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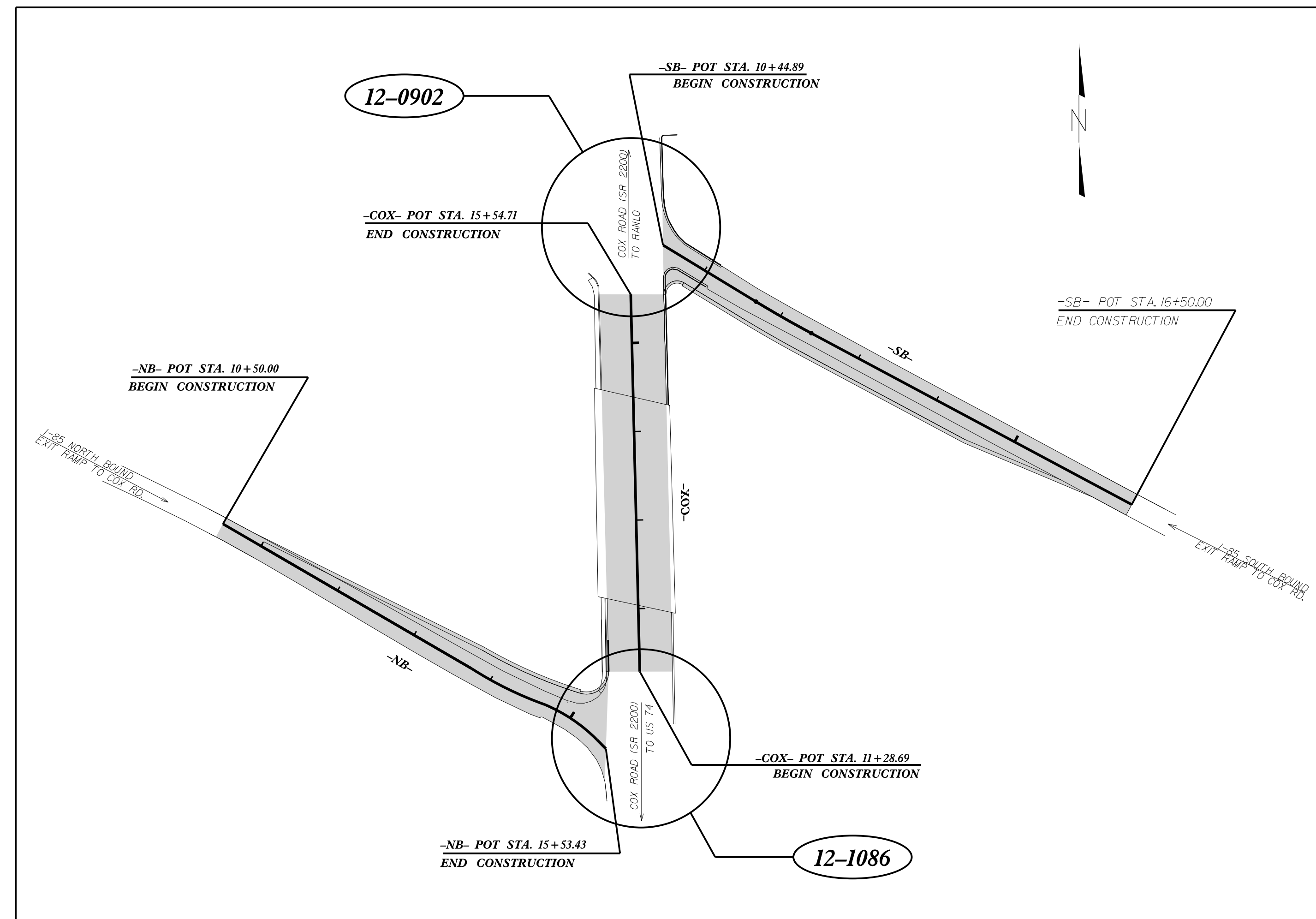
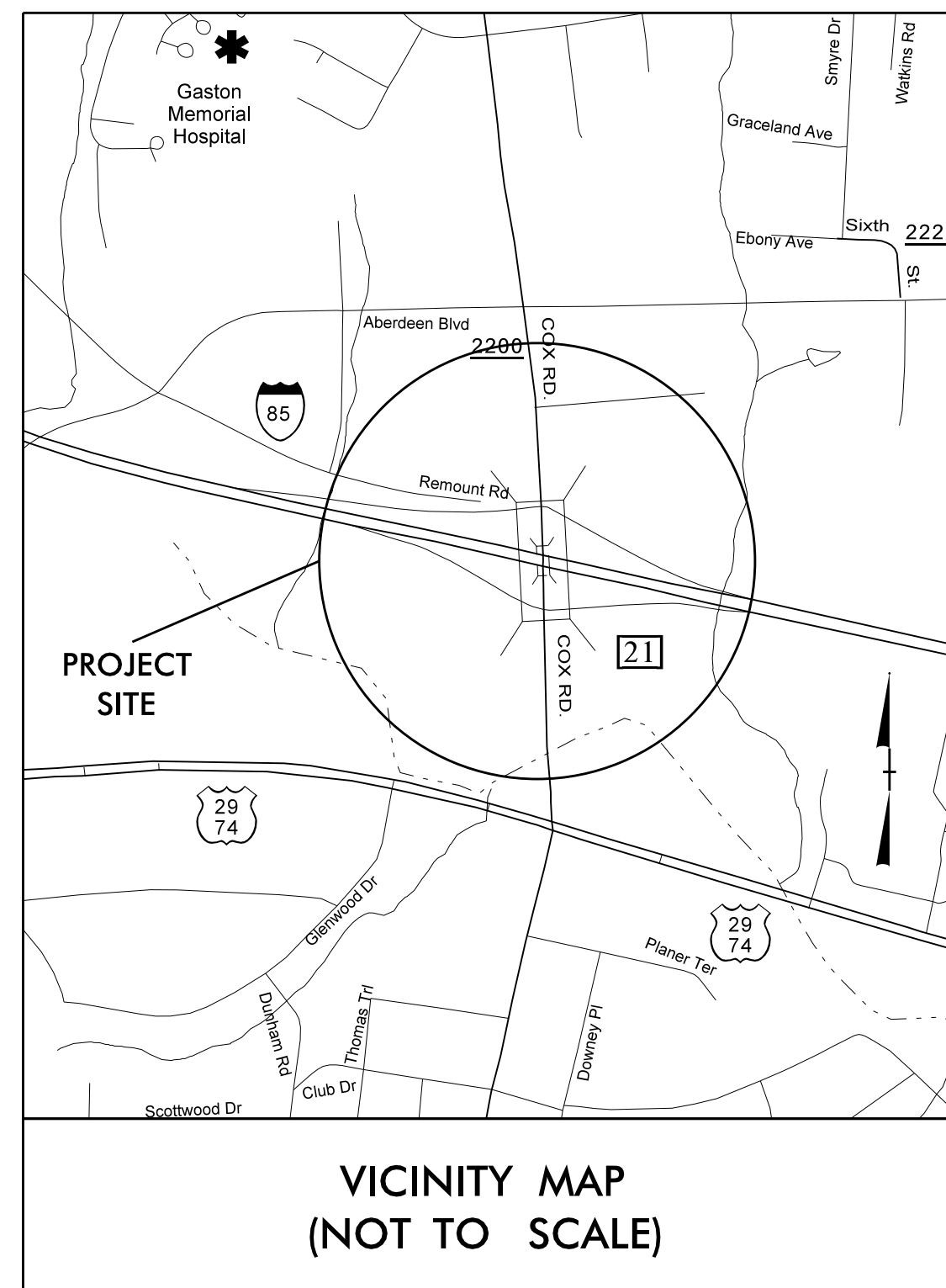
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Gaston County

**LOCATION: SR 2200 (COX RD.) AT
I-85 NORTHBOUND/SOUTHBOUND RAMP**

TYPE OF WORK: TRAFFIC SIGNALS

Project: I-5713



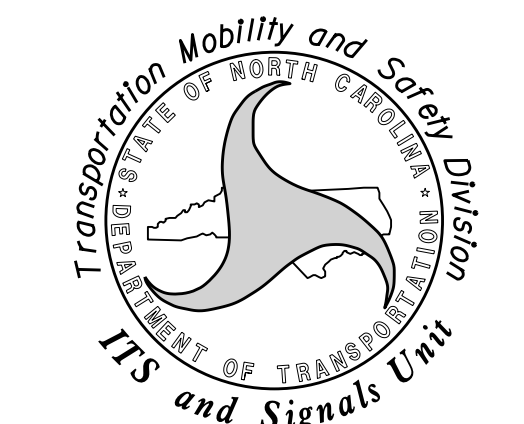
Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	
Sig. 2.0-3.4	12-0902	SR 2200 (Cox Rd.) at I-85 Southbound Ramps	
Sig. 4.0-5.4	12-1086	SR 2200 (Cox Rd.) at I-85 Northbound Ramps	

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:

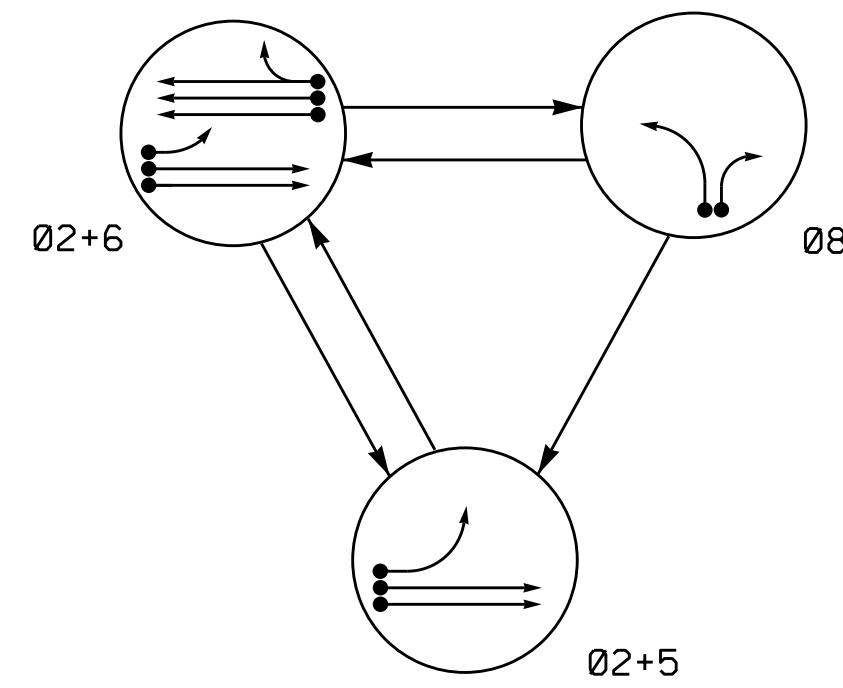
Timothy J. Williams, PE - Western Region Signals Engineer
Keith M. Mims, PE - Signal Equipment Design Engineer

Prepared in the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION

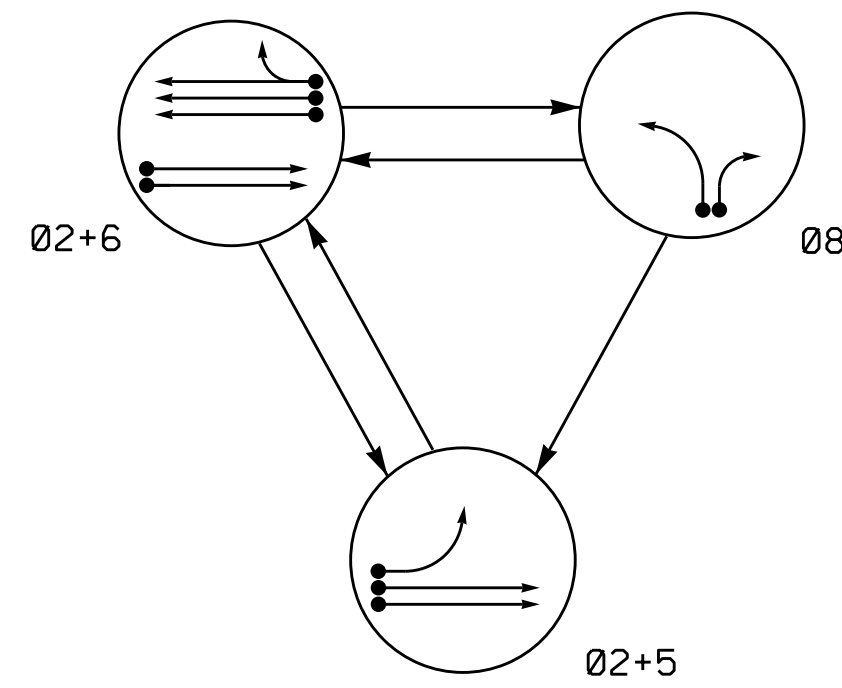


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DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22	G	G	R	Y
51	-	-	-	-
61, 62	R	G	R	Y
81, 82, 83	R	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22	G	G	R	Y
51	-	-	-	-
61, 62	R	G	R	Y
81, 82, 83	R	R	G	R

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A,2B,2C	6X6	90	EXIST	-	2	Y	Y	-	-	-	-	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	15**	-	-
6A,6B,6C	6X6	90	EXIST	-	6	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8C	6X40	0	2-4-2	Y	8	Y	Y	-	-	15	-	-
S1	6X6	+125	EXIST	-	-	-	-	-	-	-	-	Y
S2	6X6	+125	EXIST	-	-	-	-	-	-	-	-	Y

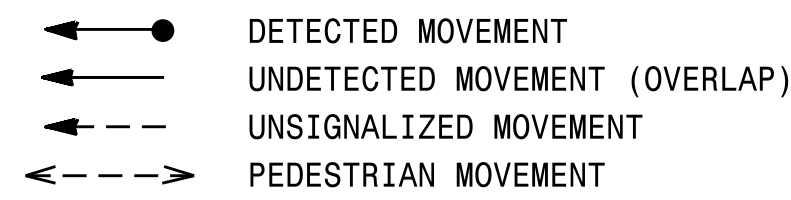
* Disable phase 2 call on loop 5A during Alternate Phasing Operation.
 ** Reduce delay on loop 5A to 3 seconds during Alternate Phasing Operation.

3 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia City System

NOTES

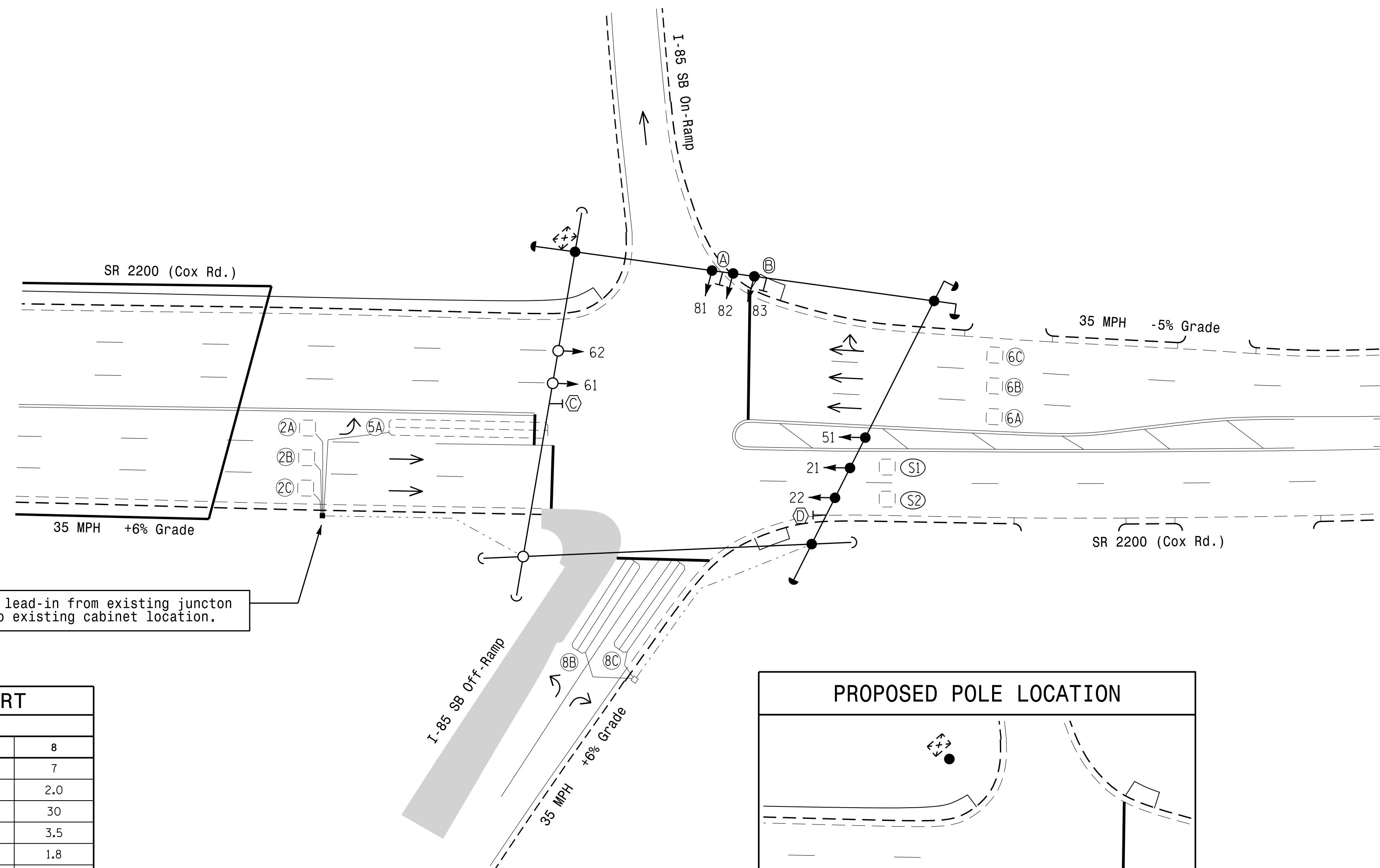
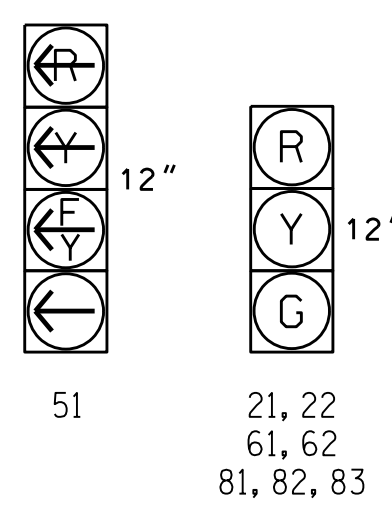
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Renumber existing signal heads 41, 42, and 43, to 81, 82, and 83, respectively.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Pavement markings are existing.
- The Gastonia City Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0902

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.

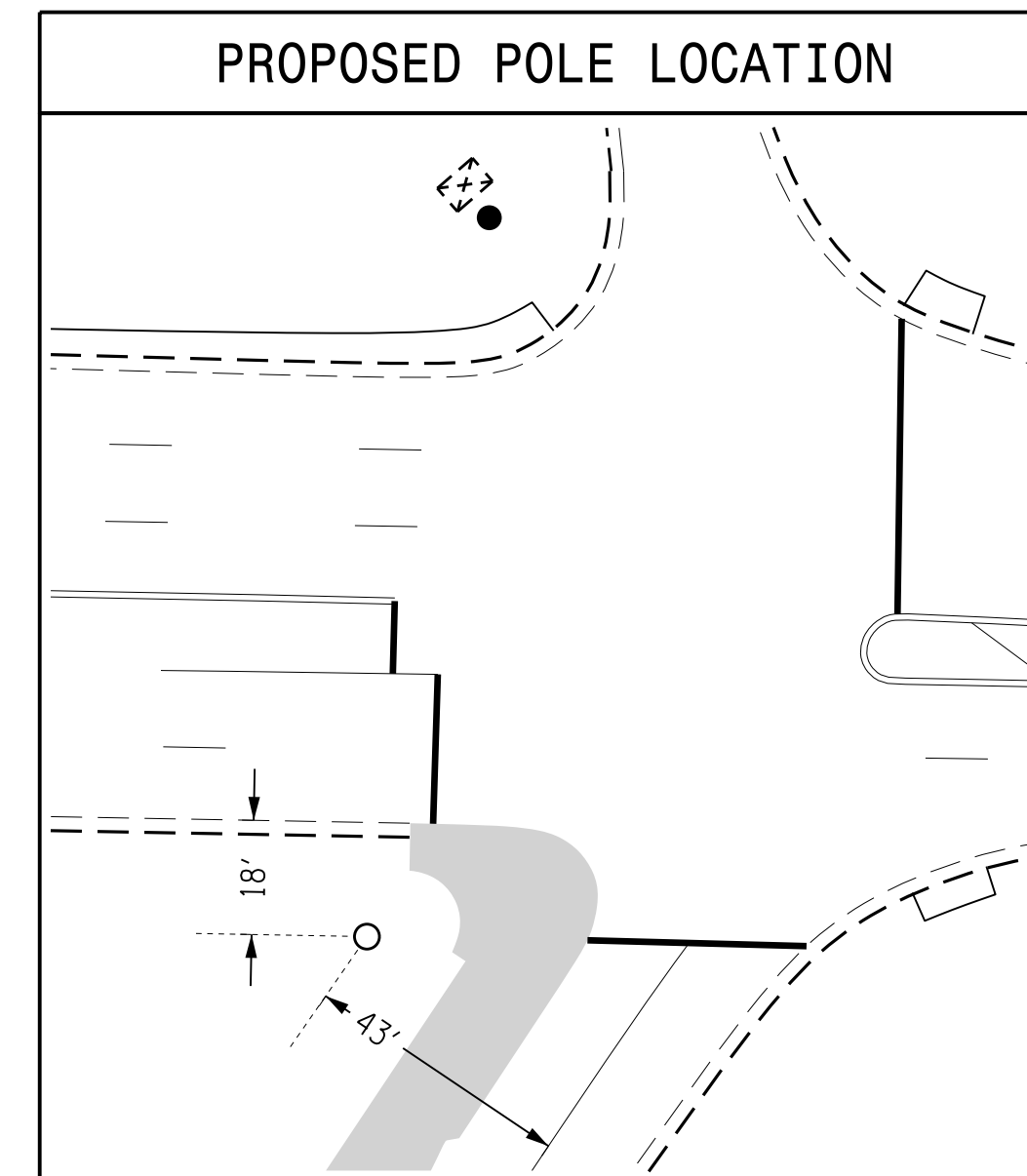


Run new lead-in from existing junction box to existing cabinet location.

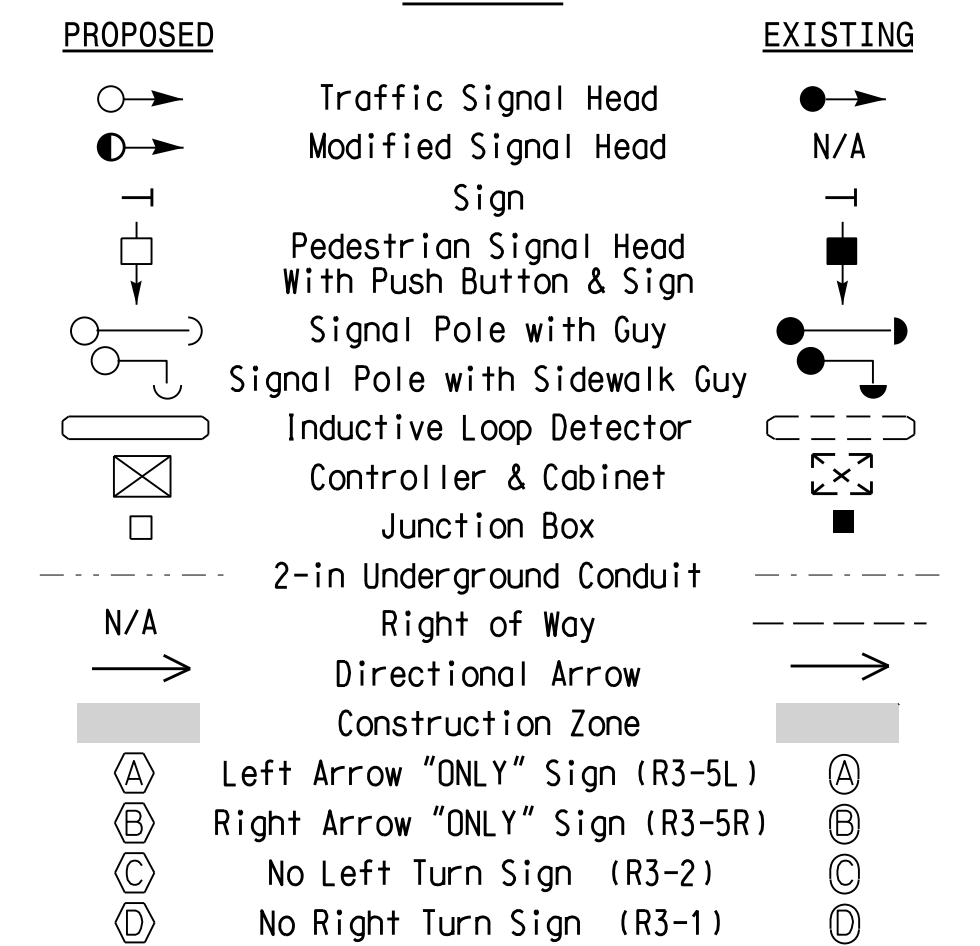
FEATURE	PHASE			
	2	5	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	45	15	45	30
Yellow Clearance	4.2	3.0	4.2	3.5
Red Clearance	2.1	2.6	2.1	1.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	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.

PROPOSED POLE LOCATION



LEGEND



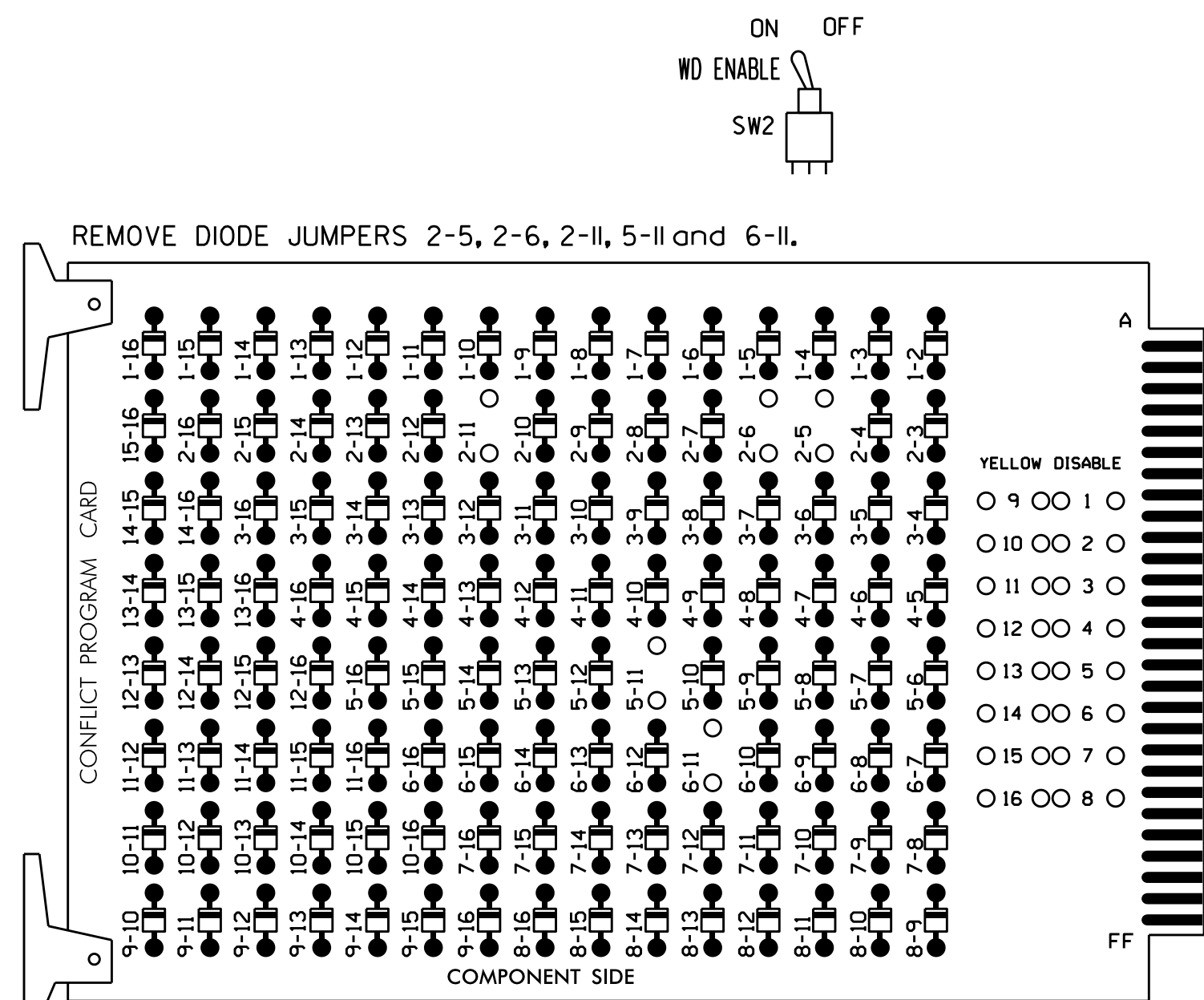
Signal Upgrade - Temporary Design

	SR 2200 (Cox Rd.) at I-85 Southbound Ramps		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER R. N. ZINSELER 043914
	Division 12 Gaston County Gastonia PLAN DATE: May 2017 REVIEWED BY: T.J. Williams PREPARED BY: R.N. Zinseler REVIEWED BY:	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
750 N. Greenfield Pkwy, Garner, NC 27529 SCALE: 0 30 1"=30'	REVISIONS:	INIT. DATE	DATE: 7/10/2017 DATE:

**EDI MODEL 2010ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

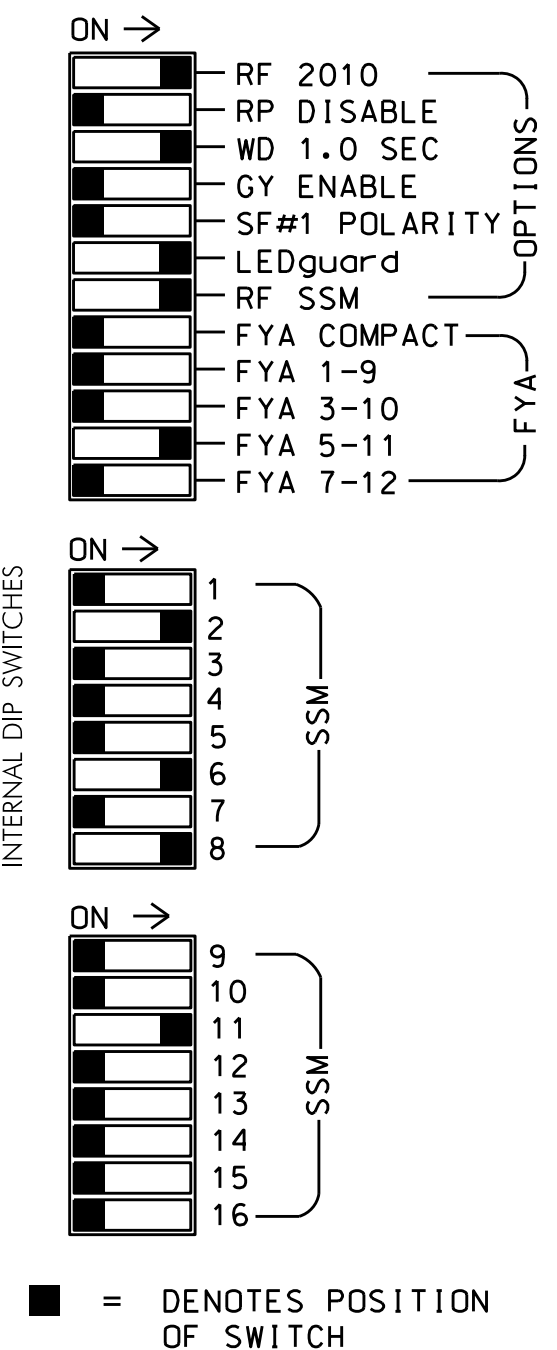
! THE 2010ECL-NC IS THE NEW MONITOR TO BE INSTALLED, IF NOT ALREADY PRESENT !



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Restore controller back to factory defaults before programming as per this electrical detail.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,4,5,7,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Gastonia City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S6,S8,S12
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	9	10	11	12	13	14
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51	61,62	NU	NU	81,82 83	NU	NU	NU	NU	51	NU	NU
RED		128						134			107							
YELLOW		129					*	135			108							
GREEN		130						136			109							
RED ARROW																		A114
YELLOW ARROW																		A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW								133										

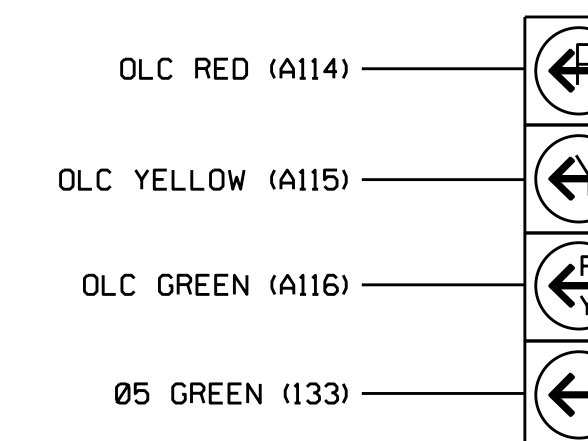
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



51

NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S	Ø 2	S	S	S	S	S	S	SYS. DET. S1	S	S	S	S	FS
L	2A,2B,2C	NOT USED	Ø 3	Ø 4	Ø 5	Ø 6	Ø 7	Ø 8	SYS. DET. S2	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
U	Ø 5	Ø 6	Ø 7	Ø 8	Ø 9	Ø 10	Ø 11	Ø 12	Ø 13	Ø 14	Ø 15	Ø 16	Ø 17	Ø 18
L	5A	6A,6B,6C	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

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

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

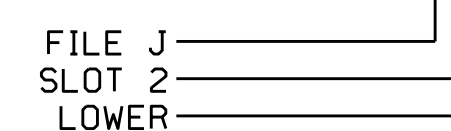
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
* S1	TB6-9,10	I9U	60	22	11	SYS					
* S2	TB6-11,12	I9L	62	24	13	SYS					
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9 ★	22	2	Y	Y			
6A,6B,6C	-	J1U	55	17 ★	55	5	Y	Y			3
	TB3-5,6	J2U	40	2	6	6	Y	Y			
	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			15

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

★ See Input Page Assignment programming details on sheet 3.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

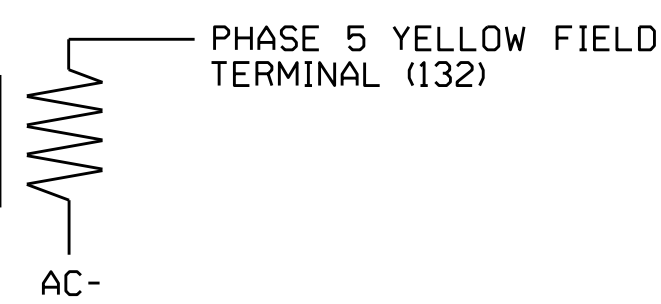
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY ADMINISTRATION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

Division 12 Gaston County Gastonia

SR 2200 (Cox Road) at I-85 Southbound Ramps

PLAN DATE: July 2017 REVIEWED BY:
 PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

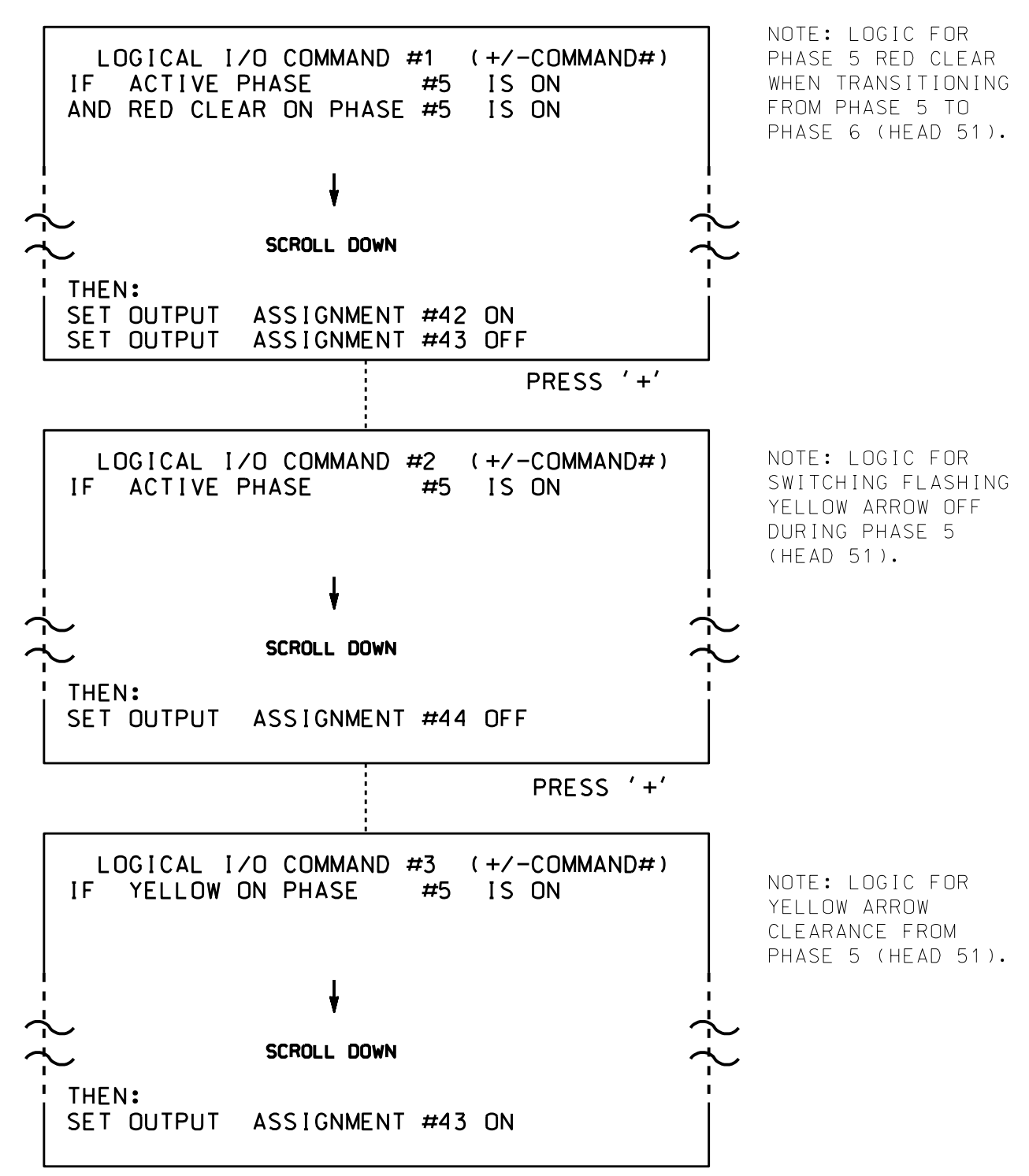
Keith M. Minns 7/14/2017
 2580766803445 DATE
 SIG. INVENTORY NO. 12-0902T

14-Jul-2017 09:57
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 J.peterson

**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).



NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEAD 51).

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

← NOTICE GREEN FLASH

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

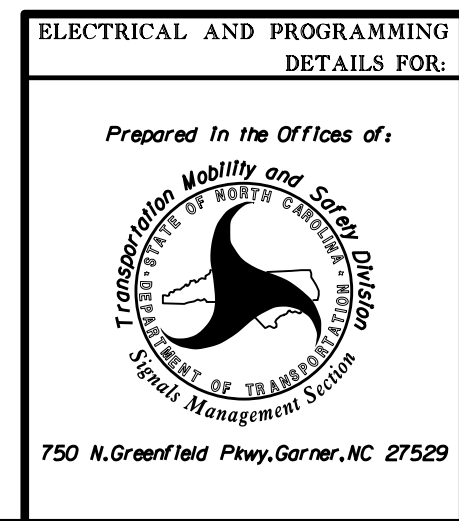
NOTICE PAGE 2 →

PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: :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)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

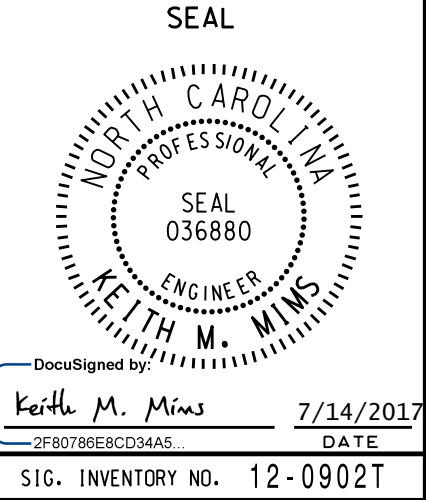
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 DESIGNED: May 2017
 SEALED: 7-10-17
 REVISED: N/A

Electrical Detail - Sheet 2 of 4



SR 2200 (Cox Road) at I-85 Southbound Ramps	
Division 12	Gaston County
PLAN DATE: July 2017	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



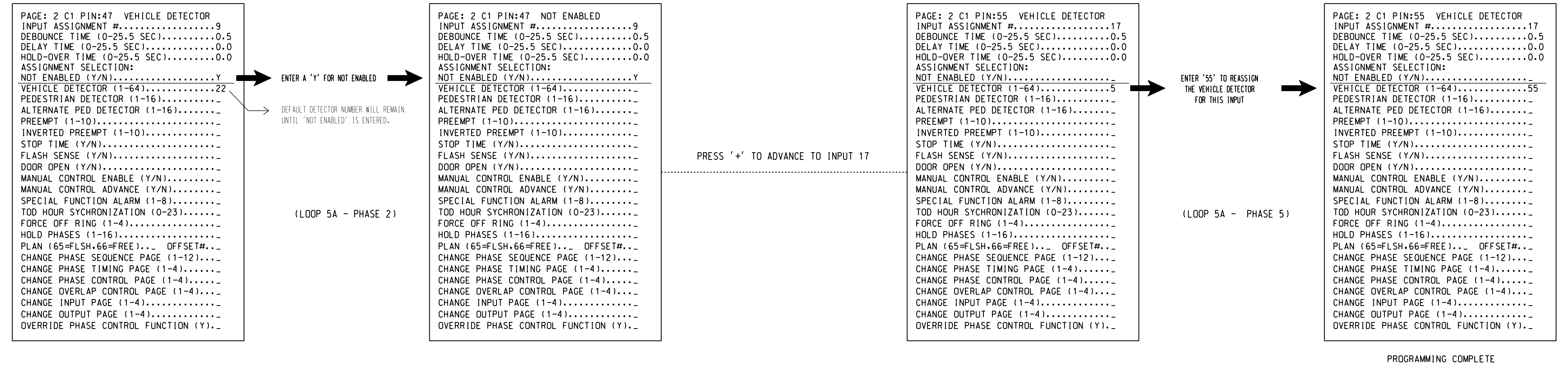
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 J.peterson

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.

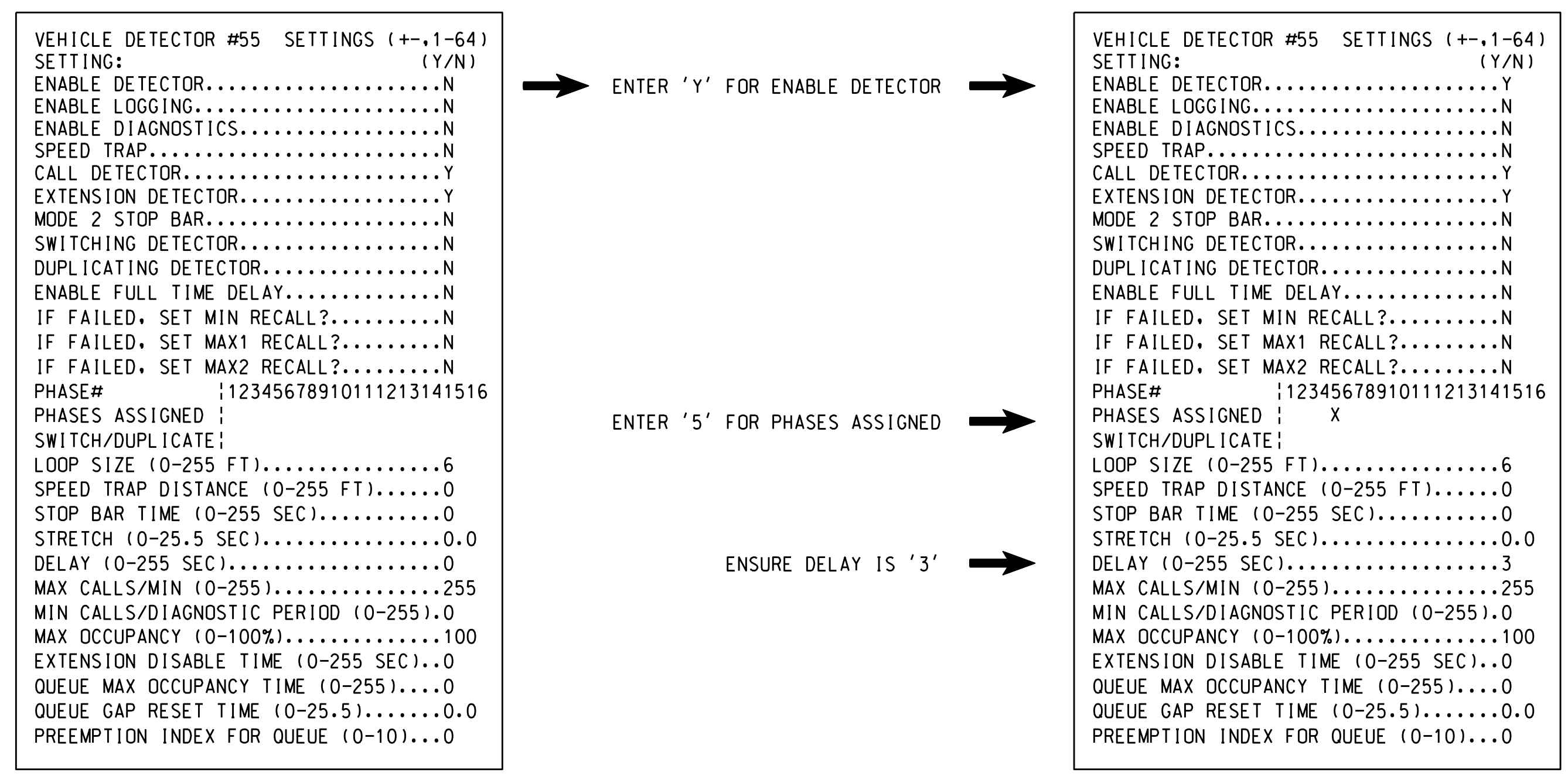
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



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: 12-0902T
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

14-JUL-2017 08:50 S:\ITS\AS\1\15_Signal\work\hgr\loop5\g_Morph\eter\son\2002T_Sum.ele.xxx.dgn T:peterson

Electrical Detail - Sheet 3 of 4

Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

Division 12 Gaston County Gastonia

SR 2200 (Cox Road) at I-85 Southbound Ramps

PLAN DATE: July 2017 REVIEWED BY: James Peterson

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: Keith M. Minis 7/14/2017 2:40:06 PM

SIG. INVENTORY NO. 12-0902T

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SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 KEITH M. MINIS

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 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.

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

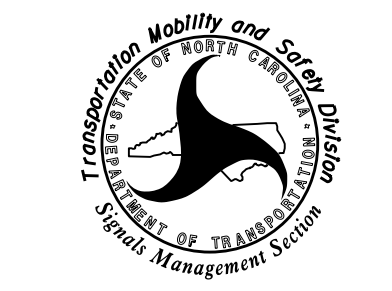
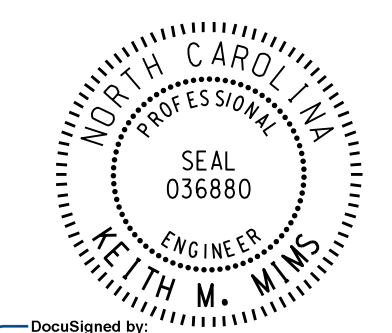
THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

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

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

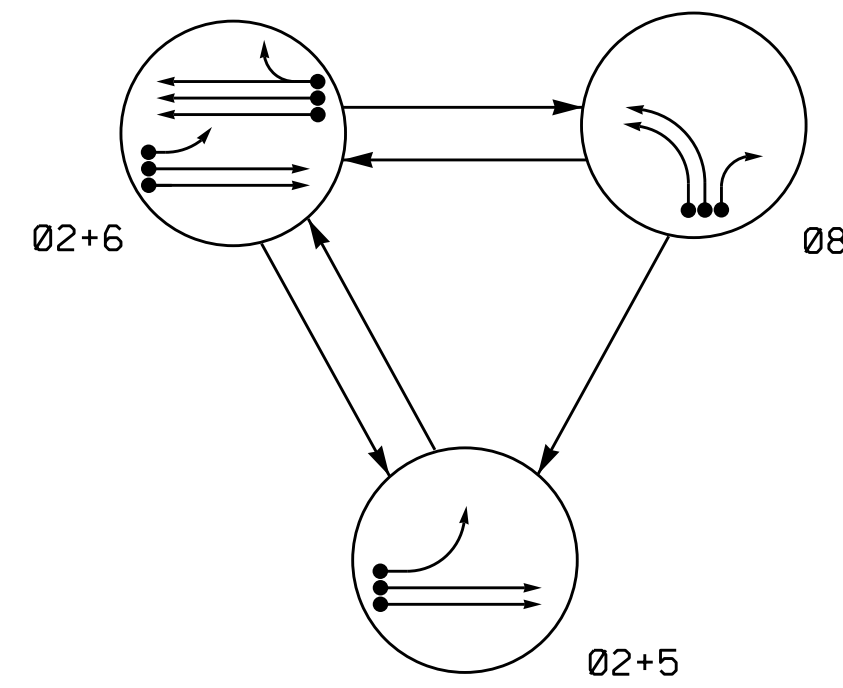
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0902T
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

Electrical Detail - Sheet 4 of 4

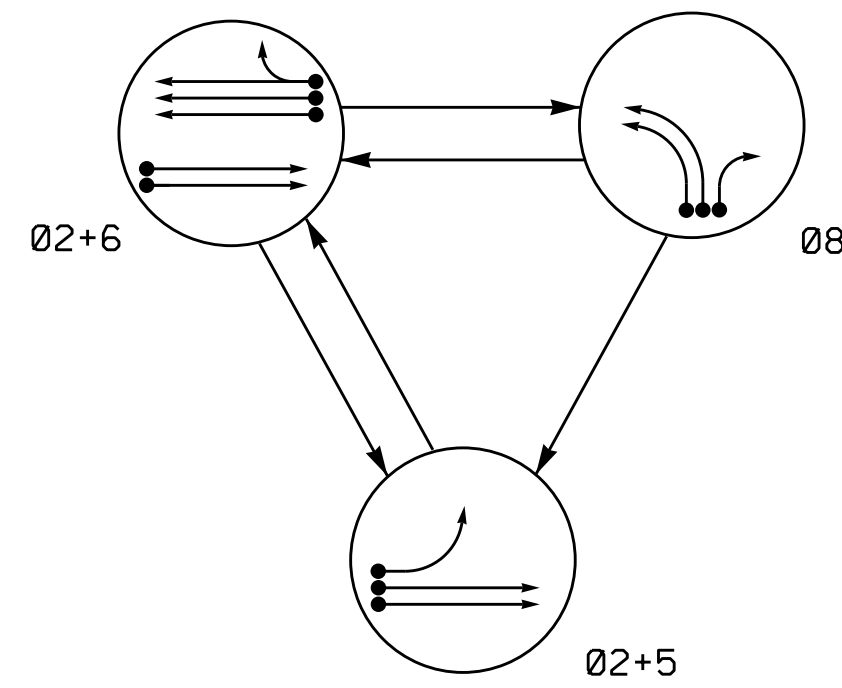
<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center; font-size: small;">Prepared In the Offices of:</p> <div style="text-align: center;">  <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p> </div>	<p>SR 2200 (Cox Road) at I-85 Southbound Ramps</p> <p>Division 12 Gaston County Gastonia</p> <p>PLAN DATE: July 2017 REVIEWED BY:</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 70%;">REVISIONS</th> <th style="width: 15%;">INIT.</th> <th style="width: 15%;">DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE				<p style="text-align: center; font-size: x-small;">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p style="text-align: center; font-size: x-small;">SEAL</p> <div style="text-align: center;">  <p style="font-size: x-small;">SEAL 036880 ENGINEER KEITH M. MINS</p> </div> <p style="font-size: x-small;">DocuSigned by: Keith M. Mins 7/14/2017 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 12-0902T</p>
REVISIONS	INIT.	DATE						

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jpeterson

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22	G	G	R	Y
51	-	-	-	-
61, 62	R	G	R	Y
81, 82, 83	R	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	FLASH
21, 22	G	G	R	Y
51	-	-	-	-
61, 62	R	G	R	Y
81, 82, 83	R	R	G	R

INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A,2B,2C	6X6	90	EXIST	-	2	Y	Y	-	-	-	-	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	15**	-	-
6A,6B,6C	6X6	90	EXIST	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8C	6X40	+5	2-4-2	-	8	Y	Y	-	-	15	-	-
S1	6X6	+125	EXIST	-	-	-	-	-	-	-	Y	-
S2	6X6	+125	EXIST	-	-	-	-	-	-	-	Y	-

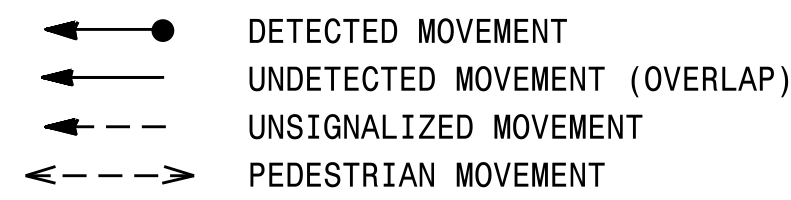
* Disable phase 2 call on loop 5A during Alternate Phasing Operation.
 ** Reduce delay on loop 5A to 3 seconds during Alternate Phasing Operation.

3 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia City System

NOTES

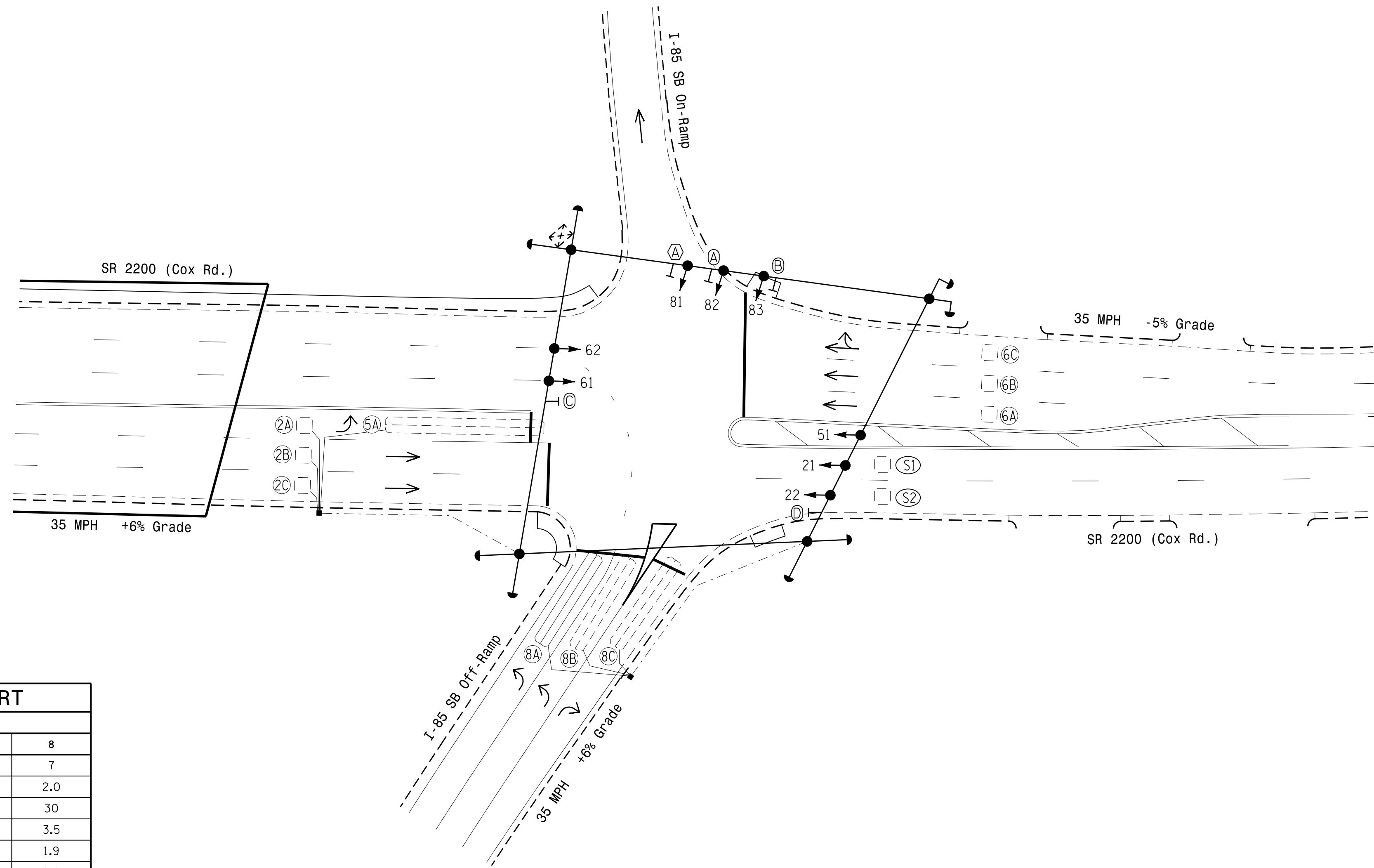
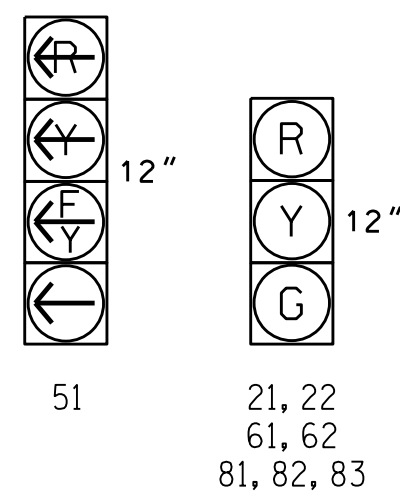
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Reposition existing signal heads 81, 82, and 83.
- Reposition existing signs "A" and "B".
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- See Pavement Marking Plans for stop bar locations.
- The Gastonia City Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0902

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

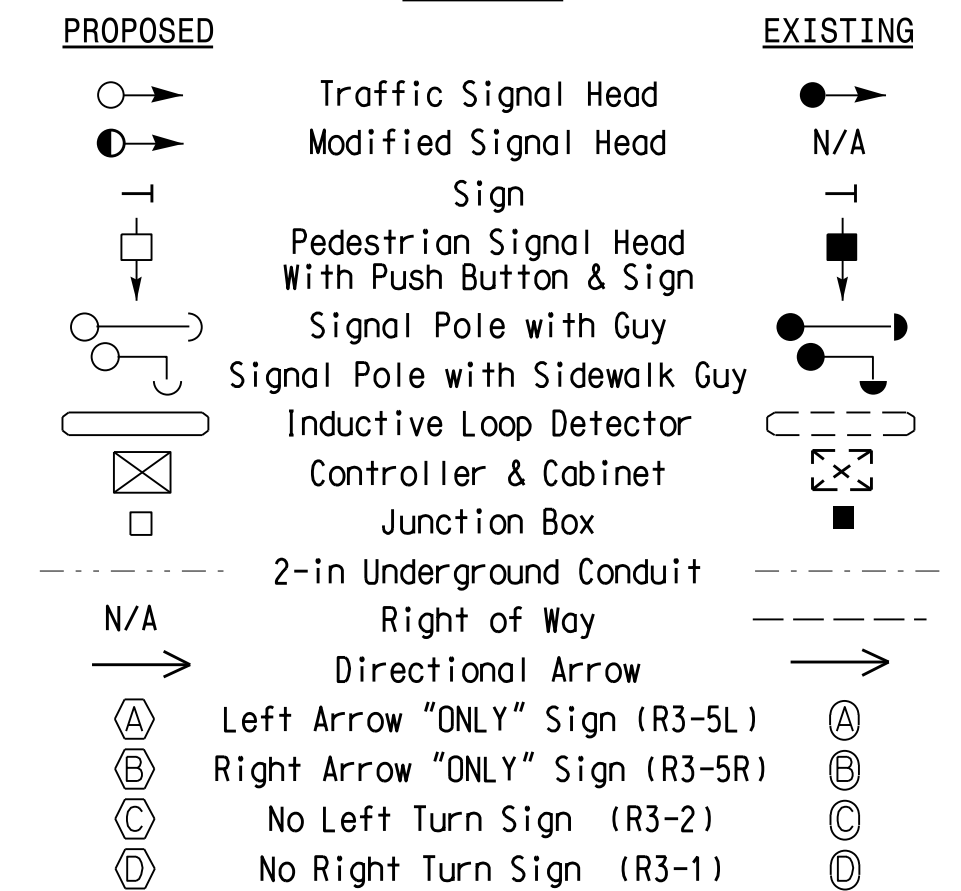
All Heads L.E.D.



FEATURE	PHASE			
	2	5	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	45	15	45	30
Yellow Clearance	4.2	3.0	4.2	3.5
Red Clearance	2.1	2.6	2.1	1.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

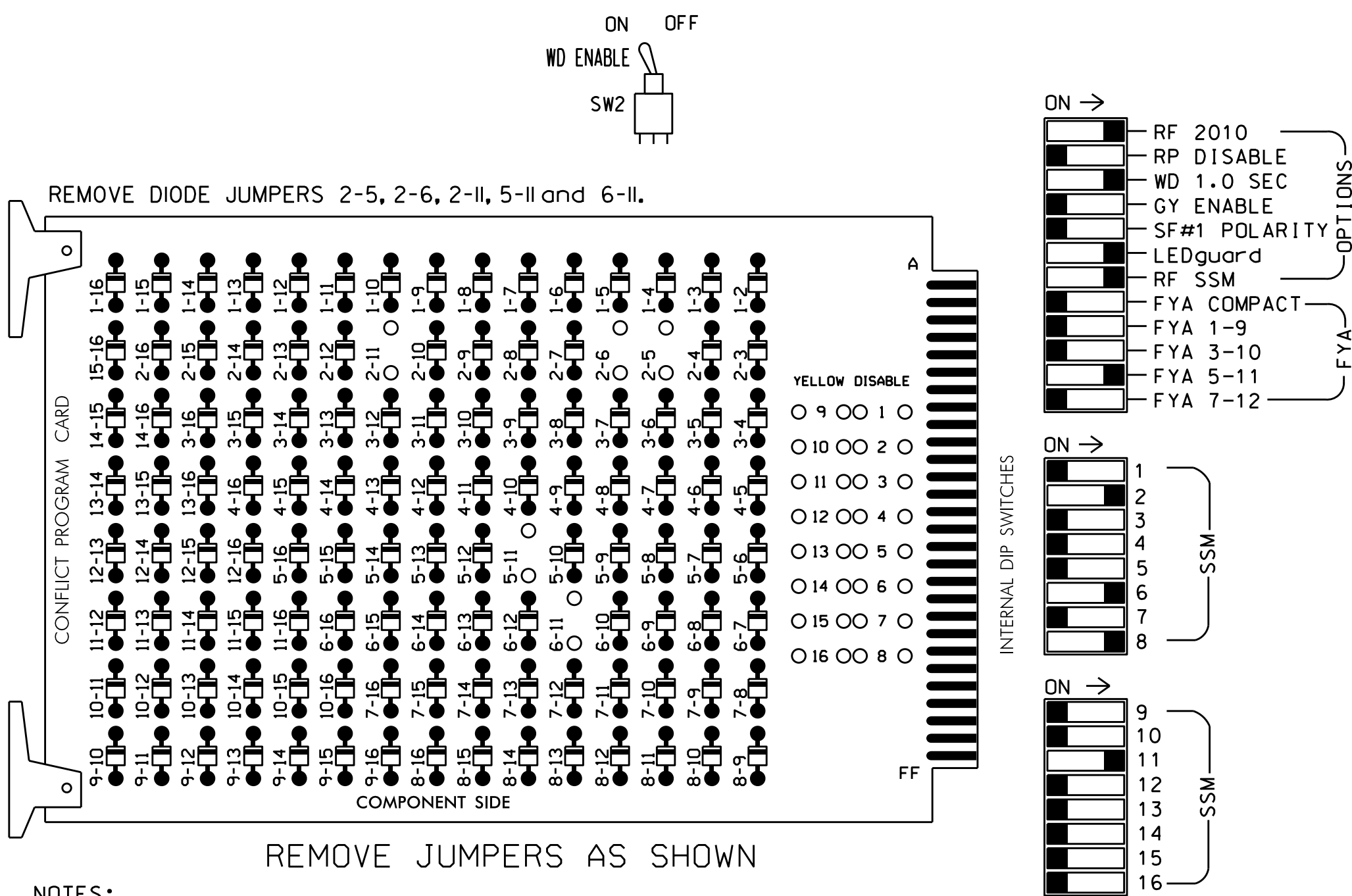


Signal Upgrade - Final Design

	SR 2200 (Cox Rd.) at I-85 Southbound Ramps		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 043914 RICHARD N. ZINZER
	Division 12 Gaston County Gastonia PLAN DATE: May 2017 REVIEWED BY: T.J. Williams PREPARED BY: R.N. Zinzer REVIEWED BY:	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
750 N. Greenfield Pkwy, Garner, NC 27529 SCALE: 0 30 1"=30'	REVISIONS:	INIT. DATE:	DATE: 7/10/2017 DATE: 7/10/2017 DATE: 7/10/2017

**EDI MODEL 2010ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,4, 5,7,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Startup In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Gastonia City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S6,S8,S12
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
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	NU	NU	51	61,62	NU	NU	81,82 83	NU	NU	NU	NU	51	NU	NU	
RED		128						134			107								
YELLOW		129					*	135			108								
GREEN		130						136			109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

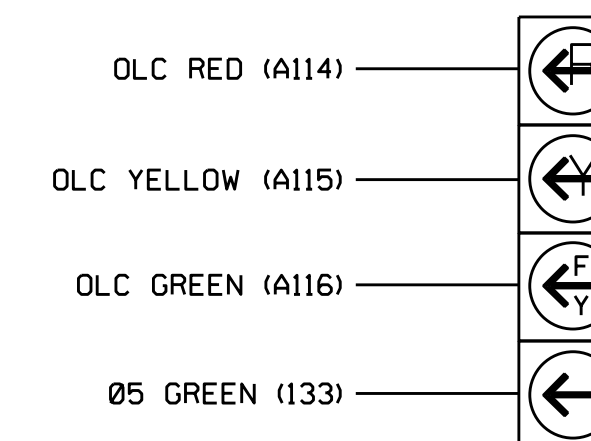
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



51

NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

FILE	U	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	S	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	SYS. DET. S1	S	S	S	S	FS
	2A,2B,2C	NOT USED	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	SYS. DET. S2	∅ 9	∅ 10	∅ 11	∅ 12	DC ISOLATOR
"J"	∅ 5	∅ 6	∅ 7	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	S	S	S	S	S	S
	5A	6A,6B,6C	∅ 7	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	DC ISOLATOR

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

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

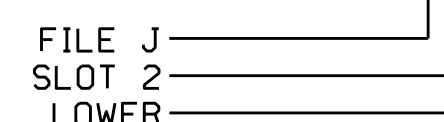
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
* S1	TB6-9,10	I9U	60	22	11	SYS					
* S2	TB6-11,12	I9L	62	24	13	SYS					
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9 ★	22	2	Y	Y			
6A,6B,6C	-	J1U	55	17 ★	55	5	Y	Y			3
	TB3-5,6	J2U	40	2	6	6	Y	Y			
	TB5-9,10	J6U	42	4	8	8	Y	Y			
	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			15

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

★ See Input Page Assignment programming details on sheet 3.

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

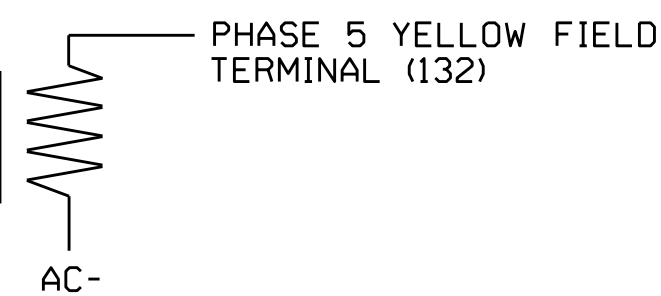
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY ADMINISTRATION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

SR 2200 (Cox Road) at I-85 Southbound Ramps

Division 12 Gaston County Gastonia

PLAN DATE: July 2017 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

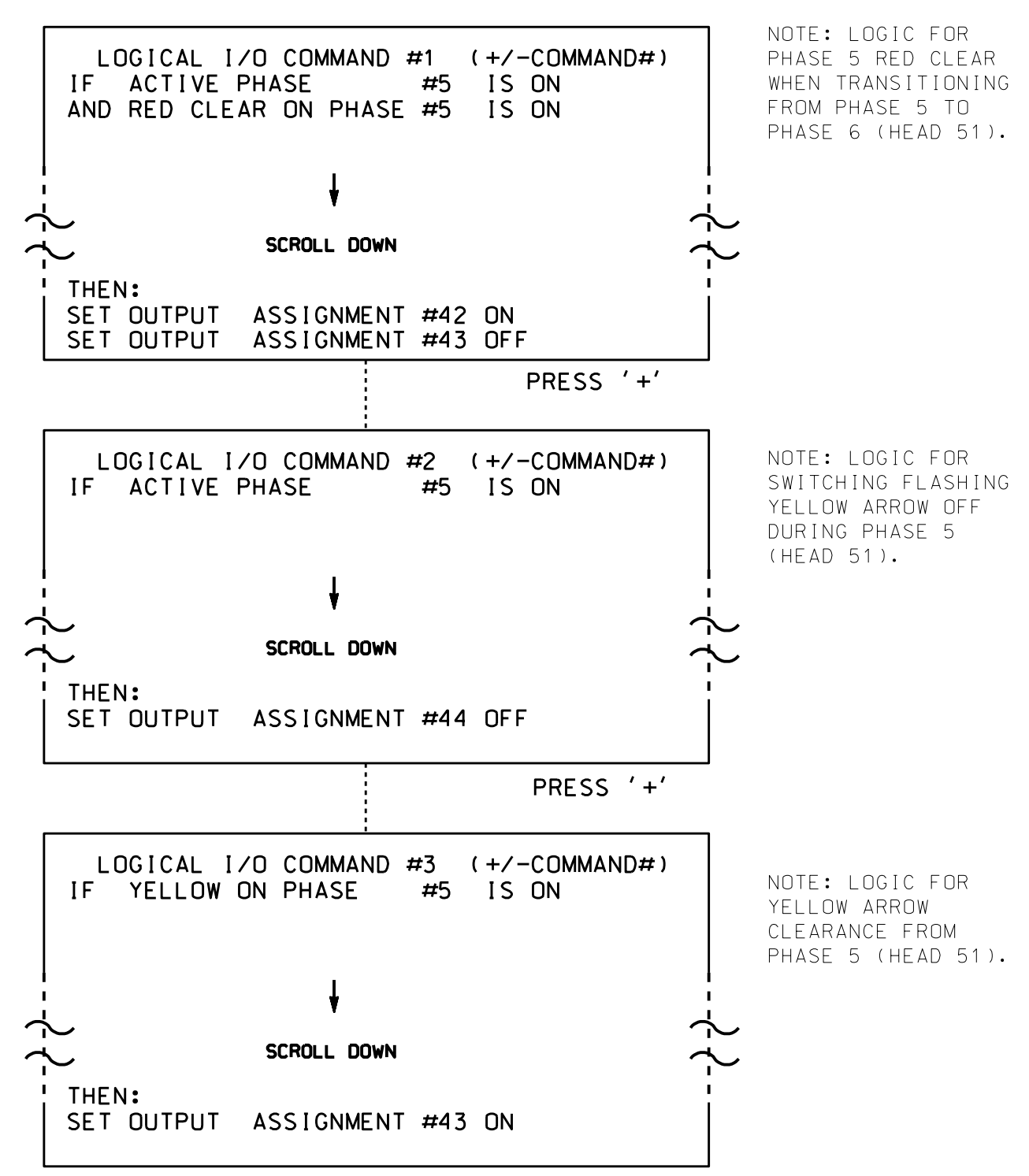
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SIG. INVENTORY NO. 12-0902

**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).



NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEAD 51).

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

← NOTICE GREEN FLASH

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

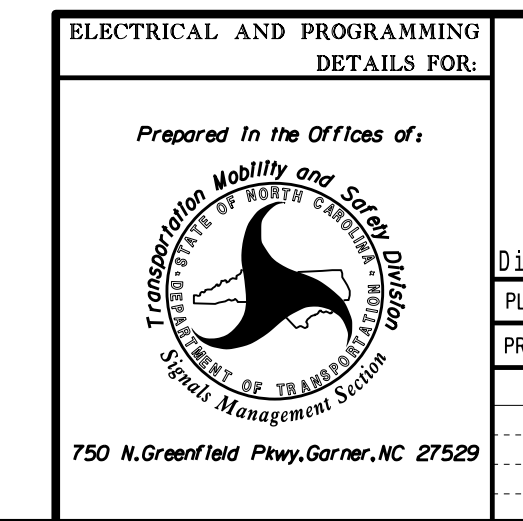
NOTICE PAGE 2 →

PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: 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)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-0902
 DESIGNED: May 2017
 SEALED: 7-10-17
 REVISED: N/A

Electrical Detail - Sheet 2 of 4



SR 2200 (Cox Road) at I-85 Southbound Ramps	
Division 12	Gaston County Gastonia
PLAN DATE: July 2017	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: Keith M. Minis 7/14/2017
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 DATE
 SIG. INVENTORY NO. 12-0902

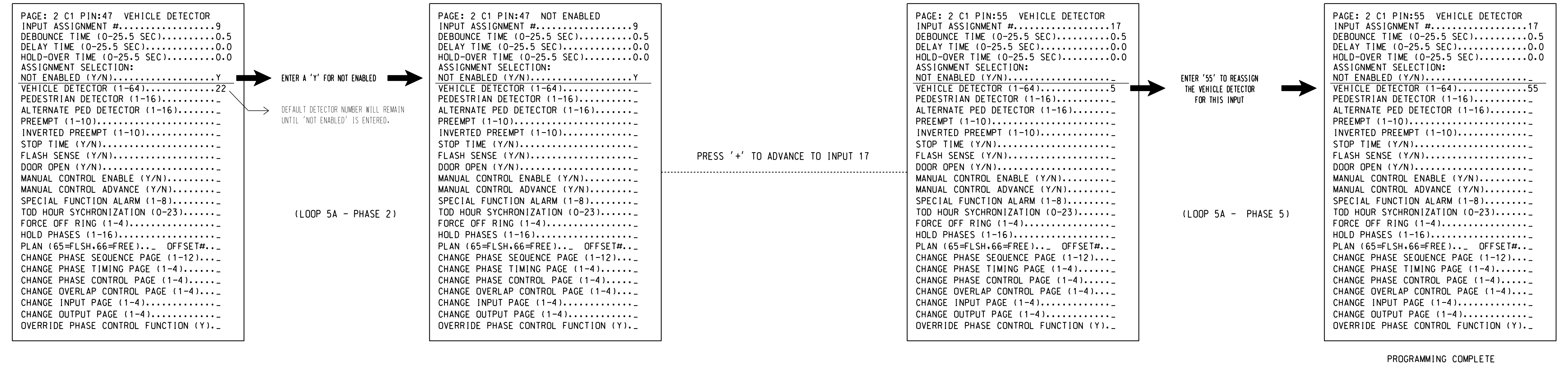
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 jpeterson

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.

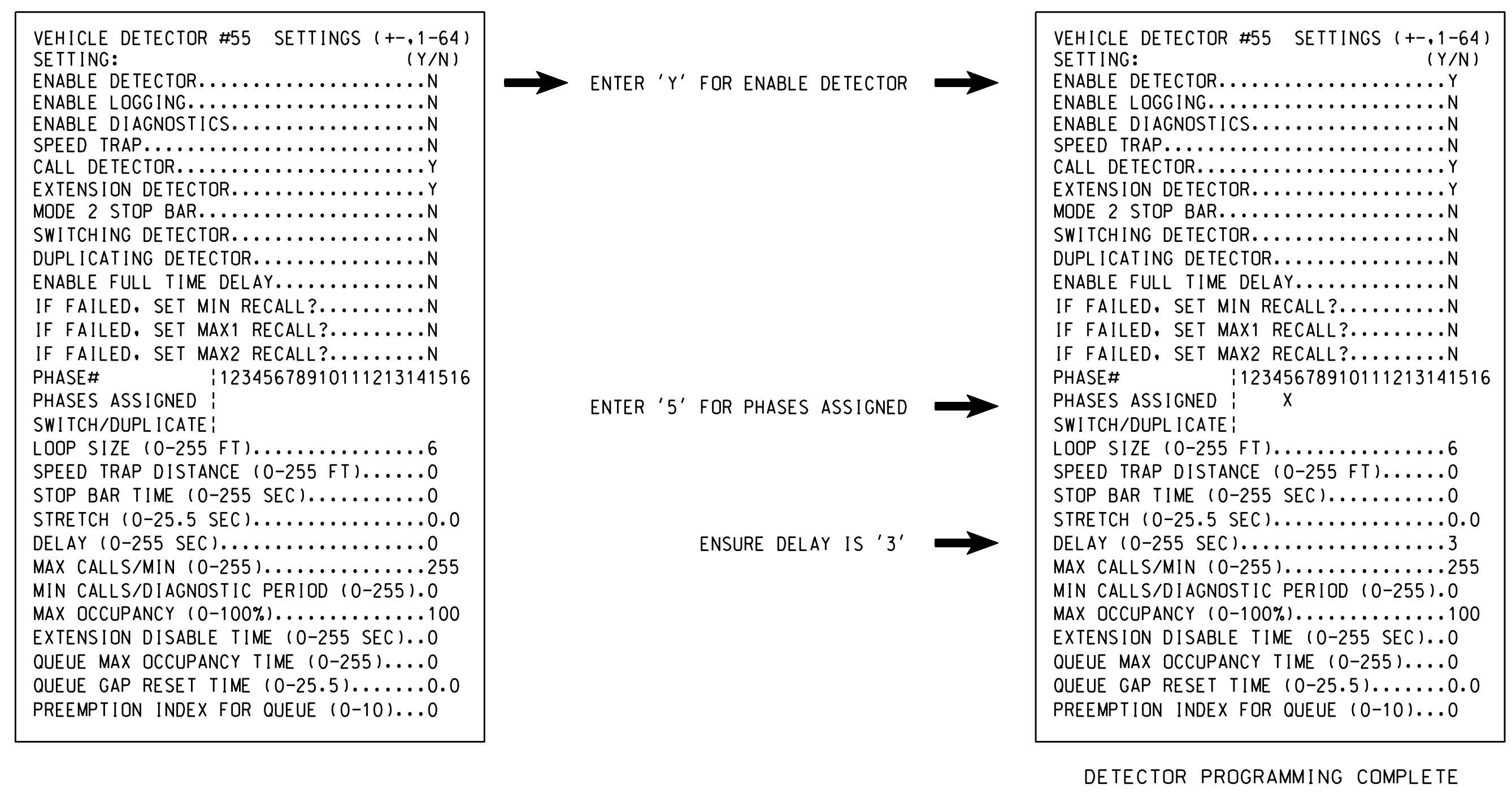
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



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: 12-0902
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

14-JUL-2017 09:00 S:\ITS\AS\ITS_Signals\work\hgr\loop5a\g_Morph\eter\son\k120902_sml.ele_xxx.dgn T:peterson

Electrical Detail - Sheet 3 of 4

Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

DETAILS FOR: SR 2200 (Cox Road) at I-85 Southbound Ramps

Division 12 Gaston County Gastonia

PLAN DATE: July 2017 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

DocuSigned by: Keith M. Minns 7/14/2017 2:40:06 PM

SIG. INVENTORY NO. 12-0902

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SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 KEITH M. MINNS

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 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.

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

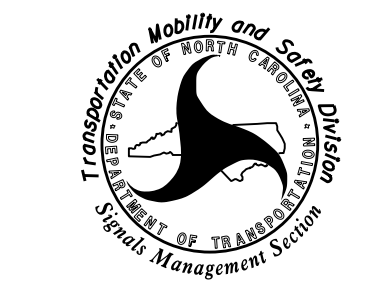
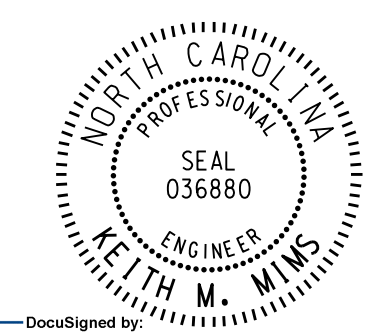
THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

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

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

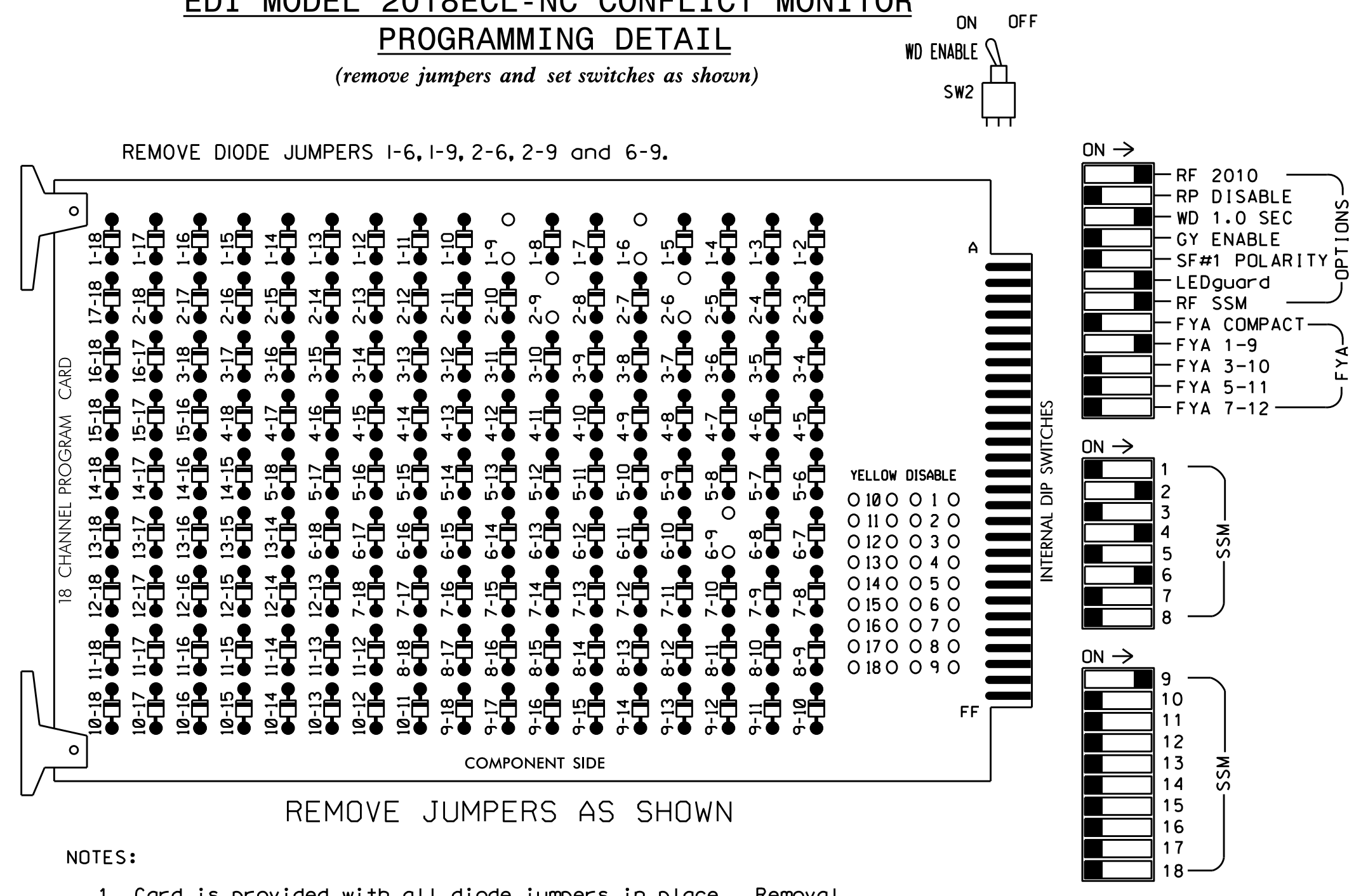
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-0902
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

Electrical Detail - Sheet 4 of 4

<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center; font-size: small;">Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION OF NORTH CAROLINA Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529</p> 	<p>SR 2200 (Cox Road) at I-85 Southbound Ramps</p> <p>Division 12 Gaston County Gastonia</p> <p>PLAN DATE: July 2017 REVIEWED BY:</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;">REVISIONS</th> <th style="width: 10%;">INIT.</th> <th style="width: 10%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="text-align: center; font-size: x-small;">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p style="text-align: center;">SEAL</p>  <p style="text-align: center; font-size: x-small;">DocuSigned by: Keith M. Mims 7/14/2017 DATE</p> <p style="text-align: center; font-size: x-small;">SIG. INVENTORY NO. 12-0902</p>
REVISIONS	INIT.	DATE												

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 2 and 6 for Startup In Green.
4. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
5. The cabinet and controller are part of the Gastonia Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42 43	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	

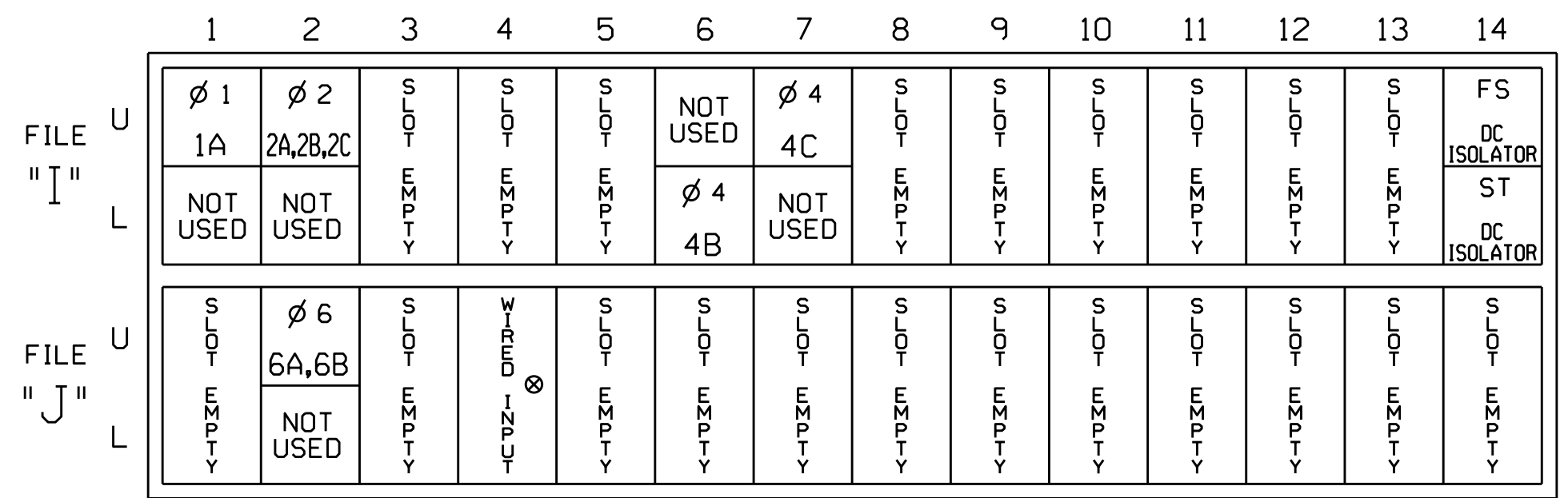
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



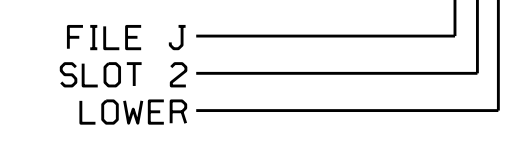
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

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
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10★	26	6	Y	Y			
	-	I1U	56	18★	51	1	Y	Y			3
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			

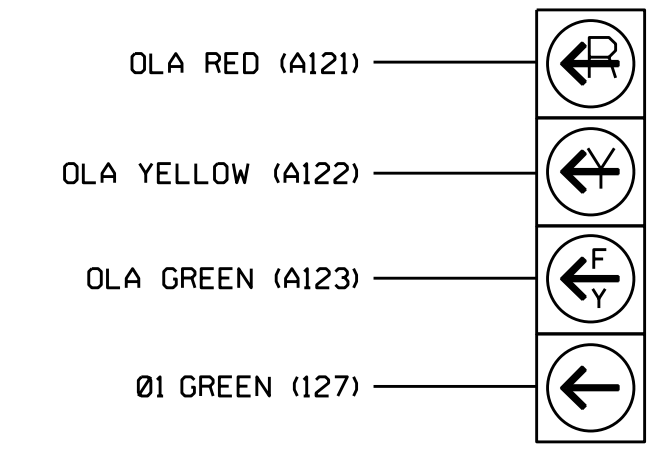
★ Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

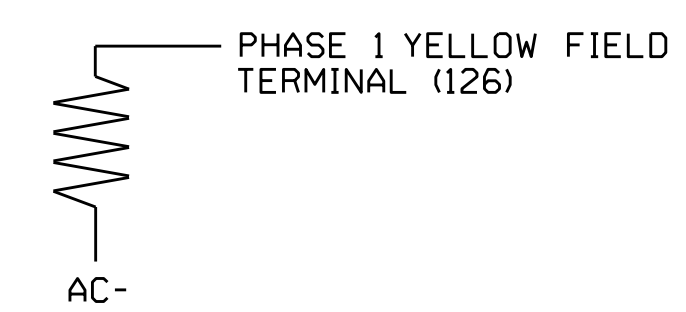
NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 4

Electrical and Programming Details for: SR 2200 (Cox Rd.) at I-85 Northbound Ramps

Division 12 Gaston County Gastonia

PLAN DATE: June 2017 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: KEITH M. MINS, ENGINEER, 036880

DocuSigned by: Keith M. Mins 7/14/2017

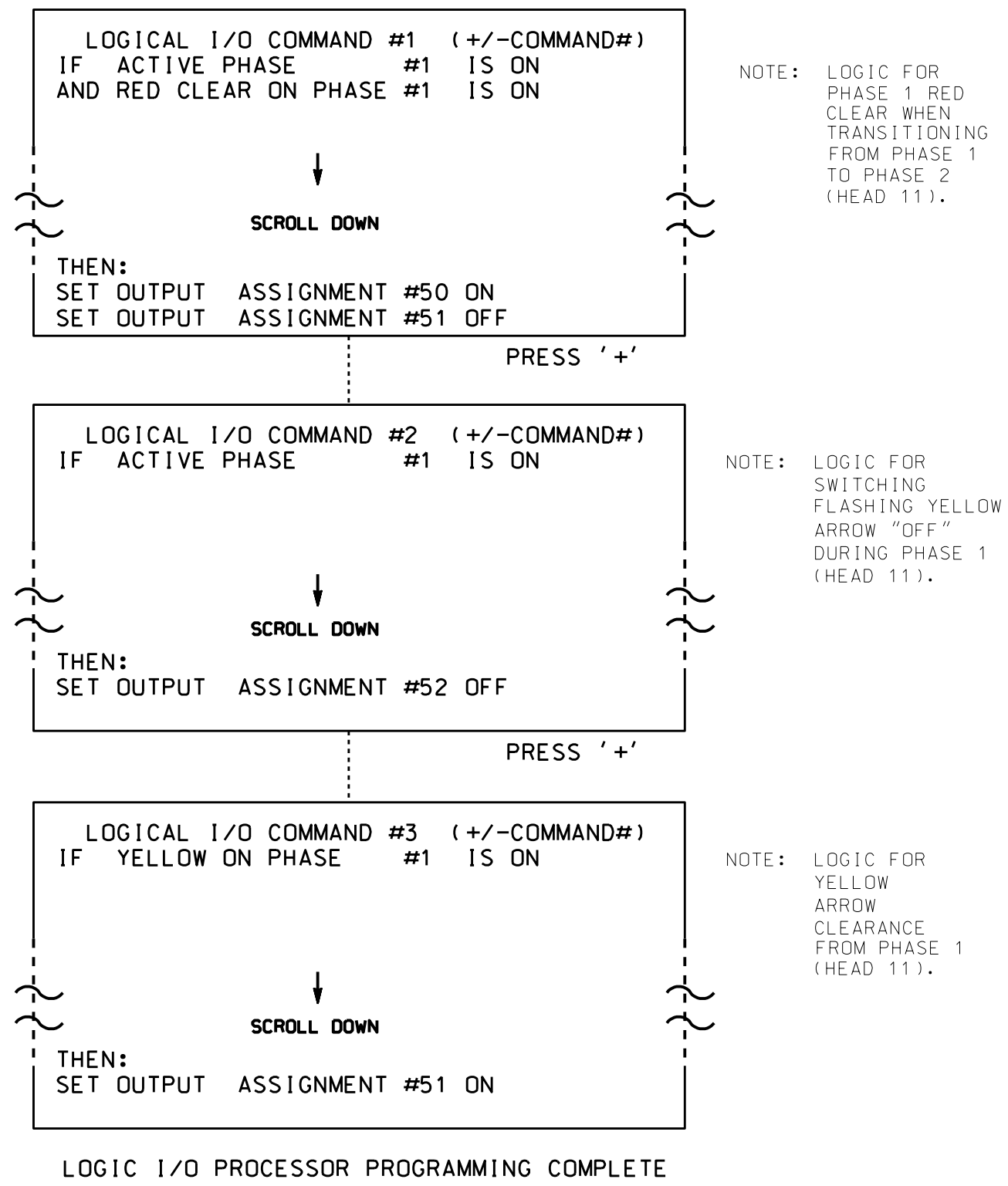
SIG. INVENTORY NO. 12-1086T

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

(program controller as shown below)

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



OUTPUT REFERENCE SCHEDULE	
OUTPUT 50 =	Overlap A Red
OUTPUT 51 =	Overlap A Yellow
OUTPUT 52 =	Overlap A 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 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...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.

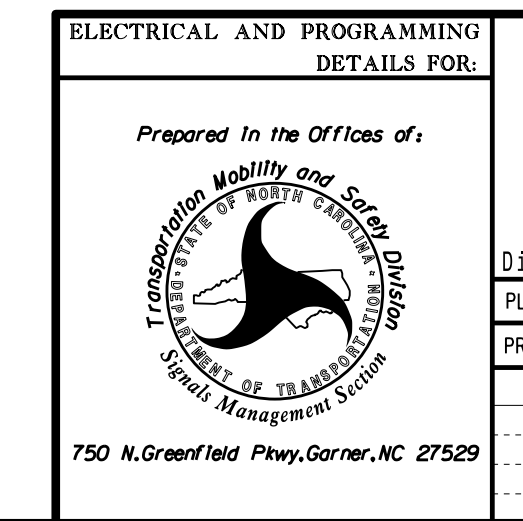
NOTICE PAGE 2 →

PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 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)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1086T
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

Electrical Detail - Sheet 2 of 4



SR 2200 (Cox Rd.) at I-85 Northbound Ramps	
Division 12	Gastonia
PLAN DATE: June 2017	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:
REVISIONS	INIT. DATE

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

SEAL

NORTH CAROLINA
PROFESSIONAL
ENGINEER
KEITH M. MIMS

DocuSigned by:
Keith M. Mims 7/14/2017
2F8078E6C03445 DATE

SIG. INVENTORY NO. 12-1086T

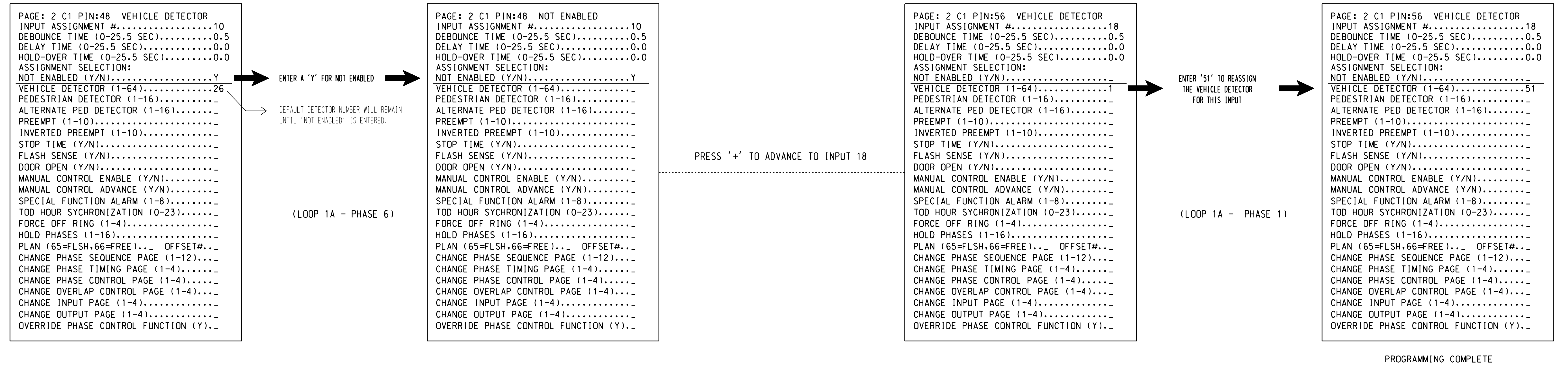
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J.Peterson

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

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

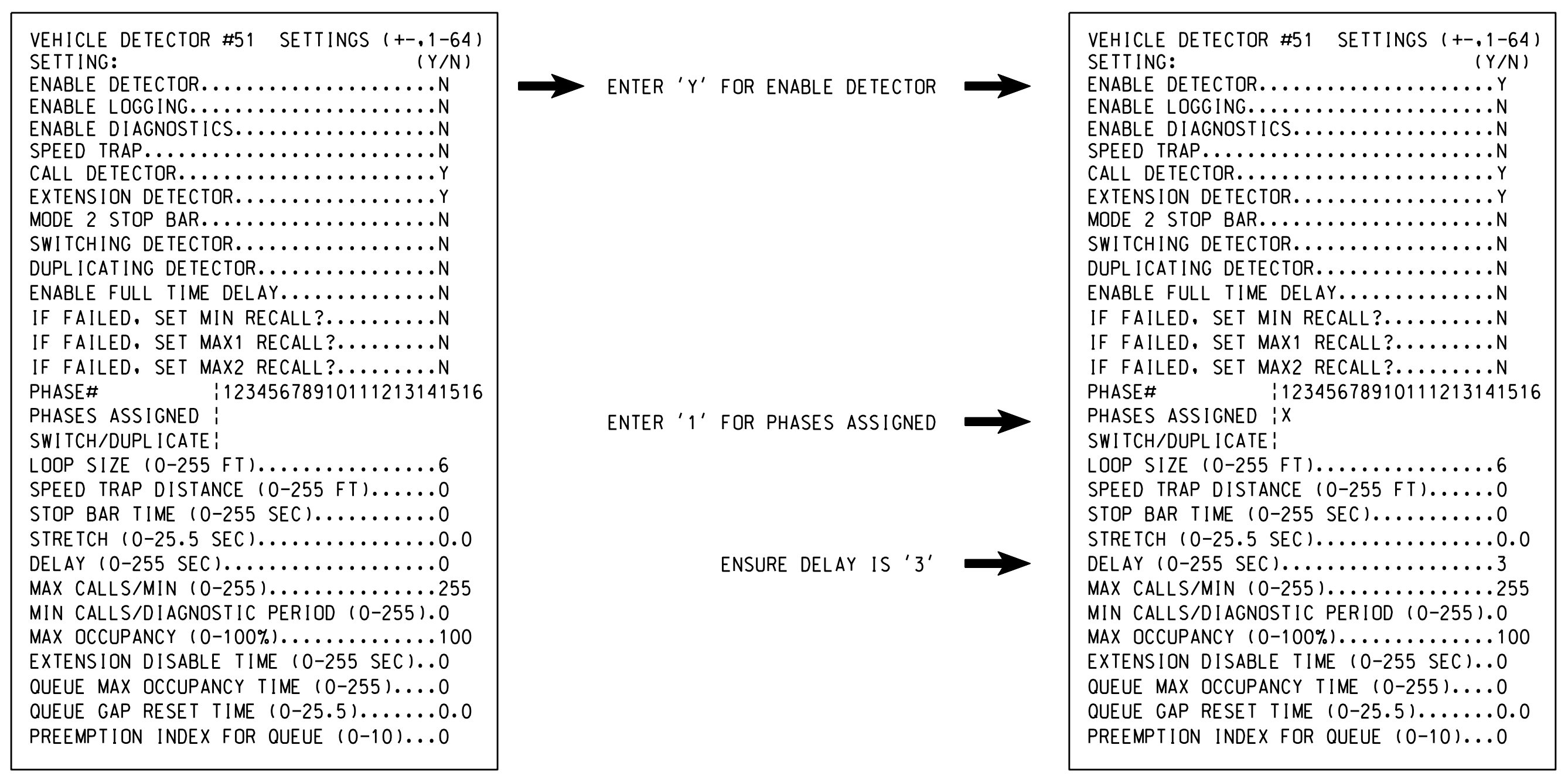
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



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: 12-1086T
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

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Electrical Detail - Sheet 3 of 4

	Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY INSTITUTE STATE OF NORTH CAROLINA Signal Management System 750 N. Greenfield Pkwy, Garner, NC 27529		Division 12 Gaston County Gastonia SR 2200 (Cox Rd.) at I-85 Northbound Ramps PLAN DATE: June 2017 REVIEWED BY: PREPARED BY: James Peterson REVIEWED BY:		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL Keith M. Minis ENGINEER DocuSigned by: Keith M. Minis 7/14/2017 2F807868EC0344S DATE SIG. INVENTORY NO. 12-1086T
	REVISIONS INIT. DATE		REVISIONS INIT. DATE		

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 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.

<u>PHASING</u>	<u>INPUTS PAGE</u>	<u>OVERLAPS PAGE</u>
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u>	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":

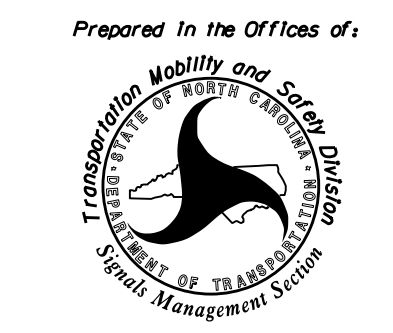
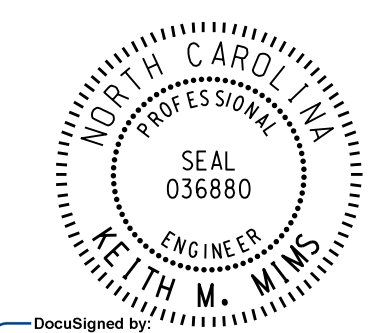
OVERLAPS PAGE 2: Modifies overlap parent phases for head 11 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 12-1086T
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

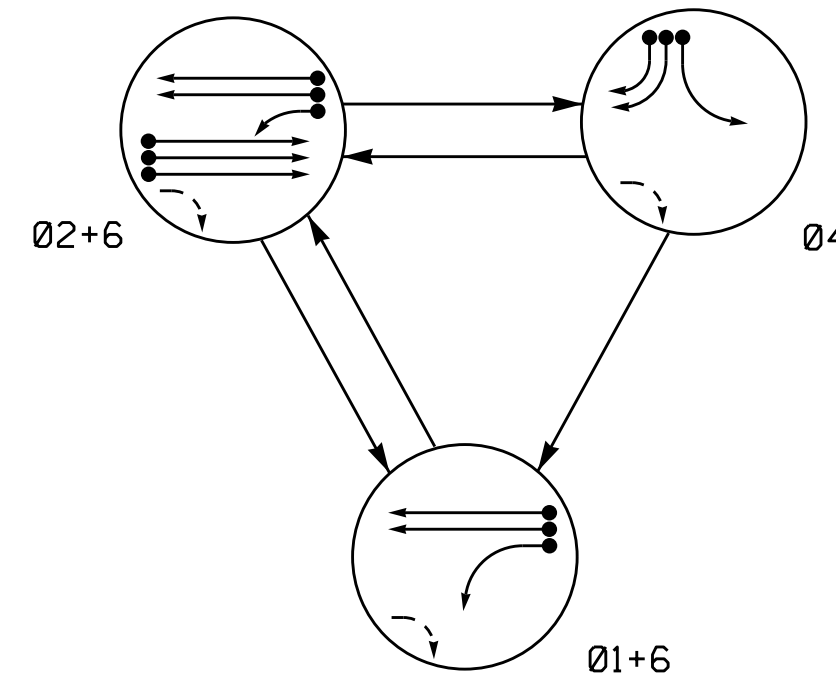
Electrical Detail - Sheet 4 of 4

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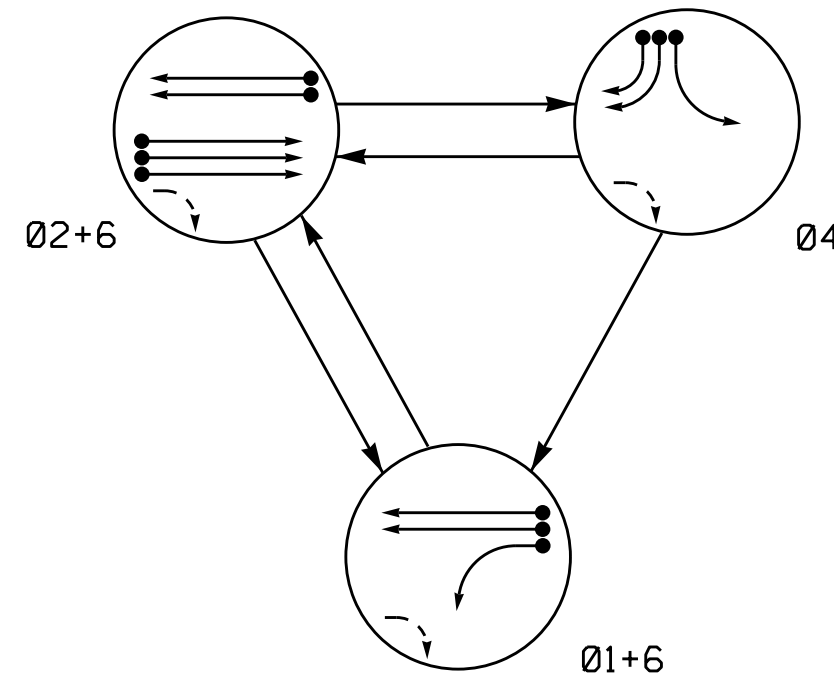
<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared In the Offices of:</p>  <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 2200 (Cox Rd.) at I-85 Northbound Ramps</p> <p style="font-size: x-small;">Division 12 Gaston County Gastonia</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: June 2017</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: James Peterson</td> <td>REVIEWED BY:</td> </tr> </table> <table style="width: 100%; font-size: x-small;"> <tr> <td>REVISIONS</td> <td>INIT.</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	PLAN DATE: June 2017	REVIEWED BY:	PREPARED BY: James Peterson	REVIEWED BY:	REVISIONS	INIT.	DATE							<p style="text-align: center;">SEAL</p>  <p style="font-size: x-small;">DocuSigned by: Keith M. Mims 7/14/2017 2F8078E6CD3445 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 12-1086T</p>
PLAN DATE: June 2017	REVIEWED BY:														
PREPARED BY: James Peterson	REVIEWED BY:														
REVISIONS	INIT.	DATE													

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DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	F L S H
11	←	←	←	←
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

ALTERNATE PHASING TABLE OF OPERATION

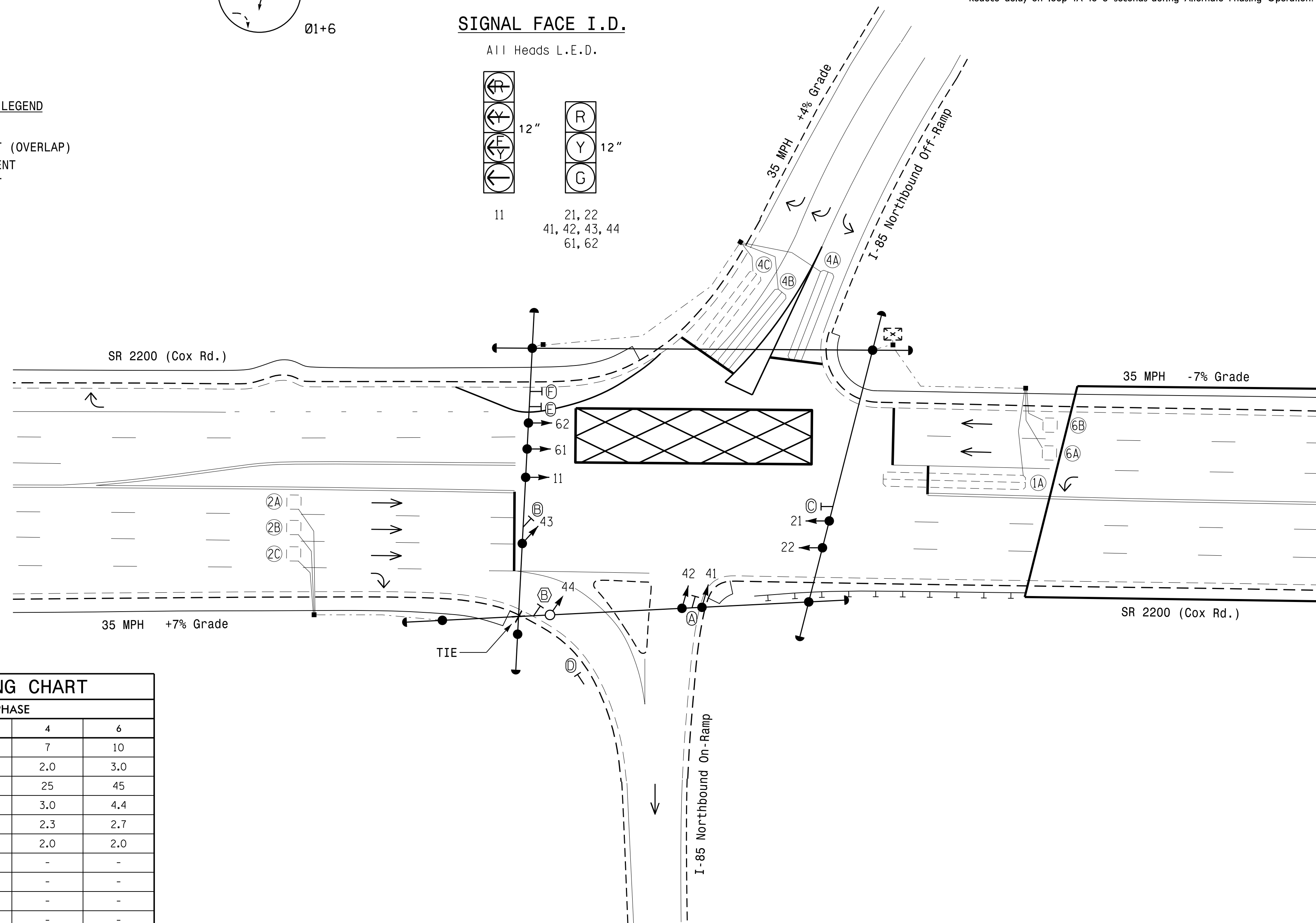
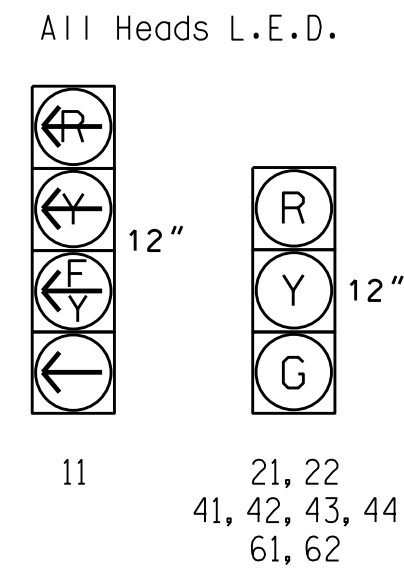
SIGNAL FACE	PHASE			
	01+6	02+6	04	F L S H
11	←	←	←	←
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6X60	+18	2-4-2	-	1	Y	Y	-	15**	-
2A, 2B, 2C	6X6	90	EXIST	-	2	Y	Y	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	15	-
4C	6X40	0	2-4-2	-	4	Y	Y	-	15	-
6A, 6B	6X6	62	3	-	6	Y	Y	-	-	-

* Disable phase 6 call on loop 1A during Alternate Phasing Operation.
 ** Reduce delay on loop 1A to 3 seconds during Alternate Phasing Operation.

SIGNAL FACE I.D.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	10	7	10
Extension 1 *	2.0	3.0	2.0	3.0
Max Green 1 *	15	45	25	45
Yellow Clearance	3.2	4.4	3.0	4.4
Red Clearance	3.7	2.7	2.3	2.7
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	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.

3 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- The Gastonia City Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 1086

LEGEND

- | | | | |
|--|---|--|------------------------------|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | N/A |
| | Proposed Pedestrian Signal Head | | N/A |
| | Proposed Signal Pole with Guy | | N/A |
| | Proposed Signal Pole with Sidewalk Guy | | N/A |
| | Proposed Inductive Loop Detector | | N/A |
| | Proposed Controller & Cabinet | | N/A |
| | Proposed Junction Box | | N/A |
| | Proposed 2-in Underground Conduit | | N/A |
| | Proposed Right of Way | | N/A |
| | Proposed Directional Arrow | | N/A |
| | Proposed Left Arrow "ONLY" Sign (R3-5L) | | N/A |
| | Proposed Right Arrow "ONLY" Sign (R3-5R) | | N/A |
| | Proposed No Left Turn Sign (R3-2) | | N/A |
| | Proposed "YIELD" Sign (R1-2) | | N/A |
| | Proposed "DO NOT BLOCK INTERSECTION" Sign (R10-7) | | N/A |
| | Proposed No Right Turn Sign (R3-1) | | N/A |

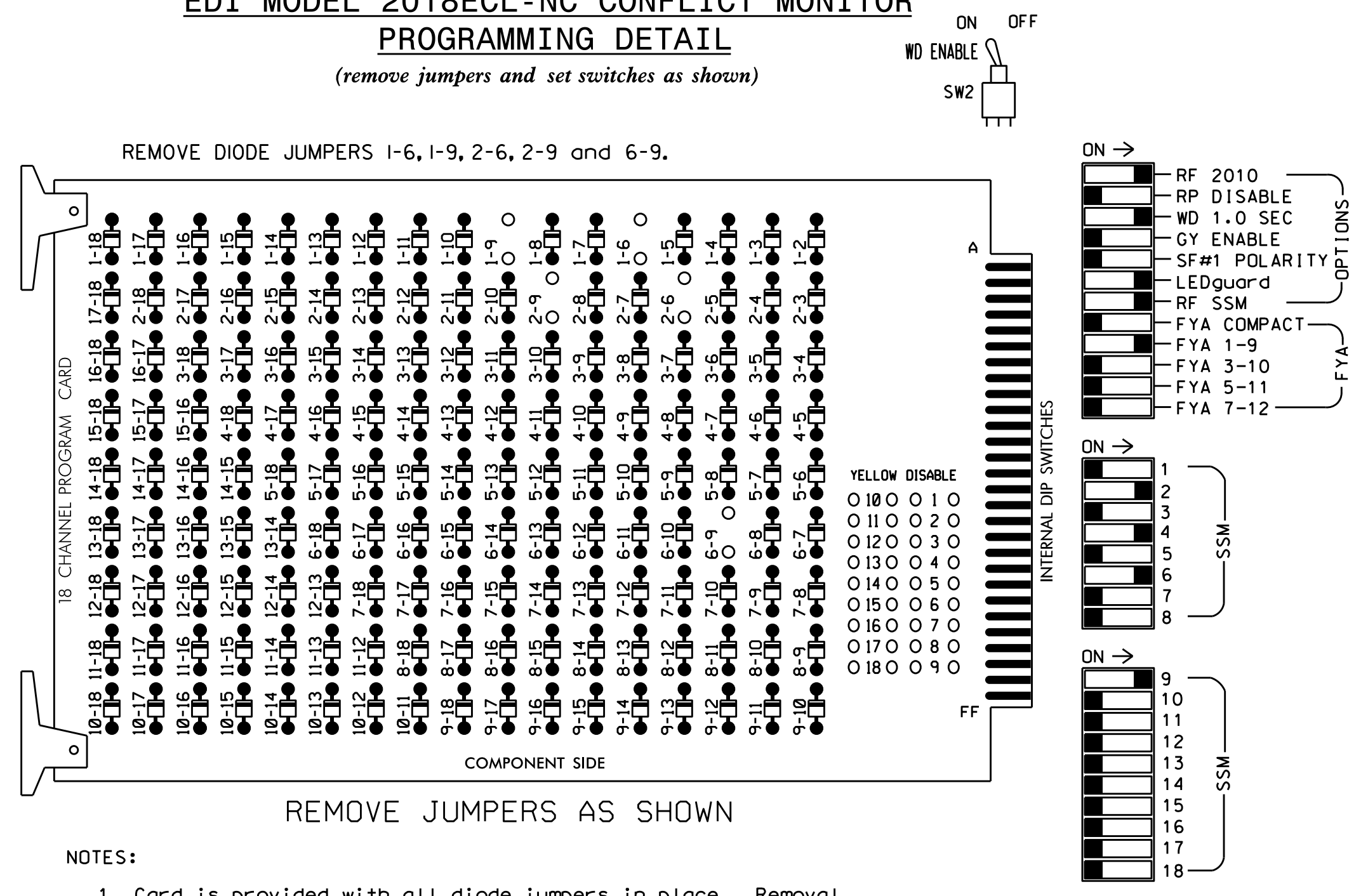
Signal Upgrade - Final Design

	SR 2200 (Cox Rd.) at I-85 Northbound Ramps		
	Division 12 Gaston County Gastonia PLAN DATE: May 2017 REVIEWED BY: T.J. Williams PREPARED BY: R.N. Zinser REVIEWED BY:	REVISIONS:	
SCALE: 1" = 30' 	DATE: 7/10/2017		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 2 and 6 for Startup In Green.
4. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
5. The cabinet and controller are part of the Gastonia Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42 43,44	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2 2A,2B,2C	∅ 3 -∅ 3	∅ 4 -∅ 4	∅ 5 -∅ 5	∅ 6 -∅ 6	∅ 7 -∅ 7	∅ 8 -∅ 8	∅ 9 -∅ 9	∅ 10 -∅ 10	∅ 11 -∅ 11	∅ 12 -∅ 12	∅ 13 -∅ 13	∅ 14 -∅ 14
L	NOT USED	NOT USED	∅ 3 -∅ 3	∅ 4 -∅ 4	∅ 5 -∅ 5	∅ 6 -∅ 6	∅ 7 -∅ 7	∅ 8 -∅ 8	∅ 9 -∅ 9	∅ 10 -∅ 10	∅ 11 -∅ 11	∅ 12 -∅ 12	∅ 13 -∅ 13	∅ 14 -∅ 14
U	∅ 1 -∅ 1	∅ 2 -∅ 2	∅ 3 -∅ 3	∅ 4 -∅ 4	∅ 5 -∅ 5	∅ 6 -∅ 6	∅ 7 -∅ 7	∅ 8 -∅ 8	∅ 9 -∅ 9	∅ 10 -∅ 10	∅ 11 -∅ 11	∅ 12 -∅ 12	∅ 13 -∅ 13	∅ 14 -∅ 14
L	∅ 1 -∅ 1	∅ 2 -∅ 2	∅ 3 -∅ 3	∅ 4 -∅ 4	∅ 5 -∅ 5	∅ 6 -∅ 6	∅ 7 -∅ 7	∅ 8 -∅ 8	∅ 9 -∅ 9	∅ 10 -∅ 10	∅ 11 -∅ 11	∅ 12 -∅ 12	∅ 13 -∅ 13	∅ 14 -∅ 14

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

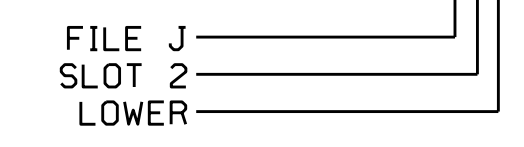
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	11U	56	18	1	1	Y	Y			15
	-	J4U	48	10★	26	6	Y	Y			
	-	11U	56	18★	51	1	Y	Y			3
2A,2B,2C	TB2-5,6	12U	39	1	2	2	Y	Y			
4A	TB4-9,10	16U	41	3	4	4	Y	Y			
4B	TB4-11,12	16L	45	7	14	4	Y	Y			15
4C	TB6-1,2	17U	65	27	34	4	Y	Y			15
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y			

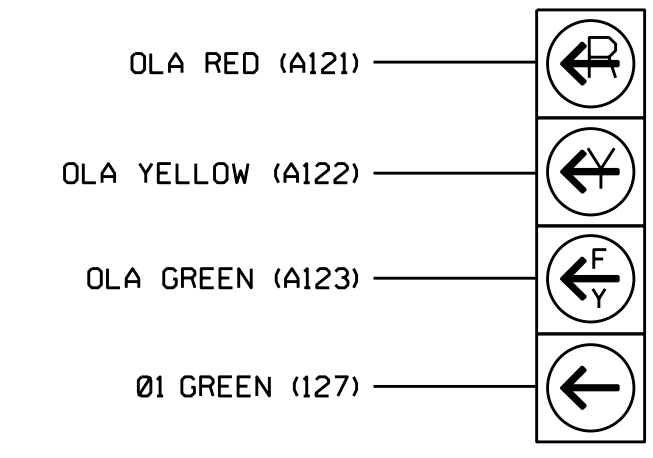
¹Add jumper from 11-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

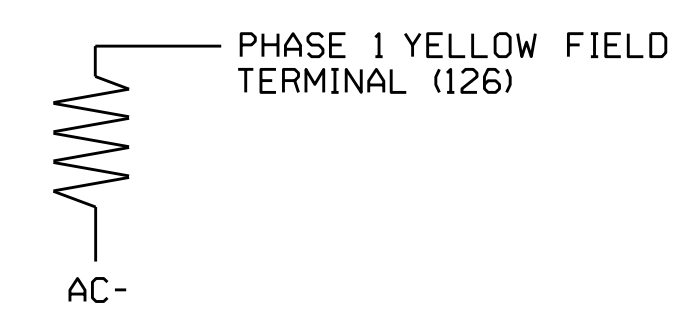
NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 4

Electrical and Programming Details For: SR 2200 (Cox Rd.) at I-85 Northbound Ramps

Division 12 Gaston County Gastonia

PLAN DATE: June 2017 REVIEWED BY: [Signature]

PREPARED BY: James Peterson REVIEWED BY: [Signature]

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: KEITH M. MINS, ENGINEER, 036880

7/14/2017 DATE

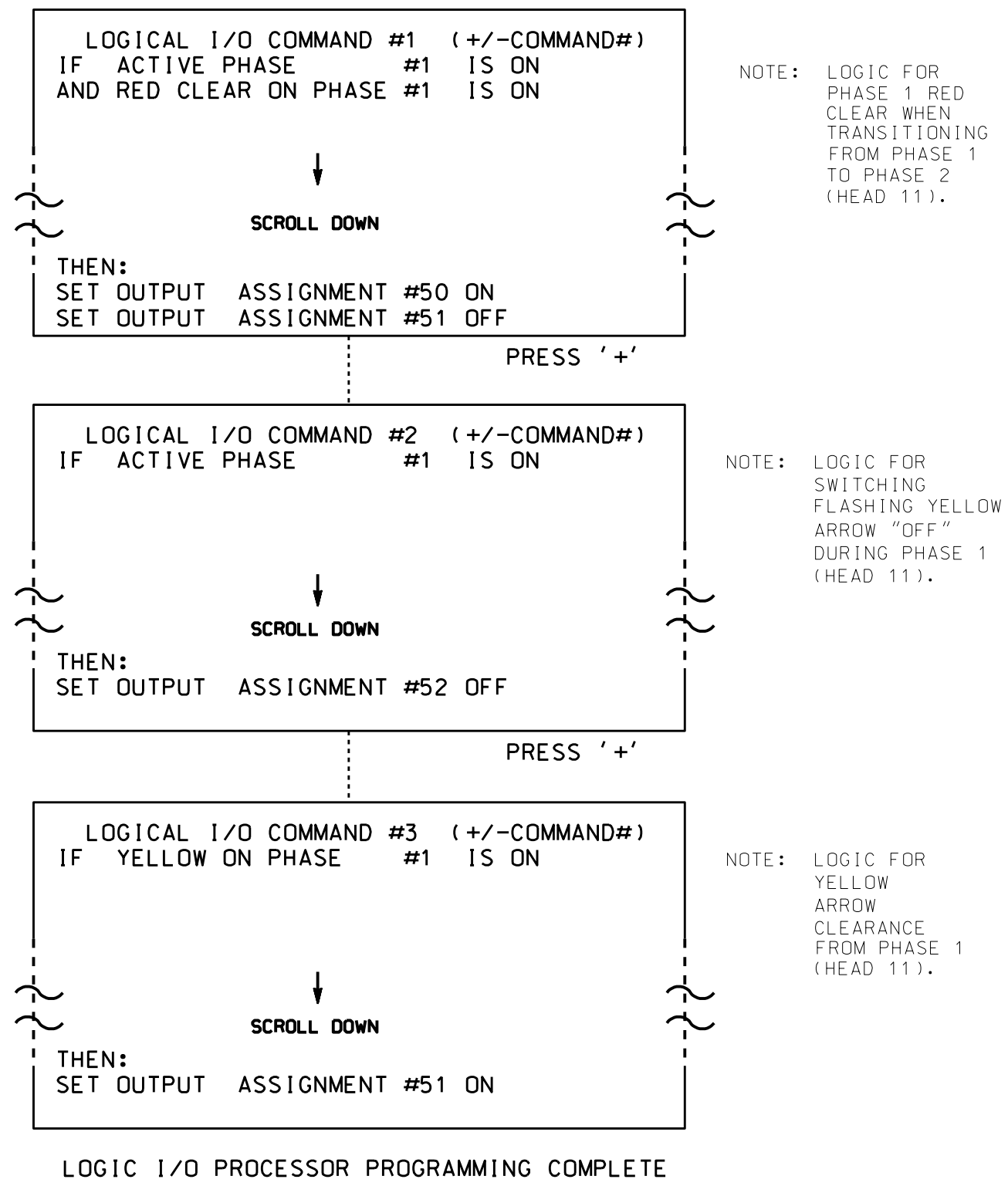
SIG. INVENTORY NO. 12-1086

14-Jul-2017 09:53 S:\TAS\15\SIGNAL\work\hgr\oups\51g_Minh\eter\son\21086_smc.e...xxx.dgn J.peterson

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

(program controller as shown below)

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



OUTPUT REFERENCE SCHEDULE	
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A 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 'A' SETTINGS
    PHASE: 12345678910111213141516
    VEH OVL PARENTS: XX
    VEH OVL NOT VEH:
    VEH OVL NOT PED:
    VEH OVL GRN EXT:
    STARTUP COLOR: - RED - YELLOW - GREEN
    FLASH COLORS: - RED - YELLOW X GREEN
    SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
    FLASH YELLOW IN CONTROLLER FLASH?...Y
    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

**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.

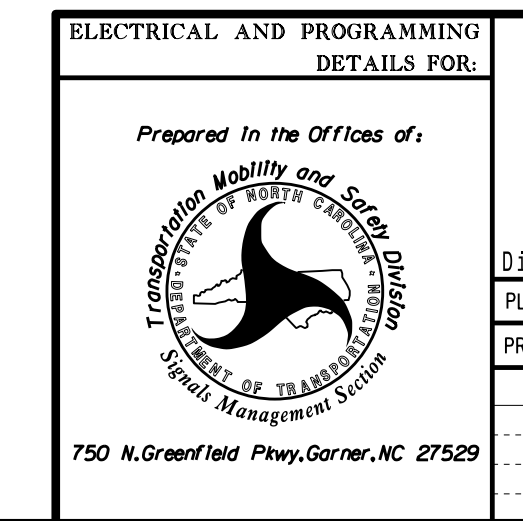
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    PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
    PHASE: 12345678910111213141516
    VEH OVL PARENTS: X
    VEH OVL NOT VEH:
    VEH OVL NOT PED:
    VEH OVL GRN EXT:
    STARTUP COLOR: - RED - YELLOW - GREEN
    FLASH COLORS: - RED - YELLOW - GREEN
    SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
    FLASH YELLOW IN CONTROLLER FLASH?...Y
    GREEN EXTENSION (0-255 SEC)...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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1086
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

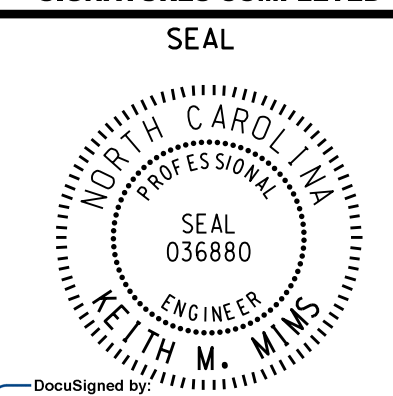
Electrical Detail - Sheet 2 of 4



**SR 2200 (Cox Rd.)
at
I-85 Northbound Ramps**

Division 12	Gaston County	Gastonia
PLAN DATE: June 2017	REVIEWED BY:	
PREPARED BY: James Peterson	REVIEWED BY:	
REVISIONS	INIT.	DATE

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DocuSigned by:
Keith M. Mims 7/14/2017
DATE
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SIG. INVENTORY NO. 12-1086

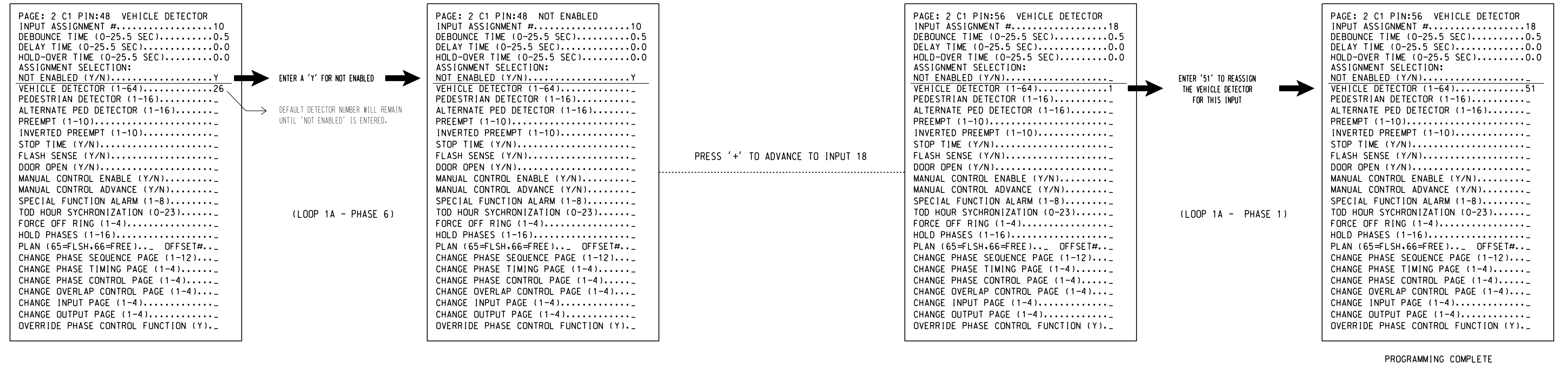
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S:\1\12510\15_Signal\work\hgr\oups\51g_MarkPeterson\121086_sml.e...xxx.dgn
JPeterson

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

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

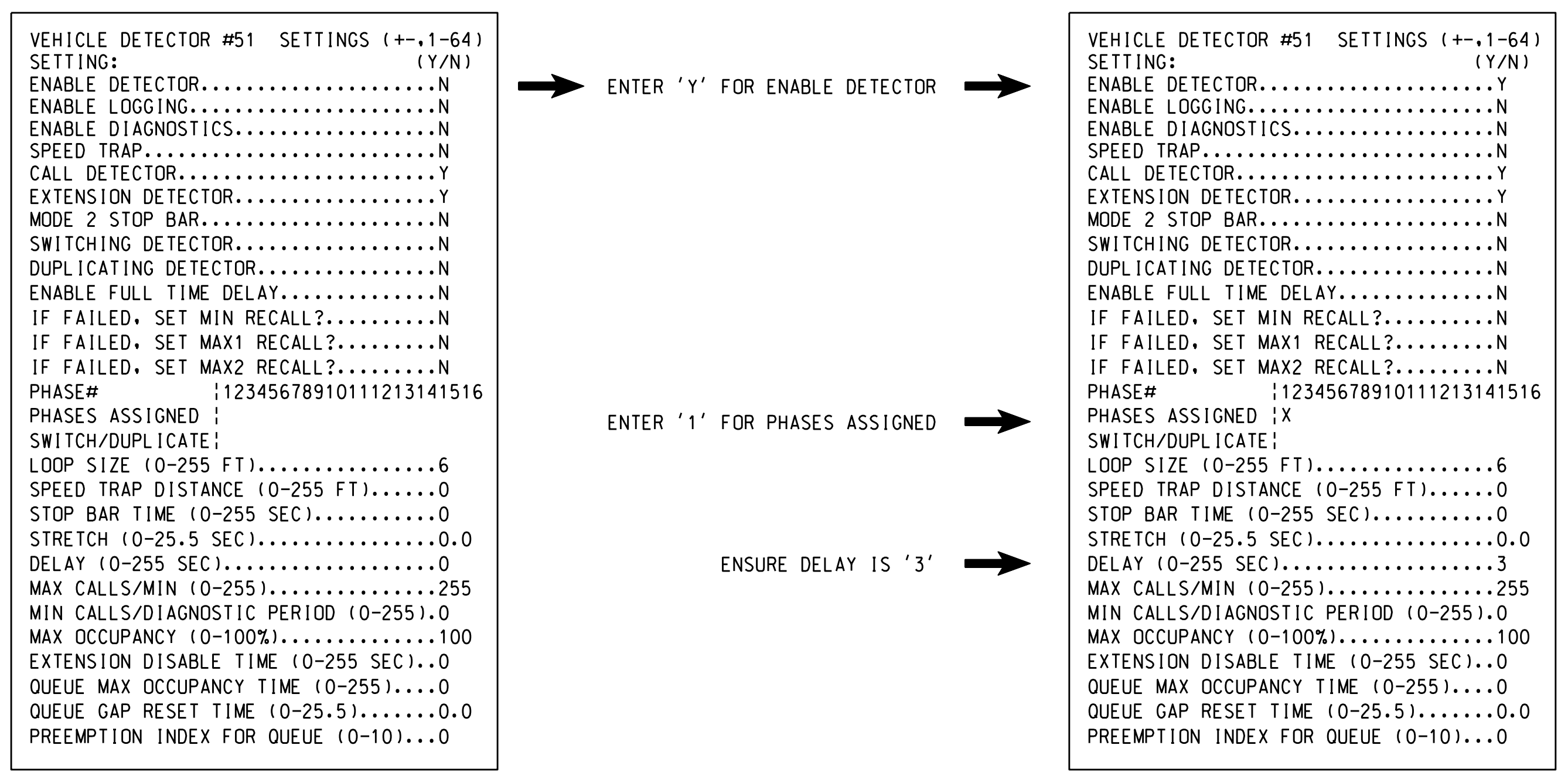
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



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: 12-1086
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

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T.peterson

Electrical Detail - Sheet 3 of 4

	Prepared In the Offices of: Keith M. Mims Professional Engineer No. 3578 State of North Carolina		Division 12 SR 2200 (Cox Rd.) at I-85 Northbound Ramps Gaston County Gastonia	SEAL
	PLAN DATE: June 2017 PREPARED BY: James Peterson	REVIEWED BY: REVIEWED BY:		

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 12-1086

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 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.

<u>PHASING</u>	<u>INPUTS PAGE</u>	<u>OVERLAPS PAGE</u>
ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u>	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 11 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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 12-1086
DESIGNED: May 2017
SEALED: 7-10-17
REVISED: N/A

Electrical Detail - Sheet 4 of 4

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SIGNATURES COMPLETED

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared In the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="font-weight: bold; font-size: large;">SR 2200 (Cox Rd.) at I-85 Northbound Ramps</p> <p style="font-size: x-small;">Division 12 Gaston County Gastonia</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: June 2017</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: James Peterson</td> <td>REVIEWED BY:</td> </tr> </table> <table style="width: 100%; font-size: x-small;"> <tr> <td>REVISIONS</td> <td>INIT.</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	PLAN DATE: June 2017	REVIEWED BY:	PREPARED BY: James Peterson	REVIEWED BY:	REVISIONS	INIT.	DATE				<p style="text-align: center;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: Keith M. Mims 7/14/2017 2F8078E8EC03445 DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 12-1086</p>
PLAN DATE: June 2017	REVIEWED BY:											
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