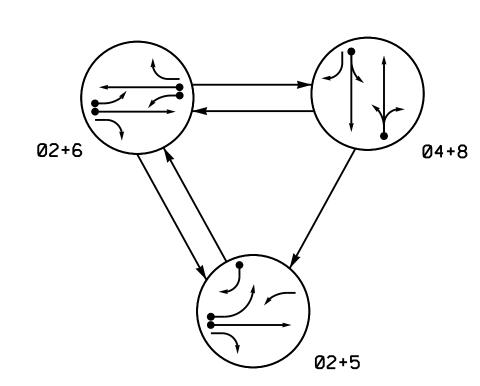
DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

OASIS 2070 TIMING CHART

2.0

30

3.7

2.4

2.0

ON

ON

lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6

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

Red Revert 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

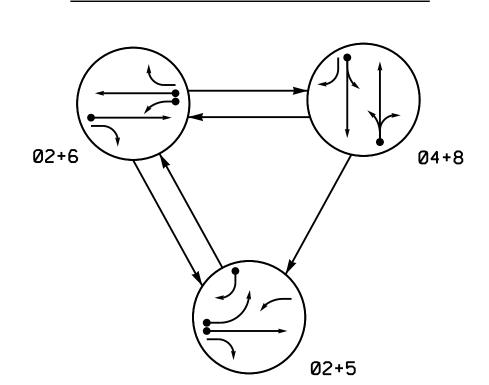
-

ON

ON

◆---- PEDESTRIAN MOVEMENT

ALTERNATE PHASING DIAGRAM

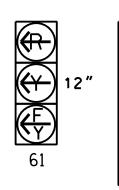


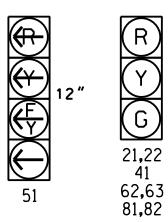
DEFAULT TABLE OF				N	
		PHA	4SE		
SIGNAL FACE	0 2+5	0 2+6	04+8	11日のエ	
21,22	G	G	R	Υ	
41	R	R	G	R	
42	$\mathbb{R}/$	R	G	R	
51	←	나	#	-Y	
61	따	누	#	₹	
62,63	R	G	R	Υ	
81,82	R	R	G	R	

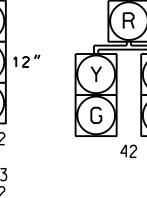
ALTERNAT	_					OASIS	2070	L00P	& DET	EC	TOR	IN	ST	AL	LATIO	NC
TABLE OF	0PI	ERA	TIO	N		II	NDUCTI	VE LOC	PS		DETE	ECT	OR	PF	ROGRAI	MMI
SIGNAL FACE	02+	PH# 0 2 +	Ø 4 +	トレロのエ		LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DEL TIA
	5	6	8	H		2 A	6X6	300	*	*	2	Y	Υ	ı	ı	-
21,22	G	G	R	Υ		4A	6X40	0	*	*	4	Υ	Υ	ı	-	_
41	R	R	G	R		5A	6X:40	0	*	*	5	Υ	Υ	-	ı	**
42	R/	R	G	R		JΆ	0240		不	k	** 2	Y	Υ	Υ	I	3
51	1	√R	-₽	-Y		5B	6X40	0	*	*	5	Υ	Υ	ı	ı	15
	투		#	- Y		6A	6X6	300	*	*	6	Υ	Υ	ı	•	-
			-			6B	6X40	0	*	*	6	Y	Υ	Υ	-	3
62,63	R	G	R	Υ		8A	6X40	0	*	*	8	Υ	Υ	-	1	-
81,82	R	R	G	R]											
·					_	y M l +	: 7000	14:05	2112	Γ.	-+	⊥ :				

SIGNAL FACE I.D.

All Heads L.E.D.







* Multizone Microwave Detection.

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

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

R-5021

PROJECT REFERENCE NO.

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.

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

LEGEND

PROPOSED EXISTING \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 Controller & Cabinet Junction Box 2-in Underground Conduit Right of Way \longrightarrow Directional Arrow Microwave Detection Zone Construction Zone N/A

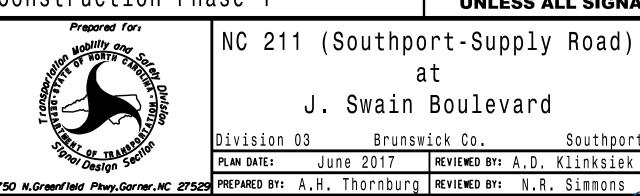
Right Arrow "ONLY" Sign (R3-5R) Combined Through and Left Arrow Sign (R3-6L)

Signal Upgrade Temporary Design 1 Construction Phase

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INIT. DATE

Construction Barricade



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

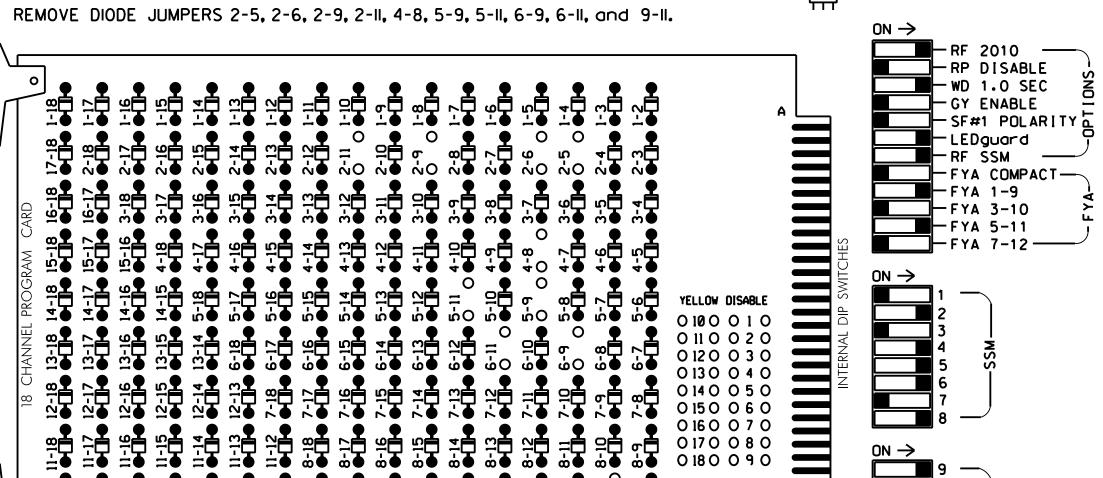
MATH CARO 031464

SIG. INVENTORY NO. 03-1043T1

N/A

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

REMOVE JUMPERS AS SHOWN

COMPONENT SIDE

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

[⊗] Wired Input - Do not populate slot with detector card

(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.
- 3. Enable Simultaneous Gap-Out for all Phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap
- 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

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE

AUX S4 PHASES USED...........2,4,5,6,8

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

- 2. Program phases 4 and 8 for Dual Entry.
- Reduction.

CABINET MOUNT.....BASE

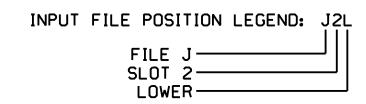
LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1.

OVERLAP "A"......2

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 5A1	-	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.



SPECIAL DETECTOR NOTE

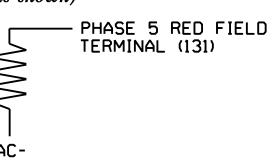
Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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)



750 N.Greenfield Pkwy.Garner.NC 27529

PROJECT REFERENCE NO. Sig. 25

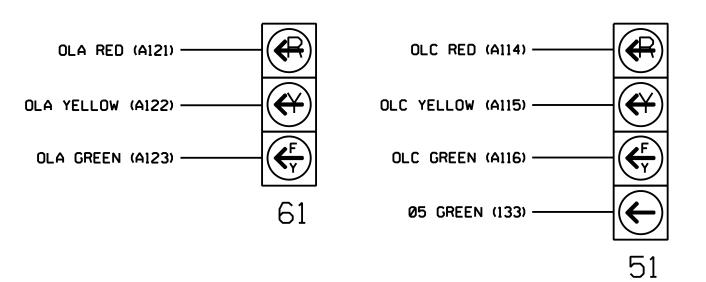
					SIC	ANE	L	HEA	D F	100	K-l	JP	CHA	٩RT	1				
LOAD SWITCH NO.	SI	S2	S 3	S4	S5	S6	S	57	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	ļ	5	6	15	7	8	16	σ	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	•	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	★ 51	62,63	NU	NU	81,82	NU	★	NU	NU	★ 51	NU	NU
RED		128			101		*		134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW														A121			A114		
YELLOW ARROW							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

ELECTRICAL AND PROGRAMMING

DETAILS FOR: NC 211 (Southport-Supply Road)

J. Swain Boulevard

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. 03-1043T1

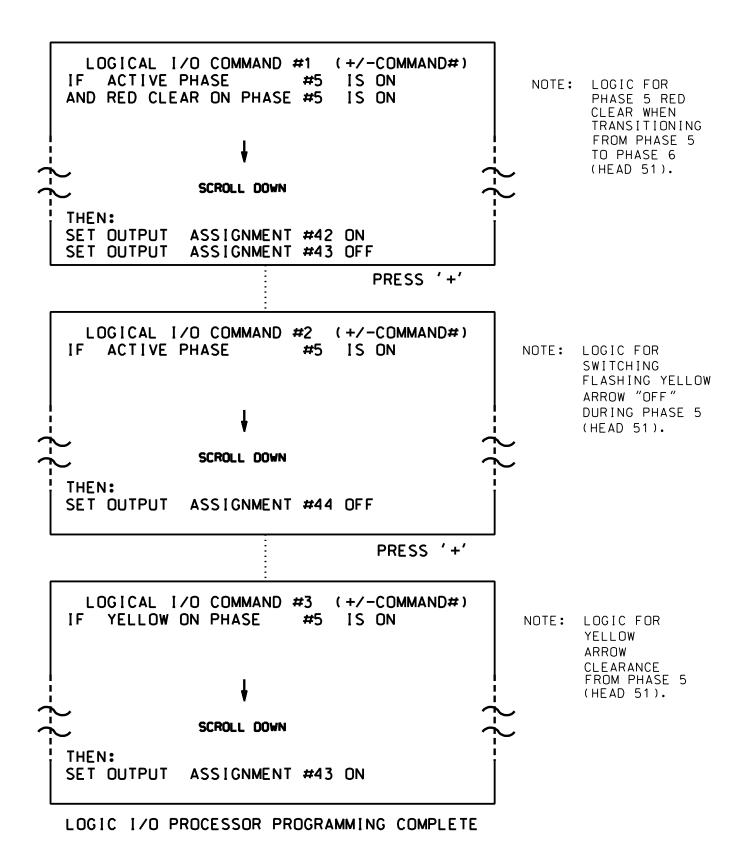
PROJECT REFERENCE NO. Sig 25 R-5021

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

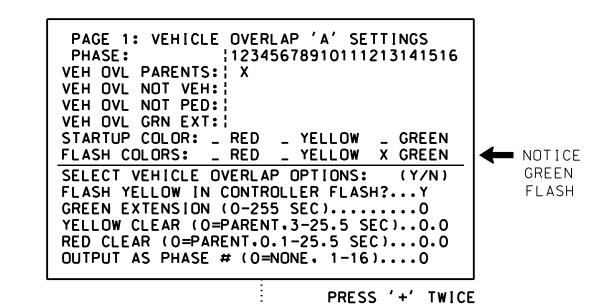
OUTPUT 43 = Overlap C Yellow

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).



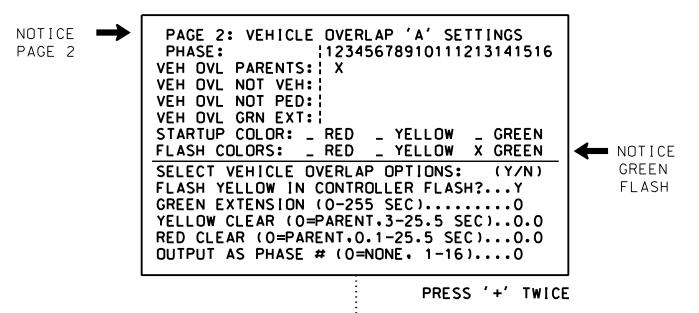
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y 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.



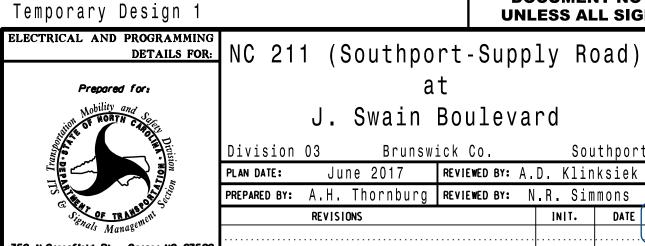
NOTICE -PAGE 2: VEHICLE OVERLAP 'C' SETTINGS PAGE 2 ¦12345678910111213141516 VEH OVL PARENTS: X VEH OVL NOT VEH: ! VEH OVL NOT PED: : VEH OVL GRN EXT: STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW _ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y 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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Signal Upgrade

J. Swain Boulevard June 2017

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

TH CARO 031464

SIG. INVENTORY NO. 03-1043T1

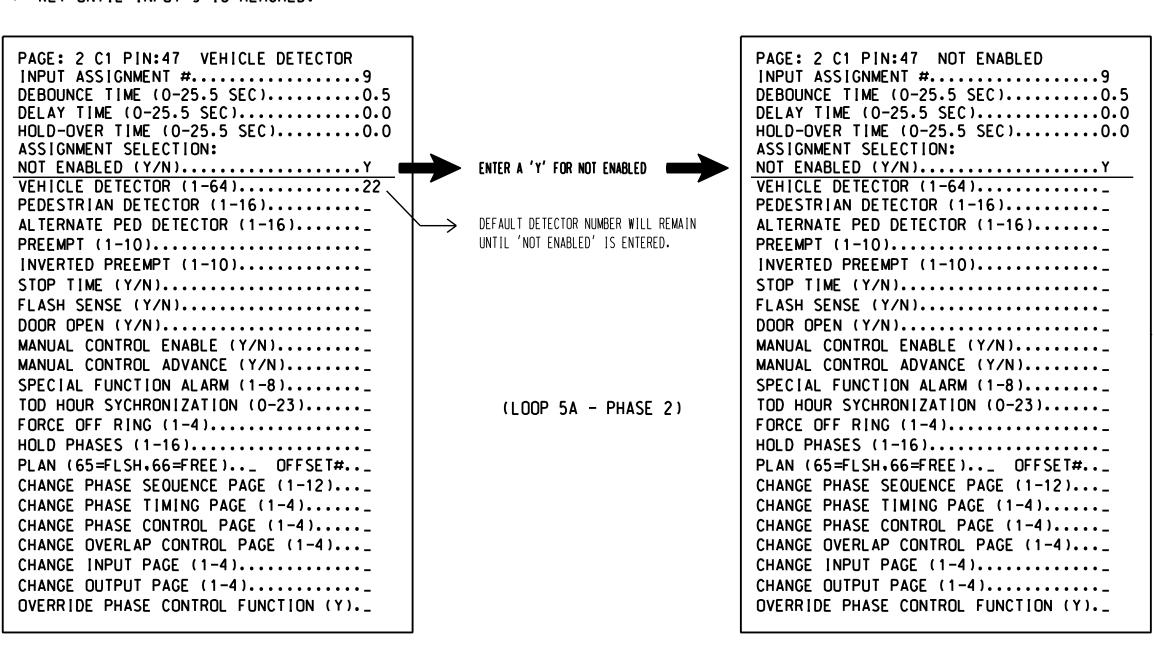
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

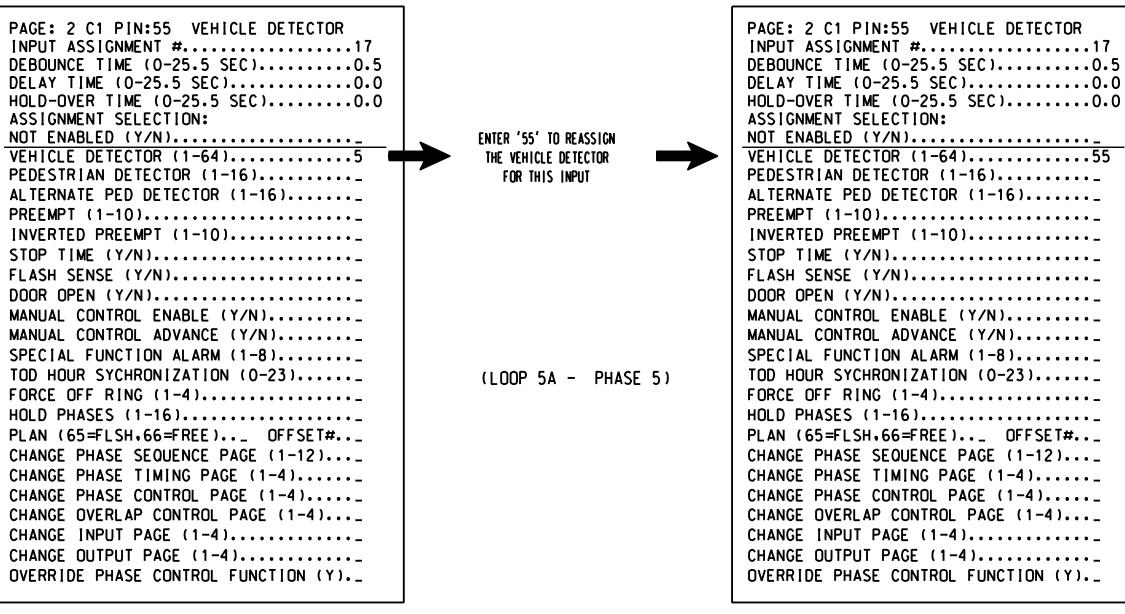
NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

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.



ASSIGNMENT SELECTION: PRESS '+' TO ADVANCE TO INPUT 17



PROGRAMMING COMPLETE

PROJECT REFERENCE NO.

R-5021

Sig 25

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		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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

Brunswick Co June 2017

J. Swain Boulevard ivision 03 Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

TH CARO 031464

SIG. INVENTORY NO. 03-1043T1

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

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

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 21,22,51,81,82 and sign Θ .
- 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

<u>EXISTING</u>

N/A

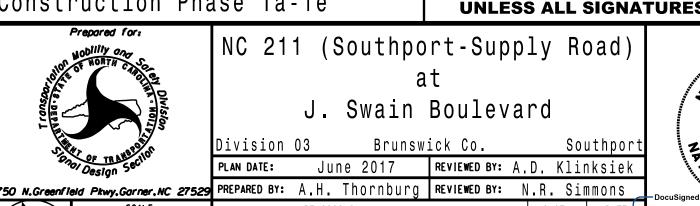
- 9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 10. Closed loop system data: Controller Asset #: 1043.

II	INDUCTIVE LOOPS						OR		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
2A	6X6	300	*	*	2	Υ	Υ	ı	ı	-	ı	1
4A	6X40	0	*	*	4	Υ	Υ	ı	ı	-	ı	1
4B	6X40	0	*	*	4	Υ	Υ	1	-	10	1	-
ΕΛ	6X40	0	*	*	5	Υ	Υ	-	-	*** 15	-	1
5·A	6840	U	不	不	*** 2	Υ	Υ	Υ	-	3	-	1
6 A	6X6	300	*	*	6	Υ	Υ	1	•	-	1	1
6B	6X40	0	*	*	6	Υ	Υ	Υ	-	3	1	-
8A	6X40	0	*	*	8	Υ	Υ	ı	-	-	1	-
: Mult	izone	Micro	owave	De	etec	+ i	on	•				

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

	35 MPH +2% Grade J. Swain Boulevard R/W	45 MPH +3% Grade
NC 211 (Southport-Supply Road)	81 82	→ WFH +3% Grade
	—————————————————————————————————————	
- 720-	37	←
	→ → 21 → - 22 →	
45 MPH -3% Grade	42 41 A	NC 211 (Southport-Supply Road)
		,



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Right of Way \longrightarrow Directional Arrow Microwave Detection Zone Construction Zone N/A Right Arrow "ONLY" Sign (R3-5R) Signal Upgrade Temporary Design 2 **DOCUMENT NOT CONSIDERED FINAL** Construction Phase 1a-1e **UNLESS ALL SIGNATURES COMPLETED** TH CARO

PROPOSED

 \bigcirc

031464 INIT. DATE SIG. INVENTORY NO. 03-1043T2

02+6 04+8

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT UNDETECTED MOVEMENT (OVERLAP)

UNSIGNALIZED MOVEMENT

→---- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D. All Heads L.E.D. 61

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

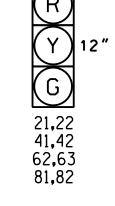
61

62,63

81,82

PHASE

12"



ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

51

61

62,63

81,82

PHASE

R/W —— R/W —/—

ALTERNATE PHASING DIAGRAM

02+6

PHASE FEATURE 5 12 12 Min Green 1 * 6.0 2.0 2.0 6.0 2.0 Extension 1 * 30 25 90 30 90 Max Green 1 * 4.8 3.7 3.0 3.0 4.8 Yellow Clearance 1.6 2.4 **3.**5 2.4 1.6 Red Clearance 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 Max Variable Initial * 15 15 Time Before Reduction 30 30 Time To Reduce * -

3.0

MIN RECALL

YELLOW

ON

OASIS 2070 TIMING CHART

* 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

3.0

MIN RECALL

YELLOW

Minimum Gap

Dual Entry

Vehicle Call Memory

Simultaneous Gap

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

(remove jumpers and set switches as shown)

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

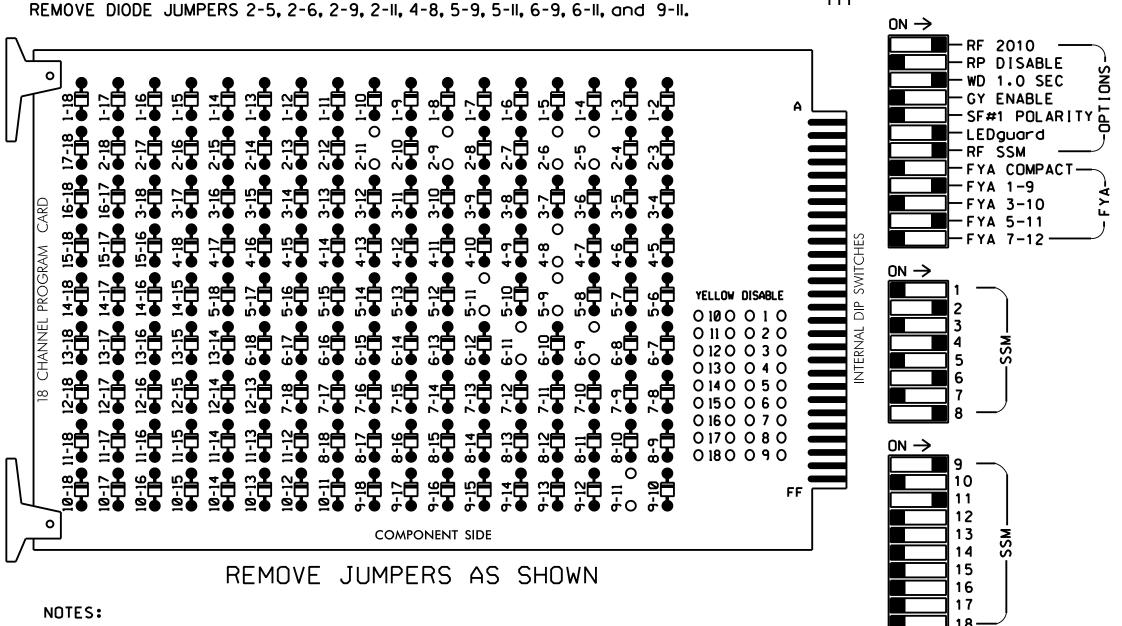
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.

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

of any jumper allows its channels to run concurrently.



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
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE

AUX S4

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

OF SWITCH

= DENOTES POSITION

ON OFF

OVERLAP "D".....NOT USED

- 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.

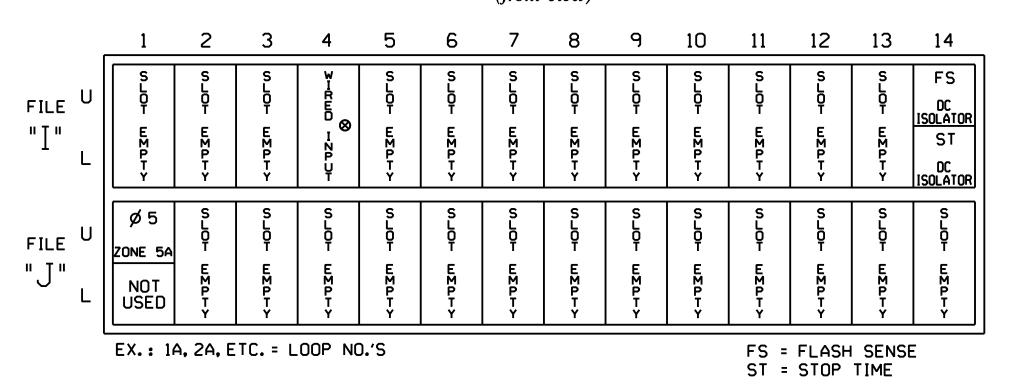
SOFTWARE......ECONOLITE OASIS CABINET MOUNT.....BASE

LOAD SWITCHES USED.....S2.S5.S7.S8.S11.AUX S1.

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

INPUT FILE POSITION LAYOUT

(front view)

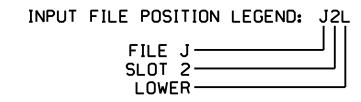


[⊗] Wired Input - Do not populate slot with detector card

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
	**	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.



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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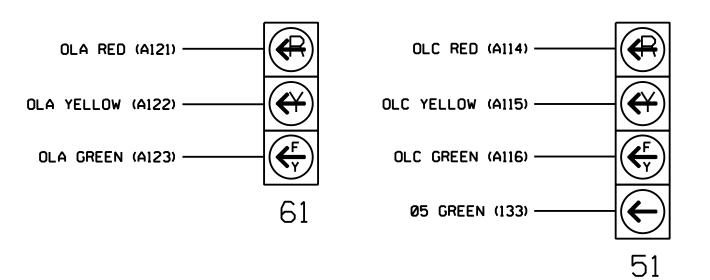
					SIC	ANE	L	HEA	D F	100	K-l	JP	CHA	٩RT	•			
LOAD SWITCH NO.	Sl	S2	S 3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	★ 51	62,63	NU	NU	81.82	NU	★	NU	NU	★ 51	NU	NU
RED		128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							133											

NU = Not Used

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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



<u>NOTE</u>

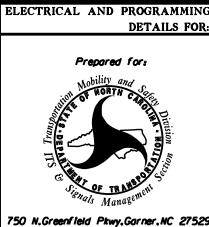
The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> 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)

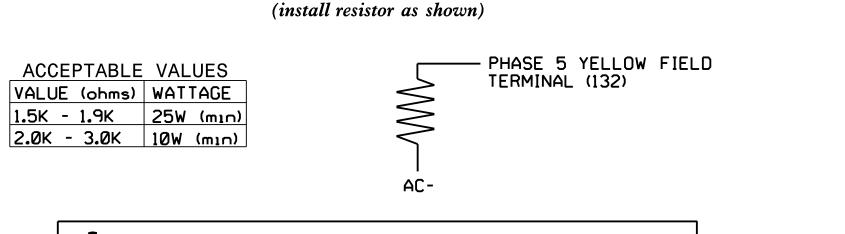
J. Swain Boulevard

Brunswick Co. June 2017

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

TH CARO 031464

SIG. INVENTORY NO. 03-1043T2



FIELD TERMINAL, IF PRESENT.

REMOVE RESISTOR FROM PHASE 5 RED

LOAD RESISTOR INSTALLATION DETAIL

IMPORTANT:

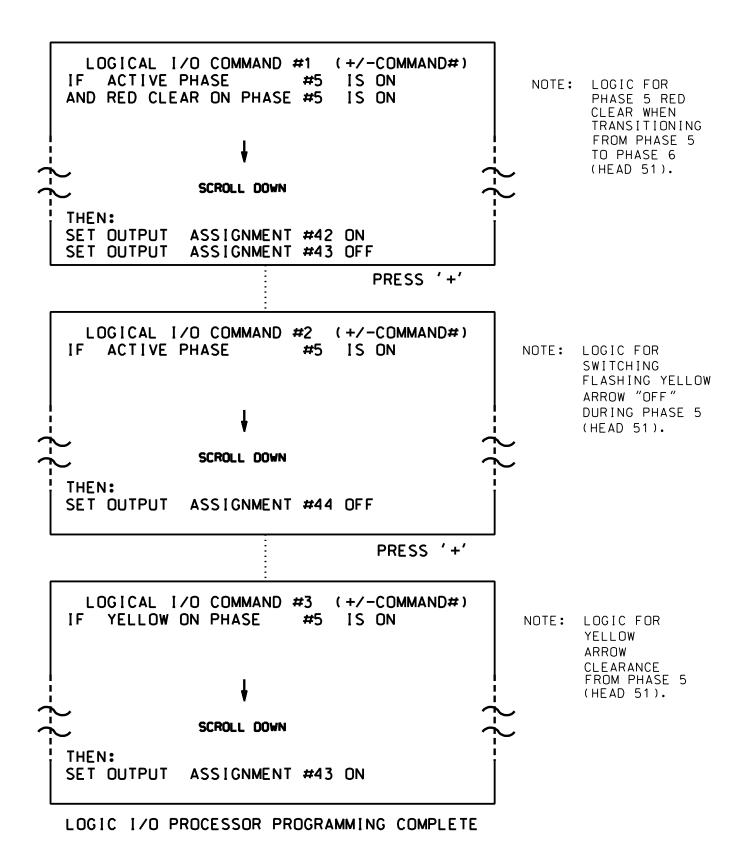
PROJECT REFERENCE NO. Sig 26 R-5021

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

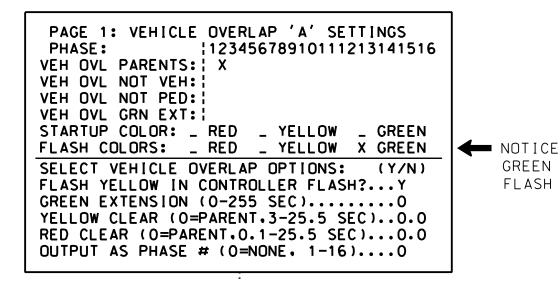
OUTPUT 43 = Overlap C Yellow

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

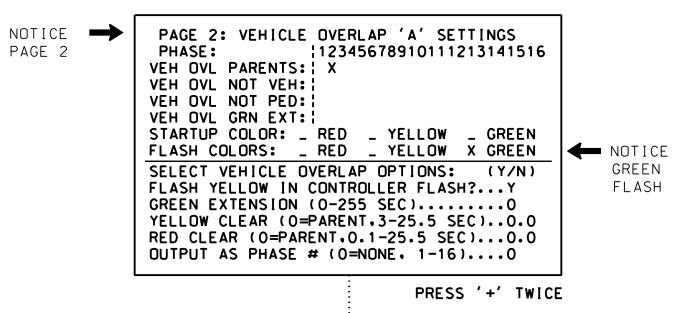
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y 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

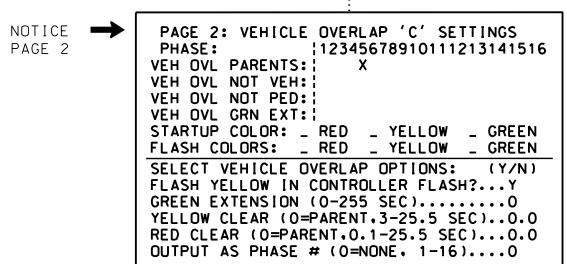
OVERLAP PROGRAMMING COMPLETE

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.



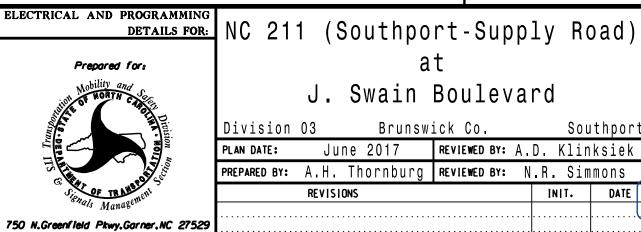


OVERLAP PROGRAMMING COMPLETE

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Temporary Design 2

J. Swain Boulevard June 2017

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

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

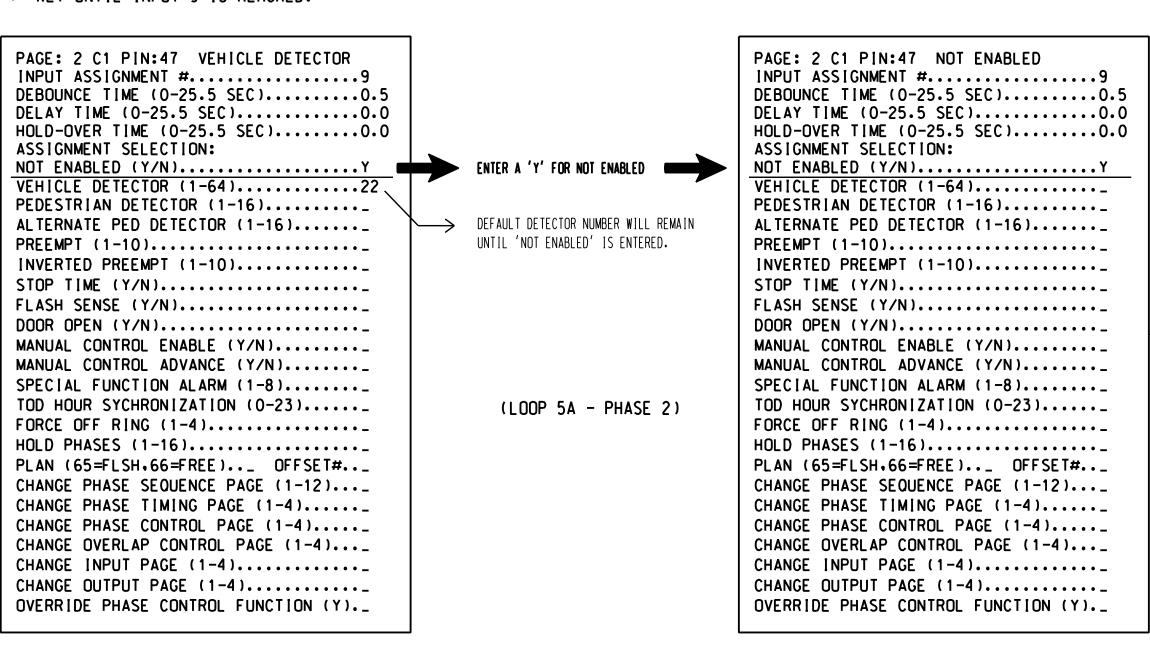
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(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.



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)...

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

DELAY TIME (0-25.5 SEC).............

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)..... (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 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 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		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

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

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

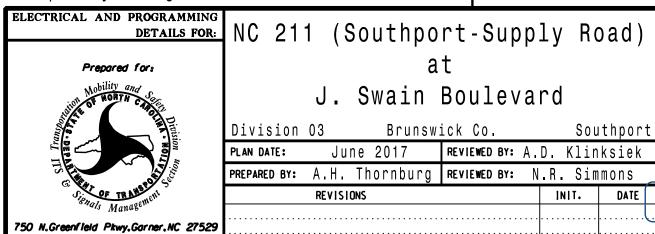
turns only.

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

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

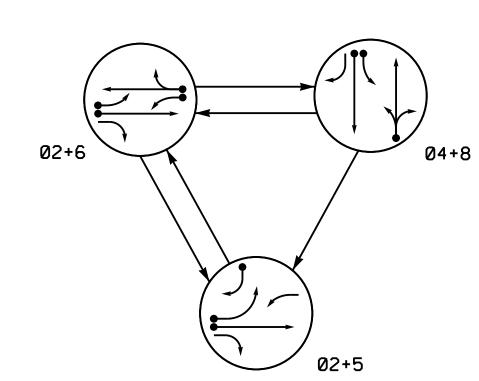
SIG. INVENTORY NO. 03-1043T2

031464

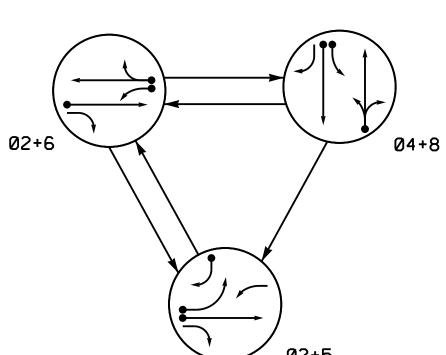
ATH CAROL

PROJECT REFERENCE NO. R-5021 Sig. 27.

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT TABLE OF		-		N
		PHA	ASE	
SIGNAL FACE	◎ ~+5	⊗ ∩+6	04+0	止しなのエ
21,22	G	G	R	Υ
41	R	R	G	R
42	\mathbb{R}^{\downarrow}	R	G	R
51	—	누	#	₹
61	т∤≻	L	₽	*

62,63

61

ALTERNAT TABLE OF											
	PHASE										
SIGNAL FACE	02+5	0 2+6	Ø 4 + 8	FLANI							
21,22	G	G	R	Υ							
41	R	R	G	R							
42	<u>R/</u>	R	G	R							
51	—	#	#	√ Y							
61	따	누	#	≺							
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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART DETECTOR PROGRAMMING INDUCTIVE LOOPS SIZE FROM STOPBAR 6X6 6X40 * |*| 4 |Y|Y|-| 4·A 6X40 4B ***15 6X40 6X40 300 6X6

* Multizone Microwave Detection.

6X40

6X40

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

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

	F	3 Pha ully Ac		d
(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 $oldsymbol{eta}_{oldsymbol{\cdot}}$
- 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.

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

Construction Zone

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

Microwave Detection Zone

<u>EXISTING</u>

N/A

r×3 L×3

 \longrightarrow

N/A

10. Closed loop system data: Controller Asset #: 1043.

PROPOSED

 \circ

PHASING DIAGRAM DETECTION LEGEND

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

_ ,			NC	211	(Sou	ıthpo	ort-S	Supp	oly	Ro	ad))
R / W -	_											
-	_	_	_					_	_	_	_	_

OASIS 2070 TIMING CHART										
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	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	-					
Minimum Gap	3.0	-	-	3.0	-					
Recall Mode	MIN RECALL	-	-	MIN RECALL	-					
Vehicle Call Memory	YELLOW	-	-	YELLOW	-					

* 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.

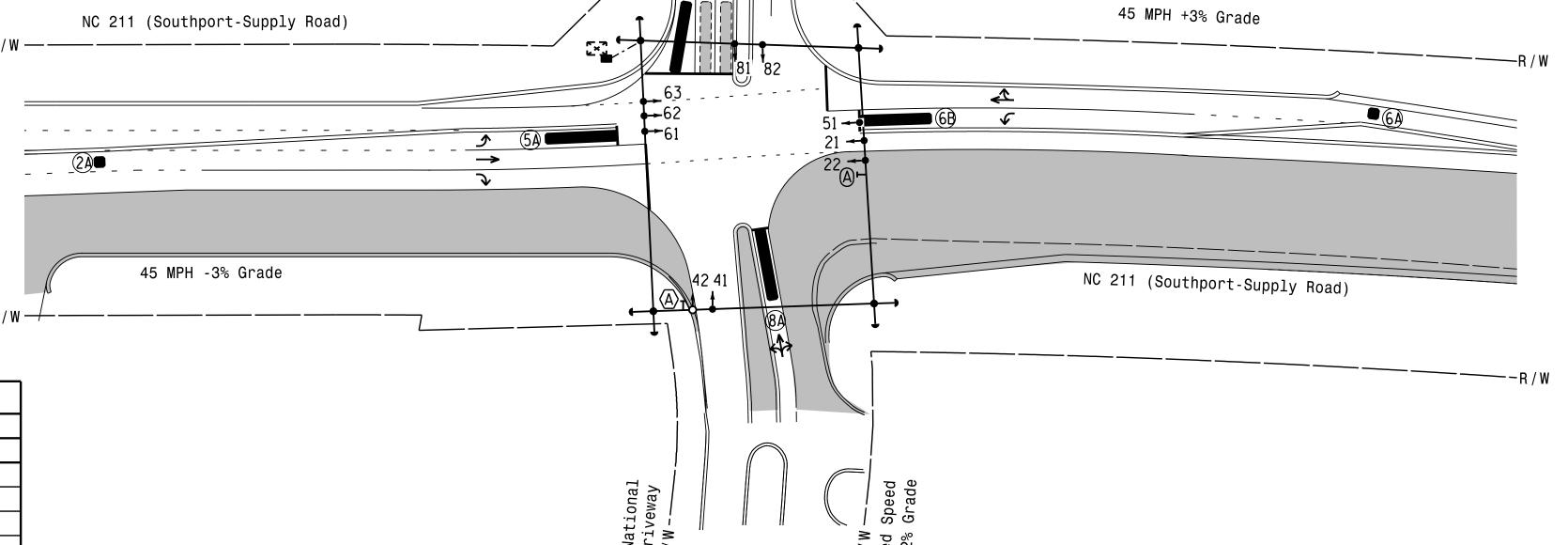
ON

ON

Dual Entry

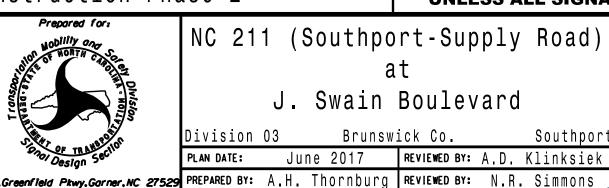
Simultaneous Gap

ON



Signal Upgrade Temporary Design 3 Construction Phase 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SIG. INVENTORY NO. 03-1043T3

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 CAROL J. Swain Boulevard SEAL 031464 Brunswick Co. Division 03 June 2017 REVIEWED BY: A.D. Klinksiek '50 N.Greenfleid Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

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

OF SWITCH

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.

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— FYA 1-9 FYA 3-10

⊢RF SSM

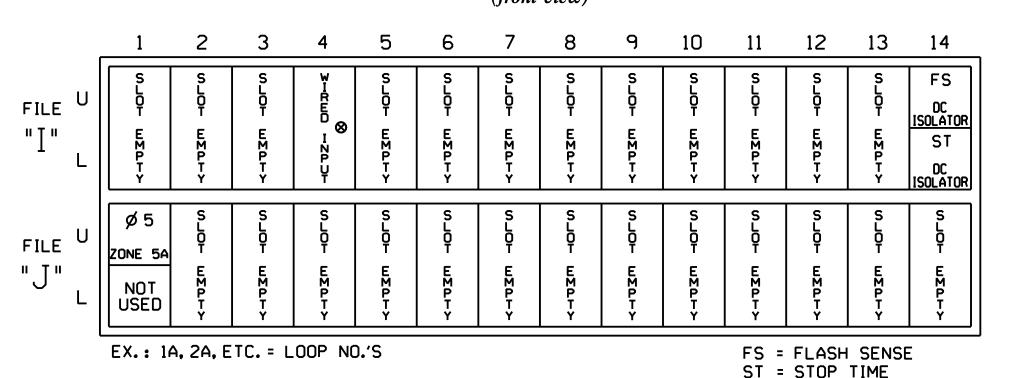
FYA 5-11 FYA 7-12 ----

= DENOTES POSITION

- WD 1.0 SEC GY ENABLE

-SF#1 POLARITY

WD ENABLE (



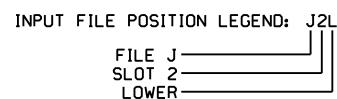
[⊗] Wired Input - Do not populate slot with detector card

PHASE 5 RED FIELD

TERMINAL (131)

LOOP N	0.	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 5	Α¹	-	I4U	47	9 ★	22	2	Y	Υ	Υ		3
		-	JlU	55	17 ★	55	5	Y	Υ			3

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



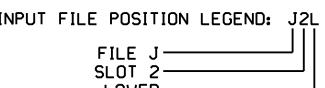
SPECIAL DETECTOR NOTE

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.

INPUT FILE CONNECTION & PROGRAMMING CHART

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

alternate phasing on sheet 3.



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.

PROJECT REFERENCE NO. Sig. 27

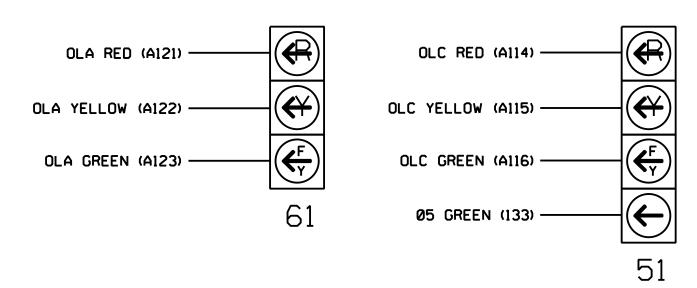
	SIGNAL HEAD HOOK-UP CHART																		
LOAD SWITCH NO.	Sl	S2	S 3	S4	S5	S6	S	57	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	ļ	5	6	15	7	8	16	g	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	•	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU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

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

750 N.Greenfield Pkwy.Garner.NC 27529

J. Swain Boulevard

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

REVISIONS

Southport INIT. DATE

SIG. INVENTORY NO. 03-1043T3

031464

TH CARO,

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

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

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)

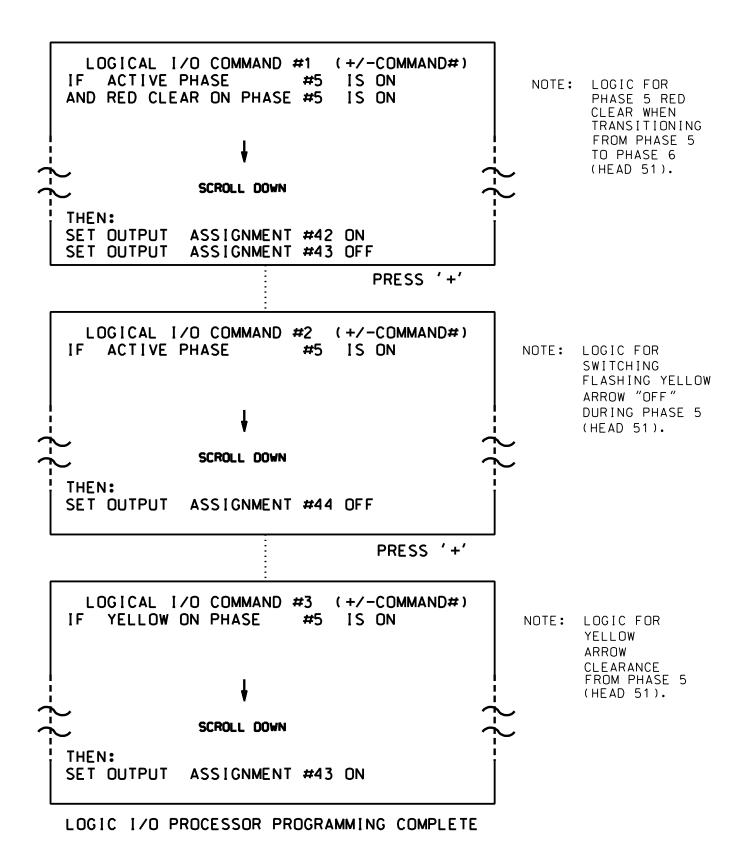
PROJECT REFERENCE NO. Sig 27 R-5021

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

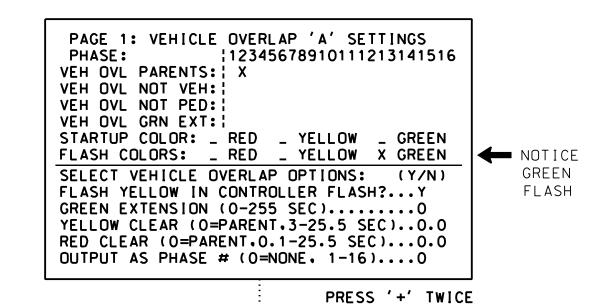
- 1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- 2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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



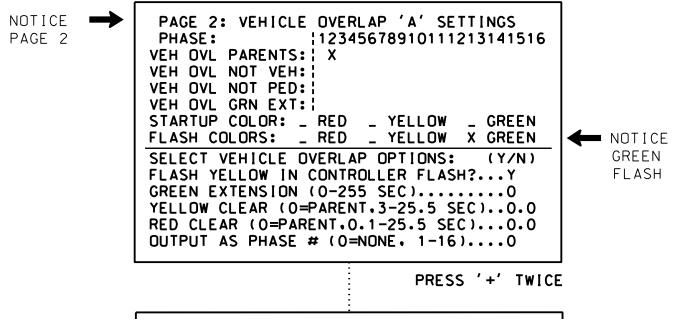
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: : VEH OVL NOT PED: VEH OVL GRN EXT: : STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW X GREEN **I** ← NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y 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

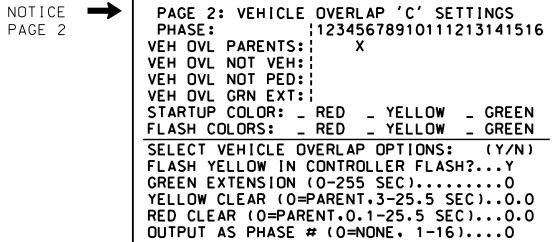
OVERLAP PROGRAMMING COMPLETE

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

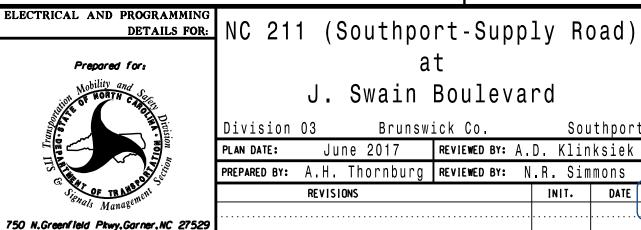
OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR

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

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

PAGE 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

TH CARO 031464

SIG. INVENTORY NO. 03-1043T3

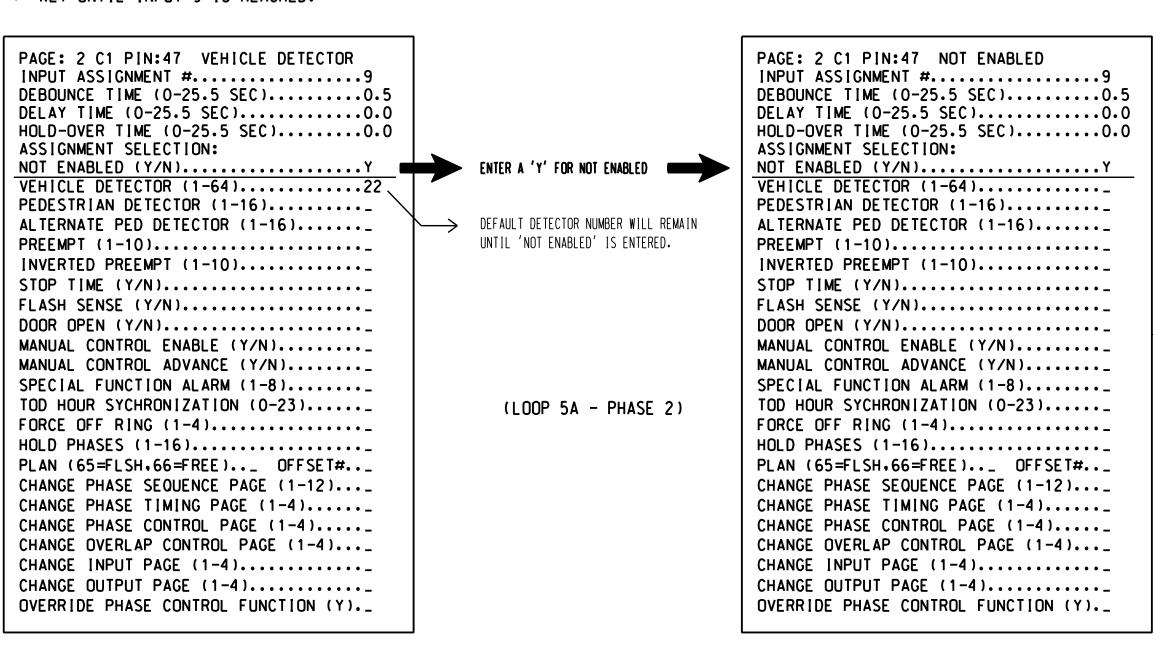
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(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. 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		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: 03-1043T3 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

(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 Brunswick Co

ivision 03 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. 03-1043T3

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

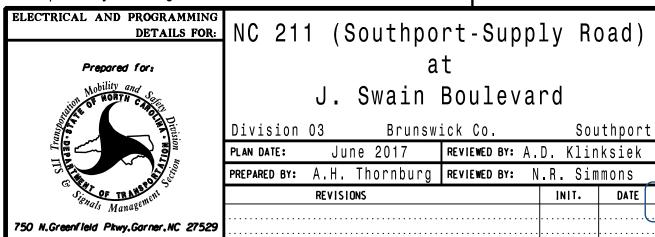
turns only.

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

SIG. INVENTORY NO. 03-1043T3

ATH CAROL

SE:AL 031464

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

→---- PEDESTRIAN MOVEMENT

02+6

ALTERNATE PHASING DIAGRAM

02+6

04+8

PROJECT REFERENCE NO. R-5021 Sig. 28.

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.
- numbered 21,22,41,51,61,62,63,81, 82, and sign \triangle .
- presence mode.
- will determine the hours of use for each phasing plan.
- 8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain
- 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:

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

Construction Barricade

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

Microwave Detection Zone Construction Zone

<u>EXISTING</u>

●→

N/A

K×N K×N

 \longrightarrow

N/A

N/A

TH CARO

031464

SIG. INVENTORY NO. 03-1043T4

- 4. Reposition existing signal heads
- 5. Set all detector units to
- 7. Incorporate Microwave Detection
- system for vehicle detection.
- detection zones as shown.
- Controller Asset #: 1043.

PROPOSED

 \circ

3. Phase 5 may be lagged. 6. The Division Traffic Engineer

ALTERNATE PHASING

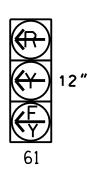
TABLE OF OPERATION PHASE SIGNAL FACE

21,22 41,42 43

51 61 62,63 81,82

SIGNAL FACE I.D.

All Heads L.E.D.



DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

43

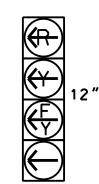
51

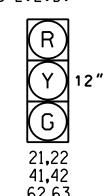
62,63

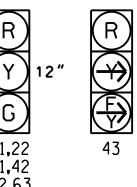
81,82

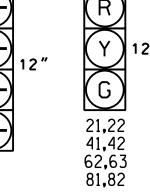
04+8

PHASE









NC 211 (Southport-Supply Road) 45 MPH +3% Grade NC 211 (Southport-Supply Road) 45 MPH -3% Grade

> Signal Upgrade Temporary Design 4 Construction Phase 3

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

** Disable phase 2 call for 5A during alternate

*** Reduce delay to 0 seconds during alternate

TURNS

INDUCTIVE LOOPS

FROM

STOPBAR

300

300

* Multizone Microwave Detection.

SIZE (FT)

6X6 6X40

6X40

6X40

6X40

6X6

6X40

phasing operation.

phasing operation.

LOOP

4A

4B

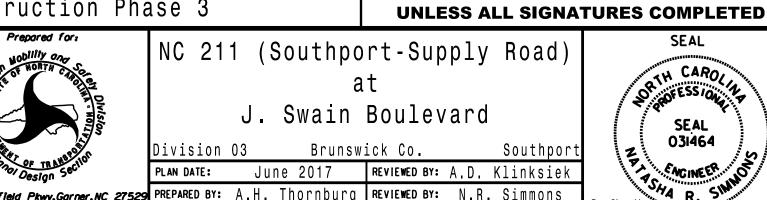
6·A

6B

DETECTOR PROGRAMMING

***15

DOCUMENT NOT CONSIDERED FINAL



REVISIONS

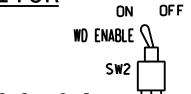
'50 N.Greenfleig Phwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997 HNTB INIT. DATE

OASIS 2070 TIMING CHART										
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	1.5	2.6	2.9	1.5	4.3					
Red Revert	2.0	2.0	2.0	2.0	2.0					
Walk 1 *	-	-	-	-	-					
Don't Walk 1	-	-	-	-	-					
Seconds Per Actuation *	2.5	ı	-	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					
Simultaneous Gap	ON	ON	ON	ON	ON					

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

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



= DENOTES POSITION OF SWITCH

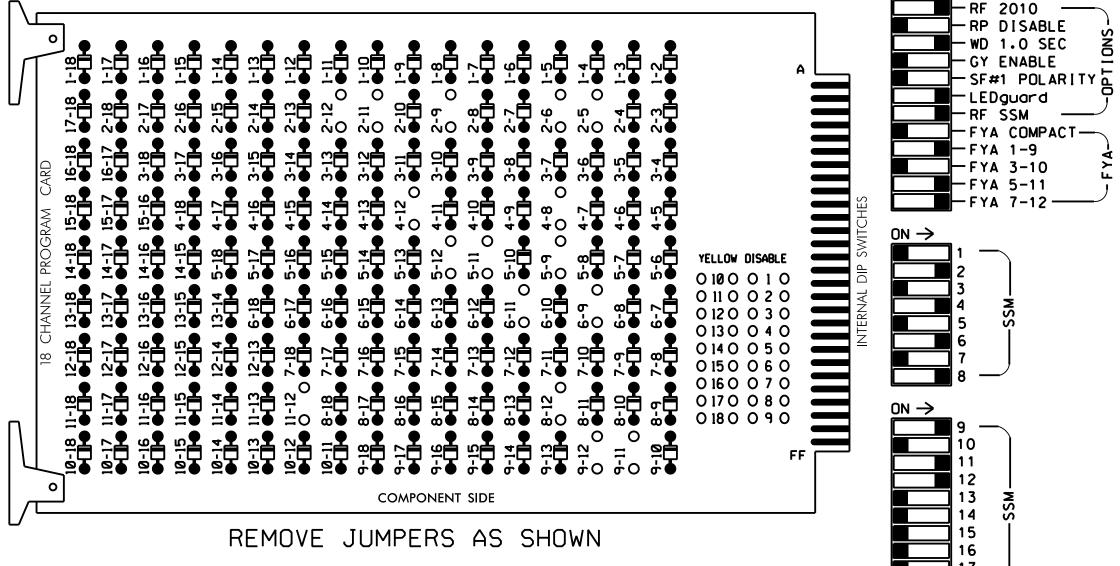
DC ISOLATOR

ST

FS = FLASH SENSE

ST = STOP TIME

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

"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.

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

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

alternate phasing on sheet 3.

AUX S4, AUX S5

★ See pictorial of head wiring in detail this sheet.

installation detail this sheet.

* Denotes install load resistor. See load resistor

102

***** | 135 |

FYA SIGNAL WIRING DETAIL

SIGNAL HEAD HOOK-UP CHART

51 62.63 NU NU 81.82 NU 61 NU

(wire signal heads as shown)

PROJECT REFERENCE NO.

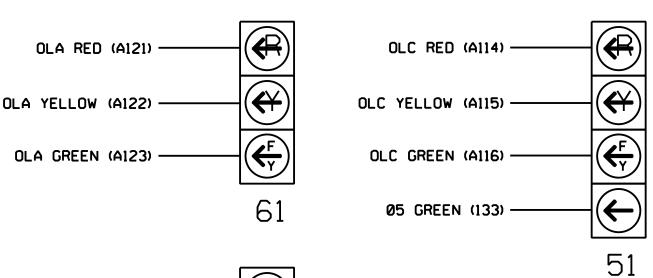
A114

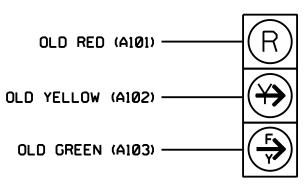
| A115 | A102

A116 A103

8 RED OLA OLB SPARE OLC OLD SPARE

Sig. 28





<u>NOTE</u>

LOAD SWITCH NO.

PHASE

RED

YELLOW

GREEN

ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

GREEN ARROW

NU = Not Used

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 Temporary Design 4 **UNLESS ALL SIGNATURES COMPLETED**

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

J. Swain Boulevard

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

Southport INIT. DATE

TH CARO,

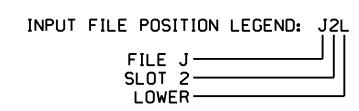
031464

SIG. INVENTORY NO. 03-1043T4

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
	**	JlU	55	17	5	5	Y	Υ			15
ZONE 5A1	-	I4U	47	9 ★	22	2	Y	Υ			
	-	JIU	55	17 ★	55	5	Υ	Υ			

- 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

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:

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

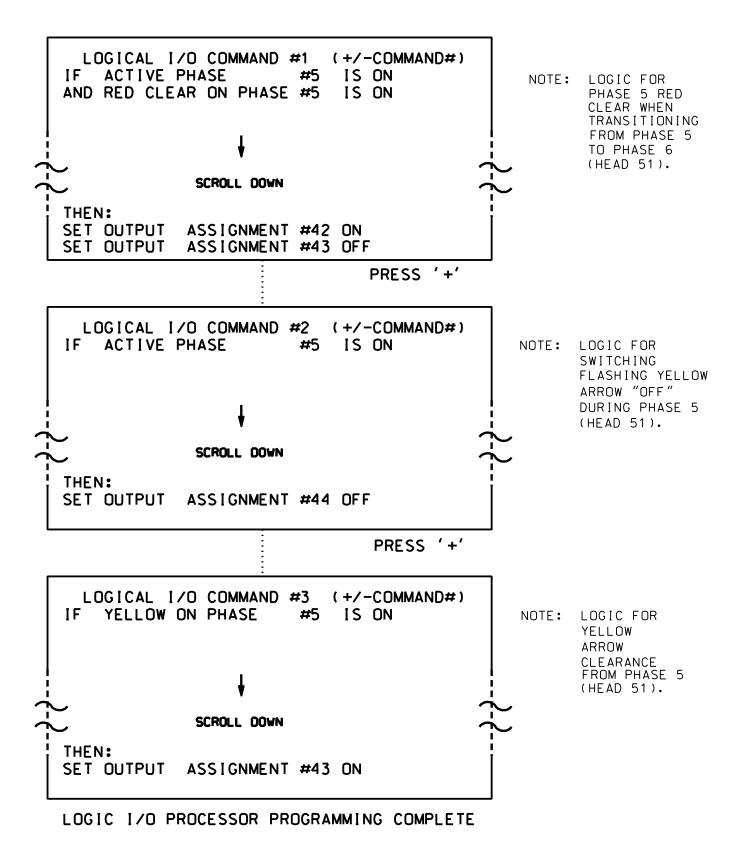
REMOVE RESISTOR FROM PHASE 5 RED FIELD TERMINAL. IF PRESENT.

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).



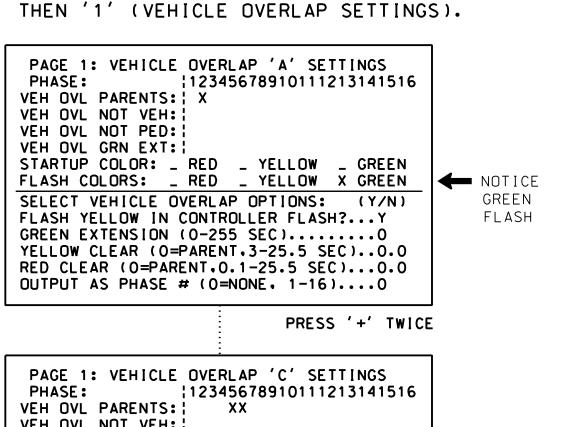
OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR

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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

PROJECT REFERENCE NO. R-5021 Sig 28

(program controller as shown below)



FROM MAIN MENU PRESS '8' (OVERLAPS).

PAGE 1: VEHICLE OVERLAP 'D' 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 SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...N 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

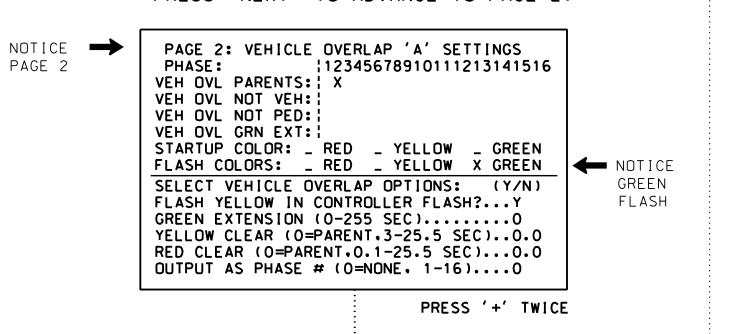
VEH OVL NOT VEH: VEH OVL NOT PED: VEH OVL GRN EXT: STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW X GREEN **←** NOTICE SELECT VEHICLE OVERLAP OPTIONS: (Y/N) GREEN FLASH YELLOW IN CONTROLLER FLASH?...Y FLASH GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED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

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

PAGE 2

(program controller as shown below)

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



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

OVERLAP PROGRAMMING COMPLETE

NOTICE -PAGE 2: VEHICLE OVERLAP 'C' SETTINGS PAGE 2 VEH OVL PARENTS: | X

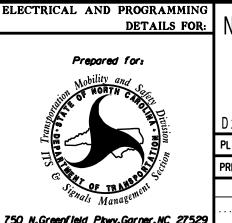
VEH OVL NOT VEH: | VEH OVL NOT PED: | VEH OVL GRN EXT: STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED X YELLOW _ GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y GREEN EXTENSION (0-255 SEC)..... YELLOW CLEAR (O=PARENT.3-25.5 SEC)..0.0 RED CLEAR (0=PARENT.0.1-25.5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

12345678910111213141516

PRESS '+'

Electrical Detail - Sheet 2 of 4 Signal Upgrade

Temporary Design 4 **UNLESS ALL SIGNATURES COMPLETED** DETAILS FOR: NC 211 (Southport-Supply Road)



750 N.Greenfield Pkwy.Garner.NC 27529

PLAN DATE:

TH CARO J. Swain Boulevard oivision 03 Brunswick Co Southport June 2017 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

INIT. DATE SIG. INVENTORY NO. 03-1043T4

031464

DOCUMENT NOT CONSIDERED FINAL

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043T4 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

REVISIONS

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

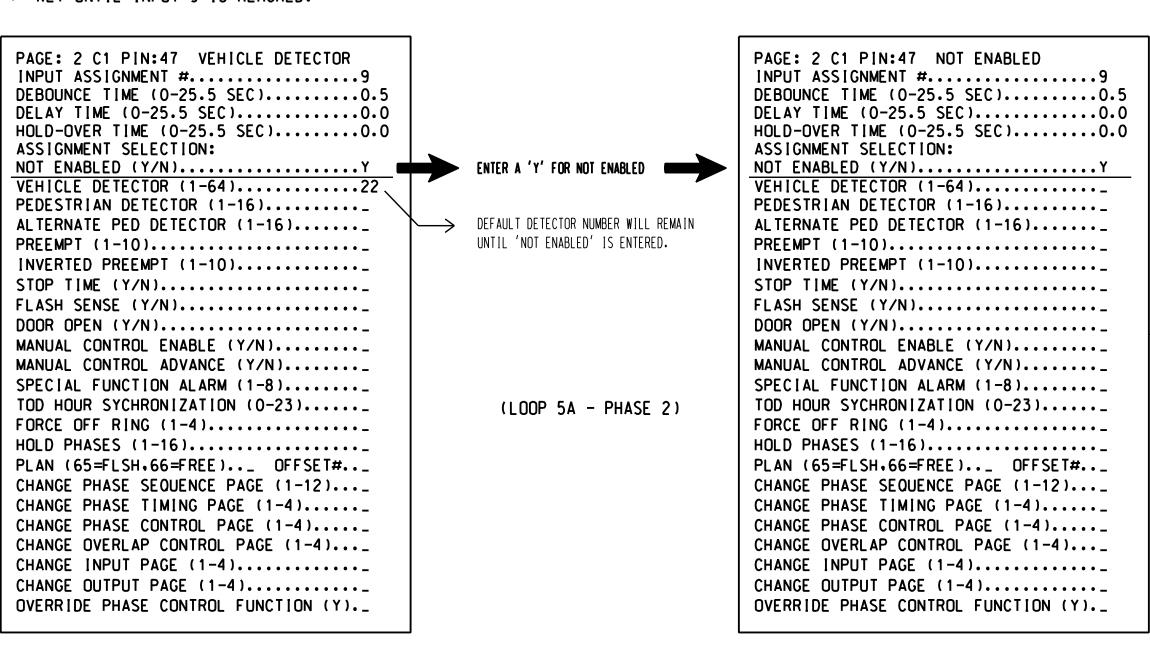
(program controller as shown below)

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 0 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 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.

	•	
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
PHASE# 12345678910111213141516 PHASES ASSIGNED	ENTER '5' FOR PHASES ASSIGNED	PHASE#
SWITCH/DUPLICATE; LOOP SIZE (0-255 FT)		SWITCH/DUPLICATE; LOOP SIZE (0-255 FT)
DELAY (0-255 SEC)	ENSURE DELAY IS 'O'	DELAY (0-255 SEC)
		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: 03-1043T4 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

(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 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. $03-1043\overline{14}$

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 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 <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 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 0 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

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

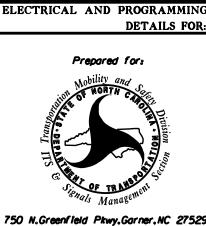
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAILS FOR: NC 211 (Southport-Supply Road)

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

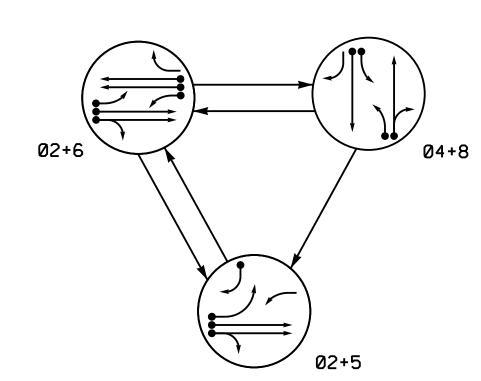
REVISIONS

TH CAROL

031464

INIT. DATE SIG. INVENTORY NO. 03-1043T4

DEFAULT PHASING DIAGRAM



DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)
UNSIGNALIZED MOVEMENT

15

30

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

Time Before Reduction

Time To Reduce *

Vehicle Call Memory

Simultaneous Gap

Minimum Gap

Recall Mode

Dual Entry

15

30

3.0

MIN RECALL

YELLOW

-

ON

ON

PHASING DIAGRAM DETECTION LEGEND

→---- PEDESTRIAN MOVEMENT

ALTERNATE PHASING DIAGRAM

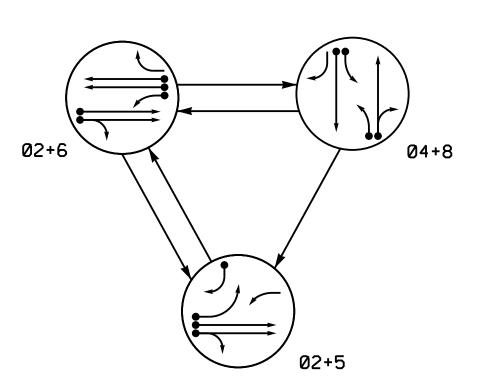


TABLE OF	0PI	N	TA		
		PHA	4SE		
SIGNAL FACE	0 2+5	0 2+6	04+8	止しなのエ	SI F
21,22	G	G	R	Υ	2
41	#	#	나	#	
42,43	R	R	G	R	4
44	F∱	R	수	R	
51	\	цþ≻	┿	*	
61	₽ţ≻	F }	#	*	
62,63	R	G	R	Υ	6
81	#	#	누	#	
82,83	R	R	G	R	8

DEFAULT PHASING

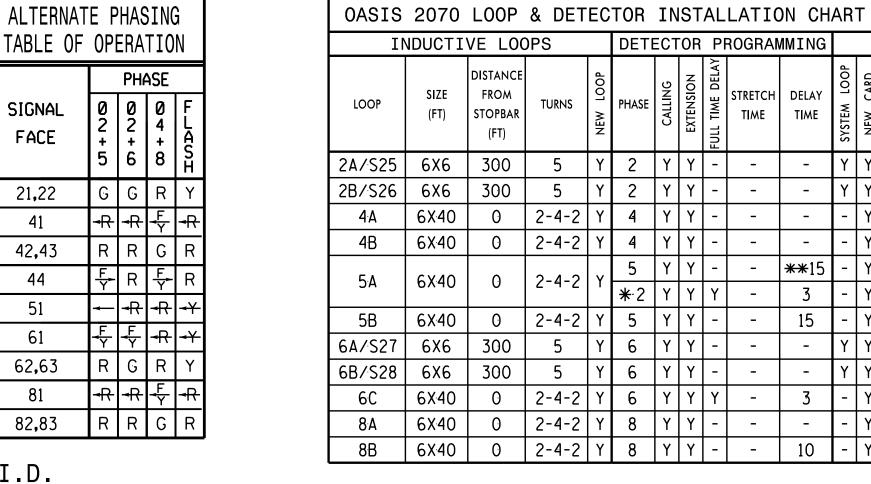
41

SIGNAL FACE I.D.

All Heads L.E.D.

(5B(4B(4A)

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



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

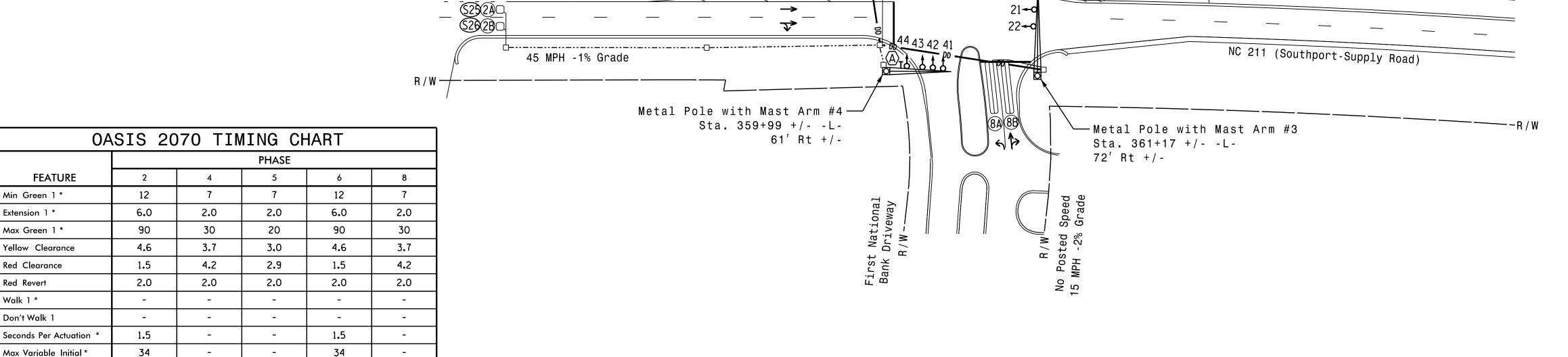
** Reduce delay to 3 seconds during alternate phasing operation.

R-5021 Sig. 29.0

3 Phase Fully Actuated (NC 133 Closed Loop System)

<u>NOTES</u>

- 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-

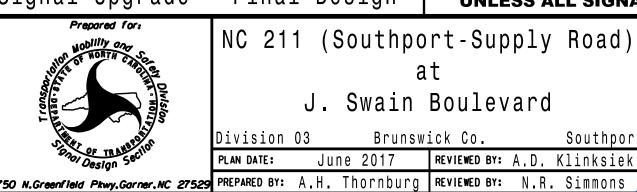
71' Lt +/-

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 \boxtimes ار×ع ال Controller & Cabinet Junction Box ----- 2-in Underground Conduit _-----Right of Way Directional Arrow Directional Drill N/A Metal Pole with Mastarm "RIGHT TURN MUST YIELD TO U-TURN" Sign **(A)**

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



HNT

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 with Mast Arm #2

45 MPH +1% Grade

Sta. 361+05 +/- -L-

73′ Lt +/-

SEAL
Southport

No. Klinksiek

R. Simmons

INIT. DATE

Page 10 A COMPLE ED

SEAL

O31464

SEAL

O31464

SEAL

O31464

Page 10 A COMPLE

SEAL

O31464

SEAL

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Page 10 A COMPLE

SEAL

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Page 10 A COMPLE

SEAL

O31464

Page 10 A COMPLE

SIG. INVENTORY NO. 03-1043

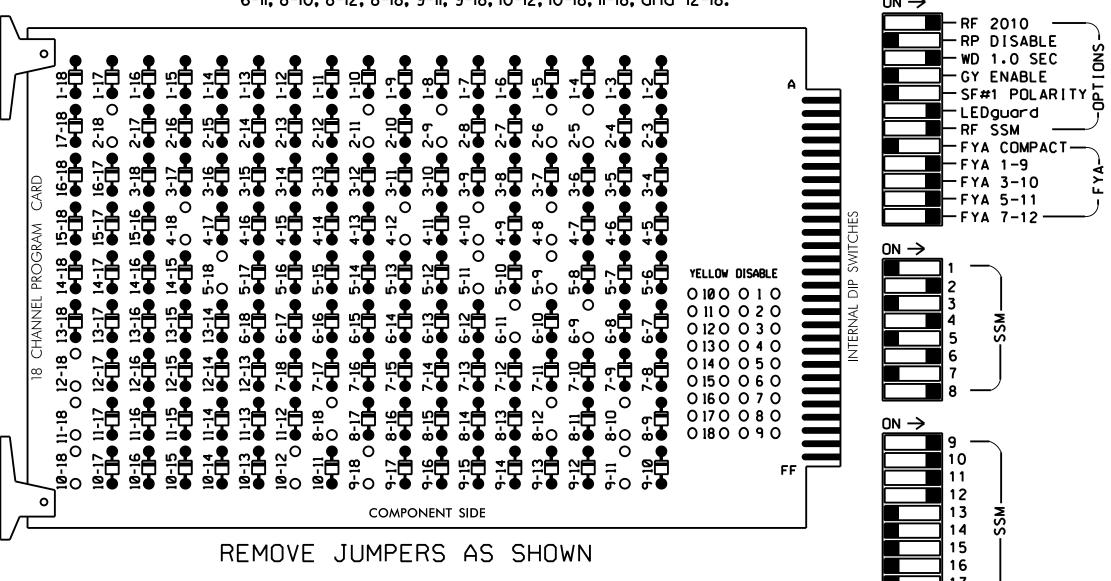
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL WD ENABLE (

(remove jumpers and set switches as shown)

ON OFF

= DENOTES POSITION

OF SWITCH



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.

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	NP 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	 	ģ	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													

[™] Wired Input - Do not populate slot with detector card

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

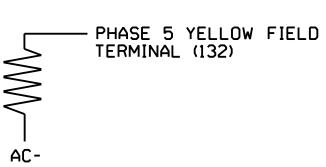
.00P NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S25	TB2-5,6	I2U	39	1	2	2/SYS	Υ	Υ			
2B/S26	TB2-7,8	I2L	43	5	12	2/SYS	Υ	Υ			
4A	TB4-9,10	I6U	41	3	4	4	Y	Υ			
4B	TB4-11,12	I6L	45	7	14	4	Υ	Υ			
	TB3-1,2	JlU	55	17	5	5	Υ	Υ			15
5A ¹	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3
	-	JlU	55	17 ★	55	5	Υ	Υ			3
5B	TB3-5,6	J2U	40	2	6	5	Υ	Υ			15
6A/S27	TB3-9,10	J3U	64	26	36	6/SYS	Υ	Υ			
6B/S28	TB3-11,12	J3L	77	39	46	6/SYS	Υ	Υ			
6C	TB5-1,2	J4U	48	10	26	6	Y	Υ	Y		3
8A	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 -

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)



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

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PROJECT REFERENCE NO. Sig. 29

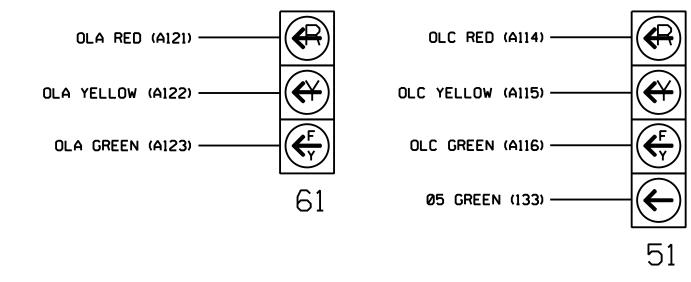
					SIC	SNA	L	HEA	D H	00H	K-l	JP	CHA	4RT	•			
LOAD SWITCH NO.	Sı	S2	S 3	S 4	S5	S6	S 7	S8	S 9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43	NU	★ 51	62,63	NU	NU	82,83	NU	6 1	8 1	NU	★ 51	★	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

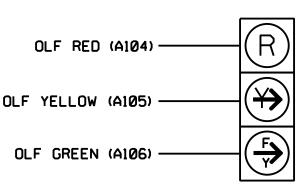
- * Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



OLB RED (A124) -OLD RED (A101) (4) OLB YELLOW (A125) -OLD YELLOW (A102) - $\overline{\binom{F}{Y}}$ OLB GREEN (A126) -OLD GREEN (A103) — 81 41



<u>NOTE</u>

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)



750 N.Greenfield Pkwy.Garner.NC 27529

Final Design

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)ivision 03 Brunswick Co.

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

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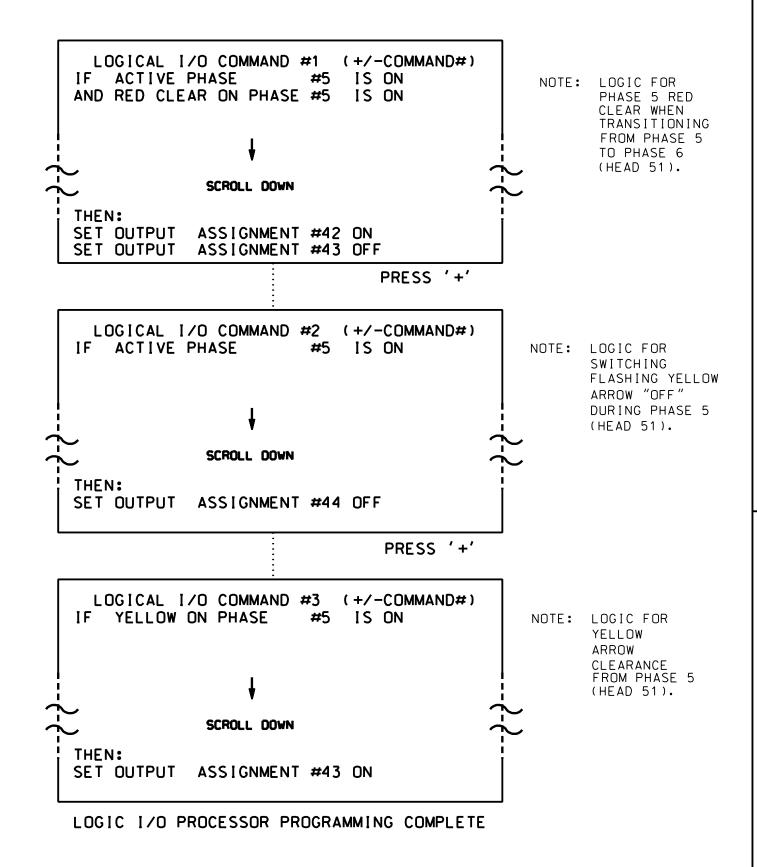
SIG. INVENTORY NO. 03-1043

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).



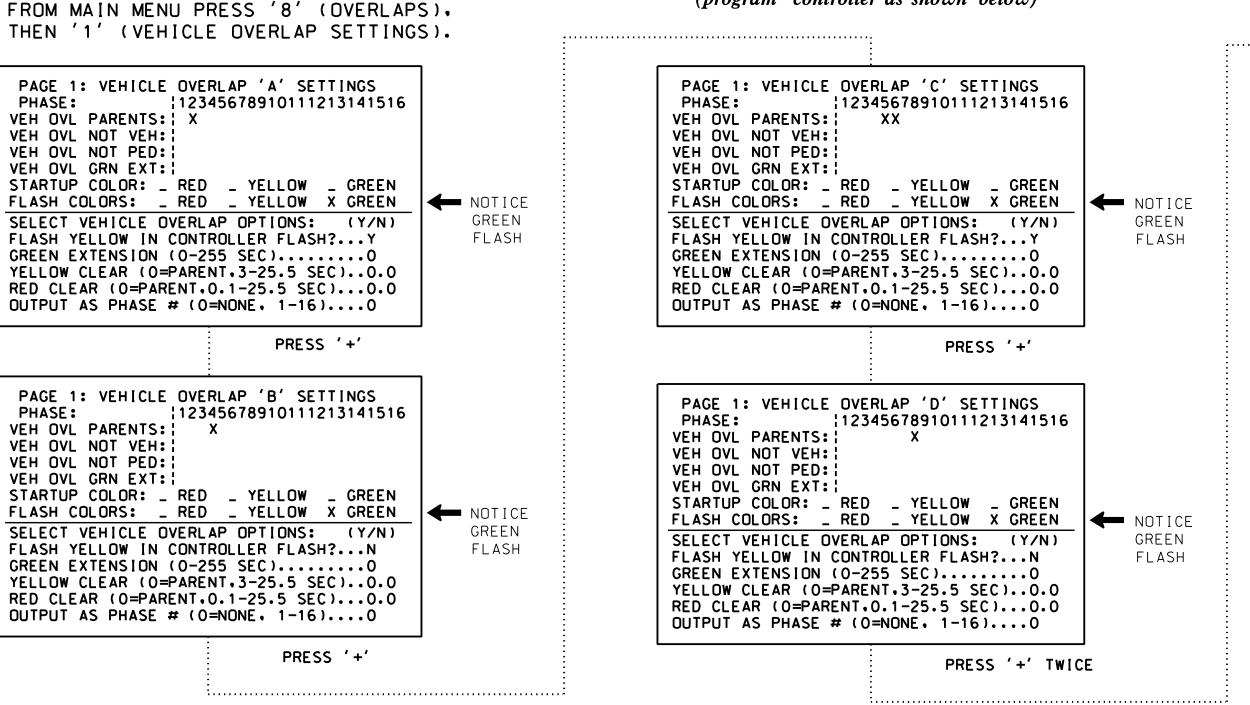
OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red

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 'F' SETTINGS 112345678910111213141516 PHASE: 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 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

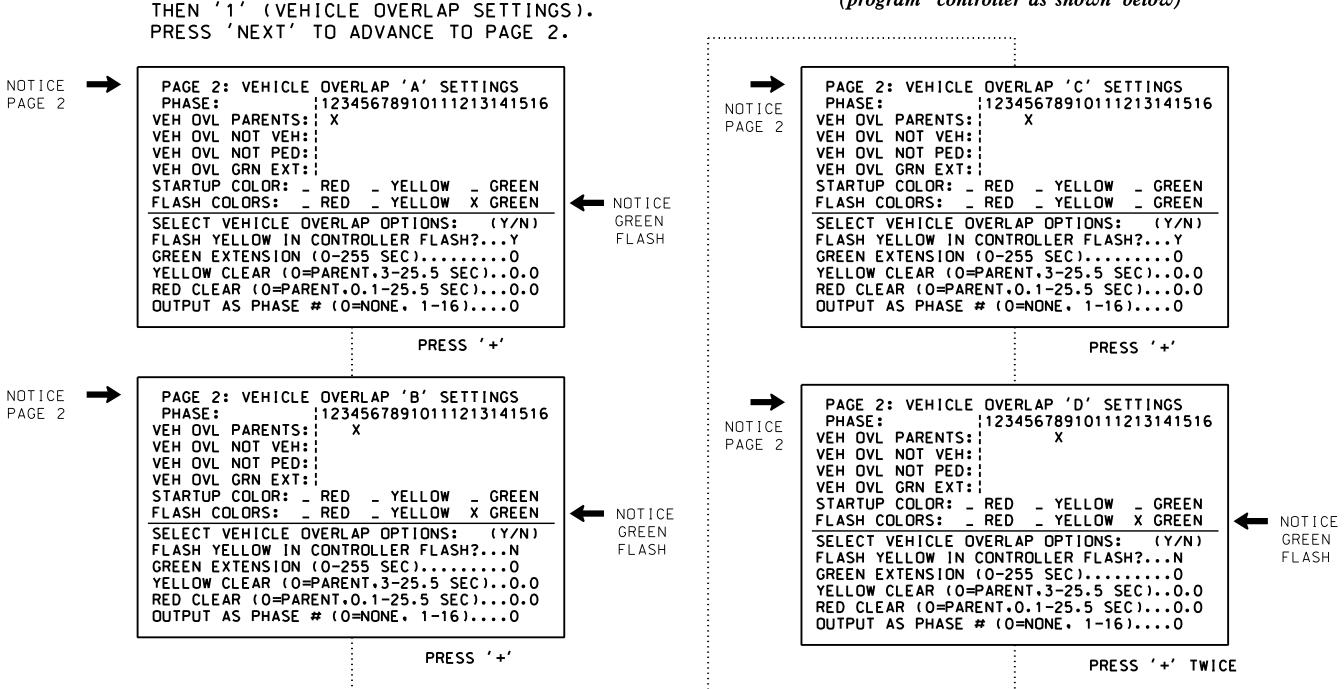
SHEET NO

Sig 29

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)



FROM MAIN MENU PRESS '8' (OVERLAPS).

PAGE 2

PAGE 2

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

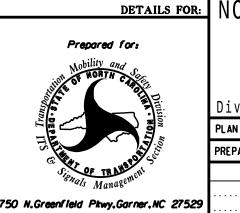
OVERLAP PROGRAMMING COMPLETE

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Electrical Detail - Sheet 2 of 5 Signal Upgrade

> **UNLESS ALL SIGNATURES COMPLETED** DETAILS FOR: NC 211 (Southport-Supply Road)



Final Design

ELECTRICAL AND PROGRAMMING

J. Swain Boulevard

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

CACINEER SIG. INVENTORY NO. 03-1043

TH CARO

PESSION 1

031464

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GREEN

FLASH

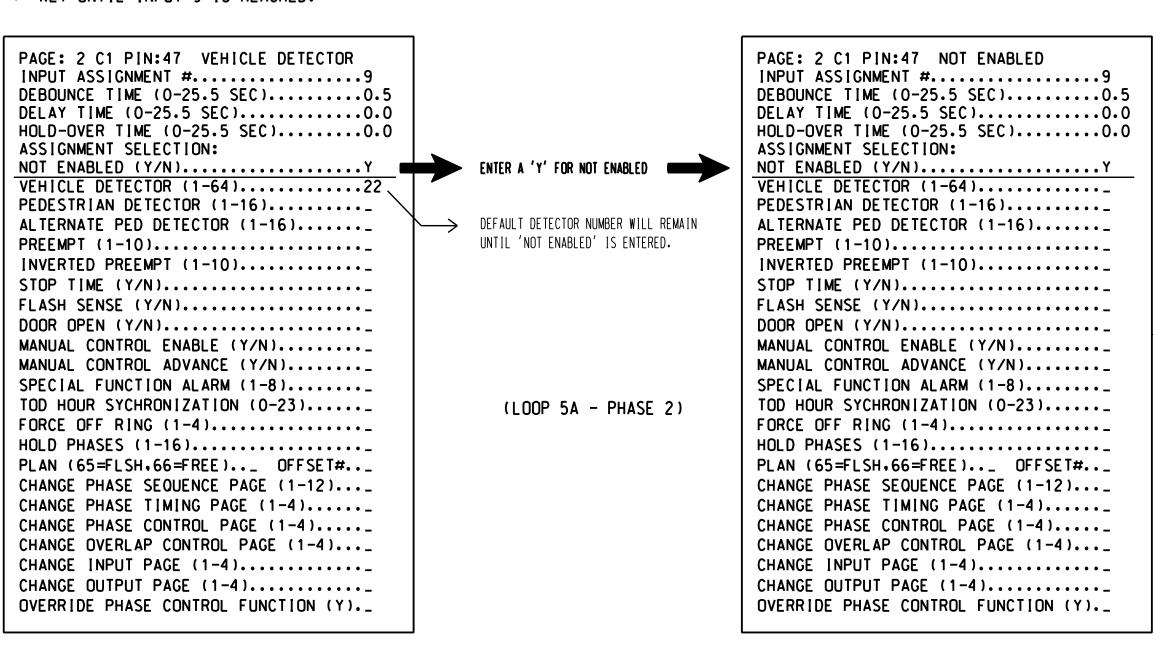
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(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.

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 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) 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		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.

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Electrical Detail - Sheet 3 of 5 Signal Upgrade Final Design

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

(LOOP 5A - PHASE 5)

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

J. Swain Boulevard

Southport ivision 03 Brunswick Co 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. 03-1043

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 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.

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 Final Design

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

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

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INIT. DATE REVISIONS

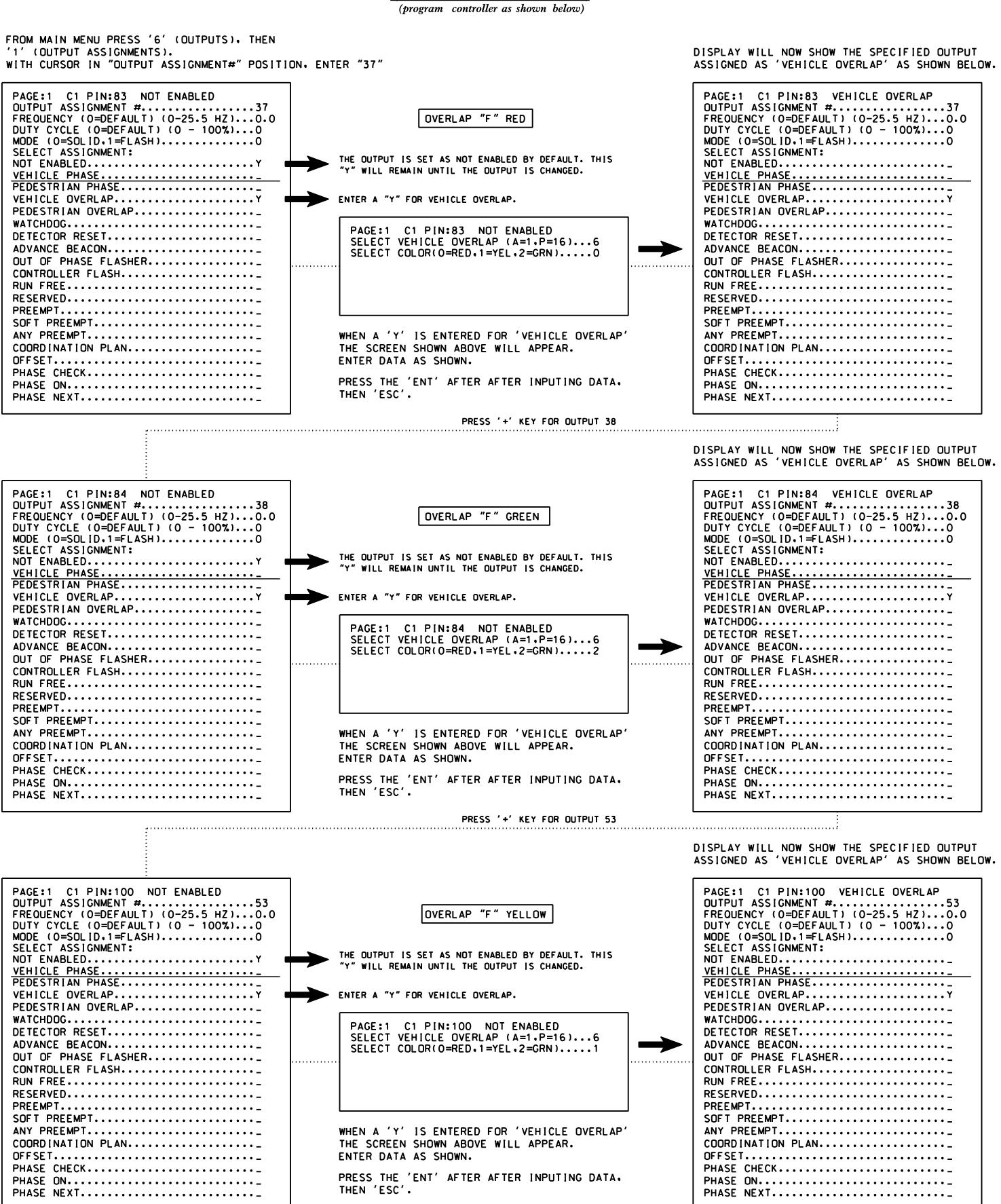
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SIG. INVENTORY NO. 03-1043

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

(FOR SIGNAL HEAD 44)



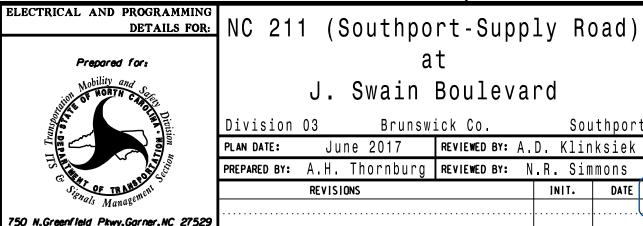
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1043 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 5 of 5 Signal Upgrade

Final Design

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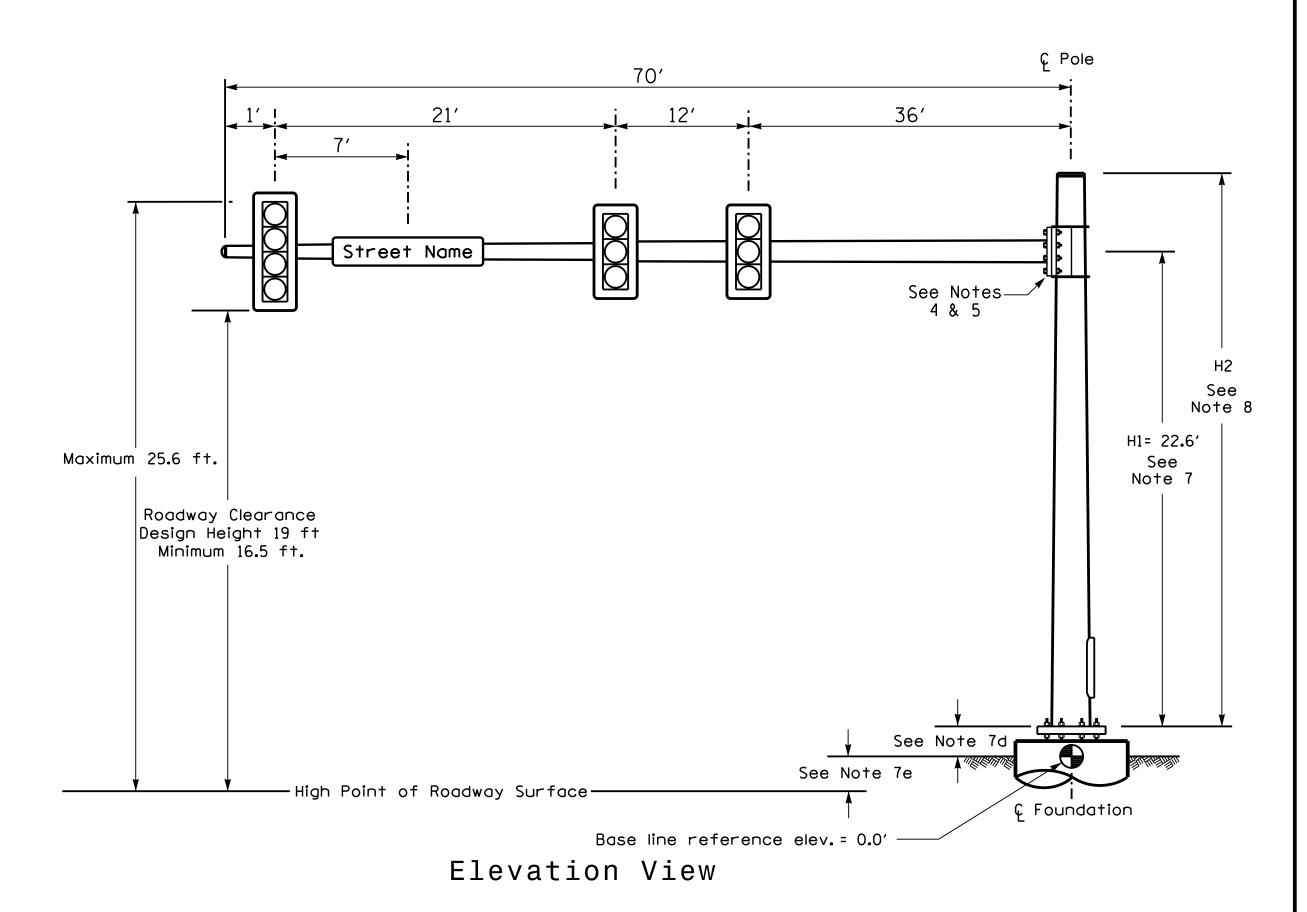
Brunswick Co Southport June 2017 TREVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons INIT. DATE

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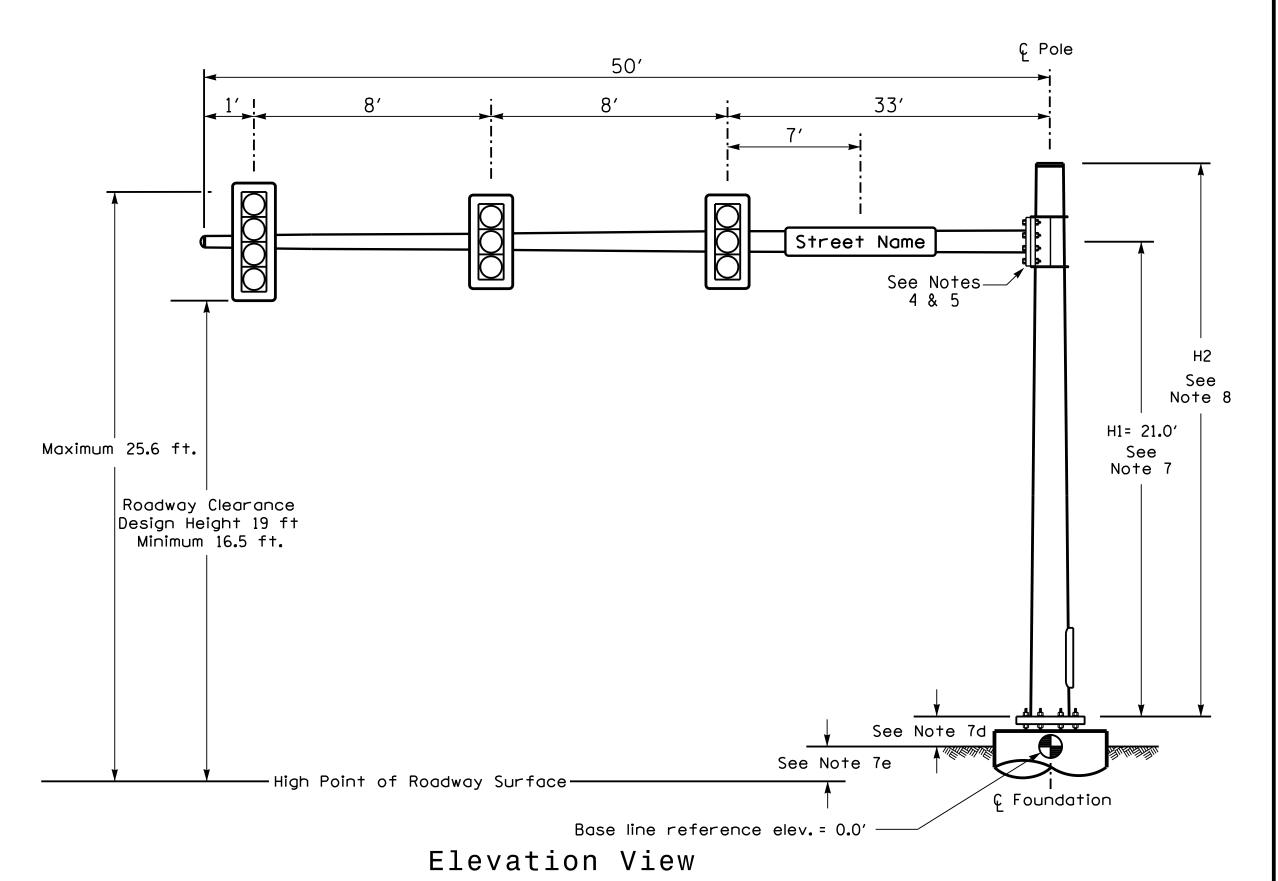
SIG. INVENTORY NO. 03-1043

REVISIONS

Design Loading for METAL POLE NO. 1



Design Loading for METAL POLE NO. 2

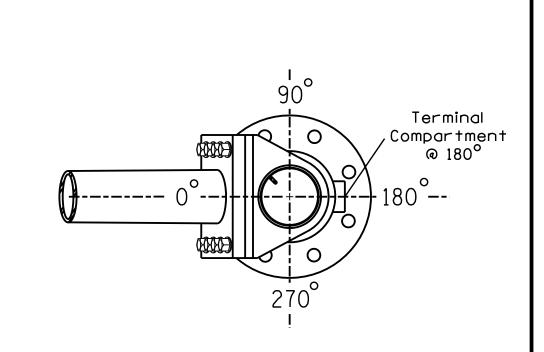


SPECIAL NOTE

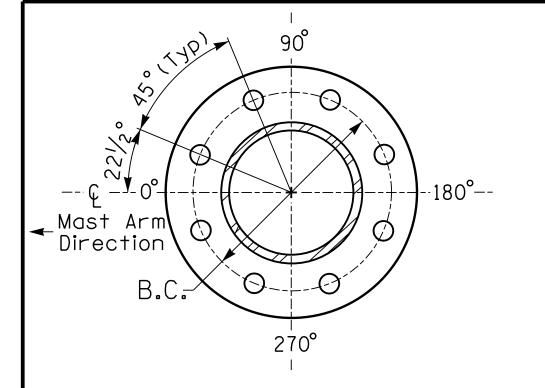
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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.

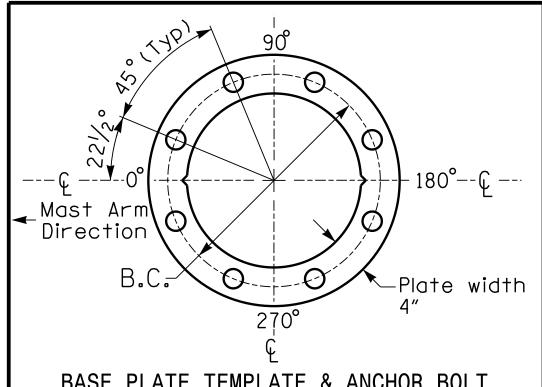


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

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METAL POLE No. 1,2

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
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 . 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

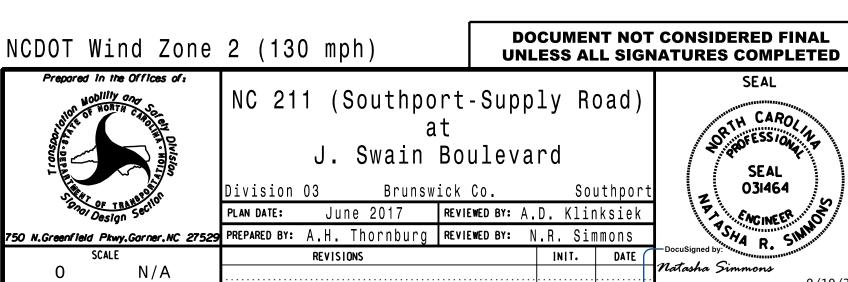
- 1. Design the traffic signal structure and foundation in accordance with:
- The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
- The 2018 NCDOT "Standard Specifications for Roads 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

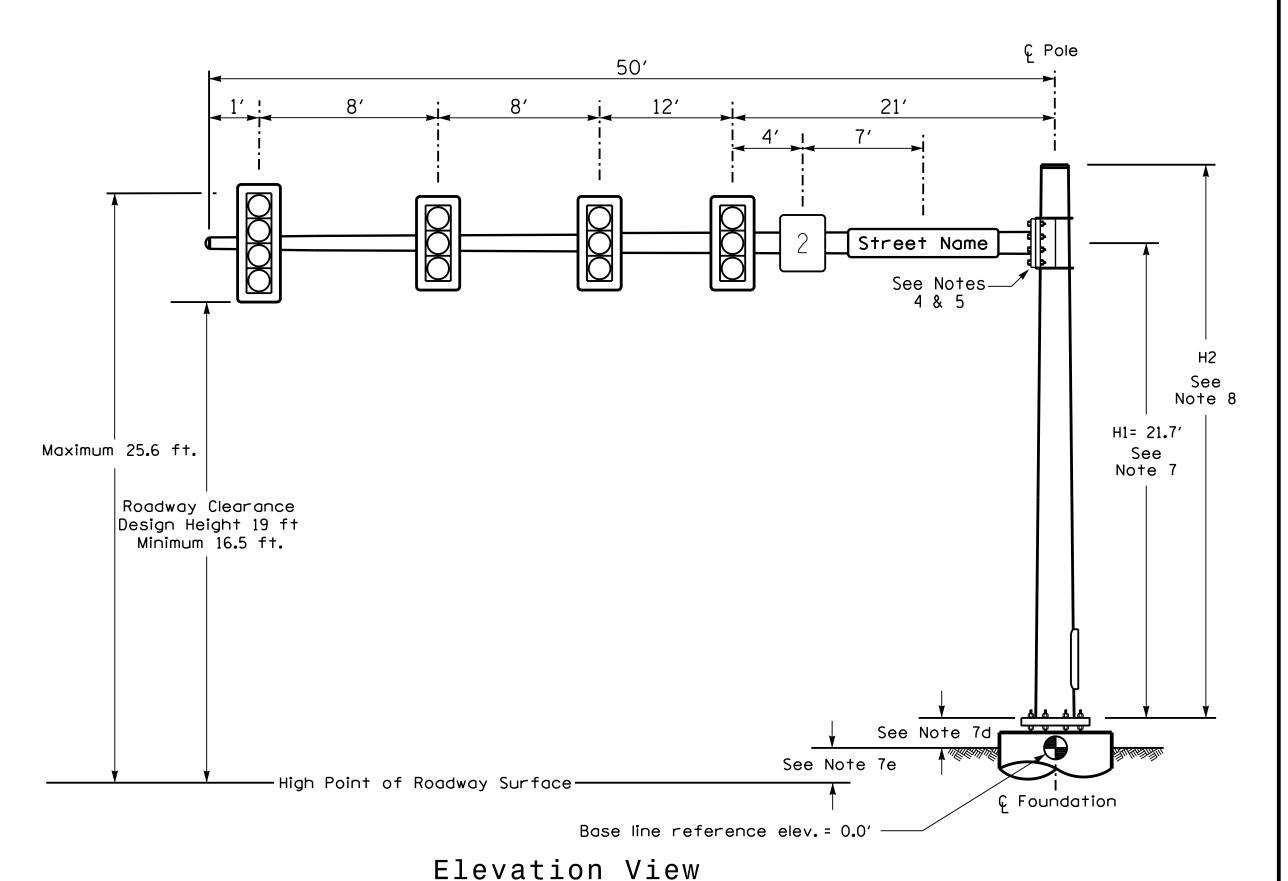
N/A

- 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 soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.



SIG. INVENTORY NO.

Design Loading for METAL POLE NO. 4

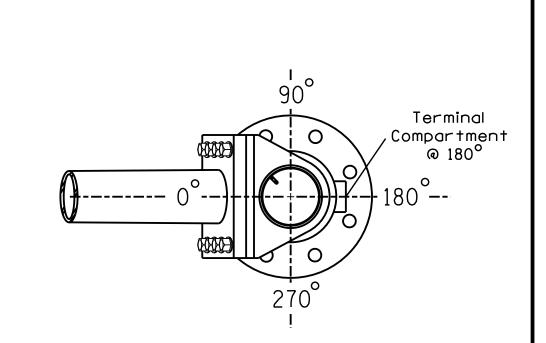


SPECIAL NOTE

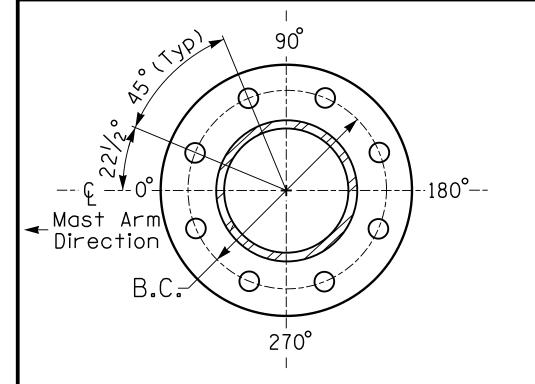
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

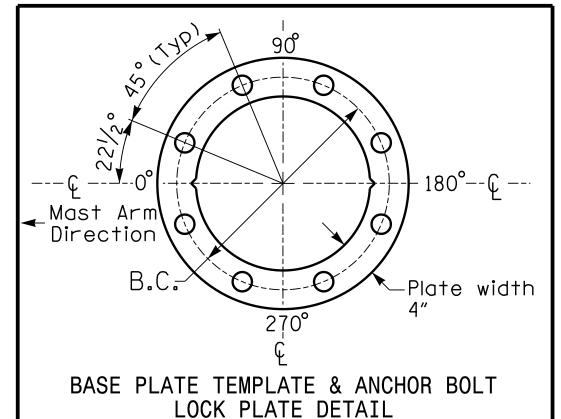
Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at © Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.96 ft.	+0.70 ft.
Elevation difference at Edge of travelway or face of curb	-0.61 ft.	-0.27 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL See Note 6



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. 3,4

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
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 . 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

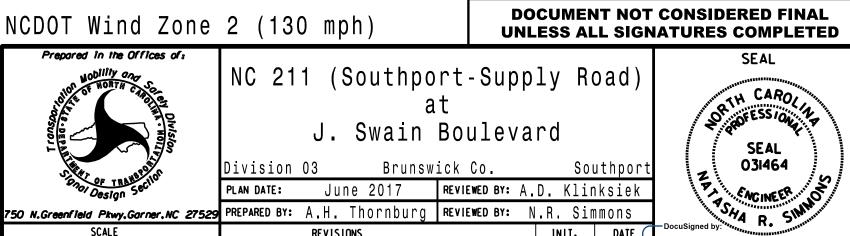
- 1. Design the traffic signal structure and foundation in accordance with:
- The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
- The 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
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- The traffic signal project plans and special provisions.
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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

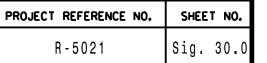
N/A

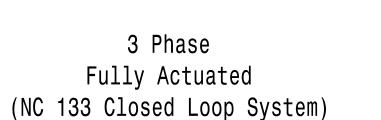
- Hi plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- 9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section 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.



INIT. DATE REVISIONS

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.

INDUCTIVE LOOPS DETECTOR PROGRAMMING SIZE FROM STOPBAR 6X6 300 6X40 0 * |***|** 4 |Y|Y|-***15 - Y 6X40 6X6 | 300 | * |* | 6 | Y | Y |

* Multizone Microwave Detection.

LOOP

4A

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

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

	5:	12" Y 12" Y 12" 43	12"			
		RIM Dosher Cut Off A5 MPH 0% Gr				
NC 211 (Southport-Supply Road)	Wood Pole — Sta. 380+69 +/ LREV- 80' +/- Lt	Grade (5B)	Wood Pol Sta. 381 68' +/- I	+82 +/LREV-		R/W
		62 61 (5A)	51	<u>₹</u>	■ (6A)	
45 MPH +2% Grade		43 T B 42	41 A	NC 211 (Southport-Supply Roa	ad)	——— R/W

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62

SIGNAL FACE I.D.

All Heads L.E.D.

PHASE

RGRY

LEGEND

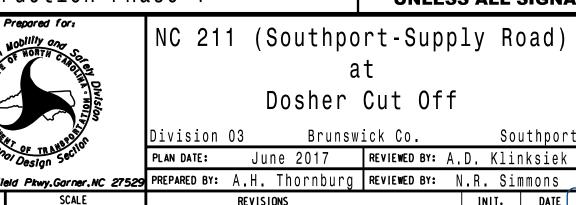
PROPOSED <u>EXISTING</u> \bigcirc Traffic Signal Head Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy r×3 L×3 Controller & Cabinet Junction Box 2-in Underground Conduit Right of Way \longrightarrow Directional Arrow Microwave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

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

Signal Upgrade Temporary Design 1 Construction Phase 1

UNLESS ALL SIGNATURES COMPLETED

DOCUMENT NOT CONSIDERED FINAL



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

These values may be	field adjusted	d. Do not adjust	Min Green and	Extension times
hases 2 and 6 lower	than what is	shown. Min Gre	en for all other p	hases should no
ohases 2 and 6 lower ower than 4 seconds.	than what is	shown. Min Gre	en tor all other p	hases should no

OASIS 2070 TIMING CHART

2.0

30

3.0

2.9

2.0

12

6.0

90

4.7

1.5

2.0

2.5

20 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

Simultaneous Gap

Minimum Gap

Recall Mode

Dual Entry

Yellow Clearance

PHASE

2.0

20

3.0

1.9

2.0

ON

12

6.0

90

4.7

1.5

2.0

-

-

2.5

34

20

30

3.0

MIN RECALL

YELLOW

-

ON

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

→---- PEDESTRIAN MOVEMENT

02+6

R/W ———

ALTERNATE PHASING DIAGRAM

02+6

____ R/W ----Wood Pole — Sta. 380+68 +/- -LREV-58' +/- Rt

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

51

61,62

PHASE

63′ +/- Rt

Sta. 381+66 +/- -LREV-

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

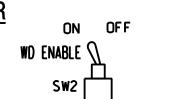
─ Wood Pole

TH CAROL 031464 . CACINEER

SIG. INVENTORY NO. 03-0267T

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.

REMOVE JUMPERS AS SHOWN

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

of any jumper allows its channels to run concurrently.

-RF 2010 -RP DISABLE ₩D 1.0 SEC -GY ENABLE SF#1 POLARITY ⊢LEDguard RF SSM ———FYA 1-9 FYA 3-10 FYA 5-11 FYA 7-12 ----

DENOTES POSITION

OF SWITCH

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

CABINET MOUNT.....BASE

LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4,AUX S5

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

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

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.

NU = Not Used

<u>NOTE</u>

130

CMU CHANNEL

YELLOW

GREEN

RED ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

GREEN ARROW

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

OLC RED (A114) -

OLC YELLOW (A115) -

OLC GREEN (A116) -

05 GREEN (133) -

The sequence display for signal head 51 requires special

logic programming. See sheet 2 for programming instructions.

DESIGNED: June 2017

SEALED: 9/10/2021

REVISED: N/A

THIS ELECTRICAL DETAIL IS FOR

THE SIGNAL DESIGN: 03-0267T1

SIGNAL HEAD HOOK-UP CHART

***** 135

136

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

★ See pictorial of head wiring in detail this sheet.

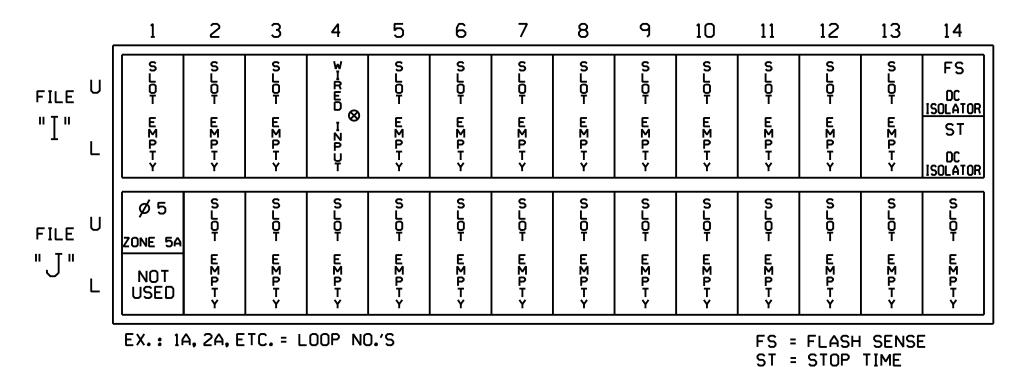
102

SOFTWAREECONOLITE OASIS OUTPUT FILE POSITIONS..18 WITH AUX. OUTPUT FILE

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

INPUT FILE POSITION LAYOUT

(front view)



[⊗] 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
Z	ONE	5A ¹	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3	
			-	J1U	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.

750 N.Greenfield Pkwy.Garner.NC 27529

Temporary Design 1

ELECTRICAL AND PROGRAMMING

Signal Upgrade

| Electrical Detail - Sheet 1 of 4

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

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

TH CARO, 031464

SIG. INVENTORY NO. 03-0267T1

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.

8 OLA OLB SPARE OLC OLD SPARE

A114

A115 A102

A103

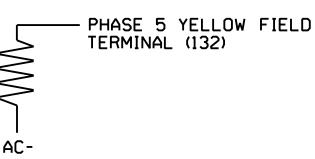
Sig. 30

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)

NOTES:

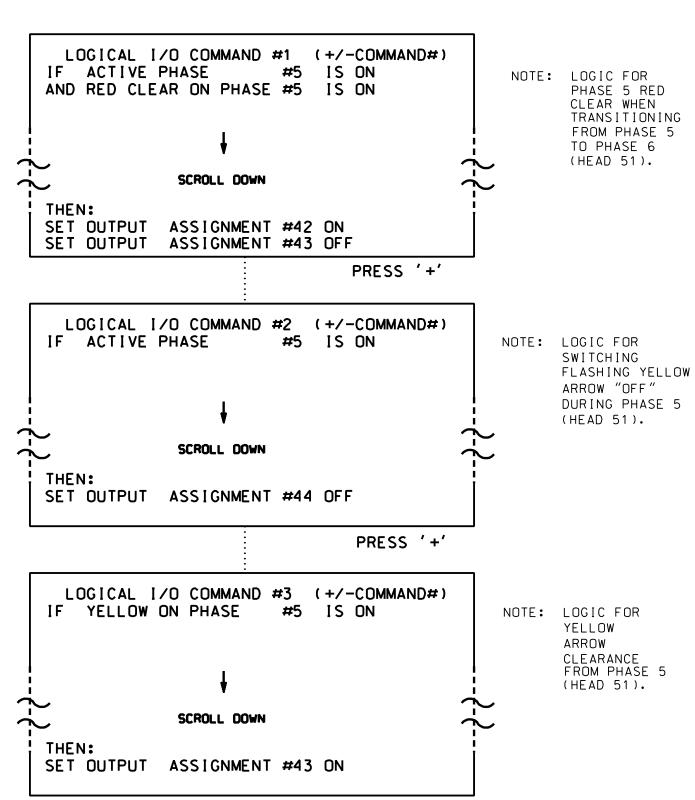


PROJECT REFERENCE NO. R-5021 Sig. 30.

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

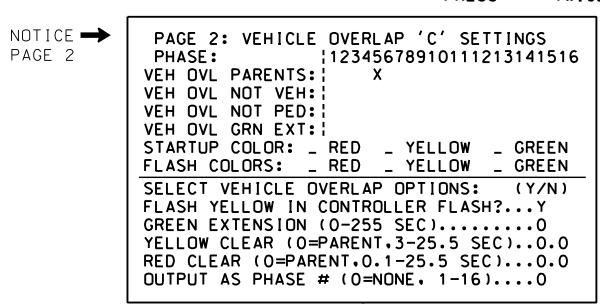
OVERLAP PROGRAMMING COMPLETE

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



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

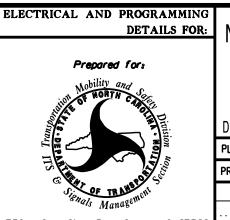
Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

PAGE 2

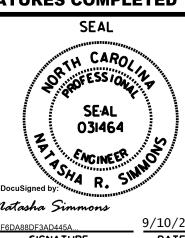
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Southport



Temporary Design 1

DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off)ivision 03 Brunswick Co. June 2017 REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons REVISIONS



SIG. INVENTORY NO. 03-0267T1

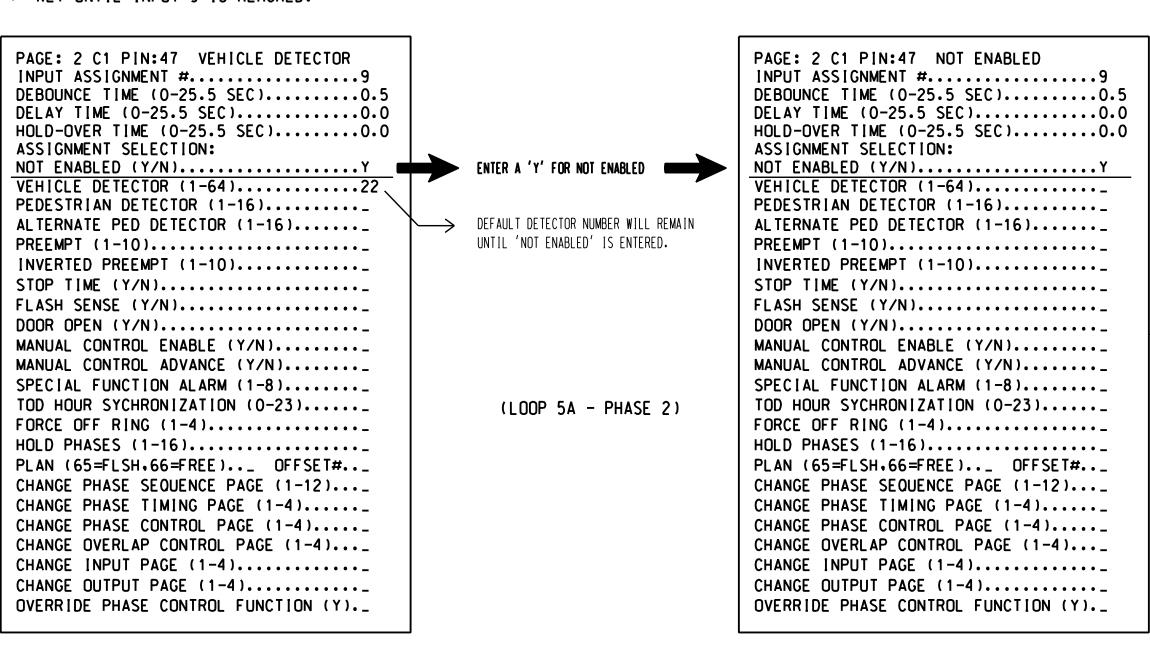
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(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.



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)...

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR

DELAY TIME (0-25.5 SEC).............

HOLD-OVER TIME (0-25.5 SEC)......0.0

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)..... (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. 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) ENABLE DETECTOR	ENTER 'Y' FOR ENABLE DETECTOR	VEHICLE DETECTOR #55 SETTINGS (+1-64) SETTING: (Y/N) ENABLE DETECTOR
IF FAILED, SET MAX1 RECALL?N IF FAILED, SET MAX2 RECALL?N PHASE# 12345678910111213141516 PHASES ASSIGNED SWITCH/DUPLICATE LOOP SIZE (0-255 FT)	ENSURE DELAY IS '3'	IF FAILED. SET MAX1 RECALL?
OUEUE MAX OCCUPANCY TIME (0-255)0 OUEUE GAP RESET TIME (0-25.5)0.0 PREEMPTION INDEX FOR QUEUE (0-10)0		QUEUE MAX OCCUPANCY TIME (0-255)0 QUEUE GAP RESET TIME (0-25.5)0.0 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

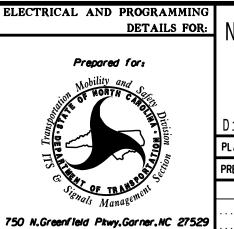
Electrical Detail - Sheet 3 of 4 Signal Upgrade Temporary Design 1

ENTER '55' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

Division 03 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. 03-0267T

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



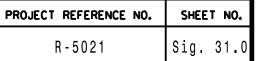
DETAILS FOR: NC 211 (Southport-Supply Road) Dosher Cut Off

Southport June 2017 REVIEWED BY: A.D. Klinksiek REVISIONS INIT. DATE

031464 SIG. INVENTORY NO. 03-0267T1

H CARO

Division 03 Brunswick Co. PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons 02+6



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.
- 4. Reposition existing signal heads numbered 21,22,51,61 and 62.
- 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
- Controller Asset #: 0267.

LEGEND

PROPOSED <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 Controller & Cabinet Junction Box ----- 2-in Underground Conduit

> Directional Arrow Microwave Detection Zone

Right Arrow "ONLY" Sign (R3-5R) 🔘

DOCUMENT NOT CONSIDERED FINAL

NC 211 (Southport-Supply Road) Dosher Cut Off

Division 03 Brunswick Co. June 2017

Signal Upgrade

Temporary Design 2

Construction Phase 1a

TH CARO 031464

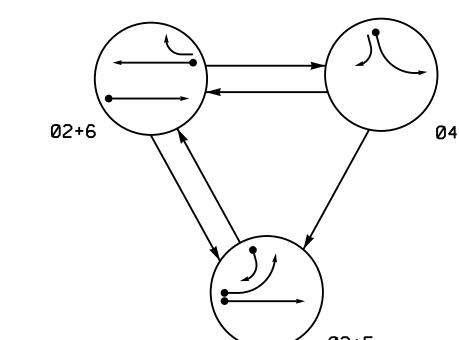
SIG. INVENTORY NO. 03-0267T2

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N/A

Southpor

DEFAULT PHAS	SING DIAGRAM	ALTERNATE	PHASING DIAGRAM

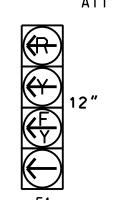


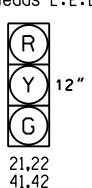
DEFAULT TABLE OF				١				
	Phase							
SIGNAL FACE	0 2 + 5	00 + 6	04	止しなのエ				
21,22	G	G	R	Υ				
41,42	R	R	G	R				
43	<u> </u>	R	<u></u>	R				
51	<u> </u>	щ <mark>≻</mark>	#	- ¥				
61,62	R	Ġ	R	Υ				

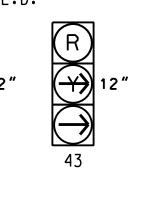
ALTERNATE TABLE OF					
		PHA	4SE		
SIGNAL FACE	02+5	Ø2+6	0	エヘひこ	
21,22	G	G	R	Υ	
41,42	R	R	G	R	
43	\rightarrow	R	1	R	
51	—	₩	₩	≺	
61,62	R	O	R	Υ	

SIGNAL FACE I.D.

All Heads L.E.D.







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

NC 211 (Southport-Supply Road)

45 MPH +2% Grade

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 *

PHASE

ON

ON

OASIS 2070 TIMING CHART

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

◆---- PEDESTRIAN MOVEMENT

20 20 Time Before Reduction 30 30 Time To Reduce * Minimum Gap 3.0 3.0 MIN RECALL MIN RECALL Recall Mode Vehicle Call Memory YELLOW YELLOW 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

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

6X6 300 6X40 0 4·A * |***|** 4 |Y|Y|-***15 6X40 6X6 | 300 | * |*| 6 | Y | Y | * Multizone Microwave Detection. phasing operation.

45 MPH -2% Grade

NC 211 (Southport-Supply Road)

INDUCTIVE LOOPS

FROM STOPBAR

SIZE

** Disable phase 2 call for 5A during alternate

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

DETECTOR PROGRAMMING

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

3. Phase 5 may be lagged.

5. Set all detector units to

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:

 \bigcirc

Right of Way

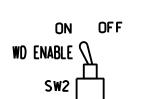
Construction Zone Left Arrow "ONLY" Sign (R3-5L)

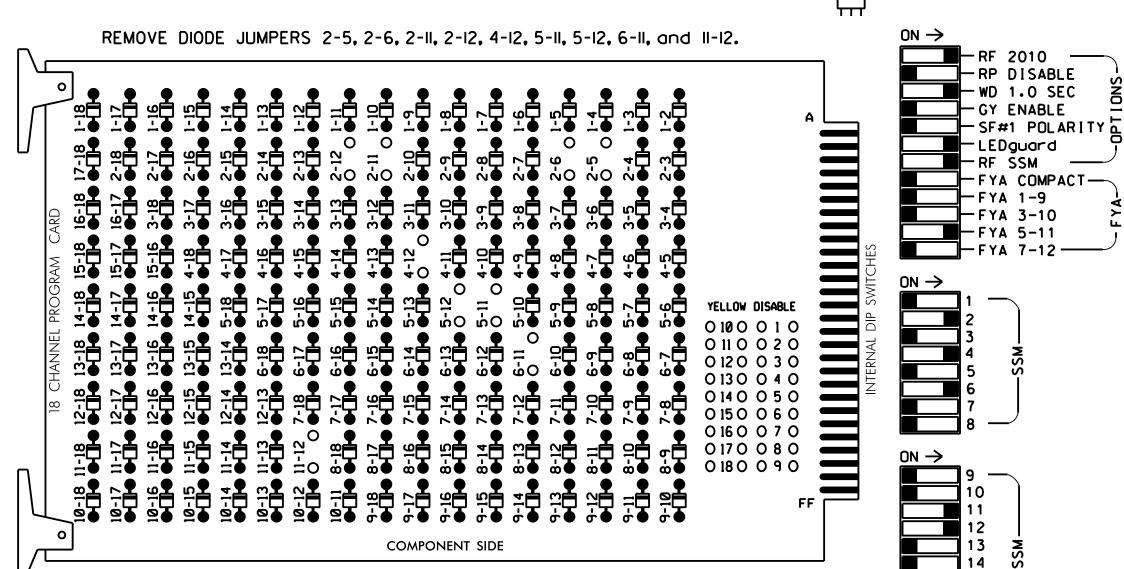
UNLESS ALL SIGNATURES COMPLETED

REVIEWED BY: A.D. Klinksiek 750 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

(remove jumpers and set switches 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.

REMOVE JUMPERS AS SHOWN

- 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)

[⊗] 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

SOFTWAREECONOLITE 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

DENOTES POSITION

OF SWITCH

ST

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

PROJECT REFERENCE NO. Sig. 31

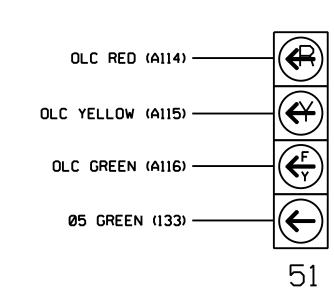
	SIGNAL HEAD HOOK-UP CHART																	
LOAD SWITCH NO.	Sl	S2	S3	S4	S 5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22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

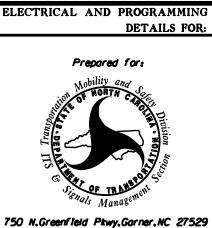
> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

| Electrical Detail - Sheet 1 of 4

Temporary Design 2

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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

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

REVISIONS INIT. DATE

TH CARO 031464

SIG. INVENTORY NO. 03-0267T2

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			
	ZONE 5A	5A ¹	**	JlU	55	17	5	5	Y	Y			15			
			5A ¹	5A ¹	NE 5A ¹	•	I4U	47	9 ★	22	2	Y	Y	Y		3
L					-	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

AC-

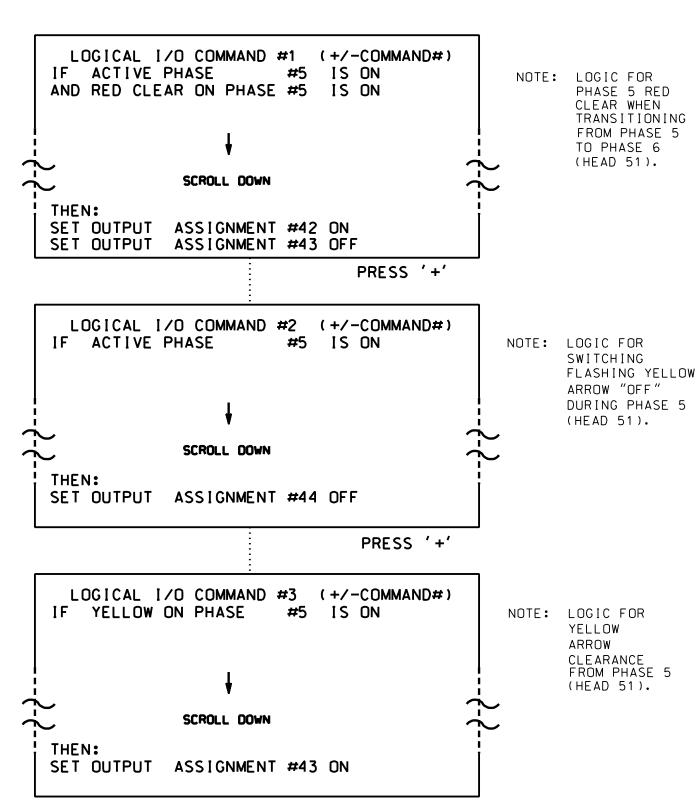
PHASE 5 YELLOW FIELD TERMINAL (132)

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: 1 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

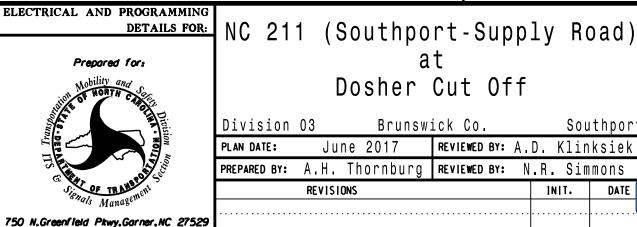
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 4 Signal Upgrade

PAGE 2

PAGE 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Temporary Design 2

PLAN DATE:

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



SIG. INVENTORY NO. 03-0267T2

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

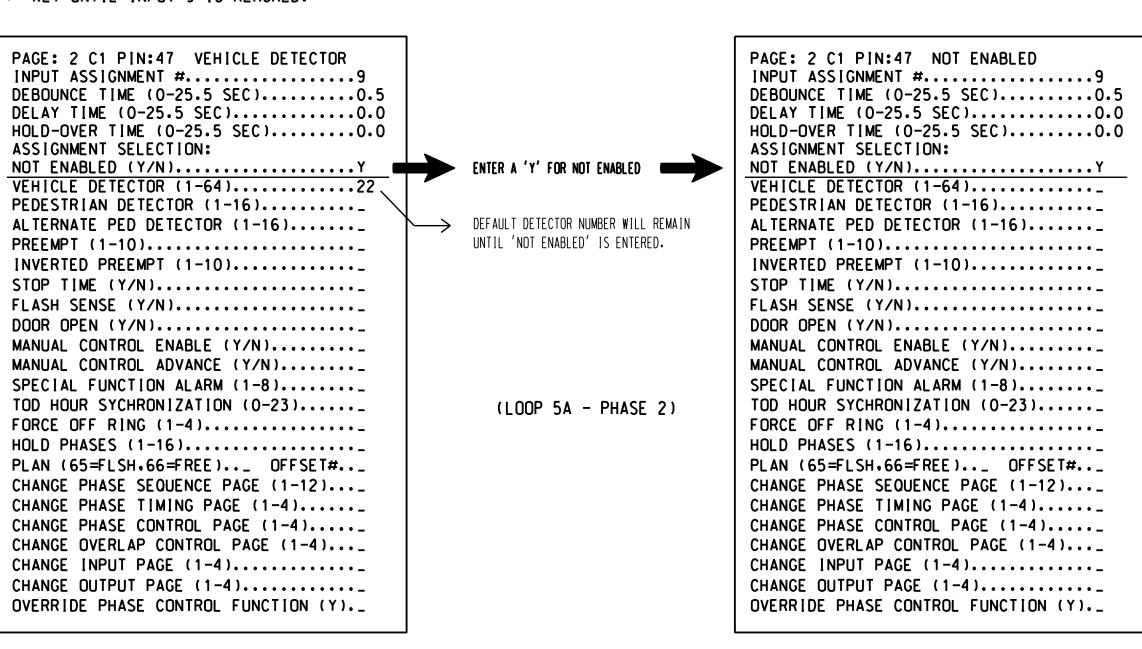
(program controller as shown below)

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

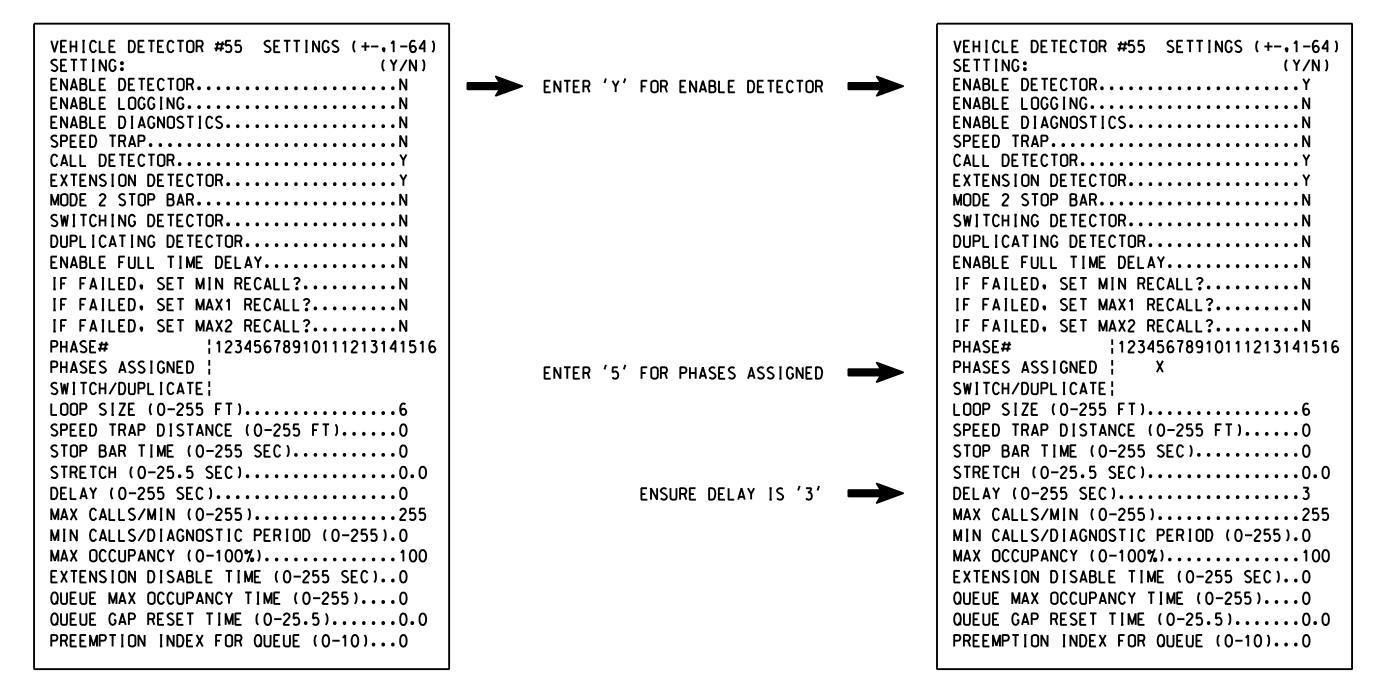
Sig. 31

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.



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

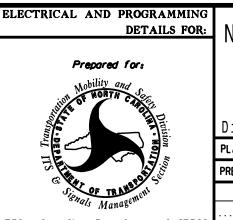
ENTER '55' TO REASSIGN

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)

at

Dosher Cut Off

DUSTIET GUL OTT

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

SEAL 031464

Docusigned by:

Natasha Simmons

PAROLINEER 9/10

| Docusigned by: | Docusion | Doc

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:

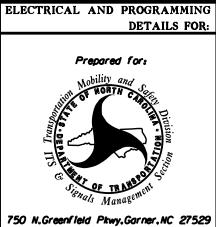
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DETAILS FOR: NC 211 (Southport-Supply Road)

at

Dosher Cut Off

DUSTIET CUL UIT

Division 03 Brunswick Co. Southport

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

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

Cocusigned by:

Natasha Simmons

F6DA88DF3AD445A...

SIGNATURE

031464

R. SIMMINION

9/10

D.

H CARO

PROJECT REFERENCE NO. R-5021 Sig. 32.

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.

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	-	-	-	-	1
4A	6X40	0	*	*	4	Υ	Υ	-	-	3	-	ı
5 _' A	6X:40	0	*	*	5	Υ	Υ	-	-	*** 15	ı	-
JA	0240		*	不	** 2	Y	Υ	Υ	-	3	ı	-
5B	6X40	0	*	*	5	Υ	Υ	-	-	15	ı	1
6·A	6X6	300	*	*	6	Υ	Υ	-	1	-	ı	-
⊬ Mult (* Dis		_		_			_		ring	alte	rn	at

DETECTOR PROGRAMMING

INDUCTIVE LOOPS

** Disable pha phasing operation.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

		12"	
	RIW Dosher Cut Off A5 MPH 0% Grade		
NC 211 (Southport-Supply Road)		51 21 22	45 MPH -2% Grade NC 211 (Southport-Supply Road)
		(Ma)	

OASIS	2070	TIMING	CHAR1	-
		PHA	\SE	
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	2.9	1.9	1.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	ī
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
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-

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.

Simultaneous Gap

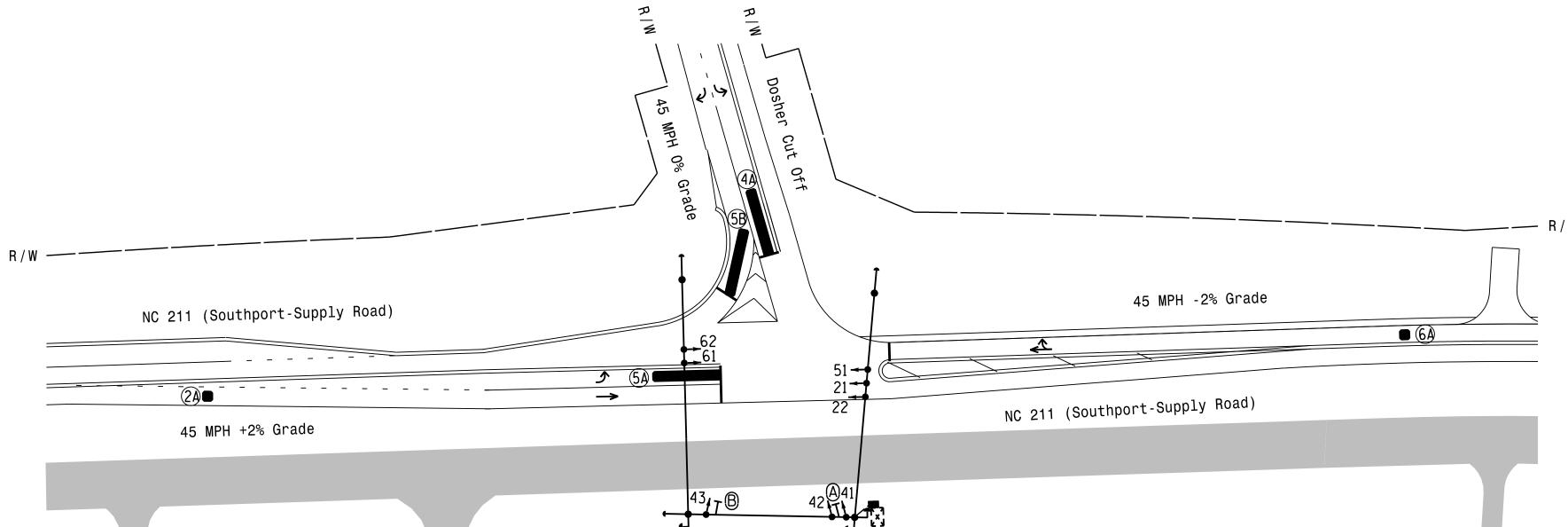
ON

Signal Upgrade Temporary Design 3 Construction Phase 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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) TH CARO Dosher Cut Off 031464 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



ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62

SIGNAL FACE I.D.

All Heads L.E.D.

(R)

PHASE

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

51

61,62

PHASE

ALTERNATE PHASING DIAGRAM

02+6

Pedestrian Signal Head With Push Button & Sign

PROPOSED

 \bigcirc

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

LEGEND

Traffic Signal Head Modified Signal Head <u>EXISTING</u>

N/A

 \longrightarrow

N/A

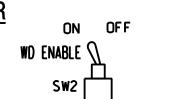
SIG. INVENTORY NO. 03-0267T3

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

Construction Zone

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



RF 2010

- LEDguard ⊢RF SSM

DENOTES POSITION

OF SWITCH

-RP DISABLE - WD 1.0 SEC -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.

───────FYA COMPACT── — FYA 1-9 FYA 3-10 FYA 5-11 FYA 7-12 ----

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

SOFTWAREECONOLITE 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

Sig. 32

PROJECT REFERENCE NO.

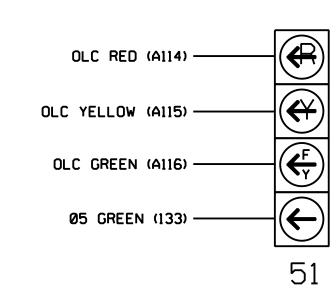
				SI	GNA	L	ΗEA	D ł	100	K-l	JP	CHA	٩RT					
LOAD SWITCH NO.	Sl	S2	S 3	S4	S5	S6	S7	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,	NU	★	61,62	NU	NU	NU	NU	NU	NU	NU	5 1	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: 03-0267T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 4

Signal Upgrade Temporary Design 3

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

Dosher Cut Off

Division 03 Brunswick Co. June 2017

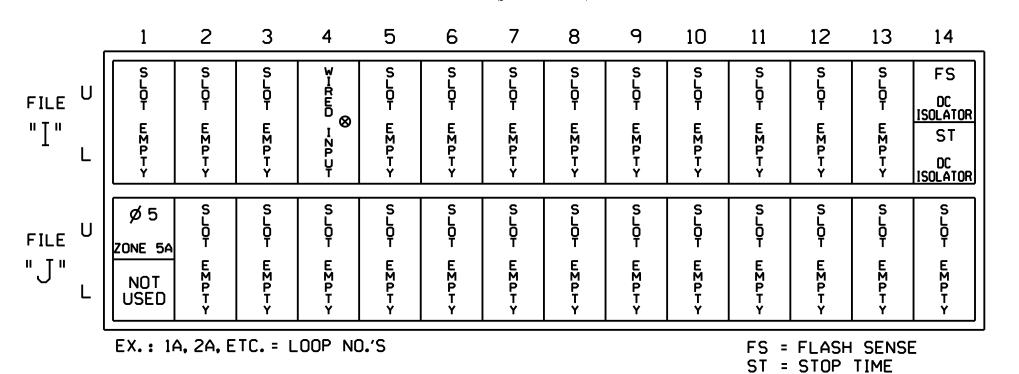
Southport REVIEWED BY: A.D. Klinksiek PLAN DATE: PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS INIT. DATE

TH CARO, 031464

SIG. INVENTORY NO. 03-0267T3

INPUT FILE POSITION LAYOUT

(front view)



[⊗] 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
	**	JlU	55	17	5	5	Y	Υ			15
ZONE 5A1	-	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 (m10)

PHASE 5 YELLOW FIELD TERMINAL (132) AC-

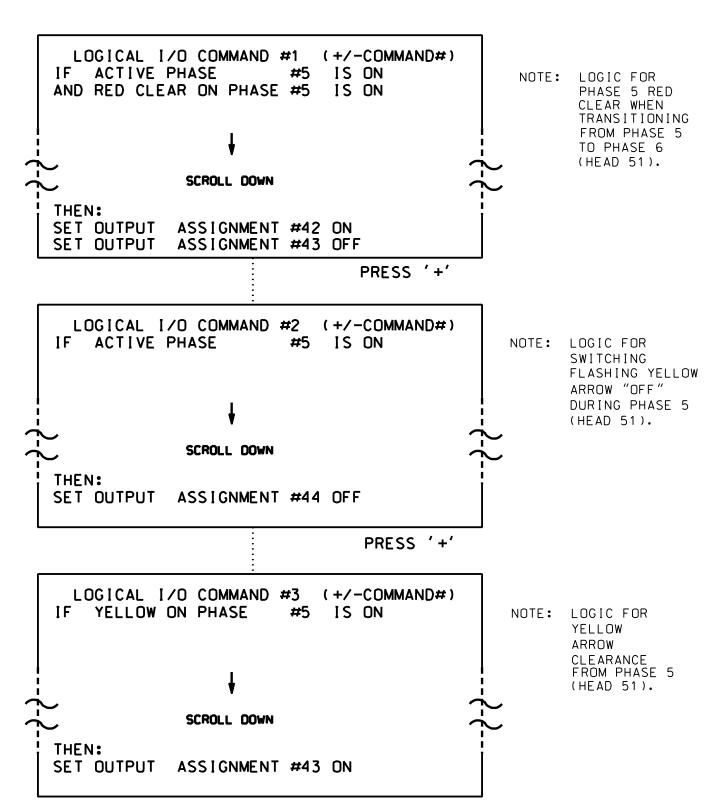
750 N.Greenfield Pkwy.Garner.NC 27529

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 (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 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

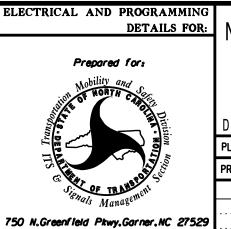
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T3 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

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

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

TH CARO, 031464 Southport

SIG. INVENTORY NO. 03-0267T3

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

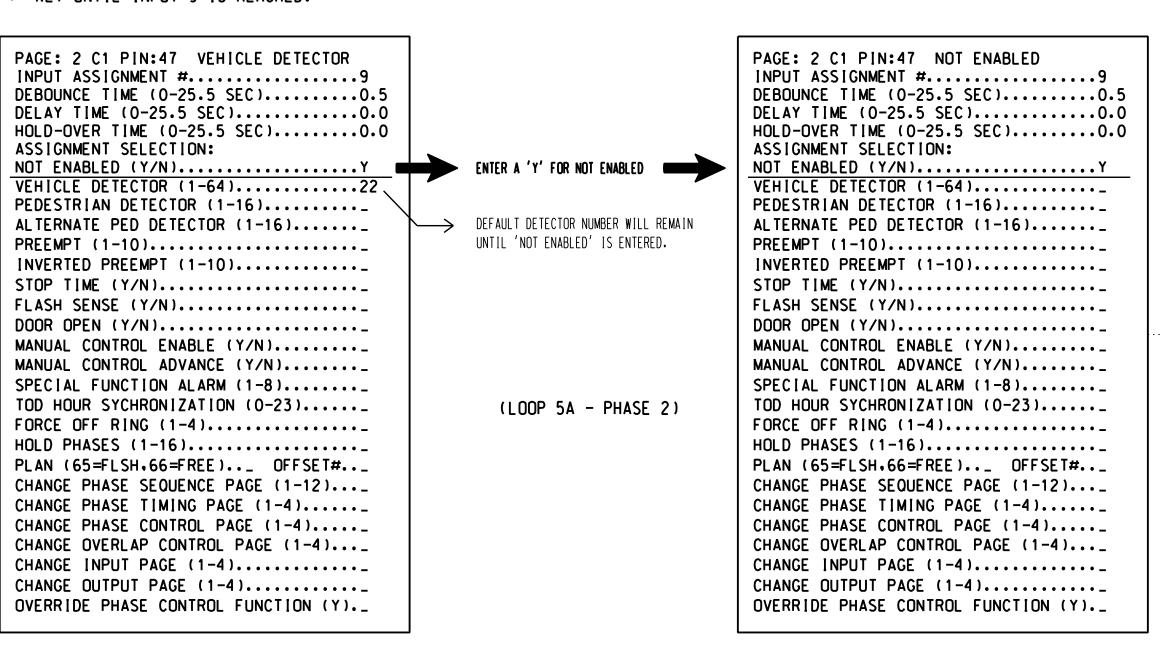
(program controller as shown below)

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.



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. 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.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64)		VEHICLE DETECTOR #55 SETTINGS (+1-64)
SETTING: (Y/N)		SETTING: (Y/N)
ENABLE DETECTORN	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 DETECTOR		SWITCHING DETECTORN
DUPLICATING DETECTORN		DUPLICATING DETECTORN
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?N		IF FAILED, SET MAX2 RECALL?
PHASE# \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		PHASE# \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
PHASES ASSIGNED !	ENTED 'E' FOR DUACEC ACCIONED	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)0.0		STRETCH (0-25.5 SEC)0.0
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		QUEUE GAP RESET TIME (0-25.5)0.0
PREEMPTION INDEX FOR QUEUE (0-10)0		PREEMPTION INDEX FOR QUEUE (0-10)0
122 1.3 1.3 13 33 13 13 13		

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

Prepared for:

Prepared for:

Prepared for:

Prepared for:

PL

PR

PR

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

DOSHEL CUL OIT

Division 03 Brunswick Co. Southport

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

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

TH CARO,

R-5021 Sig. 32.4

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.

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)

a for:

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

Docusigned by:

Matasha Simmons

FEDABBDF3AD445A...

SIGNATURE

SIG. INVENTORY NO. 03-0267T3

H CARO

031464

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.
- presence mode.
- 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.
- Controller Asset #: 0267.

PROPOSED

 \bigcirc

5. Set all detector units to 6. Incorporate Microwave Detection

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

Directional Drill

Construction Zone

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

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

"RIGHT TURN MUST YIELD TO U-TURN" Sign

Construction Barricade

Microwave Detection Zone

<u>EXISTING</u>

N/A

K×N K×N

 \longrightarrow

N/A

N/A

N/A

 \bigcirc

9. Closed loop system data:

INDUCTIVE LOOPS DETECTOR PROGRAMMING SIZE FROM LOOP STOPBAR 6X6 300 6X40 0 4A * |*| 4 |Y|Y|-***15 6X40 6X6 | 300 | * |* | 6 | Y | Y |

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

45 MPH -2% Grade NC 211 (Southport-Supply Road) **■**(6A) 51**~** 21 -22 -

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

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 *	-	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

ALTERNATE PHASING DIAGRAM

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

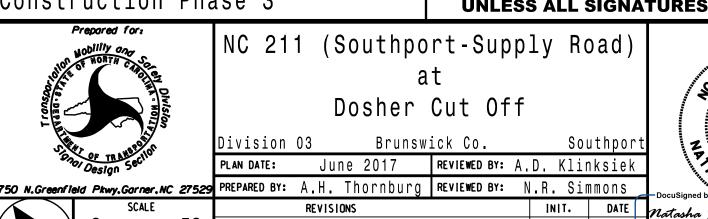
Vehicle Call Memory

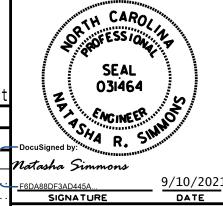
Simultaneous Gap

Dual Entry

Signal Upgrade Temporary Design 4 Construction Phase 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





SIG. INVENTORY NO. 03-0267T

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

41,42 41,42 61,62 61,62 RGRY SIGNAL FACE I.D. All Heads L.E.D. phasing operation. R Y 12" 21,22 41,42 61,62 12"

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

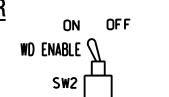
21,22

PHASE

NC 211 (Southport-Supply Road) 45 MPH +2% Grade

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



−RF 2010

- LEDguard ⊢RF SSM

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

───────FYA COMPACT── FYA 1-9

DENOTES POSITION

OF SWITCH

-RP DISABLE ₩D 1.0 SEC -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.

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

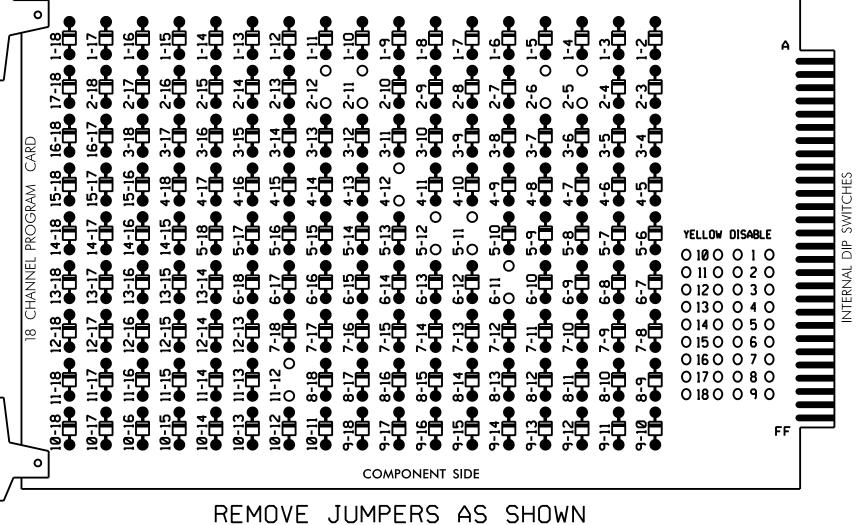
of any jumper allows its channels to run concurrently.

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



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

SOFTWAREECONOLITE 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. Sig. 33

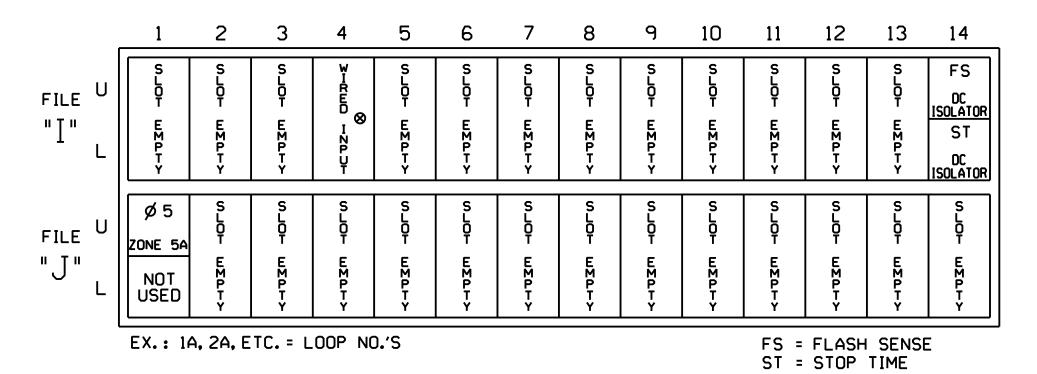
				SI	GNA	LH	HEA	D F	100	K-l	JP	CHA	\RT					
LOAD SWITCH NO.	Sl	S2	S 3	S4	S 5	S6	S 7	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	★ 51	61,62	NU	NU	NU	NU	NU	NU	NU	5 1	★ 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	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.

(front view)

INPUT FILE POSITION LAYOUT



[⊗] Wired Input - Do not populate slot with detector card

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
	**	JlU	55	17	5	5	Y	Υ			15
ZONE 5A1	-	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

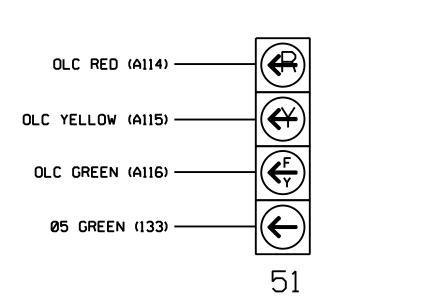
SPECIAL DETECTOR NOTE

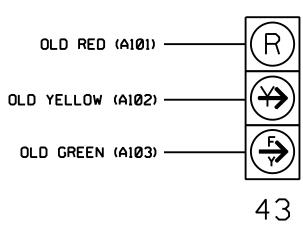
Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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

(wire signal heads as shown)





<u>NOTE</u>

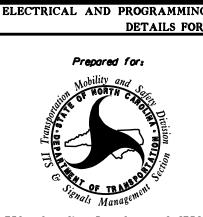
The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0267T4 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



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

031464 SIG. INVENTORY NO. 03-0267T4

TH CARO,

LOAD RESISTOR INSTALLATION DETAIL (install resistor as shown)

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

NOTES:

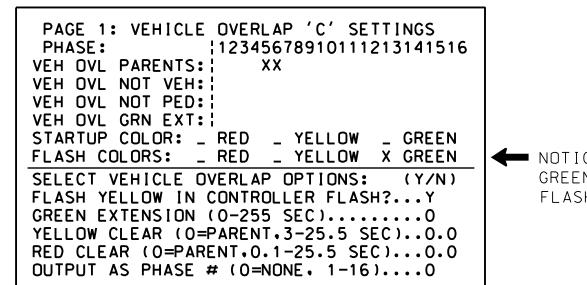
PHASE 5 YELLOW FIELD TERMINAL (132) AC-

PROJECT REFERENCE NO. R-5021 Sig 33

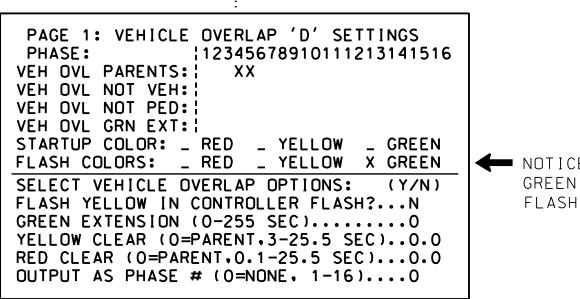
OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN



PRESS '+'



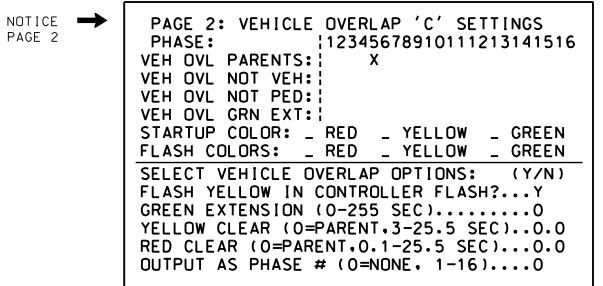
OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

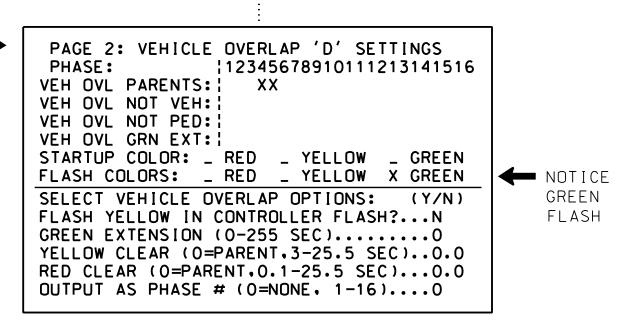
(program controller as shown below)

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

PRESS '+' TWICE



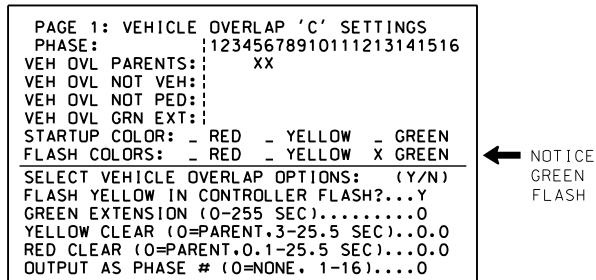
PRESS '+'

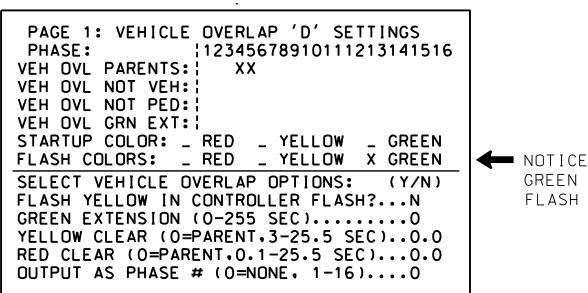


OVERLAP PROGRAMMING COMPLETE

'1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE





OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)

LOGICAL I/O COMMAND #2 (+/-COMMAND#)

LOGICAL I/O COMMAND #3 (+/-COMMAND#)

AND RED CLEAR ON PHASE #5 IS ON

SCROLL DOWN

SCROLL DOWN

SET OUTPUT ASSIGNMENT #44 OFF

IF YELLOW ON PHASE #5 IS ON

SET OUTPUT ASSIGNMENT #43 ON

SET OUTPUT ASSIGNMENT #42 ON

SET OUTPUT ASSIGNMENT #43 OFF

#5 IS ON

#5 IS ON

PRESS '+'

PRESS '+'

NOTE: LOGIC FOR

NOTE: LOGIC FOR

NOTE: LOGIC FOR YELLOW ARROW

> CLEARANCE FROM PHASE 5 (HEAD 51).

SWITCHING

ARROW "OFF"

(HEAD 51).

FLASHING YELLOW

DURING PHASE 5

PHASE 5 RED

CLEAR WHEN

TRANSITIONING

FROM PHASE 5 TO PHASE 6

(HEAD 51).

ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

IF ACTIVE PHASE

IF ACTIVE PHASE

PROCESSOR).

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

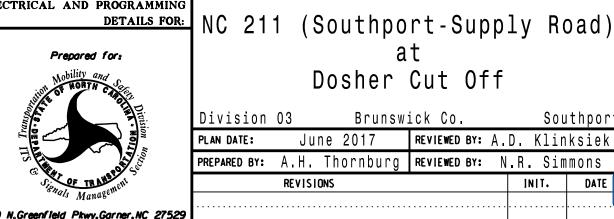
OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

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

Signal Upgrade Temporary Design 4 ELECTRICAL AND PROGRAMMING

PAGE 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Electrical Detail - Sheet 2 of 4

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

REVISIONS

TH CARO 031464

SIG. INVENTORY NO. 03-0267T4

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

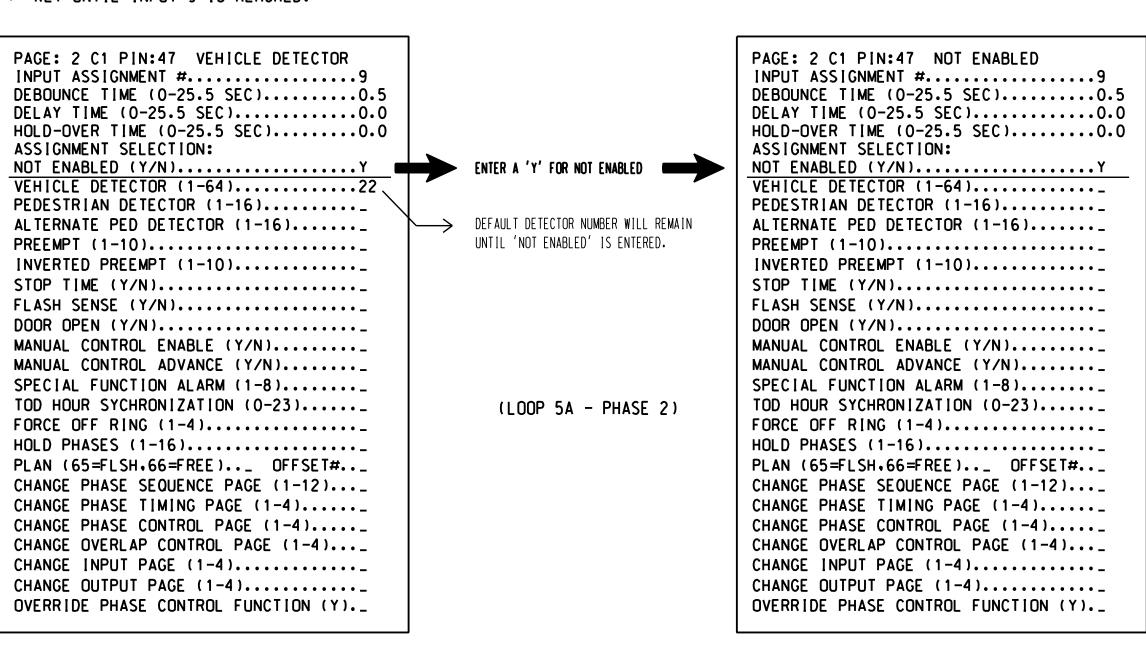
(program controller as shown below)

NOTES: 1. THIS PROGRAMMING APPLIES <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.



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).... 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 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.

VEHICLE DETECTOR #55 SETTINGS (+-,1-64) SETTING: (Y/N) ENABLE DETECTOR. N ENABLE DETECTOR. N ENABLE DIAGNOSTICS. N SPEED TRAP
DUPLICATING DETECTOR
ENABLE FULL TIME DELAYN IF FAILED, SET MIN RECALL?N IF FAILED, SET MAX1 RECALL?N IF FAILED, SET MAX2 RECALL?N PHASE# 12345678910111213141516 PHASES ASSIGNED ENTER '5' FOR PHASES ASSIGNED
IF FAILED, SET MIN RECALL?N IF FAILED, SET MAX1 RECALL?N IF FAILED, SET MAX2 RECALL?N PHASE# 12345678910111213141516 PHASES ASSIGNED ENTER '5' FOR PHASES ASSIGNED PHASES ASSIGNED PHASES ASSIGNED Y
IF FAILED, SET MAX1 RECALL?N IF FAILED, SET MAX2 RECALL?N PHASE# 12345678910111213141516 PHASES ASSIGNED ENTER '5' FOR PHASES ASSIGNED PHASES ASSIGNED PHASES ASSIGNED X
IF FAILED, SET MAX2 RECALL?N PHASE#
PHASE# 12345678910111213141516
PHASES ASSIGNED ENTER '5' FOR PHASES ASSIGNED PHASES ASSIGNED X
LIVILIA DI LINI LINALO ASSIGNED
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)
SPEED TRAP DISTANCE (0-255 FT)0 SPEED TRAP DISTANCE (0-255 FT)0
STOP BAR TIME (0-255 SEC)
STRETCH (0-25.5 SEC)
DELAY (0-255 SEC)
MAX CALLS/MIN (0-255)
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)
QUEUE MAX OCCUPANCY TIME (0-255)0 QUEUE MAX OCCUPANCY TIME (0-255)0
QUEUE GAP RESET TIME (0-25.5)0.0
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: 03-0267T4 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

(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

REVISIONS INIT. DATE

SEAL
03I464

Docusigned by:

Natasha Simmons

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SIGNATURE

PATE

P

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REVISIONS

INIT. DATE

Natasha Simmons

F6DA88DF3AD445A... 9/10/20

SIGNATURE DATE

S1G. INVENTORY NO. 03-0267T4

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 <u>DEFAULT PHASIN</u> G	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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

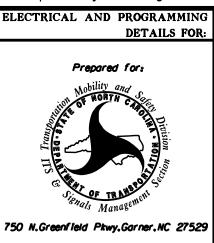
- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

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

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

REVISIONS INIT. DATE

natasha Simmons

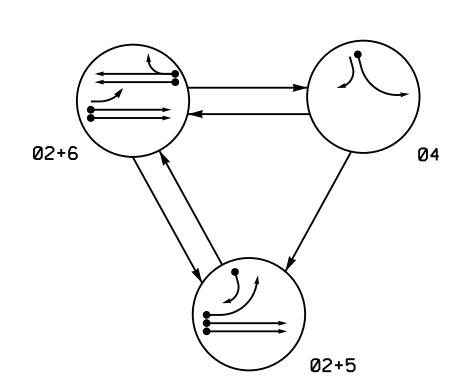
-F6DA88DF3AD445A...
SIGNATURE

S1G. INVENTORY NO. 03-0267T4

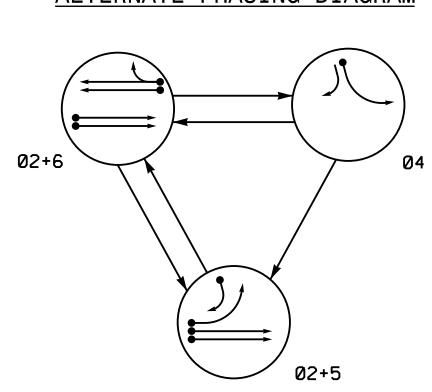
H CARO

031464

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION							
PHASE							
SIGNAL FACE	0 2+5	0 2+6	04	止しなのエ			
21,22	G	G	R	Υ			
41,42	R	R	G	R			
43,44	Ⴡ	R	ᆄ	R			
51	1	F ≻	#	- ¥			
61,62	R	G	R	Y			

OASIS	2070	L00P	& DET	EC	TOR	IN	ST	AL	LATIC	N CH	AR	Τ
II	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	C0 4 C / 1/2 4
2A/S29	6X6	300	4	Υ	2	Υ	Υ	ı	-	ı	Υ	
2B/S30	6X6	300	4	Y	2	Υ	Υ	ı	1	1	Υ	\
4·A	6X40	0	2-4-2	Y	4	Υ	Υ	-	-	3	ı	\
5∕A	6X:40	0	2-4-2	Υ	5	Υ	Υ	-	-	** 15	4	\
JΆ	OPAG	0	2-4-2	_	* ·2	Υ	Υ	Υ	-	3	ı	\
5B	6X40	0	2-4-2	Υ	5	Υ	Υ	-	-	15	ı	\
6A/S31	6X6	300	5	Υ	6	Υ	Υ	-	-	1	Υ	١
6B/S32	6X6	300	5	Υ	6	Υ	Υ	_	-	-	Υ	\
									•			_

* 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

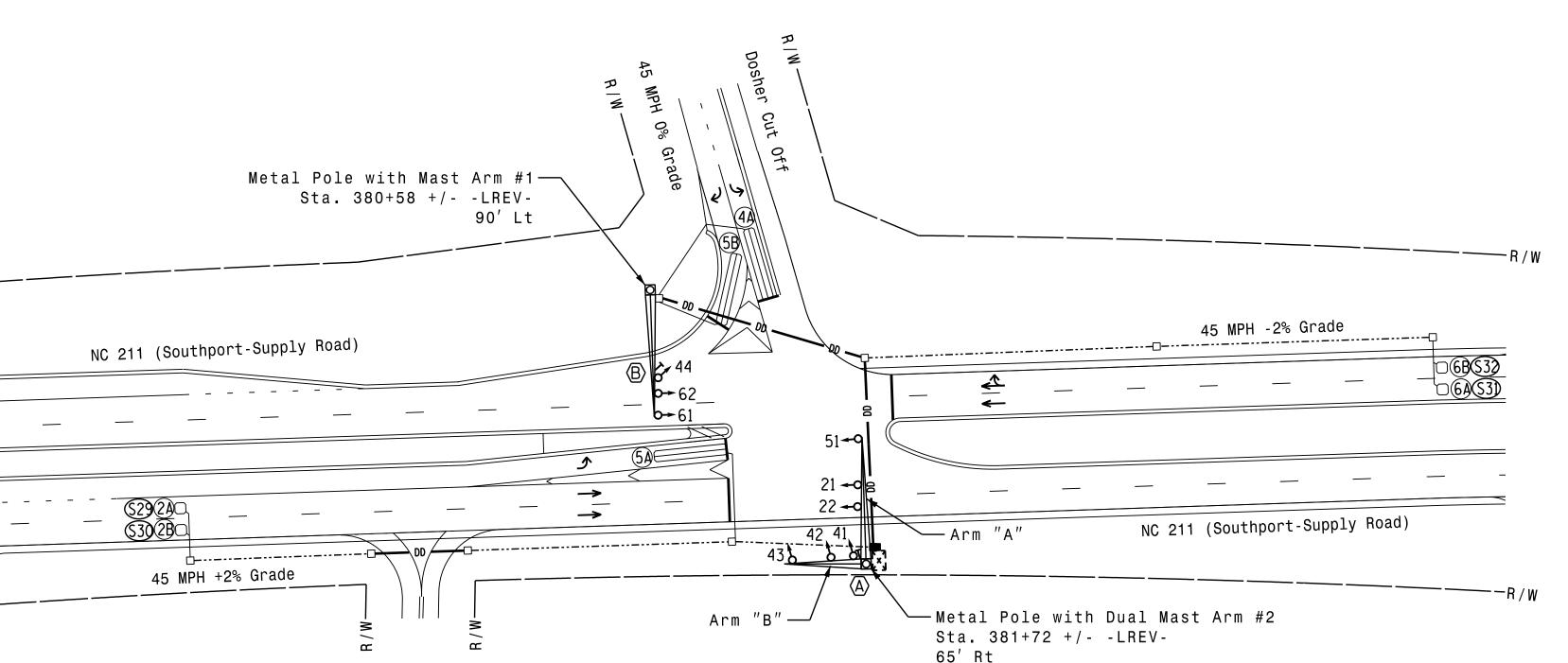
UNDETECTED MOVEMENT (OVERLAP)

UNSIGNALIZED MOVEMENT →---- PEDESTRIAN MOVEMENT

12" 51	R Y 12" 21,22 41,42 61,62	12" 43,44

SIGNAL FACE I.D.

All Heads L.E.D.



ALTERNATE PHASING

TABLE OF OPERATION

FACE

61,62

PHASE

<u>PROPOSED</u>		EXISTING
\bigcirc	Traffic Signal Head	
O	Modified Signal Head	N/A
\dashv	Sign	-
†	Pedestrian Signal Head With Push Button & Sign	#
\bigcirc	Signal Pole with Guy	—)
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
\boxtimes	Controller & Cabinet	K×7
	Junction Box	
	- 2-in Underground Conduit	
N/A	Right of Way	
\longrightarrow	Directional Arrow	\longrightarrow
<u> </u>	Directional Drill	N/A
0	 Metal Pole with Mastarm 	
$\langle A \rangle$	Left Arrow "ONLY" Sign (R3-5L) <u>(A</u>
B	"RIGHT TURN MUST YIELD TO U-TURN" Sign	₿

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

OASIS 2070 TIMING CHART

2.0

12

6.0

FEATURE

Min Green 1 *

Extension 1 *

Simultaneous Gap

PHASE

2.0

ON

12

6.0

Time Before Reduction 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 HNTB NORTH CAROLINA, P.C.
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Signal Upgrade - Final Design NC 211 (Southport-Supply Road) Dosher Cut Off Division 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

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 #: 0267.

LEGEND

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

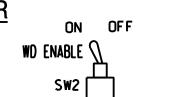
INIT. DATE

TH CARO 031464

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

DENOTES POSITION

OF SWITCH

ST

FS = FLASH SENSE ST = STOP TIME

─ LEDguard RF SSM

____⊢FYA 1-9

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. FYA 3-10 FYA 7-12

REMOVE JUMPERS AS SHOWN

COMPONENT SIDE

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 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

CONTROLLER.....2070E

SOFTWAREECONOLITE 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

LOAD SWITCH NO. CMU CHANNEL NO. 8 | 8 | OLA OLB | SPARE | OLC | OLD | SPARE NU 21,22 NU NU 41,42 NU 51 61,62 NU NU NU NU NU NU NU NU NU SIGNAL HEAD NO 101 128 102 129 ***** 135 YELLOW 103 130 GREEN

SIGNAL HEAD HOOK-UP CHART

PROJECT REFERENCE NO.

R-5021

A114

A115 A102

A116 A103

Sig. 34

GREEN ARROW

NU = Not Used

RED ARROW

YELLOW

ARROW

FLASHING YELLOW ARROW

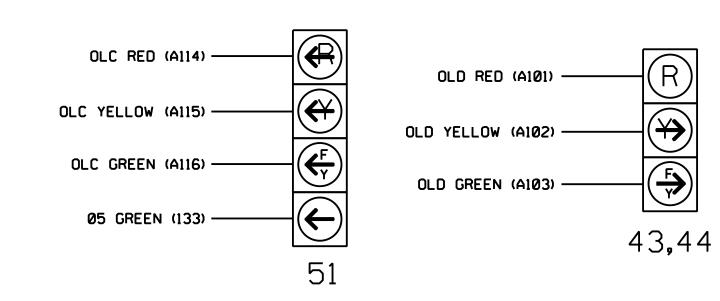
* Denotes install load resistor. See load resistor installation detail this sheet.

133

★ 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: 03-0267 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

ELECTRICAL AND PROGRAMMIN 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

031464

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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/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 , 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

REVISIONS INIT. DATE

SIG. INVENTORY NO. 03-0267

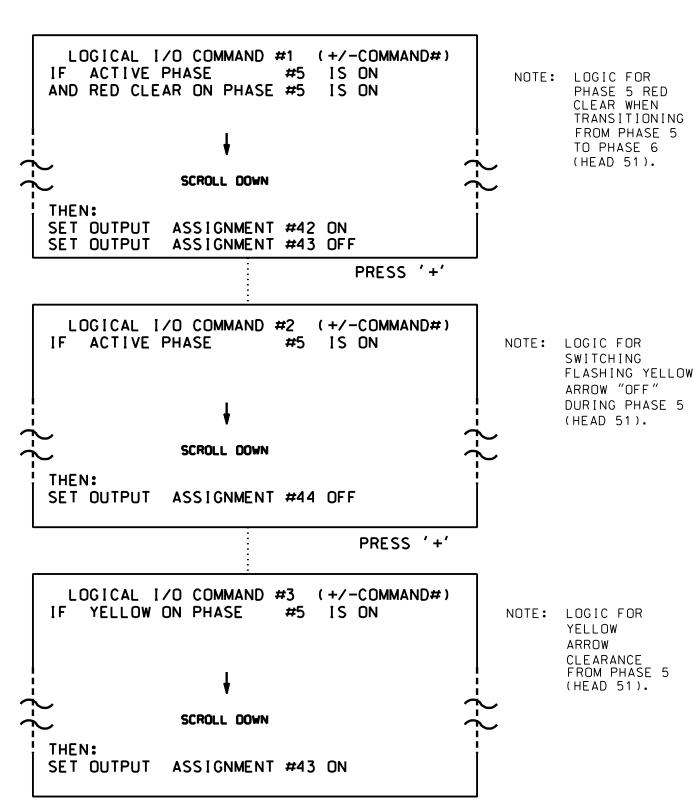
TH CARO,

PROJECT REFERENCE NO. R-5021 Sig 34

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

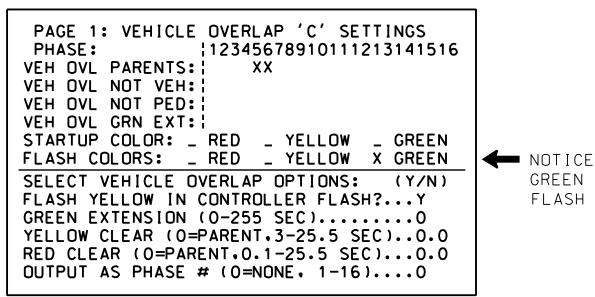
OUTPUT REFERENCE SCHEDULE USE TO INTERPRET LOGIC PROCESSOR OUTPUT 42 = Overlap C Red OUTPUT 43 = Overlap C Yellow OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

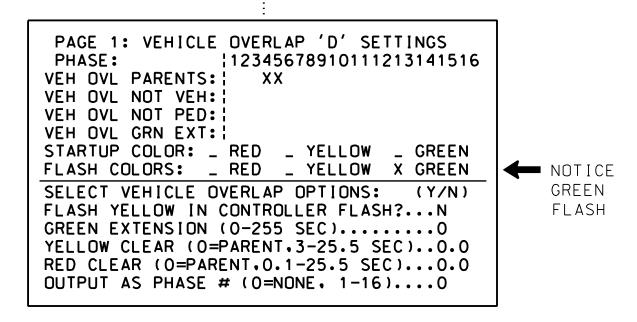
(program controller as shown below)

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

PRESS '+' TWICE



PRESS '+'



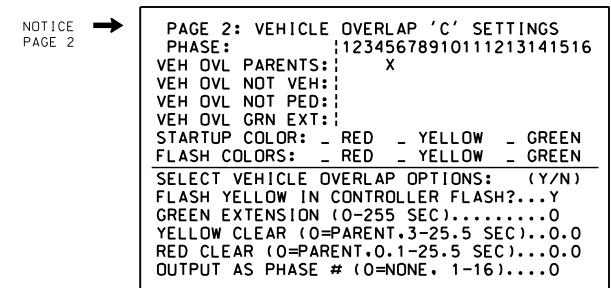
OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

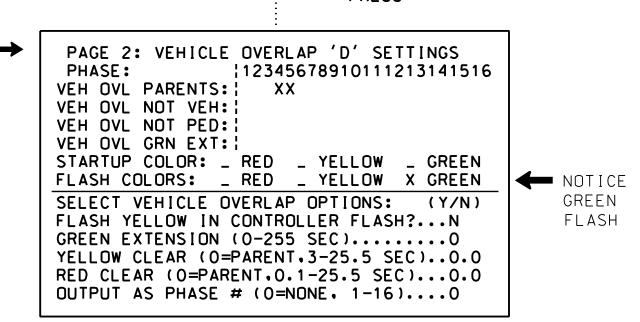
(program controller as shown below)

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

PRESS '+' TWICE



PRESS '+'



OVERLAP PROGRAMMING COMPLETE

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

ELECTRICAL AND PROGRAMMIN

Final Design

PAGE 2

Electrical Detail - Sheet 2 of 4 Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

TH CARO, 031464 Southport REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg | REVIEWED BY: N.R. Simmons SIG. INVENTORY NO. 03-0267

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

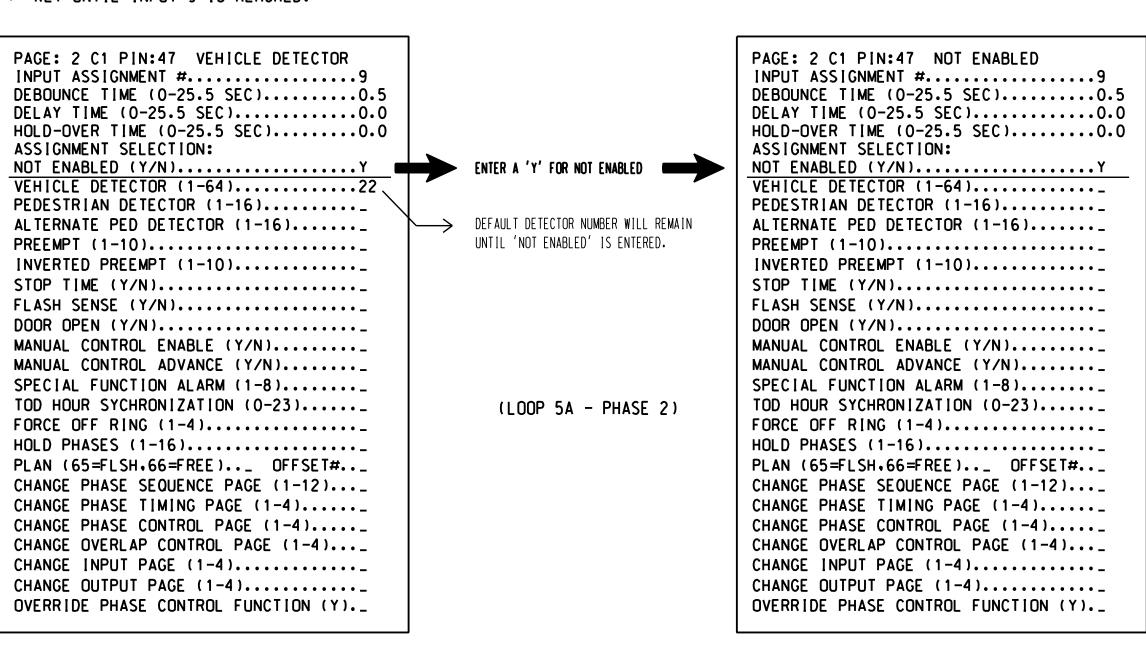
(program controller as shown below)

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.

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 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 DETECTOR
ENABLE LOGGING	ENTER I FUR ENABLE DETECTOR	ENABLE LOGGING
ENABLE DIAGNOSTICS		ENABLE DIAGNOSTICS
SPEED TRAP		SPEED TRAP
CALL DETECTOR		CALL DETECTORY
EXTENSION DETECTOR		EXTENSION DETECTOR
MODE 2 STOP BAR		MODE 2 STOP BAR
SWITCHING DETECTOR		SWITCHING DETECTOR
DUPLICATING DETECTORN		DUPLICATING DETECTORN
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# 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)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 DEER! 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
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: 03-0267 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

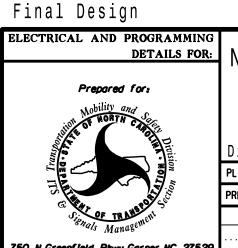
Electrical Detail - Sheet 3 of 4 Signal Upgrade

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

031464

SIG. INVENTORY NO. 03-0267

TH CARO

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REVISIONS INIT. DATE

R-5021 Sig. 34.4

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 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

INIT. DATE

Prepared for:

Prepared for:

Nobility and Management MC 27529

DETAILS FOR: NC 211 (Southport-Supply Road)

at

Dosher Cut Off

DUSTIET CUL UTT

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

Docusigned by: R. S. S. Market R. S. Market

TH CARO

031464

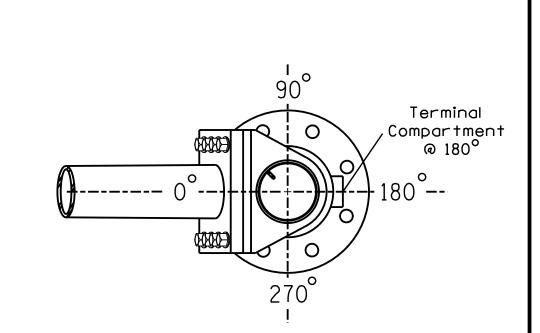
Elevation View

SPECIAL NOTE

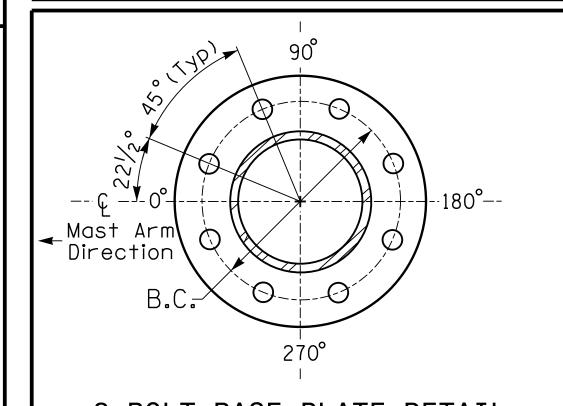
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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.	

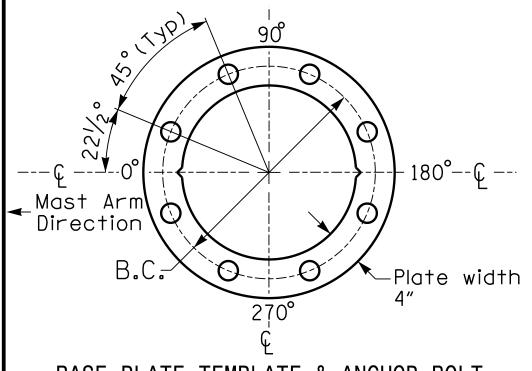


POLE RADIAL ORIENTATION



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	HEDUI	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

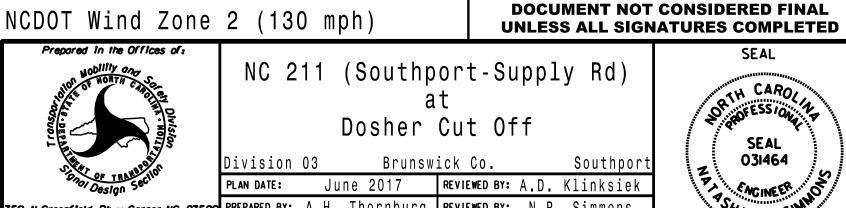
- 1. Design the traffic signal structure and foundation in accordance with:
- The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
- The 2018 NCDOT "Standard Specifications for Roads 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

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 soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

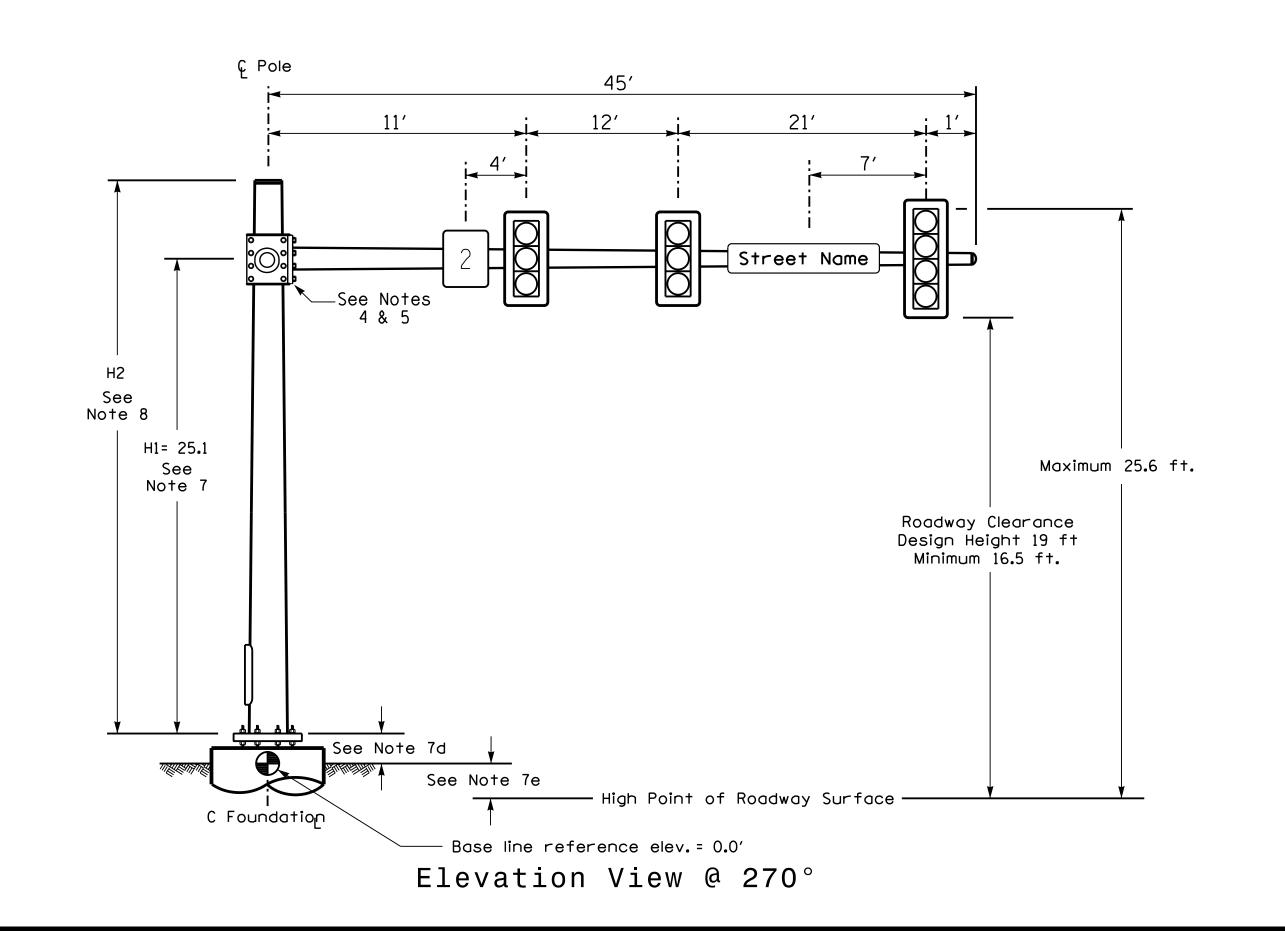


750 N.Greenfleid Phwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons REVISIONS

INIT. DATE SIG. INVENTORY NO. 03-0267

Design Loading for METAL POLE NO. 2 ARM B

Elevation View @ 0°

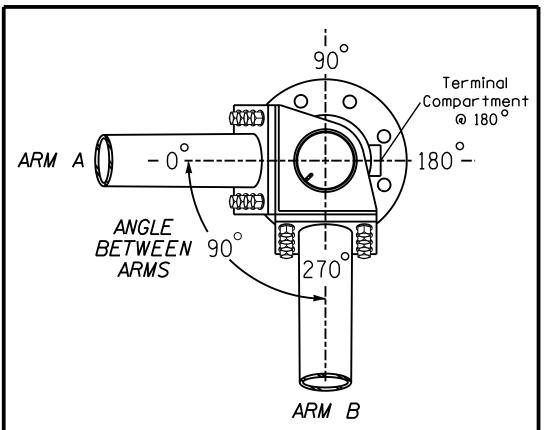


SPECIAL NOTE

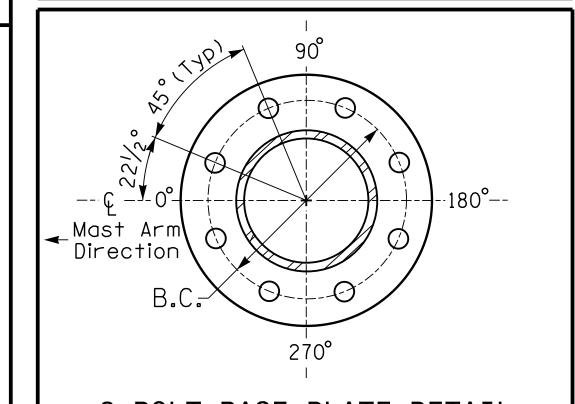
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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.

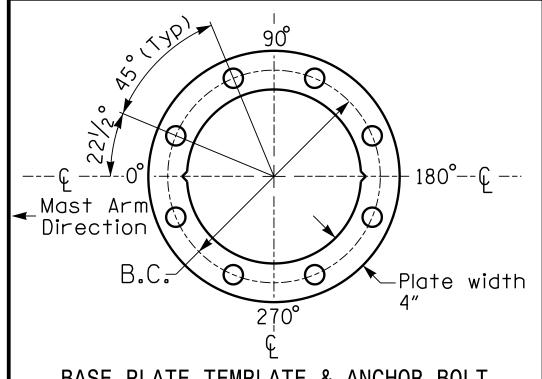


POLE RADIAL ORIENTATION



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

METAL POLE No. 2

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
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11 . 5 S.F.	25 . 5" W X 66 . 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

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 "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.

NCDOT Wind Zone 2 (130 mph)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



N/A

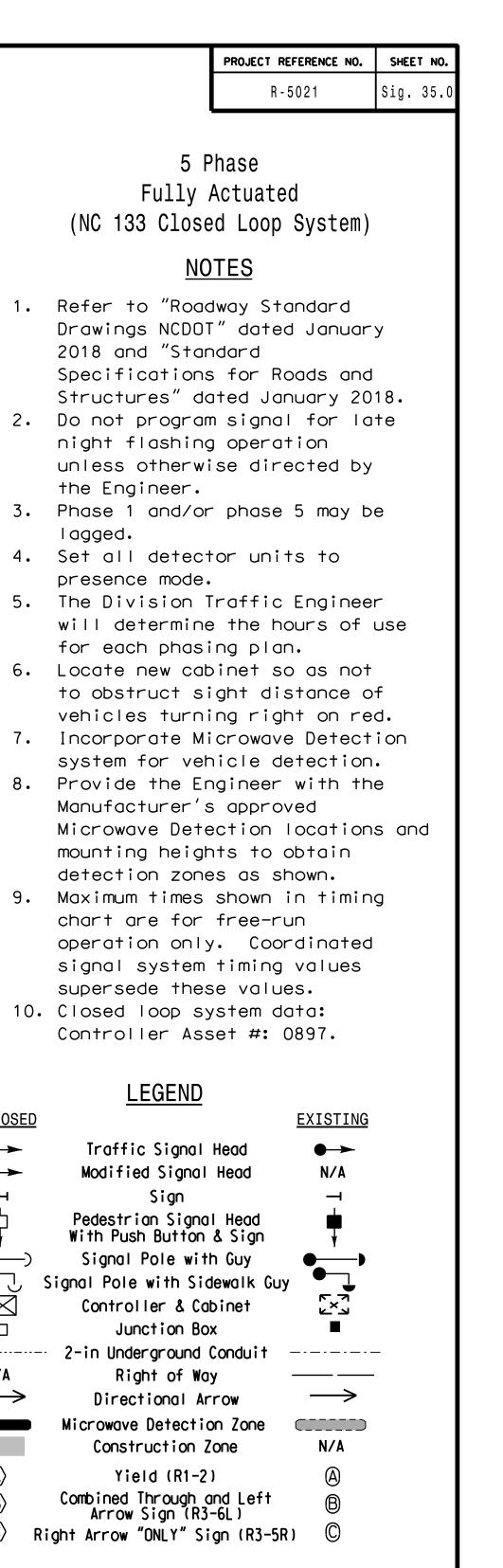
NC 211 (Southport-Supply Rd) Dosher Cut Off

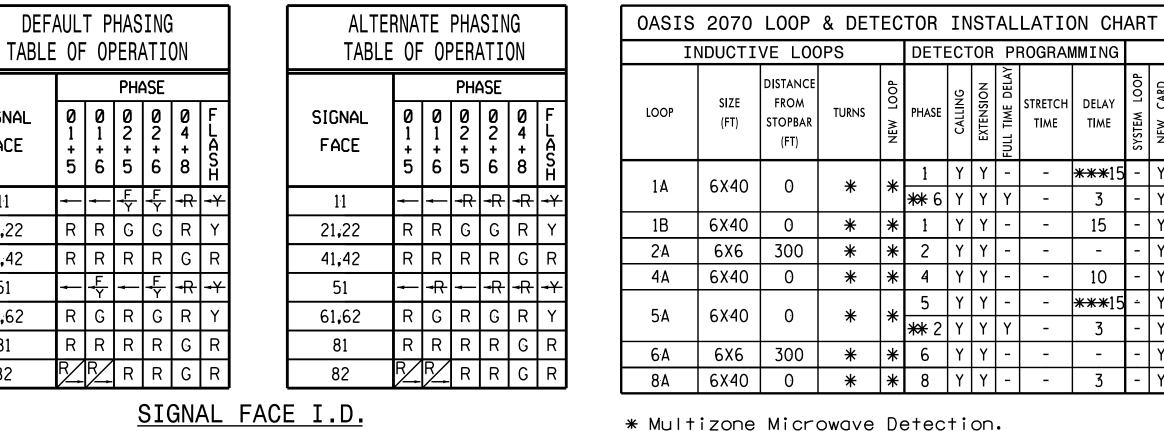
Division 03 Brunswick Co. Southport June 2017

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

031464 SIG. INVENTORY NO. 03-0267

TH CAROL CESSION 1





All Heads L.E.D. <u>G</u> 21,22 41,42 61,62

-Wood Pole

62' Lt +/-

- Wood Pole

72' Rt +/-

Sta. 406+65 +/- -L-

Sta. 406+52 +/- -L-

SIGNAL

FACE

21,22

41,42

61,62

81

Wood Pole —

55' Lt +/-

Sta. 405+76 +/- -L-

Wood Pole -

73' Rt +/-

Sta. 405+47 +/- -L-

OASIS	2070	LOOP	& DET	EC	TOR	IN	ST	AL	LATIC	ON CH	AR	T
II	NDUCTI	VE LOC	PS		DETE	ECT	OR		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
1 A	6X:40	0	¥	*	1	Υ	Υ	-	-	*** 15	-	Υ
1 A	6740	U	* * -		₩ 6	Υ	Υ	Υ	-	3	ı	Υ
1B	6X40	0	*	*	1	Y	Y	-	-	15	-	Υ
2·A	6X6	300	*	*	2	Υ	Υ	-	-	-	-	Υ
4A	6X40	0	*	*	4	Υ	Υ	-	-	10	-	Υ
E A	CV40	0	N/	v	5	Υ	Υ	-	-	*** 15	•	Υ
5·A	6X40	0	*	*	*** 2	Υ	Υ	Υ	-	3	-	Υ
6·A	6X6	300	*	*	6	Υ	Υ	-	-	-	1	Υ
8 [.] A	6X40	0	*	*	8	Υ	Υ	-		3	-	Υ

- * Multizone Microwave Detection.
- ** Disable phase 2 and 6 call for 1A and 5A during alternate phasing operation.

45 MPH +2% Grade

NC 211 (Howe Street)

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

				R/W		
	OASIS	2070	TIMING	CHAR	 Т	
			PHA		_	
FEATURE	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	25	20	90	25
Yellow Clearance	3.0	4.3	3.8	3.0	4.3	3.8
Red Clearance	2.1	1.0	1.3	2.1	1.0	1.5
Red Revert	2.0	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
Simultaneous Gap	ON	ON	ON	ON	ON	ON

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

←---- PEDESTRIAN MOVEMENT

UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

02+6

02+5

ALTERNATE PHASING DIAGRAM

02+6

02+5

01+5

NC 211 (Howe Street)

45 MPH +2% Grade

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



NC 211 (Howe Street)

REVIEWED BY: A.D. Klinksiek June 2017 INIT. DATE SIG. INVENTORY NO. 03-0897T

<u>PROPOSED</u>

 \bigcirc

N/A

TH CAROL Tidewater Plaza/Sandy Lane 031464 Division 03 Brunswick Co. 750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. SIMMONS

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

ON OFF

RP DISABLE

SF#1 POLARITY

₩D 1.0 SEC GY ENABLE

____LEDguard RF SSM

FYA 1-9 FYA 3-10

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

FYA COMPACT-

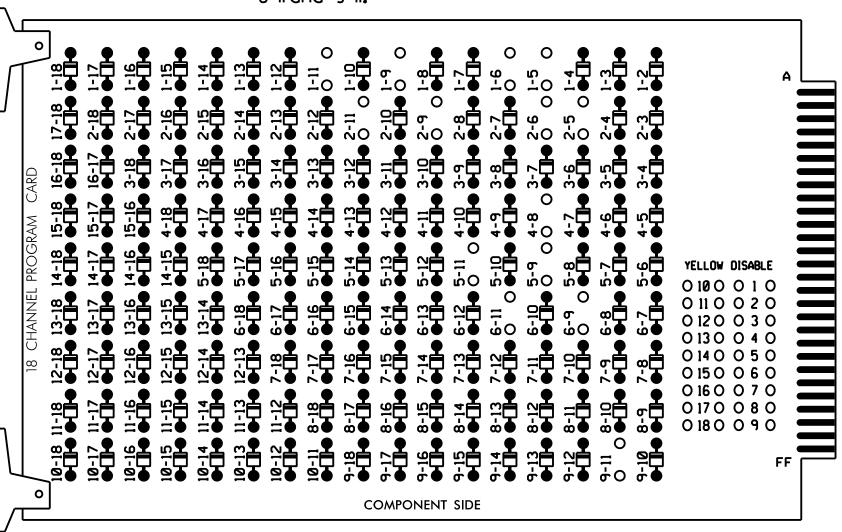
DENOTES POSITION

OF SWITCH

WD ENABLE

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

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

OVERLAP "D".....NOT USED

PROJECT REFERENCE NO. R-5021 Sig. 35

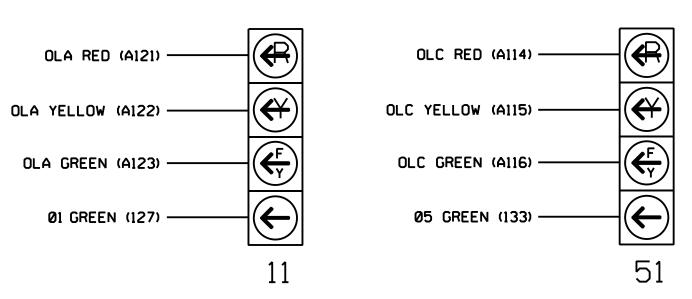
-					SI	GNA	L F	ΗEA	D H	100	K-l	JP	CHA	٩RT					
LOAD SWITCH NO.	S	1	S2	S 3	S4	S5	S6	S 7	S8	S9	S10	SII	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	ď	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	82	21,22	NU	NU	41,42	NU	★ 51	61,62	NU	NU	81,82	NU	11	NU	NU	★ 51	NU	NU
RED		*	128			101			134			107							
YELLOW			129			102		*	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		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.
- ★ 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 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

NC 211 (Howe Street) Tidewater Plaza/Sandy Lane

)ivision 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

031464 SIG. INVENTORY NO. 03-0897T1

TH CARO,

INPUT FILE POSITION LAYOUT (front view)

							(JIOIII	view)						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	Ø 1 ZONE 1A NOT USED	SLOT MXPTY	SLOT EXPTY	ארמבי סשאר¥ ⊗	SLOT WMPTY	SLOT EXPTY	SLOT EXPTY	SLOT EXPTY	SLOT EXPTY	SLOT EXPTY	SLOT EXPTY	SLOT EMPTY	SLOT EMPTY	FS OC ISOLATOR ST OC ISOLATOR
FILE U "J" L	Ø 5 ZONE 5A NOT USED	WHOT EXPTY	%_OF m∑t+ ≻	ארגהם רסדסר ⊗	%LOF m∑t+	%_O⊢ ш∑₽⊢≻	%_OF m∑t+ ≻	%_OF m∑t+ ≻	%_O⊢ ш∑₽⊢≻	%_OF m∑t+ ≻	ወገርተ መጀ ሲተት	SLOT EXPTY	SLOT EMPTY	SLOT EXPTY

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

ACCEPTABLE VALUES

VALUE (ohms) WATTAGE

1.5K - 1.9K 25W (m1n)

2.0K - 3.0K | 10W (min)

FS = FLASH SENSE ST = STOP TIME

PHASE 1 RED FIELD

PHASE 5 YELLOW FIELD

TERMINAL (132)

TERMINAL (125)

[⊗] Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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
		TB2-1,2	IIU	56	18	1	1	Y	Υ			15
ZONE	1A ¹	-	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	ZONE 5A2	-	I4U	47	9 ★	22	2	Y	Υ	Y		3
Ì	-	JlU	55	17 ★	55	5	Y	Υ			3	

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

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

★ See Input Page Assignment programming details on sheets 3 and 4.

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.

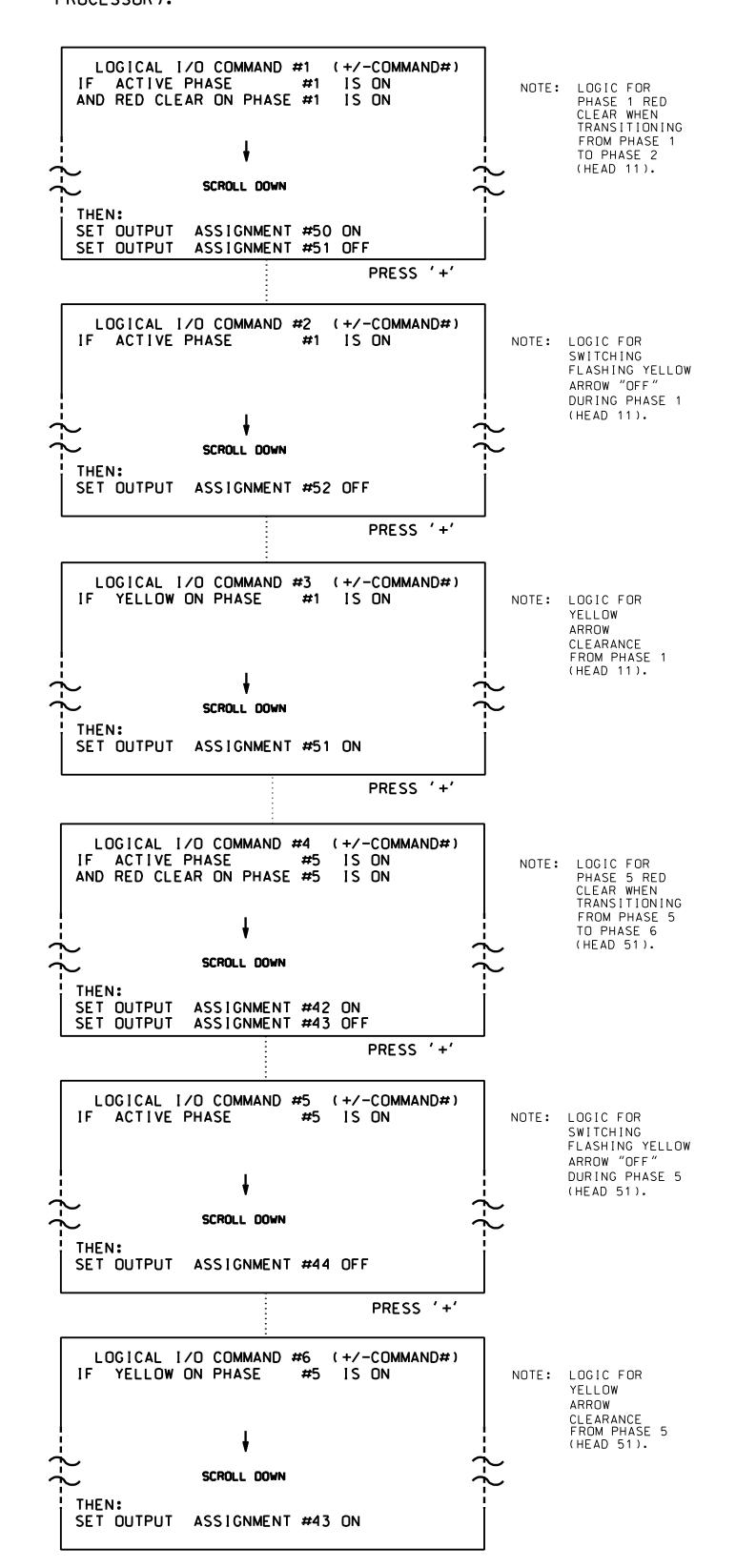
For loops 1A and 5A, detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3,4, and 5 of this electrical detail.

750 N.Greenfield Pkwy.Garner.NC 27529

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).

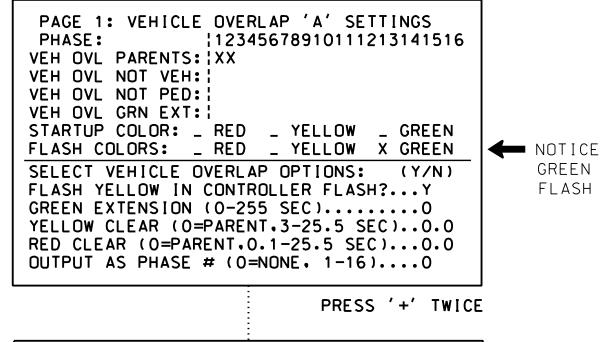


LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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



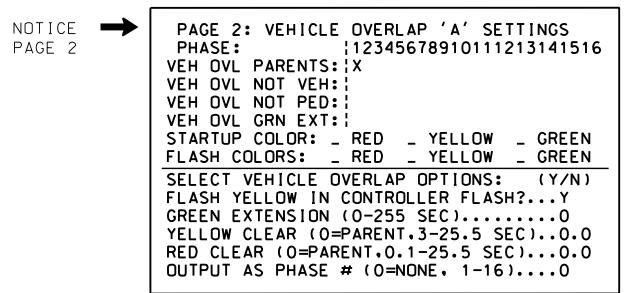
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS 12345678910111213141516 VEH OVL PARENTS: | XX VEH OVL NOT VEH: ; VEH OVL NOT PED: VEH OVL GRN EXT: | STARTUP COLOR: _ RED _ YELLOW _ GREEN FLASH COLORS: _ RED _ YELLOW X GREEN **←** NOTICE GREEN SELECT VEHICLE OVERLAP OPTIONS: (Y/N) FLASH YELLOW IN CONTROLLER FLASH?...Y 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

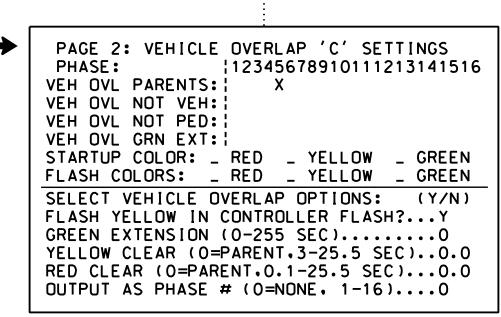
OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(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

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T1 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 2 of 5 Signal Upgrade

PAGE 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Temporary Design 1

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

SIG. INVENTORY NO. 03-0897T1

PROJECT REFERENCE NO. R-5021 Sig 35

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

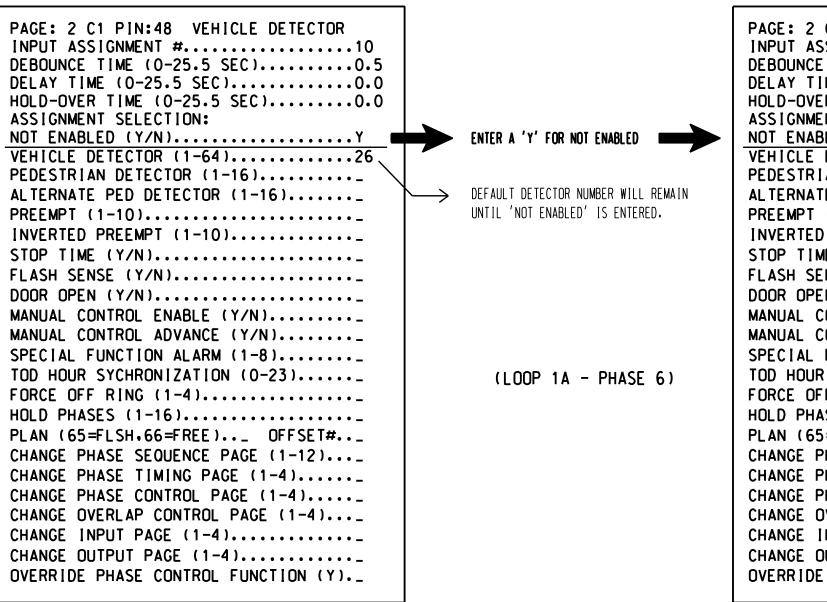
NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

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.

PRESS '+' TO ADVANCE TO INPUT 18

(Y/N)

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:48 NOT ENABLED INPUT ASSIGNMENT #.....10 DELAY TIME (0-25.5 SEC).............. HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N).....Y VEHICLE DETECTOR (1-64).... 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: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)..... 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)._

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)..... VEHICLE DETECTOR (1-64).....51 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 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)._

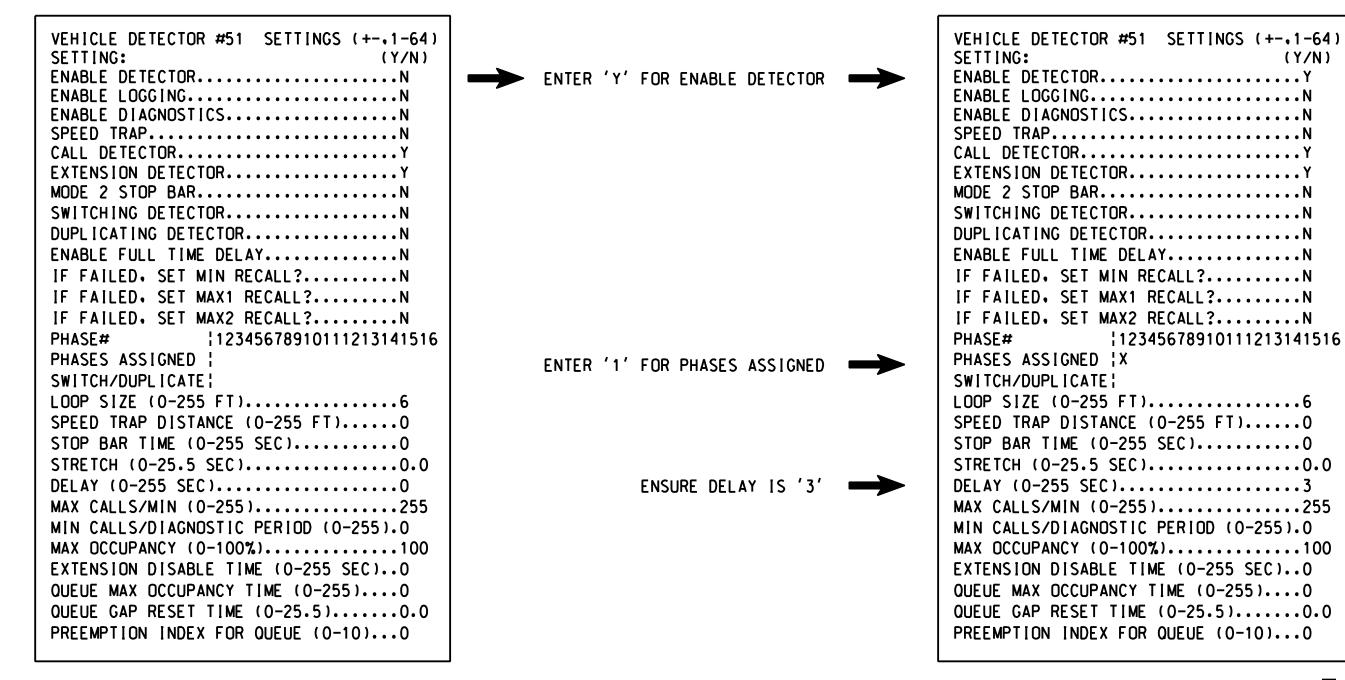
PROGRAMMING COMPLETE

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR

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

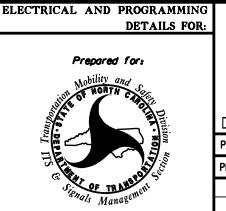
Electrical Detail - Sheet 3 of 5 Signal Upgrade Temporary Design 1

ENTER '51' TO REASSIGN

THE VEHICLE DETECTOR

FOR THIS INPUT

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 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 DETECTOR PROGRAMMING COMPLE

SIG. INVENTORY NO. 03-0897T1

R-5021 Sig. 35.

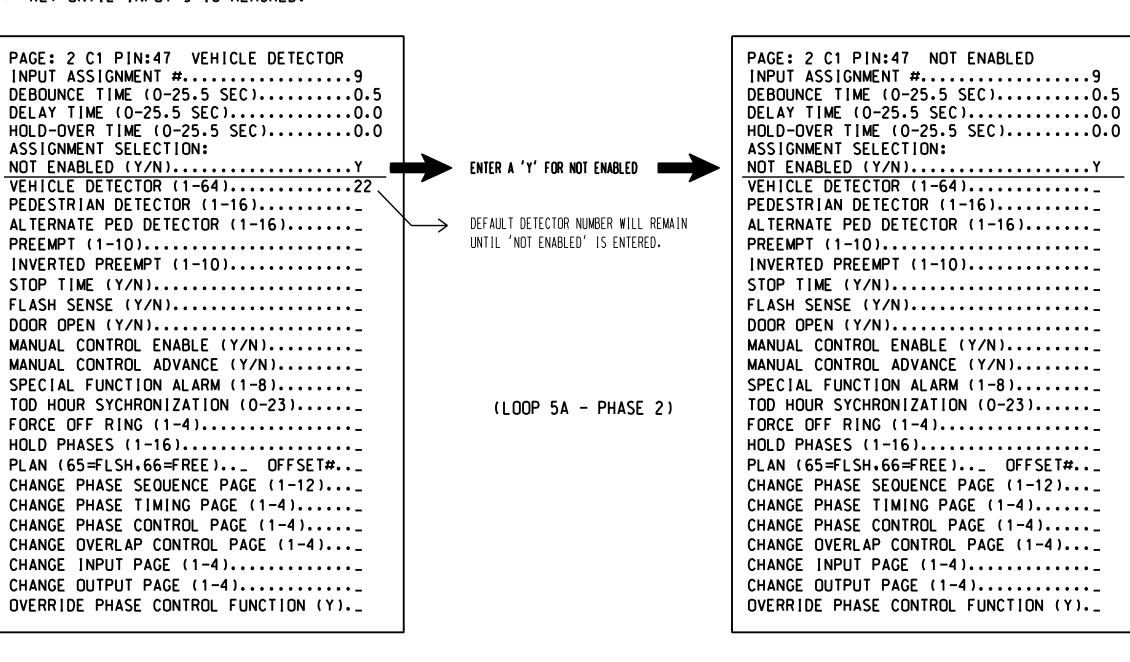
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

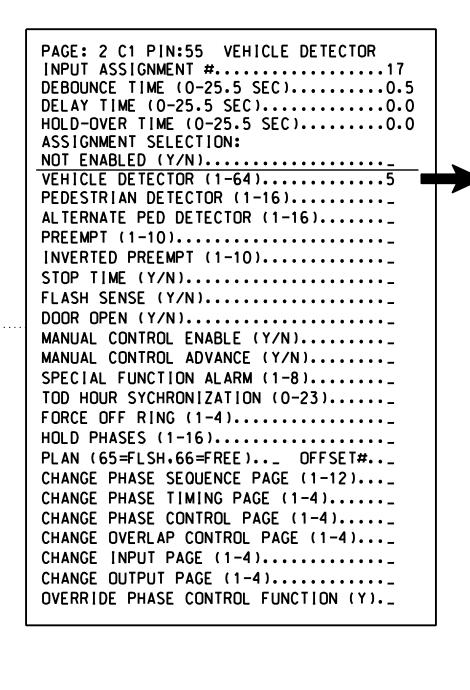
NOTES: 1. THIS PROGRAMMING APPLIES <u>FOR INPUT PAGE 2</u> ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.

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



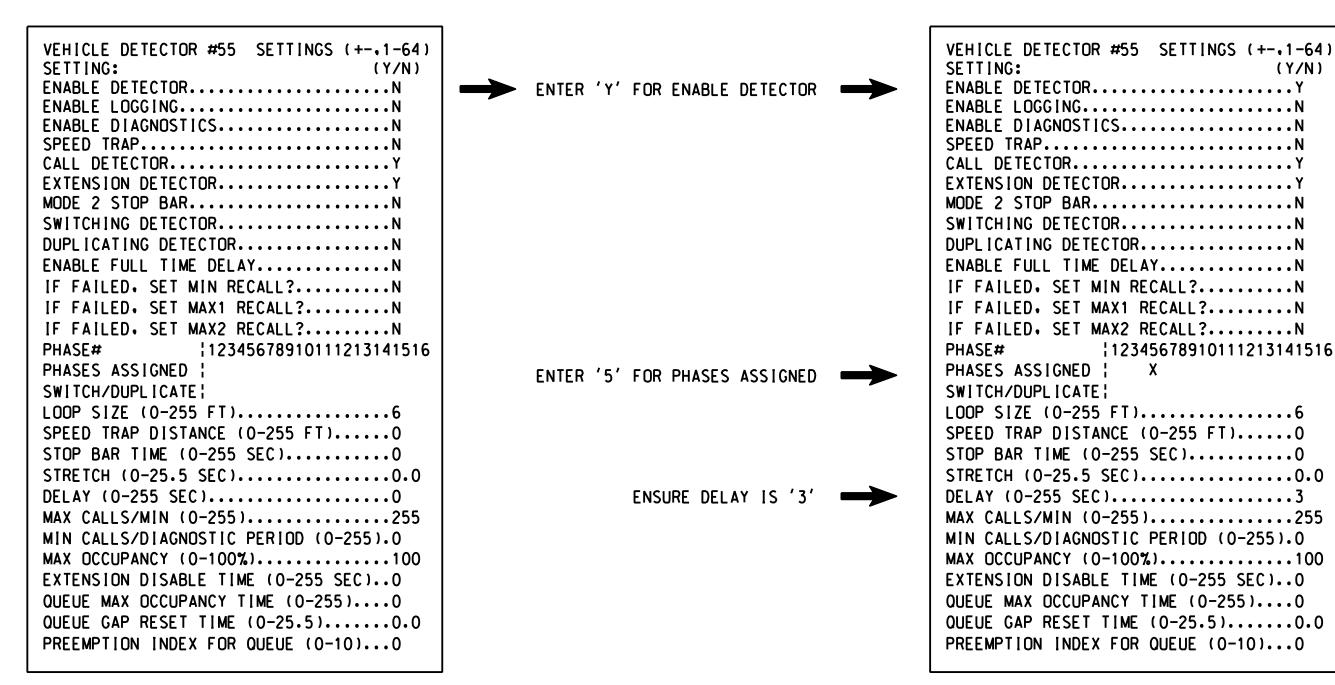
PAGE: 2 C1 PIN:55 VEHICLE DETECTOR DELAY TIME (0-25.5 SEC)................0.0 HOLD-OVER TIME (0-25.5 SEC).........0.0 ASSIGNMENT SELECTION: NOT ENABLED (Y/N)..... VEHICLE DETECTOR (1-64).....55 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... 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)._

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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Prepared for:

Nobility and Management Annuals Management

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

SEAL
031464

Docusigned by:

R. Silling

Ratasha Simmons

-60D880F3AD445A

9/10/20

SIG. INVENTORY NO. 03-0897T1

DETECTOR PROGRAMMING COMPLETE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
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(919) 546-8997

 PROJECT REFERENCE NO.
 SHEET NO.

 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 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 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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for:

Nobility and Roman Management.

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 031464
O31464

Pocusigned by:

Natasha Simmons

F6DA88DF3AD445A...

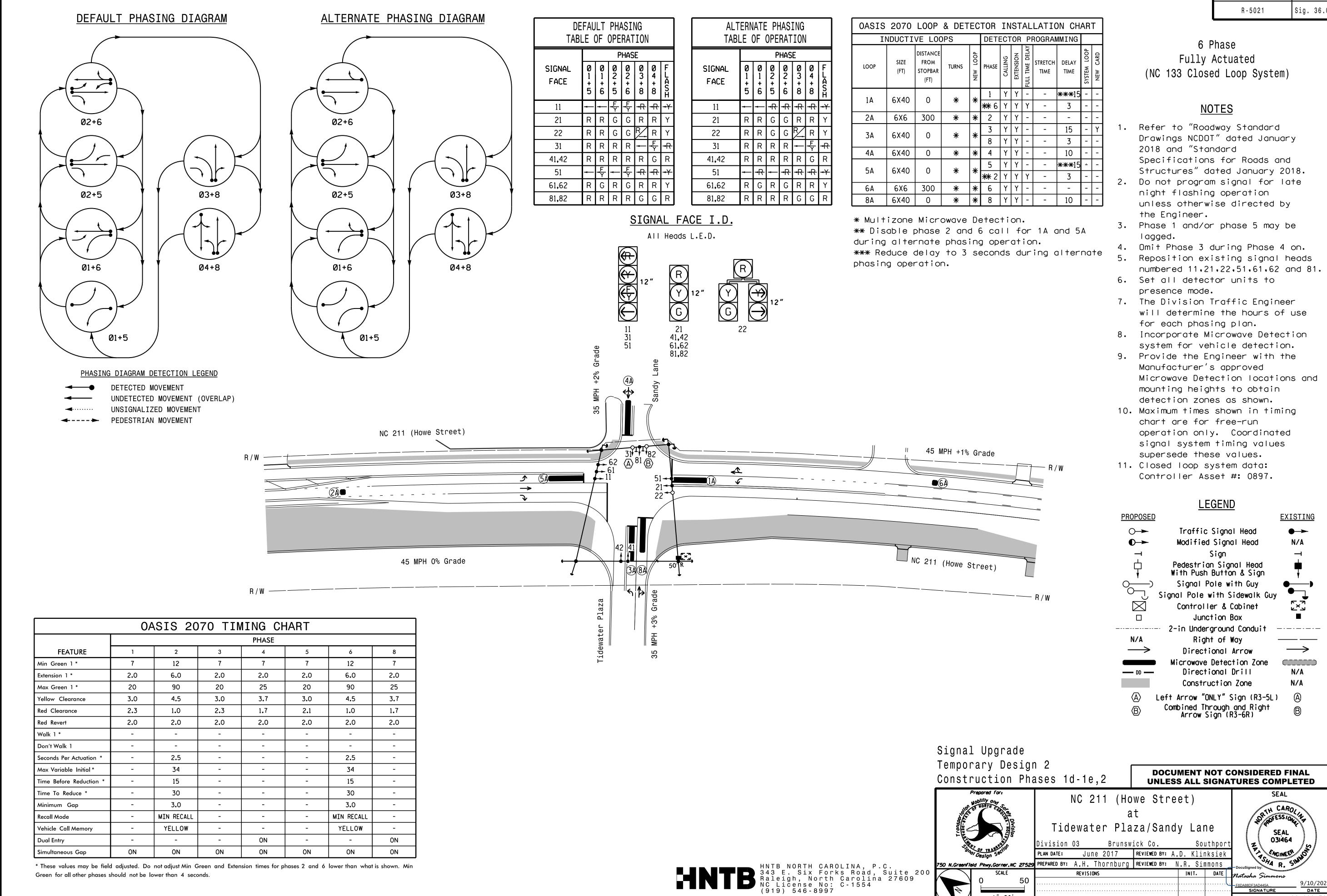
SIGNATURE

SEAL

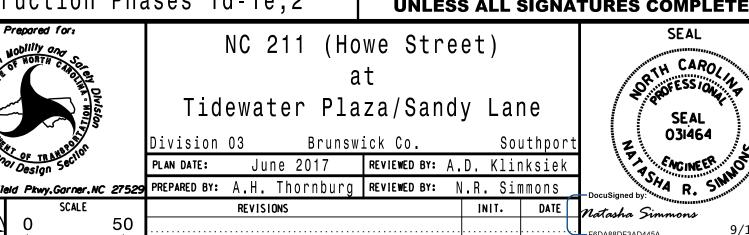
O31464

9/1

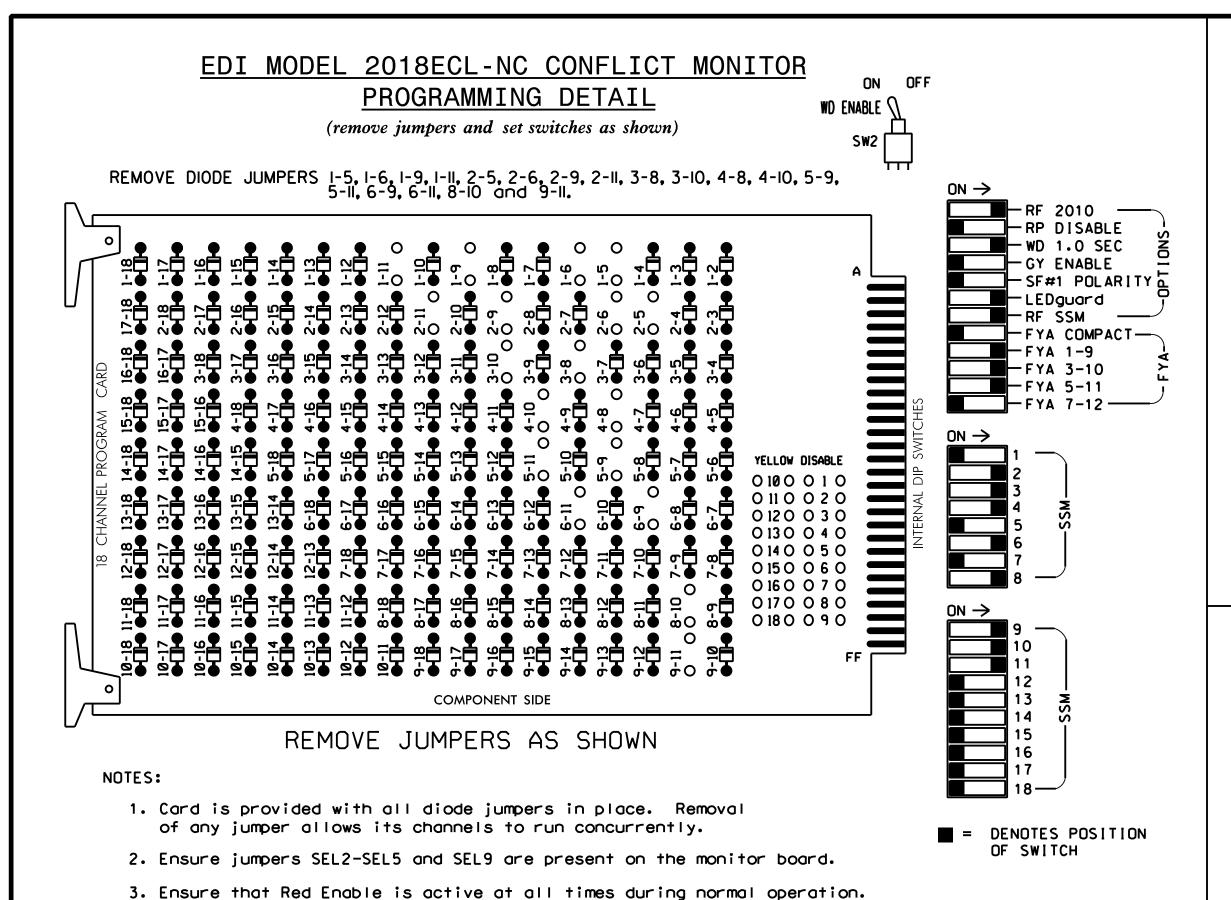
SIG. INVENTORY NO. 03-0897T1



PROJECT REFERENCE NO.



SIG. INVENTORY NO. 03-0897T2



NOTES

- red flash program blocks for all unused vehicle load switches in the output file. The installer

- 4. Program phases 2 and 6 for Variable Initial and Gap
- 6. Program phases 2 and 6 for Yellow Flash, and
- enable controller and detector logging for all
- 8. The cabinet and controller are part of the NC 133 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E

CABINET MOUNT.....BASE

OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED......\$1,\$2,\$4,\$5,\$7,\$8,\$11,

AUX S1, AUX S2, AUX S4

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

1. To prevent "flash-conflict" problems, insert 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.
- Reduction.
- 5. Program phases 2 and 6 for Startup In Green.
- overlaps 1 and 2 as Wag Overlaps.
- 7. If this signal will be managed by an ATMS software. detectors used at this location.

SOFTWARE......ECONOLITE OASIS

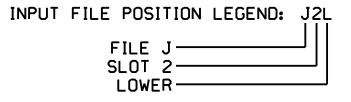
OVERLAP "A".....1+2 OVERLAP "B".....3+4

OVERLAP "D".....NOT USED

INPUT FILE CONNECTION & PROGRAMMING CHART

_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
		TB2-1,2	IIU	56	18	1	1	Υ	Υ			15
ZONE	1A1	-	J4U	48	10 ★	26	6	Υ	Υ	Y		3
		-	IIU	56	18 ★	51	1	Υ	Υ			3
70\JE	242	TB4-5,6	I5U	58	20	3	3	Υ	Υ			15
ZONE	3A-	-	J8U	50	12	28	8	Υ	Υ			3
		TB3-1.2	JlU	55	17	5	5	Υ	Υ			15
ZONE	5A ³	-	I4U	47	9 ★	22	2	Υ	Υ	Y		3
		-	JlU	55	17 ★	55	5	Υ	Υ			3

- Add jumper from I1-W to J4-W, on rear of input file.
- ² Add jumper from 15-W to J8-W, on rear of input file.
- 3 Add jumper from J1-W to I4-W, on rear of input file.
- ★ See Input Page Assignment programming details on sheets 4, 5, 6, and 7.



LOAD RESISTOR INSTALLATION DETAIL (install resistors as shown)

[⊗] Wired Input - Do not populate slot with detector card

4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

10

13 14

FS = FLASH SENSE

ST = STOP TIME

(front view)

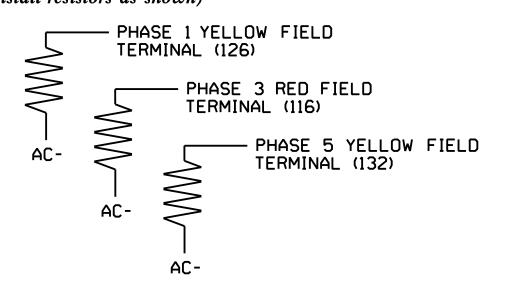
ACCEPTABLE VALUES |VALUE (ohms) | WATTAGE 1.5K - 1.9K 25W (m1n) 2.0K - 3.0K | 10W (m1n)

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

NOT USED

FILE

"J"



REMOVE RESISTOR FROM PHASE 1 RED 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 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 on sheets 3,4, and 5 of this electrical detail.

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PROJECT REFERENCE NO. R-5021 Sig. 36

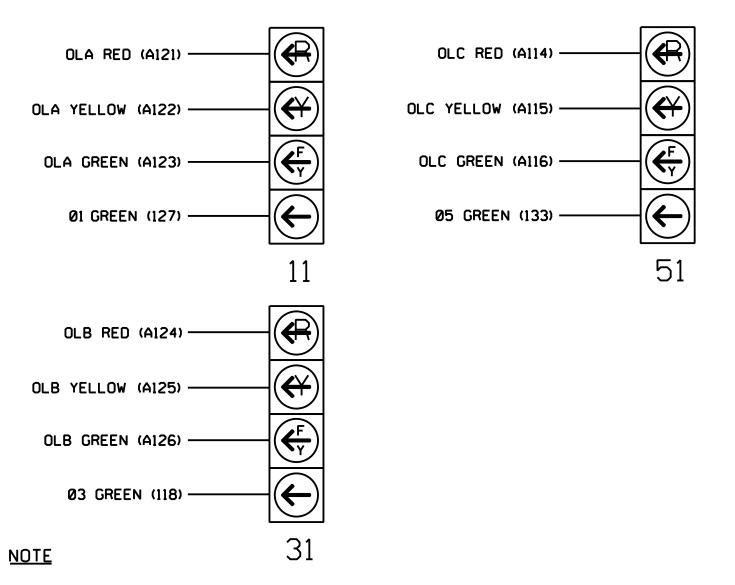
				SI	3NA	L F	ΗEA	D ł	100	K-l	JP	CHA	\RT						
LOAD SWITCH NO.	S1	S2	S 3	S	4	S5	S6	S7	S8	59	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	;	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	;	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	22	3 1	41,42	NU	★ 51	61,62	NU	NU	81,82	NU	11	3 1	NU	★ 51	NU	NU
RED		128		*		101			134			107							
YELLOW	*	129				102		*	135			108							
GREEN		130				103			136			109							
RED ARROW														A121	A124		A114		
YELLOW ARROW				117										A122	A125		A115		
FLASHING YELLOW ARROW														A123	A126		A116		
GREEN ARROW	127			118	118			133											
₩																			
Ϋ́																			

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)

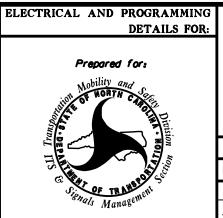


The sequence display for signal heads 11, 31 and 51 requires special logic programming. See sheet 2 for programming instructions.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0897T2 DESIGNED: June 2017 SEALED: 9/10/2021 REVISED: N/A

Electrical Detail - Sheet 1 of 5 Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Temporary Design 2

NC 211 (Howe Street) Tidewater Plaza/Sandy Lane

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

Southport REVISIONS INIT. DATE

031464 SIG. INVENTORY NO. 03-0897T2

TH CARO,