

**TABLE OF OPERATION**

SIGNAL FACE	PHASE										
	01+5	01+6	02+5	02+6	03	04	EVP 3	EVP 4	EVP 5	EVP 6	HOV 3
11	→	→	→	→	→	→	→	→	→	→	→
21,22	R	R	G	G	R	R	G	R	R	R	Y
31	R	R	R	R	G	R	R	R	G	R	R
32	R	R	R	R	G	R	R	R	G	R	R
41	R	R	R	R	G	R	R	R	G	R	R
42	R	R	R	R	G	R	R	R	G	R	R
51	←	←	←	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	G	R	R	R	Y
62	R	G	R	G	R	R	G	R	R	R	Y
P41,P42	DW	DW	DW	DW	DW	DW	DW	DW	DW	DRK	

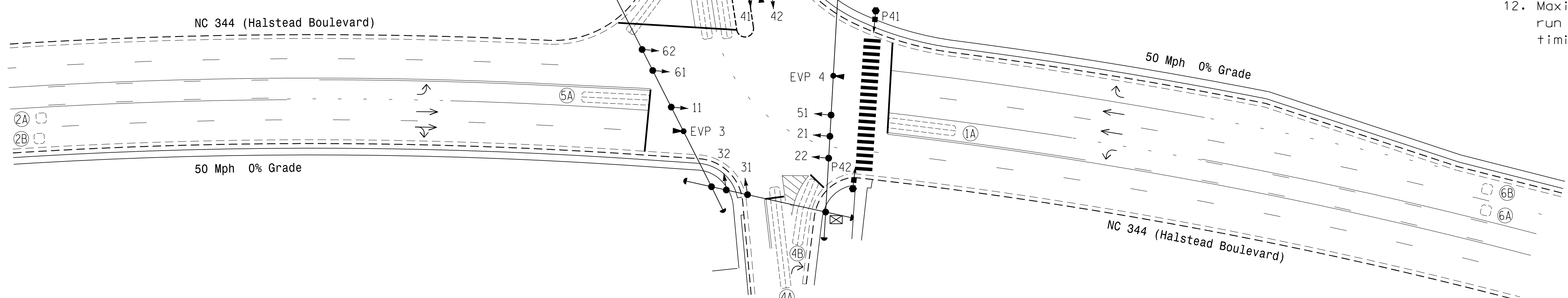
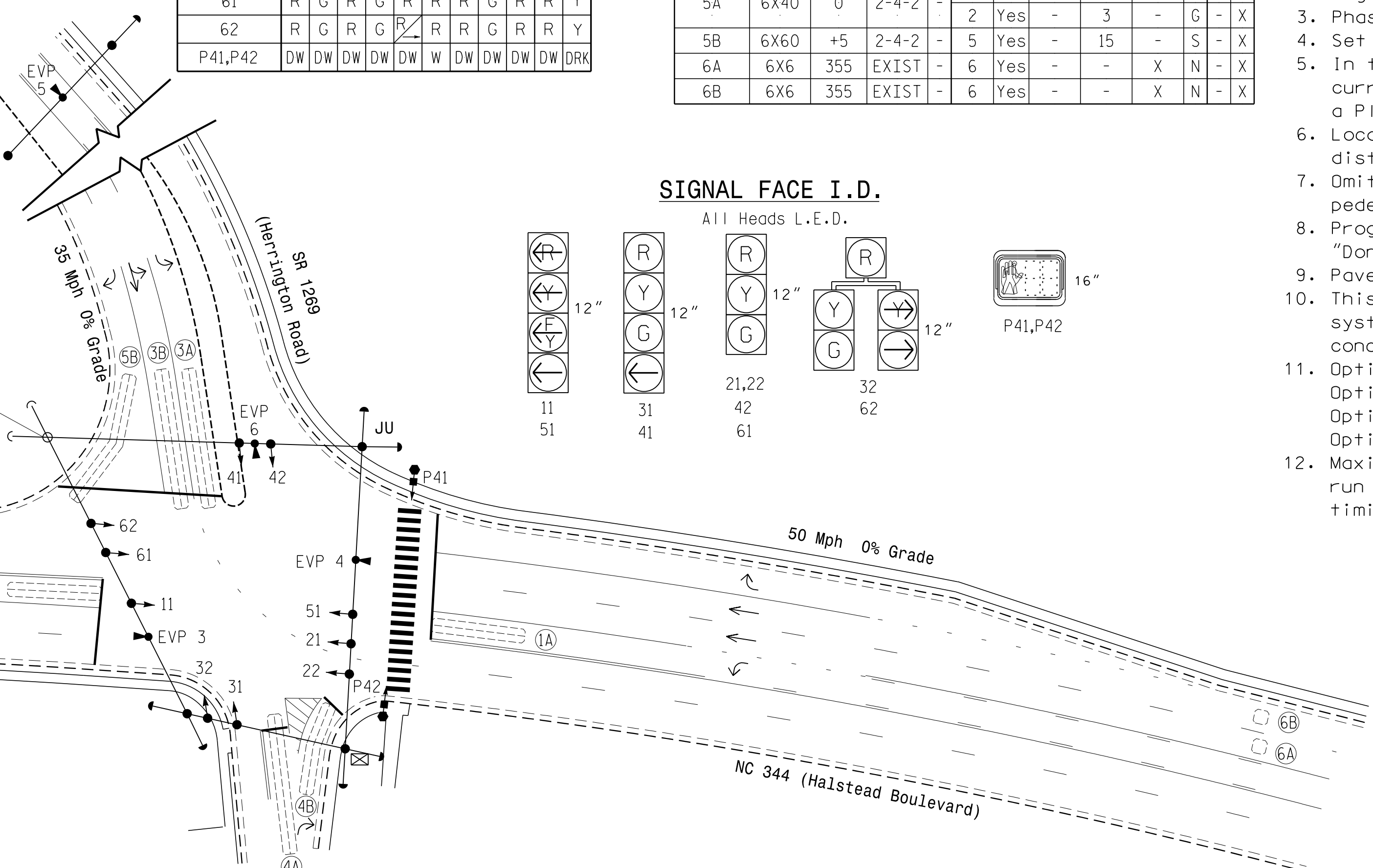
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
2A	6X6	355	EXIST	-	2	Yes	-	-	-	X	N	-
					3/10	Yes	-	-	-	S	-	X
3A	6X60	+5	2-4-2	-	3/10	Yes	-	-	-	S	-	X
					4	Yes	-	10	-	S	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	15	-	S	-	X
					5	Yes	-	15	-	S	-	X
5A	6X40	0	2-4-2	-	2	Yes	-	3	-	G	-	X
					5	Yes	-	15	-	S	-	X
5B	6X60	+5	2-4-2	-	5	Yes	-	15	-	S	-	X
					6	Yes	-	-	-	X	N	-
6A	6X6	355	EXIST	-	6	Yes	-	-	-	X	N	-
					6	Yes	-	-	-	X	N	-

**6 Phase Fully Actuated w/ EV Preemption (Elizabeth City 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.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Optical detector 3 calls EVP 3; Optical detector 4 calls EVP 4; Optical detector 5 calls EVP 5; Optical detector 6 calls EVP 6.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

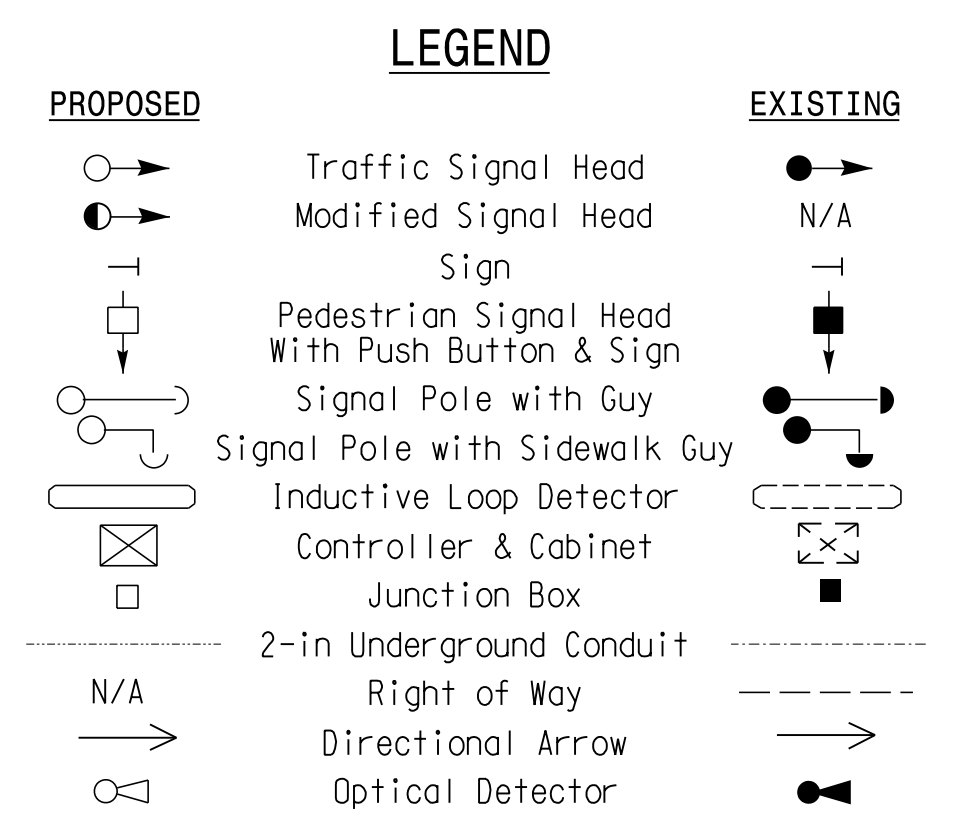
FEATURE	PHASE							**10	OLH	OLI
	1	2	3	4	5	6				
Min Green *	7	14	7	7	7	14	7	0.1	0.1	
Walk *	-	-	-	7	-	-	-	-	-	
Ped Clear	-	-	-	23	-	-	-	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	-	-	
Max 1 *	15	100	20	35	15	100	20	-	-	
Yellow	3.0	4.8	3.8	3.2	3.0	4.8	3.8	3.8	3.8	
Red Clear	2.9	1.8	2.5	2.6	2.8	1.8	2.5	2.5	2.5	
Actuations B4 Add *	-	0	-	-	-	0	-	-	-	
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-	-	
Max Initial *	-	40	-	-	-	40	-	-	-	
Time Before Reduction *	-	15	-	-	-	15	-	-	-	
Time To Reduce *	-	60	-	-	-	60	-	-	-	
Minimum Gap	-	3.3	-	-	-	3.3	-	-	-	
Locking Detector	-	X	-	-	-	X	-	-	-	
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-	-	
Dual Entry	-	-	-	-	-	-	-	-	-	
Simultaneous Gap	X	X	X	X	X	X	X	-	-	

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

**ASC/3 EV PREEMPT**

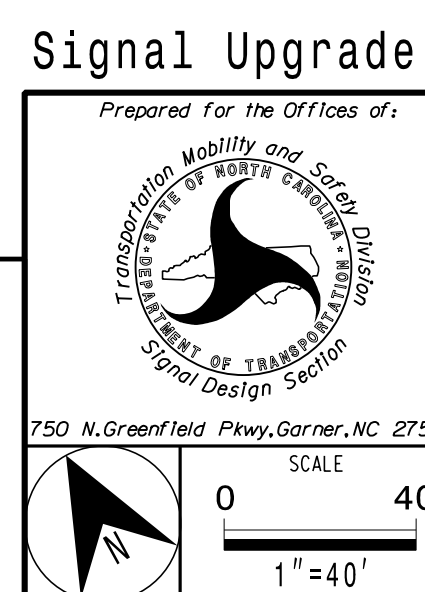
FUNCTION	PRE 3	PRE 4	PRE 5	PRE 6
Exit Phase(s)	2,6	2,6	2,6	2,6
Preempt Override	OFF	OFF	OFF	OFF
Delay Time	0	0	0	0
Ped Clear Through Yellow	Y	Y	Y	Y
Terminate Phases	N	N	N	N
Entrance Walk	255*	255*	255*	255*
Entrance Ped Clear	255*	255*	255*	255*
Entrance Min Green	1	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*	25.5*
Minimum Dwell Time	14	14	7	7
Preempt Input Extension Time	2	2	2	2
Preempt Max Time	120	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*	25.5*

\*Time defaults to time used for phase during normal operation



9/21/2018  
 R:\Projects\2018\Signal\Signal\5942\Signal\5942.dwg  
 Signal Design Section

**PLANS PREPARED BY:**  
**RK&K**  
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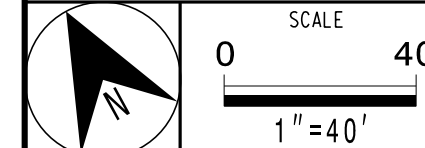
**Signal Upgrade**

Prepared for the Offices of:  
**NC 344 (Halstead Boulevard) At SR 1269 (Herrington Road)**

Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: CBHolden  
 PREPARED BY: DTSears REVIEWED BY:

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SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 033753  
 C. BYRON HILLEN  
 9/21/2018

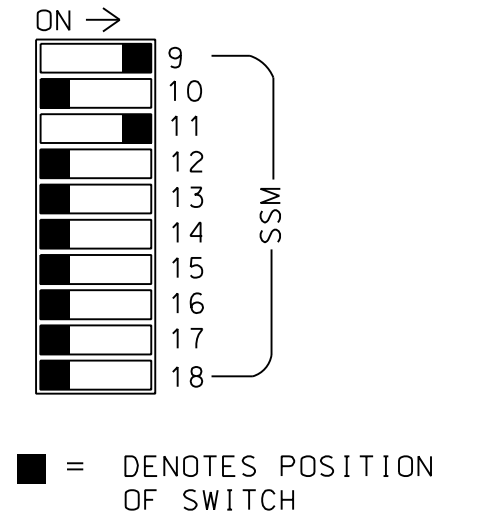
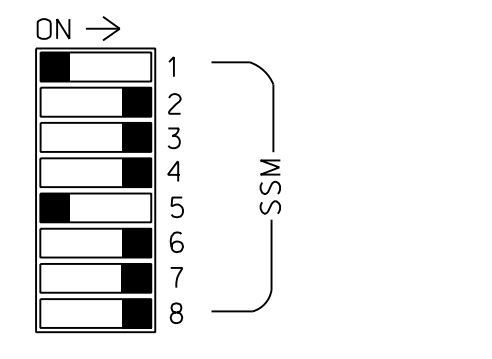
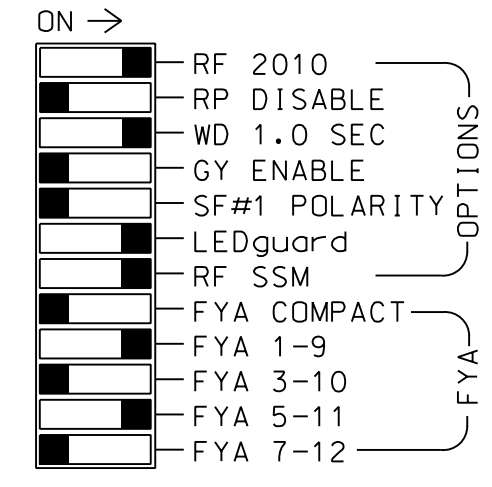
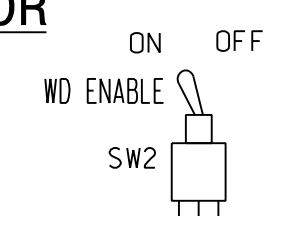
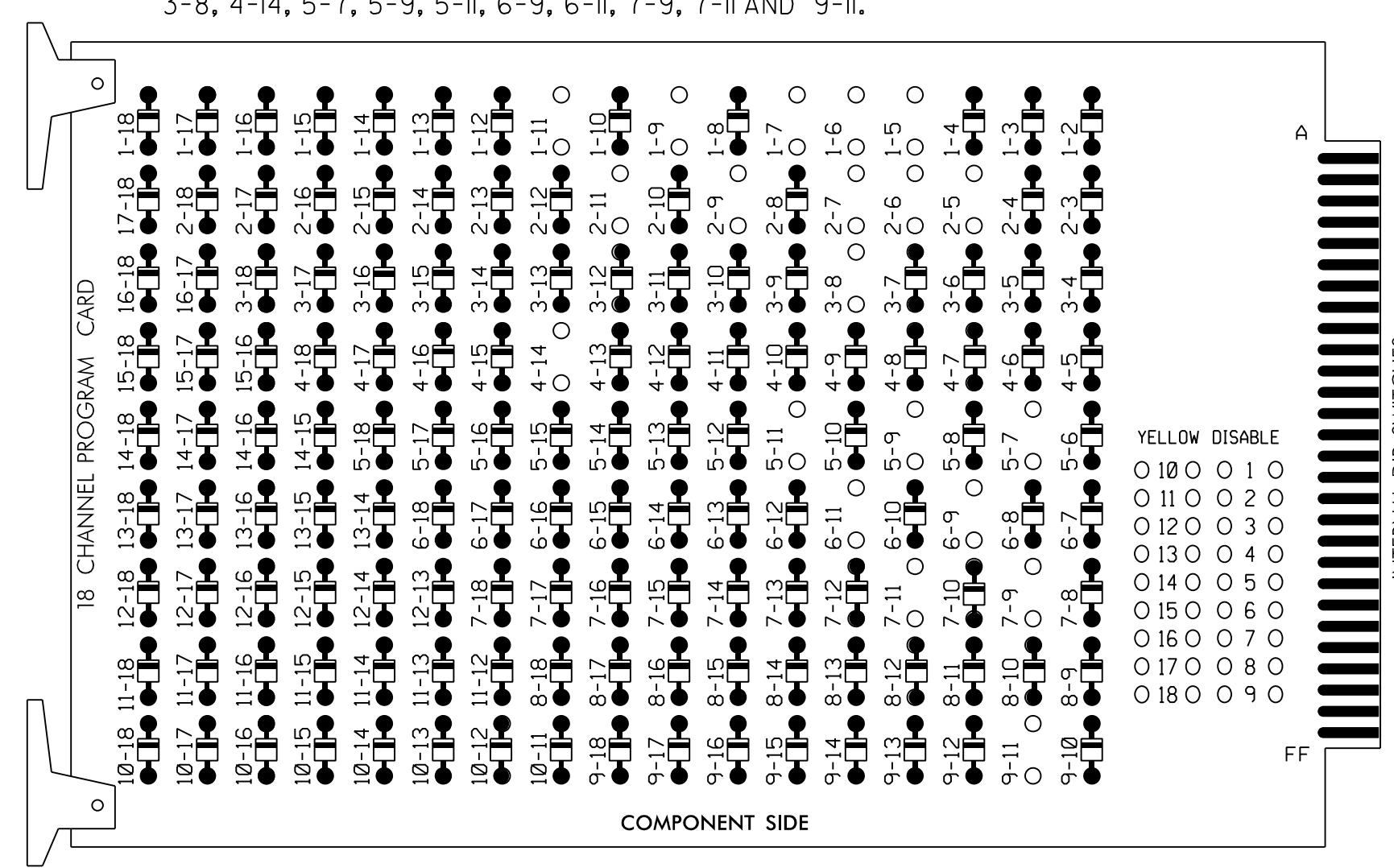


REVISIONS	INIT.	DATE

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

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-7, 1-9, 1-11, 2-5, 2-6, 2-7, 2-9, 2-11, 3-8, 4-14, 5-7, 5-9, 5-11, 6-9, 6-11, 7-9, 7-11 AND 9-11.



#### 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 Elizabeth City Signal System.

#### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S7,S8,S10,S11,  
 AUX S1,AUX S4  
 PHASES USED.....1,2,3,4,5,6,\*\*10,4PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 OVERLAP "G".....\*  
 OVERLAP "H".....\*  
 OVERLAP "I".....\*

\* See overlap programming detail on sheet 2  
 \*\* Phase 10 used for timing purposes only

#### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	OLI	4	4 PED	5	6	6 PED	OLG	OLH	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	P41, P42	51	61,62	NU	32	62	NU	11	NU	NU	51	NU
RED		128		116	116	101	101			134		*	*						
YELLOW	*	129		117	117	102	102		*	135									
GREEN		130		118	118	103	103			136									
RED ARROW														A121				A114	
YELLOW ARROW												123	108	A122				A115	
FLASHING YELLOW ARROW														A123				A116	
GREEN ARROW	127			118		103			133		124	109							
Hand icon								104											
Person icon								106											

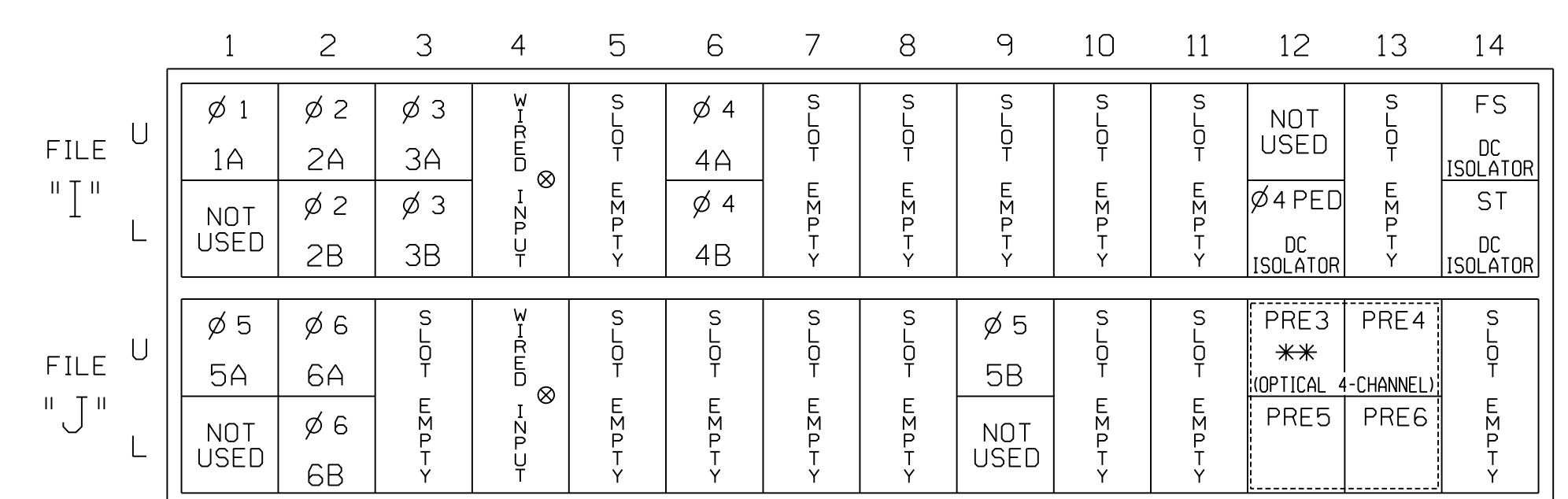
NU = Not Used

\* 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)



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

FS = FLASH SENSE  
ST = STOP TIME  
PRE = PREEMPT

⊗ Wired Input - Do not populate slot with detector card

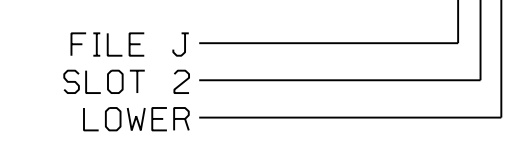
#### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
2A	TB2-5,6	J4U	48	26	6	YES		3		G
2B	TB2-7,8	I2L	43	12	2	YES			X	N
3A	TB2-9,10	I3U	63	32	3/10	YES				S
3B	TB2-11,12	I3L	76	42	3/10	YES				S
4A	TB4-9,10	I6U	41	4	4	YES		10		S
4B	TB4-11,12	I6L	45	14	4	YES		15		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
5B	TB7-9,10	J9U	59	15	5	YES		15		S
PED PUSH BUTTONS										
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT 112.

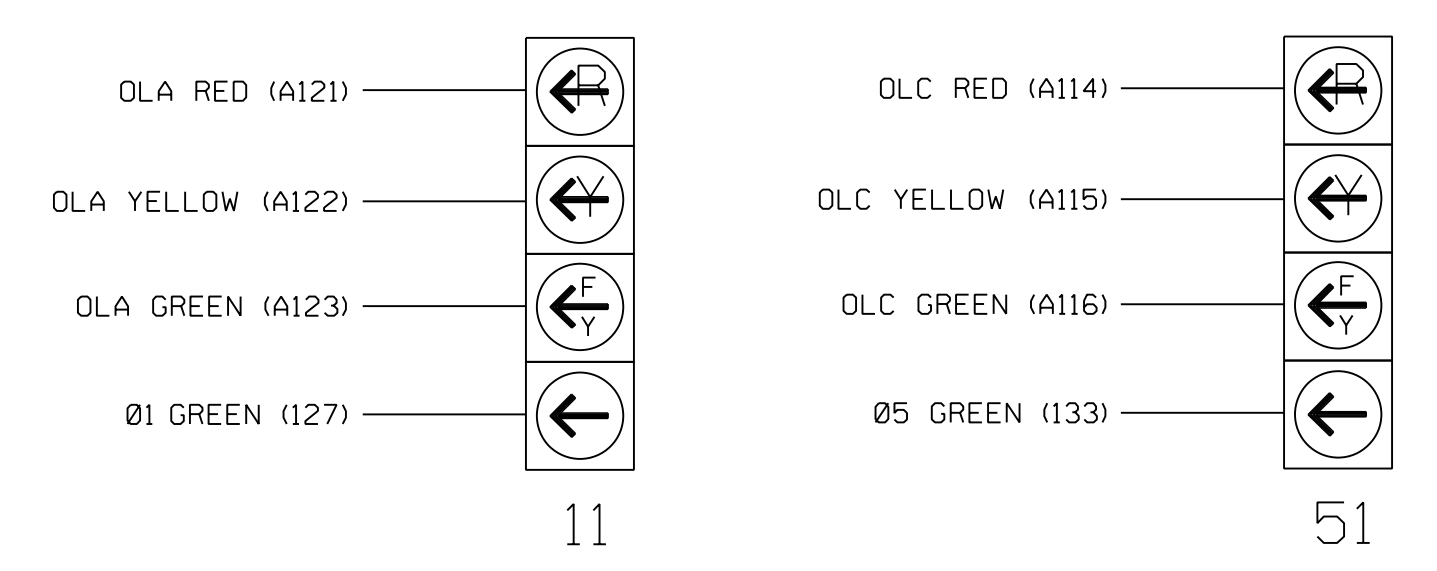
- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

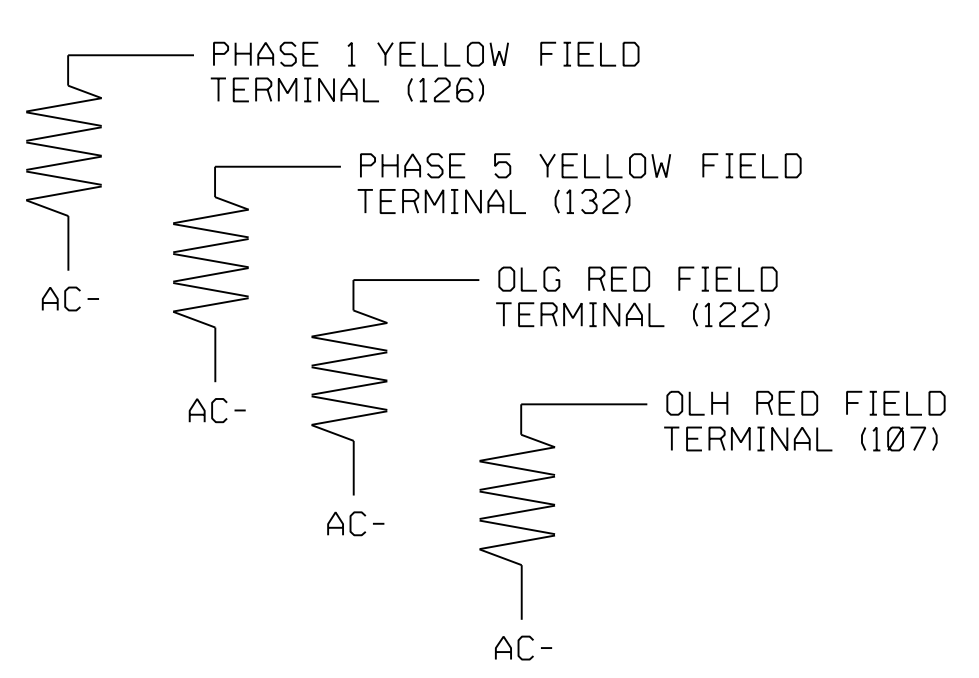
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0219  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

#### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



#### \*\* OPTICAL PREEMPTION SYSTEM

- Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's instructions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the signal design plans.
- Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specifications of the type 2070 controller.

PLANS PREPARED BY:

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Electrical Detail Sheet 1 of 4

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SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON

NC 344 (Halstead Boulevard) at SR 1269 (Herrington Road)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: James O. Deaton 9/21/2018

SIG. INVENTORY NO. 01-0219

## 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

Toggle to Overlap G

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

TMG VEH OVLP...[G] TYPE: .....NORMAL

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

INCLUDED . . . . X . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0

Toggle Once

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

TMG VEH OVLP...[H] TYPE: .....NORMAL

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

INCLUDED . . X . . . . . X . . . . .

LAG GRN 0.1 YEL 3.8 RED 2.5

Toggle Once

OVERLAP I

Select TMG VEH OVLP [I] and 'NORMAL'

TMG VEH OVLP...[I] TYPE: .....NORMAL

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

INCLUDED . . X . . . . . X . . . . .

LAG GRN 0.1 YEL 3.8 RED 2.5

END PROGRAMMING

## ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switches S4, S10 and S11 as OLI, OLG and OLH, program LD SWITCH 3 as OVLP '9', LD SWITCH 7 as OVLP '7' and LD SWITCH 8 as OVLP '8', all TYPE '0' as shown below.

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

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

## ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

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

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

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 01-0219  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

## ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 6. DETECTORS
2. From DETECTOR Submenu select 2. VEHICLE DETECTOR SETUP

VEH DETECTOR [32] VEH DET PLAN [ 1 ]

TYPE: S-STANDARD

TS2 DETECTOR..... X ECPI LOG..... NO

DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

32 3 . . X . . . . . X . . . . .

EXTEND TIME... 0.0 DELAY TIME... 10.0

USE ADDED INITIAL . CROSS SWITCH PH.. 0

LOCK IN..... NONE NTCIP VOL . OR OCC .

PMT QUEUE DELAY. NO

VEH DETECTOR [42] VEH DET PLAN [ 1 ]

TYPE: S-STANDARD

TS2 DETECTOR..... X ECPI LOG..... NO

DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6

42 3 . . X . . . . . X . . . . .

EXTEND TIME... 0.0 DELAY TIME... 15.0

USE ADDED INITIAL . CROSS SWITCH PH.. 0

LOCK IN..... NONE NTCIP VOL . OR OCC .

PMT QUEUE DELAY. NO

END PROGRAMMING

9/21/2018 8:11:00 AM C:\Users\jgarcia\Documents\Signal\01-0219-04-200.dgn

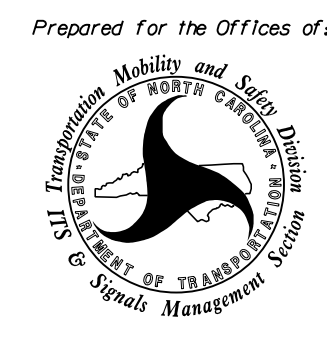
**PLANS PREPARED BY :**

**RK&K**

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ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard)  
at  
SR 1269 (Herrington Road)

Division 1 Pasquotank County Elizabeth City

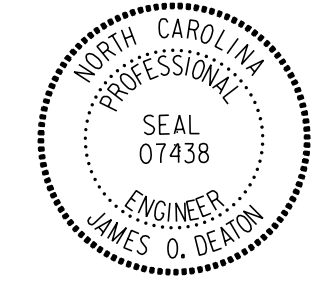
PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

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SEAL



DocuSigned by:  
**James O. Deaton** 9/21/2018

DATE

SIG. INVENTORY NO. 01-0219

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

*(program controller as shown)*

1. From Main Menu select 4. PREEMPTOR/TSP
2. From PREEMPT/TSP/SCP Submenu select 2. ENABLE PREEMPT FILTERING & TSP/SCP

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

## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR SPLIT SIDE STREET PHASING

*(program controller as shown)*

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

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

```

LP#: 1 COPY FROM: 1 ACTIVE: M (T/F)
IF VEH GREEN ON PH 3 IS ON

THEN LP SET LOGIC FLAG 1 ON
ELSE
    
```

PHASE 3 GREEN ON SETS  
LOGIC FLAG 1 ON  
(SIDE STREET BACKUP)

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

```

LP#: 2 COPY FROM: 2 ACTIVE: M (T/F)
IF LP FLAG 1 IS ON

THEN CTR OMIT PHASE 10 ON
ELSE
    
```

OMIT PHASE 10 SO  
PHASE 3 MOVEMENTS  
RUN ONCE PER CYCLE

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#: 3 COPY FROM: 3 ACTIVE: M (T/F)
IF VEH GREEN ON PH 2 IS ON

THEN LP SET LOGIC FLAG 1 OFF
ELSE
    
```

DISABLE LOGIC FLAG 1  
TO RETURN TO NORMAL  
OPERATION

3. From LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

ENABLE LOGIC PROCESSOR STATEMENTS 1, 2 & 3 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

END PROGRAMMING

Electrical Detail

Sheet 3 of 4

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

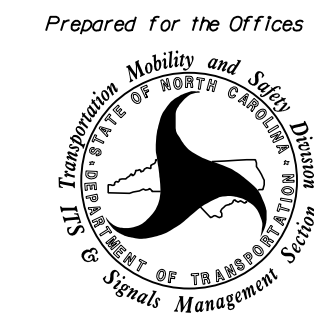
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 01-0219  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

**PLANS PREPARED BY :**



RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard)  
at  
SR 1269 (Herrington Road)

Division 1	Pasquotank County	Elizabeth City
PLAN DATE: September 2018	REVIEWED BY: J O Deaton	
PREPARED BY: M W Yalch	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

DocuSigned by:  
**James O. Deaton**  
9/21/2018  
DATE  
SIG. INVENTORY NO. 01-0219

# ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select **4. PREEMPTOR/TSP**

2. From PREEMPTOR/TSP/SCP Submenu select **1. PREEMPT PLAN 1-10**

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

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #4.

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

Place cursor in [ ] next to Preempt Plan and press 6. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #6.

```

PREEMPT PLAN [ 3]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 .F1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL YESITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 14I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

```

PREEMPT PLAN [ 4]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH X . . . . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 .F1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL YESITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 14I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

```

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

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL YESITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 7I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

```

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

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL YESITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 7I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

PROGRAM EXTEND TIME ON OPTICAL DETECTOR UNITS FOR 2.0 SEC.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0219 DESIGNED: September 2018 SEALED: 09/21/2018 REVISED: N/A

**PLANS PREPARED BY :**



**RUMMEL, KLEPPER & KAHL, LLP**  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

Electrical Detail Sheet 4 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

North Carolina Professional Engineer James O. Deaton

SEAL 07438

NC 344 (Halstead Boulevard) at SR 1269 (Herrington Road)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

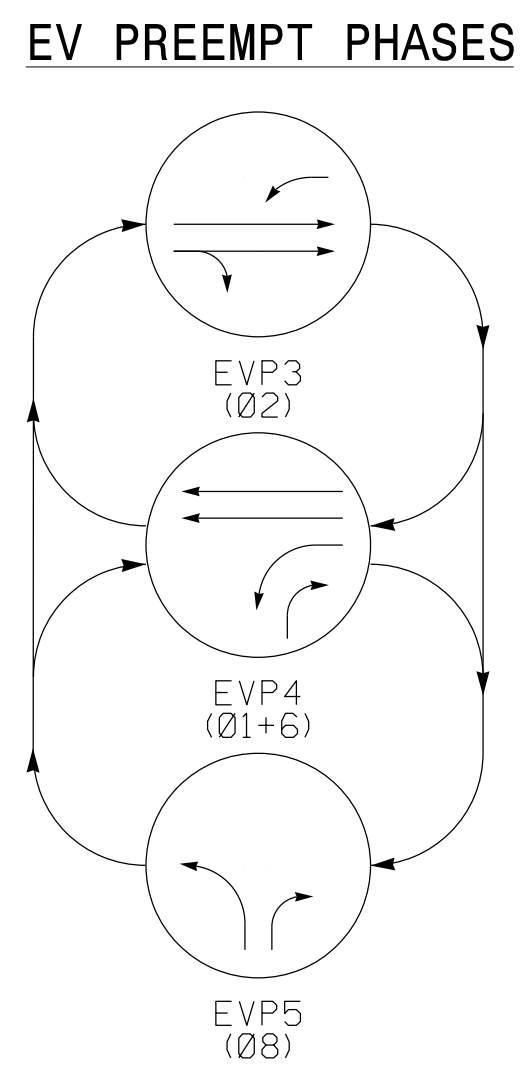
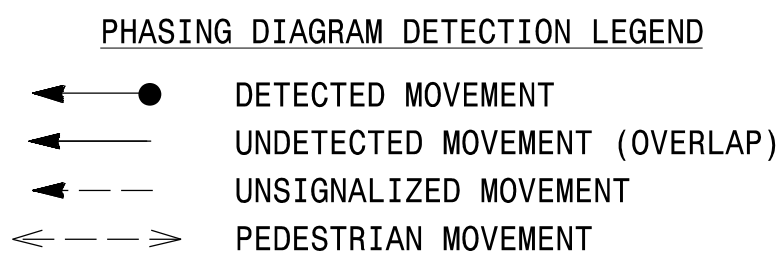
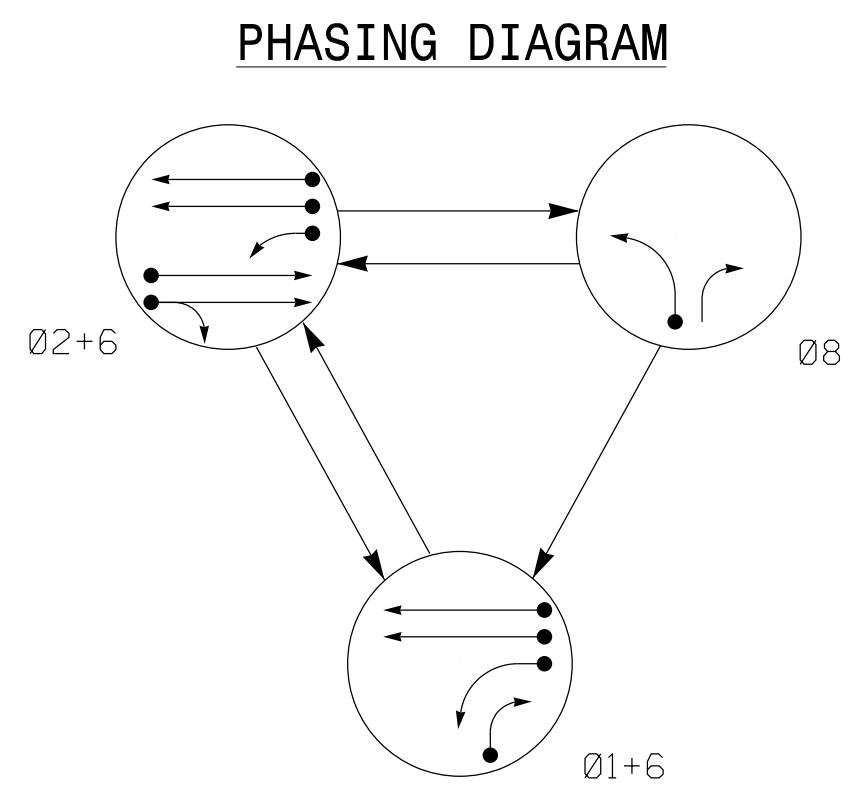
PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

DocuSigned by: James O. Deaton 9/21/2018

SIG. INVENTORY NO. 01-0219

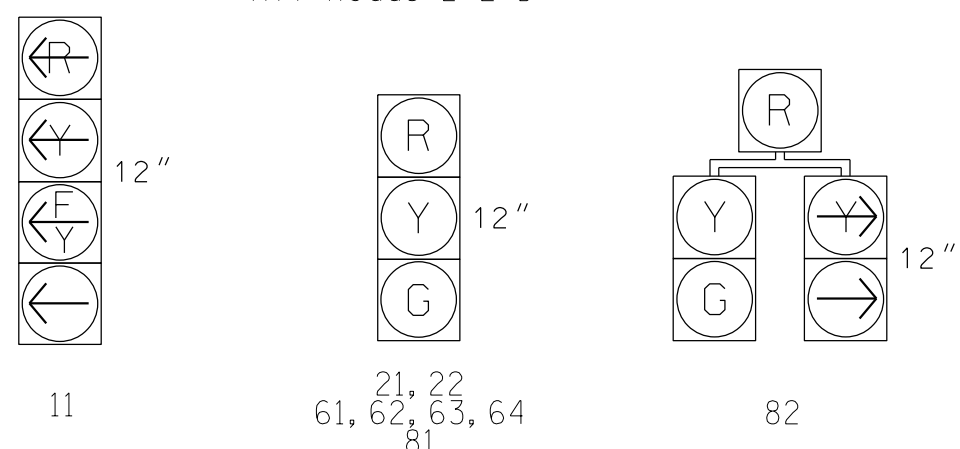
9/21/2018 R:\Projects\01-0219\Signal\01-0219-04-200.dgn dsccsr



SIGNAL FACE	PHASE					
	01+6	02+6	08	EVP3	EVP4	FLASH
11	R	G	R	G	R	Y
21, 22	R	G	R	G	R	Y
61, 62, 63, 64	G	G	R	R	G	Y
81	R	R	G	R	G	R
82	R	R	G	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.

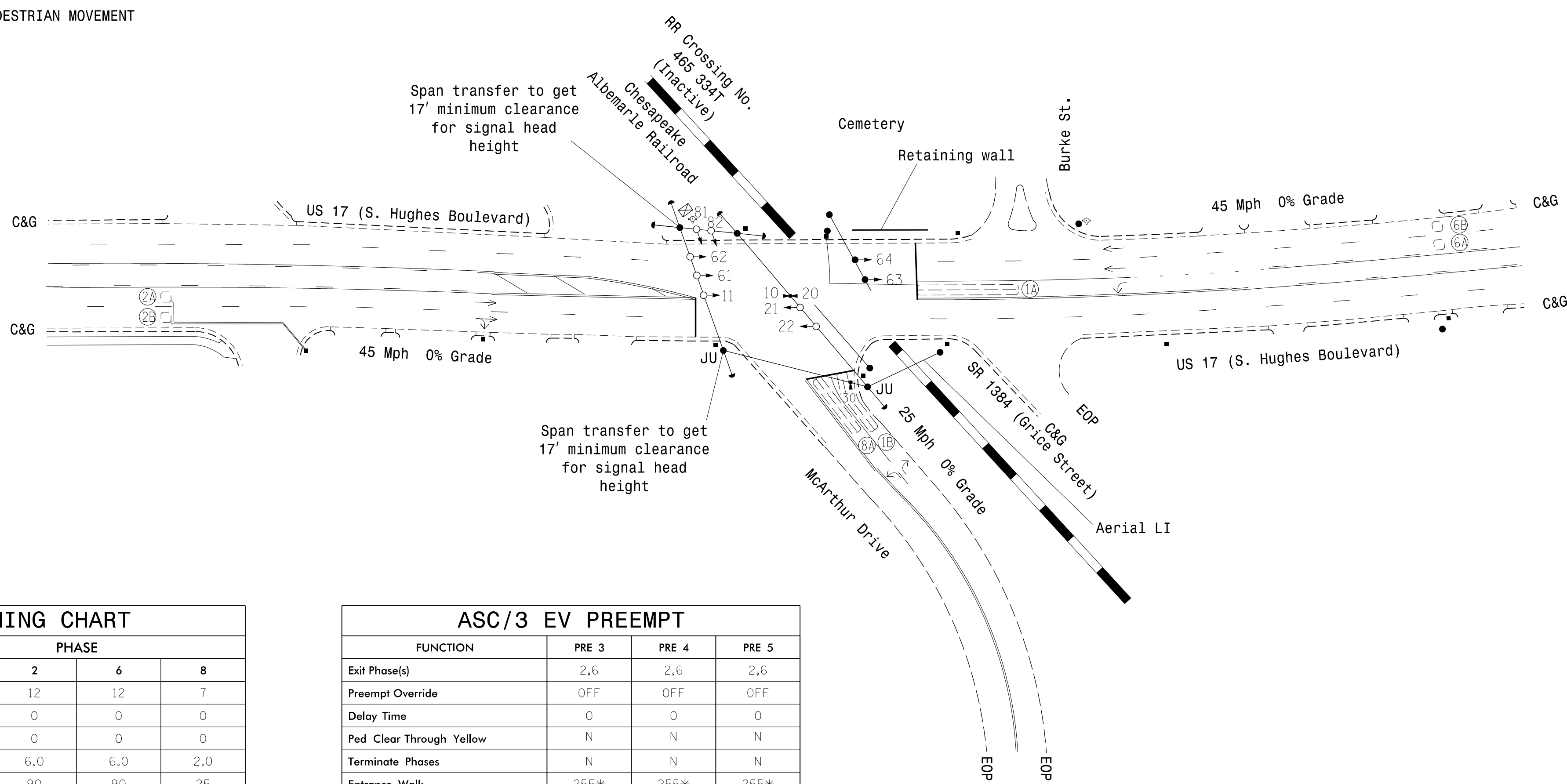


ASC/3 DETECTOR INSTALLATION CHART												
LOOP	DETECTOR			PROGRAMMING								
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X60	0	2-4-2	-	6	Yes	-	3	-	G	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
6A	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X

**3 Phase Fully Actuated W/ EV Preemption (Elizabeth City 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.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Optical detector 10 calls EVP3; Optical detector 20 calls EVP4; Optical detector 30 calls EVP5.
- Relocate existing Optical detection equipment from existing cabinet to new cabinet.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	ASC/3 TIMING CHART			
	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	2.0
Max 1 *	25	90	90	25
Yellow	3.0	4.5	4.5	3.2
Red Clear	3.3	2.2	2.2	2.5
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	-
Lacking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

FUNCTION	ASC/3 EV PREEMPT		
	PRE 3	PRE 4	PRE 5
Exit Phase(s)	2,6	2,6	2,6
Preempt Override	OFF	OFF	OFF
Delay Time	0	0	0
Ped Clear Through Yellow	N	N	N
Terminate Phases	N	N	N
Entrance Walk	255*	255*	255*
Entrance Ped Clear	255*	255*	255*
Entrance Min Green	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*
Minimum Dwell Time	12	12	7
Preempt Input Extension Time	2	2	2
Preempt Max Time	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*

\* Allows normal phase times to be used.

\* 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:  
 Transportation Mobility and Safety Division  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 STREET OF EMBARRASZ  
 Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

**DRMP**  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27519  
 NC License No. 2-2213 (919) 650-1038

**US 17 (S. Hughes Blvd.) at McArthur Drive**

Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: February 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: JA Le REVIEWED BY: LM Moon

REVISIONS: INIT. DATE

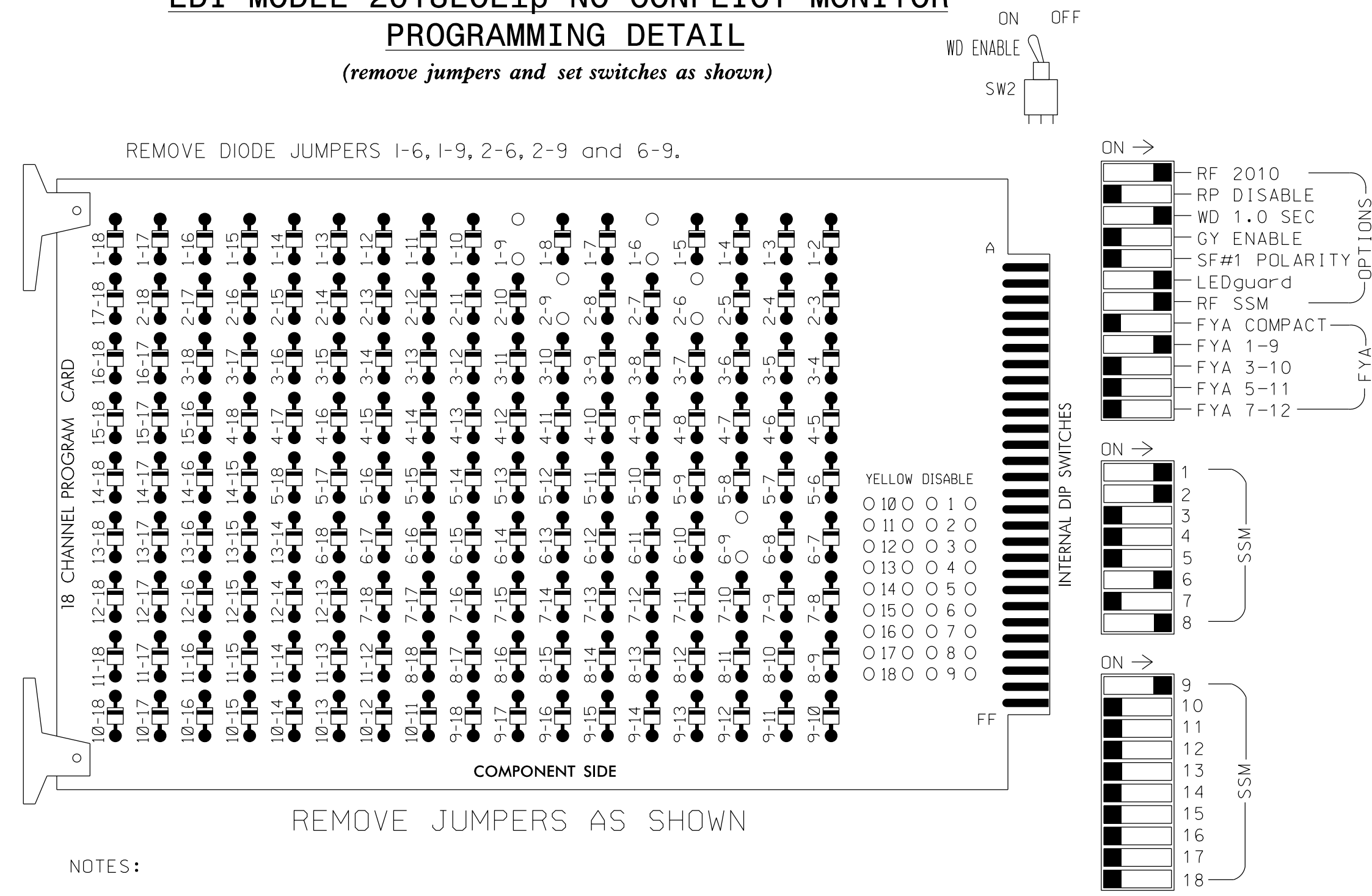
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022516  
 LISA M. MOON  
 LISA M. MOON

DocuSigned by:  
 Lisa M Moon  
 8/21/2018  
 DATE  
 SCS588032042  
 SIG. INVENTORY NO. 01-0222

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

(remove jumpers and set switches as shown)



### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Elizabeth City 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,S8,S11,AUX S1  
 PHASES USED.....1,2,6,8  
 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*	82	21,22	NU	NU	NU	NU	61,62 63,64	NU	NU	81,82	NU	11*	NU	NU	NU	NU	NU
RED	*	128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW		126											A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	127																

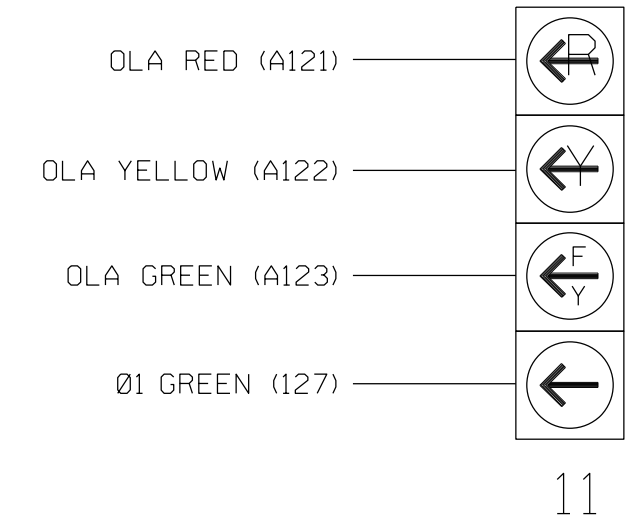
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

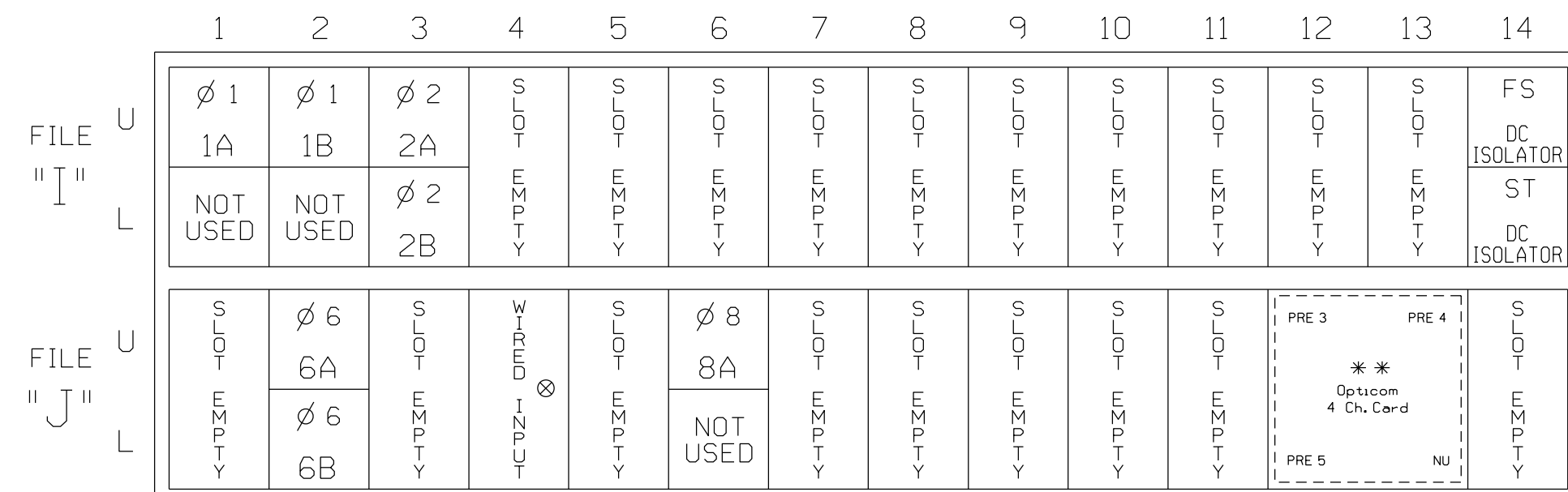
### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



### INPUT FILE POSITION LAYOUT

(front view)



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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE  
ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES		3		G
1B	TB2-5,6	I2U	39	2	2	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES			X	N
2B	TB2-11,12	I3L	76	42	2	YES			X	N
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S

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

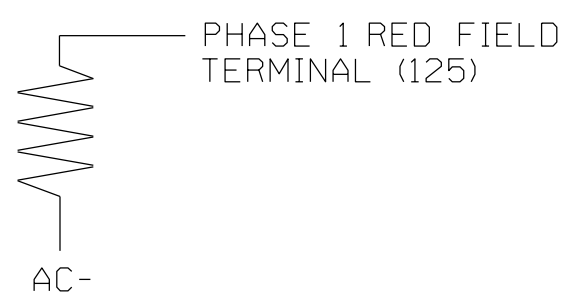
INPUT FILE POSITION LEGEND: J2L



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



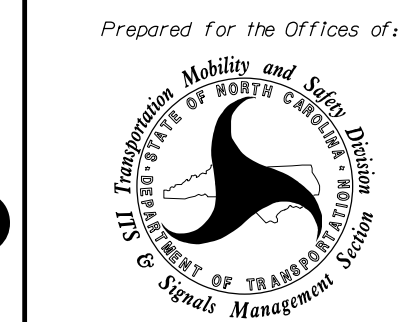
### \*\*OPTICAL PREEMPTION SYSTEM

- Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the Signal Design Plans.
- Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specification of the type 2070 controller.



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

US 17 (S. Hughes Blvd.) at McArthur Drive

Division 1 Pasquotank County Elizabeth City

PLAN DATE: February 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS INIT. DATE

DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0222

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



# ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL

(program controller as shown)

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

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

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #4.

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

```

PREEMPT PLAN [ 3]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF

```

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

```

PREEMPT PLAN [ 4]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH X . . . . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF

```

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

```

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

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 7I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF

```

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

# ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

### OVERLAP A

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

```

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

FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

```

END PROGRAMMING

# ECONOLITE ASC/3-2070 PREEMPT FILTERING PROGRAMMING DETAIL

(program controller as shown)

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

```

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

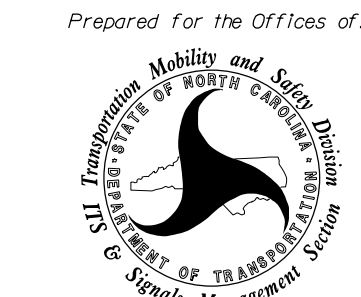
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THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0222  
 DESIGNED: FEBRUARY 2018  
 SEALED: 08/21/2018  
 REVISED: N/A


Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



Plans Prepared by:



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

US 17 (S. Hughes Blvd.)  
 at  
 McArthur Drive

Division 1 Pasquotank County Elizabeth City

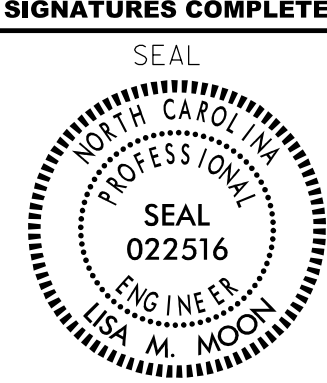
PLAN DATE: February 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

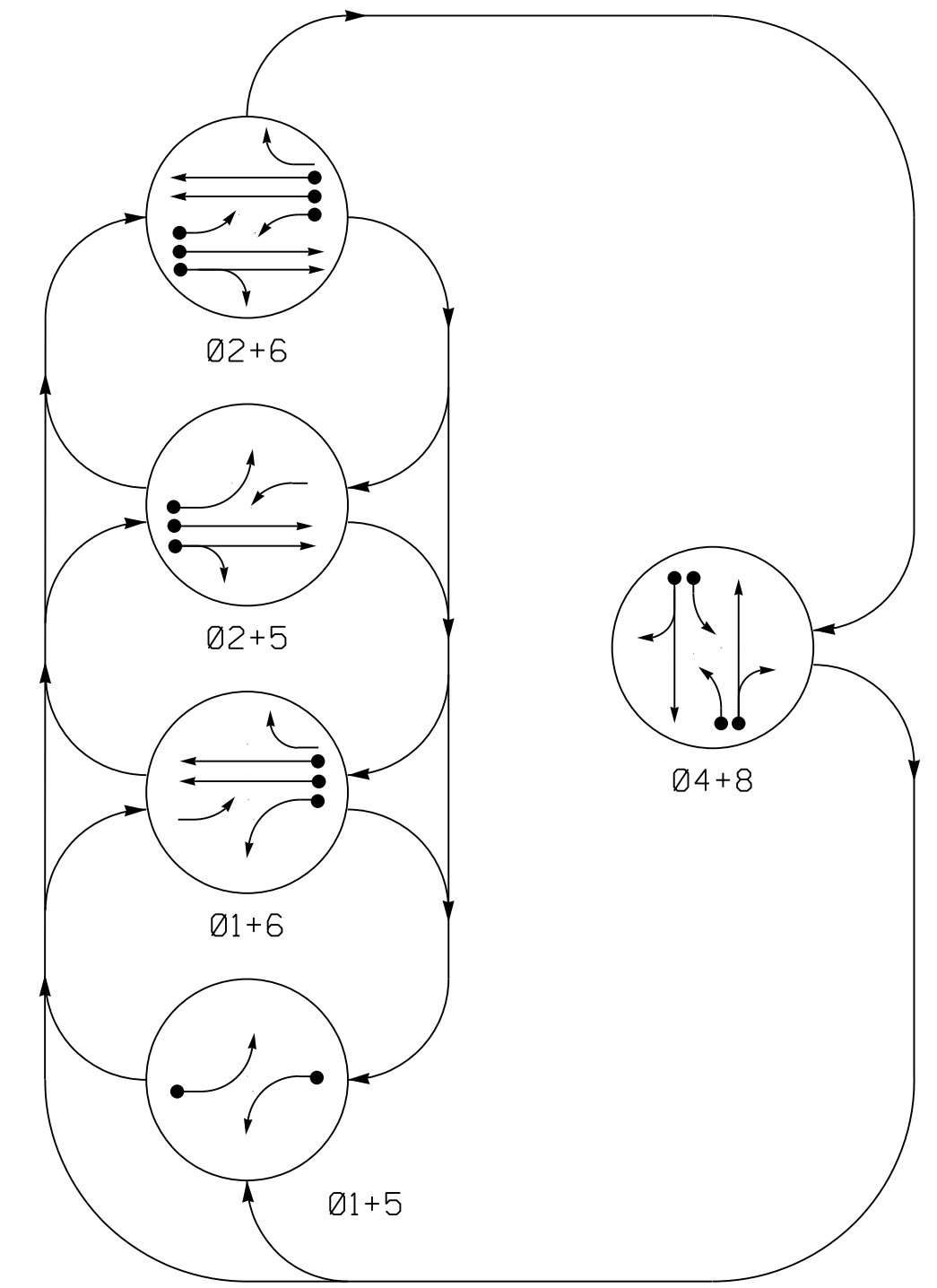


DocuSigned by:  
 Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0222



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

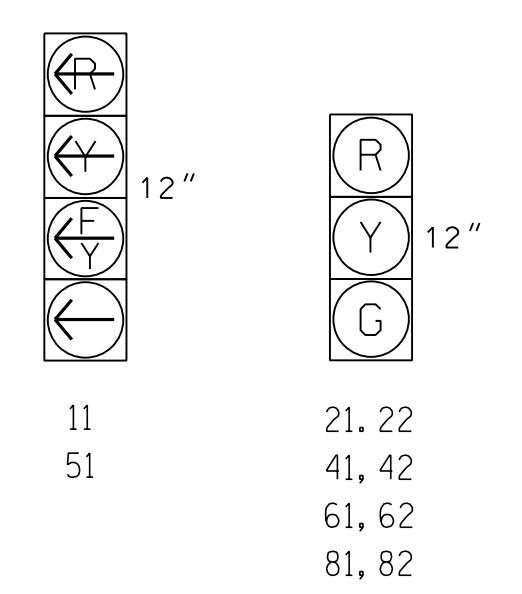
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

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

SIGNAL FACE I.D.

All Heads L.E.D.



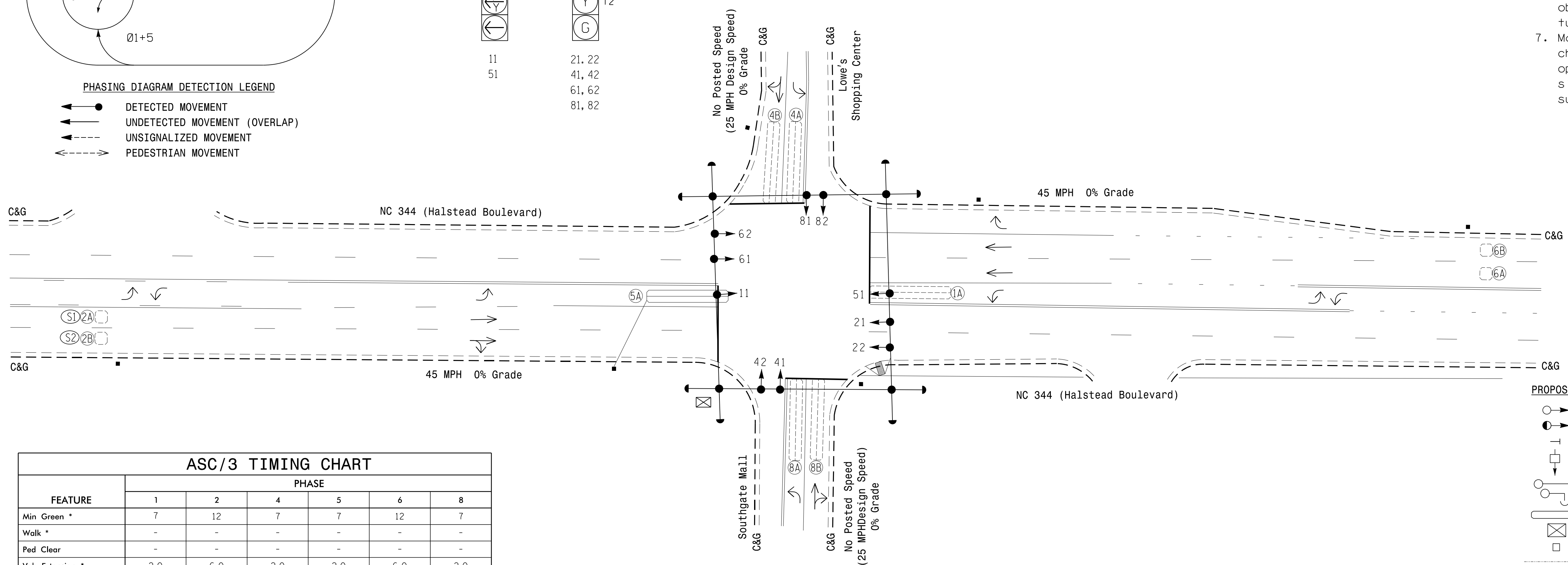
ASC/3 DETECTOR INSTALLATION CHART

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
2A/S1	6X6	300	EXIST	-	2	Yes	-	3	-	G	-	X
2B/S2	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	10	-	S	-	X
5A	6X40	+5	2-4-2	X	5	Yes	-	15	-	S	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	X
6B	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	10	-	S	-	X

5 Phase Fully Actuated (Elizabeth City 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.
- Pavement markings are existing.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 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 *	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	
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	3.2	3.0	4.5	3.2	
Red Clear	2.1	1.0	2.2	2.3	1.0	2.4	
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	-	-	-	-	-	-	
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 Traffic Signal Head		EXISTING Traffic Signal Head
	PROPOSED Modified Signal Head		EXISTING N/A
	PROPOSED Pedestrian Signal Head With Push Button & Sign		EXISTING N/A
	PROPOSED Signal Pole with Guy		EXISTING Signal Pole with Sidewalk Guy
	PROPOSED Inductive Loop Detector		EXISTING Inductive Loop Detector
	PROPOSED Controller & Cabinet		EXISTING Controller & Cabinet
	PROPOSED Junction Box		EXISTING Junction Box
	PROPOSED 2-in Underground Conduit		EXISTING 2-in Underground Conduit
	N/A Right of Way		EXISTING Right of Way
	N/A Directional Arrow		EXISTING Directional Arrow
	N/A Wheel Chair Ramp		EXISTING Wheel Chair Ramp

Signal Upgrade

PLANS PREPARED BY:  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard) at Southgate Mall / Lowe's Shopping Center  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: CBHolden  
 PREPARED BY: DTSears REVIEWED BY:  
 REVISIONS: \_\_\_\_\_ INIT. DATE: \_\_\_\_\_

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

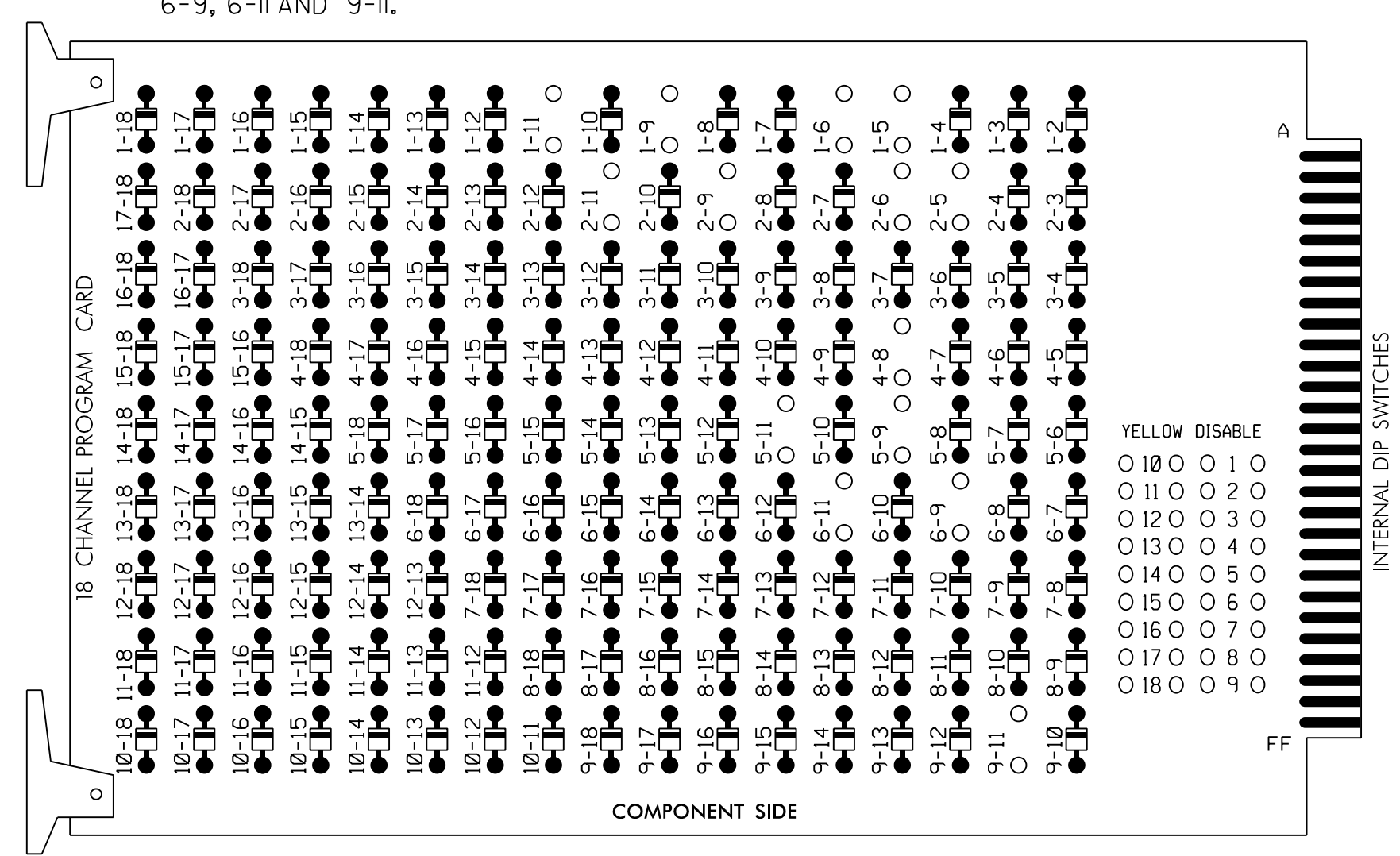
SEAL  
  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 033753  
 C. BYRON HOLDEN

DocuSigned by:  
 C. Byron Holden  
 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0315

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

(remove jumpers and set switches as shown)

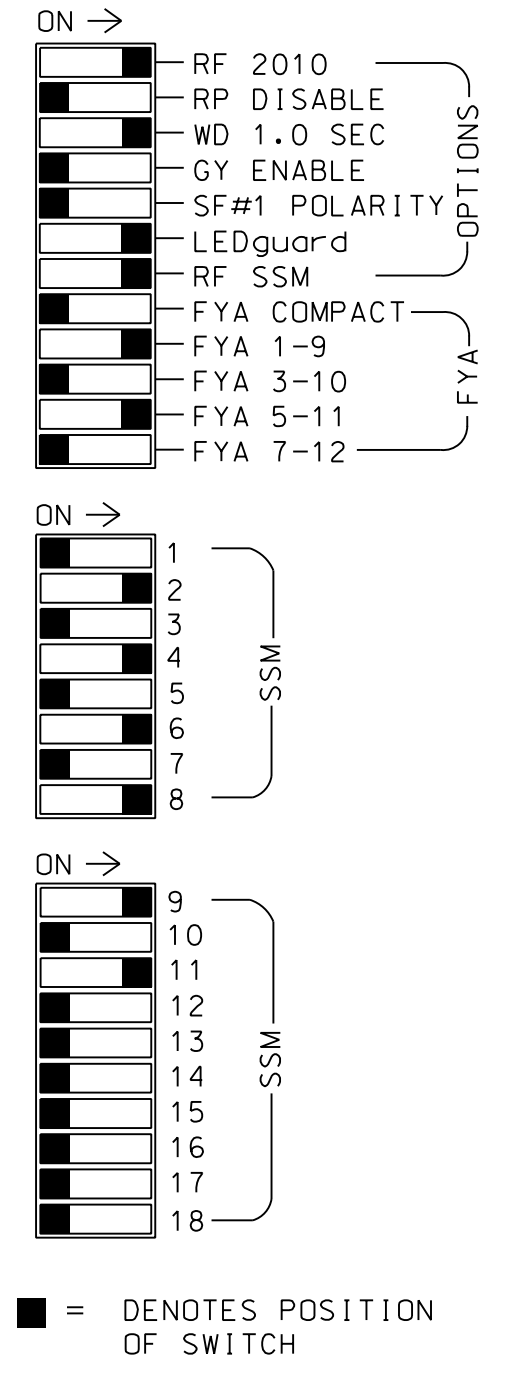
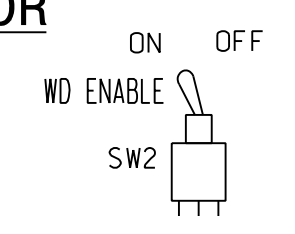
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 AND 9-11.



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 Elizabeth City Signal System.

### EQUIPMENT INFORMATION

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

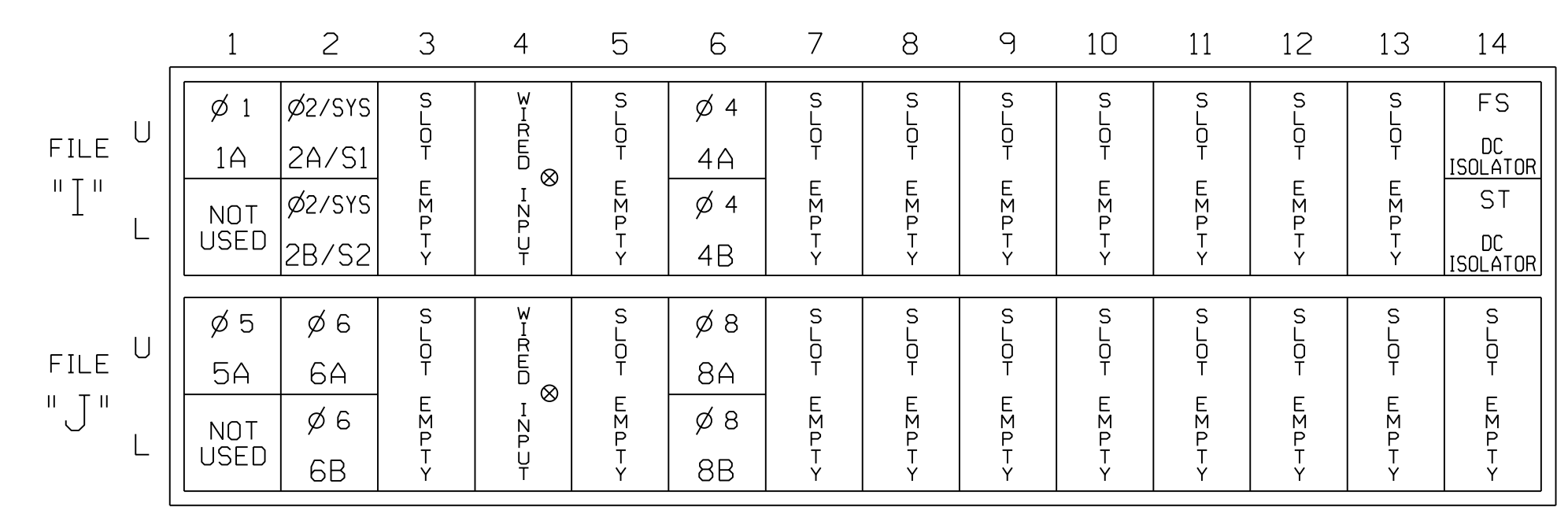
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	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)

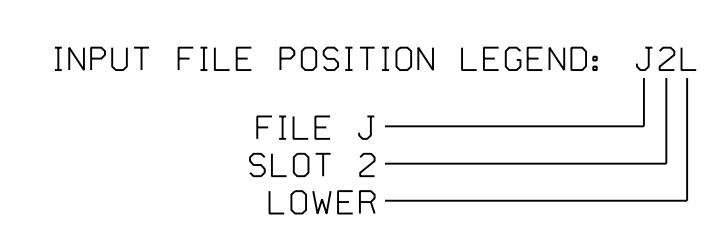


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

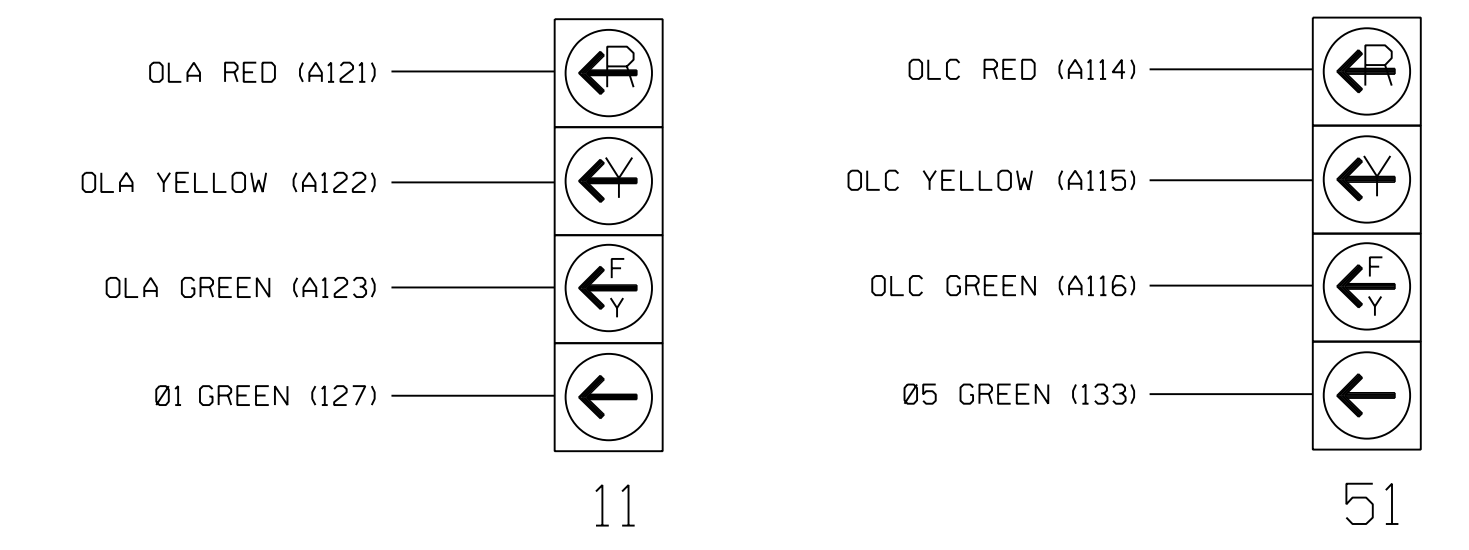
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	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

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.



### FYA SIGNAL WIRING DETAIL

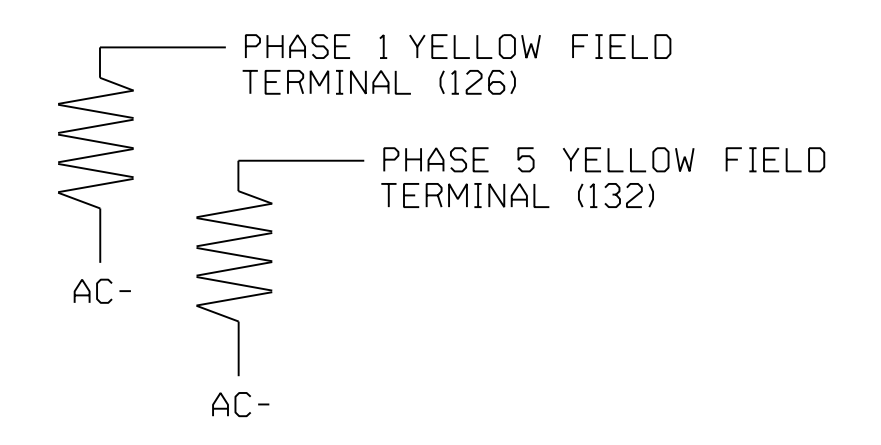
(wire signal heads as shown)



### 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

**PLANS PREPARED BY :**  
  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:  
 Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard) at Southgate Mall / Lowe's Shopping Center  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
 PREPARED BY: M W Yalch REVIEWED BY:  
 REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
  
 DocuSigned by: James O. Deaton 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0315

## 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


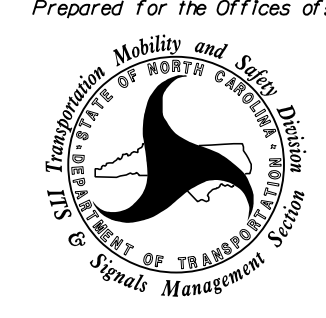

```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0315  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

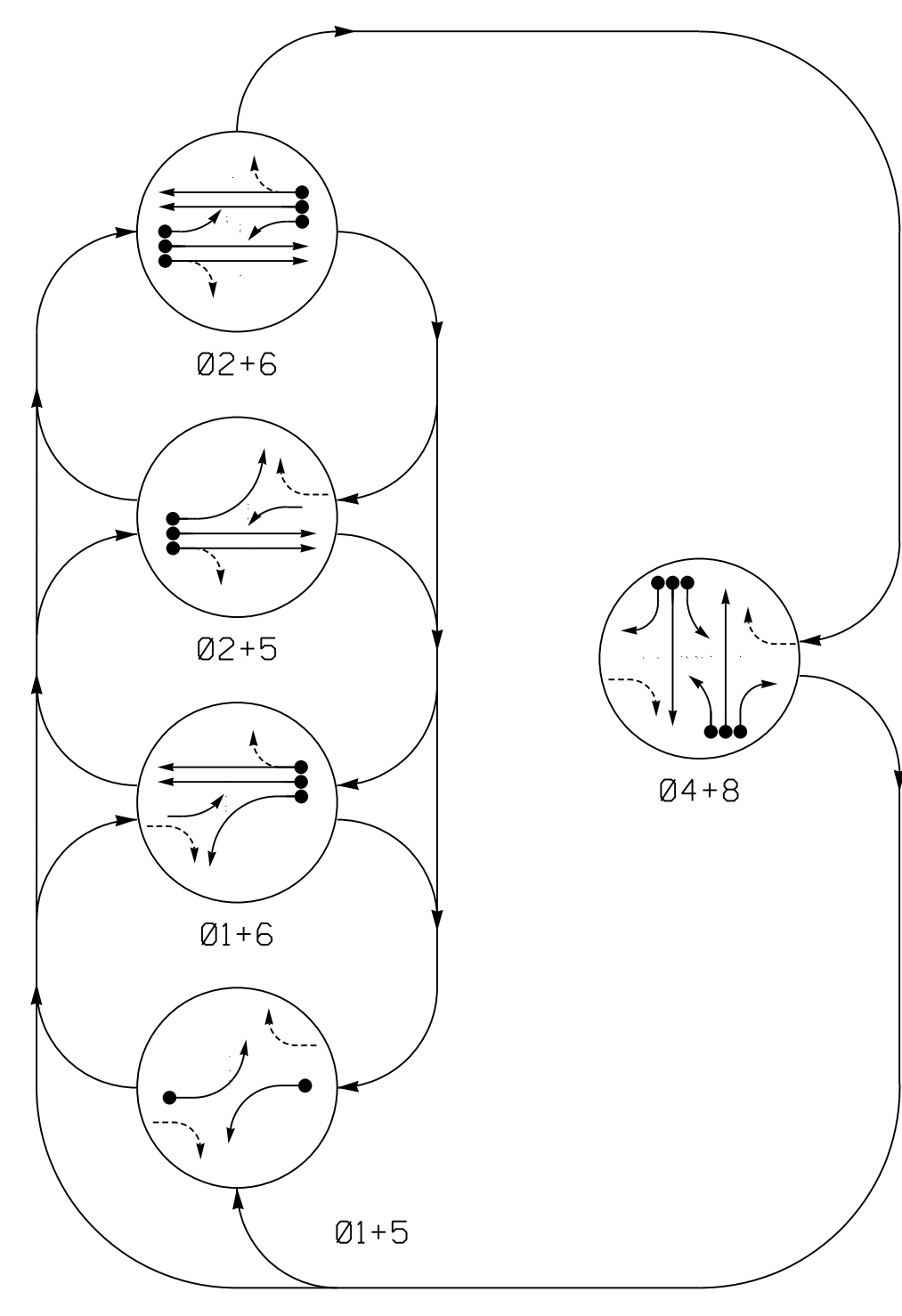
Electrical Detail - Sheet 2 of 2

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FINAL UNLESS ALL  
SIGNATURES COMPLETED

<p><b>PLANS PREPARED BY :</b></p> <div style="text-align: center; font-size: 2em; font-weight: bold; margin: 5px 0;">  </div> <p style="font-size: x-small;">RUMMEL, KLEPPER &amp; KAHL, LLP          900 RIDGEFIELD DRIVE SUITE 350          RALEIGH, NORTH CAROLINA 27609-3960          NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <div style="text-align: center;">  </div> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="font-weight: bold; font-size: 1.2em;">NC 344 (Halstead Boulevard)</p> <p style="font-weight: bold; font-size: 1.2em;">at</p> <p style="font-weight: bold; font-size: 1.2em;">Southgate Mall / Lowe's Shopping Center</p> <p style="font-size: x-small;">Division 1 Pasquotank County Elizabeth City</p> <p style="font-size: x-small;">PLAN DATE: September 2018 REVIEWED BY: J O Deaton</p> <p style="font-size: x-small;">PREPARED BY: M W Yalch 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> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <div style="text-align: center;">  </div> <p style="font-size: x-small;">DocuSigned by: <b>James O. Deaton</b> 9/21/2018</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 01-0315</p>
REVISIONS	INIT.	DATE													

9/21/2018 R:\Traffic\cws\Signal\04as\gnw\electr\loc\Detail\01-0315e-04-200.dgn dsccs

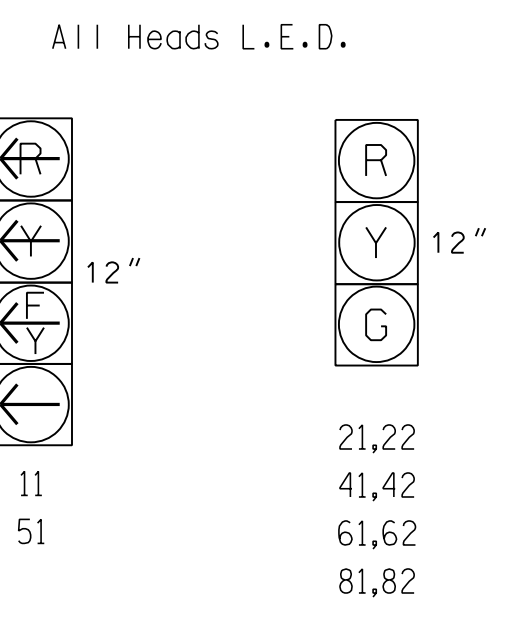
**PHASING DIAGRAM**



**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**



**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X6	355	EXIST	-	6	Yes	-	3	-	G	-	X
2B	6X6	355	EXIST	-	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4C	6X40	0	2-4-2	-	4	Yes	-	15	-	S	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	355	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	355	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	-	S	-	X
8C	6X40	0	2-4-2	-	8	Yes	-	15	-	S	-	X

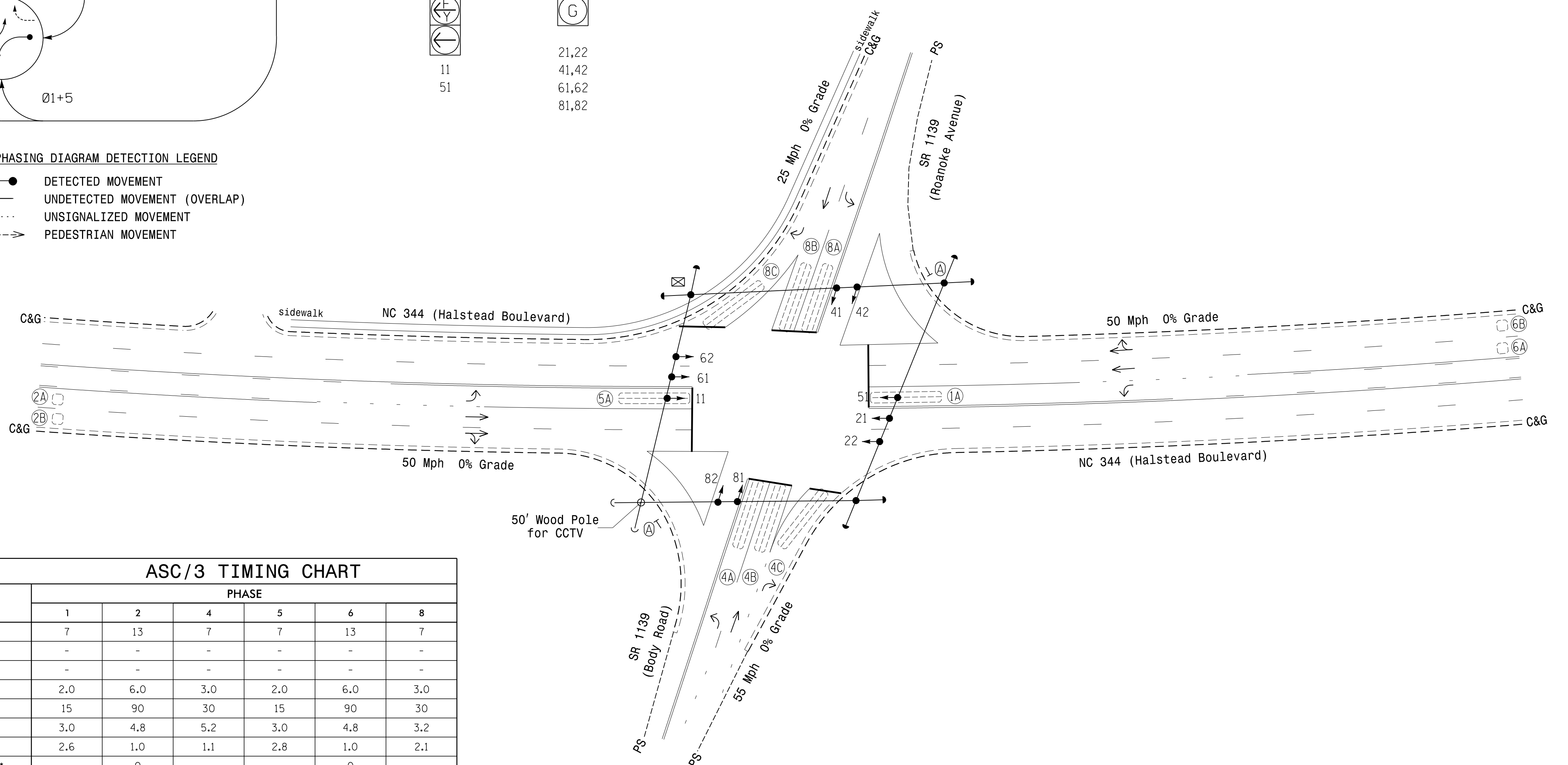
**5 Phase Fully Actuated (Elizabeth City Signal System)**

**NOTES**

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

**PHASING DIAGRAM DETECTION LEGEND**

- ◄● (solid arrow) DETECTED MOVEMENT
- ◄ (dashed arrow) UNDETECTED MOVEMENT (OVERLAP)
- ◄ (dotted arrow) UNSIGNALIZED MOVEMENT
- ◄ (double arrow) PEDESTRIAN MOVEMENT

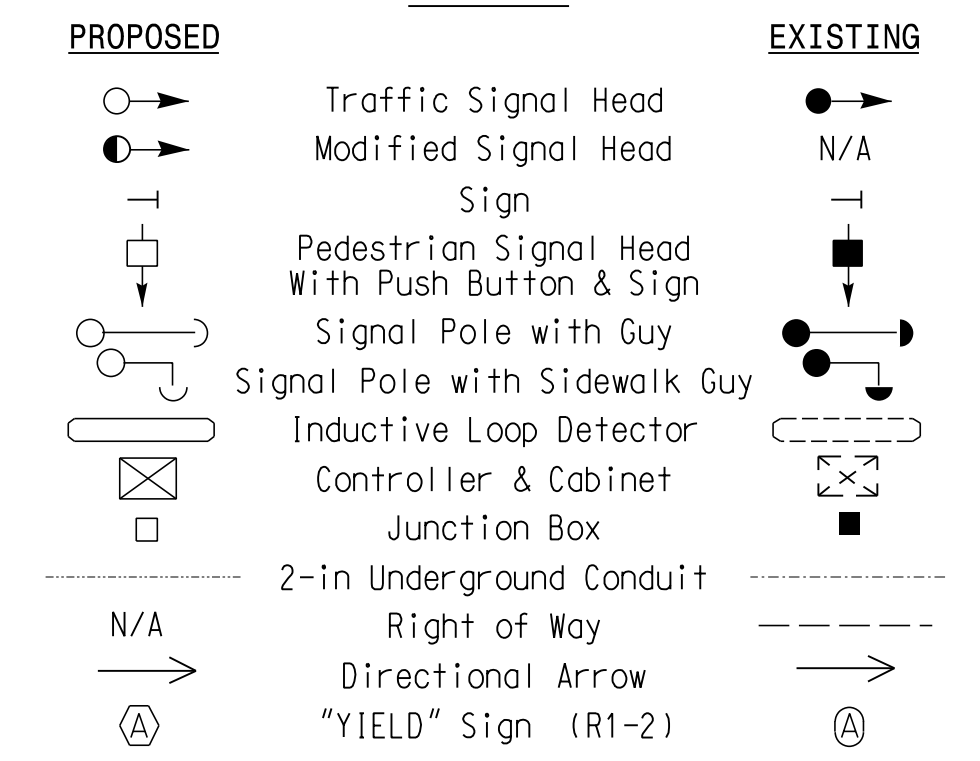


**ASC/3 TIMING CHART**

FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	13	7	7	13	7	
Walk *	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	
Veh. Extension *	2.0	6.0	3.0	2.0	6.0	3.0	
Max 1 *	15	90	30	15	90	30	
Yellow	3.0	4.8	5.2	3.0	4.8	3.2	
Red Clear	2.6	1.0	1.1	2.8	1.0	2.1	
Actuations B4 Add *	-	0	-	-	0	-	
Seconds / Actuation *	-	1.5	-	-	1.5	-	
Max Initial *	-	40	-	-	40	-	
Time Before Reduction *	-	20	-	-	20	-	
Time To Reduce *	-	50	-	-	50	-	
Minimum Gap	-	3.5	-	-	3.5	-	
Locking Detector	-	X	-	-	X	-	
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	

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

**LEGEND**



**Signal Upgrade**

Prepared for the Offices of:

PLANS PREPARED BY:  
**RK&K**  
RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

NC 344 (Halstead Boulevard)  
At  
SR 1139  
(Roanoke Avenue/Body Road)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: DTSeares

PREPARED BY: CBHolden REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SCALE: 1" = 40'

9/21/2018

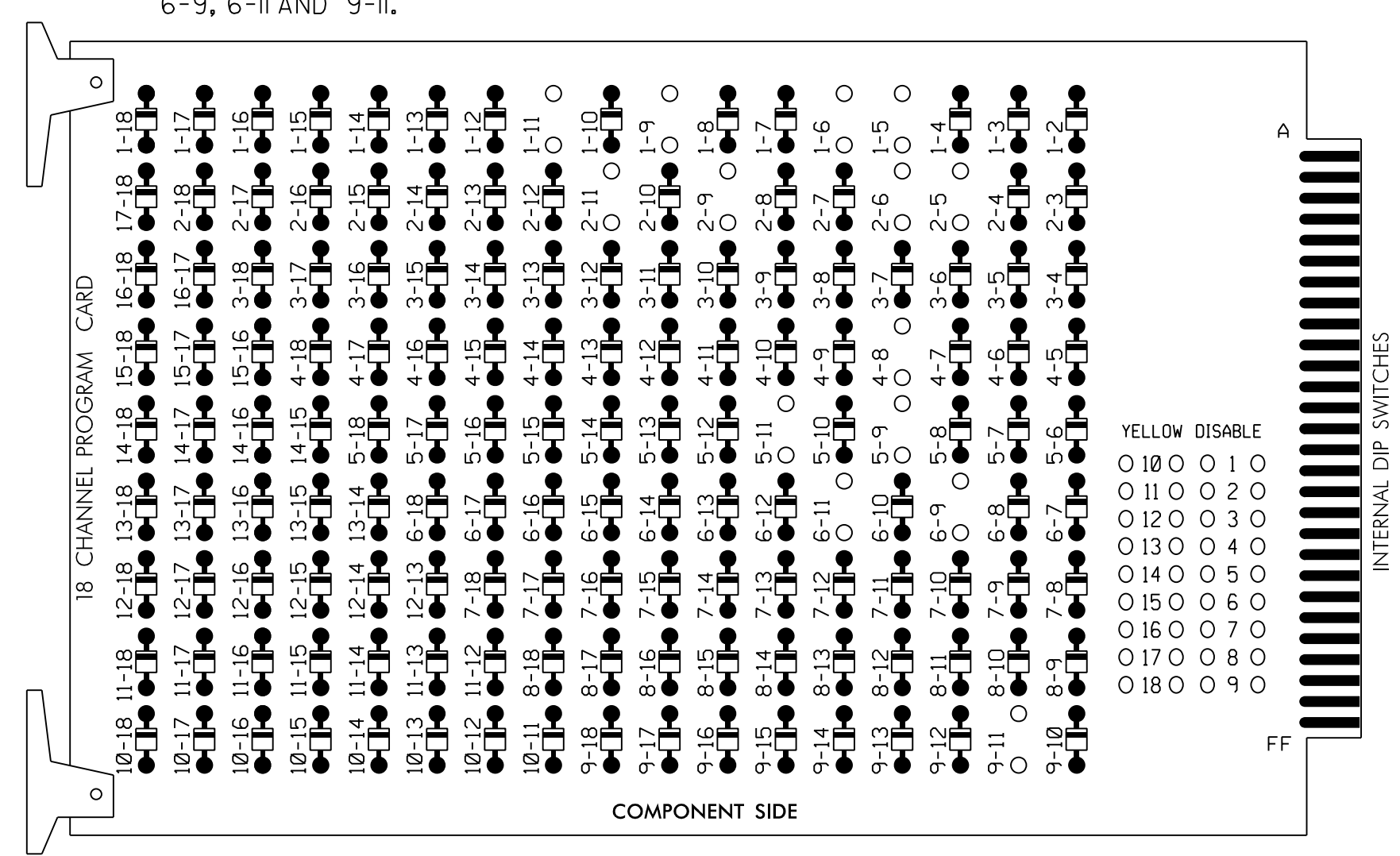
DocuSigned by: C. Byron Holden

SIG. INVENTORY NO. 01-0336

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

(remove jumpers and set switches as shown)

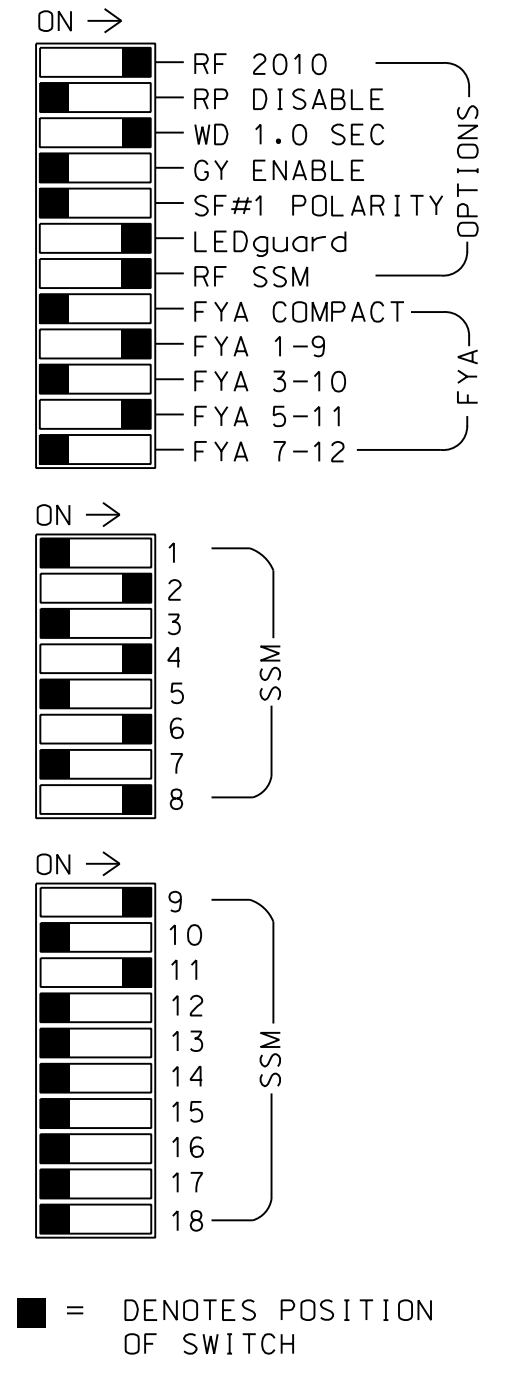
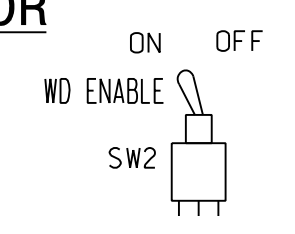
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 AND 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

### NOTES

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

### EQUIPMENT INFORMATION

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

### SIGNAL HEAD HOOK-UP CHART

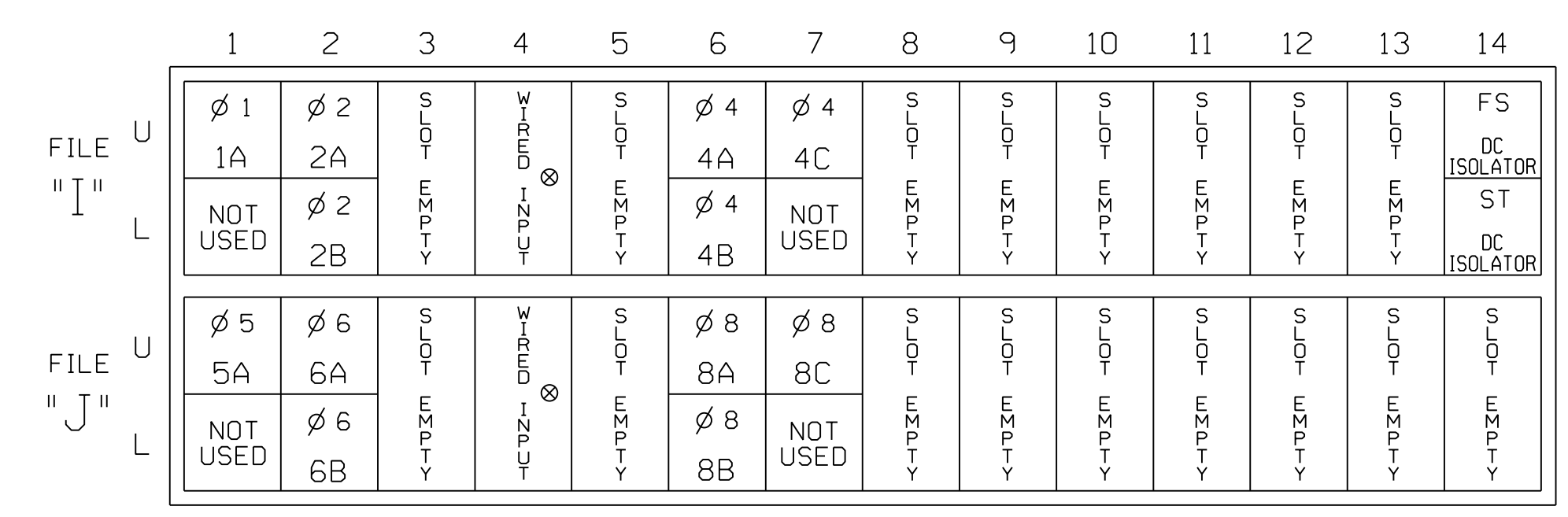
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	DLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	11	NU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

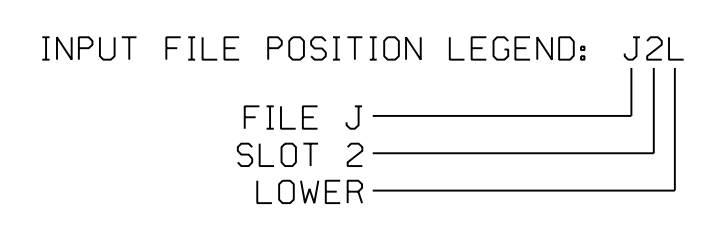
FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

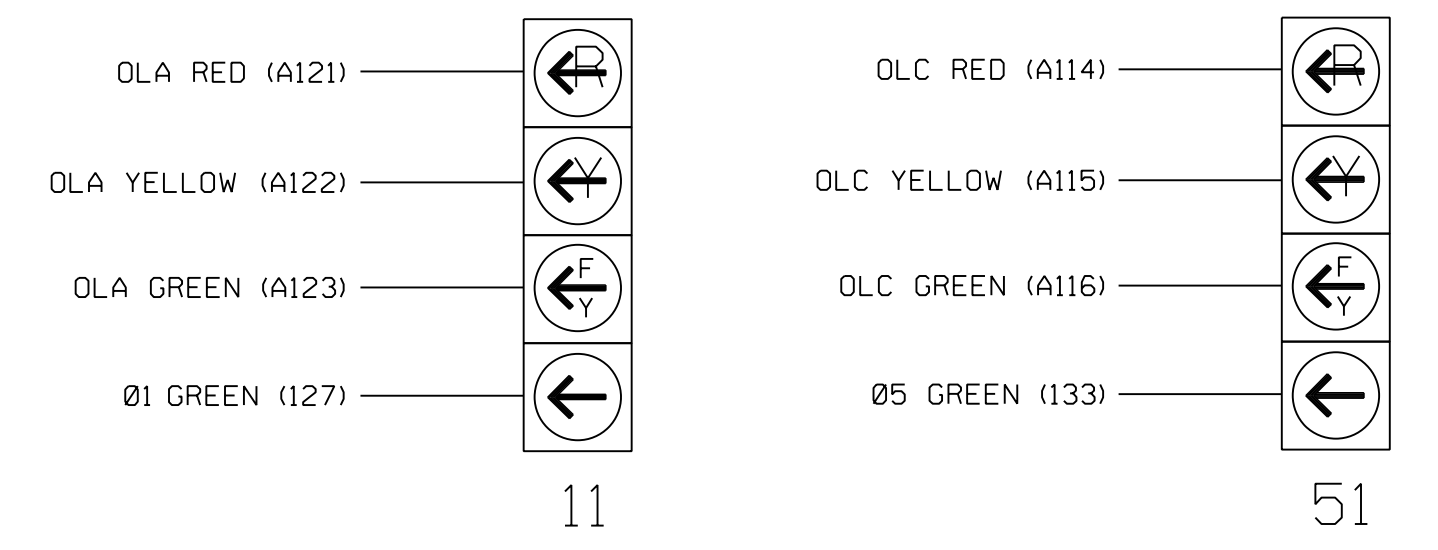
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES				S
4C	TB6-1,2	I7U	65	34	4	YES		15		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES				S
8C	TB7-1,2	J7U	66	38	8	YES		15		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.



### FYA SIGNAL WIRING DETAIL

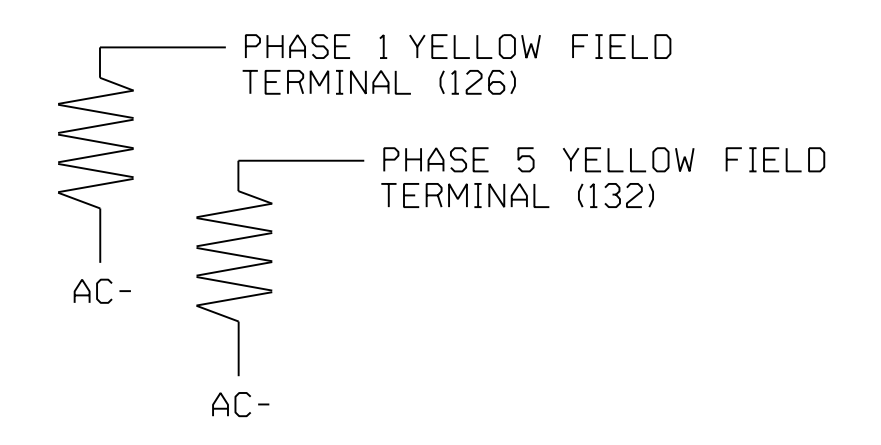
(wire signal heads as shown)



### 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

PLANS PREPARED BY:  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:  
 Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard)  
 at  
 SR 1139  
 (Roanoke Avenue/Body Road)  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
 PREPARED BY: M W Valch REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
  
 ENGINEER JAMES O. DEATON

DocuSigned by:  
 James O. Deaton  
 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0336

## 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: 01-0336  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
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SIGNATURES COMPLETED

**PLANS PREPARED BY :**

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**NC 344 (Halstead Boulevard)**  
 at  
**SR 1139**  
 (Roanoke Avenue/Body Road)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

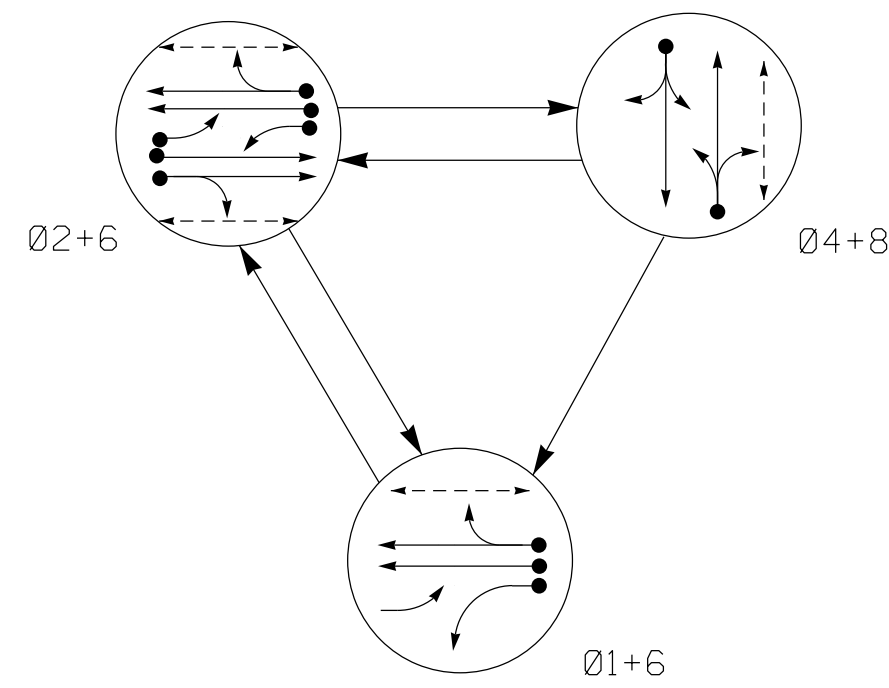
REVISIONS	INIT.	DATE

SEAL

DocuSigned by:  
**James O. Deaton** 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0336

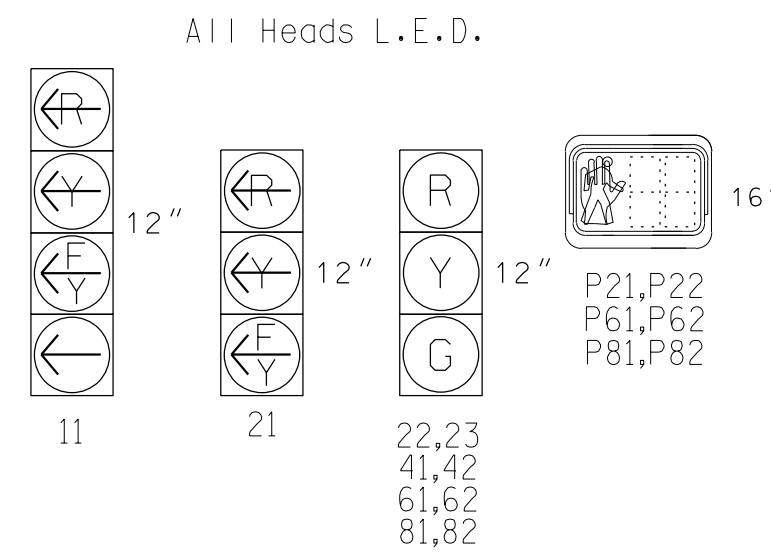
9/21/2018 R:\Projects\cws\Signal\Signal\electrical\Detail\01-0336e-04-200.dgn dsccars

**PHASING DIAGRAM**



SIGNAL FACE	PHASE			
	Ø 1+6	Ø 2+6	Ø 4+8	FLASH
Ø 2+6	←	←	←	←
21	←	←	←	←
22, 23	R	G	R	Y
41, 42	R	R	G	R
61, 62	G	G	R	Y
81, 82	R	R	G	R
P21, P22	DW	W	DW	DRK
P61, P62	W	W	DW	DRK
P81, P82	DW	DW	W	DRK

**SIGNAL FACE I.D.**



ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP TYPE	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	- X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	- X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	- X
2C	6X40	+5	2-4-2	-	2	Yes	-	-	-	S	- X
4A	6X40	+15	2-4-2	-	4	Yes	-	5	-	S	- X
4B	6X6	+10	EXIST	-	4	Yes	-	15	-	S	- X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	- X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	- X
8A	6X40	+5	2-4-2	-	8	Yes	-	5	-	S	- X
S1	6X6	+75	EXIST	-	-	Yes	-	-	-	N	X X
S2	6X6	+75	EXIST	-	-	Yes	-	-	-	N	X X

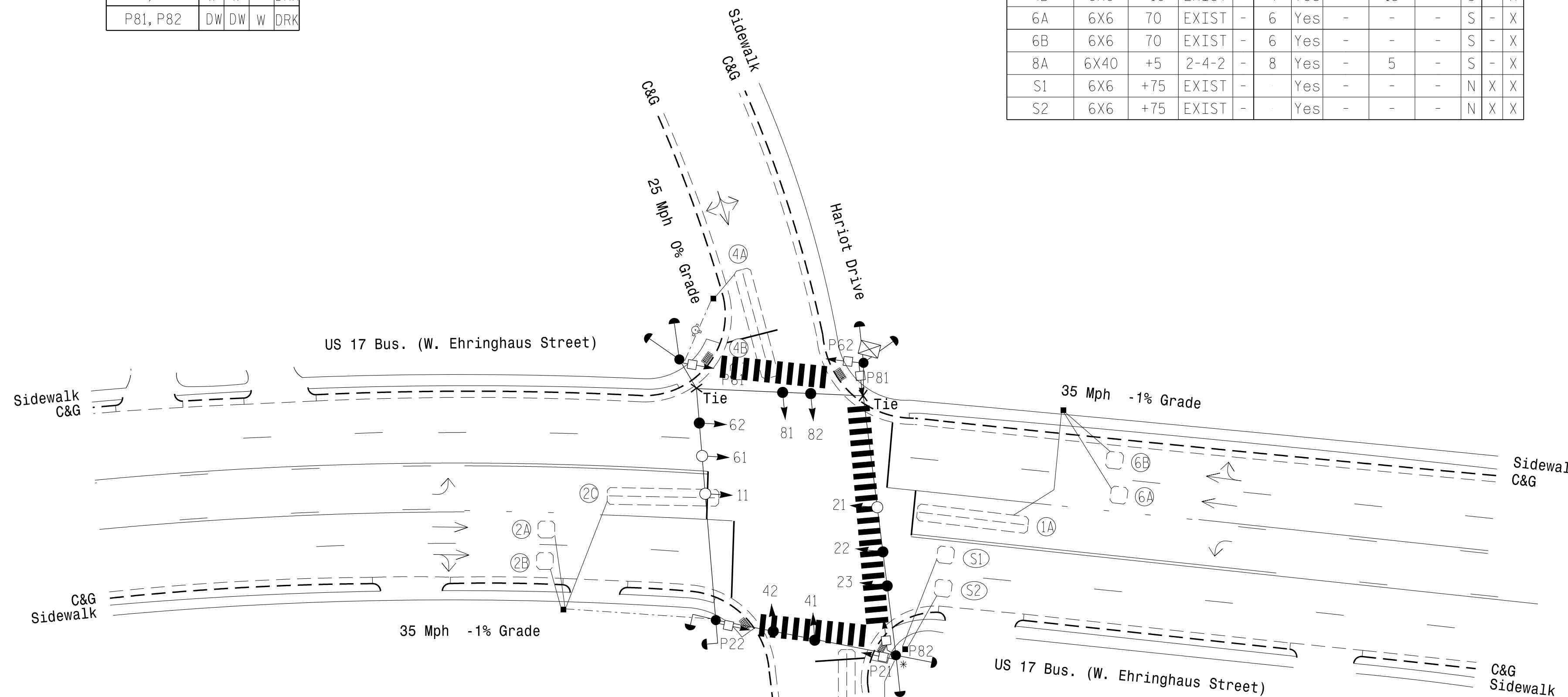
**3 Phase Fully Actuated (Elizabeth City Signal System)**

**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 62.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Program phase 8 ped detector to call phase 4 and 8 ped.
- Phase 4 ped is dummy ped to enable phase 8 leading ped interval.
- Pavement markings are existing unless otherwise indicated.
- Raise spans to obtain 17' minimum clearance for signal head heights.
- 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



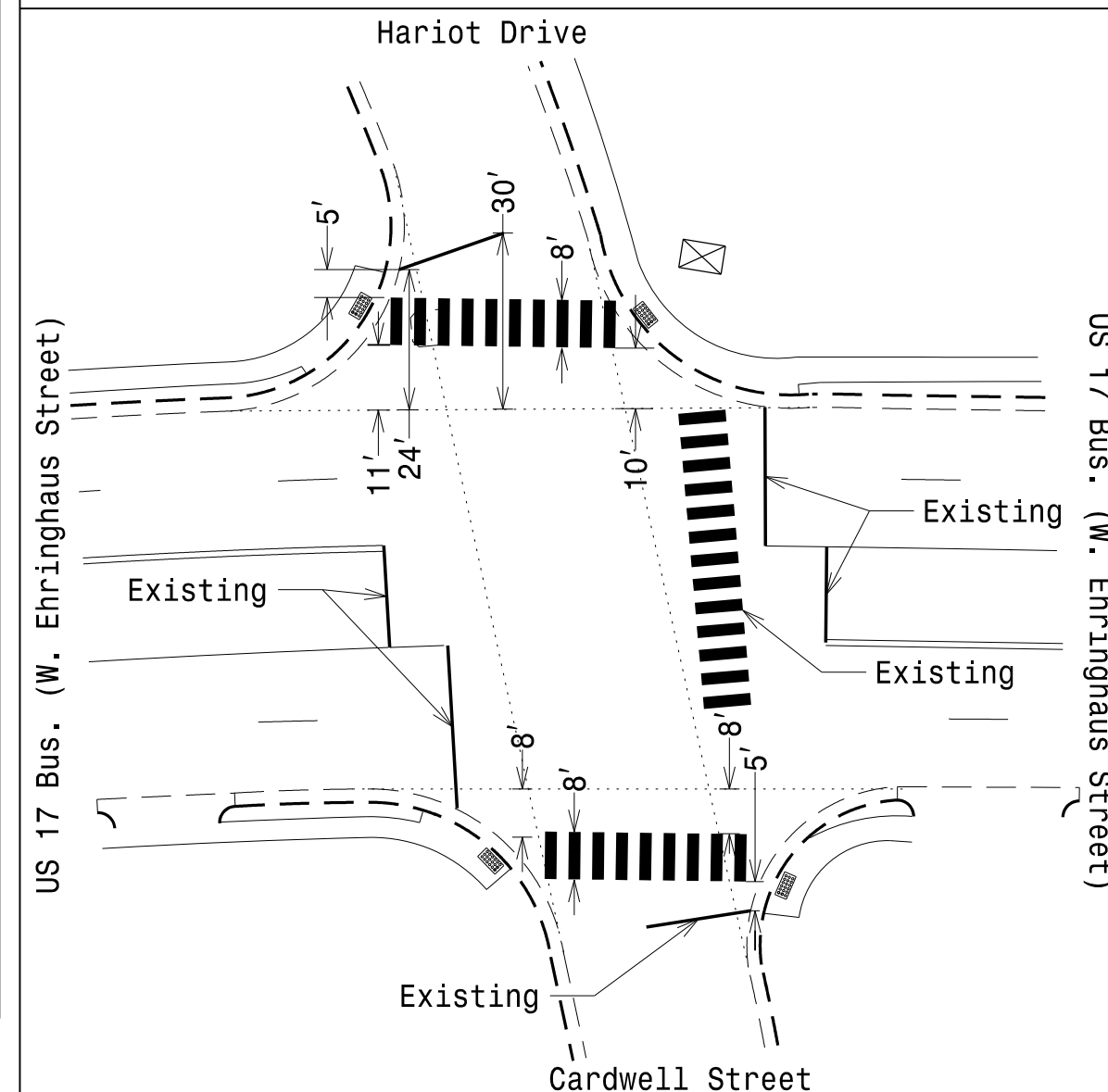
**LEGEND**

- | PROPOSED   | EXISTING  |
|--|-----------|
| ○ → Traffic Signal Head                          | ● → N/A   |
| ○ → Modified Signal Head                         | ○ → N/A   |
| → Sign   | → N/A     |
| □ Pedestrian Signal Head with Push Button & Sign | □ → N/A   |
| ○ → Signal Pole with Guy                         | ○ → N/A   |
| ○ → Signal Pole with Sidewalk Guy                | ○ → N/A   |
| ⊗ Inductive Loop Detector                        | ⊗ → N/A   |
| □ Controller & Cabinet                           | □ → N/A   |
| □ Junction Box                                   | □ → N/A   |
| --- 2-in Underground Conduit                     | --- → N/A |
| --- Right of Way                                 | --- → N/A |
| → Directional Arrow                              | → → N/A   |
| ○ Fire Hydrant                                   | ○ → N/A   |
| ▬ Truncated Domes                                | ▬ → N/A   |

FEATURE	ASC/3 TIMING CHART PHASE				
	1	2	4	6	8
Min Green *	7	10	7	10	7
Delay Green	0	0	7	0	7
Walk *	0	7	0	7	7
Ped Clear	0	8	0	8	20
Veh. Extension *	2.0	3.0	2.0	3.0	2.0
Max 1 *	15	45	25	45	25
Yellow	3.0	3.9	3.2	3.9	3.3
Red Clear	2.1	1.2	2.9	1.2	2.8
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	X	-
Recall Position	-	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	X	-	X
Simultaneous Gap	X	X	X	X	X

\* 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.

**STOP BAR AND CROSSWALK LOCATIONS**



**Signal Upgrade**

Prepared for the Offices of:  
  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27519  
 NC License No. C-2213 (919) 650-1038

**US 17 Bus. (W. Ehringhaus Street) at Cardwell Street/Hariot Drive**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: February 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: JA Le REVIEWED BY: LM Moon

SEAL  
  
 Lisa M. Moon  
 9/20/2018  
 DATE

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





### 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 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

### ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

- 1. From Main Menu select **6. DETECTORS**
- 2. From DETECTOR Submenu select **3. PED DETECTOR INPUT ASSIGNMENT**

PED DET PHASE ASSIGNMENT MODE: NTCIP												
PHASE	1	2	3	4	5	6	7	8				
DETECTOR	0	2	0	8	0	6	0	8				
PHASE	9	10	11	12	13	14	15	16				
DETECTOR	0	0	0	0	0	0	0	0				

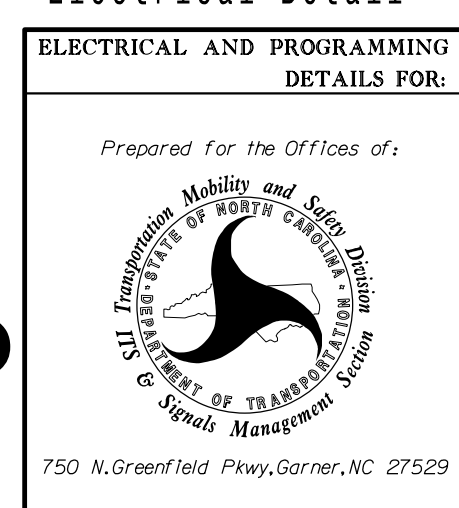
← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 4 & 8

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0374  
DESIGNED: FEBRUARY 2018  
SEALED: 09/20/2018  
REVISED: N/A

### 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.

20-SEP-2018 18:51 R:\415942\451\001\5405\0001\5405\0001\1\mg01-0374-08212018e.dgn Jmoon AT CAR-LMD\JMT-W7



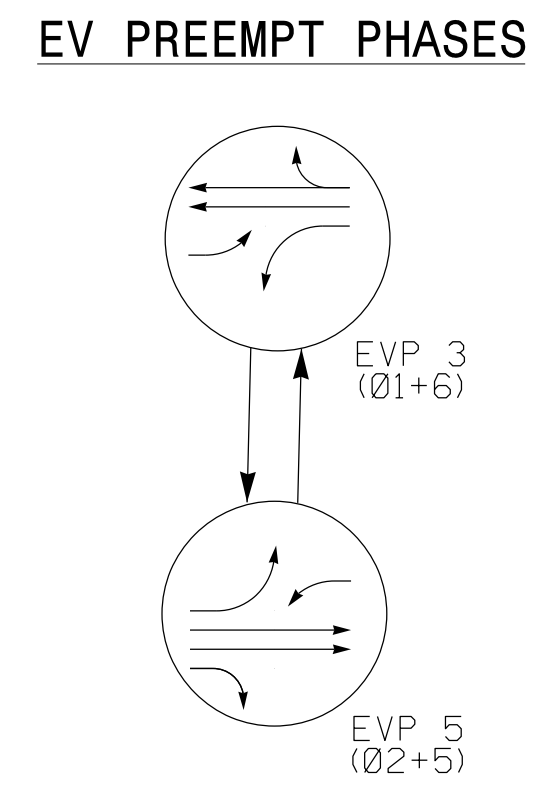
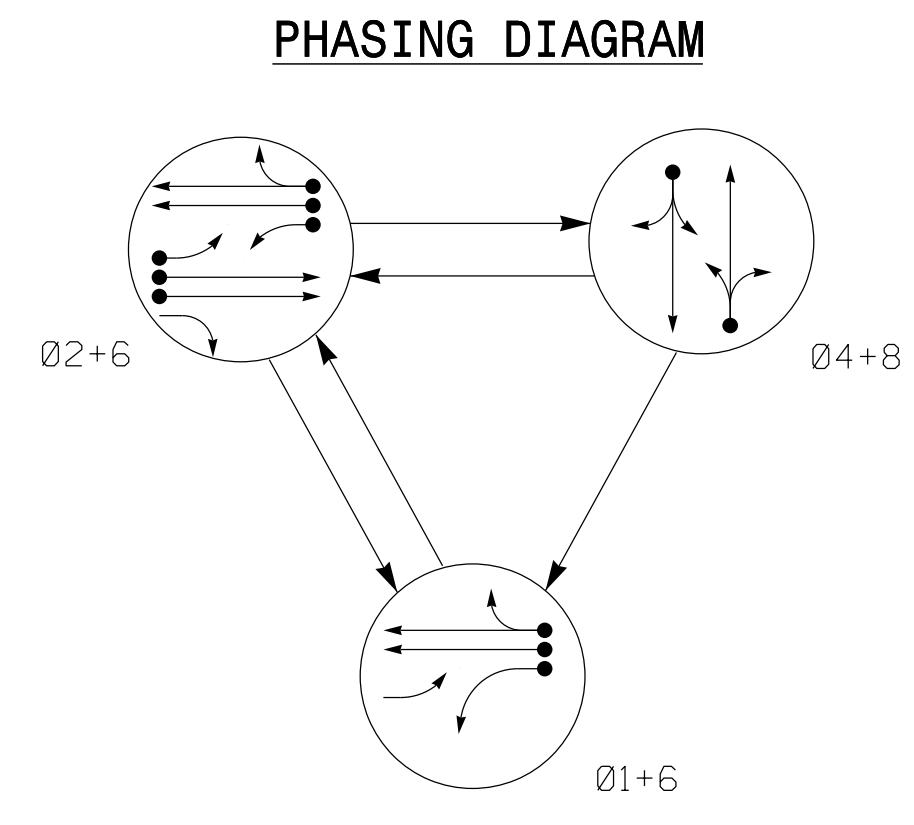
Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	
US 17 Bus. (W. Ehringhaus Street) at Cardwell Street/Hariot Drive	
Division 1 Pasquotank County Elizabeth City	
PLAN DATE: February 2018	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

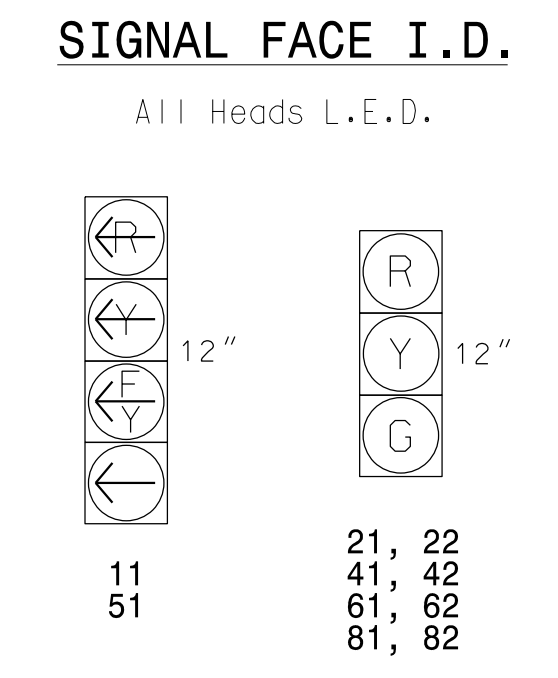
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: Lisa M. Moon 9/20/2018  
SIC65880300421 DATE  
SIG. INVENTORY NO. 01-0374

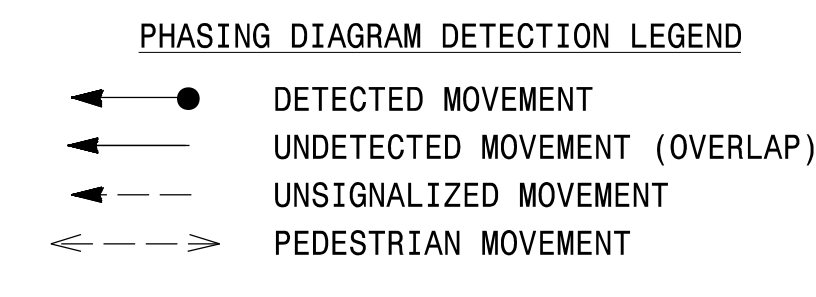


SIGNAL FACE	PHASE					
	Ø 1 + 6	Ø 2 + 6	Ø 4 + 8	EVP 3	EVP 5	F L S H
11	F	F	R	R	F	F
21, 22	R	G	R	R	G	Y
41, 42	R	R	G	R	R	R
51	F	F	R	F	F	F
61, 62	G	G	R	G	R	Y
81, 82	R	R	G	R	R	R



ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	+5	2-4-2	-	1	Yes	-	15	-	S	-	X
2A/S1	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2C	6X40	0	2-4-2	X	2	Yes	-	3	-	G	-	X
4A	6X20	+5	*	-	4	Yes	-	5	-	S	-	X
6A/S3	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
8A	6X30	0	*	-	8	Yes	-	5	-	S	-	X
8B	6X20	+5	*	-	8	Yes	-	15	-	S	-	X

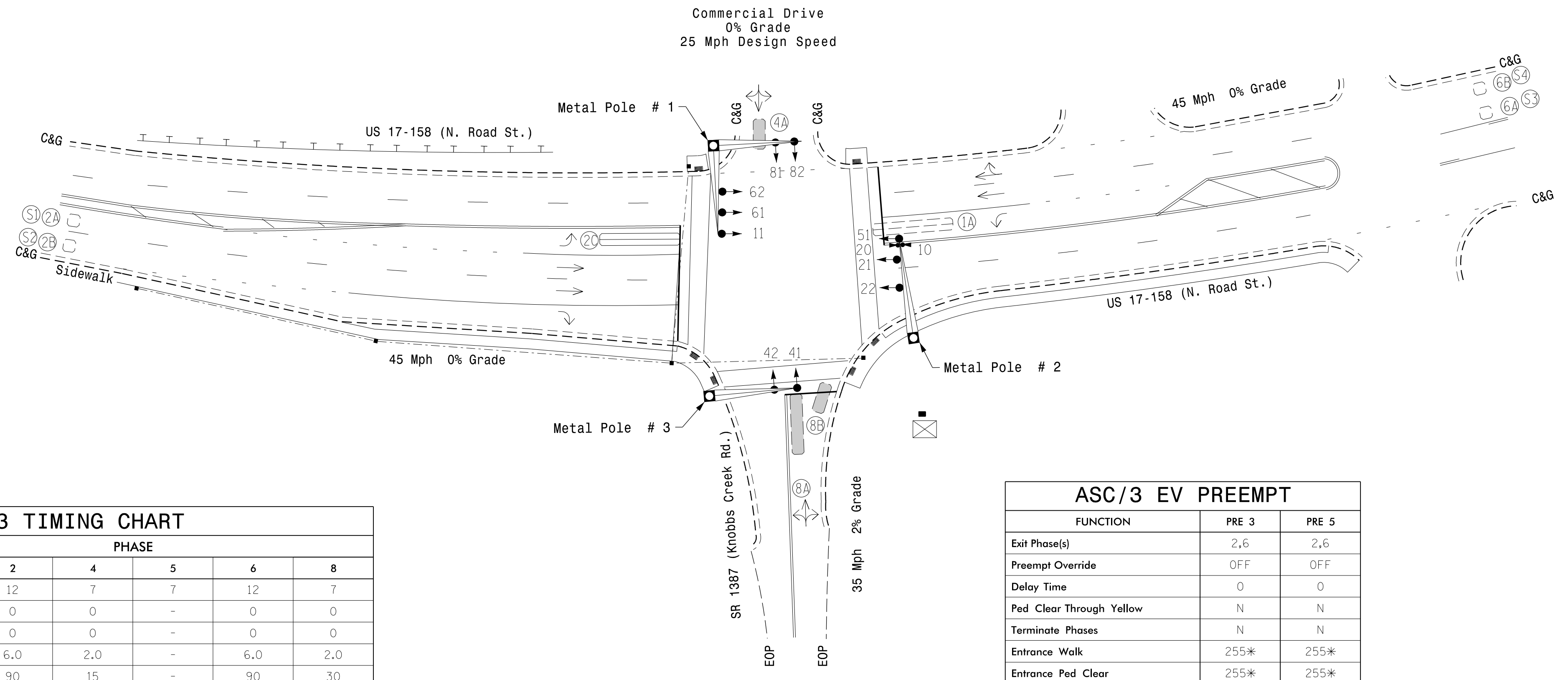
\* Wireless Detection Zone



### 3 Phase Fully Actuated W/ EV Preemption (Elizabeth City 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.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Relocate existing optical detection equipment from existing cabinet to new cabinet.
- Optical detector 10 calls EVP3; Optical detector 20 calls EVP5.
- Relocate existing wireless detection from existing cabinet to new cabinet.
- 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.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

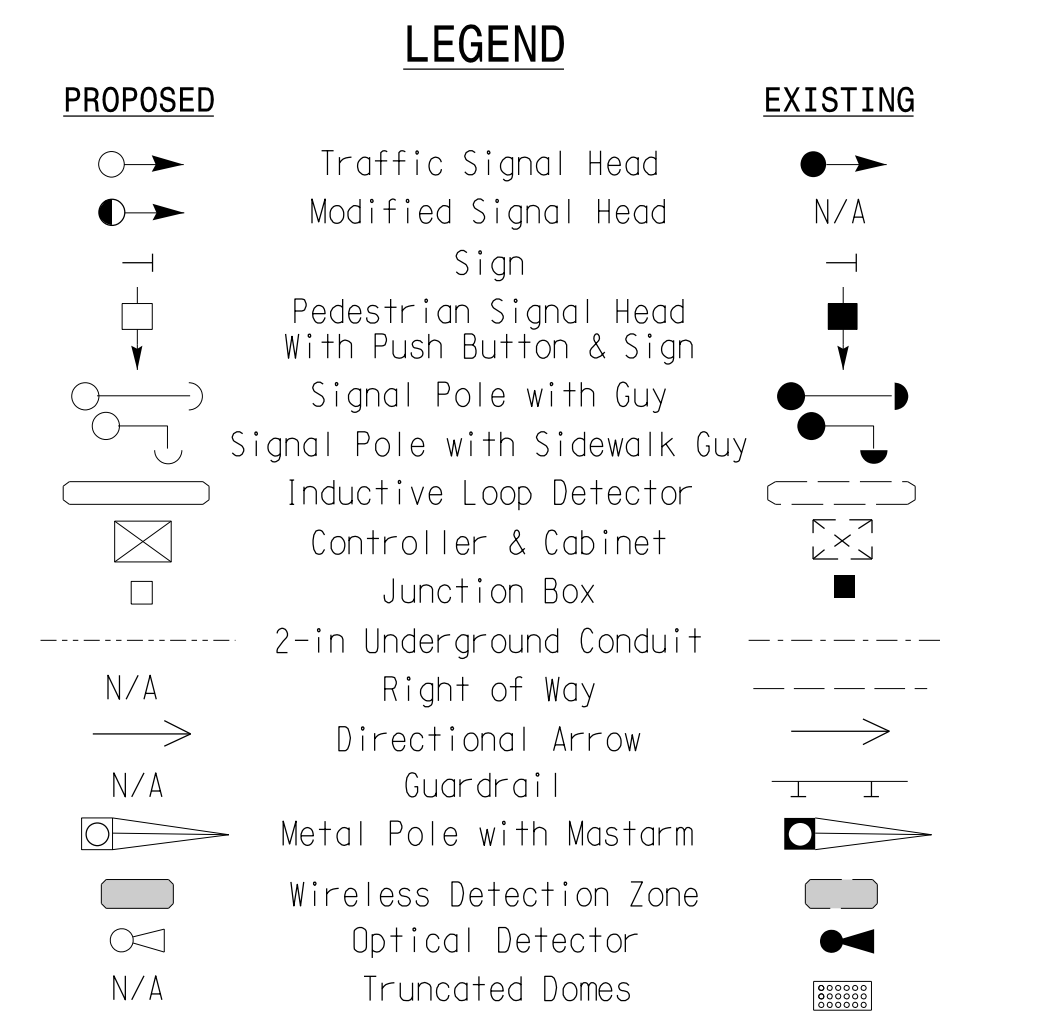


ASC/3 TIMING CHART						
FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	0	0	0	-	0	0
Ped Clear	0	0	0	-	0	0
Veh. Extension *	2.0	6.0	2.0	-	6.0	2.0
Max 1 *	20	90	15	-	90	30
Yellow	3.0	4.5	3.2	3.0	4.5	3.7
Red Clear	2.6	1.6	2.6	2.3	1.6	2.6
Actuations B4 Add *	-	0	-	-	0	-
Seconds / Actuation *	-	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.

ASC/3 EV PREEMPT		
FUNCTION	PRE 3	PRE 5
Exit Phase(s)	2,6	2,6
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	N	N
Terminate Phases	N	N
Entrance Walk	255*	255*
Entrance Ped Clear	255*	255*
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	12	12
Preempt Input Extension Time	2	2
Preempt Max Time	120	120
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

\* Allows normal phase times to be used.



#### Signal Upgrade

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

US 17-158 (N. Road Street) at SR 1387 (Knobbs Creek Road)/ Commercial Drive

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: JA Le REVIEWED BY: LJ Moon

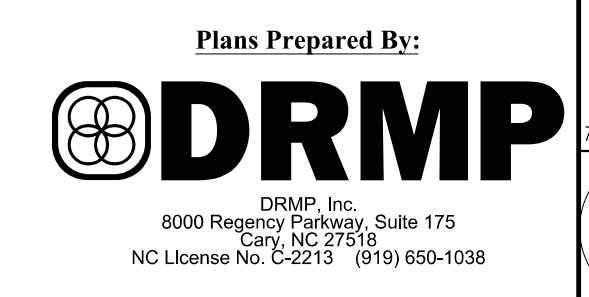
REVISIONS: INIT. DATE

SCALE: 1" = 40'

Seal: LISA M. MOON, ENGINEER, SEAL 022516

DocuSigned by: Lisa M. Moon 8/21/2018

SIG. INVENTORY NO. 01-0404

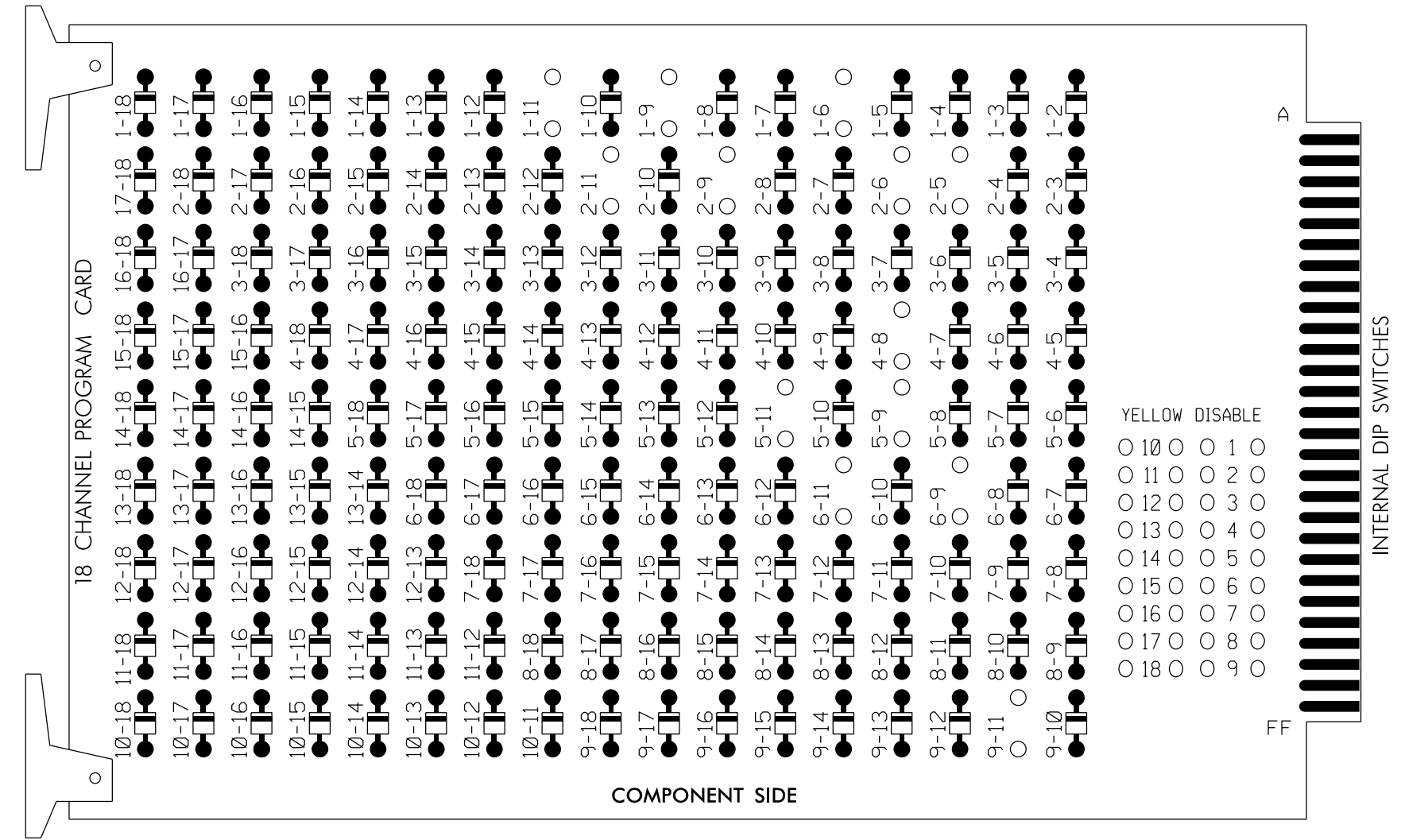


21-AUG-2018 17:26 R:\05942\51001\SR1387\Signal\01-0404.dgn DWI:TB AT CAR-DWH:TE-LTW

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

(remove jumpers and set switches as shown)

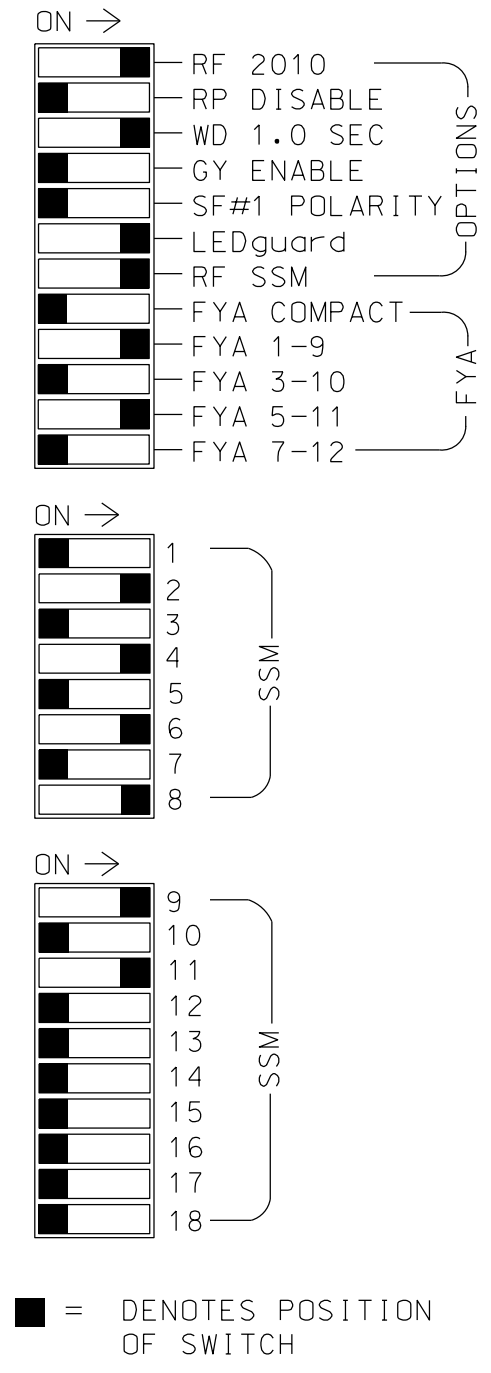
REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 and 9-11.



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.



### 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 Elizabeth City 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  
 \*\* Phase only used during Preempt

### SIGNAL HEAD HOOK-UP CHART

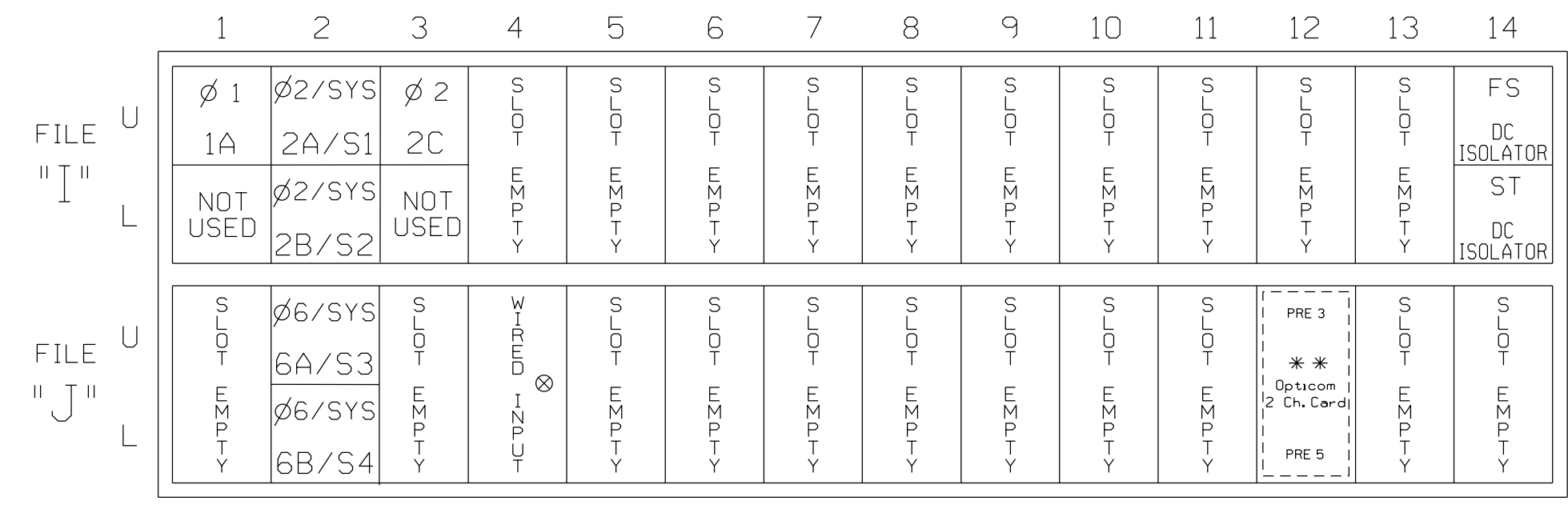
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CNU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	1*	21,22	NU	NU	41,42	NU	51*	61,62	NU	NU	81,82	NU	11*	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 on sheet 2.  
 ★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

(front view)



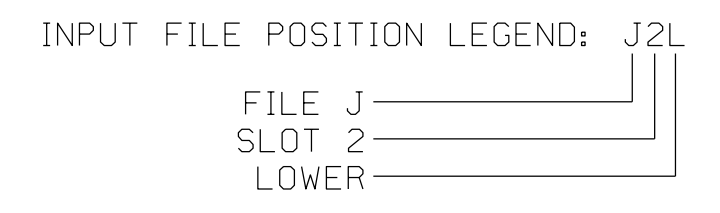
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 ⊗ Wired Input - Do not populate slot with detector card  
 \* See Sensys Access Box Wiring Detail this sheet.

FS = FLASH SENSE  
 ST = STOP TIME  
 PRE = PREEMPT

### INPUT FILE CONNECTION & PROGRAMMING CHART

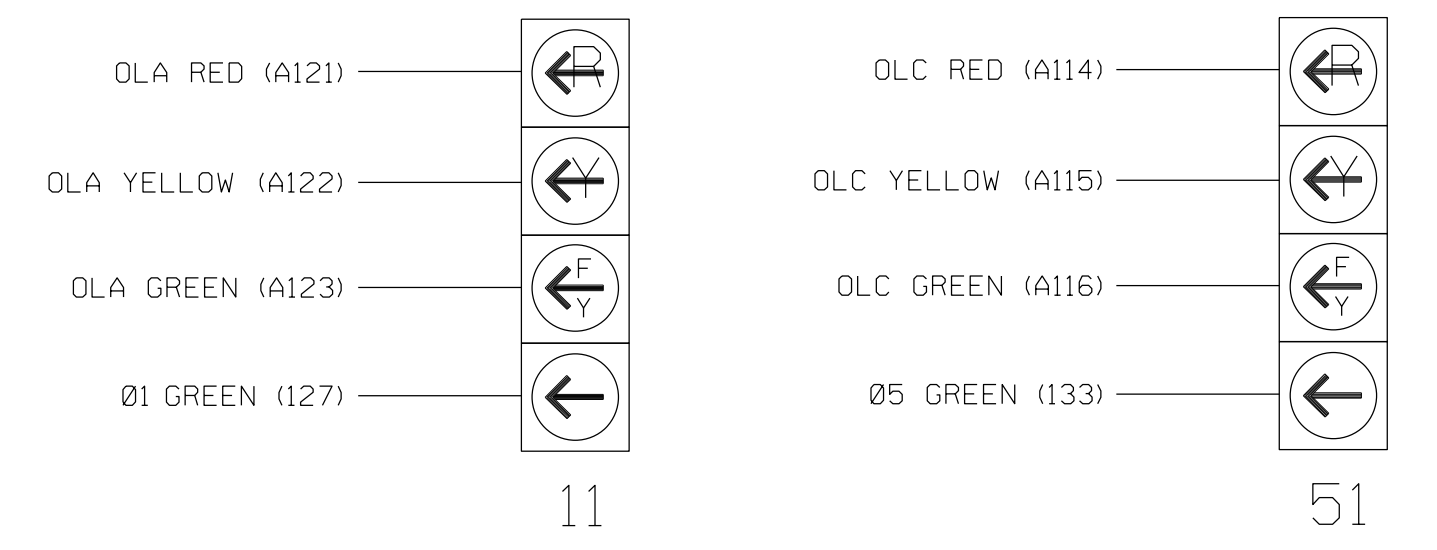
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A*	TB2-1,2	I1U	56	1	1	YES		15		S
		J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N

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



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### \*\* OPTICAL PREEMPTION SYSTEM

1. Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the Signal Design Plans.
2. Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specification of the type 2070 controller.

### WIRELESS DETECTION SYSTEM

1. For loops 4A, 8A and 8B install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.



Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical AND PROGRAMMING DETAILS FOR: US 17-158 (N. Road Street) at SR 1387 (Knobbs Creek Road)/ Commercial Drive

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER LISA M. MOON 022516

DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0404

20-SEP-2018 18:51 R:\415942\451\and\shades\gnw\l1\img\01-0404-08212018e.dgn lmoon AT CAR-LMOON-WT

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

(program controller as shown)

The following logic processor configuration omits phase 5 on FYA head (signal 51) for the duration of the normal phase cycle and at startup until preemt activating phase is called to activate phase 5.

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

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

```

LP#: 1 COPY FROM: 1 ACTIVE: M (T/F)
IF PMT PREEMPT ACTIVE 5 IS OFF

THEN CTR OMIT PHASE 5 ON

ELSE

```

LOGIC FOR OMITTING PHASE 5 AT STARTUP AND/OR WHEN NOT IN PREEMPT

- From the LOGIC PROCESSOR Submenu select **1. LOGIC STATEMENT CONTROL**

ENABLE LOGIC PROCESSOR STATEMENTS 1-4 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM .

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

END PROGRAMMING

### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

#### OVERLAP A

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

```

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

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

```

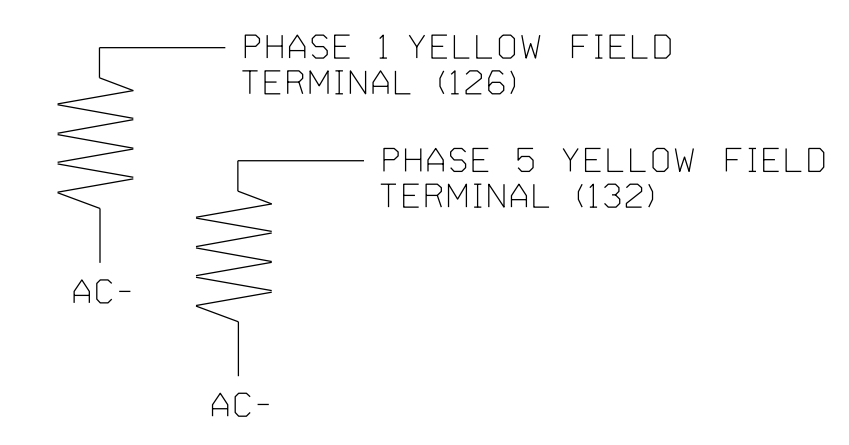
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0404  
 DESIGNED: MARCH 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

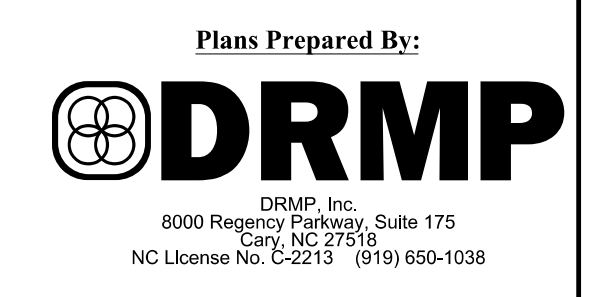
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



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Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 17-158 (N. Road Street) at SR 1387 (Knobbs Creek Road)/ Commercial Drive	
Prepared for the Offices of:		Division 1 Pasquotank County Elizabeth City	
PLAN DATE:	March 2018	REVIEWED BY:	AJ Davis
PREPARED BY:	DJ White	REVIEWED BY:	LW Moon
REVISIONS	INIT.	DATE	

SEAL	
NORTH CAROLINA PROFESSIONAL ENGINEER	
LISA M. MOON	
SEAL 022516	
DocuSigned by: Lisa M. Moon 9/20/2018	
SIC INVENTORY NO. 01-0404	

### ECONOLITE ASC/3-2070 EMERGENCY VEHICLE

#### PREEMPT PROGRAMMING DETAIL

(program controller as shown)

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

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

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

```

PREEMPT PLAN [ 3 ]   ENABLE....YES
  VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  OVERLAP A B C D E F G H I J K L M N O P
  TRKCLR V . . . . .
  TRKCLR O . . . . .
  ENA TRL . . . . .
  DWEL VEH X . . . . X . . . . .
  DWEL PED . . . . .
  DWEL OLPF1 .F1 . . . . .
  CYC VEH . . . . .
  CYC PED . . . . .
  CYC OLP . . . . .
  EXIT PH . X . . . . X . . . . .
  EXIT CAL . . . . .
  SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..INTERLOCK. NO
DET LOCK... XIDELAY.. 0INHIBIT... 0
OVERIDE FL. IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

```

PREEMPT PLAN [ 5 ]   ENABLE....YES
  VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  OVERLAP A B C D E F G H I J K L M N O P
  TRKCLR V . . . . .
  TRKCLR O . . . . .
  ENA TRL . . . . .
  DWEL VEH . X . . . X . . . . .
  DWEL PED . . . . .
  DWEL OLPF1 .F1 . . . . .
  CYC VEH . . . . .
  CYC PED . . . . .
  CYC OLP . . . . .
  EXIT PH . X . . . . X . . . . .
  EXIT CAL . . . . .
  SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..INTERLOCK. NO
DET LOCK... XIDELAY.. 0INHIBIT... 0
OVERIDE FL. IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

### ECONOLITE ASC/3-2070 PREEMPT

#### FILTERING PROGRAMMING DETAIL

(program controller as shown)

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

```

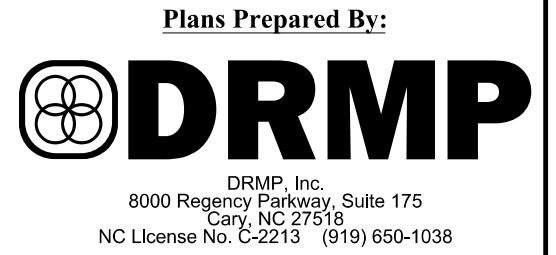
ENABLE PREEMPT FILTERING & TSP/SCP
FILTERED SOLID PULSING
INPUT 1 ...BYPASSED.. ...BYPASSED..
      2 ...BYPASSED.. ...BYPASSED..
      3 ..PREEMPT 3. ...BYPASSED..
      4 ..PREEMPT 4. ...BYPASSED..
      5 ..PREEMPT 5. ...BYPASSED..
      6 ..PREEMPT 6. ...BYPASSED..
      7 ..BYPASSED.. ...BYPASSED..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

```

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0404  
 DESIGNED: MARCH 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

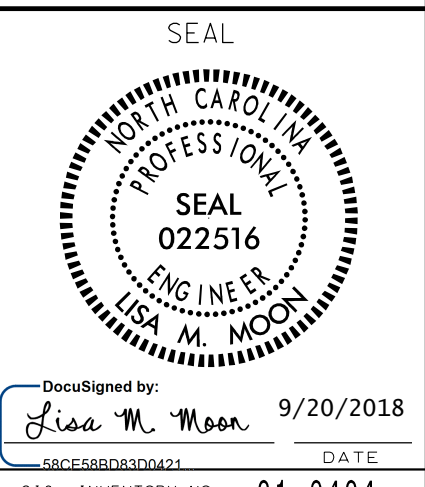
20-SEP-2018 18:51 R:\415942\51\001\415942.dgn AT CAR-LMD\DWI-WT

Electrical Detail - Sheet 3 of 3



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 17-158 (N. Road Street)	
Prepared for the Offices of:		at	
		SR 1387 (Knobbs Creek Road)/	
		Commercial Drive	
Division 1 Pasquotank County Elizabeth City			
PLAN DATE: March 2018	REVIEWED BY: AJ Davis		
PREPARED BY: DJ White	REVIEWED BY: LM Moon		
REVISIONS	INIT.	DATE	

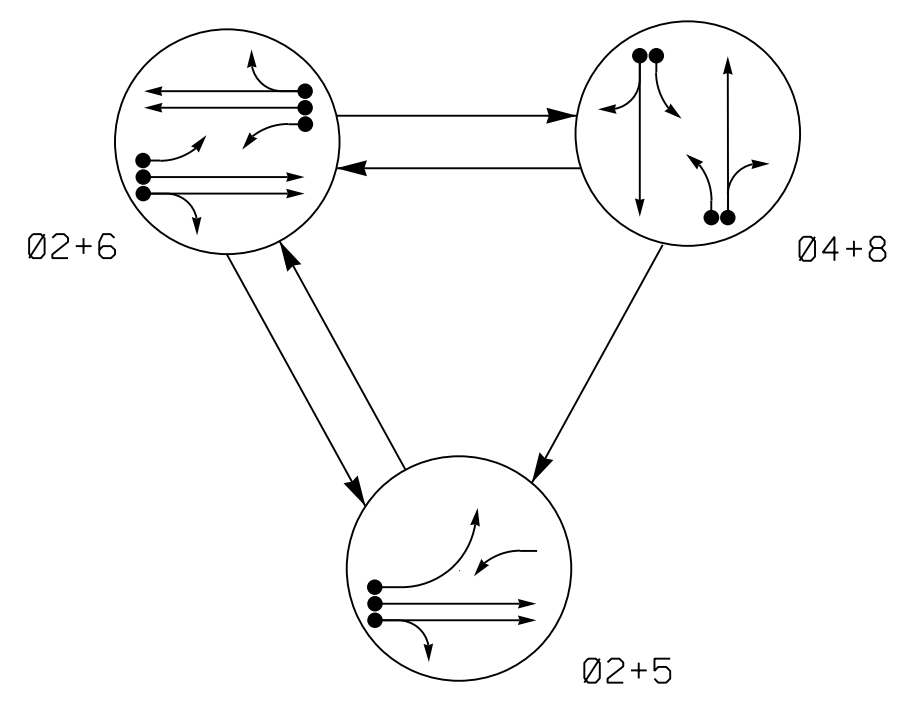
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 9/20/2018

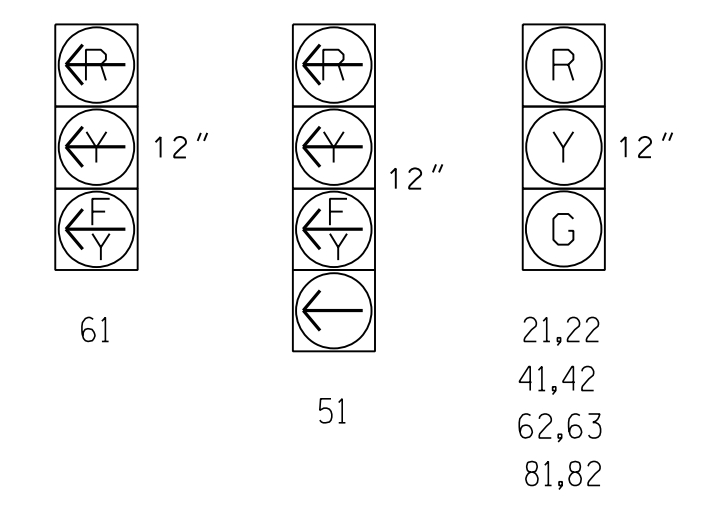
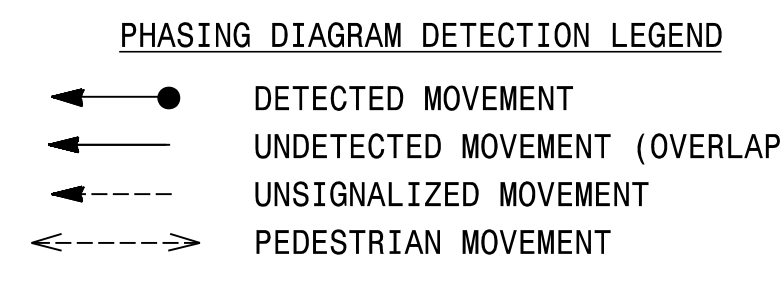
SIG. INVENTORY NO. 01-0404

**PHASING DIAGRAM**



SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21,22	G	G	R	Y
41,42	R	R	G	R
51	←	←	←	←
61	←	←	←	←
62,63	R	G	R	Y
81,82	R	R	G	R

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

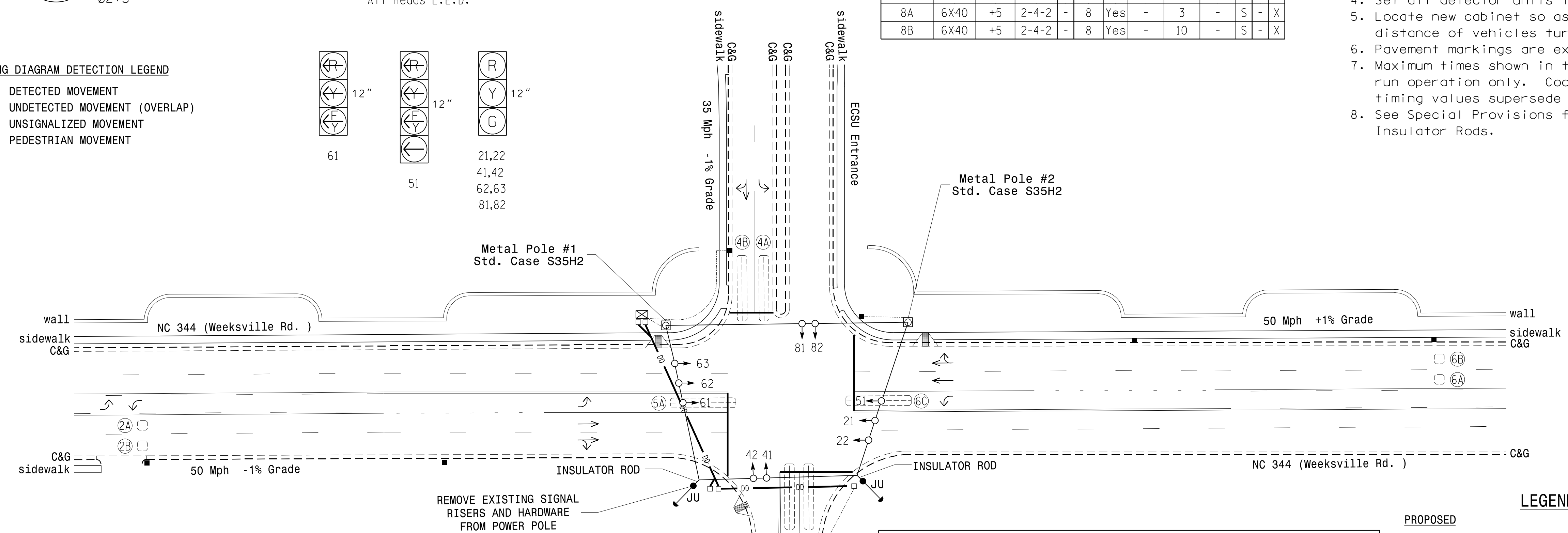


ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	NEW CARD
2A	6X6	355	EXIST	-	2	Yes	-	-	X	N	-
2B	6X6	355	EXIST	-	2	Yes	-	-	X	N	-
4A	6X40	+5	2-4-2	-	4	Yes	-	-	-	S	-
4B	6X40	+5	2-4-2	-	4	Yes	-	10	-	S	-
5A	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	-
6A	6X6	355	EXIST	-	6	Yes	-	-	X	N	-
6B	6X6	355	EXIST	-	6	Yes	-	-	X	N	-
6C	6X40	+5	2-4-2	-	6	Yes	-	3	-	G	-
8A	6X40	+5	2-4-2	-	8	Yes	-	3	-	S	-
8B	6X40	+5	2-4-2	-	8	Yes	-	10	-	S	-

**2 Phase Fully Actuated (Elizabeth City Signal System)**

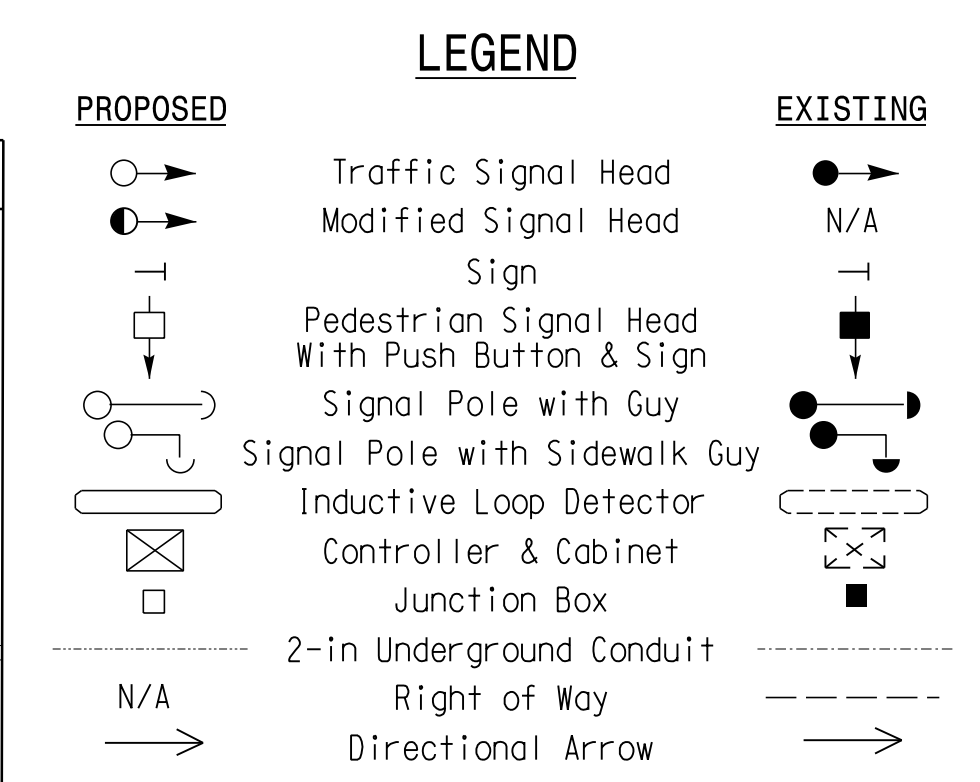
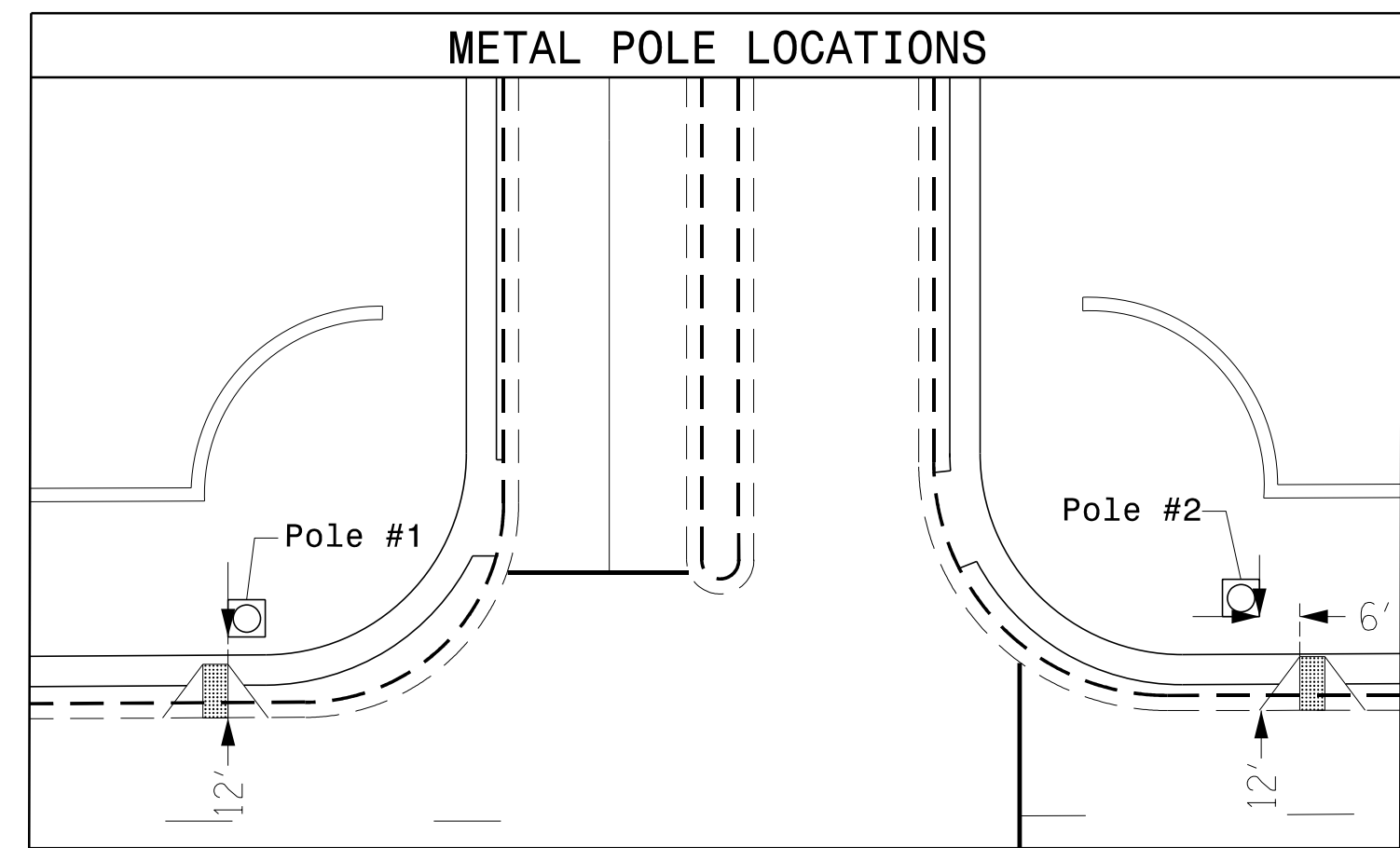
**NOTES**

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. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. See Special Provisions for details regarding Insulator Rods.



FEATURE	PHASE				
	2	4	5	6	8
Min Green *	14	7	7	14	7
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Veh. Extension *	6.0	2.0	2.0	6.0	2.0
Max 1 *	120	20	15	120	20
Yellow	4.9	3.9	3.0	4.9	3.8
Red Clear	1.1	2.0	1.9	1.1	1.6
Actuations B4 Add *	0	-	-	0	-
Seconds / Actuation *	1.5	-	-	1.5	-
Max Initial *	40	-	-	40	-
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	-	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:  
**TRANSPORTATION MOBILITY AND SAFETY DIVISION**  
STATE OF NORTH CAROLINA  
SIGNAL DESIGN SECTION

**PLANS PREPARED BY:**  
**RK&K**  
RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

**NC 344 (Weeksville Road)**  
At  
**SR 1206 (Industrial Park Dr.) and ECSU Entrance**  
Division 1 Pasquotank County Elizabeth City  
PLAN DATE: January 2019 REVIEWED BY: CBHolden  
PREPARED BY: DTSears REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 033753  
C. BYRON HOLDEN

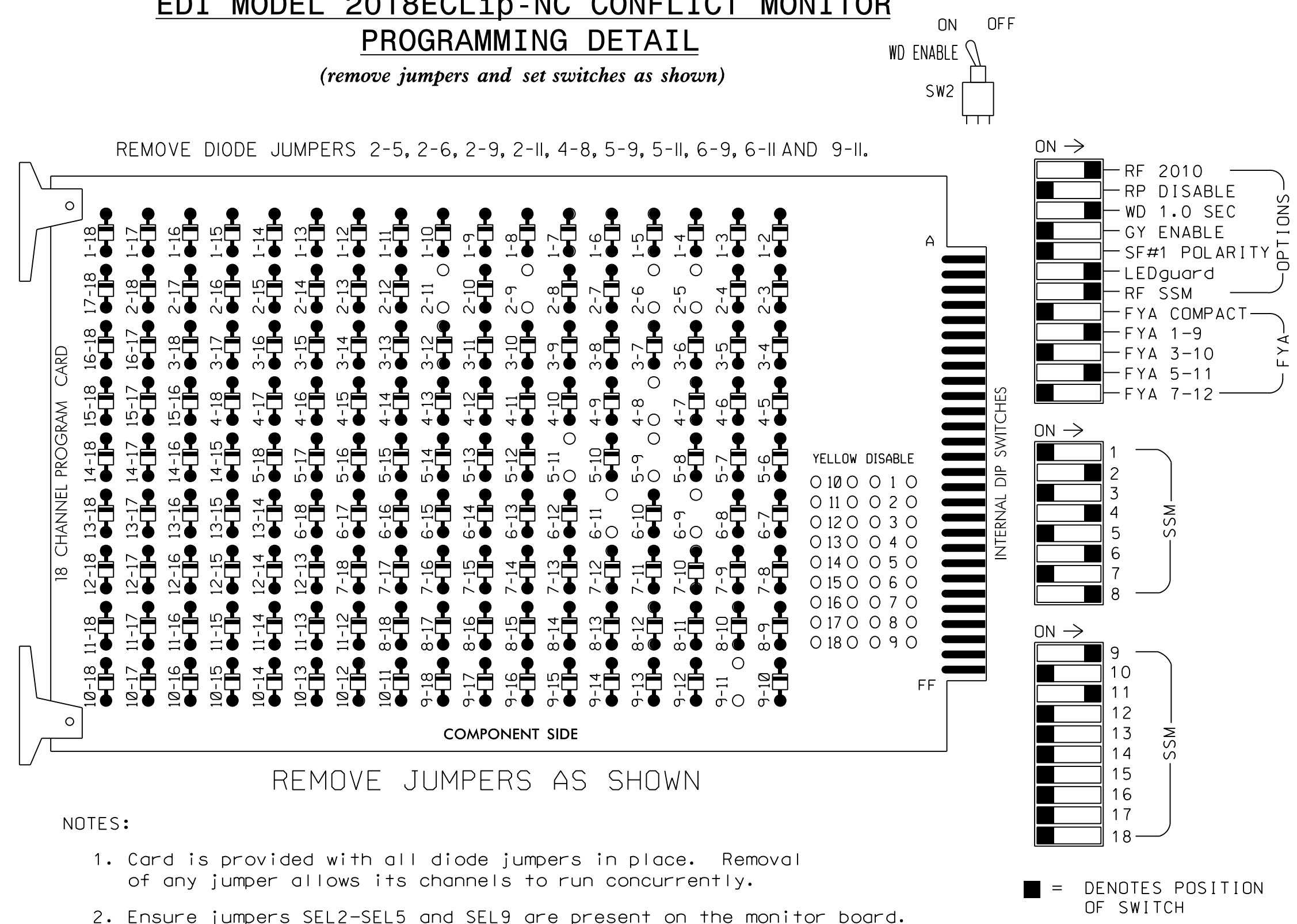
DocuSigned by:  
C. Byron Holden  
1/4/2019

SIGNATURE DATE  
SIG. INVENTORY NO. 01-0407

1/4/2019 10:45:11 AM I:\Projects\Signal\5942\Signal\5942.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 Elizabeth City 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										

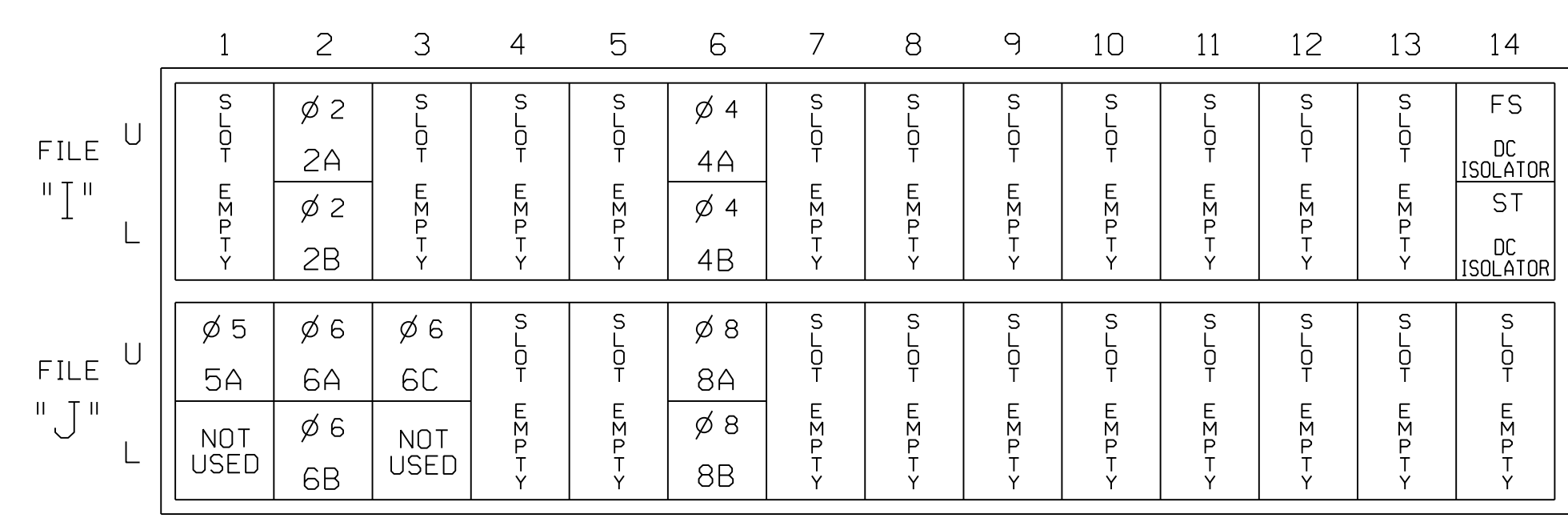
NU = Not Used

\* 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)

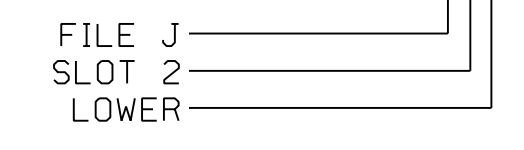


### INPUT FILE CONNECTION & PROGRAMMING CHART

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	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		G
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		10		S

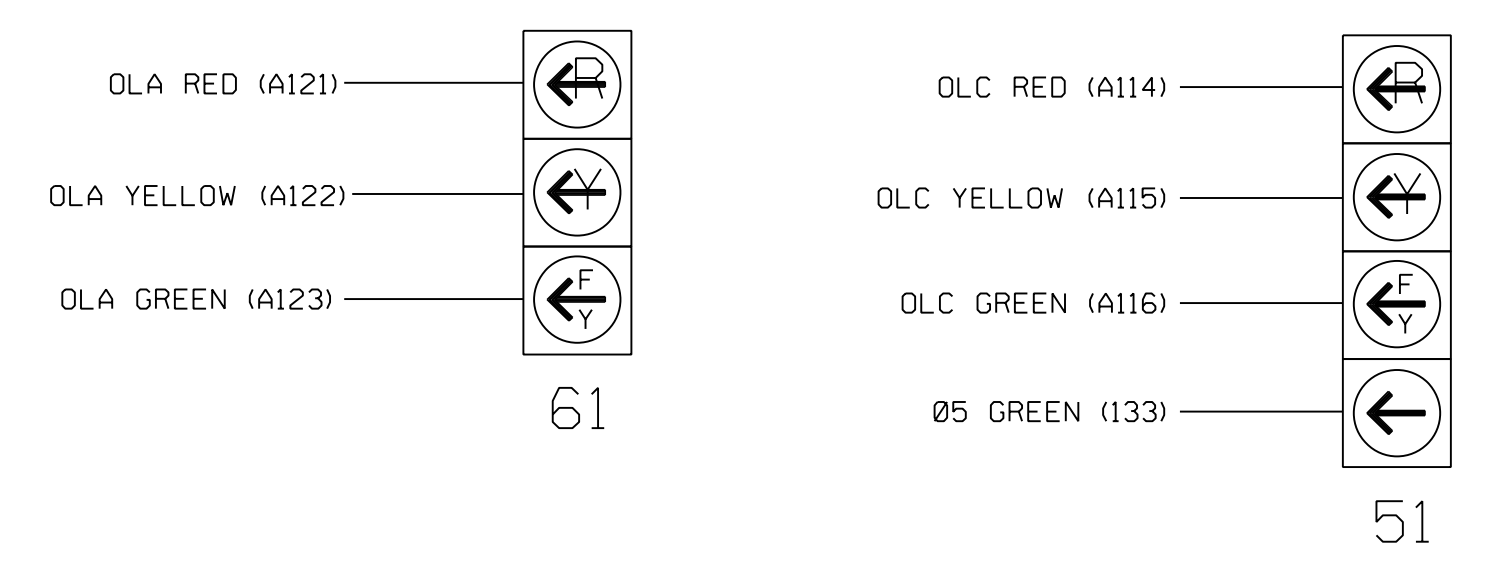
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

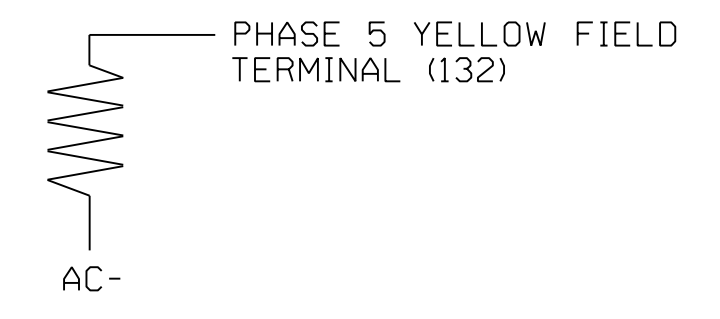


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0407  
 DESIGNED: January 2019  
 SEALED: 1/4/2019  
 REVISED: N/A

### 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED BY: **RK&K**

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Weeksville Road) at SR 1206 (Industrial Park Dr.) and ECSU Entrance

Division 1 Pasquotank County Elizabeth City

PLAN DATE: January 2019 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: James O. Deaton 1/4/2019

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON SEAL 07438

SIG. INVENTORY NO. 01-0407

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

END PROGRAMMING

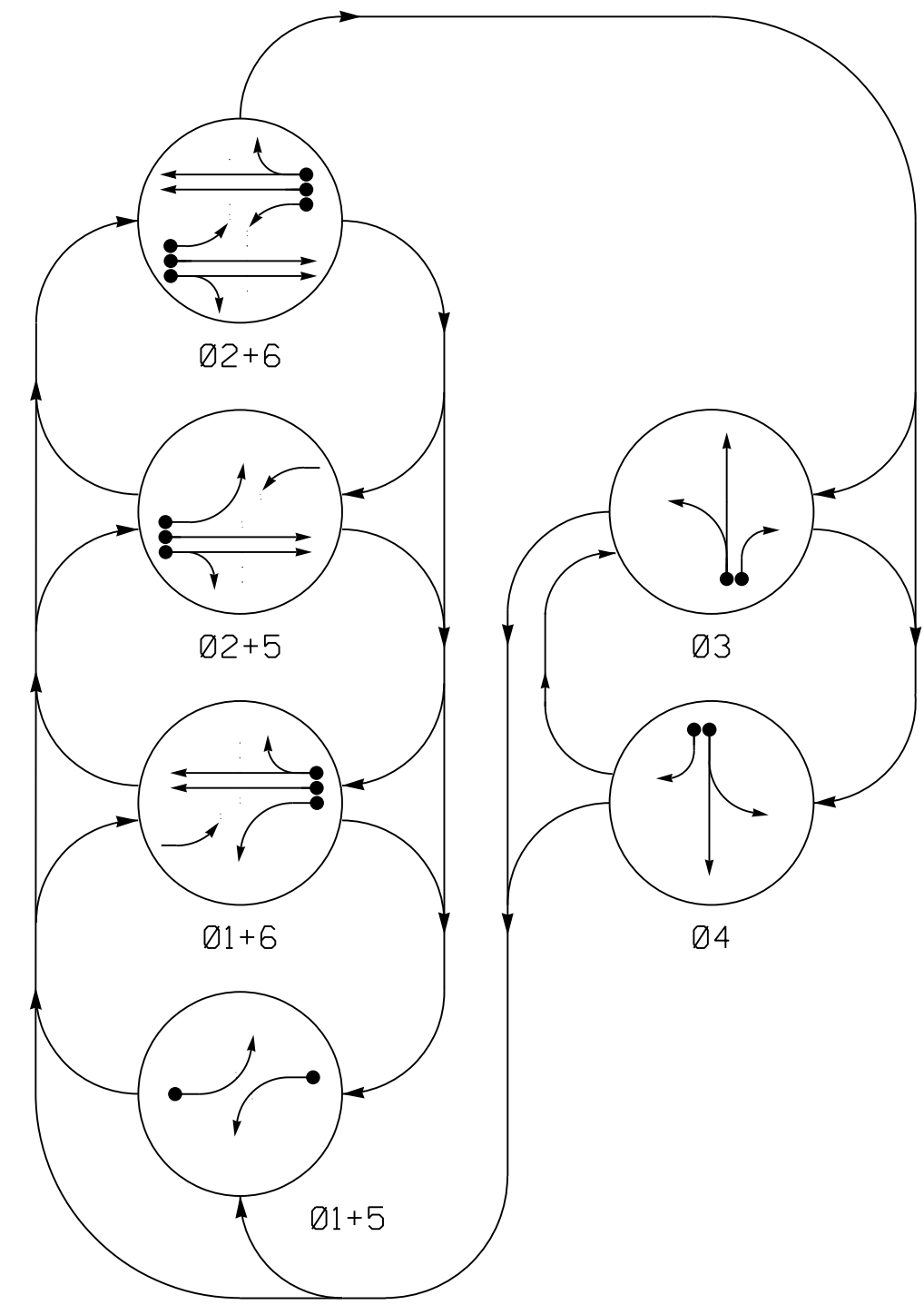
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0407  
 DESIGNED: January 2019  
 SEALED: 1/4/2019  
 REVISED: N/A

1/4/2019 R:\Projects\10407\10407E\10407E-03-200.dgn dsdars

Electrical Detail		Sheet 2 of 2		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED									
<p style="text-align: center;"><b>PLANS PREPARED BY :</b></p> <div style="text-align: center;"> </div> <p style="font-size: x-small;">RUMMEL, KLEPPER &amp; KAHL, LLP          900 RIDGEFIELD DRIVE SUITE 350          RALEIGH, NORTH CAROLINA 27609-3960          NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <div style="text-align: center;"> </div> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="text-align: center;">NC 344 (Weeksville Road) at SR 1206 (Industrial Park Dr.) and ECSU Entrance</p> <p style="font-size: x-small;">Division 1 Pasquotank County Elizabeth City</p> <p style="font-size: x-small;">PLAN DATE: January 2019 REVIEWED BY: J O Deaton</p> <p style="font-size: x-small;">PREPARED BY: M W Valch REVIEWED BY:</p>	<div style="text-align: center;"> </div> <p style="font-size: x-small;">DocuSigned by: <b>James O. Deaton</b> 1/4/2019</p> <p style="font-size: x-small;">4DEF3AC430B04E</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="font-size: x-small;">REVISIONS</th> <th style="font-size: x-small;">INIT.</th> <th style="font-size: x-small;">DATE</th> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE						
REVISIONS	INIT.	DATE											
				SIG. INVENTORY NO. 01-0407									



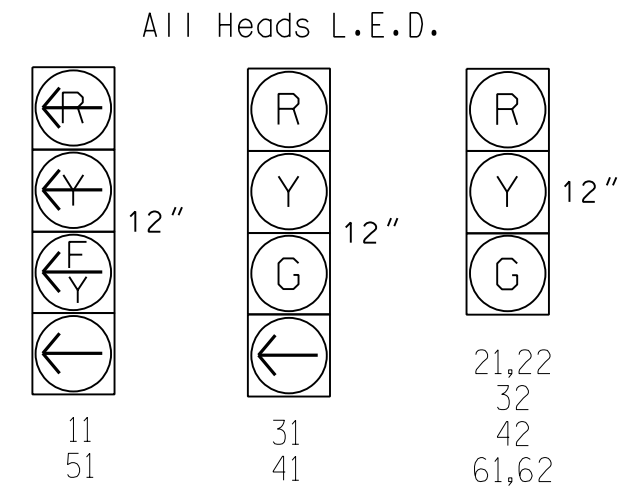
**PHASING DIAGRAM**



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

SIGNAL FACE	PHASE									
	01+5	01+6	02+5	02+6	03	04	05	06	07	08
11	←	→	←	→	←	→	←	→	←	→
21,22	R	R	G	G	R	R	Y			
31	R	R	R	R	G	R	R			
32	R	R	R	R	G	R	R			
41	R	R	R	R	R	R	G	R		
42	R	R	R	R	R	R	G	R		
51	←	→	←	→	←	→	←	→	←	→
61,62	R	G	R	G	R	R	Y			

**SIGNAL FACE I.D.**

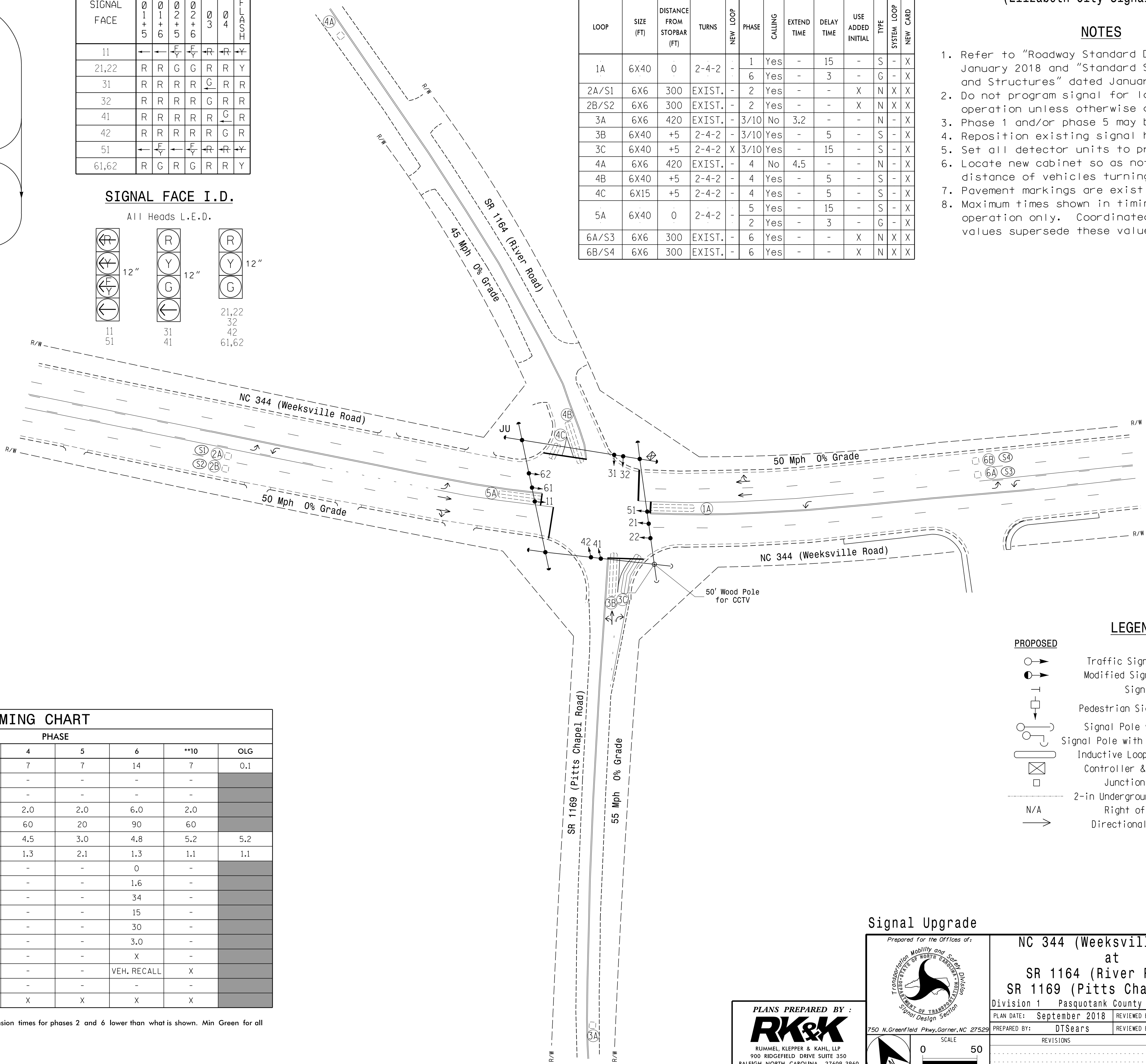


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
2A/S1	6X6	300	EXIST.	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	300	EXIST.	-	2	Yes	-	-	X	N	X	X
3A	6X6	420	EXIST.	-	3/10	No	3.2	-	-	N	-	X
3B	6X40	+5	2-4-2	-	3/10	Yes	-	5	-	S	-	X
3C	6X40	+5	2-4-2	X	3/10	Yes	-	15	-	S	-	X
4A	6X6	420	EXIST.	-	4	No	4.5	-	-	N	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	5	-	S	-	X
4C	6X15	+5	2-4-2	-	4	Yes	-	5	-	S	-	X
					5	Yes	-	15	-	S	-	X
					2	Yes	-	3	-	G	-	X
6A/S3	6X6	300	EXIST.	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	300	EXIST.	-	6	Yes	-	-	X	N	X	X

**6 Phase Fully Actuated (Elizabeth City Signal System)**

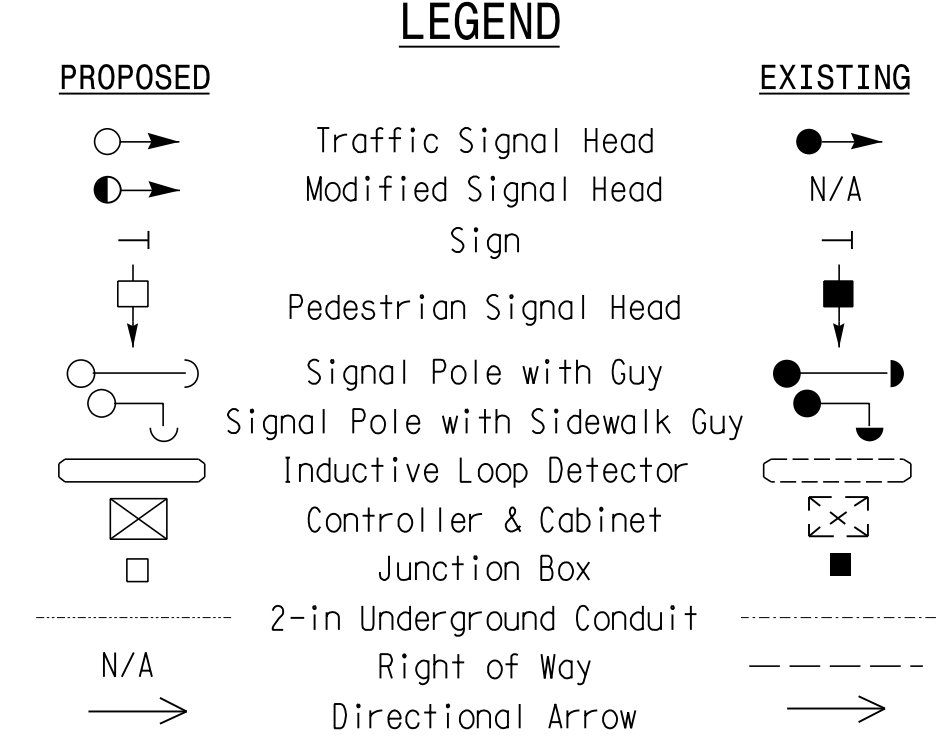
**NOTES**

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 31, 32.
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									
FEATURE	PHASE							*10	OLG
	1	2	3	4	5	6	7		
Min Green *	7	14	7	7	7	14	7	0.1	
Walk *	-	-	-	-	-	-	-		
Ped Clear	-	-	-	-	-	-	-		
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0		
Max I *	20	90	60	60	20	90	60		
Yellow	3.0	4.8	5.2	4.5	3.0	4.8	5.2	5.2	
Red Clear	1.9	1.3	1.1	1.3	2.1	1.3	1.1	1.1	
Actuations B4 Add *	-	0	-	-	-	0	-		
Seconds / Actuation *	-	1.6	-	-	-	1.6	-		
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	X		
Dual Entry	-	-	-	-	-	-	-		
Simultaneous Gap	X	X	X	X	X	X	X		

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



**Signal Upgrade**

PLANS PREPARED BY:  
**RK&K**  
 RUMMEL, KLEPPER & KAHL LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

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

**NC 344 (Weeksville Road) at SR 1164 (River Road) / SR 1169 (Pitts Chapel Road)**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: CBHolden  
 PREPARED BY: DTSears REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

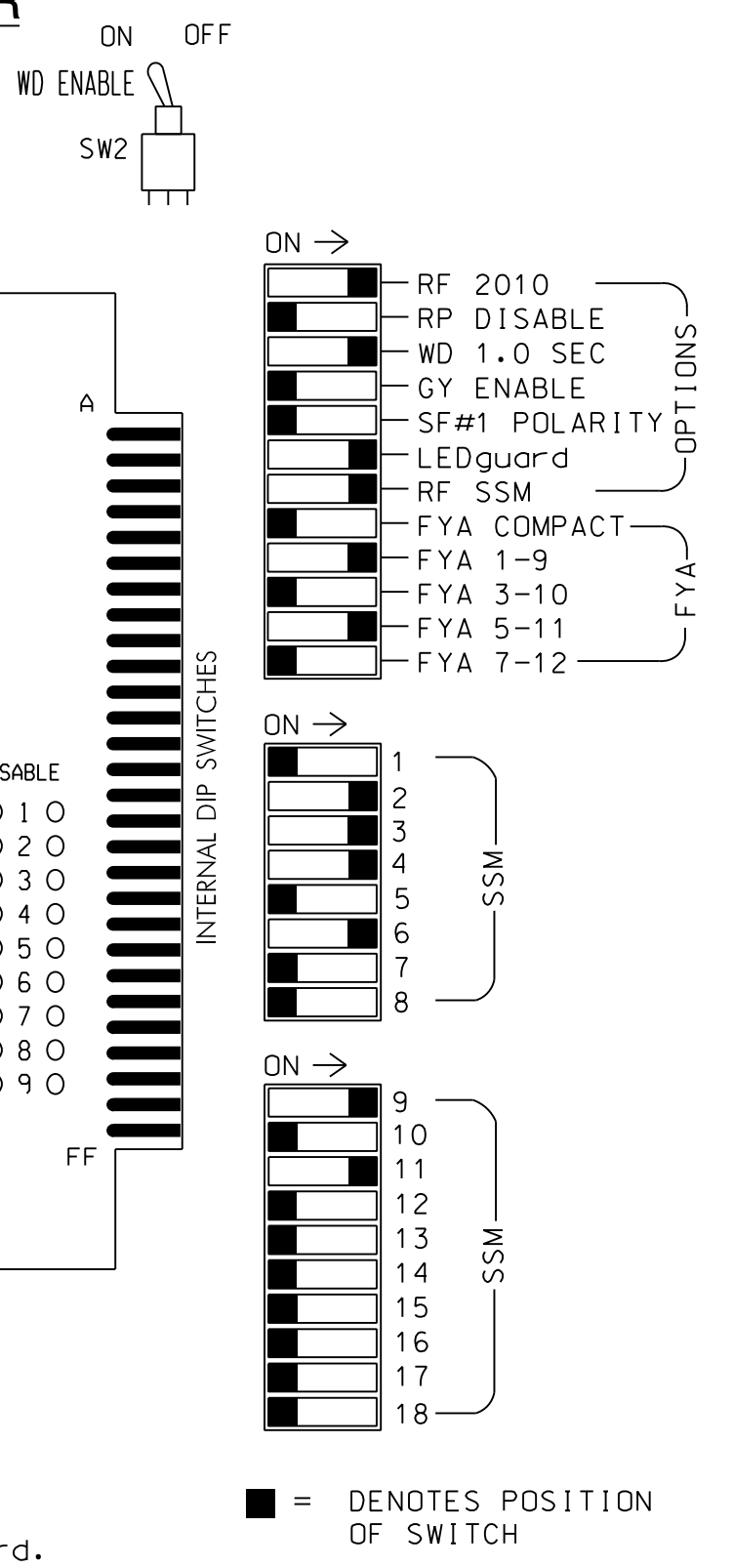
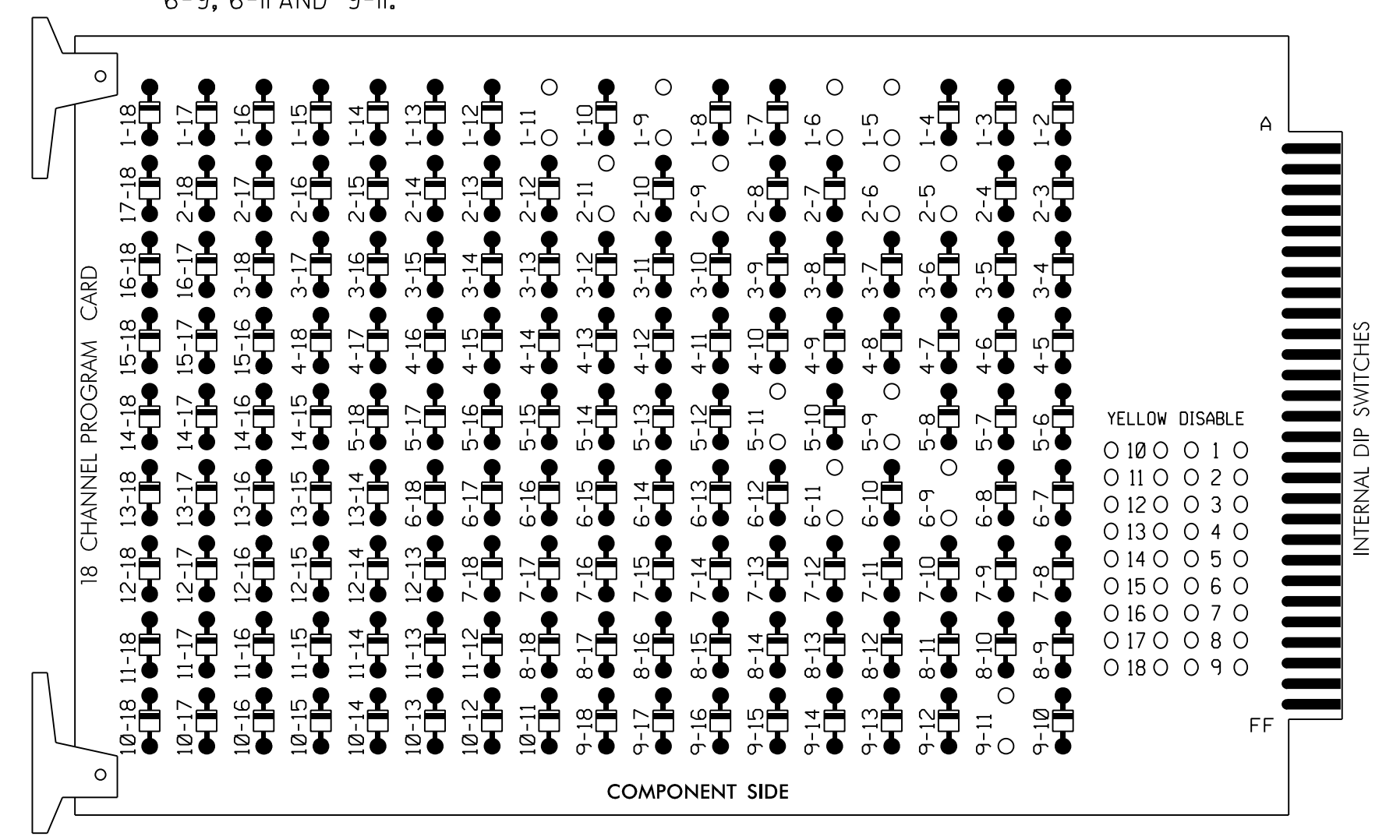
SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 033753  
 C. BYRON HOLDEN

DocuSigned by:  
 C. Byron Holden  
 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0408

### 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-II, 2-5, 2-6, 2-9, 2-II, 5-9, 5-II, 6-9, 6-II AND 9-II.



- 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 Elizabeth City Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,AUX S1,  
 AUX S4  
 PHASES USED.....1,2,3,4,5,6,\*\*10  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 OVERLAP "G".....\*

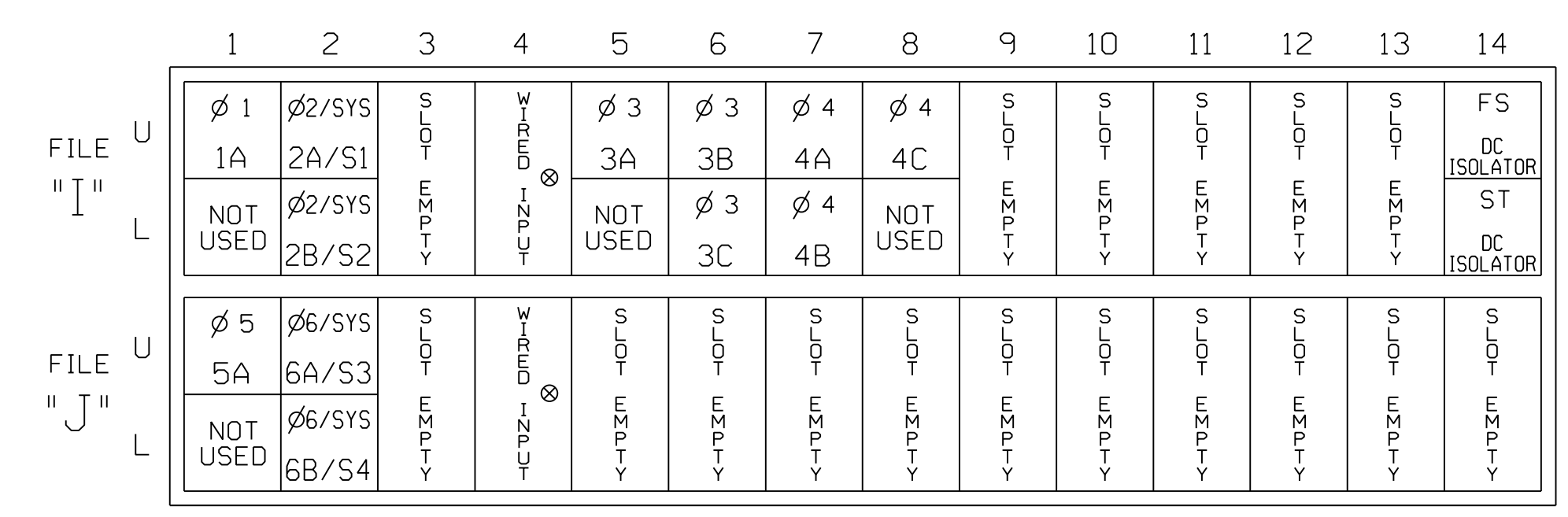
\* See overlap programming detail on sheet 2  
 \*\* Phase 10 used for timing purposes only

### SIGNAL HEAD HOOK-UP CHART

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

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

### INPUT FILE POSITION LAYOUT (front view)



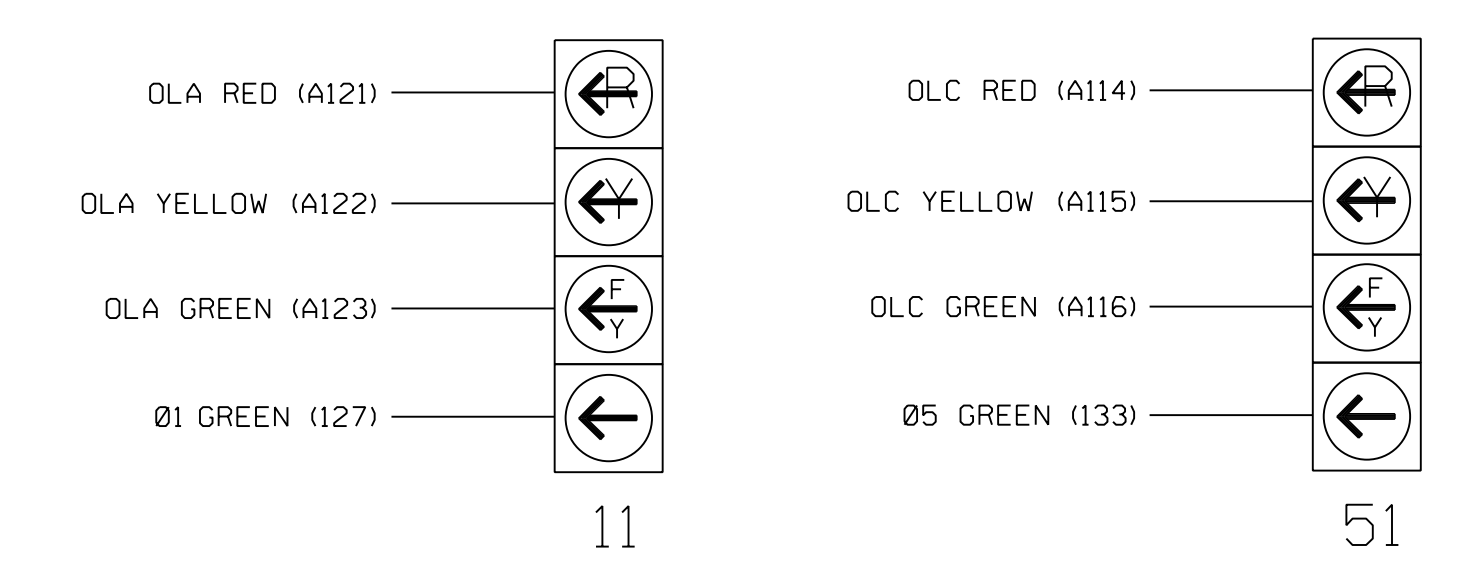
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 \* Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
3A	TB4-5,6	I5U	58	3	3/10	NO	3.2			N
3B	TB4-9,10	I6U	41	4	3/10	YES		5		S
3C	TB4-11,12	I6L	45	14	3/10	YES		15		S
4A	TB6-1,2	I7U	65	34	4	NO	4.5			N
4B	TB6-3,4	I7L	78	44	4	YES		5		S
4C	TB6-5,6	I8U	49	24	4	YES		5		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N

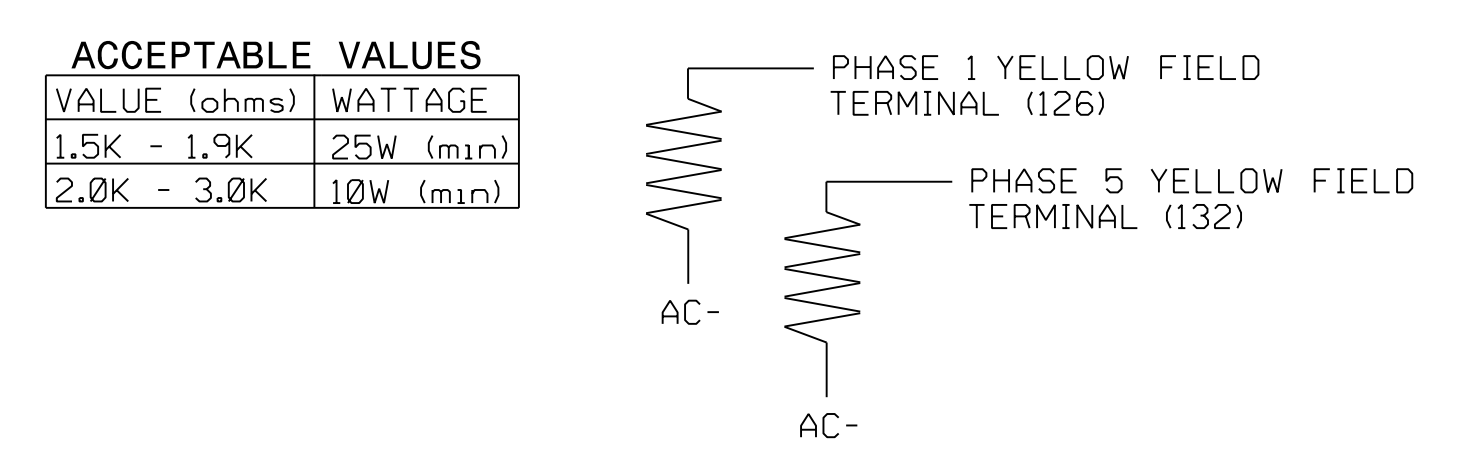
<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### FYA SIGNAL WIRING DETAIL (wire signal heads as shown)

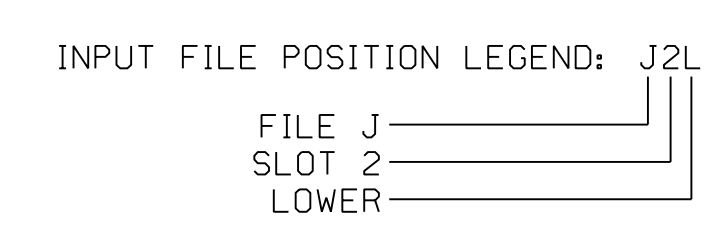


THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0408  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

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



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



Signal Upgrade - Electrical Detail - Sheet 1 of 3

**PLANS PREPARED BY:**  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

**ELECTRICAL AND PROGRAMMING DETAILS FOR:**  
 Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

**NC 344 (Weeksville Road) at SR 1164 (River Road) / SR 1169 (Pitts Chapel Road)**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
 PREPARED BY: M W Yalch REVIEWED BY:

**REVISIONS**

NO.	DESCRIPTION	INIT.	DATE

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

SEAL  
  
 ENGINEER JAMES O. DEATON

DocuSigned by:  
 James O. Deaton  
 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0408

### 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
  
```

Toggle 4 Times

OVERLAP G  
 Select TMG VEH OVLP [G] and 'NORMAL'

```

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

  LAG GRN 0.1 YEL 5.2 RED 1.1
  
```

END PROGRAMMING

### ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 as OLG, program LD SWITCH 3 as DVLP '7', TYPE '0' as shown below.

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

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

### ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

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

```

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

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

END PROGRAMMING

### ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

(program controller as shown)

- 1. From Main Menu select **6. DETECTORS**
- 2. From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**

```

  VEH DETECTOR [ 3 ] VEH DET PLAN [ 1 ]
  TYPE: N-NTCIP
  TS2 DETECTOR..... X ECPI LOG..... NO
  DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  3 3 . . X . . . . . X . . . . .
  CALL OPTION... NO DELAY TIME... 0.0
  EXT OPTION... NONE EXTENSION TIME. 3.2
  USE ADDED INITIAL . CROSS SWITCH PH.. 0
  LOCK IN..... NONE NTCIP VOL . OR OCC .
  PMT QUEUE DELAY. NO
  
```

```

  VEH DETECTOR [ 4 ] VEH DET PLAN [ 1 ]
  TYPE: S-STANDARD
  TS2 DETECTOR..... X ECPI LOG..... NO
  DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  4 3 . . X . . . . . X . . . . .
  EXTEND TIME... 0.0 DELAY TIME... 5.0
  USE ADDED INITIAL . CROSS SWITCH PH.. 0
  LOCK IN..... NONE NTCIP VOL . OR OCC .
  PMT QUEUE DELAY. NO
  
```

```

  VEH DETECTOR [ 14 ] VEH DET PLAN [ 1 ]
  TYPE: S-STANDARD
  TS2 DETECTOR..... X ECPI LOG..... NO
  DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  14 3 . . X . . . . . X . . . . .
  EXTEND TIME... 0.0 DELAY TIME... 15.0
  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: 01-0408  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<b>PLANS PREPARED BY :</b>  RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	NC 344 (Weeksville Road) at SR 1164 (River Road) / SR 1169 (Pitts Chapel Road) Division 1 Pasquotank County Elizabeth City		SEAL  SEAL 07438 ENGINEER JAMES O. DEATON
		PLAN DATE: September 2018 PREPARED BY: M W Yalch	REVIEWED BY: J O Deaton	

9/21/2018 R:\Projects\cnc\Signal\Signal\electrical\Detail\sig01-0408e-04-200.dgn dsccsr

## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR SPLIT SIDE STREET PHASING

(program controller as shown)

1. From Main Menu select 1. CONFIGURATION

2. From CONFIGURATION Submenu select 8. LOGIC PROCESSOR

3. From LOGIC PROCESSOR Submenu select 2. LOGIC STATEMENTS

3. From LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

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

```

LP#:  1 COPY FROM:  1 ACTIVE: M (T/F)
IF   VEH GREEN ON PH      3 IS ON

THEN LP SET LOGIC FLAG      1      ON
ELSE
    
```

PHASE 3 GREEN ON SETS  
LOGIC FLAG 1 ON  
(SIDE STREET BACKUP)

ENABLE LOGIC PROCESSOR STATEMENTS 1, 2 & 3 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

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

```

LP#:  2 COPY FROM:  2 ACTIVE: M (T/F)
IF   LP FLAG                1 IS ON

THEN CTR OMIT PHASE        10      ON
ELSE
    
```

OMIT PHASE 10 SO  
PHASE 3 MOVEMENTS  
RUN ONCE PER CYCLE

END PROGRAMMING

ENTER A "3" IN THE LP# FIELD. PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#:  3 COPY FROM:  3 ACTIVE: M (T/F)
IF   VEH GREEN ON PH      2 IS ON

THEN LP SET LOGIC FLAG      1      OFF
ELSE
    
```

DISABLE LOGIC FLAG 1  
TO RETURN TO NORMAL  
OPERATION

END PROGRAMMING

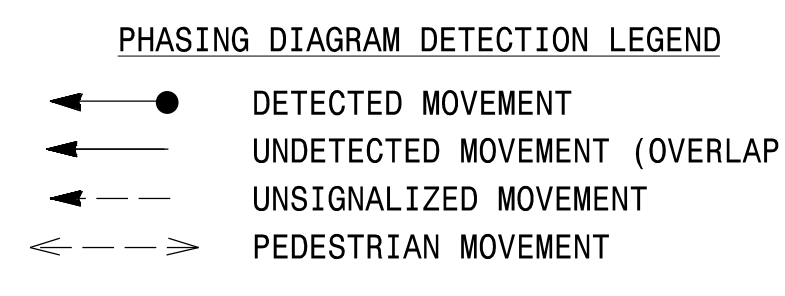
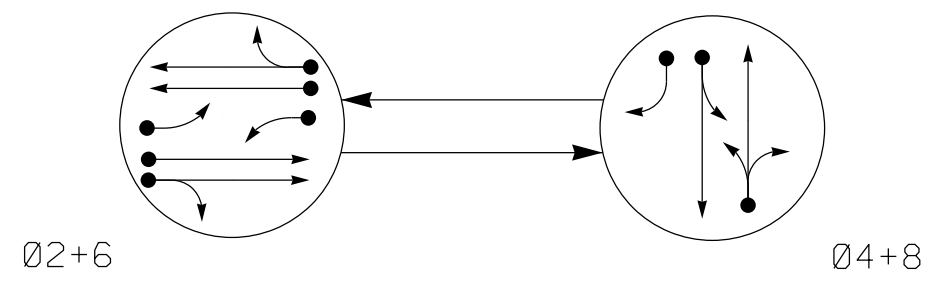
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 01-0408  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

Signal Upgrade - Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

<p><b>PLANS PREPARED BY :</b></p> <p>RUMMEL, KLEPPER &amp; KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<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 style="text-align: center;">NC 344 (Weeksville Road) at SR 1164 (River Road) / SR 1169 (Pitts Chapel Road)</p> <p style="font-size: x-small;">Division 1 Pasquotank County Elizabeth City</p> <p style="font-size: x-small;">PLAN DATE: September 2018 REVIEWED BY: J O Deaton</p> <p style="font-size: x-small;">PREPARED BY: M W Yalch 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> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE							<p style="text-align: center; font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <b>James O. Deaton</b> 9/21/2018</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 01-0408</p>
REVISIONS	INIT.	DATE										

PHASING DIAGRAM



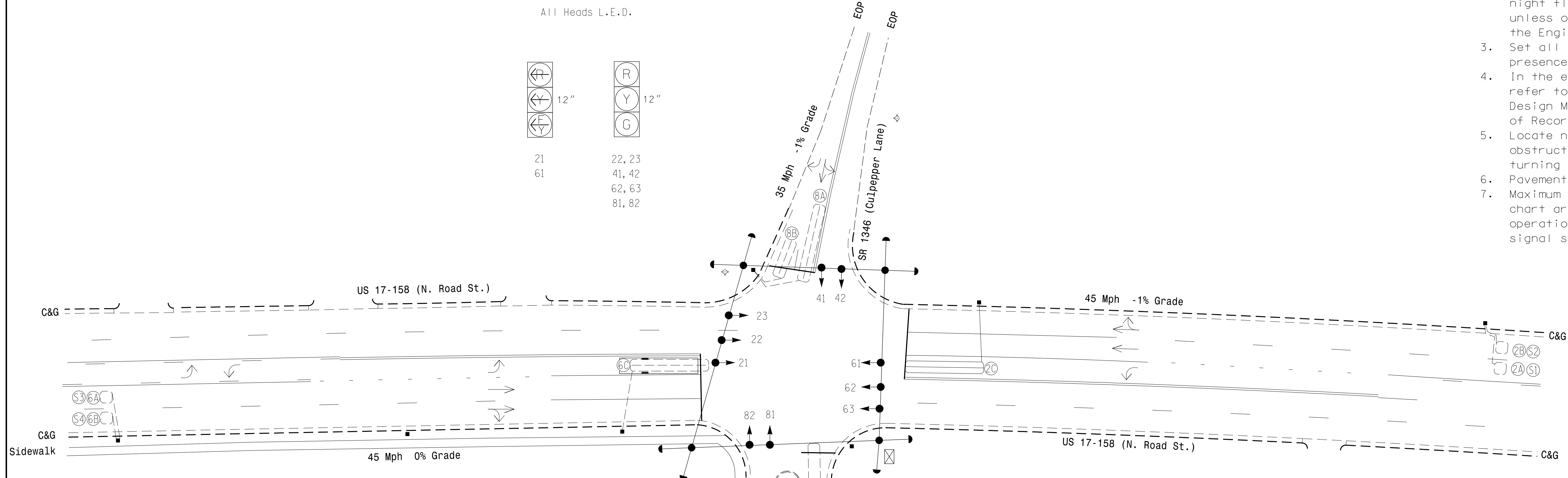
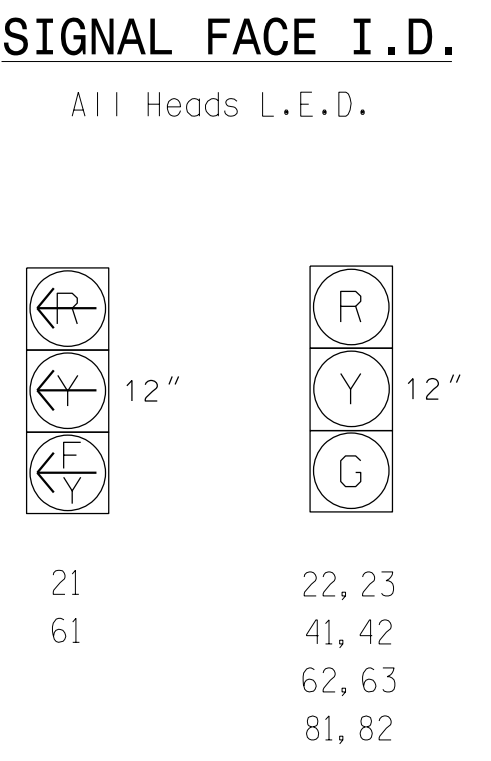
SIGNAL FACE	PHASE		
	Q2+6	Q4+8	FLASH
21	F	R	Y
22,23	G	R	Y
41,42	R	G	R
61	F	R	Y
62,63	G	R	Y
81,82	R	G	R

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/S1	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2C	6X40	0	2-4-2	X	2	Yes	-	3	-	S	-	X
4A	6X40	+5	EXIST	-	4	Yes	-	5	-	S	X	X
6A/S3	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6C	6X40	+5	2-4-2	-	6	Yes	-	3	-	S	-	X
8A	6X40	+5	2-4-2	-	8	Yes	-	3	-	S	-	X
8B	6X20	+5	2-4-2	-	8	Yes	-	15	-	S	-	X

2 Phase Fully Actuated (Elizabeth City Signal System)

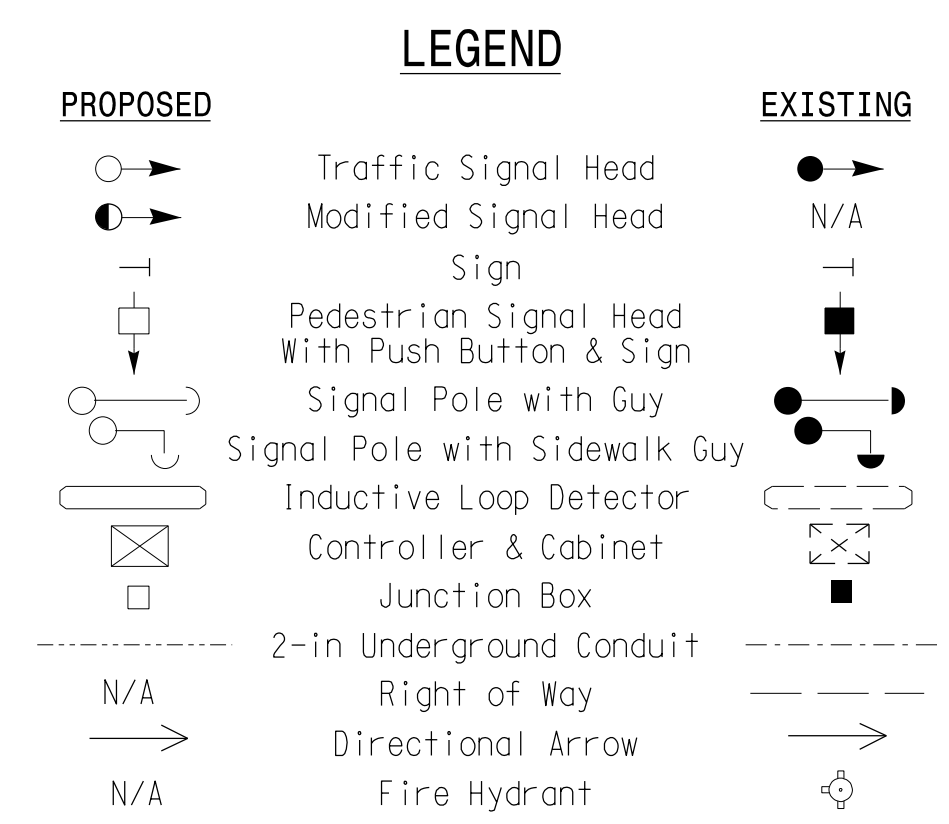
NOTES

- 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 to not obstruct sight distance of vehicles turning right on red.
- 6. Pavement markings are existing.
- 7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values.



FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	6.0	2.0	6.0	2.0
Max 1 *	90	30	90	30
Yellow	4.6	3.2	4.6	3.9
Red Clear	1.3	2.1	1.3	1.6
Actions 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

\* 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.



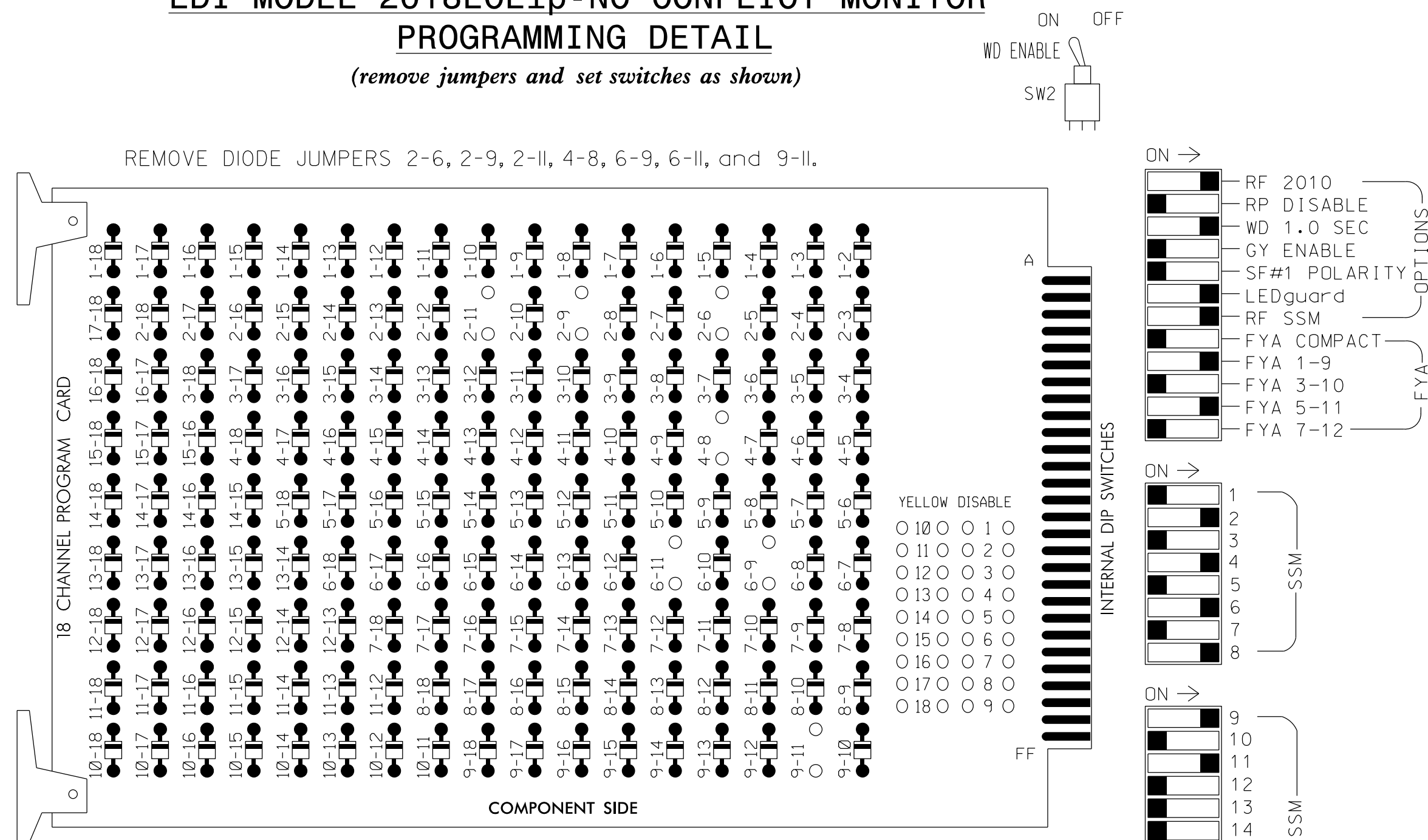
Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27518 NC License No. C-2215 (819) 656-1038</p>	<p>Prepared for the Offices of:</p> <p>US 17-158 (N Road St) at SR 1346 (Culpepper Lane)/ Fairway Terrace Drive</p>	<p>SEAL LISA M. MOON ENGINEER 022516</p>
	<p>Plans Prepared By:</p> <p>Division 1 Pasquotank County Elizabeth City</p> <p>PLAN DATE: February 2018 REVIEWED BY: AJ Davis</p> <p>PREPARED BY: JA Le REVIEWED BY: LM Moon</p> <p>SCALE: 0 30 1"=30'</p> <p>REVISIONS: INIT. DATE</p> <p>DocuSigned by: Lisa M. Moon 8/21/2018</p>	<p>9/21/2018</p> <p>SIG. INVENTORY NO. 01-0442</p>

### 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 Elizabeth City 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,AUX S1,AUX S4  
 PHASES USED.....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

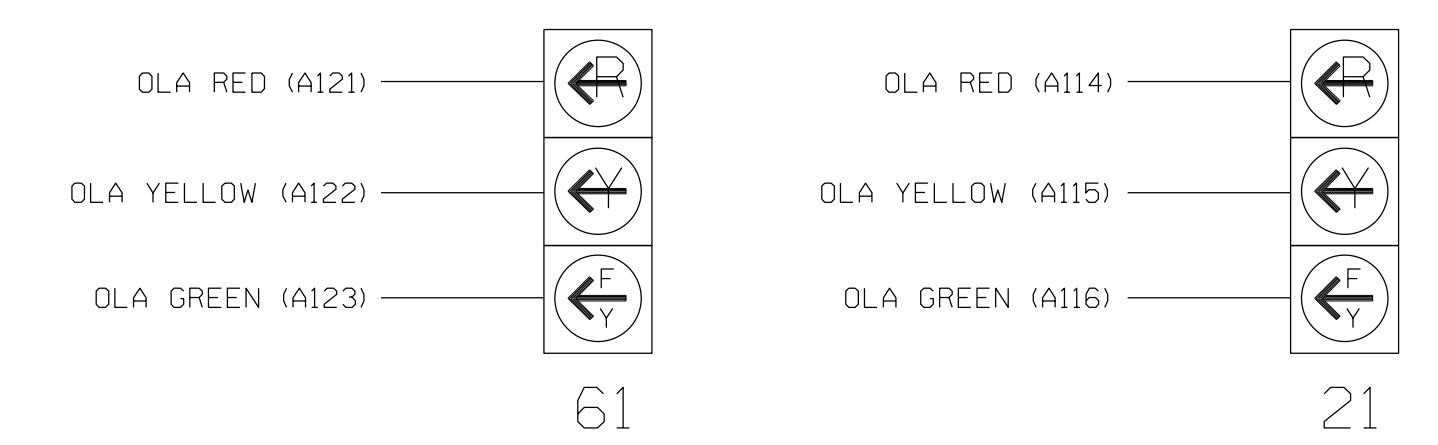
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23	NU	NU	41,42	NU	NU	62,63	NU	NU	81,82	NU	61	NU	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																		

NU = Not Used

\* See pictorial of head wiring in detail this sheet.

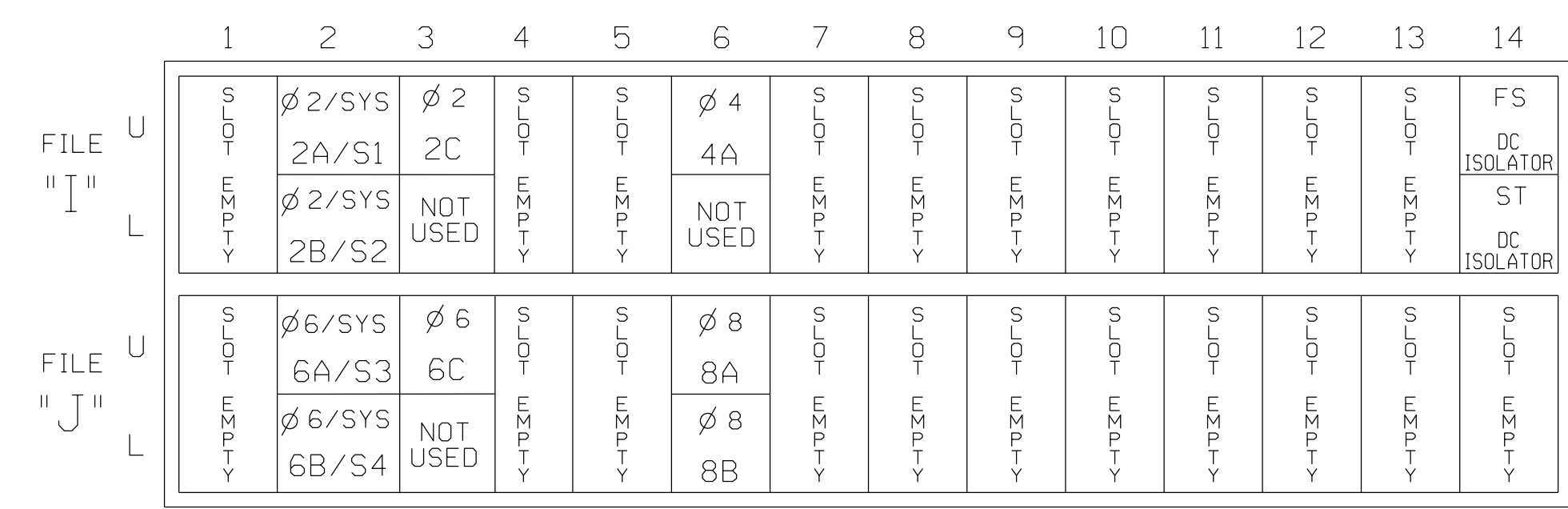
### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### INPUT FILE POSITION LAYOUT

(front view)

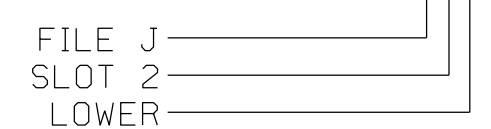


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

### 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/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		S
4A	TB4-9,10	I6U	41	4	4	YES		5		S
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		15		S

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0442  
 DESIGNED: FEBRUARY 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

20-SEP-2018 18:51 R:\5942\51\001\shp\ed\onw\l\img\01-0442-08212018e.dgn Incon AT CAR-L\MOON-MT

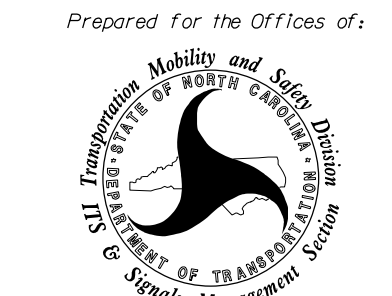
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER LISA M. MOON

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

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

US 17 -158 (N. Road St.)  
 at  
 SR 1346 (Culpepper Lane)/  
 Fairway Terrace Drive  
 Division 1 Pasquotank County Elizabeth City

PLAN DATE: February 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

DocuSigned by:  
 Lisa M. Moon 9/20/2018  
 SECESB0300421 DATE  
 SIG. INVENTORY NO. 01-0442

## 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 '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

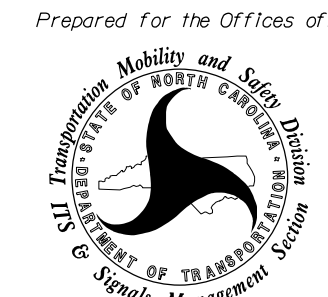
THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0442  
 DESIGNED: FEBRUARY 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

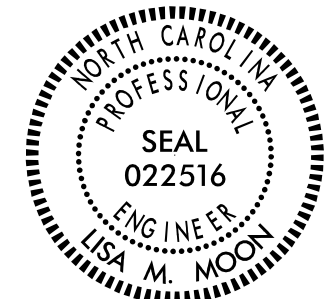
Prepared for the Offices of:



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

US 17 -158 (N. Road St.) at SR 1346 (Culpepper Lane)/ Fairway Terrace Drive	
Division 1 Pasquotank County Elizabeth City	
PLAN DATE: February 2018	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

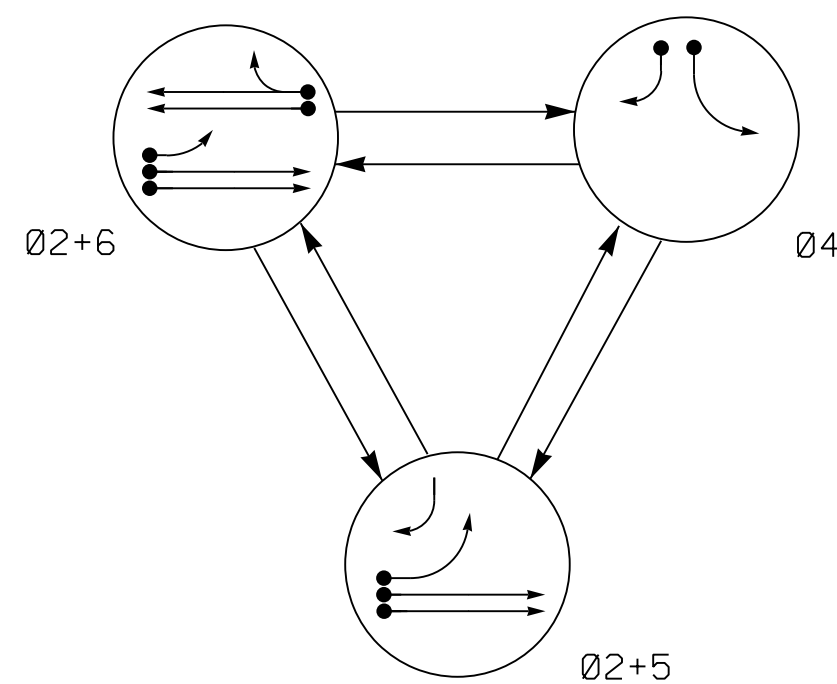
SEAL



DocuSigned by:  
*Lisa M. Moon* 9/20/2018  
SIC:CB88B3D0F21 DATE  
SIG. INVENTORY NO. 01-0442

20-SEP-2018 18:51  
R:\05942\51001\5\K05\000\1\1\0401-0442-08212018e.dgn  
lmoon AT CAR-LMCDNI-W7

**PHASING DIAGRAM**



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

ASC/3 DETECTOR INSTALLATION CHART													
DETECTOR					PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD	
2A	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X	
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X	
4A	6X40	+5	2-4-2	-	4	Yes	-	3	-	S	-	X	
5A	6X40	+5	2-4-2	-	5	Yes	-	15	-	S	-	X	
					2	Yes	-	3	-	G	-	X	
5B	6X40	+5	2-4-2	-	1	Yes	-	10	-	S	-	X	
6A/S1	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X	
6A/S2	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X	

**3 Phase Fully Actuated (Elizabeth City Signal System)**

**NOTES**

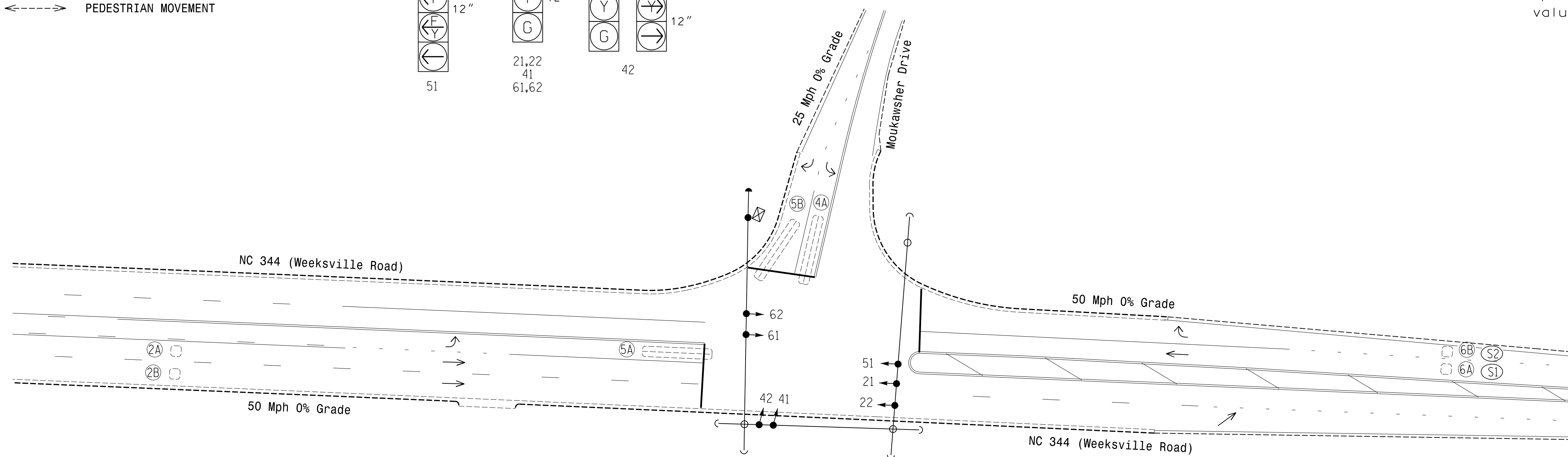
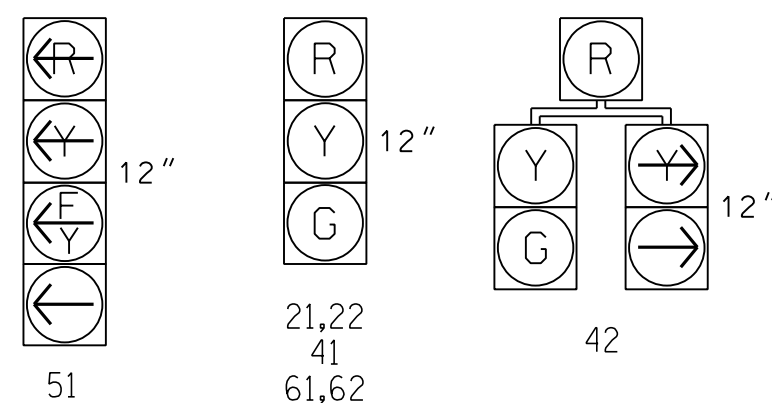
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in 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

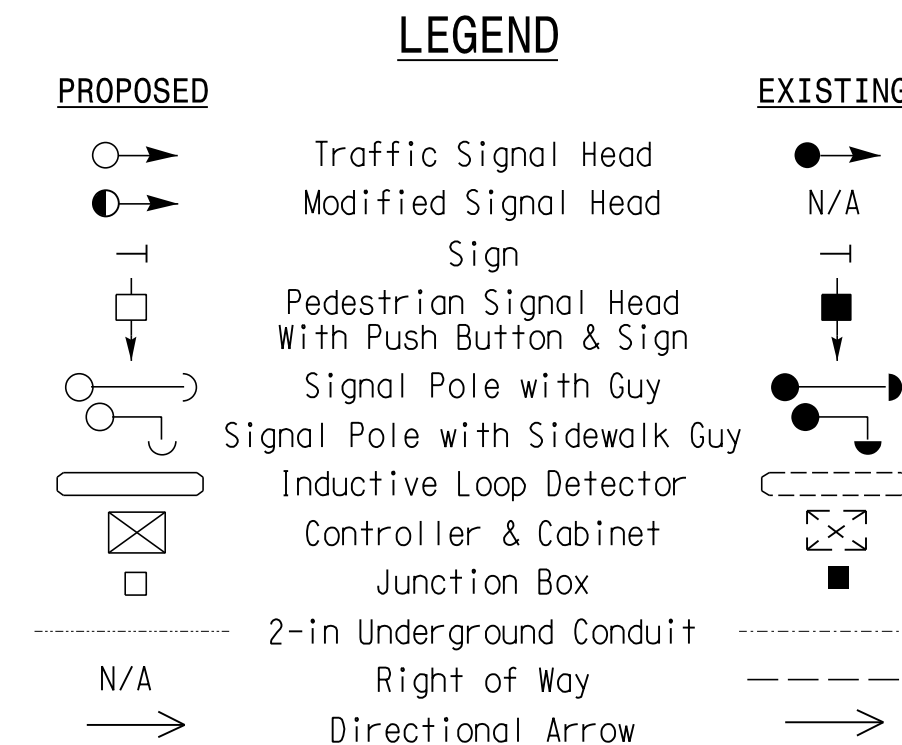
**SIGNAL FACE I.D.**

All Heads L.E.D.



FEATURE	PHASE			
	2	4	5	6
Min Green *	14	7	7	14
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	100	20	30	100
Yellow	4.8	3.0	3.0	4.8
Red Clear	1.5	2.1	2.4	1.5
Actuations B4 Add *	0	-	-	0
Seconds /Actuation *	1.5	-	-	1.5
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	50	-	-	50
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**

PLANS PREPARED BY:  
**RK&K**  
 RUMMEL, KLEPPER & KAHL LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 SCALE: 1" = 40'

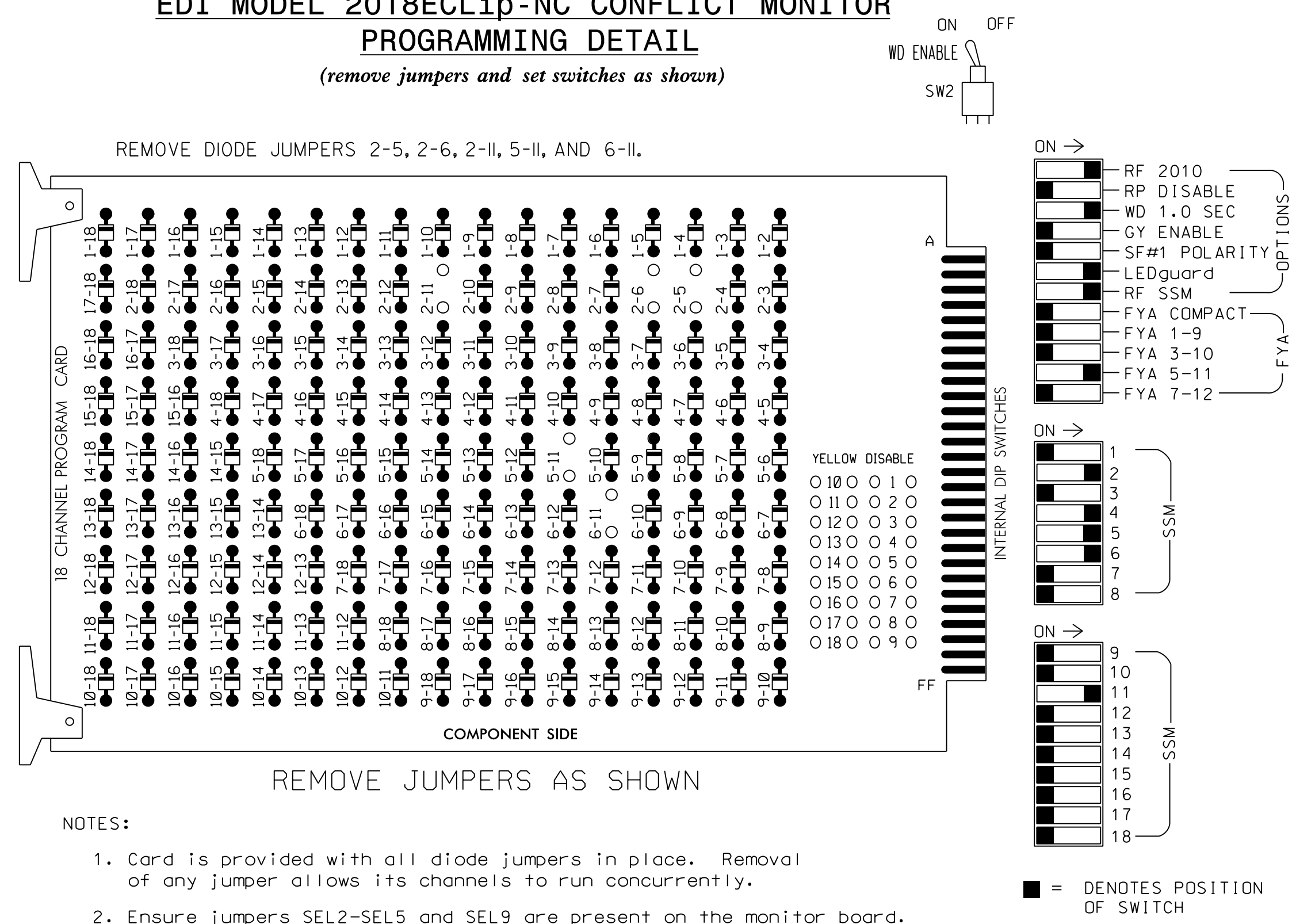
**NC 344 (Weeksville Road) At Moukawsher Drive (Entrance to USCGS)**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: CBHolden  
 PREPARED BY: DTSears REVIEWED BY:  
 REVISIONS: INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
  
 DocuSigned by: C. Byron Holden 9/21/2018  
 DATE: 9/21/2018  
 SIG. INVENTORY NO. 01-0443



### 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 Elizabeth City Signal System.

### EQUIPMENT INFORMATION

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

\* See overlap programming detail on this sheet

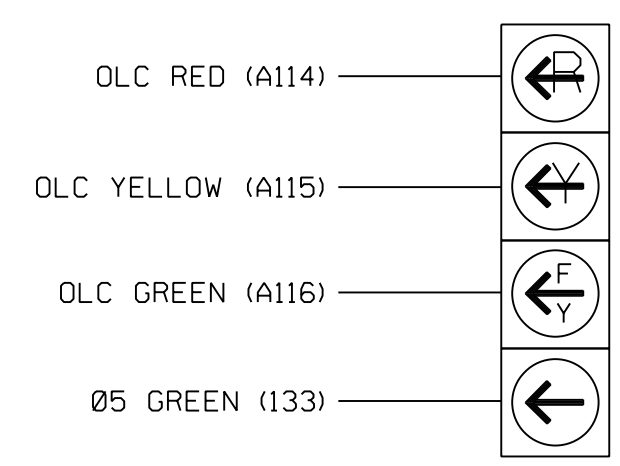
### SIGNAL HEAD HOOK-UP CHART

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	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51*	61,62	NU	NU	NU	NU	NU	NU	NU	51*	NU
RED		128			101		*		134									
YELLOW		129			102				135									
GREEN		130			103				136									
RED ARROW																		A114
YELLOW ARROW								132										A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW							133	133										

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

### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



51

### INPUT FILE POSITION LAYOUT

(front view)

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

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

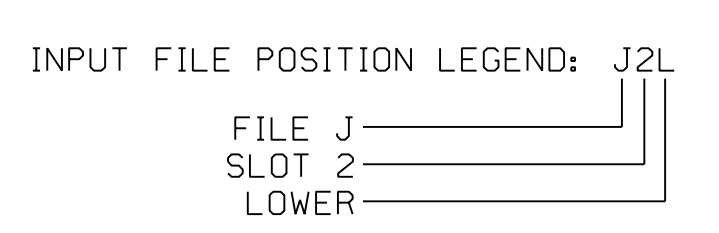
FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES				S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
6A/S1	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S2	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
5B	TB7-9,10	J9U	59	15	5	YES		10		S

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



### 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

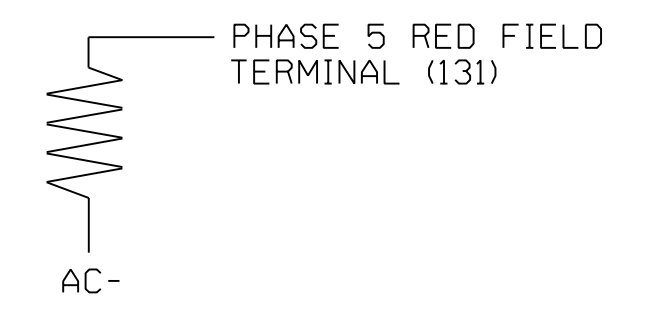
END PROGRAMMING

### 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)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0443  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Weeksville Road) at Moukawsher Drive (Entrance to USCGS)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

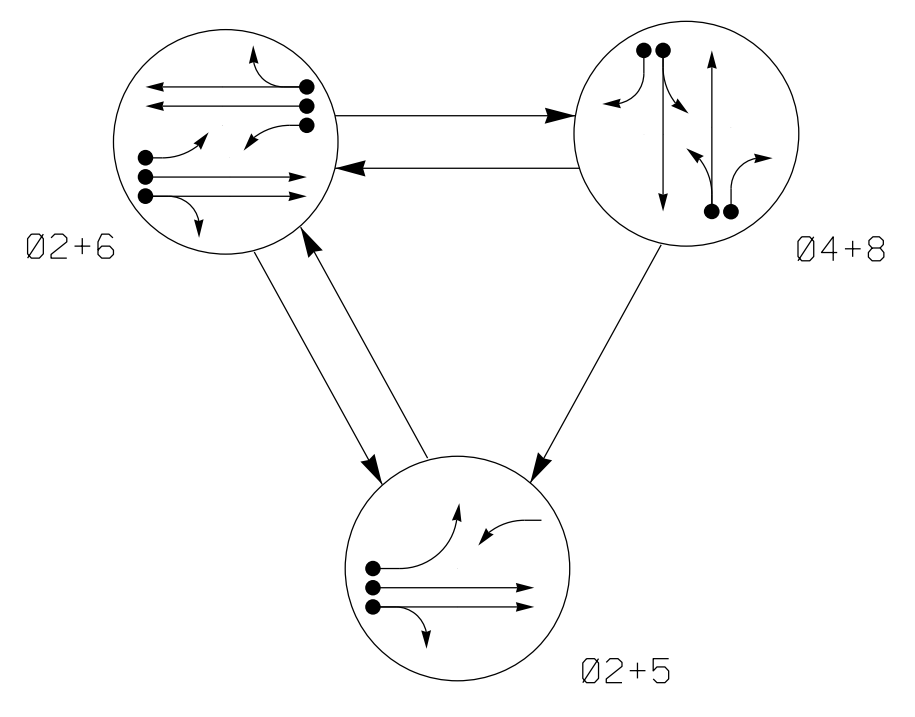
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: James O. Deaton 9/21/2018

SIG. INVENTORY NO. 01-0443

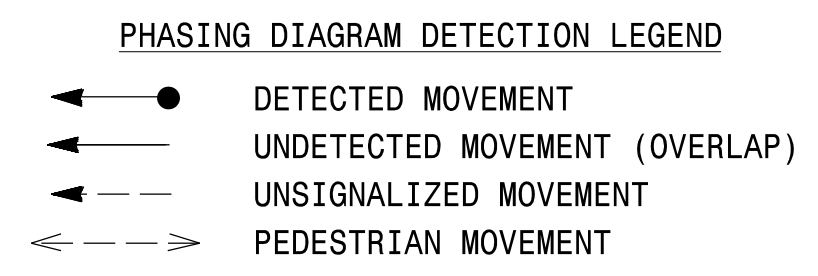
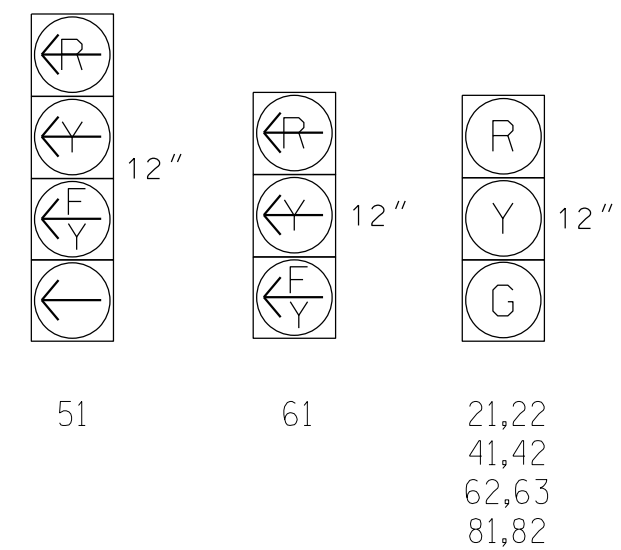
**PHASING DIAGRAM**



SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21,22	G	G	R	Y
41,42	R	R	G	R
51	←	→	←	→
61	←	→	←	→
62,63	R	G	R	Y
81,82	R	R	G	R

**SIGNAL FACE I.D.**

All Heads L.E.D.

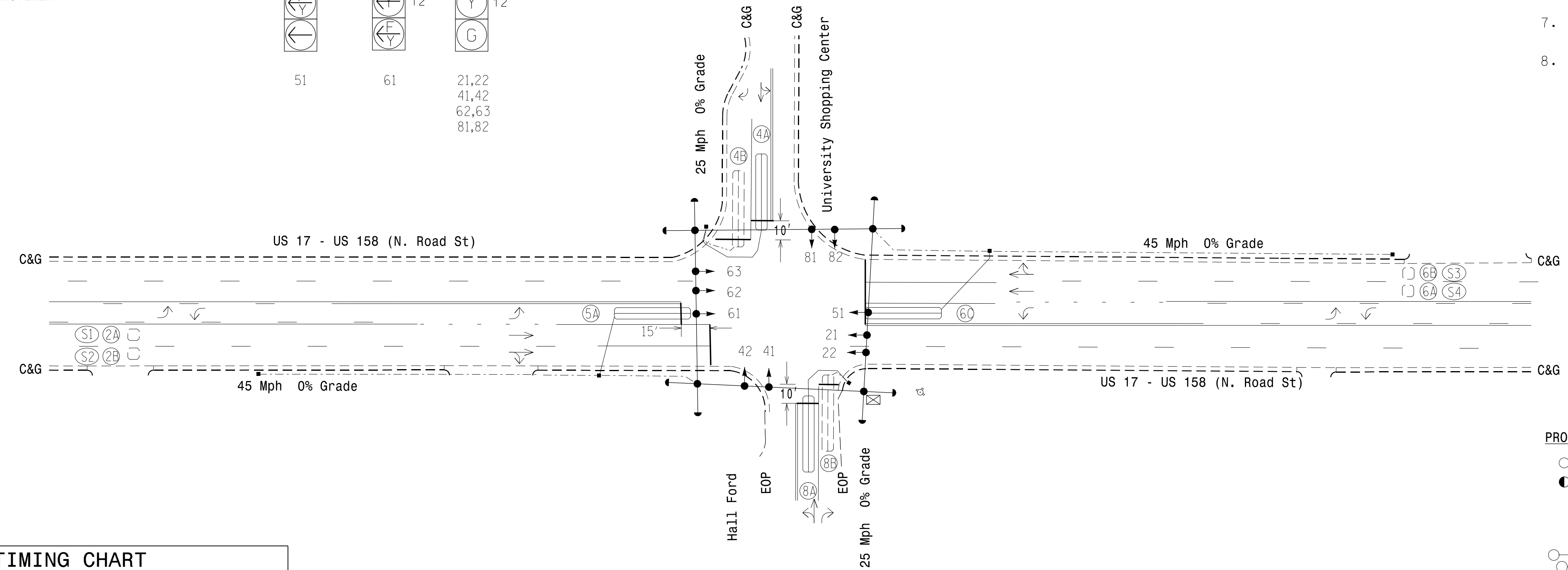


ASC/3 DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
2A/S1	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
4A	6X40	+5	2-4-2	X	4	Yes	-	3	-	S	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	15	-	S	-	X
5A	6X40	+5	2-4-2	X	5	Yes	-	15	-	S	-	X
6A/S3	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
6C	6X40	0	2-4-2	X	6	Yes	-	3	-	G	-	X
8A	6X40	+5	2-4-2	X	8	Yes	-	3	-	S	-	X
8B	6X40	+3	2-4-2	-	8	Yes	-	15	-	S	-	X

**3 Phase Fully Actuated (Elizabeth City Signal System)**

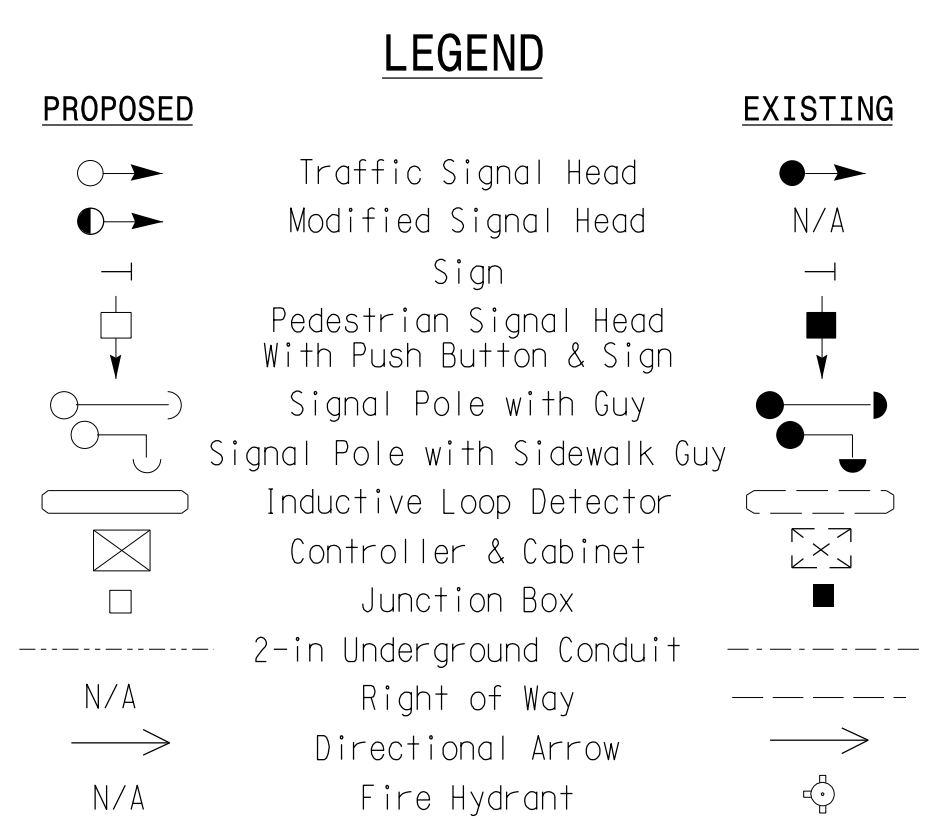
**NOTES**

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



FEATURE	PHASE				
	2	4	5	6	8
Min Green *	12	7	7	12	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	6.0	2.0	2.0	6.0	2.0
Max 1 *	90	30	30	90	30
Yellow	4.5	3.2	3.0	4.5	3.2
Red Clear	1.3	2.2	2.1	1.3	2.4
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

\* 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.



22-AUG-2018 15:40 R:\05942\51001\DWG\Signal\0461.dgn Jmoon AT CAR-L\MOON-W

Plans Prepared By:

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

**Signal Upgrade**

US 17 - 158 (N. Road Street) at University Shopping Center/ Hall Ford

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: JA Le REVIEWED BY: LM Moon

SCALE: 1" = 40'

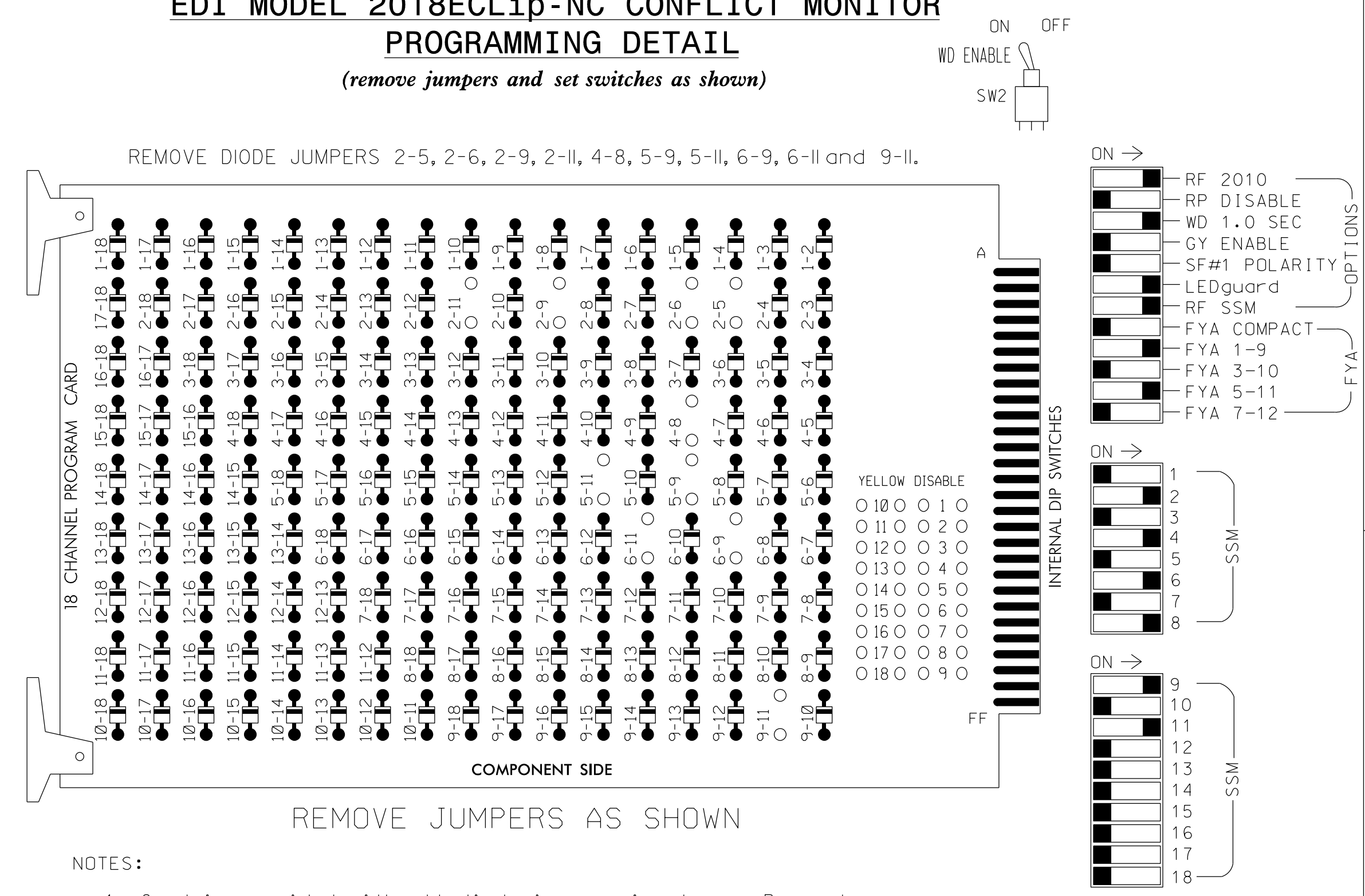
8/22/2018

SEAL: LISA M. MOON, ENGINEER

SIG. INVENTORY NO. 01-0461

### 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 Elizabeth City 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
CNU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51★	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										

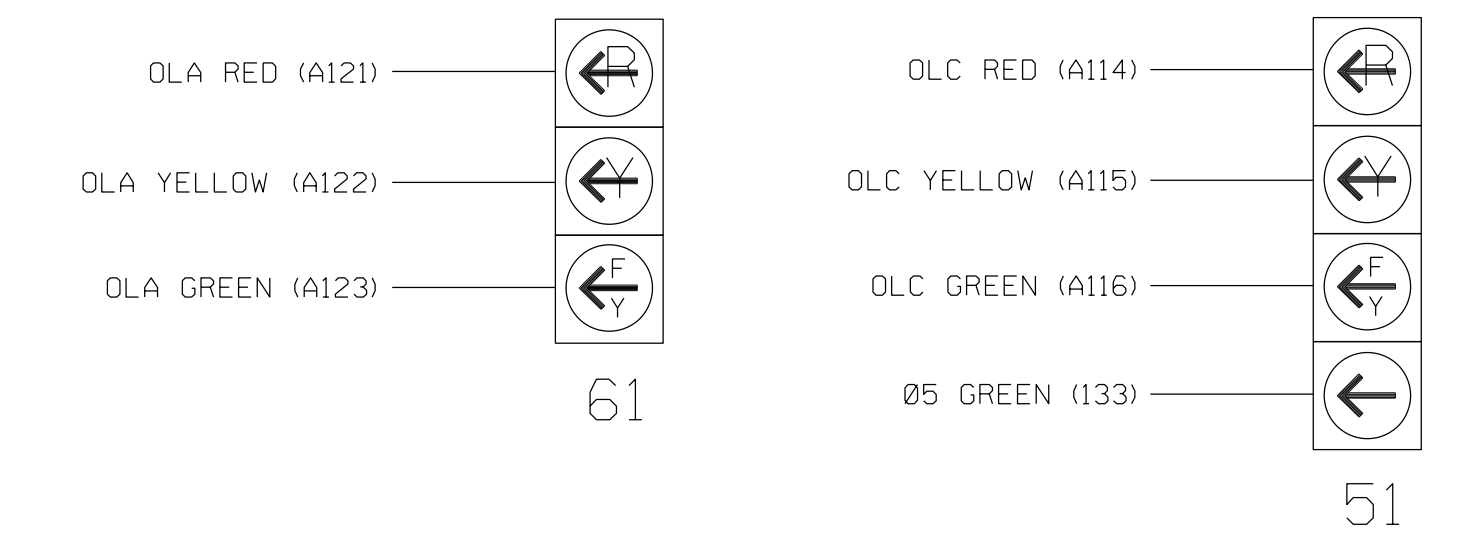
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

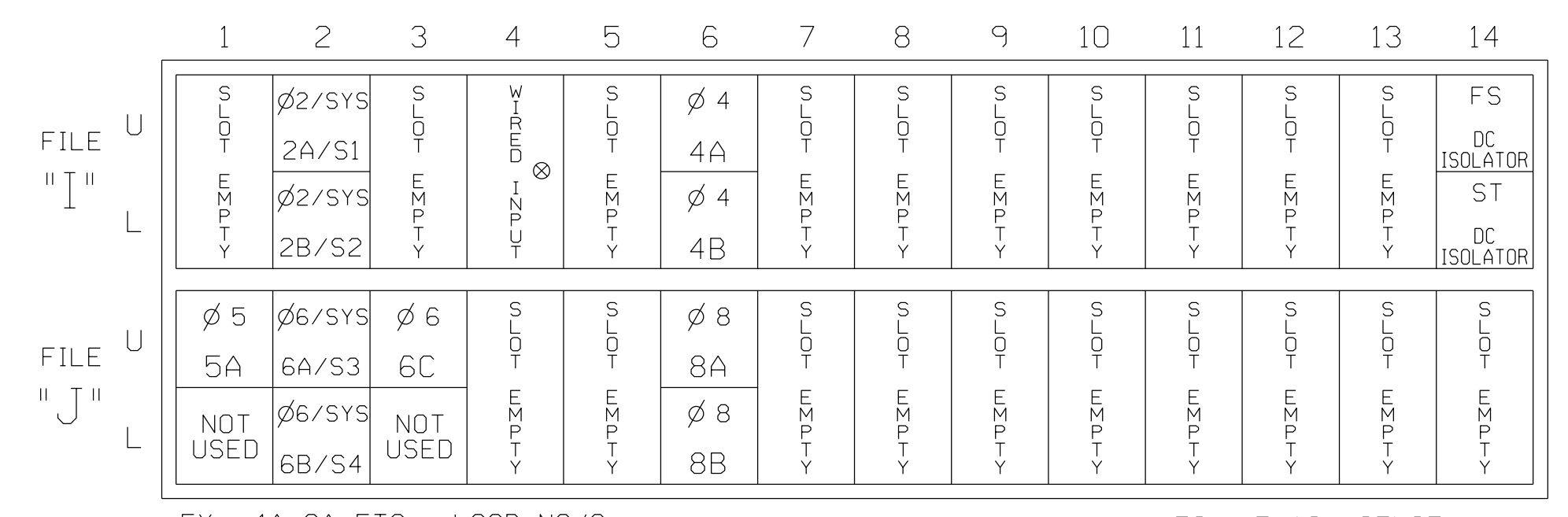
#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### INPUT FILE POSITION LAYOUT

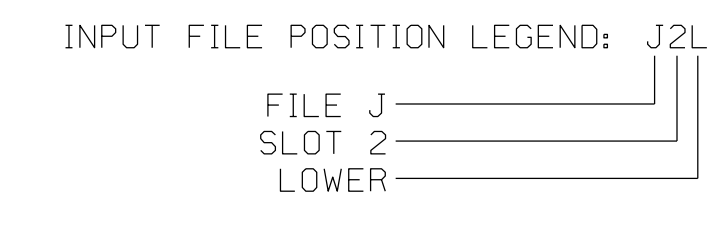
(front view)



#### 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/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		15		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
-	-	I4U	47	22	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		G
8A	TB5-9,10	J6U	42	8	8	YES		3		S
8B	TB5-11,12	J6L	46	18	8	YES		15		S

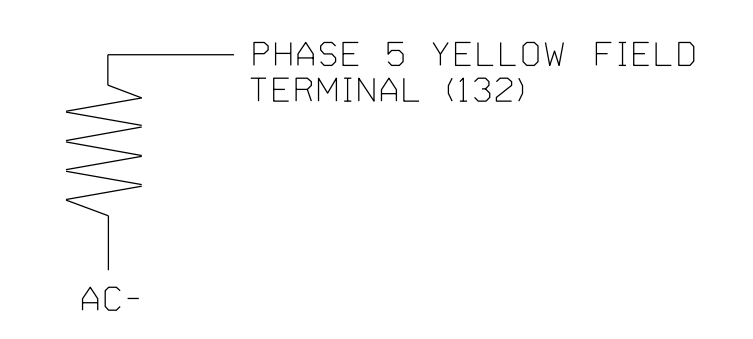
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.



#### LOAD RESISTOR INSTALLATION DETAIL

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:

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

US 17-158 (N. Road Street) at University Shopping Center/Hall Ford

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0461

## 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 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
        
```

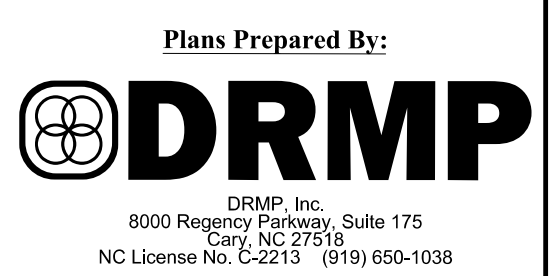
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0461  
 DESIGNED: MARCH 2018  
 SEALED: 08/22/2018  
 REVISED: N/A

20-SEP-2018 18:51  
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 lmoon AT CAR-LMCDNI-W7

Electrical Detail - Sheet 2 of 2

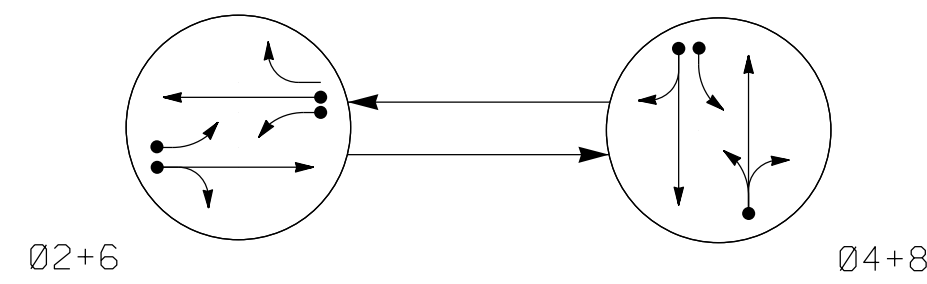
DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED



ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 17-158 (N. Road Street) at University Shopping Center/ Hall Ford	
Division 1 Pasquotank County Elizabeth City			
PLAN DATE:	March 2018	REVIEWED BY:	AJ Davis
PREPARED BY:	DJ White	REVIEWED BY:	LM Moon
REVISIONS	INIT.	DATE	



**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

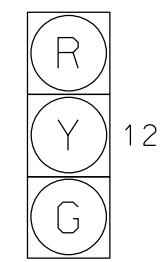
- ← DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



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

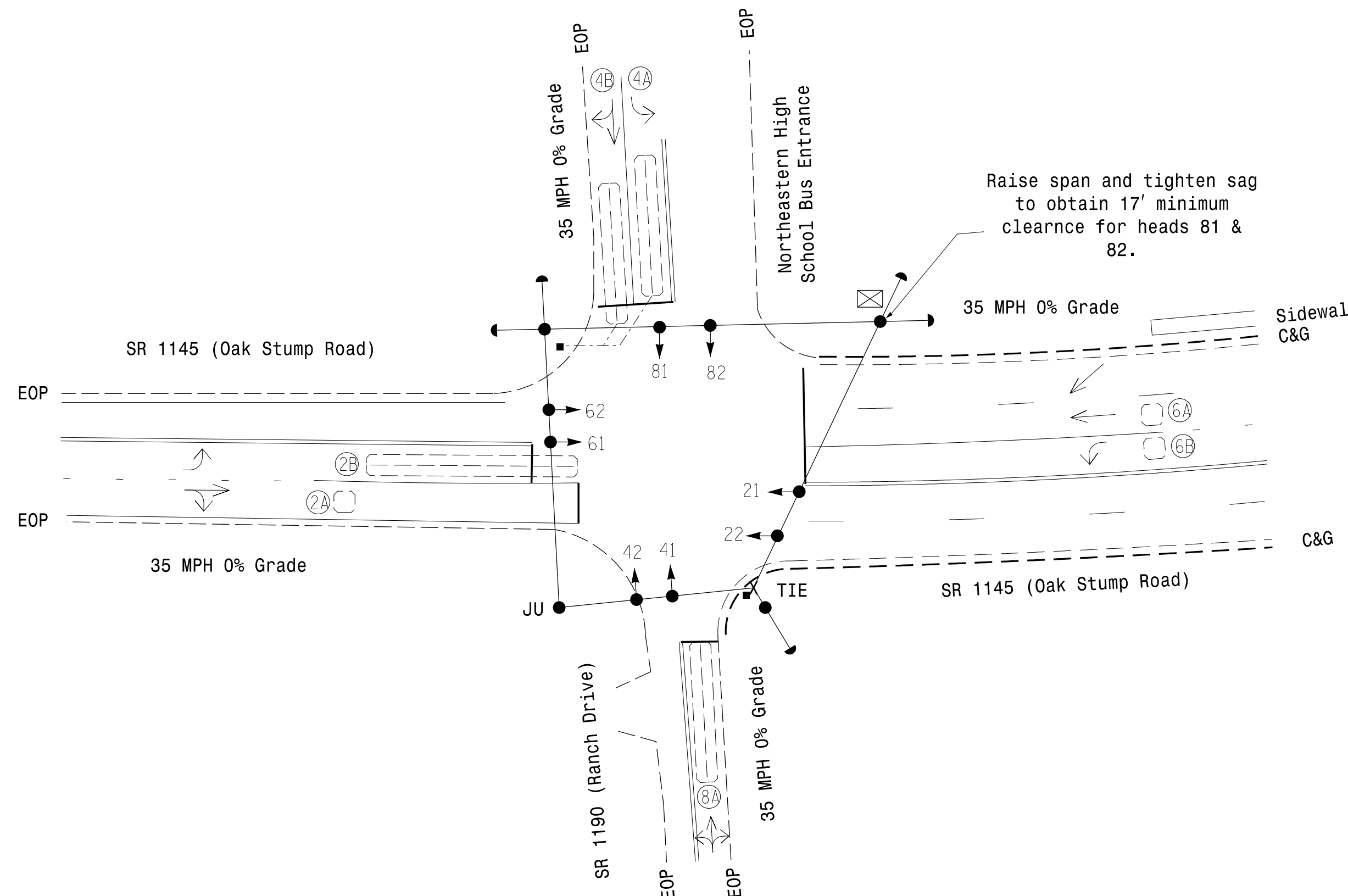
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	-	X
2B	6X60	+10	2-4-2	-	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X40	+5	2-4-2	-	4	Yes	-	10	-	S	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	5	-	S	-	X

**2 Phase Fully Actuated (Elizabeth City Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 41 and 42.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	45	25	45	25
Yellow	3.8	3.8	3.8	3.8
Red Clear	1.1	1.4	1.1	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

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

**LEGEND**

- | PROPOSED   | EXISTING |
|--|----------|
| ○ → Traffic Signal Head                            | ● → N/A  |
| ○ → Modified Signal Head                           | ○ → N/A  |
| ○ → Pedestrian Signal Head 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    |

**Signal Upgrade**

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

Plans Prepared By:

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

Prepared for the Offices of:

**SR 1145 (Oak Stump Road) at SR 1190 (Ranch Drive)/Northeastern High School Bus**

Division 1 Pasquotank County Elizabeth City

PLAN DATE: June 2018 REVIEWED BY: AJ Davis

PREPARED BY: JA Le REVIEWED BY: LM Moon

SCALE: 1" = 30'

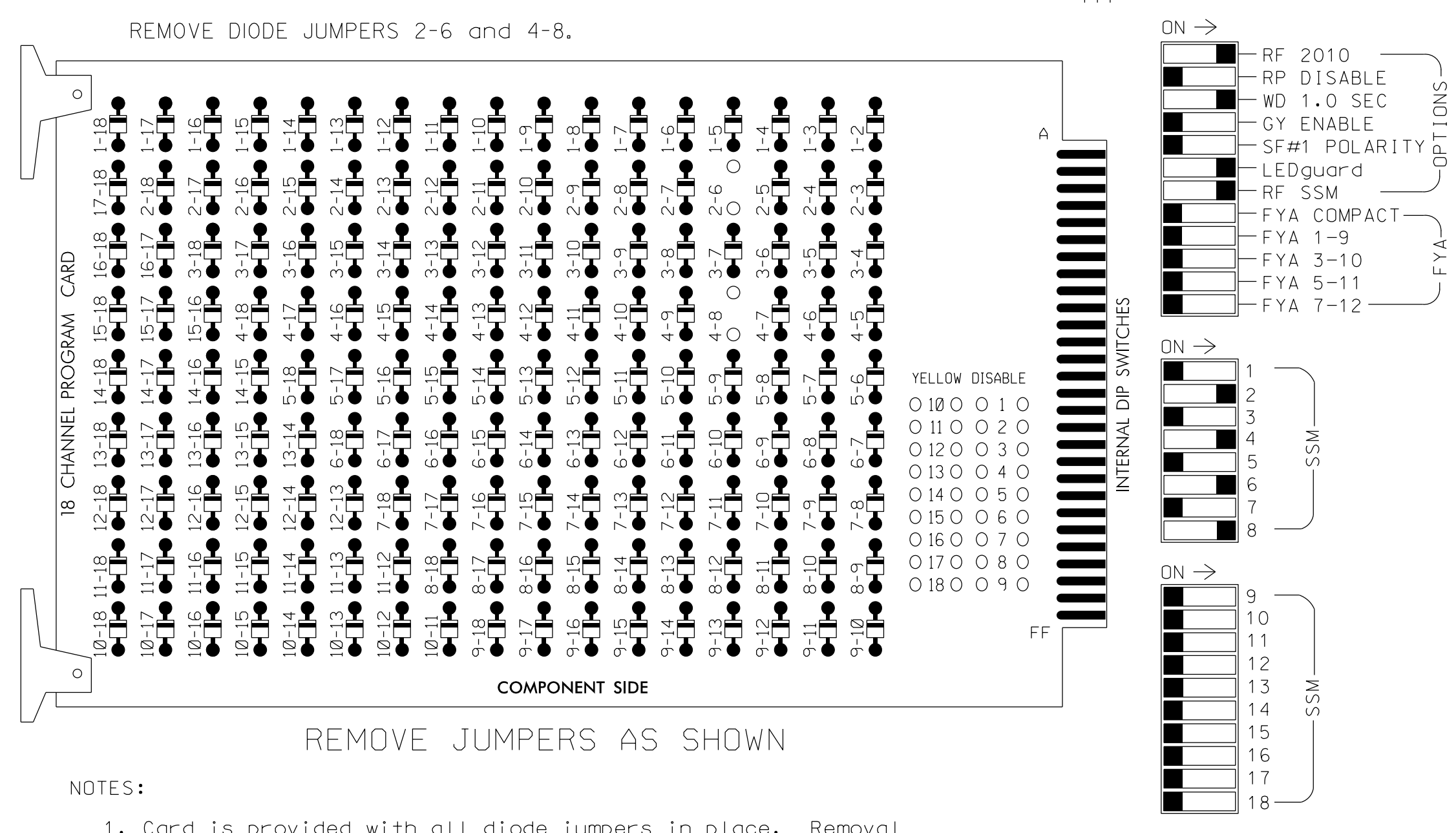
SEAL

DocuSigned by:  
**Lisa M. Moon**  
8/22/2018

SIG. INVENTORY NO. 01-0465

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 Elizabeth City 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

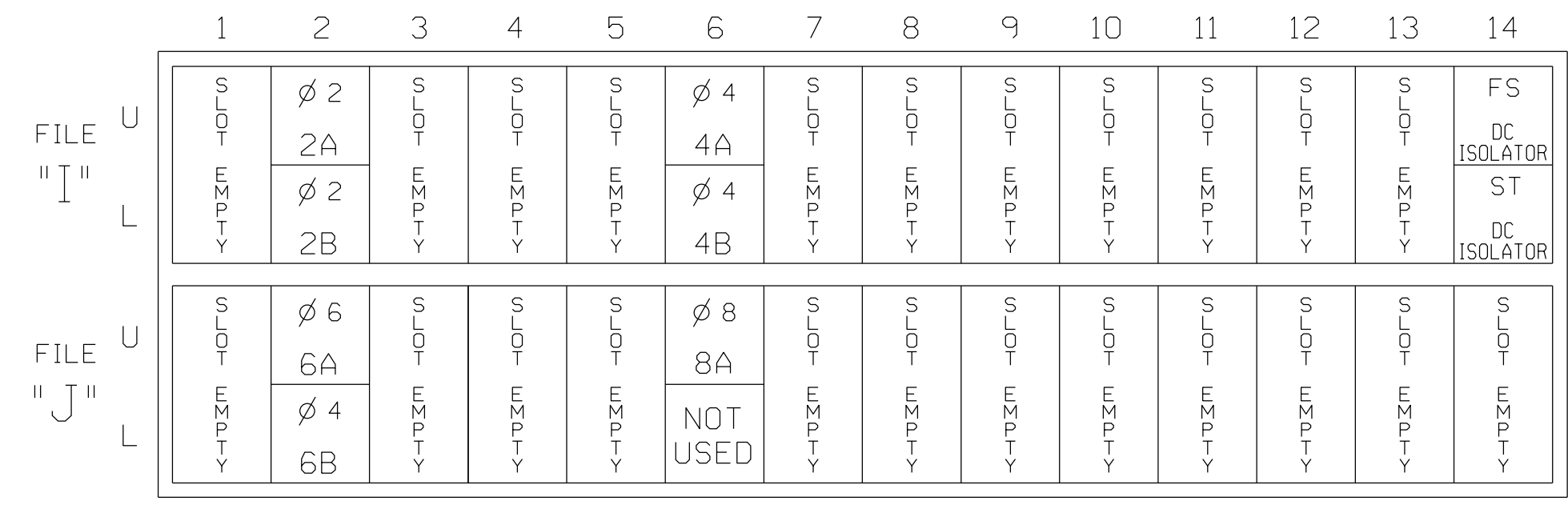
SIGNAL HEAD HOOK-UP CHART

Table with columns for Load Switch No., Channel No., Phase, Signal Head No., and auxiliary switches (AUX S1-S6).

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

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0465
DESIGNED: JUNE 2018
SEALED: 08/22/2018
REVISED: N/A

20-SEP-2018 18:51 R:\J5942\51001\EMPS\gdnw\1r\img\01-0465-08222018e.dgn
10con AT: CAR-LMD\DMH-W7

Electrical Detail - Sheet 1 of 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

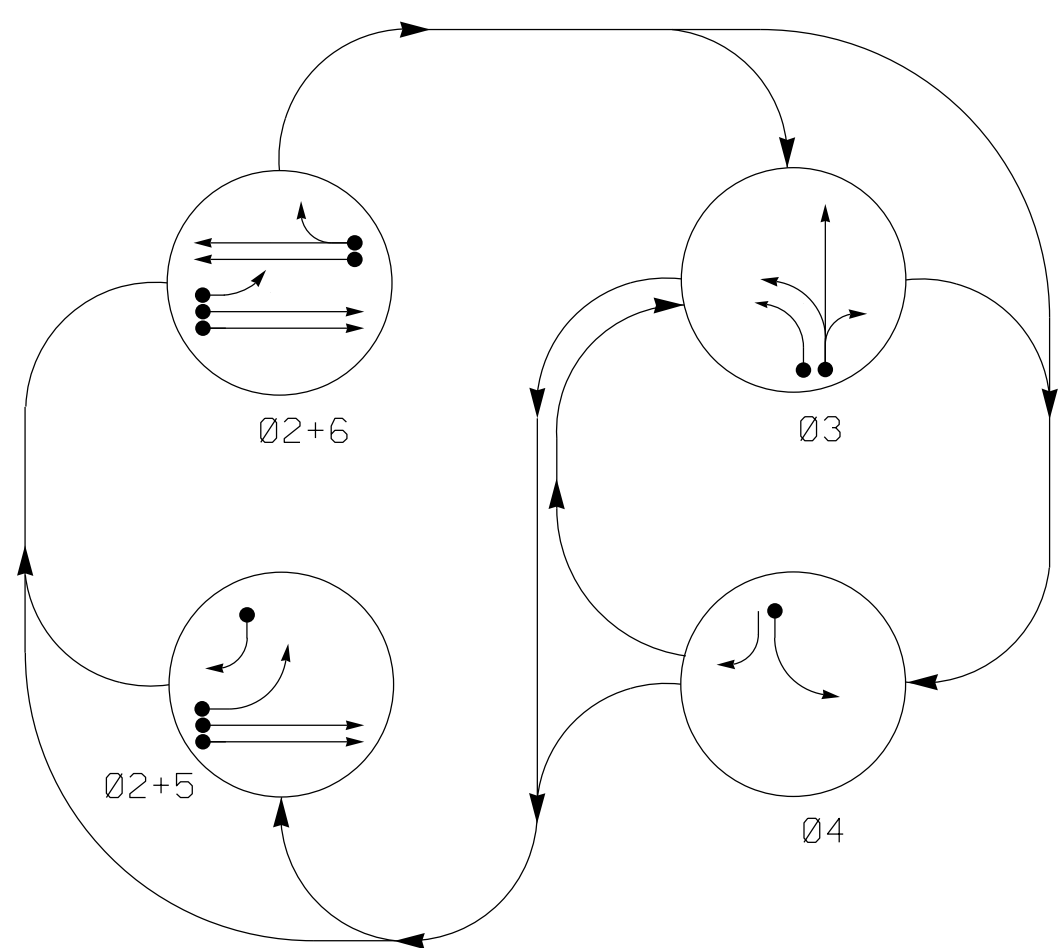


Electrical AND PROGRAMMING DETAILS FOR: SR 1145 (Oak Stump Road) at SR 1190 (Ranch Drive)/Northeastern High School Bus. Includes plan date, reviewer, and signature information.

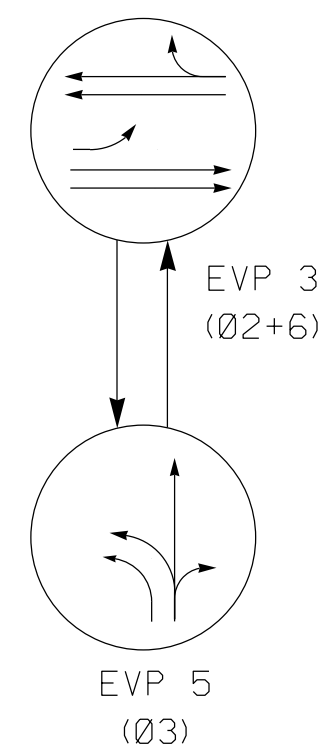
Professional Engineer Seal for Lisa M. Moon, State of North Carolina, License No. 422516.

DocuSigned by: Lisa M. Moon 9/20/2018
SECES8808320421 DATE
SIG. INVENTORY NO. 01-0465

PHASING DIAGRAM



EV PREEMPT PHASES



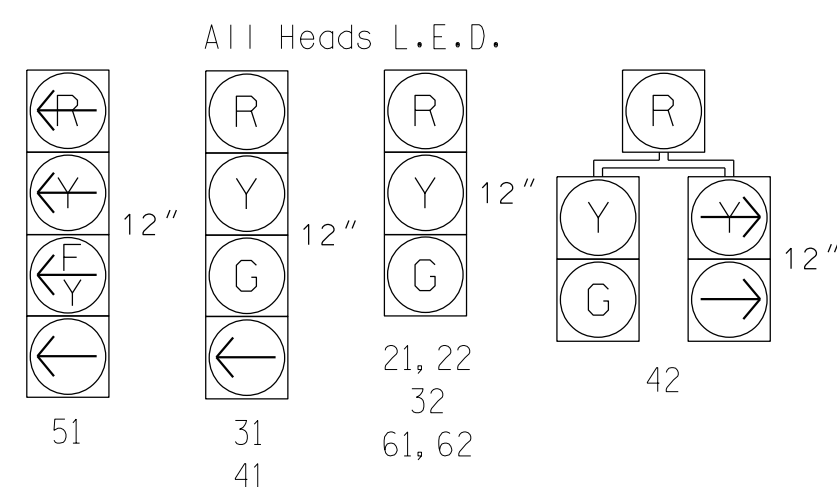
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

Table with 7 columns: SIGNAL FACE, PHASE, and signal colors (G, R, Y, F, F, F, F). Rows list signal faces 21, 22, 31, 32, 41, 42, 51, and 61, 62.

SIGNAL FACE I.D.



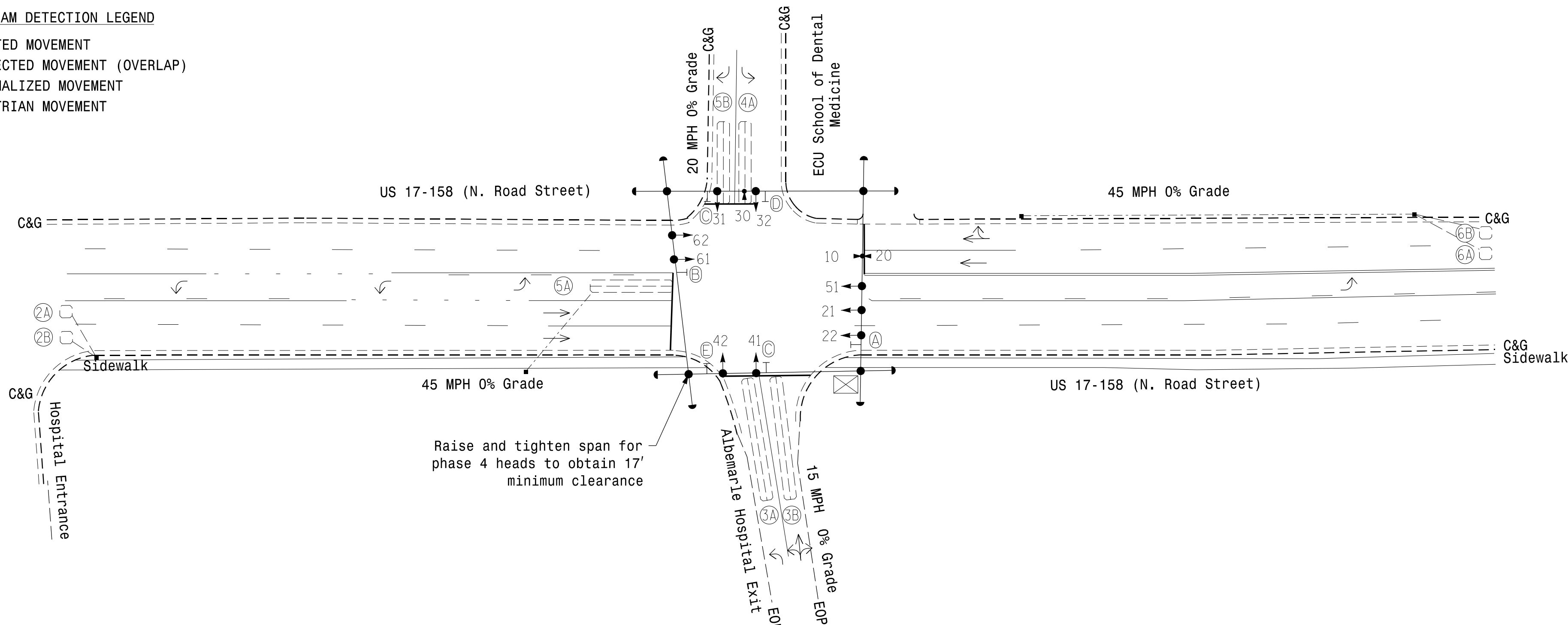
ASC/3 DETECTOR INSTALLATION CHART

Table with 12 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. Rows list detector loops 2A through 6B.

4 Phase Fully Actuated W/ EV Preemption (Elizabeth City 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. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
6. Optical detectors 10 and 20 call EVP3; Optical detector 30 calls EVP5.
7. Relocate existing optical detection equipment from existing cabinet to new cabinet.
8. Set all detector units to presence mode.
9. Pavement markings are existing.
10. 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.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



Raise and tighten span for phase 4 heads to obtain 17' minimum clearance

ASC/3 TIMING CHART

Timing chart table with columns for FEATURE, PHASE (2, 3, 4, 5, 6, \*\*10), and OLG. Rows include Min Green, Walk, Ped Clear, Veh. Extension, Max 1, Yellow, Red Clear, Actuations B4 Add, Seconds/Actuation, Max Initial, Time Before Reduction, Time To Reduce, Minimum Gap, Locking Detector, Recall Position, Dual Entry, and Simultaneous Gap.

ASC/3 EV PREEMPT

EV Preempt table with columns for FUNCTION, PRE 3, and PRE 5. Rows include Exit Phase(s), Preempt Override, Delay Time, Ped Clear Through Yellow, Terminate Phases, Entrance Walk, Entrance Ped Clear, Entrance Min Green, Entrance Yellow Change, Entrance Red Clear, Minimum Dwell Time, Preempt Input Extension Time, Preempt Max Time, Exit Yellow Change, and Exit Red Clear.

LEGEND

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

\* 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.
\*\* Phase used for timing purposes only.

\* Allows normal phase times to be used.

Signal Upgrade

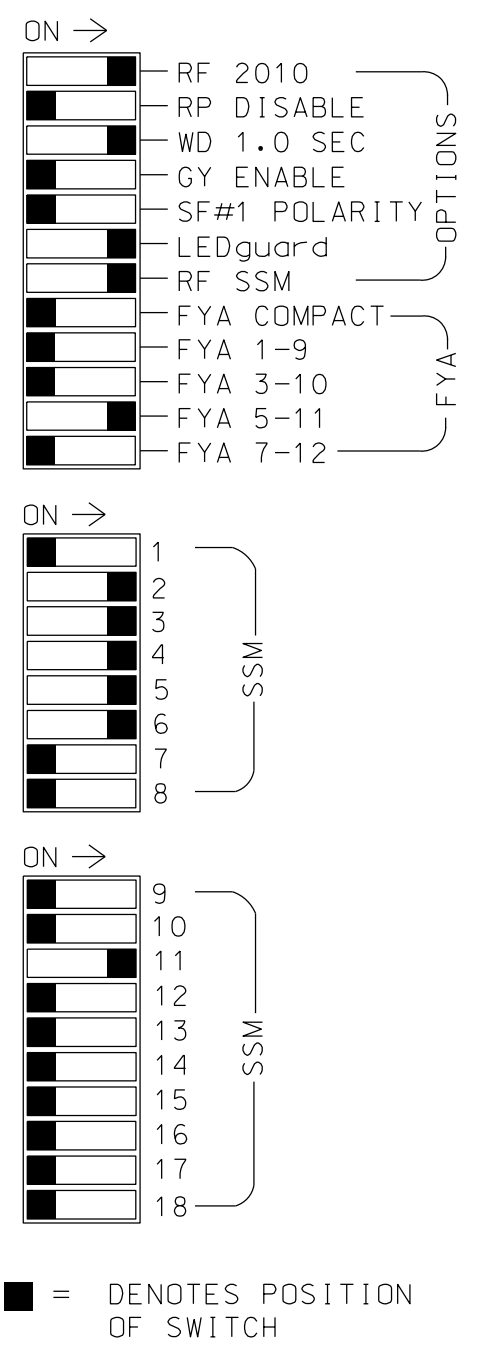
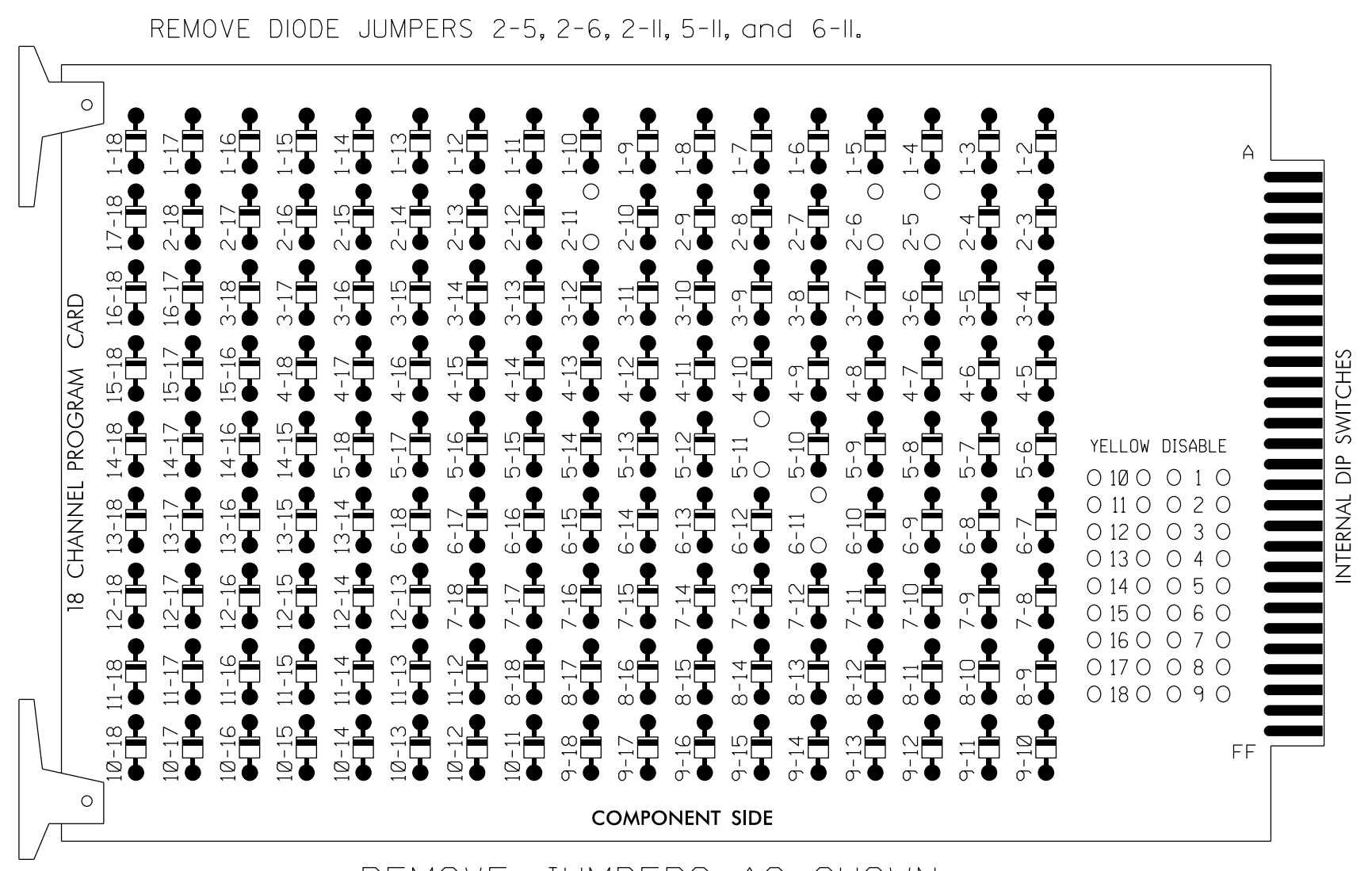
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Professional engineer stamp for Lisa M. Moon, State of North Carolina, License No. 022516. Includes project name, location, and date.

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

(remove jumpers and set switches as shown)



**NOTES:**

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

**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. The cabinet and controller are part of the Elizabeth City 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,S4,S5,S7,S8,AUX S4  
 PHASES USED.....2,3,4,5,6.\*\*10  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 OVERLAP "G".....\*

\* See overlap programming detail on sheet 2  
 \*\* Phase used for timing purposes only.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	OLG	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	31	32	41	42	51*	42	61,62	NU	NU	NU	NU	NU	51*	NU	NU	
RED		128		116	116	101	101		*		134								
YELLOW		129		117	117	102	102				135								
GREEN		130		118	118	103	103				136								
RED ARROW																		A114	
YELLOW ARROW										132									A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW				118	103			133	133										

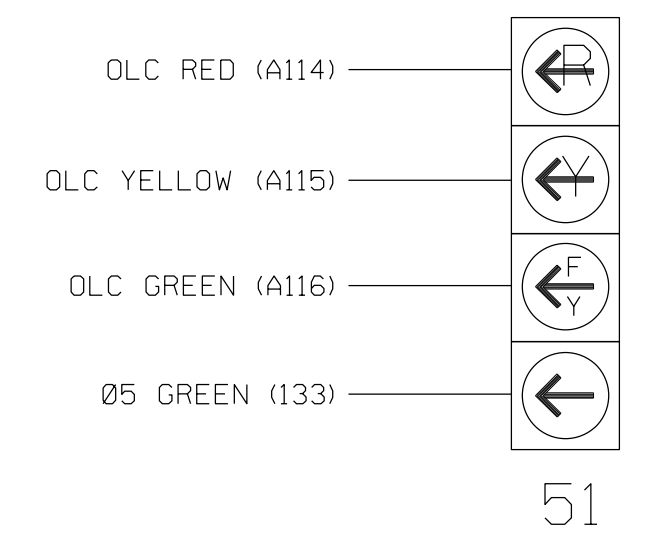
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

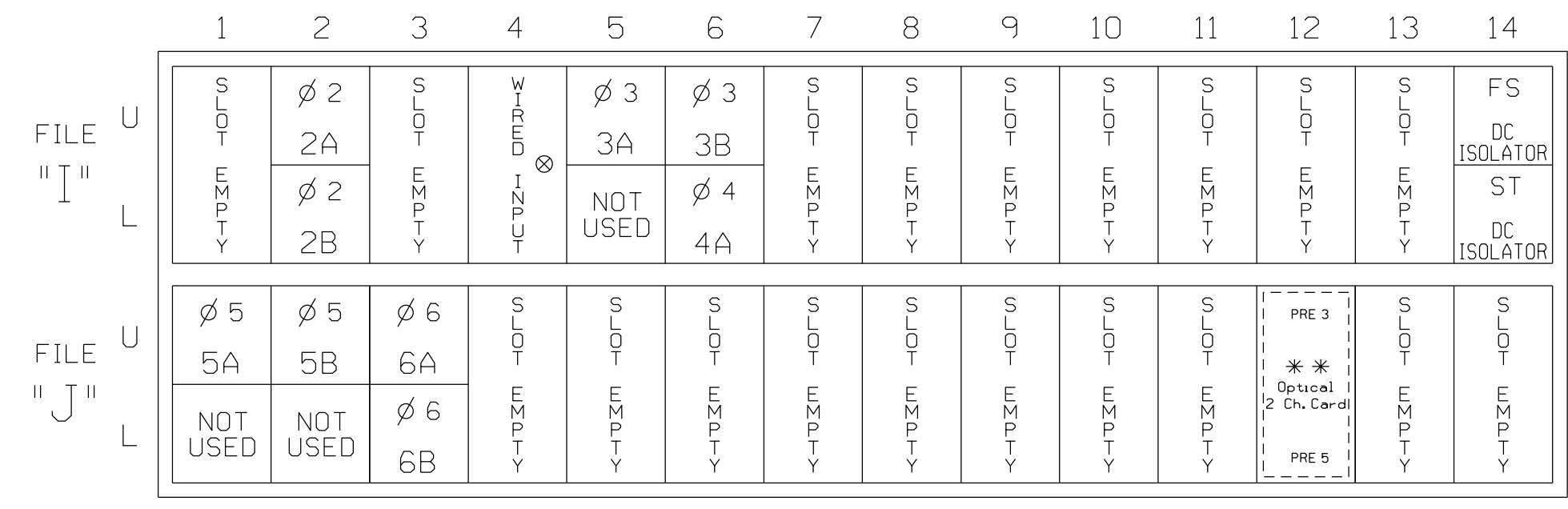
**FYA SIGNAL WIRING DETAIL**

(wire signal heads as shown)



**INPUT FILE POSITION LAYOUT**

(front view)

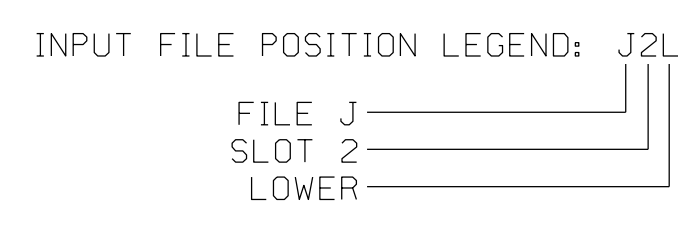


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 ⊗ Wired Input - Do not populate slot with detector card  
 FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3/10	YES				S
3B	TB4-9,10	I6U	41	4	3/10	YES		5		S
4A	TB4-11,12	I6L	45	14	4	YES				S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
		I4U	47	22	2	YES		3		G
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES			X	N
6B	TB3-11,12	J3L	77	46	6	YES			X	N

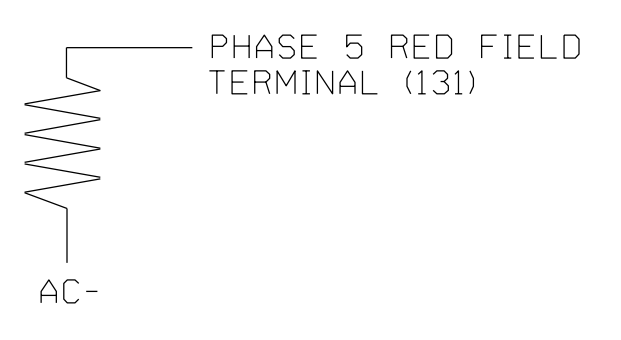
<sup>1</sup>Add jumper from J1-W to I4-W, on rear of input file.



**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown)

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



**\*\*OPTICAL PREEMPTION SYSTEM**

1. Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the Signal Design Plans.
2. Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specification of the type 2070 controller.



Electrical Detail - Sheet 1 of 4

Electrical and Programming Details For: **US 17-158 (N. Road Street)** at **Albemarle Hospital Exit/ ECU School of Dental Medicine**

Division 1 Pasquotank County Elizabeth City

PLAN DATE: **March 2018** REVIEWED BY: **AJ Davis**

PREPARED BY: **DJ White** REVIEWED BY: **LM Moon**

REVISIONS: INIT. DATE

DocuSigned by: **Lisa M. Moon** 9/20/2018

SIG. INVENTORY NO. **01-0481**

20-SEP-2018 18:51 R:\51942\51942.dwg User: lmgwlr-0481-08232018.dgn



## ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

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

```

CONTROLLER SEQUENCE [ 1 ]
SEQUENCE COMMANDS . HW ALT SEQ ENA.          NO.
   01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC-B  -  B  -  B  -  -  -  -  -  -  -  -  -  -  -  -
R1-1 . 2 3 4 10 . . . . .
R2-15 6 . . . . .
R3-1 . . . . .
R4-1 . . . . .

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

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

Toggle Three Times

*OVERLAP C*

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

```

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

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

Toggle 4x

*OVERLAP G*

Select TMG VEH OVLP [G] and 'NORMAL'

```

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

LAG GRN 0.1 YEL 3.0 RED 3.3
    
```

END PROGRAMMING

## ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 as OLE, program LD SWITCH 3 as OVLP '5' TYPE 'O' as shown below.


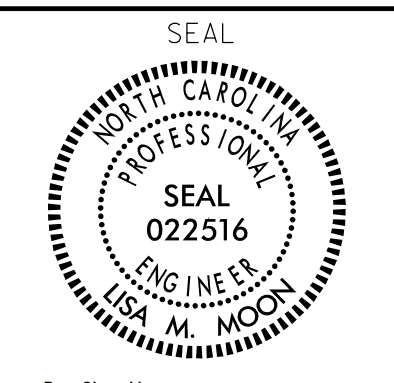
1. From Main Menu select 1. CONFIGURATION
2. From CONFIGURATION Submenu select 3. LOAD SW ASSIGN

NOTICE OVL P 7  
ASSIGNED TO  
LD SWITCH 3 →

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0481  
DESIGNED: MARCH 2018  
SEALED: 09/20/2018  
REVISED: N/A

Electrical Detail - Sheet 2 of 4

<b>ELECTRICAL AND PROGRAMMING DETAILS FOR:</b>  Prepared for the Offices of:  DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27518 NC License No. C-2213 (019) 650-1038	<b>US 17-158 (N. Road Street)</b> at <b>Albemarle Hospital Exit/                  ECU School of Dental Medicine</b> Division 1 Pasquotank County Elizabeth City	SEAL  ENGINEER LISA M. MOON
	PLAN DATE: March 2018 PREPARED BY: DJ White REVIEWED BY: AJ Davis REVIEWED BY: LM Moon	REVISIONS INIT. DATE

20-SEP-2018 18:51  
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Lincon AT CAR-LMCDM-W7

## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR SIDE STREET PHASING

*(program controller as shown)*

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

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

```

LP#: 1 COPY FROM: 1 ACTIVE: M (T/F)
IF VEH GREEN ON PH 3 IS ON

THEN LP SET LOGIC FLAG 1 ON

ELSE
    
```

PHASE 3 GREEN SETS  
LOGIC FLAG 1 ON  
(SIDE STREET BACKUP)

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#: 3 COPY FROM: 3 ACTIVE: M (T/F)
IF VEH GREEN ON PH 2 IS ON

THEN LP SET LOGIC FLAG 1 OFF

ELSE
    
```

TURNS LOGIC FLAG 1  
OFF TO ALLOW NORMAL  
OPERATION

END PROGRAMMING

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

```

LP#: 2 COPY FROM: 2 ACTIVE: M (T/F)
IF LP FLAG 1 IS ON

THEN CTR OMIT PHASE 10 ON

ELSE
    
```

OMIT PHASE 10 SO  
PHASE 3 MOVEMENTS  
RUN ONCE PER CYCLE

4. From LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

ENABLE LOGIC PROCESSOR STATEMENTS 1, 2 & 3 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

## ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

*(program controller as shown)*

1. From Main Menu select 6. DETECTORS
2. From DETECTOR Submenu select 2. VEHICLE DETECTOR SETUP

```

VEH DETECTOR [ 3] VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... X ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
3 3 . . X . . . . . X . . . . .
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
    
```

```

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

END PROGRAMMING

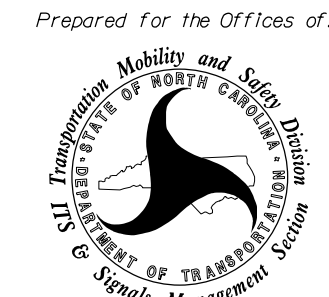
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 01-0481  
DESIGNED: MARCH 2018  
SEALED: 09/20/2018  
REVISED: N/A

Electrical Detail - Sheet 3 of 4

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

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:



Plans Prepared By:  
**DRMP**  
DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2215 (019) 650-1038

US 17-158 (N. Road Street) at Albemarle Hospital Exit/ ECU School of Dental Medicine	
Division 1 Pasquotank County Elizabeth City	
PLAN DATE: March 2018	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

SEAL  
NORTH CAROLINA  
PROFESSIONAL  
SEAL  
022516  
ENGINEER  
LISA M. MOON

DocuSigned by:  
*Lisa M. Moon* 9/20/2018  
SIC6880830421  
DATE  
SIG. INVENTORY NO. 01-0481

20-SEP-2018 18:51  
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Incon. AT CAR-LMCDM-W7

# ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL

(program controller as shown)

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

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

```

PREEMPT PLAN [ 3]  ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . . X . . . . .
DWEL PED . . . . .
DWEL OLP . .F1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP FUNC . . . . .

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT...0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120125.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

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

```

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

```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT...0IX FLCOLR REDIEEXIT OPT. OFF
X TMG PLN...0IRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1125.5125.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5125.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 7I 2.0I 120125.5125.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT.....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0

```

# ECONOLITE ASC/3-2070 PREEMPT FILTERING PROGRAMMING DETAIL

(program controller as shown)

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

```

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

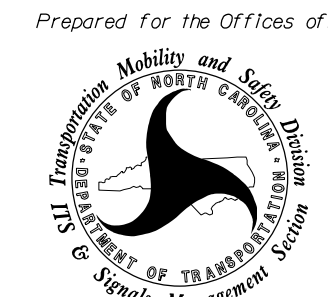
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THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0481  
DESIGNED: MARCH 2018  
SEALED: 09/20/2018  
REVISED: N/A


Electrical Detail - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



Plans Prepared By:



DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2213 (019) 650-1038

US 17-158 (N. Road Street) at Albemarle Hospital Exit/ ECU School of Dental Medicine

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS	INIT.	DATE

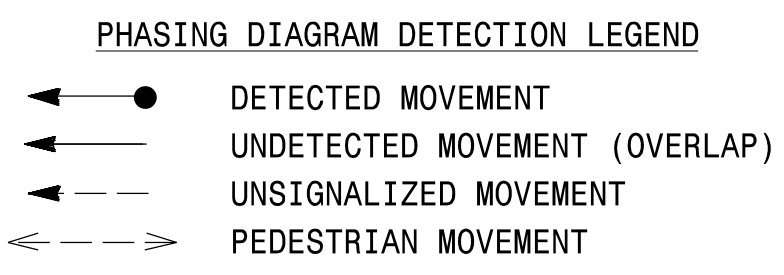
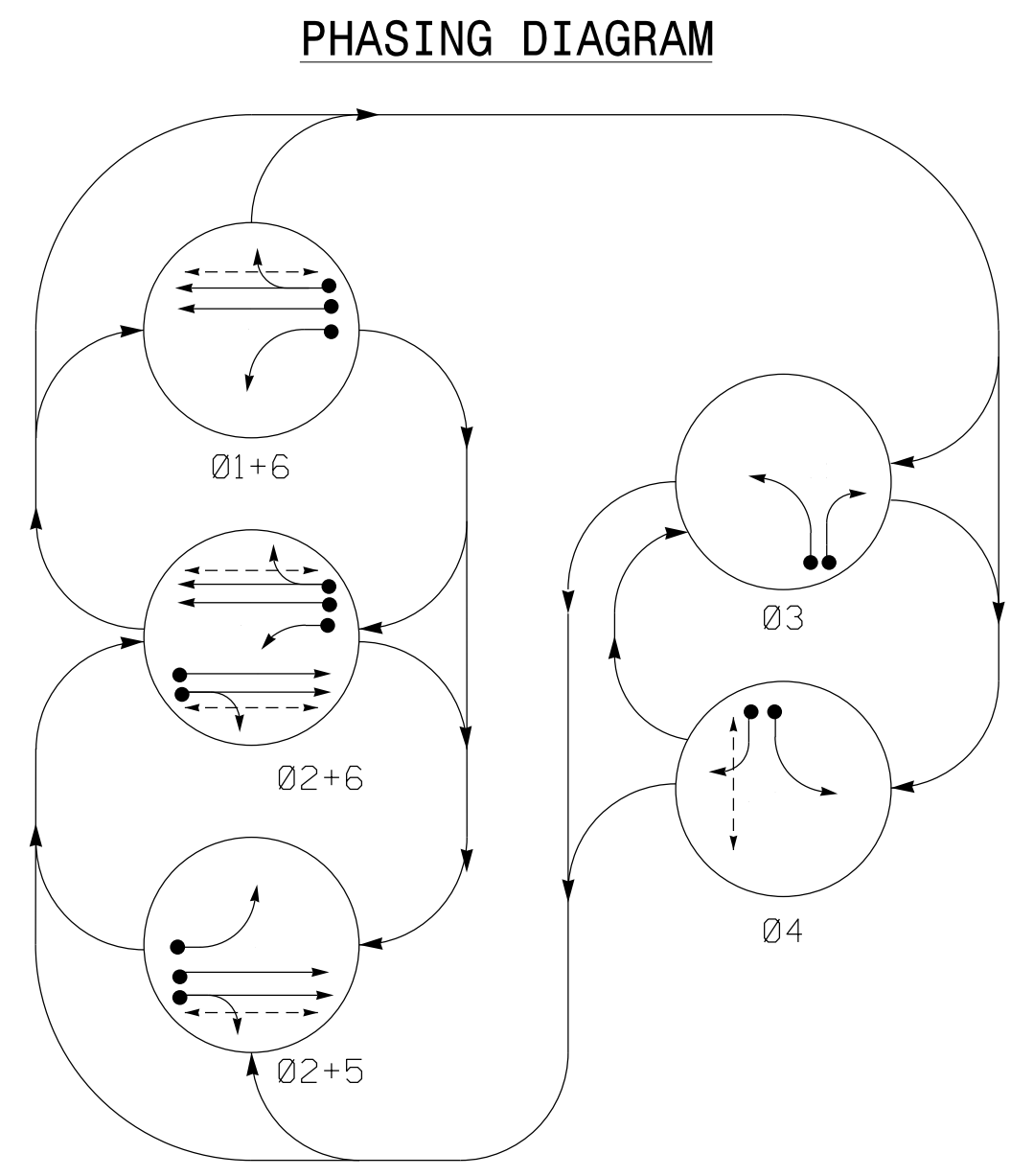
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 9/20/2018

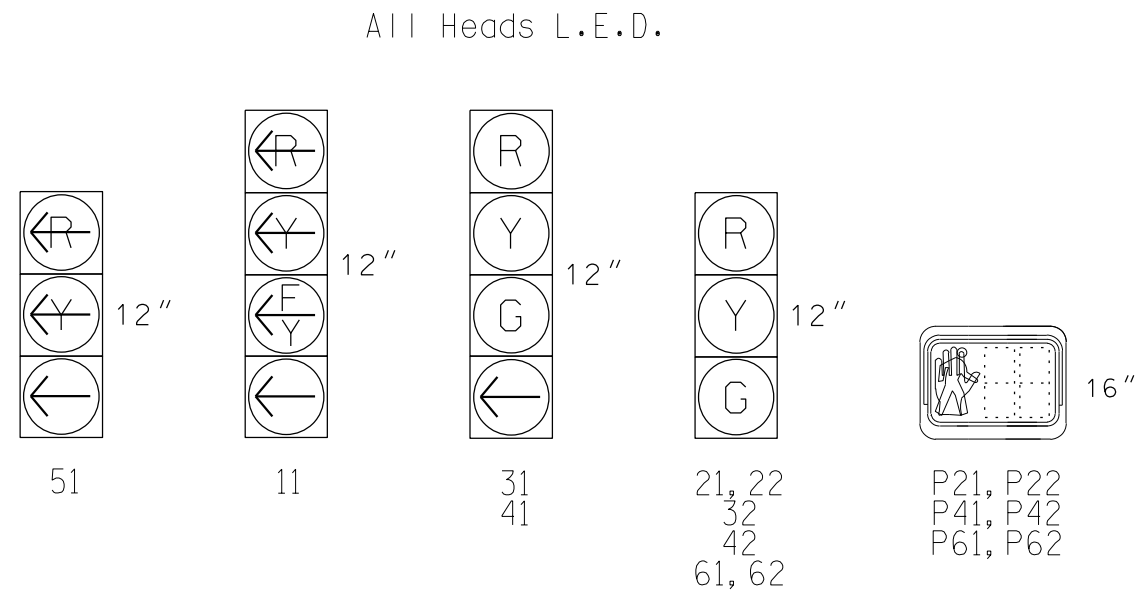
SIG. INVENTORY NO. 01-0481

20-SEP-2018 18:51 R:\415942\451\001\4405\gnw\17\img\01-0481-08232018e.dgn Incon AT CAR-LMCDN1-W7



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

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

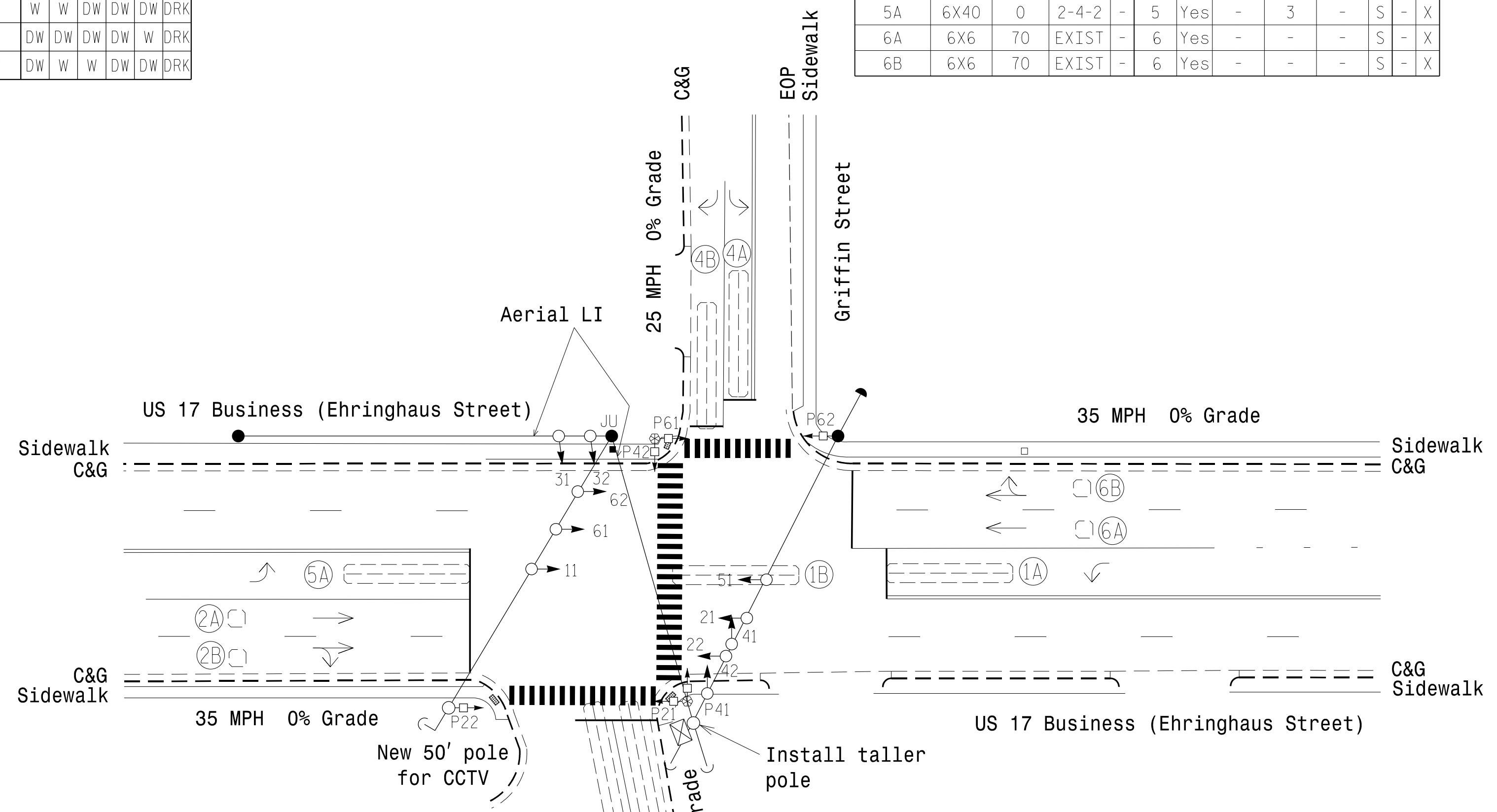


ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	X
1B	6X40	+67	2-4-2	-	6	Yes	-	-	-	S	X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	S	X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	S	X
3A	6X40	+5	2-4-2	-	3/10	Yes	-	3	-	S	X
3B	6X40	+5	2-4-2	-	3/10	Yes	-	10	-	S	X
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	S	X
4B	6X40	+3	2-4-2	-	4	Yes	-	10	-	S	X
5A	6X40	0	2-4-2	-	5	Yes	-	3	-	S	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	S	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	S	X

**5 Phase Fully Actuated (Elizabeth City Signal System)**

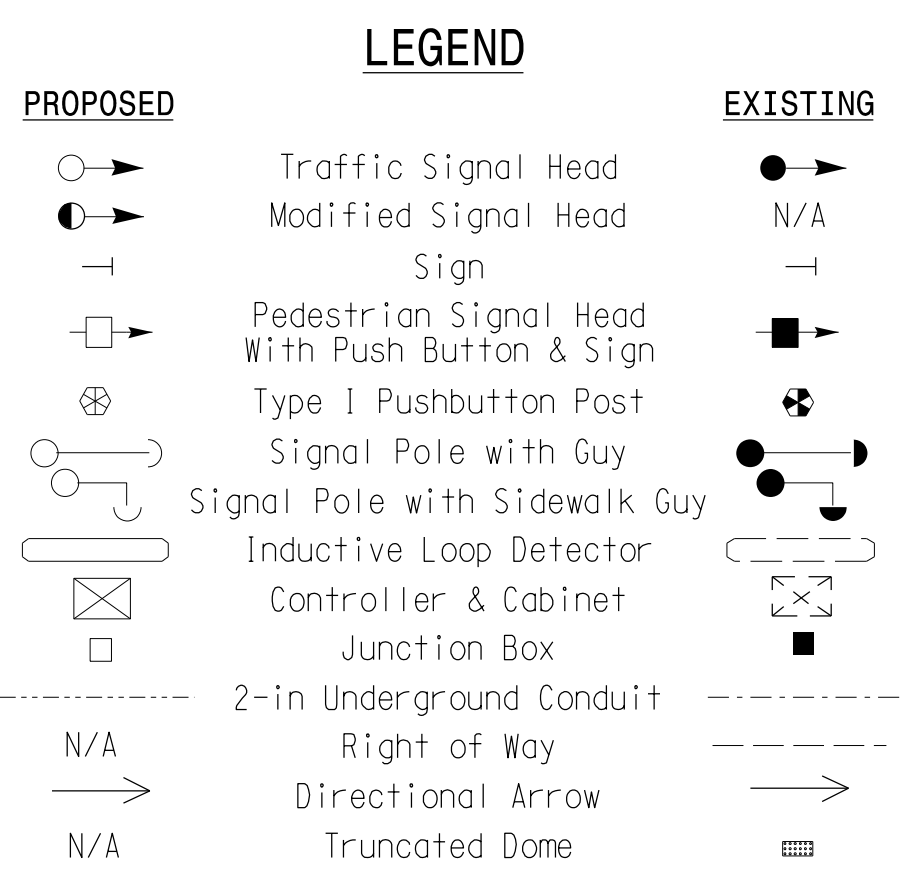
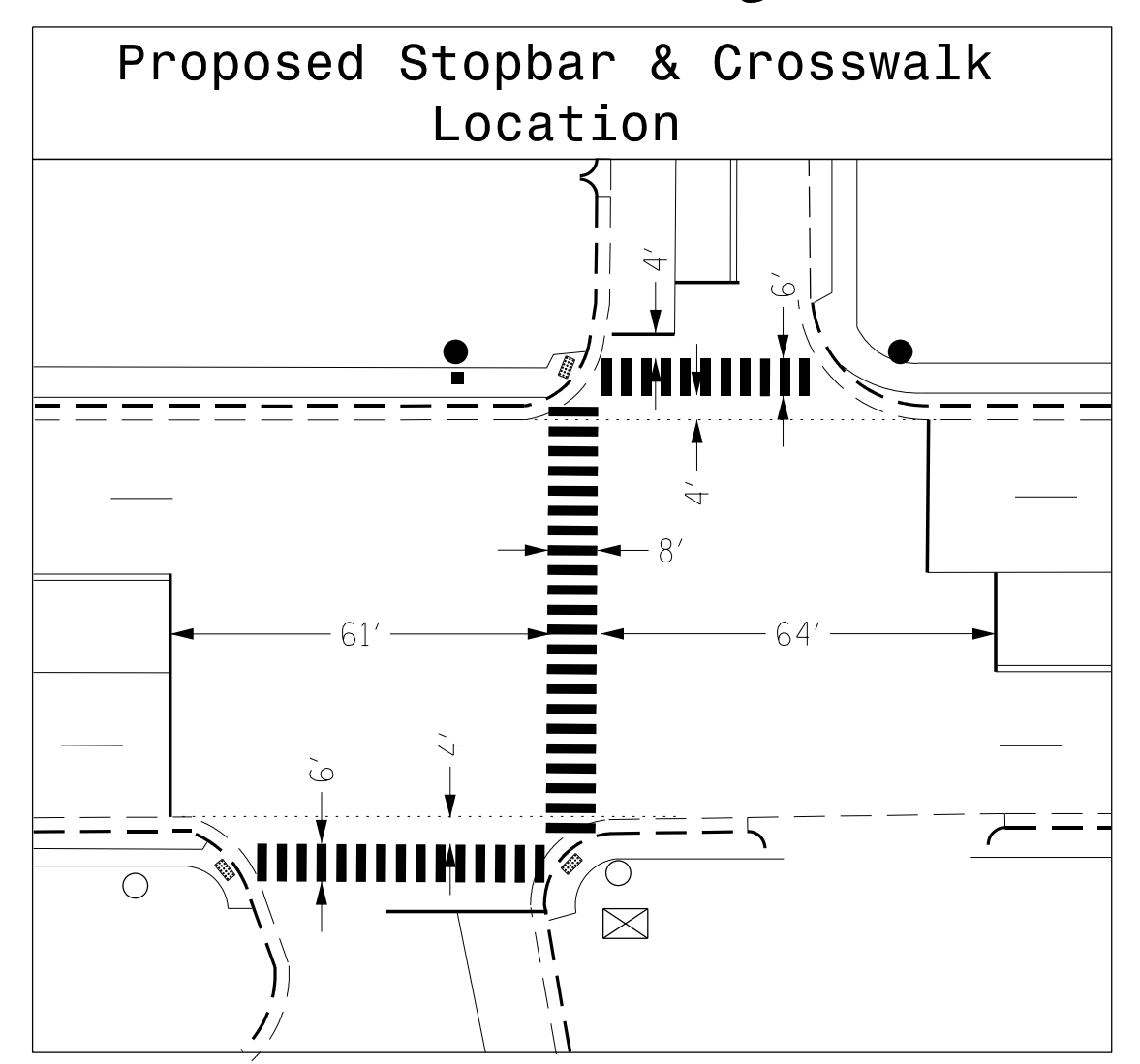
**NOTES**

- 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 Prevent to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
- 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.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Pavement markings are existing except where noted on plan.
- Repaint stopbars for approaches 2 and 6. Repaint double yellow line and lane line for phase 4 approach as shown on plan.
- Install new poles directly adjacent to existing poles and raise signal spans to obtain 17' minimum clearance.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

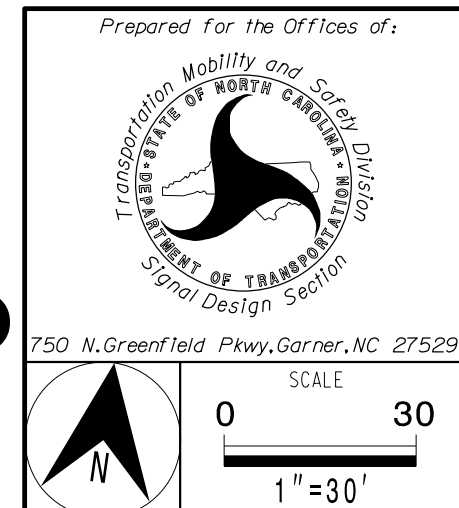


ASC/3 TIMING CHART								
FEATURE	PHASE							OLG
	1	2	3	4	5	6	**10	
Min Green *	7	10	7	7	7	10	7	0.1
Delayed Green *	-	-	-	7	-	-	-	
Walk *	-	7	-	7	-	7	-	
Ped Clear	-	11	-	18	-	8	-	
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	
Max I *	15	60	25	20	15	60	25	
Yellow	3.0	3.8	3.0	3.0	3.0	3.8	3.0	3.0
Red Clear	3.4	2.6	2.4	2.3	3.3	2.6	2.4	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	5.0	2.0	
Actuations B4 Add *	-	-	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	-	-	
Max Initial *	-	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	-	
Locking Detector	-	X	-	-	-	X	-	
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	
Dual Entry	-	-	-	-	-	-	-	
Simultaneous Gap	X	X	X	X	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.  
\*\* Phase used for timing purposes only.



**Signal Upgrade**



US 17 Bus. (Ehringhaus Street) at Griffin Street/ Post Office Entrance	
Division 1 Pasquotank County Elizabeth City	
PLAN DATE: March 2018	REVIEWED BY: AJ Davis
PREPARED BY: JA Le	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

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

DocuSigned by: <b>Lisa M. Moon</b>	8/21/2018
SIG. INVENTORY NO.	01-0519

21-AUG-2018 11:40 R:\05942\51001\5942\Signal\022516-0519.dgn DWI:TB AT CAR-DWH:TE-LTW



### ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **1. CONFIGURATION**
- From CONFIGURATION Submenu select **1. CONTROLLER SEQ**
- From CONTROLLER SEQUENCE Submenu select **1. PHASE RING SEQUENCE AND ASSIGNMENT**

Move the cursor to the SEQUENCE COMMANDS field, toggle to select "C" mode, enter phases in desired sequence.

```

CONTROLLER SEQUENCE [ 1 ]
SEQUENCE COMMANDS . HW ALT SEQ ENA. NO
01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC- C C C C C C C C C C C C C C C C
R1- . 2 1 3 4 10 . . . . .
R2- 5 6 . . . . .
R3- . . . . .
R4- . . . . .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=CURRENT GROUP RING BARRIER
C=COMPATIBILITY PROGRAMMED BY MAIN MENU 1-1-2

```

END SEQUENCE AND ASSIGNMENT PROGRAMMING

- From Main Menu select **1. CONFIGURATION**
- From CONFIGURATION Submenu select **1. CONTROLLER SEQ**
- From CONTROLLER SEQUENCE Submenu select **2. PHASE COMPATIBILITY**

Program phase compatibility as shown below to ensure phases 1 and 5 cannot run concurrently.

```

PHASE COMPATIBILITY
6 5 4 3 2 1 0 9 8 7 6 5 4 3 2
1 . . . . . X . . . . .
2 . . . . . X X . . . . .
3 . . . . . . . . . . .
4 . . . . . . . . . . .
5 . . . . . . . . . . .
6 . . . . . . . . . . .
7 . . . . . . . . . . .
8 . . . . . . . . . . .
9 . . . . . . . . . . .
10 . . . . . . . . . . .
11 . . . . . . . . . . .
12 . . . . . . . . . . .
13 X X . . . . .
14 X X . . . . .
15 . . . . . . . . . . .

```

END COMPATIBILITY PROGRAMMING

### 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
TMG/BKUP 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
1 . . . . .
2 . . . . .
3 . . . . .
4 . . . . .
5 . . . . .
6 . . . . B . . . . .
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 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 as OLG, program LD SWITCH 3 as OVLP '7' TYPE '0' as shown below.

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

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

NOTICE OVLP 5 ASSIGNED TO LD SWITCH 3

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

(program controller as shown)

- From Main Menu select **1. CONFIGURATION**
- From DETECTOR Submenu select **2. PHASES IN USE/PED**

PHASES IN USE / EXCLUSIVE PED	PHASE	1	2	3	4	5	6	7	8
IN USE.....		X	X	X	X	X	X	.	.
EXCLUSIVE PED		.	.	.	.	.	.	.	.

PHASES IN USE / EXCLUSIVE PED	PHASE	9	10	11	12	13	14	15	16
IN USE.....		.	X	.	.	.	.	.	.
EXCLUSIVE PED		.	.	.	.	.	.	.	.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0519 DESIGNED: MARCH 2018 SEALED: 08/21/2018 REVISED: N/A

Electrical Detail - Sheet 2 of 4

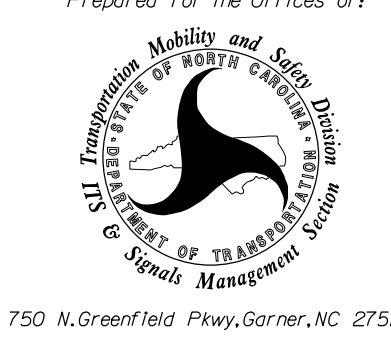
Electrical AND PROGRAMMING DETAILS FOR: US 17 Bus. (Ehringhaus Street) at Griffin Street/ Post Office Entrance

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS INIT. DATE



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

PROFESSIONAL ENGINEER

SEAL 022516

DATE 9/20/2018

SIG. INVENTORY NO. 01-0519

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## ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

*(program controller as shown)*

- From Main Menu select
- From DETECTOR Submenu select

```

VEH DETECTOR [ 3]  VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... X ECPI LOG.....  NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
      3 3   . . X . . . . . X . . . . .
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
  
```



```

VEH DETECTOR [22] VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... X ECPI LOG.....  NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
      22 3   . . X . . . . . X . . . . .
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
  
```

## ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

*(program controller as shown)*

- From Main Menu select
- From CONTROLLER Submenu select

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 6X

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```

TMG VEH OVLP... [G] TYPE: ..... [NORMAL]
PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . . . . X . . . . .
LAG GRN 0.1 YEL 3.2 RED 2.8
  
```

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0519  
 DESIGNED: MARCH 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

20-SEP-2018 14:51 R:\415942\451001\451001\451001\451001\451001.dgn AT: CAR - LMD\DMH-W

Electrical Detail - Sheet 3 of 4

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

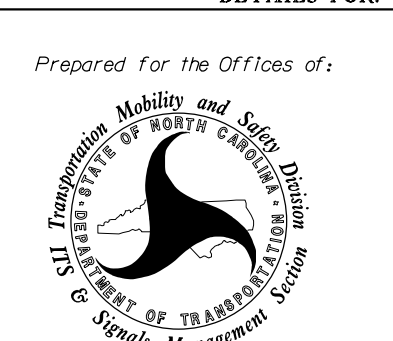
Plans Prepared By:



DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27518  
NC License No. C-2213 (019) 650-1038

ELECTRICAL AND PROGRAMMING  
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Bus. (Ehringhaus Street)  
at  
Griffin Street/  
Post Office Entrance

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

PREPARED BY: DJ White REVIEWED BY: LM Moon

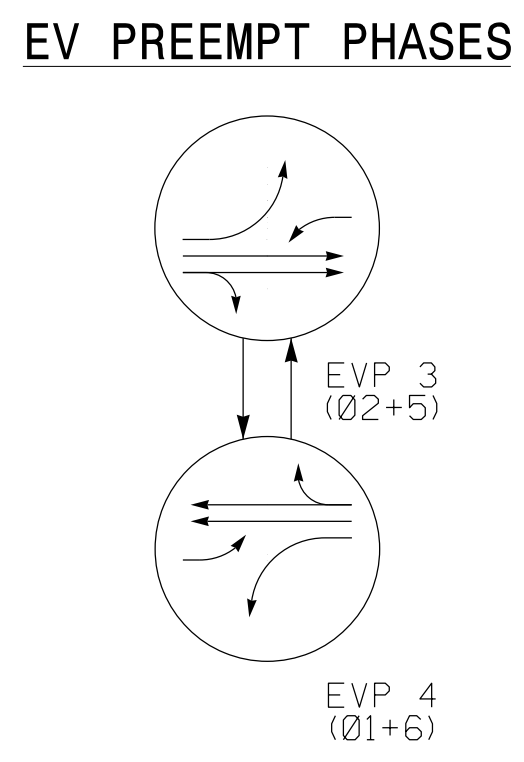
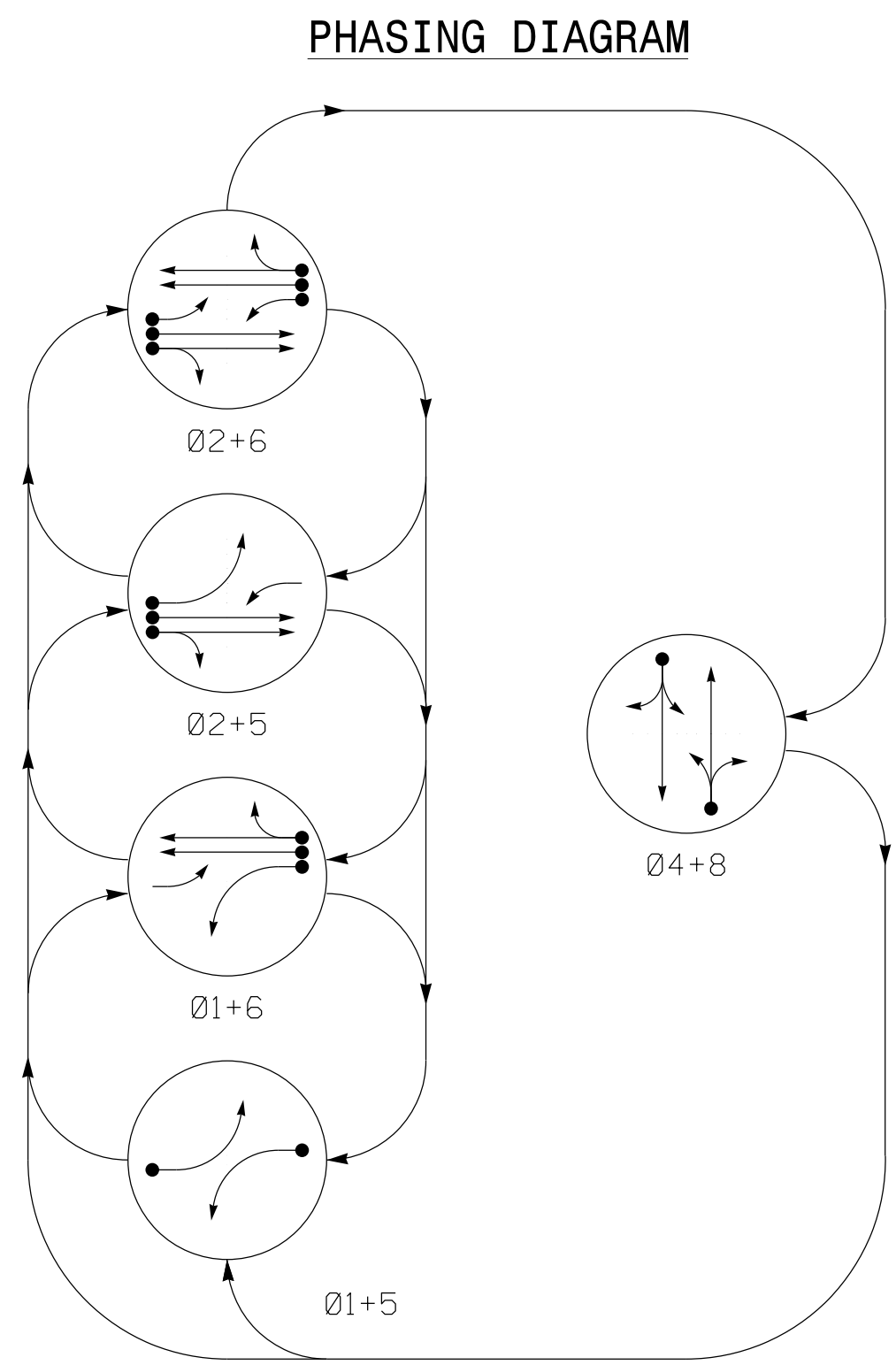
REVISIONS	INIT.	DATE

SEAL

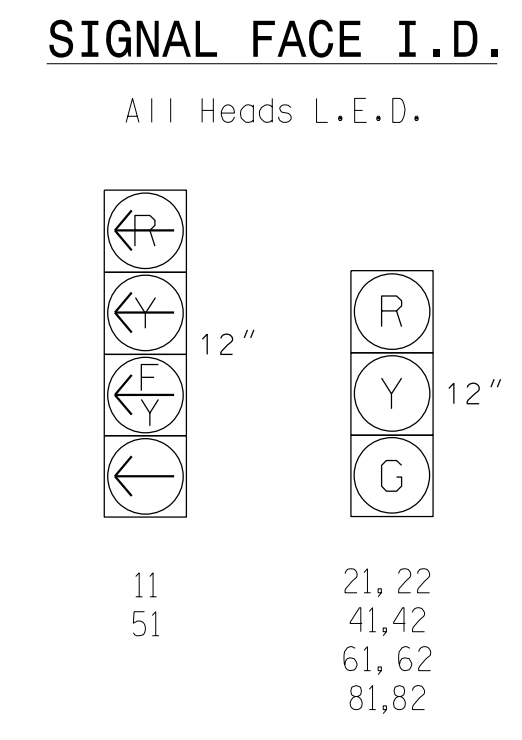


DocuSigned by:  
**Lisa M. Moon** 9/20/2018

SIG. INVENTORY NO. 01-0519



SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	04+8	EVP 3	EVP 4	WALK
11								
21, 22	R	R	G	G	R	G	R	Y
41, 42	R	R	R	R	G	R	R	R
51								
61, 62	R	G	R	G	R	R	G	Y
81, 82	R	R	R	R	G	R	R	R

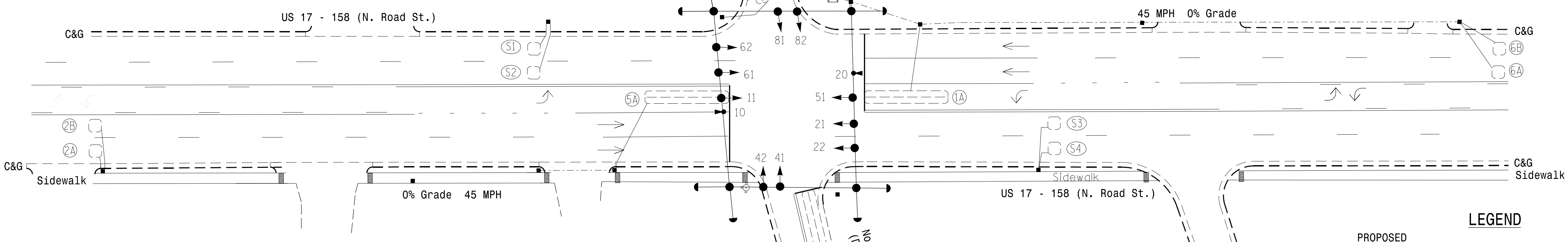
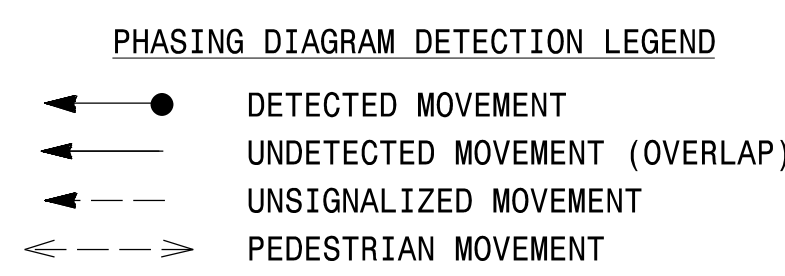


ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	- X
2A	6X6	300	EXIST	-	2	Yes	-	-	X	N	- X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	- X
4A	6X40	+5	2-4-2	-	4	Yes	-	5	-	S	- X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	- X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	- X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	- X
8A	6X40	+5	2-4-2	-	8	Yes	-	5	-	S	- X
S1	6X6	+155	EXIST	-	-	-	-	-	-	N	X X
S2	6X6	+155	EXIST	-	-	-	-	-	-	N	X X
S3	6X6	+152	EXIST	-	-	-	-	-	-	N	X X
S4	6X6	+152	EXIST	-	-	-	-	-	-	N	X X

5 Phase Fully Actuated w/ EV Preemption (Elizabeth City Signal System)

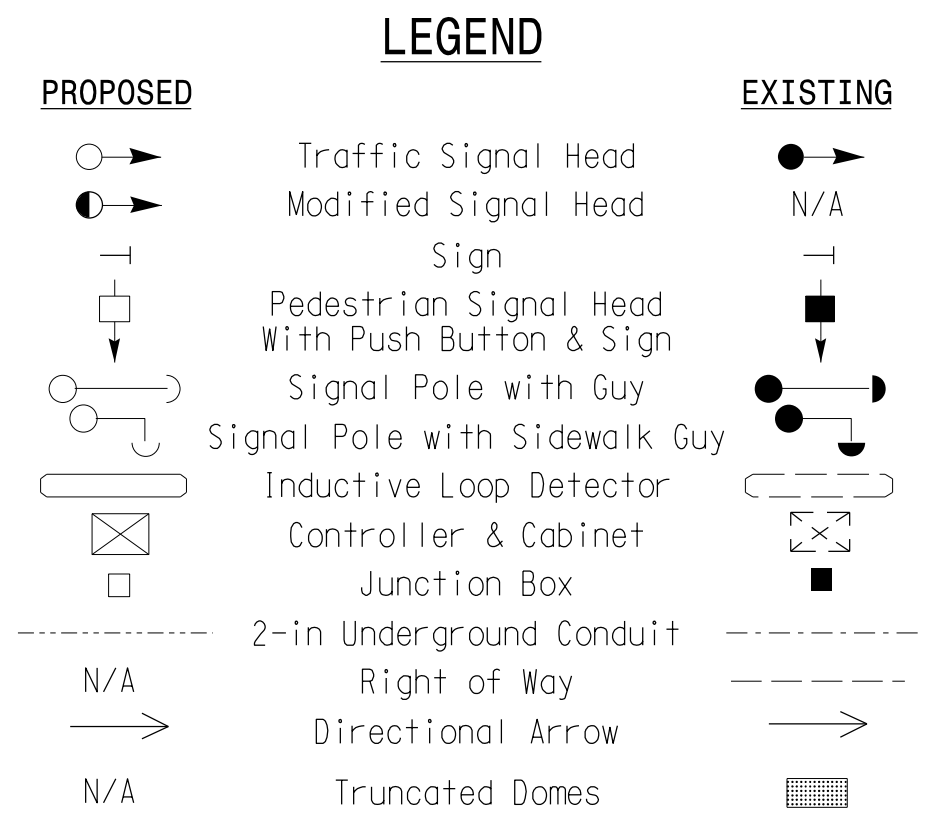
NOTES

- 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.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Optical detector 10 calls EVP 3; Optical detector 20 calls EVP 4.
- Relocate existing optical detection equipment from existing cabinet to new cabinet.
- Raise signal spans with heads 41 & 42 and heads 81 & 82 to obtain 17' minimum clearance.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



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 *	2.0	6.0	2.0	2.0	6.0	2.0	
Max 1 *	15	90	30	15	90	30	
Yellow	3.0	4.5	3.2	3.0	4.5	3.1	
Red Clear	2.3	1.0	2.2	1.8	1.0	2.2	
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	

ASC/3 EV PREEMPT		
FUNCTION	PRE 3	PRE 4
Exit Phase(s)	2, 6	2, 6
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	N	N
Terminate Phases	N	N
Entrance Walk	255*	255*
Entrance Ped Clear	255*	255*
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	12	12
Preempt Input Extension Time	2	2
Preempt Max Time	120	120
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*



\* 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.

\* Allows normal phase times to be used.

Signal Upgrade

US 17-158 (N. Road Street) at Medical Drive/Northeastern Professional Center

Division 1 Pasquotank County Elizabeth City

PLAN DATE: February 2018 REVIEWED BY: AJ Davis

PREPARED BY: JA Le REVIEWED BY: LM Moon

REVISIONS: INIT. DATE

SCALE: 1"=30'

DRMP 750 N. Greenfield Pkwy, Garner, NC 27529

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 USA M. MOON

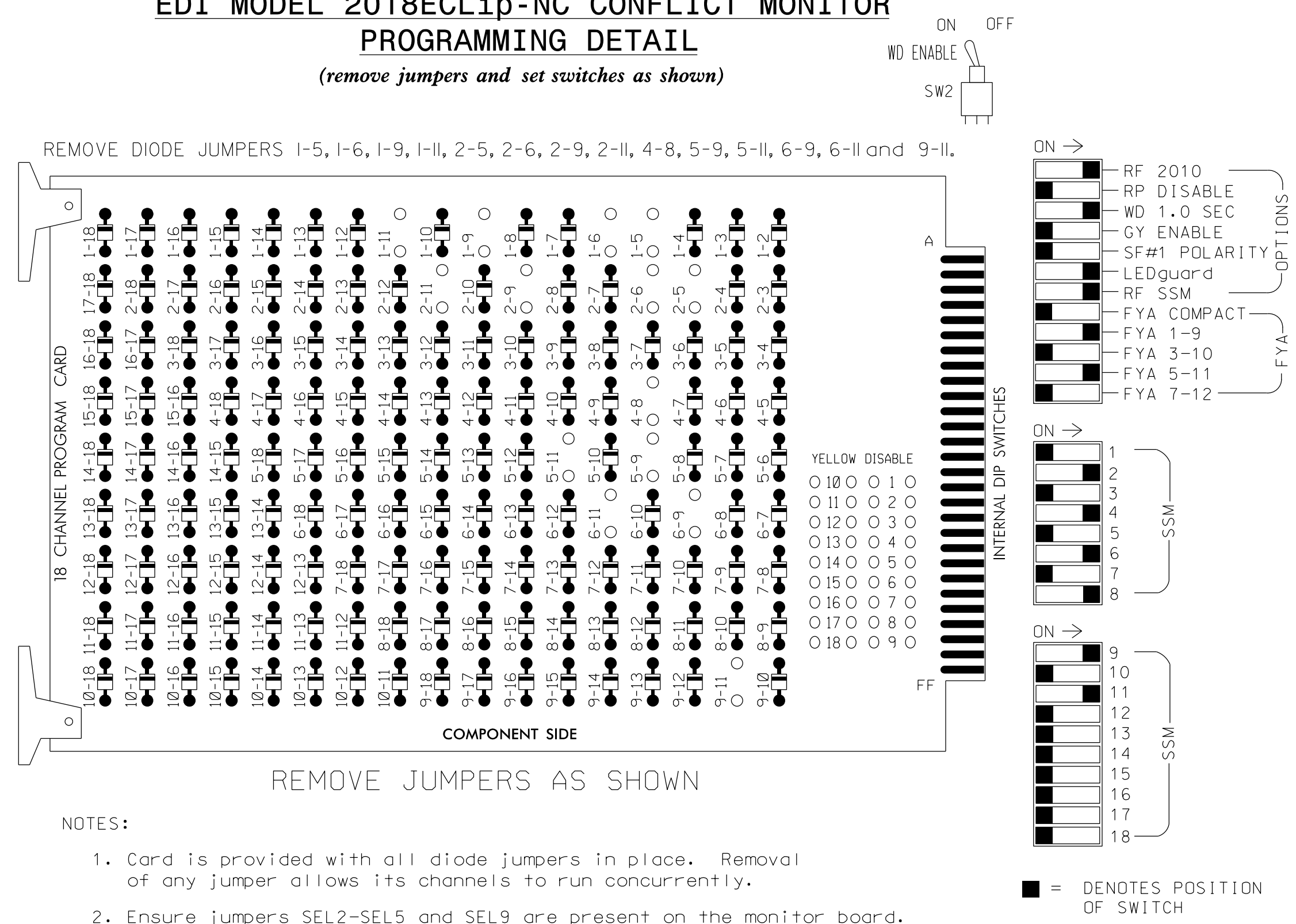
DocuSigned by: Lisa M. Moon 9/20/2018

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### 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 Elizabeth City Signal System.

### EQUIPMENT INFORMATION

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

\* See overlap programming detail on sheet 2

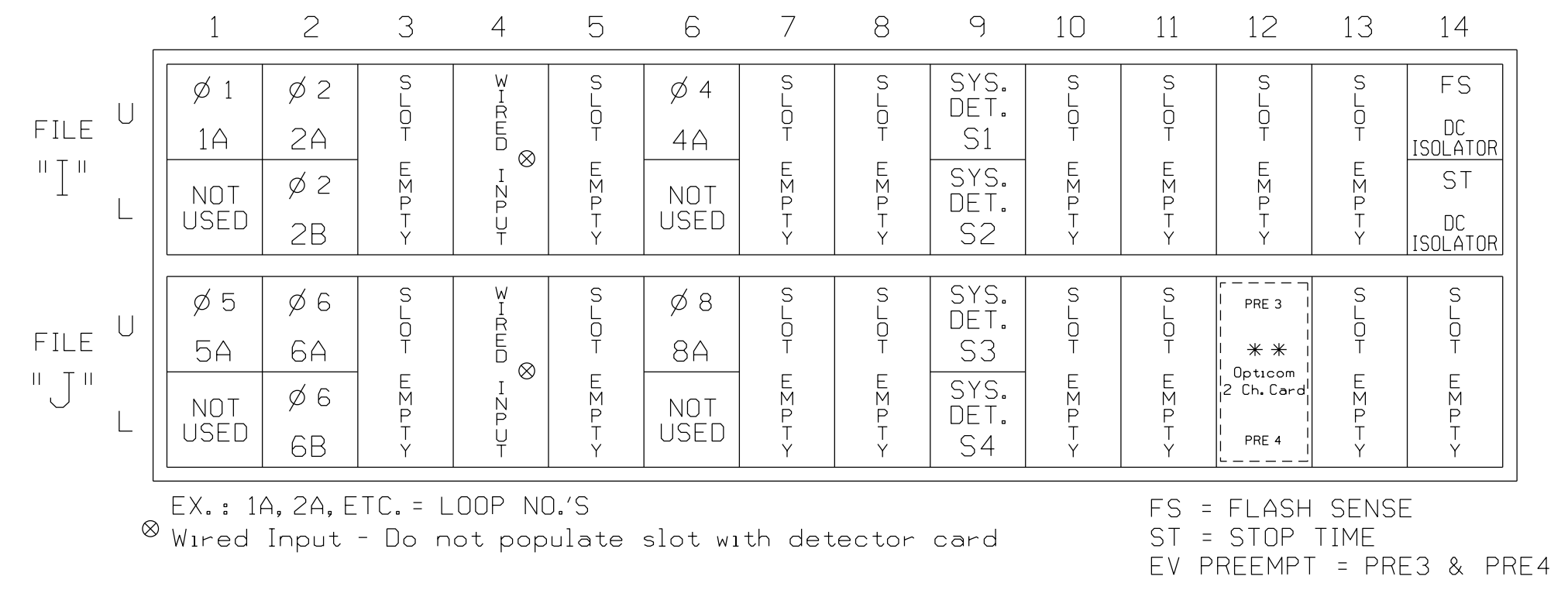
### SIGNAL HEAD HOOK-UP CHART

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



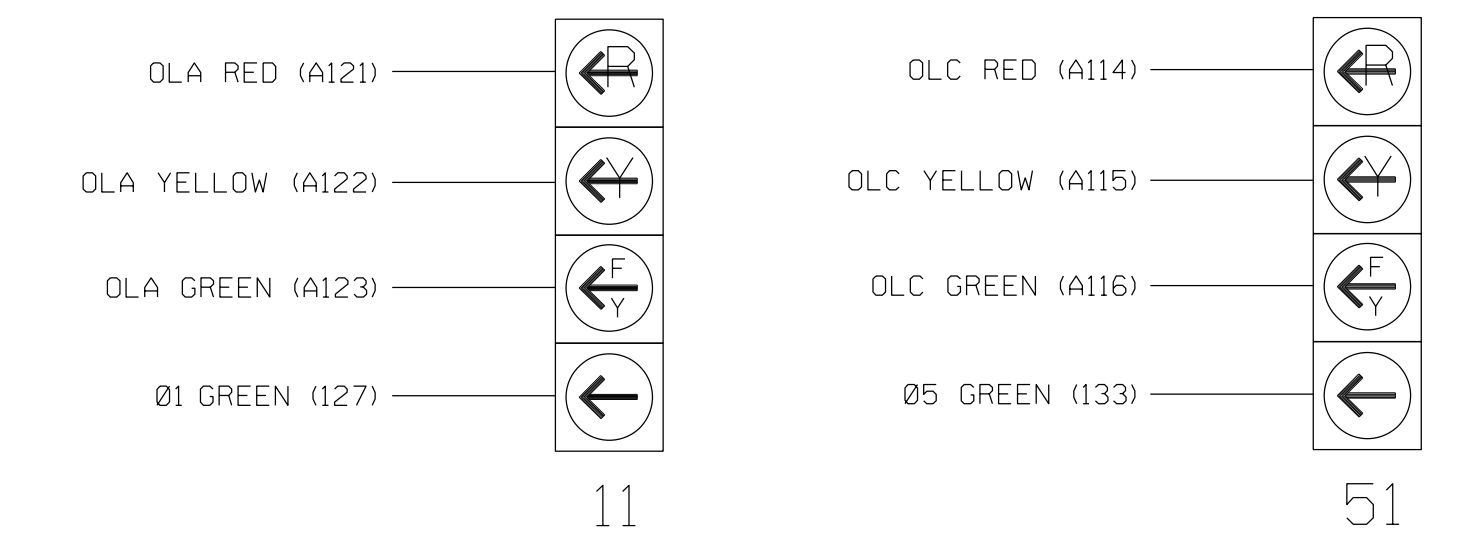
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
	2A	TB2-5,6	I2U	39	2	YES			X	N
	2B	TB2-7,8	I2L	43	12	2 YES			X	N
4A	TB4-9,10	I6U	41	4	4 YES		5		S	
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5 YES			15		S
	-	I4U	47	22	2 YES			3		G
	6A	TB3-5,6	J2U	40	6	6 YES			X	N
	6B	TB3-7,8	J2L	44	16	6 YES			X	N
* S3	TB7-9,10	J9U	59	15	SYS	NO				N
* S4	TB7-11,12	J9L	61	17	SYS	NO				N

- \* System detector only. Remove any assigned vehicle phase.  
<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### FYA SIGNAL WIRING DETAIL

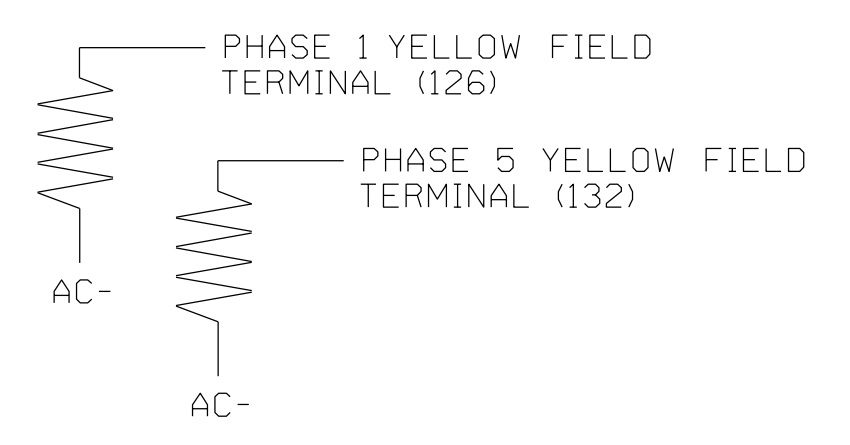
(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

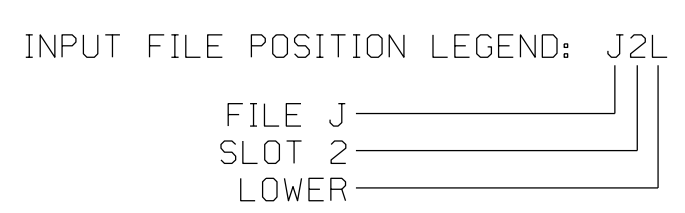
(install resistors as shown)

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



### \*\* OPTICAL PREEMPTION SYSTEM

- Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the Signal Design Plans.
- Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specification of the type 2070 controller.



Electrical Detail - Sheet 1 of 2

Electrical and Programming Details For: **US 17-158 (N. Road Street) at Medical Drive / Northeastern Professional Center**

Division 1 Pasquotank County Elizabeth City

Plan Date: February 2018 Reviewed By: AJ Davis

Prepared By: DJ White Reviewed By: LM Moon

REVISIONS INIT. DATE

DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27519 NC License No. C-2215 (919) 650-1038

Seal: Lisa M. Moon, Professional Engineer, No. 022516, State of North Carolina

DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0540

## ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL

*(program controller as shown)*

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

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

```

PREEMPT PLAN [ 3]  ENABLE...YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH . X . . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 .F1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP_FUNC . . . . .
    
```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1I25.5I25.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5I25.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5I25.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0
    
```

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #4.

```

PREEMPT PLAN [ 4]  ENABLE...YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . .
TRKCLR O . . . . .
ENA TRL . . . . .
DWEL VEH X . . . . X . . . . .
DWEL PED . . . . .
DWEL OLPF1 .F1 . . . . .
CYC VEH . . . . .
CYC PED . . . . .
CYC OLP . . . . .
EXIT PH . X . . . X . . . . .
EXIT CAL . . . . .
SP_FUNC . . . . .
    
```

```

ENABLE... YESIPMT OVRIDE..IINTERLOCK. NO
DET LOCK... XIDELAY.. 0IINHIBIT... 0
OVERIDE FL. .IDURATION 0ICLR-GRN... NO
TERM OLP. NOIPC>YEL NOITERM PH NO
PED DARK.. NOITC RESRV NOIDWELL FL OFF
LINK PMT....0IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV.. 0IFLT TYPE.HARD
FREE DUR PMTIR1 NOIR2 NOIR3 NOIR4 NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 255I 255I 1I25.5I25.5
-----MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 0I 0I 0I25.5I25.5
-----MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 12I 2.0I 120I25.5I25.5
PMT ACTIVE OUT..ON PMT ACT DWELL...NO
OTHER - PRI PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0 PED PR RETURN...OFF
PRIORITY RETURN.OFF QUEUE DELAY.... OFF
COND DELAY.....OFF
PHASES 1 2 3 4 5 6 7 8
PR RTN% 0 0 0 0 0 0 0 0
PHASES 9 10 11 12 13 14 15 16
PR RTN% 0 0 0 0 0 0 0 0
    
```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0540  
DESIGNED: FEBRUARY 2018  
SEALED: 09/20/2018  
REVISED: N/A

## 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

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

*(program controller as shown)*

1. From Main Menu select 4. PREEMPTOR/TSP
2. From PREEMPT/TSP/SCP Submenu select 2. ENABLE PREEMPT FILTERING & TSP/SCP

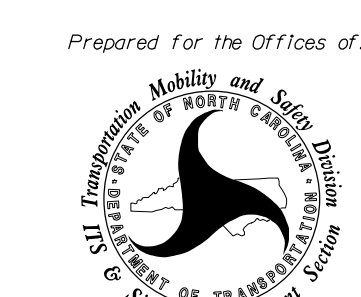
```

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

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



DRMP, Inc.  
8000 Regency Parkway, Suite 175  
Cary, NC 27519  
NC License No. C-2215 (019) 650-1038

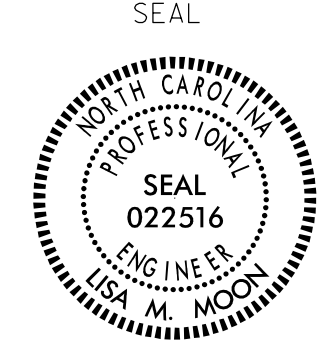
US 17-158 (N. Road Street)  
at  
Medical Drive / Northeastern  
Professional Center

Division 1 Pasquotank County Elizabeth City

PLAN DATE: February 2018	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

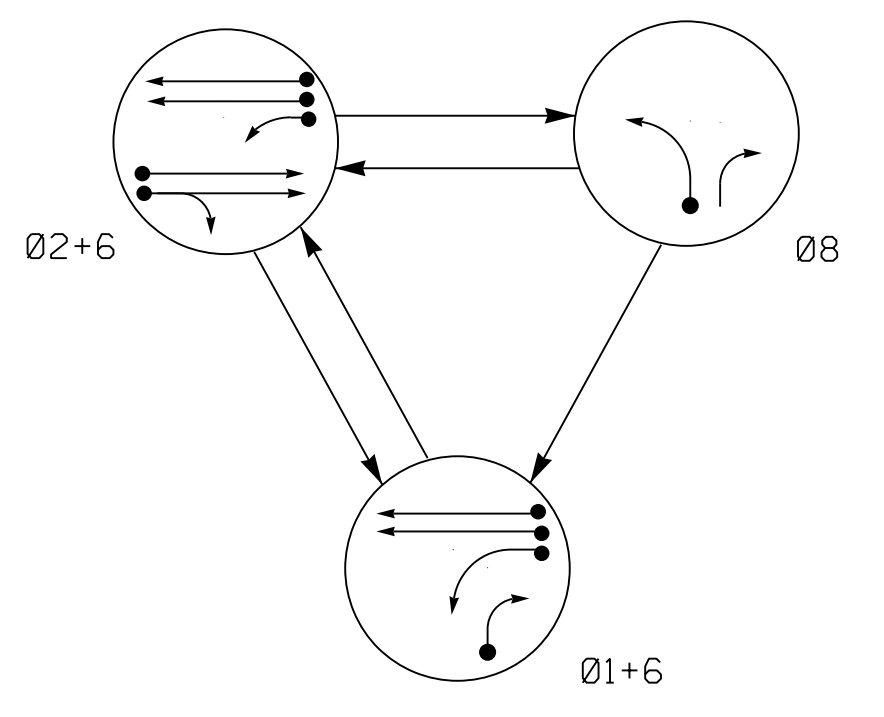
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL



DocuSigned by:  
*Lisa M. Moon* 9/20/2018  
SIC65880300421 DATE  
SIG. INVENTORY NO. 01-0540

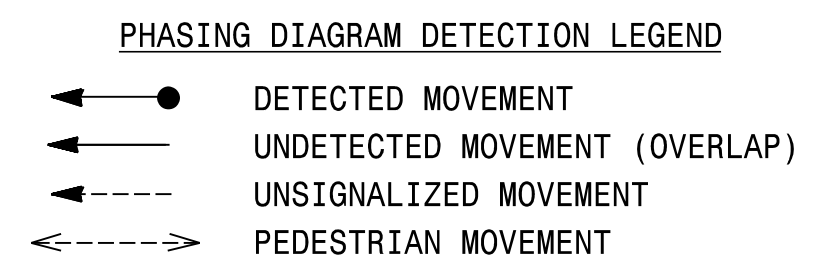
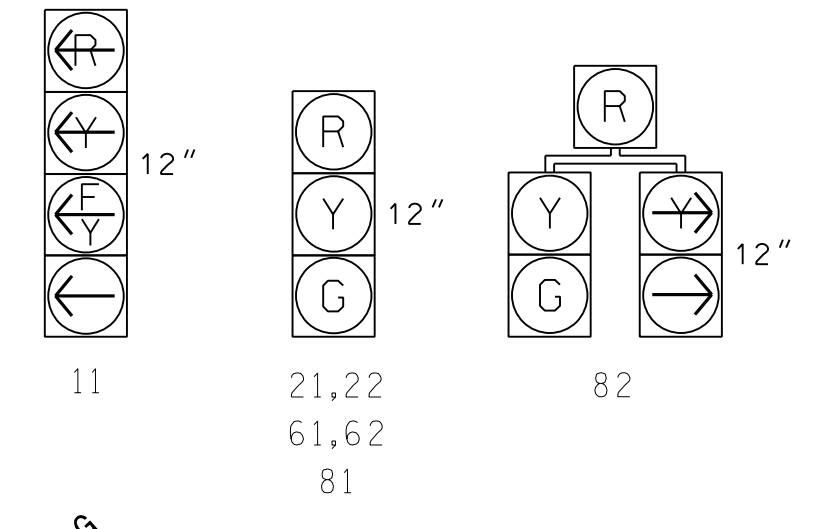
**PHASING DIAGRAM**



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

**SIGNAL FACE I.D.**

All Heads L.E.D.

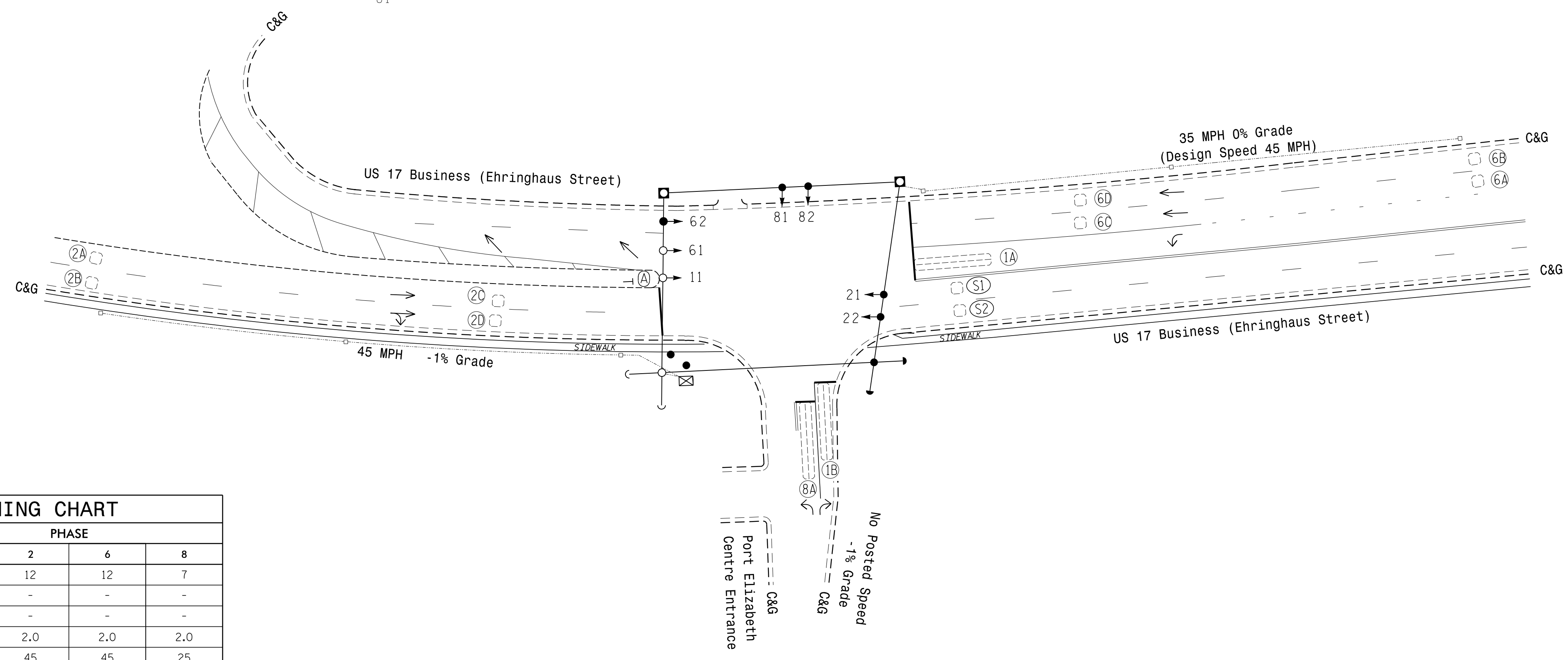


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	EXIST	-	2	Yes	1.6	-	-	S	-	X
2B	6X6	300	EXIST	-	2	Yes	1.6	-	-	S	-	X
2C	6X6	90	EXIST	-	2	Yes	-	-	-	S	-	X
2D	6X6	90	EXIST	-	2	Yes	-	-	-	S	-	X
6A	6X6	300	EXIST	-	6	Yes	1.6	-	-	S	-	X
6B	6X6	300	EXIST	-	6	Yes	1.6	-	-	S	-	X
6C	6X6	90	EXIST	-	6	Yes	-	-	-	S	-	X
6D	6X6	90	EXIST	-	6	Yes	-	-	-	S	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	3	-	S	-	X
S1	6X6	+110	EXIST	-	-	Yes	-	-	-	N	X	X
S2	6X6	+110	EXIST	-	-	Yes	-	-	-	N	X	X

**3 Phase Fully Actuated (Elizabeth City Signal System)**

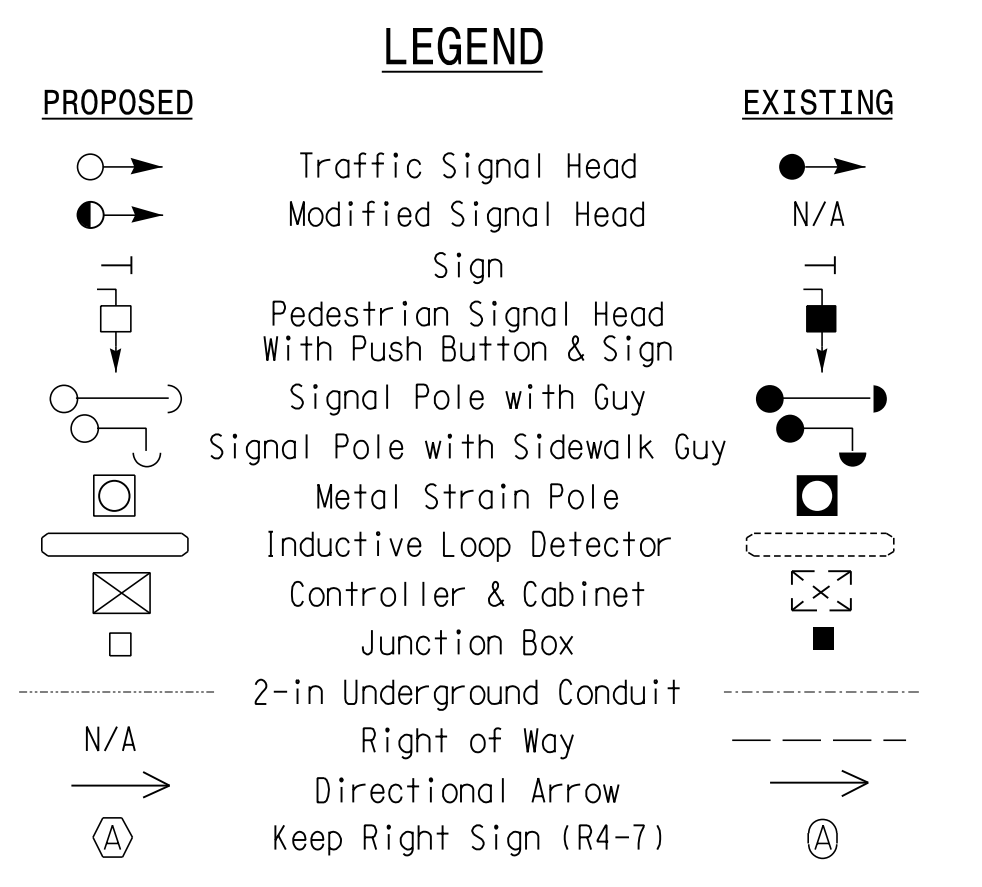
**NOTES**

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



FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	2.0	2.0	2.0
Max 1 *	15	45	45	25
Yellow	3.0	4.6	4.6	3.0
Red Clear	1.8	1.5	1.5	2.6
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	X	-
Recall Position	-	VEH. RECALL	VEH. RECALL	-
Dual Entry	-	-	-	-
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.



9/21/2018 8:41:11 AM C:\Users\jg\OneDrive\Documents\Signal Design\01-0629.dgn

**PLANS PREPARED BY :**  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

**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

**US 17 Bus. (Ehringhaus Street) at Port Elizabeth Centre**

Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: D. Sears  
 PREPARED BY: B. Holden REVIEWED BY:

REVISIONS	INIT.	DATE

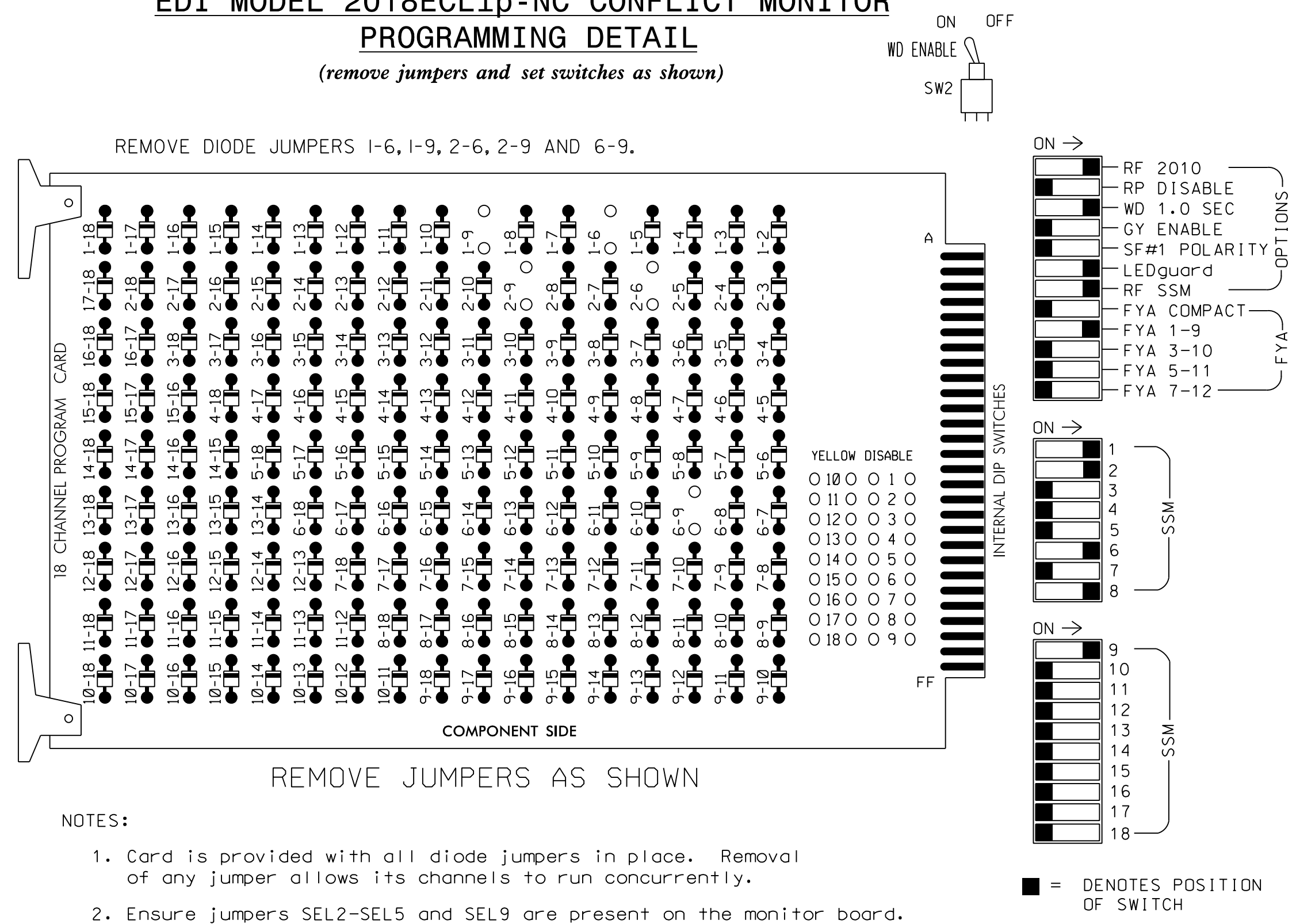
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 033753  
 C. BYRON HOLDEN

DocuSigned by:  
 C. Byron Holden  
 9/21/2018  
 DATE  
 SIG. INVENTORY NO. 01-0629

### 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 Elizabeth City 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,S8,S11,AUX S1  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* See overlap programming detail this sheet

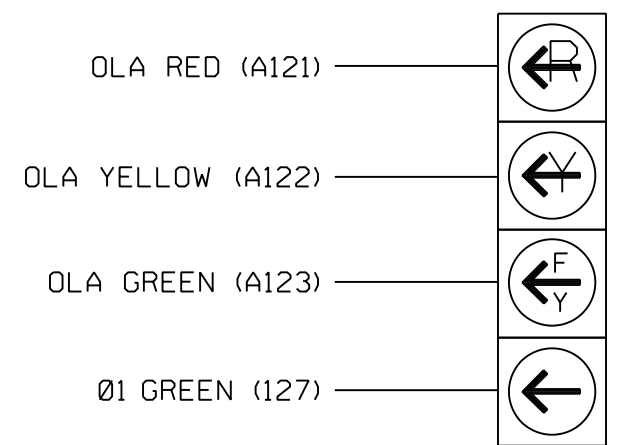
### SIGNAL HEAD HOOK-UP CHART

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

### FYA SIGNAL WIRING DETAIL

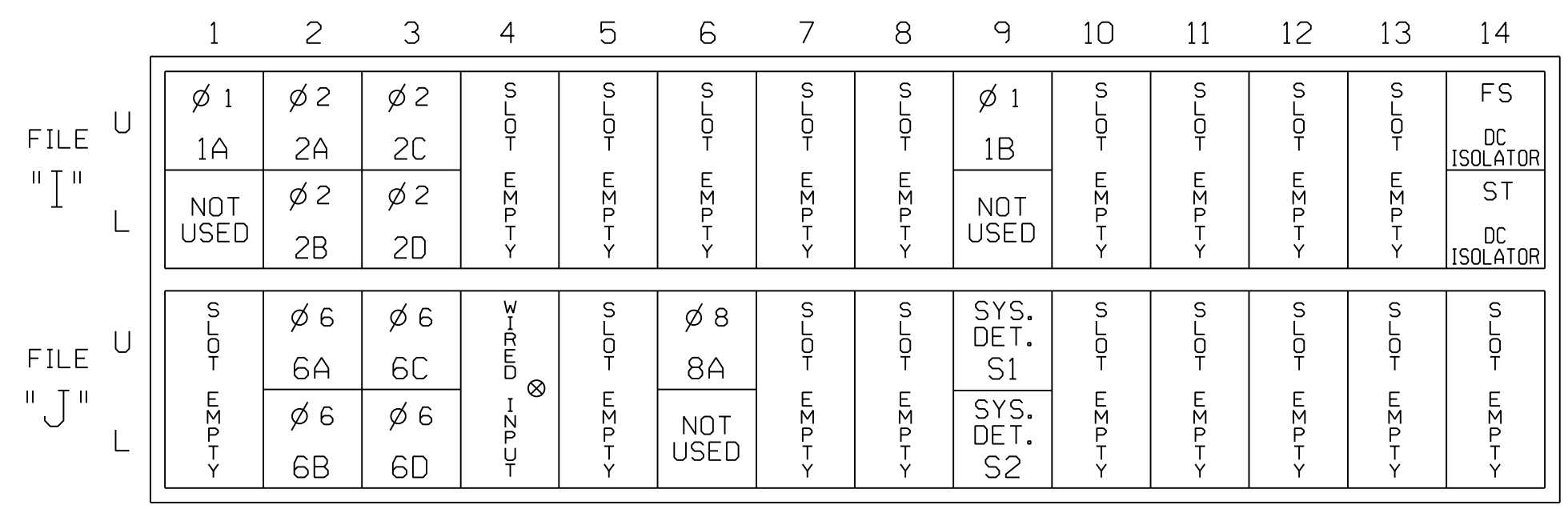
(wire signal head as shown)



11

### INPUT FILE POSITION LAYOUT

(front view)

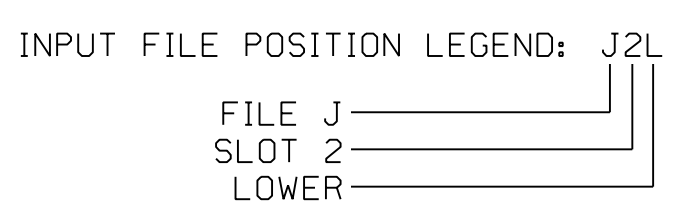


EX. : 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

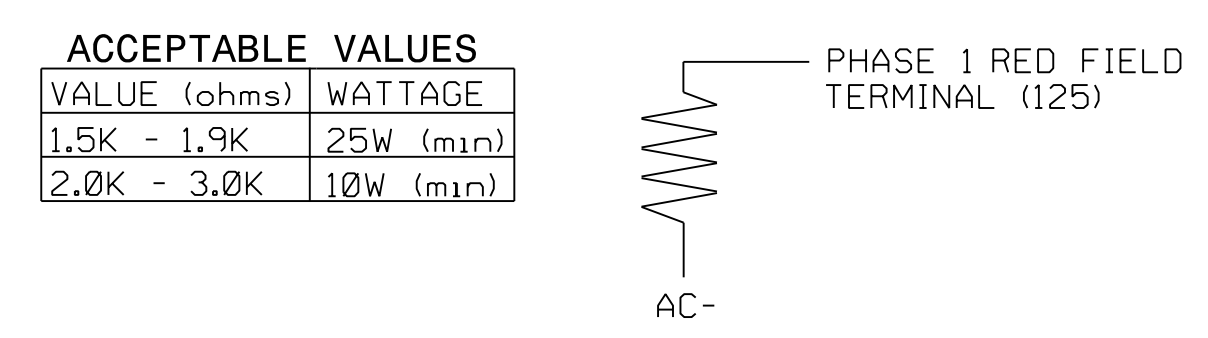
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES	1.6			S
2B	TB2-7,8	I2L	43	12	2	YES	1.6			S
2C	TB2-9,10	I3U	63	32	2	YES				S
2D	TB2-11,12	I3L	76	42	2	YES				S
1B	TB6-9,10	I9U	60	11	1	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES	1.6			S
6B	TB3-7,8	J2L	44	16	6	YES	1.6			S
6C	TB3-9,10	J3U	64	36	6	YES				S
6D	TB3-11,12	J3L	77	46	6	YES				S
8A	TB5-9,10	J6U	42	8	8	YES		3		S
* S1	TB7-9,10	J9U	59	15	SYS	YES				N
* S2	TB7-11,12	J9L	61	17	SYS	YES				N

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



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0629  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

Signal Upgrade - Electrical Detail

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:  
 NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON

US 17 Bus. (Ehringhaus Street) at Port Elizabeth Centre

Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
 PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: James O. Deaton 9/21/2018  
 DATE: 9/21/2018  
 SIG. INVENTORY NO. 01-0629

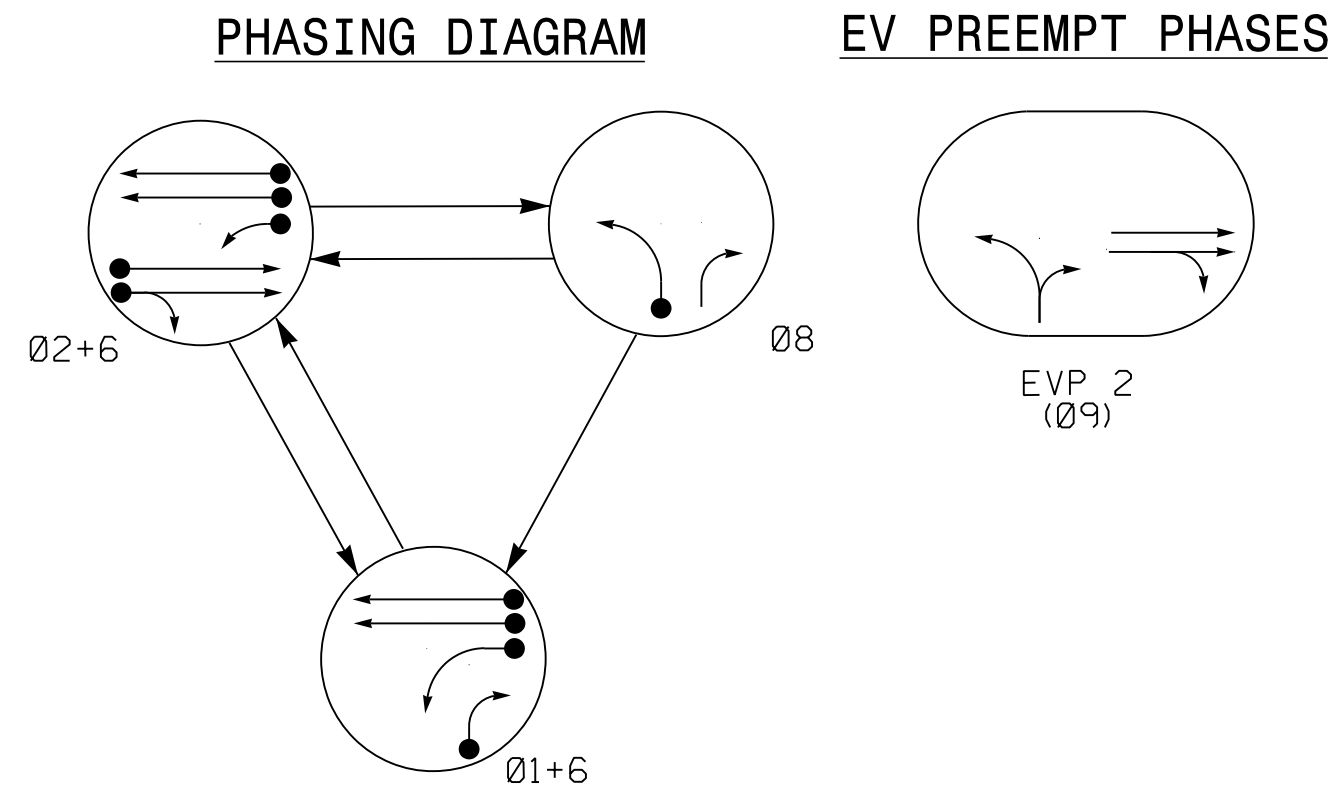


TABLE OF OPERATION showing SIGNAL FACE, PHASE, and timing details for various signal heads (11, 21,22, 23,24,25,26, 61,62, 81, 82, 91).

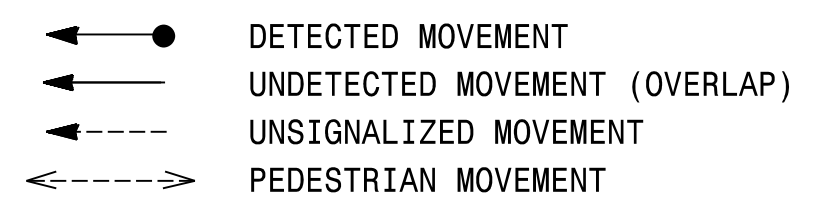
ASC/3 DETECTOR INSTALLATION CHART detailing LOOP, SIZE (FT), DISTANCE FROM STOPBAR (FT), TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, SYSTEM LOOP, and NEW CARD for loops 1A through 8A.

### 3 Phase Fully Actuated (Elizabeth City Signal System)

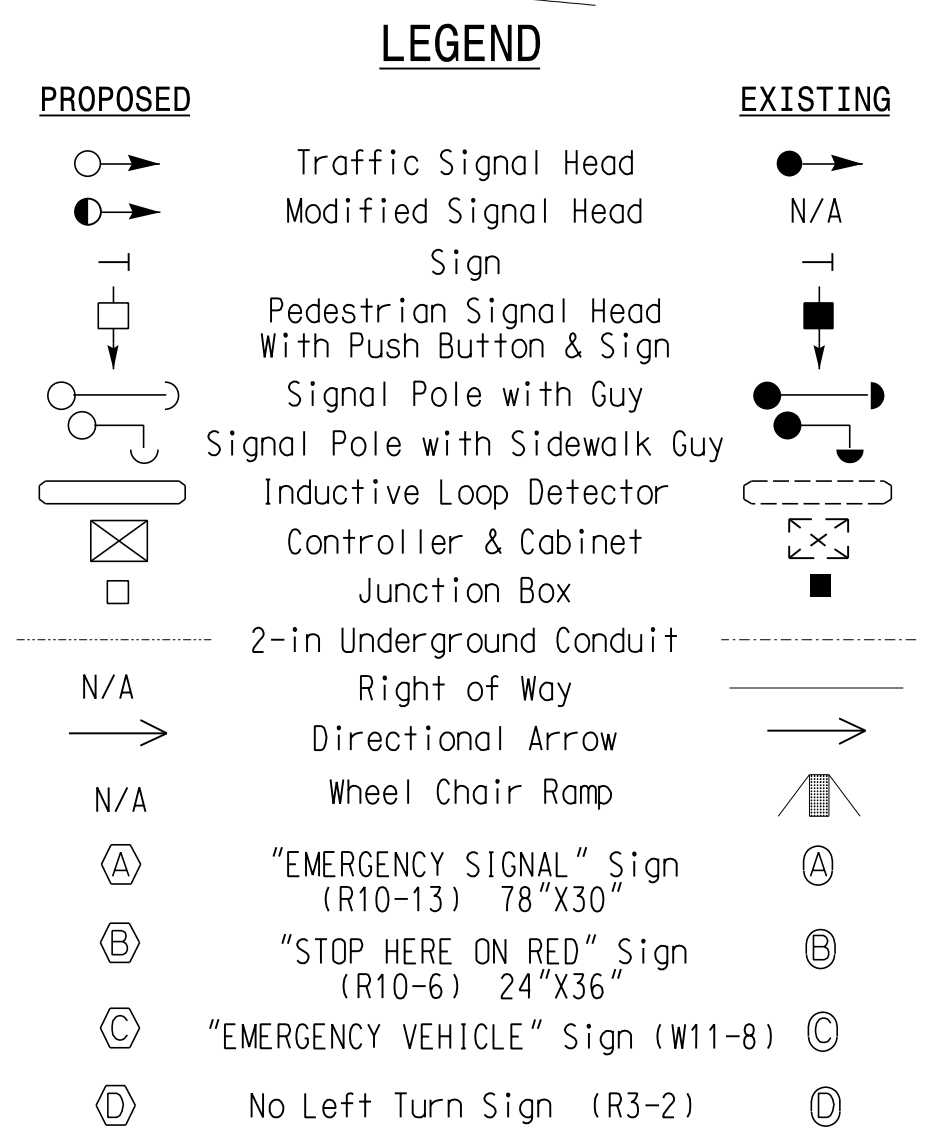
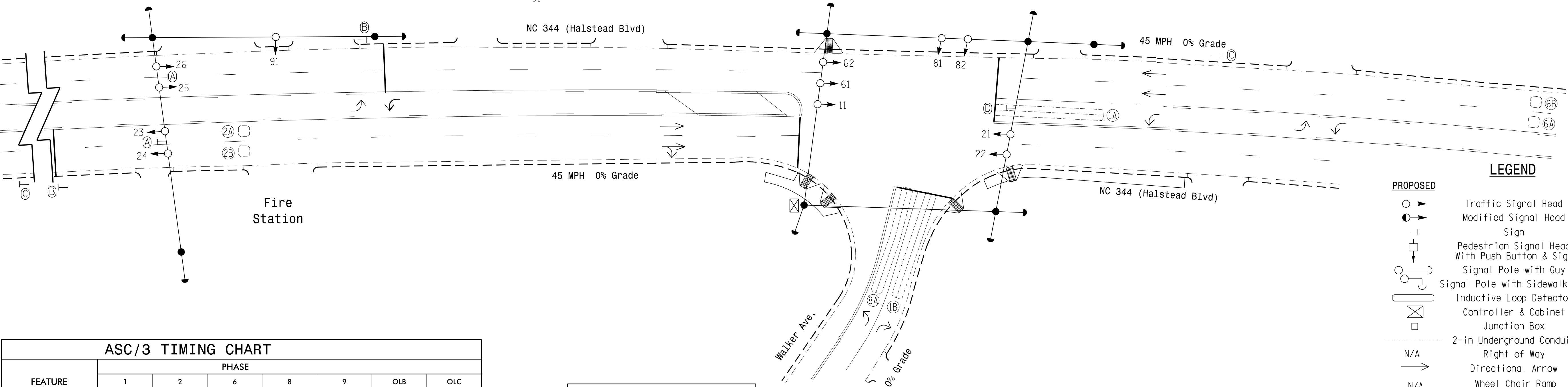
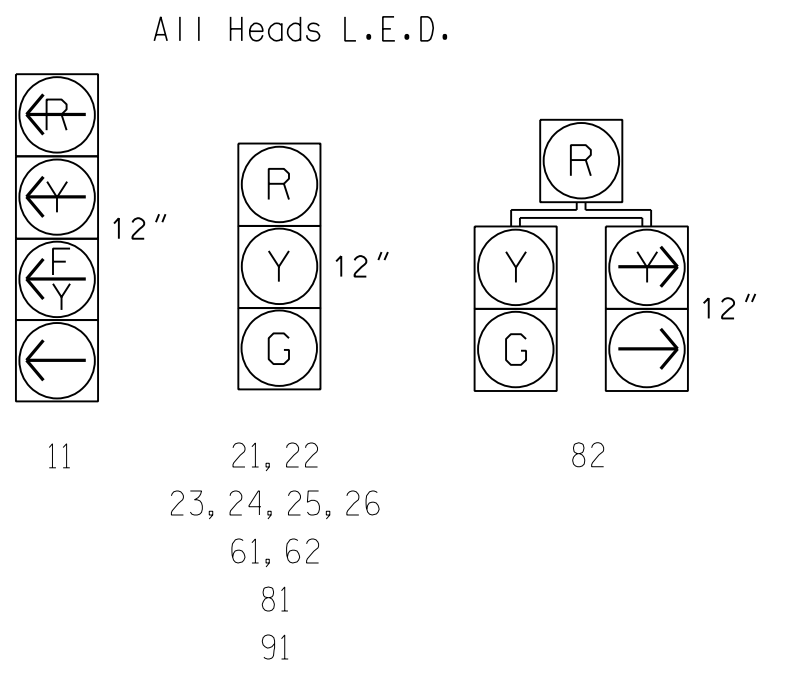
#### NOTES

- 1. Refer to "Roadway Standgrd 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. 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. Maintain emergency vehicle preemption switch in fire station.
9. The Division Traffic Engineer will determine Delay Time and Preempt Dwell Min Time for the emergency vehicle preemption timing.
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.



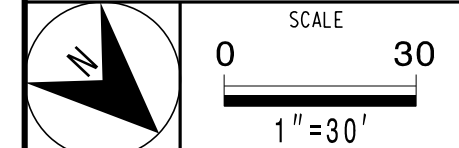
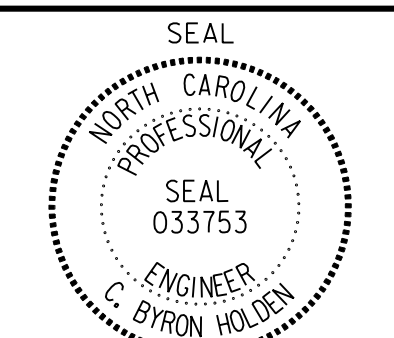
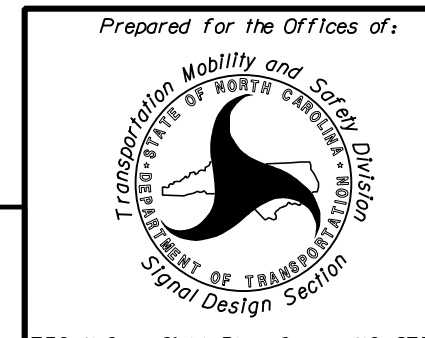
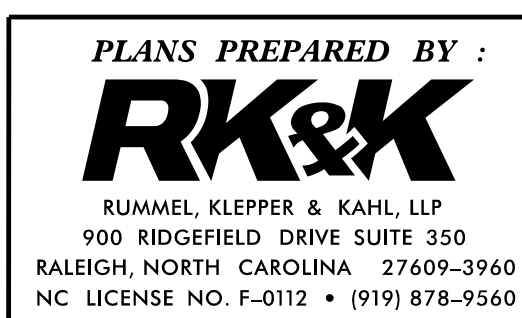
ASC/3 TIMING CHART with columns for FEATURE, PHASE (1, 2, 6, 8, 9), OLB, and OLC, detailing timing parameters like Min Green, Walk, Ped Clear, etc.

ASC/3 EV PREEMPT table detailing FUNCTION and PRE 2 values for Exit Phase(s), Preempt Override, Delay Time, etc.

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

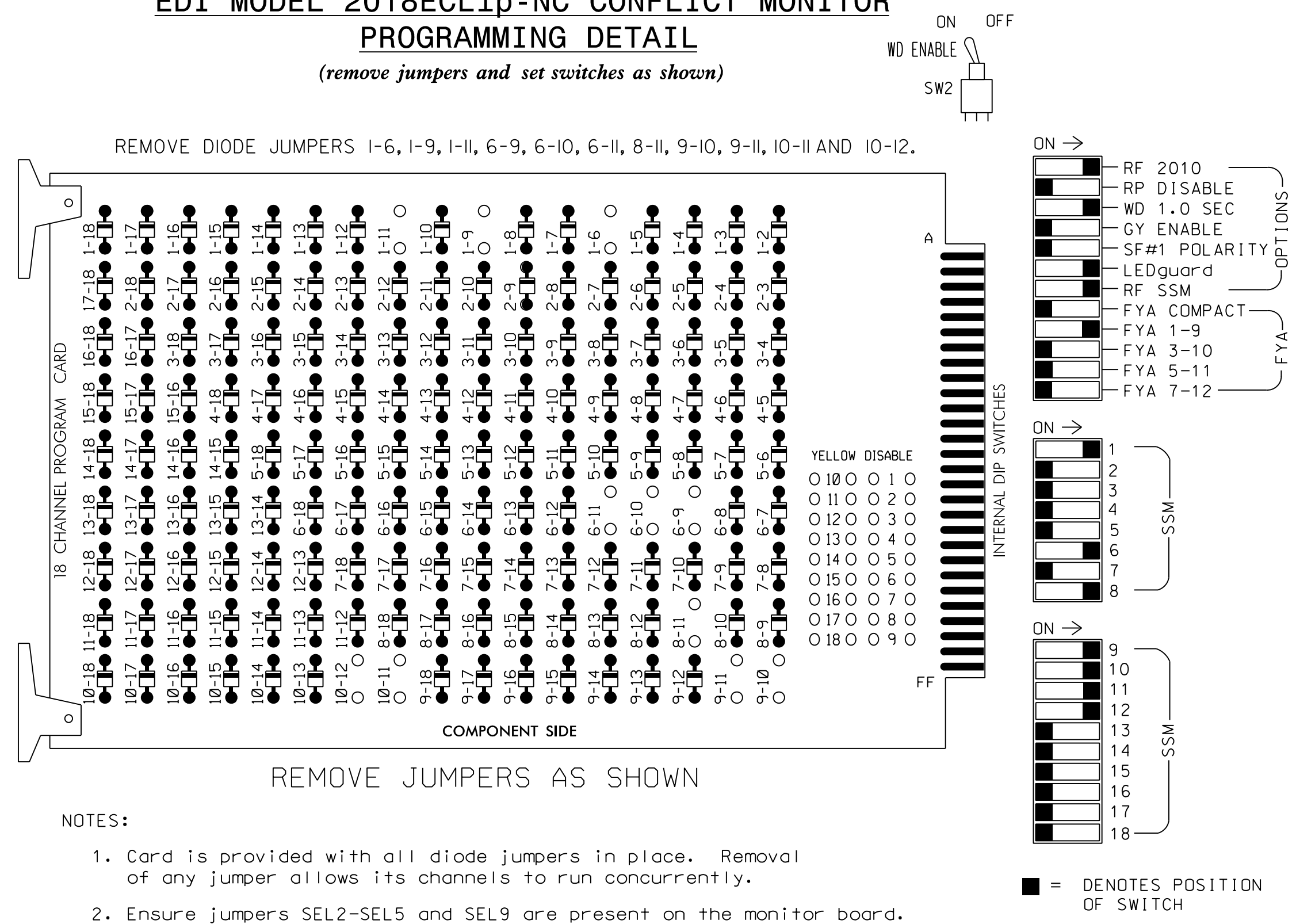
\* Allows normal phase times to be used
\*\* Program Timing on Optical Detection Unit
\*\*\* See Note 9.

Signal Upgrade project information including Plan Date (September 2018), Division 1 Pasquotank County Elizabeth City, and signatures of the Engineer (C. Byron Holden) and other project members.



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

(remove jumpers and set switches as shown)



### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Elizabeth City 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, \*\*S3, S8, S11, AUX S1, AUX S2, AUX S4, AUX S5

PHASES USED.....1, \*\*\*2, 6, 8, \*\*\*\*9  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*

\* See overlap programming detail this sheet  
 \*\* Used for Firehouse Pilot Lamp  
 \*\*\* Used for timing purposes only  
 \*\*\*\* Used for Preempt only

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	NC	FIRE PILOT LAMP	NU	NU	NU	61,62	NU	NU	81,82	NU	11	21,22	NU	23,24, 25,26	91	NU
RED	*							134			107			A124		A114	A101	
YELLOW								135			108			A125		A115	A102	
GREEN								136			109			A126		A116	A103	
RED ARROW														A121				
YELLOW ARROW		126												A122				
FLASHING YELLOW ARROW														A123				
GREEN ARROW	127	127																
PED YELLOW																		

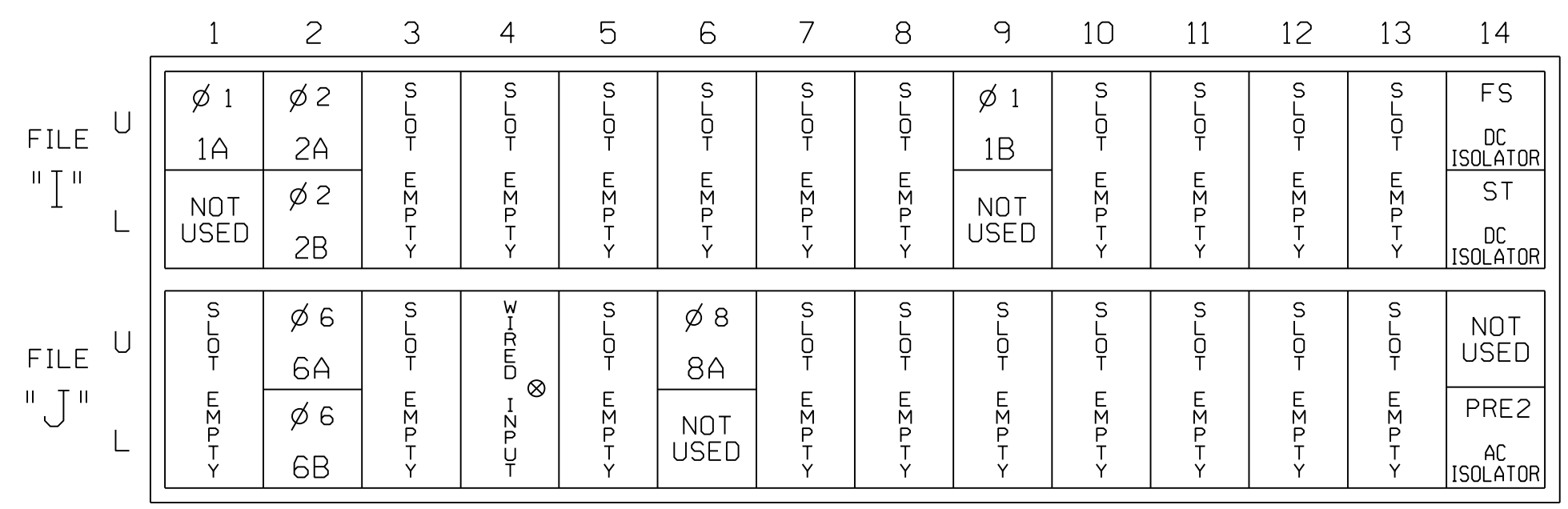
NC = No Connection  
 NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

### INPUT FILE POSITION LAYOUT

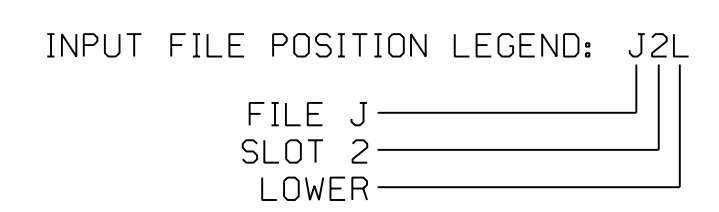
(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

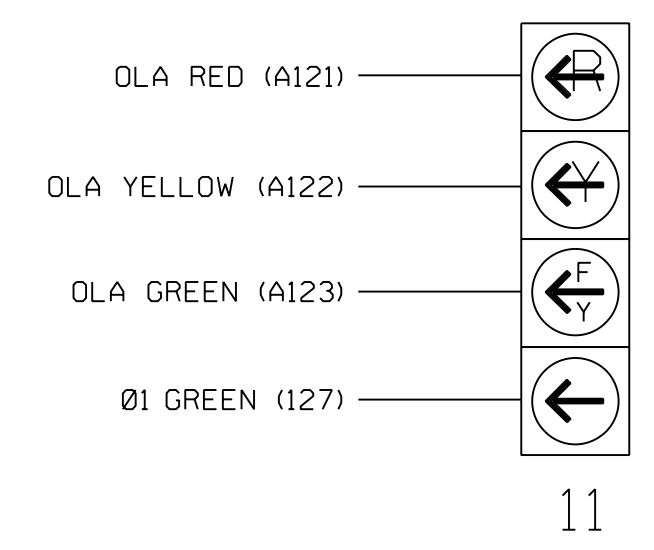
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		10		S
	-	J4U	48	26	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
1B	TB6-9,10	I9U	60	11	1	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		S

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



### FYA SIGNAL WIRING DETAIL

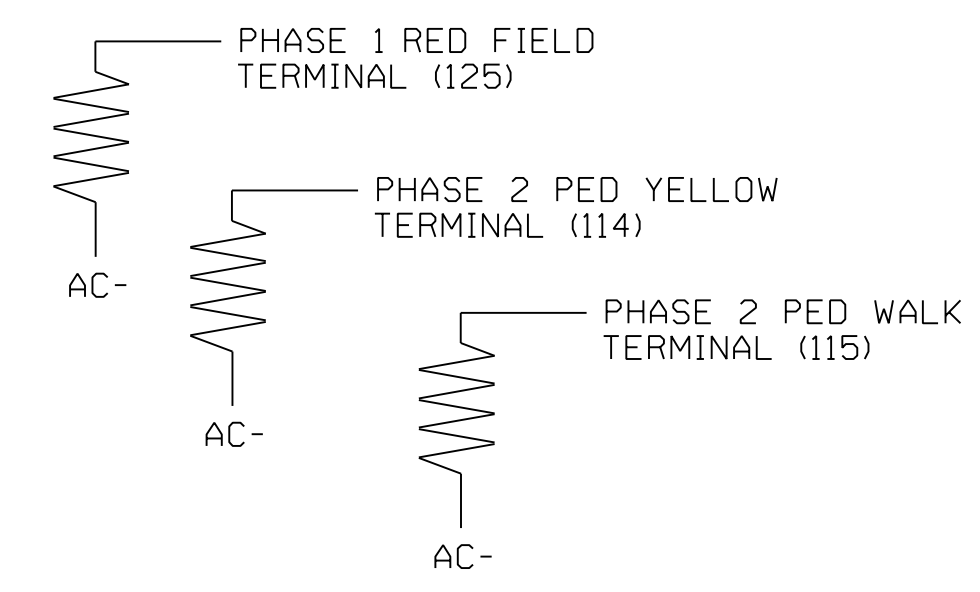
(wire signal head as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0674  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard) at Walker Avenue

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: James O. Deaton 9/21/2018

SIG. INVENTORY NO. 01-0674

## 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 'NORMAL'

```

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

LAG GRN 0.1 YEL 4.5 RED 1.3
    
```

Toggle Once

*OVERLAP C*

Select TMG VEH OVLP [C] and 'NORMAL'

```

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

LAG GRN 0.1 YEL 4.5 RED 1.3
    
```

Toggle Once

*OVERLAP D*

Select TMG VEH OVLP [D] and 'NORMAL'

```

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

LAG GRN 0.0 YEL 0.0 RED 0.0
    
```

END PROGRAMMING

## ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

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

```

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

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

END PROGRAMMING

9/21/2018 R:\Projects\cws\Signal\Drawings\Detail\01-0674e-03-200.dgn dsccsr

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0674  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p><b>PLANS PREPARED BY :</b></p> <p style="font-size: 2em; font-weight: bold; text-align: center;">RK&amp;K</p> <p style="font-size: small;">RUMMEL, KLEPPER &amp; KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<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 style="font-size: 1.2em; font-weight: bold;">NC 344 (Halstead Boulevard) at Walker Avenue</p> <p style="font-size: x-small;">Division 1 Pasquotank County Elizabeth City</p> <p style="font-size: x-small;">PLAN DATE: September 2018 REVIEWED BY: J O Deaton</p> <p style="font-size: x-small;">PREPARED BY: M W Yalch 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> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE							<p style="text-align: center; font-size: small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <b>James O. Deaton</b> 9/21/2018</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 01-0674</p>
REVISIONS	INIT.	DATE										

# ECONOLITE ASC/3-2070 EV PREEMPT PROGRAMMING DETAIL

(program controller as shown)

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

Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Preempt #2.

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

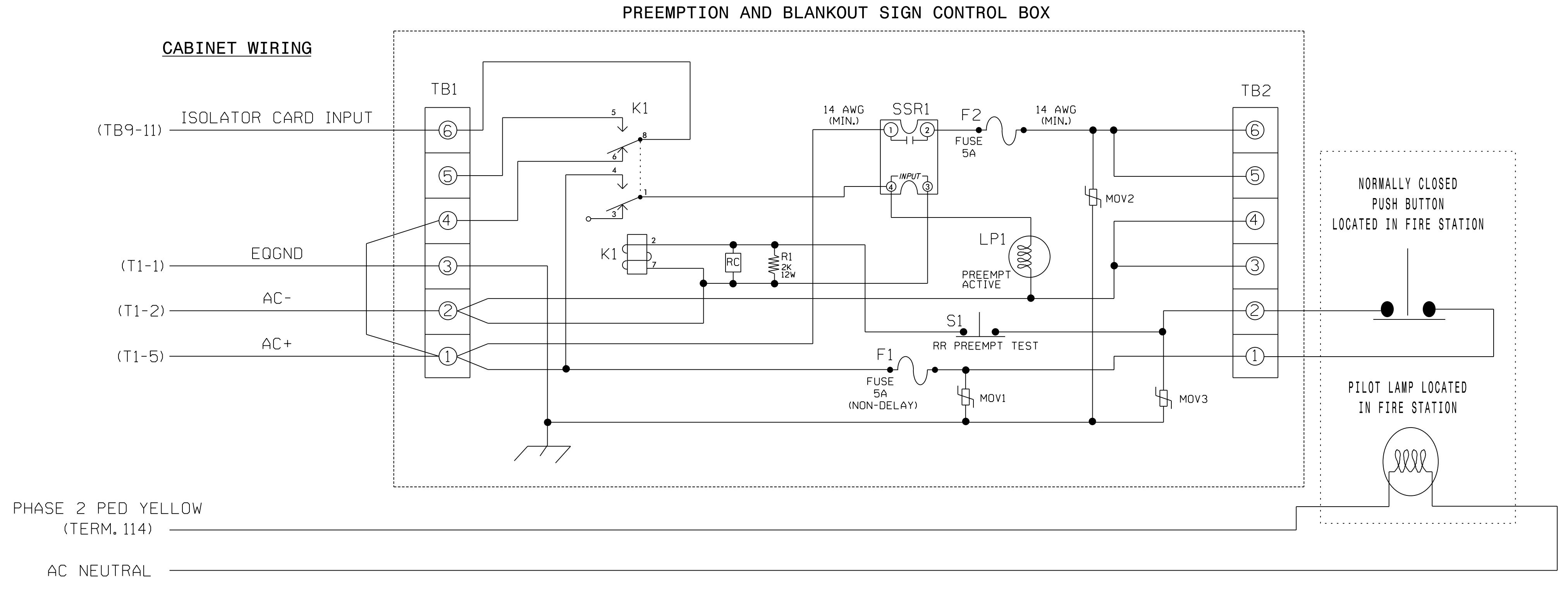
ENABLE... YES	I	PMT	OVRIDE..	I	INTERLOCK.	NO																	
DET LOCK... X	I	DELAY..	*I	INHIBIT... 0																			
OVERIDE FL. .	I	DURATION	O	ICLR-GRN... NO																			
TERM OLP. NO	I	IPC>YEL	NO	TERM PH	NO																		
PED DARK.. NO	I	ITC	RESRV	YES	DWELL FL	OFF																	
LINK PMT...O	I	X	FLCOLR	RED	I	EXIT OPT. OFF																	
X TMG PLN...O	I	I	RE-SERV..	O	I	FLT TYPE.HARD																	
FREE DUR	P	M	T	R1	NO	I	R2	NO	I	R3	NO	I	R4	NO									
--TIMING----	W	A	L	K	P	E	D	C	L	I	M	N	G	R	I	Y	E	L	I	R	E	D	
ENTRANCE TM.	255	I	255	I	1	4.5	I	1.9															
-----MIN	G	R	I	E	X	T	G	R	I	M	X	G	R	I	Y	E	L	I	R	E	D		
TRACK CLEAR	0	I	0	I	0	125.5	I	125.5															
-----MIN	D	L	I	P	M	T	E	X	I	M	X	T	M	I	Y	E	L	I	R	E	D		
DWL/CYC-EXIT	*I	0.0	I	75	I	125.5	I	125.5															
PMT ACTIVE	O	U	T..	O	N	P	M	T	A	C	T	D	W	E	L	L	..	N	O				
OTHER - PRI	P	M	T.	O	F	N	O	N	-	P	R	I	P	M	T	..	O	F					
INH EXT	T	I	M	E	...	0.0	P	E	D	P	R	R	E	T	U	R	N	...	O	F			
PRIORITY	R	E	T	U	R	N.	O	F	Q	U	E	U	E	D	E	L	A	Y	...	O	F		
COND	D	E	L	A	Y	.....	O	F															
PHASES	1	2	3	4	5	6	7	8															
PR RTN%	0	0	0	0	0	0	0	0															
PHASES	9	10	11	12	13	14	15	16															
PR RTN%	0	0	0	0	0	0	0	0															

NOTICE  
DWL/CYC-EXIT  
VARIABLE

\* DIVISION TRAFFIC ENGINEER WILL DETERMINE DELAY TIME AND PREEMPT DWELL MIN. TIME.

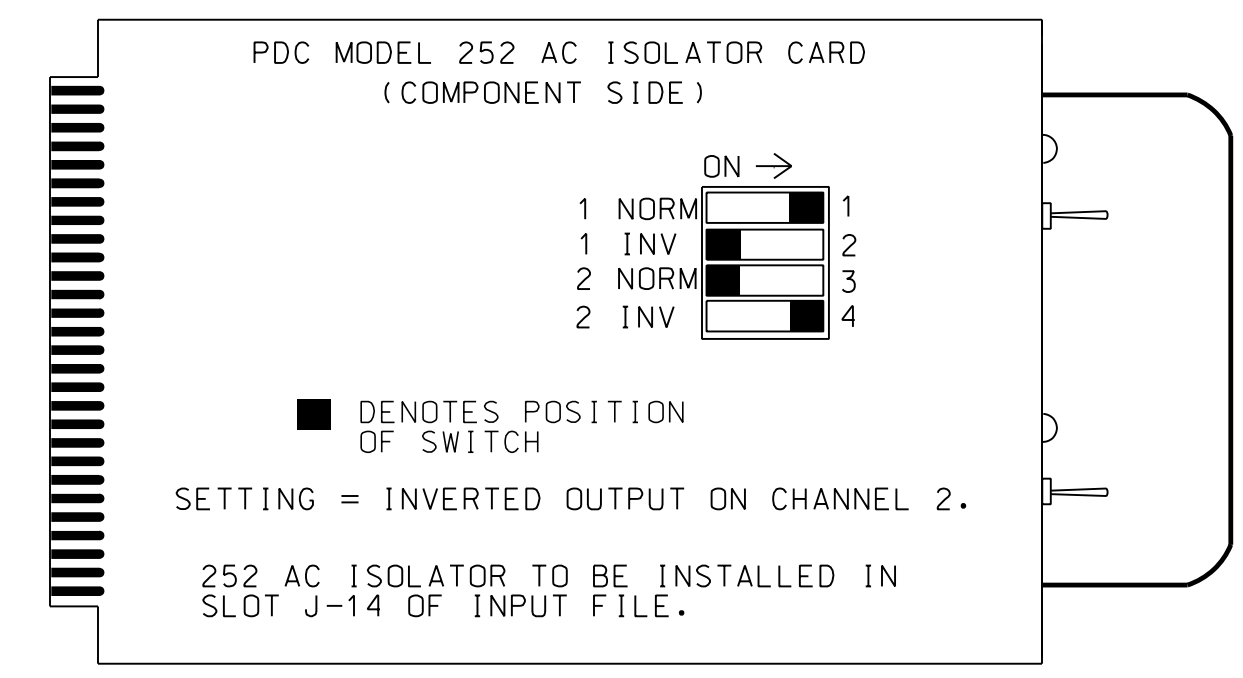
# EV PREEMPTION 2 CONTROL BOX WIRING DETAIL

(wire as shown below)



## PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)

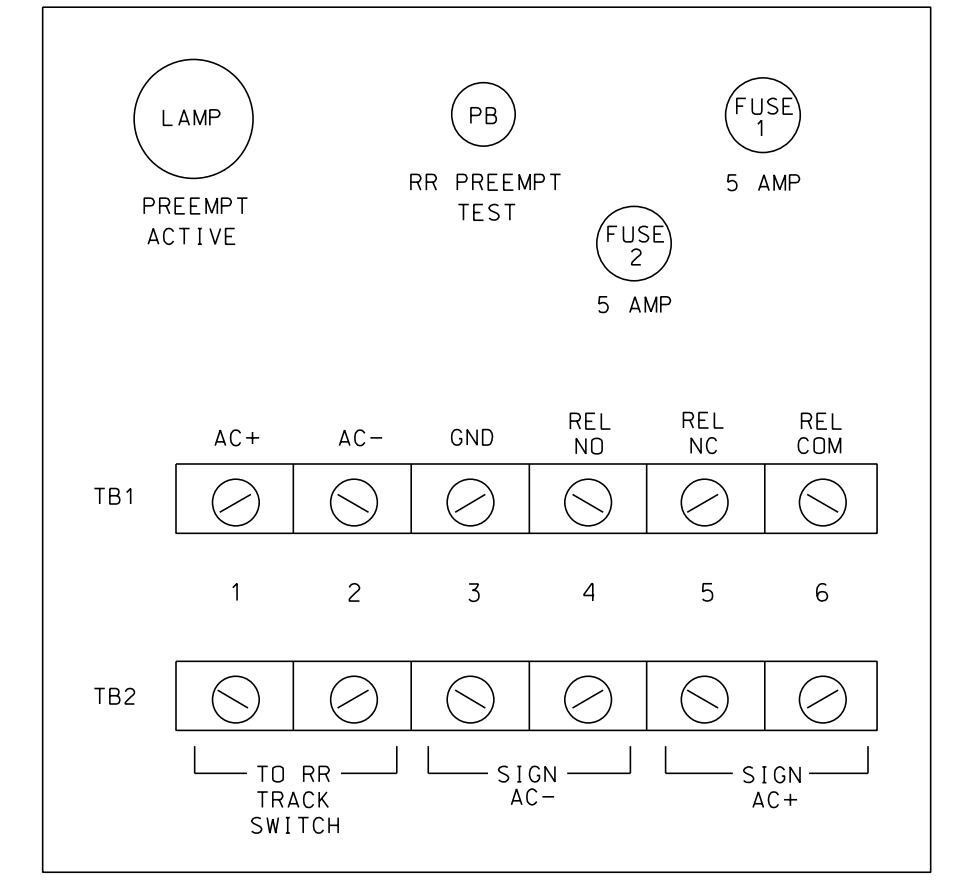


NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

## NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay 'K1' is an enclosed DPDT general purpose relay with a 120VAC coil, 10A contacts, and octal-style plug.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this, set invert dip switch on AC Isolator Card.
- IMPORTANT!! Terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

## FRONT VIEW



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THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0674  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
RALEIGH, NORTH CAROLINA 27609-3960  
NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 344 (Halstead Boulevard) at Walker Avenue

Division 1 Pasquotank County Elizabeth City

PLAN DATE: September 2018 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

DocuSigned by: James O. Deaton  
9/21/2018  
DATE  
SIG. INVENTORY NO. 01-0674



## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

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

ENABLE LOGIC PROCESSOR STATEMENTS 1, 2 & 3 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

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

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

```

LP#:  1 COPY FROM:  1 ACTIVE:  M (T/F)
IF  PMT INPUT           2  IS ON
OR  PMT PREEMPT ACTIVE  2  IS ON

THEN SIG SET PH PED CLR  2      ON

ELSE
    
```

LOGIC TO TURN ON  
FIRE HOUSE  
PILOT LAMP

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

```

LP#:  2 COPY FROM:  2 ACTIVE:  M (T/F)
IF  PMT INPUT           2  IS OFF
AND PMT PREEMPT ACTIVE  2  IS OFF

THEN SIG SET PH PED CLR  2      OFF

ELSE
    
```

LOGIC TO TURN OFF  
FIRE HOUSE  
PILOT LAMP

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#:  3 COPY FROM:  3 ACTIVE:  M (T/F)
IF  PMT PREEMPT ACTIVE  2  IS OFF

THEN CTR OMIT PHASE      9      ON

ELSE
    
```

LOGIC TO OMIT PHASE 9  
WHILE NOT IN PREEMPT 2  
(AND ALSO OMITTS PHASE 9  
AT CONTROLLER STARTUP)

END PROGRAMMING

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

(program controller as shown)

1. From Main Menu select 4. PREEMPTOR/TSP
2. From PREEMPT/TSP/SCP Submenu select 2. ENABLE PREEMPT FILTERING & TSP/SCP

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0674  
DESIGNED: September 2018  
SEALED: 09/21/2018  
REVISED: N/A

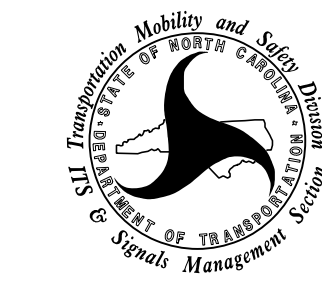
PLANS PREPARED BY :



RUMMEL, KLEPPER & KAHL, LLP  
900 RIDGEFIELD DRIVE SUITE 350  
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NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

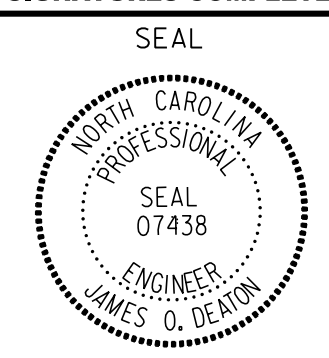


NC 344 (Halstead Boulevard)  
at  
Walker Avenue

Division 1 Pasquotank County Elizabeth City  
PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
PREPARED BY: M W Valch REVIEWED BY:

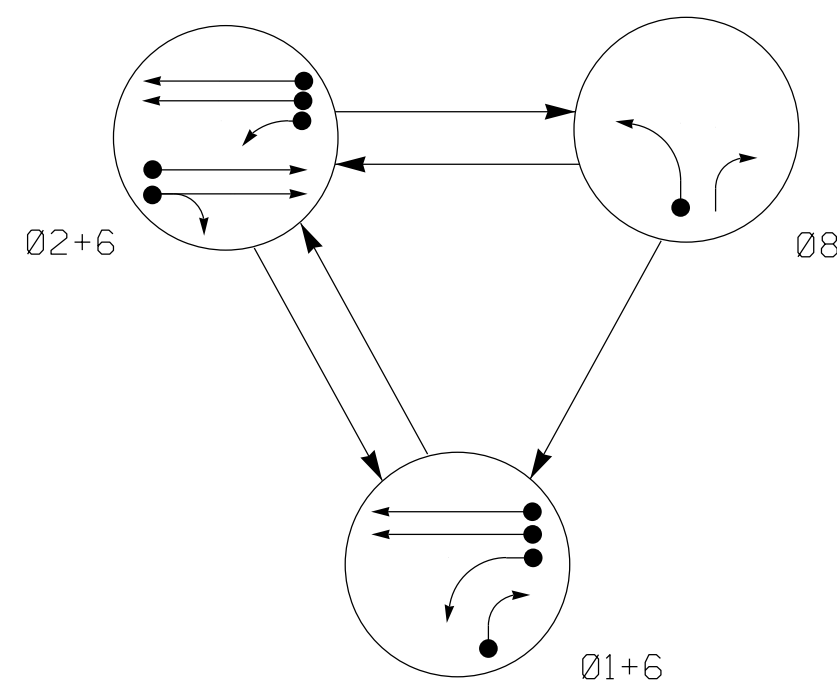
REVISIONS	INIT.	DATE

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DocuSigned by: **James O. Deaton** 9/21/2018  
DATE  
SIG. INVENTORY NO. 01-0674

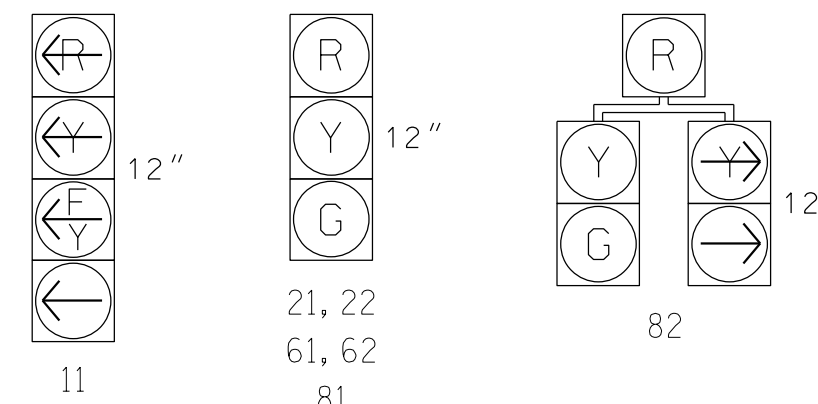
### PHASING DIAGRAM



SIGNAL FACE	PHASE			
	01+6	02+6	08	150P
11	←	←	←	←
21, 22	R	G	R	Y
61, 62	G	G	R	Y
81	R	R	G	R
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	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
1B	6X40	0	2-4-2	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	X
6A	6X6	300	5	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	5	X	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	-	X

Remove Video Detection

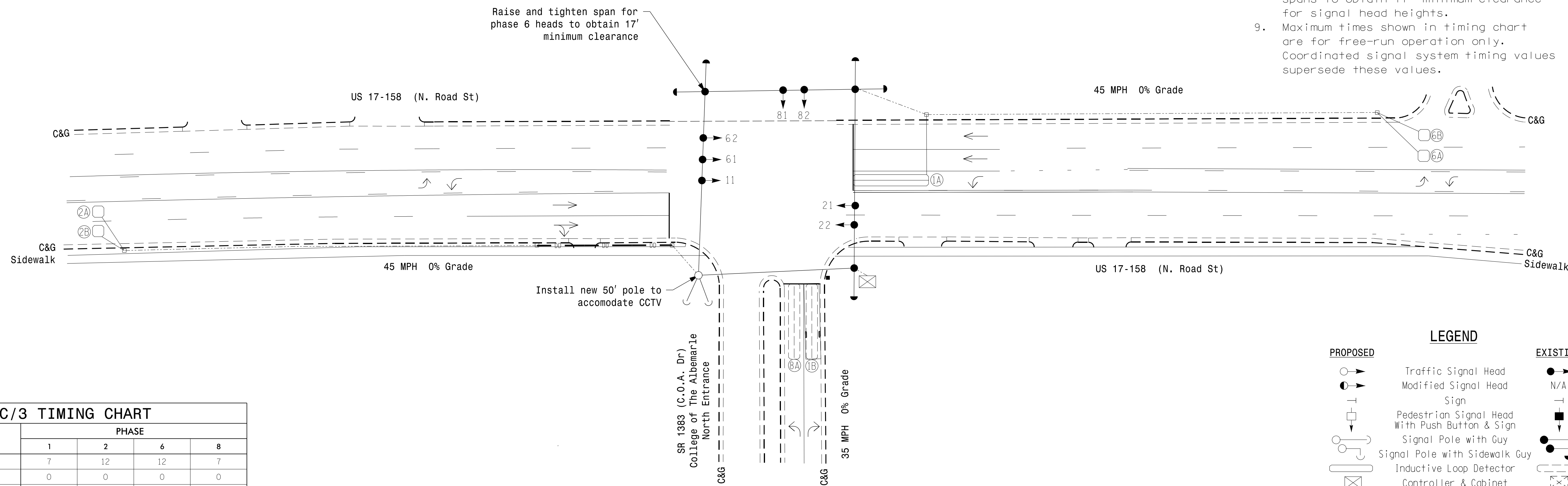
### 3 Phase Fully Actuated (Elizabeth City Signal System)

#### 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.
- 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.
- Install new pole directly adjacent to existing pole and raise signal spans to obtain 17' minimum clearance for signal head heights.
- 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)
- ←- UN SIGNALIZED MOVEMENT
- ←- - - PEDESTRIAN MOVEMENT



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 *	2.0	6.0	6.0	2.0
Max 1 *	30	90	90	30
Yellow	3.0	4.5	4.5	3.0
Red Clear	2.1	1.3	1.3	2.6
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	-	-	-	-
Simultaneous Gap	X	X	X	X

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

#### LEGEND

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

### Signal Upgrade

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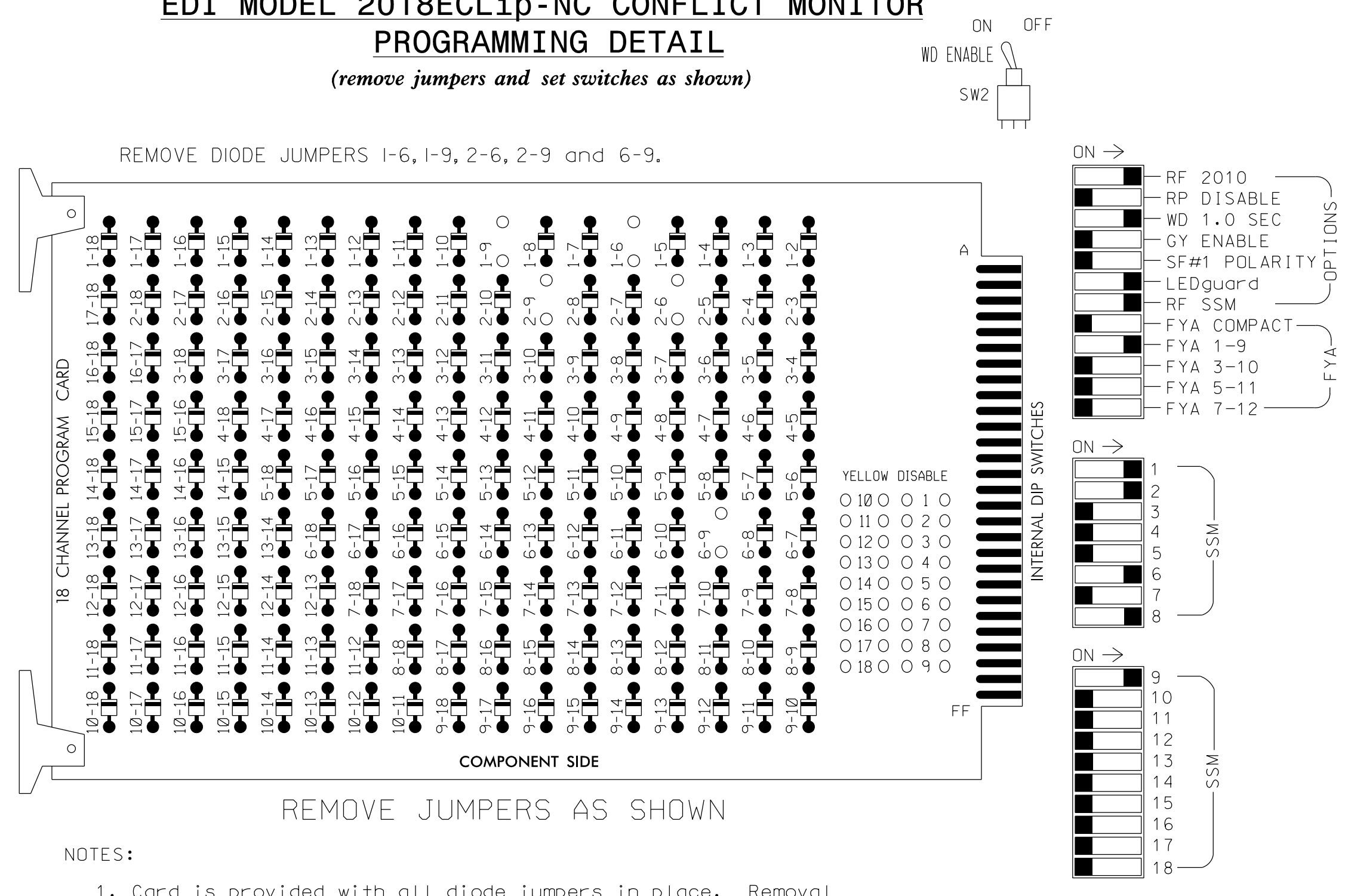


	<b>US 17-158 (N. Road St)</b> <b>at</b> <b>SR 1383 (College of the Albemarle Drive)</b>	
	Division 1 Pasquotank County Elizabeth City PLAN DATE: March 2018 REVIEWED BY: AJ Davis PREPARED BY: JA Le REVIEWED BY: LM Moon	SEALS PROFESSIONAL ENGINEER LISA M. MOON License No. 022516 State of North Carolina Date: 8/22/2018 Signature:

22-AUG-2018 15:40  
 R:\05942\51041\5942\Sigs\Signal 40.0-0712.dgn  
 Lmoon AT CAR-LMOON-WT

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

(remove jumpers and set switches as shown)



### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 Green and 6 Green.
- The cabinet and controller are part of the Elizabeth City 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,S8,S11,AUX S1  
 PHASES USED.....1,2,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* See overlap programming detail on sheet 2

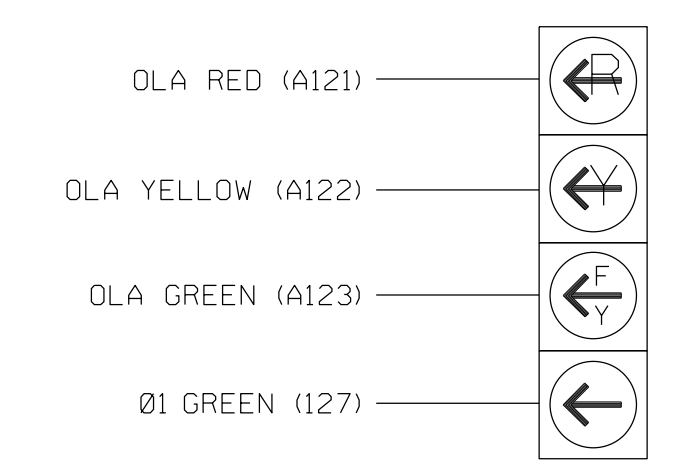
### SIGNAL HEAD HOOK-UP CHART

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
CMJ CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	11	NU	NU	NU	NU	NU
RED	*	128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW		126												A122				
FLASHING YELLOW ARROW														A123				
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.

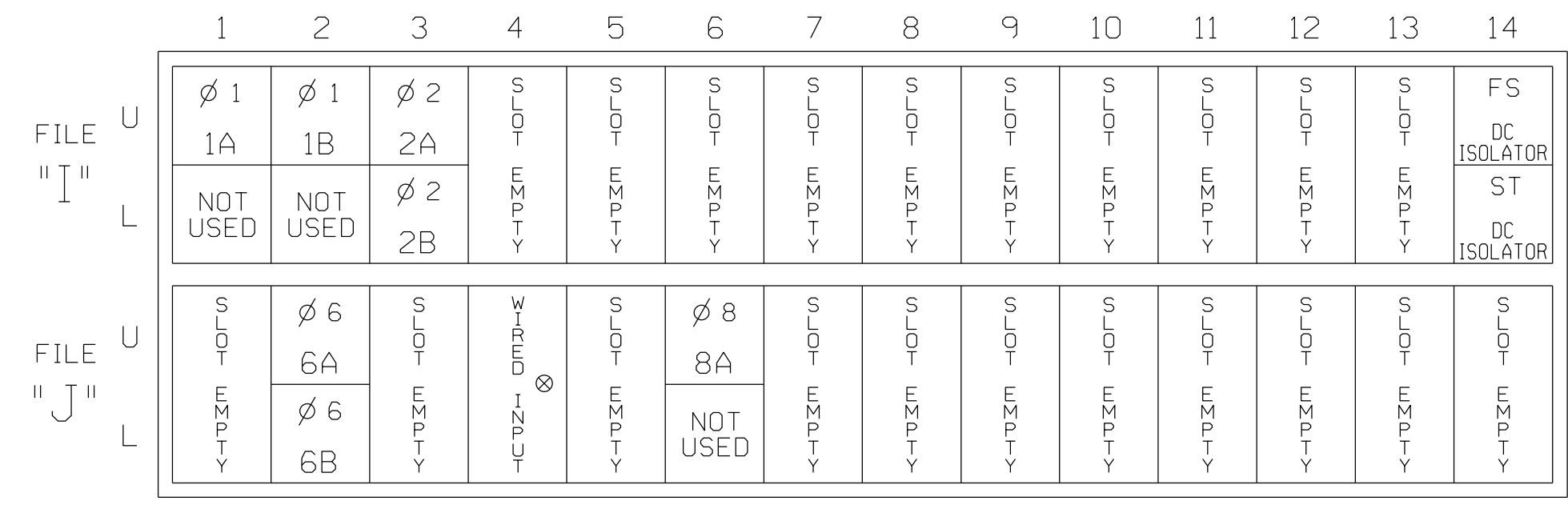
### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### INPUT FILE POSITION LAYOUT

(front view)

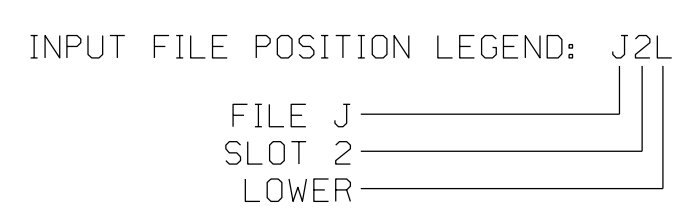


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 ⊗ Wired Input - Do not populate slot with detector card  
 FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
1B	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES			X	N
2B	TB2-11,12	I3L	76	42	2	YES			X	N
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES				S

<sup>1</sup>Add jumper from 11-W to J4-W, on rear of input file.



### ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

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

END PROGRAMMING

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0712  
 DESIGNED: MARCH 2018  
 SEALED: 08/22/2018  
 REVISED: N/A

### Electrical Detail

Electrical and Programming Details For:  
 Prepared for the Offices of:  
  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27518  
 NC License No. C-2215 (019) 650-1038

US 17-158 (N. Road St.)  
 at  
 SR 1383 (College of the Albemarle Drive)  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: March 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
  
 SEAL 022516  
 ENGINEER  
 LISA M. MOON  
 DocuSigned by:  
 Lisa M. Moon 9/20/2018  
 DATE  
 SIG. INVENTORY NO. 01-0712

PHASING DIAGRAM

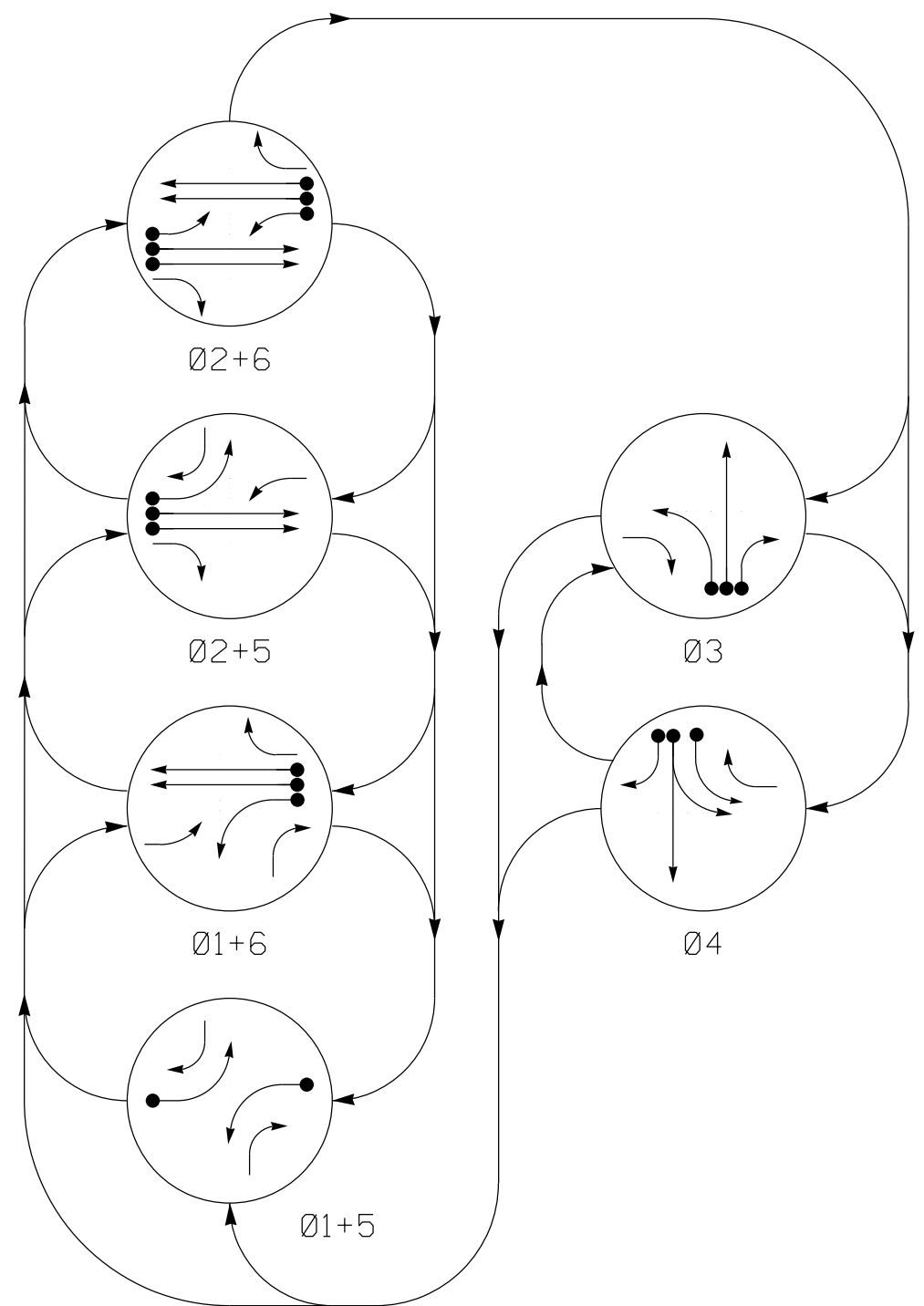
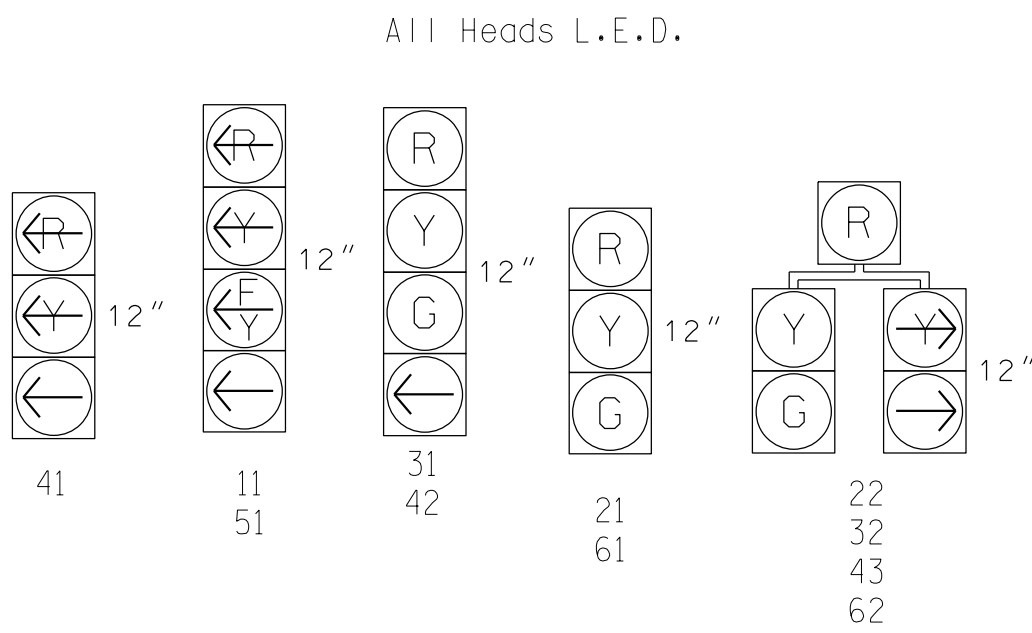


TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (01+5 to 04, FLASH), and signal status (R, G, Y).

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

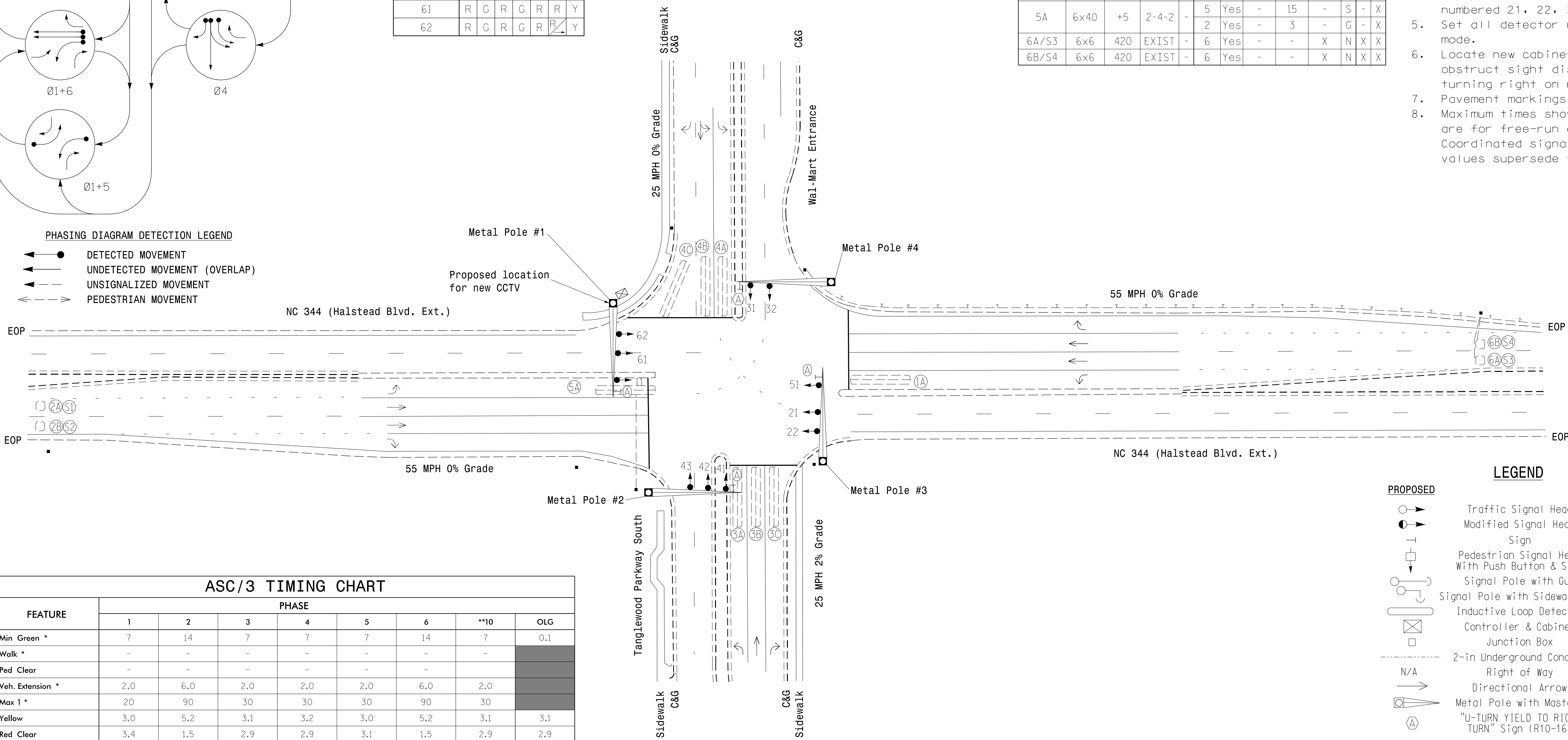
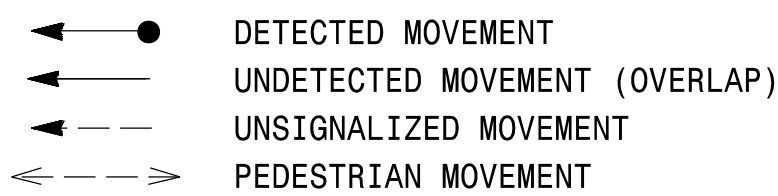
Table with columns: LOOP, SIZE (FT), DISTANCE FROM STOPBAR (FT), TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, SYSTEM LOOP, NEW CARD.

6 Phase Fully Actuated (Elizabeth City Signal System)

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" 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. Backplates are existing on signal heads numbered 21, 22, 31, 33, 41, 61 and 62.
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.

PHASING DIAGRAM DETECTION LEGEND

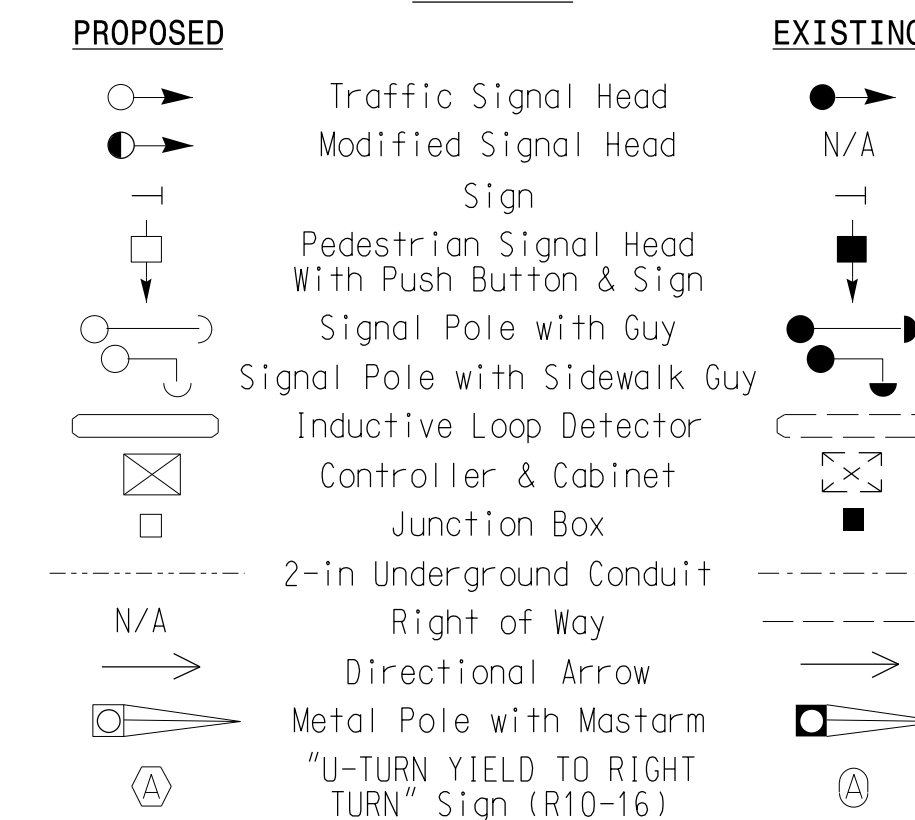


ASC/3 TIMING CHART

Table with columns: FEATURE, PHASE (1-6), \*\*10, OLG. 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.

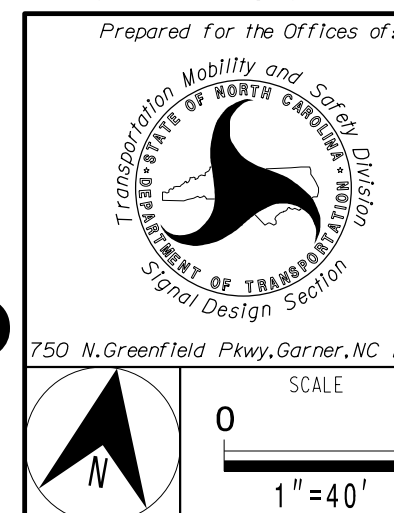
\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
\*\* Phase used for timing purposes only.

LEGEND

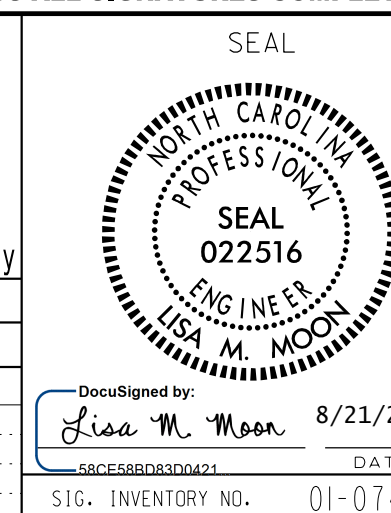


Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



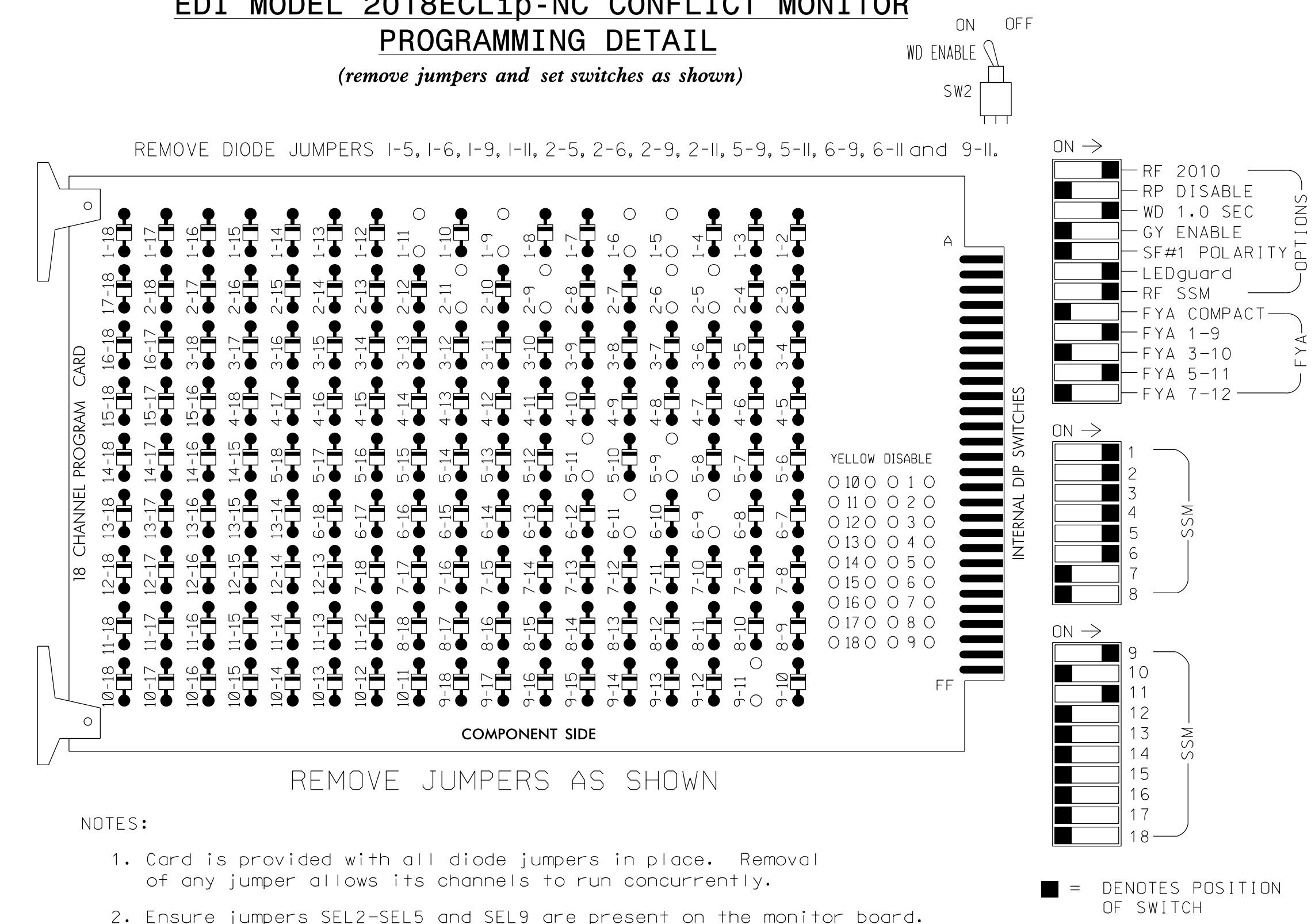
NC 344 (Halstead Blvd. Ext.) at Wal-Mart Entrance/ Tanglewood Parkway South. Division 1 Pasquotank County Elizabeth City. PLAN DATE: March 2018. PREPARED BY: JA Le. REVIEWED BY: AJ Davis. REVIEWED BY: LM Moon.



21-AUG-2018 17:42 E:\5942\51001\5942\SIGNAL\001\001.dgn DWG:18 AT CAR-DWHITTE-LTW

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

(remove jumpers and set switches as shown)



### 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	OLG	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	32	21,22	NU	22	31	32	41	42	43	62	NU	43	51	61,62	NU	NU	NU
RED	*	128		116	116	101	101		*		134							
YELLOW		129		117	117	102	102				135							
GREEN		130		118	118	103	103				136							
RED ARROW						101							A121			A114		
YELLOW ARROW	126			117		102		102	132				A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127	127		118	118	103	103	103	133	133								

NU = Not Used

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

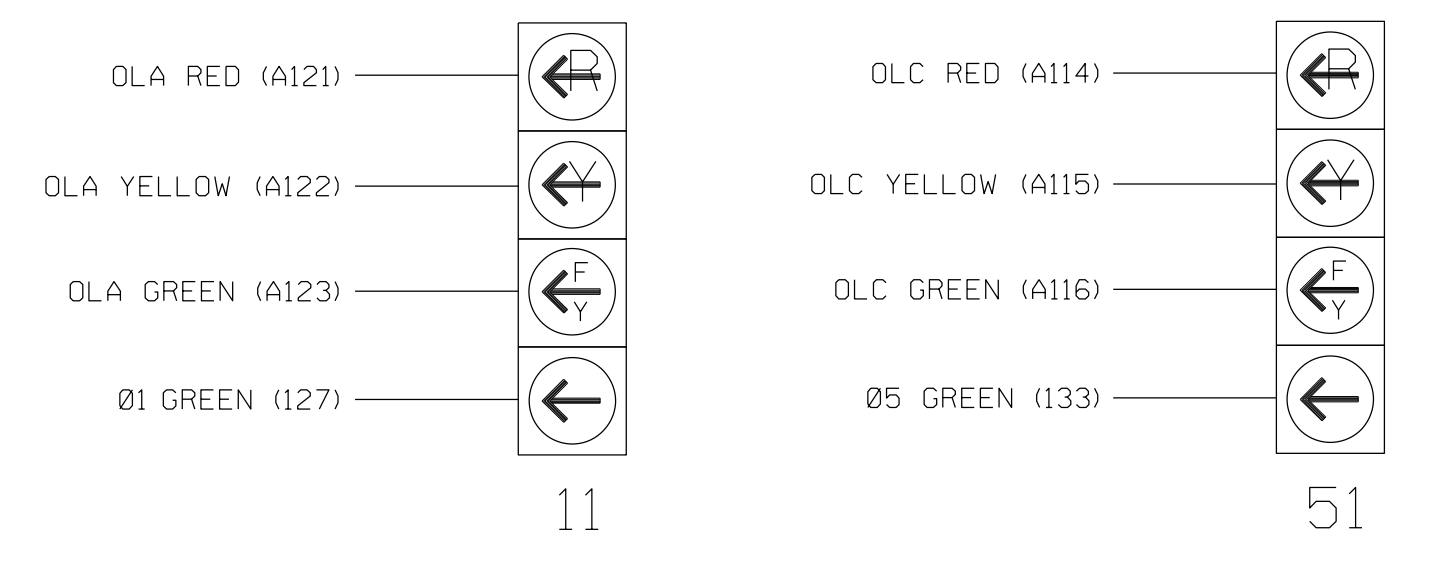
### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....ECONOLITE ASC/3-2070  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,AUX S1,AUX S4  
 PHASES USED.....1,2,3,4,5,6,\*\*10  
 OVERLAP "A".....\*  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....\*  
 OVERLAP "D".....NOT USED  
 OVERLAP "G".....\*

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

### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



### INPUT FILE POSITION LAYOUT

(front view)

FILE	U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	Ø 1	Ø 2/SYS	Ø 3	Ø 3	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4	Ø 4
	L	1A	2A/S1	3A	3C	4A	4C	4C	4C	4C	4C	4C	4C	4C	4C
"J"	U	Ø 5	Ø 6/SYS	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6	Ø 6
	L	5A	6A/S3	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B

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

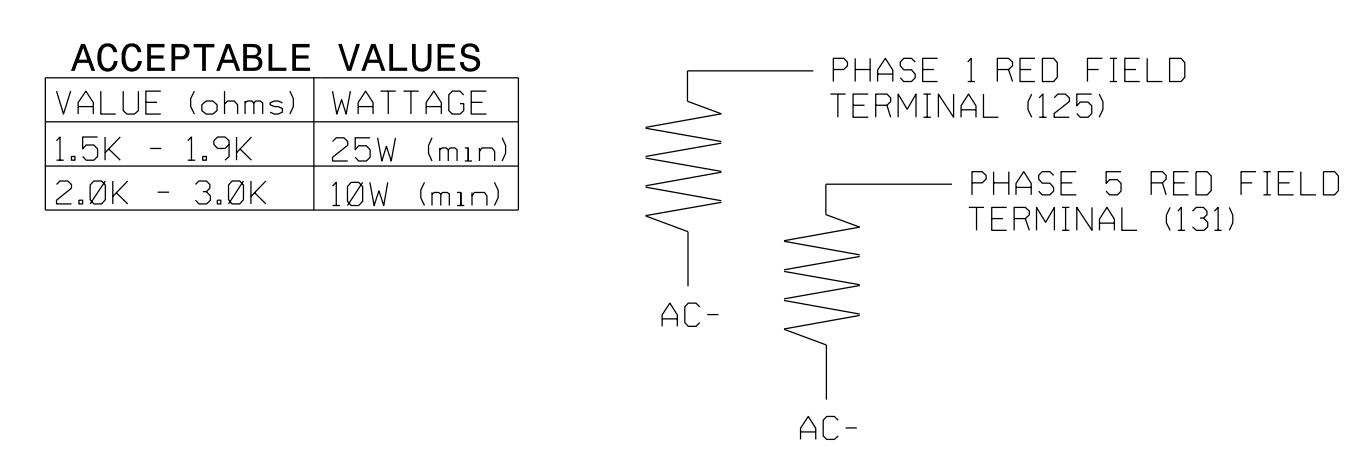
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
3A	TB2-9,10	I3U	63	32	3/10	YES				S
3B	TB2-11,12	I3L	76	42	3/10	YES				S
3C	TB4-5,6	I5U	58	3	3/10	YES		15		S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES				S
4C	TB6-1,2	I7U	65	34	4	YES		15		S
5A <sup>2</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N

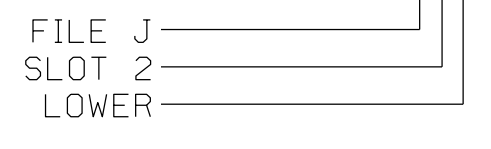
<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



### INPUT FILE POSITION LEGEND: J2L



### 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 Elizabeth City Signal System.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0747  
 DESIGNED: MARCH 2018  
 SEALED: 08/21/2018  
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: NC 344 (Halstead Blvd. Ext.) at Wal-Mart Entrance/Tanglewood Parkway South Division 1 Pasquotank County Elizabeth City

Prepared for the Offices of: DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27519 NC License No. C-2215 (919) 650-1038

Prepared by: DJ White Reviewed by: AJ Davis

Plan Date: March 2018

Seal: Lisa M. Moon, Professional Engineer, License No. 022516

DocuSigned by: Lisa M. Moon 9/20/2018

REVISIONS: INIT. DATE

SIG. INVENTORY NO. 01-0747

### ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

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

```

CONTROLLER SEQUENCE [ 1 ]
SEQUENCE COMMANDS . HW ALT SEQ ENA. NO.
  01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC-B - B - B - - - - - - - - - - - -
R1-1 2 3 4 10 . . . . .
R2-5 6 . . . . .
R3- . . . . .
R4- . . . . .

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

```

### ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 as DLE, program LD SWITCH 3 as OVLP '5' TYPE '0' as shown below.

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

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

NOTICE OVLP 7 ASSIGNED TO LD SWITCH 3 →

### ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

(program controller as shown)

- 1. From Main Menu select 6. DETECTORS
- 2. From DETECTOR Submenu select 2. VEHICLE DETECTOR SETUP

```

VEH DETECTOR [ 3] VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR.... X ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
  3 3 . . X . . . . . X . . . . .
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

```

```

VEH DETECTOR [32] VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR.... X ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
32 3 . . X . . . . . X . . . . .
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

```

```

VEH DETECTOR [42] VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR.... X ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
42 3 . . X . . . . . X . . . . .
EXTEND TIME... 0.0 DELAY TIME... 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO

```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0747  
DESIGNED: MARCH 2018  
SEALED: 08/21/2018  
REVISED: N/A

### 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

```

Toggle X4

```

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

LAG GRN 0.1 YEL 3.1 RED 2.9

```

END PROGRAMMING

Electrical Detail - Sheet 2 of 3



Prepared for the Offices of:

**NC 344 (Halstead Blvd. Ext.)**  
at  
**Wal-Mart Entrance Ext. / Tanglewood Parkway South**  
Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018	REVIEWED BY: AJ Davis
PREPARED BY: DJ White	REVIEWED BY: LM Moon
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

**PROFESSIONAL ENGINEER**  
LISA M. MOON  
022516

DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0747

20-SEP-2018 18:51 R:\415942\451\001\DWG\11\110401-0147-08212018a.dgn lmoon AT CAR-LMCDM-WT

## ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL FOR SIDESTREET PHASING

(program controller as shown)

The following logic processor configuration holds the FYA's on signal heads 11, 31, 51, and 71 red for the duration of the delayed green time (leading ped interval) when serving a ped call on the opposing through phase.

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

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

```

LP#:  1 COPY FROM:  1 ACTIVE:  M (T/F)
IF   VEH GREEN ON PH      3  IS  ON

THEN LP SET LOGIC FLAG    1      ON

ELSE
    
```

PHASE 3 GREEN SETS  
LOGIC FLAG 1 ON  
(SIDESTREET BACKUP)

4. From the LOGIC PROCESSOR Submenu select 1. LOGIC STATEMENT CONTROL

ENABLE LOGIC PROCESSOR STATEMENTS 1-4 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM .

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

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

```

LP#:  2 COPY FROM:  2 ACTIVE:  M (T/F)
IF   LP FLAG              1  IS  ON

THEN CTR OMIT PHASE      10      ON

ELSE
    
```

OMIT PHASE 10 SO  
PHASE 3 MOVEMENTS  
RUN ONCE PER CYCLE

END PROGRAMMING

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```

LP#:  3 COPY FROM:  3 ACTIVE:  M (T/F)
IF   VEH GREEN ON PH      2  IS  ON

THEN LP SET LOGIC FLAG    1      OFF

ELSE
    
```

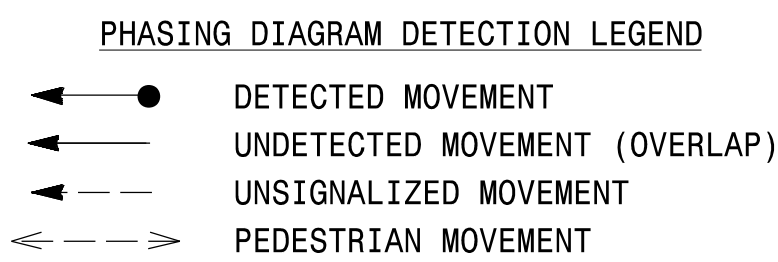
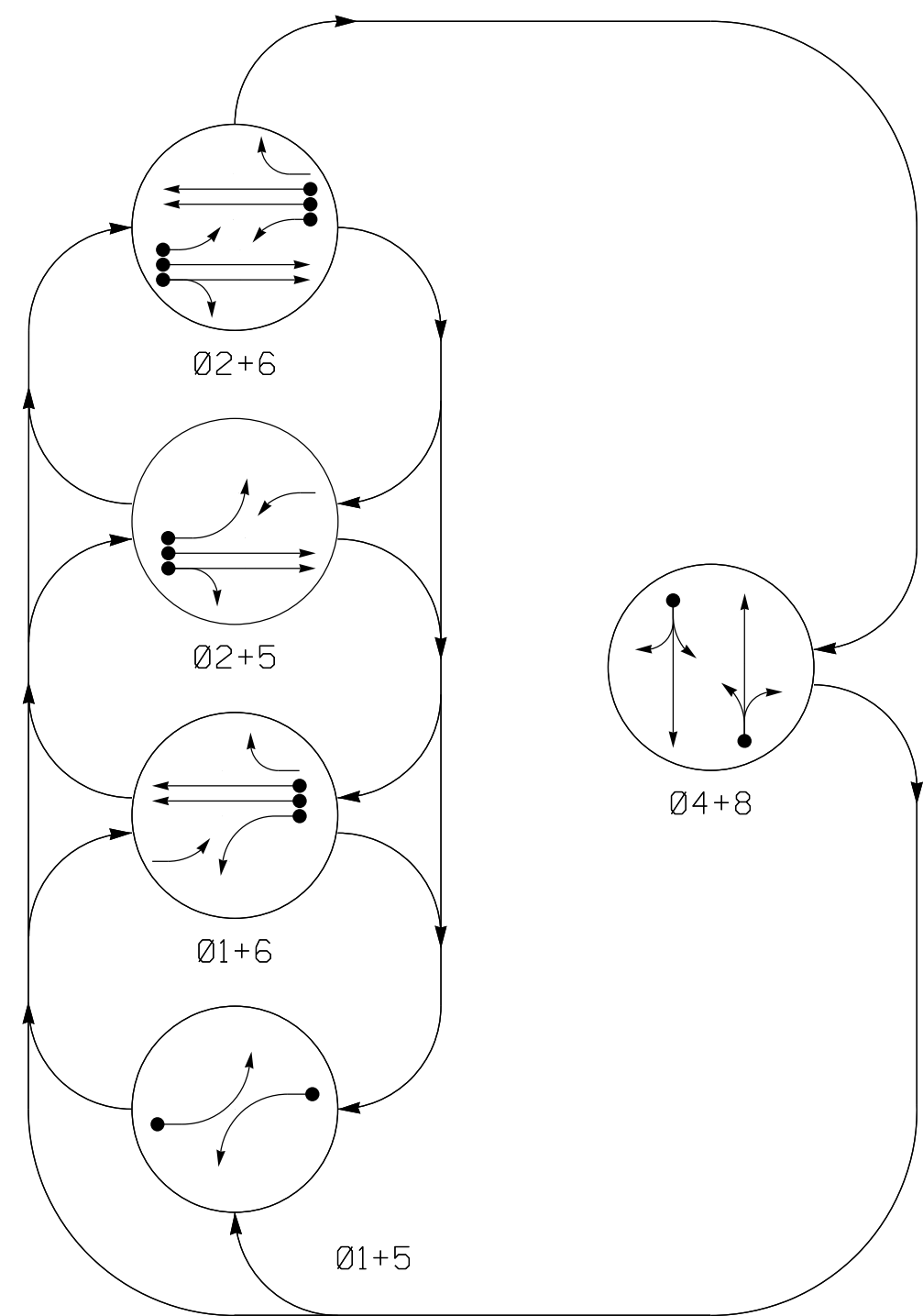
URNS LOGIC FLAG 1  
OFF TO ALLOW NORMAL  
OPERATION

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 01-0747  
DESIGNED: MARCH 2018  
SEALED: 08/21/2018  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

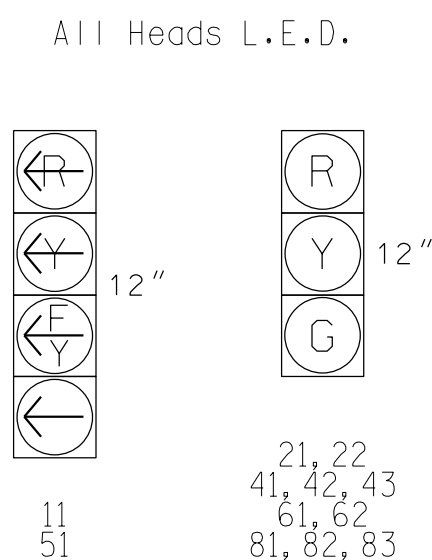
<p><b>ELECTRICAL AND PROGRAMMING DETAILS FOR:</b></p> <p style="font-size: small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27519 NC License No. C-2215 (019) 650-1038</p>	<p><b>NC 344 (Halstead Blvd. Ext.) at Wal-Mart Entrance Ext./ Tanglewood Parkway South</b></p> <p>Division 1 Pasquotank County Elizabeth City</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: March 2018</td> <td>REVIEWED BY: AJ Davis</td> </tr> <tr> <td>PREPARED BY: DJ White</td> <td>REVIEWED BY: LM Moon</td> </tr> </table>	PLAN DATE: March 2018	REVIEWED BY: AJ Davis	PREPARED BY: DJ White	REVIEWED BY: LM Moon	<p style="text-align: center; font-weight: bold; font-size: small;">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <div style="text-align: center;"> <p>SEAL 022516 LISA M. MOON ENGINEER</p> </div> <p style="font-size: x-small;">DocuSigned by: <i>Lisa M. Moon</i> 9/20/2018 DATE SIG. INVENTORY NO. 01-0747</p>
PLAN DATE: March 2018	REVIEWED BY: AJ Davis					
PREPARED BY: DJ White	REVIEWED BY: LM Moon					

PHASING DIAGRAM



SIGNAL FACE	PHASE					FLASH
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 8	
11	←	←	←	←	←	Y
21, 22	R	R	G	G	R	Y
41, 42, 43	R	R	R	R	G	R
51	←	←	←	←	←	Y
61, 62	R	G	R	G	R	Y
81, 82, 83	R	R	R	R	G	R

SIGNAL FACE I.D.

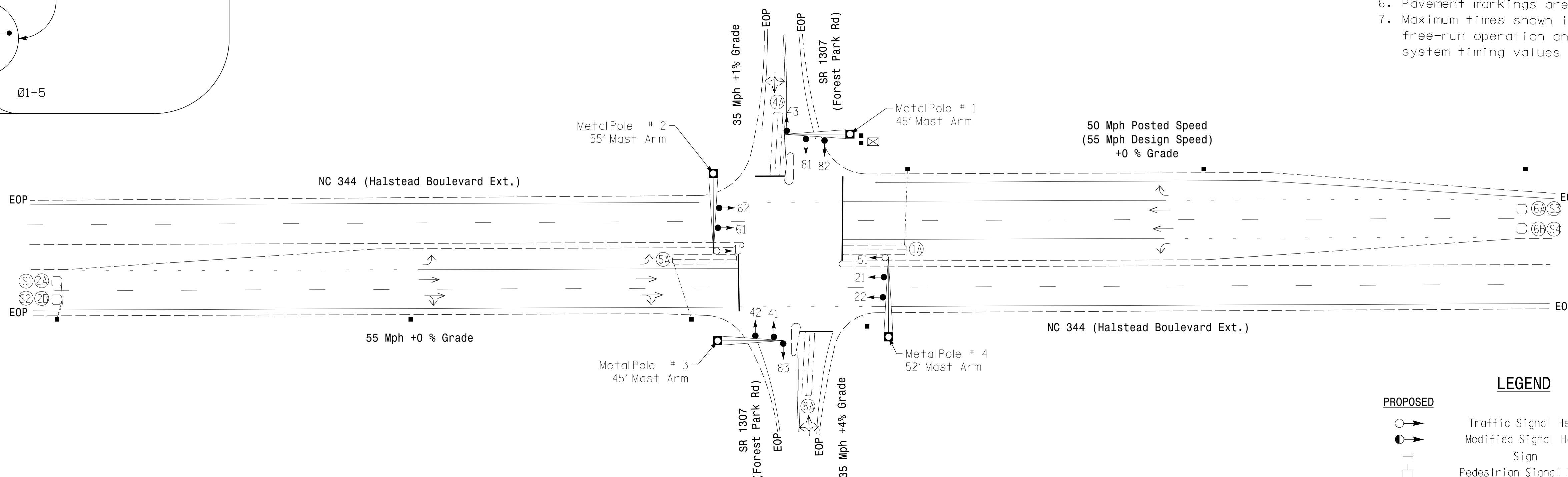


ASC/3 DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	X
2A/S1	6X6	420	EXIST	-	2	Yes	-	-	X	N	X
2B/S2	6X6	420	EXIST	-	2	Yes	-	-	X	N	X
4A	6X40	0	2-4-2	-	4	Yes	-	10	-	S	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	X
6A/S3	6X6	420	EXIST	-	2	Yes	-	3	-	G	X
6B/S4	6X6	420	EXIST	-	6	Yes	-	-	X	N	X
8A	6X40	0	2-4-2	-	8	Yes	-	10	-	S	X

5 Phase Fully Actuated (Elizabeth City Signal System)

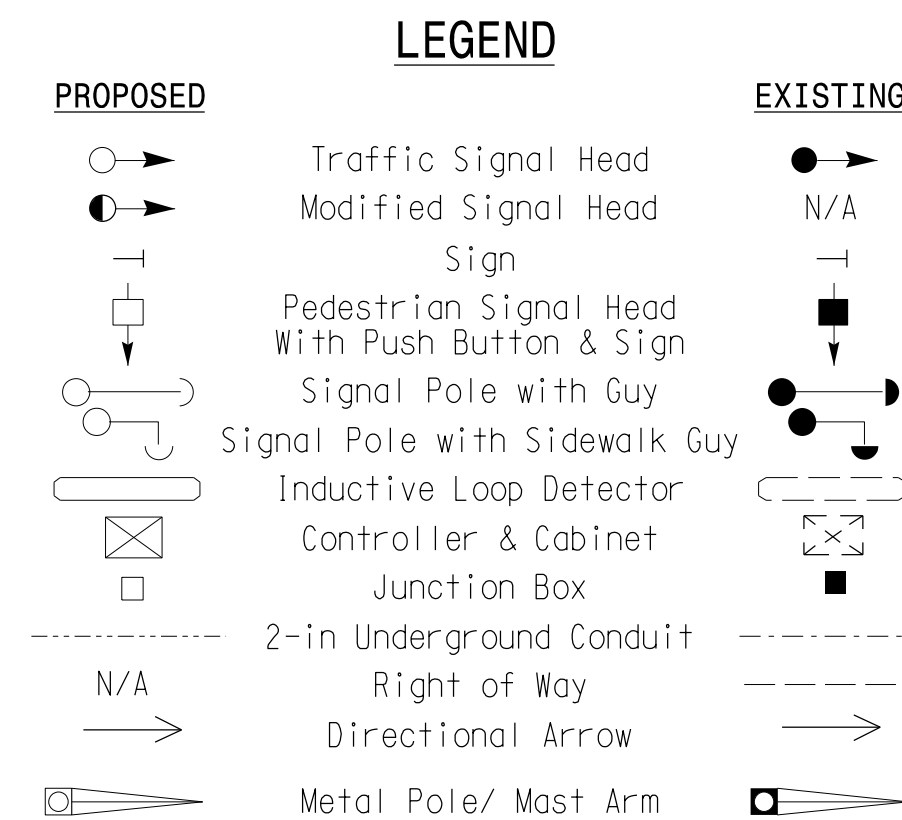
NOTES

- 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.
- 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.

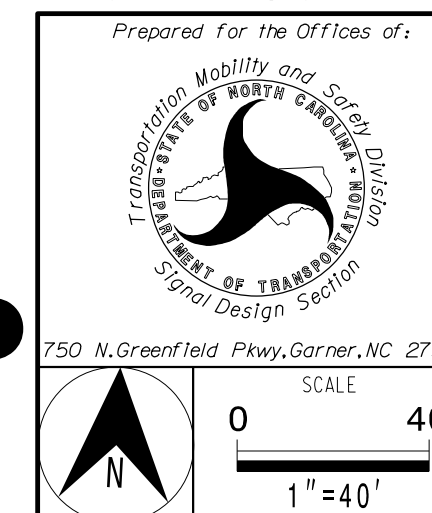


FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	14	7	7	14	7	
Walk *	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0	
Max 1 *	15	90	25	15	90	25	
Yellow	3.0	5.2	3.8	3.0	5.2	3.6	
Red Clear	1.9	1.0	1.7	2.3	1.0	2.0	
Actuations B4 Add *	-	0	-	-	0	-	
Seconds / Actuation *	-	1.8	-	-	1.8	-	
Max Initial *	-	46	-	-	46	-	
Time Before Reduction *	-	15	-	-	15	-	
Time To Reduce *	-	30	-	-	30	-	
Minimum Gap	-	3.4	-	-	3.4	-	
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



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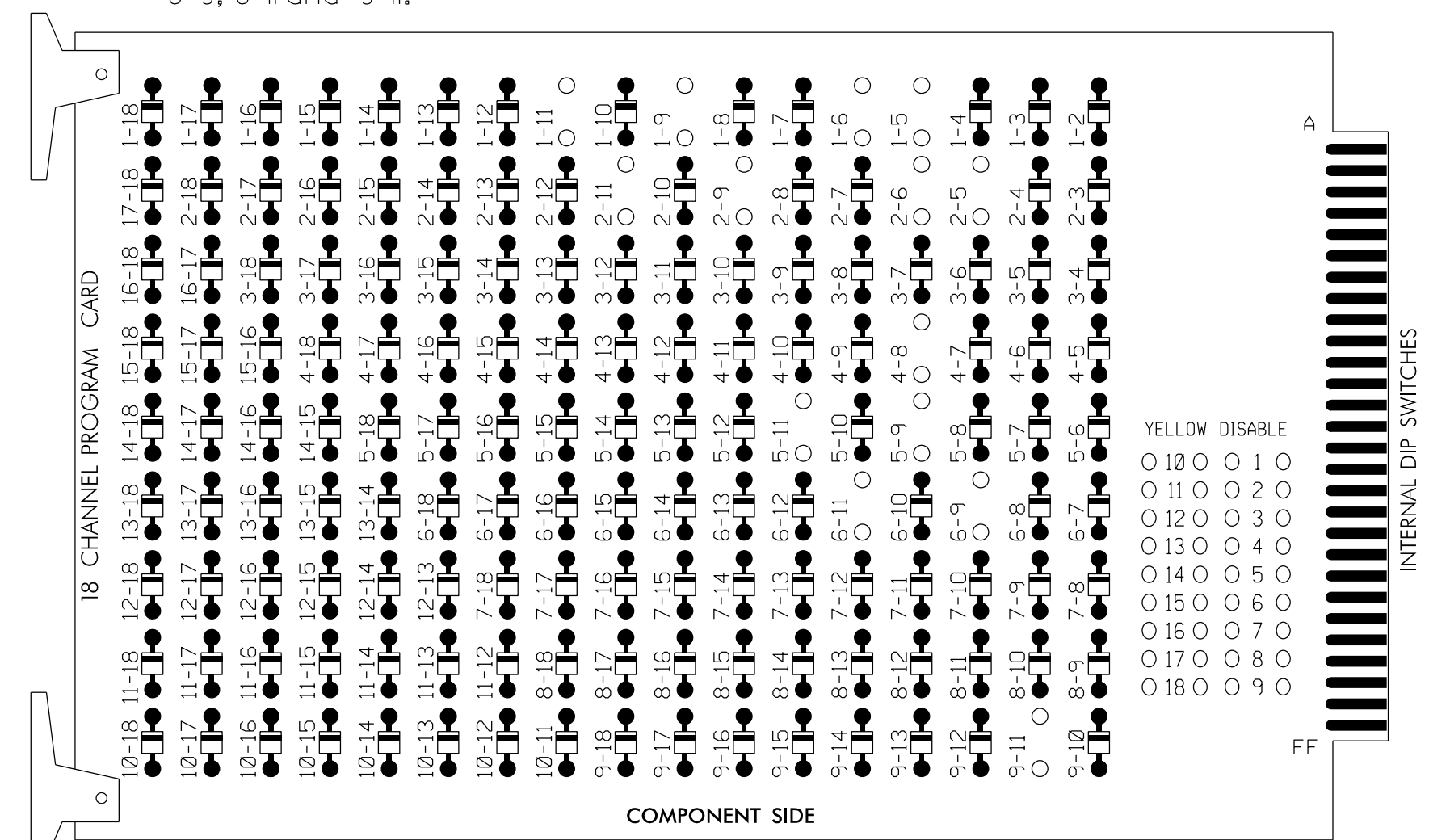
Prepared for the Offices of: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529		NC 344 (Halstead Boulevard Ext.) at SR 1307 (Forest Park Road)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON
Plans Prepared By: <b>DRMP</b> DRMP, Inc. 8000 Regency Parkway, Suite 175 Cary, NC 27519 NC License No. C-2213 (919) 650-1038		Division 1 Pasquotank County Elizabeth City PLAN DATE: March 2018 REVIEWED BY: AJ Davis PREPARED BY: JA Le REVIEWED BY: LM Moon		DATE: 8/22/2018 DATE:
SCALE: 1"=40' 0 40		REVISIONS: INIT. DATE		SIG. INVENTORY NO. 01-0749



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

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

### NOTES

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

### EQUIPMENT INFORMATION

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

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CNU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	DLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	NU	41,42 43	NU	51*	61,62	NU	NU	81,82 83	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										

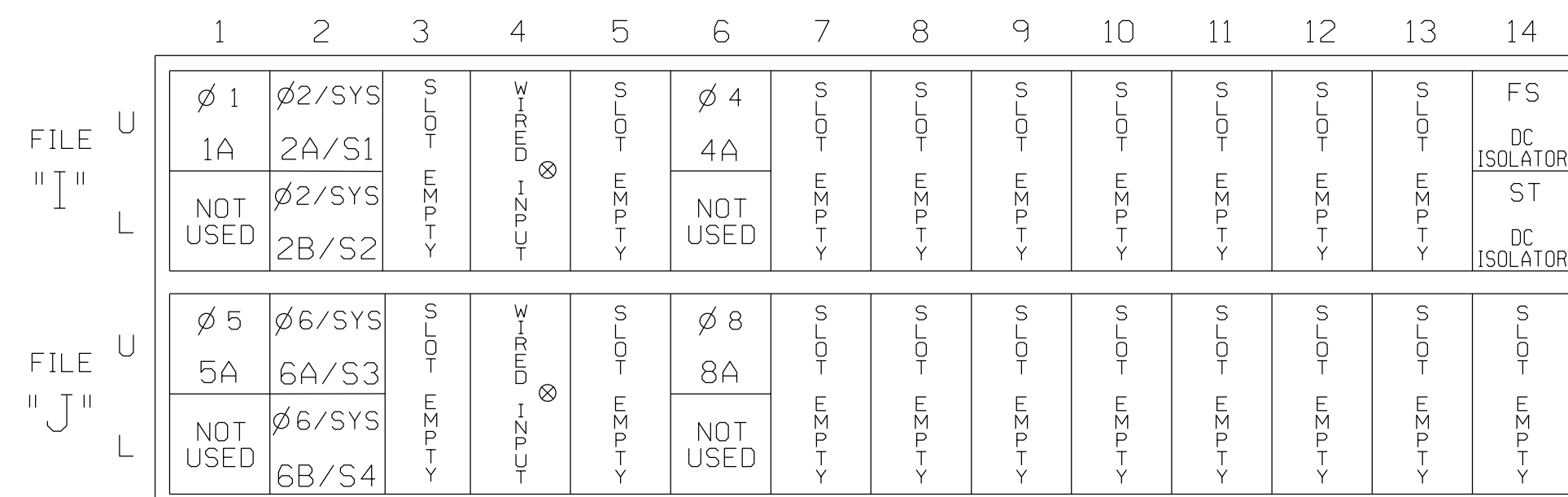
NU = Not Used

\* 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  
 ⊗ Wired Input - Do not populate slot with detector card  
 FS = FLASH SENSE  
 ST = STOP TIME

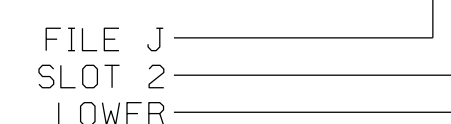
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A <sup>1</sup>	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		10		S
5A <sup>1</sup>	TB3-1,2	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		10		S

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

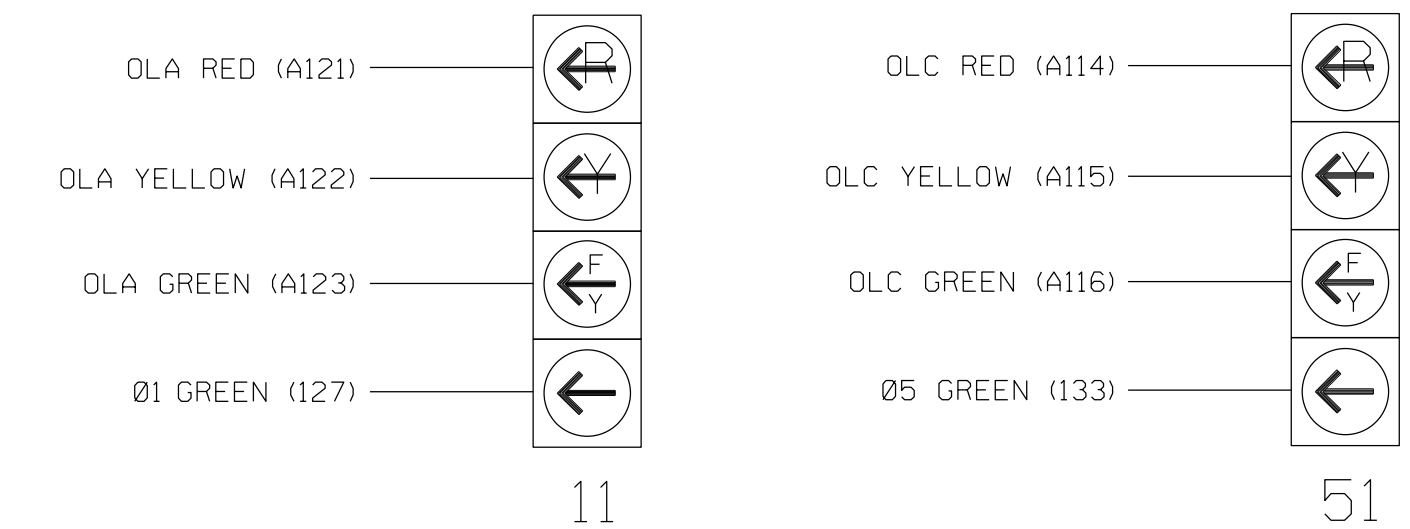
<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

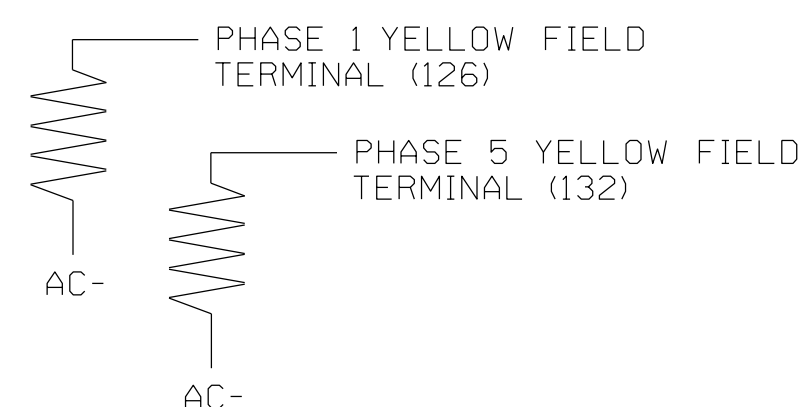
(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 344 (Halstead Boulevard Ext.)

at SR 1307 (Forest Park Road)

Division 1 Pasquotank County Elizabeth City

PLAN DATE: March 2018 REVIEWED BY: AJ Davis

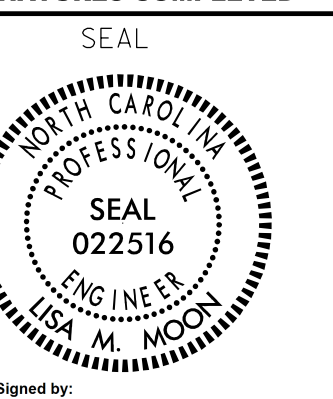
PREPARED BY: DJ White REVIEWED BY: LM Moon

REVISIONS INIT. DATE

750 N.Greenfield Pkwy, Garner, NC 27529



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Lisa M. Moon 9/20/2018

SIG. INVENTORY NO. 01-0749

## 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
```

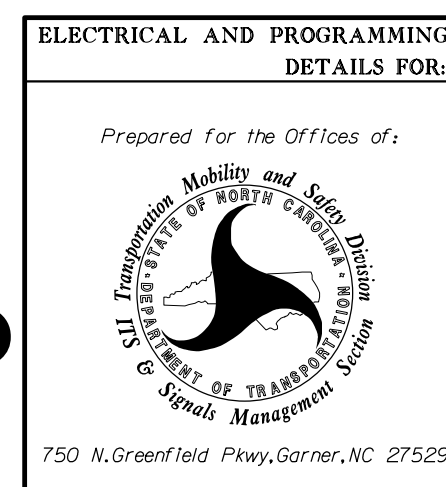
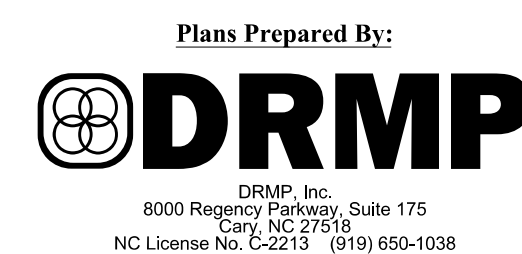
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0749  
 DESIGNED: MARCH 2018  
 SEALED: 08/22/2018  
 REVISED: N/A

20-SEP-2018 18:51  
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 Incon AT CAR-LMCDN1-W7

Electrical Detail - Sheet 2 of 2

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FINAL UNLESS ALL  
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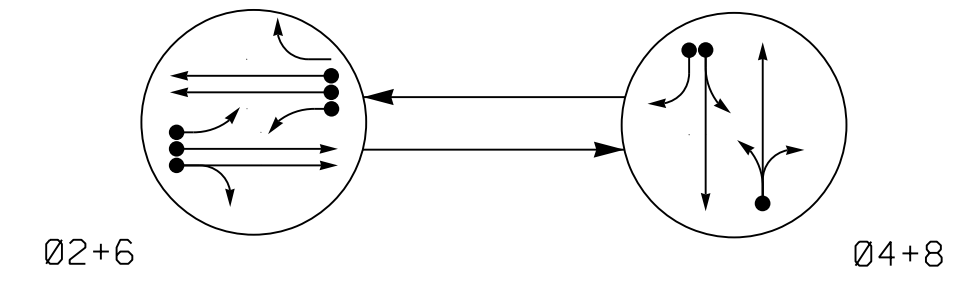
ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 344 (Halstead Boulevard Ext.) at SR 1307 (Forest Park Road)	
Prepared for the Offices of:		Division 1 Pasquotank County Elizabeth City	
PLAN DATE: March 2018	REVIEWED BY: AJ Davis		
PREPARED BY: DJ White	REVIEWED BY: LM Moon		
REVISIONS	INIT.	DATE	

SEAL

NORTH CAROLINA  
PROFESSIONAL  
SEAL  
022516  
ENGINEER  
LISA M. MOON

DocuSigned by:  
*Lisa M. Moon* 9/20/2018  
DATE  
SIG. INVENTORY NO. 01-0749

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

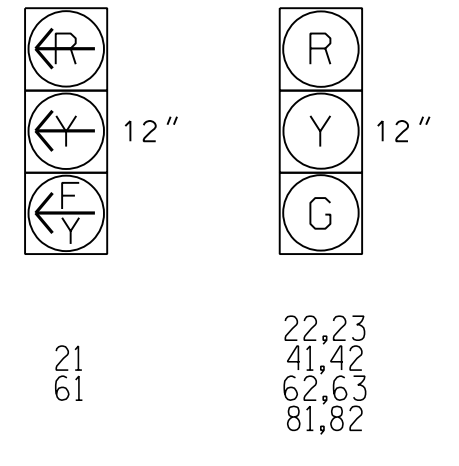
- ← DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



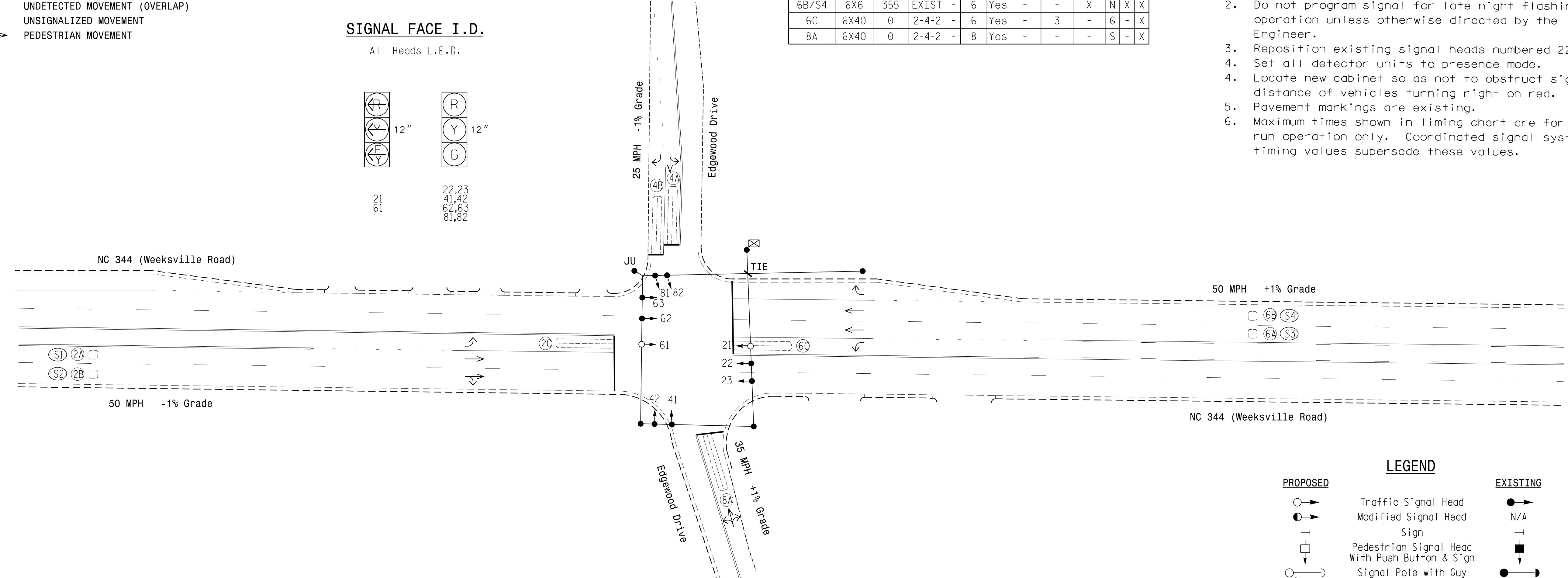
**ASC/3 DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S1	6X6	355	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	355	EXIST	-	2	Yes	-	-	X	N	X	X
2C	6X40	0	2-4-2	-	2	Yes	-	3	-	G	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	15	-	S	-	X
6A/S3	6X6	355	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	355	EXIST	-	6	Yes	-	-	X	N	X	X
6C	6X40	0	2-4-2	-	6	Yes	-	3	-	G	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	-	X

**2 Phase Fully Actuated (Elizabeth City Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 22 and 23.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**ASC/3 TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green *	14	7	14	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	6.0	2.0
Max I *	90	25	90	25
Yellow	4.9	3.2	4.9	3.8
Red Clear	1.1	2.8	1.1	2.1
Actuations B4 Add *	0	-	0	-
Seconds /Actuation *	1.5	-	1.5	-
Max Initial *	40	-	40	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

**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

**Signal Upgrade**

**PLANS PREPARED BY :**  
**RK&K**  
 RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 DEPARTMENT OF TRANSPORTATION  
 STATE OF NORTH CAROLINA  
 Signal Design Section  
 750 N. Greenfield Pkwy, Garner, NC 27529

**NC 344 (Weeksville Road) At Edgewood Drive**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: DTSears  
 PREPARED BY: CBHolden REVIEWED BY: DTSears

REVISIONS	INIT.	DATE

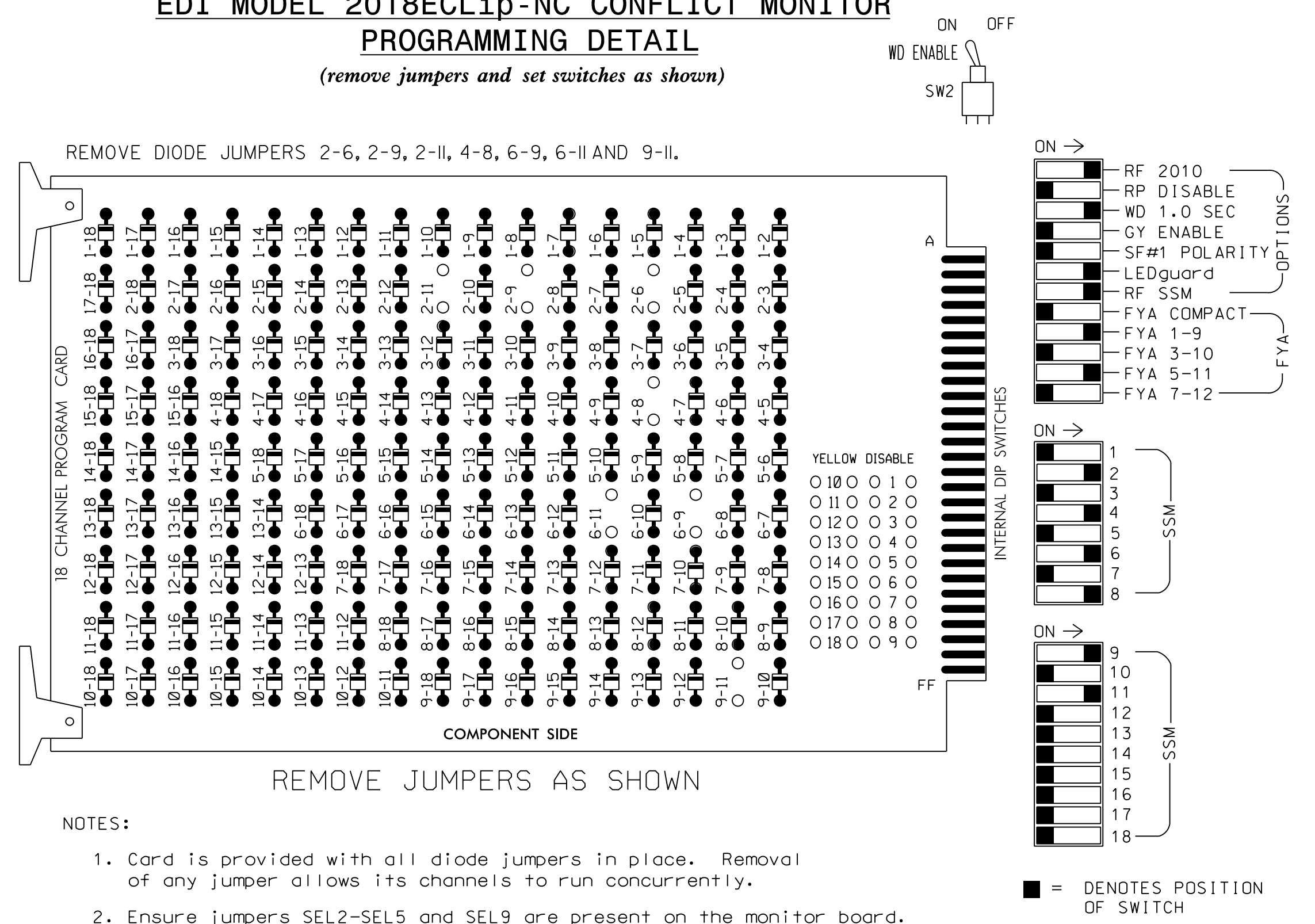
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 033753  
 C. BYRON HOLDEN  
 DocuSigned by: C. Byron Holden  
 9/21/2018  
 DATE  
 SIGNATURE  
 SIG. INVENTORY NO. 01-0750

9/21/2018  
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### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

### NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Elizabeth City 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,AUX S1, AUX S4  
 PHASES USED.....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.	NU	22,23	NU	NU	41,42	NU	NU	62,63	NU	NU	81,82	NU	61	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																		

NU = Not Used

★ 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	∅2/SYS	∅2	∅2	∅2	∅4	∅4	∅4	∅4	∅4	∅4	∅4	∅4	∅4	FS
I	2A/S1	2C	2C	2C	4A	4A	4A	4A	4A	4A	4A	4A	4A	DC ISOLATOR
L	∅2/SYS	NOT USED	NOT USED	NOT USED	∅4	∅4	∅4	∅4	∅4	∅4	∅4	∅4	∅4	ST
U	∅6/SYS	∅6	∅6	∅6	∅8	∅8	∅8	∅8	∅8	∅8	∅8	∅8	∅8	DC ISOLATOR
I	6A/S3	6C	6C	6C	8A	8A	8A	8A	8A	8A	8A	8A	8A	
L	∅6/SYS	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	
U	6B/S4													

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

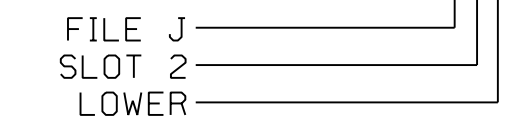
FS = FLASH SENSE  
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

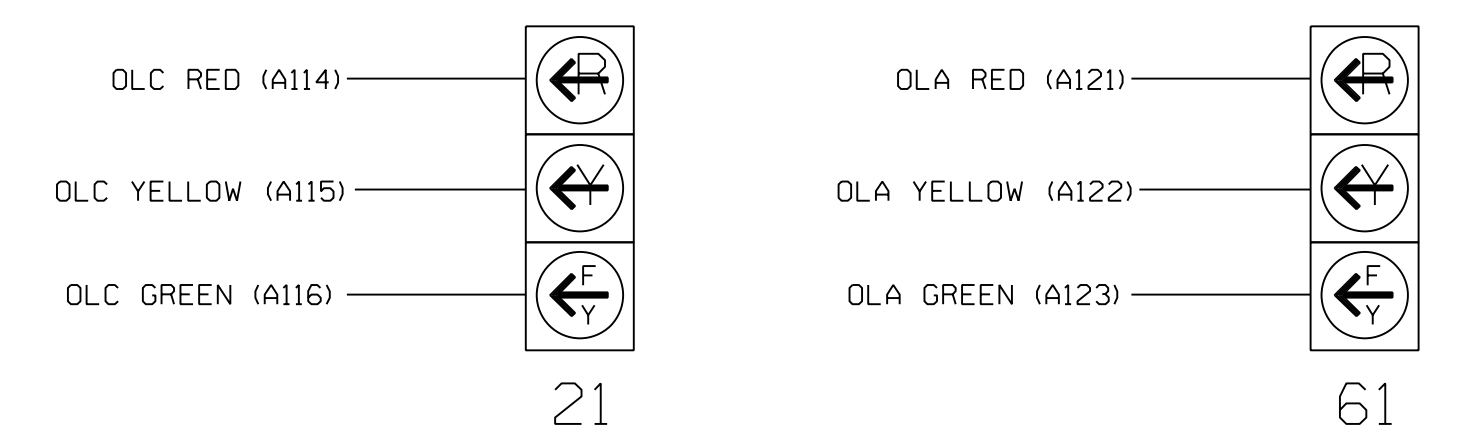
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES		3		G
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		15		S
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES		3		G
8A	TB5-9,10	J6U	42	8	8	YES				S

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0750  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

Electrical Detail Sheet 1 of 2

PLANS PREPARED BY: **RK&K**

RUMMEL, KLEPPER & KAHL, LLP  
 900 RIDGEFIELD DRIVE SUITE 350  
 RALEIGH, NORTH CAROLINA 27609-3960  
 NC LICENSE NO. F-0112 • (919) 878-9560

Prepared for the Offices of:

NC 344 (Weeksville Road) at Edgewood Drive

Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: September 2018 REVIEWED BY: J O Deaton  
 PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: James O. Deaton 9/21/2018

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JAMES O. DEATON SEAL 07438

SIG. INVENTORY NO. 01-0750

9/21/2018 R:\Projects\cncs\Signal\gnw\electrical\Detail\01-0750e-04-200.dgn dsccsr

## 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:	<span style="border: 1px solid black; padding: 2px;">OTHER/ECONOLITE</span>
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 'OTHER/ECONOLITE'

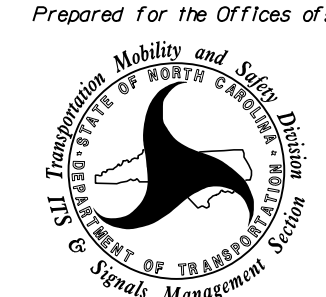
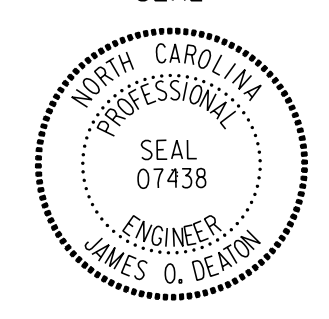
TMG VEH OVLP... [C] TYPE:	<span style="border: 1px solid black; padding: 2px;">OTHER/ECONOLITE</span>
PHASES	1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED	. . . . . X . . . . .
PROTECT	. . . . .
PED PRTC	. . . . .
NOT OVLP	. . . . .
FLSH GRN	. . . . . 1 . . . . .
LAG X PH	. . . . .
LAG 2 PH	. . . . .
LAG GRN	0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

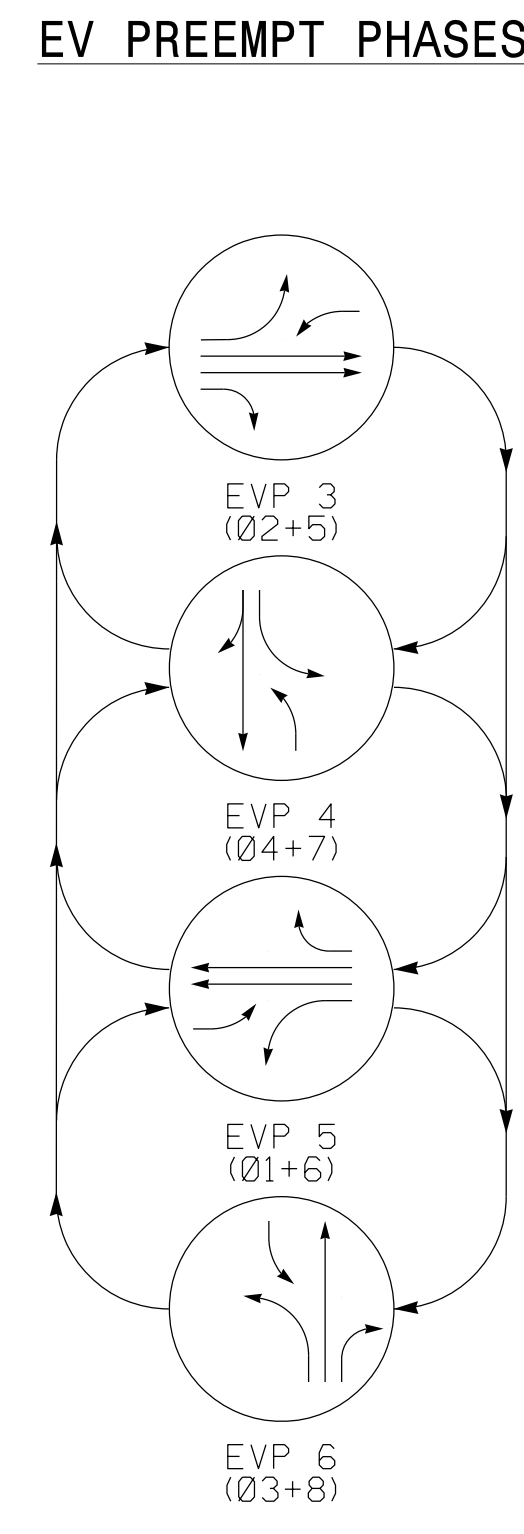
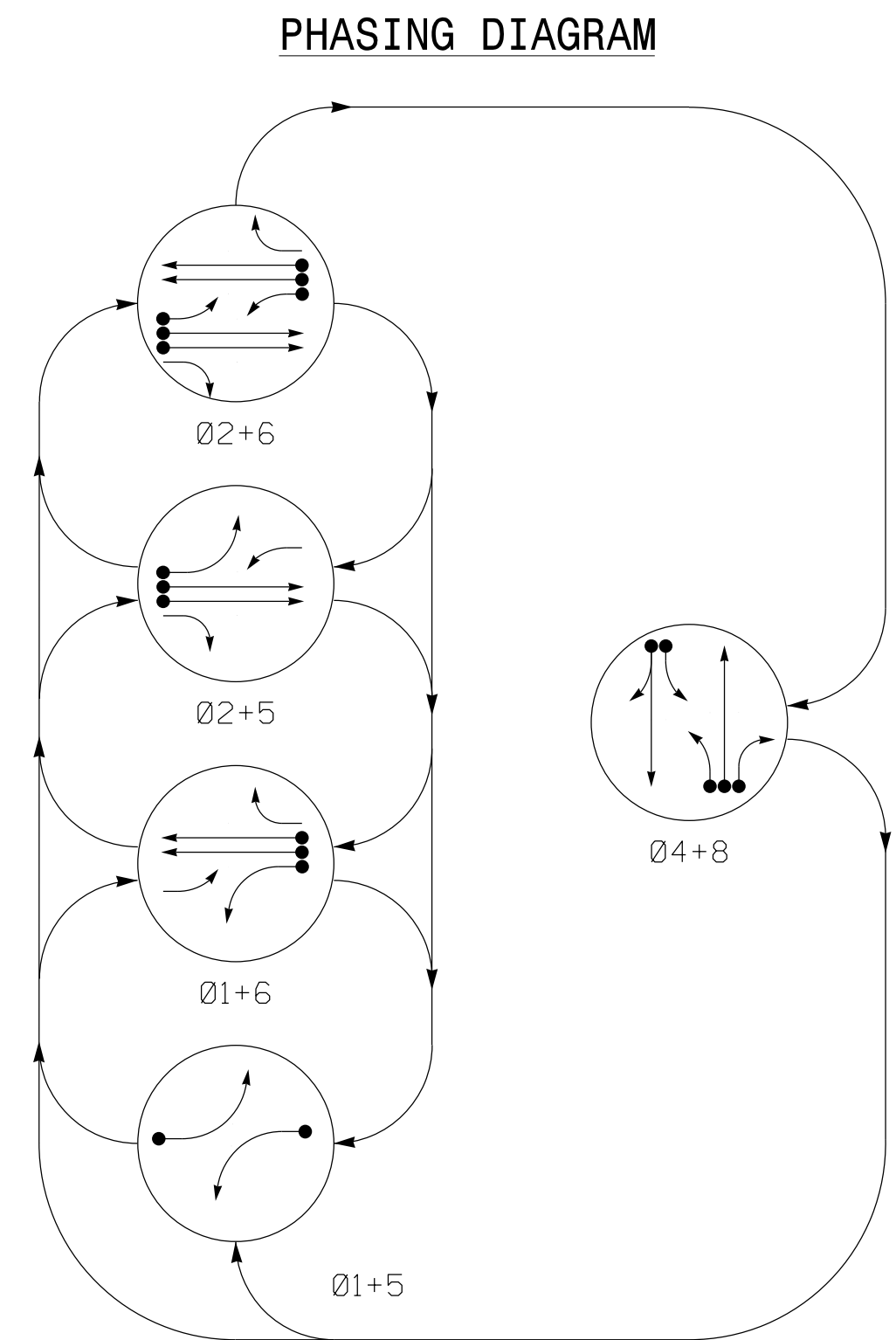
END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 01-0750  
 DESIGNED: September 2018  
 SEALED: 09/21/2018  
 REVISED: N/A

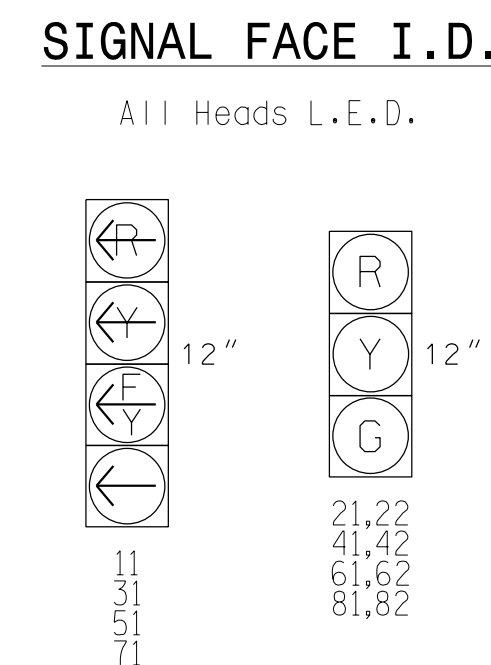
9/21/2018  
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 dsccs

DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

<p><b>PLANS PREPARED BY :</b></p> <p style="font-size: 2em; font-weight: bold; text-align: center;">RK&amp;K</p> <p style="font-size: small;">RUMMEL, KLEPPER &amp; KAHL, LLP          900 RIDGEFIELD DRIVE SUITE 350          RALEIGH, NORTH CAROLINA 27609-3960          NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <div style="text-align: center;">  <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p> </div>	<p style="font-size: 1.2em;">NC 344 (Weeksville Road) at Edgewood Drive</p> <p style="font-size: x-small;">Division 1 Pasquotank County Elizabeth City</p> <p style="font-size: x-small;">PLAN DATE: September 2018 REVIEWED BY: J O Deaton</p> <p style="font-size: x-small;">PREPARED BY: M W Yalch 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="text-align: center; font-size: small;">SEAL</p> <div style="text-align: center;">  <p style="font-size: x-small;">NORTH CAROLINA PROFESSIONAL SEAL 07438 ENGINEER JAMES O. DEATON</p> </div> <p style="font-size: x-small;">DocuSigned by: <i>James O. Deaton</i> 9/21/2018</p> <p style="font-size: x-small;">DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 01-0750</p>
REVISIONS	INIT.	DATE										



SIGNAL FACE	PHASE								
	Ø1+5	Ø2+5	Ø2+6	Ø4+8	EVP3	EVP4	EVP5	EVP6	FLASH
11									
21, 22	R	R	G	G	R	G	R	R	Y
31	R	R	R	R	F	R	F	R	R
41, 42	R	R	R	R	G	R	G	R	R
51	R	F	R	R	G	R	R	R	Y
61, 62	R	G	R	G	R	R	R	G	Y
71	R	R	R	R	F	R	F	R	R
81, 82	R	R	R	R	G	R	R	R	G

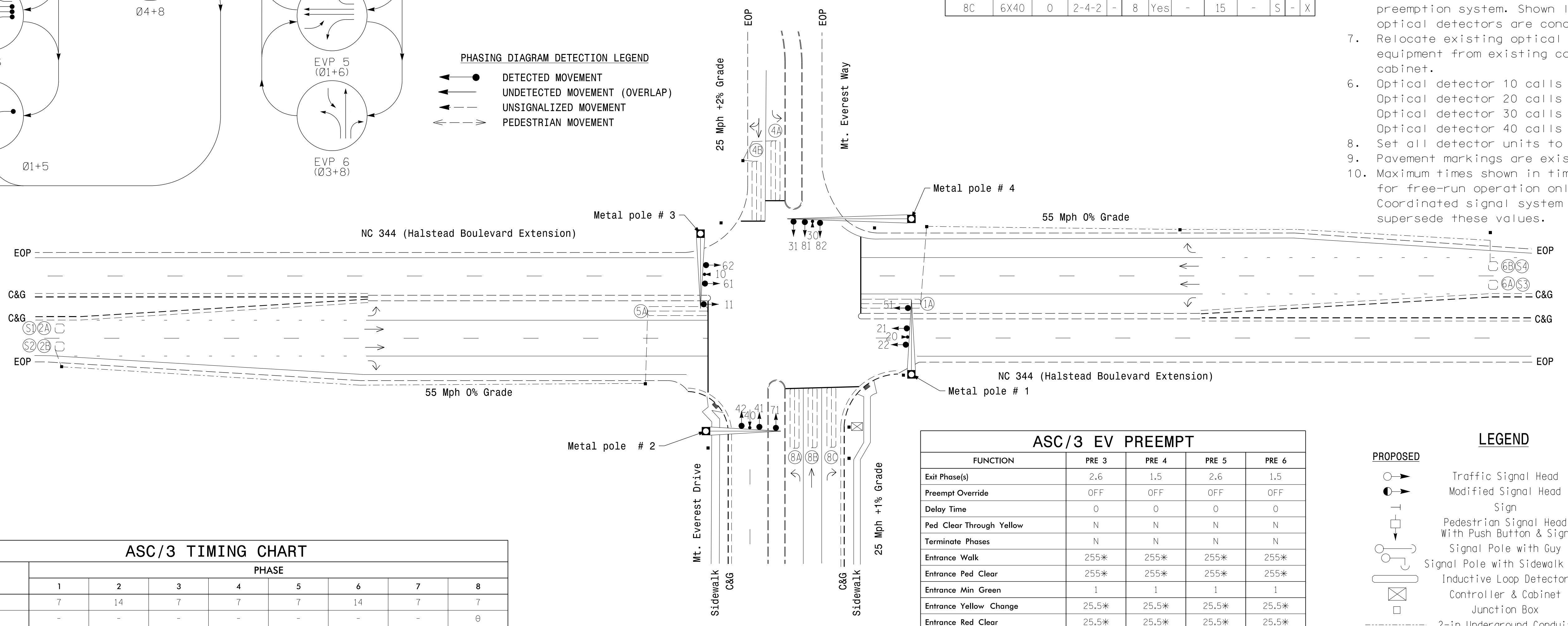
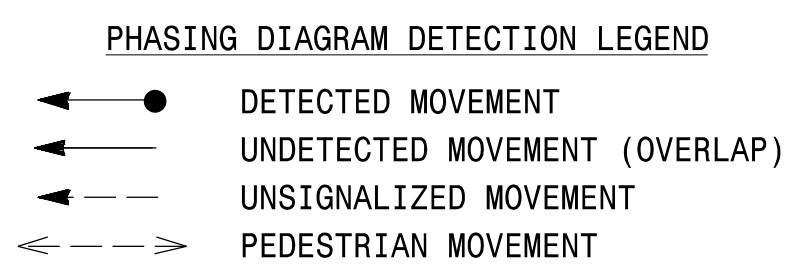


ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	S	X
2A/S1	6X6	420	EXIST	-	2	Yes	-	3	-	G	X
2B/S2	6X6	420	EXIST	-	2	Yes	-	-	X	N	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	S	X
4B	6X40	0	2-4-2	-	4	Yes	-	10	-	S	X
5A	6X40	0	2-4-2	-	5	Yes	-	15	-	S	X
6A/S3	6X6	420	EXIST	-	6	Yes	-	-	X	N	X
6B/S4	6X6	420	EXIST	-	6	Yes	-	-	X	N	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	S	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	-	S	X
8C	6X40	0	2-4-2	-	8	Yes	-	15	-	S	X

### 5 Phase Fully Actuated W/ EV Preemption (Elizabeth City 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 5 may be lagged.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Relocate existing optical detection equipment from existing cabinet to new cabinet.
- Optical detector 10 calls EVP5; Optical detector 20 calls EVP3; Optical detector 30 calls EVP6; Optical detector 40 calls EVP4;
- Set all detector units to presence mode.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

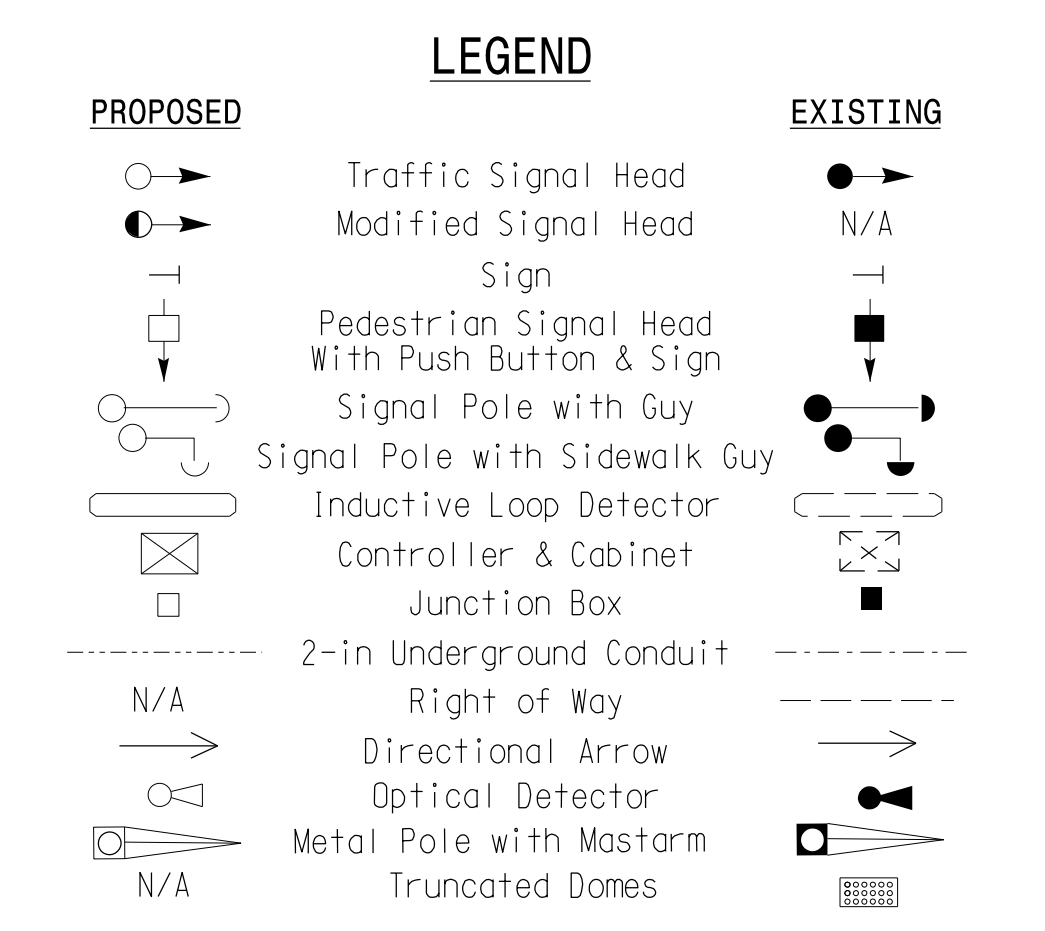


FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Walk *	-	-	-	-	-	-	-	0
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	-	2.0	2.0	6.0	-	2.0
Max 1 *	25	70	-	25	25	70	-	25
Yellow	3.0	5.2	3.0	3.1	3.0	5.2	3.0	3.1
Red Clear	2.9	1.2	2.6	3.1	2.9	1.2	3.2	3.1
Actions B4 Add *	-	0	-	-	-	0	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	46	-	-	-	46	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	45	-	-	-	45	-	-
Minimum Gap	-	3.4	-	-	-	3.4	-	-
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.

ASC/3 EV PREEMPT				
FUNCTION	PRE 3	PRE 4	PRE 5	PRE 6
Exit Phase(s)	2.6	1.5	2.6	1.5
Preempt Override	OFF	OFF	OFF	OFF
Delay Time	0	0	0	0
Ped Clear Through Yellow	N	N	N	N
Terminate Phases	N	N	N	N
Entrance Walk	255*	255*	255*	255*
Entrance Ped Clear	255*	255*	255*	255*
Entrance Min Green	1	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*	25.5*
Minimum Dwell Time	14	7	14	7
Preempt Input Extension Time	2	2	2	2
Preempt Max Time	120	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*	25.5*

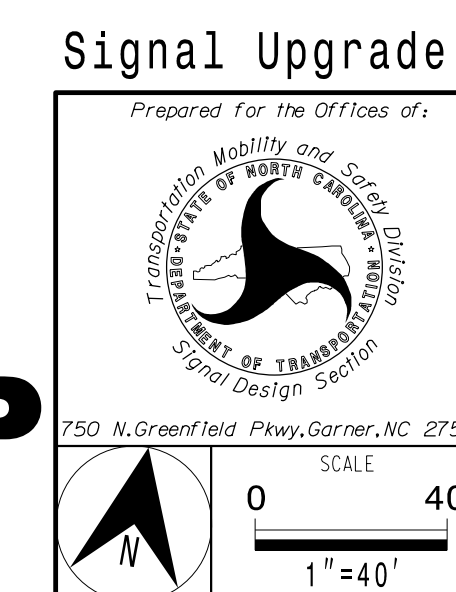
\* Allows normal phase times to be used.



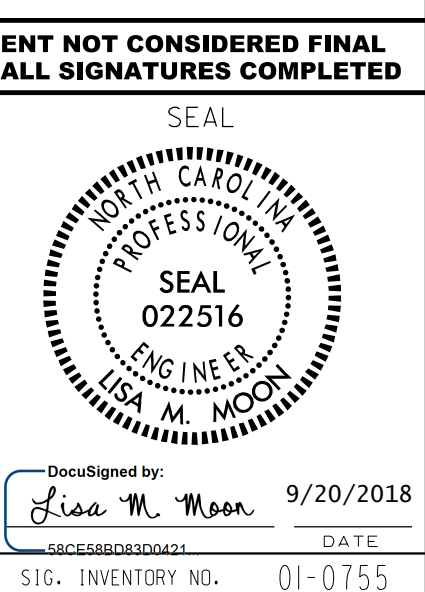
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 R:\415942\5\1\001\4\4\5\Sig.44.0\1\001\4\4\5\Sig.44.0.dgn  
 Imcon AT CAR-L\MOON\W



Plans Prepared By:  
 DRMP, Inc.  
 8000 Regency Parkway, Suite 175  
 Cary, NC 27516  
 NC License No. C-2213 (919) 650-1038



Signal Upgrade  
 Prepared for the Offices of:  
**NC 344 (Halstead Blvd. Ext.)**  
**at**  
**Mt. Everest Way/**  
**Mt. Everest Drive**  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: March 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: JA Le REVIEWED BY: LM Moon  
 REVISIONS: \_\_\_\_\_ INIT. DATE: \_\_\_\_\_



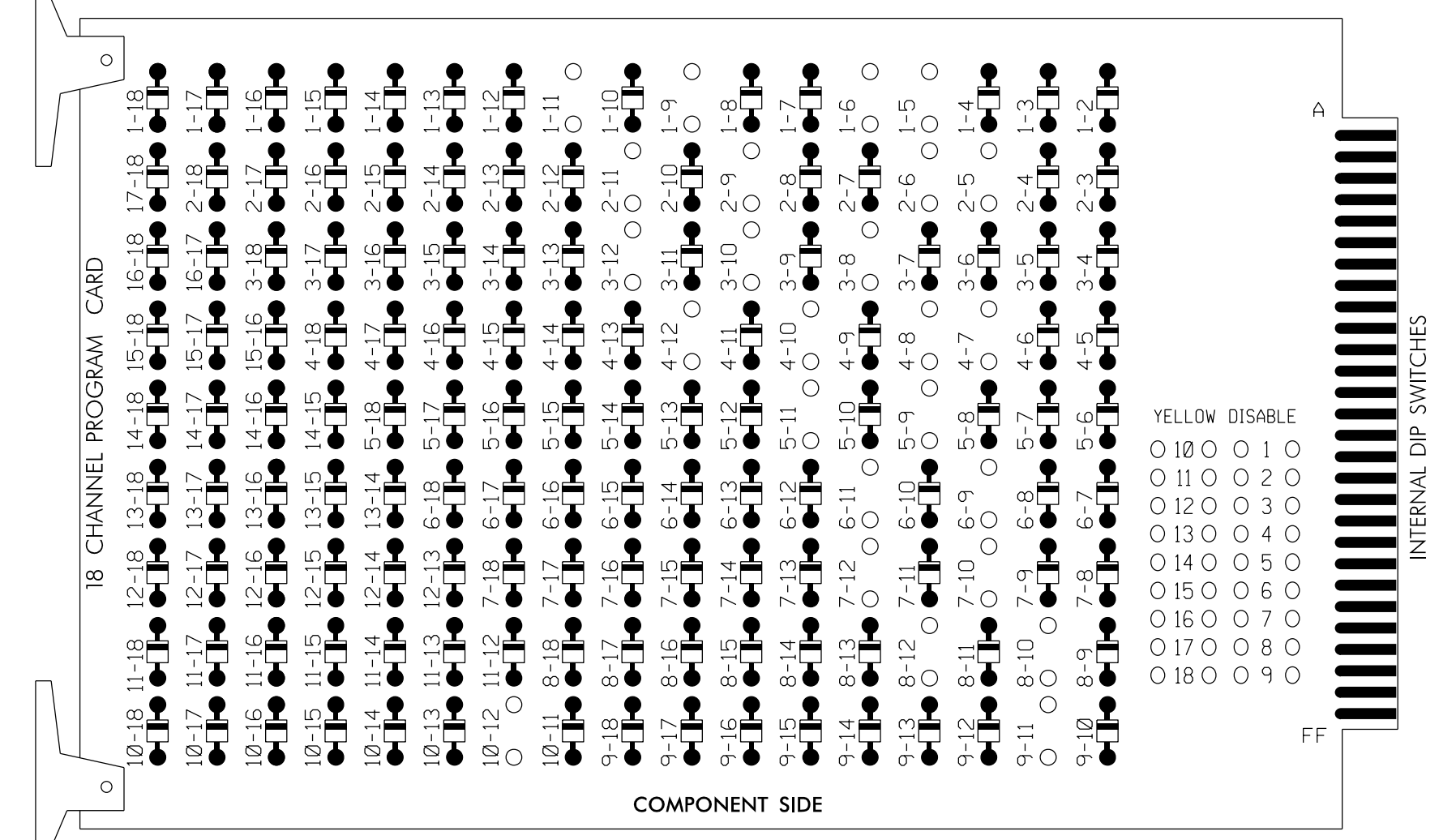
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:  
 Lisa M. Moon  
 9/20/2018  
 SIG. INVENTORY NO. 01-0755

### 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, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 and 10-12.



REMOVE JUMPERS AS SHOWN

**NOTES:**

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

### 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 Elizabeth City Signal System.

### EQUIPMENT INFORMATION

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

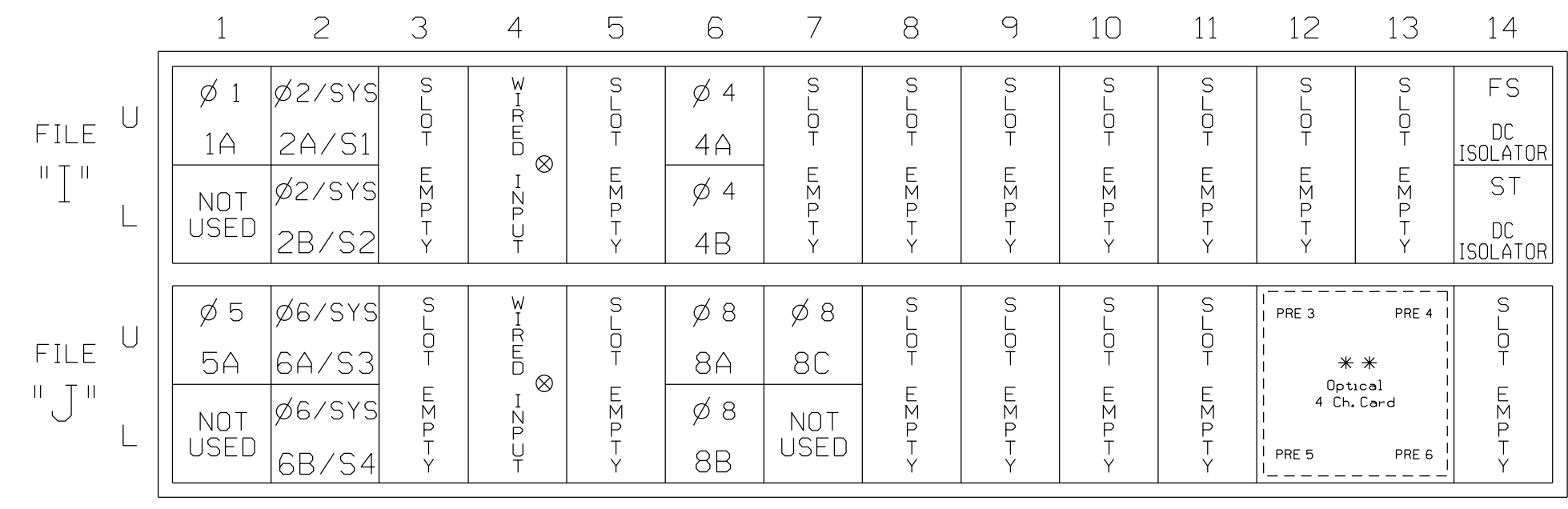
### SIGNAL HEAD HOOK-UP CHART

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

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

### INPUT FILE POSITION LAYOUT

(front view)



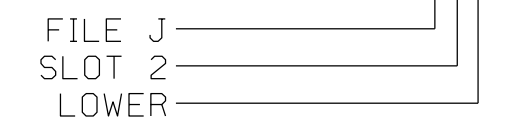
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 \* Wired Input - Do not populate slot with detector card  
 FS = FLASH SENSE  
 ST = STOP TIME  
 PRE = PREEMPT

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A'	TB2-1,2	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
2A/S1	TB2-5,6	I2U	39	2	2/SYS	YES			X	N
2B/S2	TB2-7,8	I2L	43	12	2/SYS	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A'	TB3-1,2	J1U	55	5	5	YES		15		S
-	-	I4U	47	22	2	YES		3		G
6A/S3	TB3-5,6	J2U	40	6	6/SYS	YES			X	N
6B/S4	TB3-7,8	J2L	44	16	6/SYS	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES				S
8C	TB7-1,2	J7U	66	38	8	YES		15		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



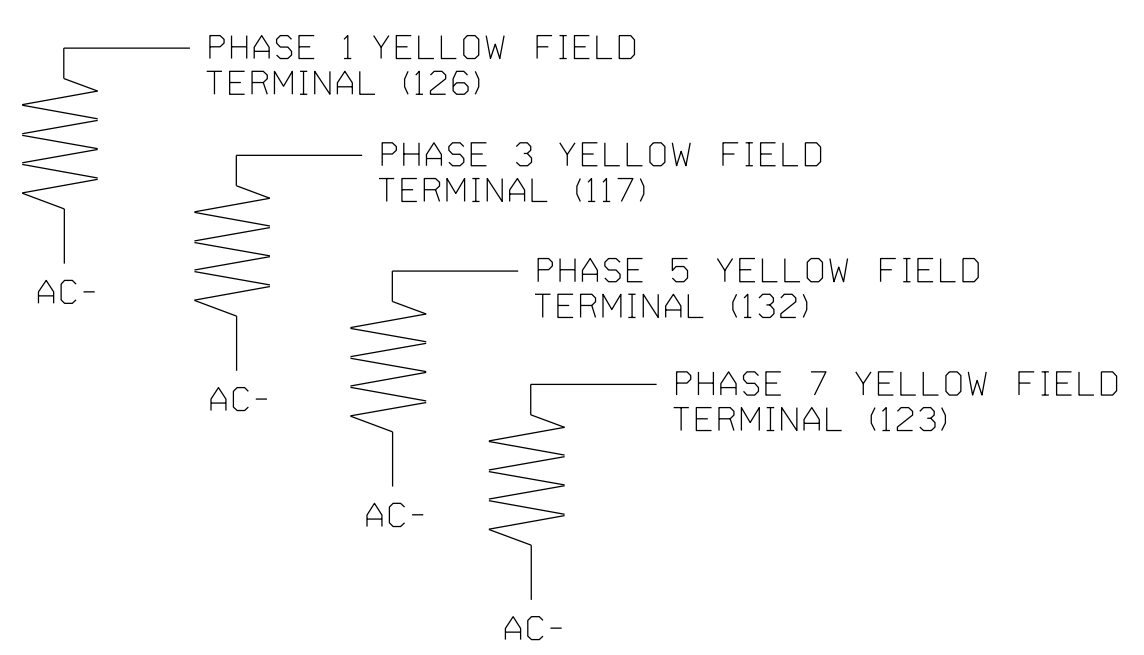
### \*\* OPTICAL PREEMPTION SYSTEM

- Install an optical preemption system for emergency vehicle preemption. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the preemption schemes shown on the Signal Design Plans.
- Ensure that the Optical Preemption System is fully compatible with equipment manufactured in accordance with the specification of the type 2070 controller.

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0755  
 DESIGNED: MARCH 2018  
 SEALED: 09/20/2018  
 REVISED: N/A

Electrical Detail - Sheet 1 of 3

NC 344 (Halstead Blvd. Ext.)  
 at  
 Mt. Everest Way/  
 Mt. Everest Drive  
 Division 1 Pasquotank County Elizabeth City  
 PLAN DATE: March 2018 REVIEWED BY: AJ Davis  
 PREPARED BY: DJ White REVIEWED BY: LM Moon

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022516  
 LISA M. MOON  
 DocuSigned by:  
 Lisa M. Moon 9/20/2018  
 DATE  
 SIG. INVENTORY NO. 01-0755

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

750 N. Greenfield Pkwy, Garner, NC 27529

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

(program controller as shown)

The following logic processor configuration holds the FYA's on signal heads 31 and 71 red during normal phasing operation and only become an active phase when Preemption calls are activated.

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

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

LP#:	1	COPY FROM:	1	ACTIVE:	M	(T/F)	
IF	PMT PREEMT ACTIVE		4	IS	OFF		
THEN	CTR OMIT PHASE		7	ON			
ELSE							

LOGIC FOR OMITTING PHASE 7 AT STARTUP AND/OR WHEN NOT IN PREEMPT

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

LP#:	2	COPY FROM:	2	ACTIVE:	M	(T/F)	
IF	PMT PREEMT ACTIVE		6	IS	OFF		
THEN	CTR OMIT PHASE		3	ON			
ELSE							

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

END PROGRAMMING

- From LOGIC PROCESSOR Submenu select **1. LOGIC STATEMENT CONTROL**

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

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

END PROGRAMMING

## FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

# ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

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

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

Toggle Once

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

TMG VEH OVLP...[B] TYPE:	....	[PPLT FYA]
PROTECTED LEFT TURN....	PHASE	3
OPPOSING THROUGH.....	PHASE	4
FLASHING ARROW OUTPUT.....	CH10	ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE.....	0	

Toggle Once

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

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

Toggle Once

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

TMG VEH OVLP...[D] TYPE:	....	[PPLT FYA]
PROTECTED LEFT TURN....	PHASE	7
OPPOSING THROUGH.....	PHASE	8
FLASHING ARROW OUTPUT.....	CH12	ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE.....	0	

END PROGRAMMING

# ECONOLITE ASC/3-2070 PREEMPT FILTERING PROGRAMMING DETAIL

(program controller as shown)

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

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0755  
DESIGNED: MARCH 2018  
SEALED: 09/20/2018  
REVISED: N/A

Electrical Detail - Sheet 2 of 3



ELECTRICAL AND PROGRAMMING DETAILS FOR:		<b>NC 344 (Halstead Blvd. Ext.)</b>	
Prepared for the Offices of:		at	
		Mt. Everest Way/ Mt. Everest Drive	
Division 1 Pasquotank County Elizabeth City			
PLAN DATE: March 2018	REVIEWED BY: AJ Davis		
PREPARED BY: DJ White	REVIEWED BY: LM Moon		
REVISIONS	INIT.	DATE	

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

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 022516  
LISA M. MOON

DocuSigned by:  
*Lisa M. Moon* 9/20/2018  
SIC6588D8300421  
DATE  
SIG. INVENTORY NO. 01-0755

20-SEP-2018 18:51  
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Incon AT CAR-LMDM1-W7



# ECONOLITE ASC/3-2070 EMERGENCY VEHICLE PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select **4. PREEMPTOR/TSP**

2. From PREEMPTOR/TSP/SCP Submenu select **1. PREEMPT PLAN 1-10**

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

PREEMPT PLAN [ 3 ]	ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
OVERLAP A B C D E F G H I J K L M N O P	
TRKCLR V . . . . .	
TRKCLR O . . . . .	
ENA TRL . . . . .	
DWEL VEH . X . . X . . . . .	
DWEL PED . . . . .	
DWEL OLPF1 .F1 . . . . .	
CYC VEH . . . . .	
CYC PED . . . . .	
CYC OLP . . . . .	
EXIT PH . X . . . X . . . . .	
EXIT CAL . . . . .	
SP FUNC . . . . .	
ENABLE... YES	PMT OVRIDE.. IINTERLOCK. NO
DET LOCK... X	IDELAY.. O IINHIBIT... 0
OVERIDE FL. .	IDURATION OICLR-GRN... NO
TERM OLP. NO	IPC>YEL NOITERM PH NO
PED DARK.. NO	ITC RESRV NOIDWELL FL OFF
LINK PMT....O	IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...O	IRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMT	IR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----	WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 2551	2551 1125.5125.5
-----MIN	GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 01	01 0125.5125.5
-----MIN	DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 141	2.01 120125.5125.5
PMT ACTIVE OUT..ON	PMT ACT DWELL...NO
OTHER - PRI	PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0	PED PR RETURN...OFF
PRIORITY RETURN.OFF	QUEUE DELAY.... OFF
COND DELAY.....OFF	
PHASES 1 2 3 4 5 6 7 8	
PR RTN% 0 0 0 0 0 0 0 0	
PHASES 9 10 11 12 13 14 15 16	
PR RTN% 0 0 0 0 0 0 0 0	

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #4.

PREEMPT PLAN [ 4 ]	ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
OVERLAP A B C D E F G H I J K L M N O P	
TRKCLR V . . . . .	
TRKCLR O . . . . .	
ENA TRL . . . . .	
DWEL VEH . . . X . . X . . . . .	
DWEL PED . . . . .	
DWEL OLP .F1 .F1 . . . . .	
CYC VEH . . . . .	
CYC PED . . . . .	
CYC OLP . . . . .	
EXIT PH X . . . X . . . . .	
EXIT CAL . . . . .	
SP FUNC . . . . .	
ENABLE... YES	PMT OVRIDE.. IINTERLOCK. NO
DET LOCK... X	IDELAY.. O IINHIBIT... 0
OVERIDE FL. .	IDURATION OICLR-GRN... NO
TERM OLP. NO	IPC>YEL NOITERM PH NO
PED DARK.. NO	ITC RESRV NOIDWELL FL OFF
LINK PMT....O	IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...O	IRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMT	IR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----	WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 2551	2551 1125.5125.5
-----MIN	GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 01	01 0125.5125.5
-----MIN	DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 71	2.01 120125.5125.5
PMT ACTIVE OUT..ON	PMT ACT DWELL...NO
OTHER - PRI	PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0	PED PR RETURN...OFF
PRIORITY RETURN.OFF	QUEUE DELAY.... OFF
COND DELAY.....OFF	
PHASES 1 2 3 4 5 6 7 8	
PR RTN% 0 0 0 0 0 0 0 0	
PHASES 9 10 11 12 13 14 15 16	
PR RTN% 0 0 0 0 0 0 0 0	

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

PREEMPT PLAN [ 5 ]	ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
OVERLAP A B C D E F G H I J K L M N O P	
TRKCLR V . . . . .	
TRKCLR O . . . . .	
ENA TRL . . . . .	
DWEL VEH X . . . . X . . . . .	
DWEL PED . . . . .	
DWEL OLPF1 .F1 . . . . .	
CYC VEH . . . . .	
CYC PED . . . . .	
CYC OLP . . . . .	
EXIT PH . X . . . X . . . . .	
EXIT CAL . . . . .	
SP FUNC . . . . .	
ENABLE... YES	PMT OVRIDE.. IINTERLOCK. NO
DET LOCK... X	IDELAY.. O IINHIBIT... 0
OVERIDE FL. .	IDURATION OICLR-GRN... NO
TERM OLP. NO	IPC>YEL NOITERM PH NO
PED DARK.. NO	ITC RESRV NOIDWELL FL OFF
LINK PMT....O	IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...O	IRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMT	IR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----	WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 2551	2551 1125.5125.5
-----MIN	GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 01	01 0125.5125.5
-----MIN	DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 141	2.01 120125.5125.5
PMT ACTIVE OUT..ON	PMT ACT DWELL...NO
OTHER - PRI	PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0	PED PR RETURN...OFF
PRIORITY RETURN.OFF	QUEUE DELAY.... OFF
COND DELAY.....OFF	
PHASES 1 2 3 4 5 6 7 8	
PR RTN% 0 0 0 0 0 0 0 0	
PHASES 9 10 11 12 13 14 15 16	
PR RTN% 0 0 0 0 0 0 0 0	

Place cursor in [ ] next to Preempt Plan and press 6. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Emergency Vehicle Preempt #6.

PREEMPT PLAN [ 6 ]	ENABLE....YES
VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6	
OVERLAP A B C D E F G H I J K L M N O P	
TRKCLR V . . . . .	
TRKCLR O . . . . .	
ENA TRL . . . . .	
DWEL VEH . . X . . . . X . . . . .	
DWEL PED . . . . .	
DWEL OLP .F1 .F1 . . . . .	
CYC VEH . . . . .	
CYC PED . . . . .	
CYC OLP . . . . .	
EXIT PH X . . . X . . . . .	
EXIT CAL . . . . .	
SP FUNC . . . . .	
ENABLE... YES	PMT OVRIDE.. IINTERLOCK. NO
DET LOCK... X	IDELAY.. O IINHIBIT... 0
OVERIDE FL. .	IDURATION OICLR-GRN... NO
TERM OLP. NO	IPC>YEL NOITERM PH NO
PED DARK.. NO	ITC RESRV NOIDWELL FL OFF
LINK PMT....O	IX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...O	IRE-SERV.. OIFLT TYPE.HARD
FREE DUR PMT	IR1 NOIR2 NOIR3 NOIR4 NO
--TIMING----	WALKIPED CLIMN GRI YELI RED
ENTRANCE TM. 2551	2551 1125.5125.5
-----MIN	GRIEXT GRIMX GRI YELI RED
TRACK CLEAR 01	01 0125.5125.5
-----MIN	DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT 71	2.01 120125.5125.5
PMT ACTIVE OUT..ON	PMT ACT DWELL...NO
OTHER - PRI	PMT.OFF NON-PRI PMT....OFF
INH EXT TIME... 0.0	PED PR RETURN...OFF
PRIORITY RETURN.OFF	QUEUE DELAY.... OFF
COND DELAY.....OFF	
PHASES 1 2 3 4 5 6 7 8	
PR RTN% 0 0 0 0 0 0 0 0	
PHASES 9 10 11 12 13 14 15 16	
PR RTN% 0 0 0 0 0 0 0 0	

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lmoon AT CAR-LMOON-WT

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0755  
DESIGNED: MARCH 2018  
SEALED: 09/20/2018  
REVISED: N/A



Electrical Detail - Sheet 3 of 3

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: <b>NC 344 (Halstead Blvd. Ext.)</b>	
at <b>Mt. Everest Way/ Mt. Everest Drive</b>	
Division 1 Pasquotank County Elizabeth City	
PLAN DATE: <b>March 2018</b>	REVIEWED BY: <b>AJ Davis</b>
PREPARED BY: <b>DJ White</b>	REVIEWED BY: <b>LM Moon</b>
REVISIONS	INIT. DATE

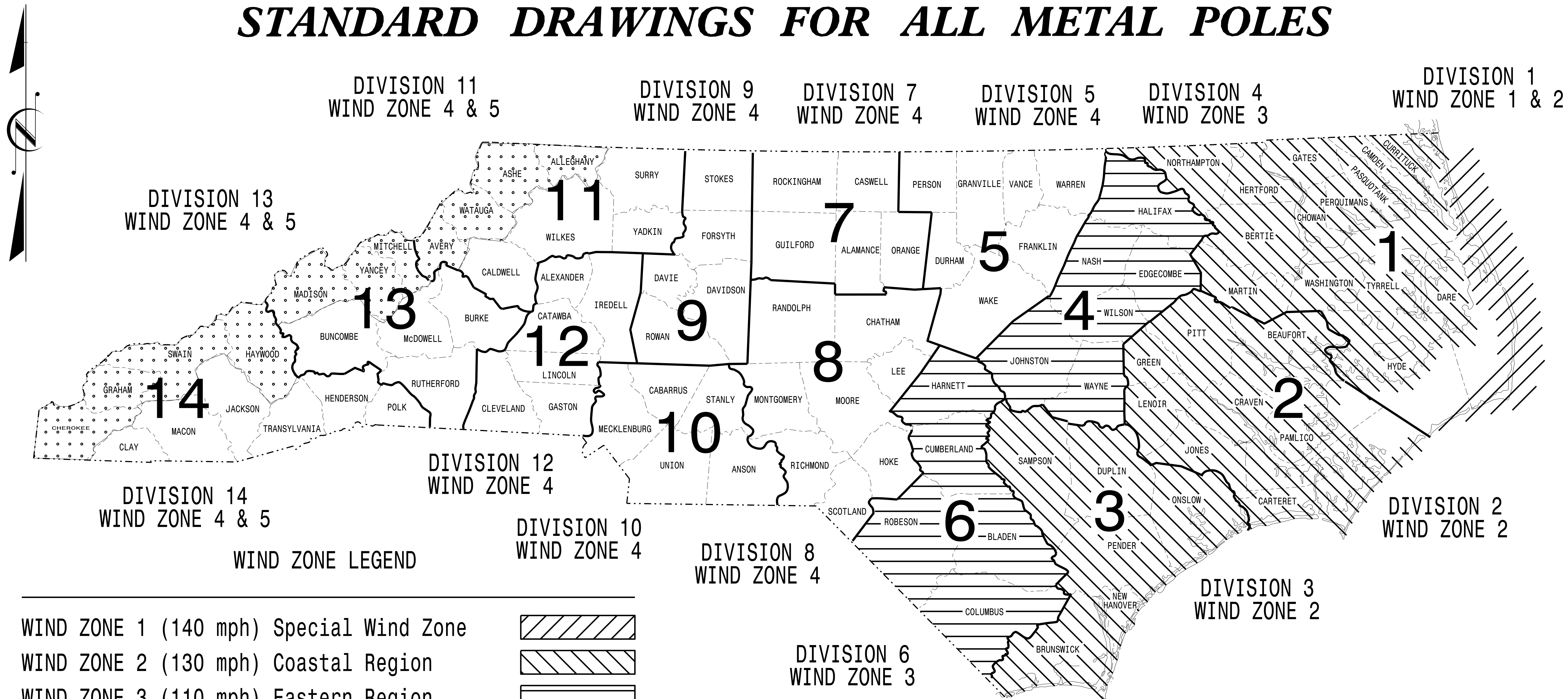
Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON

DocuSigned by: **Lisa M. Moon** 9/20/2018  
SIC65888030421 DATE  
SIG. INVENTORY NO. 01-0755

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO. <b>U-5942</b>	SHEET NO. <b>Sig.M1</b>
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## STANDARD DRAWINGS FOR ALL METAL POLES

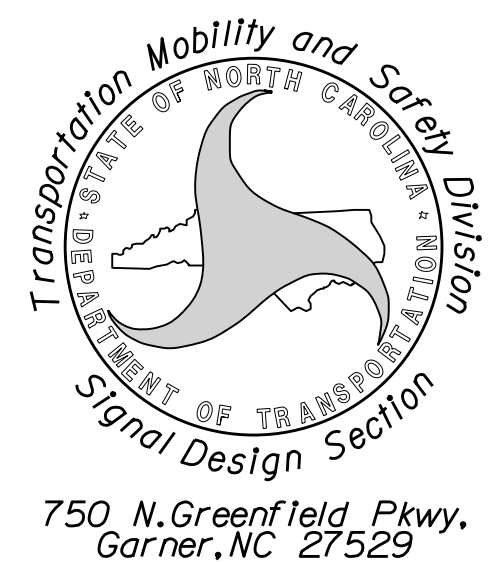


WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

Prepared In the Offices of:



Designed in conformance  
with the latest  
2015 Interim to the  
6th Edition 2013  
**AASHTO**  
Standard Specifications for  
Structural Supports for  
Highway Signs, Luminaires,  
and Traffic Signals

DRAWING NUMBER	DESCRIPTION
Sig. M 1	Statewide Wind Zone Map
Sig. M 2	Typical Fabrication Details-All Metal Poles
Sig. M 3	Typical Fabrication Details-Strain Poles
Sig. M 4	Typical Fabrication Details-Mast Arm Poles
Sig. M 5	Typical Fabrication Details-Mast Arm Connection
Sig. M 6	Typical Fabrication Details-Strain Pole Attachments
Sig. M 7	Construction Details-Foundations
Sig. M 8	Standard Strain Pole Foundation-All Soil Conditions

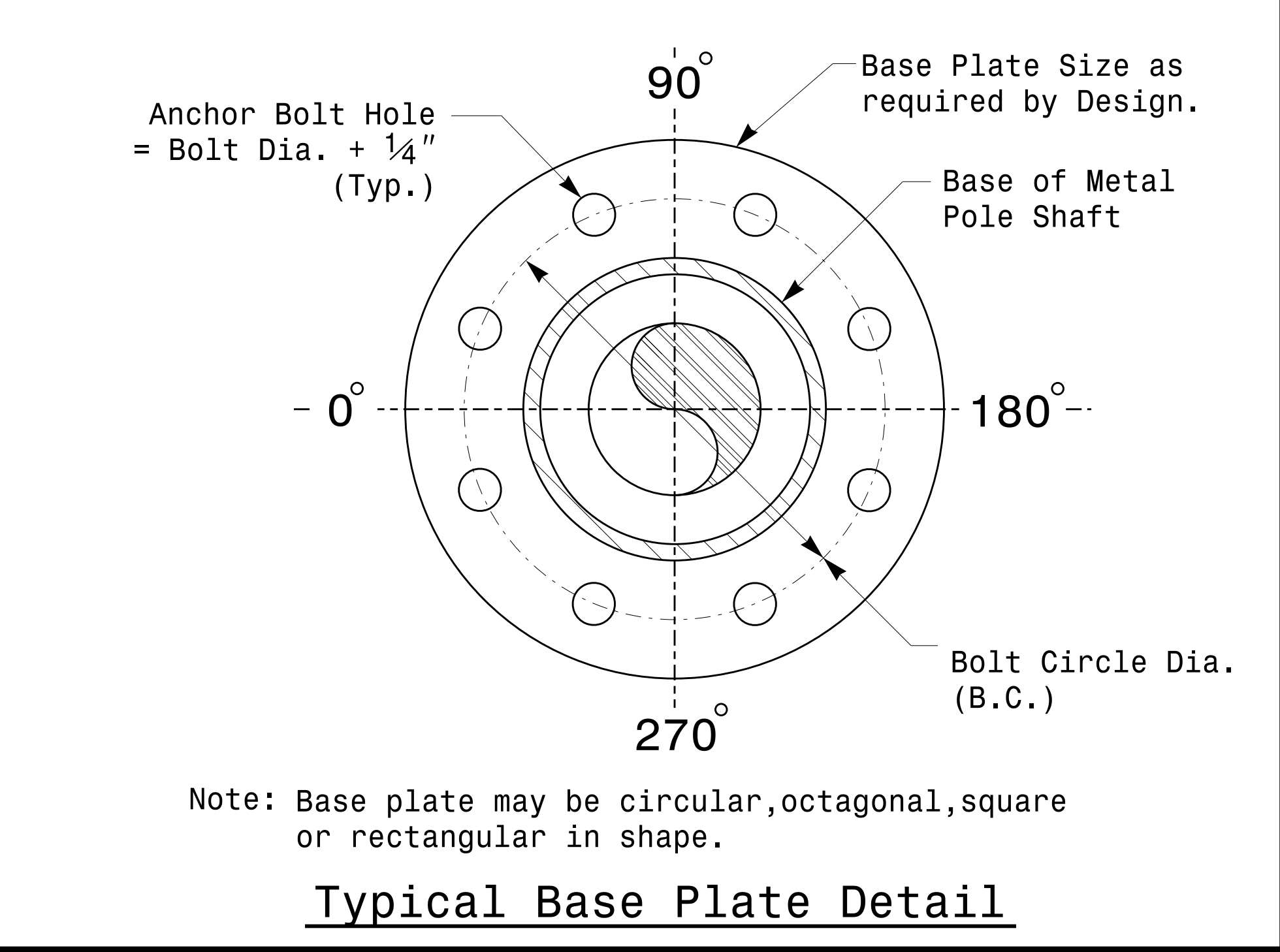
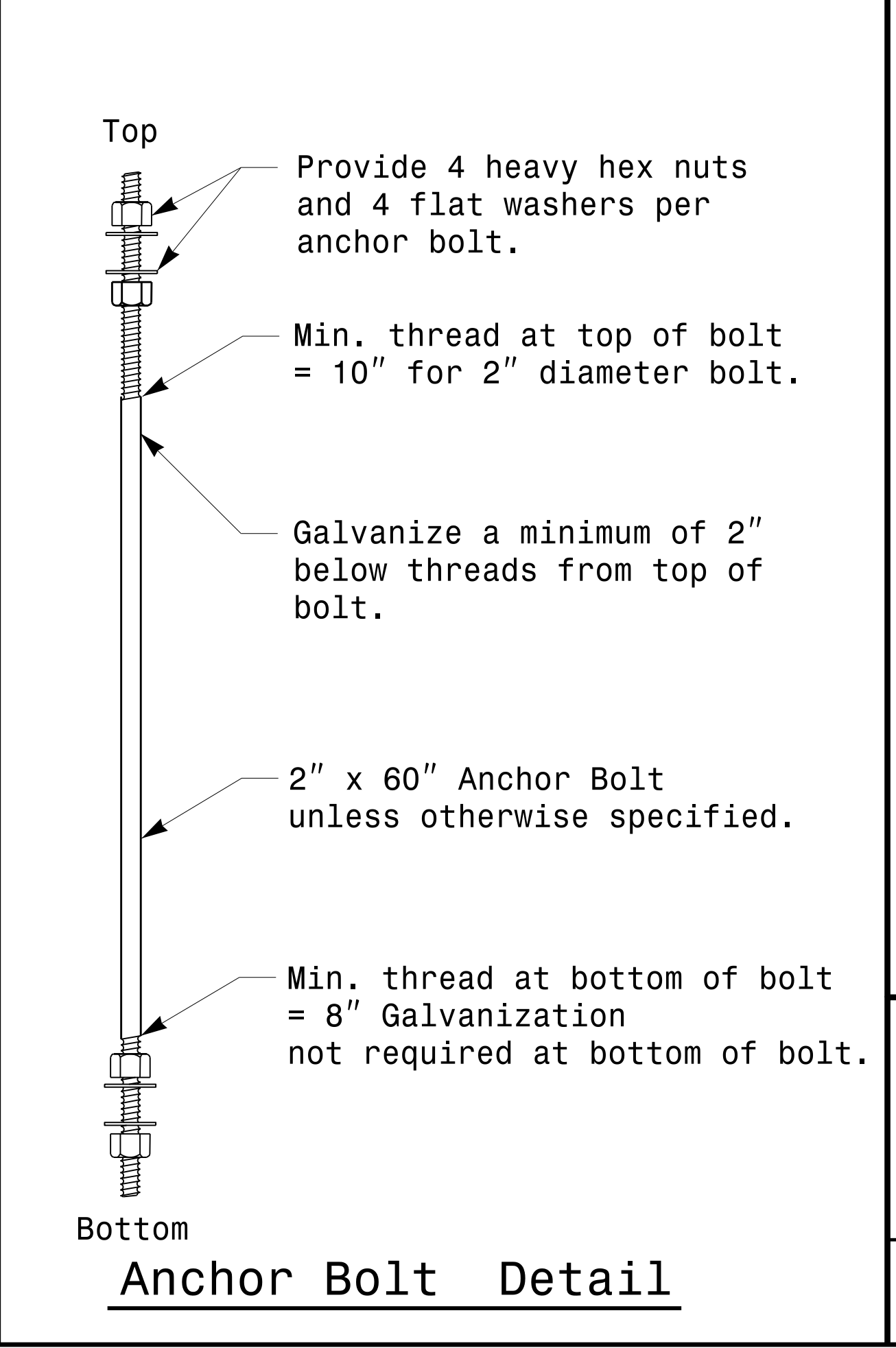
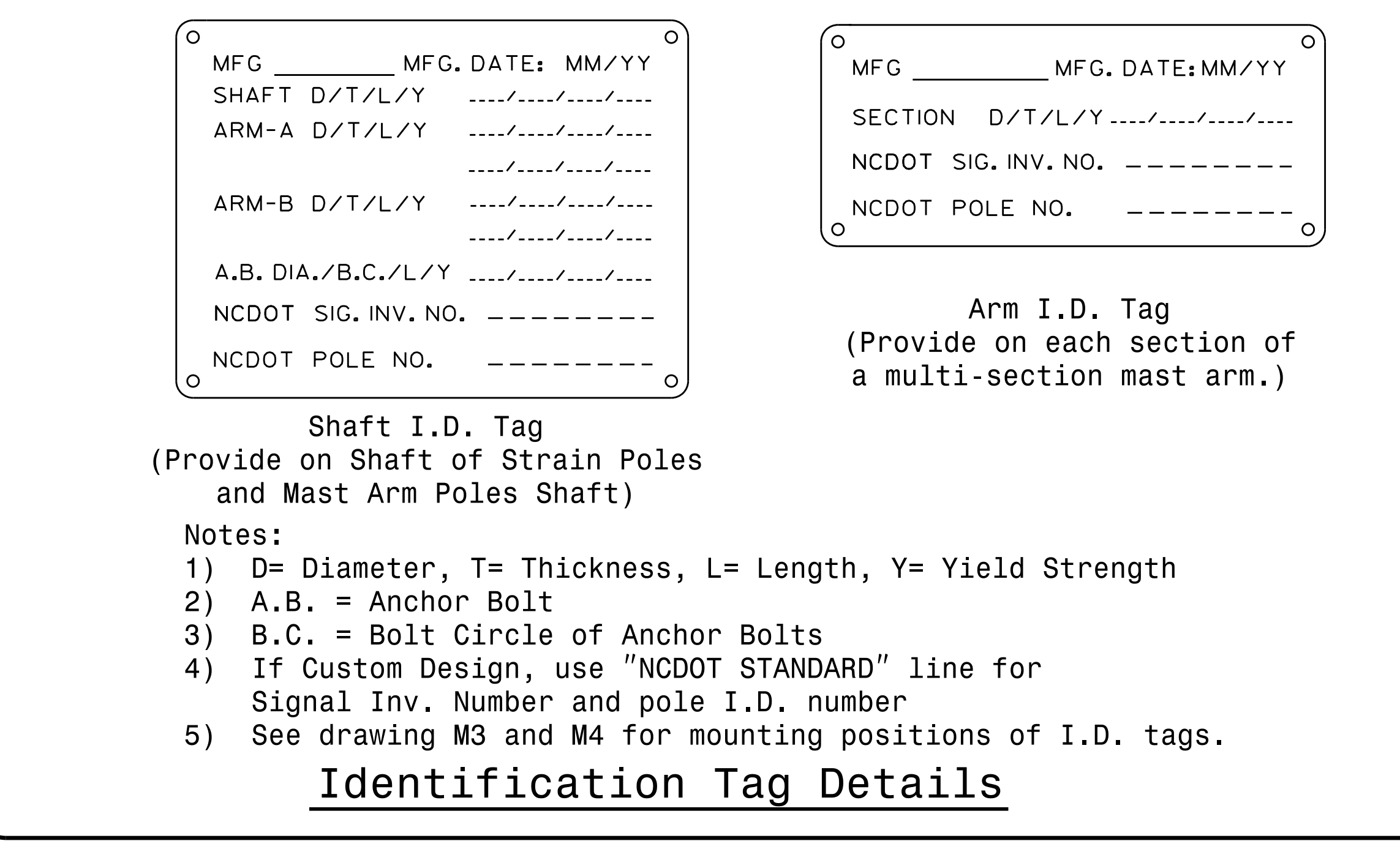
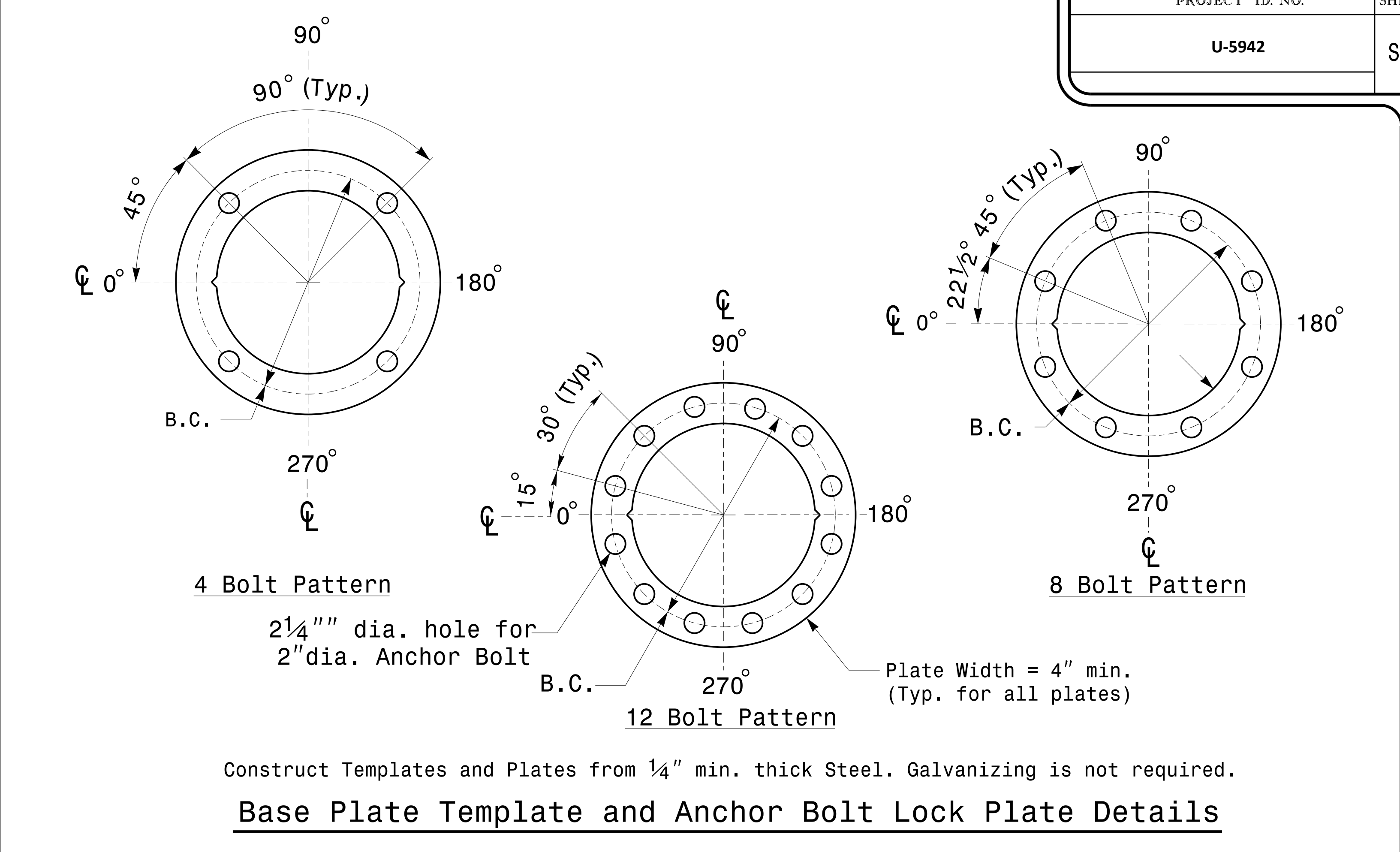
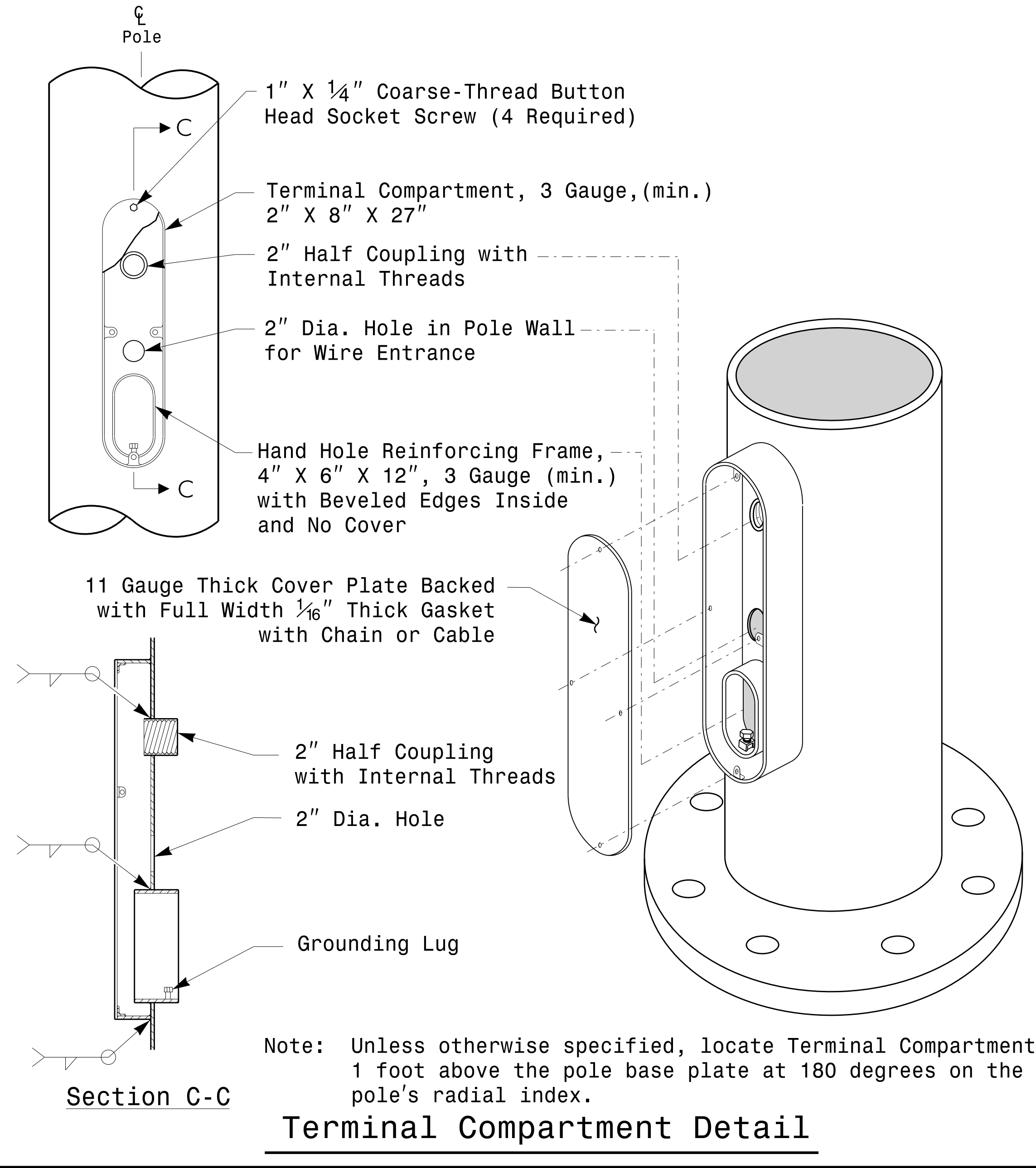
**NC DOT CONTACTS:**  
**MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT**

---

**M.M. MCDIARMID, P.E. - STATE ITS AND SIGNALS ENGINEER**  
**J. P. GALLOWAY, P.E. - STATE SIGNALS ENGINEER**  
**D.C. SARKAR, P.E. - ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER**

SEAL

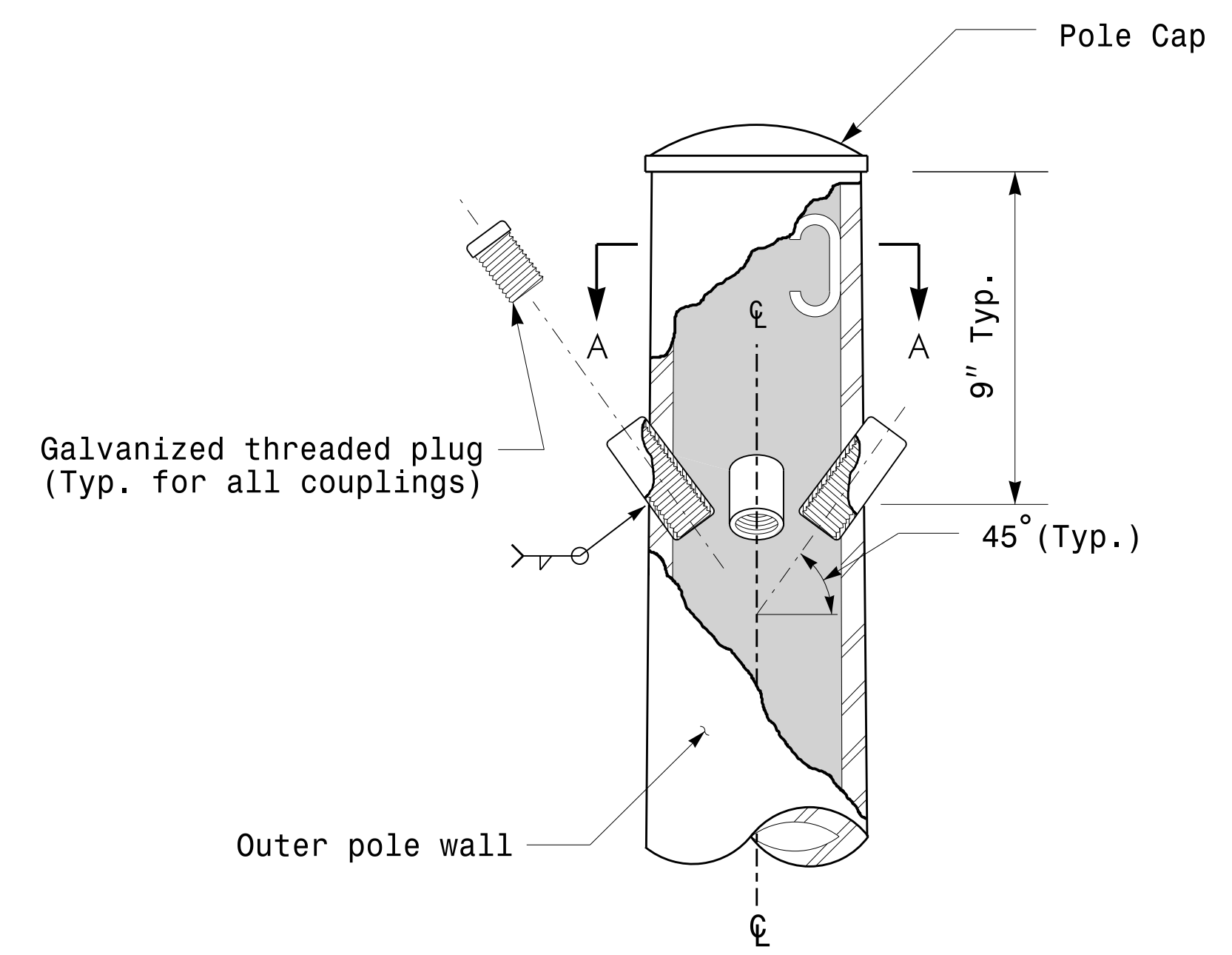
DocuSigned by:  
**Debesh C. Sarkar**  
DATE: 10/11/2017



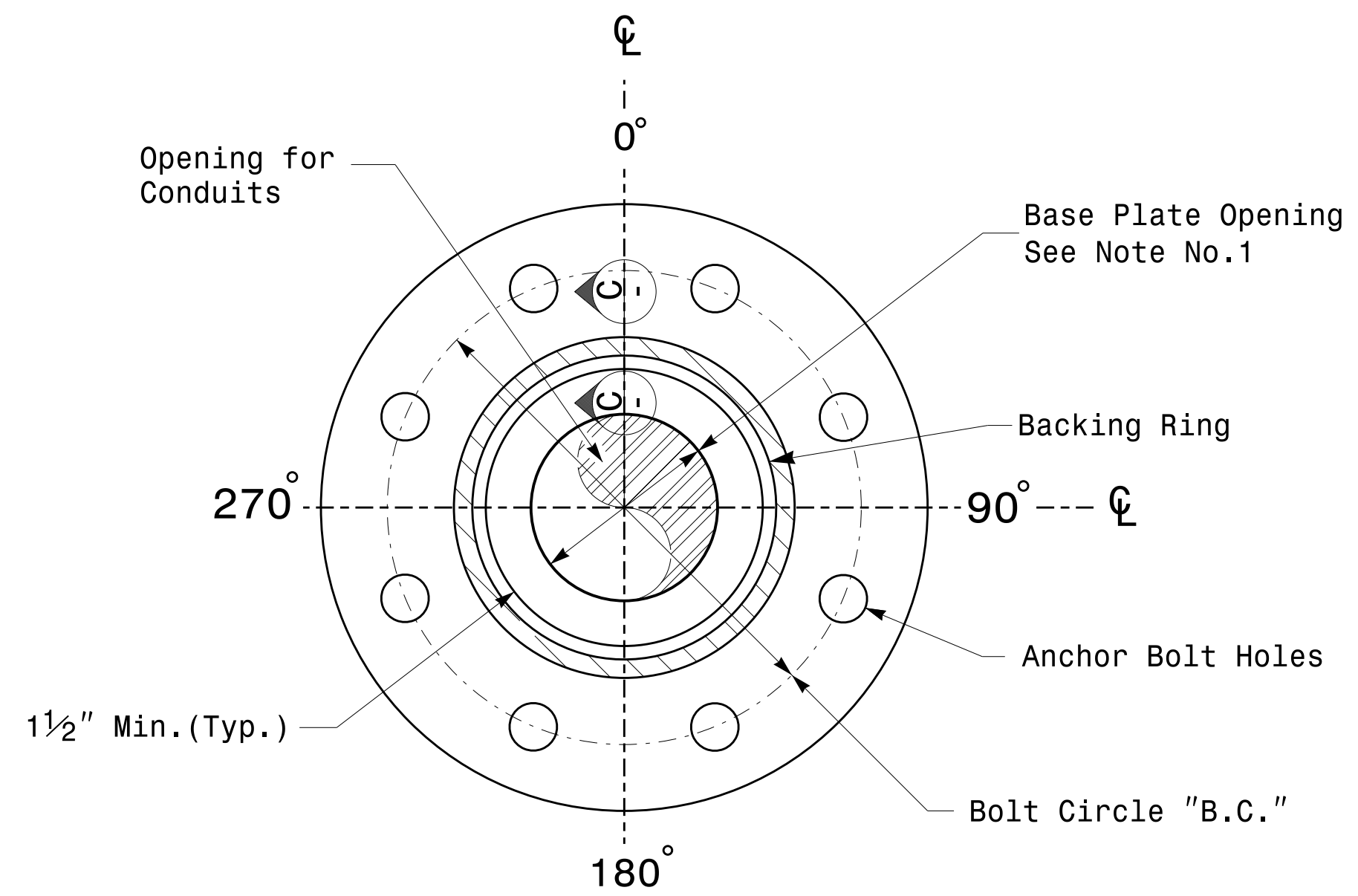
	<b>Typical Fabrication Details For All Metal Poles</b>		
	PLAN DATE: OCTOBER 2017 DESIGNED BY: C.F. ANDREWS	PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR	
SCALE: 0 NONE NA	REVISIONS:	INITI:	DATE:
DocuSigned by: <i>Dhruva C. Sarkar</i>			10/11/2017 DATE

11-001-2017-08:30 136504115 Signal Design Section Eastern Region 11-001-2017-08:30 136504115 Signal Design Section Eastern Region 11-001-2017-08:30 136504115 Signal Design Section Eastern Region 11-001-2017-08:30 136504115 Signal Design Section Eastern Region

Note:  
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".

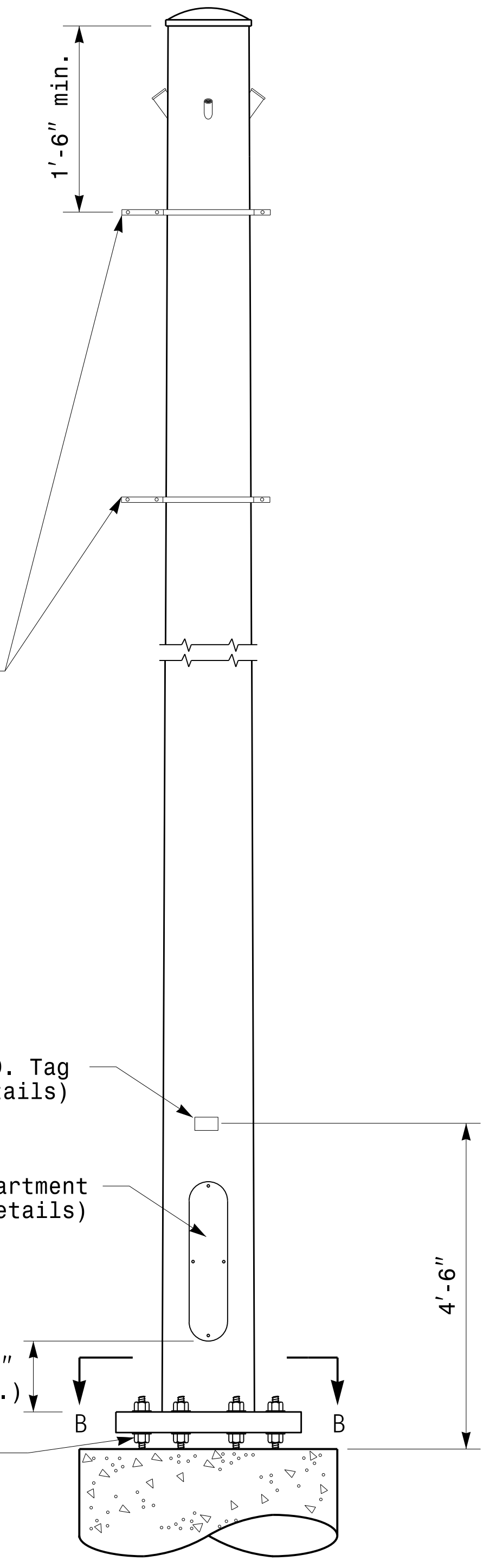


Cable Entrances at Top of Pole

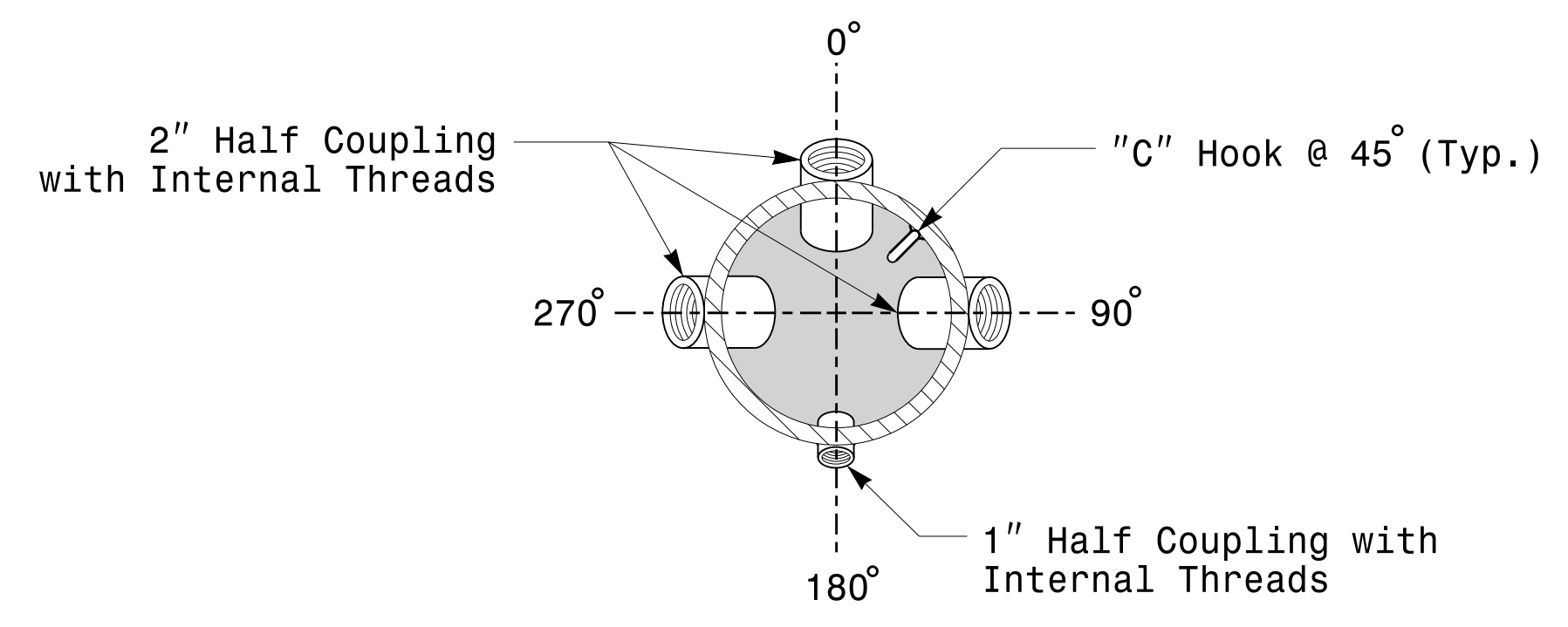


Section B-B  
Pole Base Plate Details  
(8 and 12 Bolt Pattern)

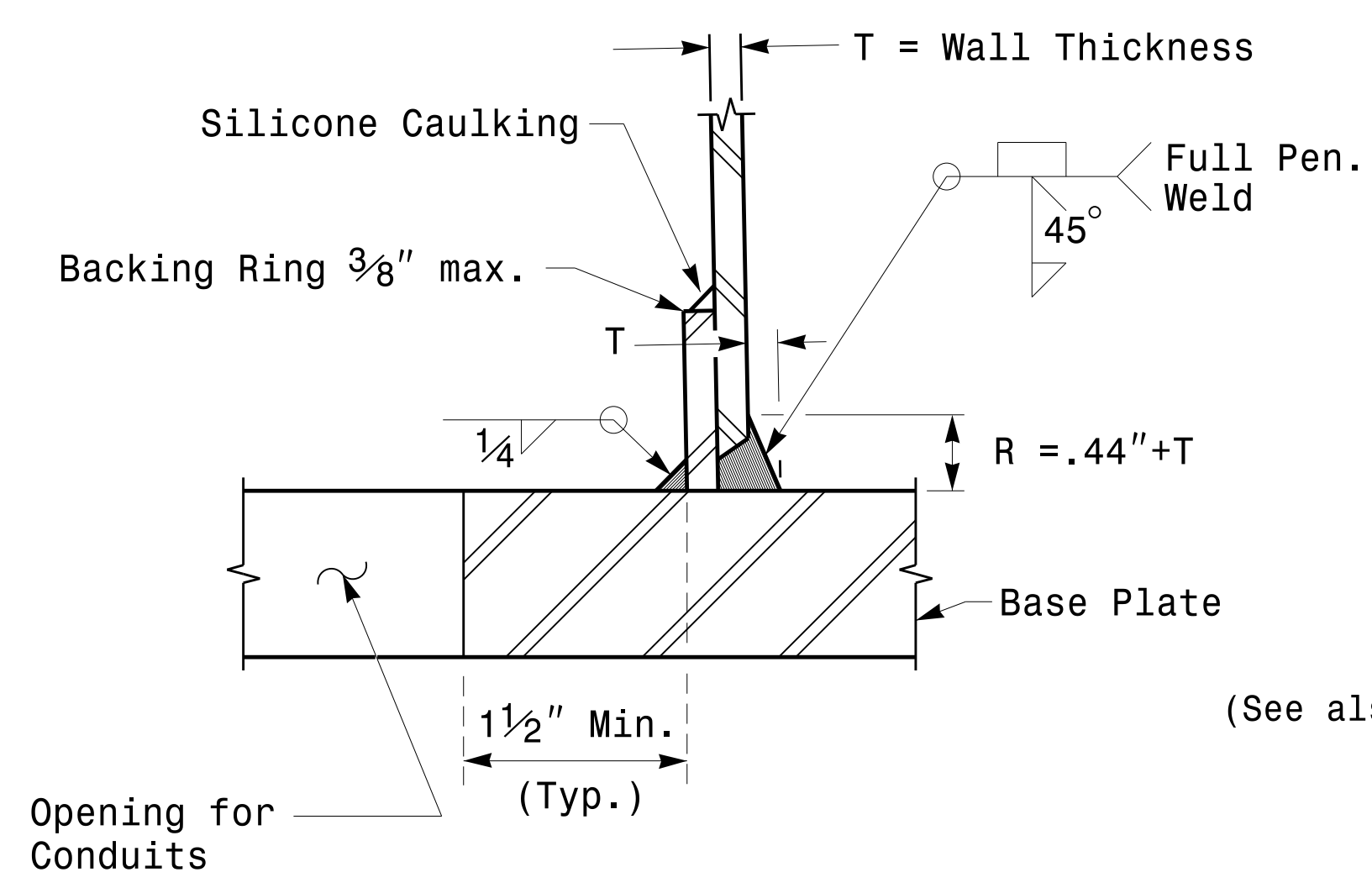
2 Cable Clamps designed for variable attachment heights from 1'-6" to 5'-0" below the top of the pole.



Monotube Strain Pole



Section A-A  
Radial Orientation for Factory Installed  
Accessories at Top of Pole



Section C-C  
(Pole Attachment to Base Plate)  
Full-Penetration  
Groove Weld Detail

Prepared in the Offices of:  
  
 750 N. Greenleaf Pkwy, Garner, NC 27529

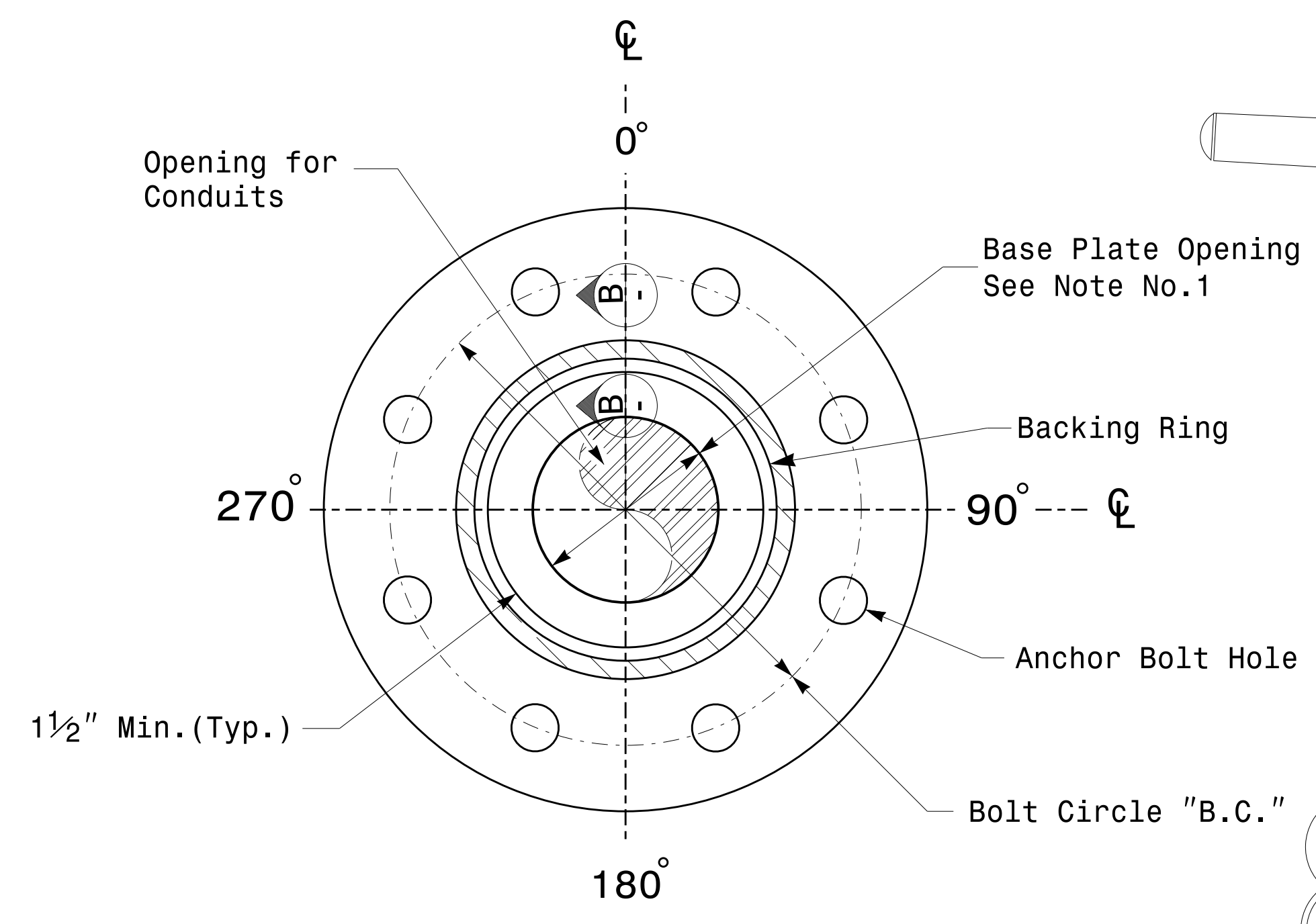
Typical Fabrication Details For Strain Poles			
PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR
REVISIONS	INIT.	DATE	

SEAL  
  
 DocuSigned by:  
 Debesh C. Sarkar  
 44EBE7816FA74FURE  
 10/11/2017  
 DATE

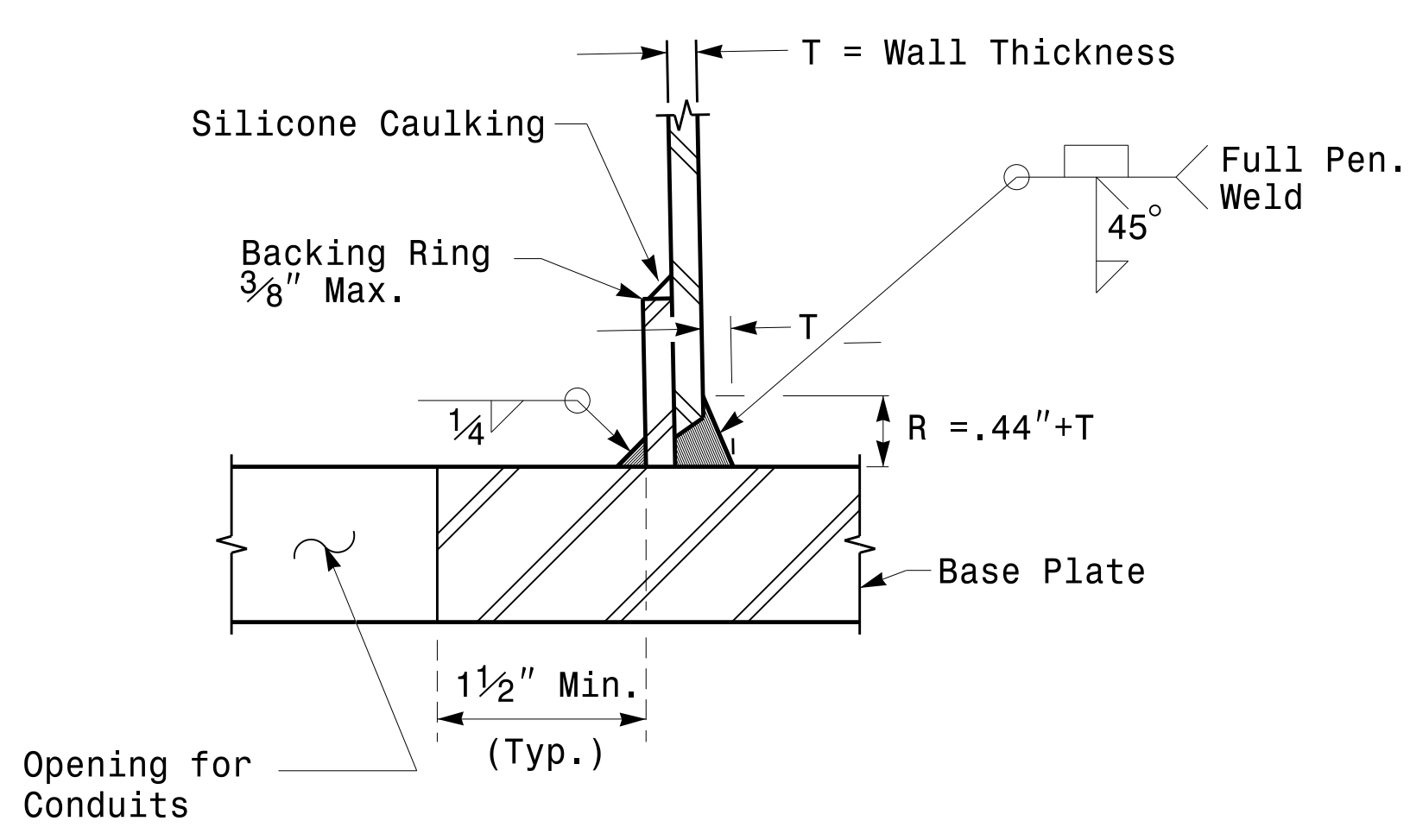
11-001-2017-08225  
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 01/16/2014

**Fabrication Details – Strain Poles**

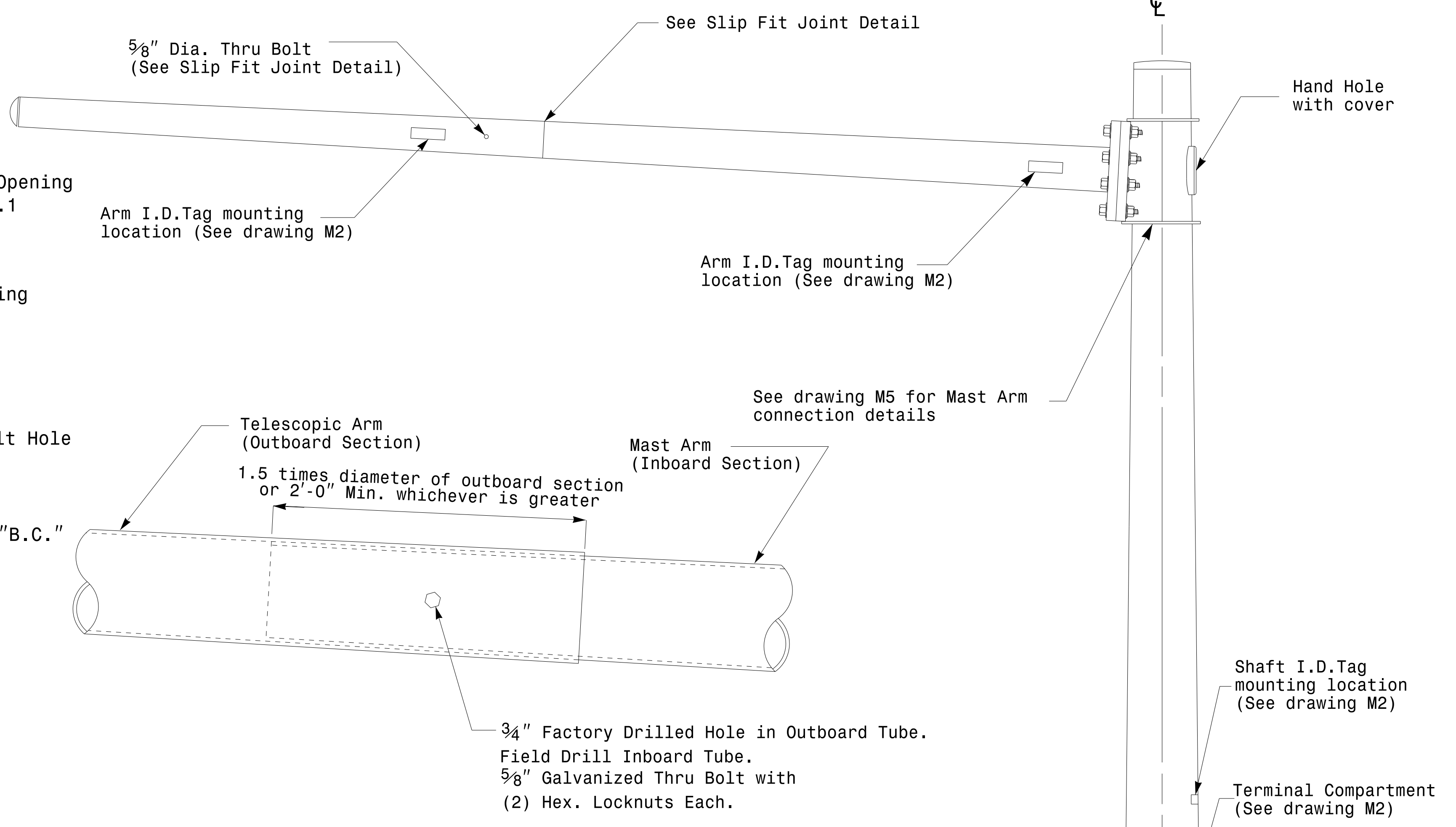
Note:  
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



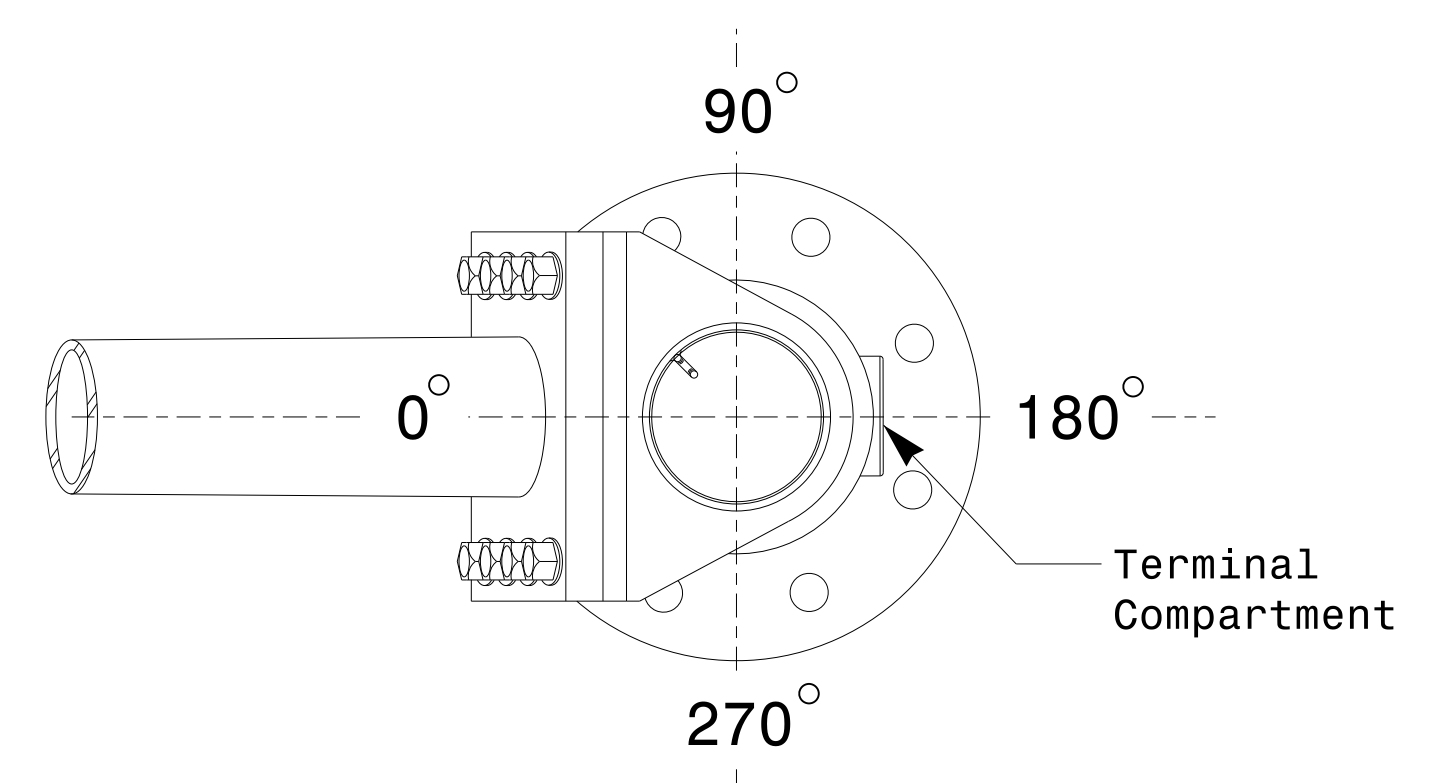
**Section A-A**  
**Pole Base Plate Details**



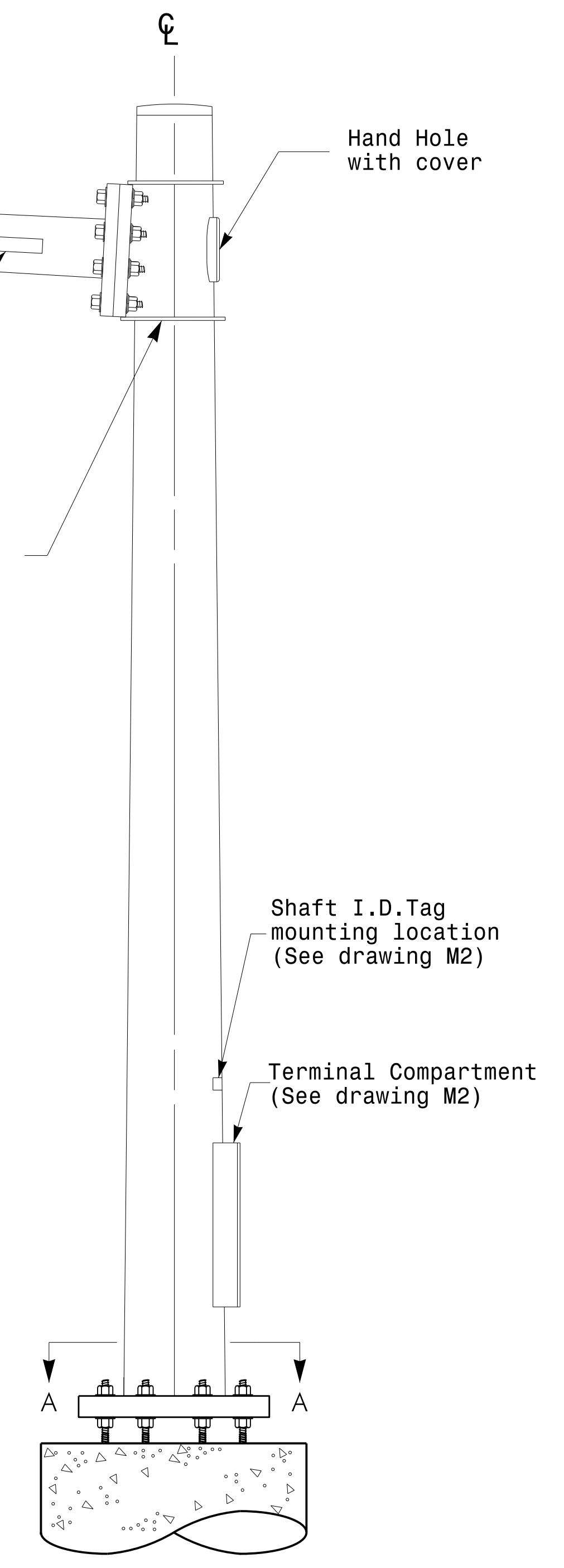
**Section B-B**  
 (Pole Attachment to Base Plate)  
**Full-Penetration Groove Weld Detail**



**Slip Fit Joint Detail for Mast Arm**



**Mast Arm Radial Orientation**



**Mast Arm Pole**

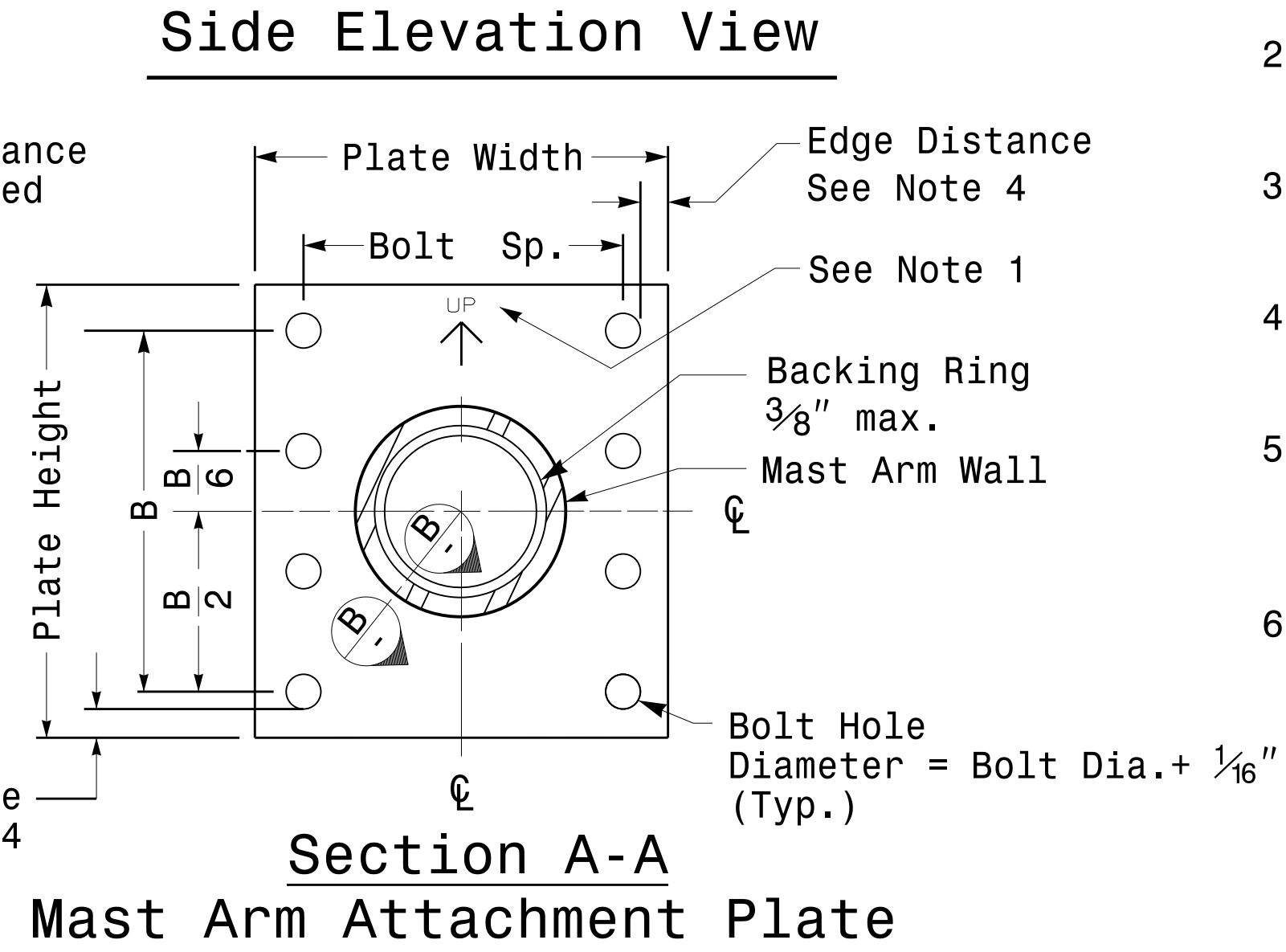
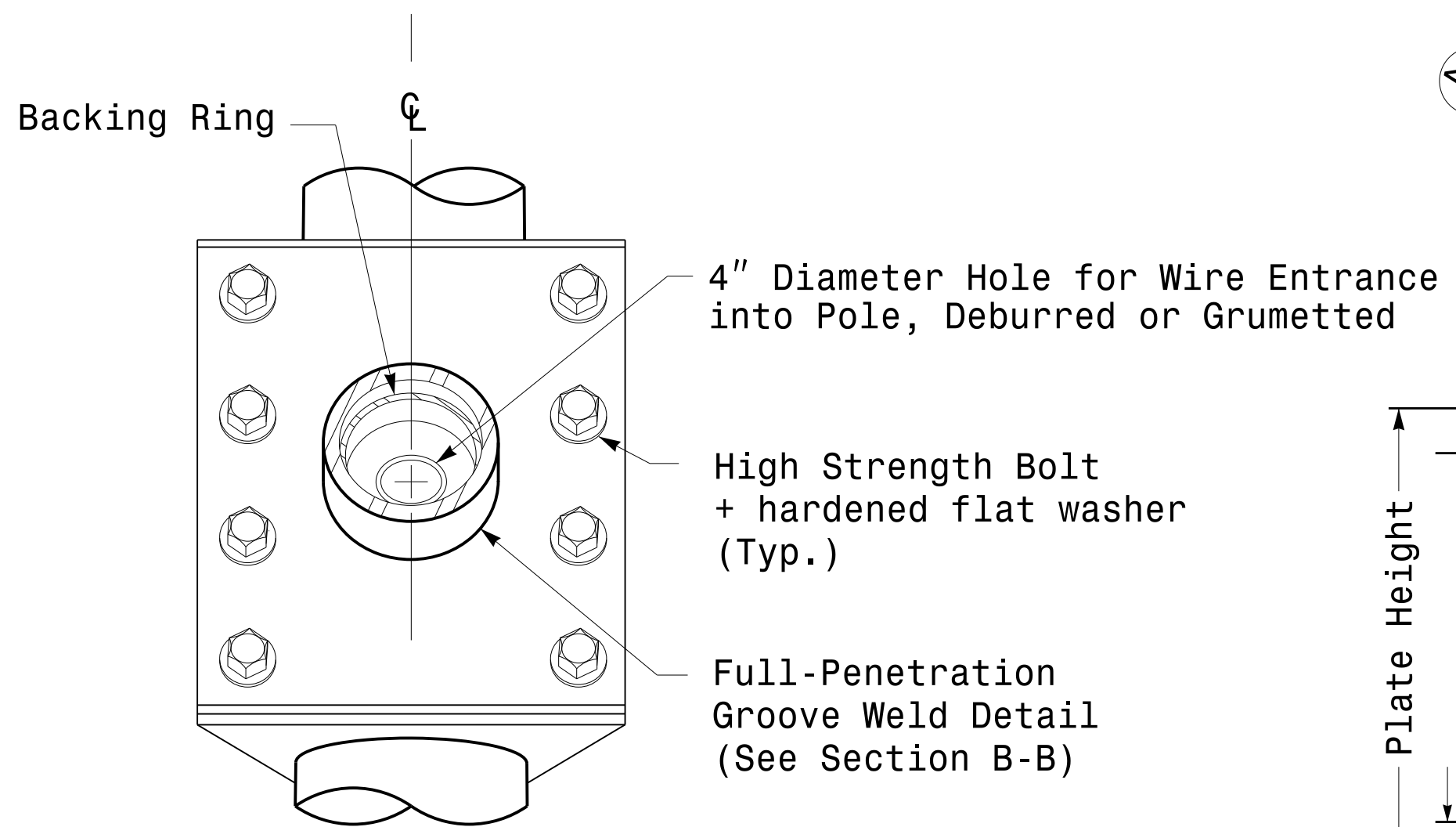
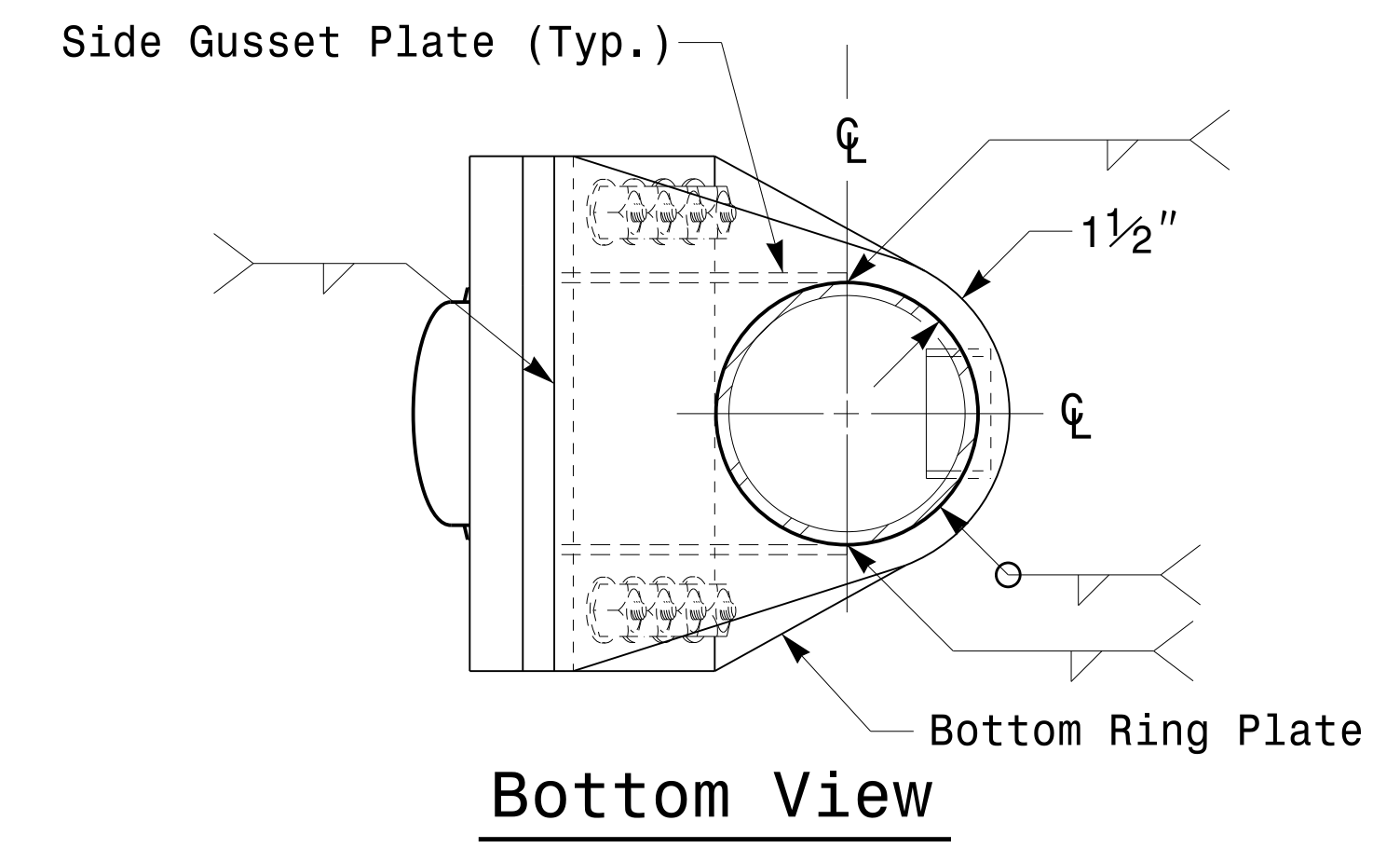
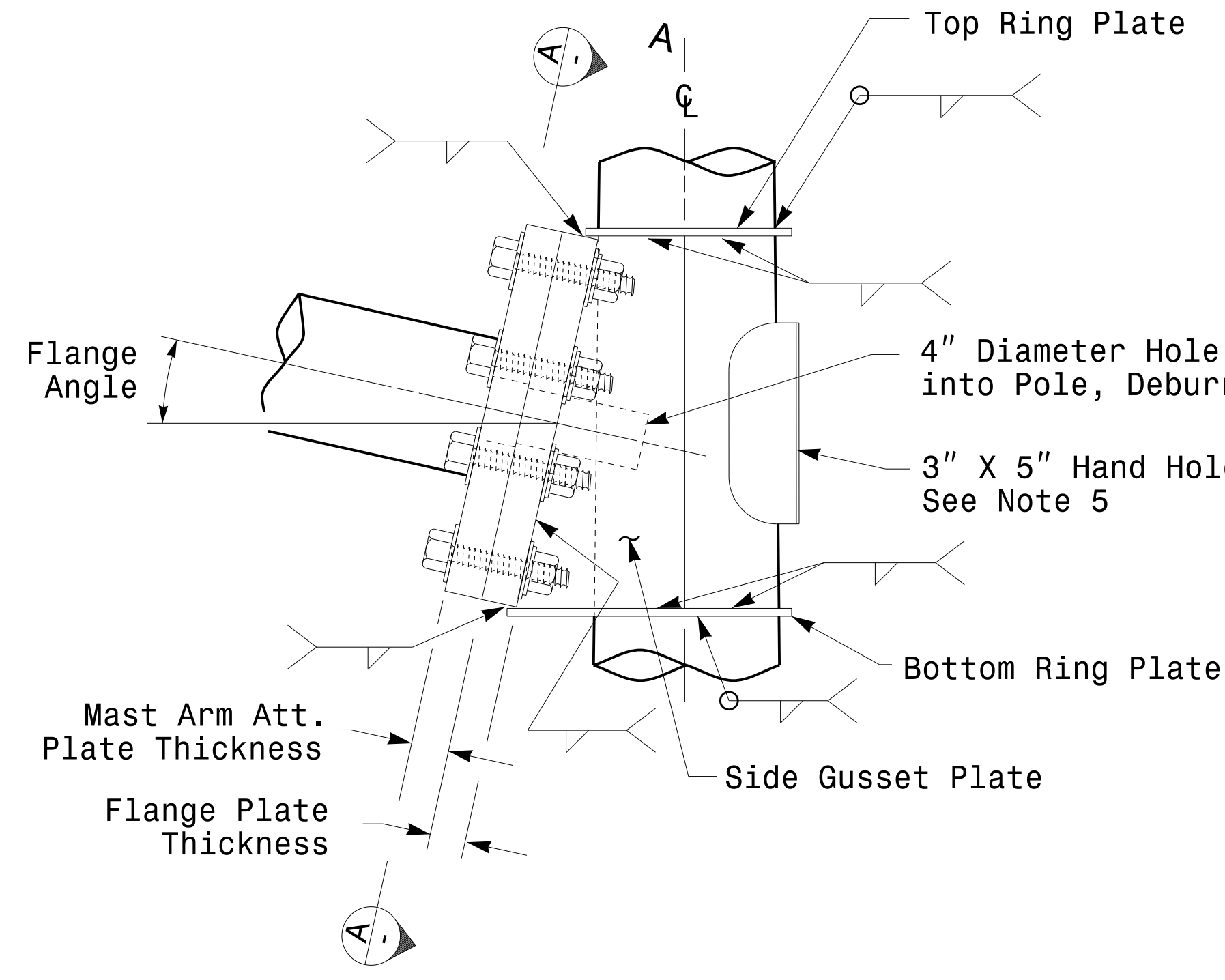
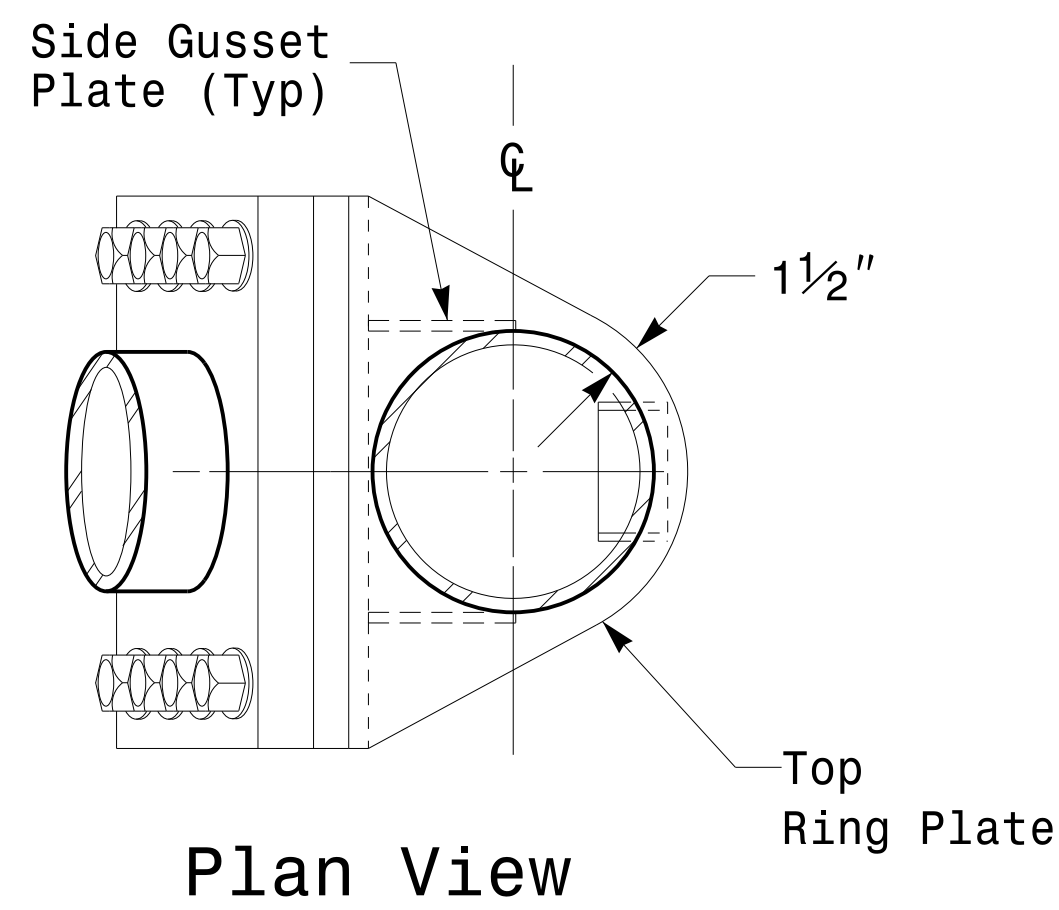
**Fabrication Details – Mast Arm Poles**

11-OCT-2017 08:33 136504115 510015451gncl Design Section Eastern RegionM4 Sheets20162014 Sig.M4 Std. Fabrication Detail-Mast Arm Poles.dgn

	Typical Fabrication Details For Mast Arm Poles		SEAL 
	PLAN DATE: OCTOBER 2017 PREPARED BY: N. BITTING	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	
SCALE 0 NA NONE	DocuSigned by: 		10/11/2017 DATE

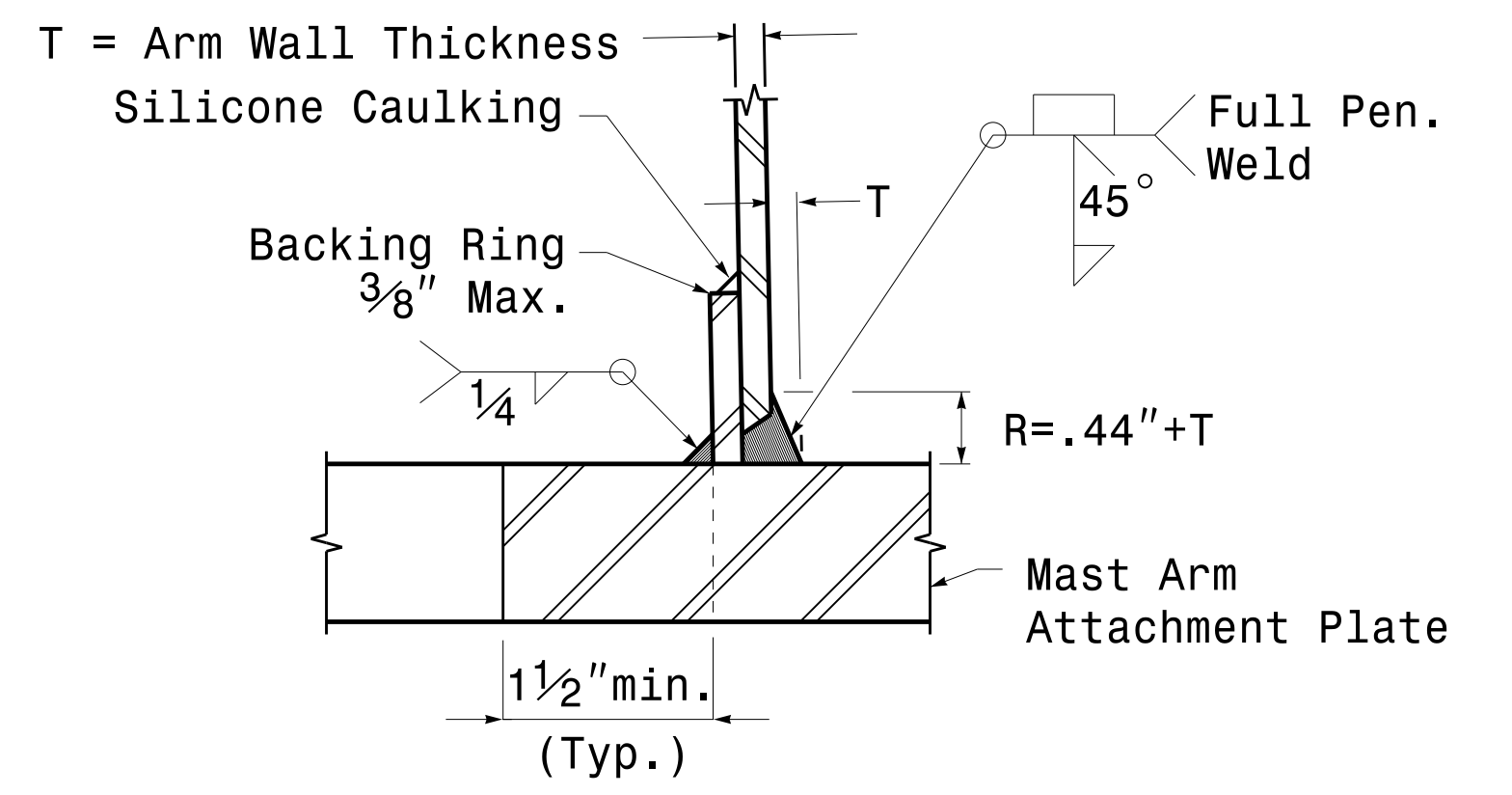
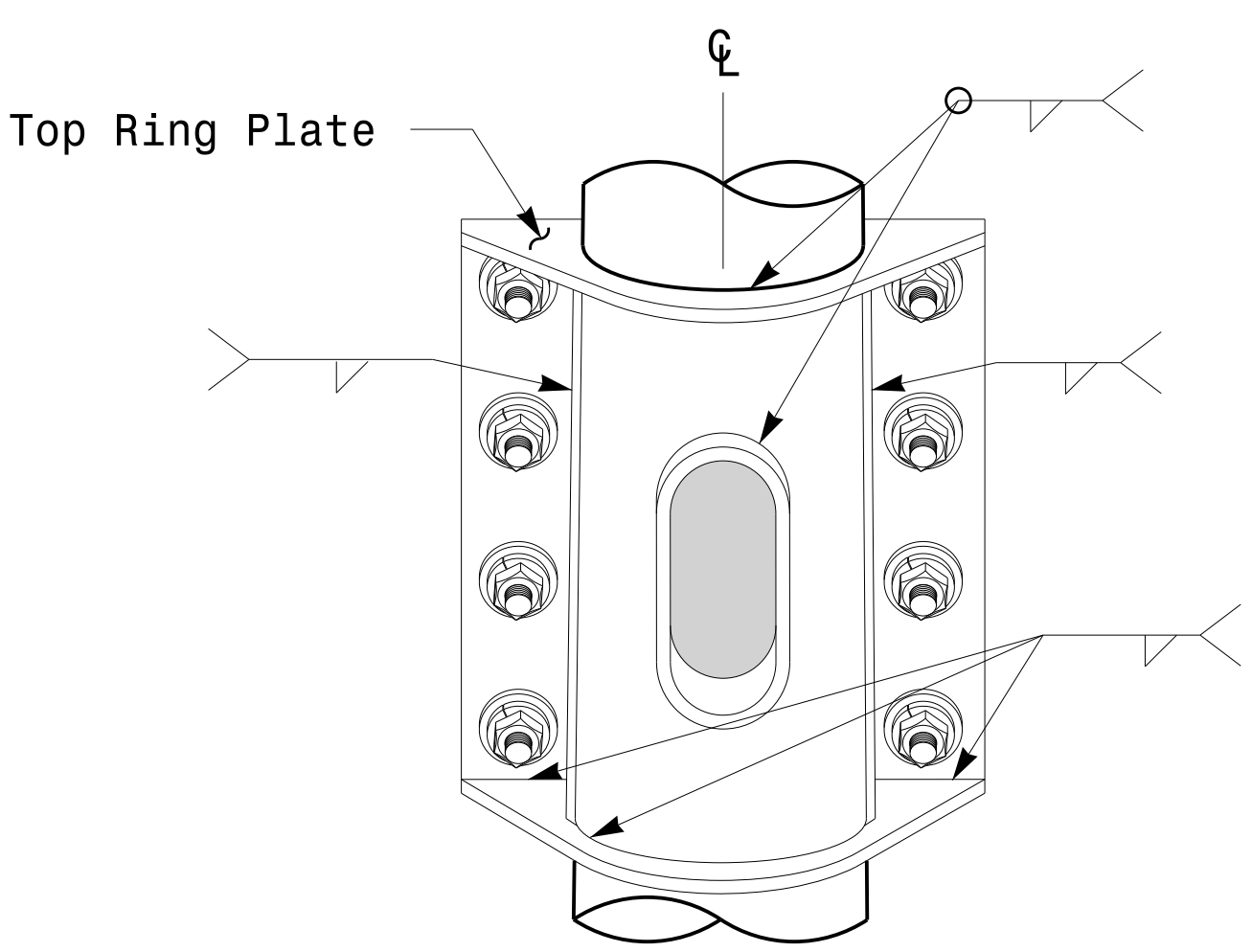
# Welded Ring Stiffened Mast Arm Connection

PROJECT ID. NO.	SHEET NO.
U-5942	Sig.M5



**Notes:**

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are required for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For Mast Arm Connection To Pole

PLAN DATE: OCTOBER 2017	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

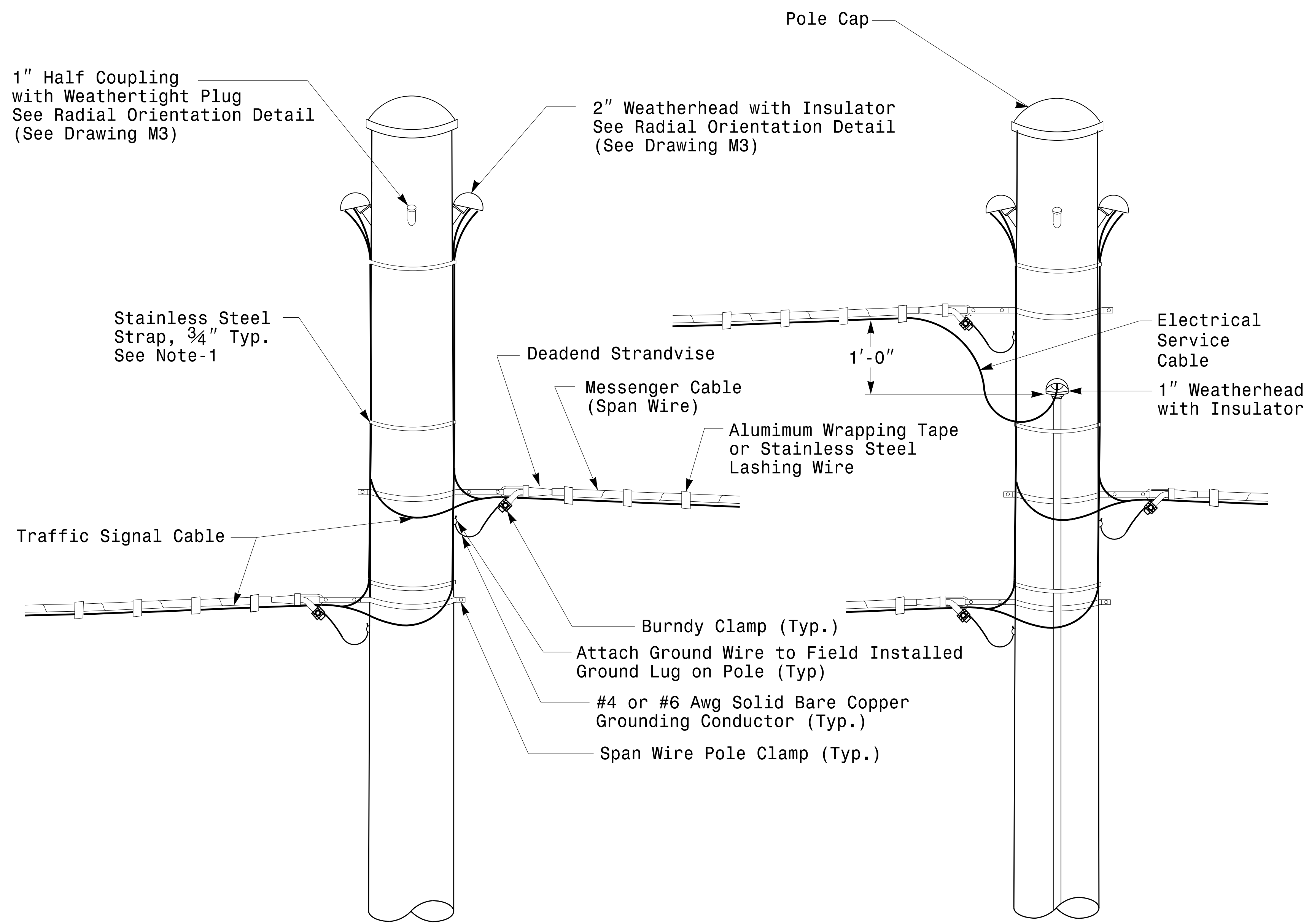
Discussed by: D.C. Sarkar

10/11/2017

DATE

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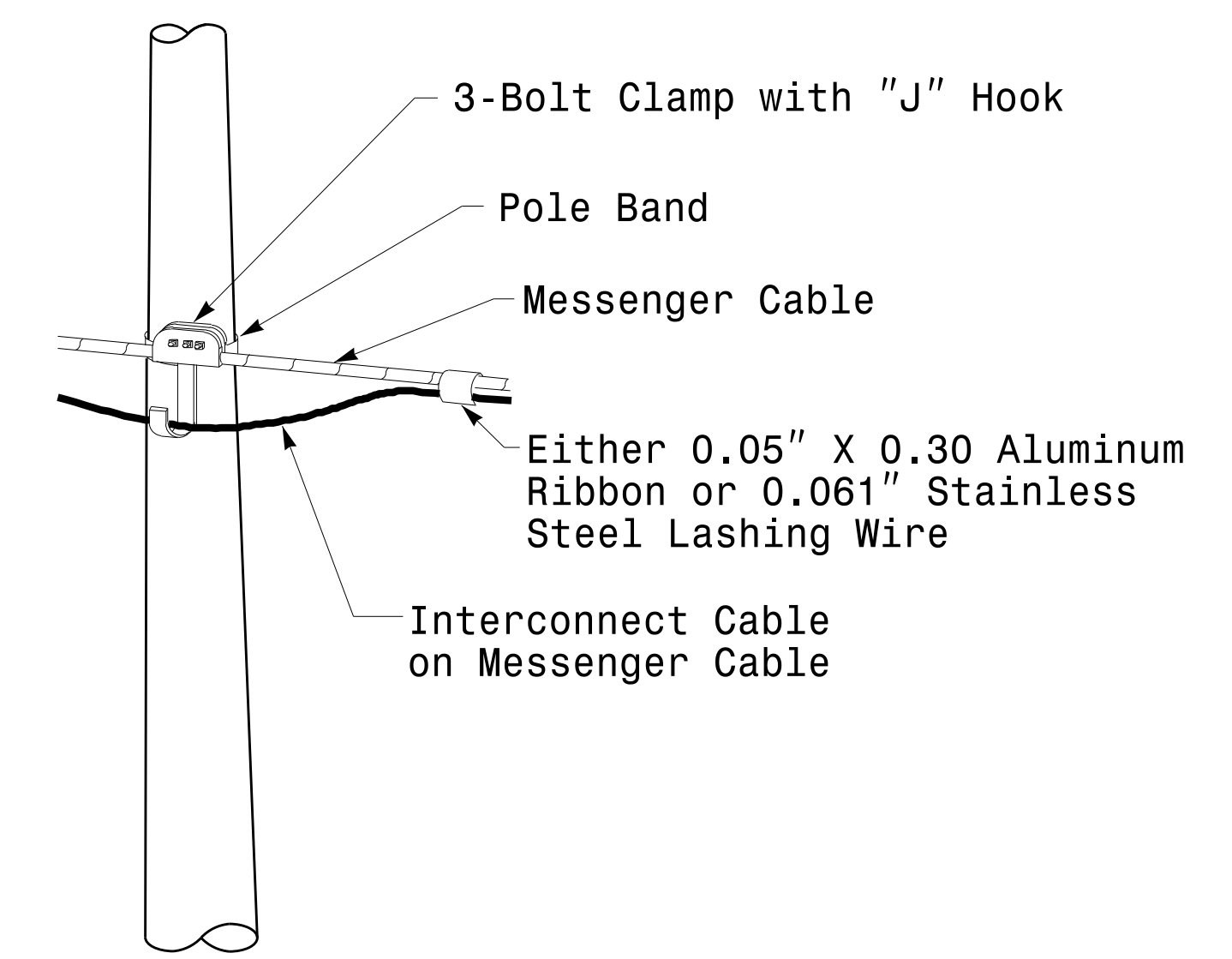
Fabrication Details - Mast Arm Connection



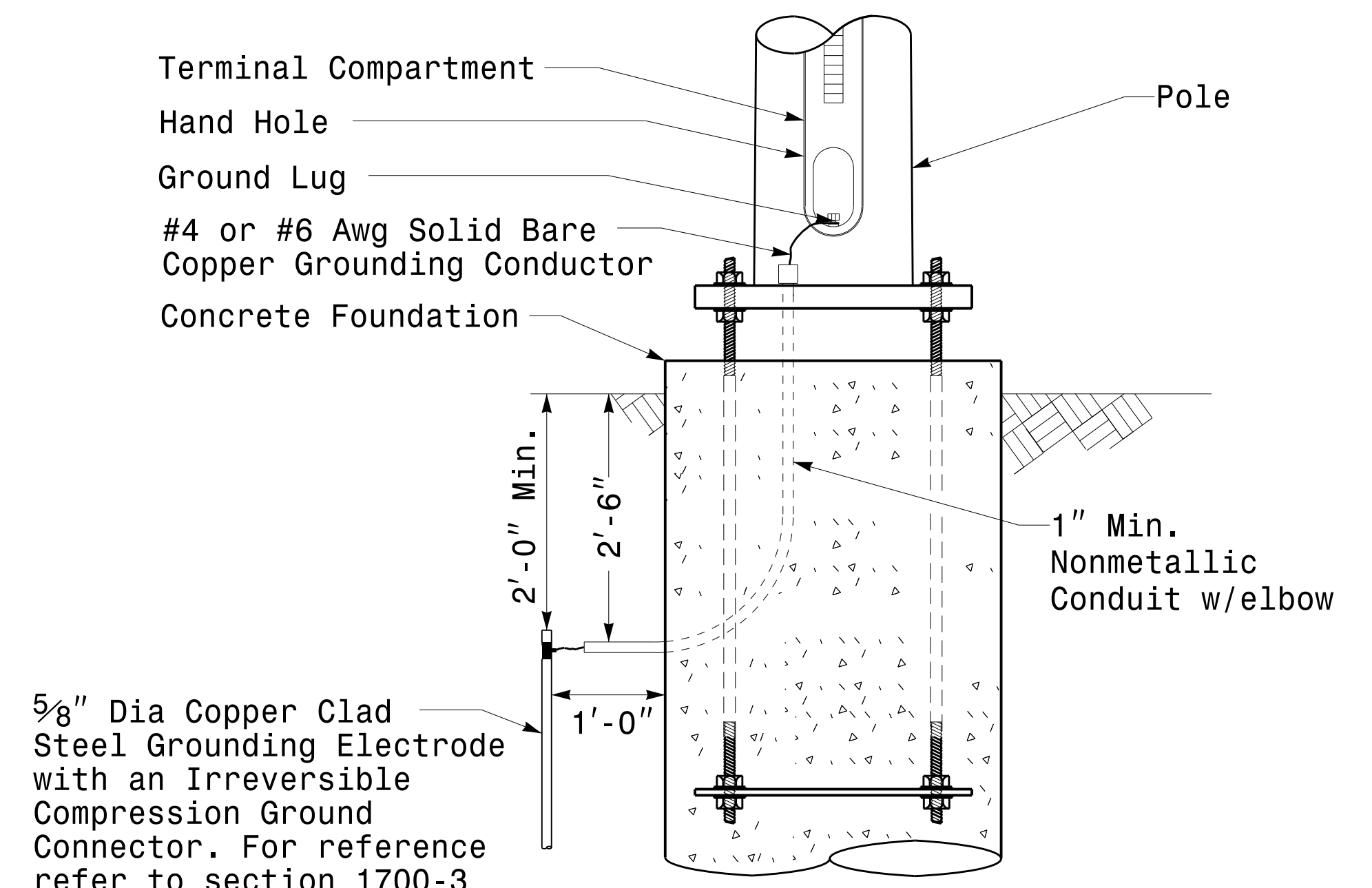
**Strain Pole Attachments**

**NOTE:**

1. Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3'-0".
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2018.



**Attachment of Cable to Intermediate Metal Pole**



5/8" Dia Copper Clad Steel Grounding Electrode with an Irreversible Compression Ground Connector. For reference refer to section 1700-3 K and L for electrical grounding and bonding requirements, See Note 4.

**Metal Pole Grounding Detail For Strain Pole and Mast Arm**

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 NA NONE

Typical Fabrication Details For Strain Pole Attachments	
PLAN DATE: OCTOBER 2017	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

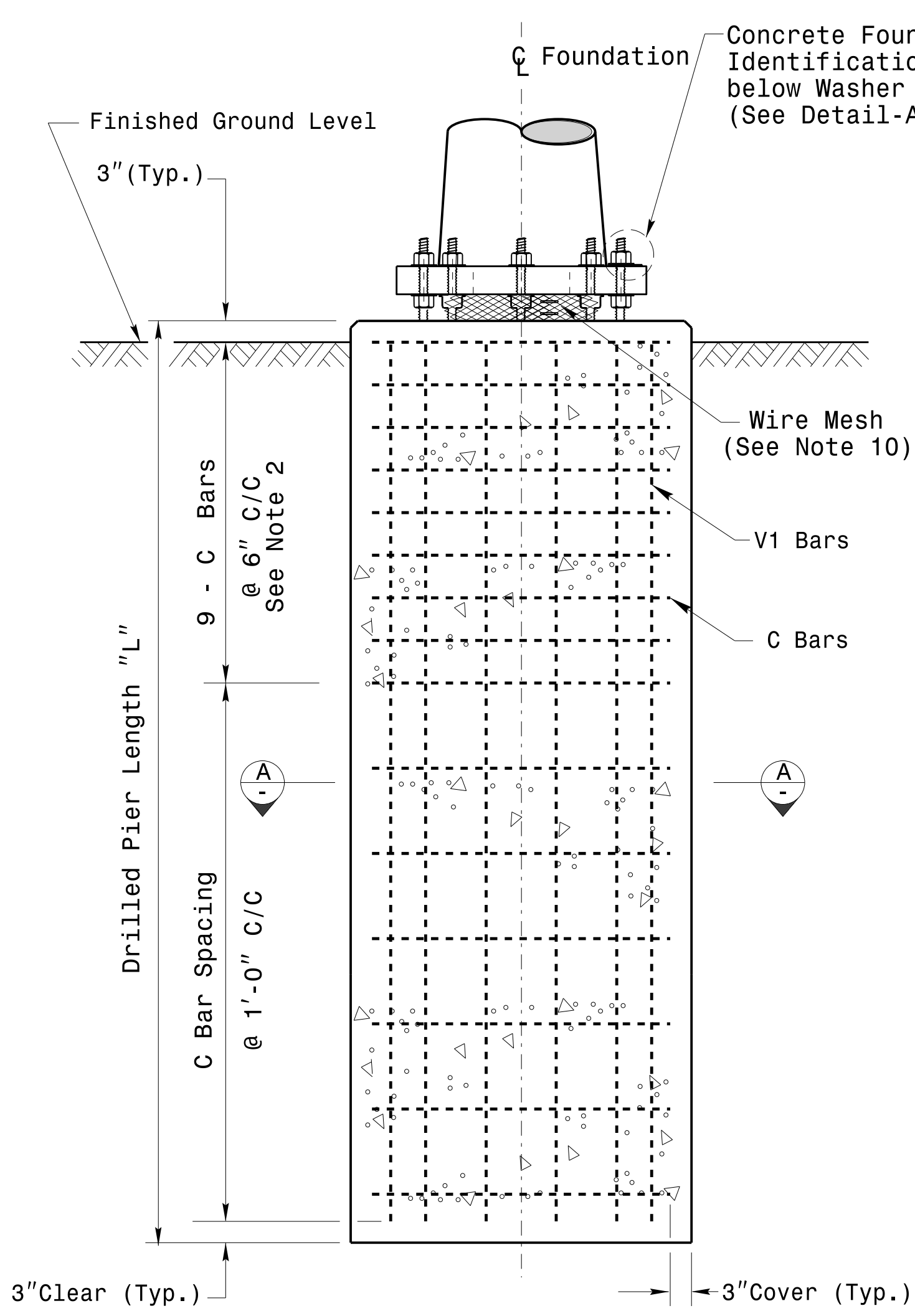
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DocuSigned by: D. C. SARKAR

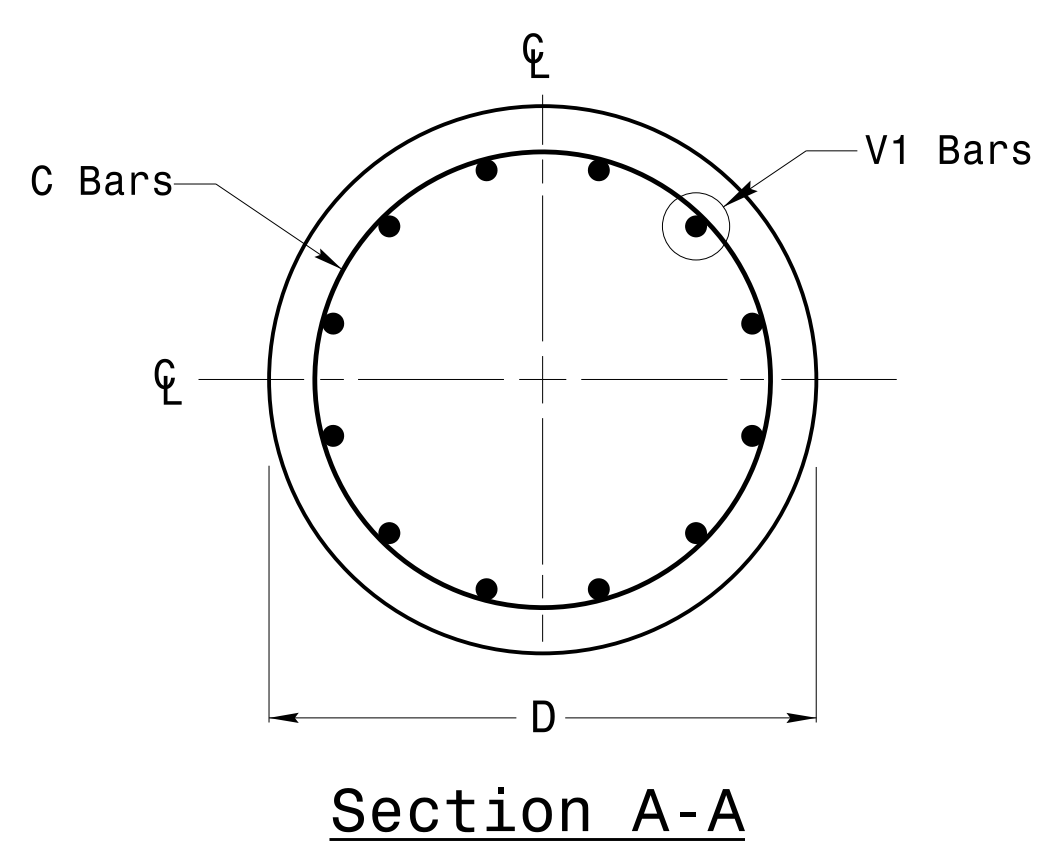
10/11/2017

DATE

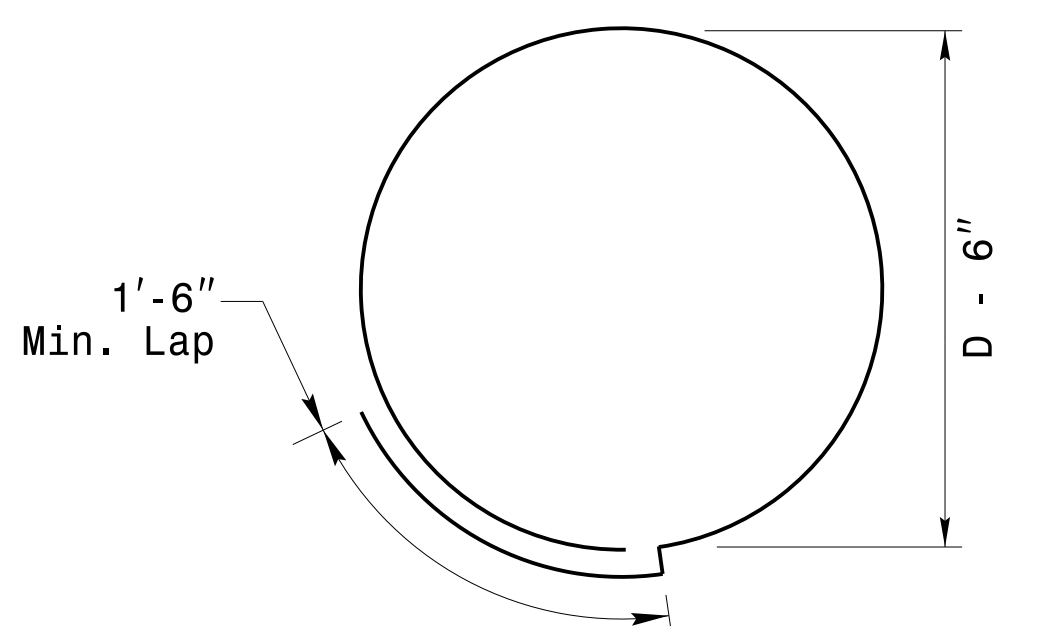
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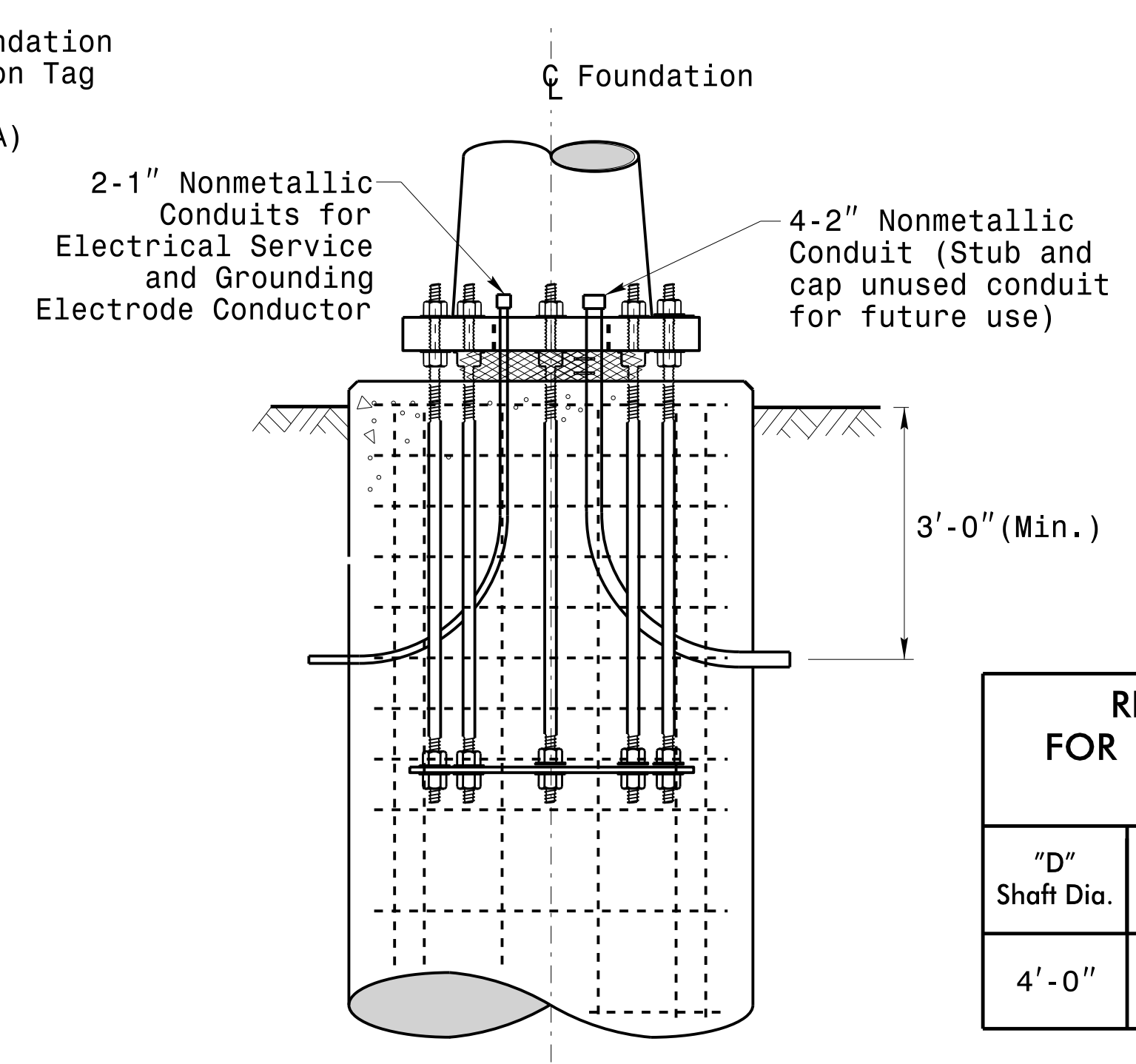
**Concrete Shaft Elevation**



**Section A-A**



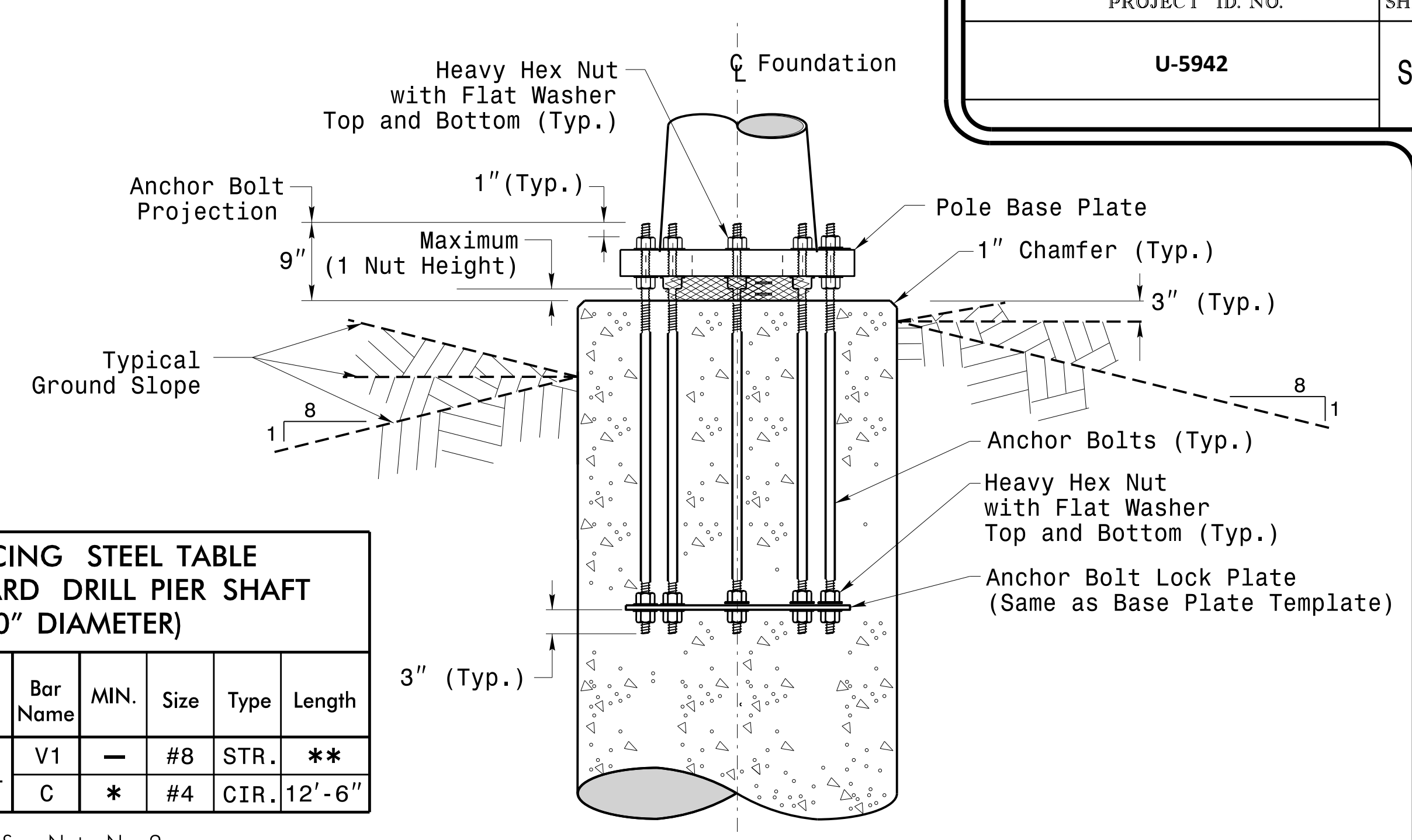
**Typical "C" Bar Detail**



**Typical Foundation Conduit Details**

"D" Shaft Dia.	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
4'-0"	.465 x L	V1	-	#8	STR.	**
		C	*	#4	CIR.	12'-6"

\* See Note No. 2  
 \*\* See Note No. 3

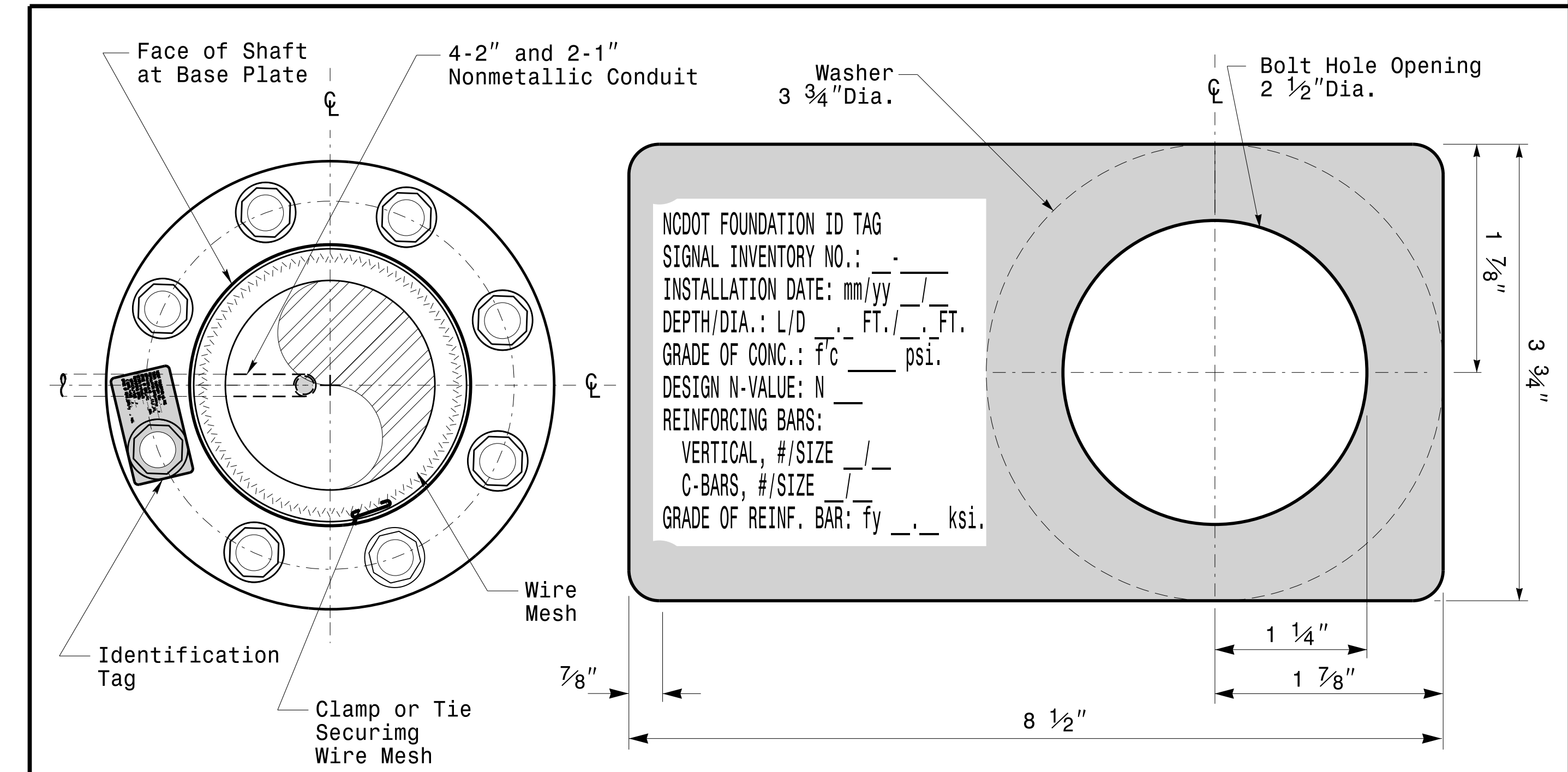


**Typical Foundation Anchor Bolt Details**

(Reinforcing Cage Not Shown for Clarity)

**General Notes:**

1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3" to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2" to 5" foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2018 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.  
[https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx](https://connect.ncdot.gov/resources/Specifications%20and%20Special%20Provisions.aspx)
7. Use air entrained AA concrete mix with a compression strength of f'c=4500 psi.(min.) after 28 days.
8. Use ASTM A615 grade 60 deformed bars for all reinforcing steel. Maintain at least 3" cover on all reinforcement.
9. Locate the Identification Tag on the top of the base plate, directly above the conduit's entry point.
10. Provide two layers of galvanized welded 23 gauge (0.25) 6" wide 4 mesh wire around pipes under the base plate and secure it with ties if necessary.
11. Preferred location for the I.D. Tag is as shown in Detail-A; directly above the conduit entering the foundation.



**Concrete Foundation Identification Tag Details**

D = Diameter  
 L = Length/Depth  
 mm = Month  
 yy = Year

**Detail-A**

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Construction Details For Foundations</p>		
	<p>PLAN DATE: OCTOBER 2018</p> <p>DESIGNED BY: C.B. COGDILL</p> <p>PREPARED BY: N. BITTING</p> <p>REVIEWED BY: D.C. SARKAR</p>	<p>REV. NO.</p> <p>COMMENTS</p> <p>INIT.</p> <p>DATE</p>	

**Construction Details - Foundations**

11-001-2017-08:33T 13560W115 510n1s45:gnal Design SectionEastern RegionM Sheers20162014 Sig.M7 Std. Construction Detail (s-Strain Poles.dgn) PLOT



# SOIL CONDITION

PROJECT ID. NO.	SHEET NO.
U-5942	Sig.M8

		STANDARD STRAIN POLES					STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) - Feet							Reinforcement				
Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups			
			Axial (kip)	Shear (kip)	Moment (ft-kip)	Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30	Bar Size (#)	Quantity (ea.)	Bar Size (#)	Spacing (in.)		
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	10	8	17	14.5	12.5	8	12	4	12
		S30L3	30	25	2	11	300	19.5	13.5	10	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	10.5	8	17.5	15	13	8	14	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	16	12	9	21	17.5	15	8	16	4	6
		S35H3	35	29	4	16	515	26	17	12.5	9.5	22	18.5	16	8	16	4	6
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11.5	8.5	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	9	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	9	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	13.5	10.5	8	18	15	13.5	8	16	4	6
		S35H1	35	25	4	12	350	21	14	10.5	8.5	18.5	15.5	13.5	8	16	4	6
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6

**General Notes:**

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

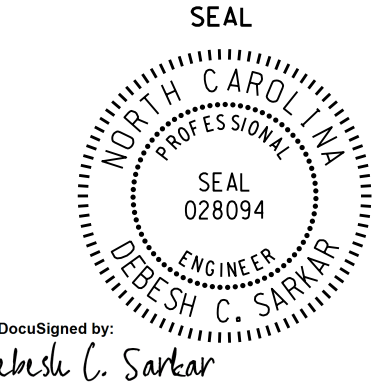
**Foundation Selection:**

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column under "Standard Foundations" based on soil type and "N" value. Select the appropriate row based on the pole load case.
6. The foundation depth is the value shown in the "Standard Foundations" category where the column and the row intersect.
7. Use Construction Procedures and Design Methods prescribed by FHWA-NHI-10-016 for Reference Drilled Shafts.

48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Drilled Pier Length

Standard Strain Pole Foundation-All Soil Condition

11-007-2017-08-10 S:\112450415 Signal\Signal Design Section\Eastern Region\MM Sheets\2016\2014 Sig.M8 Std. Strain Pole Found.-Saturated Soil -Cond111on.dgn rnz/insgr



**Standard Strain Pole Foundation for All Soil Conditions**

PLAN DATE: OCTOBER 2017    DESIGNED BY: C. B. COGDILL  
 PREPARED BY: N. BITTING    REVIEWED BY: D. C. SARKAR

10/11/2017  
DATE

REVISIONS

NO.	DATE	DESCRIPTION
1	7/12/2015	Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.

SCALE: 0 NA NONE