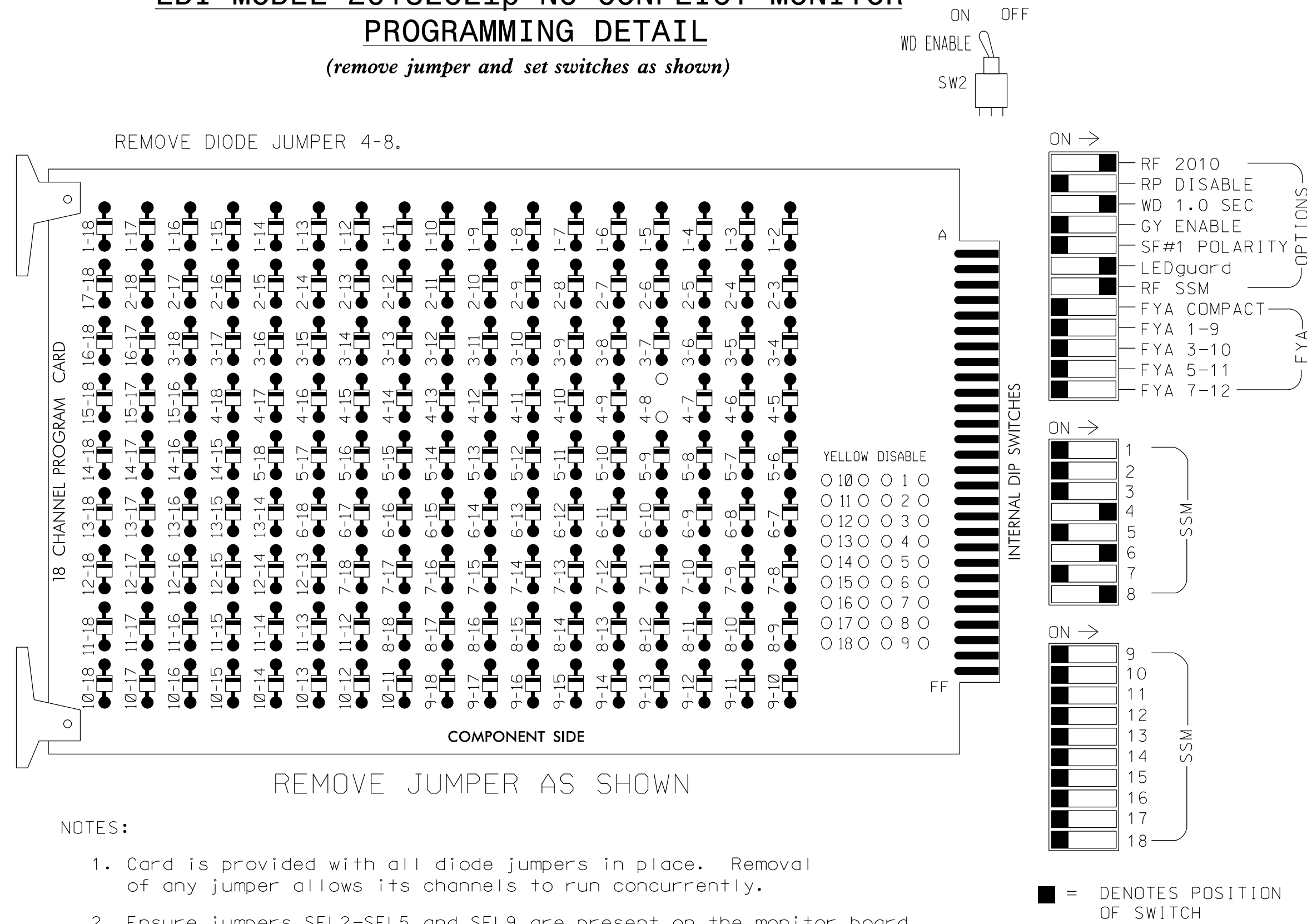


EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

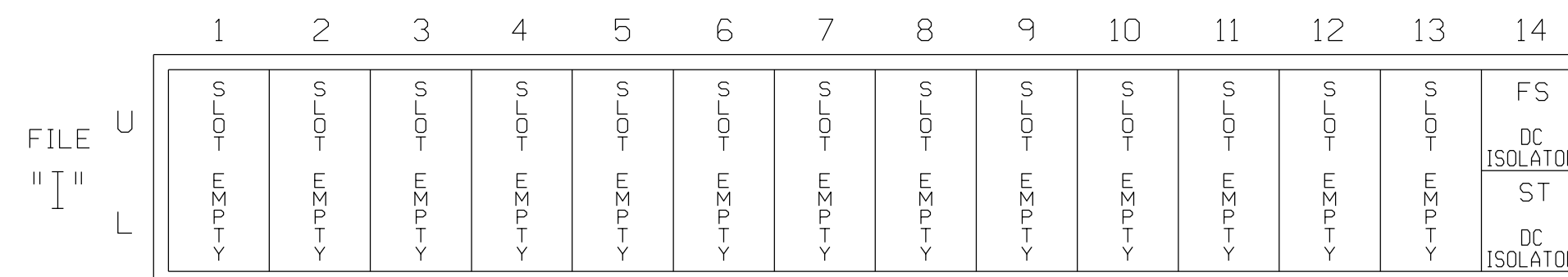
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42, 43	NU	NU	61,62, 63	NU	NU	81,82	NU
RED					101			134			107	
YELLOW					102			135			108	
GREEN					103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0981
 DESIGNED: SEPT-2017
 SEALED: 06-13-2018
 REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

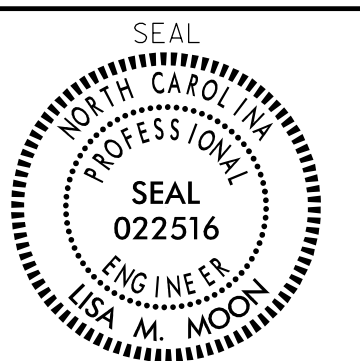
Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
 Lisa M. Moon
 6/13/2018
 ELECTRICAL INVENTORY NO. 07-0981

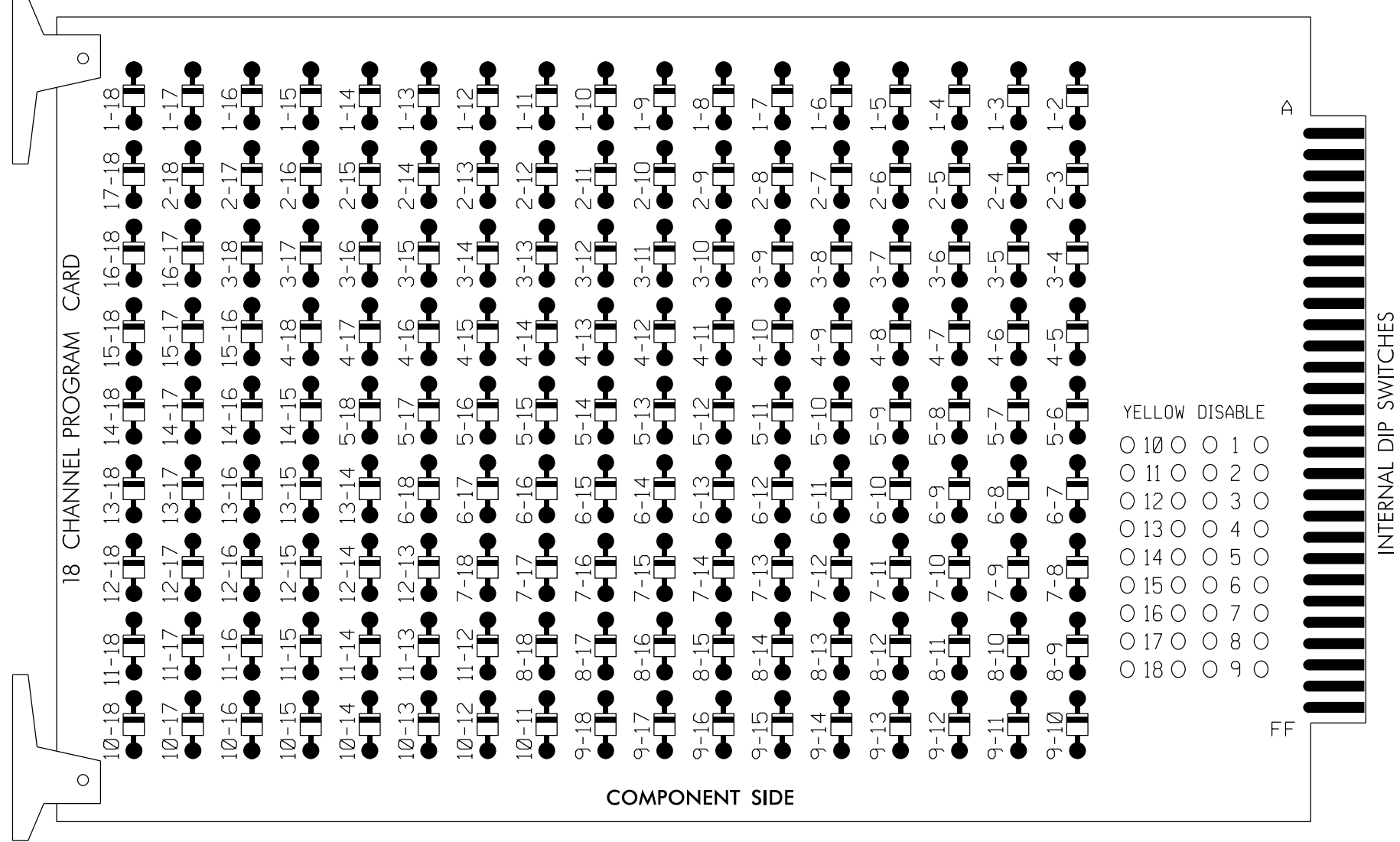
Plans Prepared By:

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

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)

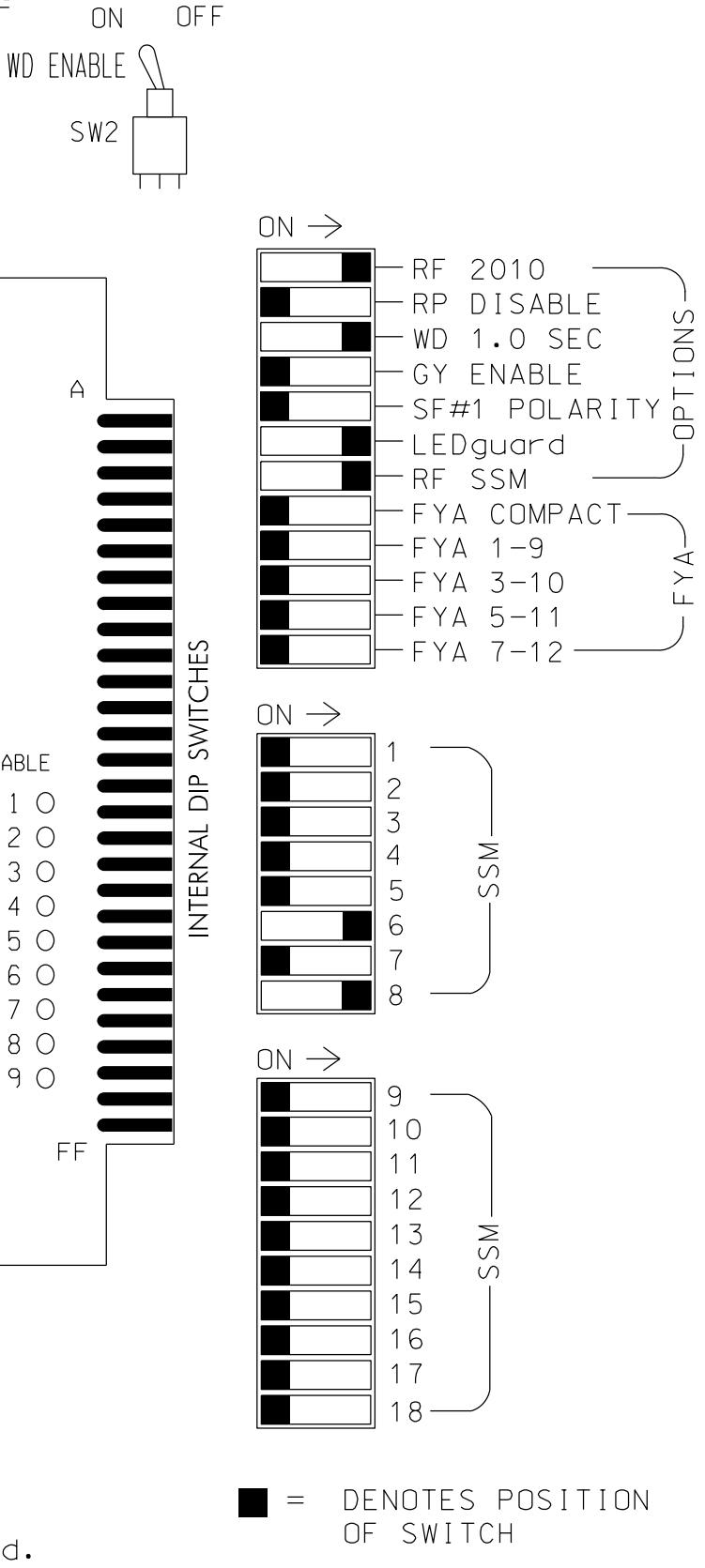
DO NOT REMOVE ANY JUMPERS



DO NOT REMOVE ANY JUMPERS

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

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

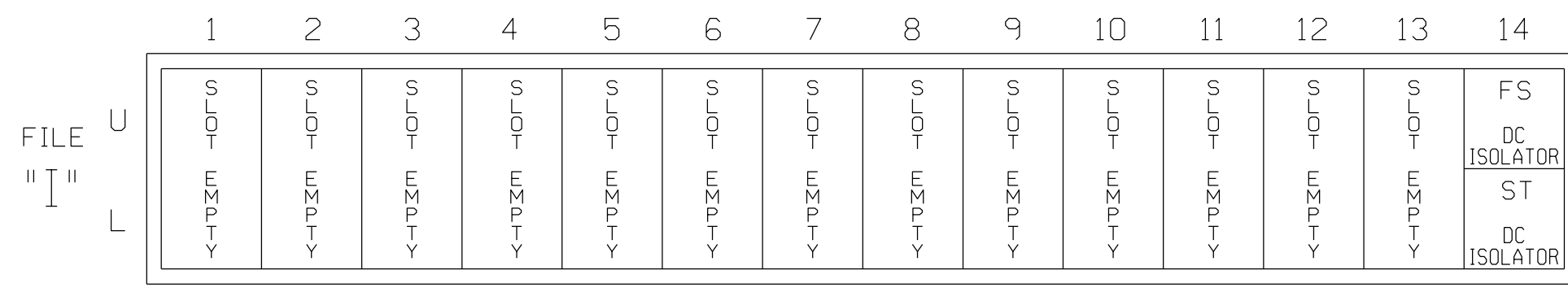
SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED								134			107	
YELLOW								135			108	
GREEN								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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0982
 DESIGNED: NOVEMBER 2017
 SEALED: 06-13-2018
 REVISED: N/A

13-UNA-2018.17-44 R:\66015\17\off\ek\signo\design\wiring\07-0982e.dgn KANDERSON AT CHA-KANDERSON

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

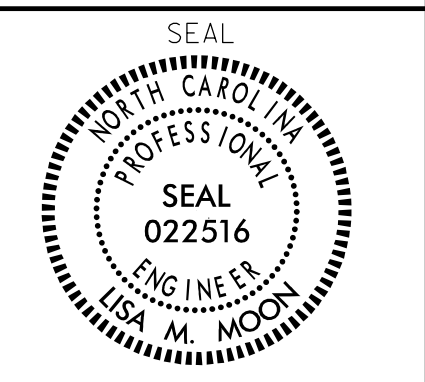
US 70-NC 62 (S. Fisher Street) at Morehead Street

Division 7 Alamance County Burlington

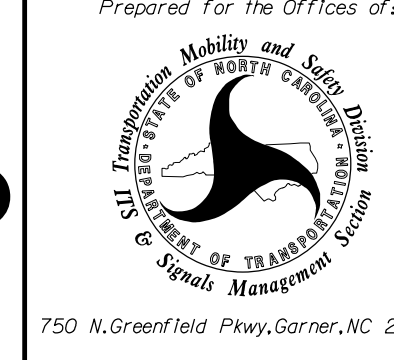
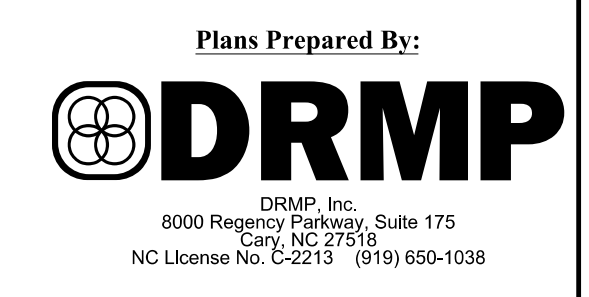
PLAN DATE: November 2017 REVIEWED BY: AJ Davis
 PREPARED BY: RD Lawton REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

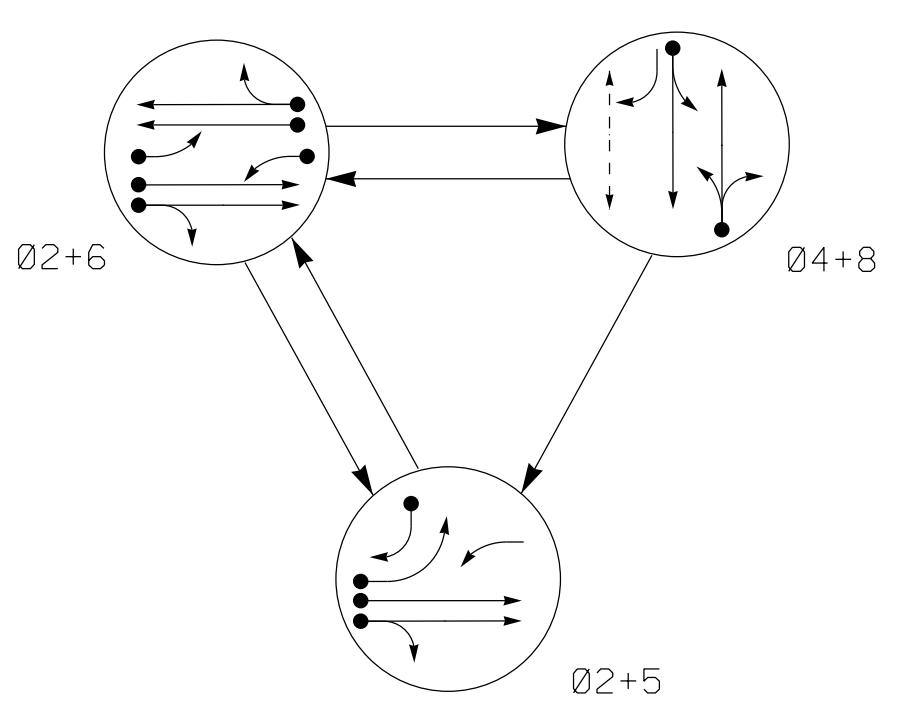
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 6/13/2018
 sig. INVENTORY NO. 07-0982



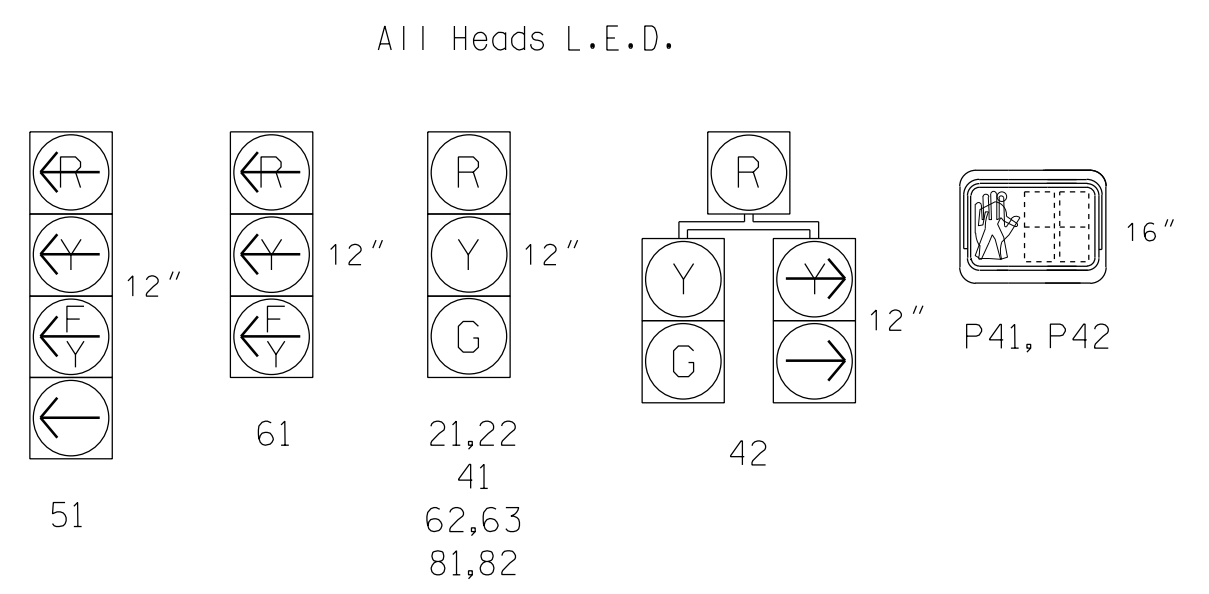
DEFAULT PHASING DIAGRAM



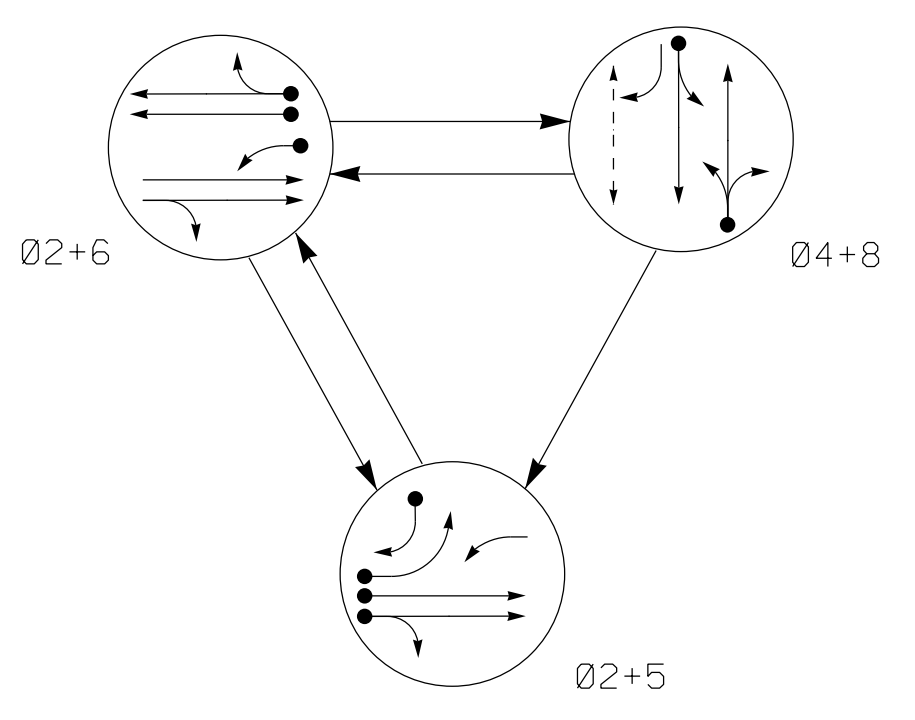
DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4+8	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	F	F	FR	Y
61	F	F	FR	Y
62,63	R	G	R	Y
81,82	R	R	G	R
P41,P42	DW	DW	W	DRK

SIGNAL FACE I.D.



ALTERNATE PHASING DIAGRAM



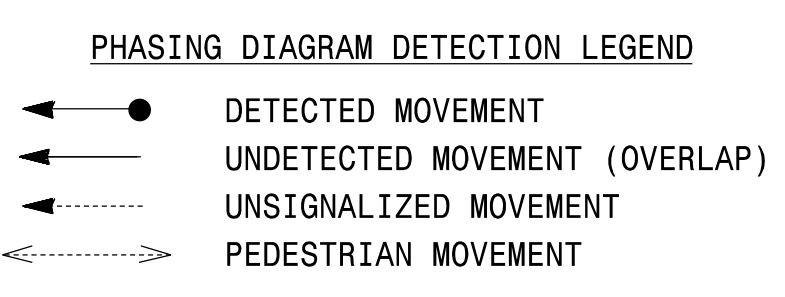
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4+8	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	F	F	FR	Y
61	F	F	FR	Y
62,63	R	G	R	Y
81,82	R	R	G	R
P41,P42	DW	DW	W	DRK

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

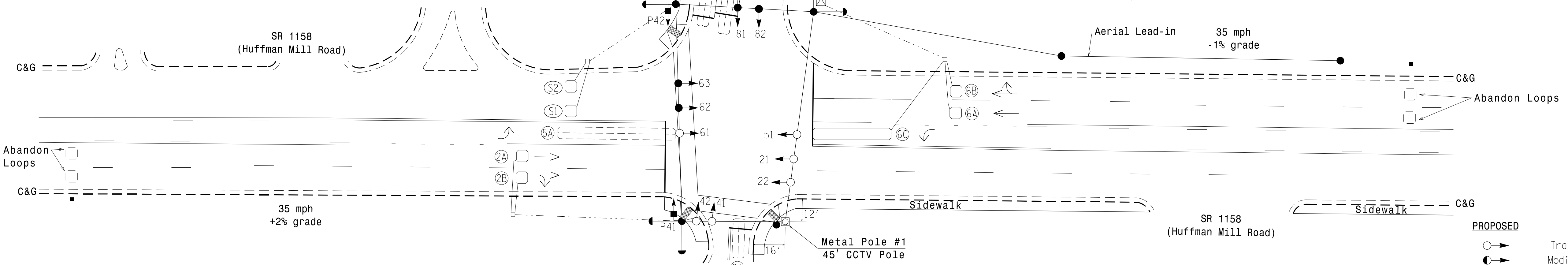
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 62 and 63.
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" time only.
9. Program pedestrian heads as to countdown the flashing "Don't Walk" time only.
10. Pavement markings are existing.
11. The City Traffic Engineer will determine the hours of use for each phasing plan.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A,2B	6X6	70	3	X	2	Yes	-	-	-	S	-	X
4A	6X60	+10	2-4-2	-	4	Yes	-	3	-	S	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	*15	-	S	-	X
5B	6X60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
6A,6B	6X6	70	3	X	6	Yes	-	-	-	S	-	X
6C	6X40	0	2-4-2	X	6	Yes	-	-	-	S	-	X
8A	6X20	+5	2-4-2	-	8	Yes	-	5	-	S	-	X
S1	6X6	+120	3	X	-	No	-	-	-	N	X	X
S2	6X6	+120	3	X	-	No	-	-	-	N	X	X

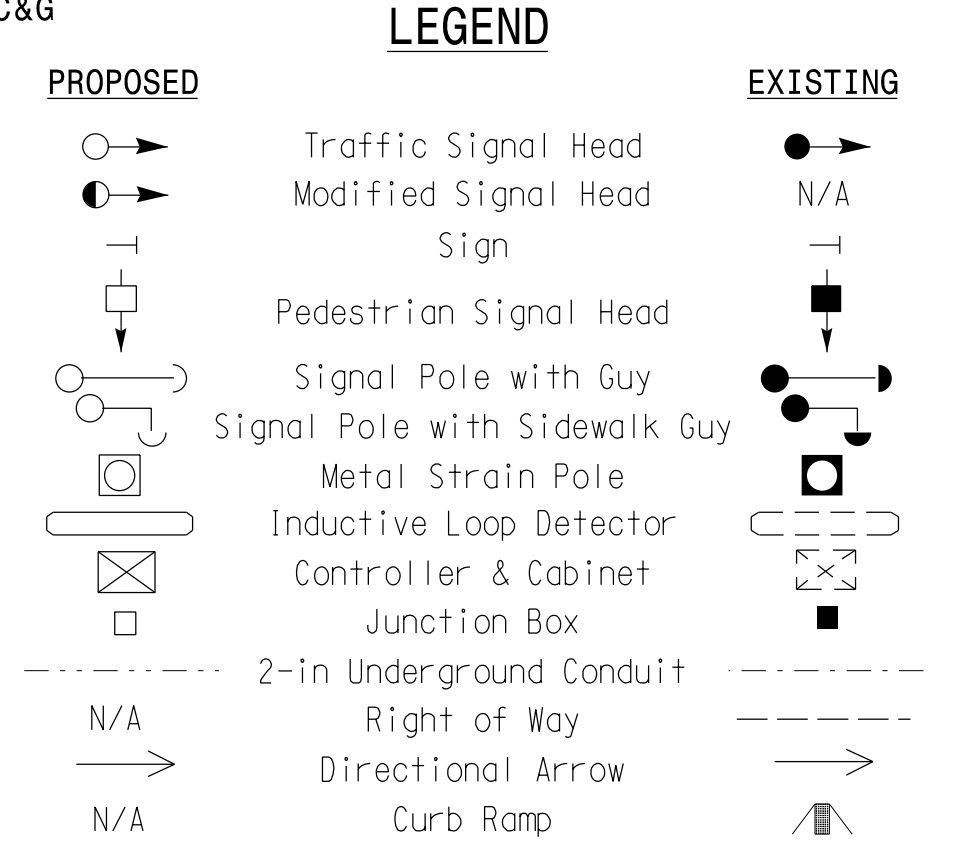
* Disable Delay During Alternate Phasing Operation.
 ** Disable Phase 2 Call For Loop 5A During Alternate Phasing Operation.



ASC/3 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green *	10	7	7	10	7
Walk *	0	4	0	0	0
Ped Clear	0	21	0	0	0
Veh. Extension *	4.0	3.0	2.0	4.0	2.0
Max I *	60	20	30	60	20
Yellow	3.9	3.7	3.0	3.9	3.0
Red Clear	1.3	1.9	1.8	1.3	2.8
Actuations B4 Add *	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Lacking Detector	X	-	-	X	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X

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



Signal Upgrade

Prepared For the Offices of:

SR 1158 (Huffman Mill Road) at Forestdale Drive/ The Brittany Apartments

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion

PREPARED BY: VJ Paul REVIEWED BY: PL Alexander

SCALE: 1"=30'

750 N. Greenfield Pkwy, Garner, NC 27529

Seal of the State of North Carolina, Professional Engineer, Pamela L. Alexander, License No. 023489, dated 6/7/2018.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

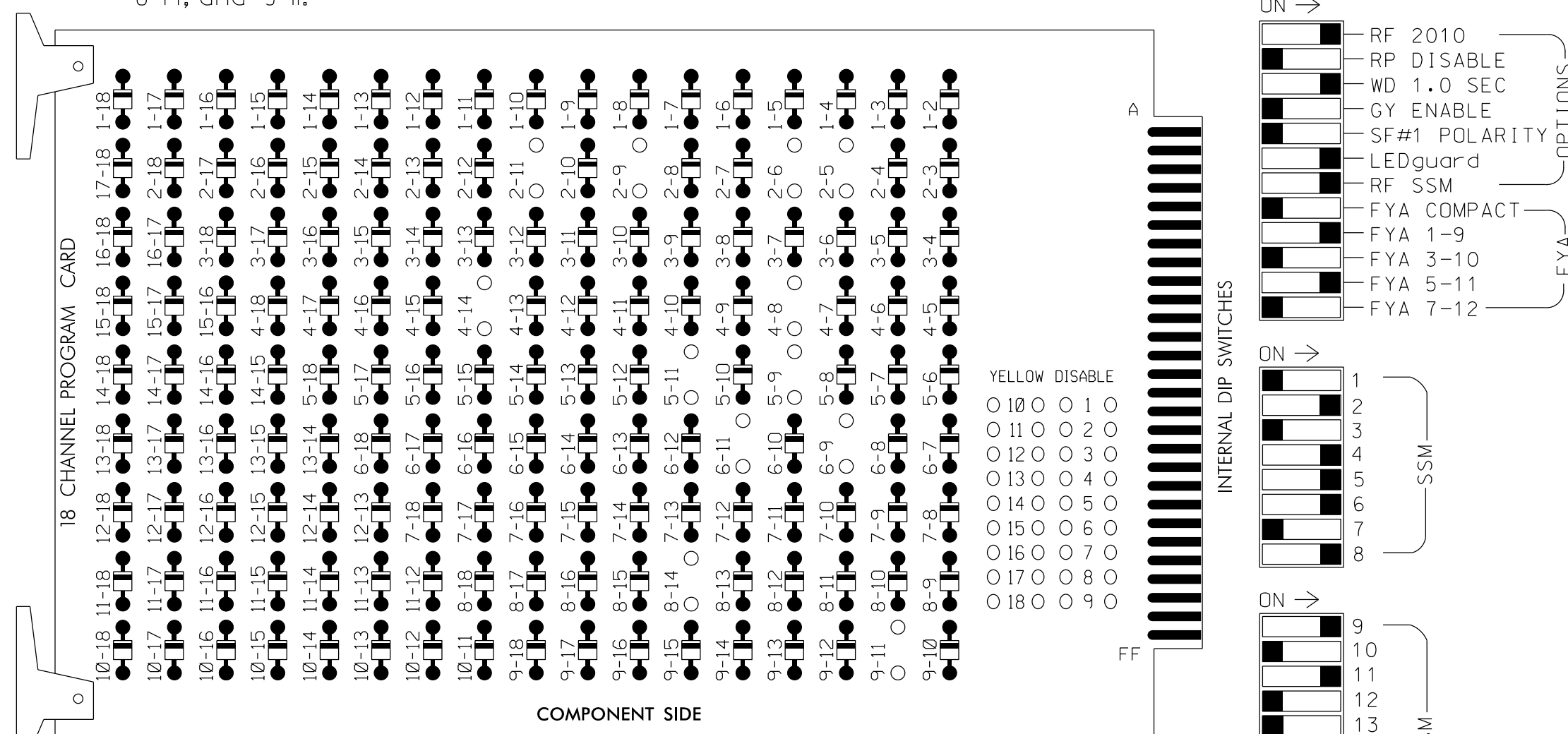
SIG. INVENTORY NO. 07-1026

07-JUN-2018 11:15 D:\Forsdorfer\atkins\proj\100056469 U-6015 B-G S19 SysTask 05_11_Signal\Des\gpm07-1026.dgn ALEX3361 AT LUS210649

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 4-8, 4-14, 5-9, 5-11, 6-9, 6-11, 8-14, 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.

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,S7,S8,S11,AUX S1
 AUX S4
 PHASES USED.....2,4,4PED,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	P41, P42	42	51	62,63	NU	NU	81,82	NU	61	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							132						A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							133	133										
Hand icon							104											
Person icon							106											

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 2	2A,2B	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	SYS. DET. S1	∅ 9	∅ 10	∅ 11	∅ 12	FS DC ISOLATOR
L	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	∅ 4 PED	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
U	∅ 5	∅ 6	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17
L	5A	5B	6A,6B	6C	7A	7B	7C	7D	7E	7F	7G	7H	7I	7J
	NOT USED	NOT USED	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

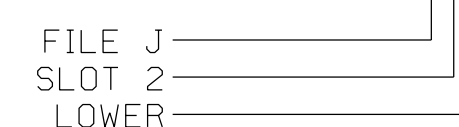
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A,2B	TB2-5,6	I2U	39	2	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A ¹	TB3-1,2	J1U	55	5	★	YES		15		S
	-	I4U	47	22	★	YES				S
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A,6B	TB3-9,10	J3U	64	36	6	YES				S
6C	TB3-11,12	J3L	77	46	6	YES				S
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					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT 112.

- * System detector only. Remove any assigned vehicle phase.
- ★ See the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

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

INPUT FILE POSITION LEGEND: J2L

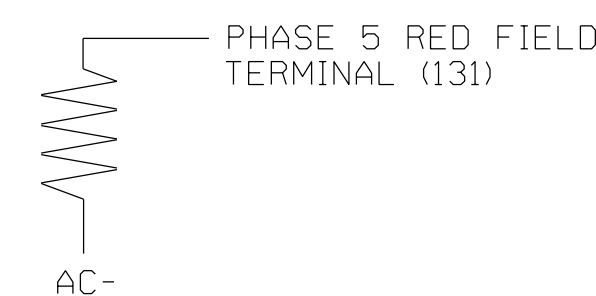


LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

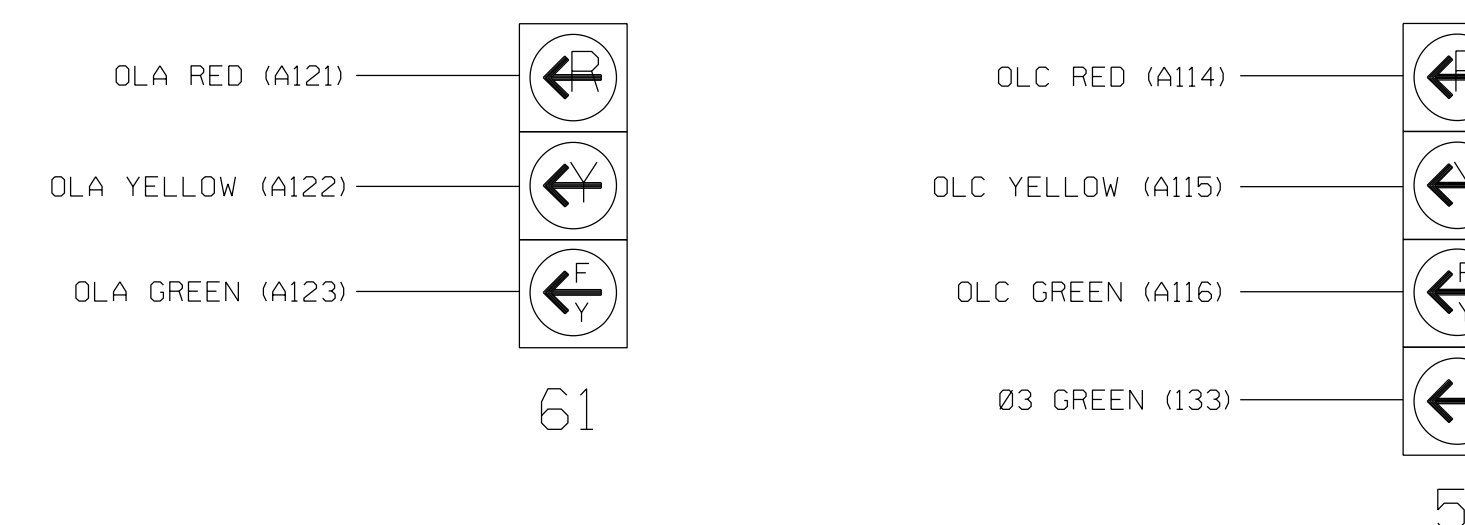
ACCEPTABLE VALUES

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1026
 DESIGNED: January 2018
 SEALED: 6/7/2018
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	SR 1158 (Huffman Mill Road) at Forestdale Drive/ The Brittany Apartments		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER SEAL 023489
	Division 7 PLAN DATE: January 2018 PREPARED BY: VJ Paul	Alameda County REVIEWED BY: AM Encarnacion REVIEWED BY: PL Alexander		Burlington DATE: 6/9/2018
REVISIONS		INIT.	DATE
PAMELA L. ALEXANDER		DATE: 6/9/2018	DATE
SIG. INVENTORY NO. 07-1026			

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

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

```

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

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

Toggle Twice

OVERLAP C

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

```

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

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

NOTICE ACTION
PLAN SF BIT "5"

END PROGRAMMING

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

IMPORTANT!

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

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

```

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

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

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

```

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

NOTICE VEH
DET PLAN 2

ENSURE DELAY
IS SET TO '0'

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

```

VEH DETECTOR [22] VEH DET PLAN [ 2]
 TYPE: S-STANDARD
 TS2 DETECTOR..... ECPI LOG..... NO
 DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0 . . . . .
 EXTEND TIME... 0.0 DELAY TIME... 0.0
 USE ADDED INITIAL . CROSS SWITCH PH.. 0
 LOCK IN..... NONE NTCIP VOL . OR OCC .
 PMT QUEUE DELAY. NO
    
```

NOTICE VEH
DET PLAN 2

ENSURE PHASE
IS SET TO "0"

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1026
DESIGNED: January 2018
SEALED: 6/7/2018
REVISED: N/A

END PROGRAMMING

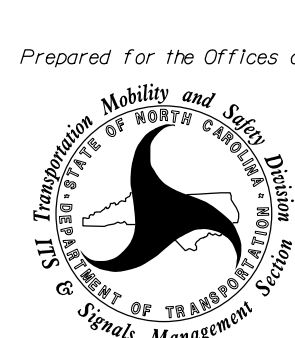
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 ALEX3361 AT LUS3361

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

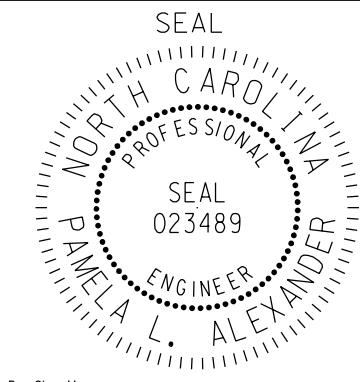
Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

SR 1158 (Huffman Mill Road) at Forestdale Drive/ The Brittany Apartments	
Division 7	Alamance County
PLAN DATE: January 2018	REVIEWED BY: AM Encarnacion
PREPARED BY: VJ Paul	REVIEWED BY: PL Alexander
REVISIONS	INIT. DATE

SEAL



SEAL
023489
PAMELA L. ALEXANDER
ENGINEER

6/9/2018
DATE

SIG. INVENTORY NO. 07-1026

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

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

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

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

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

```

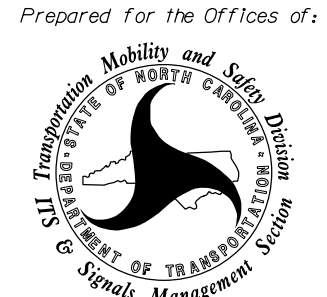
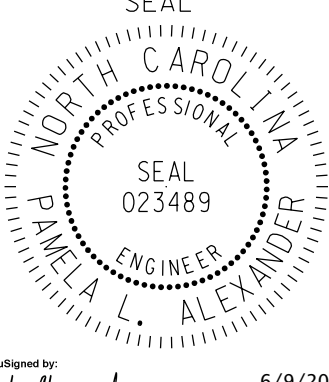
ACTION PLAN...[ 1]
PATTERN.....AUTO  SYS OVERRIDE.... NO
TIMING PLAN..... 0  SEQUENCE..... 0
VEH DETECTOR PLAN.. 2  DET LOG.....NONE
FLASH..... --  RED REST..... NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE.. NO  PRIORITY RETURN. NO
PED PR RETURN.. NO  QUEUE DELAY..... NO
PMT COND DELAY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

```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1026
DESIGNED: January 2018
SEALED: 6/7/2018
REVISED: N/A

Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	SR 1158 (Huffman Mill Road) at Forestdale Drive/ The Brittany Apartments		
	Division 7 Alamance County Burlington	PLAN DATE: January 2018 REVIEWED BY: AM Encarnacion PREPARED BY: VJ Paul REVIEWED BY: PL Alexander	
REVISIONS DATE INIT. DATE		6/9/2018 Pamela Alexander DATE	
		SIG. INVENTORY NO. 07-1026	

METAL POLE No. 1

STRAIN POLE LOADING SCHEDULE					
SYMBOL	LOADING	DESCRIPTION	AREA	SIZE	WEIGHT
← 5		SIGNAL HEAD 12"-5 SECTION WITH BACKPLATE, HANGER AND BALANCE ADJUSTER	16.3 S.F.	42.0" W X 56.0" L	103 LBS
← 4		SIGNAL HEAD 12"-4 SECTION WITH BACKPLATE, HANGER AND BALANCE ADJUSTER	11.5 S.F.	25.5" W X 66.0" L	74 LBS
← 3		SIGNAL HEAD 12"-3 SECTION WITH BACKPLATE, HANGER AND BALANCE ADJUSTER	9.3 S.F.	25.5" W X 52.5" L	60 LBS
—		STREET NAME SIGN WITH HANGER	16.0 S.F.	24.0" W X 96.0" L	36 LBS

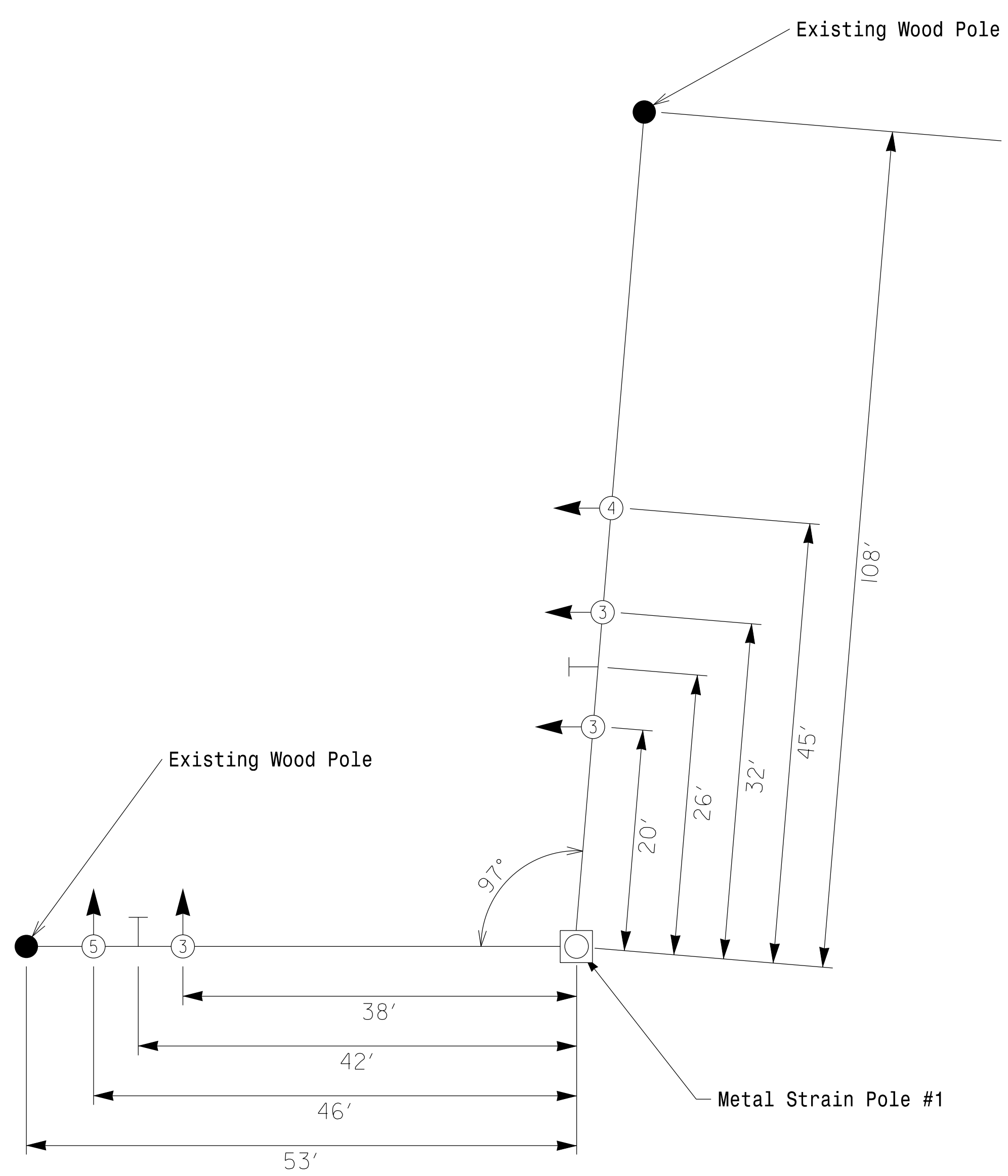
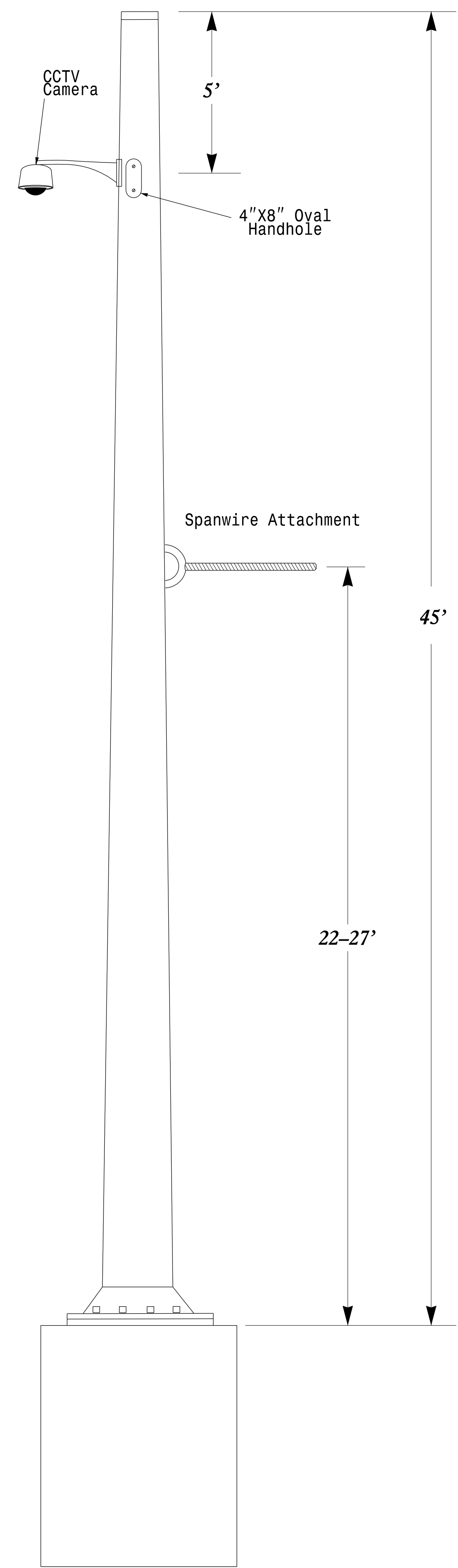
NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2018 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the plan view. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal support using stress ratios that do not exceed 0.9.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- Design 2 cable clamps for variable attachment height between 22 and 27 feet.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



NCDOT Wind Zone 4 (90 mph) Strain Pole Loading Detail

	SR 1158 (Huffman Mill Road)		
	at Forestdale Drive/ The Brittany Apartments		
Division 7	Alamance County	Burlington	
PLAN DATE: January 2018	REVIEWED BY: AM Encarnacion		
PREPARED BY: VJ Paul	REVIEWED BY: PL Alexander		
SCALE	REVISIONS	INIT.	DATE
NTS			

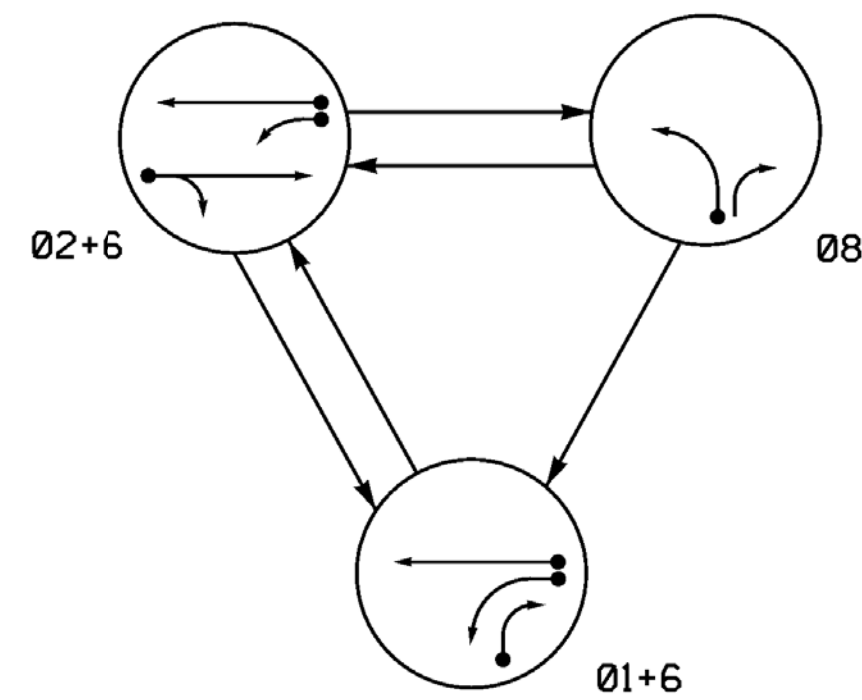
750 N. Greenfield Pkwy, Garner, NC 27529

6/7/2018
Pamela Alexander
DATE

SIG. INVENTORY NO. 07-1026

07-JUN-2018 11:15
 ***DOT/ITS-COM/Project/ISRLA/Transportation/Traffic/Curr#00056469 U-6015 B-6 Sig Sys*Task 05-11-15 Signal is 06as 09M07-1026mp.dgn
 ALEX3361 AT LUS210649

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	01+6	02+6	08	FLASH
11	-	Y	R	Y
21, 22	R	G	R	Y
81	R	R	G	R
82	R	R	G	R
61, 62	G	G	R	Y

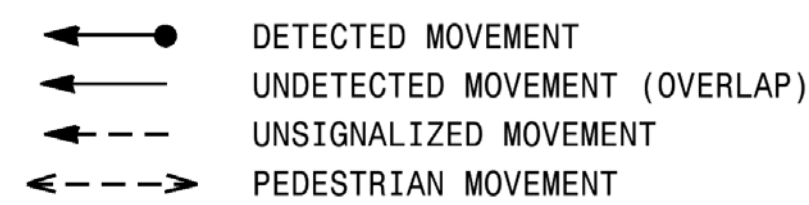
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW LOOP
1A	6x60	+5	2-4-2	-	1	Yes	-	15	-	S	- X
					6	Yes	-	3	-	G	- X
1B	6x60	+10	2-4-2	-	1	Yes	-	15	-	S	- X
2A	6x6	330	EXIST.	-	2	Yes	-	-	X	N	- X
6A	6x6	330	EXIST.	-	6	Yes	-	-	X	N	- X
8A	6x60	+10	2-4-2	-	8	Yes	-	3	-	S	- X
SI	6x6	+230	EXIST.	-	-	No	-	-	-	N	X X

3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

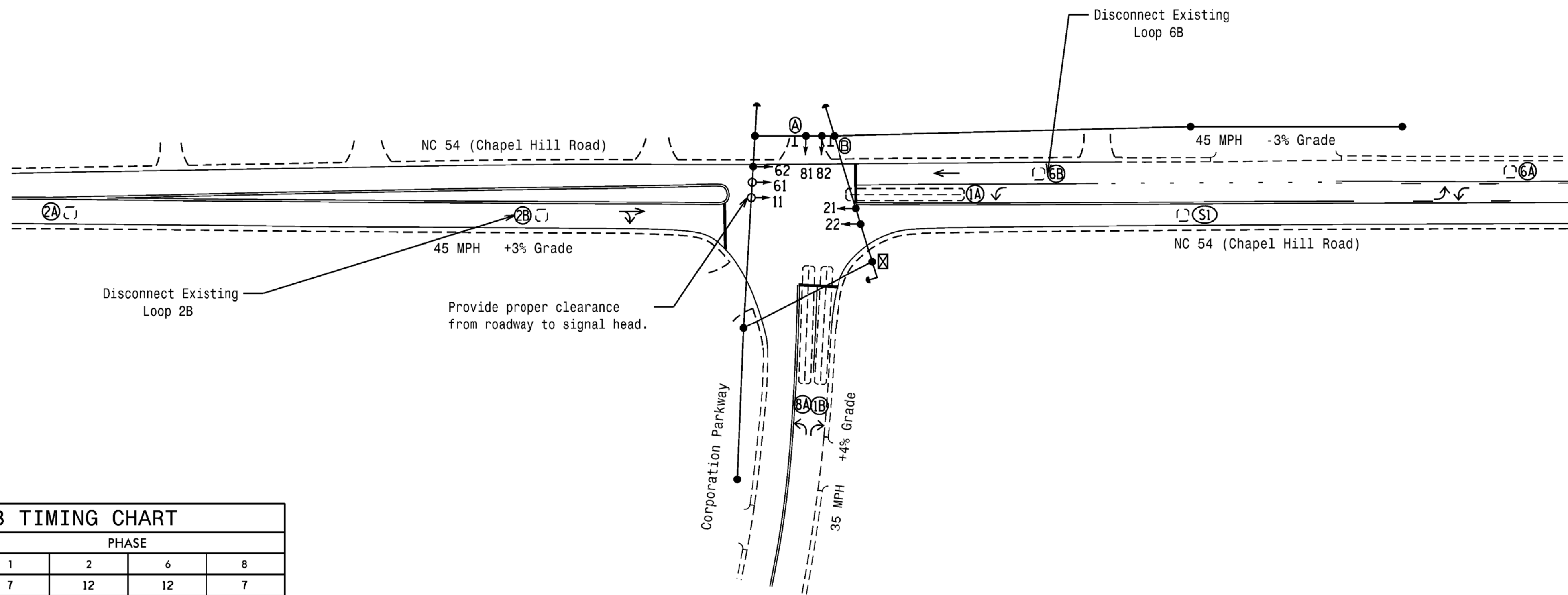
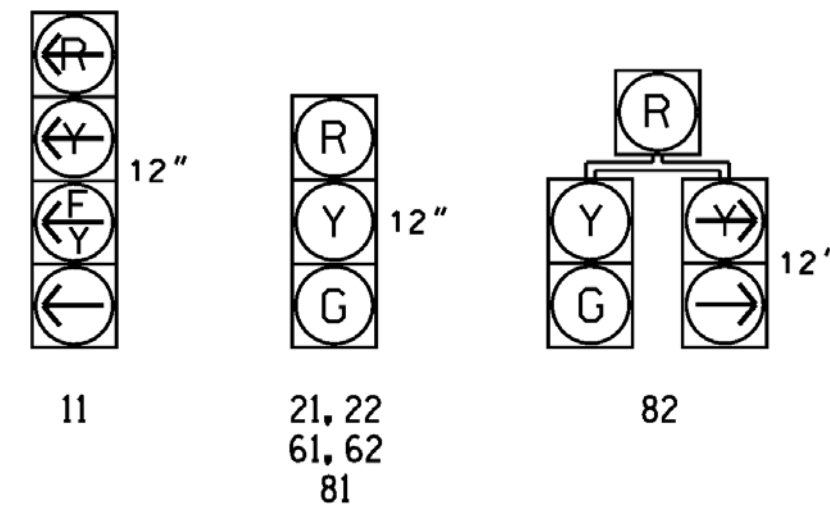
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal head numbered 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. Remove existing "Left Turn Yield on Green" ball sign (R10-12).
9. Existing lane control signs (R3-5L and R3-5R) may be removed at the discretion of the Regional Traffic Engineer.
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.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.

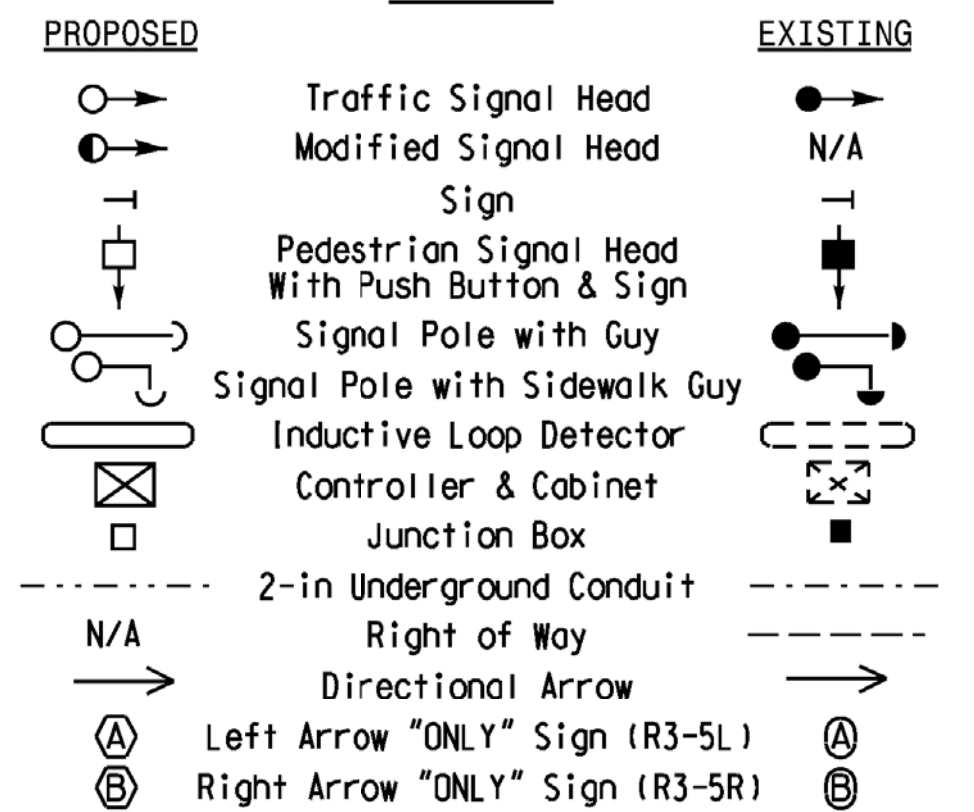


ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	1.0	6.0	6.0	1.0
Max 1 *	15	90	90	25
Yellow	3.0	4.8	4.8	3.0
Red Clear	1.4	1.0	1.0	2.1
Actuations B4 Add *	-	0	0	-
Seconds / Actuation *	-	2.5	2.5	-
Max Initial *	-	37	37	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
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



Mattern & Craig
ENGINEERS • SURVEYORS

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

Signal Upgrade

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC 54 (Chapel Hill Road) at Corporation Parkway

Division 7 Alamance County Burlington

PLAN DATE: January 2018 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS INIT. DATE

SEAL
JAMES B. VOSO
ENGINEER
6/13/2018
SIG. INVENTORY NO. 07-1030

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

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

OVERLAP A

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

```

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-1030
 DESIGNED: January 2018
 SEALED: 6/13/2018
 REVISED: NA

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
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 SIGNATURES COMPLETED



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 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 (Chapel Hill Road) at Corporation Parkway	
Division 7	Alamance County
PLANNED BY: SE Greene	REVIEWED BY: JB Voso
PREPARED BY: SE Greene	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL



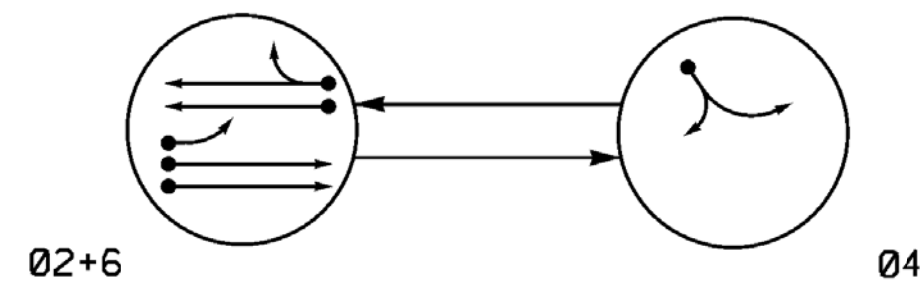
James Voso 6/13/2018

DATE

SIG. INVENTORY NO. 07-1030

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

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD
2A	6x20	300	EXIST.	-	2	Yes	-	-	X	N	- X
4A	6x40	+5	2-4-2	-	4	Yes	-	5	-	S	- X
6A	6x20	300	EXIST.	-	6	Yes	-	-	X	N	- X
S1	6x6	+150	4	X	-	No	-	-	-	N	X X
S2	6x6	+150	4	X	-	No	-	-	-	N	X X

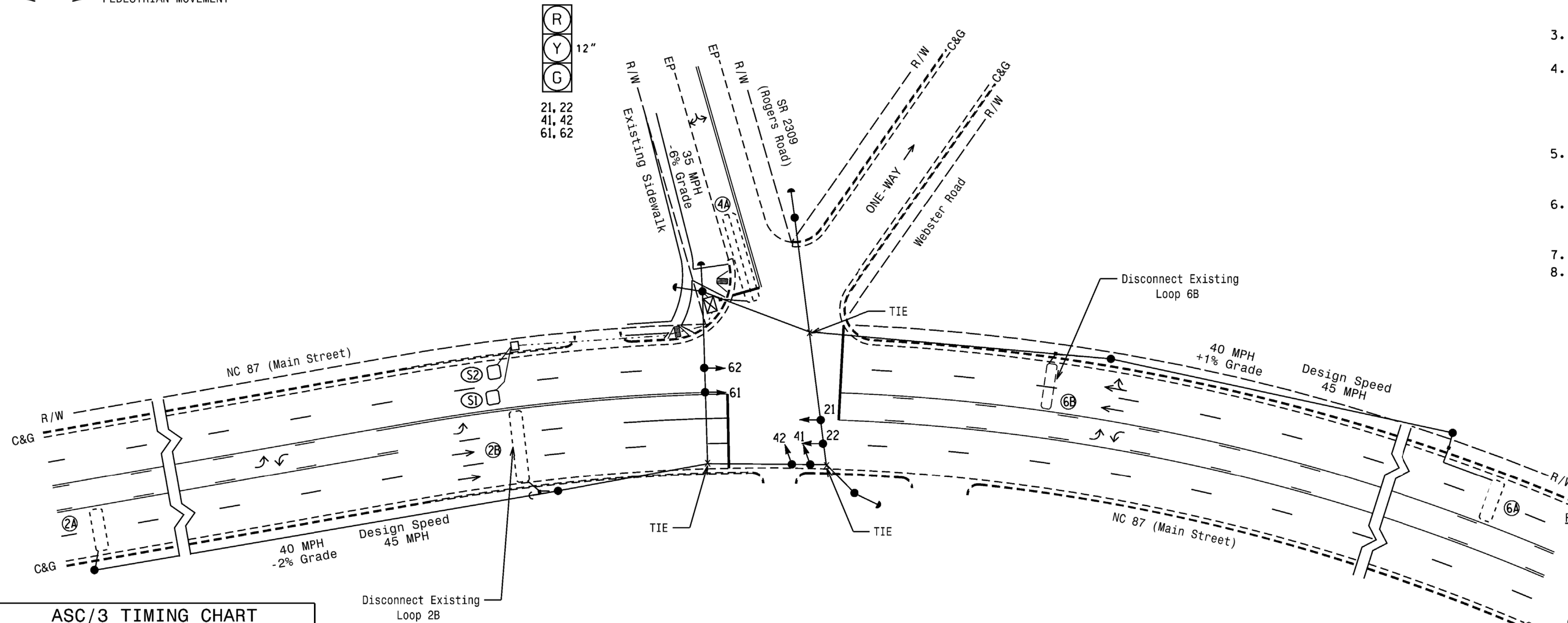
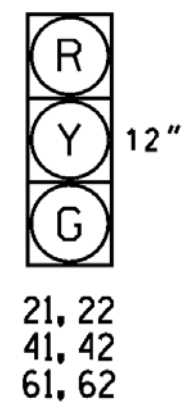
2 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 TIMING CHART

FEATURE	PHASE		
	2	4	6
Min Green *	12	7	12
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	6.0	1.0	6.0
Max I *	90	20	90
Yellow	4.7	3.1	4.4
Red Clear	1.0	2.6	1.0
Actuations B4 Add *	0	-	0
Seconds / Actuation *	1.5	-	1.5
Max Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	45	-	45
Minimum Gap	3.0	-	3.0
Locking Detector	X	-	X
Recall Position	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

LEGEND

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

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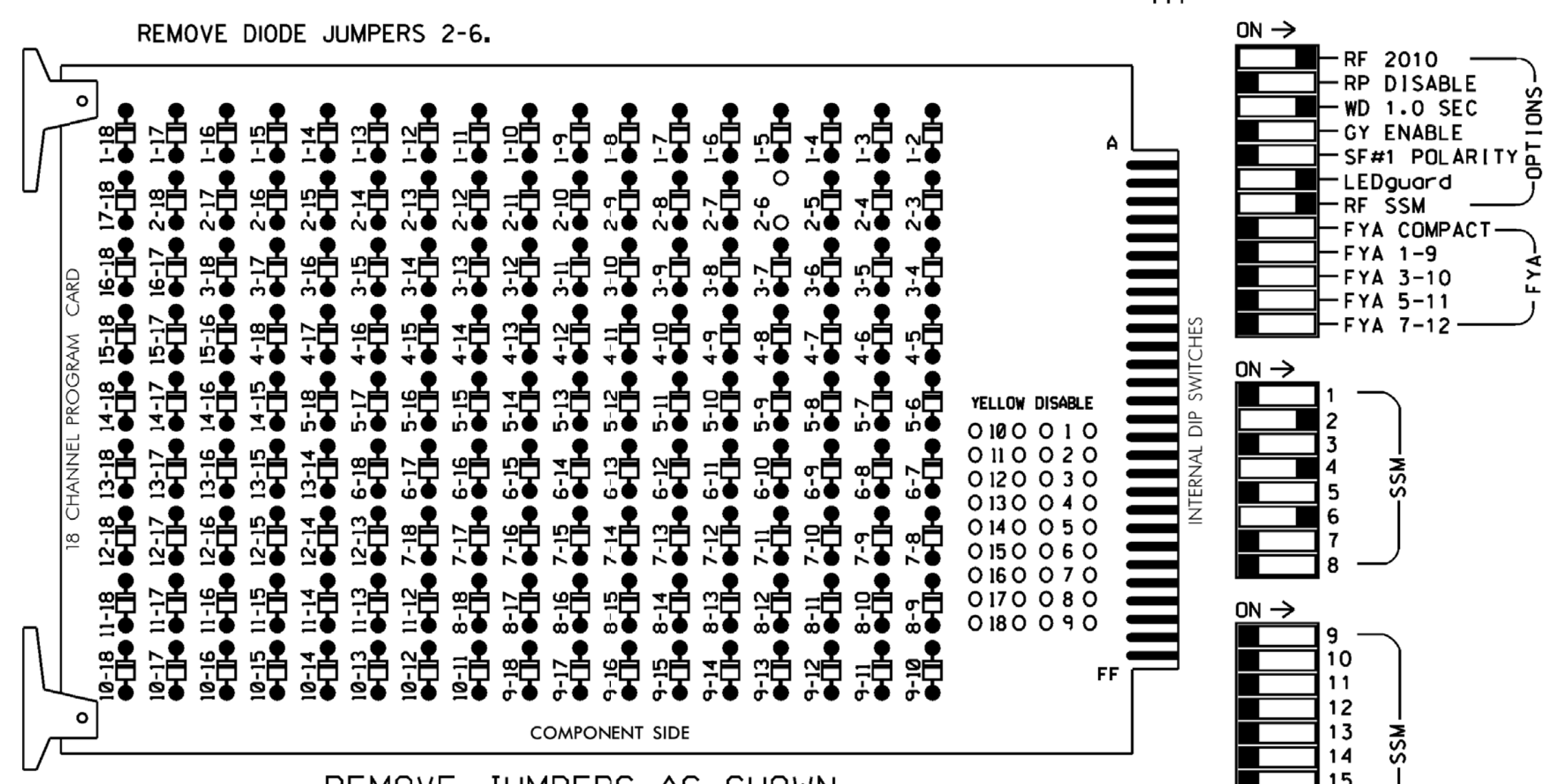
Signal Upgrade

	NC 87 (Main Street) at SR 2309 (Rogers Road) / Webster Road Division 7 Alamance County Graham		
	PLAN DATE: March 2018 PREPARED BY: SE Greene	REVIEWED BY: JB Voso REVIEWED BY:		SCALE: 1"=30' 0 30 1"=30'
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
SIG. INVENTORY NO. 07-1038			

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

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

SIGNAL HEAD HOOK-UP CHART

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

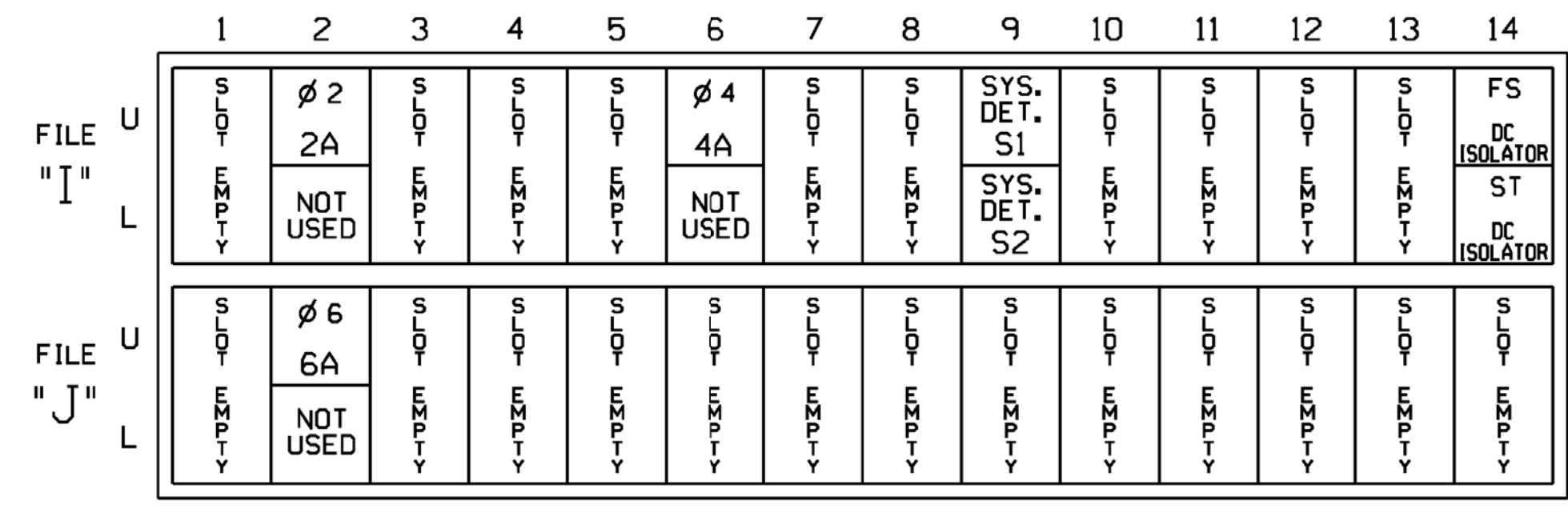
NU = Not Used

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)



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

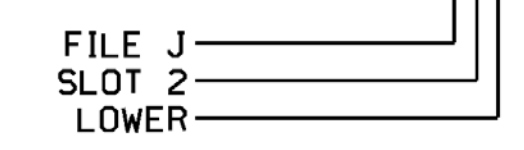
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

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

* System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1038
 DESIGNED: March 2018
 SEALED: 6/13/2018
 REVISED: NA

*****SYTIME*****

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

Electrical Detail

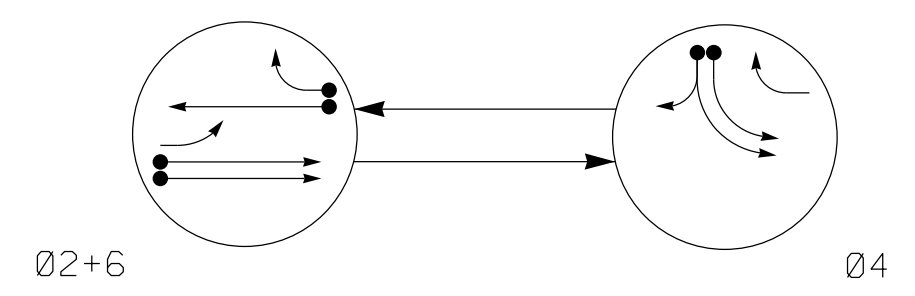
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022599
 JAMES B. VOSE

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

James Voso 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-1038

PHASING DIAGRAM



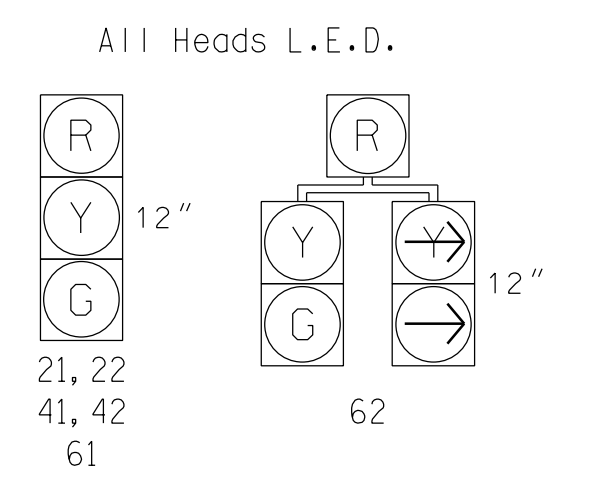
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

SIGNAL FACE I.D.



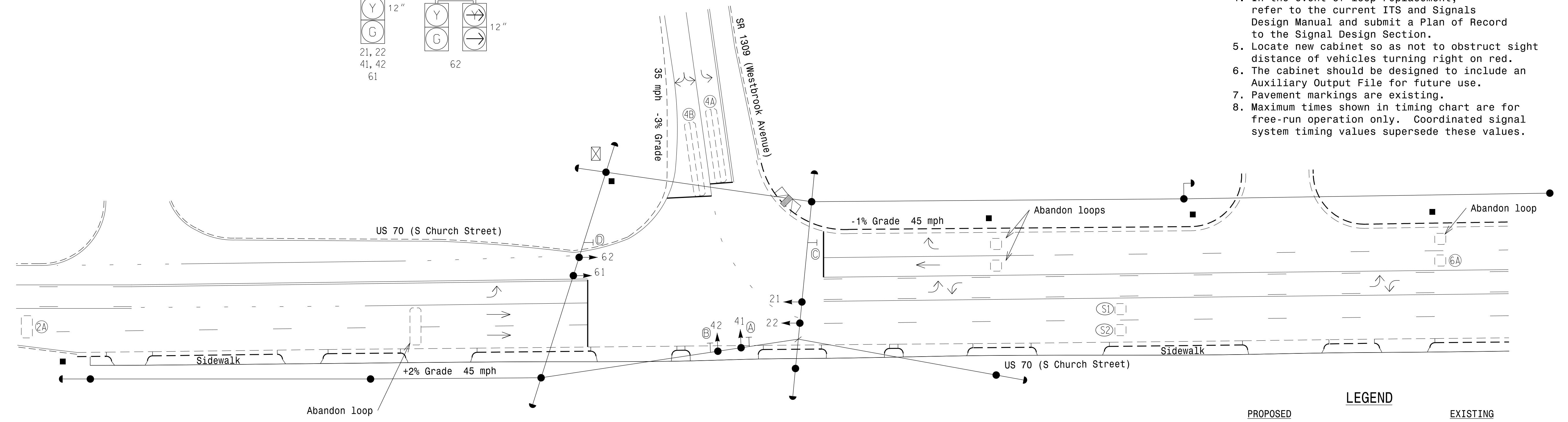
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A	6X12	300	EXIST	-	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	10	-	S	-	X
6A	6X6	330	EXIST	-	6	Yes	0.5	-	X	N	-	X
S1	6X6	+270	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+270	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.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE		
	2	4	6
Min Green *	12	7	12
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	6.0	2.0	6.0
Max 1 *	90	40	90
Yellow	4.3	3.0	4.6
Red Clear	1.9	2.8	1.3
Actuations B4 Add *	0	-	0
Seconds /Actuation *	2.0	-	2.5
Max Initial *	34	-	37
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

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

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
◐→ Modified Signal Head	◐→ N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head	⊥ Pedestrian Signal Head
⊥ With Push Button & Sign	⊥ With Push Button & Sign
○ Signal Pole with Guy	● Signal Pole with Guy
⊥ Signal Pole with Sidewalk Guy	⊥ Signal Pole with Sidewalk Guy
▭ Inductive Loop Detector	▭ Inductive Loop Detector
⊗ Controller & Cabinet	⊗ Controller & Cabinet
□ Junction Box	□ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
N/A Curb Ramp	▲ Curb Ramp
Ⓐ Left Arrow "ONLY" Sign (R3-5L)	Ⓐ Left Arrow "ONLY" Sign (R3-5L)
Ⓑ Dual Turn Arrows Sign	Ⓑ Dual Turn Arrows Sign
Ⓒ Right Arrow "ONLY" Sign (R3-5R)	Ⓒ Right Arrow "ONLY" Sign (R3-5R)
Ⓓ "RIGHT LANE MUST TURN RIGHT" Sign (R3-7)	Ⓓ "RIGHT LANE MUST TURN RIGHT" Sign (R3-7)

07-JUN-2018 11:15
 SIGNALING DESIGN SECTION
 ALEX3361 AT LUS250649
 U-6015 B-0 Sigs Task 05.11.15 Signal is 0605 0907-1049-dgn

Signal Upgrade

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 70 (S. Church Street) at SR 1309 (Westbrook Avenue)

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'

DATE: 6/7/2018

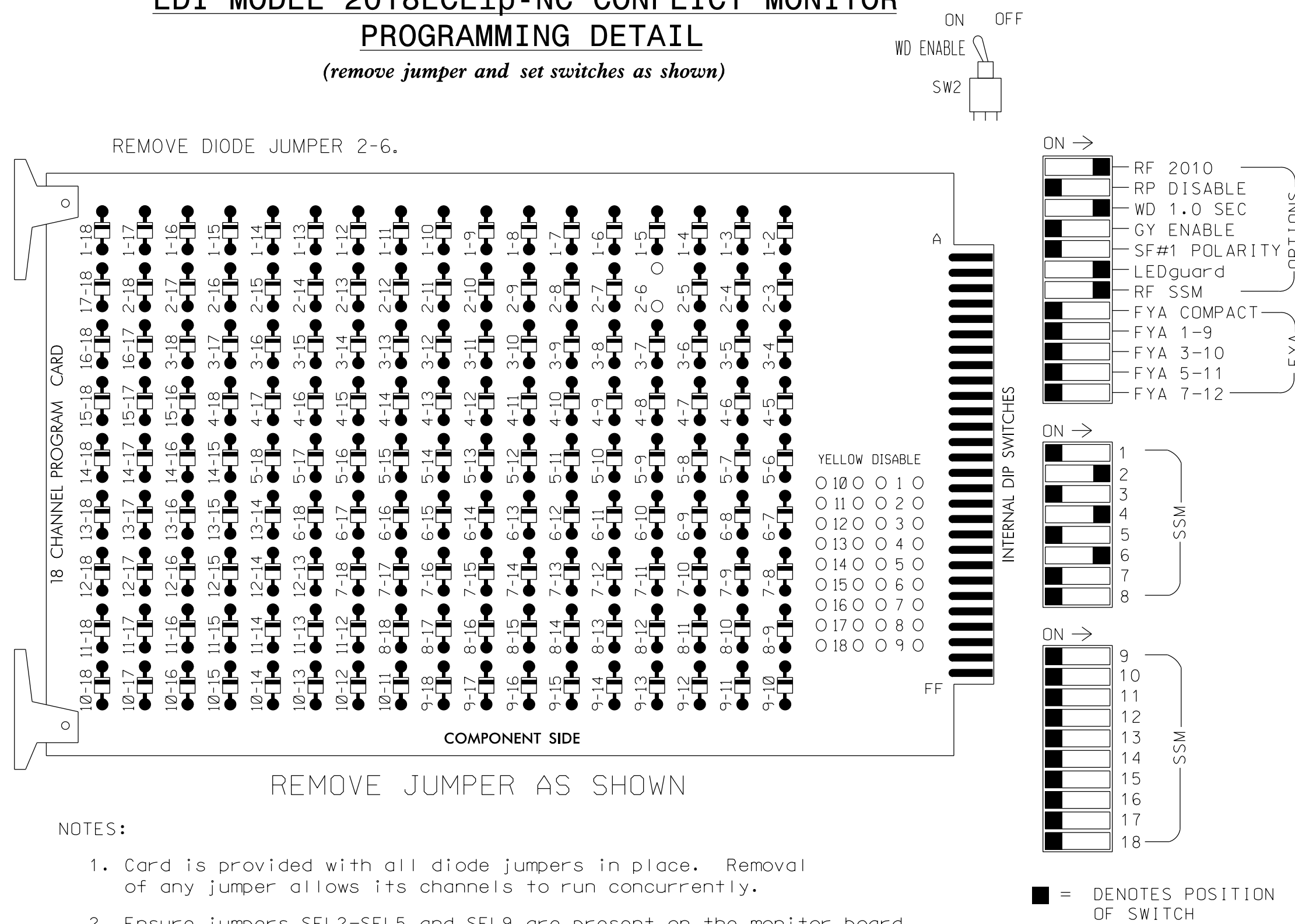
Signature: Pamela Alexander

SIG. INVENTORY NO. 07-1049

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONDLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8
 PHASES USED.....2,4,6
 OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-6015	Fig. 97.1

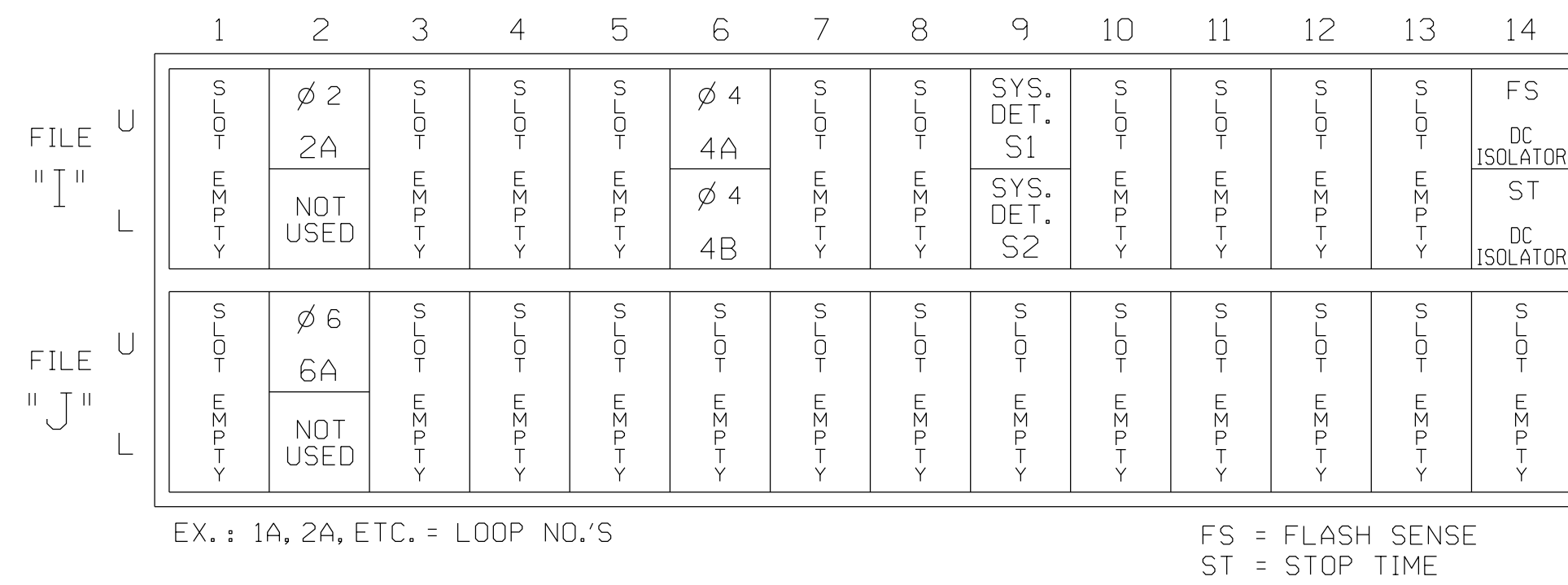
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101				134									
YELLOW		129			102				135									
GREEN		130			103				136									
RED ARROW																		
YELLOW ARROW					123													
GREEN ARROW					124													

NU = Not Used

INPUT FILE POSITION LAYOUT

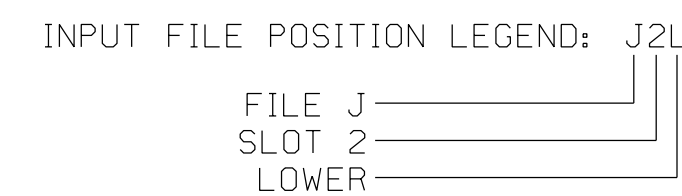
(front view)



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			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES	0.5		X	N

* System detector only. Remove any assigned vehicle phase.

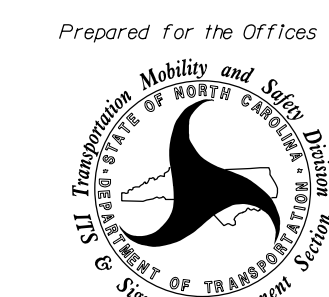


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1049
 DESIGNED: December 2017
 SEALED: 6/7/2018
 REVISED: N/A

09-JUN-2018 14:14 ***SIGNALS.COM***C:\Users\alexa\Documents\TransportationTrafficControl\Curran\00056469 U-6015 B-0 Sig Sys\Task 05-11-15\Signal\00056469.dgn ALEX3361 AT LUS33069

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

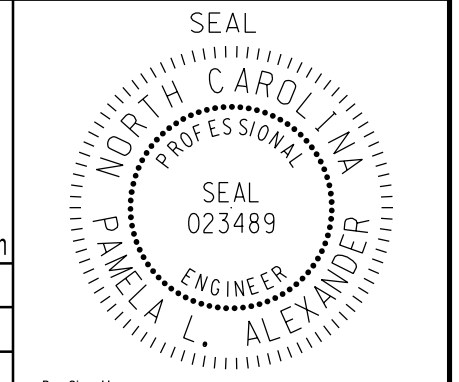


US 70 (S. Church Street)
 at
 SR 1309 (Westbrook Avenue)

Division 7 Alamance County Burlington
 PLAN DATE: December 2017 REVIEWED BY: MB Toth
 PREPARED BY: PL Alexander REVIEWED BY:

REVISIONS	INIT.	DATE

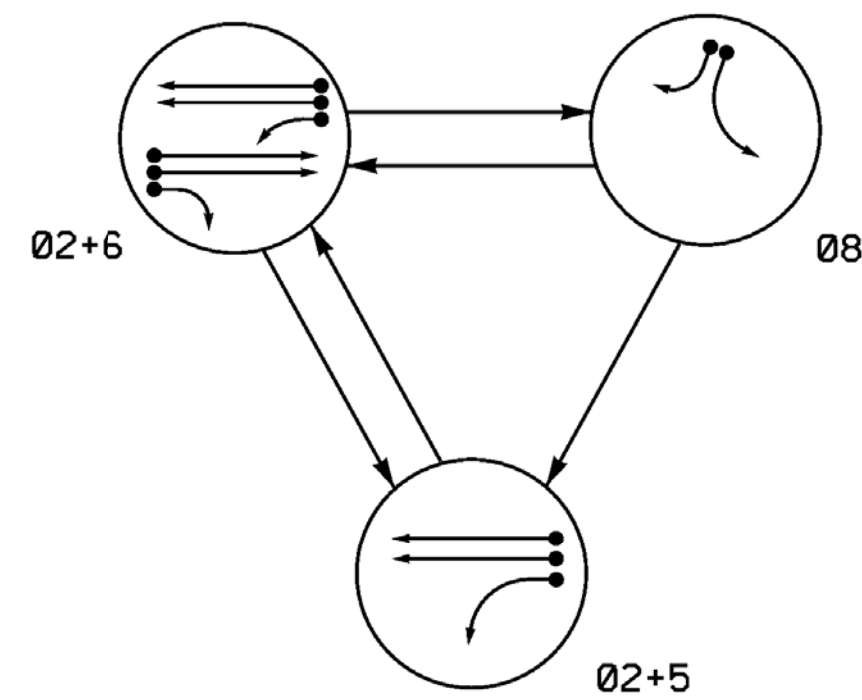
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



6/9/2018
 DATE
 SIG. INVENTORY NO. 07-1049

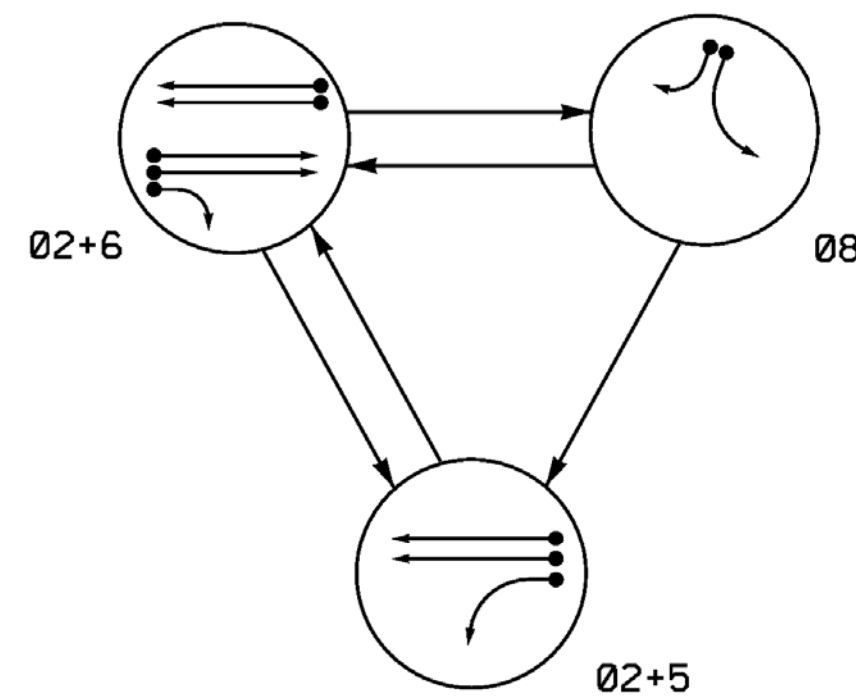
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 160
 RALEIGH, NORTH CAROLINA 27609
 (919) 876-6888 NCBEE #F-0326

DEFAULT PHASING DIAGRAM



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

ALTERNATE PHASING DIAGRAM



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

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP NEW CARD
2A	6x20	300	EXIST.	-	2	Yes	-	-	X	N	- X
5A	6x60	+5	2-4-2	-	5	Yes	-	15*	-	S	- X
6A	6x20	300	EXIST.	-	6	Yes	-	3	-	G	- X
8A	6x60	+5	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 X
S2	6x6	+150	4	X	-	No	-	-	-	N	X X

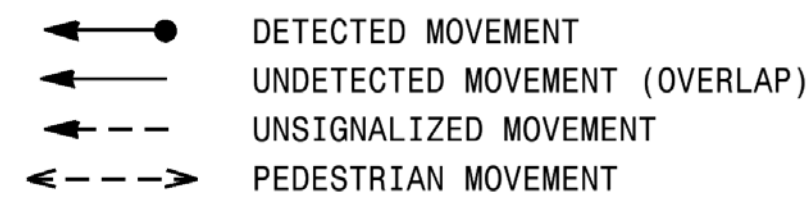
* Disable Delay During Alternate Phasing Operation
 ** Disable Phase 2 Call for Loop 5A during Alternate Phasing Operation.

3 Phase Fully Actuated (Burlington-Graham Signal System)

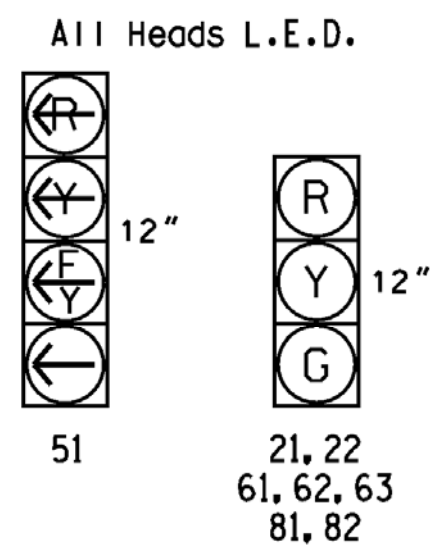
NOTES

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

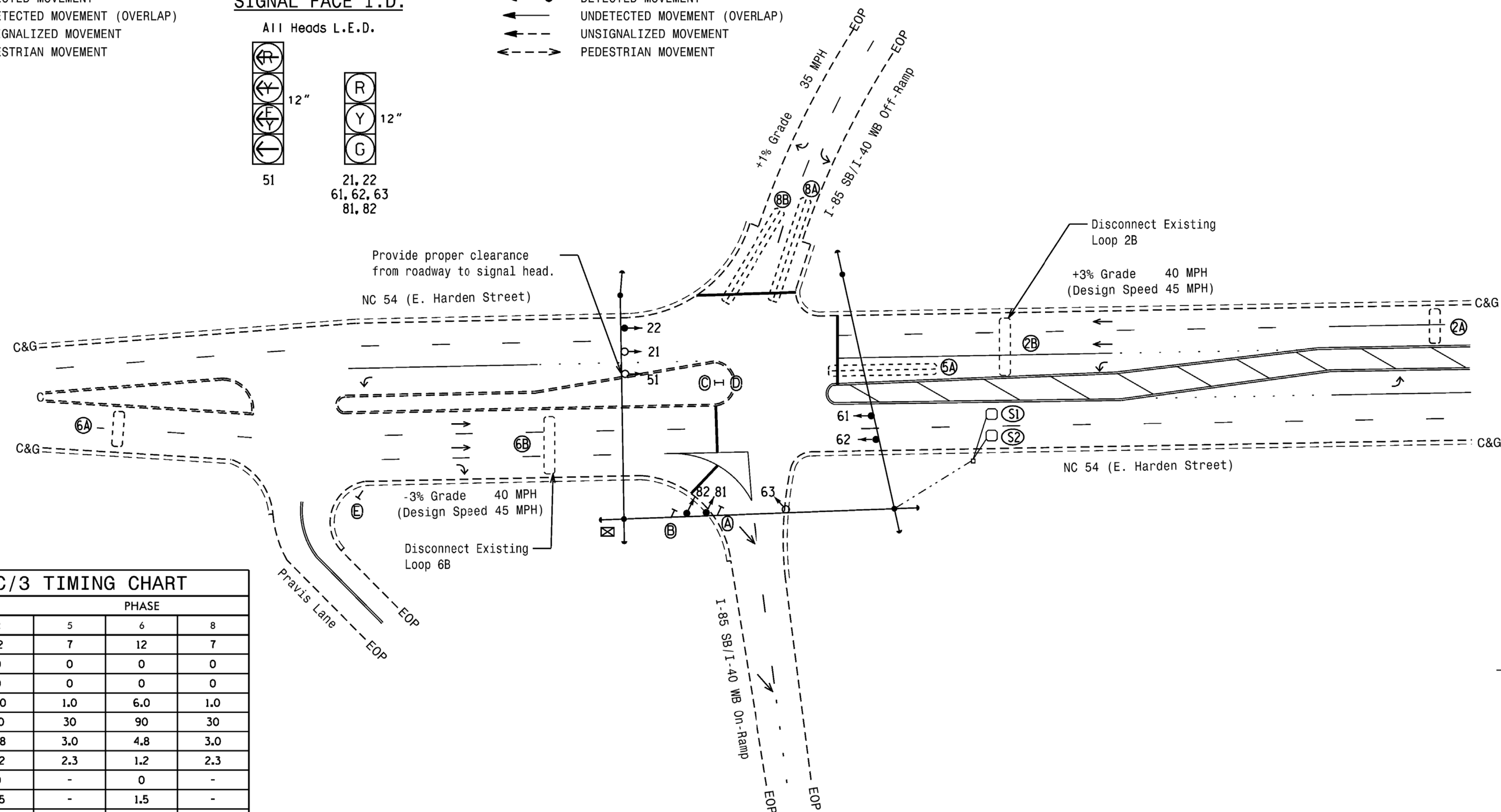
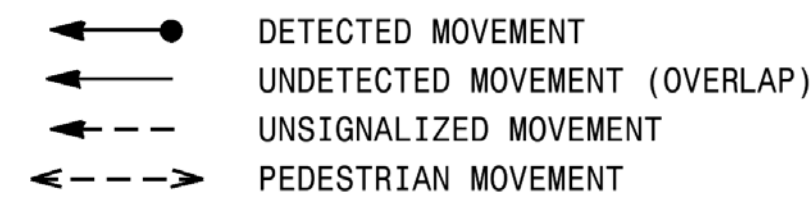
PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.



PHASING DIAGRAM DETECTION LEGEND



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Min Green *	12	7	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	1.0	6.0	1.0
Max 1 *	90	30	90	30
Yellow	4.8	3.0	4.8	3.0
Red Clear	1.2	2.3	1.2	2.3
Actuations 34 Add *	0	-	0	-
Seconds / Actuation *	1.5	-	1.5	-
Max Initial *	34	-	34	-
Time Before Reduction *	30	-	30	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

PROPOSED		EXISTING	
	Traffic Signal Head		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
	Right of Way		Right of Way
	Directional Arrow		Directional Arrow
	Left Arrow "ONLY" Sign (R3-5L)		Left Arrow "ONLY" Sign (R3-5L)
	Right Arrow "ONLY" Sign (R3-5R)		Right Arrow "ONLY" Sign (R3-5R)
	No Left Turn Sign (R3-2)		No Left Turn Sign (R3-2)
	Keep Right Sign (R4-7A)		Keep Right Sign (R4-7A)
	"STOP" Sign (R1-1)		"STOP" Sign (R1-1)

*****SYTIME*****
 *****USERNAME*****



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 I-85 SB/I-40 WB Ramps

Division 7 Alamance County Graham

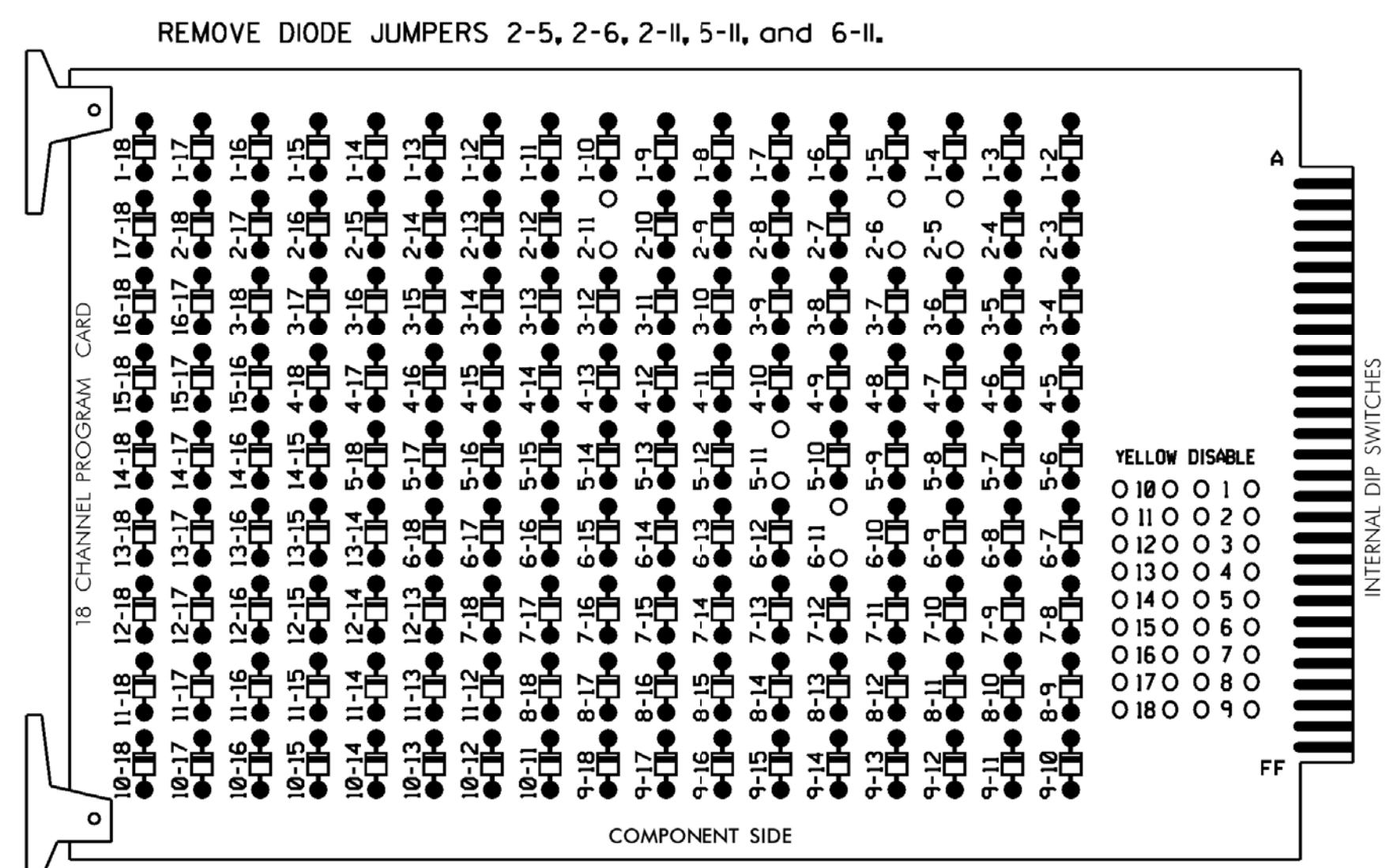
PLAN DATE: March 2018 REVIEWED BY: JB Voso
 PREPARED BY: SE Greene REVIEWED BY:

REVISIONS: INIT. DATE

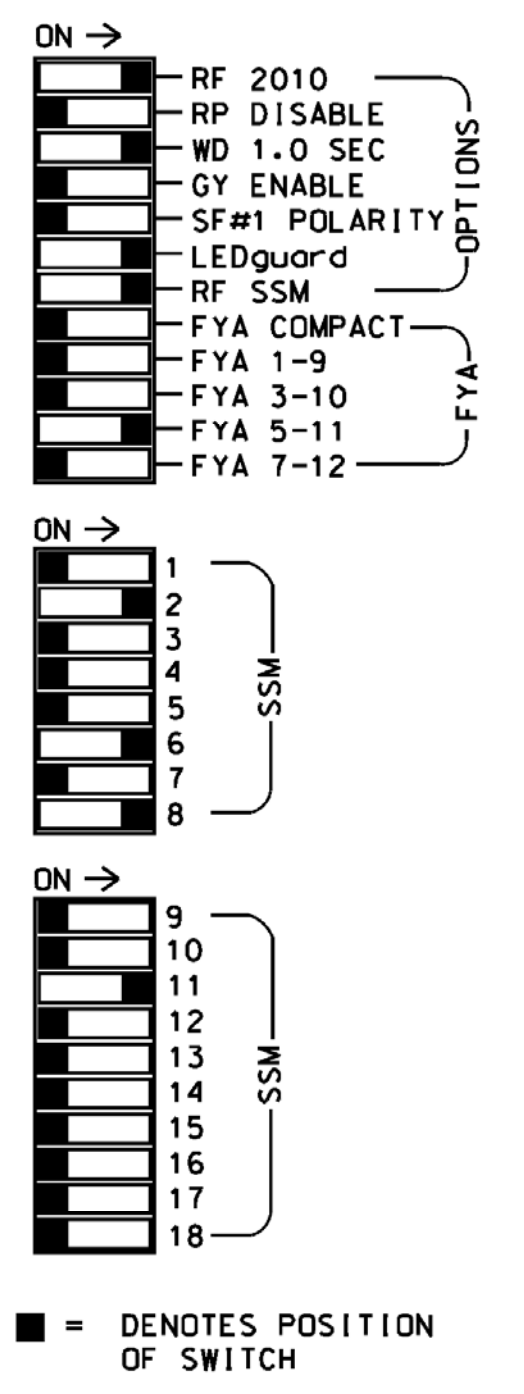
SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 JAMES B. VOSO
 022599
 6/13/2018
 SIG. INVENTORY NO. 07-1051

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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



NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 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 on sheet 2

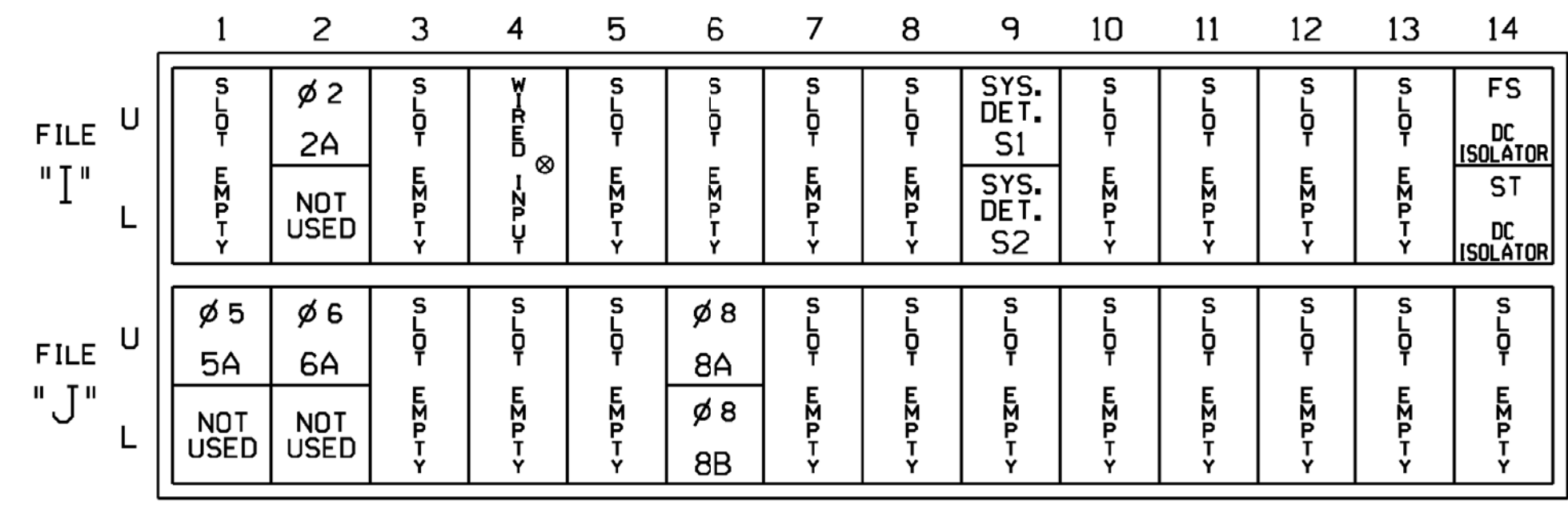
SIGNAL HEAD HOOK-UP CHART

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	
P-HASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62,63	NU	NU	81,82	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.

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

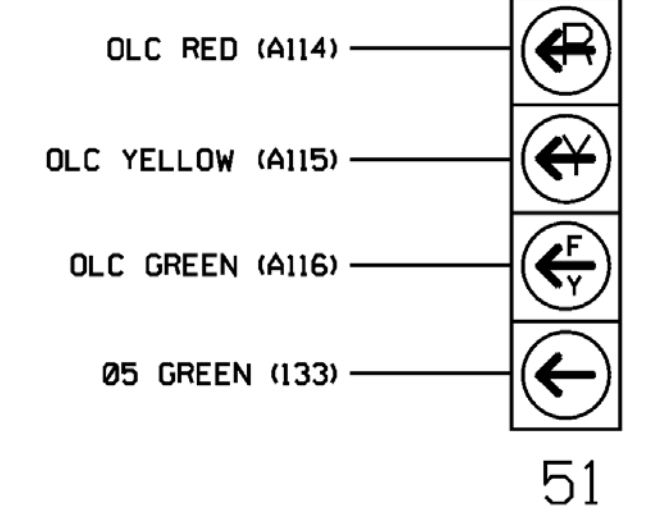
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES		10		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N

- ¹Add jumper from J1-W to I4-W, on rear of input file.
 * For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 3.
 * System detector only. Remove any assigned vehicle phase.
- INPUT FILE POSITION LEGEND: J2L
- FILE J
 SLOT 2
 LOWER

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

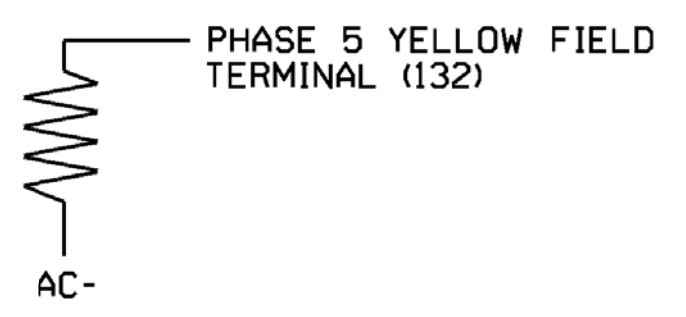


LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

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



Mattern & Craig
 ENGINEERS • SURVEYORS

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

Electrical Detail - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

150 N. Greenfield Pkwy, Corner, NC 27529

NC 54 (E. Harden Street) at I-85 SB/I-40 WB Ramps

Division 7 Alamance County Graham

PLAN DATE: March 2018 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS

NO.	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

James Voso
 6/13/2018
 DATE

SIG. INVENTORY NO. 07-1051

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

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

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

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

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

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




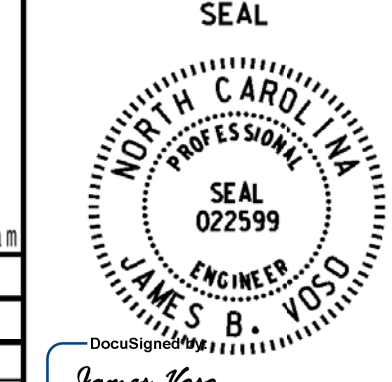
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12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562
NC LIC. NO. C-1154

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1051
DESIGNED: March 2018
SEALED: 6/13/2018
REVISED: NA

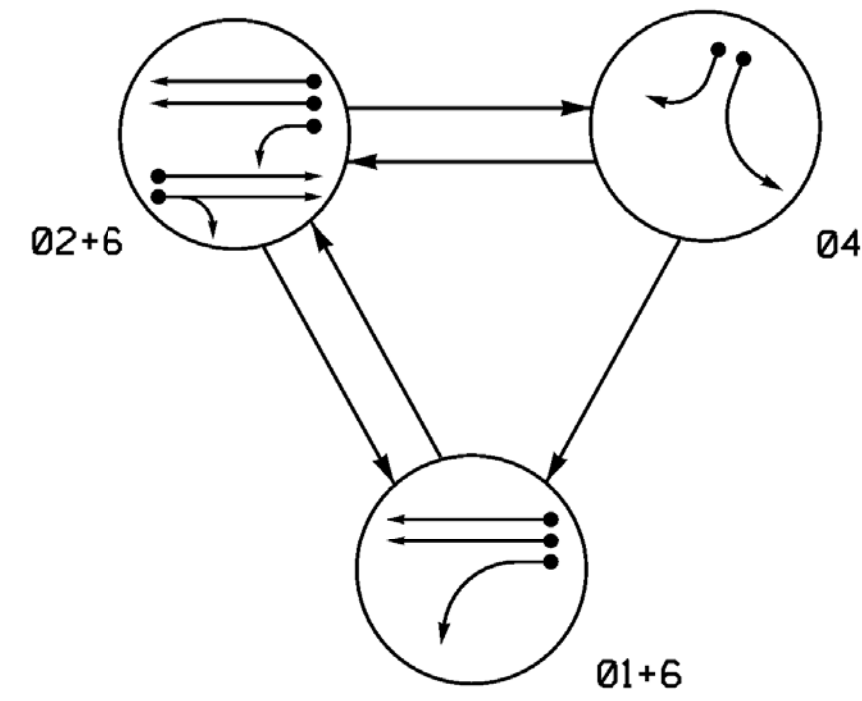
Electrical Detail - Sheet 4 of 4

DOCUMENT NOT CONSIDERED
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<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;">150 N. Greenfield Hwy, Garner, NC 27529</p>	<p>NC 54 (E. Harden Street) at I-85 SB/I-40 WB Ramps</p> <p style="font-size: x-small;">Division 7 Alamance County Graham</p> <p style="font-size: x-small;">PLAN DATE: March 2018 REVIEWED BY: JB Voso</p> <p style="font-size: x-small;">PREPARED BY: SE Greene REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE				<p style="font-size: x-small;">SEAL</p>  <p style="font-size: x-small;">James Voso 6/13/2018 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-1051</p>
REVISIONS	INIT.	DATE						

*****SYSTEM*****
*****USER*****

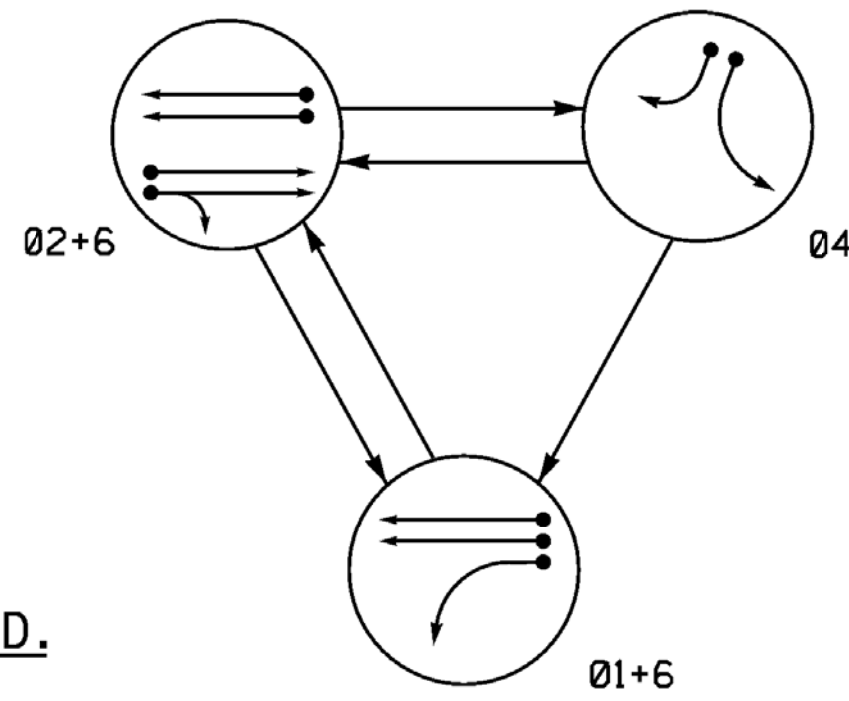
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

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

ALTERNATE PHASING DIAGRAM



ALTERNATE TABLE OF OPERATION

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

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6x60	+5	2-4-2	-	1	Yes	-	15*	-	S	-	X
2A	6x20	330	EXIST.	-	2	Yes	-	-	X	N	-	X
4A	6x60	+5	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6x60	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
6A	6x20	330	EXIST.	-	6	Yes	-	-	X	N	-	X
S1	6x6	+80	EXIST.	-	-	No	-	-	-	N	X	X
S2	6x6	+80	EXIST.	-	-	No	-	-	-	N	X	X

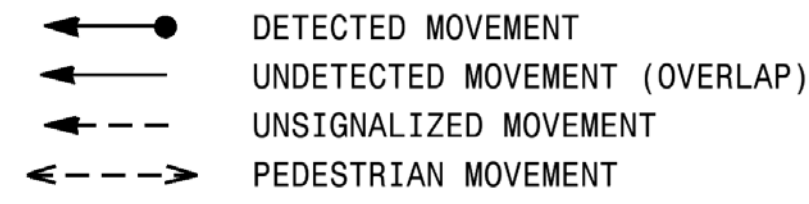
* Disable Delay During Alternate Phasing Operation.
 ** Disable Phase 6 Call for Loop 1A during Alternate Phasing Operation.

3 Phase Fully Actuated (Burlington-Graham Signal System)

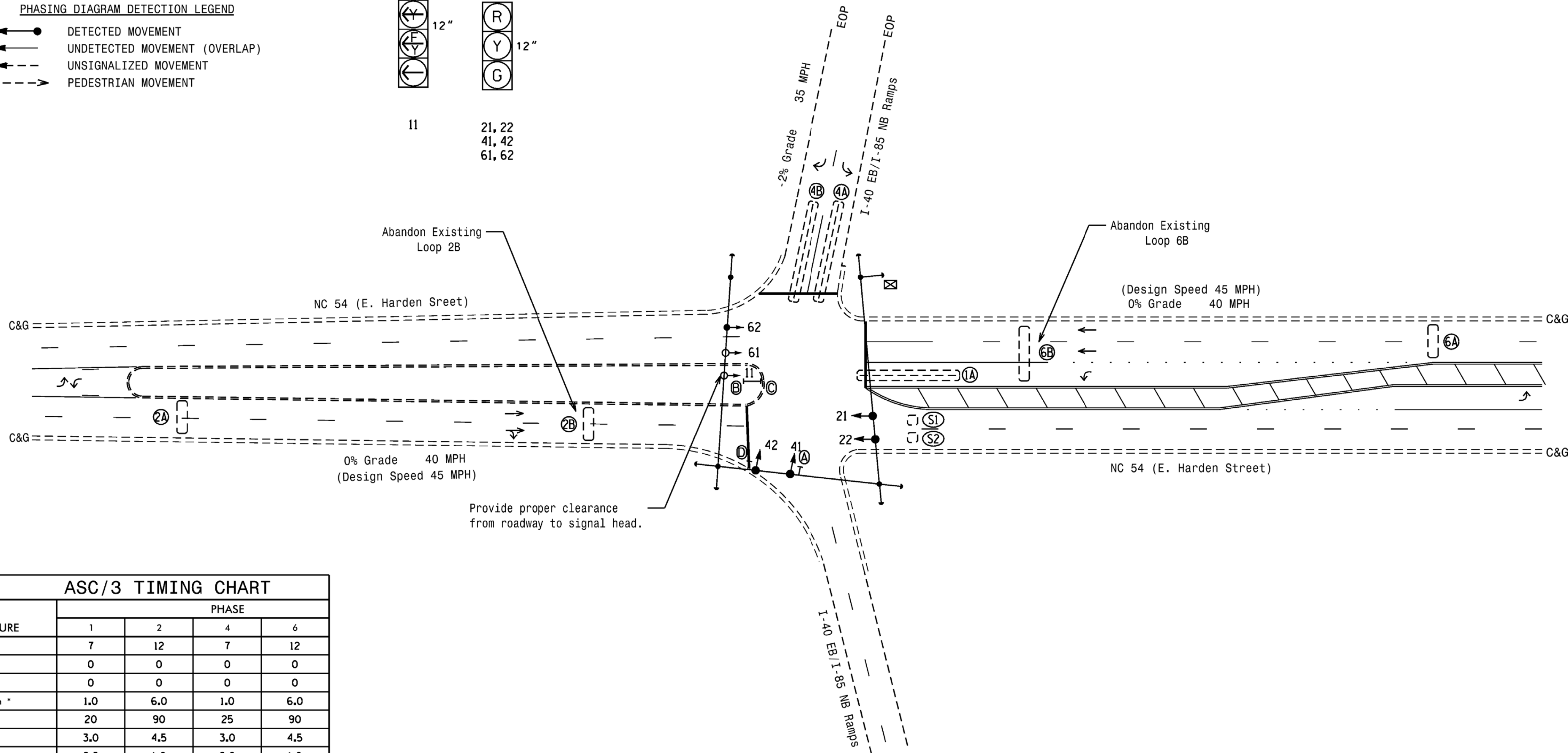
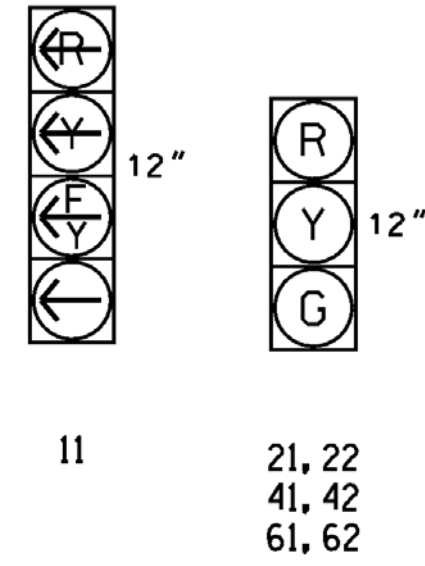
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal head numbered 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. The City Traffic Engineer will determine the hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



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

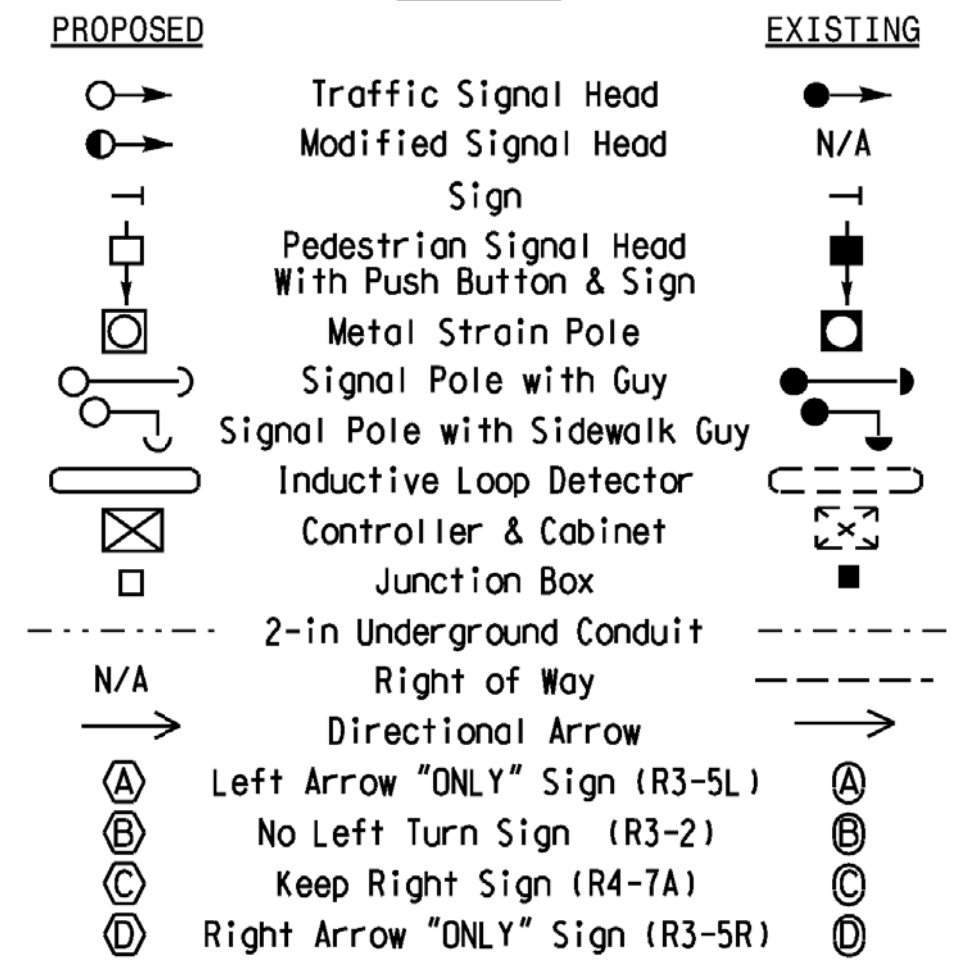


ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	12	7	12
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	1.0	6.0	1.0	6.0
Max I *	20	90	25	90
Yellow	3.0	4.5	3.0	4.5
Red Clear	2.3	1.0	2.6	1.0
Actuations 34 Add *	-	0	-	0
Seconds / Actuation *	-	1.5	-	1.5
Max Initial *	-	34	-	34
Time Before Reduction *	-	30	-	30
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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



*****SYTIME*****
 *****BUSERNAME*****



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

Signal Upgrade

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

750 N. Greenfield Pkwy, Garner, NC 27529

NC 54 (E. Harden Street) at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Graham

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

REVISIONS: _____ INIT. DATE

SCALE: 0 40
 1"=40'

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SEAL: JAMES B. VOSO, ENGINEER, No. 022599

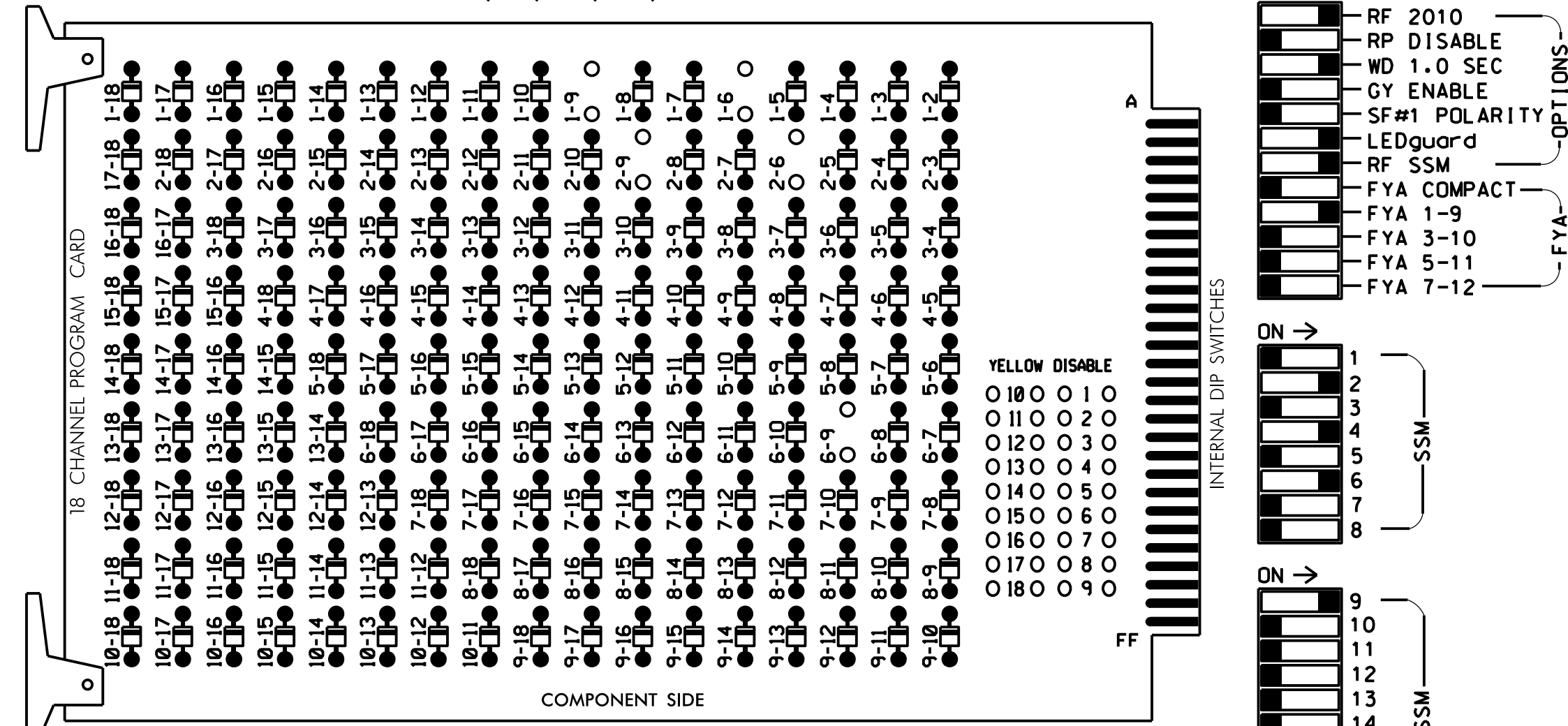
James Voso 6/13/2018
 SIGNATURE DATE

SIG. INVENTORY NO. 07-1052

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 2-6, 2-9, and 6-9.



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE

LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

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

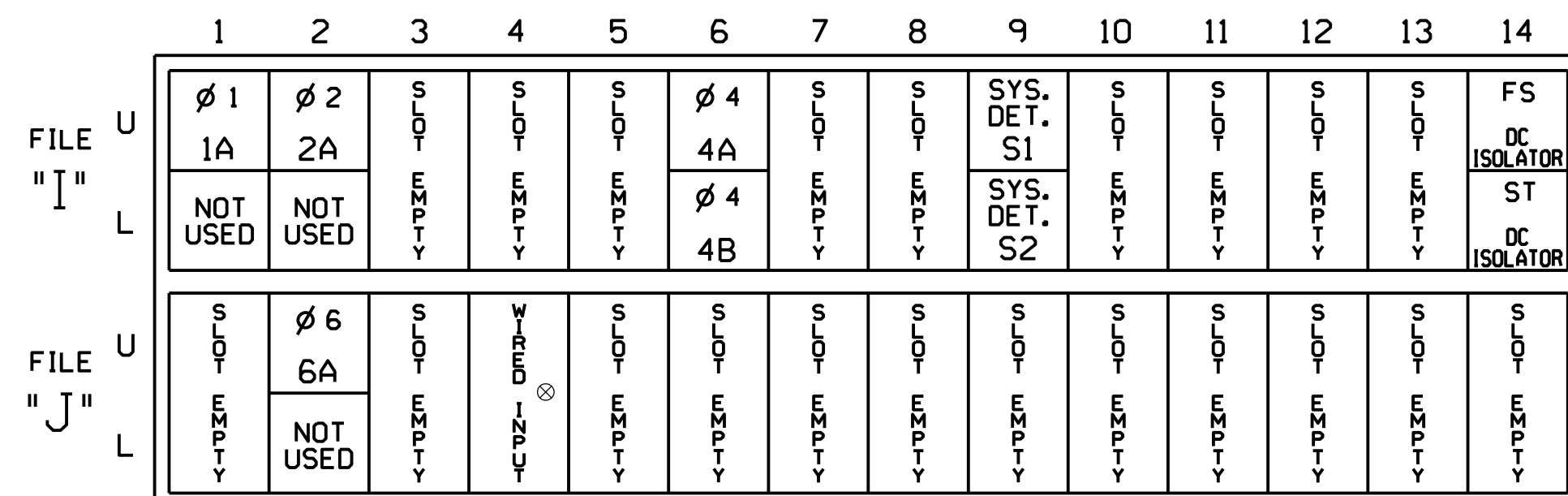
NU = Not Used

* 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)



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

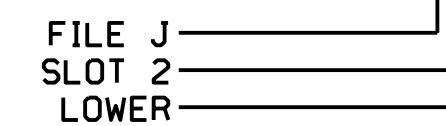
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES			X	N
	4A	TB4-9,10	16U	41	4	YES				S
4B	TB4-11,12	16L	45	14	4	YES		10		S
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES			X	N

* System detector only. Remove any assigned vehicle phase.

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

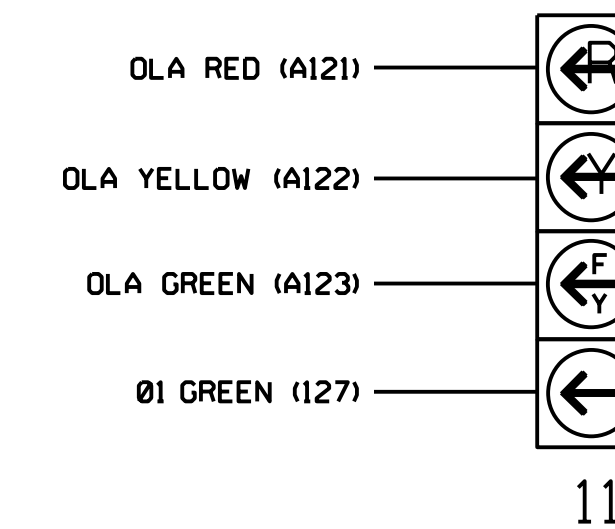
★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

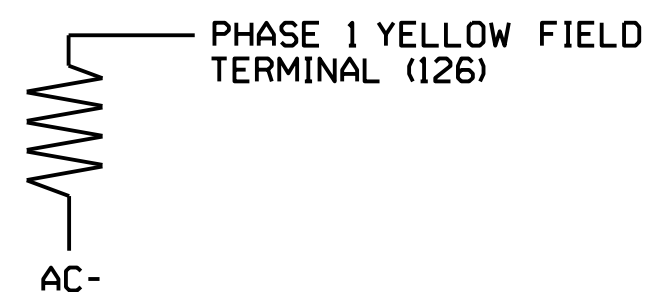
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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

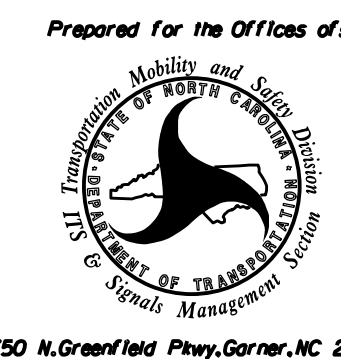


Electrical Detail - Sheet 1 of 4



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 NC LIC. NO. C-1154

ELECTRICAL AND PROGRAMMING DETAILS FOR:



NC 54 (E. Harden Street) at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Graham

PLAN DATE: March 2018 REVIEWED BY: JB Voso

PREPARED BY: SE Greene REVIEWED BY:

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 JAMES B. VOSO
 022599
 6/13/2018
 DATE
 SIG. INVENTORY NO. 07-1052

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING

LOOP 1A

(program controller as shown)

IMPORTANT!

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

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

```

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

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

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

```

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

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

```

VEH DETECTOR [26]  VEH DET PLAN [ 2] ← NOTICE VEH
TYPE: G-GREEN EXTENSION/DELAY  DET PLAN 2
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
      26 0 ..... ← ENSURE PHASE
EXTEND TIME... 0.0 DELAY TIME... 3.0 IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
    
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1052
DESIGNED: March 2018
SEALED: 6/13/2018
REVISED: NA

Electrical Detail - Sheet 3 of 4

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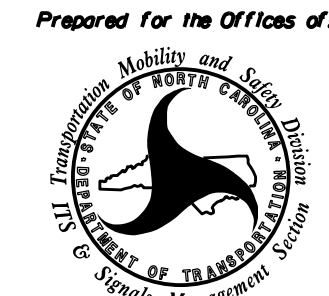


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ELECTRICAL AND PROGRAMMING
DETAILS FOR:

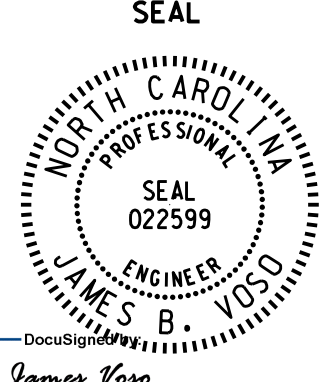
Prepared for the Offices of:



750 N. Greenfield Pkwy, Corner, NC 27529

NC 54 (E. Harden Street) at I-40 EB/I-85 NB Ramps	
Division 7	Alamance County
PLAN DATE: March 2018	REVIEWED BY: JB Voso
PREPARED BY: SE Greene	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL



James Voso
6/13/2018
DATE

SIG. INVENTORY NO. 07-1052

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