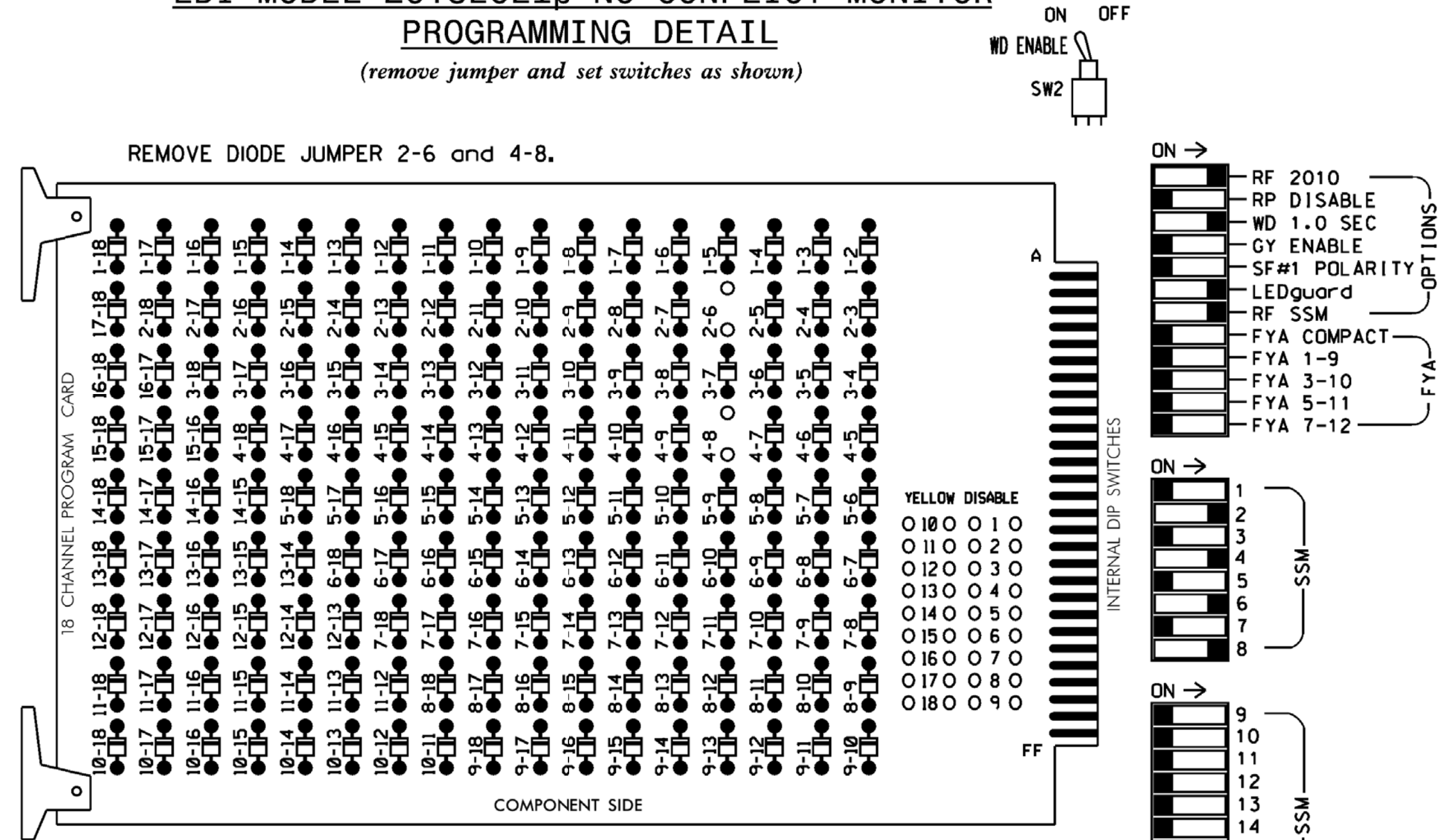


EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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.

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

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22, 23	NU	NU	41,42	NU	NU	61,62	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)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	S	Ø 2	S	S	S	Ø 4	S	S	SYS. DET. S1	S	S	S	S	FS
"I"	Ø	2A	Ø	Ø	Ø	4A	Ø	Ø	SYS. DET. S2	Ø	Ø	Ø	Ø	DC ISOLATOR
L		NOT USED				4B								DC ISOLATOR
FILE "J"	S	Ø 6	S	S	S	Ø 8	S	S	S	S	S	S	S	S
"J"	Ø	6A	Ø	Ø	Ø	8A	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
L		NOT USED				8B								Ø

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

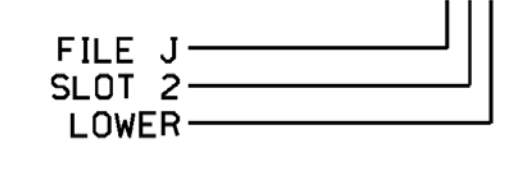
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

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

* System Detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1442
 DESIGNED: November 2017
 SEALED: 6/13/2018
 REVISED: N/A



*****SYTIME*****
 *****DGN*****
 *****USER*****

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

Seal of the State of North Carolina, Department of Transportation, Signal Management

750 N. Greenfield Pkwy, Corner, NC 27529

US 70 (Haw River Bypass) at SR 1725 (Stone Quarry Road) / SR 1801 (W. Main Street)	
Division 7	Alamance County
PLAN DATE: November 2017	REVIEWED BY: J. Voso
PREPARED BY: S. Homewood	REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Seal of James B. Voso, Professional Engineer, License No. 022599

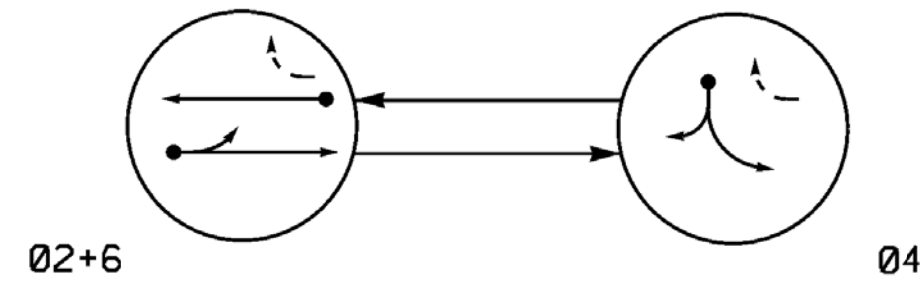
James Voso 6/13/2018

DATE

SIG. INVENTORY NO. 07-1442

2 Phase Fully Actuated (Burlington-Graham Signal System)

PHASING DIAGRAM

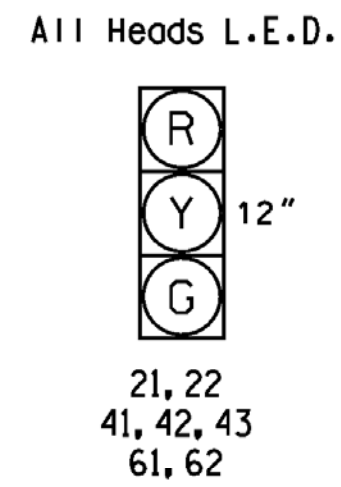


PHASING DIAGRAM DETECTION LEGEND

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

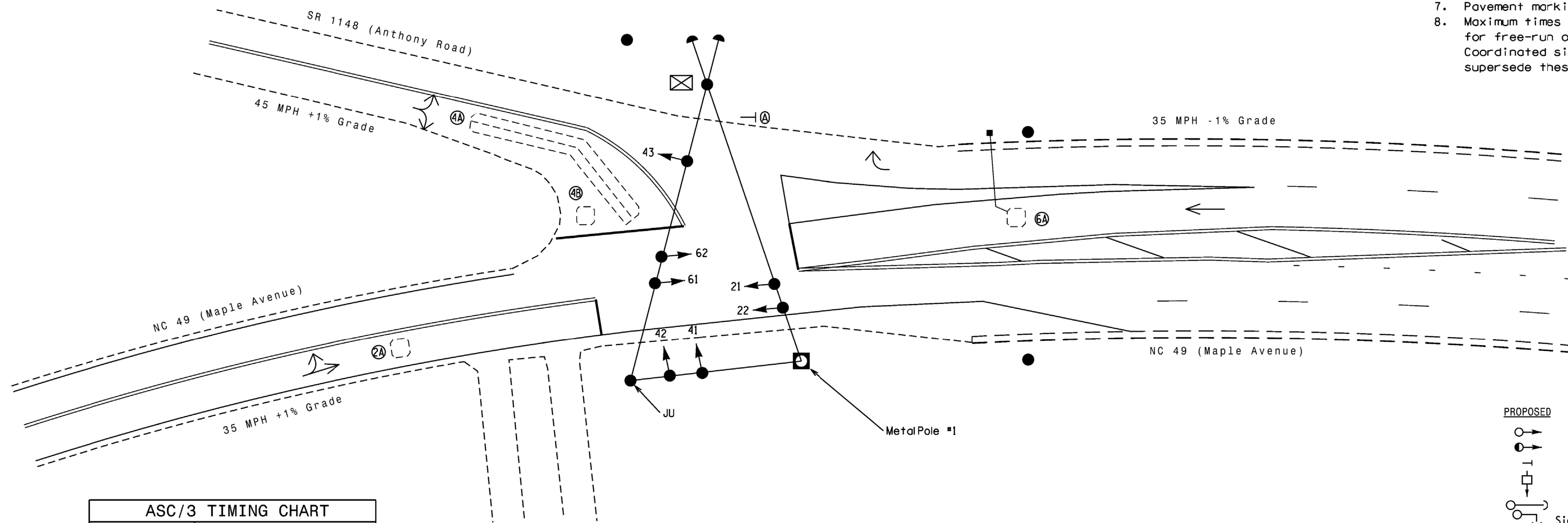
SIGNAL FACE	PHASE		
	02+6	04	F L S H
21, 22	G	R	Y
41, 42, 43	R	G	R
61, 62	G	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXIST.	-	2	Yes	-	-	-	S	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X6	0	EXIST.	-	4	Yes	-	25	-	S	-	X
6A	6X6	70	EXIST.	-	6	Yes	-	-	-	S	-	X

- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
 - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
 - 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
Min Green *	10	7	10
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	4.0	4.0	4.0
Max 1 *	45	30	45
Yellow	3.8	3.0	3.9
Red Clear	1.4	2.3	1.5
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	X	-	X
Recall Position	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → Traffic Signal Head |
| ● → Modified Signal Head | N/A |
| □ → 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 |
| → → Directional Arrow | → → Directional Arrow |
| □ → Metal Strain Pole | □ → Metal Strain Pole |
| Ⓐ → "Yield" Sign (R1-2) | Ⓐ → "Yield" Sign (R1-2) |

*****SYTIME*****
 *****BUSURNAME*****

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

NC 49 (Maple Avenue) at SR 1148 (Anthony Road)

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: J. Voso

PREPARED BY: S. Homewood REVIEWED BY:

SCALE: 1"=20'

REVISIONS: _____

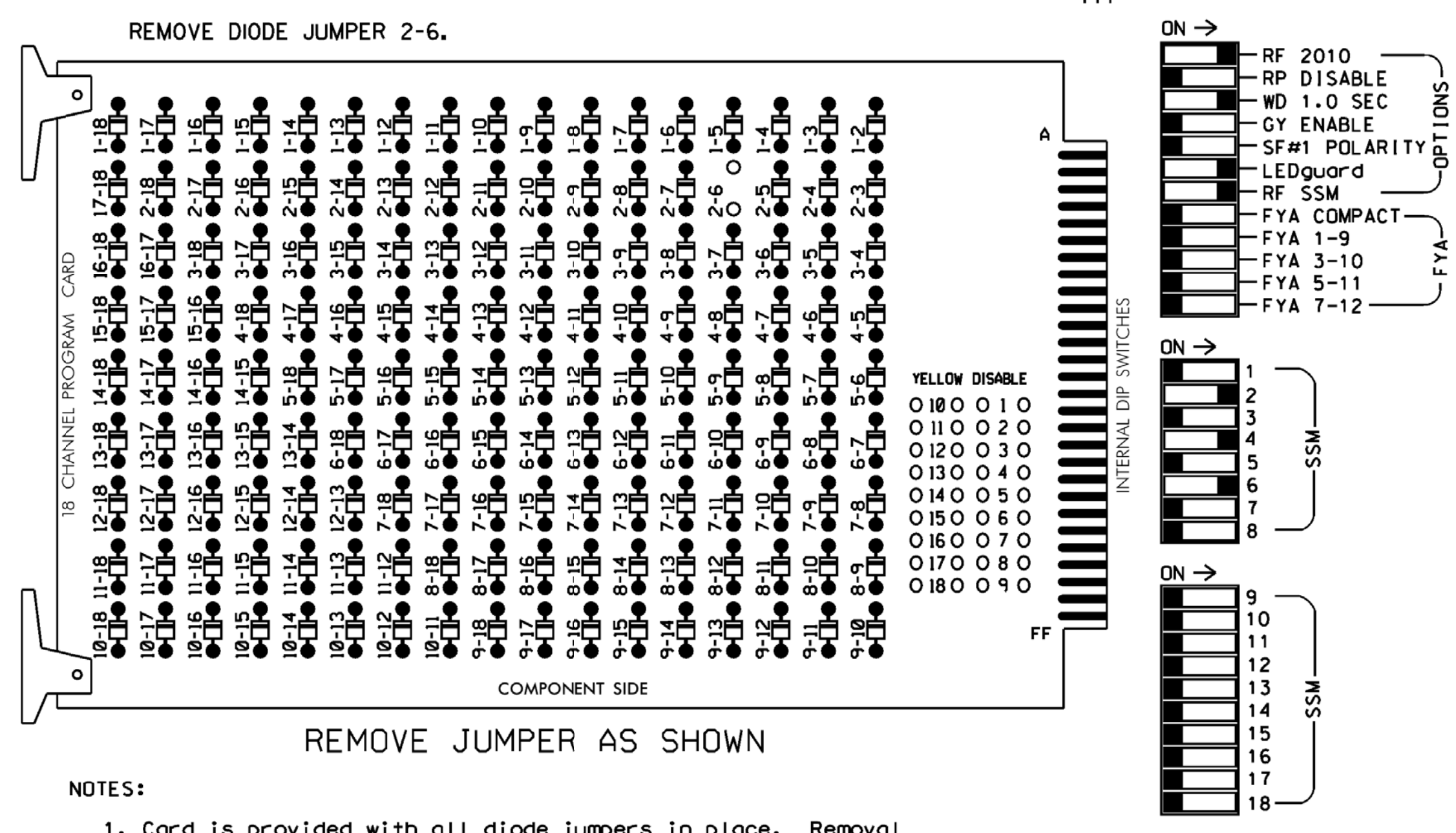
INIT. DATE

SEAL: JAMES B. VOSO, ENGINEER, 022599, 6/13/2018

SIG. INVENTORY NO. 17-1463

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....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
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

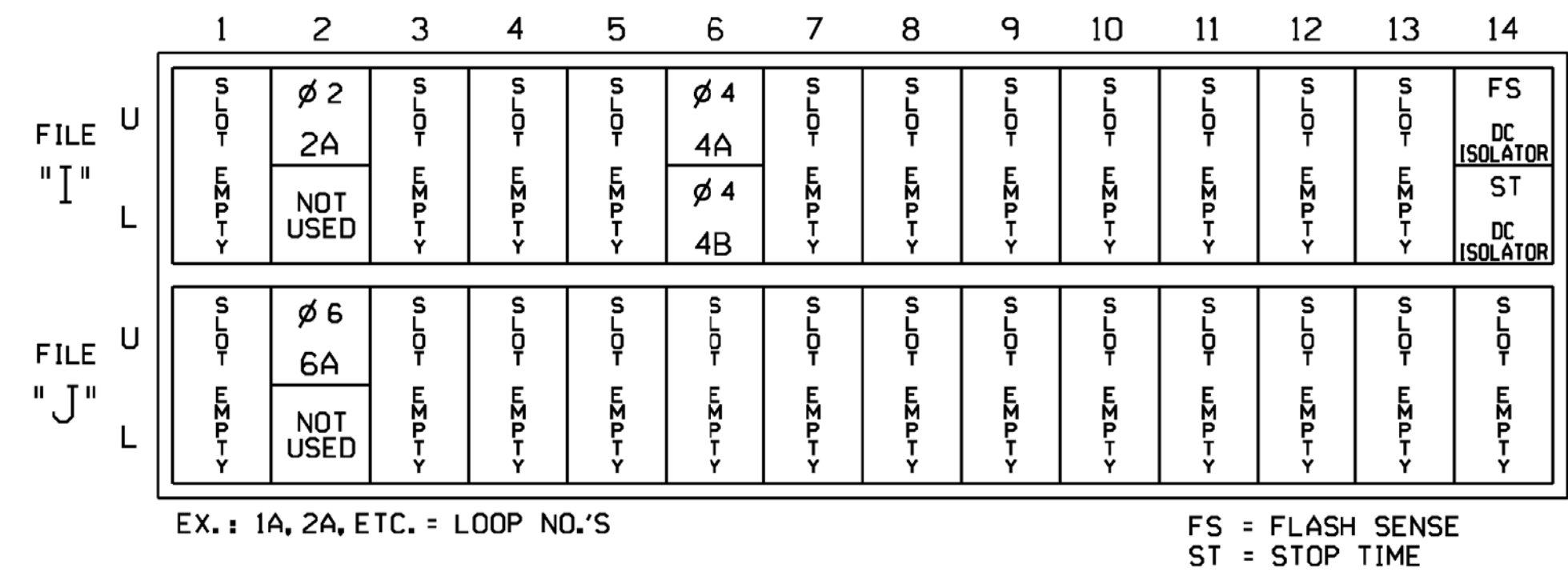
SIGNAL HEAD HOOK-UP CHART

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	41,42,43	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																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		25		S
6A	TB3-5,6	J2U	40	6	6	YES				S

INPUT FILE POSITION LEGEND: J2L
 FILE J
 SLOT 2
 LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1463
 DESIGNED: November 2017
 SEALED: 6/13/2018
 REVISED: N/A

*****SYSTEM*****
 *****JOB*****
 *****DRAWING*****
 *****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:

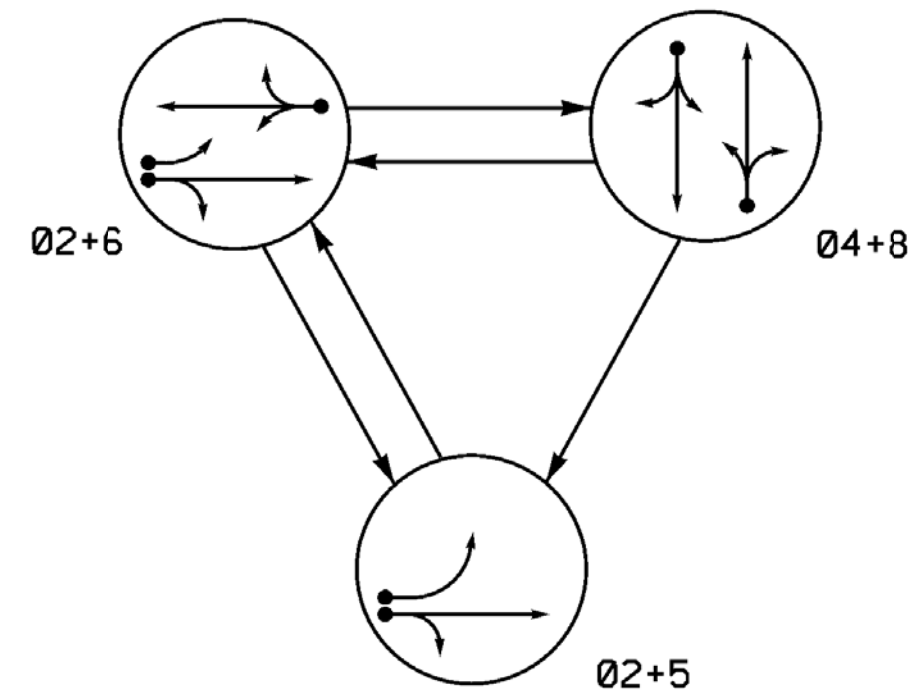


NC 49 (Maple Avenue) at SR 1148 (Anthony Road)	
Division 7	Alamance County
Prepared By: S. Homewood	Reviewed By: J. Voso
DATE: November 2017	DATE: 6/13/2018
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 JAMES B. VOSO
 022599
 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-1463

PHASING DIAGRAM

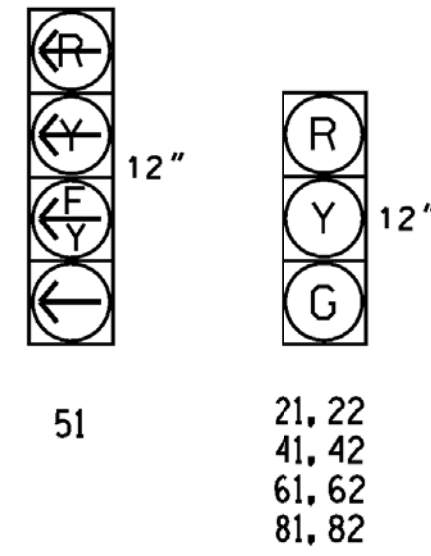


PHASING DIAGRAM DETECTION LEGEND

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

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

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

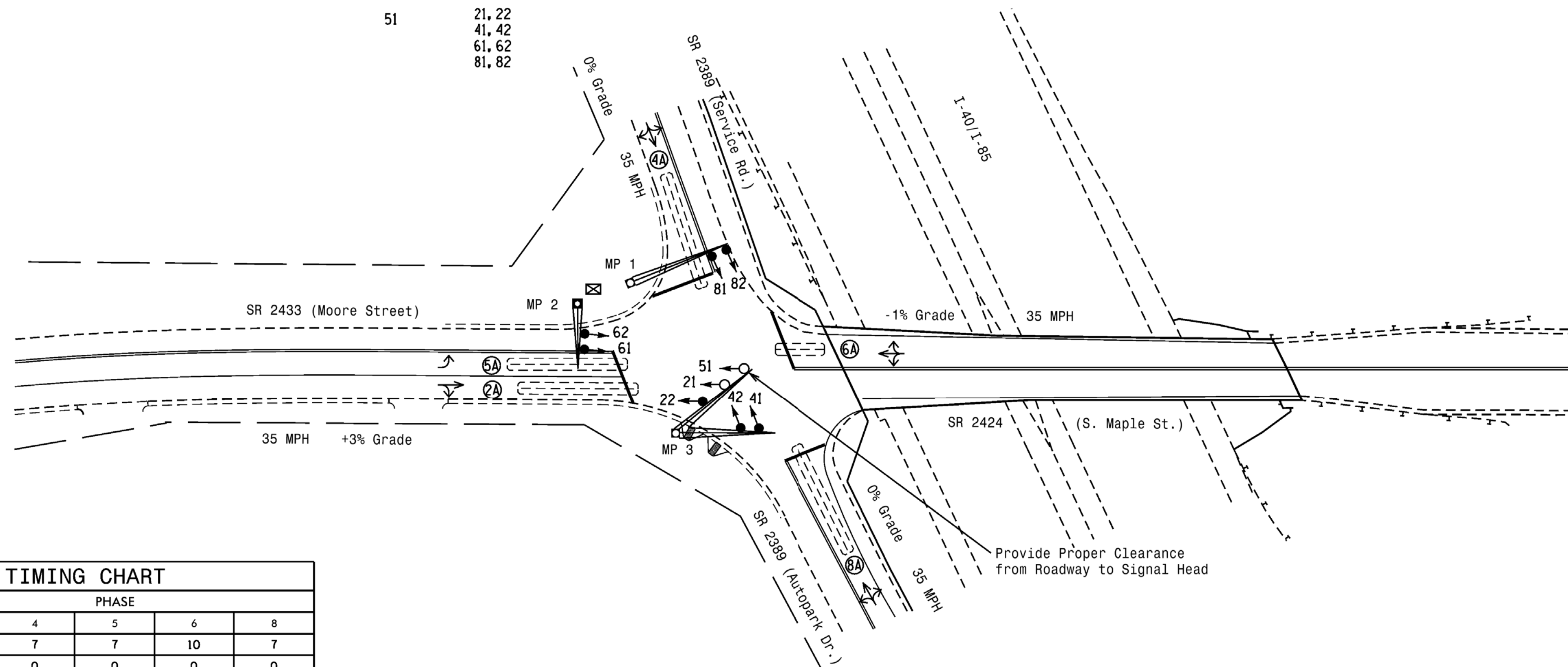


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CAB
2A	6X60	+5	2-4-2	-	2	Yes	-	-	-	S	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X25	+5	2-4-2	-	6	Yes	-	-	-	S	-	X
8A	6X60	+5	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.
- Enable Backup Protect to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
- 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.



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

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 *	6.0	2.0	1.0	6.0	2.0
Max 1 *	45	30	25	45	30
Yellow	3.9	3.8	3.0	3.9	3.8
Red Clear	1.7	1.6	2.1	1.7	2.0
Red Revert	5.0	2.0	2.0	2.0	2.0
Actuations 34 Add *	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Lacking Detector	-	-	-	-	-
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*****
*****BUSERNAME*****

Mattern & Craig
CONSULTING ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

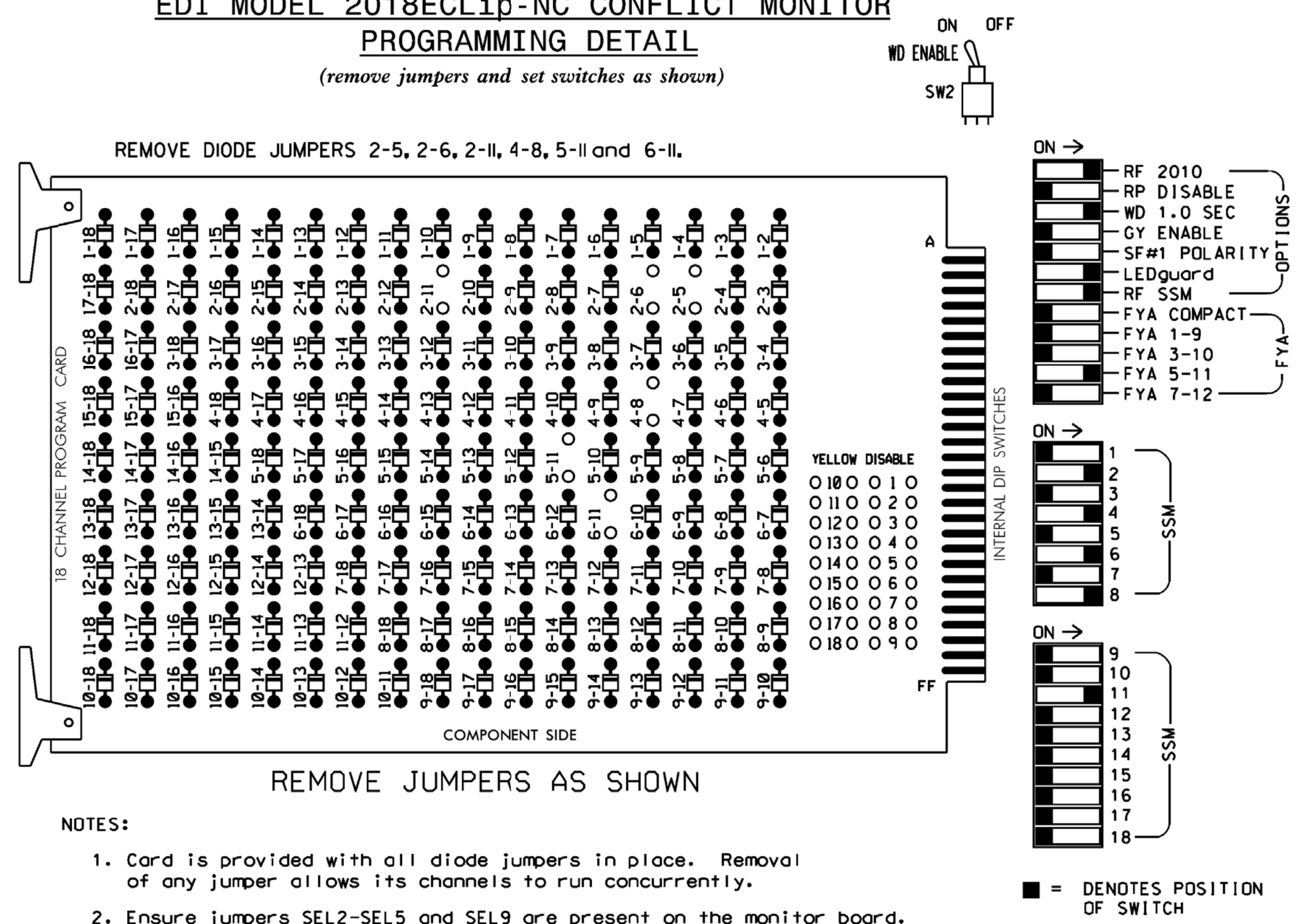
Signal Upgrade

Prepared for the Offices of:

 SR 2424 (S. Maple St.) / SR 2433 (Moore St.) at SR 2389 (Autopark Dr./Service Rd.)
 Division 7 Alamance County Graham
 PLAN DATE: November 2017 REVIEWED BY: J. Voso
 PREPARED BY: S. Homewood REVIEWED BY:
 SCALE: 1" = 40'
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 SEAL: JAMES B. VOSO, ENGINEER, SEAL 022599
 SIGNATURE: James Voso DATE: 6/13/2018
 SIG. INVENTORY NO. 07-1487

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.

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,AUX S4
 PHASES USED.....2,4,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

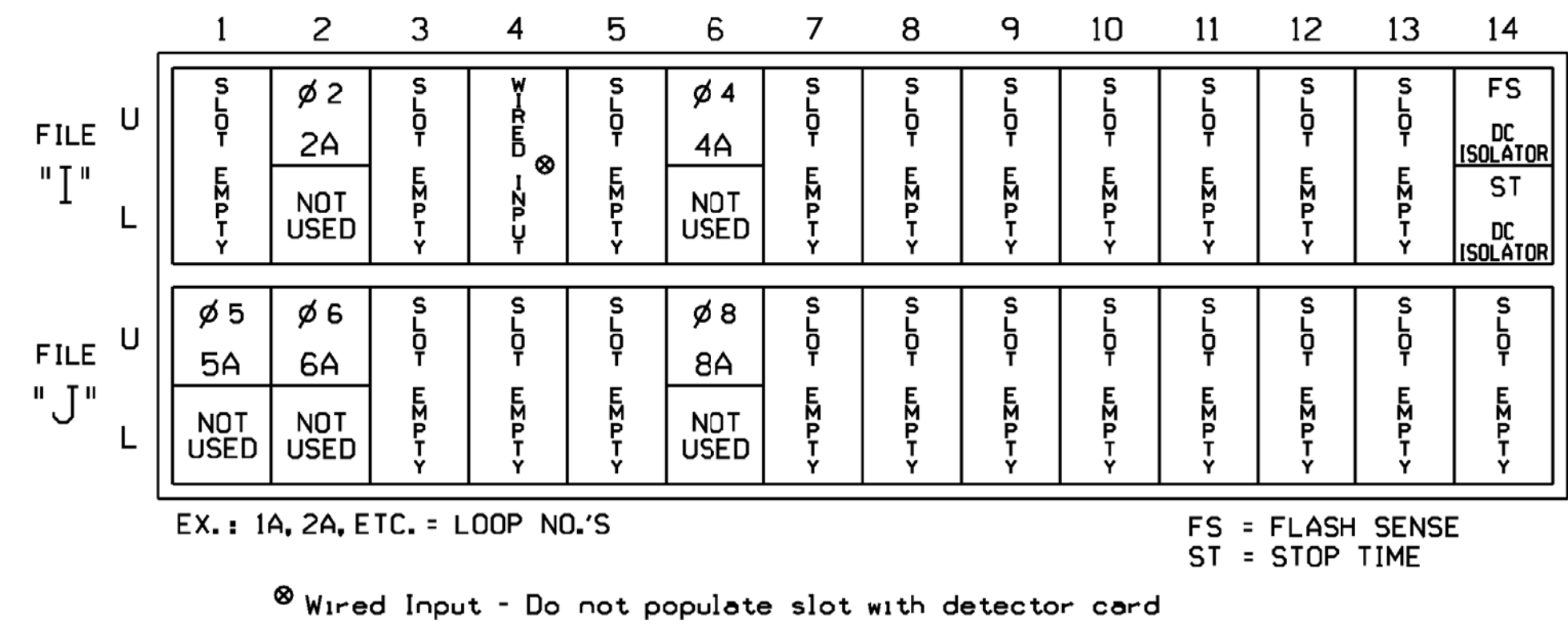
SIGNAL HEAD HOOK-UP CHART

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

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

INPUT FILE POSITION LAYOUT

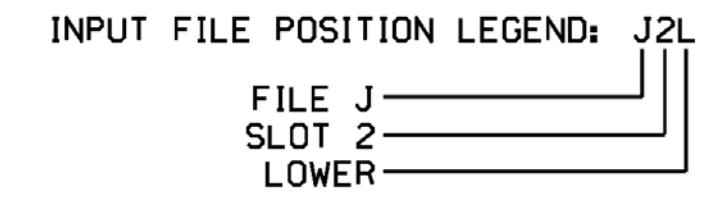
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

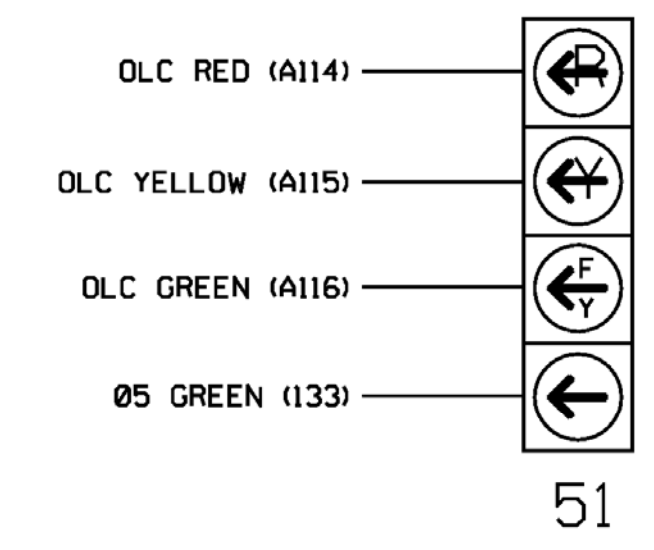
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		10		S
5A'	TB3-1,2	J1U	55	5	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		10		S

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



FYA SIGNAL WIRING DETAIL

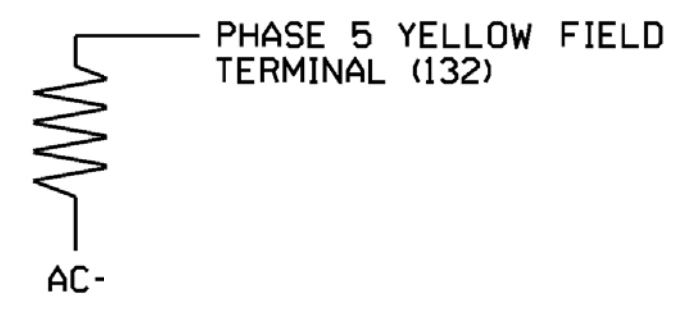
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Electrical Design - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Corner, NC 27529

SR 2424 (S. Maple St.) / SR 2433 (Moore St.) at SR 2389 (Autopark Dr./Service Rd)

Division 7 Alamance County Graham

PLAN DATE: November 2017 REVIEWED BY: J. Voso

PREPARED BY: S. Homewood REVIEWED BY:

SEAL

James Voso 6/13/2018

SIG. INVENTORY NO. 07-1487

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

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

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

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

END PROGRAMMING

NOTE

1. 'B' without a 'C' programmed for the 'TIMING' (row) phase inhibits the controller from servicing the 'BACKUP' (column) phase when the 'TIMING' (row) phase is active, or next, until the controller goes through Red Revert and Red Clear. Make sure the proper Red Revert and Red Clear times shown on the Signal Design plan are programmed in the controller phase timing.

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

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

Toggle Twice
OVERLAP C

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1487
DESIGNED: November 2017
SEALED: 6/13/2018
REVISED: N/A

*****SYTIME*****
*****SINCE*****
*****1978*****
*****USERNAME*****

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



Mattern & Craig
CONSULTING ENGINEERS • SURVEYORS
FIRM LICENSE No. C-1154
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

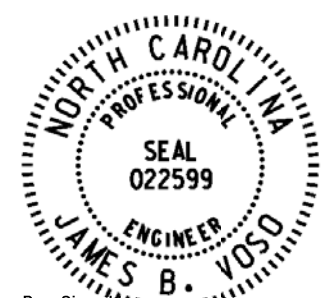
ELECTRICAL AND PROGRAMMING
DETAILS FOR:



Prepared for the Offices of:
North Carolina State Board of Electrical and Mechanical Engineers
750 N. Greenfield Pkwy, Corner, NC 27529

SR 2424 (S. Maple St.)/ SR 2433 (Moore St.) at SR 2389 (Autopark Dr./Service Rd)	
Division 7	Alamance County
PREPARED BY: S. Homewood	REVIEWED BY: J. Voso
DATE: November 2017	
REVISIONS	INIT. DATE

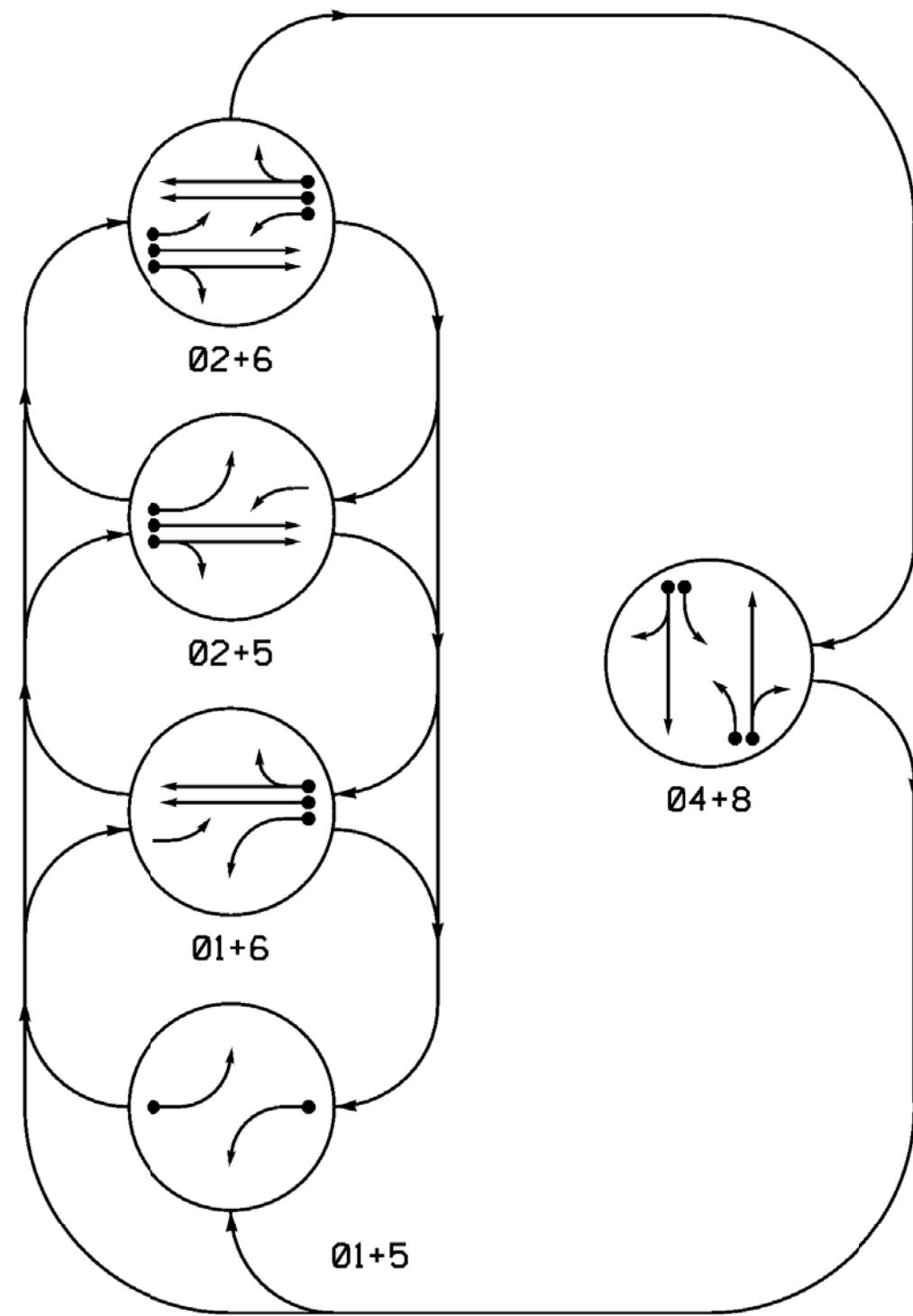
SEAL



James Voso
6/13/2018
DATE

SIG. INVENTORY NO. 07-1487

PHASING DIAGRAM



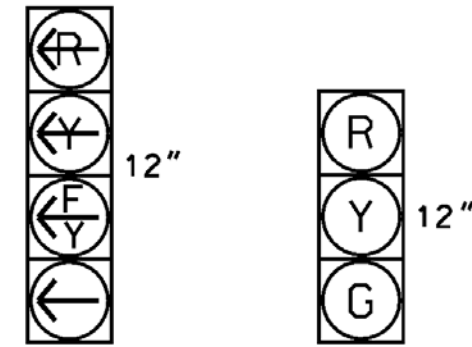
PHASING DIAGRAM DETECTION LEGEND

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

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

SIGNAL FACE I.D.

All Heads L.E.D.



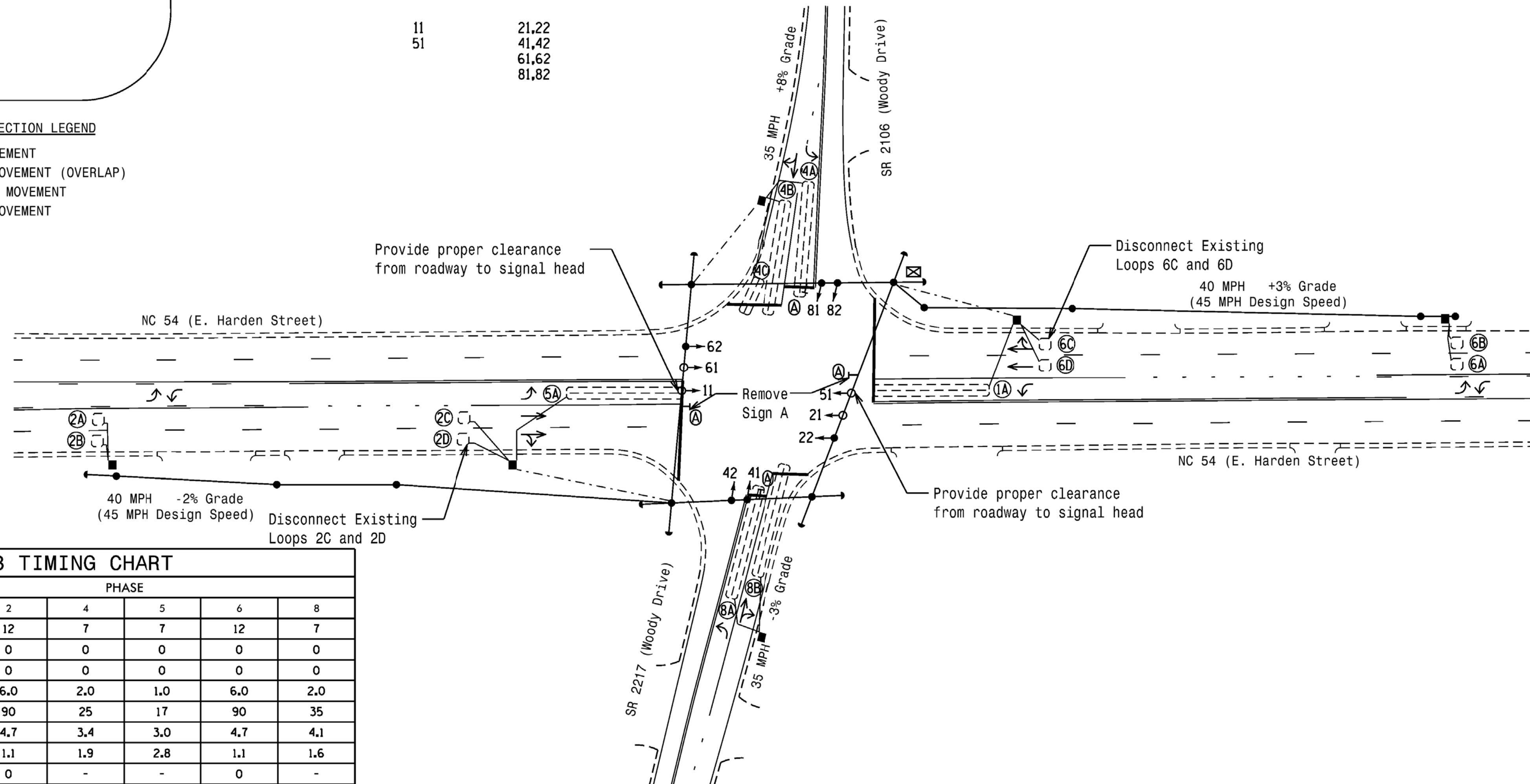
11 51 21,22 41,42 61,62 81,82

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP NEW CARD
1A	6x60	0	2-4-2	-	1	Yes	-	15	-	S	- X
					6	Yes	-	3	-	G	- X
2A,2B	6x6	300	EXIST.	-	2	Yes	-	-	X	N	- X
4A	6x40	+5	2-4-2	-	4	Yes	-	3	-	S	- X
4B	6x40	+5	2-4-2	-	4	Yes	-	10	-	S	- X
4C	6x20	+10	2-4-2	-	4	Yes	-	15	-	S	- X
5A	6x60	0	2-4-2	-	5	Yes	-	15	-	S	- X
					2	Yes	-	3	-	G	- X
6A,6B	6x6	300	EXIST.	-	6	Yes	-	-	X	N	- X
8A	6x40	+5	2-4-2	-	8	Yes	-	3	-	S	- X
8B	6x40	+5	2-4-2	-	8	Yes	-	10	-	S	- X

5 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 22 and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Existing Left Arrow "ONLY" sign(s)-(R3-5L) may be removed at the discretion of the Regional Traffic Engineer.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

- | PROPOSED | EXISTING |
|---|------------------------------------|
| ○→ Traffic Signal Head | ●→ N/A |
| ○→ Modified Signal Head | ○→ 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 | ⊗ Inductive Loop Detector |
| ⊠ Controller & Cabinet | ⊠ Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A Right of Way | N/A Right of Way |
| → Directional Arrow | → Directional Arrow |
| (A) Left Arrow "ONLY" Sign (R3-5L) | (A) Left Arrow "ONLY" Sign (R3-5L) |

FEATURE	ASC/3 TIMING CHART						
	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 *	1.0	6.0	2.0	1.0	6.0	2.0	
Max I *	17	90	25	17	90	35	
Yellow	3.0	4.7	3.4	3.0	4.7	4.1	
Red Clear	2.6	1.1	1.9	2.8	1.1	1.6	
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.



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

Signal Upgrade

Prepared for the Offices of:

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC 54 (E. Harden Street) at SR 2217/SR 2106 (Woody Drive)

Division 7 Alamance County Graham

PLAN DATE: November 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Wilson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

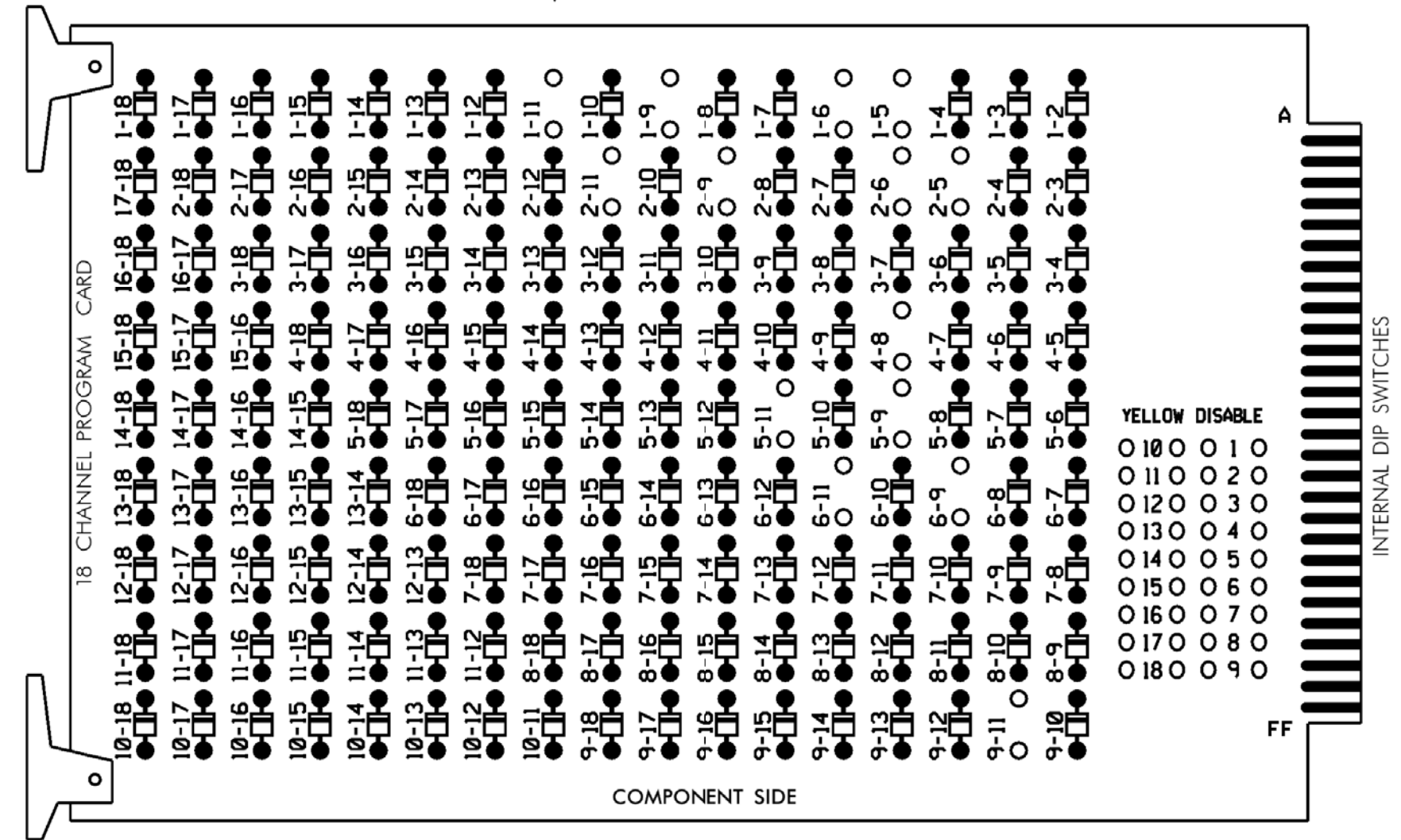
 JAMES B. VOSO
 ENGINEER
 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-1521

*****SYSTEM TIME*****
 *****USER NAME*****

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

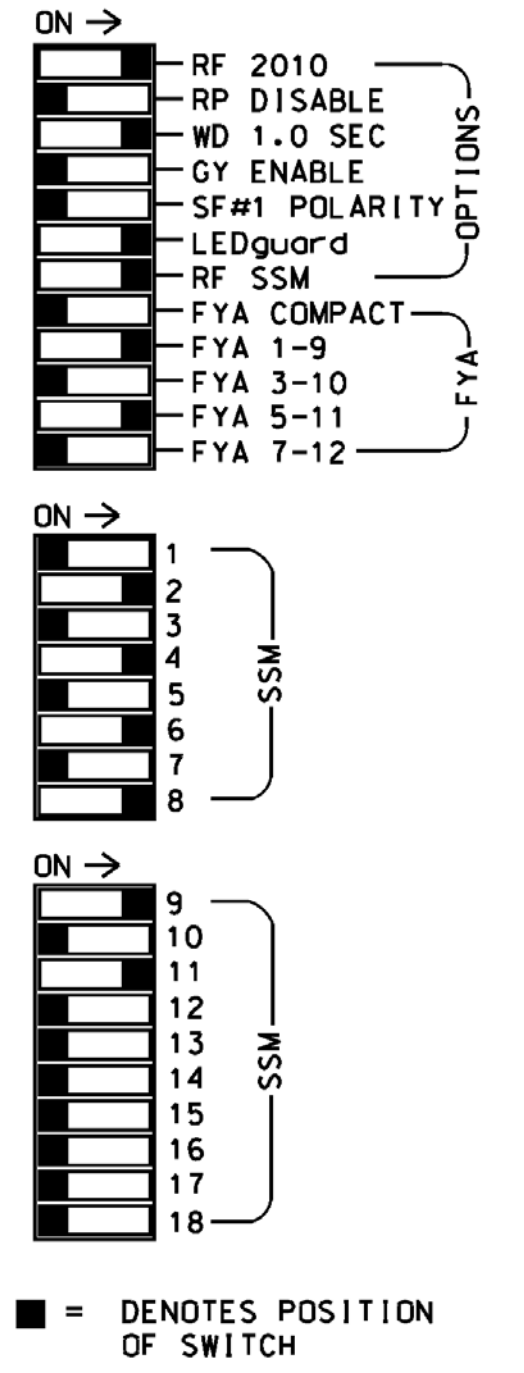
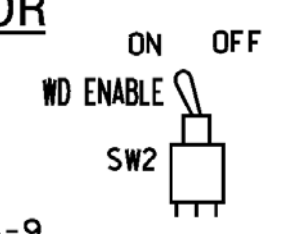
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11, and 9-11.



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

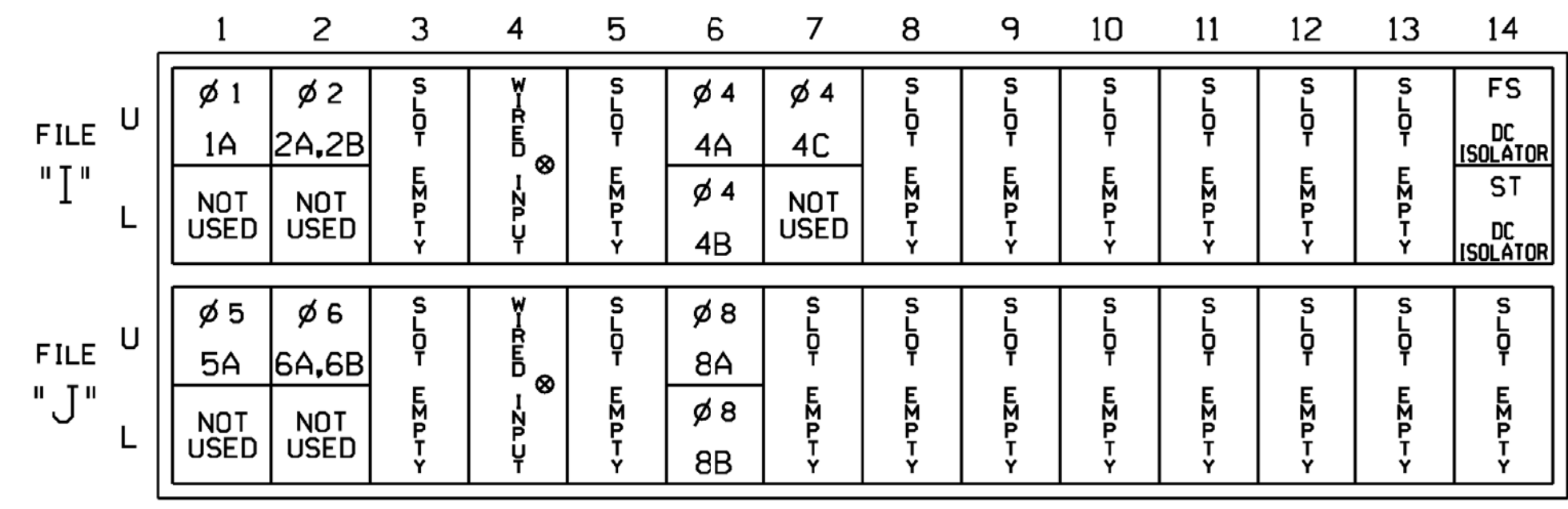
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	PED	3	4	PED	5	6	PED	7	8	PED	OLA	DLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	11	NU	NU	51	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

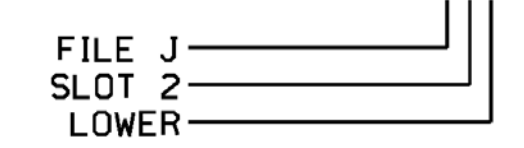
Wired Input - Do not populate slot with detector card

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		3		G
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		10		S
4C	TB5-1,2	I7U	65	34	4	YES		15		S
5A ²	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
6A,6B	TB3-5,6	J2U	40	6	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

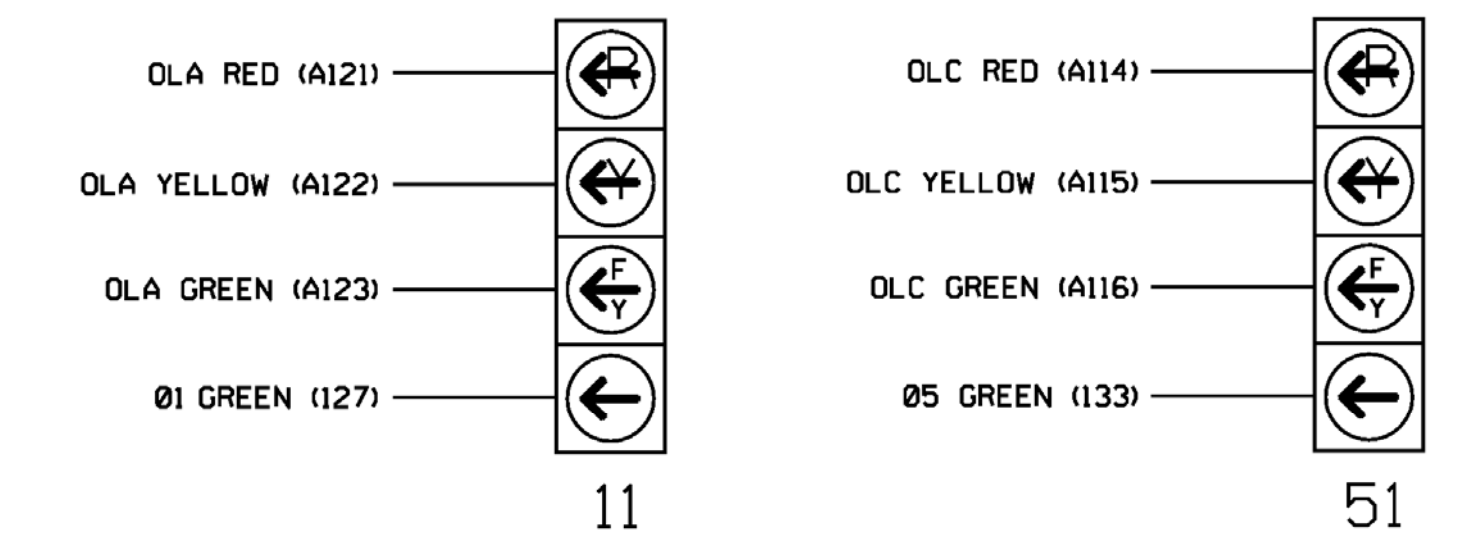
- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

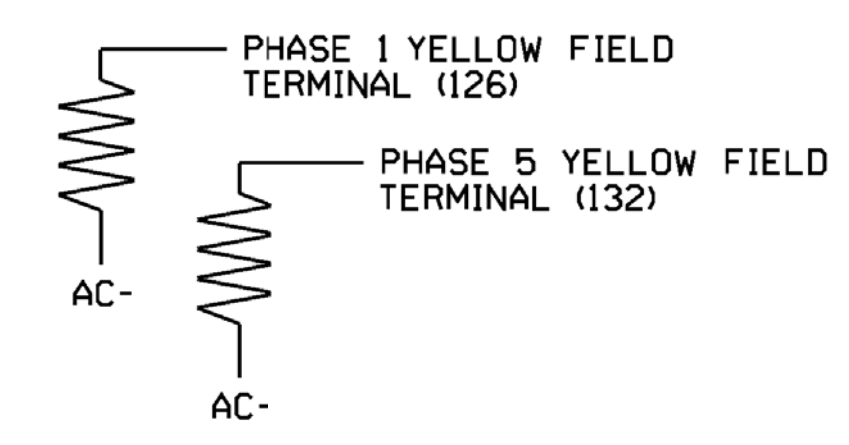
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



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

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: NC 54 (E. Harden Street) at SR 2217/SR 2106 (Woody Drive)

Division 7 Alamance County Graham

PLAN DATE: November 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Wilson REVIEWED BY:

REVISIONS: INIT. DATE

James Voso 6/13/2018

SIG. INVENTORY NO. 07-1521

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

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: 07-1521
DESIGNED: November 2017
SEALED: 6/13/2018
REVISED: NA


Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



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


ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Hwy, Garner, NC 27529

NC 54 (E. Harden Street)
at
SR 2217/SR 2106 (Woody Drive)

Division 7	Alamance County	Graham
PLAN DATE: November 2017	REVIEWED BY: JB Voso	
PREPARED BY: SE Wilson	REVIEWED BY:	
REVISIONS	INIT.	DATE

SEAL

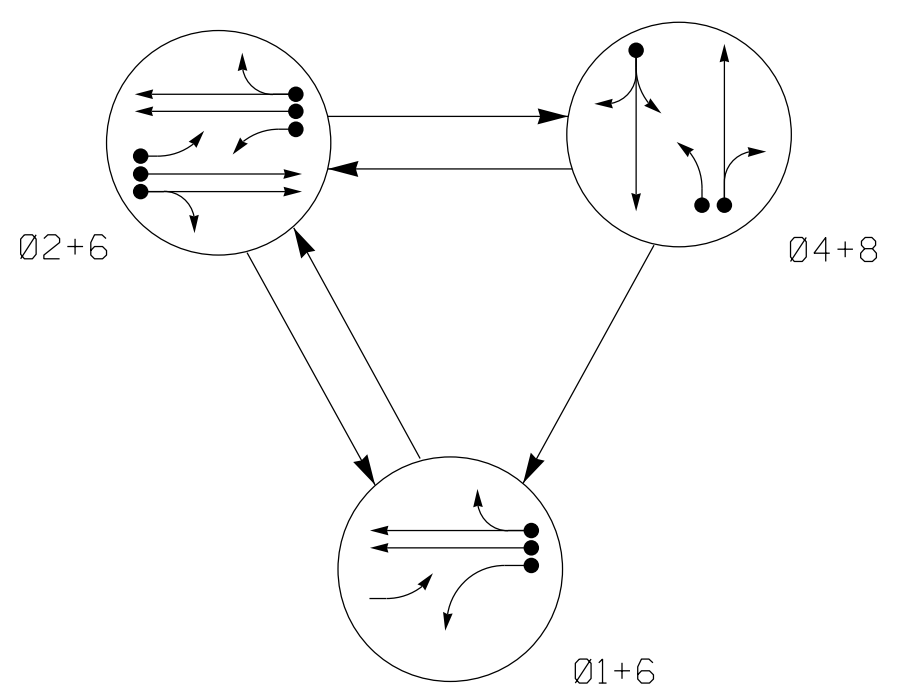


James Voso
6/13/2018
DATE

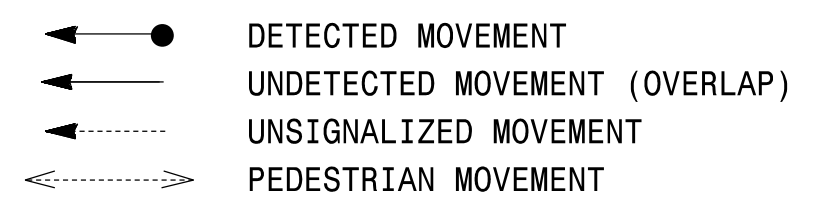
SIG. INVENTORY NO. 07-1521

*****SYSTEM*****
*****PROJECT*****
*****USER*****

PHASING DIAGRAM



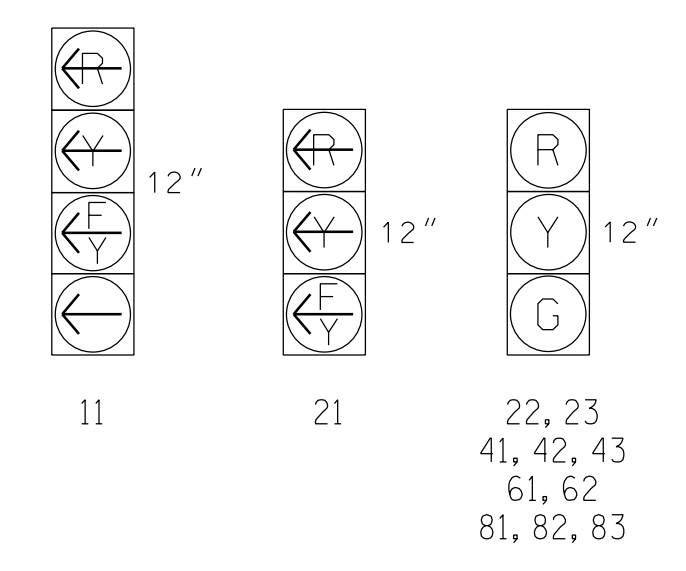
PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 4 + 8	Ø 1 + 6 + Ø 4 + 8
11	F	F	R	Y
21	F	F	R	Y
22, 23	R	G	R	Y
41, 42, 43	R	R	G	R
61, 62	G	G	R	Y
81, 82, 83	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	-	-	S	-	X
2A,2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
2C	6X40	+15	2-4-2	-	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	10	-	S	-	X
4B	6X6	0	EXIST	-	4	Yes	-	15	-	S	-	X
6A,6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	10	-	S	-	X

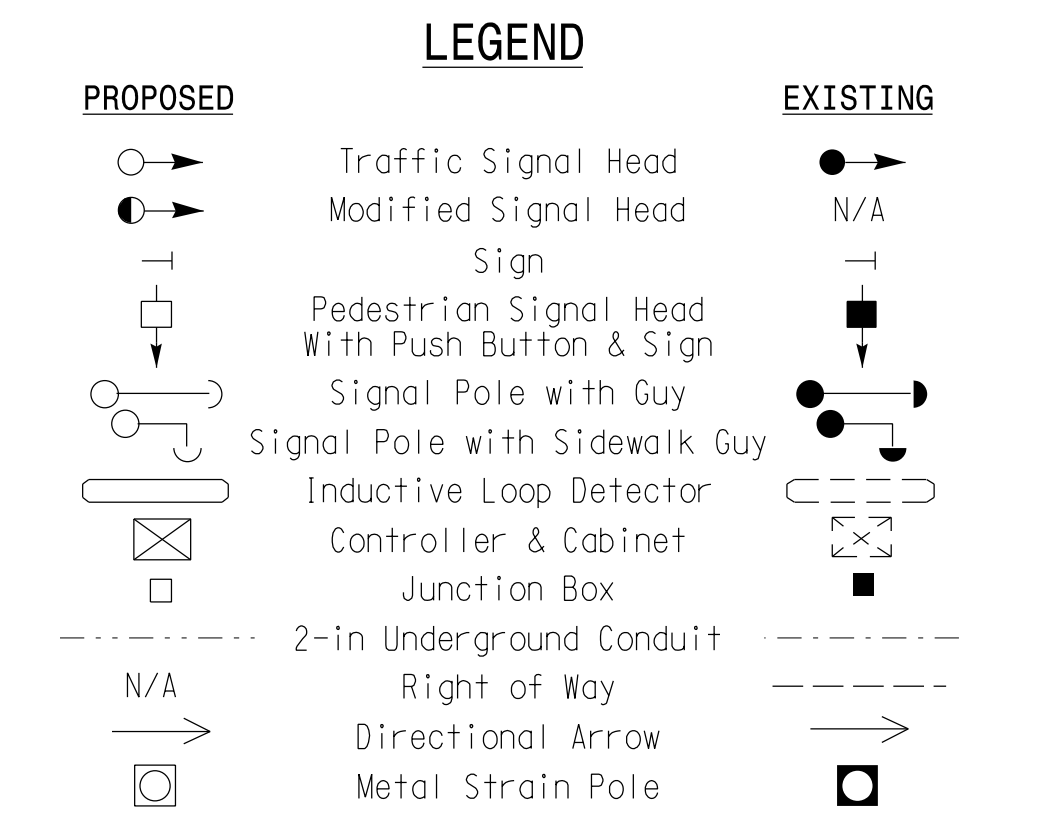
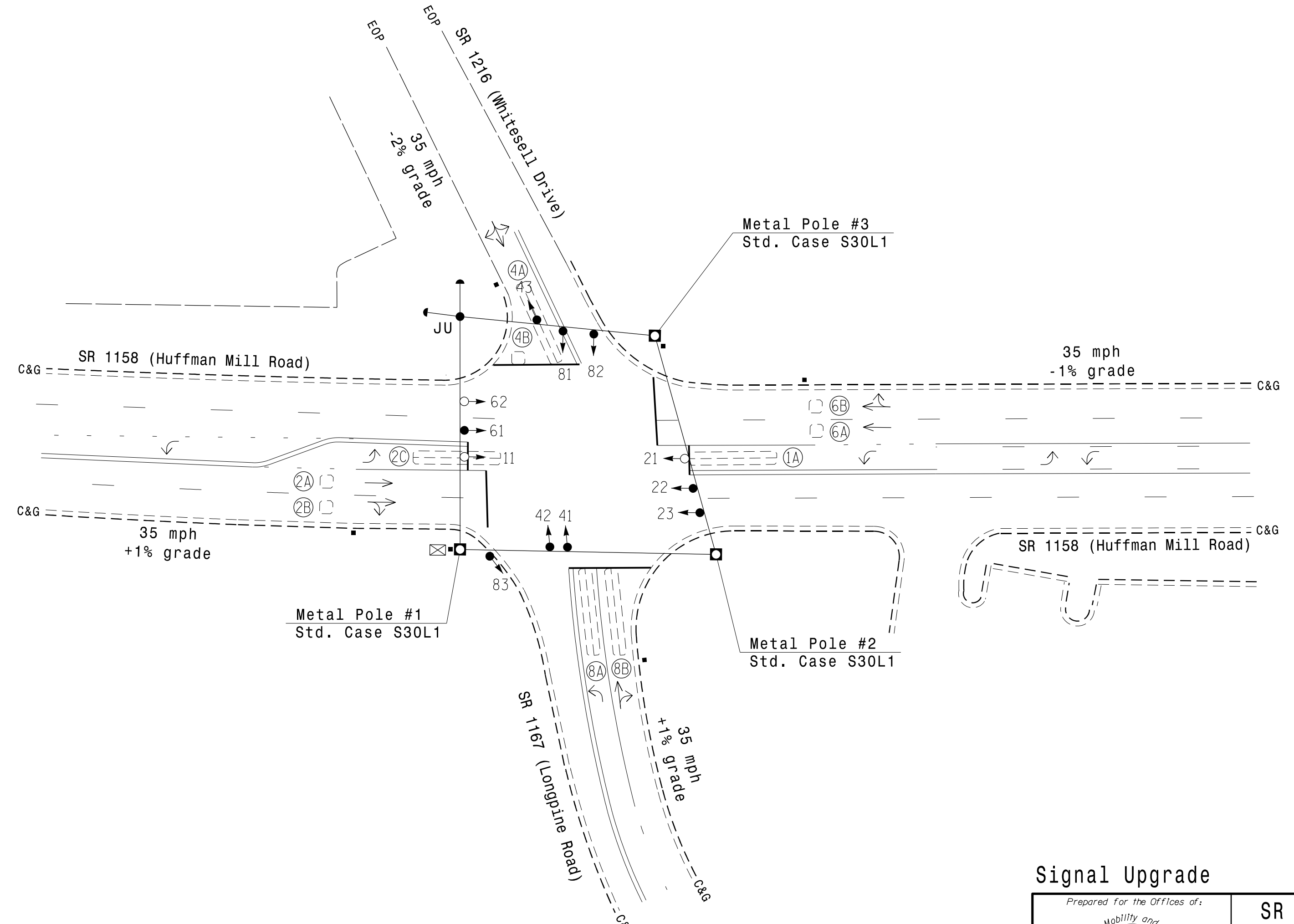
3 Phase Fully Actuated (Burlington-Graham Signal System)

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 1 may be lagged.
- Reposition existing signal heads numbered 22, 23 and 61.
- 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				
	1	2	4	6	8
Min Green *	7	10	7	10	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0	2.0
Max 1 *	20	45	25	45	25
Yellow	3.0	3.9	4.0	3.9	3.8
Red Clear	2.4	1.6	1.5	1.6	1.7
Actuations B4 Add *	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	X	-
Recall Position	-	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	X	-	X
Simultaneous Gap	X	X	X	X	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.



07-JUN-2018 11:15
 C:\Users\rahi\OneDrive\Work\Projects\2018\06\06-01\U-6015-B-C-Sig-Sys\Task_05_11_Signal\as\as\gn07-1541.dgn
 L:\2018\06\06-01\U-6015-B-C-Sig-Sys\Task_05_11_Signal\as\as\gn07-1541.dgn

Signal Upgrade

**SR 1158 (Huffman Mill Road)
at
SR 1167 (Longpine Road)/
SR 1216 (Whitesell Drive)**

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

SEAL

6/7/2018
DATE

SIG. INVENTORY NO. 07-1541

750 N. Greenfield Pkwy, Garner, NC 27529

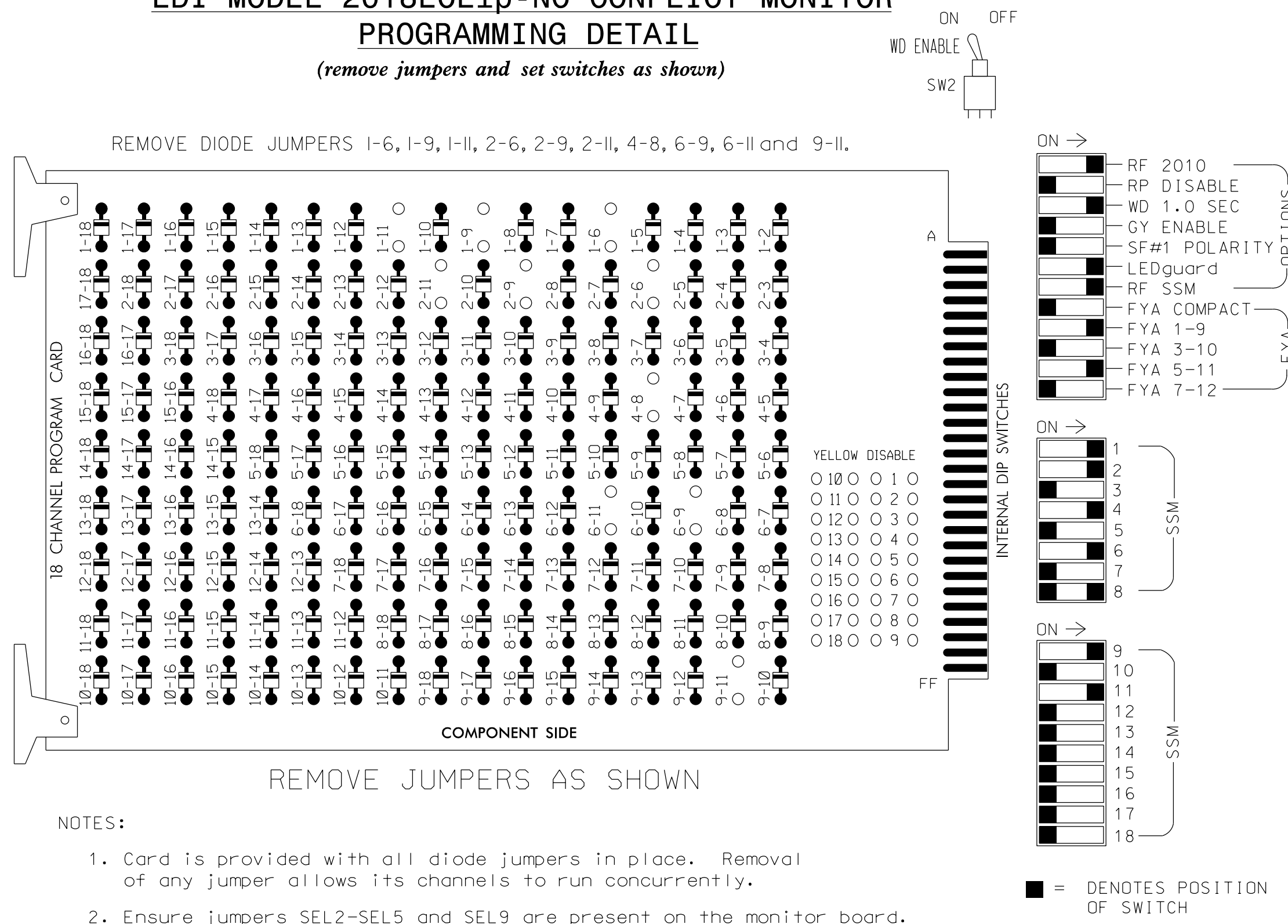
SCALE: 0" = 40'

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

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.

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,S11,AUX S1,AUX S4
 PHASES USED.....1,2,4,6,8
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

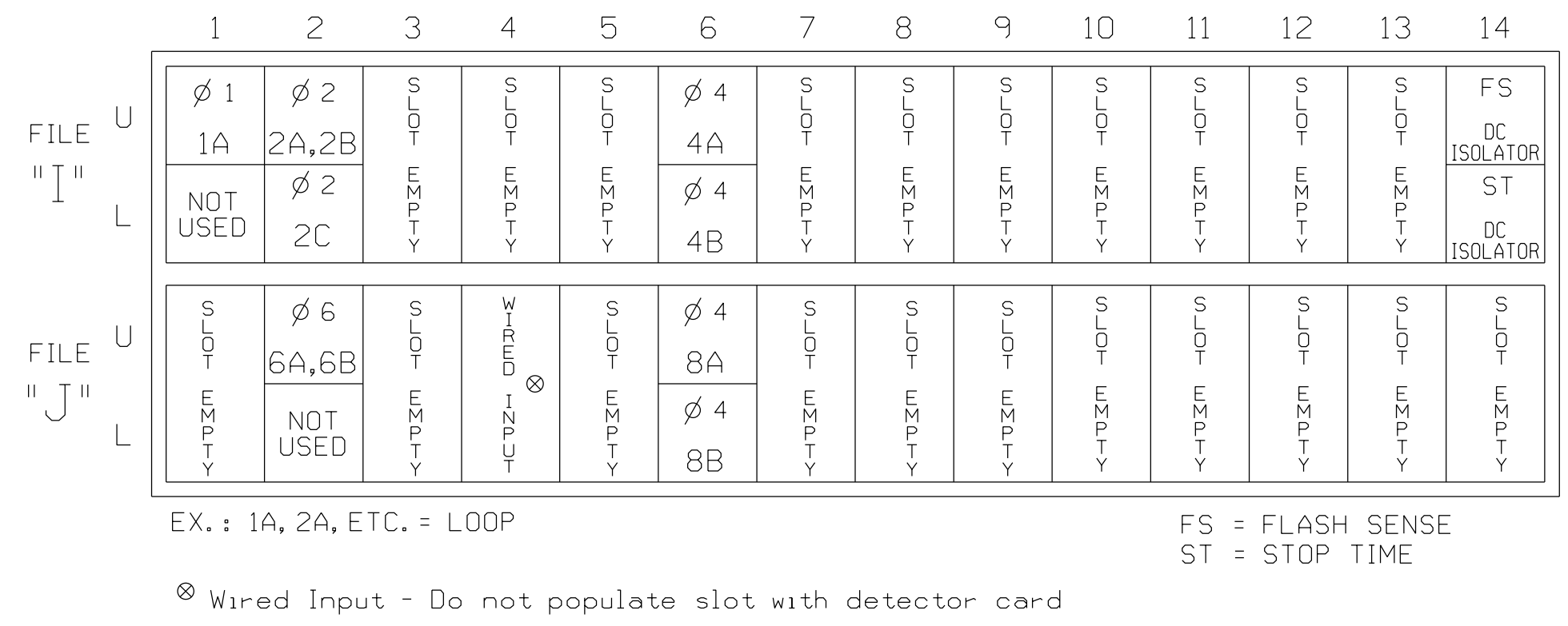
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	22,23	NU	NU	41,42,43	NU	NU	61,62	NU	NU	81,82,83	NU	11	NU	NU	21	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127																	

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

INPUT FILE POSITION LAYOUT

(front view)

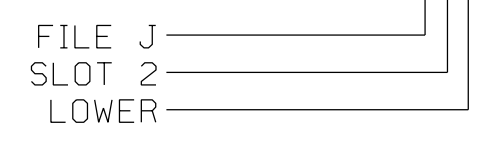


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A 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
2C	TB2-7,8	I2L	43	12	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		10		S
4B	TB4-11,12	I6L	45	14	4	YES		15		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

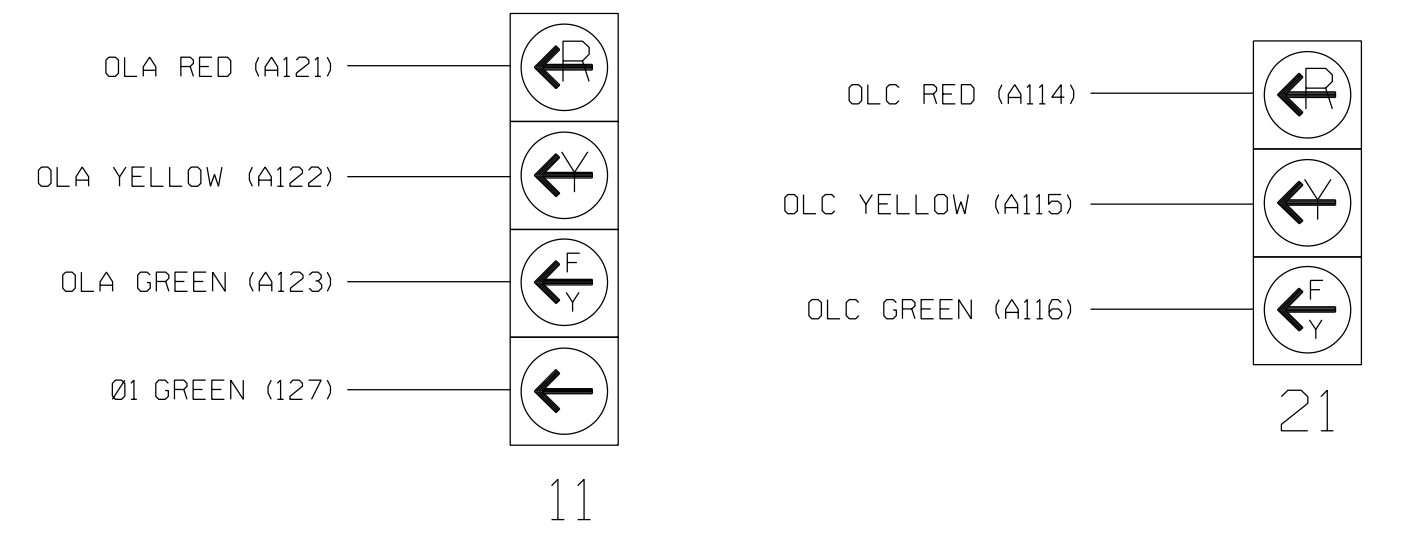
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

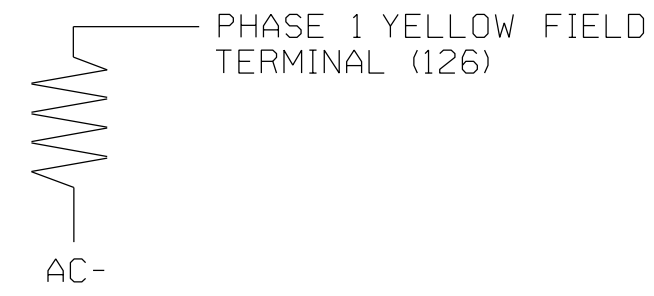
(wire signal heads as shown)



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

Electrical and Programming Details For:
 Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1158 (Huffman Mill Road)	
at	
SR 1167 (Longpine Road)/	
SR 1216 (Whitesell Drive)	
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

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 PAMELA L. ALEXANDER
 SEAL 023489
 6/9/2018
 DATE
 SIG. INVENTORY NO. 07-1541

09-JUN-2018 14:15
 D:\Transportation\tr-office\curr*100056469 U-6015 B-G Sig Sys*task 05-11-SIGNALS\04as\gn\Wf\ing07-1541E.dgn
 ALEX3361 AT LUS20619

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

PERMISSIVE PHASE (OPPOSING TURN)... 2

FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

ACTION PLAN SF BIT DISABLE..... 0

Toggle Twice

OVERLAP C

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

TMG VEH OVLP...[C] TYPE:OTHER/ECONOLITE

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

INCLUDED X

PROTECT

PED PRTC

NOT OVLP

FLSH GRN 1

LAG X PH

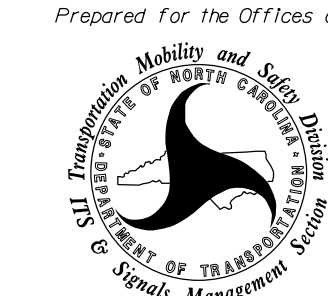
LAG 2 PH

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1541
 DESIGNED: NOVEMBER 2017
 SEALED: 6/7/2018
 REVISED: N/A

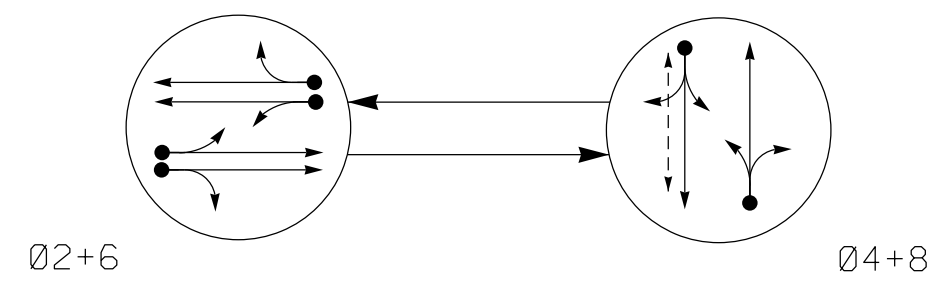
09-JUN-2018 14:15
 D:\Transportation\tr-off\c\curr\10006469 U-6015 B-s Sig Sys\Task 05-11-Signal\is\0as\gn\WIF.rng\07-1541E.dgn
 ALEX3361 AT LUS240619

Electrical Detail - Sheet 2 of 2		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED													
<div style="text-align: center;">  <p style="font-size: x-small;">Prepared for the Offices of: All Transportation, Mobility and Safety Division of the NORTH CAROLINA DEPARTMENT OF TRANSPORTATION & Signal Management Systems</p> </div>	<p style="text-align: center;">SR 1158 (Huffman Mill Road) at SR 1167 (Longpine Road)/ SR 1216 (Whitesell Drive)</p> <p style="text-align: center;">Division 7 Alamance County Burlington</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <td>PLAN DATE: November 2017</td> <td>REVIEWED BY: AM Encarnacion</td> </tr> <tr> <td>PREPARED BY: JA Wiles</td> <td>REVIEWED BY: PL Alexander</td> </tr> </table> <table 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>	PLAN DATE: November 2017	REVIEWED BY: AM Encarnacion	PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander	REVISIONS	INIT.	DATE							<div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 80px; margin: 0 auto;"> <p style="font-size: x-small;">SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 023489</p> </div> <p style="font-size: x-small; margin-top: 5px;"> Date signed by: <i>Pamela Alexander</i> 6/9/2018 Signature: _____ DATE: _____ SIG. INVENTORY NO. 07-1541 </p>
PLAN DATE: November 2017	REVIEWED BY: AM Encarnacion														
PREPARED BY: JA Wiles	REVIEWED BY: PL Alexander														
REVISIONS	INIT.	DATE													

ATKINS

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

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

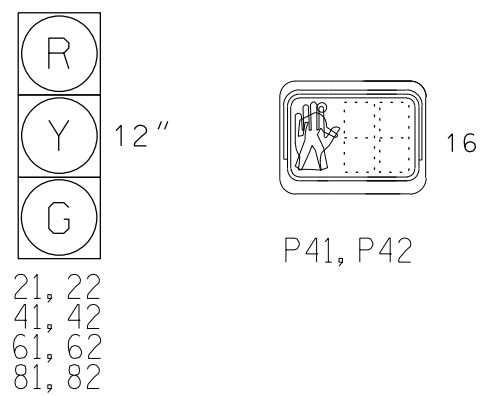
- ← DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ← UNSIGNALIZED MOVEMENT
- ← → PEDESTRIAN MOVEMENT

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
P41, P42	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



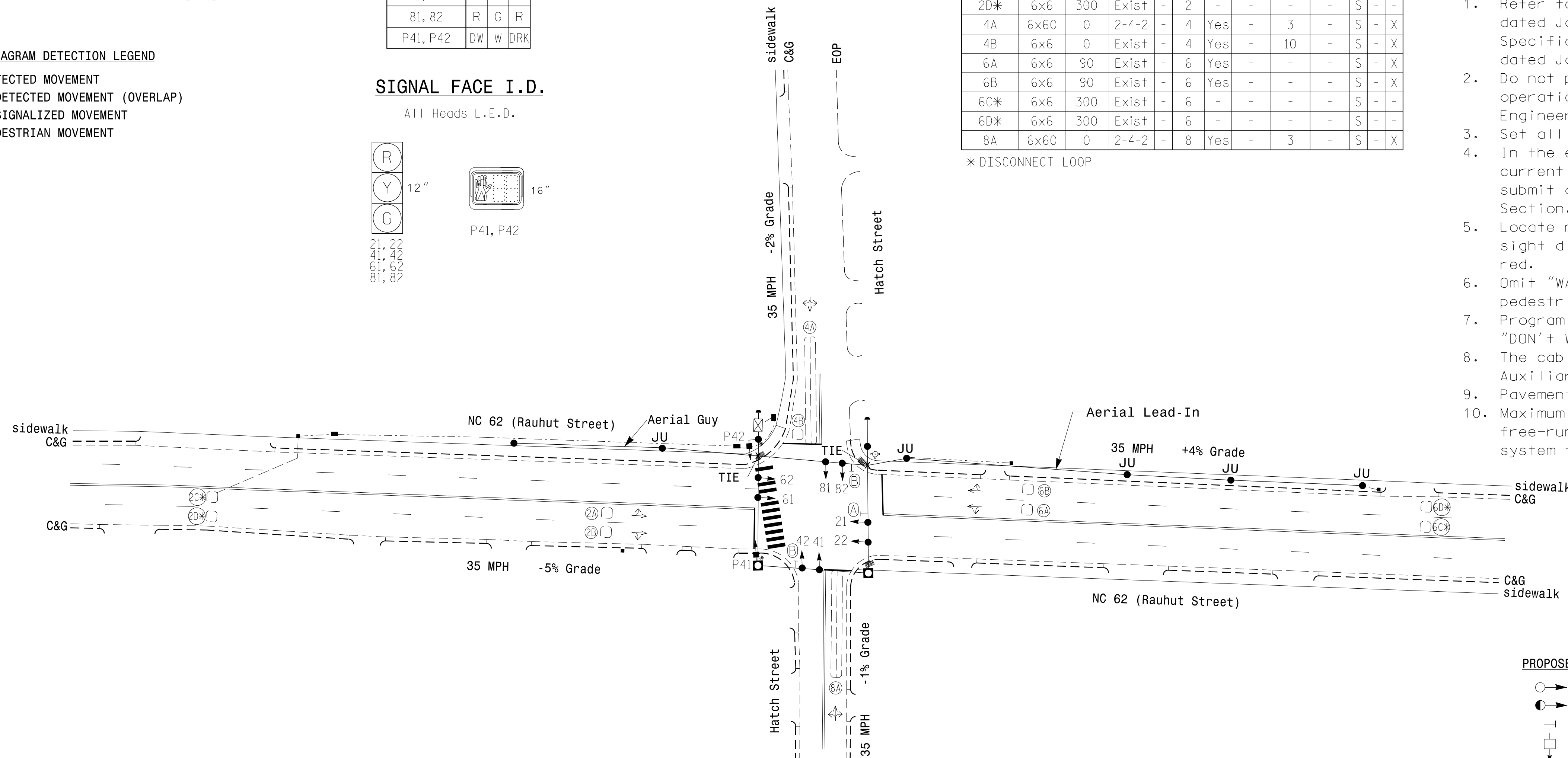
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD
2A	6x6	90	Exist	-	2	Yes	-	-	-	S	X
2B	6x6	90	Exist	-	2	Yes	-	-	-	S	X
2C*	6x6	300	Exist	-	2	-	-	-	-	S	-
2D*	6x6	300	Exist	-	2	-	-	-	-	S	-
4A	6x60	0	2-4-2	-	4	Yes	-	3	-	S	X
4B	6x6	0	Exist	-	4	Yes	-	10	-	S	X
6A	6x6	90	Exist	-	6	Yes	-	-	-	S	X
6B	6x6	90	Exist	-	6	Yes	-	-	-	S	X
6C*	6x6	300	Exist	-	6	-	-	-	-	S	-
6D*	6x6	300	Exist	-	6	-	-	-	-	S	-
8A	6x60	0	2-4-2	-	8	Yes	-	3	-	S	X

* DISCONNECT LOOP

2 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
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.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	4	0	0
Ped Clear	0	11	0	0
Veh. Extension *	3.0	2.0	3.0	3.0
Max 1 *	45	25	45	25
Yellow	4.2	4.0	3.6	3.9
Red Clear	1.1	1.3	1.2	1.1
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	-	X	-	X
Simultaneous Gap	X	X	X	X

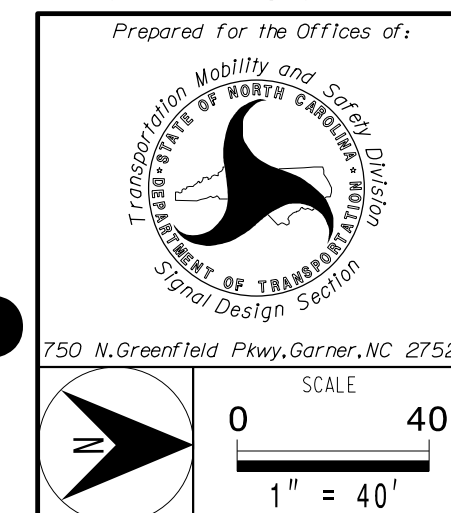
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | PROPOSED | | EXISTING |
|----------|--------------------------------------|----------|
| ○ → | Traffic Signal Head | ● → |
| ● → | Modified Signal Head | N/A |
| ⊥ | Sign | ⊥ |
| ⊥ | Pedestrian Signal Head | ⊥ |
| * | Pedestrian Push Button & Sign | * |
| ⊥ | Metal Strain Pole | ⊥ |
| ⊥ | Signal Pole with Guy | ⊥ |
| ⊥ | Signal Pole with Sidewalk Guy | ⊥ |
| ⊥ | Inductive Loop Detector | ⊥ |
| ⊥ | Controller & Cabinet | ⊥ |
| ⊥ | Junction Box | ⊥ |
| ⊥ | Over Sized Junction Box | ⊥ |
| ⊥ | 2-in Underground Conduit | ⊥ |
| N/A | Right of Way | --- |
| → | Directional Arrow | → |
| N/A | Fire Hydrant | ⊕ |
| N/A | Truncated Domes | ▒ |
| ⊕ | "LEFT TURN MUST YIELD" Sign (R10-12) | ⊕ |
| ⊕ | "NO TURN ON RED" Sign (R10-11) | ⊕ |

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



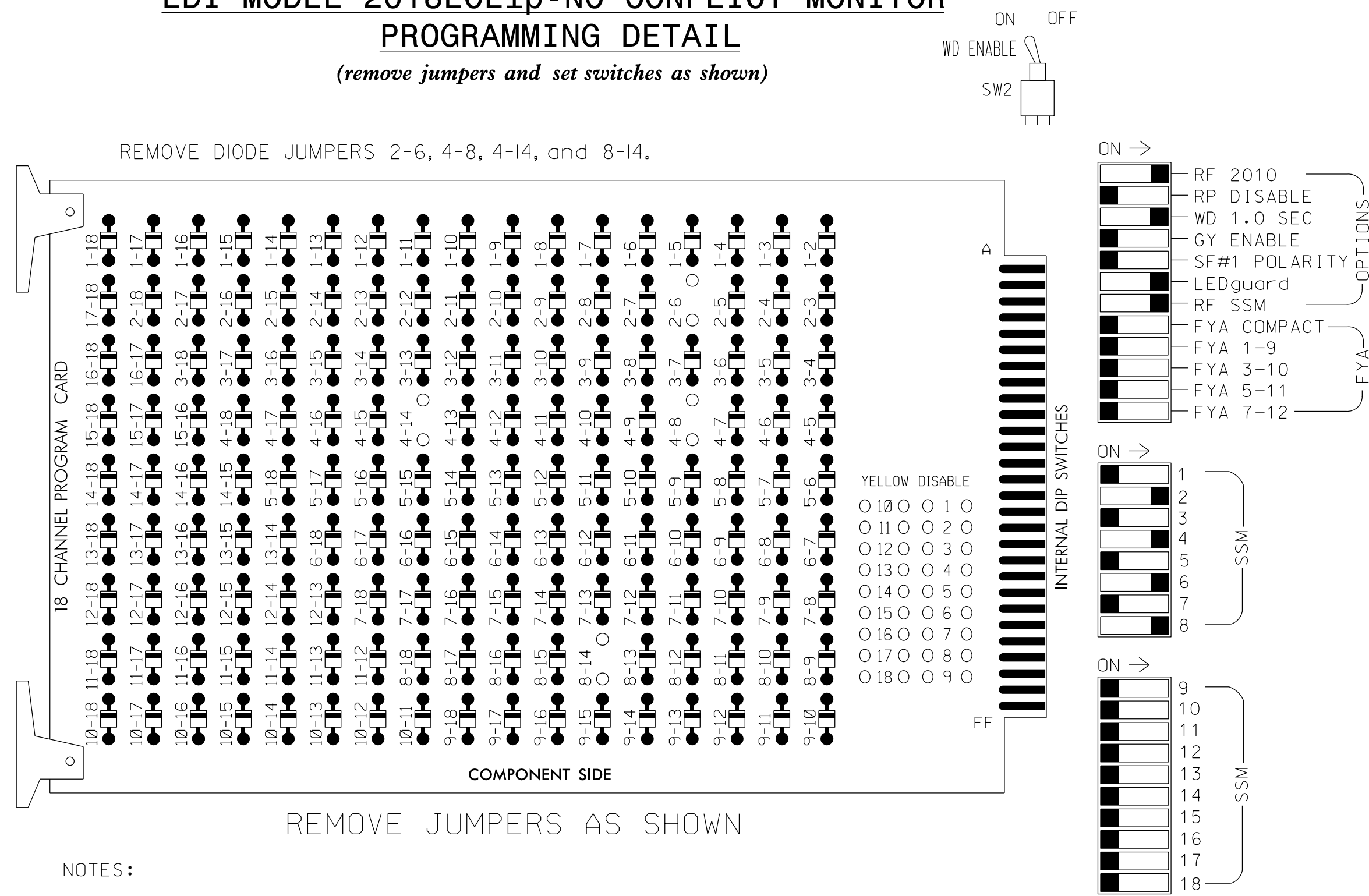
NC 62 (Rauhut Street) at Hatch Street	
Division 7	Alamance County Burlington
PLAN DATE: November 2017	REVIEWED BY: AJ Davis
PREPARED BY: RD Lawton	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

DocuSigned by:
Lisa M. Moon 6/13/2018
SIGNATURE DATE
SIG. INVENTORY NO. 07-1570

13-JUN-2018 17:46 R:\66015\7\off\c\k\signal\signal\signal\07-1570.dgn KANDERSON AT CHA-Y.ANDERSON

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.....S2,S5,S6,S8,S11
 PHASES USED.....2,4,4PED,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

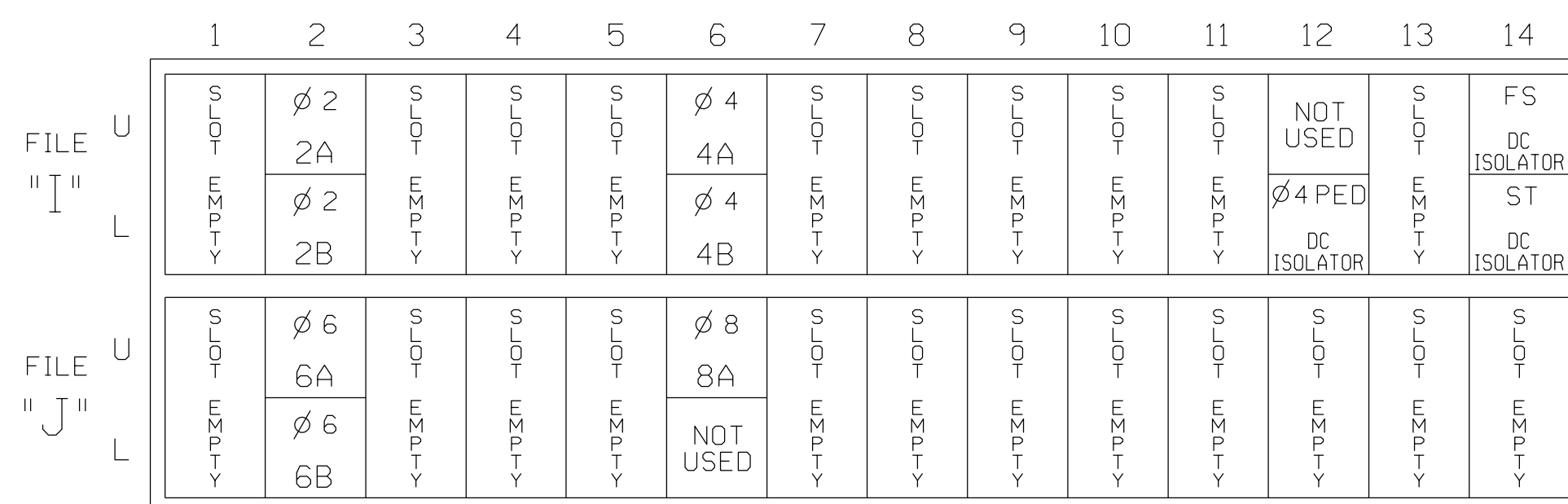
SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

INPUT FILE POSITION LAYOUT

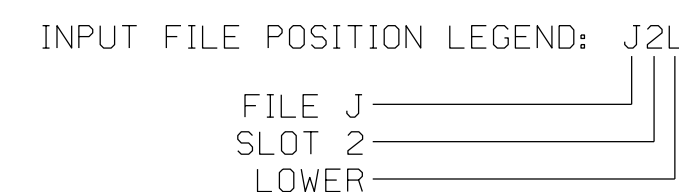
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
2B	TB2-7,8	I3L	43	12	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES				S

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.



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: 07-1570
 DESIGNED: NOVEMBER 2017
 SEALED: 06-13-2018
 REVISED: N/A

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

Plans Prepared By: **DRMP**

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

NC 62 (Rauhut Street) at Hatch Street

Division 7 Alamance County Burlington

PLAN DATE: November 2017 REVIEWED BY: AJ Davis

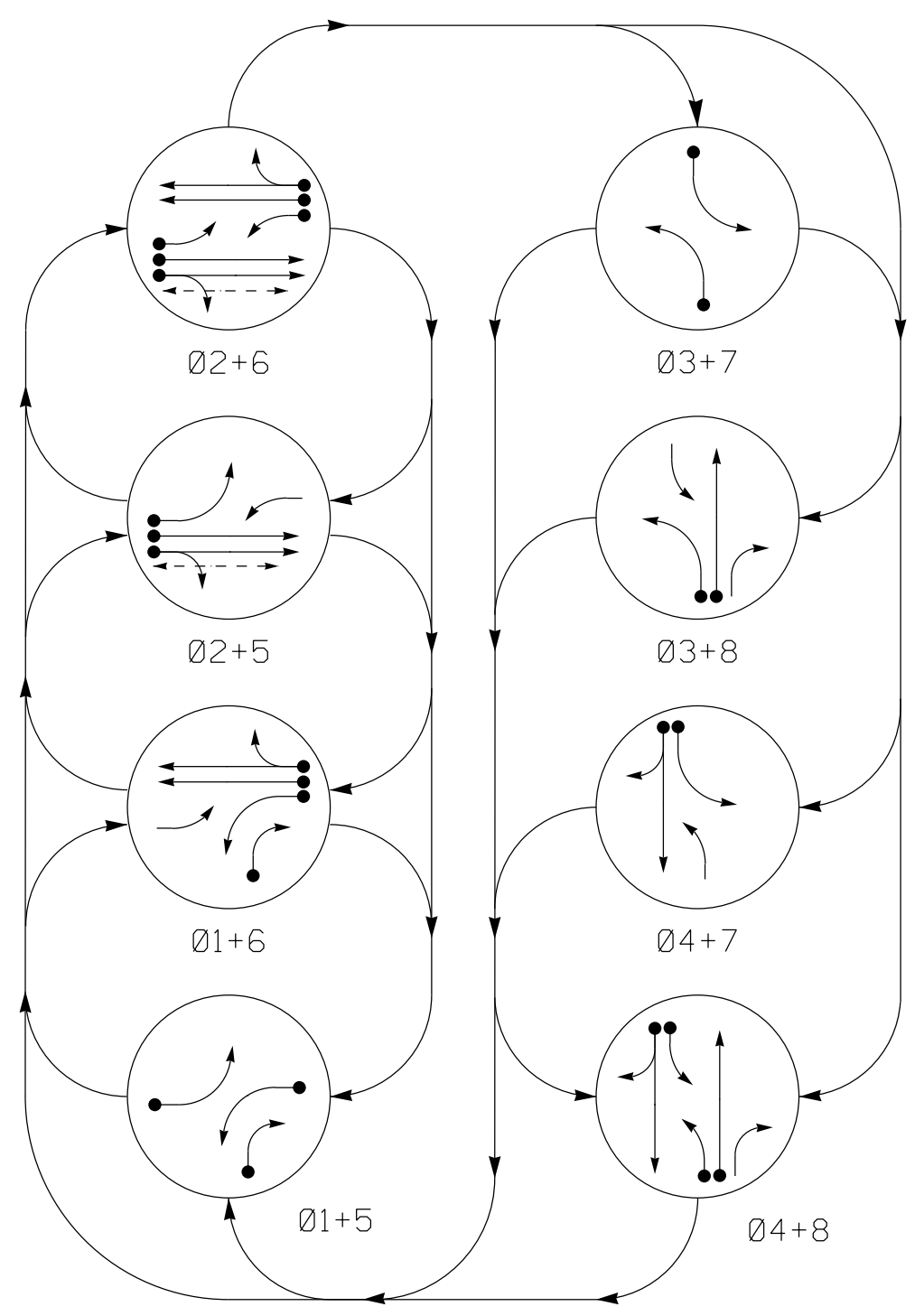
PREPARED BY: RD Lawton REVIEWED BY: LM Moon

REVISIONS INIT. DATE

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

SIG. INVENTORY NO. 07-1570

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

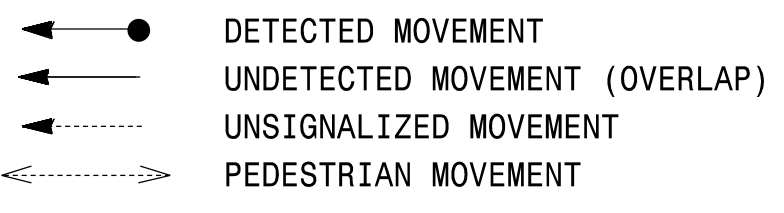
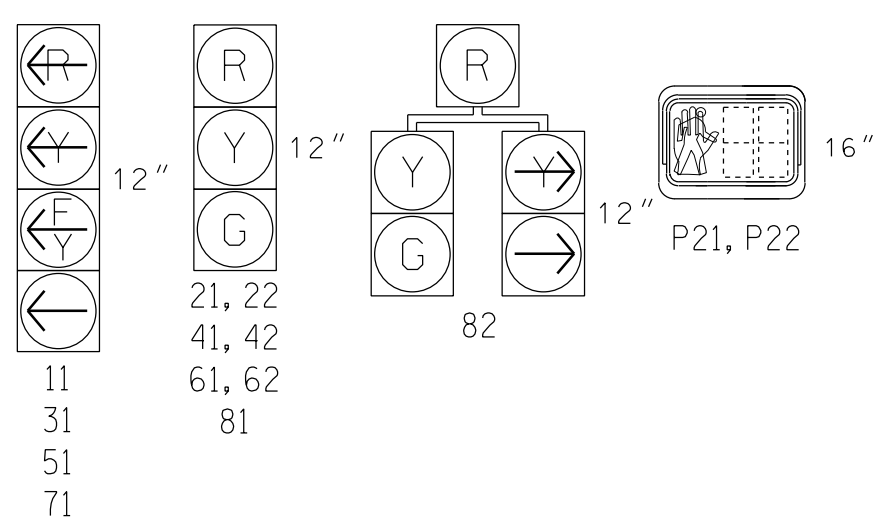


TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



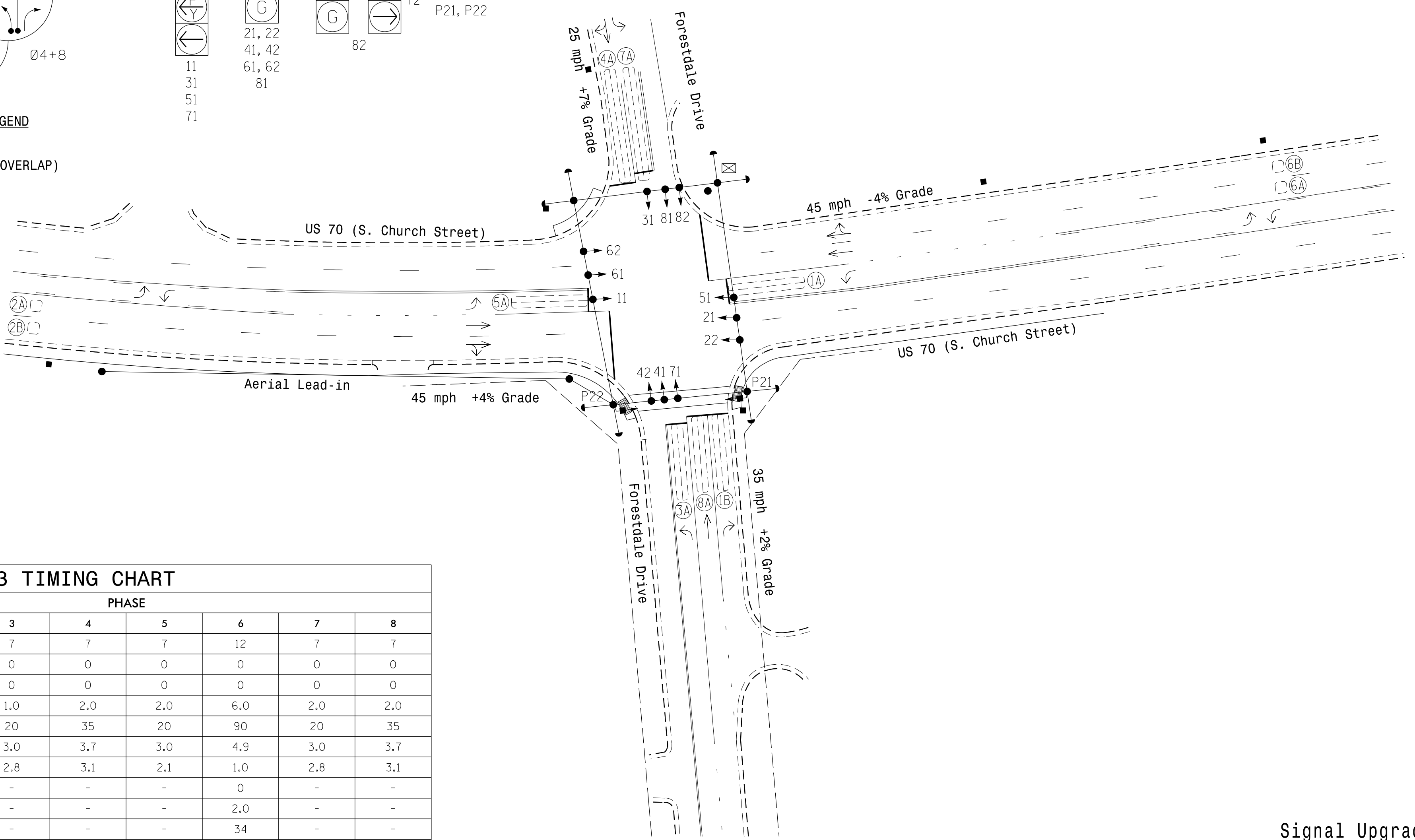
ASC/3 DETECTOR INSTALLATION CHART

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
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
1B	6X40	0	2-4-2	-	6	Yes	-	3	-	G	-	X
2A, 2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	15	-	S	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A, 6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
7A	6X60	+5	2-4-2	-	7	Yes	-	15	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	-	X

8 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. 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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

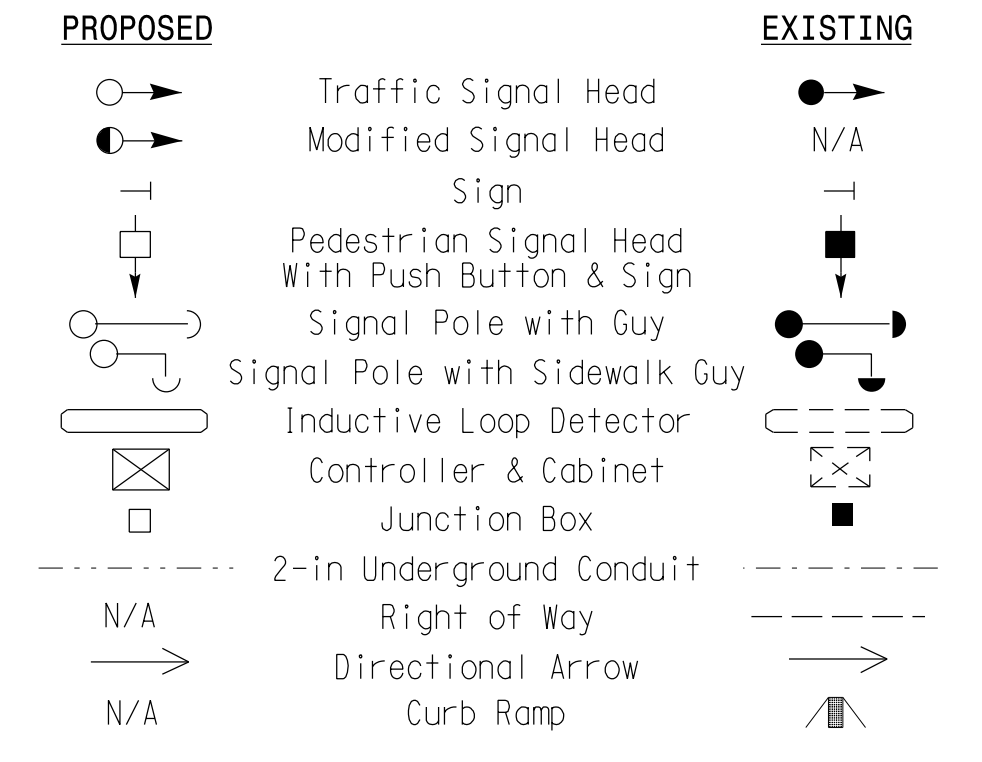


ASC/3 TIMING CHART

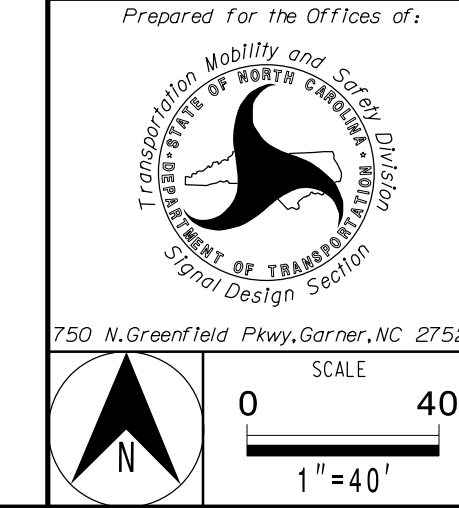
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	0	4	0	0	0	0	0	0
Ped Clear	0	10	0	0	0	0	0	0
Veh. Extension *	2.0	6.0	1.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	35	20	90	20	35
Yellow	3.0	4.9	3.0	3.7	3.0	4.9	3.0	3.7
Red Clear	2.4	1.0	2.8	3.1	2.1	1.0	2.8	3.1
Actuations B4 Add *	-	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	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



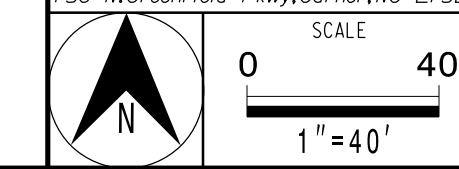
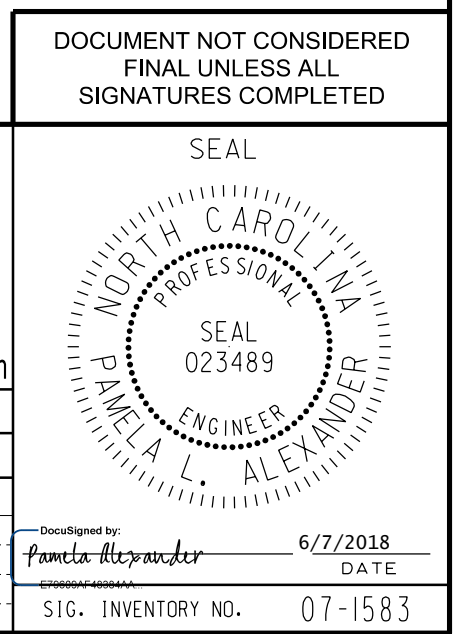
US 70 (S. Church Street) at Forestdale Drive

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: MB Toth

PREPARED BY: PL Alexander REVIEWED BY:

REVISIONS	INIT.	DATE

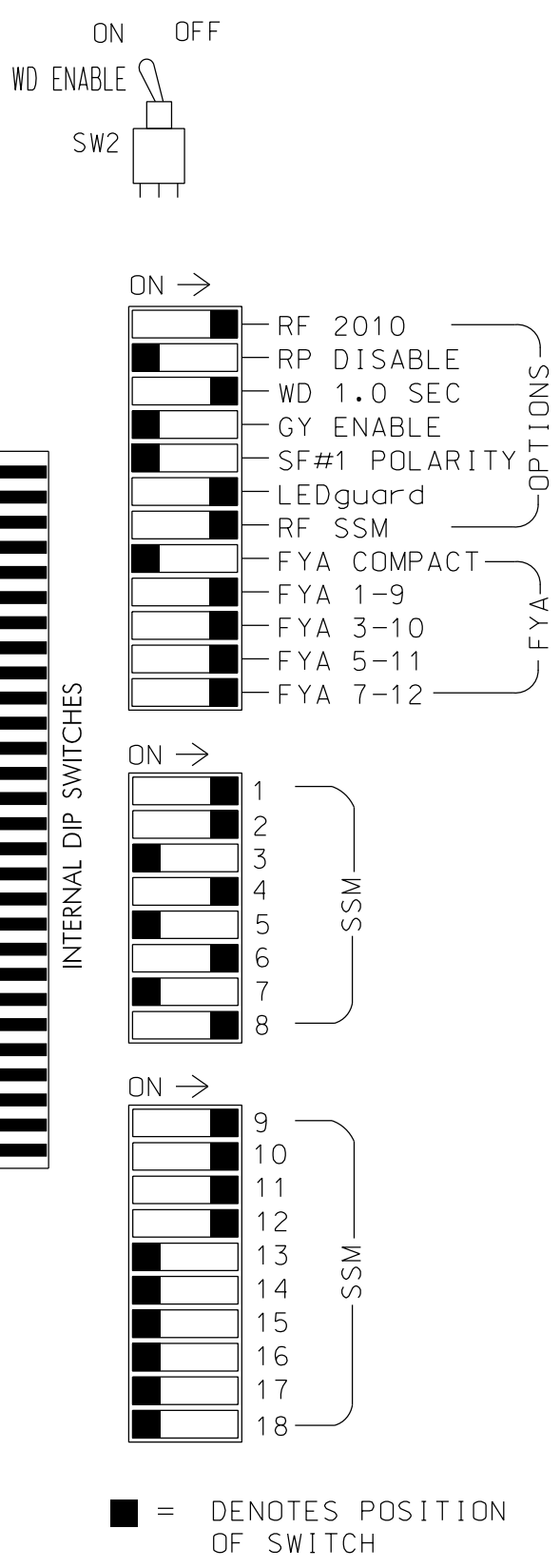
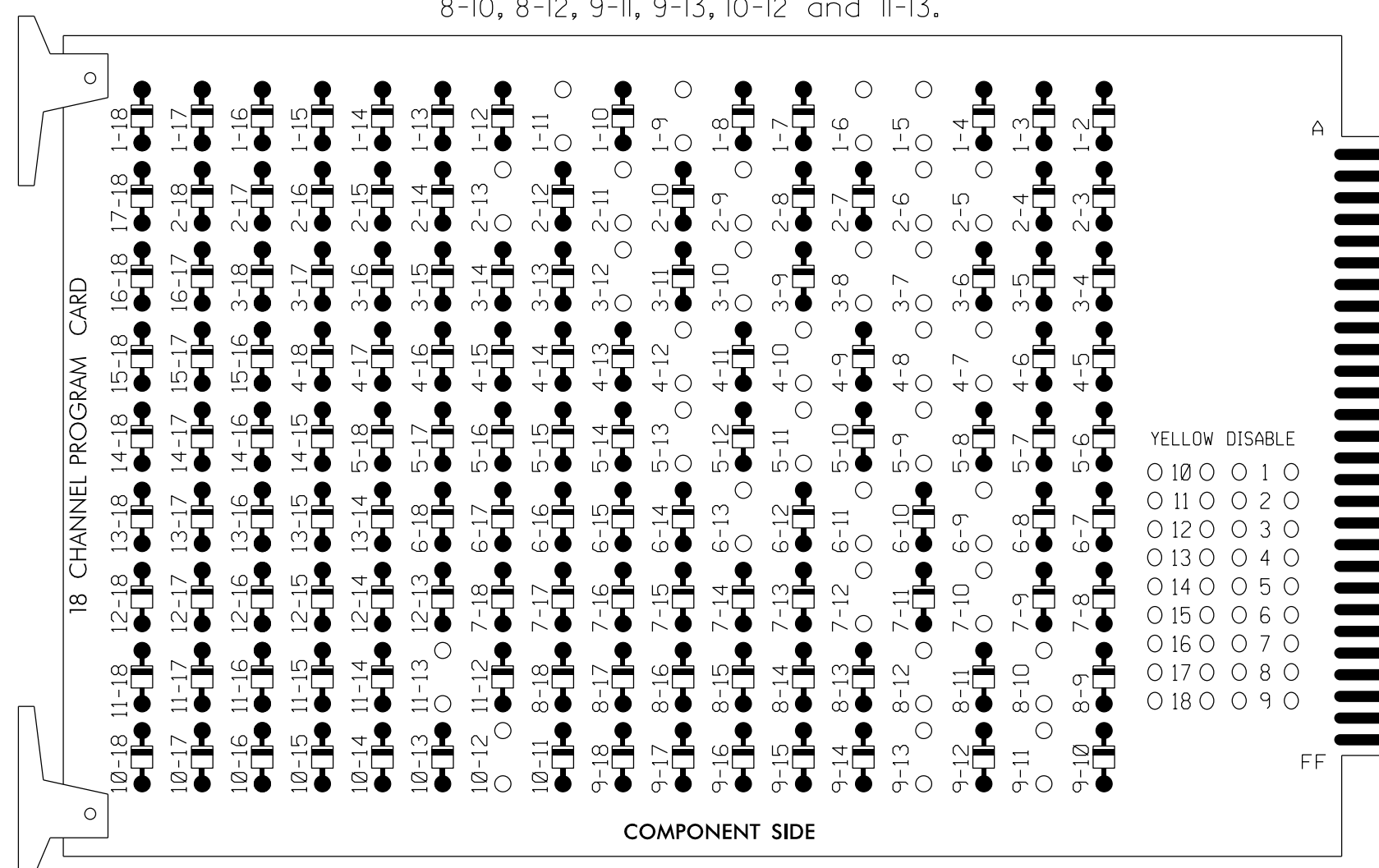


07-JUN-2018 11:15 D:\p\consort\at\work\proj\off\c\cur\100056469 U-6015 B-G S19 Sys\Task 05_11_Signal\Des\gsm07-1583.dgn ALEX3361 AT LUS210649

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Walk and 6 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,S3,S4,S5,S7,S8,S10,S11,
AUX S1,AUX S2,AUX S4,AUX S5
PHASES USED.....1,2,2PED,3,4,5,6,7,8

OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

Table with columns for LOAD SWITCH NO., PHASE, SIGNAL HEAD NO., and various signal colors (RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, FLASHING YELLOW ARROW, GREEN ARROW) and their corresponding terminal numbers.

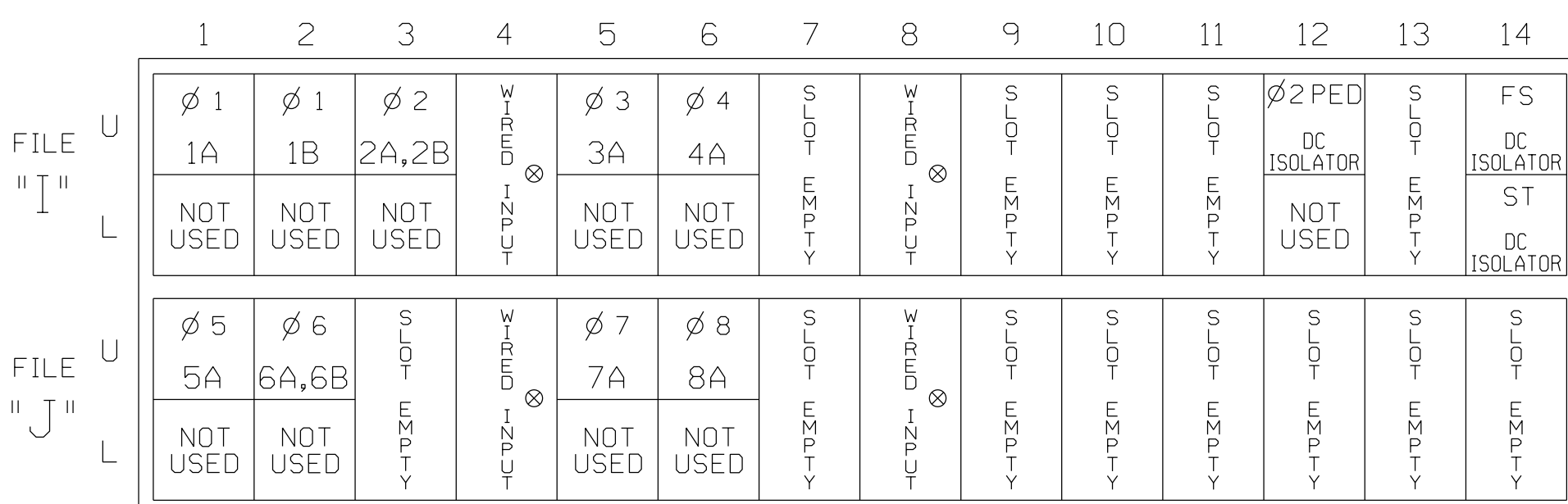
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

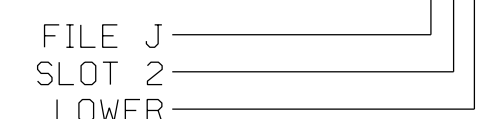
INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns for LOOP NO., LOOP TERMINAL, INPUT FILE POS., PIN NO., DETECTOR NO., NEMA PHASE, CALL, EXTEND TIME, DELAY TIME, ADDED INITIAL, and DETECTOR TYPE.

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOT 112.

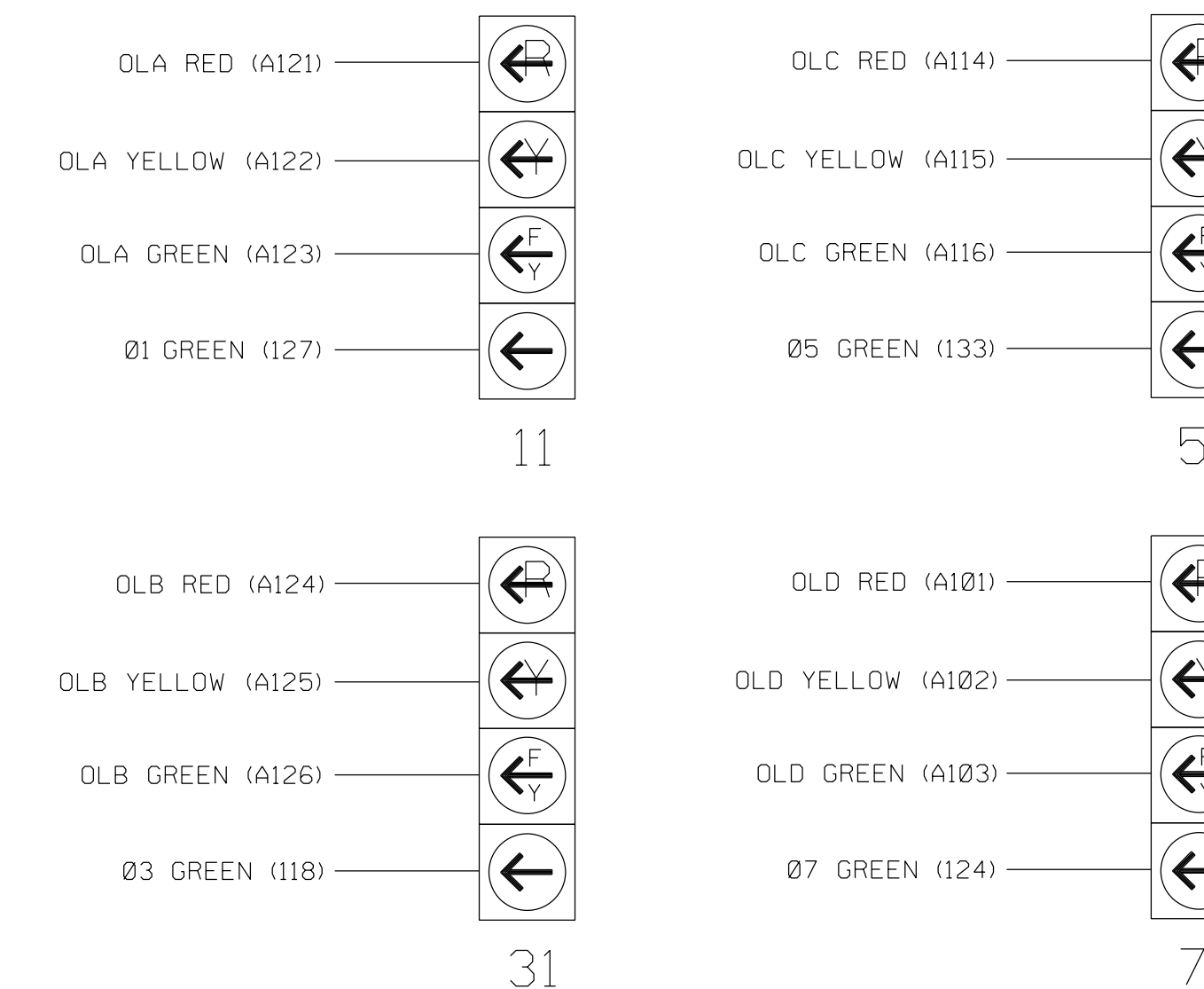
- 1 Add jumper from I1-W to J4-W, on rear of input file.
2 Add jumper from I5-W to J8-W, on rear of input file.
3 Add jumper from J1-W to I4-W, on rear of input file.
4 Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

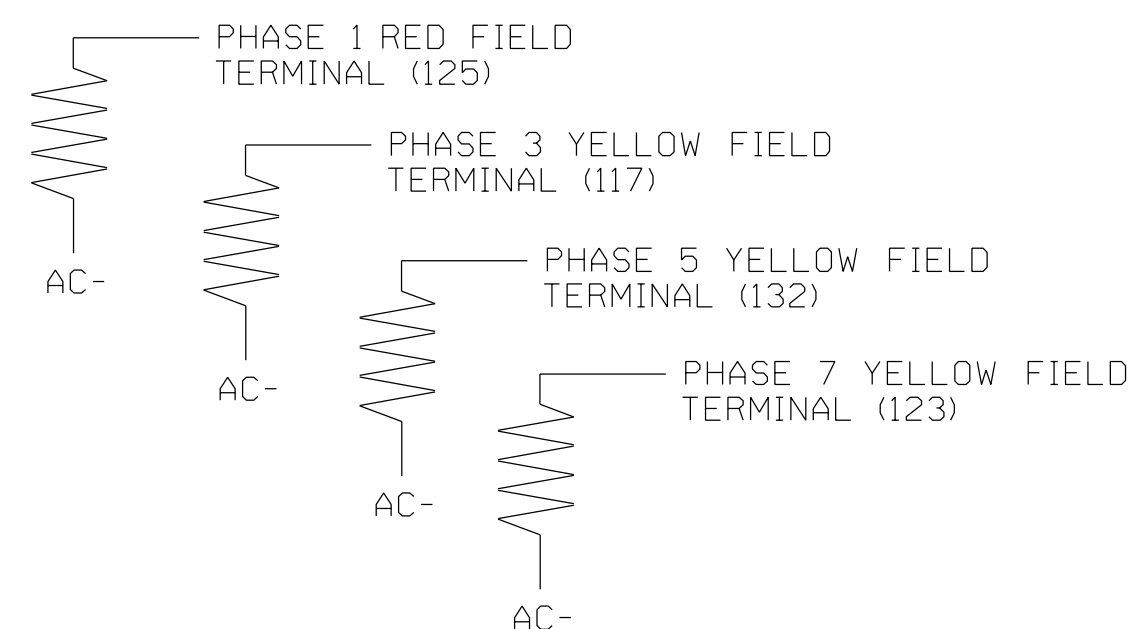
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

Table with columns for VALUE (ohms) and WATTAGE, showing acceptable ranges like 1.5K - 1.9K and 25W (min).



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1583
DESIGNED: January 2018
SEALED: 6/7/2018
REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Professional Engineer seal for Pamela L. Alexander, North Carolina, License No. 023489. Includes project details for US 70 at Forestdale Drive, Alameda County, Burlington, NC.

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 Once

OVERLAP B

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

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

PROTECTED LEFT TURN.... PHASE 3

OPPOSING THROUGH..... PHASE 4

FLASHING ARROW OUTPUT.....CH10 ISOLATE

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

ACTION PLAN SF BIT DISABLE..... 0

Toggle Once

OVERLAP C

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

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

PROTECTED LEFT TURN.... PHASE 5

OPPOSING THROUGH..... PHASE 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

ACTION PLAN SF BIT DISABLE..... 0

Toggle Once

OVERLAP D

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

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

PROTECTED LEFT TURN.... PHASE 7

OPPOSING THROUGH..... PHASE 8

FLASHING ARROW OUTPUT.....CH12 ISOLATE

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

ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

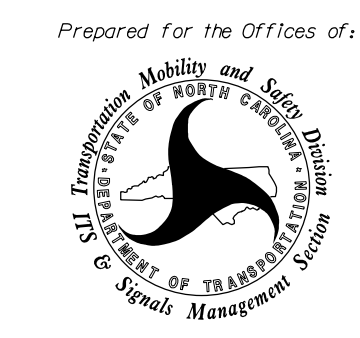
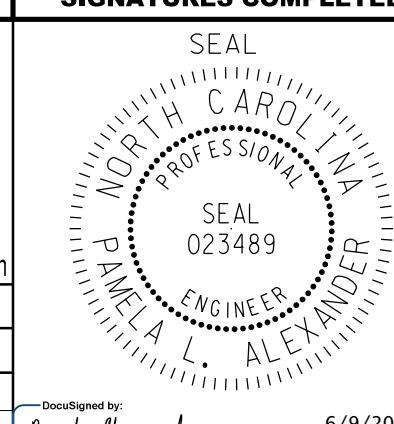

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1583

DESIGNED: January 2018

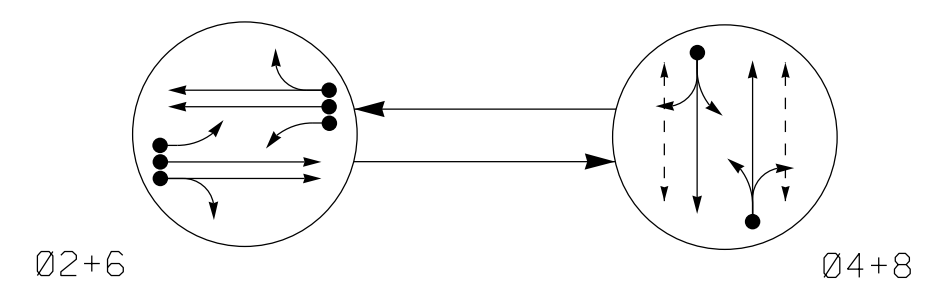
SEALED: 6/7/2018

REVISED: N/A

09-JUN-2018 14:15 D:\Tonsor\at\at\office\curr\100056469 U-6015 B-G S1g Sys\Task 05_11_Signal\Des\gn\mtr\ing\07-1583E.dgn ALEX3361 AT LUS330649

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 Forestdale Drive Division 7 Alamance County Burlington PLAN DATE: January 2018 REVIEWED BY: MB Toth PREPARED BY: PL Alexander REVIEWED BY:	SEAL  SEAL 023489 PAMELA L. ALEXANDER ENGINEER									
 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							6/9/2018 Pamela Alexander DATE SIG. INVENTORY NO. 07-1583
REVISIONS	INIT.	DATE									

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

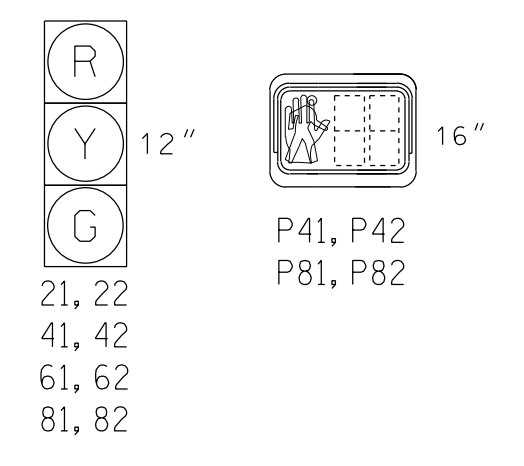
- ← DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ⋯ UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R
P41, P42	DW	W	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



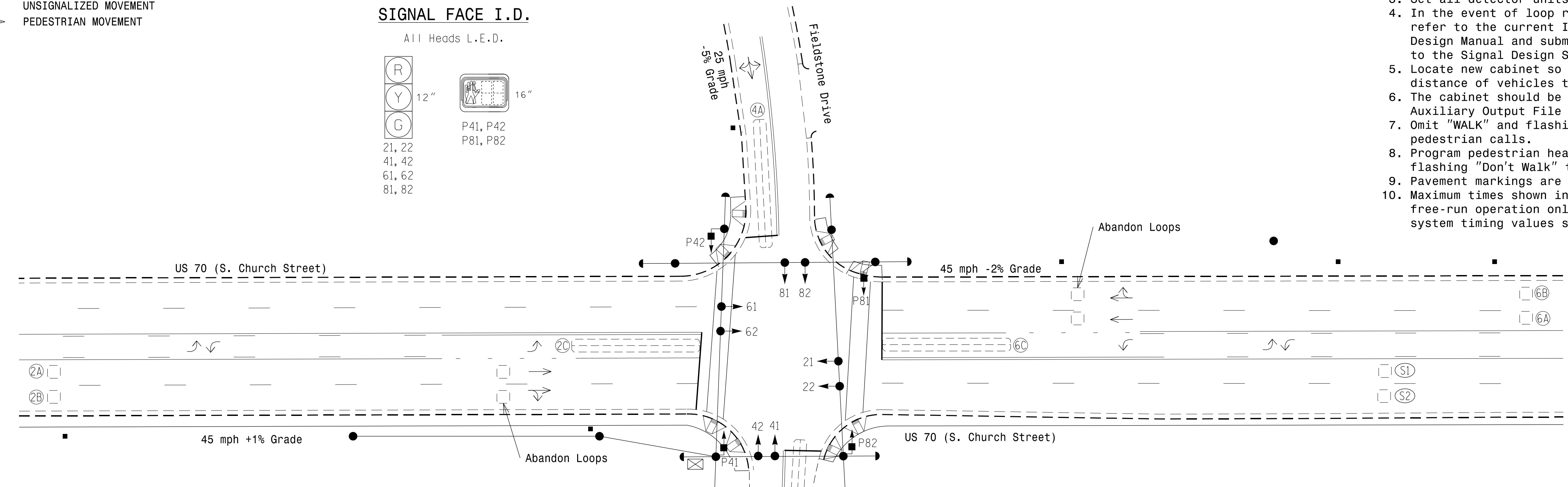
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A, 2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
2C	6X60	0	2-4-2	-	2	Yes	-	3	-	G	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	5	-	S	-	X
6A, 6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6C	6X60	0	2-4-2	-	6	Yes	-	3	-	G	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	5	-	S	-	X
S1	6X6	+320	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+320	EXIST	-	-	No	-	-	-	N	X	X

2 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by 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.
- Omit "WALK" and flashing "DON't WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	0	4	0	4
Ped Clear	0	18	0	16
Veh. Extension *	6.0	3.0	6.0	3.0
Max 1 *	90	50	90	50
Yellow	4.4	3.5	4.7	3.1
Red Clear	1.2	2.4	1.2	2.4
Activations 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	-	ON	-	ON
Simultaneous Gap	X	X	X	X

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

LEGEND

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

Signal Upgrade

Prepared for the Offices of:

US 70 (S. Church Street) at Coachlight Trail/Fieldstone Drive

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: MB Toth

PREPARED BY: PL Alexander REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 1"=30'

6/7/2018

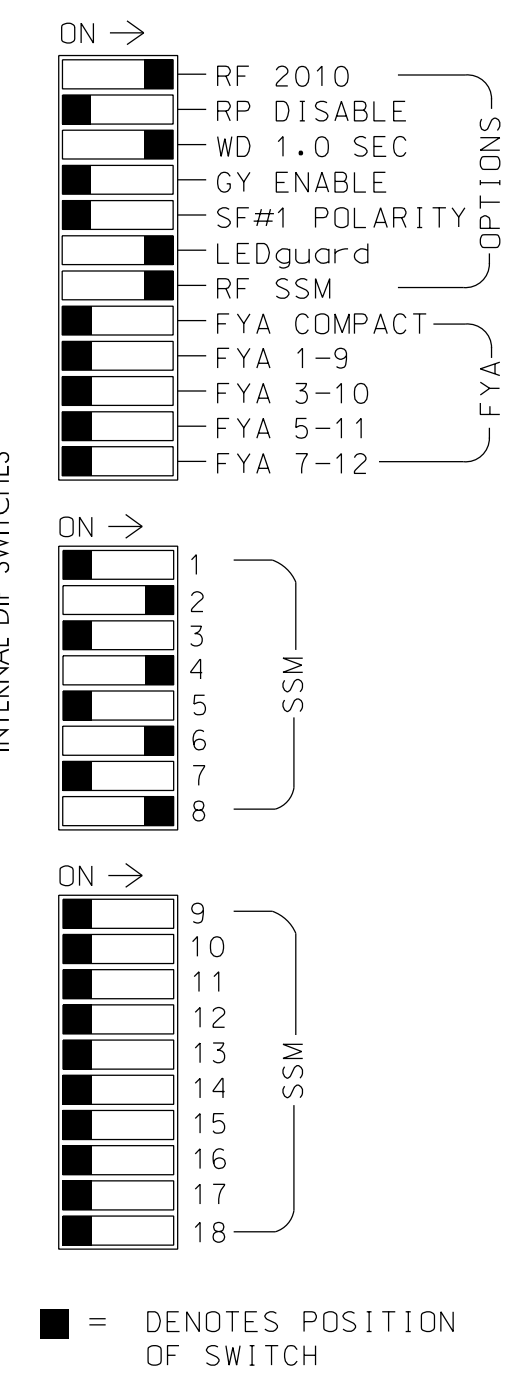
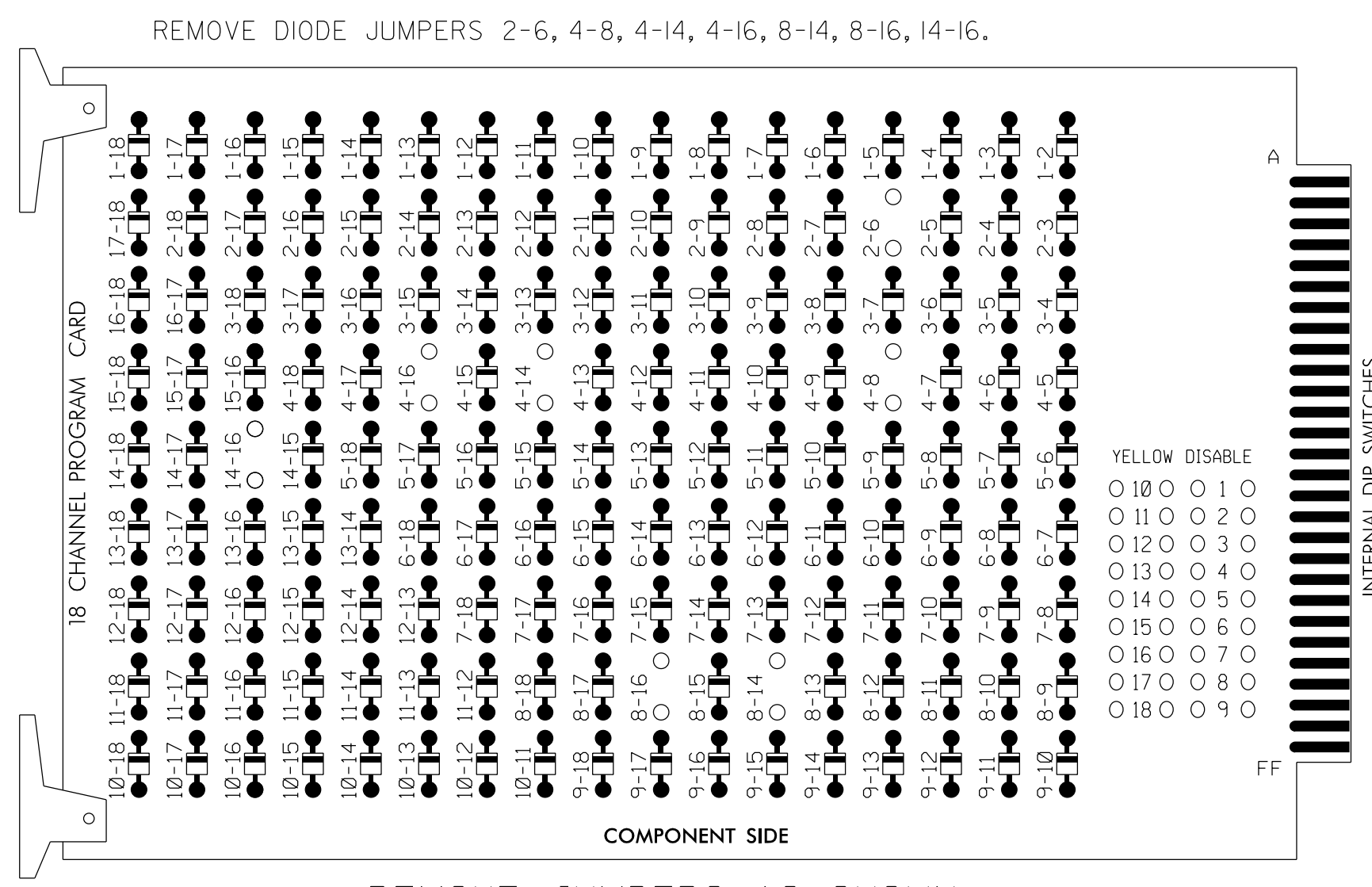
SIG. INVENTORY NO. 07-1612

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

07-JUN-2018 11:15 ***SIGNALING-COMING-TO-TRAFFIC-CONTROL-TRAFFIC-CURR-00006469 U-6015 B-0 Sig. Sys*Task 05-11-15 Signal is 0605 0907-1612-dgn ALEX3361 AT LUS20869

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.....ECONDLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S6,S8,S11,S12
 PHASES USED.....2,4,4PED,6,8,8PED
 OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Fig.128.1

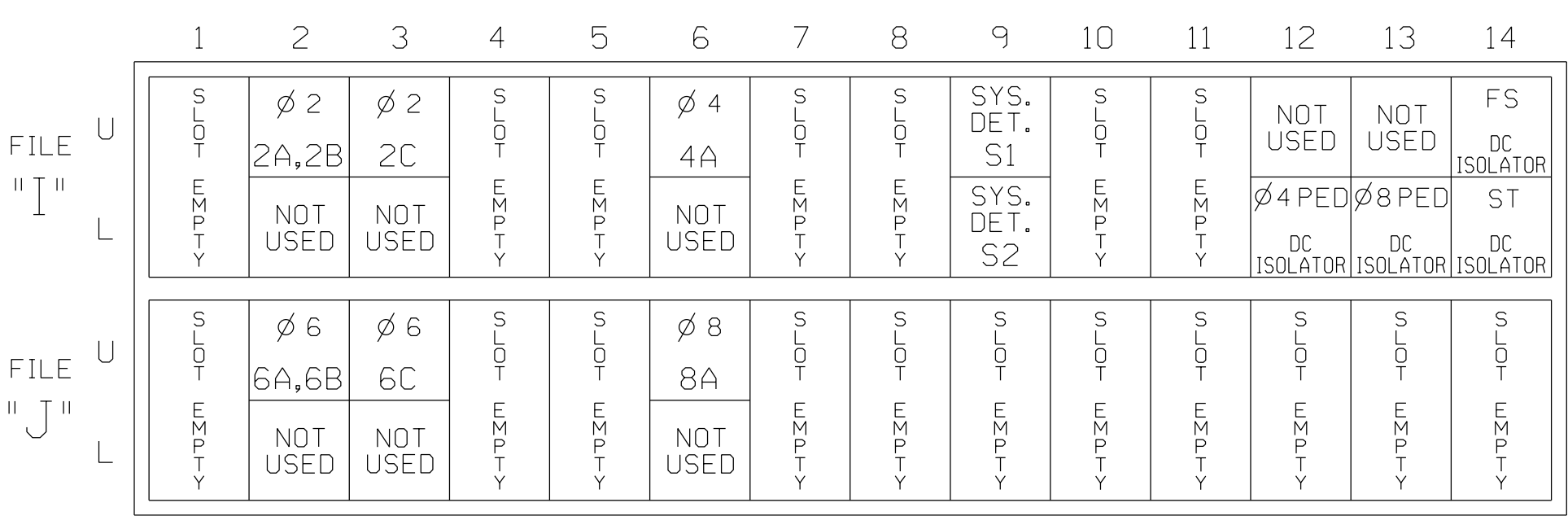
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41 P42	NU	61,62	NU	NU	81,82	P81 P82	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		
Hand icon						104					110							
Person icon						106					112							

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



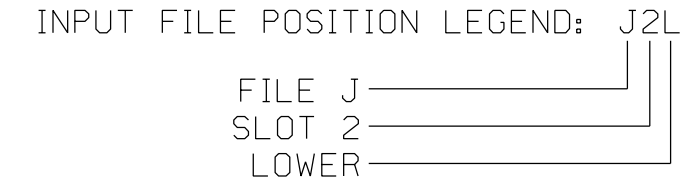
EX. : 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	DETECTOR TYPE
2A, 2B	TB2-5,6	I2U	39	2	2	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		G
4A	TB4-9,10	I6U	41	4	4	YES		5		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A, 6B	TB3-5,6	J2U	40	6	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		G
8A	TB5-9,10	J6U	42	8	8	YES		5		S
PED PUSH BUTTONS										
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

NOTE:
 INSTALL DC ISOLATORS
 IN INPUT FILE SLOTS
 I12 AND I13.

* System detector only. Remove any assigned vehicle phase.



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: 07-1612
 DESIGNED: December 2017
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	US 70 (S. Church Street) at Coachlight Trail/ Fieldstone Drive		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
	Division 7 PLAN DATE: December 2017 PREPARED BY: PL Alexander	Alamance County REVIEWED BY: MB Toth REVIEWED BY:		Burlington DATE:
REVISIONS INIT. DATE	REVISIONS INIT. DATE	REVISIONS INIT. DATE	DATE: 6/9/2018 Signature: Pamela Alexander DATE:

PHASING DIAGRAM

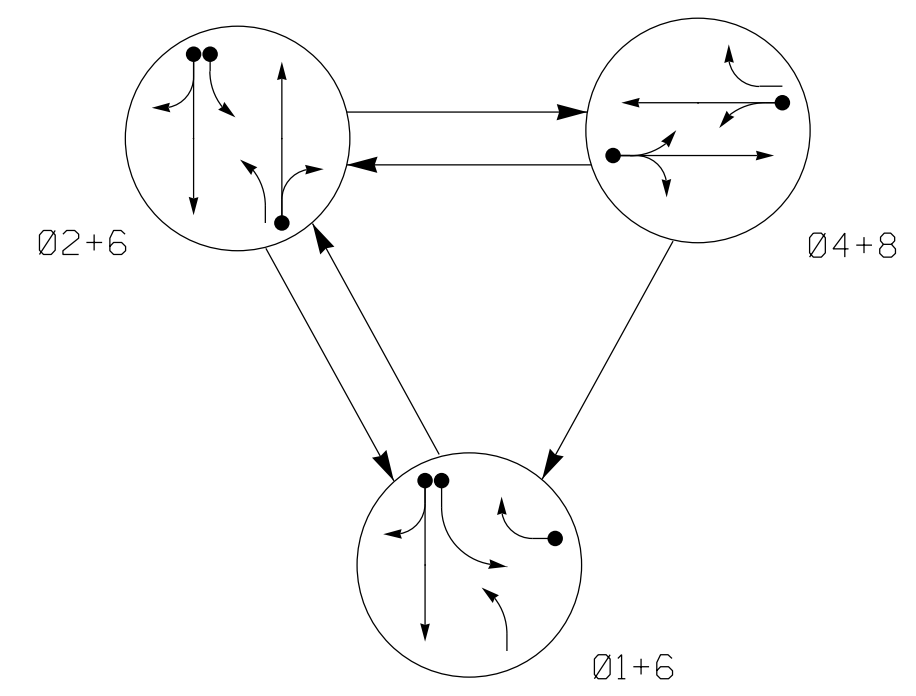


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 4 + 8	FLASH
11	←	←	←	←
21	←	←	←	←
22, 23	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y
81	R	R	G	R
82	←	R	G	R

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	-	-	S	-	X
1B	6X60	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
4A	6X60	+4	2-4-2	-	4	Yes	-	5	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X60	+10	2-4-2	-	8	Yes	-	3	-	S	-	X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

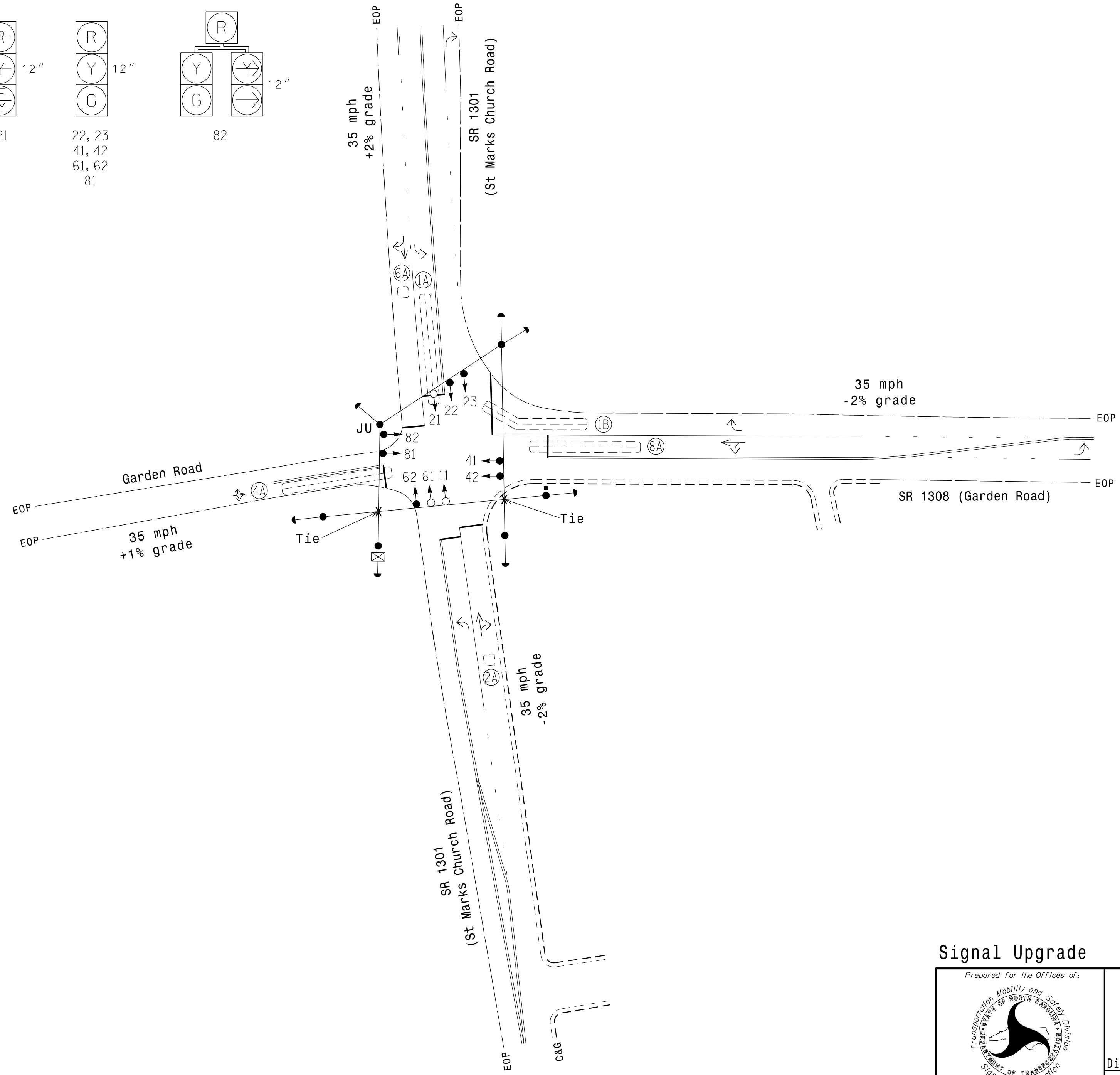
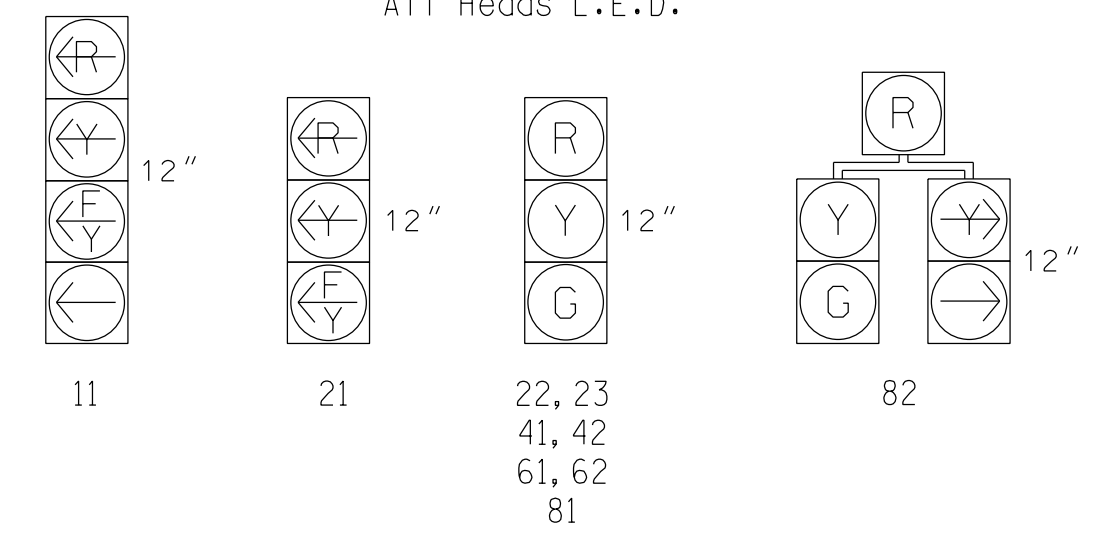
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal heads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

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	10	7	10	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0	2.0
Max I *	45	45	35	45	35
Yellow	3.0	4.0	3.8	4.0	4.0
Red Clear	1.6	1.7	1.0	1.7	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	-	-	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.

LEGEND

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

Signal Upgrade

Prepared for the Offices of:

SR 1301 (St. Marks Church Road) at SR 1308 (Garden Road)

Division 7 Alamance County Burlington

PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion

PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

SCALE: 1"=40'

REVISIONS: INIT. DATE

DATE: 6/7/2018

SIGNATURE: Pamela Alexander

SIC. INVENTORY NO. 07-1616

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

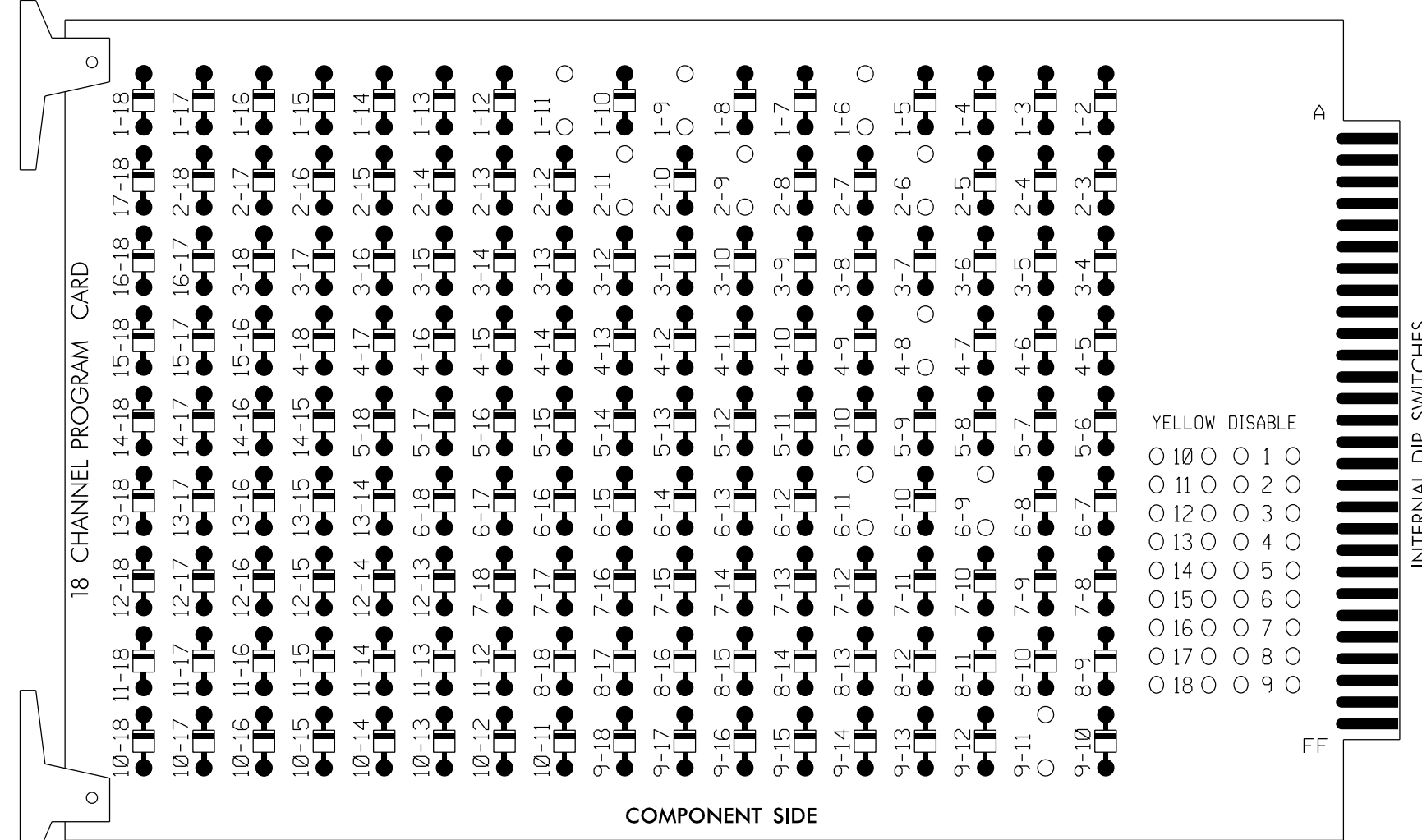
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBES #F-0326

07-JUN-2018 11:15 C:\Users\patt\OneDrive\Documents\Curr\100006469 U-6015 B-C Sig Sys\Task 05_11_Signal\asig07-1616.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

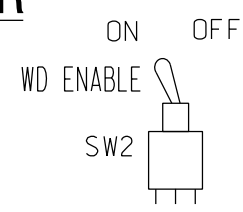
REMOVE DIODE JUMPERS I-6, I-9, I-II, 2-6, 2-9, 2-II, 4-8, 6-9, 6-II and 9-II



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 phases 2 and 6 for Startup in 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,S11,AUX S1,AUX S4
 PHASES USED.....1,2,4,6,8
 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.129.1

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	DLC	DLD	SPARE
SIGNAL HEAD NO.	11*	82	22,23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	11*	NU	NU	21*	NU
RED	*	128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121				A114	
YELLOW ARROW		126											A122				A115	
FLASHING YELLOW ARROW													A123				A116	
GREEN ARROW	127	127																

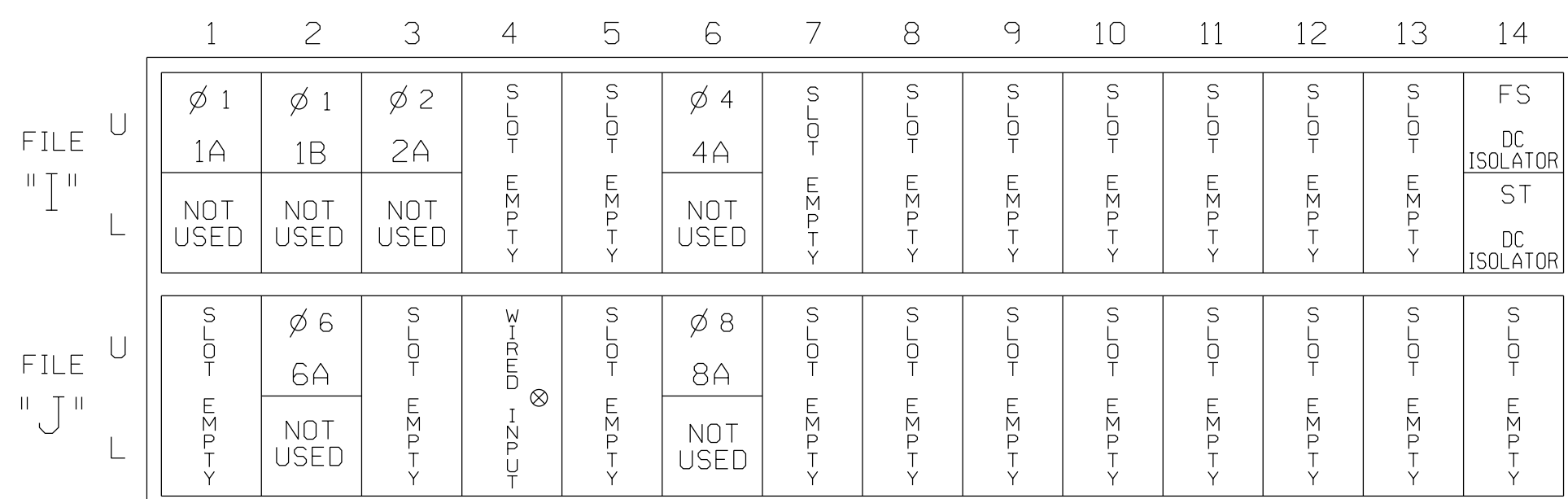
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

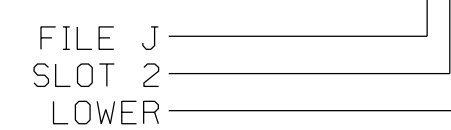
⊗ Wired Input - Do not populate slot with detector card

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	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		5		S
6A	TB3-5,6	J2U	40	6	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S

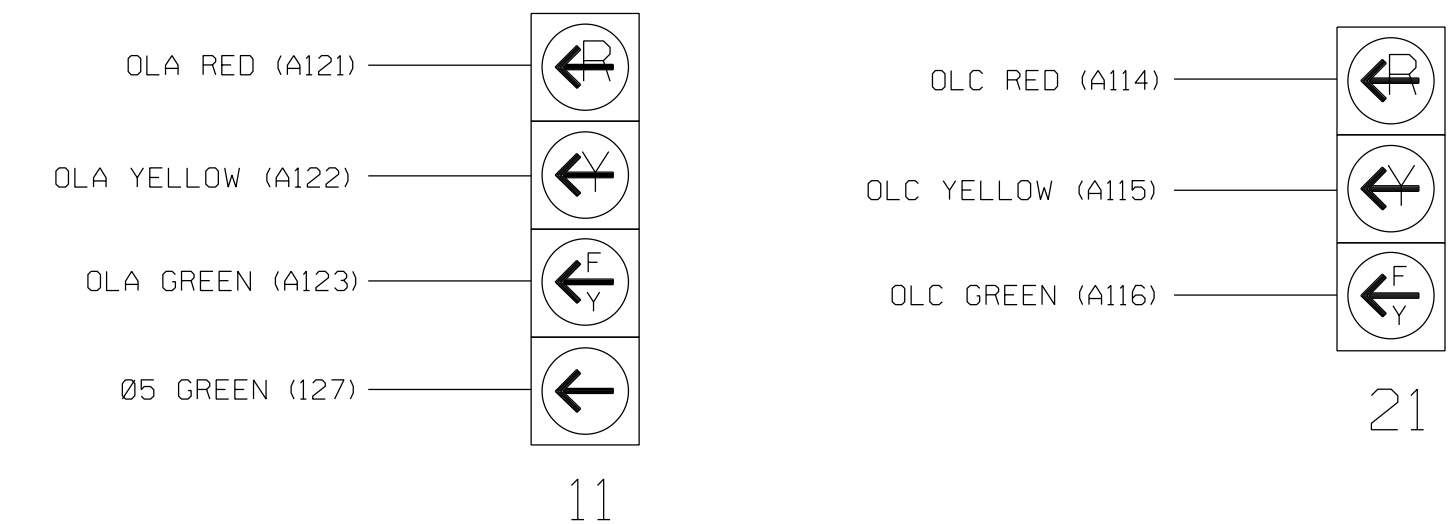
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

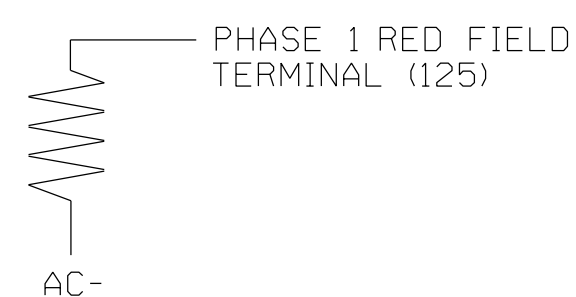


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1616
 DESIGNED: December 2017
 SEALED: 6/7/2018
 REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail - Sheet 1 of 2

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

SR 1301
 (St. Marks Church Road)
 at
 SR 1308 (Garden Road)
 Division 7 Alamance County Burlington
 PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion
 PREPARED BY: JA Wiles REVIEWED BY: PL Alexander

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 PAMELA L. ALEXANDER
 SEAL 023489
 DATE: 6/9/2018
 DATE: _____
 DATE: _____

09-JUN-2018 14:15
 ***sctk ins-commproj\elect\MSL\AMT\transportation\tr\off\c\cur\k100056469 U=6015 B=C S1g Sys\Task 05-11-Stgna\005\gn\w\tr\ng\07-1616e.dgn
 ALEX3361 AT LUS340619

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```

TMG VEH OVLP...[A] TYPE: .....PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 1
PERMISSIVE PHASE (OPPOSING TURN)... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

Toggle Twice

OVERLAP C

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

```

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

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

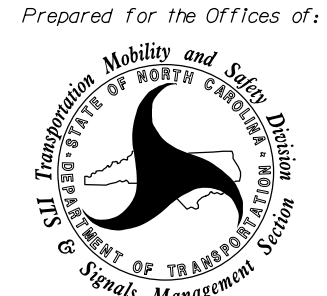
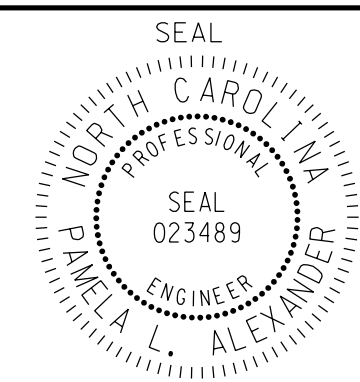
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1616
 DESIGNED: December 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 14:15
 ***shtk ins-commproj\project\MUSL\AMT\transportation\trf\trf\k\cur\k100056469 U-6015 B-C 51g SysTask 05-11-Stgna\k\0056469\tr\trng\07-1616E.dgn
 ALEX3361 AT LUS240619

Electrical Detail - Sheet 2 of 2

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

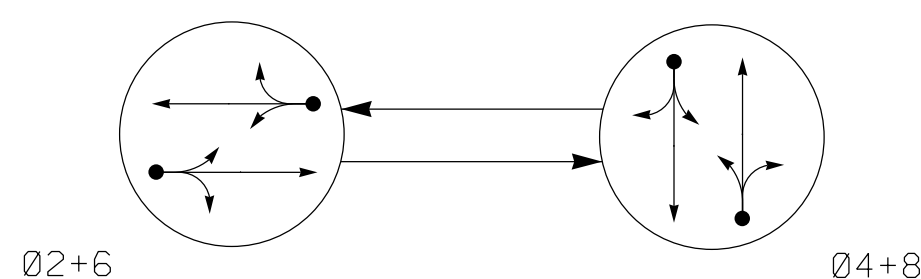
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	SR 1301 (St. Marks Church Road) at SR 1308 (Garden Road) Division 7 Alamance County Burlington	SEAL 					
PLAN DATE: December 2017 REVIEWED BY: AM Encarnacion PREPARED BY: JA Wiles REVIEWED BY: PL Alexander		Date Signed by: <i>Pamela Alexander</i> 6/9/2018 DATE: _____ SIG. INVENTORY NO. 07-1616					
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			REVISIONS	INIT.	DATE		
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

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

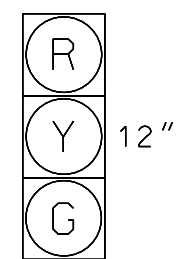
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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

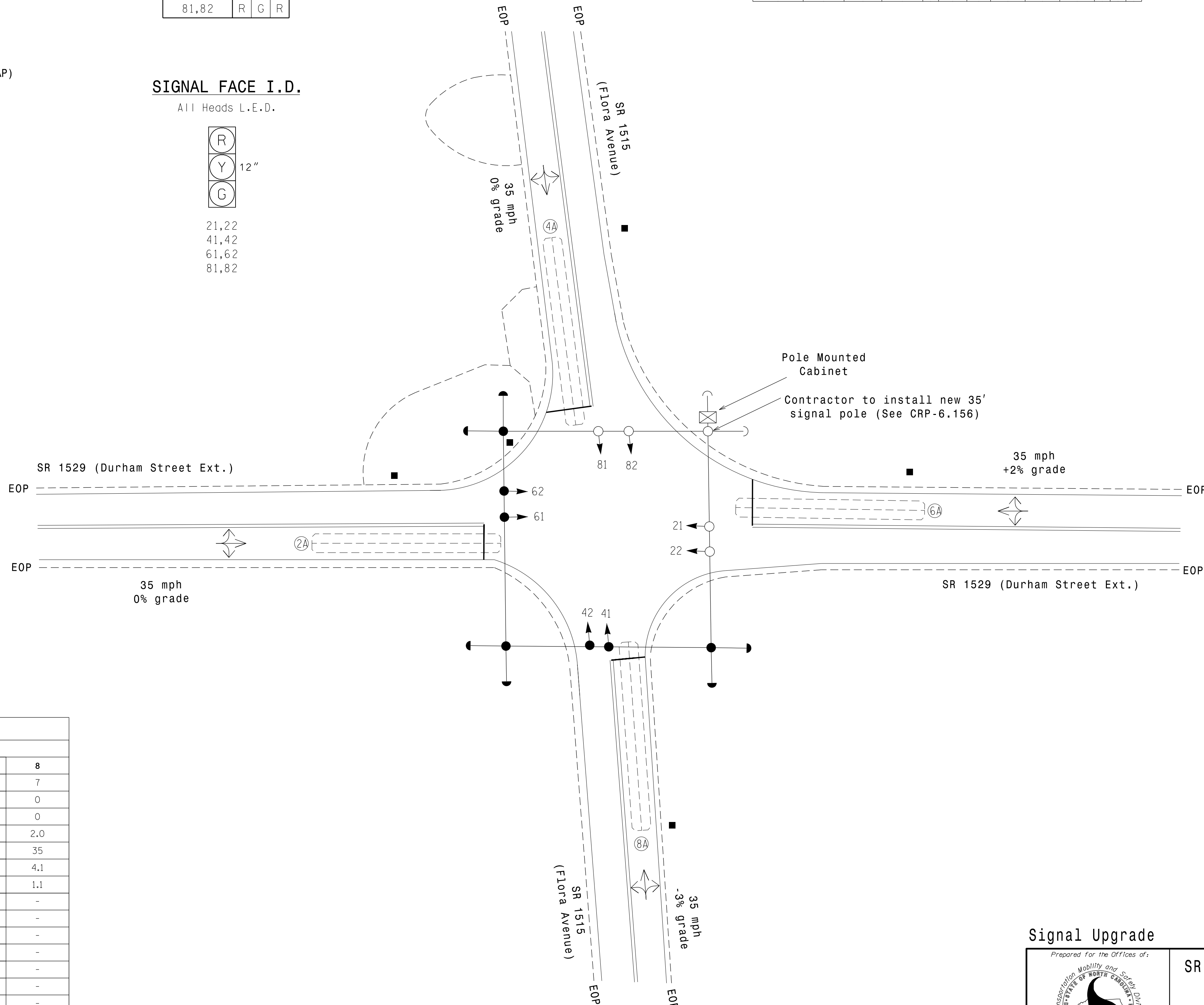
ASC/3 DETECTOR INSTALLATION CHART

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

2 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

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



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	7	7	7	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	2.0	2.0	2.0
Max 1 *	35	35	35	35
Yellow	3.8	3.8	3.7	4.1
Red Clear	1.0	1.0	1.2	1.1
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	-	-	-	-
Dual Entry	X	X	X	X
Simultaneous Gap	X	X	X	X

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

LEGEND

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

Signal Upgrade

Prepared For the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1529 (Durham Street Ext.) at SR 1515 (Flora Avenue)

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

REVISIONS: INIT. DATE

SCALE: 0 20
1"=20'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

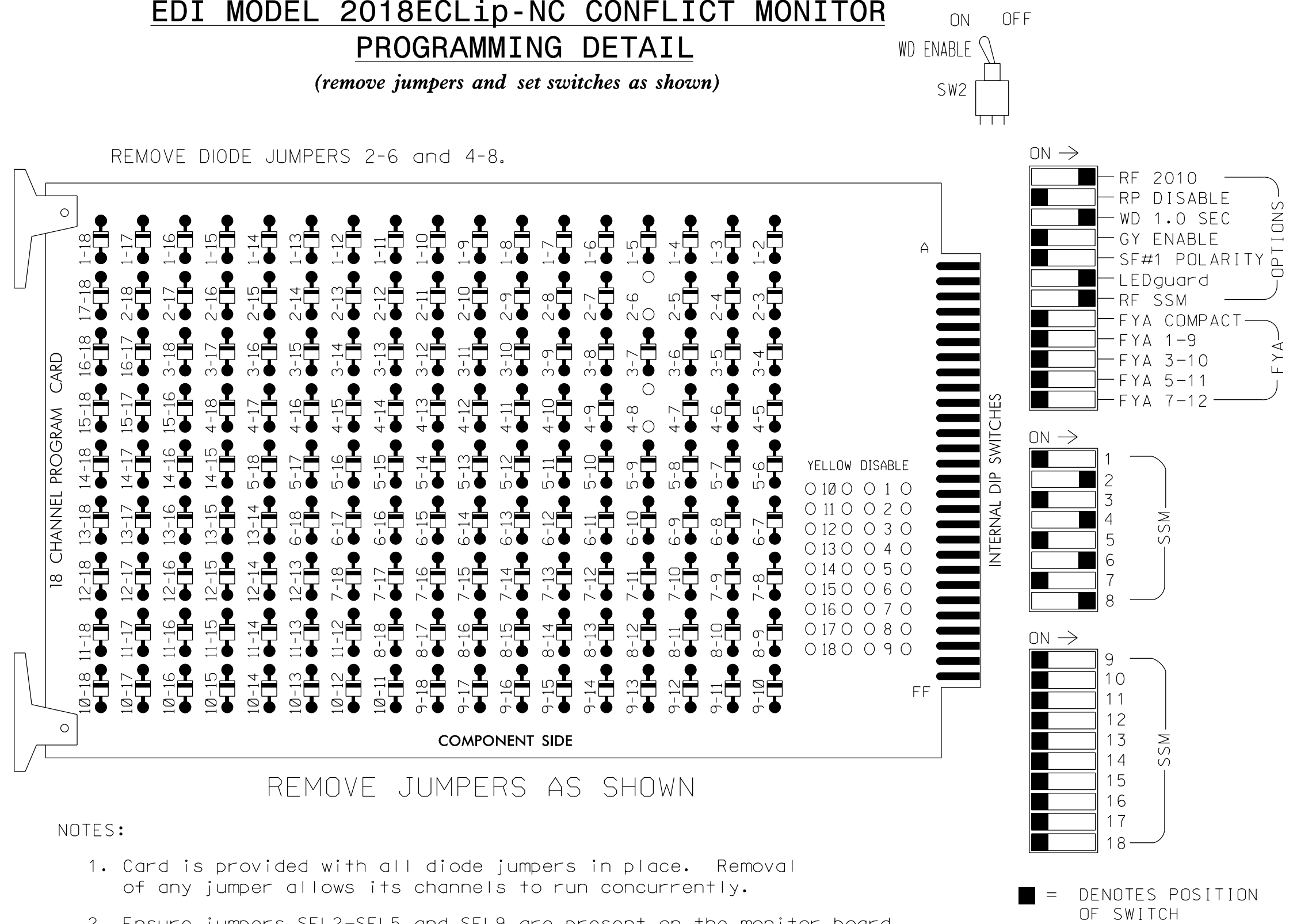
6/7/2018
 DATE
 SIG. INVENTORY NO. 07-1634

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

07-JUN-2018 11:15
 0:\Programs\pof\atkins\staff\c\curt\100056469 U-6015 B-G Sig Sys*Task 05_11_Signals*Design*07-1634.dgn
 ALEX361 AT LUS340649

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

EQUIPMENT INFORMATION

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

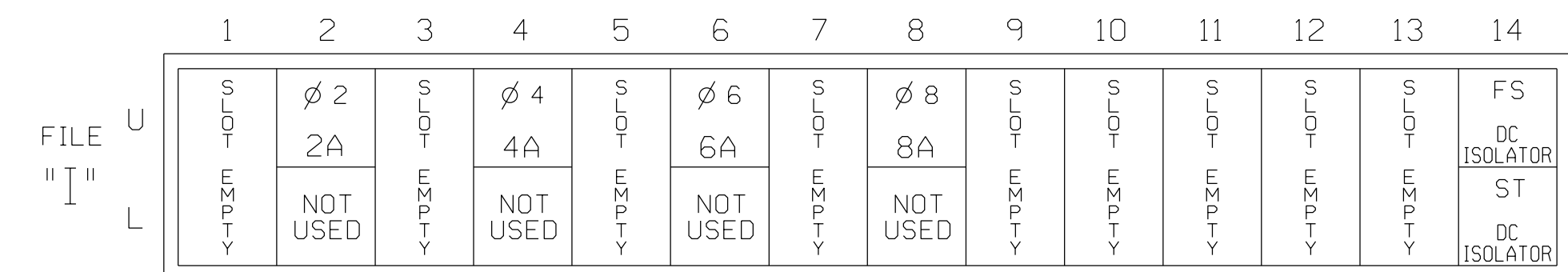
SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



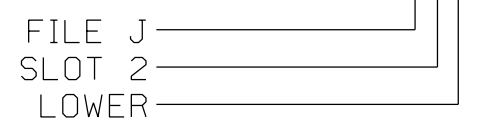
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB21-3,4	12U	39	2	2	YES		5		S
4A	TB21-7,8	14U	41	4	4	YES		5		S
6A	TB21-11,12	16U	40	6	6	YES		5		S
8A	TB22-1,2	18U	42	8	8	YES		5		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1634
 DESIGNED: December 2017
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1529 (Durham Street Ext.) at SR 1515 (Flora Avenue)	
Division 7	Alamance County Burlington
PLAN DATE: December 2017	REVIEWED BY: AM Encarnacion
PREPARED BY: NA Ptak	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

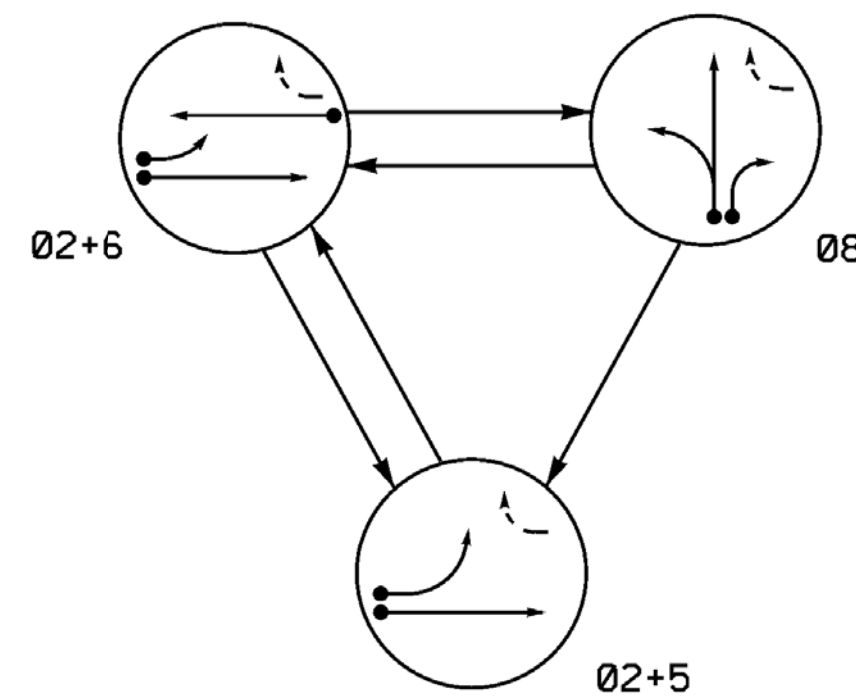
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DATE: 6/9/2018

SIG. INVENTORY NO. 07-1634

PHASING DIAGRAM



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

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP NEW CARD
2A*	NA	300	NA	-	2	Yes	-	-	X	N	X
5A	6x60	0	2-4-2	-	5	Yes	-	15	-	S	X
6A	6x6	300	EXIST.	-	6	Yes	-	-	X	N	X
8A	6x60	0	2-4-2	-	8	Yes	-	-	-	S	X
8B	6x60	+5	2-4-2	-	8	Yes	-	10	-	S	X
S1	6x6	+150	4	X	-	No	-	-	-	N	X

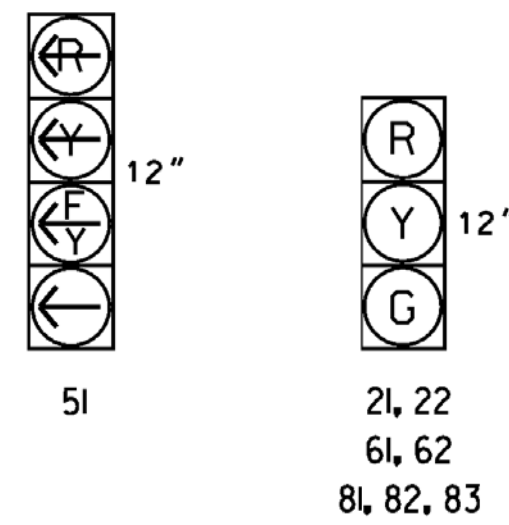
3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

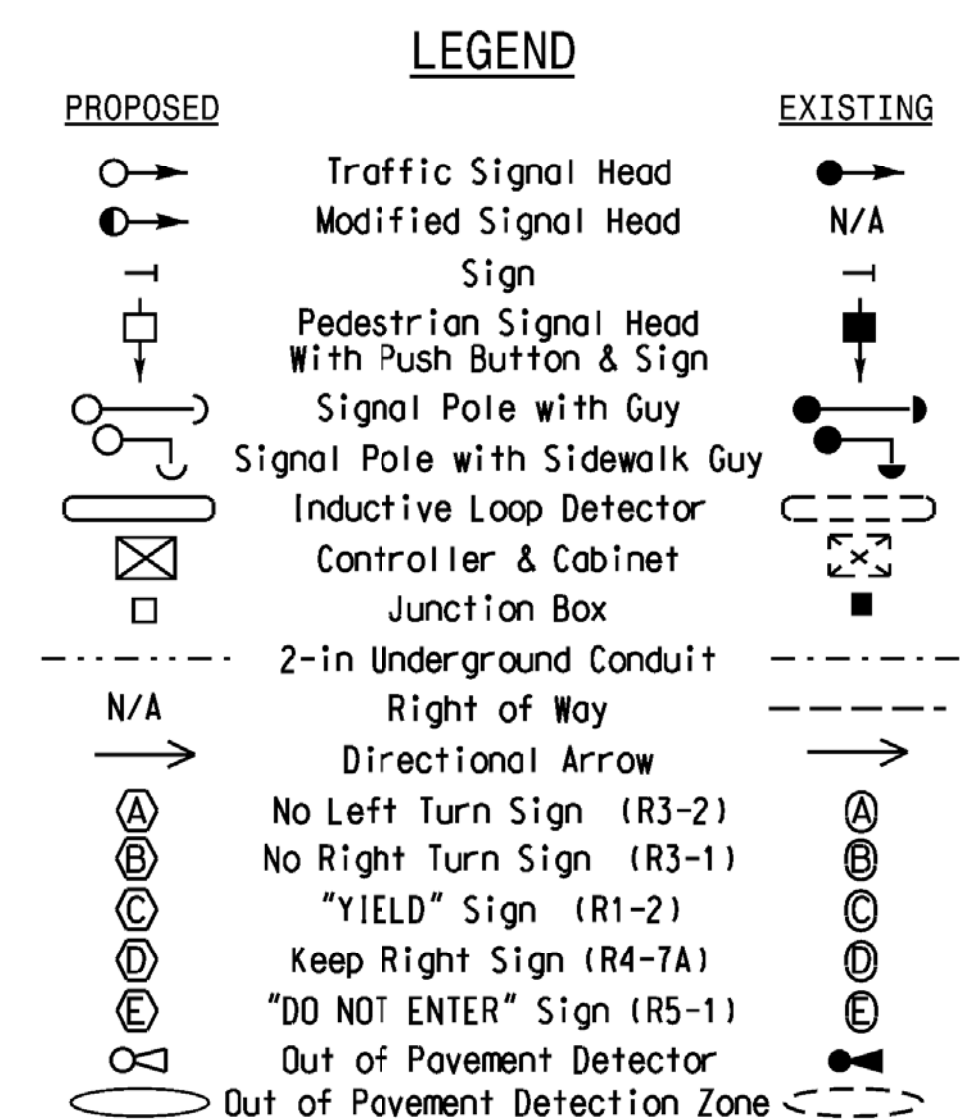
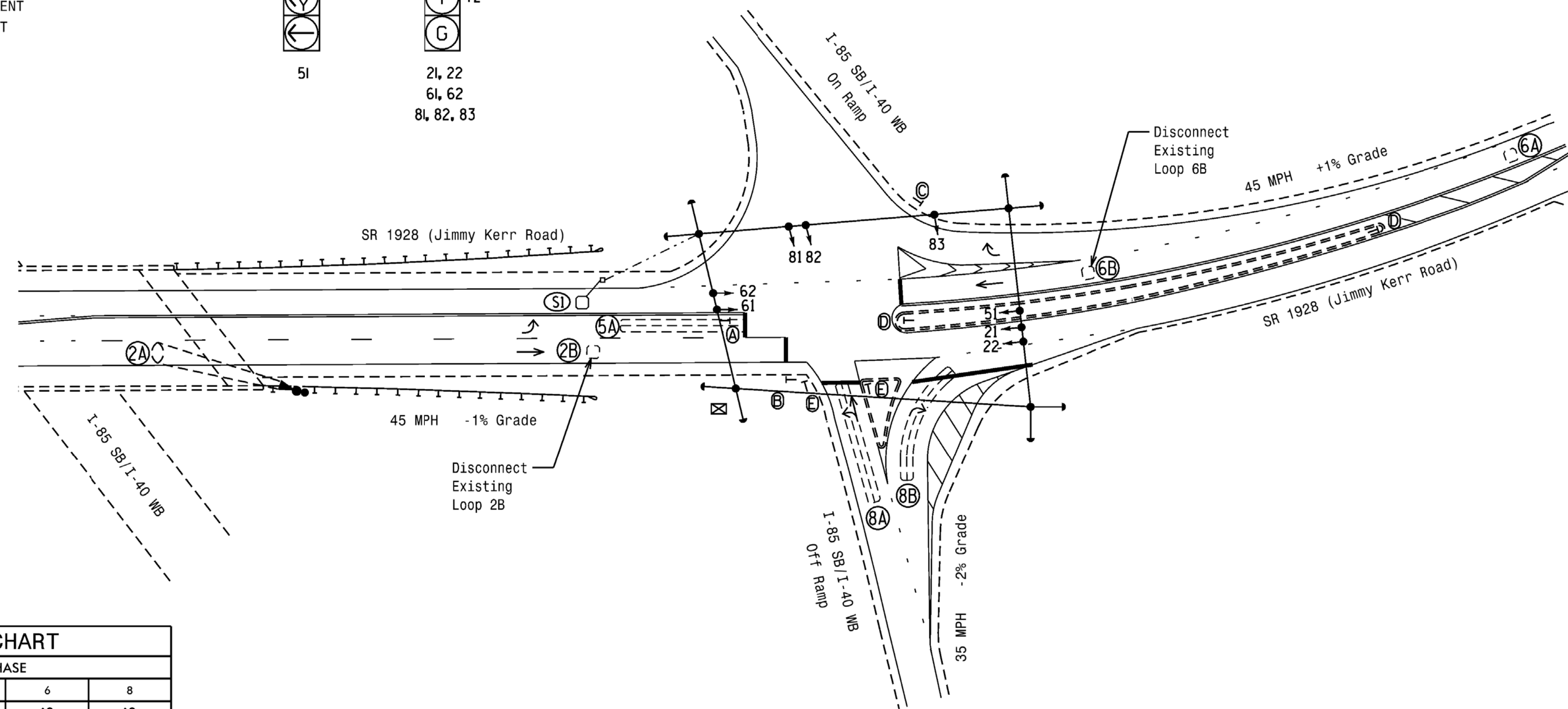
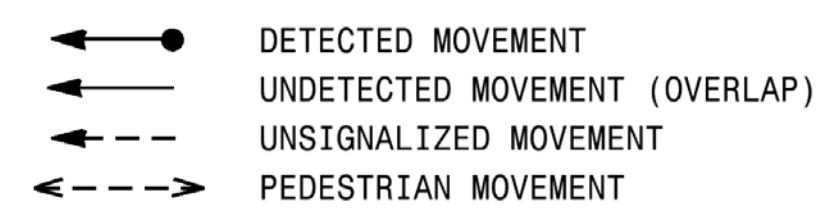
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence 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.

SIGNAL FACE I.D.

All Heads L.E.D.



PHASING DIAGRAM DETECTION LEGEND



FEATURE	PHASE			
	2	5	6	8
Min Green *	12	10	12	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	6.0	4.0
Max 1 *	90	30	90	50
Yellow	4.6	3.0	4.6	4.0
Red Clear	1.5	1.8	1.5	1.1
Actuations 34 Add *	0	-	0	-
Seconds /Actuation *	2.5	-	2.5	-
Max Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

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

SR 1928 (Jimmy Kerr Road) at I-85 SB/I-40 WB Ramps

Division 7 Alamance County Graham

PLANNED BY: December 2017 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS

INIT. DATE

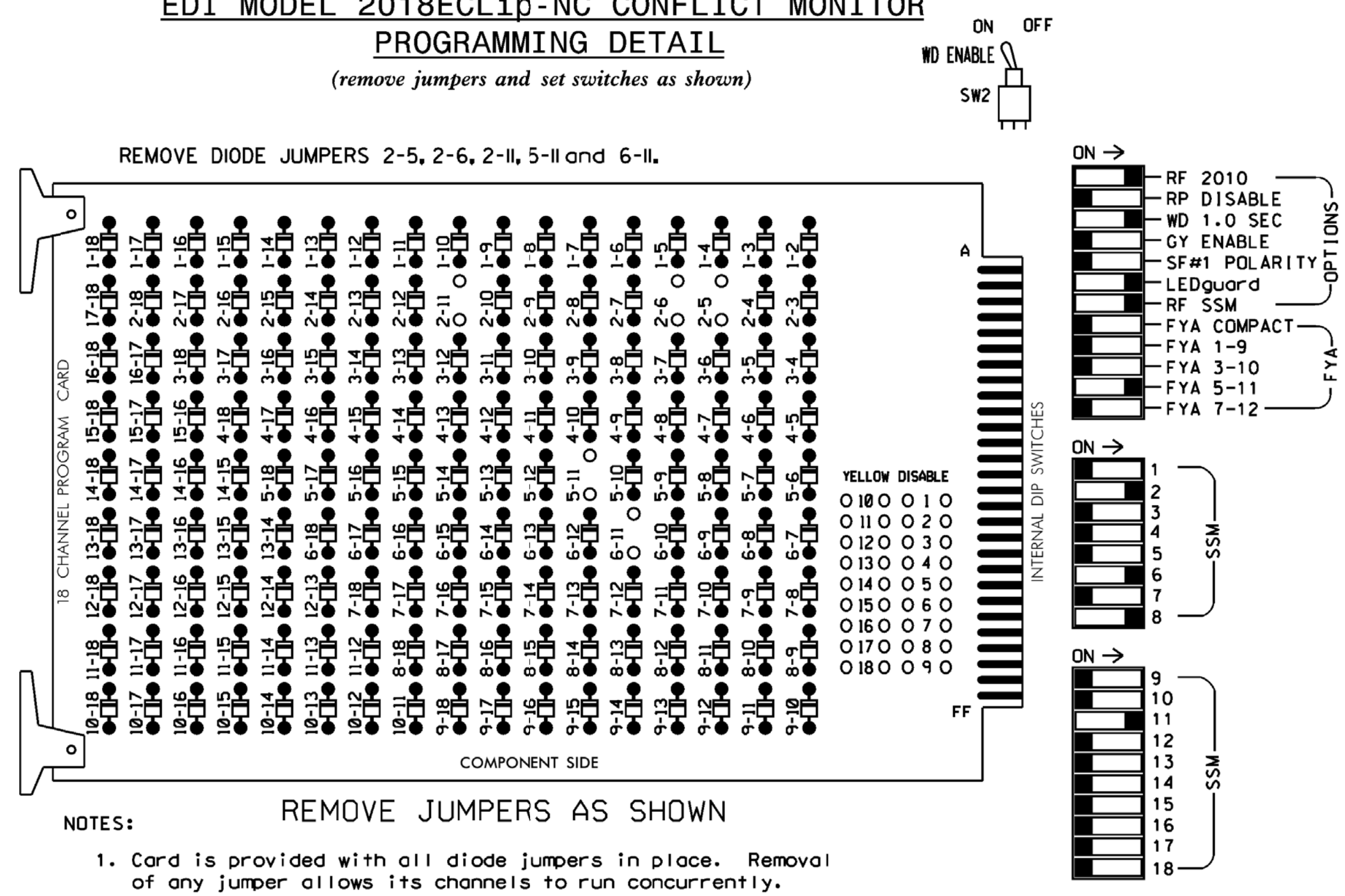
6/13/2018

SIG. INVENTORY NO. 07-1650

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

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	PED	3	4	PED	5	6	PED	7	8	PED	OLA	DLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51*	61,62	NU	NU	81,82,83	NU	NU	NU	NU	51*	NU	NU	
RED		128						134			107								
YELLOW		129					*	135			108								
GREEN		130						136			109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW							133												

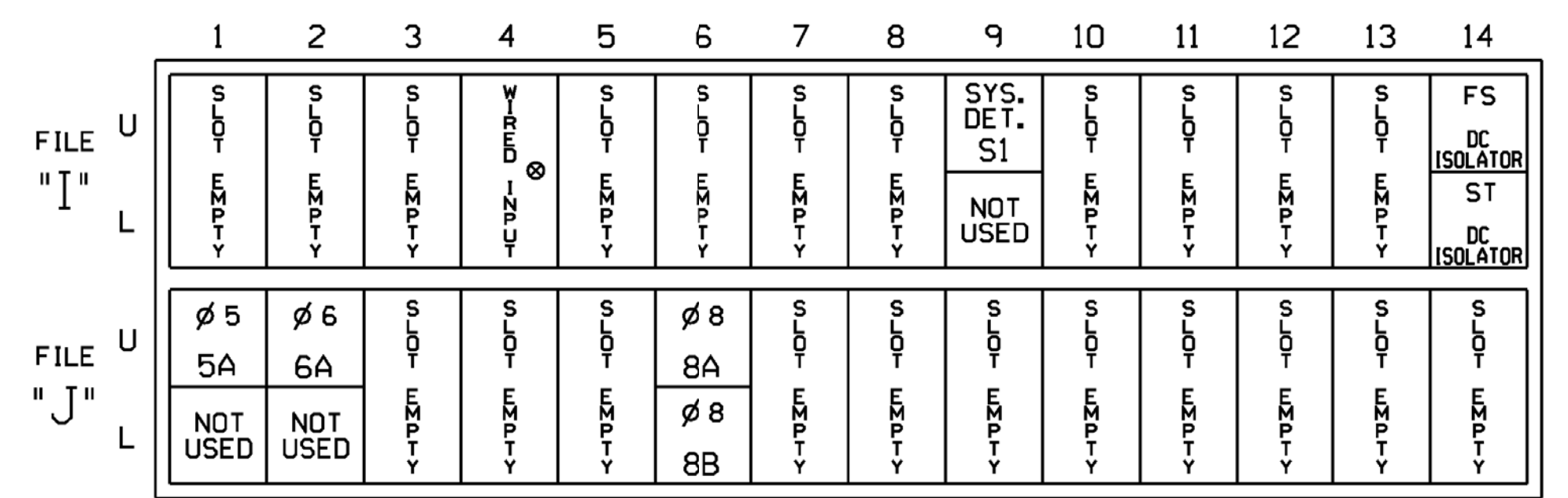
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)

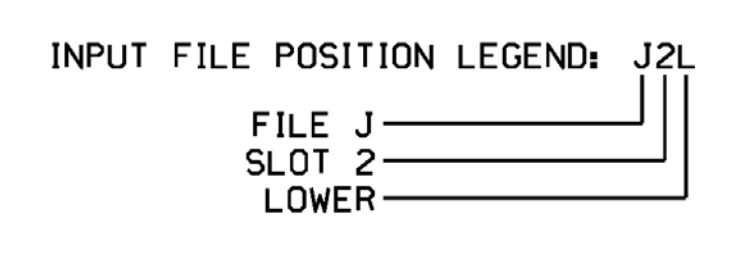


EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 * Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

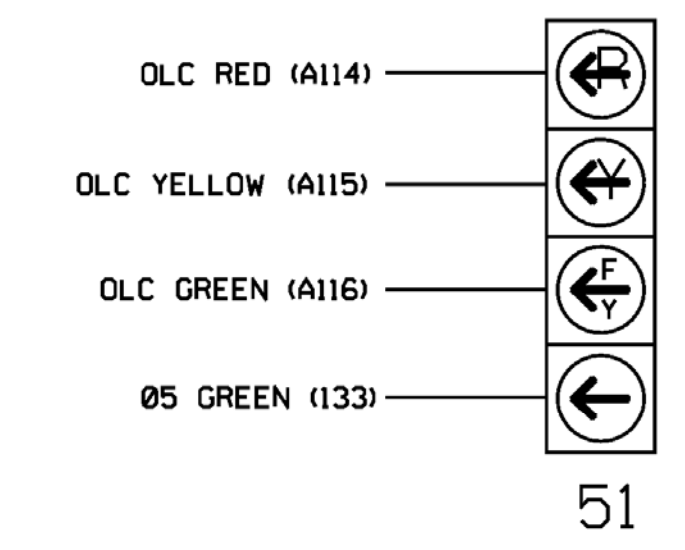
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
	-	14U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES				S
* S1	TB6-9,10	19U	60	11	SYS	NO				N

¹Add jumper from J1-W to 14-W, on rear of input file.
 * System detector only. Remove any assigned vehicle phase.



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



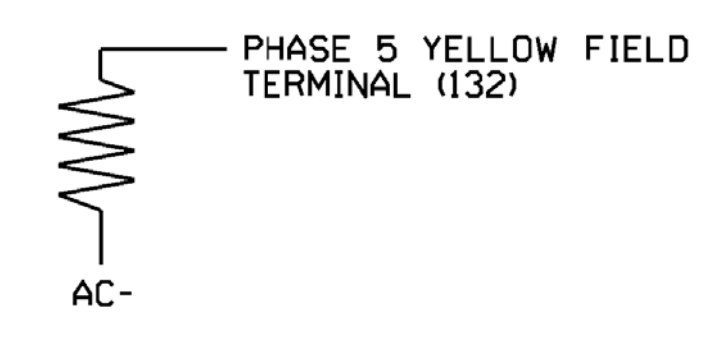
SPECIAL DETECTOR NOTE

For detection zone 2A, install a microwave detection system for vehicular detection. Perform installation according to manufacturer's directions and NCDOT-approved location to accomplish the detection scheme shown on the Signal Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**
 TOGGLE TWICE
 OVERLAP C
 Select TMG VEH OVLP [C] and 'PPLT FYA'

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1650
 DESIGNED: December 2017
 SEALED: 6/13/2018
 REVISED: NA



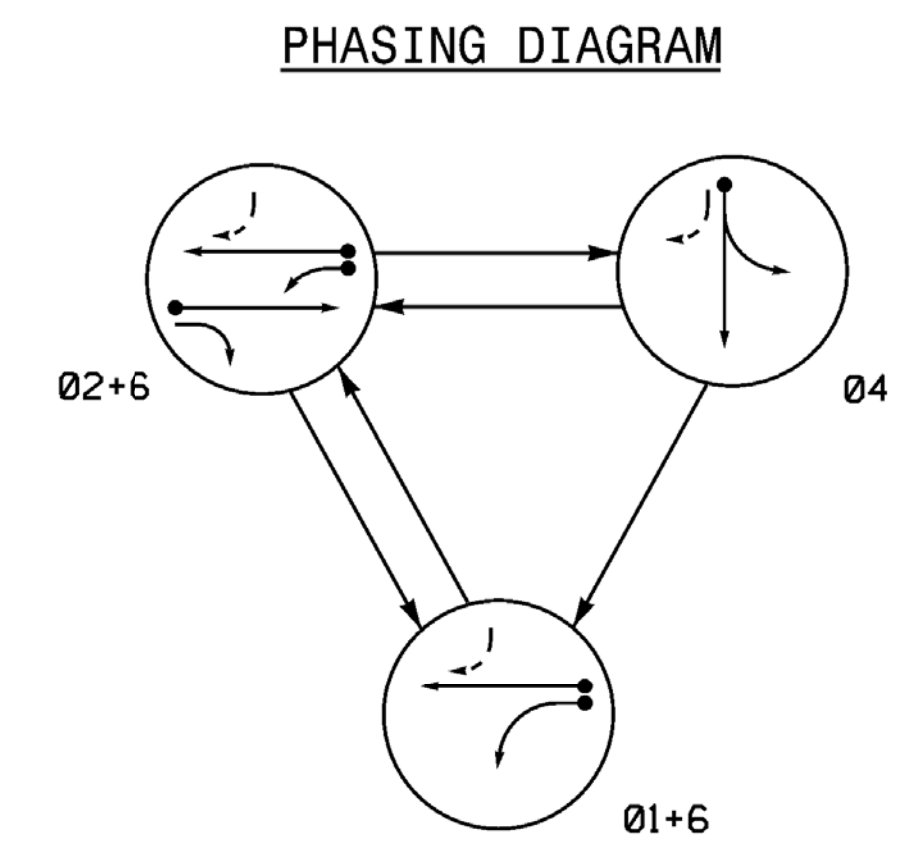
12 BROAD STREET
 ASHEVILLE, NORTH CAROLINA 28801
 (828) 254-2201
 FAX (828) 254-4562
 NC LIC. NO. C-1154

Electrical Detail

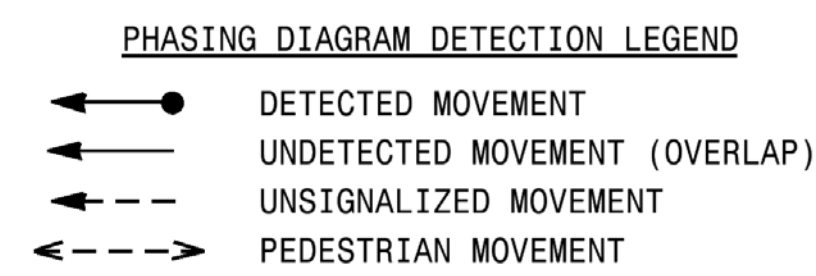
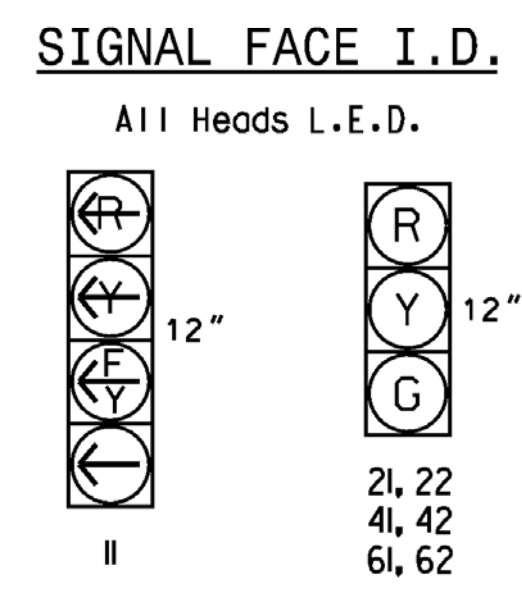
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Corner, NC 27529	SR 1928 (Jimmy Kerr Road) at I-85 SB/I-40 WB Ramps		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL James B. Voso 6/13/2018
	Division 7 PLAN DATE: December 2017 PREPARED BY: SE Greene	Alamance County REVIEWED BY: JB Voso REVIEWED BY:	

*****SYTIME*****
 *****DOWNS*****
 *****USER*****

3 Phase Fully Actuated (Burlington-Graham Signal System)



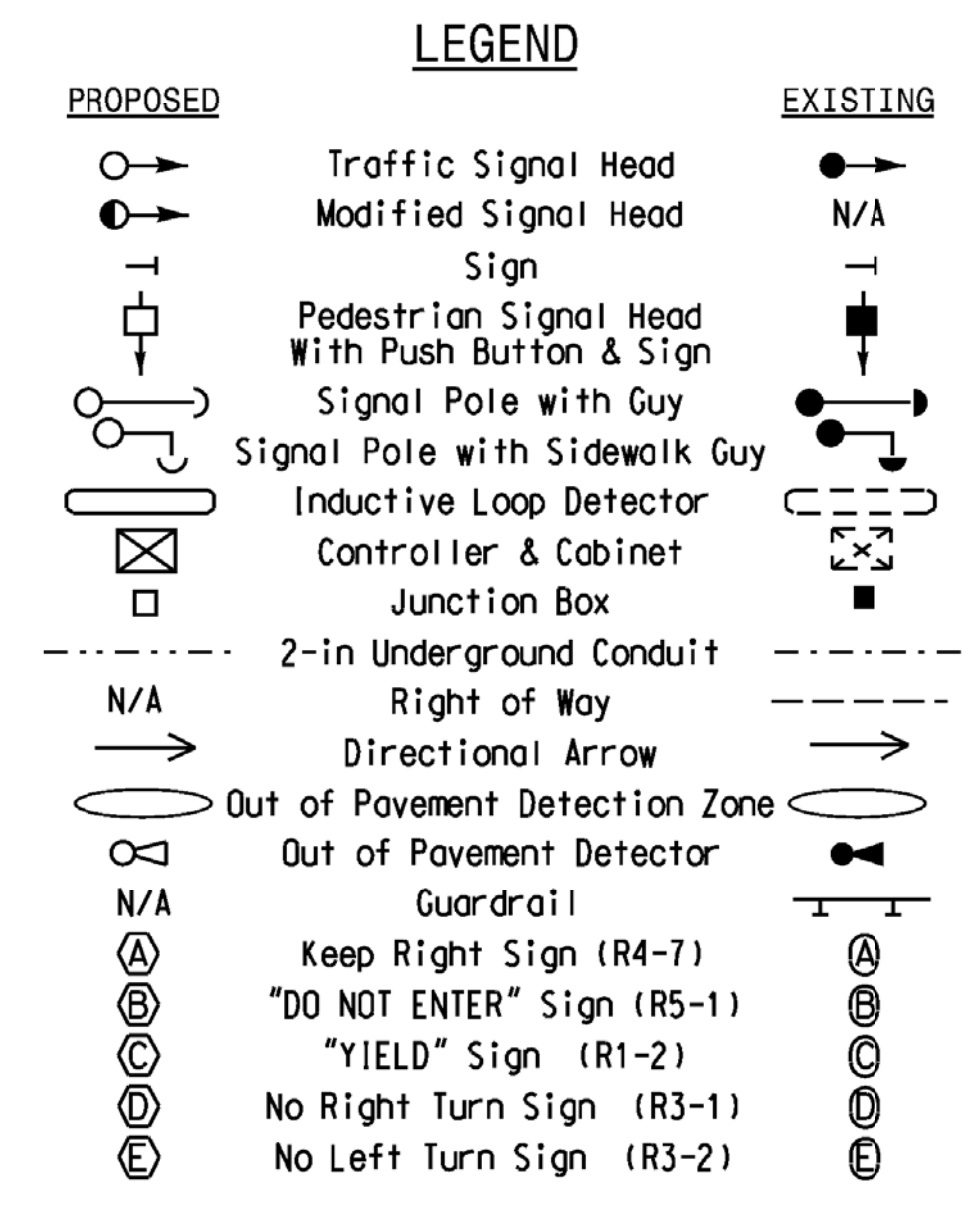
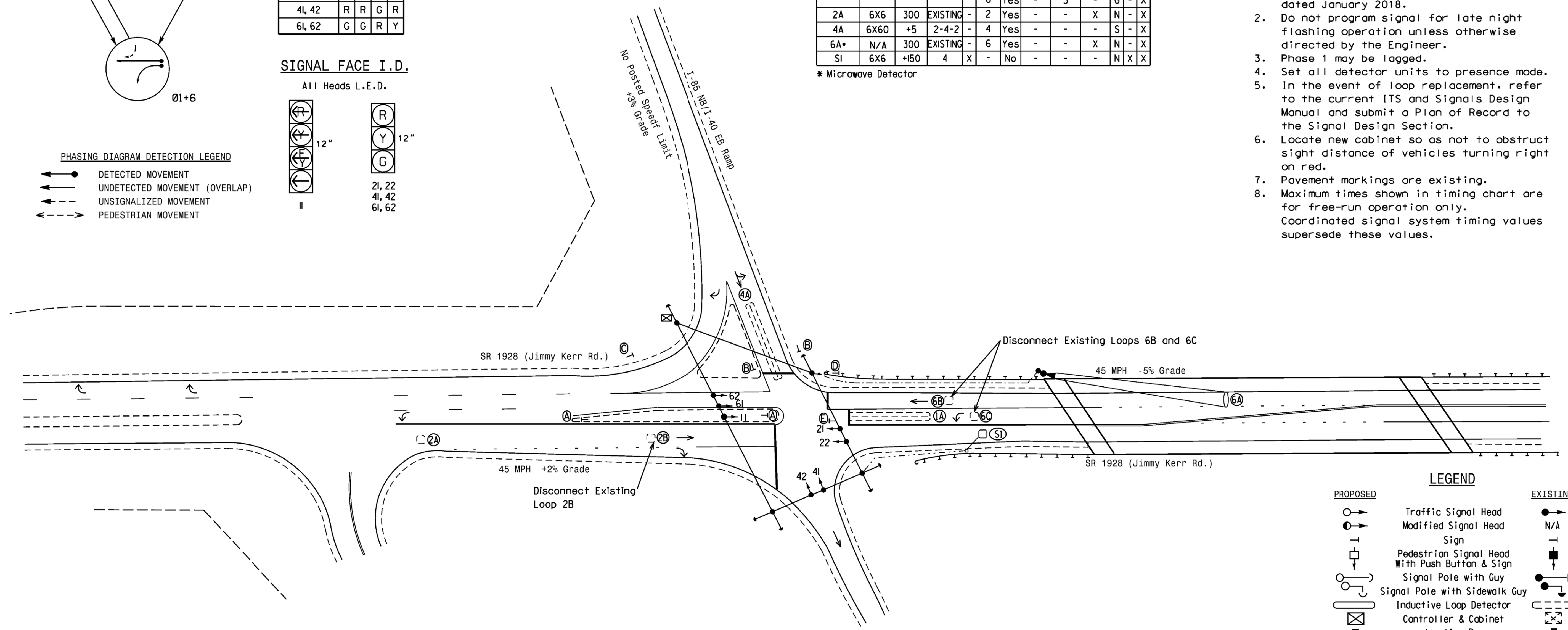
SIGNAL FACE	PHASE			
	01+6	02+6	04	FLASH
II	—	—	—	—
21, 22	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y



ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP / ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
IA	6X60	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	EXISTING	-	2	Yes	-	3	-	G	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
6A*	N/A	300	EXISTING	-	6	Yes	-	-	-	X	N	-
SI	6X6	+150	4	X	-	No	-	-	-	N	X	X

* Microwave Detector

- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
 - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
 - Phase 1 may be lagged.
 - 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			
	1	2	4	6
Min Green *	10	12	12	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	6.0	6.0	6.0
Max I *	30	90	50	90
Yellow	3.1	5.0	3.7	5.0
Red Clear	1.6	1.0	1.4	1.0
Actuations B4 Add *	-	0	-	0
Seconds / Actuation *	-	2.5	-	2.5
Max Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 1928 (Jimmy Kerr Road) at I-85 NB/I-40 EB Ramps

Division 7 Alamance County Graham

PLAN DATE: November 2017 REVIEWED BY: J. Voso

PREPARED BY: S. Homewood REVIEWED BY:

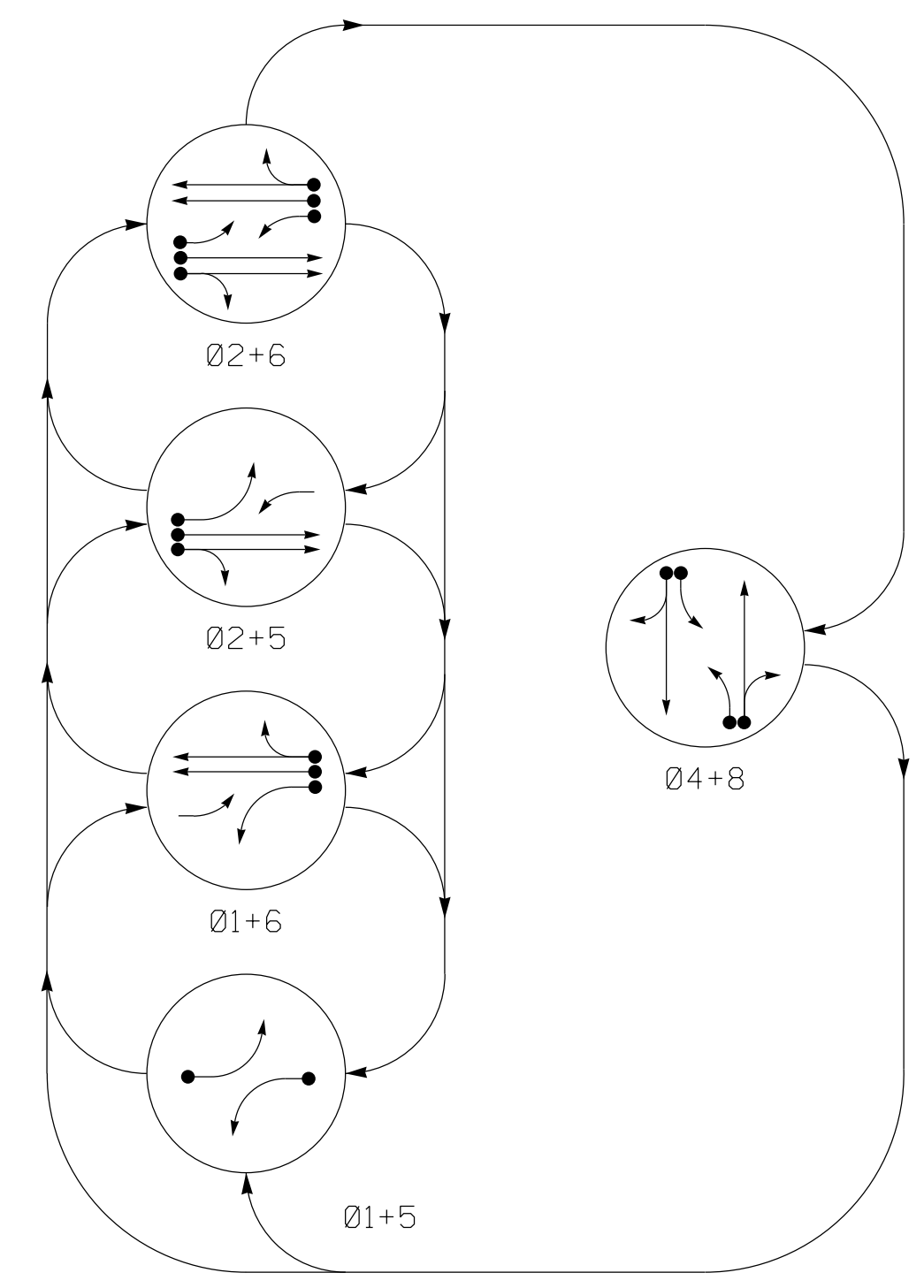
REVISIONS: _____ INIT. DATE

James Voso 6/13/2018
 SIGNATURE DATE

SIG. INVENTORY NO. 07-1651

*****SYSTEMS*****
 *****USER NAME *****

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

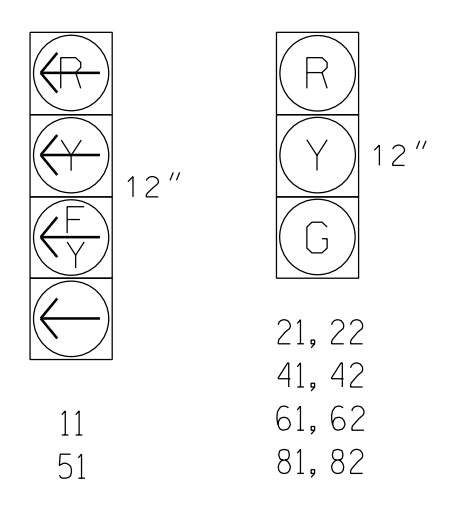
- ◄● DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UN SIGNALIZED MOVEMENT
- ◄ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE					FLASH
	01+5	01+6	02+5	02+6	04+8	
11	←	←	←	←	←	Y
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	←	←	←	←	Y
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.



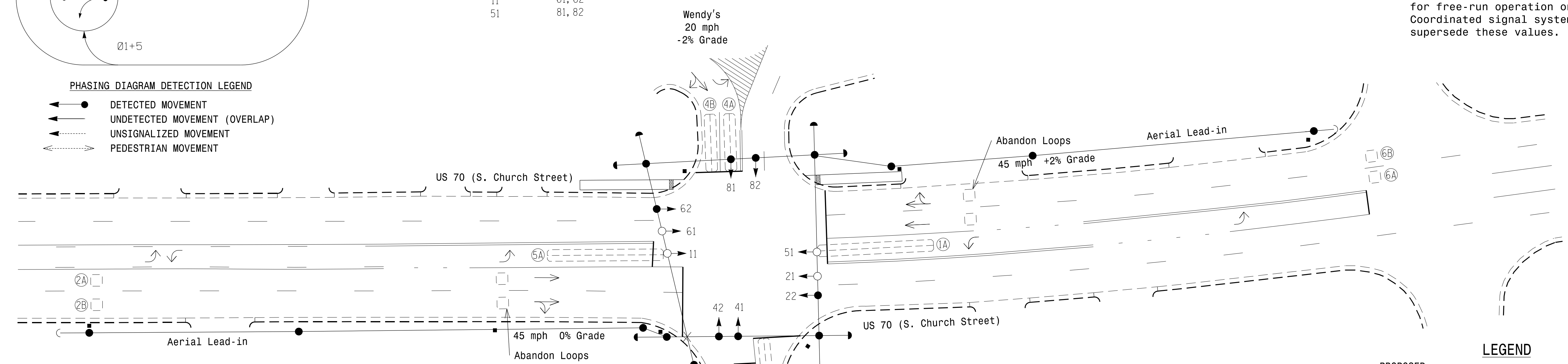
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
2A,2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
4A	6X30	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X30	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
					2	Yes	-	3	-	G	-	X
6A,6B	6X6	282	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X60	0	2-4-2	-	8	Yes	-	10	-	S	-	X

5 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

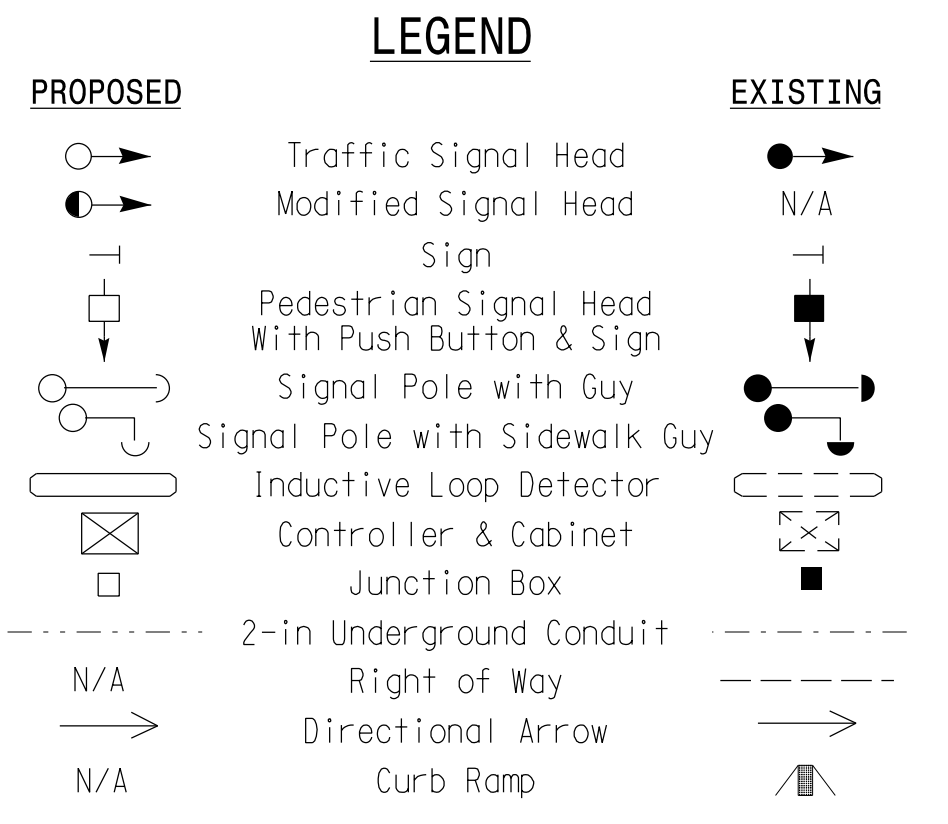
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 22 and 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.



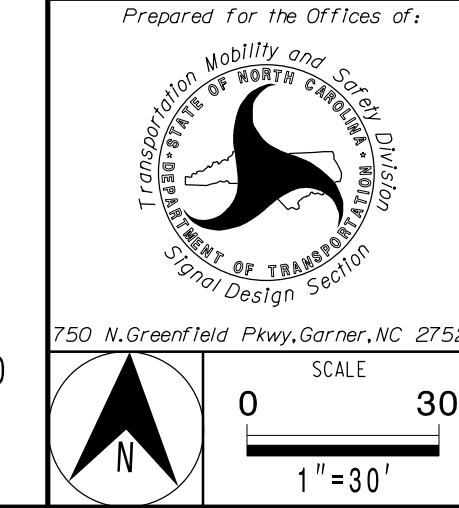
ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	8		
Min Green *	7	12	7	7	12	7		
Walk *	0	0	0	0	0	0		
Ped Clear	0	0	0	0	0	0		
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0		
Max 1 *	20	90	25	20	90	25		
Yellow	3.0	4.5	3.0	3.0	4.5	4.1		
Red Clear	2.3	1.0	2.8	2.3	1.0	1.6		
Actuations B4 Add *	-	0	-	-	0	-		
Seconds / Actuation *	-	2.0	-	-	2.0	-		
Max Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Locking Detector	-	X	-	-	X	-		
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-		
Dual Entry	-	-	X	-	-	X		
Simultaneous Gap	X	X	X	X	X	X		

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



Signal Upgrade



US 70 (S. Church Street) at Delaney Drive/ Wendy's Driveway	
Division 7	Alamance County Burlington
PLAN DATE: January 2018	REVIEWED BY: MB Toth
PREPARED BY: PL Alexander	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

STATE OF NORTH CAROLINA

PROFESIONAL ENGINEER

PAAMELA L. ALEXANDER

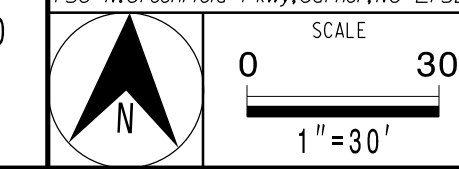
023489

6/7/2018

DATE

SIG. INVENTORY NO. 07-1653

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

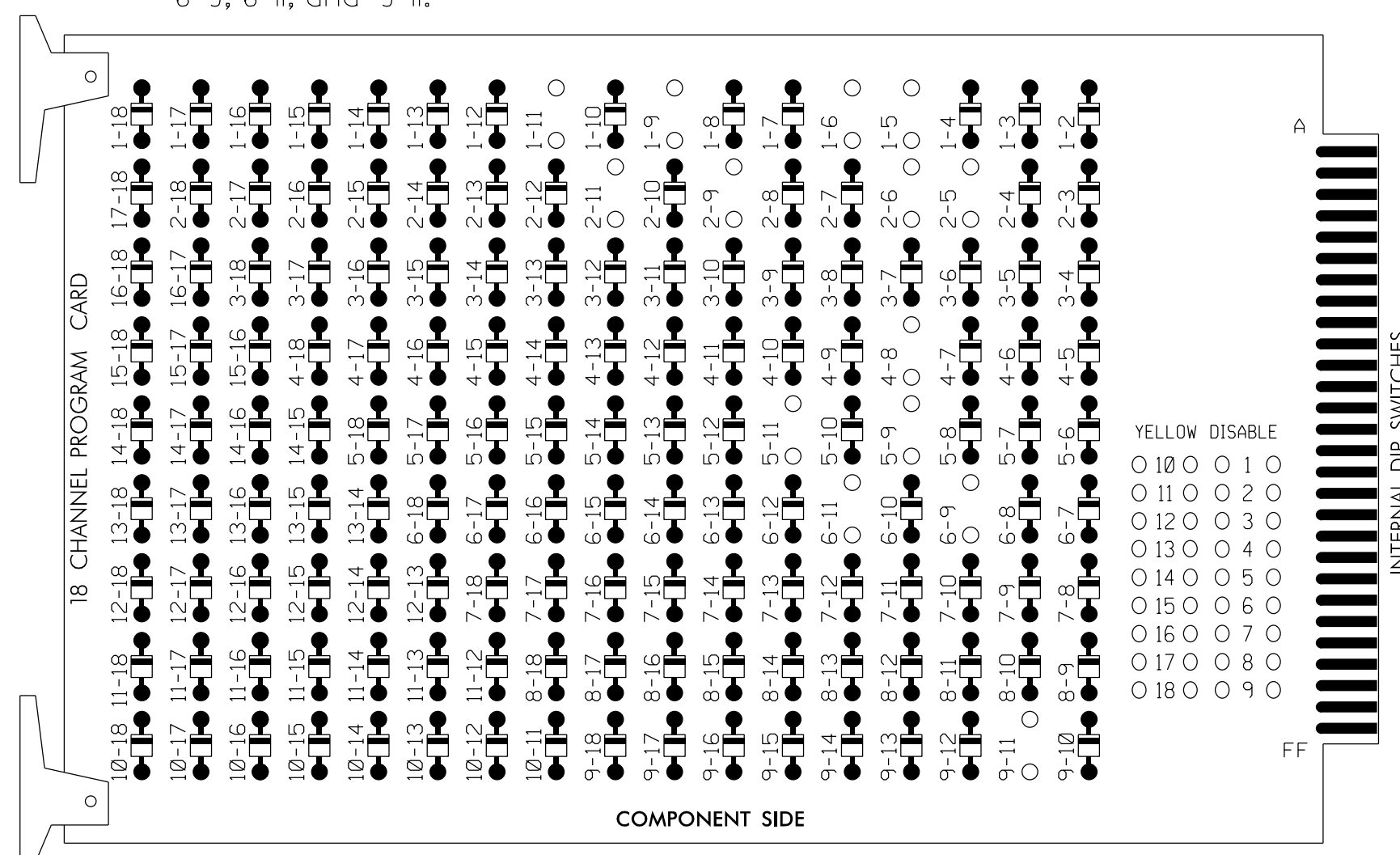


07-JUN-2018 11:15 ***SIG-TPLS-COM-PROJECTS\BURLA\Transportation\Traffic\Cur\U-6015-B-0-Sig\Task_05_11_15\Signal\sig05as\gn07-1653.dgn ALEX05069

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

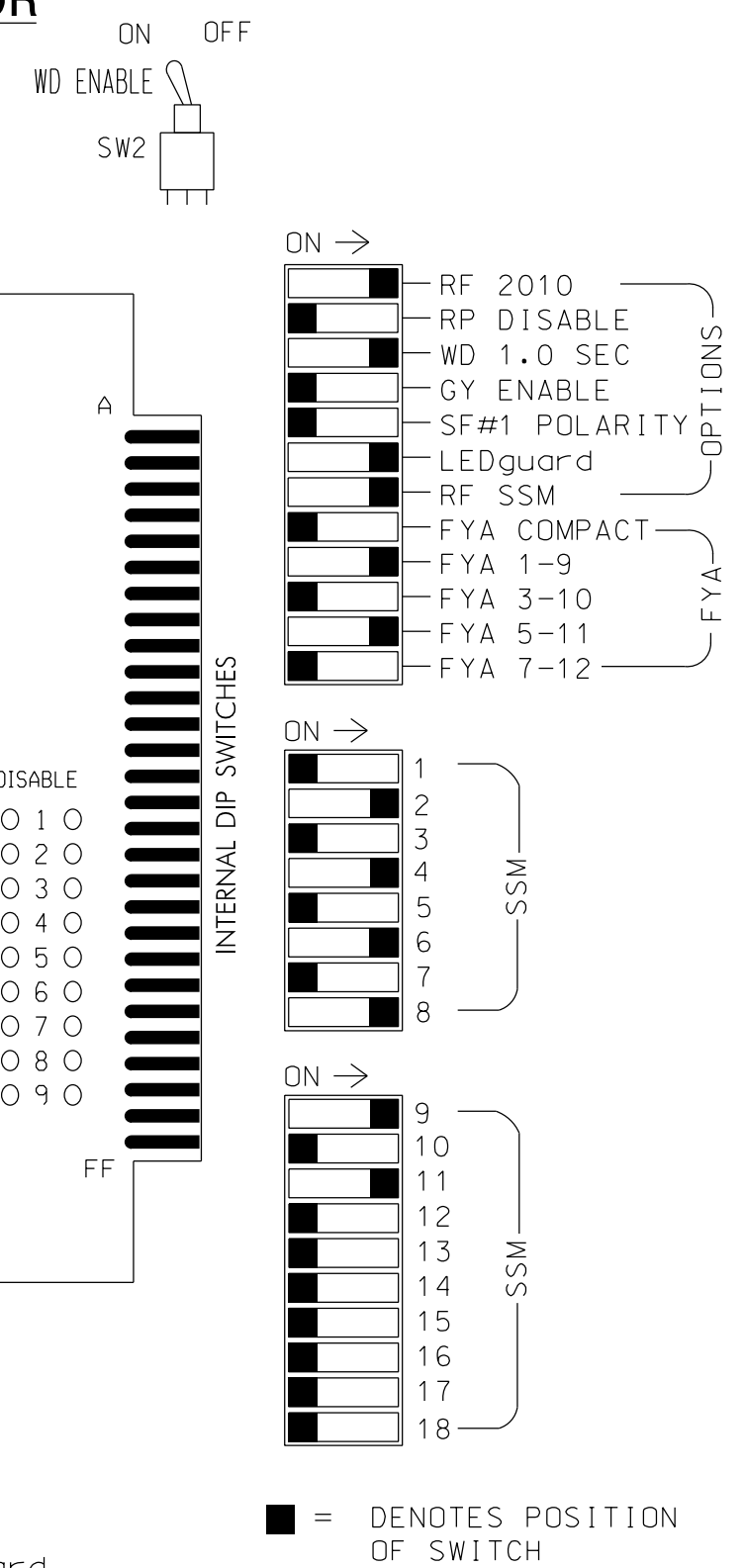
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11, and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

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 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,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

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Sig.133.1

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	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)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14
L	1A	2A,2B	3A	4A	5A	6A,6B	7A	8A	9A	10A	11A	12A	13A	14A
U	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
L	FS	DC ISOLATOR	ST	DC ISOLATOR	FS	DC ISOLATOR	ST	DC ISOLATOR	FS	DC ISOLATOR	ST	DC ISOLATOR	FS	DC ISOLATOR

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

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

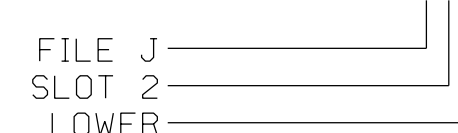
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3	X	G
2A, 2B	TB2-5,6	I2U	39	2	2	YES				N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A ²	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A, 6B	TB3-5,6	J2U	40	6	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

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

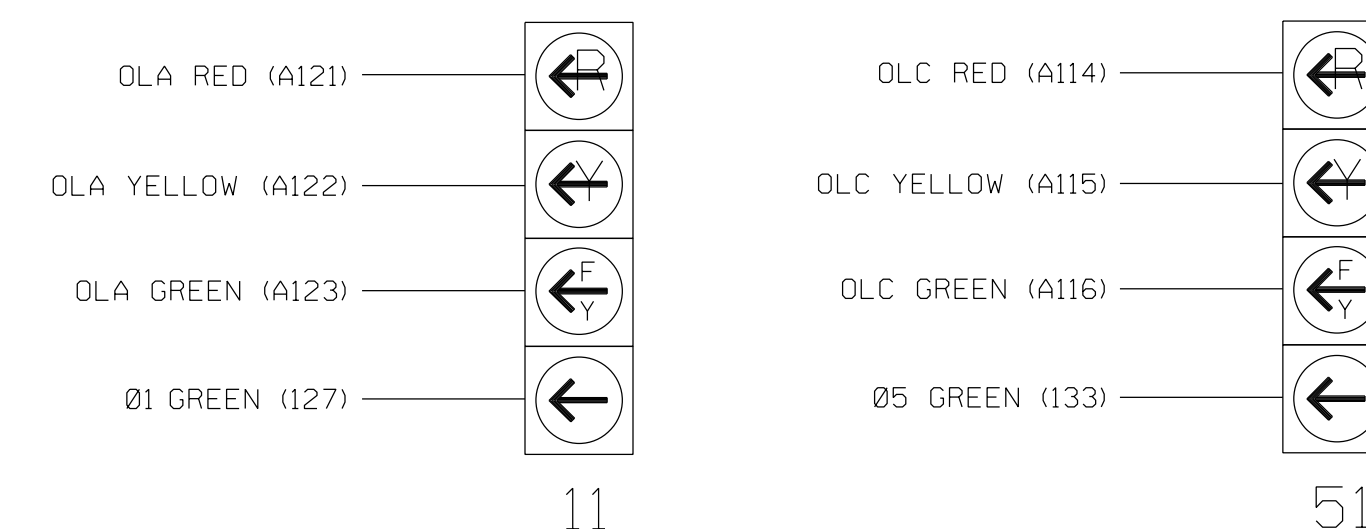
²Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

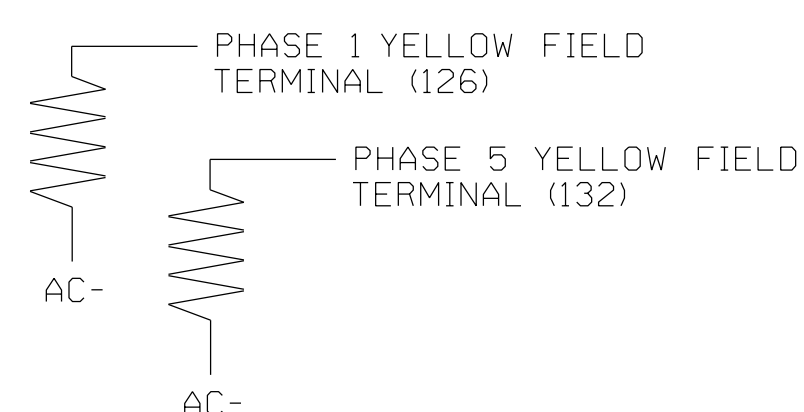
(wire signal heads as shown)



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

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: 	US 70 (S. Church Street) at Delaney Drive/ Wendy's Driveway		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489 DATE 6/9/2018
	Division 7 PLAN DATE: January 2018 PREPARED BY: PL Alexander	Alamance County REVIEWED BY: MB Toth REVIEWED BY:		Burlington DATE
REVISIONS			SIG. INVENTORY NO. 07-1653

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: 07-1653
 DESIGNED: January 2018
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 14:15
 ***SIGNALS-COM-PROJECTS\RLA\Transportation\Traffic\Curr*00056469 U-6015 B-s Sig Sys*Task 05-11-SIGNALS\05as\gn\WIF.rng\07-1653E.dgn
 ALEX3361 AT LUS210649

Electrical Detail - Sheet 2 of 2

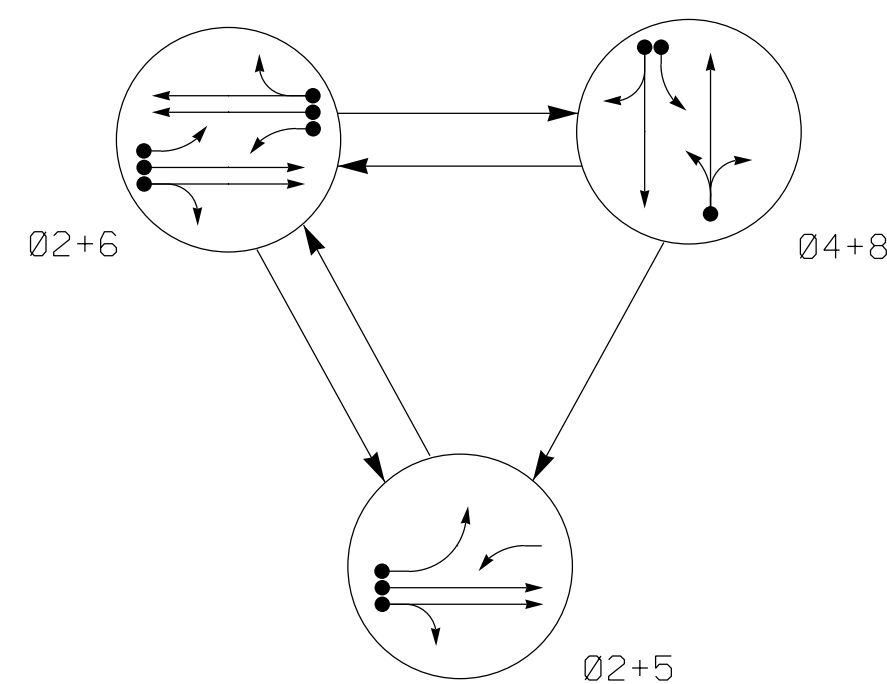
DOCUMENT NOT CONSIDERED
 FINAL UNLESS ALL
 SIGNATURES COMPLETED

<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>US 70 (S. Church Street) at Delaney Drive/ Wendy's Driveway</p> <p style="font-size: x-small;">Division 7 Alamance County Burlington</p> <p style="font-size: x-small;">PLAN DATE: January 2018 REVIEWED BY: MB Toth</p> <p style="font-size: x-small;">PREPARED BY: PL Alexander REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">Seal of Pamela L. Alexander, Professional Engineer, State of North Carolina, License No. 023489</p> <p style="font-size: x-small;">6/9/2018</p> <p style="font-size: x-small;">Pamela Alexander</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-1653</p>
REVISIONS	INIT.	DATE									

ATKINS

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

PHASING DIAGRAM

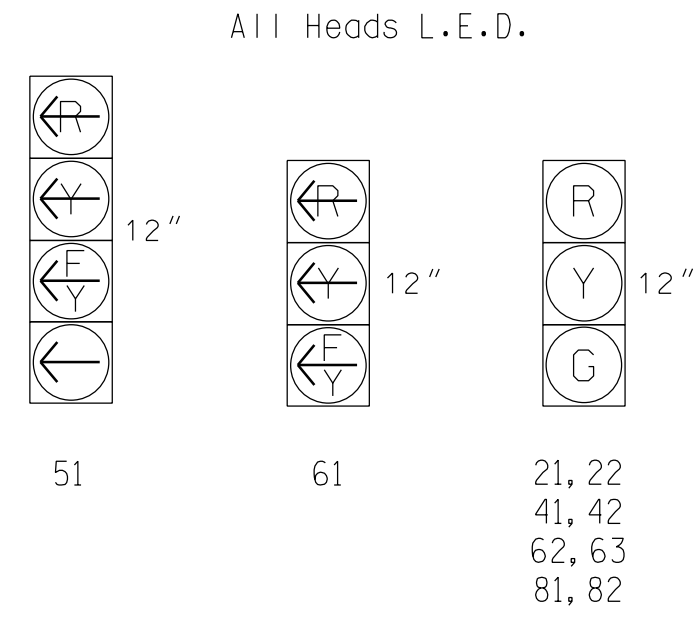


PHASING DIAGRAM DETECTION LEGEND
DETECTED MOVEMENT (solid arrow with dot)
UNDETECTED MOVEMENT (OVERLAP) (solid arrow)
UNSIGNALIZED MOVEMENT (dashed arrow)
PEDESTRIAN MOVEMENT (dashed arrow with circle)

TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (0, 2, 4, 6, 8), FLASH. Rows include signal faces 21, 22, 41, 42, 51, 61, 62, 63, 81, 82.

SIGNAL FACE I.D.

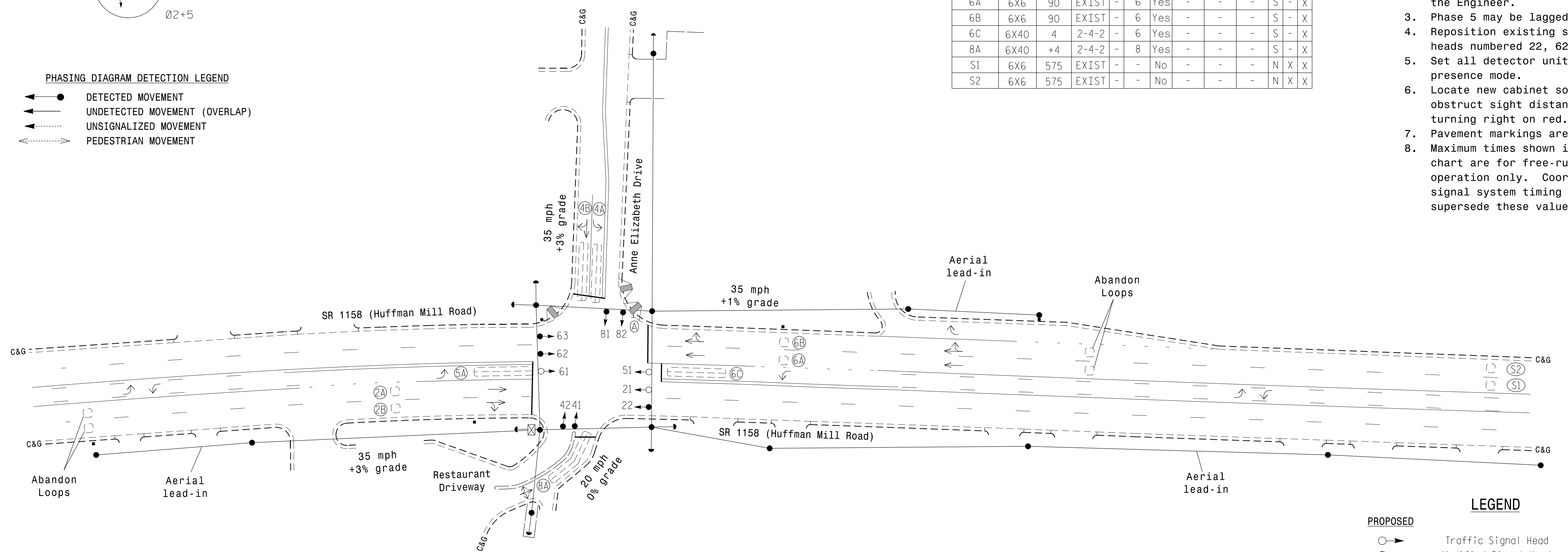


ASC/3 DETECTOR INSTALLATION CHART

Table with columns: LOOP, SIZE (FT), DISTANCE FROM STOPBAR (FT), TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, SYSTEM LOOP, NEW CARD. Lists detector loops 2A through S2.

3 Phase Fully Actuated (Burlington-Graham Signal System)

- NOTES
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 22, 62 and 63.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

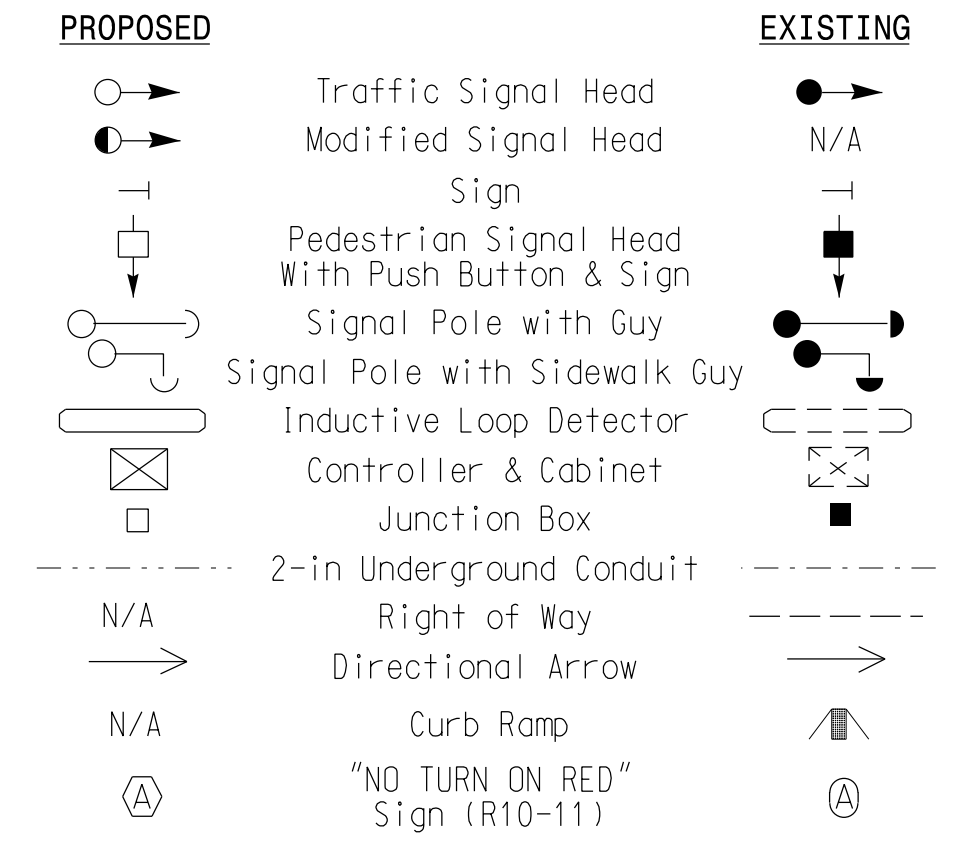


ASC/3 TIMING CHART

Timing chart table with columns: FEATURE, PHASE (2, 4, 5, 6, 8). Rows include Min Green, Walk, Ped Clear, Veh. Extension, Max I, 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 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND



Signal Upgrade

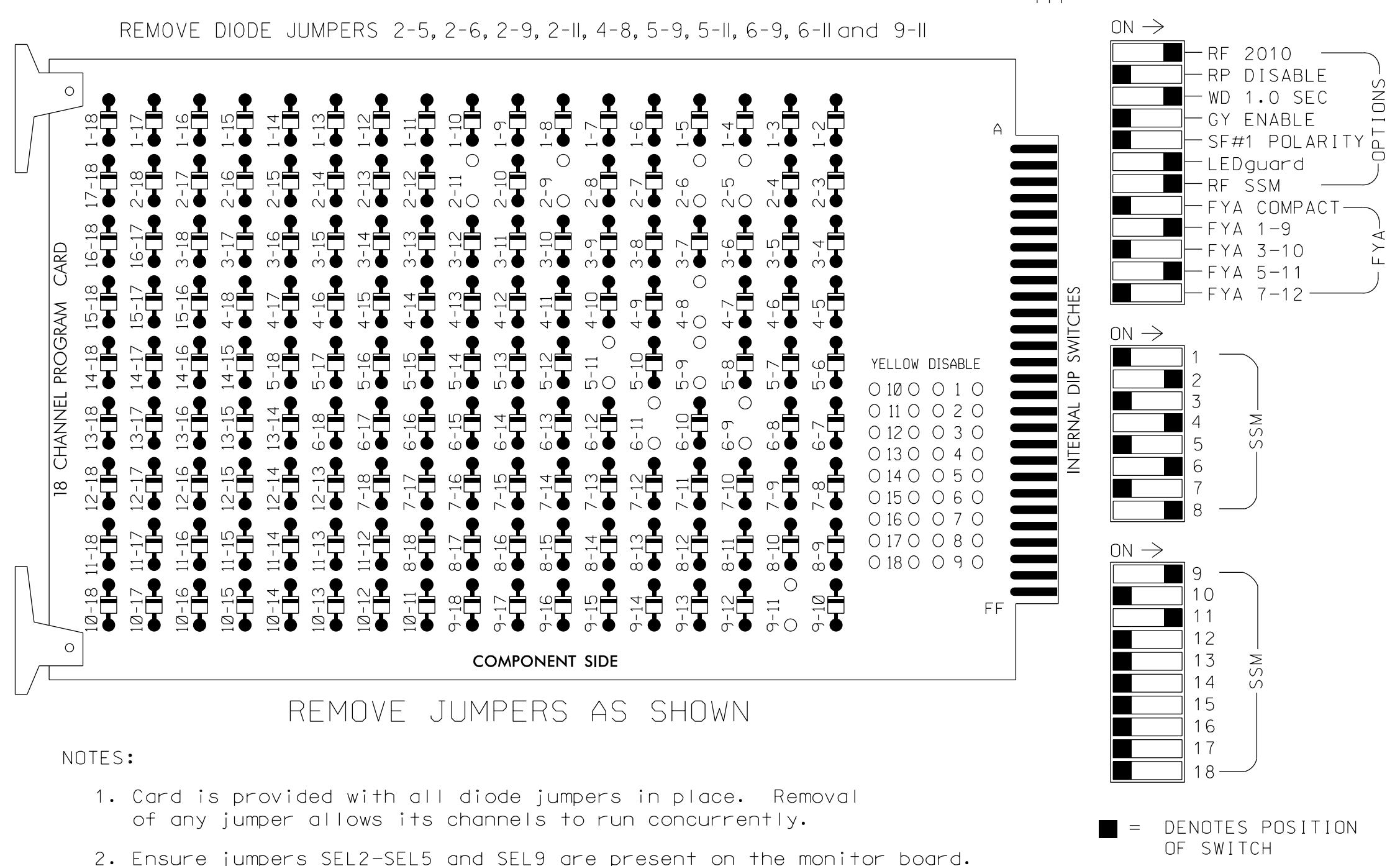
Project information block including: Signal Upgrade title, location (SR 1158 at Anne Elizabeth Drive/Restaurant Driveway), division (Alamance County), prepared by (JA Wiles), reviewed by (PL Alexander), date (6/7/2018), and signature/seal area.

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

07-JUN-2018 11:15 D:\Projects\101\101\101\off\c\curr\100056469 U-6015 B-6 Sig. Syste\Task 05_11_Signal\sigdes\gnd07-1679.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program 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,AUX S1,AUX S4
 PHASES USED.....2,4,5,6,8
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED

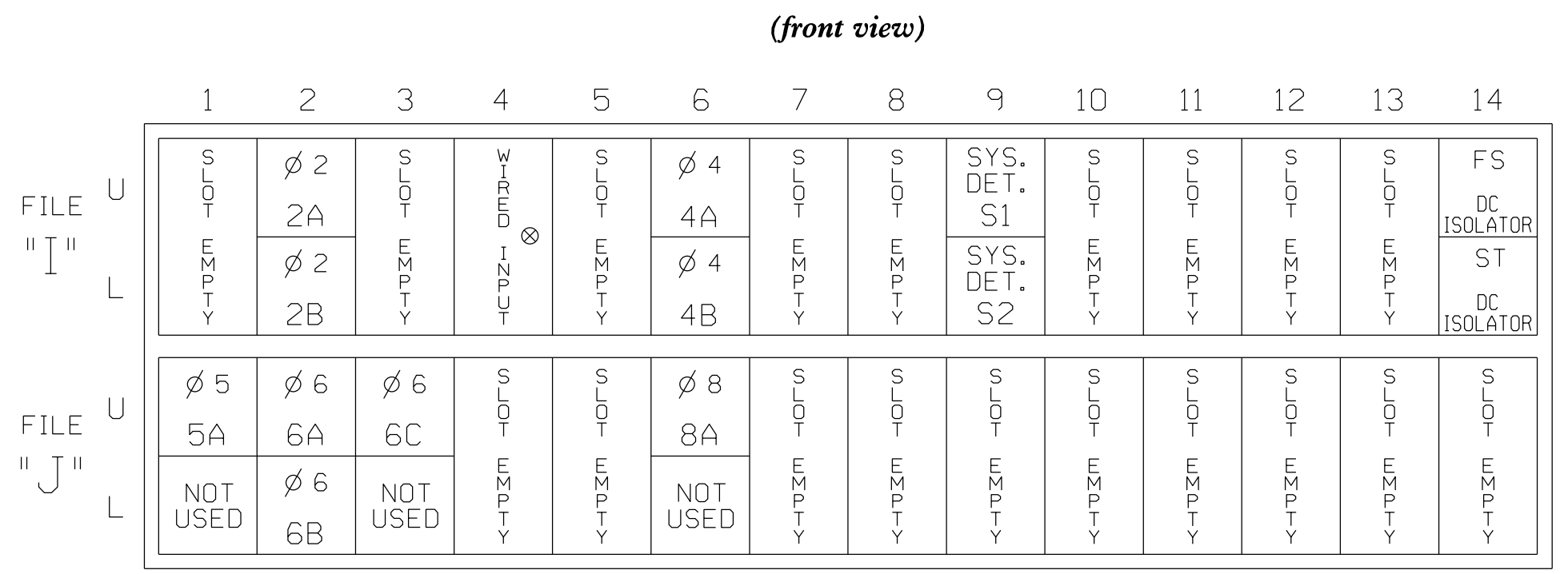
* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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

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

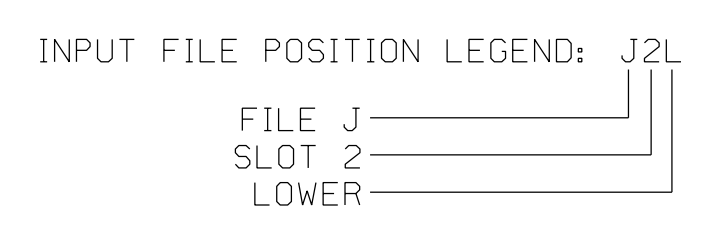
INPUT FILE POSITION LAYOUT (front view)



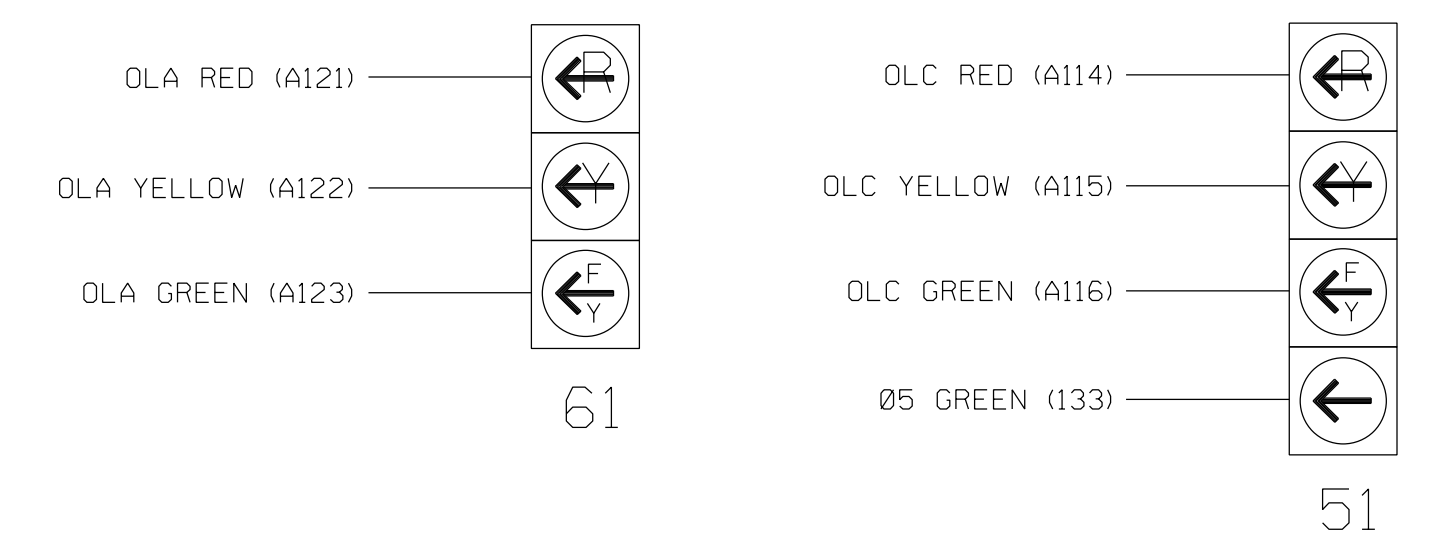
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	J2U	39	2	2	YES				S
2B	TB2-7,8	J2L	43	12	2	YES				S
4A	TB4-9,10	J6U	41	4	4	YES		3		S
4B	TB4-11,12	J6L	45	14	4	YES		10		S
* S1	TB6-9,10	J9U	60	11	SYS	NO				N
* S2	TB6-11,12	J9L	62	13	SYS	NO				N
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
		J4U	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

¹Add jumper from J11-W to 14-W, on rear of input file.
 * System Detector only. Remove the vehicle phase assigned to this detector in the default programming.

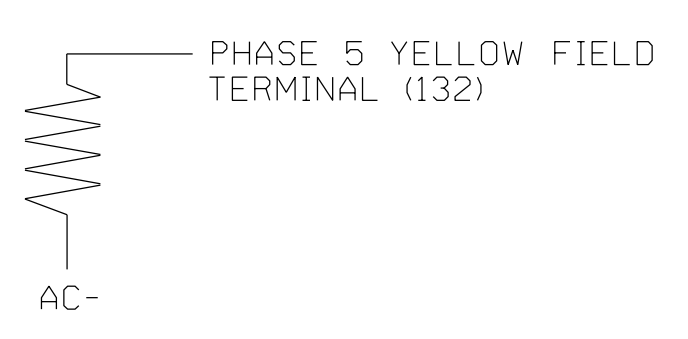


FYA SIGNAL WIRING DETAIL (wire signal heads as shown)

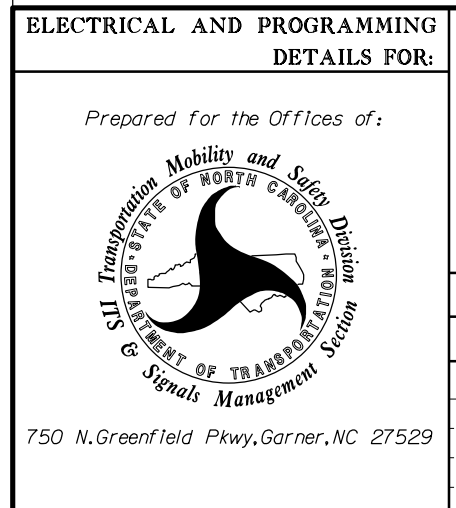


LOAD RESISTOR INSTALLATION DETAIL (install resistor as shown)

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



Electrical Detail - Sheet 1 of 2



SR 1158 (Huffman Mill Road)
 at
 Anne Elizabeth Drive/
 Restaurant Driveway

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

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 PAMELA L. ALEXANDER
 SEAL 023489

6/9/2018
 DATE
 SIG. INVENTORY NO. 07-1679

09-JUN-2018 14:15 D:\Transportation\tr-office\curr*100056469 U-6015 B-6 Sig Sys*task 05-11-15\signal\sig05as\gn\wif\prog07-1679E.dgn ALK33561 AT LUS40649

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```

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

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

Toggle Twice

OVERLAP C

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

```

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

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1679
 DESIGNED: November 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 14:15
 D:\Transportation\tr-off\c\curr*10006469 U-6015 B-s Sig Syle*task 05-11-SIGNALS\04as\gn\WIF.rng\07-1679E.dgn
 ALEX3361 AT LUS240619

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

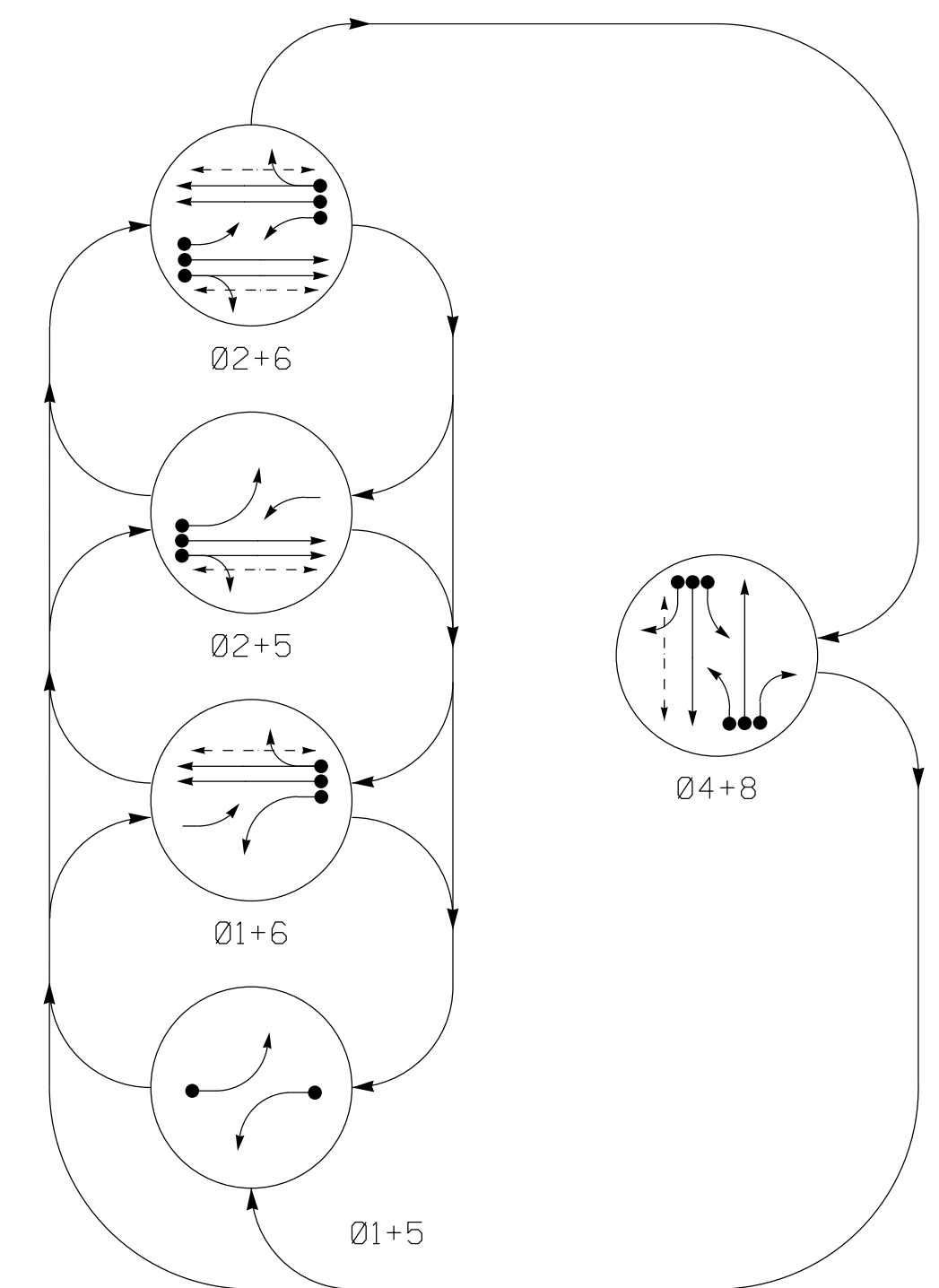
<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p>	<p>SR 1158 (Huffman Mill Road) at Anne Elizabeth Drive/ Restaurant Driveway</p> <p>Division 7 Alamance County Burlington</p> <p>PLAN DATE: November 2017 REVIEWED BY: AM Encarnacion</p> <p>PREPARED BY: JA Wiles REVIEWED BY: PL Alexander</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p>SEAL</p> <p style="font-size: x-small;">Designed by: <i>Pamela Alexander</i> 6/9/2018 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-1679</p>
REVISIONS	INIT.	DATE												

ATKINS

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

750 N. Greenfield Pkwy, Garner, NC 27529

PHASING DIAGRAM



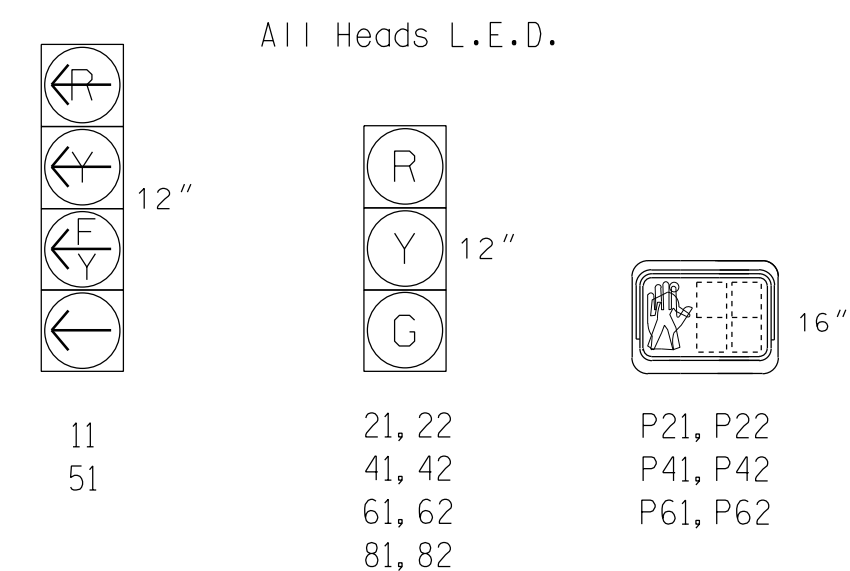
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

SIGNAL FACE I.D.



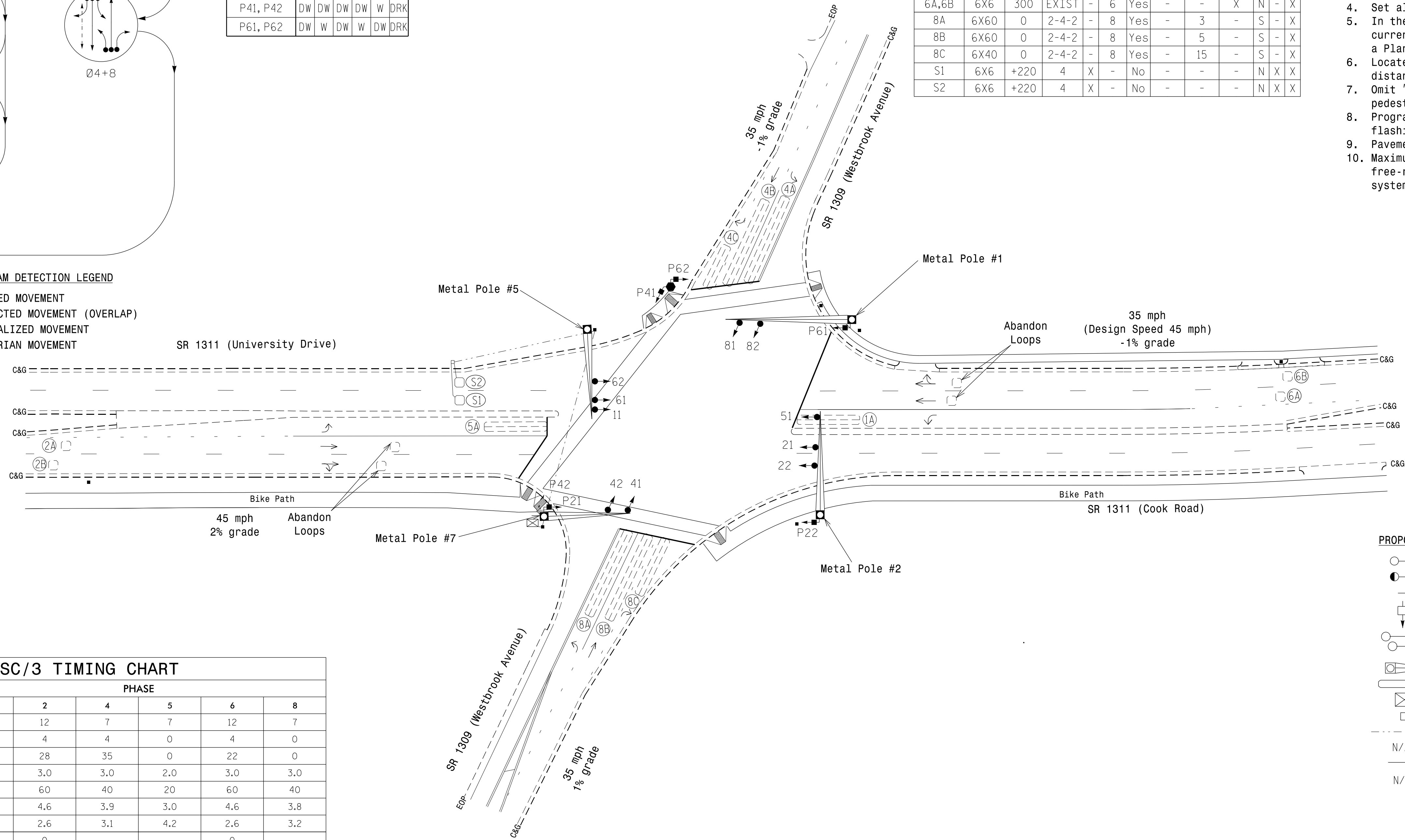
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A,2B	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	-
4A	6X60	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X55	0	2-4-2	-	4	Yes	-	5	-	S	-	X
4C	6X30	0	2-4-2	-	4	Yes	-	15	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A,6B	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-
8A	6X60	0	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X60	0	2-4-2	-	8	Yes	-	5	-	S	-	X
8C	6X40	0	2-4-2	-	8	Yes	-	15	-	S	-	X
S1	6X6	+220	4	X	-	No	-	-	-	N	X	X
S2	6X6	+220	4	X	-	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.
- 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.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system supersedes these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	8		
Min Green *	7	12	7	7	12	7		
Walk *	0	4	4	0	4	0		
Ped Clear	0	28	35	0	22	0		
Veh. Extension *	2.0	3.0	3.0	2.0	3.0	3.0		
Max 1 *	20	60	40	20	60	40		
Yellow	3.0	4.6	3.9	3.0	4.6	3.8		
Red Clear	3.7	2.6	3.1	4.2	2.6	3.2		
Actuations B4 Add *	-	0	-	-	0	-		
Seconds /Actuation *	-	2.0	-	-	2.0	-		
Max Initial *	-	34	-	-	34	-		
Time Before Reduction *	-	15	-	-	15	-		
Time To Reduce *	-	30	-	-	30	-		
Minimum Gap	-	3.0	-	-	3.0	-		
Locking Detector	-	X	-	-	X	-		
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-		
Dual Entry	-	-	X	-	-	X		
Simultaneous Gap	X	X	X	X	X	X		

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

LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Signal Upgrade

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1311 (University Drive/ Cook Road) at SR 1309 (Westbrook Avenue)

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: PL Alexander

PREPARED BY: AM Encarnacion REVIEWED BY:

SEAL

PANELA L. ALEXANDER

ENGINEER

6/7/2018

SIG. INVENTORY NO. 07-1716

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

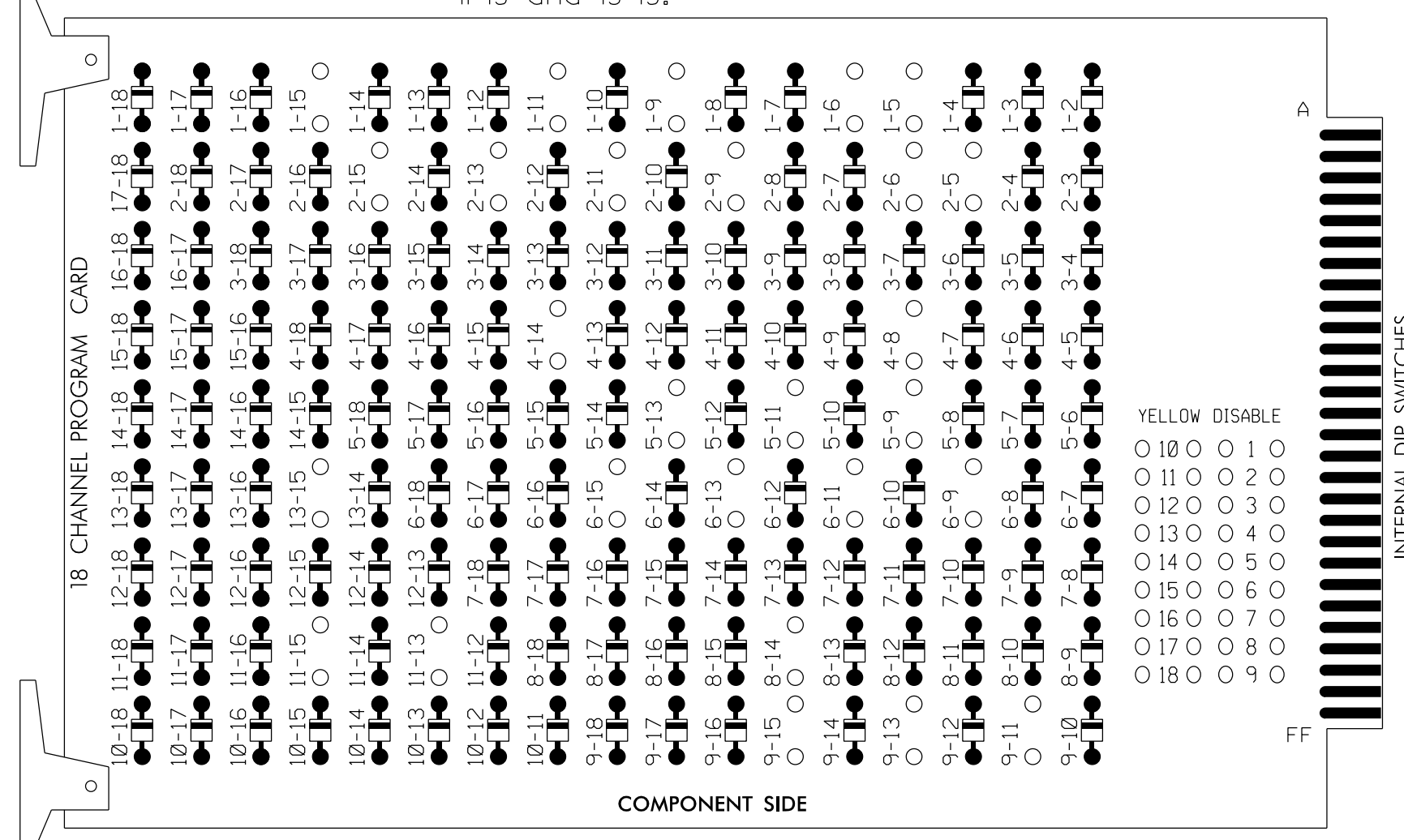
SCALE 0 40 1"=40'

07-JUN-2018 11:15 D:\P\consort\atkins\proj\offices\cur\10056469 U-6015 B-G S10 Sys\Task 05_11_Signal\Des\gsm07-1716.dgn ALEX3361 AT LUS510649

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Walk and 6 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 AUX S1,AUX S4
 LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,
 PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,8
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED
 * See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42	P41, P42	51	61,62	P61, P62	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										
Hand				113			104		119									
Walker				115			106		121									

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

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

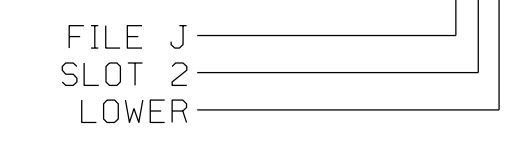
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES		3		G
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		5		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
5A ²	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
6A, 6B	TB3-5,6	J2U	40	6	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		5		S
8C	TB7-1,2	J7U	66	38	8	YES		15		S

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

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

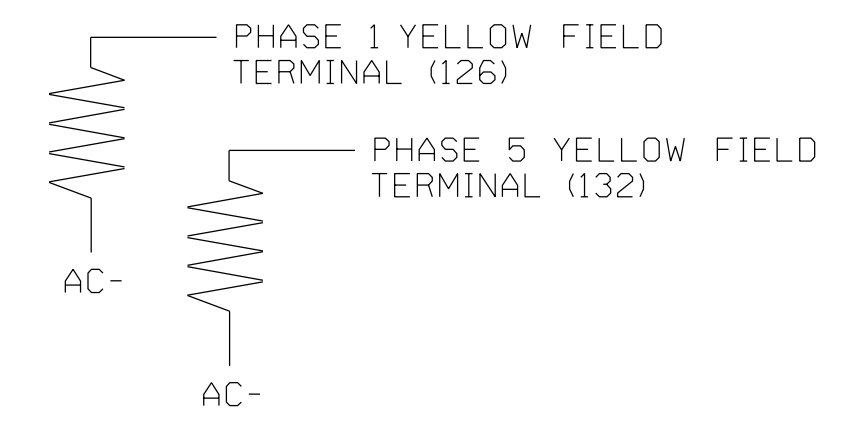
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

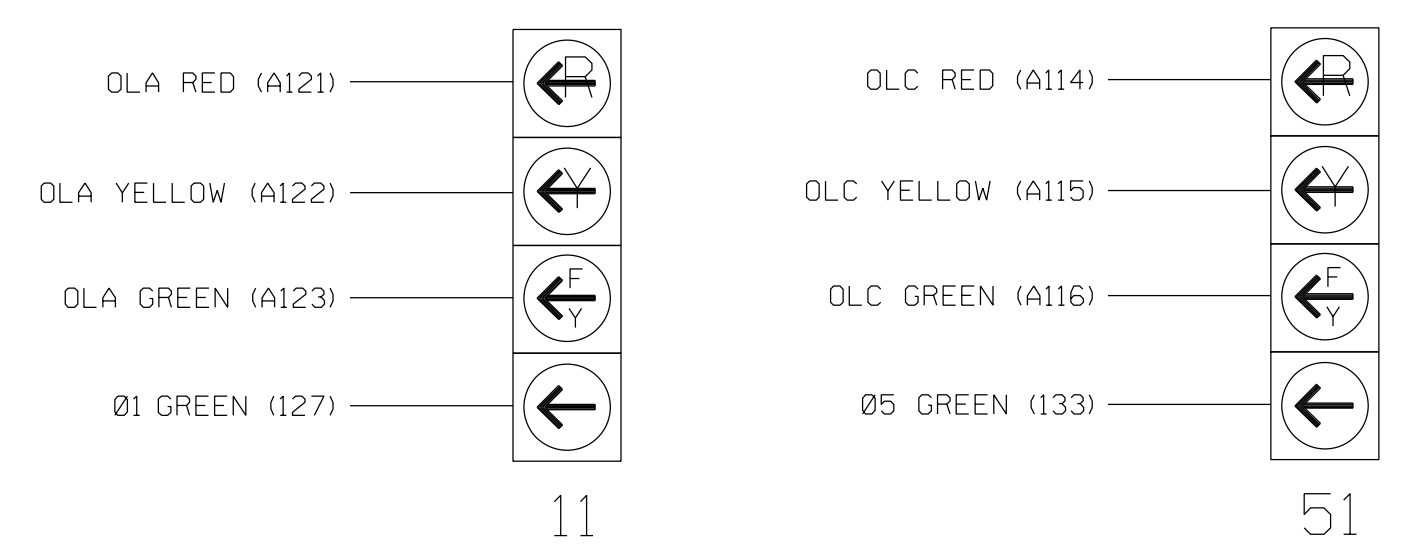
(install resistors as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1716
 DESIGNED: January 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: DEPARTMENT OF TRANSPORTATION AND SAFETY STATE OF NORTH CAROLINA	SR 1311 (University Drive/ Cook Road) at SR 1309 (Westbrook Avenue)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489 6/9/2018 DATE
	Division 7 Alamance County Burlington PLAN DATE: January 2018 REVIEWED BY: PL Alexander PREPARED BY: AM Encarnacion REVIEWED BY:		REVISIONS INIT. DATE

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```

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

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

Toggle Twice

OVERLAP C

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

```

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1716
 DESIGNED: January 2018
 SEALED: 6/7/2018
 REVISED: N/A

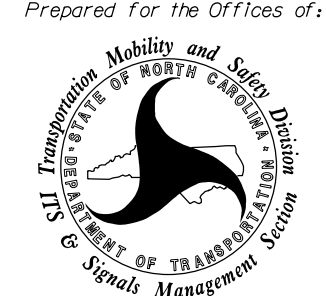
09-JUN-2018 14:15
 D:\Transpor\at\off\ck\cur\100056469 U-6015 B-G S1g Sys\Task 05_11_Signal\Des\gn\wlr\Inq07-1716E.dgn
 ALEX3361 AT LUS33069

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

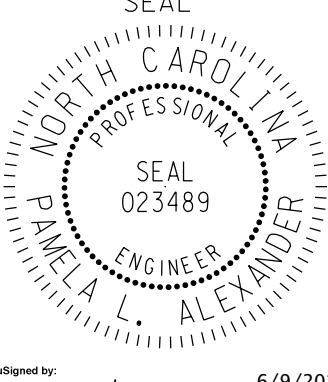
Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

SR 1311 (University Drive/ Cook Road)	
at	
SR 1309 (Westbrook Avenue)	
Division 7	Alamance County Burlington
PLAN DATE: January 2018	REVIEWED BY: PL Alexander
PREPARED BY: AM Encarnacion	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL



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

6/9/2018

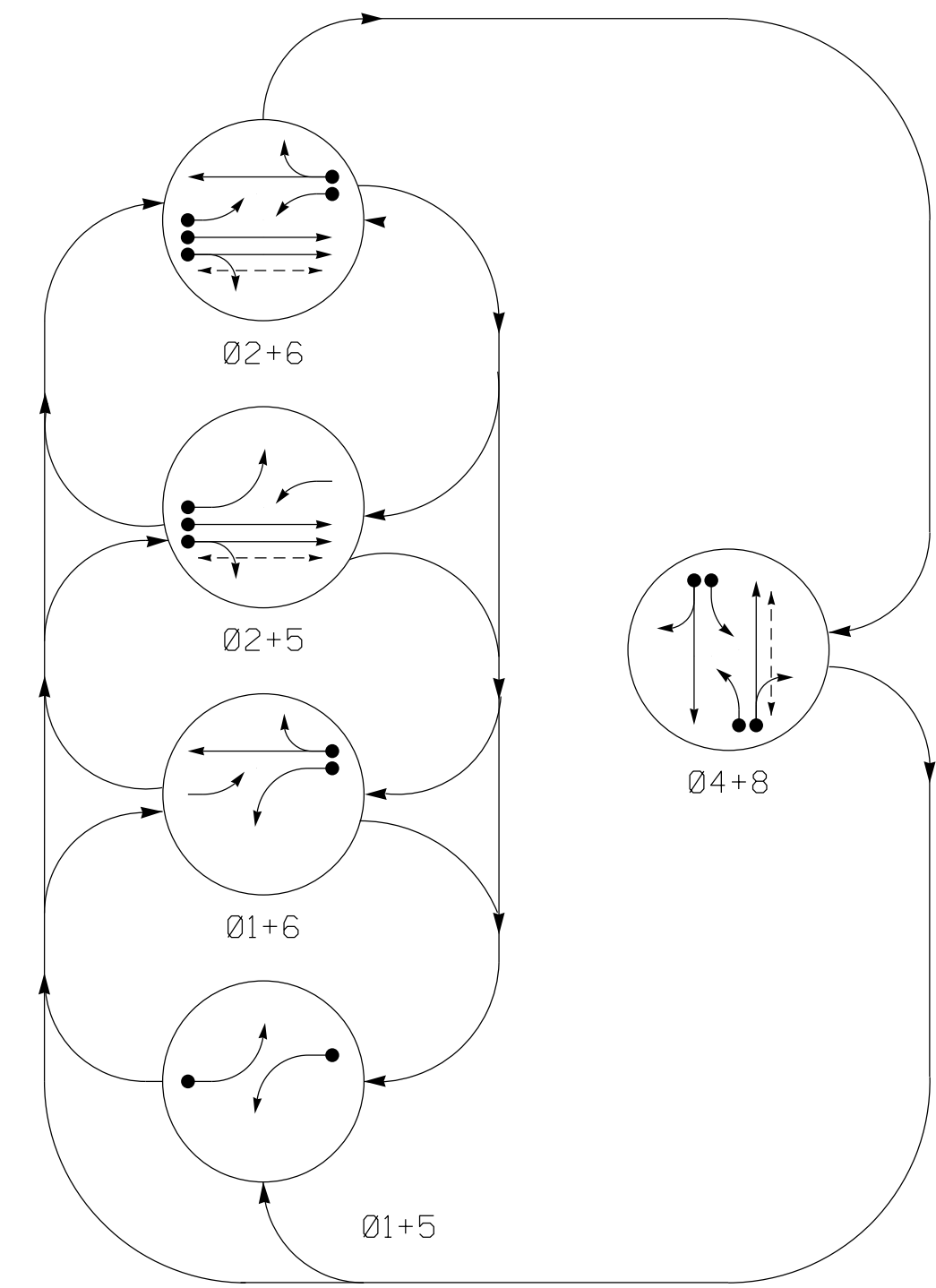
DATE

SIC. INVENTORY NO. 07-1716

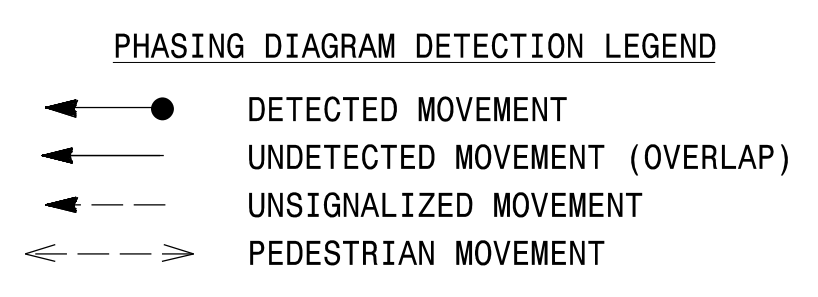
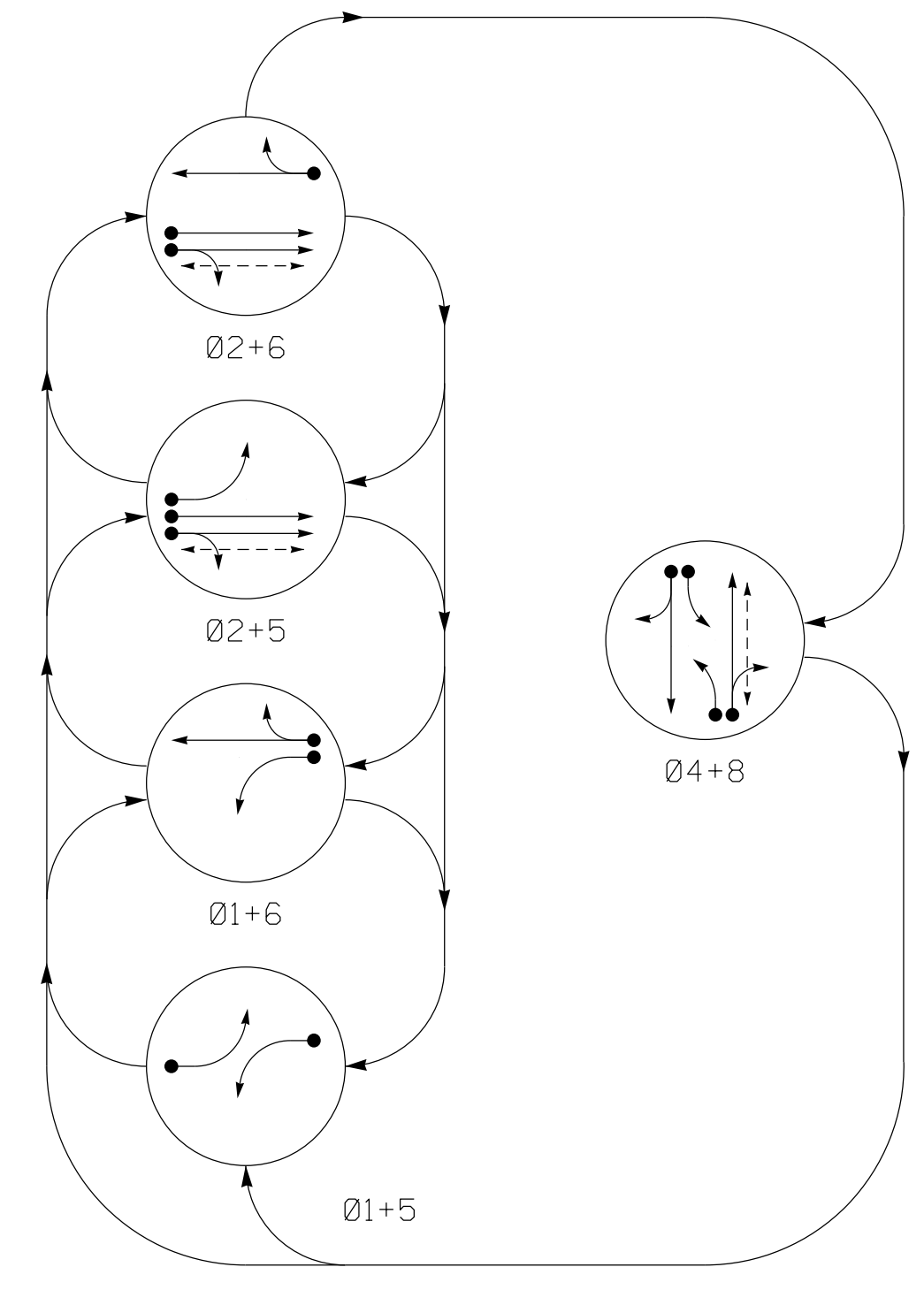
ATKINS

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

DEFAULT PHASING DIAGRAM

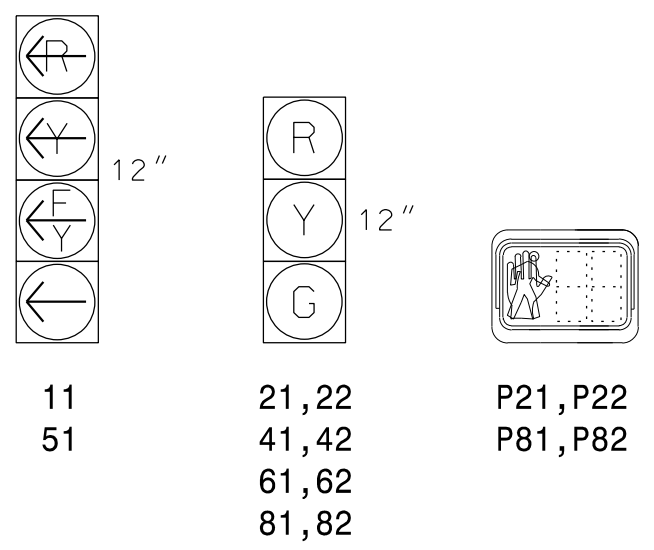


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	*15	-	S	-	X
2A	6X6	75	Exist	-	2	Yes	-	-	-	S	-	X
2B	6X6	75	Exist	-	2	Yes	-	-	-	S	-	X
4A	6X60	+6	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	*15	-	S	-	X
6A	6X6	75	Exist	-	6	Yes	-	-	-	S	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	-	-	S	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	10	-	S	-	X
S1	6X6	+230	3	X	-	No	-	-	-	N	X	X

* Disable delay during alternate phasing operation
 ** Disable phase 2 and 6 call for loops 1A and 5A during alternate phasing operation

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	F	H	D
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	Y		
81,82	R	R	R	R	G	R		
P21,P22	DW	DW	W	W	DW	DRK		
P81,P82	DW	DW	DW	DW	W	DRK		

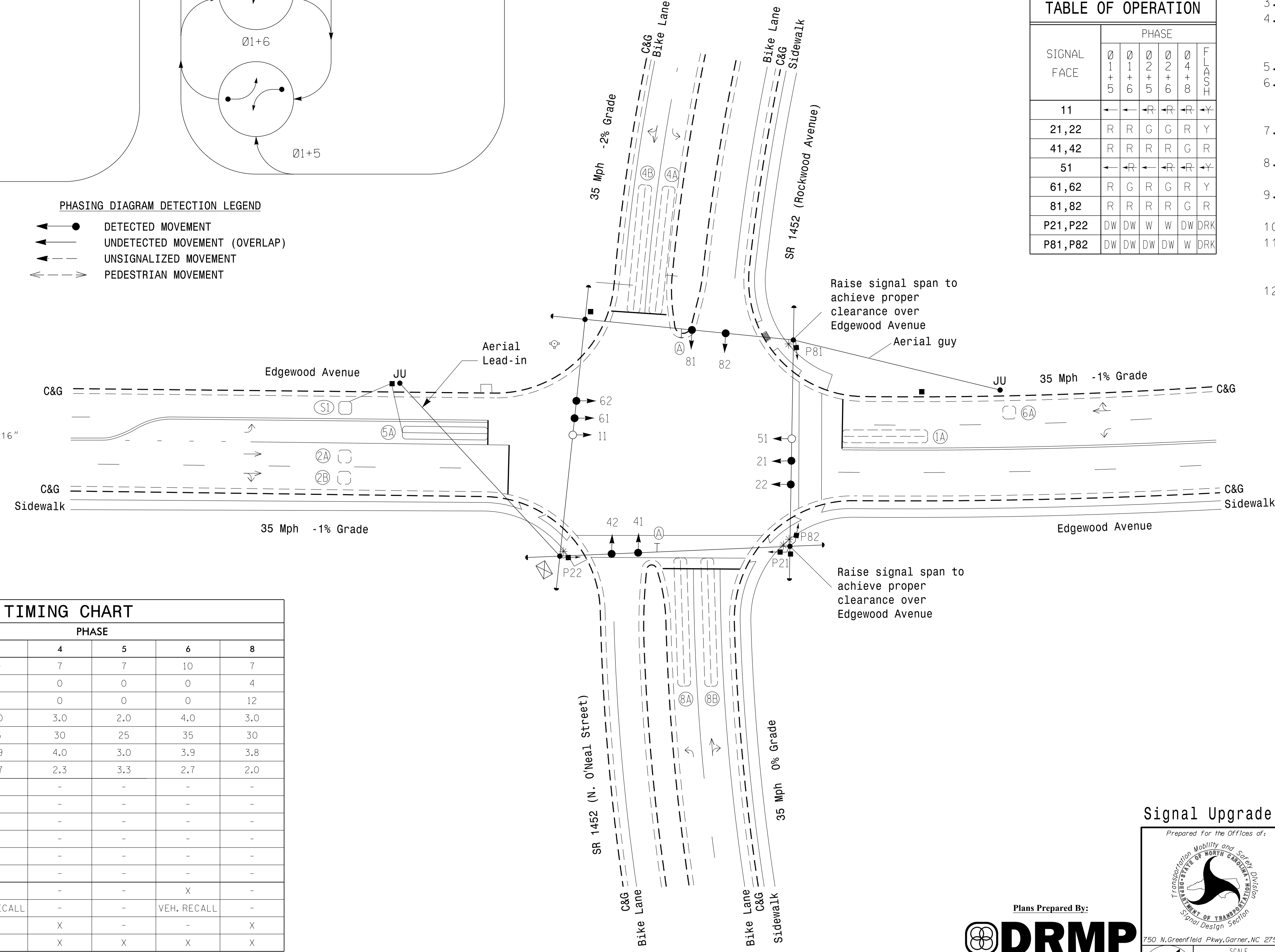
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	F	H	D
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	Y		
41,42	R	R	R	R	G	R		
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	Y		
81,82	R	R	R	R	G	R		
P21,P22	DW	DW	W	W	DW	DRK		
P81,P82	DW	DW	DW	DW	W	DRK		

5 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

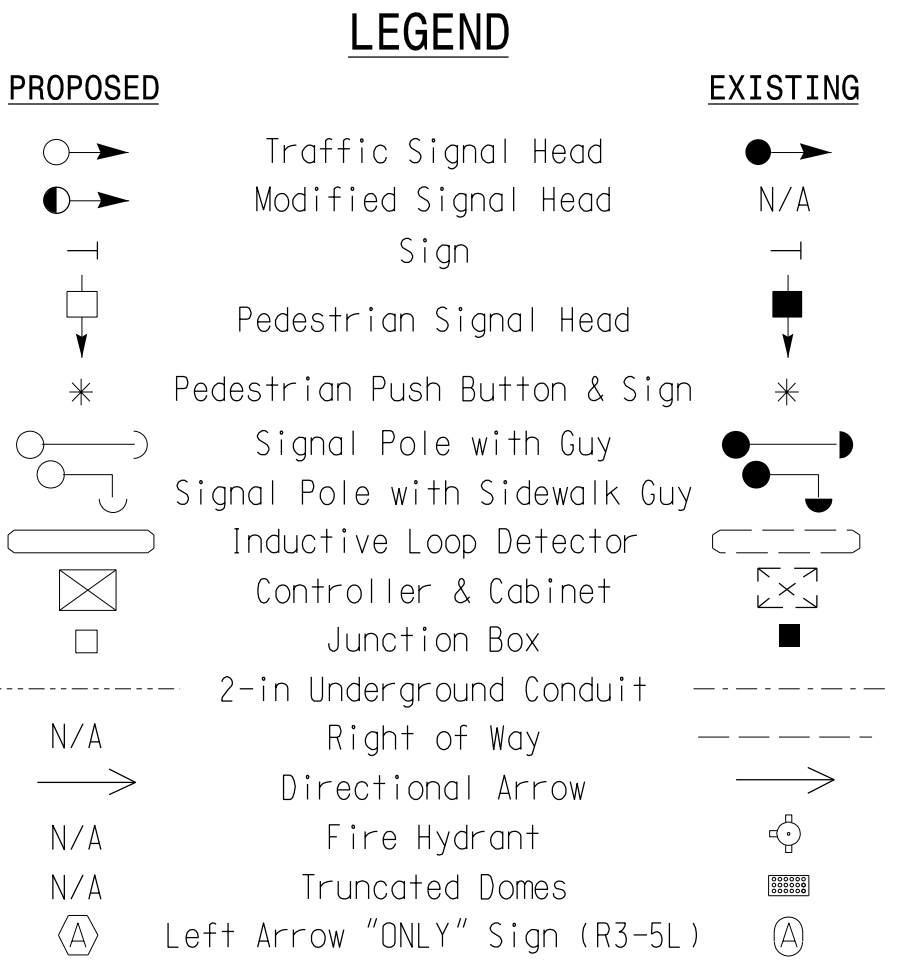
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 or phase 5 may be lagged.
- Reposition existing signal heads numbered 61 and 62 to be centered over through lane as shown.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Remove existing Left Arrow "Only" signs (R3-5) on EB-WB Edgewood Avenue.
- Pavement markings are existing.
- The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



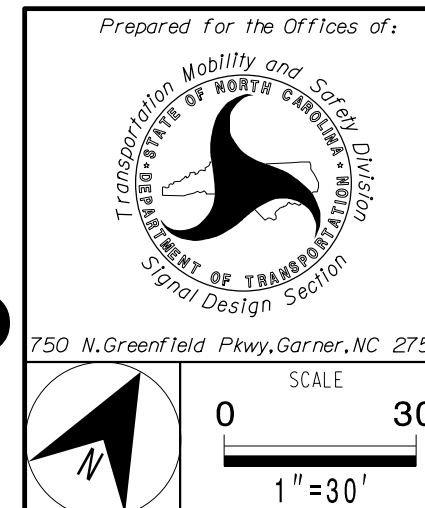
ASC/3 TIMING CHART

FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	10	7	7	10	7	
Walk *	0	4	0	0	0	4	
Ped Clear	0	17	0	0	0	12	
Veh. Extension *	2.0	4.0	3.0	2.0	4.0	3.0	
Max 1 *	25	35	30	25	35	30	
Yellow	3.0	3.9	4.0	3.0	3.9	3.8	
Red Clear	3.4	2.7	2.3	3.3	2.7	2.0	
Actions 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.



Signal Upgrade



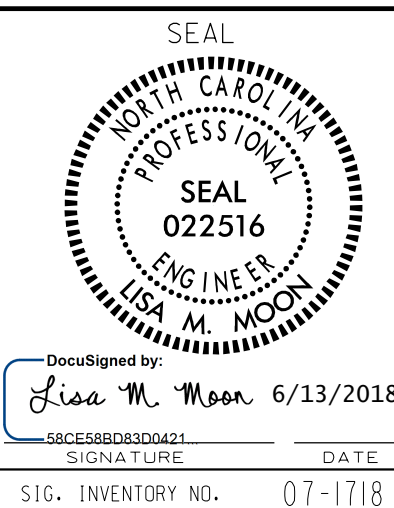
Edgewood Avenue at SR 1452 (Rockwood Avenue/N. O'Neal Street)

Division 7 Alamance County Burlington

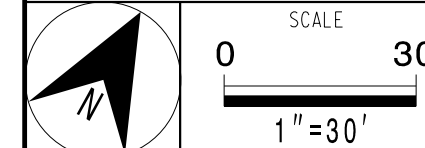
PLAN DATE: December 2017 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS: _____ INIT. DATE



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



13-JUN-2018 17:56
 R:\66015\17118\17118.dgn
 AT CAR-RA-LAN-TN-W7