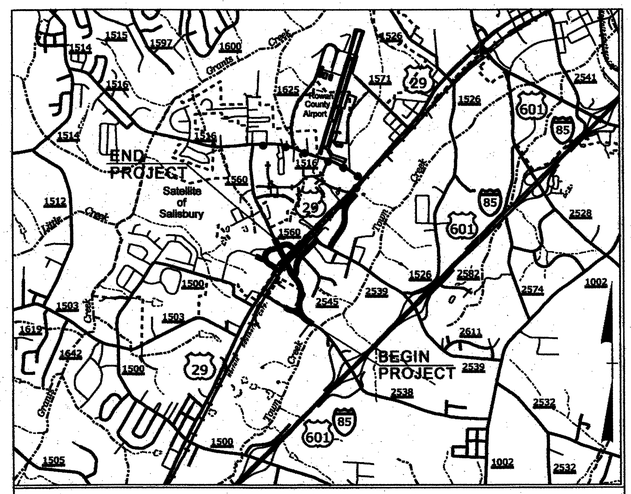
0151DEL_P10b1

TIP PROJECT: P-5206A

CONTRACT: C203143

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$



VICINITY MAP

OFF-SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
RAIL DIVISIONS

ROWAN COUNTY

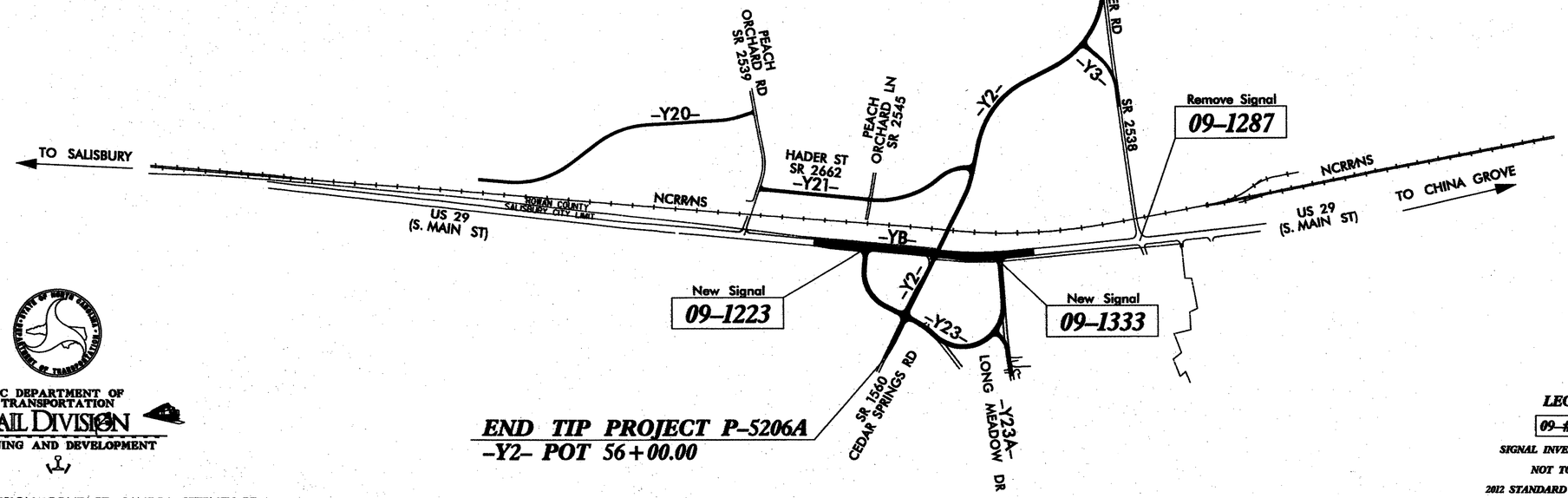
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	P-5206A	Sig.1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
52000.1.STR03T1B		P.E., UTIL P.E.
52000.1.STR04T3		P.E., UTIL P.E.
43219.2.STR08P5206		R/W
52000.3.STR01T4A		UTIL. CONST.
52000.3.STR01T4A		CONST.

LOCATION: *PEELER ROAD (SR 2538)/CEDAR SPRINGS ROAD (SR 1560) GRADE SEPARATION OVER NCRR/NS*

TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS AND STRUCTURES*

TRAFFIC SIGNAL DESIGN PLANS



NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
PLANNING AND DEVELOPMENT

NCDOT RAIL DIVISION CONTACT: SANDRA STEPNEY, PE

LEGEND

09-####

SIGNAL INVENTORY NUMBER

NOT TO SCALE

2012 STANDARD SPECIFICATIONS

INDEX OF PLANS

SHEET NO.	SIG. INV. NO.	LOCATION /DESCRIPTION
Sig.1		Title Sheet
Sig.2 to 4	09-1223	US 29 (S. Main St) at SR 1560 (Cedar Springs Rd) WB Connector
Sig.5 to 7	09-1333	US 29 (S. Main St) at SR 1560 (Cedar Springs Rd) EB Connector
Sig.8	N/A	Wireless Communications Plan
Remove Signal	09-1287	US 29 (S. Main St) at SR 2538 (Peeler Rd)

Florence & Hutcheson
An ICA Company
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0886

2012 STANDARD SPECIFICATIONS

BRIAN A. WILES, PE
PROJECT ENGINEER

LETTING DATE:	*RIGHT OF WAY DATE:*
MARCH 19, 2013	MARCH 30, 2012

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
Prepared for the Offices of:

ITS and Signals Unit

750 N.Greenfield Pkwy.,Garner,NC 27529

ROB ZIEMBA, P.E., Central Region Signals Project Engineer
GEORGE BROWN, P.E., Signal Equipment Design Engineer
NEIL AVERY, Signal Communications Project Engineer

SIGNAL DESIGN ENGINEER
Prepared in the Office of:

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Raleigh, NC 27607
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NC License No.: C-3496

JOSEPH L. LEWIS, P.E.
PRINCIPAL ENGINEER

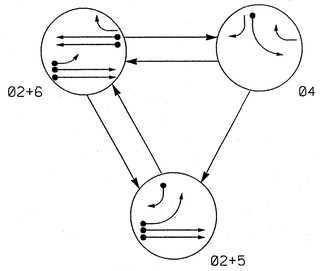
DONALD J. DARITY, P.E.
SR. PROJECT MANAGER

JUSTINE MA, P.E., PTOE
PROJECT DESIGN ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.2

3 Phase
Fully Actuated
(US 29 (S. Main St) Closed Loop System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R/Y	R	G	R
51	←	F Y	R	Y
61	R	G	R	Y
62	R	G	R/Y	Y

SIGNAL FACE I.D.

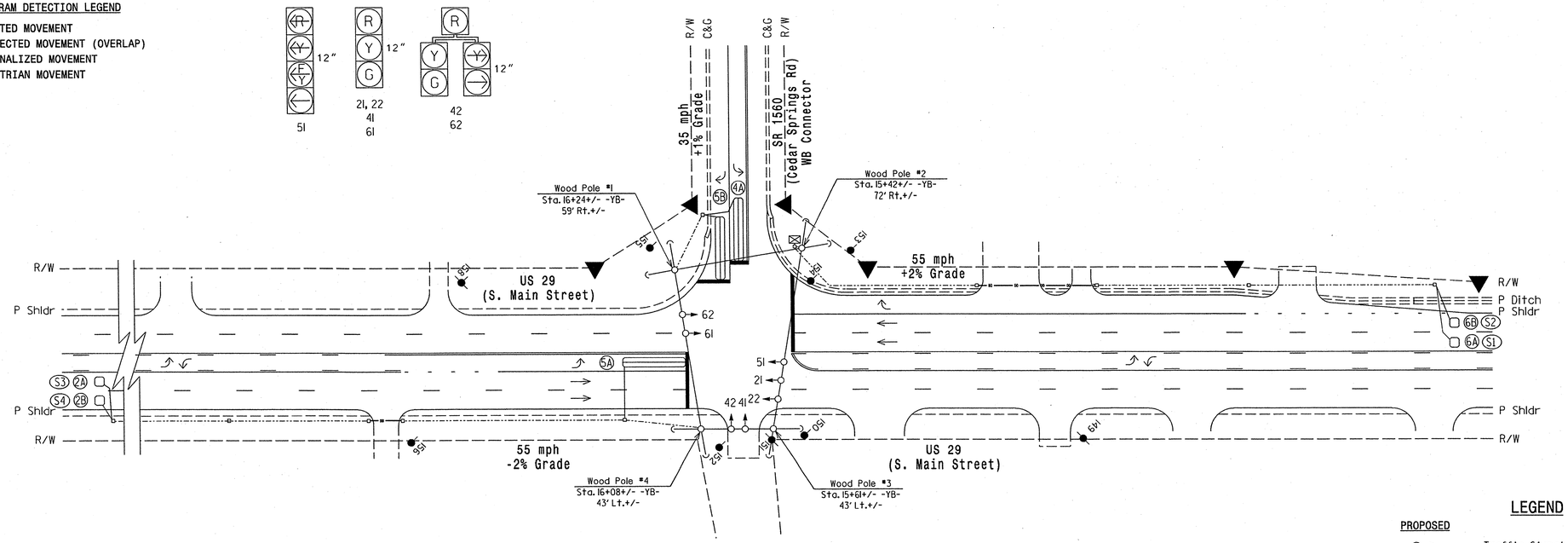
All Heads L.E.D.

OASIS 2070L 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/S3	6X6	420	6	Y	2	Y	Y	-	-	-	Y	Y
2B/S4	6X6	420	6	Y	2	Y	Y	-	-	-	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A/S1	6X6	420	6	Y	6	Y	Y	-	-	-	Y	Y
6B/S2	6X6	420	6	Y	6	Y	Y	-	-	-	Y	Y

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.
3. 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. Closed loop system data: Controller Asset #1223.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	14	7	7	14
Extension 1 *	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	5.4	3.0	3.0	5.4
Red Clearance	1.0	2.6	2.1	1.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	46	-	-	46
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.4	-	-	3.4
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

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	---·---
—▼—	Right of Way	—▽—
→	Directional Arrow	→
—▪—▪—	Directional Drill	N/A

New Installation

MARTIN ALEXIOU BRYSON
4000 Westchase Blvd.
Suite 530
Raleigh, NC 27607
Tel. 919.829.0328
Fax. 919.829.0329
NC License No: C-3496

RECOVERY.GOV

Prepared for 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

US 29 (S. Main Street)
at
SR 1560 (Cedar Springs Rd)
WB Connector

Division 9 | Rowan County | Salisbury

PLAN DATE:	Sept 2012	REVIEWED BY:	J.L. Lewis
PREPARED BY:	D.J. Darity	WAB PROJECT NO.:	2011044

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
1-24-2013
SIGNATURE | DATE

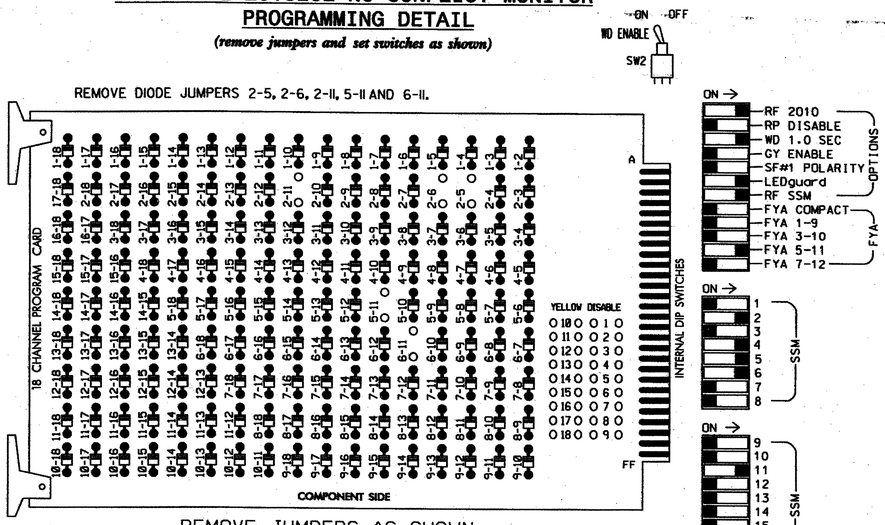
SIG. INVENTORY NO. 09-1223

0151DEL_P10b1

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.3

EDI MODEL 2018ECL-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. 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 29 (S. Main St) Closed Loop System.

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.....S2,S5,S7,S8,AUXS4
PHASES USED.....2,4,5,6
OVERLAP "A".....NONE
OVERLAP "B".....NONE
OVERLAP "C".....5+6
OVERLAP "D".....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51★	42	61,62	NU	NU	NU	NU	NU	NU	51★	NU	NU
RED		128			101			*		134								
YELLOW		129			102					135								
GREEN		130			103					136								
RED ARROW																A114		
YELLOW ARROW						102		132								A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW						103		133	133									

NU = NOT USED
* Denotes install load resistor. See Load Resistor Installation Detail this page.
★ Denotes see pictorial of head wiring in detail below.

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/SYS 2A/S3	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2/SYS 2B/S4				NOT USED								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø5 5B	ø6/SYS 6A/S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED	ø6/SYS 6B/S2											

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S3	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S4	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A/S1	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S2	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			

[1] Add jumper from J1W to I4W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

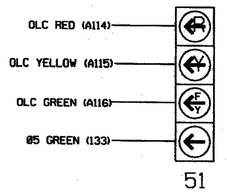
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)

PHASE 5 RED FIELD TERMINAL (131)

AC-

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1223
DESIGNED: Sept 2012
SEALED: 1-24-2013
REVISED:

Electrical Detail Sheet 1 of 2

New Installation

MARTIN ALEXIOU BRYSON
4000 Westchase Blvd.
Suite 530
Raleigh, NC 27607
Tel. 919.829.0328
Fax. 919.829.0329
NC License No: C-3496

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of: NCDOT Traffic Engineering Branch

750 N.Greenfield Pkwy,Garner,NC 27529

US 29 (S. Main Street) at SR 1560 (Cedar Springs Rd) WB Connector

Division 9 | Rowan County | Salisbury

PLAN DATE: Sept 2012 | REVIEWED BY: J.L. Lewis

PREPARED BY: D.J. Darity | MAB PROJECT NO.: 2011044

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19713 ENGINEER DONALD J. DARITY
1-24-2013
SIGNATURE | DATE

SIG. INVENTORY NO. 09-1223

0151DEL_P10b1

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.4

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

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

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

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

            SCROLL DOWN

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

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

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

            SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1223
DESIGNED: Sept 2012
SEALED: 1-24-2013
REVISED:

Electrical Detail Sheet 2 of 2

New Installation

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 29 (S. Main Street) at SR 1560 (Cedar Springs Rd) WB Connector

Division 09 | Rowan County | Salisbury

PLAN DATE:	Sept 2012	REVIEWED BY:	J.L. Lewis
PREPARED BY:	D.J. Darity	MAB PROJECT NO.:	2011044

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J DARITY

1-24-2013

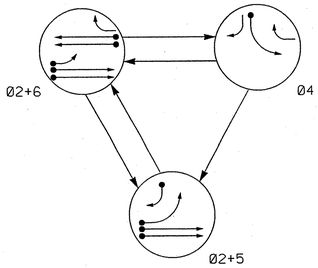
SIGNATURE | DATE

SIG. INVENTORY NO. 09-1223

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.5

3 Phase
Fully Actuated
US 29 (S. Main St) Closed Loop System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R/—	R	G	R
51	—	F Y	R	Y
61	R	G	R	Y
62	R	G	R/—	Y

OASIS 2070L LOOP & DETECTOR INSTALLATION

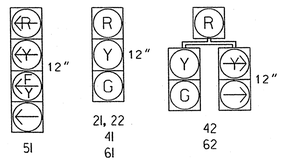
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S7	6X6	420	6	Y	2	Y	Y	-	-	-	Y	Y
2B/S8	6X6	420	6	Y	2	Y	Y	-	-	-	Y	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A/S5	6X6	420	6	Y	6	Y	Y	-	-	-	Y	Y
6B/S6	6X6	420	6	Y	6	Y	Y	-	-	-	Y	Y

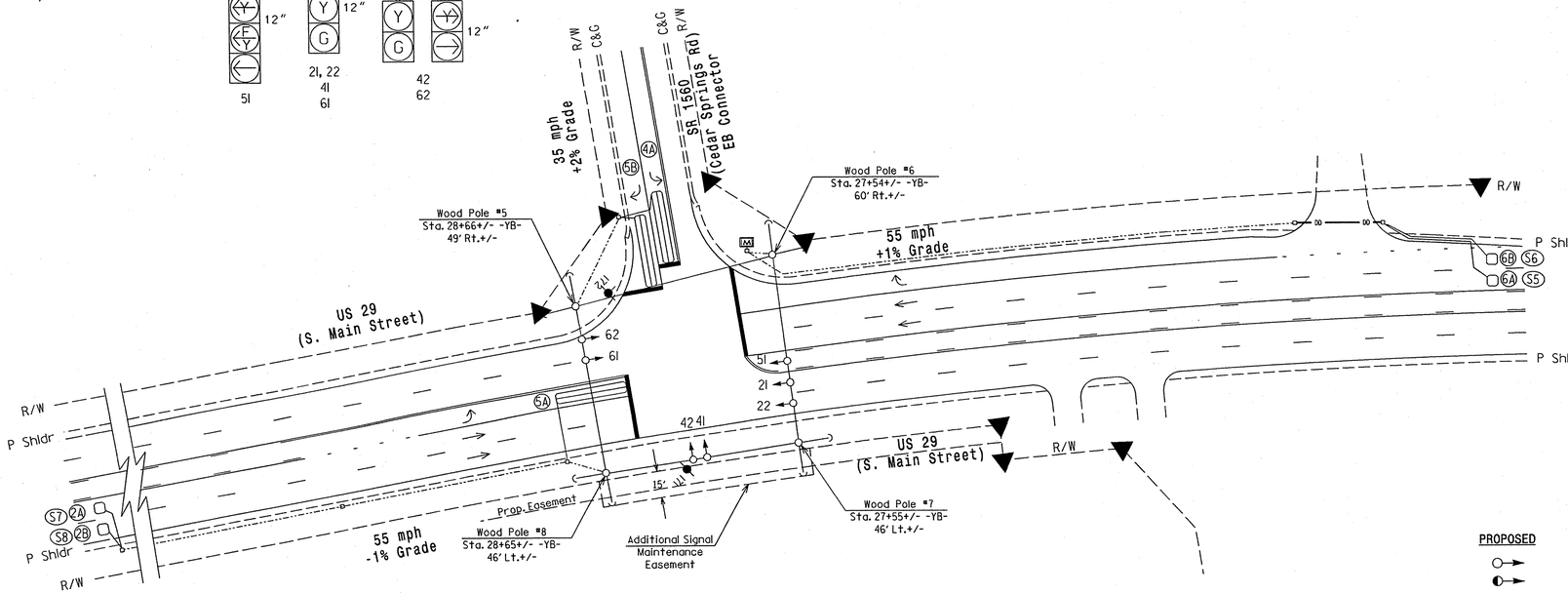
NOTES

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.
3. 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. Closed loop system data: Master Asset #10925, Controller Asset #1333.

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	14	7	7	14
Extension 1 *	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	20	90
Yellow Clearance	5.3	3.0	3.0	5.3
Red Clearance	1.0	2.6	2.1	1.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	46	-	-	46
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.4	-	-	3.4
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

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	
M	Master Controller & Cabinet	M
	Junction Box	
	2-in Underground Conduit	
	Right of Way	
	Directional Arrow	

New Installation

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RECOVERY.GOV

Prepared for the Offices of:
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

US 29 (S. Main Street)
at
SR 1560 (Cedar Springs Rd)
EB Connector

Division 9 | Rowan County | Salisbury

PLAN DATE: Sept 2012 | REVIEWED BY: J.L. Lewis

PREPARED BY: D.J. Darity | MAB PROJECT NO.: 2011044

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19719 ENGINEER DONALD J. DARITY
1-24-2013
SIGNATURE DATE

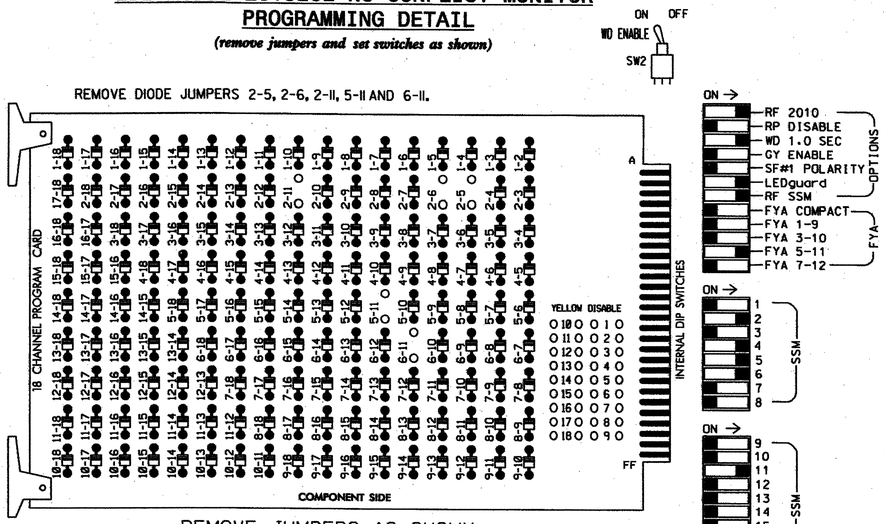
SIG. INVENTORY NO. 09-1333

0151DEL_P10b1

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.6

EDI MODEL 2018ECL-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. 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 29 (S. Main St) Closed Loop System.

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.....S2,S5,S7,S8,AUXS4
PHASES USED.....2,4,5,6
OVERLAP "A".....NONE
OVERLAP "B".....NONE
OVERLAP "C".....5+6
OVERLAP "D".....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4		14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4		4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	51★	42	61,62	NU	NU	NU	NU	NU	NU	NU	51★	NU	NU
RED		128			101			*		134										
YELLOW		129			102					135										
GREEN		130			103					136										
RED ARROW																		A114		
YELLOW ARROW						102			132									A115		
FLASHING YELLOW ARROW																		A116		
GREEN ARROW						103		133	133											

NU = NOT USED
* Denotes install load resistor. See Load Resistor Installation Detail this page.
* Denotes see pictorial of head wiring in detail below.

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/SYS 2A/S7	SLOT EMPTY	WIRED INPUT ⊛	SLOT EMPTY	Ø4 4A NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR ST DC ISOLATOR
FILE "I" L		Ø2/SYS 2B/S8												
FILE "J" U	Ø5 5A	Ø5 5B	Ø6/SYS 6A/S5	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	NOT USED	NOT USED	Ø6/SYS 6B/S6											

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

FS = FLASH SENSE
ST = STOP TIME

⊛ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

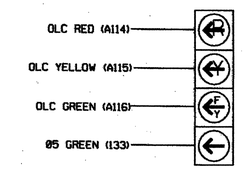
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S7	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S8	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A/S5	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
6B/S6	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y			

[1] Add jumper from J1W to I4W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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

PHASE 5 RED FIELD TERMINAL (131)
AC-

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: Ø9-1333
DESIGNED: Sept 2012
SEALED: 1-24-2013
REVISED:

Electrical Detail Sheet 1 of 2

New Installation

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N.Greenfield Pkwy,Garner,NC 27529

US 29 (S. Main Street)
at
SR 1560 (Cedar Springs Rd)
EB Connector

Division 9 | Rowan County | Salisbury

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PREPARED BY:	D.J. Darity	MAB PROJECT NO.:	2011044

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 19713 ENGINEER DONALD J. DARITY
1-24-2013
SIGNATURE DATE

SIG. INVENTORY NO. 09-1333

0151DEL_P10b1

PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig.7

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

(program controller as shown below)

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

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

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

                ↓
           SCROLL DOWN

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

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

PRESS '+'

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

                ↓
           SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

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

PRESS '+'

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

                ↓
           SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 09-1333
DESIGNED: Sept 2012
SEALED: 1-24-2013
REVISED:

Electrical Detail Sheet 2 of 2

New Installation

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Traffic Safety Unit, Traffic Engineering Branch, Highway and Safety Division, North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 29 (S. Main Street) at SR 1560 (Cedar Springs Rd) EB Connector

Division 9 | Rowan County | Salisbury

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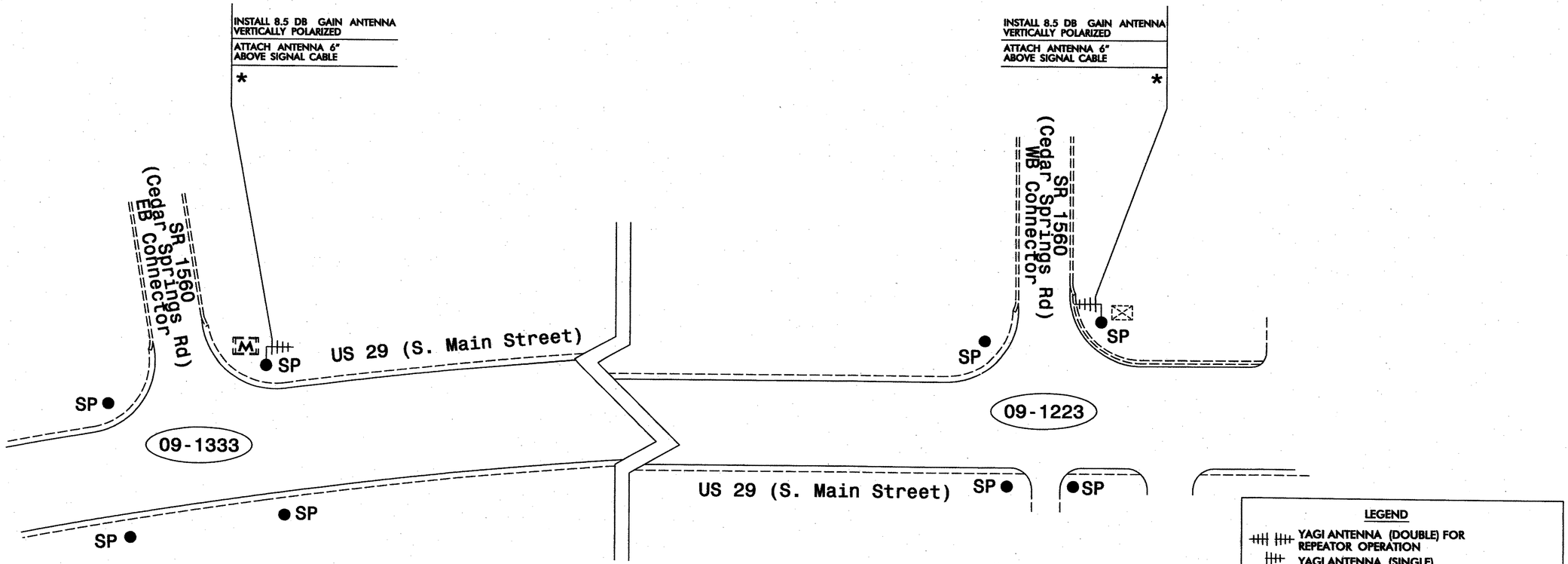
PROJECT REFERENCE NO.	SHEET NO.
P-5206A	Sig-8

* Coil extra Coaxial Cable for possible future relocation/transfer of Antenna and Antenna pole mounting hardware to a new pole.



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".
   - E. FOR UNDERGROUND CONDUIT INSTALLATIONS, PROVIDE COAXIAL CABLE SUITABLE FOR WET LOCATIONS.
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 REPEATOR OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER CONTROLLER AND CABINET
- XX-XXXX SIGNAL INVENTORY NUMBER
- EXISTING METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- EXISTING METAL POLE
- SP SIGNAL POLE
- EXISTING OVERSIZED JUNCTION BOX
- NEW OVERSIZED JUNCTION BOX
- EXISTING CONDUIT
- EXI EXISTING COMMUNICATIONS CABLE

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Prepared for the Office of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0 40 1"=40'

US 29 (S. Main Street) Wireless Communication Plan

Division 9 | Rowan County | Salisbury

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