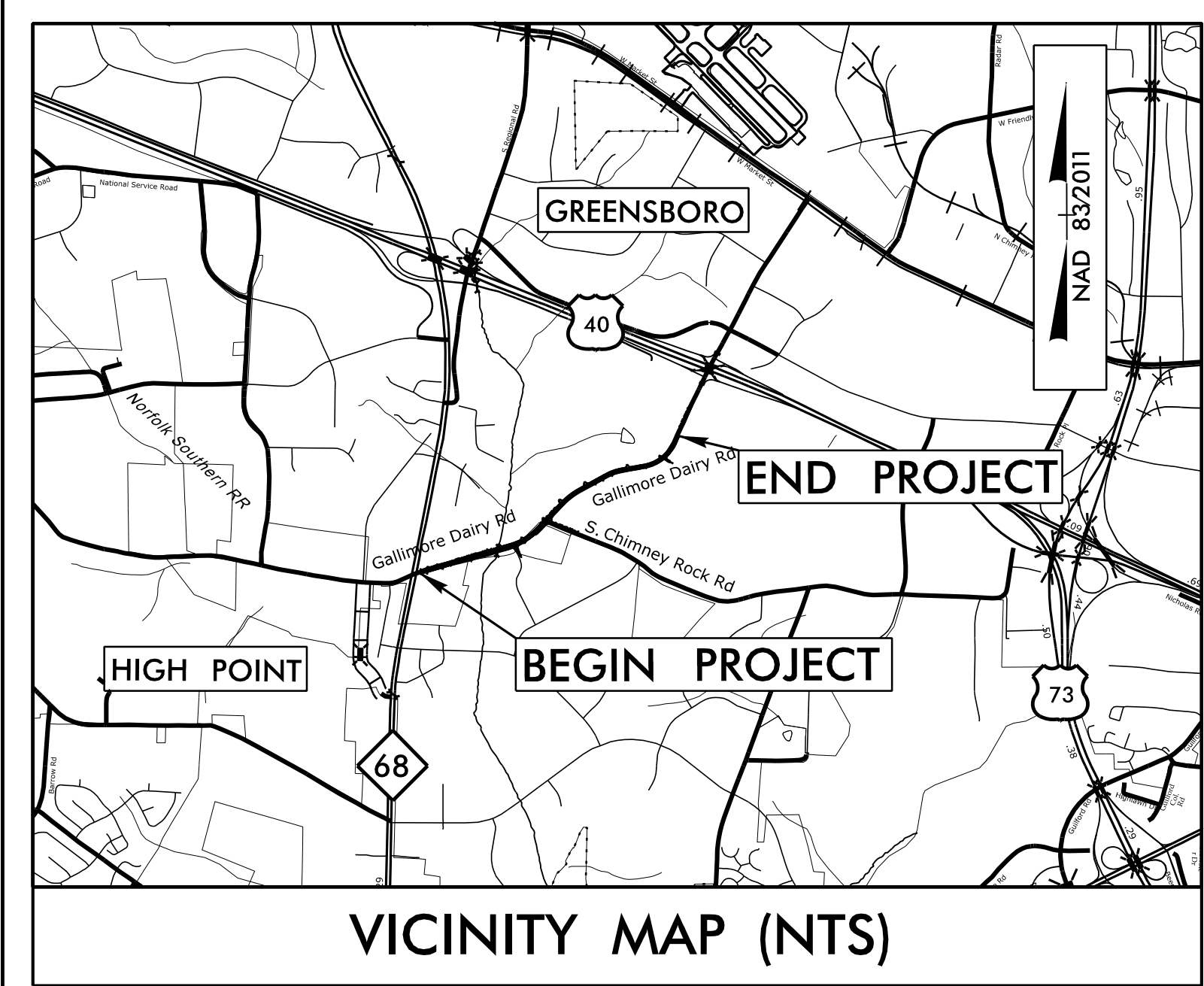
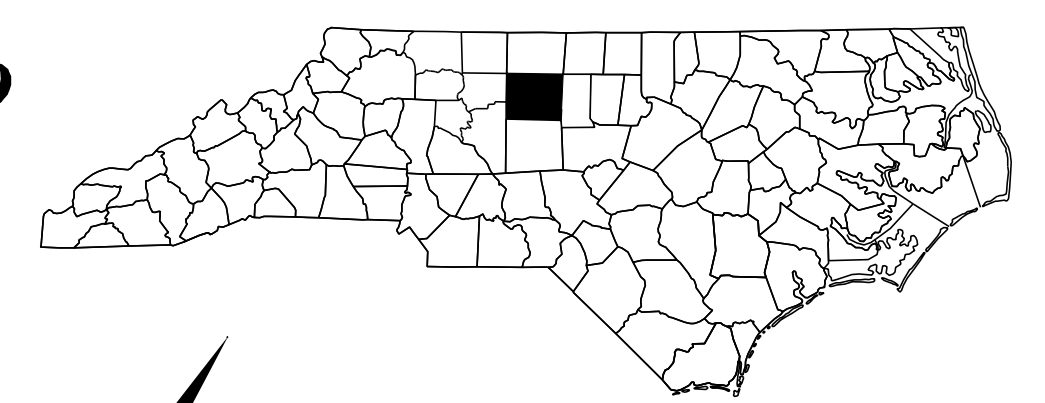


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# GUILFORD COUNTY

**LOCATION: SR 1556 (GALLIMORE DAIRY RD.) FROM NC 68 (LYNWOOD SMITH EXPY.) TO AIRPARK RD. IN GREENSBORO**

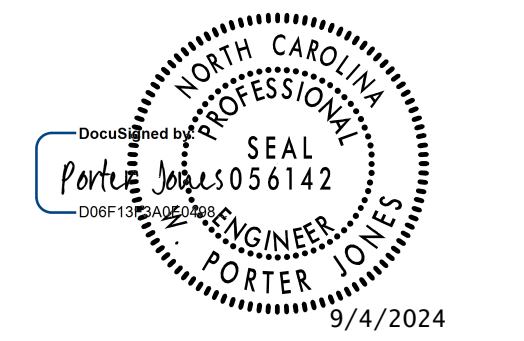
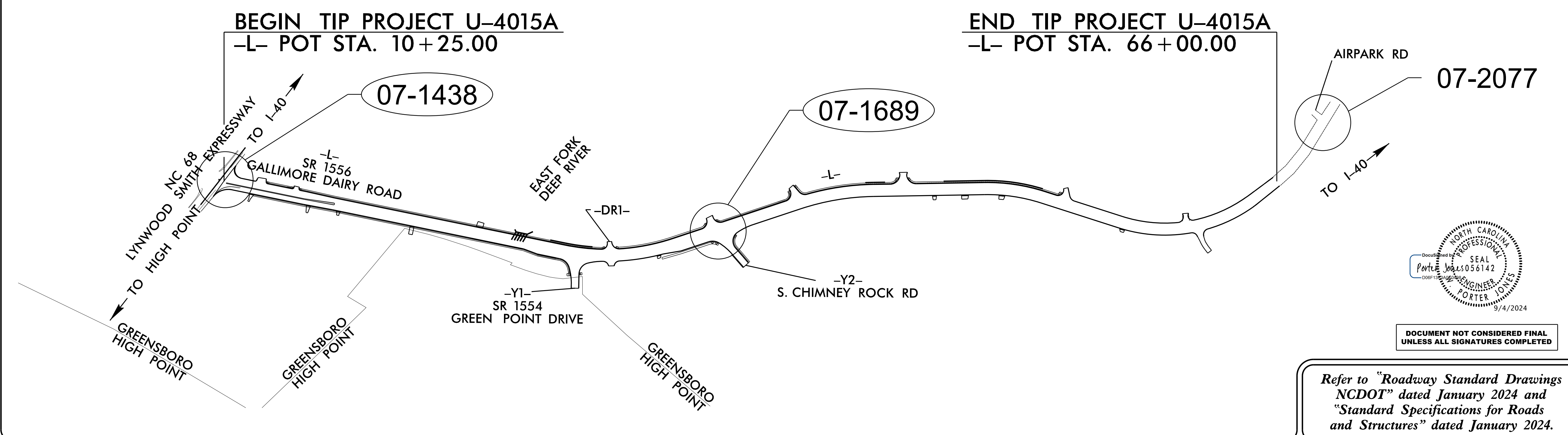
**TYPE OF WORK: TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS**



VICINITY MAP (NTS)

**TIP PROJECT: U-4015A**

**CONTRACT: C204821**



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Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.

Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	
Sig. 2.0-4.3	07-1438	NC 68 at SR 1556 (Gallimore Dairy Rd.)	
Sig. 5.0-9.4	07-1689	SR 1556 at SR 1554 (Chimney Rock Rd.)	
Sig. M1A-M9	N/A	Standard Drawings for Metal Poles	
SCP 1-9	N/A	Signal Communications Plans	

**TRANSPORTATION SYSTEMS  
MANAGEMENT & OPERATIONS UNIT**

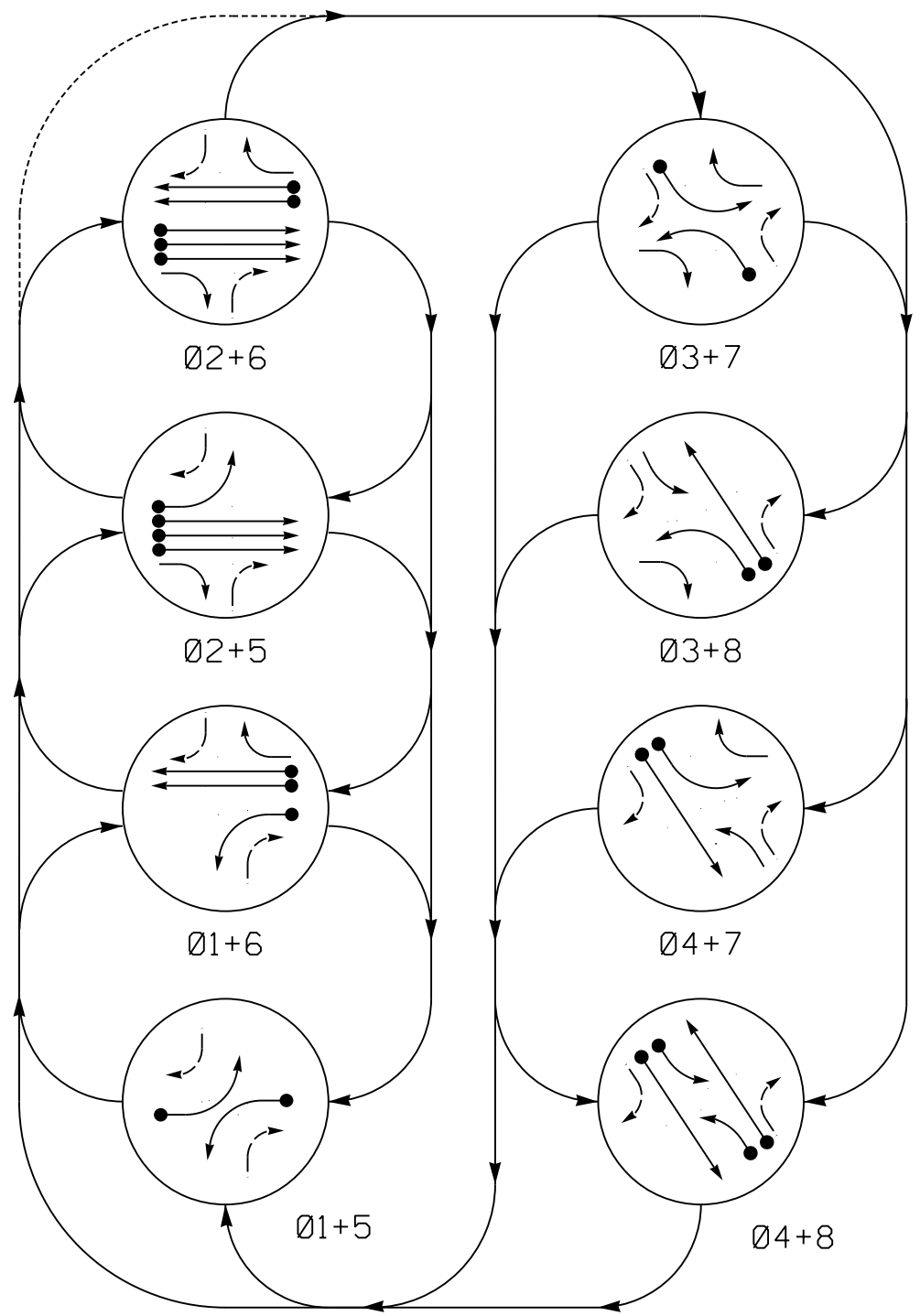
Contacts:

Robert J. Ziemba, P.E. - Central Region Signals Engineer  
D. Todd Joyce, P.E. - Signal Equipment Design Engineer  
Gregory A. Green - Signal Communications Project Engineer  
Heidi T. Berggren, E.I. - Signal Communications Project Design Engineer

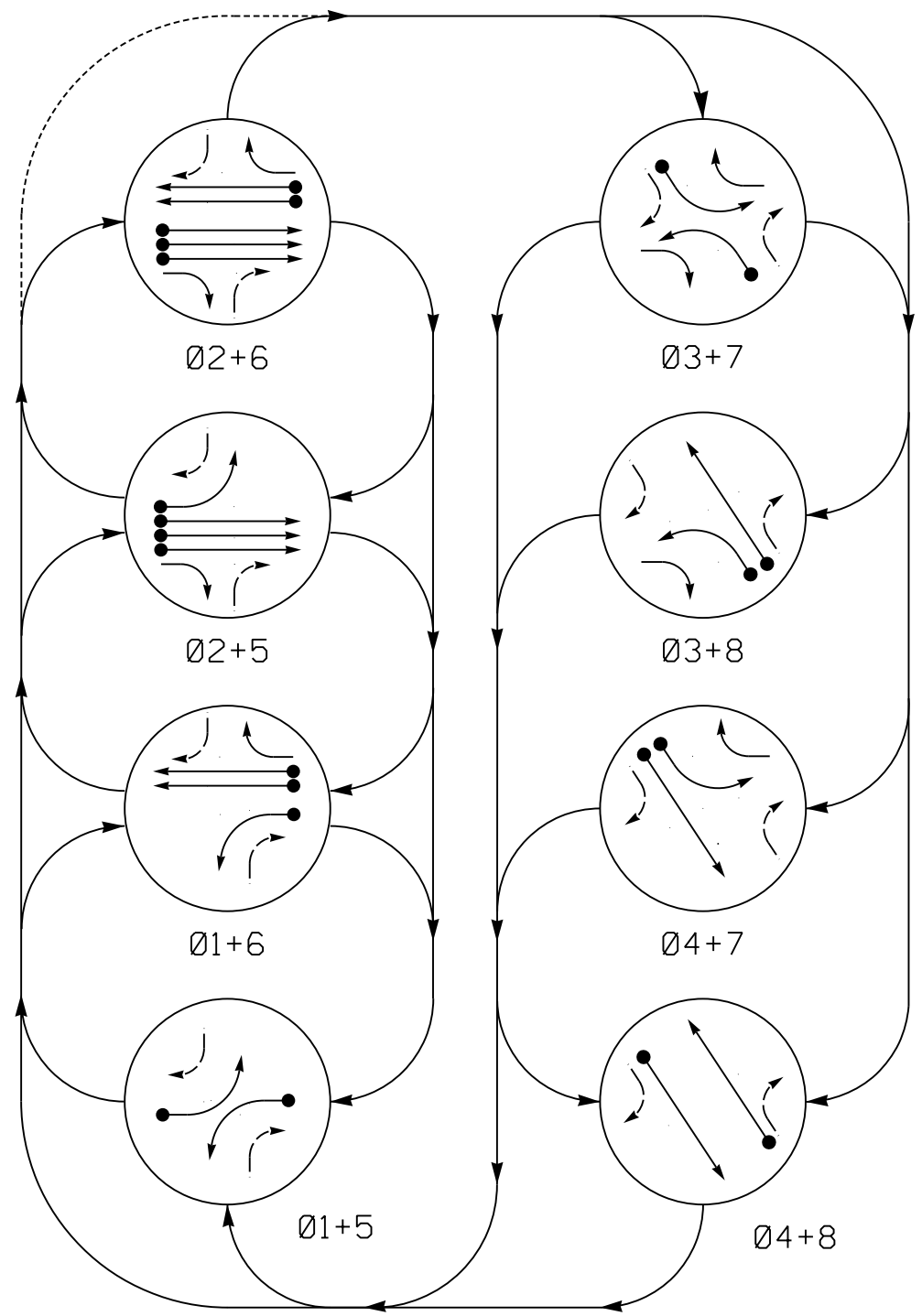
Prepared for the Office of:  
DIVISION OF HIGHWAYS  
TRANSPORTATION MOBILITY & SAFETY DIVISION

750 N. Greenfield Parkway, Garner, NC 27529

**DEFAULT PHASING DIAGRAM**



**ALTERNATE PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

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

**DEFAULT PHASING TABLE OF OPERATION**

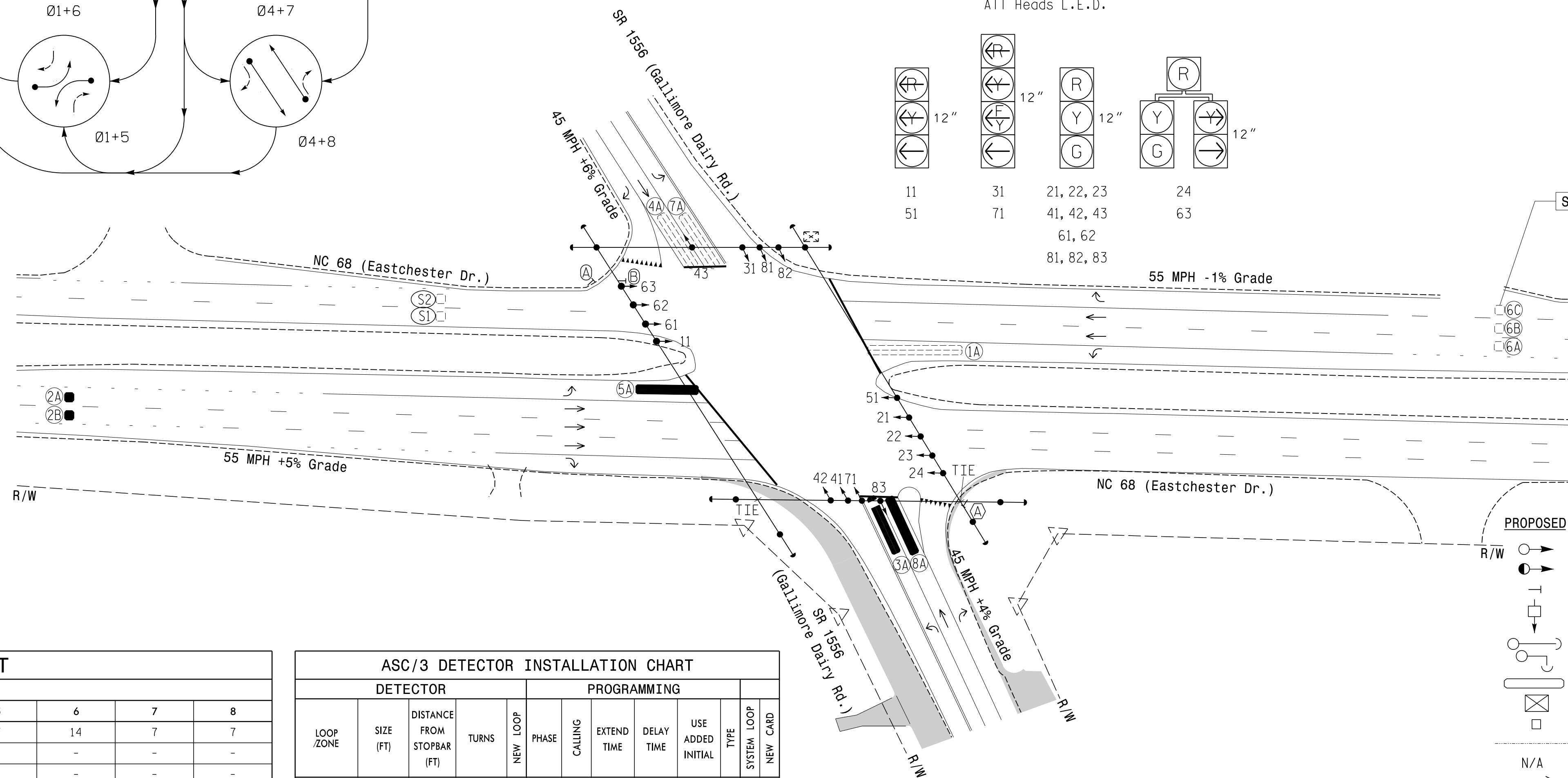
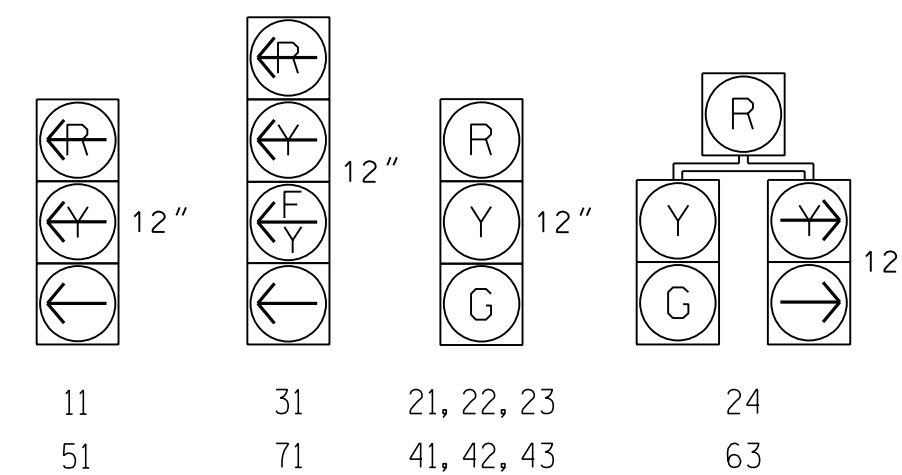
SIGNAL FACE	PHASE								FLASH	
	01+5	02+6	03+7	04+8	01+6	02+5	03+8	04+7		
11	←	←	←	←	←	←	←	←	←	
21,22,23	R	R	G	G	R	R	R	R	R	
24	R	R	G	G	R	R	R	R	R	
31	←	←	←	←	←	←	←	←	←	
41,42,43	R	R	R	R	G	R	G	R	R	
51	←	←	←	←	←	←	←	←	←	
61,62	R	G	R	G	R	R	R	R	R	
63	R	G	R	G	R	R	R	R	R	
71	←	←	←	←	←	←	←	←	←	
81,82,83	R	R	R	R	G	R	G	R	R	

**ALTERNATE PHASING TABLE OF OPERATION**

SIGNAL FACE	PHASE								FLASH	
	01+5	02+6	03+7	04+8	01+6	02+5	03+8	04+7		
11	←	←	←	←	←	←	←	←	←	
21,22,23	R	R	G	G	R	R	R	R	R	
24	R	R	G	G	R	R	R	R	R	
31	←	←	←	←	←	←	←	←	←	
41,42,43	R	R	R	R	G	R	G	R	R	
51	←	←	←	←	←	←	←	←	←	
61,62	R	G	R	G	R	R	R	R	R	
63	R	G	R	G	R	R	R	R	R	
71	←	←	←	←	←	←	←	←	←	
81,82,83	R	R	R	R	G	R	G	R	R	

**SIGNAL FACE I.D.**

All Heads L.E.D.



SEE NOTE 5

**LEGEND**

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

**ASC/3 TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Delayed Green *	-	-	-	-	-	-	-	-
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	3.0	3.0	2.0	6.0	3.0	3.0
Max 1 *	15	120	15	25	15	120	15	25
Yellow	3.0	5.3	3.0	4.2	3.0	5.3	3.0	4.2
Red Clear	3.1	1.2	4.0	2.8	2.9	1.2	3.9	2.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	46	-	-	-	45	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.4	-	-	-	3.4	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	SOFT RECALL	-	-	-	SOFT 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 DETECTOR INSTALLATION CHART**

LOOP ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	EXIST	-	1	Yes	-	-	-	N	-	-
2A*	6X6	420	*	*	2	Yes	-	-	X	N	-	*
2B*	6X6	420	*	*	2	Yes	-	-	X	N	-	*
3A*	6X40	0	*	*	3	Yes	-	15.0**	-	N	-	*
					8#	Yes	-	3.0	-	N	-	*
4A	6X40	+2	EXIST	-	4	Yes	-	-	-	N	-	-
5A*	6X40	0	*	*	5	Yes	-	-	-	N	-	*
6A	6X6	405	EXIST	-	6	Yes	-	-	X	N	-	-
6B	6X6	405	EXIST	-	6	Yes	-	-	X	N	-	-
7A	6X40	0	EXIST	-	7	Yes	-	15.0**	-	N	-	-
					4#	Yes	-	3.0	-	N	-	-
8A*	6X40	0	*	*	8	Yes	-	-	-	N	-	*
S1	6X6	+265	EXIST	-	0	No	-	-	-	N	X	-
S2	6X6	+265	EXIST	-	0	No	-	-	-	N	X	-

\* VIDEO DETECTION  
 \*\* REDUCE DELAY TO 3 SECONDS DURING ALTERNATE PHASING OPERATION.  
 # DISABLE PHASE CALL FOR LOOP(S) DURING ALTERNATE PHASING OPERATION.

**Signal Upgrade-Temporary Design 1 (TMP Phase I-II)**

**RK&K**  
 P: (919) 878-8560  
 8801 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965  
 NC License No. F-0112  
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Prepared for the Offices of:  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 STATE OF NORTH CAROLINA  
 SIGNAL DESIGN SECTION

**NC 68 (Eastchester Dr.)  
 at  
 SR 1556 (Gallimore Dairy Rd.)**  
 Division 7 Guilford County High Point  
 PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones  
 PREPARED BY: A.C. Norman REVIEWED BY:  
 REVISIONS INIT. DATE

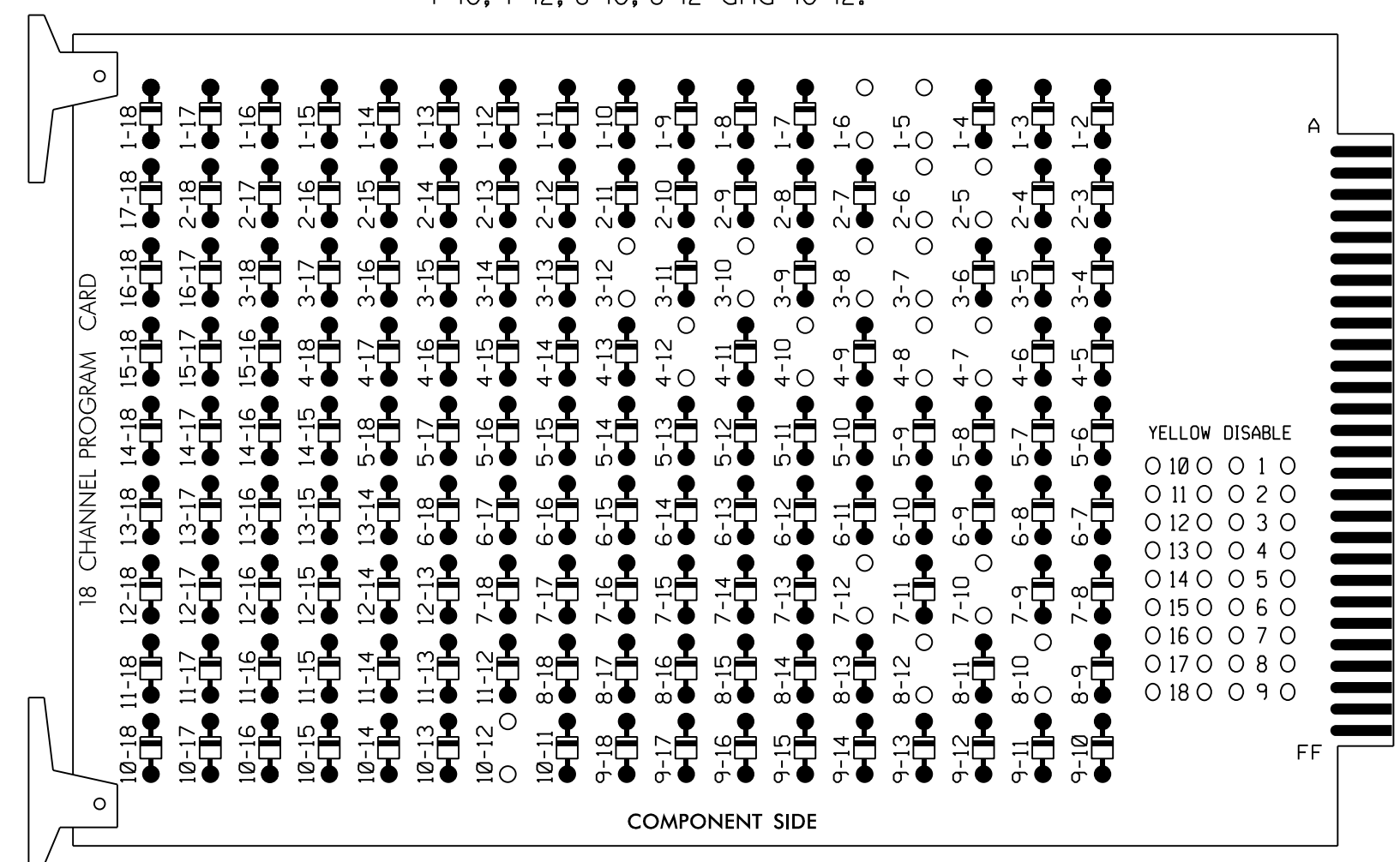
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 056142  
 W. PORTER JONES  
 8/22/2024  
 DATE  
 SIGNATURE  
 DATE  
 SIG. INVENTORY NO. 07-143811

8/22/2024  
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 wpjones

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

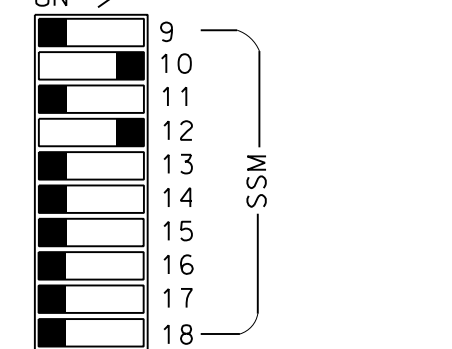
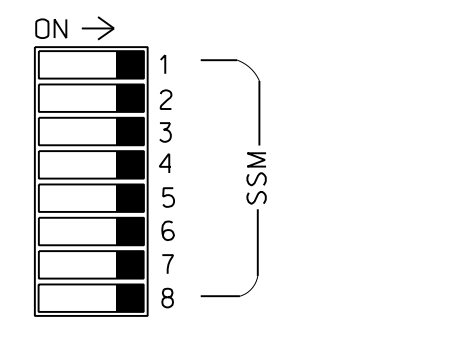
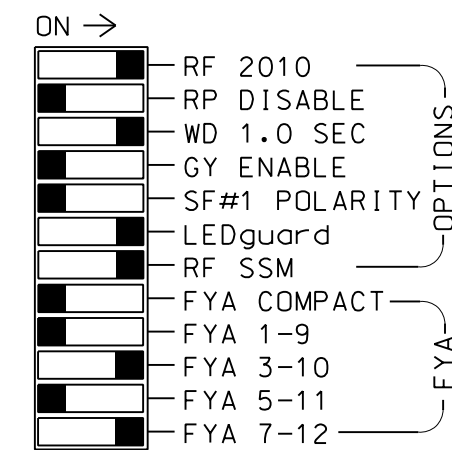
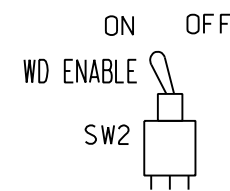
REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 7-10, 7-12, 8-10, 8-12 and 10-12.



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.



■ = 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 High Point 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 S2,AUX S5  
 PHASES USED.....1,2,3,4,5,6,7,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....\*  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....\*  
 \* See overlap programming detail on sheet 2.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22,23,24	NU	31★	24	41,42,43	NU	51	61,62,63	NU	71★	63	81,82,83	NU	NU	31★	NU	71★	NU
RED		128		*	101			134		*	107								
YELLOW		129			102			135			108								
GREEN		130			103			136			109								
RED ARROW	125							131							A124			A101	
YELLOW ARROW	126			117			132			123					A125			A102	
FLASHING YELLOW ARROW															A126			A103	
GREEN ARROW	127			118	118		133			124	124								

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

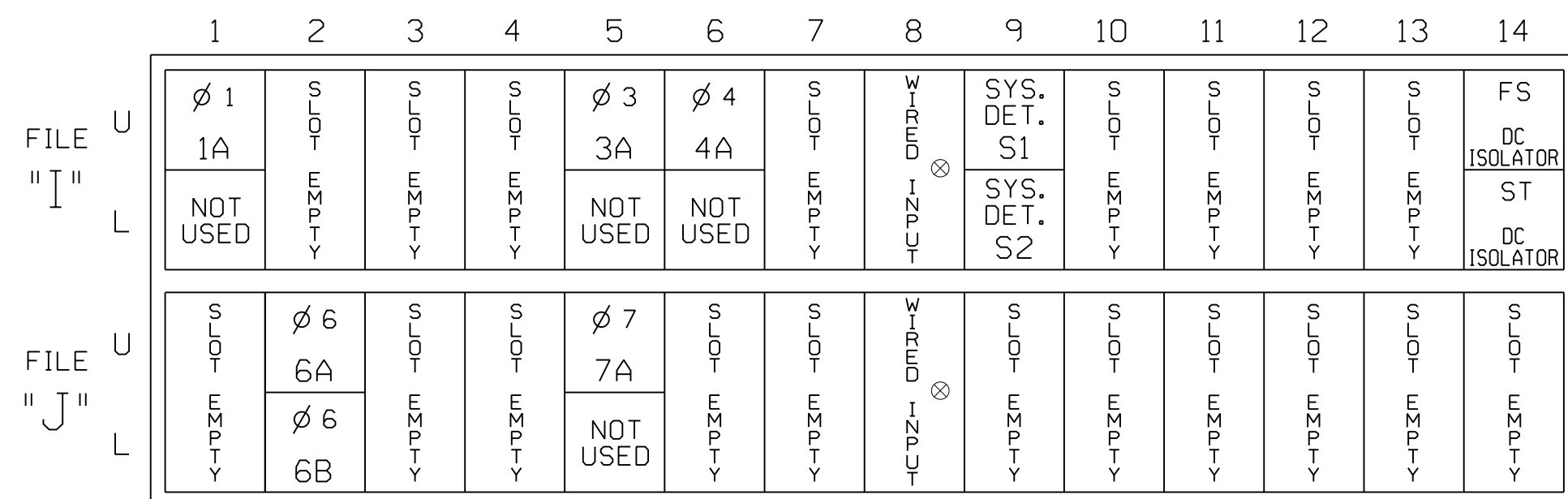
### INPUT FILE CONNECTION & PROGRAMMING CHART

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				N
3A <sup>1</sup>	TB4-5,6	I5U	58	3★	3	YES		15		N
		J8U	50	28★	8	YES		3		N
4A	TB4-9,10	I6U	41	4	4	YES				N
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
7A <sup>2</sup>	TB5-5,6	J5U	57	7★	7	YES		15		N
		I8U	49	24★	4	YES		3		N
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N

- \* System detector only. Remove any assigned vehicle phase.  
<sup>1</sup>Add jumper from I5-W to J8-W, on rear of input file.  
<sup>2</sup>Add jumper from J5-W to I8-W, on rear of input file.  
 ★For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

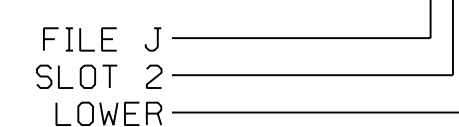
### INPUT FILE POSITION LAYOUT

(front view)



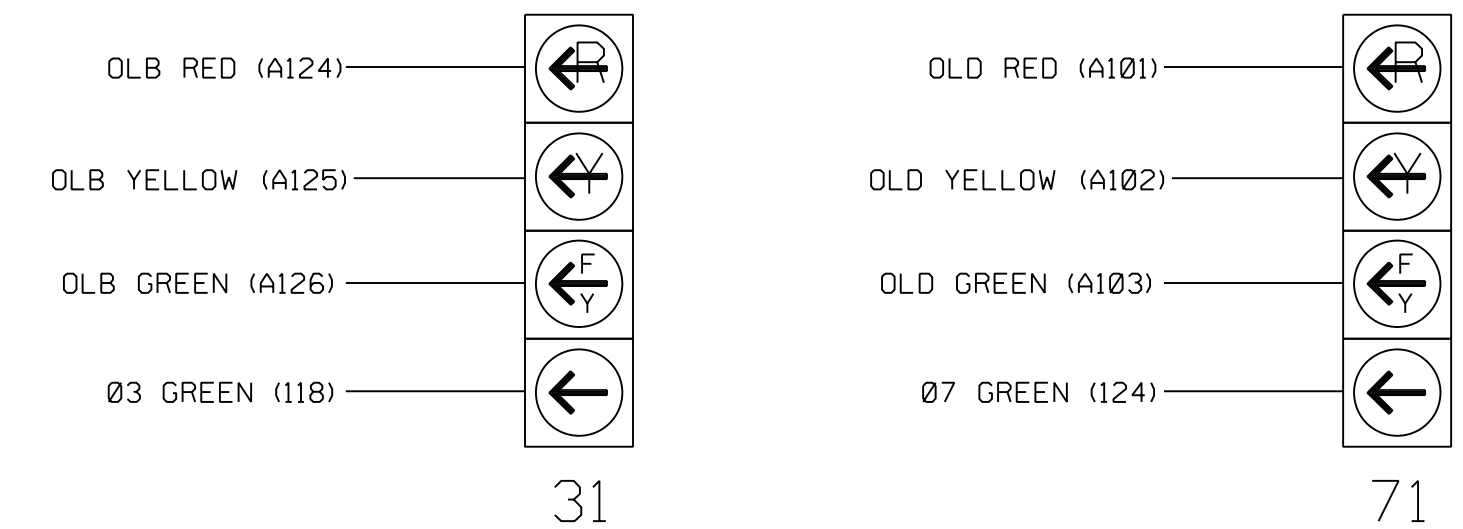
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

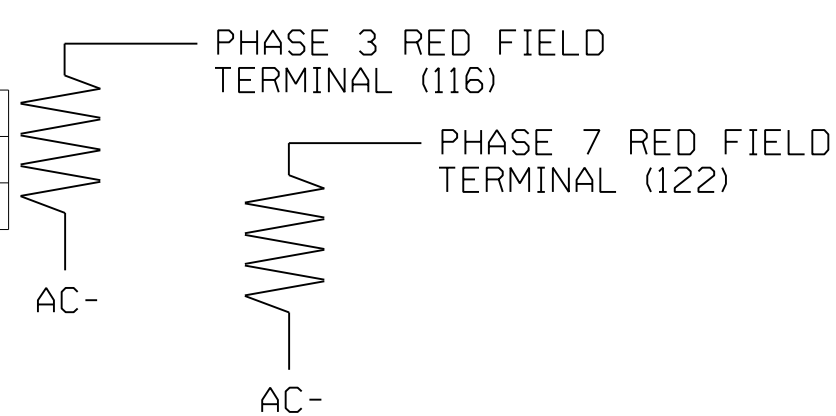
(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T1  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

### LOAD RESISTOR INSTALLATION DETAIL

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



### SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 2A, 2B, 3A, 5A, and 8A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For Detection Zone 3A, the equipment placement and slots reserved for wired inputs are typical for a NCDOT installation.

Signal Upgrade - Temporary Design 1 (TMP Phase I-II) - Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)		SEAL 
	Division 7 PLAN DATE: August 2024 PREPARED BY: WP Erickson-Jones	Guilford County REVIEWED BY: DT Sears REVIEWED BY:	

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### 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 once to position on Overlap B

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..... 3
    
```

← NOTICE ACTION PLAN SF BIT "3"

Toggle Twice

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..... 7
    
```

← NOTICE ACTION PLAN SF BIT "7"

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 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING

#### LOOPS 3A & 7A

*(program controller as shown)*

## IMPORTANT!

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

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

```

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

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

- Place cursor in VEH DETECTOR [ ] position and enter "3".  
- Set delay time to "3".

```

VEH DETECTOR [ 3] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
3 3
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3'

- Place cursor in VEH DETECTOR [ ] position and enter "28".  
- Set assigned phase to "0".

```

VEH DETECTOR [28] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
28 0
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

- Place cursor in VEH DETECTOR [ ] position and enter "7".  
- Set delay time to "3".

```

VEH DETECTOR [ 7] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
7 7
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3'

- Place cursor in VEH DETECTOR [ ] position and enter "24".  
- Set assigned phase to "0".

```

VEH DETECTOR [24] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
24 0
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

END PROGRAMMING

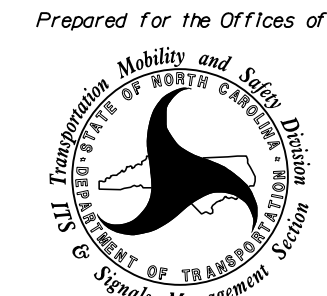
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T1  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Temporary Design 1  
(TMP Phase I-II) - Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Dr.)  
at  
SR 1556 (Gallimore Dairy Rd.)


Division 7 Guilford County High Point

PLAN DATE: August 2024 REVIEWED BY: DT Sears

PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL



Porter Jones  
Professional Engineer  
8/22/2024

SIGNATURE DATE

SIG. INVENTORY NO. 07-1438T1



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### ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	3, 7

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

#### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 3 AND 7 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- SF BITS 3,7: Modifies overlap parent phases for heads 31 and 71 to run protected turns only.
- VEH DET PLAN 2: Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 3 seconds.  
Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

### ECONOLITE ASC/3-2070 ACTION PLAN

#### PROGRAMMING DETAIL

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

```

ACTION PLAN... [ *]
PATTERN.....AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0   SEQUENCE..... 0
VEH DETECTOR PLAN.. 2   DET LOG.....NONE
FLASH..... --      RED REST..... NO
VEH DET DIAG PLN... 0   PED DET DIAG PLN..0
DIMMING ENABLE.. NO   PRIORITY RETURN. NO
PED PR RETURN.. NO   QUEUE DELAY..... NO
PMT COND DELAY NO

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

  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    
```

\*The Action Plan number(s) are to be determined by the Division and/or City Traffic Engineer.

### ASC/3 FLASH SENSE INPUT CONTROL FOR RED-RED FLASH

\*The NCDOT default database is programmed to address Yellow-Red flash. Logic Statement 100 must be modified as shown when running Red-Red flash.

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

Change the "LP" to 100 and move the cursor down. Delete the two "CTR-SET" statements by moving the cursor over them and hitting the "C" key, then hit "ENTER", select "LP SET CIB ON", hit "ENT", and then set the number to 427.

```

LP#:100 COPY FROM:100 ACTIVE: M FALSE
IF LP CIB CODE ON 331 F

THEN LP DELAY FOR 1.0 SECONDS
LP SET CIB ON 427

ELSE
    
```

THIS STATEMENT IS USED TO CONTROL THE FLASH SENSE INPUT WHEN RUNNING RED-RED FLASH OPERATION.

Hit "ESC", then 1 for "LOGIC STATEMENT CONTROL", next verify that LP#100 is ENABLED.

END PROGRAMMING

### ECONOLITE ASC/3-2070 STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **5. START/FLASH**

```

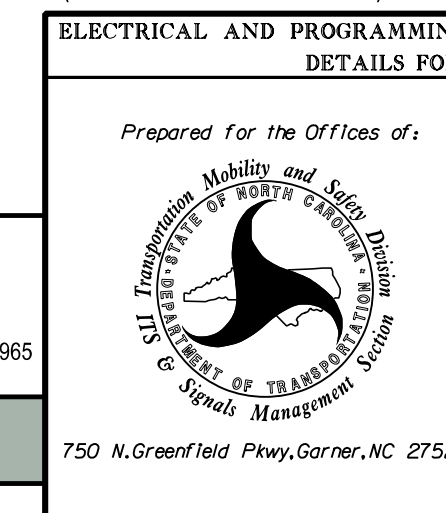
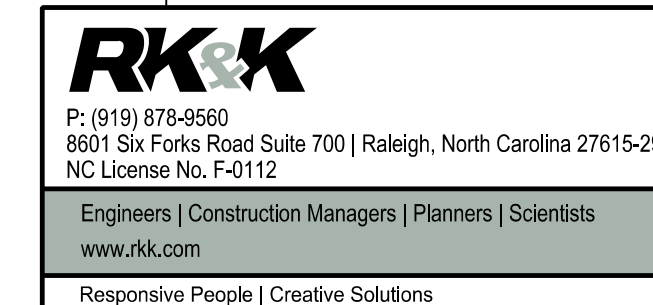
START/FLASH DATA
-----START UP-----
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
          G      G
          A B C D E F G H I J K L M N O P
OVERLAP  X X X X X X X X X X X X X X X X
FLASH>MON. NO FL TIME.. 0 ALL RED... 6
PWR START SEQ.. 1 MUTCD=> YES Y- G: NO
    
```

Scroll down on this screen and set "Exit Fl" to Green "G"

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T1  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Temporary Design 1 (TMP Phase I-II) - Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

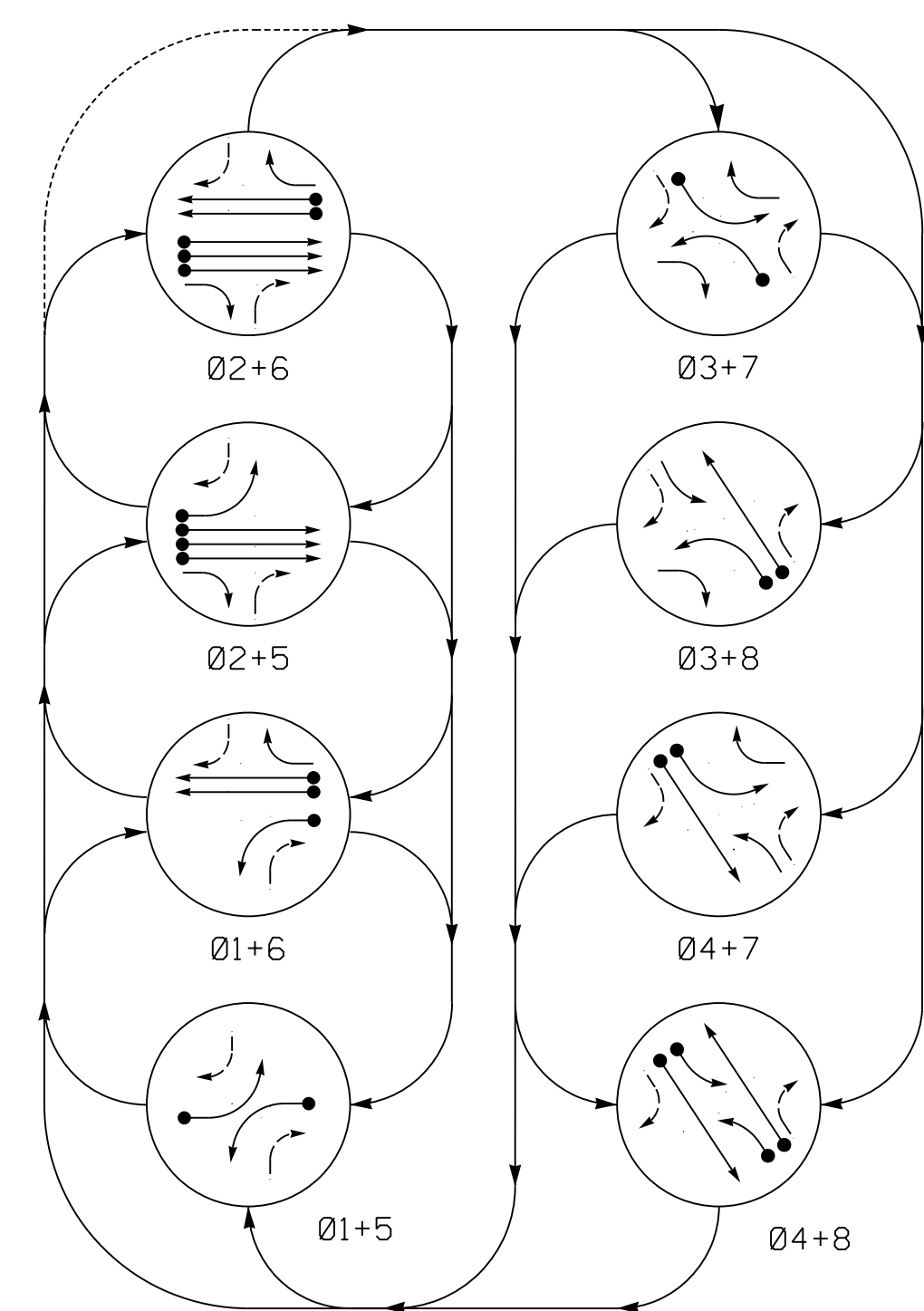


NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)	
Division 7	Guilford County High Point
PLAN DATE: August 2024	REVIEWED BY: DT Sears
PREPARED BY: WP Erickson-Jones	REVIEWED BY:
REVISIONS	INIT. DATE

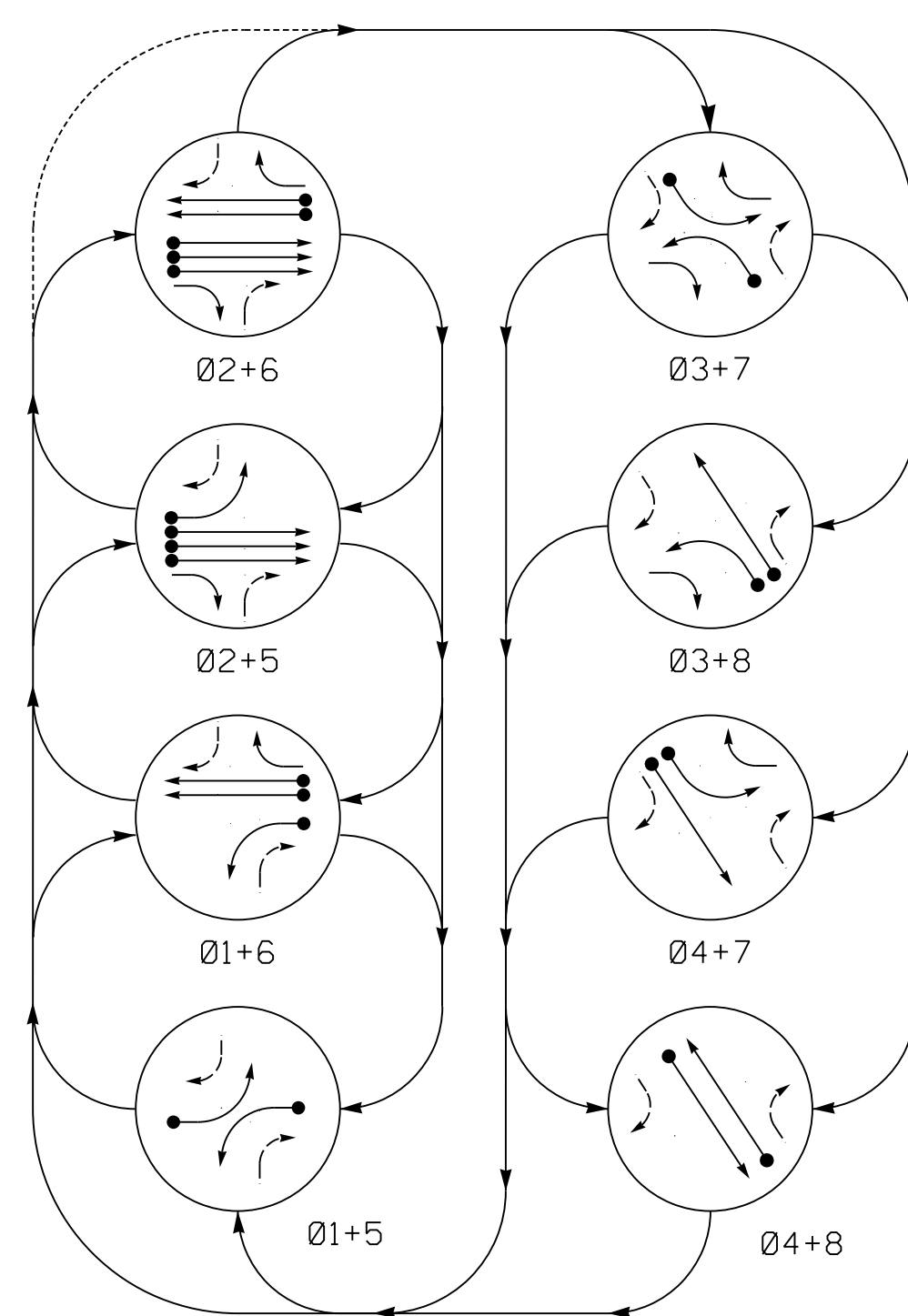
	SEAL PORTER JONES 8/22/2024 DATE
SIG. INVENTORY NO. 07-1438T1	

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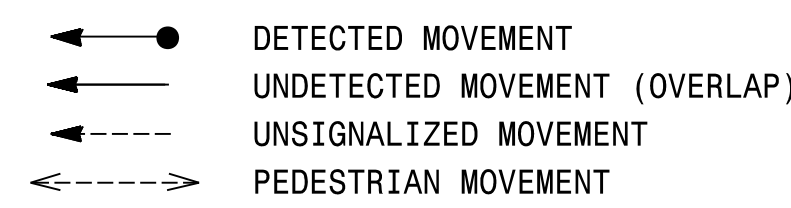
**DEFAULT PHASING DIAGRAM**



**ALTERNATE PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**



**DEFAULT PHASING TABLE OF OPERATION**

SIGNAL FACE	PHASE								FLASH	
	Ø1+5	Ø2+6	Ø3+7	Ø4+8	Ø1+5	Ø2+6	Ø3+7	Ø4+8		
11	←	←	←	←	←	←	←	←	←	↑
21,22,23	R	R	G	G	R	R	R	R	R	↑
24	R	R	G	G	R	R	R	R	R	↑
31	←	←	←	←	←	←	←	←	←	↑
41,42,43	R	R	R	R	R	R	G	G	R	↑
51	←	←	←	←	←	←	←	←	←	↑
61,62	R	G	R	G	R	R	R	R	R	↑
63	R	G	R	G	R	R	R	R	R	↑
71	←	←	←	←	←	←	←	←	←	↑
81,82,83	R	R	R	R	G	R	G	R	R	↑

**ALTERNATE PHASING TABLE OF OPERATION**

SIGNAL FACE	PHASE								FLASH	
	Ø1+5	Ø2+6	Ø3+7	Ø4+8	Ø1+5	Ø2+6	Ø3+7	Ø4+8		
11	←	←	←	←	←	←	←	←	←	↑
21,22,23	R	R	G	G	R	R	R	R	R	↑
24	R	R	G	G	R	R	R	R	R	↑
31	←	←	←	←	←	←	←	←	←	↑
41,42,43	R	R	R	R	R	R	G	G	R	↑
51	←	←	←	←	←	←	←	←	←	↑
61,62	R	G	R	G	R	R	R	R	R	↑
63	R	G	R	G	R	R	R	R	R	↑
71	←	←	←	←	←	←	←	←	←	↑
81,82,83	R	R	R	R	G	R	G	R	R	↑

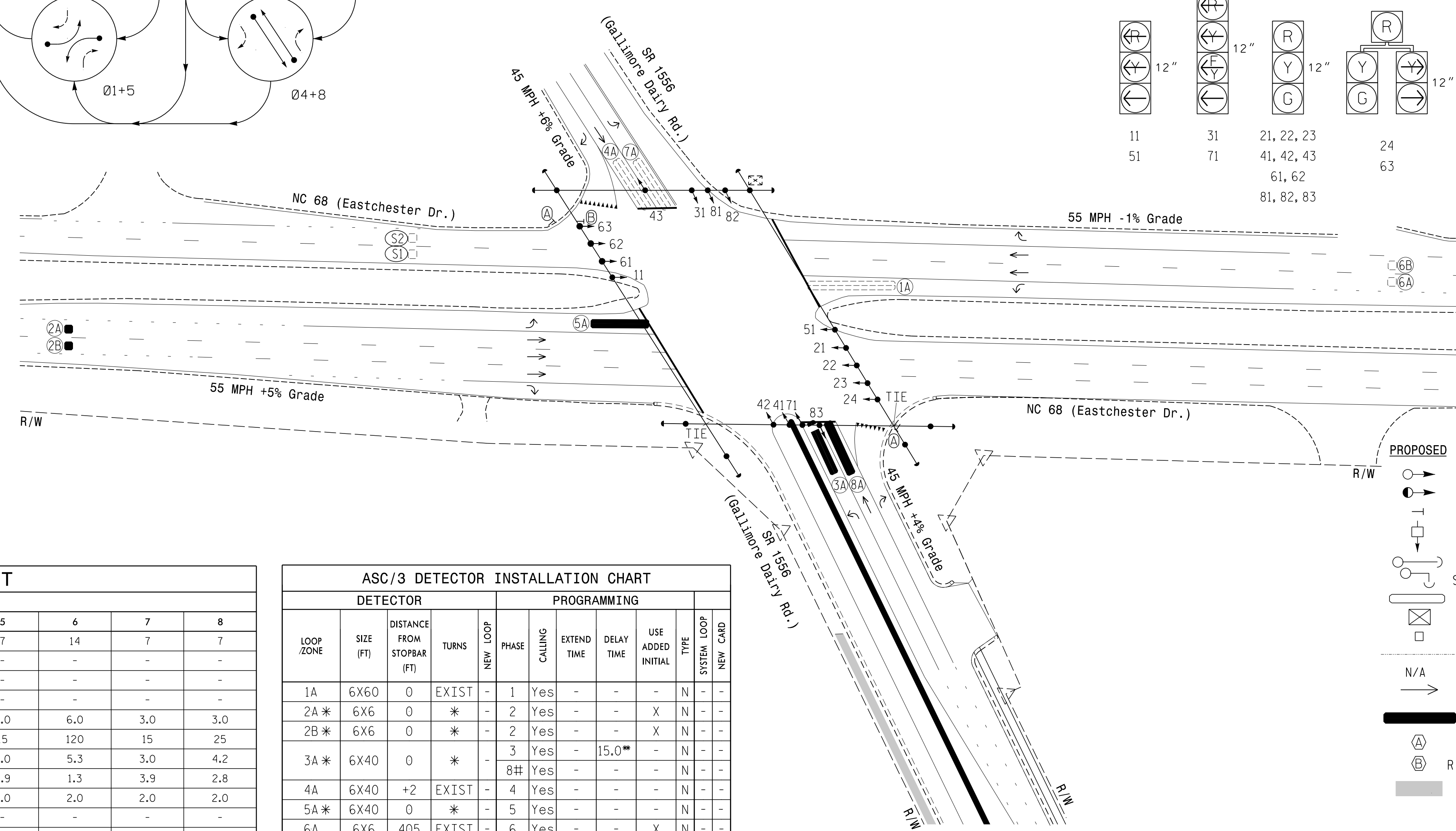
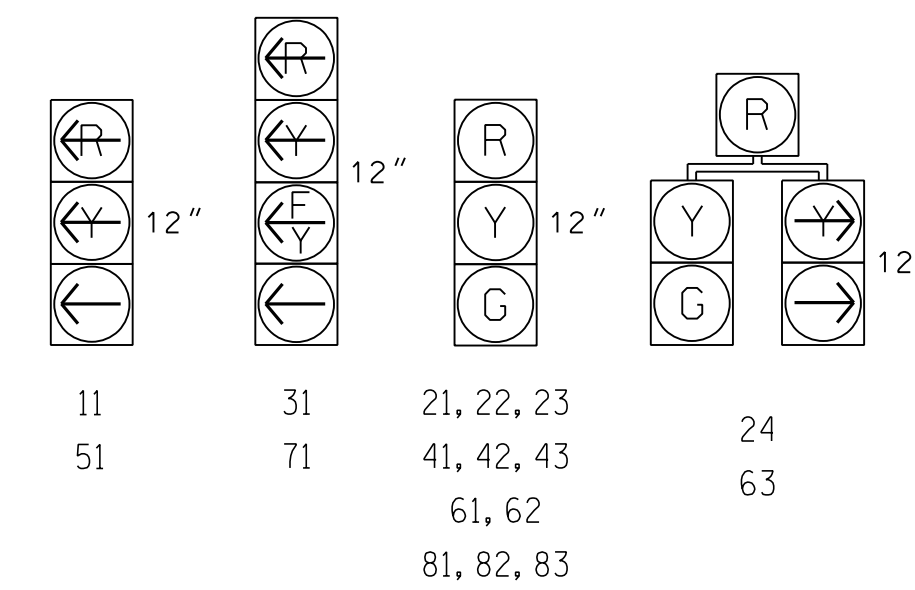
**8 Phase Fully Actuated (High Point Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- The City Traffic Engineer will determine the hours of use for each phasing plan.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

**SIGNAL FACE I.D.**

All Heads L.E.D.



**ASC/3 TIMING CHART**

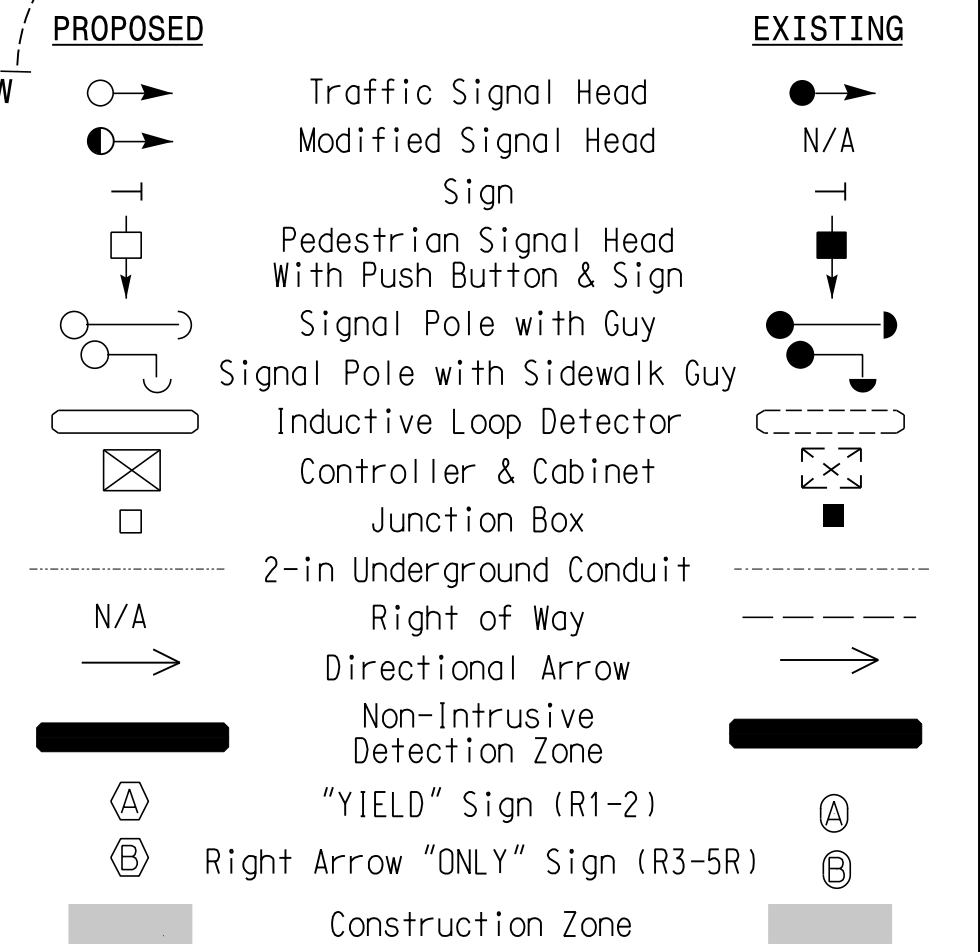
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Delayed Green *	-	-	-	-	-	-	-	-
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	3.0	3.0	2.0	6.0	3.0	3.0
Max I *	15	120	15	25	15	120	15	25
Yellow	3.0	5.3	3.0	4.2	3.0	5.3	3.0	4.2
Red Clear	3.3	1.3	4.0	2.8	2.9	1.3	3.9	2.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	46	-	-	-	45	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.4	-	-	-	3.4	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X	X	X

**ASC/3 DETECTOR INSTALLATION CHART**

DETECTOR				PROGRAMMING									
LOOP ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP	TYPE	NEW	CARD
1A	6X60	0	EXIST	-	1	Yes	-	-	-	N	-	-	-
2A *	6X6	0	*	-	2	Yes	-	-	X	N	-	-	-
2B *	6X6	0	*	-	2	Yes	-	-	X	N	-	-	-
3A *	6X40	0	*	-	3	Yes	-	15.0**	-	N	-	-	-
4A	6X40	+2	EXIST	-	4	Yes	-	-	-	N	-	-	-
5A *	6X40	0	*	-	5	Yes	-	-	-	N	-	-	-
6A	6X6	405	EXIST	-	6	Yes	-	-	X	N	-	-	-
6B	6X6	405	EXIST	-	6	Yes	-	-	-	N	-	-	-
7A	6X40	0	EXIST	-	7	Yes	-	15.0***	-	N	-	-	-
8A *	6X40	0	*	-	8	Yes	-	3.0	-	N	-	-	-
S1	6X6	+265	EXIST	-	0	No	-	-	-	N	X	-	-
S2	6X6	+265	EXIST	-	0	No	-	-	-	N	X	-	-

- \* VIDEO DETECTION
- \*\* DISABLE DELAY DURING ALTERNATE PHASING OPERATION.
- \*\*\* REDUCE DELAY TO 3 SECONDS DURING ALTERNATE PHASING OPERATION.
- # DISABLE PHASE CALL FOR LOOP(S) DURING ALTERNATE PHASING OPERATION.

**LEGEND**



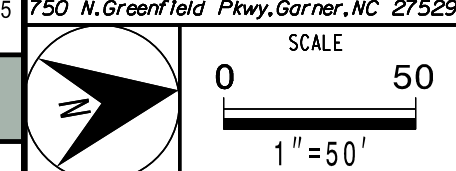
**Signal Upgrade-Temporary Design 2 (TMP Phase III)**

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 DEPARTMENT OF TRANSPORTATION AND SAFETY  
 NORTH CAROLINA

NC 68 (Eastchester Dr.)  
 at  
 SR 1556 (Gallimore Dairy Rd.)  
 Division 7 Guilford County High Point  
 PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones  
 PREPARED BY: A. C. Norman REVIEWED BY:  
 REVISIONS: \_\_\_\_\_ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
  
 PORTER JONES  
 ENGINEER  
 SIGNATURE DATE  
 SIG. INVENTORY NO. 07-143872



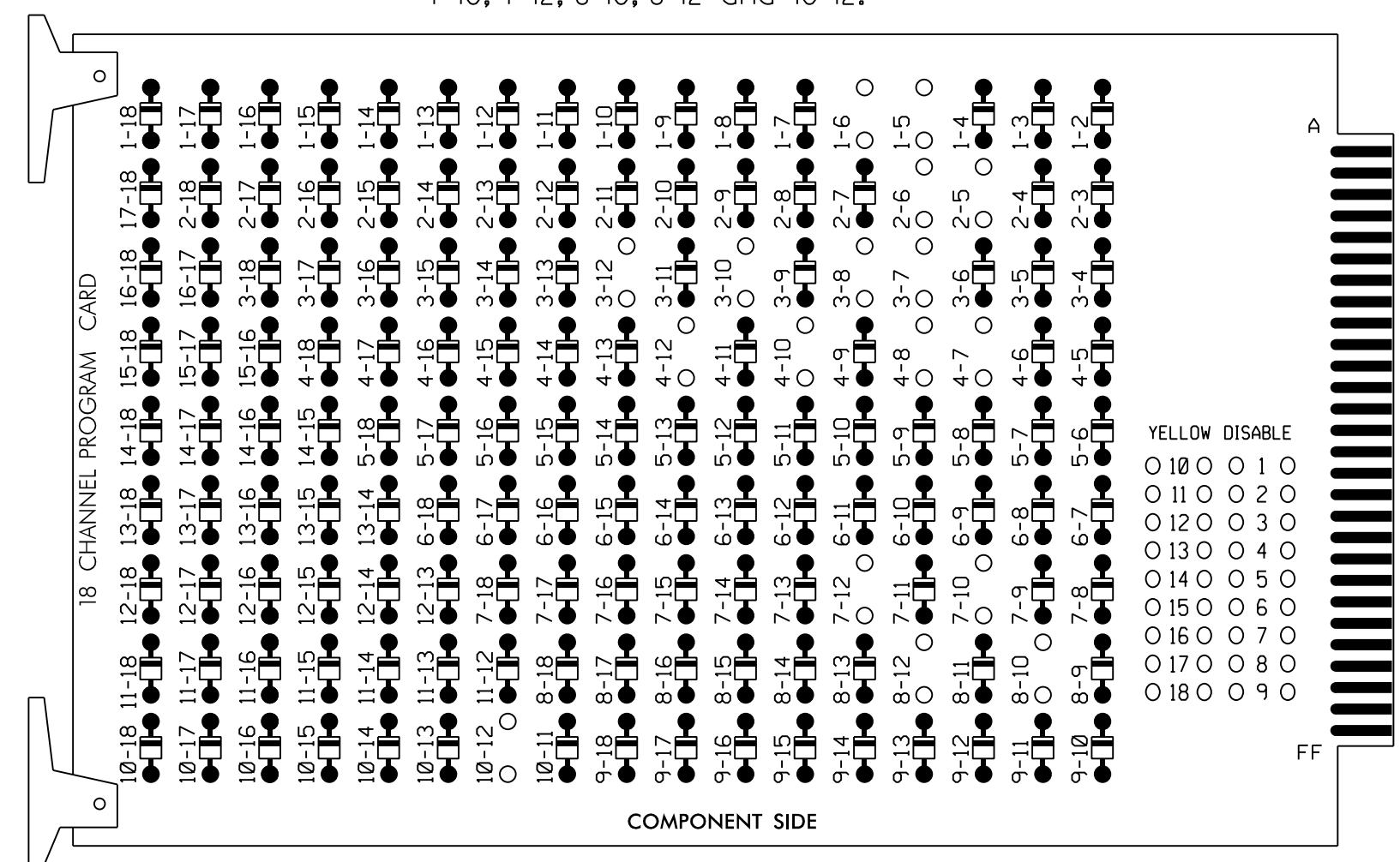
8/22/2024  
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 WJL/lonas

\* 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.

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

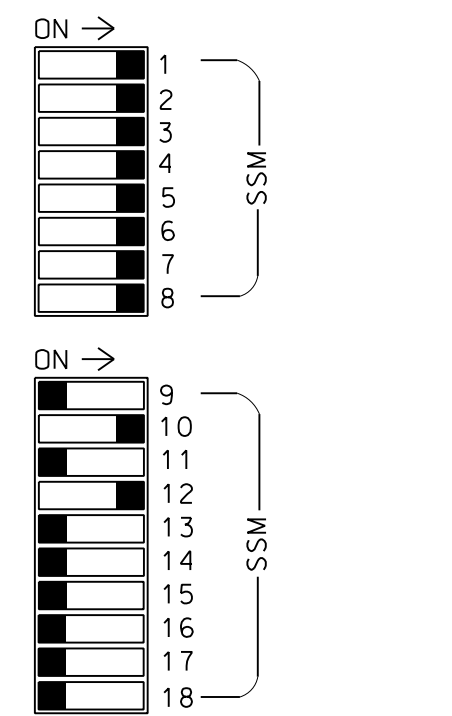
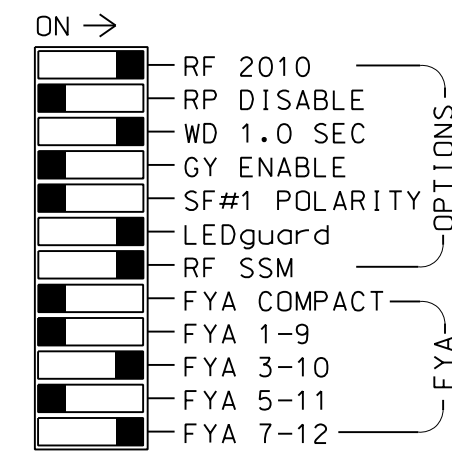
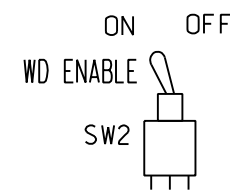
REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 7-10, 7-12, 8-10, 8-12 and 10-12.



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.



■ = 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 High Point 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 S2,AUX S5  
 PHASES USED.....1,2,3,4,5,6,7,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....\*  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....\*  
 \* See overlap programming detail on sheet 2.

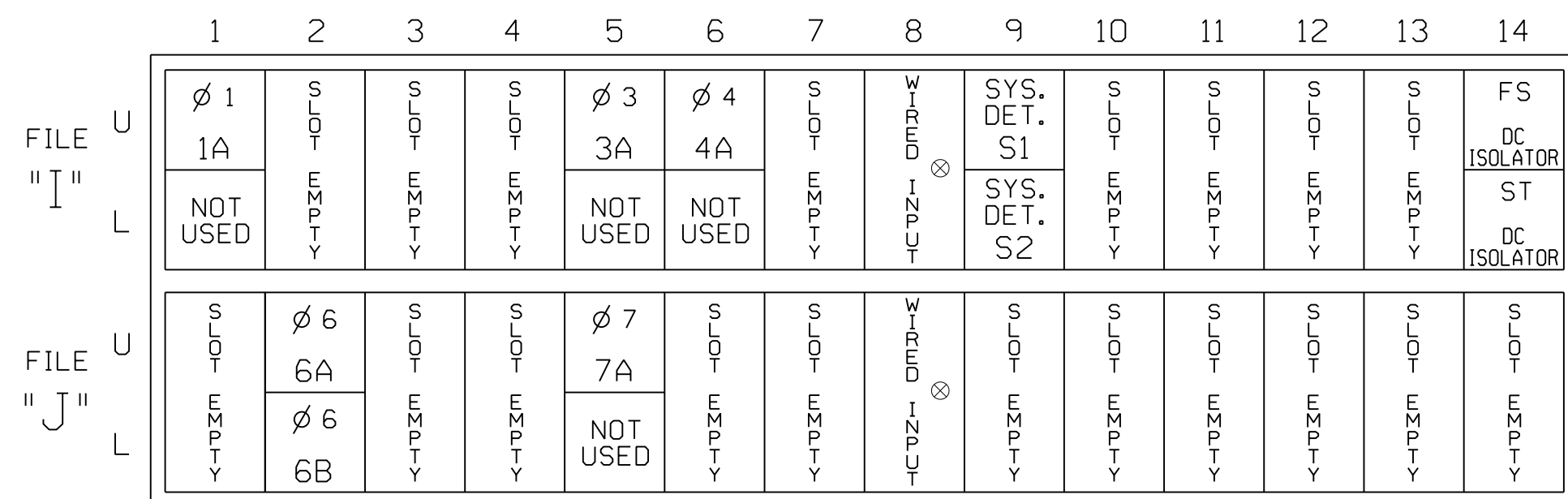
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22,23,24	NU	31	24	41,42,43	NU	51	61,62,63	NU	71	63	81,82,83	NU	31	NU	71	NU
RED		128		*	101			134		*	107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125							131					A124				A101	
YELLOW ARROW	126				117			132			123		A125				A102	
FLASHING YELLOW ARROW													A126				A103	
GREEN ARROW	127			118	118			133			124	124						

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

### INPUT FILE POSITION LAYOUT

(front view)

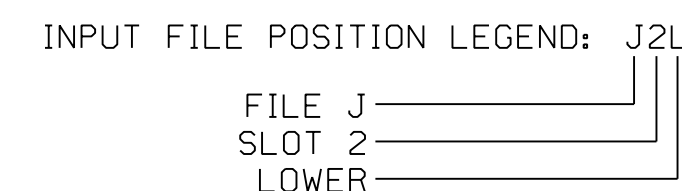


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

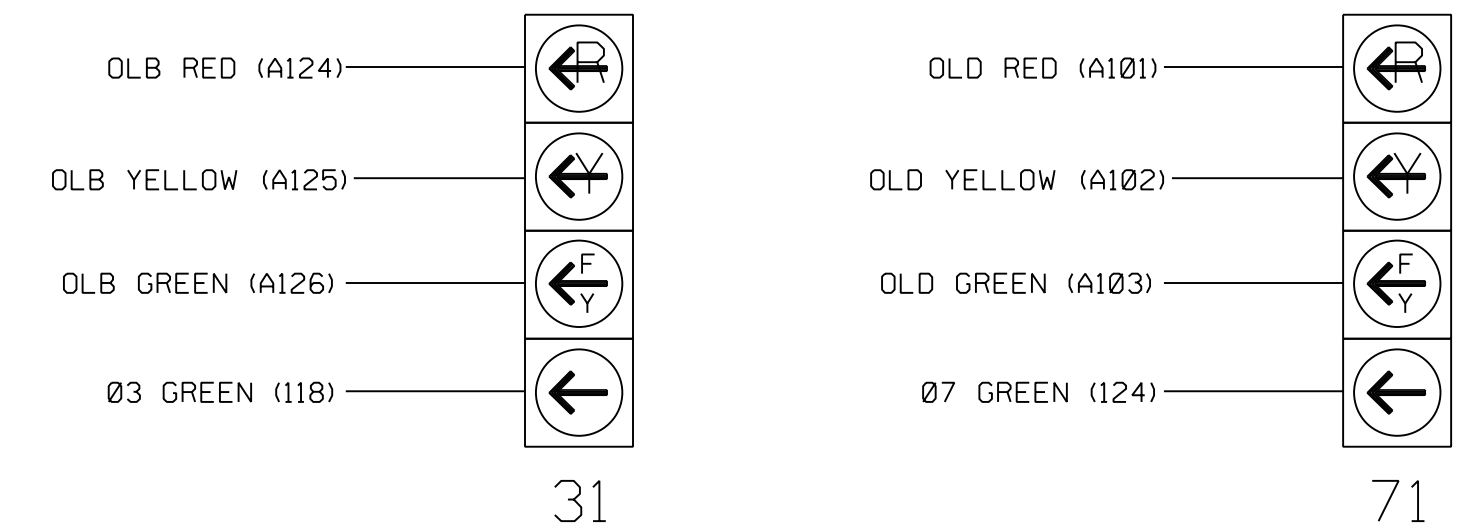
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				N
3A <sup>1</sup>	TB4-5,6	I5U	58	3	3	YES		15		N
	-	J8U	50	28	8	YES				N
4A	TB4-9,10	I6U	41	4	4	YES				N
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
7A <sup>2</sup>	TB5-5,6	J5U	57	7	7	YES		15		N
	-	I8U	49	24	4	YES		3		N
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N

- \* System detector only. Remove any assigned vehicle phase.  
<sup>1</sup>Add jumper from I5-W to J8-W, on rear of input file.  
<sup>2</sup>Add jumper from J5-W to I8-W, on rear of input file.  
 \* For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.



### FYA SIGNAL WIRING DETAIL

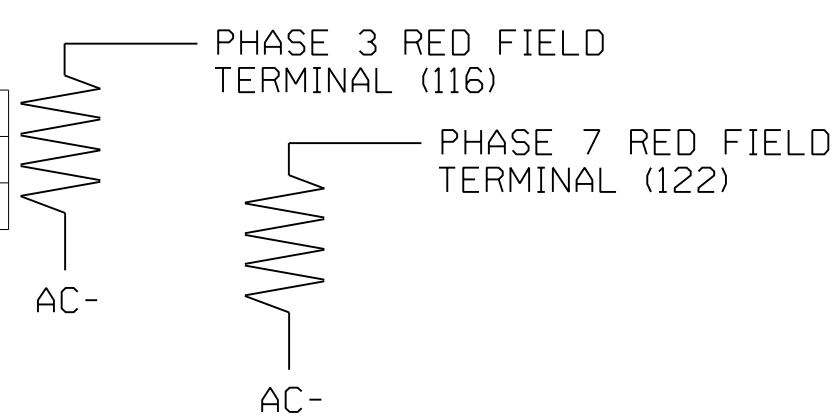
(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T2  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

### LOAD RESISTOR INSTALLATION DETAIL

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



### SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 2A, 2B, 3A, 5A, and 8A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For Detection Zone 3A, the equipment placement and slots reserved for wired inputs are typical for a NCDOT installation.

Signal Upgrade - Temporary Design 2 (TMP Phase III) - Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)		SEAL 
	Division 7 PLAN DATE: August 2024 PREPARED BY: WP Erickson-Jones	Guilford County REVIEWED BY: DT Sears REVIEWED BY:	

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## 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 once to position on Overlap B

**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..... 3
    
```

NOTICE ACTION PLAN SF BIT "3"

**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..... 7
    
```

NOTICE ACTION PLAN SF BIT "7"

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 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING

### LOOPS 3A & 7A

(program controller as shown)

# IMPORTANT!

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

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

```

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

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

- Place cursor in VEH DETECTOR [ ] position and enter "3".  
- Set delay time to "0".

```

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

NOTICE VEH DET PLAN 2

ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "28".  
- Set assigned phase to "0".

```

VEH DETECTOR [28] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
28 0
CALL OPTION... YES DELAY TIME... 0.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0"

- Place cursor in VEH DETECTOR [ ] position and enter "7".  
- Set delay time to "3".

```

VEH DETECTOR [ 7] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
7 7
CALL OPTION... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2

ENSURE DELAY IS SET TO '3'

- Place cursor in VEH DETECTOR [ ] position and enter "24".  
- Set assigned phase to "0".

```

VEH DETECTOR [24] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
24 0
CALL OPTION... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0"

END PROGRAMMING

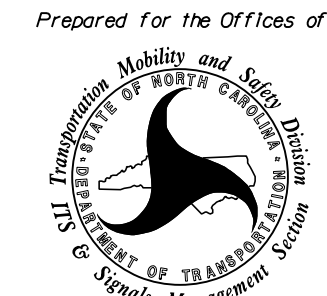
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T2  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Temporary Design 2 (TMP Phase III) - Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)


Division 7 Guilford County High Point

PLAN DATE: August 2024 REVIEWED BY: DT Sears

PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL



Porter Jones  
Professional Engineer  
No. 056142

DocuSigned by:  
Porter Jones  
8/22/2024

SIGNATURE DATE

SIG. INVENTORY NO. 07-1438T2



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### ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	3, 7

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

#### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 3 AND 7 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- SF BITS 3,7: Modifies overlap parent phases for heads 31 and 71 to run protected turns only.
- VEH DET PLAN 2: Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.  
  
Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

### ECONOLITE ASC/3-2070 ACTION PLAN

#### PROGRAMMING DETAIL

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

```

ACTION PLAN... [ *]
PATTERN.....AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0   SEQUENCE..... 0
VEH DETECTOR PLAN.. 2   DET LOG.....NONE
FLASH..... --   RED REST..... NO
VEH DET DIAG PLN... 0   PED DET DIAG PLN..0
DIMMING ENABLE.. NO   PRIORITY RETURN. NO
PED PR RETURN.. NO   QUEUE DELAY..... NO
PMT COND DELAY NO

  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT  .  .  X  .  .  .  X  .  (1-8)
AUX FCT  .  .  .  (1-3)
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
    
```

\*The Action Plan number(s) are to be determined by the Division and/or City Traffic Engineer.

### ASC/3 FLASH SENSE INPUT CONTROL FOR RED-RED FLASH

\*The NCDOT default database is programmed to address Yellow-Red flash. Logic Statement 100 must be modified as shown when running Red-Red flash.

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

Change the "LP" to 100 and move the cursor down. Delete the two "CTR-SET" statements by moving the cursor over them and hitting the "C" key. then hit "ENTER", select "LP SET CIB ON", hit "ENT", and then set the number to 427.

```

LP#:100 COPY FROM:100 ACTIVE: M FALSE
IF LP CIB CODE ON 331 F

THEN LP DELAY FOR 1.0 SECONDS
LP SET CIB ON 427

ELSE
    
```

THIS STATEMENT IS USED TO CONTROL THE FLASH SENSE INPUT WHEN RUNNING RED-RED FLASH OPERATION.

Hit "ESC", then 1 for "LOGIC STATEMENT CONTROL", next verify that LP#100 is ENABLED.

END PROGRAMMING

### ECONOLITE ASC/3-2070 STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **5. START/FLASH**

```

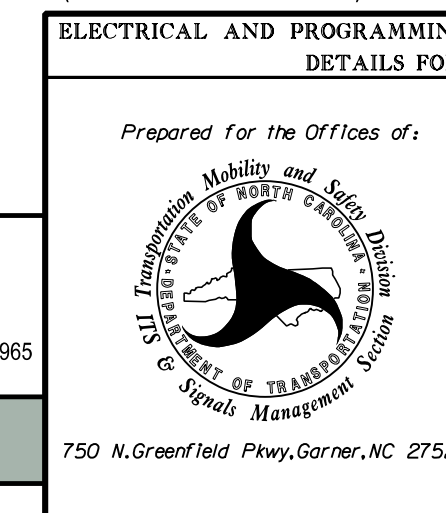
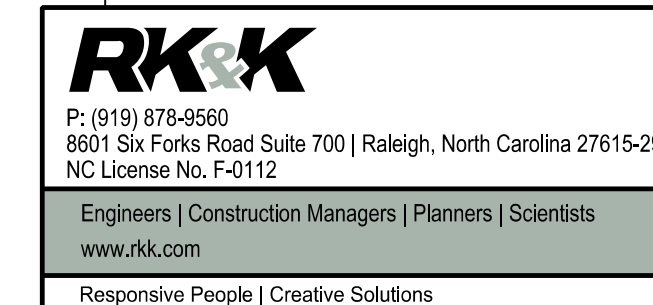
START/FLASH DATA
-----START UP-----
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PHASE    G      G
          A  B  C  D  E  F  G  H  I  J  K  L  M  N  O  P
OVERLAP  X  X  X  X  X  X  X  X  X  X  X  X  X  X  X  X
FLASH>MON. NO FL TIME.. 0 ALL RED... 6
PWR START SEQ.. 1 MUTCD> YES Y- G: NO
    
```

Scroll down on this screen and set "Exit Fl" to Green "G"

Signal Upgrade - Temporary Design 2 (TMP Phase III) - Electrical Detail - Sheet 3 of 3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438T2  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

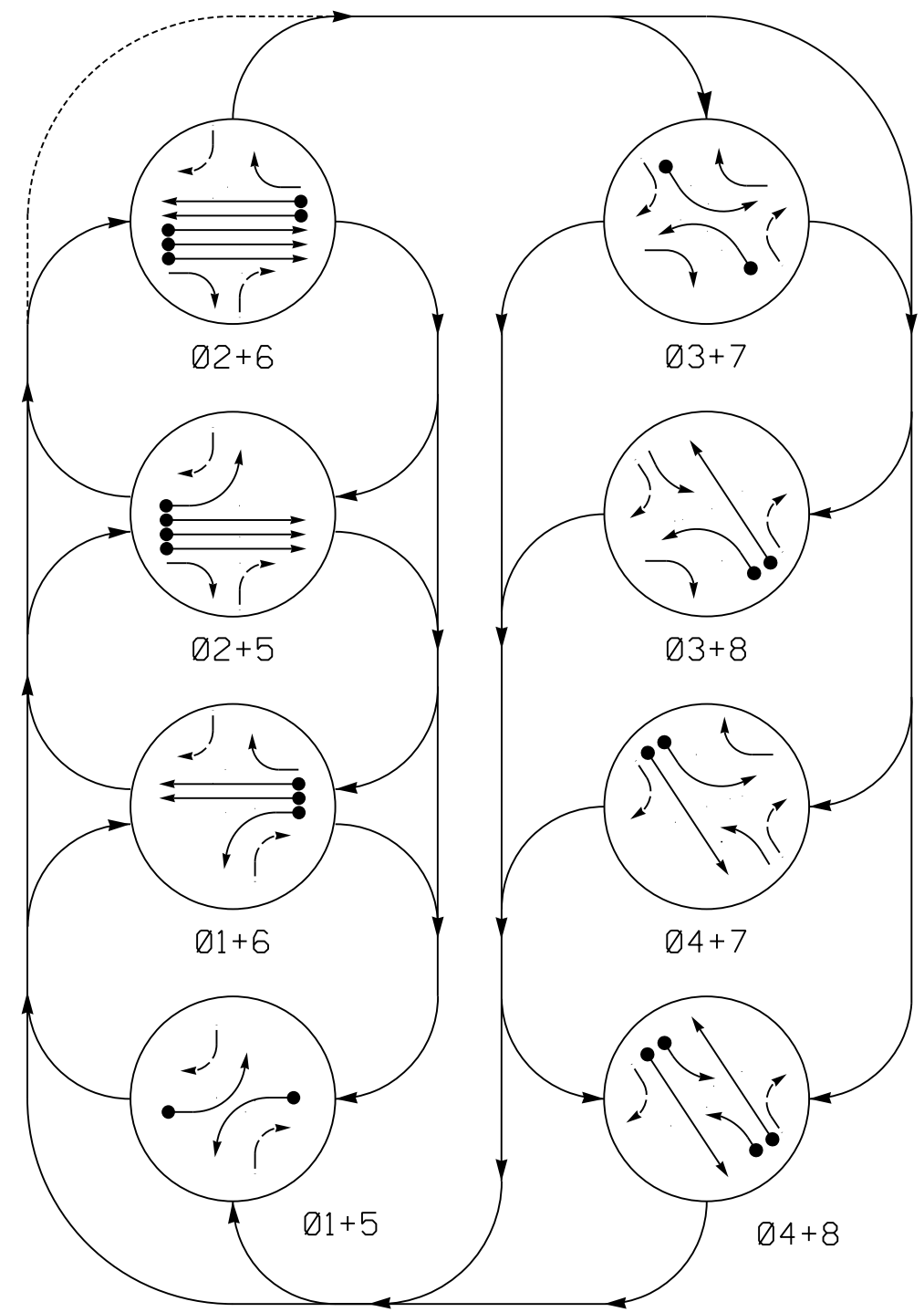
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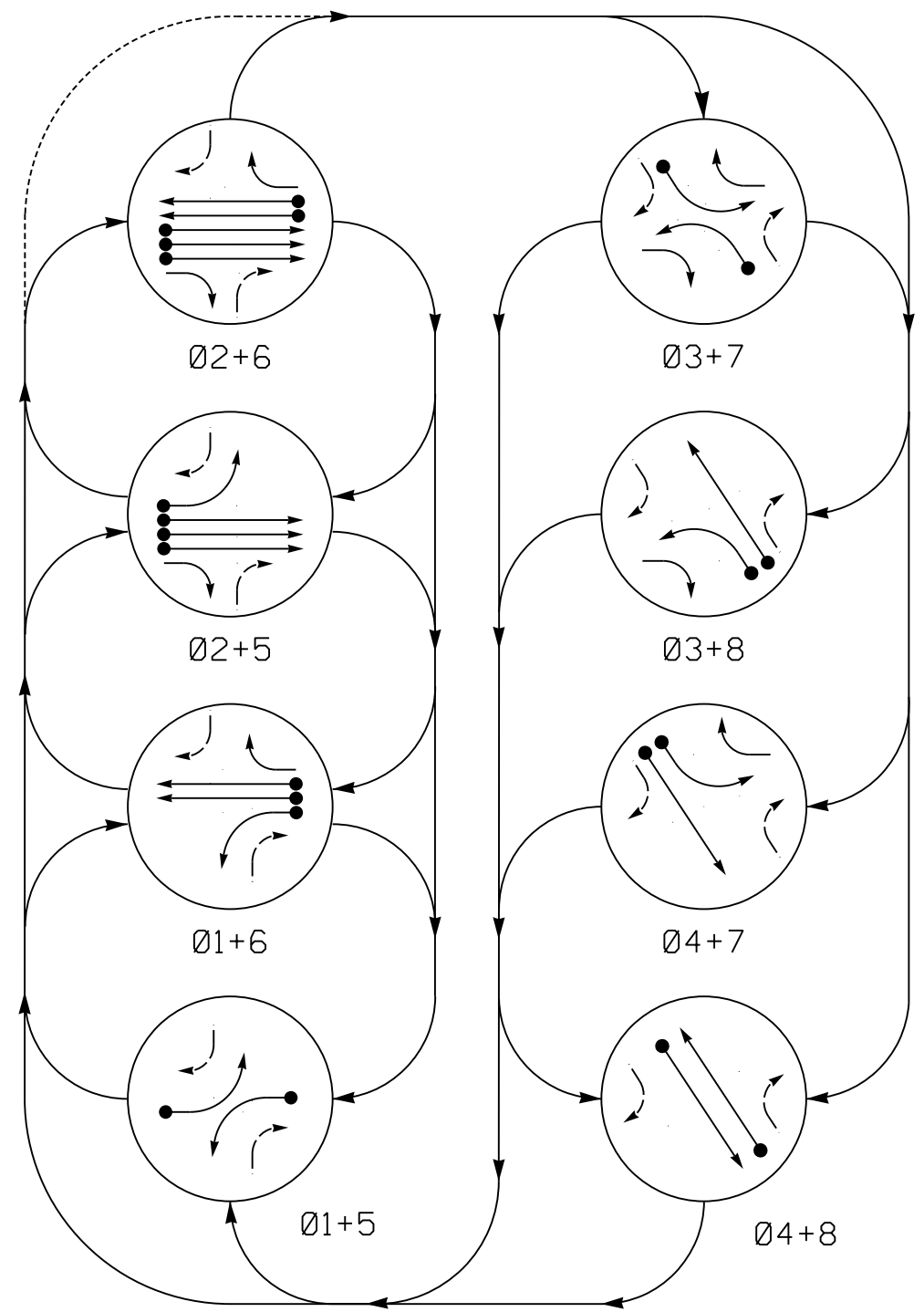
ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)	
Division 7	Guilford County	High Point	
PLAN DATE: August 2024	REVIEWED BY: DT Sears		
PREPARED BY: WP Erickson-Jones	REVIEWED BY:		
REVISIONS	INIT.	DATE	

DocuSigned by: <b>Porter Jones</b> 08/22/2024	8/22/2024
SIGNATURE	DATE
SIG. INVENTORY NO. 07-1438T2	

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
11	←	←	←	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R	R	R	R
24	R	R	→	→	→	→	R	R	R
31	←	←	←	←	←	←	←	←	←
41,42,43	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	R	R
63	R	→	R	→	R	→	R	→	R
71	←	←	←	←	←	←	←	←	←
81,82,83	R	R	R	R	R	G	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
11	←	←	←	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R	R	R	R
24	R	R	→	→	→	→	R	R	R
31	←	←	←	←	←	←	←	←	←
41,42,43	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	R	R
63	R	→	R	→	R	→	R	→	R
71	←	←	←	←	←	←	←	←	←
81,82,83	R	R	R	R	R	G	R	G	R

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	N	-	X
2A	6X6	420	6	X	2	Yes	-	-	-	X	N	-
2B	6X6	420	6	X	2	Yes	-	-	-	X	N	-
3A	6X40	0	2-4-2	X	3	Yes	-	15.0*	-	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	N	-	X
6A	6X6	420	5	X	6	Yes	-	-	-	X	N	-
6B	6X6	420	5	X	6	Yes	-	-	-	X	N	-
7A	6X40	0	2-4-2	X	7	Yes	-	15.0**	-	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	-	-	N	-	X
S1	6X6	+265	4	X	0	No	-	-	-	N	X	X
S2	6X6	+265	4	X	0	No	-	-	-	N	X	X

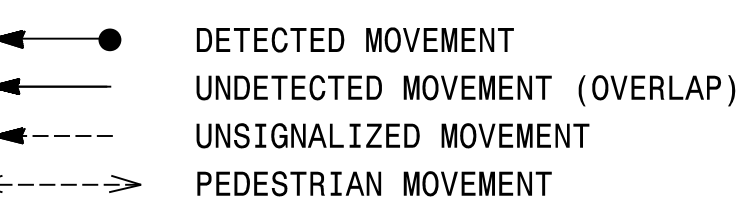
\* DISABLE DELAY DURING ALTERNATE PHASING OPERATION.  
 \*\* REDUCE DELAY TO 3 SECONDS DURING ALTERNATE PHASING OPERATION.  
 # DISABLE PHASE CALL FOR LOOP(S) DURING ALTERNATE PHASING OPERATION.

8 Phase Fully Actuated (High Point Signal System)

NOTES

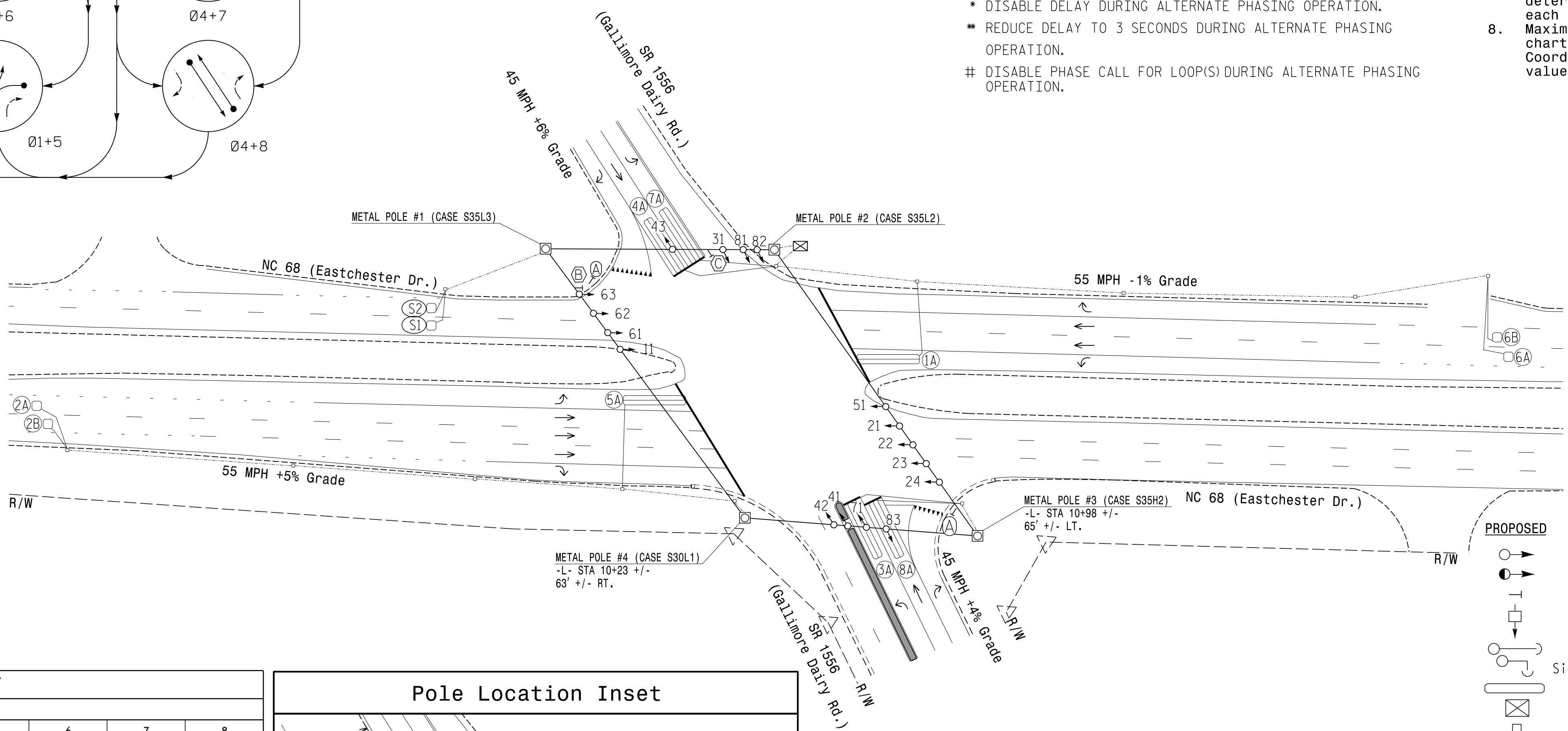
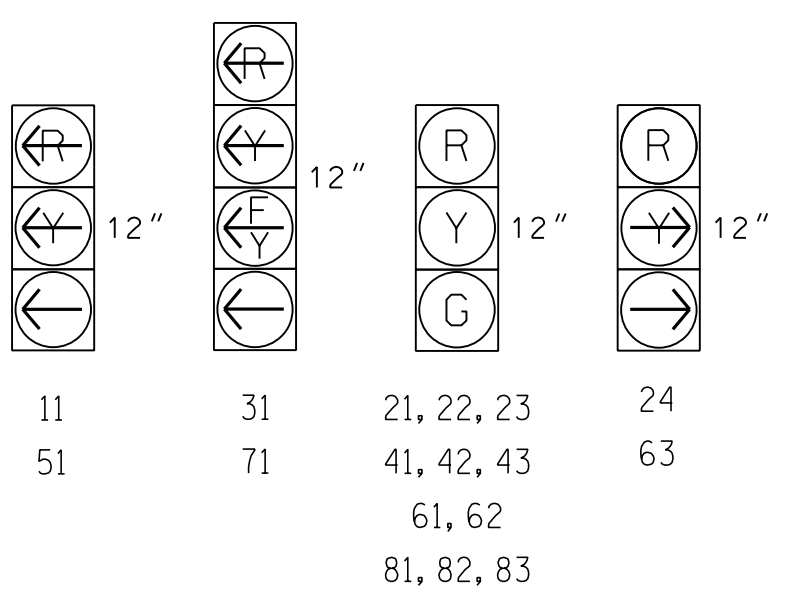
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 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.
- The City Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

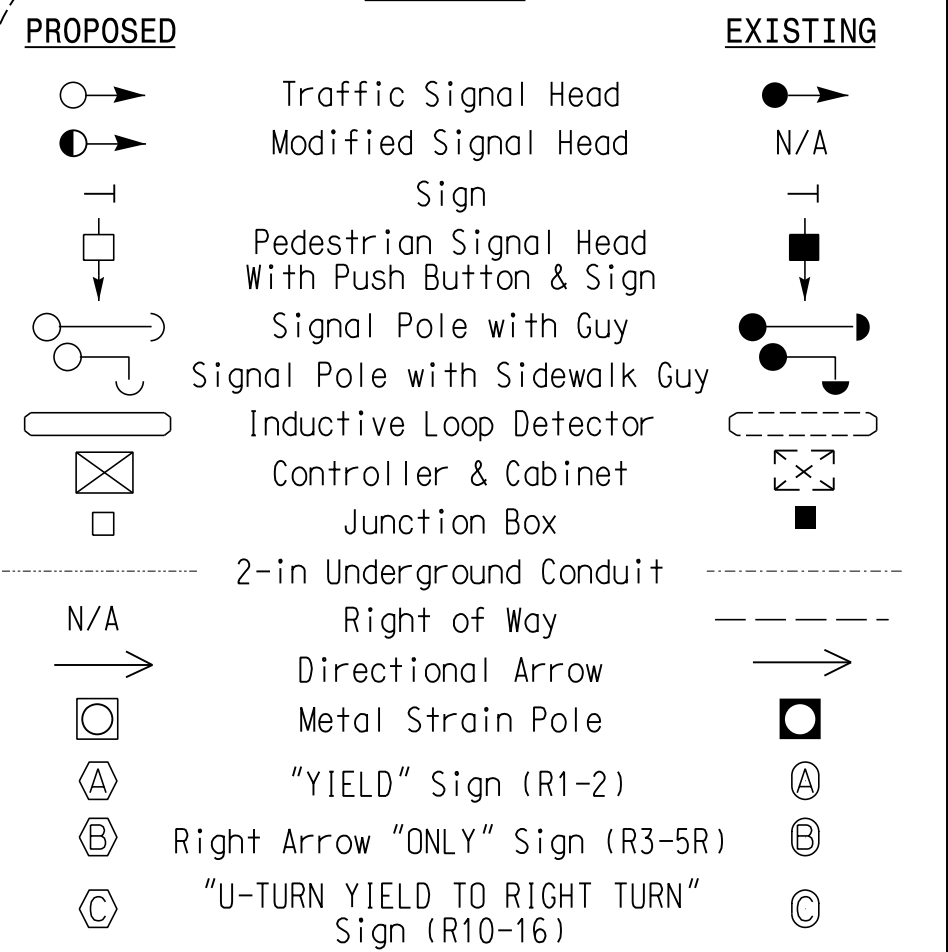


SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

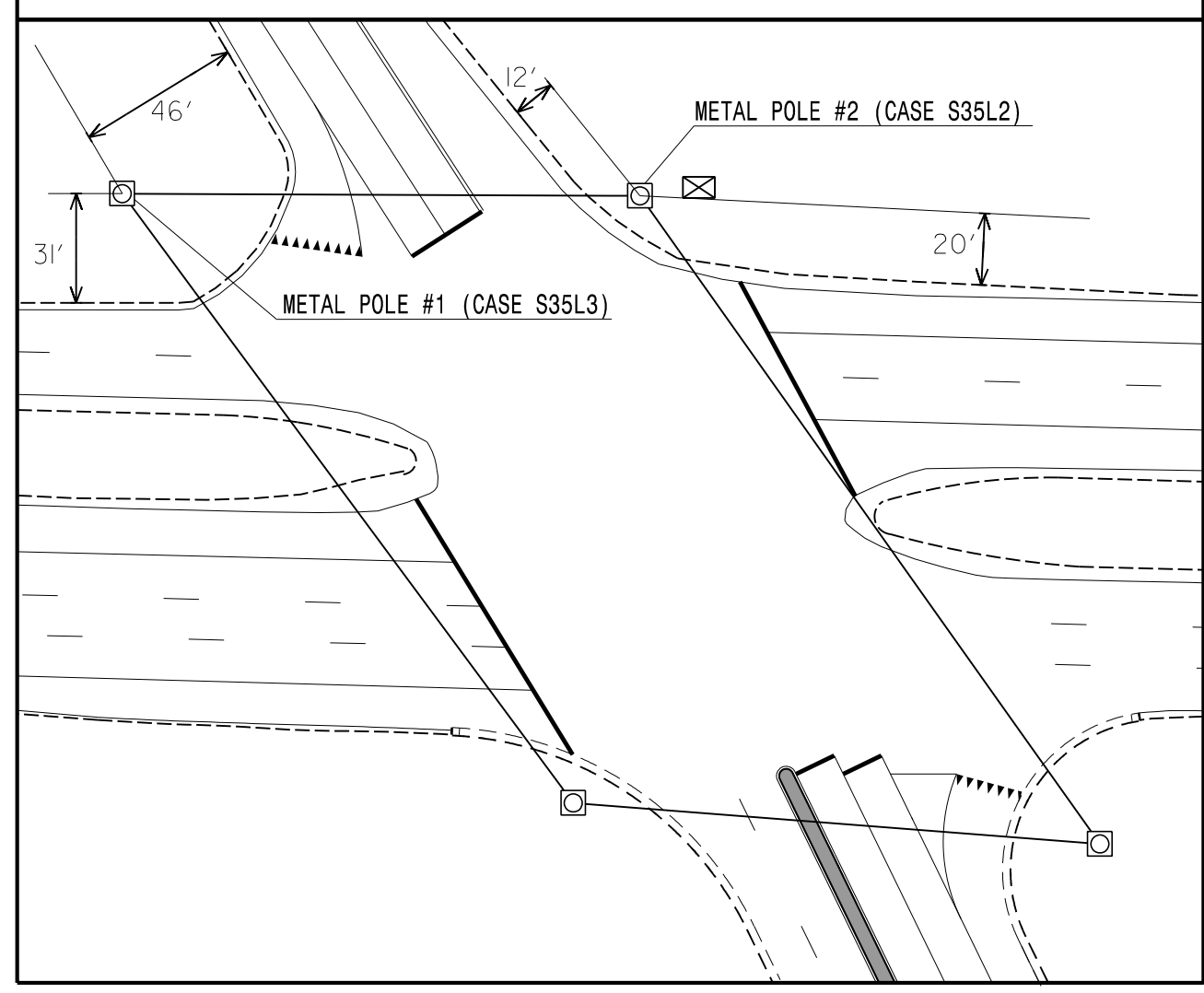


ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Delayed Green *	-	-	-	-	-	-	-	-
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	3.0	3.0	2.0	6.0	3.0	3.0
Max 1 *	15	120	15	25	15	120	15	25
Yellow	3.0	5.3	3.0	4.2	3.0	5.3	3.0	4.2
Red Clear	3.1	1.3	3.9	2.8	2.9	1.3	3.9	2.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	SOFT RECALL	-	-	-	SOFT 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.

Pole Location Inset



Signal Upgrade-Final Design

Prepared For the Offices of:  
 TRANSPORTATION MOBILITY AND SAFETY DIVISION  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

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NC 68 (Eastchester Dr.)  
 at  
 SR 1556 (Gallimore Dairy Rd.)

Division 7 Guilford County High Point

PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones

PREPARED BY: A.C. Norman REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 056142  
 W. PORTER JONES  
 PORTER JONES ENGINEERS

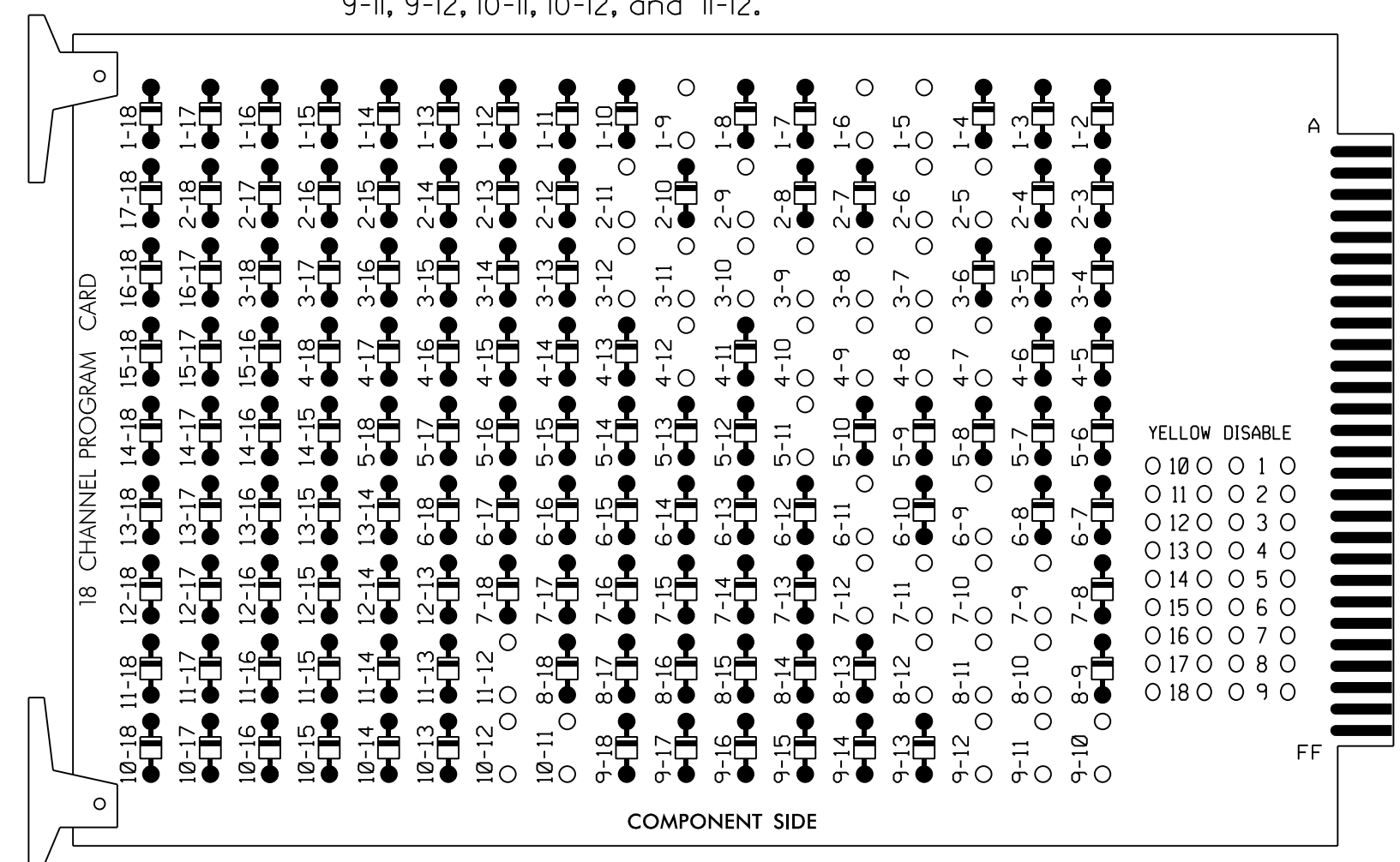
8/22/2024

SIG. INVENTORY NO. 07-1438

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



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 High Point 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.

### SIGNAL HEAD HOOK-UP CHART

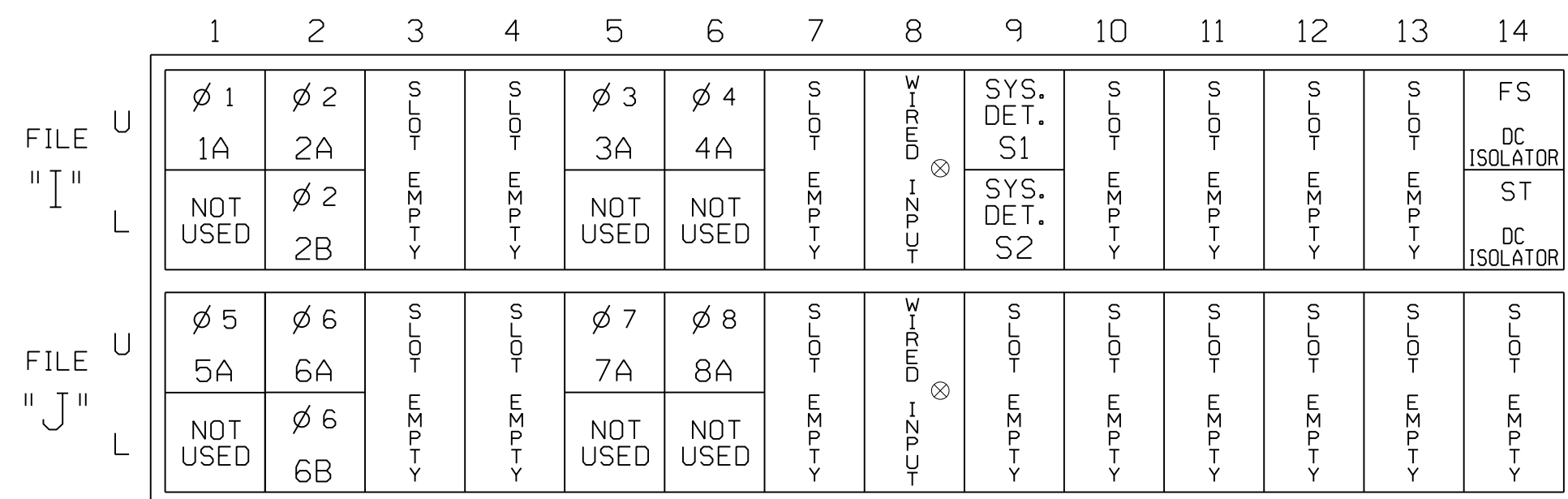
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22,23	NU	31	41,42,43	NU	51	61,62	NU	71	81,82,83	NU	63	31	NU	24	71	NU
RED		128			101			134			107		A121				A114	
YELLOW		129		*	102			135		*	108							
GREEN		130			103			136			109							
RED ARROW	125							131						A124			A101	
YELLOW ARROW	126							132					A122	A125		A115	A102	
FLASHING YELLOW ARROW													A126				A103	
GREEN ARROW	127			118				133			124		A123			A116		

NU = Not Used

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

### INPUT FILE POSITION LAYOUT

(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

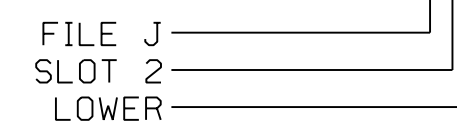
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				N
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
3A <sup>1</sup>	TB4-5,6	I5U	58	3	3	YES		15		N
	-	J8U	50	28	8	YES				N
4A	TB4-9,10	I6U	41	4	4	YES				N
5A	TB3-1,2	J1U	55	5	5	YES				N
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
7A <sup>2</sup>	TB5-5,6	J5U	57	7	7	YES		15		N
	-	I8U	49	24	4	YES		3		N
8A	TB5-9,10	J6U	42	8	8	YES				N
* S1	TB6-9,10	I9U	60	11	SYS	NO				N
* S2	TB6-11,12	I9L	62	13	SYS	NO				N

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

- Add jumper from I5-W to J8-W, on rear of input file.
- Add jumper from J5-W to I8-W, on rear of input file.

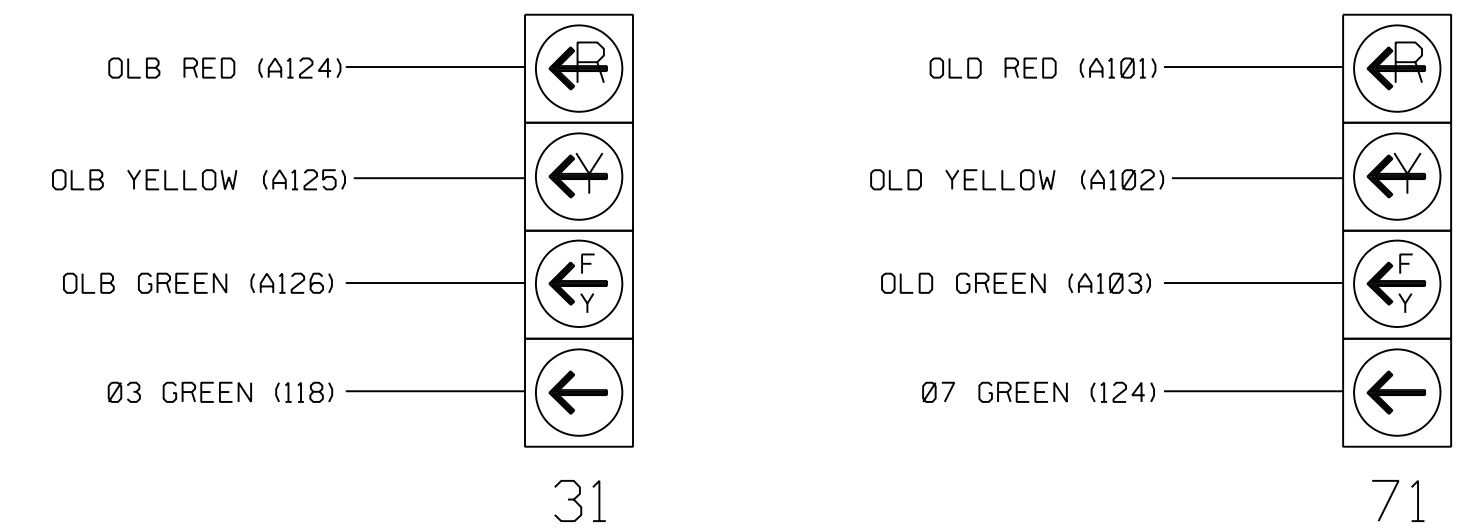
\* For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



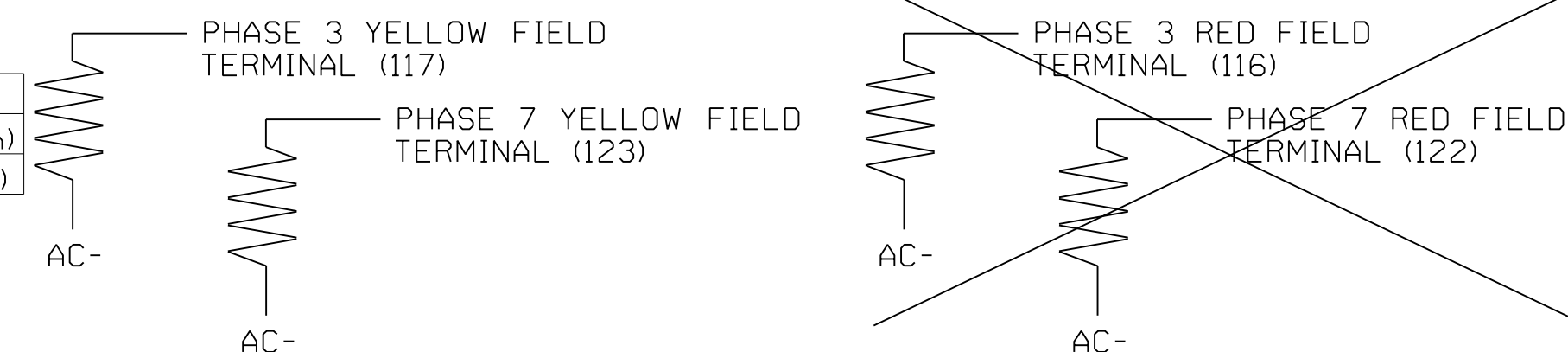
### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



### LOAD RESISTOR INSTALLATION DETAIL

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



Signal Upgrade - Final Design  
 Electrical Detail - Sheet 1 of 3

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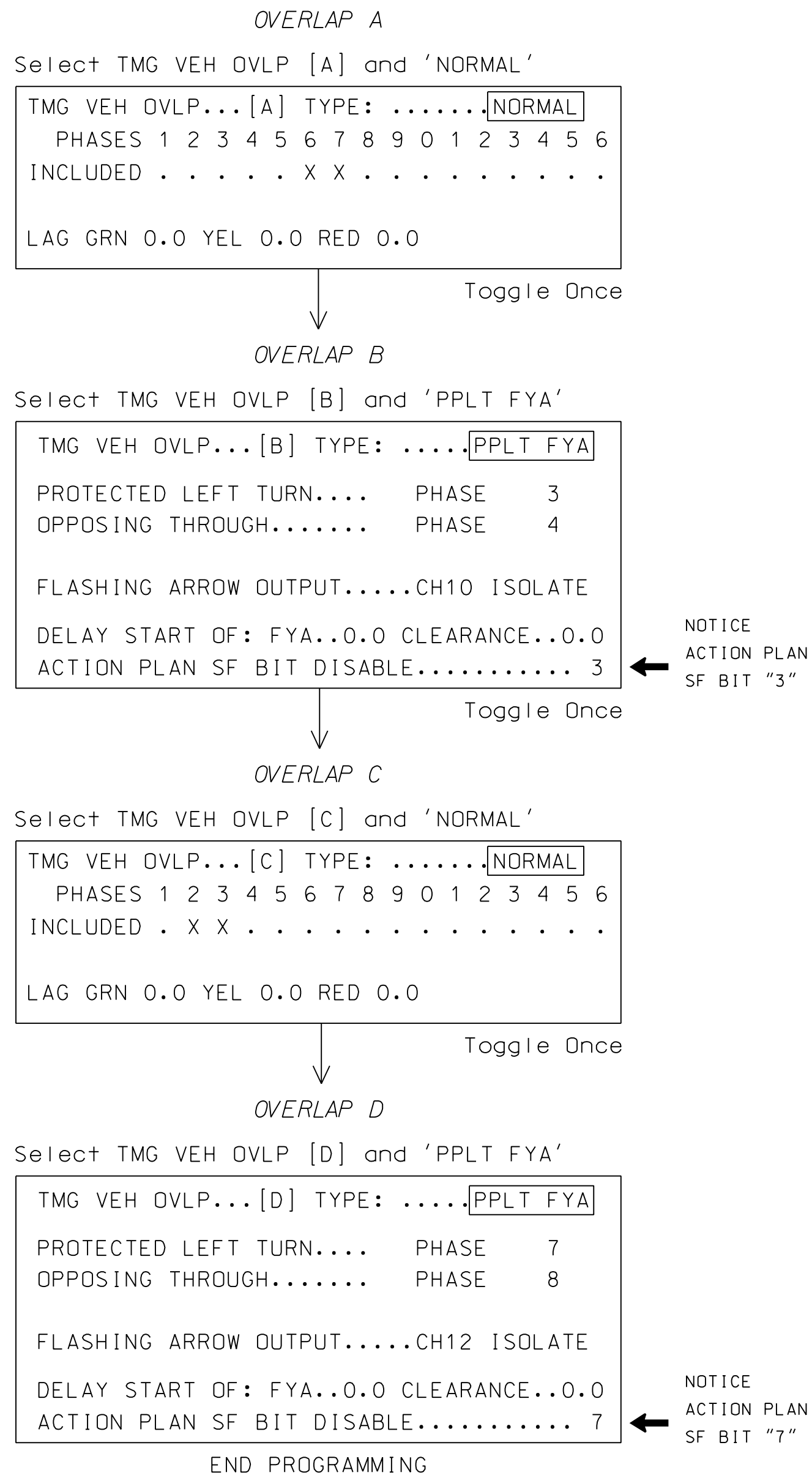
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	NC 68 (Eastchester Dr.) at SR 1556 (Gallimore Dairy Rd.)		SEAL 
	Division 7 PLAN DATE: August 2024 PREPARED BY: WP Erickson-Jones	Guilford County REVIEWED BY: DT Sears REVIEWED BY:	
REVISIONS INIT. DATE	REVISIONS INIT. DATE	REVISIONS INIT. DATE	REVISIONS INIT. DATE

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

(program controller as shown)

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



### 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 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING

#### LOOPS 3A & 7A

(program controller as shown)

## IMPORTANT!

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

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

```

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

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

- Place cursor in VEH DETECTOR [ ] position and enter "3".  
- Set delay time to "0".

```

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

NOTICE VEH DET PLAN 2

ENSURE DELAY IS SET TO '0'

- Place cursor in VEH DETECTOR [ ] position and enter "28".  
- Set assigned phase to "0".

```

VEH DETECTOR [28] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
28 0 . . . . .
CALL OPTION.... YES DELAY TIME... 0.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2

ENSURE PHASE IS SET TO "0"

- Place cursor in VEH DETECTOR [ ] position and enter "7".  
- Set delay time to "3".

```

VEH DETECTOR [ 7] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
7 7 . . . . .
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2

ENSURE DELAY IS SET TO '3'

- Place cursor in VEH DETECTOR [ ] position and enter "24".  
- Set assigned phase to "0".

```

VEH DETECTOR [24] VEH DET PLAN [ 2]
TYPE: N-NTCIP
TS2 DETECTOR..... ECPI LOG..... NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
24 0 . . . . .
CALL OPTION.... YES DELAY TIME... 3.0
EXT OPTION. PASSAGE EXTENSION TIME. 0.0
USE ADDED INITIAL . CROSS SWITCH PH.. 0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY- NO
    
```

NOTICE VEH DET PLAN 2


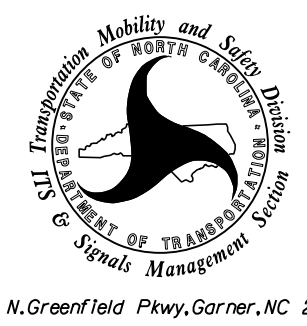

ENSURE PHASE IS SET TO "0"

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Final Design  
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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		<p>Division 7 Guilford County High Point</p> <p>PLAN DATE: August 2024 REVIEWED BY: DT Sears</p> <p>PREPARED BY: WP Erickson-Jones REVIEWED BY:</p>	<table border="1"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REVISIONS	INIT.	DATE
REVISIONS	INIT.	DATE					

8/22/2024 R:\Traffic\c4s1\gnal\sm4015a\SIG\_07-1438ea.dgn wplones

### ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 3 AND 7.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	3, 7

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

#### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 3 AND 7 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- SF BITS 3,7:** Modifies overlap parent phases for heads 31 and 71 to run protected turns only.
- VEH DET PLAN 2:** Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 0 seconds.  
Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

### ECONOLITE ASC/3-2070 ACTION PLAN

#### PROGRAMMING DETAIL

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

```

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

\*The Action Plan number(s) are to be determined by the Division and/or City Traffic Engineer.

### ASC/3 FLASH SENSE INPUT CONTROL FOR RED-RED FLASH

\*The NCDOT default database is programmed to address Yellow-Red flash. Logic Statement 100 must be modified as shown when running Red-Red flash.

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

Change the "LP" to 100 and move the cursor down. Delete the two "CTR-SET" statements by moving the cursor over them and hitting the "C" key, then hit "ENTER", select "LP SET CIB ON", hit "ENT", and then set the number to 427.

```

LP#:100 COPY FROM:100 ACTIVE: M FALSE
IF LP CIB CODE ON 331 F

THEN LP DELAY FOR 1.0 SECONDS
LP SET CIB ON 427

ELSE
    
```

THIS STATEMENT IS USED TO CONTROL THE FLASH SENSE INPUT WHEN RUNNING RED-RED FLASH OPERATION.

Hit "ESC", then 1 for "LOGIC STATEMENT CONTROL", next verify that LP#100 is ENABLED.

END PROGRAMMING

### ECONOLITE ASC/3-2070 STARTUP AND SOFTWARE FLASH PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **5. START/FLASH**

```

START/FLASH DATA
-----START UP-----
  PHASE  1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
          G      G
          A B C D E F G H I J K L M N O P
OVERLAP  X X X X X X X X X X X X X X X X
FLASH>MON. NO FL TIME.. 0 ALL RED... 6
PWR START SEQ.. 1 MUTCD> YES Y- G: NO
    
```

Scroll down on this screen and set "Exit Fl" to Green "G"

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1438  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Final Design  
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Dr.)  
at  
SR 1556 (Gallimore Dairy Rd.)

Division 7 Guilford County High Point

PLAN DATE: August 2024 REVIEWED BY: DT Sears

PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS	INIT.	DATE

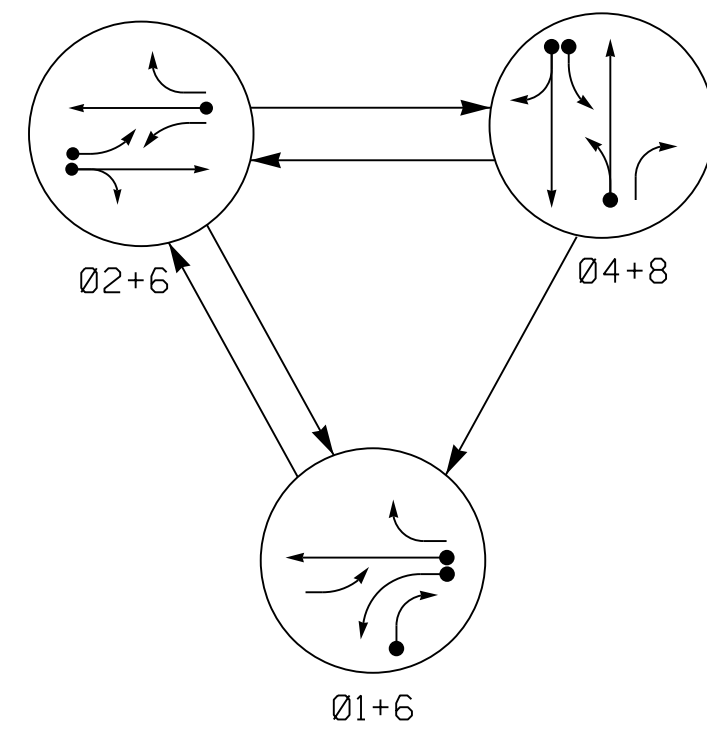
SEAL

Porter Jones  
8/22/2024

SIG. INVENTORY NO. 07-1438

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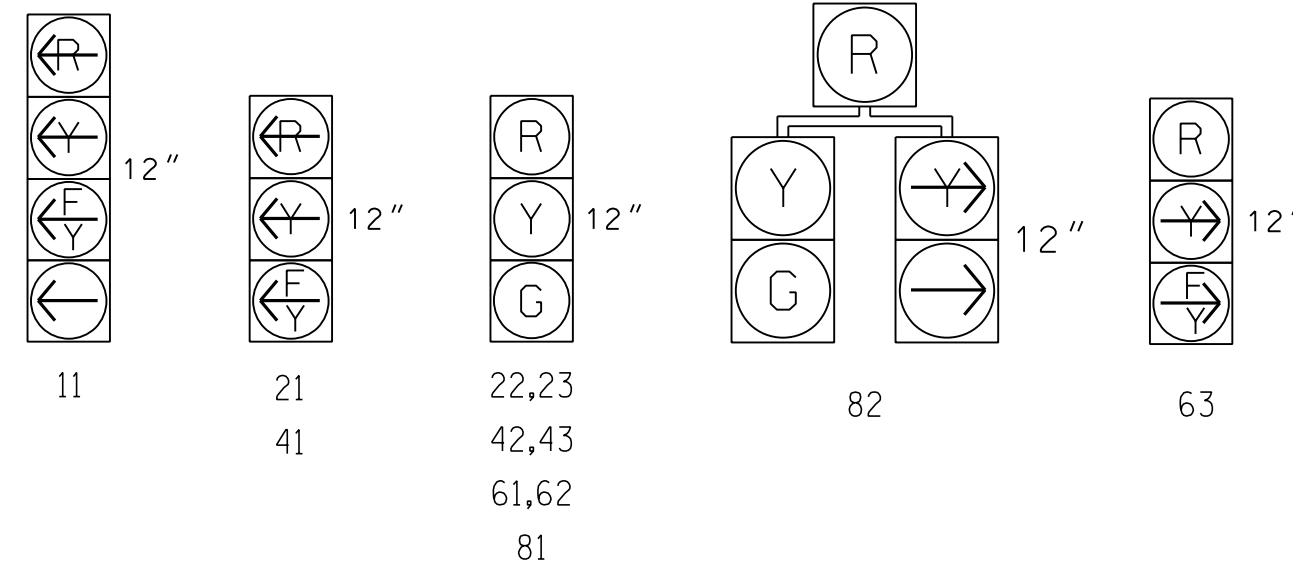
PHASING DIAGRAM



SIGNAL FACE	PHASE			
	Ø 1+6	Ø 2+6	Ø 4+8	F L T H S
11	←	←	←	←
21	←	←	←	←
22,23	R	G	R	R
41	←	←	←	←
42,43	R	R	G	R
61,62	G	G	R	R
63	←	←	←	←
81	R	R	G	R
82	←	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



LOOP & DETECTOR UNIT INSTALLATION CHART

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING								
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
1A*	6X40	0	*	*	1	-	15	-	X	X	-	-	*
1B*	6X40	0	*	*	1	-	15	-	X	X	-	-	*
2A*	6X6	300	*	*	2	-	-	1.6	X	X	-	-	*
2B*	6X6	90	*	*	2	-	-	-	X	X	-	-	*
2C*	6X40	0	*	*	2	-	-	-	X	X	-	-	*
4A*	6X40	0	*	*	4	-	3	-	X	X	-	-	*
4B*	6X40	0	*	*	4	-	10	-	X	X	-	-	*
6A*	6X6	300	*	*	6	-	-	1.6	X	X	-	-	*
6B*	6X6	90	*	*	6	-	-	-	X	X	-	-	*
8A*	6X40	0	*	*	8	-	3	-	X	X	-	-	*

\* VIDEO DETECTION

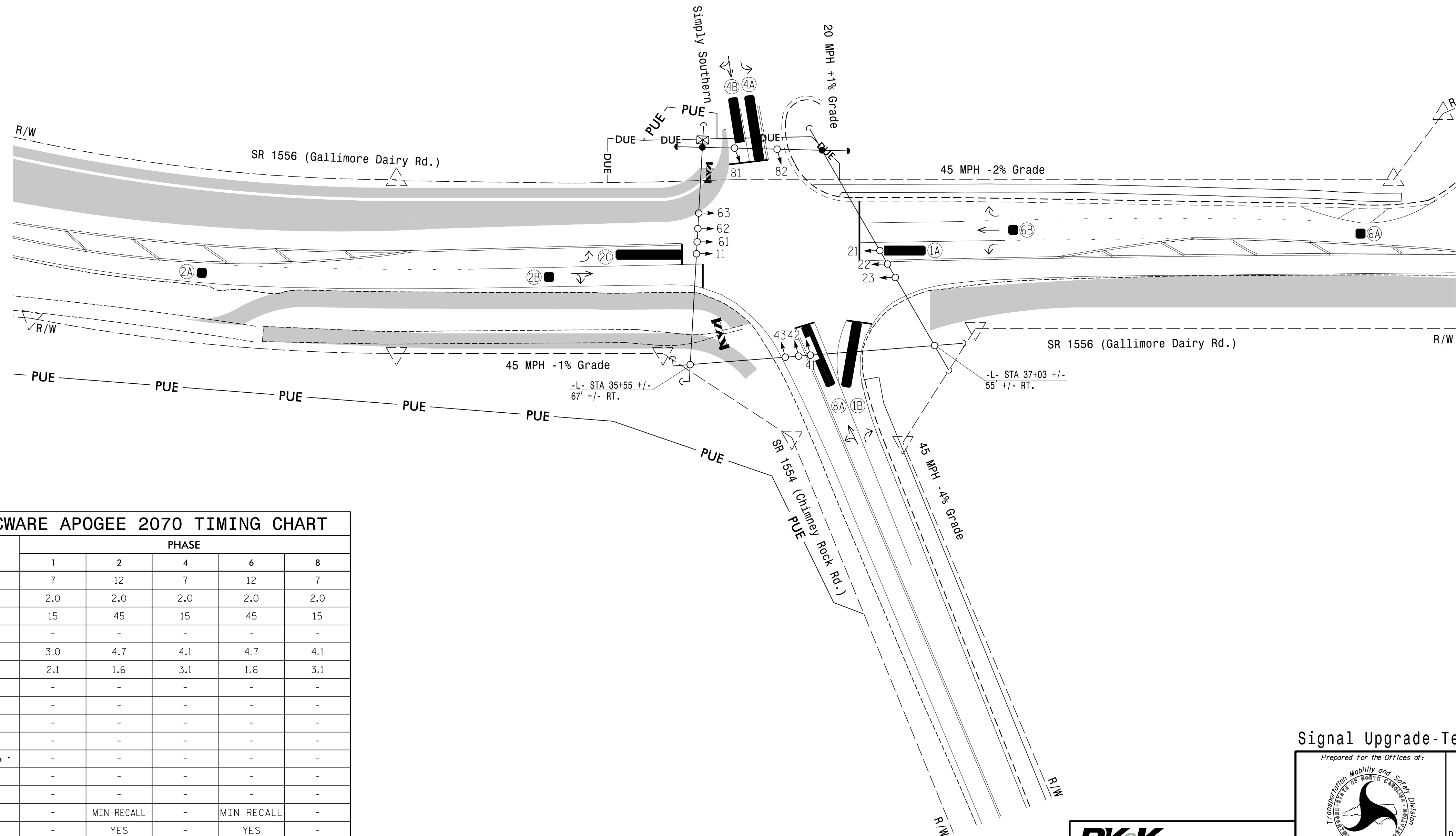
3 Phase Fully Actuated (Greensboro Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- 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.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- 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



TRAFFICWARE APOGEE 2070 TIMING CHART

FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	12	7	12	7
Gap, Extension *	2.0	2.0	2.0	2.0	2.0
Maximum Green 1 *	15	45	15	45	15
Maximum Green 2 *	-	-	-	-	-
Yellow Clear	3.0	4.7	4.1	4.7	4.1
Red Clear	2.1	1.6	3.1	1.6	3.1
Walk *	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Lock Calls	-	YES	-	YES	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

LEGEND

- |       |   |       |   |
|-------|---|-------|---|
| ○     | PROPOSED Traffic Signal Head                            | ●     | EXISTING Traffic Signal Head                            |
| ○     | PROPOSED Modified Signal Head                           | N/A   | EXISTING Modified Signal Head                           |
| ○     | PROPOSED Sign   | N/A   | EXISTING Sign   |
| ○     | PROPOSED Pedestrian Signal Head With Push Button & Sign | ○     | EXISTING Pedestrian Signal Head With Push Button & Sign |
| ○     | PROPOSED Signal Pole with Guy                           | ○     | EXISTING Signal Pole with Guy                           |
| ○     | PROPOSED Signal Pole with Sidewalk Guy                  | ○     | EXISTING Signal Pole with Sidewalk Guy                  |
| ○     | PROPOSED Inductive Loop Detector                        | ○     | EXISTING Inductive Loop Detector                        |
| ○     | PROPOSED Controller & Cabinet                           | ○     | EXISTING Controller & Cabinet                           |
| ○     | PROPOSED Junction Box                                   | ○     | EXISTING Junction Box                                   |
| ○     | PROPOSED 2-in Underground Conduit                       | ○     | EXISTING 2-in Underground Conduit                       |
| N/A   | PROPOSED Right of Way                                   | ---   | EXISTING Right of Way                                   |
| →     | PROPOSED Directional Arrow                              | →     | EXISTING Directional Arrow                              |
| █     | PROPOSED Non-Intrusive Detection Zone                   | █     | EXISTING Non-Intrusive Detection Zone                   |
| █     | PROPOSED Construction Zone                              | █     | EXISTING Construction Zone                              |
| █     | PROPOSED Pedestrian Barricade                           | █     | EXISTING Pedestrian Barricade                           |
| -DUE- | PROPOSED Dual Utility Easement                          | -DUE- | EXISTING Dual Utility Easement                          |
| -PUE- | PROPOSED Permanent Utility Easement                     | -PUE- | EXISTING Permanent Utility Easement                     |

Signal Upgrade-Temporary Design 1 (TMP Phase I)

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

SR 1556 (Gallimore Dairy Rd.)  
 at  
 SR 1554 (Chimney Rock Rd.) /  
 Simply Southern

Division 7 Guilford County Greensboro  
 PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones  
 PREPARED BY: A.C. Norman REVIEWED BY:

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REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 0 40  
 1" = 40'

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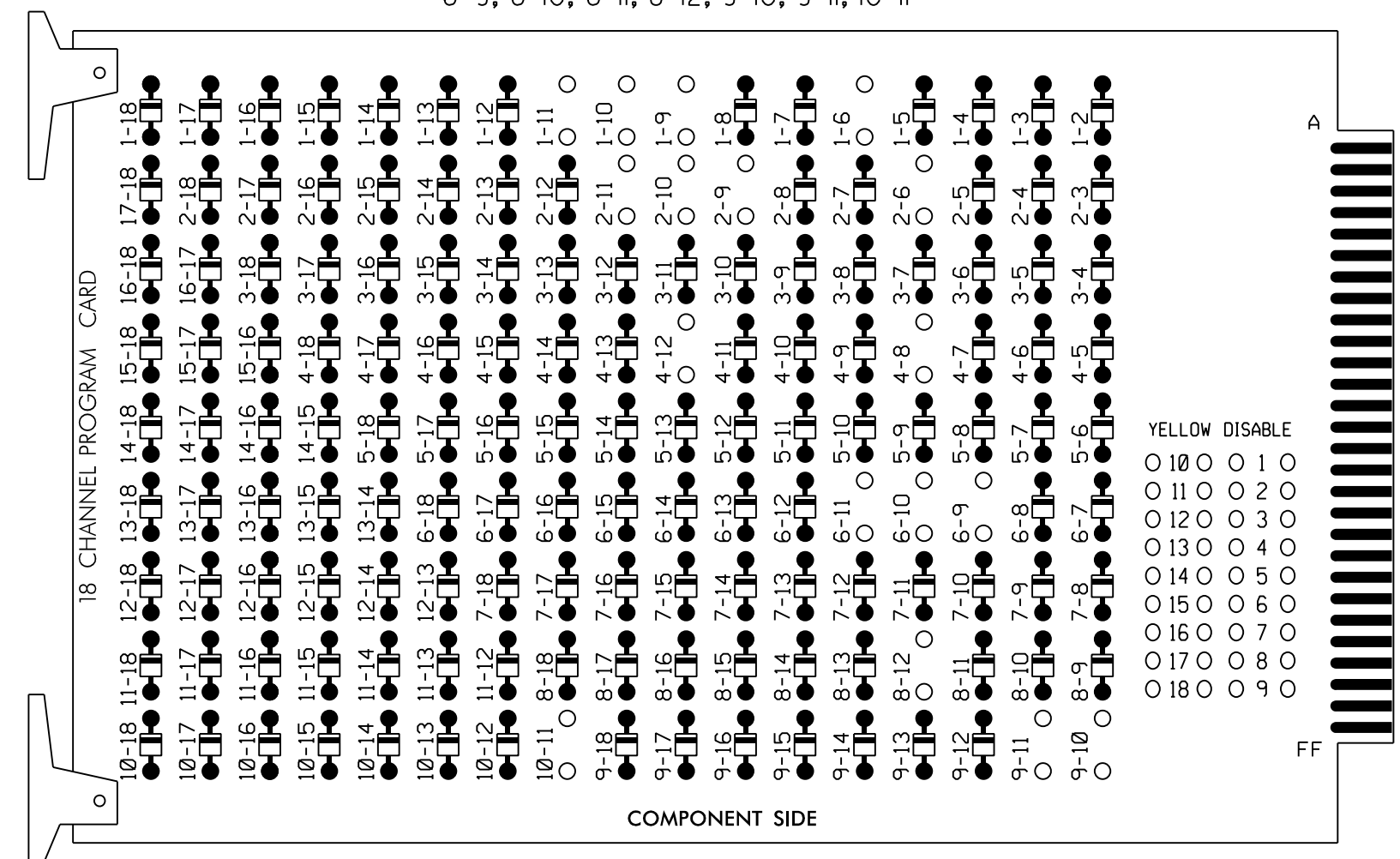
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 SEAL 056142  
 W. PORTER JONES  
 PORTER JONES  
 8/22/2024  
 DATE  
 SIG. INVENTORY NO. 07-168911

8/22/2024  
 R:\Traffic\c4s1\gnal\shd\as1\gnms1\gnal\shd\015a...S1c\_07-168911.dgn  
 wp1 Jones

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 1-11, 2-6, 2-9, 2-10, 2-11, 4-8, 4-12, 6-9, 6-10, 6-11, 8-12, 9-10, 9-11, 10-11



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.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "Rst".
- Ensure "InhFYARedSt" feature is set to "ON".
- Ensure "Flash Mode" is set to "CHANNEL" (MM 1-4-1).
- Program all channels in use to flash red (MM 1-8-1).
- Program Start Red Time for 6.0 Seconds.

11. Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:

```
FROM MAIN MENU->1->8->7 (I/O LOGIC) Result Src.Fcn TimeOp Time
1208 = 01208 DLY 1
```

- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the Greensboro Signal System.

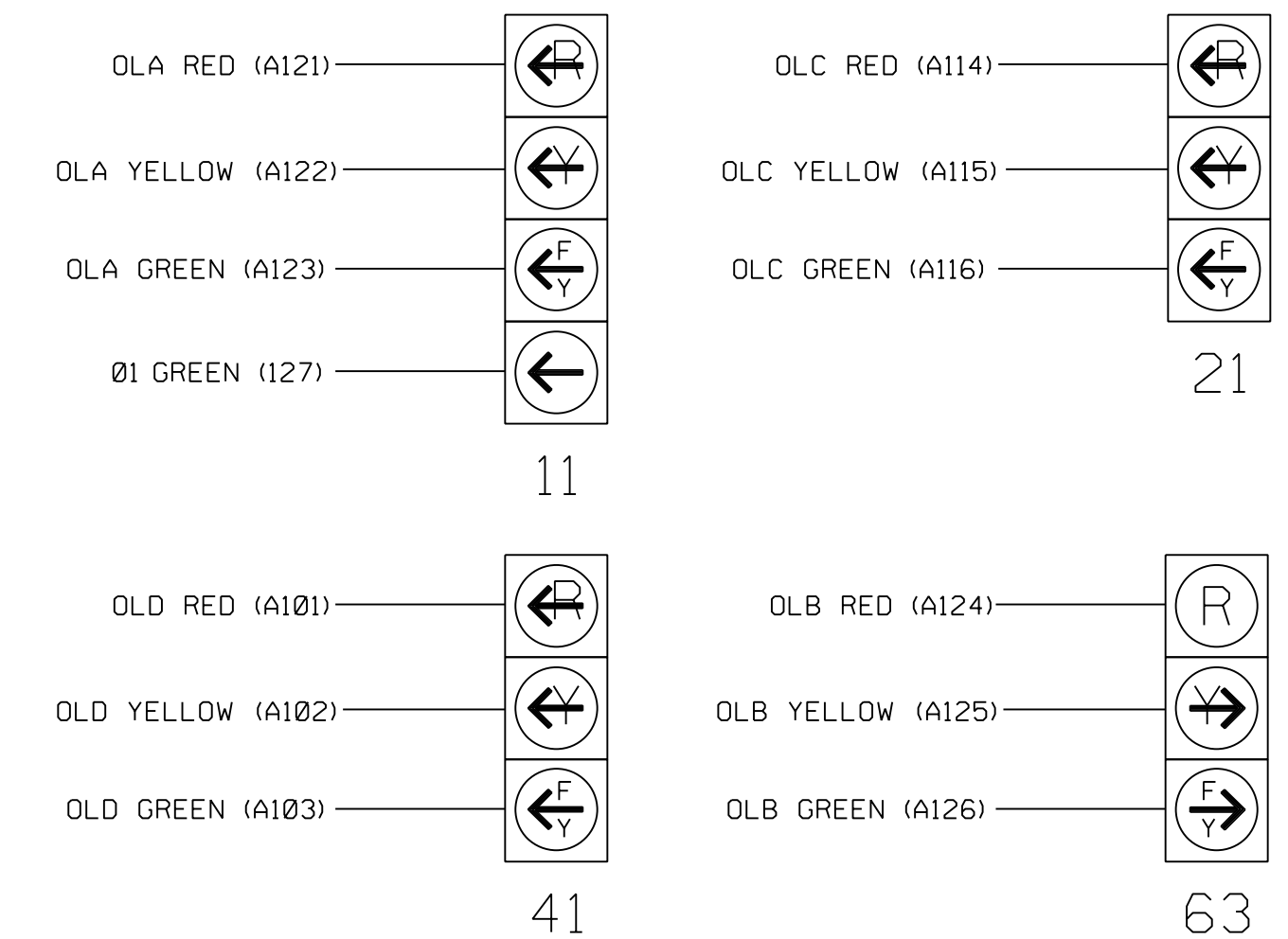
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	22,23	NU	NU	42,43	NU	NU	61,62	NU	NU	81,82	NU	11	63	NU	21	41	NU
RED	*	128				101			134			107			A124				
YELLOW		129				102			135			108							
GREEN		130				103			136			109							
RED ARROW															A121		A114	A101	
YELLOW ARROW		126													A122	A125	A115	A102	
FLASHING YELLOW ARROW															A123	A126	A116	A103	
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 below.

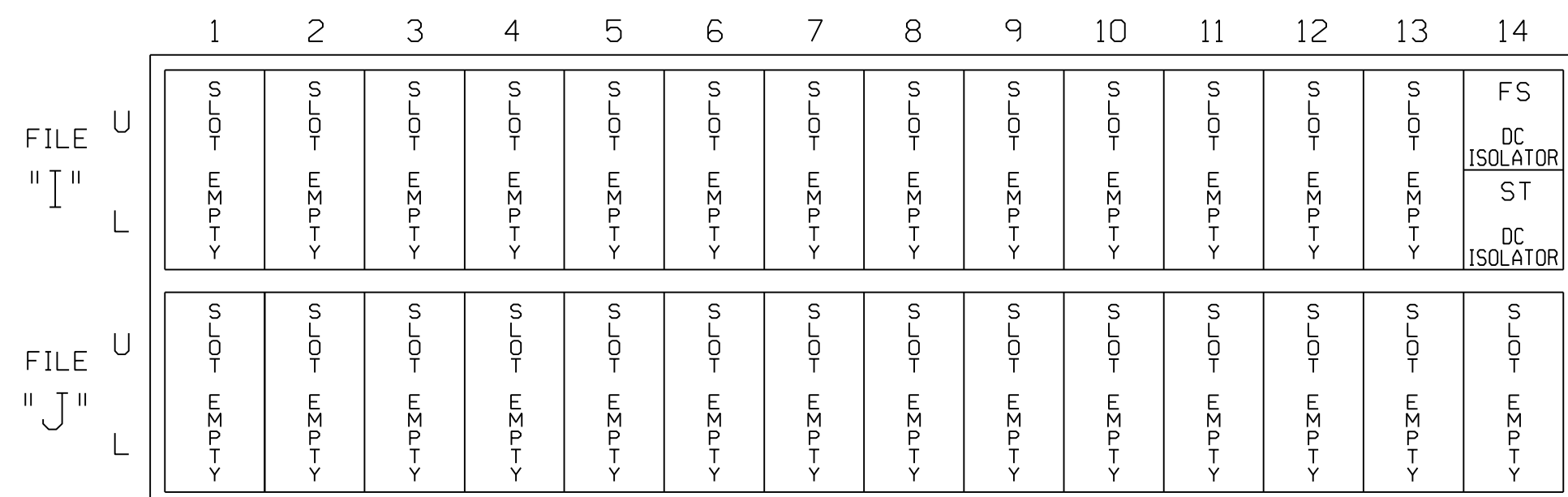
### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....TRAFFICWARE APOGEE  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)  
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11,AUX S1,  
 AUX S2,AUX S4, AUX S5  
 PHASES USED.....1,2,4,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*

\* See overlap programming detail on sheet 2.

### FLASHER CIRCUIT MODIFICATION DETAIL

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

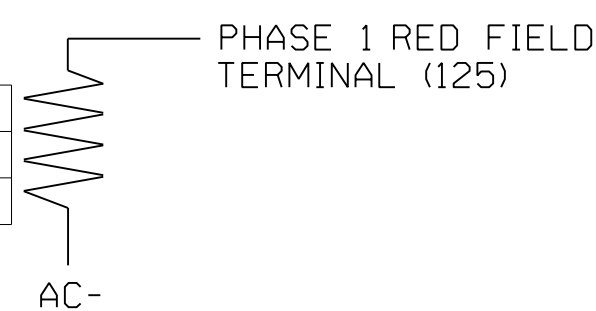
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
  - ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
  - REMOVE FLASHER UNIT 2.
- THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

### SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 1A, 1B, 2A, 2B, 2C, 4A, 4B, 6A, 6B, and 8A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### LOAD RESISTOR INSTALLATION DETAIL

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: 07-1689T1  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 1 (TMP Phase I) Electrical Detail - Sheet 1 of 3

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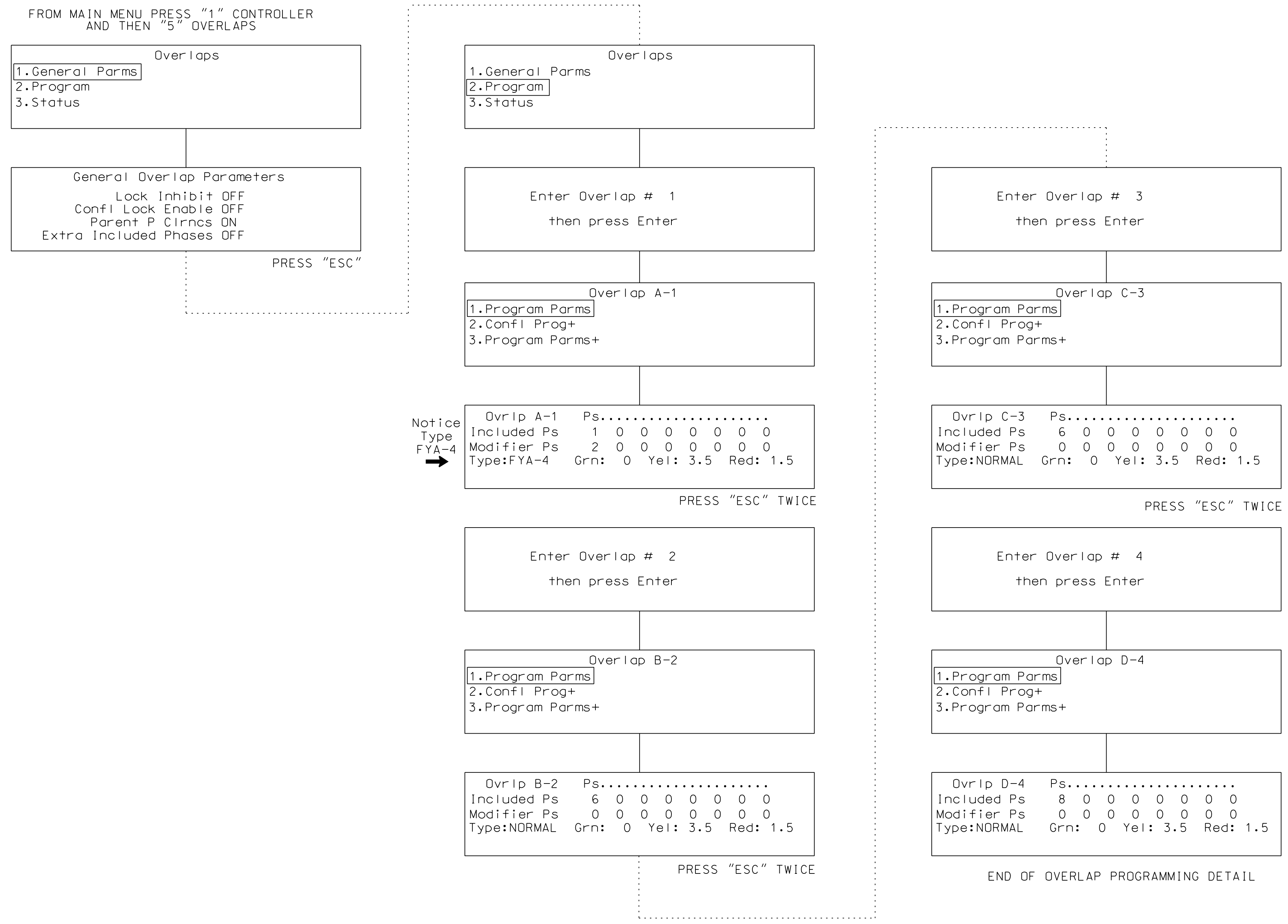
Electrical and Programming Details For: **SR 1556 (Gallimore Dairy Rd.)**  
 at **SR 1554 (Chimney Rock Rd.) / Simply Southern**  
 Division 7 Guilford County Greensboro  
 PLAN DATE: August 2024 REVIEWED BY: DT Sears  
 PREPARED BY: WP Erickson-Jones REVIEWED BY: \_\_\_\_\_  
 REVISIONS: \_\_\_\_\_ INIT. DATE \_\_\_\_\_  
 Prepared for the Offices of: **North Carolina Department of Transportation**  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 056142 PORTER JONES  
 Signature: Porter Jones Date: 8/22/2024  
 SIG. INVENTORY NO. 07-1689T1

**RK&K**  
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### OVERLAP PROGRAMMING DETAIL FOR OVERLAPS A, B, C, and D\*

(program controller as shown below)


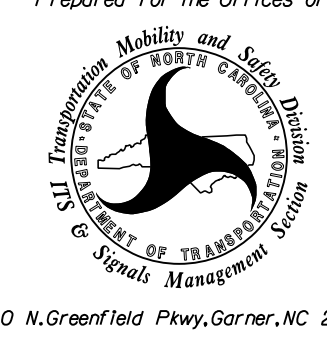
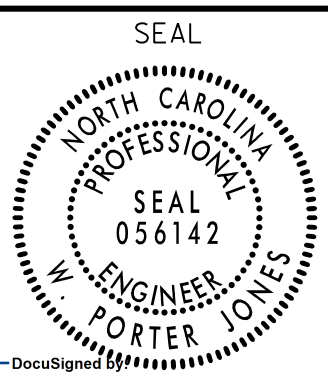
\*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T1  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Temporary Design 1  
(TMP Phase I) Electrical Detail - Sheet 2 of 3

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		<p>Division 7 Guilford County Greensboro</p> <p>PLAN DATE: August 2024 REVIEWED BY: DT Sears</p> <p>PREPARED BY: WP Erickson-Jones REVIEWED BY:</p>	<table border="1"> <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							
REVISIONS	INIT.	DATE												

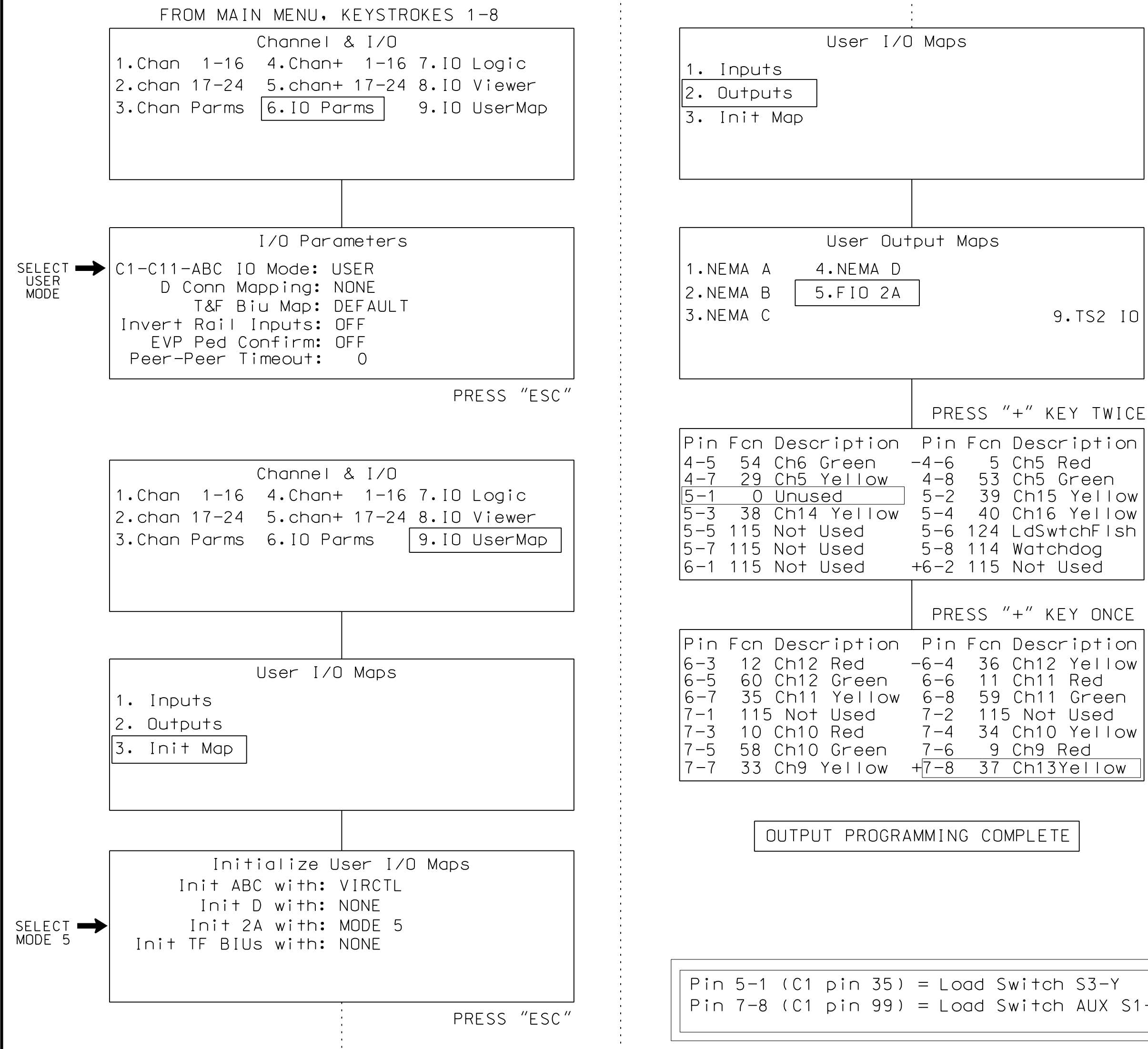
8/22/2024  
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wplones



### 4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



! Press the "\*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

#### NOTE

I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

### CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

PROJECT REFERENCE NO. U-4015A SHEET NO. Sig. 5.3

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.

FROM MAIN MENU, KEYSTROKES 1-8

```

Channel & I/O
1.Chan 1-16 4.Chan+ 1-16 7.I/O Logic
2.chan 17-24 5.chan+ 17-24 8.I/O Viewer
3.Chan Parm 6.I/O Parm 9.I/O UserMap
    
```

PRESS THE RIGHT ARROW KEY UNTIL THE SCREEN AT RIGHT APPEARS

```

Chan.1...2...3...4...5...6...7...8 >
Flash Red . . . . .
Flash Yel . . . . .
Flash Grn . . . . .
Inhibit Red Flash In
Preempt . . . . .
Olap Ovrdr 0 0 0 0 0 0 0 0
    
```

```

Chan.9..10..11..12..13..14..15..16
Flash Red . . . . .
Flash Yel . . . . X . . . .
Flash Grn . X X X . . . .
Inhibit Red Flash In
Preempt . . . . .
Olap Ovrdr 0 0 0 0 1 0 0 0
    
```

Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

#### NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

#### Programming Notes:

Default	Change To:
Pin Fcn Description Fcn Description	
5-1 37 Ch13 Yellow...0 Unused	

#### Programming Notes:

Default	Change To:
Pin Fcn Description Fcn Description	
7-8 57 Ch9 Green...37 Ch13 Yellow	

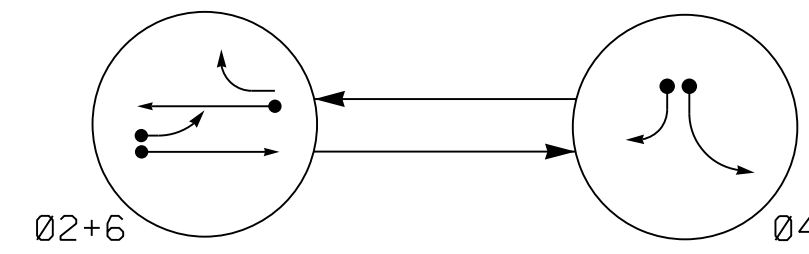
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T1  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 1 (TMP Phase I) - Electrical Detail - Sheet 3 of 3

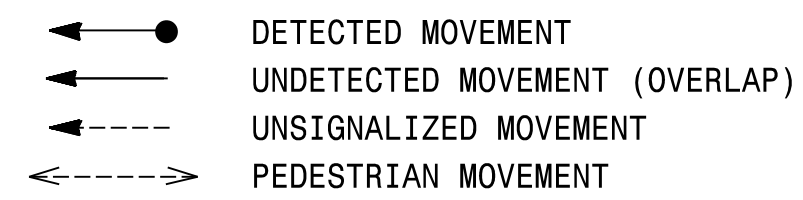
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		Division 7 Guilford County Greensboro	PLAN DATE: August 2024 REVIEWED BY: DT Sears	

PHASING DIAGRAM



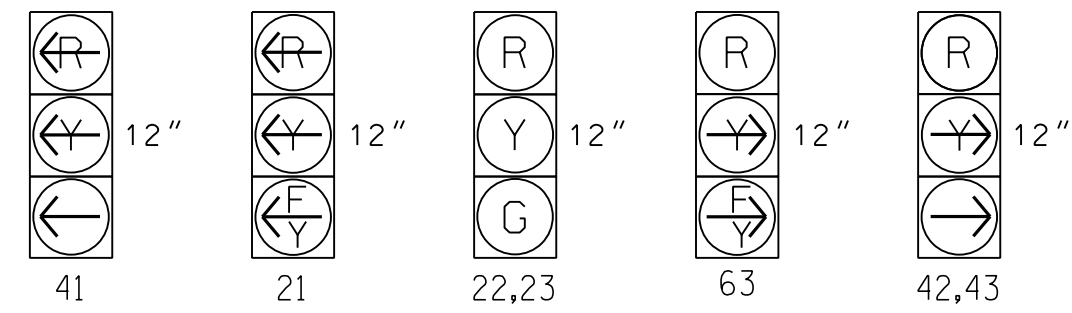
PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE	PHASE		
	02+6	04	FLASH
21	F	R	R
22,23	G	R	R
41	R	-	R
42,43	R	-	R
61,62	G	R	R
63	F	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



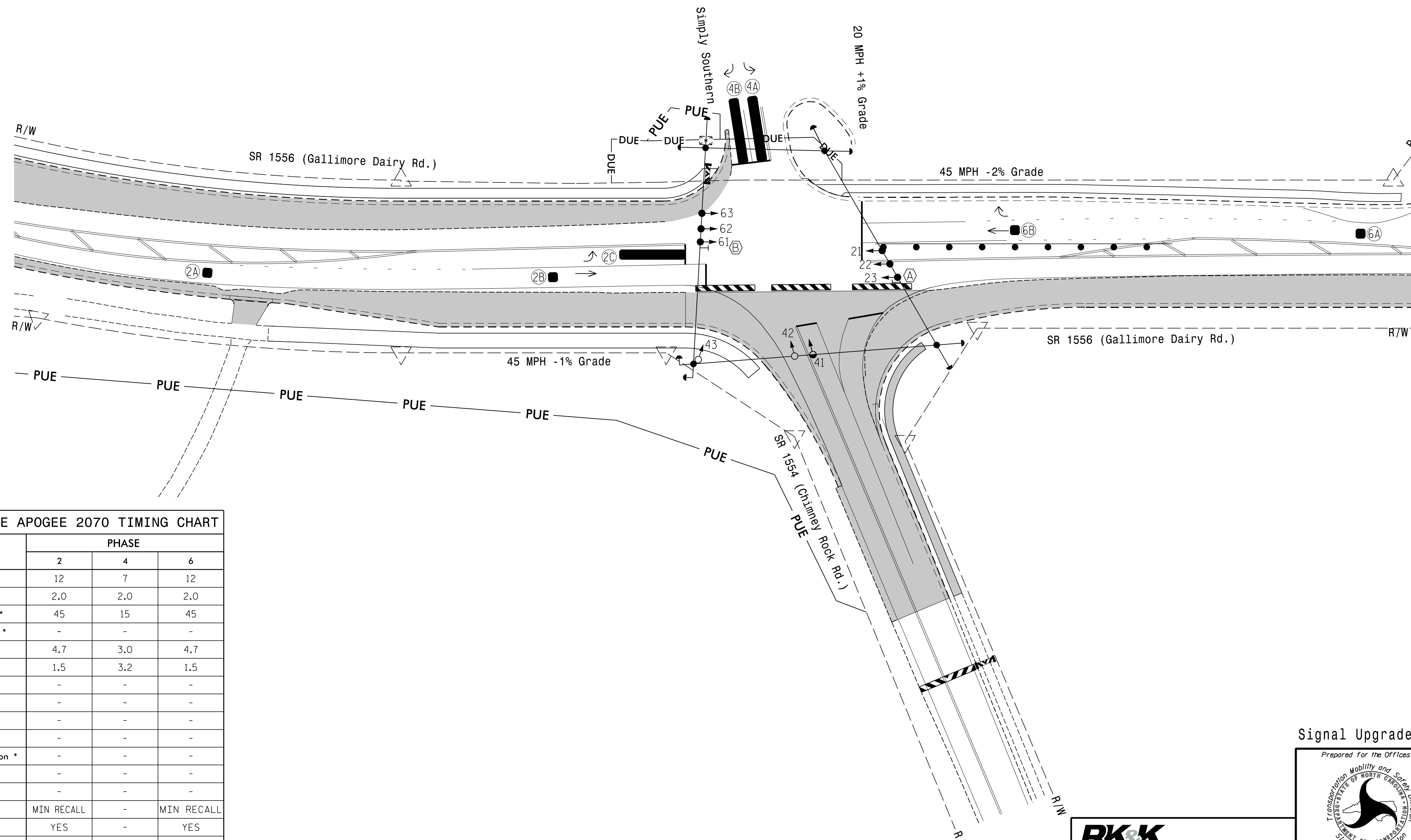
LOOP & DETECTOR UNIT INSTALLATION CHART													
INDUCTIVE LOOPS					DETECTOR PROGRAMMING								
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
2A*	6X6	300	*	-	2	-	-	1.6	X	X	-	-	-
2B*	6X6	90	*	-	2	-	-	-	X	X	-	-	-
2C*	6X40	0	*	-	2	-	-	-	X	X	-	-	-
4A*	6X40	0	*	-	4	-	3	-	X	X	-	-	-
4B*	6X40	0	*	-	4	-	15	-	X	X	-	-	-
6A*	6X6	300	*	-	6	-	-	1.6	X	X	-	-	-
6B*	6X6	90	*	-	6	-	-	-	X	X	-	-	-

\* VIDEO DETECTION

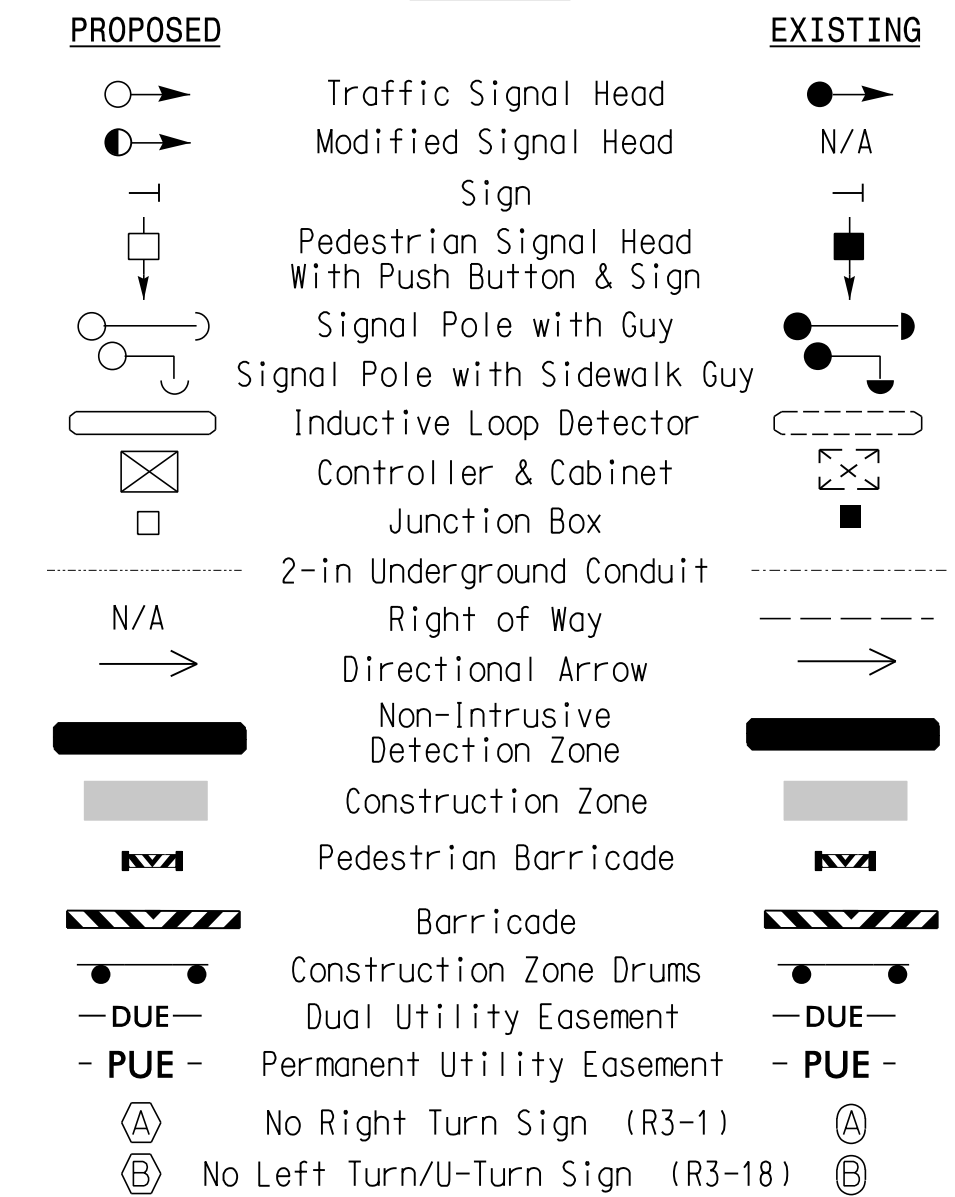
2 Phase Fully Actuated (Greensboro Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Disconnect and cover existing signal heads 11, 81, and 82 during temporary pattern.
- Modify existing signal head 41.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND



FEATURE	PHASE		
	2	4	6
Min Green *	12	7	12
Gap, Extension *	2.0	2.0	2.0
Maximum Green 1 *	45	15	45
Maximum Green 2 *	-	-	-
Yellow Clear	4.7	3.0	4.7
Red Clear	1.5	3.2	1.5
Walk *	-	-	-
Pedestrian Clear	-	-	-
Added Initial *	-	-	-
Maximum Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Lock Calls	YES	-	YES
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

Signal Upgrade-Temporary Design 2 (TMP Phase I Step 3)

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

SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.) / Simply Southern	
Division 7	Guilford County Greensboro
PLAN DATE: August 2024	REVIEWED BY: WP Erickson-Jones
PREPARED BY: A. C. Norman	REVIEWED BY:
REVISIONS	INIT. DATE

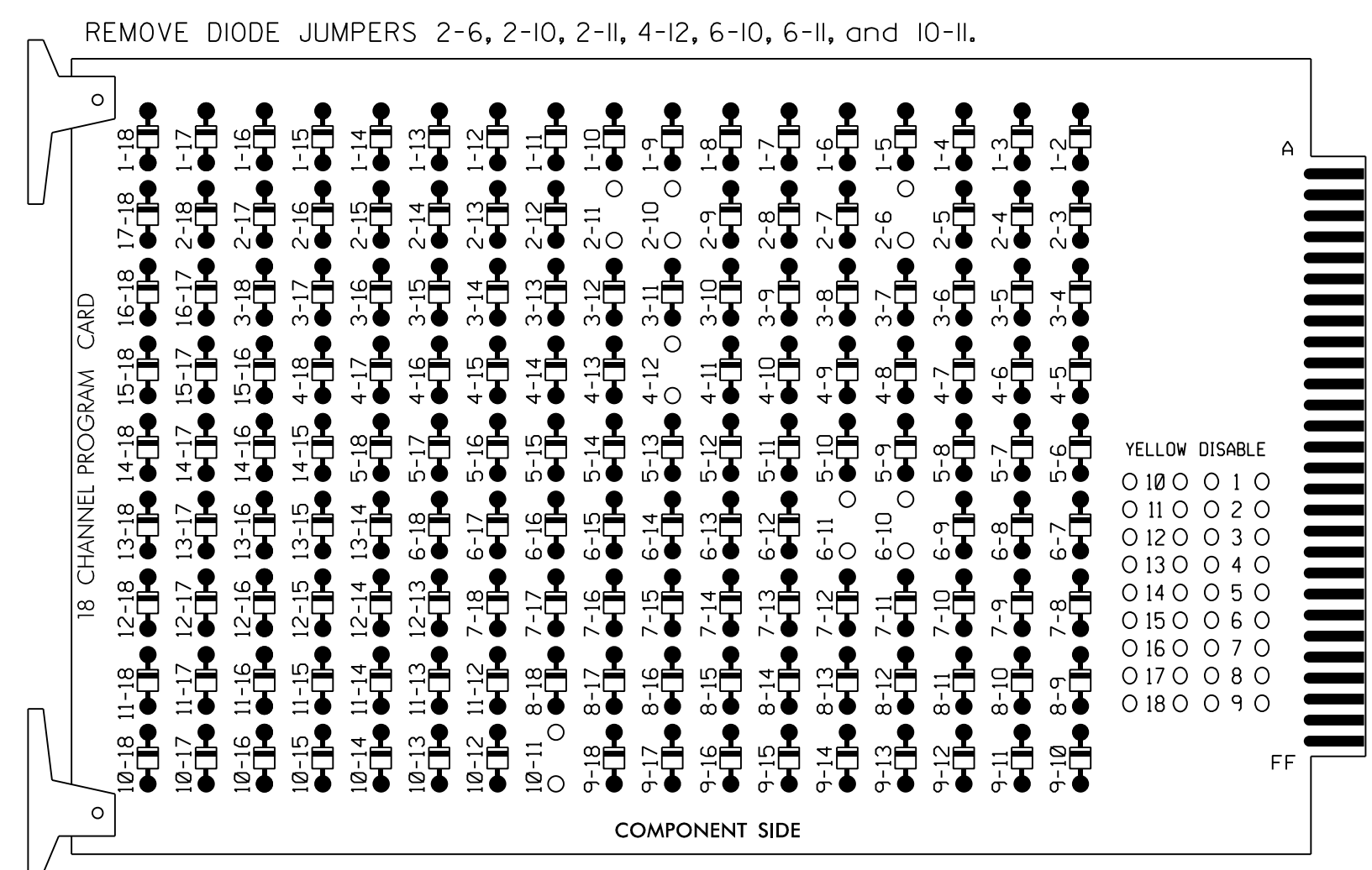
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 PORTER JONES  
 8/22/2024  
 DATE  
 SIG. INVENTORY NO. 07-1689T2

8/22/2024  
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 wplones

### 18 CHANNEL IP 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.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "RSt".
- Ensure "InhFYARedSt" feature is set to "ON".
- Ensure "Flash Mode" is set to "CHANNEL" (MM 1-4-1).
- Program all channels in use to flash red (MM 1-8-1).
- Program Start Red Time for 6.0 Seconds.
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:

```
FROM MAIN MENU->1->8->7 (I/O LOGIC)
Result Src.Fcn TimeOp Time
1208 = 01208 DLY 1
```

- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the Greensboro Signal System.

### SIGNAL HEAD HOOK-UP CHART

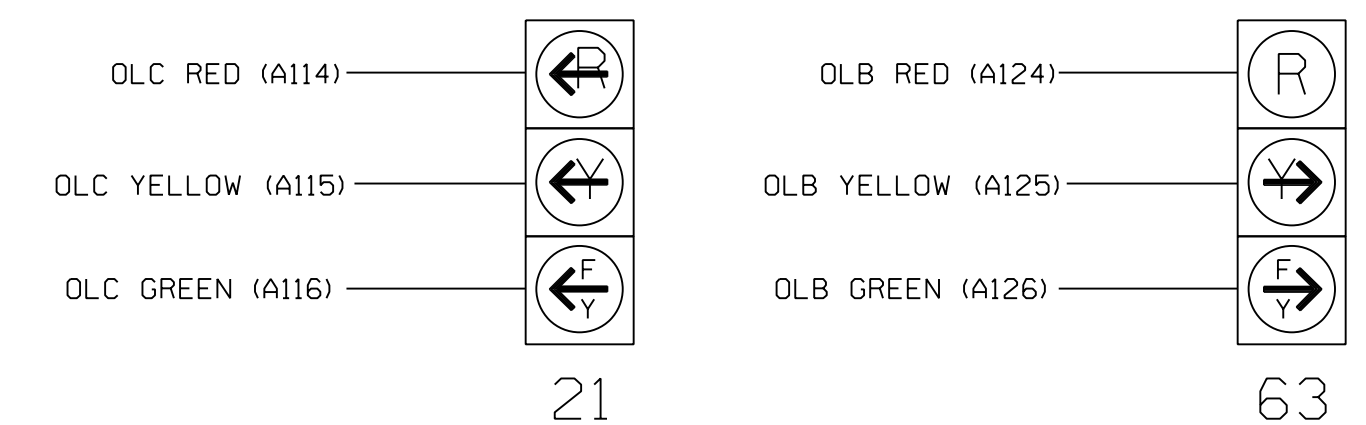
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23	NU	NU	42,43	NU	NU	61,62	NU	NU	NU	NU	NU	63	NU	21	41	NU
RED		128			101			134						A124				
YELLOW		129						135										
GREEN		130						136										
RED ARROW																A114	A101	
YELLOW ARROW					102								A125			A115	A102	
FLASHING YELLOW ARROW													A126			A116		
GREEN ARROW						103												A103

NU = Not Used

★ See pictorial of head wiring in detail below.

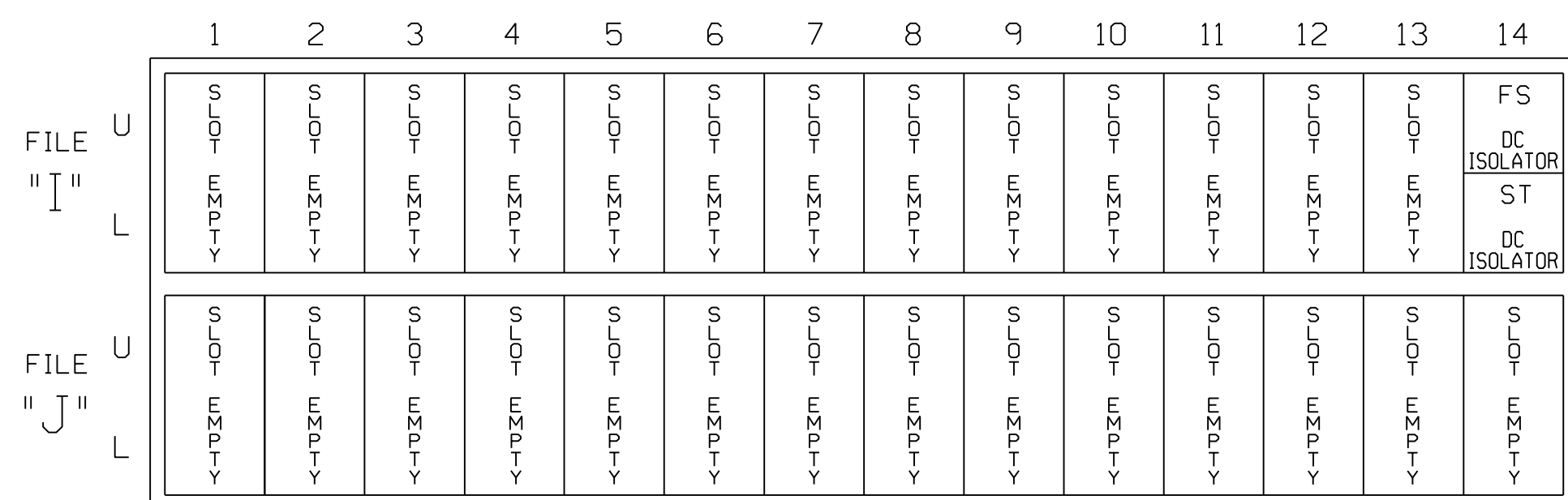
### FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....TRAFFICWARE APOGEE  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S8,AUX S2,AUX S4,AUX S5  
 PHASES USED.....2,4,6  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*  
 \* See overlap programming detail on sheet 2.

### 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.

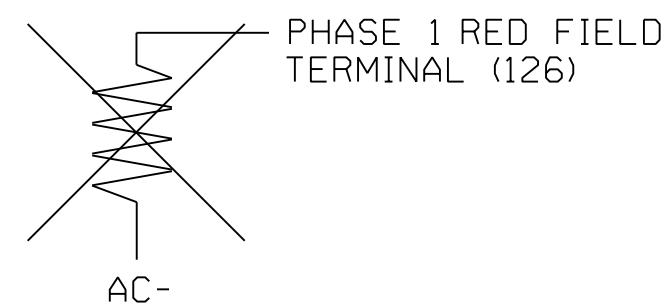
THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

### SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 2A, 2B, 2C, 4A, 4B, 6A, and 6B. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### LOAD RESISTOR INSTALLATION DETAIL

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



NOTE: IF PRESENT, REMOVE THE LOAD RESISTOR FROM PHASE 1 RED FIELD TERMINAL 125.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T2  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 2 (TMP Phase I Step 3) - Electrical Detail - Sheet 1 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern

Division 7 Guilford County Greensboro

PLAN DATE: August 2024 REVIEWED BY: DT Sears

PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

Prepared for the Offices of:

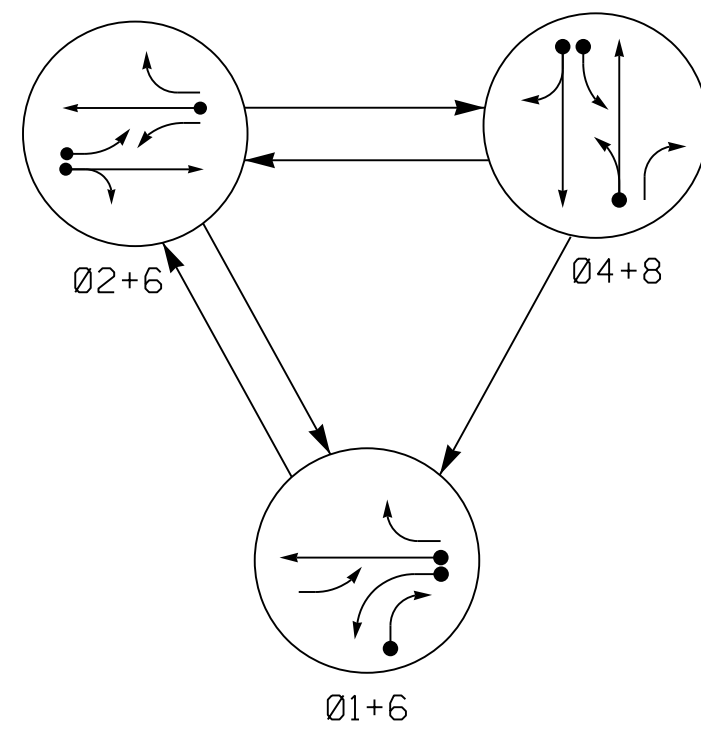
Porter Jones  
 PROFESSIONAL ENGINEER  
 SEAL 056142  
 SIGNATURE DATE 8/22/2024

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SIG. INVENTORY NO. 07-1689T2

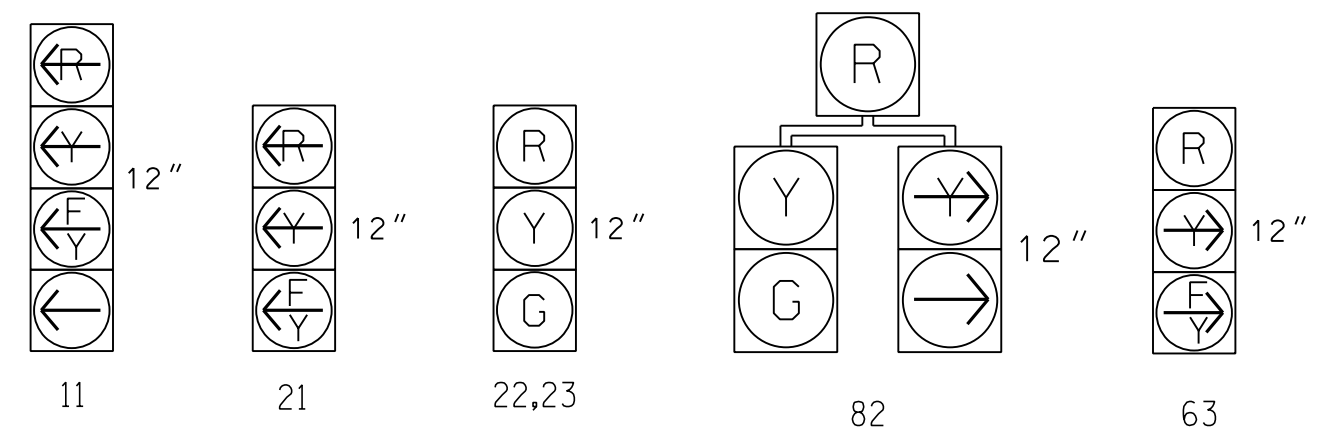


**PHASING DIAGRAM**



SIGNAL FACE	PHASE				FLASH
	01+6	02+6	04+8	04+8	
11	←	←	←	←	
21	←	←	←	←	
22,23	R	G	R	R	
41	←	←	←	←	
42,43	R	R	G	R	
61,62	G	G	R	R	
63	←	←	←	←	
81	R	R	G	R	
82	←	R	G	R	

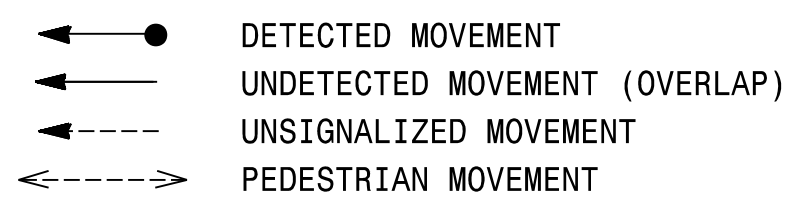
**SIGNAL FACE I.D.**  
All Heads L.E.D.



LOOP & DETECTOR UNIT INSTALLATION CHART													
TRAFFICWARE APOGEE SOFTWARE 2070 CONTROLLER													
INDUCTIVE LOOPS					DETECTOR PROGRAMMING								
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
1A*	6X40	0	*	*	1	-	15	-	X	X	-	-	*
1B*	6X40	0	*	*	1	-	15	-	X	X	-	-	*
2A*	6X6	300	*	-	2	-	-	1.6	X	X	-	-	-
2B*	6X6	90	*	-	2	-	-	-	X	X	-	-	-
2C*	6X40	0	*	-	2	-	-	-	X	X	-	-	-
4A*	6X40	0	*	-	4	-	3	-	X	X	-	-	-
4B*	6X40	0	*	-	4	-	10	-	X	X	-	-	-
6A*	6X6	300	*	-	6	-	-	1.6	X	X	-	-	-
6B*	6X6	90	*	-	6	-	-	-	X	X	-	-	-
8A*	6X40	0	*	*	8	-	3	-	X	X	-	-	*

\* VIDEO DETECTION

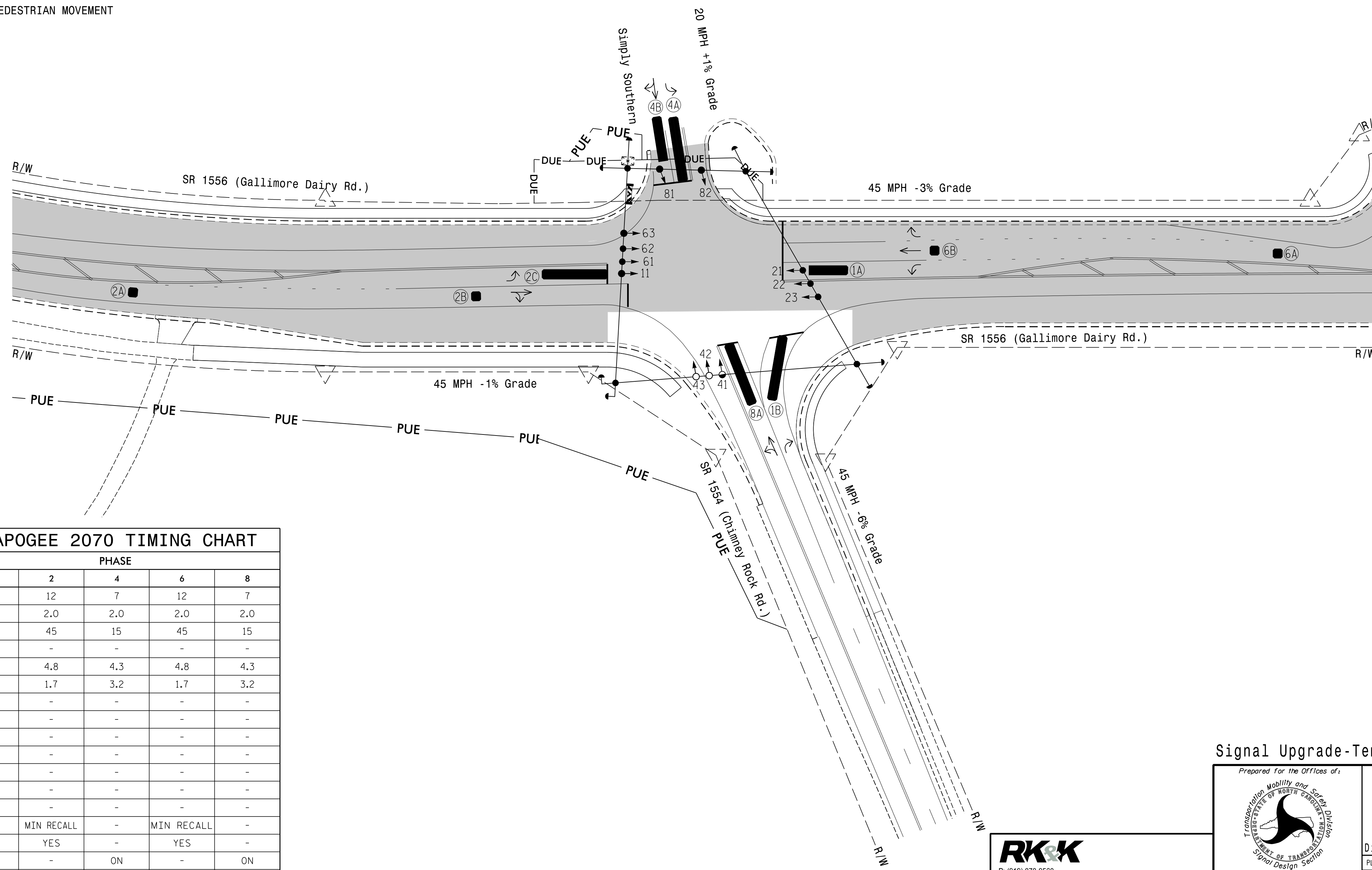
**PHASING DIAGRAM DETECTION LEGEND**



**3 Phase Fully Actuated (Greensboro Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reconnect and uncover existing signal heads 11, 81, and 82.
- Modify existing signal head 41.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



PROPOSED	EXISTING

TRAFFICWARE APOGEE 2070 TIMING CHART					
FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	12	7	12	7
Gap, Extension *	2.0	2.0	2.0	2.0	2.0
Maximum Green 1 *	15	45	15	45	15
Maximum Green 2 *	-	-	-	-	-
Yellow Clear	3.0	4.8	4.3	4.8	4.3
Red Clear	2.1	1.7	3.2	1.7	3.2
Walk *	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Lock Calls	-	YES	-	YES	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

**Signal Upgrade-Temporary Design 3 (TMP Phase II)**

Prepared For the Offices of:

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
Signal Design Section

SR 1556 (Gallimore Dairy Rd.)  
at  
SR 1554 (Chimney Rock Rd.) /  
Simply Southern

Division 7 Guilford County Greensboro

PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones

PREPARED BY: A.C. Norman REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Porter Jones  
REGISTERED PROFESSIONAL ENGINEER  
SIGNATURE DATE 8/22/2024

SIG. INVENTORY NO. 07-1689T3

**RK&K**  
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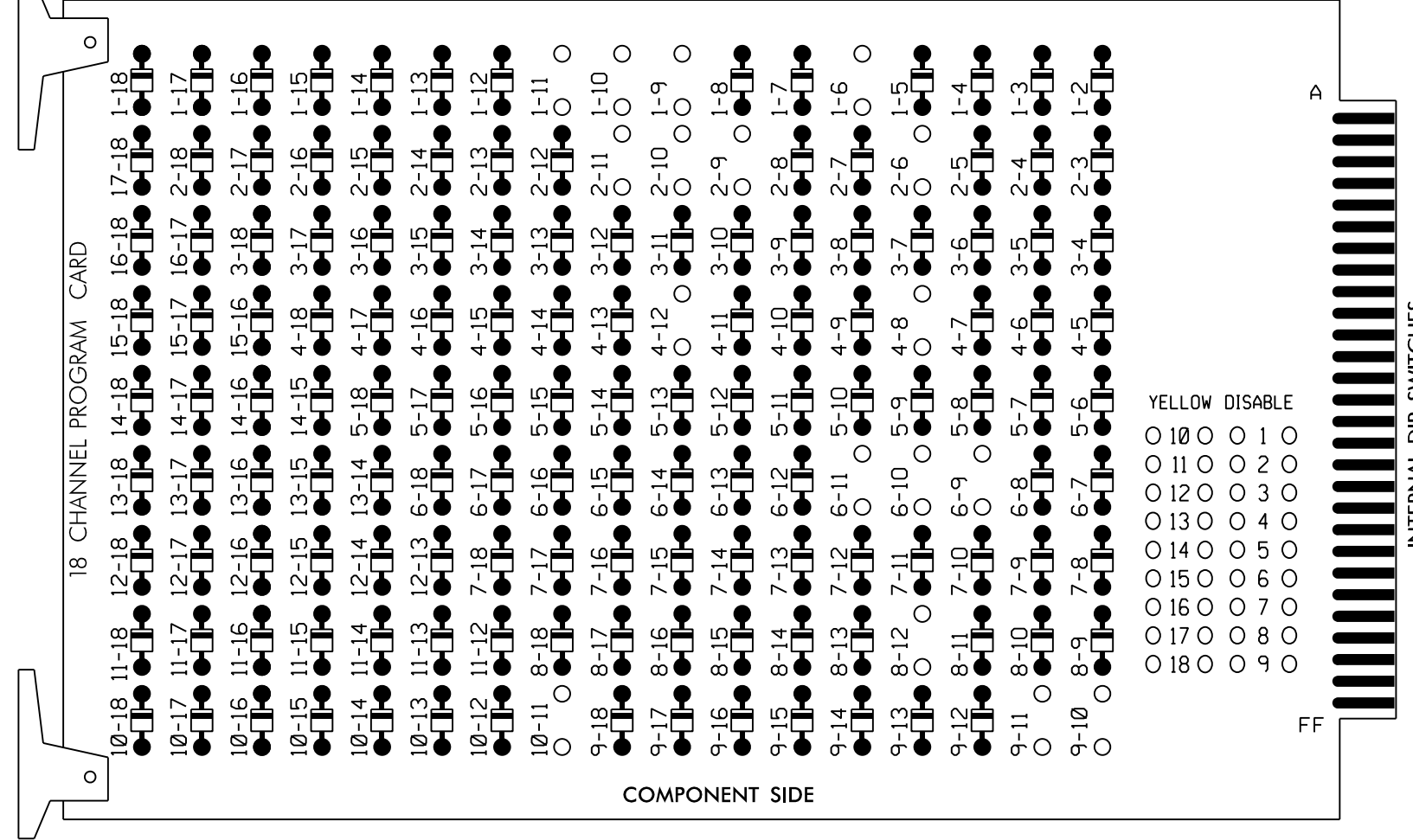
SCALE: 0 to 40  
1" = 40'

REVISIONS	INIT.	DATE

8/22/2024 8:44:00 AM Traffic\cs\gms\gnal\sa\0015a\_s1c\_07-1689T3.dgn

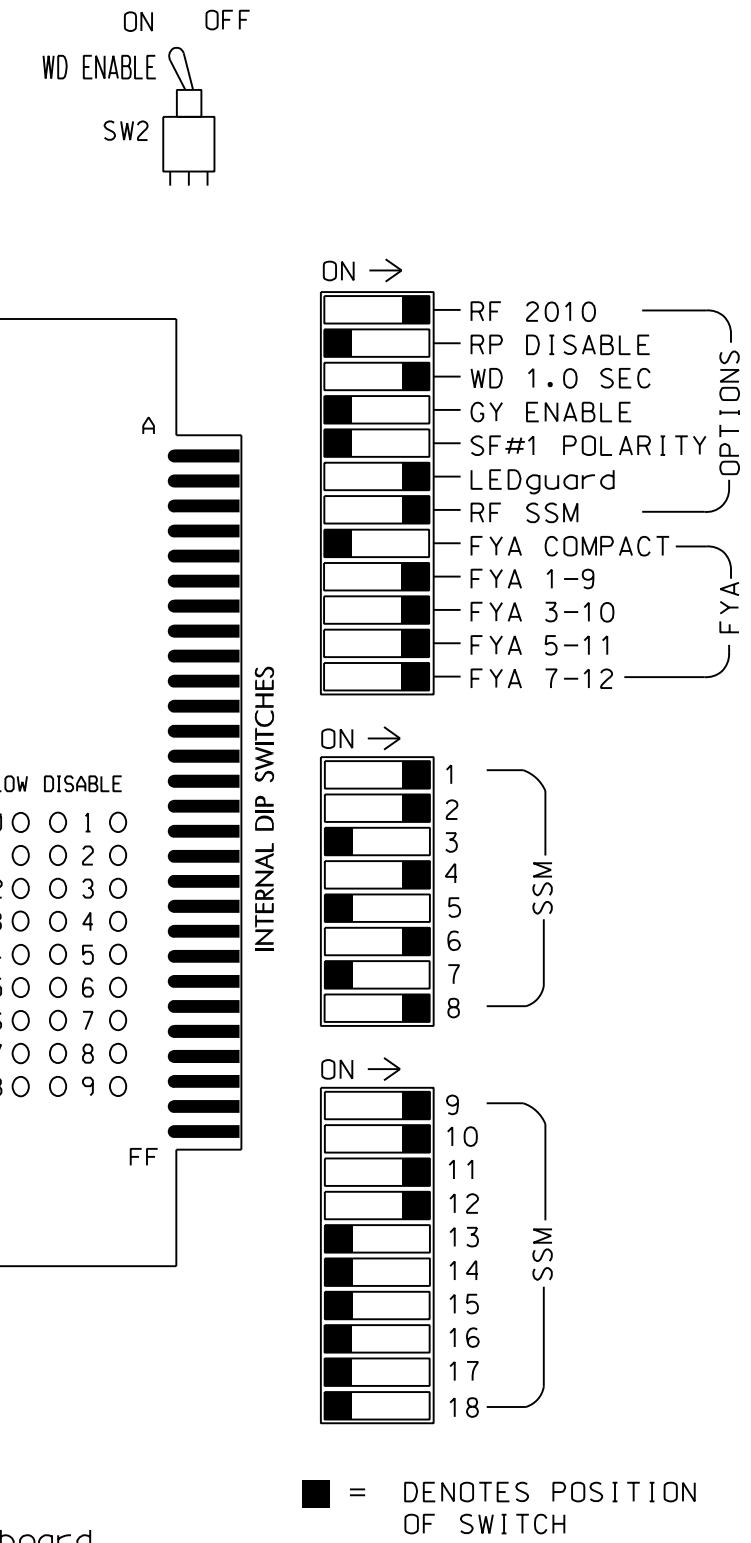
**18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL**  
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 1-11, 2-6, 2-9, 2-10, 2-11, 4-8, 4-12, 6-9, 6-10, 6-11, 8-12, 9-10, 9-11, 10-11



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.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "Rst".
- Ensure "InhFYARedSt" feature is set to "ON".
- Ensure "Flash Mode" is set to "CHANNEL" (MM 1-4-1).
- Program all channels in use to flash red (MM 1-8-1).
- Program Start Red Time for 6.0 Seconds.
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:  

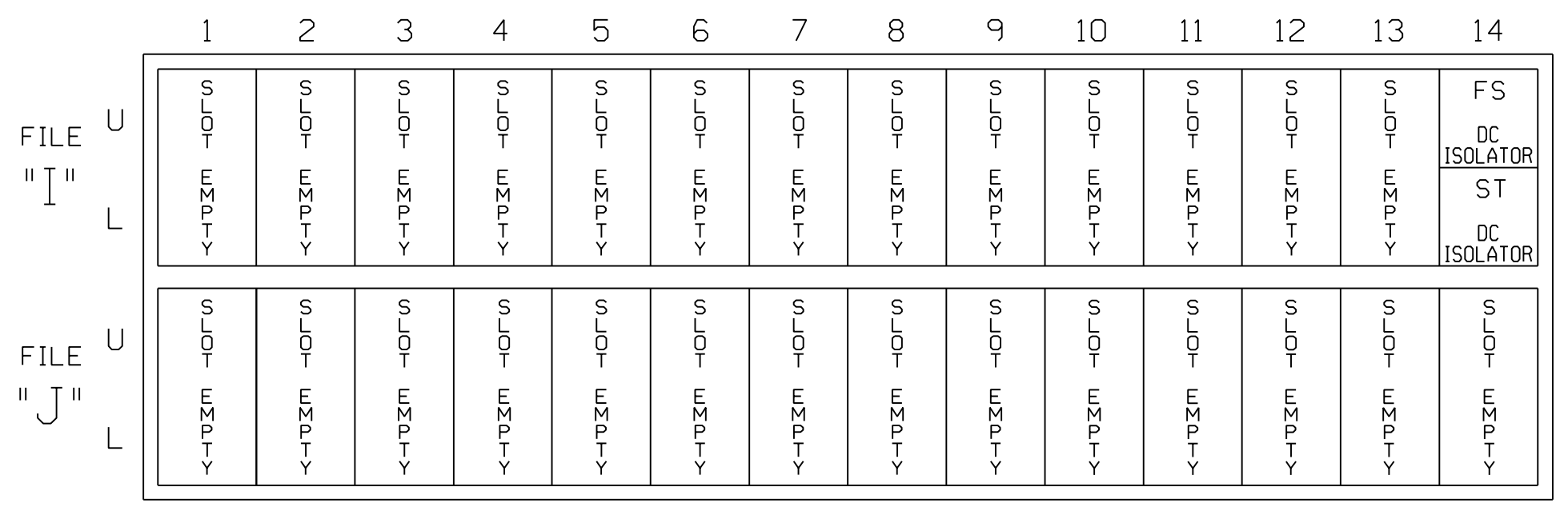
```
FROM MAIN MENU->1->8->7 (I/O LOGIC) Result Src.Fcn TimeOp Time
1208 = 01208 DLY 1
```
- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the Greensboro Signal System.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	22,23	NU	NU	42,43	NU	NU	61,62	NU	NU	81,82	NU	11	63	NU	21	41	NU
RED	*	128				101			134			107			A124				
YELLOW			129			102			135			108							
GREEN						103			136			109							
RED ARROW															A121			A114	A101
YELLOW ARROW			126												A122	A125		A115	A102
FLASHING YELLOW ARROW															A123	A126		A116	A103
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 below.

**INPUT FILE POSITION LAYOUT**  
(front view)



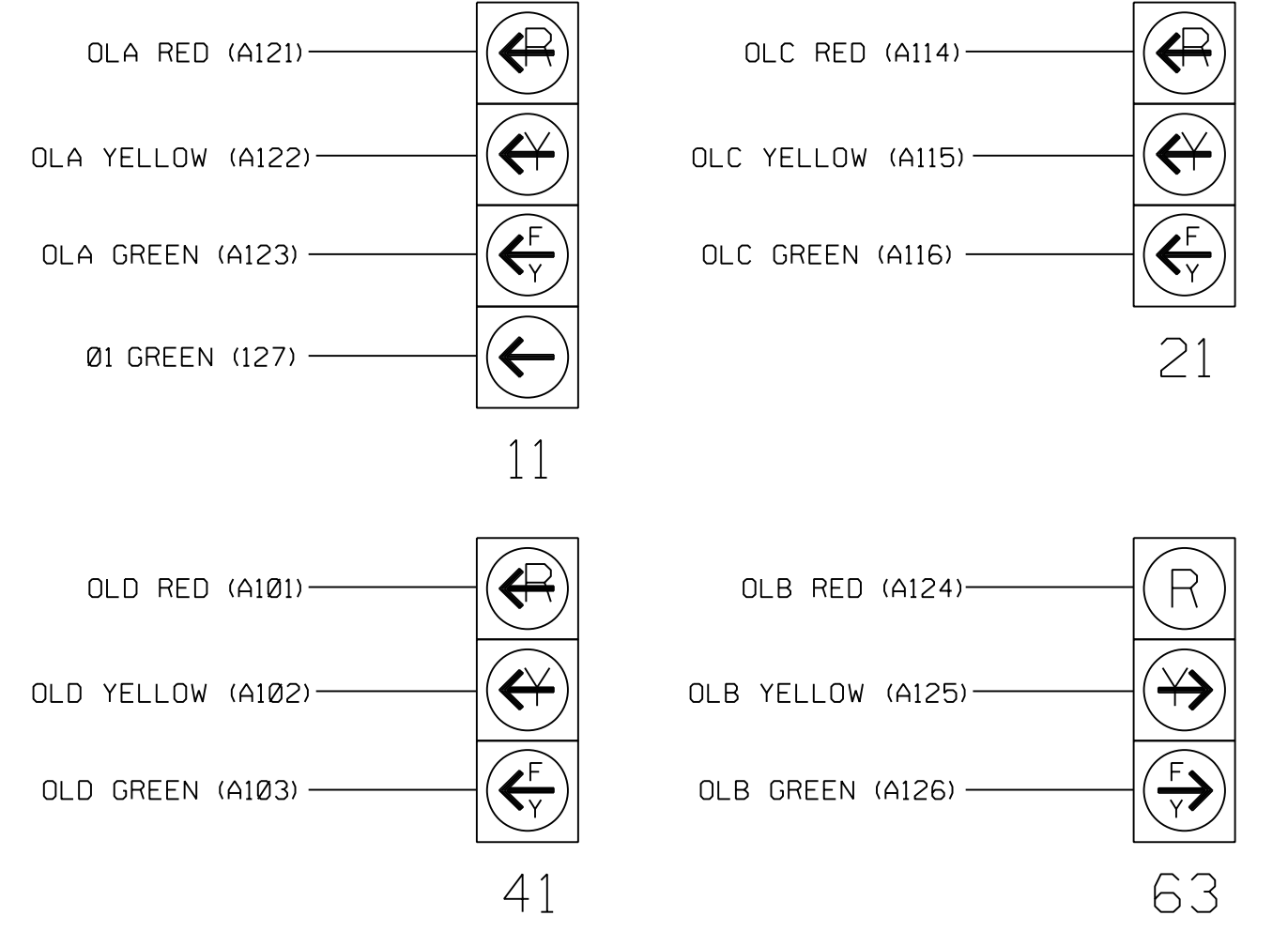
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME

**EQUIPMENT INFORMATION**

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....TRAFFICWARE APOGEE  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)  
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11,AUX S1, AUX S2,AUX S4, AUX S5  
 PHASES USED.....1,2,4,6,8  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*

\* See overlap programming detail on sheet 2.

**FYA SIGNAL WIRING DETAIL**  
(wire signal head as shown)



**FLASHER CIRCUIT MODIFICATION DETAIL**

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

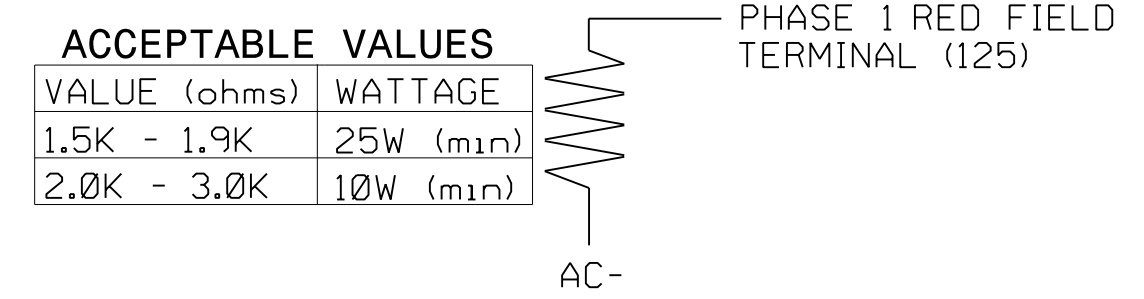
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

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

**SPECIAL DETECTOR NOTE**

Install a video detection system for vehicle detection for zones 1A, 1B, 2A, 2B, 2C, 4A, 4B, 6A, 6B, and 8A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

**LOAD RESISTOR INSTALLATION DETAIL**



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T3  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 3  
 (TMP Phase II) Electrical Detail - Sheet 1 of 3

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

Prepared for the Offices of:  
 North Carolina Department of Transportation  
 Statewide Mobility and Safety Division  
 Signal Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

SR 1556 (Gallimore Dairy Rd.)  
 at  
 SR 1554 (Chimney Rock Rd.)/  
 Simply Southern

Division 7 Guilford County Greensboro  
 PLAN DATE: August 2024 REVIEWED BY: DT Sears  
 PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS	INIT.	DATE

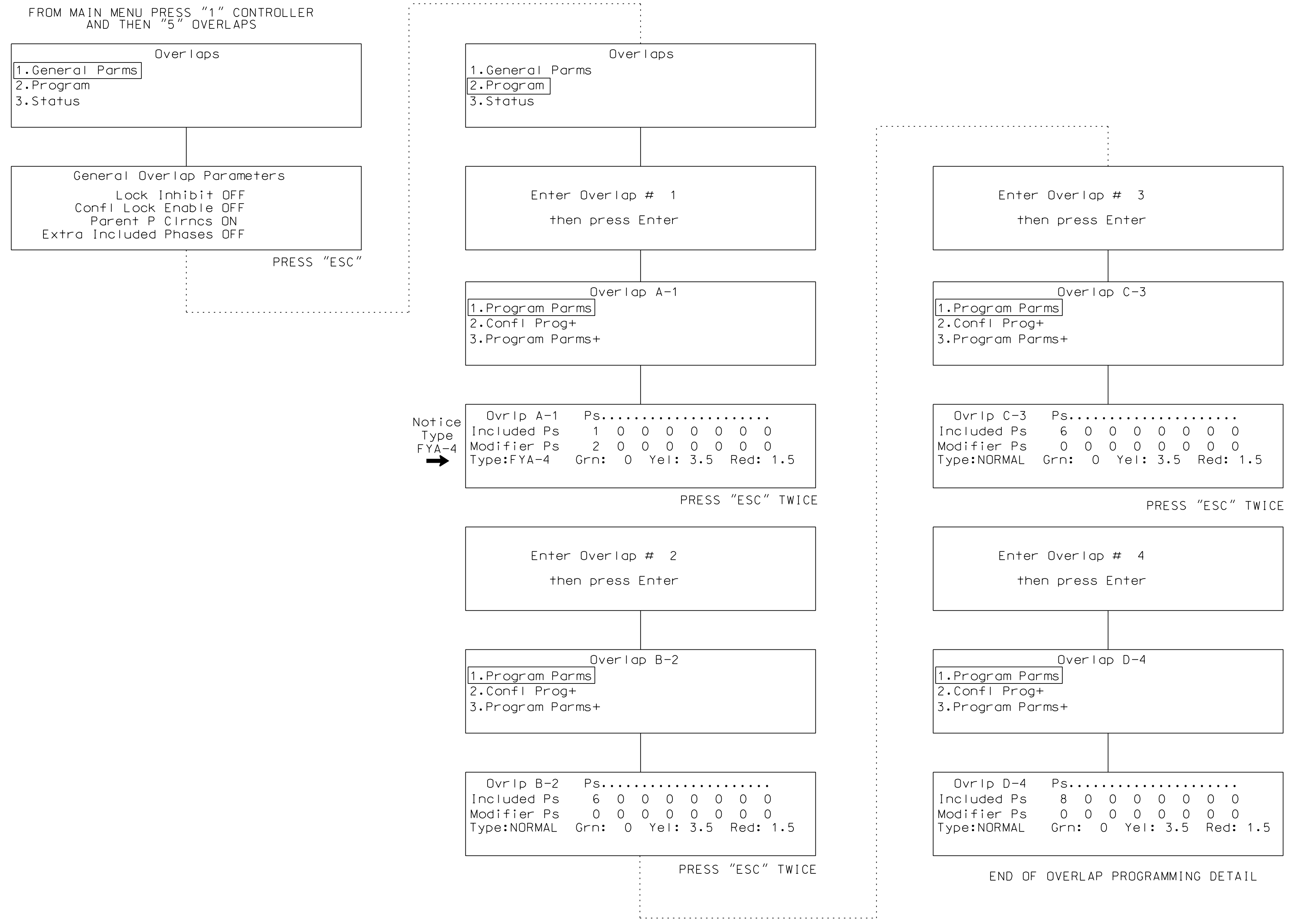
Porter Jones  
 PROFESSIONAL ENGINEER  
 SEAL 056142  
 DATE 8/22/2024

SIG. INVENTORY NO. 07-1689T3

**OVERLAP PROGRAMMING DETAIL  
FOR OVERLAPS A, B, C, and D\***

(program controller as shown below)


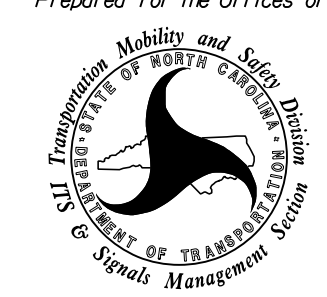

\*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T3  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Temporary Design 3  
(TMP Phase II) Electrical Detail - Sheet 2 of 3

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

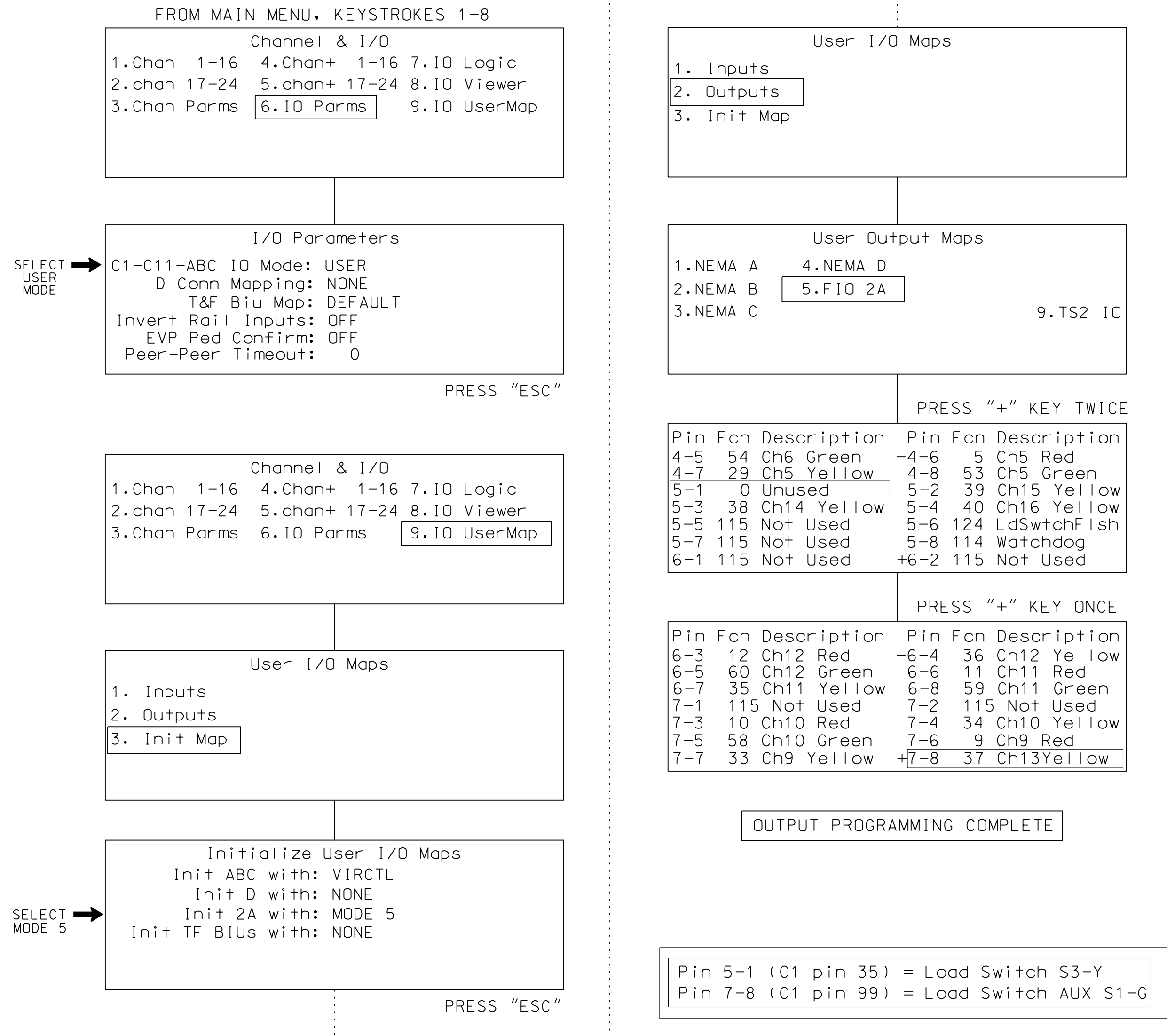
 P: (919) 878-8560 8801 Six Forks Road Suite 700   Raleigh, North Carolina 27615-2965 NC License No. F-0112 Engineers   Construction Managers   Planners   Scientists www.rk.com Responsive People   Creative Solutions	Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern	SEAL  PORTER JONES ENGINEER 056142 8/22/2024
	Division 7 Guilford County Greensboro PLAN DATE: August 2024 REVIEWED BY: DT Sears PREPARED BY: WP Erickson-Jones REVIEWED BY:	REVISIONS INIT. DATE	DocuSigned by Porter Jones 8/22/2024 SIGNATURE DATE

8/22/2024 R:\Projects\07-1689T3\07-1689T3.dgn wpjones

### 4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



! Press the "\*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

#### NOTE

I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

### CHANNEL & I/O PROGRAMMING DETAIL

FOR FYA OPERATION

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.

FROM MAIN MENU, KEYSTROKES 1-8

```

Channel & I/O
1.Chan 1-16 4.Chan+ 1-16 7.I/O Logic
2.chan 17-24 5.chan+ 17-24 8.I/O Viewer
3.Chan Parm 6.I/O Parm 9.I/O UserMap
    
```

PRESS THE RIGHT ARROW KEY UNTIL THE SCREEN AT RIGHT APPEARS

```

Chan.1...2...3...4...5...6...7...8 >
Flash Red . . . . .
Flash Yel . . . . .
Flash Grn . . . . .
Inhibit Red Flash In
Preempt . . . . .
Olap Ovr 0 0 0 0 0 0 0 0
    
```

```

Chan.9..10..11..12..13..14..15..16
Flash Red . . . . .
Flash Yel . . . . X . . . .
Flash Grn . X X X . . . .
Inhibit Red Flash In
Preempt . . . . .
Olap Ovr 0 0 0 0 1 0 0 0
    
```

Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

#### NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

#### Programming Notes:

Default	Change To:
Pin Fcn Description Fcn Description	
5-1 37 Ch13 Yellow...0 Unused	

#### Programming Notes:

Default	Change To:
Pin Fcn Description Fcn Description	
7-8 57 Ch9 Green...37 Ch13 Yellow	

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T3  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 3  
 (TMP Phase II) - Electrical Detail - Sheet 3 of 3

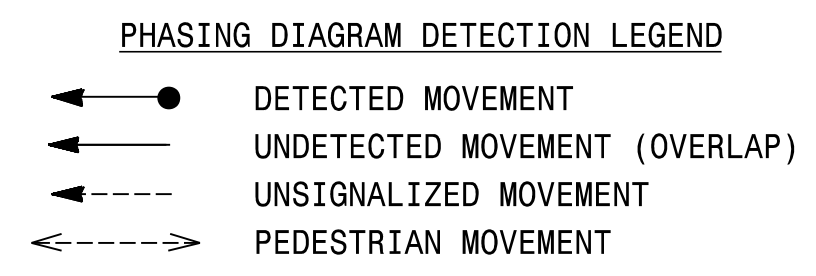
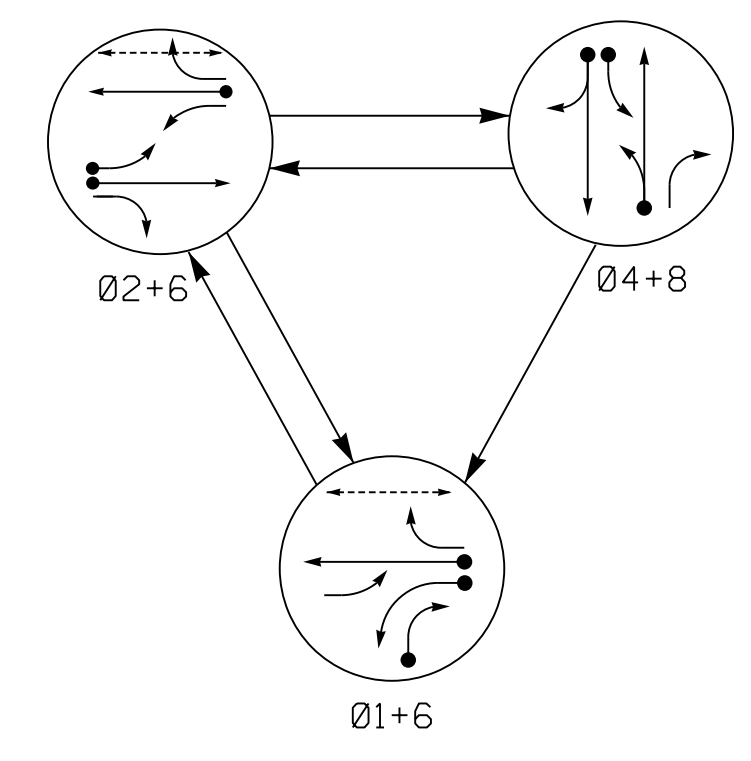
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern	SEAL  PORTER JONES
	Division 7 Guilford County Greensboro PLAN DATE: August 2024 REVIEWED BY: DT Sears PREPARED BY: WP Erickson-Jones REVIEWED BY:	

  
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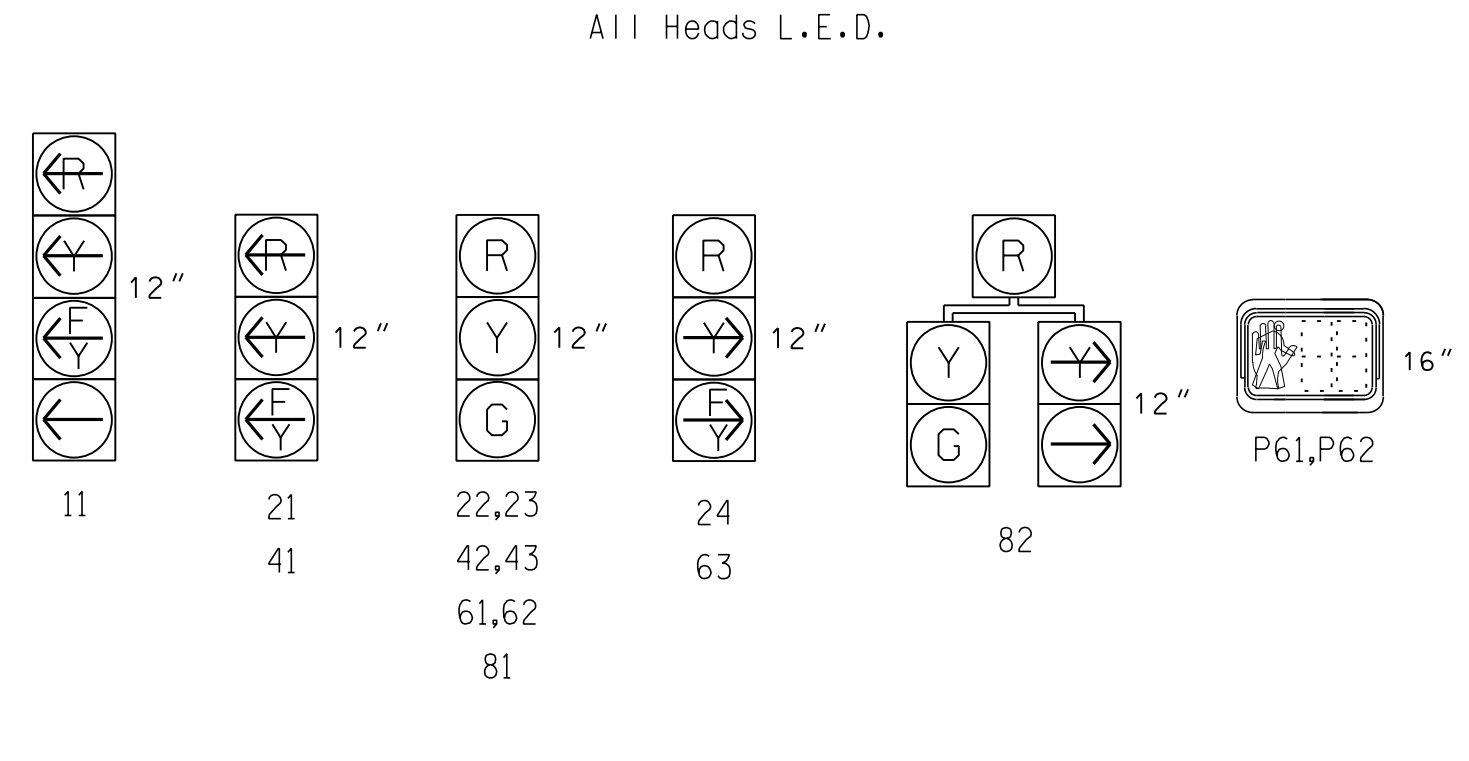
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø4+8	F L S H
11	←	←	←	←
21	←	←	←	←
22,23	R	G	R	R
24	R	←	←	←
41	←	←	←	←
42,43	R	R	G	R
61,62	G	G	R	R
63	←	←	←	←
81	R	R	G	R
82	←	←	←	←
P61,P62	W	W	DW	DRK

**SIGNAL FACE I.D.**



**LOOP & DETECTOR UNIT INSTALLATION CHART**  
TRAFFICWARE APOGEE SOFTWARE 2070 CONTROLLER

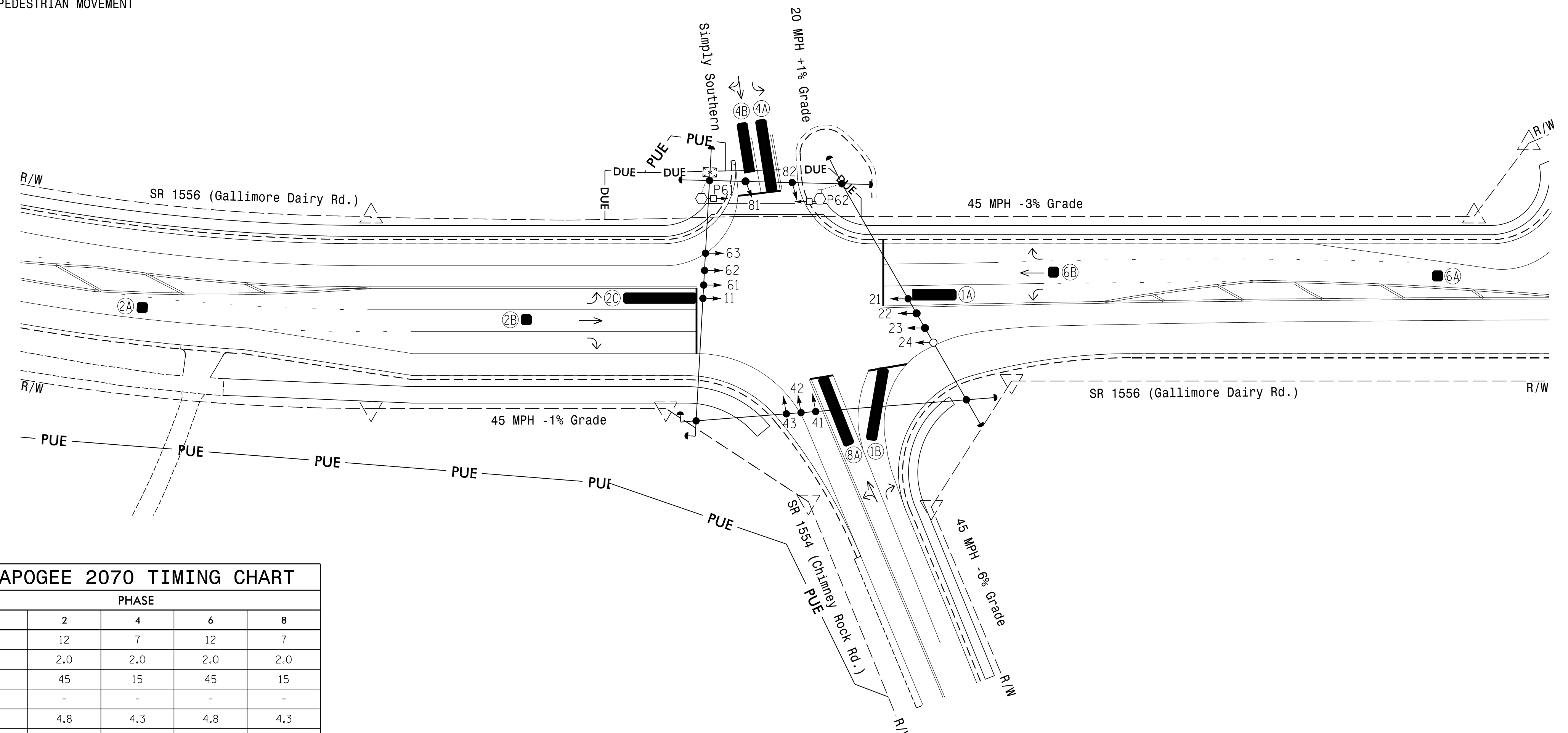
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING								
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
1A*	6X40	0	*	-	1	-	15	-	X	X	-	-	-
1B*	6X40	0	*	-	1	-	15	-	X	X	-	-	-
2A*	6X6	300	*	-	2	-	-	1.6	X	X	-	-	-
2B*	6X6	90	*	*	2	-	-	-	X	X	-	-	*
2C*	6X40	0	*	*	2	-	-	-	X	X	-	-	*
4A*	6X40	0	*	-	4	-	3	-	X	X	-	-	-
4B*	6X40	0	*	-	4	-	10	-	X	X	-	-	-
6A*	6X6	90	*	-	6	-	-	1.6	X	X	-	-	-
6B*	6X6	300	*	-	6	-	-	-	X	X	-	-	-
8A*	6X40	0	*	-	8	-	3	-	X	X	-	-	-

\* VIDEO DETECTION

**3 Phase Fully Actuated (Greensboro Signal System)**

**NOTES**

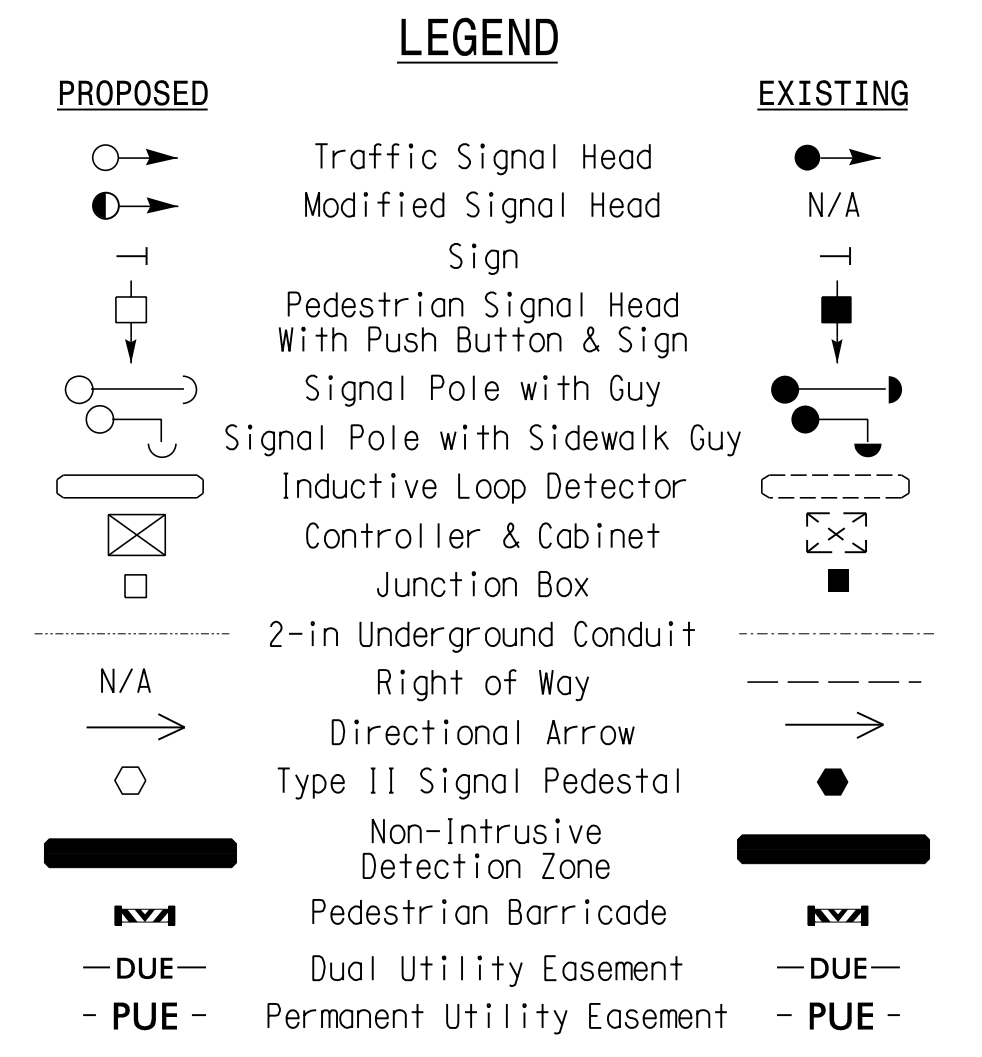
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal heads #21, 22, and 23.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**TRAFFICWARE APOGEE 2070 TIMING CHART**

FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	12	7	12	7
Gap, Extension *	2.0	2.0	2.0	2.0	2.0
Maximum Green 1 *	15	45	15	45	15
Maximum Green 2 *	-	-	-	-	-
Yellow Clear	3.0	4.8	4.3	4.8	4.3
Red Clear	2.1	1.8	3.2	1.8	3.2
Walk *	-	-	-	14	-
Pedestrian Clear	-	-	-	10	-
GreenPed Delay	-	-	-	7	-
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Lock Calls	-	YES	-	YES	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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



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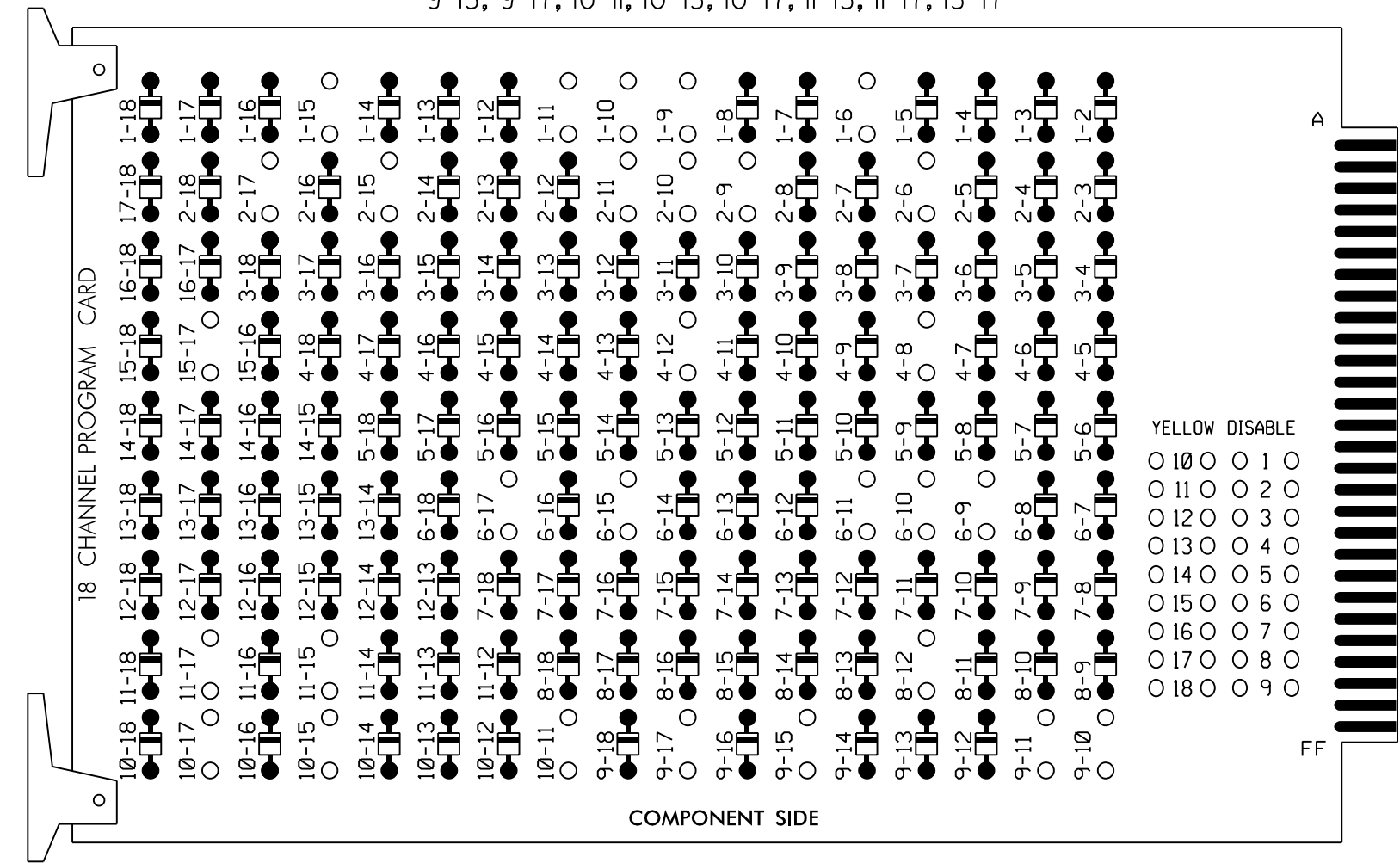
Signal Upgrade-Temporary Design 4 (TMP Phase III)

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	Division 7 Guilford County Greensboro PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones PREPARED BY: A.C. Norman REVIEWED BY:			
	REVISIONS	INIT.		DATE

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

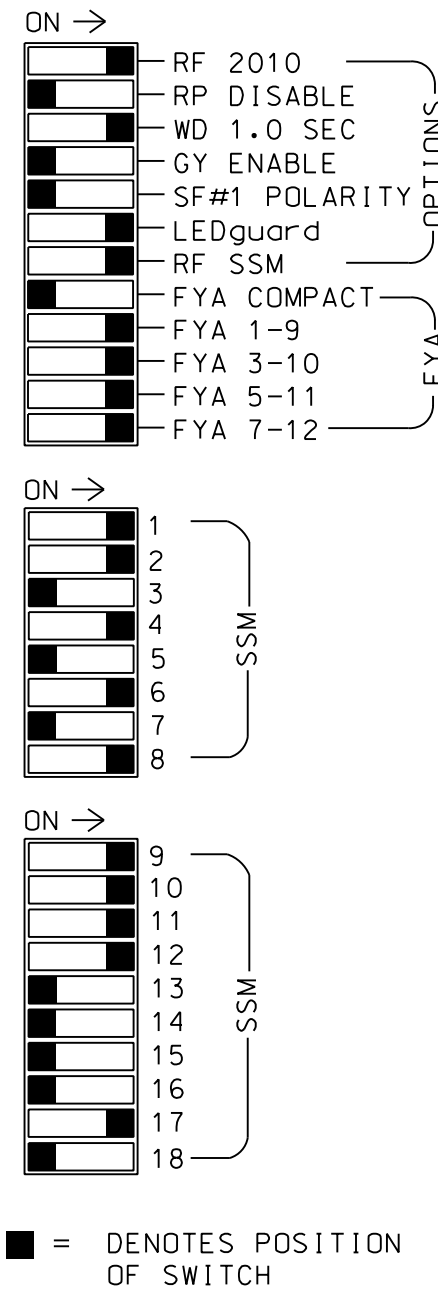
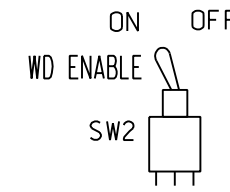
REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 1-11, 1-15, 2-6, 2-9, 2-10, 2-11, 2-15, 2-17, 4-8, 4-12, 6-9, 6-10, 6-11, 6-15, 6-17, 8-12, 9-10, 9-11, 9-15, 9-17, 10-11, 10-15, 10-17, 11-15, 11-17, 15-17



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.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "RST".
- Ensure "InhFYARedSt" feature is set to "ON".
- Ensure "Flash Mode" is set to "CHANNEL" (MM 1-4-1).
- Program all channels in use to flash red (MM 1-8-1).
- Program Start Red Time for 6.0 Seconds.
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:  

FROM MAIN MENU->1->8->7 (I/O LOGIC)	Result Src.Fcn	TimeOp Time
	1208 = 01208	DLY 1
- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the Greensboro Signal System.

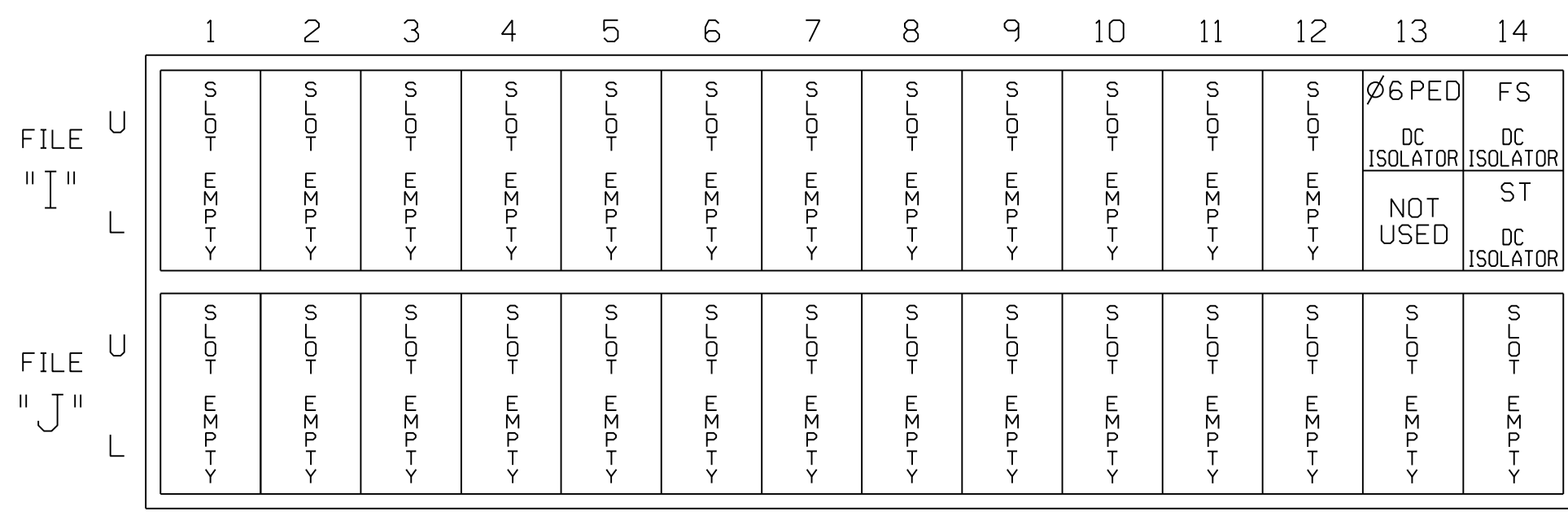
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11★	82	22,23	NU	NU	42,43	NU	NU	61,62	P61, P62	NU	81,82	11★	63★	24★	21★	41★	NU	
RED	*	128				101			134			107			A124	A111			
YELLOW		129				102			135			108							
GREEN		130				103			136			109							
RED ARROW															A121		A114	A101	
YELLOW ARROW		126													A122	A125	A112	A115	A102
FLASHING YELLOW ARROW															A123	A126	A113	A116	A103
GREEN ARROW	127	127																	
Hand													119						
Walking																			

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

### INPUT FILE POSITION LAYOUT

(front view)



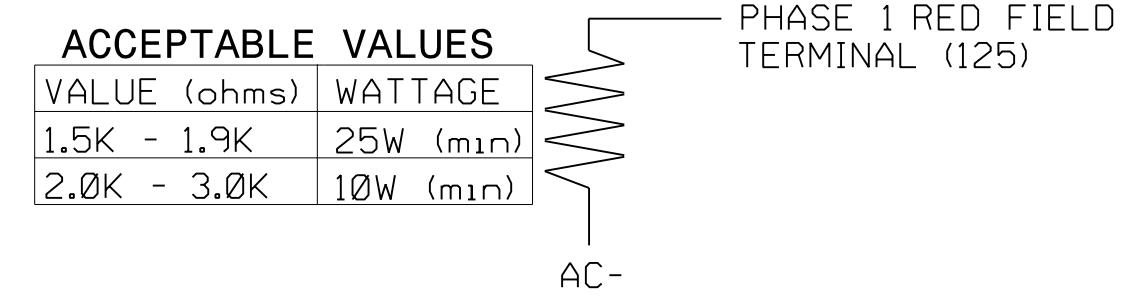
EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
PED PUSH BUTTONS											
P61,P62	T88-7,9	I13U	68	PED 6	6 PED						

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

### LOAD RESISTOR INSTALLATION DETAIL



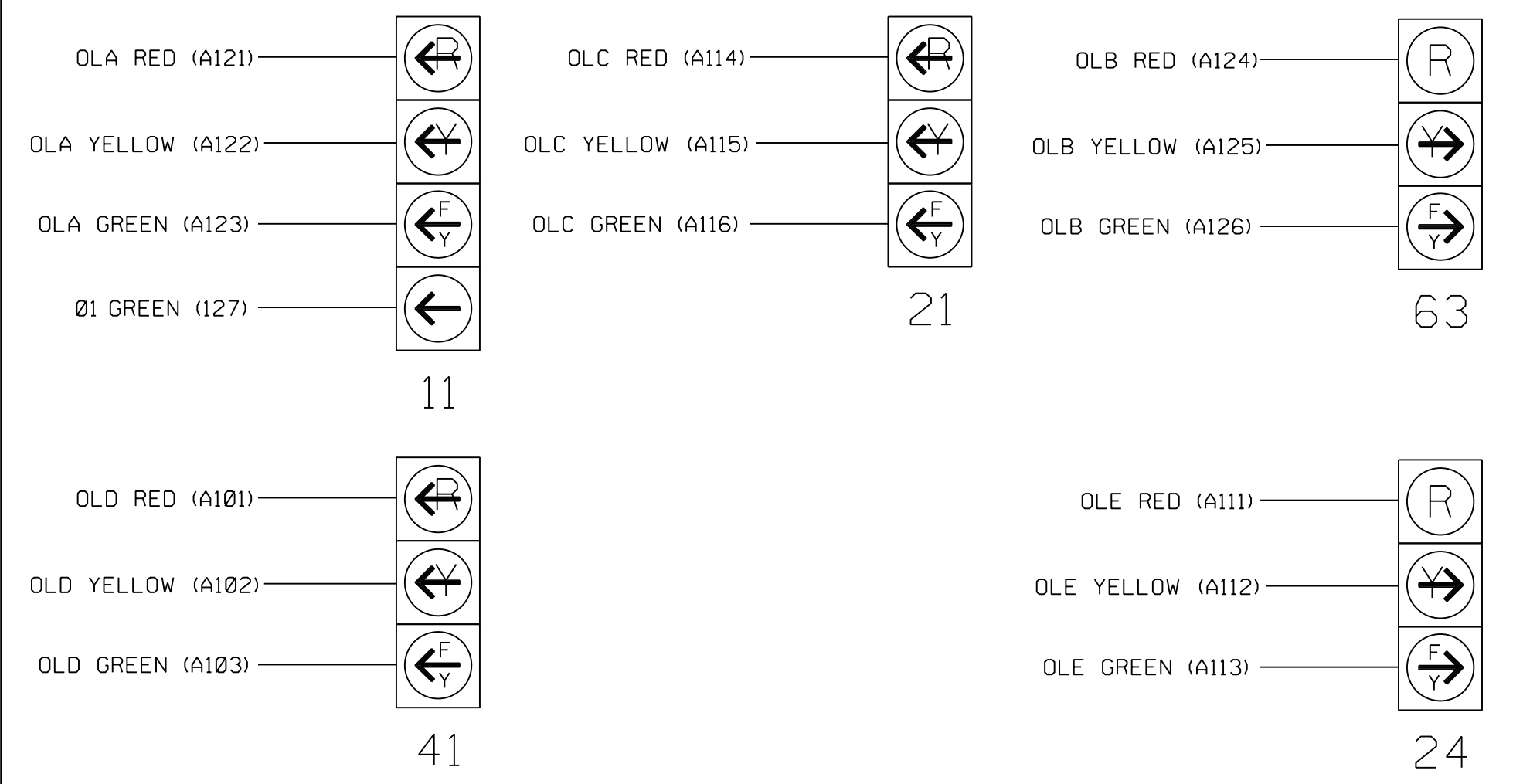
### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....TRAFFICWARE APOGEE  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S5,S8,S9,S11,AUX S1,AUX S2  
 AUX S3,AUX S4,AUX S5  
 PHASES USED.....1,2,4,6,8,6PED  
 OVERLAP "A".....\*  
 OVERLAP "B".....\*  
 OVERLAP "C".....\*  
 OVERLAP "D".....\*  
 OVERLAP "E".....\*

\* See overlap programming detail on sheet 2.

### FYA SIGNAL WIRING DETAIL

(wire signal head 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.

### SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 1A, 1B, 2A, 2B, 2C, 4A, 4B, 6A, 6B, and 8A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

Signal Upgrade - Temporary Design 4 (TMP Phase III) Electrical Detail - Sheet 1 of 3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T4  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.) / Simply Southern

Division 7 Guilford County Greensboro

PLAN DATE: August 2024 REVIEWED BY: DT Sears

PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS	INIT.	DATE

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

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL: PORTER JONES ENGINEER, PROFESSIONAL SEAL 056142

DocuSigned by: Porter Jones 8/22/2024

DATE: 8/22/2024

SIG. INVENTORY NO. 07-1689T4

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8/22/2024 R:\Traffic\c&s\Signal\Signal\015a...S1c.07-1689t4.dgn wpl Jones

**OVERLAP PROGRAMMING DETAIL FOR OVERLAPS A, B, C, D, And E\***

(program controller as shown below)

\*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details

**GREEN DELAY PROGRAMMING DETAIL FOR LEADING PEDESTRIAN INTERVAL OPERATION**

(program controller as shown below)

FROM MAIN MENU, KEYSTROKES 1-1

```

Channel & I/O
1.Times      4.Ring,Start,Concur  7.Times+
2.Options    5.Call,Inh,Redirect  8.Copy
3.Options+   6.All Progs+        9.AdvWarn
    
```

PRESS "+" KEY ONCE

```

Options+   P..1..2..3..4..5..6..7.8 >
  Ped Delay - . . . . .
Red Rest On Gap . . . . .
Conflicting P 0 0 0 0 0 0 0 0 0
Grn/Ped Delay 0 0 0 0 0 0 7 0 0
Omit Yel. Yel P 0 0 0 0 0 0 0 0 0
Ped Out/OvrIp P 0 0 0 0 0 0 0 0 0
StartYel,Next P + 0 0 0 0 0 0 0 0 0
    
```

CHANNEL & I/O PROGRAMMING COMPLETE

FROM MAIN MENU PRESS "1" CONTROLLER AND THEN "5" OVERLAPS

```

Overlaps
1.General Parm
2.Program
3.Status
    
```

```

General Overlap Parameters
Lock Inhibit OFF
Conf Lock Enable OFF
Parent P Clrnc ON
Extra Included Phases OFF
    
```

PRESS "ESC"

```

Overlaps
1.General Parm
2.Program
3.Status
    
```

Enter Overlap # 1 then press Enter

```

Overlap A-1
1.Program Parm
2.Confl Prog+
3.Program Parm+
    
```

Notice Type FYA-4

```

OvrIp A-1 Ps.....
Included Ps 1 0 0 0 0 0 0 0 0
Modifier Ps 2 0 0 0 0 0 0 0 0
Type:FYA-4 Grn: 0 Yel: 3.5 Red: 1.5
    
```

PRESS "ESC" TWICE

Enter Overlap # 2 then press Enter

```

Overlap B-2
1.Program Parm
2.Confl Prog+
3.Program Parm+
    
```

```

OvrIp B-2 Ps.....
Included Ps 6 0 0 0 0 0 0 0 0
Modifier Ps 0 0 0 0 0 0 0 0 0
Type:NORMAL Grn: 0 Yel: 3.5 Red: 1.5
    
```

PRESS "ESC" TWICE

Enter Overlap # 3 then press Enter

```

Overlap C-3
1.Program Parm
2.Confl Prog+
3.Program Parm+
    
```

```

OvrIp C-3 Ps.....
Included Ps 6 0 0 0 0 0 0 0 0
Modifier Ps 0 0 0 0 0 0 0 0 0
Type:NORMAL Grn: 0 Yel: 3.5 Red: 1.5
    
```

PRESS "ESC" TWICE

Enter Overlap # 4 then press Enter

```

Overlap D-4
1.Program Parm
2.Confl Prog+
3.Program Parm+
    
```

```

OvrIp D-4 Ps.....
Included Ps 8 0 0 0 0 0 0 0 0
Modifier Ps 0 0 0 0 0 0 0 0 0
Type:NORMAL Grn: 0 Yel: 3.5 Red: 1.5
    
```

PRESS "ESC" TWICE

Enter Overlap # 5 then press Enter

```

Overlap E-5
1.Program Parm
2.Confl Prog+
3.Program Parm+
    
```

```

OvrIp E-5 Ps.....
Included Ps 2 0 0 0 0 0 0 0 0
Modifier Ps 0 0 0 0 0 0 0 0 0
Type:NORMAL Grn: 0 Yel: 3.5 Red: 1.5
    
```

END OF OVERLAP PROGRAMMING DETAIL

**FLASHER CIRCUIT MODIFICATION DETAIL**

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

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

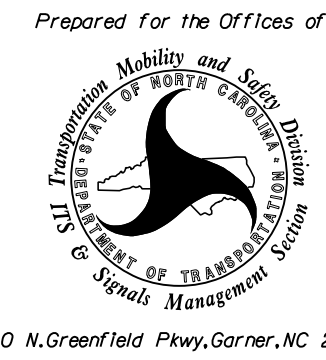
THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T4  
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Signal Upgrade - Temporary Design 4 (TMP Phase III) Electrical Detail - Sheet 2 of 3

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REVISIONS	INIT.	DATE

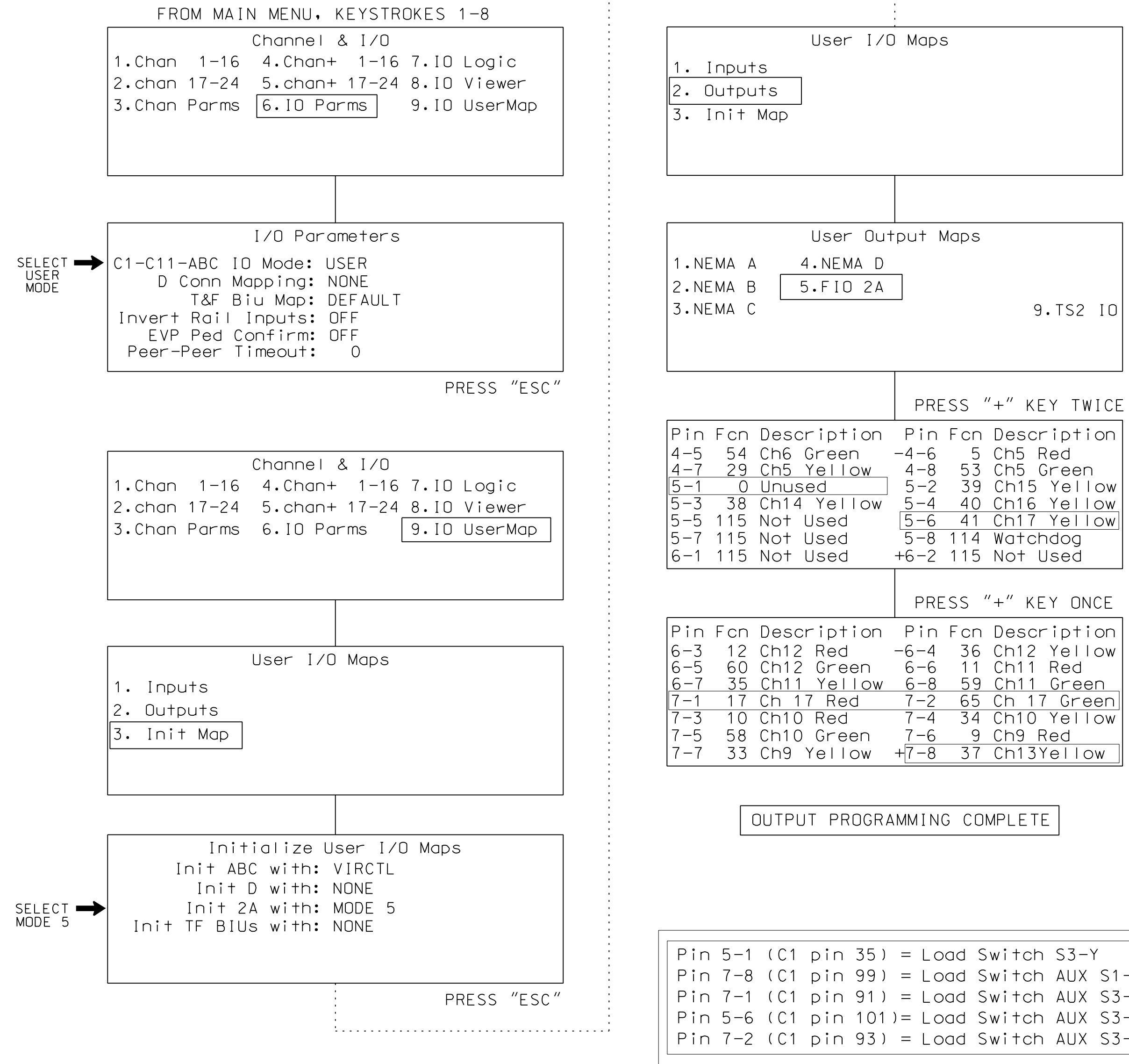
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 ENGINEER  
 PORTER JONES  
 056142  
 8/22/2024  
 DATE  
 SIGNATURE  
 SIG. INVENTORY NO. 07-1689T4

8/22/2024 8:54:11 AM Traffic\_Sig\_S10\_07-1689T4.dgn wpjones

### 4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.
- The programming shown below also enables the use of loadswitch AUX S3 for OLE.



! Press the "\*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

#### NOTE

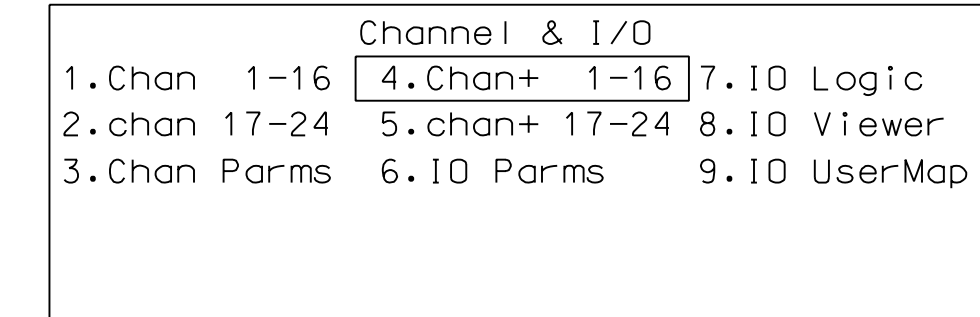
I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

### CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

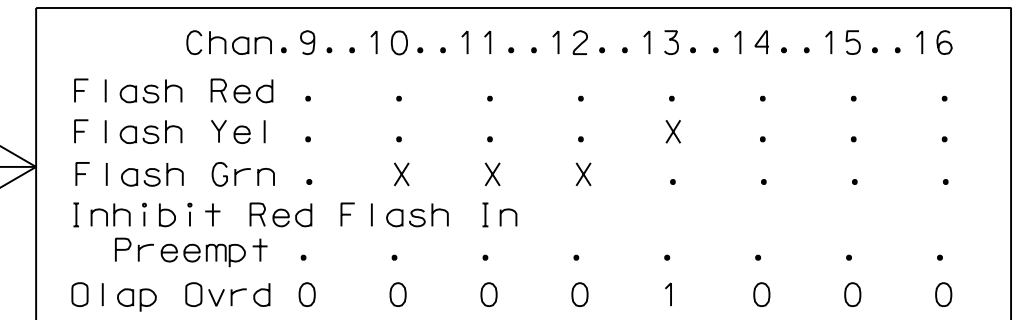
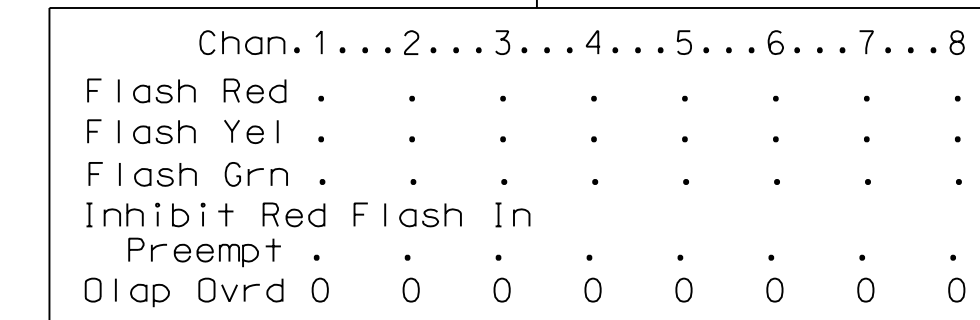
(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.

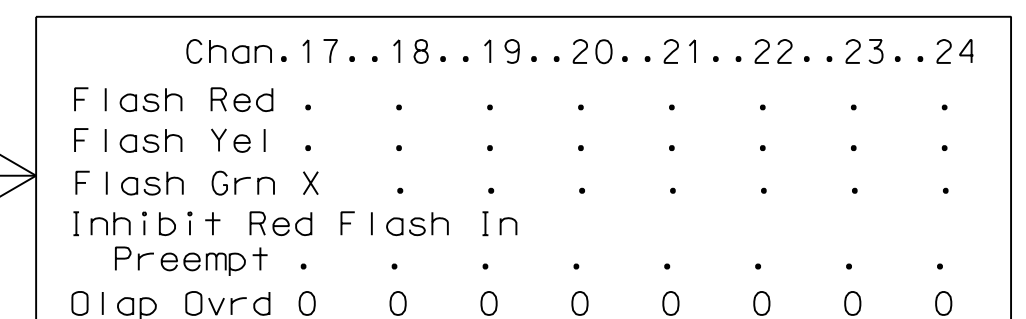
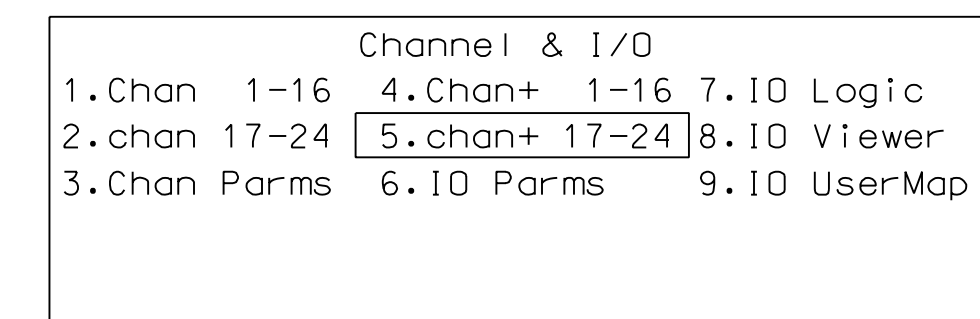
FROM MAIN MENU, KEYSTROKES 1-8



PRESS THE RIGHT ARROW KEY UNTIL THE SCREEN AT RIGHT APPEARS



PRESS "ESC"



#### Programming Notes:

Default Change To:  
 Pin|Fcn Description Fcn Description  
 5-1 37 Ch13 Yellow...0 Unused  
 5-6 124 LdSwchFish...41 Ch17 Yellow

#### Programming Notes:

Default Change To:  
 Pin|Fcn Description Fcn Description  
 7-1 115 Not Used...17 Ch17 Red  
 7-2 115 Not Used...65 Ch17 Green  
 7-8 57 Ch9 Green...37 Ch13 Yellow

Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

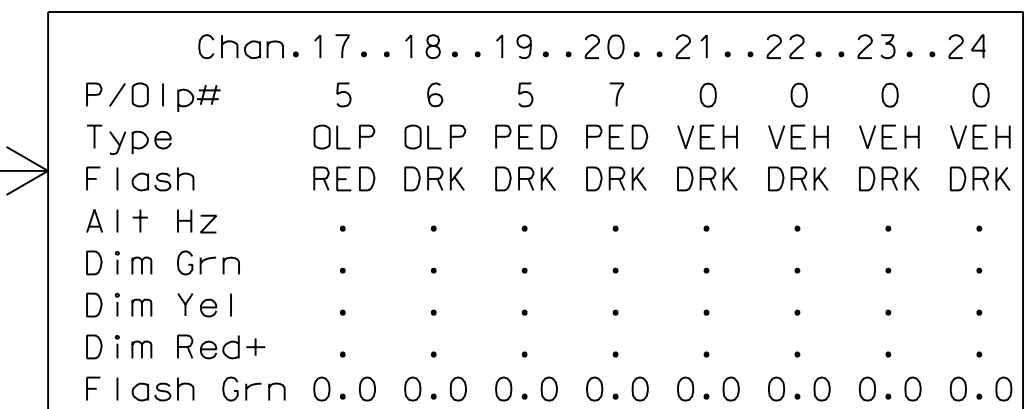
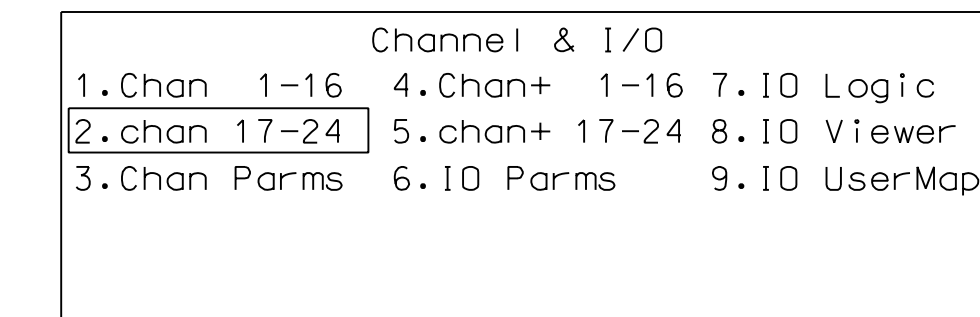
#### NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

### CHANNEL & I/O PROGRAMMING DETAIL ASSIGN CHANNELS FOR OVERLAP E

(program controller as shown below)

FROM MAIN MENU, KEYSTROKES 1-8



Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689T4  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Temporary Design 4 (TMP Phase III) Electrical Detail - Sheet 3 of 3

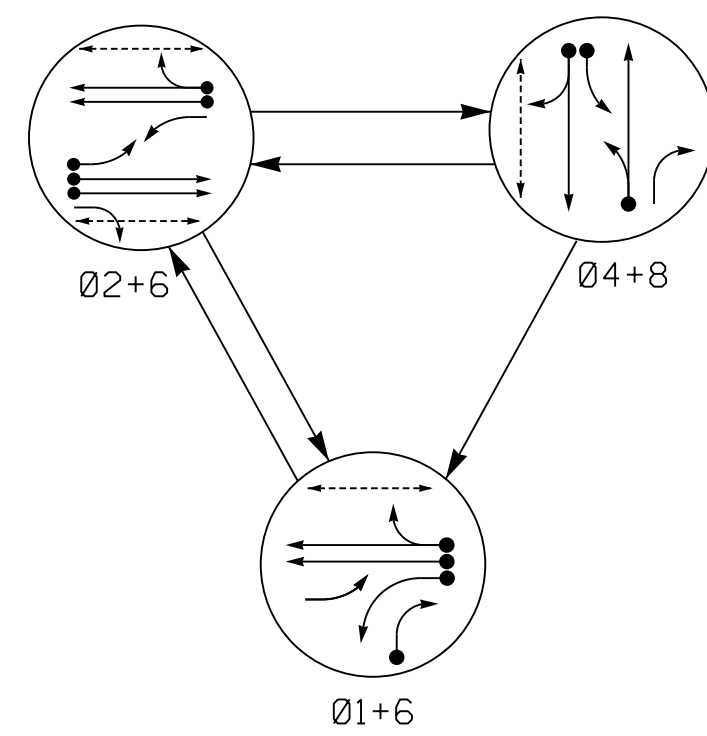
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 PLAN DATE: August 2024 REVIEWED BY: DT Sears  
 PREPARED BY: WP Erickson-Jones REVIEWED BY:  
 REVISIONS INIT. DATE  
 DocuSigned by:  
 Porter Jones  
 8/22/2024  
 DATE  
 SIG. INVENTORY NO. 07-1689T4

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 SIG. INVENTORY NO. 07-1689T4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

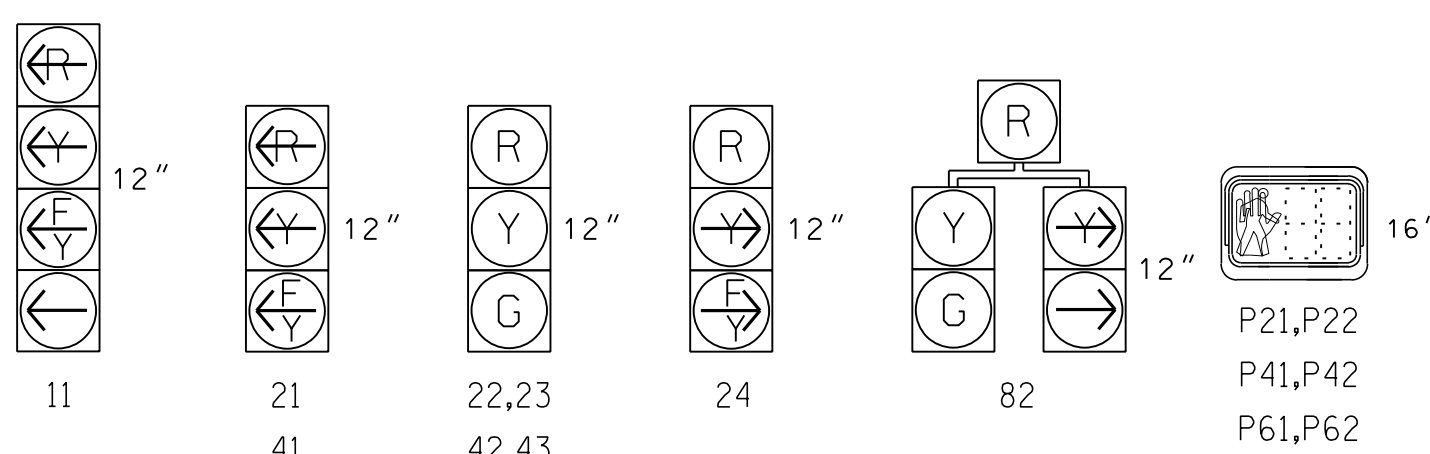
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	01+6	02+6	04+8	FLASH
11	←	←	←	←
21	←	←	←	←
22,23	R	G	R	R
24	R	←	R	R
41	←	←	←	←
42,43	R	R	G	R
61,62	G	G	R	R
81	R	R	G	R
82	←	R	G	R
P21,P22	DW	W	DW	DRK
P41,P42	DW	DW	W	DRK
P61,P62	W	W	DW	DRK

- W - Walk
- DW - Don't Walk
- DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



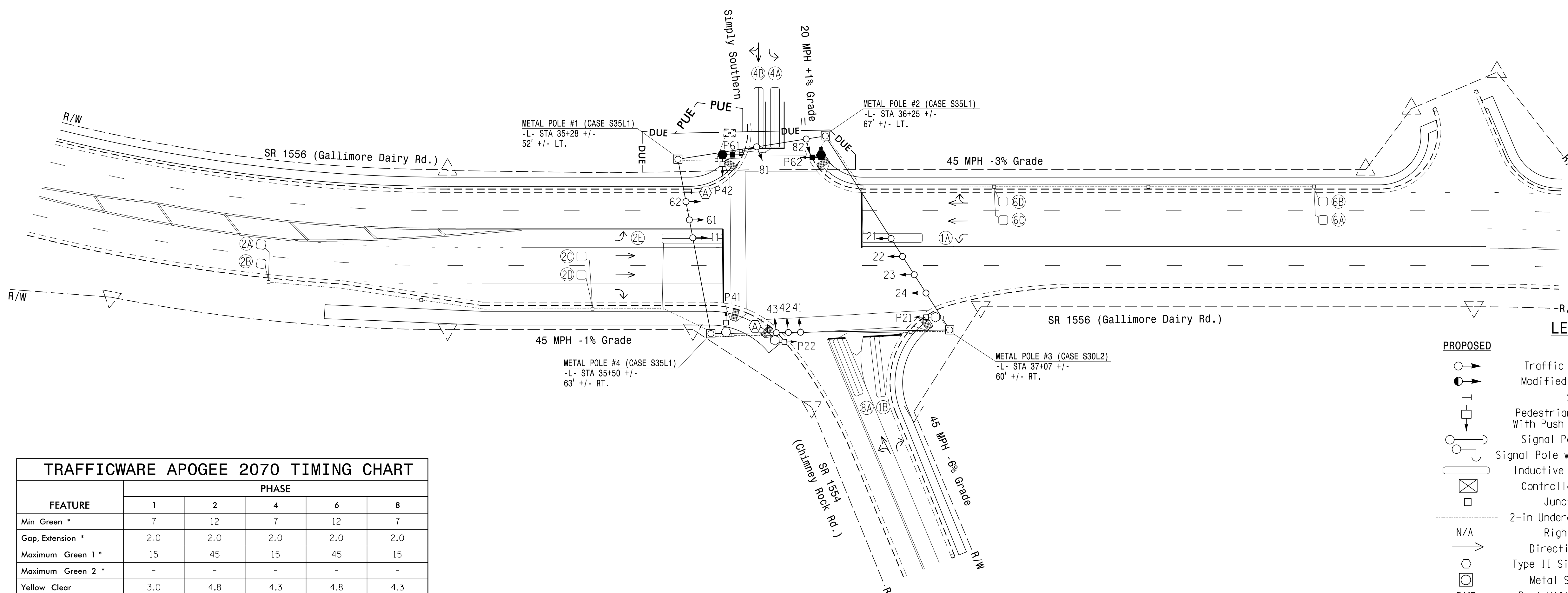
LOOP & DETECTOR UNIT INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP
1A	6X40	0	2-4-2	X	1	-	5	-	X	X	-	X
1B	6X40	0	2-4-2	X	1	-	15	-	X	X	-	X
2A	6X6	300	4	X	2	-	-	1.6	X	X	-	X
2B	6X6	300	4	X	2	-	-	1.6	X	X	-	X
2C	6X6	90	3	X	2	-	-	-	X	X	-	X
2D	6X6	90	3	X	2	-	-	-	X	X	-	X
2E	6X40	0	2-4-2	X	2	-	-	-	X	X	-	X
4A	6X40	0	2-4-2	X	4	-	2	-	X	X	-	X
4B	6X40	0	2-4-2	X	4	-	10	-	X	X	-	X
6A	6X6	300	6	X	6	-	-	1.6	X	X	-	X
6B	6X6	300	6	X	6	-	-	1.6	X	X	-	X
6C	6X6	90	5	X	6	-	-	-	X	X	-	X
6D	6X6	90	5	X	6	-	-	-	X	X	-	X
8A	6X40	0	2-4-2	X	8	-	2	-	X	X	-	X

3 Phase Fully Actuated (Greensboro Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specification for Roads and Structures" dated January 2024.
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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



TRAFFICWARE APOGEE 2070 TIMING CHART

FEATURE	PHASE				
	1	2	4	6	8
Min Green *	7	12	7	12	7
Gap, Extension *	2.0	2.0	2.0	2.0	2.0
Maximum Green 1 *	15	45	15	45	15
Maximum Green 2 *	-	-	-	-	-
Yellow Clear	3.0	4.8	4.3	4.8	4.3
Red Clear	2.3	1.9	3.6	1.9	3.6
Walk *	-	14	14	14	14
Pedestrian Clear	-	24	25	10	25
Green/Ped Delay	-	7	7	7	7
Added Initial *	-	-	-	-	-
Maximum Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Lock Calls	-	YES	-	YES	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

LEGEND

- |  |          |  |  |          |     |
|--|----------|--|--|----------|-----|
|  | PROPOSED | Traffic Signal Head  |  | EXISTING | N/A |
|  |          | Modified Signal Head   |  |          | N/A |
|  |          | Pedestrian Signal Head   |  |          | N/A |
|  |          | Signal Pole with Guy   |  |          | N/A |
|  |          | Signal Pole with Sidewalk Guy                                  |  |          | N/A |
|  |          | Inductive Loop Detector  |  |          | N/A |
|  |          | Controller & Cabinet   |  |          | N/A |
|  |          | Junction Box   |  |          | N/A |
|  |          | 2-in Underground Conduit                                       |  |          | N/A |
|  |          | Right of Way   |  |          | N/A |
|  |          | Directional Arrow  |  |          | N/A |
|  |          | Type II Signal Pedestal  |  |          | N/A |
|  |          | Metal Strain Pole  |  |          | N/A |
|  |          | Dual Utility Easement  |  |          | N/A |
|  |          | Permanent Utility Easement                                     |  |          | N/A |
|  |          | Right "TURNING VEHICLES" Yield "TO" Pedestrians Sign (R10-15R) |  |          | N/A |
|  |          | Curb Ramp  |  |          | N/A |

Signal Upgrade - Final Design

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

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Simply Southern

Division 7 Guilford County Greensboro

PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones

PREPARED BY: A.C. Norman REVIEWED BY:

REVISIONS	INIT.	DATE

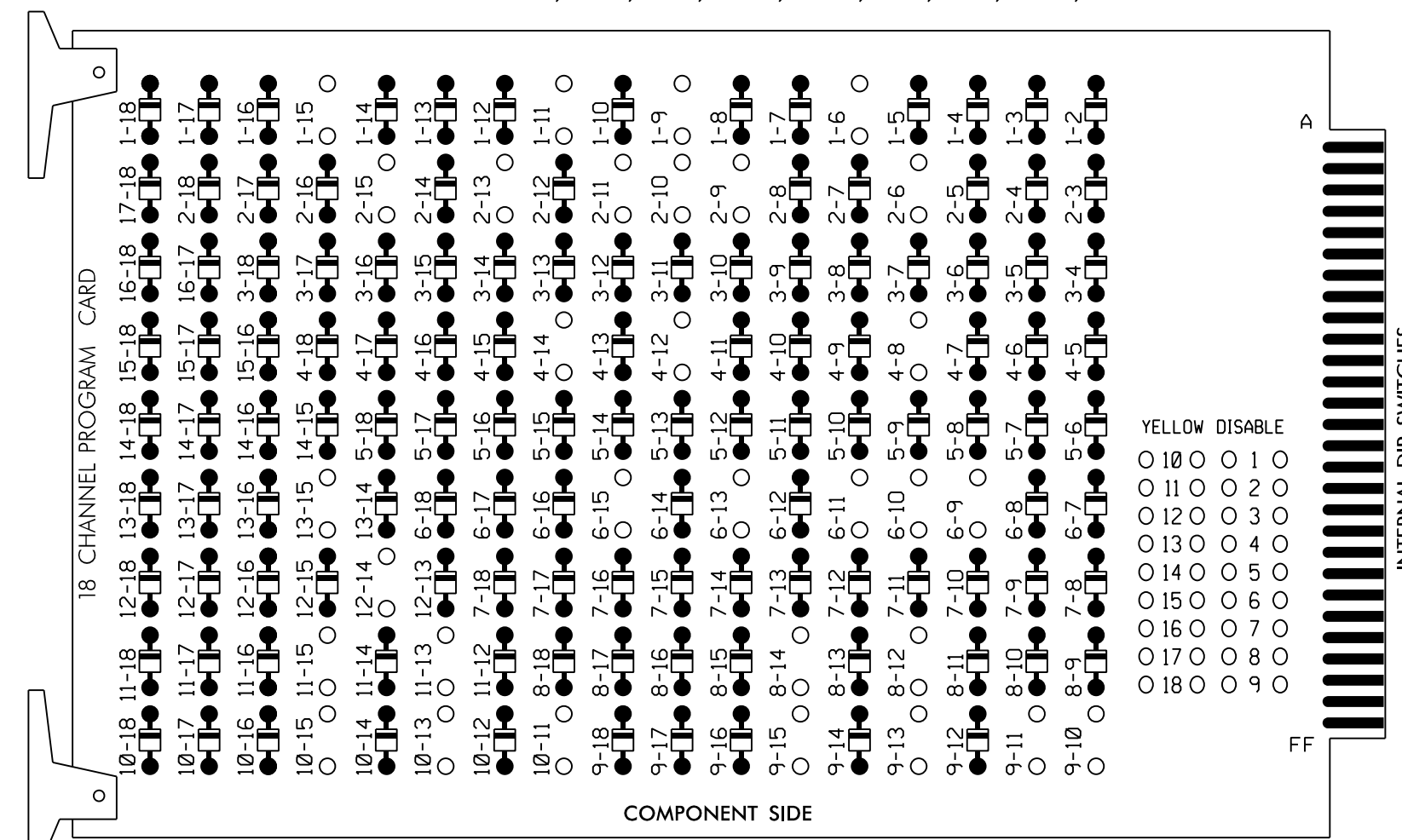
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Porter Jones  
08/22/2024  
SIC INVENTORY NO. 07-1689

### 18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

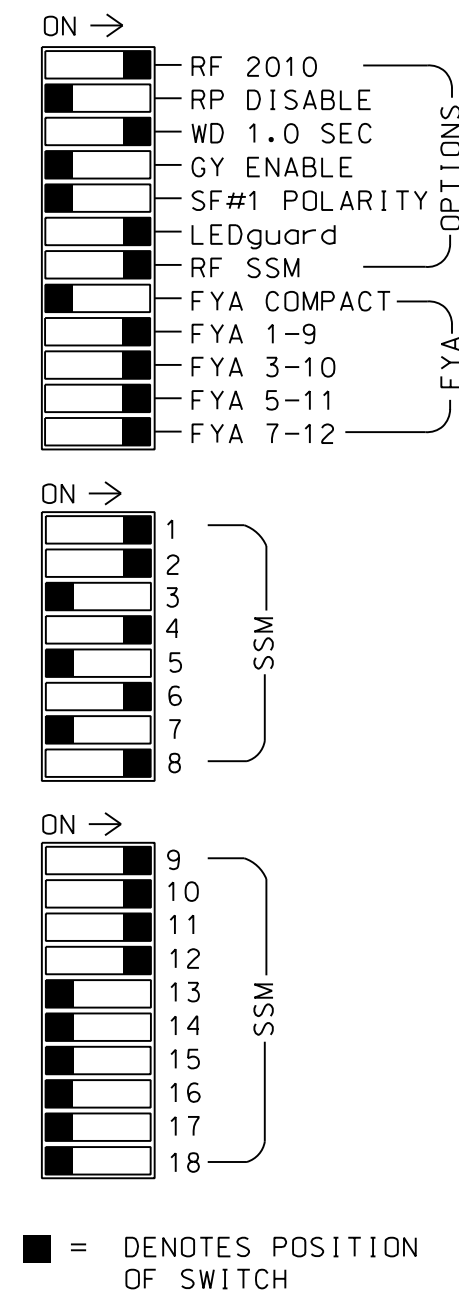
REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 1-15, 2-6, 2-9, 2-10, 2-11, 2-13, 2-15, 4-8, 4-12, 4-14, 6-9, 6-10, 6-11, 6-13, 6-15, 8-12, 8-14, 9-10, 9-11, 9-13, 9-15, 10-11, 10-13, 10-15, 11-13, 11-15, 12-14, And 13-15



REMOVE JUMPERS AS SHOWN

NOTES:

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



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "RSt".
- Ensure "InhFYARedSt" feature is set to "ON".
- Ensure "Flash Mode" is set to "CHANNEL" (MM 1-4-1).
- Program all channels in use to flash red (MM 1-8-1).
- Program Start Red Time for 6.0 Seconds.
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:  
FROM MAIN MENU->1->8->7 (I/O LOGIC) Result Src.Fcn TimeOp Time  
1208 = 01208 DLY 1
- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the Greensboro Signal System.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	22,23	P21, P22	NU	42,43	P41, P42	NU	61,62	P61, P62	NU	81,82	NC	11	24	NU	21	41
RED	*	128				101			134			107		A124				
YELLOW		129				102			135			108						
GREEN		130				103			136			109						
RED ARROW														A121		A114	A101	
YELLOW ARROW		126												A122	A125	A115	A102	
FLASHING YELLOW ARROW														A123	A126	A116	A103	
GREEN ARROW	127	127																
Hand icon							113		104			119						
Walking person icon							115		106			121						

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

### INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE  
ST = STOP TIME

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
CABINET.....332 W/ AUX  
SOFTWARE.....TRAFFICWARE APOGEE  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S8,S9,S11,  
AUX S1,AUX S2,AUX S4,AUX S5  
PHASES USED.....1,2,4,6,8,2PED,4PED,6PED,  
\*\*8PED  
OVERLAP "A".....\*  
OVERLAP "B".....\*  
OVERLAP "C".....\*  
OVERLAP "D".....\*

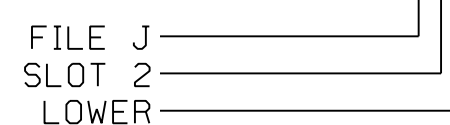
\* See overlap programming detail on sheet 2.  
\*\* 8 PED used for timing purposes only.

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
1A	TB2-1,2	I1U	56	1	1		5		X	X	
1B	TB4-5,6	I5U	58	7	1		15		X	X	
2A	TB2-5,6	I2U	39	2	2			1.6	X	X	
2B	TB2-7,8	I2L	43	3	2			1.6	X	X	
2C	TB2-9,10	I3U	63	4	2				X	X	
2D	TB2-11,12	I3L	76	5	2				X	X	
2E	TB4-1,2	I4U	47	6	2				X	X	
4A	TB4-9,10	I6U	41	8	4		2		X	X	
4B	TB4-11,12	I6L	45	9	4		10		X	X	
6A	TB3-5,6	J2U	40	16	6			1.6	X	X	
6B	TB3-7,8	J2L	44	17	6			1.6	X	X	
6C	TB3-9,10	J3U	64	18	6				X	X	
6D	TB3-11,12	J3L	77	19	6				X	X	
8A	TB5-9,10	J6U	42	22	8		2		X	X	
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED						
P41,P42	TB8-5,6	I12L	69	PED 4	4/8 PED						
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED						

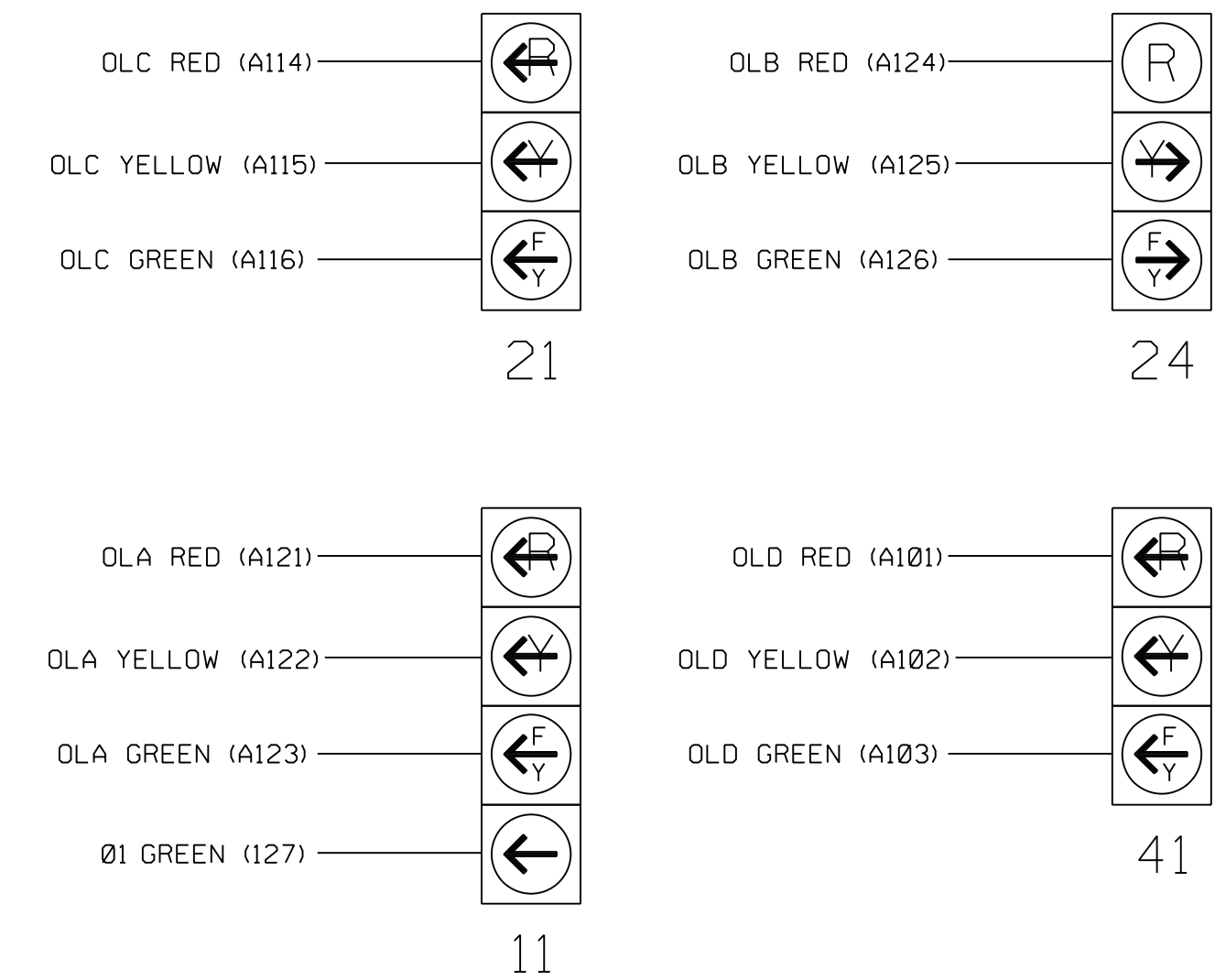
NOTE:  
INSTALL DC ISOLATORS  
IN INPUT FILE SLOTS  
112 AND 113.

INPUT FILE POSITION LEGEND: J2L



### FYA SIGNAL WIRING DETAIL

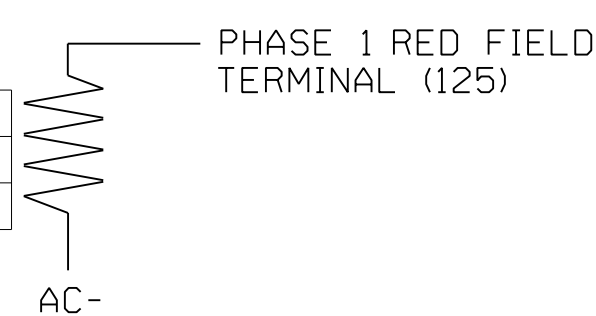
(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

### LOAD RESISTOR INSTALLATION DETAIL

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



Signal Upgrade - Final Design  
Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical and Programming Details For: SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.) / Simply Southern

Division 7 Guilford County Greensboro  
PLAN DATE: August 2024 REVIEWED BY: DT Sears  
PREPARED BY: WP Erickson-Jones REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE \_\_\_\_\_

Prepared for the Offices of:  
North Carolina Professional Seal 056142  
Porter Jones  
750 N. Greenfield Pkwy, Garner, NC 27529  
8/22/2024  
SIG. INVENTORY NO. 07-1689

## OVERLAP PROGRAMMING DETAIL FOR OVERLAPS A, B, C, And D\*

(program controller as shown below)

\*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details

FROM MAIN MENU PRESS "1" CONTROLLER  
AND THEN "5" OVERLAPS

Overlaps
1.General Parm 2.Program 3.Status

General Overlap Parameters
Lock Inhibit OFF Confl Lock Enable OFF Parent P Clnocs ON Extra Included Phases OFF

PRESS "ESC"

Overlaps
1.General Parm 2.Program 3.Status

Enter Overlap # 1 then press Enter
---------------------------------------

Overlap A-1
1.Program Parm 2.Confl Prog+ 3.Program Parm+

OvrIp A-1	Ps.....								
Included Ps	1	0	0	0	0	0	0	0	0
Modifier Ps	2	0	0	0	0	0	0	0	0
Type:FYA-4	Grn:	0	Yel:	3.5	Red:	1.5			

PRESS "ESC" TWICE

Enter Overlap # 2 then press Enter
---------------------------------------

Overlap B-2
1.Program Parm 2.Confl Prog+ 3.Program Parm+

OvrIp B-2	Ps.....								
Included Ps	2	0	0	0	0	0	0	0	0
Modifier Ps	0	0	0	0	0	0	0	0	0
Type:NORMAL	Grn:	0	Yel:	3.5	Red:	1.5			

PRESS "ESC" TWICE

Enter Overlap # 3 then press Enter
---------------------------------------

Overlap C-3
1.Program Parm 2.Confl Prog+ 3.Program Parm+

OvrIp C-3	Ps.....								
Included Ps	6	0	0	0	0	0	0	0	0
Modifier Ps	0	0	0	0	0	0	0	0	0
Type:NORMAL	Grn:	0	Yel:	3.5	Red:	1.5			

PRESS "ESC" TWICE

Enter Overlap # 4 then press Enter
---------------------------------------

Overlap D-4
1.Program Parm 2.Confl Prog+ 3.Program Parm+

OvrIp D-4	Ps.....								
Included Ps	8	0	0	0	0	0	0	0	0
Modifier Ps	0	0	0	0	0	0	0	0	0
Type:NORMAL	Grn:	0	Yel:	3.5	Red:	1.5			

END OF OVERLAP PROGRAMMING DETAIL

### NOTE

IF PRESENT, REMOVE PROGRAMMING FOR OVERLAP E.

### 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.

### FLASHER CIRCUIT MODIFICATION DETAIL

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



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

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Final Design  
Electrical Detail - Sheet 2 of 4

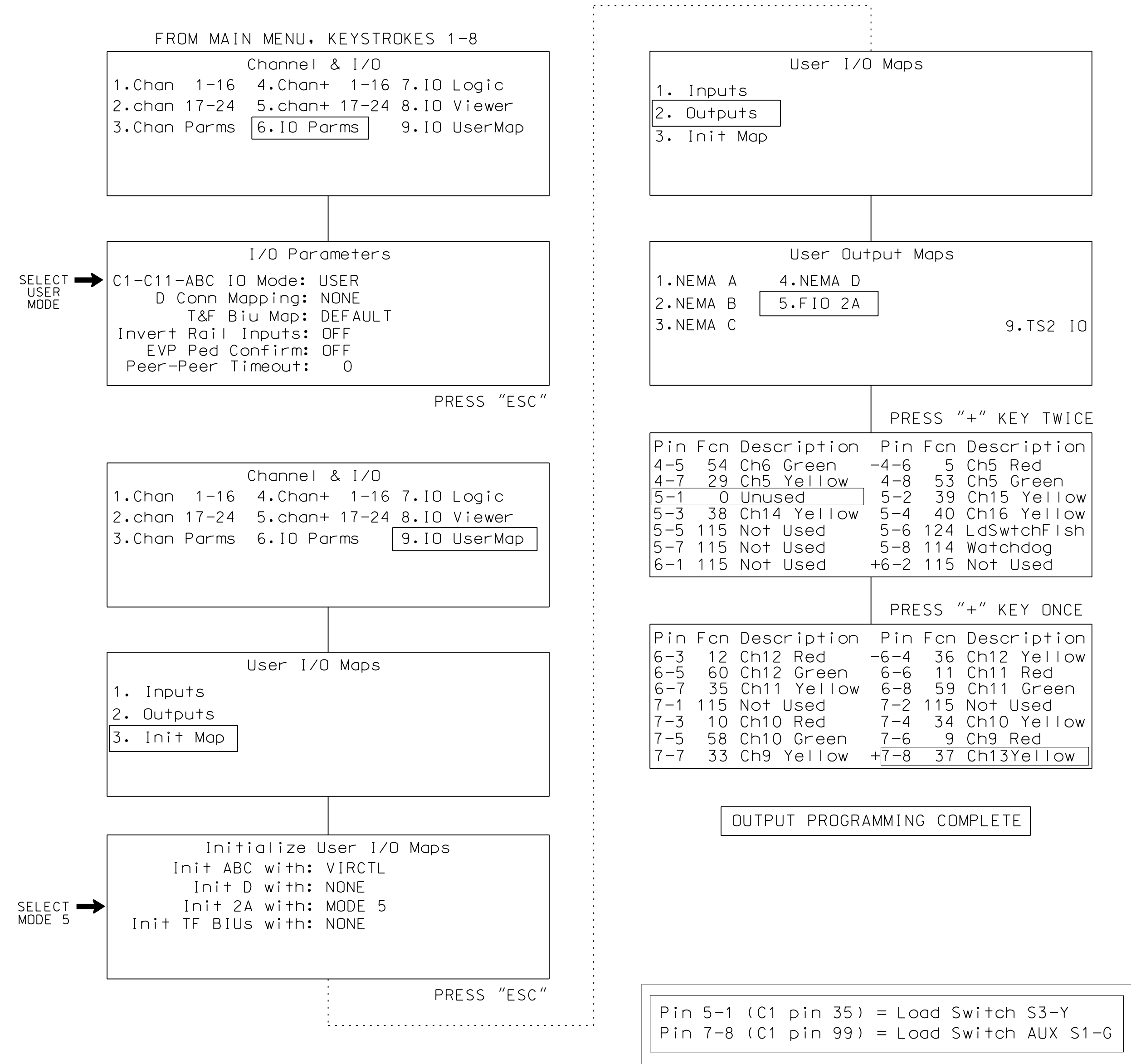
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern</p> <p style="font-size: x-small;">Division 7      Guilford County      Greensboro</p> <p style="font-size: x-small;">PLAN DATE: August 2024      REVIEWED BY: DT Sears</p> <p style="font-size: x-small;">PREPARED BY: WP Erickson-Jones      REVIEWED BY: _____</p> <table border="1" style="width: 100%; font-size: x-small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE					<p style="text-align: center;">Prepared for the Offices of:</p> <div style="text-align: center;">   <b>PORTER JONES</b>  <small>Engineers   Construction Managers   Planners   Scientists</small>  <small>8801 Six Forks Road Suite 700   Raleigh, North Carolina 27615-2965</small>  <small>NC License No. F-0112</small>  <small>www.pj.com</small>  <small>Responsive People   Creative Solutions</small> </div> <p style="font-size: x-small; text-align: center;">750 N. Greenfield Pkwy, Garner, NC 27529</p>
REVISIONS	INIT.	DATE						
<p style="font-size: small;">8/22/2024 WPE:traff/cas:gnal/sgnms:gnal/smu015a.../sic.07-1689a.dgn wpj:ones</p>		<p style="font-size: small;">DocuSigned by: <b>Porter Jones</b> 8/22/2024 DATE SIG. INVENTORY NO. 07-1689</p>						

## 4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



! Press the "\*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

### NOTE

I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

## CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.

FROM MAIN MENU, KEYSTROKES 1-8

Channel & I/O		
1.Chan 1-16	4.Chan+ 1-16	7.IO Logic
2.chan 17-24	5.chan+ 17-24	8.IO Viewer
3.Chan Parm	6.IO Parm	9.IO UserMap

PRESS THE RIGHT ARROW KEY  
UNTIL THE SCREEN AT RIGHT APPEARS

Chan.1...2...3...4...5...6...7...8 >	Chan.9..10..11..12..13..14..15..16
Flash Red . . . . .	Flash Red . . . . .
Flash Yel . . . . .	Flash Yel . . . X . . .
Flash Grn . . . . .	Flash Grn . X X X . . .
Inhibit Red Flash In	Inhibit Red Flash In
Preempt . . . . .	Preempt . . . . .
Olap Ovrdr 0 0 0 0 0 0 0	Olap Ovrdr 0 0 0 0 1 0 0

Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

### NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

Programming Notes:

Default	Change To:
Pin\Fcn Description	Fcn Description
5-1 37 Ch13 Yellow...	0 Unused

Programming Notes:

Default	Change To:
Pin\Fcn Description	Fcn Description
7-8 57 Ch9 Green...	37 Ch13 Yellow

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1689  
 DESIGNED: August 2024  
 SEALED: August 22, 2024  
 REVISED:

Signal Upgrade - Final Design  
Electrical Detail - Sheet 3 of 4

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ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern</b>  Division 7 Guilford County Greensboro PLAN DATE: August 2024 REVIEWED BY: DT Sears PREPARED BY: WP Erickson-Jones REVIEWED BY:	SEAL  PORTER JONES ENGINEER						
<b>RK&amp;K</b> PE: (919) 878-8560 8801 Six Forks Road Suite 700   Raleigh, North Carolina 27615-2965 NC License No. F-0112 Engineers   Construction Managers   Planners   Scientists www.rk.com Responsive People   Creative Solutions	REVISIONS <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	INIT.	DATE					DocuSigned by:  PORTER JONES SIGNATURE DATE: 8/22/2024 SIG. INVENTORY NO. 07-1689
INIT.	DATE							



### GREEN DELAY PROGRAMMING DETAIL FOR LEADING PEDESTRIAN INTERVAL OPERATION

(program controller as shown below)

FROM MAIN MENU, KEYSTROKES 1-1

Channel & I/O		
1. Times	4. Ring, Start, Concur	7. Times+
2. Options	5. Call, Inh, Redirect	8. Copy
3. Options+	6. Alt Progs+	9. AdvWarn

PRESS "+" KEY ONCE

Options+	P..	1..	2..	3..	4..	5..	6..	7..	8 >
Ped Delay -	.	.	.	.	.	.	.	.	.
Red Rest On Gap	.	.	.	.	.	.	.	.	.
Conflicting P	0	0	0	0	0	0	0	0	0
Grn/Ped Delay	0	7	0	7	0	7	0	7	0
Omit Yel. Yel P	0	0	0	0	0	0	0	0	0
Ped Out/OvrIp P	0	0	0	0	0	0	0	0	0
StartYel, Next P	+	0	0	0	0	0	0	0	0

CHANNEL & I/O PROGRAMMING COMPLETE

### I/O LOGIC PROGRAMMING DETAIL FOR PHASE 8 PED CALL

(program controller as shown below)

FROM MAIN MENU, KEYSTROKES 1-8

Channel & I/O		
1. Chan 1-16	4. Chan+ 1-16	7. I/O Logic
2. chan 17-24	5. chan+ 17-24	8. I/O Viewer
3. Chan Parm	6. I/O Parm	9. I/O UserMap

LOGIC TO CALL 8 PED  
WHEN 4 PED IS CALLED \*

Result	Fcn	Oper	Fcn	Oper	Fcn	Timer
I208=	I208	I	0	I	0	DLY 1
I136=	I132	I	0	I	0	DLY 0
I 0=	I 0	I	0	I	0	DLY 0
I 0=	I 0	I	0	I	0	DLY 0
I 0=	I 0	I	0	I	0	DLY 0
I 0=	I 0	I	0	I	0	DLY 0

\* Denotes input function 208 (flash sense) logic delay is assigned per standard shown in "NOTES" section of sheet 1

#### I/O REFERENCE SCHEDULE

INPUT FUNCTION 132 = Ped Call 4  
INPUT FUNCTION 136 = Ped Call 8  
INPUT FUNCTION 208 = Flash Sense

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-1689  
DESIGNED: August 2024  
SEALED: August 22, 2024  
REVISED:

Signal Upgrade - Final Design  
Electrical Detail - Sheet 4 of 4

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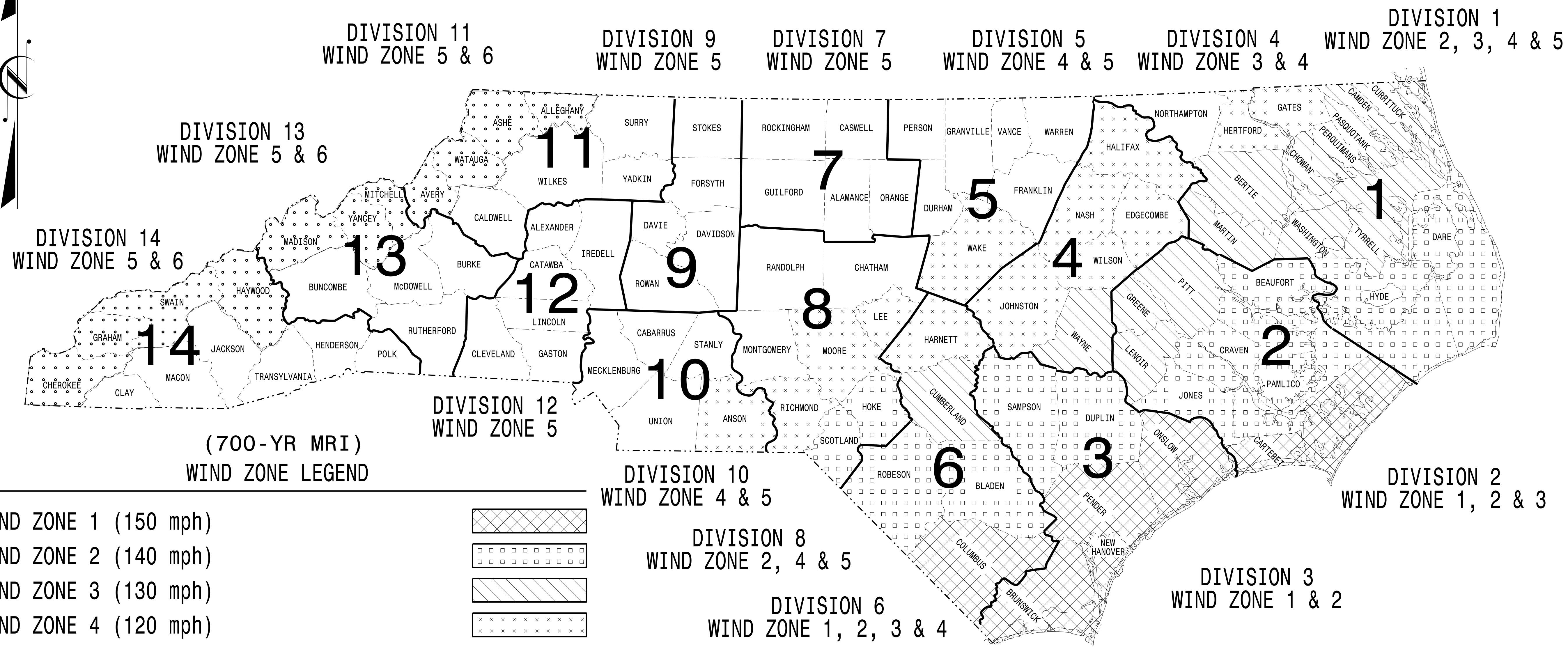
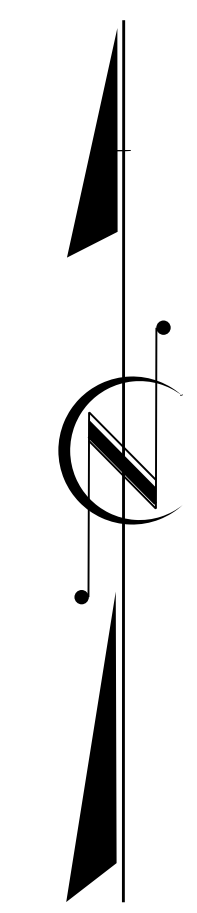
<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="font-size: x-small;">SR 1556 (Gallimore Dairy Rd.) at SR 1554 (Chimney Rock Rd.)/ Simply Southern</p> <p style="font-size: x-small;">Division 7 Guilford County Greensboro</p> <p style="font-size: x-small;">PLAN DATE: August 2024 REVIEWED BY: DT Sears</p> <p style="font-size: x-small;">PREPARED BY: WP Erickson-Jones REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <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> </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="text-align: center; font-size: x-small;">SEAL</p> <p style="font-size: x-small;">Porter Jones 8/22/2024</p> <p style="font-size: x-small;">SIGNATURE DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 07-1689</p>
REVISIONS	INIT.	DATE												

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# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

**NC DOT METAL POLE STANDARDS**

03-001-2023 1P-07  
S:\IT\AS\114\115\Sig\Drawings\Drawings\2024\Metal Pole Standard 411 Metal Pole (700-yr MRI).cdm  
Kdurigon

Prepared In the Offices of:

750 N. Greenfield Pkwy.  
Garner, NC 27529

Designed in conformance  
with the latest  
2020 Interim to the  
1st Edition 2015

**AASHTO  
LRFD**

Standard Specifications for  
Highway Signs, Luminaires,  
and Traffic Signals

DRAWING NUMBER	INDEX OF PLANS DESCRIPTION
Sig. M 1A	Statewide Wind Zone Map (700-yr MRI)
Sig. M 1B	Statewide Wind Zone Map (10-yr MRI)
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
Sig. M 9	Typical Fabrication Details-CCTV Camera Poles

MOBILITY AND SAFETY DIVISION -  
TRANSPORTATION SYSTEMS MANAGEMENT  
AND OPERATIONS UNIT

---

D.Y. ISHAK - STATE SIGNALS ENGINEER  
K. DURIGON, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER  
B. WALKER, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER

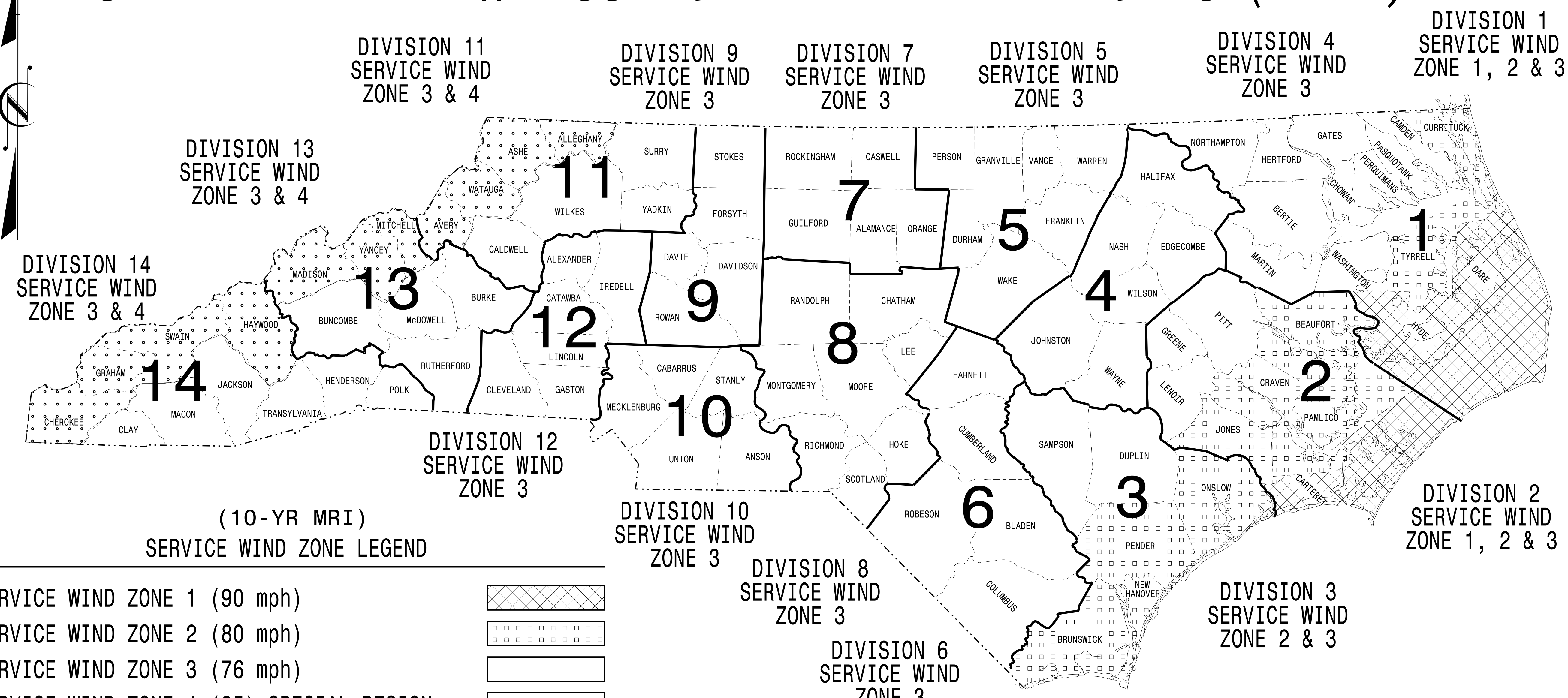
SEAL

DocuSigned by:  
**Kevin Durigon**  
SIGNATURE  
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09/21/2023  
DATE

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

## STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



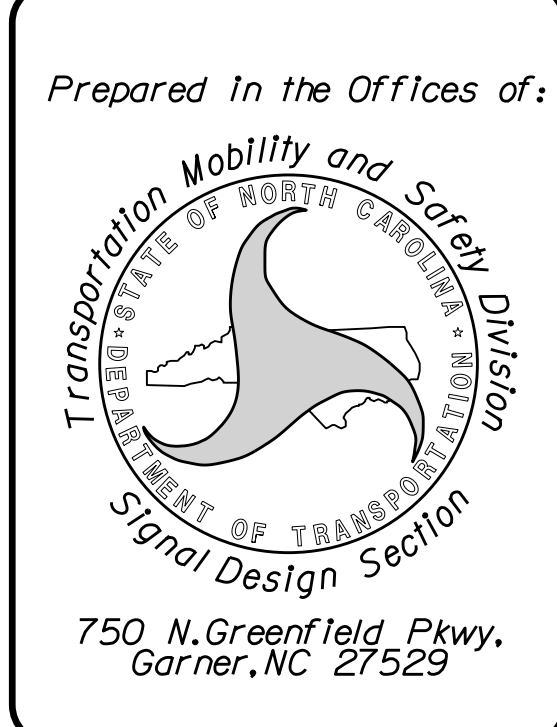
(10-YR MRI)  
SERVICE WIND ZONE LEGEND

SERVICE WIND ZONE 1 (90 mph)	
SERVICE WIND ZONE 2 (80 mph)	
SERVICE WIND ZONE 3 (76 mph)	
SERVICE WIND ZONE 4 (85) SPECIAL REGION	

<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

**NC DOT METAL POLE STANDARDS**

03-OCT-2023 10:51 S:\M1\AS1\ITS-Signal\Structures\Drawings\2024-Metal Pole (10-yr-MRI).vdgn



Designed in conformance with the latest 2020 Interim to the 1st Edition 2015  
**AASHTO LRFD**  
Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

DRAWING NUMBER	INDEX OF PLANS DESCRIPTION
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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
Sig. M 9	Typical Fabrication Details-CCTV Camera Poles

**NCDOT CONTACTS:**  
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TRANSPORTATION SYSTEMS MANAGEMENT  
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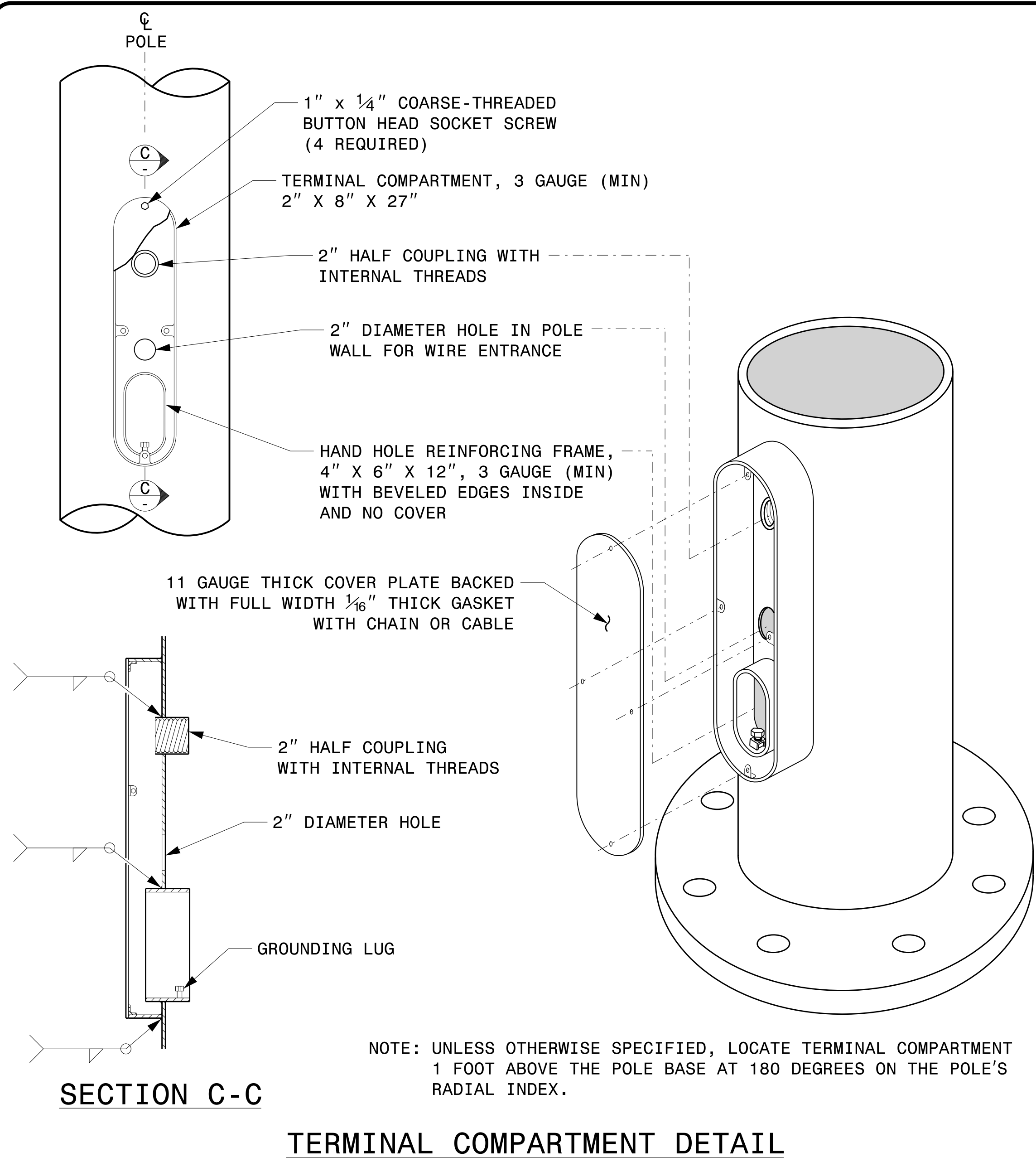
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**D.Y. ISHAK - STATE SIGNALS ENGINEER**  
**K. DURIGON, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER**  
**B. WALKER, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER**

SEAL

DocuSigned by:  
**Kevin Durigon**  
SIGNATURE  
4B23DC78B3784DA...

09/21/2023  
DATE



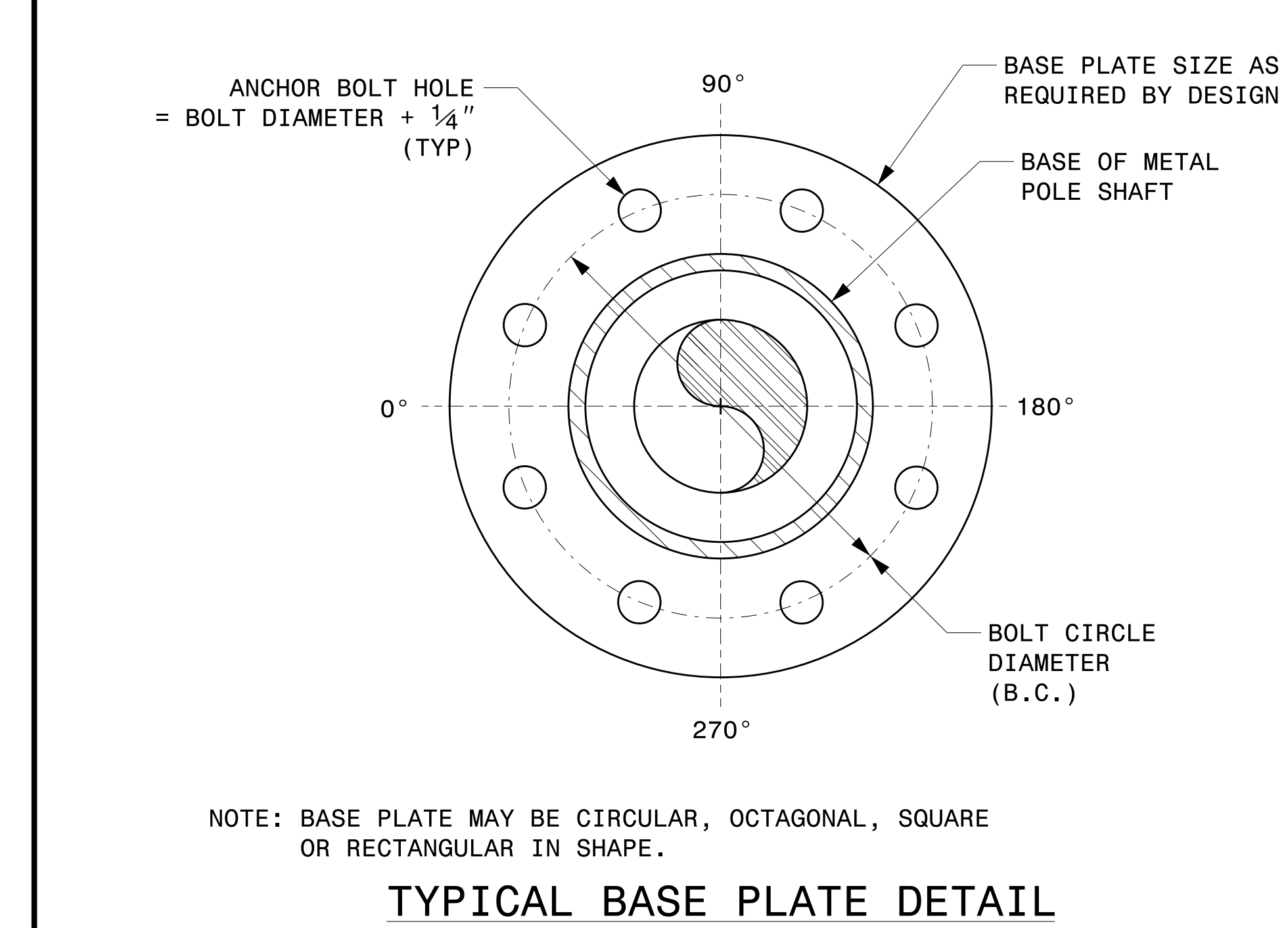
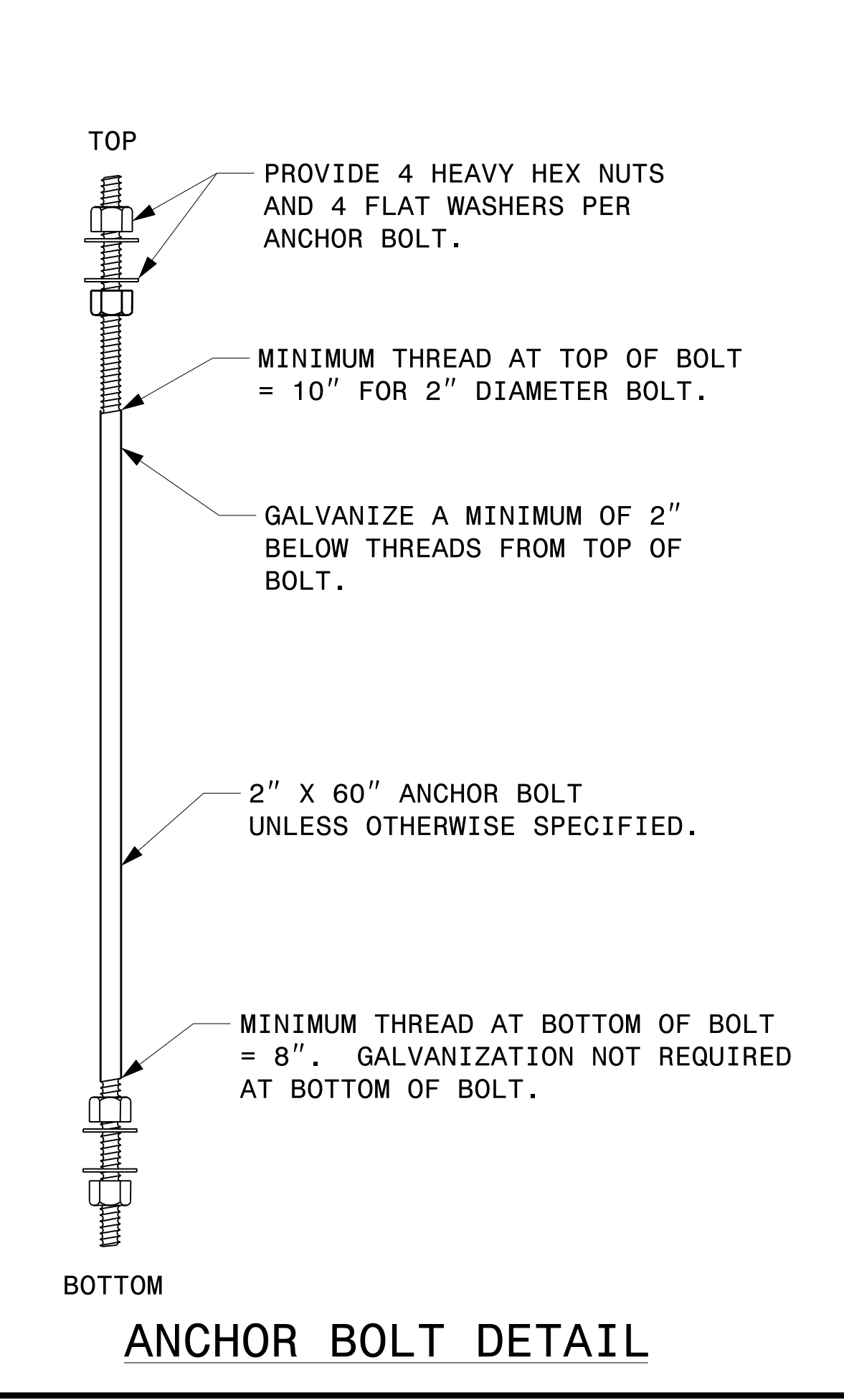
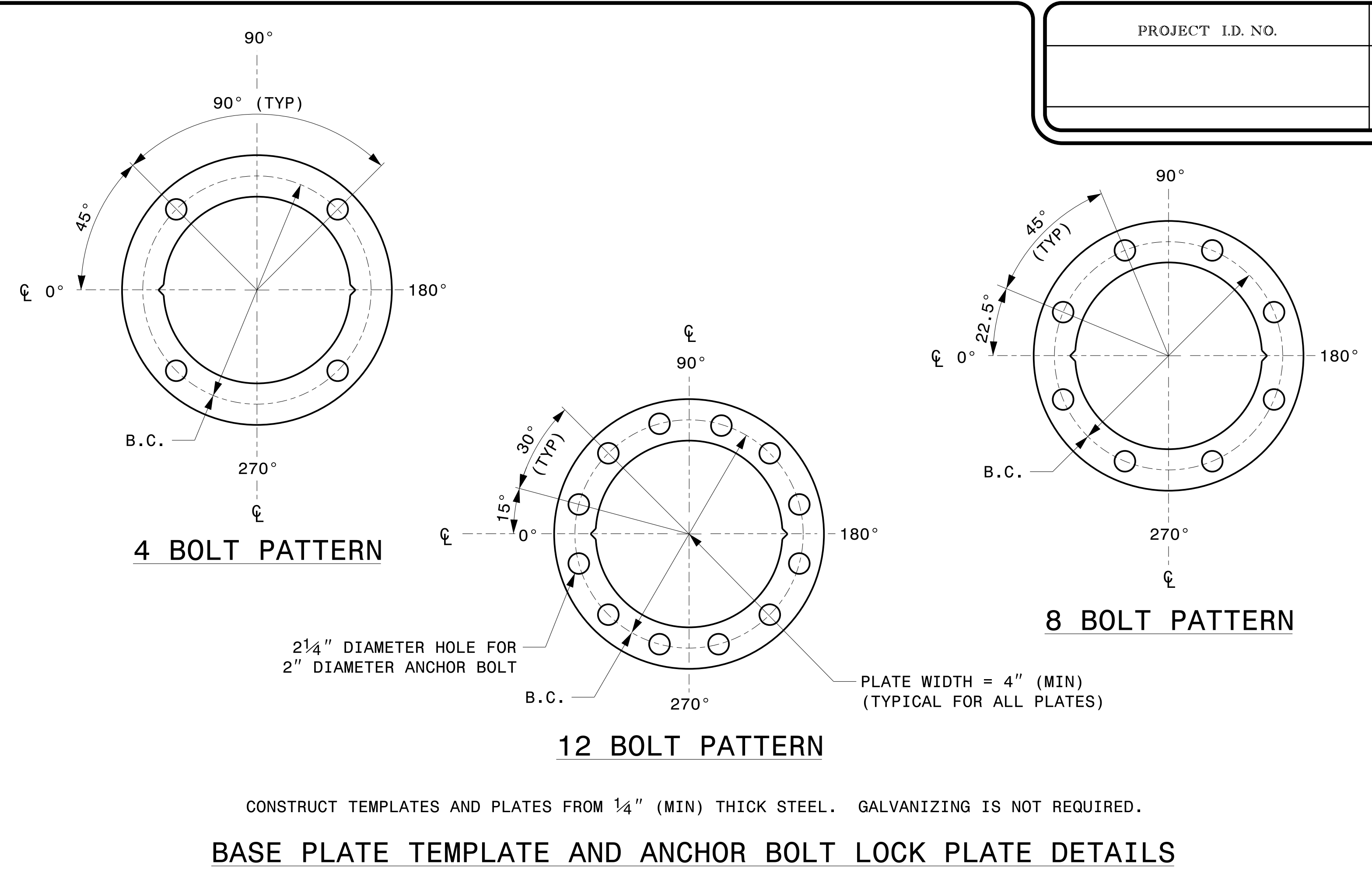
**IDENTIFICATION TAG DETAILS**

MFG _____ MFG. DATE: MM/YY	MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y _____	SECTION D/T/L/Y _____
ARM-A D/T/L/Y _____	NCDOT SIG. INV. NO. _____
ARM-B D/T/L/Y _____	NCDOT POLE NO. _____
A.B. DIA./B.C./L/Y _____	ARM I.D. TAG (PROVIDE ON EACH SECTION OF A MULTI-SECTION MAST ARM)
NCDOT SIG. INV. NO. _____	
NCDOT POLE NO. _____	

SHAFT I.D. TAG  
(PROVIDE ON SHAFT OF STRAIN POLES  
AND MAST ARM POLE SHAFT)

**NOTES:**

- D = DIAMETER, T = THICKNESS, L = LENGTH, Y = YIELD STRENGTH
- A.B. = ANCHOR BOLT
- B.C. = BOLT CIRCLE OF ANCHOR BOLTS
- IF STANDARD DESIGN, INCLUDE CASE NUMBER IN ADDITION TO POLE NUMBER ON "NCDOT POLE NO." LINE.
- SIGNAL INV. NUMBER AND POLE I.D. NUMBER. SEE DRAWING M3 AND M4 FOR MOUNTING POSITIONS OF I.D. TAGS.



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**Typical Fabrication Details For All Metal Poles**

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F. ANDREWS  
 PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA NONE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 036626 ENGINEER KEVIN C. DURIGON

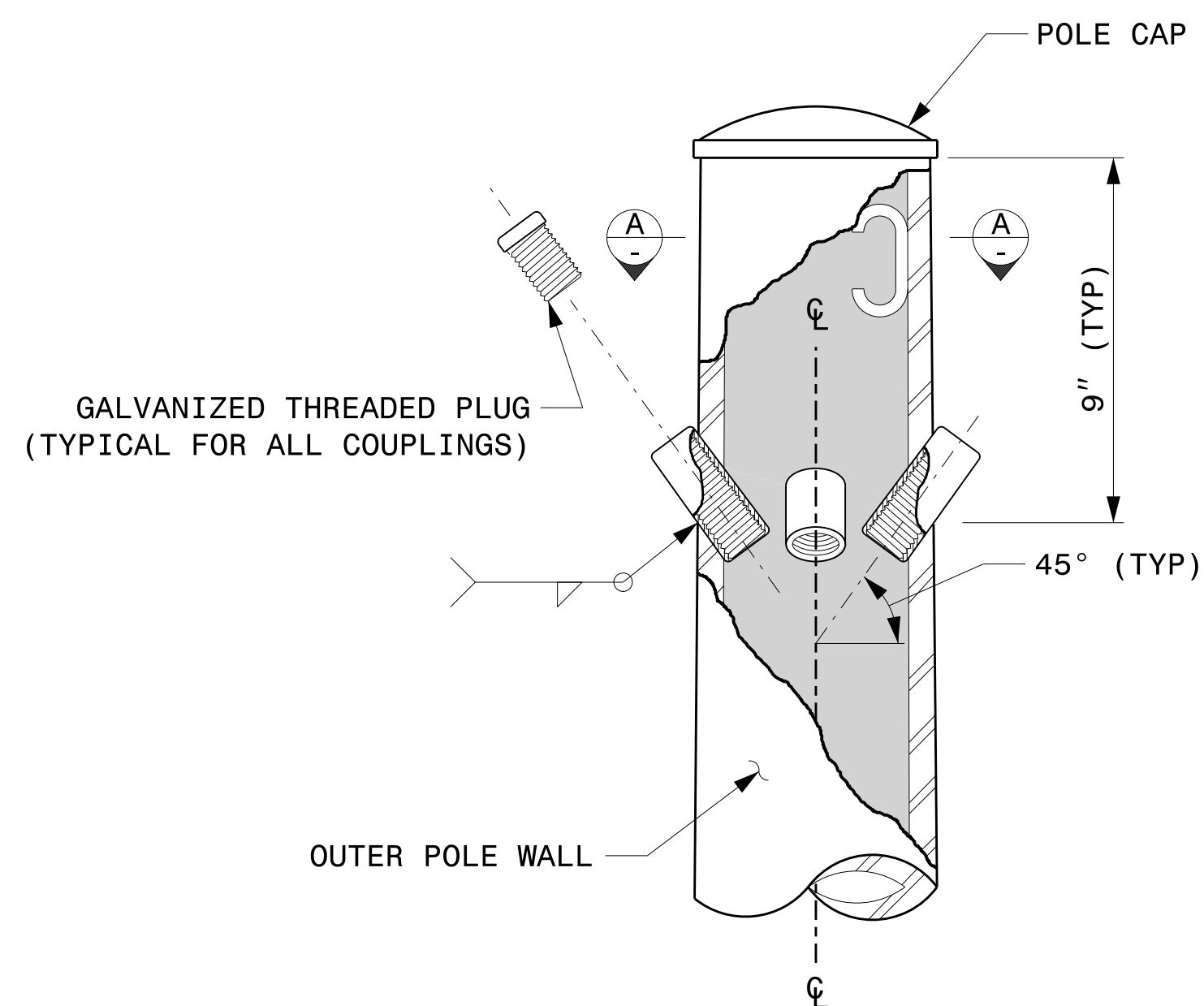
DocuSigned by: Kevin Durigon 09/21/2023 DATE 4P23DC79B3784DA

Fabrication Details – All Metal Poles

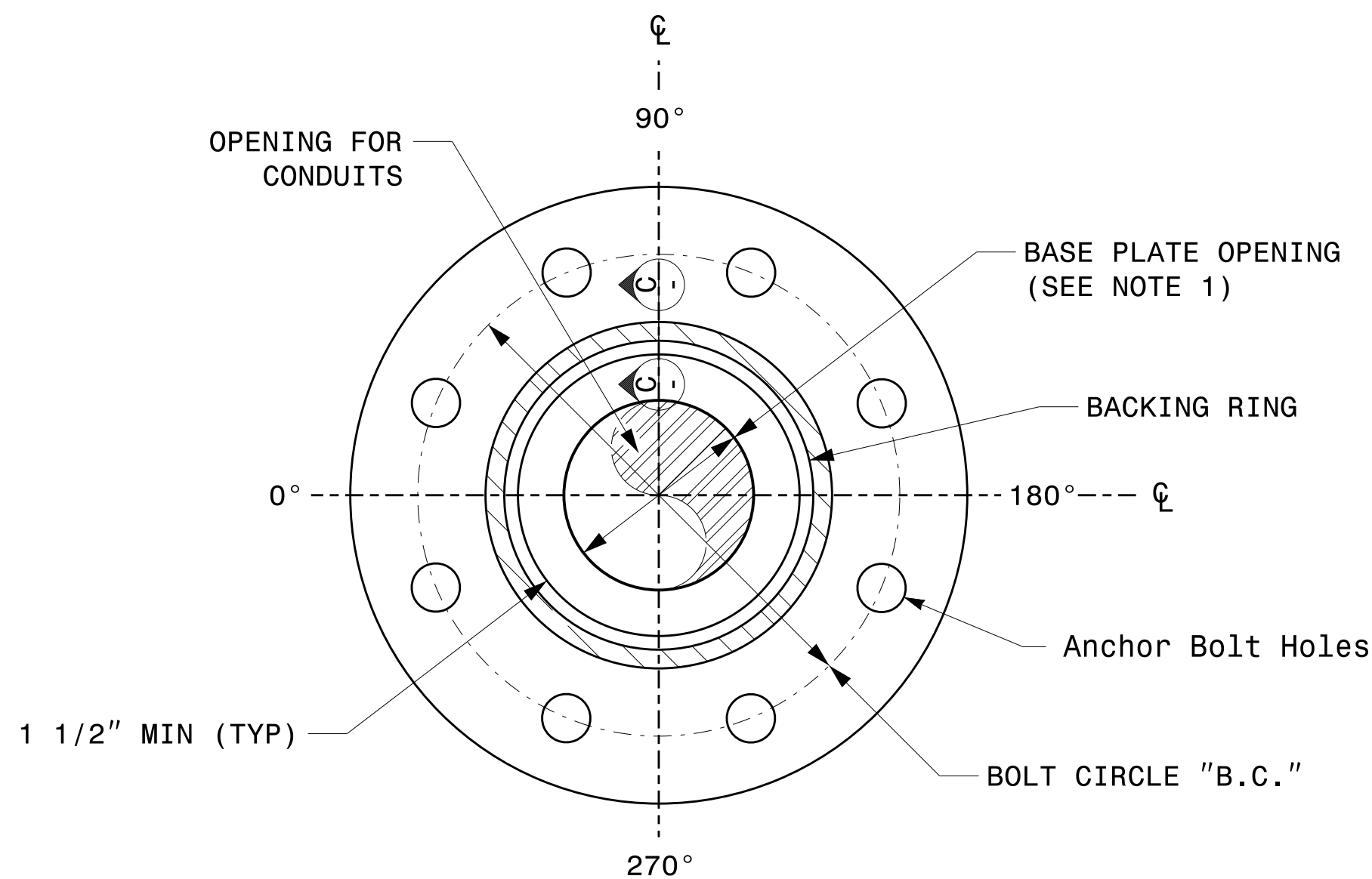
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NOTE:

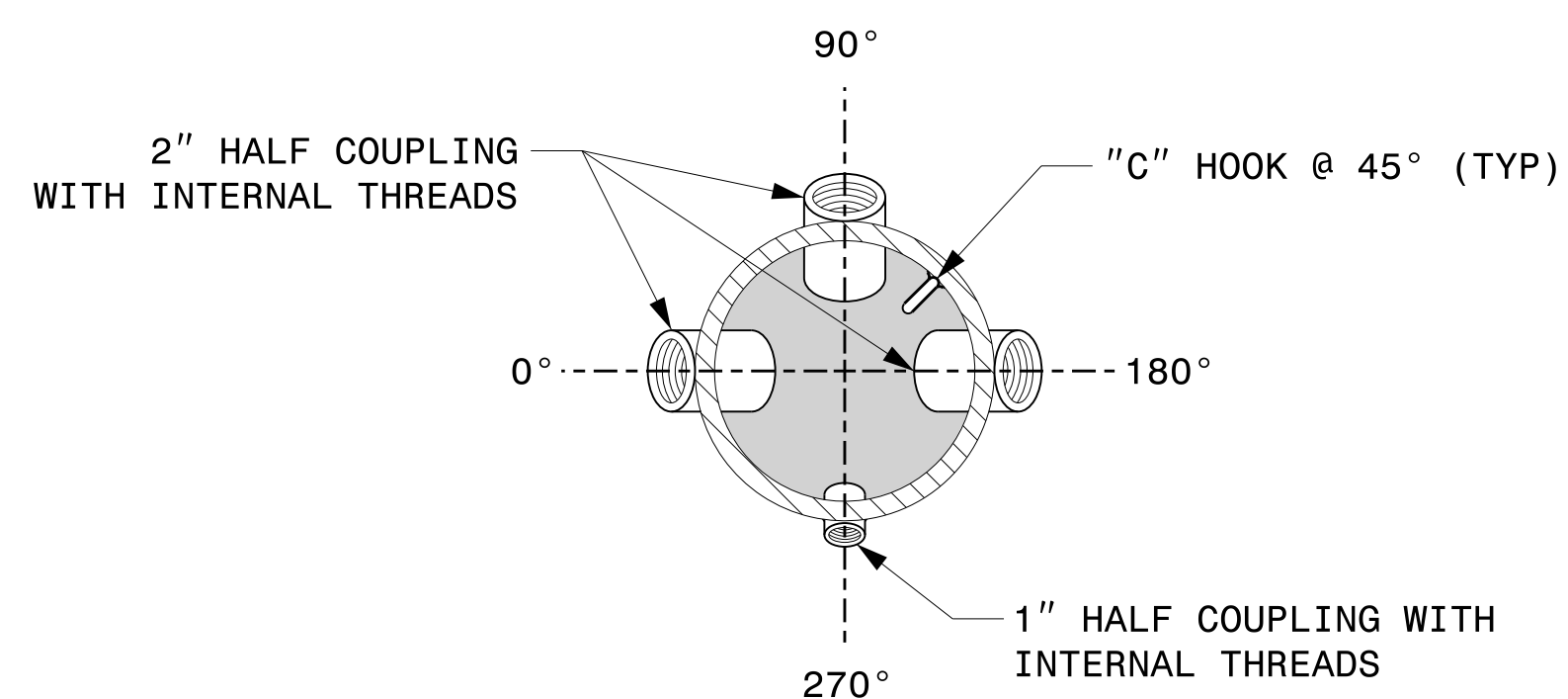
- 1. OPENING IN POLE BASE PLATE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS  $3\frac{1}{2}$ " BUT SHALL NOT BE LESS THAN  $8\frac{1}{2}$ ".



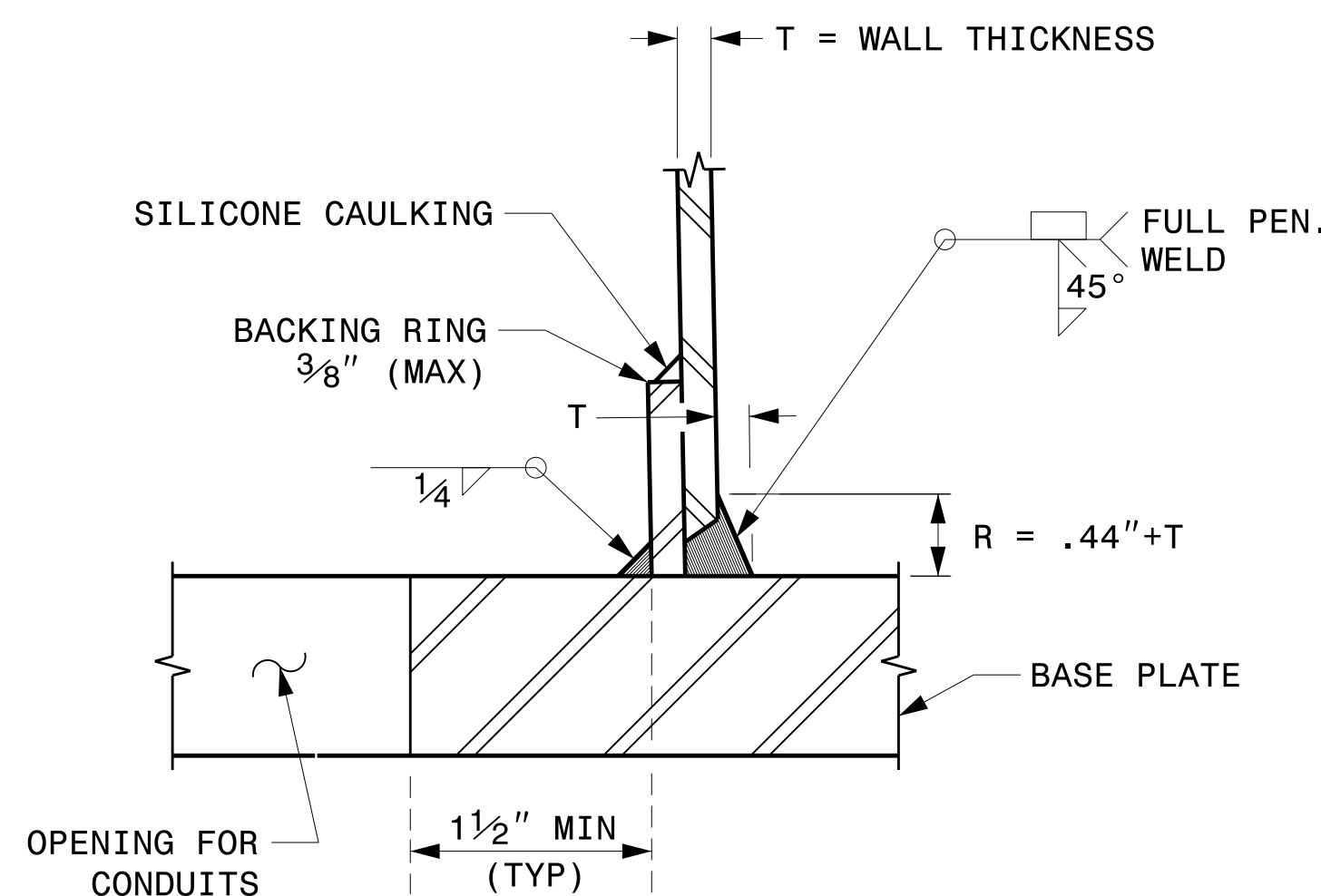
CABLE ENTRANCES AT TOP OF POLE



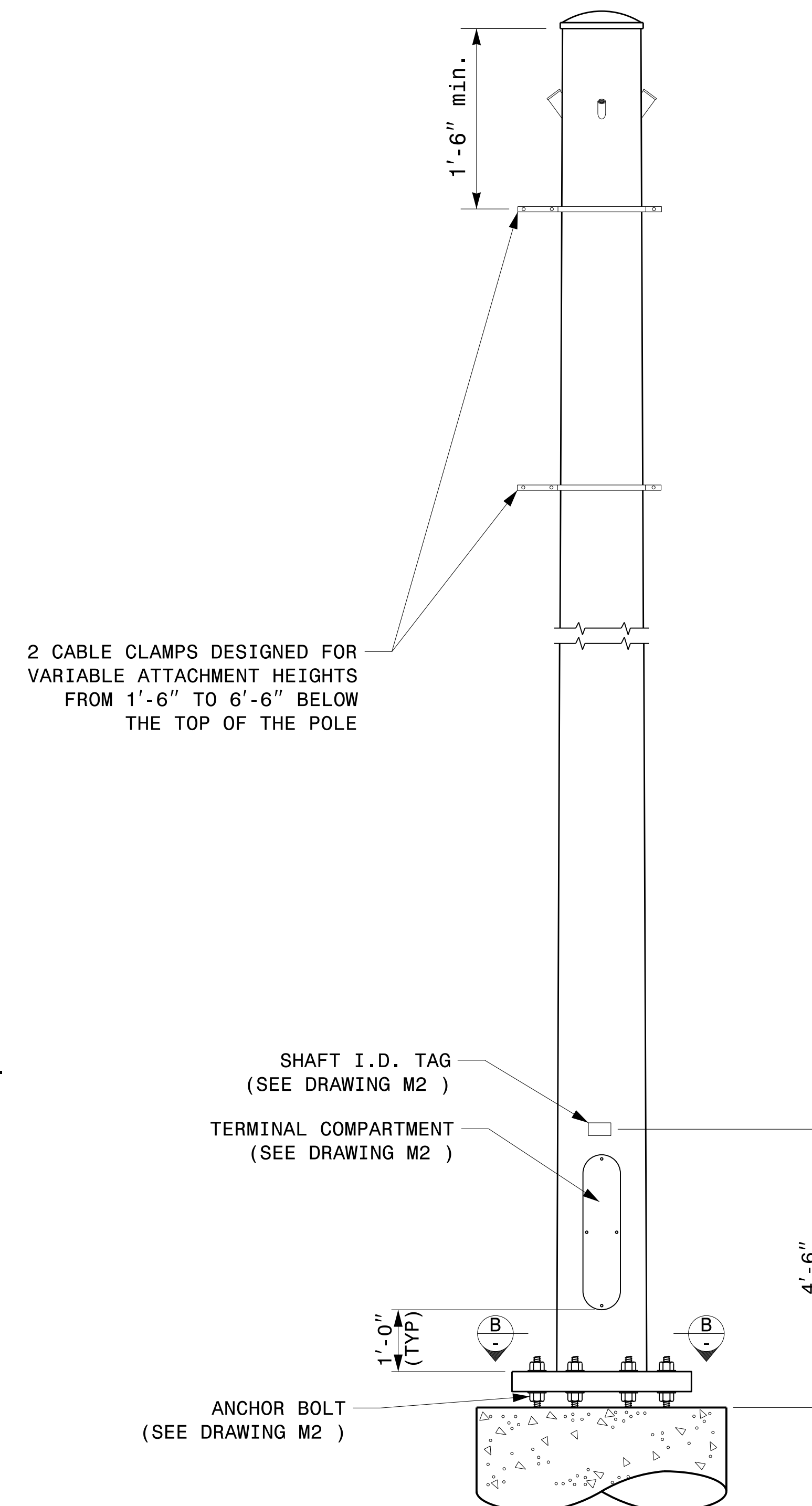
SECTION B-B  
POLE BASE PLATE DETAILS  
(8 AND 12 BOLT PATTERN)



SECTION A-A  
RADIAL ORIENTATION OF FACTORY INSTALLED  
ACCESSORIES AT TOP OF POLE



SECTION C-C  
(POLE ATTACHMENT TO BASE PLATE)  
FULL-PENETRATION  
GROOVE WELD DETAIL



MONOTUBE STRAIN POLE

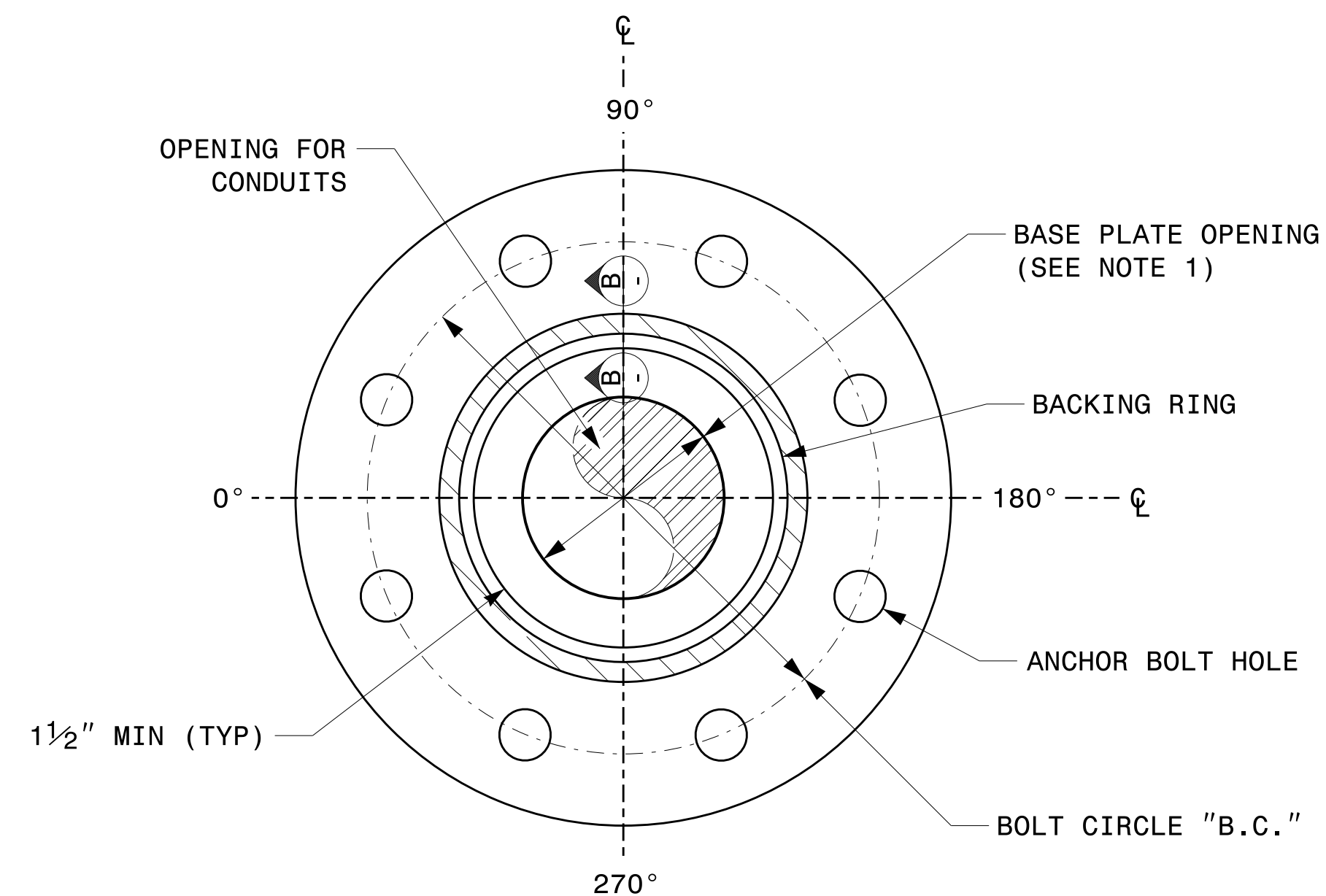
	<p>Typical Fabrication Details For Strain Poles</p>							
	<p>PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON</p> <p>PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>		INIT.	DATE			
INIT.	DATE							
<p>SCALE: 0 NA NONE</p>	<p>DATE: 09/23/2023</p>	<p>4B23DC79B3728ADA</p>	<p>DATE</p>					

08-dt-2023-10-31  
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Kedar Durigon

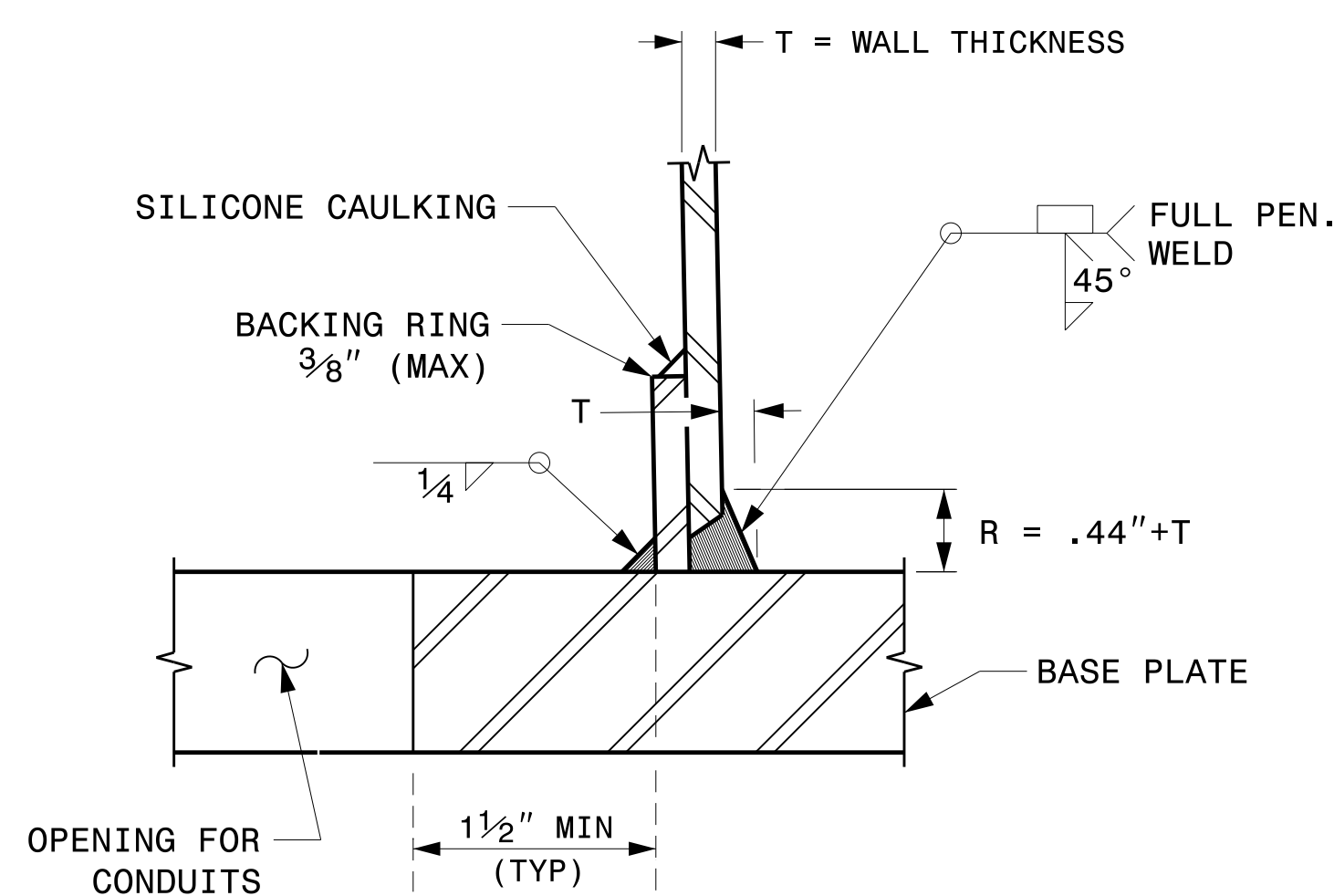
Fabrication Details – Strain Poles

NOTE:

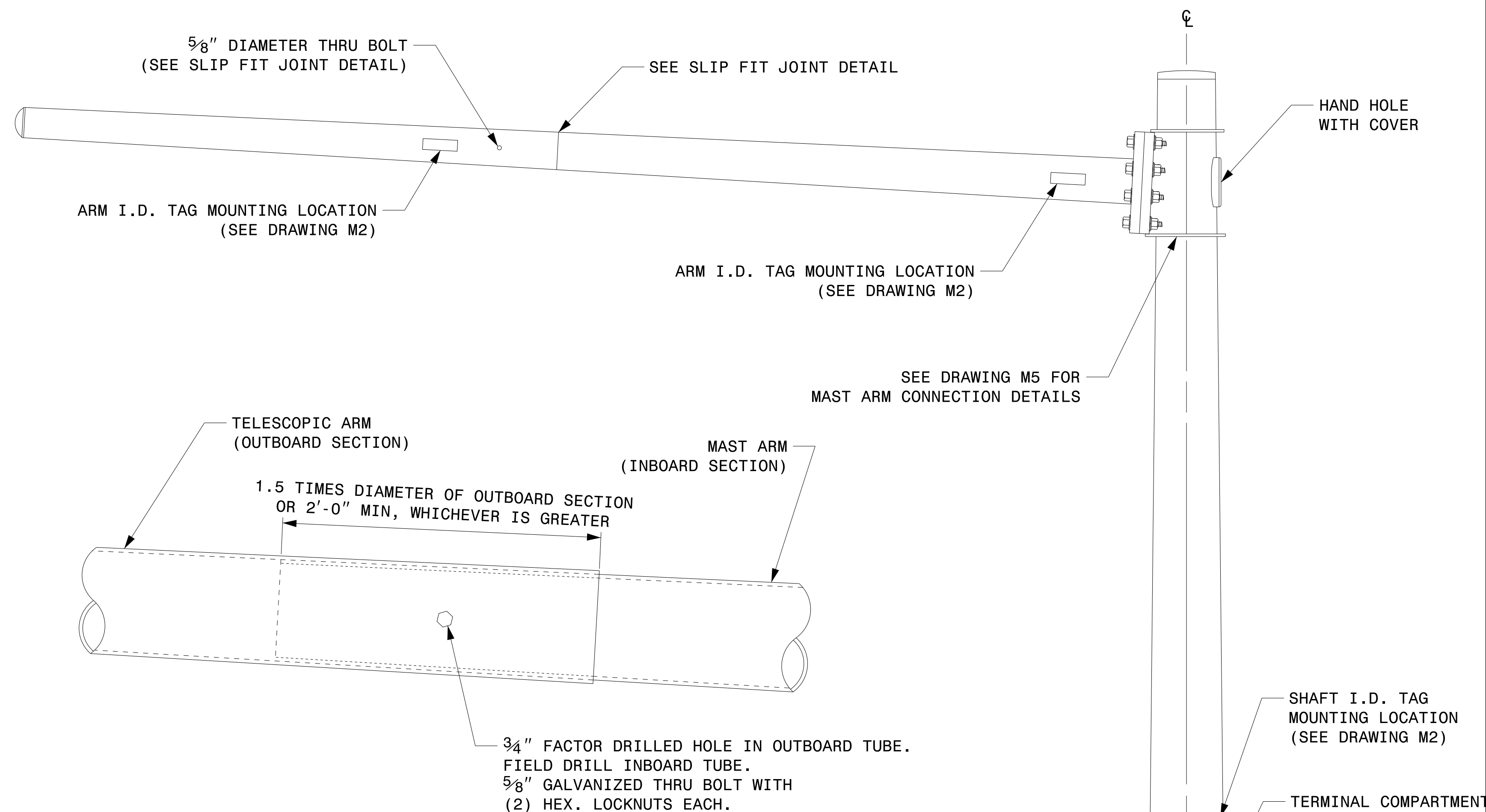
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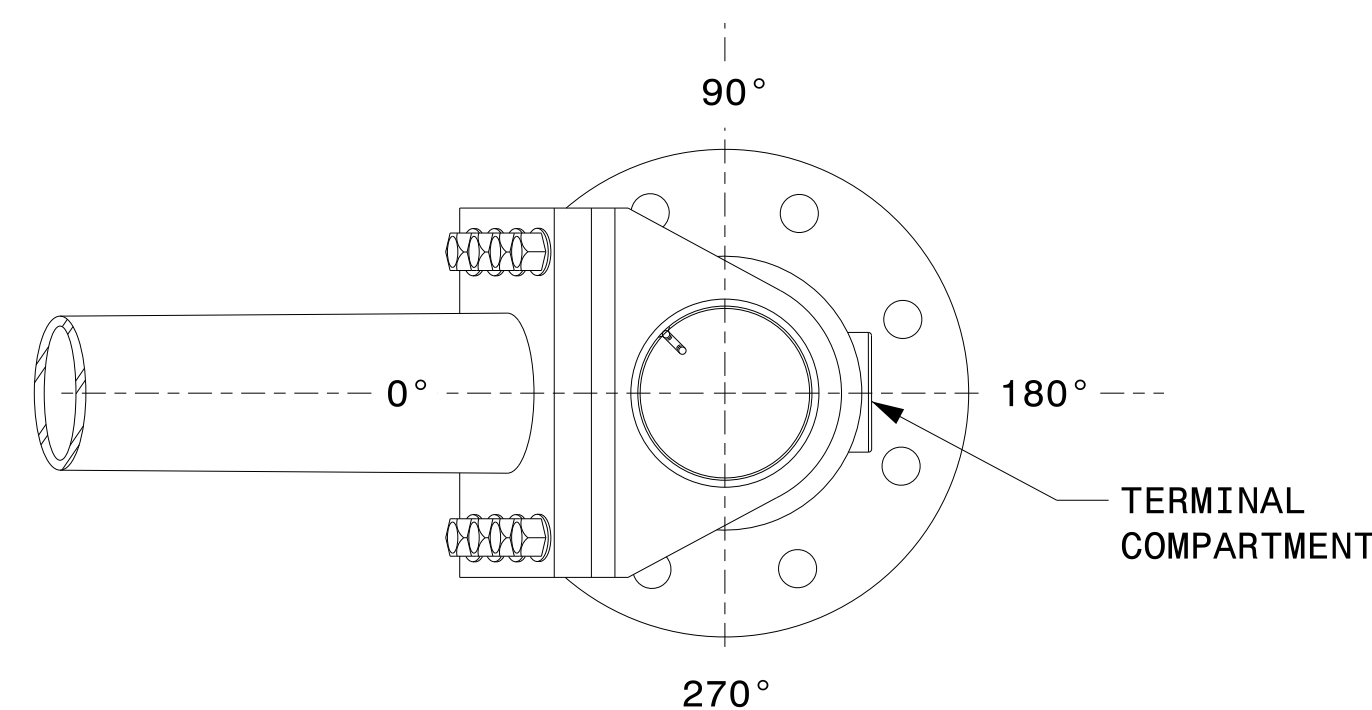
SECTION A-A  
POLE BASE PLATE DETAILS



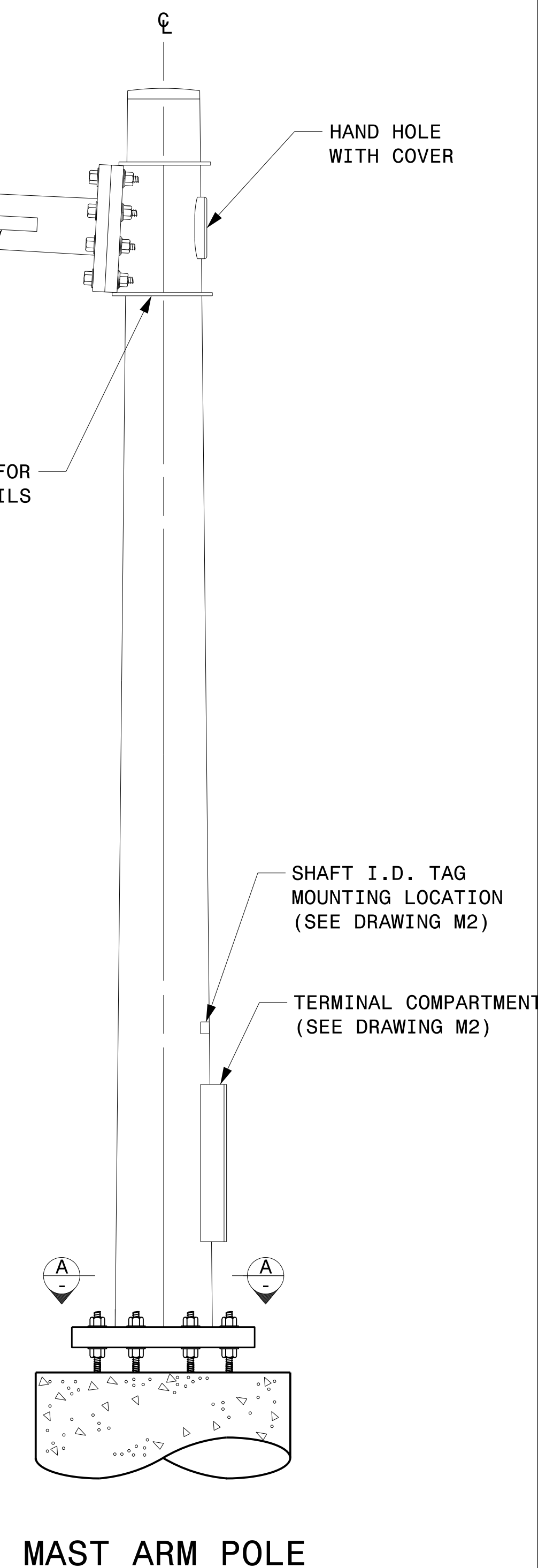
SECTION B-B  
(POLE ATTACHMENT TO BASE PLATE)  
FULL-PENETRATION  
GROOVE WELD DETAIL



SLIP FIT JOINT DETAIL FOR MAST ARM



MAST ARM RADIAL ORIENTATION



MAST ARM POLE

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: NA  
NONE

Typical Fabrication Details For Mast Arm Poles			
PLAN DATE:	SEPTEMBER 2023	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	K.C. DURIGON	REVIEWED BY:	D.C. SARKAR
REVISIONS	INIT.	DATE	

SEAL

DocuSigned by:  
**Kevin Durigon**  
09/21/2023

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Kedar Durigon

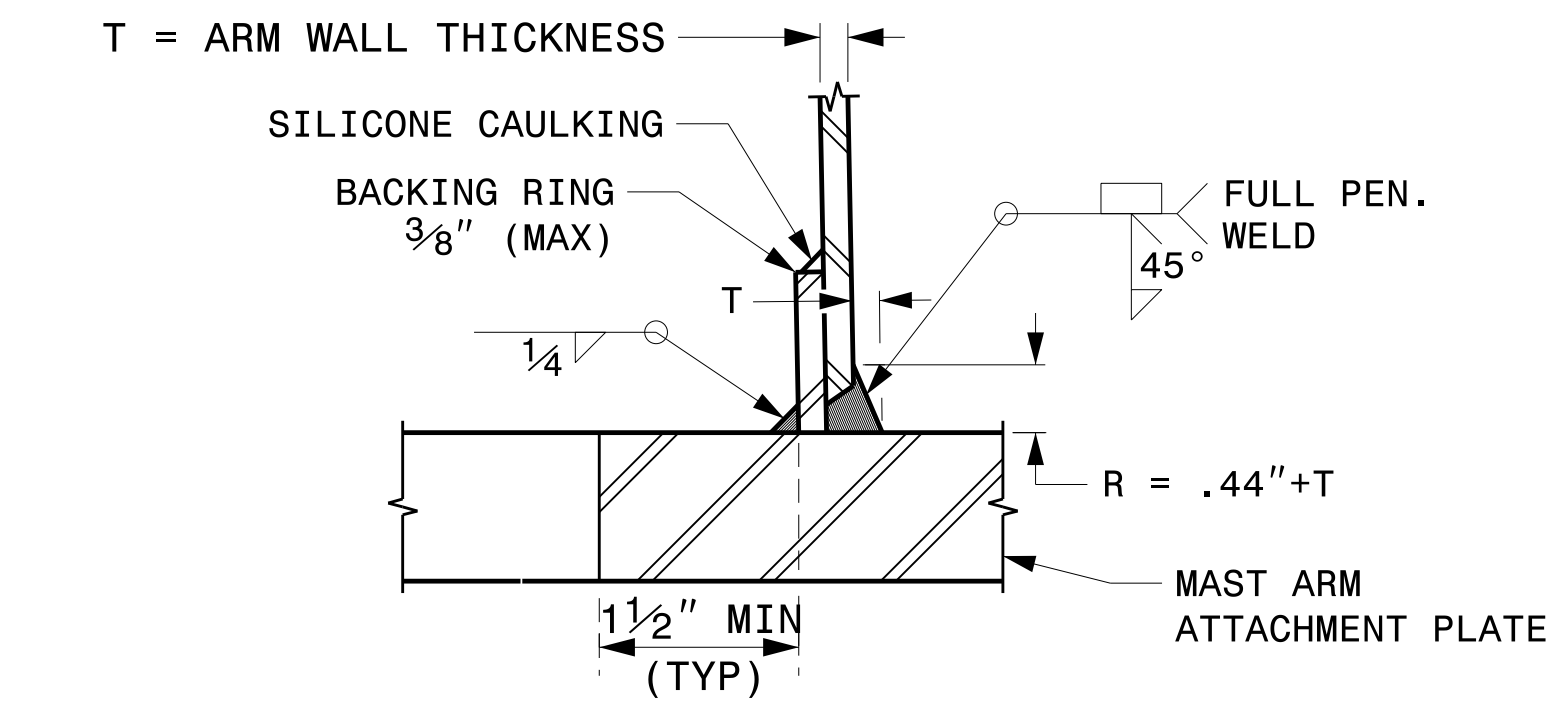
Fabrication Details – Mast Arm Poles

# WELDED RING STIFFENED MAST ARM CONNECTION

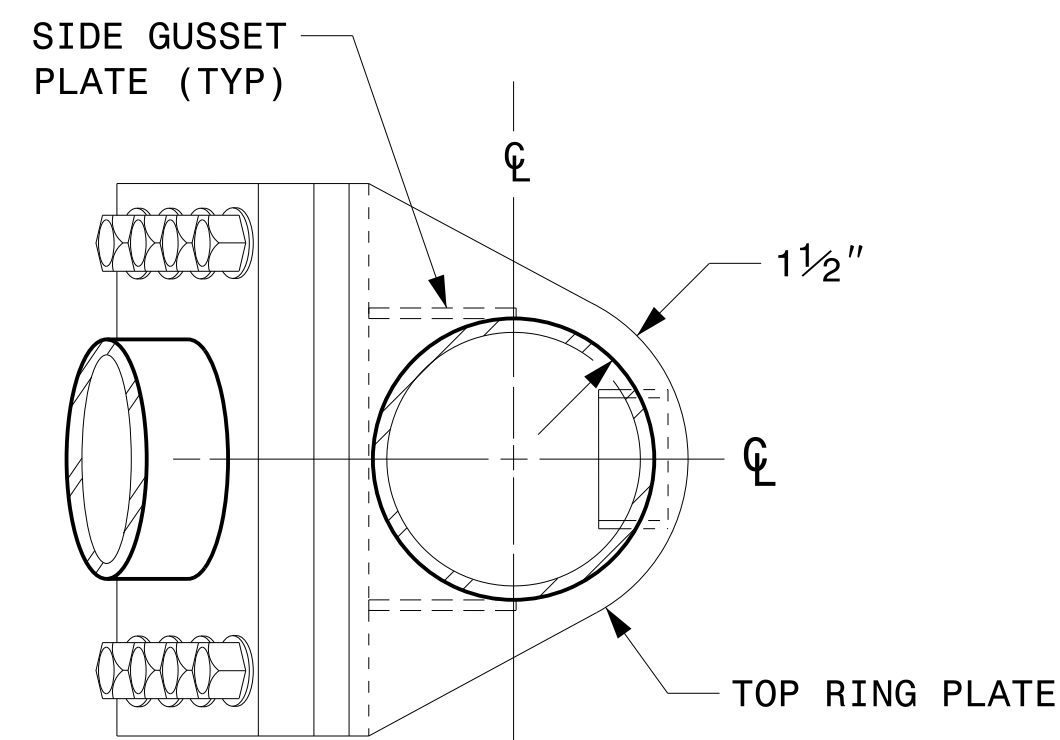
PROJECT I.D. NO.

SHEET NO.

Sig.M5



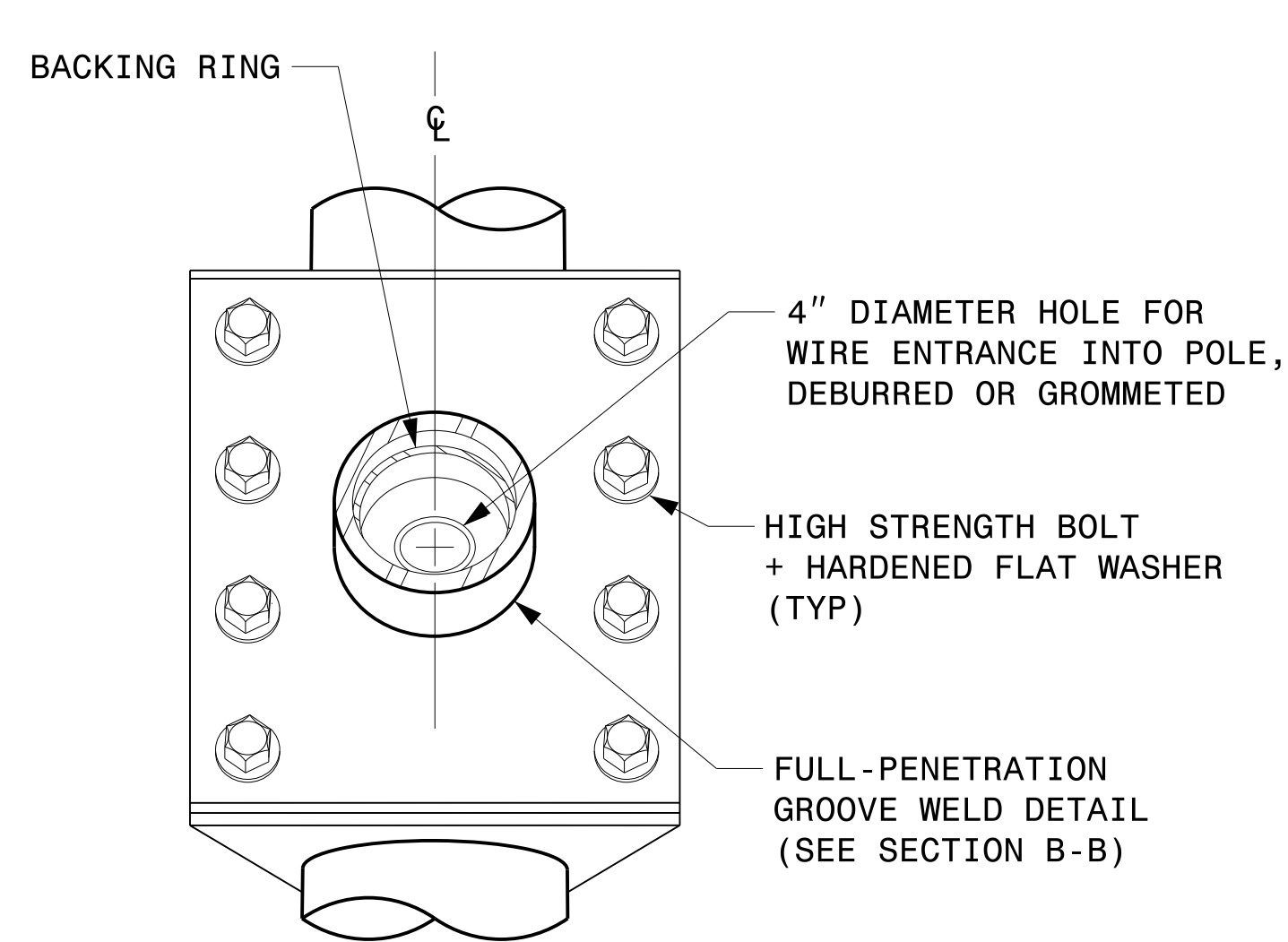
**SECTION B-B**  
FULL-PENETRATION GROOVE WELD DETAIL



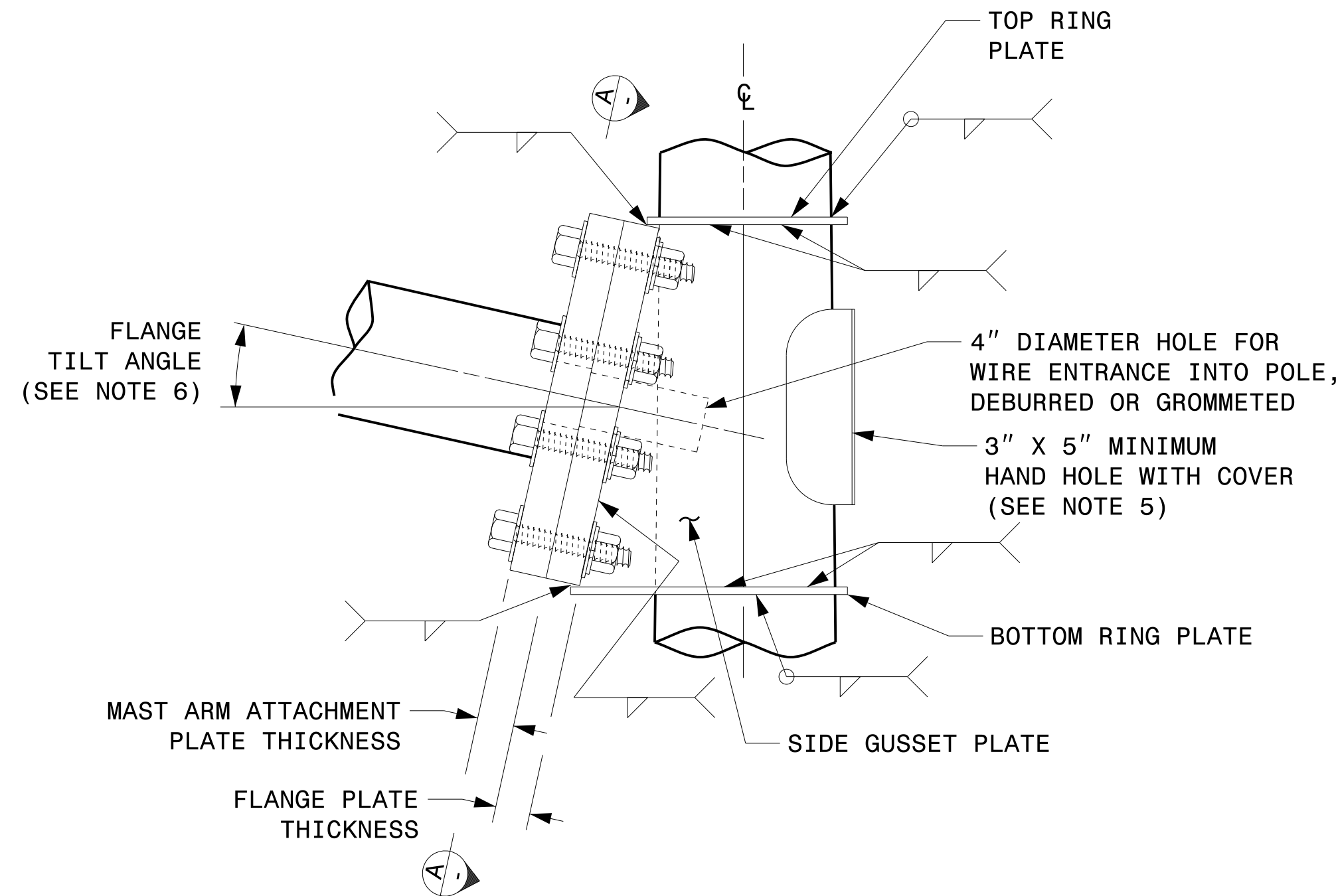
**PLAN VIEW**

**NOTES:**

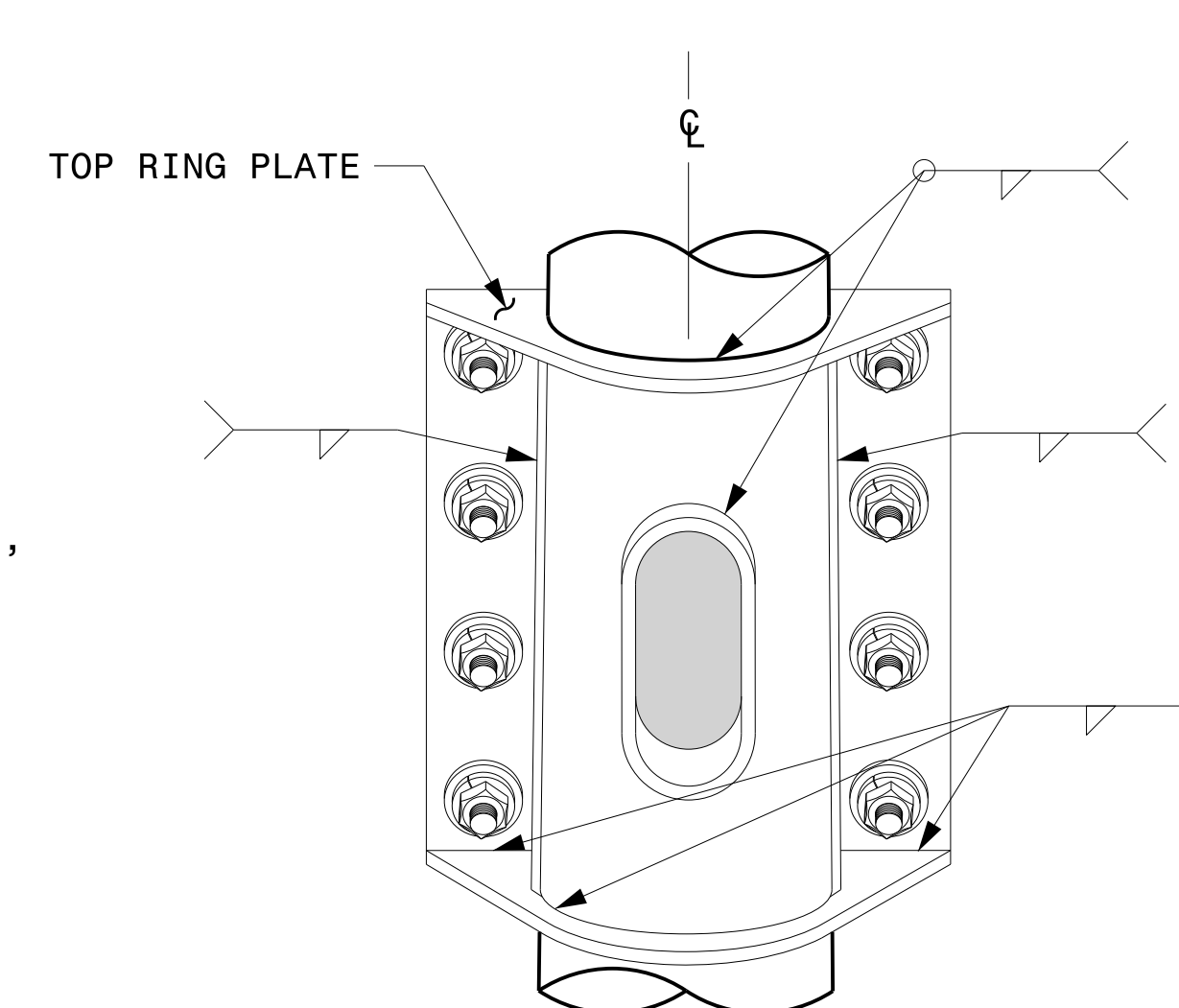
1. PROVIDE A PERMANENT MEANS OF IDENTIFICATION ABOVE THE MAST ARM TO INDICATE PROPER ATTACHMENT ORIENTATION OF THE MAST ARM.
2. DESIGNER WILL DETERMINE THE SIZE OF ALL STRUCTURAL COMPONENTS, PLATES, FASTENERS, AND WELDS SHOWN UNLESS THEY ARE ALREADY SPECIFIED.
3. FABRICATOR IS RESPONSIBLE FOR PROVIDING APPROPRIATE HOLES AT DRAINAGE POINTS TO DRAIN GALVANIZING MATERIALS.
4. FOR MINIMUM EDGE DISTANCE AND NOMINAL BOLT HOLE SIZE, FOLLOW THE LATEST AISC STEEL CONSTRUCTION MANUAL.
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.



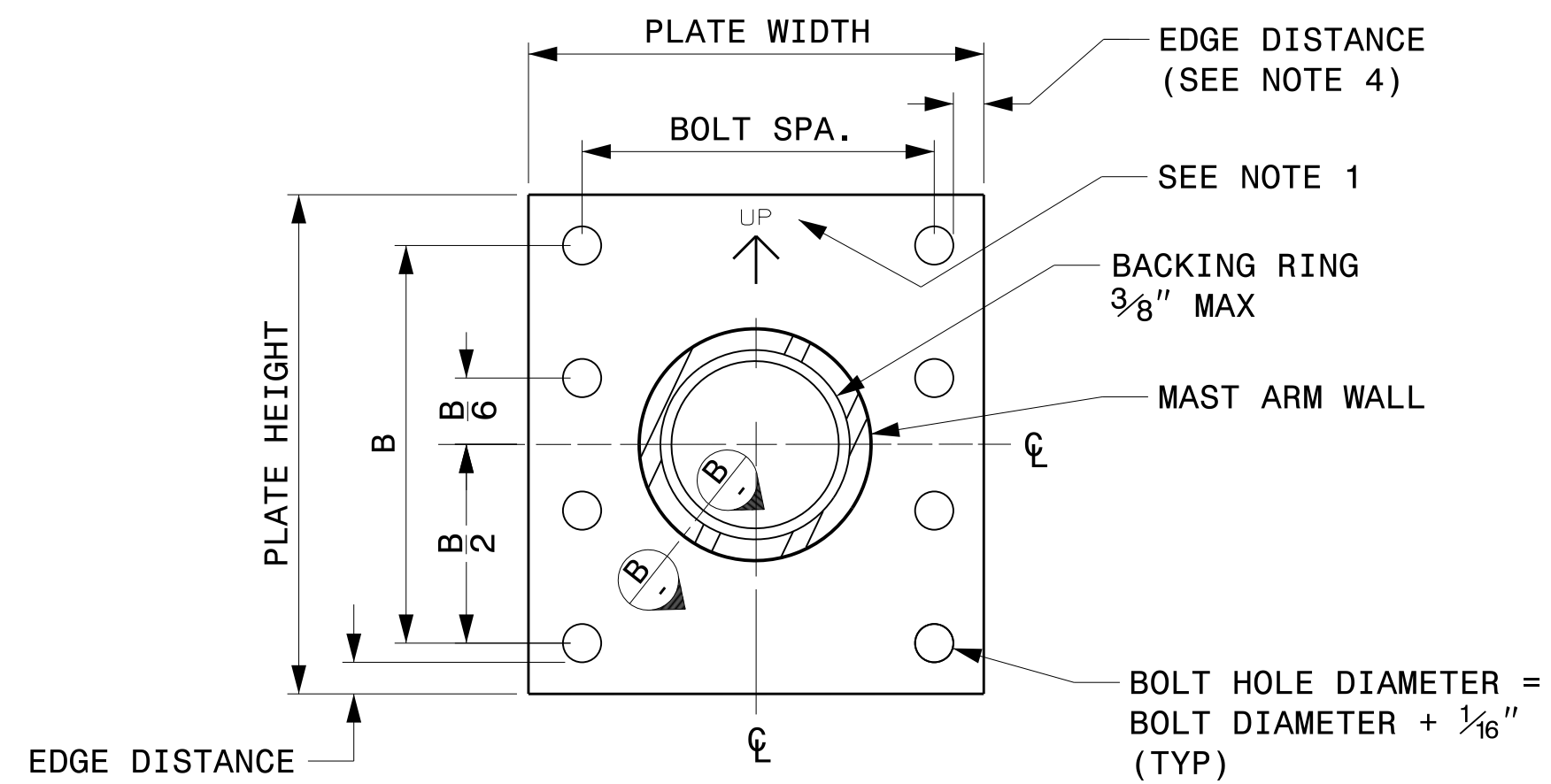
**FRONT ELEVATION VIEW**



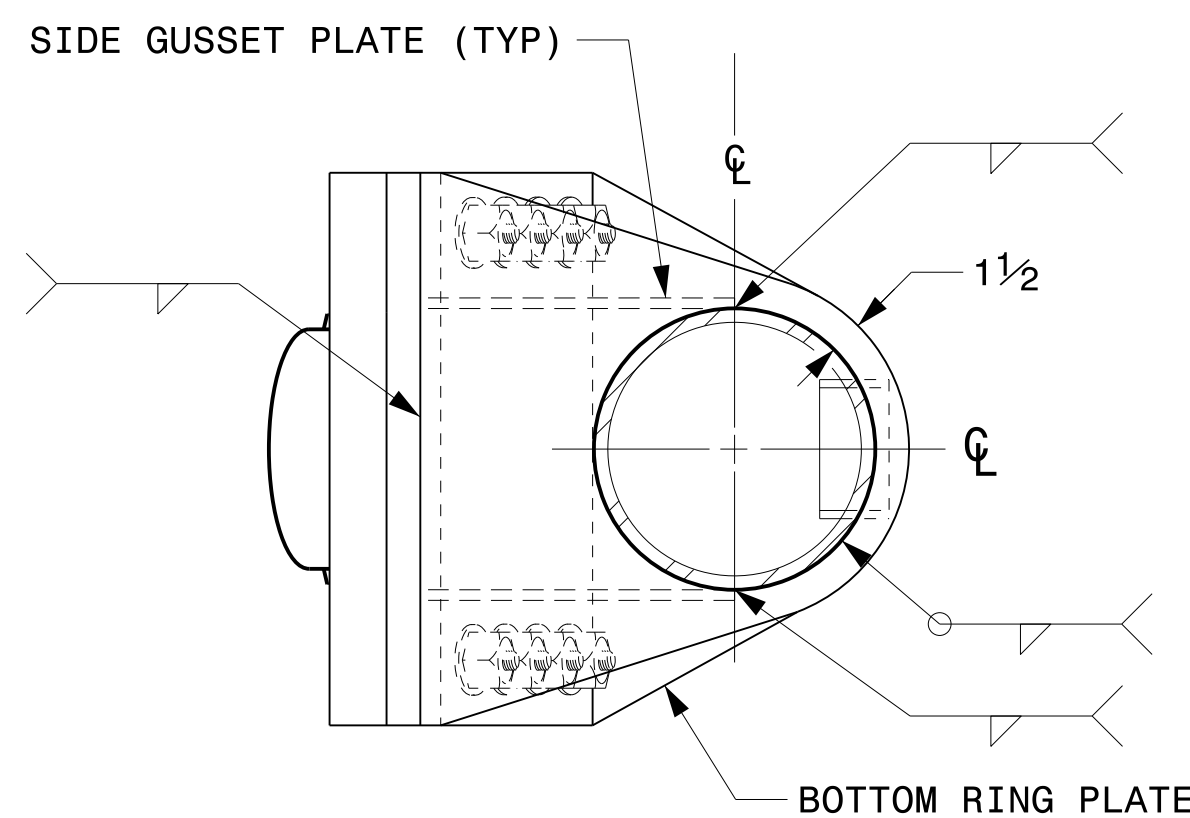
**SIDE ELEVATION VIEW**



**BACK ELEVATION VIEW**



**SECTION A-A**  
MAST ARM ATTACHMENT PLATE

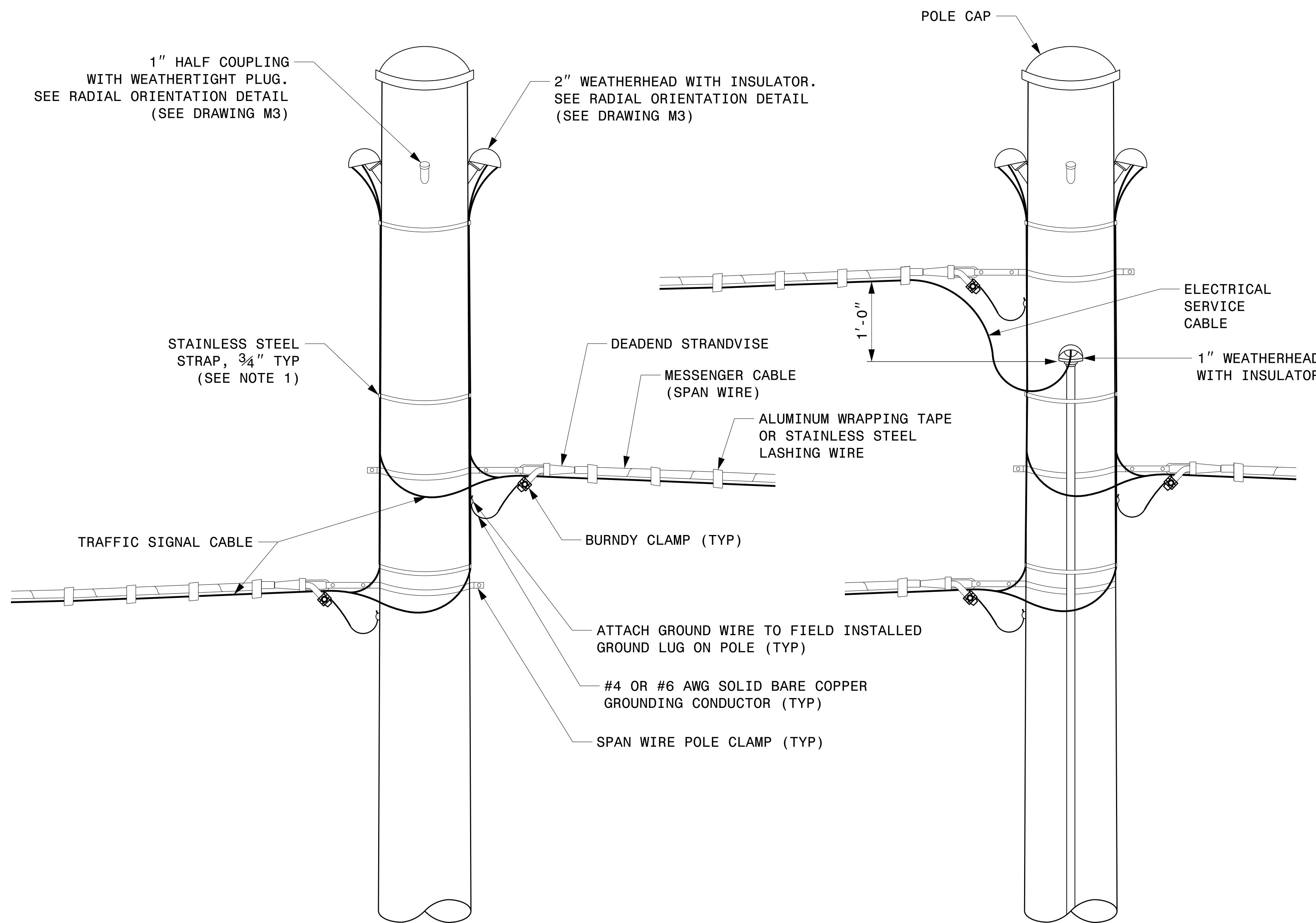


**BOTTOM VIEW**

<p style="font-size: small;">Prepared in the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p><b>Typical Fabrication Details</b> For <b>Mast Arm Connection To Pole</b></p> <p style="font-size: x-small;">PLAN DATE: SEPTEMBER 2023    DESIGNED BY: C.F. ANDREWS PREPARED BY: K.C. DURIGON    REVIEWED BY: D.C. SARKAR</p> <p style="font-size: x-small;">SCALE: NA NONE</p>	<p>SEAL</p> <p style="font-size: x-small;">DocuSigned by: <b>Kevin Durigon</b> 4B23DC79B3784DA</p>								
		<p style="font-size: x-small;">REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">INIT.</th> <th style="width: 5%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>	INIT.	DATE						
INIT.	DATE									
		<p style="font-size: x-small;">DATE: 09/21/2023</p>								

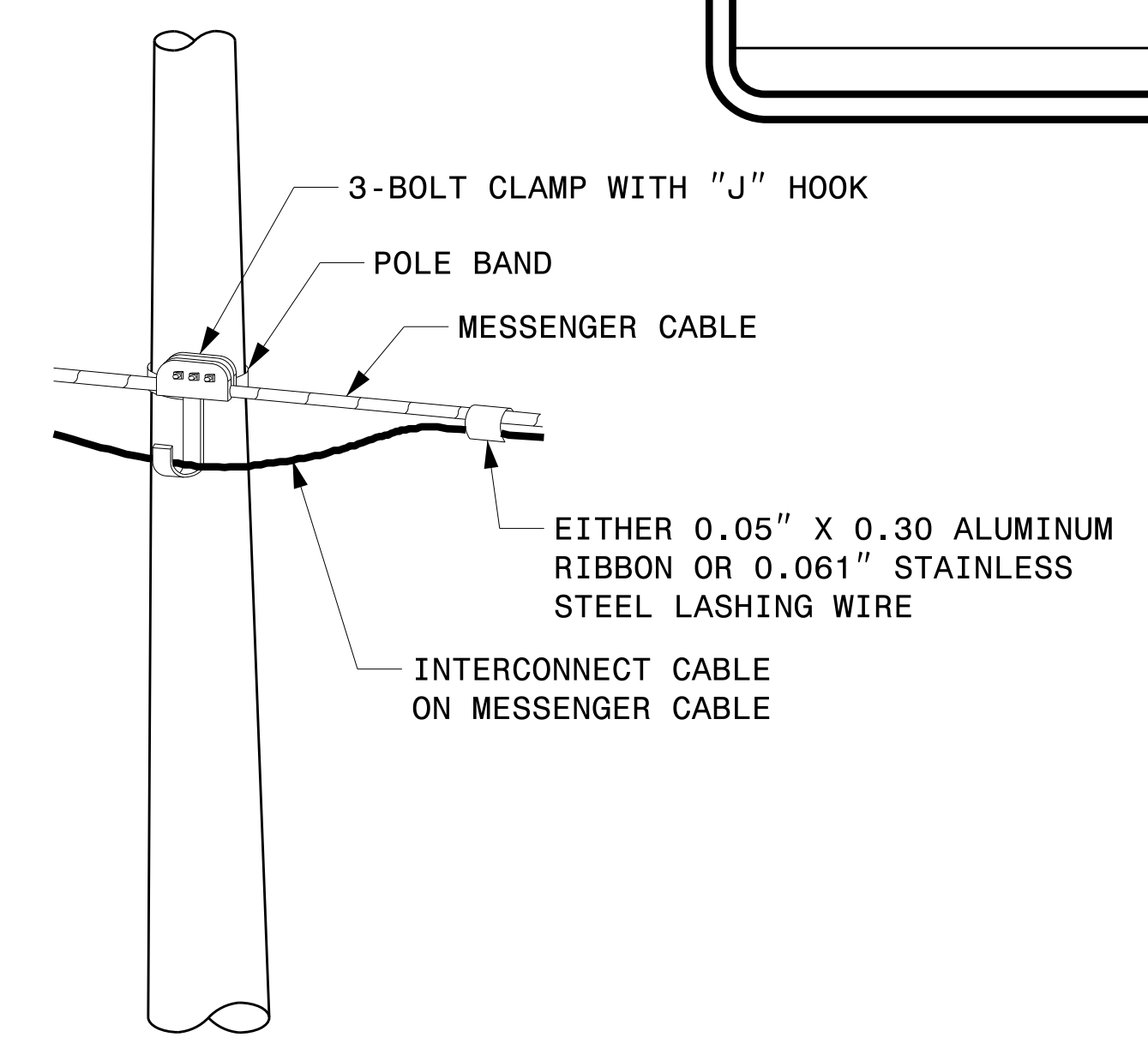
03-dt-2023-10-30  
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Kedar Tigon

Fabrication Details – Mast Arm Connection

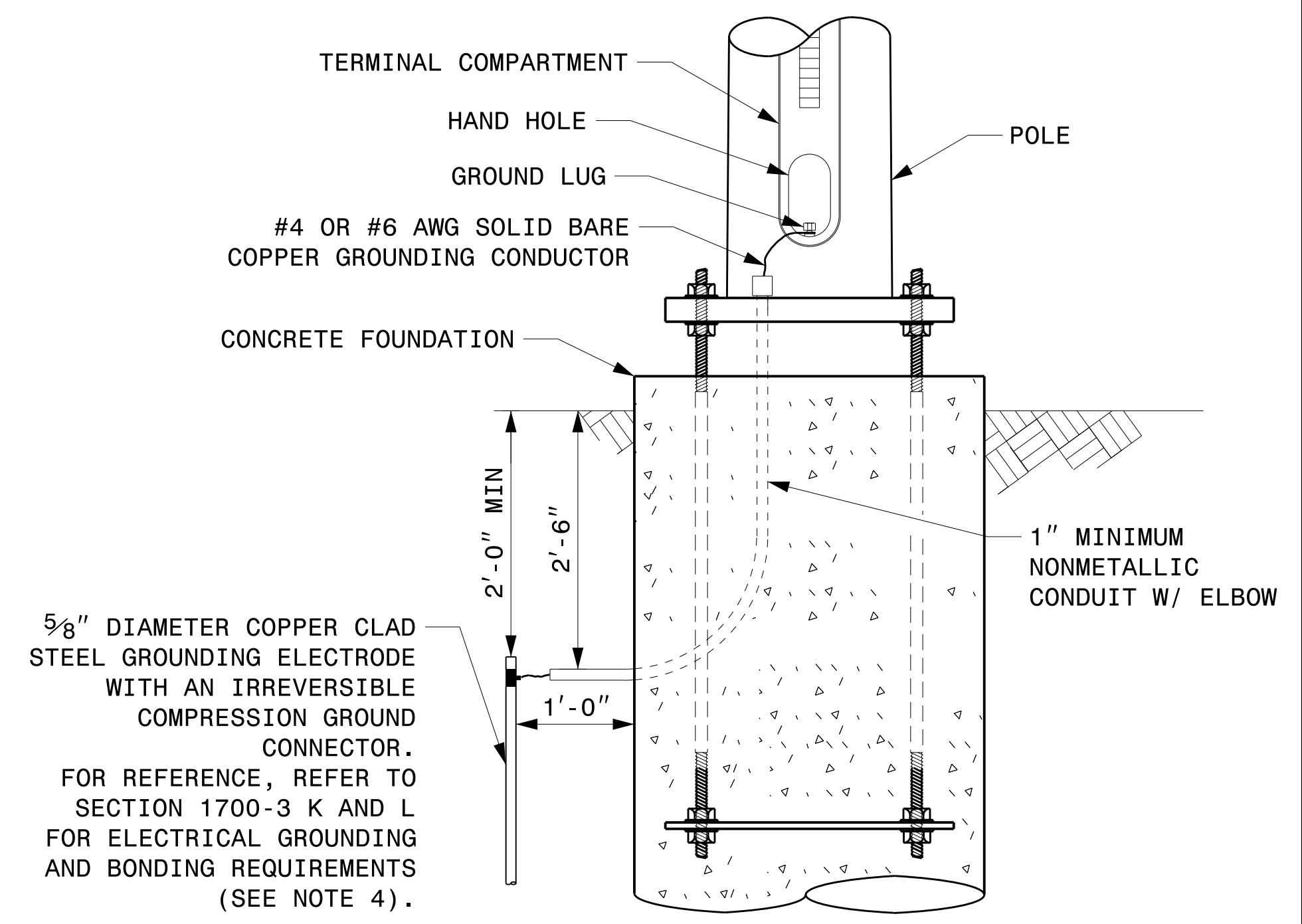


### STRAIN POLE ATTACHMENTS

- NOTES:
1. STRAP ALL SIGNAL CABLES TO THE SIDE OF THE POLE WITH 3/4" STAINLESS STEEL STRAPS WHEN THE DISTANCE BETWEEN SPAN WIRE ATTACHMENT CLAMP AND WEATHERHEADS EXCEEDS 3'-0".
  2. PROVIDE MINIMUM TWO SPAN WIRE 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 2024.



### ATTACHMENT OF CABLE TO INTERMEDIATE METAL POLE



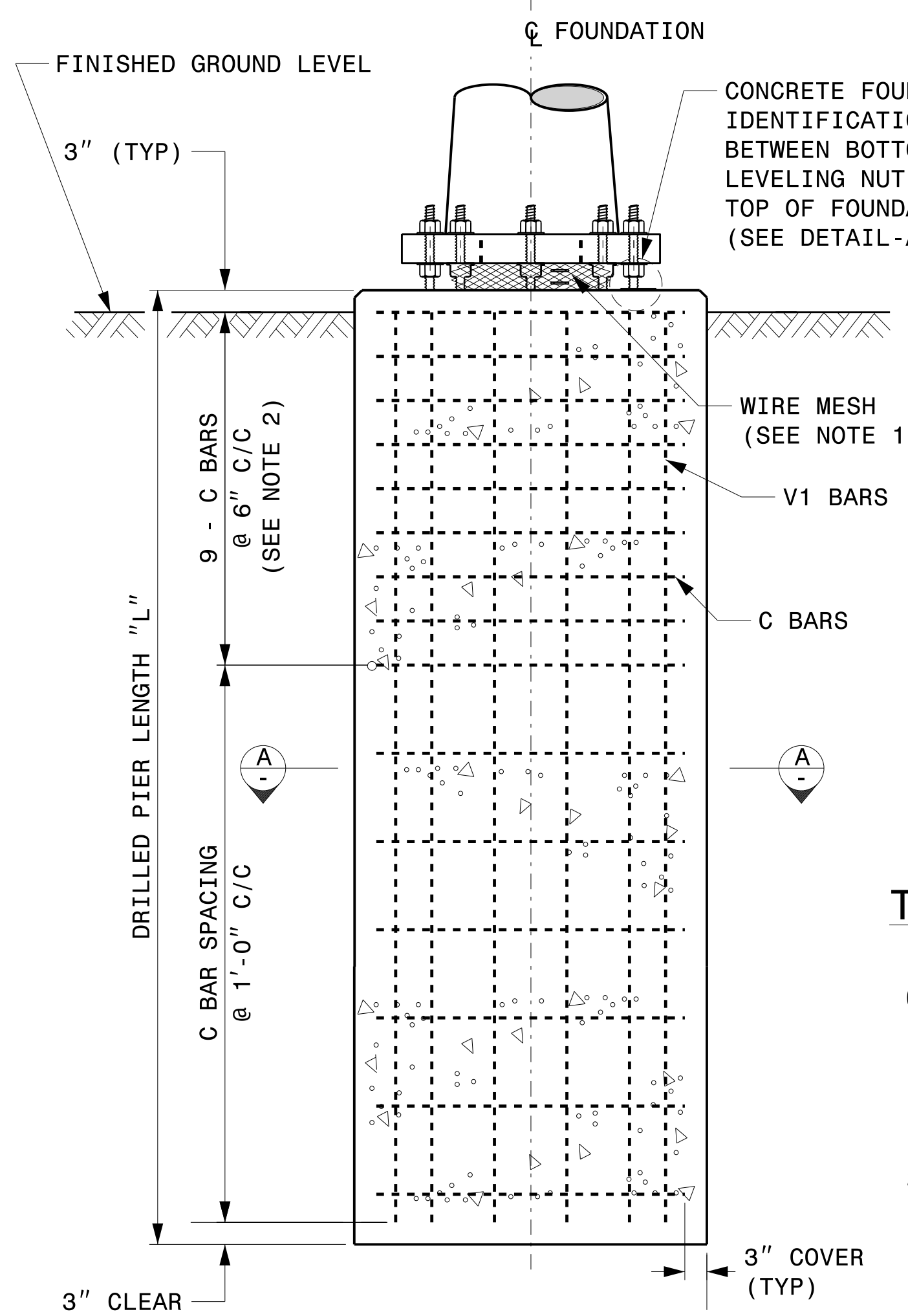
### METAL POLE GROUNDING DETAIL FOR STRAIN POLE AND MAST ARM

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Kedar Tigon

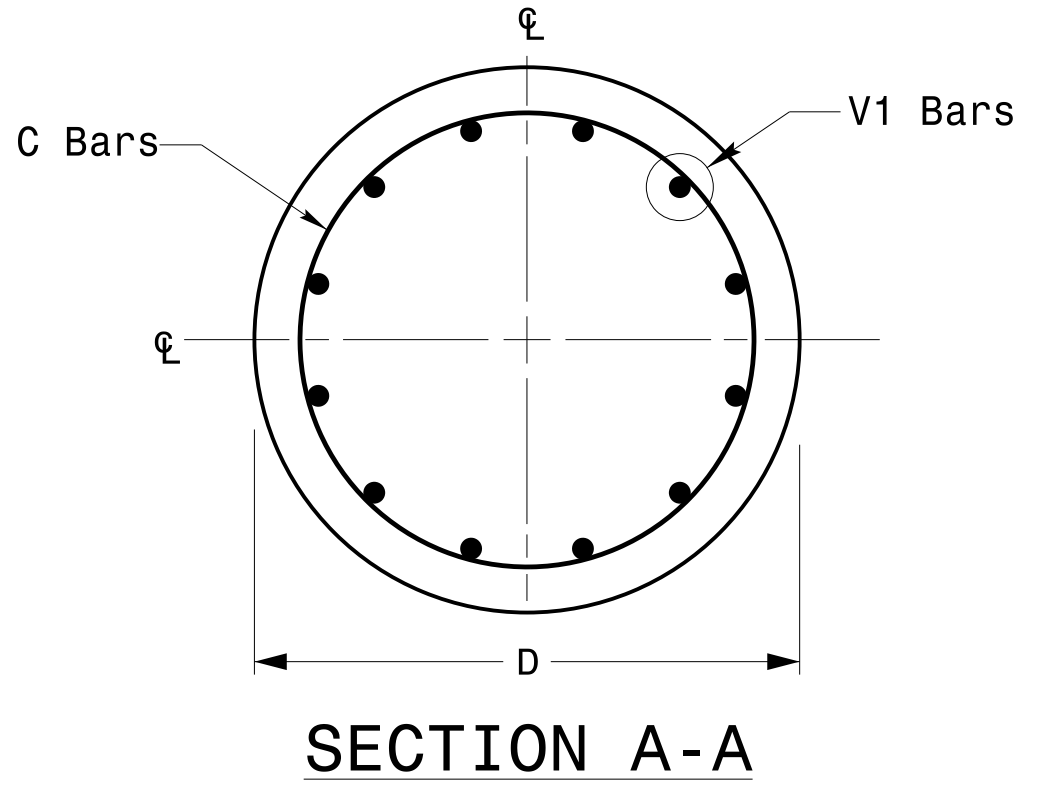
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Prepared In the Offices of:</p> <p>Typical Fabrication Details For Strain Pole Attachments</p>		<p>SEAL</p> <p>DocuSigned by: <b>Kevin Durigon</b> 4B23DC79B3784DA</p>					
	<p>PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F. ANDREWS</p> <p>PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>		INIT.	DATE			
INIT.	DATE							
<p>DATE: 09/21/2023</p>		<p>DATE</p>						

Fabrication Details – Strain Pole Attachments

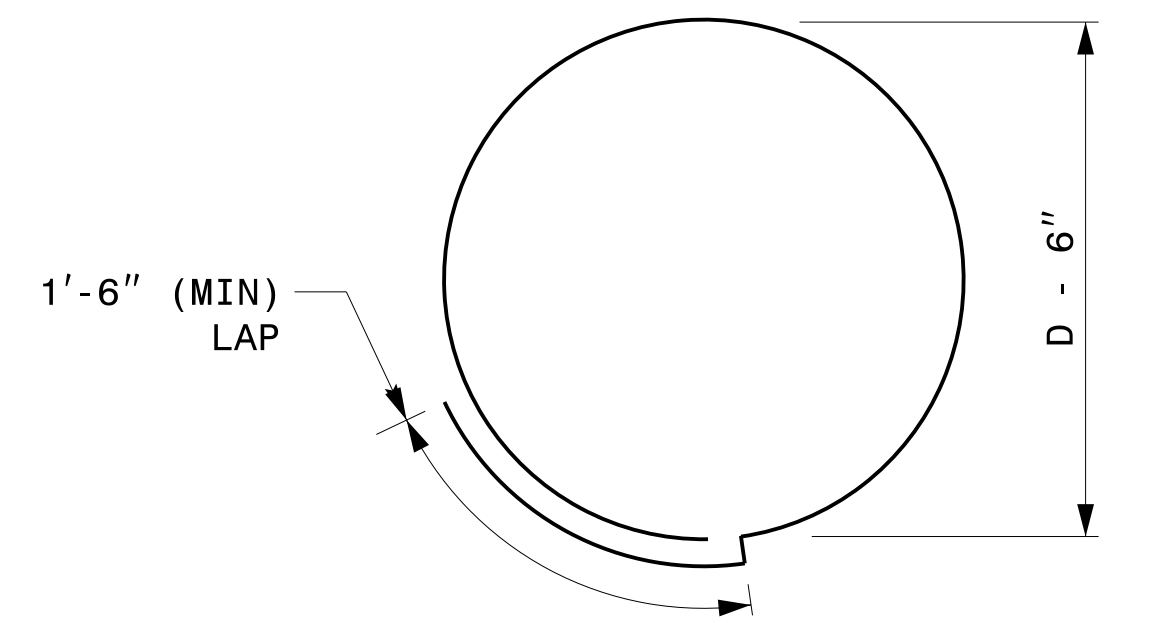




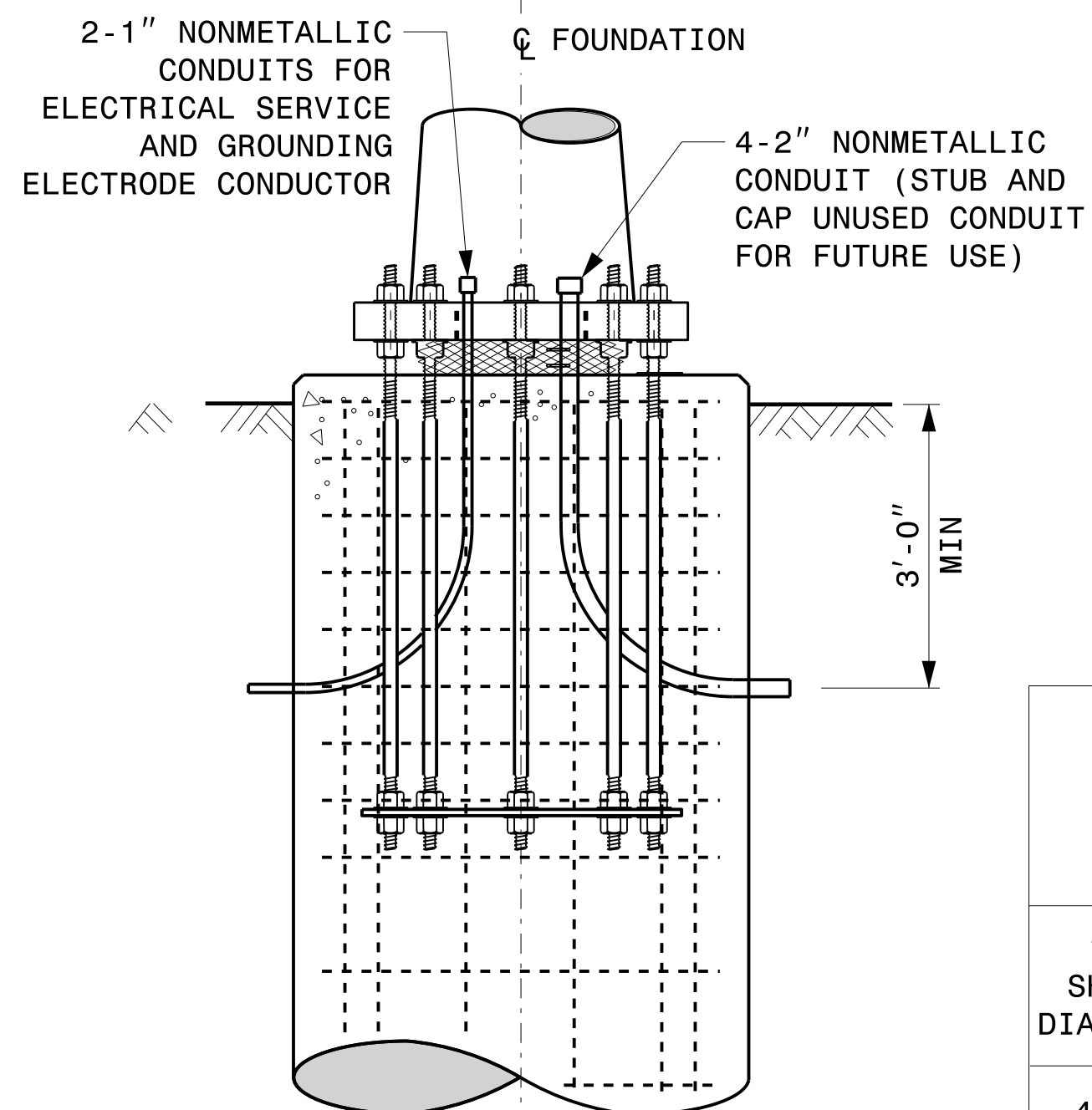
CONCRETE SHAFT ELEVATION



SECTION A-A



TYPICAL "C" BAR DETAIL



TYPICAL FOUNDATION CONDUIT DETAILS

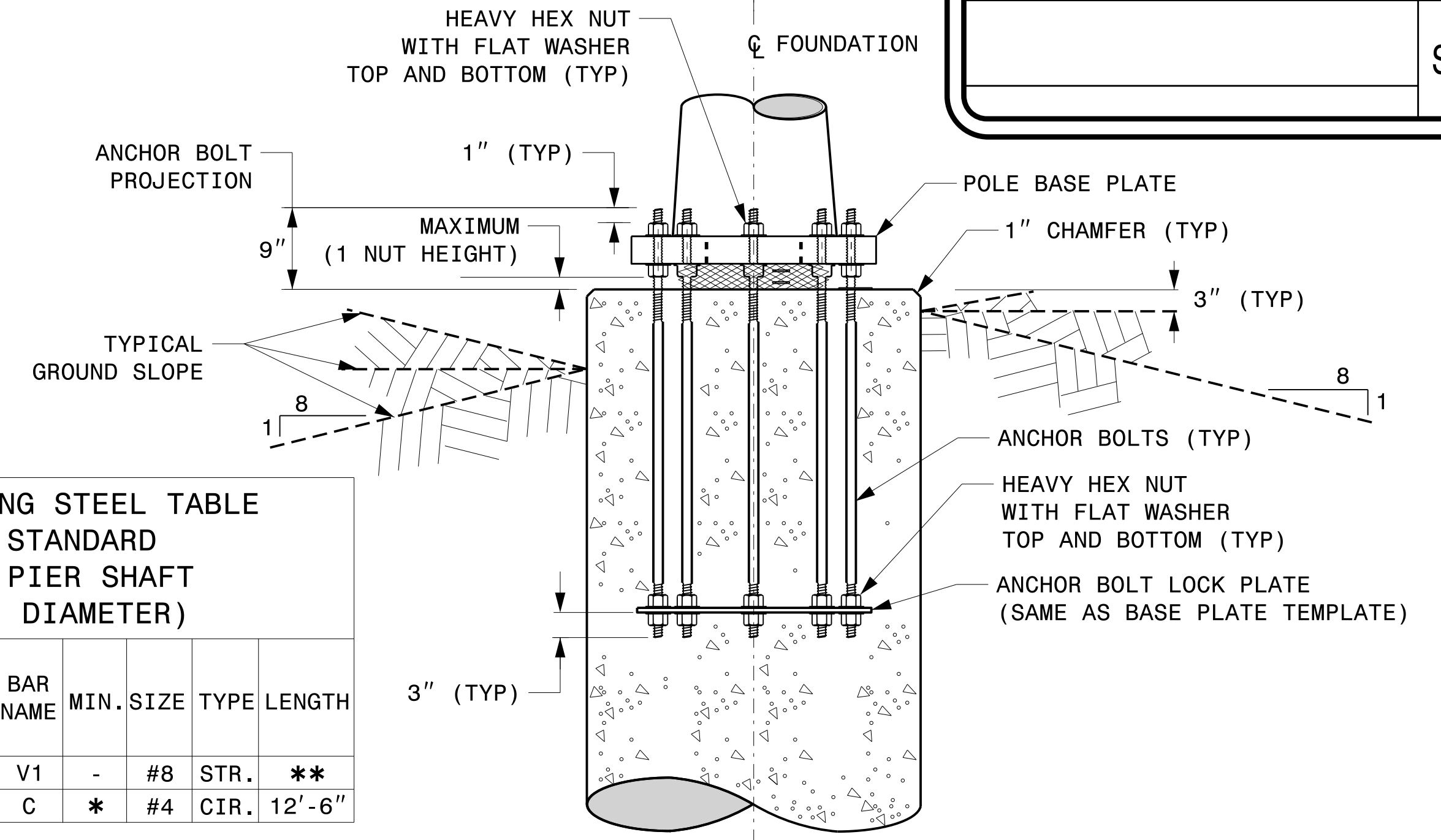
REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'-0" DIAMETER)

"D" SHAFT DIAMETER	CONCRETE VOLUME (CU. YDS)	BAR NAME	MIN. SIZE	TYPE	LENGTH
4'-0"	.465 X L	V1	-	#8 STR.	**
		C	*	#4 CIR.	12'-6"

\* SEE NOTE 2  
\*\* SEE NOTE 3

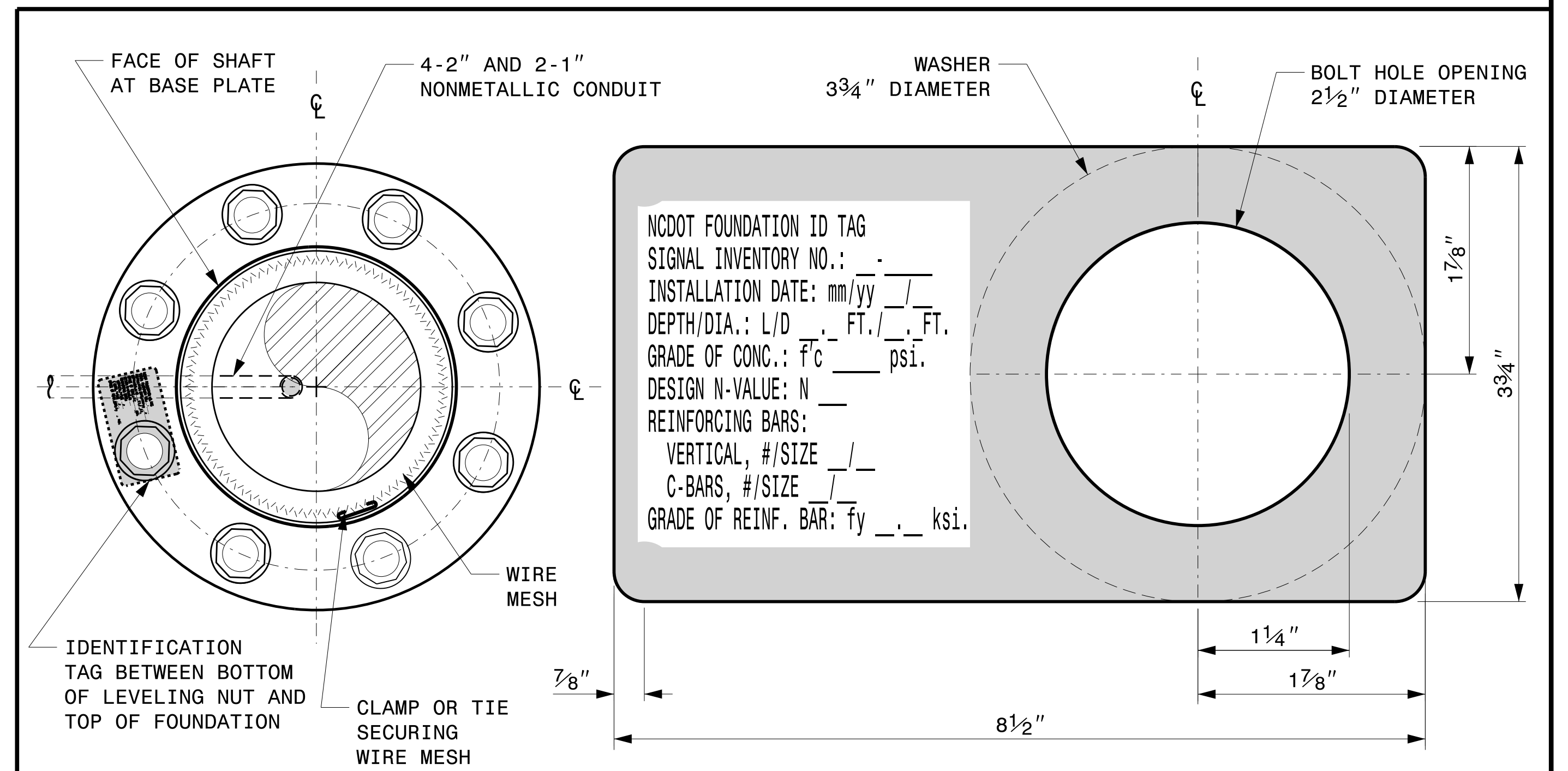
GENERAL NOTES:

- IF ACTUAL SUBSURFACE CONDITIONS DIFFER SIGNIFICANTLY FROM BORING DATA, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
- 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.
- 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.
- PROVIDE 2" TO 5" FOUNDATION PROJECTION ABOVE GROUND LEVEL, DEPENDING ON THE GROUND SLOPE.
- 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.
- CONSTRUCT FOUNDATIONS IN ACCORDANCE WITH NCDOT STANDARD PROVISIONS SP09 R005- FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES. ALL APPLICABLE 2024 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)
- USE AIR ENTRAINED AA CONCRETE MIX WITH A COMPRESSION STRENGTH OF  $f'c=4500$  psi (MIN) AFTER 28 DAYS.
- USE ASTM A615 GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
- LOCATE IDENTIFICATION TAG ON TOP OF THE FOUNDATION, DIRECTLY ABOVE THE CONDUIT'S ENTRY POINT.
- PROVIDE TWO LAYERS OF 4 MESH GALVANIZED WELDED 23 GAUGE (0.025) 6" WIDE AROUND PIPES UNDER THE BASE PLATE AND SECURE IT WITH TIES IF NECESSARY.
- PREFERRED LOCATION FOR THE I.D. TAG IS AS SHOWN IN DETAIL-A: DIRECTLY ABOVE THE CONDUIT ENTERING THE FOUNDATION.



TYPICAL FOUNDATION ANCHOR BOLT DETAILS

(REINFORCING CAGE NOT SHOWN FOR CLARITY)



CONCRETE FOUNDATION IDENTIFICATION TAG DETAILS

D = DIAMETER  
L = LENGTH / DEPTH  
mm = MONTH  
yy = YEAR

DETAIL-A

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: NA  
NONE

Construction Details For Foundations

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON  
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL

DocuSigned by:  
*Kevin Durigon*  
4B23DC78F3784DA

09/21/2023 DATE

03-dt-2023-10-4f S:\SS\0415\Sig.M7.Stu. Construction Details-Strain Poles.dgn Kedar Tigon

Construction Details - Foundations

# SOIL CONDITION

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.)
S26L1	26	22	2	9	210	19.5	12.5	9	6.5	15.5	14.5	13	8	12	4	12
S26L2	26	23	2	10	240	19.5	12	9	6.5	15.5	14.5	13	8	12	4	12
S26L3	26	25	2	11	260	20.5	12	10	8	16	15	13	8	12	4	12
S30L1	30	22	2	9	230	19	11	9	7	15.5	14	12.5	8	12	4	12
S30L2	30	23	2	10	270	20	12	10	8	16	14.5	13	8	12	4	12
S30L3	30	25	2	11	290	21	12	10	8	17	15	13.5	8	12	4	12
S30H1	30	25	3	13	355	23	13	11	9	18	16.5	14.5	8	12	4	12
S30H2	30	29	3	15	405	25	14	11	9	19	17.5	15.5	8	14	4	12
S30H3	30	29	3	16	430	26	15	12	9	20	18	16	8	14	4	6
S35L1	35	22	3	8	260	19.5	12	10	8	15.5	14.5	13	8	12	4	12
S35L2	35	23	3	10	300	21	12	10	8	16.5	15	13.5	8	12	4	12
S35L3	35	25	3	10	320	21.5	13	10	8	17	15.5	14	8	12	4	12
S35H1	35	25	3	12	390	23.5	14	11	9	18	17	15	8	14	4	12
S35H2	35	29	4	14	460	26	15	12	9	20	18	16	8	14	4	6
S35H3	35	29	4	16	495	28.5	15	13.5	10	21.5	19	17	8	14	4	6

GENERAL NOTES:

- VALUES SHOWN IN THE "REACTIONS AT THE POLE BASE" COLUMN REPRESENT THE MINIMUM ACCEPTABLE CAPACITY ALLOWED FOR DESIGN USING A COMBINED FORCE RATIO (CFR) OF 1.00.
- USE CHAIRS AND SPACERS TO MAINTAIN PROPER CLEARANCE.
- FOR FOUNDATION, ALWAYS USE AIR-ENTRAINED CONCRETE MIX.

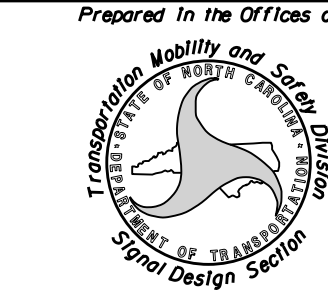
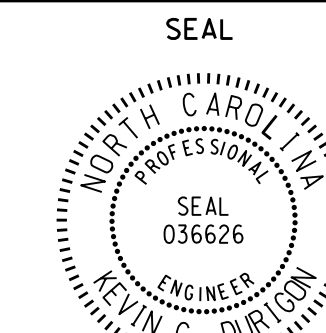
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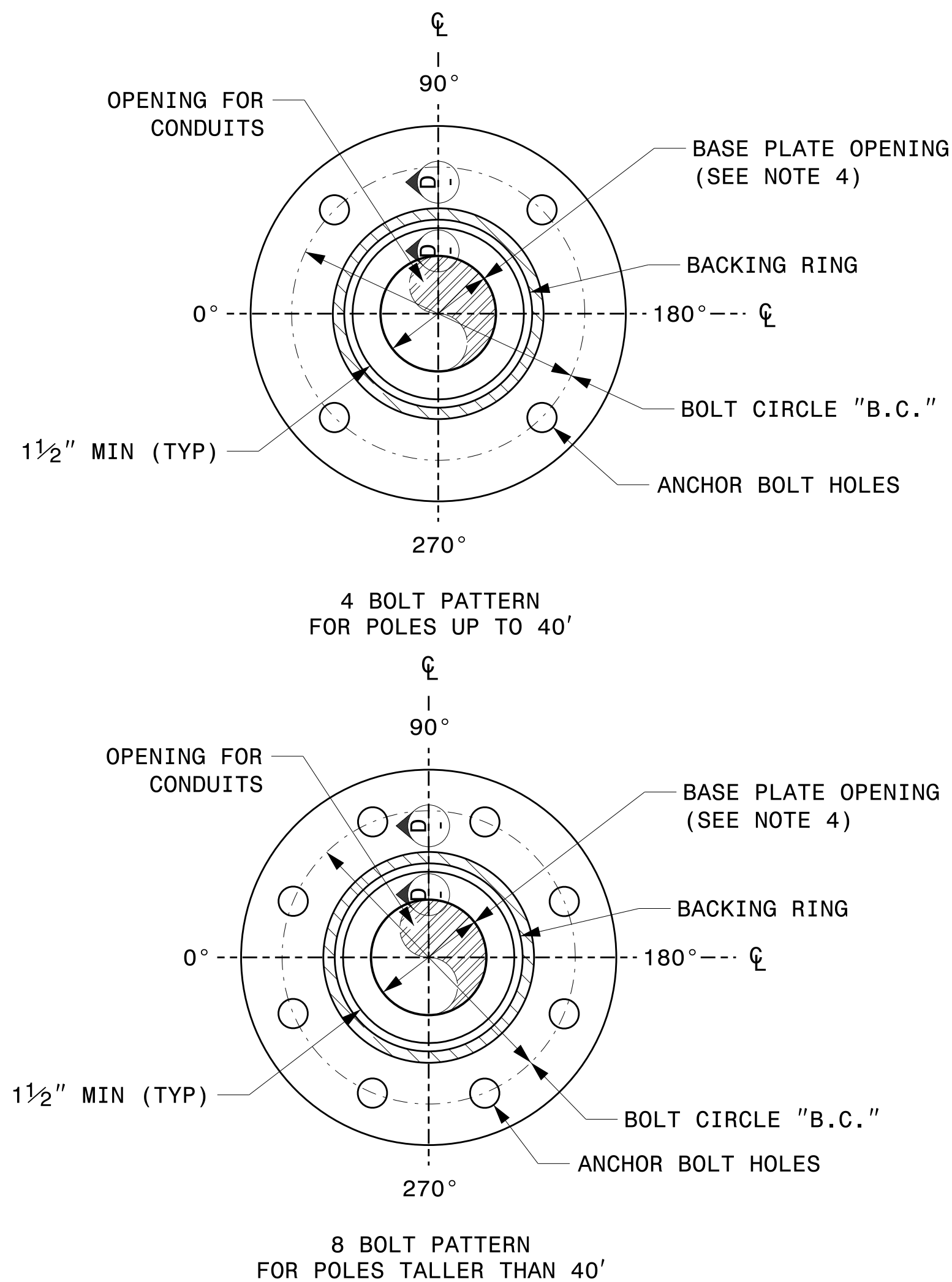
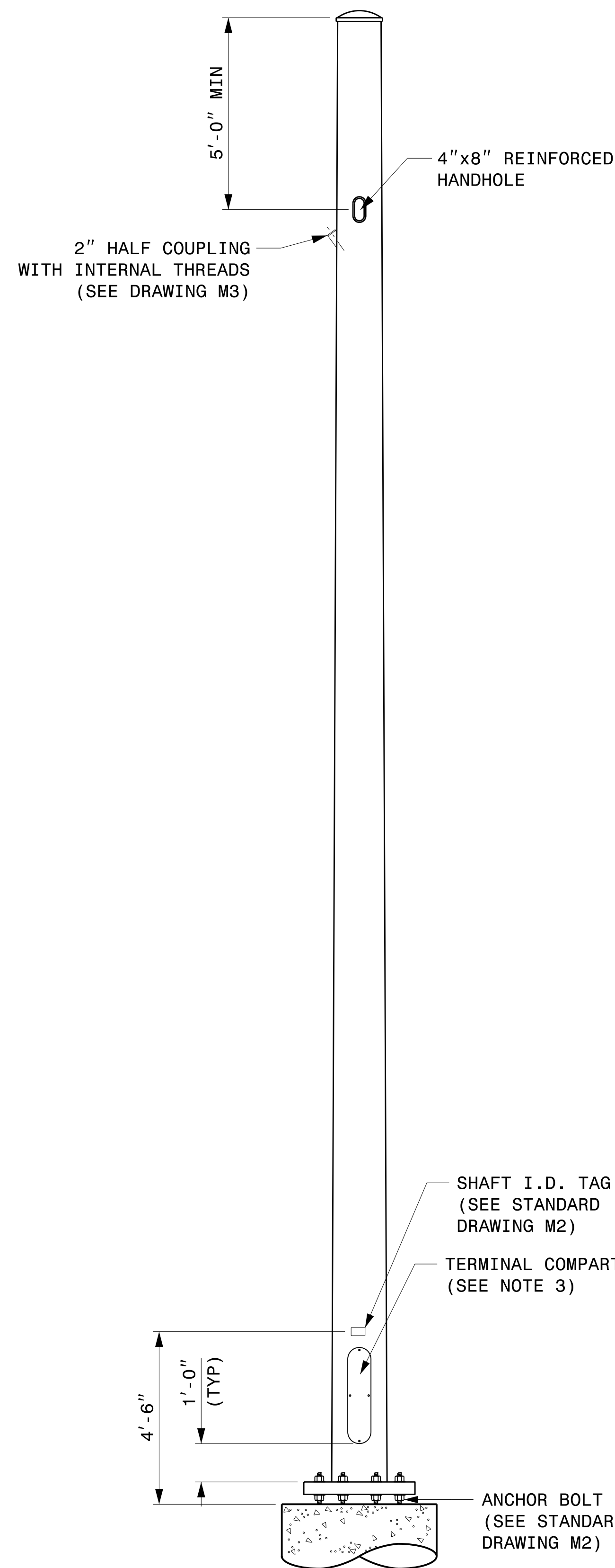
- PERFORM A STANDARD PENETRATION TEST AT EACH PROPOSED FOUNDATION SITE TO DETERMINE "N" VALUE.
- SELECT THE APPROPRIATE WIND ZONE FROM M1 DRAWING.
- SELECT THE SOIL TYPE (CLAY OR SAND) THAT BEST DESCRIBES THE SOIL CHARACTERISTICS.
- GET THE APPROPRIATE STANDARD POLE CASE NUMBER FROM THE PLANS OR FROM THE ENGINEER.
- SELECT THE APPROPRIATE COLUMN UNDER "STANDARD FOUNDATIONS" BASED ON SOIL TYPE AND "N" VALUE. SELECT THE APPROPRIATE ROW BASED ON THE POLE LOAD CASE.
- THE FOUNDATION DEPTH IS THE VALUE SHOWN IN THE "STANDARD FOUNDATIONS" CATEGORY WHERE THE COLUMN AND THE ROW INTERSECT.
- USE CONSTRUCTION PROCEDURES AND DESIGN METHODS PRESCRIBED BY FHWA-NHI-10-016 MANUAL FOR DRILLED SHAFTS.

48" DIAMETER FOUNDATION CONCRETE VOLUME (CUBIC YARDS) = (0.465) x DRILLED PIER LENGTH

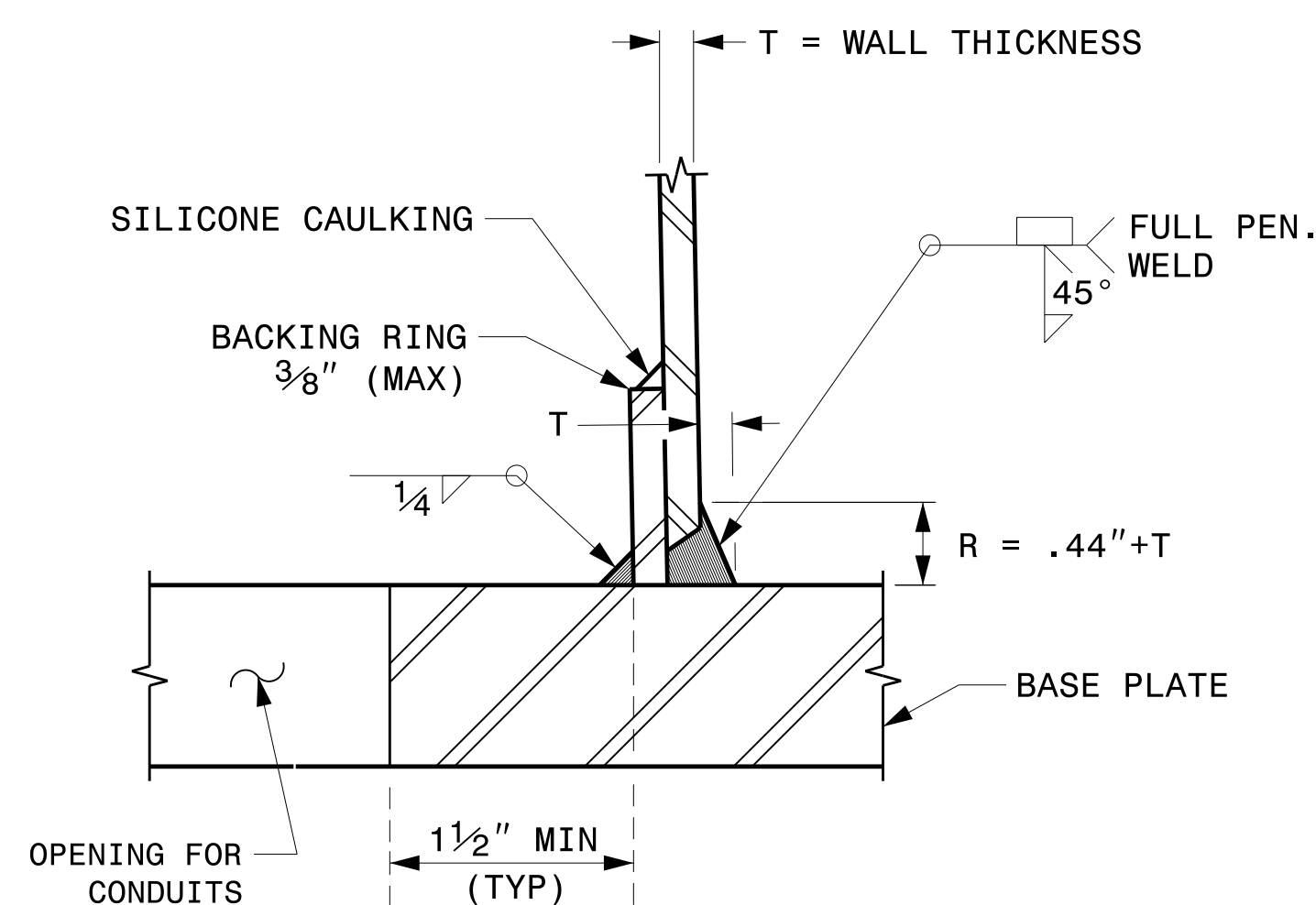
09-01-2023 10:46 S:\SSS\415\Sig.M8\Str. Pole Str. Drawings for LRF02024\Sig.M8 Str. Strain Pole Found.-Saturated Soil Condition.dgn Kedar Tigon

Standard Strain Pole Foundation – All Soil Conditions

 <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Standard Strain Pole Foundation for All Soil Conditions</p>									
	<p>PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON</p> <p>PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p> <table border="1"> <tr><th>INIT.</th><th>DATE</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>		INIT.	DATE					
INIT.	DATE									
<p>SCALE: NONE</p>	<p>DATE: 09/21/2023</p>		<p>DATE</p>							



**BASE PLATE DETAILS**



**SECTION D-D**  
(POLE ATTACHMENT TO BASE PLATE)  
**FULL - PENETRATION GROOVE WELD DETAIL**

**NOTES:**

1. THIS DRAWING PROVIDES BASIC DETAILS FOR CCTV POLES. PROJECT REQUIREMENTS MAY REQUIRE SPECIAL FACTORY PREPS THAT ARE NOT SHOWN ON THESE DETAILS.
2. DETAILS FOR INTERNAL CAMERA LOWERING SYSTEMS ARE NOT SHOWN.
3. POLE MOUNTED CABINETS MAY REQUIRE MODIFICATIONS TO THE LOWER HANDHOLE OPENING TO MOUNT CABINETS. 4" X 8" REINFORCED HANDHOLES ARE ACCEPTABLE OPTIONS, AND MAY BE PREFERRED.
4. OPENING IN POLE BASE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3 1/2" BUT SHALL NOT BE LESS THAN 8 1/2".
5. USE COMPACT SECTION CRITERIA D/T RATIO PER AASHTO LTS-LRFD 1ST EDITION SECTION 5.7.2.

**CCTV CAMERA POLE**  
(NOT TO SCALE)

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 NONE

Typical Fabrication Details For CCTV Poles

PLAN DATE: SEPTEMBER 2023	DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON	REVIEWED BY: C.F. ANDREWS
REVISIONS	INIT. DATE

SEAL

DocuSigned by: Kevin Durigon

4B23DC79B3784DA

09/21/2023

**Fabrication Details – CCTV Camera Poles**

02-dct-2023-10-151  
S:\ISSUES\415 Signal\Signal Design Section\Structures\Drawings\2024 Merlot Pole Std Drawings for LRF02024 Sig.M9 Fabrication Details - CCTV Poles.dgn  
Kedar Tigon

- 1 INSTALL COAX CABLE
- 2 INSTALL ETHERNET CABLE
- 3 EXISTING ETHERNET (OR COAX) CABLE
- 4 INSTALL SMFO CABLE
- 5 EXISTING SMFO CABLE
- 6 INSTALL FIBER OPTIC DROP CABLE
- 7 INSTALL TRACER WIRE
- 8 TRENCH
- 9 INSTALL PVC CONDUIT
- 10 INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- 13 INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
- 14 INSTALL POLYETHYLENE CONDUIT
- 15 DIRECTIONAL DRILL CONDUIT
- 16 BORE AND JACK CONDUIT
- 17 INSTALL CABLE(S) IN EXISTING CONDUIT
- 18 INSTALL CABLE(S) IN NEW CONDUIT
- 19 INSTALL CABLE(S) IN EXISTING RISER
- 20 INSTALL CABLE(S) IN NEW RISER
- 21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
- 22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 24 INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
- 25 INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
- 26 INSTALL NEW ETHERNET EDGE SWITCH
- 27 INSTALL NEW FIBER OPTIC TRANSCEIVER
- 28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPlice CABLE IN CABINET
- 29 INSTALL UNDERGROUND SPlice ENCLOSURE
- 30 INSTALL AERIAL SPlice ENCLOSURE
- 31 MODIFY EXISTING INTERCONNECT CENTER /SPlice ENCLOSURE
- 32 INSTALL POLE MOUNTED SPlice CABINET
- 33 INSTALL BASE MOUNTED SPlice CABINET

- 34 INSTALL CABINET FOUNDATION
- 35 INSTALL CCTV CAMERA POLE MOUNTED CABINET
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40A INSTALL OVERSIZED JUNCTION BOX
- 40B INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL WOOD POLE
- 43 REMOVE EXISTING WOOD POLE
- 44 INSTALL AERIAL GUY ASSEMBLY
- 45 INSTALL STANDARD GUY ASSEMBLY
- 46 INSTALL SIDEWALK GUY ASSEMBLY
- 47 INSTALL MESSENGER CABLE
- 48A REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
- 48B REMOVE EXISTING COMMUNICATIONS CABLE
- 49 BACK PULL EXISTING COMMUNICATIONS CABLE
- 50 INSTALL CELL MODEM AND ANTENNA
- 51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52 INSTALL DELINEATOR MARKER
- 53A STORE 20 FEET OF COMMUNICATIONS CABLE
- 53B STORE 50 FEET OF EACH COMMUNICATIONS CABLE
- 54 LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE
- 55 LASH CABLE(S) TO EXISTING MESSENGER CABLE
- 56 LASH CABLE(S) TO NEW MESSENGER CABLE
- 57 MODIFY EXISTING ELECTRICAL SERVICE
- 58 INSTALL NEW ELECTRICAL SERVICE
- 59 INSTALL NEW EQUIPMENT CABINET DISCONNECT
- 60 INSTALL NEW POLE MOUNTED CABINET
- 61 BOND TRACER WIRE TO EQUIPMENT GROUND BUS  
DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
- 62 BOND RISER AND MESSENGER CABLE TO POLE GROUND
- 63 BOND RISER TO POLE GROUND
- 64 BOND MESSENGER CABLE TO POLE GROUND
- 65 BOND MESSENGER CABLE TO POLE GROUND
- 66 INSTALL HEAT SHRINK TUBING RETROFIT KIT
- 67 INSTALL MOLDABLE DUCT SEAL
- 68 SLACK SPAN

**LEGEND**

	NEW FIBER OPTIC COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT

<b>NEW</b>		<b>EXISTING</b>
	OVERSIZED JUNCTION BOX	
	SPECIAL OVERSIZED JUNCTION BOX	
	WOOD POLE	
	AERIAL SPlice ENCLOSURE	
	UNDERGROUND SPlice ENCLOSURE	
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL EQUIPMENT CABINET	
	SPlice CABINET	
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
	SIGNAL POLE	
	JOINT USE POLE	
	SIGNAL INVENTORY NUMBER	

**ATTACHMENT POINT:**

'SS' YY' REFERENCE POINT

'SS' REFERENCE POINT

**"SS" REFERENCE LOCATION**  
 FS = FRONT SIDE OF POLE  
 BS = BACK SIDE OF POLE

**CONSTRUCTION NOTE SYMBOLOGY KEY**

	INDICATES NUMBER OF CABLES, LOOPS, ETC.
	INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
	INDICATES NUMBER OF RISER(S)/CONDUIT(S)
	INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)

NUMBER OF CABLE(S)		NUMBER OF FIBERS/TWISTED PAIRS
NUMBER OF RISER(S)/CONDUIT(S)		DIAMETER OF RISER(S)/CONDUIT(S) (INCH)

	NEW/EXISTING CABLE
	REMOVE/MODIFY CABLE
	CONDUIT/RISER

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Prepared for the Offices of:

**Signal Communications Plans**

Division 07 Guilford County Greensboro

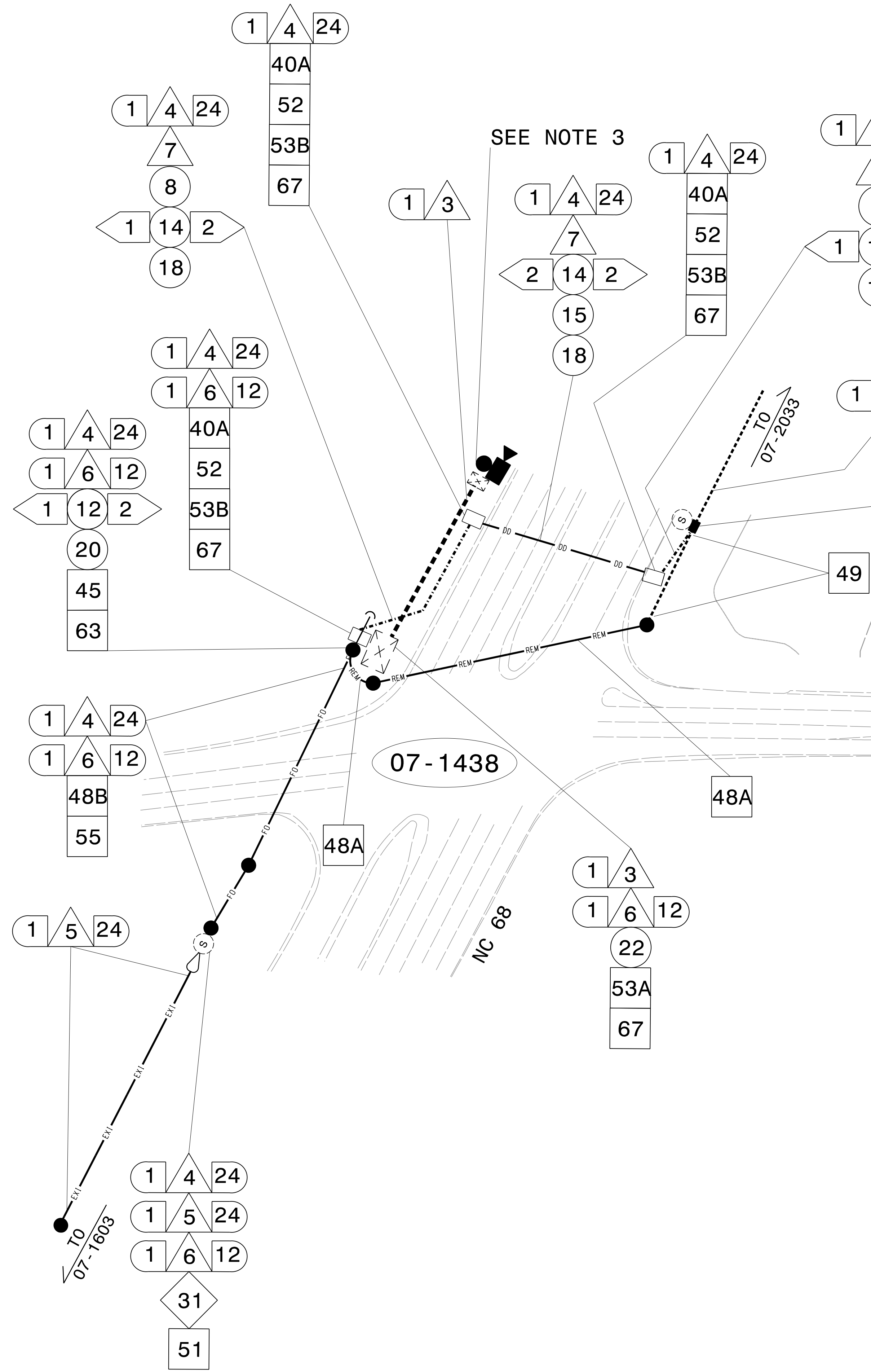
PLAN DATE: August 2024 REVIEWED BY: D.T. Sears

PREPARED BY: A.C. Norman REVIEWED BY:

REVISIONS	INIT.	DATE

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 PORTER JONES  
 PROFESSIONAL ENGINEER  
 SEAL 056142  
 PORTER JONES  
 8/22/2024  
 CADD File name:



-L- SR 1556 (Gallimore Dairy Road)

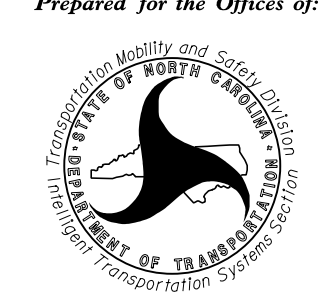
**NOTES:**

1. NOTIFY THE TRAFFIC SIGNAL SYSTEMS COORDINATOR AT (336) 373-4192 TO ARRANGE FOR THE CITY TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC SIGNAL SYSTEMS COORDINATOR AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL. HIGH POINT SIGNAL SYSTEM MUST BE BACK UP AND OPERATIONAL IN 24-HOURS (SEE ICT).
2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE CITY OF HIGH POINT ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.
3. RETAIN EXISTING CCTV CAMERA, POLE, CABINET, CABLE, AND ASSOCIATED EQUIPMENT.
4. MAINTAIN A MINIMUM OF SIX (6) FEET FROM THE EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY UNLESS OTHERWISE NOTED ON THE PLANS.

BREAKLINE SEE SHEET SCP 3

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TMP Phase I - Final Design

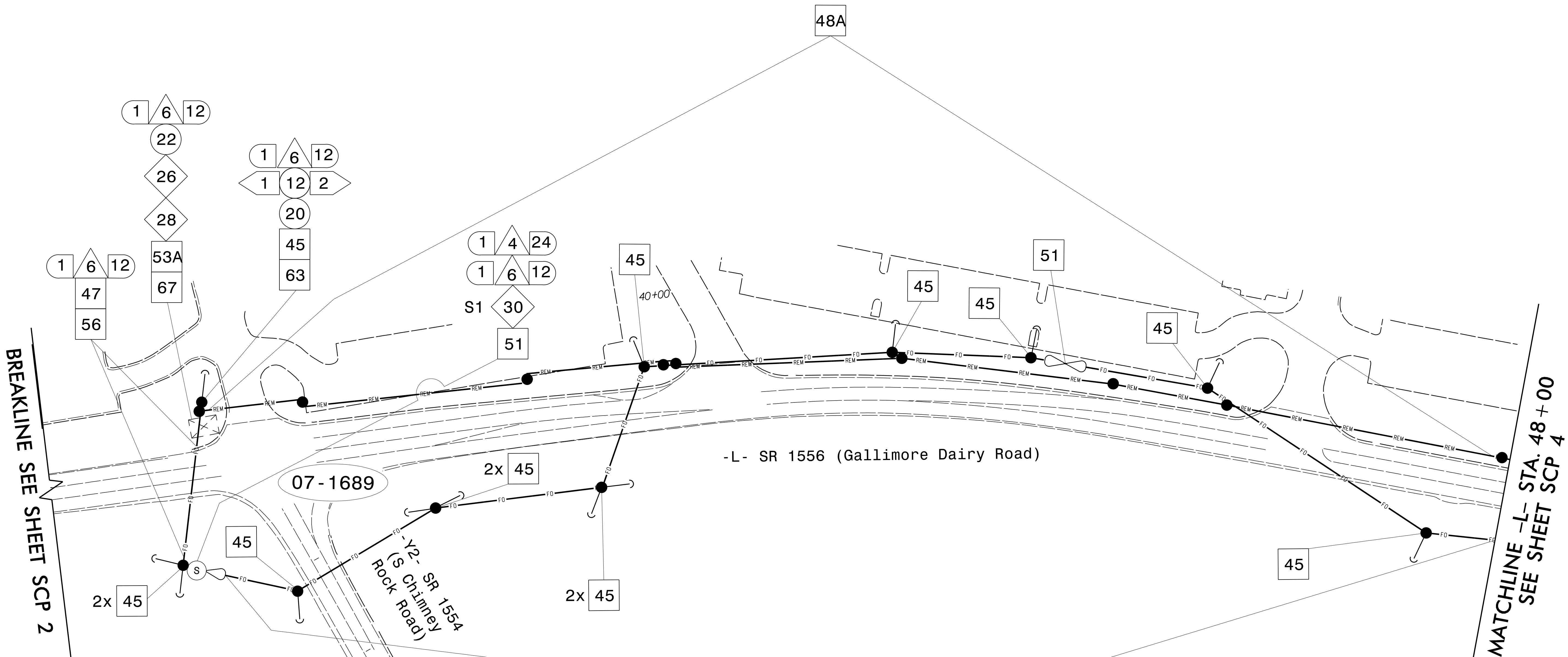
Prepared for the Offices of:  
  
 Signal System-City of High Point  
 Signal Communications Plans

Division 07 Guilford County High Point  
 PLAN DATE: August 2024 REVIEWED BY: D.T. Sears  
 PREPARED BY: A.C. Norman REVIEWED BY:

REVISIONS	INIT.	DATE

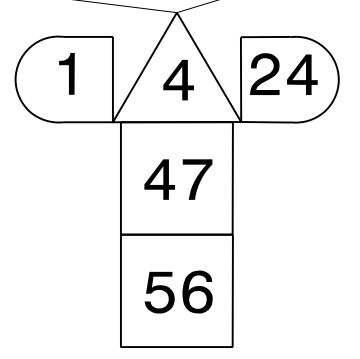
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 SEAL 056142  
 W. PORTER JONES  
 PORTER JONES  
 8/22/2024  
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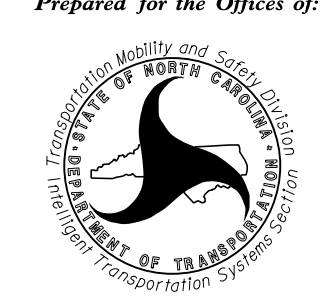
NOTES:

1. NOTIFY THE CITY OF GREENSBORO FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM TO ALLOW FOR THE CITY TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK, AND VLAN ID INFORMATION. NOTIFY THE CITY AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS OPERATIONAL. GREENSBORO SIGNAL SYSTEM MUST BE BACK UP AND OPERATIONAL IN 24-HOURS (SEE ICT).
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3. ALL CITY SIGNAL FIBER ATTACHMENT POINTS ARE 12" BELOW THE LOWEST FIBER OPTIC CABLE, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.
4. ONCE THE NEW SIGNAL SYSTEM FIBER OPTIC CABLE NETWORK HAS BEEN INSTALLED AND TERMINATED ALONG THE ENTIRE PROJECT, CUT, DELASH, BACKPULL, AND REROUTE THE EXISTING FIBER OPTIC CABLE TO THE SPLICE ENCLOSURES AT SPLICE POINTS "S1" AND "S2" AND CUT OVER TO THE NEW FIBER OPTIC CABLE. CUTTING OVER TO THE NEW FIBER OPTIC CABLE SHALL NOT EXCEED 24 HOURS (SEE ICT) CUTTING OVER TO THE NEW FIBER OPTIC CABLE IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL AND COMMUNICATION WITH THE CENTRAL SYSTEM.



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TMP PHASE I - FINAL DESIGN

Prepared for the Offices of:  


Signal System-City of Greensboro  
 Signal Communications Plans

Division 07 Guilford County Greensboro

PLAN DATE: August 2024 REVIEWED BY: D.T. Sears

PREPARED BY: A.C. Norman REVIEWED BY:

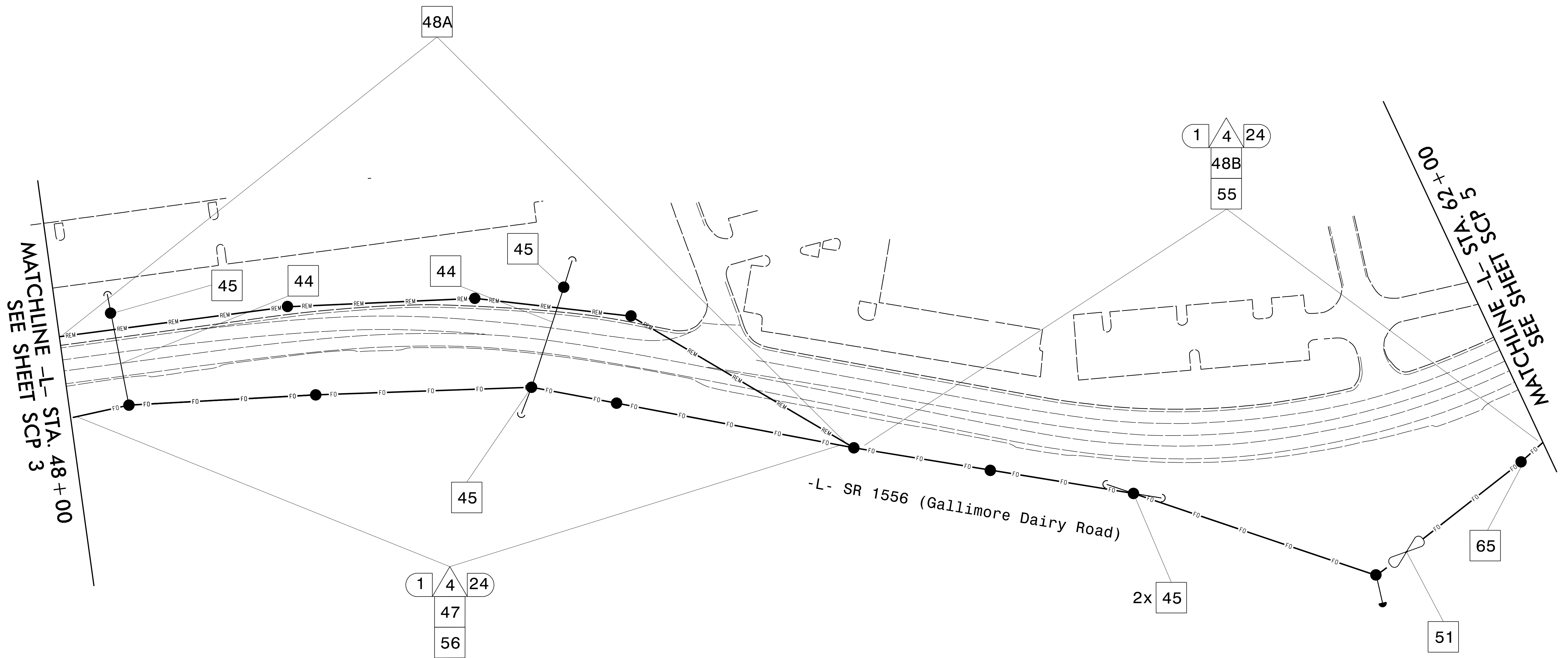
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SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 056142  
 W. PORTER JONES

DocuSigned by:  
 Porter Jones  
 8/22/2024

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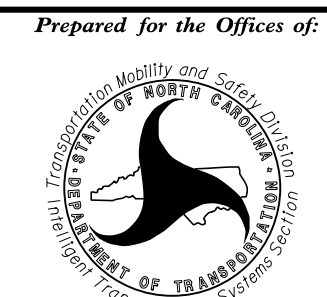


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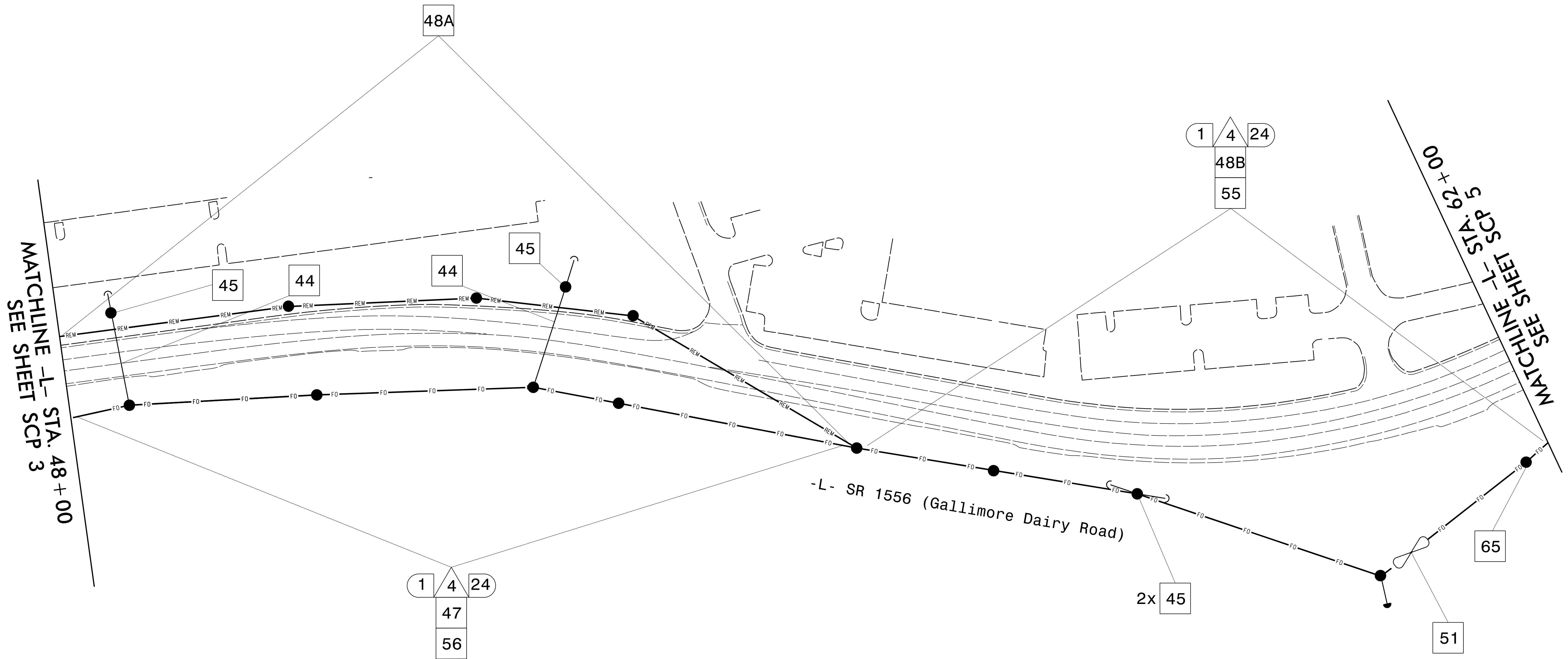
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 W. PORTER JONES

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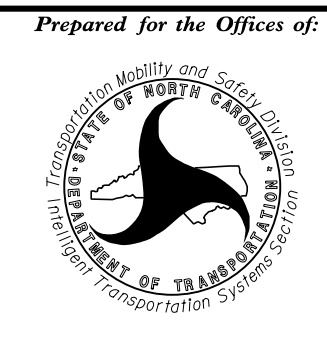


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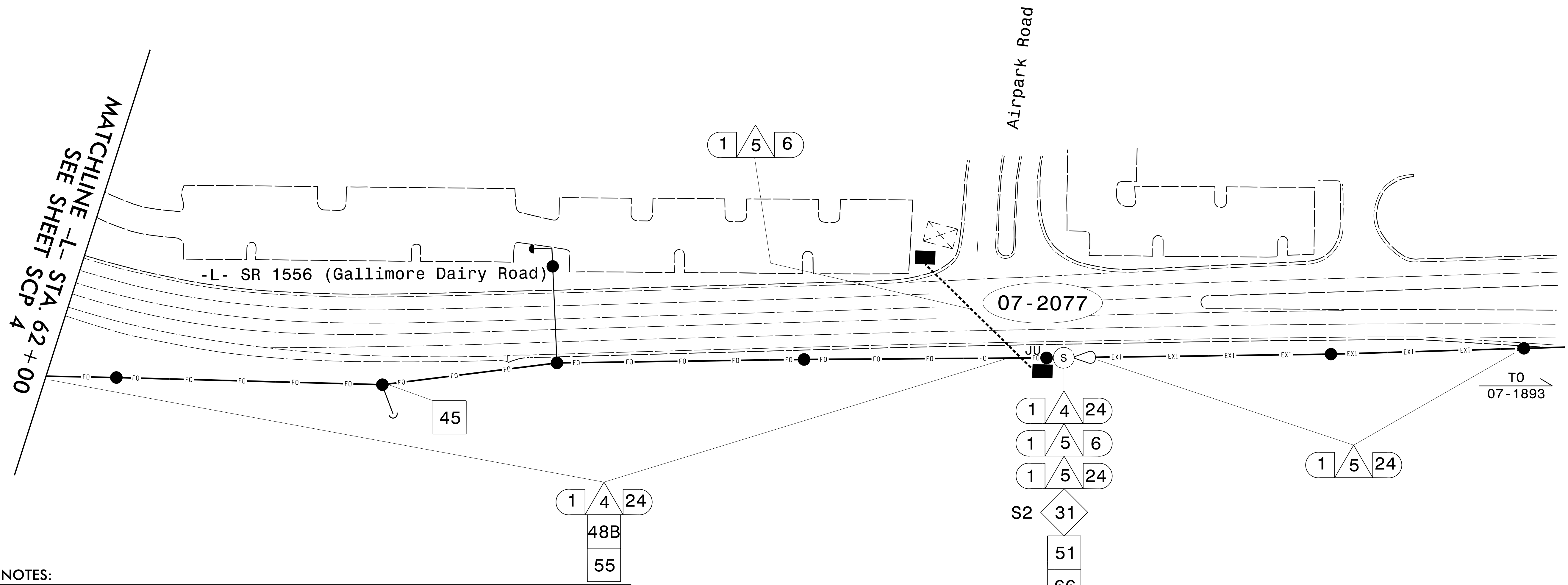
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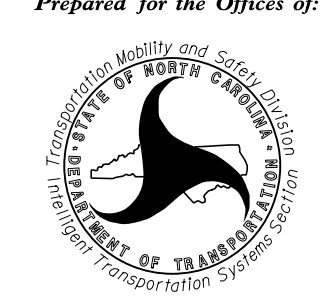


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 Department of Transportation, State of North Carolina

Signal System-City of Greensboro  
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