PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.8.5

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.

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T2
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 2 - Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

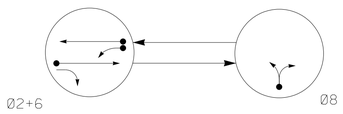
DATE

SIG. INVENTORY NO. 09-1105T2

4/25/2023
G:\43085\0_DOC\12_WC\U-2729_Traffic_Signals_09-1105_260.210_091105-20230425e5-12.dgn
User:STOBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.9.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

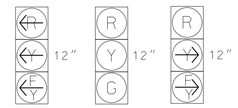
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21,22	G	R	Y
23	~~F Y~~	R	~~Y~~
61	~~F Y~~	~~R~~	~~Y~~
62,63	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

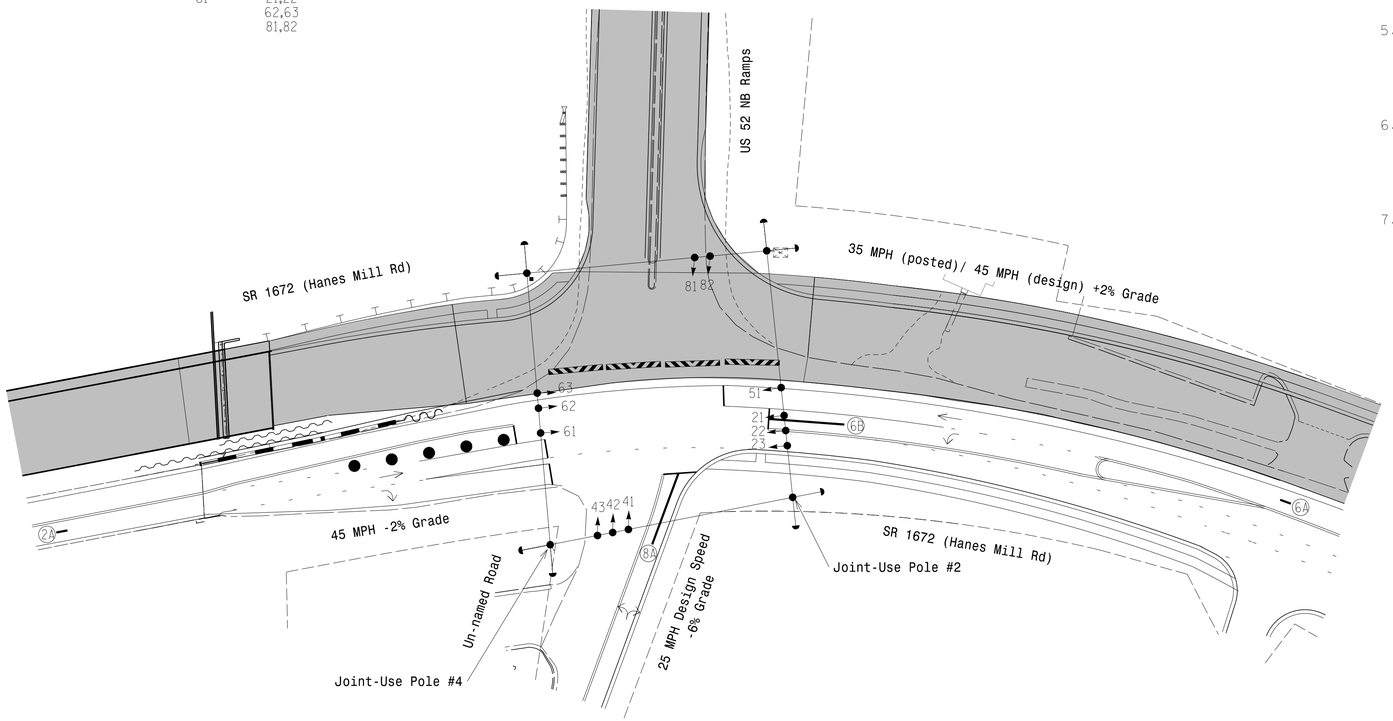
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X40	0	✳	✳	6	Y	Y	Y	-	3	-	✳
8A✳	6X40	0	✳	✳	8	Y	Y	-	-	10	-	✳

✳ Video Detection Zone

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Disconnect and Bag signal heads 41,42,43, and 51.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
	Construction Zone	
	Construction Drums	
	Video Detection Zone	
	Type III Barricade W/ R11-2 & M4-10R (SEE TMP)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	12	12	7
Extension 1 *	6.0	6.0	2.0
Max Green 1 *	90	90	25
Yellow Clearance	4.7	4.7	3.1
Red Clearance	1.2	1.2	2.3
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	-	-	-
Simultaneous Gap	ON	ON	ON

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

Signal Upgrade - Temporary Design 3 (TMP Phase IV, TMP-21)

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SCALE 0 40' 1"=40'

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson
PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

SIGNATURE DATE

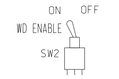
SIG. INVENTORY NO. 09-11057T3

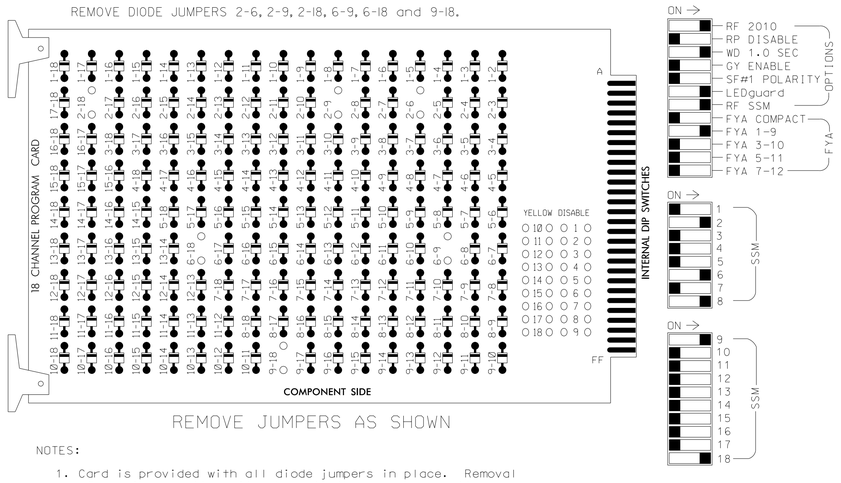
4/25/2023
C:\Projects\DOC.12\RC.U-2729\Traffic\Signals\09-11057T3_260_215_091105-20230425g-t3.dgn
User:STOUCHKO

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.9.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





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.

■ = 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 Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Startup In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlap.
6. The cabinet and controller are part of the Winston-Salem 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.....S2,S8,S11,AUX S1, AUX S6
PHASES USED.....2,6,8
OVERLAP "A".....2
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
OVERLAP "F".....2

SIGNAL HEAD HOOK-UP CHART

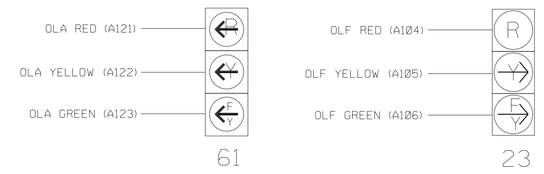
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	62,63	NU	NU	81,82	NU	61 ★	NU	NU	NU	NU	23 ★
RED		128						134			107							A104
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW													A122					A105
FLASHING YELLOW ARROW													A123					A106
GREEN ARROW																		

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

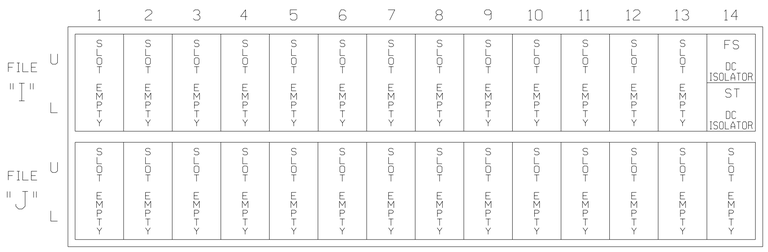
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T3
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 3 - Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T3

4/25/2023
G:\4508350.000-124NC_LI-2729\Traffic\Signals\09-1105\260.220.091105-20230425e1-T3.dgn
User:STD86227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.9.2

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

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

```
PAGE:1  C1 PIN:83  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:83  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 53

```
PAGE:1  C1 PIN:100  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:100  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 38

```
PAGE:1  C1 PIN:84  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:84  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA,
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |123456789101112131415 16
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'F' SETTINGS
 PHASE:          |123456789101112131415 16
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  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
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T3
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

N.C. Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Road)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

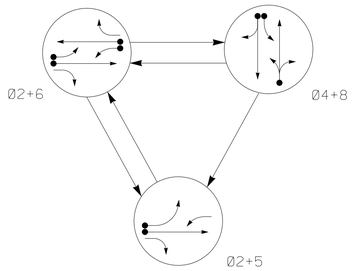
DATE

SIG. INVENTORY NO. 09-1105T3

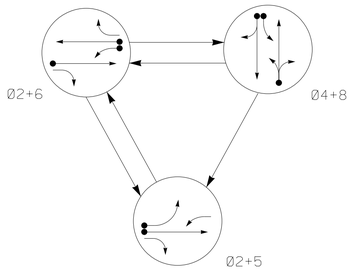
4/25/2023
d:\438350.00C.12\MCJJ-2729\Traffic\Signals\09-1105\260_225_091105-20230425e2-T3.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
23	F Y ►	F Y ►	R	Y ►
41	◄ R	◄ R	F Y ◄	◄ R
42,43	R	R	G	R
51	◄	F Y ◄	◄ R	◄ Y
61	F Y ◄	F Y ◄	◄ R	◄ Y
62,63	R	G	R	Y
81,82	R	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
23	F Y ►	F Y ►	R	Y ►
41	◄ R	◄ R	F Y ◄	◄ R
42,43	R	R	G	R
51	◄	◄ R	◄ R	◄ Y
61	F Y ◄	F Y ◄	◄ R	◄ Y
62,63	R	G	R	Y
81,82	R	R	G	R

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	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	Y	Y	-	-	-	-	✳
4A✳	6X40	0	✳	✳	4	Y	Y	-	-	3	-	✳
4B✳	6X40	0	✳	✳	4	Y	Y	-	-	10	-	✳
5A✳	6X40	0	✳	✳	5	Y	Y	-	-	15✳✳	-	✳
					2 #	Y	Y	Y	-	3	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X40	0	✳	✳	6	Y	Y	Y	-	3	-	✳
8A✳	6X40	0	✳	✳	8	Y	Y	-	-	10	-	✳

✳ Video Detection Zone
✳✳ Reduce Delay to 3 Seconds During Alternate Phasing Operation
\# Disable Phase Call for Loop(s) During Alternate Phasing Operation.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

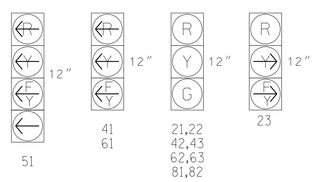
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 41,42 and 43.
5. Set all detector units to presence mode.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Reconnect and Unbag signal heads 41,42, 43, and 51.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED		EXISTING
○►	Traffic Signal Head	●►
◐►	Modified Signal Head	N/A
⊣	Sign	⊣
▯	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
N/A	Guardrail	⊥⊥
▒	Construction Zone	▒
▬	Video Detection Zone	▬

OASIS 2070 TIMING CHART

FEATURE	PHASE 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	25	25	90	25
Yellow Clearance	4.7	3.5	3.0	4.7	3.5
Red Clearance	1.2	1.9	2.8	1.2	1.9
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

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

Signal Upgrade - Temporary Design 4 (TMP Phase IV, TMP-21A)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SCALE 0 40' 1"=40'

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson
PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

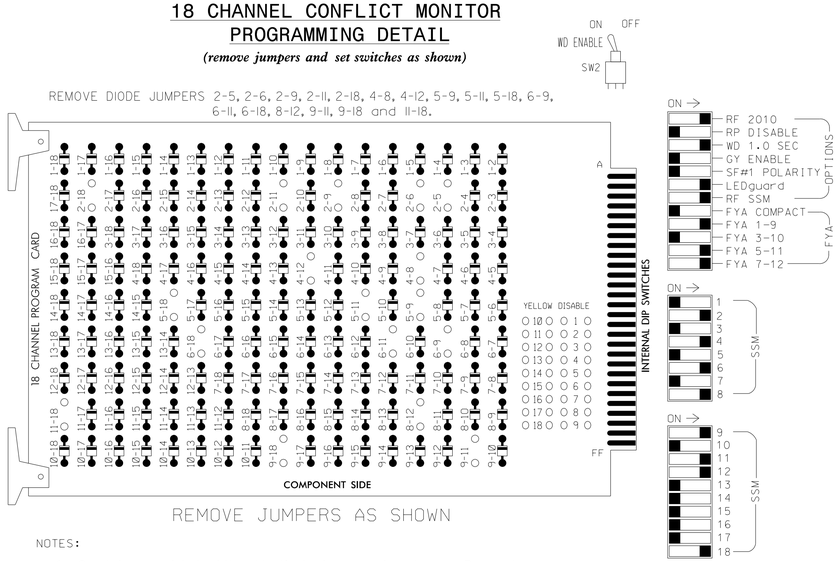
SIGNATURE DATE

SIG. INVENTORY NO. 09-110514

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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.

■ = 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. 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 Overlap.
7. The cabinet and controller are part of the Winston-Salem 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.....S2,S5,S7,S8,S11,AUX S1,AUX S4,AUX S5,AUX S6
PHASES USED.....2,4,5,6,8
OVERLAP "A".....2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....8
OVERLAP "F".....2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43	NU	51★	62,63	NU	NU	81,82	NU	61★	NU	NU	51★	41★	23★
RED		128			101			134			107							A104
YELLOW		129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114	A101	
YELLOW ARROW													A122			A115	A102	A105
FLASHING YELLOW ARROW													A123			A116	A103	A106
GREEN ARROW							133											
✋																		
🚶																		

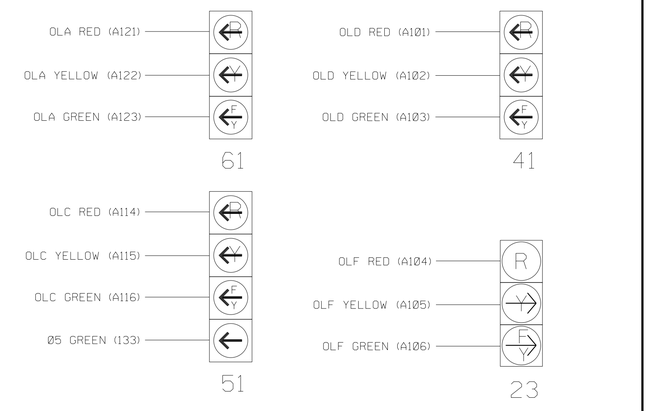
NU = Not Used

✳ 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)

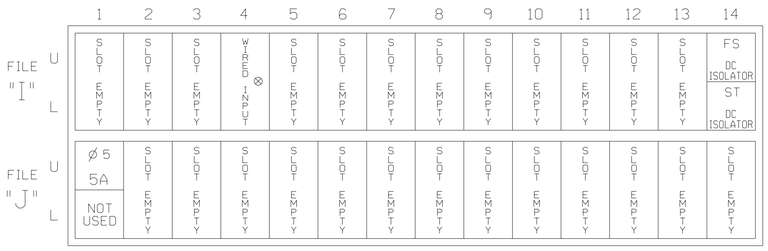


NOTE

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9 ★	22	2	Y	Y	Y		3
	-	J1U	55	17 ★	55	5	Y	Y			3

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

★ See Input Page Assignment programming details on sheet 4.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTES

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

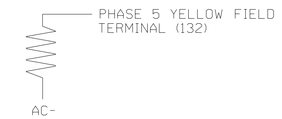
2) For detection zone 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 4 of this electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 4 - Electrical Detail - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T4

4/25/2023
G:\430\8350.DOC.12\MCL.U-2729\Traffic\Signals\09-1105\260.235.091105-20230425e1-T4.dgn
User:STDB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.2

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).

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #42 ON
 SET OUTPUT  ASSIGNMENT #43 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

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).

```
 PAGE 1: 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  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
```

← NOTICE GREEN FLASH

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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' 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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'F' 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  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
```

← 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.

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  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
```

← NOTICE GREEN FLASH

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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'D' 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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'F' 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  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
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 4 - Electrical Detail - Sheet 2 of 5

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Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T4

4/25/2023
d:\4368350.00C.12\MC.IJ-2729\Traffic\Signals\09-1105\260_240_091105-20230425e2-T4.dgn
User:STDBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.3

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

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

```
PAGE:1  C1 PIN:83  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:83  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 53

```
PAGE:1  C1 PIN:100  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:100  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 38

```
PAGE:1  C1 PIN:84  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:84  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1.P=16)...6
SELECT COLOR(0=RED.1=YEL.2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 4 - Electrical Detail - Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
State of North Carolina
Department of Transportation
Traffic Engineering & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Road)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 032711
ENGINEER
RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T4

4/25/2023
d:\4308350.00C.124RC.LJ-2729#Traffic#Signals#09-1105#260_245_091105-20230425d3-14.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.4

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.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
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)..................Y
VEHICLE DETECTOR (1-64).............22
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........Y
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........N
TOD HOUR SYCHRONIZATION (0-23)......N
FORCE OFF RING (1-4)................N
HOLD PHASES (1-16)..................N
PLAN (65=FLSH,66=FREE)..._  OFFSET#..N
CHANGE PHASE SEQUENCE PAGE (1-12)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
OVERRIDE PHASE CONTROL FUNCTION (Y).N
```

→ ENTER A 'Y' FOR NOT ENABLED →

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
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)..................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).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........Y
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........N
TOD HOUR SYCHRONIZATION (0-23)......N
FORCE OFF RING (1-4)................N
HOLD PHASES (1-16)..................N
PLAN (65=FLSH,66=FREE)..._  OFFSET#..N
CHANGE PHASE SEQUENCE PAGE (1-12)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
OVERRIDE PHASE CONTROL FUNCTION (Y).N
```

PRESS '+' TO ADVANCE TO INPUT 17

```
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)..................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).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........Y
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........N
TOD HOUR SYCHRONIZATION (0-23)......N
FORCE OFF RING (1-4)................N
HOLD PHASES (1-16)..................N
PLAN (65=FLSH,66=FREE)..._  OFFSET#..N
CHANGE PHASE SEQUENCE PAGE (1-12)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
OVERRIDE PHASE CONTROL FUNCTION (Y).N
```

→ ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
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)..................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).....................N
FLASH SENSE (Y/N)...................N
DOOR OPEN (Y/N).....................N
MANUAL CONTROL ENABLE (Y/N).........Y
MANUAL CONTROL ADVANCE (Y/N)........N
SPECIAL FUNCTION ALARM (1-8)........N
TOD HOUR SYCHRONIZATION (0-23)......N
FORCE OFF RING (1-4)................N
HOLD PHASES (1-16)..................N
PLAN (65=FLSH,66=FREE)..._  OFFSET#..N
CHANGE PHASE SEQUENCE PAGE (1-12)...N
CHANGE PHASE TIMING PAGE (1-4)......N
CHANGE PHASE CONTROL PAGE (1-4).....N
CHANGE OVERLAP CONTROL PAGE (1-4)...N
CHANGE INPUT PAGE (1-4).............N
CHANGE OUTPUT PAGE (1-4)............N
OVERRIDE PHASE CONTROL FUNCTION (Y).N
```

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 LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR →

→ ENTER '5' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '3' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................3
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..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: 09-1105T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T4

4/25/2023
G:\3063550.DOC:12\MCL_LI-2729\Traffic\Signals\09-1105\260.250_091105-20230426x4-14.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.10.5

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.

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 4 - Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Traffic Engineering Branch
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US 52 NB Ramps

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PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

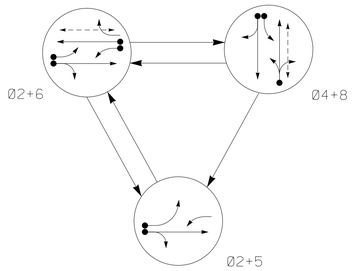
DATE

SIG. INVENTORY NO. 09-1105T4

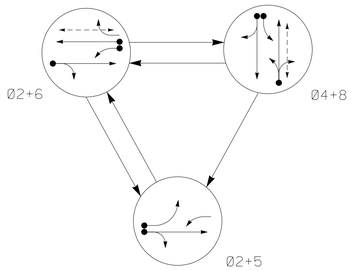
4/25/2023
G:\43085\0_DOC\12_WC\U-2729_Traffic_Signals_09-1105_260.255_091105-20230425e5-t4.dgn
User:STOBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.11.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~F Y~~	~~R~~
42,43	R	R	G	R
51	←	~~F Y~~	~~R~~	~~Y~~
61	~~F Y~~	~~F Y~~	~~R~~	~~Y~~
62,63	R	G	R	Y
64	R	~~F Y~~	R	~~Y~~
81,82	R	R	G	R
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

ALTENATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~F Y~~	~~R~~
42,43	R	R	G	R
51	←	~~R~~	~~R~~	~~Y~~
61	~~F Y~~	~~F Y~~	~~R~~	~~Y~~
62,63	R	G	R	Y
64	R	~~F Y~~	R	~~Y~~
81,82	R	R	G	R
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	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	Y	Y	-	-	-	-	✳
4A✳	6X40	0	✳	✳	4	Y	Y	-	-	3	-	✳
4B✳	6X40	0	✳	✳	4	Y	Y	-	-	10	-	✳
5A✳	6X40	0	✳	✳	5	Y	Y	-	-	15✳✳	-	✳
					2 #	Y	Y	Y	-	3	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X40	0	✳	✳	6	Y	Y	Y	-	3	-	✳
8A✳	6X40	0	✳	✳	8	Y	Y	-	-	10	-	✳

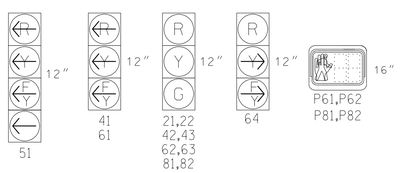
✳ Video Detection Zone
✳✳ Reduce Delay to 3 Seconds During Alternate Phasing Operation
\# Disable Phase Call for Loop(s) During Alternate Phasing Operation.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART

FEATURE	PHASE 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	25	25	90	25
Yellow Clearance	4.8	3.5	3.0	4.8	3.5
Red Clearance	1.6	3.2	2.3	1.6	3.2
Walk 1 *	-	-	-	7	7
Don't Walk 1	-	-	-	26	24
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

* 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
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 21,22,51, 61,62 and 63.
5. Set all detector units to presence mode.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○~	Signal Pole with Sidewalk Guy	●~
▭	Inductive Loop Detector	- - -
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	- - - - - -
→	Directional Arrow	→
N/A	Guardrail	⊥⊥
▒	Construction Zone	▒
▬	Portable Concret Barrier	▬
▬	Video Detection Zone	▬
⬡	Type II Signal Pedestal	⬢
⊛	Type I Pushbutton Post	⊛

Signal Upgrade - Temporary Design 5 (TMP Phase V)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SCALE 0 40' 1"=40'

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson
PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

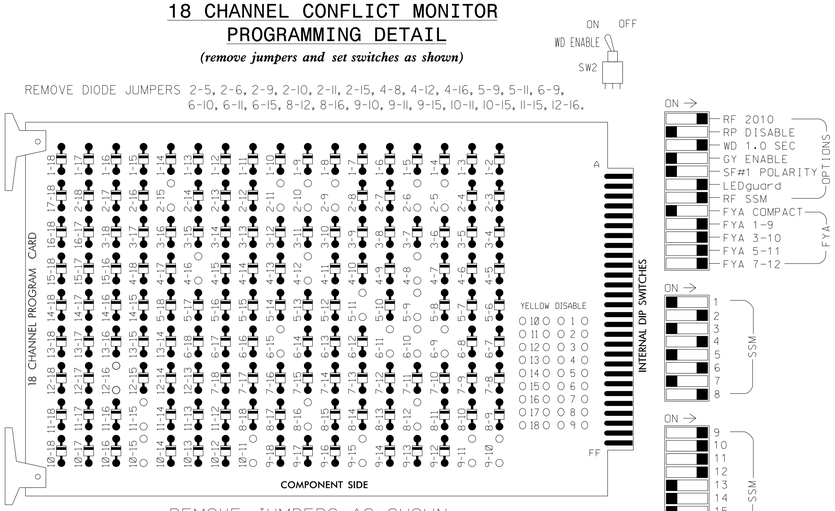
SIGNATURE DATE

SIG. INVENTORY NO. 09-110515

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.11.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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.

■ = 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. 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 6 and 8 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Winston-Salem 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.....S2,S5,S7,S8,S9,S11,S12,AUX S1, AUX 2,AUX S4,AUX S5
PHASES USED.....2,4,5,6,6PED,8,8PED
OVERLAP "A".....2
OVERLAP "B".....6
OVERLAP "C".....5+6
OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	42,43	NU	51★	62,63	P61, P62	NU	81,82	P81, P82	61★	64★	NU	51★	41★	NU
RED		128			101			134			107			A124				
YELLOW		129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW							133											
✋									119			110						
🚶									121			112						

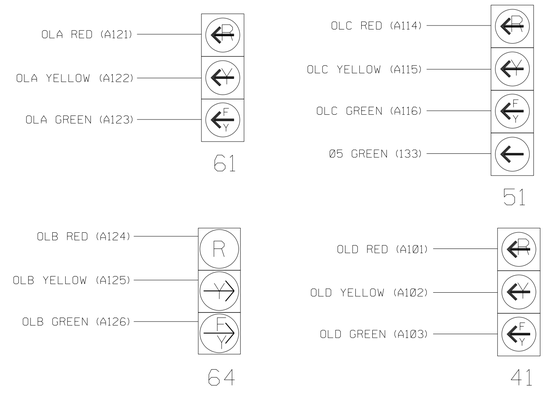
NU = Not Used

✳ 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)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L													Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	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
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9★	22	2	Y	Y	Y		3
	-	J1U	55	17★	55	5	Y	Y			3
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

INSTALL DC ISOLATORS IN INPUT FILE SLOTS I13.

[1] Add 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
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

SPECIAL DETECTOR NOTES

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

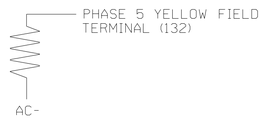
2) For detection zone 5A detector card placement and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 3 and 4 of this electrical detail.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105T5
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 5 - Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T5

4/25/2023
G:\4508350.000-124NC_LI-2729\Traffic\Signals\09-1105\260_265_091105-20230425e1-15.dgn
User:STDBG227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.11.2

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).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:              |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
PHASE:              |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:              |1234567891011121314 1516
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:              |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
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.

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
PHASE:              |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'B' SETTINGS
PHASE:              |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
PHASE:              |1234567891011121314 1516
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
```

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'D' SETTINGS
PHASE:              |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-110575
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 5 - Electrical Detail - Sheet 2 of 4

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-110575

4/25/2023
G:\4305350.000-12WC_JJ-2729\Traffic\Signals\09-1105\260.270_091105-20230425s2-15.dgn
User:ISTOBZ27

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.11.3

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.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
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)..................Y
VEHICLE DETECTOR (1-64).............22
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)._
```

→ ENTER A 'Y' FOR NOT ENABLED →

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
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)..................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)._
```

PRESS '+' TO ADVANCE TO INPUT 17

```
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).............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)._
```

→ ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
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)._
```

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 LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR →

→ ENTER '5' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '3' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................3
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..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: 09-1105T5
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 5 - Electrical Detail - Sheet 3 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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License No. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T5

4/25/2023
G:\#3053350.DOC:12#RL_LI-2729#Traffic#Signals#09-1105#260.275_091105-20230426e3-15.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.11.4

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.

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T5
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 5 - Electrical Detail - Sheet 4 of 4

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NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

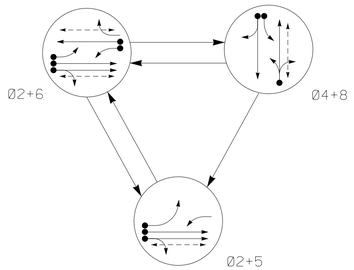
DATE

SIG. INVENTORY NO. 09-1105T5

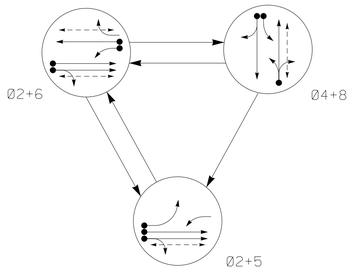
4/25/2023
G:\SIGNALS\DOC\2729\Traffic\Signals\09-1105\260.280_091105-20230425e4-t5.dgn
User:STOBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.12.0

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 Ø2+5	Ø2+6	Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~FY~~	~~R~~
42,43	R	R	G	R
51	←	~~FY~~	~~R~~	~~Y~~
61	~~FY~~	~~FY~~	~~R~~	~~Y~~
62,63	R	G	R	Y
64	R	~~FY~~	R	~~Y~~
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

ALTENATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~FY~~	~~R~~
42,43	R	R	G	R
51	←	~~R~~	~~R~~	~~Y~~
61	~~FY~~	~~FY~~	~~R~~	~~Y~~
62,63	R	G	R	Y
64	R	~~FY~~	R	~~Y~~
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

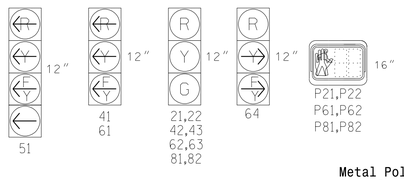
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP/ ZONE	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	Y	Y	-	-	-	-	✳
2B✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15✳✳	-	Y
					2 #	Y	Y	Y	-	3	-	Y
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	4	Y	6	Y	Y	-	-	-	-	Y
6C	6X40	0	2-4-2	Y	6	Y	Y	Y	-	3	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	Y

✳ Video Detection Zone
✳✳ Reduce Delay to 3 Seconds During Alternate Phasing Operation
\# Disable Phase Call for Loop(s) During Alternate Phasing Operation.

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART

FEATURE	PHASE 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	25	25	90	25
Yellow Clearance	4.8	3.5	3.0	4.8	3.5
Red Clearance	1.8	3.3	3.2	1.8	3.3
Walk 1 *	7	-	-	7	7
Don't Walk 1	21	-	-	26	24
Seconds Per Actuation *	1.5	-	-	1.5	-
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.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
6. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○—	Signal Pole with Guy	●—
○—	Signal Pole with Sidewalk Guy	●—
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
N/A	Guardrail	⊥⊥⊥
▭	Construction Zone	▭
———	Video Detection Zone	———
⬡	Type II Signal Pedestal	⬢
⊛	Type I Pushbutton Post	⊛
◯	Metal Strain Pole	◘

Signal Upgrade - Temporary Design 6 (TMP Phase VI)

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SCALE 0 40' 1"=40'

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at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson
PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

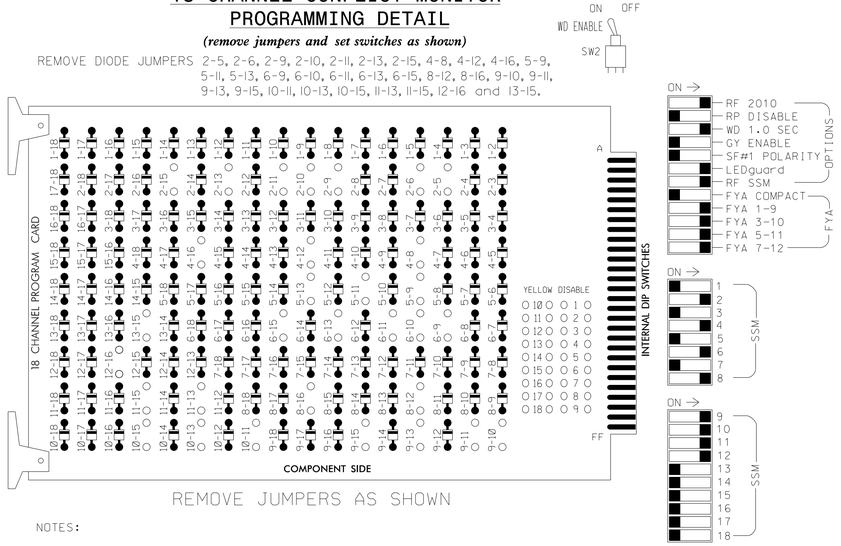
SIGNATURE DATE
SIG. INVENTORY NO. 09-110516

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.12.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-10, 2-11, 2-13, 2-15, 4-8, 4-12, 4-16, 5-9, 5-11, 5-13, 6-9, 6-10, 6-11, 6-13, 6-15, 8-12, 8-16, 9-10, 9-11, 9-13, 9-15, 10-11, 10-13, 10-15, 11-13, 11-15, 12-16 and 13-15.



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.

■ = 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. 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, 6 and 8 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Winston-Salem 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.....S2,S3,S5,S7,S8,S9,S11,S12,AUX S1, AUX S2,AUX S4,AUX S5
PHASES USED.....2,2PED,4,5,6,6PED,8,8PED
OVERLAP "A".....2
OVERLAP "B".....6
OVERLAP "C".....5+6
OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	42,43	NU	51★	62,63	P61, P62	NU	81,82	P81, P82	61★	64★	NU	51★	41★	NU
RED		128			101			134			107			A124				
YELLOW		129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW							133											
✋			113						119			110						
🚶			115						121			112						

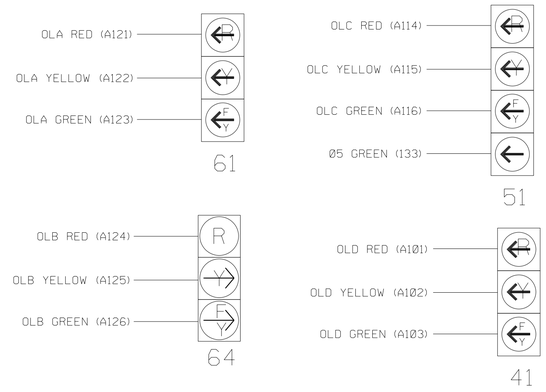
NU = Not Used

✳ 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)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L						Ø4 4B						NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B	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
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9★	22	2	Y	Y	Y		3
	-	J1U	55	17★	55	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add 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
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a video detection system for phase 2 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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105T6
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 6 - Electrical Detail - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

N.C. Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Traffic Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T6

4/25/2023
G:\4308350.000-124NC_LI-2729\Traffic\Signals\09-1105\260.290_091105-20230425e1-+6.dgn
User:STDB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.12.2

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).

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #42 ON
 SET OUTPUT  ASSIGNMENT #43 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

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).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314 1516
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
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.

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314 1516
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
```

PRESS '+'

NOTICE PAGE 2 →

```
 PAGE 2: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105T6
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 6 - Electrical Detail - Sheet 2 of 4

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REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T6

4/25/2023
G:\SIGNAL\DOC.12\MC_JJ-2729\Traffic\Signals\09-1105\260.295.091105-20230425s2-16.dgn
User:ISTOBZ27

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.12.3

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.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
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)...................Y
VEHICLE DETECTOR (1-64).............22
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)._
```

→ ENTER A 'Y' FOR NOT ENABLED →

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
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)...................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)._
```

PRESS '+' TO ADVANCE TO INPUT 17

```
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).............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)._
```

→ ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
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)._
```

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 LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR →

→ ENTER '5' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '3' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT).................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................3
MAX CALLS/MIN (0-255)..............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%).............100
EXTENSION DISABLE TIME (0-255 SEC)..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: 09-1105T6
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division Traffic Engineering Branch Signals Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105T6

4/25/2023
G:\3063550.DOC-12\MCL_LI-2729\Traffic\Signals\09-1105\260.300_091105-20230425e3-16.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.12.4

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.

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105T6
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 6 - Electrical Detail - Sheet 4 of 4

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US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

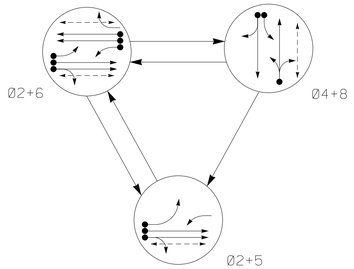
DATE

SIG. INVENTORY NO. 09-1105T6

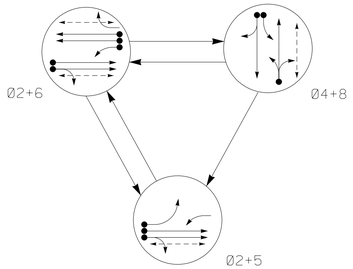
4/25/2023
G:\4308350_00C.12#GCJJ-2729#Traffic#Signals#09-1105#260.305_091105-20230425e4-1f6.dgn
User:STOBG227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.13.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~F~~	~~R~~
42,43	R	R	G	R
51	←	~~F~~	~~R~~	~~Y~~
61	~~F~~	~~F~~	~~R~~	~~Y~~
62, 63	R	G	R	Y
64	R	~~F~~	R	~~Y~~
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

ALTENATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~F~~	~~R~~
42,43	R	R	G	R
51	←	~~R~~	~~R~~	~~Y~~
61	~~F~~	~~F~~	~~R~~	~~Y~~
62, 63	R	G	R	Y
64	R	~~F~~	R	~~Y~~
81,82	R	R	G	R
P21,P22	W	W	DW	DRK
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP/ ZONE	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	Y	Y	-	-	-	-	✳
2B✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15✳✳	-	-
					2 #	Y	Y	Y	-	3	-	-
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6C	6X40	0	2-4-2	Y	6	Y	Y	Y	-	3	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	-

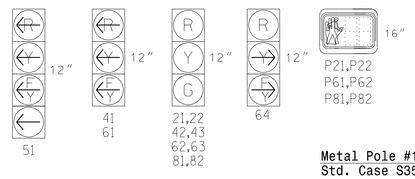
✳ Video Detection Zone
✳✳ Reduce Delay to 3 Seconds During Alternate Phasing Operation
\# Disable Phase Call for Loop(s) During Alternate Phasing Operation.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6	PHASE 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	25	25	90	25
Yellow Clearance	4.8	3.5	3.0	4.8	3.5
Red Clearance	1.8	2.9	3.1	1.8	2.9
Walk 1 *	7	-	-	7	7
Don't Walk 1	21	-	-	26	24
Seconds Per Actuation *	1.5	-	-	1.5	-
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.

3 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 21,22,51, 61,62 and 63.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
8. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	- - - - -
→	Directional Arrow	→
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢
N/A	Guardrail	⊥⊥
◎	Metal Strain Pole	◘
▬	Video Detection Zone	▬

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40' 1"=40'

SR 1672 (Hanes Mill Rd) at US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson

PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

SIGNATURE DATE

SIG. INVENTORY NO. 09-1105

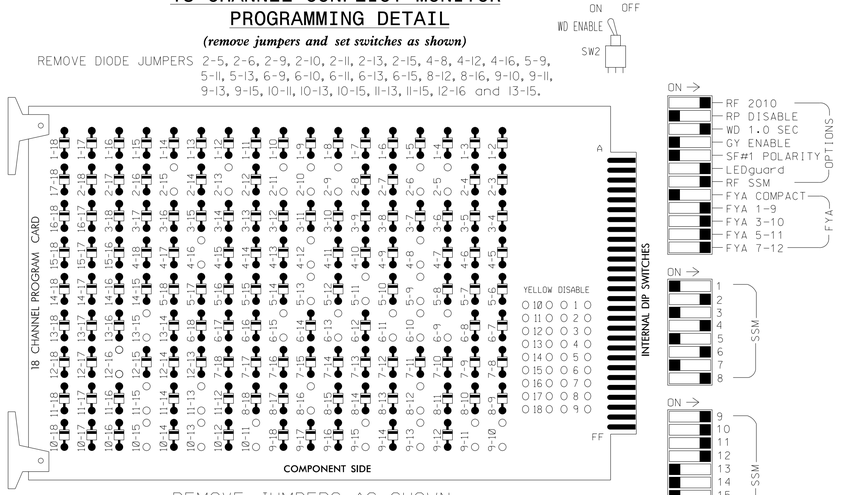
4/25/2023
C:\MMGDOT_DOC_12\MC_U-2729\Traffic\Signals\09-1105\260_310_091105-20230425a.dgn
User:STOB8227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.13.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-10, 2-11, 2-13, 2-15, 4-8, 4-12, 4-16, 5-9, 5-11, 5-13, 6-9, 6-10, 6-11, 6-13, 6-15, 8-12, 8-16, 9-10, 9-11, 9-13, 9-15, 10-11, 10-13, 10-15, 11-13, 11-15, 12-16 and 13-15.



REMOVE JUMPERS AS SHOWN

■ = 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.

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, 6 and 8 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Winston-Salem 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.....S2,S3,S5,S7,S8,S9,S11,S12,AUX S1, AUX S2,AUX S4,AUX S5
PHASES USED.....2,2PED,4,5,6,6PED,8,8PED
OVERLAP "A".....2
OVERLAP "B".....6
OVERLAP "C".....5+6
OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	42,43	NU	51★	62,63	P61, P62	NU	81,82	P81, P82	61★	64★	NU	51★	41★	NU
RED		128			101			134			107			A124				
YELLOW		129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW							133											
✋			113						119			110						
🚶			115						121			112						

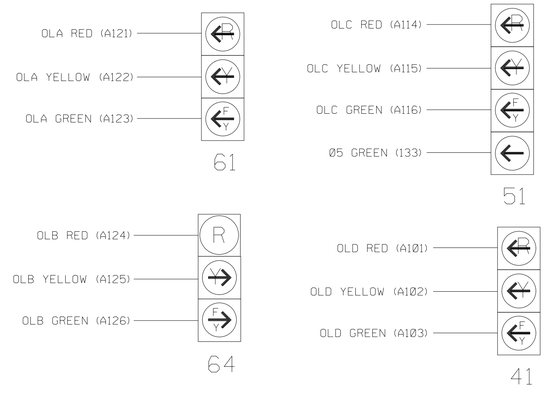
NU = Not Used

✳ 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)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L						Ø4 4B						NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B	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
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9★	22	2	Y	Y	Y		3
	-	J1U	55	17★	55	5	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add 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
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

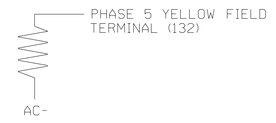
Install a video detection system for phase 2 vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Final Design - Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
North Carolina Department of Transportation
Traffic Engineering Branch
Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
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REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105

4/25/2023
G:\4308350.000-124NC_LI-2729\Traffic\Signals\09-1105\260.315_091105-20230425e1.dgn
User:STOBG227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.13.2

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).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |1234567891011121314 1516
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:          |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
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.

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'B' SETTINGS
PHASE:          |1234567891011121314 1516
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  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
```

← NOTICE GREEN FLASH

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |1234567891011121314 1516
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
```

PRESS '+'

NOTICE PAGE 2 →

```
PAGE 2: VEHICLE OVERLAP 'D' SETTINGS
PHASE:          |1234567891011121314 1516
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  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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1105
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Final Design - Sheet 2 of 4

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1672 (Hanes Mill Rd)
at
US 52 NB Ramps

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105

4/25/2023
G:\4305350.000-124WC_JJ-2729\Traffic\Signals\09-1105\260.320.091105-20230425e2.dgn
User:ISTOBZ27

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.

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #..................9
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)...................Y
VEHICLE DETECTOR (1-64).............22
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).
```

→ ENTER A 'Y' FOR NOT ENABLED →

DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #..................9
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)...................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).
```

PRESS '+' TO ADVANCE TO INPUT 17

```
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).............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).
```

→ ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT →

(LOOP 5A - PHASE 5)

```
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).
```

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 LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................0
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..0
QUEUE MAX OCCUPANCY TIME (0-255)....0
QUEUE GAP RESET TIME (0-25.5).......0.0
PREEMPTION INDEX FOR QUEUE (0-10)...0
```

→ ENTER 'Y' FOR ENABLE DETECTOR →

ENTER '5' FOR PHASES ASSIGNED →

ENSURE DELAY IS '3' →

```
VEHICLE DETECTOR #55  SETTINGS (+-,1-64)
SETTING:                          (Y/N)
ENABLE DETECTOR.....................Y
ENABLE LOGGING......................N
ENABLE DIAGNOSTICS..................N
SPEED TRAP..........................N
CALL DETECTOR.......................Y
EXTENSION DETECTOR..................Y
MODE 2 STOP BAR.....................N
SWITCHING DETECTOR..................N
DUPLICATING DETECTOR................N
ENABLE FULL TIME DELAY..............N
IF FAILED, SET MIN RECALL?..........N
IF FAILED, SET MAX1 RECALL?.........N
IF FAILED, SET MAX2 RECALL?.........N
PHASE#          ¦12345678910111213141516
PHASES ASSIGNED ¦    X
SWITCH/DUPLICATE¦
LOOP SIZE (0-255 FT)................6
SPEED TRAP DISTANCE (0-255 FT)......0
STOP BAR TIME (0-255 SEC)...........0
STRETCH (0-25.5 SEC)................0.0
DELAY (0-255 SEC)...................3
MAX CALLS/MIN (0-255)...............255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).0
MAX OCCUPANCY (0-100%)..............100
EXTENSION DISABLE TIME (0-255 SEC)..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: 09-1105
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Final Design - Sheet 3 of 4

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation

750 N.Greenfield Pkwy, Garner, NC 27529

SR 1672 (Hanes Mill Rd) at US 52 NB Ramps

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-1105

4/25/2023

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.13.4

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.

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1105
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Final Design - Sheet 4 of 4

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SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

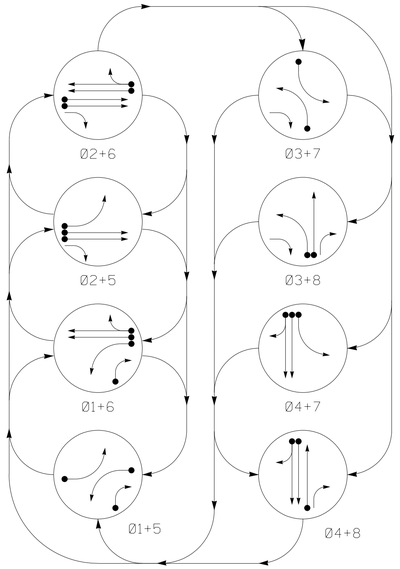
DATE

SIG. INVENTORY NO. 09-1105

4/25/2023
G:\4308350.000.12\RC_U-2729\Traffic\Signals\09-1105\260_330_091105-20230425d4.dgn
User:S1086227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.14.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

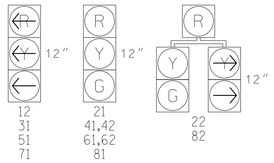
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
12	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R / ~~R~~		R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
41,42	R	R	R	R	R	R	G	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61,62	R	G	R	G	R	R	R	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
81	R	R	R	R	R	G	R	G	R
82	R / ~~R~~		R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A✳	6X40	0	✳	✳	1	Y	Y	-	-	3	-	✳
1C✳	6X40	0	✳	✳	1	Y	Y	-	-	15	-	✳
2A✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
2B✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
3A✳	6X40	0	✳	✳	3	Y	Y	-	-	3	-	✳
4A✳	6X40	0	✳	✳	4	Y	Y	-	-	-	-	✳
4B✳	6X40	0	✳	✳	4	Y	Y	-	-	10	-	✳
4C✳	6X6	0	✳	✳	4	Y	Y	-	-	15	-	✳
5A✳	6X40	0	✳	✳	5	Y	Y	-	-	3	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
7A✳	6X40	0	✳	✳	7	Y	Y	-	-	3	-	✳
8A✳	6X6	0	✳	✳	8	Y	Y	-	-	-	-	✳

✳ Video Detection Zone

8 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output File for future use.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○►	Traffic Signal Head	●►
◐►	Modified Signal Head	N/A
⊣	Sign	⊣
▽	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○~	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - - -
→	Directional Arrow	→
∞	Directional Drill	N/A
⋈	TYPE III Barricade	⋈
▩	Construction Zone	▩
▬	Video Detection Zone	▬

Ⓐ Right Arrow "ONLY" Sign (R3-5R) Ⓐ
Ⓑ Street Name Sign by others (D3-1) Ⓑ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	25	30	25	90	25	30
Yellow Clearance	3.0	4.3	3.0	4.1	3.0	4.8	3.0	4.1
Red Clearance	2.8	1.2	2.4	1.7	2.8	1.4	2.3	1.7
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Temporary Design 1 (TMP Phase II)

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Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 50' 1"=50'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

SIGNATURE DATE

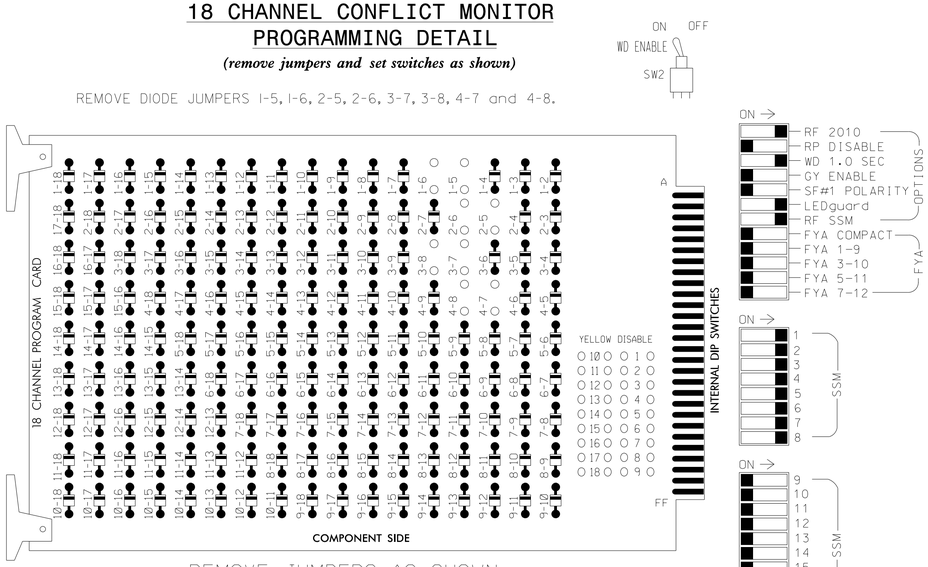
SIG. INVENTORY NO. 09-0557TI

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.14.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

■ = 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.

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. The cabinet and controller are part of the Winston Salem 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,S4,S5,S7,
S8,S10,S11
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP 'A'.....NOT USED
OVERLAP 'B'.....NOT USED
OVERLAP 'C'.....NOT USED
OVERLAP 'D'.....NOT USED

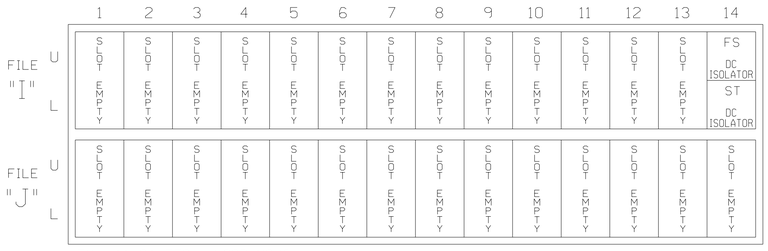
SIGNAL HEAD HOOK-UP CHART

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.	12	82	21,22	NU	22	31	41,42	NU	51	61,62	NU	71	81,82	NU	NU	NU	NU	NU	NU	NU
RED			128				101			134			107							
YELLOW			129				102			135			108							
GREEN			130				103			136			109							
RED ARROW	125					116			131			122								
YELLOW ARROW	126	126			117	117			132			123								
GREEN ARROW	127	127			118	118			133			124								

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0557T1
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Signal Upgrade - Temporary Design 1 - Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Transportation Mobility and Safety Division Traffic Engineering Branch & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 4000 (University Parkway) at SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W THOMPSON

DATE

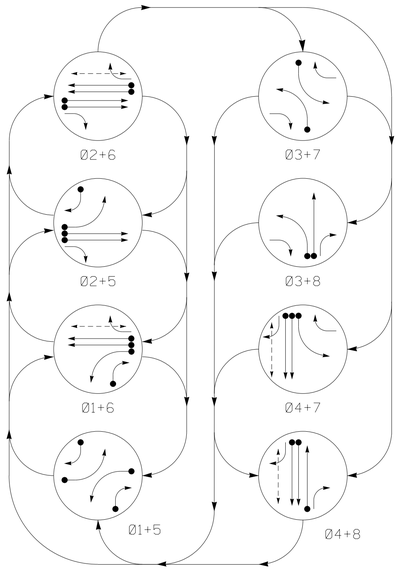
SIG. INVENTORY NO. 09-0557TI

4/25/2023
G:\4305350.000.124RC.U-2729\Traffic\Signals\09-0557\260.340.090557-20230425e-t1.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig. 15.0

8 Phase
Fully Actuated
(Winston-Salem Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

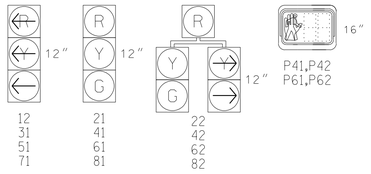
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
12	←R	←R	←R	←R	←R	←R	←R	←R	←R
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R/→R	R/→R	R	R	Y
31	←R	←R	←R	←R	←	←	←R	←R	←R
41	R	R	R	R	R	R	G	G	R
42	R/→R	R	R/→R	R	R	R	G	G	R
51	←	←R	←	←R	←R	←R	←R	←R	←R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R/→R	R	R/→R	R	Y
71	←R	←R	←R	←R	←	←	←R	←R	←R
81	R	R	R	R	R	G	R	G	R
82	R/→R	R/→R	R	R	R	G	R	G	R
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

ZONE	INDUCTIVE LOOPS: SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A✳	6X40	0	✳	✳	1	Y	Y	-	-	3	-	✳
1C✳	6X40	0	✳	✳	1	Y	Y	-	-	15	-	✳
2A✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
2B✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
3A✳	6X40	0	✳	✳	3	Y	Y	-	-	3	-	✳
4A✳	6X40	0	✳	✳	4	Y	Y	-	-	-	-	✳
4B✳	6X40	0	✳	✳	4	Y	Y	-	-	-	-	✳
5A✳	6X40	0	✳	✳	5	Y	Y	-	-	3	-	✳
5B✳	6X40	0	✳	✳	5	Y	Y	-	-	15	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
7A✳	6X40	0	✳	✳	7	Y	Y	-	-	3	-	✳
8A✳	6X6	0	✳	✳	8	Y	Y	-	-	-	-	✳

✳ Video Detection Zone

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Reposition existing signal heads numbered 11,21,22,41, 51,61 and 71.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○|	Signal Pole with Guy	●|
○\	Signal Pole with Sidewalk Guy	●\
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·-·-·
N/A	Right of Way	———
→	Directional Arrow	→
—∞—	Directional Drill	N/A
⬡	Type II Signal Pedestal	⬢
⊛	Type I Pushbutton Post	⊛
♿	Curb Ramp	♿
⋈	Pedestrian Barricade	⋈
▩	Construction Zone	▩
———	Video Detection Zone	———
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Street Name Sign by others (D3-1)	Ⓑ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	25	30	25	90	25	30
Yellow Clearance	3.0	4.3	3.0	4.1	3.0	4.8	3.0	4.1
Red Clearance	3.3	1.6	3.2	2.2	3.3	2.2	3.2	2.4
Walk 1 *	-	-	-	7	-	7	-	-
Don't Walk 1	-	-	-	31	-	33	-	-
Walk Advance Time	-	-	-	3	-	3	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Temporary Design 2 (TMP Phase III)

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Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner, NC 27529

SCALE 0 50' 1"=50'

SR 4000 (University Parkway) at SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

SIGNATURE DATE

SIG. INVENTORY NO. 09-0557T2

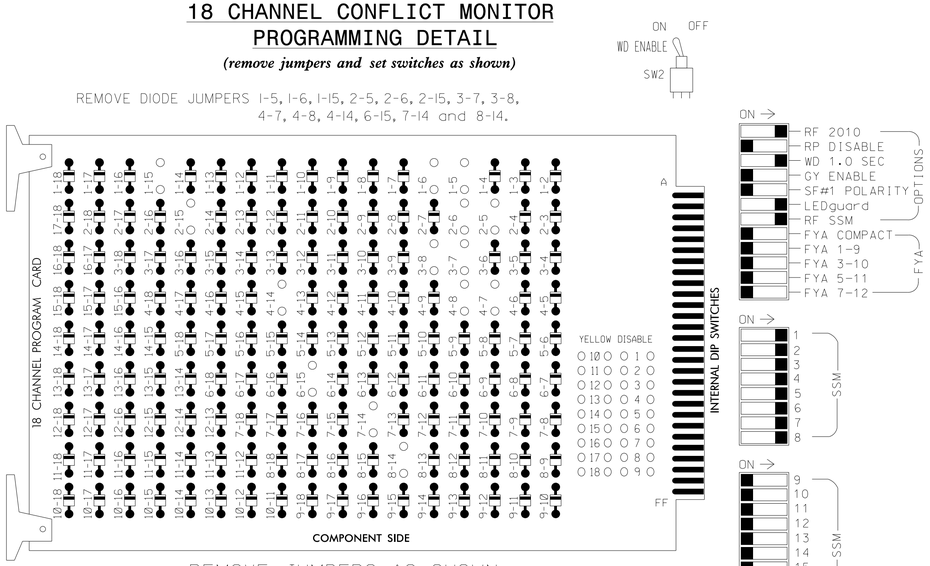
4/25/2023
C:\MS\SIG_DOC_12WC_U-2729\Traffic\Signals\09-0557\260_345_090557-20230425g-t2.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.15.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-15, 3-7, 3-8, 4-7, 4-8, 4-14, 6-15, 7-14 and 8-14.



■ = DENOTES POSITION OF SWITCH

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. The cabinet and controller are part of the Winston Salem 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,S4,S5,S6,S7,
S8,S9,S10,S11
PHASES USED.....1,2,3,4,4PED,5,6,6PED,7,8
OVERLAP 'A'.....NOT USED
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.	12	82	21,22	NU	22	31	41,42	P41, P42	51	42	61,62	P61, P62	71	62	81,82	NU	NU	NU	NU	NU	NU	NU
RED			128				101				134				107							
YELLOW			129				102				135				108							
GREEN			130				103				136				109							
RED ARROW	125					116			131				122									
YELLOW ARROW	126	126			117	117			132	132			123	123								
GREEN ARROW	127	127			118	118			133	133			124	124								
✋								104				119										
🚶								106				121										

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ADVANCED WALK NOTE

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 4 and 6 for 'Advanced Walk'.
Make sure the Walk Advance Time shown on the Signal Design plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T2
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a video 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.

Signal Upgrade - Temporary Design 2 - Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division Traffic Engineering Branch Signals Section
NC DEPT. OF TRANSPORTATION
750 N.Greenfield Pkwy, Garner, NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

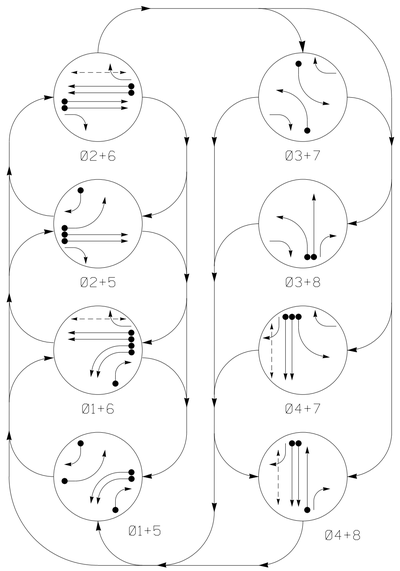
DATE

SIG. INVENTORY NO. 09-0557T2

4/25/2023
G:*3083350_DOC_12\MCL_LI-2729\Traffic\Signals\09-0557\260.350.090557-20230426e-t2.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.16.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

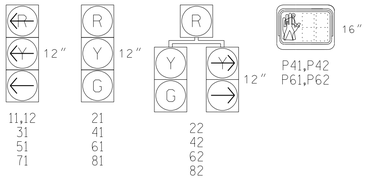
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11,12	←R	←R	←R	←R	←R	←R	←R	←R	←R
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	→R	→R	R	R	Y
31	←R	←R	←R	←R	←	←	←R	←R	←R
41	R	R	R	R	R	R	G	G	R
42	→R	R	→R	R	R	R	G	G	R
51	←	←R	←	←R	←R	←R	←R	←R	←R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	→R	R	→R	R	Y
71	←R	←R	←R	←R	←	←R	←	←R	←R
81	R	R	R	R	R	G	R	G	R
82	→R	→R	R	R	R	G	R	G	R
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A✳	6X40	0	✳	✳	1	Y	Y	-	-	3	-	✳
1B✳	6X40	0	✳	✳	1	Y	Y	-	-	-	-	✳
1C✳	6X40	0	✳	✳	1	Y	Y	-	-	15	-	✳
2A✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
2B✳	6X6	300	✳	✳	2	Y	Y	-	-	-	-	✳
3A✳	6X40	0	✳	✳	3	Y	Y	-	-	3	-	✳
4A✳	6X40	0	✳	✳	4	Y	Y	-	-	-	-	✳
4B✳	6X40	0	✳	✳	4	Y	Y	-	-	-	-	✳
5A✳	6X40	0	✳	✳	5	Y	Y	-	-	3	-	✳
5B✳	6X40	0	✳	✳	5	Y	Y	-	-	15	-	✳
6A✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
6B✳	6X6	300	✳	✳	6	Y	Y	-	-	-	-	✳
7A✳	6X40	0	✳	✳	7	Y	Y	-	-	3	-	✳
8A✳	6X6	0	✳	✳	8	Y	Y	-	-	-	-	✳

✳ Video Detection Zone

8 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
7. Reposition existing signal heads numbered 21,22,31, 51,81 and 82.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▽	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●●
○⤵	Signal Pole with Sidewalk Guy	●■
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
⬡	Type II Signal Pedestal	⬢
⊛	Type I Pushbutton Post	●
⋈	Pedestrian Barricade	⋈
♿	Curb Ramp	♿
▬	Construction Zone	▬
———	Video Detection Zone	———
Ⓐ	Right Arrow "ONLY" Sign (R3-5R)	Ⓐ
Ⓑ	Street Name Sign by others (D3-1)	Ⓑ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	25	30	25	90	25	30
Yellow Clearance	3.0	4.3	3.0	4.1	3.0	4.8	3.0	4.1
Red Clearance	3.5	1.6	3.6	2.4	3.3	2.1	3.6	2.4
Walk 1 *	-	-	-	7	-	7	-	-
Don't Walk 1	-	-	-	32	-	24	-	-
Advanced Walk *	-	-	-	3	-	3	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Temporary Design 3 (TMP Phase IV)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 50' 1"=50'

SR 4000 (University Parkway) at SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE: March 2023 REVIEWED BY: RW Thompson

PREPARED BY: LD Stouchko REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

SIGNATURE DATE

SIG. INVENTORY NO. 09-0557T3

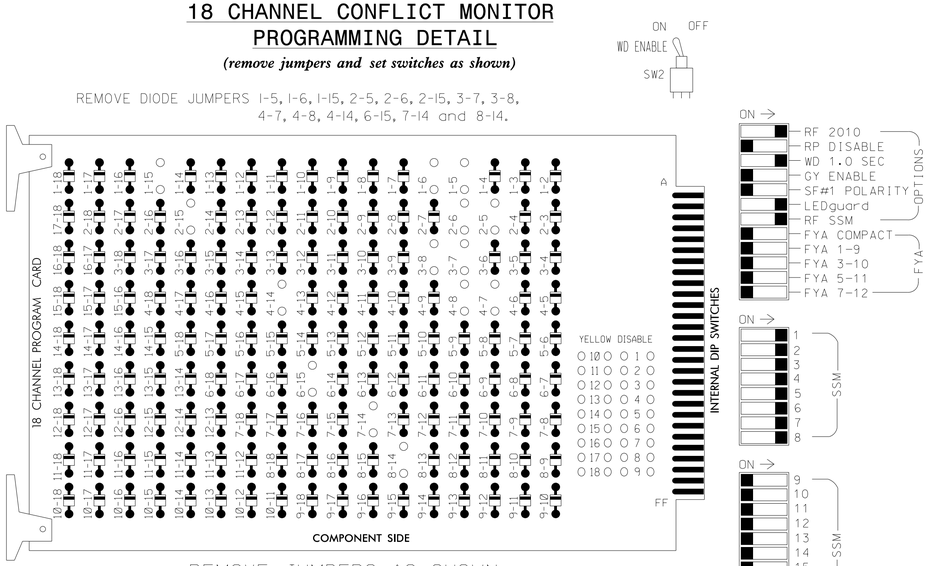
4/25/2023
C:\MMD_CADD\...\DOC.12\MC.U-2729\traffic\Signals\09-0557\260.355_090557-20230425g-r3.dgn
User:STOUCHKO

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.16.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-15, 2-5, 2-6, 2-15, 3-7, 3-8, 4-7, 4-8, 4-14, 6-15, 7-14 and 8-14.



REMOVE JUMPERS AS SHOWN

■ = 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.

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. The cabinet and controller are part of the Winston Salem 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,S4,S5,S6,S7,
S8,S9,S10,S11
PHASES USED.....1,2,3,4,4PED,5,6,6PED,7,8
OVERLAP 'A'.....NOT USED
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.	11,12	82	21,22	NU	22	31	41,42	P41, P42	51	42	61,62	P61, P62	71	62	81,82	NU	NU	NU	NU	NU	NU	NU
RED			128				101				134				107							
YELLOW			129				102				135				108							
GREEN			130				103				136				109							
RED ARROW	125					116			131				122									
YELLOW ARROW	126	126			117	117			132	132			123	123								
GREEN ARROW	127	127			118	118			133	133			124	124								
✋								104				119										
🚶								106				121										

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ADVANCED WALK NOTE

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 4 and 6 for 'Advanced Walk'. Make sure the Walk Advance Time shown on the Signal Design plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T3
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a video 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.

Signal Upgrade - Temporary Design 3 - Electrical Detail

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division Traffic Engineering Branch Signals Section

750 N.Greenfield Pkwy, Garner, NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

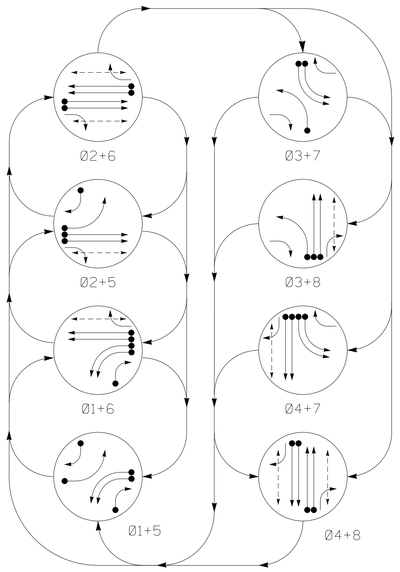
DATE

SIG. INVENTORY NO. 09-0557T3

4/25/2023
G:*3083550.DOC.12*NCL.LI-2729*Traffic*Signals*09-0557*260.360.090557-20230426e-t3.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

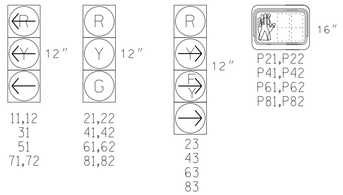
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11,12	↚	↚	←R	←R	←R	←R	←R	←R	←R
21,22	R	R	G	G	R	R	R	R	Y
23	R	R	F Y→	F Y→	↛	↛	R	R	Y↛
31	←R	←R	←R	←R	↚	↚	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
43	↛	R	↛	R	R	R	F Y→	F Y→	R
51	↚	←R	↚	←R	←R	←R	←R	←R	←R
61,62	R	G	R	G	R	R	R	R	Y
63	R	F Y→	R	F Y→	↛	R	↛	R	Y↛
71,72	←R	←R	←R	←R	↚	←R	↚	←R	←R
81,82	R	R	R	R	R	G	R	G	R
83	↛	↛	R	R	R	F Y→	R	F Y→	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	3	-	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	Y
1C	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	3	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	3	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

8 Phase Fully Actuated (Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○ ○	Signal Pole with Guy	●●
○ ○	Signal Pole with Sidewalk Guy	●●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·-·	2-in Underground Conduit	·-·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
—∞—	Directional Drill	N/A
⊕	Type I Pushbutton Post	☢
⬡	Type II Signal Pedestal	⬢
◭	Curb Ramp	◭
▩	Construction Zone	▩
Ⓐ	"U-TURN YIELD TO RIGHT TURN" SIGN (R10-16)	Ⓐ
Ⓑ	Street Name Sign by others (D3-1)	Ⓑ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	25	30	25	90	25	30
Yellow Clearance	3.0	4.3	3.0	4.1	3.0	4.8	3.0	4.1
Red Clearance	3.7	2.2	3.8	2.6	3.6	2.2	3.8	2.7
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	33	-	32	-	33	-	34
Advanced Walk *	-	3	-	3	-	3	-	3
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Temporary Design 4 (TMP Phase V)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE: 0 50' — 1"=50'

SR 4000 (University Parkway) at SR 1672 (Hanes Mill Rd)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE: March 2023 | REVIEWED BY: RW Thompson

PREPARED BY: LD Stouchko | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

SIGNATURE | DATE

SIG. INVENTORY NO. 09-0557T4

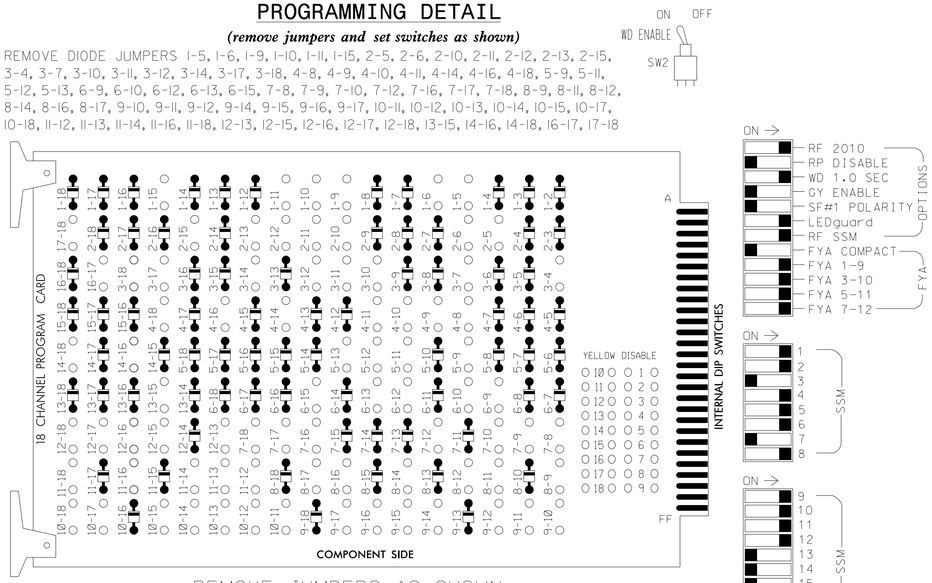
4/25/2023
C:\Projects\...DOC.12\MRC_U-2729\Traffic\Signals\09-0557\260_365_090557-20230425g-t4.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-10, I-11, I-15, 2-5, 2-6, 2-10, 2-11, 2-12, 2-13, 2-15, 3-4, 3-7, 3-10, 3-11, 3-12, 3-14, 3-17, 3-18, 4-8, 4-9, 4-10, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-10, 6-12, 6-13, 6-15, 7-8, 7-9, 7-10, 7-12, 7-16, 7-17, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 8-17, 9-10, 9-11, 9-12, 9-14, 9-15, 9-16, 9-17, 10-11, 10-12, 10-13, 10-14, 10-15, 10-17, 10-18, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 12-17, 12-18, 13-15, 14-16, 14-18, 16-17, 17-18



REMOVE JUMPERS AS SHOWN

■ = 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.

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 and overlaps 1. 2 and 5 as Wag Overlaps.
6. The cabinet and controller are part of the Winston Salem 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,S3,S4,S5,S6,S7,S8, S9,S10,S11,S12,AUX S1,AUX S2, AUX S3,AUX S4,AUX S5,AUX S6
PHASES USED.....1,2,2PED,3,4,4PED, 5,6,6PED,7,8,8PED
OVERLAP 'A'.....1+8
OVERLAP 'B'.....6+7
OVERLAP 'C'.....4+5
OVERLAP 'D'.....2+3
OVERLAP 'E'.....3
OVERLAP 'F'.....7
OVERLAP 'G'.....7
OVERLAP 'H'.....3

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	OLG	4	4 PED	5		6	6 PED	OLH	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	83 ★	21,22	P21 P22	63 ★	41,42	P41, P42	51	43 ★	61,62	P61, P62	23 ★	81,82	P81, P82	83 ★	63 ★	31	43 ★	23 ★	71,72
RED			128			101				134			107		A121	A124		A114	A101	
YELLOW			129		*	102				135		*	108							
GREEN			130			103				136			109							
RED ARROW	125							131									A111			A104
YELLOW ARROW	126							132							A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124					A113			A106
✋				113			104				119			110						
🚶				115			106				121			112						

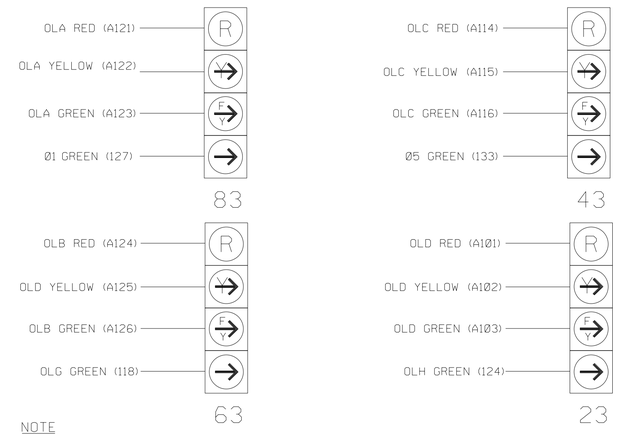
NU = Not Used

* 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)



NOTE

The sequence display for signal heads 23, 43, 63 and 83 require special logic programming. See sheet 4 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø1 1B	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED	Ø2 2B			NOT USED	Ø4 4B			Ø1 1C			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø7 7A	Ø8 8A	SLOT EMPTY	SLOT EMPTY	Ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	Ø6 6B			NOT USED	Ø8 8B			Ø7 7B					

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

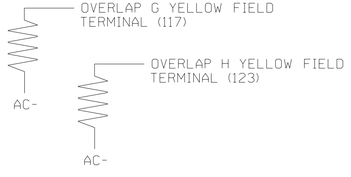
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
1B	TB6-9,10	I9U	60	22	11	1	Y	Y			
1C	TB6-11,12	I9L	62	24	13	1	Y	Y			15
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-1,2	I1U	55	17	5	5	Y	Y			3
5B	TB7-9,10	I9U	59	21	15	5	Y	Y			15
6A	TB3-5,6	I2U	40	2	6	6	Y	Y			
6B	TB3-7,8	I2L	44	6	16	6	Y	Y			
7A	TB5-5,6	I5U	57	19	7	7	Y	Y			3
7B	TB7-11,12	I9L	61	23	17	7	Y	Y			
8A	TB5-9,10	I6U	42	4	8	8	Y	Y			
8B	TB5-11,12	I6L	46	8	18	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0557T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Temporary Design 4 - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy.Garner, NC 27529

SR 4000 (University Parkway) at SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557T4

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.2

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'E' TO LOADSWITCH AUX S3

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "45"

```
PAGE:1  C1 PIN:91  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:91  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:91  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 54

```
PAGE:1  C1 PIN:101  CONTROLLER FLASH
OUTPUT ASSIGNMENT #.................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................Y
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 YELLOW

THE CONTROLLER FLASH ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:101  CONTROLLER FLASH
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:101  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 46

```
PAGE:1  C1 PIN:93  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:93  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:93  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

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

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

```
PAGE:1  C1 PIN:83  NOT ENABLED
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:83  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 53

```
PAGE:1  C1 PIN:100  NOT ENABLED
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:100  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 38

```
PAGE:1  C1 PIN:84  NOT ENABLED
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:84  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

Electrical Detail - Temporary Design 4 - Sheet 2 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

MOTT MACDONALD
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Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com
License No. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Transportation Mobility and Safety Division
Traffic Engineering Branch
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750 N.Greenfield Pkwy.Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557T4

4/25/2023
G:\4308350.00C.12\#RCLU-2729\Traffic\Signals\09-0557\260_371_090557-20230425d2-t4.dgn
User:STOBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.3

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'G' TO LOADSWITCH S4

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "6"

```
PAGE:1  C1 PIN:7  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 RED

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:7  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:7  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 7

```
PAGE:1  C1 PIN:8  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 YELLOW

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:8  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:8  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 8

```
PAGE:1  C1 PIN:9  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 GREEN

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:9  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:9  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'H' TO LOADSWITCH S10

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "22"

```
PAGE:1  C1 PIN:24  VEHICLE PHASE
OUTPUT ASSIGNMENT #................22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 RED

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:24  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:24  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 23

```
PAGE:1  C1 PIN:25  VEHICLE PHASE
OUTPUT ASSIGNMENT #................23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 YELLOW

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:25  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:25  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 24

```
PAGE:1  C1 PIN:26  VEHICLE PHASE
OUTPUT ASSIGNMENT #................24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 GREEN

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A 'Y' IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:26  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:26  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

Electrical Detail - Temporary Design 4 - Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

MOTT MACDONALD
7621 Purfoy Road
Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC DEPARTMENT OF TRANSPORTATION — Mobility and Safety Division — Traffic Engineering Branch — Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-055T4

4/25/2023
G:\#SIGNAL\DGN\U-2729#Traffic#Signals#09-0557#260.372_090557-20230425e3-14.dgn
User:ST086227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.4

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, 6, 7, 8. 9, 10, 11, 12, 13, 14, 15 AND 16.

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 8 (HEAD 83).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 83).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 83).

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #39 ON
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 2 (HEAD 23).

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 23).

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 23).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 4 (HEAD 43).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 43).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 23).

LOGICAL I/O COMMAND #10 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON
AND RED CLEAR ON PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #47 ON
SET OUTPUT ASSIGNMENT #48 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 6 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 6 (HEAD 63).

LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 63).

LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF YELLOW ON PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 63).

OUTPUT REFERENCE SCHEDULE

OUTPUT 2 = PHASE 4 WALK
OUTPUT 5 = PHASE 4 GREEN
OUTPUT 10 = PHASE 2 WALK
OUTPUT 13 = PHASE 2 GREEN
OUTPUT 18 = PHASE 8 WALK
OUTPUT 21 = PHASE 8 GREEN
OUTPUT 26 = PHASE 6 WALK
OUTPUT 29 = PHASE 6 GREEN
OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

LOGICAL I/O COMMAND #13 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #18 IS ON
AND OUTPUT ASSIGNMENT #21 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF
SET OUTPUT ASSIGNMENT #51 OFF
SET OUTPUT ASSIGNMENT #50 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 83 "OFF" DURING PED 8 ADVANCE WALK.

LOGICAL I/O COMMAND #14 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #10 IS ON
AND OUTPUT ASSIGNMENT #13 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #41 OFF
SET OUTPUT ASSIGNMENT #40 OFF
SET OUTPUT ASSIGNMENT #39 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 23 "OFF" DURING PED 2 ADVANCE WALK.

LOGICAL I/O COMMAND #15 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #2 IS ON
AND OUTPUT ASSIGNMENT #5 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF
SET OUTPUT ASSIGNMENT #43 OFF
SET OUTPUT ASSIGNMENT #42 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 43 "OFF" DURING PED 4 ADVANCE WALK.

LOGICAL I/O COMMAND #16 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #26 IS ON
AND OUTPUT ASSIGNMENT #29 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF
SET OUTPUT ASSIGNMENT #48 OFF
SET OUTPUT ASSIGNMENT #47 ON

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 63 "OFF" DURING PED 6 ADVANCE WALK.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Temporary Design 4 - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557T4

4/25/2023
d:\430350_DOC_12\MCJJ-2729\Traffic\Signals\09-0557\260_375_090557-20230425e4-T4.dgn
User:S1086227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.17.5

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:|X       X
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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011121314151 6
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011121314151 6
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'F' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'G' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'H' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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

ADVANCED WALK NOTE

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2, 4, 6 and 8 for 'Advanced Walk'. Make sure the Walk Advance Time shown on the Signal Design plans are programmed in the 'Phase Timing' menu.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557T4
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MOTT MACDONALD
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

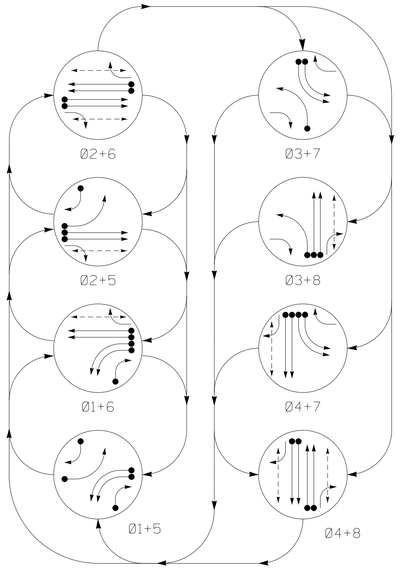
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557T4

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

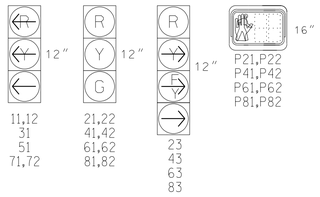
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11,12	←	←	↑R	↑R	↑R	↑R	↑R	↑R	↑R
21,22	R	R	G	G	R	R	R	R	Y
23	R	R	F.Y→	F.Y→	→	→	R	R	Y→
31	←R	←R	↑R	↑R	←	←	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
43	→	R	→	R	R	R	F.Y→	F.Y→	R
51	←	←R	←	←R	←R	←R	←R	←R	←R
61,62	R	G	R	G	R	R	R	R	Y
63	R	F.Y→	R	F.Y→	→	R	→	R	Y→
71,72	←R	←R	←R	←R	←	←R	←	←R	←R
81,82	R	R	R	R	R	G	R	G	R
83	→	→	R	R	R	F.Y→	R	F.Y→	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	3	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	-
1C	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-	-
4A	6X6	300	6	Y	4	-	Y	-	-	-	-	-
4B	6X6	300	6	Y	4	-	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	3	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	3	-	-
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	-
8A	6X6	300	6	Y	8	-	Y	-	-	-	-	-
8B	6X6	300	6	Y	8	-	Y	-	-	-	-	-

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	25	30	25	90	25	30
Yellow Clearance	3.0	4.3	3.0	4.1	3.0	4.8	3.0	4.1
Red Clearance	3.6	2.2	3.7	2.6	3.5	2.2	3.8	2.6
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	33	-	31	-	33	-	34
Advanced Walk *	-	3	-	3	-	3	-	3
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
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	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	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.

8 Phase
Fully Actuated
(Winston-Salem Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Reposition existing signal heads numbered 11,21,22,31, 51,61,62,71,72 and 81.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Curb Ramp	
	Metal Strain Pole	
(A)	"U-TURN YIELD TO RIGHT TURN" SIGN (R10-16)	(A)
(B)	Street Name Sign by others (D3-1)	(B)

Signal Upgrade - Final Design

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Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE
0 50'
1"=50'

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

SIGNATURE DATE

SIG. INVENTORY NO. 09-0557

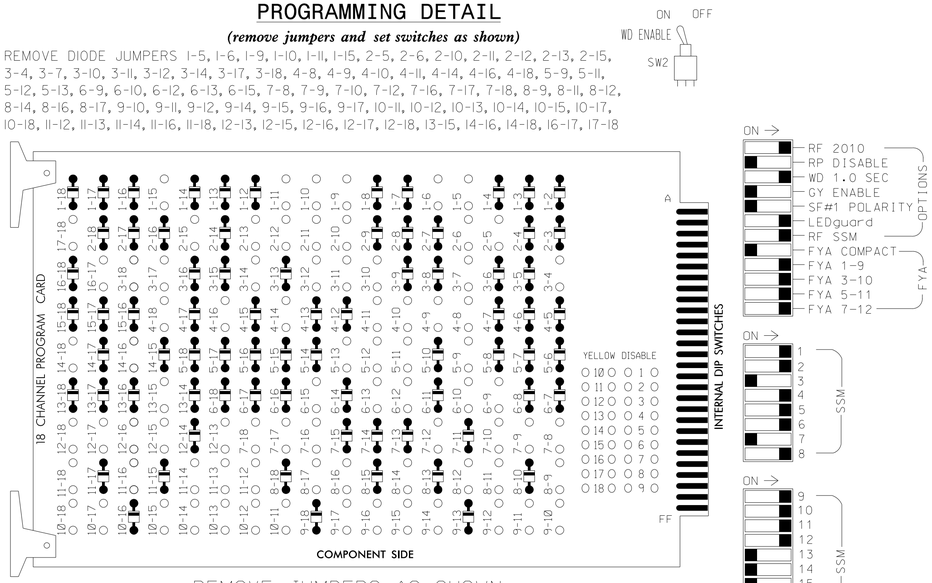
4/25/2023
U-2729_SIG_DOC_12#0_U-2729#Traffic%5Signals%09-0557%260_385_090557-20230425g.dgn
User:STOBB227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-10, I-11, I-15, 2-5, 2-6, 2-10, 2-11, 2-12, 2-13, 2-15, 3-4, 3-7, 3-10, 3-11, 3-12, 3-14, 3-17, 3-18, 4-8, 4-9, 4-10, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-10, 6-12, 6-13, 6-15, 7-8, 7-9, 7-10, 7-12, 7-16, 7-17, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 8-17, 9-10, 9-11, 9-12, 9-14, 9-15, 9-16, 9-17, 10-11, 10-12, 10-13, 10-14, 10-15, 10-17, 10-18, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 12-17, 12-18, 13-15, 14-16, 14-18, 16-17, 17-18



REMOVE JUMPERS AS SHOWN

■ = 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.

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 and overlaps 1. 2 and 5 as Wag Overlaps.
6. The cabinet and controller are part of the Winston Salem 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,S3,S4,S5,S6,S7,S8, S9,S10,S11,S12,AUX S1,AUX S2, AUX S3,AUX S4,AUX S5,AUX S6
PHASES USED.....1,2,2PED,3,4,4PED, 5,6,6PED,7,8,8PED
OVERLAP 'A'.....1+8
OVERLAP 'B'.....6+7
OVERLAP 'C'.....4+5
OVERLAP 'D'.....2+3
OVERLAP 'E'.....3
OVERLAP 'F'.....7
OVERLAP 'G'.....7
OVERLAP 'H'.....3

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	OLG	4	4 PED	5		6	6 PED	OLH	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	83★	21,22	P21 P22	63★	41,42	P41, P42	51	43★	61,62	P61, P62	23★	81,82	P81, P82	83★	63★	31	43★	23★	71,72
RED			128			101				134			107		A121	A124		A114	A101	
YELLOW			129		✳	102				135		✳	108							
GREEN			130			103				136			109							
RED ARROW	125							131									A111			A104
YELLOW ARROW	126							132							A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124					A113			A106
✋				113			104				119			110						
🚶				115			106				121			112						

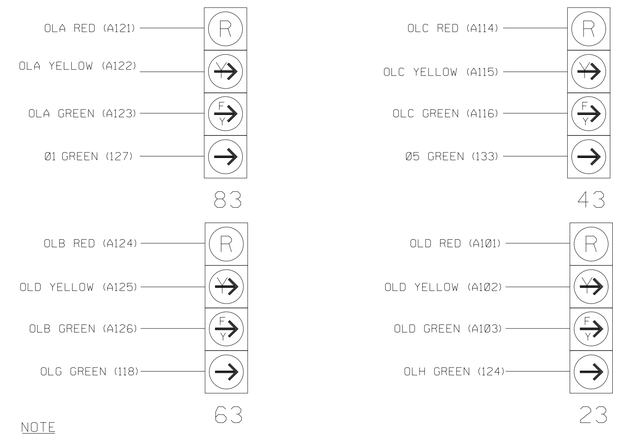
NU = Not Used

✳ 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)



NOTE

The sequence display for signal heads 23, 43, 63 and 83 require special logic programming. See sheet 4 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø1 1B	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED	Ø2 2B			NOT USED	Ø4 4B			Ø1 1C			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø7 7A	Ø8 8A	SLOT EMPTY	SLOT EMPTY	Ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	Ø6 6B			NOT USED	Ø8 8B			Ø7 7B					

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			3
1B	TB6-9,10	I9U	60	22	11	1	Y	Y			
1C	TB6-11,12	I9L	62	24	13	1	Y	Y			15
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4		Y			
4B	TB4-11,12	I6L	45	7	14	4		Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
5B	TB7-9,10	J9U	59	21	15	5	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			3
7B	TB7-11,12	J9L	61	23	17	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8		Y			
8B	TB5-11,12	J6L	46	8	18	8		Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

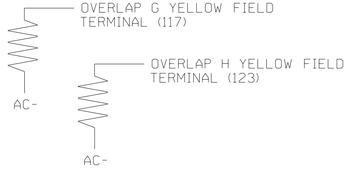
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-0557
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557

4/25/2023
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User:STOBE227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.2

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'E' TO LOADSWITCH AUX S3

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION. ENTER "45"

```
PAGE:1  C1 PIN:91  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:91  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:91  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 54

```
PAGE:1  C1 PIN:101  CONTROLLER FLASH
OUTPUT ASSIGNMENT #.................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................Y
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 YELLOW

THE CONTROLLER FLASH ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:101  CONTROLLER FLASH
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:101  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 46

```
PAGE:1  C1 PIN:93  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S3 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:93  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:93  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

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

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION. ENTER "37"

```
PAGE:1  C1 PIN:83  NOT ENABLED
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 RED

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:83  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 53

```
PAGE:1  C1 PIN:100  NOT ENABLED
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 YELLOW

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:100  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 38

```
PAGE:1  C1 PIN:84  NOT ENABLED
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................Y
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH AUX S6 GREEN

THE NOT ENABLED ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD

```
PAGE:1  C1 PIN:84  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

Electrical Detail - Sheet 2 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

MOTT MACDONALD
7621 Purfoy Road
Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com
License No. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
STATE OF NORTH CAROLINA
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557

4/25/2023
G:\4308350.00C.12\WRC_LU-2729\Traffic\Signals\09-0557\260_391_090557-20230425s2.dgn
User:S1086227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.3

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'G' TO LOADSWITCH S4

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "6"

```
PAGE:1  C1 PIN:7  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 RED

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:7  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:7  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................6
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 7

```
PAGE:1  C1 PIN:8  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 YELLOW

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:8  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:8  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................7
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 8

```
PAGE:1  C1 PIN:9  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S4 GREEN

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:9  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...7
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:9  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................8
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

OUTPUT REMAPPING PROGRAMMING DETAIL
TO ASSIGN OVERLAP 'H' TO LOADSWITCH S10

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "22"

```
PAGE:1  C1 PIN:24  VEHICLE PHASE
OUTPUT ASSIGNMENT #................22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 RED

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:24  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:24  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................22
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 23

```
PAGE:1  C1 PIN:25  VEHICLE PHASE
OUTPUT ASSIGNMENT #................23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 YELLOW

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:25  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:25  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................23
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

PRESS "+" KEY FOR OUTPUT 24

```
PAGE:1  C1 PIN:26  VEHICLE PHASE
OUTPUT ASSIGNMENT #................24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

LOADSWITCH S10 GREEN

THE VEHICLE PHASE ENTRY IS EXISTING BY DEFAULT:
ENTER A "Y" IN THE VEHICLE OVERLAP FIELD.

```
PAGE:1  C1 PIN:26  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...8
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER ENTERING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:26  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................24
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

Electrical Detail - Sheet 3 of 5

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MOTT MACDONALD
7621 Parfoy Road
Suite 115
Fuquay-Varina, NC 27526
www.mottmac.com
License No. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC DEPARTMENT OF TRANSPORTATION — Mobility and Safety Division — Traffic Engineering Branch — Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 | Forsyth County | Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557

4/25/2023
G:\#363550_DOC_124RCJJ-2729\Traffic\e*Signals\09-0557\260.392_090557-20230425e3.dgn
User:STOB6227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.4

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, 6, 7, 8. 9, 10, 11, 12, 13, 14, 15 AND 16.

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 8 (HEAD 83).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 83).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 83).

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #39 ON
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 2 (HEAD 23).

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 23).

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 23).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 4 (HEAD 43).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 43).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 23).

LOGICAL I/O COMMAND #10 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON
AND RED CLEAR ON PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #47 ON
SET OUTPUT ASSIGNMENT #48 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 6 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 6 (HEAD 63).

LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF ACTIVE PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 63).

LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF YELLOW ON PHASE #7 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 63).

OUTPUT REFERENCE SCHEDULE

OUTPUT 2 = PHASE 4 WALK
OUTPUT 5 = PHASE 4 GREEN
OUTPUT 10 = PHASE 2 WALK
OUTPUT 13 = PHASE 2 GREEN
OUTPUT 18 = PHASE 8 WALK
OUTPUT 21 = PHASE 8 GREEN
OUTPUT 26 = PHASE 6 WALK
OUTPUT 29 = PHASE 6 GREEN
OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

LOGICAL I/O COMMAND #13 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #18 IS ON
AND OUTPUT ASSIGNMENT #21 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF
SET OUTPUT ASSIGNMENT #51 OFF
SET OUTPUT ASSIGNMENT #50 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 83 "OFF" DURING PED 8 ADVANCE WALK.

LOGICAL I/O COMMAND #14 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #10 IS ON
AND OUTPUT ASSIGNMENT #13 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #41 OFF
SET OUTPUT ASSIGNMENT #40 OFF
SET OUTPUT ASSIGNMENT #39 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 23 "OFF" DURING PED 2 ADVANCE WALK.

LOGICAL I/O COMMAND #15 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #2 IS ON
AND OUTPUT ASSIGNMENT #5 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF
SET OUTPUT ASSIGNMENT #43 OFF
SET OUTPUT ASSIGNMENT #42 ON

PRESS '+'

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 43 "OFF" DURING PED 4 ADVANCE WALK.

LOGICAL I/O COMMAND #16 (+/-COMMAND#)
IF OUTPUT ASSIGNMENT #26 IS ON
AND OUTPUT ASSIGNMENT #29 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF
SET OUTPUT ASSIGNMENT #48 OFF
SET OUTPUT ASSIGNMENT #47 ON

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

NOTE: LOGIC STATEMENT FOR ADVANCE WALK WITH FYA'S. TURN FYA HEAD 63 "OFF" DURING PED 6 ADVANCE WALK.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

Electrical Detail - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Traffic Engineering Branch, Traffic Engineering Unit, Transportation Mobility and Safety Division, NC Department of Transportation, Traffic Engineering & Safety Systems Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557

4/25/2023
G:\43\68350.000-12\MCJJ-2729\Traffic\Signals\09-0557\260.395.090557-20230425e4.dgn
User:S1086227

PROJECT REFERENCE NO.	SHEET NO.
U-2729	Sig.18.5

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS:|X       X
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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |1234567891011121314151 6
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
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)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          |1234567891011121314151 6
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
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'F' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'G' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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
```

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'H' SETTINGS
 PHASE:          |1234567891011121314151 6
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?...N
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

ADVANCED WALK NOTE

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2, 4, 6 and 8 for 'Advanced Walk'. Make sure the Walk Advance Time shown on the Signal Design plans are programmed in the 'Phase Timing' menu.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-0557
DESIGNED: March 2023
SEALED: April 25, 2023
REVISED:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MOTT MACDONALD
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License No. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 4000 (University Parkway)
at
SR 1672 (Hanes Mill Rd)

Division 9 Forsyth County Winston-Salem

PLAN DATE:	March 2023	REVIEWED BY:	RW Thompson
PREPARED BY:	LD Stouchko	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DATE

SIG. INVENTORY NO. 09-0557

4/25/2023
G:\4308350.00C.12\RC_U-2729\Traffic\Signals\09-0557\260.400.090557-20230425d5.dgn
User:STOB6227

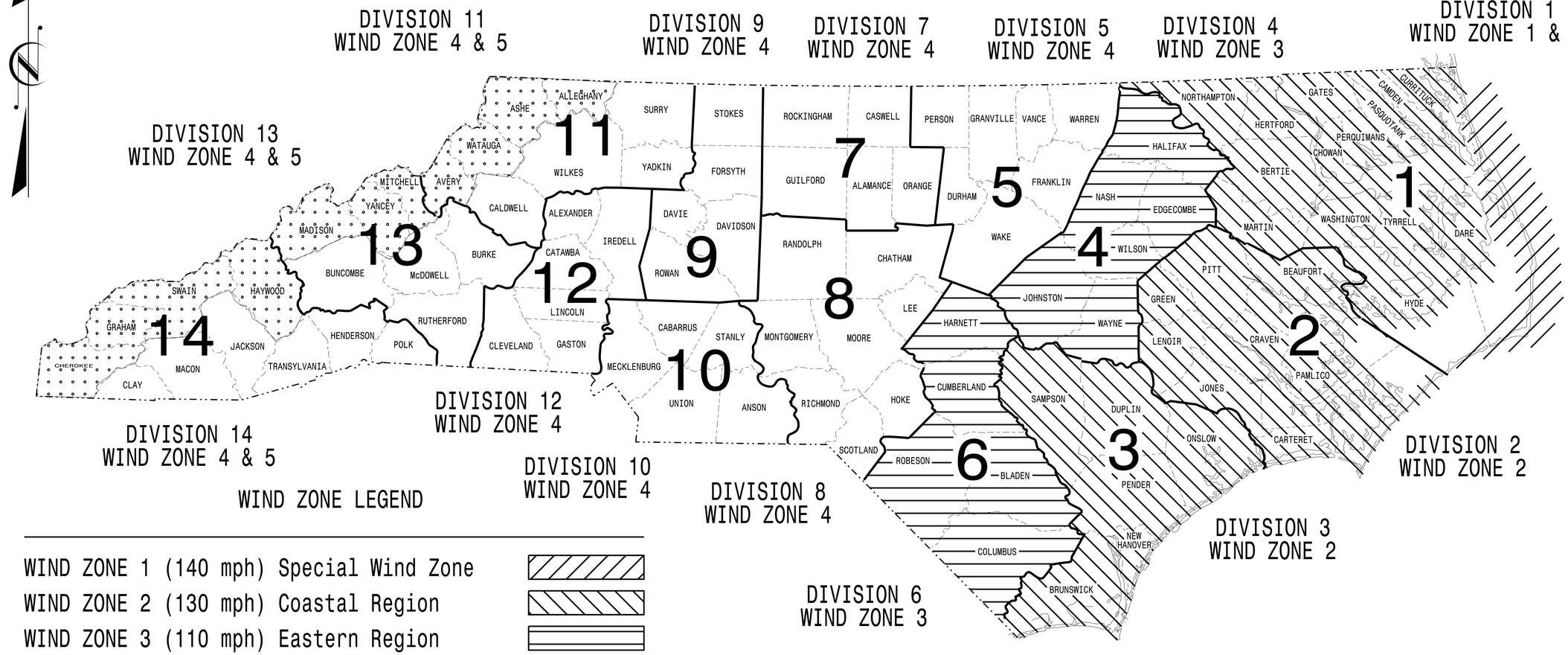
PROJECT I.D. NO.	SHEET NO.
	Sig.M1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES

POLE STANDARDS

NCDOT METAL P



WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

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

Prepared In the Offices of:

Transportation Mobility and Safety Division
Signal Design Section
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.
Garner,NC 27529

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

M.M. MCDIARMID, P.E. – STATE ITS AND SIGNALS ENGINEER

J. P. GALLOWAY, P.E. – STATE SIGNALS ENGINEER

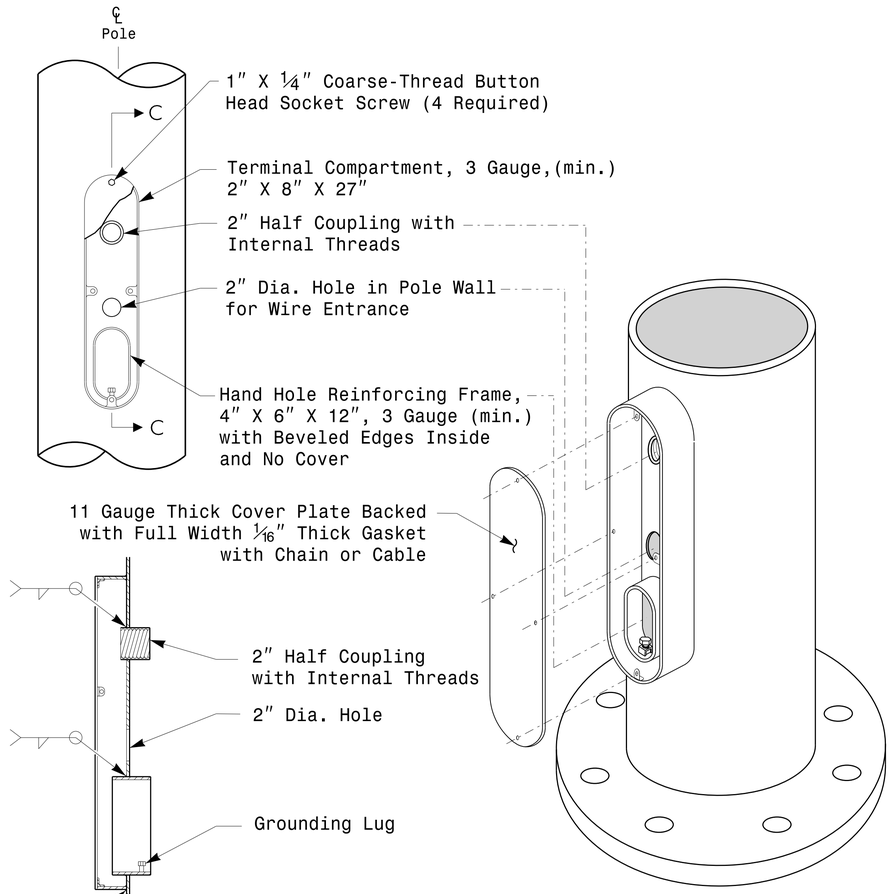
D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8E3... SIGNATURE

10/11/2017 DATE



Section C-C

Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

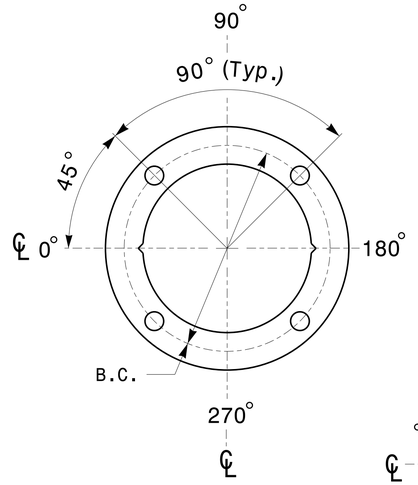
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT SIG. INV. NO. _ _ _ _ _ _ _ _
NCDOT POLE NO. _ _ _ _ _ _ _ _

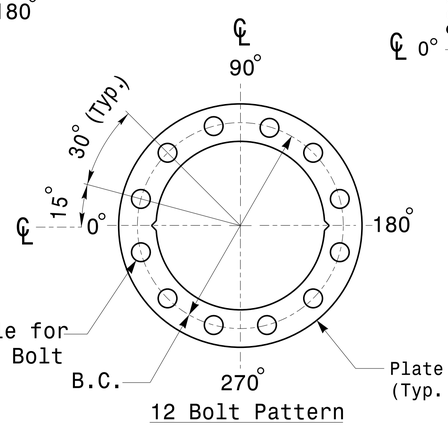
Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details



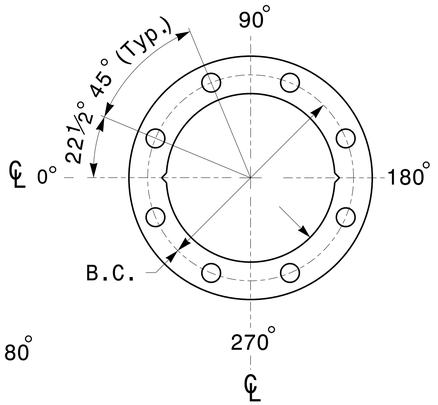
4 Bolt Pattern



2¼"" dia. hole for 2"dia. Anchor Bolt

Plate Width = 4" min. (Typ. for all plates)

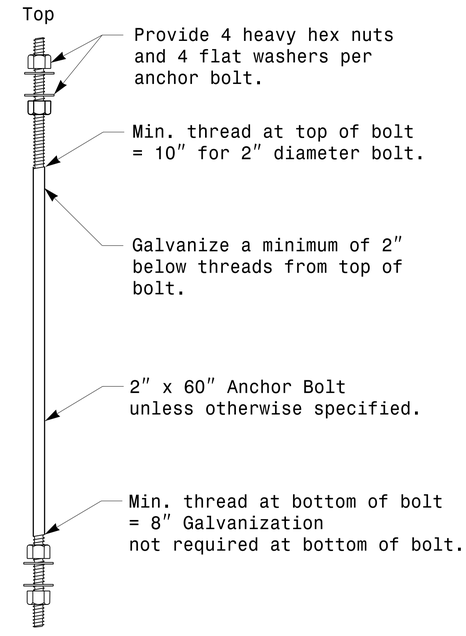
12 Bolt Pattern



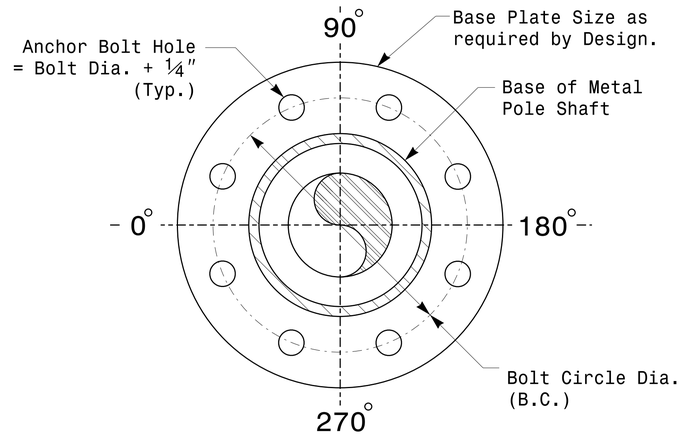
8 Bolt Pattern

Construct Templates and Plates from ¼" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail



Note: Base plate may be circular,octagonal,square or rectangular in shape.

Typical Base Plate Detail

Fabrication Details – All Metal Poles

PROJECT ID. NO.	SHEET NO.
	Sig.M2

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 NA NONE

Typical Fabrication Details For All Metal Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE32B5B4A...
SIGNATURE

10/11/2017
DATE

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