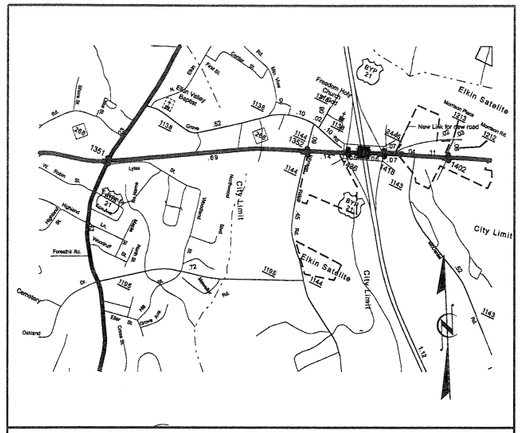
Project No.	Sheet No.
W-5601 AU	Sig. 1.0

Project: W-5601 AU



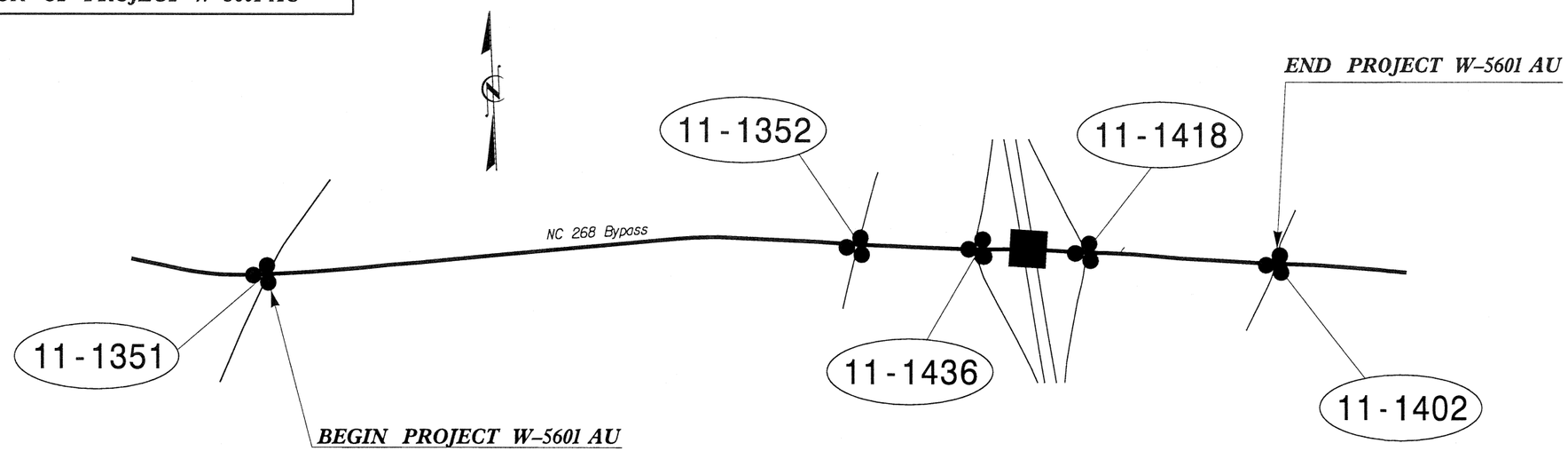
VICINITY MAP SHOWING LOCATION OF PROJECT W-5601 AU

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SURRY COUNTY

LOCATION: NC 268 from US 21 Bus. (North Bridge Street) to SR 1212 (Morrison Road) in Elkin.

TYPE OF WORK: TRAFFIC SIGNALS & WIRELESS COMMUNICATIONS PLANS



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

Index of Plans

Sheet #	Reference #	Location/Description
Sig.1.0	W-5601 AU	Title Sheet
Sig.2.0-2.2	11-1351	US 21 Bus. (North Bridge St.) at NC 268 Bypass
Sig.3.0-3.1	11-1352	NC 268 Bypass at SR 1144 (Johnson Ridge Rd.)
Sig.4.0-4.2	11-1436	NC 268 Bypass (CC Camp Rd.) at US 21 Bypass SB Off/On Ramp
Sig.5.0-5.1	11-1418	NC 268 Bypass (CC Camp Rd.) at US 21 Bypass NB Off/On Ramp
Sig.6.0-6.1	11-1402	NC 268 Bypass (CC Camp Rd.) at SR 1212 (Morrison Rd.) /Wal-Mart Entrance
SCP. 1-3	W-5601 AU	Wireless Communication Plans

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Timothy J. Williams, PE, Western Region Signals Engineer
John T. Rowe, Jr., PE, Signal Equipment Design Engineer
Gregory A. Fuller, PE, State ITS and Signals Engineer

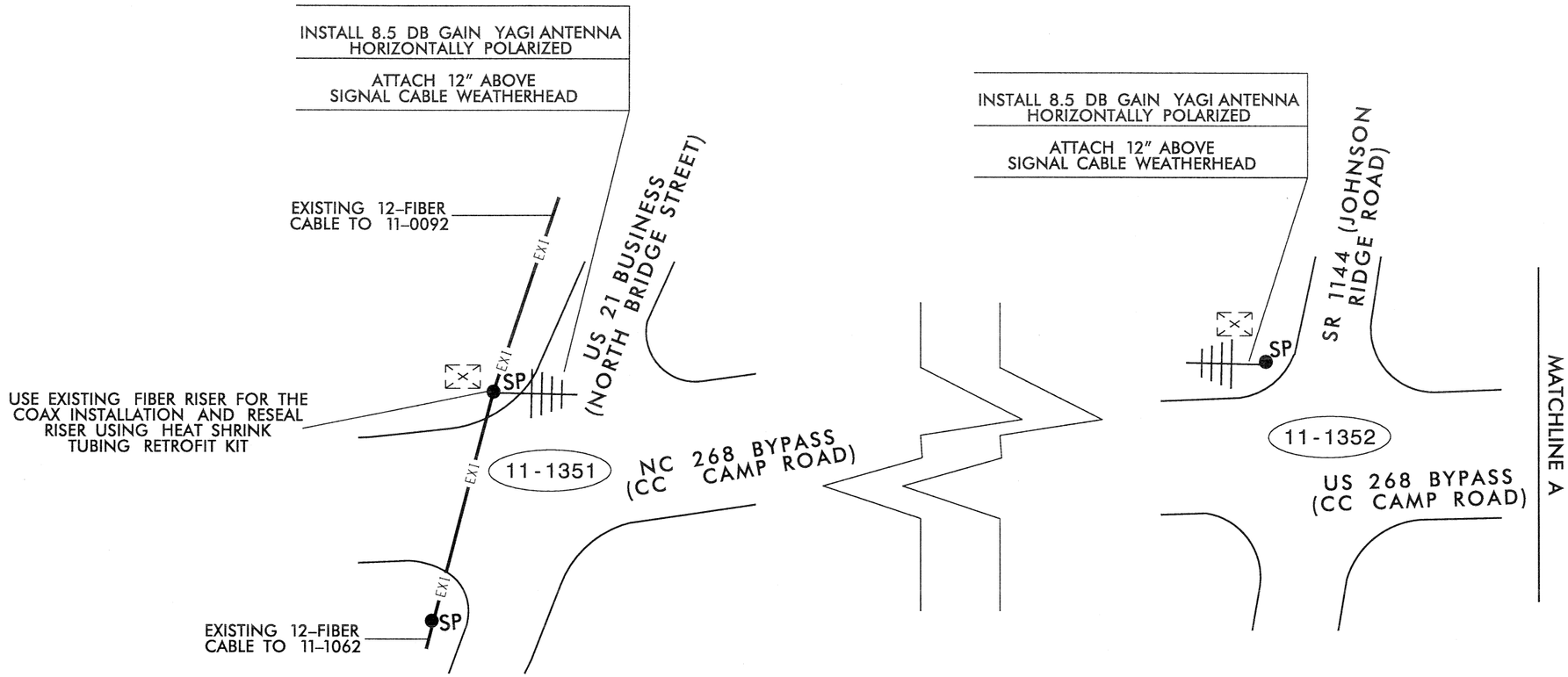
Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

Intelligent Transportation Systems & Signals Unit
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway, Garner, NC 27529

24-JUN-2015 16:06
S:\TTS&SUNITS Signals\Signal Design Section\Western Region\Div-11\W-5601AU Title sheet\W-5601AUtitlesheet.dgn

PROJECT REFERENCE NO.	SHEET NO.
W-5601AU	SCP 1



NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2" RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A 1/2" HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".
2. IF AN EXISTING 2" SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. INSTALL WIRELESS SERIAL RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET.
   (NOTE: RF ANTENNA DISCONNECT SWITCH AND DECAL ARE NOT REQUIRED WHEN THE ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
6. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."

LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET
- XX-XXXX — SIGNAL INVENTORY NUMBER
- NEW METAL POLE
- SP — SIGNAL POLE
- EXISTING METAL POLE
- —EX1— EXISTING FIBER OPTIC CABLE

Prepared in the Offices of:
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

WIRELESS COMMUNICATIONS PLANS

DIVISIONS 11 WILKES CO. ELKIN

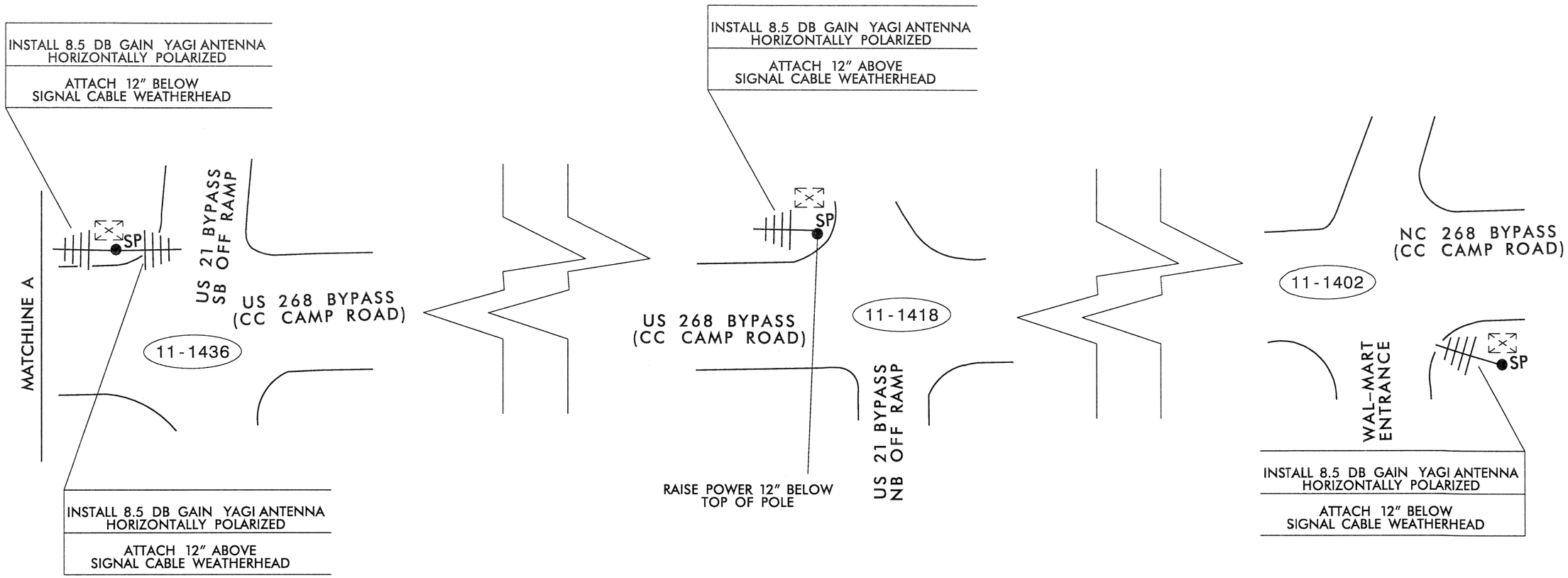
PLAN DATE: MAY 2015 REVIEWED BY: DocuSigned by: H. N. Avery
PREPARED BY: H.T.BERGGREN REVIEWED BY: 09F5C84C8ED3443...

SCALE 0 N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
DocuSigned by: Gregory A. Fuller 7032CA9AEE874FF... 5/28/2015 DATE

PROJECT REFERENCE NO.	SHEET NO.
W-5601AU	SCP 2



NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2" RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A 1/2" HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".
2. IF AN EXISTING 2" SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
   (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. INSTALL WIRELESS SERIAL RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET.
   (NOTE: RF ANTENNA DISCONNECT SWITCH AND DECAL ARE NOT REQUIRED WHEN THE ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
6. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."

LEGEND

	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
	YAGI ANTENNA (SINGLE)
	OMNI ANTENNA
	EXISTING CONTROLLER AND CABINET
	EXISTING MASTER CONTROLLER AND CABINET
XX-XXXX	SIGNAL INVENTORY NUMBER
	NEW METAL POLE
SP	SIGNAL POLE
	EXISTING METAL POLE
EXI	EXISTING FIBER OPTIC CABLE

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

WIRELESS COMMUNICATIONS PLANS

DIVISIONS 11 WILKES CO. ELKIN

PLAN DATE: MAY 2015 REVIEWED BY: DocuSigned by: J. N. Kulp
PREPARED BY: H.T.BERGGREN REVIEWED BY: 09F5DB4CBED0443...

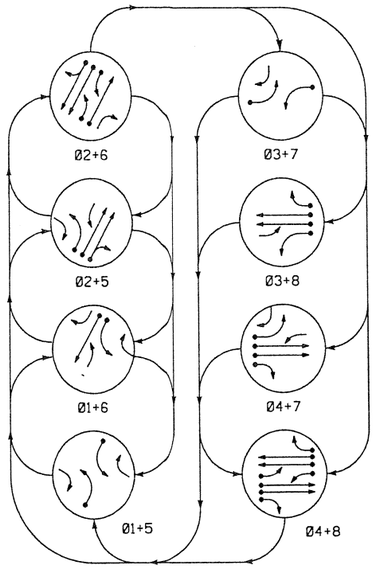
SCALE 0 N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

DocuSigned by: Gregory A. Fuller 7D32CA0AEEB74FF... 5/28/2015 DATE

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

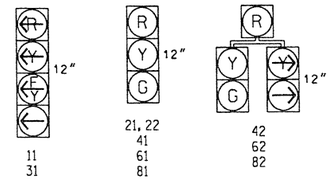
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



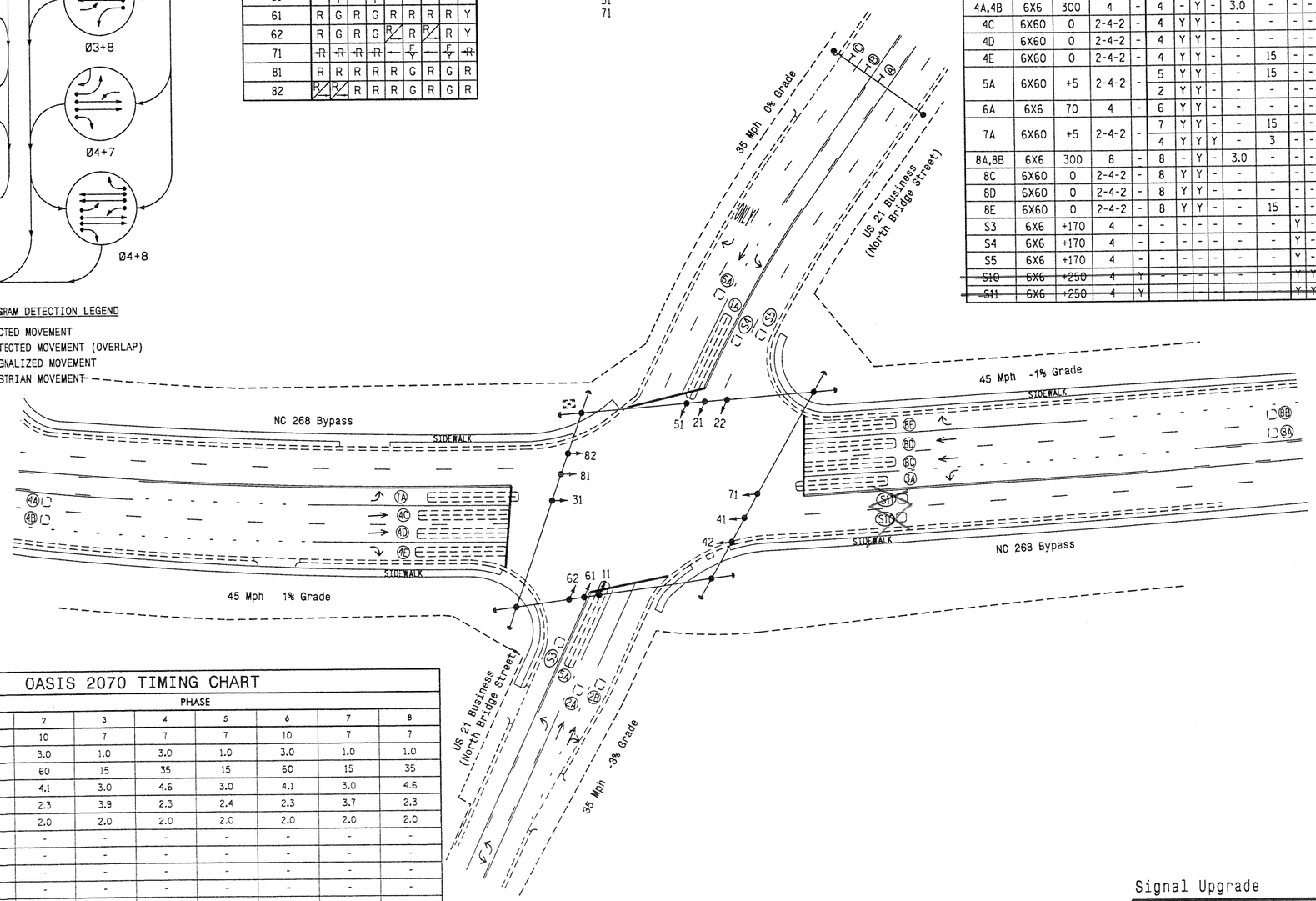
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X6	70	4	-	2	Y	Y	-	-	-	-	-
2B	6X6	70	4	-	2	Y	Y	-	-	-	-	-
3A	6X60	+5	2-4-2	-	3	Y	Y	-	-	15	-	-
					8	Y	Y	Y	-	3	-	-
4A,4B	6X6	300	4	-	4	-	Y	-	3.0	-	-	-
4C	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4D	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4E	6X60	0	2-4-2	-	4	Y	Y	-	-	15	-	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	15	-	-
					2	Y	Y	-	-	-	-	-
6A	6X6	70	4	-	6	Y	Y	-	-	-	-	-
7A	6X60	+5	2-4-2	-	7	Y	Y	-	-	15	-	-
					4	Y	Y	Y	-	3	-	-
8A,8B	6X6	300	8	-	8	-	Y	-	3.0	-	-	-
8C	6X60	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8D	6X60	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8E	6X60	0	2-4-2	-	8	Y	Y	-	-	15	-	-
S3	6X6	+170	4	-	-	-	-	-	-	-	Y	-
S4	6X6	+170	4	-	-	-	-	-	-	-	Y	-
S5	6X6	+170	4	-	-	-	-	-	-	-	Y	-
~~S10~~	~~6X6~~	~~+250~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S11~~	~~6X6~~	~~+250~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~

8 Phase
Fully Actuated
US 21 Bus. (North Bridge St.) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed loop system data: Controller Asset # 1351.
9. Install system loops S10 & S11.



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	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Through Arrow "ONLY" Sign (R3-5A)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	1.0	3.0	1.0	3.0	1.0	3.0	1.0	1.0
Max Green 1 *	15	60	15	35	15	60	15	35
Yellow Clearance	3.0	4.1	3.0	4.6	3.0	4.1	3.0	4.6
Red Clearance	2.4	2.3	3.9	2.3	2.4	2.3	3.7	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation. *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade

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

SCALE 1" = 40' (0 – 40)

US 21 Bus. (North Bridge St.)
at
NC 268 Bypass

Division 11 Surry County Elkin

PLAN DATE: June 2015 REVIEWED BY:
PREPARED BY: C. Pierce REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 024393 TIMOTHY J. WILLIAMS

DocuSigned by: T. J. Williams 6/18/2015
97A7F02AE8D5C...

SIG. INVENTORY NO. 1351

1351

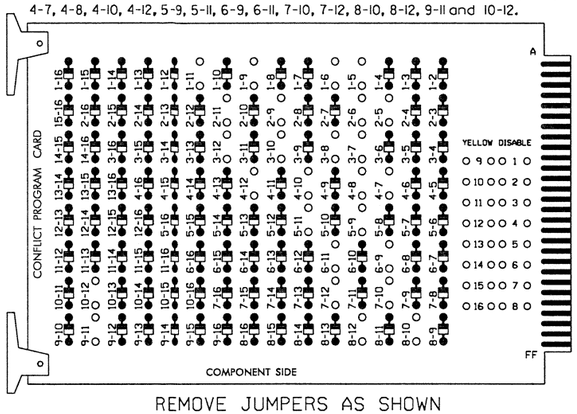
18-JUN-2015 14:11
S:\ITS\Sdlmf15 Signals\Signal Design Section\Western Region\Div-11\W11-135\W111351_sig_dsn_201505xx.dgn
cpierce

PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 2.1

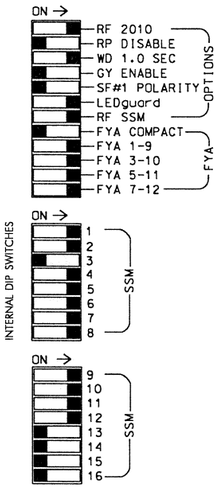
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 5-9, 5-11, 6-9, 6-11, 7-10, 7-12, 8-10, 8-12, 9-11 and 10-12.



REMOVE JUMPERS AS SHOWN



NOTES:

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

■ = 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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,13, 14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up 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 US 21 (North Bridge St.) Closed Loop System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5		S6	S6P	S7		S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1		2	2 PED	3	4	4 PED	5		6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	31★	41,42	NU	42	51★	61,62	NU	62	71★	81,82	NU	11★	31★	NU	51★	71★	NU
RED		✱	128			101		✱		134		✱		107							
YELLOW			129		✱	102				135				108							
GREEN			130			103				136				109							
RED ARROW																A121	A124		A114	A101	
YELLOW ARROW		126						132				123				A122	A125		A115	A102	
FLASHING YELLOW ARROW																A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124	124								

NU = Not Used

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

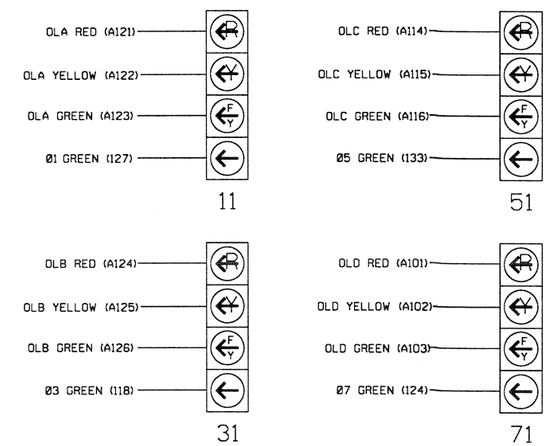
★ See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10, S12,S13
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....5+6
OVERLAP "D".....7+8

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for these signals require special logic programming. See sheet 2 of 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	Ø1	Ø2	SLOT	WIRED INPUT ⊗	Ø3	Ø4	Ø4	WIRED INPUT ⊗	SYS. DET. S10	SLOT	SLOT	SLOT	SLOT	FS
		1A	2A	EMPTY		3A	4A,4B	4D			EMPTY	EMPTY	EMPTY	EMPTY	DC ISOLATOR
	L	NOT USED	Ø2			NOT USED	Ø4	Ø4		SYS. DET. S11					ST
			2B				4C	4E							DC ISOLATOR
FILE "J"	U	Ø5	Ø6	SLOT	WIRED INPUT ⊗	Ø7	Ø8	Ø8	WIRED INPUT ⊗	SYS. DET. S3	SLOT	SLOT	SLOT	SLOT	SLOT
		5A	6A	EMPTY		7A	8A,8B	8D			EMPTY	EMPTY	EMPTY	EMPTY	EMPTY
	L	NOT USED	SYS. DET. S5			NOT USED	Ø8	Ø8		SYS. DET. S4					
							8C	8E							

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y	Y		3
4A, 4B	TB4-9,10	I6U	41	3	4	4		Y		3.0	
4C	TB4-11,12	I6L	45	7	14	4	Y	Y			
4D	TB6-1,2	I7U	65	27	34	4	Y	Y			
4E	TB6-3,4	I7L	78	40	44	4	Y	Y			15
~~✱ S10~~	~~TB6-9,10~~	~~I9U~~	~~60~~	~~22~~	~~11~~	~~SYS~~					
~~✱ S11~~	~~TB6-11,12~~	~~I9L~~	~~62~~	~~24~~	~~13~~	~~SYS~~					
5A[3]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
✱ S5	TB3-7,8	J2L	44	6	16	SYS					
7A[4]	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y	Y		3
8A, 8B	TB5-9,10	J6U	42	4	8	8		Y		3.0	
8C	TB5-11,12	J6L	46	8	18	8	Y	Y			
8D	TB7-1,2	J7U	66	28	38	8	Y	Y			
8E	TB7-3,4	J7L	79	41	48	8	Y	Y			15
✱ S3	TB7-9,10	J9U	59	21	15	SYS					
✱ S4	TB7-11,12	J9L	61	23	17	SYS					

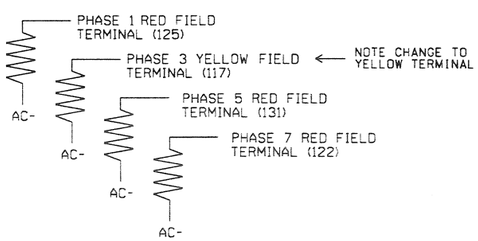
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from I5-W to J8-W, on rear of input file.
[3] Add jumper from J1-W to I4-W, on rear of input file.
[4] Add jumper from J5-W to I8-W, on rear of input file.
✱ System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



! IMPORTANT: Move Load Resistor from RED Field Terminal to YELLOW Field Terminal for Phase 3.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1351
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

REVISION SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 6/23/2015
SIGNATURE DATE

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety
Division of Highways
State of North Carolina
Department of Transportation
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 21 Bus. (North Bridge St.) at NC 268 Bypass

Division 11 Surry County Elkin

PLAN DATE: February 2014 REVIEWED BY: T. Joyce
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS	INITS.	DATE
1 Add conc system loops (JPI)	JTR	6/23/2015

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by George C. Brown, PE #022013, on 02/20/14.
This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 11-1351

23 JUN 2015 06:19
S:\TIS\SIGNALS\Signals\Workgroups\SSig Mgmt\Peterson\11351_smc.elo.20140220.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 2.2

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, 6, 7, 8, 9, 10, 11, AND 12.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  ACTIVE PHASE        #3  IS ON
AND RED CLEAR ON PHASE  #3  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-COMMAND#)
IF  ACTIVE PHASE        #3  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-COMMAND#)
IF  YELLOW ON PHASE     #3  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

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

PRESS '+'

```
LOGICAL I/O COMMAND #10 (+/-COMMAND#)
IF  ACTIVE PHASE        #7  IS ON
AND RED CLEAR ON PHASE  #7  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #39 ON
SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #11 (+/-COMMAND#)
IF  ACTIVE PHASE        #7  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #12 (+/-COMMAND#)
IF  YELLOW ON PHASE     #7  IS ON
        SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:            :123456789101112131415 16
VEH OVL PARENTS:  :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:            :123456789101112131415 16
VEH OVL PARENTS:  :  XX
VEH OVL NOT VEH:  :
VEH OVL NOT PED:  :
VEH OVL GRN EXT:  :
STARTUP COLOR:  _ RED  _ YELLOW  _ GREEN
FLASH COLORS:   _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:            :123456789101112131415 16
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:            :123456789101112131415 16
VEH OVL PARENTS:  :      XX
VEH OVL NOT VEH:  :
VEH OVL NOT PED:  :
VEH OVL GRN EXT:  :
STARTUP COLOR:  _ RED  _ YELLOW  _ GREEN
FLASH COLORS:   _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

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.

REMOVAL OF DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Remove all functions from 'Dynamic/Backup'.

2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions). Remove all phases from all 'Dynamic/Backup Control Functions'.

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 39	= Overlap D Red
OUTPUT 40	= Overlap D Yellow
OUTPUT 41	= Overlap D Green
OUTPUT 42	= Overlap C Red
OUTPUT 43	= Overlap C Yellow
OUTPUT 44	= Overlap C Green
OUTPUT 47	= Overlap B Red
OUTPUT 48	= Overlap B Yellow
OUTPUT 49	= Overlap B Green
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1351
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 6/23/2015
SIGNATURE DATE

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 21 Bus. (North Bridge St.) at NC 268 Bypass

Division 11	Surry County	Elkin
PLAN DATE: February 2014	REVIEWED BY: T. Joyce	
PREPARED BY: C. Strickland	REVIEWED BY:	

REVISIONS	INIT.	DATE
▽ Add mce system loops (UP)	CTS	6/23/2015

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by George C. Brown, PE #022013, on 02/20/14.
This document is only certified as to the revisions.

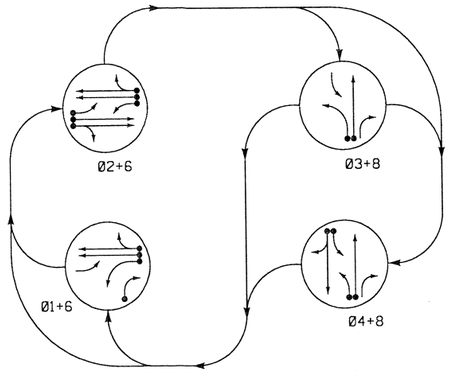
SIGNATURE DATE

SIG. INVENTORY NO. 11-1351

23-JUN-2015 06:50
S:\TSA5Units\Signals\Workgroups\Sig Mon\Petersonw11351_sm.ele.20140220.dgn
$$$$USERNAME
$$$$USERDATE

PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.
* See Note 7

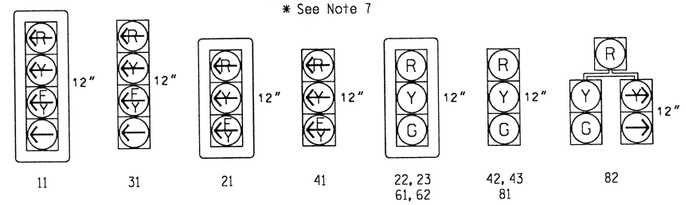


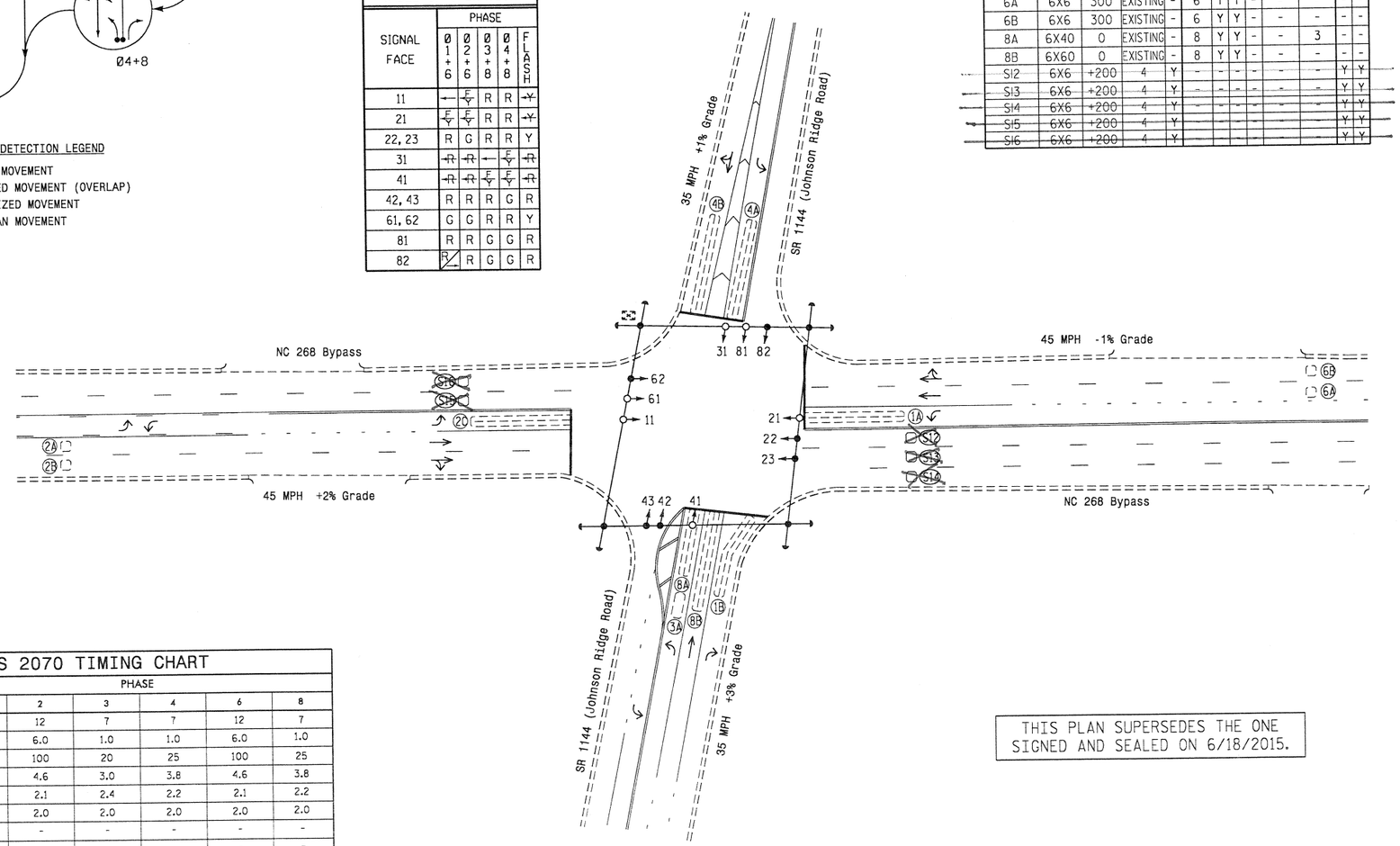
TABLE OF OPERATION					
SIGNAL FACE	PHASE				
	Ø1+6	Ø2+6	Ø3+8	Ø4+8	FLASH
11	~~←~~	~~F Y~~	R	R	~~Y~~
21	~~F Y~~	~~F Y~~	R	R	~~Y~~
22, 23	R	G	R	R	Y
31	~~R~~	~~R~~	~~←~~	~~F Y~~	~~R~~
41	~~R~~	~~R~~	~~F Y~~	~~F Y~~	~~R~~
42, 43	R	R	R	G	R
61, 62	G	G	R	R	Y
81	R	R	G	G	R
82	~~R~~	R	G	G	R

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	0	EXISTING	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X60	0	EXISTING	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	EXISTING	-	2	Y	Y	-	-	-	-	-
2C	6X60	0	EXISTING	-	2	Y	Y	Y	-	3	-	-
3A	6X15	15	EXISTING	-	3	Y	Y	-	-	15	-	-
4A	6X60	0	EXISTING	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	EXISTING	-	4	Y	Y	-	-	10	-	-
6A	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	EXISTING	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	EXISTING	-	8	Y	Y	-	-	3	-	-
8B	6X60	0	EXISTING	-	8	Y	Y	-	-	-	-	-
~~S12~~	~~6X6~~	~~+200~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S13~~	~~6X6~~	~~+200~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S14~~	~~6X6~~	~~+200~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S15~~	~~6X6~~	~~+200~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S16~~	~~6X6~~	~~+200~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~

4 Phase
Fully Actuated
US 21 Bus. (N. Bridge Street) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Phase 3 may be lagged.
5. Renumber existing signal heads 21, 22, 41 and 42, to 22, 23, 42 and 43, respectively.
6. Reposition all existing signal heads.
7. Install backplates for signal heads numbered 11, 21, 22, 23, 61 and 62.
8. Set all detector units to presence mode.
9. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
12. Install system loops: S12, S13, S14, S15 and S16.
13. Closed loop system data: Controller Asset #1352.



THIS PLAN SUPERSEDES THE ONE SIGNED AND SEALED ON 6/18/2015.

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	

OASIS 2070 TIMING CHART						
FEATURE	PHASE					
	1	2	3	4	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	1.0	6.0	1.0	1.0	6.0	1.0
Max Green 1 *	15	100	20	25	100	25
Yellow Clearance	3.0	4.6	3.0	3.8	4.6	3.8
Red Clearance	3.1	2.1	2.4	2.2	2.1	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk*	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

23 MAR 2016 09:35
S:\ATSAD\ITS\Signals\Signal Design Section\Western Region\Div-11\W11-1352\W11352_sig_dsn_2016mmdd.dgn
jzimmer

Signal Upgrade

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 268 Bypass
at
SR 1144 (Johnson Ridge Road)

Division 11 Surry County Elkin

PLAN DATE: March 2016 REVIEWED BY:
PREPARED BY: R.N. Zinser REVIEWED BY:

SCALE 0 40 1" = 40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 024393 ENGINEER TIMOTHY J. WILLIAMS

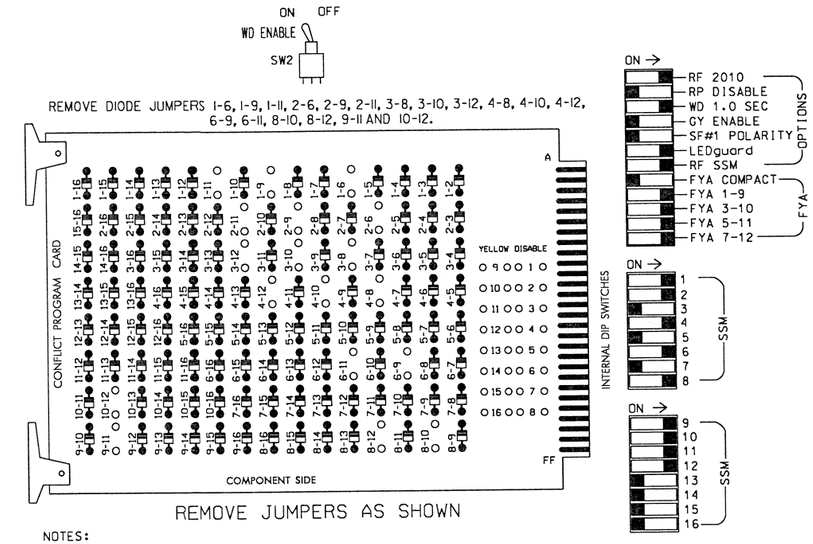
DocuSigned by: T. J. Williams 3/23/2016
SIGNATURE DATE

SIG. INVENTORY NO: 1 1352

PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 3.1

EDI MODEL 2010ECL-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.

■ = 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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,5,7, 13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Variable Initial and Gap Reduction.
6. Program phases 2 and 6 for Start Up In Green.
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 US 21 Bus. (N. Bridge Street) Closed Loop System.
9. Disable Dynamic Back-up Control Programming, if present.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	22,23	NU	31★	42,43	NU	NU	61,62	NU	NU	81,82	NU	11★	31★	NU	21★	41★	NU
RED	✱		128			101			134			107							
YELLOW			129		✱	102			135			108							
GREEN			130			103			136			109							
RED ARROW														A121	A124		A114	A101	
YELLOW ARROW		126												A122	A125		A115	A102	
FLASHING YELLOW ARROW														A123	A126		A116	A103	
GREEN ARROW	127	127			118														

NU = Not Used

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

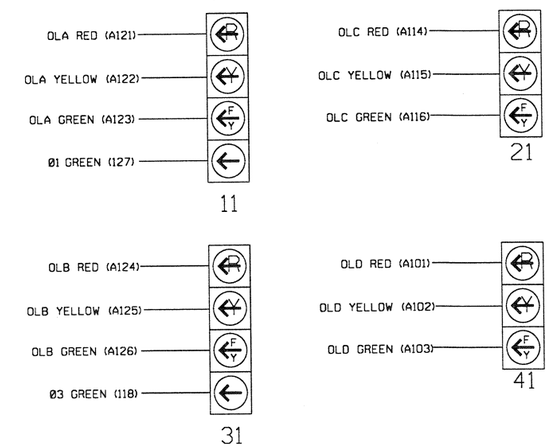
★ See pictorial of head wiring in detail below.

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,S6,S8,S9,S10, S12,S13.
PHASES USED.....1,2,3,4,6,8.
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....6
OVERLAP "D".....8

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for these signals require special logic programming. See sheet 2 of 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	Ø1	Ø1	Ø2	Ø2	Ø3	Ø4	SLOT EMPTY	SYS. DET. S12	SYS. DET. S13	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	1A	1B	2A	2C	3A	4A								ST DC ISOLATOR
		NOT USED	NOT USED	Ø2 2B	NOT USED	NOT USED	Ø4 4B		NOT USED	SYS. DET. S14					
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S15	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B			SYS. DET. S16					

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

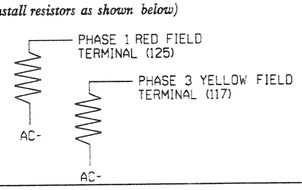
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
2C	TB4-1,2	I4U	47	9	22	2	Y	Y	Y		3
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			15
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
~~✱ S12~~	~~TB6-5,6~~	~~I8U~~	~~49~~	~~11~~	~~24~~	~~SYS~~					
~~✱ S13~~	~~TB6-9,10~~	~~I9U~~	~~60~~	~~22~~	~~11~~	~~SYS~~					
~~✱ S14~~	~~TB6-11,12~~	~~I9L~~	~~62~~	~~24~~	~~13~~	~~SYS~~					
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	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			
~~✱ S15~~	~~TB7-9,10~~	~~J9U~~	~~59~~	~~21~~	~~15~~	~~SYS~~					
~~✱ S16~~	~~TB7-11,12~~	~~J9L~~	~~61~~	~~23~~	~~17~~	~~SYS~~					

[1] Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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: 11-1352
DESIGNED: March 2016
SEALED: 3-23-16
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 6/23/15.

ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 268 Bypass
at
SR 1144 (Johnson Ridge Road)

Division 11 Surry County Elkin
PLAN DATE: March 2016 REVIEWED BY: DTJ
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MINS
DocuSigned by: Keith M. Mins 3/24/2016
-B1B4B4A7A8BE DATE
SIG. INVENTORY NO. 11-1352

24-MAR-2016 13:19
S:\MITS&SIMITS Signals\Workgroups\Sig Mon\Peterson\11352_sel_ele_xxx.dgn
jlpeterson

PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 3.2

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        #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

SCROLL DOWN

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

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

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

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          :123456789101112131415 16
VEH OVL PARENTS::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:          :123456789101112131415 16
VEH OVL PARENTS::  XX
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT::
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          :123456789101112131415 16
VEH OVL PARENTS::     X
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT::
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:          :123456789101112131415 16
VEH OVL PARENTS::        X
VEH OVL NOT VEH::
VEH OVL NOT PED::
VEH OVL GRN EXT::
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)..0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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: 11-1352
DESIGNED: March 2016
SEALED: 3-23-16
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 6/23/15.

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 268 Bypass
at
SR 1144 (Johnson Ridge Road)

Division 11 Surry County Elkin

PLAN DATE: March 2016 REVIEWED BY: DTJ
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

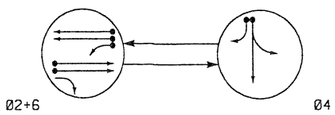
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036880 ENGINEER KEITH M. MINS

DocuSigned by: Keith M. Mins 3/24/2016
SIGNATURE DATE

SIG. INVENTORY NO. 11-1352

24 MAR 2016 13:20
S:\TrafficSignals\FTS Signals\Workgroups\Sig Mon\Peterson\11352_sm_ele_xxx.dgn
jipeterson

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

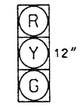
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



21,22
41,42
61,62

OASIS 2070 LOOP & DETECTOR INSTALLATION

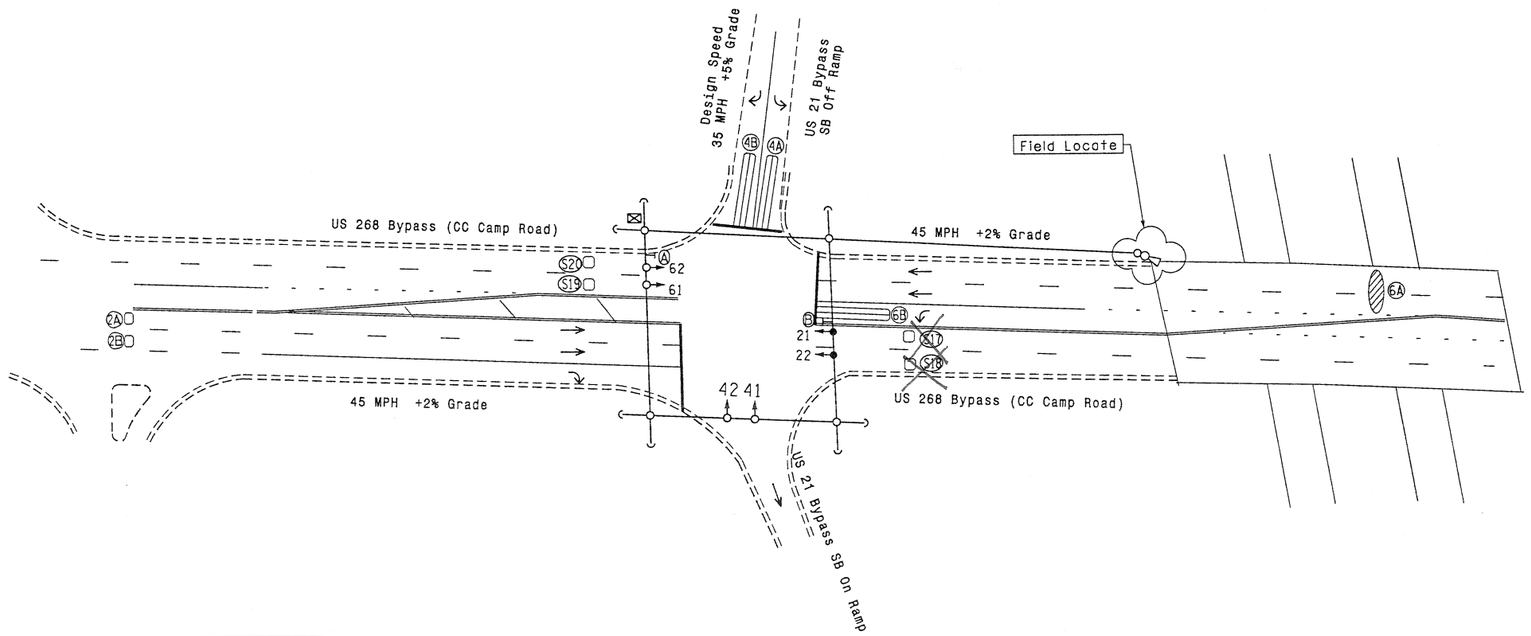
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)		TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	*	300	*	Y	6	Y	Y	-	-	-	-	*
6B	6X40	0	2-4-2	Y	4	Y	Y	Y	-	3	-	Y
~~S17~~	~~6X6~~	~~+120~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S18~~	~~6X6~~	~~+120~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S19~~	~~6X6~~	~~+120~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S20~~	~~6X6~~	~~+120~~	~~4~~	~~Y~~							~~Y~~	~~Y~~

* Out of Pavement Detection Zone

2 Phase
Fully Actuated
US 21 Bus (N. Bridge Street) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Closed loop system data: Controller Asset # 1436.
6. Field locate Pole with out of pavement detector.



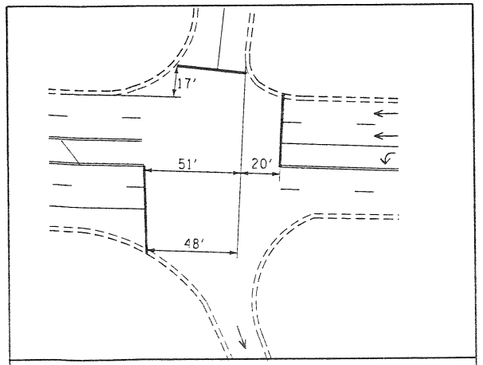
LEGEND

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	
	Out of Pavement Detection Zone	
	Out of Pavement Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
N/A	Guard Rail	
N/A	Fence	
	Directional Arrow	
	Pavement Marking Arrow	
	No Right Turn Sign (R3-1)	
	No Left Turn Sign (R3-2)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	6.0	2.0	6.0
Max Green 1 *	90	20	90
Yellow Clearance	4.7	3.6	4.3
Red Clearance	1.1	1.7	1.1
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	1.5	-	2.0
Max Variable Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	30	-	30
Minimum Gap	3.0	-	3.0
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



Proposed Stopbar Locations

New Installation

Prepared In the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
1750 N.Greenfield Pkwy, Garner, NC 27529

NC 268 Bypass (CC Camp Road)
at
US 21 Bypass SB Off/On Ramp

Division 11 Surry County Elkin

PLAN DATE: June 2015 REVIEWED BY:
PREPARED BY: D. Pierce REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 024393 ENGINEER TIMOTHY J. WILLIAMS
DocuSigned by: T. J. Williams 6/18
07A7D2EB593C...
SIG. INVENTORY NO.

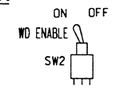
18-JUN-2015 13:58
S:\TEAS\Traffic Signals\Signal Design Section\Western Region\Div-11\11-1436\11-1436_sig_dsn_201503xx.dgn
cepierce

11-1436

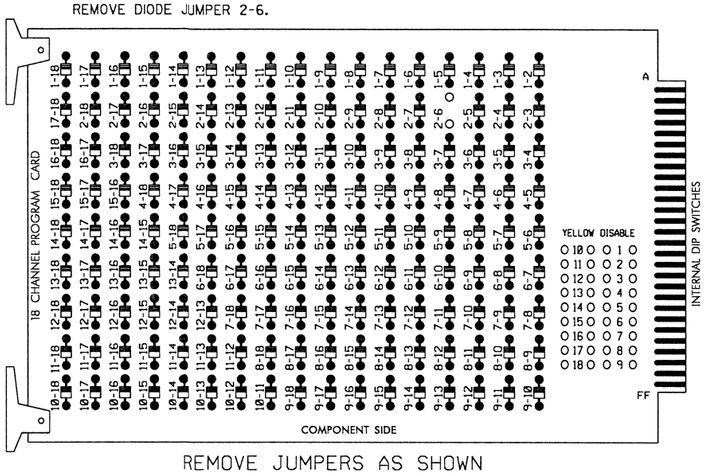
PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 4.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

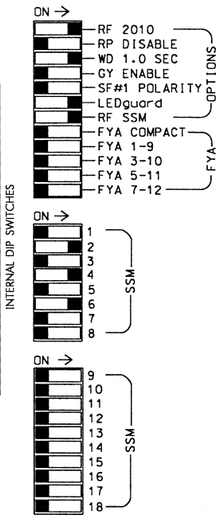
(remove jumpers and set switches as shown)



REMOVE DIODE JUMPER 2-6.



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the US 21 Bus. (N. Ridge Street) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
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			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

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	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	~~SYS. DET. S17~~	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø2 2B				Ø4 4B			~~SYS. DET. S18~~					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. S19~~	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L		NOT USED	NOT USED						~~SYS. DET. S20~~					

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 a microwave detector. See the Microwave Detector Wiring Details on sheet 2.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from the following terminals:

TB6-9, TB6-10, TB6-11 and TB6-12

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	12U	39	1	2	2	Y	Y			
2B	TB2-7,8	12L	43	5	12	2	Y	Y			
4A	TB4-9,10	16U	41	3	4	4	Y	Y			
4B	TB4-11,12	16L	45	7	14	4	Y	Y			15
~~* S17~~	~~TB6-9,10~~	~~19U~~	~~60~~	~~22~~	~~11~~	~~SYS~~					
~~* S18~~	~~TB6-11,12~~	~~19L~~	~~62~~	~~24~~	~~13~~	~~SYS~~					
★ 6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-9,10	J3U	64	26	38	6	Y	Y	Y		3
~~* S19~~	~~TB7-9,10~~	~~19U~~	~~59~~	~~21~~	~~15~~	~~SYS~~					
~~* S20~~	~~TB7-11,12~~	~~J9L~~	~~61~~	~~23~~	~~17~~	~~SYS~~					

★ Detection Zone

* 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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1436
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 268 Bypass (CC Camp Road)
at
US 21 Bypass SB Off/On Ramp

Division 11 Surry County DB Elkin

PLAN DATE: June 2015	REVIEWED BY: JTR
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

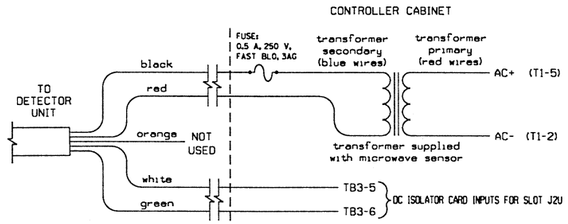
DocuSigned by:
John T. Rowe, Jr. 6/23/2015
SIGNATURE DATE

SIG. INVENTORY NO. 11-1436

23-JUN-2015 09:41
S:#ITSASUNITS Signals\workgroups\Sig Mgmt\Petersonj\11436_sm_ele_xxx.dgn
jlpeterson

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 poles 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.
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 (DETECTOR #6)

(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 sheet 2 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)

1. From Main Menu press '6' (Outputs), Then '3' (Logical I/O Processor).
2. The programming shown below will invert the input from the microwave detector so a call is placed on Detector 6 (INPUT 64) when the microwave detector Normally Closed output opens up.

```
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, SO NO CALL IS 'DETECTED' ON LOOP 6A.

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, SO A CALL IS 'DETECTED' ON LOOP 6A.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

3. 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.

REFERENCE SCHEDULE

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

* Input Remapped

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1436
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
THE STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 268 Bypass (CC Camp Road)
at
US 21 Bypass SB Off/On Ramp

Division 11 Surry County Elkin

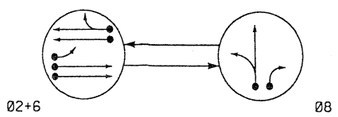
PLAN DATE: June 2015	REVIEWED BY:		
PREPARED BY: James Peterson	REVIEWED BY:		
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 6/23/2015
SIGNATURE DATE
SIG. INVENTORY NO. 11-1436

23 JUN 2015 09:42
S:\Signals\Work\Groups\Sig Mgmt\Petersonj\11436_sm_ele_xxx.dgn
jpeterson

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

SIGNAL FACE I.D.

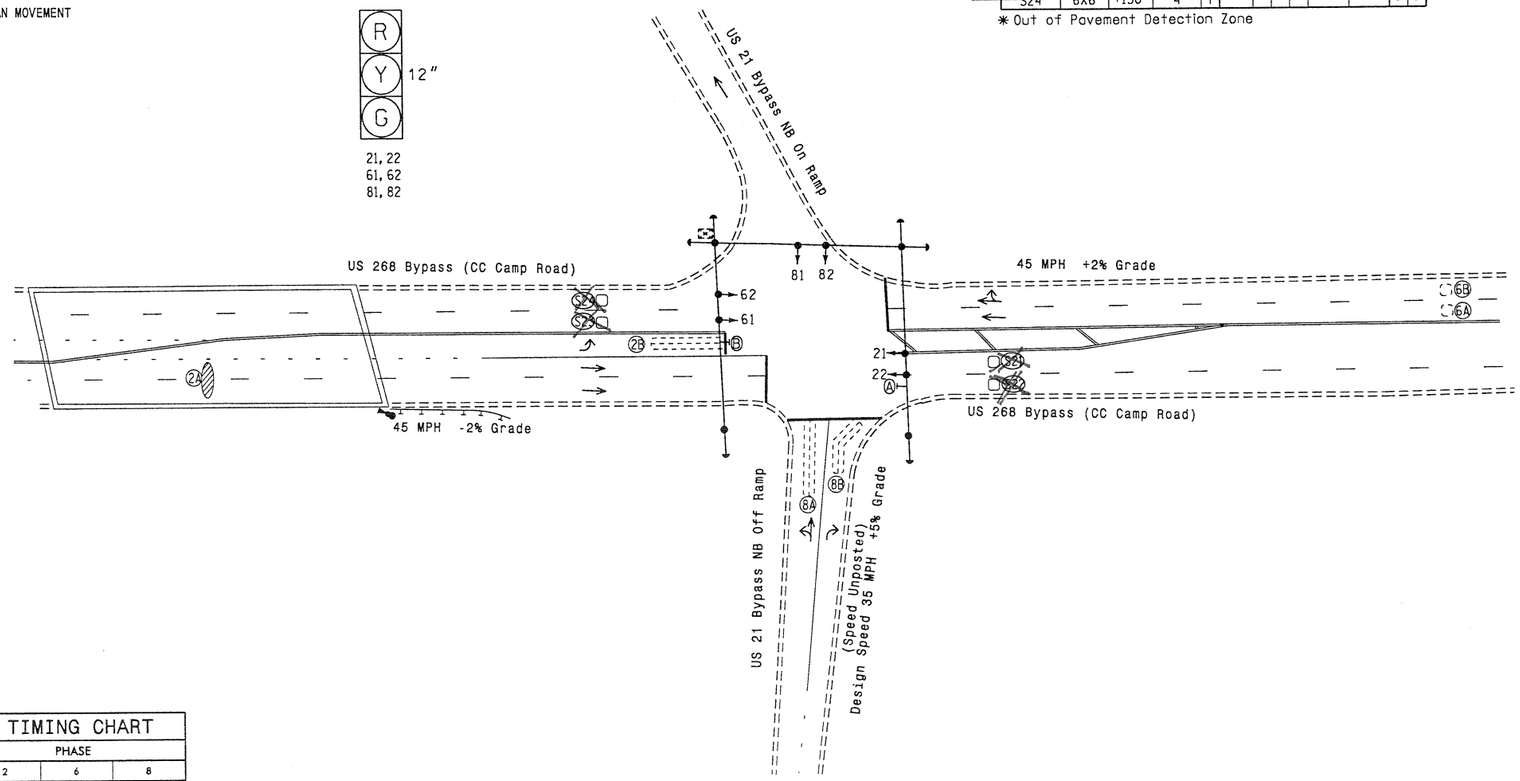
All Heads L.E.D.

21, 22
61, 62
81, 82

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
2A	*	300	*	-	2	Y	Y	-	-	-	-	*
2B	6X40	0	2-4-2	-	2	Y	Y	Y	-	3	-	-
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8B	6X40	+5	2-4-2	-	8	Y	Y	-	-	15	-	-
S21	6X6	+120	4	Y	-	-	-	-	-	-	Y	Y
S22	6X6	+120	4	Y	-	-	-	-	-	-	Y	Y
S23	6X6	+150	4	Y	-	-	-	-	-	-	Y	Y
S24	6X6	+150	4	Y	-	-	-	-	-	-	Y	Y

* Out of Pavement Detection Zone



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	12	12	7
Extension 1 *	6.0	6.0	2.0
Max Green 1 *	90	90	20
Yellow Clearance	4.7	4.3	3.6
Red Clearance	1.1	1.1	1.7
Red Revert	2.0	2.0	2.0
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	2.0	1.5	-
Max Variable Initial *	34	34	-
Time Before Reduction *	15	15	-
Time To Reduce *	30	30	-
Minimum Gap	3.0	3.0	-
Recall Mode	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* 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.

2 Phase
Fully Actuated
US 21 Bus (N. Bridge Street) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
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. Pavement markings are existing.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Closed loop system data: Controller Asset # 1418.
7. Install system loops S21, S22, S23 & S24.

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	
	Out of Pavement Detection Area	
	Out of Pavement Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
N/A	Guard Rail	
N/A	Fence	
	Directional Arrow	
	Pavement Marking Arrow	
	No Right Turn Sign (R3-1)	
	No Left Turn Sign (R3-2)	

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Design Section
1750 N.Greenfield Pkwy, Garner, NC 27529

SCALE 0 40 1"=40'

NC 268 Bypass (CC Camp Road) at US 21 Bypass NB Off/On Ramp

Division 11 Surry County Elkin

PLAN DATE: June 2015 REVIEWED BY:
PREPARED BY: C. Pierce REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 024393 ENGINEER TIMOTHY J. WILLIAMS
Docusigned by: T. J. Williams 6/18/2015
87AC7926E6934C...
SIG. INVENTORY NO. 11-1418

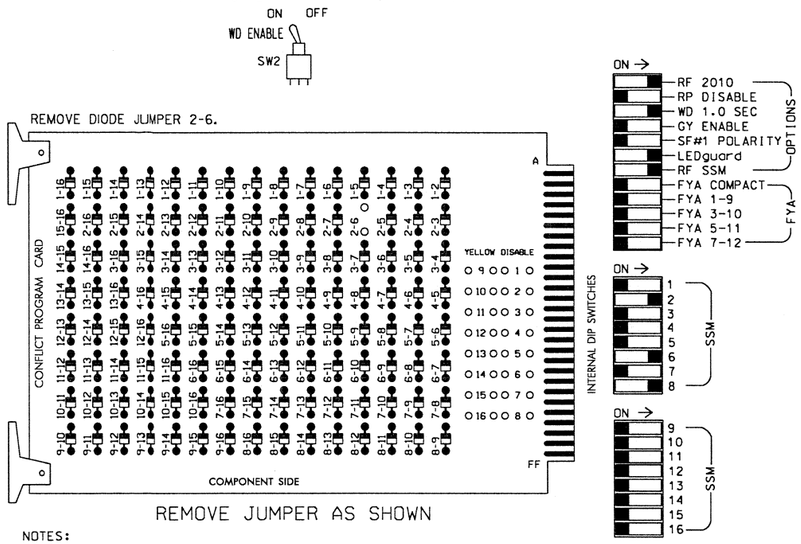
11-1418

18-JUN-2015 14:00
S:\TMS\Signals\15 Signals\Signal Design Section\Western Region\Div 11\11-1418\11-1418_sig_dsn_201503xx.dgn
Capterra

PROJECT REFERENCE NO.	SHEET NO.
SS-4911F	Sig. 5.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper and set switches as shown)



NOTES:

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

■ = 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. To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
6. ▽1 Program phases 2 and 6 for Yellow Flash.
7. ▽1 The cabinet and controller are part of the US 21 (North Bridge St.) Closed Loop System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
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	NU	NU	NU	61,62	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

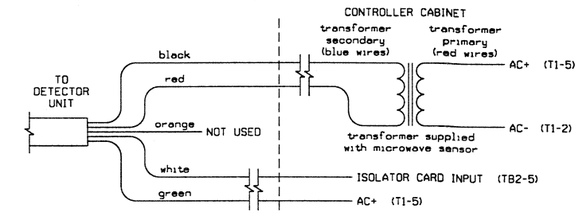
NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....EAGLE TYPE 2070L
CABINET.....McCAIN/CONTROL TECHNOLOGIES (DWG.NO.9500-332-NCDOT)
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S6,S8
PHASES USED.....2,6,8
OVERLAPS.....NONE

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 Sensors, Inc. Model TC-26B microwave motion detector mounted on poles as indicated on the Signal Design Plans.
2. Configure model 252 AC isolator card to place call upon removal of AC+ from the input. This is accomplished by setting a "DIP" switch on the isolator circuit board.
3. Important: For proper operation of the microwave detector, remove surge protection from TB2-5 and TB2-6. Tie TB2-6 to AC neutral.

▽1 INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT	Ø2 2A AC ISOLATOR	Ø2 2B	SLOT	SLOT	SLOT	SLOT	SLOT	SYS. DET. S21	SLOT	SLOT	SLOT	SLOT	FS DC ISOLATOR
	L	EMPTY	NOT USED	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	SYS. DET. S22	EMPTY	EMPTY	EMPTY	EMPTY	ST DC ISOLATOR
FILE "J"	U	SLOT	Ø6 6A	SLOT	SLOT	SLOT	Ø8 8A	SLOT	SLOT	SYS. DET. S23	SLOT	SLOT	SLOT	SLOT	SLOT
	L	EMPTY	Ø6 6B	EMPTY	EMPTY	EMPTY	Ø8 8B	EMPTY	EMPTY	SYS. DET. S24	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY

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

FS = FLASH SENSE
ST = STOP TIME

NOTE: INSTALL MODEL 252 AC ISOLATOR IN SLOT I2 FOR USE WITH MICROWAVE DETECTOR. SEE MICROWAVE DETECTOR WIRING ON THIS PAGE.

! IMPORTANT: For proper operation of the microwave detector, remove surge protection from TB2-5 and TB2-6. A DIRECT SHORT WILL OCCUR IF THIS IS NOT DONE. Tie TB2-6 to AC neutral.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
**2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-9,10	I3U	63	25	32	2	Y	Y	Y		3
~~*S21~~	~~TB6-9,10~~	~~I9U~~	~~60~~	~~22~~	~~11~~	~~SYS~~					
~~*S22~~	~~TB6-11,12~~	~~I9L~~	~~62~~	~~24~~	~~13~~	~~SYS~~					
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	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			15
~~*S23~~	~~TB7-9,10~~	~~J9U~~	~~59~~	~~21~~	~~15~~	~~SYS~~					
~~*S24~~	~~TB7-11,12~~	~~J9L~~	~~61~~	~~23~~	~~17~~	~~SYS~~					

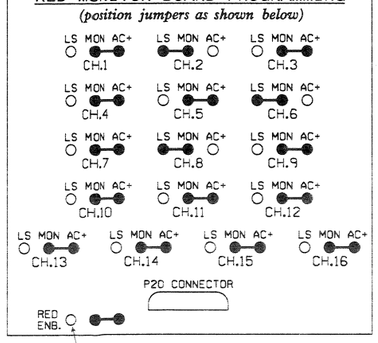
* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

** Microwave Detector (see wiring detail this page)

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1418
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N. Greenfield Pwky, Garner, NC 27529

NC 268 Bypass (CC Camp Road) at US 21 Bypass NB Off/On Ramp

Division 11 | Surry County | Elkin

PLAN DATE: April 2008	REVIEWED BY: JTR		
PREPARED BY: James Peterson	REVIEWED BY:		
REVISIONS		INIT.	DATE
▽1 Add system loops (JP)		JTR	6/23/2011

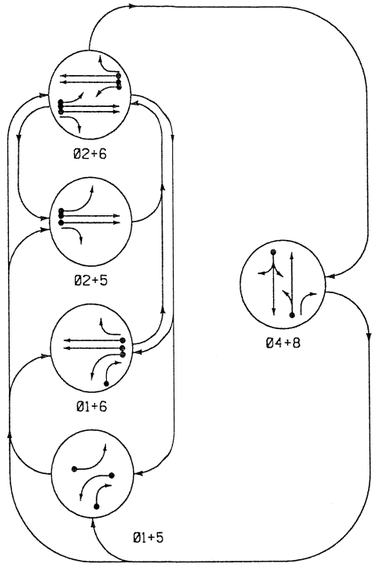
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 4-14-08
SIGNATURE DATE

SIG. INVENTORY NO. 11-1418

23-JUN-2015 07:45
S:\NITS\SUNITS Signals\Workgroups\Sig Mgmt\Petersonm\11418_sm_ele_20080414.dgn
jtpeterson

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

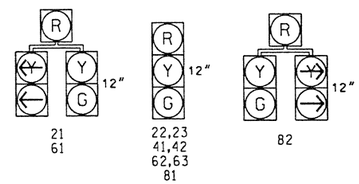
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
21	R	R	G	G	R	Y
22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
61	R	G	R	G	R	Y
62,63	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



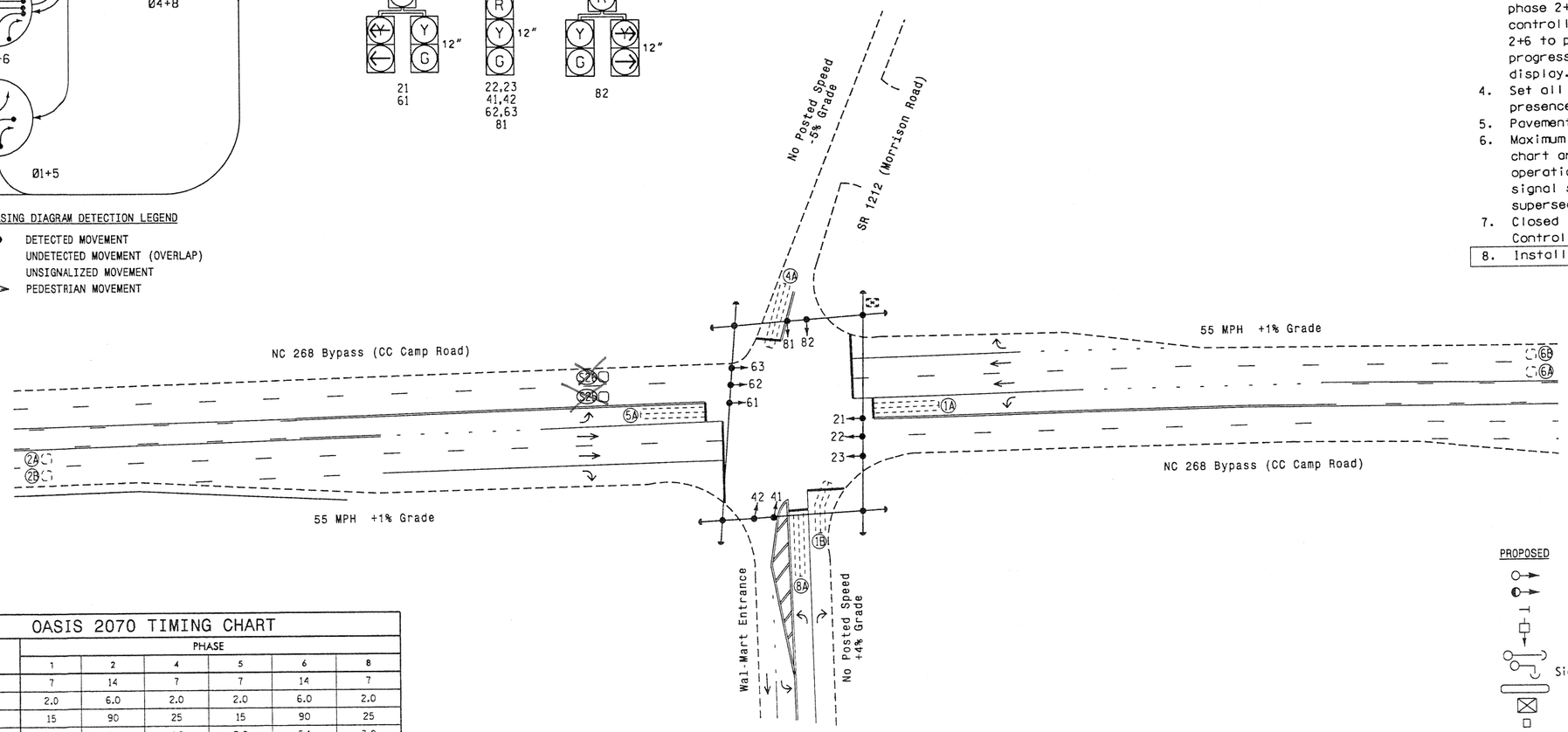
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	+5	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	420	6	-	2	Y	Y	-	-	-	-	-
2B	6X6	420	6	-	2	Y	Y	-	-	-	-	-
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	5	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	420	6	-	6	Y	Y	-	-	-	-	-
6B	6X6	420	6	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
~~S25~~	~~6X6~~	~~+150~~	~~4~~	~~Y~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~-~~	~~Y~~	~~Y~~
~~S26~~	~~6X6~~	~~+150~~	~~4~~	~~Y~~							~~Y~~	~~Y~~

5 Phase
Fully Actuated
US 21 Bus. (N. Bridge Street) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1+6 or 2+5 by progressing through an all red display.
4. Set all detector units to presence mode.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset # 1402.
8. Install system loops S25, S26.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	14	7	7	14	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	15	90	25	15	90	25
Yellow Clearance	3.0	5.1	4.2	3.0	5.1	3.0
Red Clearance	2.6	1.0	1.9	2.4	1.0	2.8
Red Revert	2.0	5.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	46	-	-	46	-
Time Before Reduction *	-	30	-	-	30	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.4	-	-	3.4	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	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	

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
3750 N. Greenfield Pkwy, Garner, NC 27529

NC 268 Bypass (CC Camp Road)
at
SR 1212 (Morrison Road) /
Wal-Mart Entrance

Division 11 Surry County Elkin

PLAN DATE: June 2015 REVIEWED BY:
PREPARED BY: C. Pierce REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 024393 ENGINEER TIMOTHY J. WILLIAMS
DocuSigned by: T. J. Williams 6/18/
07A37520EE834CA...
SIG. INVENTORY NO.

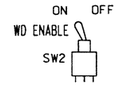
11-1402

15-JUN-2015 14:27
S:\TTSG\MITS Signals\Signal Design Section\Western Region\Div-11\11-1402\11-1402_sig_dsn_201503xx.dgn
ceperce

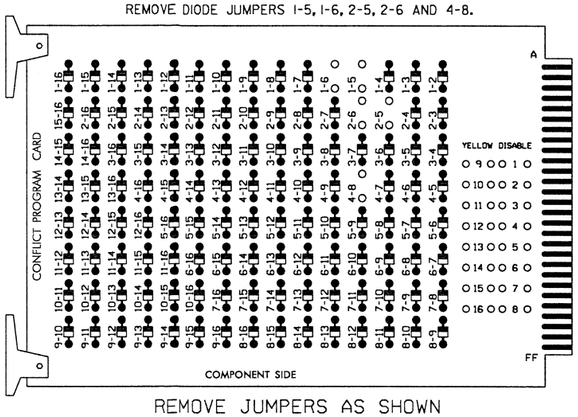
PROJECT REFERENCE NO.	SHEET NO.
W-5601 AU	Sig. 6.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

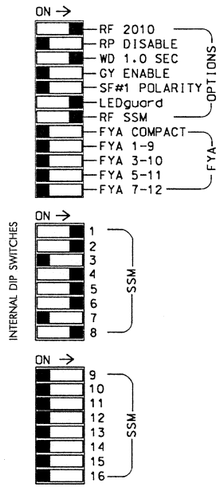
(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6 AND 4-8.



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 4 and 8, on the controller unit, for Dual Entry.
6. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
7. Program phases 2 and 6 for Yellow Flash.
8. The cabinet and controller are part of the US 21 (North Bridge St.) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61 82	21 22 23	NU	NU	41 42	NU	21	61 62 63	NU	NU	81 82	NU
RED	*	128			101		*	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132					
GREEN ARROW	127						133					
✋												
🚶												

NU = Not Used

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

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 and phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1B	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S25	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	Ø6 1A	Ø2 2B			NOT USED			SYS. DET. S26					ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø2 5A	Ø6 6B			NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1B	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	15
1A 1	TB2-5,6	I2U	39	1	2	1	Y	Y	-	-	15
	TB2-7,8	I2L	43	5	12	6	Y	Y	Y	-	3
2A	TB2-9,10	I3U	63	25	32	2	Y	Y	-	-	-
2B	TB2-11,12	I3L	76	38	42	2	Y	Y	-	-	-
4A	TB4-9,10	I6U	41	3	4	4	Y	Y	-	-	5
~~*S25~~	~~TB6-9,10~~	~~I9U~~	~~60~~	~~22~~	~~11~~	~~SYS~~					
~~*S26~~	~~TB6-11,12~~	~~I9L~~	~~62~~	~~24~~	~~13~~	~~SYS~~					
5A 2	TB3-5,6	J2U	40	2	6	5	Y	Y	-	-	15
	TB3-7,8	J2L	44	6	16	2	Y	Y	Y	-	3
6A	TB3-9,10	J3U	64	26	36	6	Y	Y	-	-	-
6B	TB3-11,12	J3L	77	39	46	6	Y	Y	-	-	-
8A	TB5-9,10	J6U	42	4	8	8	Y	Y	-	-	-

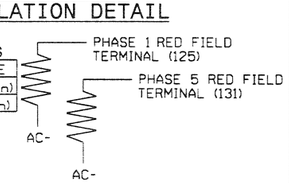
1. Add jumpers from TB2-5 to TB2-7 and from TB2-6 to TB2-8.
2. Add jumpers from TB3-5 to TB3-7 and from TB3-6 to TB3-8.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1402
DESIGNED: June 2015
SEALED: 6-18-15
REVISED: N/A

REVISION SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

DocuSigned by: John T. Rowe, Jr. 6/23/2015
SIGNATURE DATE

Elecrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division, State of North Carolina, Department of Transportation, Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 268 Bypass (CC Camp Road) at SR 1212 (Morrison Rd)/ Wal-Mart Entrance

Division 11 Surry County Elkin

PLAN DATE:	April 2007	REVIEWED BY:	Voso
PREPARED BY:	L. Boyer	REVIEWED BY:	Morgan

REVISIONS	INIT.	DATE
Revised to include westbound exclusive right turn lane.	JBV	08/23/2007
Updated conflict monitor programming details.	BEN	
Add system loops (JWP).	JTR	6/23/2015

Mattern & Craig
CONSULTING ENGINEERS • SURVEYORS
12 BROAD STREET
ASHEVILLE, NORTH CAROLINA 28801
(828) 254-2201
FAX (828) 254-4562

sims group
CONSULTING ENGINEERS P.C.
P.O. BOX 18263
ASHEVILLE, NC 28814
PHONE: 828-251-2025
FAX: 828-251-2026
SIMS@SIMSENGINEERS.COM

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by Ray E. Morgan, PE #03454, on 6/25/07.

This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 11-1402

23 JUN 2015 13:26
S:\MTS\AS\Unit5\Signals\Workgroups\Sig Mgmt\Petersons\11402_smlete_xxx.dgn
jwalker.dgn