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Project No.	Sheet No.
U–5169	Sig. 1.0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

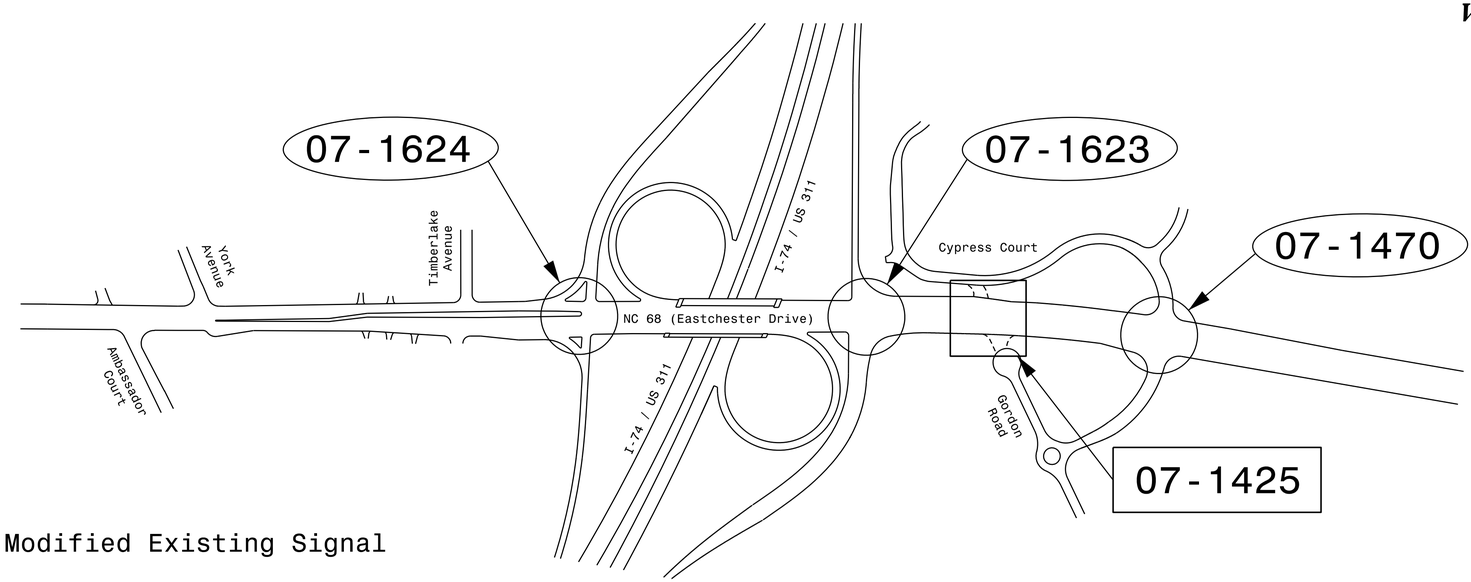
Guilford County

LOCATION: *NC 68 (EACTCHESTER DRIVE) FROM I–74 /US 311 RAMPS TO CYPRESS COURT IN HIGH POINT*

TYPE OF WORK: *TRAFFIC SIGNALS*

NAD 83/95

VICINITY MAP



07-XXXX New or Modified Existing Signal

07-XXXX Existing Signal to be Removed

Project: U–5169

Contract: C204071

DAVENPORT

HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

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

Index of Plans

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Robert J. Ziemba, PE – Central Region Signals Engineer

Keith M. Mims, PE – Signal Equipment Design Engineer

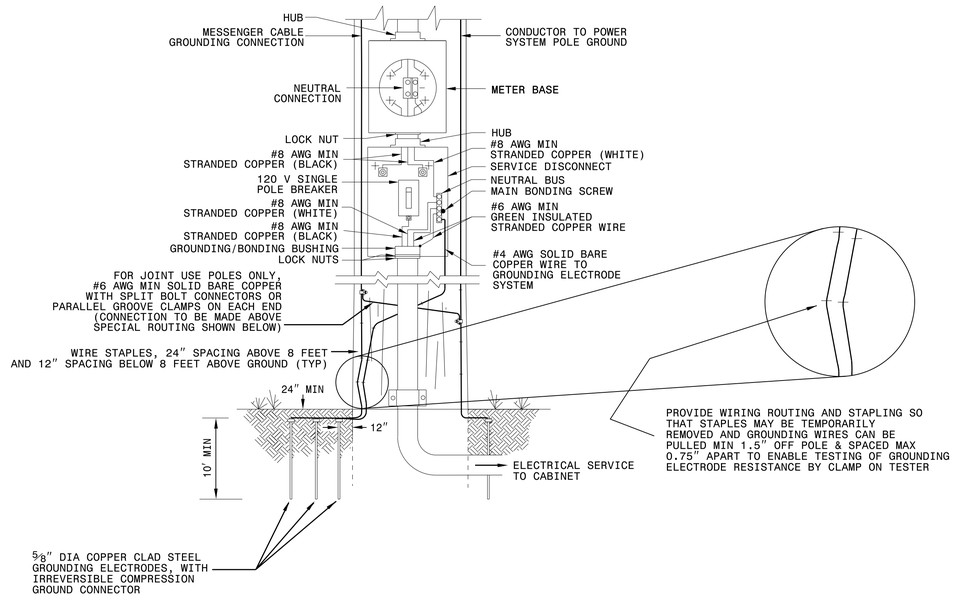
Prepared In the Office of:

DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

Transportation Mobility and Safety Division
ITS and Signals Unit
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway, Garner, NC 27529
Telephone: (919) 773–2800

PROJECT NO.	SHEET NO.
U-5169	Sig.1.1



1-18

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

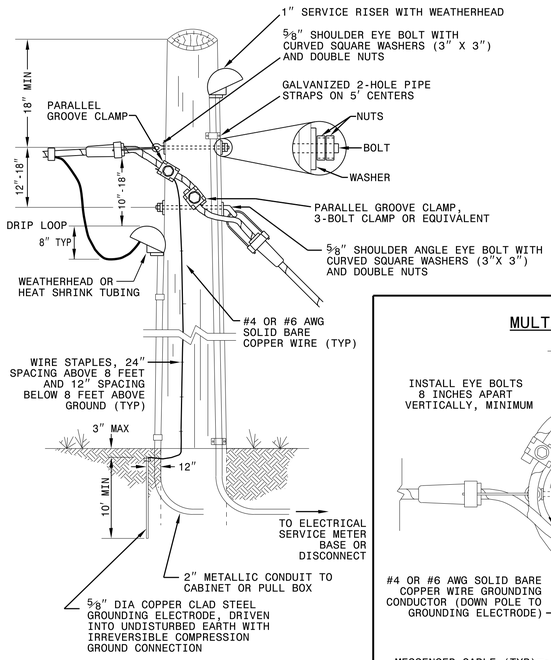
ENGLISH STANDARD DRAWING FOR

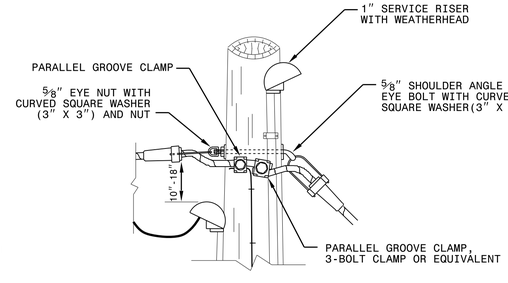
ELECTRICAL SERVICE GROUNDING

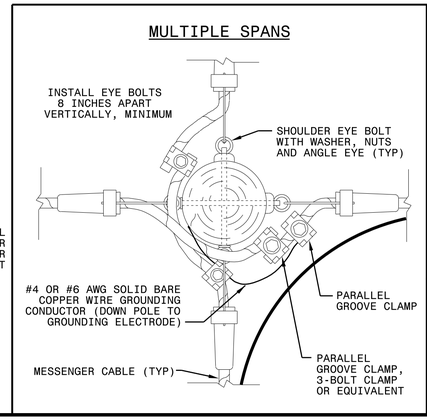
GROUNDING AND BONDING

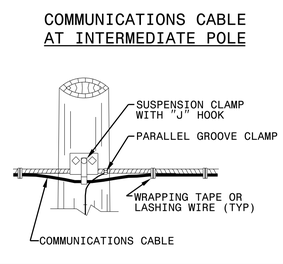
SHEET 1 OF 1

1700D01









NOTE

FOR CONNECTING MESSENGER TO MESSENGER, USE PARALLEL GROOVE CLAMP, 3-BOLT CLAMP OR EQUIVALENT. FOR CONNECTING COPPER WIRE TO MESSENGER, USE PARALLEL GROOVE CLAMP.

1-18

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

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See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

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PROFESSIONAL
SEAL
032108
ENGINEER
MOHD A. ASLAMI

DocuSigned by: Mohd Aslami
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10/11/2017
DATE

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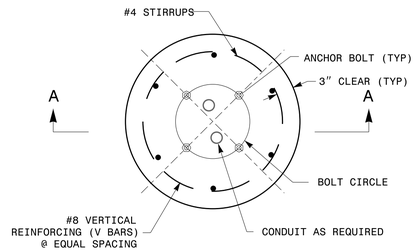
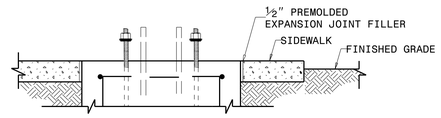
PROJECT NO.	SHEET NO.
U-5169	Sig.1.2



PEDESTAL FOUNDATION - PLAN VIEW

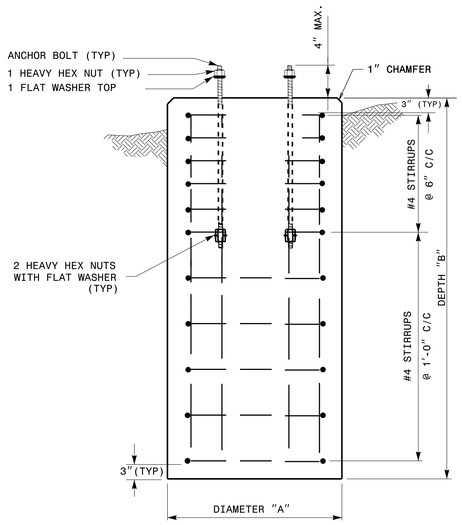


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

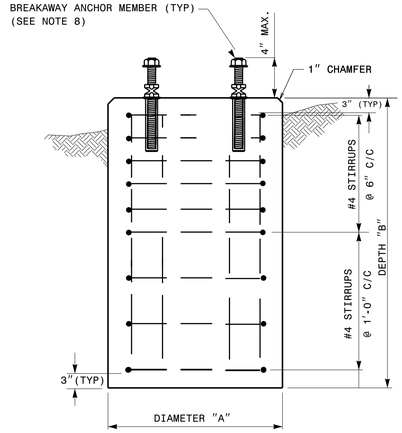
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



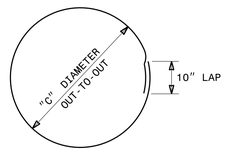
TYPES I, II & III

SECTION A-A

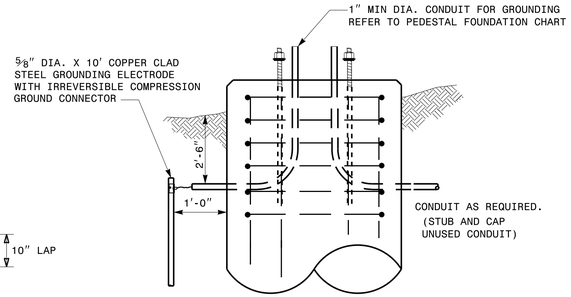


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-18

ENGLISH STANDARD DRAWING FOR

PEDESTALS

FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
ITS & Signals Unit
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

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028094
ENGINEER
DEBESH C. SARKAR

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Debesh C. Sarkar
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PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 2.0

PHASING DIAGRAM

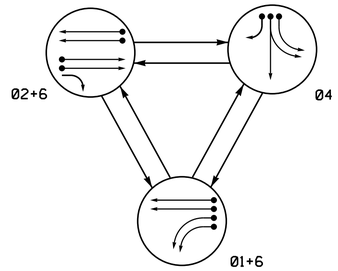
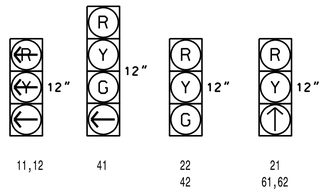


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	FLASH
11,12	←	~~R~~	~~R~~	~~R~~
21	R	↑	R	Y
22	R	G	R	Y
41	R	R	G ←	R
42	R	R	G	R
61,62	↑	↑	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP / ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Y	Y	-	-	3	-	-
1B	6X60	0	2-4-2	-	1	Y	Y	-	-	-	-	-
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	**	300	**	**	6	Y	Y	-	1.6	-	-	**
6B,6C	6X6	90	EXIST	-	6	Y	Y	-	-	-	-	-
S1	*	+220	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+220	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection
** Single Zone Microwave Detection Zone

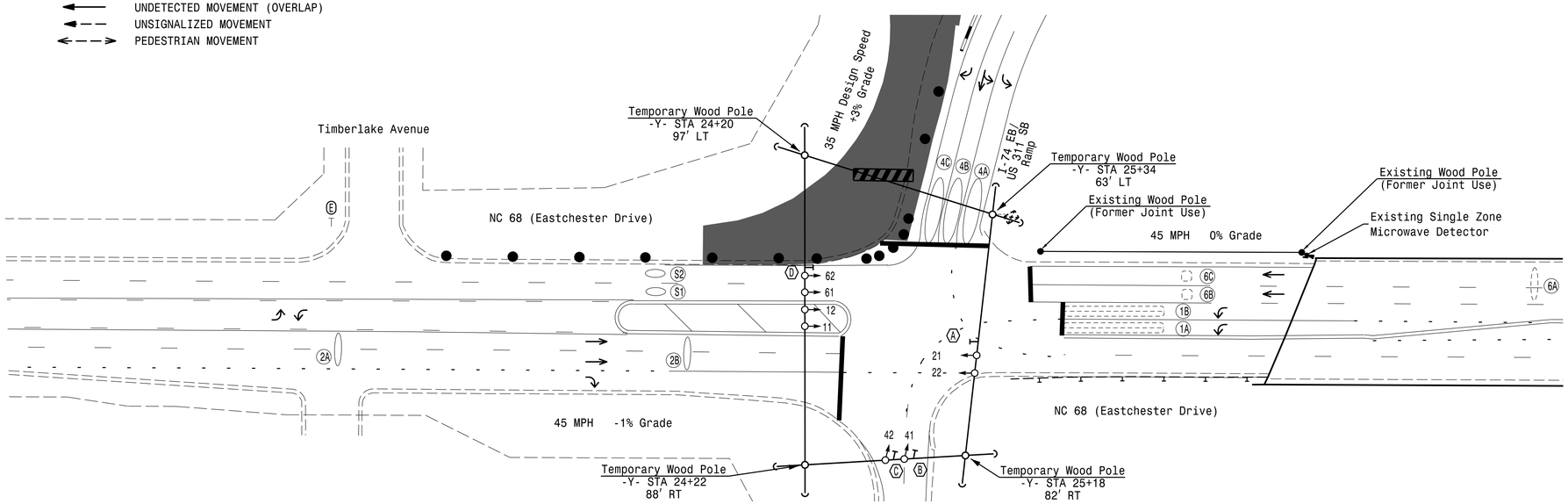
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement marking are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



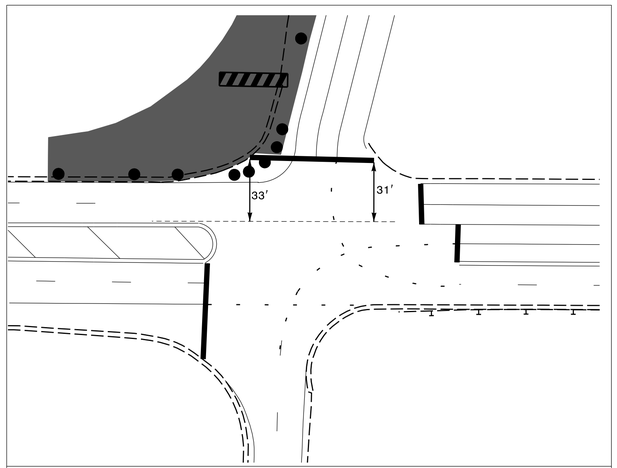
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊡↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○→	Signal Pole with Sidewalk Guy	●→
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	-----
→	Directional Arrow	→
N/A	Guardrail	I I
N/A	Curb Ramp	◢
▬	Construction Zone	▬
●▬●	Construction Zone Drums	●▬●
⋈	Single Zone Microwave Detector	⋈
⬭	Microwave Detection Zone	< >
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	7	12	7	12
Extension 1 *	3.0	2.0	2.0	2.0
Max Green 1 *	40	60	25	60
Yellow Clearance	3.0	4.6	3.7	4.5
Red Clearance	3.6	1.0	2.1	1.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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WINSTON-SALEM, NC 27101
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NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 1; TMP-6

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

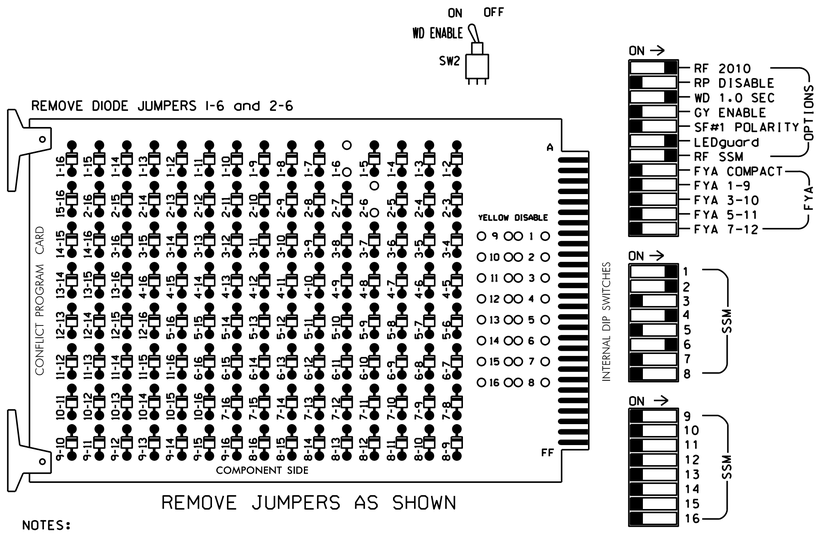
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624TI

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 2.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S5,S8
PHASES USED.....1,2,4,6
OVERLAPS.....NONE

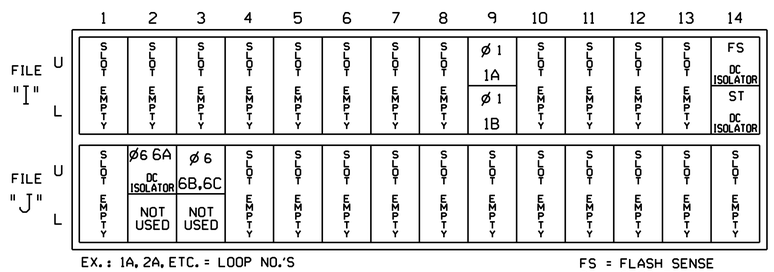
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW	125													
YELLOW ARROW	126													
GREEN ARROW	127	130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

* Note: Install a model 242 DC isolator in slot J2 for use with microwave detector. See the Microwave Detector Wiring Detail on sheet 2.

IMPORTANT: For proper operation of the microwave detector, remove surge protection from TB3-5 and TB3-6, and from TB3-7 and TB3-8.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP/ ZONE NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB6-9,10	I9U	60	22	11	1	Y	Y			3
1B	TB6-11,12	I9L	62	24	13	1	Y	Y			
★ 6A	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6B,6C	TB3-9,10	J3U	64	26	36	6	Y	Y			

★ Microwave Pulse Detector (See Wiring Detail Sheet 2).

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multiple zone microwave detection system for vehicle detection zones 2A, 2B, 4A, 4B, 4C, S1, and S2. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1624T1
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Temporary Design 1; TMP-6
Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
North Carolina Department of Transportation, Traffic Engineering Branch, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

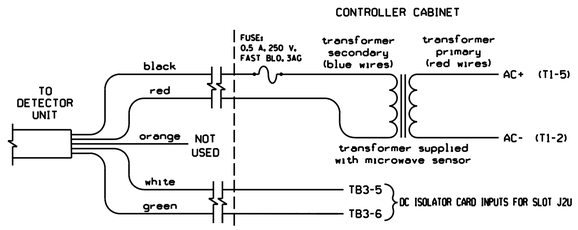
DocuSigned by: R Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 2.2

TYPICAL MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on a pole as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact on the microwave detector.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB3-5, TB3-6, TB3-7, and TB3-8 and insert 242 DC Isolator in slot J2.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 2 (PIN 40) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```
PAGE: 1 C1 PIN:40  NOT ENABLED
INPUT ASSIGNMENT #.................2
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64)............_
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................_
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

ENTER 'YES' for Not Enabled

```
PAGE: 1 C1 PIN:0  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................64
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).............6
PEDESTRIAN DETECTOR (1-16).........._
ALTERNATE PED DETECTOR (1-16)......._
PREEMPT (1-10)......................_
INVERTED PREEMPT (1-10)............._
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..65 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 '6' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

THE PROGRAMMING SHOWN BELOW WILL INVERT THE INPUT FROM THE MICROWAVE DETECTOR SO A CALL IS PLACED ON THE ASSOCIATED DETECTOR WHEN THE NORMALLY CLOSED OUTPUT OPENS UP.

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

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT ASSIGNMENT   #2  IS ON

          SCROLL DOWN

THEN:
SET INPUT  ASSIGNMENT #64 OFF
```

NOTE: TC-26B CONTACTS ARE CLOSED. SO NO CALL IS 'DETECTED'.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  INPUT ASSIGNMENT   #2  IS OFF

          SCROLL DOWN

THEN:
SET INPUT  ASSIGNMENT #64 ON
```

NOTE: TC26-B CONTACTS ARE OPEN. SO A CALL IS 'DETECTED'.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

REFERENCE SCHEDULE

* INPUT 2 = Microwave Detector Physical Input (Not Enabled)
* INPUT 64 = Dummy Microwave Detector Input (Detector 6)

* Input Remapped (See programming at left)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1624T1
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Temporary Design 1; TMP-6
Electrical Detail Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Project #: 170908

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 3.0

PHASING DIAGRAM

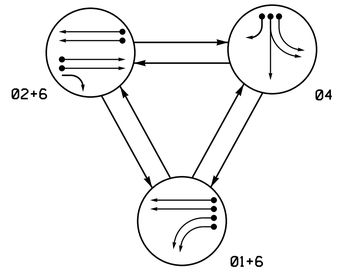
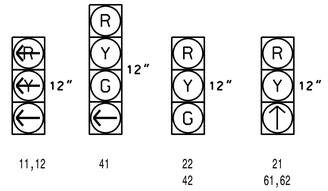


TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	FLASH
11,12	←	~~R~~	~~R~~	~~R~~
21	R	↑	R	Y
22	R	G	R	Y
41	R	R	G	R
42	R	R	G	R
61,62	↑	↑	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	3	-	*
1B	*	0	*	*	1	Y	Y	-	-	-	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+220	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+220	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

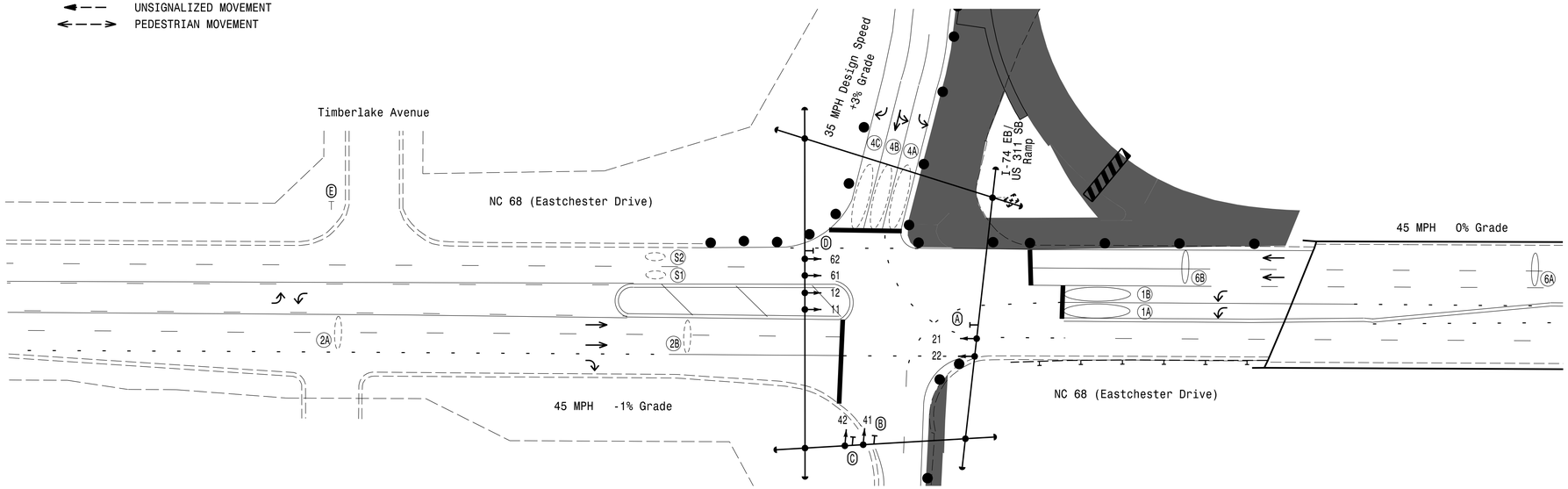
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Reposition existing signal heads numbered 41 and 42, and signs B and C.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

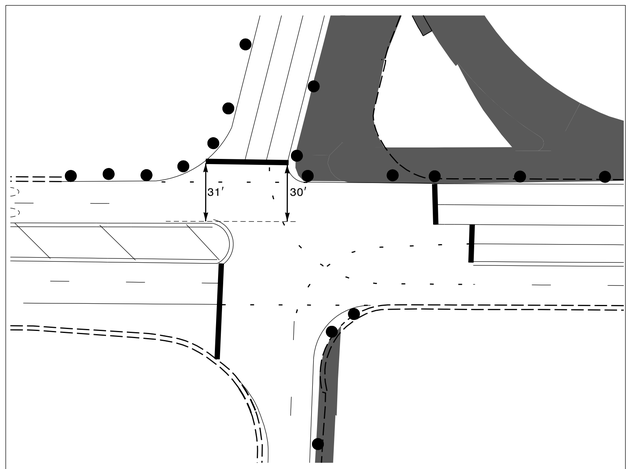
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	7	12	7	12
Extension 1 *	3.0	2.0	2.0	2.0
Max Green 1 *	40	60	25	60
Yellow Clearance	3.0	4.6	3.7	4.5
Red Clearance	3.6	1.0	2.6	1.9
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊡	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	-----
→	Directional Arrow	→
N/A	Guardrail	⊥⊥
N/A	Curb Ramp	◢
▬	Construction Zone	▬
▬	Construction Zone Drums	▬
⬭	Microwave Detection Zone	<-->
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

Project #: 170908

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Signal Upgrade - Temporary Design 2; TMP-14

Prepared for: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Transportation Mobility and Safety Division Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

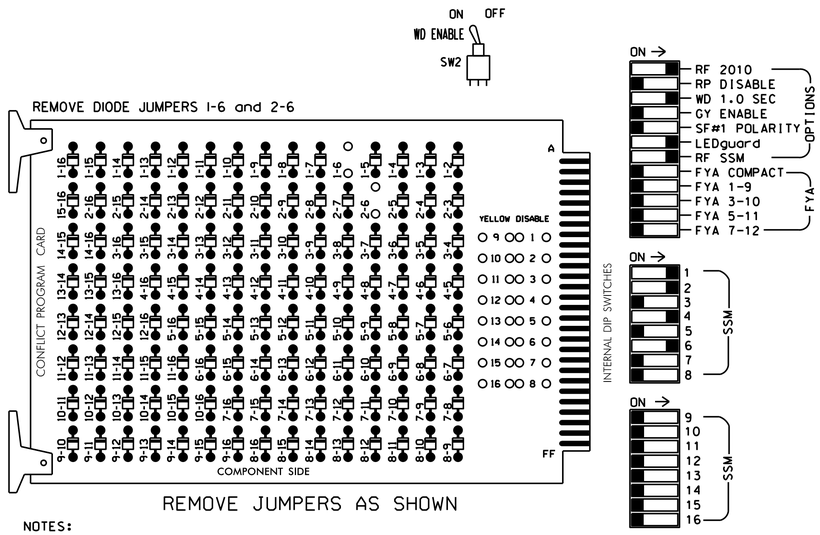
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 3.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S5,S8
PHASES USED.....1,2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW	125													
YELLOW ARROW	126													
GREEN ARROW	127	130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1624T2
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Electrical Detail - Temporary Design 2; TMP-14

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: Transportation Mobility and Safety Division, Department of Transportation, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

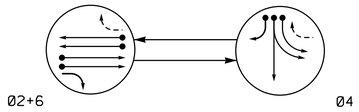
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 4.0

PHASING DIAGRAM



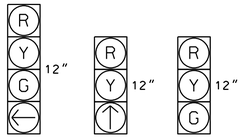
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21	┃	R	Y
22	G	R	Y
41	R	G	R
42	R	G	R
61,62	┃	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

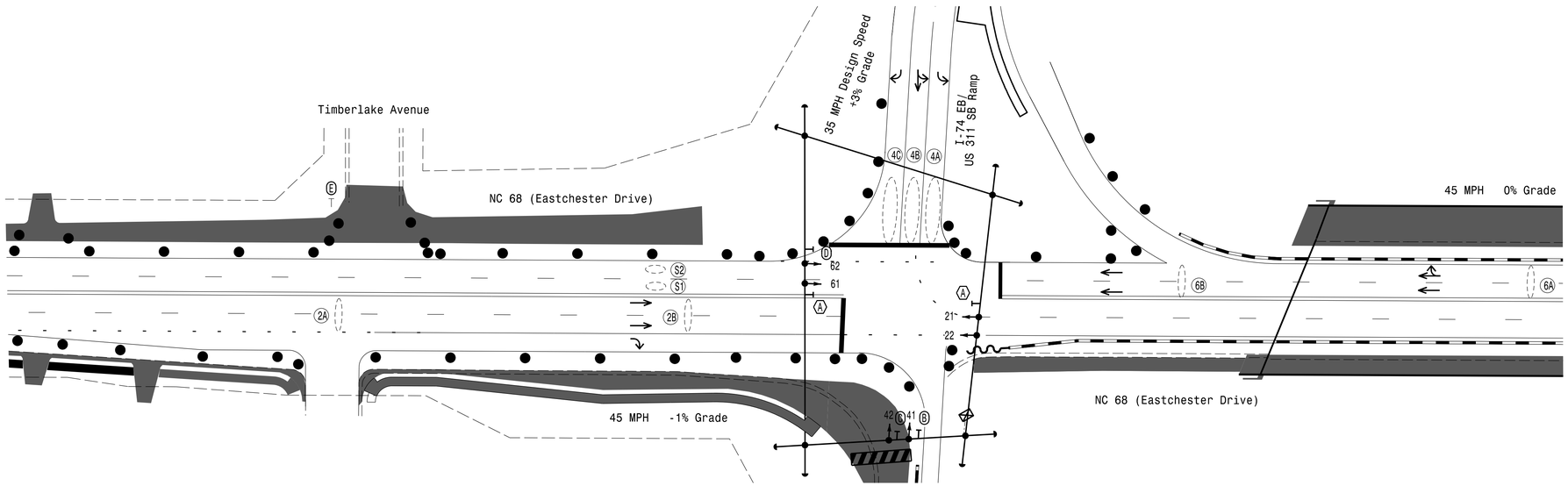
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+200	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+200	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

2 Phase
Fully Actuated
(High Point Signal System)

NOTES

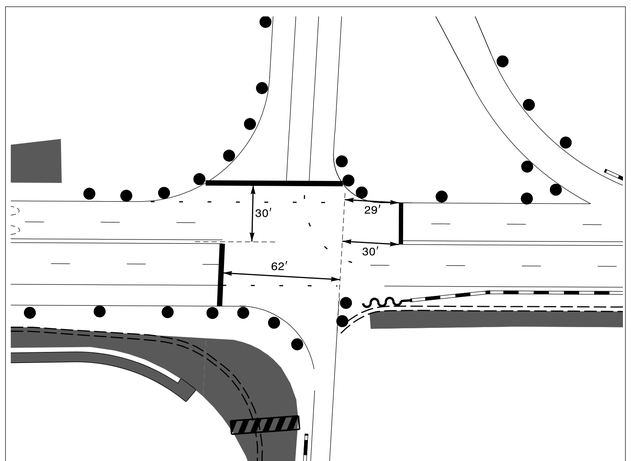
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered 21, 22, 41, and 42.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.0	1.6	1.2
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊡	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-·-·-	2-in Underground Conduit	-·-·-
N/A	Right of Way	- - - - -
→	Directional Arrow	→
N/A	Guardrail	⊥⊥
N/A	Curb Ramp	◢◣
▬	Construction Zone	▬
●—●	Construction Zone Drums	●—●
⬭	Microwave Detection Zone	⬭
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

Project #: 170908

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Signal Upgrade - Temporary Design 3; TMP-22

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

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

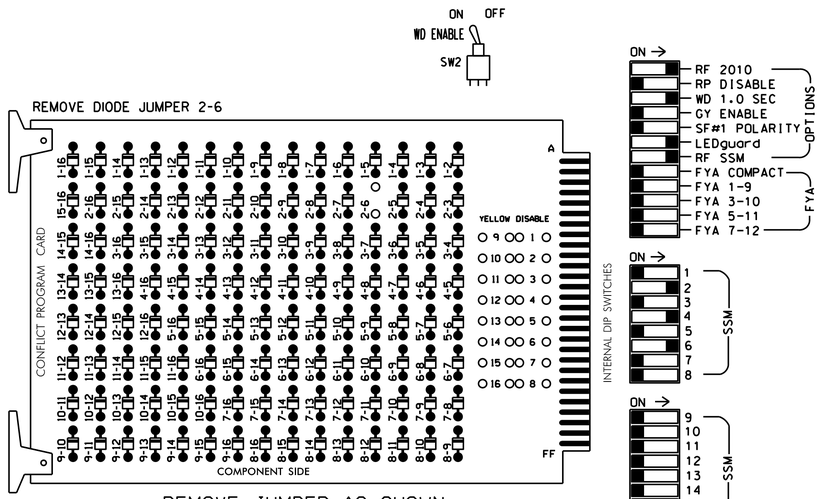
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162413

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 4.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW														
YELLOW ARROW														
GREEN ARROW		130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1624T3
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Temporary Design 3; TMP-22

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section, N.C. DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.,Garner,NC 27529

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

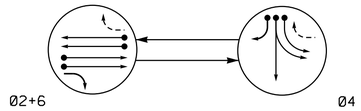
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T3

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 5.0

PHASING DIAGRAM



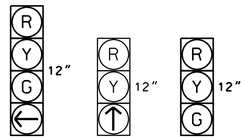
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21	G	R	Y
22	G	R	Y
41	R	G	R
42	R	G	R
61,62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

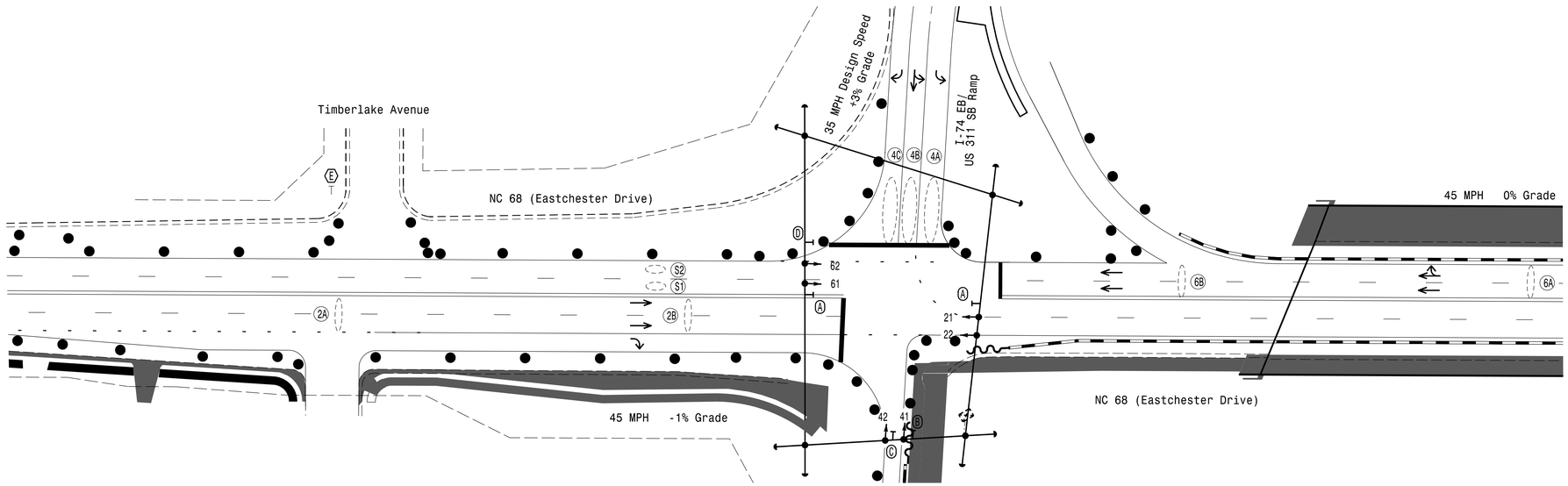
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+200	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+200	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

2 Phase
Fully Actuated
(High Point 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. Reposition existing signal heads numbered 41 and 42, and signs B and C.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement markings are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



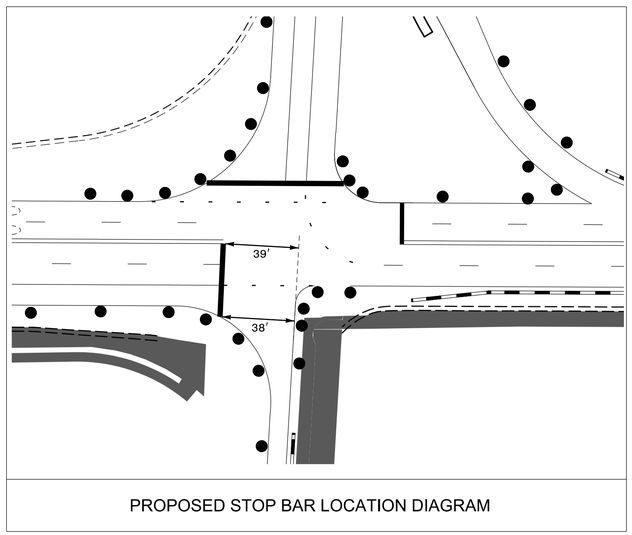
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
N/A	Guardrail	⊥
N/A	Curb Ramp	⩚
▬	Construction Zone	▬
▬	Construction Zone Drums	▬
⬭	Microwave Detection Zone	<-->
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.0	1.4	1.2
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 4 TMP-27

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, NCDOT, Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: L. Boyer

PREPARED BY: A. Ravipati REVIEWED BY: R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

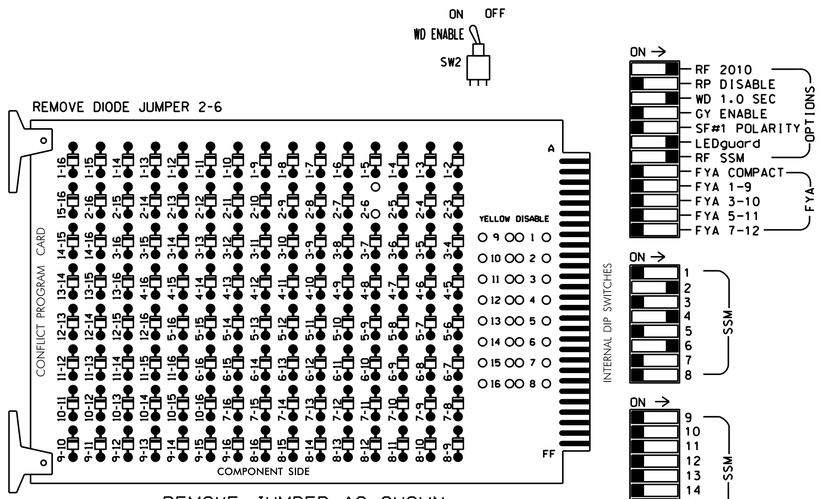
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-I624T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 5.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW														
YELLOW ARROW														
GREEN ARROW		130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1624T4
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Temporary Design 4; TMP-27

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for:
Transportation Mobility and Safety Division
NCDOT Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy.,Garner,NC 27529

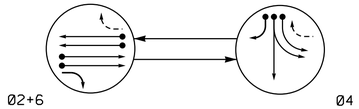
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 6.0

PHASING DIAGRAM



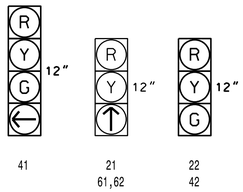
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21	†	R	Y
22	G	R	Y
41	R	G	R
42	R	G	R
61,62	†	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

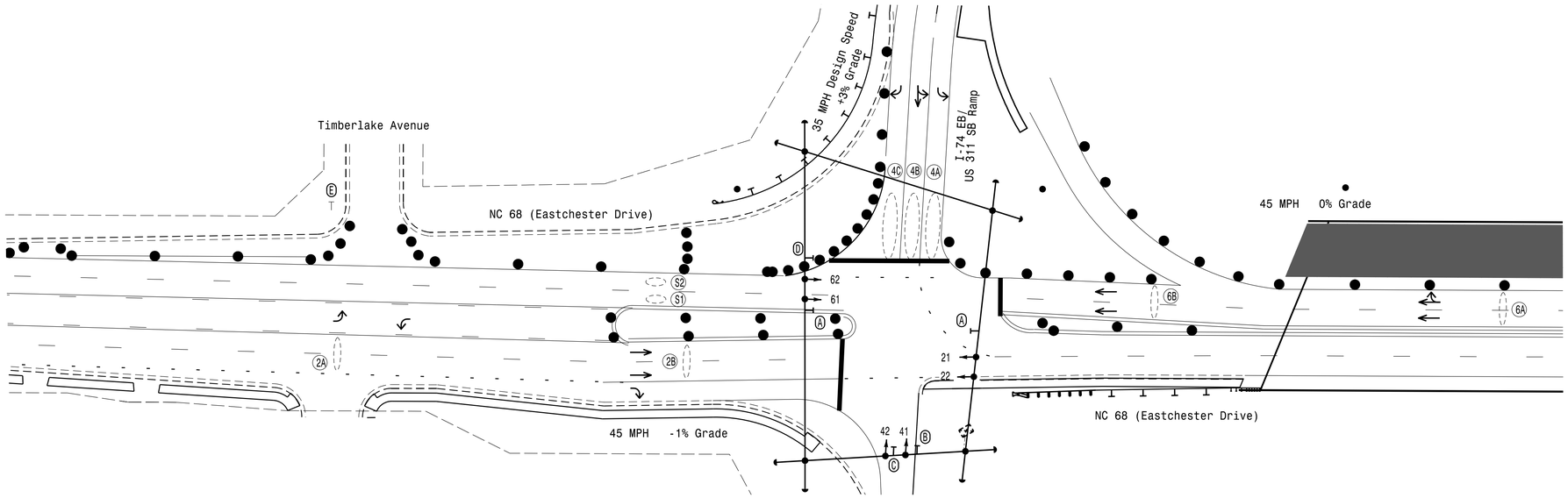
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+200	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+200	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

2 Phase
Fully Actuated
(High Point 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. Reposition existing signal heads numbered 21 and 22.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement markings are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



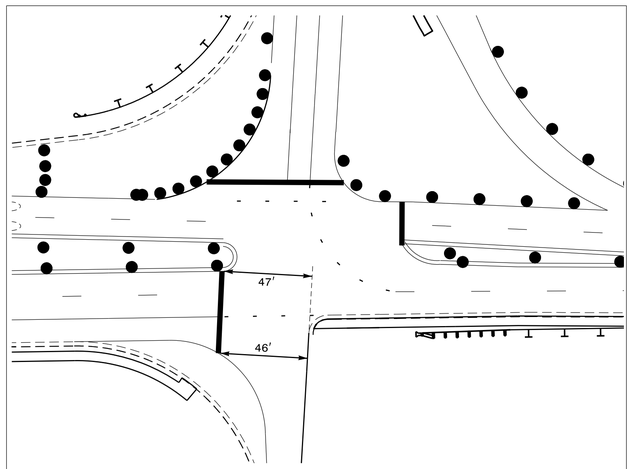
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
N/A	Guardrail	⊥
N/A	Curb Ramp	◢
▬	Construction Zone	▬
●—●	Construction Zone Drums	●—●
⬭	Microwave Detection Zone	⬭
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.0	1.9	1.2
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 5; TMP-29

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: L. Boyer

PREPARED BY: A. Ravipati REVIEWED BY: R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. HINSHAW

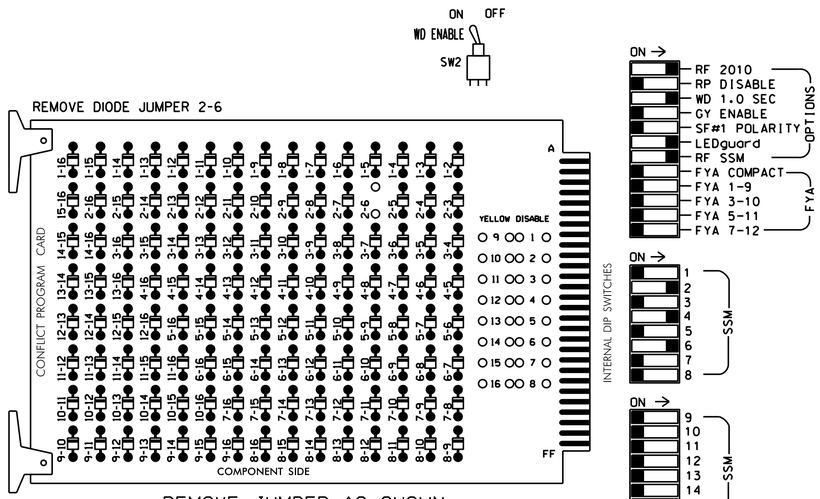
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-I624T5

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 6.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW														
YELLOW ARROW														
GREEN ARROW		130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1624T5
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Temporary Design 5; TMP-29

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

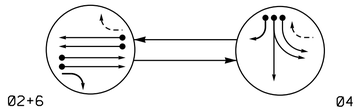
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T5

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 7.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

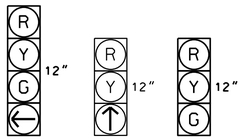
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21	↑	R	Y
22	G	R	Y
41	R	G	R
42	R	G	R
61,62	↑	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

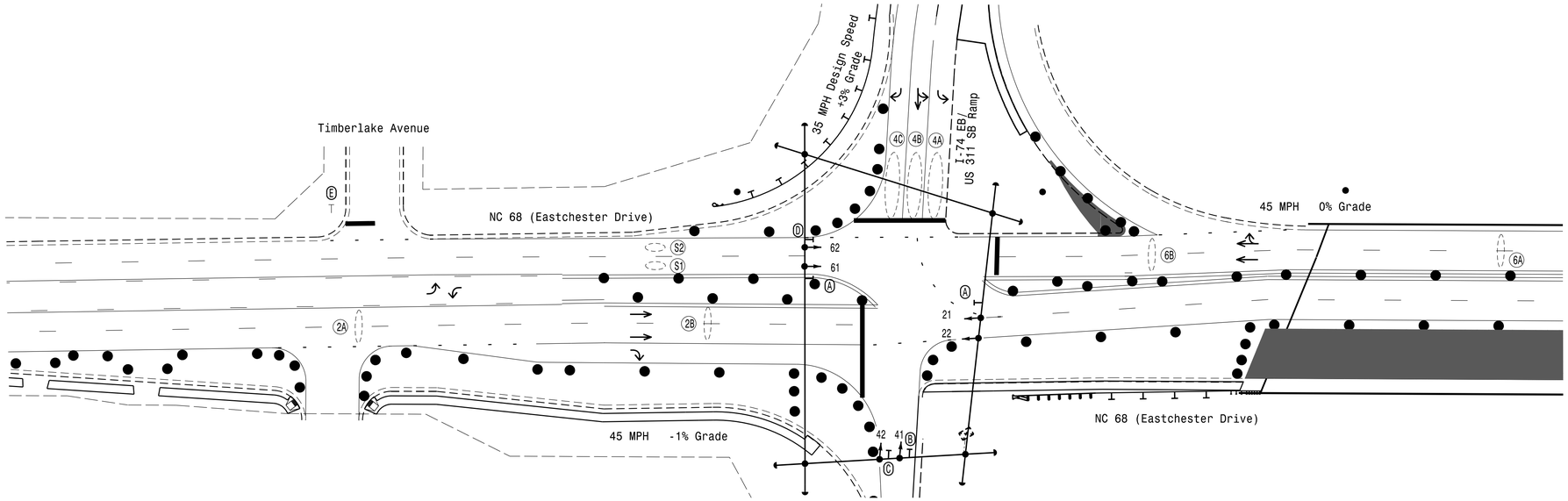
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
4C	*	0	*	*	4	Y	Y	-	-	15	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+200	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+200	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

2 Phase
Fully Actuated
(High Point 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. Reposition existing signal heads numbered 21, 22, 61, and 62.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement markings are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



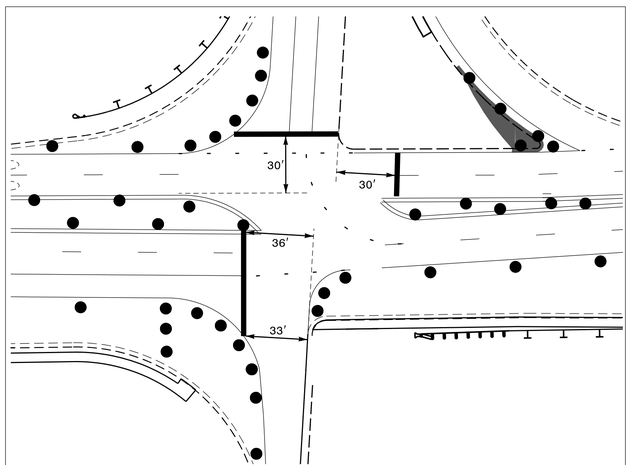
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-·-·-	2-in Underground Conduit	-·-·-
N/A	Right of Way	– – –
→	Directional Arrow	→
N/A	Guardrail	⫿
N/A	Curb Ramp	◢
▬	Construction Zone	▬
▬	Construction Zone Drums	●●●
⬭	Microwave Detection Zone	⬭
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.0	1.8	1.1
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 6; TMP-35

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

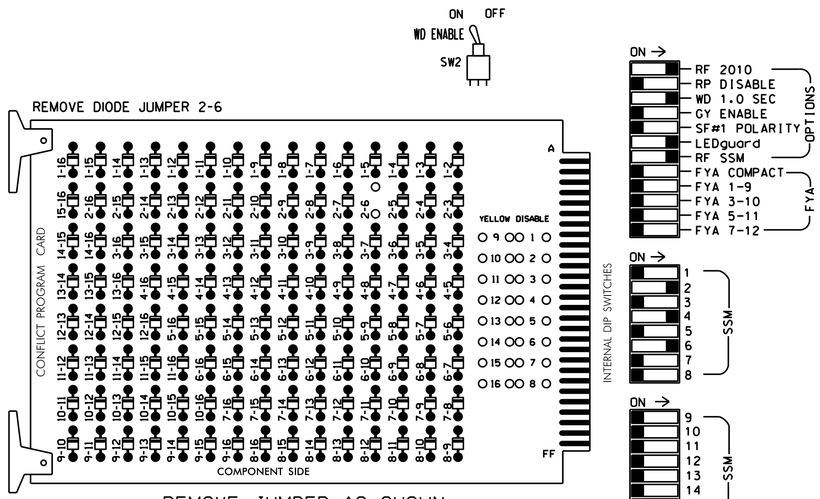
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162416

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 7.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

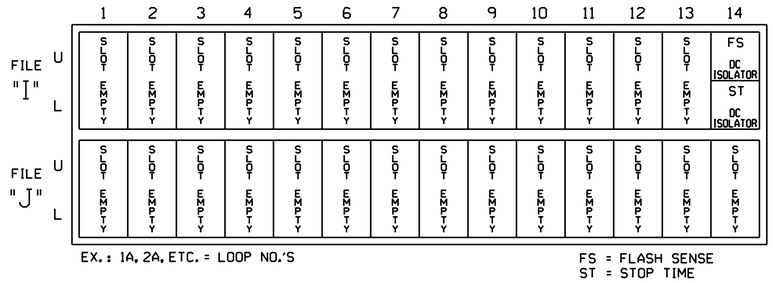
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2		S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2		13	3	4		14	5	6	15	7	8	16
PHASE	1	2		2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21	22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128	128			101	101			134				
YELLOW		129	129			102	102			135				
GREEN			130			103	103							
RED ARROW														
YELLOW ARROW														
GREEN ARROW		130				103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1624T6
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Temporary Design 6; TMP-35

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy,Garner,NC 27529

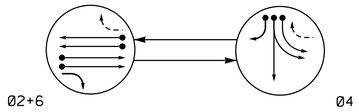
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T6

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 8.0

PHASING DIAGRAM



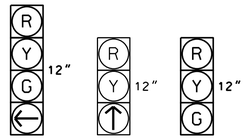
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	↑	R	Y
41	R	G	R
42	R	G	R
61,62	↑	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

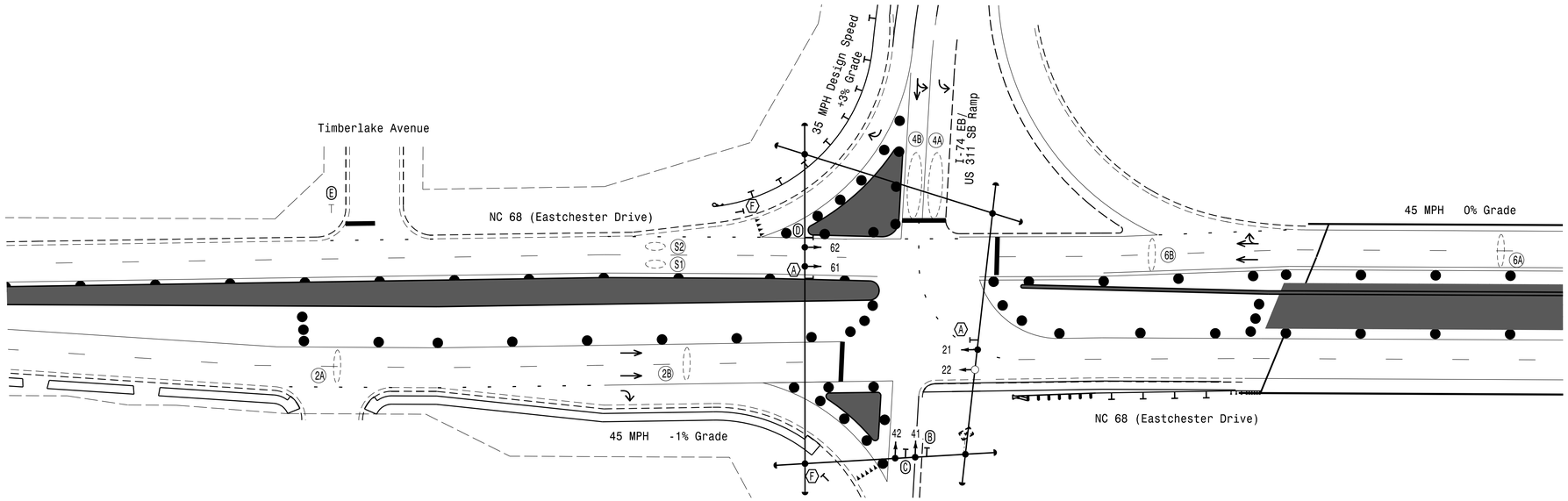
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
4B	*	0	*	*	4	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
S1	*	+200	*	*	-	Y	Y	-	-	-	Y	*
S2	*	+200	*	*	-	Y	Y	-	-	-	Y	*

* Multi-Zone Microwave Detection

2 Phase
Fully Actuated
(High Point 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. Reposition existing signal heads numbered 21, 22, 41, and 42.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during the temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement markings are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



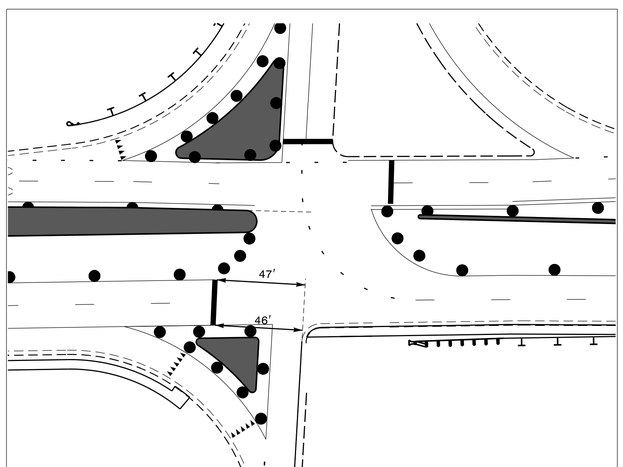
LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Though and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"STOP" Sign (R1-1)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.0	2.4	1.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 7; TMP-38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, NC DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

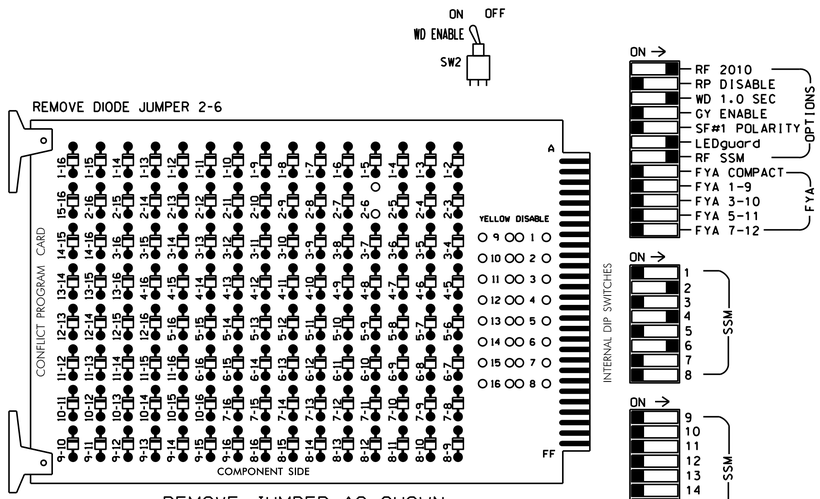
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162417

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 8.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPER AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4		14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101	101			134				
YELLOW		129			102	102			135				
GREEN					103	103							
RED ARROW													
YELLOW ARROW													
GREEN ARROW		130			103				136				

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1624T7
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
HOME OFFICE:
119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Electrical Detail Temporary Design 7; TMP-38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

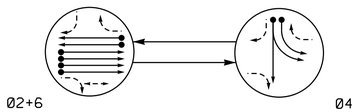
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624T7

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 9.0

PHASING DIAGRAM



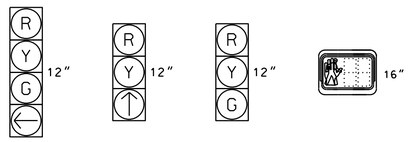
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21,22,23,24	↑	R	Y
41	R	G	R
42	R	G	R
61,62	↑	R	Y
P21,P22	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

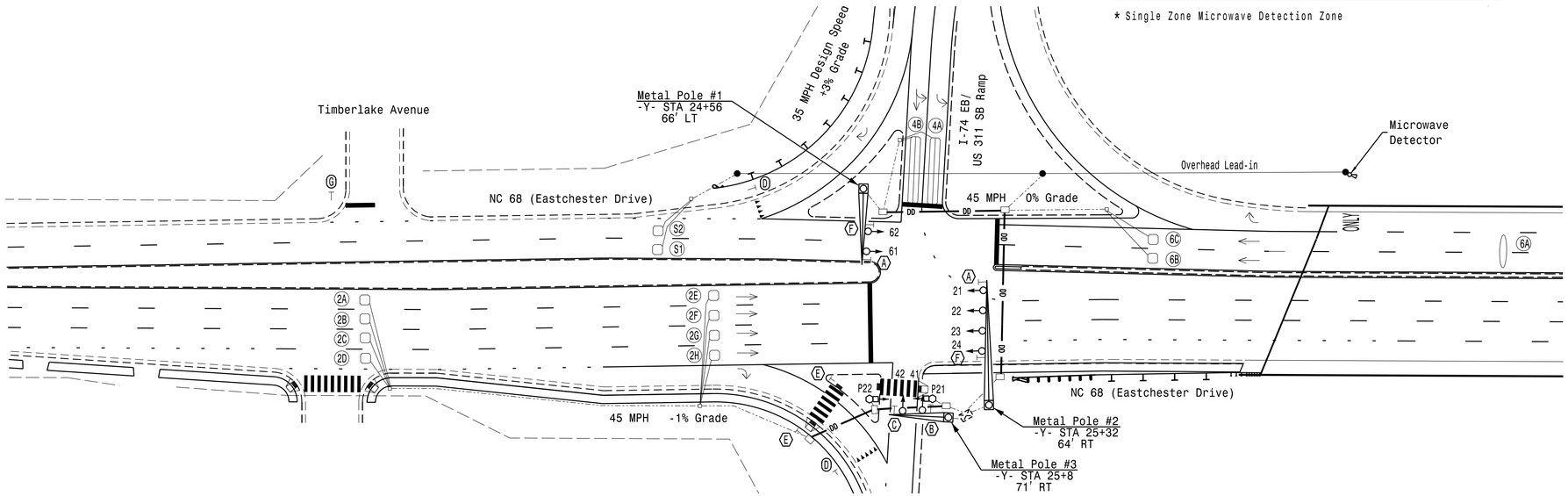
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP / ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2C	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2D	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2E	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
2F	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
2G	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
2H	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
6A *	*	300	*	Y	6	Y	Y	-	1.6	-	-	Y
6B	6x6	90	3	Y	6	Y	Y	-	-	-	-	Y
6C	6x6	90	3	Y	6	Y	Y	-	-	-	-	Y
S1	6x6	+200	5	Y	-	Y	Y	-	-	-	Y	Y
S2	6x6	+200	5	Y	-	Y	Y	-	-	-	Y	Y

* Single Zone Microwave Detection Zone

2 Phase
Fully Actuated
(High Point 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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



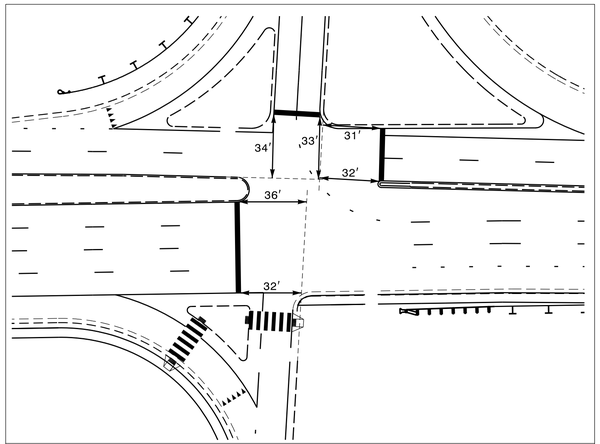
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
⊃	Metal Pole with Mastarm	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
▭	Oversize Junction Box	■
-·-·-	2-in Underground Conduit	-·-·-
—DD—	Directional Drill	N/A
N/A	Right of Way	- - - -
→	Directional Arrow	→
⊂	Microwave Detector	⊂
⬭	Microwave Detection Zone	⬭
N/A	Guardrail	⊥⊥
N/A	Curb Ramp	◢
Ⓐ	No U-Turn / No Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Combined Through and Left Arrow Sign (R3-6L)	Ⓒ
Ⓓ	"YIELD" Sign (R1-2)	Ⓓ
Ⓔ	Pedestrian Crossing Sign (W11-2) w/ Diagonal Arrow Plaque (W16-7p)	Ⓔ
Ⓕ	No Right Turn Sign (R3-1)	Ⓕ
Ⓖ	"STOP" Sign (R1-1)	Ⓖ

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	90	30	90
Yellow Clearance	4.6	3.7	4.5
Red Clearance	1.2	2.1	1.0
Walk 1 *	7	-	-
Don't Walk 1	4	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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NOBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Final Design

Prepared for: Transportation Mobility and Safety Division, NCDOT Traffic Signal Design Section

1750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: R. Hinshaw

PREPARED BY: A. Ravipati REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/18/2018
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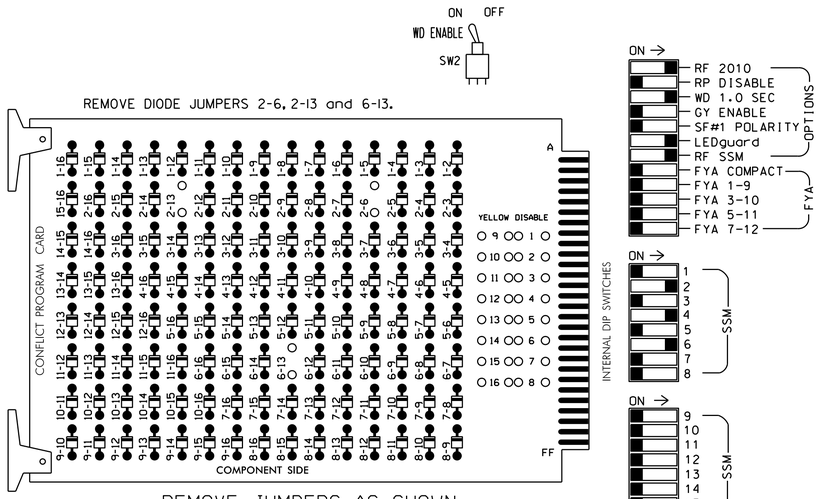
SIG. INVENTORY NO. 07-1624

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 9.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S8
PHASES USED.....2,2 PED,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4		14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22 23,24	P21, P22	NU	41	42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101	101			134				
YELLOW		129			102	102			135				
GREEN					103	103							
RED ARROW													
YELLOW ARROW													
GREEN ARROW		130			103				136				
✋			113										
🚶			115										

NU = Not Used

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

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		1.6	
2B	TB2-7,8	I2L	43	5	12	2	Y	Y		1.6	
2C	TB2-9,10	I3U	63	25	32	2	Y	Y		1.6	
2D	TB2-11,12	I3L	76	38	42	2	Y	Y			
2E	TB4-1,2	I4U	47	9	22	2	Y	Y			
2F	TB4-5,6	I5U	58	20	3	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
2G	TB6-9,10	I9U	60	22	11	2	Y	Y			
2H	TB6-11,12	I9L	62	24	13	2	Y	Y			
★ 6A	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6B	TB3-9,10	J3U	64	26	36	6	Y	Y			
6C	TB3-11,12	J3L	77	39	46	6	Y	Y			
✱ S1	TB7-9,10	J9U	59	21	15	SYS					
✱ S2	TB7-11,12	J9L	61	23	17	SYS					
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

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

★ Microwave Pulse Detector (See Wiring Detail Sheet 2).

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	Ø2 2A	Ø2 2C	Ø2 2E	Ø2 2F	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø2 2G	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø2 2B	Ø2 2D	NOT USED	NOT USED	Ø4 4B			Ø2 2H			NOT USED		ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	Ø6 6A DC ISOLATOR	Ø6 6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L		NOT USED	Ø6 6C						SYS. DET. S2					

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

FS = FLASH SENSE
ST = STOP TIME

✱ Note: Install a model 242 DC isolator in slot J2 for use with microwave detector. See the Microwave Detector Wiring Detail on sheet 2.

IMPORTANT: For proper operation of the microwave detector, remove surge protection from TB3-5 and TB3-6, and from TB3-7 and TB3-8.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1624
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

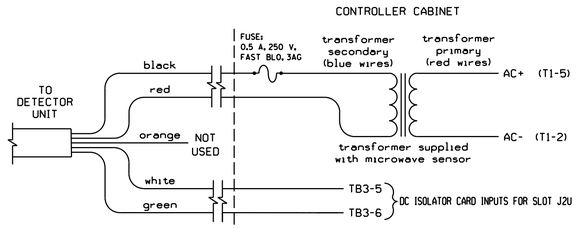
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 9.2

TYPICAL MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on a pole as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact on the microwave detector.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB3-5, TB3-6, TB3-7, and TB3-8 and insert 242 DC Isolator in slot J2.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 2 (PIN 40) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```
PAGE: 1 C1 PIN:40  NOT ENABLED
INPUT ASSIGNMENT #.................2
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC)........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)..................Y
VEHICLE DETECTOR (1-64).............._
PEDESTRIAN DETECTOR (1-16)..........._
ALTERNATE PED DETECTOR (1-16)........_
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..__  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)....._
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

← ENTER 'YES' for Not Enabled

```
PAGE: 1 C1 PIN:0  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................64
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).............6
PEDESTRIAN DETECTOR (1-16)..........._
ALTERNATE PED DETECTOR (1-16)........_
PREEMPT (1-10)......................._
INVERTED PREEMPT (1-10).............._
STOP TIME (Y/N)......................_
FLASH SENSE (Y/N)...................._
DOOR OPEN (Y/N)......................_
MANUAL CONTROL ENABLE (Y/N).........._
MANUAL CONTROL ADVANCE (Y/N)........._
SPECIAL FUNCTION ALARM (1-8)........._
TOD HOUR SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..65 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 '6' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

The programming shown below will invert the input from the microwave detector so a call is placed on the associated detector when the normally closed output opens up.

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 and 2.
2. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #2 IS ON

SCROLL DOWN

THEN:
SET INPUT   ASSIGNMENT #64 OFF
```

NOTE: MICROWAVE DETECTOR CONTACTS ARE CLOSED: NO CALL IS 'DETECTED'.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #2 IS OFF

SCROLL DOWN

THEN:
SET INPUT   ASSIGNMENT #64 ON
```

NOTE: MICROWAVE DETECTOR CONTACTS ARE OPEN: A CALL IS 'DETECTED'.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

REFERENCE SCHEDULE

* INPUT 2 = Microwave Detector Physical Input (Not Enabled)
* INPUT 64 = Dummy Microwave Detector Input (Detector 6)

* Input Remapped (See programming at left)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1624
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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HOME OFFICE:
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

Prepared for: Traffic Engineering Branch, Traffic Engineering & Signals Management Section, Department of Transportation, State of North Carolina
750 N.Greenfield Pkwy,Garner,NC 27529

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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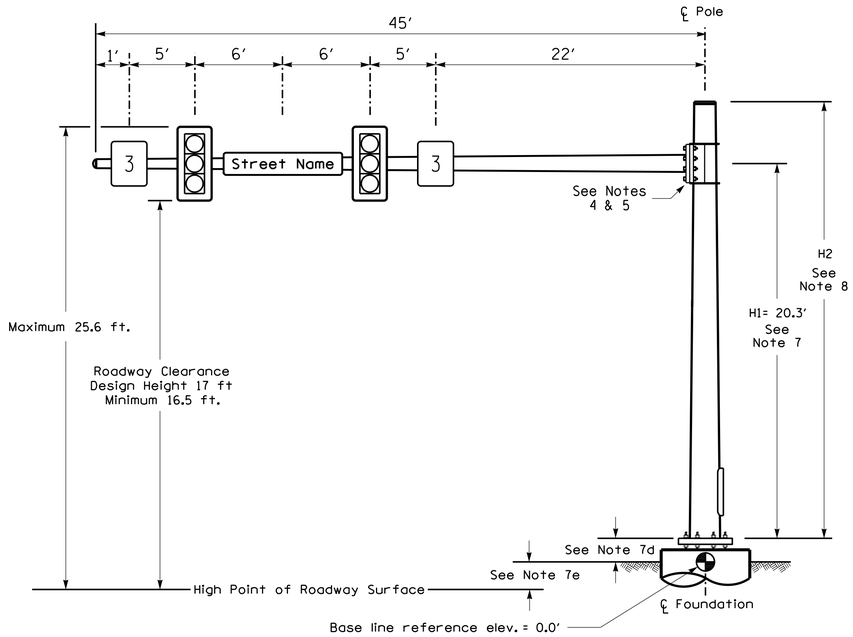
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/18/2018
SIGNATURE DATE

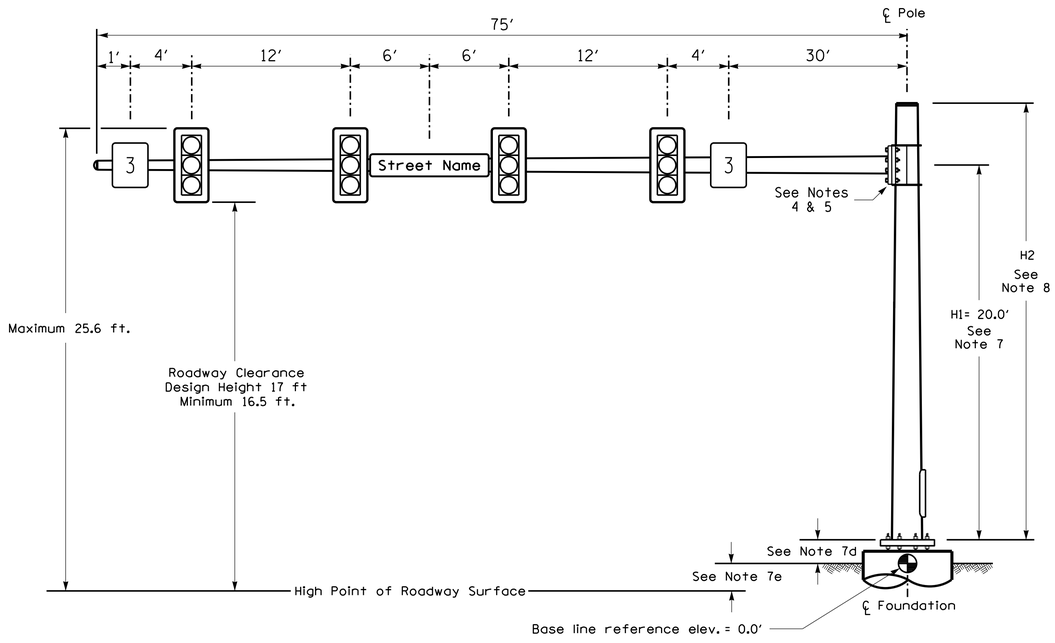
SIG. INVENTORY NO. 07-1624

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2



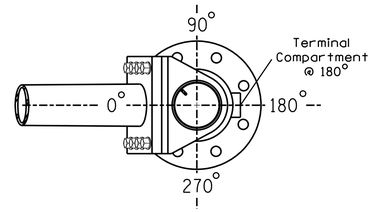
Elevation View

SPECIAL NOTE

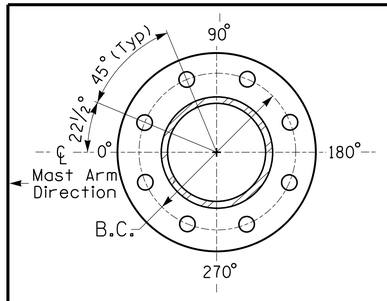
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.3 ft.	+1.0 ft.
Elevation difference at Edge of travelway or face of curb	+0.6 ft.	+0.5 ft.

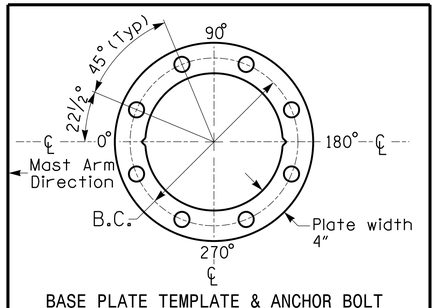


POLE RADIAL ORIENTATION



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 and 2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 9.3

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
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS
3	SIGN RIGID MOUNTED	9 S.F.	36.0"W X 36.0"L	28 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

NCDOT Wind Zone 4 (90 mph)

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE: May 2018 | REVIEWED BY: R. Hinshaw

PREPARED BY: A. Ravipati | REVIEWED BY:

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

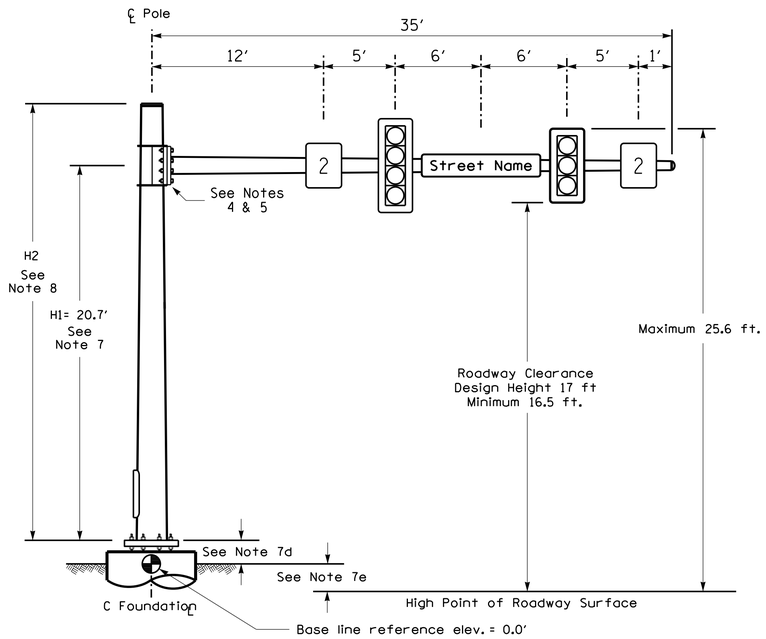
DocuSigned by: F. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624

METAL POLE No. 3

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 9.4

Design Loading for METAL POLE NO. 3



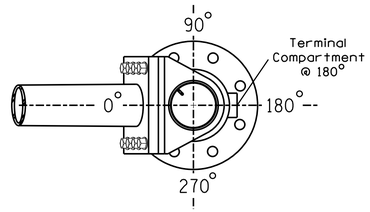
Elevation View

SPECIAL NOTE

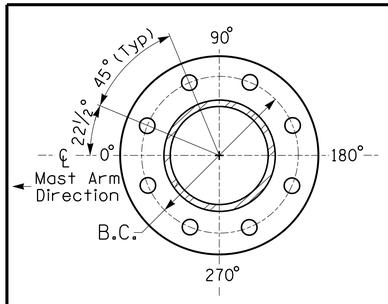
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3	
Baseline reference point at ⊕ ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+1.7 ft.	
Elevation difference at Edge of travelway or face of curb	+1.3 ft.	

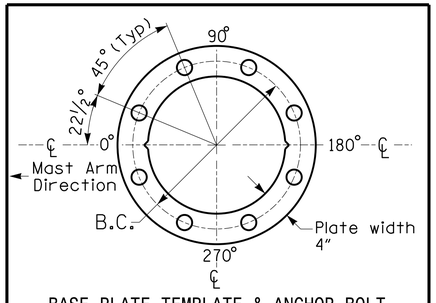


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

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

NOTES

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DESIGN REQUIREMENTS

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6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
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10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

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NCDOT Wind Zone 4 (90 mph)

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 EB/ US 311 SB Ramps

Division 7 | Guilford County | High Point

PLAN DATE: May 2018 | REVIEWED BY: R. Hinshaw

PREPARED BY: A. Ravipati | REVIEWED BY:

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER T. ROYAL HINSHAW

DocuSigned by: T. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1624

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 10.0

PHASING DIAGRAM

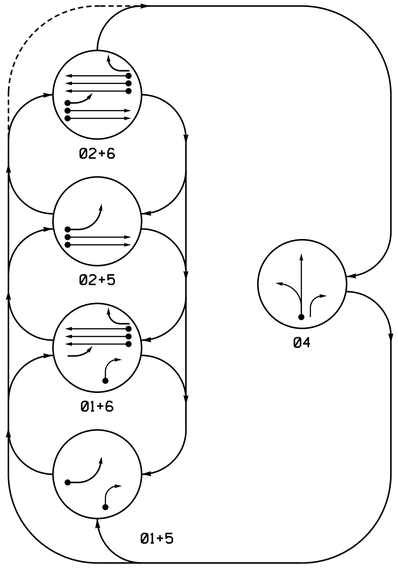
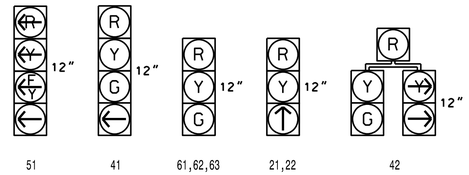


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04	FLASH
21,22	R	R	↑	↑	R	Y
41	R	R	R	R	G	R
42	R/←	R/↑	R	R	G	R
51	←	F ↑	←	F ↑	R	Y
61,62,63	R	G	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP / ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
5A	*	0	*	*	5	Y	Y	-	-	15	-	*
					2	Y	Y	-	-	-	-	*
6A,6B,6C	6x6	300	EXIST	-	6	Y	Y	-	1.6	-	-	-
6D,6E,6F	6x6	90	EXIST	-	6	Y	Y	-	-	-	-	-

* Multi-Zone Microwave Detection

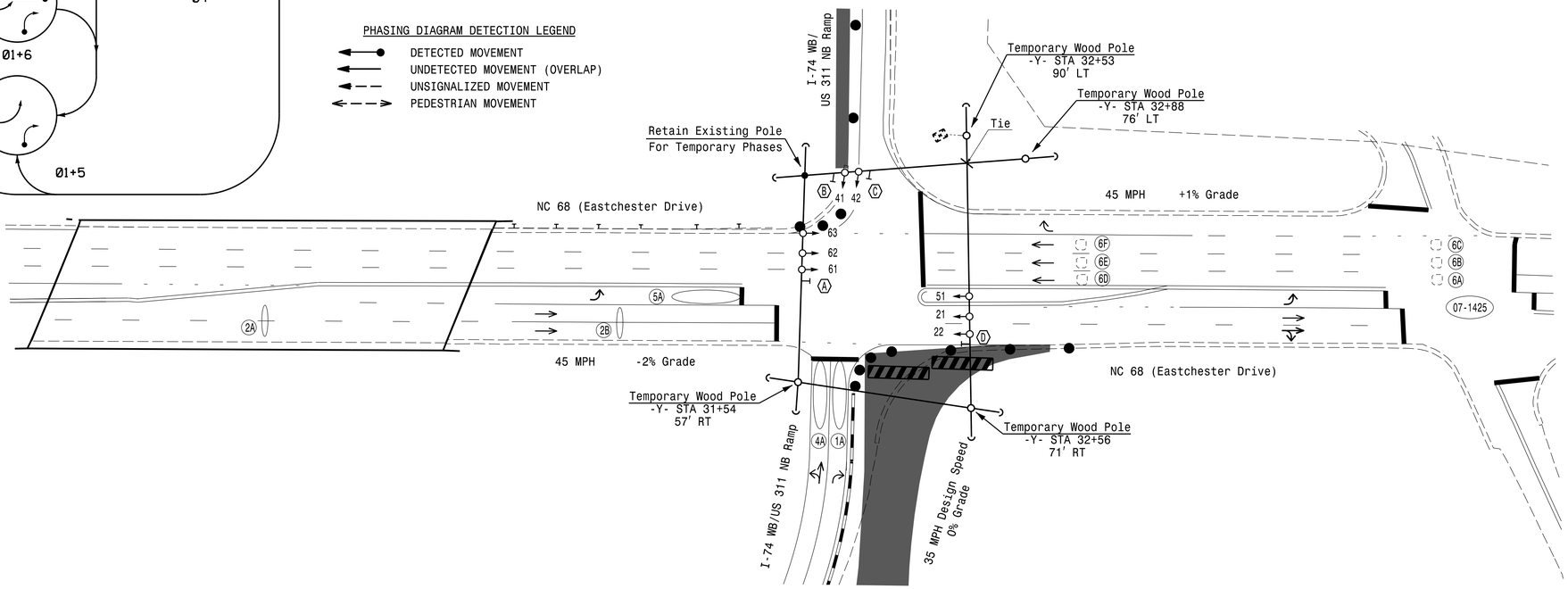
5 Phase
Fully Actuated
(High Point Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
6. Pavement markings are existing unless otherwise shown.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



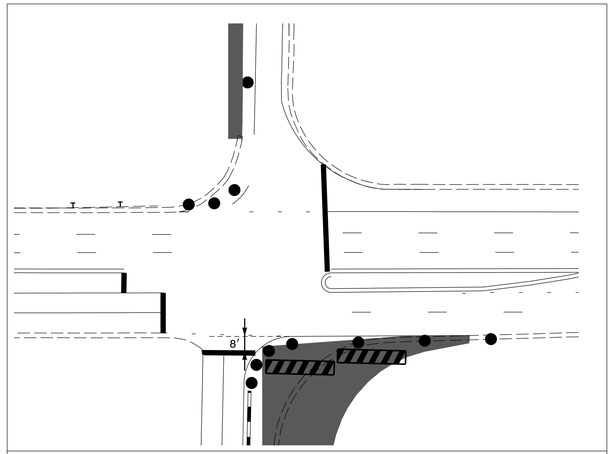
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
	Metal Pole with Mastarm	
	Inductive Loop Detector	
⊠	Controller & Cabinet	⊠
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Guardrail	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6
Min Green 1 *	7	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	15	60	30	20	60
Yellow Clearance	3.8	4.7	3.8	3.0	4.7
Red Clearance	1.8	1.4	1.8	3.1	1.4
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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Signal Upgrade - Temporary Design 1; TMP-6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, Signal Design Section, DEPARTMENT OF TRANSPORTATION, STATE OF NORTH CAROLINA

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

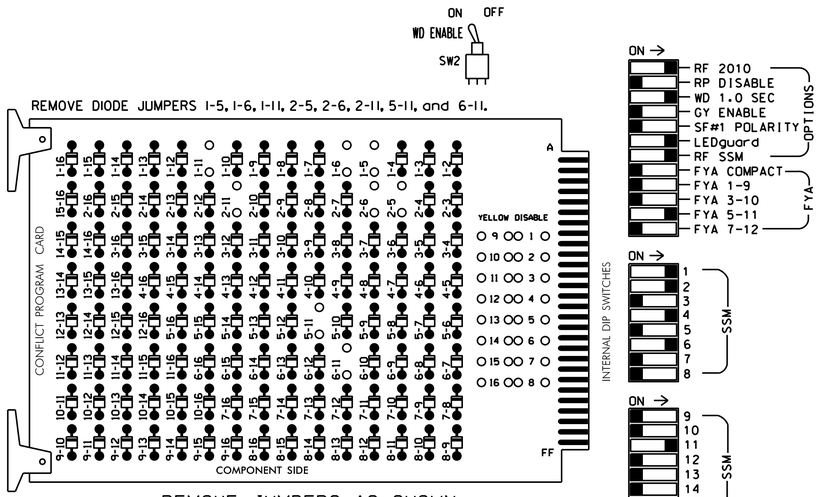
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623TI

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 10.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

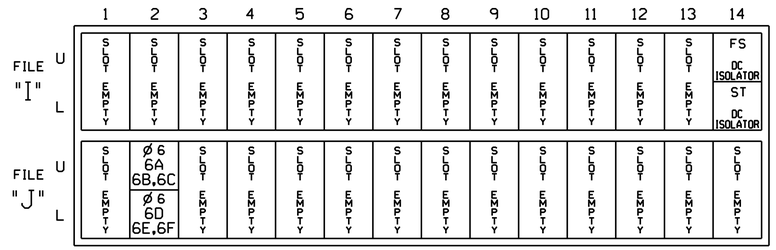
NOTES:

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

■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)



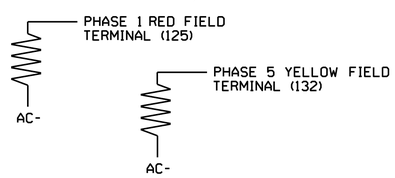
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

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)



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phases 2 and 6 for Startup In Green.
4. Program phase 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the High Point 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	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	42	21,22	NU	NU	41	42	NU	51 ★	61,62, 63	NU	NU	NU	NU	NU	NU	NU	51 ★	NU	NU
RED	✱	128			101	101			134										
YELLOW		129			102	102		✱	135										
GREEN					103	103			136										
RED ARROW																	A114		
YELLOW ARROW	126																A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW	127	130			103			133											

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.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,AUX S4
PHASES USED.....1,2,4,5,6
OVERLAPS.....NONE
OVERLAPS.....NONE
OVERLAPS.....5+6
OVERLAPS.....NONE

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP/ ZONE NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
6A,6B,6C	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6D,6E,6F	TB3-7,8	J2L	44	6	16	6	Y	Y			

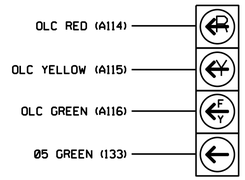
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

Install a multiple zone microwave detection system for vehicle detection zones 1A, 2A, 2B, 4A and 5A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T1
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 1; TMP-6
Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by:
R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 10.2

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

(program controller as shown below)

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

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

                SCROLL DOWN

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

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          :1234567891011121314151 6
VEH OVL PARENTS::    XX
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT::
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1623T1
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 1; TMP-6
Electrical Detail Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for:
N.C. Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 11.0

PHASING DIAGRAM

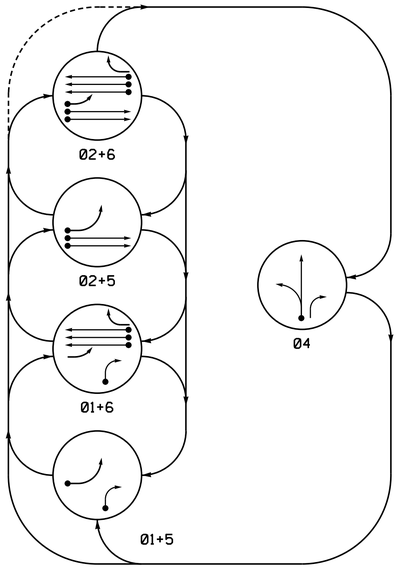
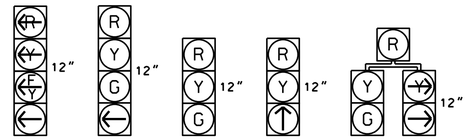


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04	FLASH
21,22	R	R	↑	↑	R	Y
41	R	R	R	R	G	R
42	R/←	R/←	R	R	G	R
51	←	F ↑	←	F ↑	R	Y
61,62,63	R	G	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
4A	*	0	*	*	4	Y	Y	-	-	-	-	*
5A	*	0	*	*	5	Y	Y	-	-	15	-	*
					2	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*

* Multi-Zone Microwave Detection

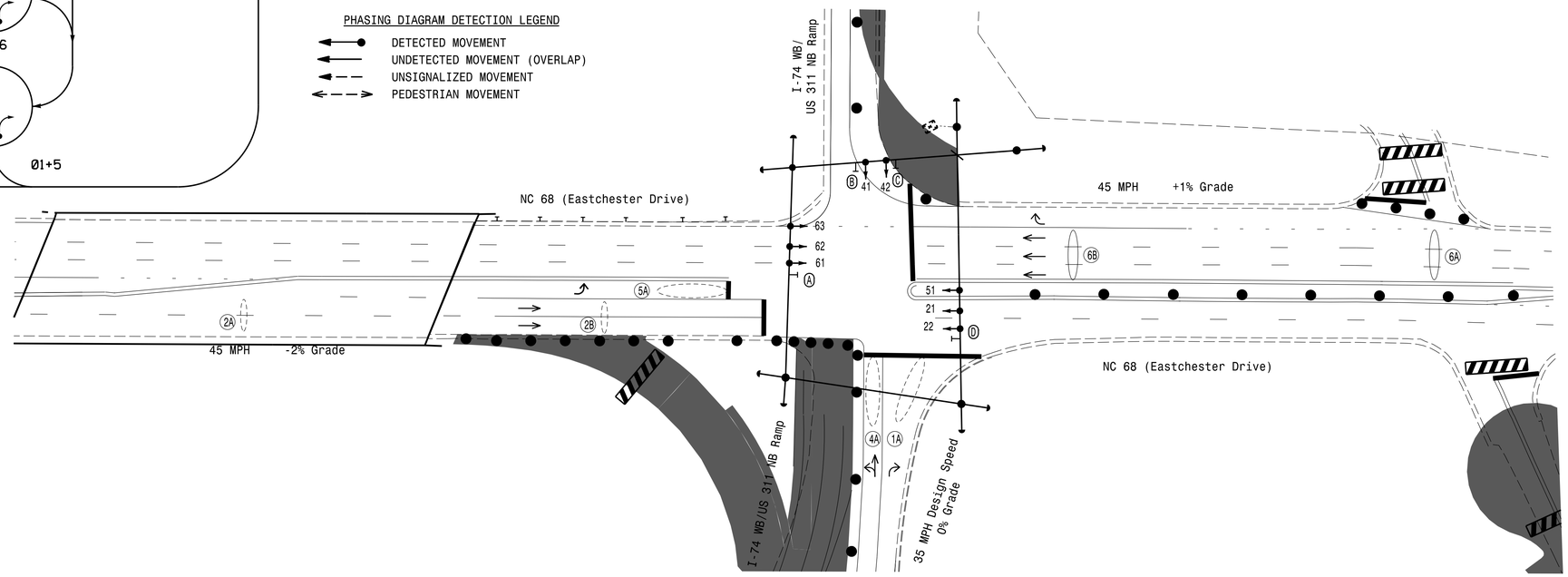
5 Phase
Fully Actuated
(High Point Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 41 and 42 and signs 'B' and 'C'.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
7. Pavement marking are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



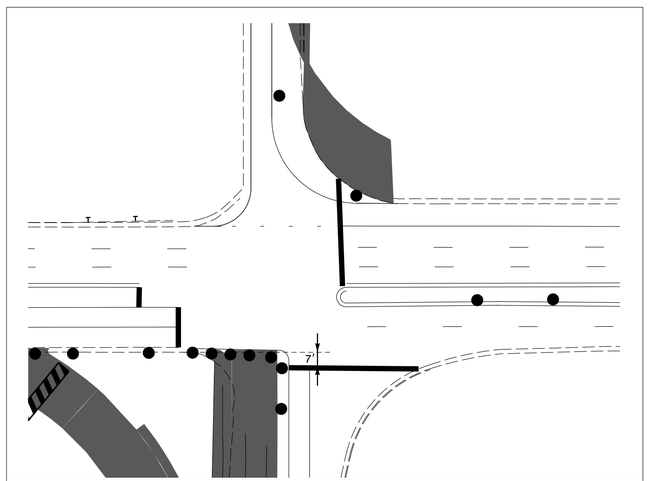
LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Guardrail	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6
Min Green 1 *	7	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	15	60	30	20	60
Yellow Clearance	3.8	4.7	3.8	3.0	4.7
Red Clearance	1.8	1.5	1.8	2.8	1.5
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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Signal Upgrade - Temporary Design 2; TMP-14

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Prepared for: North Carolina Department of Transportation, Traffic Engineering Branch, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: L. Boyer

PREPARED BY: A. Ravipati REVIEWED BY: R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

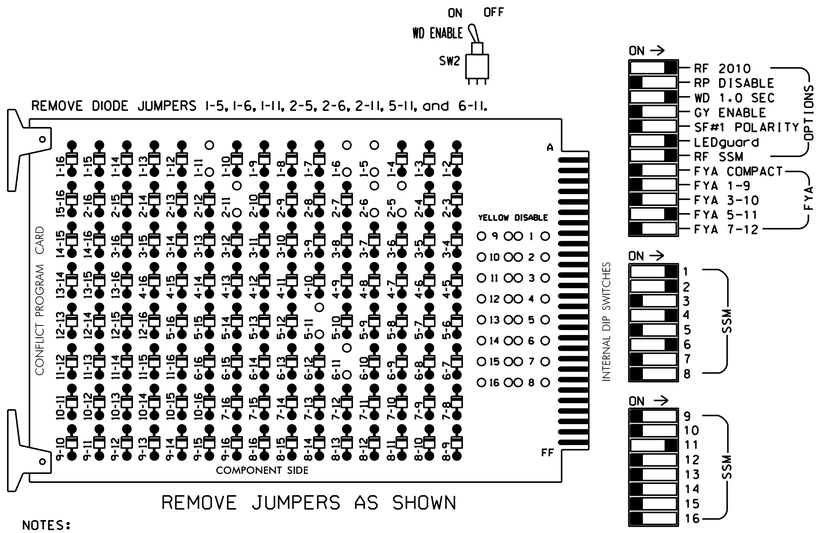
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL WINSHAW

DocuSigned by: R. Royal Winshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T2

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 11.1

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.	42	21,22	NU	NU	41	42	NU	51 ★	61,62, 63	NU	NU	NU	NU	NU	NU	NU	51 ★	NU	NU
RED	✱	128			101	101			134										
YELLOW		129			102	102		✱	135										
GREEN		130			103	103			136										
RED ARROW																	A114		
YELLOW ARROW	126																A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW	127	130			103			133											

NU = Not Used

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

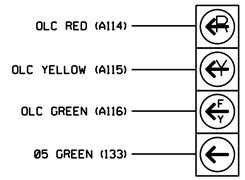
★ See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,AUX S4
PHASES USED.....1,2,4,5,6
OVERLAPS.....NONE
OVERLAPS.....NONE
OVERLAPS.....5+6
OVERLAPS.....NONE

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



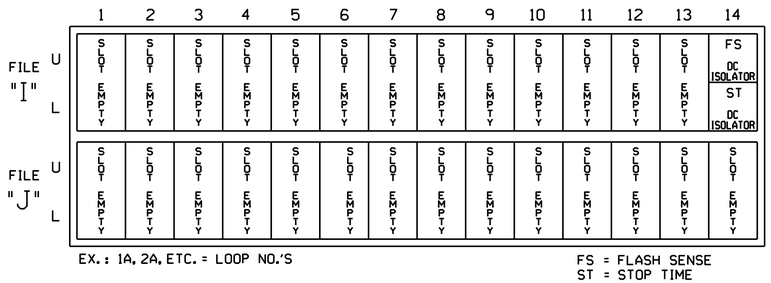
51

NOTE

The sequence display for this signal head 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

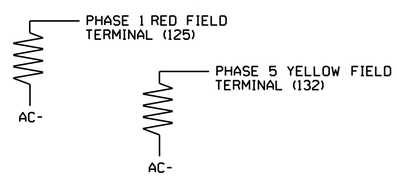
SPECIAL DETECTOR NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T2
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Temporary Design 2; TMP-14
Electrical Detail Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for: N.C. Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 11.2

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

(program controller as shown below)

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

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

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
                                PRESS '+'
```

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

```
  LOGICAL I/O COMMAND #2  (+/-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 #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #5  IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          :1234567891011121314 1516
VEH OVL PARENTS::    XX
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT::
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1623T2
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 2; TMP-14
Electrical Detail Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 12.0

PHASING DIAGRAM

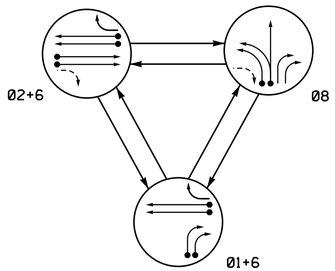
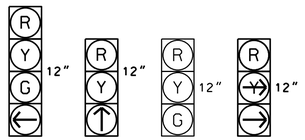


TABLE OF OPERATION				
SIGNAL FACE	PHASE			
	01+6	02+6	08	FLASH
11,12	→	R	→	R
21,22	R	↑	R	Y
61,62,63	G	G	R	Y
81	R	R	G ←	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	10	-	*
1B	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
8A	*	0	*	*	8	Y	Y	-	-	-	-	*
8B	*	0	*	*	8	Y	Y	-	-	-	-	*

* Multi-Zone Microwave Detection

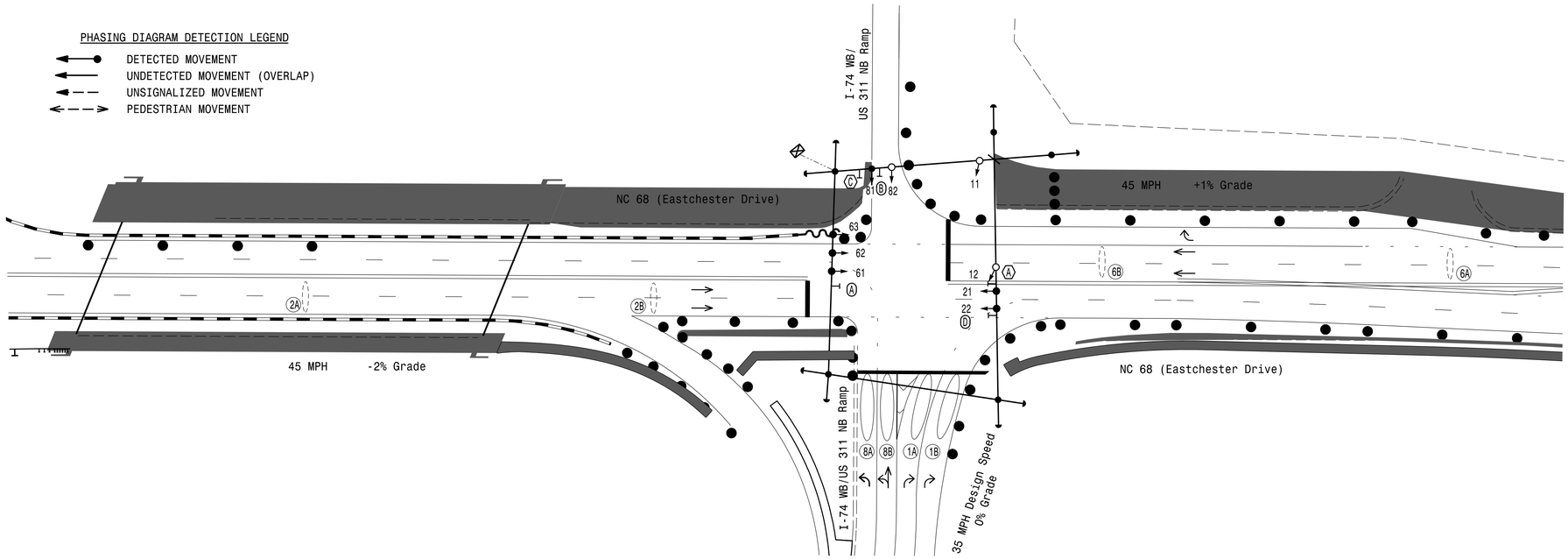
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Renumber existing signal head 41 as 81.
5. Reposition existing signal heads numbered 61, 62, 63, and 81 and signs 'A' and 'B'.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
9. Pavement markings are existing unless otherwise shown.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Reposition existing "Combined Through and Left Arrow" sign (R3-6L).

PHASING DIAGRAM DETECTION LEGEND

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



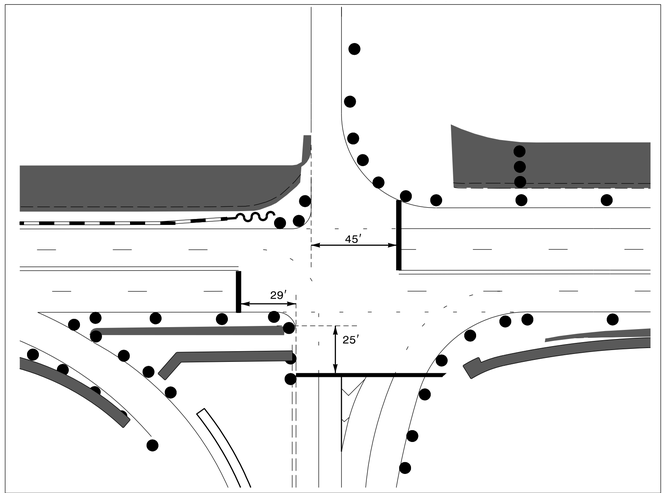
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head	■↓
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Controller & Cabinet	
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ

OASIS 2070 TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	30
Yellow Clearance	3.2	4.7	4.4	3.8
Red Clearance	1.4	1.5	1.0	1.8
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Temporary Design 3;
TMP-22, 22A, and 27

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Prepared for:
NCDOT Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL WINSHAW

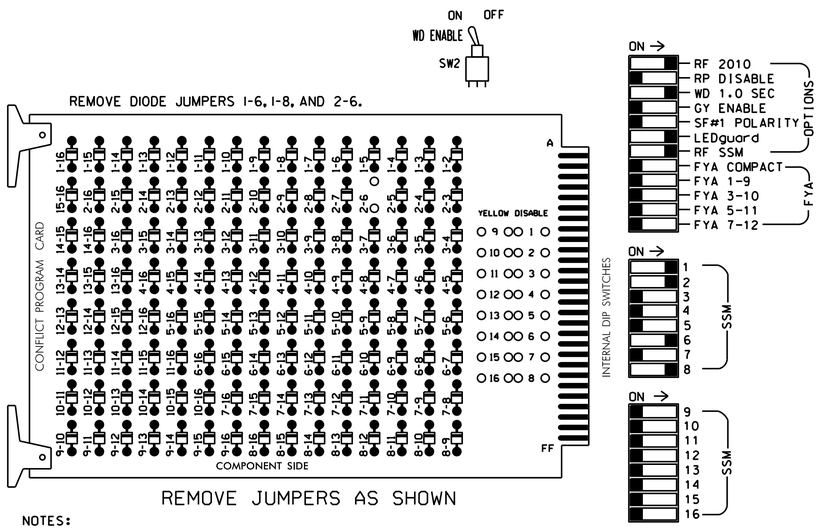
DocuSigned by: R. Royal Winshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162313

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 12.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S8,S11
PHASES USED.....1,2,6,8
OVERLAP "A".....1+8
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	OLA	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62, 63	NU	NU	81	82	NU
RED	125	128						134			107	107	
YELLOW		129						135			108	108	
GREEN												109	
RED ARROW													
YELLOW ARROW	126												
GREEN ARROW	127	130						136			109		

NU = Not Used

NOTE: Load Switch S1 requires output remapping. See sheet 2 of this electrical detail for instructions.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

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:          ¦123456789101111213141516
 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  _ 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T3
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Temporary Design 3; TMP-22, 22A, and 27
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
NC Department of Transportation — Transportation Mobility and Safety Division — Traffic Engineering Branch — Signal Management Section

750 N.Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 12.2

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAPS "A" AND "C"

(program controller as shown below)

STEP 1

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

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

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 OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

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

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

```
PAGE:1  C1 PIN16  VEHICLE OVERLAP
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.........................
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 15

STEP 2

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

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

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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 16

STEP 3

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

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

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

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

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T3
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 3; TMP-22, 22A, and 27
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 13.0

PHASING DIAGRAM

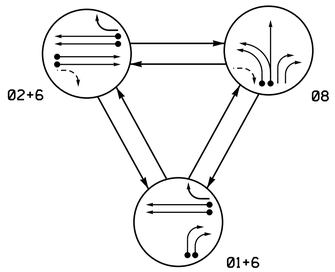
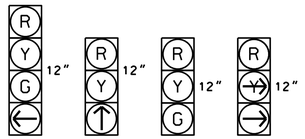


TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
11,12	→	R	→	R
21,22	R	↑	R	Y
61,62	G	G	R	Y
81	R	R	G ←	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	10	-	*
1B	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
8A	*	0	*	*	8	Y	Y	-	-	-	-	*
8B	*	0	*	*	8	Y	Y	-	-	-	-	*

* Multi-Zone Microwave Detection

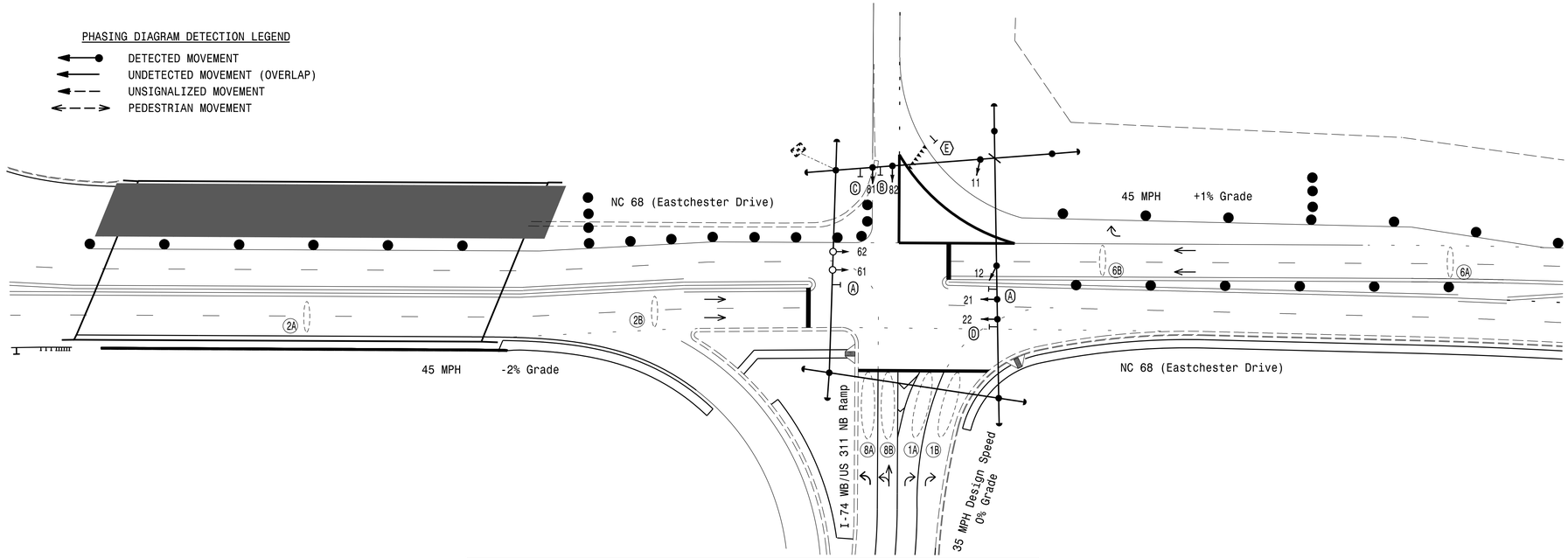
3 Phase
Fully Actuated
(High Point Signal System)

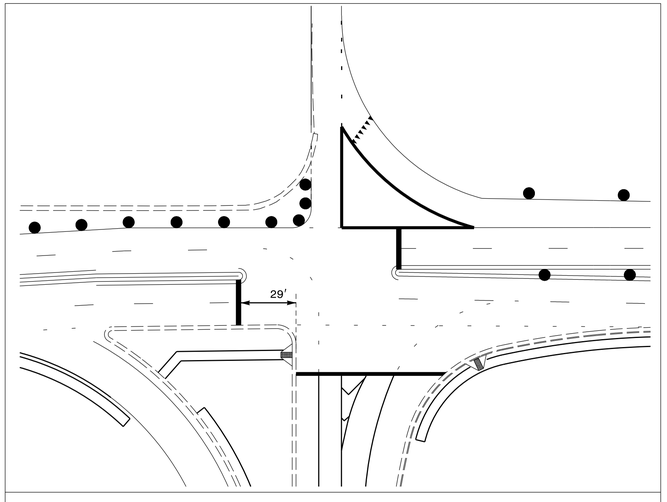
NOTES

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 may be lagged.
4. Remove existing signal head 63.
5. Reposition existing signal heads numbered 21 and 22 and signs 'A' and 'D'.
6. Set all detector units to presence mode.
7. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
8. Pavement markings are existing unless otherwise shown.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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





PROPOSED STOP BAR LOCATION DIAGRAM

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
	Metal Pole with Mastarm	
	Inductive Loop Detector	
⊠	Controller & Cabinet	⊠
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ

OASIS 2070 TIMING CHART				
	PHASE			
FEATURE	1	2	6	8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	30
Yellow Clearance	3.2	4.7	4.4	3.8
Red Clearance	1.4	1.5	1.0	1.6
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

Project #: 170908

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Signal Upgrade - Temporary Design 4; TMP-29

Prepared for: Transportation Mobility and Safety Division, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: L. Boyer

PREPARED BY: A. Ravipati REVIEWED BY: R. Hinshaw

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

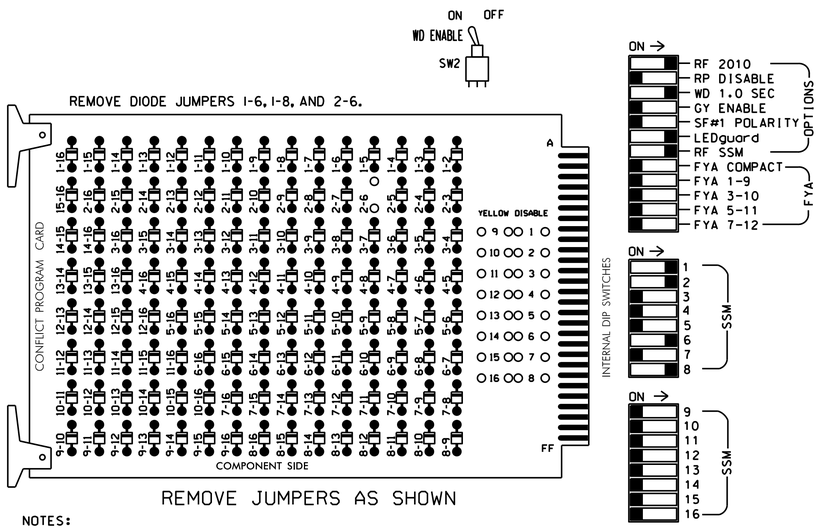
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162374

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 13.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S8,S11
PHASES USED.....1,2,6,8
OVERLAP "A".....1+8
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	OLA	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81	82	NU
RED	125	128						134			107	107	
YELLOW		129						135			108	108	
GREEN												109	
RED ARROW													
YELLOW ARROW	126												
GREEN ARROW	127	130						136			109		

NU = Not Used

NOTE: Load Switch S1 requires output remapping. See sheet 2 of this electrical detail for instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

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:          :123456789101111213141516
 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  _ 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T4
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

DAVENPORT
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NCBELS FIRM LICENSE NO. C-2522

Temporary Design 4; TMP-29
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 13.2

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAPS "A" AND "C"

(program controller as shown below)

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "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.........................
VEHICLE PHASE.....................Y
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
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..........................
```

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

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 OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

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

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

```
PAGE:1  C1 PIN16  VEHICLE OVERLAP
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.........................
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 15

STEP 2

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

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

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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 16

STEP 3

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

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

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

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

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T4
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 4; TMP-29
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw
SIGNATURE
05/18/2018
DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 14.0

PHASING DIAGRAM

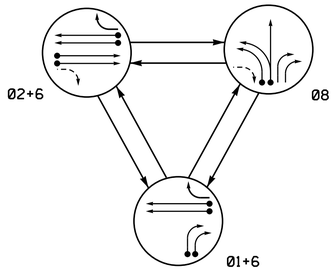
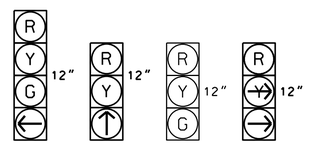


TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
11,12	→	R	→	R
21,22	R	↑	R	Y
61,62	G	G	R	Y
81	R	R	G ←	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	10	-	*
1B	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
8A	*	0	*	*	8	Y	Y	-	-	-	-	*
8B	*	0	*	*	8	Y	Y	-	-	-	-	*

* Multi-Zone Microwave Detection

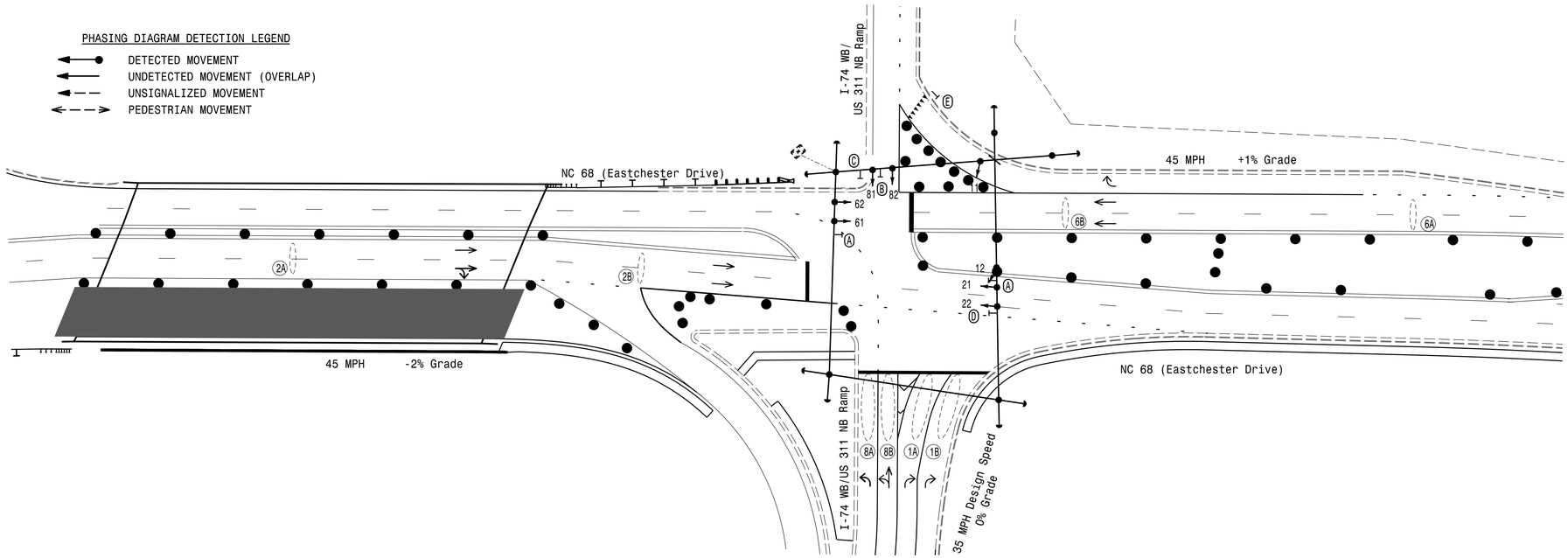
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Reposition existing signal heads numbered 21, 22, 61, and 62 and signs 'A' and 'D'.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



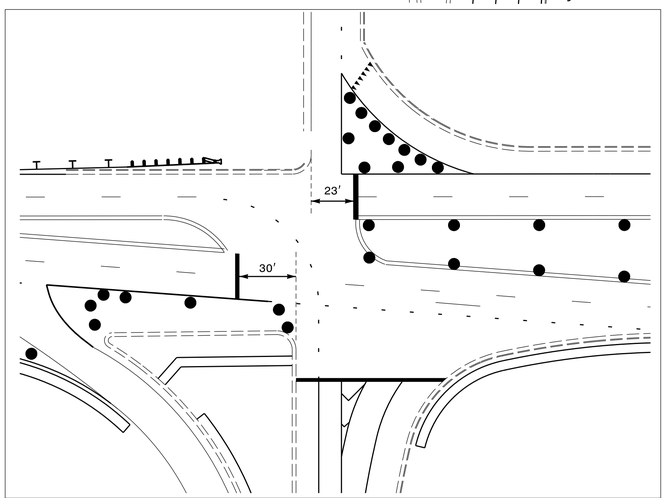
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊥	Sign	⊥
□	Pedestrian Signal Head	■
	Metal Pole with Mastarm	
	Inductive Loop Detector	
⊠	Controller & Cabinet	⊡
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Guardrail	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	30
Yellow Clearance	3.2	4.7	4.4	3.8
Red Clearance	1.5	1.5	1.0	2.5
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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Signal Upgrade - Temporary Design 5; TMP-35

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. HINSHAW

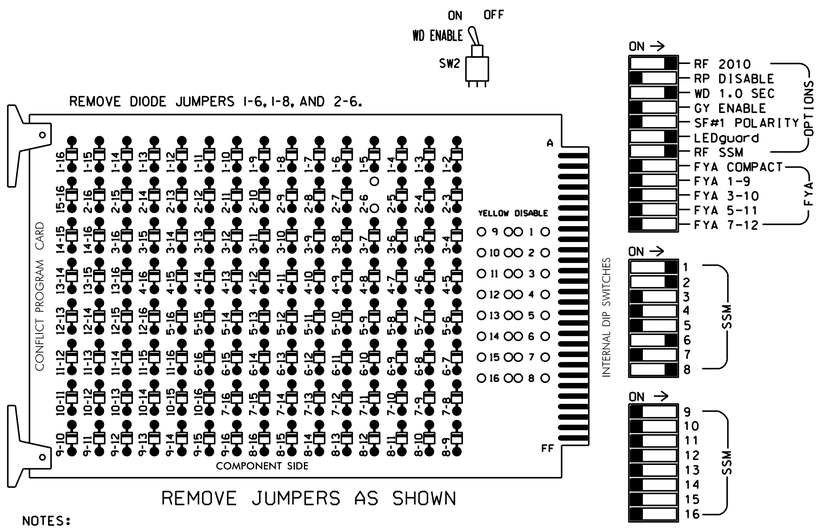
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162315

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 14.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S8,S11
PHASES USED.....1,2,6,8
OVERLAP "A".....1+8
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	OLA	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81	82	NU
RED	125	128						134			107	107	
YELLOW		129						135			108	108	
GREEN												109	
RED ARROW													
YELLOW ARROW	126												
GREEN ARROW	127	130						136			109		

NU = Not Used

NOTE: Load Switch S1 requires output remapping. See sheet 2 of this electrical detail for instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

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:          ¦123456789101111213141516
 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  _ 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T5
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

Temporary Design 5; TMP-35
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE
SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 14.2

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAPS "A" AND "C"

(program controller as shown below)

STEP 1

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

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

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 OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

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

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

```
PAGE:1  C1 PIN16  VEHICLE OVERLAP
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.........................
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 15

STEP 2

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

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

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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 16

STEP 3

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

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

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

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

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.....................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T5
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 5; TMP-35
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 15.0

PHASING DIAGRAM

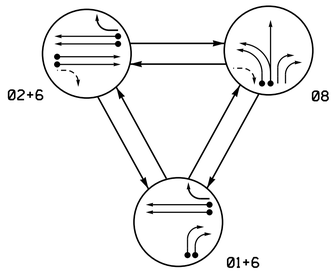
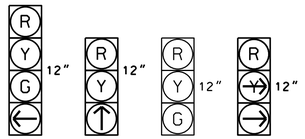


TABLE OF OPERATION				
SIGNAL FACE	PHASE			
	01+6	02+6	08	FLASH
11,12	→	R	→	R
21,22	R	↑	R	Y
61,62	G	G	R	Y
81	R	R	G←	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	*	0	*	*	1	Y	Y	-	-	10	-	*
1B	*	0	*	*	1	Y	Y	-	-	15	-	*
2A	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	*	90	*	*	2	Y	Y	-	-	-	-	*
6A	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	*	90	*	*	6	Y	Y	-	-	-	-	*
8A	*	0	*	*	8	Y	Y	-	-	-	-	*
8B	*	0	*	*	8	Y	Y	-	-	-	-	*

* Multi-Zone Microwave Detection

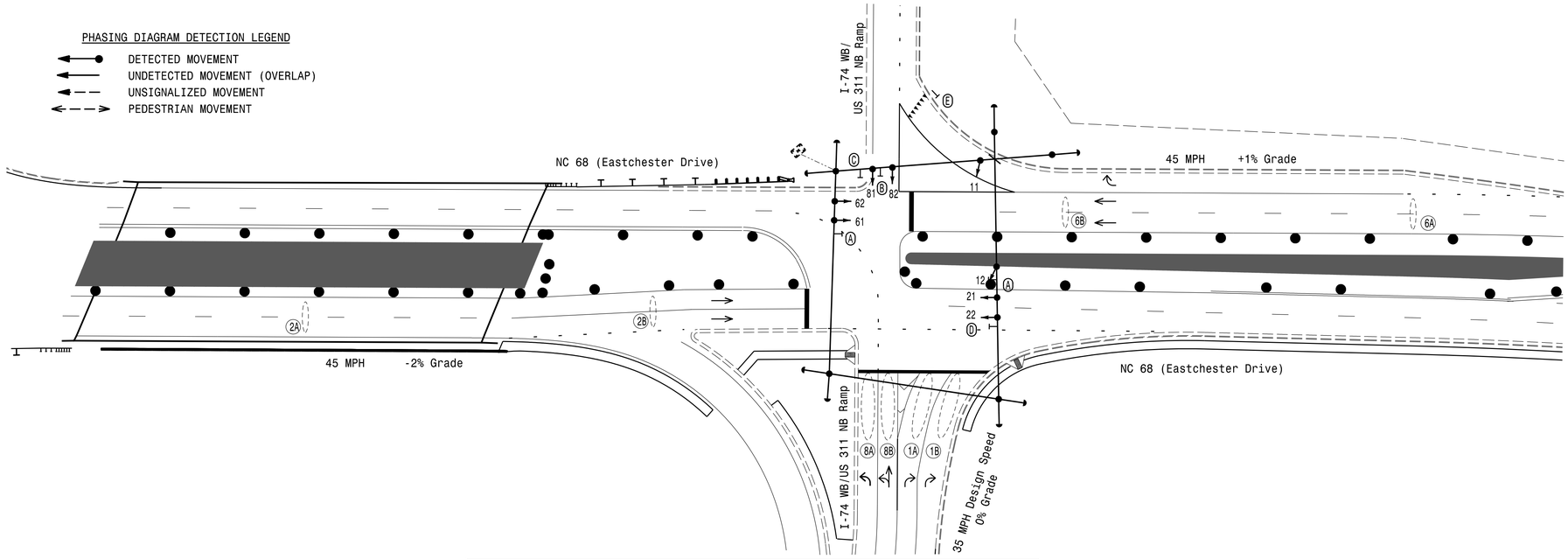
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Reposition existing signal heads numbered 21, and 22 and sign 'D'.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer- approved mounting locations to accomplish the direction schemes shown on the Signal Design Plans.
7. Pavement marking are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



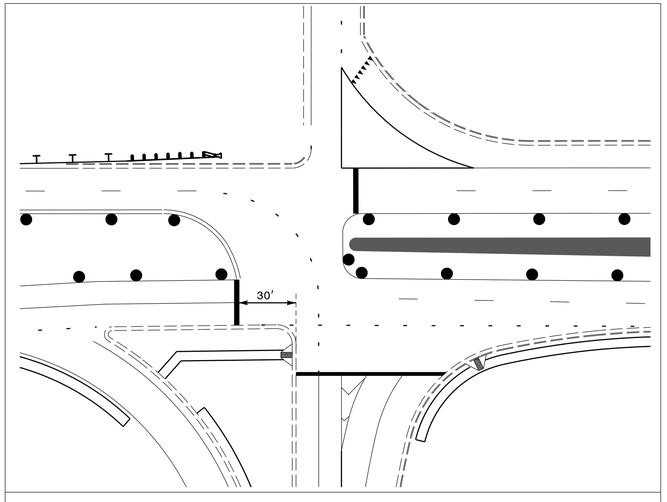
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
	Metal Pole with Mastarm	
	Inductive Loop Detector	
⊠	Controller & Cabinet	⊠
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Guardrail	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
	Microwave Detection Zone	
Ⓐ	No U-Turn/Left Turn Sign (R3-18)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓒ
Ⓓ	No Right Turn Sign (R3-1)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ

OASIS 2070 TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	30
Yellow Clearance	3.2	4.7	4.4	3.8
Red Clearance	1.4	1.5	1.0	2.4
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

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Signal Upgrade - Temporary Design 6; TMP-38

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: L. Boyer

PREPARED BY: A. Ravipati REVIEWED BY: R. Hinshaw

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

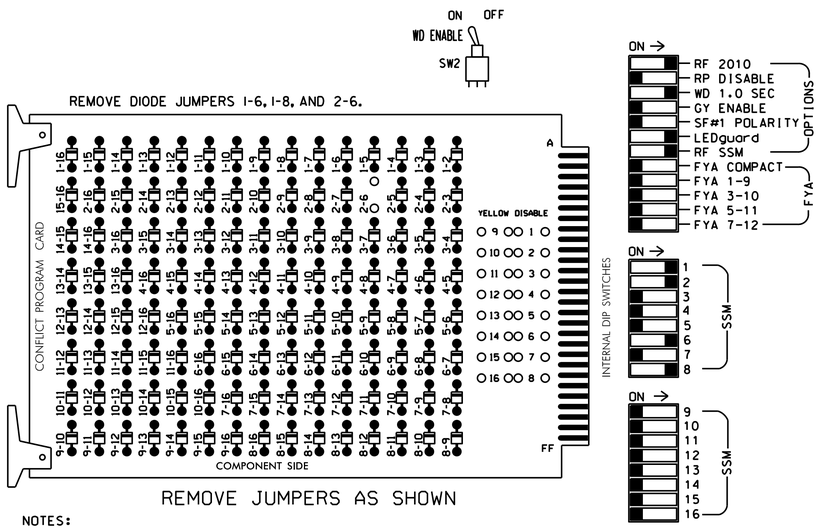
DocuSigned by: R Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-162376

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 15.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S8,S11
PHASES USED.....1,2,6,8
OVERLAP "A".....1+8
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	OLA	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81	82	NU
RED	125	128						134			107	107	
YELLOW		129						135			108	108	
GREEN												109	
RED ARROW													
YELLOW ARROW	126												
GREEN ARROW	127	130						136			109		

NU = Not Used

NOTE: Load Switch S1 requires output remapping. See sheet 2 of this electrical detail for instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

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:          ¦123456789101111213141516
 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  _ 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T6
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 6; TMP-38
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 15.2

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAPS "A" AND "C"

(program controller as shown below)

STEP 1

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

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

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 OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

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

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

```
PAGE:1  C1 PIN16  VEHICLE OVERLAP
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.........................
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 15

STEP 2

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

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

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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 16

STEP 3

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

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

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

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

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP...................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623T6
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Temporary Design 6; TMP-38
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.0

PHASING DIAGRAM

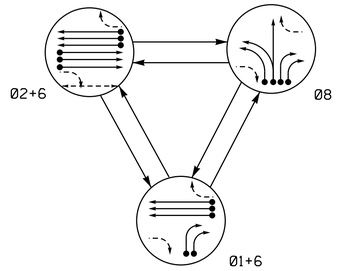
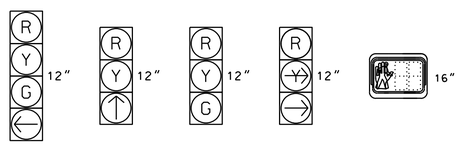


TABLE OF OPERATION				
SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
11,12	→	R	→	R
21,22,23	R	↑	R	Y
61,62,63	↑	↑	R	Y
81	R	R	G	R
82	R	R	G	R
P21,P22	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP / ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	10	-	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A *	*	300	*	Y	2	Y	Y	-	1.6	-	-	*
2B	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
2C	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
2D	6X6	90	3	Y	2	Y	Y	-	-	-	-	Y
6A	6x6	300	5	Y	6	Y	Y	-	1.6	-	-	Y
6B	6x6	300	5	Y	6	Y	Y	-	1.6	-	-	Y
6C	6x6	300	5	Y	6	Y	Y	-	1.6	-	-	Y
6D	6x6	90	4	Y	6	Y	Y	-	-	-	-	Y
6E	6x6	90	4	Y	6	Y	Y	-	-	-	-	Y
6F	6x6	90	4	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

* Microwave Detection Zone

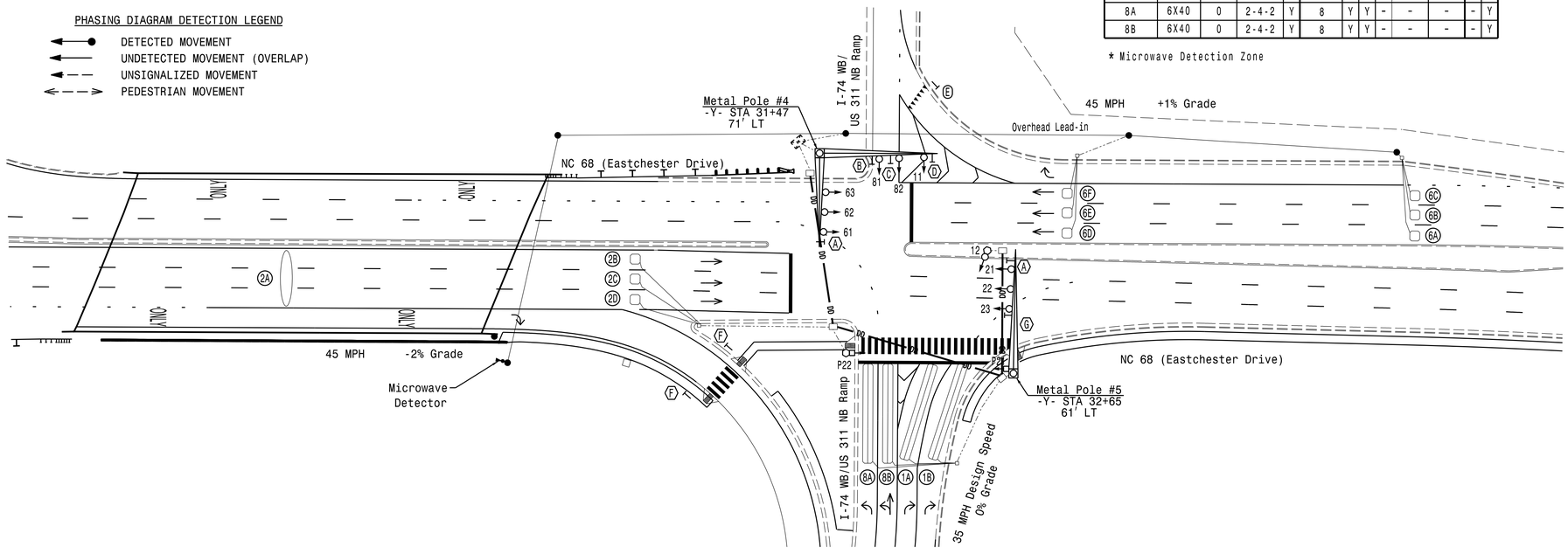
3 Phase
Fully Actuated
(High Point Signal System)

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 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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

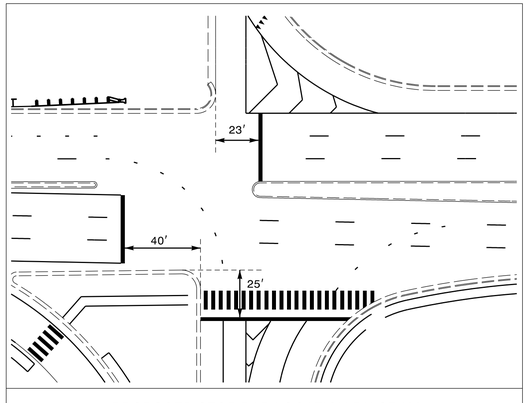


LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
	Microwave Detector	
	Microwave Detection Zone	
N/A	Guardrail	
N/A	Curb Ramp	
(A)	No U-Turn / No Left Turn Sign (R3-18)	(A)
(B)	Left Arrow "ONLY" Sign (R3-5L)	(B)
(C)	Combined Through and Left Arrow Sign (R3-6L)	(C)
(D)	Right Arrow "ONLY" Sign (R3-5R)	(D)
(E)	"YIELD" Sign (R1-2)	(E)
(F)	Pedestrian Crossing Sign (W11-2) w/ Diagonal Arrow Plaque (W16-7p)	(F)
(G)	No Right Turn Sign (R3-1)	(G)

OASIS 2070 TIMING CHART				
FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	90	30
Yellow Clearance	3.2	4.7	4.4	3.8
Red Clearance	1.4	1.9	1.2	2.6
Walk 1 *	-	7	-	-
Don't Walk 1	-	23	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	SOFT RECALL	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED STOP BAR LOCATION DIAGRAM

Project #: 170908

DAVENPORT
HOME OFFICE:
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NCBELS FIRM LICENSE NO. C-2522

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	A. Ravipati	REVIEWED BY:	L Boyer

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

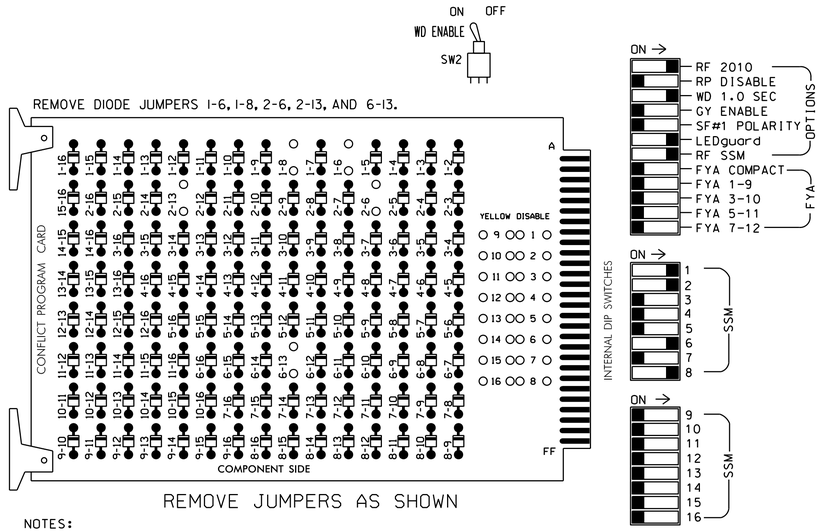
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S8,S11
PHASES USED.....1,2,2 PED,6,8
OVERLAP "A".....1+8
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	OLA	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	11,12	21,22 23	P21, P22	NU	NU	NU	NU	61,62 63	NU	NU	81	82	NU
RED	125	128						134			107	107	
YELLOW		129						135			108	108	
GREEN											109	109	
RED ARROW													
YELLOW ARROW	126												
GREEN ARROW	127	130						136			109		
✋			113										
🚶			115										

NU = Not Used

NOTE: Load Switch S1 requires output remapping. See sheet 3 of this electrical detail for 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.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

* Note: Install a model 242 DC isolator in slot 12 for use with microwave detector. See the Microwave Detector Wiring Detail on sheet 2.

IMPORTANT: For proper operation of the microwave detector, remove surge protection from TB2-5 and TB2-6, and from TB2-7 and TB2-8.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP / ZONE NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			10
★ 2A	TB2-5,6	I2U	39	1	2	2	Y	Y		1.6	
2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
2C	TB2-11,12	I3L	76	38	42	2	Y	Y			
2D	TB4-1,2	I4U	47	9	22	2	Y	Y			
1B	TB4-5,6	I5U	58	20	3	1	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6B	TB3-7,8	J2L	44	6	16	6	Y	Y		1.6	
6C	TB3-9,10	J3U	64	26	36	6	Y	Y		1.6	
6D	TB3-11,12	J3L	77	39	46	6	Y	Y			
6E	TB5-1,2	J4U	48	10	26	6	Y	Y			
6F	TB5-5,6	J5U	57	19	7	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

★ Microwave Pulse Detector (See Wiring Detail Sheet 2).

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1623
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Electrical Detail- Final Design - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

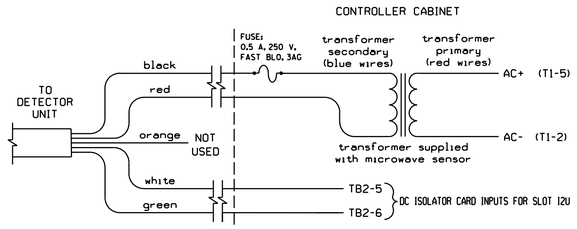
DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.2

TYPICAL MICROWAVE DETECTOR WIRING DETAIL

(wire as shown)



TC26B WIRE LIST

COLOR	FUNCTION
black	12V to 24V AC/DC (no polarity)
red	12V to 24V AC/DC (no polarity)
orange	Output Relay Normally Open
white	Output Relay Normally Closed
green	Output Relay Common

NOTES:

1. Sensor is a microwave motion detector mounted on a pole as indicated on the Signal Design Plans.
2. Microwave wiring shown above will cause a permanent call unless the Input Assignment Programming and Logical I/O Processor Programming details are entered as shown on this sheet. These programming details will cause a call to be placed upon opening the Normally Closed contact on the microwave detector.
3. DC Isolator's LED will be ON when no call is present and will be OFF when a call is present.
4. Important: For proper operation of the microwave detector, remove surge protection from TB2-5, TB2-6, TB2-7, and TB2-8 and insert 242 DC Isolator in slot 12.

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR MICROWAVE DETECTOR INPUT

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL INPUT 1 (PIN 39) IS REACHED. MODIFY DEFAULT CONDITIONS AS INDICATED BY ARROWS.

```
PAGE: 1 C1 PIN:39  NOT ENABLED
INPUT ASSIGNMENT #.................1
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..   OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

← ENTER 'YES' for Not Enabled

```
PAGE: 1 C1 PIN:0  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................64
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).............2
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..65 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 '2' for Vehicle Detector

PRESS '-' until Input Assignment #64 is reached

PROGRAMMING COMPLETE

NOTE:

This remapping removes the default detector from the microwave's physical input and reassigns it to unused INPUT 64. The Logical I/O Processor Programming Detail on this sheet will invert the disabled input and control INPUT 64 and the reassigned detector.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO INVERT INPUT FROM MICROWAVE DETECTOR

(program controller as shown below)

The programming shown below will invert the input from the microwave detector so a call is placed on the associated detector when the normally closed output opens up.

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 and 2.
2. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #1 IS ON
                  ↓
              SCROLL DOWN
THEN:
SET INPUT   ASSIGNMENT #64 OFF
```

NOTE: MICROWAVE DETECTOR CONTACTS ARE CLOSED: NO CALL IS 'DETECTED'.

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  INPUT   ASSIGNMENT #1 IS OFF
                  ↓
              SCROLL DOWN
THEN:
SET INPUT   ASSIGNMENT #64 ON
```

NOTE: MICROWAVE DETECTOR CONTACTS ARE OPEN: A CALL IS 'DETECTED'.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

REFERENCE SCHEDULE

* INPUT 2 = Microwave Detector Physical Input (Not Enabled)
* INPUT 64 = Dummy Microwave Detector Input (Detector 6)

* Input Remapped (See programming at left)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1623
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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119 BROOKSTOWN AVENUE, SUITE PH1
WINSTON-SALEM, NC 27101
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NCBELS FIRM LICENSE NO. C-2522

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive)
at
I-74 WB/ US 311 NB Ramps

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

Prepared for: NC Department of Transportation, Traffic Engineering Branch, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.3

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR OVERLAPS "A" AND "C"

(program controller as shown below)

STEP 1

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

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

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 OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.

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

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

```
PAGE:1  C1 PIN16  VEHICLE OVERLAP
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.........................
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 15

STEP 2

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................15
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:17  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

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

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

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

```
PAGE:1  C1 PIN:17  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................15
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 16

STEP 3

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
OUTPUT ASSIGNMENT #.................16
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..........................
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:18  VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

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

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

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

```
PAGE:1  C1 PIN:18  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.................16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)..............0
SELECT ASSIGNMENT:
NOT ENABLED.........................
VEHICLE PHASE.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................Y
PEDESTRIAN OVERLAP..................
WATCHDOG............................
DETECTOR RESET......................
ADVANCE BEACON......................
OUT OF PHASE FLASHER................
CONTROLLER FLASH....................
RUN FREE............................
RESERVED............................
PREEMPT.............................
SOFT PREEMPT........................
ANY PREEMPT.........................
COORDINATION PLAN...................
OFFSET..............................
PHASE CHECK.........................
PHASE ON............................
PHASE NEXT..........................
```

OUTPUT PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |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  _ 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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1623
DESIGNED: May 2018
SEALED: May 18, 2018
REVISED: N/A

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Final Design - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Prepared for: Traffic Engineering Branch, Mobility and Safety Division, NCDEPARTMENT OF TRANSPORTATION, ITS & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	R. Hinshaw

REVISIONS	INIT.	DATE

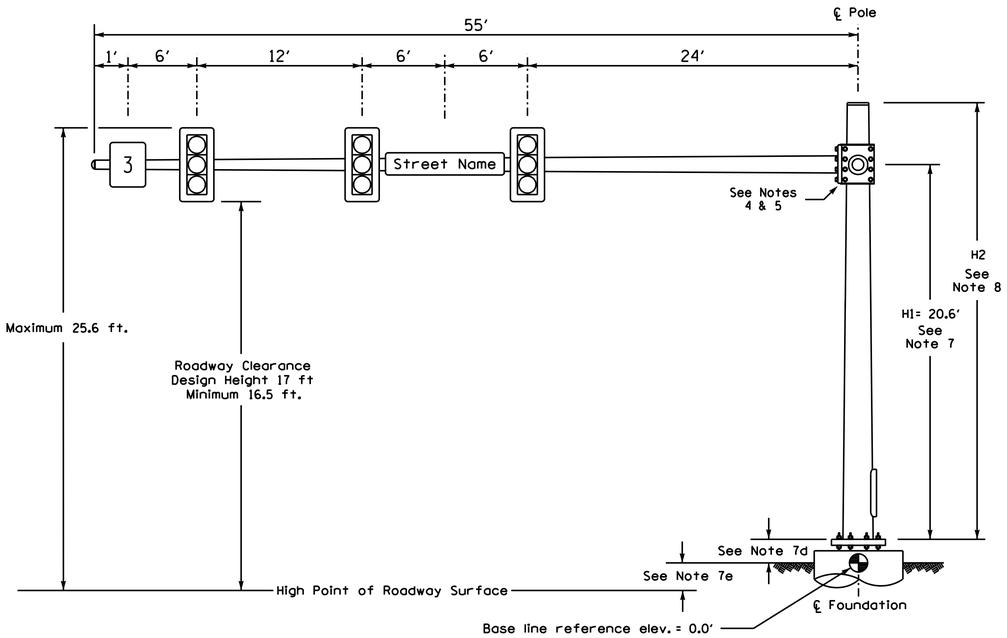
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/18/2018
SIGNATURE DATE

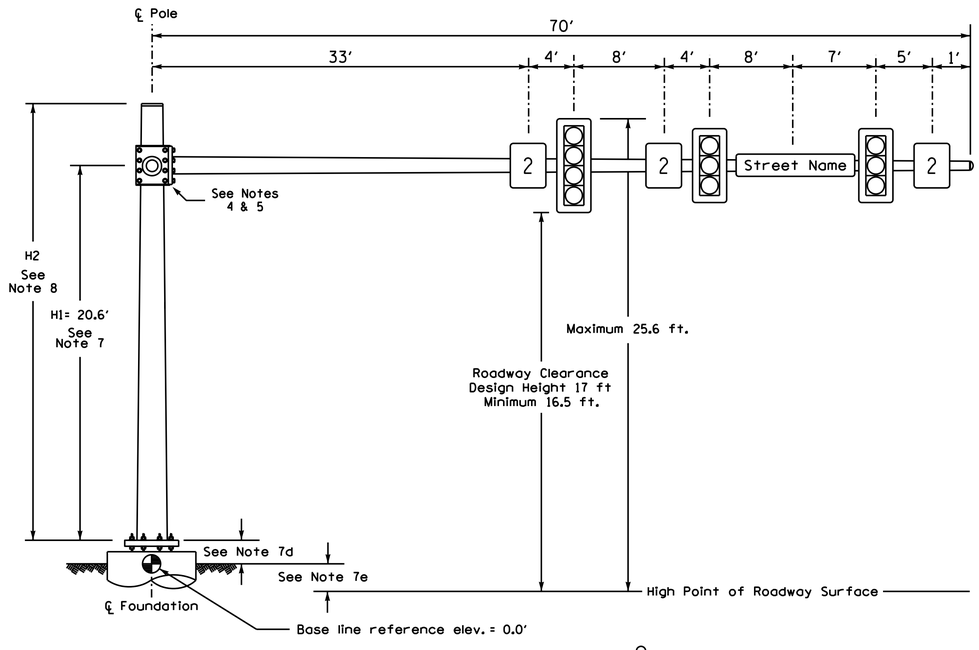
SIG. INVENTORY NO. 07-1623

Design Loading for METAL POLE NO. 4, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 4, MAST ARM B



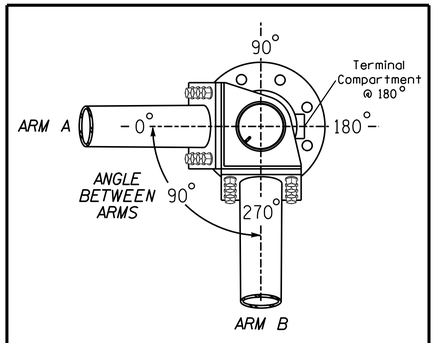
Elevation View @ 0°

SPECIAL NOTE

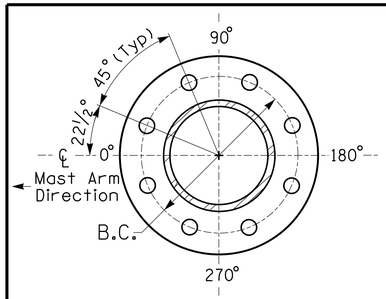
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm A	Arm B
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.6 ft.	-0.3 ft.
Elevation difference at Edge of travelway or face of curb	+0.7 ft.	-0.3 ft.

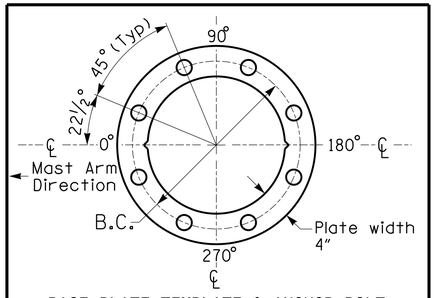


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.4

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	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"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5"W X 52.5"L	60 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0"W X 96.0"L	36 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0"W X 36.0"L	14 LBS
3	SIGN RIGID MOUNTED	9 S.F.	36.0"W X 36.0"L	28 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

NCDOT Wind Zone 4 (90 mph)

Prepared for: NCDOT Transportation Mobility and Safety Division, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	A. Ravipati	REVIEWED BY:	L Boyer

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER J. ROYAL HINSHAW

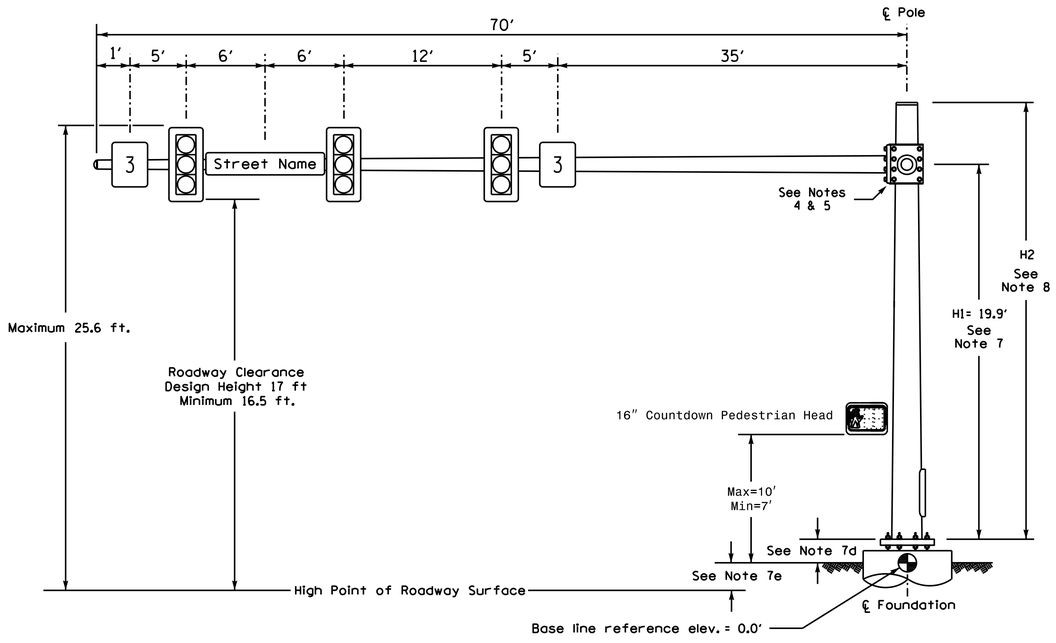
DocuSigned by: J. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623

METAL POLE No. 5

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 16.5

Design Loading for METAL POLE NO. 5



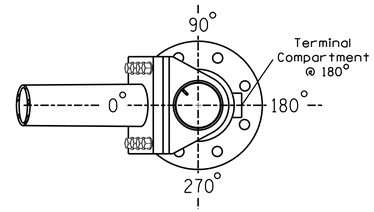
Elevation View

SPECIAL NOTE

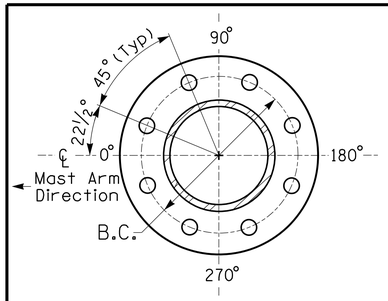
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 5	
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+0.9 ft.	
Elevation difference at Edge of travelway or face of curb	+0.5 ft.	

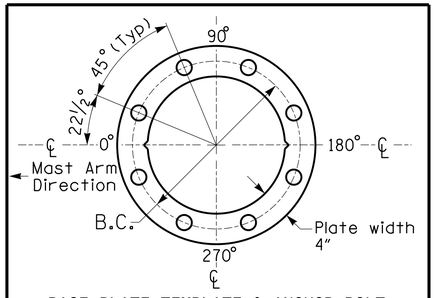


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

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
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS
3	SIGN RIGID MOUNTED	9 S.F.	36.0″W X 36.0″L	28 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″W X 17.0″L	21 LBS

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

NCDOT Wind Zone 4 (90 mph)

Prepared for: NCDOT Transportation Mobility and Safety Division, Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Drive) at I-74 WB/ US 311 NB Ramps

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	A. Ravipati	REVIEWED BY:	L Boyer

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/18/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1623

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 17.0

PHASING DIAGRAM

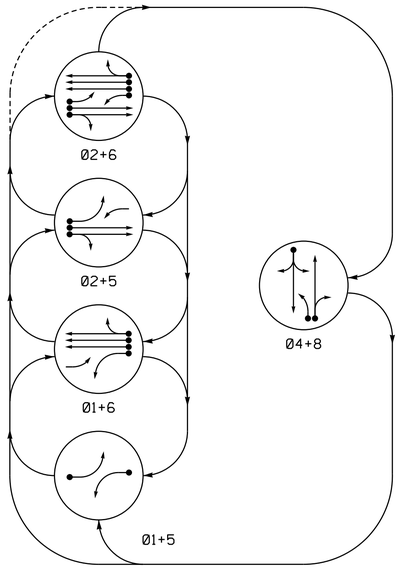


TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	~~—~~	~~—~~	~~F Y~~	~~F Y~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	~~—~~	~~F Y~~	~~—~~	~~F Y~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	~~F Y~~	~~R~~
82,83,84	R	R	R	R	G	R

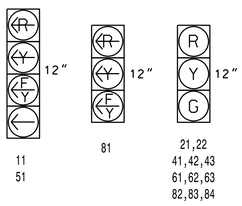
TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
101	ON	OFF

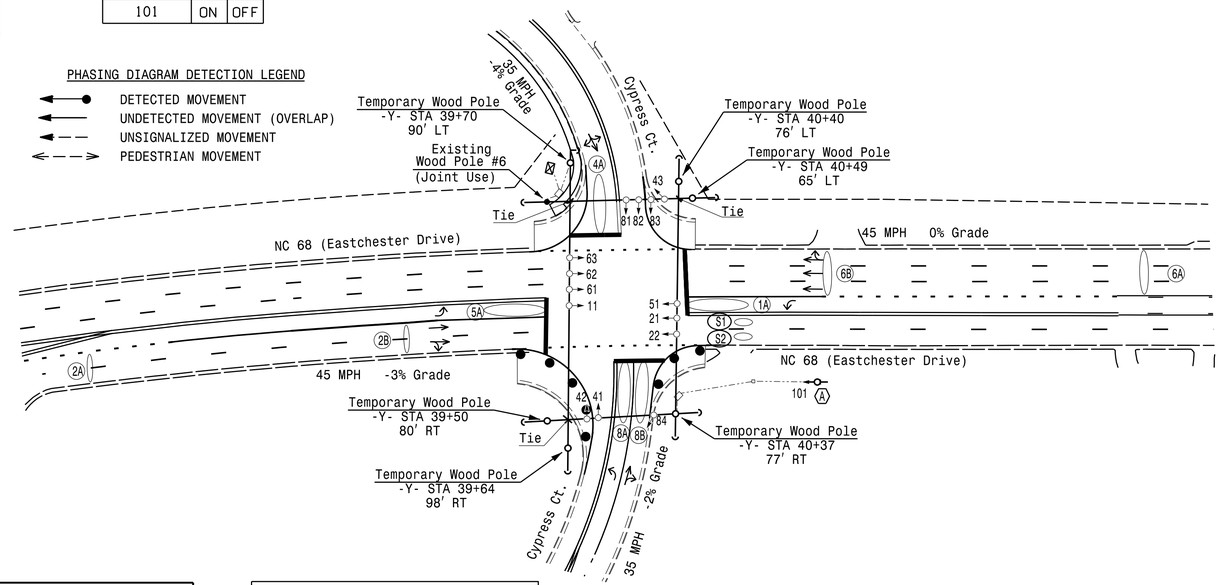
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070 LOOP & DETECTOR INSTALLATION												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A *	*	0	*	*	1	Y	Y	-	-	15	-	*
					6	Y	Y	-	-	-	-	*
2A *	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B *	*	90	*	*	2	Y	Y	-	-	-	-	*
4A *	*	0	*	*	4	Y	Y	-	-	10	-	*
5A *	*	0	*	*	5	Y	Y	-	-	15	-	*
					2	Y	Y	-	-	-	-	*
6A *	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B *	*	90	*	*	6	Y	Y	-	-	-	-	*
8A *	*	0	*	*	8	Y	Y	-	-	3	-	*
8B *	*	0	*	*	8	Y	Y	-	-	10	-	*
S1 *	*	+125	*	*	-	-	-	-	-	-	Y	*
S2 *	*	+125	*	*	-	-	-	-	-	-	Y	*

* Multi-Zone Microwave Detection

5 Phase
Fully Actuated
(High Point Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. The Division (City) Traffic Engineer will determine the hours of use for the special events beacon.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Microwave Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
(A)	"SPECIAL EVENT" Sign w/Beacon (Figure 1)	(A)

OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	20	90	30
Yellow Clearance	3.0	4.8	4.1	3.0	4.8	4.1
Red Clearance	2.1	1.2	1.5	2.4	1.2	1.5
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT 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.

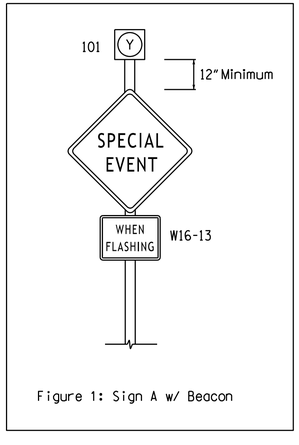
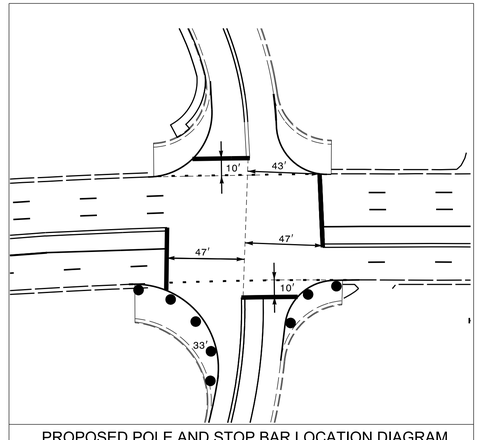


Figure 1: Sign A w/ Beacon



PROPOSED POLE AND STOP BAR LOCATION DIAGRAM
NOT TO SCALE

Project #: 170908

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New Installation - Temporary Design 1; TMP-16

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: NCDOT Transportation Mobility and Safety Division, Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Dr.) at Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	L. Boyer	REVIEWED BY:	

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

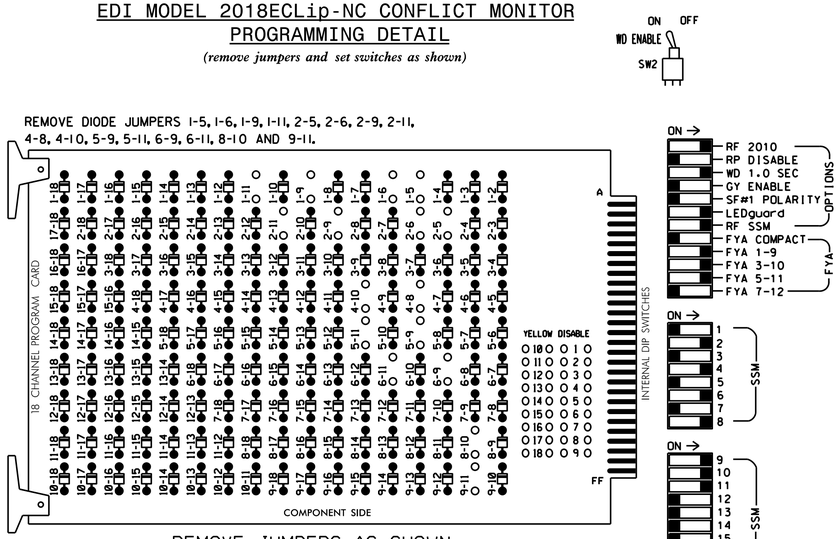
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470TI

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 17.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3✱,S4,S5,S7,S8,S11, AUX S1,AUX S2,AUX S4
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....5+6
OVERLAP "D".....NONE

✱ S3 Used for Special Event Flasher

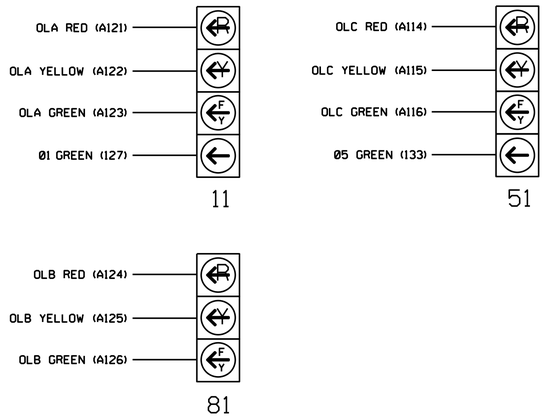
SIGNAL HEAD HOOK-UP CHART

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	SPECIAL EVENT FLASHER	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	101	NU	41,42, 43	NU	51★	61,62, 63	NU	NU	82,83, 84	NU	11★	81★	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✱	129			102		✱	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
✋																		
PED YELLOW			✱✱ 114															
🚶			✱															

NU = Not Used
✱ Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.
✱✱ S3-Y is used for the Special Events. See sheet 3 for wiring and programming detail.

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)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

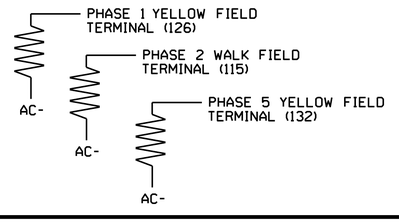
Install a multiple zone microwave detection system for all vehicle detection zones. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



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: 07-1470T1
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 1; TMP-16
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: Transportation Mobility and Safety Division, STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION, Traffic Engineering & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.) at Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 17.2

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

(program controller as shown below)

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

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
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
  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
```

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

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

(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: :   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 '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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T1
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 1; TMP-16
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
ITS & Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINGHAM

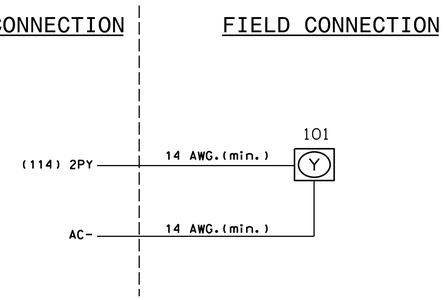
DocuSigned by: F. Royal Hingham 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 17.3

SPECIAL EVENT FLASHER (101)

(wire flashers as shown)



SPECIAL EVENT FLASHER
SCHEDULING PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'B' (SCHEDULING).

```
SCHEDULED EVENT #1      NOT ASSIGNED*
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**/**
STOP TIME (HH:MM)..............**/**
DOW     |SUN MON TUE WED THR FRI SAT
ENABLED | **  **  **  **  **  **  **
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).....................
PLAN (65=FLSH,66=FREE)...  OFFSET#...
PLAN PRIORTY:  LOW...  MED...  HIGH...
CAHNGE 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)...............
SET OUTPUT ON  (1-64).................33
SET OUTPUT OFF (1-64).................
SET INPUT ON   (1-64).................
SET INPUT OFF  (1-64).................
ENABLE FAILURES LOG?...................
ENABLE EVENTS LOG?.....................
ENABLE DATA ENTRIES LOG?...............
ENABLE COORDINATION PLANS LOG?.........
ENABLE SPECIAL FUNCTIONS LOG?..........
ENABLE SLIT MONITOR LOG?...............
ENABLE DETECTOR DATA LOG?..............
ENABLE DETECTOR (1-64).................
ENABLE DETECTOR DIAGNOSTICS (1-64).....
ENABLE DET STRETCH / DELAY (1-64)......
ENABLE DET STOP BAR MODE (1-64)........
SET LOGIC FLAG ON (1-16)...............
SET LOGIC FLAG OFF (1-64)..............
OVERIDE PHASE CONTROL FUNCTIONS?.......
```

* AFTER PROGRAMMING THIS SPACE WILL READ 'OUTPUT OVERRIDE'.

/ TIME, DATES, AND DAYS OF WEEK DETERMINED BY THE DTE.

SPECIAL EVENT FLASHER
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
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.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
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..........................
```

EDIT THE FIRST THREE PROGRAMMING ROWS TO DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE IN WHICH IT WILL FLASH.

LEAVE THE ENTRY AS IS

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T1
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 1; TMP-16
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T1

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 18.0

PHASING DIAGRAM

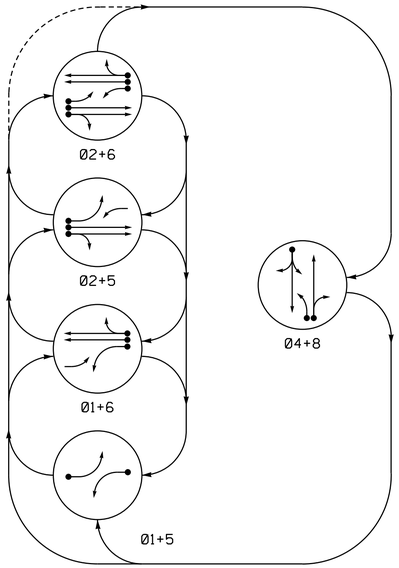


TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	←	F Y	←	F Y	~~R~~	~~Y~~
61,62	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	F Y	~~R~~
82,83,84	R	R	R	R	G	R

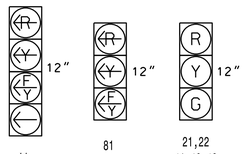
TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
101	ON	OFF

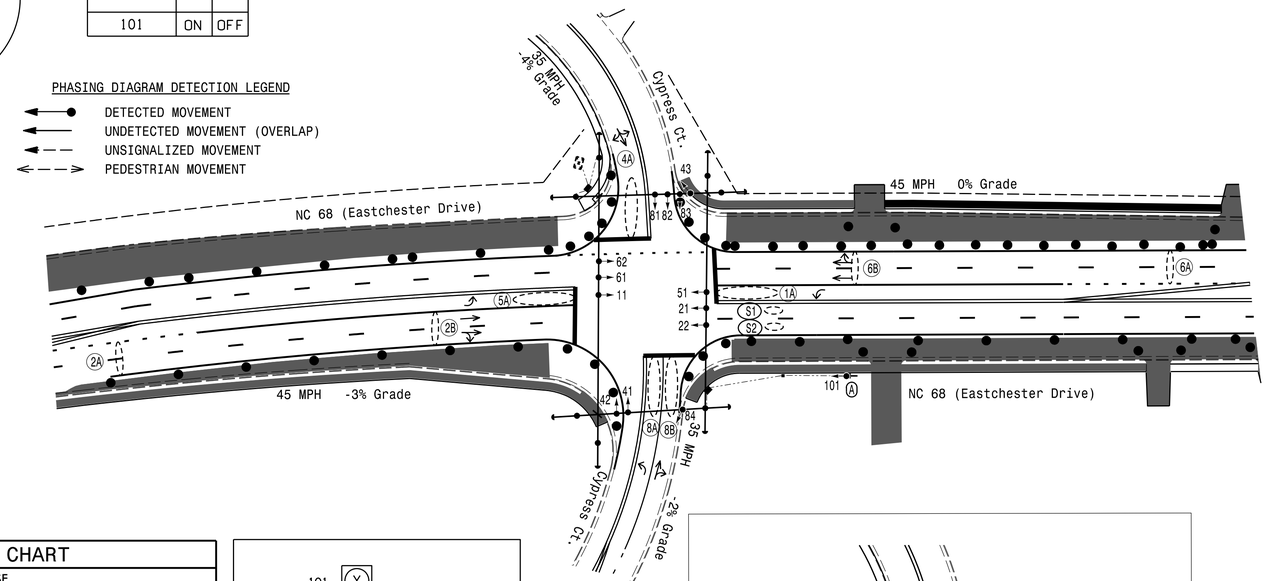
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A *	*	0	*	*	1	Y	Y	-	-	15	-	*
					6	Y	Y	-	-	-	-	*
2A *	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B *	*	90	*	*	2	Y	Y	-	-	-	-	*
4A *	*	0	*	*	4	Y	Y	-	-	10	-	*
5A *	*	0	*	*	5	Y	Y	-	-	15	-	*
					2	Y	Y	-	-	-	-	*
6A *	*	300	*	*	6	Y	Y	-	-	-	-	*
6B *	*	90	*	*	6	Y	Y	-	1.6	-	-	*
8A *	*	0	*	*	8	Y	Y	-	-	3	-	*
8B *	*	0	*	*	8	Y	Y	-	-	10	-	*
S1 *	*	+125	*	*	-	-	-	-	-	-	Y	*
S2 *	*	+125	*	*	-	-	-	-	-	-	Y	*

* Multi-Zone Microwave Detection

5 Phase
Fully Actuated
(High Point Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 11, 21, 22, 51, 61, and 62.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. The Division (City) Traffic Engineer will determine the hours of use for the special events beacon.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Microwave Detection Area	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
A	"SPECIAL EVENT" Sign w/Beacon (Figure 1)	A

OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	20	90	30
Yellow Clearance	3.0	4.8	4.1	3.0	4.8	4.1
Red Clearance	2.1	1.2	1.4	2.3	1.2	1.4
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT 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.

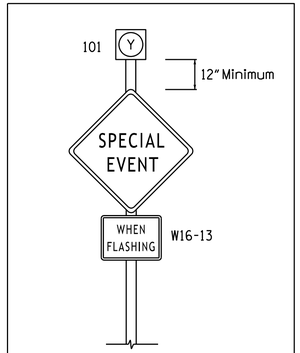
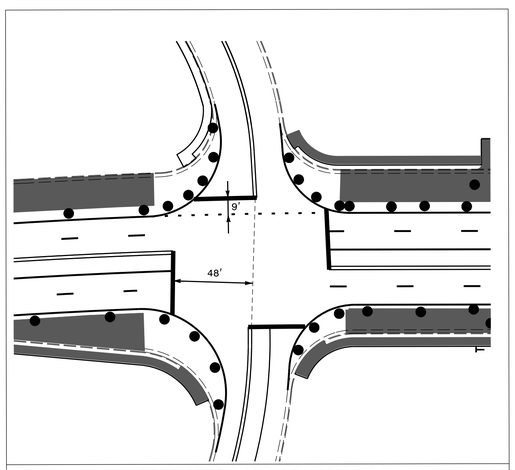


Figure 1: Sign A w/ Beacon



PROPOSED STOP BAR LOCATION DIAGRAM
NOT TO SCALE

Project #: 170908

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Signal Upgrade - Temporary Design 2; TMP-25

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Prepared for:
North Carolina Department of Transportation Mobility and Safety Division Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	L. Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE
0 50
1"=50'

SEAL
032117
NORTH CAROLINA PROFESSIONAL ENGINEER
ROYAL HINSHAW

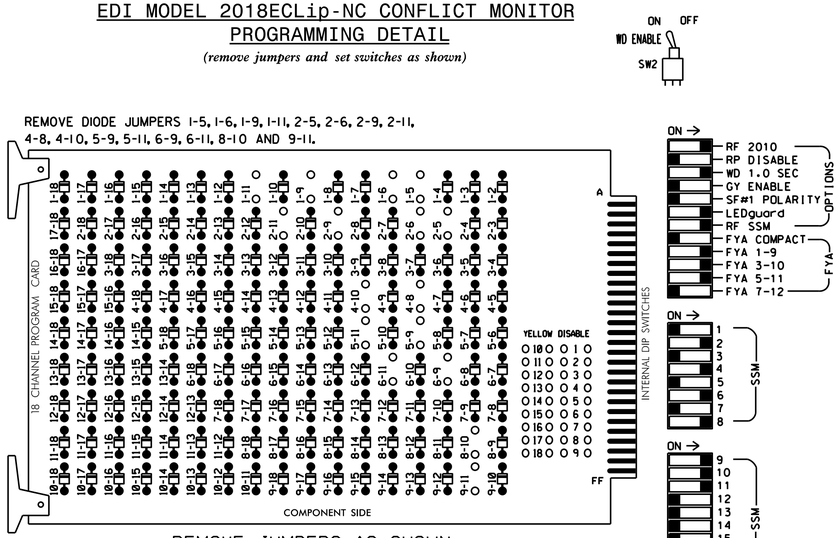
DocuSigned by:
R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-14T0T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 18.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
7. The cabinet and controller are part of the High Point Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3*,S5,S7,S8,S11, AUX S1,AUX S2,AUX S4
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....5+6
OVERLAP "D".....NONE

* S3 Used for Special Event Flasher

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	SPECIAL EVENT FLASHER	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	101	NU	41,42, 43	NU	51 ★	61,62	NU	NU	82,83, 84	NU	11 ★	81 ★	NU	51 ★	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
✋																		
PED YELLOW			** 114															
🚶			*															

NU = Not Used

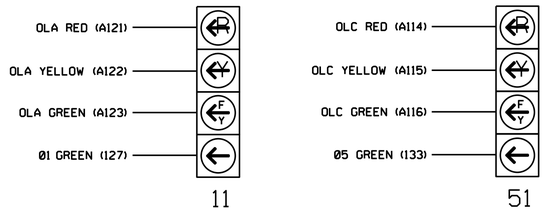
* Denotes install load resistor. See load resistor installation detail this sheet.

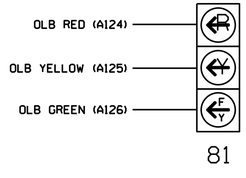
★ See pictorial of head wiring in detail this sheet.

** S3-Y is used for the Special Events. See sheet 3 for wiring and programming detail.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



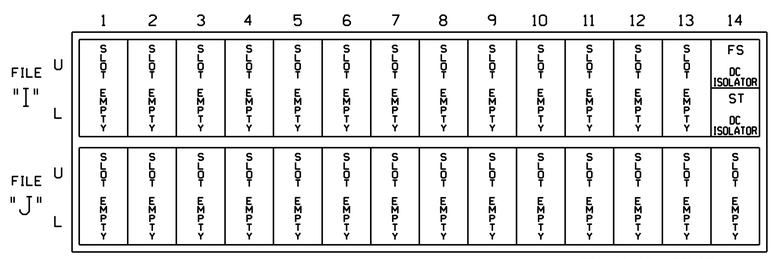


NOTE

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)



SPECIAL DETECTOR NOTE

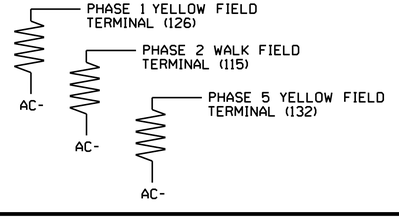
Install a multiple zone microwave detection system for all vehicle detection zones. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



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: 07-1470T2
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 2; TMP-25
Electrical Detail - Sheet 1 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.) at Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: N.C. Transportation Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section, N.C. Department of Transportation

750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 18.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

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

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
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
  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
```

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

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

(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: :  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 '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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T2
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 2; TMP-25
Electrical Detail - Sheet 2 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared for:
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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

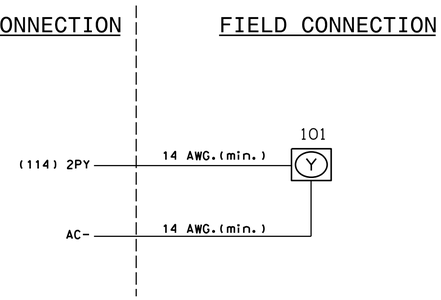
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 18.3

SPECIAL EVENT FLASHER (101)

(wire flashers as shown)



SPECIAL EVENT FLASHER
SCHEDULING PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'B' (SCHEDULING).

```
SCHEDULED EVENT #1      NOT ASSIGNED*
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**/**
STOP TIME (HH:MM)..............**/**
DOW     |SUN MON TUE WED THR FRI SAT
ENABLED | **  **  **  **  **  **  **
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORTY:  LOW..._ MED..._  HIGH.._
CAHNGE 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)............._
SET OUTPUT ON  (1-64)...............33
SET OUTPUT OFF (1-64)................_
SET INPUT ON   (1-64)................_
SET INPUT OFF  (1-64)................_
ENABLE FAILURES LOG?................._
ENABLE EVENTS LOG?..................._
ENABLE DATA ENTRIES LOG?............._
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64)..............._
ENABLE DETECTOR DIAGNOSTICS (1-64)..._
ENABLE DET STRETCH / DELAY (1-64)...._
ENABLE DET STOP BAR MODE (1-64)......_
SET LOGIC FLAG ON (1-16)............._
SET LOGIC FLAG OFF (1-64)...........
OVERIDE PHASE CONTROL FUNCTIONS?....._
```

* AFTER PROGRAMMING THIS SPACE WILL READ 'OUTPUT OVERRIDE'.

/ TIME, DATES, AND DAYS OF WEEK DETERMINED BY THE DTE.

SPECIAL EVENT FLASHER
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
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......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
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.........................._
```

EDIT THE FIRST THREE PROGRAMMING ROWS TO DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE IN WHICH IT WILL FLASH.

LEAVE THE ENTRY AS IS

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T2
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 2; TMP-25
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared for:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by:
R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T2

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 19.0

PHASING DIAGRAM

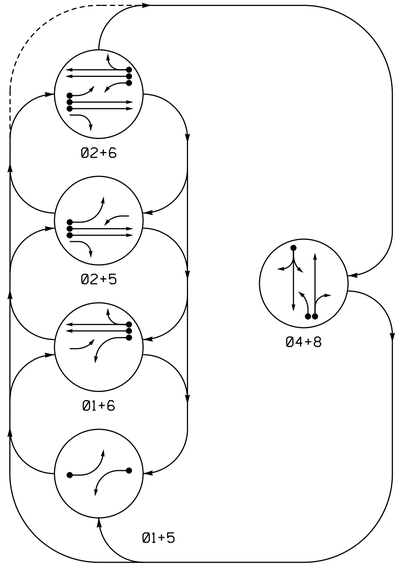


TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	~~←~~	~~←~~	F/~~Y~~	F/~~Y~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	G	R	Y
51	~~←~~	F/~~Y~~	~~←~~	F/~~Y~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	F/~~Y~~	~~R~~
82,83,84	R	R	R	R	G	R

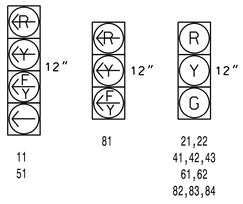
TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
101	ON	OFF

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

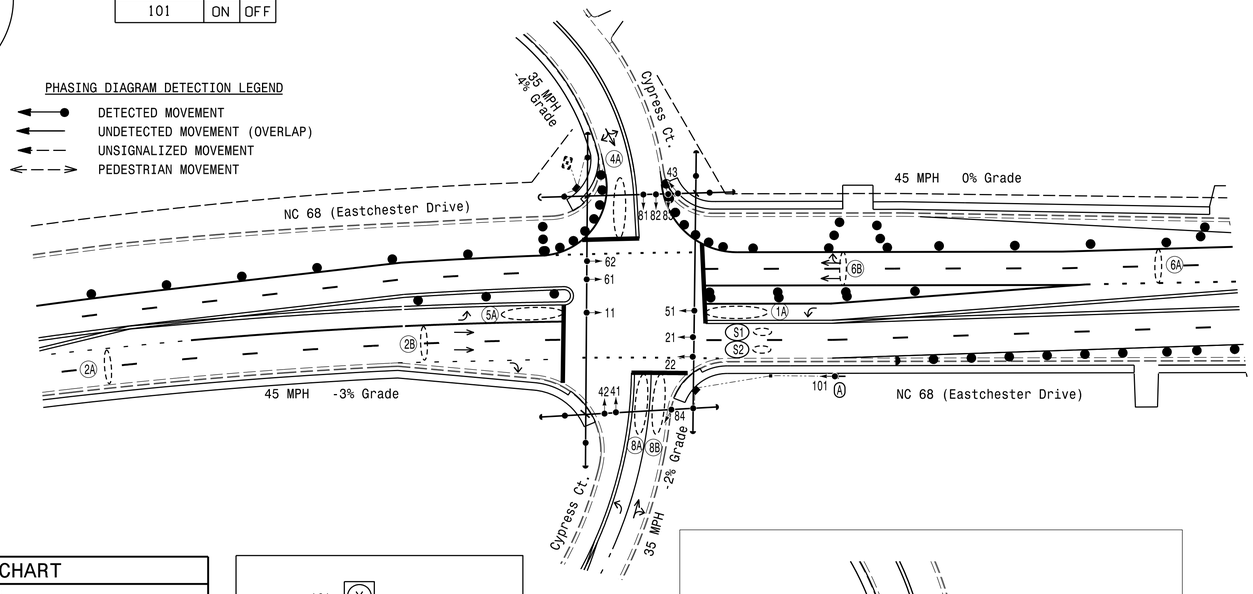
All Heads L.E.D.



11
51

81

21,22
41,42,43
61,62
82,83,84



OASIS 2070 LOOP & DETECTOR INSTALLATION												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A *	*	0	*	*	1	Y	Y	-	-	15	-	*
					6	Y	Y	-	-	-	-	*
2A *	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B *	*	90	*	*	2	Y	Y	-	-	-	-	*
4A *	*	0	*	*	4	Y	Y	-	-	10	-	*
5A *	*	0	*	*	5	Y	Y	-	-	15	-	*
					2	Y	Y	-	-	-	-	*
6A *	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B *	*	90	*	*	6	Y	Y	-	-	-	-	*
8A *	*	0	*	*	8	Y	Y	-	-	3	-	*
8B *	*	0	*	*	8	Y	Y	-	-	10	-	*
S1 *	*	+125	*	*	-	-	-	-	-	-	Y	*
S2 *	*	+125	*	*	-	-	-	-	-	-	Y	*

*Multi-Zone Microwave Detection

5 Phase Fully Actuated (High Point Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 11, 21, 22, and 51.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. The Division (City) Traffic Engineer will determine the hours of use for the special events beacon.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Metal Pole with Mastarm	
	Inductive Loop Detector	
	Microwave Detection Zone	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
	Construction Zone	
	Construction Zone Drums	
A	"SPECIAL EVENT" Sign w/Beacon (Figure 1)	A

OASIS 2070 TIMING CHART						
FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	30	20	2.0	30
Yellow Clearance	3.0	4.8	4.1	3.0	4.8	4.1
Red Clearance	2.1	1.2	1.6	2.4	1.2	1.6
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT 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.

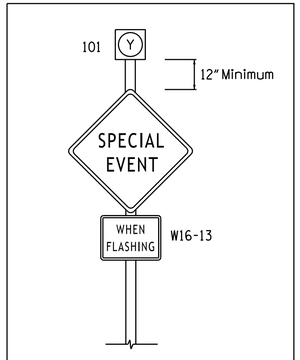
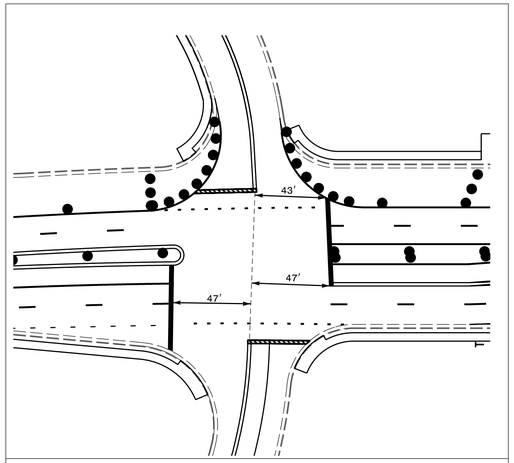


Figure 1: Sign A w/ Beacon



PROPOSED STOP BAR LOCATION DIAGRAM
NOT TO SCALE

Project #: 170908

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Signal Upgrade - Temporary Design 3; TMP-32

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Prepared for:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	L. Boyer	REVIEWED BY:	

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER J. ROYAL HINSHAW

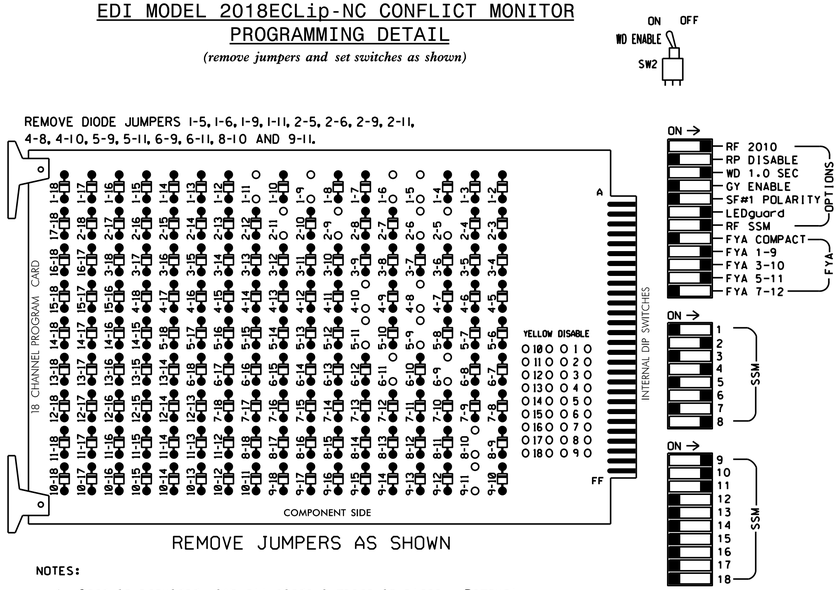
DocuSigned by: J. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-14T0T3

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 19.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
7. The cabinet and controller are part of the High Point Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3*,S5,S7,S8,S11, AUX S1,AUX S2,AUX S4
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....5+6
OVERLAP "D".....NONE

* S3 Used for Special Event Flasher

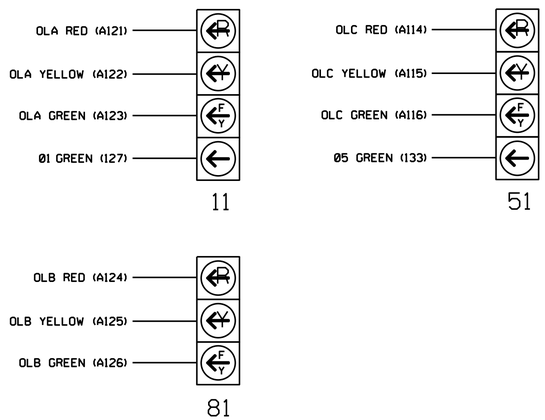
SIGNAL HEAD HOOK-UP CHART

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	SPECIAL EVENT FLASHER	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	101	NU	41,42 43	NU	51 ★	61,62	NU	NU	82,83 84	NU	11 ★	81 ★	NU	51 ★	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
✋																		
PED YELLOW			** 114															
🚶			*															

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.
** S3-Y is used for the Special Events. See sheet 3 for wiring and programming detail.

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)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

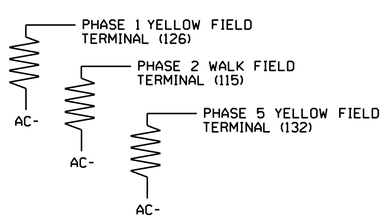
SPECIAL DETECTOR NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



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: 07-1470T3
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 3; TMP-32
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: North Carolina Department of Transportation, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

NC 68 (Eastchester Dr.) at Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T3

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 19.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

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

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
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
  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
```

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

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

(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: :  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 '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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T3
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 3; TMP-32
Electrical Detail - Sheet 2 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

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DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

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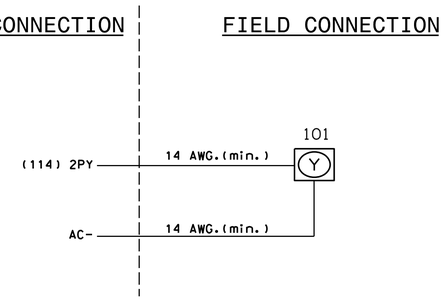
PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 19.3

SPECIAL EVENT FLASHER (101)

(wire flashers as shown)



SPECIAL EVENT FLASHER
SCHEDULING PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'B' (SCHEDULING).

```
SCHEDULED EVENT #1      NOT ASSIGNED*
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**/**
STOP TIME (HH:MM)..............**/**
DOW     |SUN MON TUE WED THR FRI SAT
ENABLED | **  **  **  **  **  **  **
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16).....................
PLAN (65=FLSH,66=FREE)...  OFFSET#...
PLAN PRIORITY:  LOW...  MED...  HIGH...
CAHNGE 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)...............
SET OUTPUT ON  (1-64).................33
SET OUTPUT OFF (1-64).................
SET INPUT ON   (1-64).................
SET INPUT OFF  (1-64).................
ENABLE FAILURES LOG?...................
ENABLE EVENTS LOG?.....................
ENABLE DATA ENTRIES LOG?...............
ENABLE COORDINATION PLANS LOG?.........
ENABLE SPECIAL FUNCTIONS LOG?..........
ENABLE SLIT MONITOR LOG?...............
ENABLE DETECTOR DATA LOG?..............
ENABLE DETECTOR (1-64).................
ENABLE DETECTOR DIAGNOSTICS (1-64).....
ENABLE DET STRETCH / DELAY (1-64)......
ENABLE DET STOP BAR MODE (1-64)........
SET LOGIC FLAG ON (1-16)...............
SET LOGIC FLAG OFF (1-64)..............
OVERIDE PHASE CONTROL FUNCTIONS?.....
```

* AFTER PROGRAMMING THIS SPACE WILL READ 'OUTPUT OVERRIDE'.

/ TIME, DATES, AND DAYS OF WEEK DETERMINED BY THE DTE.

SPECIAL EVENT FLASHER
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
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.......................
PEDESTRIAN PHASE....................
VEHICLE OVERLAP.....................
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..........................
```

EDIT THE FIRST THREE PROGRAMMING ROWS TO DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE IN WHICH IT WILL FLASH.

LEAVE THE ENTRY AS IS

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T3
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 3; TMP-32
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for:
NC Department of Transportation
Transportation Mobility and Safety Division
Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

DocuSigned by:
R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T3

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 20.0

PHASING DIAGRAM

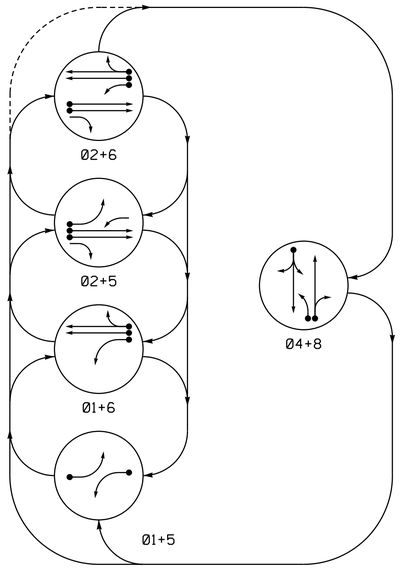


TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	04+8	FLASH
11	~~—~~	~~—~~	~~F~~ Y	~~F~~ Y	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	~~—~~	~~R~~	~~—~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	~~F~~ Y	~~R~~
82,83,84	R	R	R	R	G	R

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL	
	1	2
101	ON	OFF

OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A *	*	0	*	*	1	Y	Y	-	-	15	-	*
					6	Y	Y	-	-	-	-	*
2A *	*	300	*	*	2	Y	Y	-	1.6	-	-	*
2B *	*	90	*	*	2	Y	Y	-	-	-	-	*
4A *	*	0	*	*	4	Y	Y	-	-	10	-	*
5A *	*	0	*	*	5	Y	Y	-	-	-	-	*
6A *	*	300	*	*	6	Y	Y	-	1.6	-	-	*
6B *	*	90	*	*	6	Y	Y	-	-	-	-	*
8A *	*	0	*	*	8	Y	Y	-	-	3	-	*
8B *	*	0	*	*	8	Y	Y	-	-	10	-	*
S1 *	*	+125	*	*	-	-	-	-	-	-	Y	*
S2 *	*	+125	*	*	-	-	-	-	-	-	Y	*

* Multi-Zone Microwave Detection

5 Phase
Fully Actuated
(High Point Signal System)

NOTES

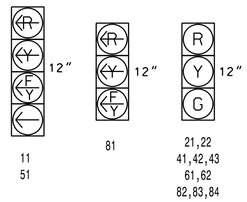
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 61 and 62.
5. Set all detector units to presence mode.
6. A multiple zone microwave detection system is used to provide traffic detection during this temporary phase on approaches where the existing loops and lead-ins have been rendered inoperable by construction. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
7. Pavement markings are existing unless otherwise shown.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. The Division (City) Traffic Engineer will determine the hours of use for the special events beacon.

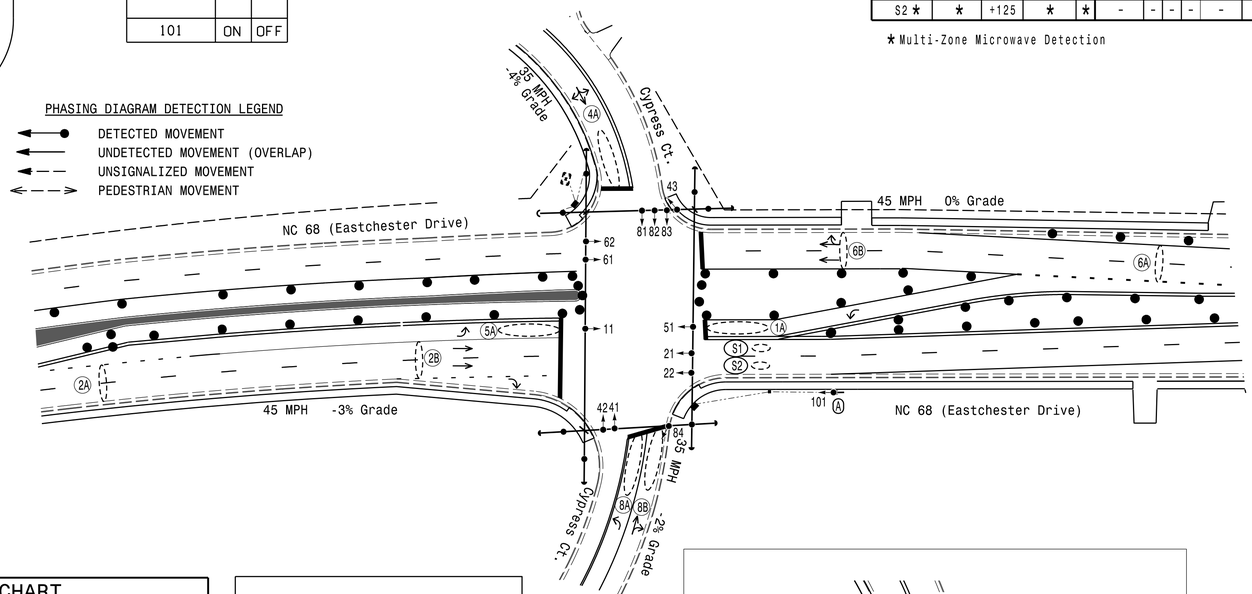
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Metal Pole with Mastarm	●
▭	Inductive Loop Detector	▭
⬭	Microwave Detection Zone	⬭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
□	Oversize Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
—DD—	Directional Drill	N/A
N/A	Right of Way	— — —
→	Directional Arrow	→
N/A	Curb Ramp	♿
▬	Construction Zone	▬
●—●	Construction Zone Drums	●—●
Ⓐ	"SPECIAL EVENT" Sign w/Beacon (Figure 1)	Ⓐ

OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	20	90	30
Yellow Clearance	3.0	4.8	4.1	3.0	4.8	4.1
Red Clearance	2.6	1.3	2.7	2.9	1.3	2.7
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT 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.

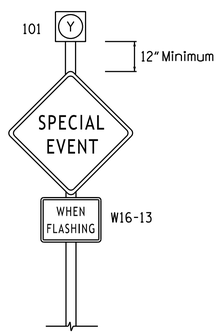
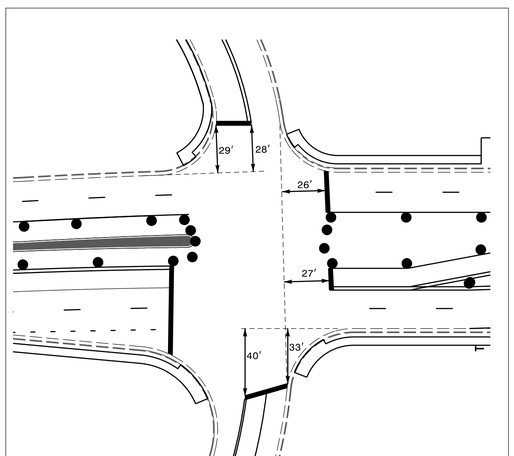


Figure 1: Sign A w/ Beacon



PROPOSED STOP BAR LOCATION DIAGRAM
NOT TO SCALE

Project #: 170908

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Signal Upgrade - Temporary Design 4; TMP-36,39

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	L. Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 50 1"=50'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

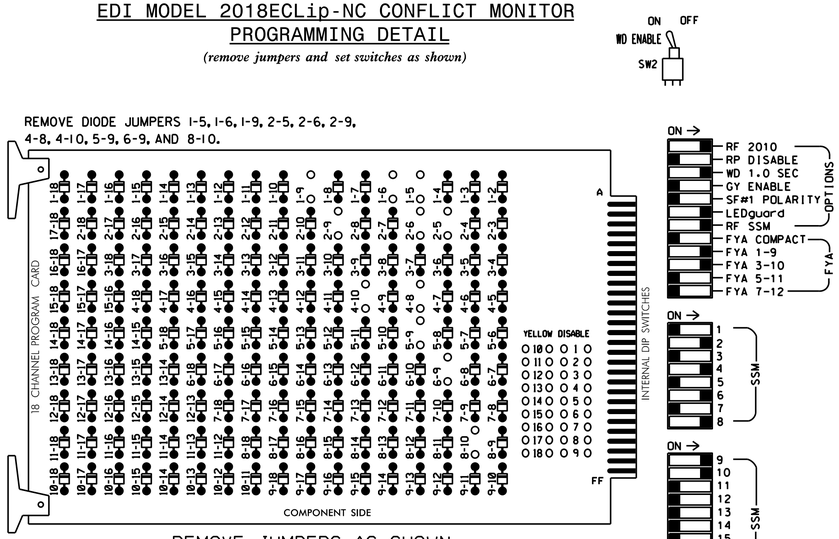
DocuSigned by: F. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-147014

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 20.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3*,S5,S7,S8,S11, AUX S1,AUX S2,AUX S4
PHASES USED.....1,2,4,5,6,8
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....NONE
OVERLAP "D".....NONE

* S3 Used for Special Event Flasher

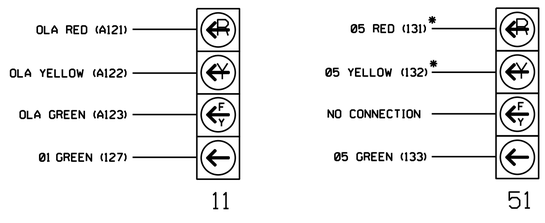
SIGNAL HEAD HOOK-UP CHART

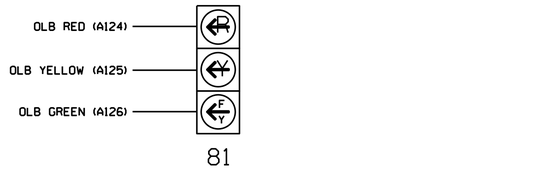
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	SPECIAL EVENT FLASHER	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	101	NU	41,42 43	NU	51 ★	61,62	NU	NU	82,83 84	NU	11 ★	81 ★	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW							131						A121	A124				
YELLOW ARROW							132						A122	A125				
FLASHING YELLOW ARROW													A123	A126				
GREEN ARROW	127						133											
✋																		
PED YELLOW			** 114															
🚶			*															

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.
** S3-Y is used for the Special Events. See sheet 3 for wiring and programming detail.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)





NOTE

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

* The wiring for head 51 is to be changed for this temporary phase.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

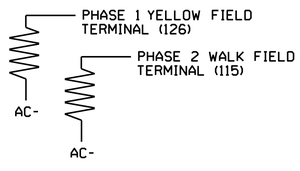
SPECIAL DETECTOR NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1470T4
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 4; TMP-36,39
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

NC 68 (Eastchester Dr.) at Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 20.2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3. LOGIC COMMANDS 4, 5, AND 6 ARE TO BE DISABLED IN THIS TEMPORARY PHASE.

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
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

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

            SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

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: :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: :   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: 07-1470T4
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 4; TMP-36,39
Electrical Detail - Sheet 2 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	L. Boyer
PREPARED BY:	A. Ravipati	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

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NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

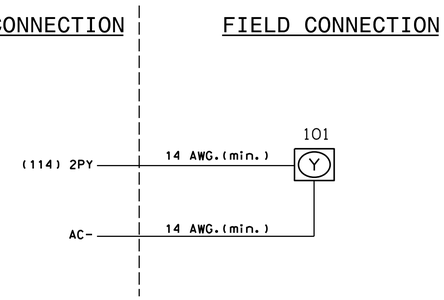
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 20.3

SPECIAL EVENT FLASHER (101)

(wire flashers as shown)



SPECIAL EVENT FLASHER
SCHEDULING PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'B' (SCHEDULING).

```
SCHEDULED EVENT #1      NOT ASSIGNED*
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**/**
STOP TIME (HH:MM)..............**/**
DOW     |SUN MON TUE WED THR FRI SAT
ENABLED | **  **  **  **  **  **  **
EVENT GROUPS    |12345678910111213141516
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORITY:  LOW..._ MED..._  HIGH.._
CAHNGE 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)............._
SET OUTPUT ON  (1-64)...............33
SET OUTPUT OFF (1-64)................_
SET INPUT ON   (1-64)................_
SET INPUT OFF  (1-64)................_
ENABLE FAILURES LOG?................._
ENABLE EVENTS LOG?..................._
ENABLE DATA ENTRIES LOG?............._
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64)..............._
ENABLE DETECTOR DIAGNOSTICS (1-64)..._
ENABLE DET STRETCH / DELAY (1-64)...._
ENABLE DET STOP BAR MODE (1-64)......_
SET LOGIC FLAG ON (1-16)............._
SET LOGIC FLAG OFF (1-64)...........
OVERIDE PHASE CONTROL FUNCTIONS?....._
```

* AFTER PROGRAMMING THIS SPACE WILL READ 'OUTPUT OVERRIDE'.

/ TIME, DATES, AND DAYS OF WEEK DETERMINED BY THE DTE.

SPECIAL EVENT FLASHER
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
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......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
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.........................._
```

EDIT THE FIRST THREE PROGRAMMING ROWS TO DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE IN WHICH IT WILL FLASH.

LEAVE THE ENTRY AS IS

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470T4
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Temporary Design 4; TMP-36,39
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Ct.

Division 7 | Guilford County | High Point

PLAN DATE: May 2018	REVIEWED BY: L. Boyer
PREPARED BY: A. Ravipati	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared for:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

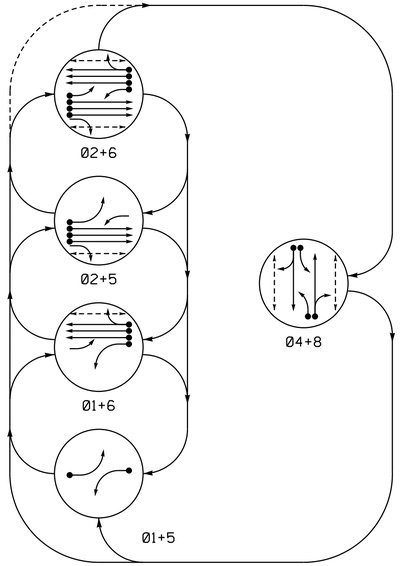
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by:
J. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470T4

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.0

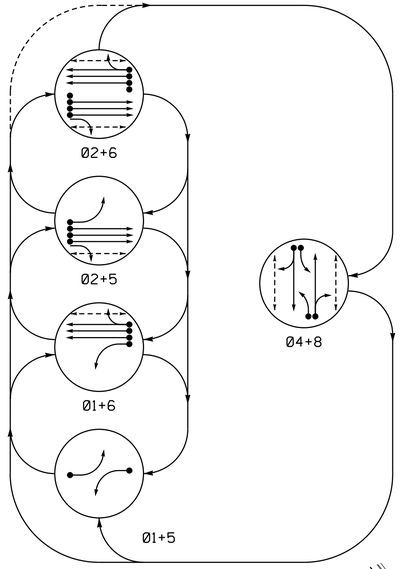
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	~~←~~	~~←~~	F Y	F Y	~~R~~	~~Y~~
21,22,23	R	R	G	G	R	Y
41	~~R~~	~~R~~	~~R~~	~~R~~	F Y	~~R~~
42,43,44	R	R	R	R	G	R
51	~~←~~	F Y	~~←~~	F Y	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	F Y	~~R~~
82,83,84	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	~~←~~	~~←~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22,23	R	R	G	G	R	Y
41	~~R~~	~~R~~	~~R~~	~~R~~	F Y	~~R~~
42,43,44	R	R	R	R	G	R
51	~~←~~	~~R~~	~~←~~	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	Y
81	~~R~~	~~R~~	~~R~~	~~R~~	F Y	~~R~~
82,83,84	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

OASIS 2070 LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15*	-	Y
					6**	Y	Y	Y	-	3	-	Y
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	Y
2C	6X6	300	6	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15*	-	Y
					2**	Y	Y	Y	-	3	-	Y
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B	6x6	300	5	Y	6	Y	Y	-	-	-	-	Y
6C	6x6	300	5	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	3	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	Y
S1	6X6	+125	4	Y	-	-	-	-	-	-	Y	Y
S2	6X6	+125	4	Y	-	-	-	-	-	-	Y	Y
S3	6X6	+125	4	Y	-	-	-	-	-	-	Y	Y

* Reduce delay to 3 seconds during Alternate Phasing operation.
** Disable phase call for loop(s) during Alternate Phasing operation.

5 Phase
Fully Actuated
(High Point Signal System)

NOTES

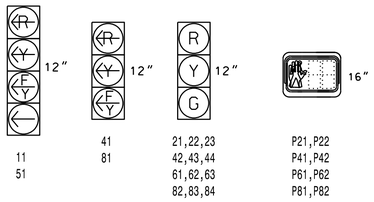
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or 5 may be lagged.
4. Set all detector units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

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

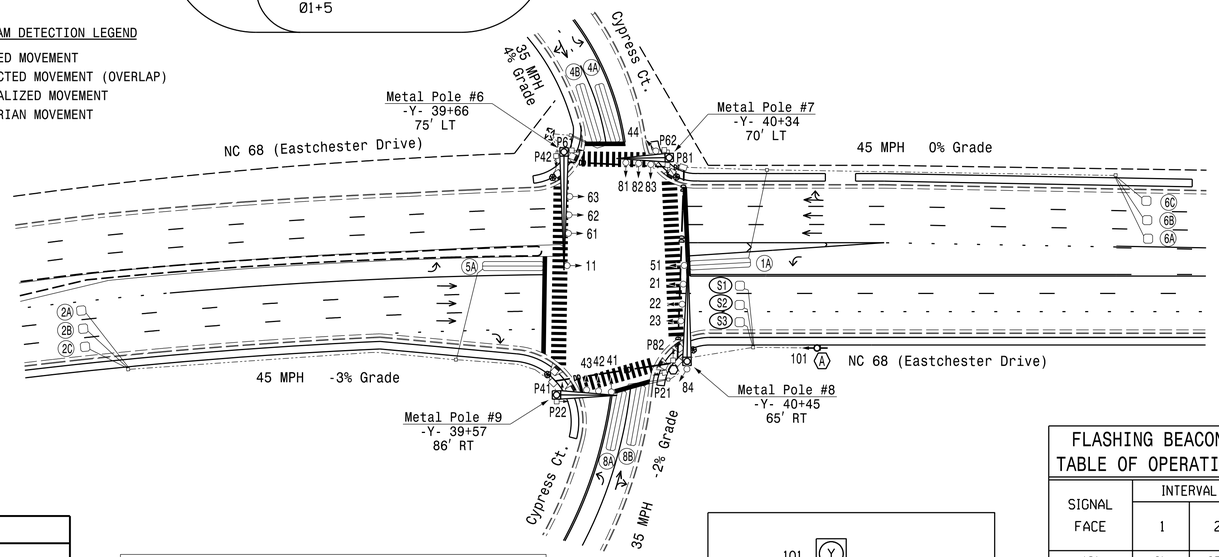


11
51

41
81

21,22,23
42,43,44
61,62,63
82,83,84

P21,P22
P41,P42
P61,P62
P81,P82



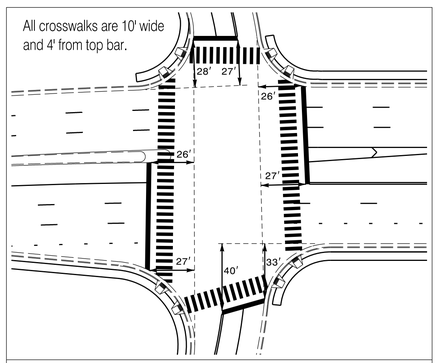
LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊓↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Metal Pole with Mastarm	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
▭	Oversize Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
— DD —	Directional Drill	N/A
N/A	Right of Way	- - - - -
→	Directional Arrow	→
N/A	Curb Ramp	♿
Ⓐ	"SPECIAL EVENT" Sign w/Beacon (Figure 1)	Ⓐ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	30	20	90	30
Yellow Clearance	3.0	4.8	4.1	3.0	4.8	4.1
Red Clearance	3.1	1.6	3.0	3.1	1.6	3.0
Walk 1 *	-	7	4	-	7	4
Don't Walk 1	-	11	31	-	9	26
Seconds Per Actuation *	-	1.0	-	-	1.0	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	30	-	-	30	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT 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.



PROPOSED STOP BAR AND CROSSWALK LOCATION DIAGRAM
NOT TO SCALE

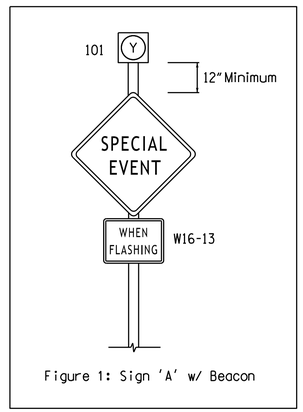


Figure 1: Sign 'A' w/ Beacon

FLASHING BEACON TABLE OF OPERATION

SIGNAL FACE	INTERVAL 1	2
101	ON	OFF

Project #: 170908

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Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 68 (Eastchester Dr.)
at
Cypress Court

Division 7 Guilford County High Point

PLAN DATE: May 2018 REVIEWED BY: R. Hinshaw
PREPARED BY: A. Ravipati REVIEWED BY: L. Boyer

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. HINSHAW

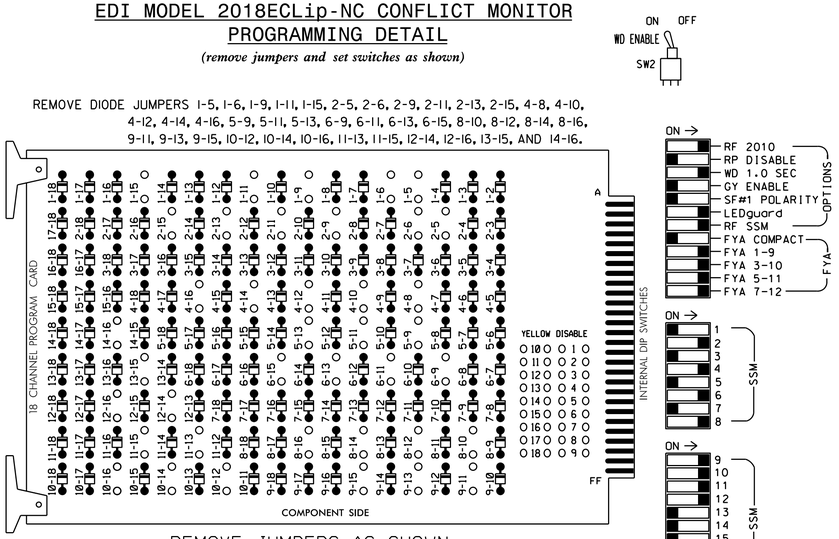
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,S12, AUX S1,AUX S2,AUX S4,AUX S5
PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,8,8PED
OVERLAP "A".....1+2
OVERLAP "B".....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	2 PED	SPECIAL EVENT FLASHER	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22, 23	P21, P22	101	NU	42,43 44	P41, P42	51 ★	61,62, 63	P61, P62	NU	82,83 84	P81, P82	11 ★	81 ★	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														A122	A125		A115	A102	
FLASHING YELLOW ARROW														A123	A126		A116	A103	
GREEN ARROW	127							133											
✋			113				104			119			110						
PED YELLOW				✱✱ 114															
🚶			115				106			121			112						

NU = Not Used

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

✱✱ S3-Y is used for the Special Events Flasher. See sheet 2 for wiring and programming detail.

★ See pictorial of head wiring in detail this sheet.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	15
	-	J4U	48	10 ★	26	6	Y	Y	Y	-	3
	-	I1U	56	18 ★	51	1	Y	Y	-	-	3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y	-	-	-
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	-	-	-
2C	TB2-9,10	I3U	63	25	32	2	Y	Y	-	-	-
4A	TB4-9,10	I6U	41	3	4	4	Y	Y	-	-	3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y	-	-	10
✱ S1	TB6-9,10	I9U	60	22	11	SYS	-	-	-	-	-
✱ S2	TB6-11,12	I9L	62	24	13	SYS	-	-	-	-	-
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y	-	-	15
	-	I4U	47	9 ★	22	2	Y	Y	Y	-	3
	-	J1U	55	17 ★	55	5	Y	Y	-	-	3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y	-	-	-
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	-	-	-
6C	TB3-9,10	J3U	64	26	36	6	Y	Y	-	-	-
8A	TB5-9,10	J6U	42	4	8	8	Y	Y	-	-	3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y	-	-	10
✱ S3	TB7-9,10	J9U	59	21	15	SYS	-	-	-	-	-
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

[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.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	ø1 1A	ø2 2A	ø2 2C	WIRED INPUT ⊗	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED	ø2 2B	NOT USED			ø4 4B			SYS. DET. S2			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	ø5 5A	ø6 6A	ø6 6C	WIRED INPUT ⊗	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S3	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	ø6 6B	NOT USED			ø8 8B			NOT USED					

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

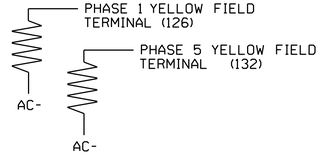
FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

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: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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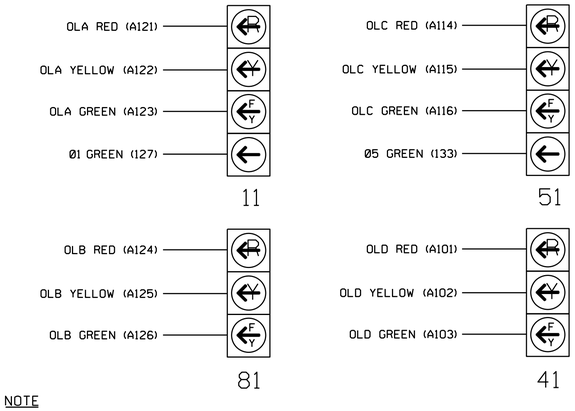
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 3 for programming instructions.

Electrical Detail - Final Design - Sheet 1 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy, Garner, NC 27529

NC 68 (Eastchester Dr.) at Cypress Court

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	R Hinshaw
PREPARED BY:	L Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

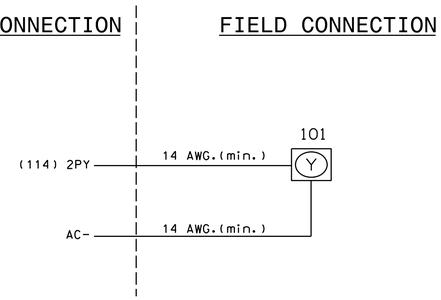
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.2

SPECIAL EVENT FLASHER (101)

(wire flashers as shown)



SPECIAL EVENT FLASHER
SCHEDULING PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 'B' (SCHEDULING).

```
SCHEDULED EVENT #1      NOT ASSIGNED*
START DATE (MM/DD).............**/**
END DATE (MM/DD)...............**/**
START TIME (HH:MM).............**/**
STOP TIME (HH:MM)..............**/**
DOW     |SUN MON TUE WED THR FRI SAT
ENABLED | **  **  **  **  **  **  **
EVENT GROUPS    |123456789101112131415 16
ASSIGNED        |

DELETE EVENT WHEN COMPLETED?........N
CONTINUOUS EVENT?...................N
INVERT EVENT?.......................N
SELECT 1 EVENT TYPE:
EVENT GROUP (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
PLAN PRIORITY:  LOW..._ MED..._  HIGH.._
CAHNGE 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)............._
SET OUTPUT ON  (1-64)...............33
SET OUTPUT OFF (1-64)................_
SET INPUT ON   (1-64)................_
SET INPUT OFF  (1-64)................_
ENABLE FAILURES LOG?................._
ENABLE EVENTS LOG?..................._
ENABLE DATA ENTRIES LOG?............._
ENABLE COORDINATION PLANS LOG?......_
ENABLE SPECIAL FUNCTIONS LOG?......._
ENABLE SLIT MONITOR LOG?............_
ENABLE DETECTOR DATA LOG?..........._
ENABLE DETECTOR (1-64)..............._
ENABLE DETECTOR DIAGNOSTICS (1-64)..._
ENABLE DET STRETCH / DELAY (1-64)...._
ENABLE DET STOP BAR MODE (1-64)....._
SET LOGIC FLAG ON (1-16)............._
SET LOGIC FLAG OFF (1-64)..........._
OVERIDE PHASE CONTROL FUNCTIONS?....._
```

* AFTER PROGRAMMING THIS SPACE WILL READ 'OUTPUT OVERRIDE'.

/ TIME, DATES, AND DAYS OF WEEK DETERMINED BY THE DTE.

SPECIAL EVENT FLASHER
OUTPUT ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). PRESS '+' UNTIL OUTPUT #33 (PIN 35) IS REACHED.

```
PAGE:1  C1 PIN:35  NOT ENABLED
OUTPUT ASSIGNMENT #.................33
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......................._
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................._
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.........................._
```

EDIT THE FIRST THREE PROGRAMMING ROWS TO DEFINE THE OUTPUT TO FLASH, ALONG WITH THE RATE IN WHICH IT WILL FLASH.

LEAVE THE ENTRY AS IS

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Electrical Detail - Final Design - Sheet 2 of 6

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
Transportation Mobility and Safety Division
Traffic Engineering & Signals Management Section
DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Court

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	R Hinshaw
PREPARED BY:	L Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032117 ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.3

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

(program controller as shown below)

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

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

```
  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
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

PRESS '+'

```
  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
```

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

PRESS '+'

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

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

```
  LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

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::  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 '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

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::  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 '+'

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

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

Project #: 170908

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

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Electrical Detail - Final Design - Sheet 3 of 6

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NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R. Royal Hinshaw 05/20/2018
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SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.4

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 SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

→ ENTER A 'Y' FOR NOT ENABLED

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

(LOOP 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 SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PRESS '+' TO ADVANCE TO INPUT 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 SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

→ ENTER '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 SYCHRONIZATION (0-23)......._
FORCE OFF RING (1-4)................._
HOLD PHASES (1-16)..................._
PLAN (65=FLSH,66=FREE)..._  OFFSET#.._
CHANGE PHASE SEQUENCE PAGE (1-12)...._
CHANGE PHASE TIMING PAGE (1-4)......._
CHANGE PHASE CONTROL PAGE (1-4)......_
CHANGE OVERLAP CONTROL PAGE (1-4)...._
CHANGE INPUT PAGE (1-4).............._
CHANGE OUTPUT PAGE (1-4)............._
OVERRIDE PHASE CONTROL FUNCTION (Y)._
```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 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
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: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Electrical Detail - Final Design - Sheet 4 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 68 (Eastchester Dr.)
at
Cypress Court

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	R Hinshaw
PREPARED BY:	L Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Traffic Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.5

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

(program controller as shown below)

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

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

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

```
PAGE: 2 C1 PIN:47  VEHICLE DETECTOR
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............22
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

→ ENTER A 'Y' FOR NOT ENABLED →

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

(LOOP 5A - PHASE 2)

```
PAGE: 2 C1 PIN:47  NOT ENABLED
INPUT ASSIGNMENT #.................9
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC).............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N)...................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYCHRONIZATION (0-23)......
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)...  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).
```

PRESS '+' TO ADVANCE TO INPUT 17

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

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

(LOOP 5A - PHASE 5)

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

PROGRAMMING COMPLETE

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

(program controller as shown below)

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

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

→ ENTER 'Y' FOR ENABLE DETECTOR →

→ ENTER '5' FOR PHASES ASSIGNED →

→ ENSURE DELAY IS '3' →

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

DETECTOR PROGRAMMING COMPLETE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

Project #: 170908

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Electrical Detail - Final Design - Sheet 5 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Court

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	R Hinshaw
PREPARED BY:	L Boyer	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.6

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

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

ALTERNATE PHASING PAGE CHANGE SUMMARY

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

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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.

Project #: 170908

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1470
DESIGNED: May 2018
SEALED: May 20, 2018
REVISED: N/A

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Electrical Detail - Final Design - Sheet 6 of 6

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.)
at
Cypress Court

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R Hinshaw
PREPARED BY:	L Boyer	REVIEWED BY:	

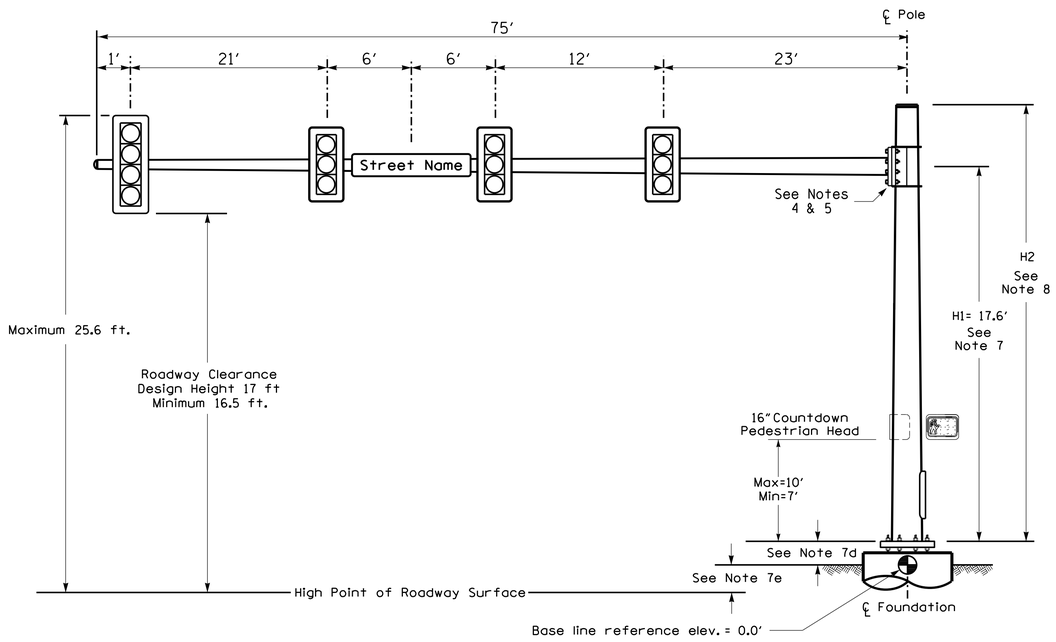
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER ROYAL HINSHAW

DocuSigned by: R Royal Hinshaw 05/20/2018
SIGNATURE DATE
PRINTED NAME

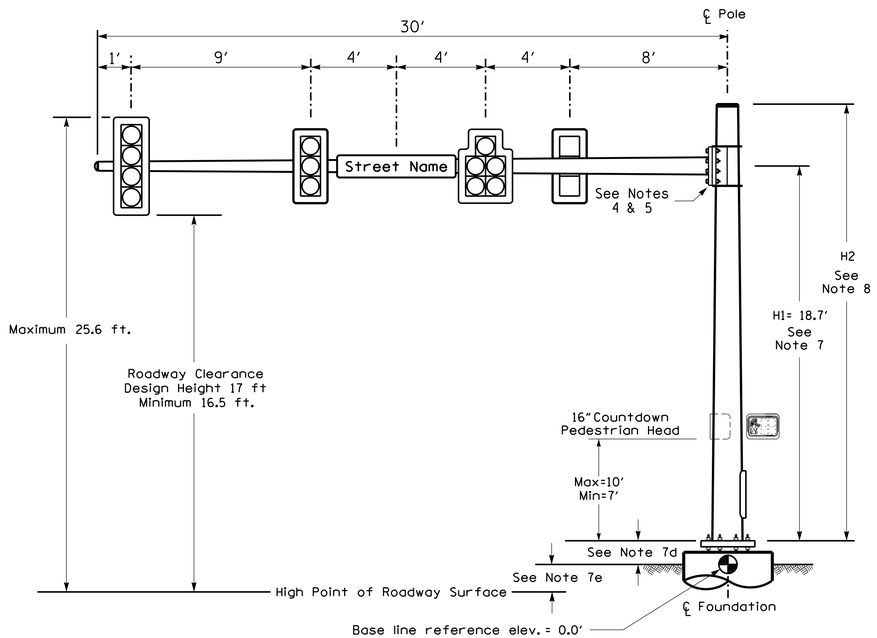
SIG. INVENTORY NO. 07-1470

Design Loading for METAL POLE NO. 6



Elevation View

Design Loading for METAL POLE NO. 7



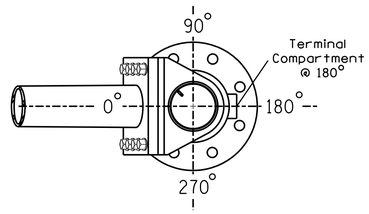
Elevation View

SPECIAL NOTE

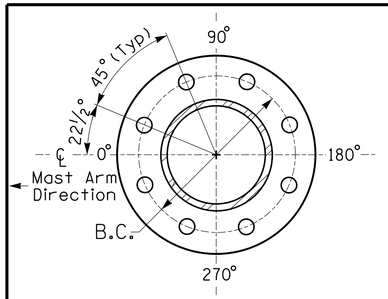
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 6	Pole 7
Baseline reference point at ℄ Foundation @ ground level ⊕	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-1.4 ft.	-0.3 ft.
Elevation difference at Edge of travelway or face of curb	-1.4 ft.	-0.8 ft.

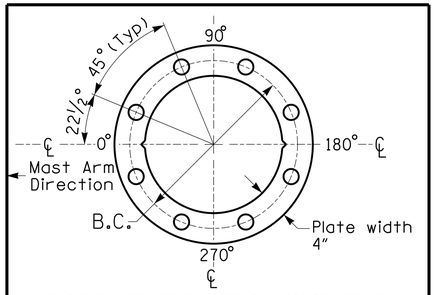


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 6 and 7

PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.7

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	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″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-5 SECTION-WITH BACKPLATE	16.3 S.F.	42.0″W X 56.0″L	103 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″W X 17.0″L	21 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

NCDOT Wind Zone 4 (90 mph)

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 68 (Eastchester Dr.) at Cypress Court

Division 7 Guilford County High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	A. Ravipati	REVIEWED BY:	L Boyer

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER R. ROYAL HINSHAW

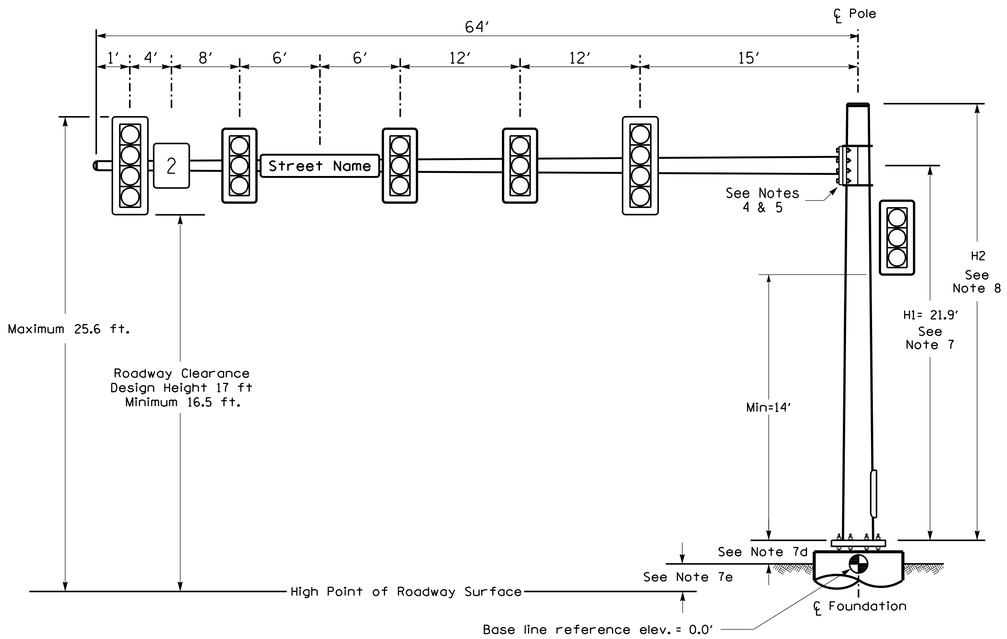
DocuSigned by: R. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470

METAL POLE No. 8 and 9

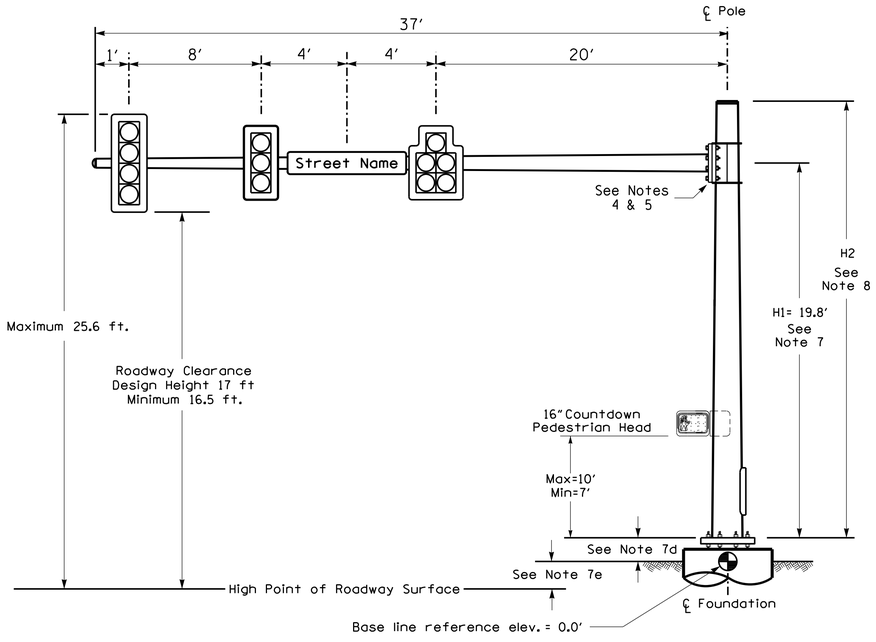
PROJECT REFERENCE NO.	SHEET NO.
U-5169	Sig. 21.8

Design Loading for METAL POLE NO. 8



Elevation View

Design Loading for METAL POLE NO. 9



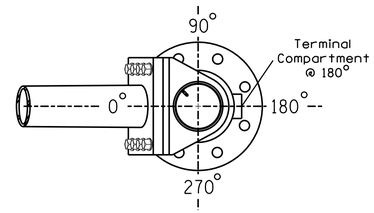
Elevation View

SPECIAL NOTE

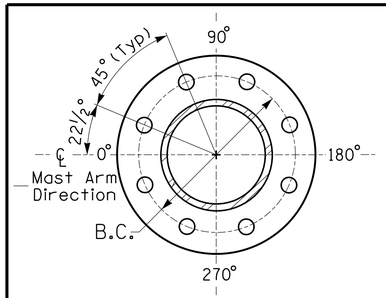
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 8	Pole 9
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+2.9 ft.	+0.8 ft.
Elevation difference at Edge of travelway or face of curb	+2.3 ft.	+0.3 ft.

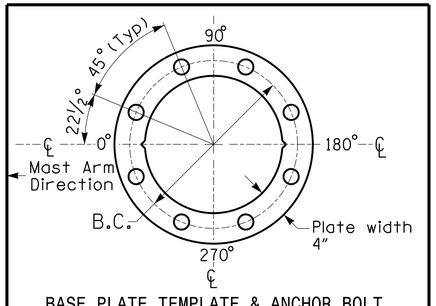


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	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″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″W X 52.5″L	60 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-5 SECTION-WITH BACKPLATE	16.3 S.F.	42.0″W X 56.0″L	103 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″W X 36.0″L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″W X 96.0″L	36 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″W X 17.0″L	21 LBS

NOTES

DESIGN REFERENCE MATERIAL

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

DESIGN REQUIREMENTS

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

Project #: 170908

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NCBELS FIRM LICENSE NO. C-2522

NCDOT Wind Zone 4 (90 mph)

Prepared for: Transportation Mobility and Safety Division, Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 68 (Eastchester Dr.) at Cypress Court

Division 7 | Guilford County | High Point

PLAN DATE:	May 2018	REVIEWED BY:	R. Hinshaw
PREPARED BY:	A. Ravipati	REVIEWED BY:	L Boyer

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032117 ENGINEER F. ROYAL HINSHAW

DocuSigned by: F. Royal Hinshaw 05/20/2018
SIGNATURE DATE

SIG. INVENTORY NO. 07-1470