

Project: U-4902D

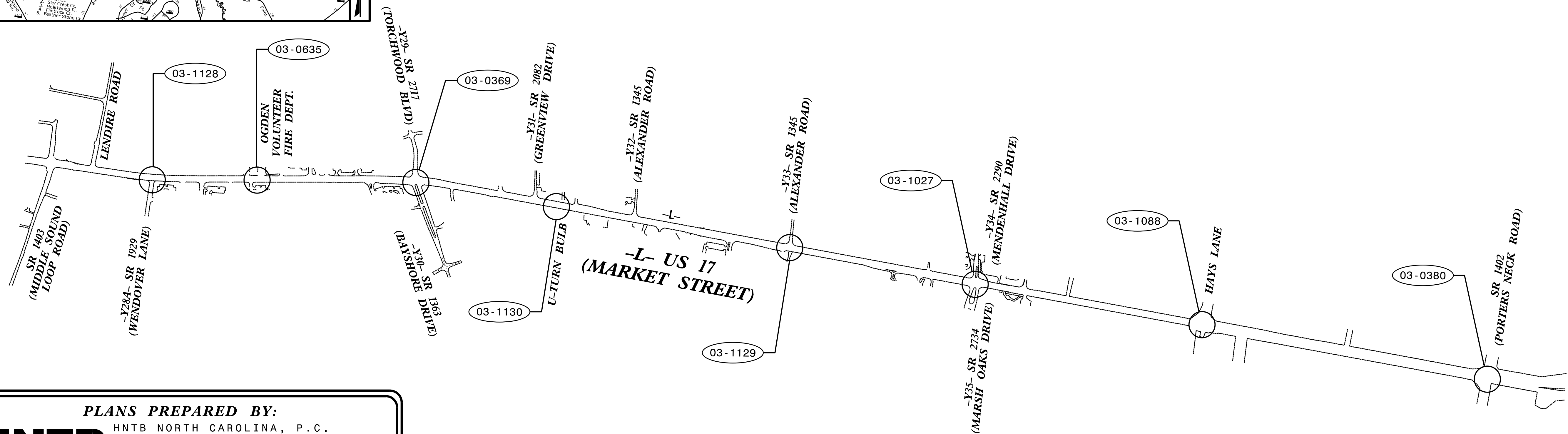
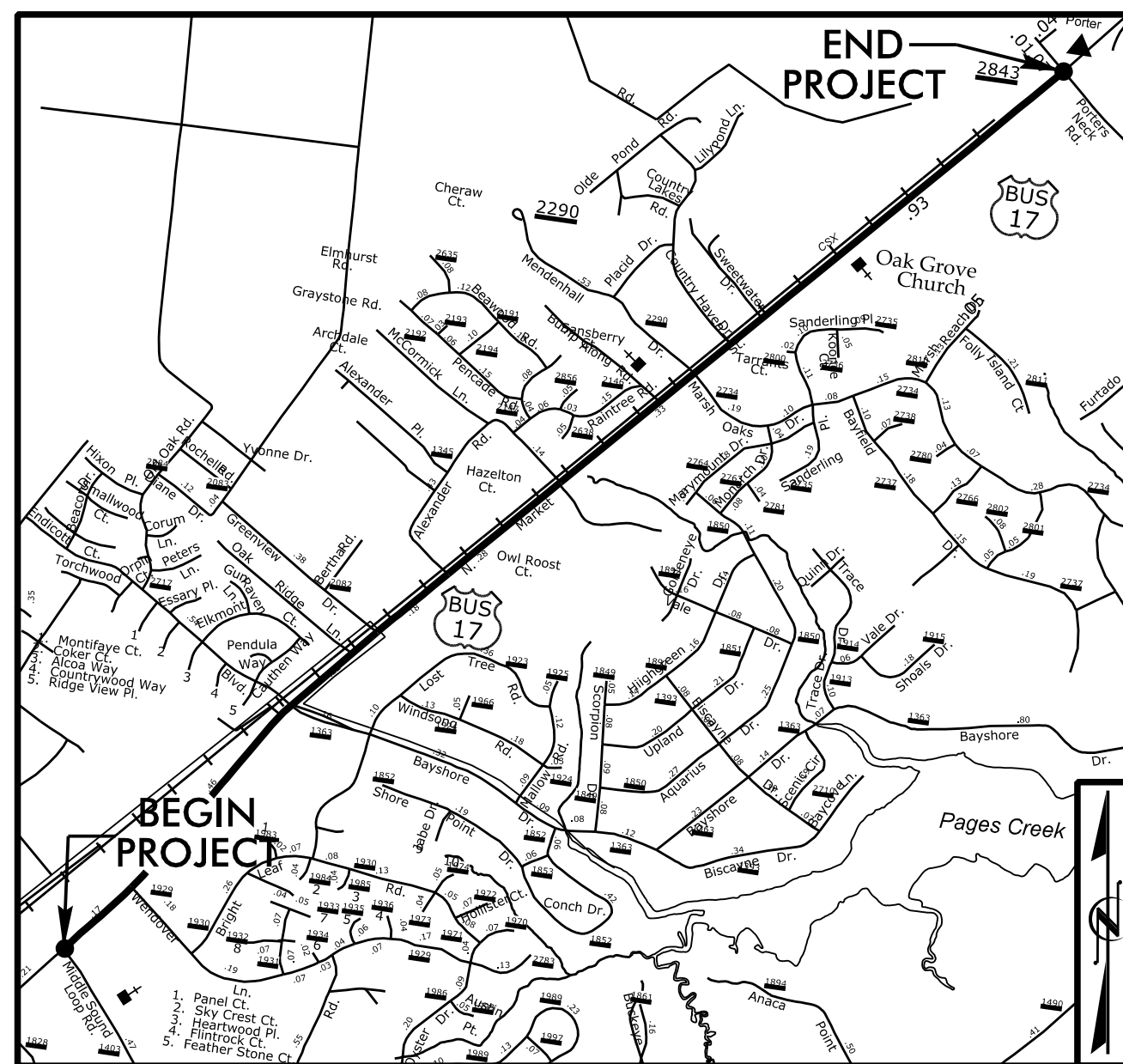
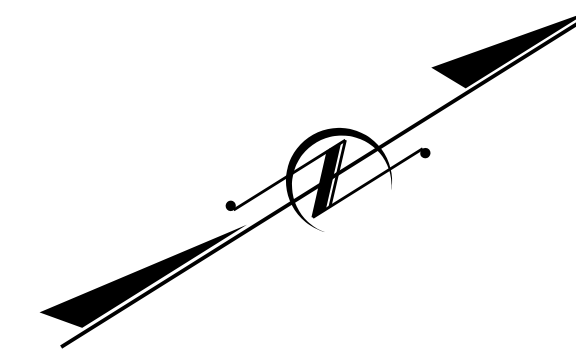
Contract: C202280

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

LOCATION: US 17 (MARKET STREET) FROM
SR 1403 (MIDDLE SOUND LOOP ROAD)
TO SR 1402 (PORTERS NECK ROAD)

TYPE OF WORK: TRAFFIC SIGNALS, CCTV CAMERAS, AND FIBER OPTIC CABLE



PLANS PREPARED BY:
HNTB
HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
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Natasha R. Simmons, PE, PTOE - Project Manager
Andrew D. Klinksiek, PE, PTOE - Project Engineer
Alex H. Thornburg, PE - Project Engineer
Nicole K. Vlanich, EI - Design Engineer
Tracey R. Terrell - Senior Design Technician

Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	
Sig. 2.0-2.5	03-1128	US 17 (Market Street) at SR 1929 (Wendover Lane)	
Sig. 3.0-3.4	03-0635	US 17 (Market Street) at Ogdén Volunteer Fire Dept.	
Sig. 4.0-7.12	03-0369	US 17 (Market Street) at SR 1363 (Bayshore Drive)/SR 2717 (Torchwood Boulevard)	
Sig. 8.0-8.5	03-1130	Northbound US 17 (Market Street) at U-Turn North of SR 2082 (Greenview Drive)	
Sig. 9.0-9.5	03-1129	US 17 (Market Street) at SR 1345 (Alexander Road)	
Sig. 10.0-13.7	03-1027	US 17 (Market Street) at SR 2734 (Marsh Oaks Drive)/SR 2290 (Mendenhall Drive)	
Sig. 14.0-14.2	03-0380	US 17 (Market Street) at SR 1402 (Porters Neck Road)	
Sig. 15.0	-----	Standard Drawing for Electrical Service Grounding and Wood Poles	
Sig. 16.0	-----	Standard Drawing for Pedestals	
Sig. M1-M8	-----	Standard Drawing for Metal Poles	
SCP. 1-34	-----	Signal Communication Plans	

LEGEND

##-#### SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Zachary Little, PE - Eastern Region Signals Engineer
Todd Joyce, PE - Signal Equipment Design Engineer
Neil Avery - Signal Communications Project Engineer

NCDOT - DIVISION 3

Contacts:

Jessi Leonard, PE - Division Traffic Engineer
R. Coke Gray III, PE - Regional Traffic Engineer

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Refer to "Roadway Standard Drawings
NCDOT" dated January 2018 and
"Standard Specifications for Roads
and Structures" dated January 2018.

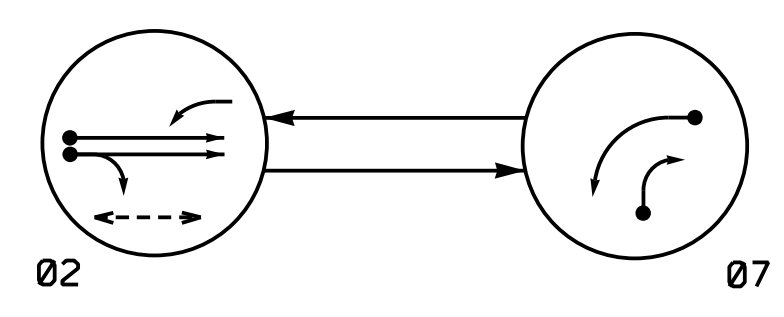
Prepared for the Office of:
DIVISION OF HIGHWAYS
**TRANSPORTATION MOBILITY AND SAFETY
DIVISION**

750 N. Greenfield Parkway, Garner, NC 27529

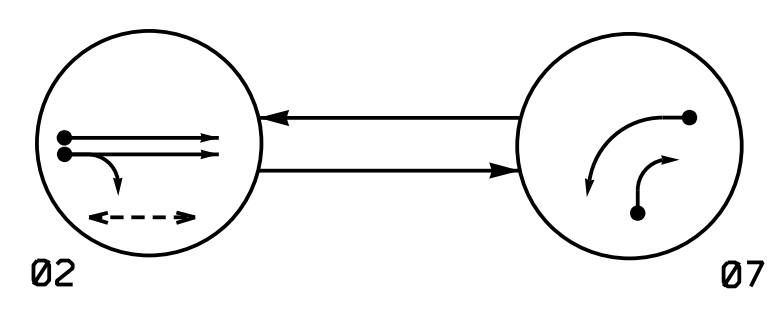
SEAL

DocuSigned by:
Natasha R. Simmons 8/1/2018
DATE

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		
	02	07	FLASH
21,22	G	R	Y
71	F	-	-
72,73	R	F	R
P21,P22	W	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

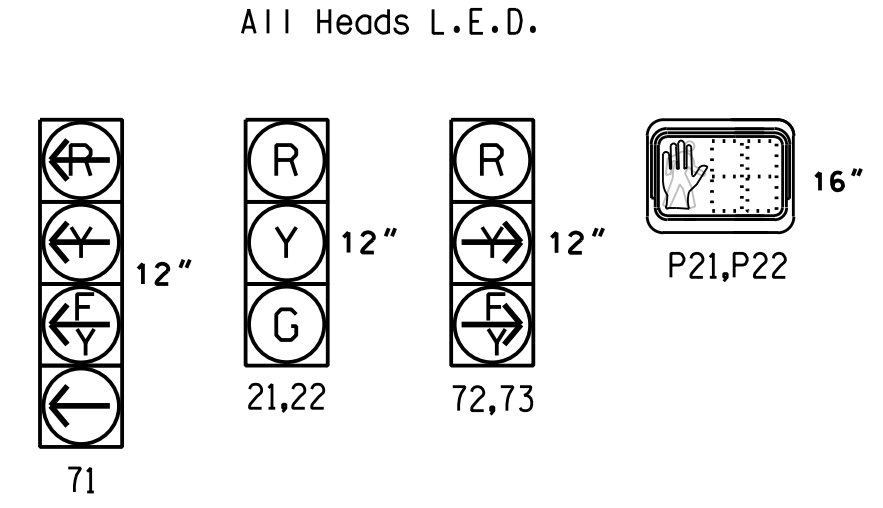
SIGNAL FACE	PHASE		
	02	07	FLASH
21,22	G	R	Y
71	R	-	-
72,73	R	F	R
P21,P22	W	DW	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	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
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	*10	-	Y
7B	6X6	0	3	Y	7	Y	Y	-	-	15	-	Y
7C	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	Y

* Reduce delay to 0 seconds during alternate phasing operation.

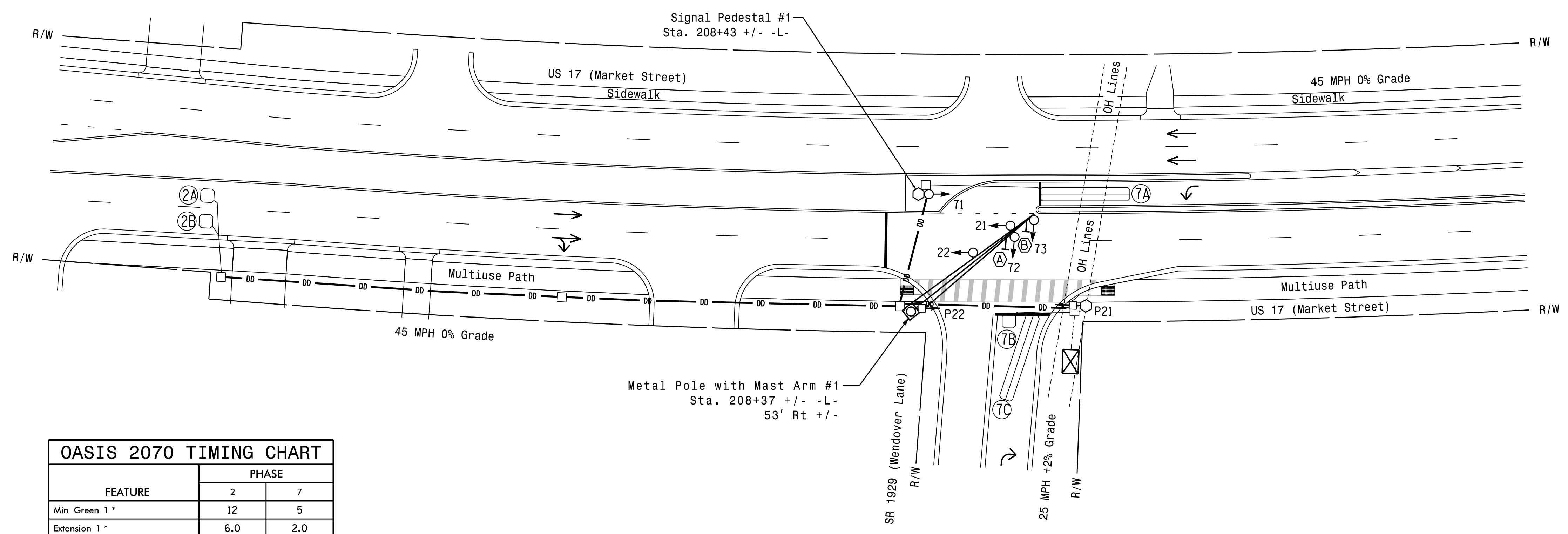
SIGNAL FACE I.D.



2 Phase Fully Actuated Wilmington Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
- All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data:
Controller Asset #1128



OASIS 2070 TIMING CHART

FEATURE	PHASE	
	2	7
Min Green 1 *	12	5
Extension 1 *	6.0	2.0
Max Green 1 *	90	20
Yellow Clearance	4.5	3.0
Red Clearance	1.2	1.8
Walk 1 *	7	-
Don't Walk 1	15	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.0	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head Sign	●→ Traffic Signal Head Sign
□→ Pedestrian Signal Head With Push Button & Sign	■→ Pedestrian Signal Head With Push Button & Sign
⊗ Inductive Loop Detector	⊗ Inductive Loop Detector
□ Junction Box	■ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A Right of Way	N/A Right of Way
→ Directional Arrow	→ Directional Arrow
- - - Directional Drill	N/A Directional Drill
⊙ Metal Pole with Mastarm	⊙ Metal Pole with Mastarm
○ Type II Signal Pedestal	● Type II Signal Pedestal
♯ Wheelchair Ramp	♯ Wheelchair Ramp
Ⓐ Right Arrow "ONLY" Sign (R3-5R)	Ⓐ Right Arrow "ONLY" Sign (R3-5R)
Ⓑ "RIGHT TURN MUST YIELD TO U-TURN" Sign	Ⓑ "RIGHT TURN MUST YIELD TO U-TURN" Sign

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 17 (Market Street)
at
SR 1929 (Wendover Lane)

Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek

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

SEAL

SEAL 031464

ENGINEER

N. R. SIMMONS

REVISIONS	INIT.	DATE

DocuSigned by:
N. R. Simmons 8/1/2018

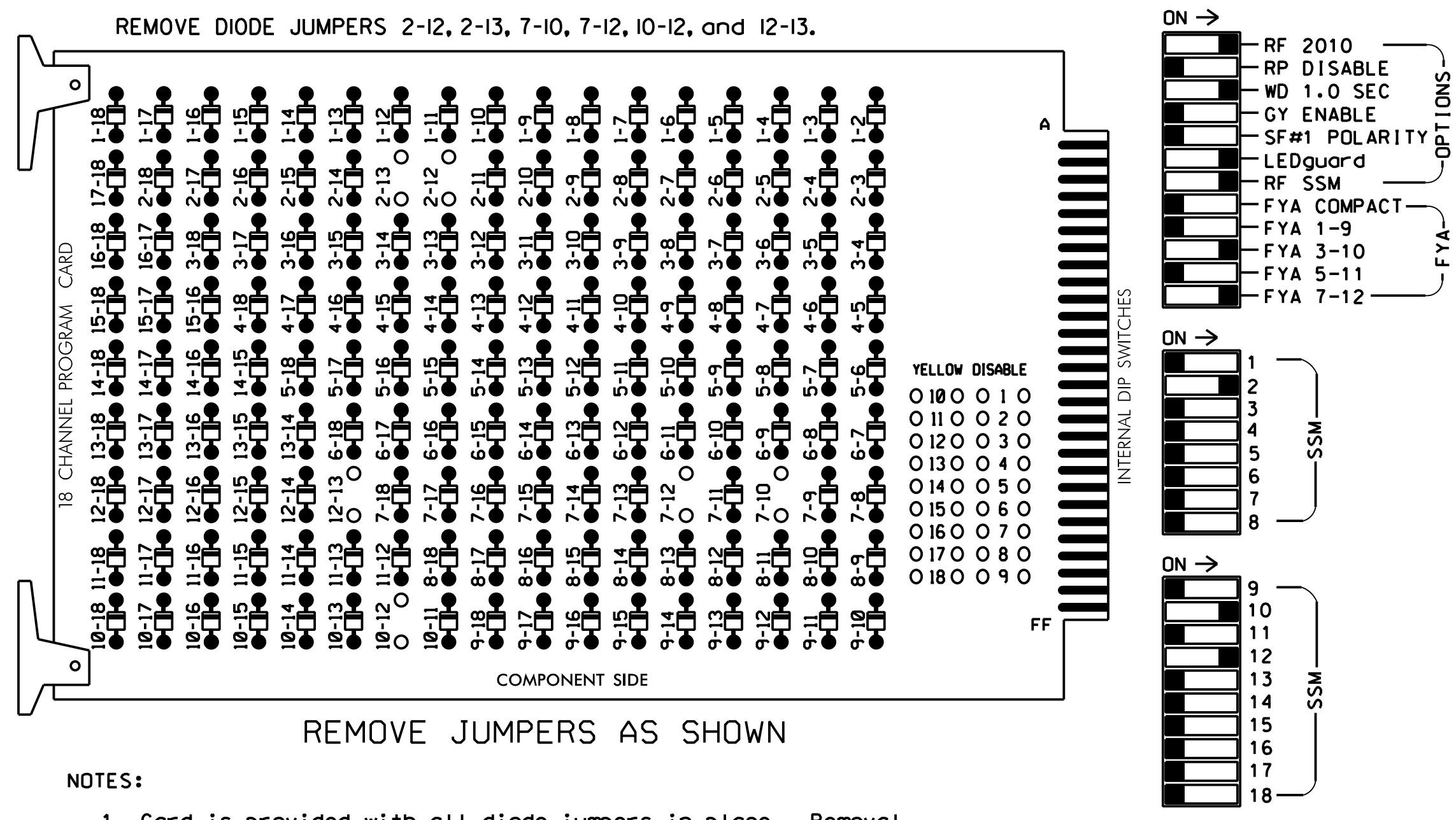
SIGNATURE DATE

SIG. INVENTORY NO. 03-1128



EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

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 phase 2 for Variable Initial and Gap Reduction.
4. Program phase 2 for Startup In Green.
5. Program phase 2 for Startup Ped Call.
6. Program phase 2 for Yellow Flash.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S3,S10,AUX S2,AUX S5
 PHASES USED.....2,2 PED,7
 OVERLAP "A".....NOT USED
 OVERLAP "B".....7
 OVERLAP "C".....NOT USED
 OVERLAP "D".....2+7

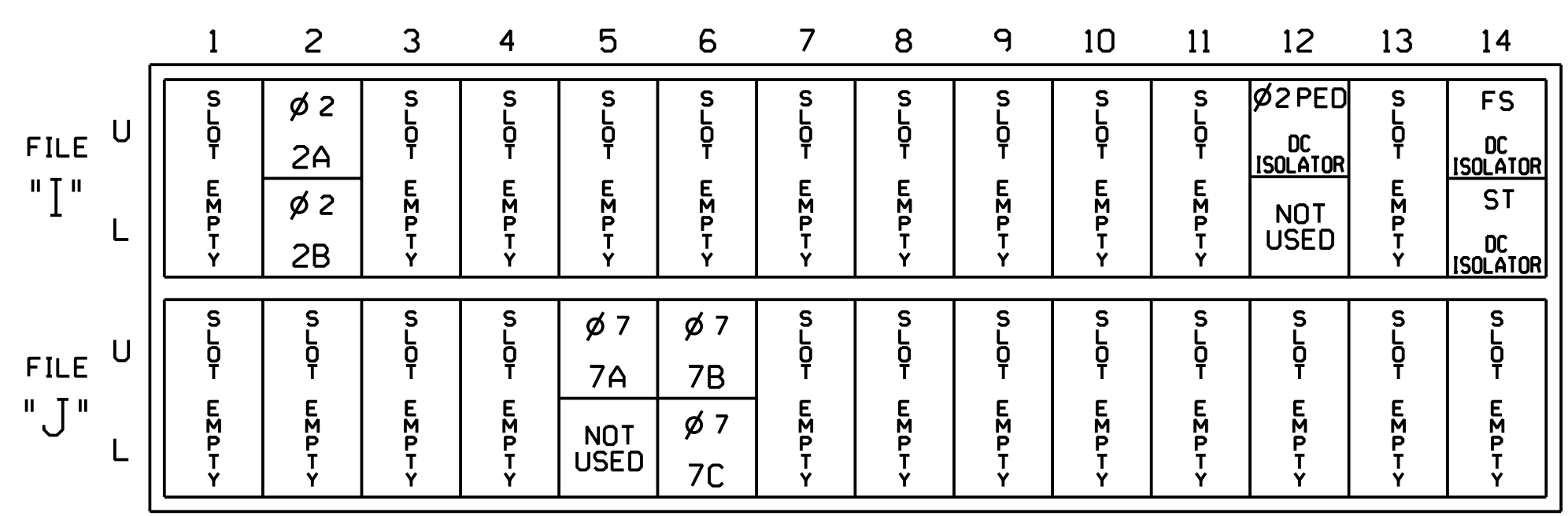
SIGNAL HEAD HOOK-UP CHART

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	NU	NU	NU	NU	NU	71*	NU	NU	NU	72,73*	NU	NU	71*	NU
RED		128												A124				
YELLOW		129								*								
GREEN		130																
RED ARROW																		A101
YELLOW ARROW														A125				A102
FLASHING YELLOW ARROW														A126				A103
GREEN ARROW										124								
Hand																		113
Walking Person																		115

NU = Not Used

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

INPUT FILE POSITION LAYOUT (front view)

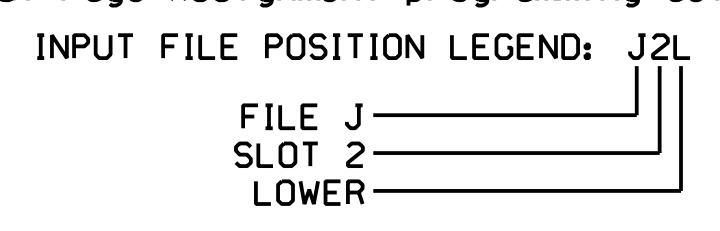


INPUT FILE CONNECTION & PROGRAMMING CHART

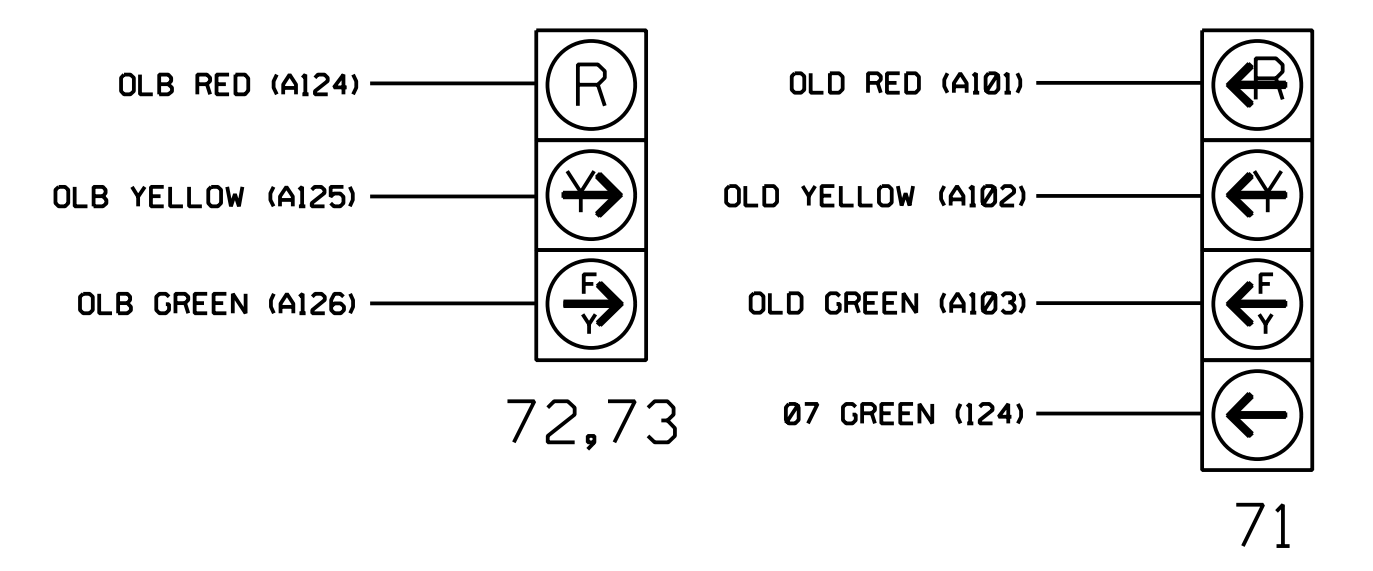
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			10
		J5U	57	19*	57	7	Y	Y			
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			15
7C	TB5-11,12	J6L	46	8	18	7	Y	Y			15
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 112.

*See Input Page Assignment programming details on sheet 3.



FYA SIGNAL WIRING DETAIL (wire signal heads as shown)



NOTE

The sequence display for signal head 71 requires special logic programming. See sheet 2 for programming instructions.

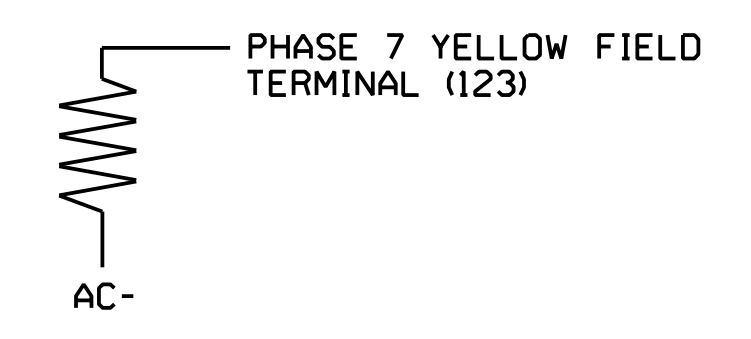
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1128
 DESIGNED: February 2018
 SEALED: 8-1-18
 REVISED: N/A

Electrical Detail - Sheet 1 of 4
 New Installation

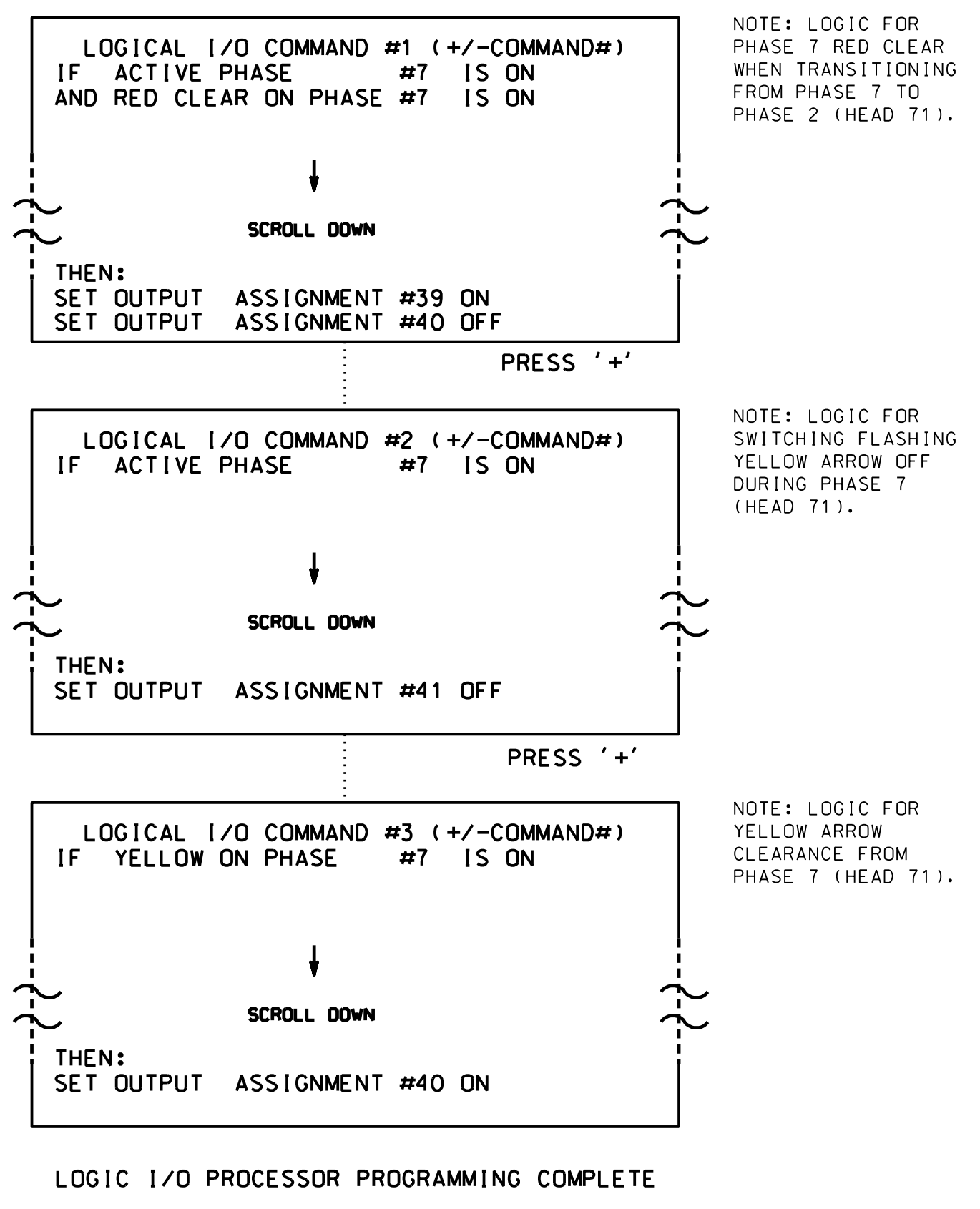
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: 	Prepared for: 		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 NATASHA R. SIMMONS
	US 17 (Market Street) at SR 1929 (Wendover Lane)		
	Division 03 New Hanover Co. Wilmington		
	PLAN DATE: February 2018 PREPARED BY: A.H. Thornburg	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	
REVISIONS _____ _____ _____	INIT. _____ _____ _____	DATE _____ _____ _____	8/1/2018 _____ _____ _____

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS), SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 39	= Overlap D Red
OUTPUT 40	= Overlap D Yellow
OUTPUT 41	= Overlap D Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

PRESS '+' TWICE

```

PAGE 1: VEHICLE OVERLAP 'B' 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)...0.0
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 PAGE 2

```

PAGE 2: VEHICLE OVERLAP 'B' 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)...0.0
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 'D' SETTINGS
PHASE: :12345678910111213141516
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?...Y
GREEN EXTENSION (0-255 SEC)...0.0
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 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 - GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
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 COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1128
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 2 of 4
New Installation

DOCUMENT NOT CONSIDERED FINAL
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at SR 1929 (Wendover Lane)		
Division 03	New Hanover Co. Wilmington	
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek	
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons	
REVISIONS	INIT.	DATE

SEAL

DocuSigned by:
Natasha R. Simmons 8/1/2018
SIGNATURE DATE
SIG. INVENTORY NO. 03-1128

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1564
(919) 546-8997

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7A

(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 TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 57 TO INPUT #19 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 19 IS REACHED.

```

PAGE: 2 C1 PIN:57 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....19
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).....7
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 SYNCHRONIZATION (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 '57' TO REASSIGN
THE VEHICLE DETECTOR
FOR THIS INPUT

(LOOP 7A - PHASE 7)

```

PAGE: 2 C1 PIN:57 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....19
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).....57
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 SYNCHRONIZATION (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 7A (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 #57.

```

VEHICLE DETECTOR #57 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 '7' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```

VEHICLE DETECTOR #57 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).....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
    
```

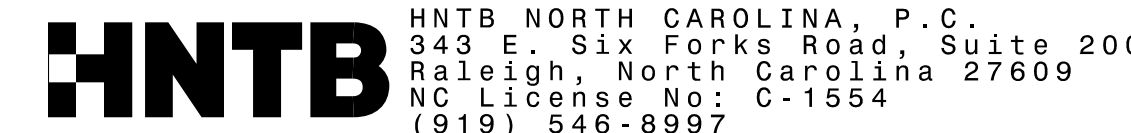
DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1128
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 3 of 4
New Installation

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



ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Office of Signal Management	US 17 (Market Street) at SR 1929 (Wendover Lane) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	SEAL SEAL 031464 NATASHA R. SIMMONS ENGINEER
REVISIONS _____ INIT. DATE _____ _____	DocuSigned by: _____ 8/1/2018 _____ _____ _____	_____ _____ _____ _____
SIG. INVENTORY NO. 03-1128		

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phase for head 71 to run protected turn only.

INPUTS PAGE 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

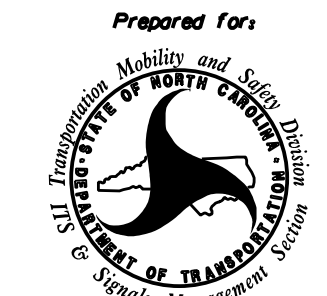
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1128
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 4 of 4
New Installation

**DOCUMENT NOT CONSIDERED FINAL
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HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street)
at
SR 1929 (Wendover Lane)

Division 03 New Hanover Co. Wilmington

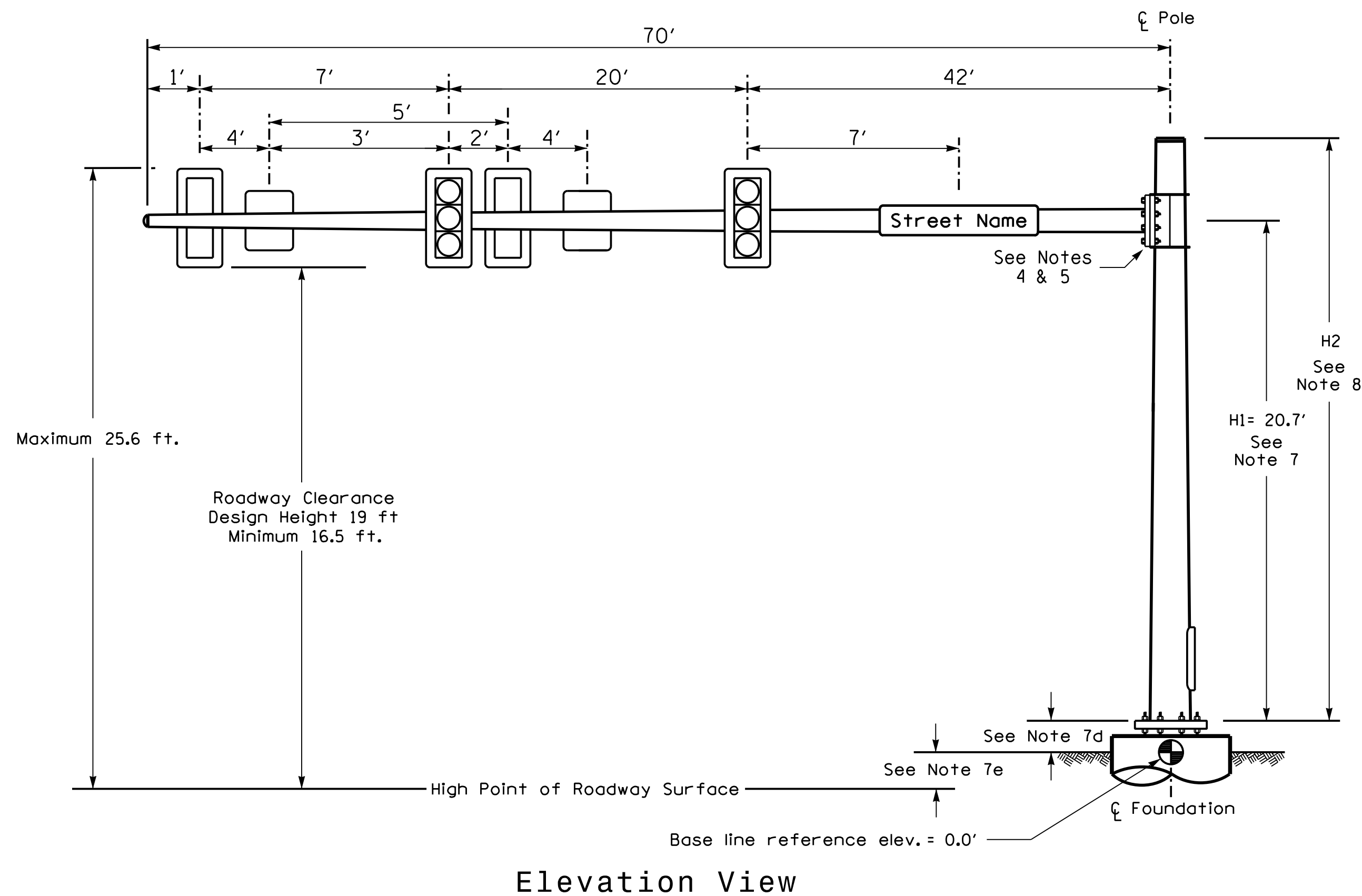
PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
031464
NATASHA R. SIMMONS

DocuSigned by:
Natasha R. Simmons 8/1/2018
SIGNATURE DATE
SIG. INVENTORY NO. 03-1128

Design Loading for METAL POLE NO. 1

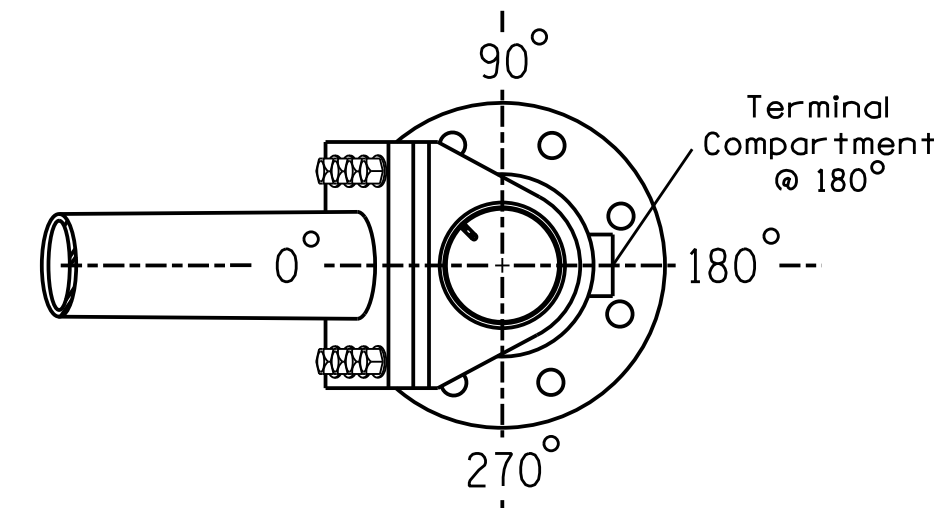


SPECIAL NOTE

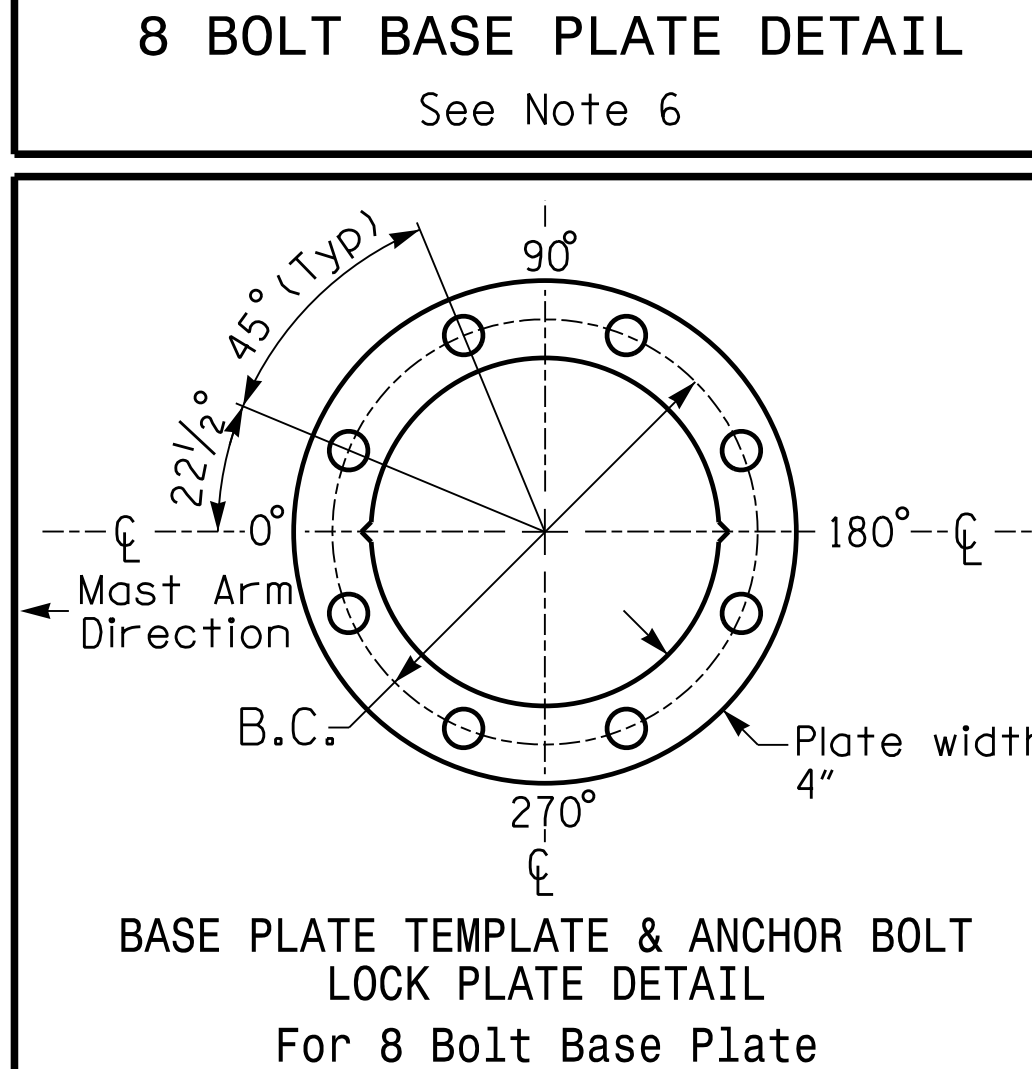
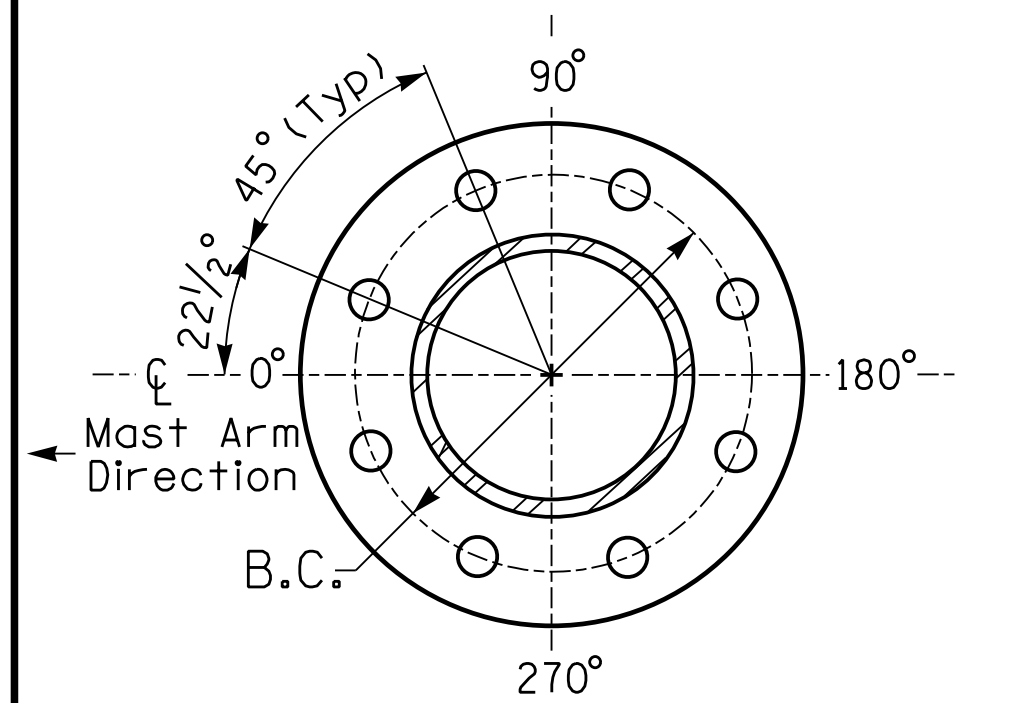
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+0.25 ft.	
Elevation difference at Edge of travelway or face of curb	+0.21 ft.	



8 BOLT BASE PLATE DETAIL



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

METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	Sig. 2.5

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0"W X 36.0"L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

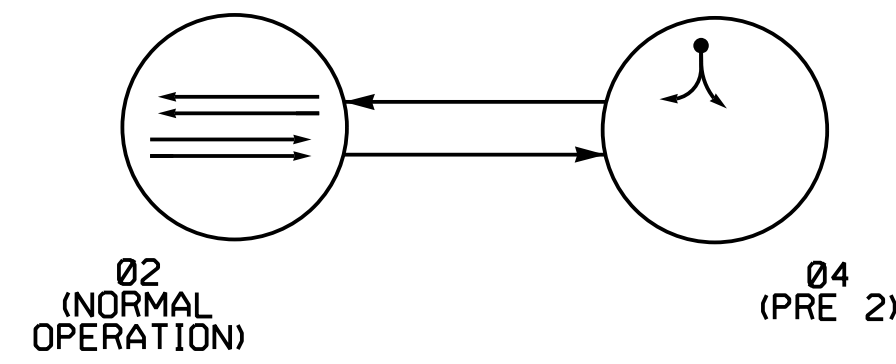
NCDOT Wind Zone 2 (130 mph)

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

	US 17 (Market Street) at SR 1929 (Wendover Lane) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
	REVISIONS INIT. DATE _____ _____ _____	

DocuSigned by: *Natasha R. Simmons* 8/1/2018
SIGNATURE DATE
SIG. INVENTORY NO. 03-1128

PHASING DIAGRAM



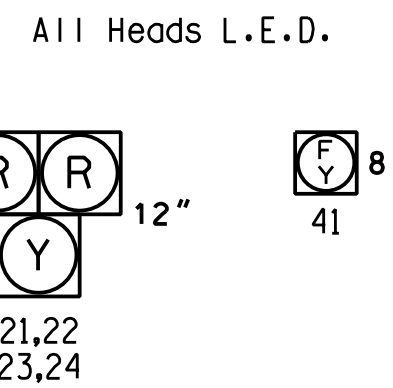
PHASING DIAGRAM DETECTION LEGEND

- ◀●▶ DETECTED MOVEMENT
- ◀▶ UNDETECTED MOVEMENT (OVERLAP)
- ◀.....▶ UNSIGNALIZED MOVEMENT
- ◀- - - -▶ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE				
	02 DARK	04 PRE 2	FLASH	STEADY RED	STEADY YELLOW
21,22	DRK	FY	Y	R	FR*
23,24	DRK	FY	Y	R	FR*
41	DRK	DRK	DRK	FY	DRK

*Alternating Flash
 Y - Steady Yellow
 FY - Flashing Yellow
 R - Steady Red
 FR - Flashing Red
 DRK - Dark

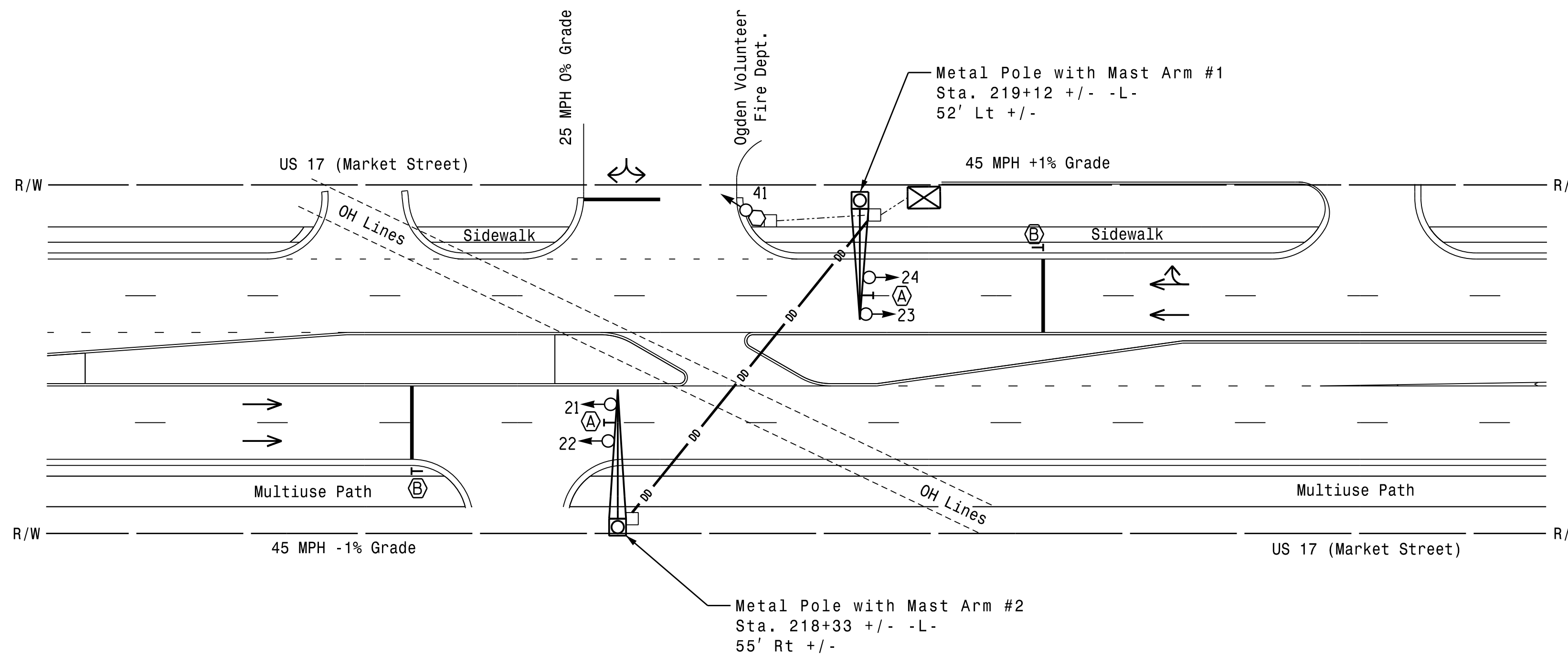
SIGNAL FACE I.D.



**2 Phase
 Emergency Hybrid Beacon
 Wilmington Signal System**

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include Auxiliary Output file for future use.
- Locate emergency vehicle preemption switch in Fire Department.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Signal head 41 shall remain Dark except during the phase 4 green interval (flashing yellow display).
- Signal system data:
 Controller Asset #0635



PROPOSED	LEGEND	EXISTING
○▶	Traffic Signal Head Sign	●▶
□▶	Pedestrian Signal Head With Push Button & Sign	■▶
⊗	Inductive Loop Detector	⊗
□	Controller & Cabinet Junction Box	■
- - - -	2-in Underground Conduit	- - - -
N/A	Right of Way	- - - -
▶	Directional Arrow	▶
- DD -	Directional Drill	N/A
○▶	Metal Pole with Mastarm	○▶
○	Type II Signal Pedestal	●
Ⓐ	"EMERGENCY SIGNAL STOP ON FLASHING RED" Sign (R10-14A)	Ⓐ
Ⓑ	"STOP HERE ON RED" Sign (R10-6)	Ⓑ

FEATURE	PHASE		
	2	4 (PRE 2)	OLA
Min Green 1 *	12	5	5
Extension 1 *	0.0	0.0	
Max Green 1 *	30	30	
Yellow Clearance	5.0	3.0	4.6
Red Clearance	2.0	0.0	2.4
Walk 1 *	-	-	
Don't Walk 1 *	-	-	
Seconds Per Actuation *	-	-	
Max Variable Initial *	-	-	
Time Before Reduction *	-	-	
Time To Reduce *	-	-	
Minimum Gap	-	-	
Recall Mode	MIN RECALL	-	
Vehicle Call Memory	-	-	
Dual Entry	-	-	
Simultaneous Gap	ON	ON	

Serves as Flashing Yellow Time
 Serves as Steady Yellow Clearance Time
 Serves as All Red Clearance Time

OASIS 2070 EV PREEMPT	
FUNCTION	PRE 2
Interval 1 - Dwell Green	255
Interval 1 - Dwell Yellow	0.0*
Interval 1 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Exit Phase(s)	2
Priority	Medium
Delay Time	**
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	**
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	-

* Time defaults to time used for phase during normal operation
 ** See Note 6.

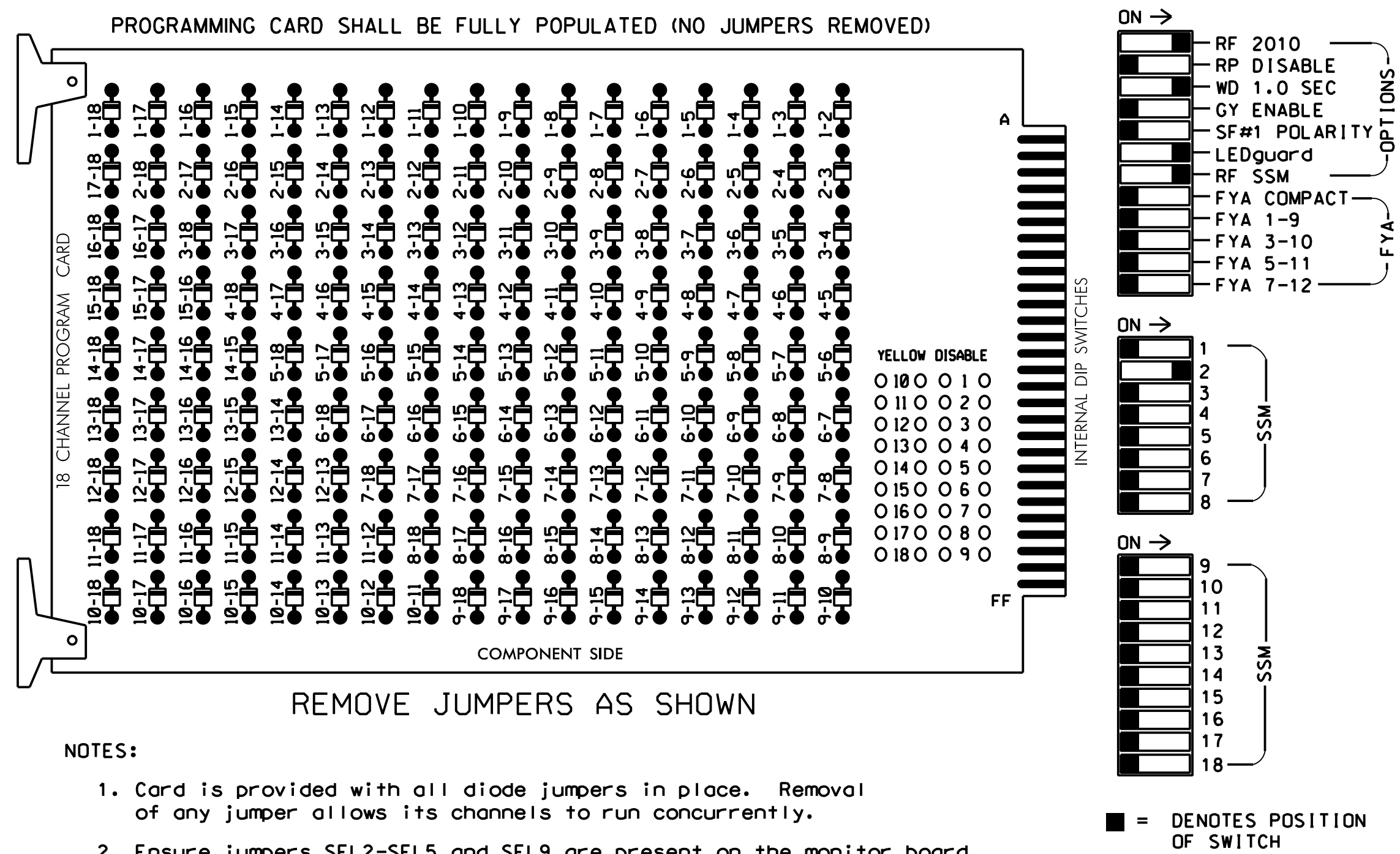
Signal Upgrade - Final Design

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

	Prepared For: US 17 (Market Street) at Ogdenville Fire Dept.	SEAL
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
750 N. Greenfield Pkwy, Garner, NC 27529 HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	SCALE 0 30 1"=30'	DocuSigned by: W. Tasha R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-0635

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- ### NOTES
- Insert yellow flash program blocks for phases 1 and 2. Insert red flash program blocks for all remaining unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
 - Program phase 2 for Startup In Green.
 - Program phase 2 for Yellow Flash.
 - Program phase 2 for Startup Calls.
 - The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3*,S5
 PHASES USED.....2,4
 OVERLAP "A".....2**
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

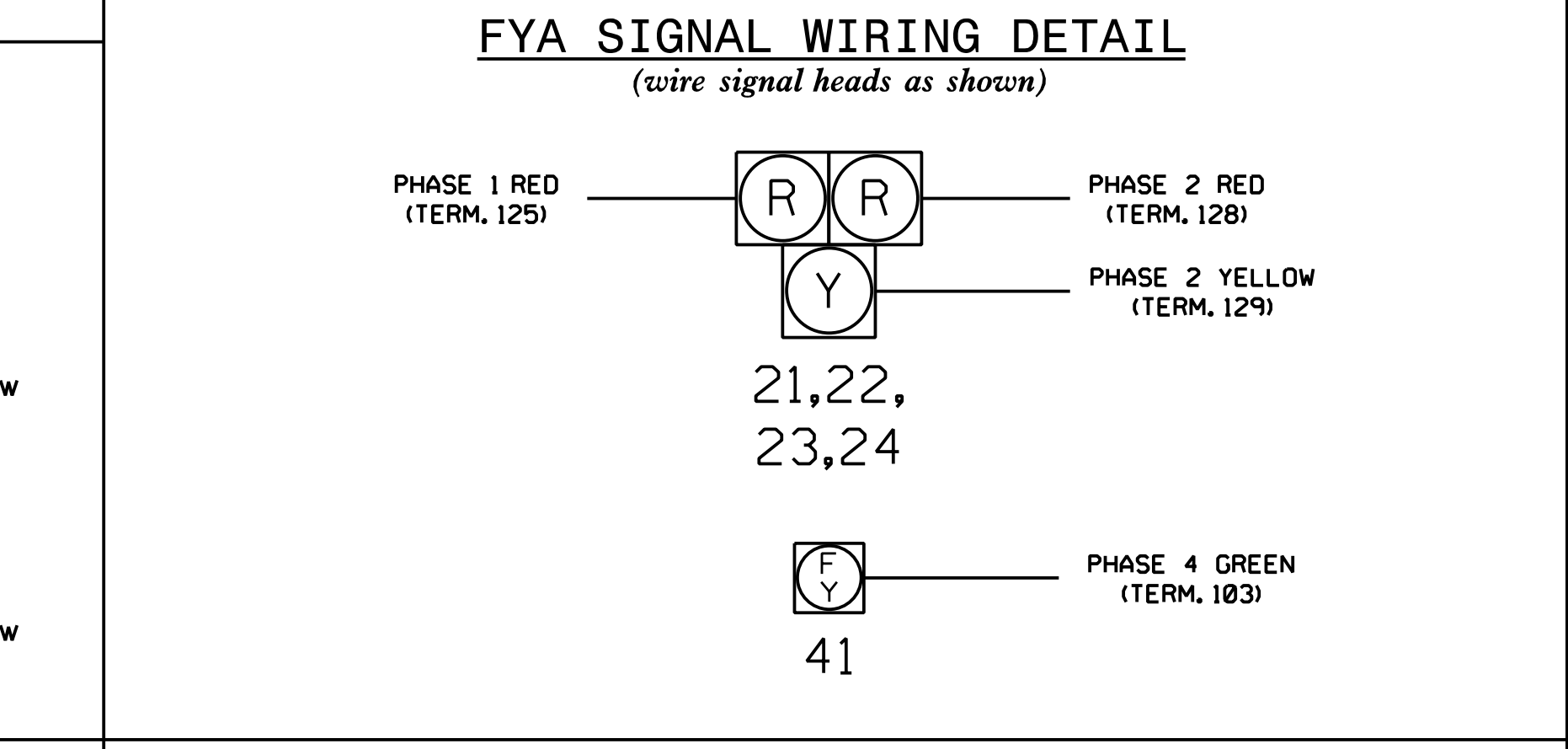
* USED FOR PILOT LIGHT ONLY
 ** DENOTES PHASE USED TO CONTROL CLEARANCE INTERVALS.

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.	21,22, 23,24	21,22, 23,24	**	NU	41	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED	125	128																
YELLOW	*	129			*													
GREEN	*	*			103													
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		
Hand																		
Walking Person																		

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ** See Lamp Notes (Sheet 2 of 3)

- ### OPERATIONAL NOTES
- In order for controller to perform the "Emergency Veh. Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheet 2 and 3 of this electrical detail.
 - This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OL A YELLOW CLEAR" timing. See signal plan for timing.
 - Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.



INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FS
U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	DC ISOLATOR
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	ST
FILE "J" <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>DC ISOLATOR</td>															DC ISOLATOR
U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NOT USED
L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	PRE2
															DC ISOLATOR

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

FS = FLASH SENSE
 ST = STOP TIME
 PRE = PREEMPT

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:          :12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT: X
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).....5
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...4.6
RED CLEAR (0=PARENT,0.1-25.5 SEC)...2.2
OUTPUT AS PHASE # (0=NONE, 1-16)....0
    
```

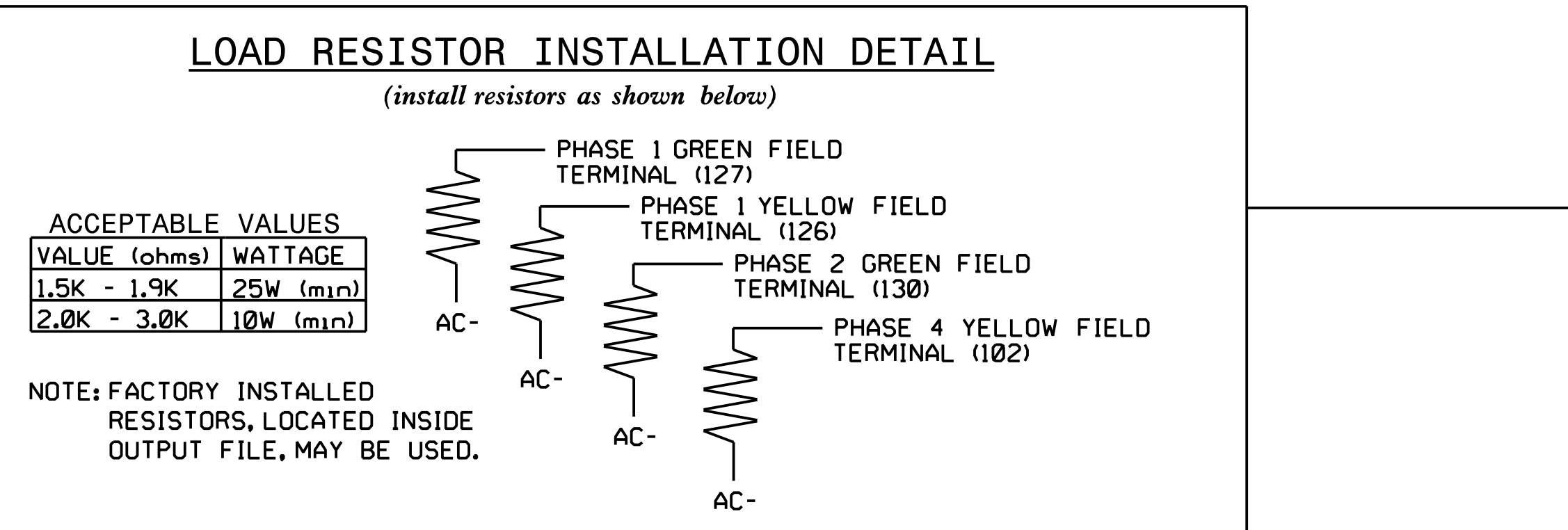
NOTICE TIMING INTERVALS

OVERLAP PROGRAMMING COMPLETE

TIMING INTERVAL SCHEDULE

PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
 OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
 OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0635
 DESIGNED: February 2018
 SEALED: 8-1-18
 REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Market Street) at Ogdon Volunteer Fire Dept.	SEAL
Prepared for:	Division 03 New Hanover Co. Wilmington	
Prepared by: A.H. Thornburg	REVIEWED BY: A.D. Klinksiek	
REVISIONS	INITI.	DATE
HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		DocuSigned by: W. Tisha R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-0635

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL FOR INDICATOR LAMP CONTROL

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1,2,3,4, AND 5.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF INPUT ASSIGNMENT #14 IS ON
OR ACTIVE PREEMPTION #2 IS ON

NOTE: FIRE HOUSE PILOT LAMP LOGIC.

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #33 ON

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF INPUT ASSIGNMENT #14 IS OFF
AND ACTIVE PREEMPTION #2 IS OFF

NOTE: FIRE HOUSE PILOT LAMP LOGIC.

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #33 OFF

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF ACTIVE PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #34 IS ON

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21,22, 23 & 24 DURING PHASE 4.

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #11 OFF

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #34 IS OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21,22, 23 & 24 DURING PHASE 4.

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #14 OFF

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF GREEN ON OVERLAP #1 IS ON
OR GRN EXT ON OVERLAP #1 IS ON
OR YELLOW ON OVERLAP #1 IS ON

NOTE: LOGIC TO ENSURE THAT RED INDICATIONS OF HEADS 21,22,23,24 REMAIN DARK UNTIL YELLOW CLEARANCE INTERVALS ARE FINISHED TIMING.

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #34 OFF
SET OUTPUT ASSIGNMENT #35 OFF

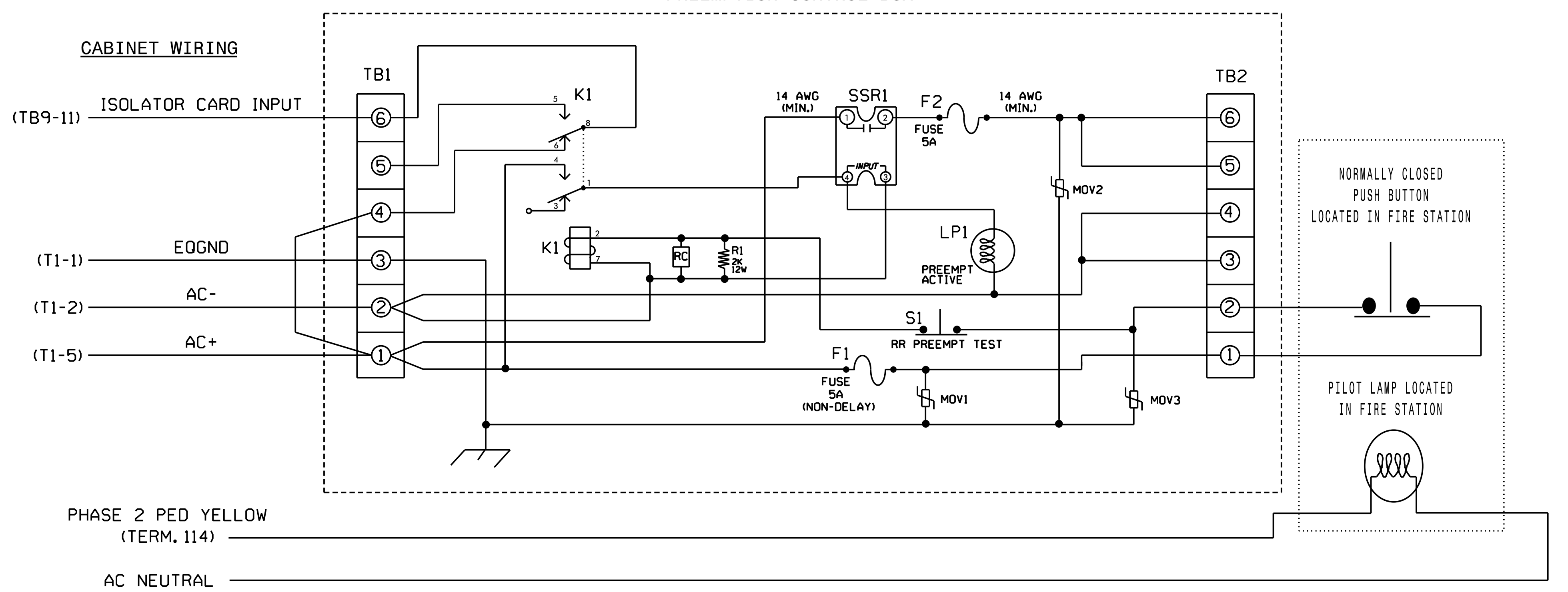
END OF PROGRAMMING

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
INPUT 14 =	Preempt 2
OUTPUT 33 =	Phase 2 PED Yellow
OUTPUT 11 =	OLA Red
OUTPUT 14 =	OLA Red (Duplicate)
OUTPUT 34 =	Out of Phase Flasher
OUTPUT 35 =	Advance Beacon 1

NOTE: Outputs 11, 14, 34, & 35 have been remapped. See detail on Sheet 3.

EV Preemption Control Box Wiring Detail

(wire as shown below)



NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay 'K1' is an enclosed DPDT general purpose relay with a 120VAC coil, 10A contacts, and octal-style plug.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this, set invert dip switch on AC Isolator Card.
- IMPORTANT!! Terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' to advance to Preemption #2.

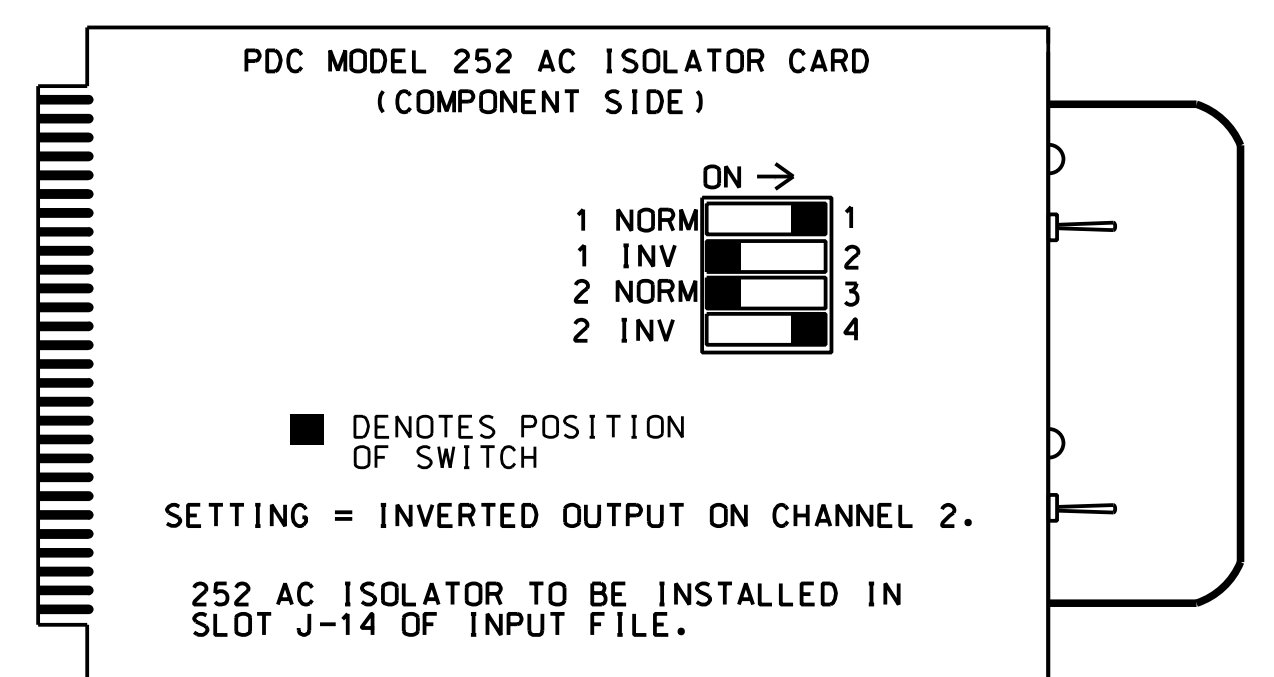
PREEMPTION #2	INTERVAL/TIMING	GRN	YEL	RED	SETTINGS (NEXT:1-10)	CLEAR/DWELL PHASES
1	255 0.0 0.0				12345678910111213141516	X
2	0 0.0 0.0					
3	0 0.0 0.0					
4	0 0.0 0.0					
5	1 0.0 0.0					X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	*
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	0.0
DWELL MIN TIMER (0-255 SEC)	*
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	Y
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY?	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION?	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL?	N
FLASH DWELL INTERVAL?	N
ALLOW PDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEF GHIJKLMNOP
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	

PROGRAMMING COMPLETE
* Denotes timing to be determined in field.

PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0635
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		Prepared for: 	US 17 (Market Street) at Ogden Volunteer Fire Dept. Division 03 New Hanover Co. Wilmington	
	PLAN DATE: February 2018 PREPARED BY: A.H. Thornburg	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons			

OUTPUT REMAPPING DETAIL FOR SPECIAL EMERGENCY VEHICLE HYBRID BEACON SEQUENCE

(program controller as shown below)

START HERE

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

```
PAGE:1 C1 PIN:12 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....11
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.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1 C1 PIN:12 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE PHASE' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER INPUTTING DATA, THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

```
PAGE:1 C1 PIN:13 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....12
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)...1
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 12 A FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW LOAD SWITCH DRIVER TO FLASH, WHICH WILL PROVIDE THE FLASHING YELLOW CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

```
PAGE:1 C1 PIN:16 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....14
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.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE. THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

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

WHEN A 'Y' IS ENTERED FOR 'VEHICLE PHASE' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER INPUTTING DATA, THEN 'ESC'.

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

```
PAGE:1 C1 PIN:13 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....51
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.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

NOTE: THIS CHANGE REMAPS THE OVERLAP "A" YELLOW DRIVER TO THE SAME PIN AS PHASE 2 YELLOW, WHICH WILL PROVIDE THE OUTPUT FOR THE STEADY YELLOW CLEARANCE.

PRESS "-" KEY MULTIPLE TIMES TO ADVANCE TO OUTPUT 34

```
PAGE:1 C1 PIN:36 NOT ENABLED
OUTPUT ASSIGNMENT #.....34
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.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

THIS OUTPUT IS DEFAULTED AS "NOT ENABLED." THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR OUT OF PHASE FLASHER.

```
PAGE:1 C1 PIN:36 NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64)...35
```

WHEN A 'Y' IS ENTERED FOR 'OUT OF PHASE FLASHER' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER INPUTTING DATA, THEN 'ESC'.

PRESS "+" KEY ONCE TO ADVANCE TO OUTPUT 35

```
PAGE:1 C1 PIN:37 NOT ENABLED
OUTPUT ASSIGNMENT #.....35
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...50
MODE (0=SOLID,1=FLASH)...1
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y
```

MODIFY DATA AS SHOWN TO MAKE OUTPUT 35 A FLASHING OUTPUT. THIS OUTPUT IS DEFAULTED AS "NOT ENABLED." THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR ADVANCE BEACON.

```
PAGE:1 C1 PIN:37 NOT ENABLED
SELECT BEACON INDEX (1-4)...1
```

WHEN A 'Y' IS ENTERED FOR 'ADVANCE BEACON' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' AFTER INPUTTING DATA, THEN 'ESC'.

OUTPUT PROGRAMMING COMPLETE

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '2' (OUTPUT BEACON SETTINGS).

```
OUTPUT BEACON SETTINGS
TRIGGER PHASES: 12345678910111213141516
BEACON #1 OFF X
BEACON #2 OFF
BEACON #3 OFF
BEACON #4 OFF
BEACON 1 2 3 4
OFF DELAY TIME (0-255) 0 0 0 0
ON DELAY TIME (0-255) 0 0 0 0
STOP-TIME HOLD (0-255) 0 0 0 0
```

ADVANCE BEACON PROGRAMMING COMPLETE

NOTE: ADVANCE BEACON IS USED TO CONTROL THE WIG-WAG RED INDICATION OF HEADS 21,22,23,AND 24. OUTPUTS HAVE TO BE ASSIGNED APPROPRIATELY. SEE SHEET 3 OF THIS ELECTRICAL DETAIL.

GREEN INTERVAL FLASH PROGRAMMING DETAIL


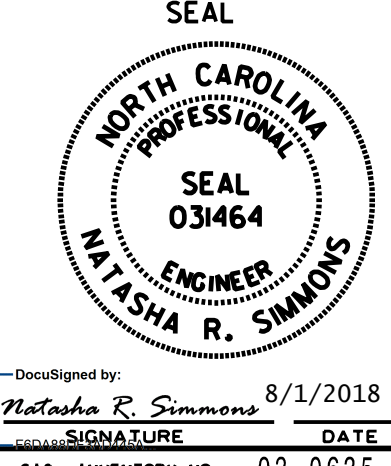
IN ORDER TO MAKE SIGNAL HEAD 41 FLASH DURING PREEMPTION DWELL, PHASE 4 WILL HAVE TO BE PROGRAMMED FOR "GREEN INTERVAL FLASH."

FOR THE OASIS MAIN MENU PRESS 2 (PHASE CONTROL) THEN "1" (PHASE CONTROL FUNCTIONS). SCROLL DOWN 15 ROWS TO ARRIVE AT THE "GREEN IN FLASH" FUNCTION - ENABLE PHASE 4.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0635
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

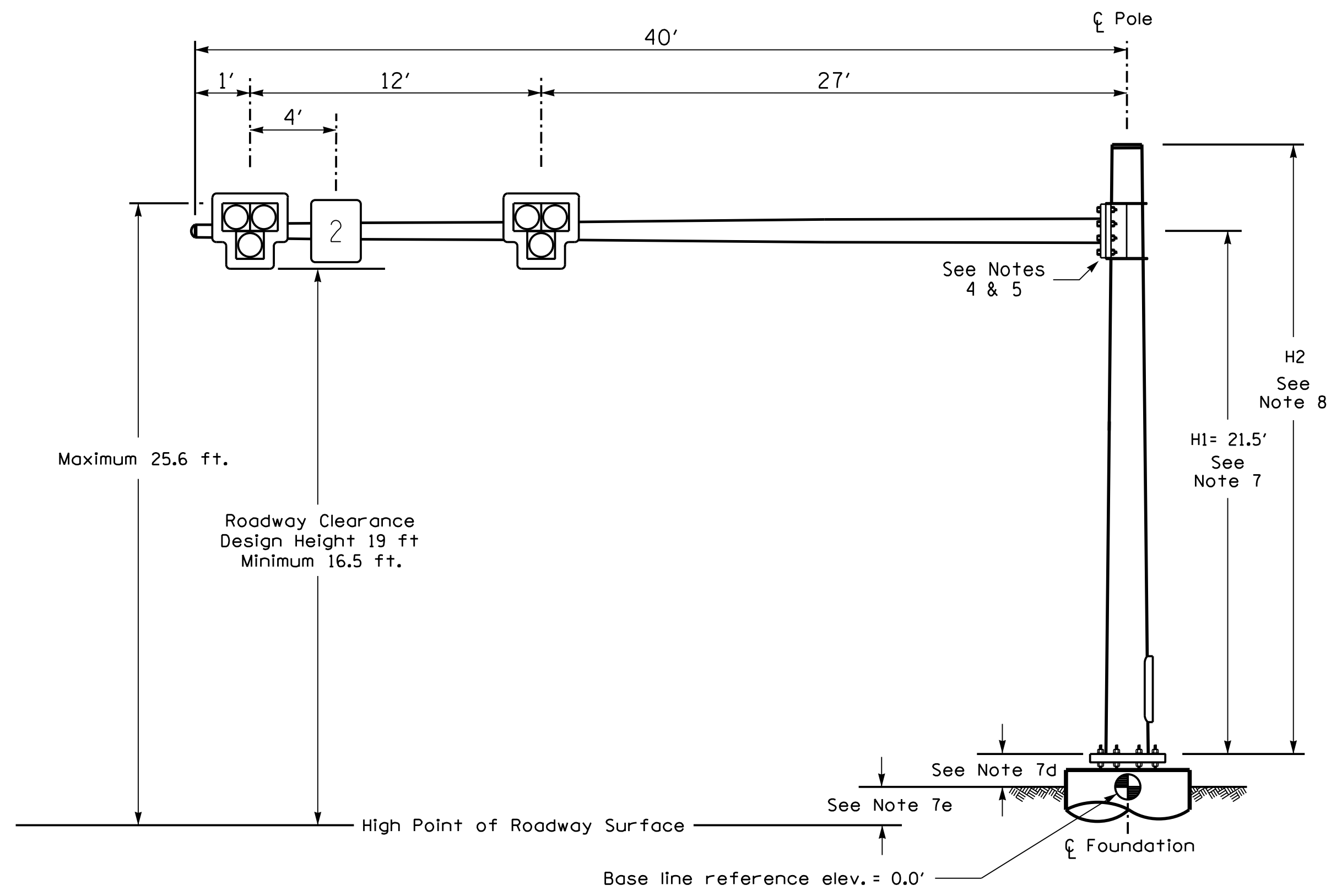
Electrical Detail - Sheet 3 of 3
Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	Prepared for: US 17 (Market Street) at Ogdon Volunteer Fire Dept.		
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons		
750 N. Greenfield Pkwy, Corner, NC 27529		REVISIONS INIT. DATE	DocuSigned by: Notasha R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-0635

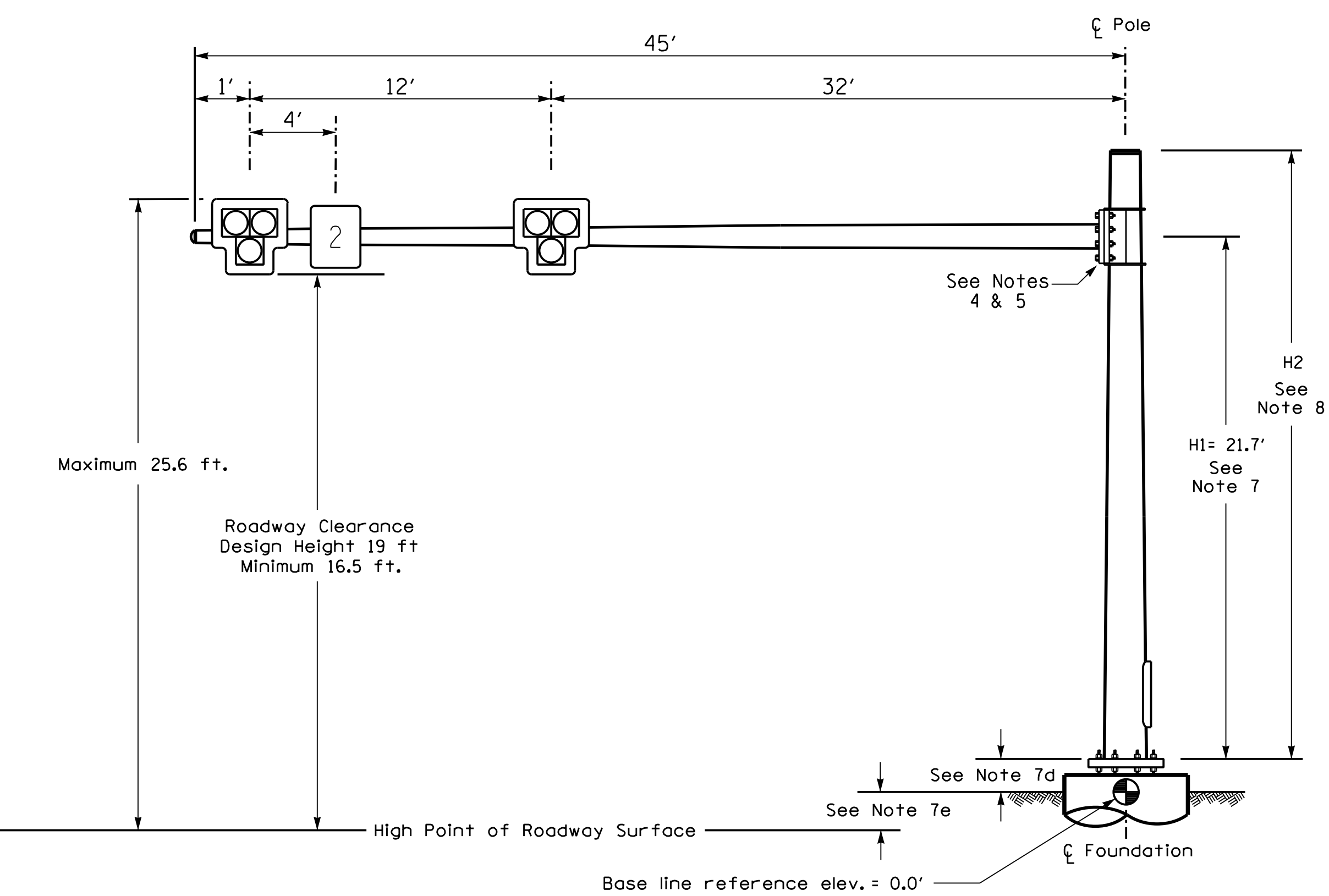
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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1564
(919) 546-8997

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2

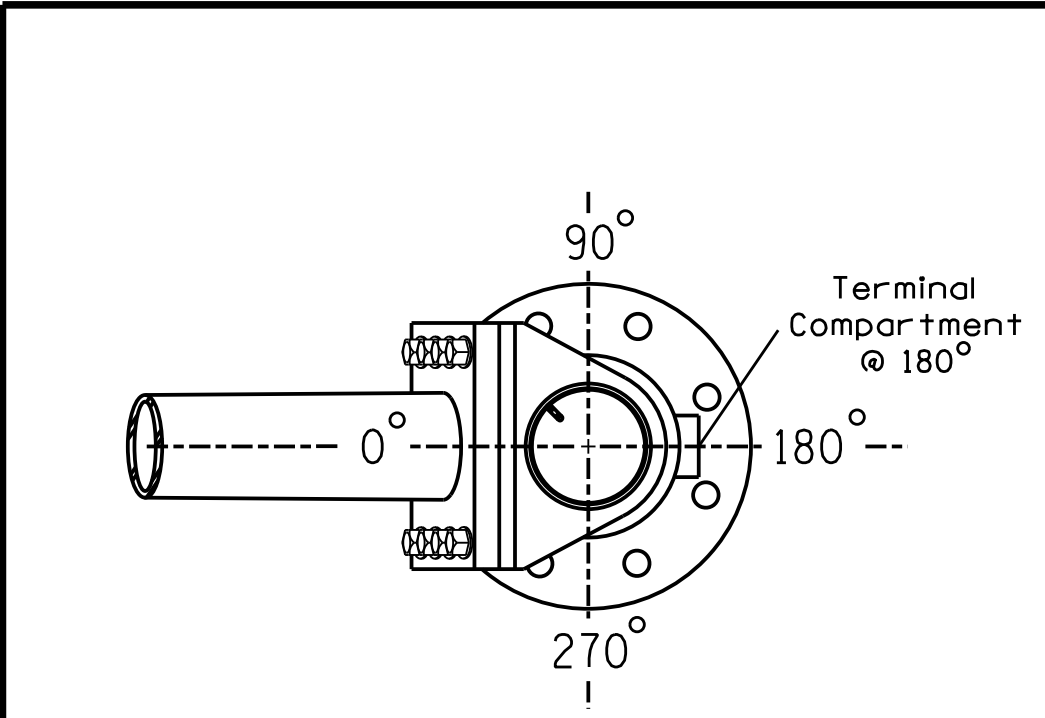


Elevation View

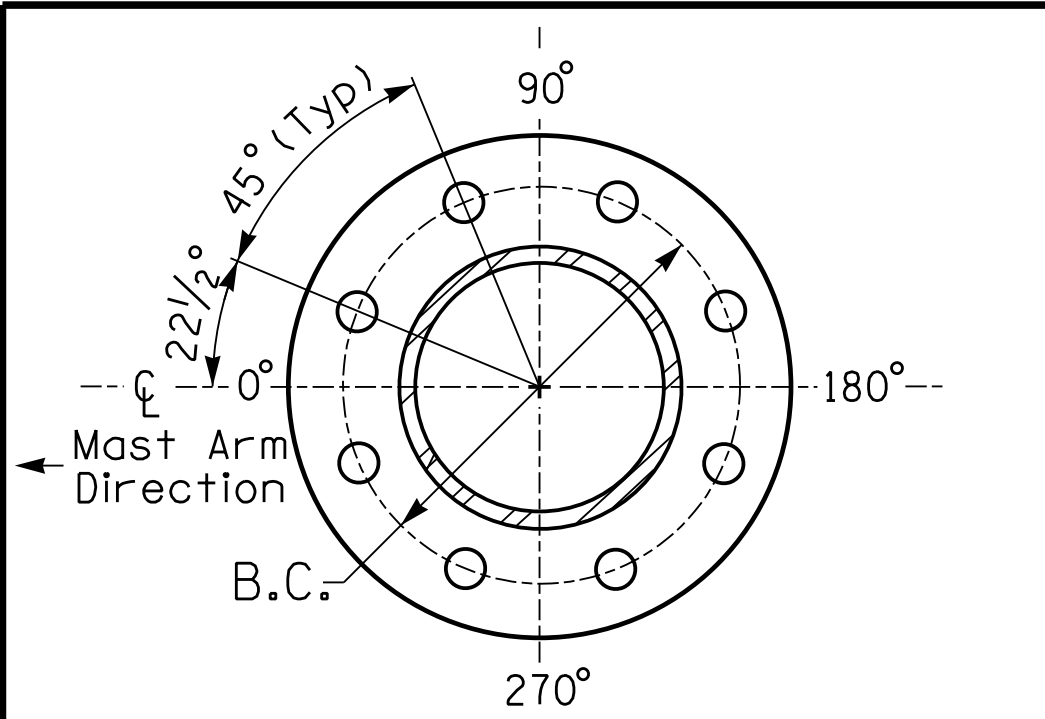
SPECIAL NOTE
 The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project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

Elevation Data for Mast Arm Attachment (H1)

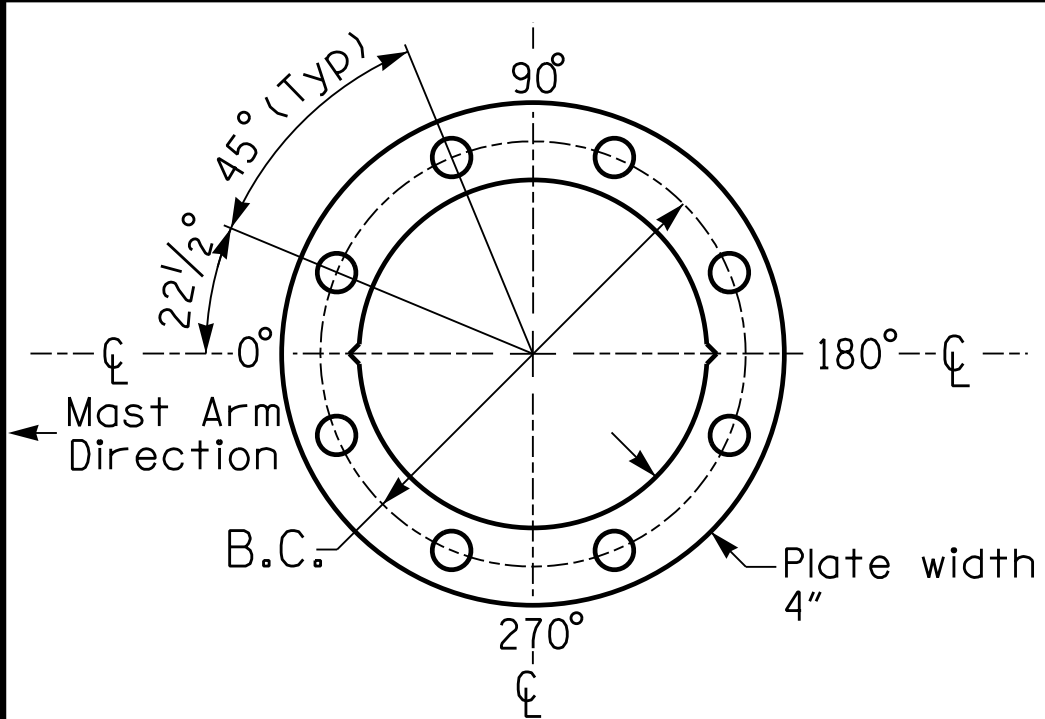
Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.37 ft.	+1.64 ft.
Elevation difference at Edge of travelway or face of curb	+0.62 ft.	+0.93 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

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METAL POLE No. 1,2

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	Sig. 3.4

MAST ARM LOADING SCHEDULE				
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION (T-TYPE)-WITH BACKPLATE	9.3 S.F.	35.0" W X 35.0" L	60 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

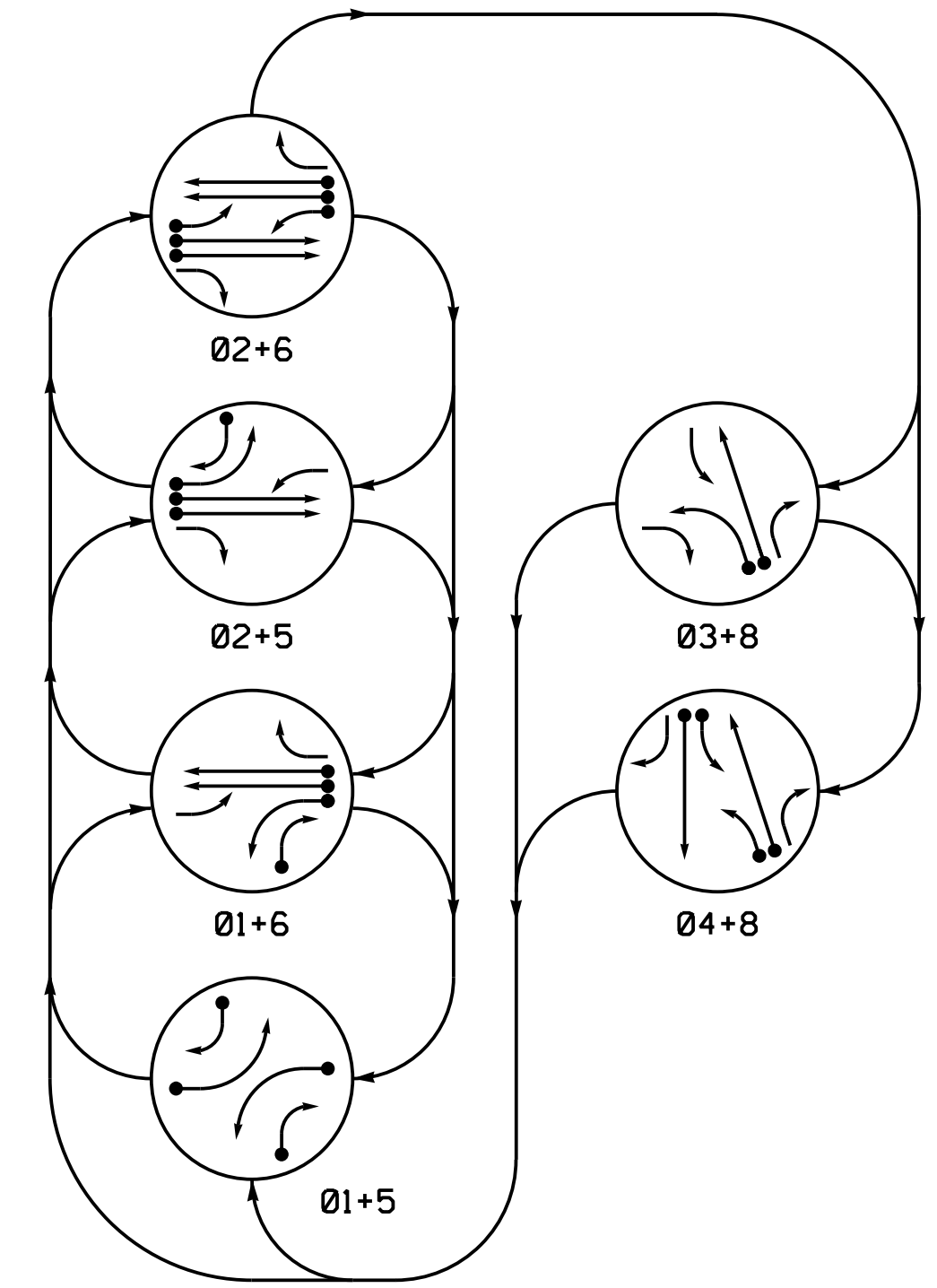
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the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

NCDOT Wind Zone 2 (130 mph)

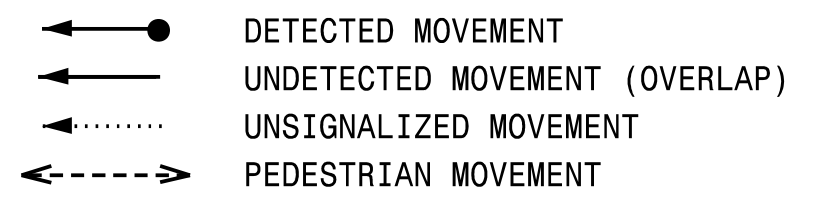
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	US 17 (Market Street) at Ogden Volunteer Fire Dept.		
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	REVISIONS INIT. DATE _____ _____	
SCALE 0 N/A N/A		DocuSigned by: N. A. Sha R. Simmons 8/1/2018 SIGNATURE DATE _____ _____ SIG. INVENTORY NO. 03-0635	

DEFAULT PHASING DIAGRAM



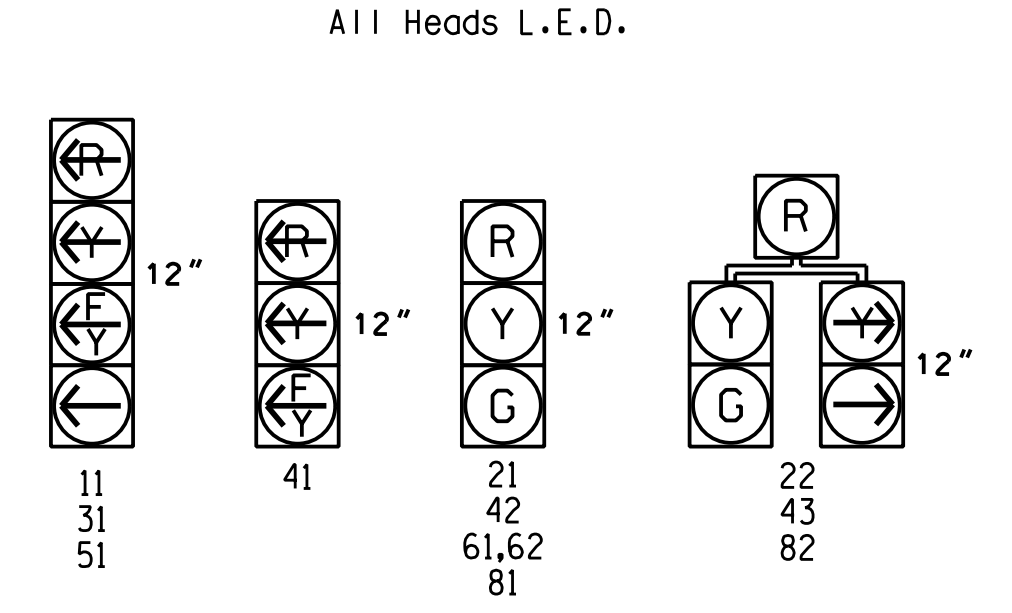
PHASING DIAGRAM DETECTION LEGEND



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE				FLASH
	01+5	02+5	03+8	04+8	
11		F	F	R	Y
21	R	R	G	G	R
22	R	R	G	G	R
31	R	R	R	R	Y
41	R	R	R	R	Y
42	R	R	R	R	G
43	R	R	R	R	G
51		F	F	R	Y
61,62	R	G	R	G	R
81	R	R	R	G	R
82	R	R	R	G	R

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

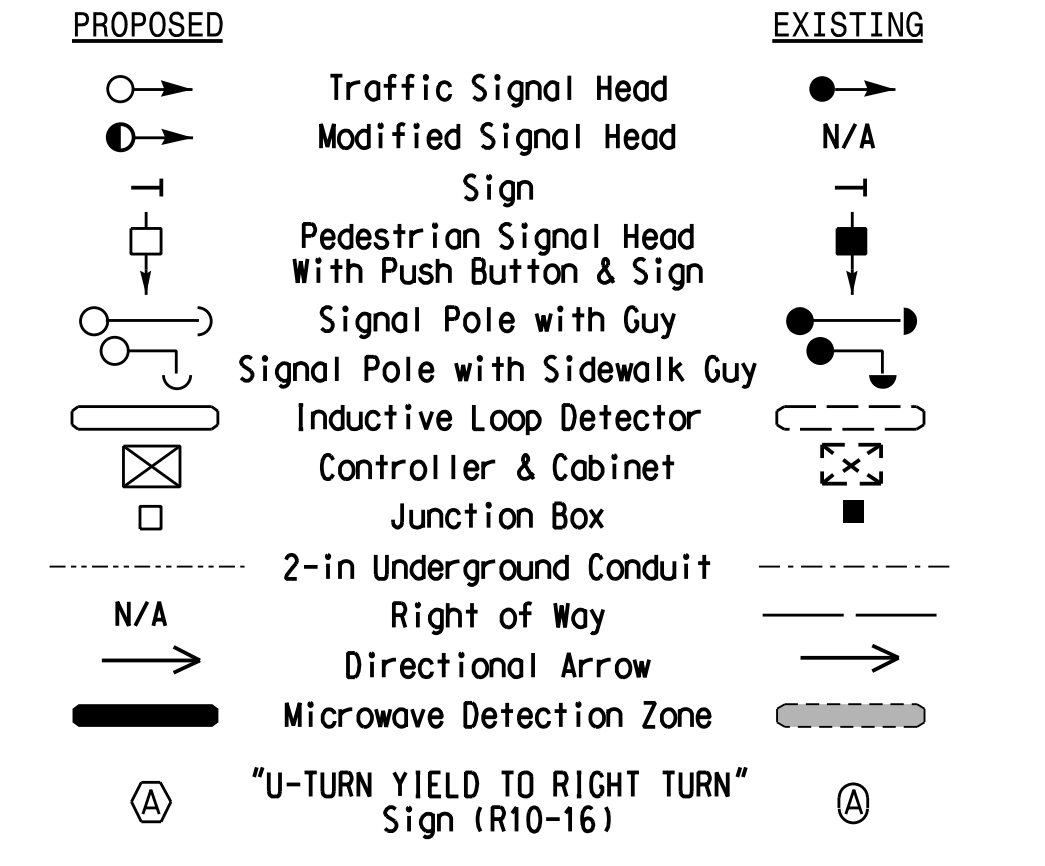
* Multizone Microwave Detection
 ** Disable phase 2 or 6 call for loops 1A and 5A during alternate phasing operation.
 *** Reduce delay to 3 seconds during alternate phasing operation.

6 Phase Fully Actuated Wilmington Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Phase 3 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Incorporate Microwave Detection system for vehicle detection.
- Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data: Controller Asset #0369

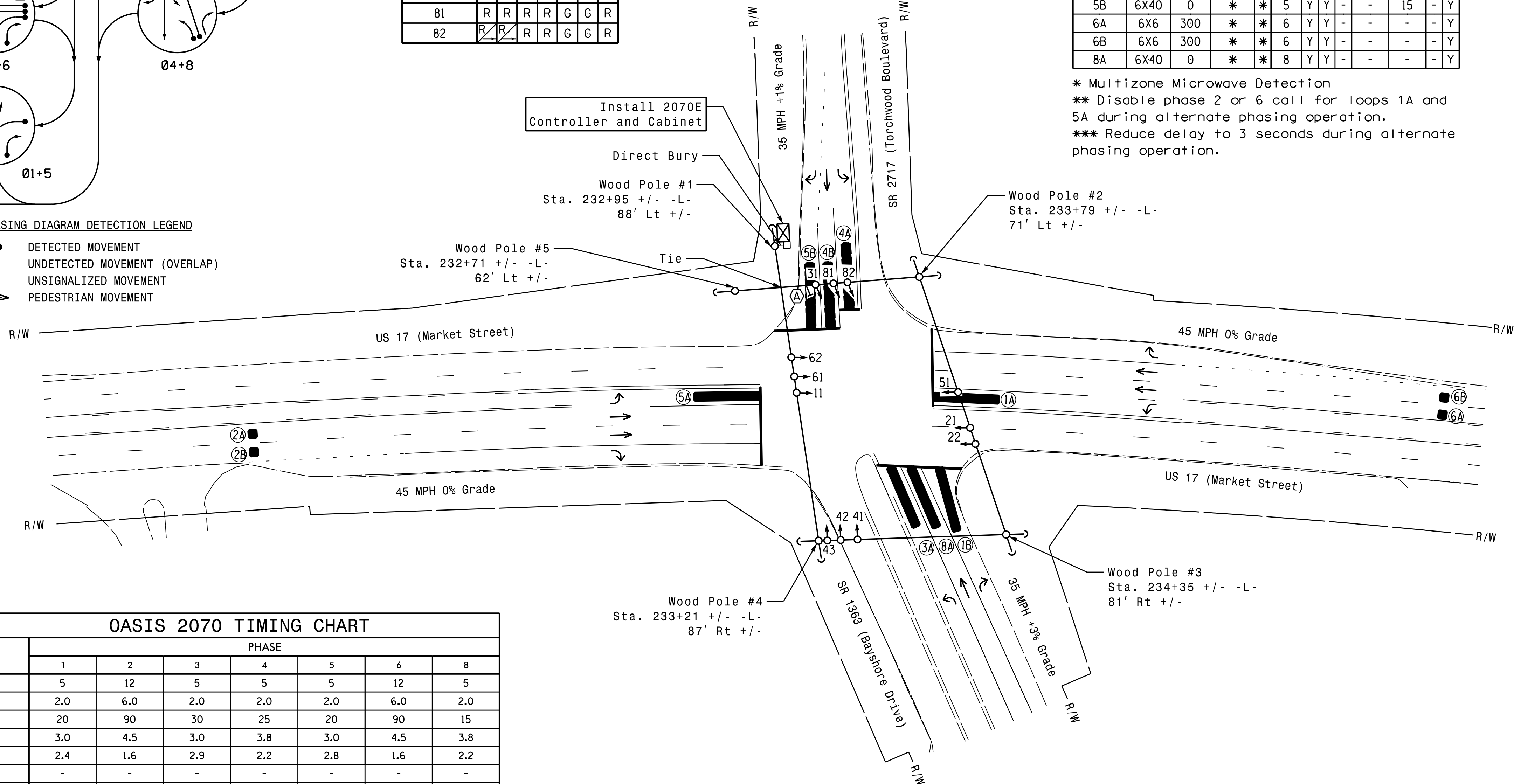
LEGEND



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	8	
Min Green 1*	5	12	5	5	5	12	5	
Extension 1*	2.0	6.0	2.0	2.0	2.0	6.0	2.0	
Max Green 1*	20	90	30	25	20	90	15	
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.8	
Red Clearance	2.4	1.6	2.9	2.2	2.8	1.6	2.2	
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	-	-	-	ON	-	-	ON	
Simultaneous Gap	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
 Construction Phase I
 Sheet 1 of 2

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HNTB
 HNTB NORTH CAROLINA, P.C.
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 (919) 546-8997

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

US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard)

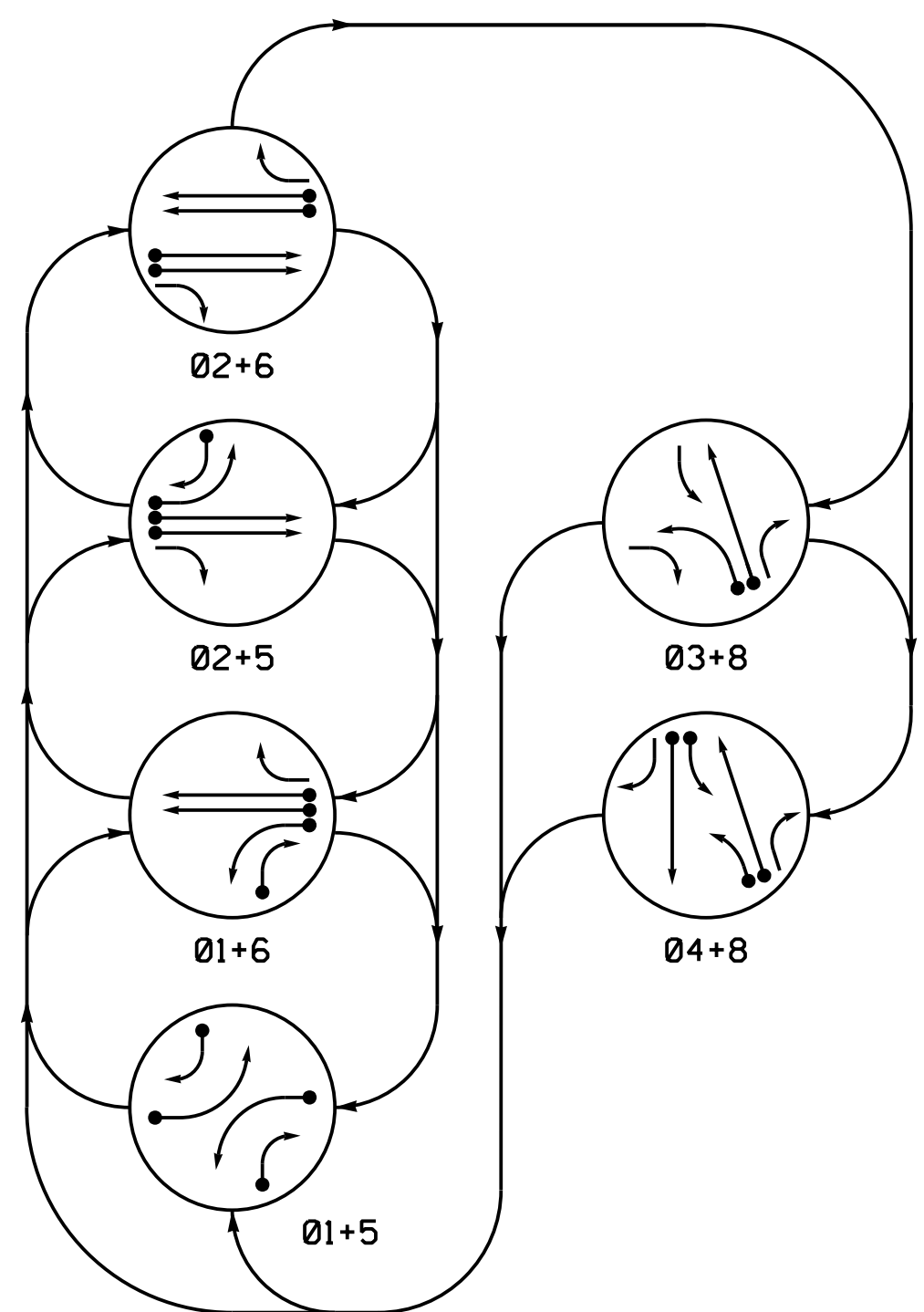
Division 03 New Hanover Co. Wilmington
 PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

SCALE: 1" = 40'

REVISIONS: _____ INITI. DATE _____

Seal: **NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464**
 M. T. SIMMONS
 8/1/2018
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-0369T1

ALTERNATE PHASING DIAGRAM



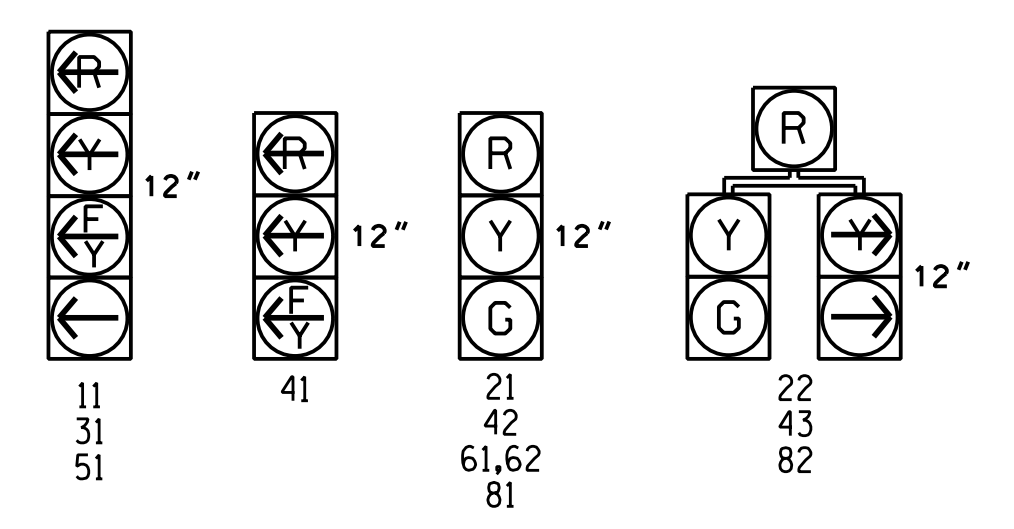
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE						FLASH
	01+5	01+6	02+5	02+6	03+8	04+8	
11	—	—	—	—	—	—	Y
21	R	R	G	G	R	R	Y
22	R	R	G	G	R	R	Y
31	—	—	—	—	—	—	Y
41	—	—	—	—	—	—	Y
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51	—	—	—	—	—	—	Y
61,62	R	G	R	G	R	R	Y
81	R	R	R	R	G	G	R
82	R	R	R	R	G	G	R

SIGNAL FACE I.D.

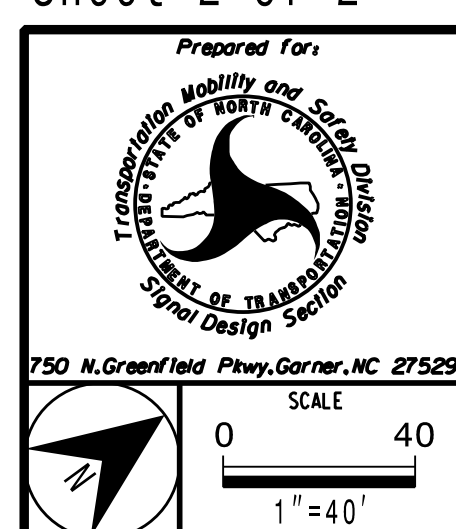
All Heads L.E.D.



Signal Upgrade
 Temporary Design 1
 Construction Phase I
 Sheet 2 of 2

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US 17 (Market Street) at
 SR 1363 (Bayshore Drive) /
 SR 2717 (Torchwood Boulevard)
 Division 03 New Hanover Co. Wilmington
 PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

SEAL
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 031464
 ENGINEER
 NATASHA R. SIMMONS

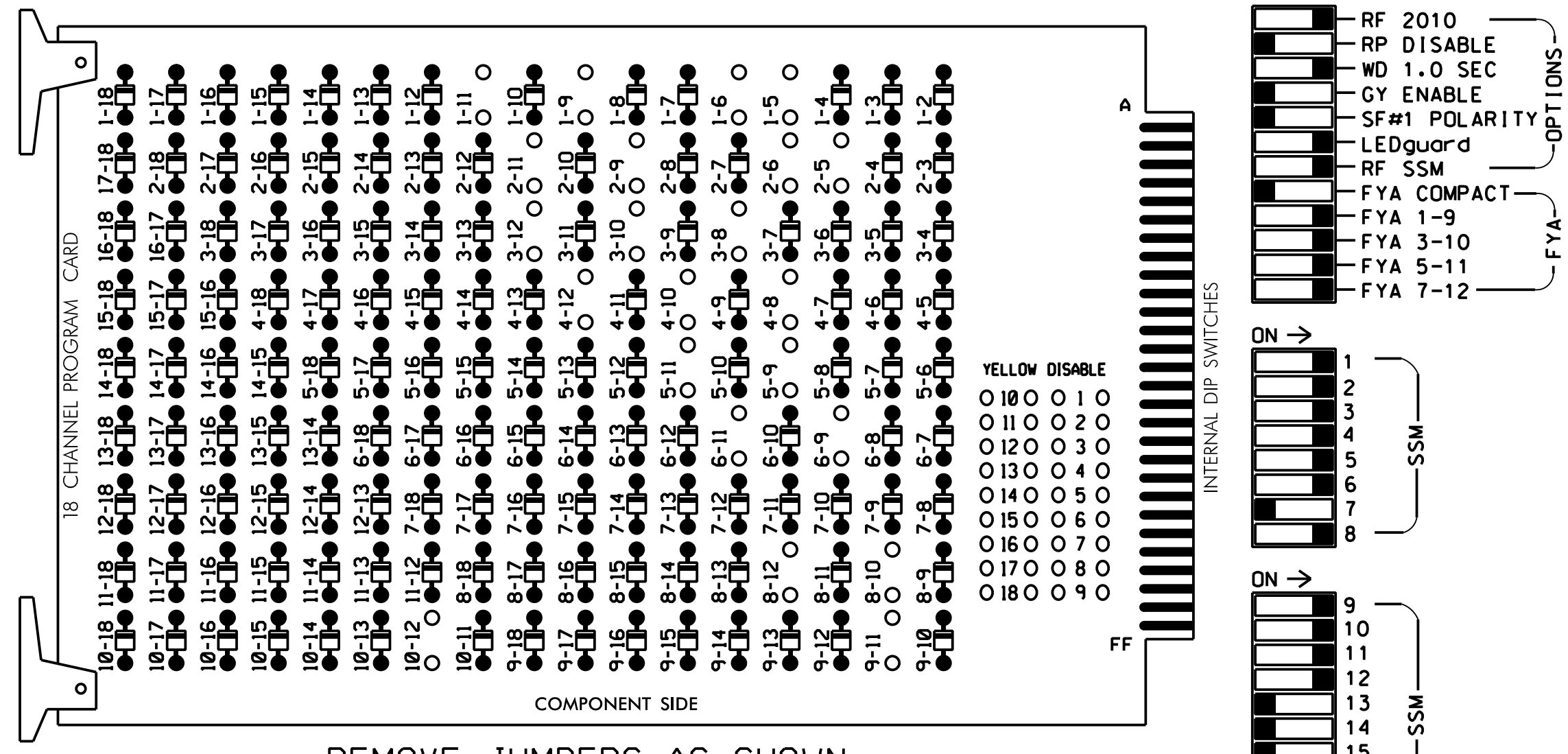
REVISIONS	INIT.	DATE

DocuSigned by:
 Natasha R. Simmons 8/1/2018
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-0369T1

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

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

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 phase 4 and 8 for Dual Entry. 3. Enable Simultaneous Gap-Out for all Phases. 4. Program phases 2 and 6 for Variable Initial and Gap Reduction. 5. Program phases 2 and 6 for Startup In Green. 6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps. 7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

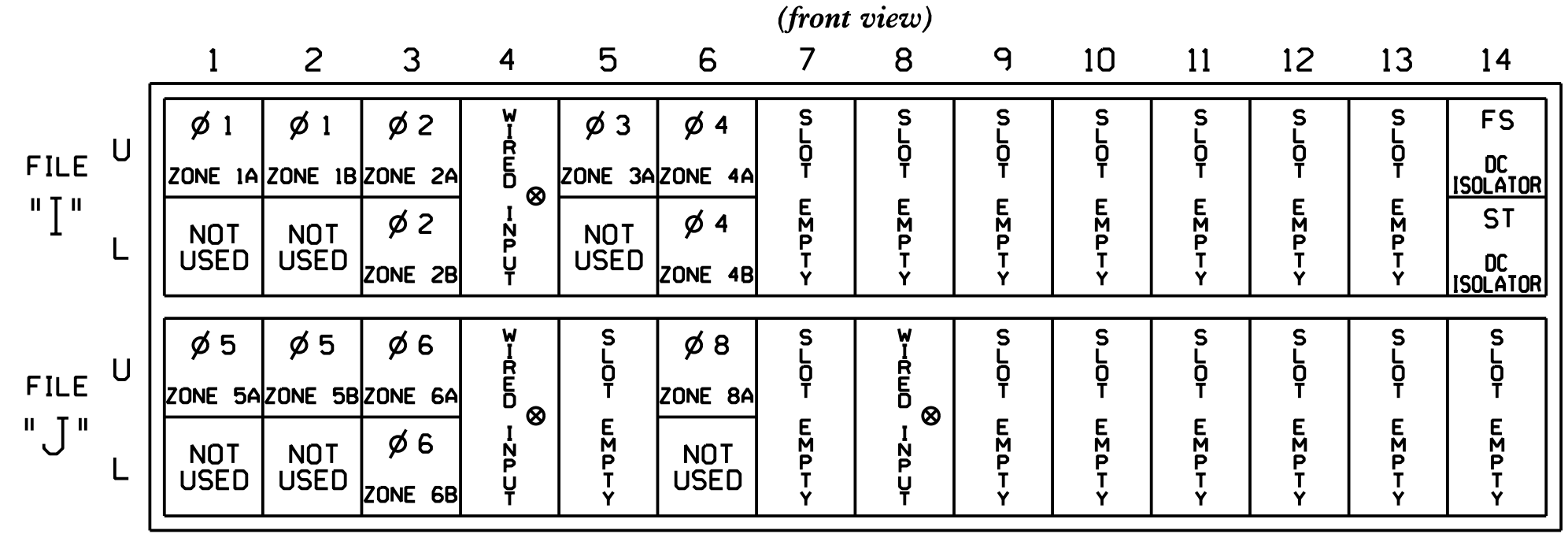
CONTROLLER.....2070E CABINET.....332 W/ AUX SOFTWARE.....ECONOLITE OASIS CABINET MOUNT.....BASE OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S11,AUX S1, AUX S2,AUX S4,AUX S5 PHASES USED.....1,2,3,4,5,6,8 OVERLAP "A".....1+2 OVERLAP "B".....3+4 OVERLAP "C".....5+6 OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

Table with columns for LOAD SWITCH NO., S1-S6, S7-S12, AUX S1-S6 and rows for CMU CHANNEL NO., PHASE, SIGNAL HEAD NO., RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, FLASHING YELLOW ARROW, GREEN ARROW.

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

INPUT FILE POSITION LAYOUT



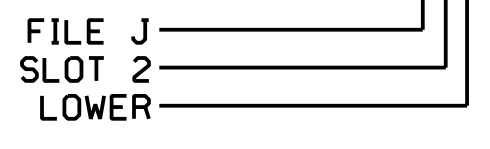
EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns: 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.

- 1 Add jumper from I1-W to J4-W, on rear of input file. 2 Add jumper from I5-W to J8-W, on rear of input file. 3 Add jumper from J1-W to I4-W, on rear of input file. * See Input Page Assignment programming details on sheets 4 and 5. ** Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L



SPECIAL DETECTOR NOTE

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

See vehicle detector setup programming detail for alternate phasing on sheets 4, 5, and 6.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

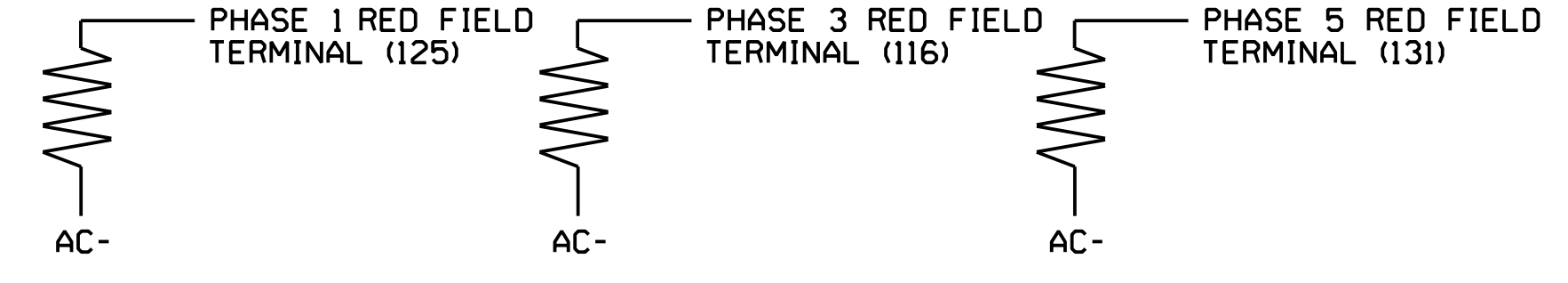
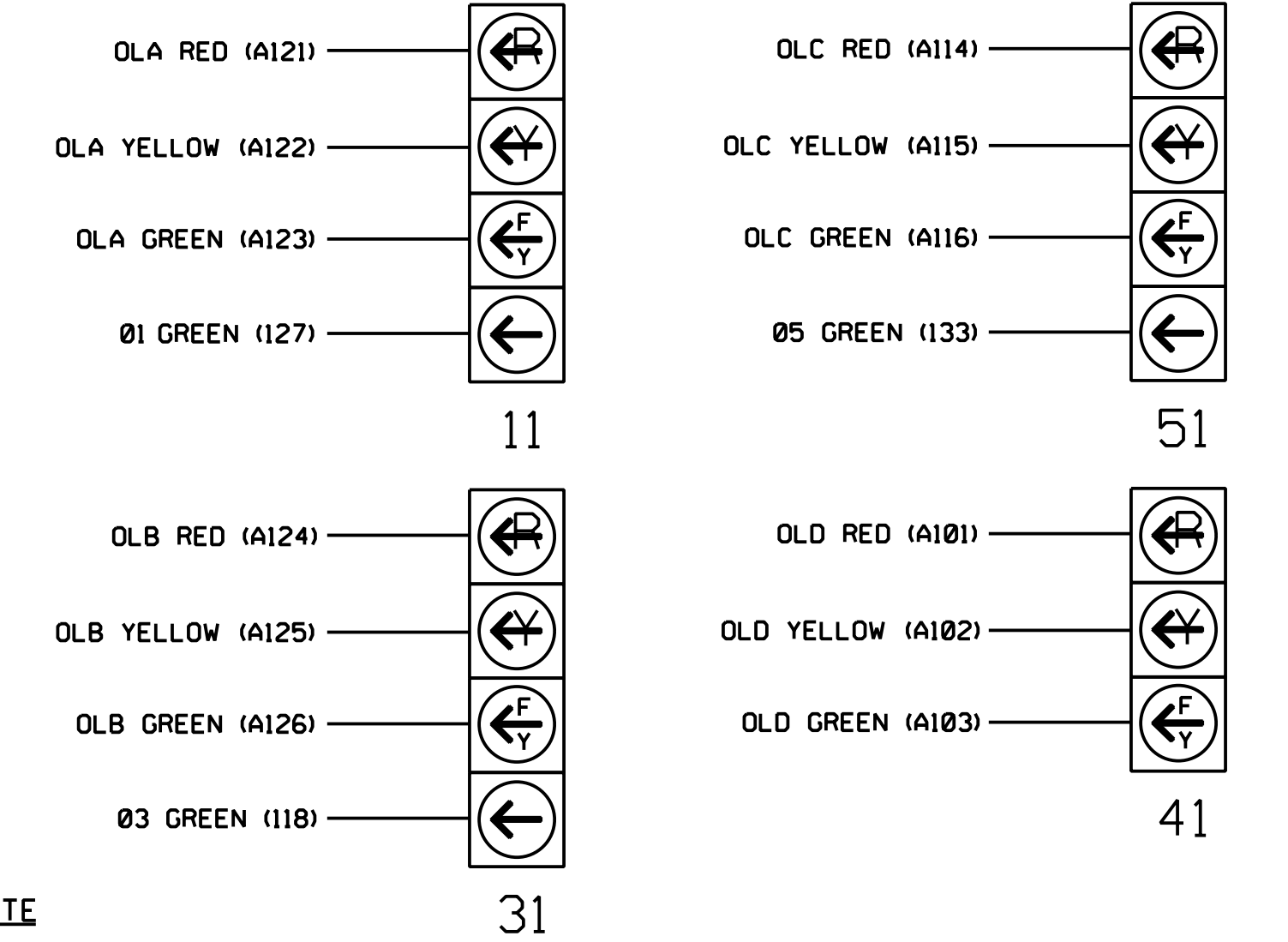


Table with columns: VALUE (ohms), WATTAGE. Values: 1.5K - 1.9K, 25W (min); 2.0K - 3.0K, 10W (min).

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T1 DESIGNED: February 2018 SEALED: 8-1-18 REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Professional seal area for HNTB and North Carolina Professional Engineer N. R. Simmons, including project address, dates, and signatures.

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, and 9.
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 2 (HEAD 11).

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 11).

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 11).

LOGICAL I/O COMMAND #4 (+/-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 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-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 51).

LOGICAL I/O COMMAND #6 (+/-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 51).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

↓
SCROLL DOWN

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

PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
FLASH GREEN IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
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: 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?...N
FLASH GREEN IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC)...0.0
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: 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
FLASH GREEN IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
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
FLASH GREEN IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC)...0.0
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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

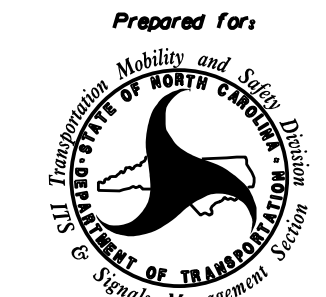
THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369T1
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 2 of 6
Signal Upgrade
Temporary Design 1


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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard)	
Division 03	New Hanover Co. Wilmington
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 031464
W. TISHA R. SIMMONS

DocuSigned by:

8/1/2018

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING *(program controller as shown below)*

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

NOTICE
PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      :12345678910111213141516
VEH OVL PARENTS: :X
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS:  - RED - YELLOW - GREEN
-----
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).....0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
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 'B' 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?...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 '+'

NOTICE
GREEN
FLASH ←

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 ←

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369T1
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 3 of 6
Signal Upgrade
Temporary Design 1

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

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:	Prepared for: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)	SEAL SEAL 031464 NICHOLAS R. SIMMONS ENGINEER
	Division 03 New Hanover Co. Wilmington	
	PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
	REVISIONS INIT. DATE	
		DocuSigned by: SIGNATURE DATE 8/1/2018
	750 N. Greenfield Pkwy, Corner, NC 27529	SIG. INVENTORY NO. 03-0369 T1

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

(program controller as shown below)

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

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

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

PAGE: 2 C1 PIN:48 VEHICLE DETECTOR INPUT ASSIGNMENT #.....10 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).....26 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 SYNCHRONIZATION (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 1A - PHASE 6)

PAGE: 2 C1 PIN:48 NOT ENABLED INPUT ASSIGNMENT #.....10 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 SYNCHRONIZATION (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 18

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 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).....1 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYNCHRONIZATION (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 '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 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).....51 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYNCHRONIZATION (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 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

VEHICLE DETECTOR #51 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).....0.0 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 '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '3'

VEHICLE DETECTOR #51 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: 03-0369T1 DESIGNED: February 2018 SEALED: 8-1-18 REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington, NC. Includes dates (February 2018), signatures (A.H. Thornburg, N.R. Simmons), and a professional seal for W. J. Simons, Engineer, No. 031464.

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

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION. 2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

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

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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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).....0.0 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: 03-0369T1 DESIGNED: February 2018 SEALED: 8-1-18 REVISED: N/A

Electrical Detail - Sheet 5 of 6
Signal Upgrade
Temporary Design 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington. Includes signature lines for A.H. Thornburg and N.R. Simmons, and a professional seal for N. R. Simmons, North Carolina Professional Engineer, No. 031464.

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

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

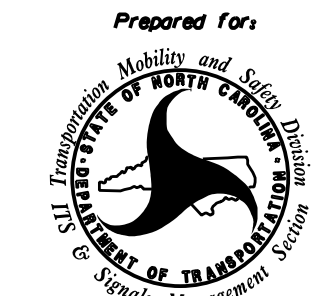
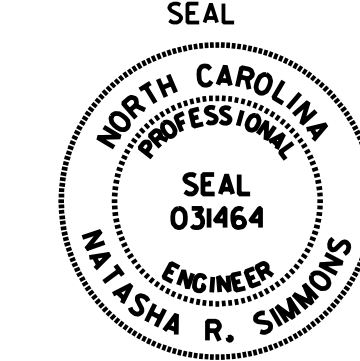
Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T1
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

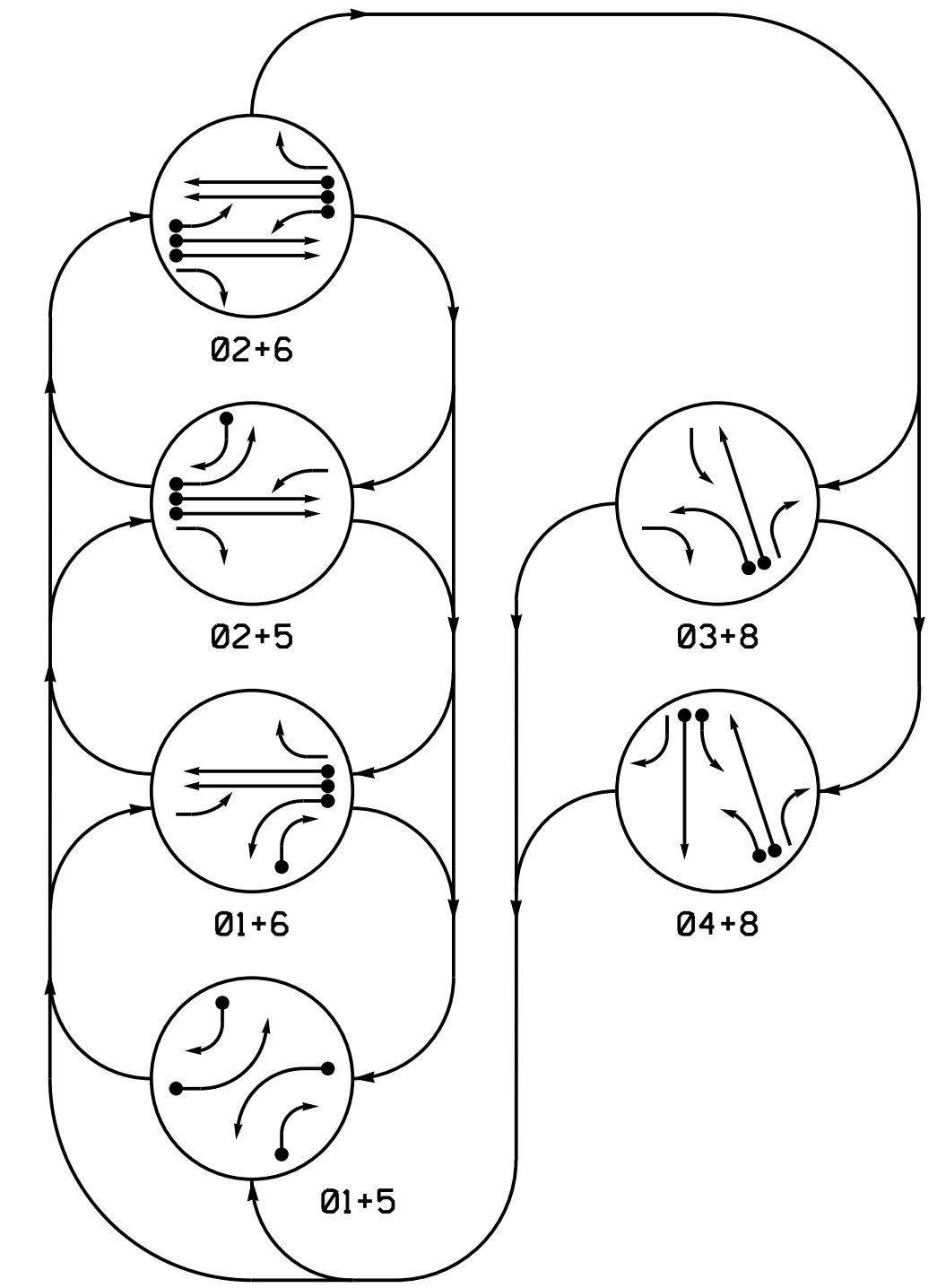
Electrical Detail - Sheet 6 of 6
Signal Upgrade
Temporary Design 1

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<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for:  750 N. Greenfield Pkwy, Corner, NC 27529</p>	<p style="text-align: center;">US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)</p> <p style="font-size: x-small;">Division 03 New Hanover Co. Wilmington</p> <p style="font-size: x-small;">PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek</p> <p style="font-size: x-small;">PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p>  <p style="font-size: x-small;">DocuSigned by: <i>Natasha R. Simmons</i> 8/1/2018</p> <p style="font-size: x-small;">SIGNATURE DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 03-0369 T1</p>
REVISIONS	INIT.	DATE												

DEFAULT PHASING DIAGRAM



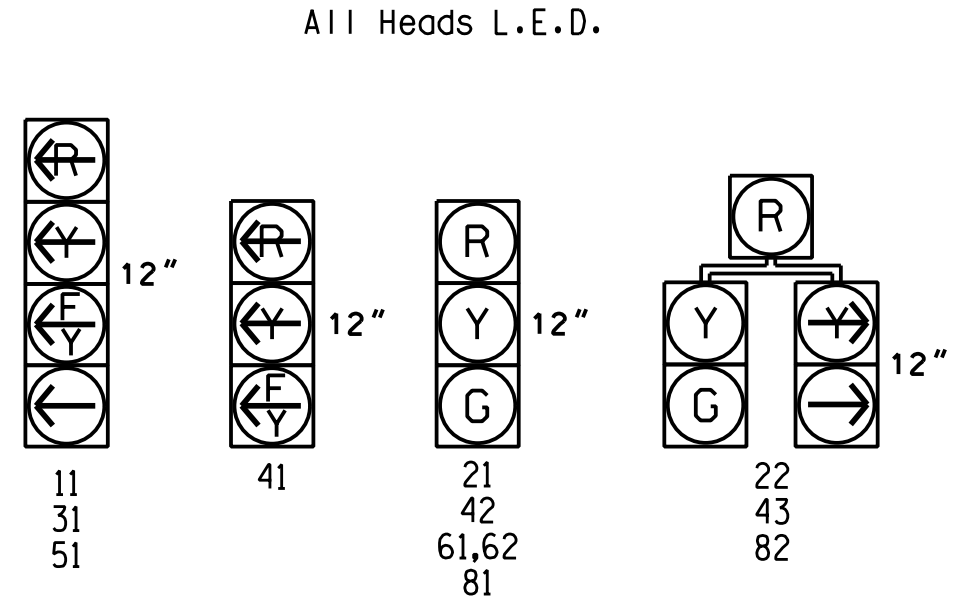
PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						FLASH
	01+5	02+5	03+8	04+8	01+6	02+6	
11							
21	R	R	G	G	R	R	Y
22	R	R	G	G	R	R	Y
31	R	R	R	R	F	F	R
41	R	R	R	R	F	F	R
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51							
61,62	R	G	R	G	R	R	Y
81	R	R	R	R	G	G	R
82	R	R	R	R	G	G	R

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

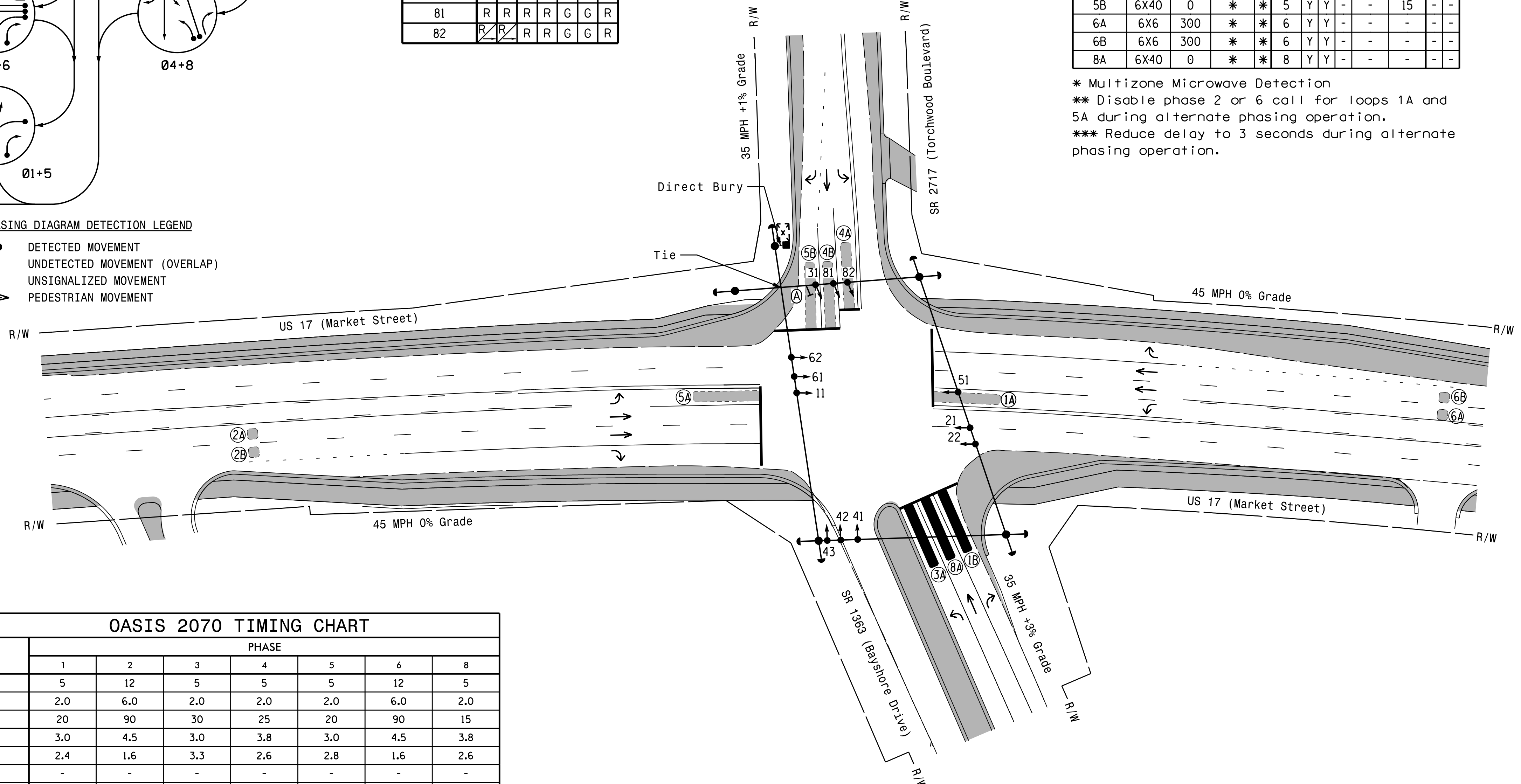
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6X40	0	*	*	1	Y	Y	-	***10	-
1B	6X40	0	*	*	1	Y	Y	-	3	-
2A	6X6	300	*	*	2	Y	Y	-	-	-
2B	6X6	300	*	*	2	Y	Y	-	-	-
3A	6X40	0	*	*	3	Y	Y	-	10	-
4A	6X40	0	*	*	4	Y	Y	-	3	-
4B	6X40	0	*	*	4	Y	Y	-	-	-
5A	6X40	0	*	*	5	Y	Y	-	***10	-
5B	6X40	0	*	*	5	Y	Y	-	3	-
6A	6X6	300	*	*	6	Y	Y	-	-	-
6B	6X6	300	*	*	6	Y	Y	-	-	-
8A	6X40	0	*	*	8	Y	Y	-	-	-

* Multizone Microwave Detection
 ** Disable phase 2 or 6 call for loops 1A and 5A during alternate phasing operation.
 *** Reduce delay to 3 seconds during alternate phasing operation.

6 Phase Fully Actuated Wilmington Signal System

NOTES

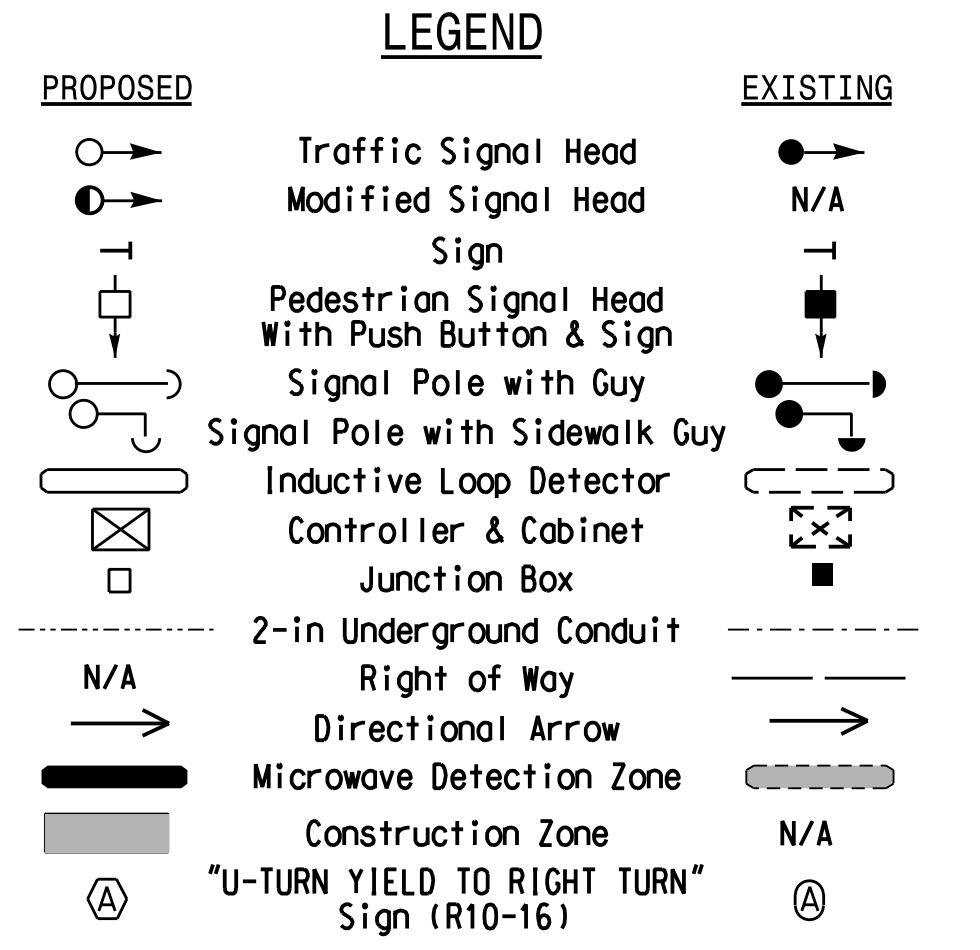
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
4. Phase 3 may be lagged.
5. Set all detector units to presence mode.
6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
7. Incorporate Microwave Detection system for vehicle detection.
8. Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Signal system data: Controller Asset #0369



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	8	
Min Green 1 *	5	12	5	5	5	12	5	
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	
Max Green 1 *	20	90	30	25	20	90	15	
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.8	
Red Clearance	2.4	1.6	3.3	2.6	2.8	1.6	2.6	
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	-	-	-	ON	-	-	ON	
Simultaneous Gap	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.



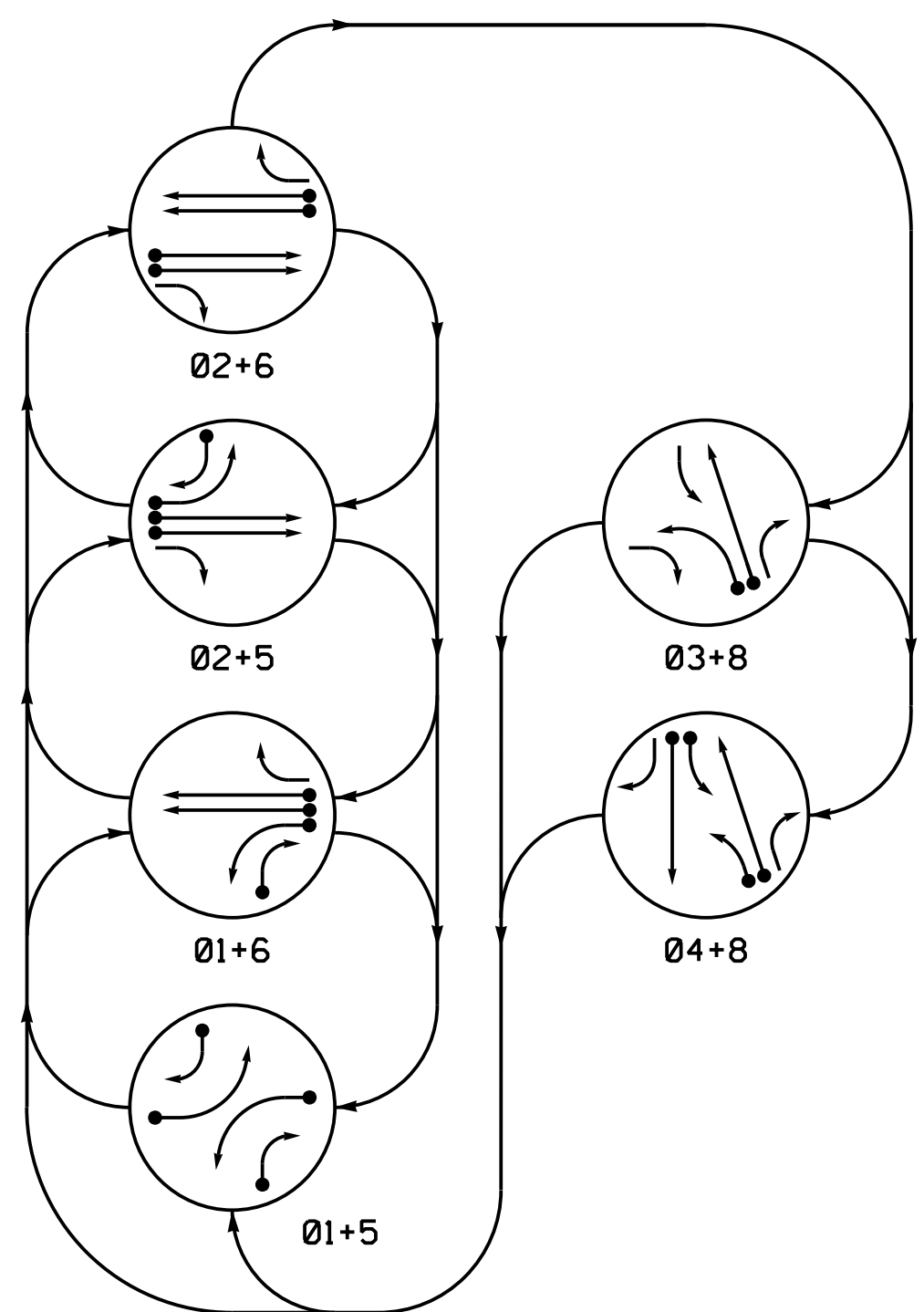
Signal Upgrade
 Temporary Design 2
 Construction Phase II
 Sheet 1 of 2

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	US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard)		
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 PREPARED BY: A.H. Thornburg	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	
SCALE 0 40 1" = 40'	REVISIONS INIT. DATE	DocuSign by: Natasha R. Simmons 8/1/2018 SIGNATURE DATE	SIG. INVENTORY NO. 03-0369T2

ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

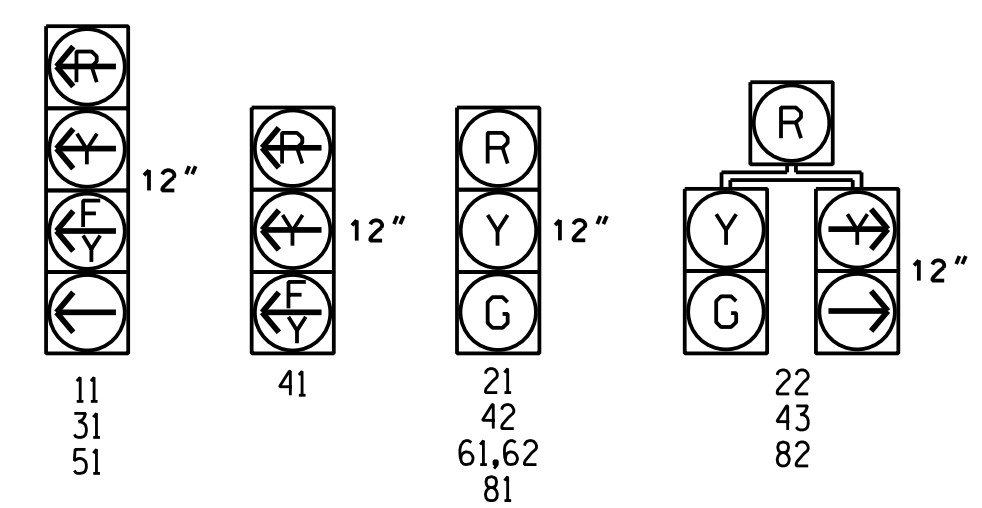
- ←●→ DETECTED MOVEMENT
- ←.....→ UNDETECTED MOVEMENT (OVERLAP)
- ←.....→ UNSIGNALIZED MOVEMENT
- ←- - - - -→ PEDESTRIAN MOVEMENT

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						FLASH
	01+5	01+6	02+5	02+6	03+8	04+8	
11	—	—	—	—	—	—	Y
21	R	R	G	G	R	R	Y
22	R	R	G	G	R	R	Y
31	—	—	—	—	—	—	Y
41	—	—	—	—	—	—	Y
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51	—	—	—	—	—	—	Y
61,62	R	G	R	G	R	R	Y
81	R	R	R	R	G	G	R
82	R	R	R	R	G	G	R

SIGNAL FACE I.D.

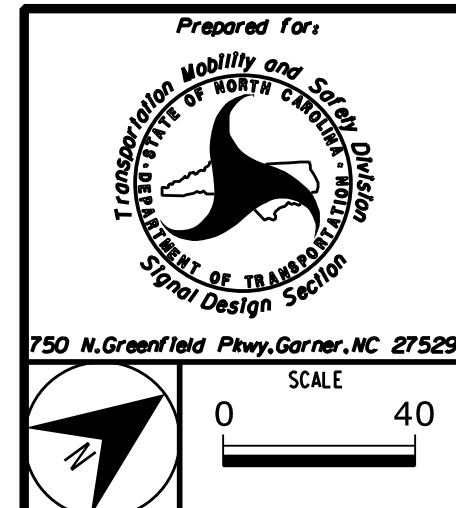
All Heads L.E.D.



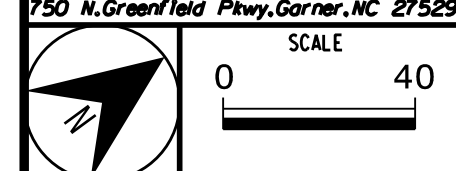
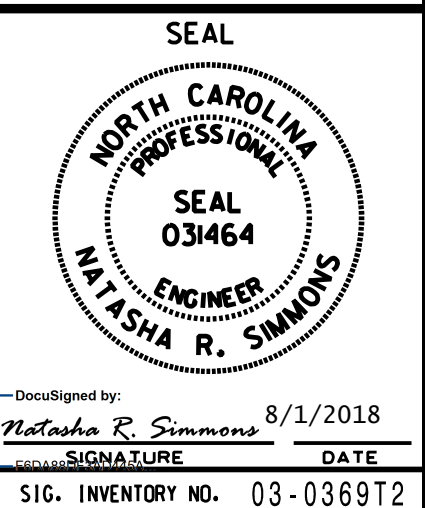
Signal Upgrade
 Temporary Design 2
 Construction Phase II
 Sheet 2 of 2

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HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
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Prepared for:
**US 17 (Market Street) at
 SR 1363 (Bayshore Drive) /
 SR 2717 (Torchwood Boulevard)**
 Division 03 New Hanover Co. Wilmington
 PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons



REVISIONS	INIT.	DATE

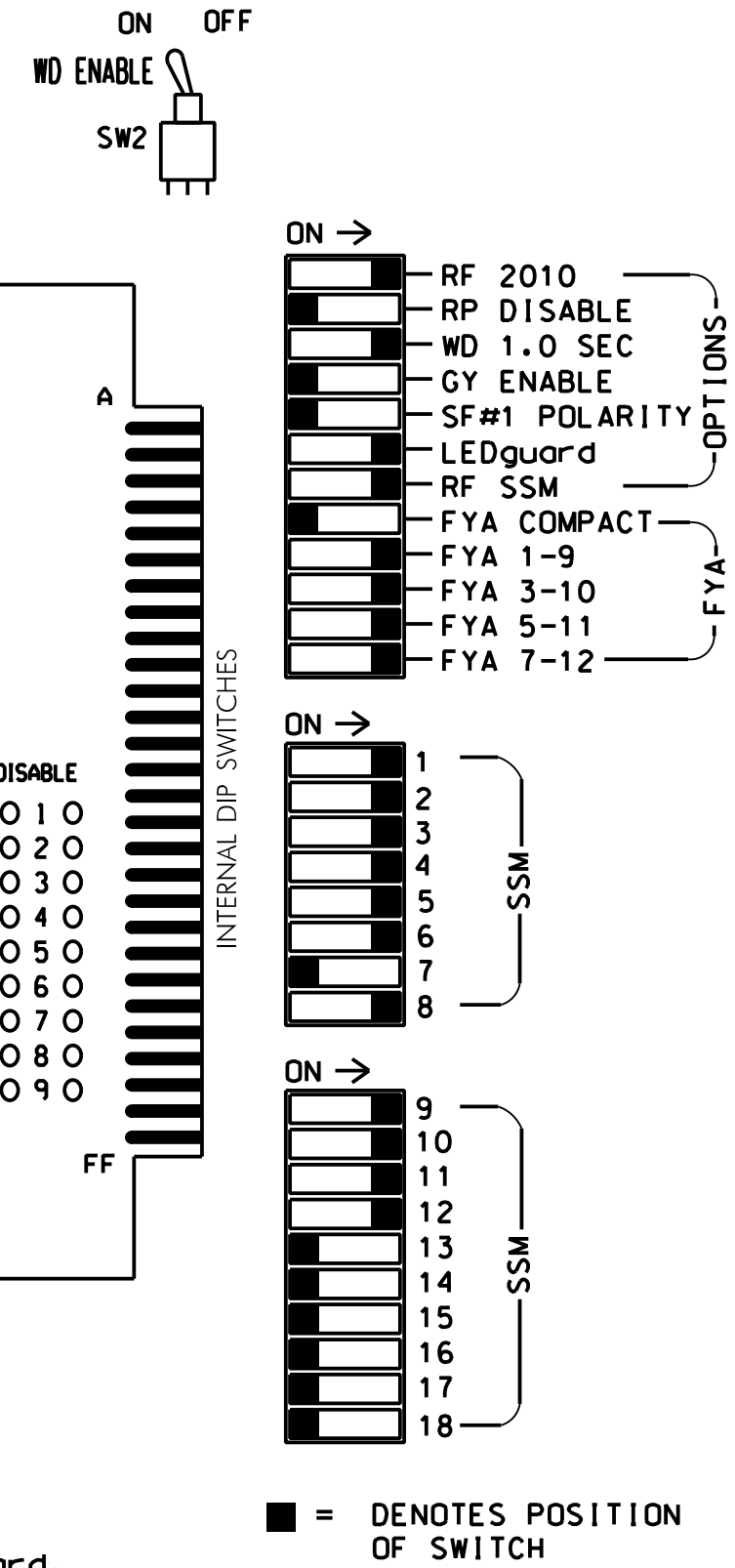
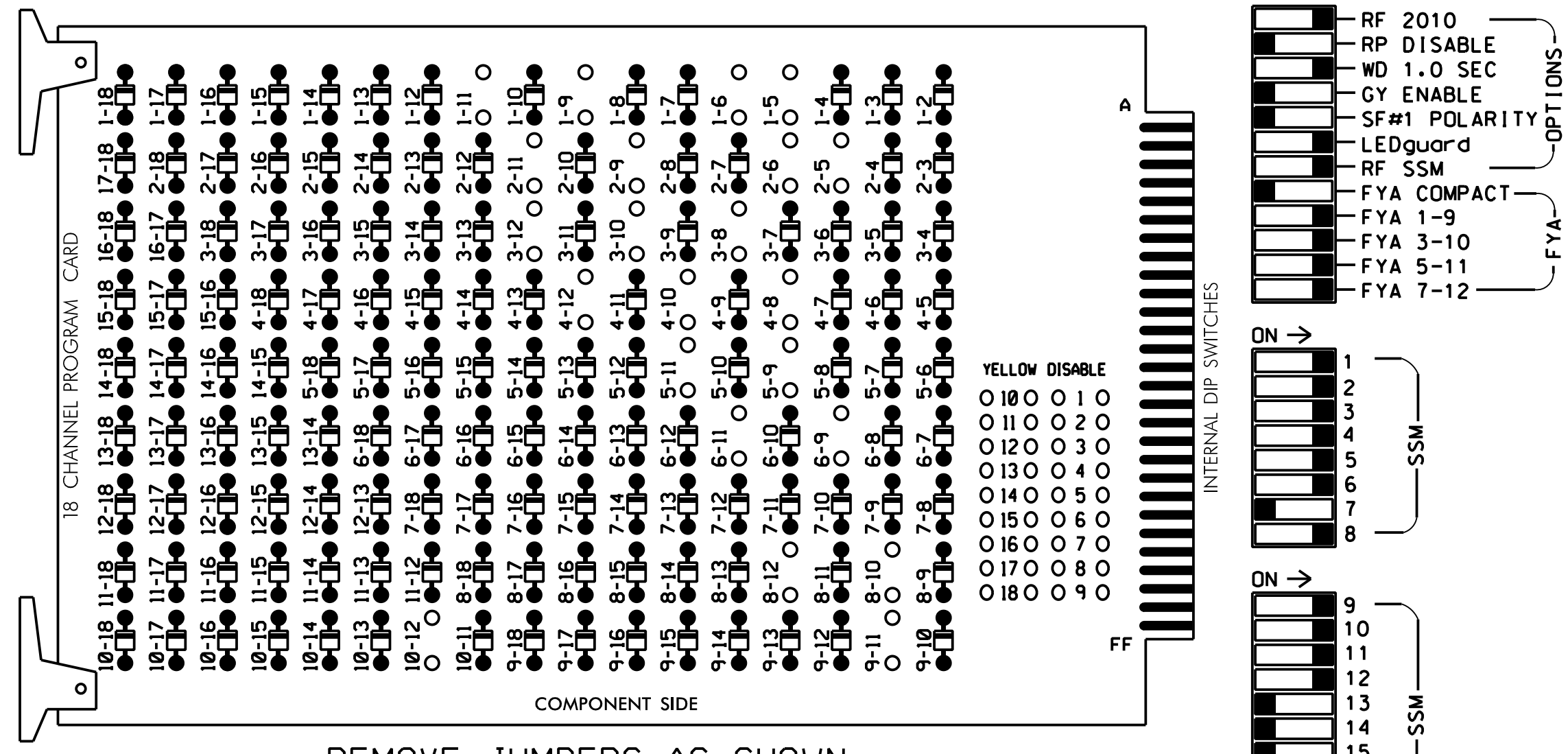
DocuSigned by:
 Natasha R. Simmons 8/1/2018
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-0369T2

EDI MODEL 2018EClip-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

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

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 phase 4 and 8 for Dual Entry. 3. Enable Simultaneous Gap-Out for all Phases. 4. Program phases 2 and 6 for Variable Initial and Gap Reduction. 5. Program phases 2 and 6 for Startup In Green. 6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps. 7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
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,S11,AUX S1,
AUX S2,AUX S4,AUX S5
PHASES USED.....1,2,3,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....5+6
OVERLAP "D".....8

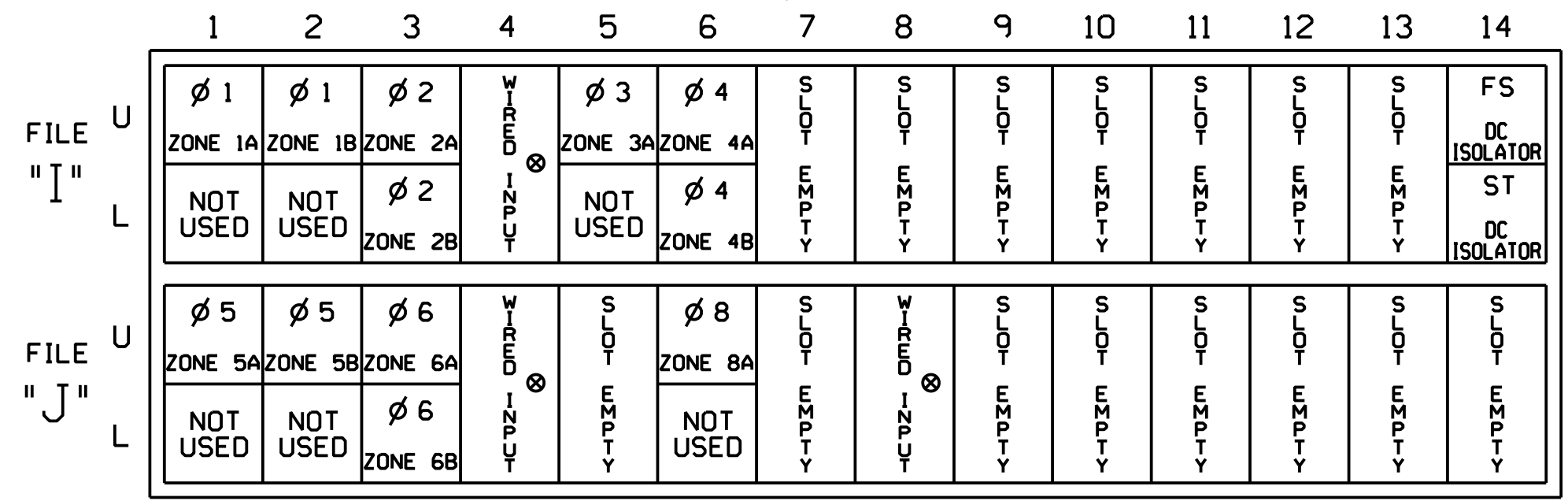
SIGNAL HEAD HOOK-UP CHART

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	PED	3	4	PED	5	6	PED	7	8	PED	OLA	OLB	SPARE	OLC	OLD	SPARE				
SIGNAL HEAD NO.	11	82	21,22	NU	22	31	42,43	NU	43	51	61,62	NU	NU	81,82	NU	11	31	NU	51	41	NU	
RED		*	128		*	101		*	134		107											
YELLOW			129			102			135		108											
GREEN			130			103			136		109											
RED ARROW																A121	A124		A114	A101		
YELLOW ARROW			126			117			132							A122	A125		A115	A102		
FLASHING YELLOW ARROW																A123	A126		A116	A103		
GREEN ARROW	127	127				118	118		133	133												

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

INPUT FILE POSITION LAYOUT

(front view)



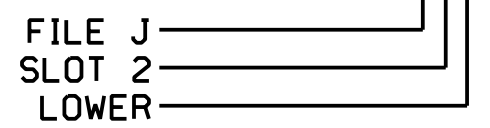
EX.: 1A, 2A, ETC. = LOOP NO.'S
FS = FLASH SENSE
ST = STOP TIME
⊗ Wired Input - Do not populate slot with detector card

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
ZONE 1A	★	I1U	56	18	1	1	Y	Y			10
	-	J4U	48	10	★	26	6	Y	Y	Y	3
	-	I1U	56	18	★	51	1	Y	Y		3
ZONE 1B	★	I2U	39	1	2	1	Y	Y			15
ZONE 2A	★	I3U	63	25	32	2	Y	Y			
ZONE 2B	★	I3L	76	38	42	2	Y	Y			
ZONE 3A	★	I5U	58	20	3	3	Y	Y			10
ZONE 4A	★	J8U	50	12	28	8	Y	Y			
ZONE 4B	★	I6U	41	3	4	4	Y	Y			3
ZONE 5A	★	J1U	55	17	5	5	Y	Y			10
ZONE 6A	★	I4U	47	9	★	22	2	Y	Y	Y	3
ZONE 6B	★	J1U	55	17	★	55	5	Y	Y		3
ZONE 5B	★	J2U	40	2	6	5	Y	Y			15
ZONE 6A	★	J3U	64	26	36	6	Y	Y			
ZONE 6B	★	J3L	77	39	46	6	Y	Y			
ZONE 8A	★	J6U	42	4	8	8	Y	Y			

- 1 Add jumper from I1-W to J4-W, on rear of input file.
- 2 Add jumper from I5-W to J8-W, on rear of input file.
- 3 Add jumper from J1-W to I4-W, on rear of input file.
- ★ See Input Page Assignment programming details on sheets 4 and 5.
- ★★ Multizone Microwave Detector Zone. See Special Detector Note.

INPUT FILE POSITION LEGEND: J2L



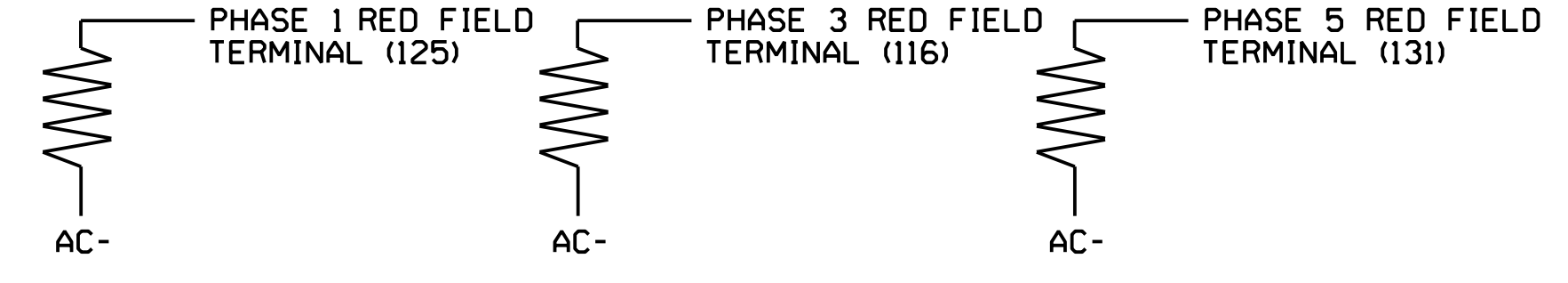
SPECIAL DETECTOR NOTE

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

See vehicle detector setup programming detail for alternate phasing on sheets 4, 5, and 6.

LOAD RESISTOR INSTALLATION DETAIL

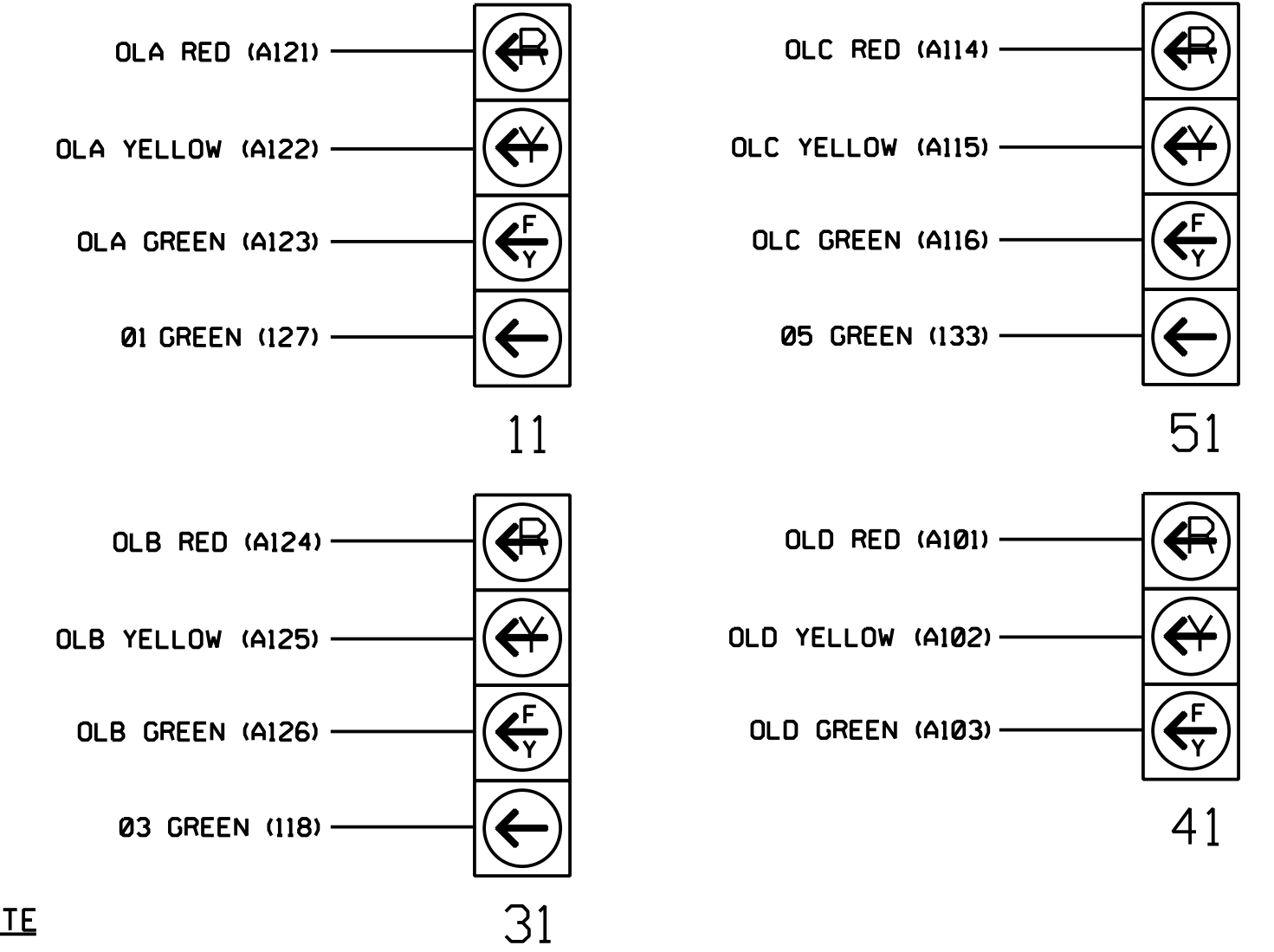
(install resistors as shown below)



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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



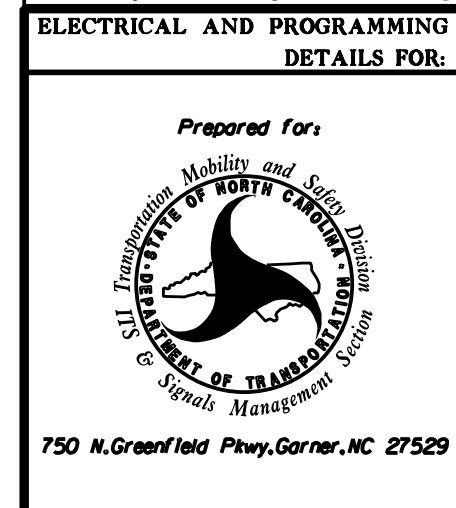
NOTE

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

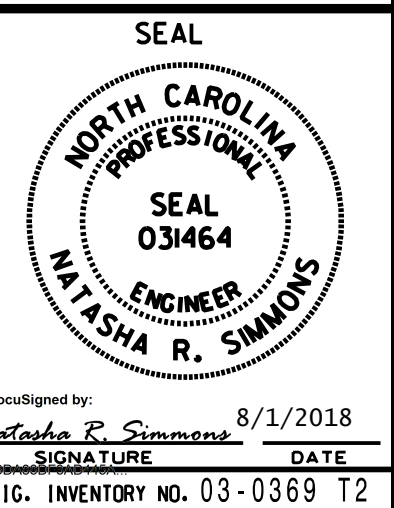
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T2
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 1 of 6
Signal Upgrade
Temporary Design 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Prepared for:
US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)
Division 03 New Hanover Co. Wilmington
PLAN DATE: February 2018 REVIEWED BY: A.D. Klinskiak
PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons



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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, and 9.
- 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 2 (HEAD 11).

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 11).

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 11).

LOGICAL I/O COMMAND #4 (+/-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 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-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 51).

LOGICAL I/O COMMAND #6 (+/-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 51).

LOGICAL I/O COMMAND #7 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON
AND RED CLEAR ON PHASE #3 IS ON

↓
SCROLL DOWN

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

PRESS '+'

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

LOGICAL I/O COMMAND #8 (+/-COMMAND#)
IF ACTIVE PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 3 (HEAD 31).

LOGICAL I/O COMMAND #9 (+/-COMMAND#)
IF YELLOW ON PHASE #3 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'B' 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?...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 '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

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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


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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369T2
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

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

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)	
Division 03	New Hanover Co. Wilmington
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
031464
W. TISHA R. SIMMONS

DocuSigned by:
Notisha R. Simmons 8/1/2018
SIGNATURE DATE

SIG. INVENTORY NO. 03-0369 T2

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(919) 546-8997

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

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

NOTICE → PAGE 2 →

```

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

PRESS '+'

NOTICE → PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'B' 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?...N
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

PRESS '+'

NOTICE → PAGE 2 →

```

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

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

OVERLAP PROGRAMMING COMPLETE

← NOTICE GREEN FLASH

← NOTICE GREEN FLASH

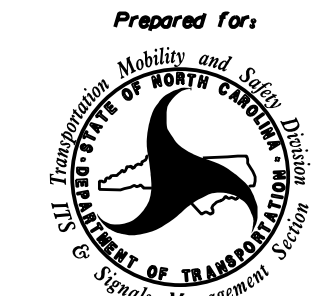
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369T2
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 3 of 6
Signal Upgrade
Temporary Design 2

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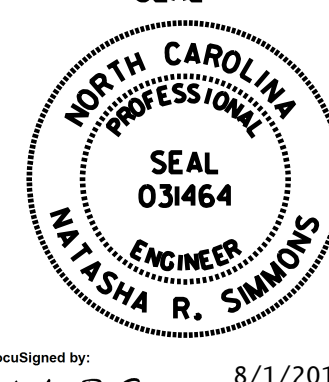
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REVISIONS	INIT. DATE

SEAL



DocuSigned by:
Natasha R. Simmons 8/1/2018

SIGNATURE DATE

SIG. INVENTORY NO. 03-0369 T2

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

(program controller as shown below)

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

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

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

PAGE: 2 C1 PIN:48 VEHICLE DETECTOR INPUT ASSIGNMENT #.....10 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).....26 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 SYNCHRONIZATION (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 1A - PHASE 6)

PAGE: 2 C1 PIN:48 NOT ENABLED INPUT ASSIGNMENT #.....10 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 SYNCHRONIZATION (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 18

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 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).....1 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYNCHRONIZATION (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 '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR INPUT ASSIGNMENT #.....18 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).....51 PEDESTRIAN DETECTOR (1-16)..... ALTERNATE PED DETECTOR (1-16)..... PREEMPT (1-10)..... INVERTED PREEMPT (1-10)..... STOP TIME (Y/N)..... FLASH SENSE (Y/N)..... DOOR OPEN (Y/N)..... MANUAL CONTROL ENABLE (Y/N)..... MANUAL CONTROL ADVANCE (Y/N)..... SPECIAL FUNCTION ALARM (1-8)..... TOD HOUR SYNCHRONIZATION (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 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

VEHICLE DETECTOR #51 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).....0.0 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 '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '3'

VEHICLE DETECTOR #51 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: 03-0369T2 DESIGNED: February 2018 SEALED: 8-1-18 REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington, NC. Includes dates (February 2018), signatures (A.H. Thornburg, N.R. Simmons), and a professional seal for N. R. Simmons, North Carolina Professional Engineer, No. 031464.

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

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION. 2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

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

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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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).....0.0 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: 03-0369T2 DESIGNED: February 2018 SEALED: 8-1-18 REVISED: N/A

Electrical Detail - Sheet 5 of 6
Signal Upgrade
Temporary Design 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

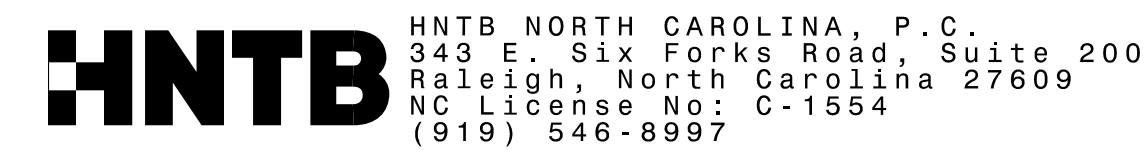


Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington. Includes signature lines for A.H. Thornburg and N.R. Simmons, and a professional seal for W. L. SIMMONS, ENGINEER, SEAL 031464.

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

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

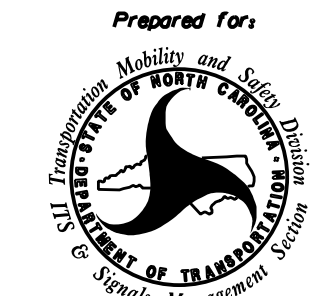


Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T2
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

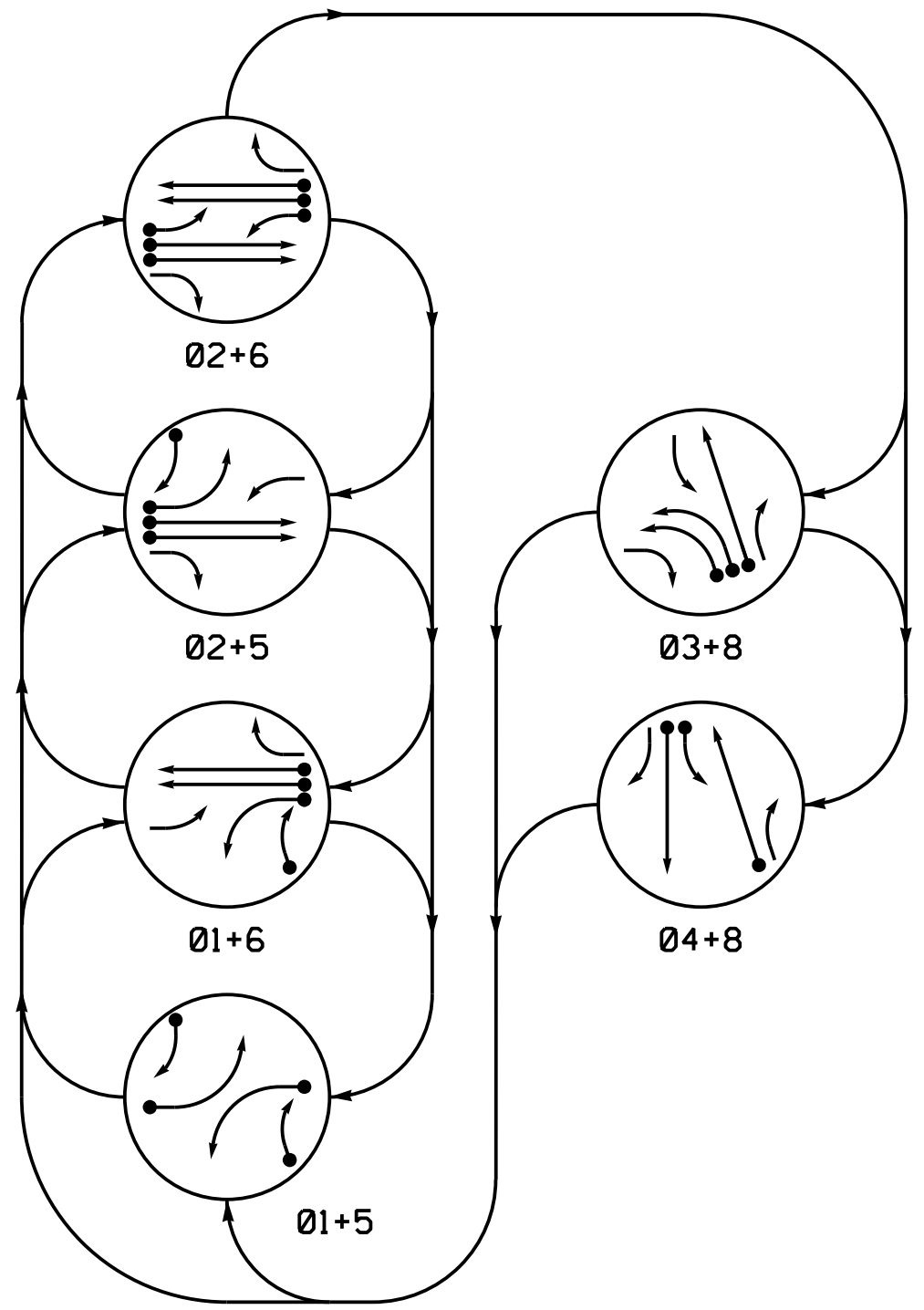
Electrical Detail - Sheet 6 of 6
Signal Upgrade
Temporary Design 2

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HNTB HNTB NORTH CAROLINA, P.C.
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Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for:  Department of Transportation, Mobility and Safety Division State of North Carolina</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Corner, NC 27529</p>	<p style="text-align: center;">US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)</p> <p style="font-size: x-small;">Division 03 New Hanover Co. Wilmington</p> <p style="font-size: x-small;">PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek</p> <p style="font-size: x-small;">PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p>  <p style="font-size: x-small;">NATASHA R. SIMMONS ENGINEER SEAL 031464</p>
REVISIONS	INIT.	DATE												
DocuSigned by:  8/1/2018 SIGNATURE DATE		SIG. INVENTORY NO. 03-0369 T2												

DEFAULT PHASING DIAGRAM



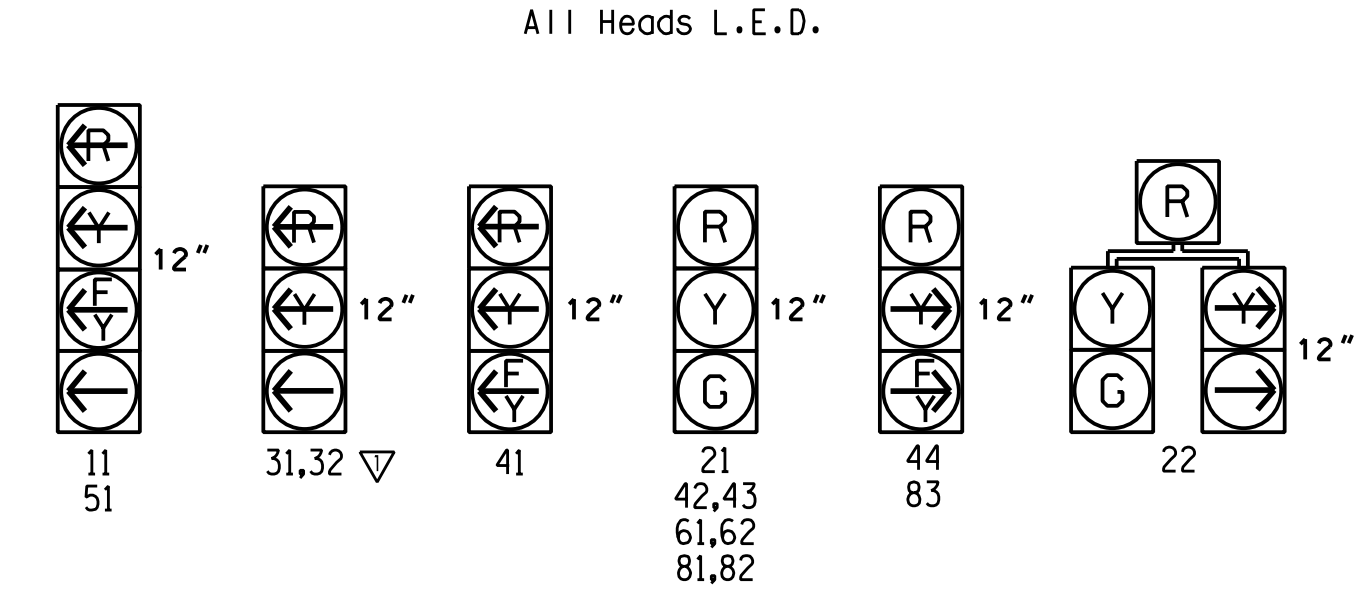
PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+8	04+8	01+5	01+6
11								
21	R	R	G	G	R	R	Y	
22	R	R	G	G	R	R	Y	
31,32	R	R	R	R				
41	R	R	R	R				
42,43	R	R	R	R	G	R		
44	F	F	F	F	R	R		
51								
61,62	R	G	R	G	R	R	Y	
81,82	R	R	R	R	G	G	R	
83	F	F	F	F	R	R		

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

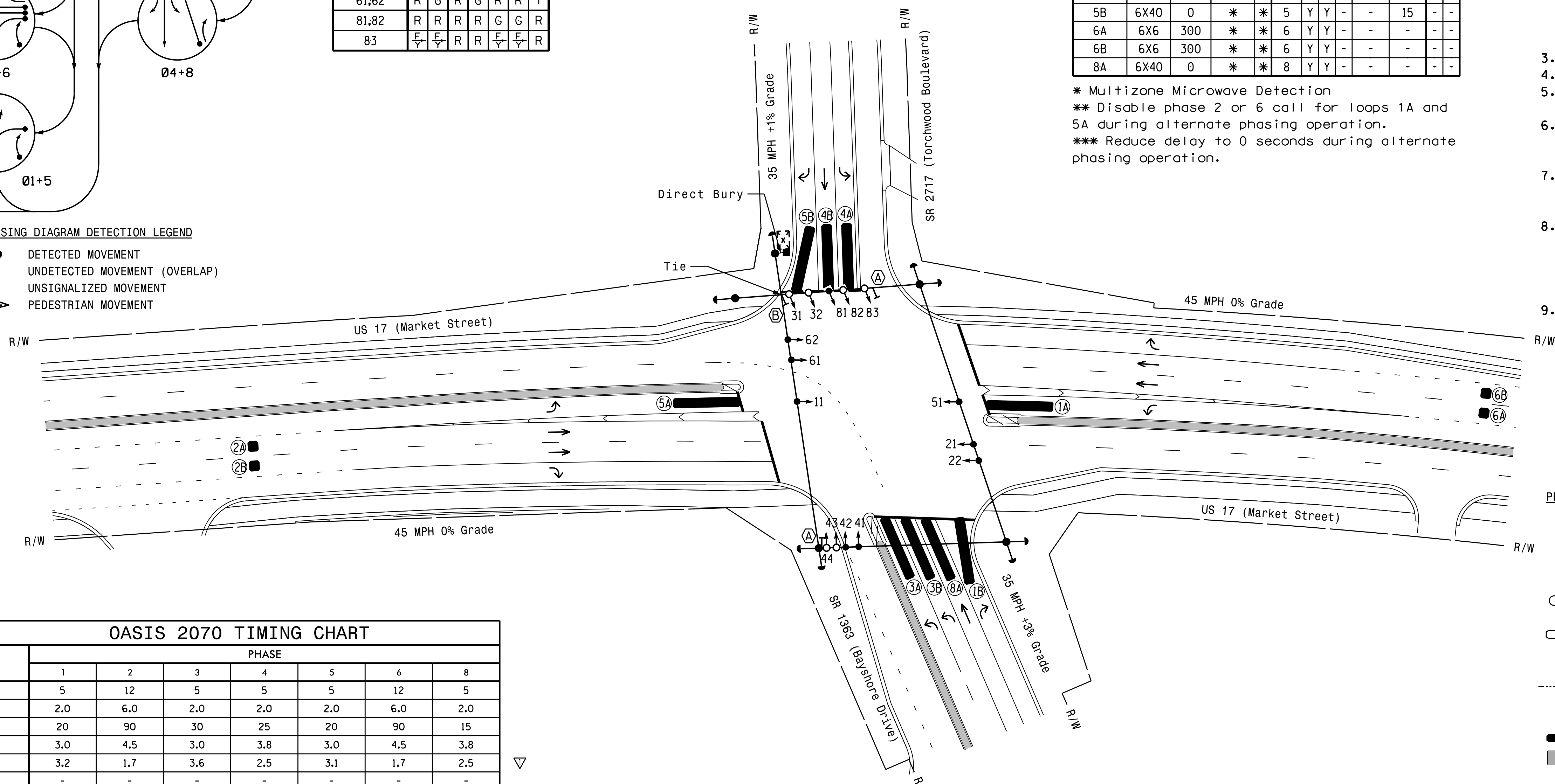
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6X40	0	*	*	1	Y	Y	-	***10	-
1B	6X40	0	*	*	1	Y	Y	-	15	-
2A	6X6	300	*	*	2	Y	Y	-	-	-
2B	6X6	300	*	*	2	Y	Y	-	-	-
3A	6X40	0	*	*	3	Y	Y	-	-	-
3B	6X40	0	*	*	3	Y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

* Multizone Microwave Detection
 ** Disable phase 2 or 6 call for loops 1A and 5A during alternate phasing operation.
 *** Reduce delay to 0 seconds during alternate phasing operation.

6 Phase Fully Actuated Wilmington Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Phase 3 may be lagged.
- Set all detector units to presence mode.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Reposition existing signal heads numbered 11,21,22,41,51,61,62, and 81.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data: Controller Asset #0369



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	8	
Min Green 1 *	5	12	5	5	5	12	5	
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	
Max Green 1 *	20	90	30	25	20	90	15	
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.8	
Red Clearance	3.2	1.7	3.6	2.5	3.1	1.7	2.5	
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	-	-	-	-	-	-	ON	
Simultaneous Gap	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.

LEGEND

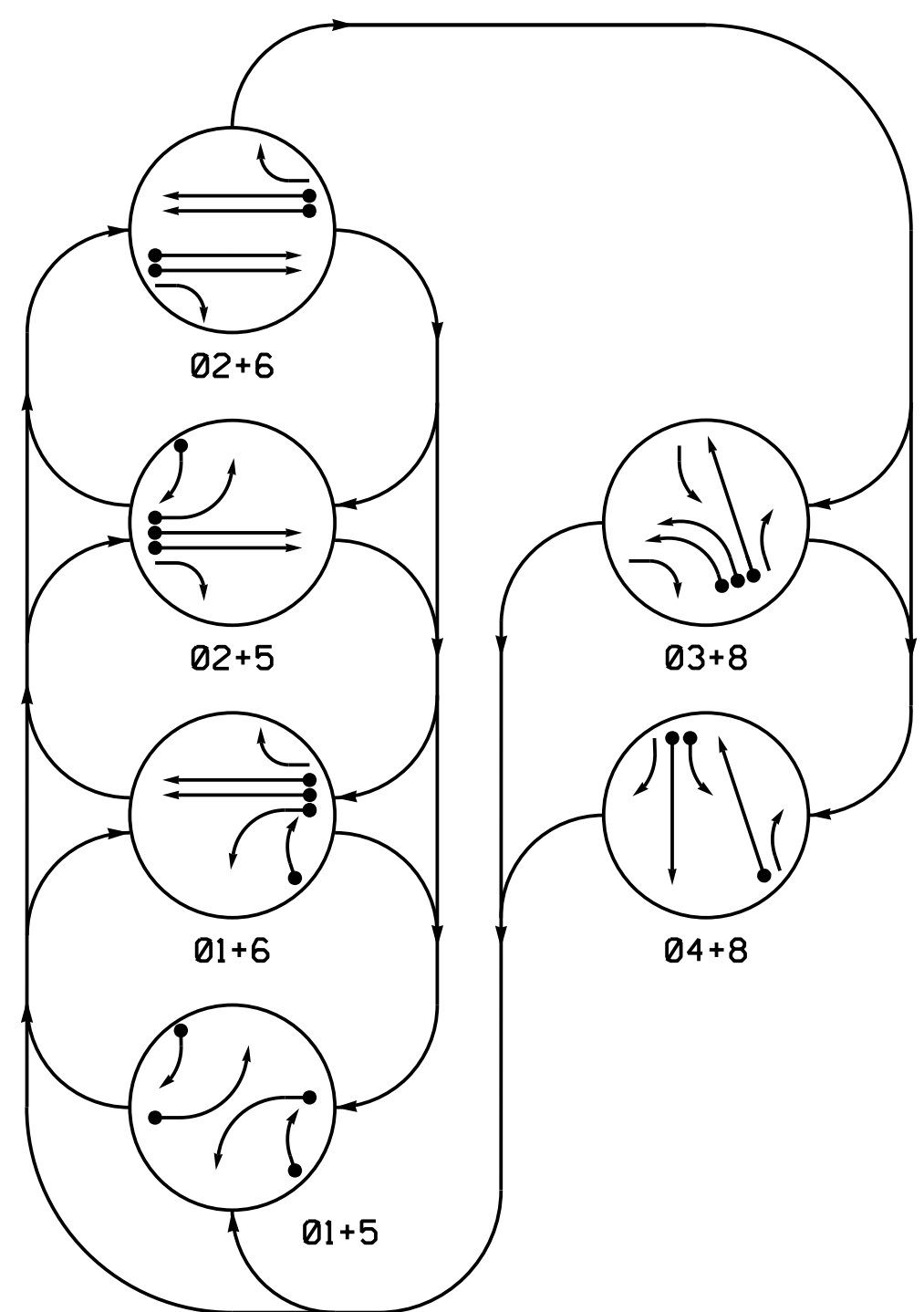
- | PROPOSED | EXISTING |
|--|--|
| ○ Traffic Signal Head | ● Traffic Signal Head |
| ○ Modified Signal Head | N/A |
| ○ Sign | ○ Sign |
| ○ Pedestrian Signal Head With Push Button & Sign | ○ Pedestrian Signal Head With Push Button & Sign |
| ○ Signal Pole with Guy | ○ Signal Pole with Guy |
| ○ Signal Pole with Sidewalk Guy | ○ Signal Pole with Sidewalk Guy |
| □ Inductive Loop Detector | □ Inductive Loop Detector |
| □ Controller & Cabinet | □ Controller & Cabinet |
| □ Junction Box | □ Junction Box |
| ○ 2-in Underground Conduit | ○ 2-in Underground Conduit |
| N/A Right of Way | ○ Right of Way |
| → Directional Arrow | → Directional Arrow |
| ▬ Microwave Detection Zone | ▬ Microwave Detection Zone |
| ▬ Construction Zone | N/A |
| Ⓐ "RIGHT TURN MUST YIELD TO U-TURN" Sign | Ⓐ "RIGHT TURN MUST YIELD TO U-TURN" Sign |
| Ⓑ "NO U-TURN" Sign (R3-4) | Ⓑ "NO U-TURN" Sign (R3-4) |

Signal Upgrade
 Temporary Design 3
 Construction Phase III
 Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997</p>	Prepared for: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529	US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 NATASHA R. SIMMONS
	SCALE 0 40 1" = 40'	REVISIONS INITI. DATE Added turn lane and updated heads for phase 3. Shifted Loop 5A stop bar.	Documented by: Natasha R. Simmons 11/4/2020 SIGNATURE DATE SIG. INVENTORY NO. 03-0369T3

ALTERNATE PHASING DIAGRAM ▽



PHASING DIAGRAM DETECTION LEGEND

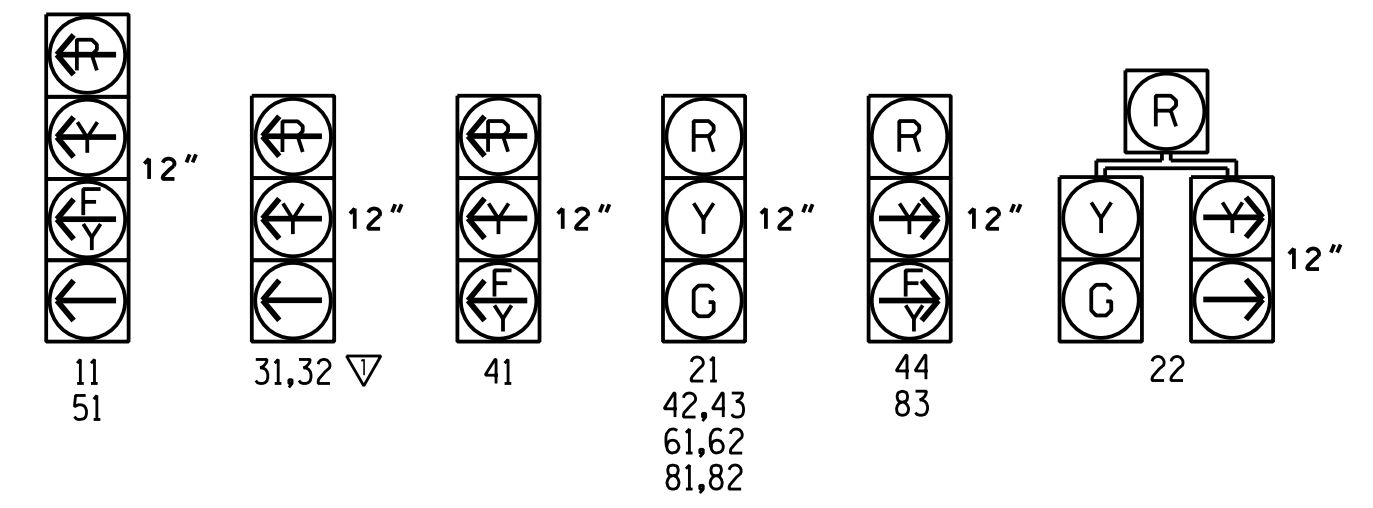
- ←●→ DETECTED MOVEMENT
- ←---→ UNDETECTED MOVEMENT (OVERLAP)
- ←.....→ UNSIGNALIZED MOVEMENT
- ←- - - -> PEDESTRIAN MOVEMENT

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	02+5	02+6	03+8	04+8	FLASH
11	—	—	—	—	—	Y
21	R	R	G	G	R	Y
22	R	R	G	G	R	Y
31,32	—	—	—	—	—	—
41	—	—	—	—	—	—
42,43	R	R	R	R	R	G
44	—	—	—	—	—	—
51	—	—	—	—	—	—
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	G
83	—	—	—	—	—	—

SIGNAL FACE I.D.

All Heads L.E.D.



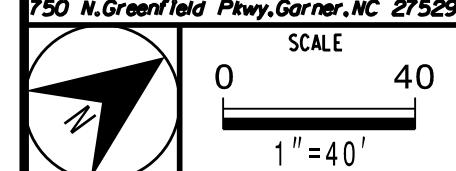
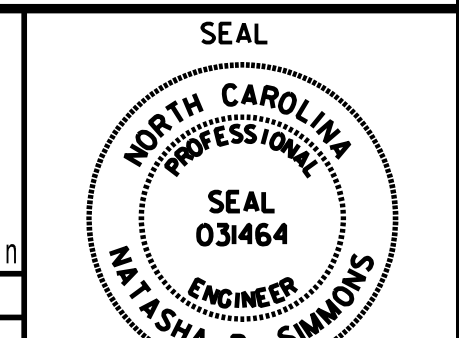
Signal Upgrade
 Temporary Design 3
 Construction Phase III
 Sheet 2 of 2

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US 17 (Market Street) at
 SR 1363 (Bayshore Drive)/
 SR 2717 (Torchwood Boulevard)
 Division 03 New Hanover Co. Wilmington
 PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons



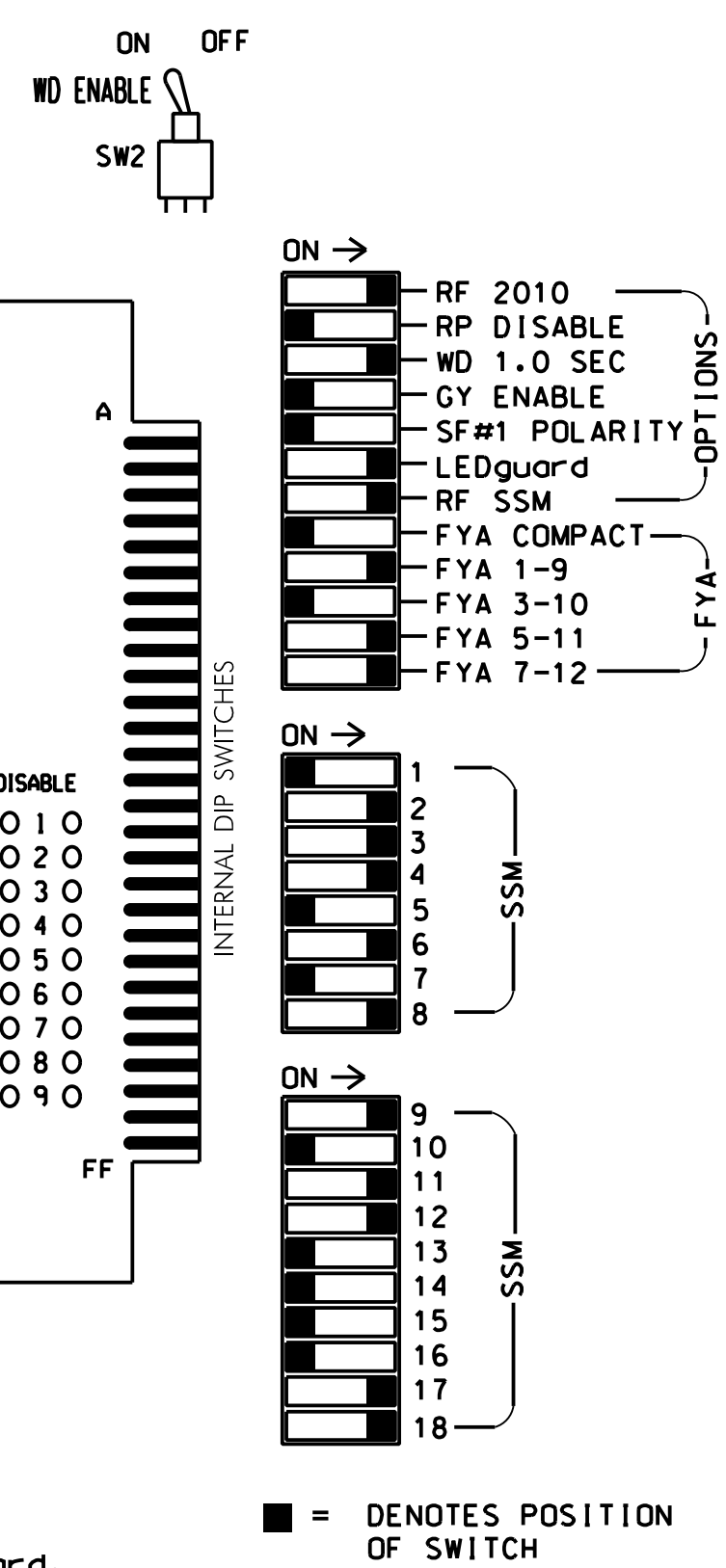
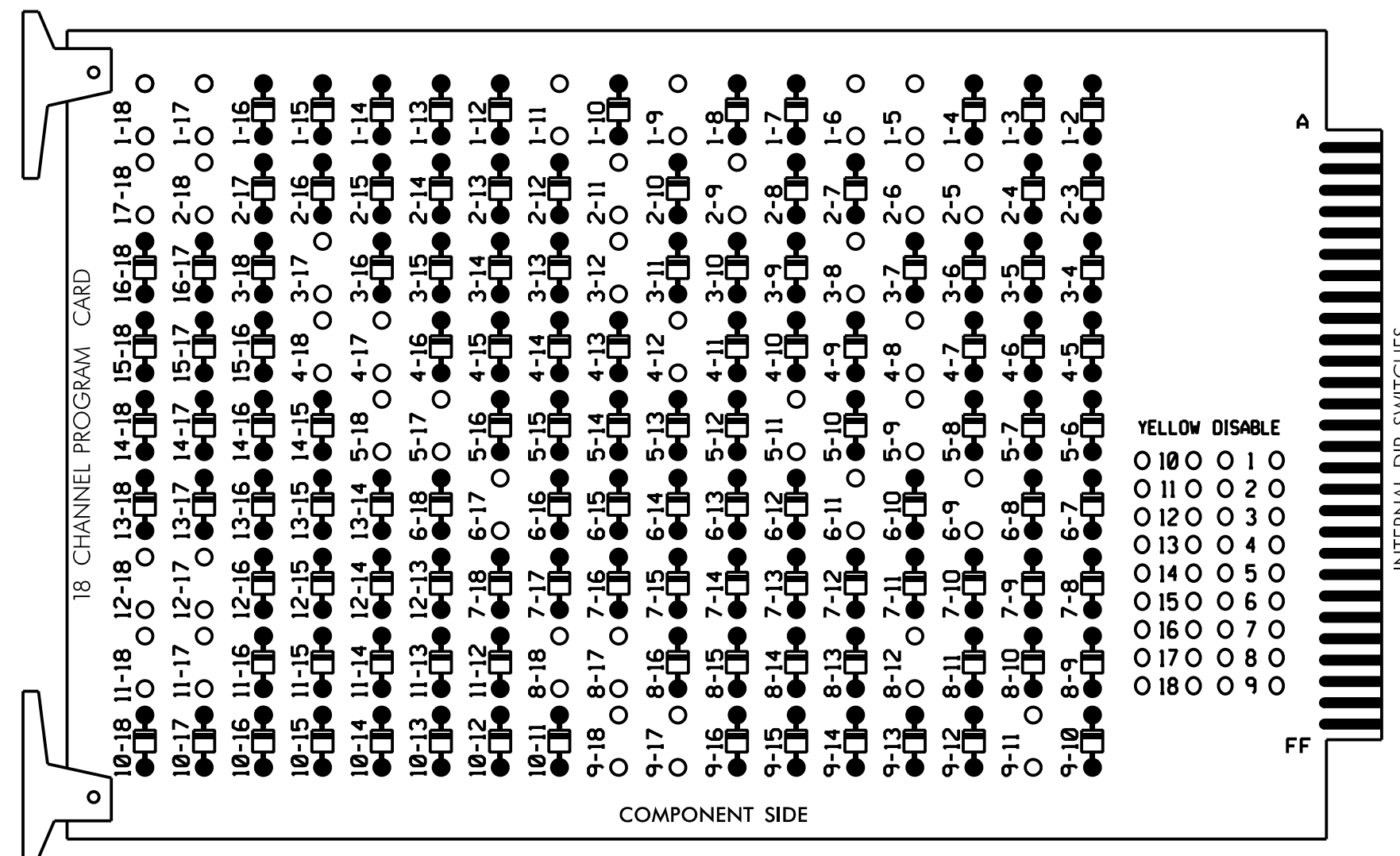
REVISIONS	INIT.	DATE
Added turn lane and updated heads for phase 3. Shifted Loop 5A stop bar.		

DocuSigned by:
 Natasha R. Simmons 11/4/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-0369T3

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-17, 1-18, 2-5, 2-6, 2-9, 2-11, 2-18, 3-8, 3-12, 3-17, 4-8, 4-12, 4-17, 4-18, 5-9, 5-11, 5-17, 5-18, 6-9, 6-11, 6-17, 8-12, 8-17, 8-18, 9-11, 9-17, 9-18, 11-17, 11-18, 12-17, 12-18, and 17-18.



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. Integrate monitor with Ethernet network in cabinet.

NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file.
2. Program phase 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 5 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

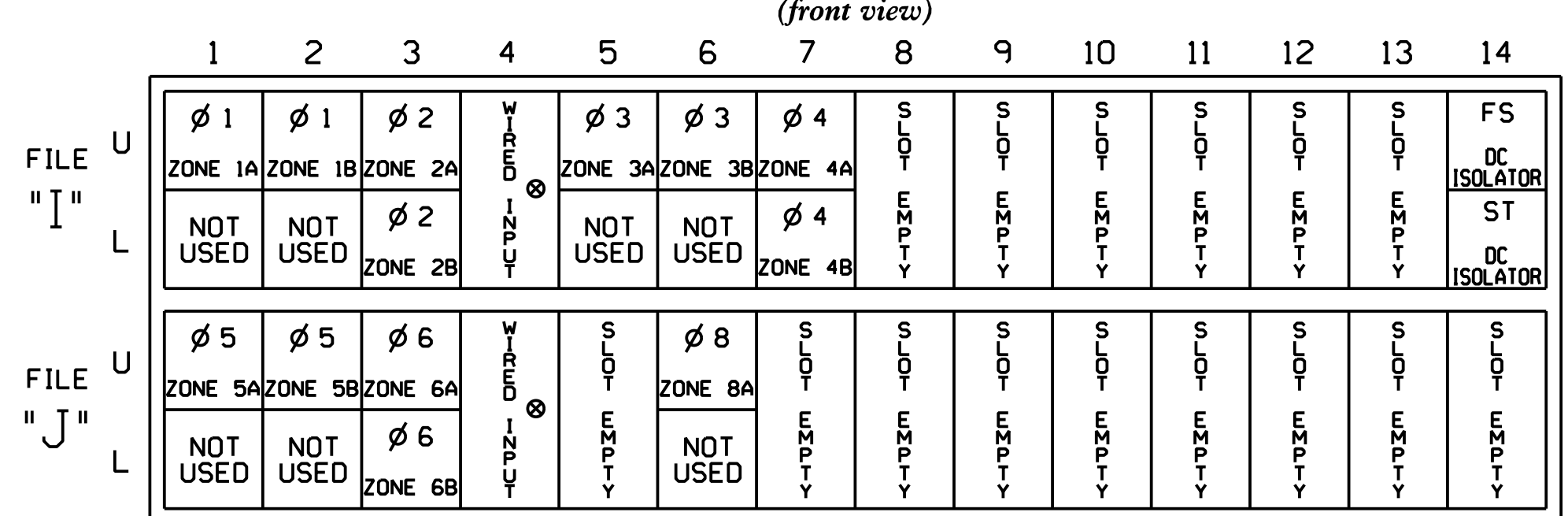
CONTROLLER.....2070E
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S11,AUX S1
AUX S3,AUX S4,AUX S5,AUX S6
PHASES USED.....1,2,3,4,5,6,8
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....8
OVERLAP "E".....1+8
OVERLAP "F".....4+5

SIGNAL HEAD HOOK-UP CHART

Table with columns for Load Switch No., CMU Channel No., Phase, Signal Head No., and various signal head types (RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, FLASHING YELLOW ARROW, GREEN ARROW).

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

INPUT FILE POSITION LAYOUT

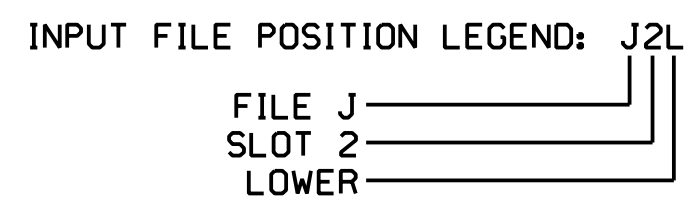


EX.: 1A, 2A, ETC. = LOOP NO.'S
FS = FLASH SENSE
ST = STOP TIME
Wired Input - Do not populate slot with detector card

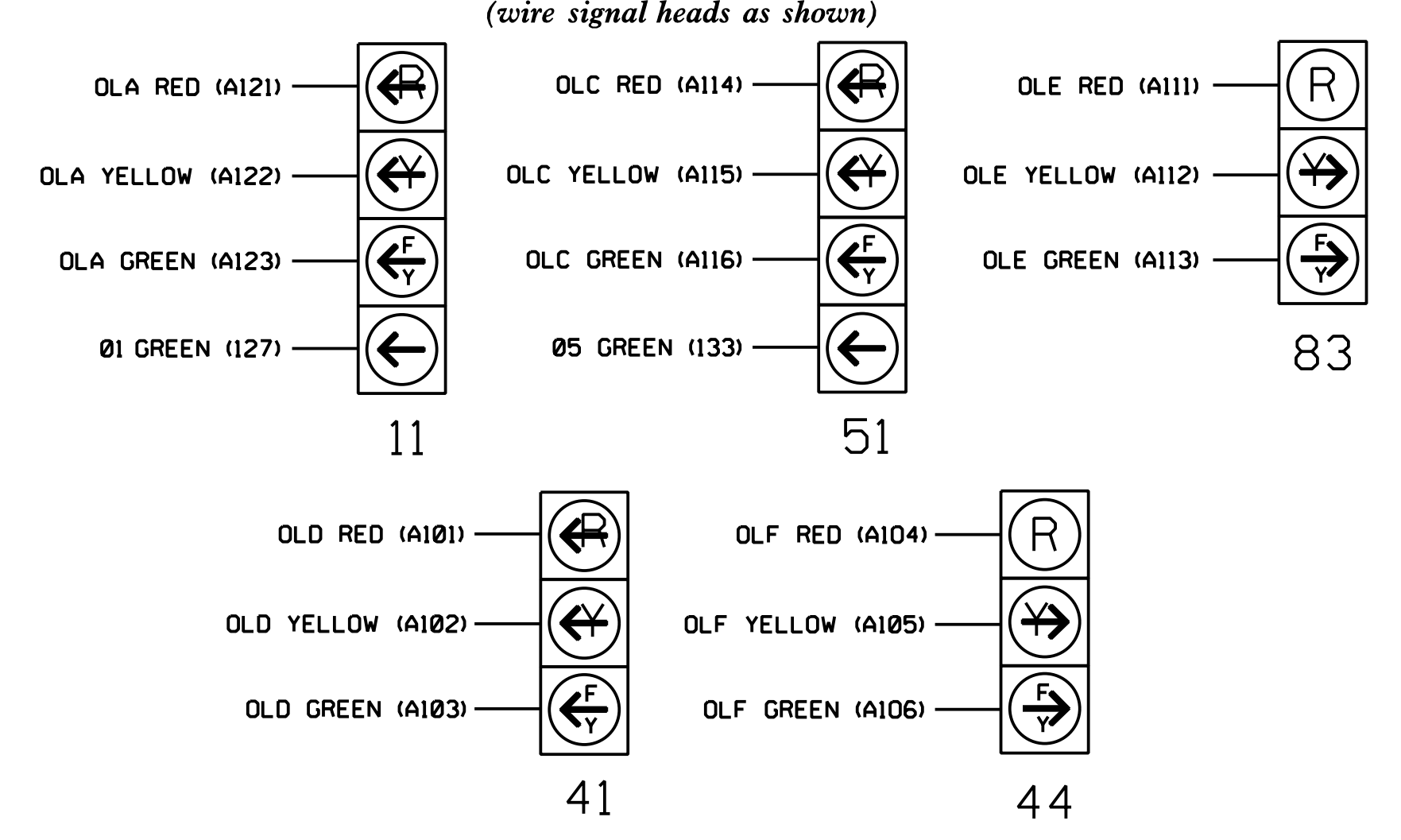
INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns: 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.

- 1Add jumper from I1-W to J4-W, on rear of input file.
2Add jumper from J1-W to I4-W, on rear of input file.
* See Input Page Assignment programming details on sheets 4 and 5.
** Multizone Microwave Detector Zone. See Special Detector Note.



FYA SIGNAL WIRING DETAIL



NOTE

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

SPECIAL DETECTOR NOTE

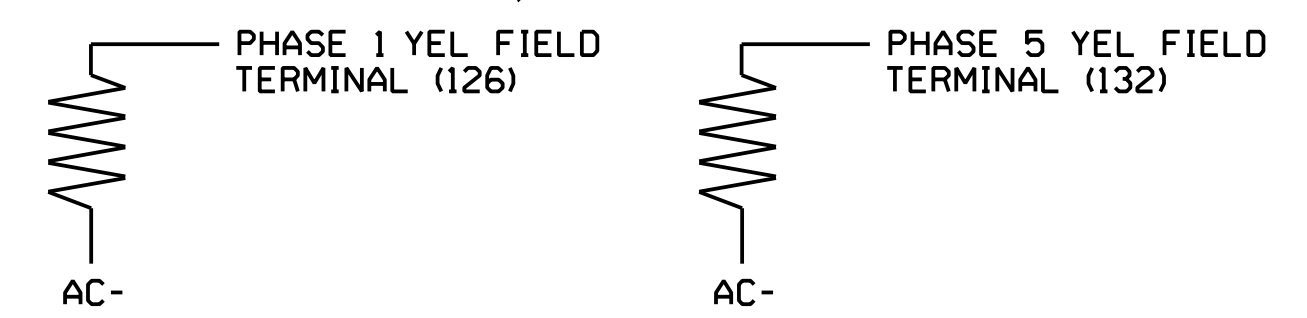
Install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

See vehicle detector setup programming detail for alternate phasing on sheets 4, 5, and 6.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES table with columns VALUE (ohms) and WATTAGE.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 1 of 8
Signal Upgrade
Temporary Design 3

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Professional seal area for HNTB North Carolina, P.C. with project details, signatures, and dates.

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, and 6.
- 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 2 (HEAD 11).

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 11).

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 11).

LOGICAL I/O COMMAND #4 (+/-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 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-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 51).

LOGICAL I/O COMMAND #6 (+/-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 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 42 =	Overlap C Red
OUTPUT 43 =	Overlap C Yellow
OUTPUT 44 =	Overlap C Green
OUTPUT 50 =	Overlap A Red
OUTPUT 51 =	Overlap A Yellow
OUTPUT 52 =	Overlap A Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

← 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 '+'

PAGE 1: VEHICLE OVERLAP 'E' 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 '+'

PAGE 1: VEHICLE OVERLAP 'F' 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?...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: 03-0369T3
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 2 of 8
Signal Upgrade
Temporary Design 3

DOCUMENT NOT CONSIDERED FINAL
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

1750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)		
Division 03	New Hanover Co. Wilmington	
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek	
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons	
REVISIONS	INIT.	DATE
Removed phase 3 4-section FYA. Added phase 3 protected dual left. Corrected loop 1A/5A delay to 10 sec.		

SEAL

DocuSigned by:
Natasha R. Simmons 11/4/2020
SIGNATURE DATE
SIG. INVENTORY NO. 03-0369T3

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

OVERLAP PROGRAMMING DETAIL ▾ FOR ALTERNATE PHASING *(program controller as shown below)*

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

NOTICE → PAGE 2 →

```

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

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
    
```

PRESS '+'

NOTICE → PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'E' SETTINGS
PHASE:      12345678910111213141516
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
    
```

PRESS '+'

NOTICE → PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'F' 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?...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

← NOTICE GREEN FLASH

← NOTICE GREEN FLASH

← NOTICE GREEN FLASH

FLASHER CIRCUIT MODIFICATION DETAIL

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

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369T3
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 3 of 8
Signal Upgrade
Temporary Design 3

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

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1564
(919) 546-8997

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031464 NATASHA R. SIMMONS
Prepared for: 	Division 03 New Hanover Co. Wilmington	DocuSigned by: 
PREPARED BY: A.H. Thornburg	PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek	REVISIONS INIT. DATE
REVIEWED BY: N.R. Simmons	REVISIONS: <ul style="list-style-type: none"> ✓ Removed phase 3 4-section FYA. Added ... phase 3 protected dual left. Corrected ... loop 1A/5A delay to 10 sec. 	11/4/2020 SIGNATURE DATE SIG. INVENTORY NO. 03-0369T3

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

(program controller as shown below)

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

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

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

```

PAGE: 2 C1 PIN:48 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....10
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).....26
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 SYNCHRONIZATION (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 1A - PHASE 6)

```

PAGE: 2 C1 PIN:48 NOT ENABLED
INPUT ASSIGNMENT #.....10
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 SYNCHRONIZATION (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 18

```

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....18
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).....1
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (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 '51' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 1A - PHASE 1)

```

PAGE: 2 C1 PIN:56 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....18
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).....51
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (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 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.

```

VEHICLE DETECTOR #51 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).....0.0
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 '1' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```

VEHICLE DETECTOR #51 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).....0.0
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
    
```

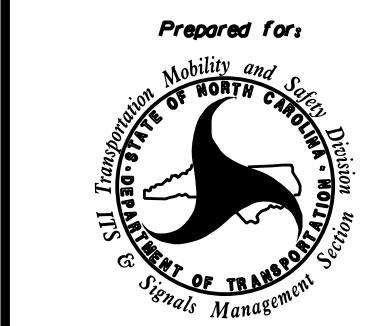
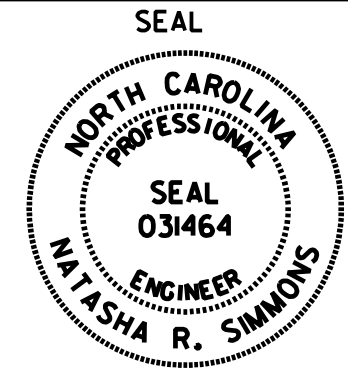
DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3
 DESIGNED: February 2018
 SEALED: 11/04/2020
 REVISED: N/A

Electrical Detail - Sheet 4 of 8
 Signal Upgrade
 Temporary Design 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	Prepared for: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)		
	Division 03 New Hanover Co. Wilmington	PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
REVISIONS		INIT.	DATE
Removed phase 3 4-section FYA. Added phase 3 protected dual left. Corrected loop 1A/5A delay to 10 sec.			
DocuSigned by: Natasha R. Simmons		11/4/2020	
750 N. Greenfield Pkwy, Corner, NC 27529		SIG. INVENTORY NO. 03-0369T3	

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 10 SECONDS TO 0 SECONDS.

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

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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 '0'

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).....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

DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 5 of 8
Signal Upgrade
Temporary Design 3

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Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington, NC. Includes HNTB logo, North Carolina Professional Engineer seal for Natasha R. Simmons, and a revision table.

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ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3
 DESIGNED: February 2018
 SEALED: 11/04/2020
 REVISED: N/A

Electrical Detail - Sheet 6 of 8
 Signal Upgrade
 Temporary Design 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)	SEAL 
Prepared for: 	Division 03 New Hanover Co. Wilmington	DocuSigned by: Natasha R. Simmons 11/4/2020
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek	SIGNATURE DATE
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons	DATE
REVISIONS		
<input checked="" type="checkbox"/> Removed phase 3 4-section FYA. Added...	INIT.	DATE
... phase 3 protected dual left. Corrected		
... loop 1A/5A delay to 10 sec.		
SIG. INVENTORY NO. 03-0369T3		

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL TO ASSIGN LOADSWITCH AUX S3 TO OVERLAP 'E' (FOR SIGNAL HEAD 83) (program controller as shown below)

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

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

PAGE:1 C1 PIN:91 NOT ENABLED 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.....

OVERLAP "E" RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 46

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.....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.....

PAGE:1 C1 PIN:93 NOT ENABLED 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.....

OVERLAP "E" GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 54

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.....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.....

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.....Y VEHICLE PHASE..... PEDESTRIAN PHASE..... VEHICLE OVERLAP.....Y 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.....

OVERLAP "E" YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

THE OUTPUT IS SET AS CONTROLLER FLASH BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

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.....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.....

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 7 of 8 Signal Upgrade Temporary Design 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 License No: C-1564 (919) 546-8997

Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington. Includes signature of Natasha R. Simmons, dated 11/4/2020, and a seal for the North Carolina Professional Engineer.

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL TO ASSIGN LOADSWITCH AUX S6 TO OVERLAP 'F' (FOR SIGNAL HEAD 44) (program controller as shown below)

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

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

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.....

OVERLAP "F" RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 38

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.....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.....

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.....

OVERLAP "F" GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 53

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.....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.....

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.....

OVERLAP "F" YELLOW

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

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.....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.....

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369T3 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 8 of 8 Signal Upgrade Temporary Design 3

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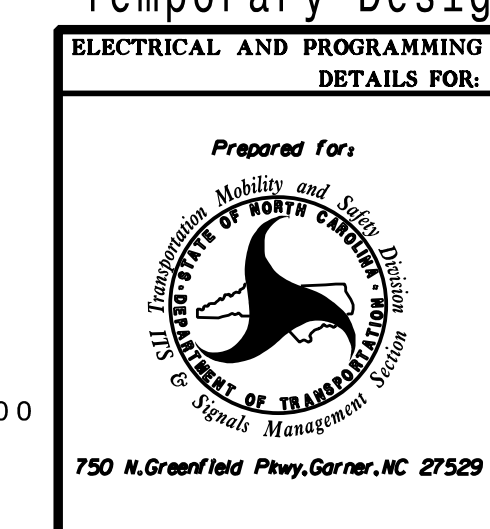
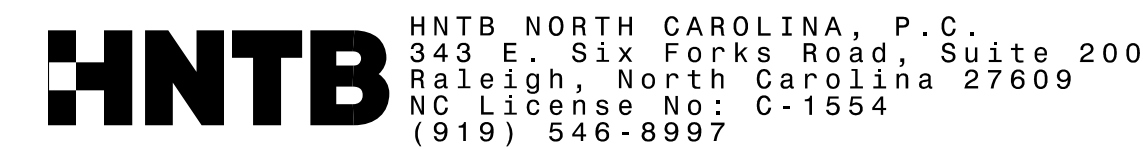
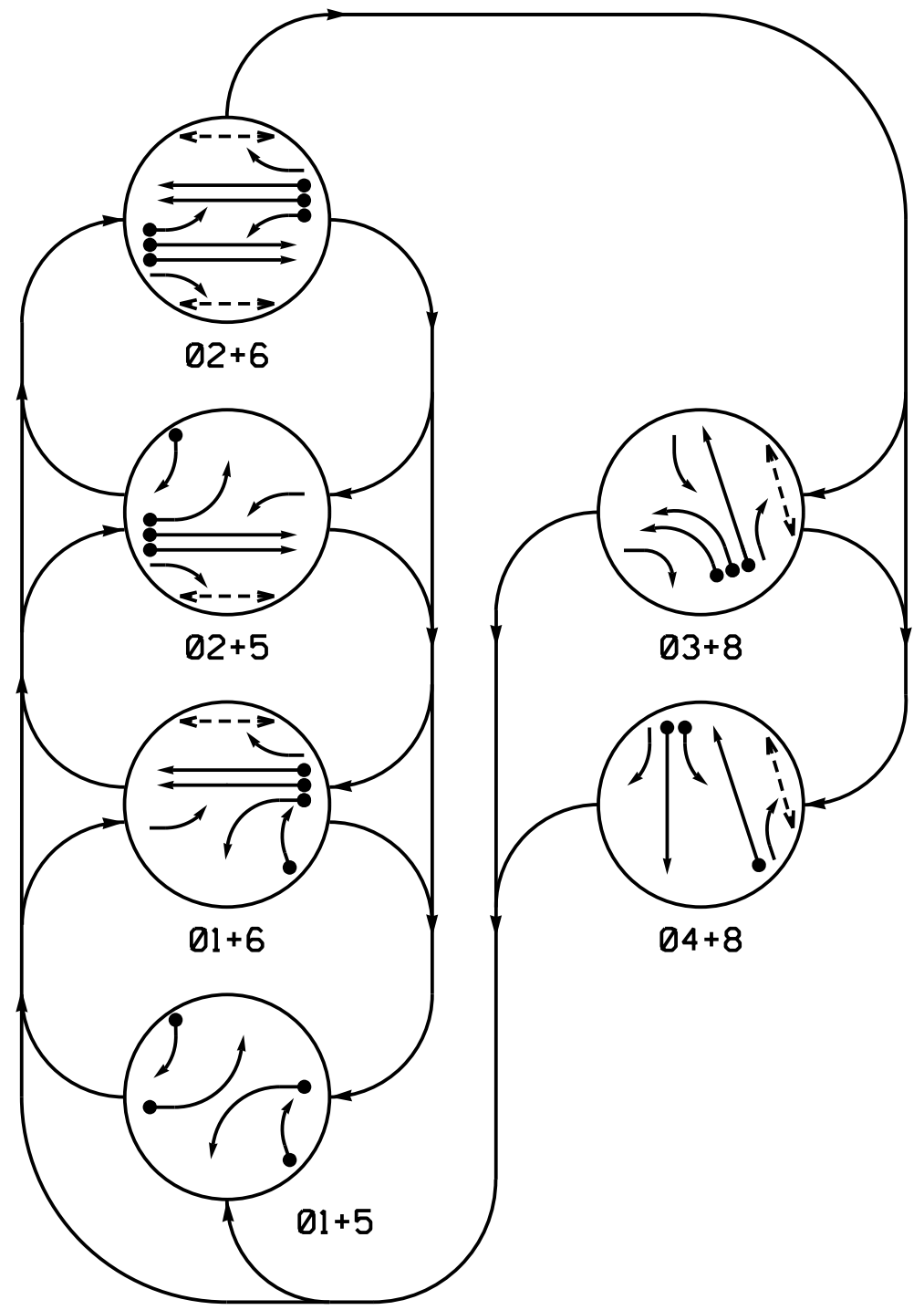


Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington, PLAN DATE: February 2018, REVIEWED BY: A.D. Klinksiek, PREPARED BY: A.H. Thornburg, REVIEWED BY: N.R. Simmons

Table with revision history: REVISIONS, INITI, DATE. Includes entry: Removed phase 3 4-section FYA. Added phase 3 protected dual left. Corrected loop 1A/5A delay to 10 sec.

DocuSigned by: Natasha R. Simmons 11/4/2020 SIGNATURE DATE

DEFAULT PHASING DIAGRAM



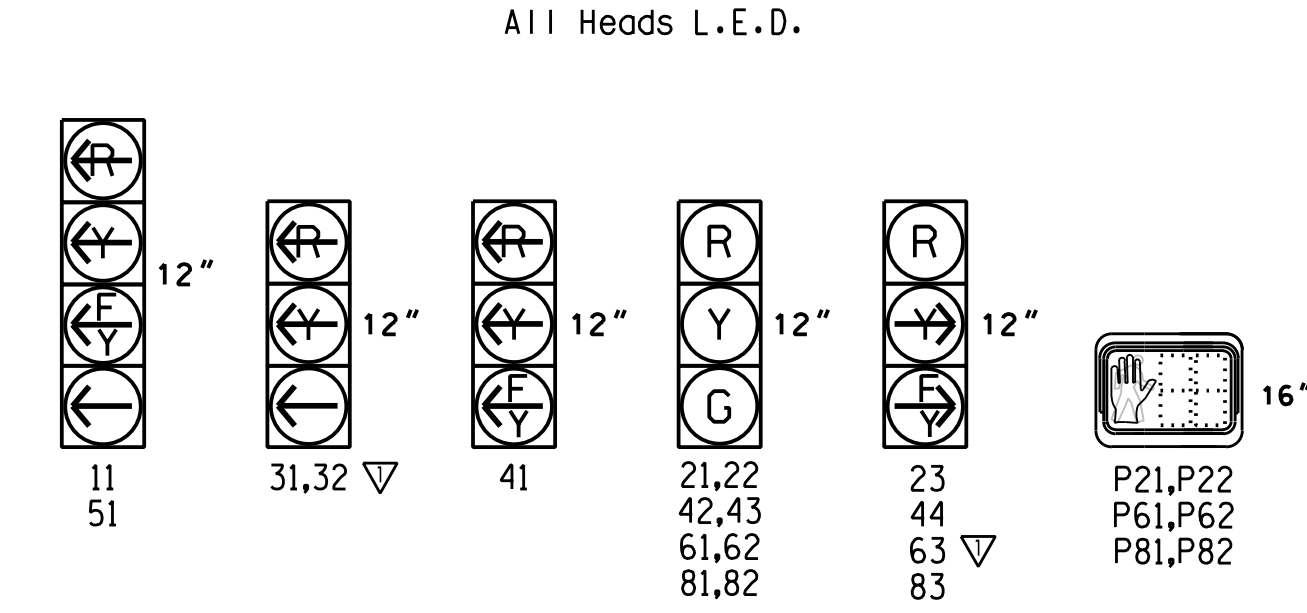
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ⋯ UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+8	04+8	FLASH	H
11								
21,22	R	R	G	G	R	R	Y	
23	R	R	F	F	F	R	Y	
31,32	R	R	R	R	R	R		
41	R	R	R	R	R	G	R	
42,43	R	R	R	R	R	G	R	
44	F	R	F	R	R	F	R	
51								
61,62	R	G	R	G	R	R	Y	
63	R	F	R	F	R	R	Y	
81,82	R	R	R	R	G	G	R	
83	F	F	R	R	F	F	R	
P21,P22	DW	DW	W	W	DW	DW	DRK	
P61,P62	DW	W	DW	W	DW	DW	DRK	
P81,P82	DW	DW	DW	DW	W	W	DRK	

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

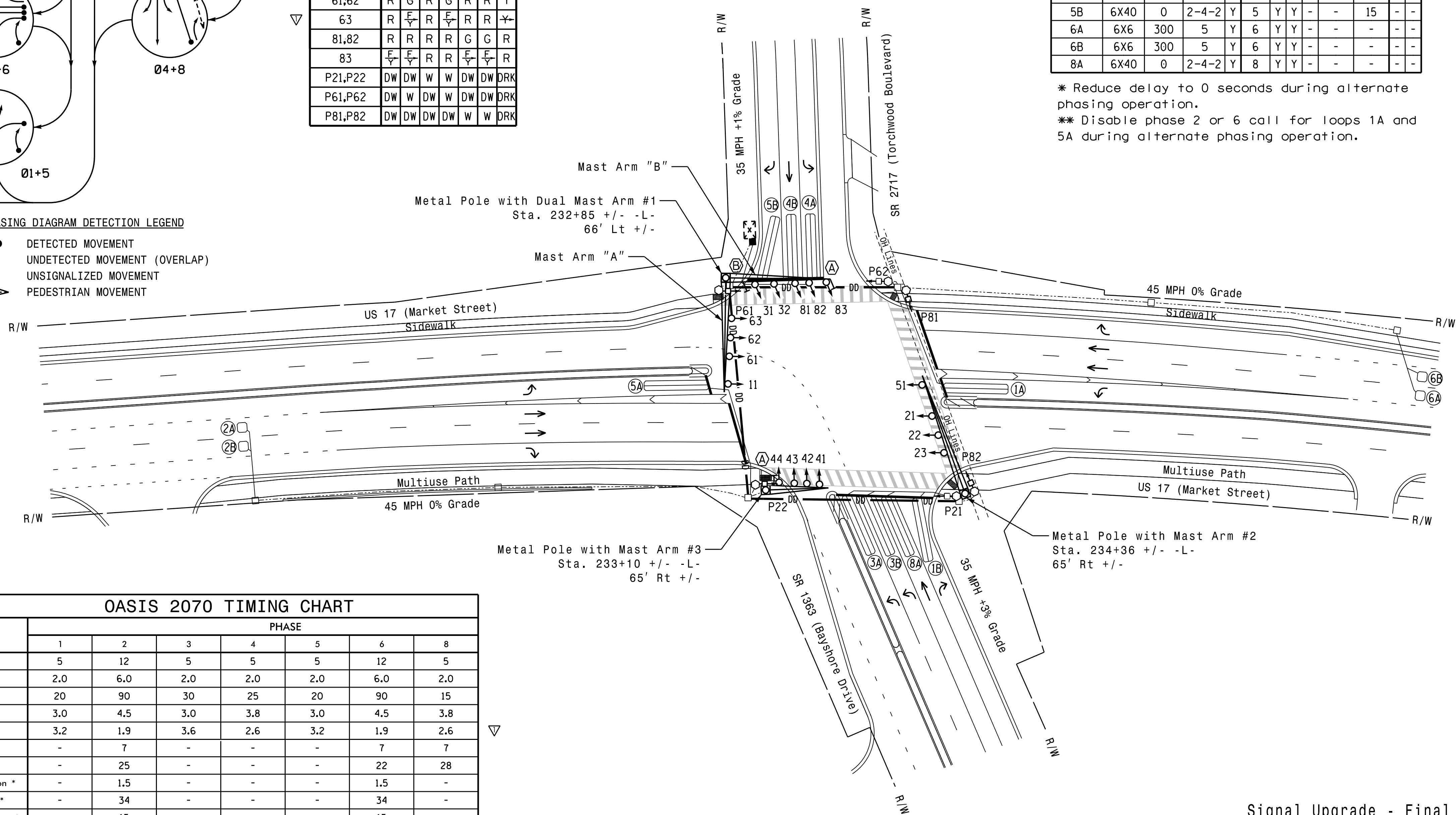
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	STRETCH TIME		
1A	6X40	0	2-4-2	Y	1	Y	Y	-	*10	-
1B	6X40	0	2-4-2	Y	**6	Y	Y	-	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-
2B	6X6	300	5	Y	2	Y	Y	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-
3B	6X40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

* Reduce delay to 0 seconds during alternate phasing operation.
 ** Disable phase 2 or 6 call for loops 1A and 5A during alternate phasing operation.

6 Phase Fully Actuated Wilmington Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Phase 3 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
- All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data: Controller Asset #0369



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	8	
Min Green 1*	5	12	5	5	5	12	5	
Extension 1*	2.0	6.0	2.0	2.0	2.0	6.0	2.0	
Max Green 1*	20	90	30	25	20	90	15	
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.8	
Red Clearance	3.2	1.9	3.6	2.6	3.2	1.9	2.6	
Walk 1*	-	7	-	-	-	7	7	
Don't Walk 1	-	25	-	-	-	22	28	
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	
Simultaneous Gap	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.

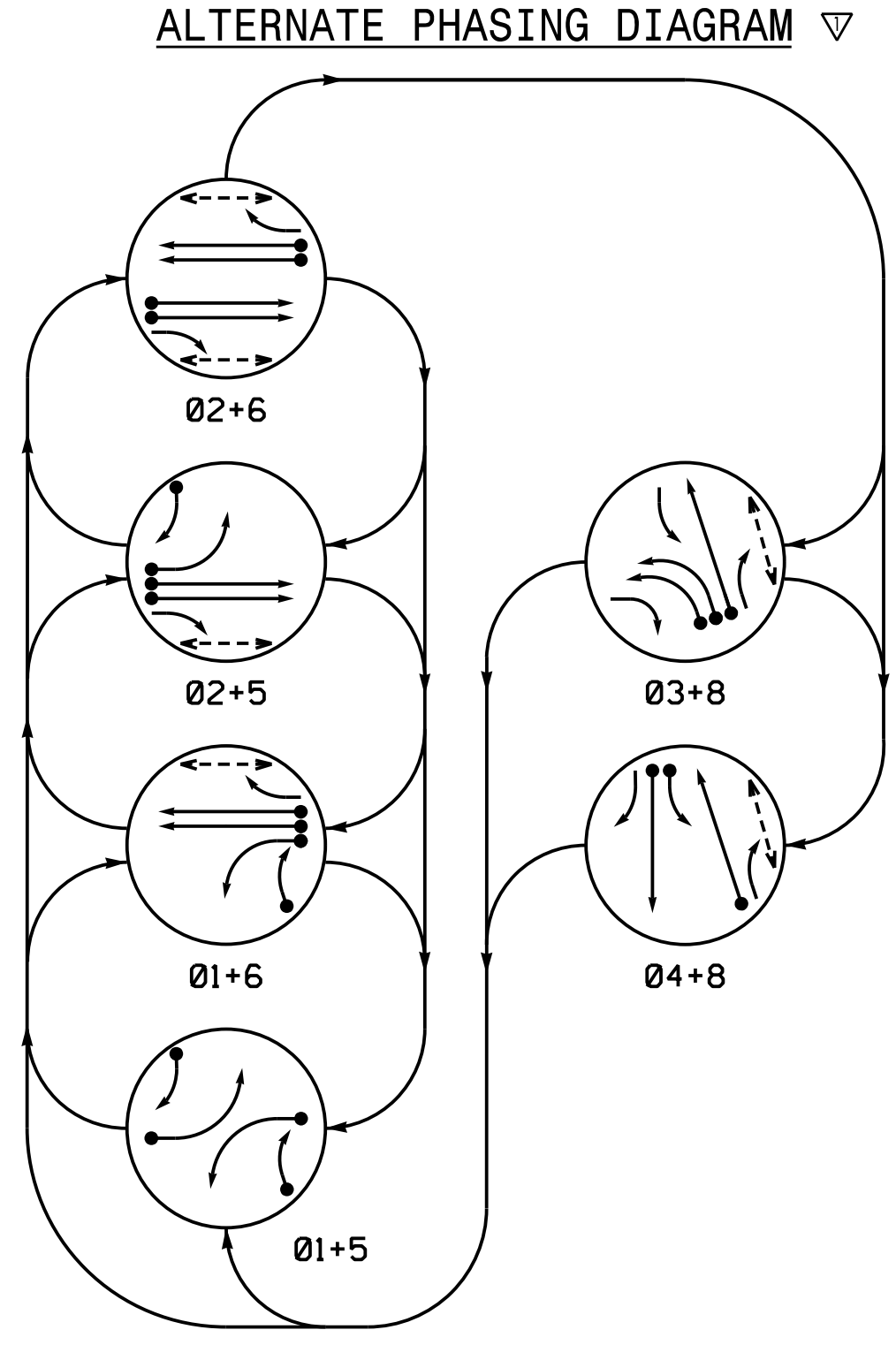
LEGEND

	Proposed Traffic Signal Head		Existing Traffic Signal Head
	Proposed Pedestrian Signal Head With Push Button & Sign		Existing Pedestrian Signal Head With Push Button & Sign
	Proposed Inductive Loop Detector Controller & Cabinet Junction Box		Existing Inductive Loop Detector Controller & Cabinet Junction Box
	Proposed 2-in Underground Conduit		Existing 2-in Underground Conduit
	Proposed Right of Way		Existing Right of Way
	Proposed Directional Arrow		Existing Directional Arrow
	Proposed Directional Drill		Existing Directional Drill
	Proposed Type II Signal Pedestal		Existing Type II Signal Pedestal
	Proposed Wheelchair Ramp		Existing Wheelchair Ramp
	Proposed "RIGHT TURN MUST YIELD TO U-TURN" Sign		Existing "RIGHT TURN MUST YIELD TO U-TURN" Sign
	Proposed "NO U-TURN" Sign (R3-4)		Existing "NO U-TURN" Sign (R3-4)

Signal Upgrade - Final Design
 Sheet 1 of 2

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 HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	Prepared for: TRANSPORTATION MOBILITY AND SAFETY DIVISION DEPARTMENT OF TRANSPORTATION Signal Design Section	SEAL NATASHA R. SIMMONS ENGINEER 031464
	US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	REVISIONS 1. Added turn lane and changed heads for phase 3. Shifted Loop 5A stop bar. 2. Added head 63.

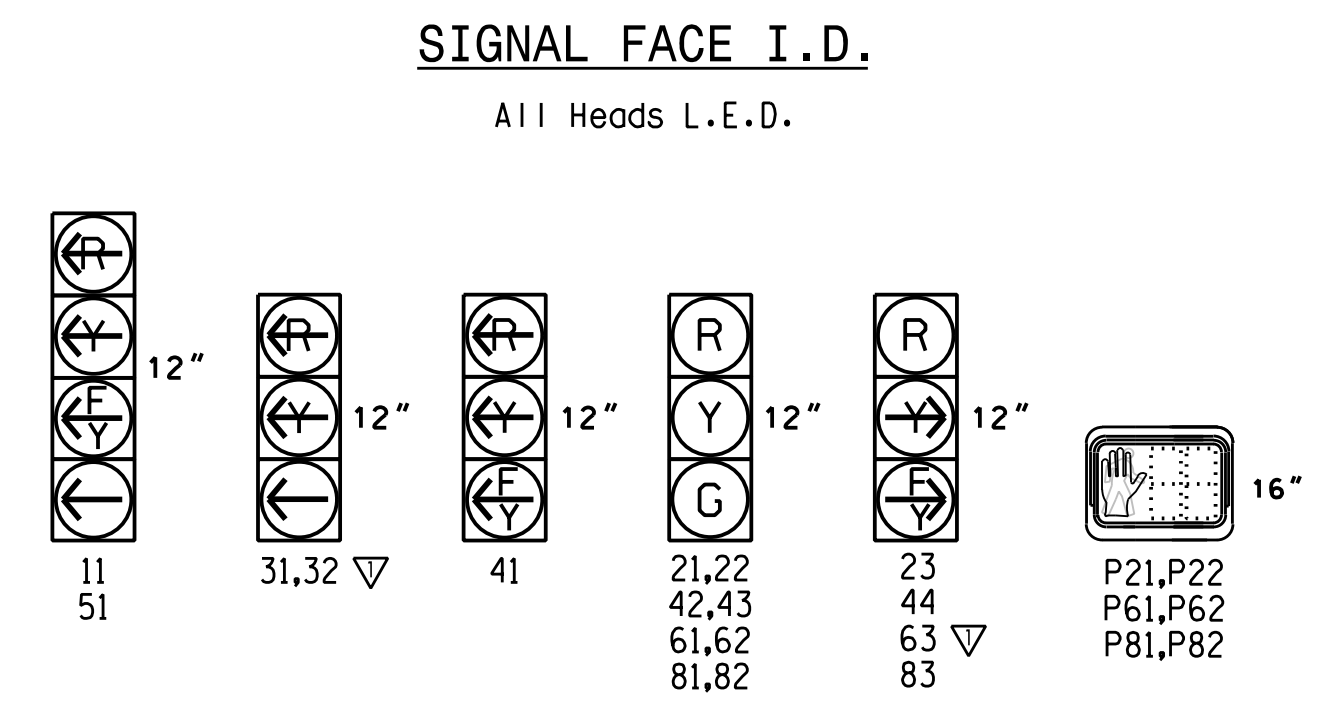


PHASING DIAGRAM DETECTION LEGEND

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

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03+8	04+8
11	←	←	←	←	←	←
21,22	R	R	G	G	R	R
23	R	R	F	F	F	R
31,32	←	←	←	←	←	←
41	←	←	←	←	←	←
42,43	R	R	R	R	R	G
44	F	R	F	R	F	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	R
63	R	F	R	F	R	R
81,82	R	R	R	R	G	G
83	F	F	R	F	F	R
P21,P22	DW	DW	W	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	W	W	DRK



Signal Upgrade - Final Design
Sheet 2 of 2

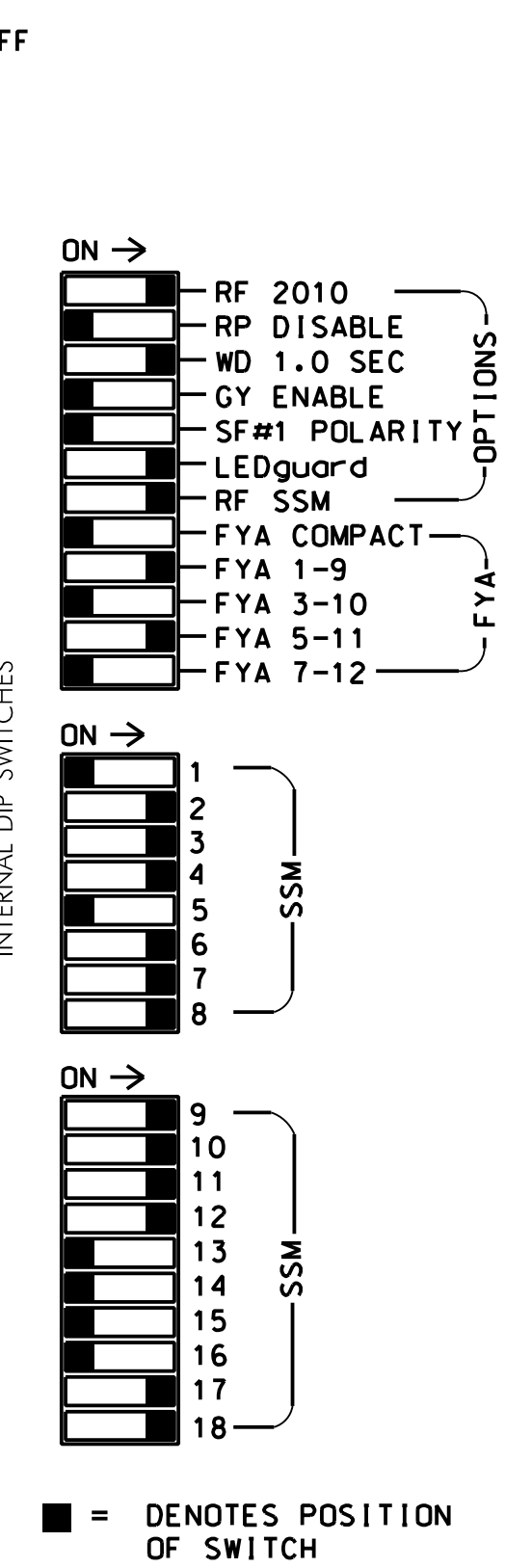
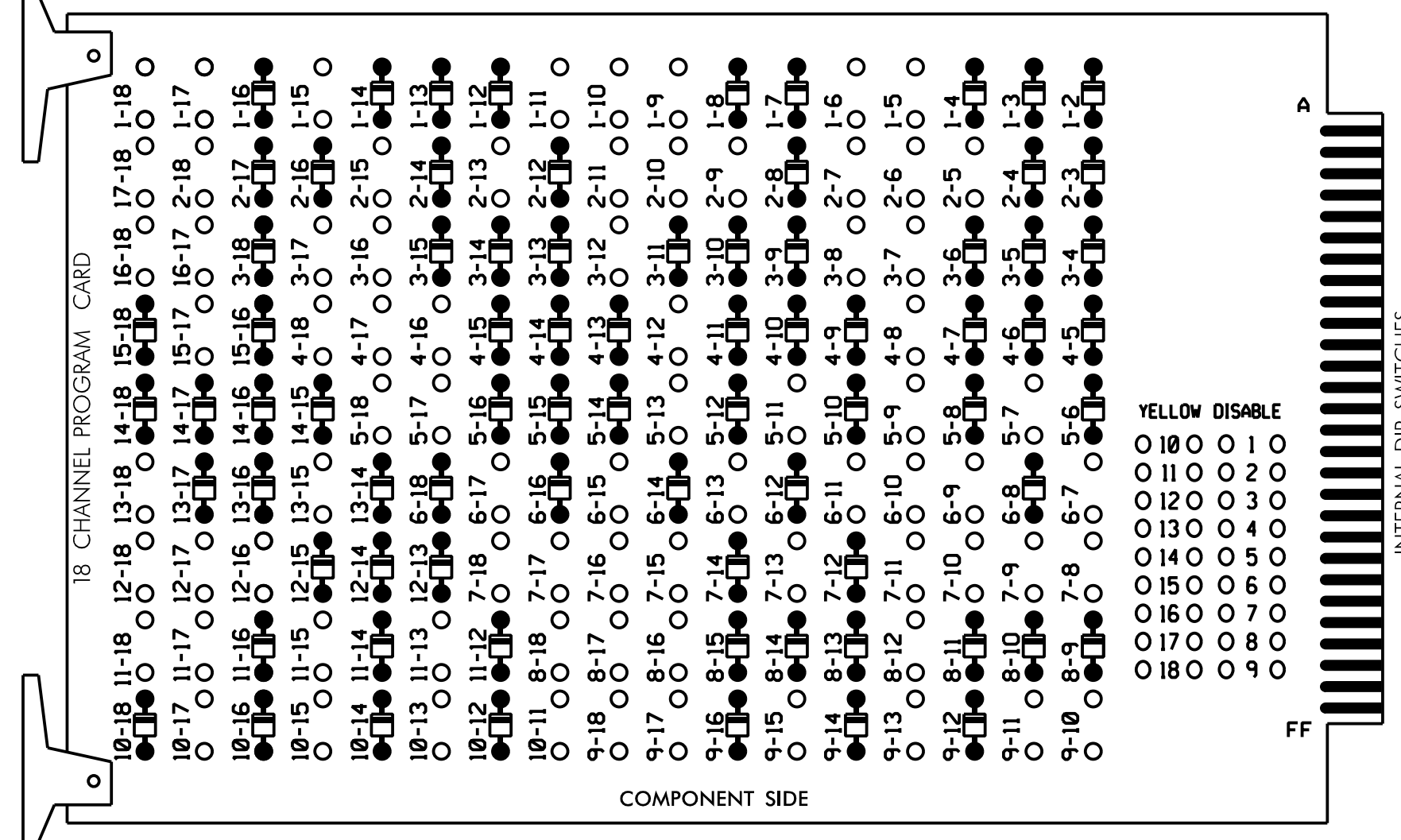
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Raleigh, North Carolina 27609
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(919) 546-8997

	Prepared for: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)		SEAL
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons		
750 N. Greenfield Pkwy, Garner, NC 27529 SCALE 0 40 1"=40'	REVISIONS ✓ Added turn lane and changed heads for phase 3. Shifted Loop 5A stop bar. Added head 63.		DocuSigned by: Natasha R. Simmons 11/4/2020 SIGNATURE DATE SIG. INVENTORY NO. 03-0369

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-10, 1-11, 1-15, 1-17, 1-18, 2-5, 2-6, 2-7, 2-9, 2-10, 2-11, 2-13, 2-15, 2-18, 3-7, 3-8, 3-12, 3-16, 3-17, 4-8, 4-12, 4-16, 4-17, 4-18, 5-7, 5-9, 5-11, 5-13, 5-17, 5-18, 6-7, 6-9, 6-10, 6-11, 6-13, 6-15, 6-17, 7-8, 7-9, 7-10, 7-11, 7-13, 7-15, 7-16, 7-17, 7-18, 8-12, 8-16, 8-17, 8-18, 9-10, 9-11, 9-13, 9-15, 9-17, 9-18, 10-11, 10-13, 10-15, 10-17, 11-13, 11-15, 11-17, 11-18, 12-16, 12-17, 12-18, 13-15, 13-18, 15-17, 16-17, 16-18, and 17-18.



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. Integrate monitor with Ethernet network in cabinet.

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 phase 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 5 as Wag Overlaps. 8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E 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,S7,S8,S9,S10,S11,S12,AUX S1,AUX S2,AUX S3,AUX S4,AUX S5,AUX S6

PHASES USED.....1,2,2 PED,3,4,5,6,6 PED,8,8 PED OVERLAP "A".....1+2 OVERLAP "B".....6 OVERLAP "C".....5+6 OVERLAP "D".....8 OVERLAP "E".....1+8 OVERLAP "F".....4+5 OVERLAP "G".....2+3

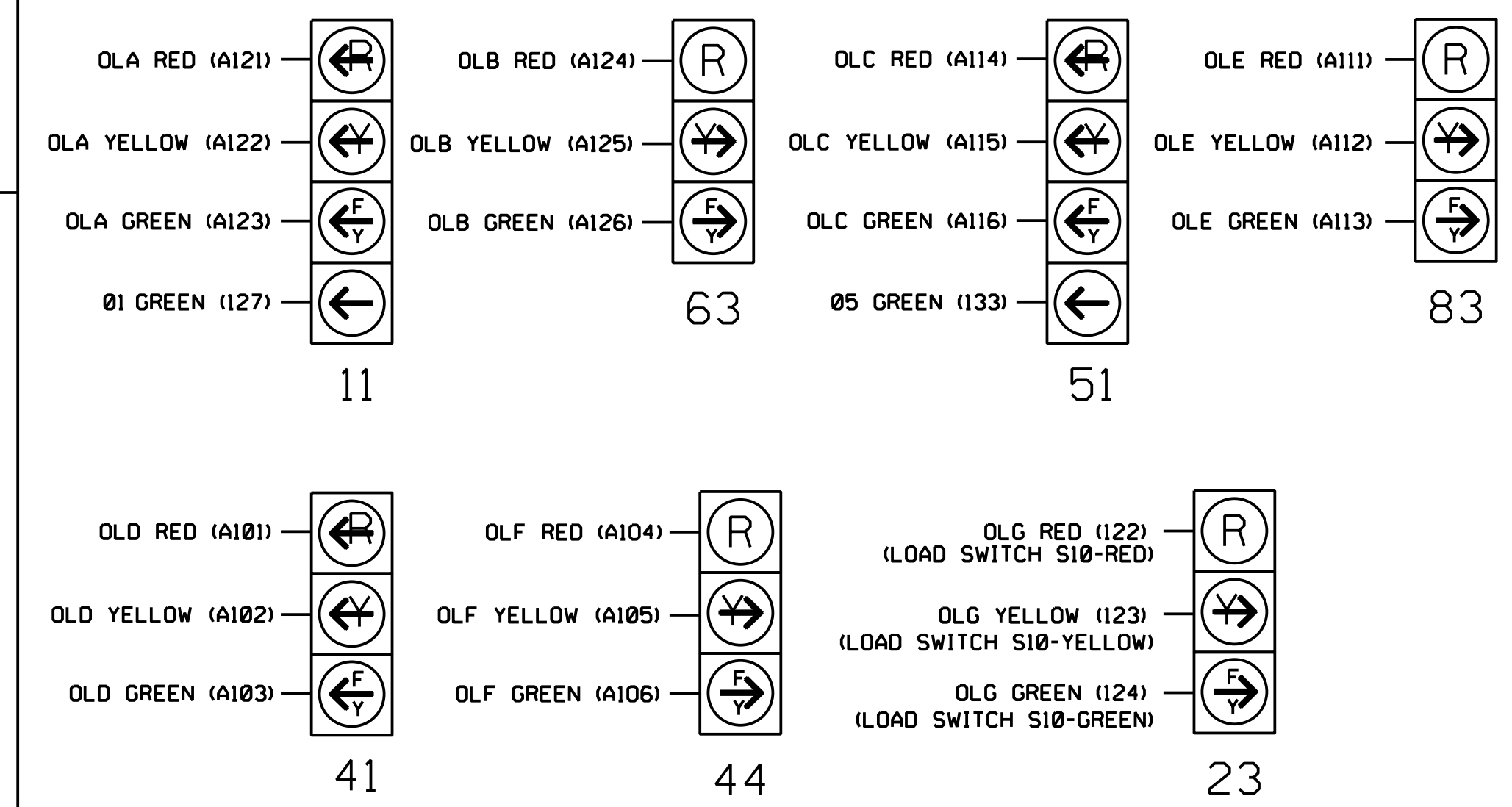
SIGNAL HEAD HOOK-UP CHART

Table with columns for LOAD SWITCH NO., CMU CHANNEL NO., PHASE, SIGNAL HEAD NO., RED, YELLOW, GREEN, RED ARROW, YELLOW ARROW, FLASHING YELLOW ARROW, GREEN ARROW, and pedestrian symbols. Rows correspond to signal heads 11, 21, 22, 31, 32, 42, 43, 51, 61, 62, 71, 81, 82, 83, 84, 85, 86, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150.

NU = Not Used * Denotes install load resistor. See load resistor installation detail this sheet. ★ See pictorial of head wiring in detail this sheet. NOTE: Load switches S10,AUX S3,and AUX S6 require output remapping. See Sheets 7,8,and 9 of this electrical detail for instructions.

FYA SIGNAL WIRING DETAIL

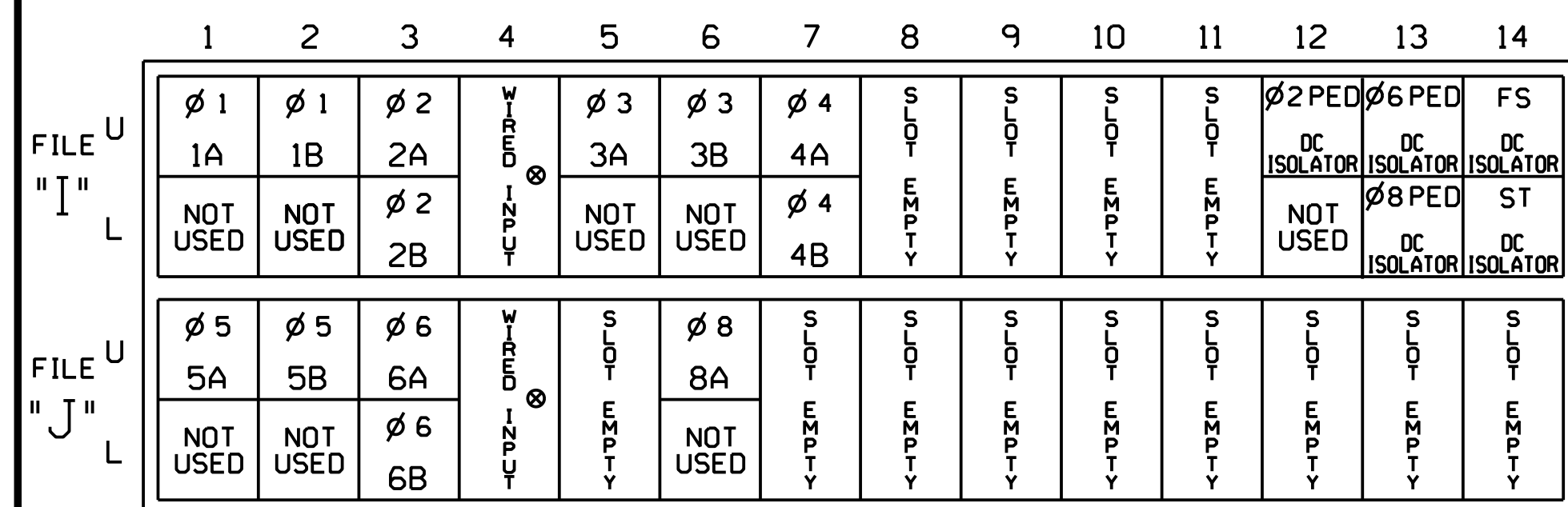
(wire signal heads as shown)



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

INPUT FILE POSITION LAYOUT

(front view)



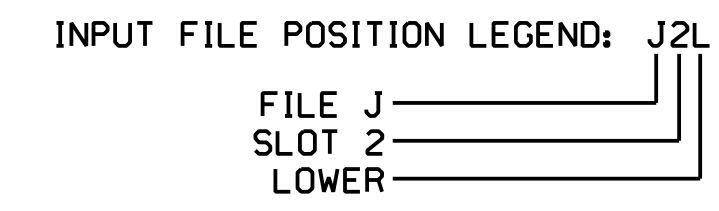
EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

Table with columns: 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. Includes rows for 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B, 8A, PED PUSH BUTTONS, P21,P22, P61,P62, P81,P82.

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

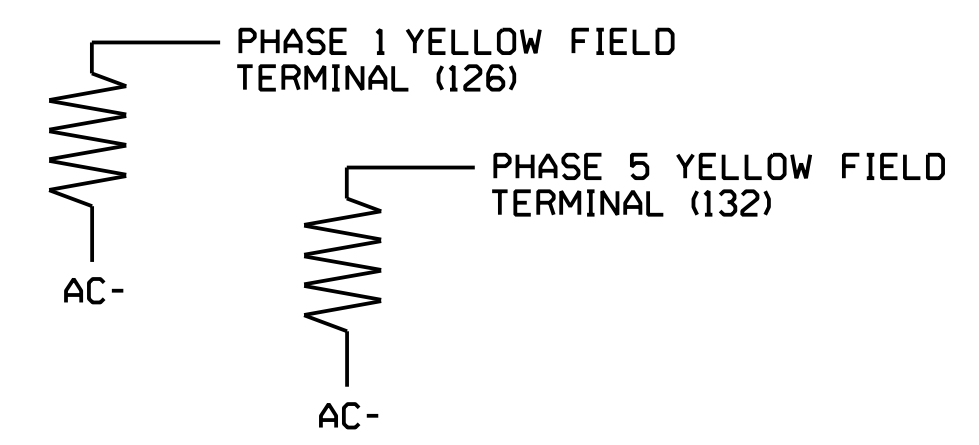
- 1 Add jumper from I1-W to J4-W. on rear of input file. 2 Add jumper from J1-W to I4-W. on rear of input file. * See Input Page Assignment programming details on sheets 4 and 5.



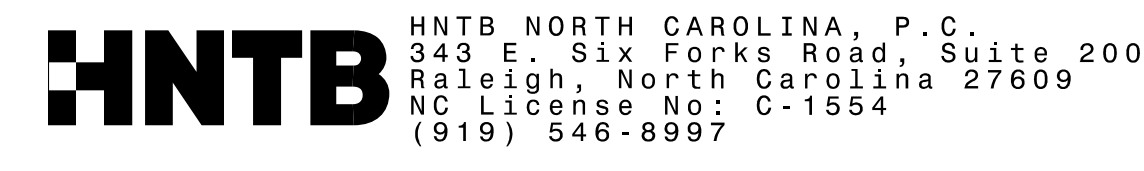
LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

Table with columns: VALUE (ohms), WATTAGE. Rows: 1.5K - 1.9K, 25W (min); 2.0K - 3.0K, 10W (min).



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A



Electrical Detail - Sheet 1 of 9 Signal Upgrade Final Design DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, and 6.
- 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 2 (HEAD 11).

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 11).

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 11).

LOGICAL I/O COMMAND #4 (+/-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 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-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 51).

LOGICAL I/O COMMAND #6 (+/-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 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 42	= Overlap C Red
OUTPUT 43	= Overlap C Yellow
OUTPUT 44	= Overlap C Green
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A Green

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.

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OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

PRESS '+'

NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'B' 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

PRESS '+'

NOTICE GREEN FLASH

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

PRESS '+'

NOTICE GREEN FLASH

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

PRESS '+'

NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
PHASE: :12345678910111213141516
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

PRESS '+'

NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'F' 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?...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 '+'

NOTICE GREEN FLASH

PAGE 1: VEHICLE OVERLAP 'G' 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

PRESS '+'


NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 2 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at
SR 1363 (Bayshore Drive)/
SR 2717 (Torchwood Boulevard)

Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS	INIT.	DATE
Removed phase 3 - 4-section LT FYA. Added phase 3 protected dual left and phase 6 3-section RT FYA. Corrected loop 1A/5A delay to 10 sec.		

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NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
031464
NATASHA R. SIMMONS

DocuSigned by:
Natasha R. Simmons 11/4/2020
SIGNATURE DATE
SIG. INVENTORY NO. 03-0369

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING (program controller as shown below)

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

NOTICE PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS:  - RED - YELLOW - GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
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 'E' SETTINGS
PHASE:      12345678910111213141516
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
  
```

PRESS '+'

NOTICE GREEN FLASH

NOTICE PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'B' 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
  
```

PRESS '+'

NOTICE GREEN FLASH

NOTICE PAGE 2 →

```

PAGE 2: VEHICLE OVERLAP 'F' 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?...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 '+'

NOTICE GREEN FLASH

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 'G' 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
  
```

PRESS '+'

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

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
  
```

PRESS '+'

NOTICE GREEN FLASH

FLASHER CIRCUIT MODIFICATION DETAIL

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

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 3 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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	Prepared for: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)		
	Division 03 New Hanover Co. Wilmington		
PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek		PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
REVISIONS 1-Removed phase 3, 4-section LT FYA. Added phase 3 protected dual left and phase 6 3-section RT FYA. Corrected loop 1A/5A delay to 10 sec.		INIT.	DATE
750 N. Greenfield Pkwy, Corner, NC 27529		DocuSigned by: Natasha R. Simmons 11/4/2020 SIGNATURE DATE SIG. INVENTORY NO. 03-0369	

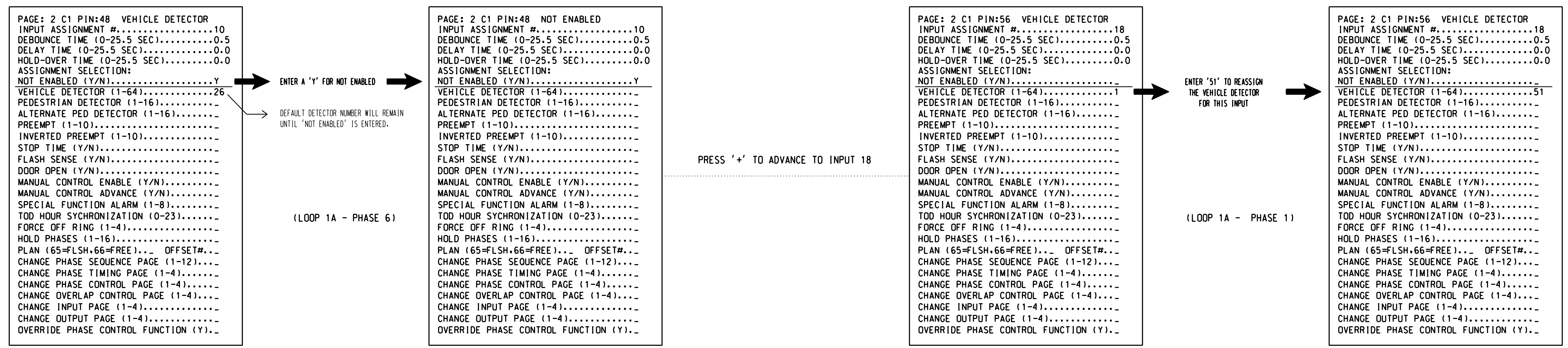
INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

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

2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 10 SECONDS TO 0 SECONDS.

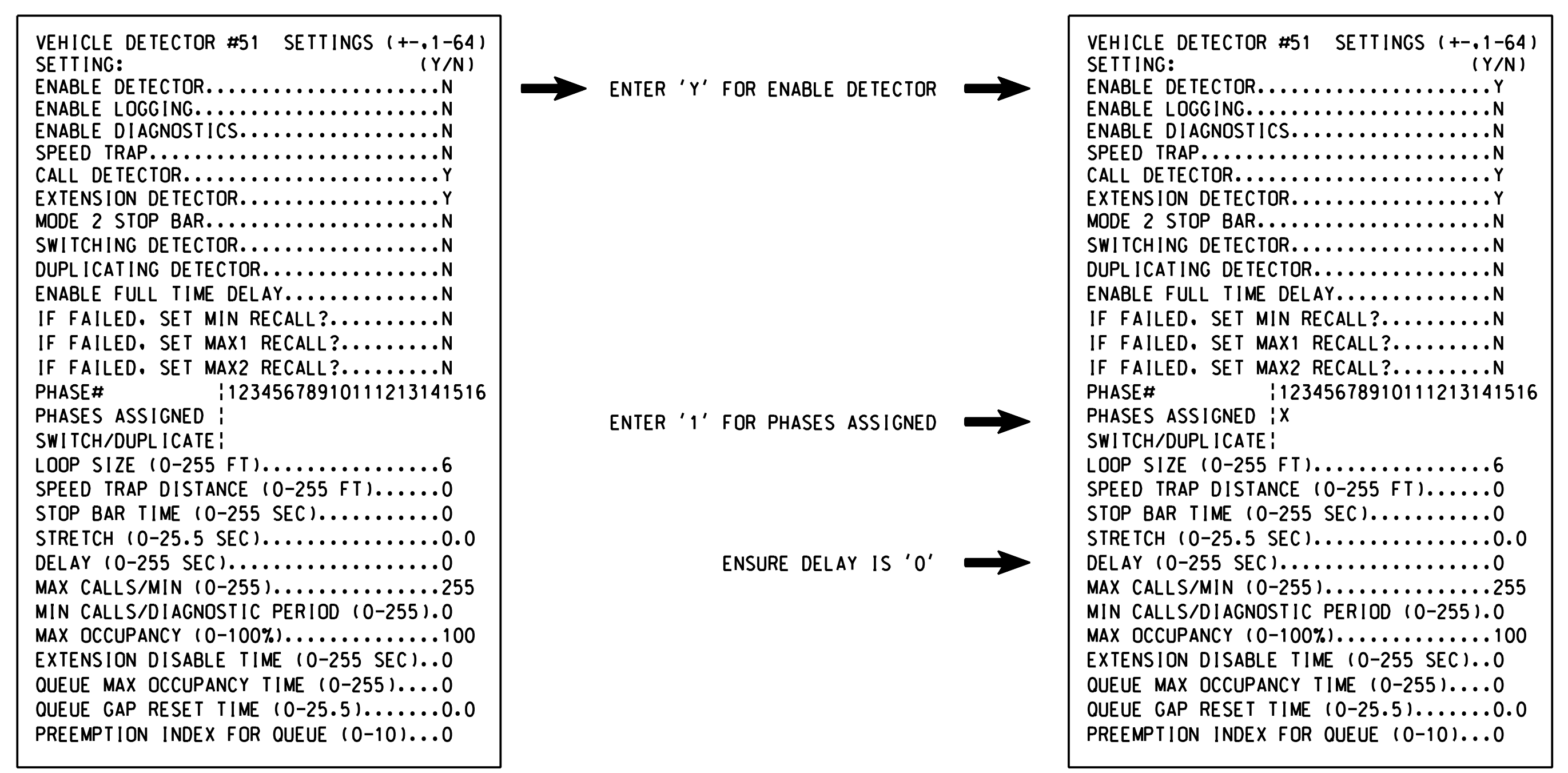
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 4 of 9 Signal Upgrade Final Design. DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED. US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard). Division 03 New Hanover Co. Wilmington. PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons. HNTB logo and project details.

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 10 SECONDS TO 0 SECONDS.

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

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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 SYNCHRONIZATION (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 '0'

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).....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

DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 5 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1564 (919) 546-8997

Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard), Division 03 New Hanover Co., Wilmington. Includes signature lines for A.H. Thornburg, N.R. Simmons, and N. R. Simmons, along with a professional seal for N. R. Simmons, Engineer No. 031464.

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.


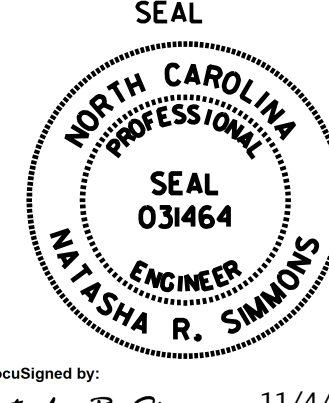
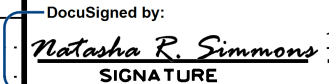
Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369
 DESIGNED: February 2018
 SEALED: 11/04/2020
 REVISED: N/A

Electrical Detail - Sheet 6 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

 Prepared for: Department of Transportation Division of Signal Management	US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)	 SEAL 031464 NATASHA R. SIMMONS
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
DocuSigned by: 		DATE: 11/4/2020 SIGNATURE: _____ DATE: _____ SIG. INVENTORY NO. 03-0369

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL
TO ASSIGN LOADSWITCH AUX S3 TO OVERLAP 'E'
(FOR SIGNAL HEAD 83)
(program controller as shown below)

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

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

```
PAGE:1 C1 PIN:91 NOT ENABLED
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.....
```

OVERLAP "E" RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING DATA,
THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 46

```
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.....Y
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.....
```

```
PAGE:1 C1 PIN:93 NOT ENABLED
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.....
```

OVERLAP "E" GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING DATA,
THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 54

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.....
```

```
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.....Y
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.....
```

OVERLAP "E" YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING DATA,
THEN 'ESC'.

THE OUTPUT IS SET AS CONTROLLER FLASH BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

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

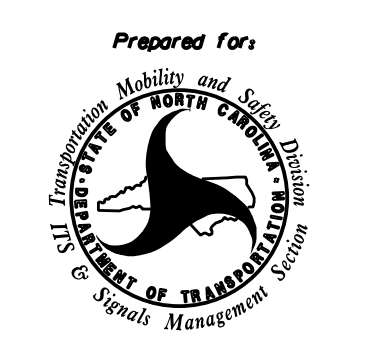

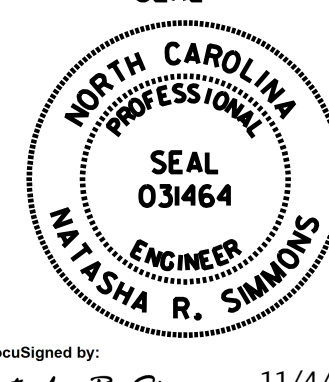

```
PAGE:1 C1 PIN:101 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
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.....
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 7 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
N.C. License No: C-1564
(919) 546-8997

	Prepared for: 		SEAL 	
	US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard)		Division 03 New Hanover Co. Wilmington	
PLAN DATE: February 2018		REVIEWED BY: A.D. Klinksiek		DocuSigned by: 
PREPARED BY: A.H. Thornburg		REVIEWED BY: N.R. Simmons		
REVISIONS		INIT.	DATE	
Removed phase 3, 4-section LT FYA. Added phase 3 protected dual left and phase 6 3-section RT FYA. Corrected loop 1A/5A delay to 10 sec.				
750 N. Greenfield Pkwy, Corner, NC 27529		SIG. INVENTORY NO. 03-0369		

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL
TO ASSIGN LOADSWITCH AUX S6 TO OVERLAP 'F'
(FOR SIGNAL HEAD 44)
(program controller as shown below)

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

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

```
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.....
```

OVERLAP "F" RED

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING DATA,
THEN 'ESC'.

```
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.....Y
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.....
```

OVERLAP "F" GREEN

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING 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.....
```

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.....
```

OVERLAP "F" YELLOW

THE OUTPUT IS SET AS NOT ENABLED BY DEFAULT. THIS
"Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
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' AFTER AFTER INPUTING 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.....
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0369
DESIGNED: February 2018
SEALED: 11/04/2020
REVISED: N/A

Electrical Detail - Sheet 8 of 9
Signal Upgrade
Final Design

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

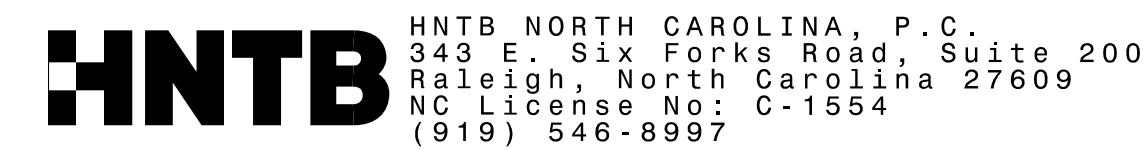


Table with columns: ELECTRICAL AND PROGRAMMING DETAILS FOR, Prepared for (University of North Carolina), Division 03, PLAN DATE (February 2018), REVIEWED BY (A.D. Klinksiek), PREPARED BY (A.H. Thornburg), REVIEWED BY (N.R. Simmons), REVISIONS, INITI, DATE, and a seal for W. Tasha R. Simmons, North Carolina Professional Engineer, Seal 031464.

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL TO ASSIGN LOADSWITCH S10 TO OVERLAP 'G' (FOR SIGNAL HEAD 23) (program controller as shown below)

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

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

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.....

OVERLAP "G" RED

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:24 NOT ENABLED 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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 23

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.....

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.....

OVERLAP "G" YELLOW

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:25 NOT ENABLED 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' AFTER AFTER INPUTING DATA, THEN 'ESC'.

PRESS '+' KEY FOR OUTPUT 24

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.....

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.....

OVERLAP "G" GREEN

THE OUTPUT IS SET AS VEHICLE PHASE BY DEFAULT. THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED. ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:26 NOT ENABLED 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' AFTER AFTER INPUTING 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.....

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0369 DESIGNED: February 2018 SEALED: 11/04/2020 REVISED: N/A

Electrical Detail - Sheet 9 of 9 Signal Upgrade Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

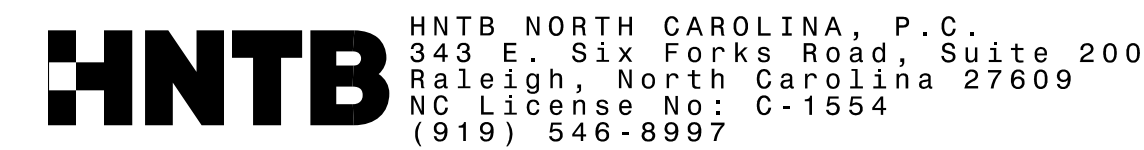
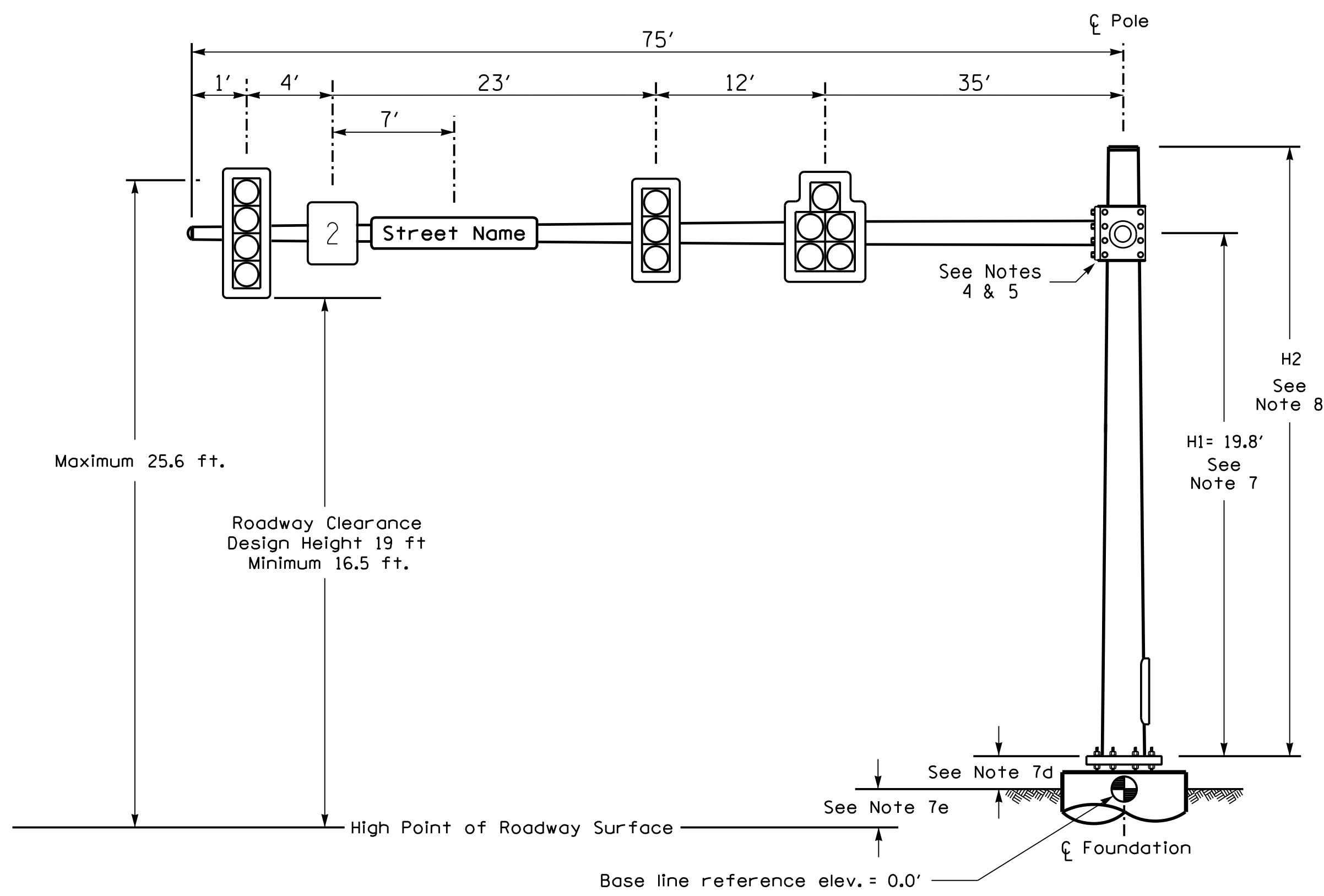


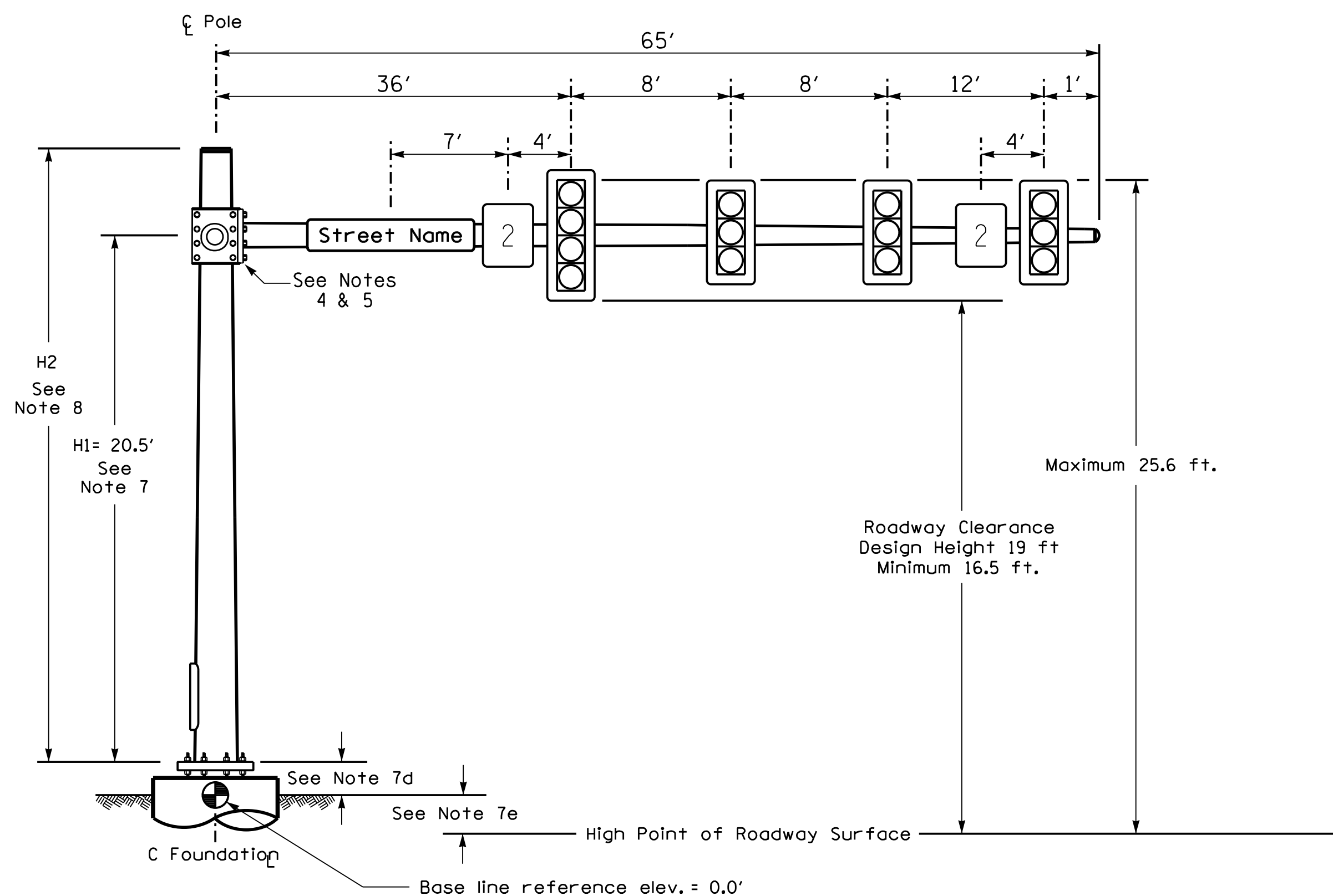
Table with project details: US 17 (Market Street) at SR 1363 (Bayshore Drive)/ SR 2717 (Torchwood Boulevard). Includes revisions table, signatures, and seals.

Design Loading for METAL POLE NO. 1 MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 1 MAST ARM B



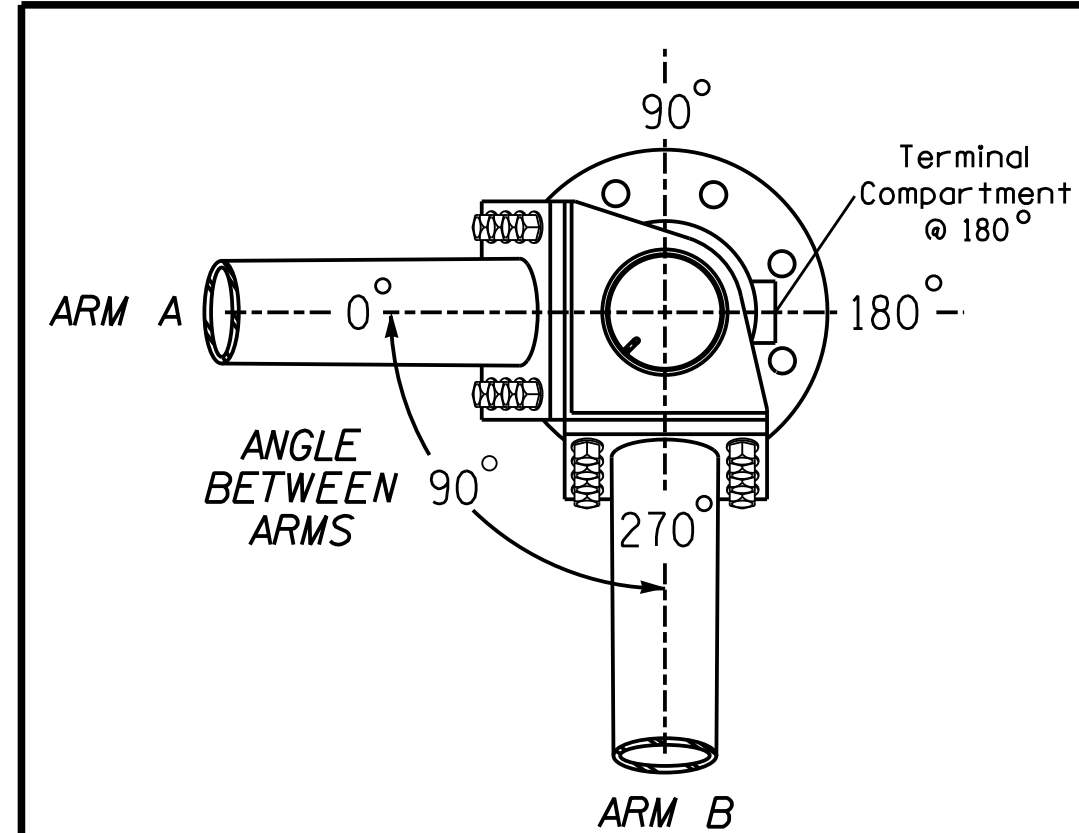
Elevation View @ 270°

SPECIAL NOTE

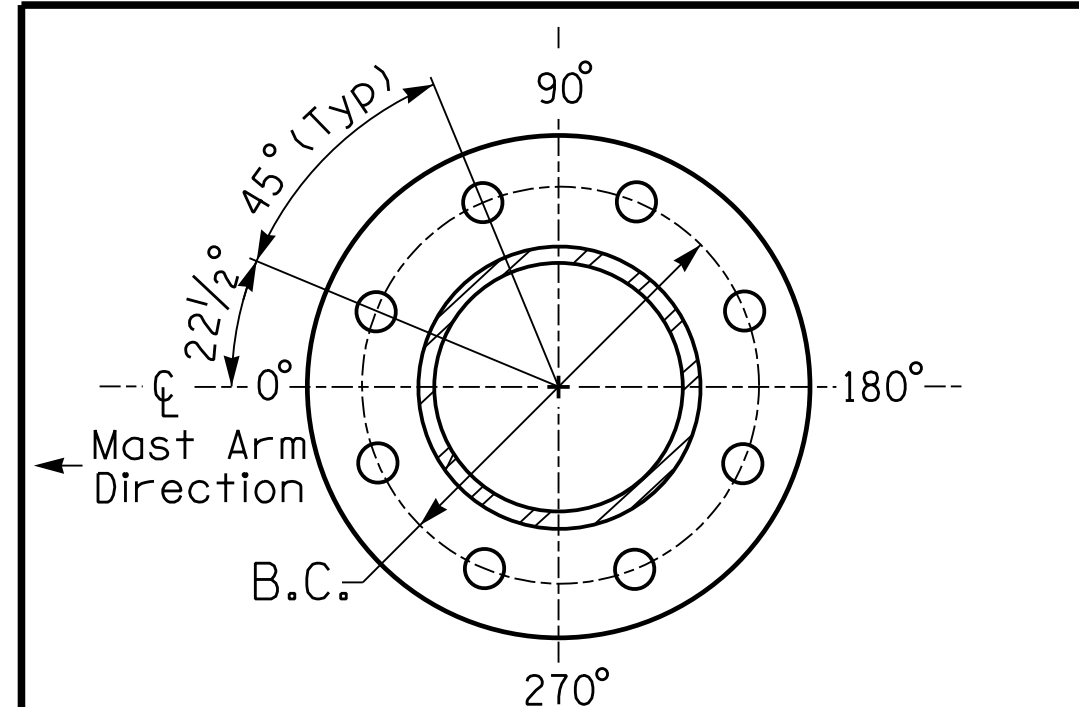
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at \odot Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-1.20 ft.	-0.53 ft.
Elevation difference at Edge of travelway or face of curb	-1.51 ft.	-0.61 ft.

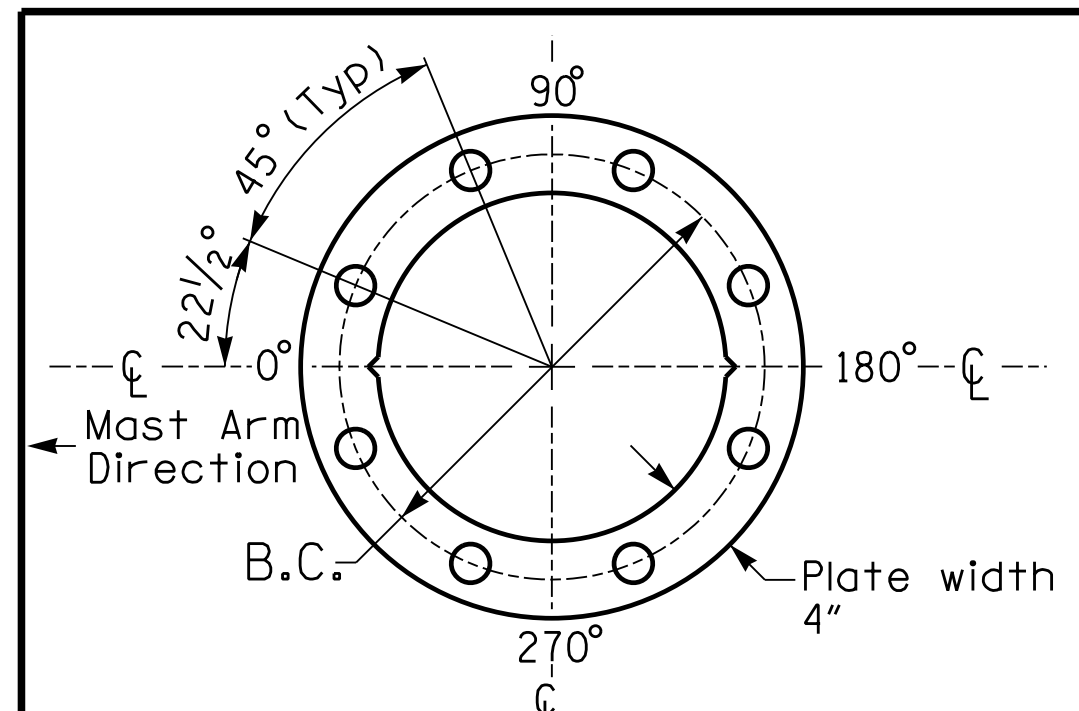


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE NO. 1

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

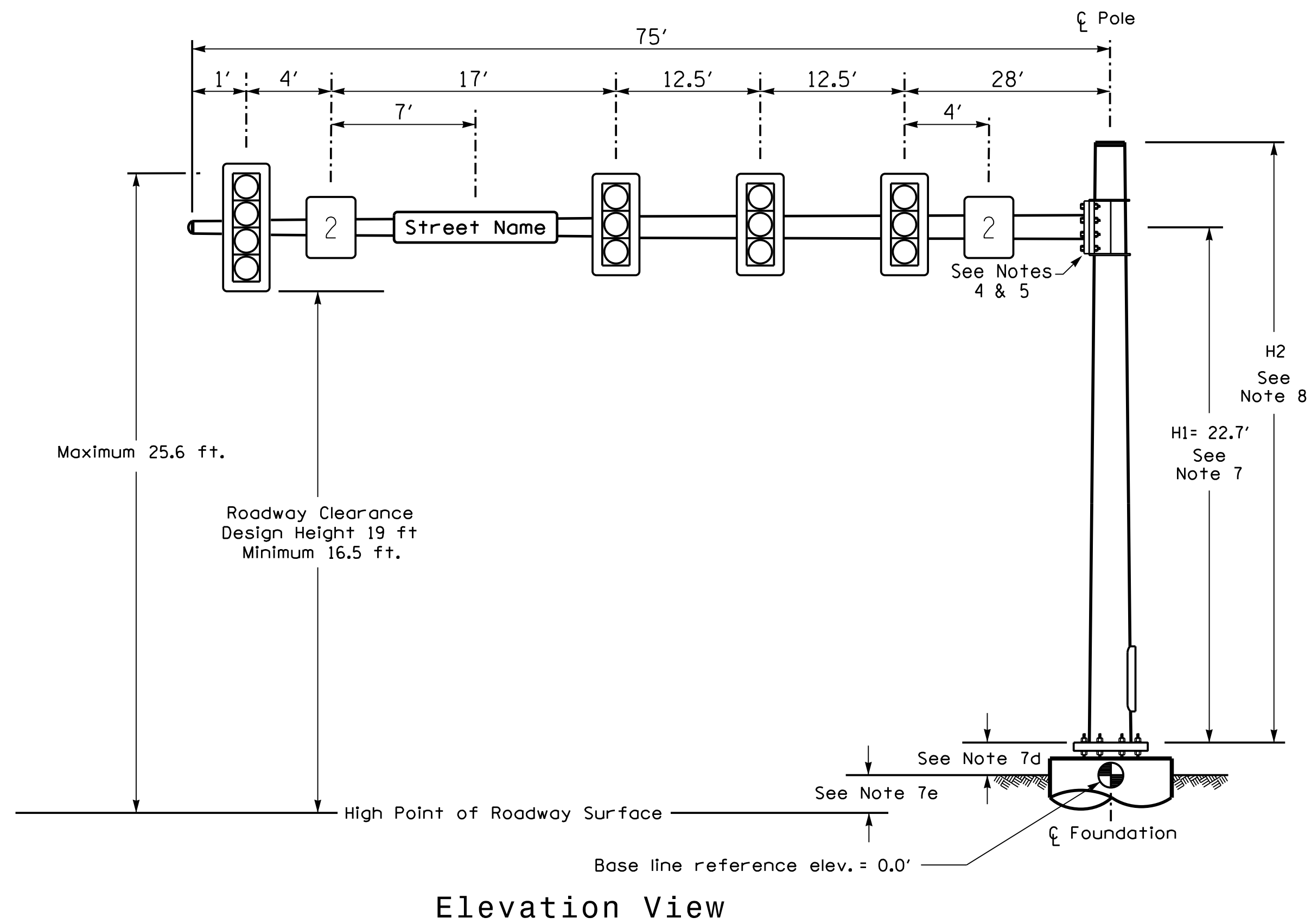
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the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

NCDOT Wind Zone 2 (130 mph)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

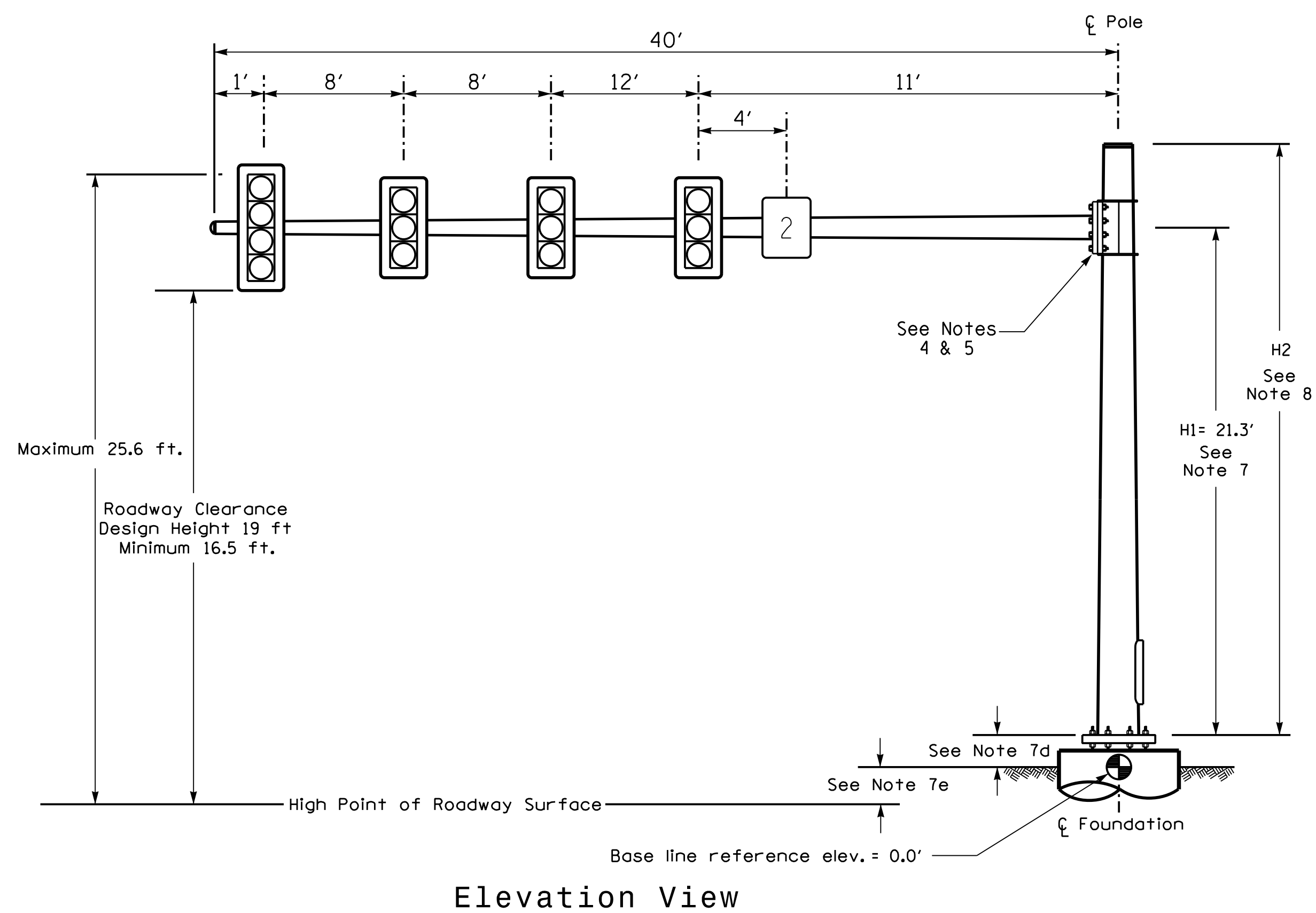
<p>Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA SIGNAL DESIGN SECTION</p>	US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard)		
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinskyk PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	REVISIONS INIT. DATE SIGNATURE DATE 8/1/2018	
SCALE 0 N/A N/A	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		SIG. INVENTORY NO. 03-0369

Design Loading for METAL POLE NO. 2



Elevation View

Design Loading for METAL POLE NO. 3



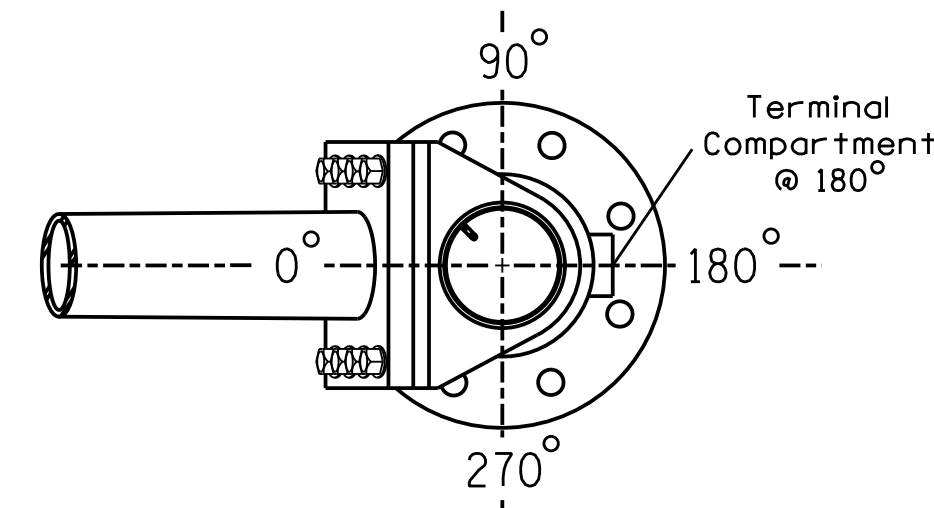
Elevation View

SPECIAL NOTE

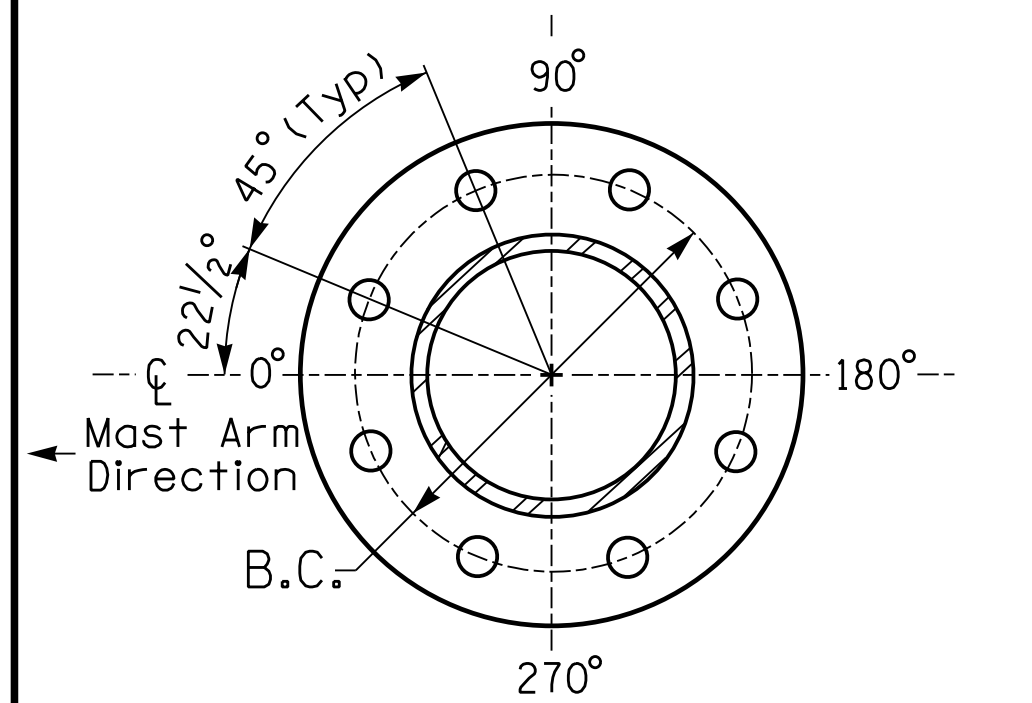
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

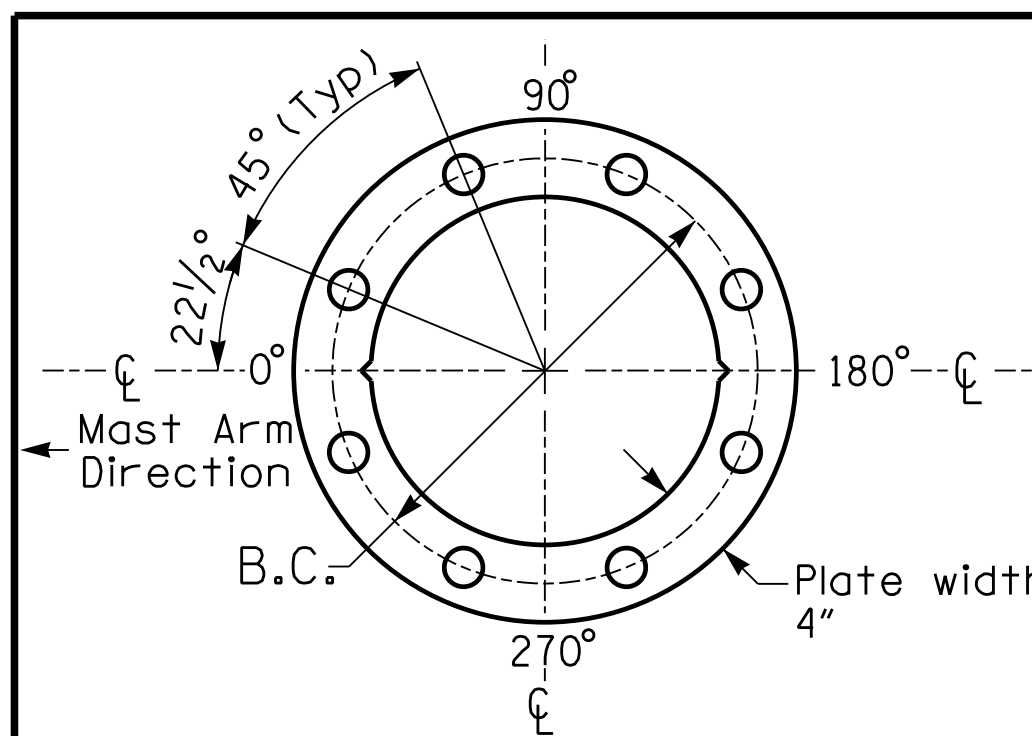
Elevation Differences for:	Pole 2	Pole 3
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.83 ft.	+0.30 ft.
Elevation difference at Edge of travelway or face of curb	-0.63 ft.	+0.20 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL For 8 Bolt Base Plate

METAL POLE No. 2,3

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	Fig. 7.12

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

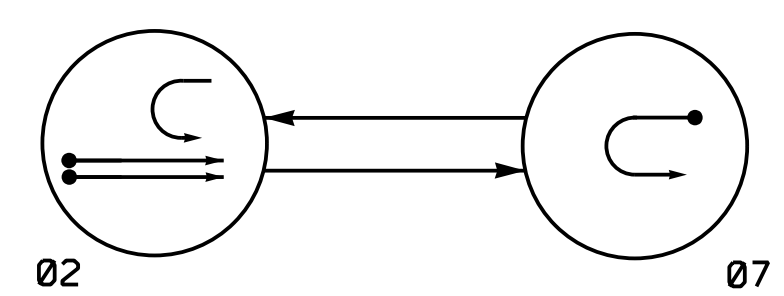
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the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

NCDOT Wind Zone 2 (130 mph)

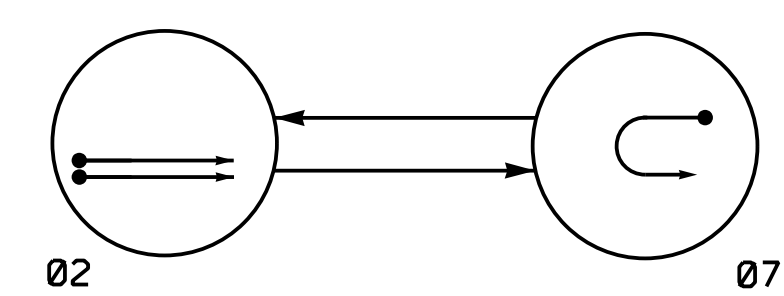
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	US 17 (Market Street) at SR 1363 (Bayshore Drive) / SR 2717 (Torchwood Boulevard)	
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
SCALE: 0 N/A N/A	REVISIONS: _____ INITI: _____ DATE: _____	DocuSigned by: N. R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-0369

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		
	02	07	FLASH
21,22	G	R	Y
71	Ⓜ	Ⓜ	Ⓜ

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02	07	FLASH
21,22	G	R	Y
71	Ⓜ	Ⓜ	Ⓜ

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	*10	-	Y

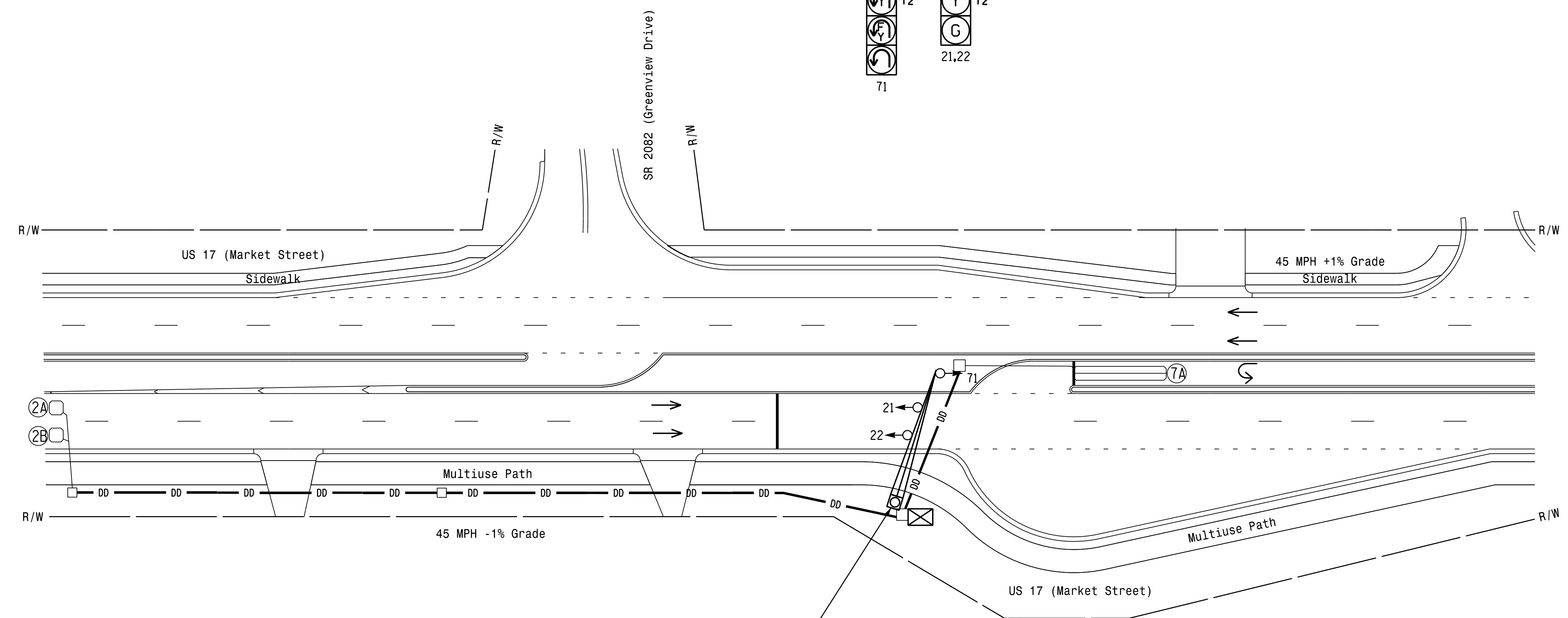
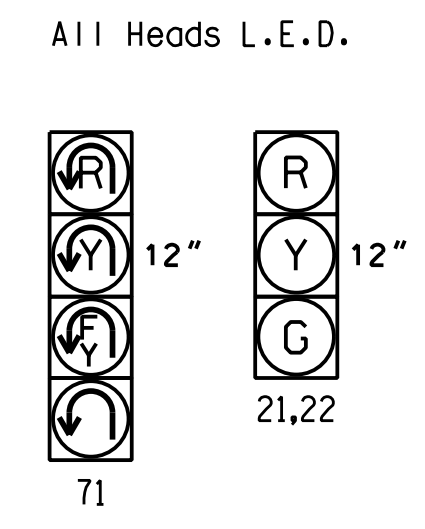
* Reduce delay to 0 seconds during alternate phasing operation.

2 Phase Fully Actuated Wilmington 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. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The Division Traffic Engineer will determine the hours of use for each phasing plan.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Signal system data: Controller Asset #1130

SIGNAL FACE I.D.



Metal Pole with Mast Arm #1
Sta. 245+99 +/- -L-
56' Rt +/-

OASIS 2070 TIMING CHART

FEATURE	PHASE	
	2	7
Min Green 1 *	12	5
Extension 1 *	6.0	2.0
Max Green 1 *	90	20
Yellow Clearance	4.5	3.0
Red Clearance	2.0	2.8
Walk 1 *	-	-
Don't Walk 1	-	-
Seconds Per Actuation *	1.5	-
Max Variable Initial *	34	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.0	-
Recall Mode	MIN RECALL	-
Vehicle Call Memory	YELLOW	-
Dual Entry	-	-
Simultaneous Gap	ON	ON

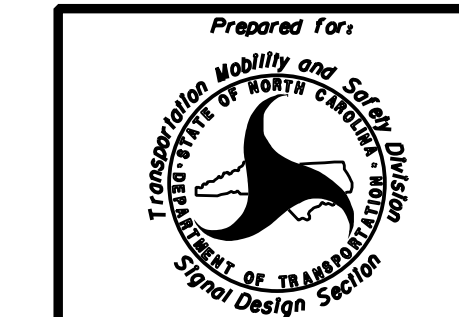
* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head Sign	●→ Traffic Signal Head Sign
□→ Pedestrian Signal Head With Push Button & Sign	■→ Pedestrian Signal Head With Push Button & Sign
⊗ Inductive Loop Detector	⊗ Inductive Loop Detector
⊠ Controller & Cabinet	⊠ Controller & Cabinet
□ Junction Box	■ Junction Box
- - - - 2-in Underground Conduit	- - - - 2-in Underground Conduit
N/A Right of Way	- - - - Right of Way
→ Directional Arrow	→ Directional Arrow
- - - - Directional Drill	- - - - Directional Drill
⊠ Metal Pole with Mastarm	⊠ Metal Pole with Mastarm

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Prepared for:
NB US 17 (Market Street) at U-Turn North of SR 2082 (Greenview Drive)

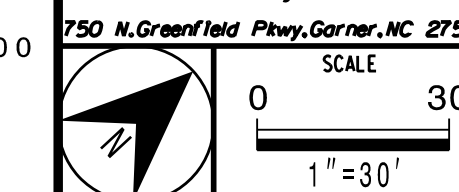
Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek

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



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



REVISIONS	INIT.	DATE

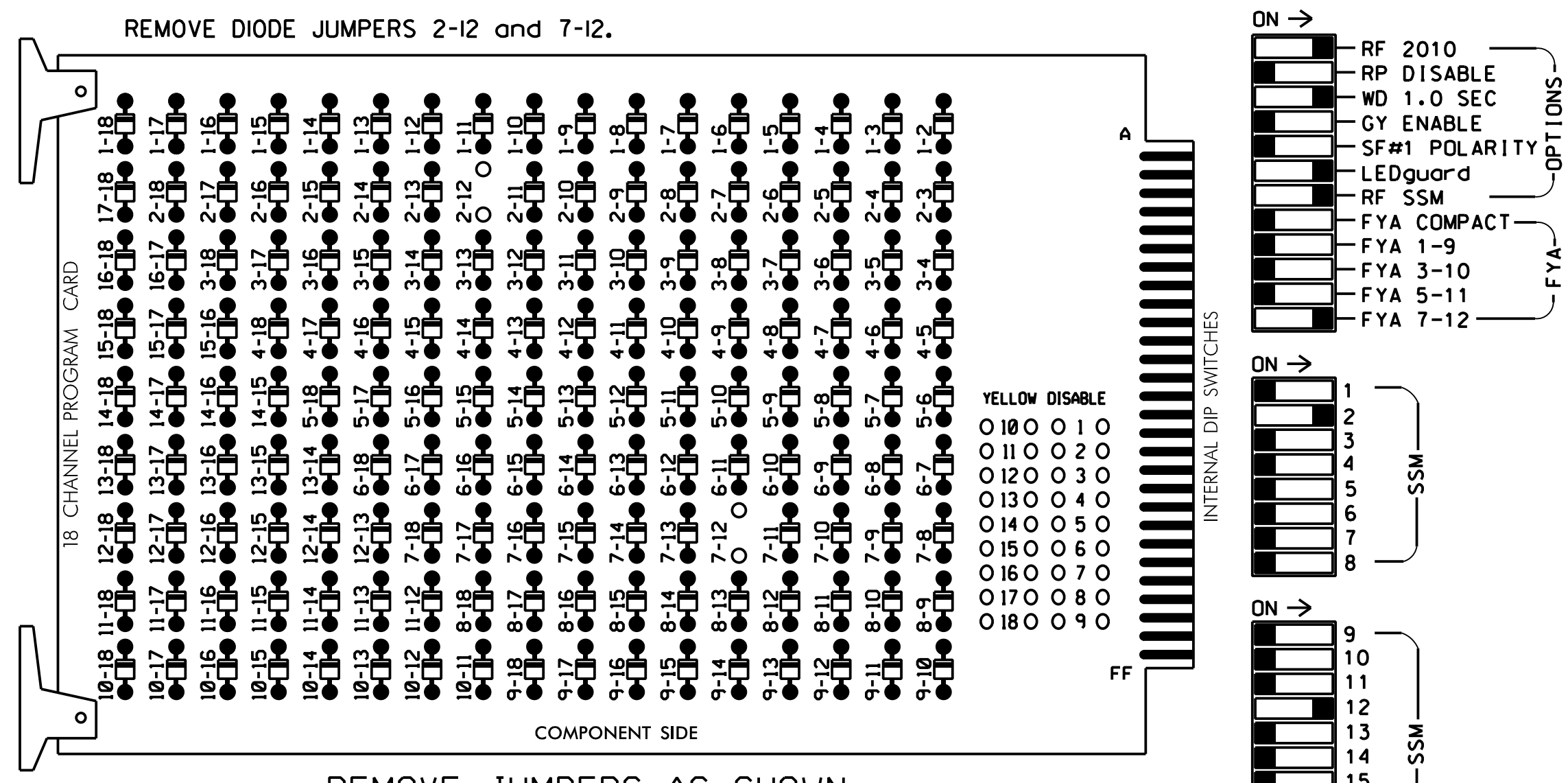
DocuSigned by: *Notisha R. Simmons* 8/1/2018

SIGNATURE DATE

SIG. INVENTORY NO. 03-1130

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

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 phase 2 for Variable Initial and Gap Reduction.
4. Program phase 2 for Startup In Green.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the Wilmington Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	PED	3	4	PED	5	6	PED	7	8	PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	71*	NU	NU	NU	NU	NU	NU	71*	NU	
RED		128																	
YELLOW		129								*									
GREEN		130																	
RED ARROW																		A101	
YELLOW ARROW																			A102
FLASHING YELLOW ARROW																			A103
GREEN ARROW										124									

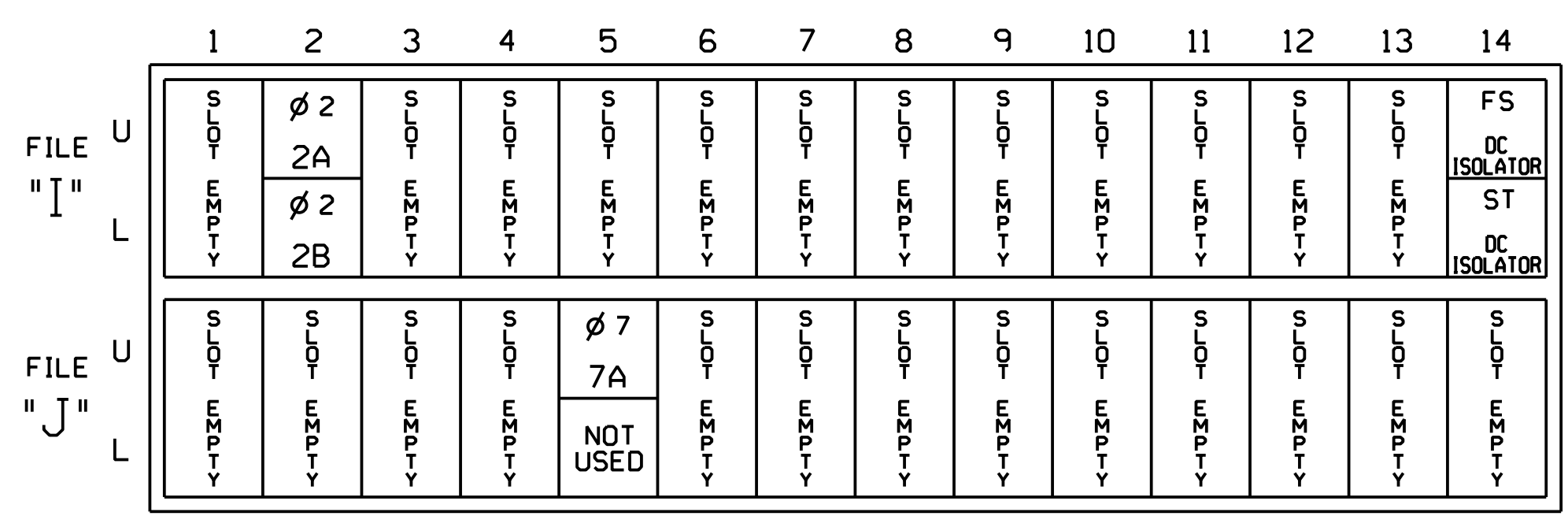
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S10,AUX S5
 PHASES USED.....2,7
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....2+7

INPUT FILE POSITION LAYOUT

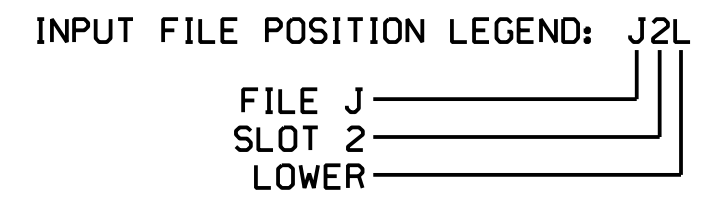
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

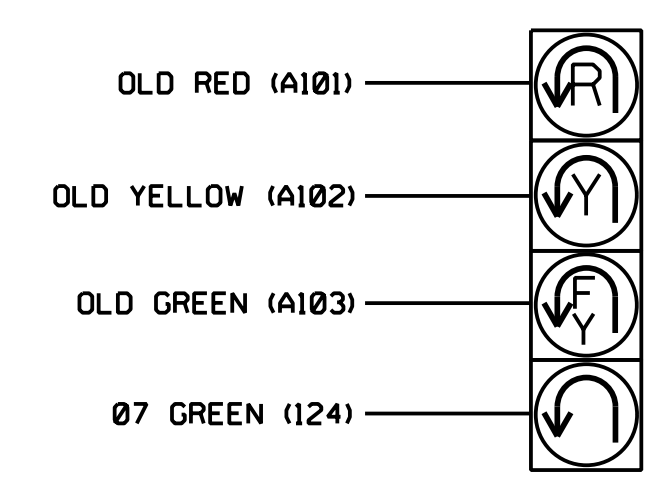
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			10

*See Input Page Assignment programming details on sheet 3.



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



71

NOTE

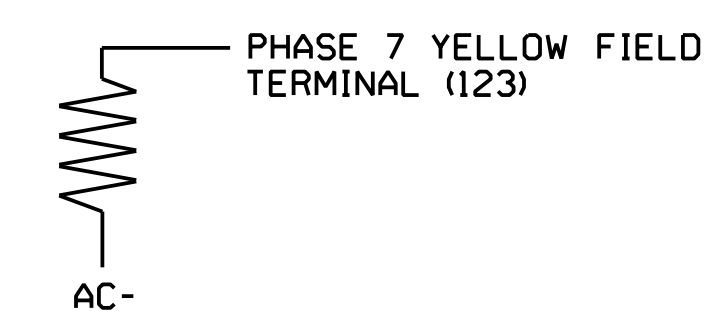
The sequence display for signal head 71 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1130
 DESIGNED: February 2018
 SEALED: 8-1-18
 REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



Electrical Detail - Sheet 1 of 4
 New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for:

Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek

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

REVISIONS	INIT.	DATE

SEAL

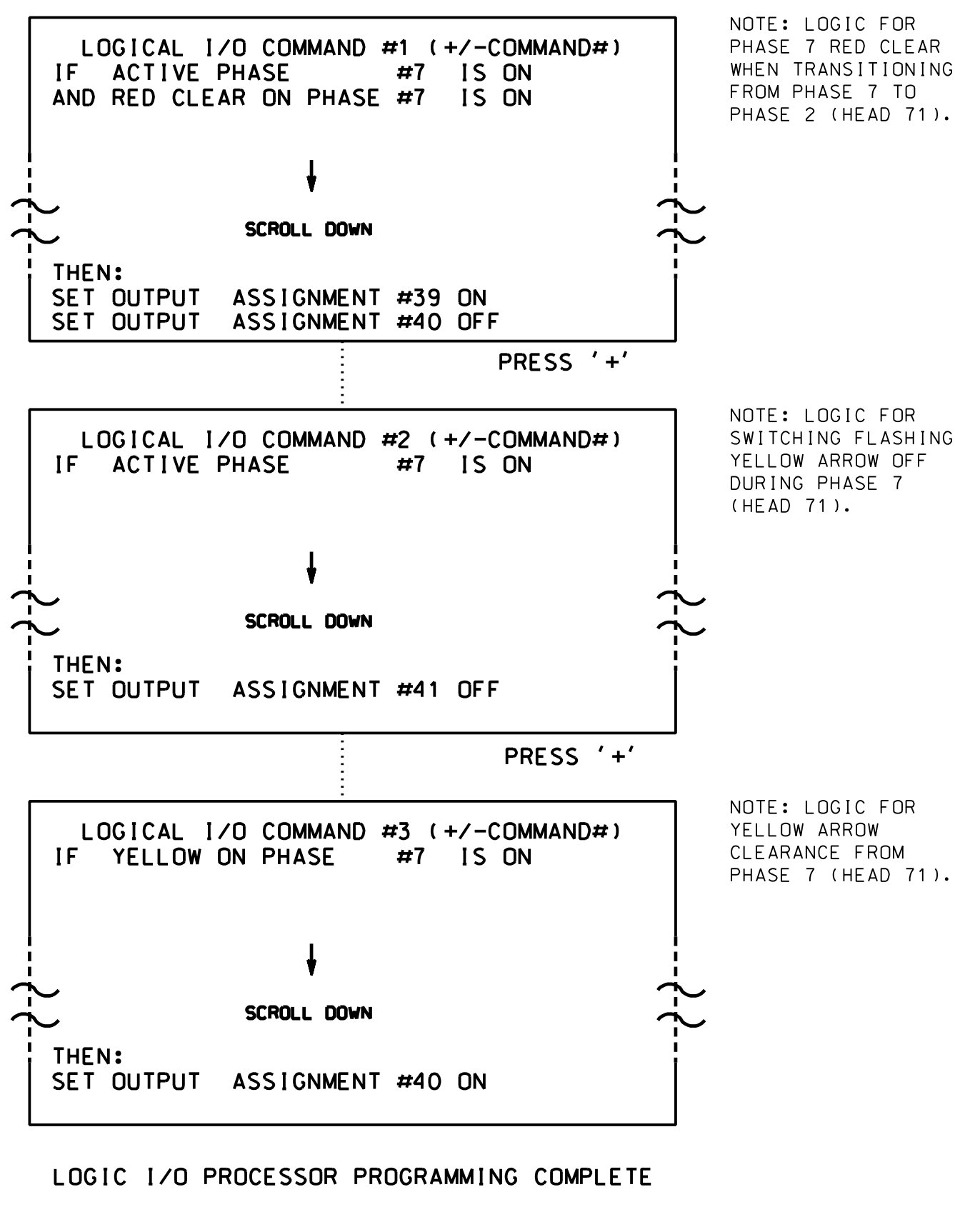
HNTB
 HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554
 (919) 546-8997

DocuSigned by:
 Natasha R. Simmons 8/1/2018
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-1130

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS), SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.



OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR
OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

PRESS '+' THREE TIMES

```

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:      :12345678910111213141516
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?...Y
GREEN EXTENSION (0=255 SEC)...0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

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

PRESS '+' THREE TIMES

```

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 _ GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0=255 SEC)...0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

OVERLAP PROGRAMMING COMPLETE

NOTICE PAGE 2 →


← NOTICE GREEN FLASH

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1130
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 2 of 4
New Installation

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:


750 N. Greenfield Pkwy, Corner, NC 27529

NB US 17 (Market Street) at U-Turn North of SR 2082 (Greenview Drive)	
Division 03	New Hanover Co. Wilmington
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
W. LISA R. SIMMONS
SEAL
031464

DocuSigned by:
W. Lisa R. Simmons 8/1/2018

SIGNATURE DATE

SIG. INVENTORY NO. 03-1130

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

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 7A

(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 TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 57 TO INPUT #19 SO THAT THE DELAY ON LOOP 7A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS). THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 19 IS REACHED.

```

PAGE: 2 C1 PIN:57 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....19
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).....7
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 SYNCHRONIZATION (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 '57' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 7A - PHASE 7)

```

PAGE: 2 C1 PIN:57 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....19
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).....57
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 SYNCHRONIZATION (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 7A (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 #57.

```

VEHICLE DETECTOR #57 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 '7' FOR PHASES ASSIGNED

ENSURE DELAY IS '0'

```

VEHICLE DETECTOR #57 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).....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
    
```

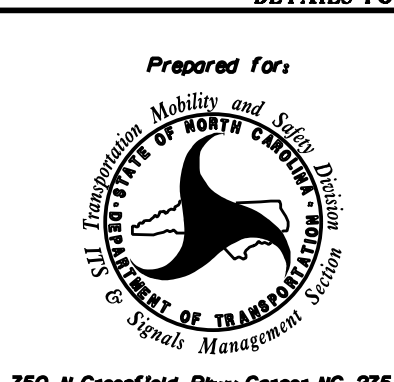
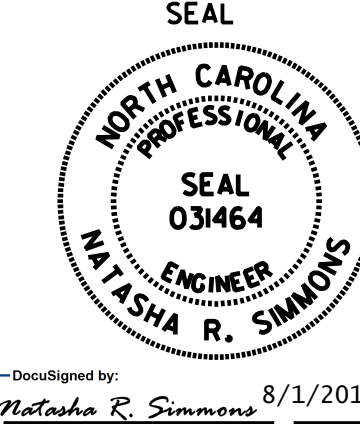
DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1130
 DESIGNED: February 2018
 SEALED: 8-1-18
 REVISED: N/A

Electrical Detail - Sheet 3 of 4
 New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	NB US 17 (Market Street) at U-Turn North of SR 2082 (Greenview Drive)		
	Division 03 New Hanover Co. Wilmington	PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	
REVISIONS	INIT.	DATE	DocuSigned by: Natasha R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-1130

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phase for head 71 to run protected turn only.

INPUTS PAGE 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

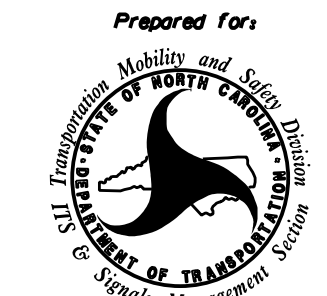
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1130
DESIGNED: February 2018
SEALED: 8-1-18
REVISED: N/A

Electrical Detail - Sheet 4 of 4
New Installation

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ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

NB US 17 (Market Street) at
U-Turn North of SR 2082
(Greenview Drive)

Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

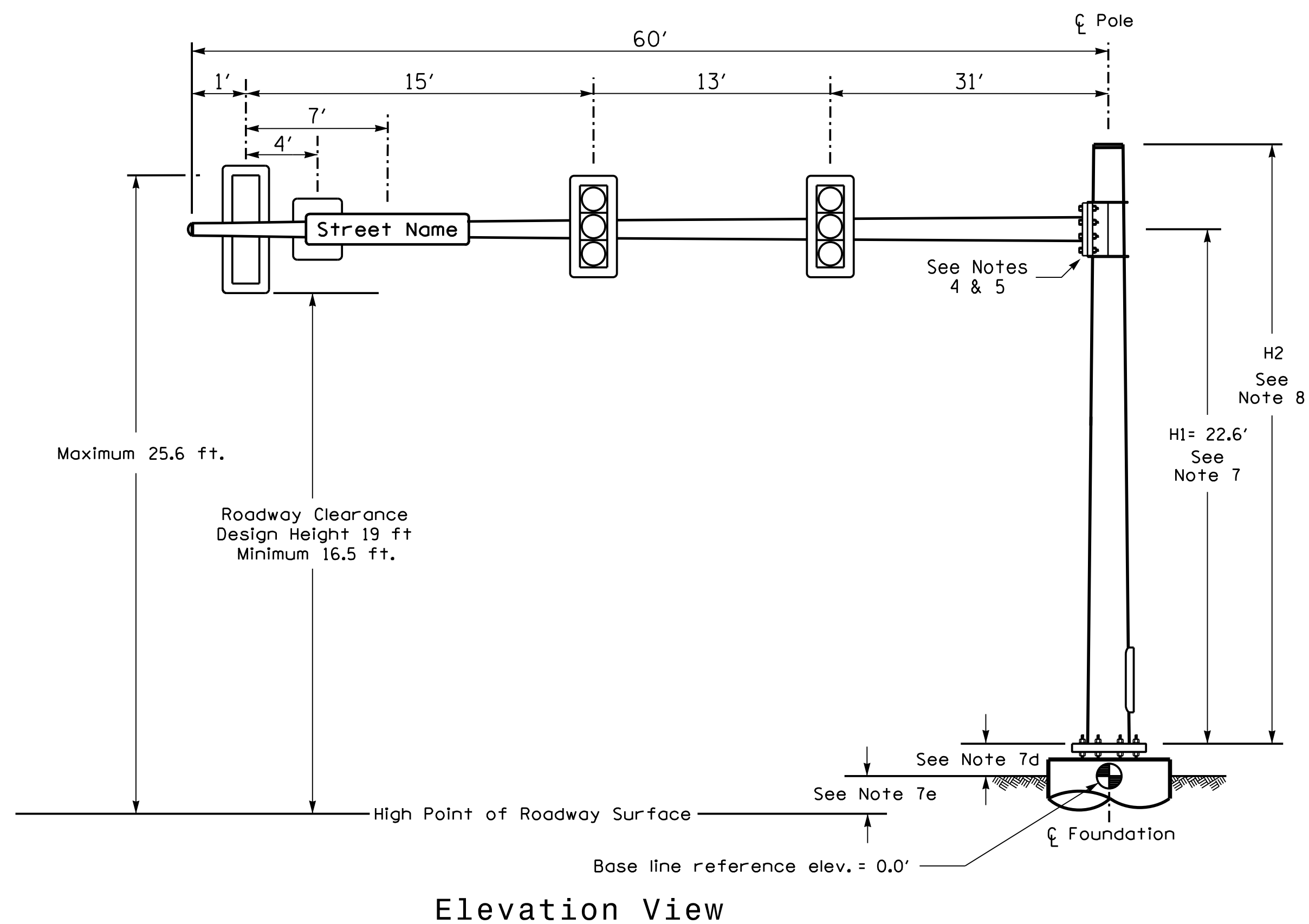
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
031464
NATASHA R. SIMMONS

DocuSigned by:
Natasha R. Simmons 8/1/2018

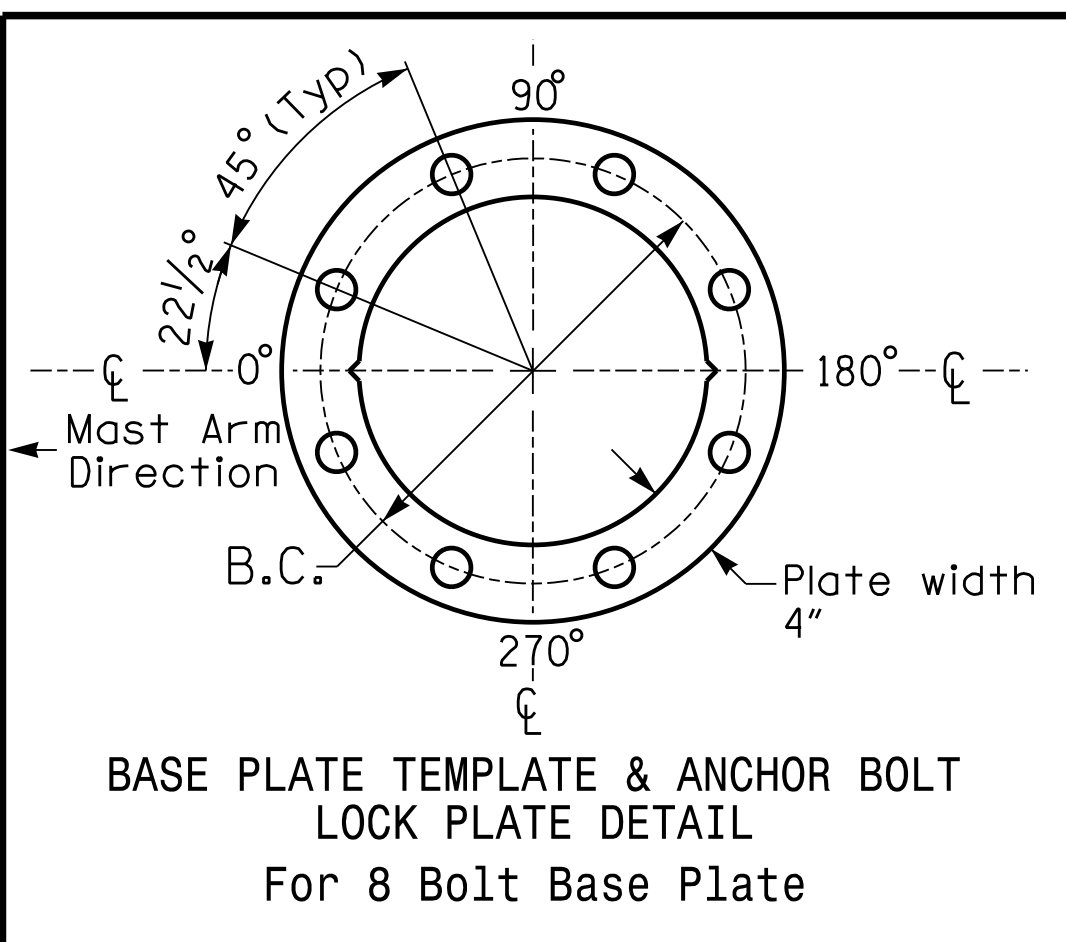
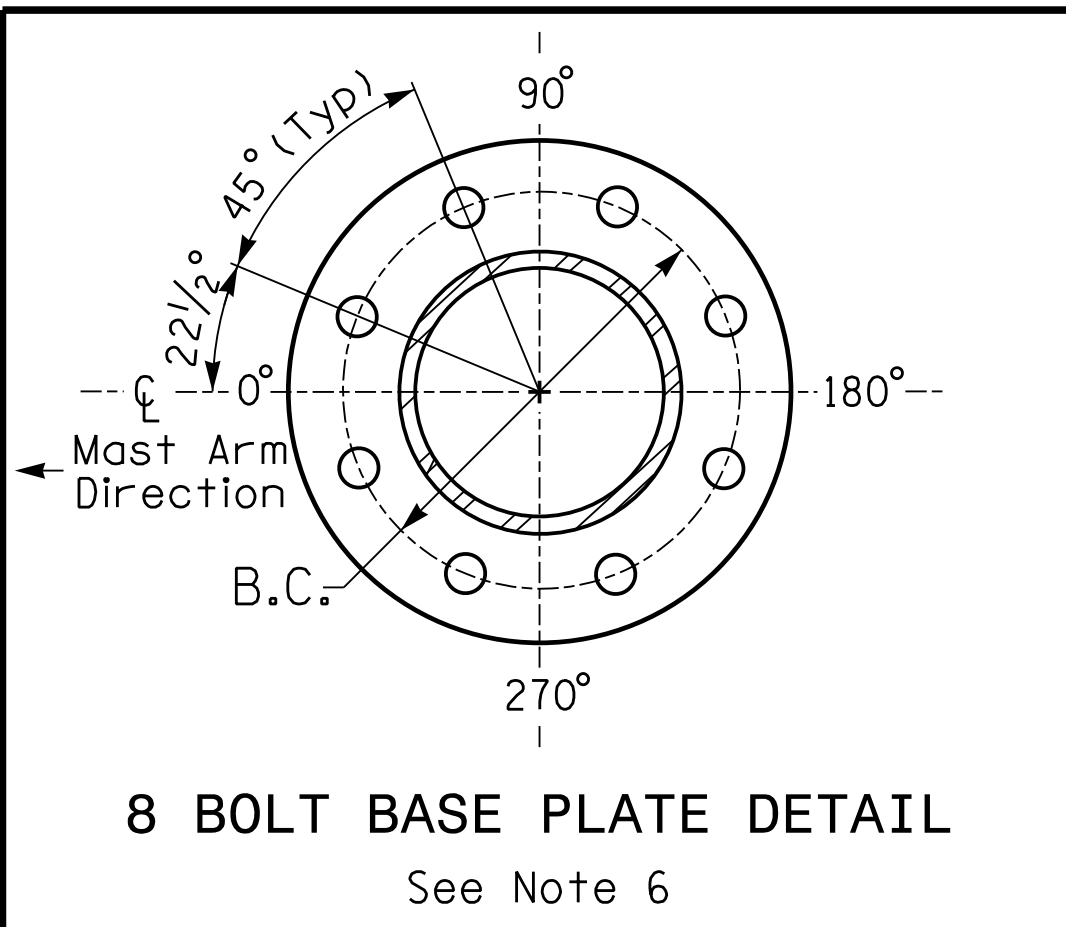
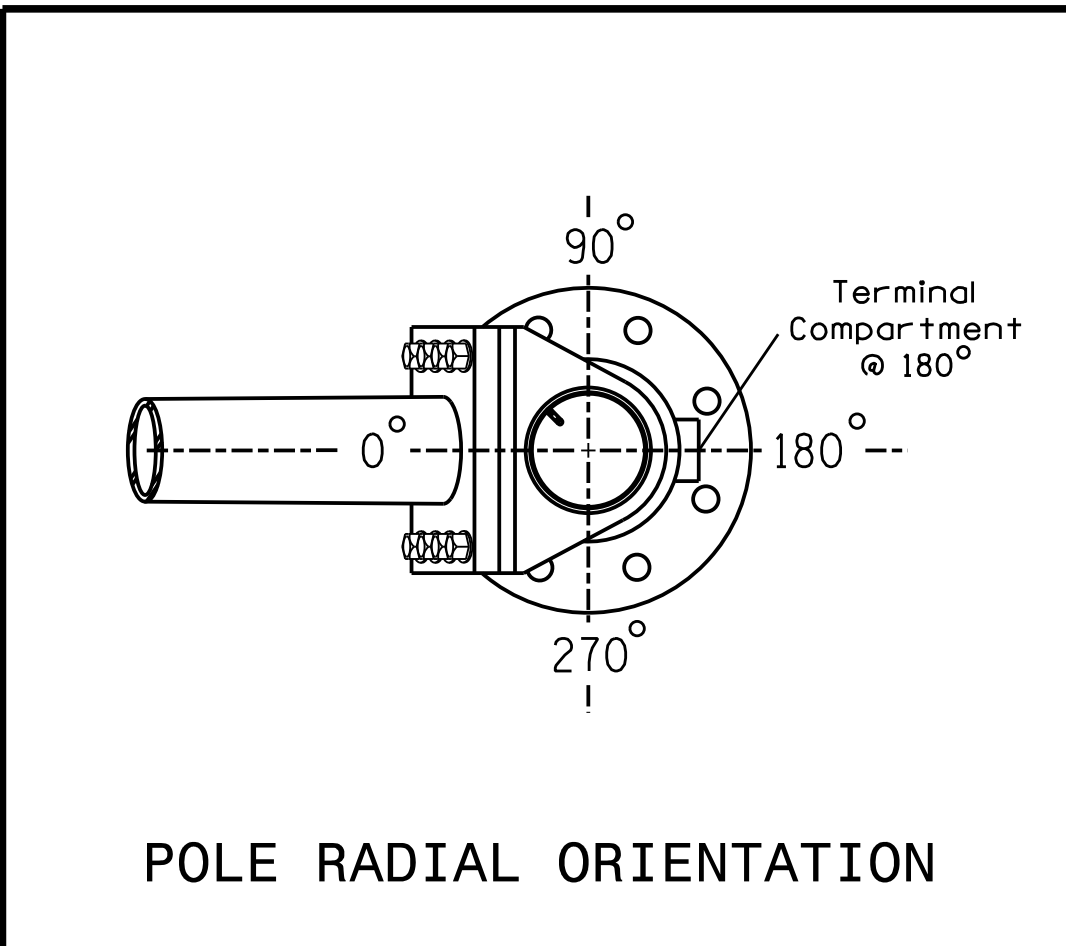
SIGNATURE DATE
SIG. INVENTORY NO. 03-1130

Design Loading for METAL POLE NO. 1



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

Elevation Data for Mast Arm Attachment (H1)	
Elevation Differences for:	Pole 1
Baseline reference point at \odot Foundation \odot ground level	0.0 ft.
Elevation difference at High point of roadway surface	+1.59 ft.
Elevation difference at Edge of travelway or face of curb	+0.66 ft.



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METAL POLE NO. 1

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	Sig. 8.5

MAST ARM LOADING SCHEDULE				
LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

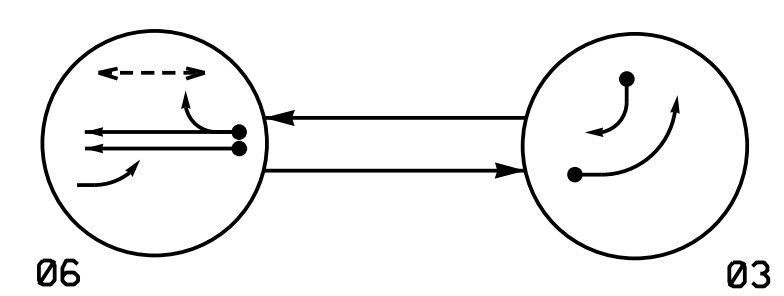
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the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

NCDOT Wind Zone 2 (130 mph)

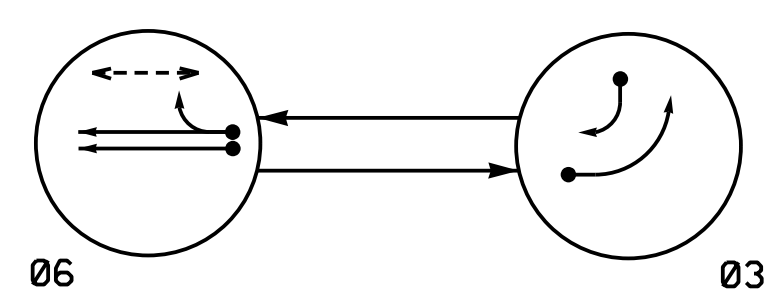
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UNLESS ALL SIGNATURES COMPLETED**

 Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529	NB US 17 (Market Street) at U-Turn North of SR 2082 (Greenview Drive)	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 03464 NATASHA R. SIMMONS
	Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



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

DEFAULT PHASING TABLE OF OPERATION table with columns for SIGNAL FACE, PHASE, and FLASH.

ALTERNATE PHASING TABLE OF OPERATION table with columns for SIGNAL FACE, PHASE, and FLASH.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART table with columns for LOOP, SIZE, DISTANCE FROM STOPBAR, TURNS, NEW LOOP, PHASE, CALLING, EXTENSION, FULL TIME DELAY, STRETCH TIME, DELAY TIME, SYSTEM LOOP, NEW CARD.

* Reduce delay to 0 seconds during alternate phasing operation.

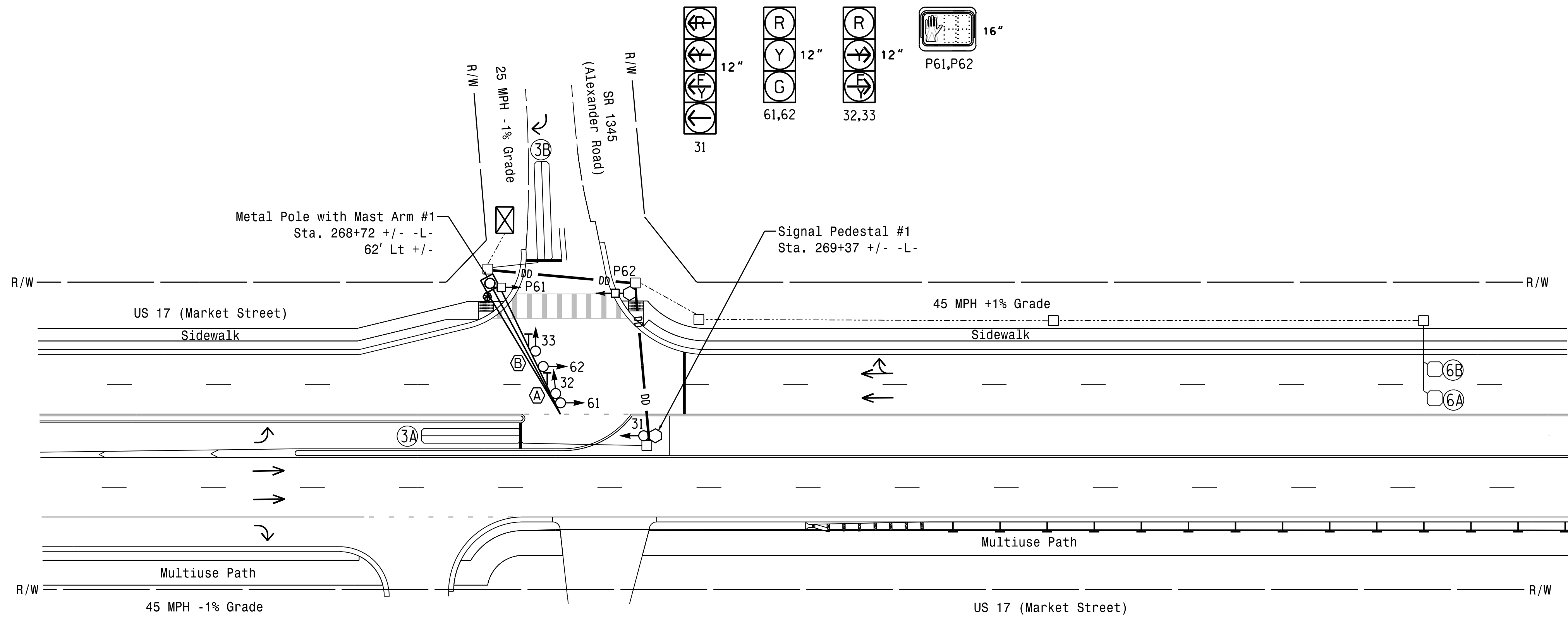
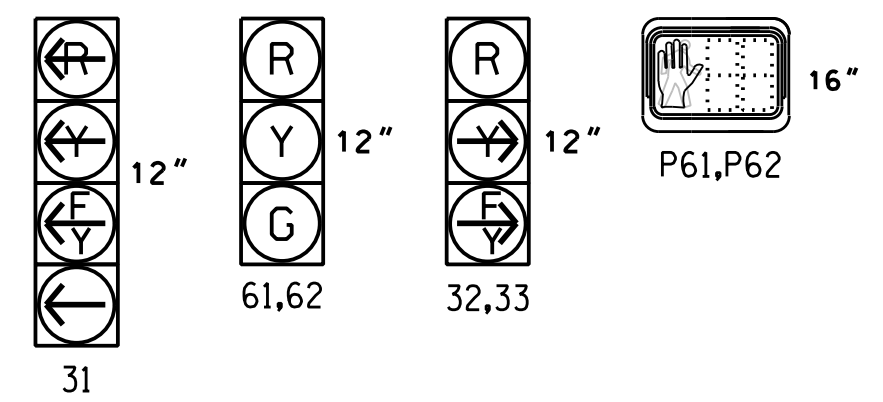
2 Phase Fully Actuated Wilmington Signal System

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. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
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. All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
8. The Division Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Signal system data: Controller Asset #1129

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART table with columns for FEATURE and PHASE (3, 6).

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

LEGEND table with columns for PROPOSED and EXISTING, listing symbols for Traffic Signal Head, Pedestrian Signal Head, Inductive Loop Detector, etc.

New Installation

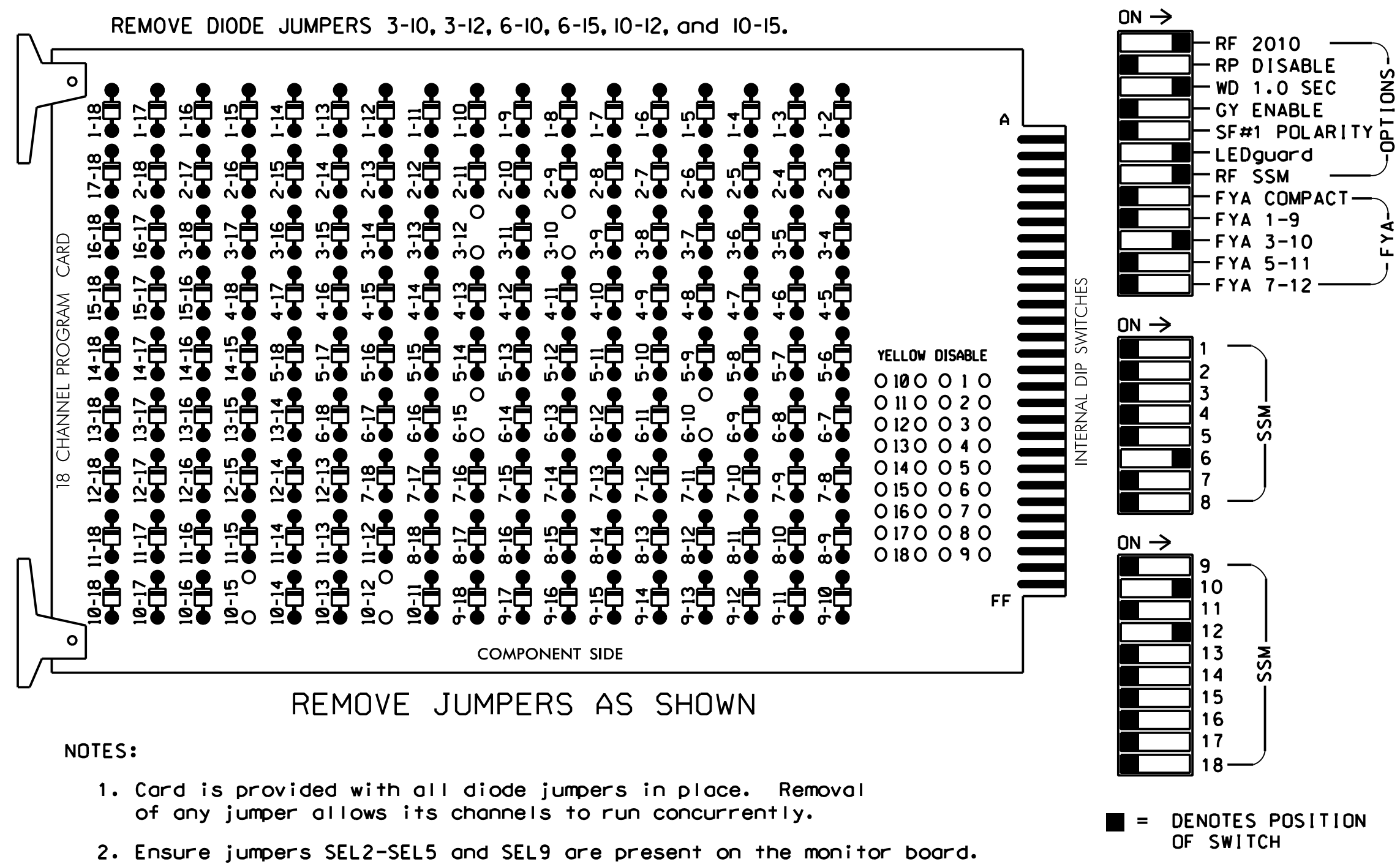
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Professional seal and signature block for A.H. Thornburg, N.R. Simmons, and M. J. Simons, dated 8/1/2018.

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

- NOTES**
- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
 - Enable Simultaneous Gap-Out for all Phases.
 - Program phase 6 for Variable Initial and Gap Reduction.
 - Program phase 6 for Startup In Green.
 - Program phase 6 for Startup Ped Call.
 - Program phase 6 for Yellow Flash.
 - The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S4,S8,S9,AUX S2,AUX S5
 PHASES USED.....3,6,6 PED
 OVERLAP "A".....NOT USED
 OVERLAP "B".....3+6
 OVERLAP "C".....NOT USED
 OVERLAP "D".....3

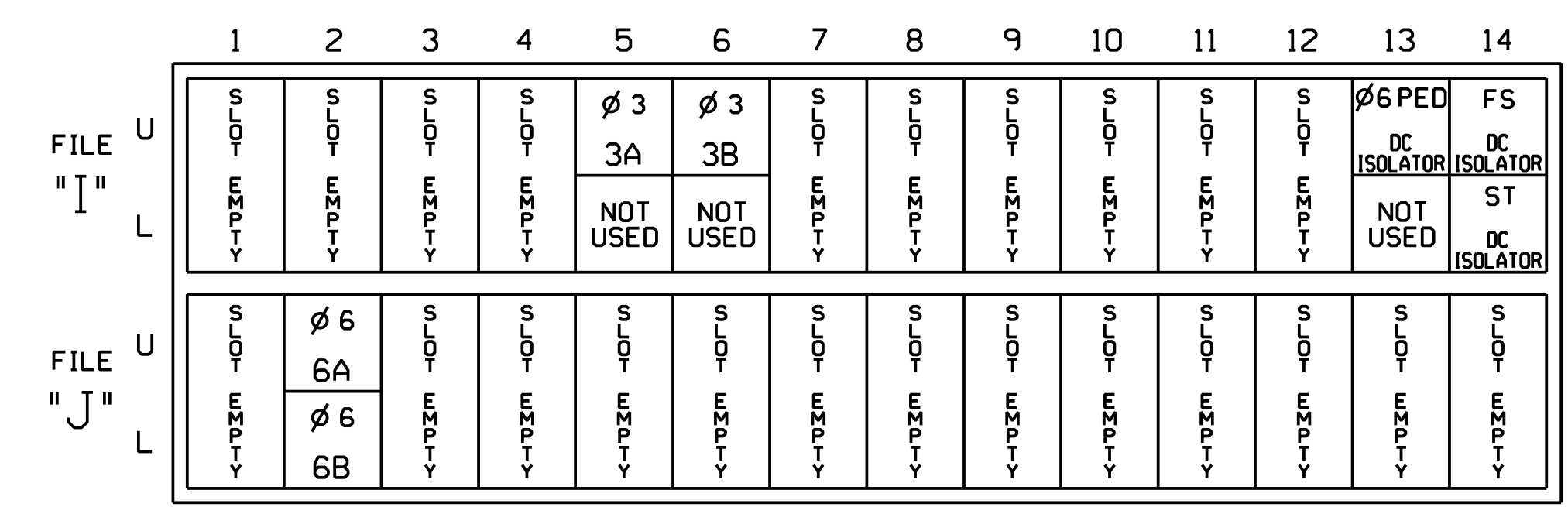
SIGNAL HEAD HOOK-UP CHART

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
CNU 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	NU	NU	31	NU	NU	NU	61,62	P61, P62	NU	NU	NU	NU	31	NU	NU	32,33	NU
RED								134										A101
YELLOW				*				135										
GREEN								136										
RED ARROW														A124				
YELLOW ARROW														A125			A102	
FLASHING YELLOW ARROW														A126			A103	
GREEN ARROW							118											
Hand									119									
Walking Person										121								

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

INPUT FILE POSITION LAYOUT

(front view)



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

INPUT FILE CONNECTION & PROGRAMMING CHART

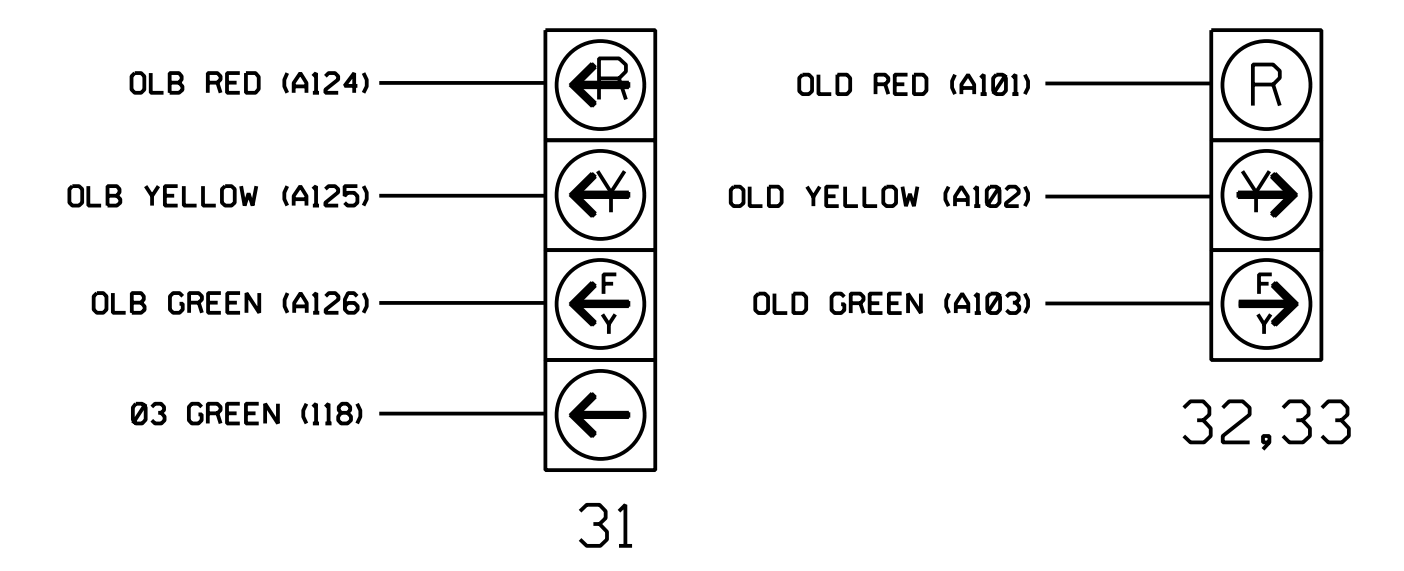
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			10
	-	I5U	58	20*	53	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 113.

* See Input Page Assignment programming details on sheet 3.
 INPUT FILE POSITION LEGEND: J2L
 FILE J
 SLOT 2
 LOWER

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE
 The sequence display for signal head 31 requires special logic programming. See sheet 2 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

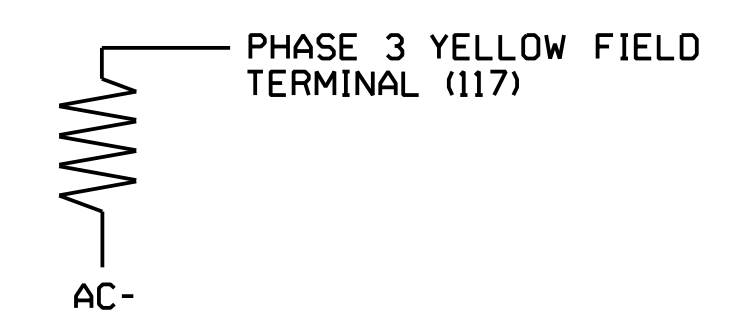
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

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: 03-1129
 DESIGNED: February 2018
 SEALED: 8-1-18
 REVISED: N/A

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

Electrical Detail - Sheet 1 of 4
 New Installation

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Prepared for:
 US 17 (Market Street) at SR 1345 (Alexander Road)
 Division 03 New Hanover Co. Wilmington

PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons

REVISIONS: INITI. DATE

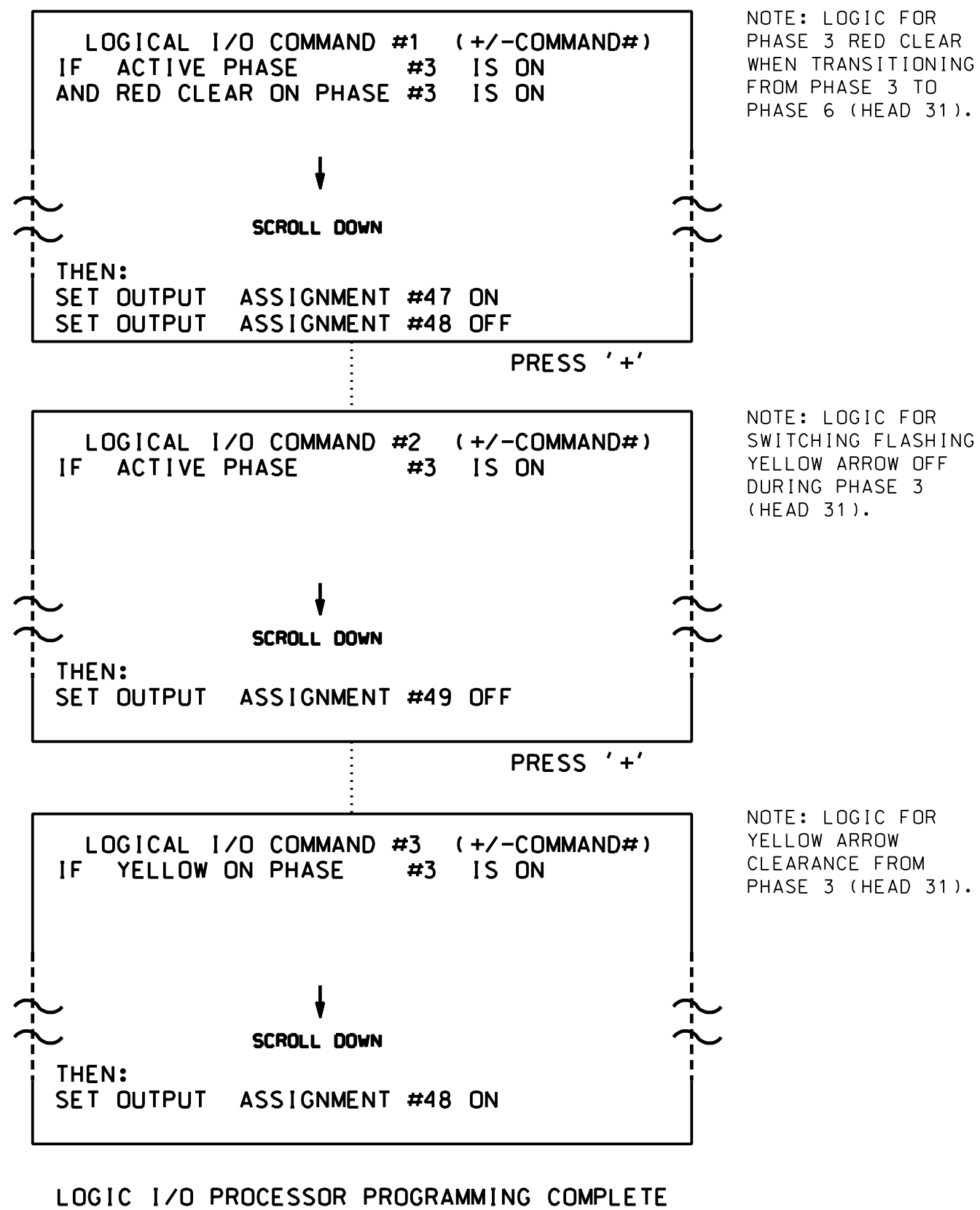
Sealed by: **W. TISHIA R. SIMMONS**, PROFESSIONAL ENGINEER, SEAL 031464

8/1/2018
 Signature: **W. TISHIA R. SIMMONS**
 DATE: 8/1/2018
 SIG. INVENTORY NO. 03-1129

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

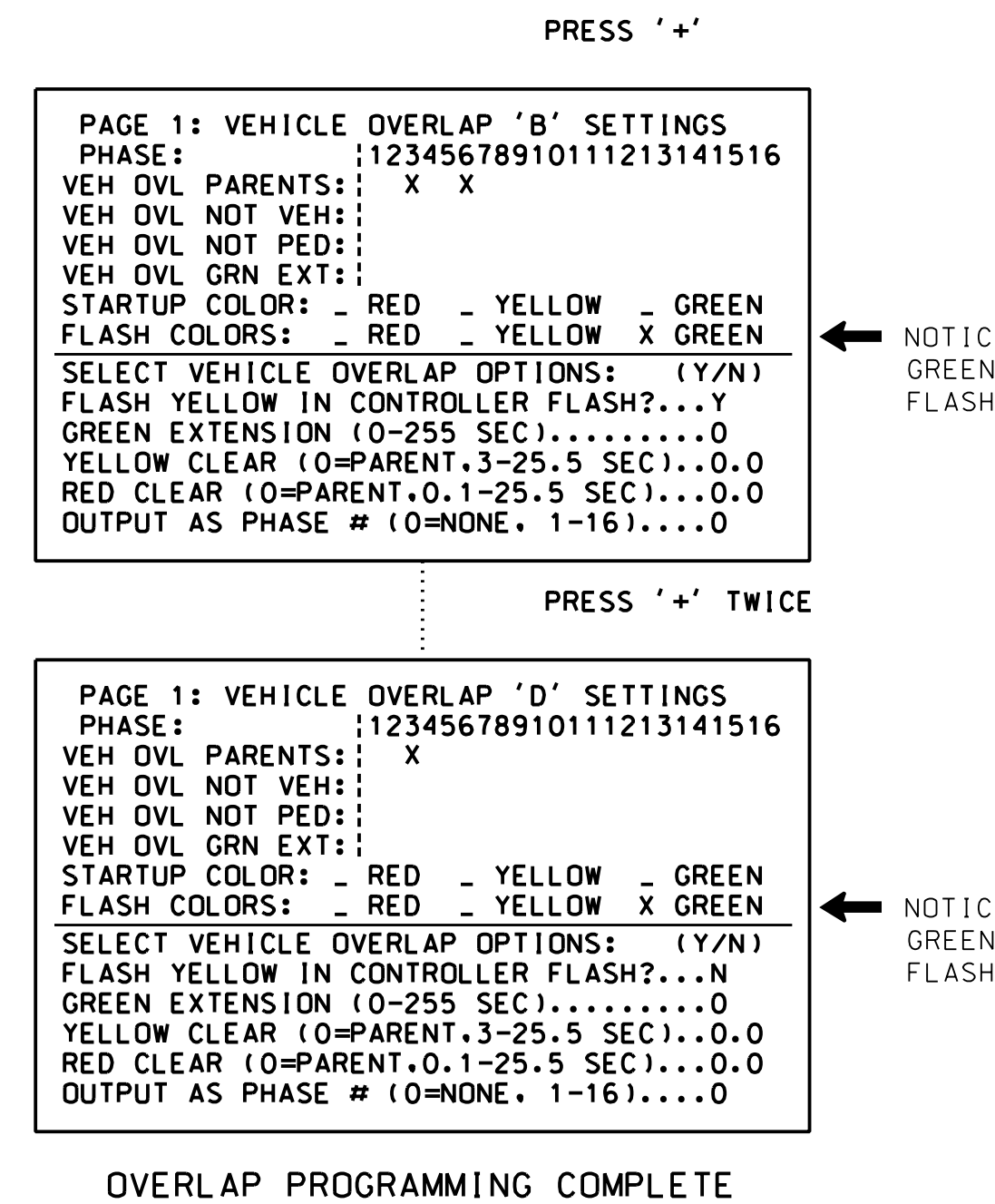


OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 47 =	Overlap B Red
OUTPUT 48 =	Overlap B Yellow
OUTPUT 49 =	Overlap B Green

**OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING**

(program controller as shown below)

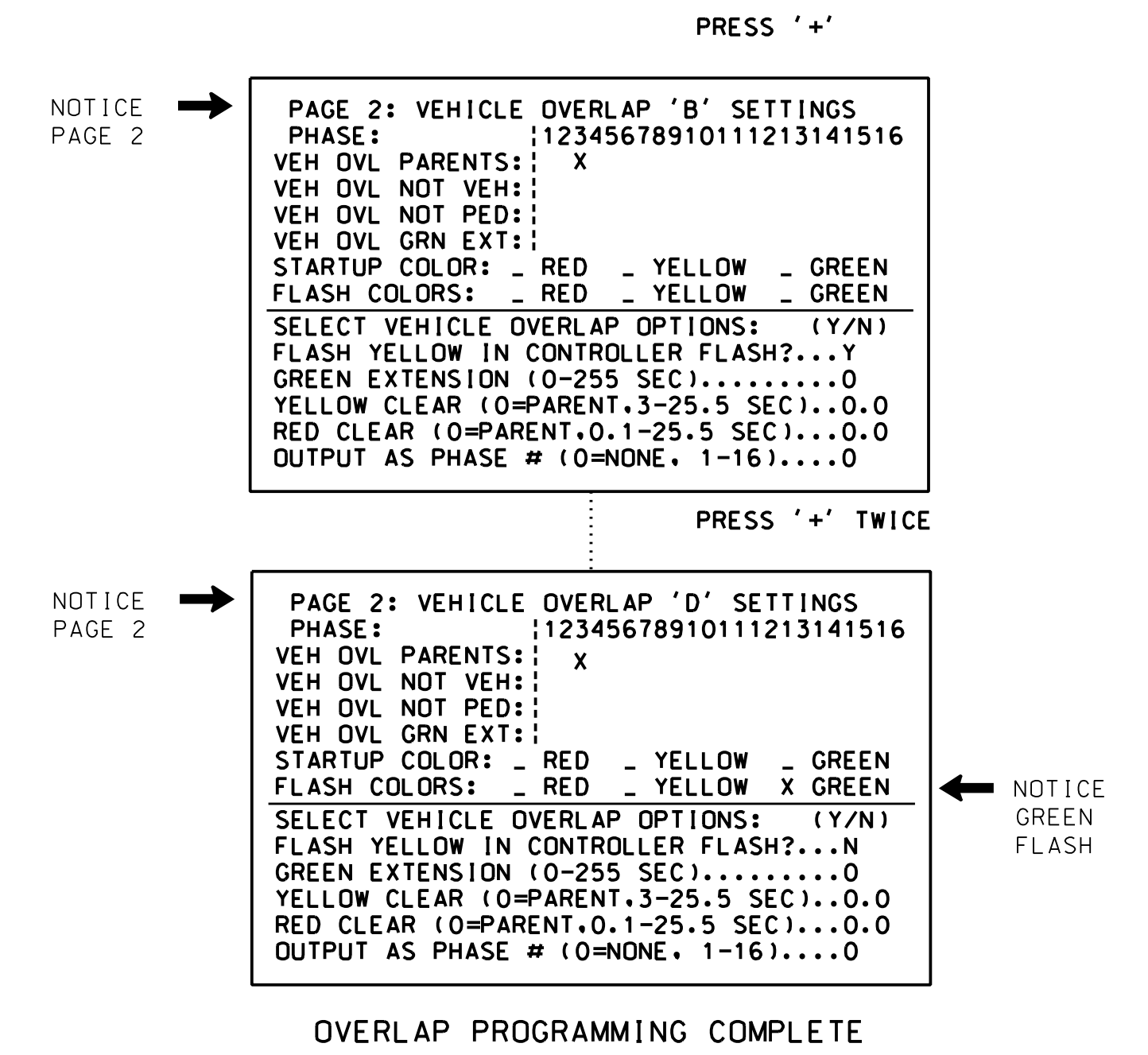
- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



**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.



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1129
DESIGNED: February 2018
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REVISED: N/A

Electrical Detail - Sheet 2 of 4
New Installation

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(919) 546-8997

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for:

750 N. Greenfield Pkwy, Corner, NC 27529

US 17 (Market Street) at SR 1345 (Alexander Road)	
Division 03	New Hanover Co. Wilmington
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons
REVISIONS	INIT. DATE

SEAL

DocuSigned by:
W. Tisha R. Simmons 8/1/2018

SIGNATURE DATE

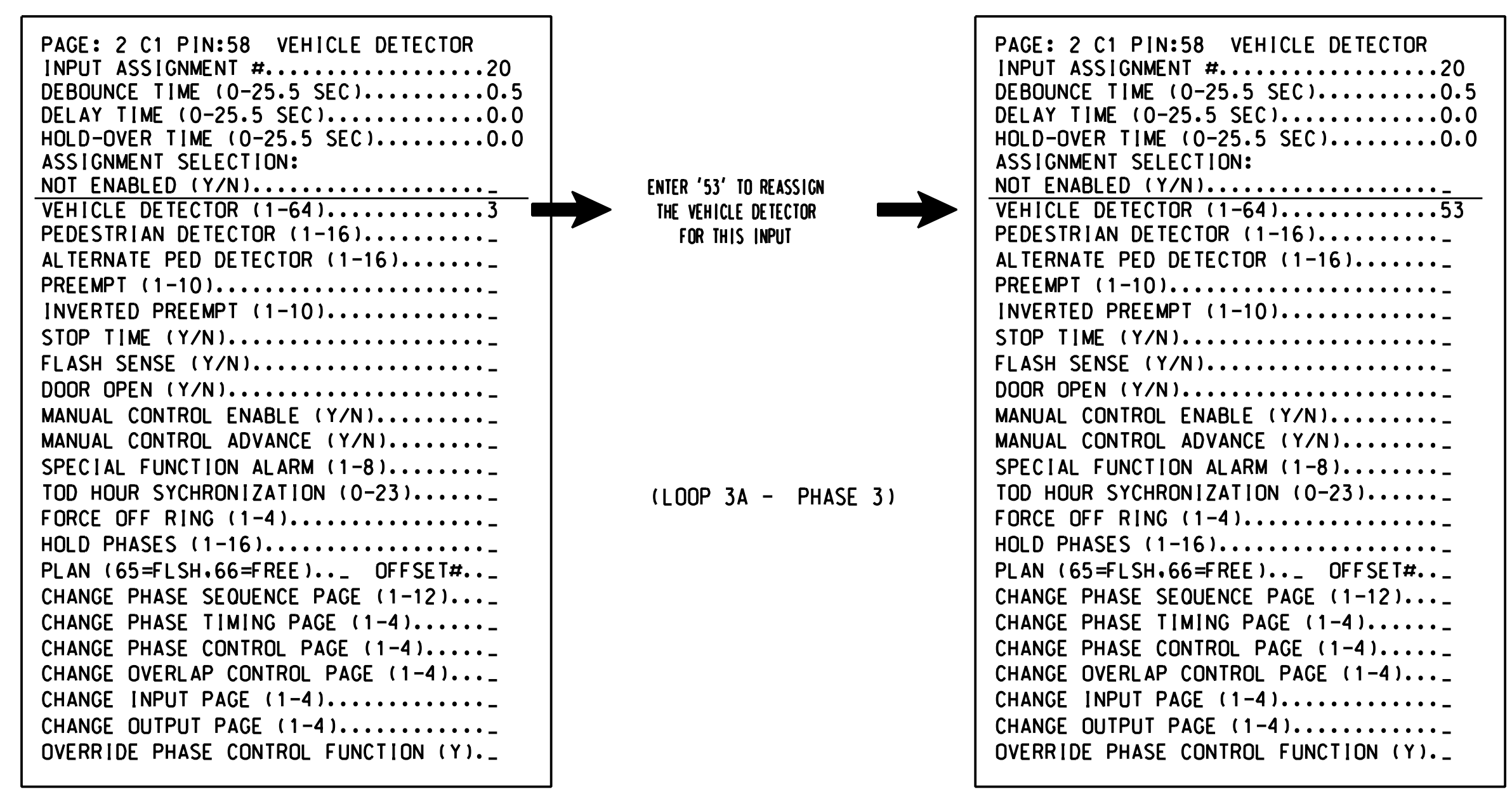
SIG. INVENTORY NO. 03-1129

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 3A

(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 TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 53 TO INPUT #20 SO THAT THE DELAY ON LOOP 3A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 20 IS REACHED.

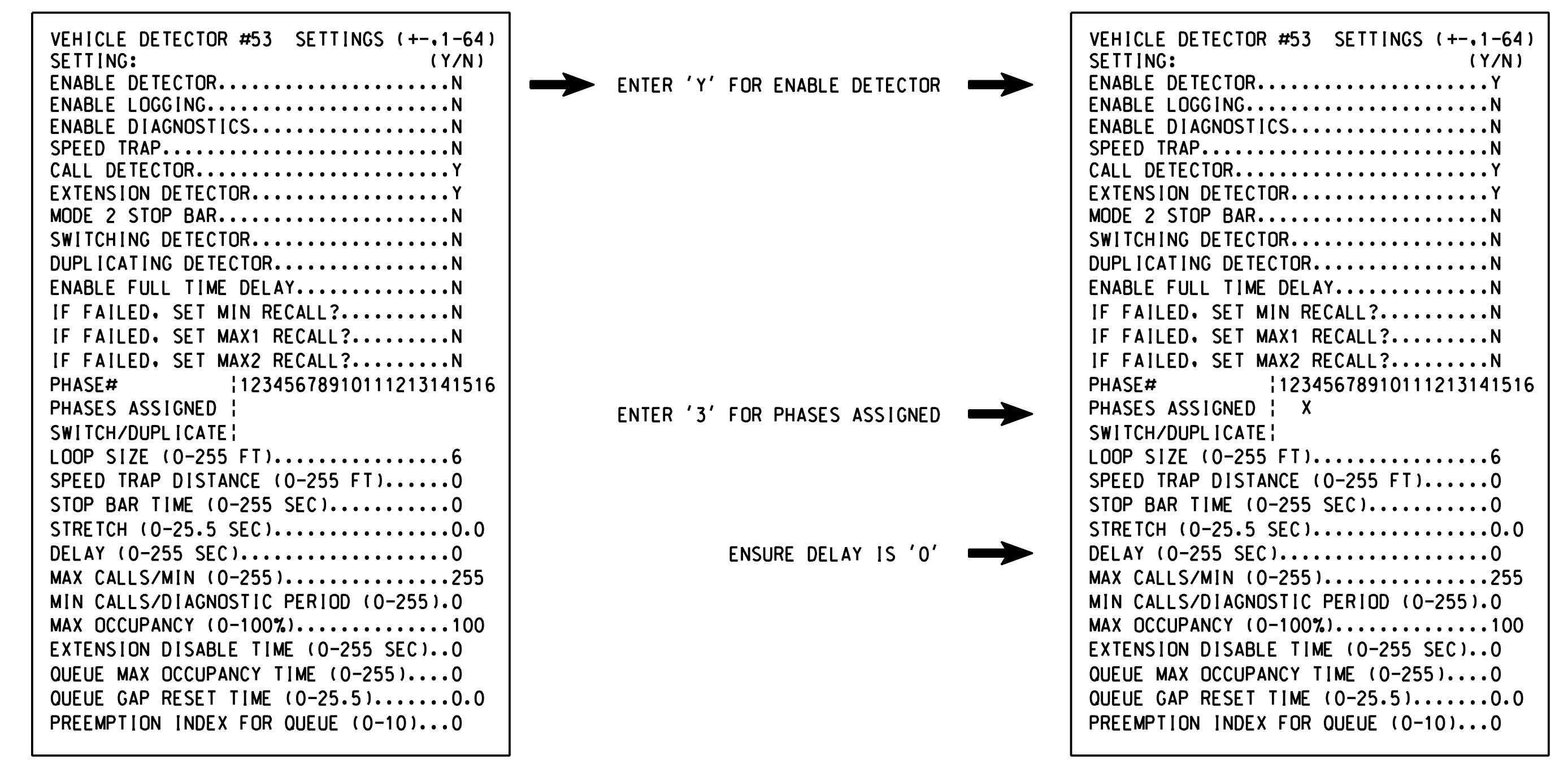


PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 3A (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 #53.



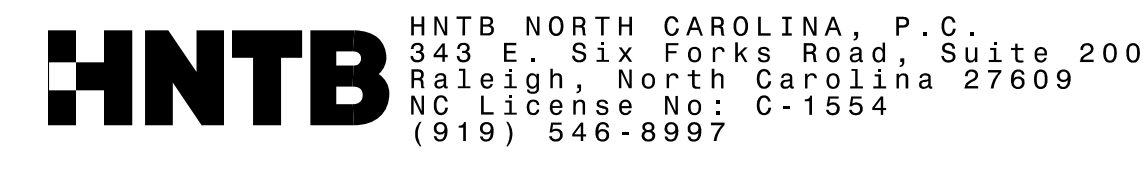
DETECTOR PROGRAMMING COMPLETE

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

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REVISED: N/A

Electrical Detail - Sheet 3 of 4
New Installation

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	US 17 (Market Street) at SR 1345 (Alexander Road)		
	Division 03 New Hanover Co. Wilmington		
Prepared for: PLAN DATE: February 2018 PREPARED BY: A.H. Thornburg	REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons	REVISIONS INIT. DATE	DocuSigned by: Natasha R. Simmons 8/1/2018 SIGNATURE DATE SIG. INVENTORY NO. 03-1129

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phase for head 31 to run protected turn only.

INPUTS PAGE 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.


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 REVISED: N/A

Electrical Detail - Sheet 4 of 4
 New Installation

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:


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US 17 (Market Street) at SR 1345 (Alexander Road)	
Division 03	New Hanover Co. Wilmington
PLAN DATE: February 2018	REVIEWED BY: A.D. Klinksiek
PREPARED BY: A.H. Thornburg	REVIEWED BY: N.R. Simmons
REVISIONS	INIT. DATE

SEAL

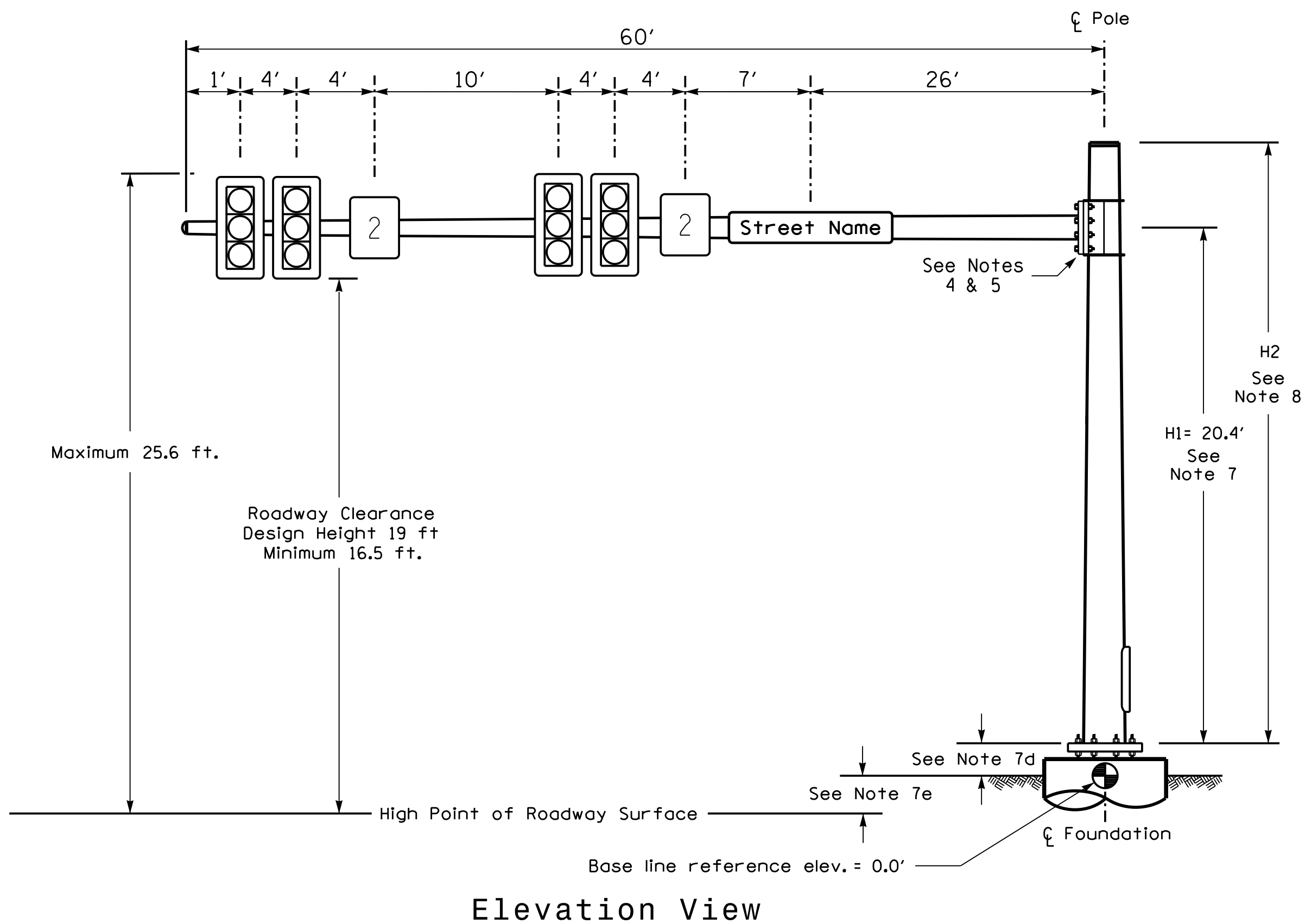
NORTH CAROLINA
 PROFESSIONAL
 SEAL
 031464
 ENGINEER
 NATASHA R. SIMMONS

DocuSigned by:
 Natasha R. Simmons 8/1/2018

SIGNATURE DATE

SIG. INVENTORY NO. 03-1129

Design Loading for METAL POLE NO. 1

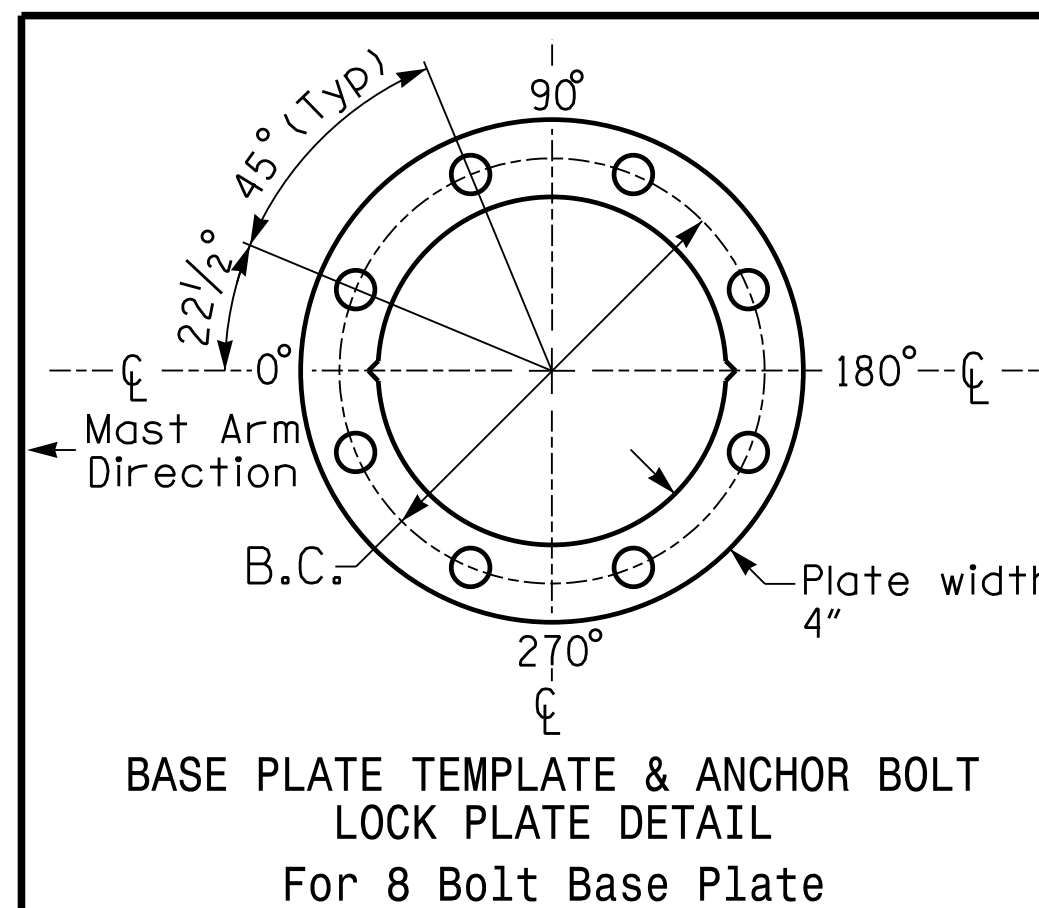
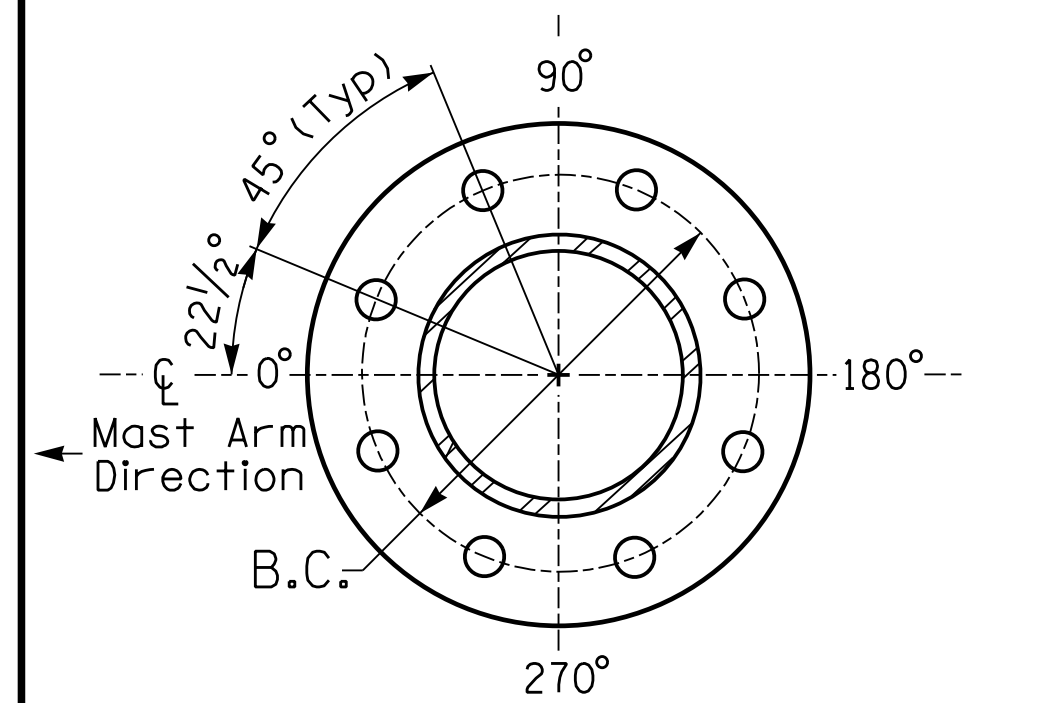
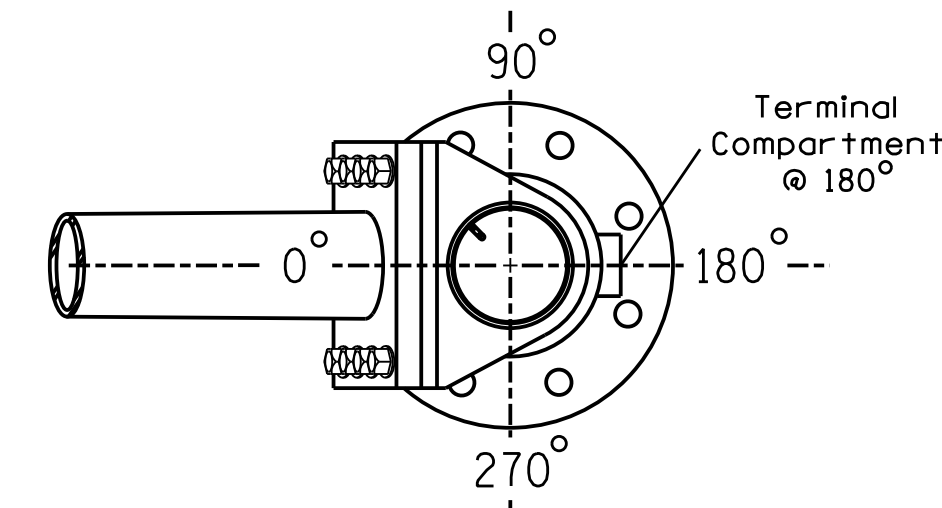


SPECIAL NOTE

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

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	-0.07 ft.	
Elevation difference at Edge of travelway or face of curb	-0.65 ft.	



METAL POLE NO. 1

PROJECT REFERENCE NO.	SHEET NO.
U-4902D	Sig. 9.5

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

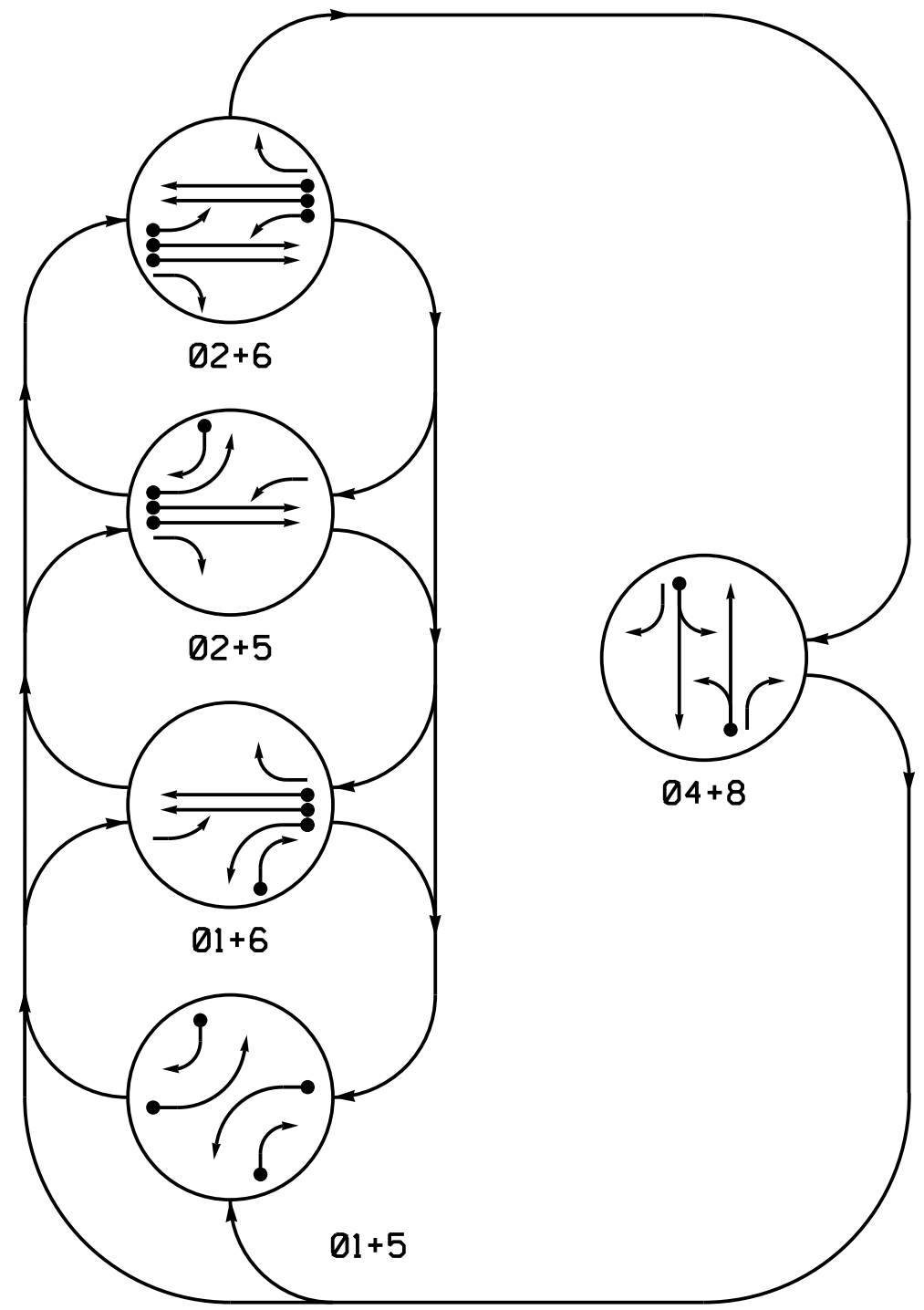
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the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

NCDOT Wind Zone 2 (130 mph)

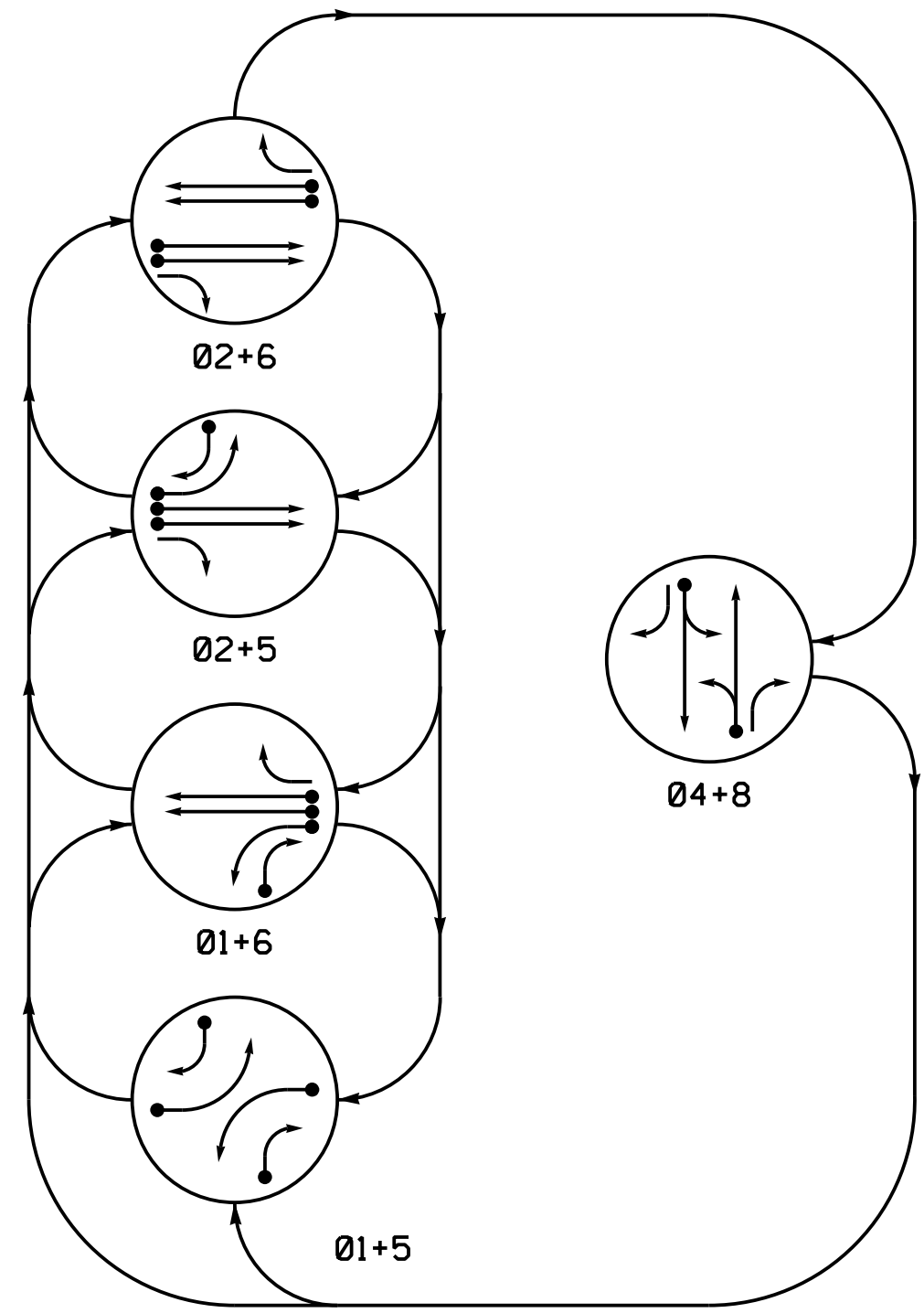
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	US 17 (Market Street) at SR 1345 (Alexander Road)		
	Division 03 New Hanover Co. Wilmington	PLAN DATE: February 2018 REVIEWED BY: A.D. Klinsky	
SCALE 0 N/A N/A	REVISIONS INIT. DATE	SIGNATURE N. R. Simmons 8/1/2018	SIG. INVENTORY NO. 03-1129

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						FLASH
	01+5	01+6	02+5	02+6	04+8		
11							
21,22	R	R	G	G	R	Y	
41	R	R	R	R	G	R	
42	R	R	R	R	G	R	
51							
61,62	R	G	R	G	R	Y	
81,82	R	R	R	R	G	R	
83	F	F	R	R	F	R	

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						FLASH
	01+5	01+6	02+5	02+6	04+8		
11							
21,22	R	R	G	G	R	Y	
41	R	R	R	R	G	R	
42	R	R	R	R	G	R	
51							
61,62	R	G	R	G	R	Y	
81,82	R	R	R	R	G	R	
83	F	F	R	R	F	R	

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

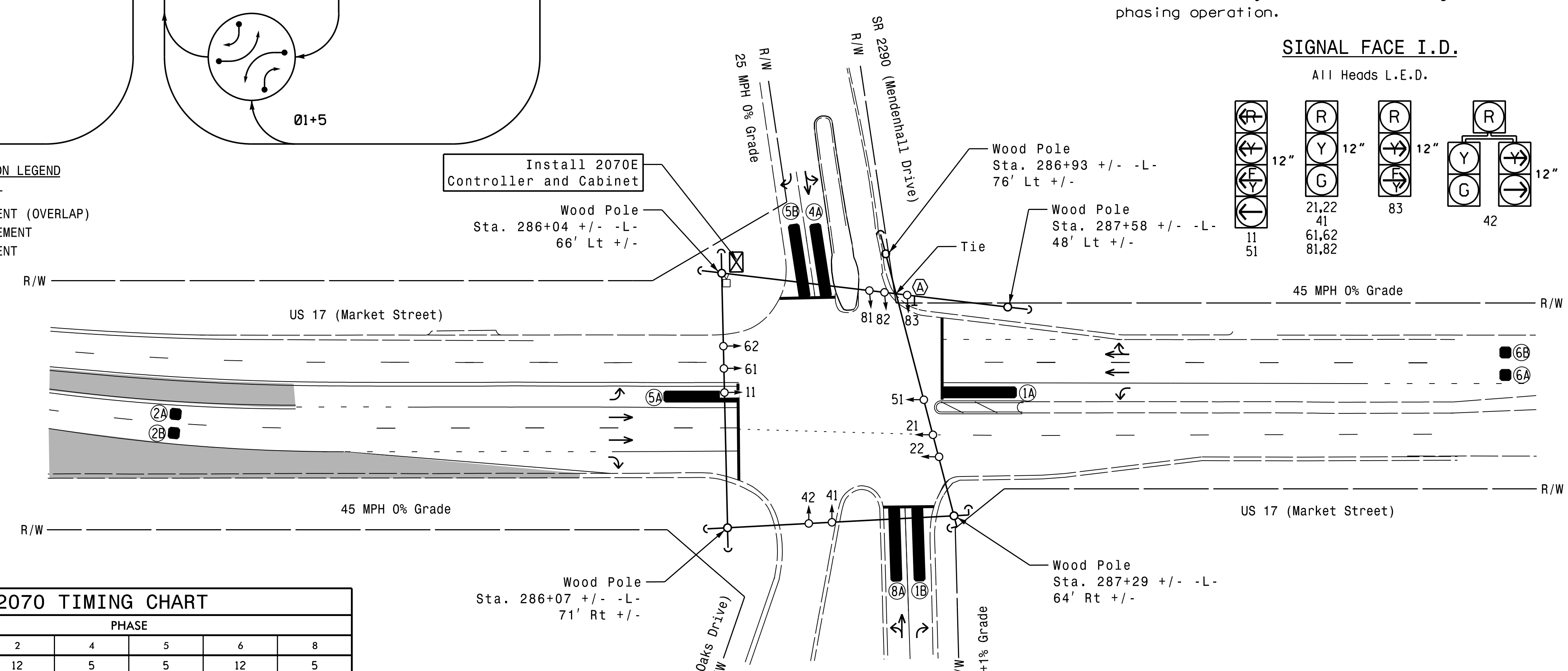
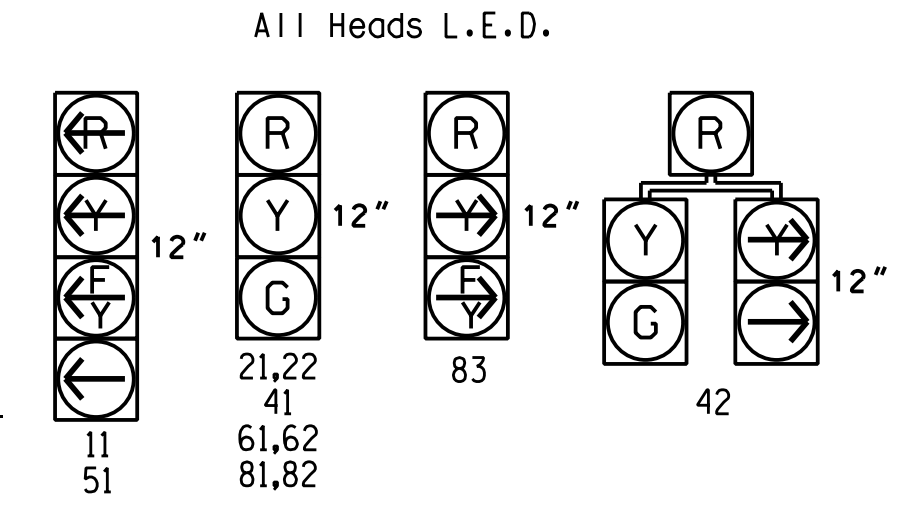
* Multizone Microwave Detection
 ** Disable phase 2 or 6 call for loops 1A and 5A during alternate phasing operation.
 *** Reduce delay to 3 seconds during alternate phasing operation.

5 Phase Fully Actuated Wilmington Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Incorporate Microwave Detection system for vehicle detection.
- Provide the Engineer with the Manufacturer's approved Microwave Detection locations and mounting heights to obtain detection zones as shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data: Controller Asset #1027

SIGNAL FACE I.D.



OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	5	12	5	5	12	5
Extension 1 *	2.0	5.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	90	20	15	90	20
Yellow Clearance	3.0	4.5	3.2	3.0	4.5	3.1
Red Clearance	2.6	1.7	3.0	2.9	1.7	3.0
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	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ Traffic Signal Head
○→ Modified Signal Head	N/A
○→ Pedestrian Signal Head With Push Button & Sign	N/A
○→ Signal Pole with Guy	●→ Signal Pole with Guy
○→ Signal Pole with Sidewalk Guy	●→ Signal Pole with Sidewalk Guy
□→ Inductive Loop Detector	□→ Inductive Loop Detector
□→ Controller & Cabinet	□→ Controller & Cabinet
□→ Junction Box	□→ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A	→ Right of Way
→ Directional Arrow	→ Directional Arrow
--- Directional Drill	N/A
■ Microwave Detection Zone	■ Microwave Detection Zone
■ Construction Zone	N/A
ⓐ "RIGHT TURN MUST YIELD TO U-TURN" Sign	ⓐ "RIGHT TURN MUST YIELD TO U-TURN" Sign

Signal Upgrade
 Temporary Design 1
 Construction Phase I

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	Prepared for: TRANSPORTATION MOBILITY AND SAFETY DIVISION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Cary, NC 27529	US 17 (Market Street) at SR 2734 (Marsh Oaks Drive) / SR 2290 (Mendenhall Drive) Division 03 New Hanover Co. Wilmington PLAN DATE: February 2018 REVIEWED BY: A.D. Klinksiek PREPARED BY: A.H. Thornburg REVIEWED BY: N.R. Simmons	SEAL
	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997	SCALE 0 40 1" = 40'	REVISIONS INIT. DATE 8/1/2018 N. R. Simmons DATE 8/1/2018 SIG. INVENTORY NO. 03-102771