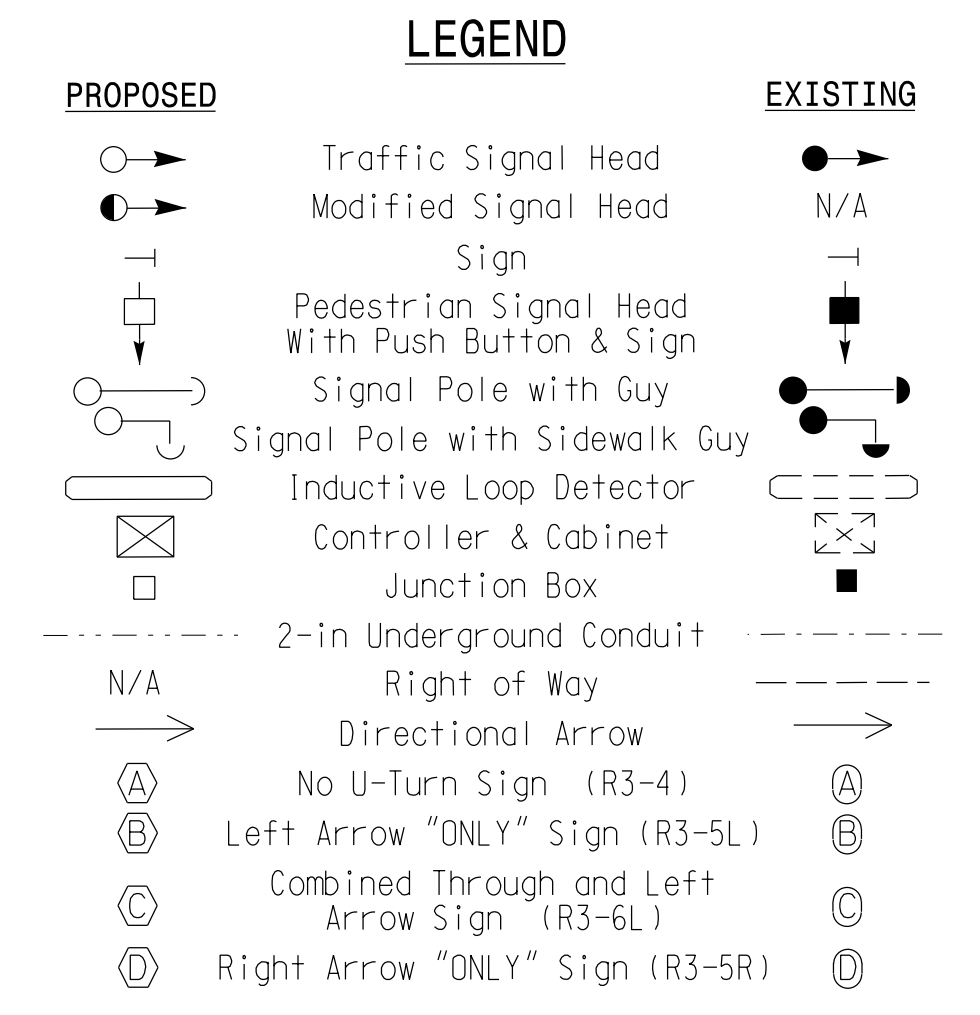
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output File for future use.
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.

PHASING DIAGRAM DETECTION LEGEND



FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0
Veh. Extension *	2.0	3.0	3.0	4.0	2.0	3.0
Max 1 *	20	50	20	35	30	50
Yellow	3.0	4.0	3.0	3.8	3.0	3.8
Red Clear	3.3	1.4	3.1	2.8	3.2	1.9
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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



Signal Upgrade

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1158 (Huffman Mill Road) at SR 1308 (Garden Road)/ Cracker Barrel Access

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

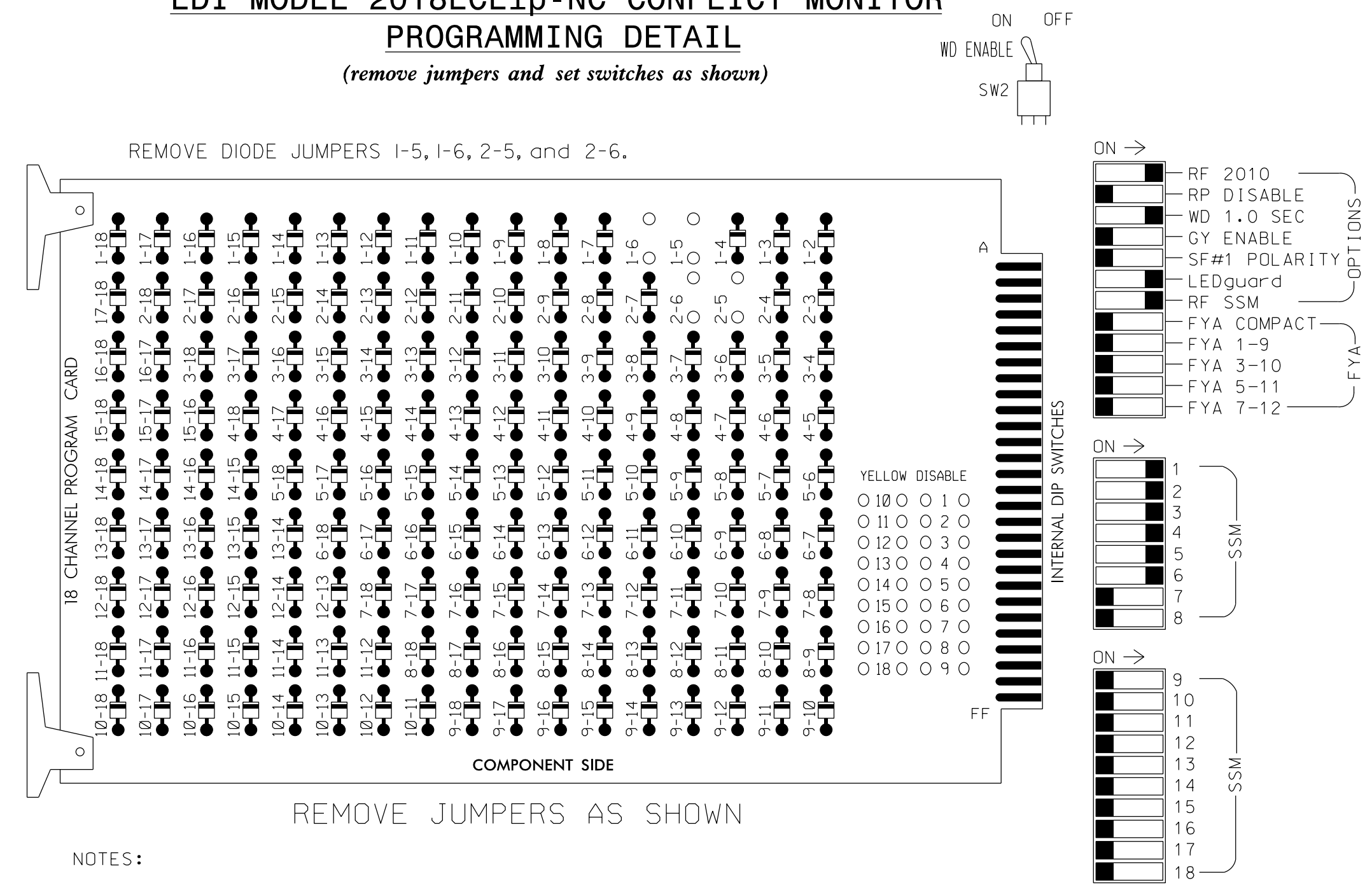
SCALE: 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

07-JUN-2018 11:11 0:\projects\atkins\work\trf\c\k\ur\100056469 U-6015 B-G S10 Sys\Task 05_11_Signals\Design\07-0170.dgn ALEX361 AT LUS340649

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 W/AUX OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
 PHASES USED.....1,2,3,4,5,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

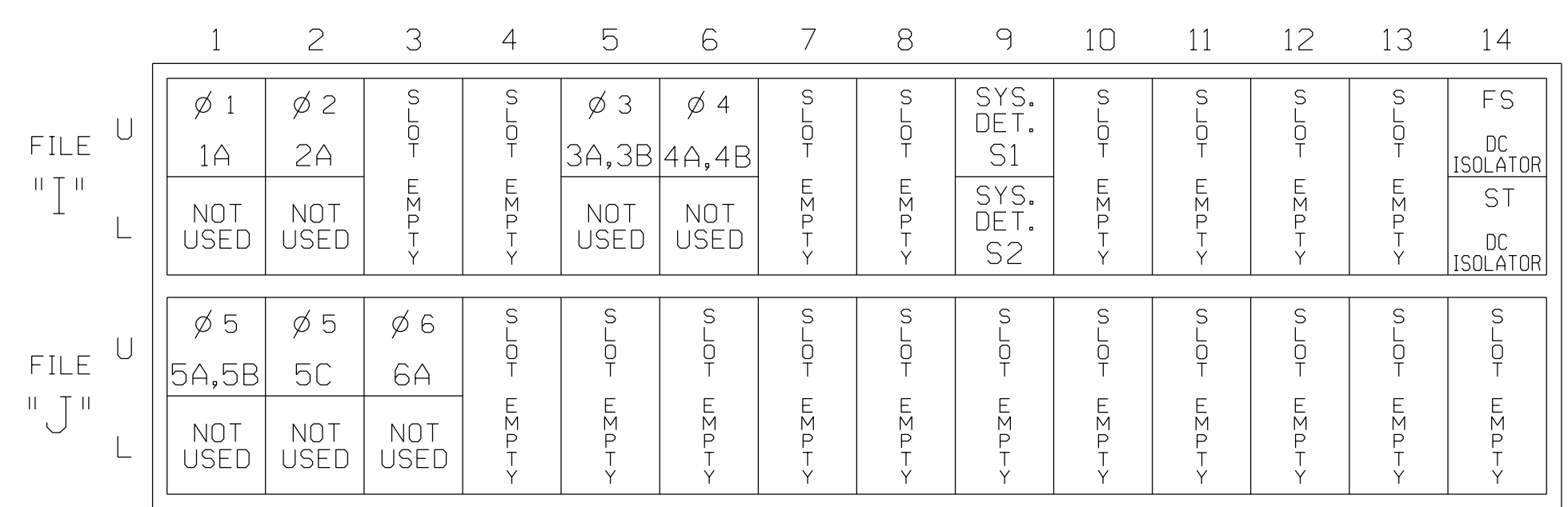
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	43	NU	43	51,52	61,62	NU	NU	NU	NU	NU	NU
RED	128			116	116	101	101					134						
YELLOW		129		117	117	102	102					135						
GREEN		130		118	118	103	103					136						
RED ARROW	125					101						131						
YELLOW ARROW	126					102						132	132					
GREEN ARROW	127					103	103					133	133					

NU = Not Used

INPUT FILE POSITION LAYOUT

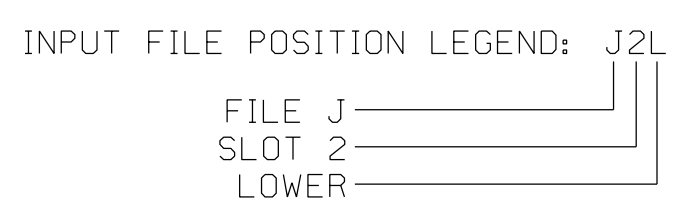
(front view)



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

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
2A	TB2-5,6	I2U	39	2	2	YES				S
3A,3B	TB4-5,6	I5U	58	3	3	YES				S
4A,4B	TB4-9,10	I6U	41	4	4	YES				S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A,5B	TB3-1,2	J1U	55	5	5	YES				S
5C	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES				S



THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0170
 DESIGNED: November 2017
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail

Electrical and Programming Details for: **SR 1158 (Huffman Mill Road) at SR 1308 (Garden Road)/Cracker Barrel Access**

Prepared for the Offices of:

Division 7 Alamance County Burlington

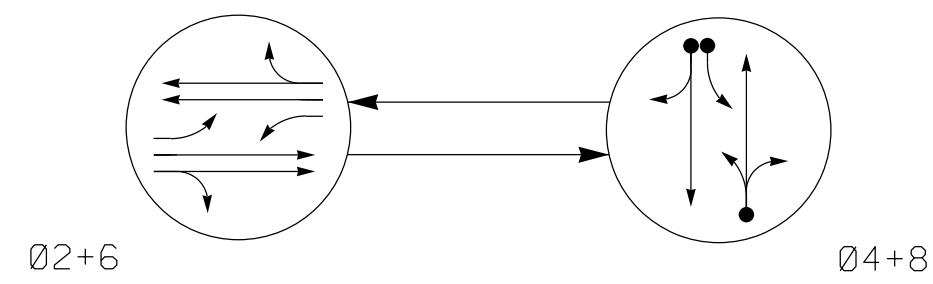
PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion
 PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

REVISIONS INIT. DATE

6/9/2018
 Pamela Alexander
 SEAL 023489
 SIG. INVENTORY NO. 07-0170

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

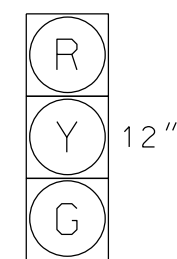
- ◄●► DETECTED MOVEMENT
- ◄◄◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄◄◄ UNSIGNALIZED MOVEMENT
- ◄◄◄ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
2l, 2r	G	R	Y
4l, 4r	R	G	R
6l, 6r	G	R	Y
8l, 8r	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



2l, 2r
4l, 4r
6l, 6r
8l, 8r

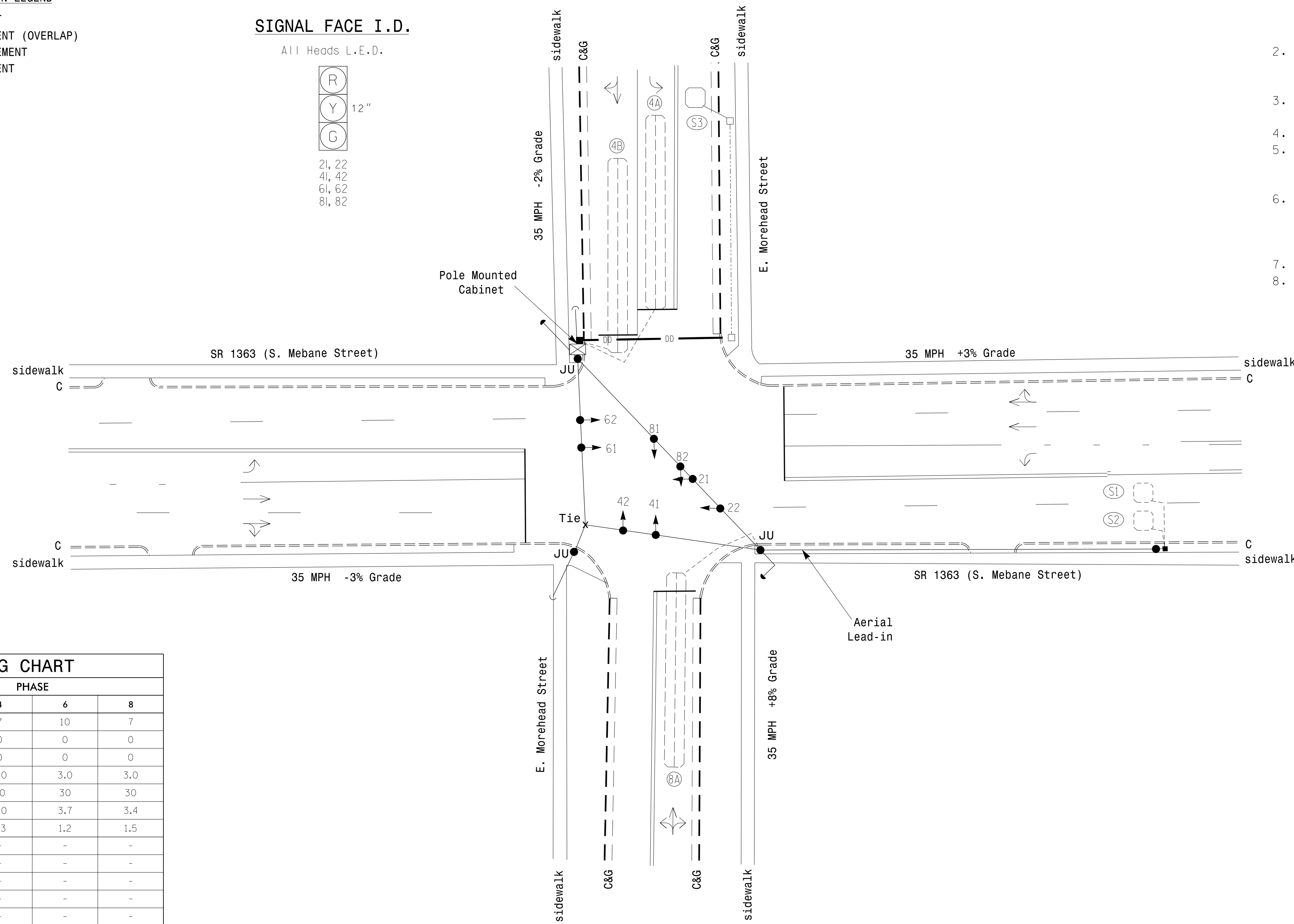
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	USE ADDED INITIAL	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
4A	6X60	0	2-4-2	-	4	Yes	-	-	3	S	-	X
4B	6X60	+3	2-4-2	-	4	Yes	-	-	10	S	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	-	5	S	-	X
S1	6X6	+185	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+185	EXIST	-	-	No	-	-	-	N	X	X
S3	6X6	+147	3	X	-	No	-	-	-	N	X	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.
- Loop data based on previous plan and field observations.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 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.
- 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	3.0
Max 1 *	30	30	30	30
Yellow	4.1	4.0	3.7	3.4
Red Clear	1.1	1.3	1.2	1.5
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
○→ Traffic Signal Head	●→ N/A
◐→ Modified Signal Head	◐→ N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head With Push Button & Sign
○ Signal Pole with Guy	○ Signal Pole with Guy
⊥ Signal Pole with Sidewalk Guy	⊥ Signal Pole with Sidewalk Guy
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Controller & Cabinet
⊥ Junction Box	⊥ Junction Box
⊥ 2-in Underground Conduit	⊥ 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1363 (S. Mebane Street) at E. Morehead 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 _____

SCALE: 0 20
1" = 20'

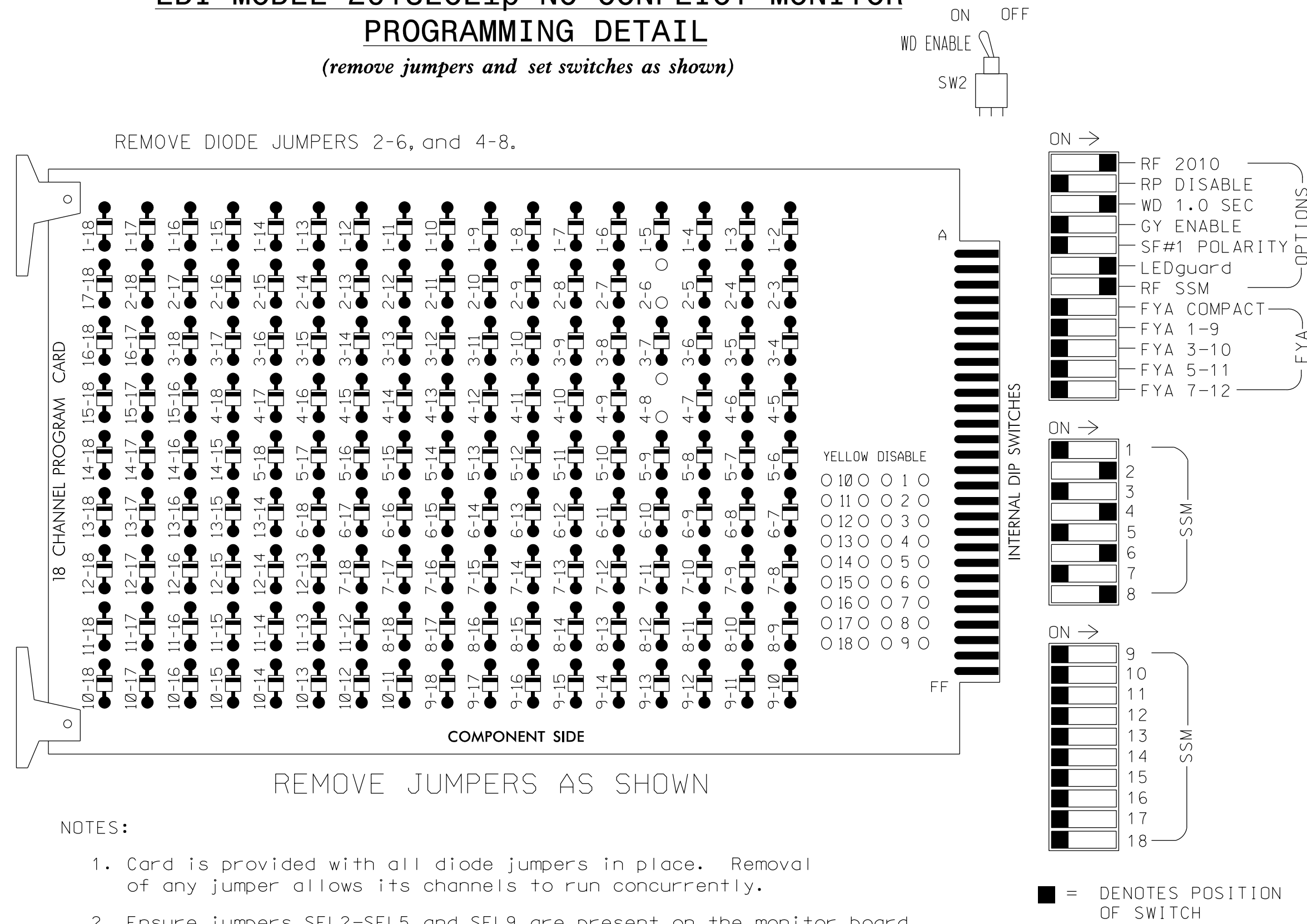
DRMP
 DRMP, Inc.
 8000 Regency Parkway, Suite 175
 Cary, NC 27519
 NC License No. C-2213 (919) 650-1038

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022516
 LISA M. MOON
 DocuSigned by: Lisa M. Moon 6/13/2018
 SIGNATURE DATE
 SIG. INVENTORY NO. 07-0174

13-JUN-2018 17:40
 R:\66015\1707\1\off\caks\gnals\022516\07-0174.dgn
 KANDERSON AT CHA-Y.ANDERSON

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

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

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

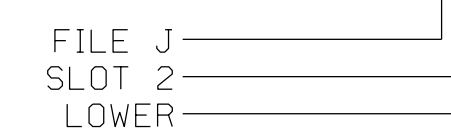
FS = FLASH SENSE
ST = STOP TIME

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	TB21-3,4	I2U	39	2	SYS	NO				N
* S2	TB23-3,4	I2L	43	12	SYS	NO				N
* S3	TB21-5,6	I3U	58	3	SYS	NO				N
4A	TB21-7,8	I4U	41	4	4	YES		3		S
4B	TB23-7,8	I4L	45	14	4	YES		10		S
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: 07-0174
 DESIGNED: NOVEMBER 2017
 SEALED: 06-13-2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



SR 1363 (S. Mebane Street) at E. Morehead Street

Division 7 Alamance County Burlington
 PLAN DATE: November 2017 REVIEWED BY: AJ Davis
 PREPARED BY: RD Lawton REVIEWED BY: LM Moon

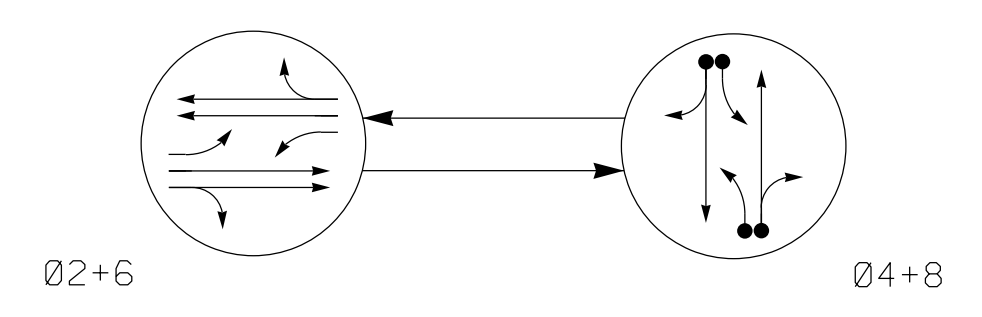
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by:
Lisa M. Moon
6/13/2018
DATE
SIG. INVENTORY NO. 07-0174

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

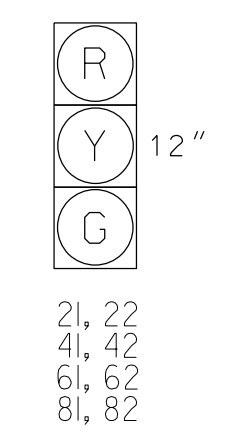
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
2l, 22	G	R	Y
4l, 42	R	G	R
6l, 62	G	R	Y
8l, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



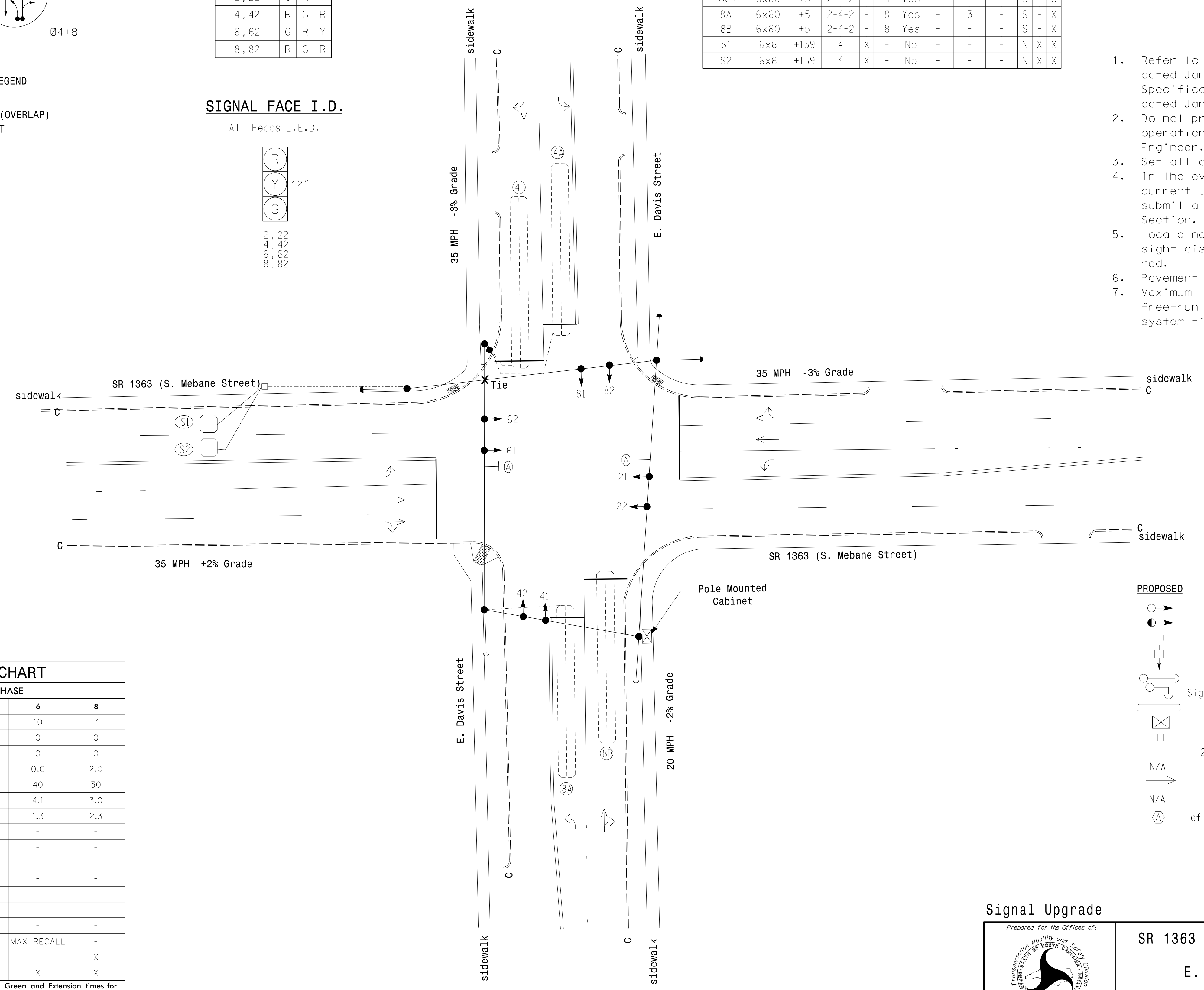
ASC/3 DETECTOR INSTALLATION CHART

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, 4B	6x60	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
8A	6x60	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6x60	+5	2-4-2	-	8	Yes	-	-	-	S	-	X
S1	6x6	+159	4	X	-	No	-	-	-	N	X	X
S2	6x6	+159	4	X	-	No	-	-	-	N	X	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.
- 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	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	0.0	2.0	0.0	2.0
Max 1 *	40	30	40	30
Yellow	3.7	4.1	4.1	3.0
Red Clear	1.4	1.3	1.3	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	-	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:

 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 DEPARTMENT OF TRANSPORTATION
 STATE OF NORTH CAROLINA
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529
 DRMP, Inc.
 8000 Regency Parkway, Suite 175
 Cary, NC 27519
 NC License No. C-2213 (919) 650-1038

SR 1363 (S. Mebane Street) at E. Davis Street	
Division 7	Alamance County
PLAN DATE: Sept 2017	REVIEWED BY: AJ Davis
PREPARED BY: RD Lawton	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

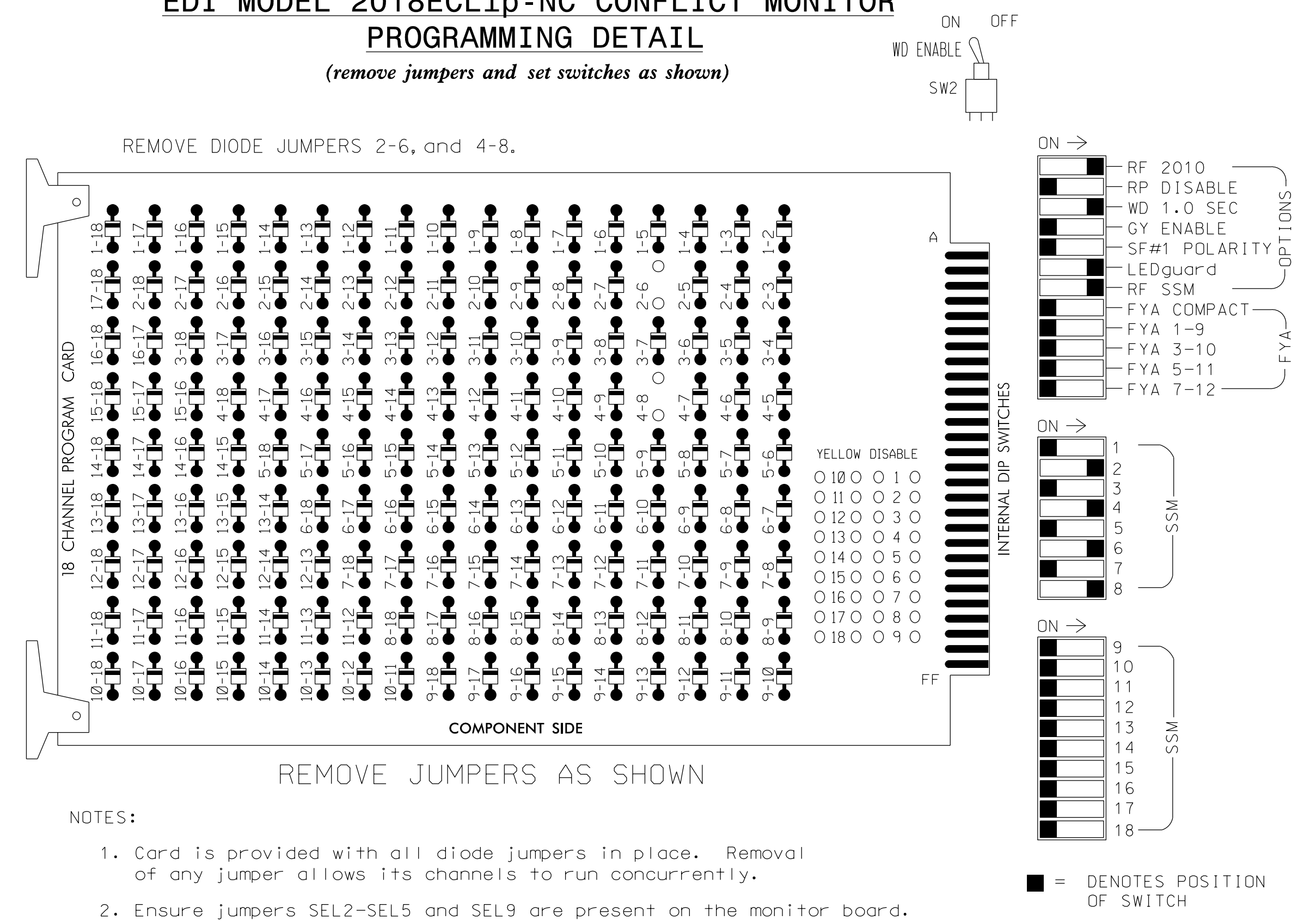
SEAL

 Lisa M. Moon
 6/13/2018
 DocuSigned by:
 Lisa M. Moon
 SIGNATURE DATE
 SIG. INVENTORY NO. 07-0175

13-JUN-2018 17:41 R:\66015\Traffic\Signal\022516\Signal\07-0175.dgn KANDERSON AT CHA-Y.ANDERSON

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

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												

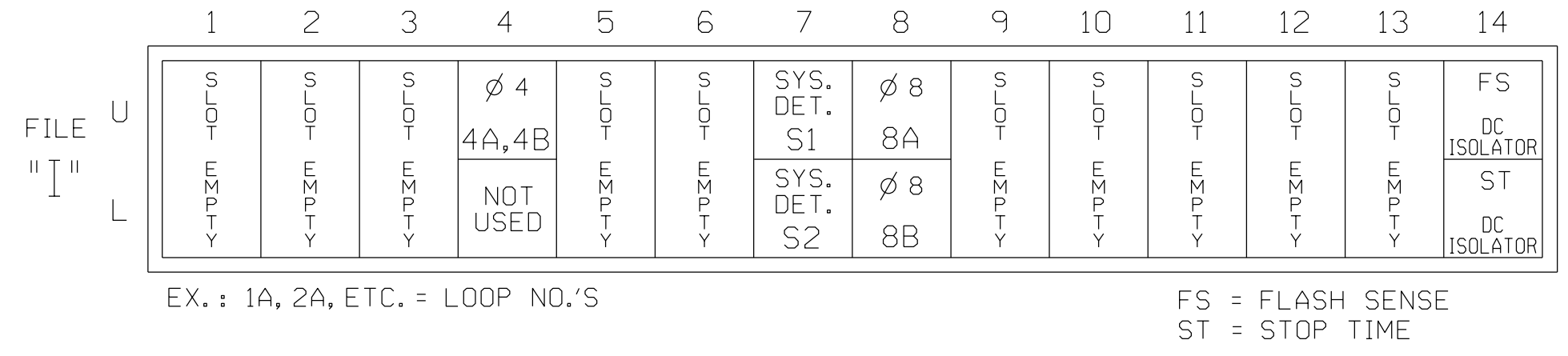
NU = Not Used

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)

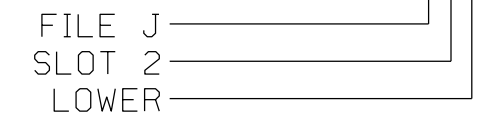


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
4A,4B	TB21-7,8	I4U	41	4	4	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
8B	TB24-1,2	J6L	46	18	8	YES				S

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0175
 DESIGNED: SEPT-2017
 SEALED: 06-13-2018
 REVISED: N/A

13-UNA-2018-17-41
 R:\66015\T\off\ek\sign\des\gn\w\ir\ng\07-0175e.dgn
 KANDERSON AT CHA-KANDERSON

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:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

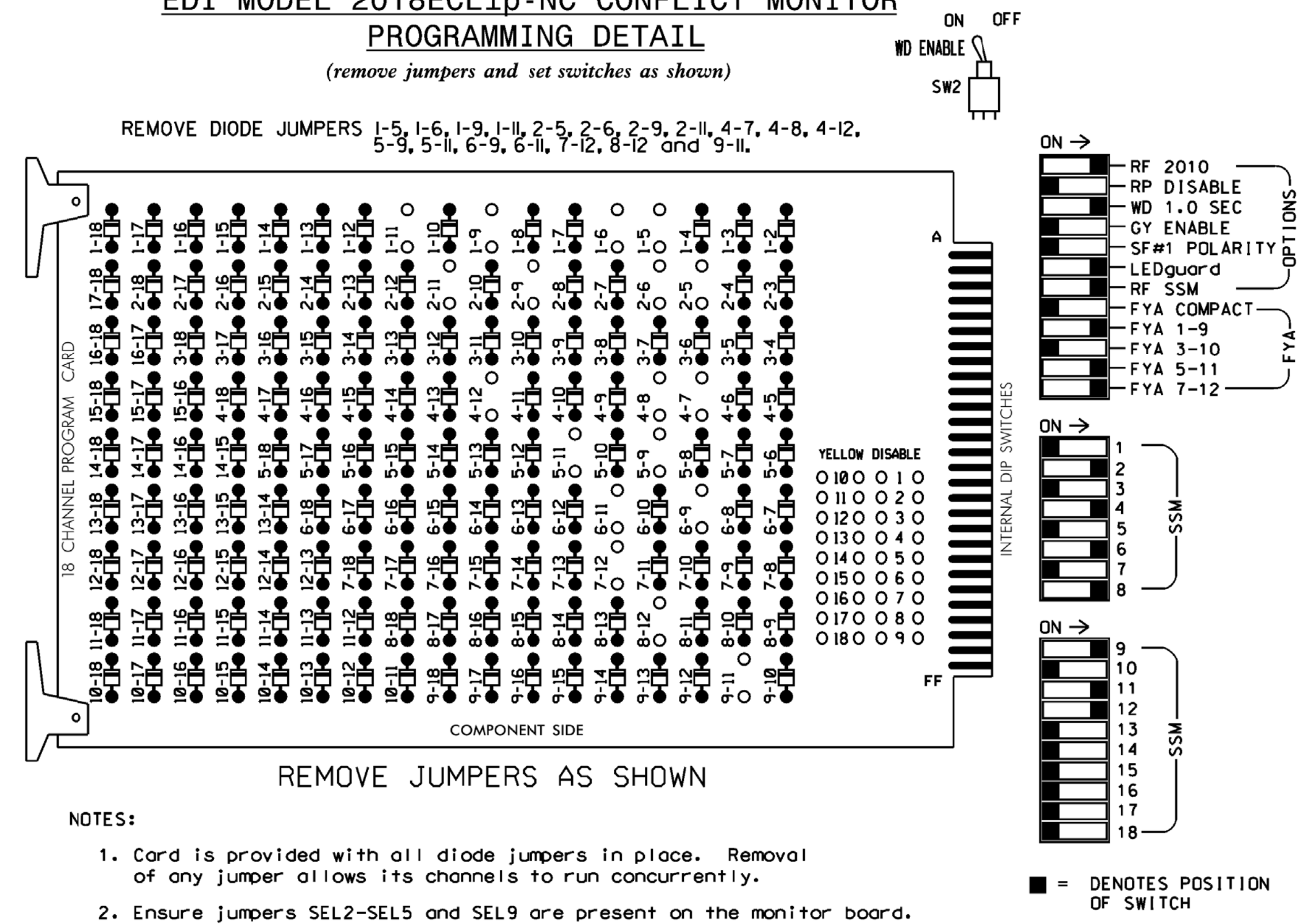
SR 1363 (S. Mebane Street) at E. Davis Street

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

DocuSigned by:
 Lisa M. Moon
 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-0175

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

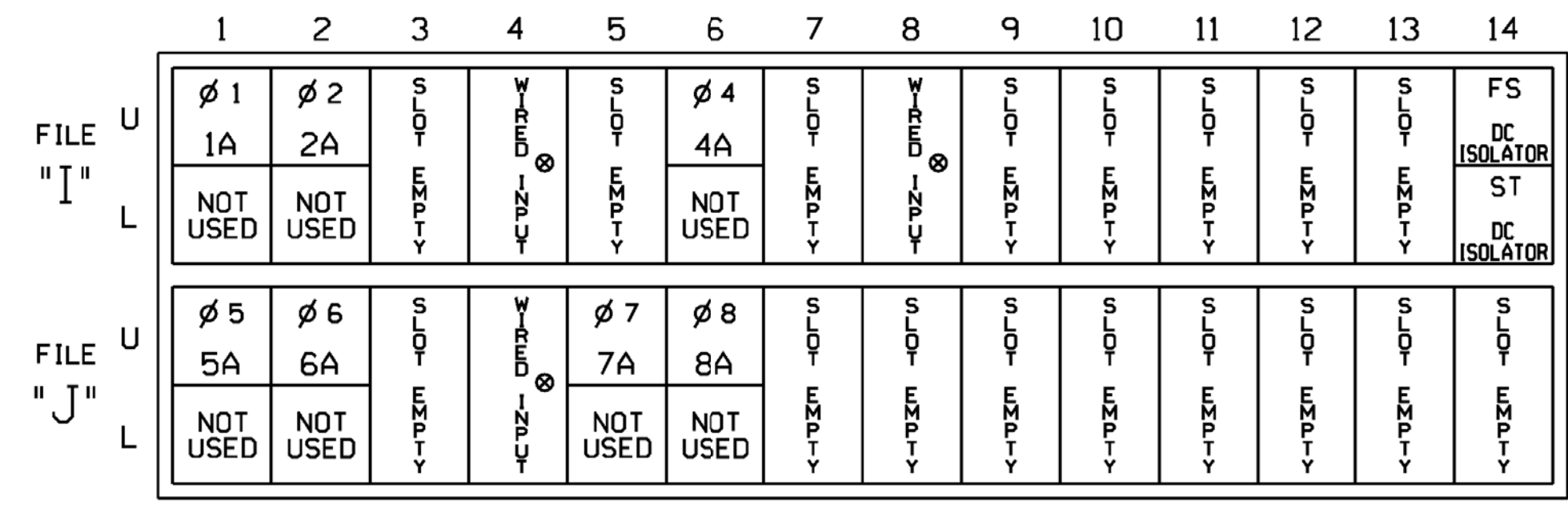
CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1.S2.S5.S7.S8.S10.S11.
 AUX S1.AUX S4.AUX S5
 PHASES USED.....1.2.4.5.6.7.8
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....*
 * See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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

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

INPUT FILE POSITION LAYOUT
(front view)

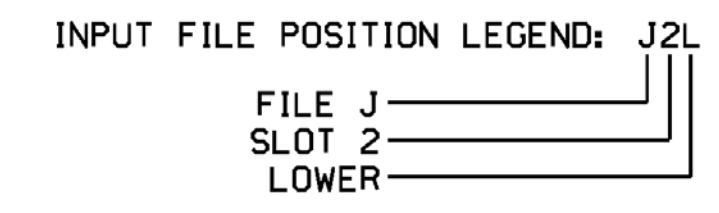


EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 * Wired Input - Do not populate slot with detector card

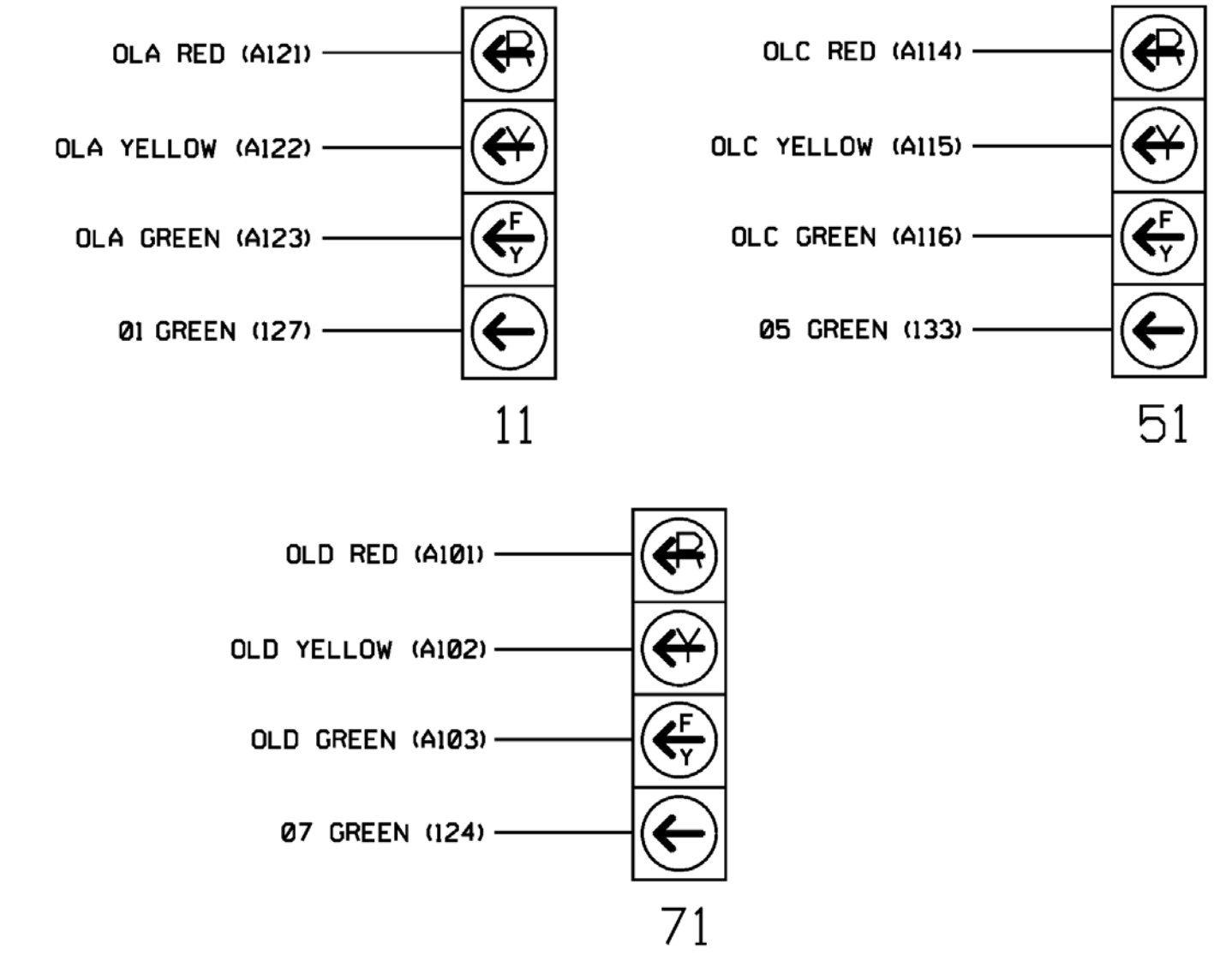
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	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
4A	TB4-9,10	I6U	41	4	4	YES		10		S
5A	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
7A	TB5-5,6	J5U	57	7	7	YES		15		S
	-	I8U	49	24	4	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		5		S

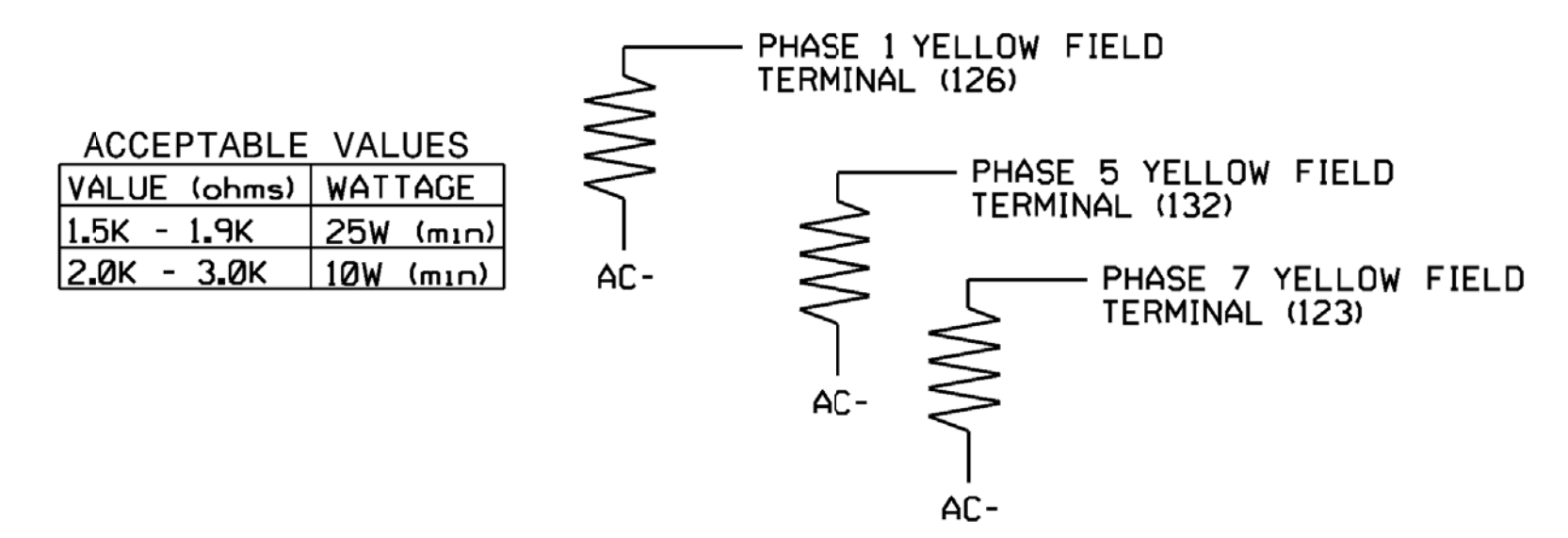
- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.
- Add jumper from J5-W to I8-W, on rear of input file.



FYA SIGNAL WIRING DETAIL
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL
(install resistors as shown)



ACCEPTABLE VALUES

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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: SR 1719 (Sellars Mill Road) at N. Mebane Street

Prepared for the Offices of:

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS: _____ INIT. DATE

James Voso 6/13/2018

SIG. INVENTORY NO. 07-0178

*****SYSTEMS*****
 *****DIAGNOSTICS*****
 *****SOFTWARE*****
 *****HARDWARE*****
 *****USER*****

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 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

↓ 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.



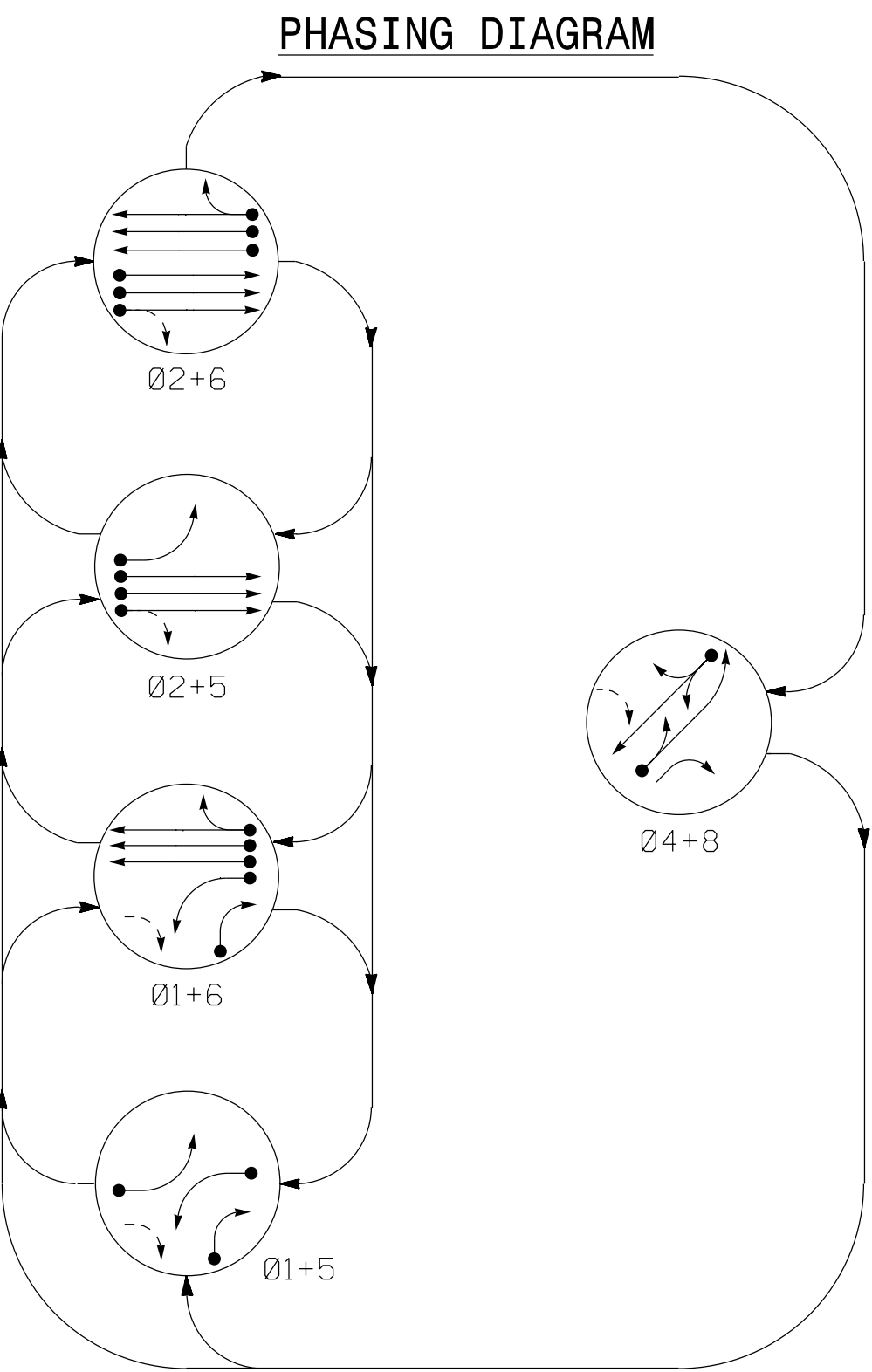
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0178
DESIGNED: January 2018
SEALED: 6/13/2018
REVISED: NA

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Hwy, Corner, NC 27529	SR 1719 (Sellars Mill Road) at N. Mebane Street		SEAL SEAL 022599 JAMES B. VOSO ENGINEER 6/13/2018 DATE
	Division 7 Alamance County Burlington		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PLAN DATE: January 2018 REVIEWED BY: JB Voso			
PREPARED BY: SE Greene REVIEWED BY:		REVISIONS INIT. DATE	
SIG. INVENTORY NO. 07-0178			

\$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$



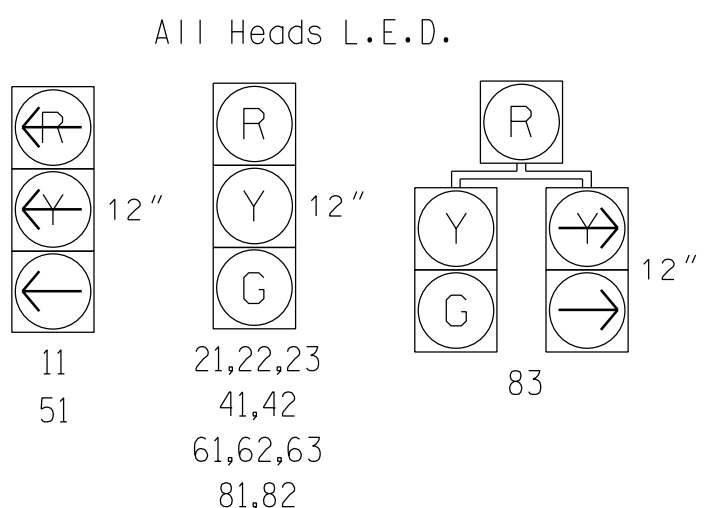
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1 1+5	Ø1 1+6	Ø2 2+5	Ø2 2+6	Ø4 4+8	F	H	S
11	←	←	←	←	←	←	←	←
21, 22, 23	R	R	G	G	R	Y		
41, 42	R	R	R	R	G	R		
51	←	←	←	←	←	←	←	←
61, 62, 63	R	G	R	G	R	Y		
81, 82	R	R	R	R	G	R		
83	←	←	R	R	G	R		

SIGNAL FACE I.D.



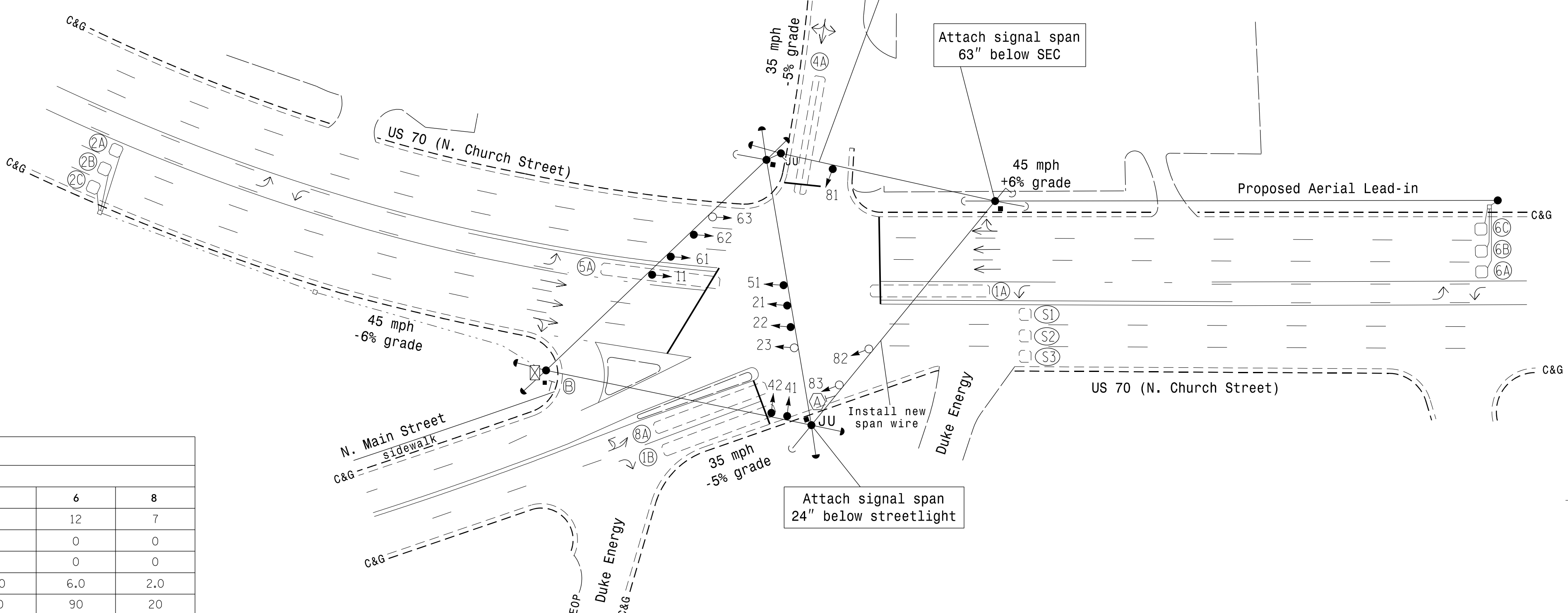
ASC/3 DETECTOR INSTALLATION CHART

LOOP	DETECTOR			PROGRAMMING								
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	EXIST	-	1	Yes	-	3	-	S	-	X
1B	6X60	+5	EXIST	-	1	Yes	-	15	-	S	-	X
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	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X60	+5	EXIST	-	5	Yes	-	3	-	S	-	X
6A	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	6	X	6	Yes	-	-	X	N	-	X
8A	6X60	+5	EXIST	-	8	Yes	-	-	-	S	-	X
S1	6X6	70	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	70	EXIST	-	-	No	-	-	-	N	X	X
S3	6X6	70	EXIST	-	-	No	-	-	-	N	X	X

5 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. Reposition existing signal heads numbered 21, 22, 61 and 62.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. The cabinet should be designed to include an Auxiliary Output File for future use.
8. Pavement markings are existing.
9. 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 *	2.0	6.0	2.0	2.0	6.0	2.0		
Max I *	30	90	20	30	90	20		
Yellow	3.0	5.1	4.2	3.1	4.1	4.2		
Red Clear	2.4	1.4	1.9	2.4	1.0	2.0		
Actuations B4 Add *	-	0	-	-	0	-		
Seconds / Actuation *	-	1.5	-	-	1.5	-		
Max Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Locking Detector	-	X	-	-	X	-		
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-		
Dual Entry	-	-	X	-	-	X		
Simultaneous Gap	X	X	X	X	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

Prepared for the Offices of:
TRANSPORTATION MOBILITY AND SERVICES DIVISION
STATE OF NORTH CAROLINA
Signal Design Section

US 70 (N. Church Street) at N. Main Street/Holly Street

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

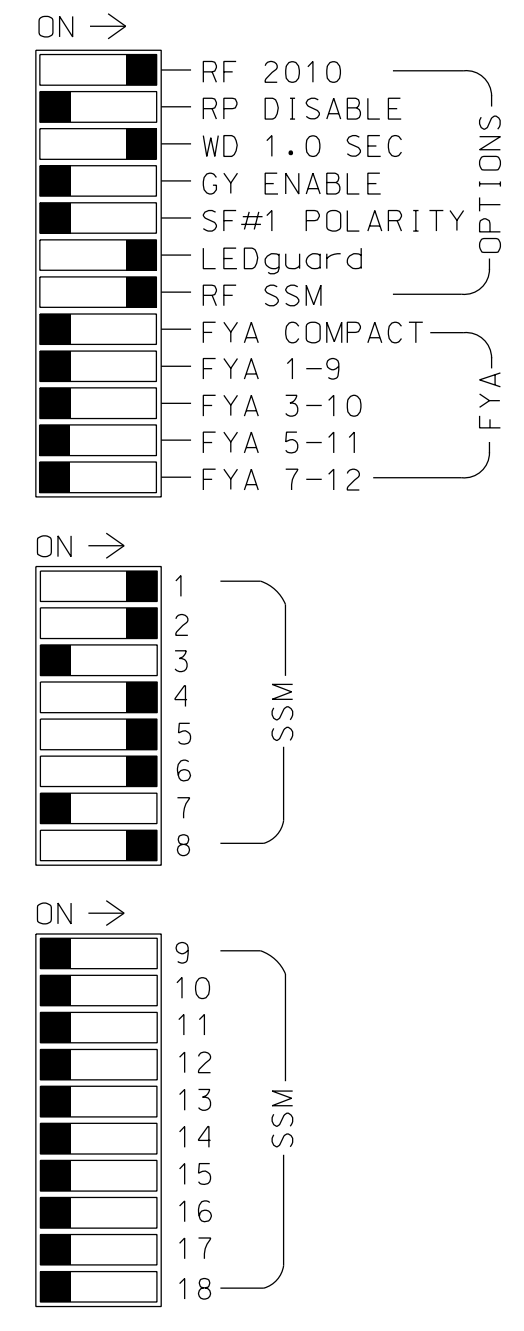
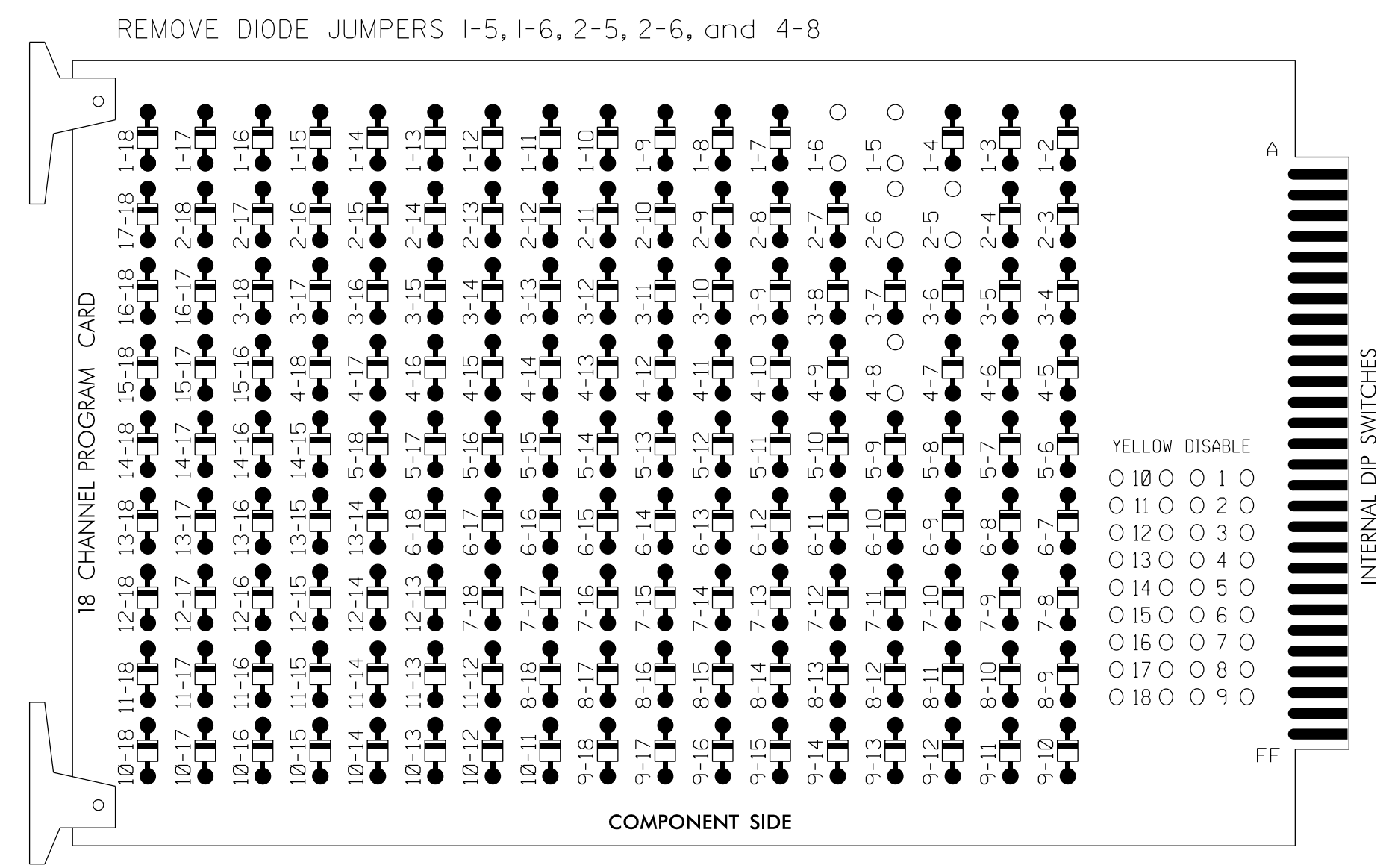
REVISIONS	INIT.	DATE

SCALE
0 40
1"=40'

07-JUN-2018 11:14 D:\Projector\atkins\Projects\Signal\11_Signal\05\05-11_Signal\05-11_Signal\05-11_Signal\05-11_Signal.dgn ALEX3351 AT LUS210699

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 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
 PHASES USED.....1,2,4,5,6,8
 OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 73.1

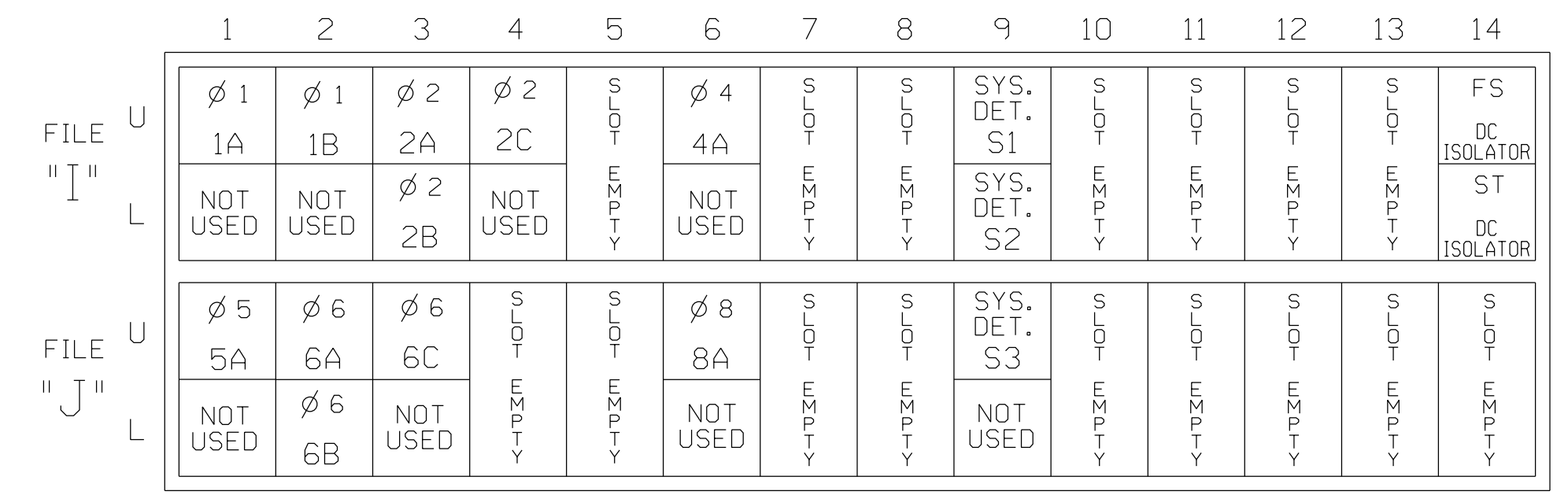
SIGNAL HEAD HOOK-UP CHART

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
EMU 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	83	21,22, 23	NU	NU	41,42	NU	51	61,62, 63	NU	NU	81,82, 83	NU	NU	NU	NU	NU	NU
RED		128			101			134				107						
YELLOW		129			102			135				108						
GREEN		130			103			136				109						
RED ARROW	125							131										
YELLOW ARROW	126	126						132										
GREEN ARROW	127	127						133										

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

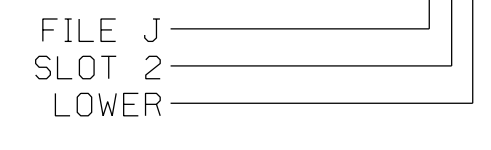
FS = FLASH SENSE
 ST = STOP TIME

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
1A	TB2-1,2	I1U	56	1	1	YES		3		S
1B	TB2-5,6	I2U	39	2	1	YES		15		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
4A	TB4-9,10	I6U	41	4	4	YES		10		S
* S1	TB5-9,10	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		3		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				S
* S3	TB7-9,10	J9U	59	15	SYS	NO				N

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0201
 DESIGNED: NOVEMBER 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 14:13 D:\transpor\at\work\Traffic\curr\100056469 U-6015 B-G Sig System\Task 05_11_Signal\Des\gmr\107-0201E.dgn ALEX3361 AT LUS210649

Electrical Detail

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 70 (N. Church Street) at N. Main Street/Holly Street

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

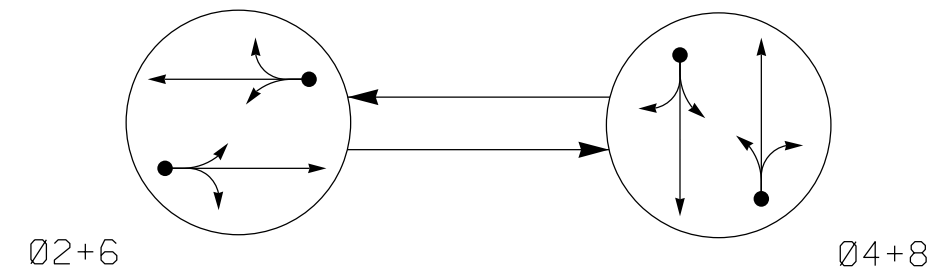
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/9/2018

SIG. INVENTORY NO. 07-0201

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

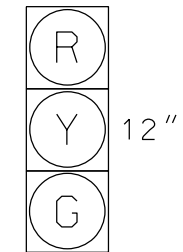
- DETECTED MOVEMENT
UNDETECTED MOVEMENT (OVERLAP)
UNSIGNALIZED MOVEMENT
PEDESTRIAN MOVEMENT

TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (02+6, 04+8, FLASH), and rows for signal faces 21,22; 41,42; 61,62; 81,82,83.

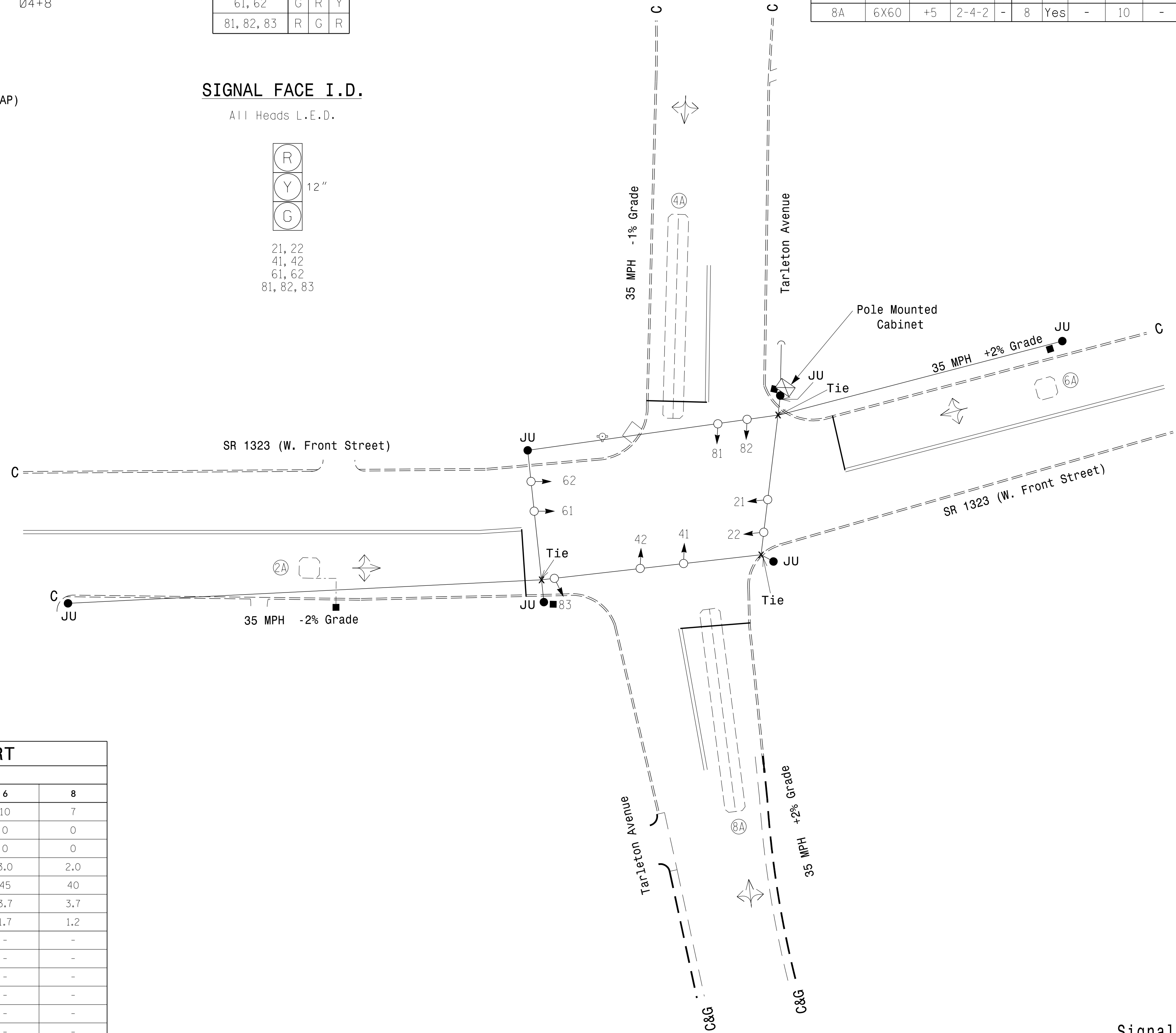
SIGNAL FACE I.D.

All Heads L.E.D.



- 21, 22
41, 42
61, 62
81, 82, 83

ASC/3 DETECTOR INSTALLATION CHART with columns for DETECTOR (LOOP, SIZE, DISTANCE) and PROGRAMMING (PHASE, CALLING, EXTEND, DELAY, USE ADDED, TYPE, SYSTEM, NEW).



ASC/3 TIMING CHART with columns for FEATURE and PHASE (2, 4, 6, 8) and rows for Min Green, Walk, Ped Clear, Veh. Extension, etc.

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

2 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

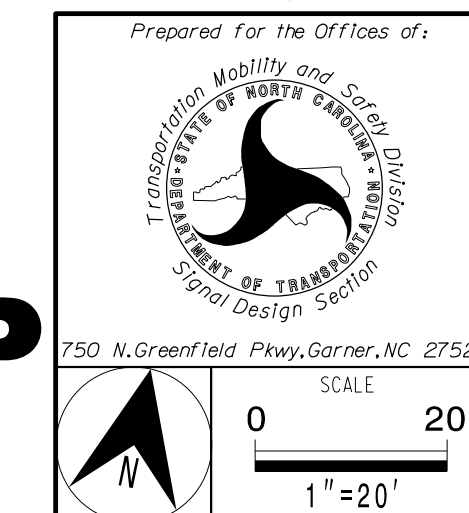
- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018...
2. Do not program signal for late night flashing operation...
3. Reposition existing signal head 83 as far west as possible...
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signals Design Manual...
6. Maximum times shown in timing chart are for free-run operation only.

LEGEND

- PROPOSED: Traffic Signal Head, Modified Signal Head, Pedestrian Signal Head, Signal Pole with Guy, Inductive Loop Detector, Controller & Cabinet, Junction Box, 2-in Underground Conduit, Right of Way, Directional Arrow, Fire Hydrant.
EXISTING: N/A, N/A, N/A, N/A, N/A, N/A, N/A, N/A.

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



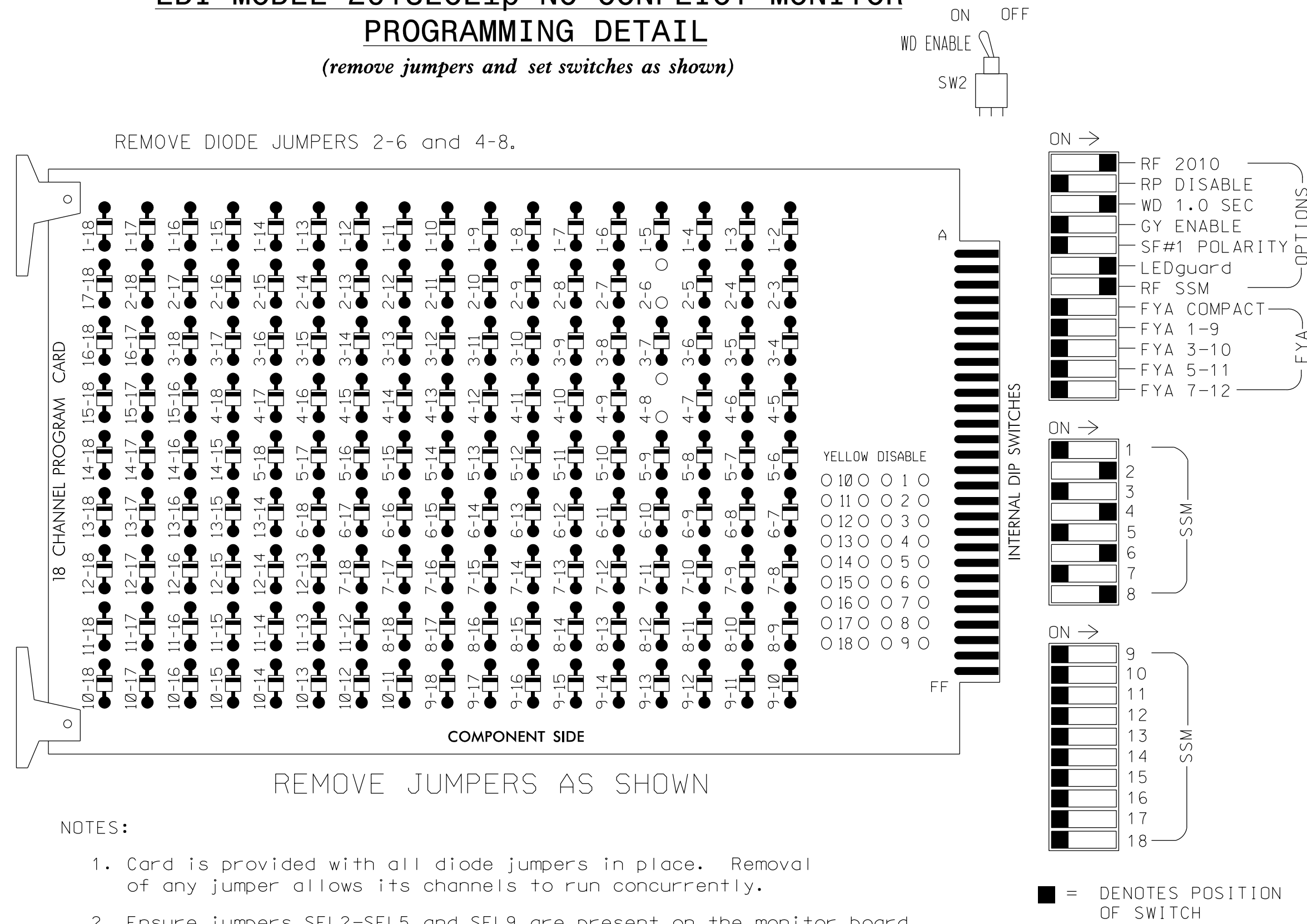
Project information table: SR 1323 (W. Front Street) at Tarleton Avenue, Division 7, Alamance County, Burlington, PLAN DATE: December 2017, PREPARED BY: DJ White, REVIEWED BY: AJ Davis, etc.



13-UNA-2018-17-42 R:\66015\17044\04\Signal\gms\Signal\07-0206.dgn X:\ANDERSON AT CHA-X\ANDERSON

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

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												

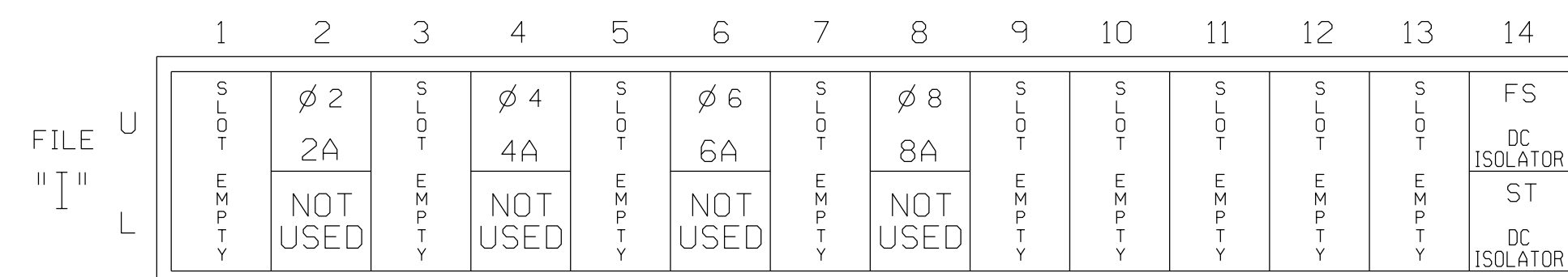
NU = Not Used

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)



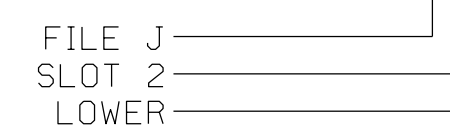
EX.: 1A, 2A, ETC. = LOOP NO.'S

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	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		10		S
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		10		S

INPUT FILE POSITION LEGEND: J2L

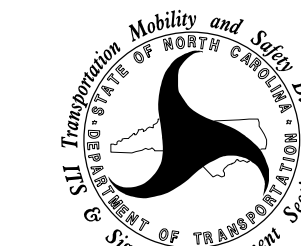


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0206
 DESIGNED: DECEMBER 2017
 SEALED: 06-13-2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



Plans Prepared By:
 DRMP, Inc.
 8000 Regency Parkway, Suite 175
 Cary, NC 27518
 NC License No. C-2215 (019) 650-1038

SR 1323 (W. Front Street) at Tarleton Avenue

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS INIT. DATE

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

SIG. INVENTORY NO. 07-0206

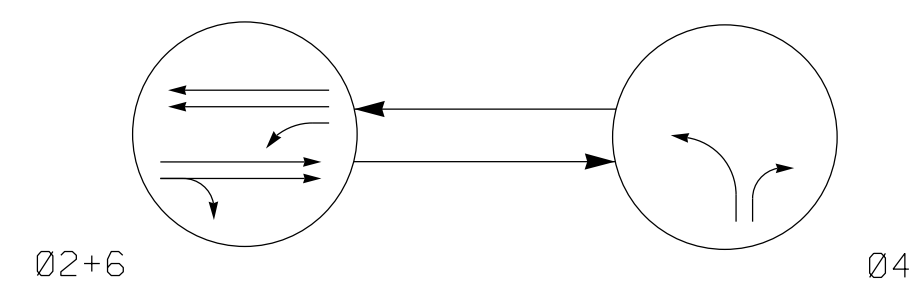
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

SIG. INVENTORY NO. 07-0206

PHASING DIAGRAM



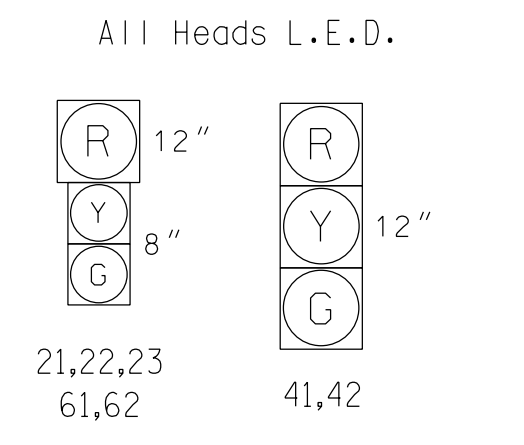
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø4	FLASH
21,22,23	G	R	Y
41,42	R	G	R
61,62	G	R	Y

SIGNAL FACE I.D.



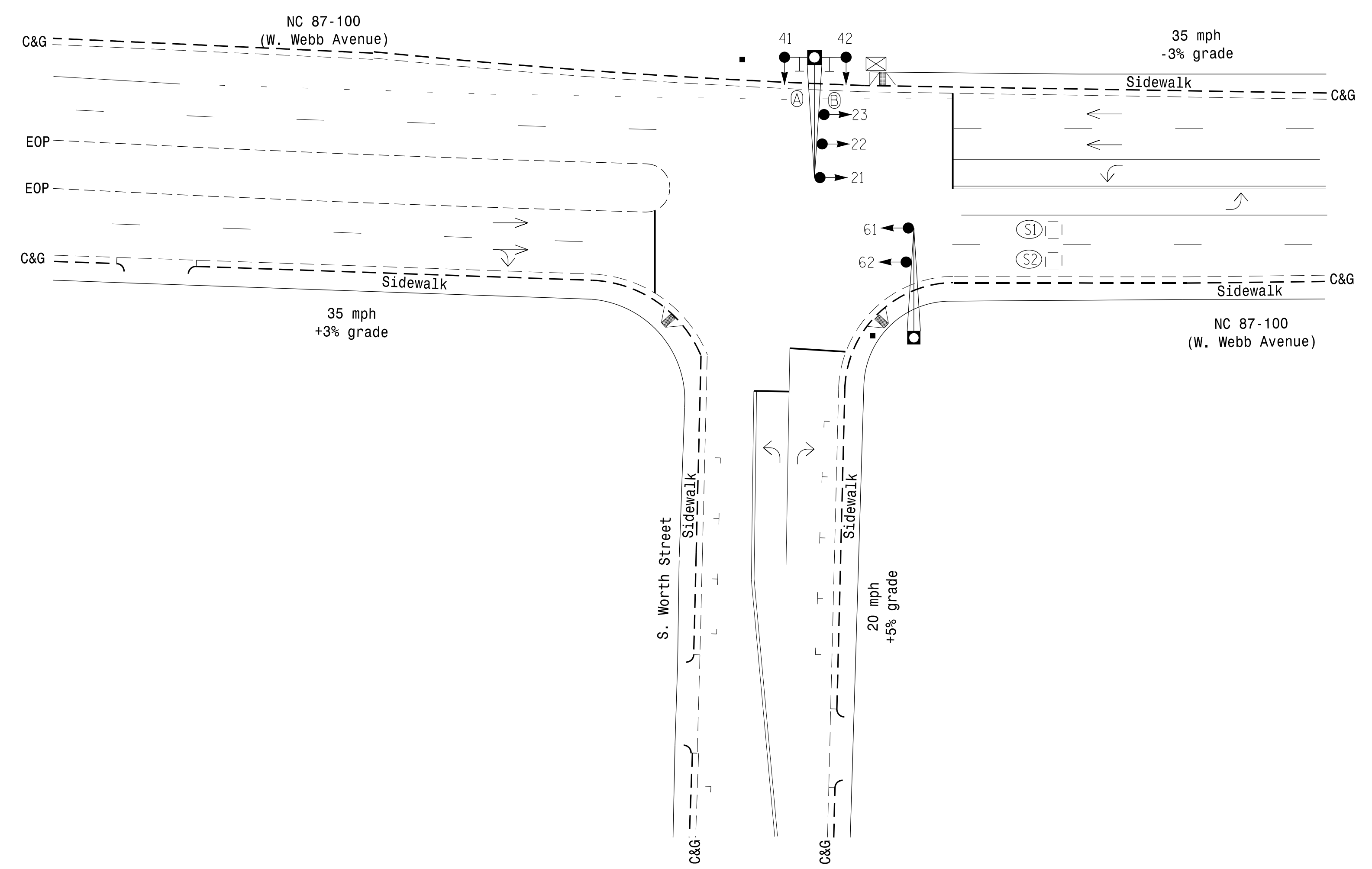
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	PROGRAMMING								
			DETECTOR	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
S1	6X6	+141	EXIST	-	No	-	-	-	N	X	X
S2	6X6	+141	EXIST	-	No	-	-	-	N	X	X

2 Phase Pre-Timed (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.
- 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
Min Green *	10	7	10
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	-	-	-
Max 1 *	50	20	50
Yellow	4.1	3.0	3.7
Red Clear	1.8	3.1	1.4
Actuations B4 Add *	-	-	-
Seconds /Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	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	— Sign
○→ Pedestrian Signal Head	●→ Signal Pole with Guy
○→ Signal Pole with Guy	●→ Signal Pole with Sidewalk Guy
○→ Signal Pole with Sidewalk Guy	○→ Metal Pole with Mastarm
○→ Metal Pole with Mastarm	□→ Inductive Loop Detector
□→ Inductive Loop Detector	□→ Controller & Cabinet
□→ Junction Box	□→ Junction Box
--- 2-in Underground Conduit	--- Right of Way
N/A	→ Directional Arrow
N/A	→ Curb Ramp
Ⓐ Left Arrow "ONLY" Sign (R3-SL)	Ⓐ Left Arrow "ONLY" Sign (R3-SL)
Ⓑ Right Arrow "ONLY" Sign (R3-5R)	Ⓑ Right Arrow "ONLY" Sign (R3-5R)

Signal Upgrade

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

SCALE: 0 30
1"=30'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC 87-100 (W. Webb Avenue) at S. Worth Street

Division 7 Alamance County Burlington

PLAN DATE: August 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: MB Toth

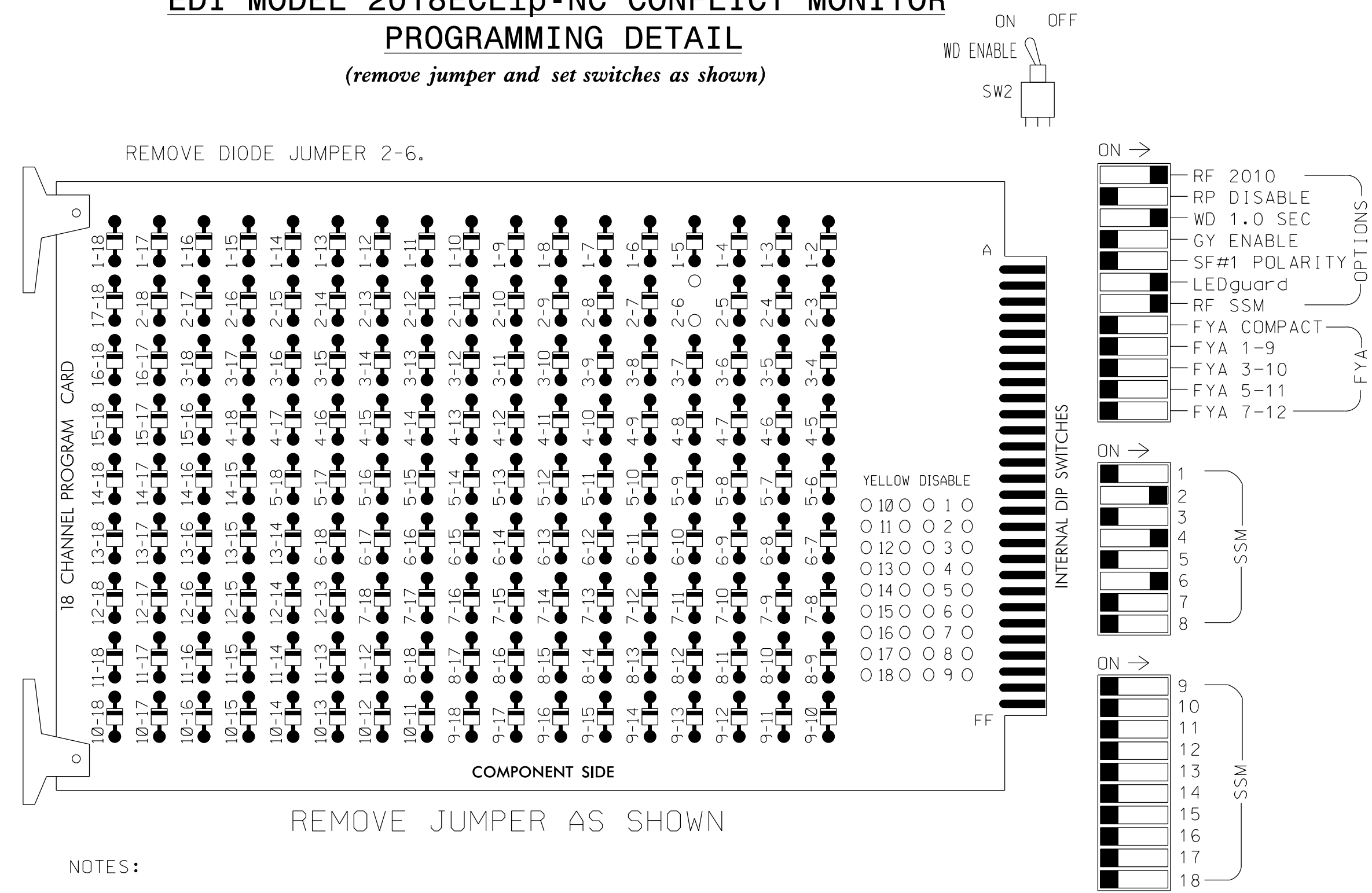
REVISIONS	INIT.	DATE

Developed by: Melissa B. Toth 6/7/2018
 SIGNATURE: _____ DATE: _____
 SIG. INVENTORY NO. 07-0210

07-JUN-2018 11:14
 SIGNALING DESIGNER
 ALEX3361 AT LUS210849

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.

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 75.1

SIGNAL HEAD HOOK-UP CHART

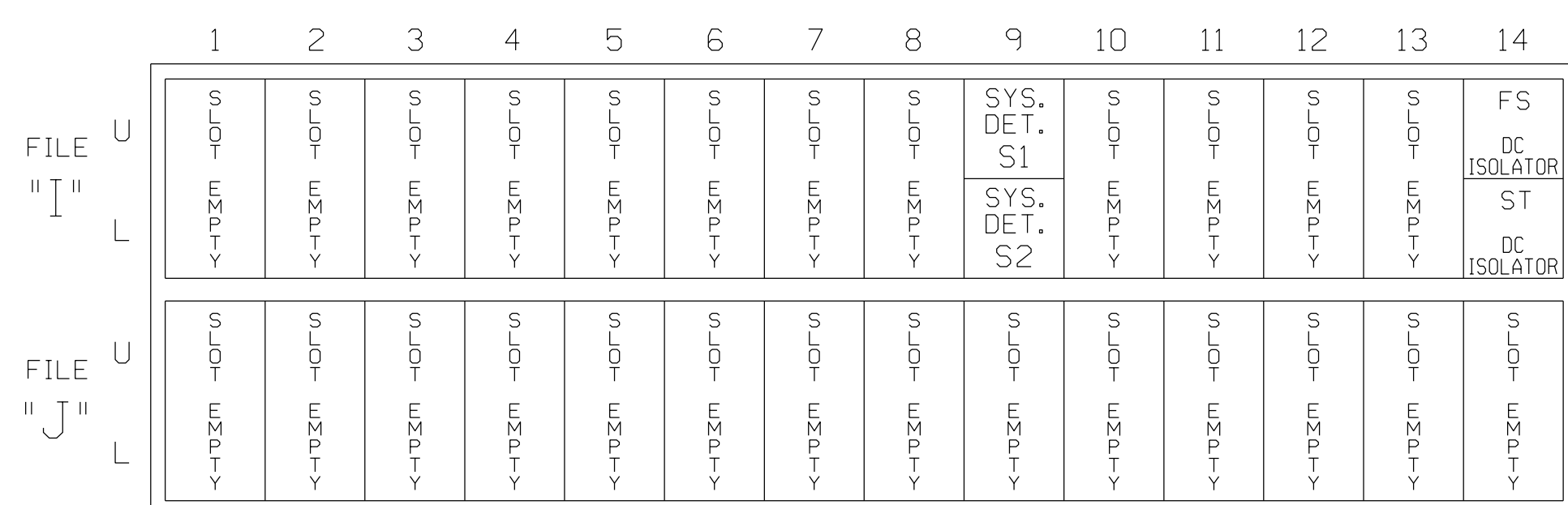
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

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
 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

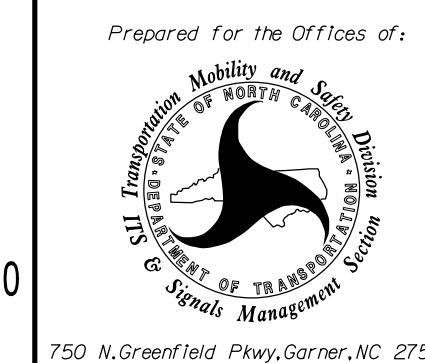
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
*S1	TB6-9,10	I9U	60	11	SYS	NO				N
*S2	TB6-11,12	I9L	62	13	SYS	NO				N

* System detector only. Remove any assigned vehicle phase.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0210
 DESIGNED: August 2017
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:



NC 87-100 (W. Webb Avenue) at S. Worth Street

Division 7 Alamance County Burlington
 PLAN DATE: August 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 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 025892 MELISSA B. TOTH

6/11/2018

SIG. INVENTORY NO. 07-0210

PHASING DIAGRAM

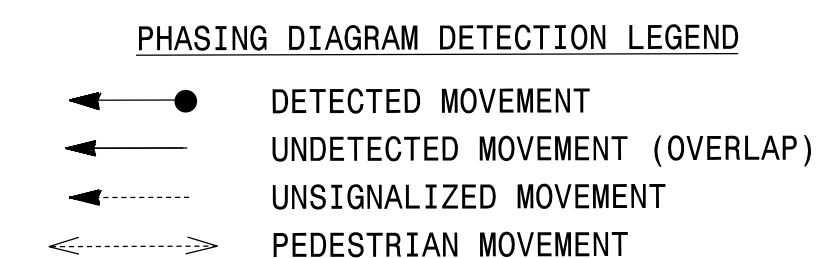
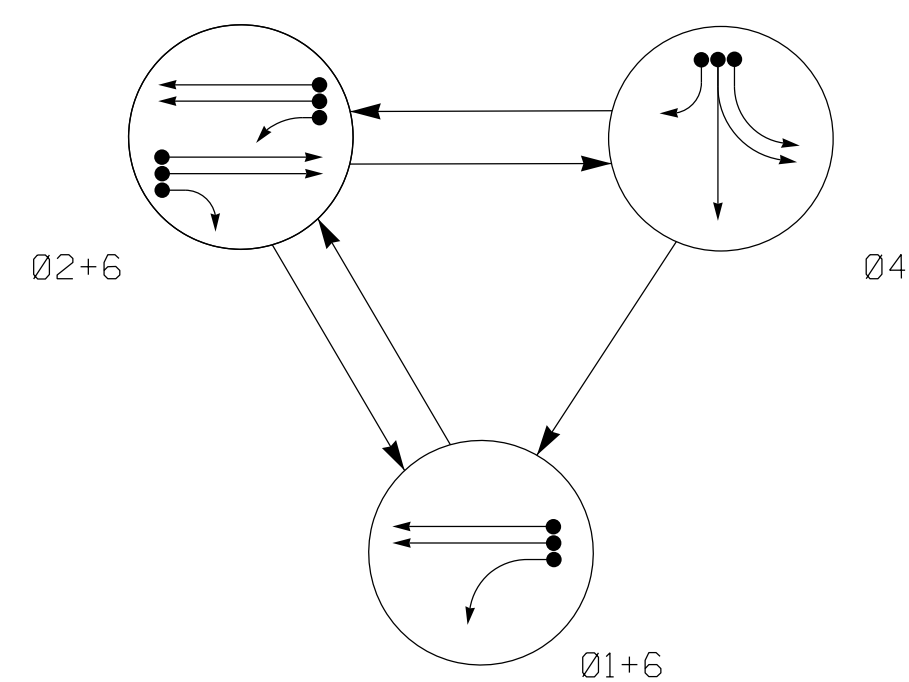
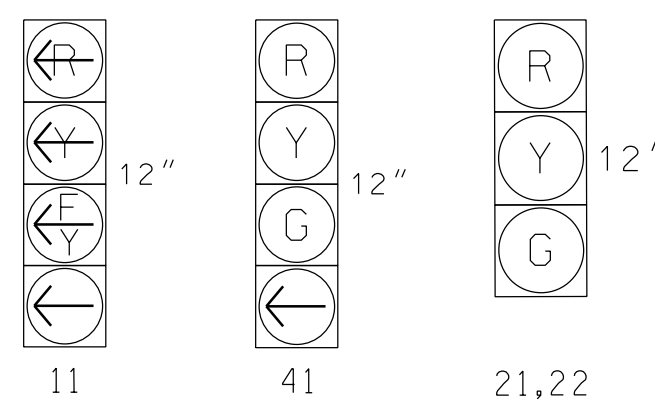


TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



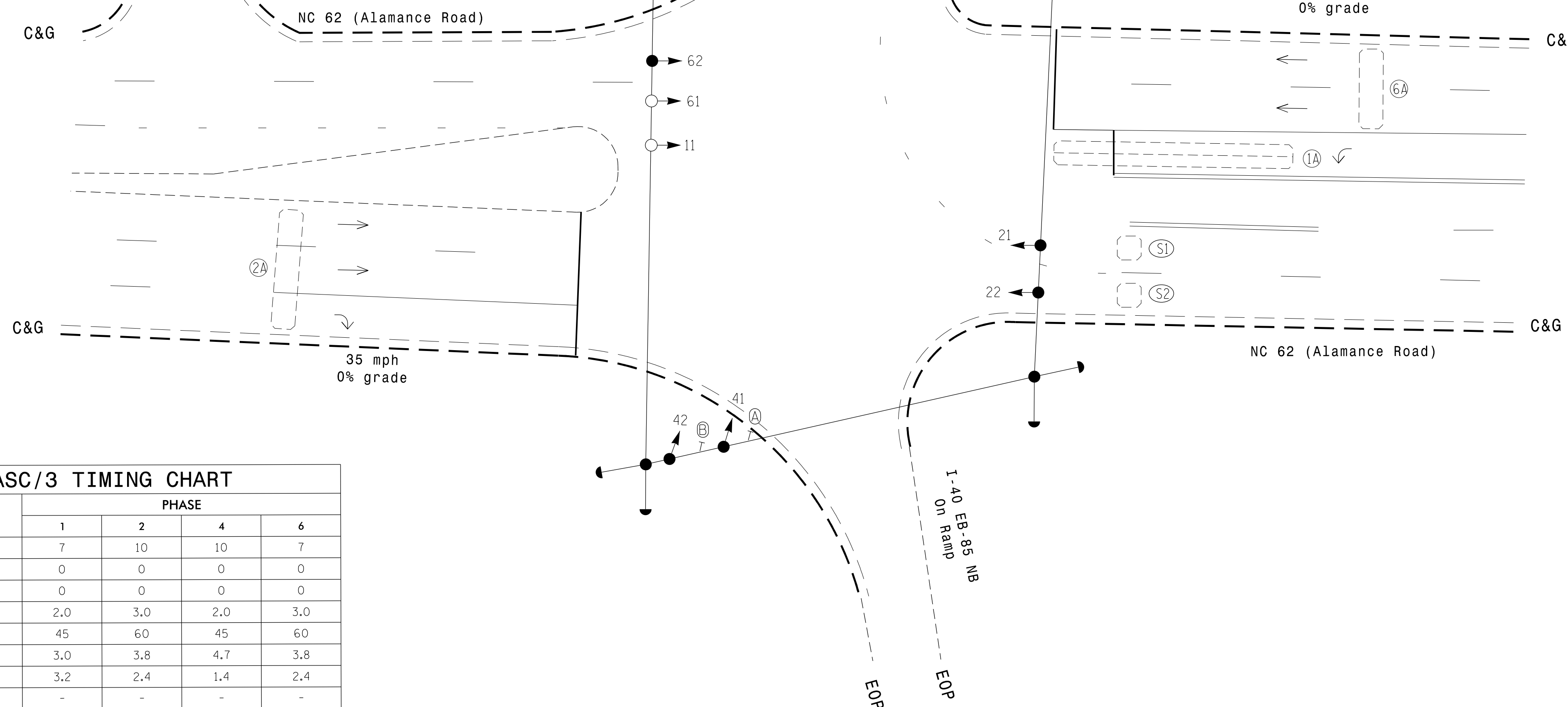
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	PROGRAMMING									
			TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X60	+15	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X30	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4C	6X40	0	2-4-2	-	4	Yes	-	15	-	S	-	X
4D	6X6	0	EXIST	-	4	Yes	-	15	-	S	-	X
6A	6X20	70	EXIST	-	6	Yes	-	-	-	S	-	X
S1	6X6	+135	EXIST	-	-	NO	-	-	-	N	X	X
S2	6X6	+135	EXIST	-	-	NO	-	-	-	N	X	X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal head number 62.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

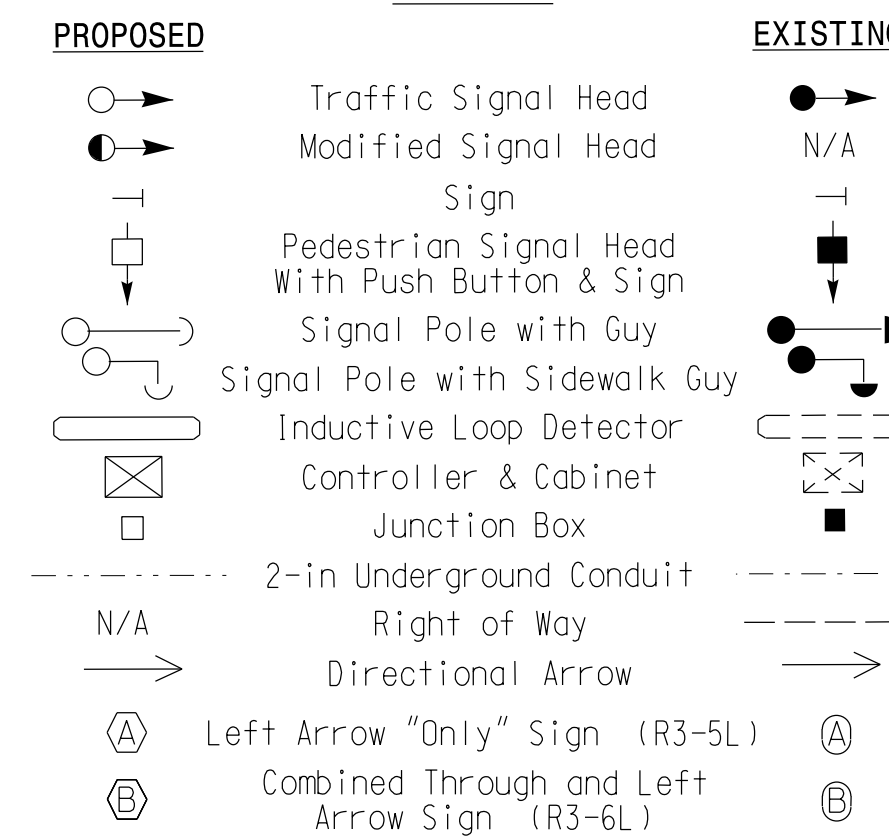


ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	45	60	45	60
Yellow	3.0	3.8	4.7	3.8
Red Clear	3.2	2.4	1.4	2.4
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	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND



Signal Upgrade

750 N. Greenfield Parkway, Garner, NC 27529

SCALE: 0 20 1"=20'

NC 62 (Alamance Road) at I-40 EB-85 NB Ramps

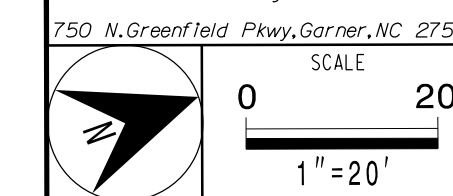
Division 7 Alamance County Burlington

PLAN DATE: October 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: MB Toth
REVISIONS	INIT. DATE

SEAL

MELISSA B. TOTH

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

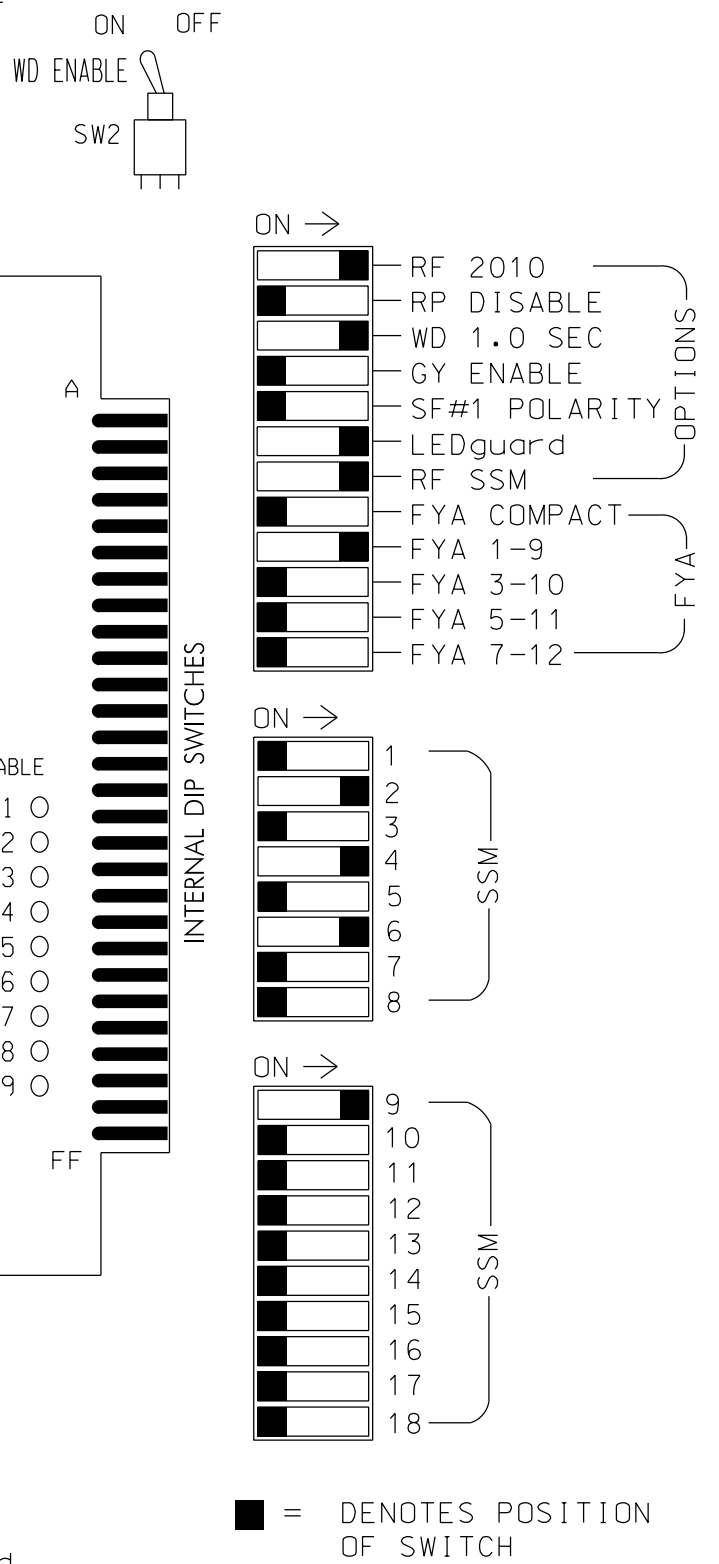
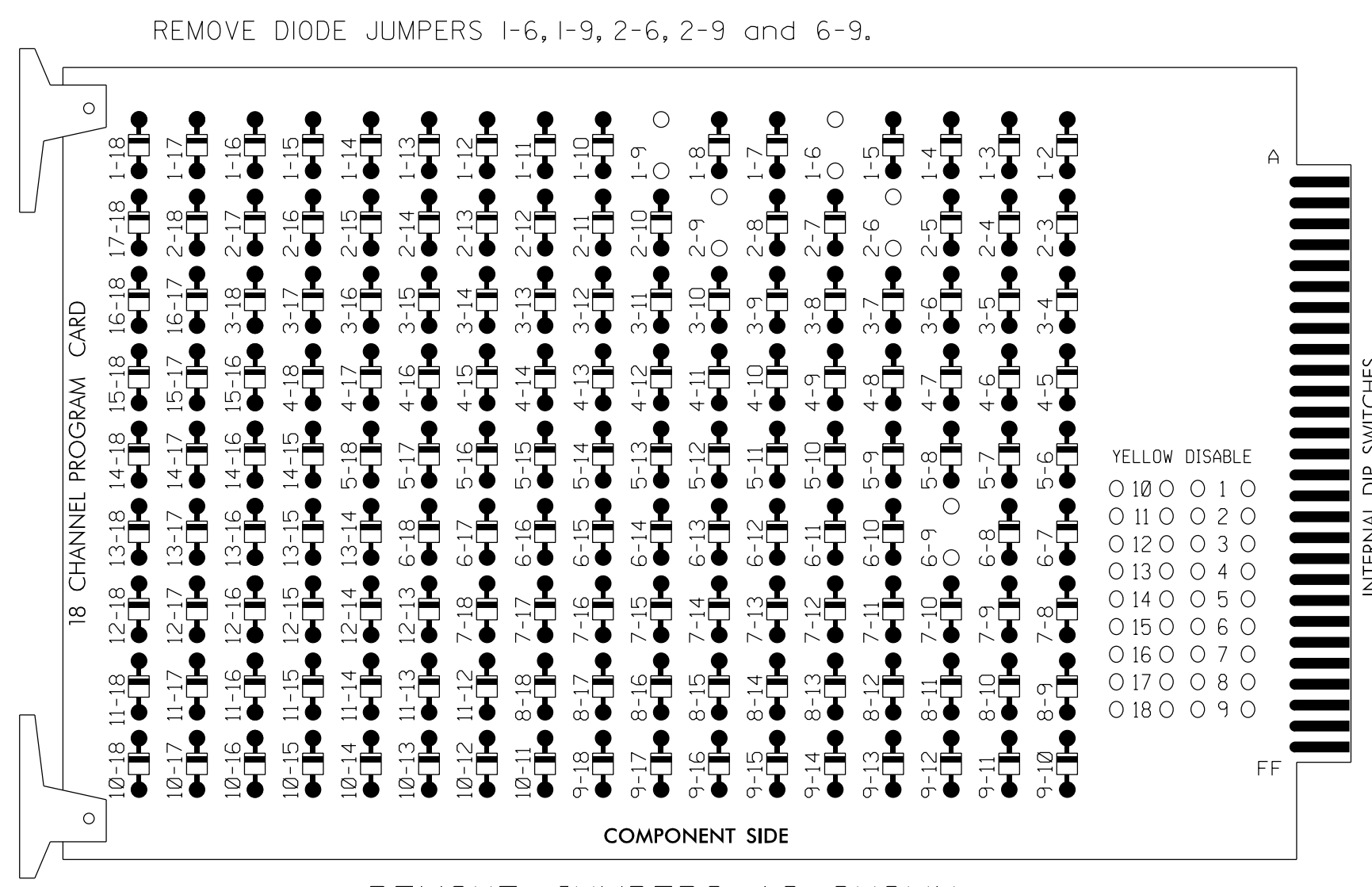


Prepared by: Melissa B. Toth	DATE: 6/7/2018
------------------------------	----------------

SIG. INVENTORY NO.	07-0220
--------------------	---------

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONDLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2.

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Fig. 76.1

SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

- ★ See pictorial of head wiring in detail this sheet.
- * Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

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

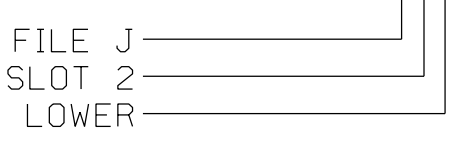
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 ⊗ Wired Input - Do not populate slot with detector card

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 ¹	TB2-1,2	I1U	56	1	1	YES		15		S
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES				S
4C	TB6-1,2	I7U	65	34	4	YES		15		S
4D	TB6-3,4	I7L	78	44	4	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES				S
* S1	TB7-9,10	J9U	59	15	SYS	NO				N
* S2	TB7-11,12	J9L	61	17	SYS	NO				N

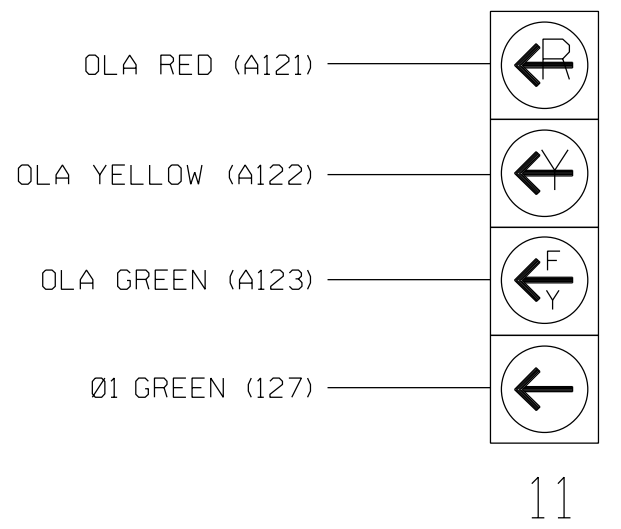
- ¹Add jumper from I1-W to J4-W, on rear of input file.
- * System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



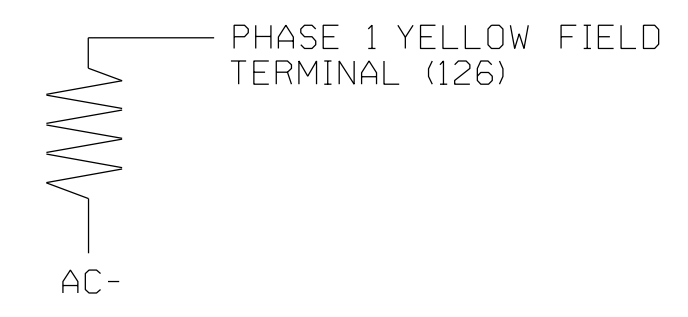
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 62 (Alamance Road) at I-40 EB-85 NB Ramps		SEAL
	Division 7 Alamance County Burlington PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion PREPARED BY: NA PtaK REVIEWED BY: MB Toth	REVISIONS INIT. DATE _____ _____		DATE 6/11/2018 _____

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

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 07-0220

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0220
 DESIGNED: October 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 13:38
 D:\Consolidation\Projects\00056469 U-6015 B-G S19 SysTask 05_11_Signal\Des\gn\wlr\Inq07-0220E.dgn
 ALEX3361 AT LUS30669

Electrical Detail - Sheet 2 of 2

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

<p style="text-align: center; font-size: small;">Prepared for the Offices of:</p> <p style="text-align: center; font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>NC 62 (Alamance Road) at I-40 EB-85 NB Ramps</p> <p style="font-size: x-small;">Division 7 Alamance County Burlington</p> <p style="font-size: x-small;">PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion</p> <p style="font-size: x-small;">PREPARED BY: NA Ptak REVIEWED BY: MB Toth</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">SEAL 025892 MELISSA B. TOTH</p> <p style="font-size: x-small;">Developed by: <u>Melissa B. Toth</u> 6/11/2018</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-0220</p>
REVISIONS	INIT.	DATE									

ATKINS

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

THIS SHEET LEFT INTENTIONALLY BLANK

18-JUN-2018 15:10
 ***work files.com\projects\US\RA\Transportation\Traffic\Cur**10056469 U-6015 B-C S19 Sys*Task 05-11-Signal\Design\07-0263 (FUTURE).dgn
 P183636 AT US40478

Signal Upgrade



SR 1716 (N. Graham-Hopedale Rd)
 at
 SR 1343 (Martin Street) (Future)
 Division 7 Alamance County Burlington
 PLAN DATE: June 2018 REVIEWED BY: MBT
 PREPARED BY: NAP REVIEWED BY: AME

750 N. Greenfield Pkwy, Garner, NC 27529

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

REVISIONS	INIT.	DATE

NTS

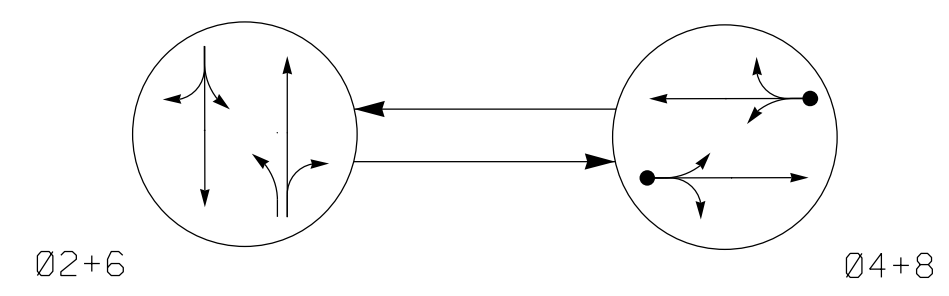
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SIGNATURE _____ DATE _____

SIG. INVENTORY NO. 07-0263

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

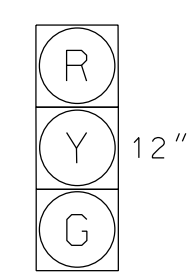
- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←... UNSIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



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

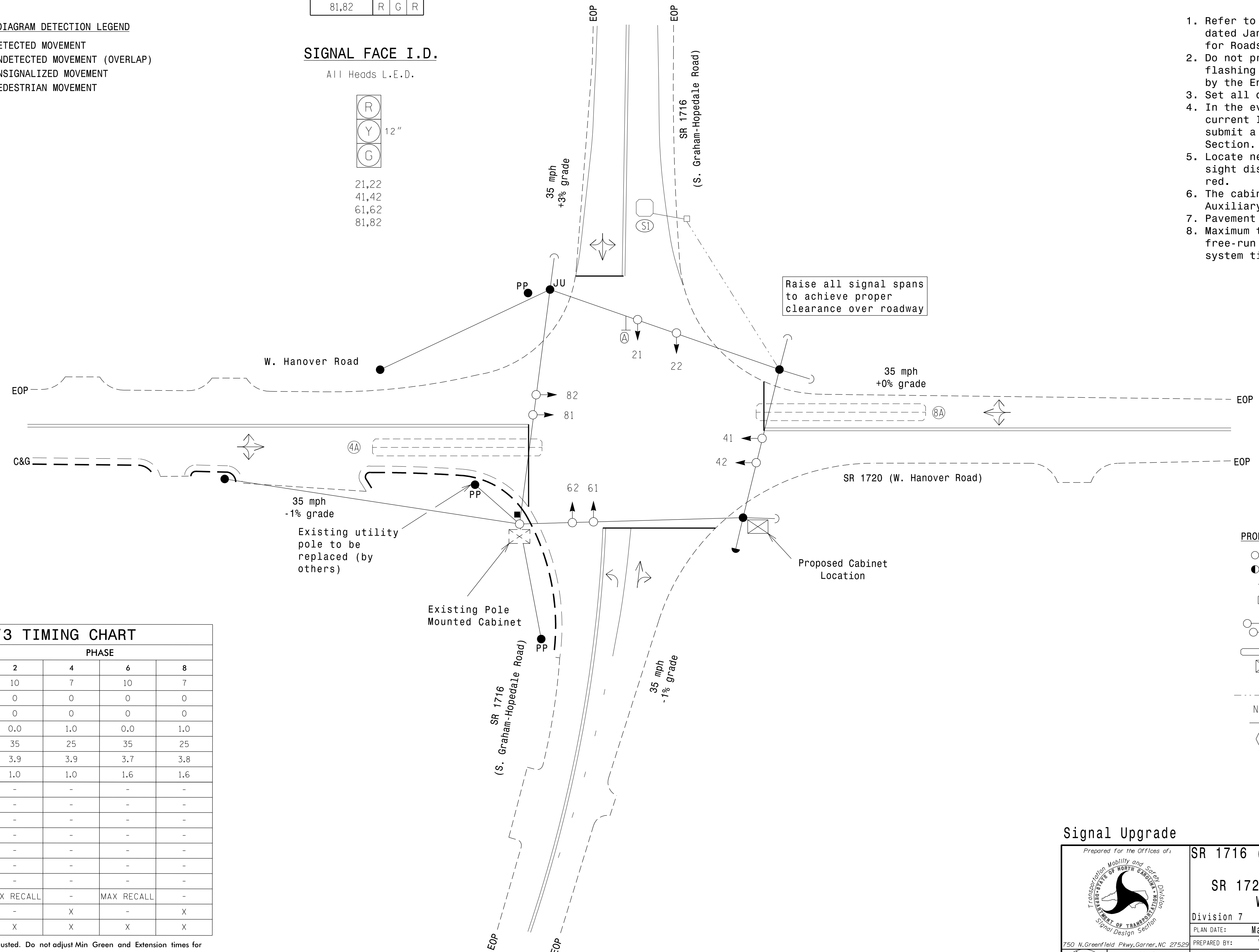
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
4A	6X60	+5	2-4-2	-	4	Yes	-	5	-	S	-	X
8A	6X60	+3	2-4-2	-	8	Yes	-	5	-	S	-	X
S1	6X6	+110	3	X	-	No	-	-	-	N	X	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. 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. The 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 *	0.0	1.0	0.0	1.0
Max I *	35	25	35	25
Yellow	3.9	3.9	3.7	3.8
Red Clear	1.0	1.0	1.6	1.6
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	-	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	●→ N/A
◐→ Modified Signal Head	+
⊥ Sign	⊥
⊥ Pedestrian Signal Head	⊥
⊥ With Push Button & Sign	⊥
○→ Signal Pole with Guy	●→ Signal Pole with Guy
○→ Signal Pole with Sidewalk Guy	●→ Signal Pole with Sidewalk Guy
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Junction Box
⊥ Junction Box	⊥
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
⊙ Left Arrow "ONLY" Sign (R3-5L)	⊙ Left Arrow "ONLY" Sign (R3-5L)

Signal Upgrade

Prepared for the Offices of:

SR 1716 (S. Graham-Hopedale Rd) at SR 1720 (W. Hanover Road) / W. Hanover Road

Division 7 Alamance County Burlington

PLAN DATE: March 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 20 1"=20'

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 023489

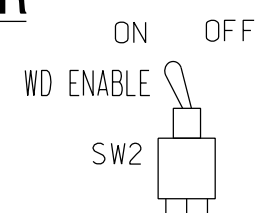
6/7/2018

SIG. INVENTORY NO. 07-0292

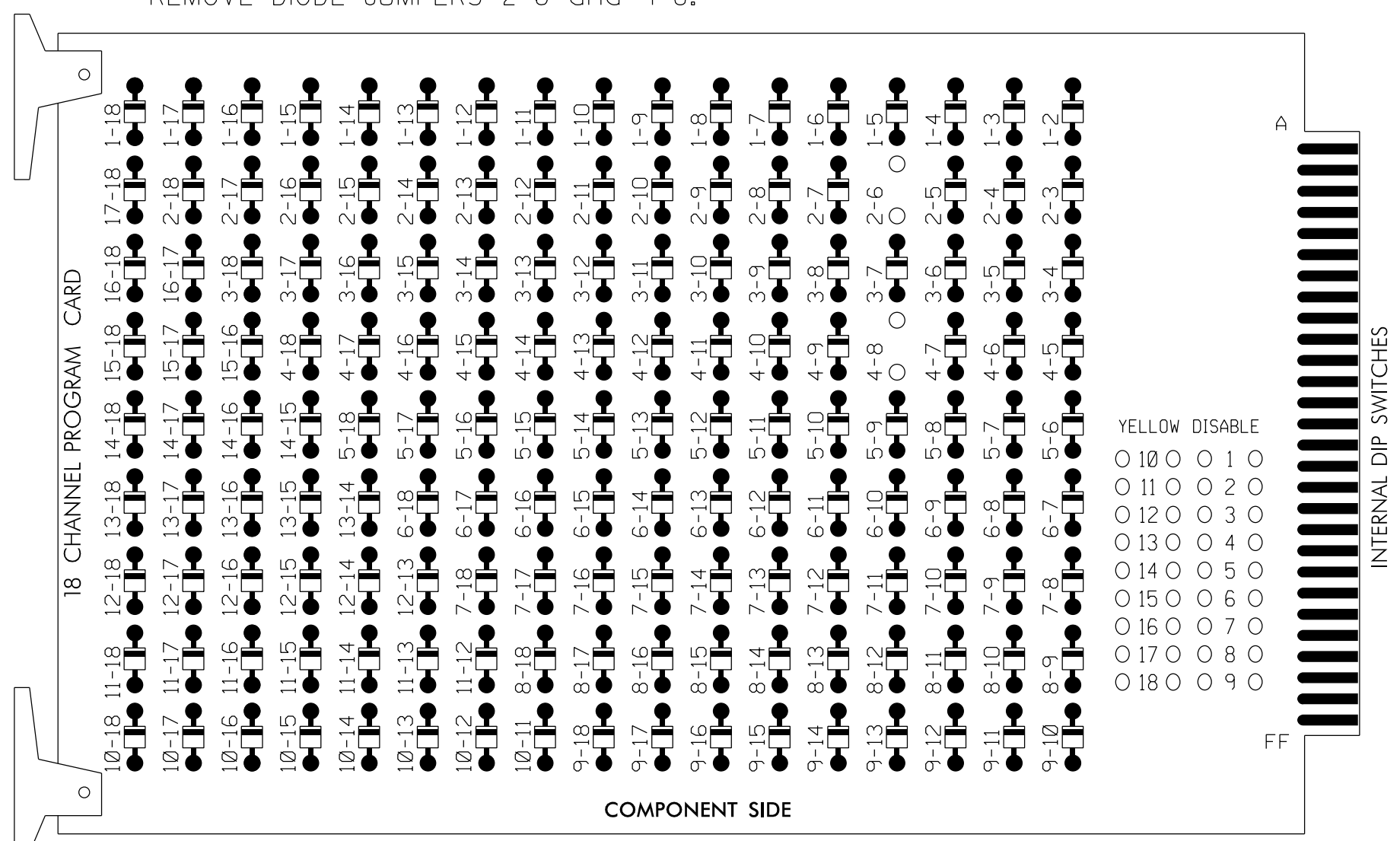
07-JUN-2018 11:15 D:\Projects\atkins\Projects\00056469 U-6015 B-G S19 SystemTask 05_11_Signal\Des\gsm07-0292.dgn ALEX3361 AT LUS336069

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



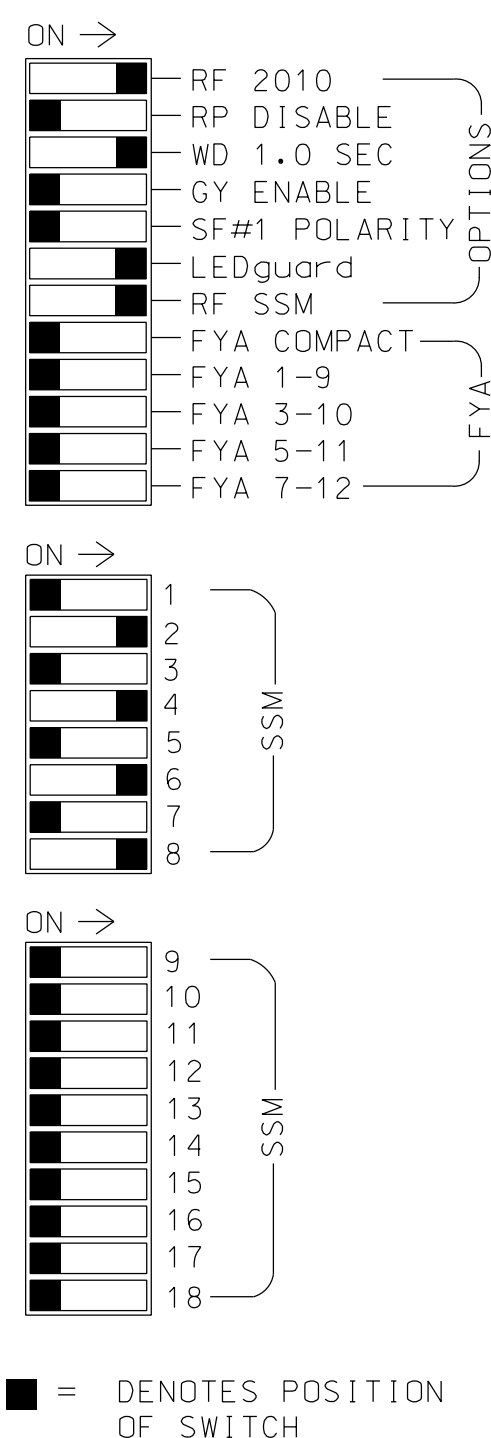
REMOVE DIODE JUMPERS 2-6 and 4-8.



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

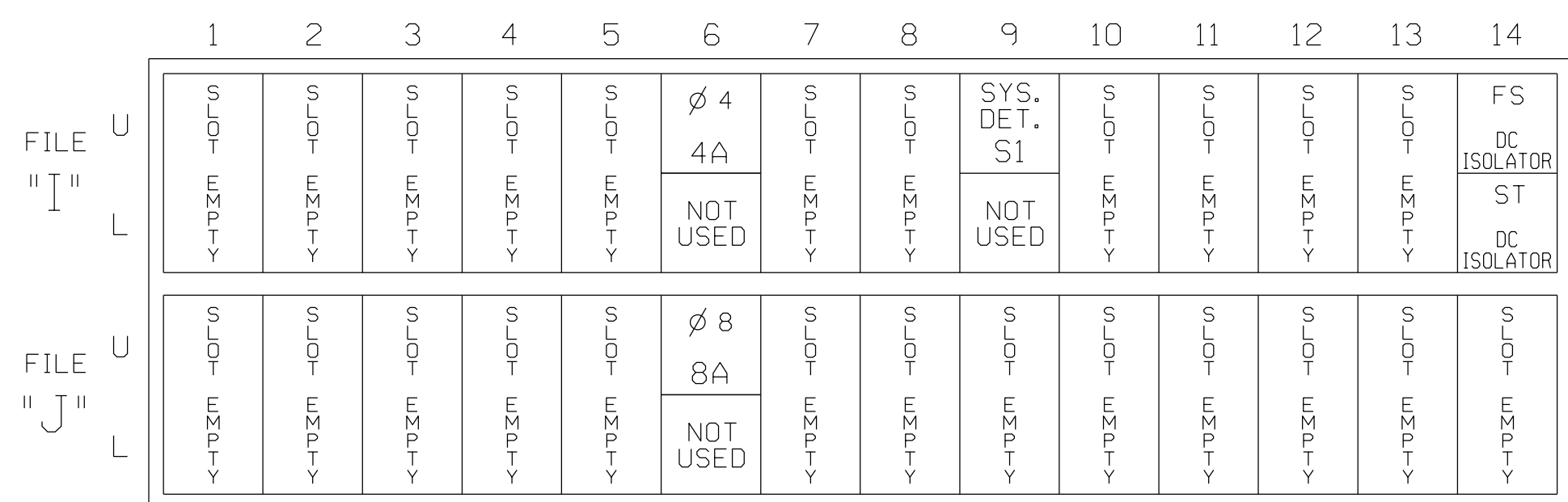
SIGNAL HEAD HOOK-UP CHART

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	3	4	4	5	6	6	7	8	8	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	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

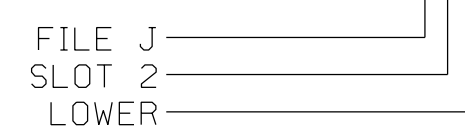
FS = FLASH SENSE
ST = STOP TIME

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
4A	TB4-9,10	I6U	41	4	4	YES		5		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
8A	TB5-9,10	J6U	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: 07-0292
 DESIGNED: MARCH 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1716 (S. Graham-Hopedale Rd) at

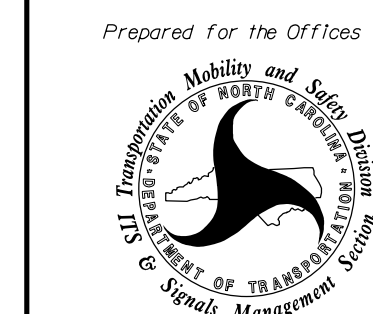
SR 1720 (W. Hanover Road) / W. Hanover Road

Division 7 Alamance County Burlington

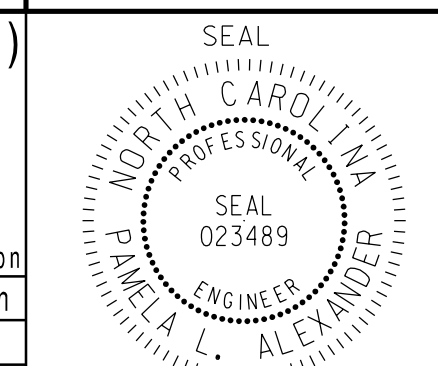
PLAN DATE: March 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

REVISIONS INIT. DATE



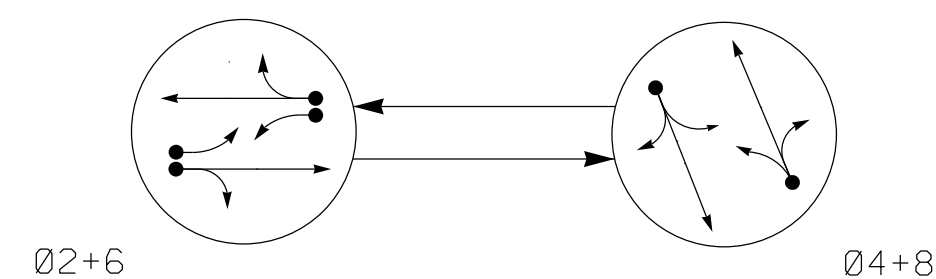
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

SIG. INVENTORY NO. 07-0292

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

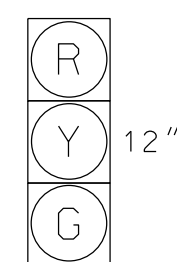
- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←- UN SIGNALIZED MOVEMENT
- ←- - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	F L HEADS
2,22	G	R	Y
4,42	R	G	R
6,62	G	R	Y
8,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



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

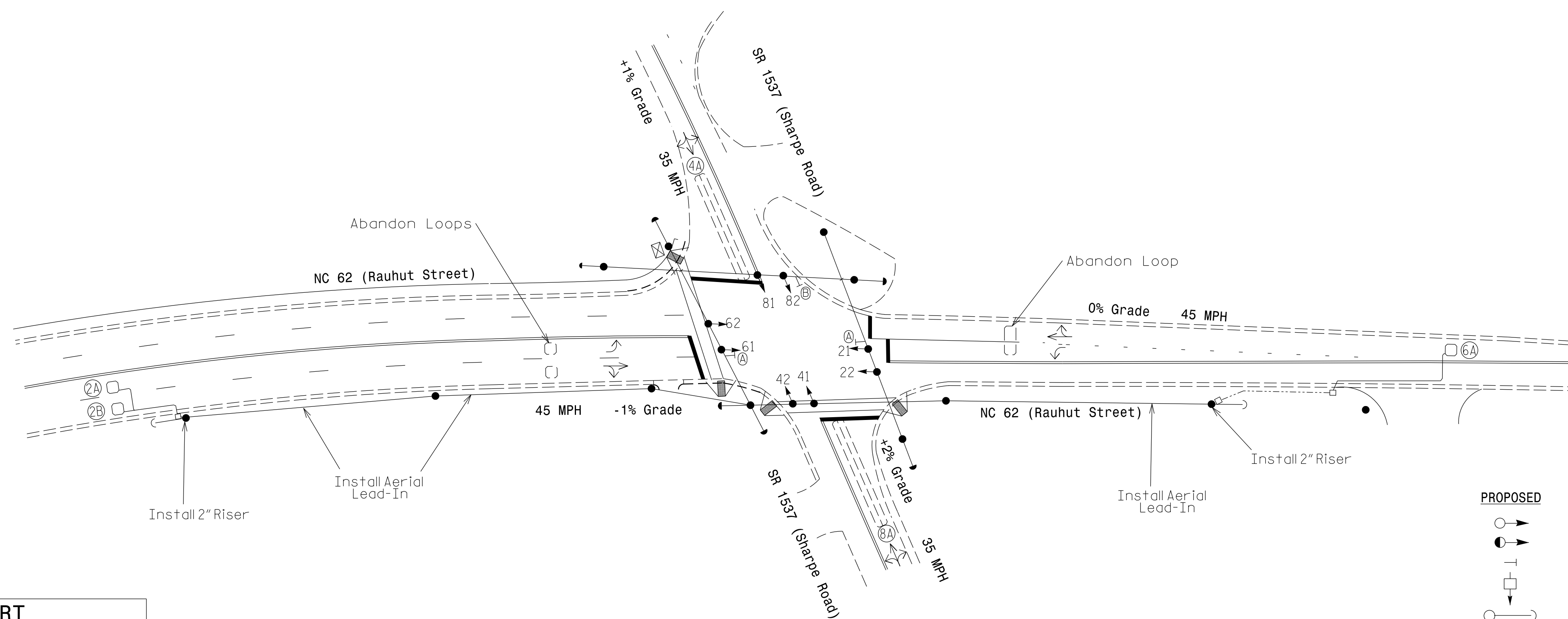
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	5	-	S	-	X
6A	6X6	300	5	X	6	Yes	-	-	X	N	-	X
8A	6X60	0	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.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	6.0	2.0
Max I *	90	20	90	20
Yellow	4.6	3.8	4.5	3.7
Red Clear	1.2	1.6	1.4	2.4
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	1.5	-	2.5	-
Max Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH, RECALL	-	VEH, RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

PROPOSED	EXISTING
	N/A

Prepared in the Office of:



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

Signal Upgrade

Prepared For:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
DEPARTMENT OF TRANSPORTATION
SIGNAL DESIGN SECTION
750 N. Greenfield Pkwy, Garner, NC 27529
SCALE
0 40
1" = 40'

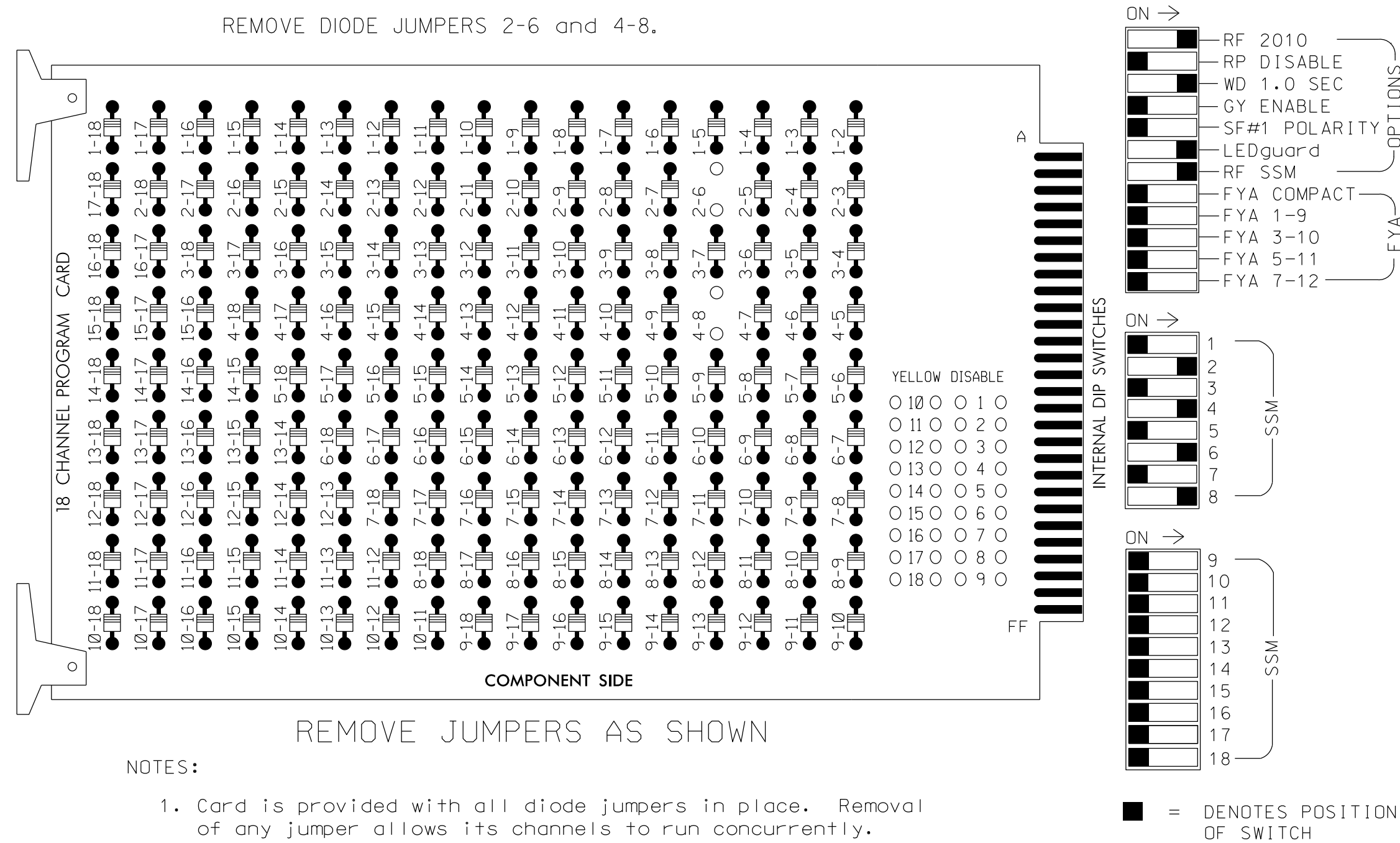
NC 62 (Rauhut Street) at SR 1537 (Sharpe Road)
Division 7 Alamance County Burlington
PLAN DATE: April 2018 REVIEWED BY: E. Sirgany
PREPARED BY: M. Parker REVIEWED BY:
REVISIONS INIT. DATE
DocuSigned by: Edward W Sirgany 5/16/2018
SIC. INVENTORY NO. 07-0350

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 018174
EDWARD W. SIRGANY
DATE

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- 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	Z PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	QLA	QLB	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																		

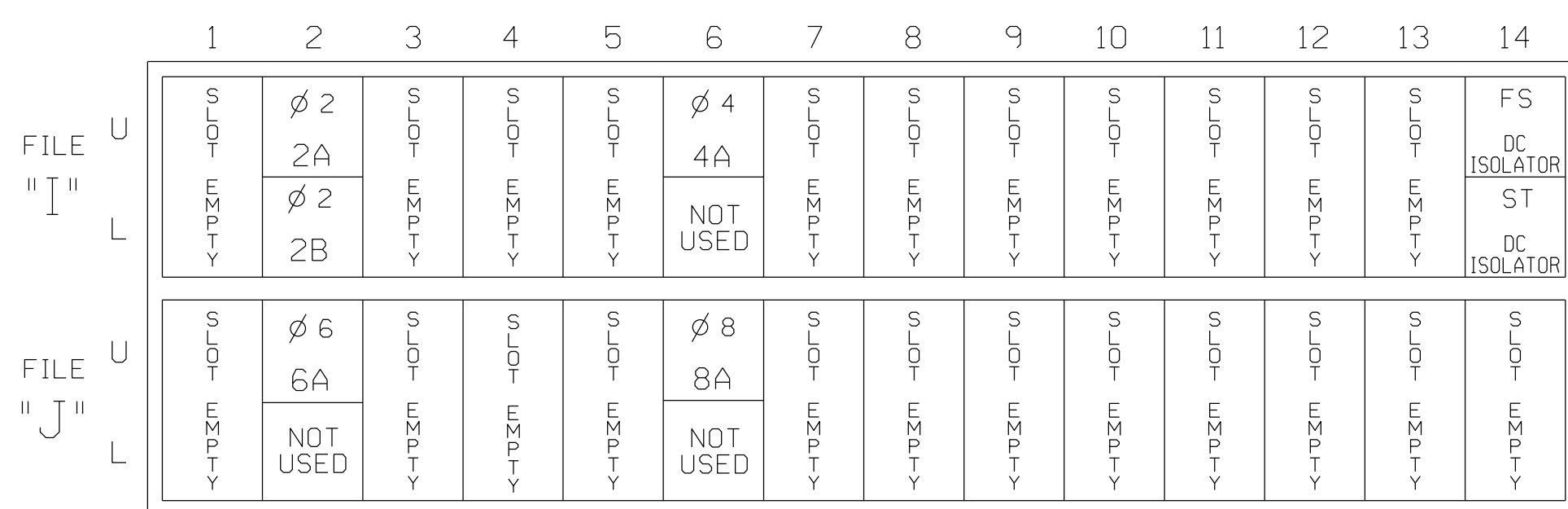
NU = Not Used

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
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	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
8A	TB5-9,10	J6U	42	8	8	YES		5		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0350
 PREPARED: April 2018
 SEALED: 5/16/2018
 REVISED: N/A

*****SYSTEMS*****
 *****DESIGN*****
 *****DRAWING*****
 *****DATE*****

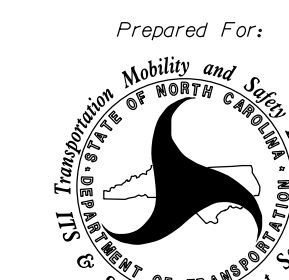
Electrical Detail

Prepared in the Office of:



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

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 62 (Rauhut Street)
 at
 SR 1537 (Sharpe Road)

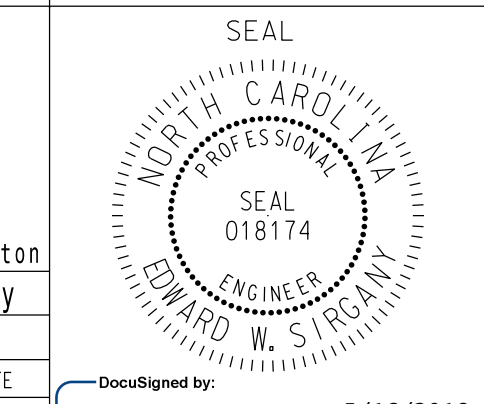
Division 7 Alamance County Burlington

PLAN DATE: April 2018 REVIEWED BY: E. W. Sirgany

PREPARED BY: J. Smith REVIEWED BY:

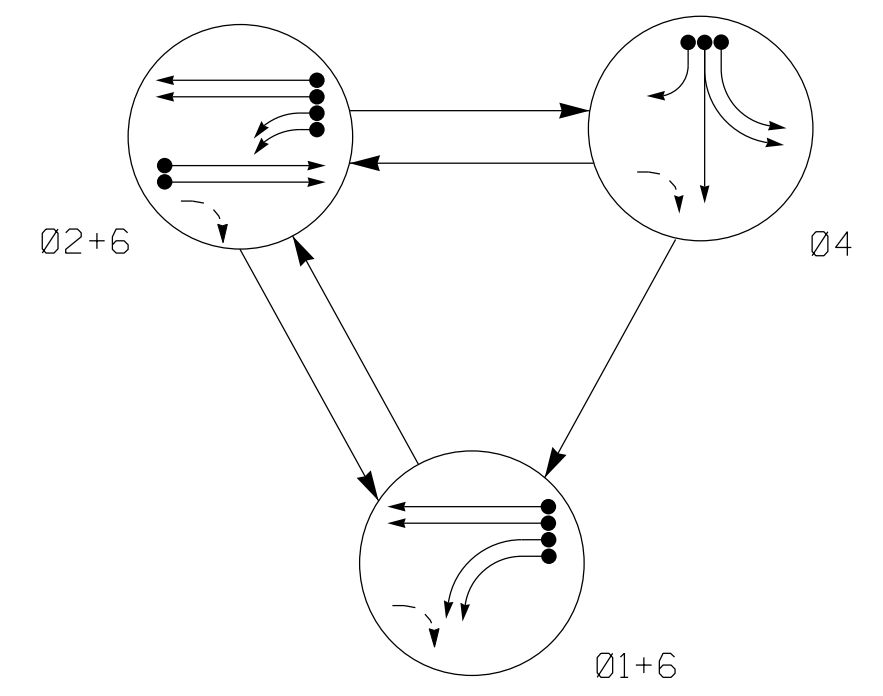
REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

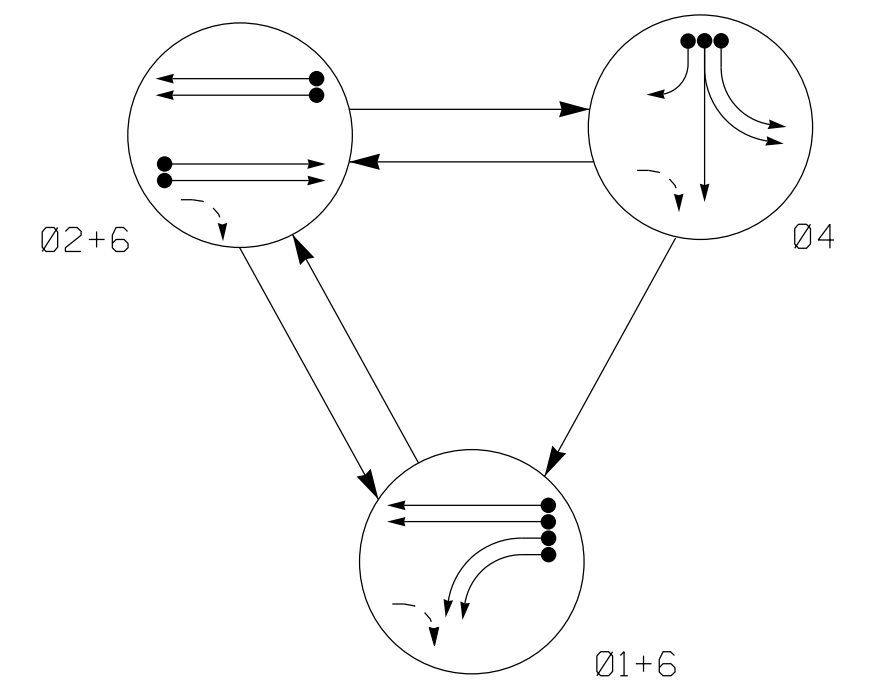


DocuSign by: Edward W. Sirgany 5/16/2018
 SEAL 018174
 DATE: 5/16/2018
 SIG. INVENTORY NO. 07-0350

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

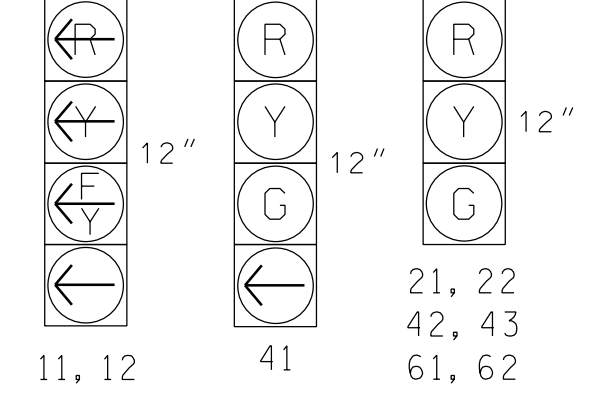
SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
11, 12	←	→	←	→
21, 22	R	G	R	Y
41	R	R	G	R
42, 43	R	R	G	R
61, 62	G	G	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
11, 12	←	→	←	→
21, 22	R	G	R	Y
41	R	R	G	R
42, 43	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

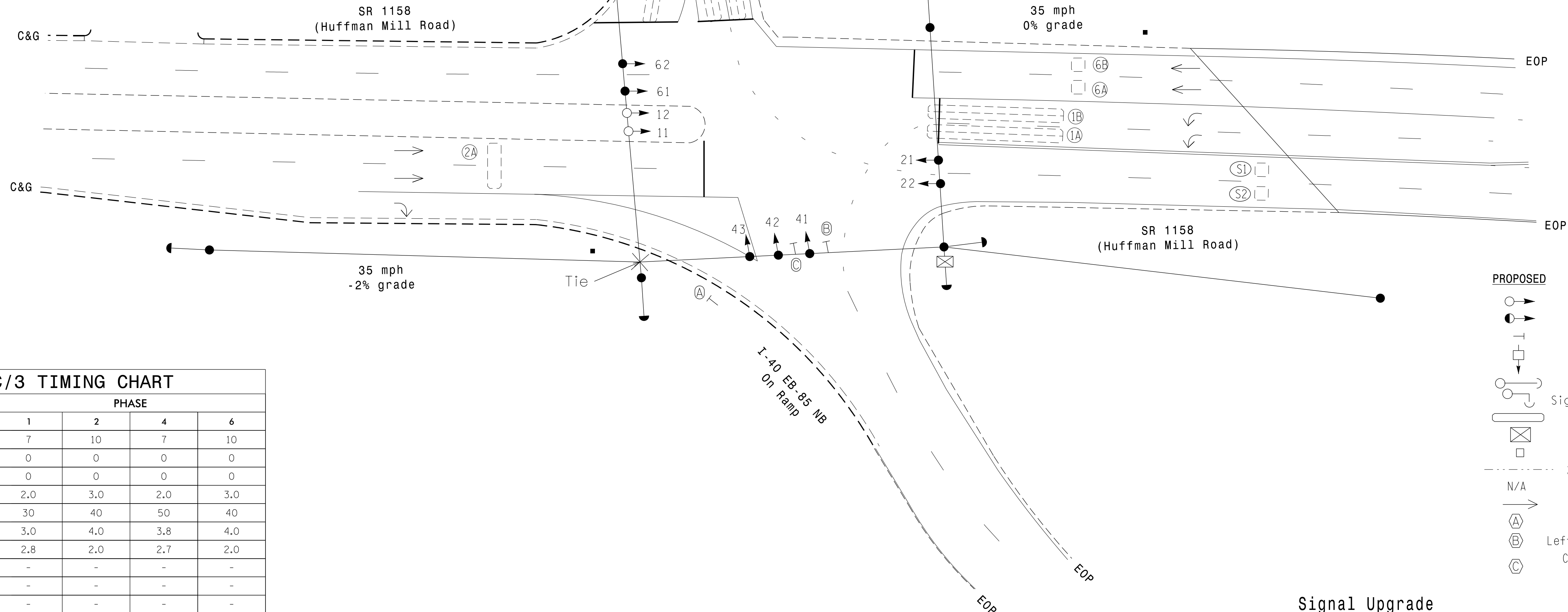
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	*15	-	S	-	X
1B	6X60	+5	2-4-2	-	1	Yes	-	*15	-	S	-	X
					**6	Yes	-	-	-	S	-	X
2A	6X20	90	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4C	6X60	0	2-4-2	-	4	Yes	-	15	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
S1	6X6	+250	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+250	EXIST	-	-	No	-	-	-	N	X	X

- * Disable delay during alternate phasing operation.
- ** Disable phase 6 call during alternate phasing operation.

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

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



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	7	10
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	30	40	50	40
Yellow	3.0	4.0	3.8	4.0
Red Clear	2.8	2.0	2.7	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ⊥ Sign | ⊥ N/A |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ N/A |
| ○ Signal Pole with Guy | ● Signal Pole with 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 |
| (A) "YIELD" Sign (R1-2) | (A) "YIELD" Sign (R1-2) |
| (B) Left Arrow "ONLY" Sign (R3-5L) | (B) Left Arrow "ONLY" Sign (R3-5L) |
| (C) Combined Through and Left Arrow Sign (R3-6L) | (C) Combined Through and Left Arrow Sign (R3-6L) |

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For the Offices of:

SR 1158 (Huffman Mill Road) at I-40 EB-85 NB Ramps

Division 7 Alamance County Burlington

PLAN DATE: February 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 30 1"=30'

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

6/7/2018

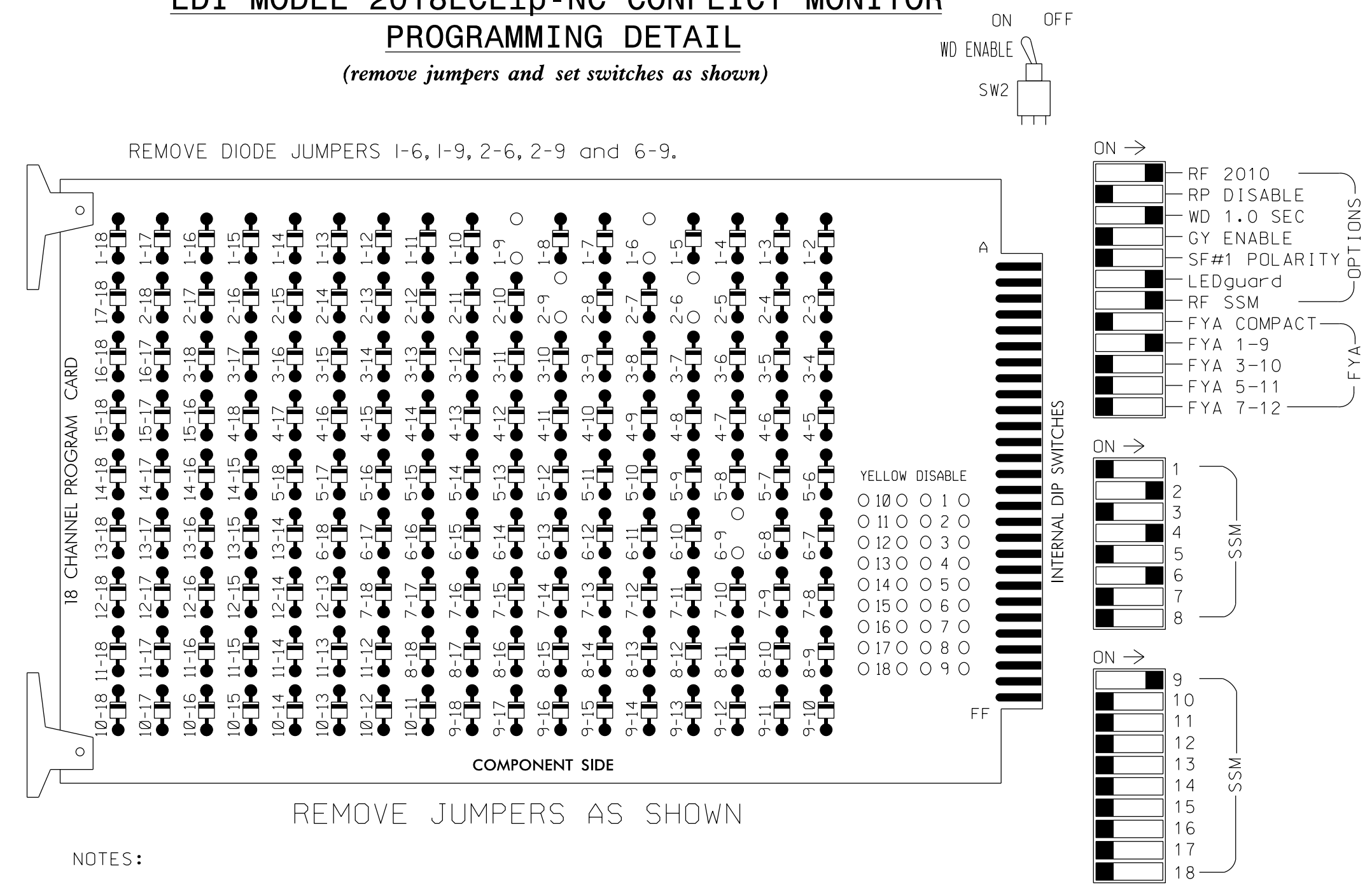
Signature: Pamela Alexander

SIG. INVENTORY NO. 07-0410

07-JUN-2018 11:15 O:\Projects\2018\Traffic\Task\Task 05_11_Sig\Task 05_11_Sig.dgn

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- REMOVE DIODE JUMPERS 1-6, 1-9, 2-6, 2-9 and 6-9.
- 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 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,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

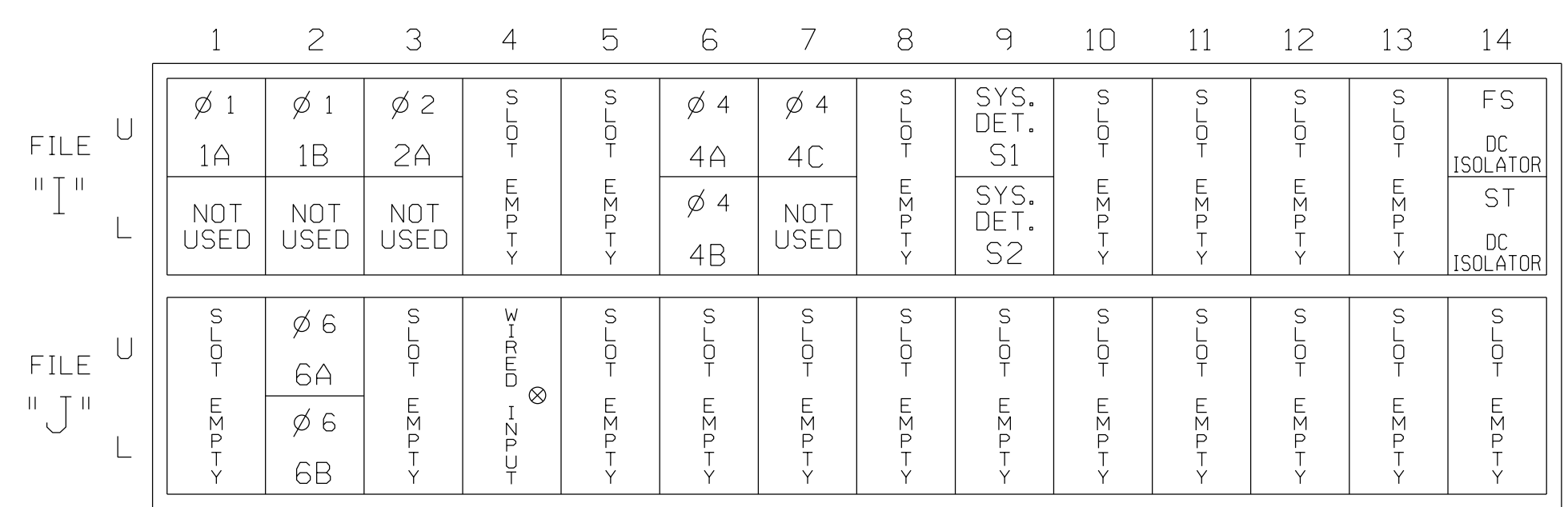
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	NU	NU	41	42,43	NU	NU	61,62	NU	NU	NU	11,12	NU	NU	NU	NU	NU
RED		128			101	101			134									
YELLOW	*	129			102	102			135									
GREEN		130			103	103			136									
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127					103												

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

INPUT FILE POSITION LAYOUT

(front view)



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

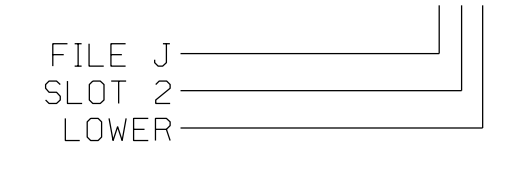
* Wired Input - Do not populate slot with detector card

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 ¹	TB2-1,2	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26★	6	YES				S
1B ²	TB2-5,6	I2U	39	2 ★	1	YES		15		S
	-	J4U	48	26★	6	YES				S
2A	TB2-9,10	I3U	63	32	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES				S
4C	TB6-1,2	I7U	65	34	4	YES		15		S
* 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
6B	TB3-7,8	J2L	44	16	6	YES				S

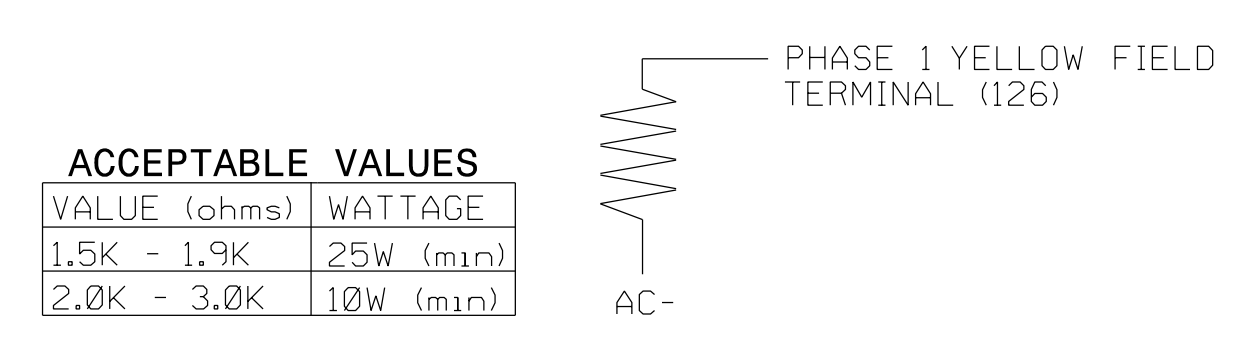
- * System detector only. Remove any assigned vehicle phase.
- ¹Add jumper from I1-W to J4-W, on rear of input file.
²Add jumper from I2-W to J4-W, on rear of input file.
- ★ See the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

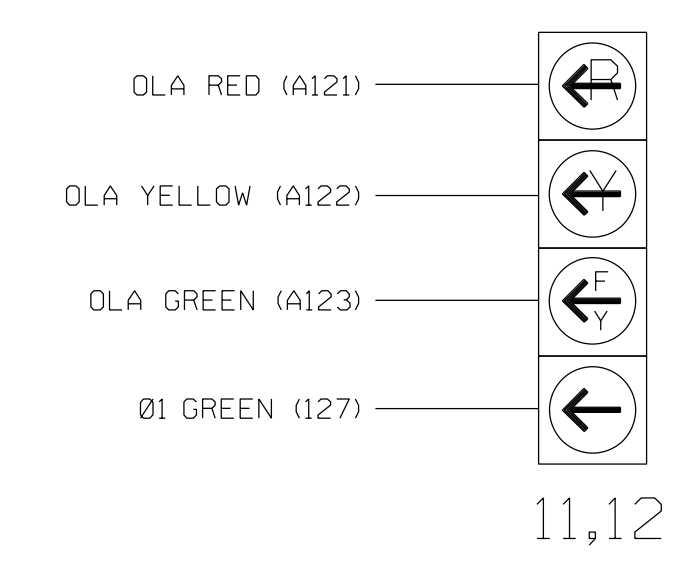
(install resistor as shown)



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

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



Electrical Detail - Sheet 1 of 3

Electrical and Programming Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1158 (Huffman Mill Road) at I-40 EB-85 NB Ramps	
Division 7	Alamance County
PLAN DATE: February 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. 07-0410

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

(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 "2".
- Set delay time to "0".

```

VEH DETECTOR [ 2]  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
  2 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"

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0410
 DESIGNED: February 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 2 of 3

	<p>SR 1158 (Huffman Mill Road) at I-40 EB-85 NB Ramps</p> <p>Division 7 Alamance County Burlington</p> <p>PLAN DATE: February 2018 REVIEWED BY: AM Encarnacion</p> <p>PREPARED BY: NA Ptak REVIEWED BY: PL Alexander</p>	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>
	<p>1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326</p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489 6/9/2018 DATE SIG. INVENTORY NO. 07-0410</p>

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 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 BITS 1: Modifies overlap parent phases for heads 11 and 12 to run protected turns only.

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

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

```

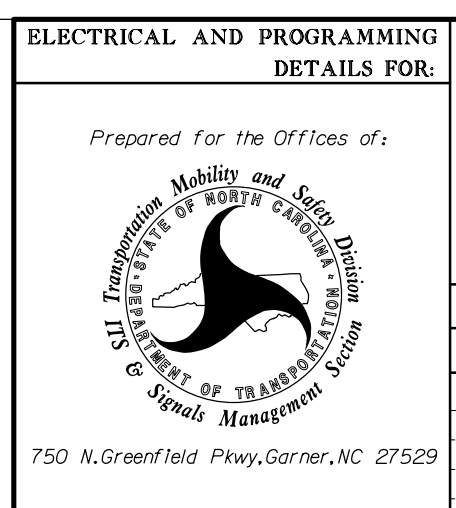
ACTION PLAN...[ 1]
PATTERN.....AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0   SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --   RED REST..... NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE.. 0   PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND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

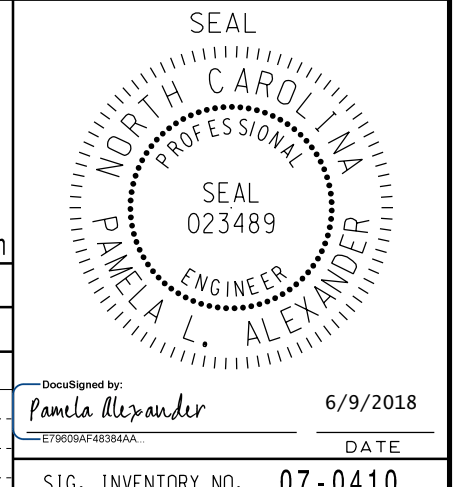
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0410
 DESIGNED: February 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ELECTRICAL AND PROGRAMMING DETAILS FOR:	
Prepared for the Offices of:	
SR 1158 (Huffman Mill Road) at I-40 EB-85 NB Ramps	
Division 7	Alamance County Burlington
PLAN DATE: February 2018	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE



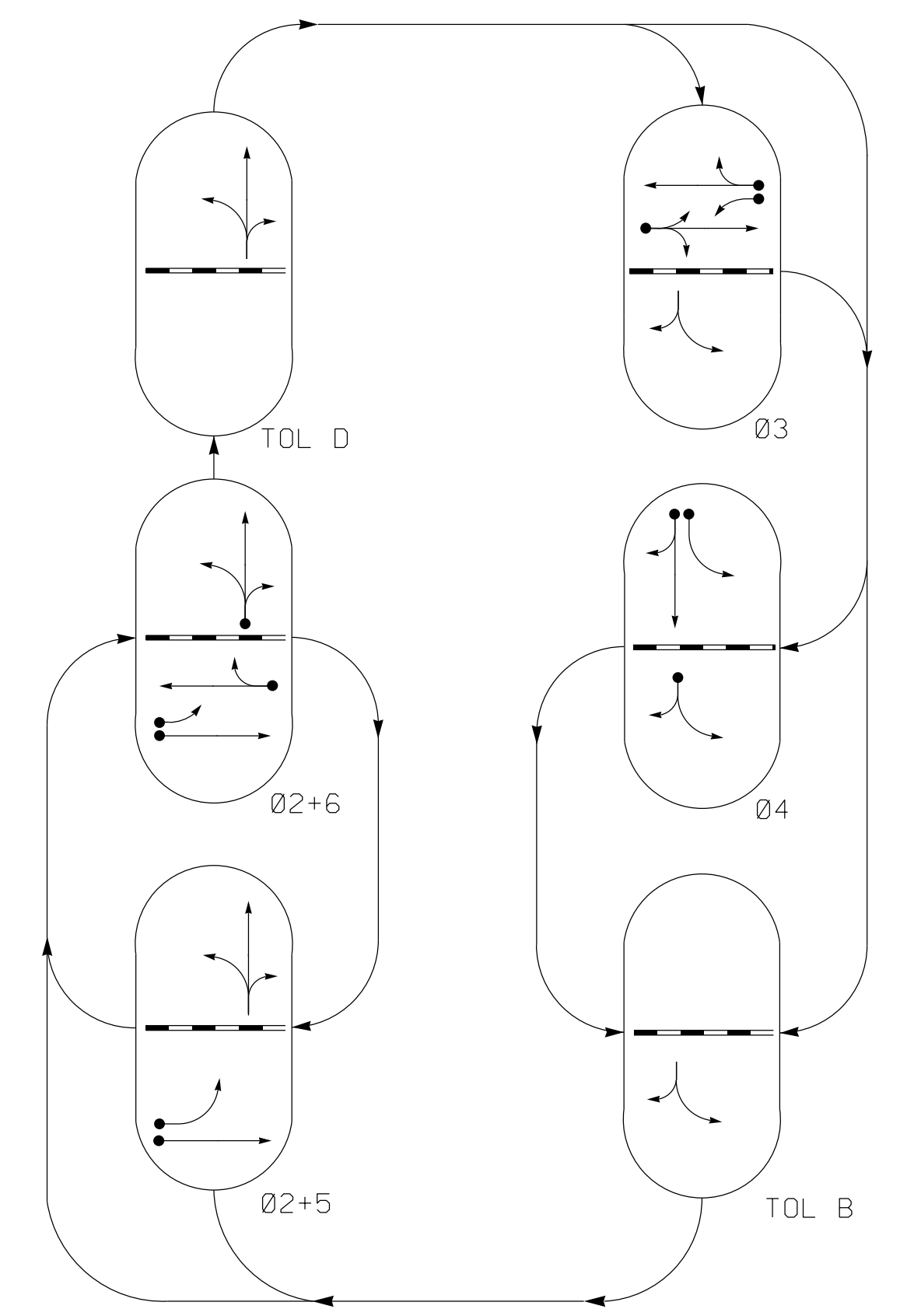
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160
 RALEIGH, NORTH CAROLINA 27609
 (919) 876-6888 NCBEES #F-0326

750 N. Greenfield Pkwy, Garner, NC 27529

6/9/2018
 Pamela Alexander
 DATE
 SIG. INVENTORY NO. 07-0410

09-JUN-2018 14:13 D:\P\consort\at\off\c\curr\100056469 U-6015 B-G S19 Sys\Task 05_11_Signal\Des\gn\mtr\ing\07-0410E.dgn ALEX3361 AT LUS30669

PHASING DIAGRAM



RAIL PREEMPT PHASES

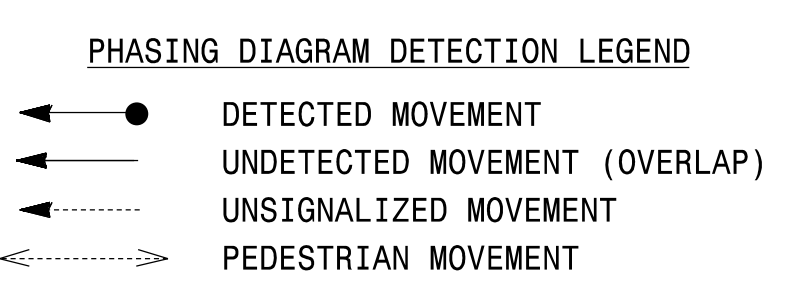
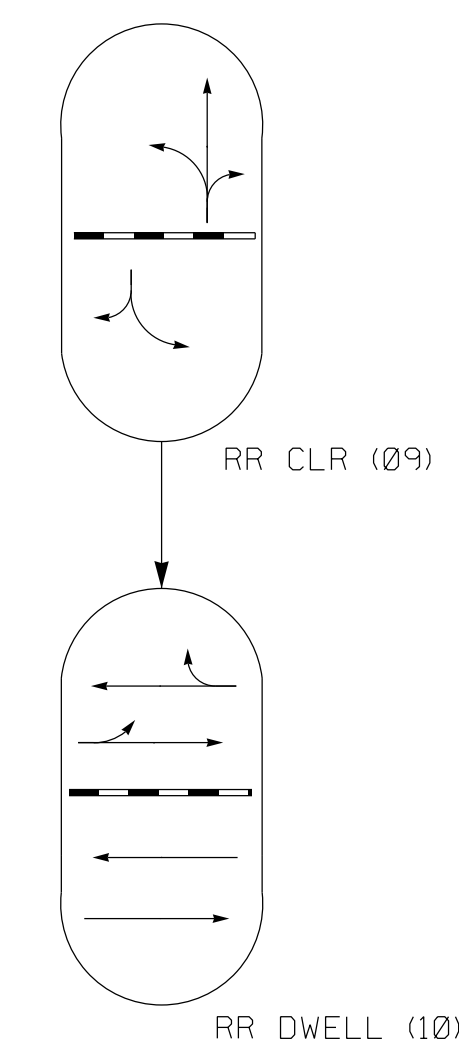


TABLE OF OPERATION

SIGNAL FACE	PHASE									
	02+5	02+6	TOL D	03	04	TOL B	RR CLR	RR DWL	RR	FLASH
21, 22	G	G	R	R	R	R	R	G	Y	
31, 32	R	R	R	G	R	R	R	G	R	
33, 34	R	R	R	G	R	R	R	G	R	
41	R	R	R	R	G	R	R	R	R	
42	R	R	R	R	G	R	R	R	R	
43, 44	R	R	R	G	G	G	G	R	R	
51	←	←	←	←	←	←	←	←	←	
61, 62	R	G	R	R	R	R	R	G	Y	
63	G	G	G	R	R	R	G	R	R	
64	G	G	G	R	R	R	G	R	R	
SIGN A	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	*	
SIGN B	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	*	

* SEE NOTE 8

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	6X40	+5	2-4-2	-	2	Yes	-	-	-	S	-	X
3A	6X40	+5	2-4-2	-	3	Yes	-	3	-	S	-	X
3B	6X40	+5	2-4-2	-	3	Yes	-	10	-	S	-	X
3C	6X40	+5	2-4-2	-	3	Yes	-	-	-	S	-	X
4A	6X40	+10	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	+10	2-4-2	-	4	Yes	-	-	-	S	-	X
4C	6X6	0	EXIST	-	4	Yes	-	5	-	S	-	X
5A	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X40	+5	2-4-2	-	6	Yes	-	-	-	S	-	X
6B	6X6	0	EXIST	-	6	Yes	-	-	-	S	-	X
S1	6X6	+112	EXIST	-	-	No	-	-	-	S	X	X

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

NOTES

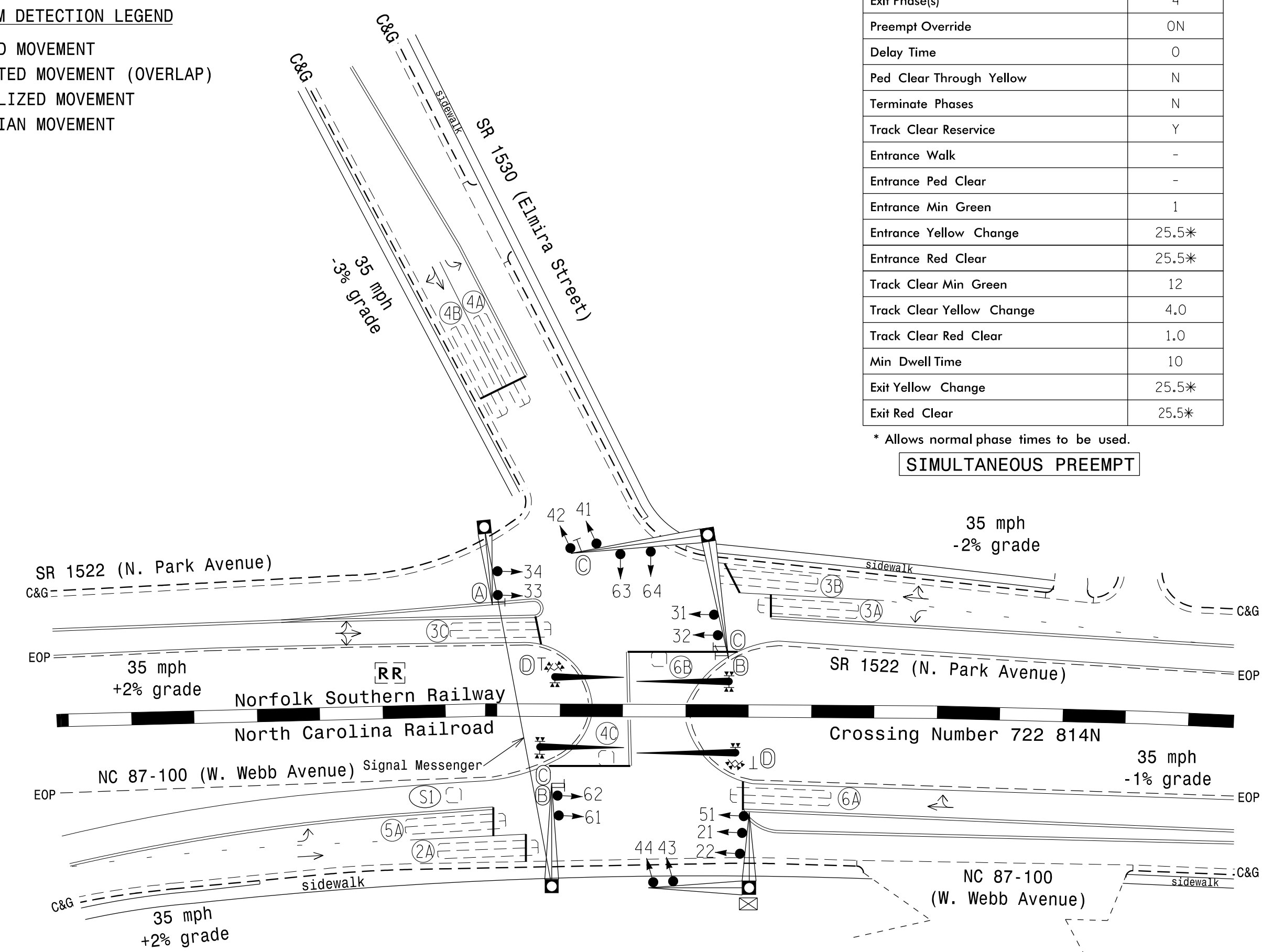
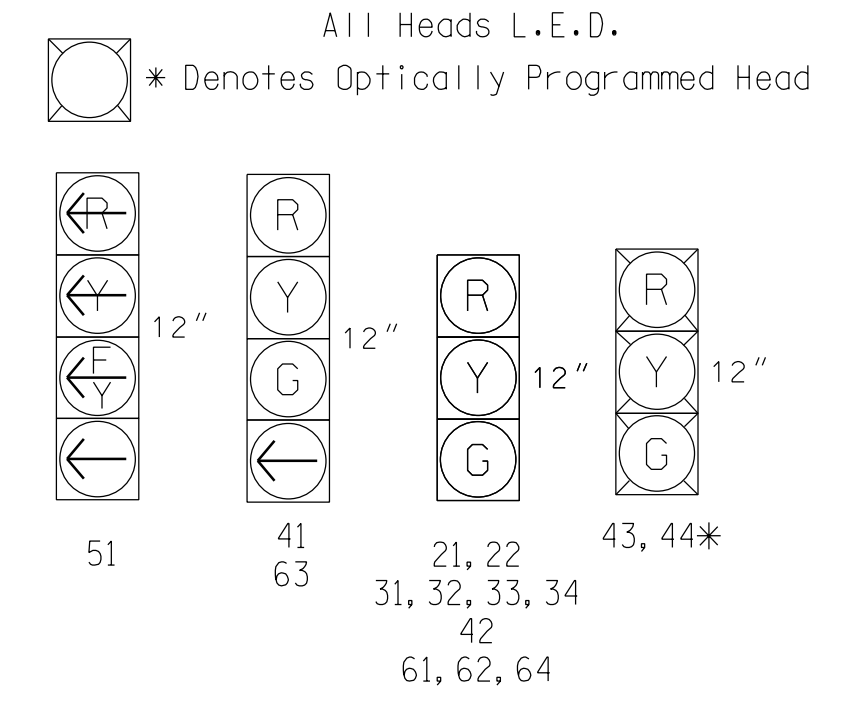
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
- Phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual.
- Pavement markings are existing.
- Ensure flashing operation does not alter operation of blankout signs.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system supersede these values.

ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	4
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	12
Track Clear Yellow Change	4.0
Track Clear Red Clear	1.0
Min Dwell Time	10
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

* Allows normal phase times to be used.

SIGNAL FACE I.D.

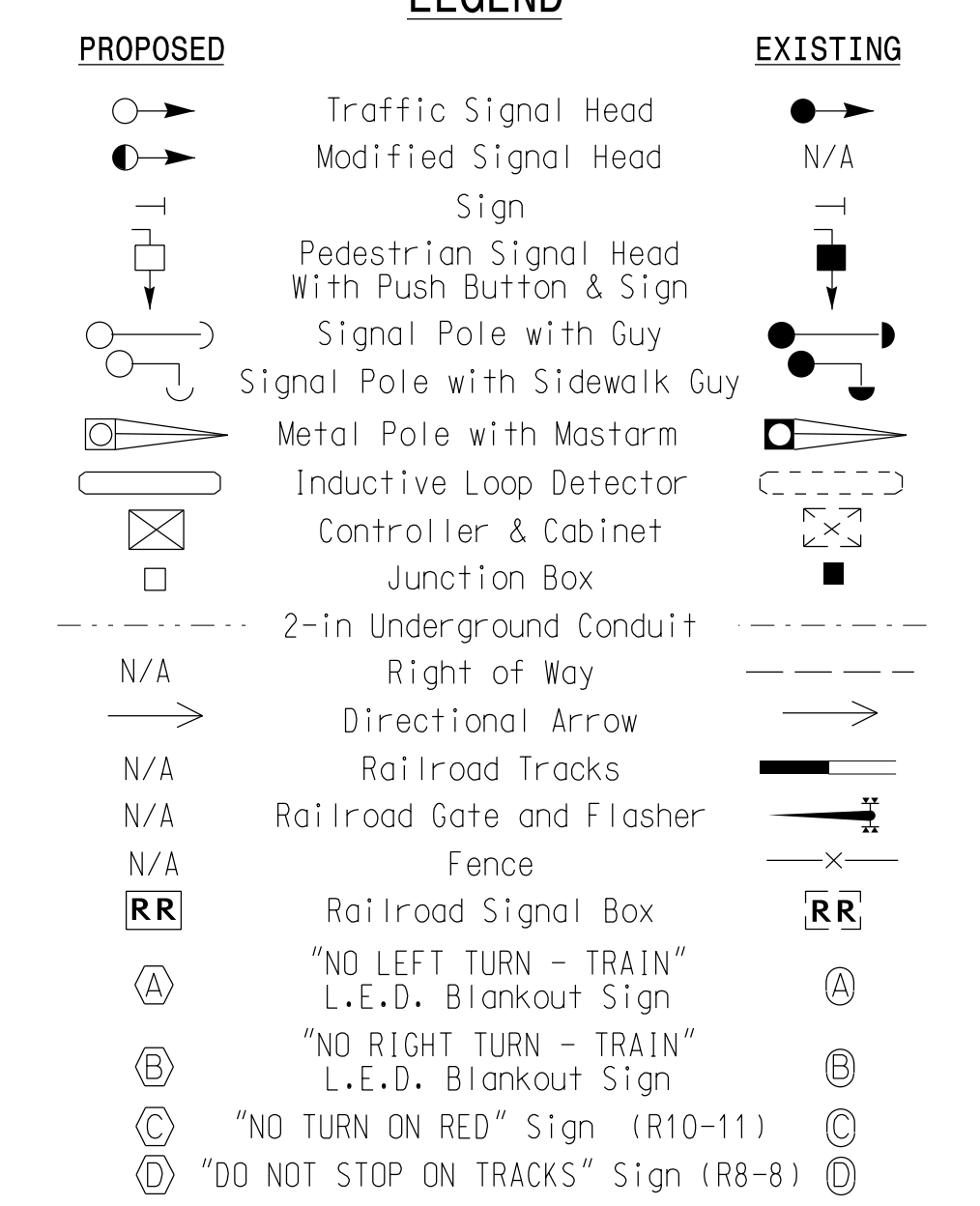


ASC/3 TIMING CHART

FEATURE	PHASE						TOL B	TOL D
	2	3	4	5	6	10		
Min Green *	10	7	7	7	10	10	3	3
Walk *	0	0	0	0	0	0		
Ped Clear	0	0	0	0	0	0		
Veh. Extension *	2.0	2.0	2.0	2.0	2.0	2.0		
Max I *	50	20	40	20	50	30		
Yellow	3.9	4.0	4.1	3.0	3.9	4.0	3.0	4.0
Red Clear	1.2	1.5	2.3	2.1	1.2	1.5	1.6	1.0
Actuations B4 Add *	-	-	-	-	-	-		
Seconds / Actuation *	-	-	-	-	-	-		
Max Initial *	-	-	-	-	-	-		
Time Before Reduction *	-	-	-	-	-	-		
Time To Reduce *	-	-	-	-	-	-		
Minimum Gap	-	-	-	-	-	-		
Locking Detector	-	-	-	-	-	-		
Recall Position	VEH. RECALL	-	-	-	VEH. RECALL	-		
Dual Entry	-	-	-	-	-	-		
Simultaneous Gap	X	X	X	X	X	X		

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

LEGEND



Signal Upgrade

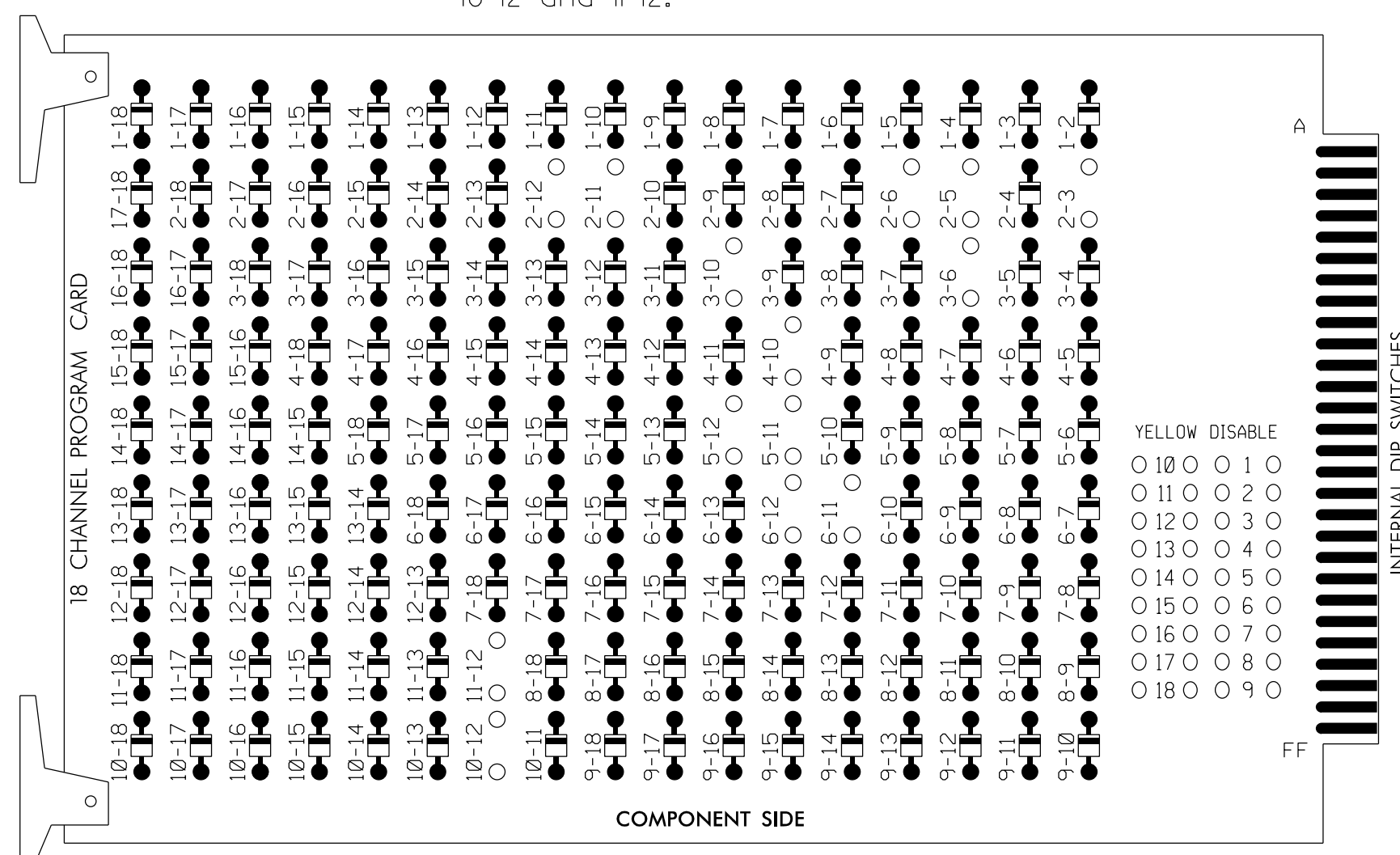
Prepared for the Offices of:
NC 87-100 (W. Webb Avenue) at SR 1530 (Elmira Street) and SR 1522 (N. Park Avenue)
 Division 7 Alamance County Burlington
 PLAN DATE: October 2017 REVIEWED BY: PL Alexander
 PREPARED BY: AM Encarnacion REVIEWED BY:
 SCALE: 1"=40'
 REVISIONS: _____ INIT. DATE
 6/8/2018
 SEAL: PAMELA L. ALEXANDER, PROFESSIONAL ENGINEER, 023489
 SIG. INVENTORY NO. 07-0415

08-JUN-2018 13:59 D:\Transpor\at\work\off\c\cur\100056469 U-6015 B-G S10 Sys\Task 05_11_Signal\Des\gsm07-0415.dgn ALEX0361 AT LUS10649

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

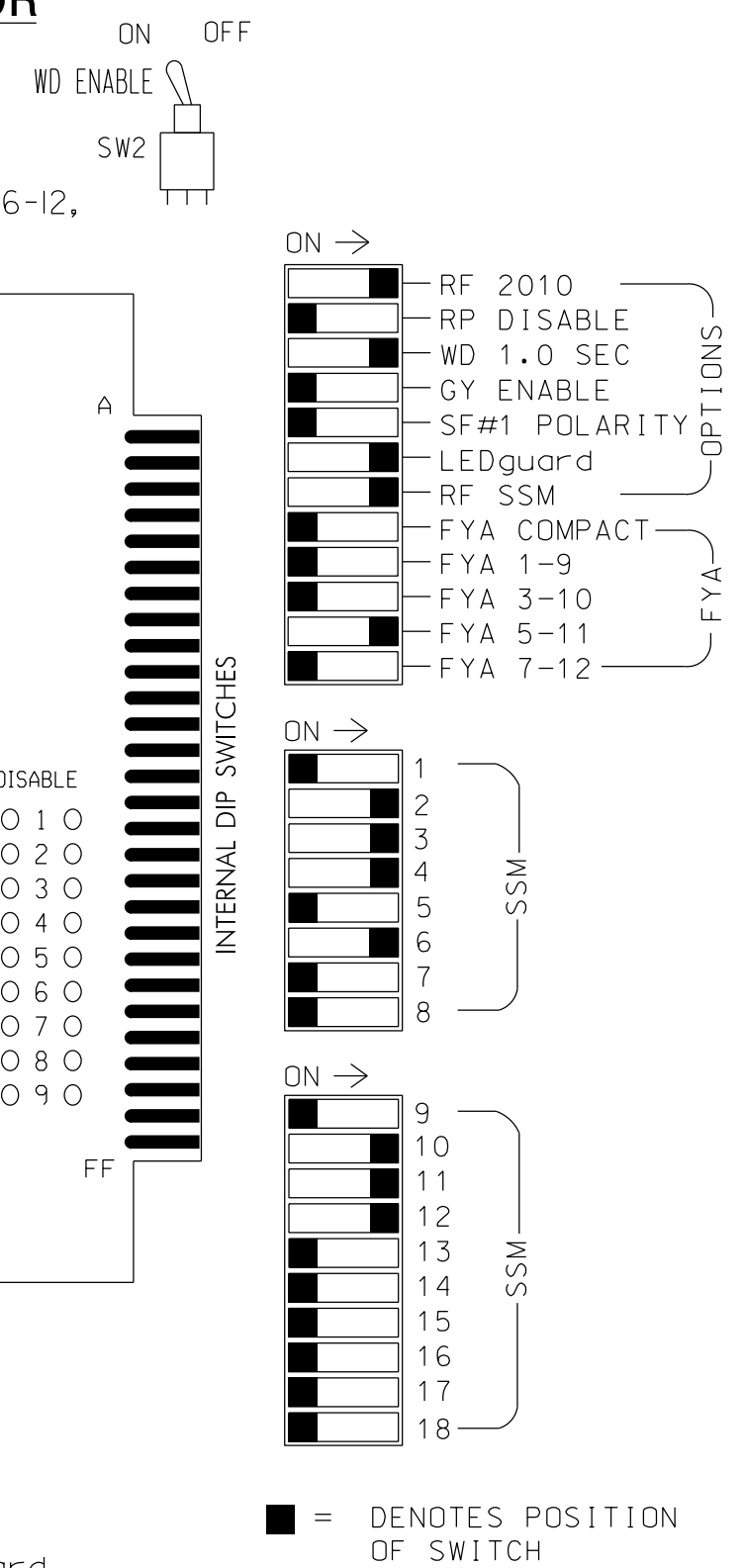
REMOVE DIODE JUMPERS 2-3, 2-5, 2-6, 2-11, 2-12, 3-6, 3-10, 4-10, 5-11, 5-12, 6-11, 6-12, 10-12 and 11-12.



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 controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONDLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S4,S5,S7,S8,AUX S2,
 AUX S4,AUX S5
 PHASES USED.....2,3,4,5,6,**9,**10
 OVERLAP "A".....NOT USED
 OVERLAP "B".....3+4+9 TOL
 OVERLAP "C".....*
 OVERLAP "D".....5+6+9 TOL
 OVERLAP "G".....2+10
 OVERLAP "H".....3+10
 OVERLAP "I".....6+10

* See overlap programming detail on sheet 2
 ** Denotes phases 9 and 10 used in preemption sequence only.
 See sheet 4 for phase sequence details for phase 9 and 10 programming.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	OLG	2 PED	OLH	4	4 PED	5	OLI	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	31,32, 33,34	41	42	NU	51	61,62	NU	NU	NU	NU	43,44	NU	51	63	64	NU
RED	128			116	101	101			134									A101	A101
YELLOW		129		117	102	102		*	135									A102	A102
GREEN		130		118	103	103			136									A103	A103
RED ARROW																		A114	
YELLOW ARROW																		A115	
FLASHING YELLOW ARROW																		A116	
GREEN ARROW					103				133									A103	

NU = Not Used

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

* See pictorial of head wiring in detail this sheet.

NOTE: Output functions for load switches S2, S4, and S8 have been reassigned. See Sheet 2 for details

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 3	∅ 3	∅ 3	∅ 3	∅ 4	∅ 4	SYS. DET. S1	∅ 5	∅ 5	∅ 5	∅ 5	FS DC ISOLATOR
L	NOT USED	2A	NOT USED	3A	3B	4A	4C	NOT USED	NOT USED	∅ 6	∅ 6	∅ 6	∅ 6	ST
U	∅ 5	∅ 6	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	∅ 7	RR AC ISOLATOR
L	NOT USED	6A	NOT USED	7A	7B	7C	7D	7E	7F	7G	7H	7I	7J	NOT USED

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

FS = FLASH SENSE
 ST = STOP TIME
 RR = RAILROAD PREEMPT

⊗ 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
2A	TB2-5,6	I2U	39	2	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES		10		S
3C	TB4-11,12	I6L	45	14	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES		3		S
4B	TB6-3,4	I7L	78	44	4	YES				S
4C	TB6-5,6	I8U	49	24	4	YES		5		S
* S1	TB6-9,10	I9U	60	11	SYS NO					N
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S

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

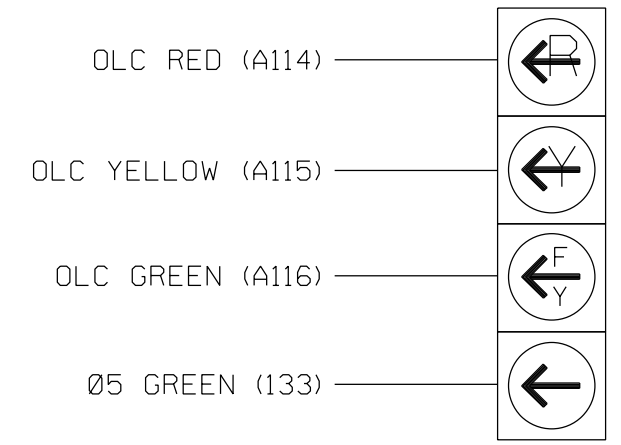
* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



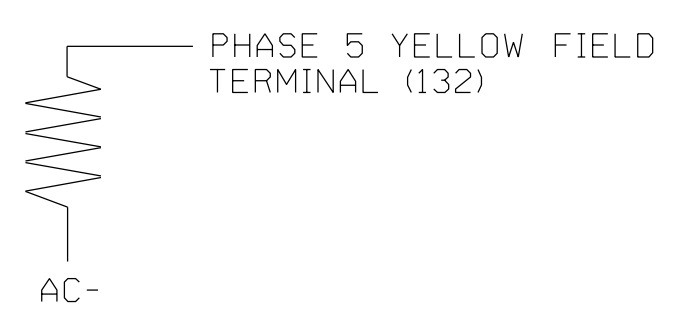
51

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0415
 DESIGNED: October 2017
 SEALED: 6/8/2018
 REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 87-100 (W. Webb Avenue) at SR 1530 (Elmira Street) and SR 1522 (N. Park Avenue)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL SEAL 025892 ENGINEER MELISSA B. TOTH
	Division 7 PLAN DATE: October 2017 PREPARED BY: AM Encarnacion	Alamance County REVIEWED BY: MB Toth REVIEWED BY:		Burlington DATE: 6/11/2018 DATE:

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

Toggle Once

OVERLAP B

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

```

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

LAG GRN 3.0 YEL 3.0 RED 1.6
    
```

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 'OTHER/ECONOLITE'

```

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

LAG GRN 3.0 YEL 4.0 RED 1.0
    
```

Toggle 3 Times

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```

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

LAG GRN 0.0 YEL 0.0 RED 0.0
    
```

Toggle Once

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

```

TMG VEH OVLP...[H] 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 I

Select TMG VEH OVLP [I] and 'NORMAL'

```

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

LAG GRN 0.0 YEL 0.0 RED 0.0
    
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0415
 DESIGNED: October 2017
 SEALED: 6/8/2018
 REVISED: N/A

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switches S2, S3 and S6 as OLG, OLG and OLI, program LD SWITCH 2 as OVLP '7' TYPE '0', LD SWITCH 3 as OVLP '8' TYPE '0' and LD SWITCH 6 as OVLP '9' TYPE '0' as shown below.

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

NOTICE OVLP 5 ASSIGNED TO LD SWITCH 2 →

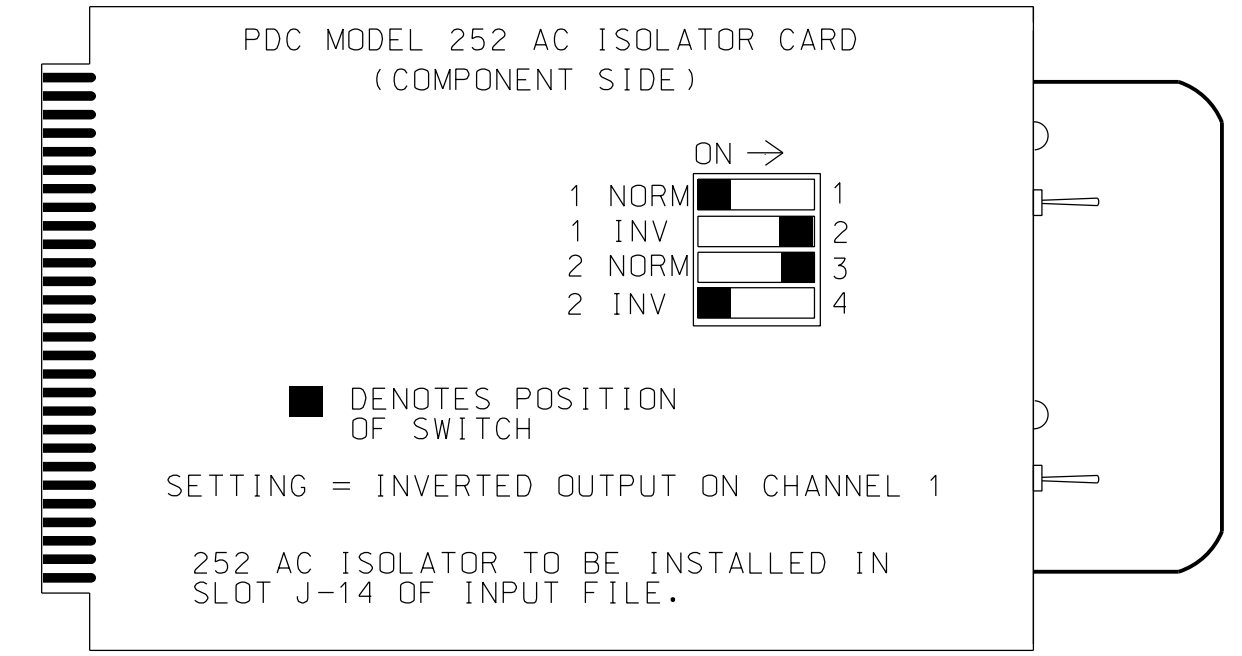
NOTICE OVLP 6 ASSIGNED TO LD SWITCH 3 →

NOTICE OVLP 7 ASSIGNED TO LD SWITCH 6 →

LD SWITCH ASSIGN									
PHASE /OVLP	TYPE	DIMMING	---FLASH---						
		R	Y	G	D	PWR	AUT	TGR	
1	1	V	.	.	.	+	A	R	X
2	7	0	.	.	.	+	A	Y	.
3	8	0	.	.	.	+	A	R	X
4	4	V	.	.	.	+	A	R	.
5	5	V	.	.	.	-	A	R	.
6	9	0	.	.	.	-	A	Y	X
7	7	V	.	.	.	-	A	R	.
8	8	V	.	.	.	-	A	R	X
9	1	0	.	.	.	+	A	R	X
10	2	0	.	.	.	+	A	R	X
11	3	0	.	.	.	-	A	R	.
12	4	0	.	.	.	-	A	R	.
13	2	P	.	.	.	+	A	.	.
14	4	P	.	.	.	-	A	.	.
15	6	P	.	.	.	+	A	.	.
16	8	P	.	.	.	-	A	.	.

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

Electrical Detail - Sheet 2 of 4

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 1530 (Elmira Street) and SR 1522 (N. Park Avenue)		SEAL SEAL MELISSA B. TOTH ENGINEER
	Division 7 Alamance County Burlington		DATE 6/11/2018
	PLAN DATE: October 2017 REVIEWED BY: MB Toth	PREPARED BY: AM Encarnacion REVIEWED BY:	
	REVISIONS			DATE

ATKINS

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

09-JUN-2018 13:38
 D:\Consolidation\Projects\00056469 U-6015 B-G S19 SystemTask 05_11_Signal\Des\gn\mfr\mg07-0415E.dgn
 ALEX3361 AT LUS210649

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

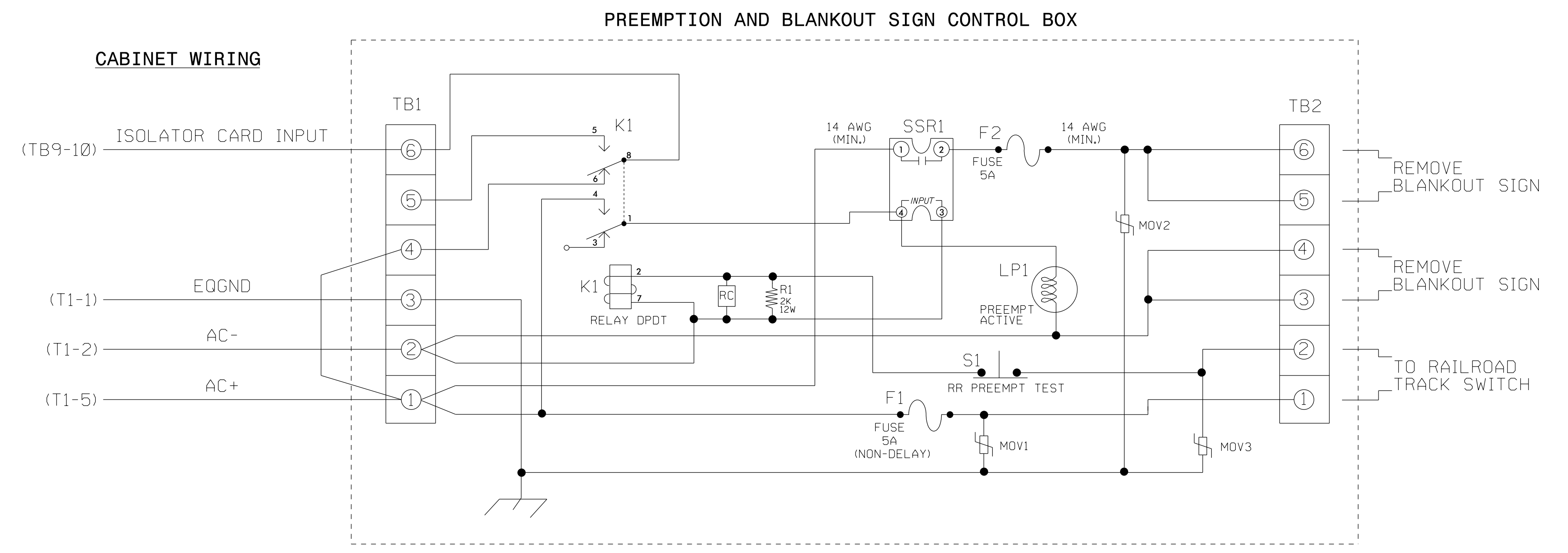
Place cursor in [] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

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 . X . X	
ENA TRL	
DWEL VEH X	
DWEL PED	
DWEL OLP	
CYC VEH	
CYC PED	
CYC OLP	
EXIT PH . . . 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.	255I 255I	1125.5125.5	
-----MIN	GRIEXT GRIMX	GRI YELI RED	
TRACK CLEAR	12I 0I	0I 4.0I 1.0	
-----MIN	DLIPMTEXTIMX	TMI YELI RED	
DWL/CYC-EXIT	10I 0.0I	0I25.5I25.5	
PMT ACTIVE OUT..	ON PMT ACT	DWELL...NO	
OTHER - PRI	PMT.OFF	NON-PRI PMT.....OFF	
INH EXT TIME...	0.0 PED PR	RETURN...OFF	
PRIORITY RETURN.	OFF QUEUE	DELAY.... OFF	
COND DELAY.....	OFF		
PHASES	1 2 3 4 5 6 7 8		
PR RTN%	0 0 0 0 0 0 0 0		
PHASES	9 10 11 12 13 14 15 16		
PR RTN%	0 0 0 0 0 0 0 0		

RAILROAD PREEMPTION WIRING DETAIL

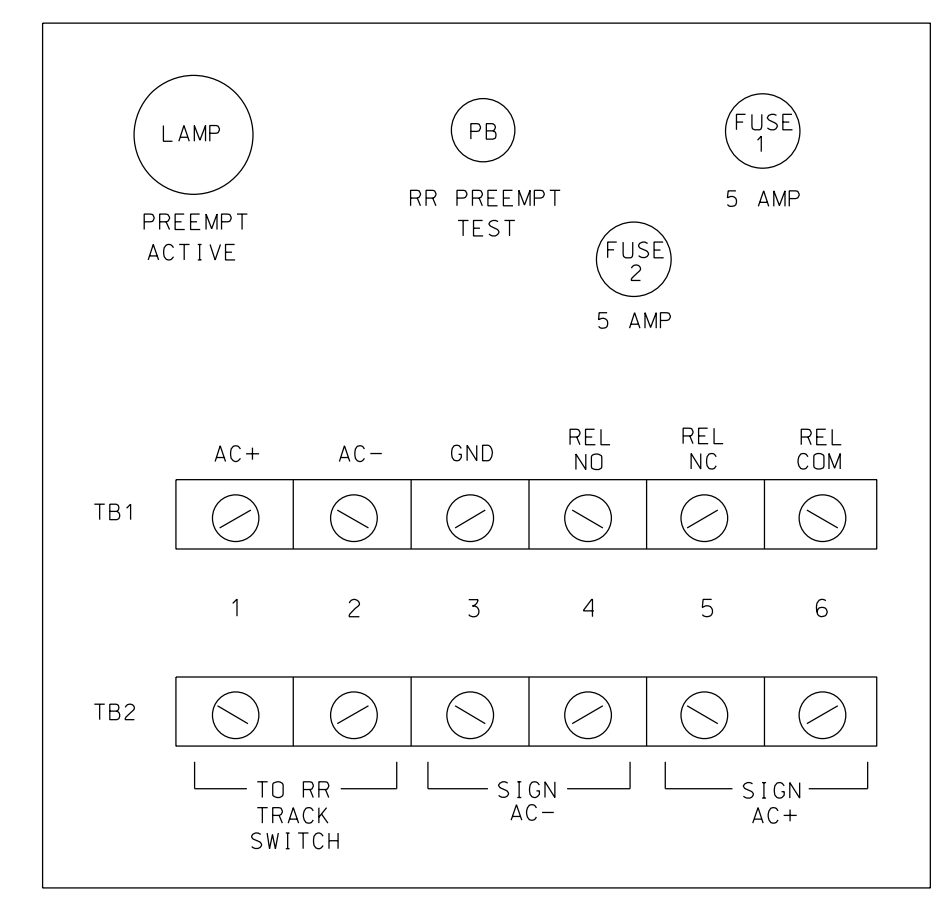
(wire as shown below)



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!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0415
 DESIGNED: October 2017
 SEALED: 6/8/2018
 REVISED: N/A

Electrical Detail - Sheet 3 of 4

	Electrical and Programming Details for: NC 87-100 (W. Webb Avenue) at SR 1530 (Elmira Street) and SR 1522 (N. Park Avenue)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
	Prepared for the Offices of: Mobility and Safety Division Department of Transportation 750 N. Greenfield Pkwy, Garner, NC 27529		Division 7 Alamance County Burlington PLAN DATE: October 2017 REVIEWED BY: MB Toth PREPARED BY: AM Encarnacion REVIEWED BY:
REVISIONS INIT. DATE		Date: 6/11/2018 Signature: Melissa B. Toth Date:
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326		SIG. INVENTORY NO. 07-0415

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR PHASE 9 AND 10 OMIT

(program controller as shown)

The following logic processor programming ensures phase 9 and 10 is only served during preemption. This logic will ensure phase 9 and 10 is not served during startup.

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

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

```

LP#:  1 COPY FROM:  1 ACTIVE:  M  TRUE
IF   CTR SEQUENCE #          IS 1 T
THEN CTR OMIT PHASE          9   ON
    
```

LOGIC FOR OMITTING
PHASE 9 WHILE IN
NORMAL PHASING

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

```

LP#:  2 COPY FROM:  1 ACTIVE:  M  TRUE
IF   CTR SEQUENCE #          IS 1 T
THEN CTR OMIT PHASE          10  ON
    
```

LOGIC FOR OMITTING
PHASE 10 WHILE IN
NORMAL PHASING

END PROGRAMMING

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 8. LOGIC PROCESSOR
3. From LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0415
DESIGNED: October 2017
SEALED: 6/8/2018
REVISED: N/A

ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 1. CONTROLLER SEQ
3. From CONTROLLER SEQUENCE Submenu select 1. PHASE RING SEQUENCE AND ASSIGNMENT

CONTROLLER SEQUENCE [1]


SEQUENCE COMMANDS	. HW ALT SEQ ENA.	NO.
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16		
BC=B	-	B
R1-	.	02 03 04 09 10
R2-	.	05 06
R3-	.	.
R4-	.	.

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE

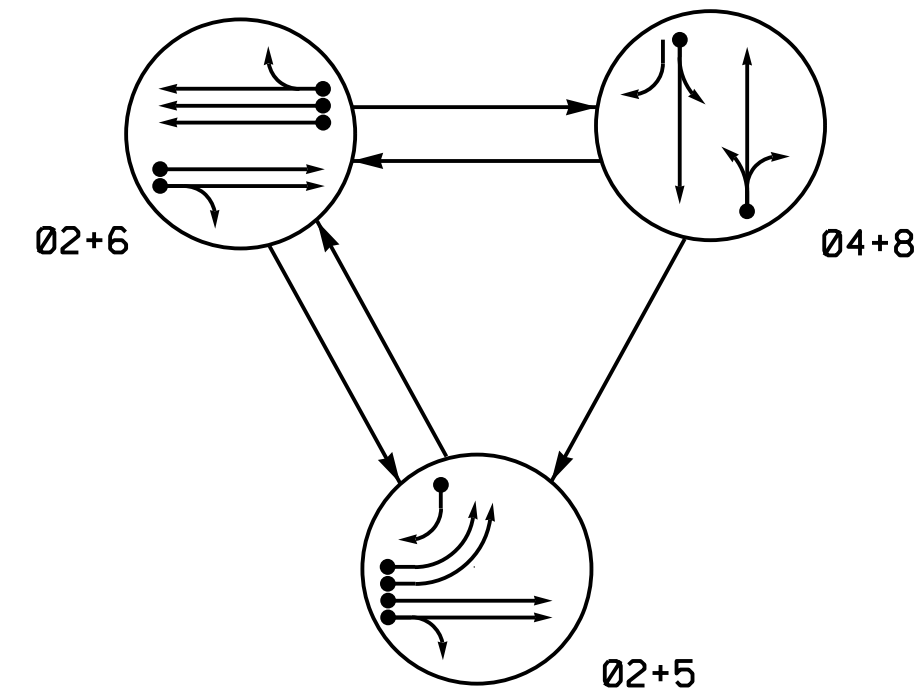
END PROGRAMMING

Electrical Detail - Sheet 4 of 4

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 87-100 (W. Webb Avenue) at SR 1530 (Elmira Street) and SR 1522 (N. Park Avenue)	SEAL NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOH
Prepared for the Offices of: 	Division 7 Alamance County Burlington	6/11/2018
PLAN DATE: October 2017 REVIEWED BY: MB Toth	PREPARED BY: AM Encarnacion REVIEWED BY:	DATE
REVISIONS	INIT. DATE	DATE
750 N. Greenfield Pkwy, Garner, NC 27529		DATE
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326		SIG. INVENTORY NO. 07-0415

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51, 52	-	-R	-R	-R
61, 62	R	G	R	Y
81, 82	R	R	G	R

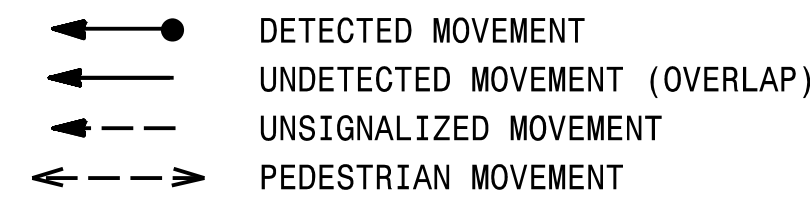
ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR						PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A,2B	6x6	70	EXIST.	-	2	Yes	-	-	-	S	-	X
4A	6x60	+5	2-4-2	-	4	Yes	-	3	-	S	-	X
5A	6x60	+5	2-4-2	-	5	Yes	-	-	-	S	-	X
5B	6x60	+5	2-4-2	-	5	Yes	-	-	-	S	-	X
5C	6x60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A,6B,6C	6x6	70	EXIST.	-	6	Yes	-	-	-	S	-	X
8A	8x20	+5	2-4-2	-	8	Yes	-	5	-	S	-	X
S1	6x6	145	EXIST.	-	-	No	-	-	-	N	X	X
S2	6x6	145	EXIST.	-	-	No	-	-	-	N	X	X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

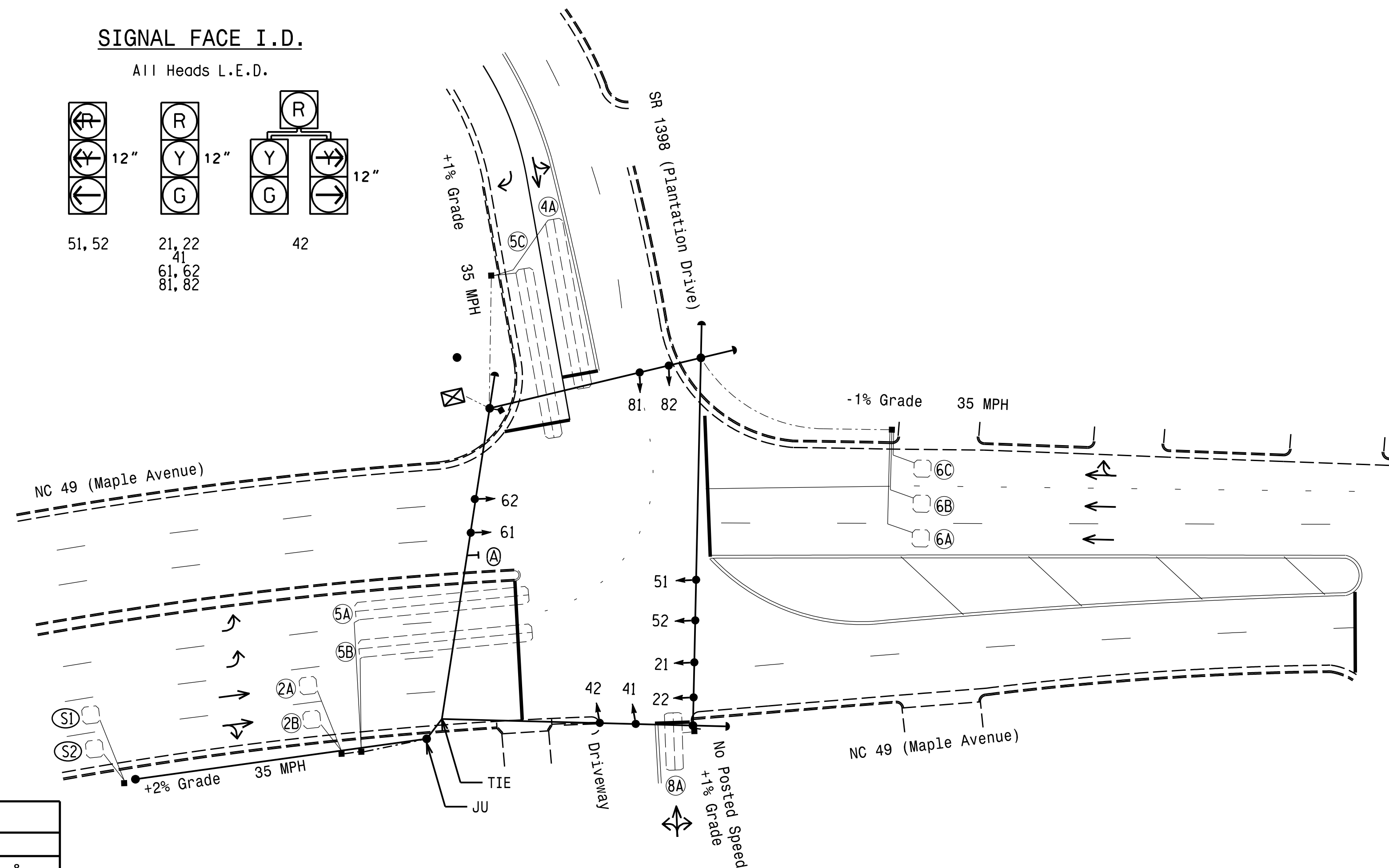
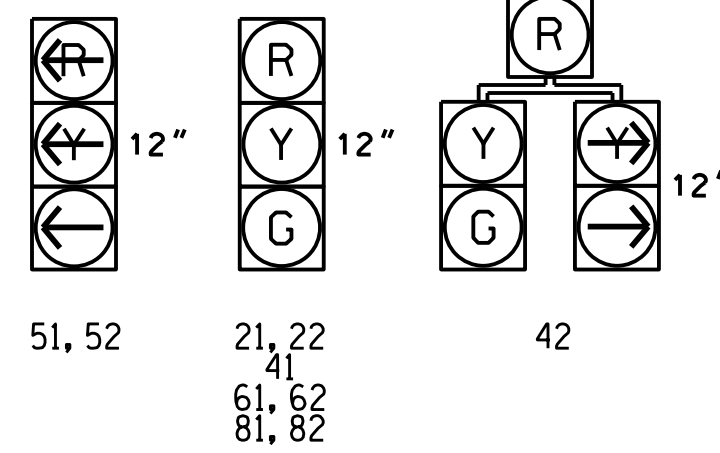
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

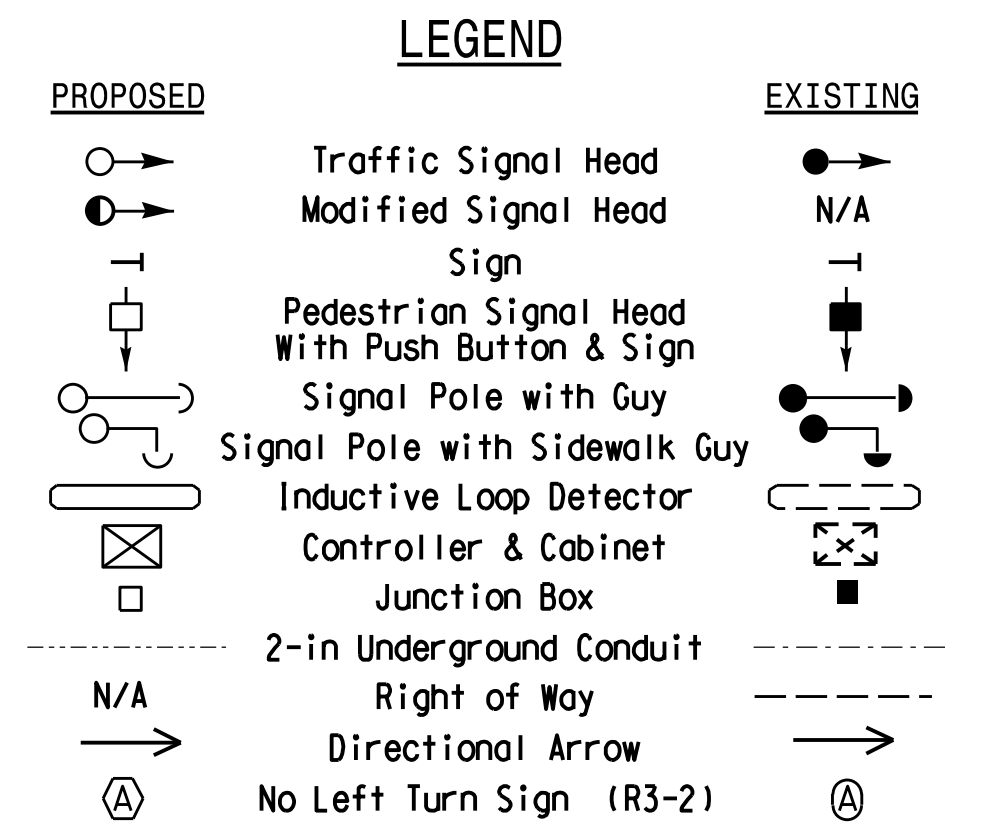
All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green *	10	7	7	10	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	3.0	1.0	1.0	3.0	1.0
Max 1 *	54	23	21	54	23
Yellow	3.9	3.8	3.0	3.9	3.1
Red Clear	2.2	2.4	2.9	2.2	2.6
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	X	-	-	X	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X

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



\$\$\$\$\$\$SYTIME\$\$\$\$\$\$
 \$\$\$\$\$\$DATE\$\$\$\$\$\$
 \$\$\$\$\$\$DRAWING NO. \$\$\$\$\$\$
 \$\$\$\$\$\$SERIAL NO. \$\$\$\$\$\$



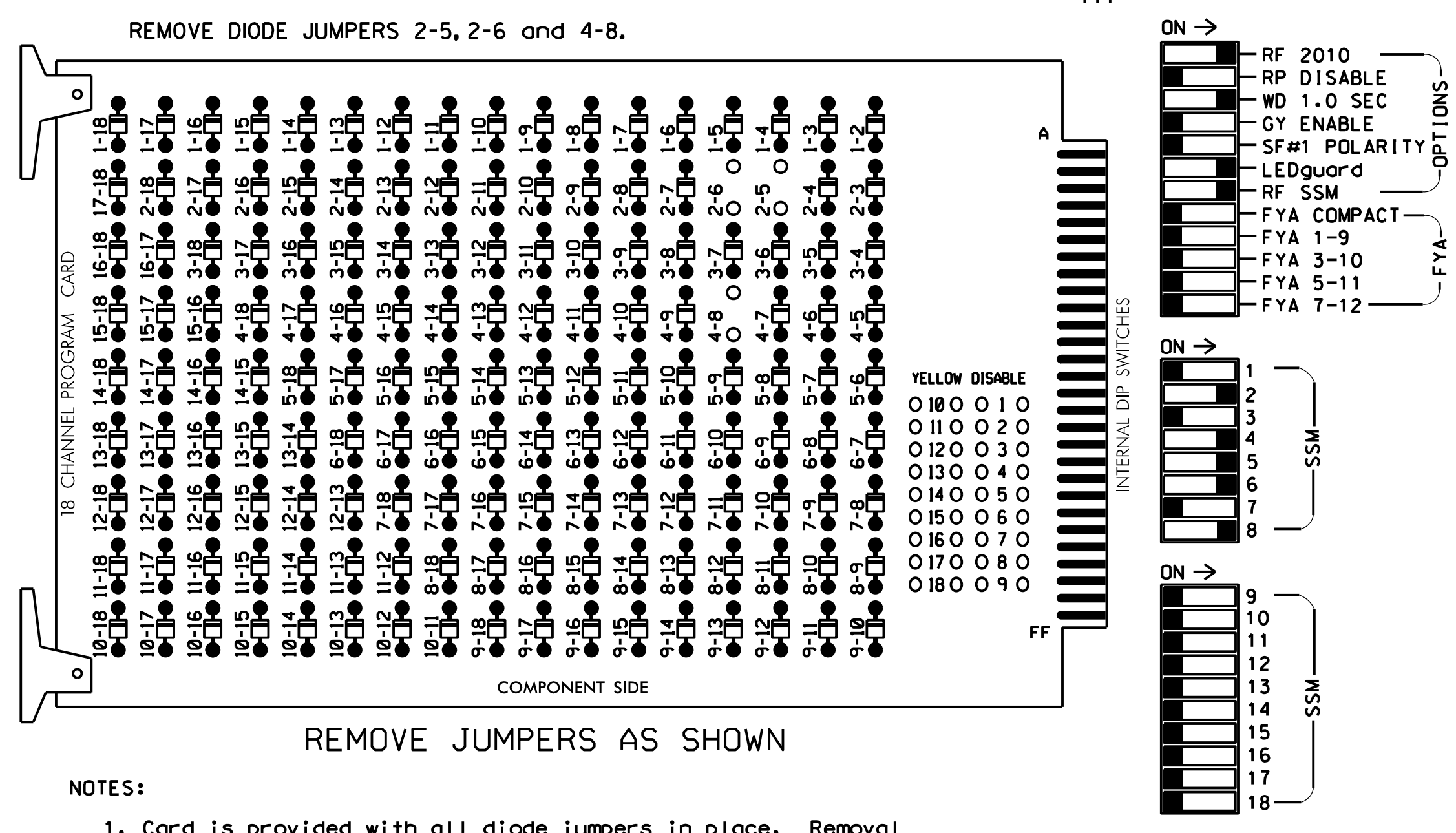
12 BROAD STREET
 ASHEVILLE, NORTH CAROLINA 28801
 (828) 254-2201
 FAX (828) 254-4562
 NC LIC. NO. C-1154

Signal Upgrade

	Prepared for the Offices of: NC 49 (Maple Avenue) at SR 1398 (Plantation Drive)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
	Division 7 Alamance County Burlington PLAN DATE: January 2018 REVIEWED BY: JB Voso PREPARED BY: SE Greene REVIEWED BY:		
SCALE 0 30 1"=30'	REVISIONS INIT. DATE	DATE 6/13/2018	SIG. INVENTORY NO. 07-0857

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,S7,S8,S11
 PHASES USED.....2,4,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

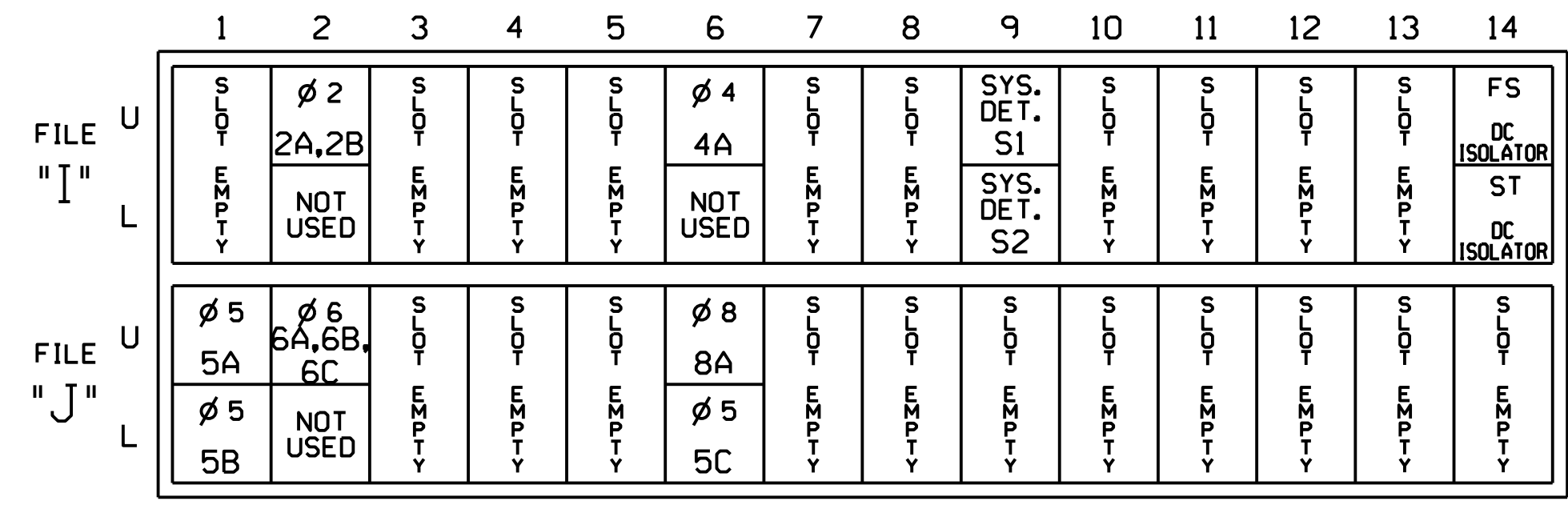
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51,52	42	61,62	NU	71	81,82	NU	NU	NU	NU	NU	NU
RED		128			101				134			107						
YELLOW		129			102				135			108						
GREEN		130			103				136			109						
RED ARROW								131										
YELLOW ARROW							132	132										
GREEN ARROW							133	133										

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

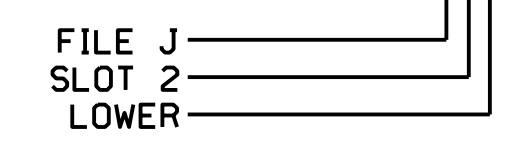
FS = FLASH SENSE
ST = STOP TIME

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	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-3,4	J1L	55	5	5	YES				S
6A,6B,6C	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		5		S
5C	TB5-11,12	J6L	46	18	5	YES		15		S

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0857
 DESIGNED: January 2018
 SEALED: 6/13/2018
 REVISED: NA

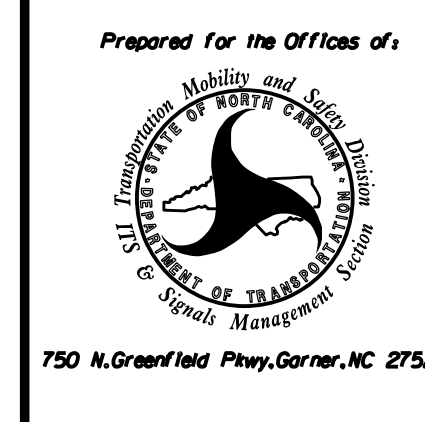
*****SYTIME*****
 *****DOON*****
 *****USERNAME*****



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

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:



NC 49 (Maple Avenue)
at
SR 1398 (Plantation Drive)

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: JB Voso

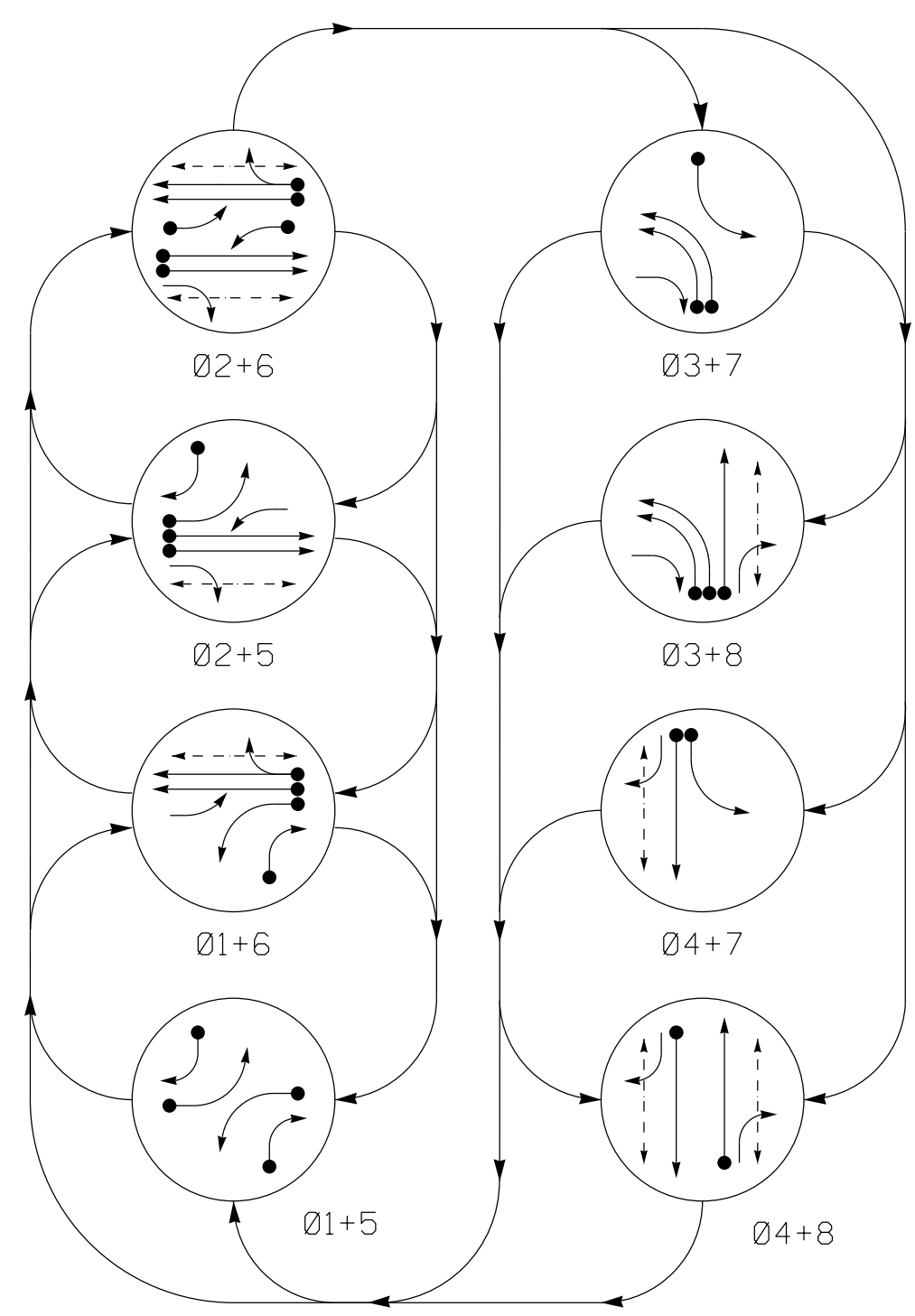
PREPARED BY: SE Greene REVIEWED BY:

REVISIONS	INIT.	DATE

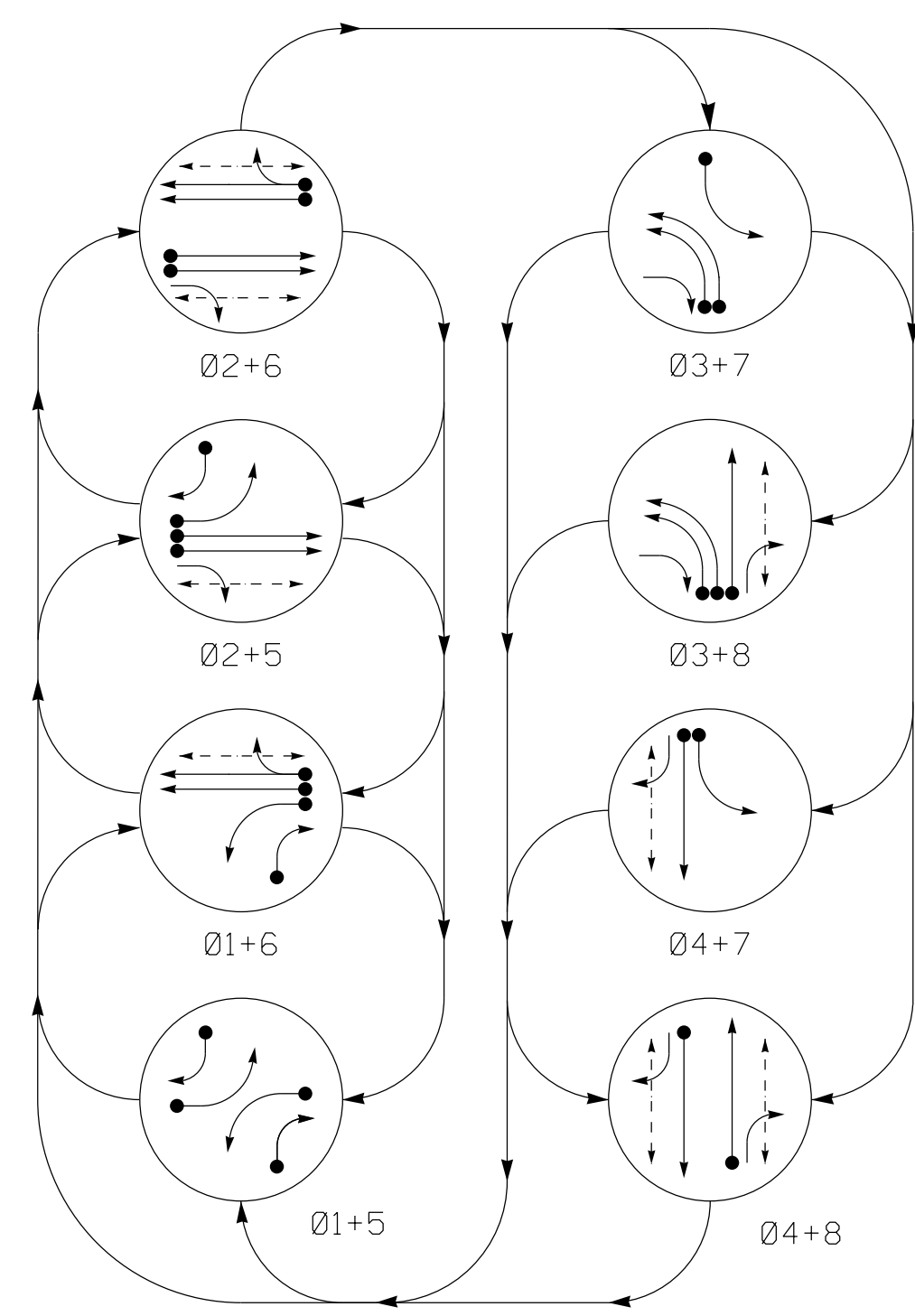
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE	SIG. INVENTORY NO.
6/13/2018	07-0857

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM

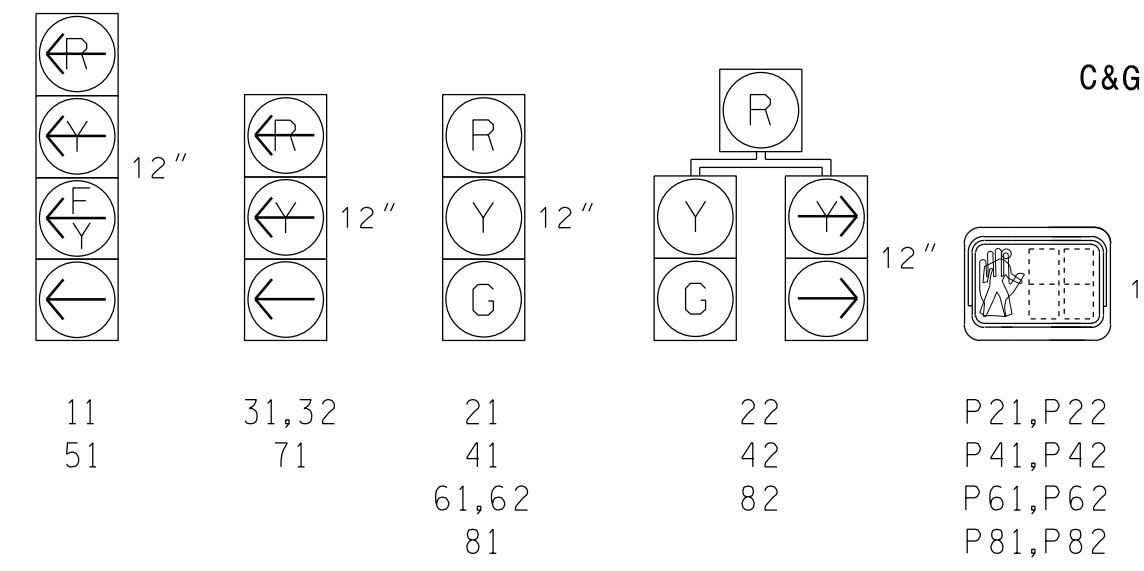


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



DEFAULT PHASING TABLE OF OPERATION

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

ALTERNATE PHASING TABLE OF OPERATION

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

ASC/3 DETECTOR INSTALLATION CHART

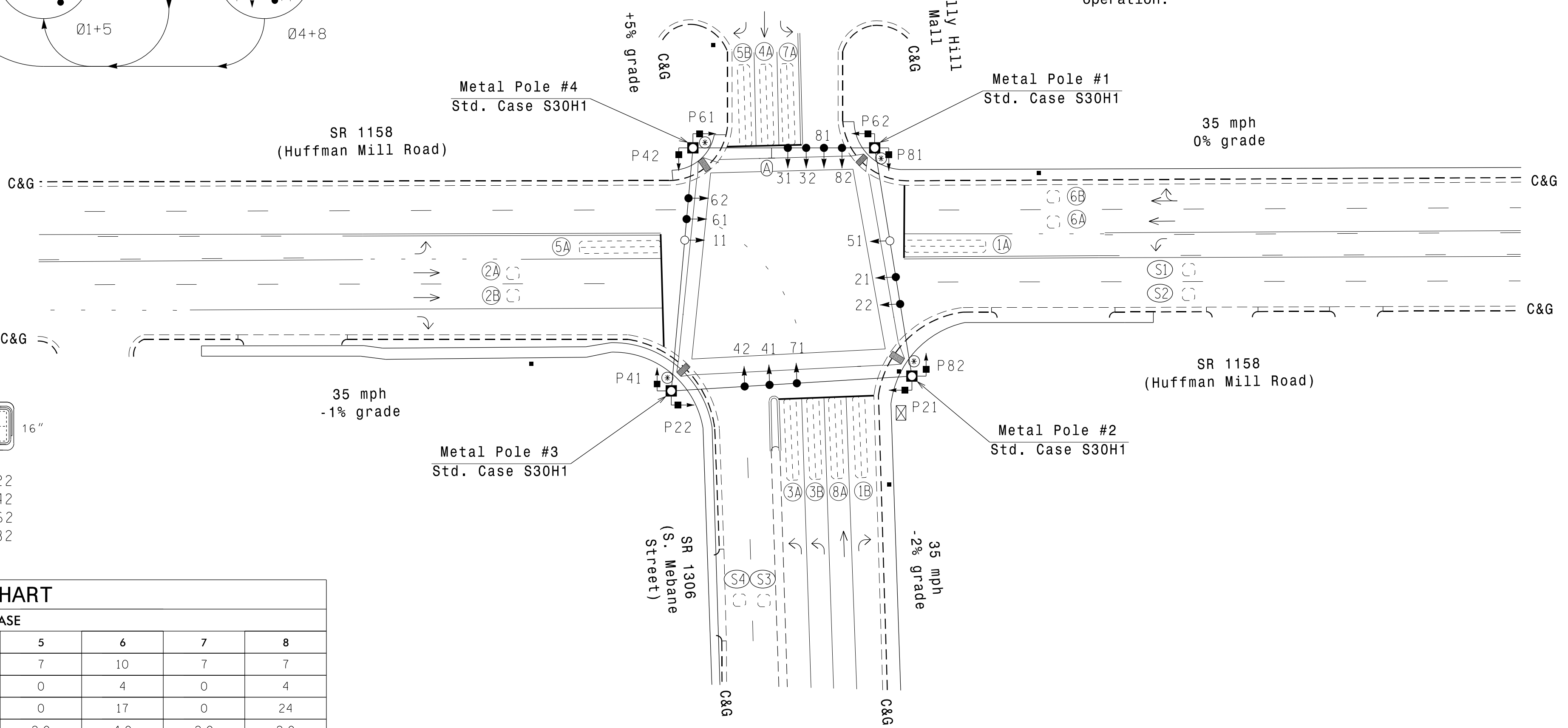
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD SYSTEM LOOP	
1A	6X40	0	2-4-2	-	1	Yes	-	*15	-	S	X	-
1B	6X40	0	2-4-2	-	1	Yes	-	-	-	S	X	-
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	X	-
2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	X	-
3A	6X40	0	2-4-2	-	3	Yes	-	3	-	S	X	-
3B	6X40	0	2-4-2	-	3	Yes	-	-	-	S	X	-
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	X	-
5A	6X40	0	2-4-2	-	5	Yes	-	*15	-	S	X	-
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	S	X	-
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	X	-
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	X	-
7A	6X40	0	2-4-2	-	7	Yes	-	3	-	S	X	-
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	X	-
S1	6X6	+255	EXIST	-	-	NO	-	-	-	N	X	X
S2	6X6	+255	EXIST	-	-	NO	-	-	-	N	X	X
S3	6X6	+220	EXIST	-	-	NO	-	-	-	N	X	X
S4	6X6	+220	EXIST	-	-	NO	-	-	-	N	X	X

- * Disable delay during alternate phasing operation.
- ** Disable phases 2 & 6 call during alternate phasing operation.

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 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 WALK with no pedestrian calls.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. The 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	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	0	4	0	4	0	4	0	4
Ped Clear	0	25	0	25	0	17	0	24
Veh. Extension *	2.0	4.0	2.0	2.0	2.0	4.0	2.0	2.0
Max 1 *	20	50	30	30	20	50	20	30
Yellow	3.0	3.9	3.0	3.0	3.0	3.9	3.0	4.0
Red Clear	3.1	2.3	3.4	3.3	2.9	2.3	2.6	2.3
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	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 |
| ○ → Pedestrian Signal Head | ○ → N/A |
| N/A | ○ → 2" Pedestrian Post with Ped Push Button & Sign |
| ○ → Signal Pole with Sidewalk Guy | ○ → Signal Pole with Guy |
| ○ → Metal Strain Pole | ○ → Metal Strain Pole |
| ○ → Inductive Loop Detector | ○ → Inductive Loop Detector |
| ○ → Controller & Cabinet | ○ → Controller & Cabinet |
| ○ → Junction Box | ○ → Junction Box |
| ○ → 2-in Underground Conduit | ○ → 2-in Underground Conduit |
| N/A | ○ → Right of Way |
| ○ → Directional Arrow | ○ → Directional Arrow |
| N/A | ○ → Curb Ramp |
| ○ → "U-Turn Yield To Right Turn" Sign (R10-16) | ○ → "U-Turn Yield To Right Turn" Sign (R10-16) |

Signal Upgrade

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

SR 1158 (Huffman Mill Road) at SR 1306 (S. Mebane Street)/Holly Hill Mall

Division 7 Alamance County Burlington

PLAN DATE: February 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

SCALE: 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

6/7/2018

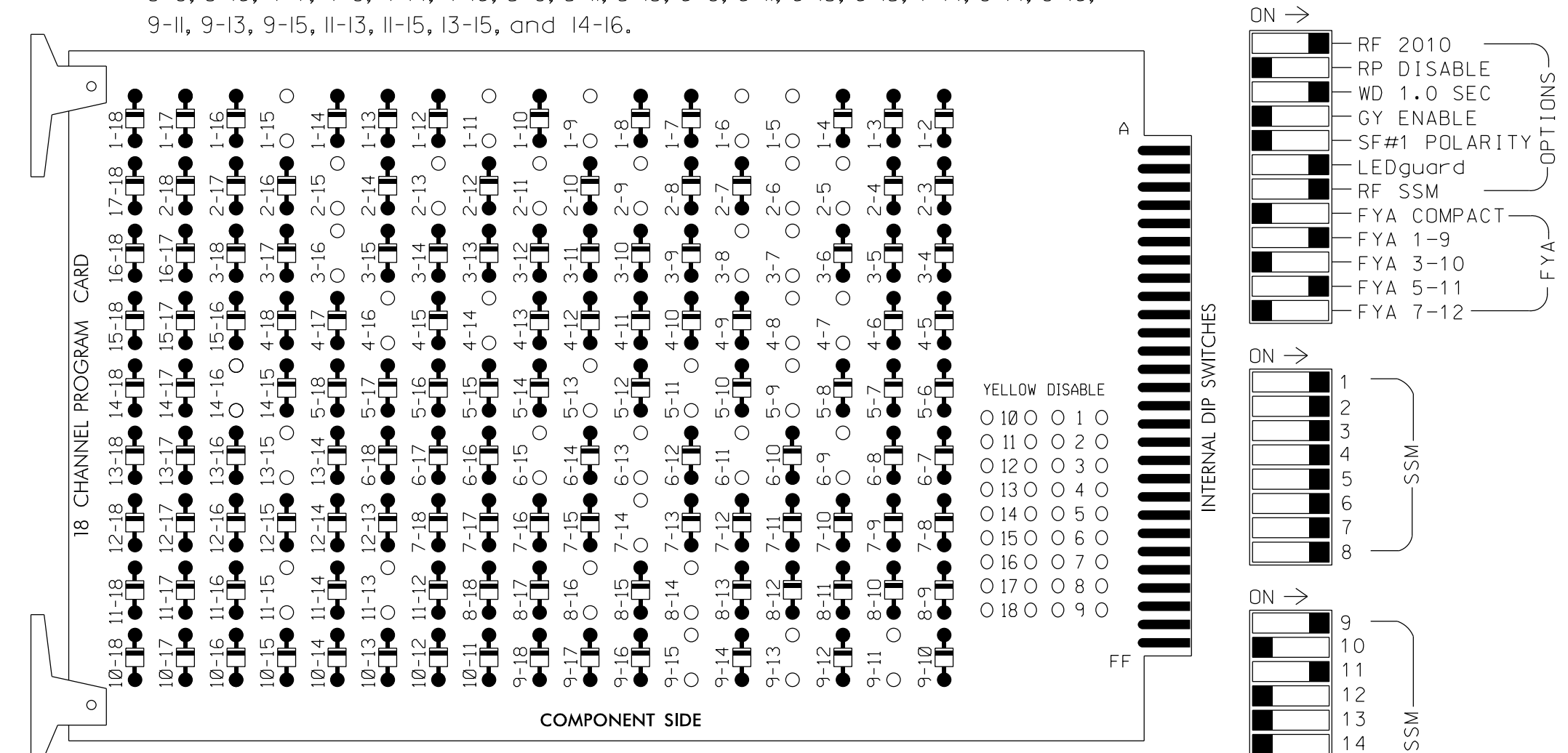
SIG. INVENTORY NO. 07-0868

07-JUN-2018 11:15
 U:\Projects\2018\06\07\Task 05_11_Signal\Design\Task 05_11_Signal.dgn
 ALEX3361 AT LUS340649

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, 3-16, 4-7, 4-8, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-14, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 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,AUX S1,AUX S4
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,
 7,8,8PED
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED
 * See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-6015	83.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	22	31,32	41,42	42	51	61,62	71	81,82	81,82	11	NU	NU	51	NU	NU
RED	*	128			101		*		134		107							
YELLOW		129			102				135		108							
GREEN		130			103				136		109							
RED ARROW				116						122			A121					A114
YELLOW ARROW	126			117	117			132			123		A122					A115
FLASHING YELLOW ARROW													A123					A116
GREEN ARROW	127	127		118	118			133	133		124							
Hand				113				104		119			110					
Walking Person				115				106		121			112					

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

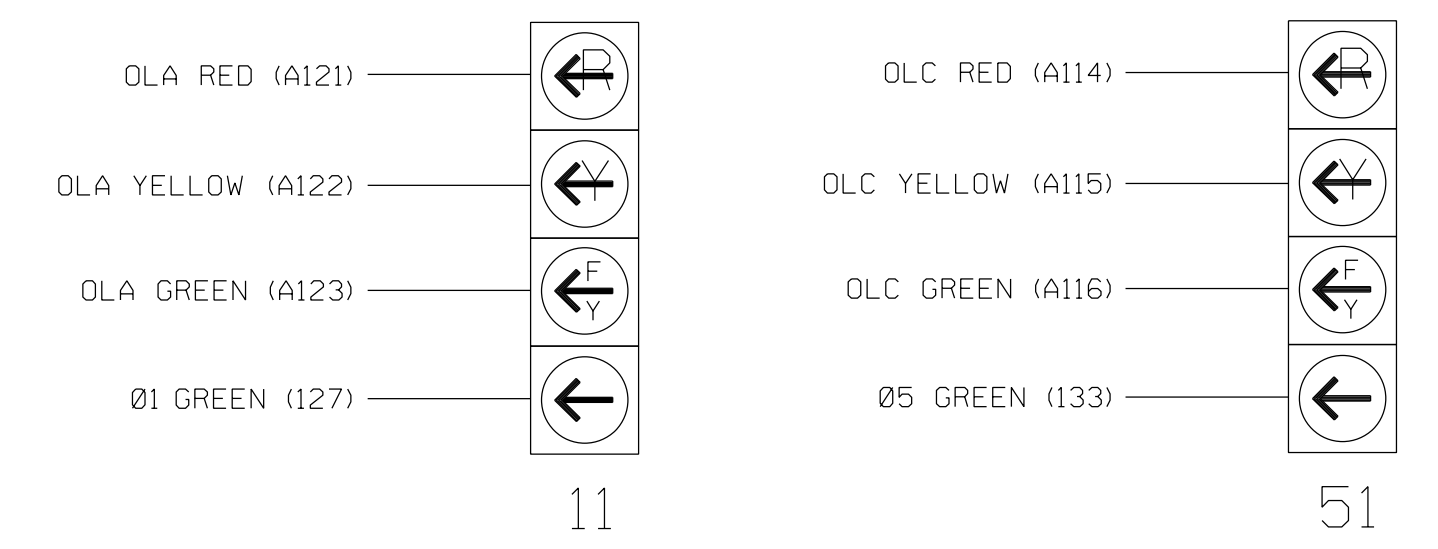
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	J1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
	TB2-5,6	J2U	39	2	1	YES		15		S
	TB2-9,10	J3U	63	32	2	YES				S
2B	TB2-11,12	J3L	76	42	2	YES				S
3A	TB4-5,6	J5U	58	3	3	YES		3		S
3B	TB4-9,10	J6U	41	4	3	YES				S
4A	TB4-11,12	J6L	45	14	4	YES				S
* S1	TB6-9,10	J9U	60	11	SYS	NO				N
* S2	TB6-11,12	J9L	62	13	SYS	NO				N
5A ²	TB3-1,2	J1U	55	5 ★	5	YES		15		S
	-	J4U	47	22 ★	2	YES				S
	TB3-5,6	J2U	40	6	5	YES		15		S
	TB3-9,10	J3U	64	36	6	YES				S
6B	TB3-11,12	J3L	77	46	6	YES				S
7A	TB5-5,6	J5U	57	7	7	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES				S
* 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	J12U	67	PED 2	2	PED				
P41,P42	TB8-5,6	J12L	69	PED 4	4	PED				
P61,P62	TB8-7,9	J13U	68	PED 6	6	PED				
P81,P82	TB8-8,9	J13L	70	PED 8	8	PED				

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

- Add jumper from I1-W to J4-W, on rear of input file.
 - Add jumper from J1-W to I4-W, on rear of input file.
- * System detector only. Remove any assigned vehicle phase.
 ★ See the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

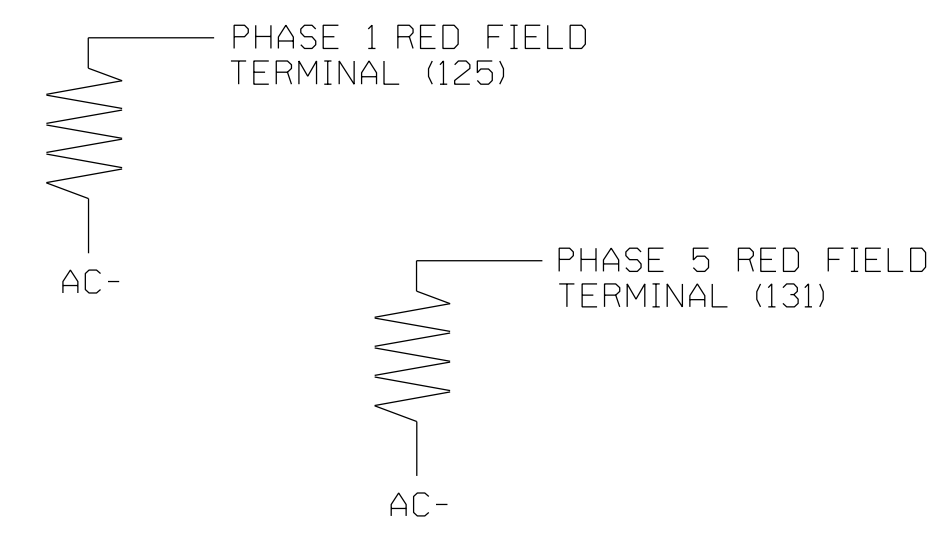
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0868
 DESIGNED: February 2018
 SEALED: 6/7/2018
 REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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



INPUT FILE POSITION LEGEND: J2L

FILE J
 SLOT 2
 LOWER

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1158 (Huffman Mill Road) at SR 1306 (S. Mebane Street)/ Holly Hill Mall	SEAL 023489 PANELA L. ALEXANDER ENGINEER
Prepared for the Offices of:		Division 7 Alamance County Burlington
PLAN DATE: February 2018	REVIEWED BY: AM Encarnacion	
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander	
REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy,Garner,NC 27529

6/9/2018
 Pamela Alexander
 DATE

SIG. INVENTORY NO. 07-0868

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

(program controller as shown)

IMPORTANT!

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

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

```

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

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

- Place cursor in VEH DETECTOR [] position and enter "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"

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

```

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

← NOTICE VEH DET PLAN 2
← ENSURE DELAY IS SET TO '0'

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

```

VEH DETECTOR [22]  VEH DET PLAN [ 2]
TYPE: 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
22 0
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
  
```

← NOTICE VEH DET PLAN 2
← ENSURE PHASE IS SET TO "0"

END PROGRAMMING

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..... 1
  
```

← NOTICE ACTION PLAN SF BIT "1"

Toggle Twice

OVERLAP C

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

```

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

FLASHING ARROW OUTPUT....CH11 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 5
  
```

← NOTICE ACTION PLAN SF BIT "5"

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0868
DESIGNED: February 2018
SEALED: 6/7/2018
REVISED: N/A

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	SR 1158 (Huffman Mill Road) at SR 1306 (S. Mebane Street)/ Holly Hill Mall		
	Division 7 Alamance County Burlington	PLAN DATE: February 2018 REVIEWED BY: AM Encarnacion PREPARED BY: NA Ptak REVIEWED BY: PL Alexander	
Prepared for the Offices of: Transportation Mobility and Safety Director STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION & TRAFFIC MANAGEMENT SYSTEMS 750 N. Greenfield Pkwy, Garner, NC 27529	REVISIONS INIT. DATE	DATE 6/9/2018	Signature of Pamela L. Alexander DATE 6/9/2018 SIG. INVENTORY NO. 07-0868

09-JUN-2018 14:13
D:\Transfer\at\at\off\c\cur\100056469 U-6015 B-G S1g Sys\Task 05_11_Signal\Des\gn\wlr\ing\07-0868E.dgn
ALEX3361 AT LUS210649

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

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

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

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

```

ACTION PLAN...[ 1]
PATTERN.....AUTO  SYS OVERRIDE.... NO
TIMING PLAN..... 0  SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --  RED REST..... NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE.. NO  PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND DELAY  NO
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT  X  .  .  .  X  .  .  .  .  .  .  .  .  .  .  .  .
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: 07-0868
DESIGNED: February 2018
SEALED: 6/7/2018
REVISED: N/A

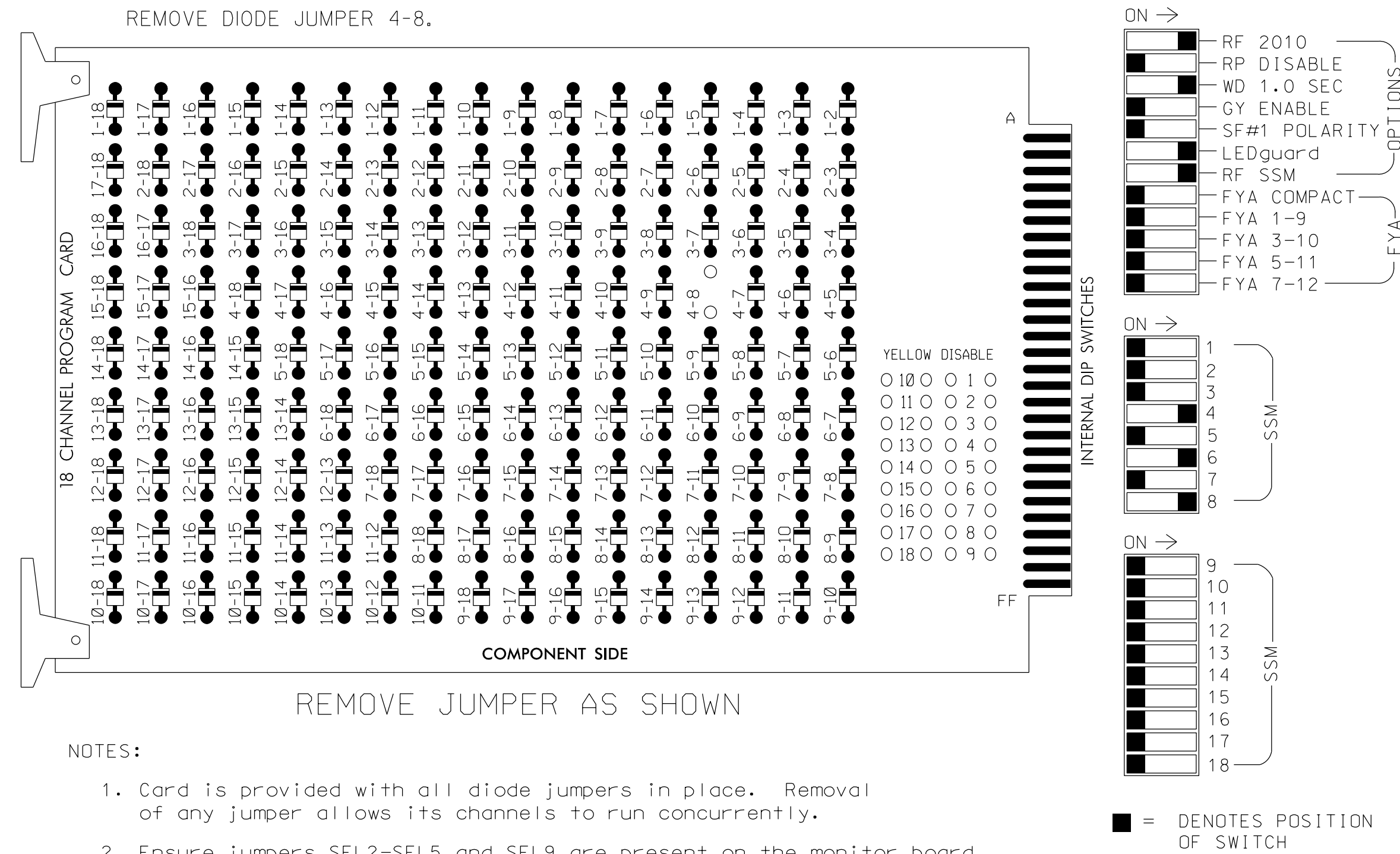
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

	<p style="margin: 0;">ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1158 (Huffman Mill Road) at SR 1306 (S. Mebane Street)/ Holly Hill Mall</p> <p style="margin: 0; font-size: x-small;">Prepared for the Offices of: </p> <p style="margin: 0; font-size: x-small;">Division 7 Alamance County Burlington</p> <p style="margin: 0; font-size: x-small;">PLAN DATE: February 2018 REVIEWED BY: AM Encarnacion</p> <p style="margin: 0; font-size: x-small;">PREPARED BY: NA Ptak REVIEWED BY: PL Alexander</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE				<p style="font-size: x-small;">SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 023489</p> <p style="font-size: x-small;">6/9/2018 DATE</p> <p style="font-size: x-small;">SIC. INVENTORY NO. 07-0868</p>
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 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	NU	NU	NU	41,42 43	NU	NU	61,62 63	NU	NU	81,82	NU
RED					101			134			107	
YELLOW					102			135			108	
GREEN					103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

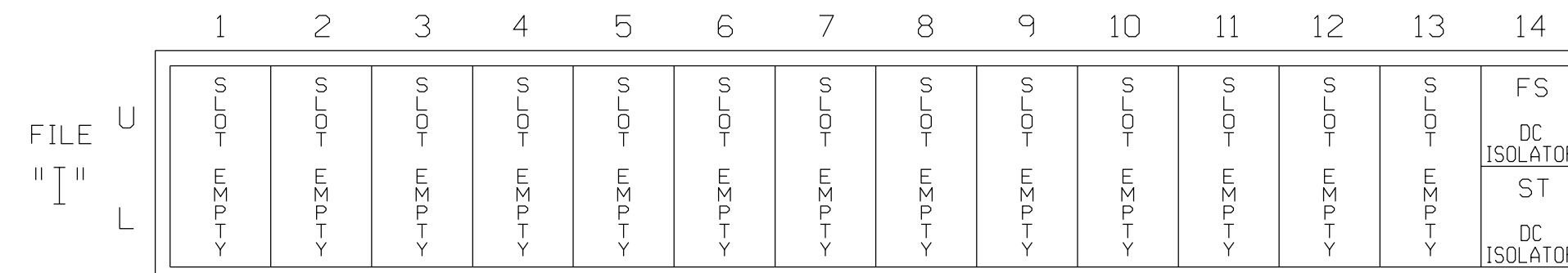
NU = Not Used

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)



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

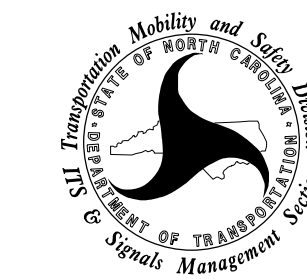
FS = FLASH SENSE
 ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0872
 DESIGNED: SEPT-2017
 SEALED: 06-13-2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

Plans Prepared By:

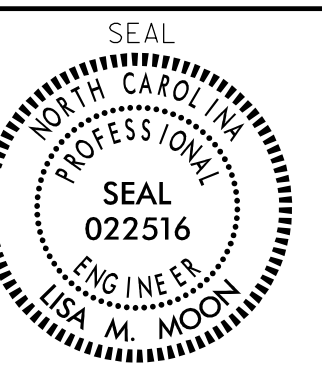
 DRMP, Inc.
 8000 Regency Parkway, Suite 175
 Cary, NC 27518
 NC License No. C-2213 (919) 650-1038

US 70-NC 62 (S. Fisher Street)
 at
 W. Maple Avenue

Division 7 Alamance County Burlington
 PLAN DATE: September 2017 REVIEWED BY: LM Moon
 PREPARED BY: AJ Davis REVIEWED BY:

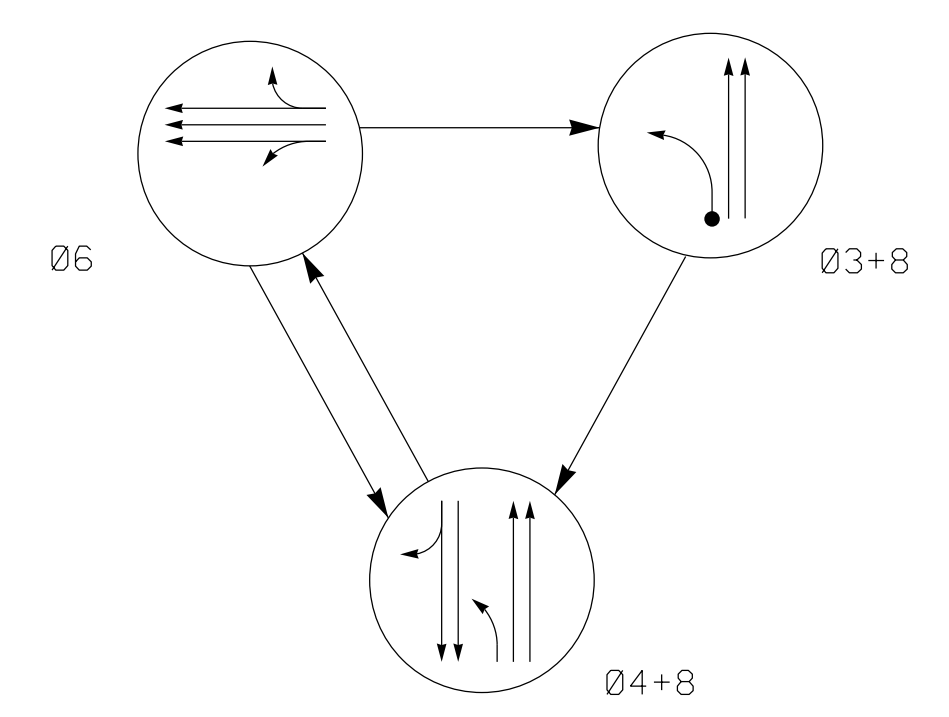
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
 Lia M. Moon 6/13/2018
 SACS08B830021 DATE
 SIG. INVENTORY NO. 07-0872

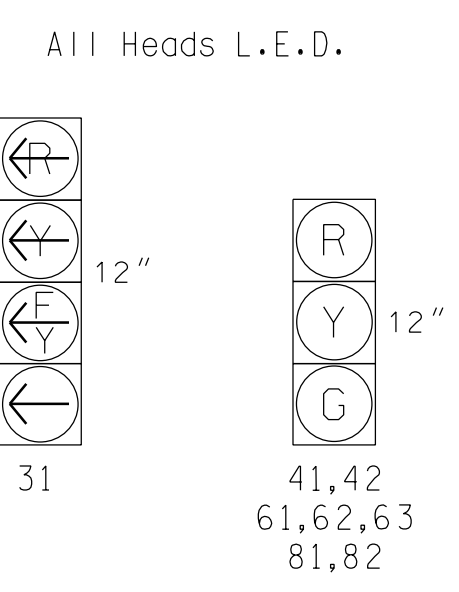
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND
● DETECTED MOVEMENT
◄ UNDETECTED MOVEMENT (OVERLAP)
◄ UNSIGNALIZED MOVEMENT
◄ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	Ø6	Ø3+8	Ø4+8	FLASH
31	R	R	G	R
41,42	R	R	G	R
61,62,63	G	R	R	Y
81,82	R	G	G	R

SIGNAL FACE I.D.

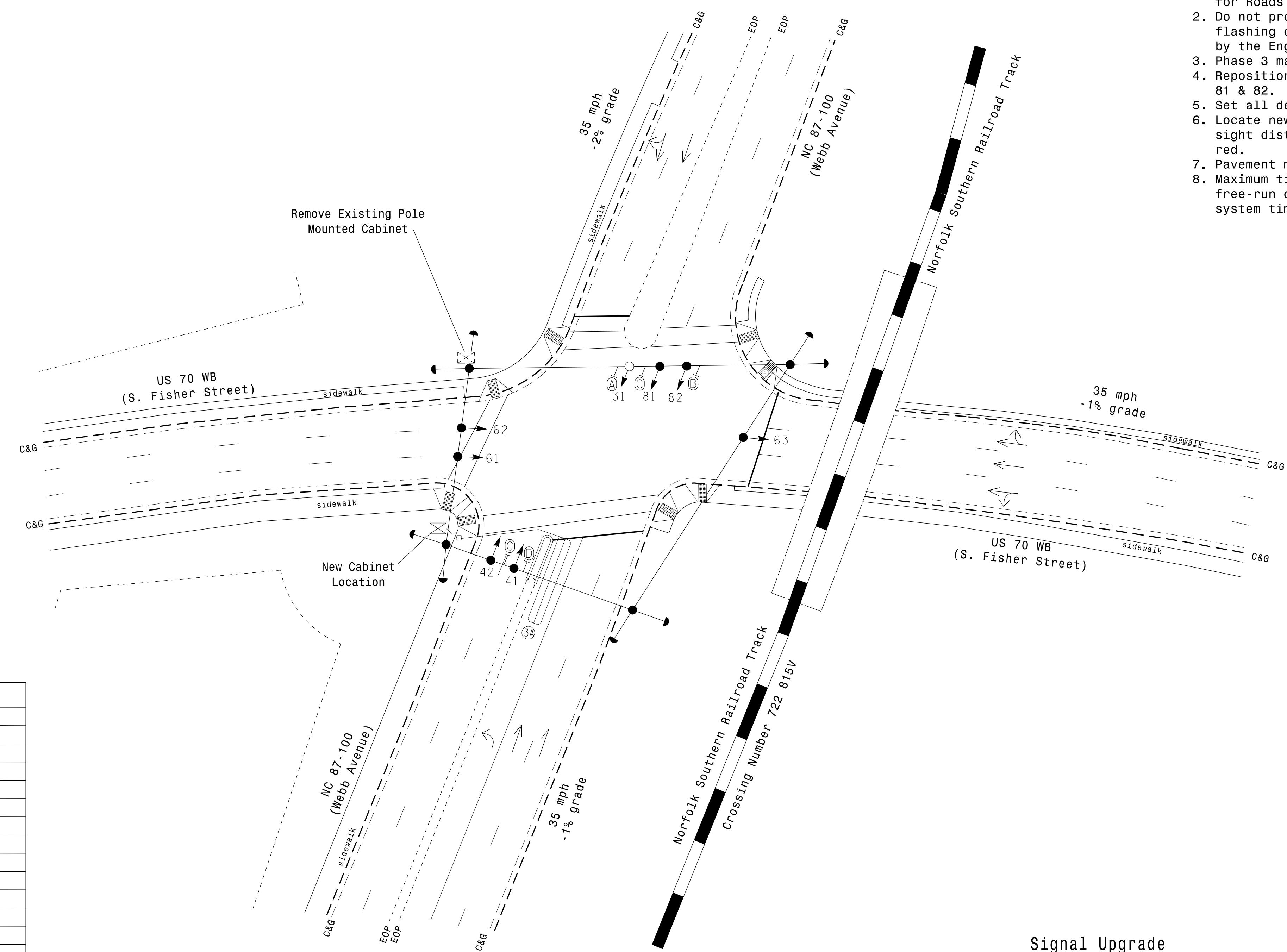


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP	TYPE	NEW CARD
3A	6x40	0	2-4-2	X	3	Yes	-	15	-	S	-	X

3 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. Phase 3 may be lagged.
4. Reposition existing signal heads numbered 81 & 82.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE			
	3	4	6	8
Min Green *	7	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	0.0	0.0	0.0
Max I *	15	30	40	30
Yellow	3.0	4.0	3.9	4.0
Red Clear	2.1	1.9	2.4	1.9
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	-	MAX RECALL	MAX RECALL	MAX 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 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED	EXISTING
	N/A
N/A	
N/A	

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

750 N. Greenfield Pkwy, Garner, NC 27529

US 70 WB (S. Fisher Street) at NC 87-100 (Webb Avenue)

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

MELISSA B. TOOTH

6/7/2018

SIG. INVENTORY NO. 07-0873

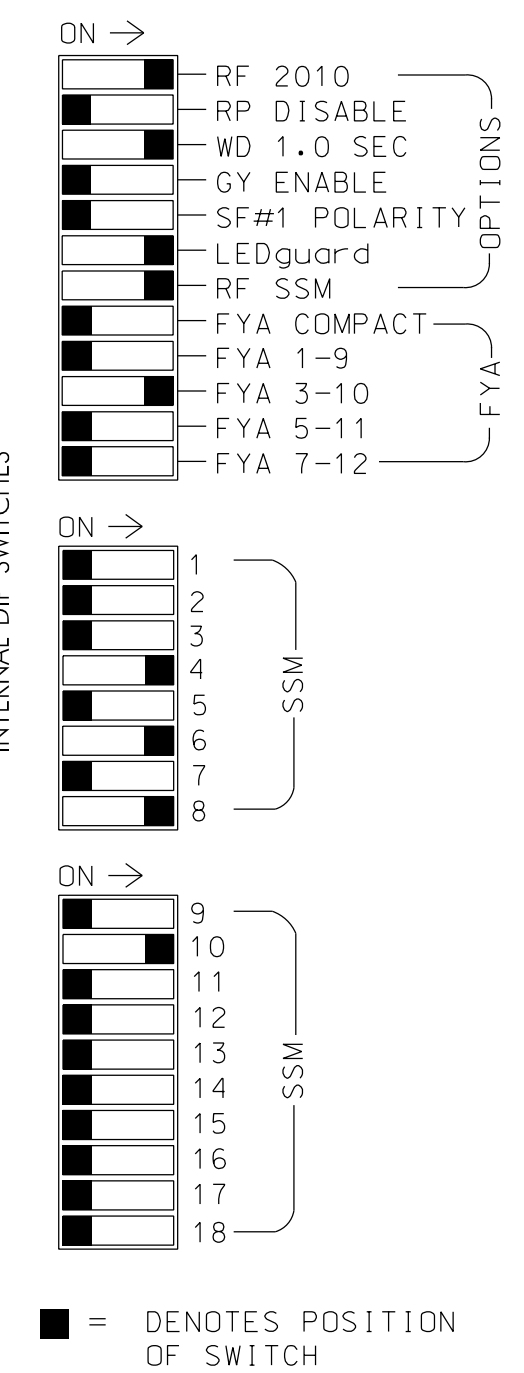
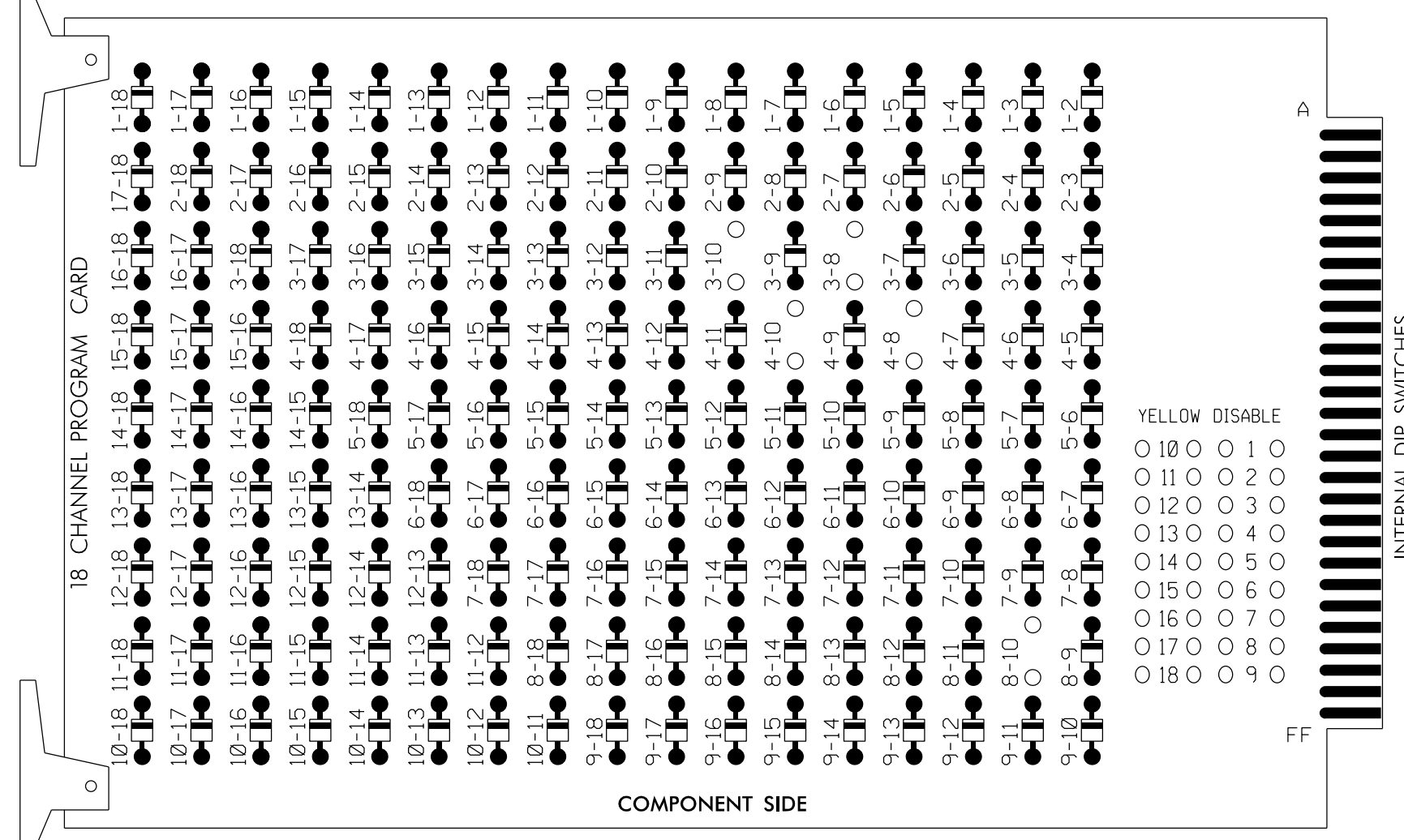
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326

07-JUN-2018 11:15 Q:\Projects\07-0873\07-0873.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 3-8, 3-10, 4-8, 4-10 and 8-10.



NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 6 Green.
3. Program phase 2 for Red Flash.
4. The cabinet and controller are part of the 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.....S4,S5,S8,S11,AUX S2
 PHASES USED.....3,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....*
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2.

SIGNAL HEAD HOOK-UP CHART

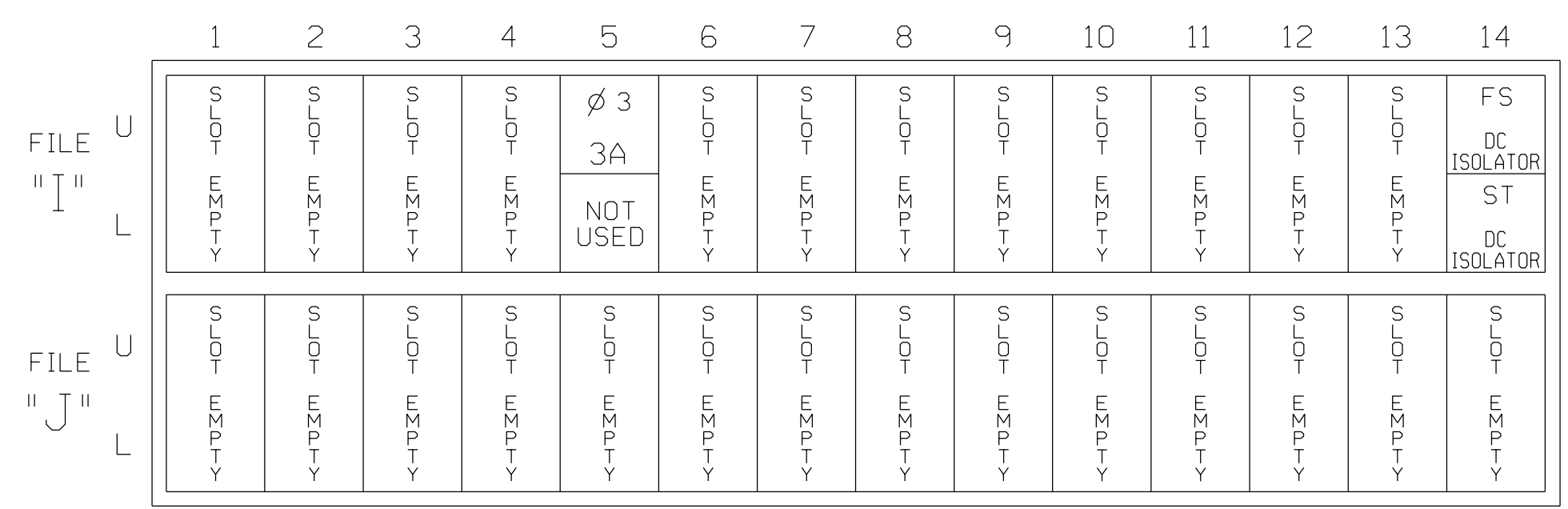
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	NU	NU	31	41,42	NU	NU	61,62,63	NU	NU	81,82	NU	NU	31	NU	NU	NU	NU	
RED					101			134			107								
YELLOW				*	102			135			108								
GREEN					103			136			109								
RED ARROW																		A124	
YELLOW ARROW																			A125
FLASHING YELLOW ARROW																			A126
GREEN ARROW					118														

NU = Not Used

- * See pictorial of head wiring in detail this sheet.
- * Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



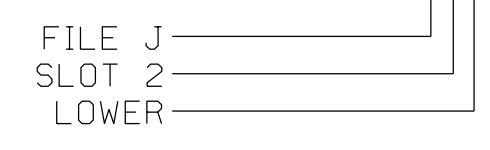
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

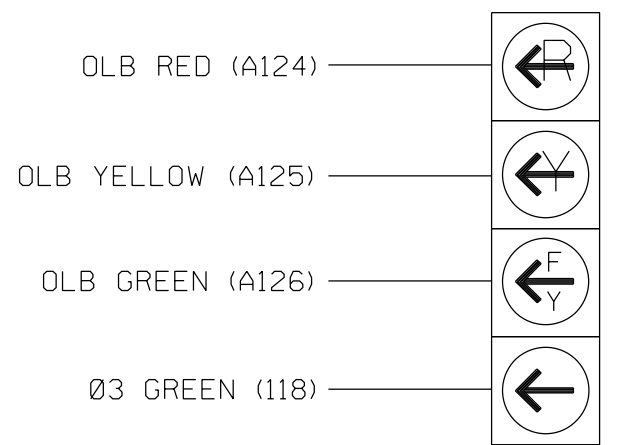
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
3A	T84-5,6	15U	58	3	3	YES		15		S

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



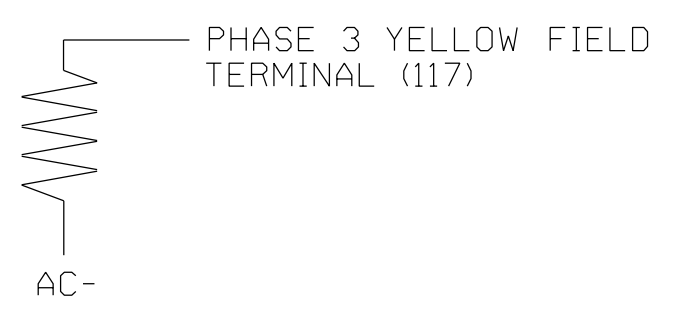
31

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0873
 DESIGNED: October 2017
 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 2

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 70 WB (S. Fisher Street) at NC 87-100 (Webb Avenue)	
Division 7	Alamance County
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

 SEAL
 MELISSA B. TOTH
 ENGINEER

6/11/2018
 DATE

SIG. INVENTORY NO. 07-0873

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

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

Toggle 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

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL



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

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

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

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0873
 DESIGNED: October 2017
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Details - Sheet 2 of 2

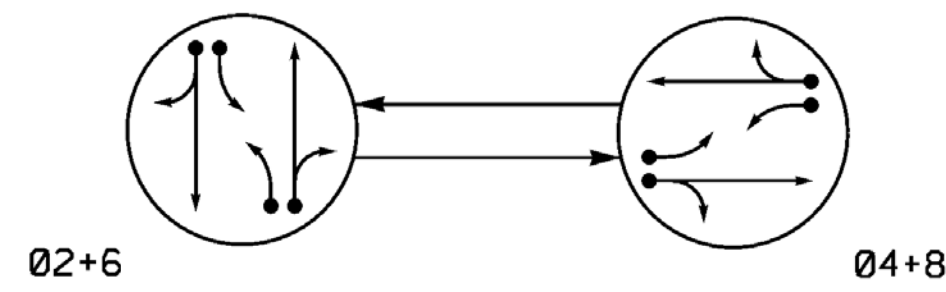
ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 70 WB (S. Fisher Street) at NC 87-100 (Webb Avenue)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared for the Offices of: 	Division 7 Alamance County Burlington	
PLAN DATE: October 2017	REVIEWED BY: AM Encarnacion	SEAL 025892 ENGINEER MELISSA B. TOTH
PREPARED BY: NA Ptak	REVIEWED BY: MB Toth	DEVELOPED BY: Melissa B. Toth 6/11/2018
REVISIONS	INIT. DATE	CHECKED BY: _____ DATE _____
_____		SIG. INVENTORY NO. 07-0873

ATKINS

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

750 N. Greenfield Pkwy, Garner, NC 27529

PHASING DIAGRAM



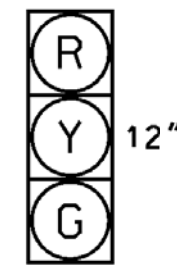
PHASING DIAGRAM DETECTION LEGEND

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

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

SIGNAL FACE I.D.

All Heads L.E.D.



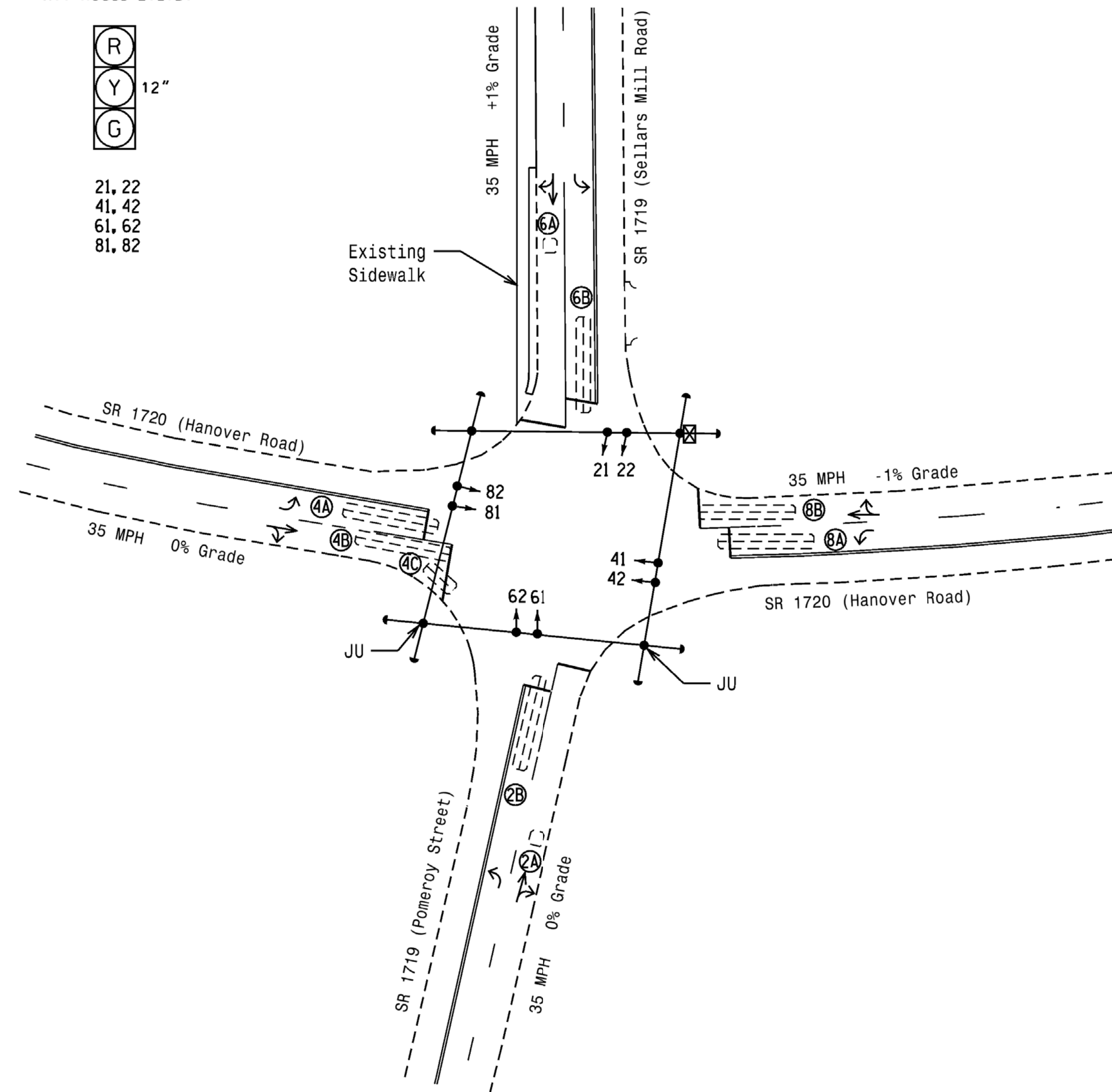
21, 22
41, 42
61, 62
81, 82

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE
2A	6x6	70	4	-	2	Yes	-	-	-	S - X
2B	6x40	+5	2-4-2	-	2	Yes	-	-	-	S - X
4A,4B	6x40	+5	2-4-2	-	4	Yes	-	3	-	S - X
4C	6x15	+5	2-4-2	-	4	Yes	-	15	-	S - X
6A	6x6	70	4	-	6	Yes	-	-	-	S - X
6B	6x40	+5	2-4-2	-	6	Yes	-	-	-	S - X
8A	6x40	+5	2-4-2	-	8	Yes	-	3	-	S - X
8B	6x40	0	2-4-2	-	8	Yes	-	10	-	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.
- 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 *	30	30	30	30
Yellow	3.8	3.8	3.8	3.9
Red Clear	1.8	2.0	1.6	1.9
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	● → N/A
● → Modified Signal Head	○ → N/A
⊥ Sign	⊥ N/A
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ N/A
○ ⊥ Signal Pole with Guy	○ ⊥ N/A
○ ⊥ Signal Pole with Sidewalk Guy	○ ⊥ N/A
⊔ Inductive Loop Detector	⊔ N/A
⊠ Controller & Cabinet	⊠ N/A
□ Junction Box	□ N/A
--- 2-in Underground Conduit	--- N/A
N/A Right of Way	N/A
→ Directional Arrow	→



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

Signal Upgrade

Prepared for the Offices of:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27529
SCALE 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SR 1719 (Pomeroy Street) / (Sellers Mill Road) at SR 1720 (Hanover Road)
Division 7 Alamance County Graham
PLAN DATE: January 2018 REVIEWED BY: JB Voso
PREPARED BY: SE Greene REVIEWED BY:

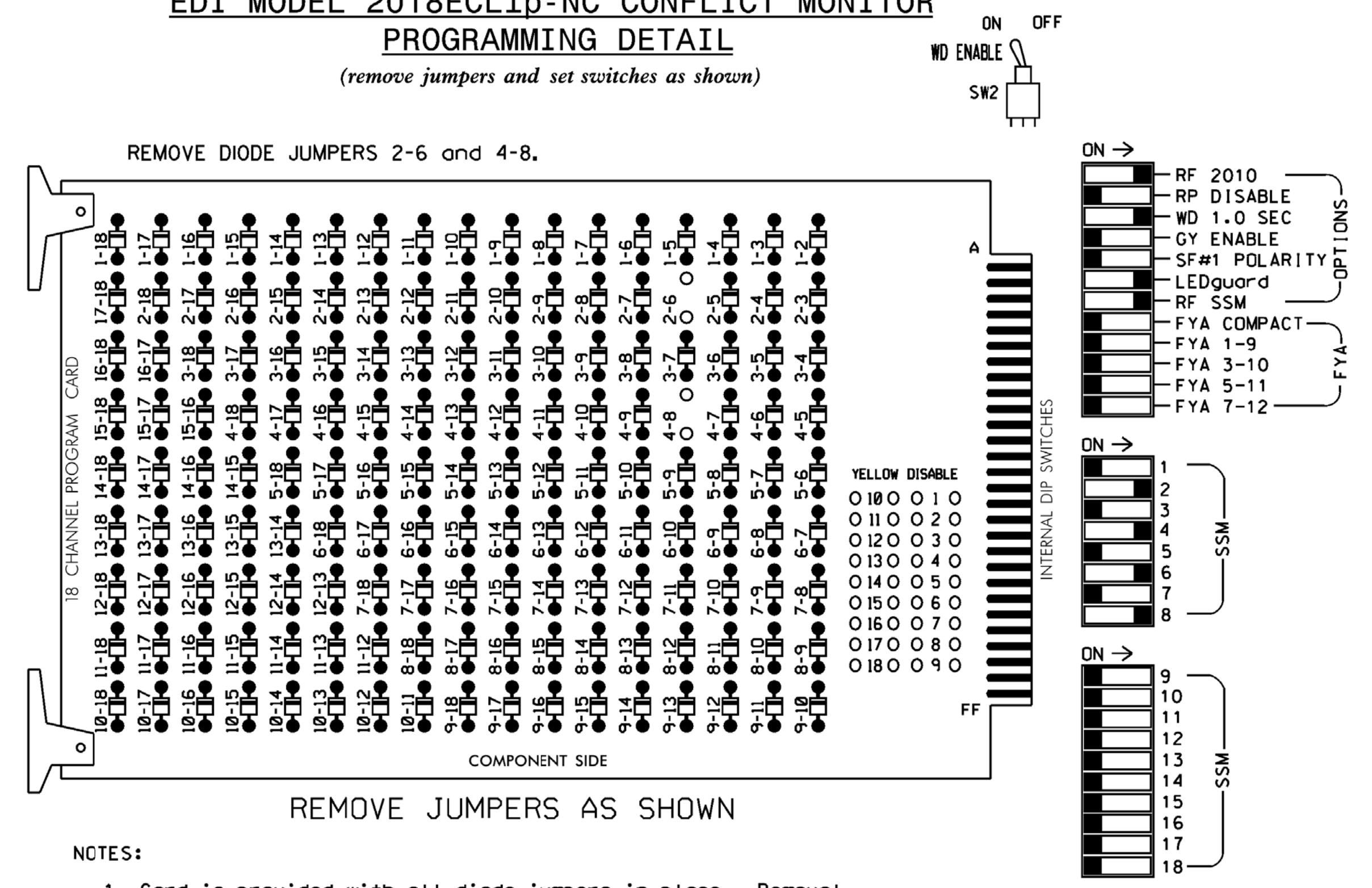
REVISIONS	INIT.	DATE

SEAL
MATTEN & CRAIG
ENGINEERS
JAMES B. VOSO
6/13/2018
SIG. INVENTORY NO. 07-0891

*****SYSTEM *****
*****BUSINESS *****

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												

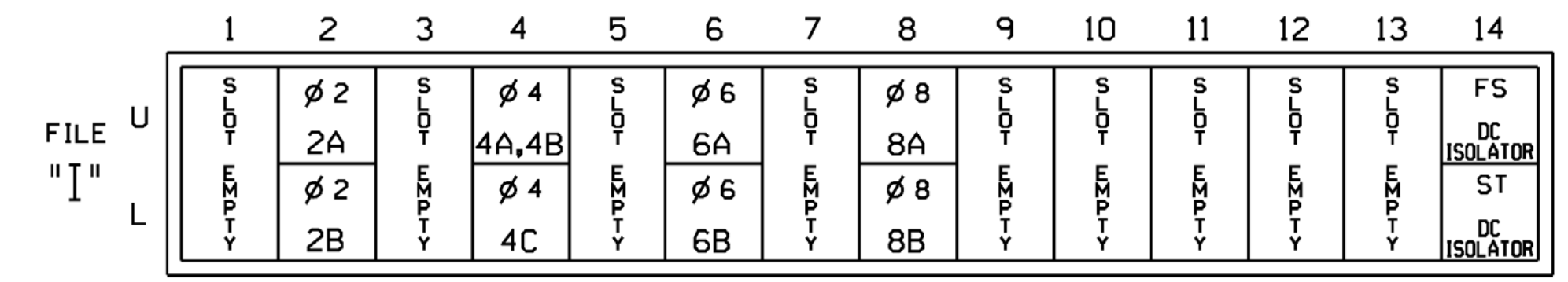
NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....336
 SOFTWARE.....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

INPUT FILE POSITION LAYOUT

(front view)



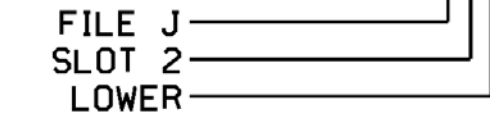
EX.: 1A, 2A, ETC. = LOOP NO.'S

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	I2U	39	2	2	YES				S
2B	TB23-3,4	I2L	43	12	2	YES				S
4A,4B	TB21-7,8	I4U	41	4	4	YES		3		S
4C	TB23-7,8	I4L	45	14	4	YES		15		S
6A	TB21-11,12	I6U	40	6	6	YES				S
6B	TB23-11,12	I6L	44	16	6	YES				S
8A	TB22-1,2	I8U	42	8	8	YES		3		S
8B	TB24-1,2	I8L	46	18	8	YES		5		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0891
 DESIGNED: January 2018
 SEALED: 6/13/2018
 REVISED: NA

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



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

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:



SR 1719 (Pomeroy Street)
 / (Sellars Mill Road)
 at
 SR 1720 (Hanover Road)

Division 7	Alamance County	Graham
PLAN DATE: January 2018	REVIEWED BY: JB Voso	
PREPARED BY: SE Greene	REVIEWED BY:	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 JAMES B. VOSO
 022599
 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-0891

PHASING DIAGRAM

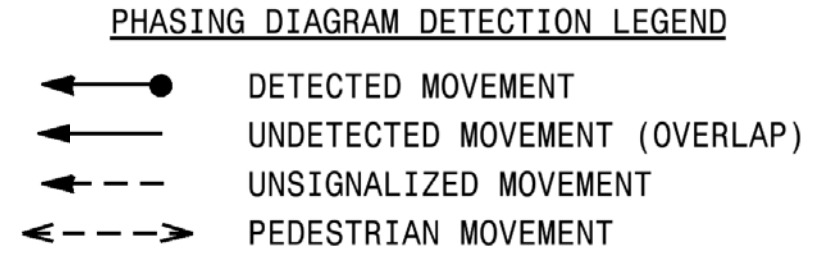
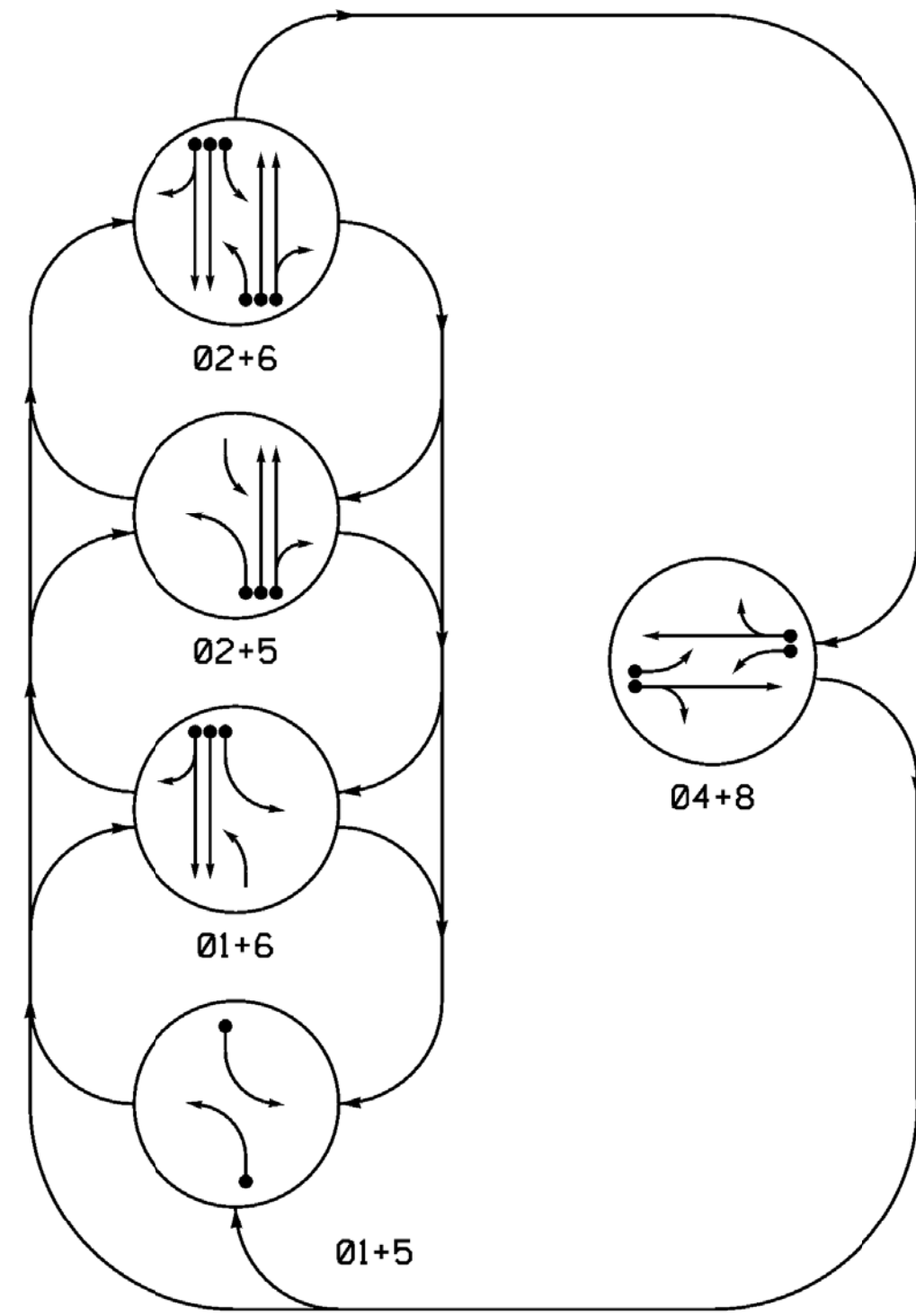
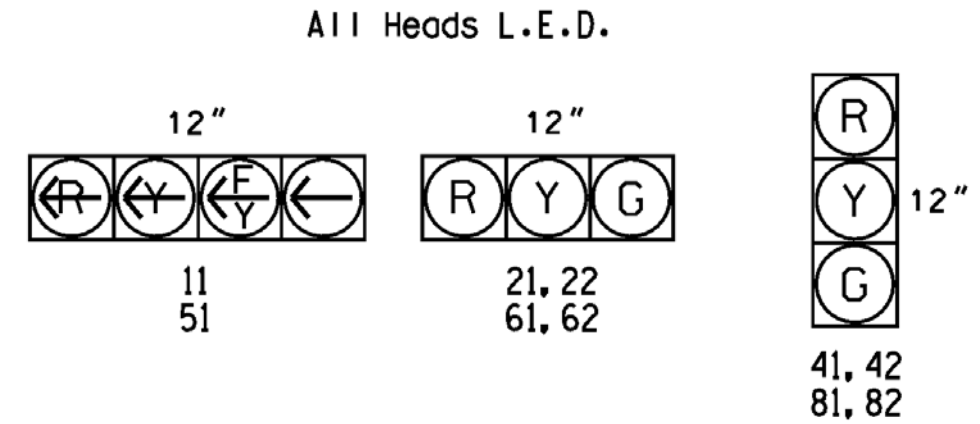


TABLE OF OPERATION

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

SIGNAL FACE I.D.



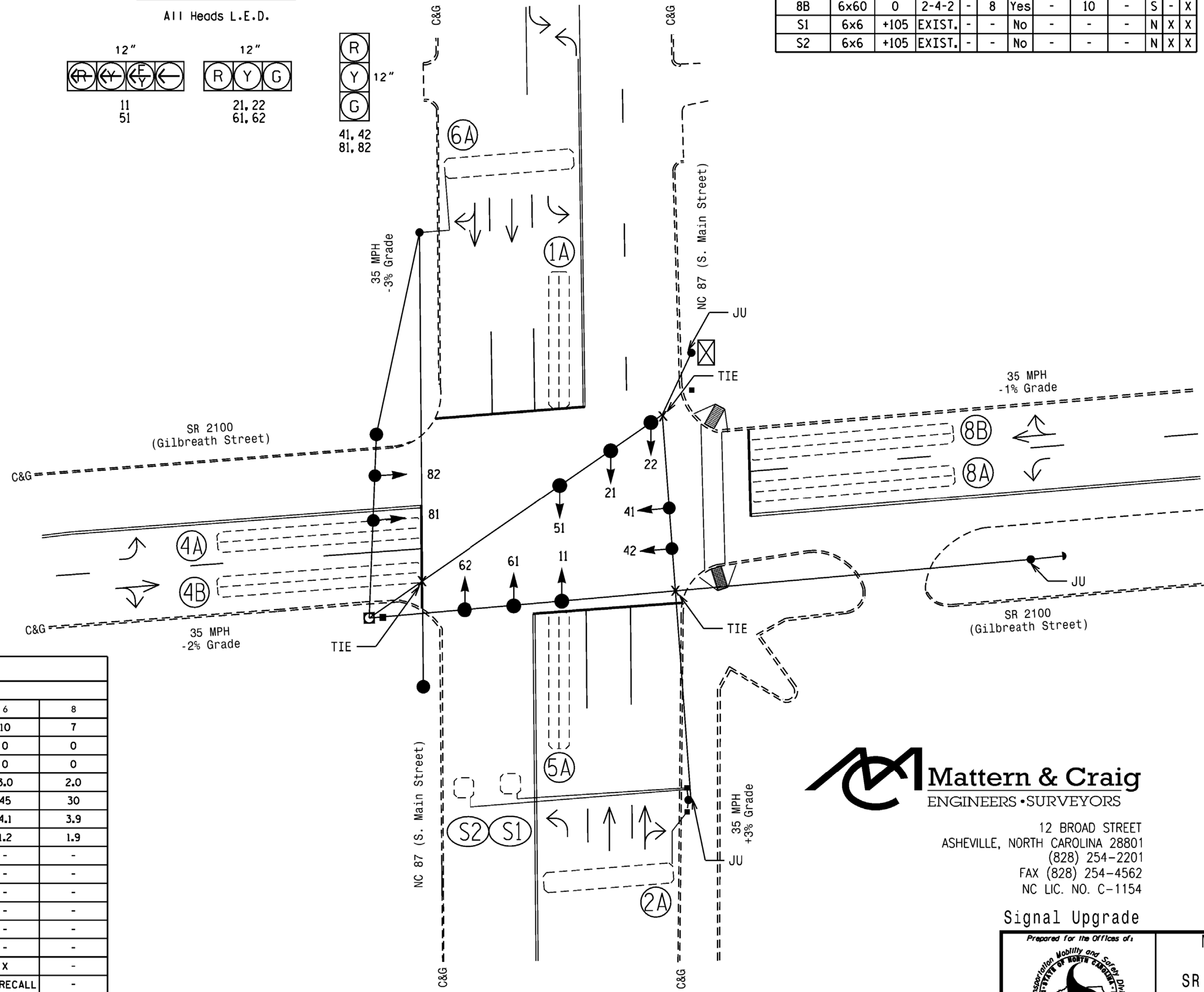
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME					
1A	6x40	0	2-4-2	-	1	Yes	-	15	-	S	-	X	
2A	6x36	70	EXIST.	-	2	Yes	-	-	-	S	-	X	
4A	6x60	0	2-4-2	-	4	Yes	-	3	-	S	-	X	
4B	6x60	0	2-4-2	-	4	Yes	-	10	-	S	-	X	
5A	6x40	0	2-4-2	-	5	Yes	-	15	-	S	-	X	
6A	6x36	70	EXIST.	-	6	Yes	-	-	-	S	-	X	
8A	6x60	0	2-4-2	-	8	Yes	-	3	-	S	-	X	
8B	6x60	0	2-4-2	-	8	Yes	-	10	-	S	-	X	
S1	6x6	+105	EXIST.	-	-	No	-	-	-	N	X	X	
S2	6x6	+105	EXIST.	-	-	No	-	-	-	N	X	X	

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



ASC/3 TIMING CHART

FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	10	7	7	10	7	
Walk *	0	0	0	0	0	0	
Ped Clear	0	0	0	0	0	0	
Veh. Extension *	2.0	3.0	2.0	2.0	3.0	2.0	
Max 1 *	15	45	30	15	45	30	
Yellow	3.0	4.1	4.0	3.0	4.1	3.9	
Red Clear	2.1	1.2	1.7	1.9	1.2	1.9	
Actuations B4 Add *	-	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	-	
Max Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	
Locking Detector	-	X	-	-	X	-	
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	

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

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

Prepared for the Offices of:
Transportation Mobility and Safety Planning
SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

NC 87 (S. Main Street)
at
SR 2100 (Gilbreath Street)

Division 7 Alamance County Graham

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
JAMES B. VOSO
022599

6/13/2018
DATE

SIG. INVENTORY NO. 07-0897

*****SYTIME*****
*****BUSINESS*****

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: 07-0897
 DESIGNED: March 2018
 SEALED: 6/13/2018
 REVISED: NA

\$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$
 \$\$\$SYTIME\$\$\$\$\$



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		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 87 (S. Main Street) at SR 2100 (Gilbreath Street)	SEAL
Prepared for the Offices of: 	Division 7 Alamance County Graham	James Vosso 6/13/2018 DATE
PLAN DATE: March 2018 PREPARED BY: SE Greene	REVIEWED BY: JB Vosso	REVISIONS INIT. DATE
REVISIONS _____ _____ _____		SIG. INVENTORY NO. 07-0897

PHASING DIAGRAM

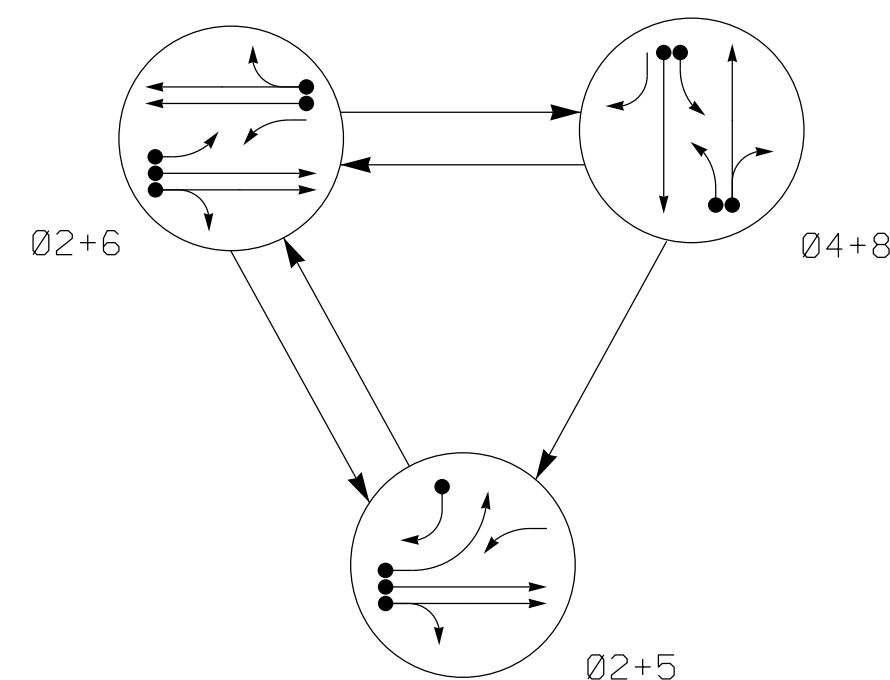


TABLE OF OPERATION

SIGNAL FACE	PHASE				
	02+5	02+6	04+8	F L R	Y
21,22	G	G	R	Y	
41	R	R	F	R	
42,44	R	R	G	R	
43	R	R	G	R	
51	F	F	R	Y	
61	F	F	R	Y	
62,63	R	G	R	Y	
81	R	R	F	R	
82,83	R	R	G	R	

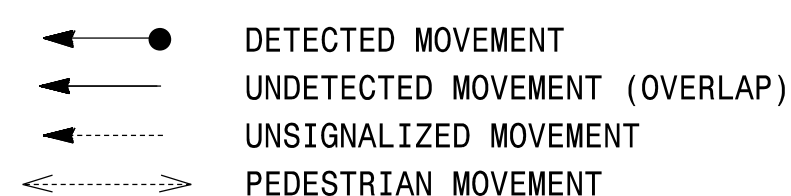
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD
2A,2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	- X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	- X
4B	6X40	0	2-4-2	-	4	Yes	-	-	-	S	- X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	- X
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	S	- X
6A,6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	- X
6C	6X60	+5	2-4-2	-	6	Yes	-	3	-	G	- X
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	S	- X
8B	6X60	0	2-4-2	-	8	Yes	-	10	-	S	- X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

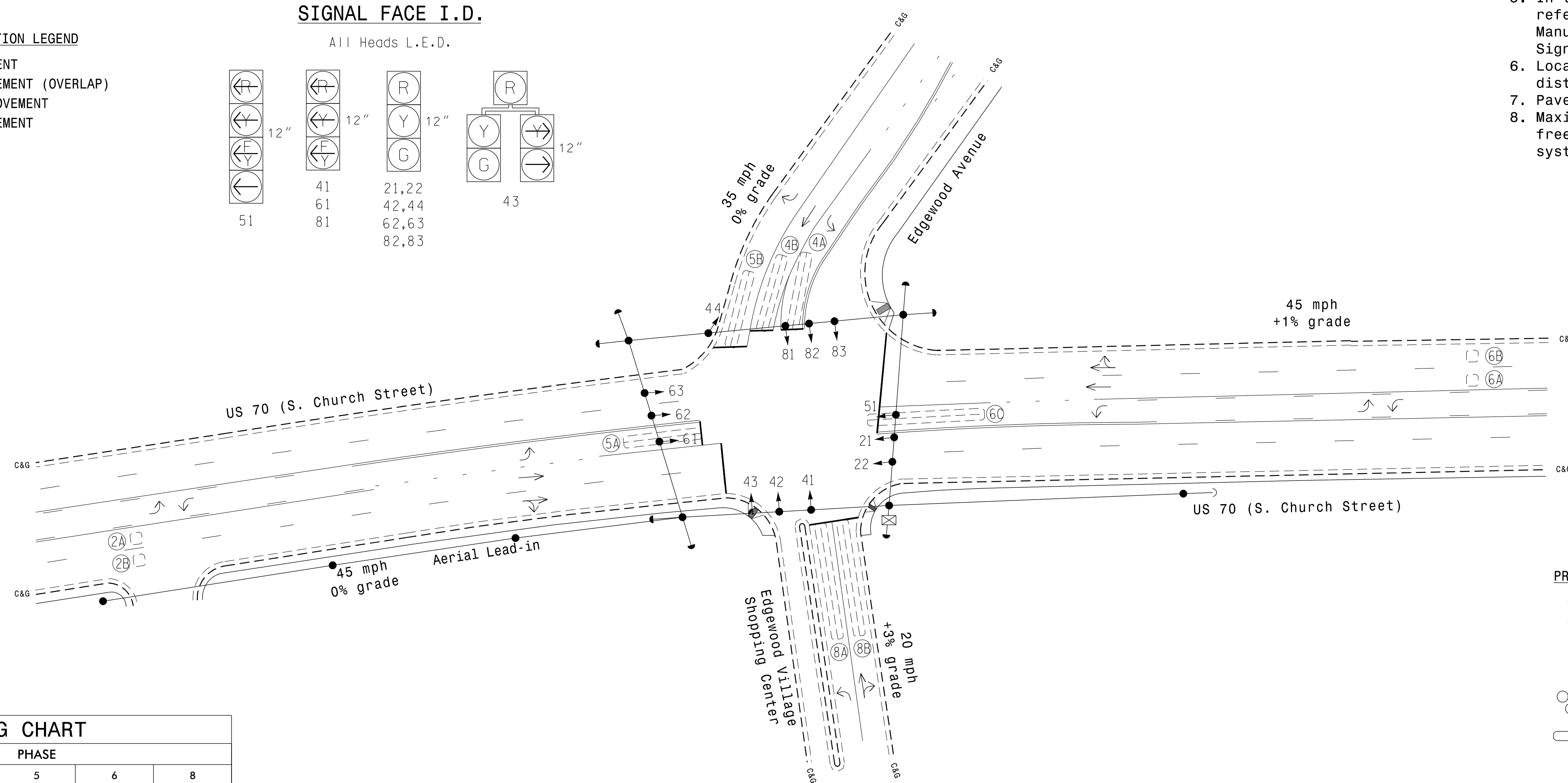
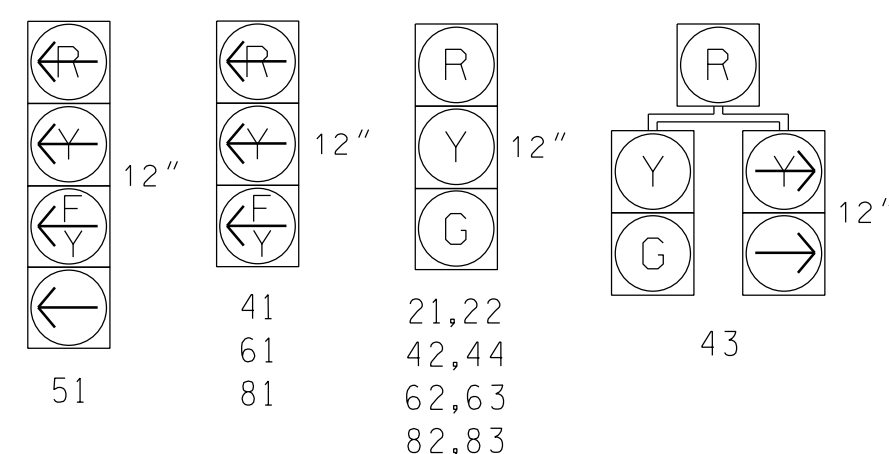
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence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

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

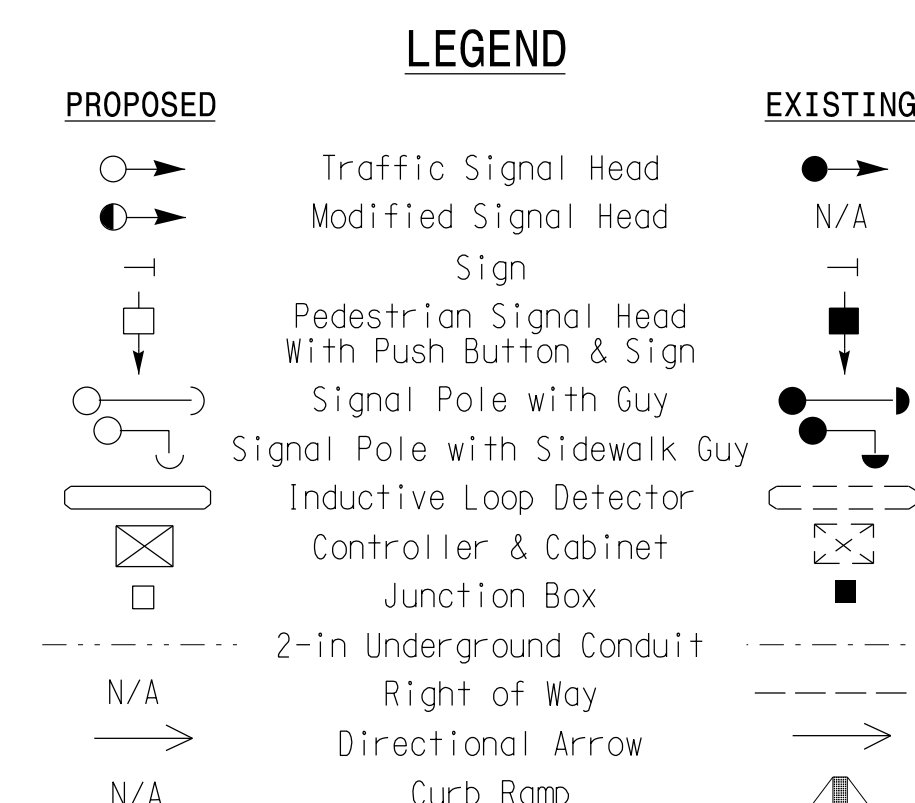
All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green *	12	7	7	12	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0	2.0
Max 1 *	90	30	25	90	20
Yellow	4.5	3.8	3.0	4.5	3.8
Red Clear	1.3	3.1	2.4	1.3	3.1
Actuations B4 Add *	0	-	-	0	-
Seconds / Actuation *	2.0	-	-	2.0	-
Max Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	30	-	-	30	-
Minimum Gap	3.0	-	-	3.0	-
Locking Detector	X	-	-	X	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X

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



Signal Upgrade

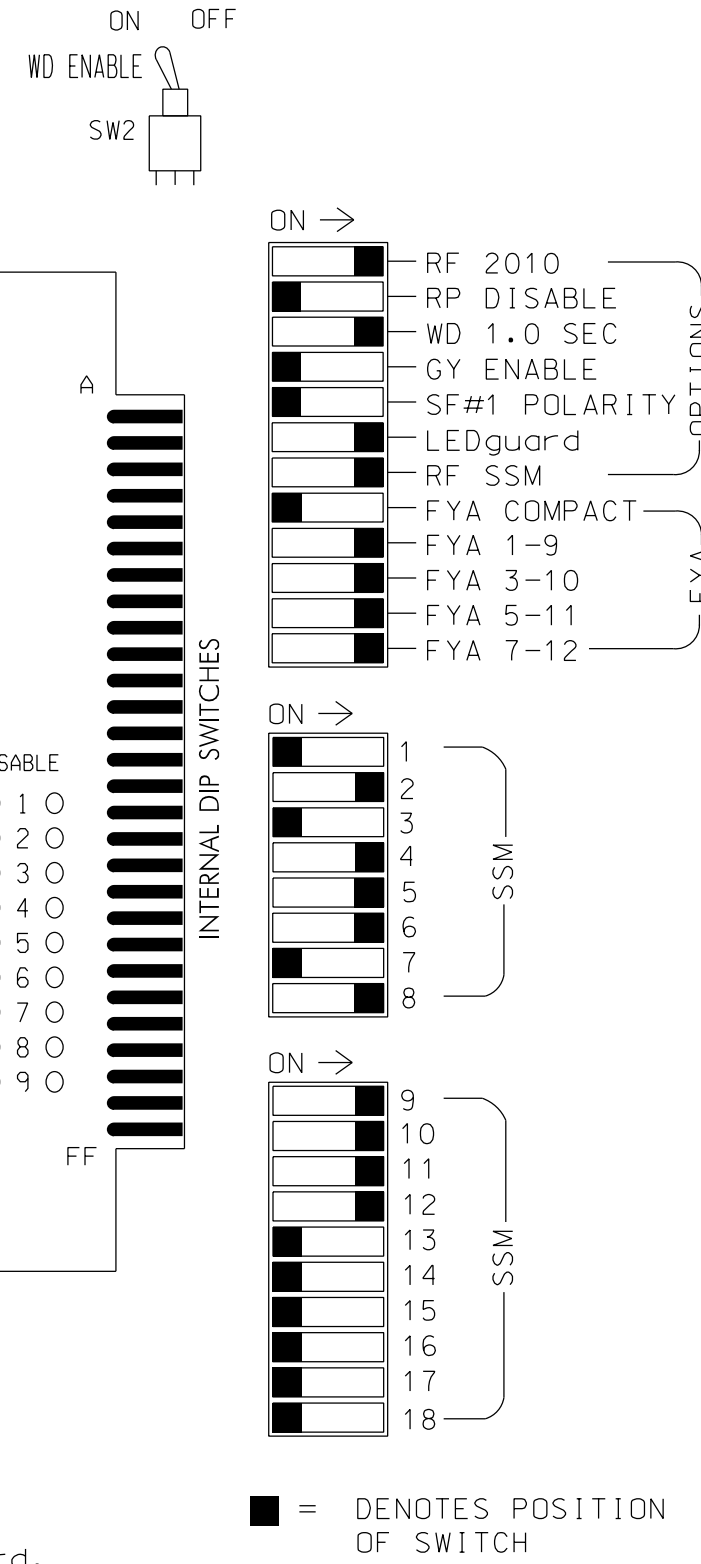
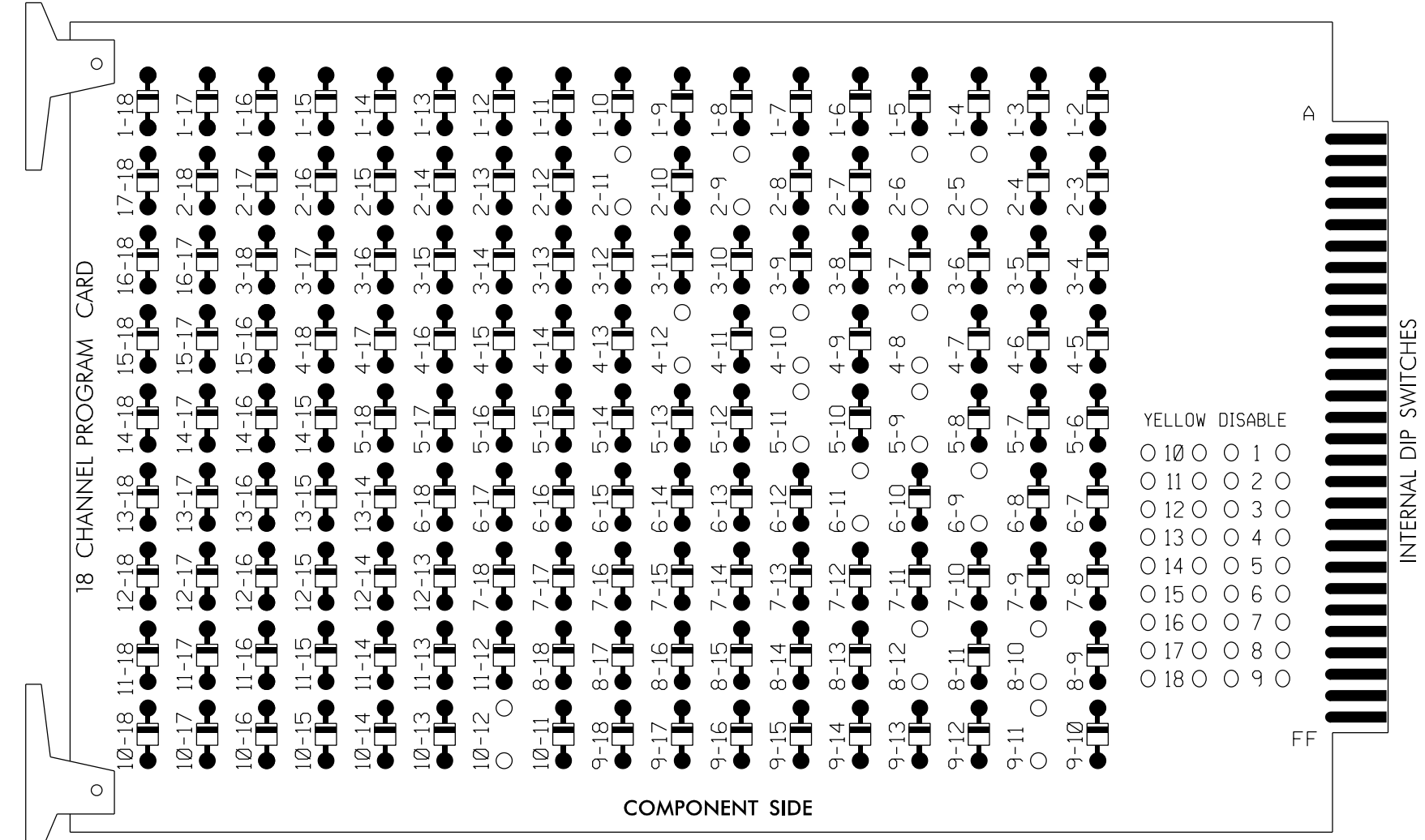
	US 70 (S. Church Street) at Edgewood Avenue/ Edgewood Village Shopping Center		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 023489
	Prepared for the Offices of: 	Division 7 Alamance County Burlington	
750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion	DATE: 6/8/2018
SCALE: 1"=40'	PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander	SIGNATURE: Pamela Alexander
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	REVISIONS:	INIT. DATE:	SIG. INVENTORY NO. 07-0932

11--JUN-2018 17:52
 01-TransportationTr-off-cacurr-100056469 U-6015 B-6 Sig SysTask 05-11--SignalSys04as:gn07-0932.dgn
 ALX3361 AT LUS40649

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 8-10, 8-12, 9-11, and 10-12.



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.....ECONDLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,S11,AUX S1, AUX S2,AUX S4,AUX S5
 PHASES USED.....2,4,5,6,8
 OVERLAP "A".....*
 OVERLAP "B".....*
 OVERLAP "C".....*
 OVERLAP "D".....*

* See sheet 2 for overlap programming.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43,44	NU	43	51	62,63	NU	NU	82,83	NU	61	81	NU	51	41	NU
RED		128			101		*	134			107								
YELLOW		129			102			135			108								
GREEN		130			103			136			109								
RED ARROW														A121	A124		A114	A101	
YELLOW ARROW								132						A122	A125		A115	A102	
FLASHING YELLOW ARROW														A123	A126		A116	A103	
GREEN ARROW								133	133										

NU = Not Used

* See pictorial of head wiring in detail this sheet.
 * Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT (front view)

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

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

FS = FLASH SENSE
 ST = STOP TIME

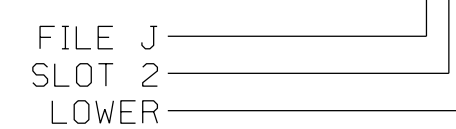
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

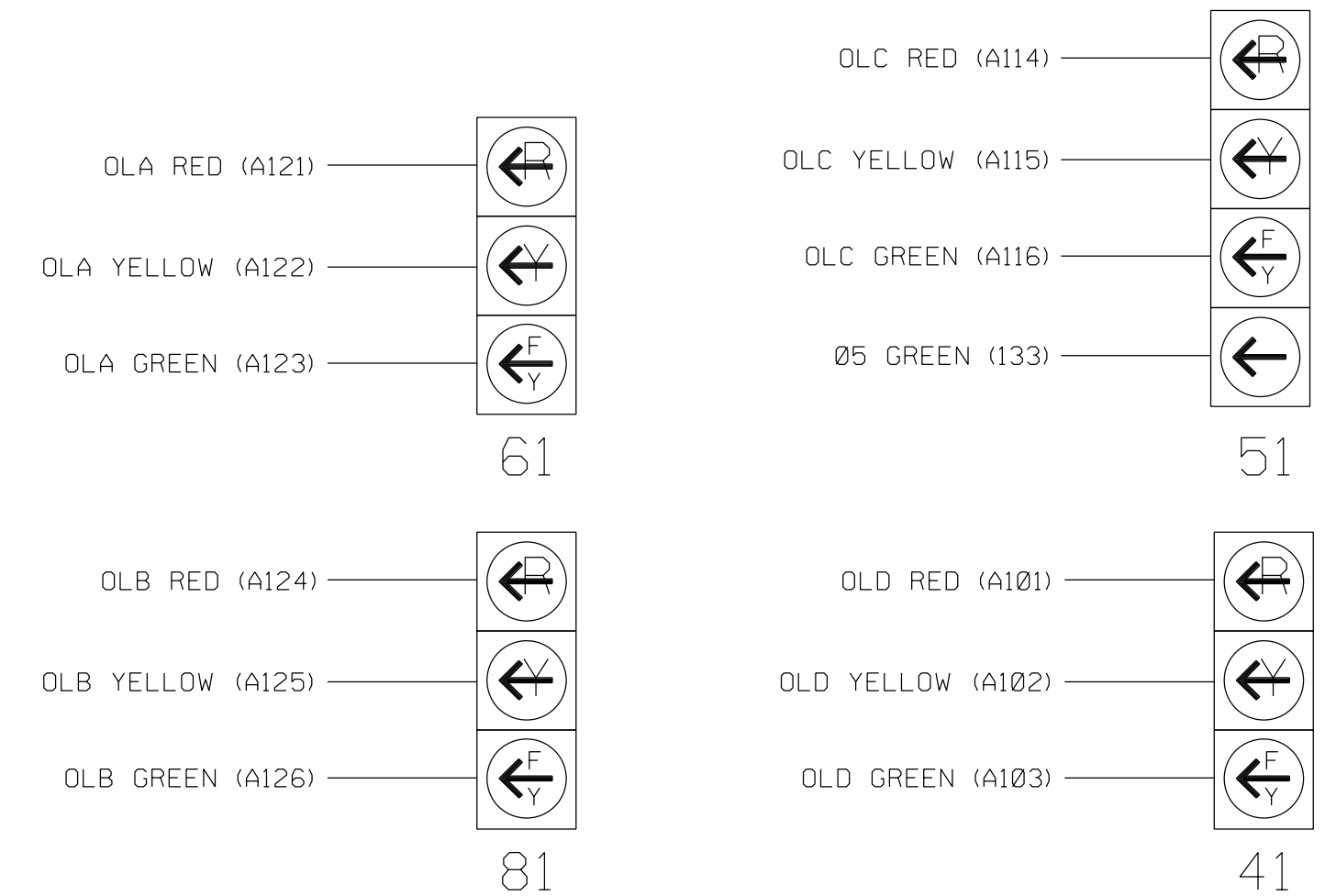
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXT TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A,2B	TB2-5,6	I2U	39	2	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES				S
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A,6B	TB3-9,10	J3U	64	36	6	YES			X	N
6C	TB3-11,12	J3L	77	46	6	YES		3		G
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

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

INPUT FILE POSITION LEGEND: J2L



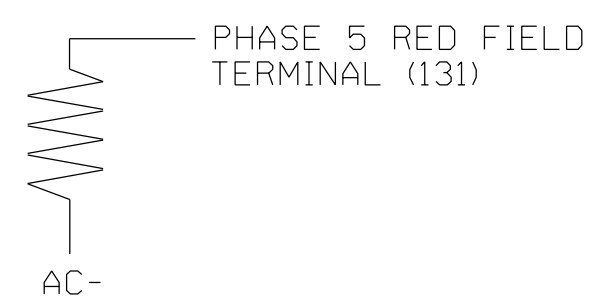
FYA SIGNAL WIRING DETAIL (wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL (install resistor as shown)

ACCEPTABLE VALUES

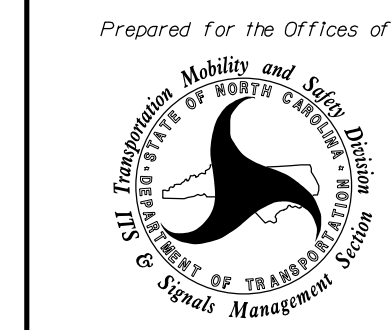
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:



US 70 (S. Church Street) at Edgewood Avenue/Edgewood Village Shopping Center
 Division 7 Alamance County Burlington
 PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion
 PREPARED BY: NA Ptak REVIEWED BY: PL Alexander

REVISIONS	INIT.	DATE



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

SIG. INVENTORY NO. 07-0932

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```

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

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
    
```

Toggle Once

OVERLAP B

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

```

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

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
    
```

Toggle 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 'OTHER/ECONOLITE'

```

TMG VEH OVLP... [D] 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

FLASHER CIRCUIT MODIFICATION DETAIL

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

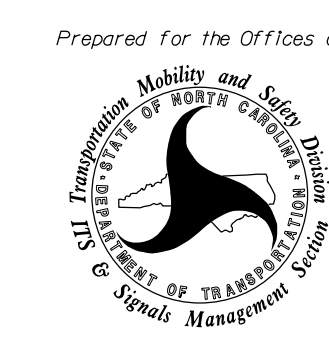
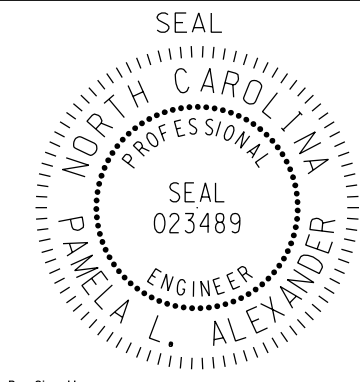
- On rear of PDA - remove wire from Term. T2-4 and terminate on T2-2.
- On rear of PDA - remove wire from Term. T2-5 and terminate on T2-3.
- Remove flasher unit 2.

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

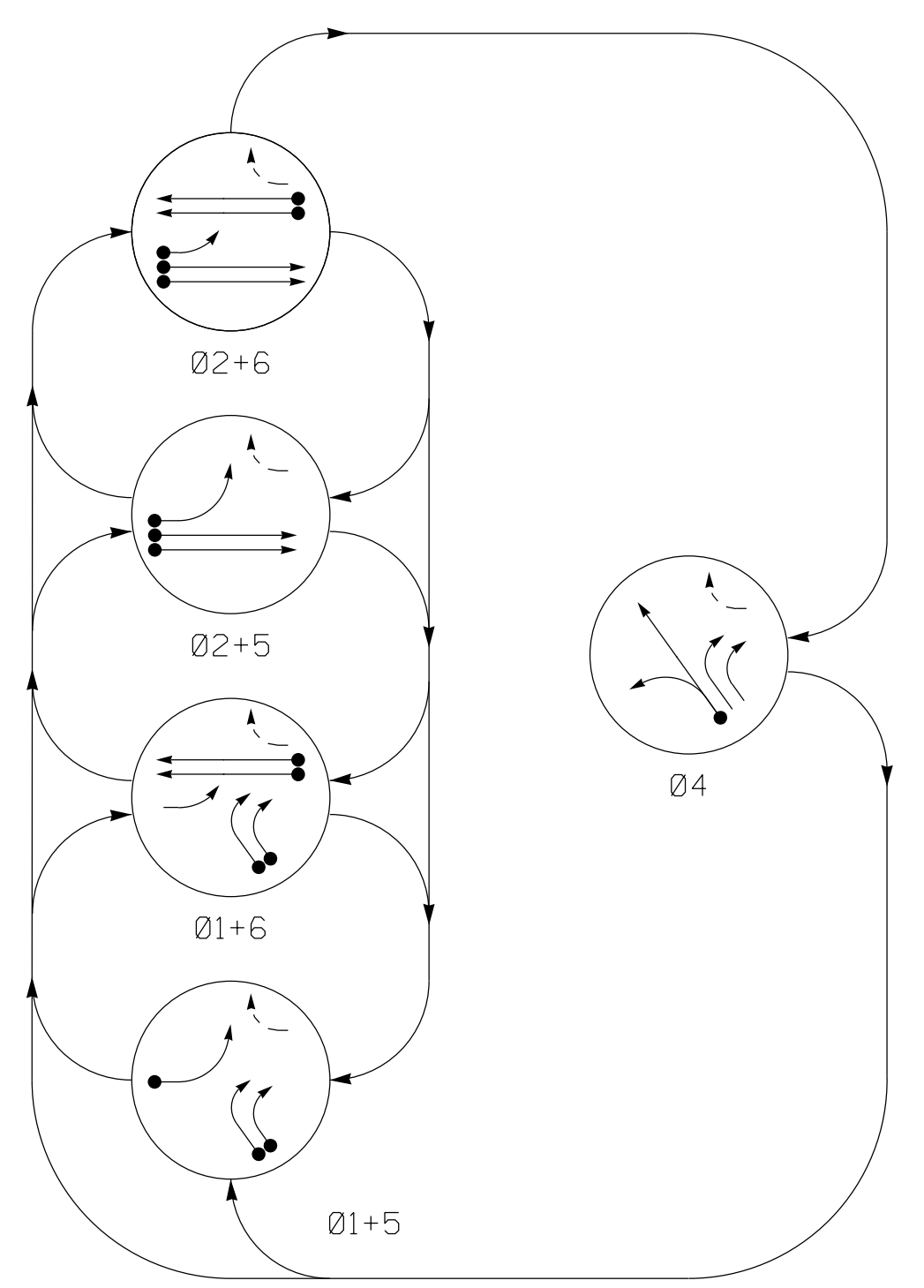
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0932
DESIGNED: December 2017
SEALED: 6/8/2018
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	US 70 (S. Church Street) at Edgewood Avenue/ Edgewood Village Shopping Center		
	Division 7 PLAN DATE: December 2017 PREPARED BY: NA Ptak	Alamance County REVIEWED BY: AM Encarnacion REVIEWED BY: PL Alexander		Burlington DATE: 6/9/2018 DATE:
REVISIONS INIT. DATE	REVISIONS INIT. DATE		SIG. INVENTORY NO. 07-0932

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

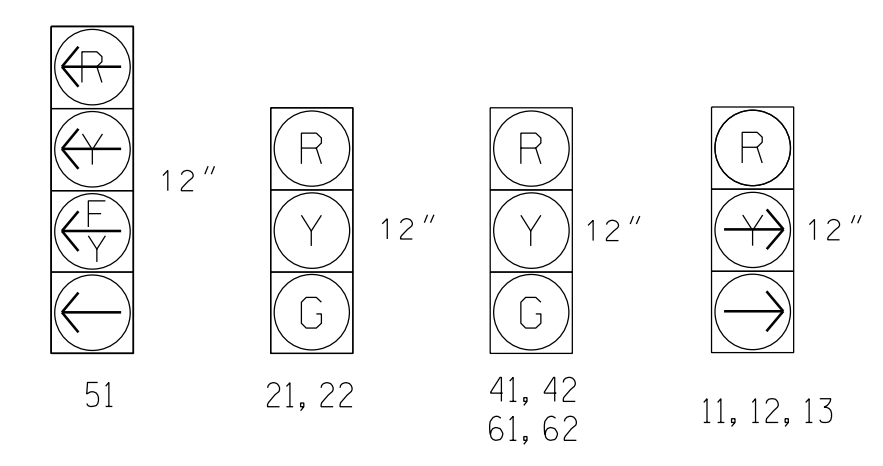
- ◄● DETECTED MOVEMENT
- ◄◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄◄◄ UNSIGNALIZED MOVEMENT
- ◄◄◄◄ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE				
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4
11, 12, 13	→	→	R R	→	R
21, 22	R R	G G	G G	R Y	
41, 42	R R	R R	G R	G R	
51	←	←	←	←	←
61, 62	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



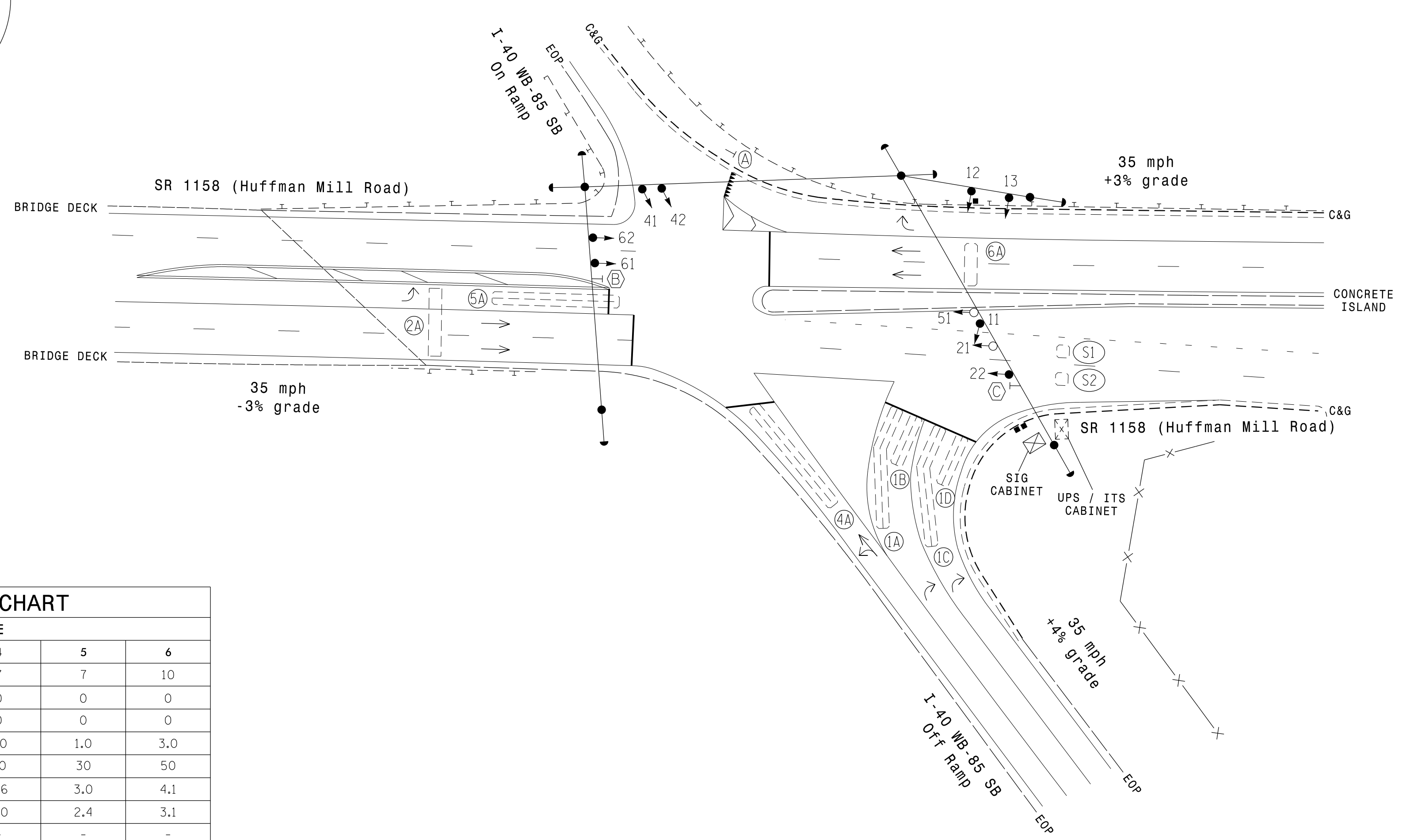
ASC/3 DETECTOR INSTALLATION CHART

LOOP	DETECTOR				PROGRAMMING							
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	15	-	S	-	X
1B	6X25	0	2-4-2	-								
1C	6X60	0	2-4-2	-								
1D	6X25	0	2-4-2	-								
2A	6X32	90	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	0	2-4-2	-								
5A	6X60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X20	92	EXIST	-								
S1	6X6	+200	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+200	EXIST	-								

5 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 may be lagged.
4. Reposition existing signal heads numbered 11 and 22.
5. Install backplates for signal heads numbered 51 & 21.
6. Set all detector units to presence mode.
7. 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.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
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	4	5	6
Min Green *	7	10	7	7	10
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	1.0	3.0	1.0	1.0	3.0
Max 1 *	30	50	20	30	50
Yellow	3.6	4.1	3.6	3.0	4.1
Red Clear	2.0	3.1	2.0	2.4	3.1
Actuations B4 Add *	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	-	X
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
◐→ Modified Signal Head	◐→ N/A
⊥ Sign	⊥ N/A
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ N/A
⊥ Signal Pole with Guy	⊥ N/A
⊥ Signal Pole with Sidewalk Guy	⊥ N/A
⊥ 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
(A) "YIELD" Sign (R1-2)	(A) N/A
(B) No U-Turn/No Left Turn Sign (R3-18)	(B) N/A
(C) No Right Turn Sign (R3-1)	(C) N/A

Signal Upgrade

Prepared for the Offices of:

SR 1158 (Huffman Mill Road) at I-40 WB-85 SB Ramps

Division 7 Alamance County Burlington

PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: MB Toth

SCALE: 1"=40'

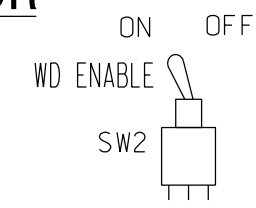
6/7/2018

SIG. INVENTORY NO. 07-0955

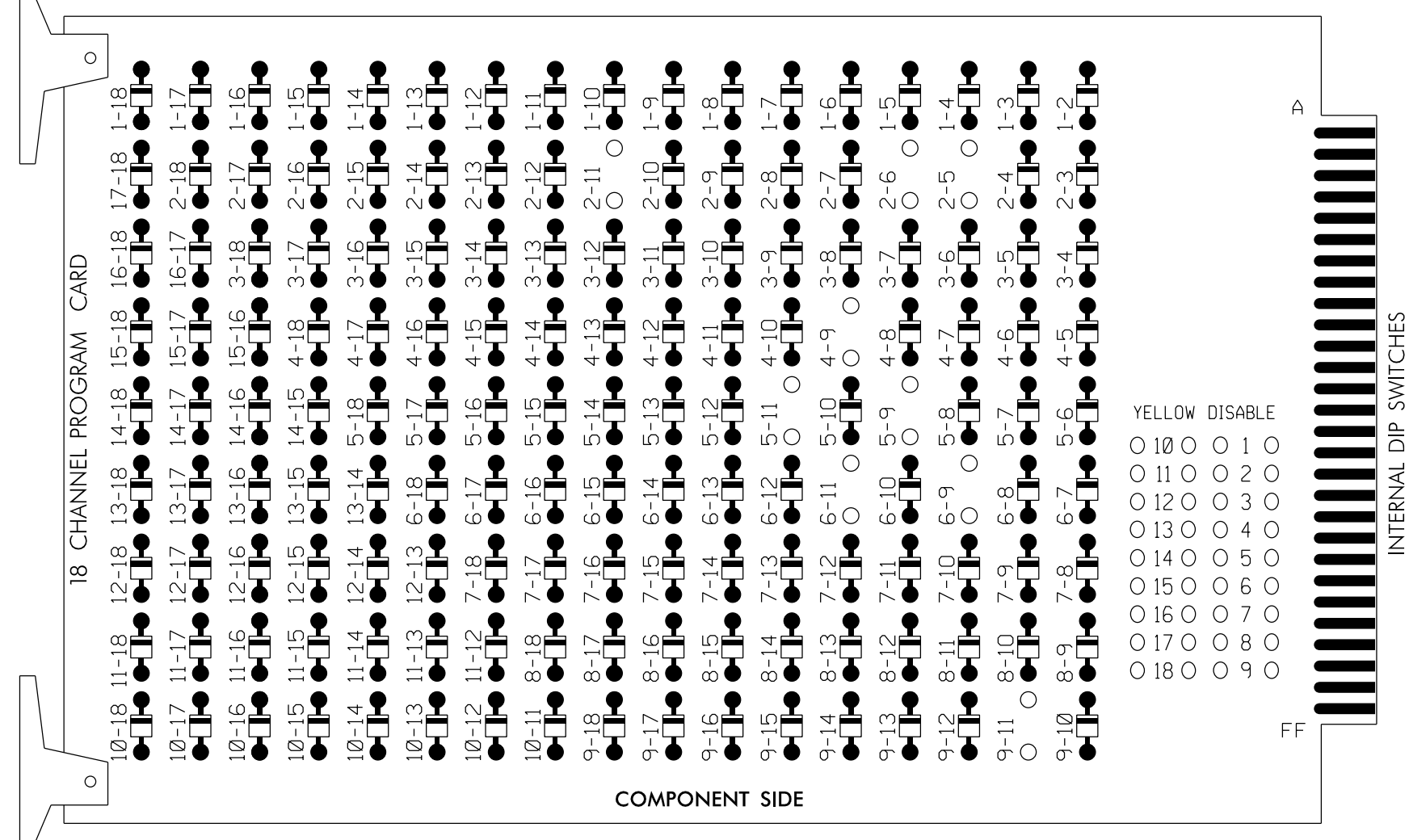
07-JUN-2018 11:15 D:\Consolidated\Projects\00056469 U-6015 B-G S19 SysTask 05_11_Signal\00056469-0955.dgn ALEX3361 AT LUS210649

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



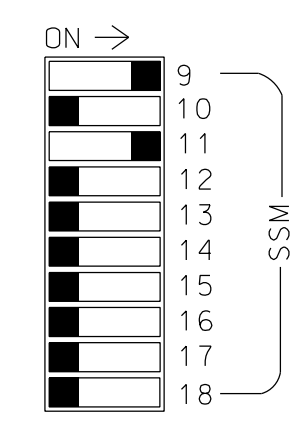
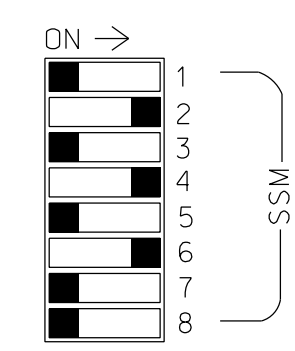
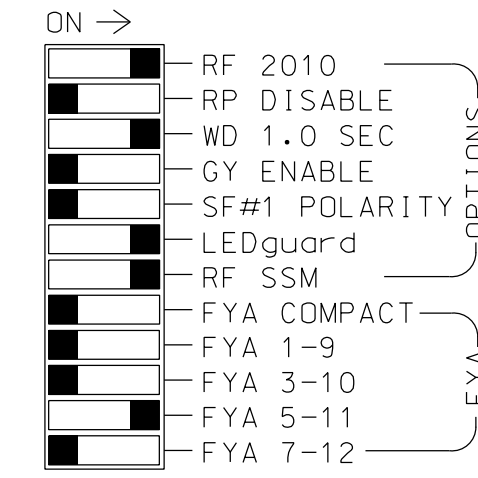
REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 4-9, 5-9, 5-11, 6-9, 6-11 and 9-11



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.



■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig. 89.1

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
EMU 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.	NC	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	NU	NU	11,12,13	NU	NU	51	NU	NU
RED		128			101			134					A121					
YELLOW		129			102		*	135										
GREEN		130			103			136										
RED ARROW																	A114	
YELLOW ARROW													A122				A115	
FLASHING YELLOW ARROW																		A116
GREEN ARROW								133					A123					

NU = Not Used

NC = Phase used for timing only

* 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)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

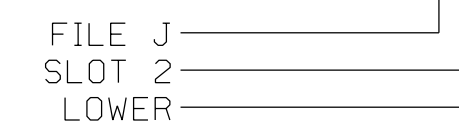
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A,1B	TB2-1,2	I1U	56	1	1	YES		15		S
1C,1D	TB2-9,10	I3U	63	32	1	YES		15		S
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S

* System detector only. Remove any assigned vehicle phase.

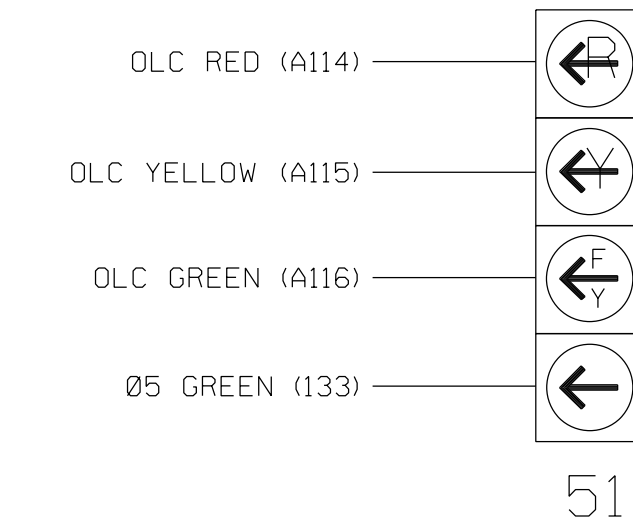
¹Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

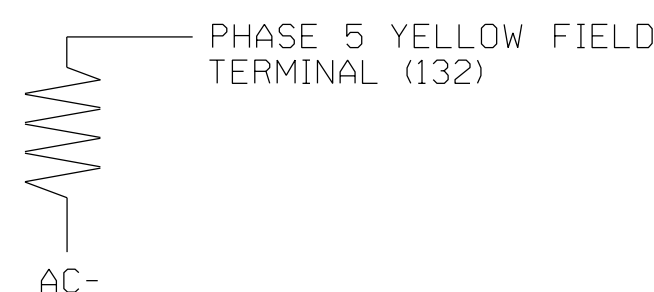
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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

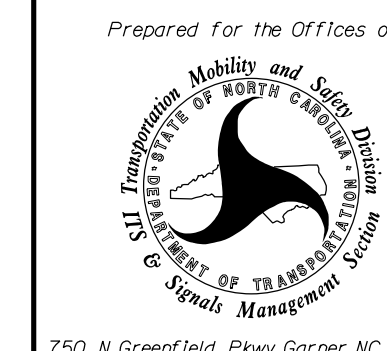


Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1158 (Huffman Mill Road)
at
I-40 WB-85 SB Ramps



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

REVISIONS	INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529

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



DATE: 6/11/2018
Melissa B. Toth

SIG. INVENTORY NO. 07-0955

09-UN-2018 13338
D:\Transportation\Tr-office\Curran\00056469 U-6015 B-6 Sig Sys\task 05-11_Signal\is04as\gn\Wfr\ing07-0955E.dgn
ALEX3361 AT LUS2018

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 'NORMAL'

TMG VEH OVLP...[A] 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 Twice

OVERLAP C

Select TMG VEH DVLP [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: 07-0955
 DESIGNED: October 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 13:38
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 ALEX3361 AT LUS240619

Electrical Detail - Sheet 2 of 2

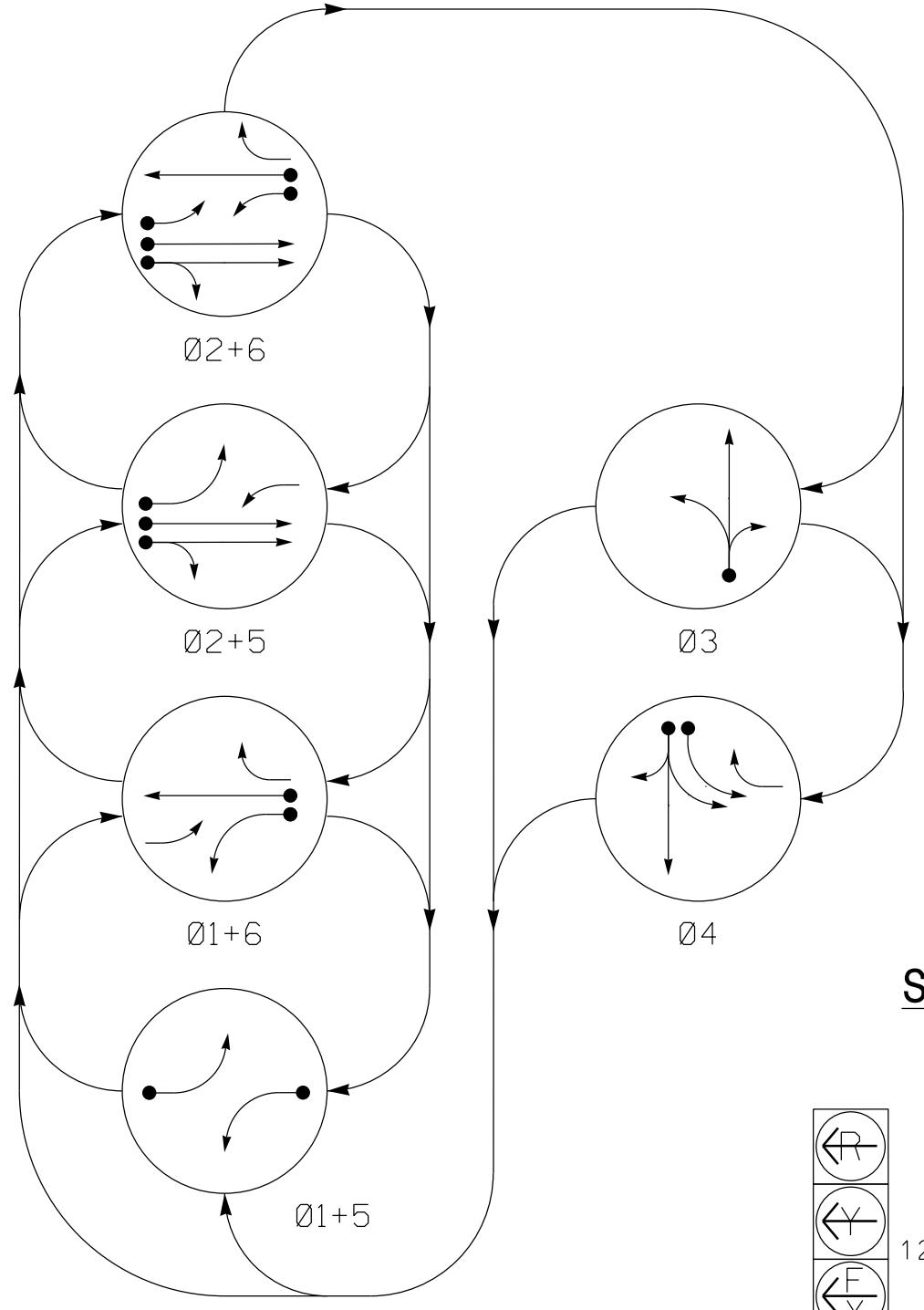
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

<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>SR 1158 (Huffman Mill Road) at I-40 WB-85 SB Ramps</p> <p>Division 7 Alamance County Burlington</p> <p>PLAN DATE: October 2017 REVIEWED BY: AM Encarnacion</p> <p>PREPARED BY: JA Wiles REVIEWED BY: MB Toth</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p>SEAL</p> <p>SEAL 025892 ENGINEER MELISSA B. TOTH</p> <p style="font-size: x-small;">Decided by: Melissa B. Toth 6/11/2018 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-0955</p>
REVISIONS	INIT.	DATE									

ATKINS

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

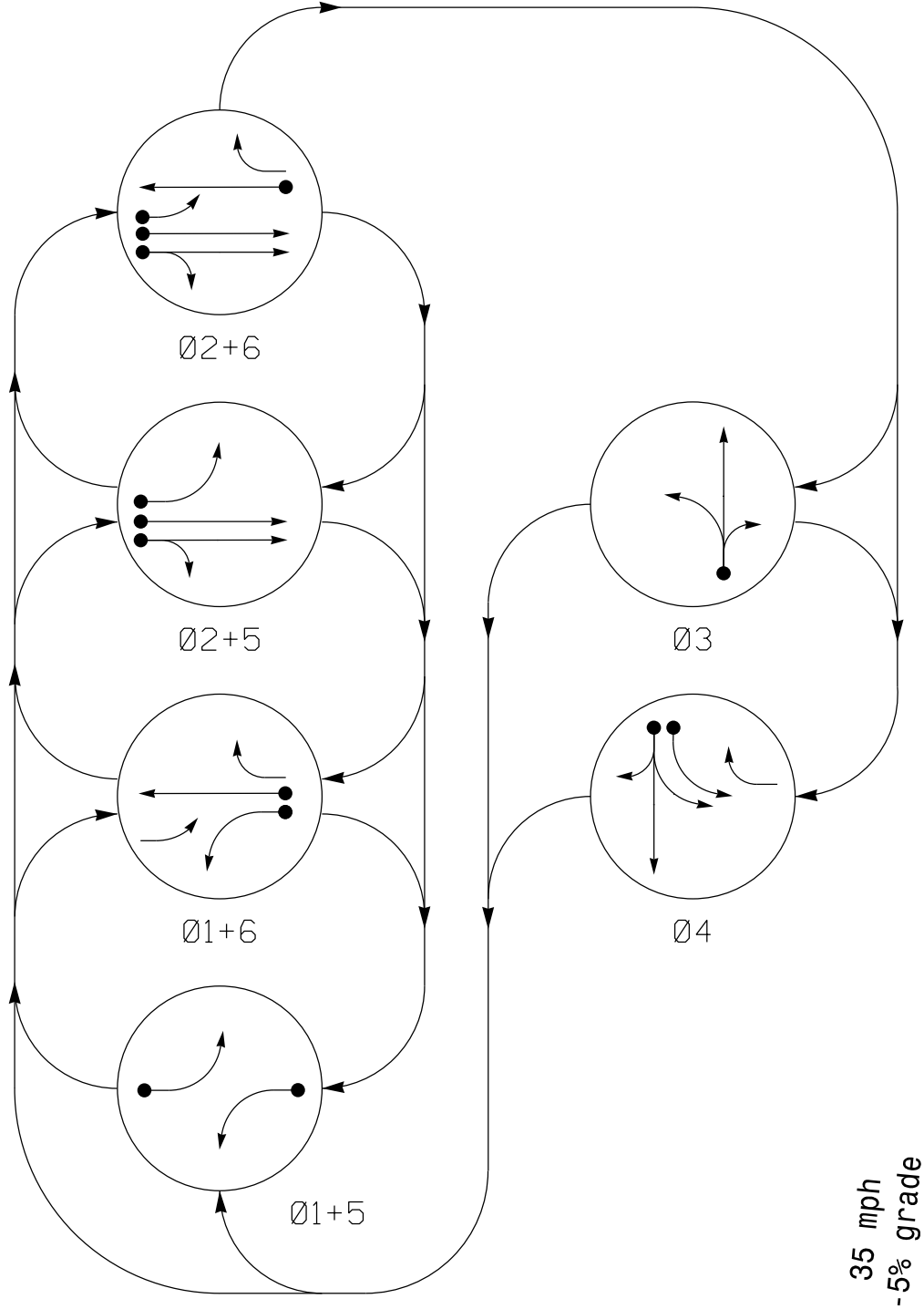
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 3	Ø 4
11	→	→	→	→	→	→
21,22	R	R	G	G	R	R
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	R	G
42	R	R	R	R	R	G
51	←	←	←	←	←	←
61	R	G	R	G	R	R
62	R	G	R	G	R	Y

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 3	Ø 4
11	→	→	→	→	→	→
21,22	R	R	G	G	R	R
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	R	G
42	R	R	R	R	R	G
51	←	←	←	←	←	←
61	R	G	R	G	R	R
62	R	G	R	G	R	Y

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	*15	-	S	-	X
2A,2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	5	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X

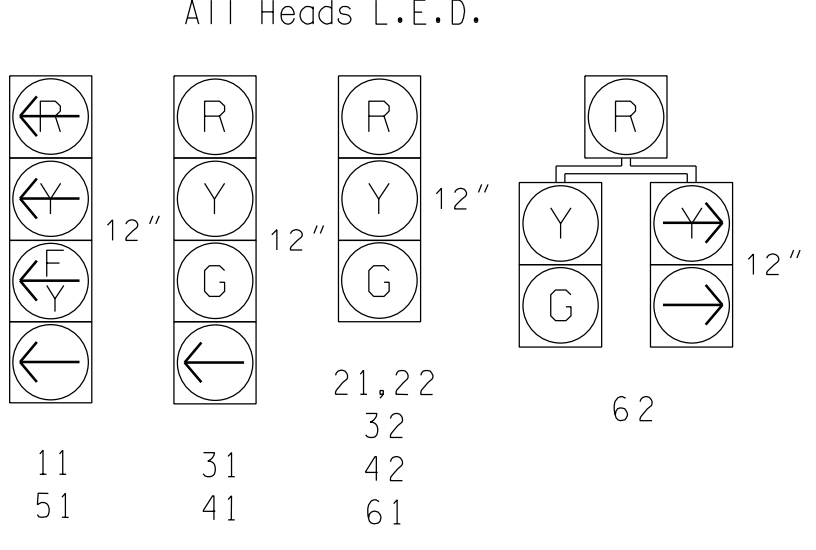
* Disable Delay During Alternate Phasing Operation.
 ** Disable Phase 6 Call For Loop 1A During Alternate Phasing Operation.

6 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

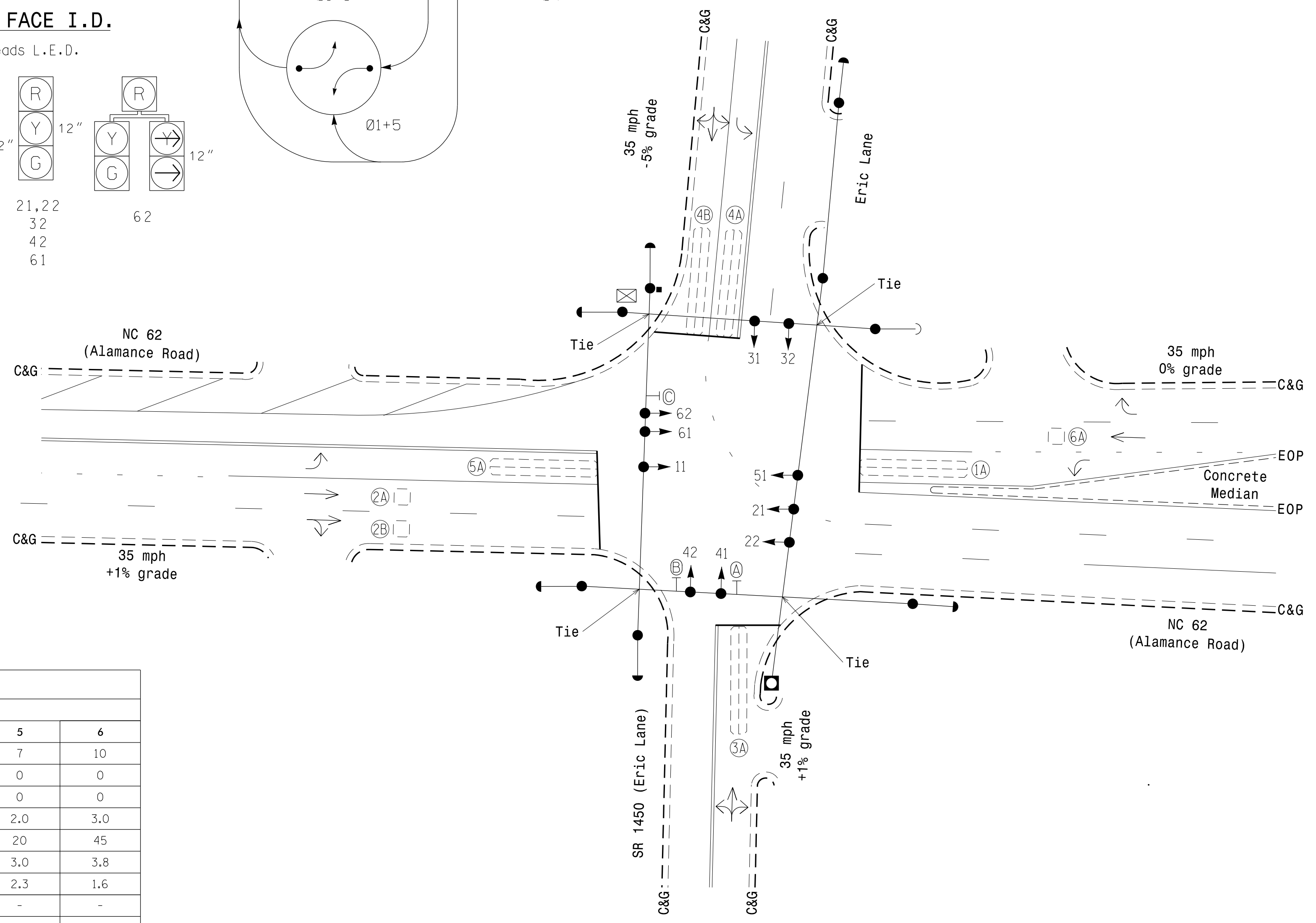
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct 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.

SIGNAL FACE I.D.



PHASING DIAGRAM DETECTION LEGEND

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



ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	4.0	2.0	3.0
Max 1 *	15	45	15	40	20	45
Yellow	3.0	3.8	3.8	4.2	3.0	3.8
Red Clear	2.4	1.6	1.8	1.7	2.3	1.6
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

* 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 |
| | Proposed Pedestrian Signal Head | | N/A |
| | Proposed Signal Pole with Guy | | N/A |
| | Proposed Metal Strain Pole | | N/A |
| | Proposed Inductive Loop Detector | | N/A |
| | Proposed Controller & Cabinet | | N/A |
| | Proposed Junction Box | | N/A |
| | Proposed 2-in Underground Conduit | | N/A |
| | Proposed Right of Way | | N/A |
| | Proposed Directional Arrow | | N/A |
| | Proposed Left Arrow "ONLY" Sign (R3-5L) | | N/A |
| | Proposed Dual Turn and Through Arrows Sign | | N/A |
| | Proposed Right Arrow "ONLY" Sign (R3-5R) | | N/A |

Signal Upgrade

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

NC 62 (Alamance Road) at SR 1450 (Eric Lane)/Eric Lane

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

SCALE: 0 30
1"=30'

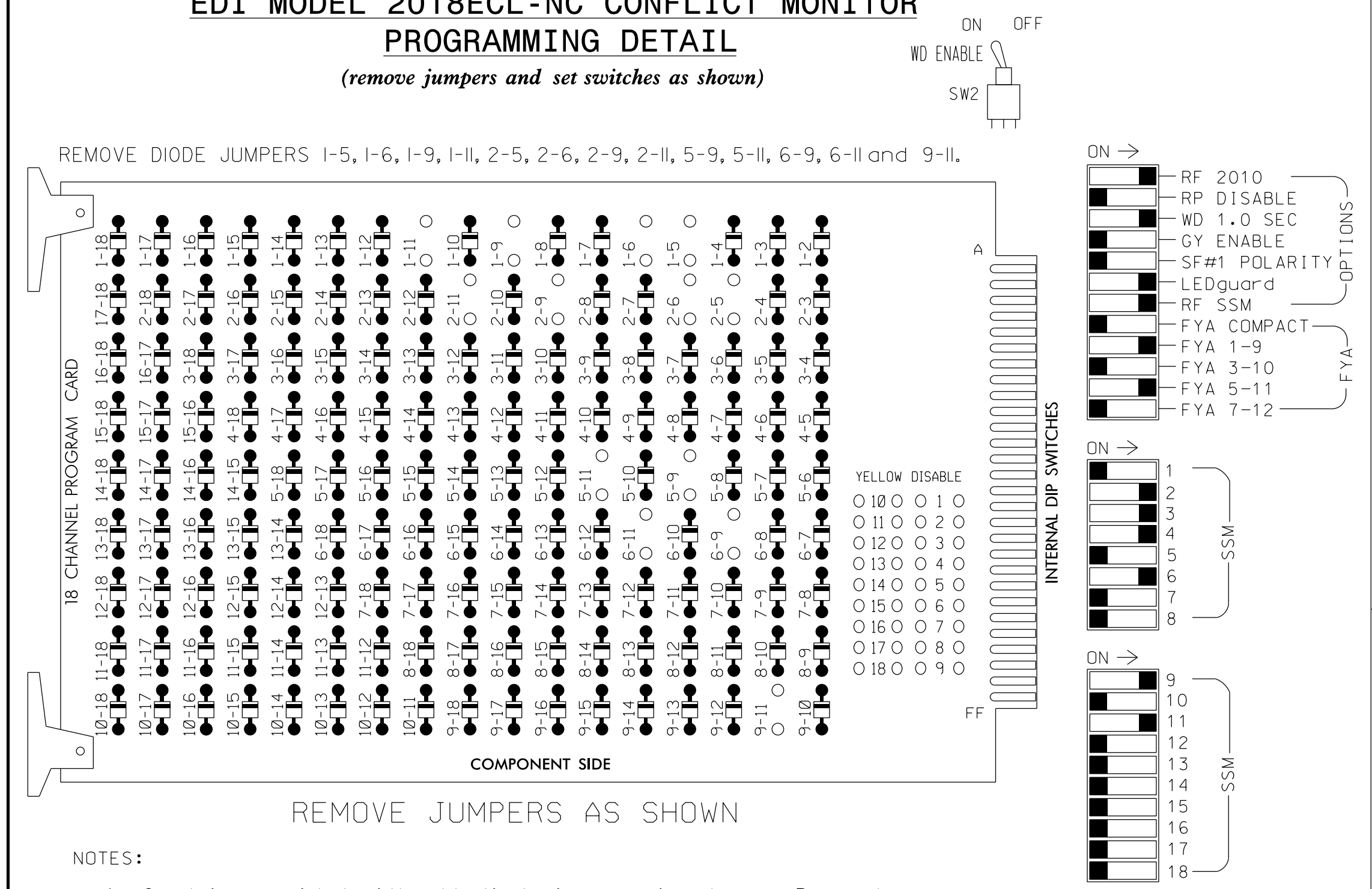
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 PAMELA L. ALEXANDER
 023489
 6/7/2018
 SIG. INVENTORY NO. 07-0961

07-JUN-2018 11:15
 D:\Transpor\at\work\Traffic\U-6015-Sig\Task\05_11_Sig\Des\gnw07-0961.dgn
 ALEX3361 AT LUS336069

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	62	NU	51	61,62	NU	NU	NU	NU	11	NU	51	NU
RED		128		116	116	101	101				134								
YELLOW	*	129		117	117	102	102		*		135								
GREEN		130		118	118	103	103				136								
RED ARROW																A121		A114	
YELLOW ARROW								102								A122		A115	
FLASHING YELLOW ARROW																A123		A116	
GREEN ARROW	127			118	103	103	133												

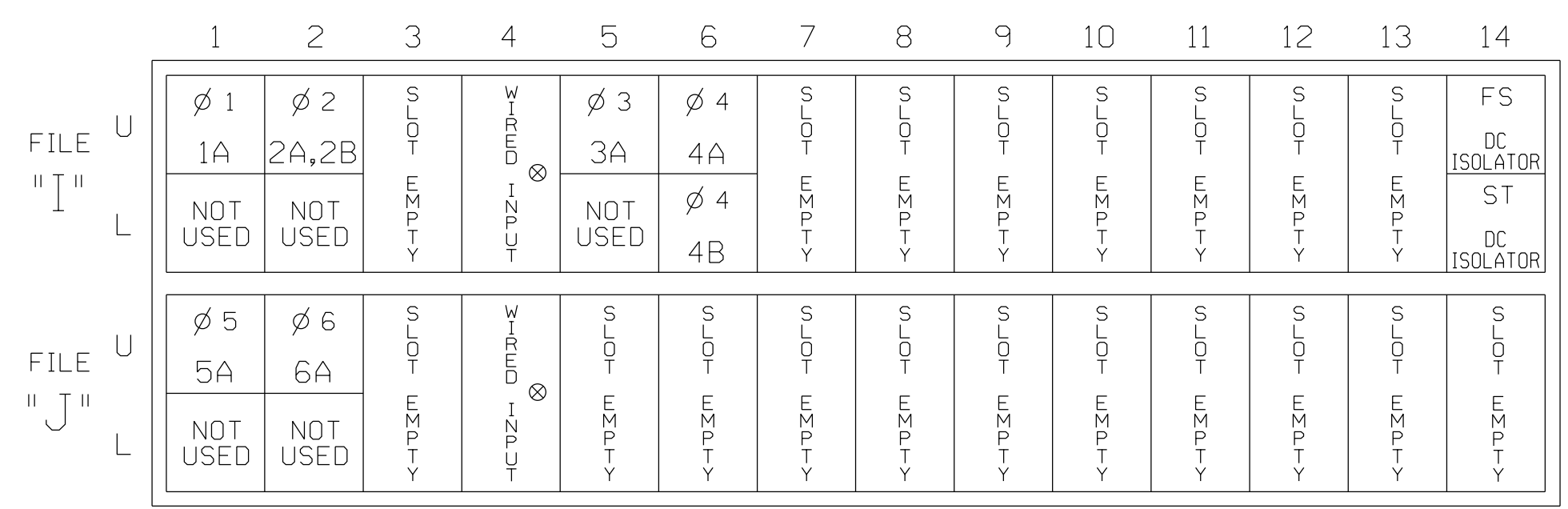
NU = Not Used

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

* See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

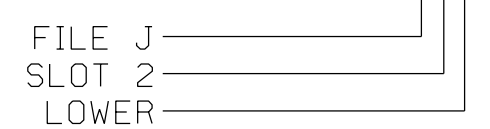
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES				S
2A,2B	TB2-5,6	I2U	39	2	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		5		S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A ²	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S

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

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

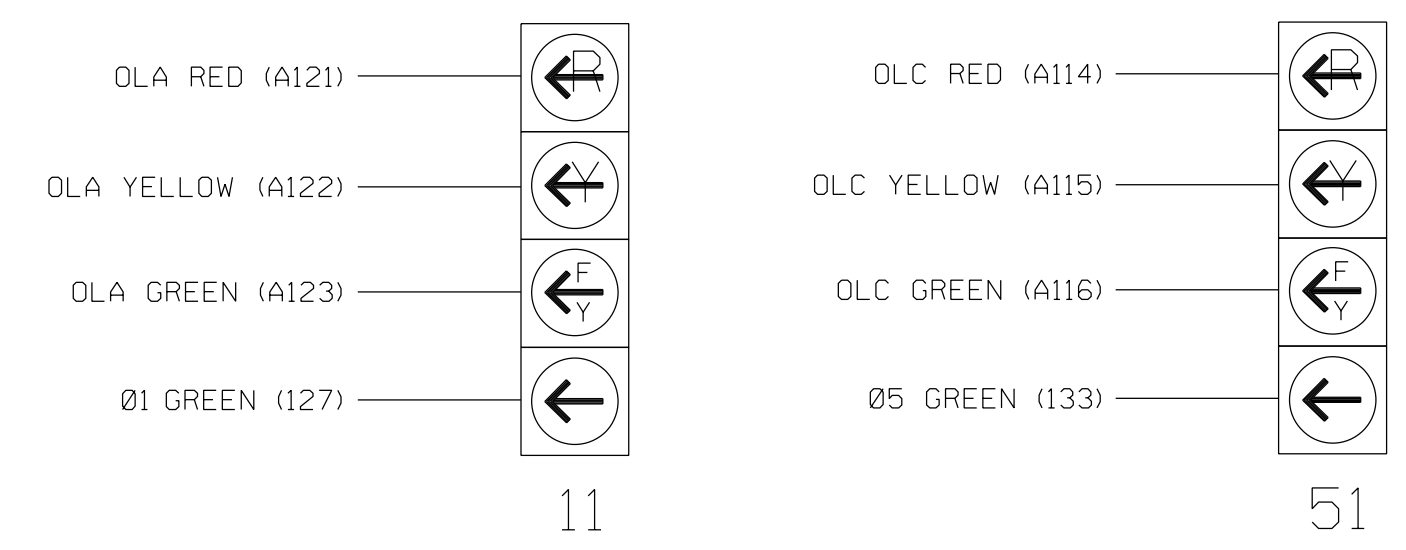
* See the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

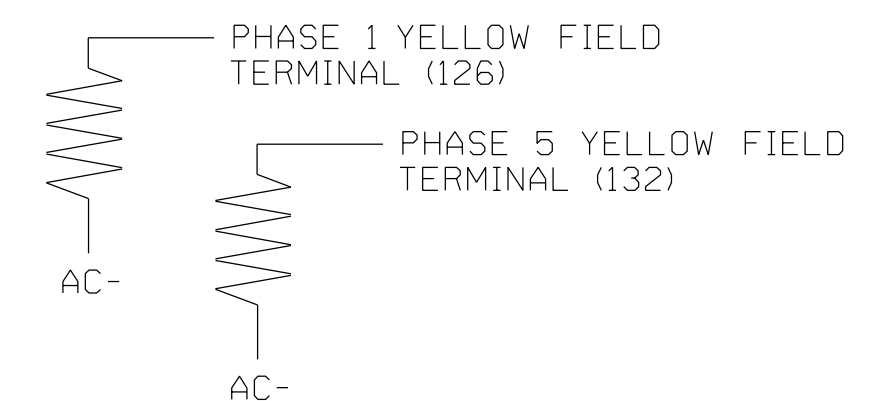
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0961
 DESIGNED: JANUARY 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 62 (Alamance Road) at SR 1450 (Eric Lane)/ Eric Lane		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489
	Division 7 Alamance County Burlington PLAN DATE: January 2018 PREPARED BY: VJ Paul	REVIEWED BY: AM Encarnacion REVIEWED BY: PL Alexander		DATE: 6/9/2018 DATE:
REVISIONS:	INIT. DATE:	DATE:	DATE:

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.

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

```

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

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

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

```

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

- 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
  
```

END PROGRAMMING

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

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

```

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
  
```

```

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
  
```

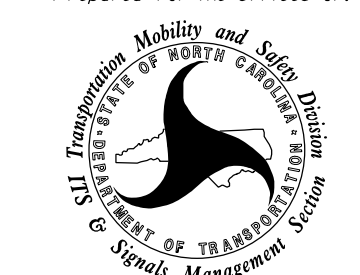
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0961
DESIGNED: JANUARY 2018
SEALED: 6/7/2018
REVISED: N/A

09-JUN-2018 14:14
D:\Fonsor\at\at\off\c\curr\100056469 U-6015 B-G S1g Sys\Task 05_11_Signal\Des\g\m\tr\ing\07-0961E.dgn
ALEX3361 AT LUS30669

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

 TRANSPORTATION AND SAFETY
 DEPARTMENT OF TRANSPORTATION AND SAFETY
 STATE OF NORTH CAROLINA

NC 62 (Alamance Road)
at
SR 1450 (Eric Lane)/
Eric Lane

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion
 PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

REVISIONS	INIT.	DATE

Seal: PAMELA L. ALEXANDER, PROFESSIONAL ENGINEER, SEAL 023489, 6/9/2018

Sig. Inventory No. 07-0961

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 BITS 1 and 5.

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

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.. NO  PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND DELAY  NO

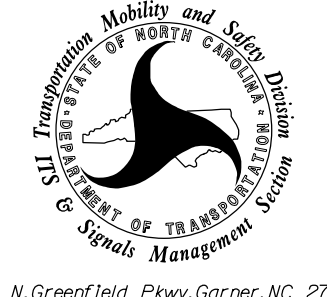
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT  X  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
AUX FCT  .  .  .  (1-3)                (1-8)

          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: 07-0961
 DESIGNED: JANUARY 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 62 (Alamance Road) at SR 1450 (Eric Lane)/ Eric Lane		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023489 PAMELA L. ALEXANDER
	Division 7 Alamance County Burlington PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion PREPARED BY: VJ Paul REVIEWED BY: PL Alexander		
REVISIONS DATE INIT. DATE	DATE DATE		Date: 6/9/2018 Signature: Pamela Alexander Date: _____ Date: _____ SIG. INVENTORY NO. 07-0961

PHASING DIAGRAM

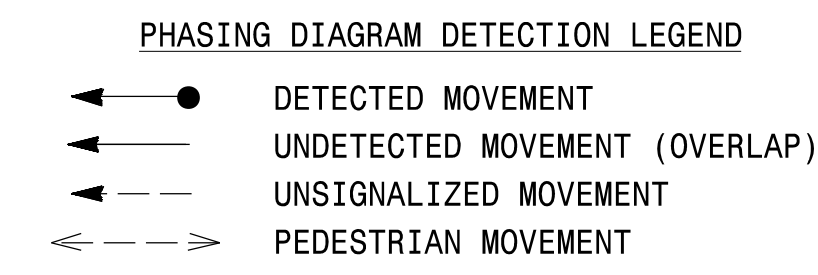
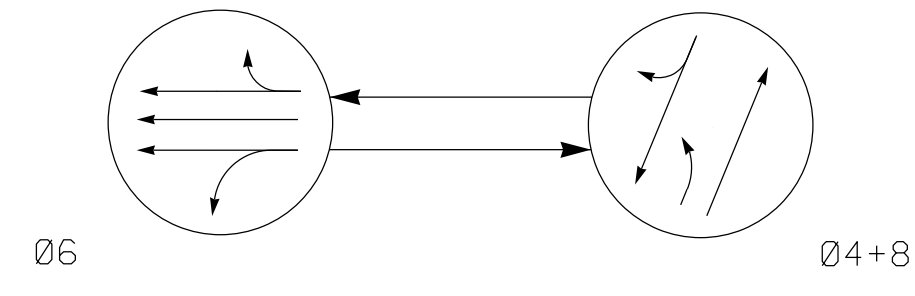
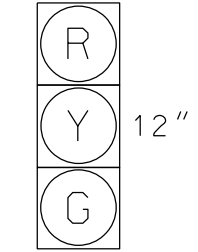


TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (06, 04+8, FLASH), and values for R, G, Y.

SIGNAL FACE I.D.

All Heads L.E.D.

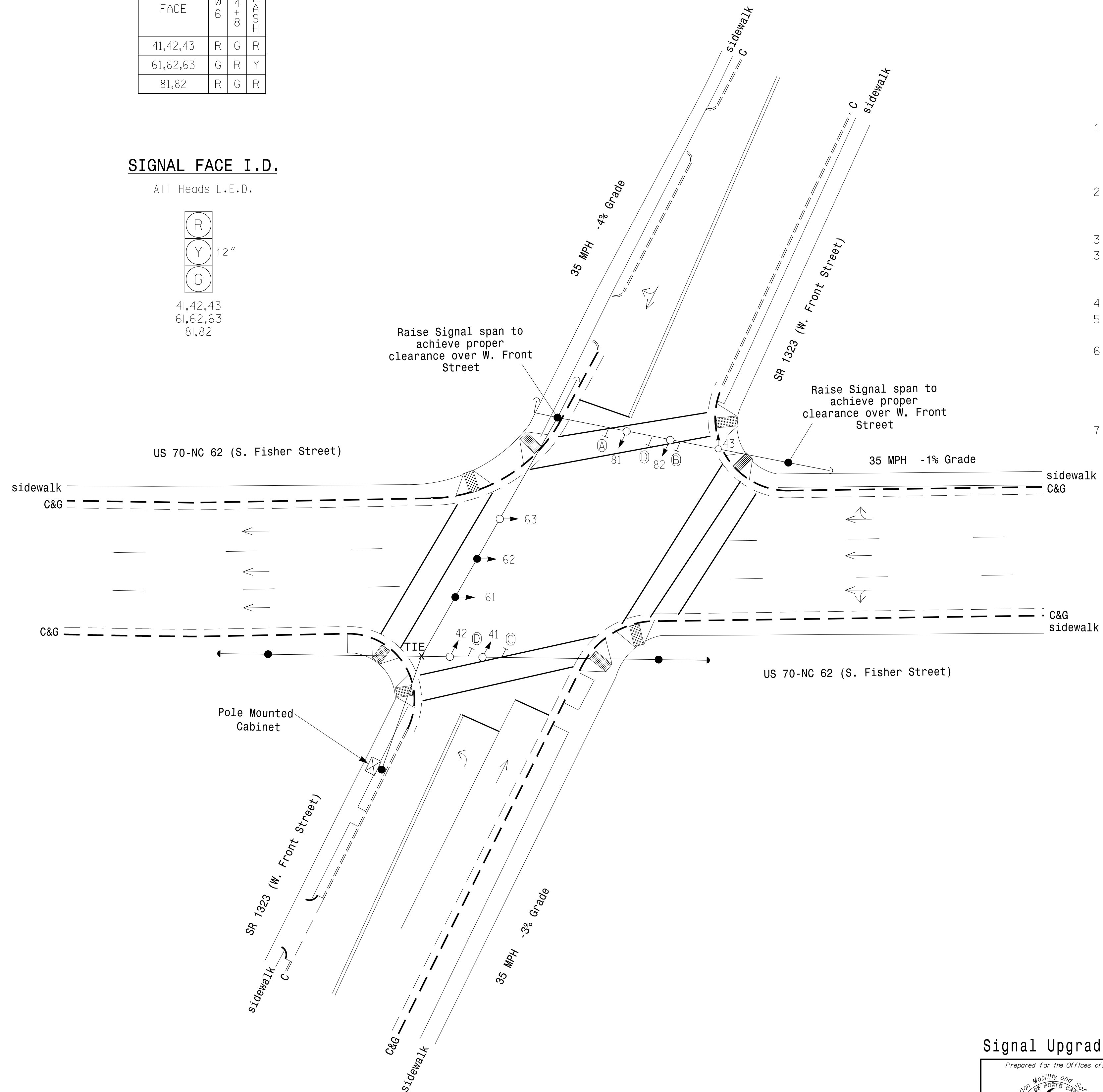


41,42,43
61,62,63
81,82

2 Phase Pretimed (Burlington-Graham Signal System)

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018...
2. Do not program signal for late night flashing operation...
3. Reposition existing heads 61 & 62.
4. Locate new cabinet so as not to obstruct sight distance...
5. Pavement markings are existing.
6. Install signal head 43 to maximize distance drivers can view head...
7. Raise existing messenger to achieve minimum clearance...
8. Suggested adjustments are shown on plan but it is contractor's responsibility...
9. Maximum times shown in timing chart are for free-run operation only.



ASC/3 TIMING CHART table with columns: FEATURE, PHASE (4, 6, 8) and rows: Min Green, Walk, Ped Clear, Veh. Extension, Max 1, Yellow, Red Clear, Actuations B4 Add, Seconds / Actuation, Max Initial, Time Before Reduction, Time To Reduce, Minimum Gap, Locking Detector, Recall Position, Dual Entry, Simultaneous Gap.

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

LEGEND

Legend table with columns: PROPOSED, EXISTING and rows: Traffic Signal Head, Modified Signal Head, Sign, Pedestrian Signal Head, Signal Pole with Guy, Signal Pole with Sidewalk Guy, Inductive Loop Detector, Controller & Cabinet, Junction Box, 2-in Underground Conduit, Right of Way, Directional Arrow, Wheelchair Ramp, Left Arrow "ONLY" Sign, No Right Turn Sign, No Left Turn Sign, "ONE WAY" Sign.

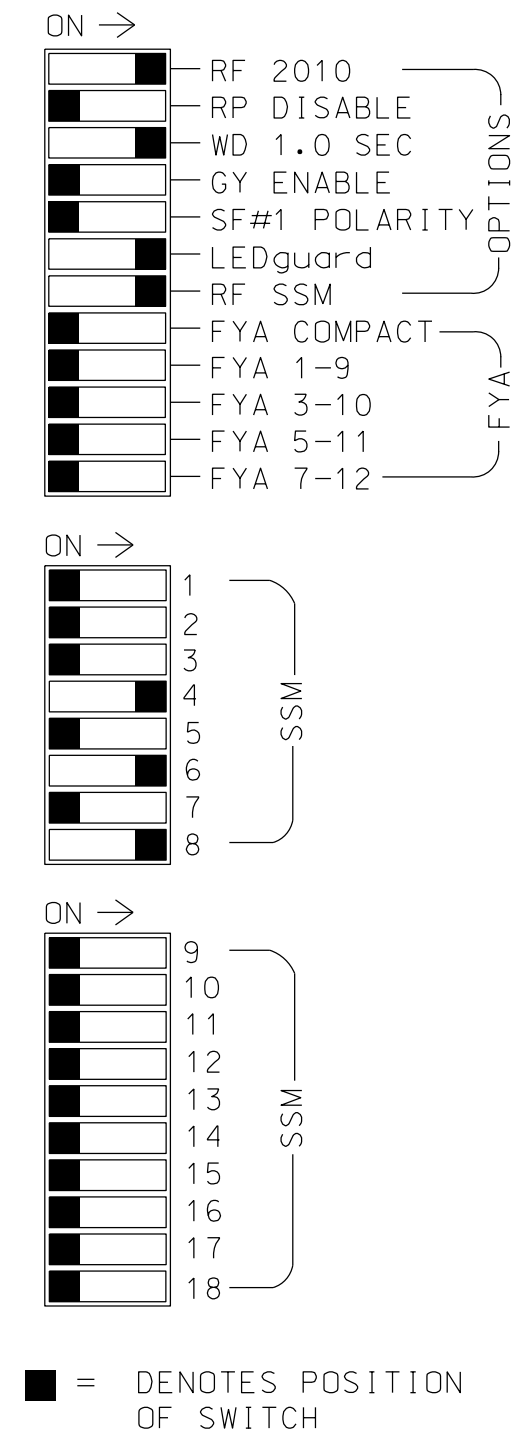
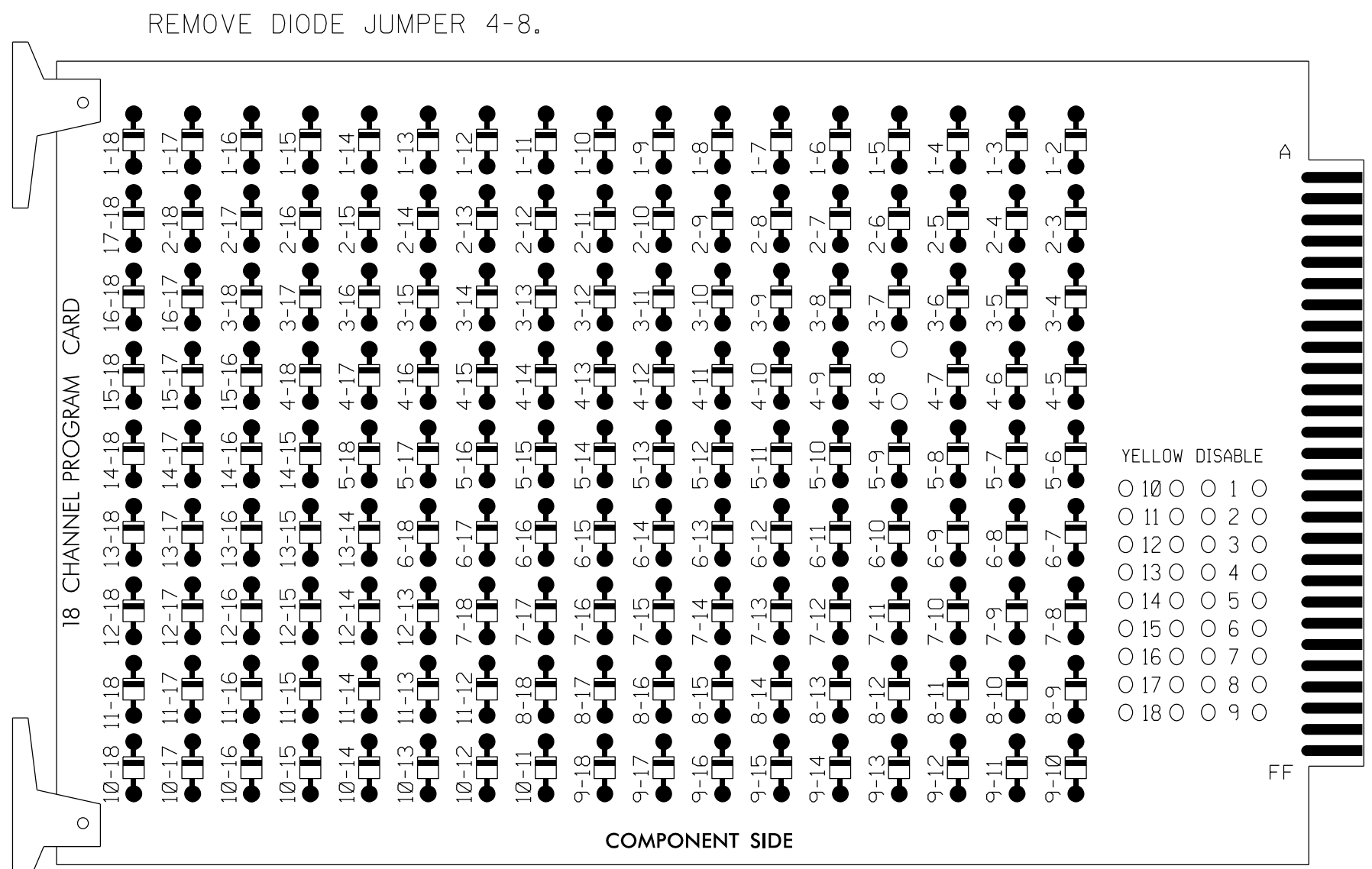
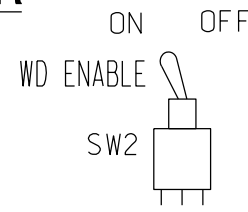
Signal Upgrade

Project information block including: DRMP logo, project title 'US 70-NC 62 (S. Fisher Street) at SR 1323 (W. Front Street)', Division 7 Alamance County Burlington, Plan Date: Sept 2017, Prepared by: RD Lawton, Reviewed by: AJ Davis, and a professional seal for Lisa M. Moon, Engineer, No. 022516, dated 6/13/2018.

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KANDERSON AT CHA-Y.ANDERSON

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



NOTES:

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

NOTES

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

SIGNAL HEAD HOOK-UP CHART

Table with columns: LOAD SWITCH NO., S1-S12, CMU CHANNEL NO., PHASE, SIGNAL HEAD NO., RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, GREEN ARROW.

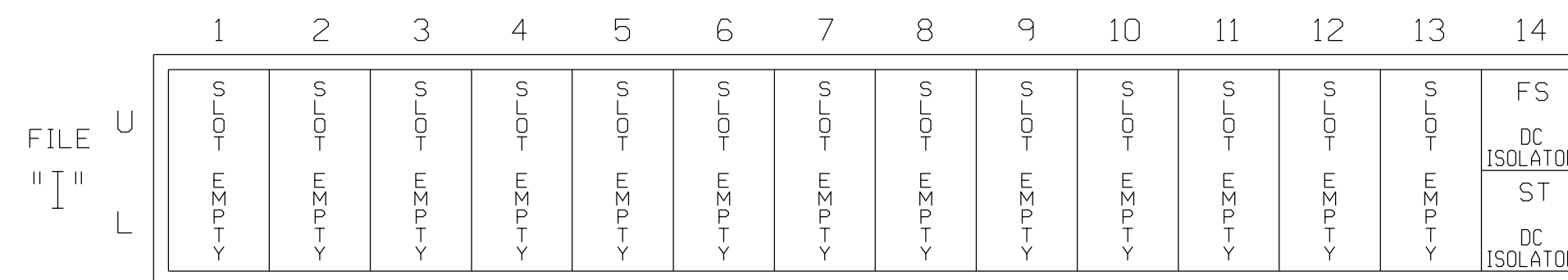
NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....336
SOFTWARE.....ECONDLITE ASC/3-2070
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S8,S11
PHASES USED.....4,6,8
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: 07-0980
DESIGNED: SEPT-2017
SEALED: 06-13-2018
REVISED: N/A

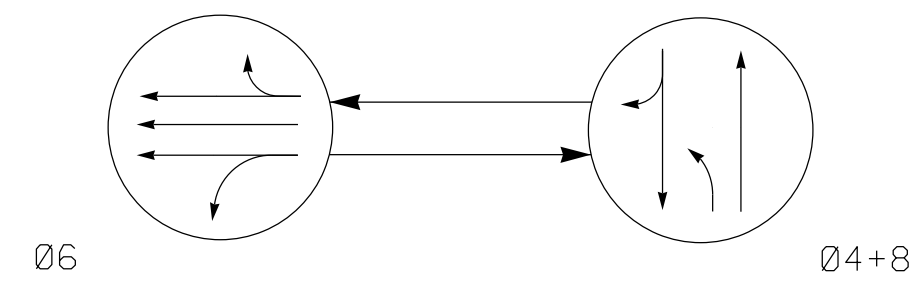
Electrical Detail

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

US 70-NC 62 (S. Fisher Street) at SR 1323 (W. Front Street). Division 7, Alameda County, Burlington. PLAN DATE: August 2017, REVIEWED BY: LM Moon. PREPARED BY: AJ Davis, REVIEWED BY: [Signature]

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED. SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON. DocuSigned by: Lisa M. Moon 6/13/2018. SIG. INVENTORY NO. 07-0980

PHASING DIAGRAM



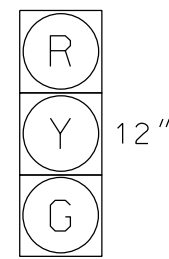
SIGNAL FACE	PHASE		
	06	04+8	FLASH
41,42,43	R	G	R
61,62,63	G	R	Y
81,82	R	G	R

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

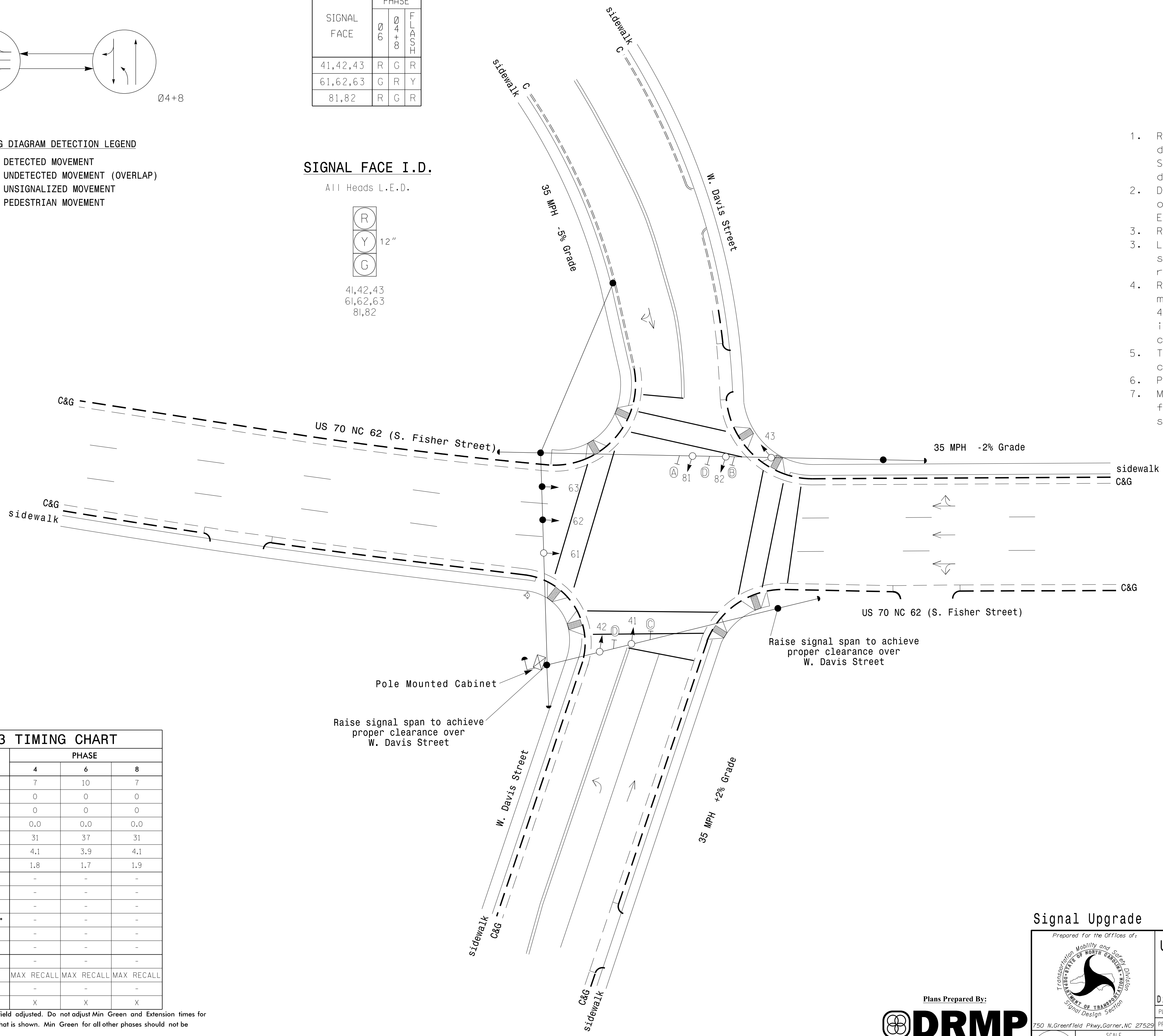


41,42,43
61,62,63
81,82

2 Phase Pretimed
(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 heads 62 & 63.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Raise and tighten existing messenger to achieve minimum clearance for the the new signal heads 41 & 42. Suggested adjustments are shown on plan but it is the contractors responsibility to meet minimum clearance.
- To accomodate span adjustments, install new signal cable for signal heads 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		
	4	6	8
Min Green *	7	10	7
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	0.0	0.0	0.0
Max I *	31	37	31
Yellow	4.1	3.9	4.1
Red Clear	1.8	1.7	1.9
Actuations B4 Add *	-	-	-
Seconds /Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	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 phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

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

Signal Upgrade

US 70-NC 62 (S. Fisher Street) at W. Davis 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	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
LISA M. MOON
022516
6/13/2018

