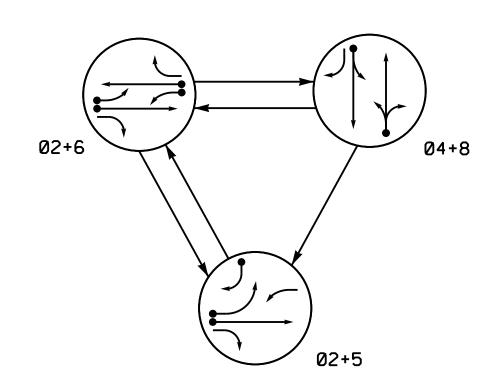
#### DEFAULT PHASING DIAGRAM



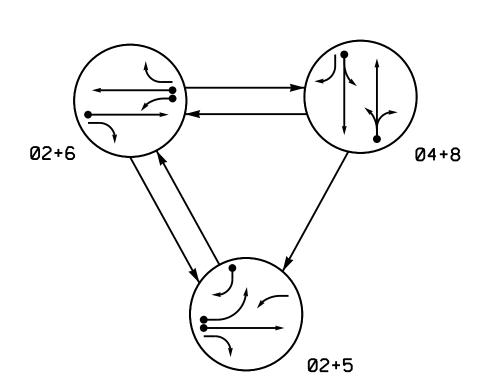
#### PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

UNSIGNALIZED MOVEMENT →---- PEDESTRIAN MOVEMENT

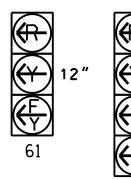
#### ALTERNATE PHASING DIAGRAM

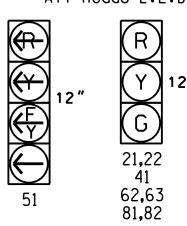


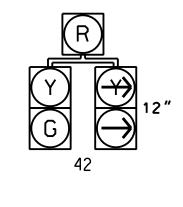
DEFAULT PHASING TABLE OF OPERATION									
		PHA	ASE						
SIGNAL FACE	<b>0</b> 2+5	<b>0</b> 2+6	04+8	11日のエ					
21,22	G	G	R	Υ					
41	R	R	G	R					
42	$\gtrsim 1$	R	G	R					
51	+	누	#	<del>*</del>					
61	누	₽	#	<del>-</del> ¥					
62,63	R	G	R	Υ					
81,82	R	R	G	R					

## SIGNAL FACE I.D.

All Heads L.E.D.







OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

TABLE OF					
		PHA	4SE		
SIGNAL	0	00	0	٦-	
FACE	<b>◎</b> ~+5	Ø2+6	<b>0</b> 4 + 8	エーロのエ	
	5	6	8	ŊΙ	
21,22	G	G	R	Υ	
41	R	R	G	R	
42	$\mathbb{R}/$	R	G	R	
51	<b>—</b>	#	#	<del>-Y</del>	
61	누	누	#	<del>⊀</del>	
62,63	R	G	R	Υ	
81,82	R	R	G	R	

ALTERNATE PHASING

\* Multizone Microwave Detection.

INDUCTIVE LOOPS

6X6 300

6x6 | 300

FROM

STOPBAR

SIZE

6X:40

6X40

6X40

6X40

LOOP

4·A

6·A

6B

\*\* Disable phase 2 call for 5A during alternate phasing operation.

\*\*\* Reduce delay to 3 seconds during alternate phasing operation.

\* |\*| 4 |Y|Y|-|

DETECTOR PROGRAMMING

\*\*\*15

PROJECT REFERENCE NO. R-5021

3 Phase Fully Actuated (NC 133 Closed Loop System)

#### **NOTES**

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 7. Incorporate Microwave Detection system for vehicle detection.
- 8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 10. Closed loop system data: Controller Asset #: 1043.

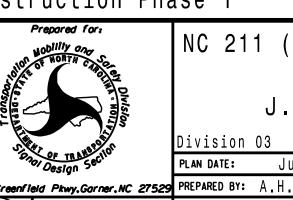
## LEGEND

**PROPOSED** 

$\bigcirc$	Traffic Signal Head	<b></b>
<b>O</b>	Modified Signal Head	N/A
$\dashv$	Sign	$\dashv$
$\downarrow$	Pedestrian Signal Head With Push Button & Sign	•
0	Signal Pole with Guy	•
$O_{\perp}$	Signal Pole with Sidewalk Guy	
$\boxtimes$	Controller & Cabinet	κ×3 Κ×3
	Junction Box	
	2-in Underground Conduit -	— - — -
N/A	Right of Way -	
$\longrightarrow$	Directional Arrow	$\longrightarrow$
	Microwave Detection Zone	
	Construction Zone	N/A

Construction Barricade Right Arrow "ONLY" Sign (R3-5R) Combined Through and Left Arrow Sign (R3-6L)

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



Brunswick Co. June 2017 REVIEWED BY: A.D. Klinksiek

031464 SIG. INVENTORY NO. 03-1043T

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

\* 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.

ON

OASIS 2070 TIMING CHART

2.0

30

3.7

2.4

2.0

12

6.0

90

4.8

1.4

2.0

2.5

15

30

3.0

MIN RECALL

YELLOW

**FEATURE** 

Min Green 1 \*

Extension 1 \*

Max Green 1 \*

Red Clearance

Walk 1 \*

Don't Walk 1

Seconds Per Actuation

Time Before Reduction

Max Variable Initial \*

Time To Reduce \*

Vehicle Call Memory

Simultaneous Gap

Minimum Gap

Recall Mode

Dual Entry

Yellow Clearance

**PHASE** 

2.0

25

3.0

2.6

2.0

ON

12

6.0

90

4.8

1.4

2.0

2.5

34

15

30

3.0

MIN RECALL

YELLOW

2.0

30

3.0

3.9

2.0

ON

Wood Pole — — Wood Pole Sta. 359+92 +/- -L-Sta. 361+05 +/- -L-71' +/- Lt 73′ +/- Lt NC 211 (Southport-Supply Road) 45 MPH +3% Grade NC 211 (Southport-Supply Road) 45 MPH -3% Grade Wood Pole -Wood Pole Sta. 359+99 +/- -L-Sta. 361+17 +/- -L-61′ +/- Rt 72' +/- Rt

> Signal Upgrade Temporary Design 1 Construction Phase

> > NC 211 (Southport-Supply Road)

J. Swain Boulevard

'50 N.Greenfleig Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

H CARO

<u>EXISTING</u>

N/A

#### EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL WD ENABLE (\)

ON OFF

= DENOTES POSITION

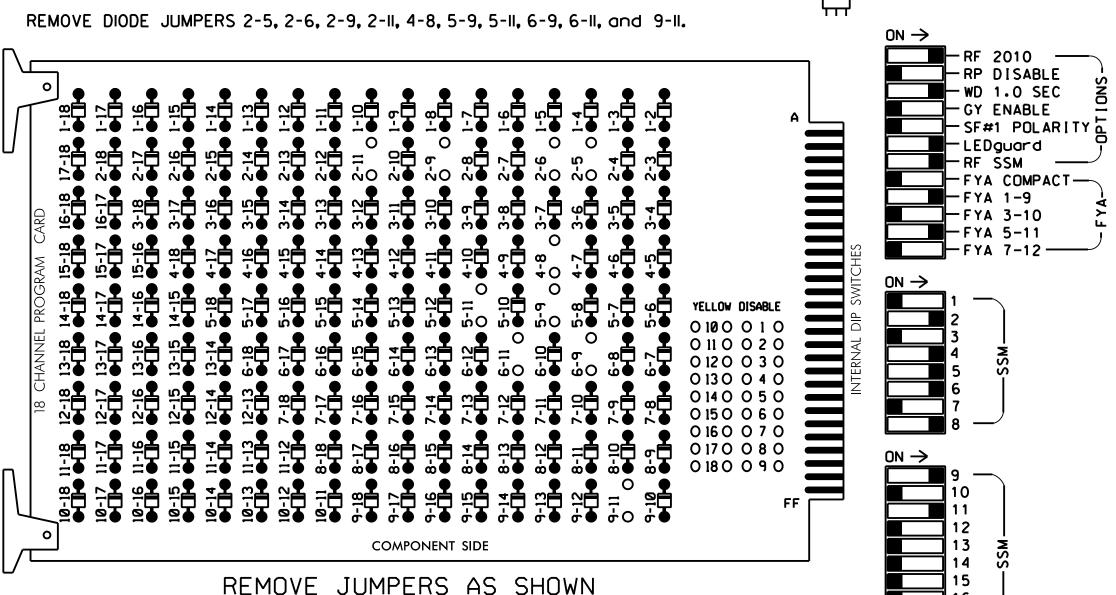
OF SWITCH

DC ISOLATOR

ST

FS = FLASH SENSE ST = STOP TIME

(remove jumpers and set switches as shown)



INPUT FILE POSITION LAYOUT

2 3 4 5 6 7 8 9 10 11 12 13 14

<sup>⊗</sup> Wired Input - Do not populate slot with detector card

(front view)

#### NOTES:

FILE U

FILE U

NOT

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

"J"

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE.....ECONOLITE OASIS CABINET MOUNT.....BASE OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1.

AUX S4

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

#### PROJECT REFERENCE NO. Sig. 25

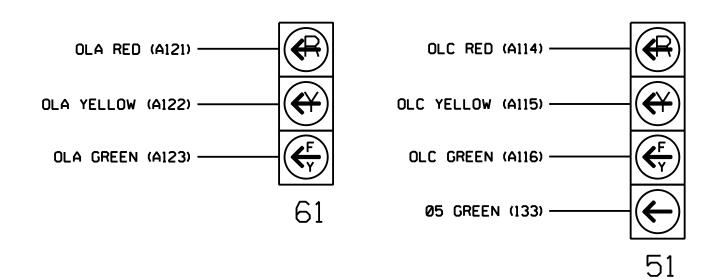
SIGNAL HEAD HOOK-UP CHART																			
LOAD SWITCH NO.	Sl	S2	<b>S</b> 3	<b>S4</b>	S5	S6	9	57	S8	<b>S</b> 9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	ļ	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED		5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	<b>5</b> 1	62,63	NU	NU	81.82	NU	<b>6</b> 1	NU	NU	<b>★</b> 51	NU	NU
RED		128			101		*		134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW														A121			A114		
YELLOW ARROW							132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW							133	133											

NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### <u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4

Signal Upgrade Temporary Design 1

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

TH CARO

SIG. INVENTORY NO. 03-1043T1

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard

Division 03 Brunswick Co. June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

031464 Southport INIT. DATE

REVISIONS 750 N.Greenfield Pkwy.Garner.NC 27529

## LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (min) 2.0K - 3.0K | 10W (min) PHASE 5 RED FIELD TERMINAL (131)

#### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
	**	JlU	55	17	5	5	Υ	Υ			15
ZONE 5A	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3
	-	JlU	55	17 ★	55	5	Υ	Υ			3

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.
- \*\* Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L FILE J-SLOT 2-LOWER .

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

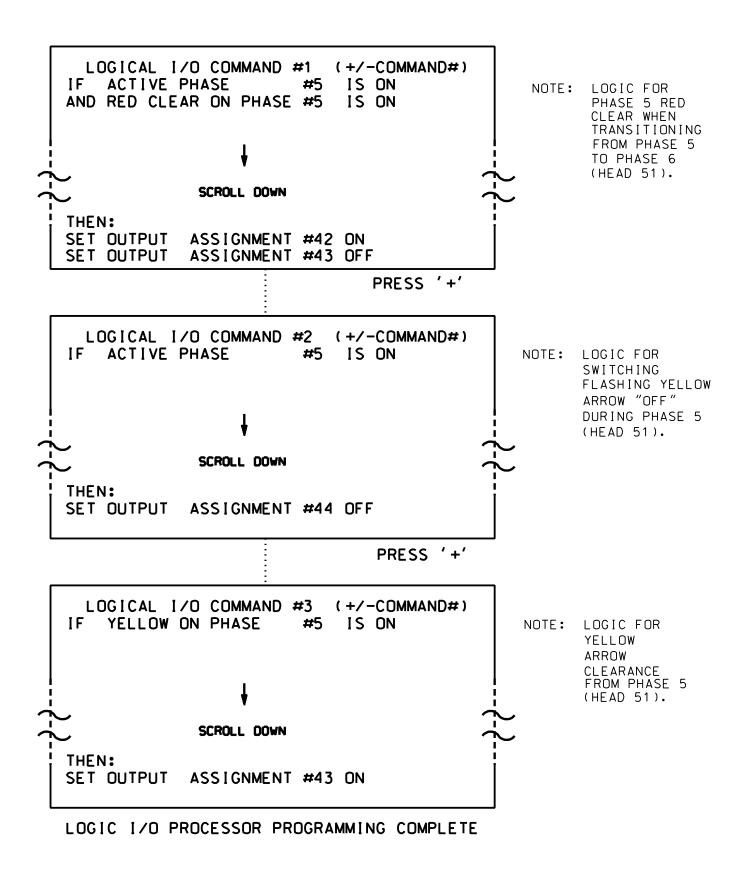
#### PROJECT REFERENCE NO. Sig 25 R-5021

#### LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

#### TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red

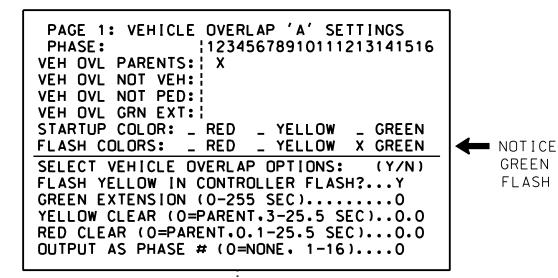
OUTPUT 43 = Overlap C Yellow

OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).



PRESS '+' TWICE

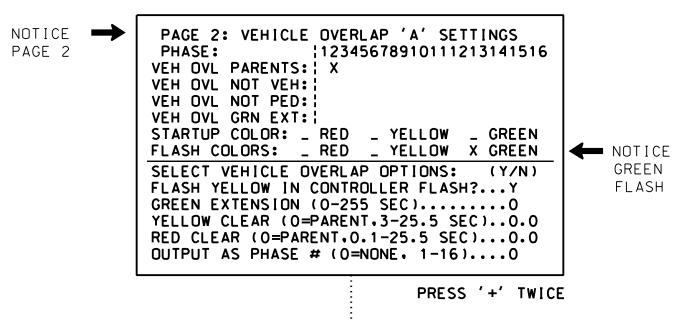
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

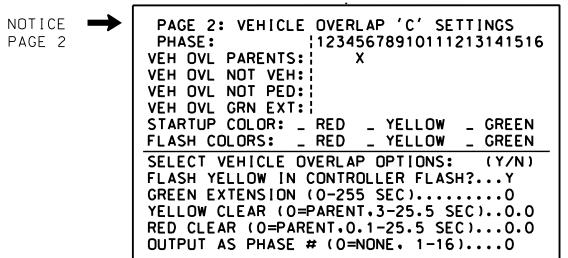
OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.





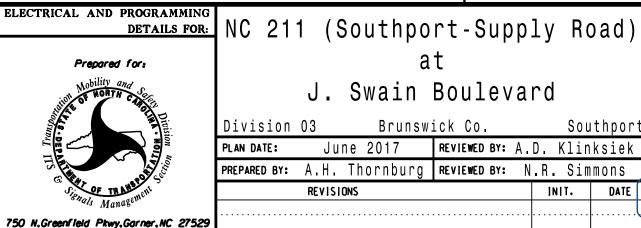
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

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



Temporary Design 1

J. Swain Boulevard Brunswick Co Southport REVIEWED BY: A.D. Klinksiek June 2017 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

TH CARO 031464

SIG. INVENTORY NO. 03-1043T1

REVISIONS

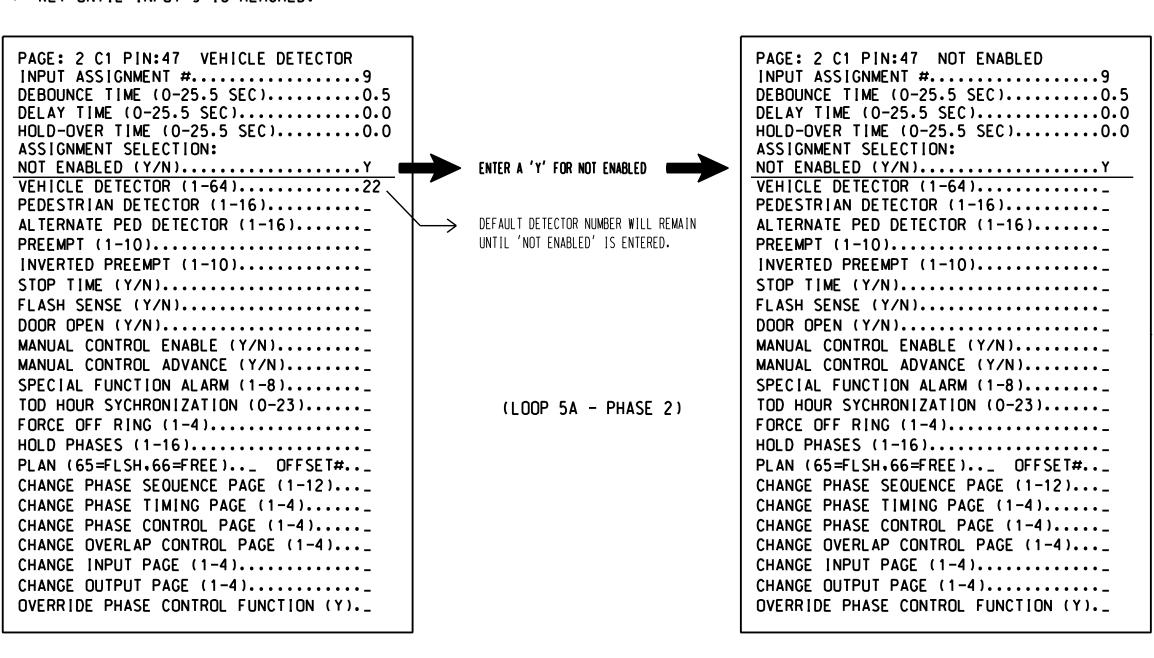
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... PRESS '+' TO ADVANCE TO INPUT 17 DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4)....

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig 25

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+1-64) SETTING: (Y/N) ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	VEHICLE DETECTOR #55 SETTINGS (+1-64) SETTING: (Y/N) ENABLE DETECTOR
MODE 2 STOP BARN		MODE 2 STOP BARN
SWITCHING DETECTORN DUPLICATING DETECTORN		SWITCHING DETECTORN DUPLICATING DETECTORN
ENABLE FULL TIME DELAYN  IF FAILED, SET MIN RECALL?N		ENABLE FULL TIME DELAYN  IF FAILED, SET MIN RECALL?N
IF FAILED, SET MAX1 RECALL?N IF FAILED, SET MAX2 RECALL?N		IF FAILED. SET MAX1 RECALL?N IF FAILED. SET MAX2 RECALL?N
PHASE#   12345678910111213141516 PHASES ASSIGNED		PHASE#   12345678910111213141516   PHASES ASSIGNED   X
SWITCH/DUPLICATE!	ENTER '5' FOR PHASES ASSIGNED	SWITCH/DUPLICATE;
LOOP SIZE (0-255 FT)6 SPEED TRAP DISTANCE (0-255 FT)0		LOOP SIZE (0-255 FT)6 SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)		STOP BAR TIME (0-255 SEC)
DELAY (0-255 SEC)	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0 MAX OCCUPANCY (0-100%)100		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0 MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0  QUEUE GAP RESET TIME (0-25.5)0.0		QUEUE MAX OCCUPANCY TIME (0-255)0  QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 3 of 4 Signal Upgrade Temporary Design 1

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard

ivision 03 Brunswick Co Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg Reviewed BY: N.R. Simmons

TH CARO 031464

REVISIONS INIT. DATE SIG. INVENTORY NO. 03-1043T1

PROJECT REFERENCE NO. R-5021 Sig 25.

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase for head 51 to run protected

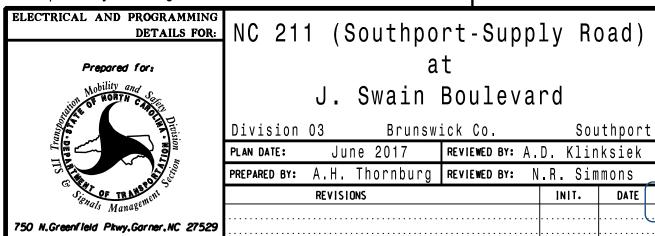
turns only.

INPUTS PAGE 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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J. Swain Boulevard

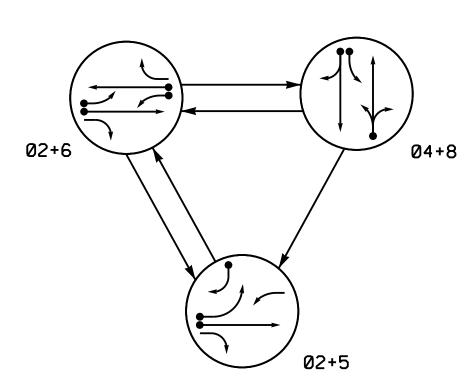
Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

ATH CAROL 031464

SIG. INVENTORY NO. 03-1043T1

#### PROJECT REFERENCE NO. R-5021

#### DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

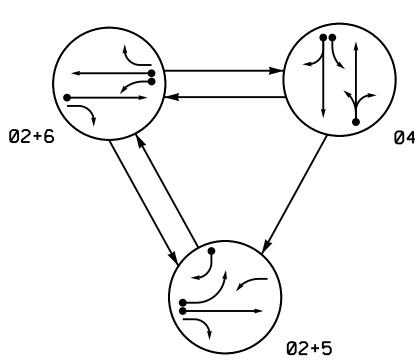
UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

◆---- PEDESTRIAN MOVEMENT

ALTERNATE PHASING DIAGRAM



 PHASING OPERATION		E PHASING OPERATION
PHASE		Phase

		PHA	4SE				PHA	15
SIGNAL FACE	<b>0</b> 2+5	Ø2+6	Ø 4 + 8	エーロのエ	SIGNAL FACE	0 2 + 5	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
21,22	G	G	R	Υ	21,22	G	G	
41,42	R	R	G	R	41,42	R	R	
51	+	쌰	₩	<del>*</del>	51	<b>—</b>	#	Y
61	цþ≻	누	#	<del>*</del>	61	₽	두	Y
62,63	R	G	R	Y	62,63	R	G	
81,82	R	R	G	R	81,82	R	R	

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS DETECTOR PROGRAMMING												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2·A	6X6	300	*	*	2	Υ	Υ	-	-	-	ı	-
4·A	6X40	0	*	*	4	Υ	Υ	-	-	-	-	-
4B	6X:40	0	*	*	4	Υ	Υ	-	-	10	-	-
5·A	6X40	0	*	*	5	Υ	Υ	-	-	<del>***</del> 15	-	-
) JA	6840		不	不	<del>***</del> 2	Υ	Υ	Υ	-	3	-	-
6·A	6X6	300	*	*	6	Υ	Υ	_	-	-	-	_
6B	6X40	0	*	*	6	Υ	Υ	Υ	-	3	-	-
8·A	6X40	0	*	*	8	Υ	Υ	-	-	-	ŀ	_

\* Multizone Microwave Detection.

\*\* Disable phase 2 call for 5A during alternate phasing operation.

\*\*\* Reduce delay to 3 seconds during alternate phasing operation.

	F	•	Pha Act	se tuate	d	
(NC	133	Clos	ed	Loop	System)	

#### NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Reposition existing signal heads numbered 21,22,51,81,82 and sign (A).
- 5. Set all detector units to presence mode.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 7. Incorporate Microwave Detection system for vehicle detection.
- 8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.

**LEGEND** 

Traffic Signal Head Modified Signal Head

Pedestrian Signal Head With Push Button & Sign

Signal Pole with Guy

Signal Pole with Sidewalk Guy

Controller & Cabinet Junction Box 2-in Underground Conduit

Right of Way

Directional Arrow Microwave Detection Zone

Construction Zone

Right Arrow "ONLY" Sign (R3-5R)

<u>EXISTING</u>

N/A

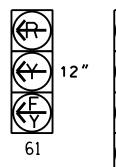
K×N K×N

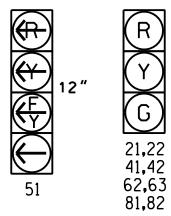
 $\longrightarrow$ 

N/A

- 9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 10. Closed loop system data: Controller Asset #: 1043.

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





R / W -			35 MPH +2% Grade  J. Swain Boulevard  R/W	
n/W —	NC 211 (Southport-Supply Road)		81 82	45 MPH +3% Grade
=				
=			63	
=		<b>5</b> (5)	61 51 -	
		→ →	21 <del></del>	
- R/W-	45 MPH -3% Grade	<b>*</b>	42 41 A	NC 211 (Southport-Supply Road
			84	

OA	SIS 20	70 TIM	IING CH	HART							
		PHASE									
FEATURE	2	4	5	6	8						
Min Green 1 *	12	7	7	12	7						
Extension 1 *	6.0	2.0	2.0	6.0	2.0						
Max Green 1 *	90	30	25	90	30						
Yellow Clearance	4.8	3.7	3.0	4.8	3.0						
Red Clearance	1.6	2.4	2.4	1.6	3.5						
Red Revert	2.0	2.0	2.0	2.0	2.0						
Walk 1 *	-	-	-	-	-						
Don't Walk 1	-	-	-	-	-						
Seconds Per Actuation *	2.5	-	-	2.5	-						
Max Variable Initial*	34	-	-	34	-						
Time Before Reduction *	15	-	-	15	-						
Time To Reduce *	30	-	-	30	-						
Minimum Gap	3.0	-	-	3.0	-						
Recall Mode	MIN RECALL	-	-	MIN RECALL	-						
Vehicle Call Memory	YELLOW	-	-	YELLOW	-						
Dual Entry	_	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.

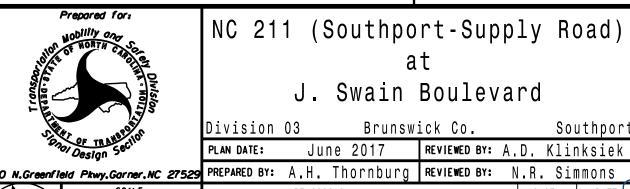
ON

Simultaneous Gap

ON

Signal Upgrade Temporary Design 2 Construction Phase 1a-1e

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



**PROPOSED** 

 $\circ$ 

J. Swain Boulevard

Brunswick Co. Division 03 June 2017

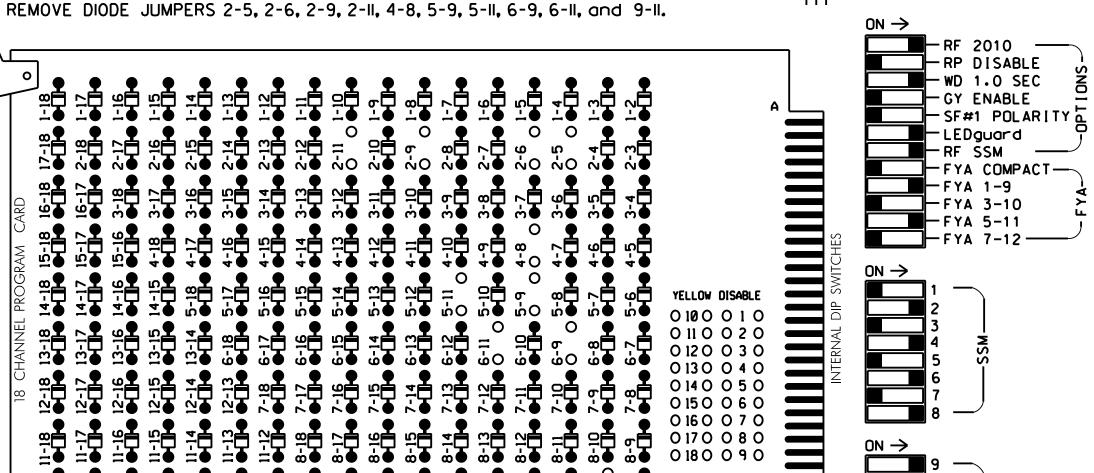
TH CARO 031464 SIG. INVENTORY NO. 03-1043T2

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

REVIEWED BY: A.D. Klinksiek '50 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

#### EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL WD ENABLE (\)

(remove jumpers and set switches as shown)



ON OFF

= DENOTES POSITION

OF SWITCH

DC ISOLATOR

ST

FS = FLASH SENSE ST = STOP TIME

COMPONENT SIDE

REMOVE JUMPERS AS SHOWN

#### NOTES:

FILE U

FILE U

NOT

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

"J"

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

2 3 4 5 6 7 8 9 10 11 12 13 14

(front view)

#### **NOTES**

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E 

SOFTWARE.....ECONOLITE OASIS

CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1.

AUX S4

PHASES USED...........2,4,5,6,8 

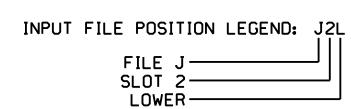
OVERLAP "B".....NOT USED

OVERLAP "C".....5+6 OVERLAP "D".....NOT USED

LOOP	NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
		**	JlU	55	17	5	5	Y	Υ			15
ZONE	5A <sup>1</sup>	-	I4U	47	9 🛨	22	2	Y	Υ	Y		3
		-	JlU	55	17 ★	55	5	Y	Υ			3

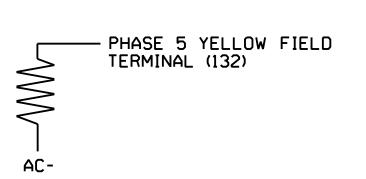
INPUT FILE CONNECTION & PROGRAMMING CHART

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.
- ★★ Multizone Microwave Detector Zone. See Special Detector Note.



LOAD RESISTOR INSTALLATION DETAIL (install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (m1n)



<sup>⊗</sup> Wired Input - Do not populate slot with detector card

REMOVE RESISTOR FROM PHASE 5 RED IMPORTANT: FIELD TERMINAL. IF PRESENT.

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

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Raleigh, North Carolina 27609
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(919) 546-8997

PROJECT REFERENCE NO. Sig. 26

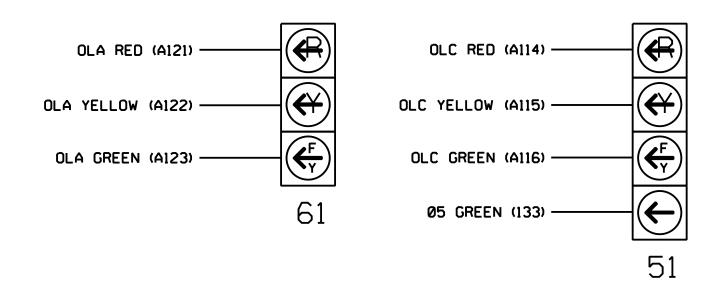
					SIC	ANE	L	HEA	D I	100	K-l	JP	CHA	٩RT	•			
LOAD SWITCH NO.	Sl	S2	<b>S</b> 3	<b>S4</b>	S5	S6	<b>S7</b>	S8	<b>S</b> 9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	g	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	<b>★</b> 51	62,63	NU	NU	81,82	NU	<b>★</b>	NU	NU	<b>5</b> 1	NU	NU
RED		128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							133											

NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



<u>NOTE</u>

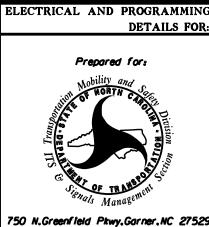
The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4 Signal Upgrade

Temporary Design 2

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



DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard

Division 03 Brunswick Co. June 2017

Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE



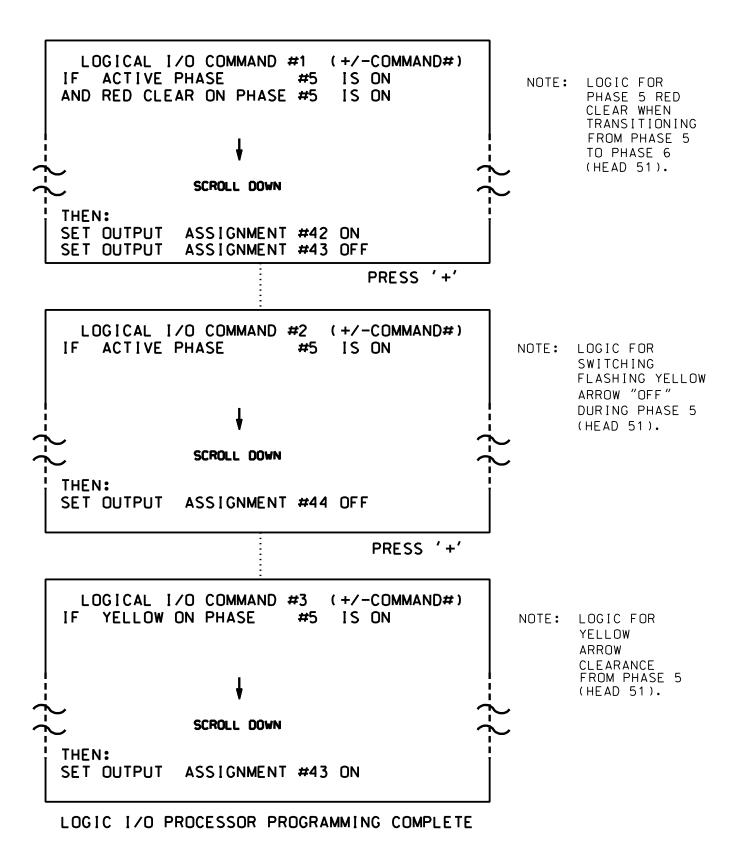
#### PROJECT REFERENCE NO. Sig 26 R-5021

#### LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

#### TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red

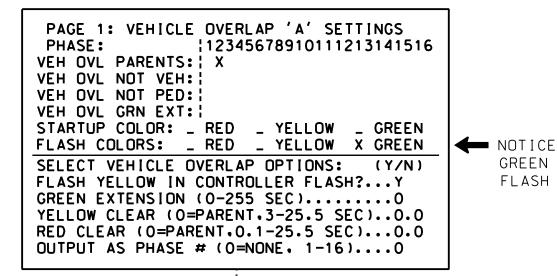
OUTPUT 43 = Overlap C Yellow

OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).



PRESS '+' TWICE

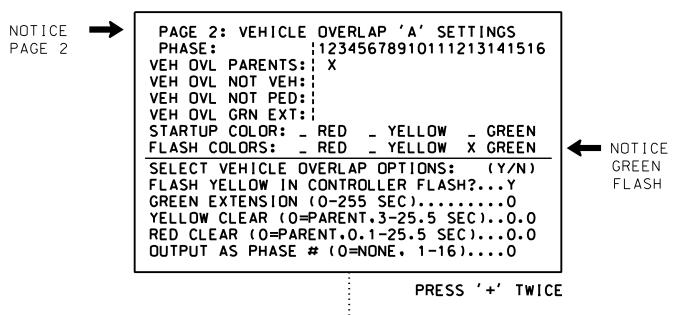
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

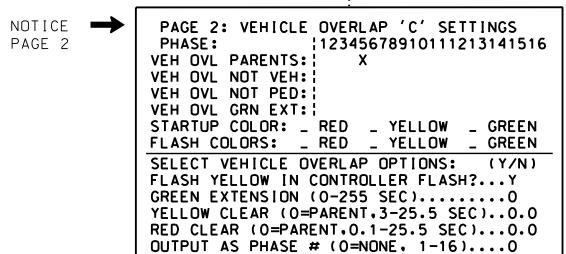
OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.



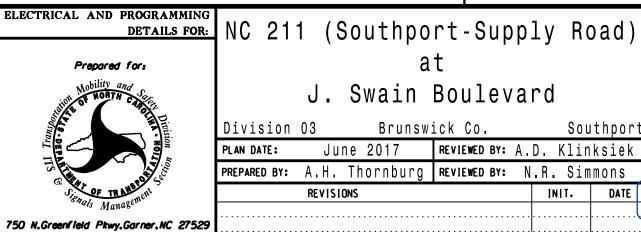


OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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



J. Swain Boulevard Brunswick Co

Southport REVIEWED BY: A.D. Klinksiek June 2017 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS

SIG. INVENTORY NO. 03-1043T2

TH CARO

031464

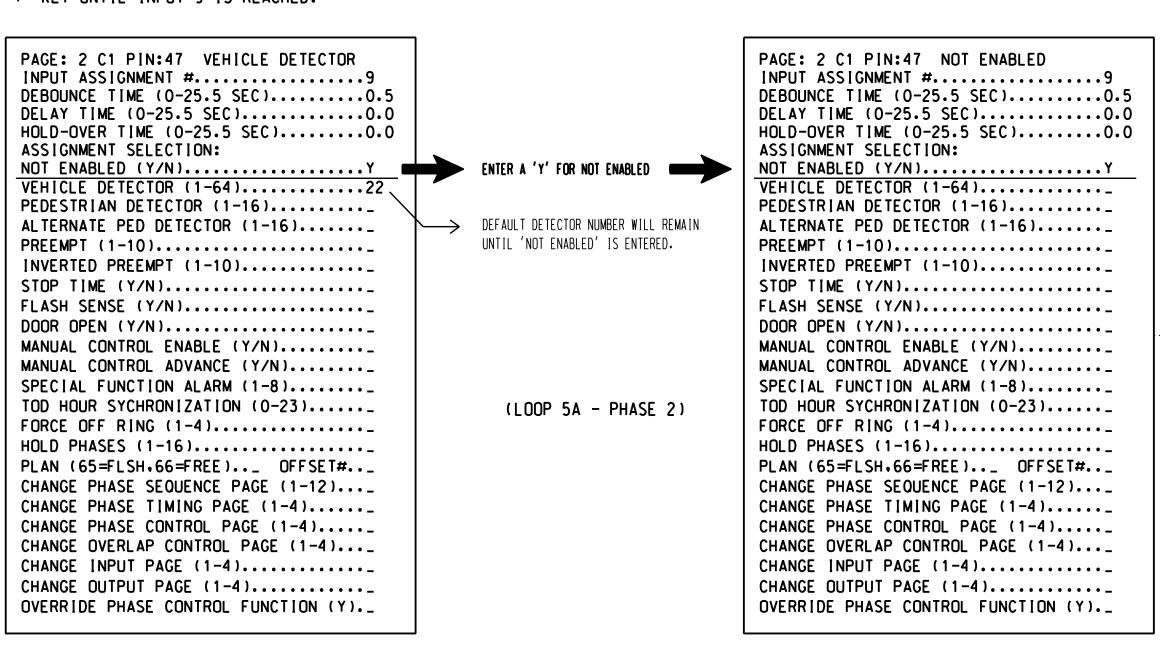
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



PRESS '+' TO ADVANCE TO INPUT 17

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig 26

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)		VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGING	ENTER I FUR ENABLE DETECTOR	ENABLE LOGGING
ENABLE DIAGNOSTICS		ENABLE DIAGNOSTICS
SPEED TRAP		SPEED TRAP
CALL DETECTORY		CALL DETECTOR
EXTENSION DETECTOR		EXTENSION DETECTOR
MODE 2 STOP BAR		MODE 2 STOP BAR
SWITCHING DETECTOR		SWITCHING DETECTOR
DUPLICATING DETECTOR		DUPLICATING DETECTOR
ENABLE FULL TIME DELAY		ENABLE FULL TIME DELAY
IF FAILED, SET MIN RECALL?		IF FAILED, SET MIN RECALL?
IF FAILED. SET MAX1 RECALL?		IF FAILED. SET MAX1 RECALL?
IF FAILED. SET MAX2 RECALL?		IF FAILED. SET MAX2 RECALL?
PHASE# 12345678910111213141516		PHASE#   12345678910111213141516
PHASES ASSIGNED :	ENTER '5' FOR PHASES ASSIGNED	PHASES ASSIGNED   X
SWITCH/DUPLICATE;		SWITCH/DUPLICATE;
LOOP SIZE (0-255 FT)6		LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)0		STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)		STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)0	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255		MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0		QUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0		QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 3 of 4 Signal Upgrade Temporary Design 2

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard ivision 03

Brunswick Co Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg Reviewed BY: N.R. Simmons REVISIONS

TH CARO 031464

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

INIT. DATE SIG. INVENTORY NO. 03-1043T2

PROJECT REFERENCE NO. R-5021 Sig 26

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

1
2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase for head 51 to run protected

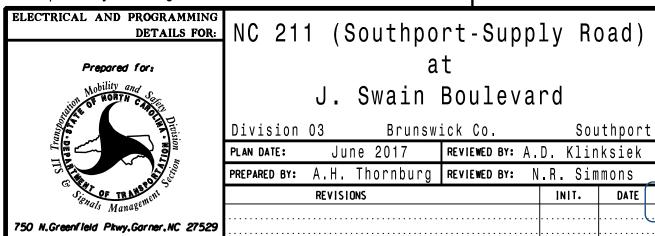
turns only.

INPUTS PAGE 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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



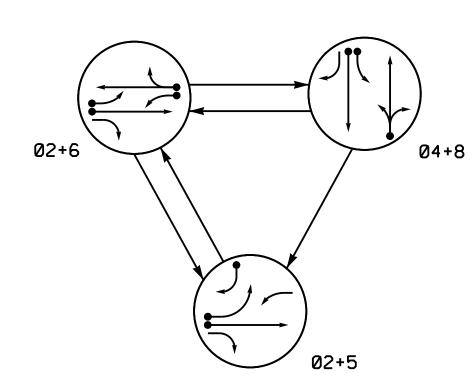
J. Swain Boulevard Brunswick Co.

Division 03 Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

ATH CAROL SE:AL 031464 SIG. INVENTORY NO. 03-1043T2

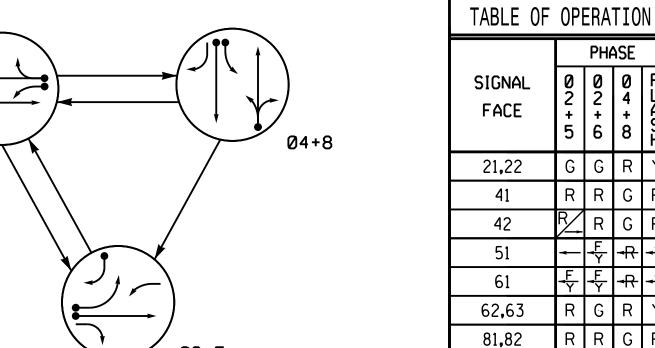
#### PROJECT REFERENCE NO. R-5021

#### DEFAULT PHASING DIAGRAM



# 02+6

## ALTERNATE PHASING DIAGRAM



DEFAULT PHASING

ALTERNAT TABLE OF									
PHASE									
SIGNAL FACE	<b>◎</b> ~+5	<b>0</b> 0 + 6	04+8	FLGOI					
21,22	G	G	R	Υ					
41	R	R	G	R					
42		R	G	R					
51	<b>↓</b>	#	#	<del>-</del> ¥					
61	щ≻	누	#	<del>-</del> Y					
62,63	R	G	R	Υ					
81,82	R	R	G	R					

SIGNAL FACE I.D.

All Heads L.E.D.

21,22 41 62,63 81,82

12

61

OASIS	2070	LOOD	0 DET	.E.C	TAR	ΤN	ICT	. V I	1 ATT(	7VI CH	<u>۸ D</u>	eg
04212	2070	LUUP	מ טבו	<u> </u>	IUK	Τ  /	101	AL	LAII	אוע עוע	AK	_
lI I	NDUCTI	OR	PI	ROGRAN	MMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2·A	6X6	300	*	*	2	Υ	Υ	-	-	-	-	-
4A	6X:40	0	*	*	4	Υ	Υ	-	-	-	-	_
4B	6X:40	0	*	*	4	Υ	Υ	-	-	-	-	_
5 <sub>A</sub>	6X:40	0	*	*	5	Υ	Υ	-	-	<del>***</del> 15	ı	-
JA	0240		不	不	<del>***</del> 2	Υ	Υ	Υ	-	3	-	_
5B	6X:40	0	*	*	5	Υ	Υ	-	-	15	1	Υ
6·A	6X6	300	*	*	6	Υ	Υ	-	-	-	-	-
6B	6740	$\cap$	<b>4</b>	业	6	$\overline{v}$	V	V	_	3		

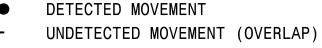
\* Multizone Microwave Detection. \*\* Disable phase 2 call for 5A during alternate

phasing operation. \*\*\* Reduce delay to 3 seconds during alternate phasing operation.

## 3 Phase Fully Actuated (NC 133 Closed Loop System)

#### **NOTES**

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Reposition existing signal heads numbered 21,22,51,61,62,63,81,82, and sign  $\Theta$ .
- 5. Set all detector units to presence mode.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 7. Incorporate Microwave Detection system for vehicle detection.
- 8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 10. Closed loop system data: Controller Asset #: 1043.



UNSIGNALIZED MOVEMENT

PHASING DIAGRAM DETECTION LEGEND

→---- PEDESTRIAN MOVEMENT

		35 MPH +2% Grade 35 MPH +2% Grade  J. Swain Boulevard  J. Swain Boulevard	
R/W-	NC 211 (Southport-Supply Road)		45 MPH +3% Grade
n / W -		81 82	
= -	<u> </u>	63 62 - 61 - 51 - 66 - 61 - 21 - 6	
-		22 <sub>A</sub> +	
R / W -	45 MPH -3% Grade	42 41 8A	NC 211 (Southport-Supply Road)
0		ational iveway W	
0 5 0		First National Bank Driveway R/W	

#### LEGEND

	<u>LLGLIID</u>	
<u>PROPOSED</u>		<b>EXISTING</b>
$\bigcirc$	Traffic Signal Head	<b></b>
<b>O</b> ->	Modified Signal Head	N/A
$\dashv$	Sign	$\dashv$
$\downarrow$	Pedestrian Signal Head With Push Button & Sign	•
0	Signal Pole with Guy	•
	Signal Pole with Sidewalk Guy	
$\boxtimes$	Controller & Cabinet	κχη Κχ
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
$\longrightarrow$	Directional Arrow	$\longrightarrow$
	Microwave Detection Zone	
	Construction Zone	N/A

⟨A⟩ Right Arrow "ONLY" Sign (R3-5R) (A)

Extension 1 *	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	90	30	25	90	30
Yellow Clearance	4.8	3.7	3.0	4.8	3.0
Red Clearance	1.6	1.4	2.9	1.6	3.5
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	2.5	-	-	2.5	-
Max Variable Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	30	-	-	30	-

OASIS 2070 TIMING CHART

**FEATURE** 

Min Green 1 \*

Minimum Gap

Dual Entry

Vehicle Call Memory

Simultaneous Gap

**PHASE** 

12

3.0

MIN RECALL

YELLOW

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.

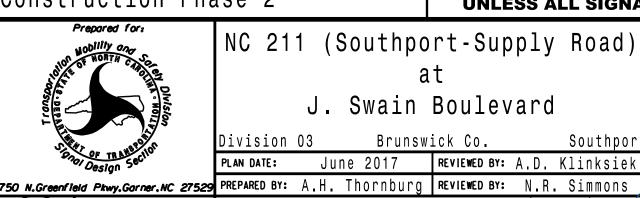
ON

3.0

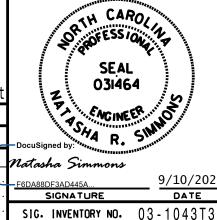
MIN RECALL

Signal Upgrade Temporary Design 3 Construction Phase 2

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



REVIEWED BY: A.D. Klinksiek



## **NOTES**

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE.....ECONOLITE OASIS CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1.

PHASES USED...........2,4,5,6,8

AUX S4

OVERLAP "A"......2 OVERLAP "B".....NOT USED OVERLAP "C".....5+6 OVERLAP "D".....NOT USED

## INPUT FILE POSITION LAYOUT

(front view)

EDI MODEL 2018ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

COMPONENT SIDE

REMOVE JUMPERS AS SHOWN

2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.

controller. Ensure conflict monitor communicates with 2070.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

VALUE (ohms) WATTAGE

1.5K - 1.9K 25W (m1n) |2.0K - 3.0K | 10W (min) |

3. Ensure that Red Enable is active at all times during normal operation.

4. Connect serial cable from conflict monitor to comm. port 1 of 2070

1. Card is provided with all diode jumpers in place. Removal

of any jumper allows its channels to run concurrently.

NOTES:

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

ON OFF

-RF 2010 -RP DISABLE

─ LEDguard

FYA COMPACT—

⊢RF SSM

FYA 1-9 FYA 3-10

FYA 5-11 FYA 7-12 ----

= DENOTES POSITION OF SWITCH

- WD 1.0 SEC GY ENABLE

- SF#1 POLARITY

WD ENABLE  $\Omega$ 

	1	2	3	4	5	6	7	8	9	10	11	12	13	14								
FILE U	SLO	S L O T	S L Q	%—₩—₩	S L O T	S L O	SLO	S L O	S L O T	SLO	S L Q	S L OT	SLOT	FS								
"I" L	EMPT	EM P T	- EMPT	יכ שב ה א	EMPT	- EMPT	E M P T	E M P T	E M P T	E M P T	E MP T	EMPT	- EMPTY	DC ISOLATOR S T DC								
	Ø 5	Y S	S	Š	S	y S	S	S	S	Y S	S	S	S	ISOLATOR								
FILE U	ZONE 5A	SLOT	LOT		ר ב ב	Ö	LOT	L O T	L O T	LOT			Ď	U U								
"J" L	NOT USED	EMPTY	E∑₽⊢≻	EMPLY	₩ <b>∑</b> ₽⊢≻	ш∑₽⊢≻	⊞∑₽⊢ϒ	EMPTY	EMPTY	WMOFY	EMPTY	WMPTY	<b>⊞∑⊕⊢</b> ≻	E MP T Y								
	EX.: 1A	, 2A, E	TC. = L	00P N0	'S					EX.: 1A, 2A, ETC. = LOOP NO.'S  FS = FLASH SENSE ST = STOP TIME												

<sup>⊗</sup> Wired Input - Do not populate slot with detector card

PHASE 5 RED FIELD

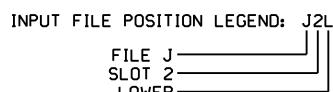
TERMINAL (131)

#### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
	**	JlU	55	17	5	5	Y	Υ			15
ZONE 5A1	-	I4U	47	9 🖈	22	2	Y	Υ	Y		3
	-	JlU	55	17 ★	55	5	Y	Υ			3

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

- ★ See vehicle detector setup programming detail for
- \*\* Multizone Microwave Detector Zone. See Special Detector Note.



#### SPECIAL DETECTOR NOTE

For loop 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

LOOP N	NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
		**	JlU	55	17	5	5	Y	Y			15
ZONE 5	5A¹	-	I4U	47	9 🖈	22	2	Y	Y	Y		3
		-	JlU	55	17 ★	55	5	Y	Y			3

alternate phasing on sheet 3.

## LOWER

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

PROJECT REFERENCE NO. R-5021 Sig. 27

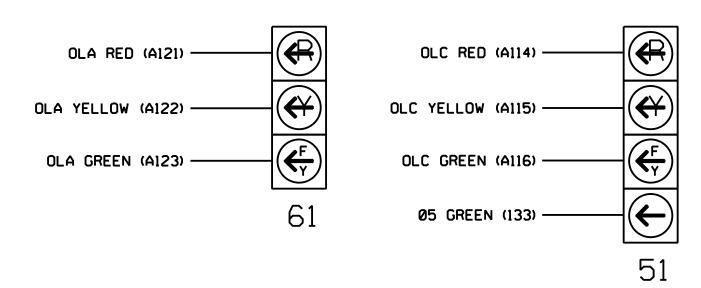
	SIGNAL HEAD HOOK-UP CHART																		
LOAD SWITCH NO.	Sl	S2	<b>S</b> 3	<b>S4</b>	S5	S6	S	57	S8	<b>S9</b>	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	ļ	5	6	15	7	8	16	σ	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	•	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	<b>★</b> 51	62,63	NU	NU	81,82	NU	<b>★</b>	NU	NU	<b>★</b> 51	NU	NU
RED		128			101		*		134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW														A121			A114		
YELLOW ARROW							132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW							133	133											

NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



<u>NOTE</u>

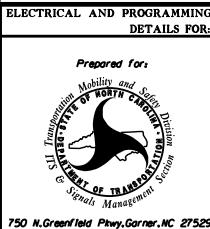
The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4

Signal Upgrade Temporary Design 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard

Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS

031464 INIT. DATE

SIG. INVENTORY NO. 03-1043T3

TH CARO,

IMPORTANT: REMOVE RESISTOR FROM PHASE 5 YELLOW FIELD TERMINAL. IF PRESENT.

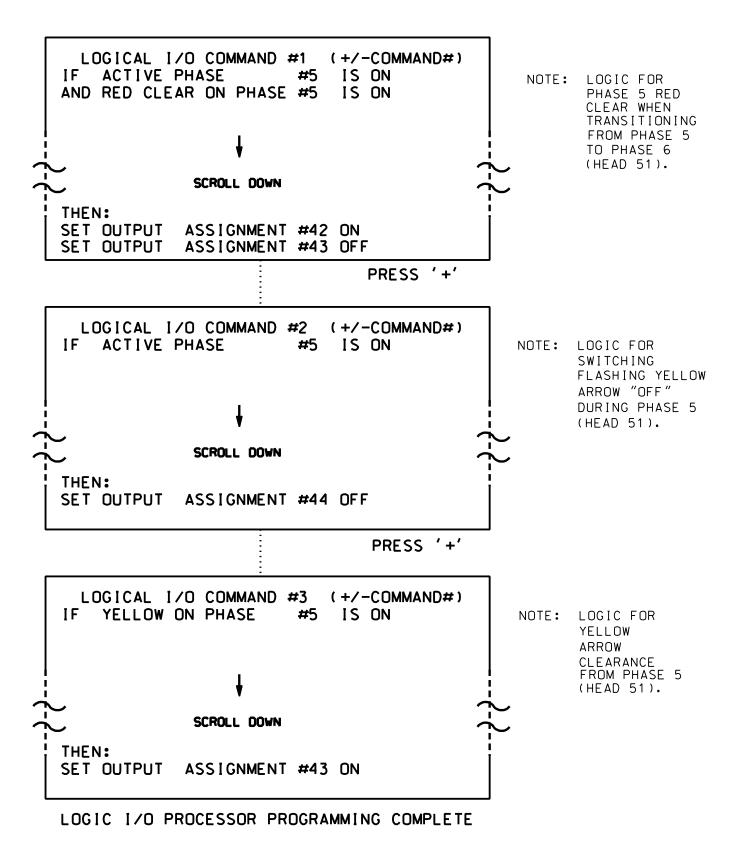
#### PROJECT REFERENCE NO. Sig. 27 R-5021

#### LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

#### TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red

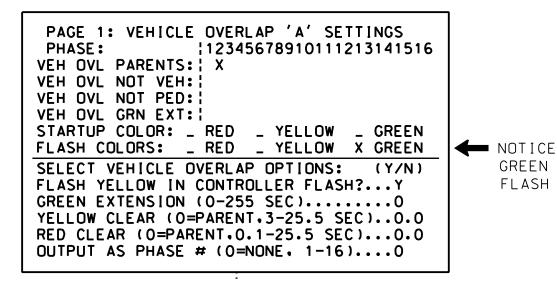
OUTPUT 43 = Overlap C Yellow

OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).



PRESS '+' TWICE

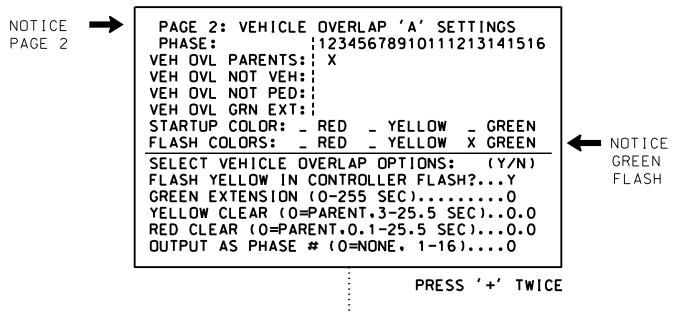
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

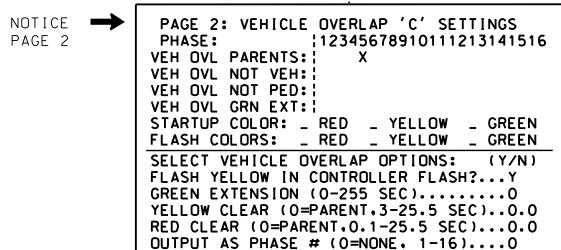
OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.



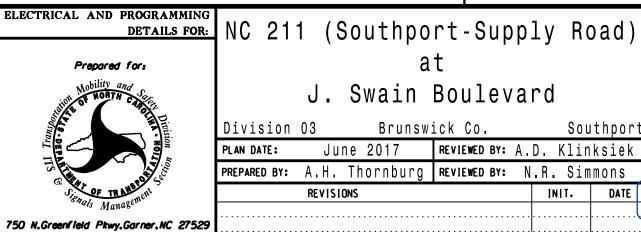


OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

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



Temporary Design 3

J. Swain Boulevard Brunswick Co

Southport REVIEWED BY: A.D. Klinksiek June 2017 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS

SIG. INVENTORY NO. 03-1043T3

031464

TH CARO

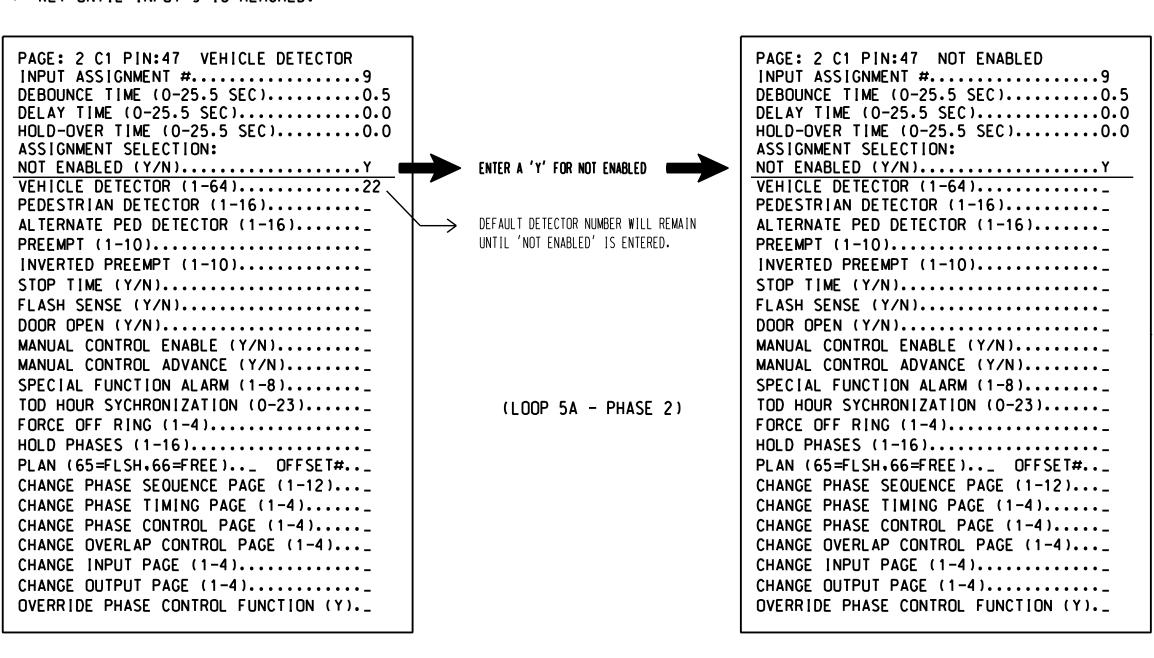
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... PRESS '+' TO ADVANCE TO INPUT 17 DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4)....

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... (LOOP 5A - PHASE 5) FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig. 27

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)		VEHICLE DETECTOR #55 SETTINGS (+1-64) SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGINGN ENABLE DIAGNOSTICSN		ENABLE LOGGINGN ENABLE DIAGNOSTICSN
SPEED TRAP		SPEED TRAP
CALL DETECTORY		CALL DETECTORY
EXTENSION DETECTOR		EXTENSION DETECTOR
MODE 2 STOP BAR		MODE 2 STOP BAR
SWITCHING DETECTOR		SWITCHING DETECTOR
DUPLICATING DETECTOR		DUPLICATING DETECTOR
ENABLE FULL TIME DELAY		ENABLE FULL TIME DELAY
IF FAILED. SET MIN RECALL?		IF FAILED. SET MIN RECALL?
IF FAILED. SET MAX1 RECALL?		IF FAILED. SET MAX1 RECALL?
IF FAILED, SET MAX2 RECALL?		IF FAILED. SET MAX2 RECALL?
PHASE#   12345678910111213141516		PHASE# \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
PHASES ASSIGNED !		PHASES ASSIGNED   X
SWITCH/DUPLICATE;	ENTER '5' FOR PHASES ASSIGNED	
LOOP SIZE (0-255 FT)6		SWITCH/DUPLICATE; LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)0		STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)		STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)0	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255		MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0		OUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0		OUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

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

ELECTRICAL AND PROGRAMMING

ivision 03 June 2017

DETAILS FOR: NC 211 (Southport-Supply Road) TH CARO J. Swain Boulevard 031464 Brunswick Co Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg Reviewed BY: N.R. Simmons REVISIONS INIT. DATE

SIG. INVENTORY NO. 03-1043T3

PROJECT REFERENCE NO. R-5021 Sig. 27

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase for head 51 to run protected

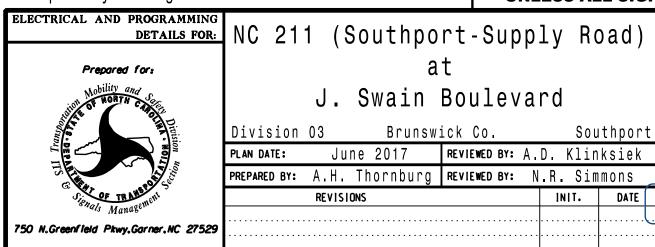
turns only.

INPUTS PAGE 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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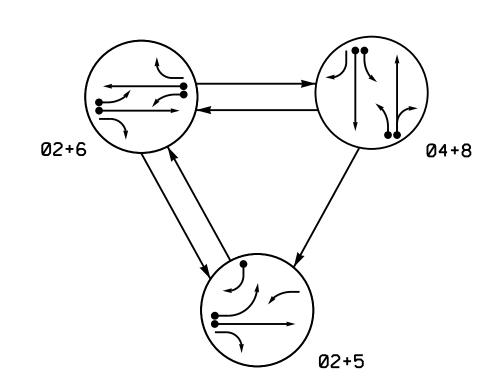
J. Swain Boulevard

Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

ATH CAROL 031464

SIG. INVENTORY NO. 03-1043T3

#### DEFAULT PHASING DIAGRAM



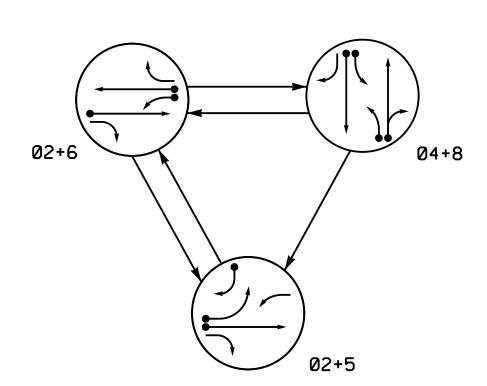
#### PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

→---- PEDESTRIAN MOVEMENT

#### ALTERNATE PHASING DIAGRAM



NC 211 (Southport-Supply Road)

45 MPH -3% Grade

DEFAULT PHASING TABLE OF OPERATION											
	PHASE										
SIGNAL FACE	<b>0</b> 2+5	<b>0</b> 2+6	04+8	FLACE							
21,22	G	G	R	Υ							
41,42	R	R	G	R							
43	ᆄ	R	F	R							
51	+	누	#	<del>≺</del>							
61	щ <mark>≻</mark>	╙	#	₹							
62,63	R	G	R	Υ							
81,82	R	R	G	R							

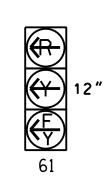
ALTERNAT TABLE OF										
	PHASE									
SIGNAL FACE	<b>◎</b> 2+5	<b>0</b> 2+6	04+8	FLGOI						
21,22	G	G	R	Υ						
41,42	R	R	G	R						
43	누	R	누	R						
51	ļ	#	#	<del>≺</del>						
61	ᆄ	누	#	<del>-Y</del>						
62,63	R	G	R	Υ						
81,82	R	R	G	R						

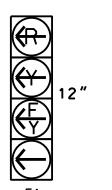
#### SIGNAL FACE I.D.

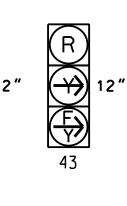
All Heads L.E.D.

R Y

21,22 41,42 62,63 81,82







OASIS 2070 LOOP & DETECTOR INSTALLATION CHART DETECTOR PROGRAMMING INDUCTIVE LOOPS SIZE (FT) FROM LOOP STOPBAR 300 6X6 2A 6X40 4Α \* |**\*|** 4 |Y|Y|-| 6X40 4B \*\*\*15 5·A 6X40 5B 6X40 6X6 300 6·A 6X40 6B

\* Multizone Microwave Detection.

45 MPH +3% Grade

NC 211 (Southport-Supply Road)

- \*\* Disable phase 2 call for 5A during alternate phasing operation.
- \*\*\* Reduce delay to 0 seconds during alternate phasing operation.

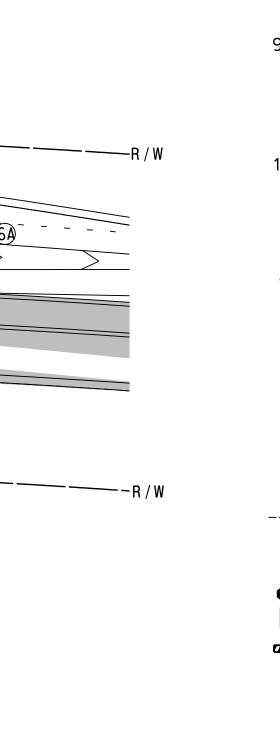
NEW CAND	3 Phase Fully Actuated (NC 133 Closed Loop System)
-	<u>NOTES</u>
	<ol> <li>Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard</li> </ol>
	Specifications for Roads and

fer to "Roadway Standard awings NCDOT" dated January 8 and "Standard Specifications for Roads and

PROJECT REFERENCE NO.

R-5021

- 2. Do not program signal for late night flashing operation unless otherwise directed by
- 4. Reposition existing signal heads numbered 21,22,41,51,61,62,63,81, 82, and sign  $\triangle$ .
- presence mode.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 7. Incorporate Microwave Detection
- Manufacturer's approved Microwave Detection locations and mounting heights to obtain
- chart are for free-run operation only. Coordinated signal system timing values
- 10. Closed loop system data:

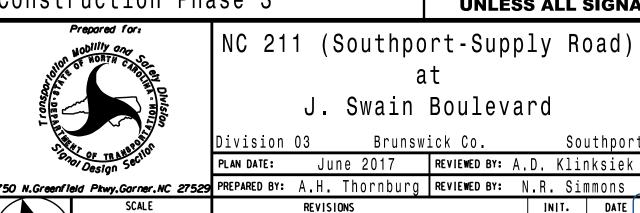


## LEGEND

**PROPOSED** <u>EXISTING</u>  $\circ$ Traffic Signal Head Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy K×N K×N Controller & Cabinet Junction Box 2-in Underground Conduit Right of Way  $\longrightarrow$ Directional Arrow Microwave Detection Zone Construction Zone N/A N/A

Signal Upgrade Temporary Design 4 Construction Phase 3

**DOCUMENT NOT CONSIDERED FINAL** 



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

ON

OASIS 2070 TIMING CHART

2.0

30

3.7

2.6

2.0

12

6.0

90

4.8

1.5

2.0

2.5

15

30

3.0

MIN RECALL

YELLOW

**FEATURE** 

Min Green 1 \*

Extension 1 \*

Max Green 1 \*

Red Clearance

Red Revert Walk 1 \*

Don't Walk 1

Seconds Per Actuation

Time Before Reduction

Max Variable Initial\*

Time To Reduce \*

**Vehicle Call Memory** 

Minimum Gap

Recall Mode

Dual Entry

Yellow Clearance

**PHASE** 

5

2.0

25

3.0

2.9

2.0

12

6.0

90

4.8

1.5

2.0

2.5

34

15

30

3.0

MIN RECALL

YELLOW

2.0

30

3.0

4.3

2.0

-

ON

TH CARO 031464

Structures" dated January 2018.

the Engineer. 3. Phase 5 may be lagged.

5. Set all detector units to

system for vehicle detection. 8. Provide the Engineer with the

detection zones as shown. 9. Maximum times shown in timing

supersede these values.

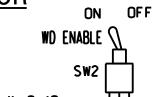
Controller Asset #: 1043.

Construction Barricade Right Arrow "ONLY" Sign (R3-5R)

**UNLESS ALL SIGNATURES COMPLETED** 

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

(remove jumpers and set switches as shown)



-RF 2010

-RP DISABLE - WD 1.0 SEC

-GY ENABLE

├ LEDguard

-FYA 1-9

= DENOTES POSITION OF SWITCH

DC ISOLATOR

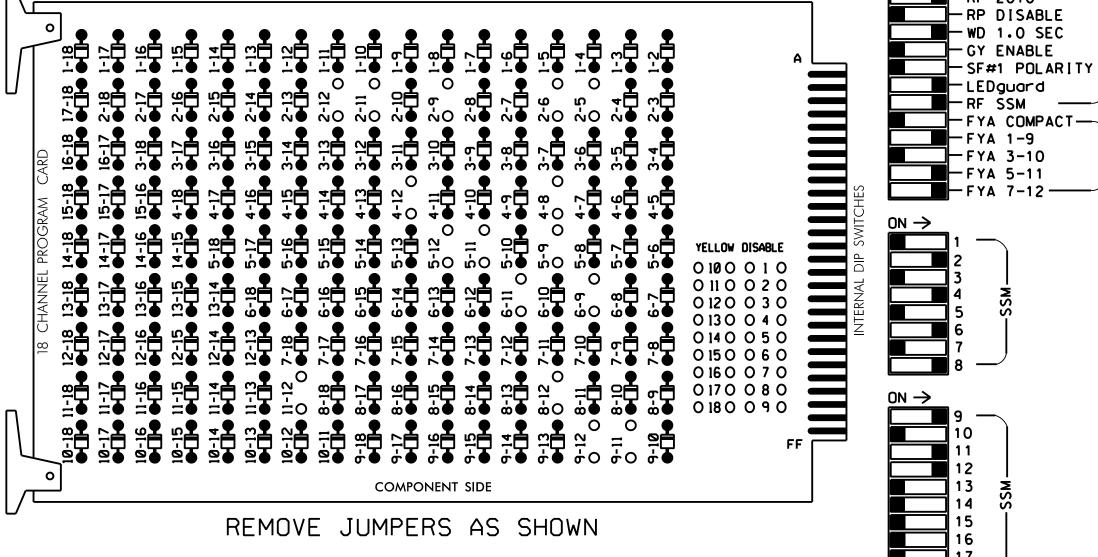
ST

FS = FLASH SENSE

ST = STOP TIME

- SF#1 POLARITY

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



#### NOTES:

FILE U

FILE U

NOT

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

"J"

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

2 3 4 5 6 7 8 9 10 11 12 13 14

(front view)

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE......ECONOLITE OASIS CABINET MOUNT.....BASE OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1. AUX S4, AUX S5

PHASES USED...........2,4,5,6,8 OVERLAP "B".....NOT USED OVERLAP "C".....5+6 OVERLAP "D".....4+5

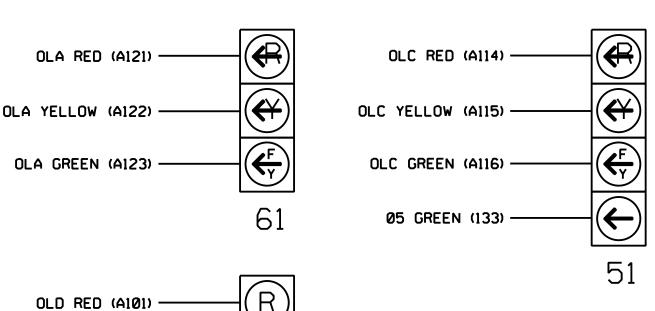
## PROJECT REFERENCE NO. R-5021 Sig. 28

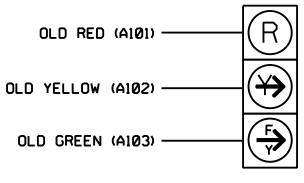
	SIGNAL HEAD HOOK-UP CHART																	
LOAD SWITCH NO.	Sl	S2	<b>S</b> 3	S4	S5	S6	<b>S</b> 7	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	<b>★</b> 51	62,63	NU	NU	81,82	NU	<b>6</b> 1	NU	NU	<b>5</b> 1	<b>★</b>	NU
RED		128			101			134			107						A101	
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115	A102	
FLASHING YELLOW ARROW													A123			A116	A103	
GREEN ARROW							133											

NU = Not Used

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

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





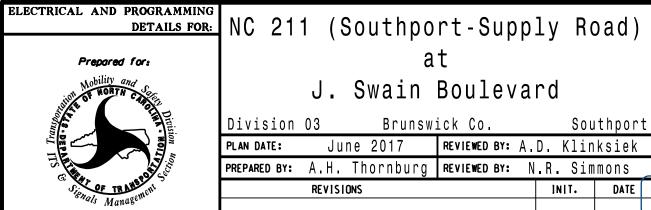
<u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4 Signal Upgrade

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



Temporary Design 4

J. Swain Boulevard

Division 03 Brunswick Co. June 2017

Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

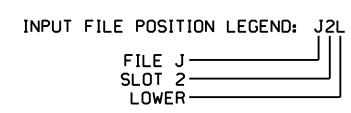
## INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
	**	J1U	55	17	5	5	Υ	Υ			15
ZONE 5A	-	I4U	47	9 ★	22	2	Υ	Υ			
	-	J1U	55	17 ★	55	5	Y	Υ			

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for

alternate phasing on sheet 3.

\*\* Multizone Microwave Detector Zone. See Special Detector Note.



#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

## LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (min)

PHASE 5 YELLOW FIELD TERMINAL (132)

⊗ Wired Input - Do not populate slot with detector card

IMPORTANT:

REMOVE RESISTOR FROM PHASE 5 RED FIELD TERMINAL. IF PRESENT.

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

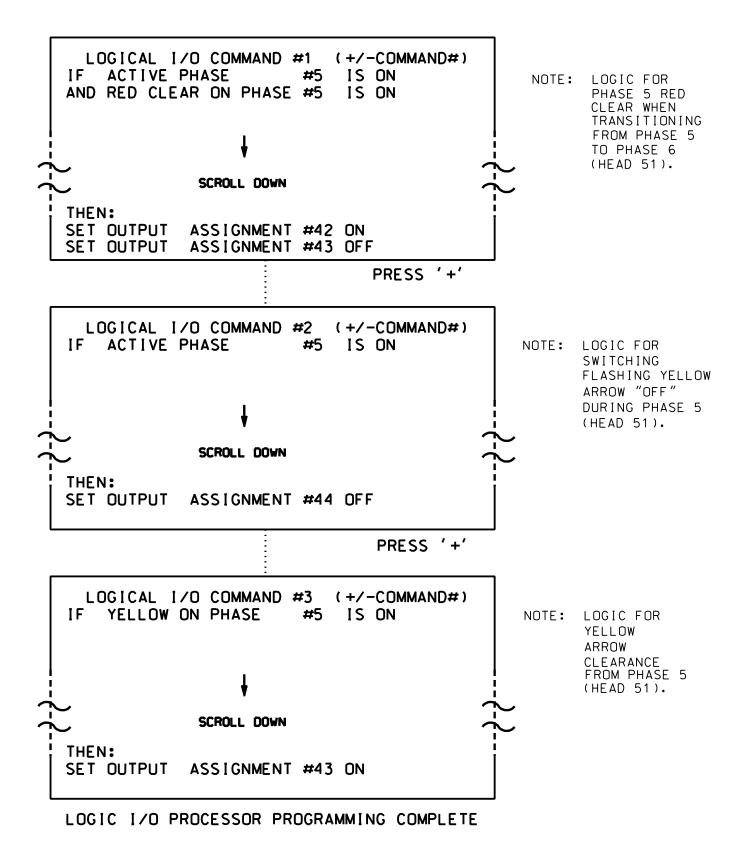
TH CARO, 031464

#### LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

#### TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PAGE 1: VEHICLE OVERLAP 'D' SETTINGS PAGE 1: VEHICLE OVERLAP 'A' SETTINGS 12345678910111213141516 12345678910111213141516 VEH OVL PARENTS: | X VEH OVL PARENTS: | XX VEH OVL NOT VEH: ! VEH OVL NOT VEH: ! VEH OVL NOT PED: 1 VEH OVL NOT PED: VEH OVL GRN EXT: 1 VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **←** NOTICE FLASH COLORS: \_ RED \_ YELLOW X GREEN **▼** NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH FLASH YELLOW IN CONTROLLER FLASH?...N FLASH GREEN EXTENSION (0-255 SEC)..... GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0 OUTPUT AS PHASE # (0=NONE, 1-16)....0 PRESS '+' TWICE OVERLAP PROGRAMMING COMPLETE PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED:

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

PAGE 2

(program controller as shown below)

**←** NOTICE

GREEN

FLASH

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)

YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0

RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0

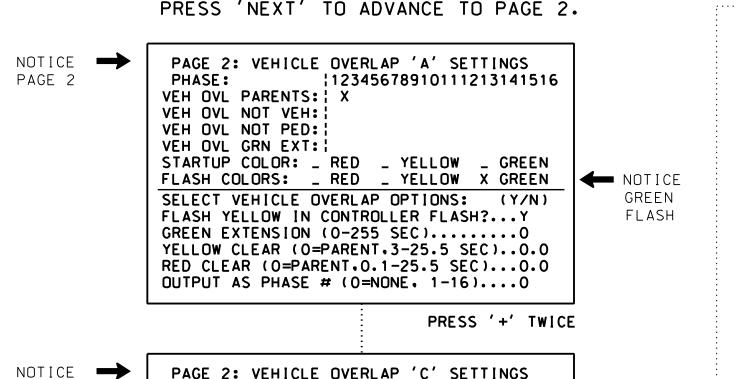
PRESS '+'

FLASH YELLOW IN CONTROLLER FLASH?...Y

GREEN EXTENSION (0-255 SEC).....

OUTPUT AS PHASE # (O=NONE, 1-16)....0

VEH OVL GRN EXT:



PAGE 2: VEHICLE OVERLAP 'D' SETTINGS 12345678910111213141516 PHASE: VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N FLASH GREEN EXTENSION (0-255 SEC)..........0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

PROJECT REFERENCE NO.

R-5021

Sig 28

OVERLAP PROGRAMMING COMPLETE

NOTICE -PAGE 2: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 PAGE 2 VEH OVL PARENTS: | X VEH OVL NOT VEH: | VEH OVL NOT PED: | VEH OVL GRN EXT: STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED X YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0 PRESS '+'

THIS ELECTRICAL DETAIL IS FOR

THE SIGNAL DESIGN: 03-1043T4

DESIGNED: June 2017

SEALED: 9/10/2021

REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

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

Southport

Temporary Design 4 ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road) 750 N.Greenfield Pkwy.Garner.NC 27529

oivision 03 PLAN DATE:

J. Swain Boulevard Brunswick Co June 2017

TH CARO 031464

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

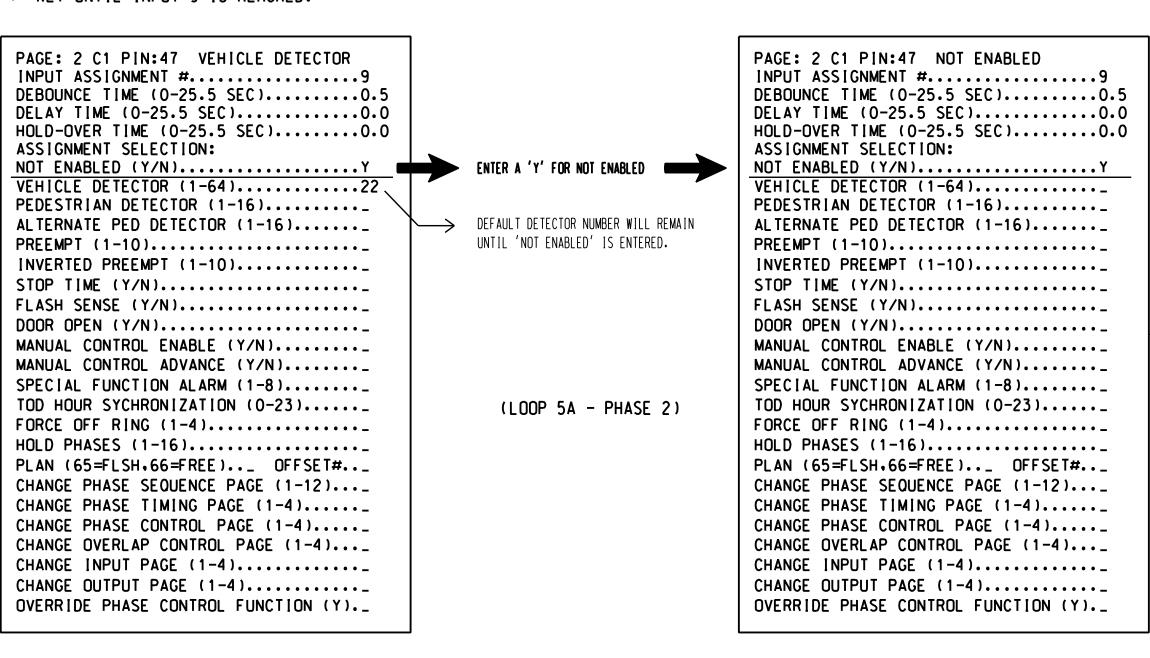
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



PRESS '+' TO ADVANCE TO INPUT 17

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... ENTER '55' TO REASSIGN VEHICLE DETECTOR (1-64).....5 THE VEHICLE DETECTOR PEDESTRIAN DETECTOR (1-16)..... FOR THIS INPUT ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... (LOOP 5A - PHASE 5) FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4)..... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4)..... CHANGE OVERLAP CONTROL PAGE (1-4)...\_ CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

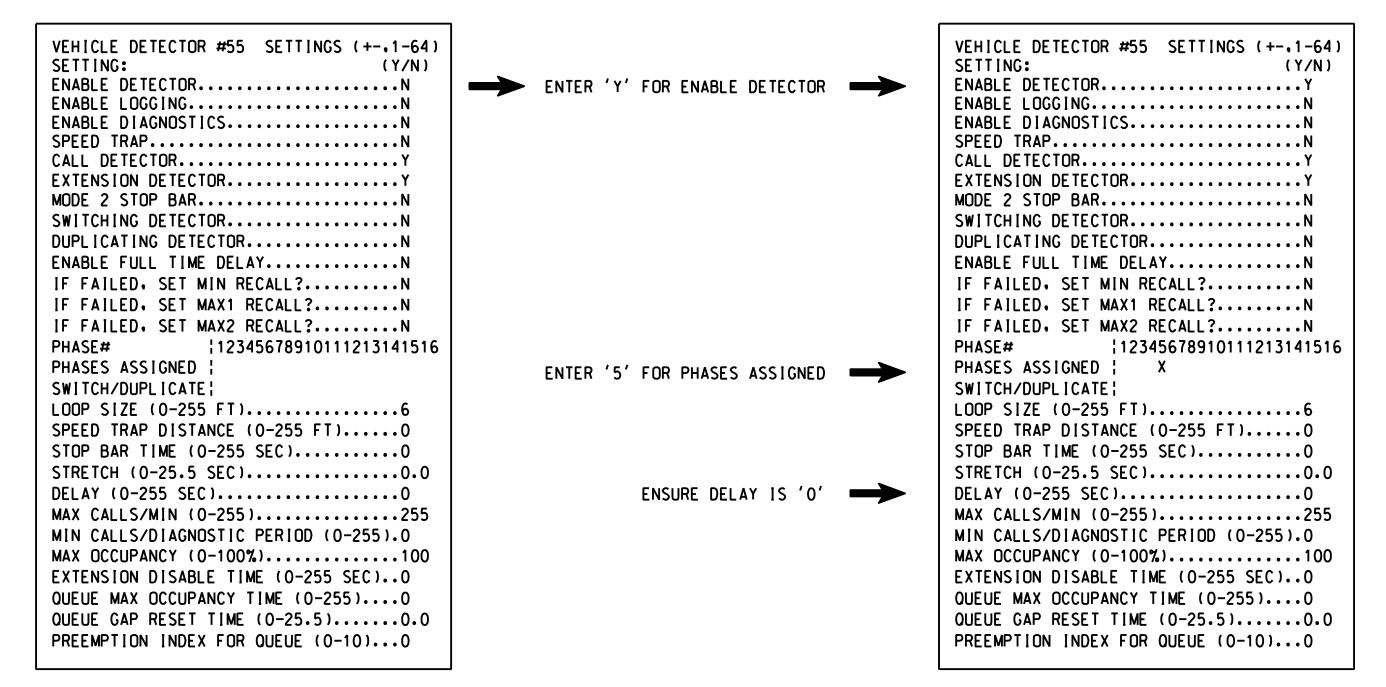
Sig. 28

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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

DETAILS FOR: NC 211 (Southport-Supply Road) 750 N.Greenfield Pkwy.Garner.NC 27529

J. Swain Boulevard

oivision 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

TH CARO, 031464

REVISIONS INIT. DATE

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

ELECTRICAL AND PROGRAMMING

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW)
WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY

EVENTS. IF PAGE 1 IS USED. NO EVENT PROGRAMMING IS NECESSARY

FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase

for head 51 to run protected

turns only.

INPUTS PAGE 2: Disc

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

#### FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE 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: 03-1043T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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Prepared for:

Nobility and Management Annual Ma

DETAILS FOR: NC 211 (Southport-Supply Road)

at

J. Swain Boulevard

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

Docusigned by:

Notasha Simmons

F6DA88DF3AD445A...

SIGNATURE

SIG. INVENTORY NO. 03-1043T4

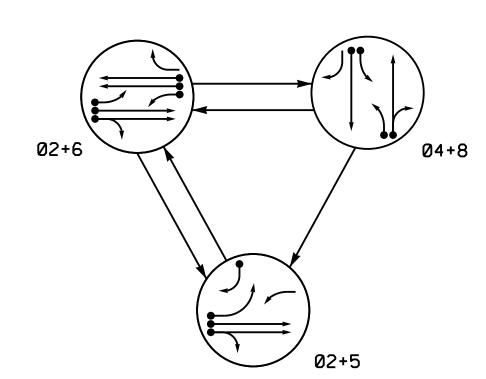
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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

HNTB NORTH CAROLINA, P.C.
750 N.Greenfield Pkwy.Garner.NC 27529

#### DEFAULT PHASING DIAGRAM



#### PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

◆---- PEDESTRIAN MOVEMENT

#### ALTERNATE PHASING DIAGRAM

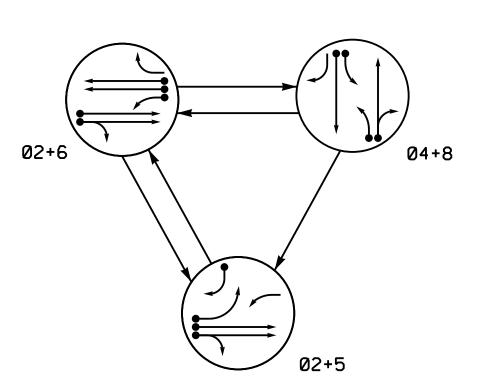


TABLE OF	0PI	ERA	TIO	N	TABLE OF	0PI	ERA	TIO	N
		PHA	4SE				PHA	4SE	
SIGNAL FACE	02+5	<b>0</b> 2+6	04+8	止しなのエ	SIGNAL FACE	<b>0</b> 2+5	<b>0</b> 2+6	04+8	FLASE
21,22	G	G	R	Υ	21,22	G	G	R	Υ
41	<del>†</del>	#	누	#	41	#	#	щ≻	₩
42,43	R	R	G	R	42,43	R	R	G	F
44	F	R	FY	R	44	F	R	F	F
51	<b>—</b>	₽	<del>-</del> ₽	*	51	<b>—</b>	₩	₩	4
61	₽	누	#	<del>-\</del>	61	뚜	щ <mark>≯</mark>	#	4
62,63	R	G	R	Υ	62,63	R	G	R	Υ
81	<del>-</del> ₽	#	뚜	#	81	₩	#	⊏∤≻	₩
82,83	R	R	G	R	82,83	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

(5B(4B(4A)

21,22 42,43 62,63 82,83

ALTERNATE PHASING

DEFAULT PHASING

41

#### OASIS 2070 LOOP & DETECTOR INSTALLATION CHART INDUCTIVE LOOPS DETECTOR PROGRAMMING DISTANCE FROM SIZE TURNS STOPBAR 2A/S25 6X6 300 5 Y 2B/S26 6X6 300 5 4A 6X40 0 2-4-2 Y 6X40 0 2-4-2 <del>\*\*</del>15 6X40 2-4-2 0 5B | 6X40 | 0 | 2-4-2 | Y | 6A/S27 6X6 300 5 6B/S28 6X6 300 5 6X40 0 2-4-2 2-4-2 Y 8 Y Y -6X40 0 6X40 0 2-4-2 Y

\* Disable phase 2 call for 5A during alternate phasing operation.

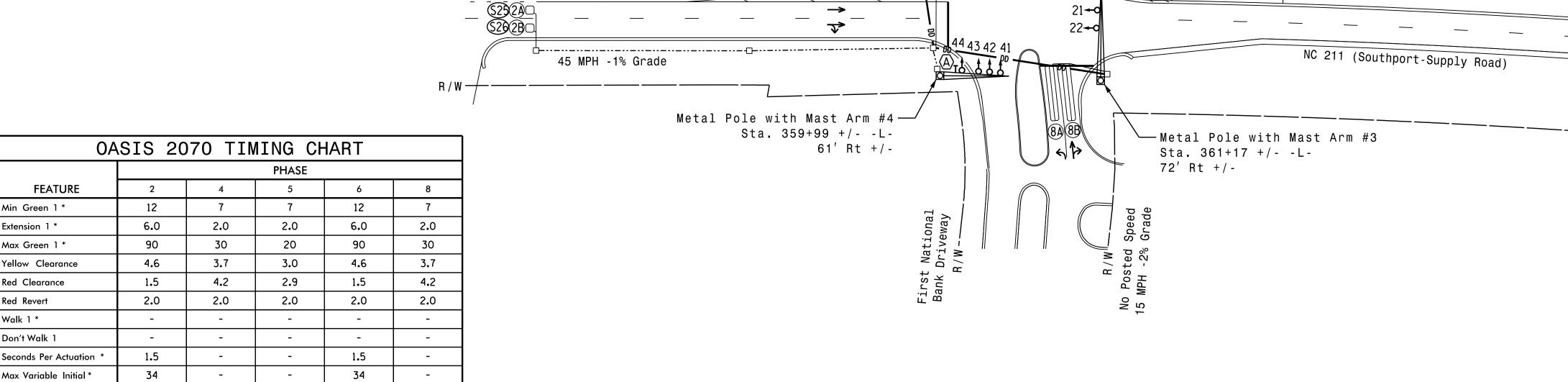
\*\* Reduce delay to 3 seconds during alternate phasing operation.

PROJECT REFERENCE NO. R-5021

3 Phase Fully Actuated (NC 133 Closed Loop System)

#### NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 7. Closed loop system data: Controller Asset #: 1043.



Metal Pole with Mast Arm #1—

NC 211 (Southport-Supply Road)

Sta. 359+92 +/- -L-

71' Lt +/-

LEGEND

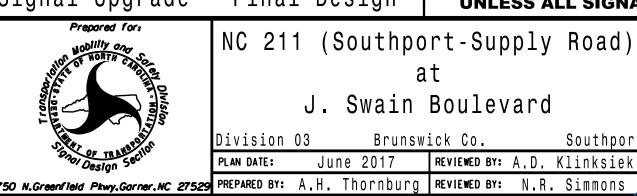
**PROPOSED** <u>EXISTING</u> Traffic Signal Head  $\bigcirc$ Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy Inductive Loop Detector ار×ع ال Controller & Cabinet Junction Box ----- 2-in Underground Conduit \_-----

Right of Way Directional Arrow Directional Drill Metal Pole with Mastarm

"RIGHT TURN MUST YIELD TO U-TURN" Sign

Signal Upgrade - Final Design

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



J. Swain Boulevard Brunswick Co. REVIEWED BY: A.D. Klinksiek INIT. DATE

 $\boxtimes$ 

TH CARO 031464

SIG. INVENTORY NO. 03-1043

N/A

**(A)** 

\* 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.

ON

ON

15

30

3.0

MIN RECALL

YELLOW

-

ON

ON

15

30

3.0

MIN RECALL

YELLOW

Time Before Reduction

Time To Reduce \*

**Vehicle Call Memory** 

Simultaneous Gap

Minimum Gap

Recall Mode

Dual Entry

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Raleigh, North Carolina 27609
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- Metal Pole with Mast Arm #2

45 MPH +1% Grade

Sta. 361+05 +/- -L-

73′ Lt +/-

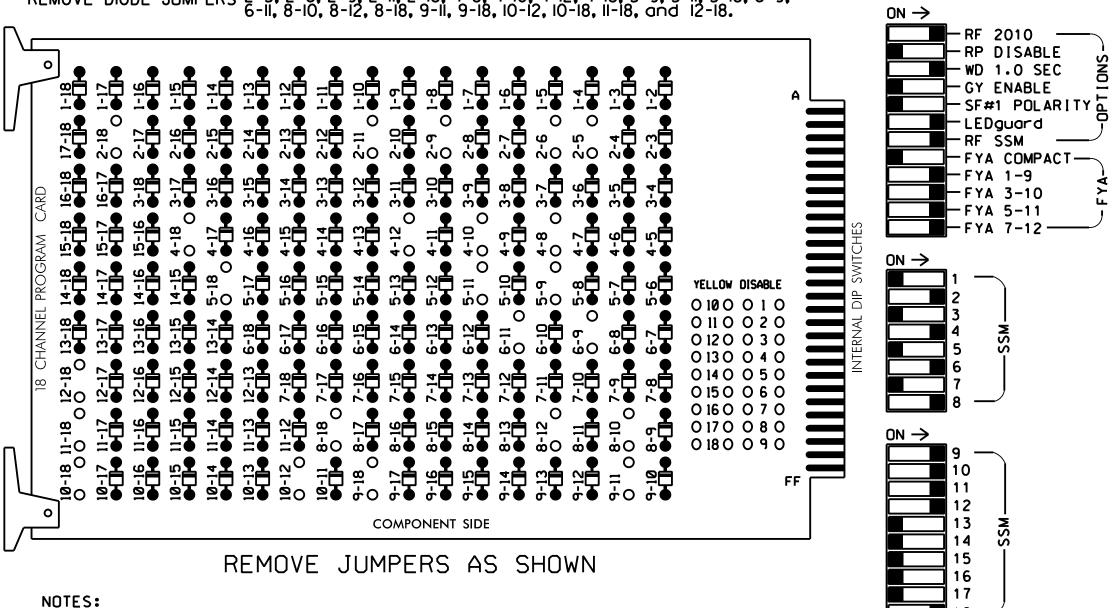
#### EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL WD ENABLE (

(remove jumpers and set switches as shown)

ON OFF

= DENOTES POSITION

OF SWITCH



- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

#### INPUT FILE POSITION LAYOUT

(front view)

,	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S L O T	ø2/sys	S L O	W I R	S L O	Ø 4	S L O	SLOT	S L O	S L O	SLOT	S L Q	S L Q	FS
FILE U		2A/S25 Ø2/SYS	Ī	I. ED ⊗		4A Ø 4	Ť EMP	T EXP	Ť E M P	T EMP	Ë E M P	Ĕ E M P	T EMP	DC ISOLATOR S T
	P	2B/S26	두	N P UT	E P T Y	4B	PTY	PTY	PTY	P T Y	P T Y	P T Y	PTY	DC ISOLATOR
	ø 5	ø 5	ø6/SYS	ø 6	S L O	Ø 8	S L O	SLOT	S	S	S	S	S	S
FILE U	5A	5B	6A/S27	6C		84	_	_	Ò	<b> </b>	þ	Ď	ģ	
"J" ,	NOT	1 190 1	ø6/sys	INUI	E M P T Y	ø 8	EΣP	ωΣP	EMP.	E M P	E M P	E M P	EΣP	E M P T
_	USED	USED	6B/S28	USED	Y	8B	Y	Y	Y	Y	Y	Y	Y	Ţ
·	EX.: 1A, 2A, ETC. = LOOP NO.'S  FS = FLASH SENSE ST = STOP TIME													

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES

|VALUE (ohms) | WATTAGE

1.5K - 1.9K 25W (m1n)

2.0K - 3.0K | 10W (min)

<sup>™</sup> Wired Input - Do not populate slot with detector card

PHASE 5 YELLOW FIELD TERMINAL (132)

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE......ECONOLITE OASIS CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED......S2,S5,S7,S8,S11,AUX S1,AUX S2, AUX S4.AUX S5.AUX S6

PHASES USED......2,4,5,6,8 OVERLAP "A"......2 OVERLAP "B".....4 OVERLAP "C".....5+6 OVERLAP "D".....8 OVERLAP "E".....NOT USED

OVERLAP "F".....4+5

#### INPUT FILE CONNECTION & PROGRAMMING CHART

L00P NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S25	TB2-5,6	I2U	39	1	2	2/SYS	Υ	Υ			
2B/S26	TB2-7,8	I2L	43	5	12	2/SYS	Υ	Υ			
4A	TB4-9,10	I6U	41	3	4	4	Y	Υ			
4B	TB4-11,12	I6L	45	7	14	4	Y	Υ			
	TB3-1,2	JlU	55	17	5	5	Y	Υ			15
5A <sup>1</sup>	-	I4U	47	9 ★	22	2	Y	Υ	Υ		3
	-	JlU	55	17 ★	55	5	Y	Υ			3
5B	TB3-5,6	J2U	40	2	6	5	Y	Υ			15
6A/S27	TB3-9,10	J3U	64	26	36	6/SYS	Y	Υ			
6B/S28	TB3-11,12	J3L	77	39	46	6/SYS	Y	Υ			
6C	TB5-1,2	J4U	48	10	26	6	Y	Υ	Υ		3
88	TB5-9,10	J6U	42	4	8	8	Y	Υ			
8B	TB5-11,12	J6L	46	8	18	8	Y	Υ			10

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L FILE J-SLOT 2-LOWER -

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

PROJECT REFERENCE NO. Sig. 29

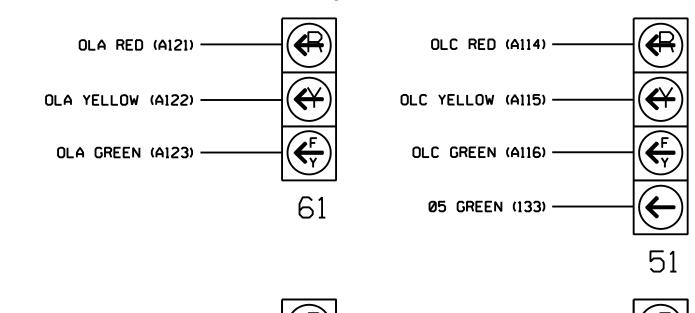
					SIC	ANE	L	HEA	D I	100	K-l	JP	CHA	٩RT	ı			
LOAD SWITCH NO.	SI	S2	<b>S</b> 3	S4	S5	S6	<b>S</b> 7	S8	<b>S</b> 9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43	NU	<b>★</b> 51	62,63	NU	NU	82,83	NU	<b>6</b> 1	<b>8</b> 1	NU	<b>★</b> 51	<b>★</b>	44
RED		128			101			134			107							A104
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	A105
FLASHING YELLOW ARROW													A123	A126		A116	A103	A100
GREEN ARROW							133											

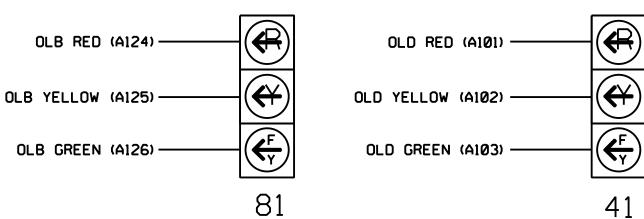
NU = Not Used

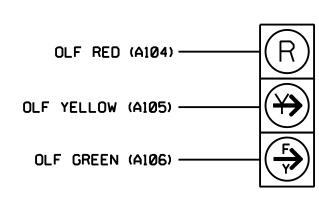
- \* Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

## FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)







The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

Electrical Detail - Sheet 1 of 5 Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)



<u>NOTE</u>

Final Design

J. Swain Boulevard

)ivision 03 Brunswick Co. June 2017

Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

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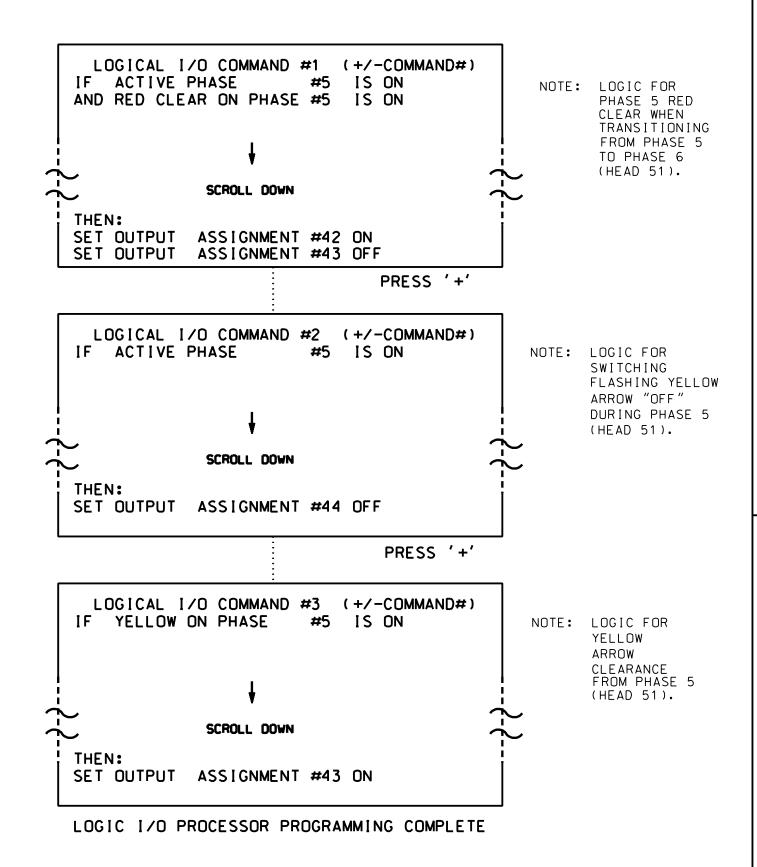
SIG. INVENTORY NO. 03-1043

## LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

#### TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow

OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

FOR DEFAULT PHASING

(program controller as shown below)

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS ¦12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT:: STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0 PRESS '+' PAGE 1: VEHICLE OVERLAP 'D' SETTINGS ¦12345678910111213141516 **VEH OVL PARENTS:** VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...N FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'F' SETTINGS 112345678910111213141516 PHASE: VEH OVL PARENTS: XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **←** NOTICE GREEN SELECT VEHICLE OVERLAP OPTIONS: FLASH YELLOW IN CONTROLLER FLASH?...N FLASH GREEN EXTENSION (0-255 SEC).....0 YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

PROJECT REFERENCE NO.

R-5021

SHEET NO

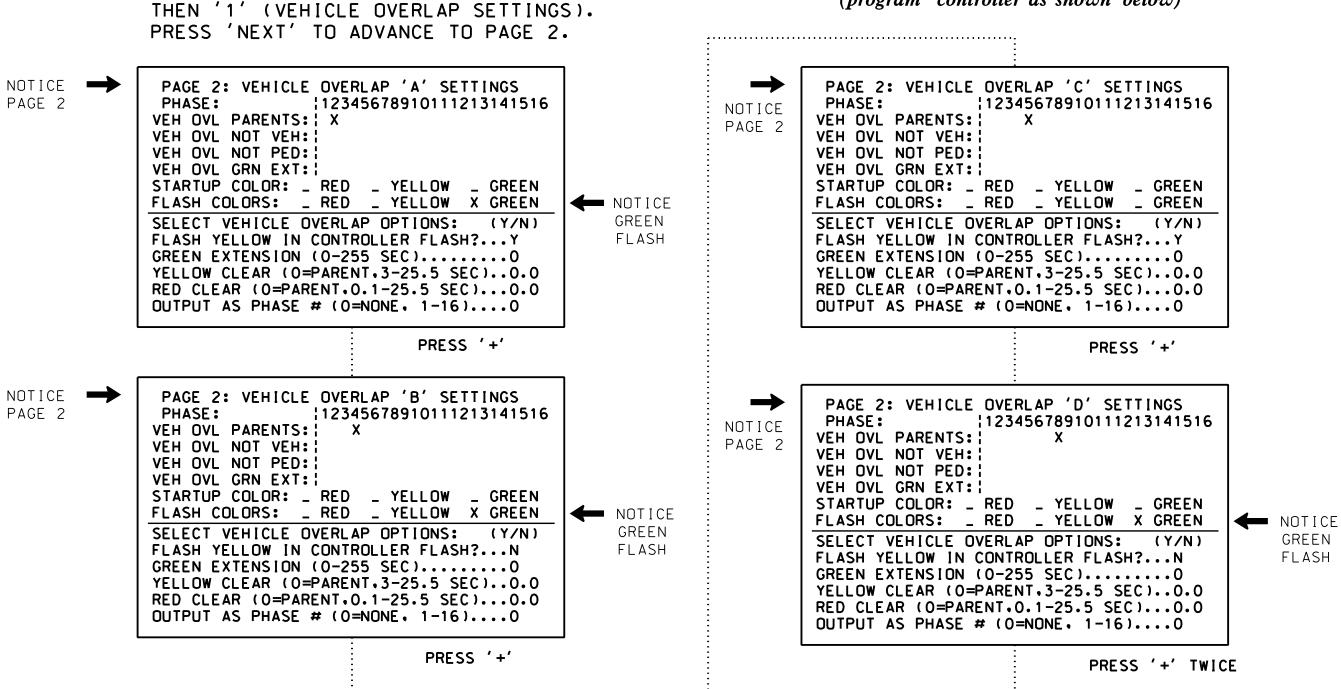
Sig 29

OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

OUTPUT AS PHASE # (0=NONE, 1-16)....0



FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

12345678910111213141516

PRESS '+'

PRESS '+'

FROM MAIN MENU PRESS '8' (OVERLAPS).

12345678910111213141516

**←** NOTICE

**←** NOTICE

GREEN

FLASH

GREEN

FLASH

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS

STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)

YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0

RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0

FLASH YELLOW IN CONTROLLER FLASH?...Y

GREEN EXTENSION (0-255 SEC).....0

OUTPUT AS PHASE # (0=NONE, 1-16)....0

PAGE 1: VEHICLE OVERLAP 'B' SETTINGS

STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN

FLASH COLORS: \_ RED \_ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)

YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0

RED CLEAR (0=PARENT, 0.1-25.5 SEC)...0.0

FLASH YELLOW IN CONTROLLER FLASH?...N

GREEN EXTENSION (0-255 SEC).....

OUTPUT AS PHASE # (0=NONE, 1-16)....0

VEH OVL PARENTS: | X

VEH OVL PARENTS: | X

VEH OVL NOT VEH:

VEH OVL NOT PED:

VEH OVL GRN EXT: ;

VEH OVL NOT VEH:

VEH OVL NOT PED:

VEH OVL GRN EXT:

PAGE 2: VEHICLE OVERLAP 'F' SETTINGS PHASE: 112345678910111213141516 VEH OVL PARENTS: XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC).....0
YELLOW CLEAR (0=PARENT.3-25.5 SEC).... RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

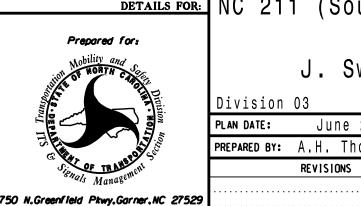
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 2 of 5 Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road) J. Swain Boulevard



Brunswick Co June 2017

031464 Southport TREVIEWED BY: A.D. Klinksiek CACINEER PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons INIT. DATE

Final Design

SIG. INVENTORY NO. 03-1043

TH CARO

PESSION 1

**DOCUMENT NOT CONSIDERED FINAL** 

**UNLESS ALL SIGNATURES COMPLETED** 

GREEN

FLASH

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

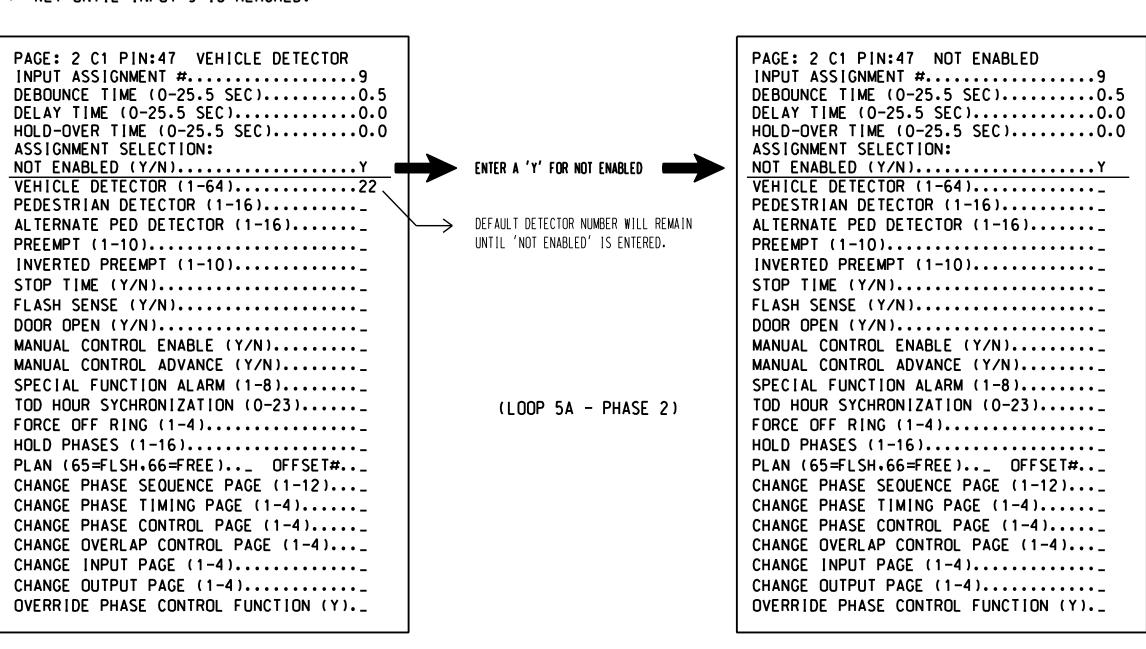
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

PRESS '+' TO ADVANCE TO INPUT 17

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig 29

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64)		VEHICLE DETECTOR #55 SETTINGS (+-,1-64)
SETTING: (Y/N)		SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGINGN		ENABLE LOGGINGN
ENABLE DIAGNOSTICSN		ENABLE DIAGNOSTICS
SPEED TRAPN		SPEED TRAPN
CALL DETECTORY		CALL DETECTORY
EXTENSION DETECTORY		EXTENSION DETECTORY
MODE 2 STOP BARN		MODE 2 STOP BARN
SWITCHING DETECTORN		SWITCHING DETECTOR
DUPLICATING DETECTORN		DUPLICATING DETECTORN
ENABLE FULL TIME DELAY		ENABLE FULL TIME DELAY
IF FAILED, SET MIN RECALL?		IF FAILED, SET MIN RECALL?
IF FAILED, SET MAX1 RECALL?N		IF FAILED, SET MAX1 RECALL?
IF FAILED, SET MAX2 RECALL?		IF FAILED. SET MAX2 RECALL?
PHASE# \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		PHASE# \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\
PHASES ASSIGNED ;		PHASES ASSIGNED : X
	ENTER '5' FOR PHASES ASSIGNED	
SWITCH/DUPLICATE;		SWITCH/DUPLICATE;
LOOP SIZE (0-255 FT)6		LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)		STOP BAR TIME (0-255 SEC)0
STRETCH (0-25.5 SEC)		STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)0	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255		MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0		QUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0		QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 3 of 5 Signal Upgrade

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

Final Design

ivision 03 Brunswick Co June 2017

TH CARO J. Swain Boulevard 031464 Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg Reviewed BY: N.R. Simmons REVISIONS INIT. DATE

SIG. INVENTORY NO. 03-1043

PROJECT REFERENCE NO. Sig 29. R-5021

## <u>ALTERNATE PHASING ACTIVATION DETAIL</u>

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASIN</u> G	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phase

for head 51 to run protected

turns only.

INPUTS PAGE 2:

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

#### FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE 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: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 4 of 5 Signal Upgrade

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

INIT. DATE

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

Final Design

J. Swain Boulevard

Division 03 Brunswick Co. Southport PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS

SIG. INVENTORY NO. 03-1043

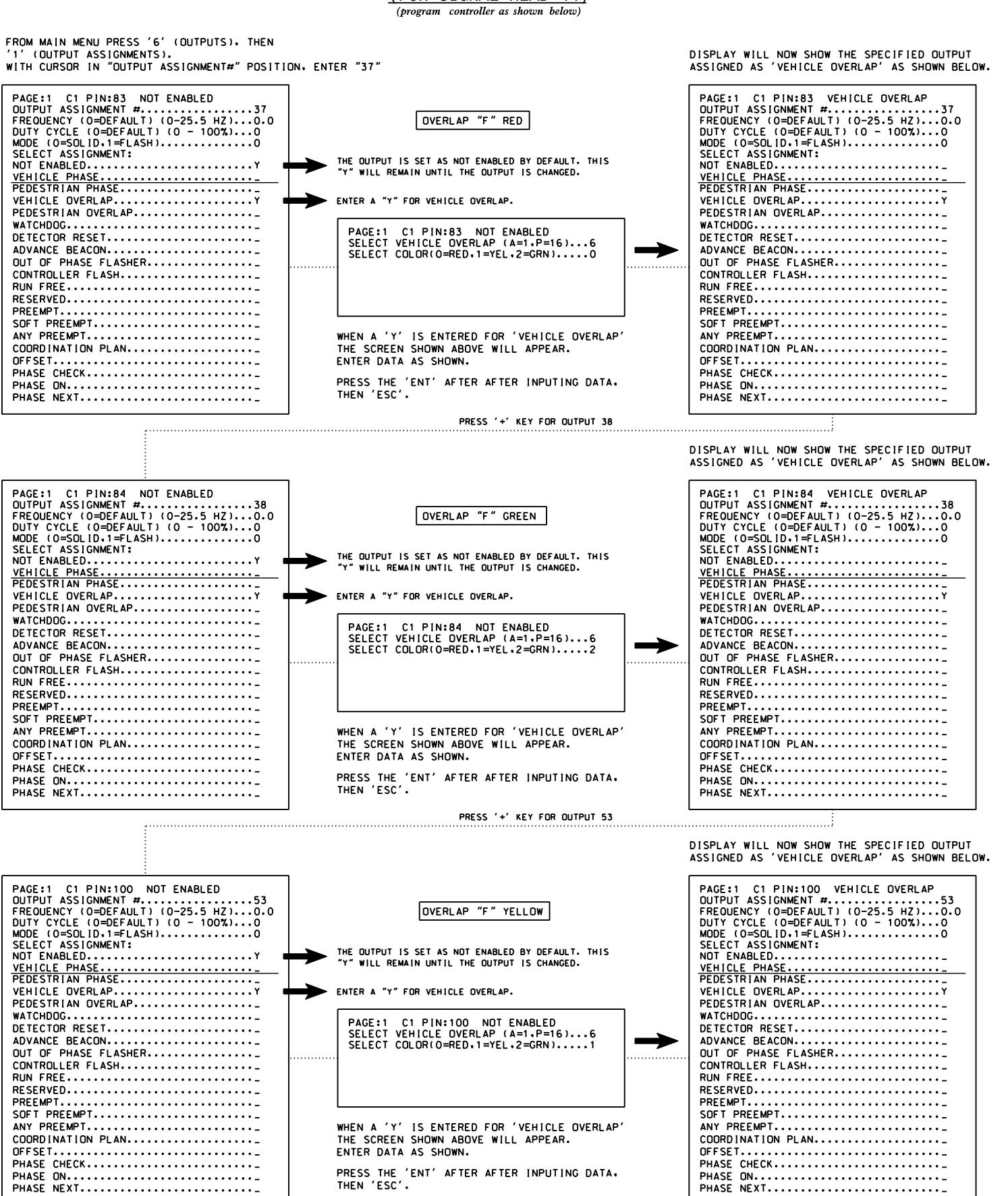
ANTH CAROL

031464

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997 750 N. Greenfield Pkwy. Garner, NC 27529

#### OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL TO ASSIGN LOADSWITCH AUX S6 TO OVERLAP 'F'

(FOR SIGNAL HEAD 44)



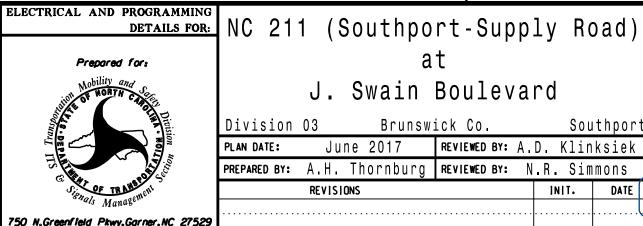
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 5 of 5

Signal Upgrade Final Design

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

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J. Swain Boulevard

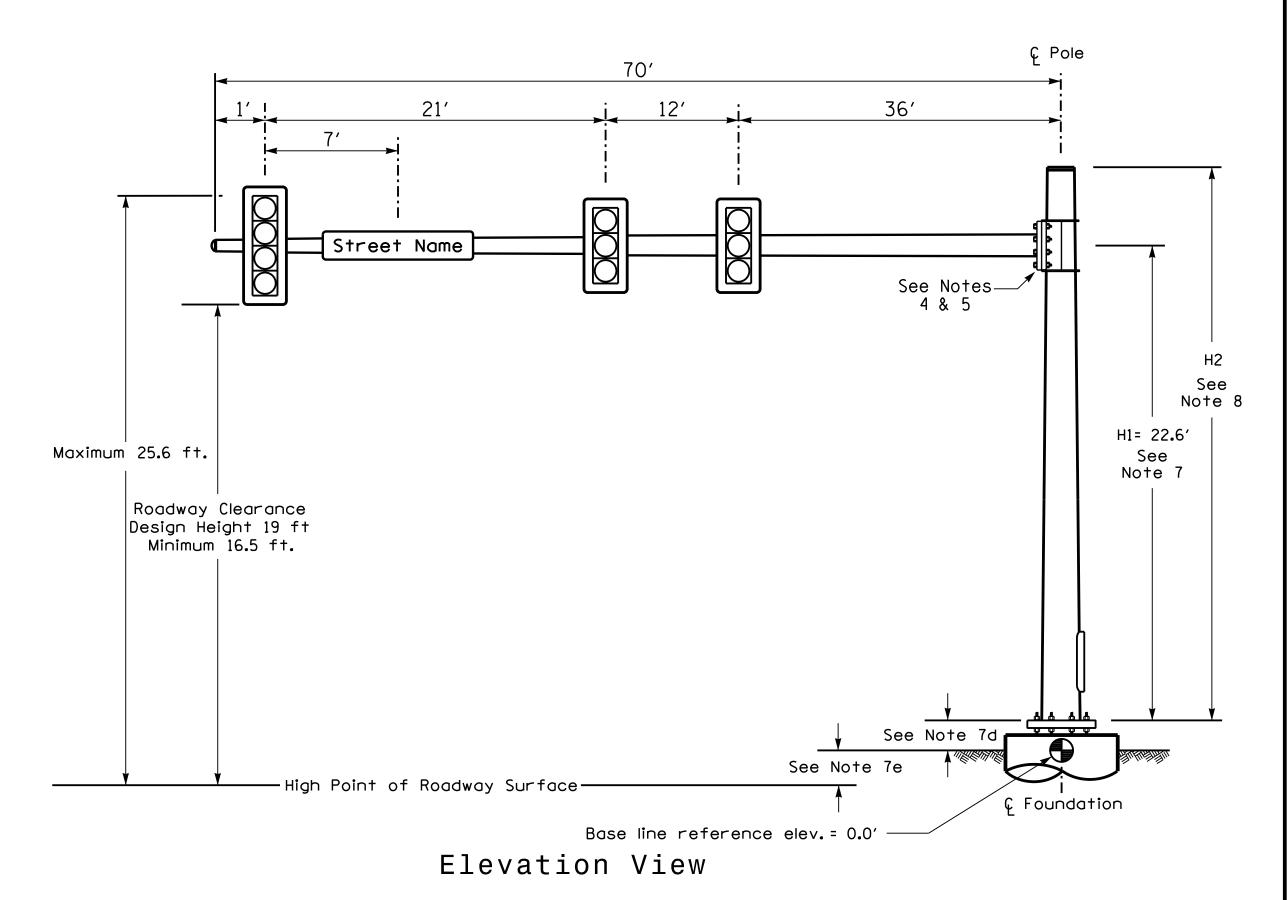
Brunswick Co Southport June 2017 TREVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

TH CARO 031464

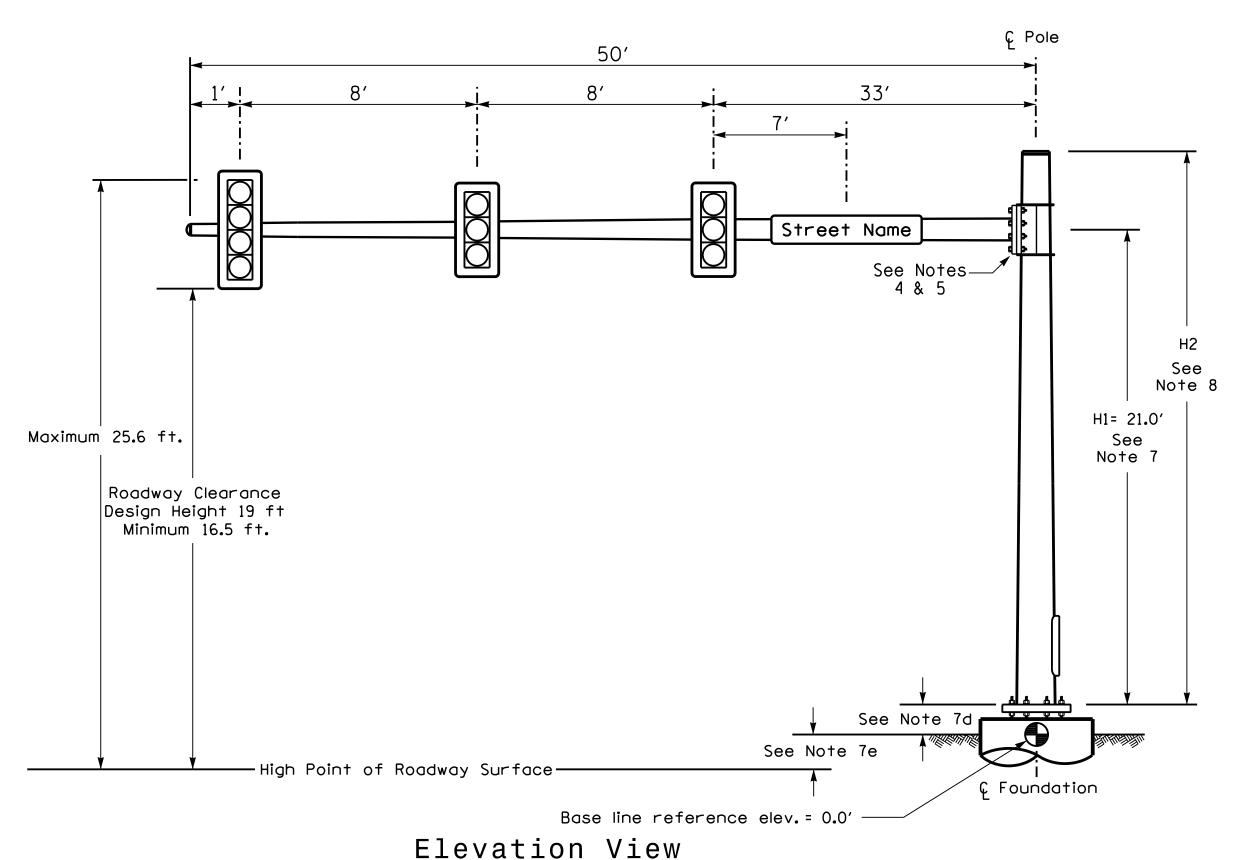
REVISIONS

INIT. DATE SIG. INVENTORY NO. 03-1043

## Design Loading for METAL POLE NO. 1



## Design Loading for METAL POLE NO. 2

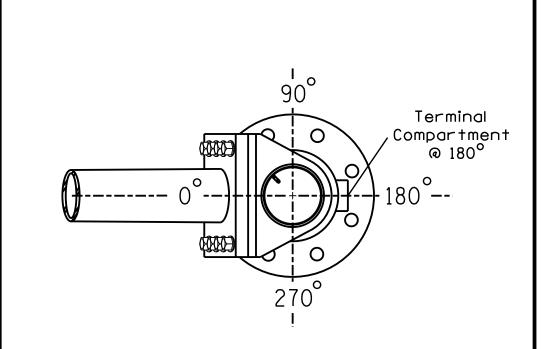


#### SPECIAL NOTE

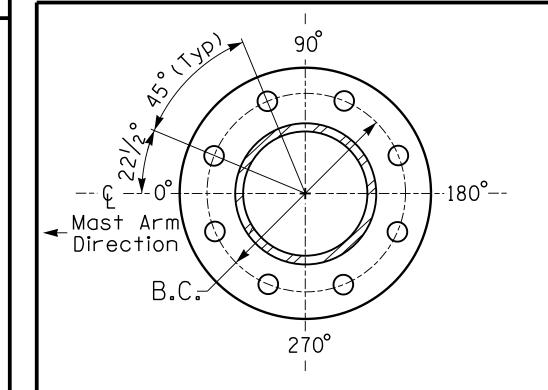
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at © Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.56 ft.	-0.05 ft.
Elevation difference at Edge of travelway or face of curb	+1.43 ft.	-0.38 ft.

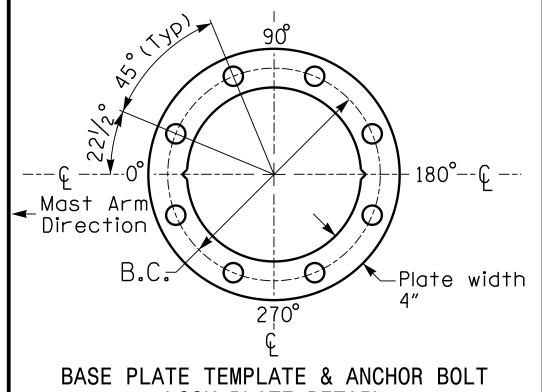


#### POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



ASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

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METAL POLE No. 1,2

PROJECT REFERENCE NO. SHEET N
R-5021 Sig. 29

	MAST ARM LOADING SC	HEDU	LE	
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 <b>.</b> 5 S.F.	25.5" W X 66.0" L	74 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0"L	36 LBS

#### **NOTES**

#### DESIGN REFERENCE MATERIAL

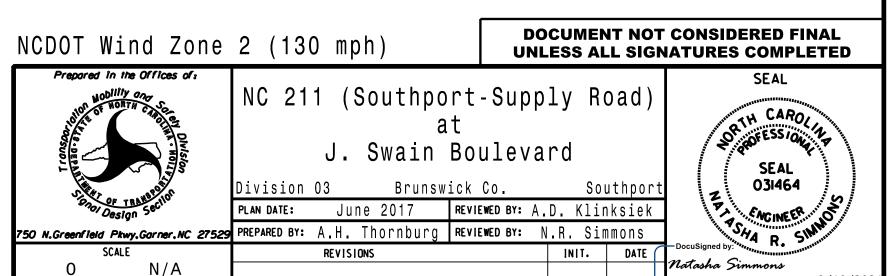
- 1. Design the traffic signalstructure and foundation in accordance with:
- The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
- The 2018 NCDOT "Standard Specifications for Roads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

#### DESIGN REQUIREMENTS

- 2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- 3. Design all signal supports using stress ratios that do not exceed 0.9.
- 4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- 5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- 6. Design base plate with 8 anchor bolt holes. Provide 2 inch  $\times$  60 inch anchor bolts.
- 7. The mast arm attachment height (H1) shown is based on the following design assumptions:
- a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
- b. Signal heads are rigidly mounted and vertically centered on the mast arm.
- c. The roadway clearance height for design is as shown in the elevation views.
- d. The top of the pole base plate is 0.75 feet above the ground elevation.
- e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.
- 8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
- Mast arm attachment height (H1) plus 2 feet, or

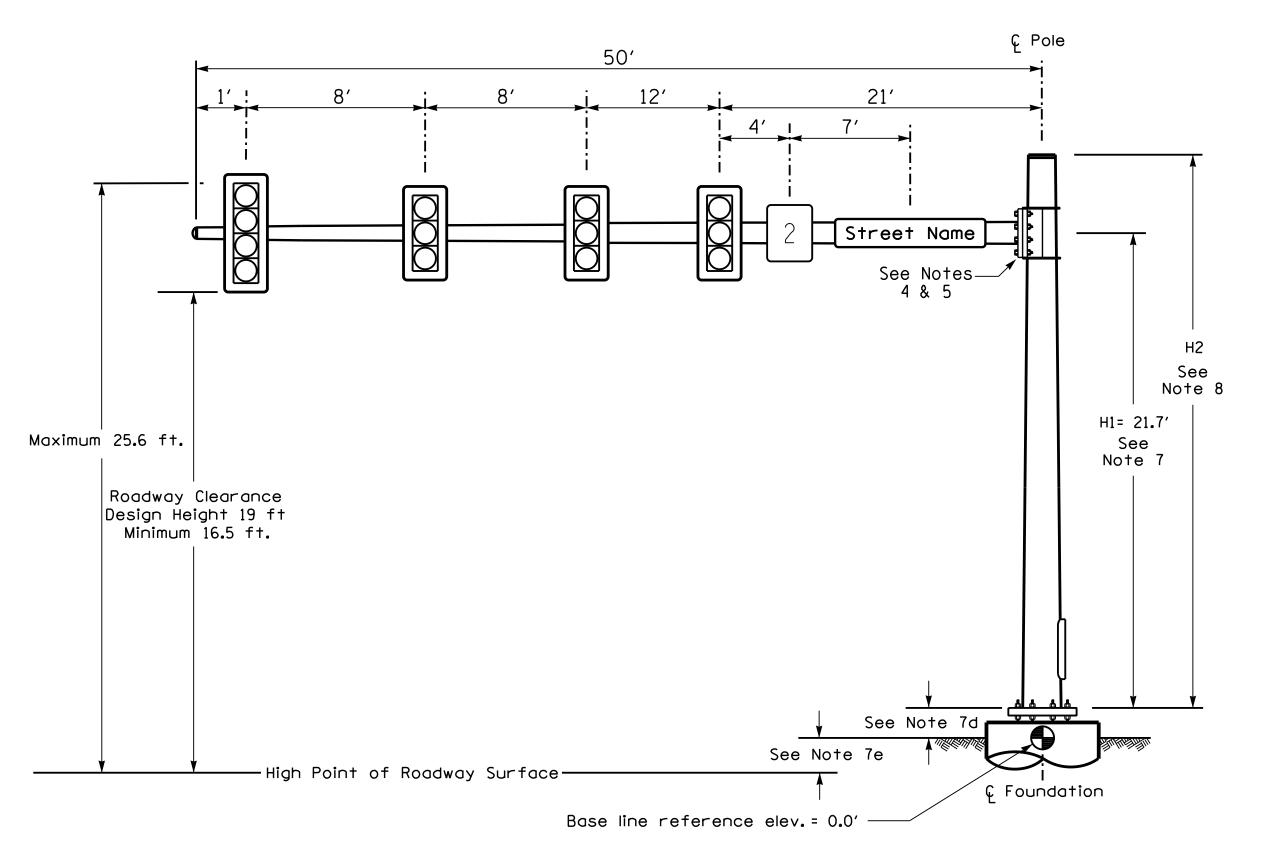
N/A

- H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- 9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- 11. The contractor is responsible for providing soilpenetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



SIG. INVENTORY NO.

#### Design Loading for METAL POLE NO. 4



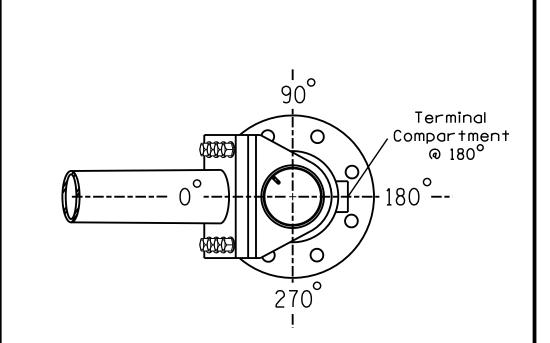
Elevation View

#### SPECIAL NOTE

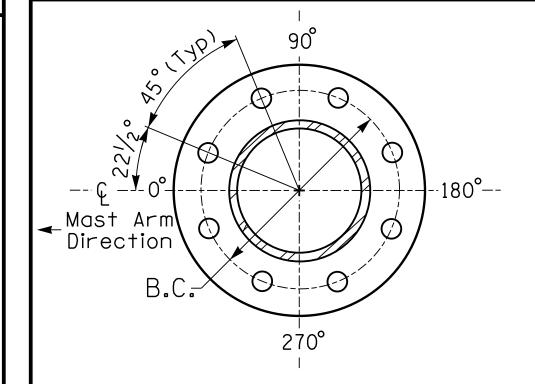
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at © Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.96 ft.	+0.70 ft.
Elevation difference at Edge of travelway or face of curb	-0.61 ft.	-0.27 ft.

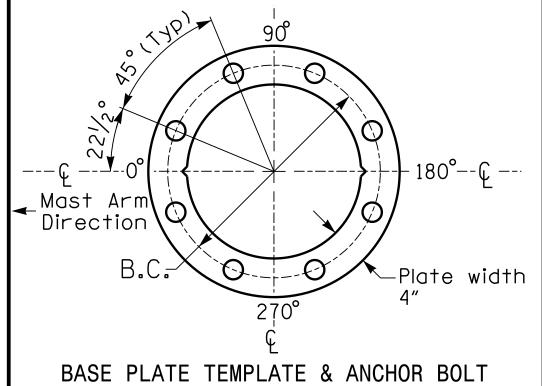


## POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



LOCK PLATE DETAIL

For 8 Bolt Base Plate

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METAL POLE No. 3,4

PROJECT REFERENCE NO.	SHEE	T NC
R - 5021	Sig.	29.

	MAST ARM LOADING SC	HEDU	LE	
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 <b>.</b> 5 S.F.	25.5" W X 66.0" L	74 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

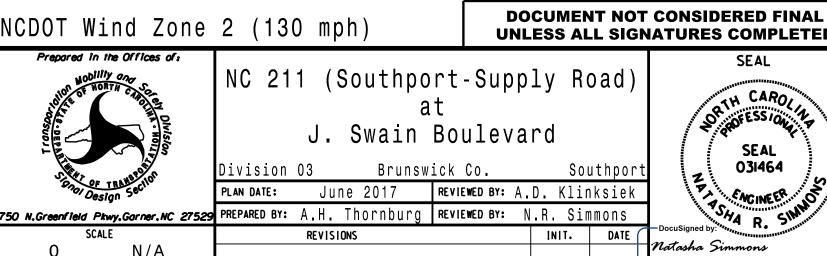
#### NOTES

#### DESIGN REFERENCE MATERIAL

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

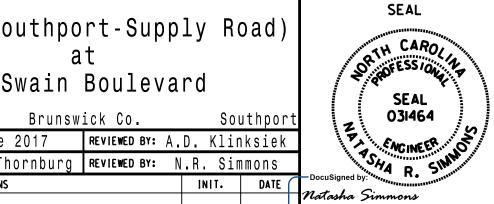
#### DESIGN REQUIREMENTS

- 2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- 3. Design all signal supports using stress ratios that do not exceed 0.9.
- 4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- 5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- 6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- 7. The mast arm attachment height (H1) shown is based on the following design assumptions:
- a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
- b. Signalheads are rigidly mounted and vertically centered on the mast arm.
- c. The roadway clearance height for design is as shown in the elevation views. d. The top of the pole base plate is 0.75 feet above the ground elevation.
- e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.
- 8. The pole manufacturer will determine the total height (H2) of each pole using the greater of
- Mast arm attachment height (H1) plus 2 feet, or
- H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- 9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- 11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



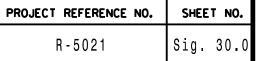
NCDOT Wind Zone 2 (130 mph)

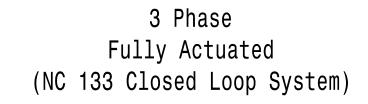
**UNLESS ALL SIGNATURES COMPLETED** 



N/A

SIG. INVENTORY NO.





## NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 6. Incorporate Microwave Detection system for vehicle detection.
- 7. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 9. Closed loop system data: Controller Asset #: 0267.

										-		
1I	NDUCTI	VE LOC	)PS		DET	ECT	OR	PI	ROGRAI	MMING		
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2·A	6X6	300	*	*	2	Υ	Υ	-	-	-	-	Υ
4·A	6X:40	0	*	*	4	Υ	Υ	-	-	3	-	Υ
ΕΛ	67/40		N/	<b>4</b>	5	Υ	Υ	-	-	<del>***</del> 15	÷	Υ
5A	6X·40	0	*	*	<del>***</del> 2	Υ	Υ	Υ	-	3	-	Υ
5B	6X:40	0	*	*	5	Υ	Υ	-	-	15	-	Υ
6·A	6X6	300	*	*	6	Υ	Υ	-	-	-	-	Υ

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

\* Multizone Microwave Detection.

\*\* Disable phase 2 call for 5A during alternate phasing operation.

\*\*\* Reduce delay to 3 seconds during alternate phasing operation.

NC 211 (Southport-Supply Road)	Wood Pole Sta. 380+69 +/LREV- 80' +/- Lt  50  50  50  50  50  50  50  50  50  5	BIM Dosher Cut Off  62 61 21 22 22	── Wood Pole Sta. 381+82 +/LREV- 68' +/- Lt 45 MPH -2% Grade	—————————————————————————————————————
	<u> </u>	43,7B 42,41	NC 211 (Southport-Supply Road)	
w ————————————————————————————————————	Wood Pole —/ Sta. 380+68 +/LREV-	(A) \	Wood Pole Sta. 381+66 +/LREV-	R/W

63' +/- Rt

# **PROPOSED** $\bigcirc$

<u>EXISTING</u> Traffic Signal Head Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy K×3 K×3 Controller & Cabinet Junction Box ----- 2-in Underground Conduit Right of Way  $\longrightarrow$ Directional Arrow Microwave Detection Zone N/A Construction Zone

LEGEND

Left Arrow "ONLY" Sign (R3-5L) Right Arrow "ONLY" Sign (R3-5R)

Signal Upgrade Temporary Design 1 Construction Phase 1

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

SIG. INVENTORY NO. 03-0267T

Division 03 Brunswick Co. June 2017

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

NC 211 (Southport-Supply Road) TH CARO Dosher Cut Off 031464 Southpor REVIEWED BY: A.D. Klinksiek .SACINEER. 750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE 50

PHASING DIAGRAM DETECTION LEGEND DETECTED MOVEMENT UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

◆---- PEDESTRIAN MOVEMENT

02+6

DEFAULT PHASING DIAGRAM

02+6

ALTERNATE PHASING DIAGRAM

51

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

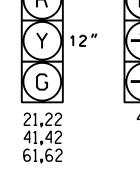
21,22

41,42

51

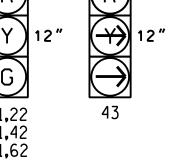
61,62

PHASE



SIGNAL FACE I.D.

All Heads L.E.D.



ALTERNATE PHASING

TABLE OF OPERATION

FACE

21,22

41,42

61,62

PHASE

R/W ———

R/W ----

OASIS 2070 TIMING CHART 58' +/- Rt

12 12 6.0 2.0 2.0 6.0 90 30 20 90 4.7 3.0 3.0 4.7 1.5 2.9 1.5 1.9 2.0 2.0 2.0 2.0

Red Clearance Red Revert Walk 1 \* -Don't Walk 1 2.5 2.5 Seconds Per Actuation 34 Max Variable Initial \* 20 Time Before Reduction 20 30 30 Time To Reduce \* Minimum Gap 3.0 3.0

PHASE

MIN RECALL MIN RECALL Recall Mode YELLOW YELLOW **Vehicle Call Memory** Dual Entry -ON ON ON Simultaneous Gap

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

lower than 4 seconds.

**FEATURE** 

Min Green 1 \*

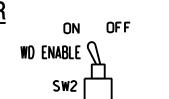
Extension 1 \*

Max Green 1 \*

Yellow Clearance

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

(remove jumpers and set switches as shown)



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

FYA 5-11

9 10 11 12 13 14

FS = FLASH SENSE ST = STOP TIME

₩D 1.0 SEC -GY ENABLE SF#1 POLARITY ⊢LEDguard RF SSM ———FYA 1-9 FYA 3-10

DENOTES POSITION

OF SWITCH

ST

-RF 2010

-RP DISABLE

FYA 7-12 ----

REMOVE JUMPERS AS SHOWN

#### NOTES:

FILE U

"J"

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

(front view)

<sup>⊗</sup> Wired Input - Do not populate slot with detector card

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 4. Program phases 2 and 6 for Startup In Green.
- 6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 7. The cabinet and controller are part of the NC 133 Closed Loop System.

#### EQUIPMENT INFORMATION

SOFTWARE .....ECONOLITE OASIS

CABINET MOUNT.....BASE OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5

PHASES USED......2,4,5,6 OVERLAP "A".....NOT USED OVERLAP "B".....NOT USED OVERLAP "C".....5+6 OVERLAP "D".....4+5

#### NOTES

CMU CHANNEL

YELLOW

GREEN

RED ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

GREEN ARROW

NU = Not Used

130

- 2. Enable Simultaneous Gap-Out for all Phases.
- 5. Program phases 2 and 6 for Yellow Flash.

## FYA SIGNAL WIRING DETAIL

SIGNAL HEAD HOOK-UP CHART

**\*** 135

136

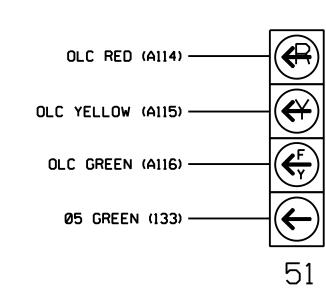
102

\* Denotes install load resistor. See load resistor

★ See pictorial of head wiring in detail this sheet.

installation detail this sheet.

(wire signal heads as shown)



#### <u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

| Electrical Detail - Sheet 1 of 4

Temporary Design 1

Signal Upgrade

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

PROJECT REFERENCE NO.

8 OLA OLB SPARE OLC OLD SPARE

A114

A115 A102

A103

Sig. 30

ELECTRICAL AND PROGRAMMING

DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. REVIEWED BY: A.D. Klinksiek June 2017 PLAN DATE: REVISIONS

TH CARO 031464 Southport

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE 750 N.Greenfield Pkwy.Garner.NC 27529 SIG. INVENTORY NO. 03-0267T1

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
	**	JlU	55	17	5	5	Y	Υ			15
ZONE 5A1	-	I4U	47	9 ★	22	2	Y	Υ	Y		3
	-	JlU	55	17 ★	55	5	Y	Υ			3

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.
- \*\* Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L SLOT 2 LOWER-

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

#### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (m1n)

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

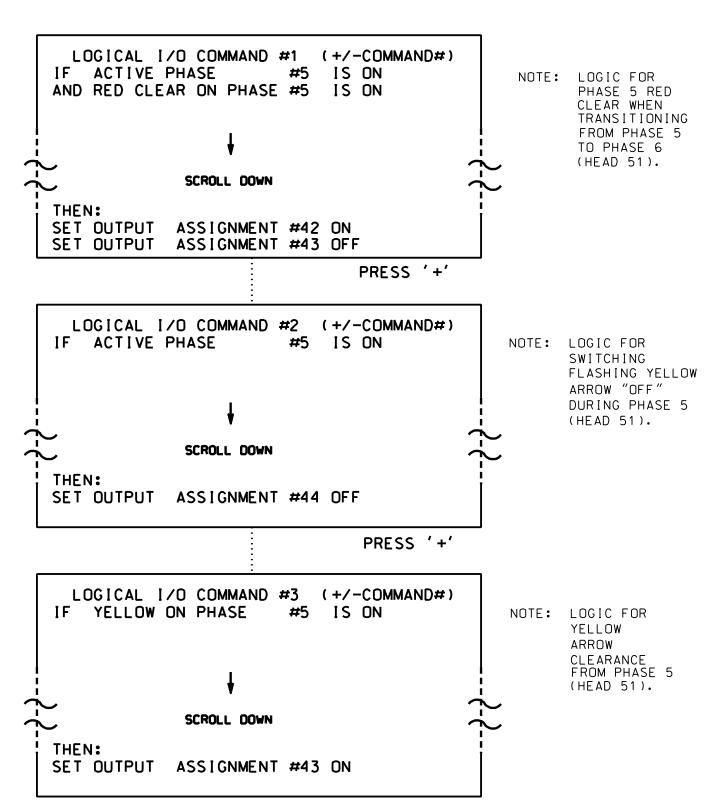
PHASE 5 YELLOW FIELD TERMINAL (132) AC-

#### PROJECT REFERENCE NO. R-5021 Sig. 30.

## LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1. 2. AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
               12345678910111213141516
PHASE:
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
                                         ← NOTICE
SELECT VEHICLE OVERLAP OPTIONS:
                                             GREEN
FLASH YELLOW IN CONTROLLER FLASH?...Y
                                             FLASH
GREEN EXTENSION (0-255 SEC).....
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS PHASE: 112345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

PRESS '+' TWICE

PAGE 2: VEHICLE OVERLAP 'C' SETTINGS NOTICE → 12345678910111213141516 PHASE: VEH OVL PARENTS: : VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

PRESS '+'

NOTICE → PAGE 2: VEHICLE OVERLAP 'D' SETTINGS PHASE: ¦12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: 1 STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

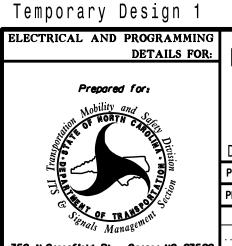
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

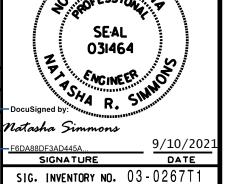
PAGE 2

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off )ivision 03 Brunswick Co. PLAN DATE:

Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS



TH CARO,

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

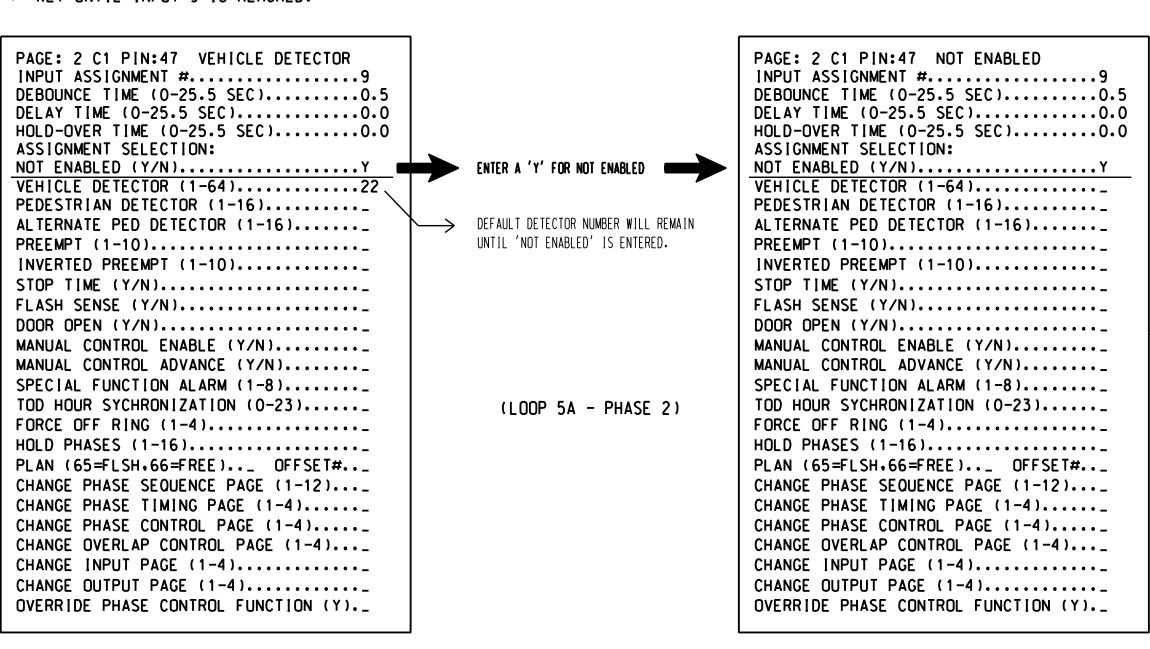
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES <u>FOR INPUT PAGE 2</u> ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

PRESS '+' TO ADVANCE TO INPUT 17

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N).... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig. 30.

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS). THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)		VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGING	ENTER I FOR ENABLE DETECTOR	ENABLE LOGGING
ENABLE DIAGNOSTICS		ENABLE DIAGNOSTICS
SPEED TRAP		SPEED TRAP
CALL DETECTORY		CALL DETECTOR
EXTENSION DETECTOR		EXTENSION DETECTOR
MODE 2 STOP BAR		MODE 2 STOP BAR
SWITCHING DETECTOR		SWITCHING DETECTOR
DUPLICATING DETECTOR		DUPLICATING DETECTOR
ENABLE FULL TIME DELAYN		ENABLE FULL TIME DELAY
IF FAILED. SET MIN RECALL?		IF FAILED. SET MIN RECALL?
IF FAILED. SET MAX1 RECALL?		IF FAILED. SET MAX1 RECALL?
IF FAILED. SET MAX2 RECALL?		IF FAILED. SET MAX2 RECALL?
PHASE#		PHASE#   12345678910111213141516
PHASES ASSIGNED :	ENTER '5' FOR PHASES ASSIGNED	PHASES ASSIGNED   X
SWITCH/DUPLICATE;		SWITCH/DUPLICATE;
LOOP SIZE (0-255 FT)6		LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)		STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)0.0		STRETCH (0-25.5 SEC)0.0
DELAY (0-255 SEC)	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255	ENSURE DELAT 15 5	MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
OUEUE MAX OCCUPANCY TIME (0-255)0		OUEUE MAX OCCUPANCY TIME (0-255)0
OUEUE GAP RESET TIME (0-25.5)0.0		OUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0267T1
DESIGNED: June 2017
SEALED: 9/10/2021
REVISED: N/A

Electrical Detail - Sheet 3 of 4 Signal Upgrade Temporary Design 1

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for:

Prepared for:

Prepared for:

Prepared for:

PLA

PRE

750 N.Greenfield Pkwy.Garner.NC 27529

DETAILS FOR: NC 211 (Southport-Supply Road)

at

Dosher Cut Off

Division 03 Brunswick Co. Southport

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE Notash

Docusigned by:

Atasha Simmons

F6DA88DF3AD445A

SIGNATURE

SIG. INVENTORY NO. 03-0267T1

TH CARO,

031464

PROJECT REFERENCE NO. Sig. 30.

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 51 to run protected

turns only.

INPUTS PAGE 2: Disables phase 5 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

#### FLASHER CIRCUIT MODIFICATION DETAIL

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

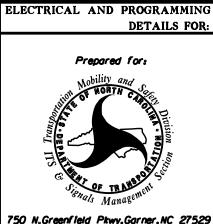
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

031464 SIG. INVENTORY NO. 03-0267T1

H CARO

PLAN DATE:

750 N. Greenfield Pkwy. Garner, NC 27529

#### PROJECT REFERENCE NO. R-5021

### 3 Phase Fully Actuated (NC 133 Closed Loop System)

#### NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Reposition existing signal heads numbered 21,22,51,61 and 62.
- 5. Set all detector units to presence mode.
- 6. Incorporate Microwave Detection system for vehicle detection.
- 7. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 9. Closed loop system data: Controller Asset #: 0267.

**LEGEND** 

**PROPOSED EXISTING**  $\bigcirc$ Traffic Signal Head Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy Controller & Cabinet Junction Box 2-in Underground Conduit Right of Way  $\longrightarrow$ 

> Microwave Detection Zone Construction Zone

Left Arrow "ONLY" Sign (R3-5L) Right Arrow "ONLY" Sign (R3-5R)

Directional Arrow

**UNLESS ALL SIGNATURES COMPLETED** 

NC 211 (Southport-Supply Road) Dosher Cut Off Division 03 Brunswick Co. Southpor June 2017 REVIEWED BY: A.D. Klinksiek

750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

TH CARO 031464

N/A

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART INDUCTIVE LOOPS DETECTOR PROGRAMMING SIZE FROM STOPBAR

LOOP 6X6 300 6X40 0 4·A \* |\*| 4 |Y|Y|-<del>\*\*\*</del>15 6X40 6X6 | 300 | \* |\* | 6 | Y | Y |

\* Multizone Microwave Detection.

\*\* Disable phase 2 call for 5A during alternate phasing operation.

\*\*\* Reduce delay to 3 seconds during alternate phasing operation.

PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

DEFAULT PHASING DIAGRAM

02+6

UNDETECTED MOVEMENT (OVERLAP)

UNSIGNALIZED MOVEMENT

→---- PEDESTRIAN MOVEMENT

All Heads L.E.D.

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

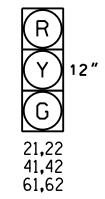
FACE

21,22

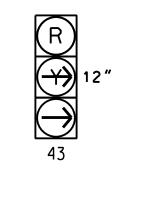
41,42

61,62

PHASE



SIGNAL FACE I.D.



ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62

PHASE

RGRY

02+6

NC 211 (Southport-Supply Road)

45 MPH +2% Grade

ALTERNATE PHASING DIAGRAM

OASIS 2070 TIMING CHART PHASE **FEATURE** 12 12 Min Green 1 \* 6.0 2.0 2.0 6.0 Extension 1 \* 90 30 20 90 Max Green 1 \* 4.7 3.0 3.0 4.7 Yellow Clearance 1.5 3.3 1.5 2.1 Red Clearance 2.0 2.0 2.0 2.0 Walk 1 \* Don't Walk 1 2.5 2.5 Seconds Per Actuation 34 Max Variable Initial\* 20 Time Before Reduction 20 30 30 Time To Reduce \* Minimum Gap 3.0 3.0 MIN RECALL MIN RECALL Recall Mode YELLOW YELLOW **Vehicle Call Memory** Dual Entry -

\* 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

Simultaneous Gap

ON

ON

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

**DOCUMENT NOT CONSIDERED FINAL** 

SIG. INVENTORY NO. 03-0267T2

45 MPH -2% Grade

NC 211 (Southport-Supply Road)

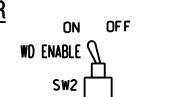
Signal Upgrade

Temporary Design 2

Construction Phase 1a

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

(remove jumpers and set switches as shown)



RF 2010

-RP DISABLE - WD 1.0 SEC

-GY ENABLE

- LEDguard ⊢RF ŠSM

— FYA 1-9

FYA 3-10 FYA 5-11 FYA 7-12 ----

───────FYA COMPACT──

- SF#1 POLARITY

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

REMOVE JUMPERS AS SHOWN

#### NOTES:

" T "

FILE U,

"J"

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

(front view)

<sup>⊗</sup> Wired Input - Do not populate slot with detector card

9 10 11 12 13 14

FS = FLASH SENSE

ST = STOP TIME

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Enable Simultaneous Gap-Out for all Phases.
- 3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 4. Program phases 2 and 6 for Startup In Green.
- 5. Program phases 2 and 6 for Yellow Flash.
- 6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 7. The cabinet and controller are part of the NC 133 Closed Loop System.

#### EQUIPMENT INFORMATION

SOFTWARE .....ECONOLITE OASIS

CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5 PHASES USED......2.4.5.6

OVERLAP "A".....NOT USED OVERLAP "B".....NOT USED OVERLAP "C".....5+6

## OF SWITCH

DENOTES POSITION

ST

## OVERLAP "D".....4+5

#### PROJECT REFERENCE NO. Sig. 31

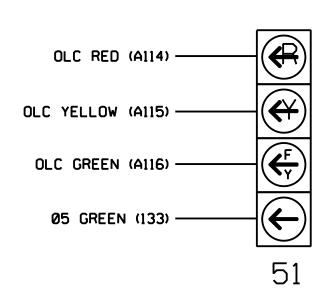
SIGNAL HEAD HOOK-UP CHART																		
				210	AVIL	<u>. L                                    </u>	1EA	ע ר	100	<u>n - (</u>	<u> </u>	$\Box \Box f$	<del>1</del> K I					
LOAD SWITCH NO.	SI	S2	53	<b>S4</b>	S5	S6	<b>S</b> 7	<b>S8</b>	<b>S</b> 9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	ď	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,	NU	<b>★</b> 51	61,62	NU	NU	NU	NU	NU	NU	NU	<b>★</b>	43	NU
RED		128			101			134									A101	
YELLOW		129			102		*	135										
GREEN		130			103			136										
RED ARROW																A114		
YELLOW ARROW																A115	A102	
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133										A103	

#### NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### <u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

| Electrical Detail - Sheet 1 of 4

Temporary Design 2

Signal Upgrade

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

Dosher Cut Off

Division 03 Brunswick Co. Southport REVIEWED BY: A.D. Klinksiek June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS

INIT. DATE SIG. INVENTORY NO. 03-0267T2

TH CARO

031464

## INPUT FILE CONNECTION & PROGRAMMING CHART

L00P NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
ZONE 5A1	**	JlU	55	17	5	5	Y	Υ			15
	-	I4U	47	9 ★	22	2	Y	Υ	Y		3
	-	JlU	55	17	55	5	Υ	Υ			3

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

- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.
- \*\* Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L SLOT 2-LOWER —

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

## LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (m1n)

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

AC-

PHASE 5 YELLOW FIELD TERMINAL (132)

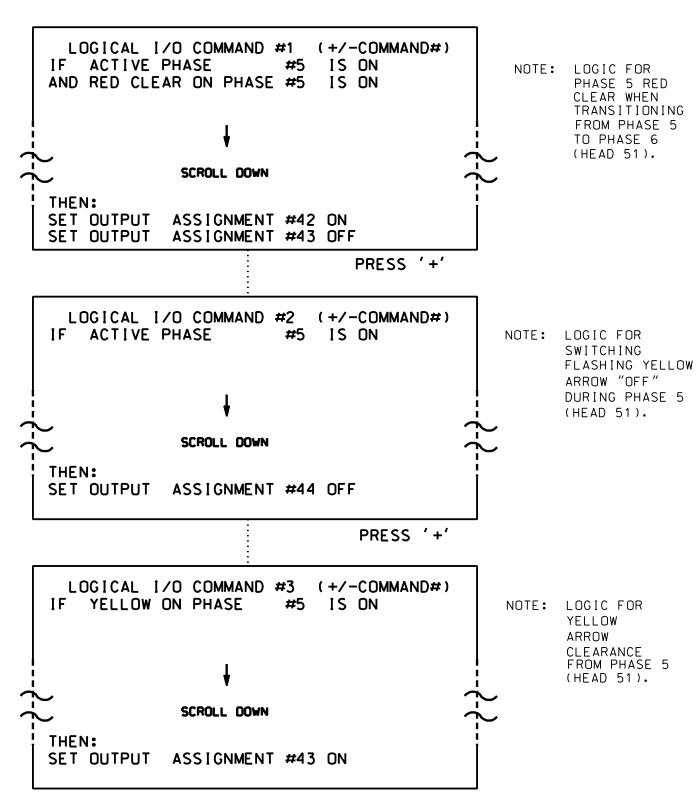
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997 750 N.Greenfield Pkwy.Garner.NC 27529

#### PROJECT REFERENCE NO. R-5021 Sig 31

## LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1. 2. AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
               12345678910111213141516
PHASE:
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
                                         ← NOTICE
SELECT VEHICLE OVERLAP OPTIONS:
                                             GREEN
FLASH YELLOW IN CONTROLLER FLASH?...Y
                                             FLASH
GREEN EXTENSION (0-255 SEC).....
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS PHASE: 112345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

PRESS '+' TWICE

PAGE 2: VEHICLE OVERLAP 'C' SETTINGS NOTICE → 12345678910111213141516 PHASE: VEH OVL PARENTS: : VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

PRESS '+'

NOTICE → PAGE 2: VEHICLE OVERLAP 'D' SETTINGS PHASE: ¦12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: 1 STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

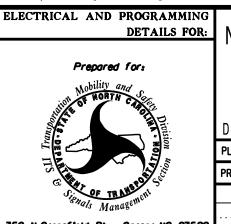
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

PAGE 2

PAGE 2

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



DETAILS FOR: NC 211 (Southport-Supply Road) )ivision 03 Brunswick Co. June 2017 PLAN DATE:



SIG. INVENTORY NO. 03-0267T2

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Dosher Cut Off Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

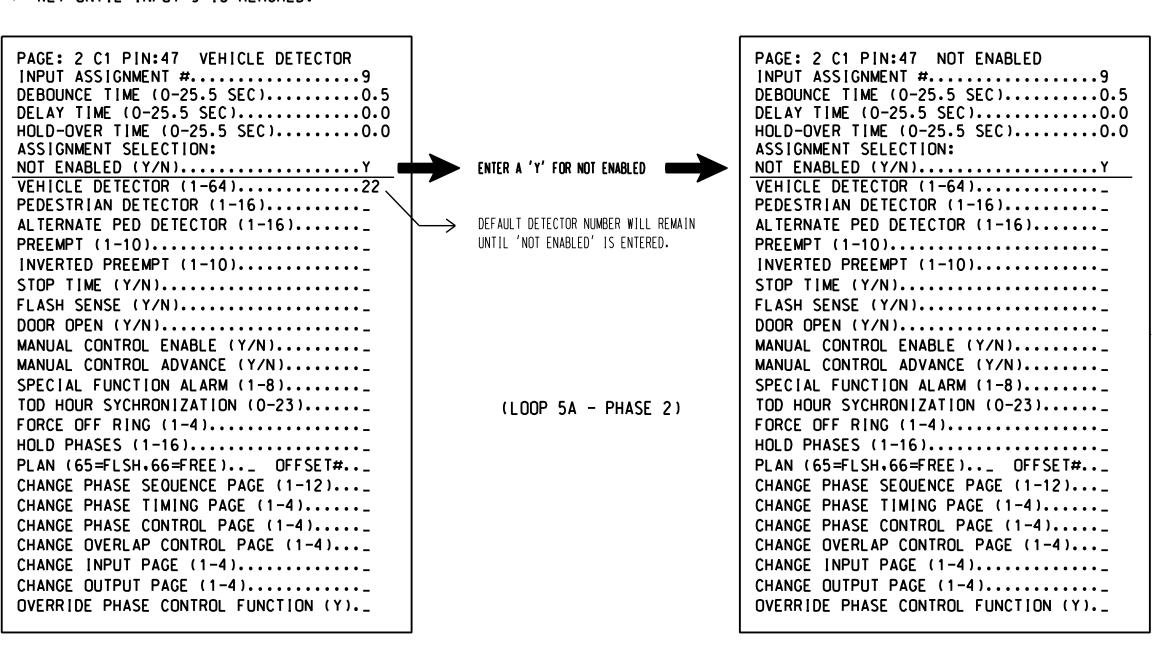
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

PRESS '+' TO ADVANCE TO INPUT 17

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DELAY TIME (0-25.5 SEC)............. HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig. 31

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64)		VEHICLE DETECTOR #55 SETTINGS (+-,1-64)
SETTING: (Y/N)		SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGINGN		ENABLE LOGGINGN
ENABLE DIAGNOSTICS		ENABLE DIAGNOSTICS
SPEED TRAPN		SPEED TRAPN
CALL DETECTORY		CALL DETECTORY
EXTENSION DETECTORY		EXTENSION DETECTORY
MODE 2 STOP BARN		MODE 2 STOP BARN
SWITCHING DETECTORN		SWITCHING DETECTOR
DUPLICATING DETECTOR		DUPLICATING DETECTOR
ENABLE FULL TIME DELAYN		ENABLE FULL TIME DELAYN
IF FAILED, SET MIN RECALL?		IF FAILED, SET MIN RECALL?
IF FAILED. SET MAX1 RECALL?		IF FAILED. SET MAX1 RECALL?
IF FAILED, SET MAX2 RECALL?		IF FAILED, SET MAX2 RECALL?
PHASE# \\ \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		PHASE# \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
PHASES ASSIGNED ;	ENTER 'E' FOR RUACEC ACCIONER	PHASES ASSIGNED   X
SWITCH/DUPLICATE!	ENTER '5' FOR PHASES ASSIGNED	SWITCH/DUPLICATE!
LOOP SIZE (0-255 FT)6		LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)		STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)		STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)0	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255		MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0		QUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0		QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0
1 1 2 2 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1		

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 3 of 4 Signal Upgrade Temporary Design 2

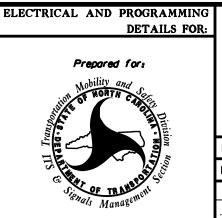
ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off Division 03 Brunswick Co. June 2017

TH CARO, 031464 Southport REVIEWED BY: A.D. Klinksiek INIT. DATE

PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

SIG. INVENTORY NO. 03-0267T2

R-5021 Sig. 31.4

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY

EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY

FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 51 to run protected

turns only.

INPUTS PAGE 2: Disables phase 5 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

#### FLASHER CIRCUIT MODIFICATION DETAIL

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

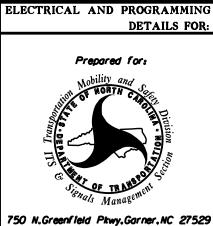
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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DETAILS FOR: NC 211 (Southport-Supply Road)

at

Dosher Cut Off

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

O31464

(Siek

ONS

DATE

Docusigned by:

Natasha Simmons

F6DA88DF3AD445A...

SIGNATURE

TH CARO

02+6

#### PROJECT REFERENCE NO. R-5021

### 3 Phase Fully Actuated (NC 133 Closed Loop System)

## NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Reposition existing signal heads numbered 21,22,51,61 and 62.
- 5. Set all detector units to presence mode.
- 6. Incorporate Microwave Detection system for vehicle detection.
- 7. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values
- 9. Closed loop system data: Controller Asset #: 0267.

supersede these values.

LEGEND

**PROPOSED** <u>EXISTING</u> Traffic Signal Head  $\bigcirc$ Modified Signal Head Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy Controller & Cabinet Junction Box ----- 2-in Underground Conduit

N/A

r×3 L×3

 $\longrightarrow$ 

N/A

Right of Way Directional Arrow Microwave Detection Zone

Left Arrow "ONLY" Sign (R3-5L) Right Arrow "ONLY" Sign (R3-5R)

Construction Zone

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

NC 211 (Southport-Supply Road) Dosher Cut Off Division 03 Brunswick Co.

June 2017

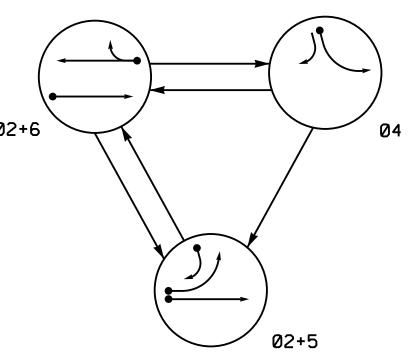
031464 . CACINEER

TH CAROL

SIG. INVENTORY NO. 03-0267T3

REVIEWED BY: A.D. Klinksiek INIT. DATE

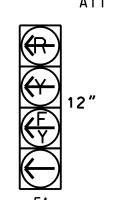
DEFAULT PHASING DIAGRAM	ALTERNATE PHASING DIAGRAM
6 04	02+6

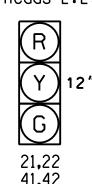


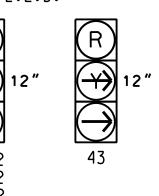
DEFAULT TABLE OF				٧	ALTERNATI TABLE OF						
		PH	4SE				PHA	4SE			
SIGNAL FACE	Ø 2 + 5	Ø2+6	0 4	上しるのエ	SIGNAL FACE	<b>0</b> Ω+5	02+6	0 4	FLEGIT		
21,22	G	G	R	Υ	21,22	G	G	R	Ì		
41,42	R	R	G	R	41,42	R	R	G	F		
43	$\rightarrow$	R	_	R	43	1	R	-	F		
51	<del>-</del>	₽	<del>-R</del>	<del>≺</del>	51	<b> </b>	<del>-R</del>	#	4		
61,62	R	G	R	Υ	61,62	R	O	R	Y		

SIGNAL FACE I.D.

All Heads L.E.D.







Y 12"
21,22
41,42
61,62

43<sub>17</sub> B

NC 211 (Southport-Supply Road) 

45 MPH +2% Grade

OASIS 2070 TIMING CHART PHASE **FEATURE** 12 12 Min Green 1 \* 6.0 2.0 2.0 6.0 Extension 1 \* 90 30 20 90 Max Green 1 \* 4.7 3.0 3.0 4.7

Yellow Clearance 1.6 2.9 1.6 1.9 Red Clearance 2.0 2.0 2.0 2.0 Red Revert Walk 1 \* Don't Walk 1 2.5 2.5 Seconds Per Actuation 34 Max Variable Initial \* 20 20 Time Before Reduction 30 30 Time To Reduce \* Minimum Gap 3.0 3.0 MIN RECALL MIN RECALL YELLOW YELLOW **Vehicle Call Memory** 

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

→---- PEDESTRIAN MOVEMENT

\* 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

-

ON

ON

Dual Entry

Simultaneous Gap

Signal Upgrade Temporary Design 3 Construction Phase 2

**■** (6A)

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

\* |**\*|** 4 |Y|Y|-

\*\* Disable phase 2 call for 5A during alternate

\*\*\* Reduce delay to 3 seconds during alternate

6X6 | 300 | \* |\* | 6 | Y | Y |

\* Multizone Microwave Detection.

45 MPH -2% Grade

NC 211 (Southport-Supply Road)

DETECTOR PROGRAMMING

<del>\*\*\*</del>15

INDUCTIVE LOOPS

6X6 300 6X40 0

SIZE

6X40

phasing operation.

phasing operation.

LOOP

4A

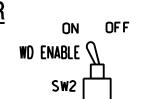
FROM

STOPBAR

750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

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

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-12, 4-12, 5-11, 5-12, 6-11, and 11-12. ───────FYA COMPACT── — FYA 1-9

FYA 3-10 FYA 5-11 FYA 7-12 ----

RF 2010

- LEDguard ⊢RF SSM

DENOTES POSITION

OF SWITCH

-RP DISABLE - WD 1.0 SEC -GY ENABLE

- SF#1 POLARITY

REMOVE JUMPERS AS SHOWN

#### NOTES:

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Enable Simultaneous Gap-Out for all Phases.
- 3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 4. Program phases 2 and 6 for Startup In Green.
- 5. Program phases 2 and 6 for Yellow Flash.
- 6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 7. The cabinet and controller are part of the NC 133 Closed Loop System.

#### EQUIPMENT INFORMATION

SOFTWARE .....ECONOLITE OASIS CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5 PHASES USED......2,4,5,6

OVERLAP "A".....NOT USED OVERLAP "B".....NOT USED OVERLAP "C".....5+6 OVERLAP "D".....4+5

## PROJECT REFERENCE NO.

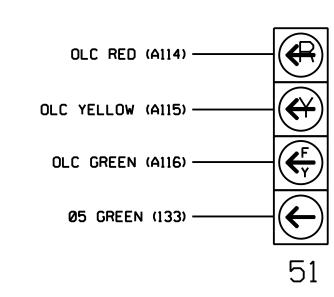
SIGNAL HEAD HOOK-UP CHART																	
Sl	<b>S2</b>	<b>S</b> 3	<b>S4</b>	S5	S6	<b>S7</b>	S8	<b>S9</b>	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
NU	21,22	NU	NU	41,42,	NU	<b>5</b> 1	61,62	NU	NU	NU	NU	NU	NU	NU	<b>★</b> 51	43	NU
	128			101			134									A101	
	129			102		*	135										
	130			103			136										
															A114		
															A115	A102	
															A116		
						133										A103	
	1	1 2 1 2 NU 21,22 128 129	S1 S2 S3  1 2 13  1 2 PED  NU 21.22 NU  128  129	S1       S2       S3       S4         1       2       13       3         1       2       PED       3         NU       21,22       NU       NU         128       -       129       -	S1       S2       S3       S4       S5         1       2       13       3       4         1       2       PED       3       4         NU       21,22       NU       NU       41,42,         128       101       102         129       102       102	S1       S2       S3       S4       S5       S6         1       2       13       3       4       14         1       2       PED       3       4       PED         NU       21,22       NU       NU       41,42       NU         128       101       102       102         129       102       102       102	S1 S2 S3 S4 S5 S6 S7  1 2 13 3 4 14 5  1 2 PED 3 4 PED 5  NU 21.22 NU NU 41.42 NU 51  128	S1 S2 S3 S4 S5 S6 S7 S8  1 2 13 3 4 14 5 6  1 2 PED 3 4 PED 5 6  NU 21.22 NU NU 41.42, NU 51 61.62  128	S1 S2 S3 S4 S5 S6 S7 S8 S9  1 2 13 3 4 14 5 6 15  1 2 PED 3 4 PED 5 6 PED  NU 21.22 NU NU 41.42, NU 51 61.62 NU  128	S1       S2       S3       S4       S5       S6       S7       S8       S9       S10         1       2       13       3       4       14       5       6       15       7         1       2       PED       3       4       PED       5       6       PED       7         NU       21.22       NU       NU       41.42.       NU       51       61.62       NU       NU         128        101        134           129        102        *       135           130        103         136           130                  130                                <	S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11         1       2       13       3       4       14       5       6       15       7       8         1       2 $\rho_{ED}^2$ 3       4 $\rho_{ED}^4$ 5       6 $\rho_{ED}^6$ 7       8         NU       21,22       NU       NU       41,42       NU       51       61,62       NU       NU       NU       NU         128        101        134            129        102        135            130        103        136            130                 130 <td>S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12  1 2 13 3 4 14 5 6 15 7 8 16  1 2 PED 3 4 PED 5 6 PED 7 8 PED  NU 21.22 NU NU 41.42, NU 51 61.62 NU NU NU NU NU  128</td> <td>S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 AUX 1 2 13 3 4 14 5 6 15 7 8 16 9 1 2 PED 3 4 PED 5 6 PED 7 8 PED 0LA  NU 21.22 NU NU 41.42, NU 51 61.62 NU NU NU NU NU NU NU 128</td> <td>S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX S2         1       2       13       3       4       14       5       6       15       7       8       16       9       10         1       2       PED       3       4       PED       5       6       PED       7       8       PED       OLA       OLB         NU       21,22       NU       NU       41,42       NU       51       61,62       NU       NU</td> <td>S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX S2       AUX S2       AUX S3         1       2       13       3       4       14       5       6       15       7       8       16       9       10       17         1       2       PED       3       4       PED       5       6       PED       7       8       PED       0LA       0LB       SPARE         NU       21.22       NU       NU       41.42       NU       51       61.62       NU       &lt;</td> <td>S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX       AUX       AUX       S44         1       2       13       3       4       14       5       6       15       7       8       16       9       10       17       11         1       2       PED       3       4       PED       5       6       PED       7       8       PED       0LA       0LB       SPARE       0LC         NU       21.22       NU       NU       41.42       NU       51*       61.62       NU       NU<!--</td--><td>S1         S2         S3         S4         S5         S6         S7         S8         S9         S10         S11         S12         AUX         AUX         AUX         SQX         AUX         SQX         SQX</td></td>	S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12  1 2 13 3 4 14 5 6 15 7 8 16  1 2 PED 3 4 PED 5 6 PED 7 8 PED  NU 21.22 NU NU 41.42, NU 51 61.62 NU NU NU NU NU  128	S1 S2 S3 S4 S5 S6 S7 S8 S9 S10 S11 S12 AUX 1 2 13 3 4 14 5 6 15 7 8 16 9 1 2 PED 3 4 PED 5 6 PED 7 8 PED 0LA  NU 21.22 NU NU 41.42, NU 51 61.62 NU NU NU NU NU NU NU 128	S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX S2         1       2       13       3       4       14       5       6       15       7       8       16       9       10         1       2       PED       3       4       PED       5       6       PED       7       8       PED       OLA       OLB         NU       21,22       NU       NU       41,42       NU       51       61,62       NU       NU	S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX S2       AUX S2       AUX S3         1       2       13       3       4       14       5       6       15       7       8       16       9       10       17         1       2       PED       3       4       PED       5       6       PED       7       8       PED       0LA       0LB       SPARE         NU       21.22       NU       NU       41.42       NU       51       61.62       NU       <	S1       S2       S3       S4       S5       S6       S7       S8       S9       S10       S11       S12       AUX       AUX       AUX       S44         1       2       13       3       4       14       5       6       15       7       8       16       9       10       17       11         1       2       PED       3       4       PED       5       6       PED       7       8       PED       0LA       0LB       SPARE       0LC         NU       21.22       NU       NU       41.42       NU       51*       61.62       NU       NU </td <td>S1         S2         S3         S4         S5         S6         S7         S8         S9         S10         S11         S12         AUX         AUX         AUX         SQX         AUX         SQX         SQX</td>	S1         S2         S3         S4         S5         S6         S7         S8         S9         S10         S11         S12         AUX         AUX         AUX         SQX         AUX         SQX         SQX

#### NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### <u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4

Signal Upgrade Temporary Design 3

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

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 211 (Southport-Supply Road)

Dosher Cut Off

Division 03 Brunswick Co. Southport PLAN DATE: June 2017 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

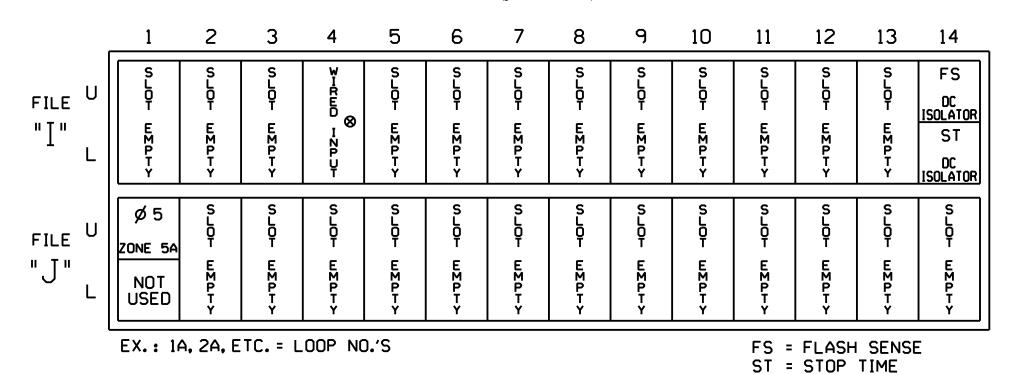
REVIEWED BY: A.D. Klinksiek REVISIONS INIT. DATE

TH CARO 031464

SIG. INVENTORY NO. 03-0267T3

INPUT FILE POSITION LAYOUT

(front view)



<sup>⊗</sup> Wired Input - Do not populate slot with detector card

#### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
	**	J1U	55	17	5	5	Υ	Υ			15
ZONE 5A	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3
	-	JIU	55	17 ★	55	5	Υ	Υ			3

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

- ★ See vehicle detector setup programming detail for alternate phasing on sheet 3.
- \*\* Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L SLOT 2-LOWER —

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K 10W (m10)

PHASE 5 YELLOW FIELD TERMINAL (132) AC-

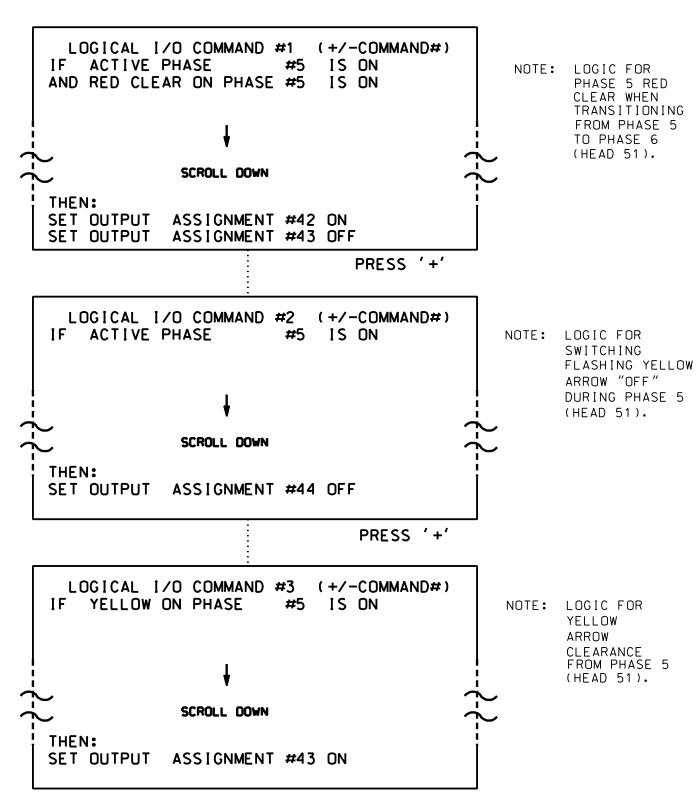
750 N.Greenfield Pkwy.Garner.NC 27529

#### PROJECT REFERENCE NO. R-5021 Sig. 32.

## LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1. 2. AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
               12345678910111213141516
PHASE:
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
                                         ← NOTICE
SELECT VEHICLE OVERLAP OPTIONS:
                                             GREEN
FLASH YELLOW IN CONTROLLER FLASH?...Y
                                             FLASH
GREEN EXTENSION (0-255 SEC).....
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS PHASE: 112345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

#### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

PRESS '+' TWICE

PAGE 2: VEHICLE OVERLAP 'C' SETTINGS NOTICE → 12345678910111213141516 PHASE: VEH OVL PARENTS: : VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

PRESS '+'

NOTICE → PAGE 2: VEHICLE OVERLAP 'D' SETTINGS PHASE: ¦12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: 1 STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW \_ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

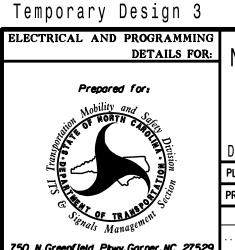
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

PAGE 2

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

)ivision 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons

031464 SIG. INVENTORY NO. 03-0267T3

TH CARO,

REVISIONS

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

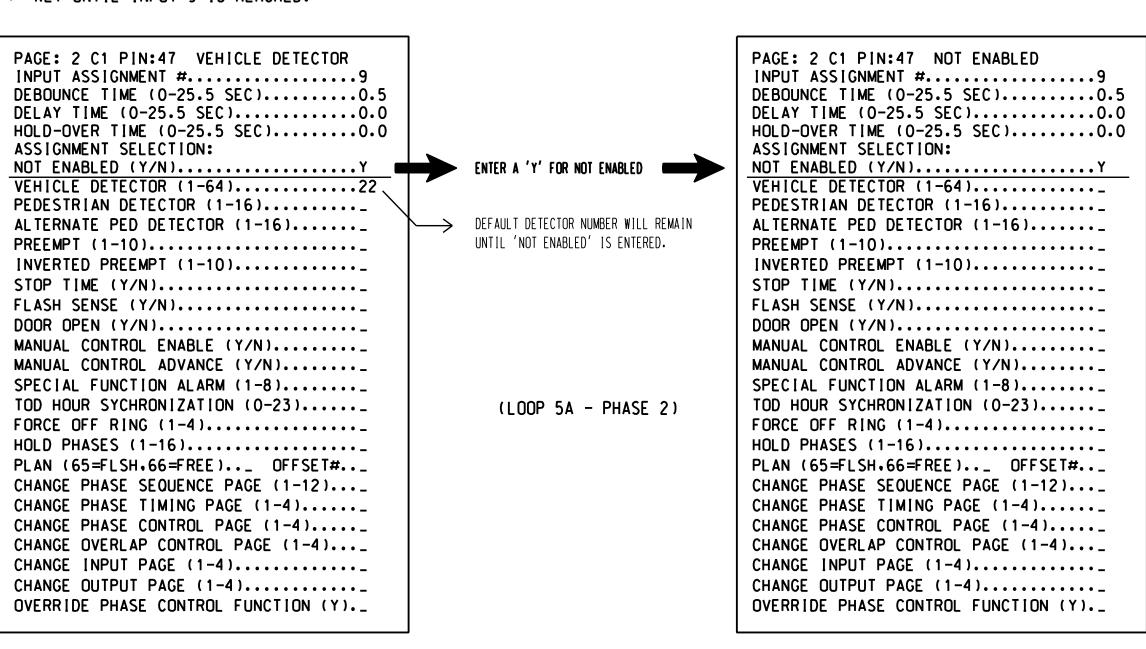
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES <u>FOR INPUT PAGE 2</u> ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

PRESS '+' TO ADVANCE TO INPUT 17

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)............ HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4)..... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4).... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)...\_ CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

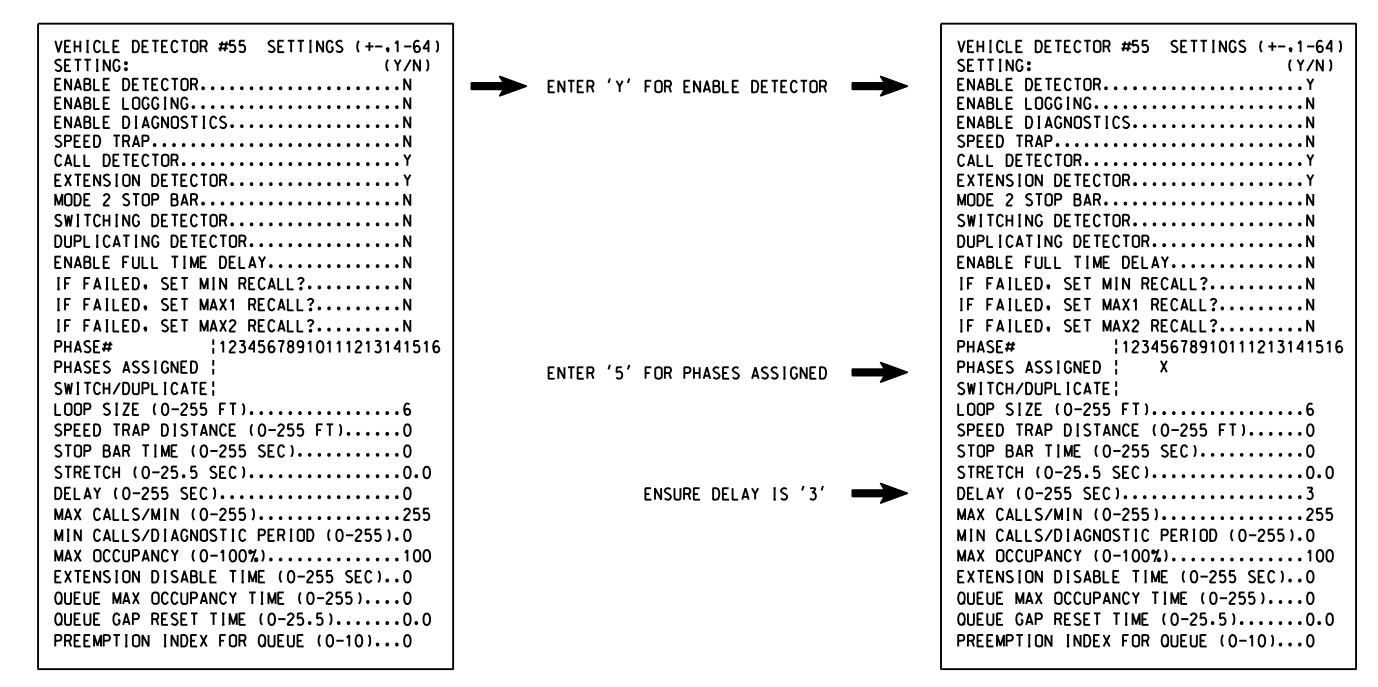
Sig. 32

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS). THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0267T3
DESIGNED: June 2017
SEALED: 9/10/2021
REVISED: N/A

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

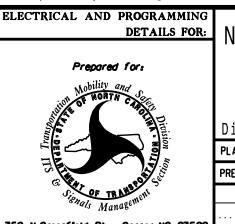
ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAILS FOR: NC 211 (Southport-Supply Road)

at

Dosher Cut Off

Division 03 Brunswick Co Southport

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

SEAL 031464

Docusigned by:

Natasha Simmons

PERDARRES 9/14

TH CARO

PROJECT REFERENCE NO. Sig. 32.

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 51 to run protected

turns only.

INPUTS PAGE 2: Disables phase 5 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

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

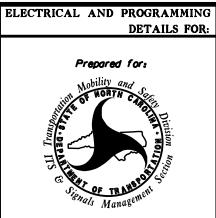
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS

031464

TH CARO

PLAN DATE: 750 N. Greenfield Pkwy. Garner, NC 27529

INIT. DATE SIG. INVENTORY NO. 03-0267T3

#### PROJECT REFERENCE NO. R-5021 Sig. 33

## 3 Phase Fully Actuated (NC 133 Closed Loop System)

## NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Reposition existing signal heads numbered 21,22,51,61 and 62.
- 5. Set all detector units to presence mode.
- 6. Incorporate Microwave Detection system for vehicle detection.
- 7. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- 8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 9. Closed loop system data: Controller Asset #: 0267.

LEGEND

Traffic Signal Head

Modified Signal Head

Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy

Signal Pole with Sidewalk Guy

Controller & Cabinet Junction Box

2-in Underground Conduit

Right of Way

Construction Barricade

<u>EXISTING</u>

**●** 

N/A

r×3 L×3

 $\longrightarrow$ 

N/A

N/A

N/A

 $\bigcirc$ 

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS DETECTOR PROGRAMMING												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2·A	6X6	300	*	*	2	Υ	Υ	-	-	-	-	-
4 A	6X40	0	*	*	4	Υ	Υ	-	-	3	-	-
ΕΛ	CV40	0	<b>*</b>	v	5	Υ	Υ	-	-	<del>***</del> 15	·	-
5 <sup>.</sup> A	6X·40		*	*	<del>***</del> 2	Υ	Υ	Υ	-	3	-	-
5B	6X:40	0	*	*	5	Υ	Υ	-	-	15	ı	-
6·A	6X6	300	*	*	6	Υ	Υ	-	-	-	1	-

- \* Multizone Microwave Detection.
- \*\* Disable phase 2 call for 5A during alternate phasing operation.
- \*\*\* Reduce delay to 3 seconds during alternate

51 61,62	
$A_{1}$ $A_{2}$ $A_{3}$ $A_{4}$	
R/W————————————————————————————————————	
NC 211 (Southport-Supply Road)	45 MPH -2% Grade  ■6A
51 - 21	NC 211 (Southport-Supply Road)

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

PHASE

FEATURE	2	4	5	6		
Min Green 1 *	12	7	7	12		
Extension 1 *	6.0	2.0	2.0	6.0		
Max Green 1 *	90	30	20	90		
Yellow Clearance	4.7	3.0	3.0	4.7		
Red Clearance	1.6	3.4	2.3	1.6		
Red Revert	2.0	2.0	2.0	2.0		
Walk 1 *	-	-	-	-		
Don't Walk 1	-	-	-	-		
Seconds Per Actuation *	2.5	-	-	2.5		
Max Variable Initial*	34	-	-	34		
Time Before Reduction *	20	-	-	20		
Time To Reduce *	30	-	-	30		
Minimum Gap	3.0	-	-	3.0		
Recall Mode	MIN RECALL	-	-	MIN RECALL		

OASIS 2070 TIMING CHART

**PHASE** 

YELLOW

-

ON

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

◆---- PEDESTRIAN MOVEMENT

02+6

\* 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.

ON

ON

YELLOW

ON

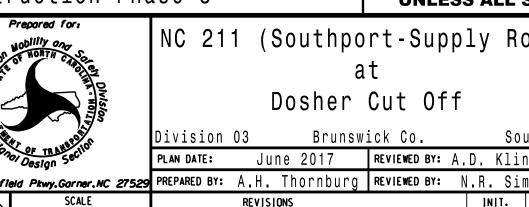
Vehicle Call Memory

Simultaneous Gap

Dual Entry

Signal Upgrade Temporary Design 4 Construction Phase 3

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



TH CARO 031464

SIG. INVENTORY NO. 03-0267T4

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997 HNTB

NC 211 (Southport-Supply Road) Southpor REVIEWED BY: A.D. Klinksiek 750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

5B 6A 61,62 61,62 SIGNAL FACE I.D. All Heads L.E.D. phasing operation. R 12" R Y 12" G 21,22 41,42 

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

PHASE

45 MPH +2% Grade

ALTERNATE PHASING DIAGRAM

02+6

Directional Arrow Microwave Detection Zone Directional Drill Construction Zone

**PROPOSED** 

 $\bigcirc$ 

Left Arrow "ONLY" Sign (R3-5L)

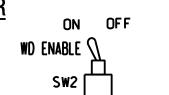
Right Arrow "ONLY" Sign (R3-5R)

"RIGHT TURN MUST YIELD TO U-TURN" Sign

NOTES:

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

(remove jumpers and set switches as shown)



−RF 2010 −

-RP DISABLE ─ WD 1.0 SEC

GY ENABLE

⊢LEDguard RF SSM

DENOTES POSITION

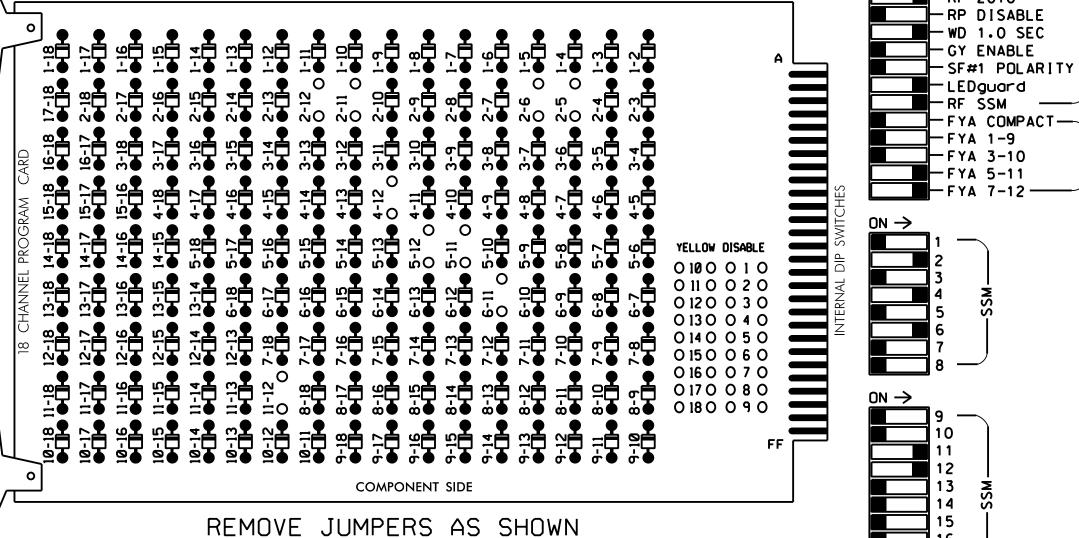
OF SWITCH

———FYA 1-9

FYA 5-11

SF#1 POLARITY

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



1. Card is provided with all diode jumpers in place. Removal

of any jumper allows its channels to run concurrently.

2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.

controller. Ensure conflict monitor communicates with 2070.

3. Ensure that Red Enable is active at all times during normal operation.

4. Connect serial cable from conflict monitor to comm. port 1 of 2070

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in
- 2. Enable Simultaneous Gap-Out for all Phases.
- 3. Program phases 2 and 6 for Variable Initial and Gap Reduction.

- Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE .....ECONOLITE OASIS

CABINET MOUNT.....BASE

PHASES USED......2,4,5,6

OVERLAP "C".....5+6

## OVERLAP "D".....4+5

#### NOTES

- the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.

- 4. Program phases 2 and 6 for Startup In Green.
- 5. Program phases 2 and 6 for Yellow Flash.
- 6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 7. The cabinet and controller are part of the NC 133 Closed

## NU = Not Used

128

129

130

LOAD SWITCH NO.

CMU CHANNEL NO.

SIGNAL HEAD NO

YELLOW

GREEN

RED ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

GREEN ARROW

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

133

★ See pictorial of head wiring in detail this sheet.

101

102

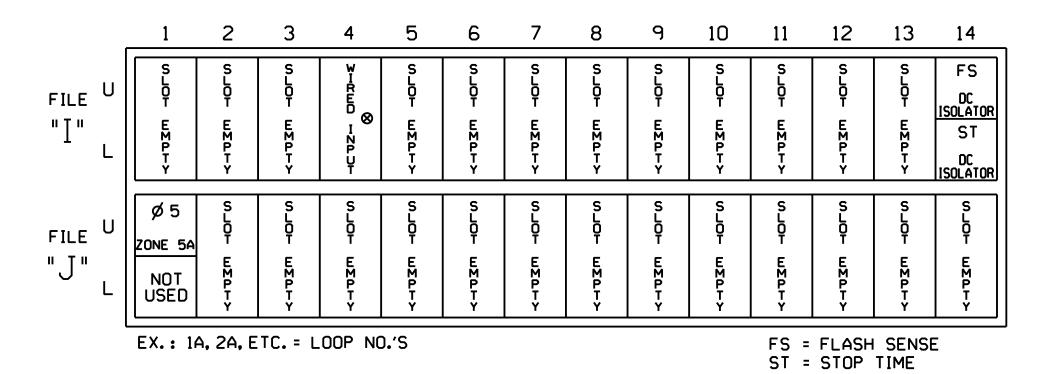
103

OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5

OVERLAP "A".....NOT USED OVERLAP "B".....NOT USED

## INPUT FILE POSITION LAYOUT

(front view)



<sup>⊗</sup> Wired Input - Do not populate slot with detector card

#### INPUT FILE CONNECTION & PROGRAMMING CHART

L	00P	NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
			**	JlU	55	17	5	5	Υ	Υ			15
;	ZONE	5A1	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3
			-	JIU	55	17 🖈	55	5	Υ	Υ			3

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

★ See vehicle detector setup programming detail for

alternate phasing on sheet 3. \*\* Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loop 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

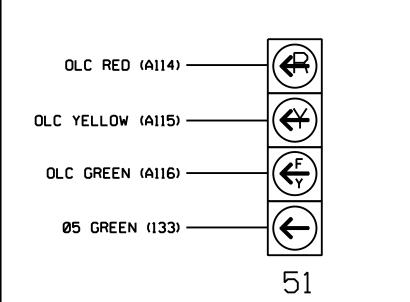
## FYA SIGNAL WIRING DETAIL

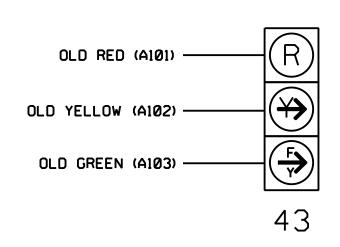
SIGNAL HEAD HOOK-UP CHART

NU 21,22 NU NU 41,42 NU 51 61,62 NU NU NU NU NU NU NU NU NU

**\*** 135

(wire signal heads as shown)





PROJECT REFERENCE NO.

A115 A102

A116 A103

8 | 8 | OLA | OLB | SPARE | OLC | OLD | SPARE

Sig. 33

#### <u>NOTE</u>

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4

Signal Upgrade Temporary Design 4

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

ELECTRICAL AND PROGRAMMING

DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. REVIEWED BY: A.D. Klinksiek June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

Southport REVISIONS INIT. DATE

031464

SIG. INVENTORY NO. 03-0267T4

TH CARO,



TERMINAL (132) ACCEPTABLE VALUES VALUE (ohms) WATTAGE |1.5K - 1.9K | 25W (min)| 2.0K - 3.0K | 10W (m1n)

AC-

PHASE 5 YELLOW FIELD

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

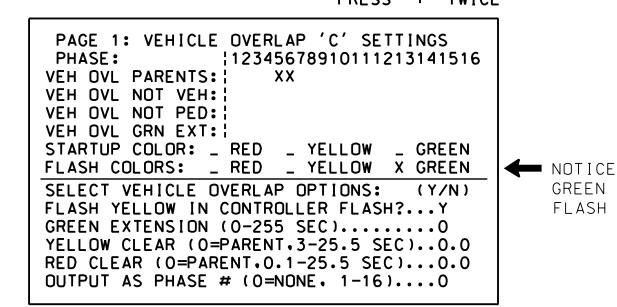
#### PROJECT REFERENCE NO. R-5021 Sig 33

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

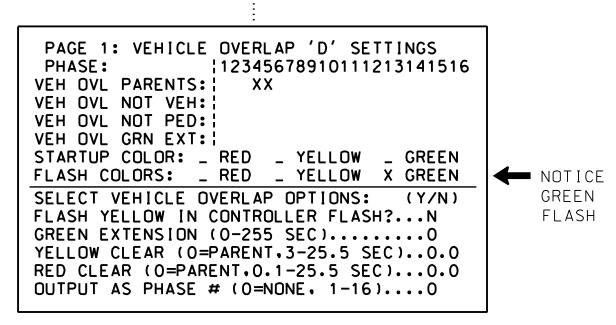
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

#### PRESS '+' TWICE



#### PRESS '+'



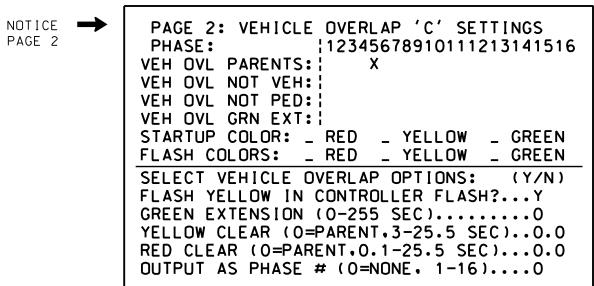
OVERLAP PROGRAMMING COMPLETE

### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

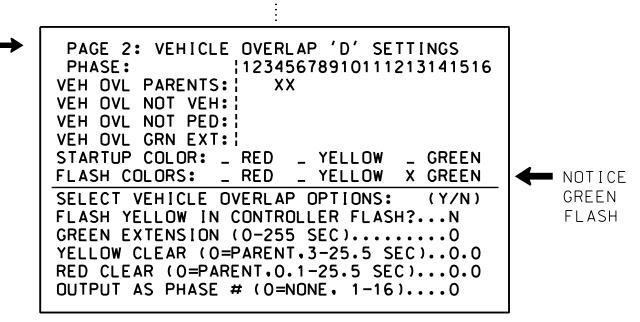
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

#### PRESS '+' TWICE



PRESS '+'



OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O COMMAND #1 (+/-COMMAND#) IF ACTIVE PHASE #5 IS ON NOTE: LOGIC FOR AND RED CLEAR ON PHASE #5 IS ON PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51). SCROLL DOWN SET OUTPUT ASSIGNMENT #42 ON SET OUTPUT ASSIGNMENT #43 OFF PRESS '+' LOGICAL I/O COMMAND #2 (+/-COMMAND#) IF ACTIVE PHASE #5 IS ON NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51). SCROLL DOWN SET OUTPUT ASSIGNMENT #44 OFF PRESS '+' LOGICAL I/O COMMAND #3 (+/-COMMAND#) IF YELLOW ON PHASE #5 IS ON NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51). SET OUTPUT ASSIGNMENT #43 ON

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

PROCESSOR).

CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T4 DESIGNED: June 2017 SEALED: 9/10/2021

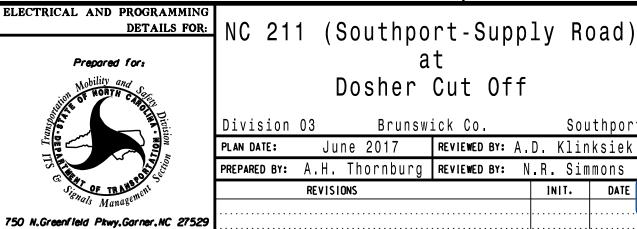
REVISED: N/A

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

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



Temporary Design 4

Dosher Cut Off )ivision 03 Brunswick Co. REVIEWED BY: A.D. Klinksiek June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS

TH CARO 031464 Southport

SIG. INVENTORY NO. 03-0267T4

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

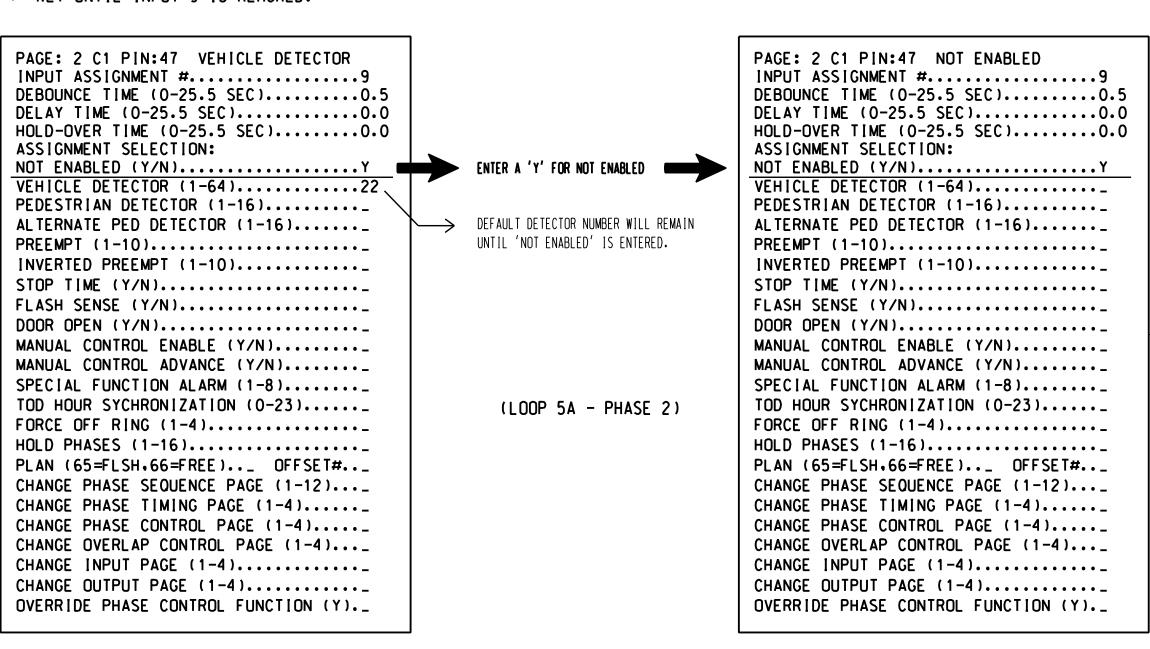
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

PRESS '+' TO ADVANCE TO INPUT 17

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)............0.0 HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4).... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N).... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... (LOOP 5A - PHASE 5) FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig 33.

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

		<b>1</b>	
SETTENAE ENAE ENAE SPEE CALL EXTE MODE SWIT	ICLE DETECTOR #55 SETTINGS (+-,1-64) FING: (Y/N) BLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	VEHICLE DETECTOR #55 SETTINGS (+1-64) SETTING: (Y/N) ENABLE DETECTOR
IF F IF F PHAS PHAS SWIT	FAILED. SET MAX1 RECALL?N FAILED. SET MAX2 RECALL?N	ENTER '5' FOR PHASES ASSIGNED	IF FAILED, SET MAX1 RECALL?N  IF FAILED, SET MAX2 RECALL?N  PHASE#   12345678910111213141516  PHASES ASSIGNED   X  SWITCH/DUPLICATE   LOOP SIZE (0-255 FT)
STRE DELA MAX MIN MAX EXTE	P BAR TIME (0-255 SEC)	ENSURE DELAY IS '3'	STOP BAR TIME (0-255 SEC)
	JE GAP RESET TIME (0-25.5)0.0 EMPTION INDEX FOR QUEUE (0-10)0		OUEUE GAP RESET TIME (0-25.5)0.0 PREEMPTION INDEX FOR QUEUE (0-10)0

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

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

ELECTRICAL AND PROGRAMMIN

DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. Southport June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons

031464

TH CARO,

REVISIONS INIT. DATE

TREVIEWED BY: A.D. Klinksiek SIG. INVENTORY NO. 03-0267T4

DETECTOR PROGRAMMING COMPLETE

R-5021 Sig. 33.4

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW)
WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT, PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY

EVENTS, IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY

FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u>	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 5 call on loop 5A and reduces delay time for phase 5

call on loop 5A to 3 seconds.

Electrical Detail - Sheet 4 of 4

#### FLASHER CIRCUIT MODIFICATION DETAIL

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

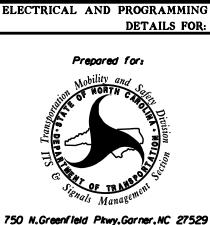
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T4 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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Dosher Cut Off

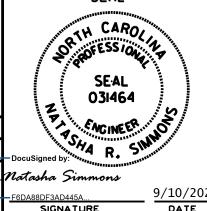
Division 03

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

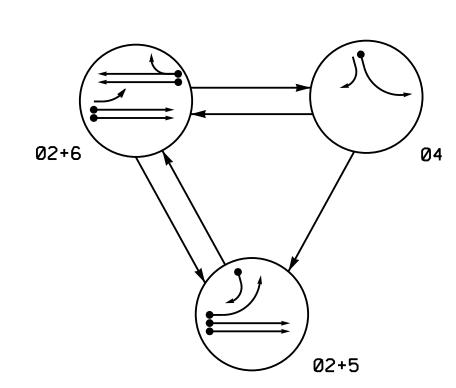
PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE



SIG. INVENTORY NO. 03-0267T4

#### DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

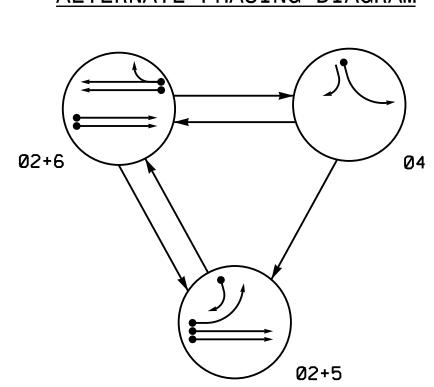
UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

→---- PEDESTRIAN MOVEMENT

## ALTERNATE PHASING DIAGRAM

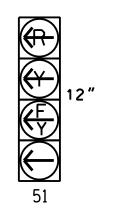


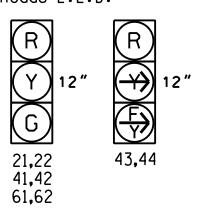
DEFAULT PHASING TABLE OF OPERATION						
		PHA	4SE			
SIGNAL FACE	<b>0</b> 2+5	<b>0</b> 2+6	04	FUGOI		
21,22	G	G	R	Υ		
41,42	R	R	G	R		
43,44	Ⴡ	R	ᆄ	R		
51	1	<del>F</del>  ≻	#	<del>-Y</del>		
61,62	R	O	R	Υ		

ALTERNATI	ALTERNATE PHASING					OASIS	2
TABLE OF	0PE	RAT	[IOI		IN	NDI	
		PHA	4SE				
SIGNAL FACE	<b>0</b> 2+5	Ø 2 +	0 4	тчдот		LOOP	
	5	6		ာ H		2A/S29	(
21,22	G	G	R	~		2B/S30	(
41,42	R	R	G	R		4A	6
43,44	나	R	누	R		5A	6
51	<b>—</b>	<del>⊀R</del>	#	‡			_
61,62	R	G	R	Y		5B	6
·					•	6A/S31	
						6B /C32	

## SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
ΙI	NDUCTI	VE LOC	)PS		DETE	ECT	OR	PI	ROGRAN	MMING		
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S29	6X6	300	4	Υ	2	Υ	Υ	ı	1	ı	Υ	Υ
2B/S30	6X6	300	4	Υ	2	Υ	Υ	ı	1	1	Υ	Υ
4·A	6X40	0	2-4-2	Υ	4	Υ	Υ	-	1	3	ı	Υ
5:A	6X40	0	2-4-2	Υ	5	Υ	Υ	ı	ı	<del>**</del> 15	4	Υ
JA	ONTO	0	2-4-2	_	<b>*</b> ·2	Y	Υ	Y	ı	3	ı	Υ
5B	6X40	0	2-4-2	Υ	5	Υ	Υ	ı		15	ı	Υ
6A/S31	6X6	300	5	Υ	6	Υ	Υ	ı		-	Υ	Υ
6B/S32	6X6	300	5	Υ	6	Υ	Υ	-	-	-	Υ	Υ

\* Disable phase 2 call for 5A during alternate phasing operation.

\*\* Reduce delay to 3 seconds during alternate phasing operation.

3 Phase

PROJECT REFERENCE NO.

R-5021

Fully Actuated (NC 133 Closed Loop System)

#### **NOTES**

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 7. Closed loop system data: Controller Asset #: 0267.

Metal Pole with Mas Sta. 380+58 +/	LREV - 90' Lt		
R/W			R/W
NC 211 (Southport-Supply Road)	B 644 0+62_	45 MPH -2% Grade	
	51- 51-		
	22 - 42 41 43 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Arm "A" NC 211 (Southport-Supply R	oad)
R/W————————————————————————————————————	Arm "B"	Metal Pole with Dual Mast Arm #2 Sta. 381+72 +/LREV- 65' Rt	——————————————————————————————————————

— R / W		
3 <u>0</u> 3 <u>0</u>		
<u> </u>		
R/W		

**PROPOSED** <u>EXISTING</u> Traffic Signal Head  $\bigcirc$ Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy Inductive Loop Detector K×N K×N Controller & Cabinet Junction Box ----- 2-in Underground Conduit \_-----Right of Way Directional Arrow Directional Drill N/A Metal Pole with Mastarm Left Arrow "ONLY" Sign (R3-5L) "RIGHT TURN MUST YIELD TO U-TURN" Sign

LEGEND

90 30 20 90 Max Green 1 \* 4.7 3.0 3.0 4.7 Yellow Clearance 1.6 3.3 1.6 2.3 Red Clearance 2.0 2.0 2.0 2.0 Red Revert Walk 1 \* -Don't Walk 1 -1.5 1.5 Seconds Per Actuation 34 Max Variable Initial \* 15 Time Before Reduction 15

OASIS 2070 TIMING CHART

2.0

12

6.0

30

**FEATURE** 

Min Green 1 \*

Extension 1 \*

Time To Reduce \*

PHASE

2.0

12

6.0

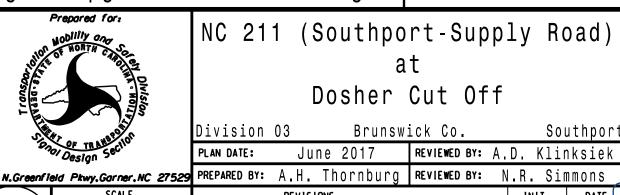
30

Minimum Gap 3.0 3.0 MIN RECALL MIN RECALL Recall Mode YELLOW YELLOW **Vehicle Call Memory** Dual Entry -ON ON ON ON Simultaneous Gap

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

Signal Upgrade - Final Design

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

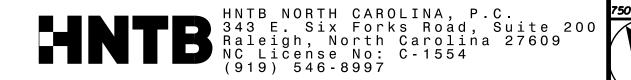


50

Dosher Cut Off

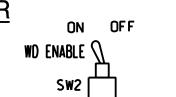
Division 03 Brunswick Co. Southport June 2017 PLAN DATE: REVIEWED BY: A.D. Klinksiek 750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

ATH CAROL 031464 MCINEER. DATE SIG. INVENTORY NO. 03-0267



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

(remove jumpers and set switches as shown)



−RF 2010 −

-RP DISABLE ─ WD 1.0 SEC

GY ENABLE

─ LEDguard RF SSM

FYA 7-12

DENOTES POSITION

OF SWITCH

ST

FS = FLASH SENSE ST = STOP TIME

\_\_\_\_⊢FYA 1-9

FYA 3-10 FYA 5-11

─GY ENABLE ☐ ─SF#1 POLARITY ☐

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

COMPONENT SIDE

REMOVE JUMPERS AS SHOWN

#### NOTES:

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

4A

NOT USED

INPUT FILE POSITION LAYOUT

(front view)

1 2 3 4 5 6 7 8 9 10 11 12 13 14

#### NOTES

- 1. To prevent "flash-conflict" problems, insert red flash
- 2. Enable Simultaneous Gap-Out for all Phases.
- 3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 4. Program phases 2 and 6 for Startup In Green.
- 5. Program phases 2 and 6 for Yellow Flash.
- 7. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E SOFTWARE .....ECONOLITE OASIS

CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5 PHASES USED......2,4,5,6

OVERLAP "A".....NOT USED OVERLAP "B".....NOT USED OVERLAP "C".....5+6

# OVERLAP "D".....4+5

- 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.

- 6. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

## FYA SIGNAL WIRING DETAIL

SIGNAL HEAD HOOK-UP CHART

NU 21,22 NU NU 41,42 NU 51 61,62 NU NU NU NU NU NU NU NU NU

**\*** 135

133

\* Denotes install load resistor. See load resistor

★ See pictorial of head wiring in detail this sheet.

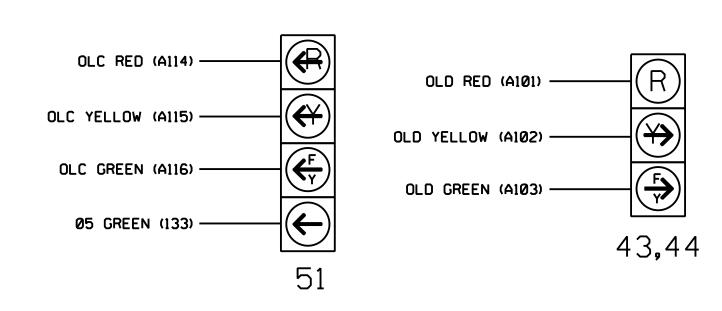
installation detail this sheet.

101

102

103

(wire signal heads as shown)



#### <u>NOTE</u>

LOAD SWITCH NO.

CMU CHANNEL NO.

SIGNAL HEAD NO.

YELLOW

GREEN

RED ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

GREEN ARROW

NU = Not Used

128

129

130

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

| Electrical Detail - Sheet 1 of 4

Signal Upgrade Final Design

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

TH CARO,

031464

SIG. INVENTORY NO. 03-0267

PROJECT REFERENCE NO.

R-5021

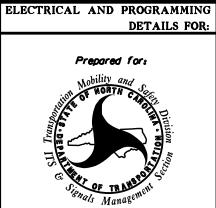
A114

A115 A102

A116 A103

8 | 8 | OLA OLB | SPARE | OLC | OLD | SPARE

Sig. 34



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS

Southport REVIEWED BY: A.D. Klinksiek INIT. DATE

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

## INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S29	TB2-5,6	I2U	39	1	2	2/SYS	Y	Υ			
2B/S30	TB2-7,8	I2L	43	5	12	2/SYS	Y	Υ			
4A	TB4-9,10	I6U	41	3	4	4	Y	Υ			3
	TB3-1,2	JlU	55	17	5	5	Y	Υ			15
5A1	-	I4U	47	9 ★	22	2	Y	Υ	Y		3
	-	JlU	55	17 ★	55	5	Y	Υ			3
5B	TB3-5 <b>,</b> 6	J2U	40	2	6	5	Y	Υ			15
6A/S31	TB3-9,10	J3U	64	26	36	6/SYS	Y	Υ			
6B/S32	TB3-11,12	J3L	77	39	46	6/SYS	Y	Υ			

- Add jumper from J1-W to I4-W, on rear of input file.
- ★ See vehicle detector setup programming detail for
- alternate phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L FILE J-SLOT 2-LOWER-

## LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (min)

5A

USED

NOT

USED 6B/S32

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

"J"

PHASE 5 YELLOW FIELD TERMINAL (132)

⊗ Wired Input - Do not populate slot with detector card

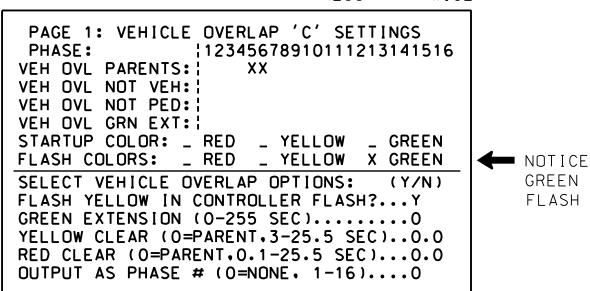
#### PROJECT REFERENCE NO. R-5021 Sig 34

#### OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

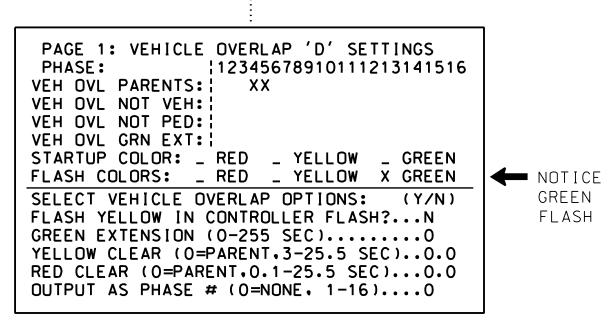
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

#### PRESS '+' TWICE



#### PRESS '+'



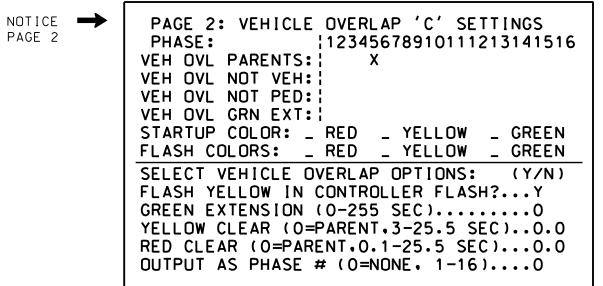
OVERLAP PROGRAMMING COMPLETE

### OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

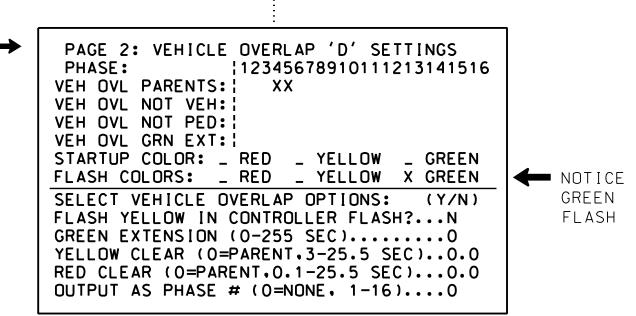
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

#### PRESS '+' TWICE



PRESS '+'



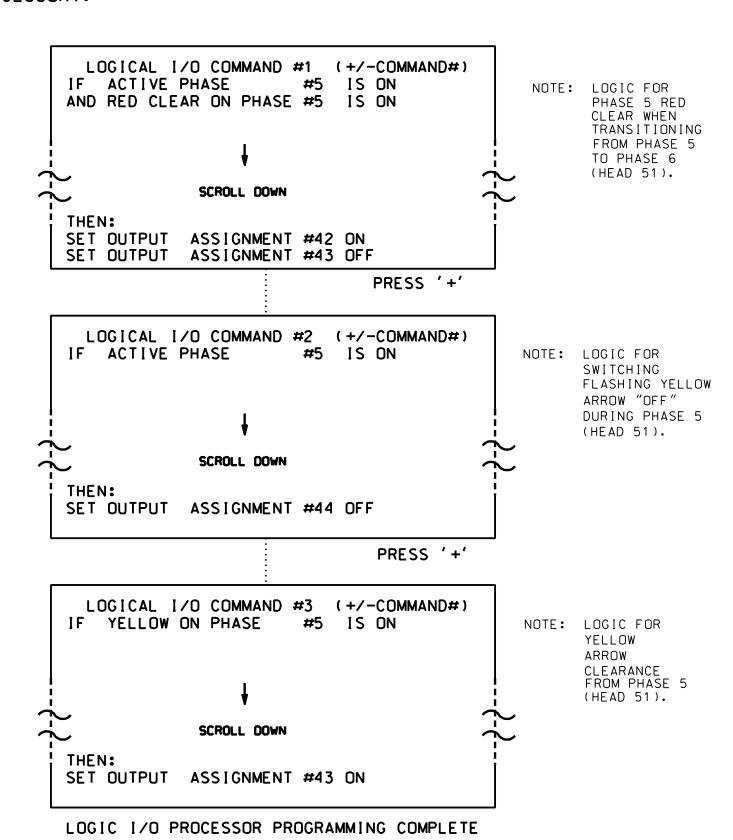
OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

(program controller as shown below)

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



**OUTPUT REFERENCE SCHEDULE** USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Signal Upgrade

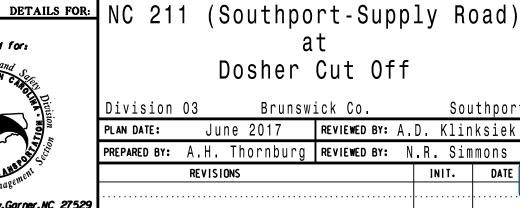
Final Design

Electrical Detail - Sheet 2 of 4

PAGE 2

ELECTRICAL AND PROGRAMMIN

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



Dosher Cut Off Brunswick Co. Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons

TH CARO, 031464 SIG. INVENTORY NO. 03-0267

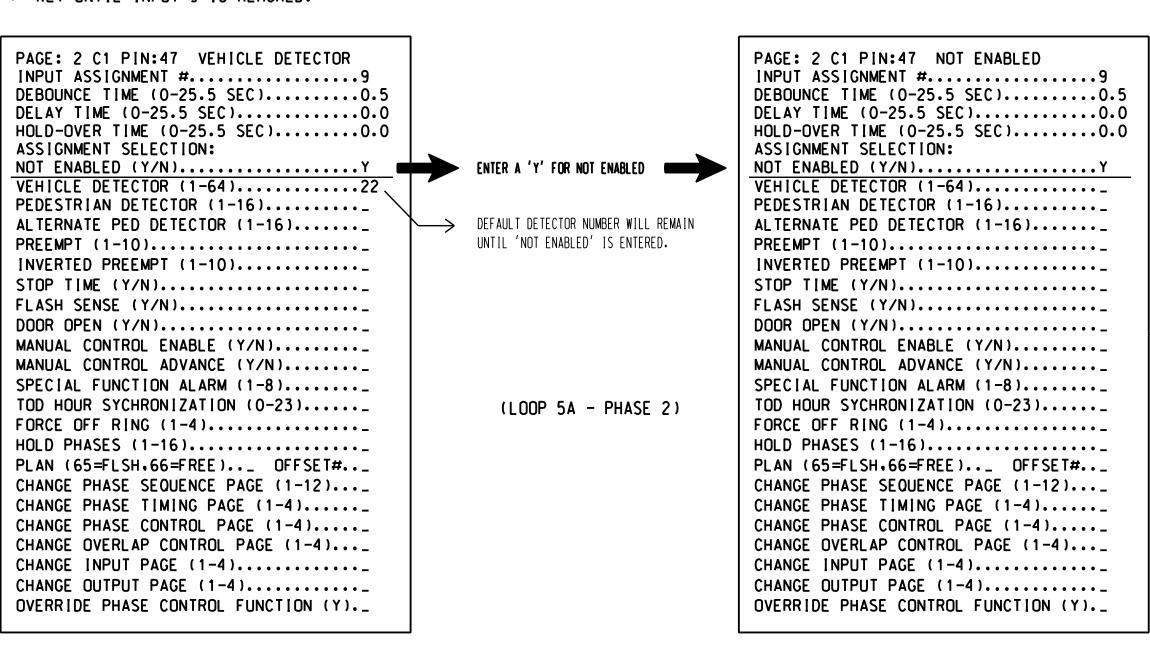
#### INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)............0.0 HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64).....5 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... PRESS '+' TO ADVANCE TO INPUT 17 DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH,66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)....

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR INPUT ASSIGNMENT #......17 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).... VEHICLE DETECTOR (1-64)......55 PEDESTRIAN DETECTOR (1-16).... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N).... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N).... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... (LOOP 5A - PHASE 5) FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROJECT REFERENCE NO.

R-5021

Sig. 34

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)		VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N)
ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	ENABLE DETECTORY
ENABLE LOGGING	ENTER I FUR ENABLE DETECTOR	ENABLE LOGGING
ENABLE DIAGNOSTICS		ENABLE DIAGNOSTICS
SPEED TRAP		SPEED TRAP
CALL DETECTORY		CALL DETECTOR
EXTENSION DETECTOR		EXTENSION DETECTOR
MODE 2 STOP BAR		MODE 2 STOP BAR
SWITCHING DETECTOR		SWITCHING DETECTOR
DUPLICATING DETECTOR		DUPLICATING DETECTOR
ENABLE FULL TIME DELAY		ENABLE FULL TIME DELAY
IF FAILED, SET MIN RECALL?		IF FAILED, SET MIN RECALL?
IF FAILED. SET MAX1 RECALL?		IF FAILED. SET MAX1 RECALL?
IF FAILED. SET MAX2 RECALL?		IF FAILED. SET MAX2 RECALL?
PHASE# 12345678910111213141516		PHASE#   12345678910111213141516
PHASES ASSIGNED :	ENTER '5' FOR PHASES ASSIGNED	PHASES ASSIGNED ¦ X
SWITCH/DUPLICATE;		SWITCH/DUPLICATE;
LOOP SIZE (0-255 FT)6		LOOP SIZE (0-255 FT)6
SPEED TRAP DISTANCE (0-255 FT)0		SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)		STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)		STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)0	ENSURE DELAY IS '3'	DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)255		MAX CALLS/MIN (0-255)255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0		MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)100		MAX OCCUPANCY (0-100%)100
EXTENSION DISABLE TIME (0-255 SEC)0		EXTENSION DISABLE TIME (0-255 SEC)0
QUEUE MAX OCCUPANCY TIME (0-255)0		QUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0		QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

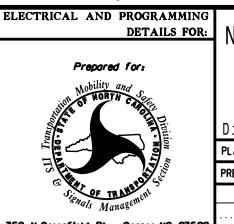
Electrical Detail - Sheet 3 of 4 Signal Upgrade Final Design

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

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



DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off Division 03

Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

TH CARO 031464

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

SIG. INVENTORY NO. 03-0267

PROJECT REFERENCE NO. Sig 34. R-5021

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASIN</u> G	1	1
ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASIN</u>	<u>IG</u> 2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for head 51 to run protected

turns only.

INPUTS PAGE 2: Disables phase 5 call on loop 5A and reduces delay time for phase 5

call on loop 5A to 3 seconds.

#### FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE 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: 03-0267 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 4 of 4 Signal Upgrade Final Design

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ELECTRICAL AND PROGRAMMING

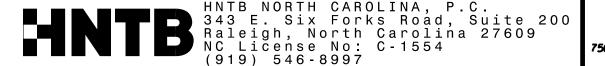
DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. Southport PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

031464

TH CARO

REVISIONS INIT. DATE SIG. INVENTORY NO. 03-0267



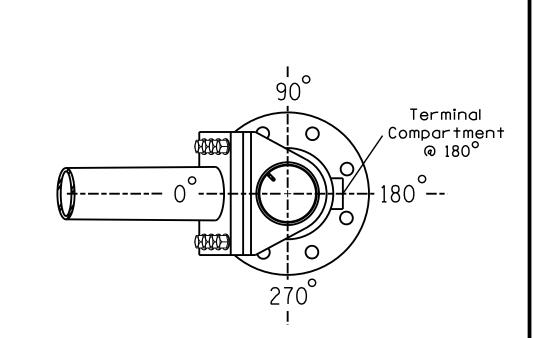
**Elevation View** 

#### SPECIAL NOTE

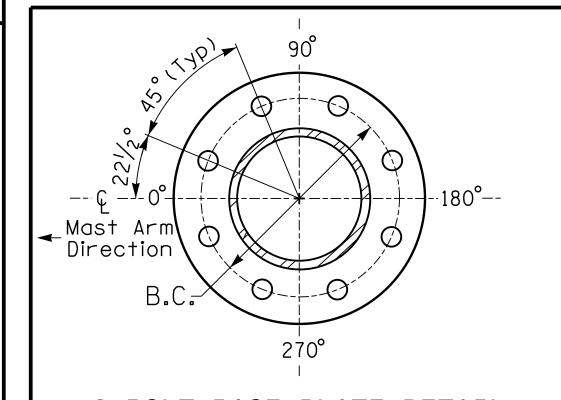
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	
Baseline reference point at & Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+2.41 ft.	
Elevation difference at Edge of travelway or face of curb	+1.34 ft.	

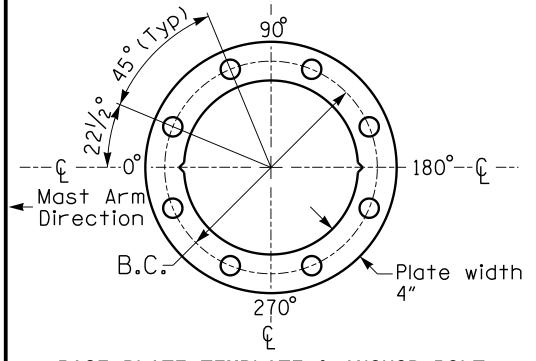


#### POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

METAL POLE No. 1

PROJECT REFERENCE NO. R-5021

	MAST ARM LOADING SC	HEDU	LE	
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

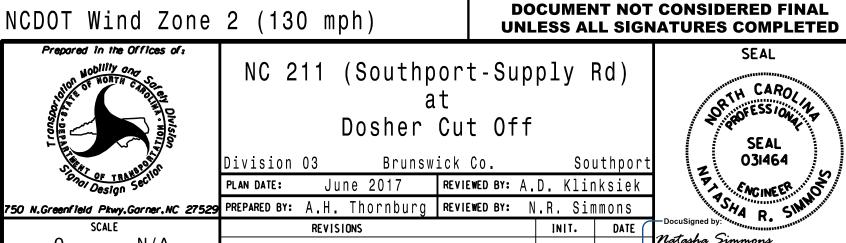
#### NOTES

#### DESIGN REFERENCE MATERIAL

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

#### DESIGN REQUIREMENTS

- 2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- 3. Design all signal supports using stress ratios that do not exceed 0.9.
- 4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- 5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- 6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- 7. The mast arm attachment height (H1) shown is based on the following design assumptions:
- a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
- b. Signalheads are rigidly mounted and vertically centered on the mast arm.
- c. The roadway clearance height for design is as shown in the elevation views.
- d. The top of the pole base plate is 0.75 feet above the ground elevation.
- e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground leveland the high point of the roadway.
- 8. The pole manufacturer will determine the total height (H2) of each pole using the greater of
- Mast arm attachment height (H1) plus 2 feet, or
- H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- 9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- 11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

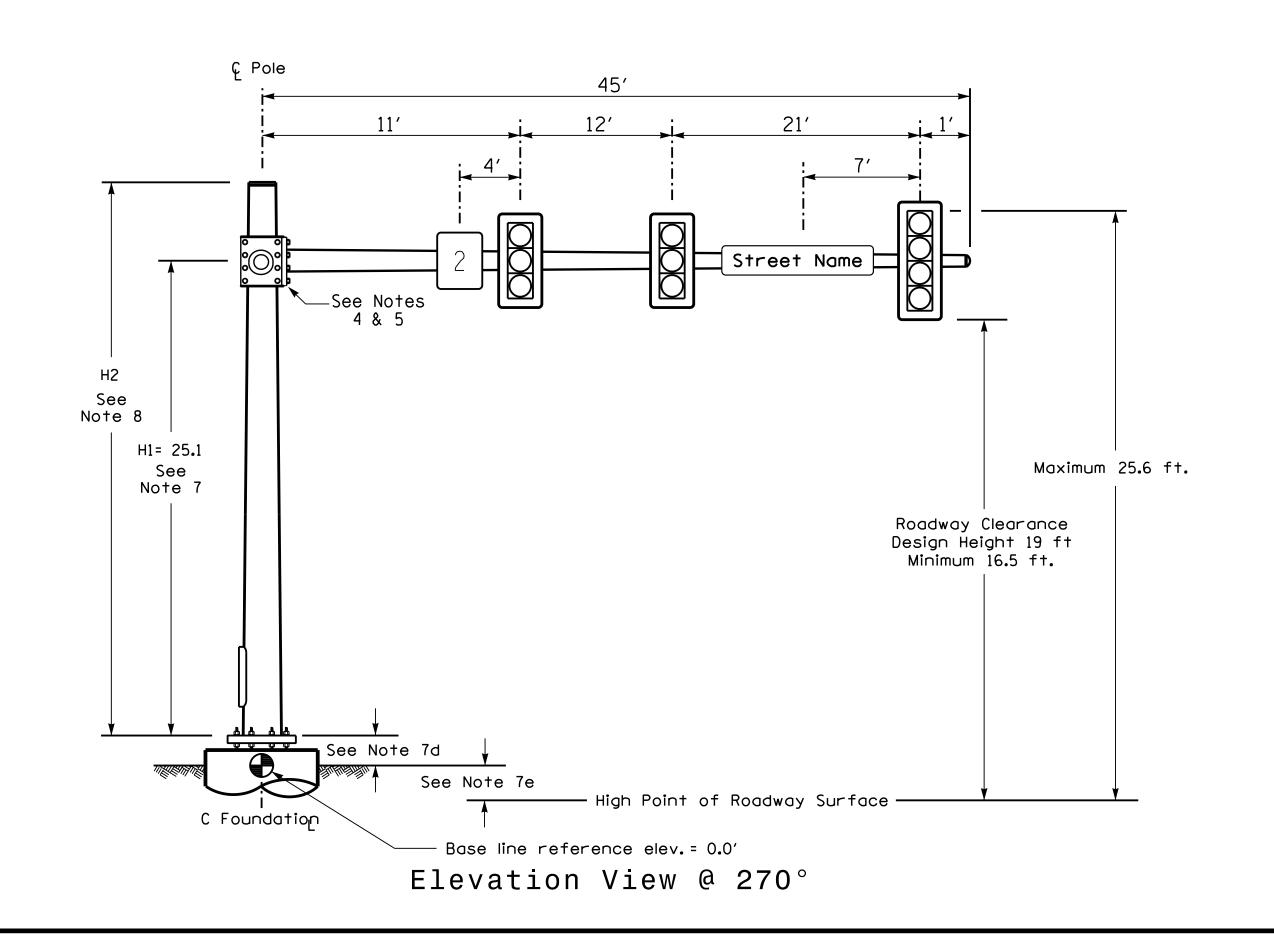


N/A

SIG. INVENTORY NO. 03-0267

#### Design Loading for METAL POLE NO. 2 ARM B

Elevation View @ 0°

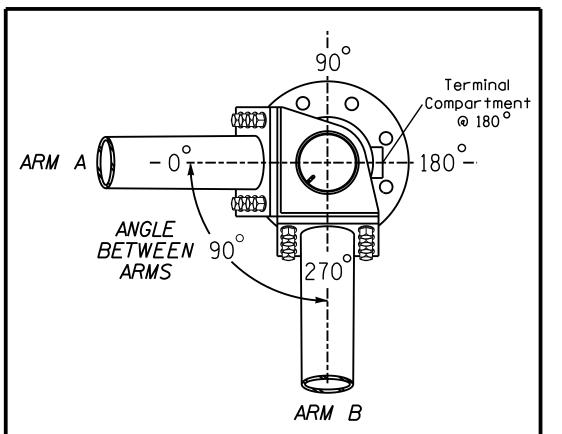


#### SPECIAL NOTE

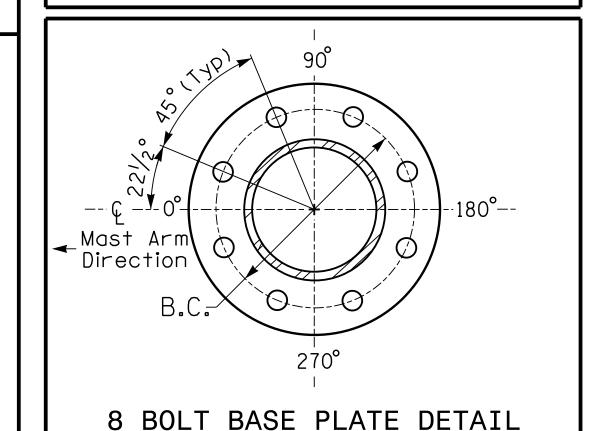
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at & Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+4.09 ft.	+0.00 ft.
Elevation difference at Edge of travelway or face of curb	+3.12 ft.	+3.12 ft.

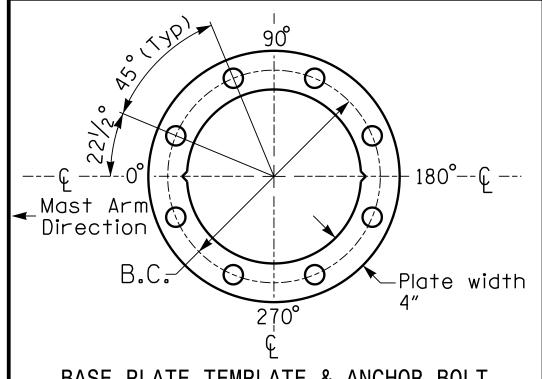


POLE RADIAL ORIENTATION



O DOLI DAGE I LATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET
R - 5021	Sig. 3

	MAST ARM LOADING SC	HEDU	LE	
loading Symbol	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 <b>.</b> 5 S.F.	25 <b>.</b> 5" W X 66 <b>.</b> 0" L	74 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0"W X 36.0"L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0"L	36 LBS

#### <u>NOTES</u>

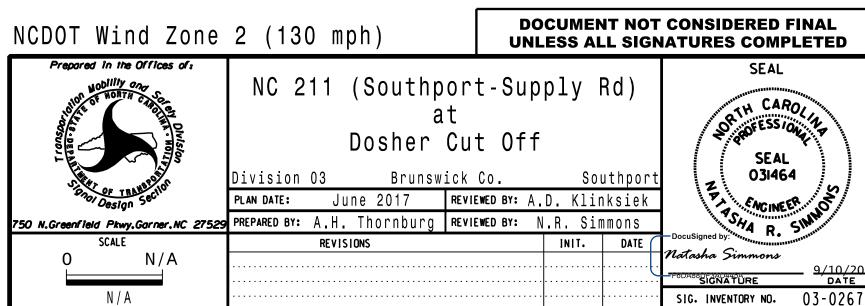
#### DESIGN REFERENCE MATERIAL

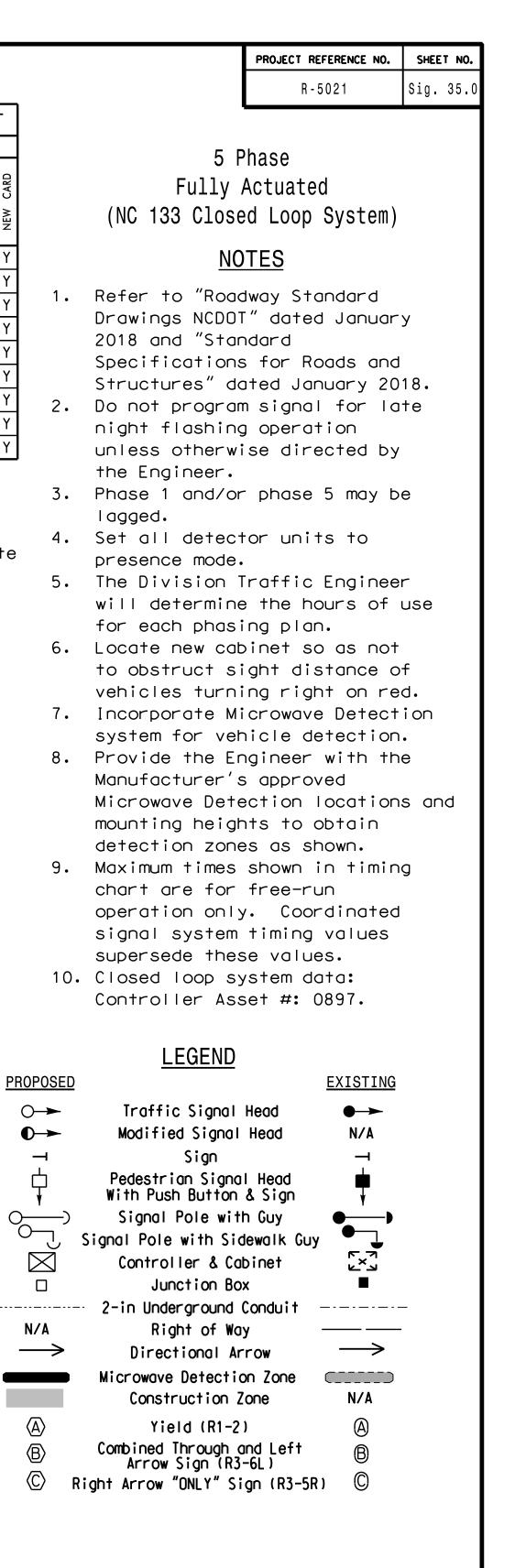
- 1. Design the traffic signal structure and foundation in accordance with:
- The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
- The 2018 NCDOT "Standard Specifications for Roads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

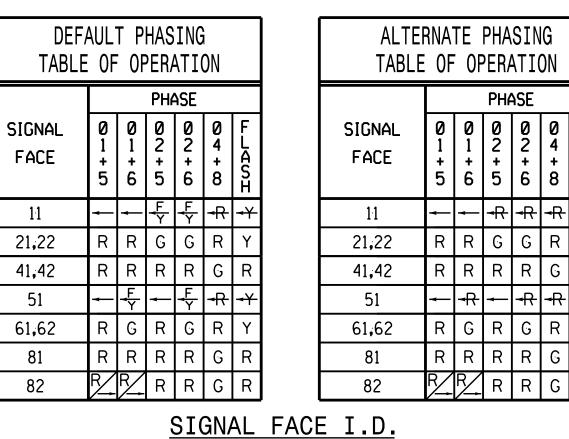
#### DESIGN REQUIREMENTS

- 2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- 3. Design all signal supports using stress ratios that do not exceed 0.9.
- 4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- 5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- 6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- 7. The mast arm attachment height (H1) shown is based on the following design assumptions: a. Mast arm slope and deflection are not considered in determining the arm attachment
- height as they are assumed to offset each other.

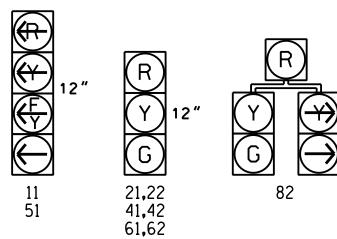
  b. Signal heads are rigidly mounted and vertically centered on the mast arm.
- c. The roadway clearance height for design is as shown in the elevation views.
- d. The top of the pole base plate is 0.75 feet above the ground elevation.
- e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- 8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
- Mast arm attachment height (H1) plus 2 feet, or
- H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
  9. If pole location adjustments are required, the contractor must gain approval from the
- Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- 11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.







All Heads L.E.D.



-Wood Pole

62' Lt +/-

- Wood Pole

72' Rt +/-

Sta. 406+65 +/- -L-

Sta. 406+52 +/- -L-

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART INDUCTIVE LOOPS DETECTOR PROGRAMMIN SIZE FROM LOOP STOPBAR 1 A 6X40 \*\* 6 Y Y Y 6X:40 1B 2A 6X6 300 \* | \* | 2 | Y | Y | 6X40 \* 5 | Y | Y | -\*\*\*15 - Y 5·A 6X:40 6X6 300 \* |**\*|** 6 | Y | Y |

\*\* Disable phase 2 and 6 call for 1A and 5A

45 MPH +2% Grade

\*\*\* Reduce delay to 3 seconds during alternate

6X<sup>-</sup>40 \* Multizone Microwave Detection. during alternate phasing operation. phasing operation.

OASIS 2070 TIMING CHART **PHASE FEATURE** 7 12 12 Min Green 1 \* 2.0 6.0 2.0 2.0 2.0 Extension 1 \* 6.0 20 90 25 20 90 25 Max Green 1 \* 3.0 4.3 3.8 3.0 4.3 3.8 Yellow Clearance 1.5 2.1 1.0 1.3 2.1 1.0 Red Clearance 2.0 2.0 2.0 2.0 2.0 2.0 Red Revert Walk 1 \* Don't Walk 1 2.5 2.5 Seconds Per Actuation 34 34 Max Variable Initial\* 15 15 Time Before Reduction 30 30 Time To Reduce ' Minimum Gap 3.0 3.0 MIN RECALL MIN RECALL Recall Mode YELLOW **Vehicle Call Memory** YELLOW ON Dual Entry ON \_ ON Simultaneous Gap

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

→ - - - ➤ PEDESTRIAN MOVEMENT

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

02+6

02+5

ALTERNATE PHASING DIAGRAM

04+8

Wood Pole —

55' Lt +/-

Sta. 405+76 +/- -L-

Wood Pole -

73' Rt +/-

Sta. 405+47 +/- -L-

02+6

02+5

01+6

NC 211 (Howe Street)

45 MPH +2% Grade

01+5

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

Signal Upgrade Temporary Design 1 Construction Phases 1,1a-1b

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



Tidewater Plaza/Sandy Lane

 $\bigcirc$ 

N/A

ivision 03 Brunswick Co. June 2017 REVIEWED BY: A.D. Klinksiek

750 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

NC 211 (Howe Street) TH CARO 031464 . CACINEER

SIG. INVENTORY NO. 03-0897T

# EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

ON OFF

RP DISABLE

SF#1 POLARITY

WD 1.0 SEC

LEDguard RF SSM

FYA 1-9
FYA 3-10

FYA 5-11 FYA 7-12

FYA COMPACT—

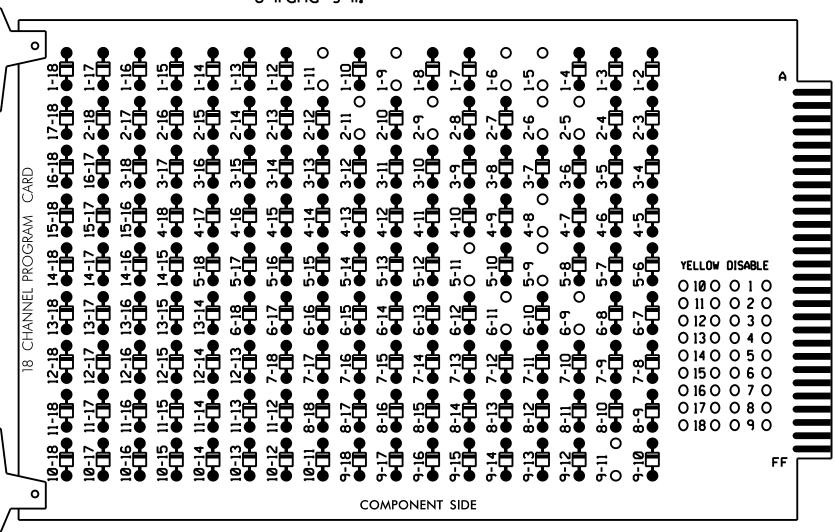
DENOTES POSITION

OF SWITCH

WD ENABLE

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-II, 2-5, 2-6, 2-9, 2-II, 4-8, 5-9, 5-II, 6-9, 6-II and 9-II.



REMOVE JUMPERS AS SHOWN

#### NOTES:

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

#### **NOTES**

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### EQUIPMENT INFORMATION

SOF TWARE......ECONOLITE ASC/3-2070

CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED......\$1.\$2.\$5.\$7.\$8.\$11.AUX \$1.

AUX S4

OVERLAP "B"......NOT USED OVERLAP "C".....5+6

OVERLAP "D".....NOT USED

# R-5021 Sig. 35.1

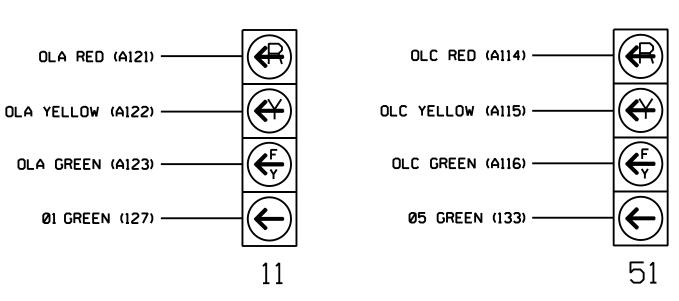
SIGNAL HEAD HOOK-UP CHART																			
LOAD SWITCH NO.	S	1	S2	<b>S</b> 3	<b>S4</b>	S5	<b>S6</b>	<b>S</b> 7	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	l	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	l	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	NU	NU	41,42	NU	<b>★</b> 51	61,62	NU	NU	81,82	NU	11*	NU	NU	<b>★</b> 51	NU	NU
RED		*	128			101			134			107							
YELLOW			129			102		*	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		126												A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127						133											
₩																			
Ķ																			

#### NU = Not Used

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

#### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



#### NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0897T1
DESIGNED: June 2017
SEALED: 9/10/2021
REVISED: N/A

Electrical Detail - Sheet 1 of 5 Signal Upgrade

Temporary Design 1

ELECTRICAL AND PROGRAMMING

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for:

NC 211 (Howe Street) at Tidewater Plaza/Sandy Lane

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

Seal O31464

Southport

Klinksiek

R. Simmons

INIT. DATE

Notasha Simmons

TH CARO,

SIG. INVENTORY NO. 03-0897T1

750 N.Greenfield Pkwy.Garner.NC 27529

## INPUT FILE POSITION LAYOUT

							(front	view)						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
file U "I" L	Ø 1 ZONE 1A NOT USED	SLOT EXPTY	SLOT EXPTY	ארעהט רבטר. ⊗	SLOT EMPTY	SLOT EXPTY	FS  DC ISOLATOR  ST  DC ISOLATOR							
FILE U "J" L	Ø 5 ZONE 5A NOT USED	SLOT EMPTY	%LOF ⊞∑₽FY	-1C12	SLOT EMPTY									

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

FS = FLASH SENSE ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

#### INPUT FILE CONNECTION & PROGRAMMING CHART

L00P	NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
		TB2-1,2	IIU	56	18	1	1	Y	Υ			15
ZONE	1A <sup>1</sup>	-	J4U	48	10 ★	26	6	Y	Υ	Y		3
		-	IIU	56	18 ★	51	1	Y	Υ			3
		TB3-1,2	JlU	55	17	5	5	Y	Υ			15
ZONE	5A <sup>2</sup>	-	I4U	47	9 ★	22	2	Y	Υ	Y		3
Ì	-	JlU	55	17 ★	55	5	Y	Υ			3	

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

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

★ See Input Page Assignment programming details on sheets 3 and 4.

FILE J
SLOT 2

#### SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For loops 1A and 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3,4,and 5 of this electrical detail.

# ACCEPTABLE VALUES VALUE (ohms) WATTAGE 1.5K - 1.9K 25W (min) 2.0K - 3.0K 10W (min) AC PHASE 1 RED FIELD TERMINAL (125) PHASE 5 YELLOW FIELD TERMINAL (132)

HNTD NODTH CAROLINA D.C.

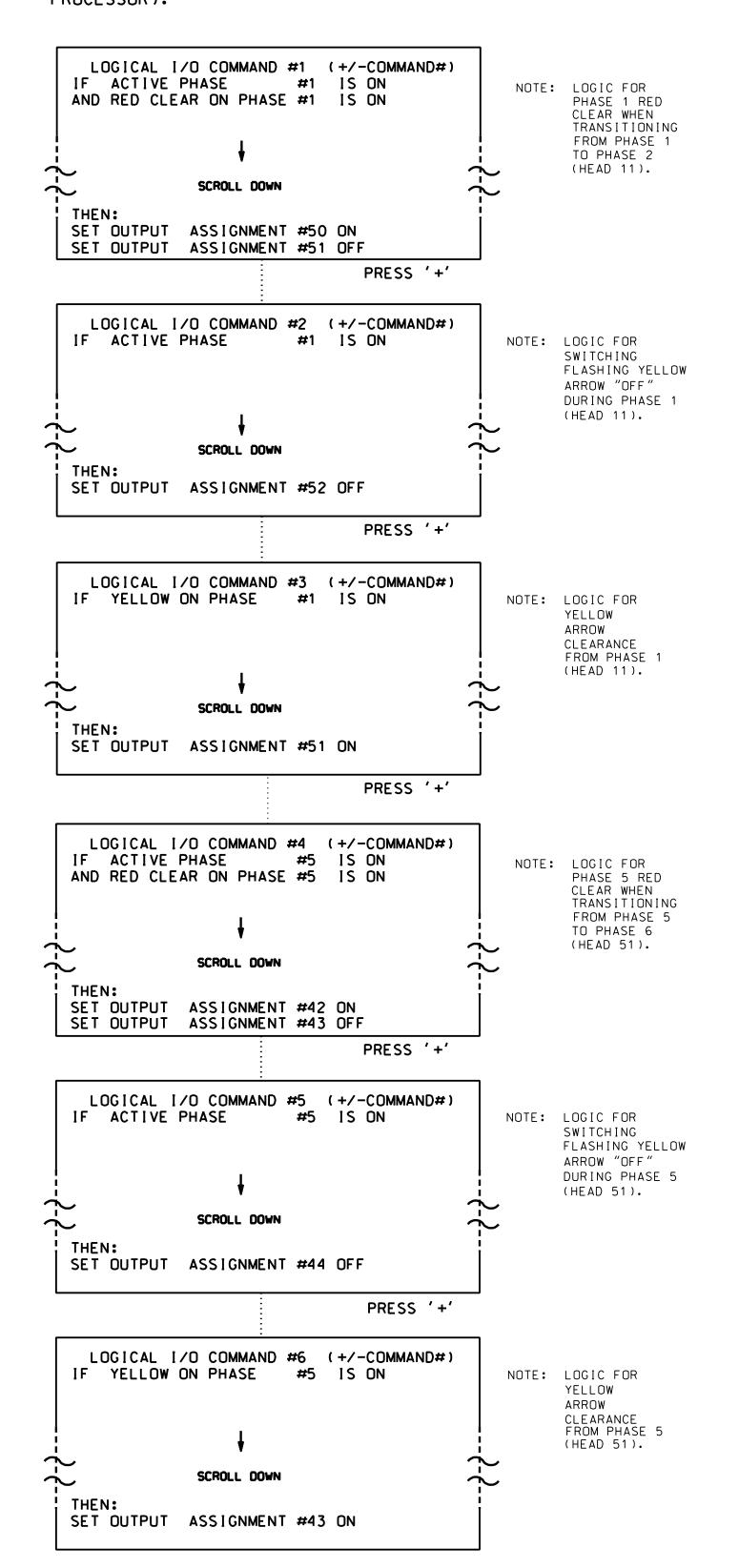
<sup>&</sup>lt;sup>⊗</sup> Wired Input - Do not populate slot with detector card

#### PROJECT REFERENCE NO. R-5021 Sig. 35.

## LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

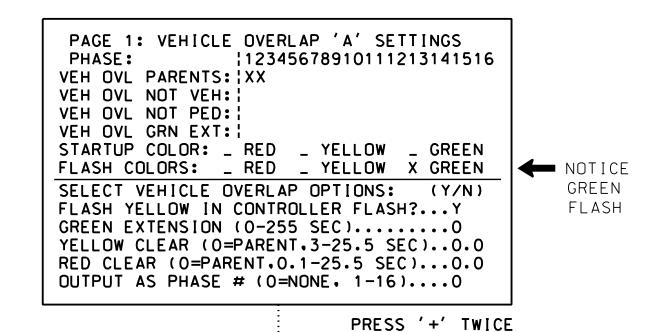


LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

## OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



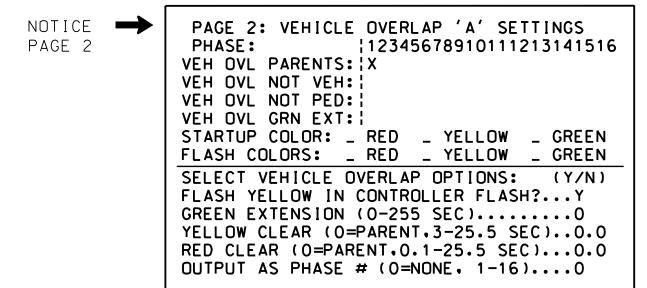
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS ¦12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: ; VEH OVL NOT PED: VEH OVL GRN EXT: | STARTUP COLOR: \_ RED \_ YELLOW \_ GREEN FLASH COLORS: \_ RED \_ YELLOW X GREEN **←** NOTICE GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT,3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0 OUTPUT AS PHASE # (0=NONE, 1-16)....0

OVERLAP PROGRAMMING COMPLETE

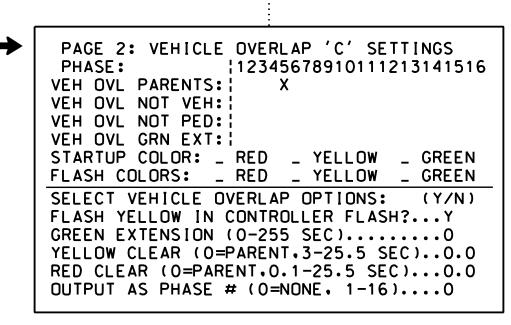
## OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.



PRESS '+' TWICE



OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red

OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green OUTPUT 50 = Overlap A Red

OUTPUT 51 = Overlap A Yellow OUTPUT 52 = Overlap A Green

Temporary Design 1 ELECTRICAL AND PROGRAMMIN DETAILS FOR: 750 N.Greenfield Pkwy.Garner.NC 27529

Signal Upgrade

Electrical Detail - Sheet 2 of 5

PAGE 2

**UNLESS ALL SIGNATURES COMPLETED** NC 211 (Howe Street) TH CARO,

Tidewater Plaza/Sandy Lane oivision 03

031464 Brunswick Co. Southpor REVIEWED BY: A.D. Klinksiek INIT. DATE

**DOCUMENT NOT CONSIDERED FINAL** 

SIG. INVENTORY NO. 03-0897T1

June 2017 PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS

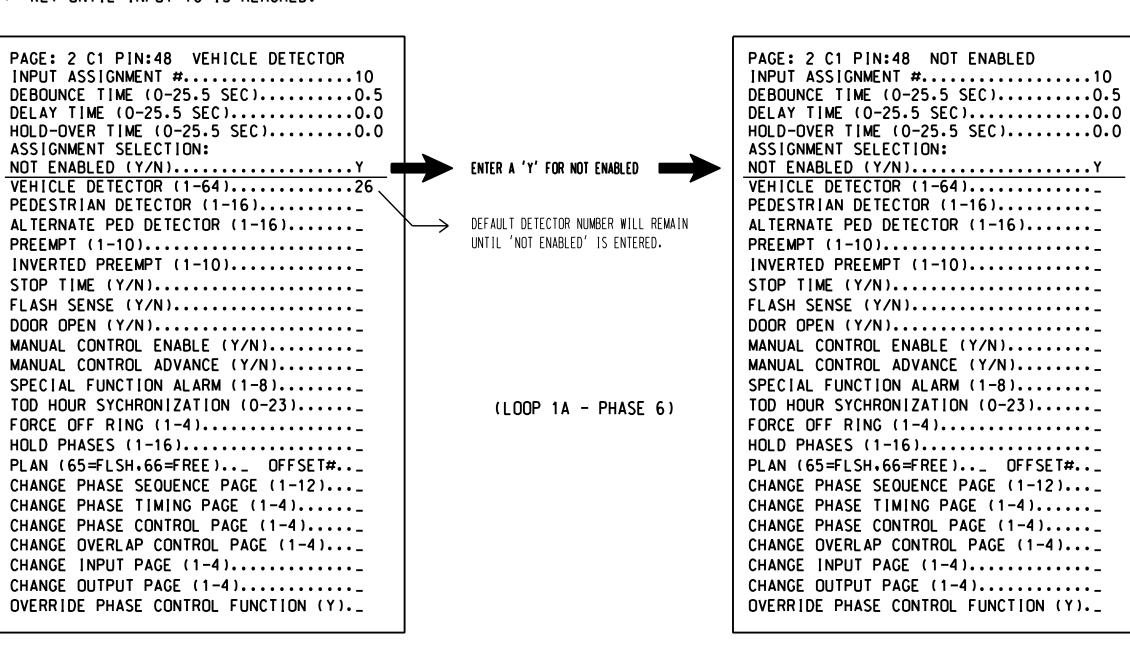
PROJECT REFERENCE NO. R-5021 Sig 35

#### INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
  - 2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 DELAY TIME (0-25.5 SEC)............0.0 HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).................1 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... PRESS '+' TO ADVANCE TO INPUT 18 DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)...\_ CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

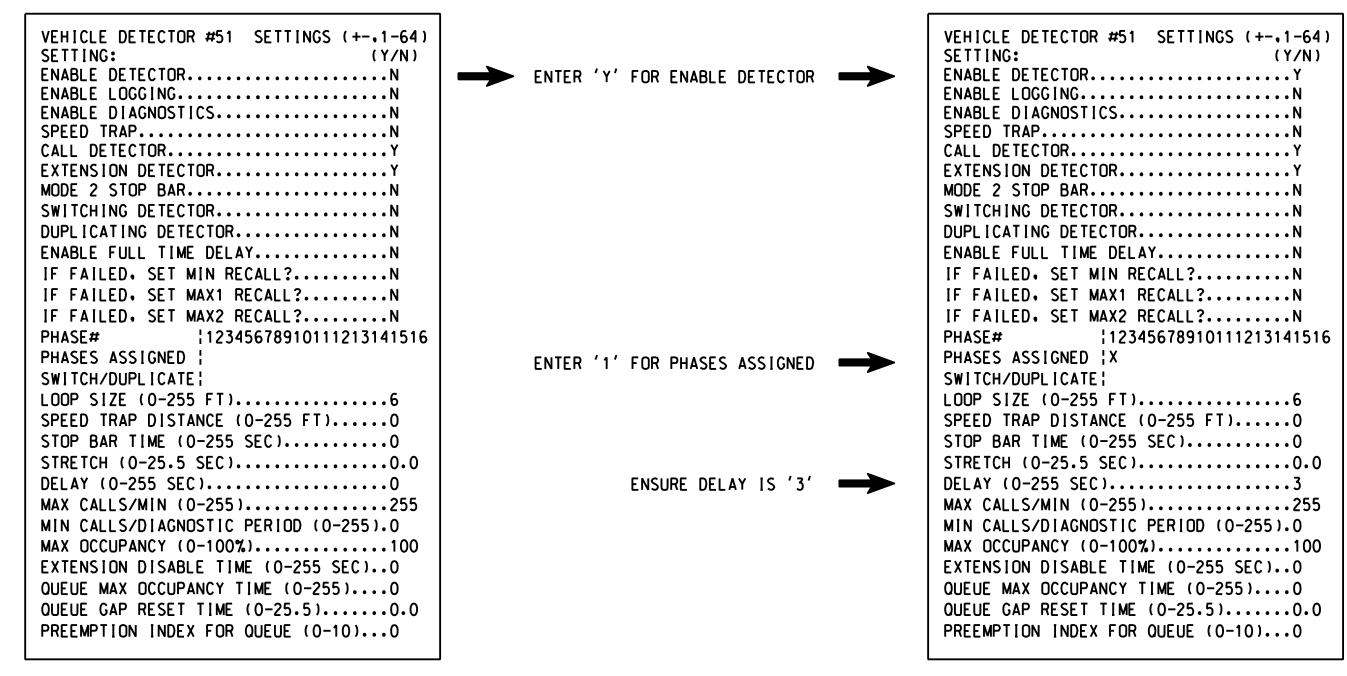
PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 DEBOUNCE TIME (0-25.5 SEC)...........0.5 DELAY TIME (0-25.5 SEC).............. HOLD-OVER TIME (0-25.5 SEC)......0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... ENTER '51' TO REASSIGN VEHICLE DETECTOR (1-64).....51 THE VEHICLE DETECTOR PEDESTRIAN DETECTOR (1-16)..... FOR THIS INPUT ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... (LOOP 1A - PHASE 1) FORCE OFF RING (1-4)..... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)... CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)... CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

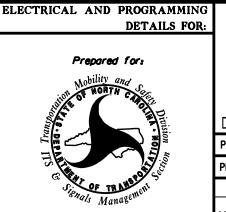


NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 3 of 5 Signal Upgrade Temporary Design 1

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



NC 211 (Howe Street) Tidewater Plaza/Sandy Lane

)ivision 03 Brunswick Co Southport June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

031464

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997 DETECTOR PROGRAMMING COMPLE

REVISIONS

SIG. INVENTORY NO. 03-0897T1

TH CARO

R-5021 Sig. 35.

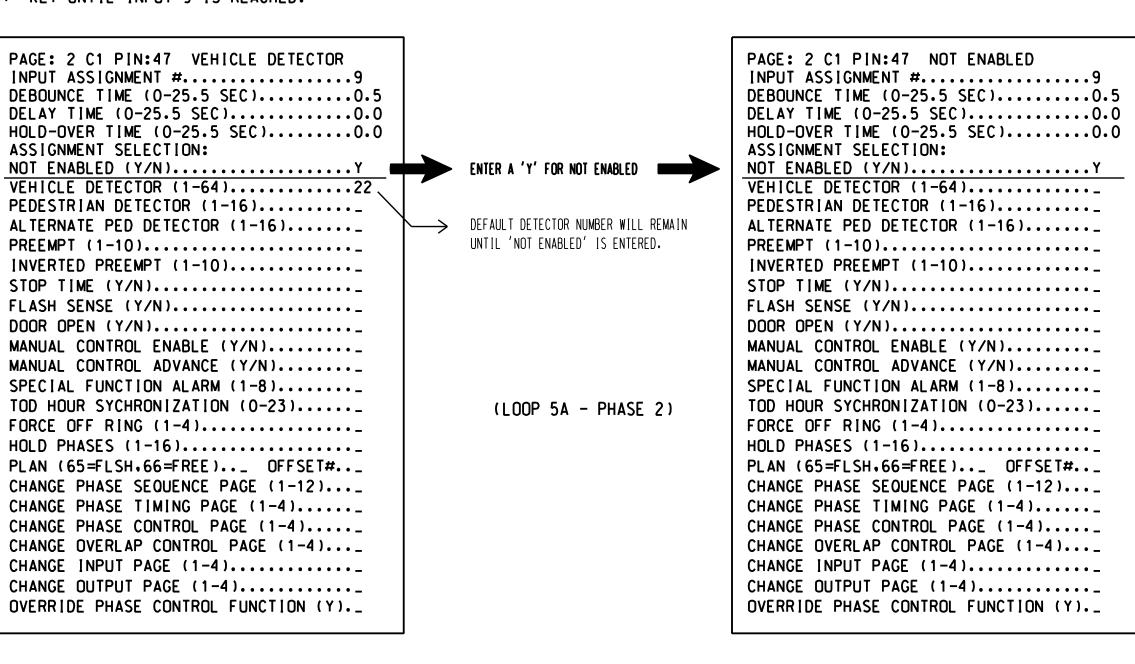
#### INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

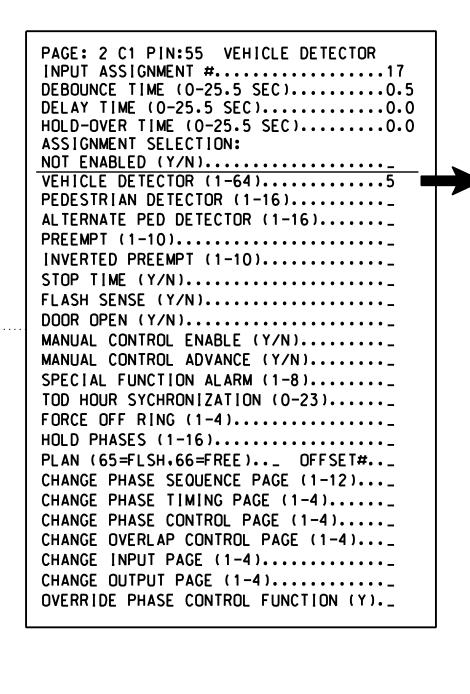
NOTES: 1. THIS PROGRAMMING APPLIES <u>FOR INPUT PAGE 2</u> ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



PRESS '+' TO ADVANCE TO INPUT 17



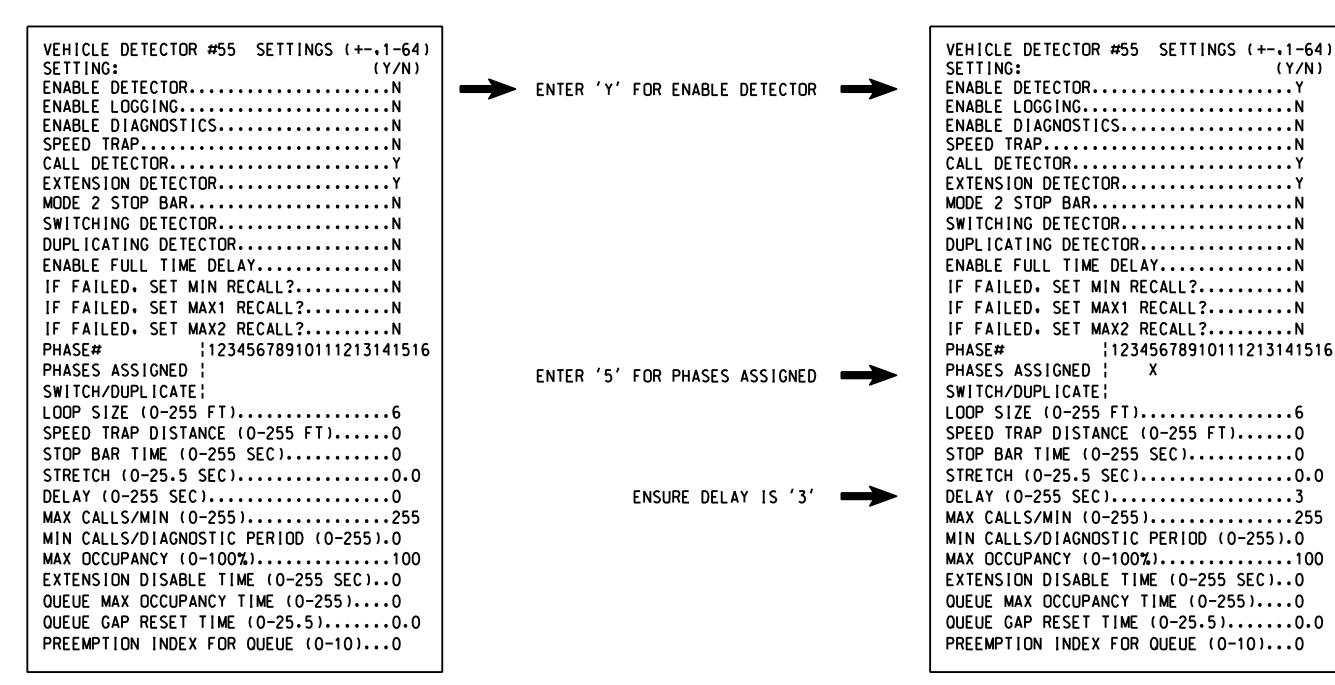
PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DELAY TIME (0-25.5 SEC)................ HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYCHRONIZATION (0-23)..... FORCE OFF RING (1-4).... HOLD PHASES (1-16)..... PLAN (65=FLSH.66=FREE)... OFFSET#... CHANGE PHASE SEQUENCE PAGE (1-12)...\_ CHANGE PHASE TIMING PAGE (1-4)..... CHANGE PHASE CONTROL PAGE (1-4).... CHANGE OVERLAP CONTROL PAGE (1-4)...\_ CHANGE INPUT PAGE (1-4)..... CHANGE OUTPUT PAGE (1-4)..... OVERRIDE PHASE CONTROL FUNCTION (Y).\_

PROGRAMMING COMPLETE

#### SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS). THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 4 of 5 Signal Upgrade Temporary Design 1

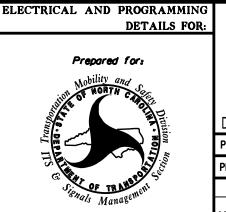
ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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NC 211 (Howe Street)
at
Tidewater Plaza/Sandy Lane
Division 03 Brunswick Co. Souths

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

TH CARO,

DETECTOR PROGRAMMING COMPLETE

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

R-5021 Sig. 35.5

## ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING <u>COORDINATION</u> - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT, PHASING DURING <u>FREE RUN</u> - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY

EVENTS, IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY

FOR THAT PARTICULAR PAGE.

PHASING	INPUTS PAGE	OVERLAPS PAGE
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASIN</u> G	1	1
ACTIVE PAGES REQUIRED TO RUN ALTERNATE PHASING	2	2

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

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

#### ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases

for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1

call on loop 1A to 3 seconds.

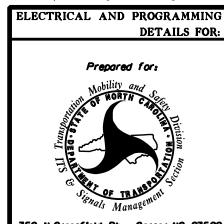
Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T1 DESIGNED: June 2017 SEALED: 9/10/2021

REVISED: N/A

Electrical Detail - Sheet 5 of 5 Signal Upgrade Temporary Design 1

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NC 211 (Howe Street) at Tidewater Plaza/Sandy Lane

Division 03 Brunswick Co. Southport

PLAN DATE: June 2017 REVIEWED BY: A.D. Klinksiek

PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

SEAL
O3I464

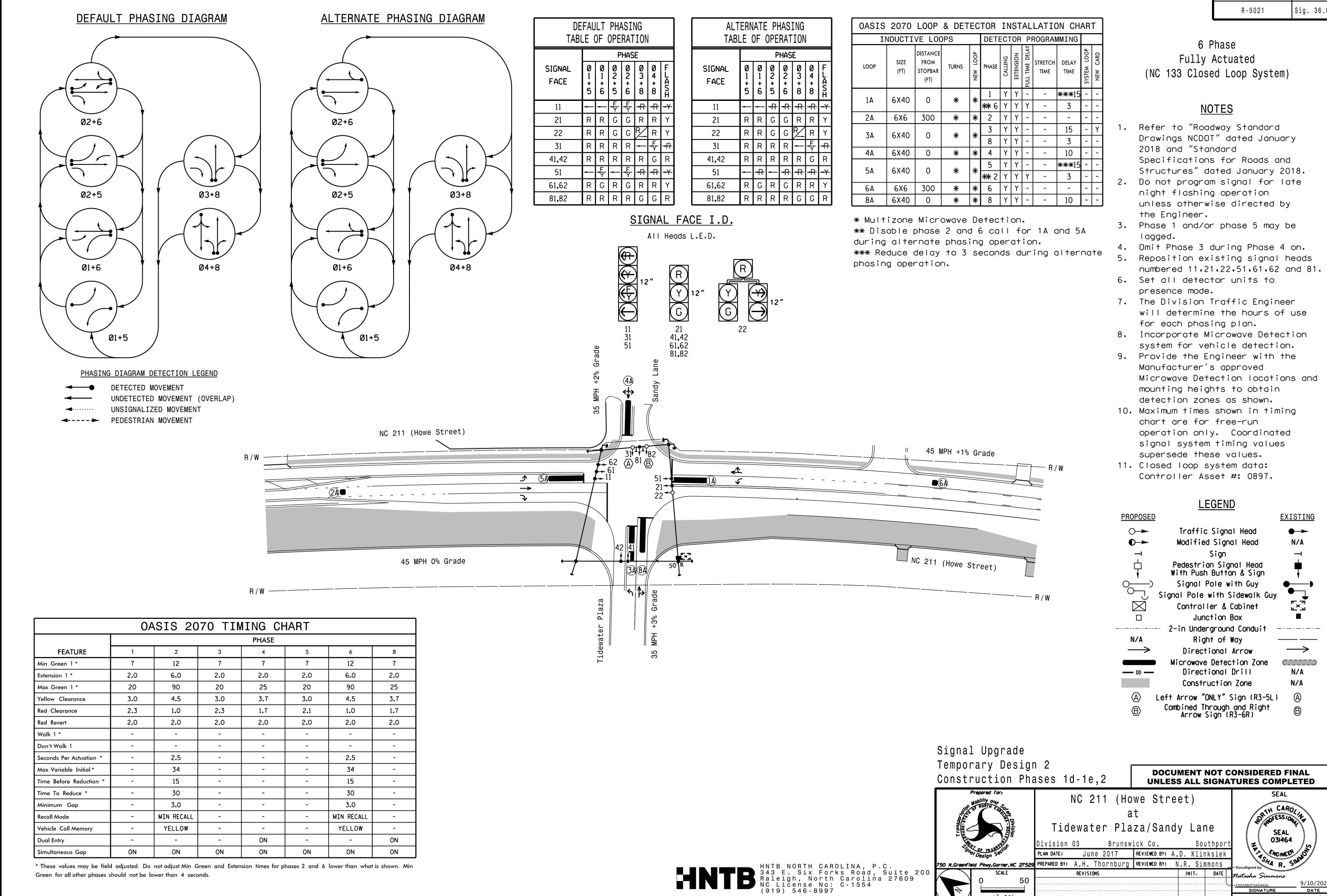
Docusigned by:

R. Simmons

P6DA88DF3AD445A

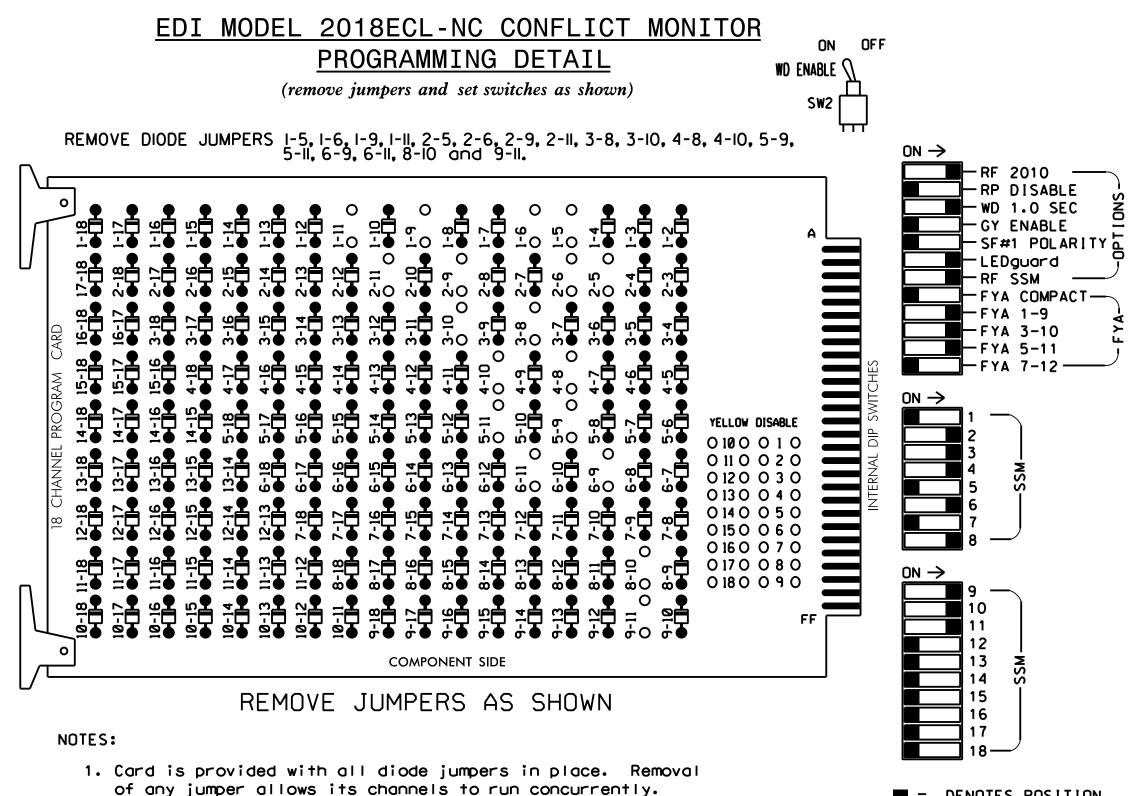
PATER

SIG. INVENTORY NO. 03-0897T1



PROJECT REFERENCE NO.

SIG. INVENTORY NO. 03-0897T2



#### **NOTES**

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 2. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- 6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. enable controller and detector logging for all detectors used at this location.
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

#### **EQUIPMENT INFORMATION**

CONTROLLER.....2070E 

SOFTWARE.....ECONOLITE OASIS CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE

INPUT FILE CONNECTION & PROGRAMMING CHART

ASSIGNMENT DETECTOR NEMA PHASE

26

28

22

55

★ See Input Page Assignment programming details on sheets 4, 5, 6, and 7.

INPUT FILE POSITION LEGEND: J2L

SPECIAL DETECTOR NOTE

Install a microwave detection system for vehicle detection. Perform

SLOT 2-LOWER -

installation according to manufacturer's directions and NCDOT

engineer-approved mounting locations to accomplish the detection

LOAD SWITCHES USED......\$1,\$2,\$4,\$5,\$7,\$8,\$11, AUX S1, AUX S2, AUX S4

OVERLAP "A".....1+2

OVERLAP "B".....3+4 OVERLAP "C".....5+6 OVERLAP "D".....NOT USED

LOOP NO. TERMINAL FILE POS. NO.

IIU

IIU

J4U | 48 |

I5U | 58 |

J8U | 50 |

J1U 55

I4U | 47 |

J1U | 55 |

schemes shown on the Signal Design Plans.

on sheets 3,4, and 5 of this electrical detail.

| 56 |

56

10 🖈

18 ★

20

12

17

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

<sup>2</sup>Add jumper from 15-W to J8-W, on rear of input file.

<sup>3</sup>Add jumper from J1-W to I4-W, on rear of input file.

9 🖈

17 ★

TB2-1**,**2

TB4-5,6

TB3-1,2

ZONE 1A

ZONE 3A

ZONE 5A3

FS = FLASH SENSE

ST = STOP TIME

#### SIGNAL HEAD HOOK-UP CHART S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX | AUX | AUX | AUX | AUX | AUX | S5 | S6 LOAD SWITCH NO. S2 S3 CMU CHANNEL NO. 13 16 8 | 8 | OLA OLB SPARE OLC OLD SPARE PHASE ★ 31 41,42 NU 51 61,62 NU 11 ★ 31 ★ NU 51 ★ SIGNAL HEAD NO. NU 22 NU 81,82 NU 21,22 134 107 101 108 129 135 102 YELLOW 103 136 109 130 GREEN A121 A124 A114 ARROW YELLOW ARROW A122 A125 117 A115

133

NU = Not Used

FLASHING YELLOW ARROW

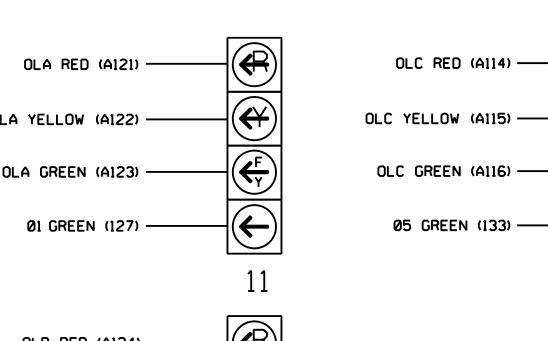
GREEN

ARROW

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

118 | 118

#### FYA SIGNAL WIRING DETAIL



THE SIGNAL DESIGN: 03-0897T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 5 Signal Upgrade

Temporary Design 2

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PROJECT REFERENCE NO.

R-5021

A123 A126

Sig. 36

# ELECTRICAL AND PROGRAMMING

Tidewater Plaza/Sandy Lane

Division 03 Brunswick Co. Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

TH CARO, 031464

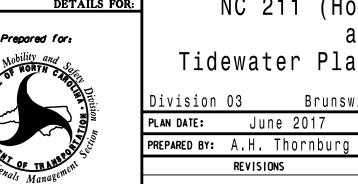
SIG. INVENTORY NO. 03-0897T2

(wire signal heads as shown) OLA YELLOW (A122) -OLA GREEN (A123) -OLB RED (A124) -OLB YELLOW (A125) -OLB GREEN (A126) -03 GREEN (118) — <u>NOTE</u>

The sequence display for signal heads 11, 31 and 51 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR

NC 211 (Howe Street)



For loops 1A,3A, and 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

NEMA CALL EXTEND FULL STRETCH DELAY

3 | Y | Y

Y

Υ

2 | Y | Y |

5 | Y |

8

| DELAY |

15

15

# DENOTES POSITION OF SWITCH 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.

# INPUT FILE POSITION LAYOUT

							()10100	00000						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U "I" L	Ø 1 ZONE 1A NOT USED	SLOT EMPT	SLOT EMPT	1642 ∪ 0M3U\$ ⊗	Ø 3 ZONE 3A NOT USED	SLOT EMPT	SLOT EMPT	SLOT EXPT	SLOT EMPT	<b>ወገ</b> ወተ	<b>ወገ</b> ወተ	<b>ወገወተ                                   </b>	SLOT EMPT	FS DC ISOLATOR ST
file U "J" L	Ø 5 ZONE 5A NOT USED	SLOT EMPTY	Y SLOT EMPTY	)+	SLOT EXPTY	SLOT EMPTY	Y SLOT EMPTY	→	SLOT EMPTY	<b>Υ</b>	י¥ מוסד שצפדץ	Ŷ %LOT ⊞∑₽⊢≻	Y SLOT EXPTY	S L O T E M P T Y

3. Ensure that Red Enable is active at all times during normal operation.

4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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

<sup>⊗</sup> Wired Input - Do not populate slot with detector card

## LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

- PHASE 1 YELLOW FIELD TERMINAL (126) ACCEPTABLE VALUES  $\ll$ |VALUE (ohms) | WATTAGE 1.5K - 1.9K | 25W (min) 2.0K - 3.0K | 10W (m1n)

PHASE 3 RED FIELD TERMINAL (116) PHASE 5 YELLOW FIELD TERMINAL (132)

REMOVE RESISTOR FROM PHASE 1 RED FIELD TERMINAL, IF PRESENT.