

Project: U-0624

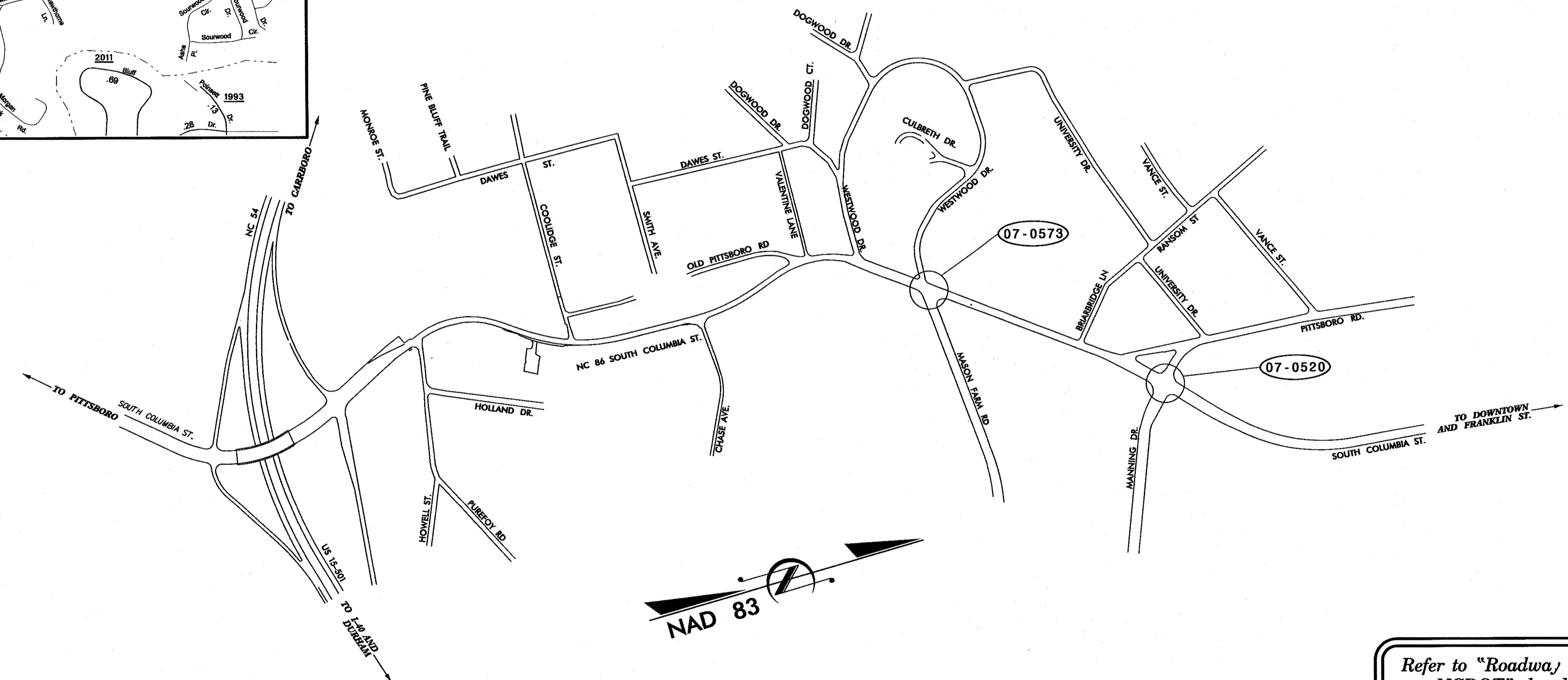
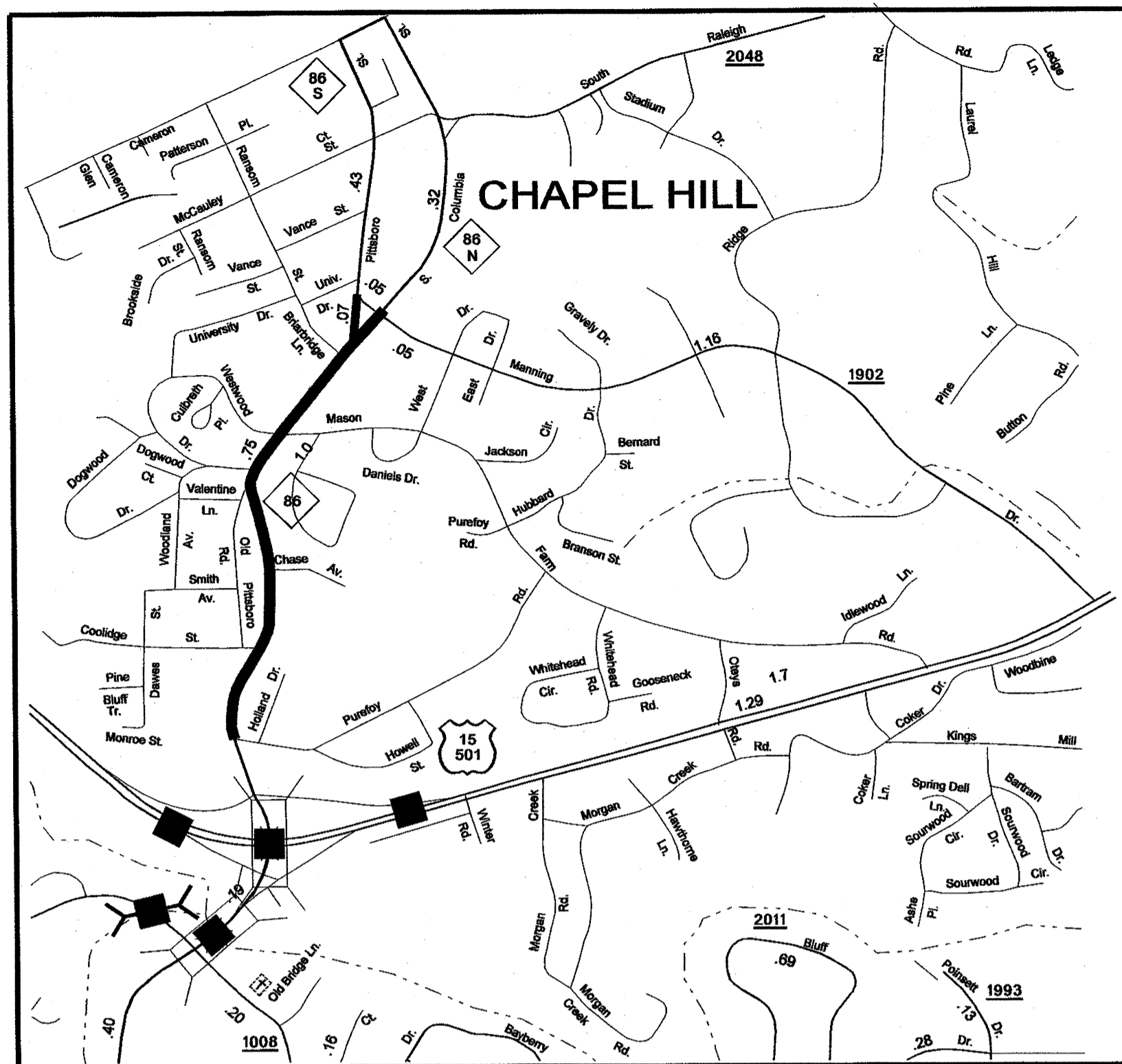
Project: 34762.1.1

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# ORANGE COUNTY

**LOCATION: NC 86 (SOUTH COLUMBIA STREET) FROM  
SR 1906 (PUREFOY ROAD) TO SR 1902 (MANNING DRIVE)  
IN CHAPEL HILL**

**TYPE OF WORK: TRAFFIC SIGNALS AND FIBER OPTIC COMMUNICATIONS SYSTEM**



Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.

**Index of Plan Sheets**

Sheet #	SIN	Location/Description
Sig. 1	-	Title Sheet
Sig. 2-15	07-0573	NC 86 (South Columbia St.) @ Mason Farm Rd./Westwood Dr.
Sig. 16-22	07-0520	NC 86 (South Columbia St.) @ NC 86 (S. Pittsboro St.) /SR 1902 (Manning Dr.)
Sig. 23-25	-	Inductive Loop Standard Drawings
Sig. 26-28	-	Communications Cable & Conduit Routing Plans

**INTELLIGENT TRANSPORTATION SYSTEMS AND SIGNALS UNIT**

Contacts:

**Robert J. Ziemba, PE** - Central Region Signals Project Engineer  
**John T. Rowe, Jr., PE** - Signal Equipment Design Engineer  
**I. Neil Avery** - Signal Communications Project Engineer

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

750 N. Greenfield Parkway, Garner, NC 27529

03-11-05-201115:34  
 C:\p0624\U0624\Traffic\Signals\Design\1\Titlesheet\U-0624-sig-tsh.dgn  
 1/11/05 11:53 AM  
 1/11/05 11:53 AM  
 1/11/05 11:53 AM

PHASING DIAGRAM

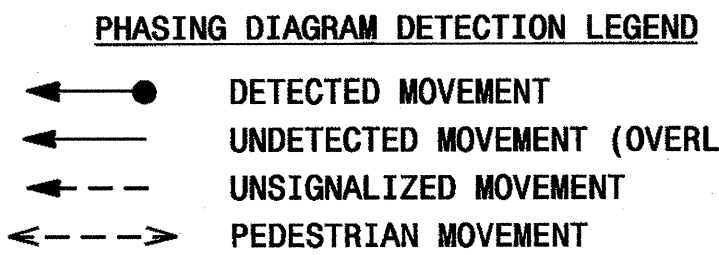
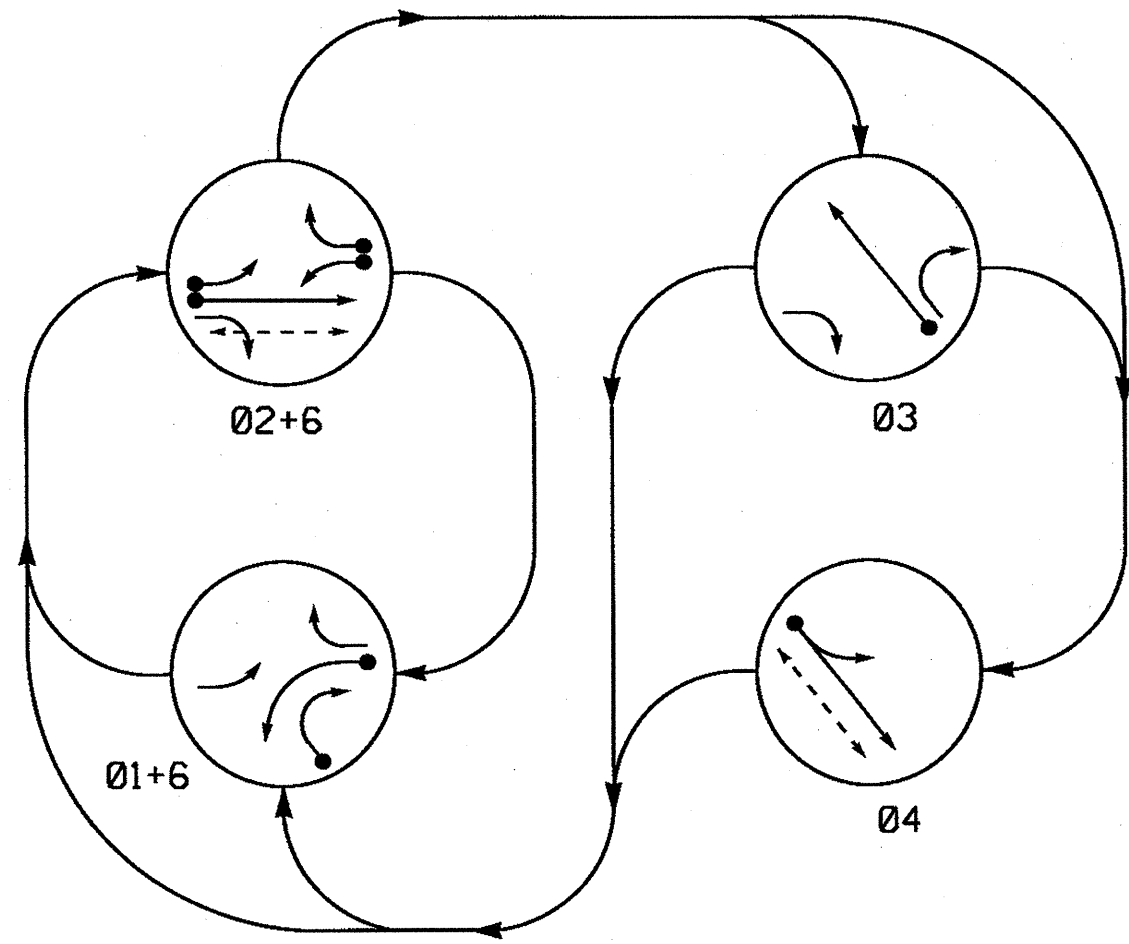
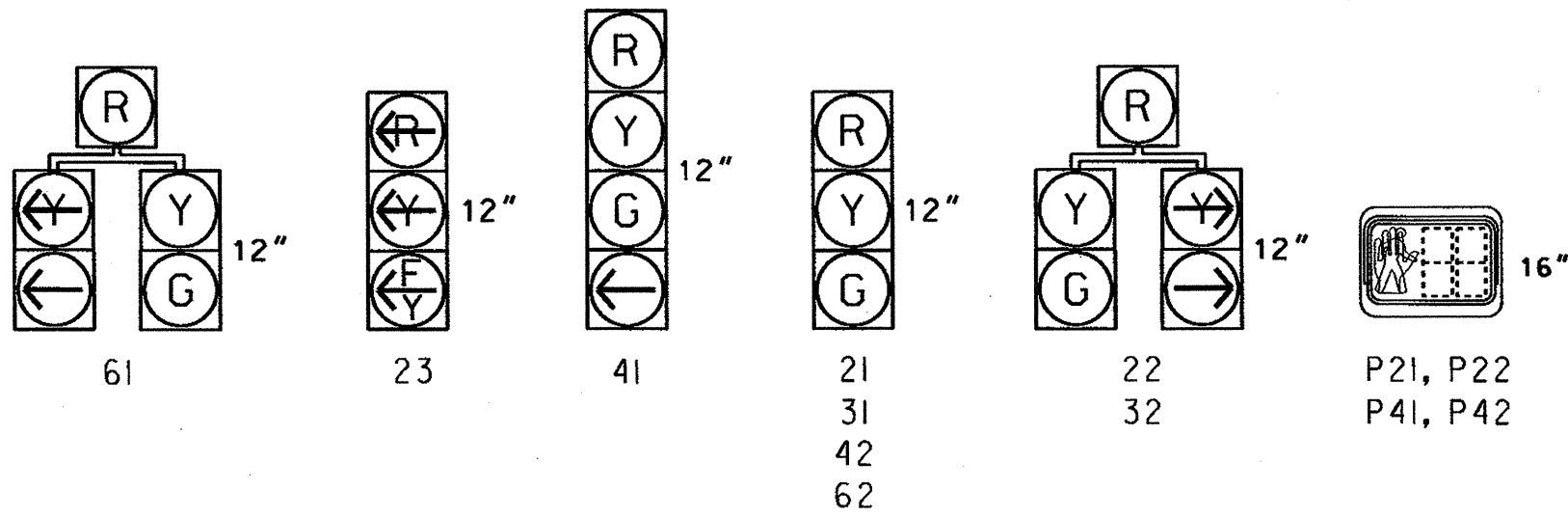


TABLE OF OPERATION
SIGNAL FACE
PHASE
0 1 2 3 4 F FLASH

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL
TO
FROM

SIGNAL FACE I.D. All Heads L.E.D.

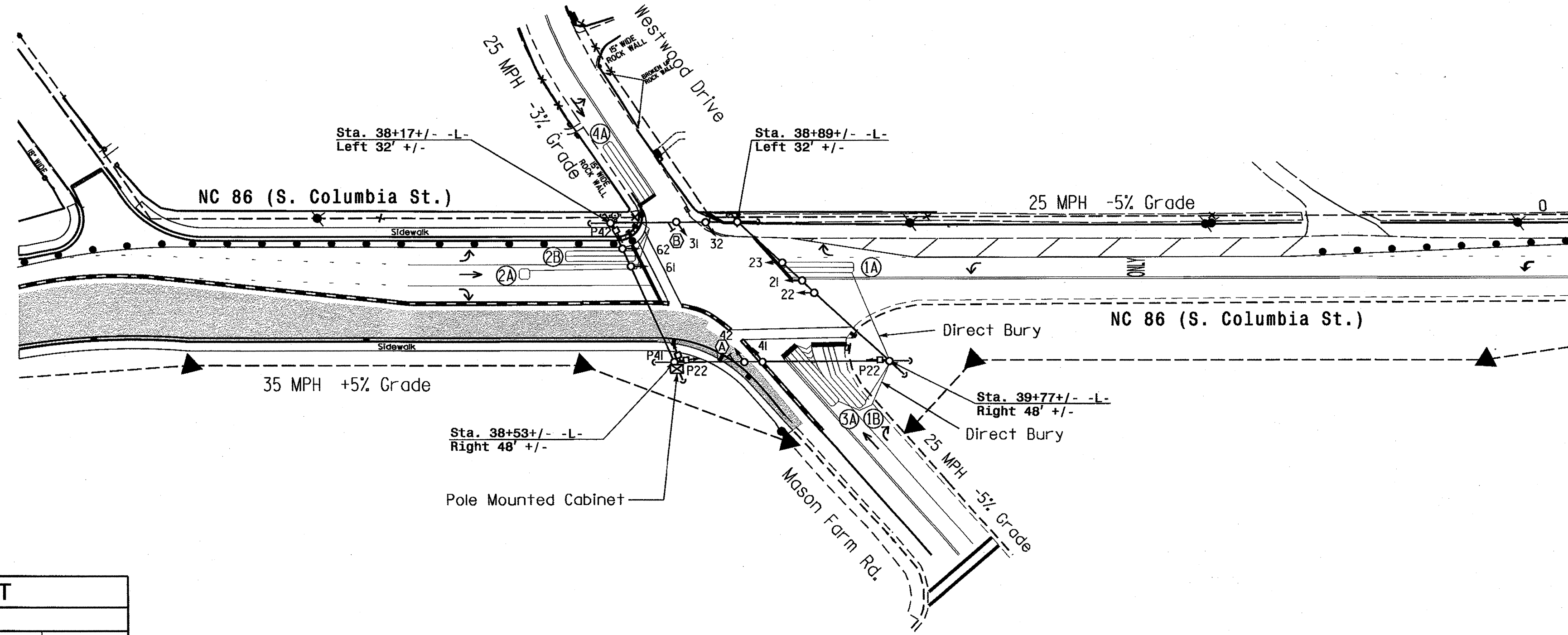


2070L LOOP & DETECTOR INSTALLATION
INDUCTIVE LOOPS
DETECTOR PROGRAMMING

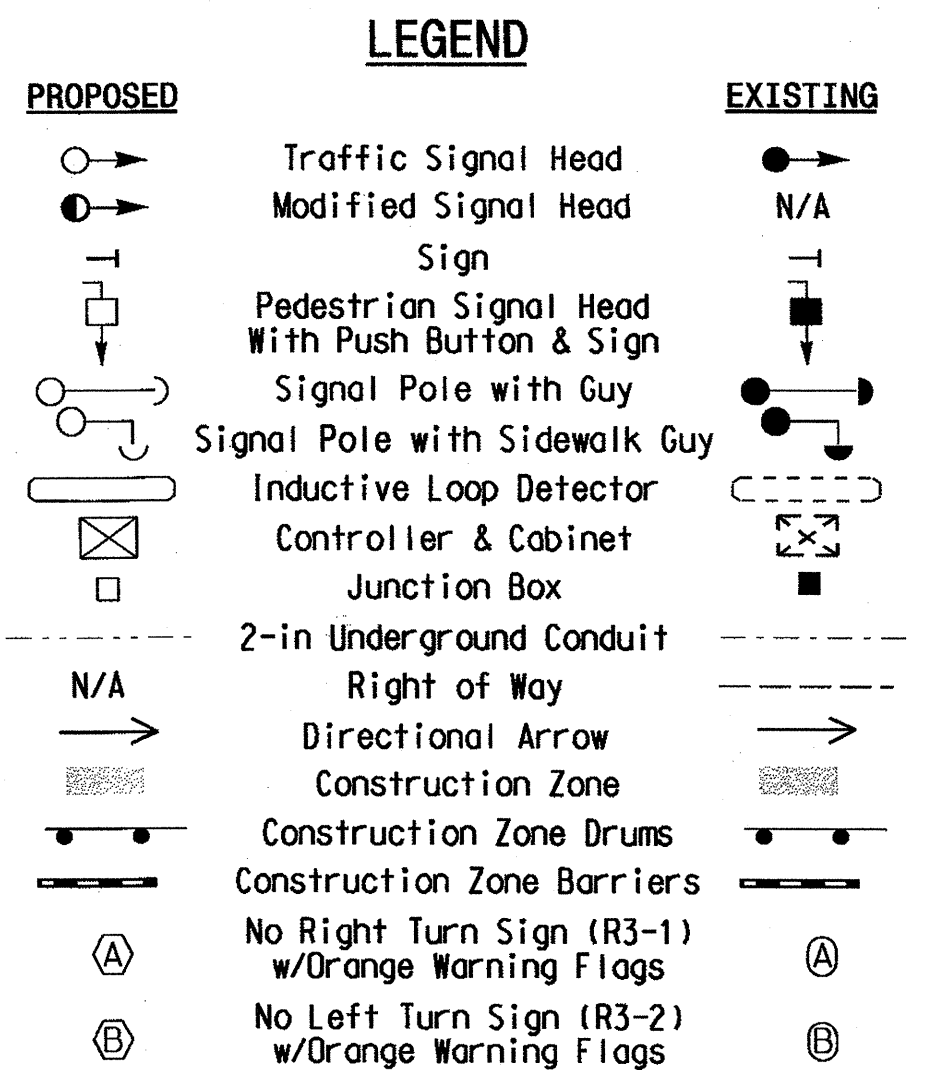
4 Phase Fully Actuated (Chapel Hill - Carrboro Signal System)

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006...
2. Do not program signal for late night flashing operation...
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance...
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART
FEATURE
PHASE
1 2 3 4 6



This plan supersedes the plan signed and sealed on 4/9/09.

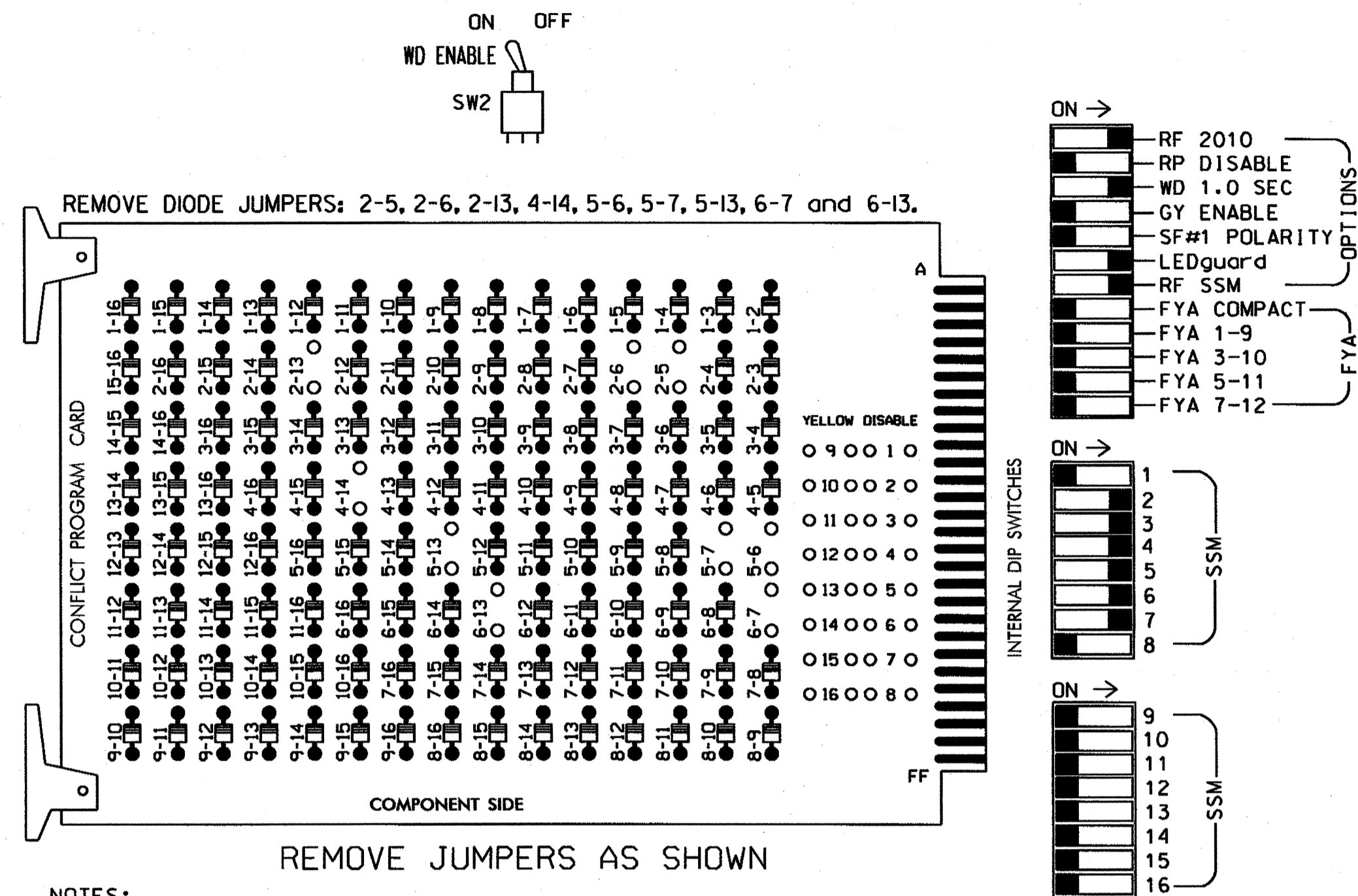
Signal Upgrade - Temporary Design 1 (Construction Phase I)

Project information including plan date (July 2011), prepared by (Sterling), and seal of Robert J. Ziehm, Professional Engineer, License No. 026486.



### EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
  - Make sure jumpers SEL2-SEL5 are present on the monitor board.
  - Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.
- = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 1,8,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 4 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Chapel Hill - Carboro Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070L  
 CABINET.....336  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S2P,S3,S4,S4P,S5,S6,S7.  
 PHASES USED.....1,2,3,4,6,2 PED,4 PED.  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....6  
 OVERLAP "D".....NOT USED  
 OVERLAP "E".....1

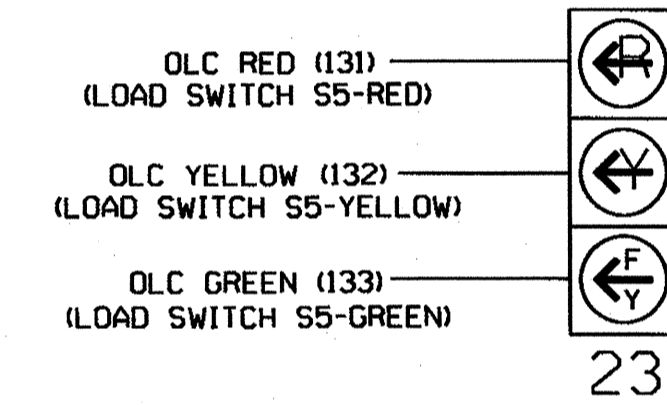
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	OLC*	6	6 PED	OLE	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	22	31,32	41	42	P41, P42	23	61,62	NU	32,61
RED		128		116	101	101			134	*		
YELLOW		129		117	102	102			135			
GREEN		130		118	103	103			136			
RED ARROW									131			
YELLOW ARROW				117					132		123	
FLASHING YELLOW ARROW									133			
GREEN ARROW				118	103						124	
				113					104			
												106

NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 \* See pictorial of head wiring in detail below.  
 NOTE: Load Switch S5 requires output remapping. See sheets 2 of this electrical detail for instructions.

### 3 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



### BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). [Remove phase 6 for 'Backup Protect']

### COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573T1  
 DESIGNED: July 2011  
 SEALED: 8-02-11  
 REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

### INPUT FILE POSITION LAYOUT

(front view)

FILE	U	1	2	3	4	5	6	7	8	9	10	11	12	13	14
		Ø 1	Ø 2	Ø 3	Ø 4	S	S	S	S	S	S	S	Ø 2 PED	S	FS
		1A	2A	3A	4A	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
		WIRED INPUT	Ø 2	Ø 1	NOT USED										
		2B	1B												

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

⊗ Wired Input - turn off Channel 2.

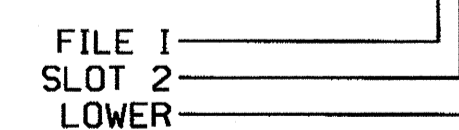
### INPUT FILE CONNECTION & PROGRAMMING CHART

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 <sup>1</sup>	TB21-1,2	I1U	56	18	1	1	Y	Y			15
2A	TB21-3,4	I2U	39	9	2	2	Y	Y			
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
3A	TB21-5,6	I3U	58	20	3	3	Y	Y			3
1B	TB23-5,6	I3L	49	11	24	1	Y	Y			15
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			3
PED PUSH BUTTONS											
P21,P22	TB22-9,10	I12U	67	29	PED 2	2 PED					
P41,P42	TB24-9,10	I12L	69	31	PED 4	4 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT 112.

<sup>1</sup>Add jumper from I1-F to I1-W, on rear of input file.

INPUT FILE POSITION LEGEND: I2L



### LOAD RESISTOR INSTALLATION DETAIL

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

NOTE: The purpose of this resistor is to load the channel red monitor input 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.

ELECTRICAL DETAIL SHEET 1 OF 2

Electrical and Programming Details For: **NC 86 (S. Columbia Street) at Mason Farm Road/Westwood Drive**

Division 7 Orange County Chapel Hill

Prepared In the Offices of: **TRANSPORTATION, MOBILITY AND SAFETY DIVISION**

PLANNING AND DESIGN DIVISION

DESIGNED: July 2011  
 PREPARED BY: James Peterson  
 REVIEWED BY: JTR

750 N. Greenfield Pkwy, Garner, NC 27529

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

Signature: *John T. Rowe* 8-2-11

SIG. INVENTORY NO. 07-0573T1

## FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 23

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

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

STEP 1

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...0
    
```

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

```

PAGE:1 C1 PIN:32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 31

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

STEP 2

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...1
    
```

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

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 32

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

STEP 3

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
    
```

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

```

PAGE:1 C1 PIN:34 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

### OVERLAP 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: :1234567891011213141516
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)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

```

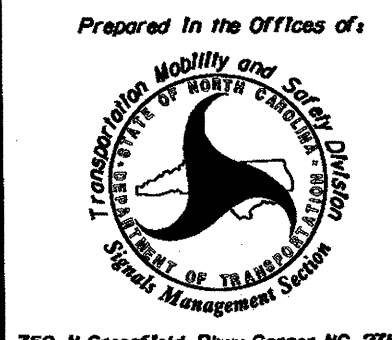
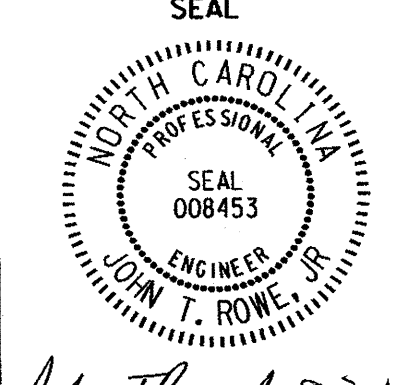
PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
PHASE: :1234567891011213141516
VEH OVL PARENTS: : X
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC)...0.0
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)...7
    
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573T1  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

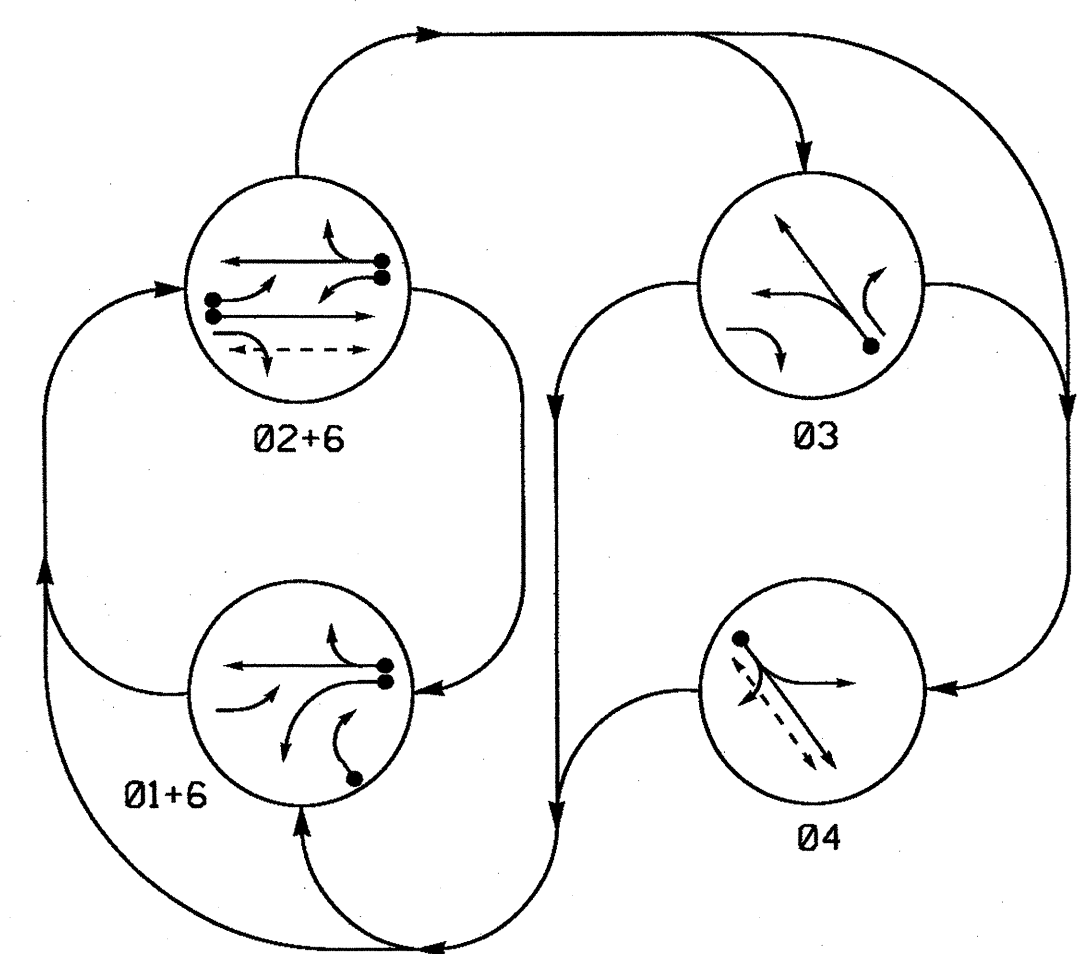
ELECTRICAL DETAIL SHEET 2 OF 2

	<p>Prepared In the Offices of:</p> <p><b>NC 86 (S. Columbia Street)</b> at <b>Mason Farm Road/ Westwood Drive</b></p>	
Division 7 PLAN DATE: July 2011 PREPARED BY: James Peterson	Orange County Chapel Hill REVIEWED BY: JTR REVIEWED BY:	SIGNATURE: <i>John T. Rowe</i> DATE: 8-3-11
REVISIONS INIT. DATE		
750 N. Greenfield Pkwy, Garner, NC 27529		

03-AUG-2011 09:05  
11:15:30 AM  
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**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE				FLASH
	Ø 1+6	Ø 2+6	Ø 3	Ø 4	
11	←	←	←	←	Y
21	R	G	R	R	Y
22	R	G	R	R	Y
23	←	←	←	←	Y
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
61, 62	G	G	R	R	Y
P21, P22	DW	W	DW	DW	DRK
P41, P42	DW	DW	DW	W	DRK

← = Flashing Yellow Arrow

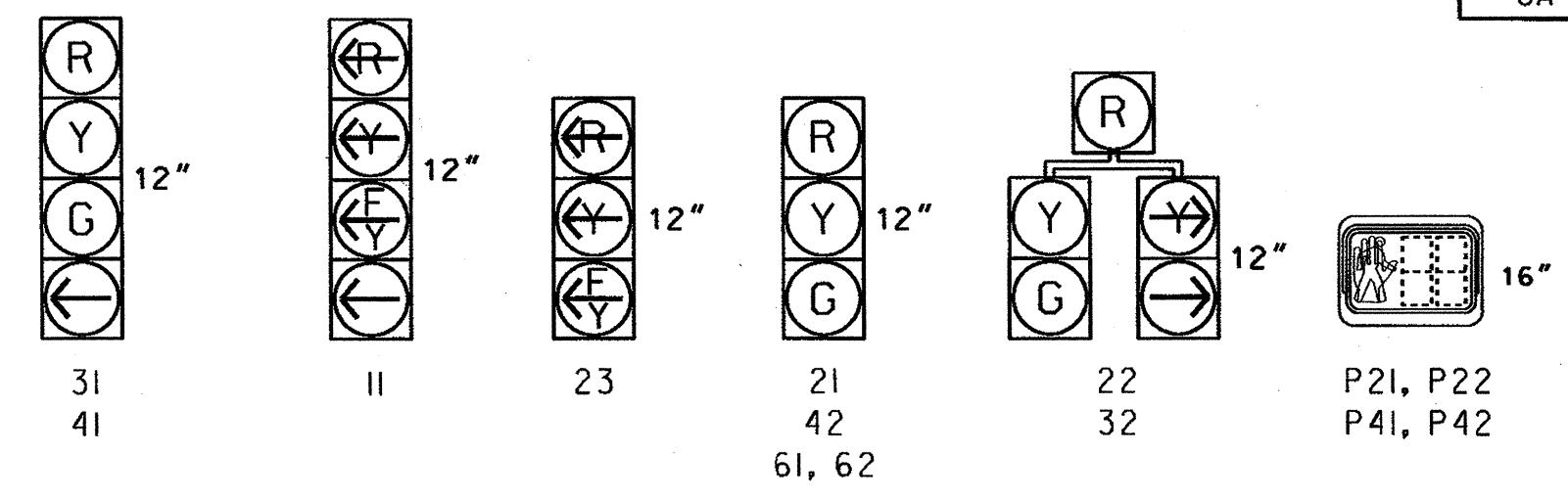
**STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL**

FROM	TO			
	←	←	←	←
	1	2	1	2
F	←	←	←	←
R	←	←	←	←
M	←	←	←	←

← = Flashing Yellow Arrow

**SIGNAL FACE I.D.**

All Heads L.E.D.



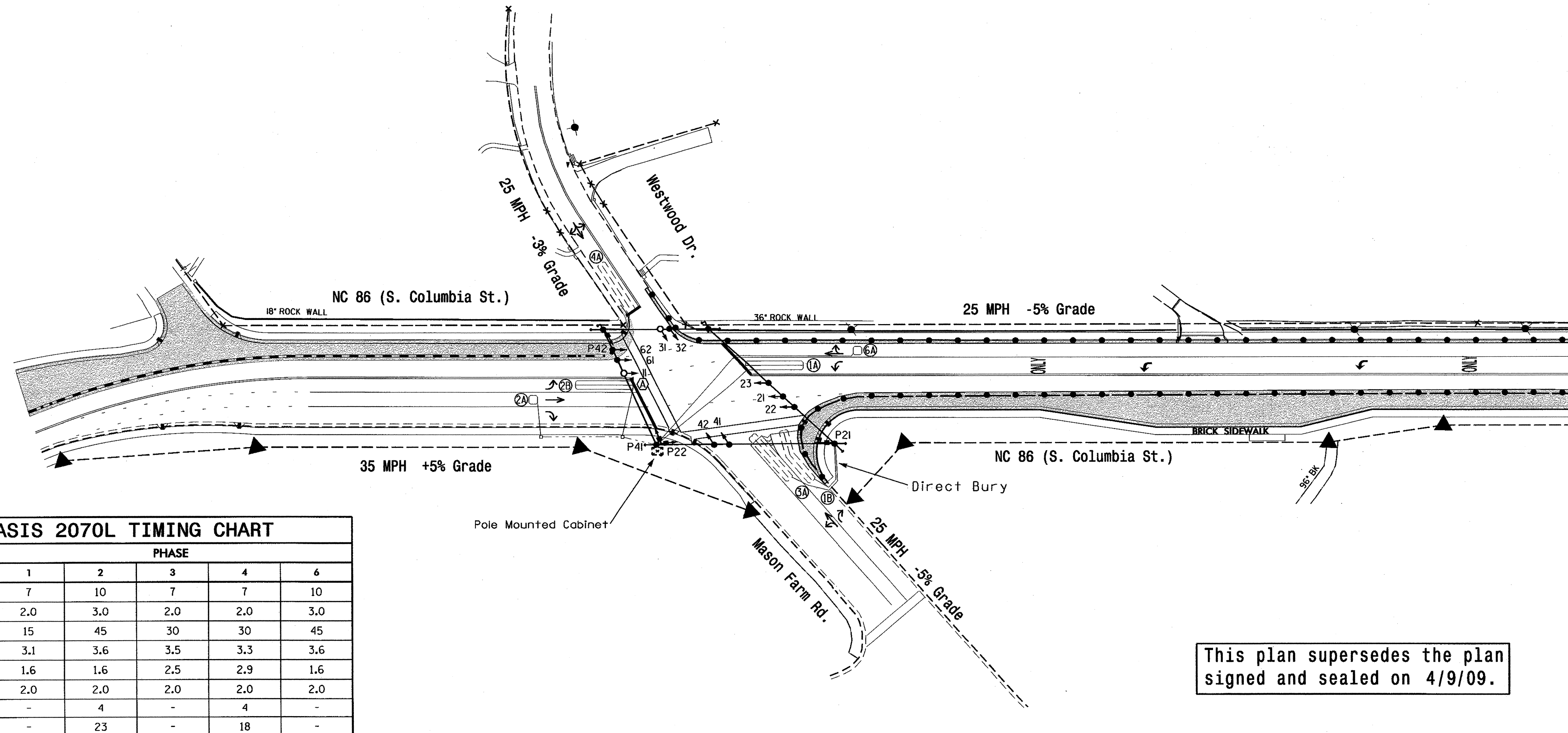
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING						
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	---	15	---	---
1B	6X40	+3	2-4-2	-	1	Y	Y	---	15	---	---
2A	6X6	70	3	Y	2	Y	Y	---	---	---	---
2B	6X40	0	2-4-2	Y	2	Y	Y	---	---	---	---
3A	6X40	+5	2-4-2	-	3	Y	Y	---	3	---	---
4A	6X40	0	2-4-2	-	4	Y	Y	---	10	---	---
6A	6X6	70	4	Y	6	Y	Y	---	---	---	---

**4 Phase Fully Actuated (Chapel Hill - Carrboro Signal System)**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Reposition existing signal heads as shown.
6. Remove existing No Left Turn (R3-2) and No Right Turn (R3-1) signs.
7. Set all detector units to presence mode.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



**OASIS 2070L TIMING CHART**

FEATURE	PHASE				
	1	2	3	4	6
Min Green 1 *	7	10	7	7	10
Extension 1 *	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	15	45	30	30	45
Yellow Clearance	3.1	3.6	3.5	3.3	3.6
Red Clearance	1.6	1.6	2.5	2.9	1.6
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	4	-	4	-
Don't Walk 1	-	23	-	18	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	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**

- |  |  |  |                              |
|--|--|--|------------------------------|
|  | Traffic Signal Head                            |  | Existing Traffic Signal Head |
|  | Modified Signal Head                           |  | N/A                          |
|  | Sign   |  | N/A                          |
|  | Pedestrian Signal Head With Push Button & Sign |  | N/A                          |
|  | Signal Pole with Guy                           |  | N/A                          |
|  | Signal Pole with Sidewalk Guy                  |  | N/A                          |
|  | Inductive Loop Detector                        |  | N/A                          |
|  | Controller & Cabinet                           |  | N/A                          |
|  | Junction Box                                   |  | N/A                          |
|  | 2-in Underground Conduit                       |  | N/A                          |
|  | Right of Way                                   |  | N/A                          |
|  | Directional Arrow                              |  | N/A                          |
|  | Construction Zone                              |  | N/A                          |
|  | Construction Zone Drums                        |  | N/A                          |
|  | Construction Zone Barriers                     |  | N/A                          |
|  | Left Arrow "ONLY" Sign (R3-5L)                 |  | N/A                          |

This plan supersedes the plan signed and sealed on 4/9/09.

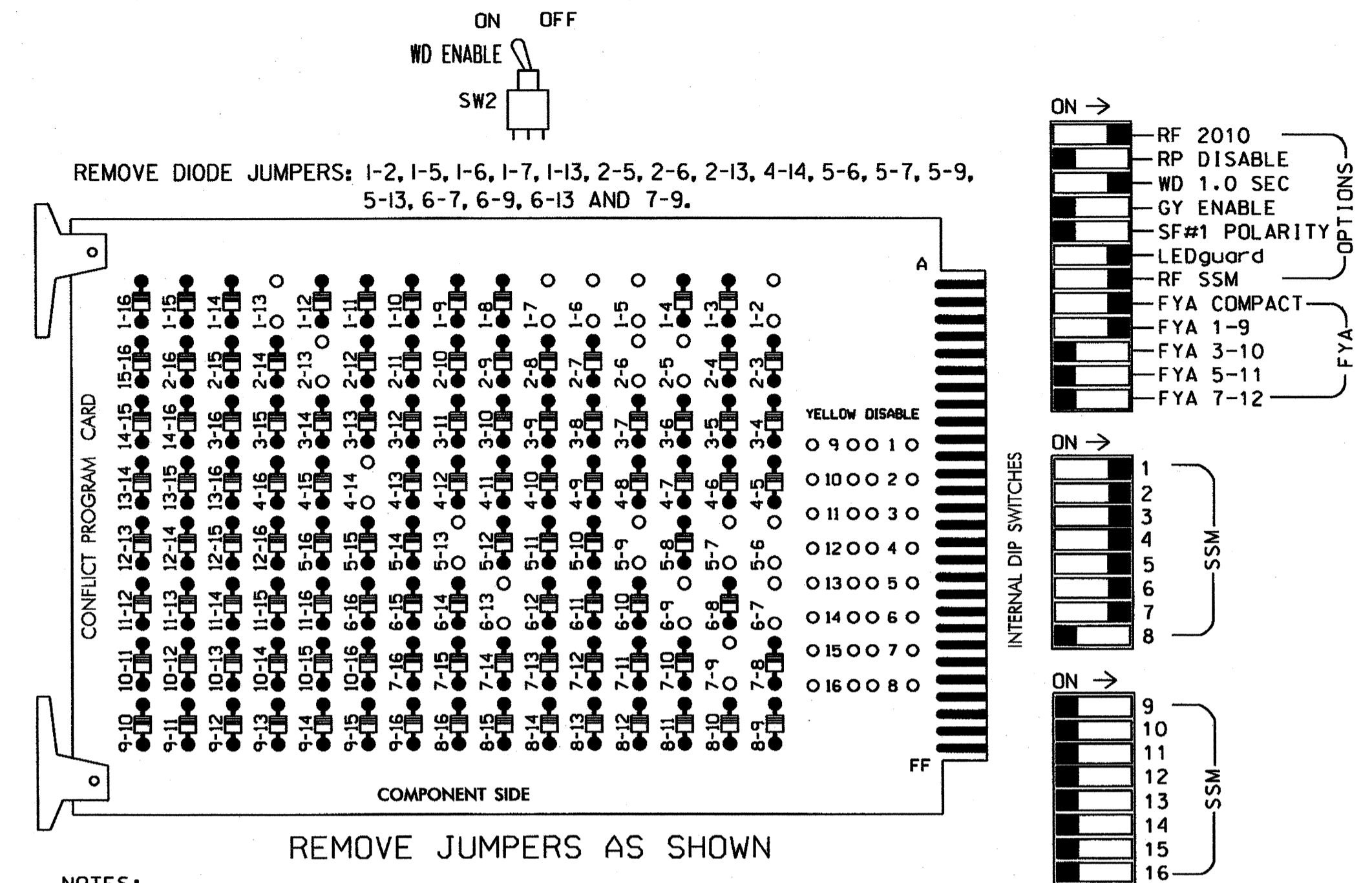
**Signal Upgrade - Temporary Design 2 (Construction Phase II)**

	<b>NC 86 (S. Columbia Street)</b>		SEAL
	<b>at</b>		
	<b>Mason Farm Road/ Westwood Drive</b>		
Division 7 Orange County Chapel Hill		PLAN DATE: July 2011 REVIEWED BY:	
PREPARED BY: Sterling		REVIEWED BY:	
REVISIONS		INIT. DATE	
SIGNATURE		DATE	
SCALE 1" = 50'		SIC. INVENTORY NO. 07-057312	



**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
  - Make sure jumpers SEL2-SEL5 are present on the monitor board.
  - Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.
- = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 8,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 4 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Chapel Hill - Carboro Signal System.

**EQUIPMENT INFORMATION**

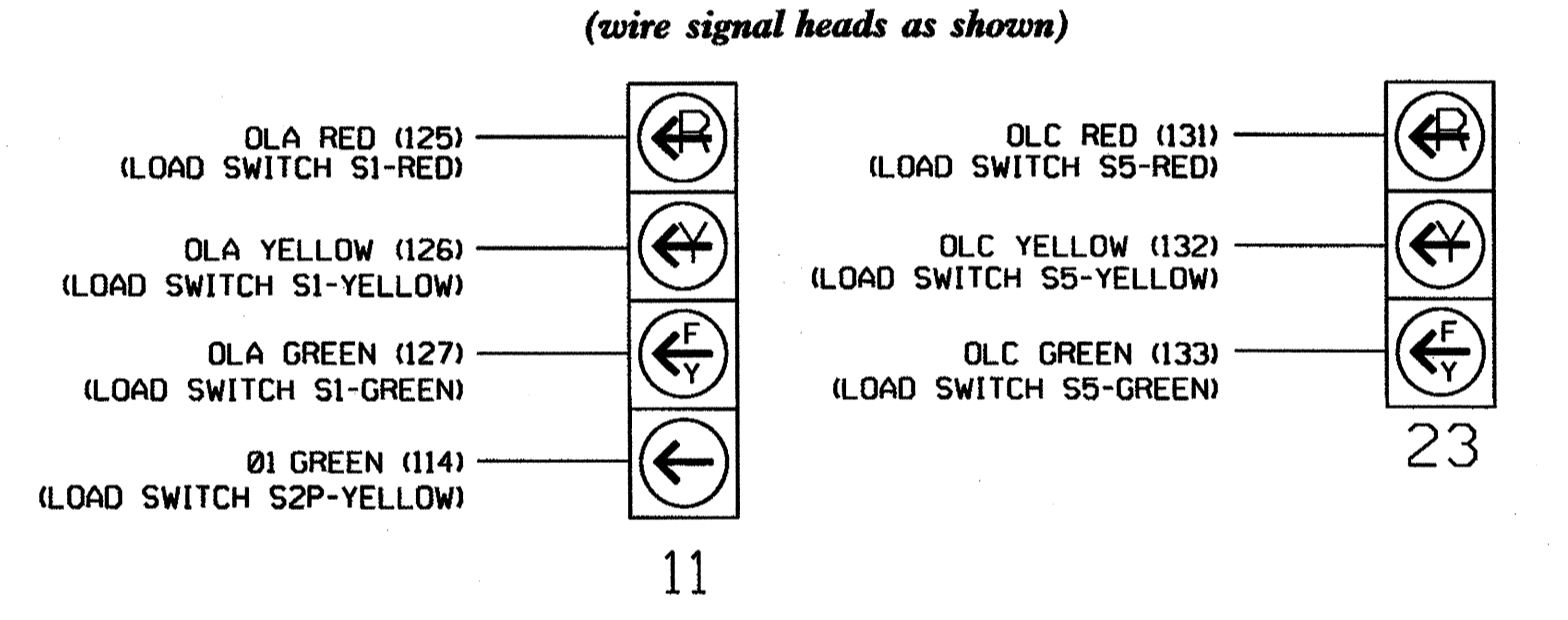
CONTROLLER.....2070L  
 CABINET.....336  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S7.  
 PHASES USED.....1,2,3,4,6,2 PED,4 PED.  
 OVERLAP "A".....1+2+6  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....6  
 OVERLAP "D".....NOT USED  
 OVERLAP "E".....1

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P		
PHASE	OLA	2	2 PED	3	4	4 PED	OLC	6	6 PED	OLE	8	8 PED		
SIGNAL HEAD NO.	11	21,22	22,22	31	32	41	42	P41, P42	23	61,62	NU	32	NU	NU
RED		128		116	116	101	101			134	*			
YELLOW		129		117	117	102	102			135				
GREEN		130		118	118	103	103			136				
RED ARROW	125									131				
YELLOW ARROW	126			117						132		123		
FLASHING YELLOW ARROW	127									133				
GREEN ARROW		114	118	118		103						124		
		115						104						
								106						

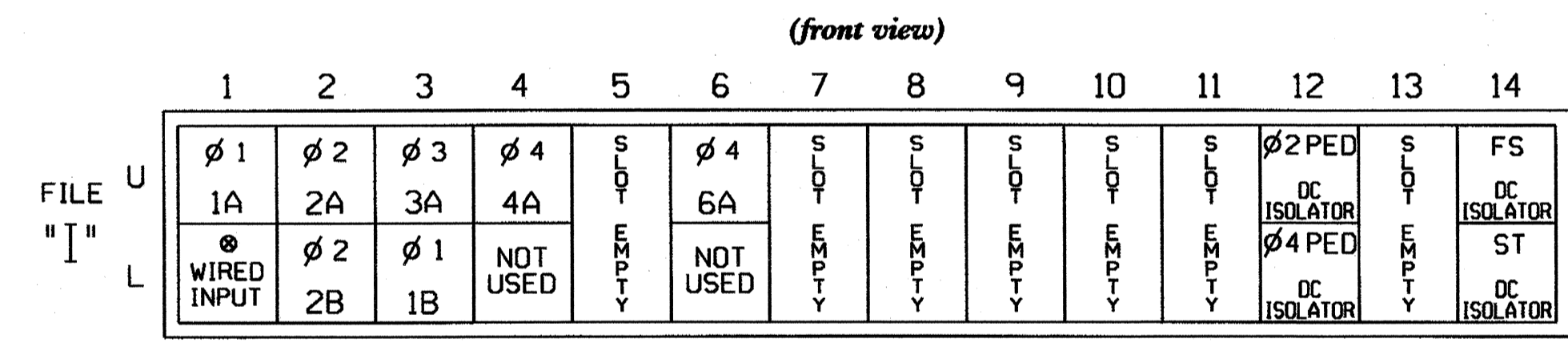
NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 \* See pictorial of head wiring in detail below.  
 NOTE: Load Switches S1, S2P, S5 require output remapping. See sheets 3 and 4 of this electrical detail for instructions.

**4 SECTION FYA PPLT SIGNAL WIRING DETAIL**



NOTE: 1. The sequence display for this signal requires special logic and output remapping. See sheet 2 of 4 for programming instructions.

**INPUT FILE POSITION LAYOUT**

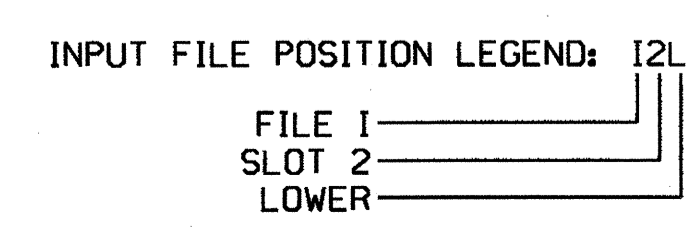


EX.: 1A, 2A, ETC. = LOOP NO.'S  
 Ⓞ Wired Input - turn off Channel 2.

**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 <sup>1</sup>	TB21-1,2	I1U	56	18	1	1	Y	Y			15
2A	TB21-3,4	I2U	39	9	22	6	Y	Y			
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
3A	TB21-5,6	I3U	58	20	3	3	Y	Y			3
1B	TB23-5,6	I3L	49	11	24	1	Y	Y			15
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			10
6A	TB21-11,12	I6U	40	2	6	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB22-9,10	I12U	67	29	PED 2	2 PED					
P41,P42	TB24-9,10	I12L	69	31	PED 4	4 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.  
<sup>1</sup>Add jumper from I1-F to I1-W, on rear of input file.



**PED YELLOW CONFLICT MONITOR WIRING DETAIL**

(make cabinet wiring changes as shown below)

In order to use FYA COMPACT mode on the 2010ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 2 PY (field term. 114) to chan. 9 green (monitor pin 13).

Follow the instructions below to make the appropriate connections:

STEP 1: Fold down rear panel of output file.

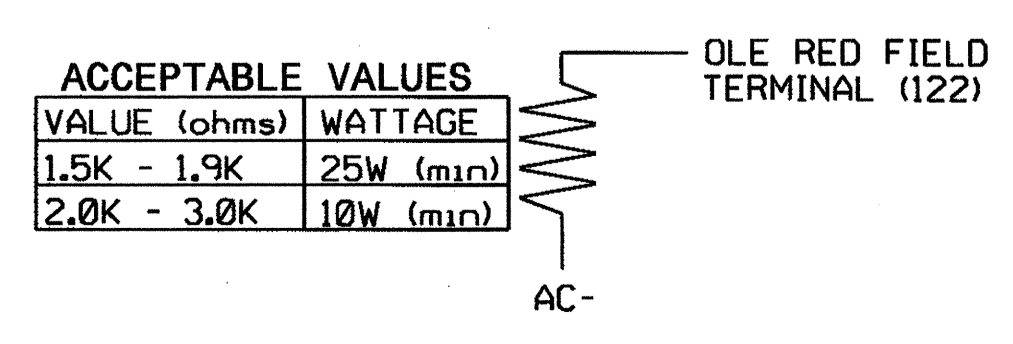
STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).

STEP 3: Find the conductors that correspond to the following conflict monitor card edge pins and solder wire to the appropriate terminal on the rear of the output file as shown below:

CMU-13 \_\_\_\_\_ 2PY (term. 114)

NOTE: Some cabinet manufacturers use a molex plug to accomplish this wiring configuration. If connectors are used, simply plug the two connectors together that are labeled with the pin-out as shown above.

**LOAD RESISTOR INSTALLATION DETAIL**



ELECTRICAL DETAIL SHEET 1 OF 4

Prepared In the Offices of:  
 NORTH CAROLINA PROFESSIONAL ENGINEERS AND SURVEYORS  
 JAMES PETERSON & ASSOCIATES, P.A.  
 750 N. Greenfield Pkwy, Carrer, NC 27529

NC 86 (S. Columbia Street) at Mason Farm Road/Westwood Drive  
 Division 7 Orange County Chapel Hill  
 PLAN DATE: July 2011 REVIEWED BY: JTR  
 PREPARED BY: James Peterson REVIEWED BY:  
 REVISIONS: INIT. DATE

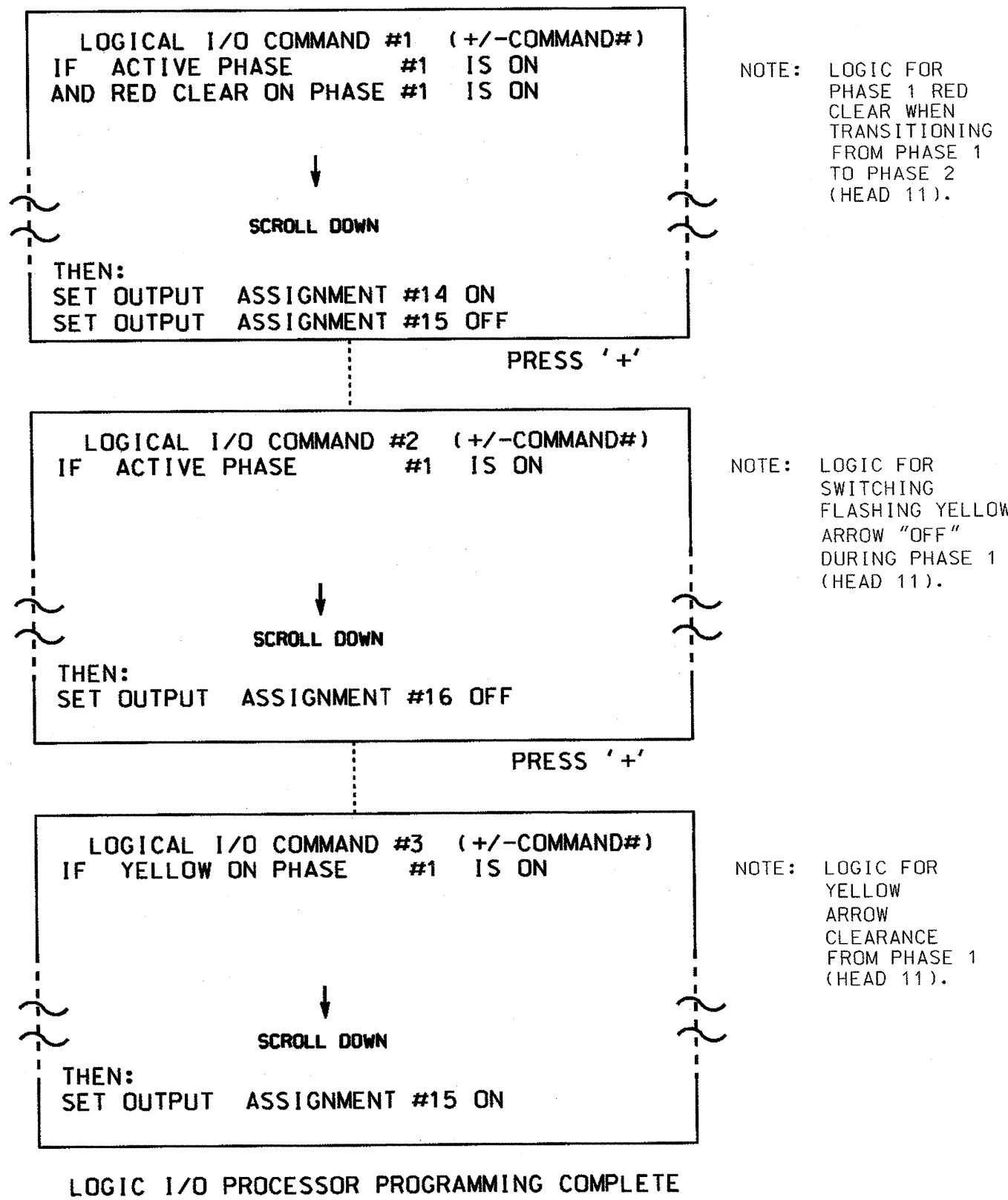
SEAL  
 JOHN T. ROWE, JR.  
 ENGINEER  
 008453  
 SIGNATURE: [Signature] DATE: 8-3-11  
 SIG. INVENTORY NO. 07-057312



**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).



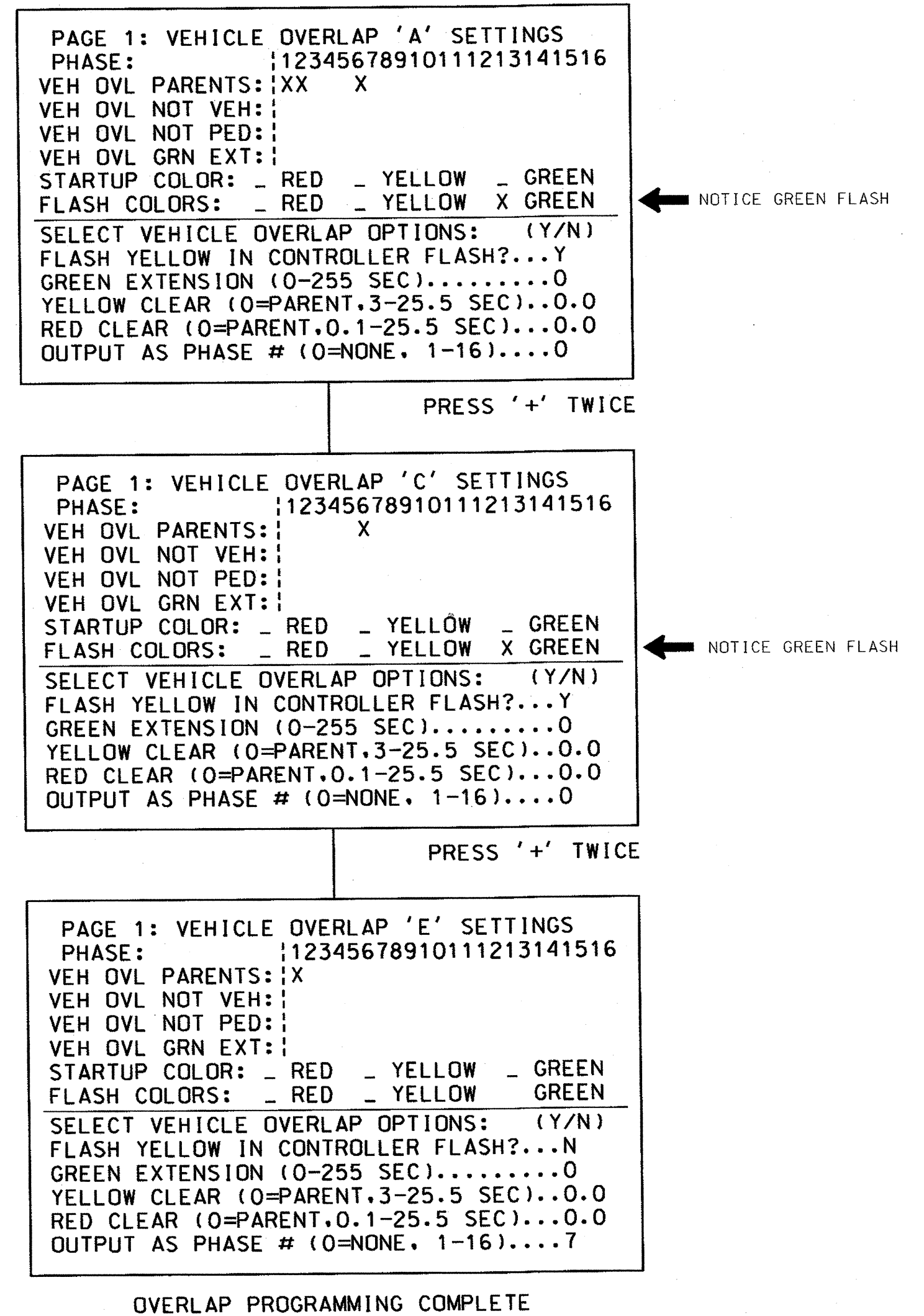
**OUTPUT REFERENCE SCHEDULE**

OUTPUT 14 = Overlap A Red  
OUTPUT 15 = Overlap A Yellow  
OUTPUT 16 = Overlap A Green

**OVERLAP PROGRAMMING DETAIL**

(program controller as shown below)

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



THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-0573T2  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes  
the detail sealed on 4/15/09.

ELECTRICAL DETAIL SHEET 2 OF 4

<p>750 N. Grandfield Pkwy, Garner, NC 27529</p>	<p>Prepared in the Offices of:</p> <p>Orange County</p>	<p>NC 86 (S. Columbia Street) at Mason Farm Road/ Westwood Drive</p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR.</p>
	<p>Division 7</p> <p>PLAN DATE: July 2011</p> <p>PREPARED BY: James Peterson</p>	<p>Orange County</p> <p>REVIEWED BY: JTR</p> <p>REVIEWED BY:</p>	<p>Chapel Hill</p> <p>REVISIONS</p> <p>INIT. DATE</p>

## FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 11

(program controller as shown below)

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "14"

```

PAGE:1 C1 PIN:16 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

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

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

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

```

PAGE:1 C1 PIN:16 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 15

STEP 2

```

PAGE:1 C1 PIN:17 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....15
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

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

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

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

```

PAGE:1 C1 PIN:17 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....15
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 16

STEP 3

```

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

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

```

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

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

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

```

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

PRESS "+" UNTIL OUTPUT 33 IS REACHED.

STEP 4

```

PAGE:1 C1 PIN:35 NOT ENABLED
OUTPUT ASSIGNMENT #.....33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:35 NOT ENABLED
SELECT VEHICLE PHASE (1-16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
    
```

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

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

```

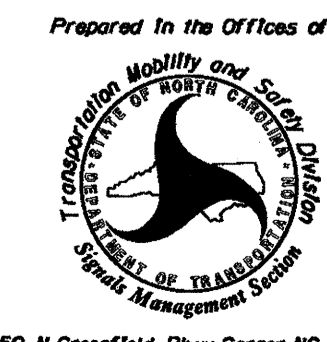
PAGE:1 C1 PIN:35 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

OUTPUT PROGRAMMING FOR HEAD 11 COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573T2  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

ELECTRICAL DETAIL SHEET 3 OF 4

	<p><b>NC 86 (S. Columbia Street)</b> at <b>Mason Farm Road/ Westwood Drive</b></p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE JR.</p>						
<p>Division 7 Orange County Chapel Hill</p>								
<p>PLAN DATE: July 2011</p>		<p>REVIEWED BY: JTR</p>						
<p>PREPARED BY: James Peterson</p>		<p>REVIEWED BY:</p>						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			REVISIONS	INIT.	DATE			
REVISIONS	INIT.	DATE						
<p>750 N. Greenfield Plwy., Garner, NC 27529</p>		<p>SIGNATURE: <i>John T. Rowe Jr.</i> 83-11 DATE: _____ SIG. INVENTORY NO. 07-0573T2</p>						

03-AUG-2011 09:08 S:\115304175 Signal\work\grcoups\sig Mon#Peterson\070573\_tsm.e.d.xxx.dgn Peterson



### FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 23

(program controller as shown below)

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS). WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...0
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

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

```

PAGE:1 C1 PIN:32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 31

STEP 2

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...1
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 32

STEP 3

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTING DATA. THEN 'ESC'.

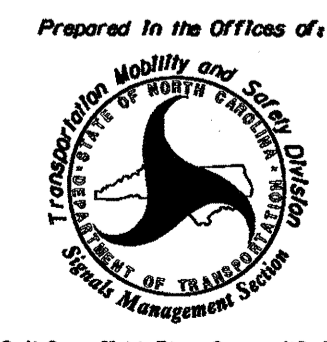
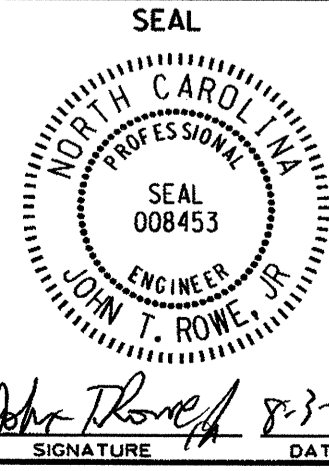
```

PAGE:1 C1 PIN:34 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573T2  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

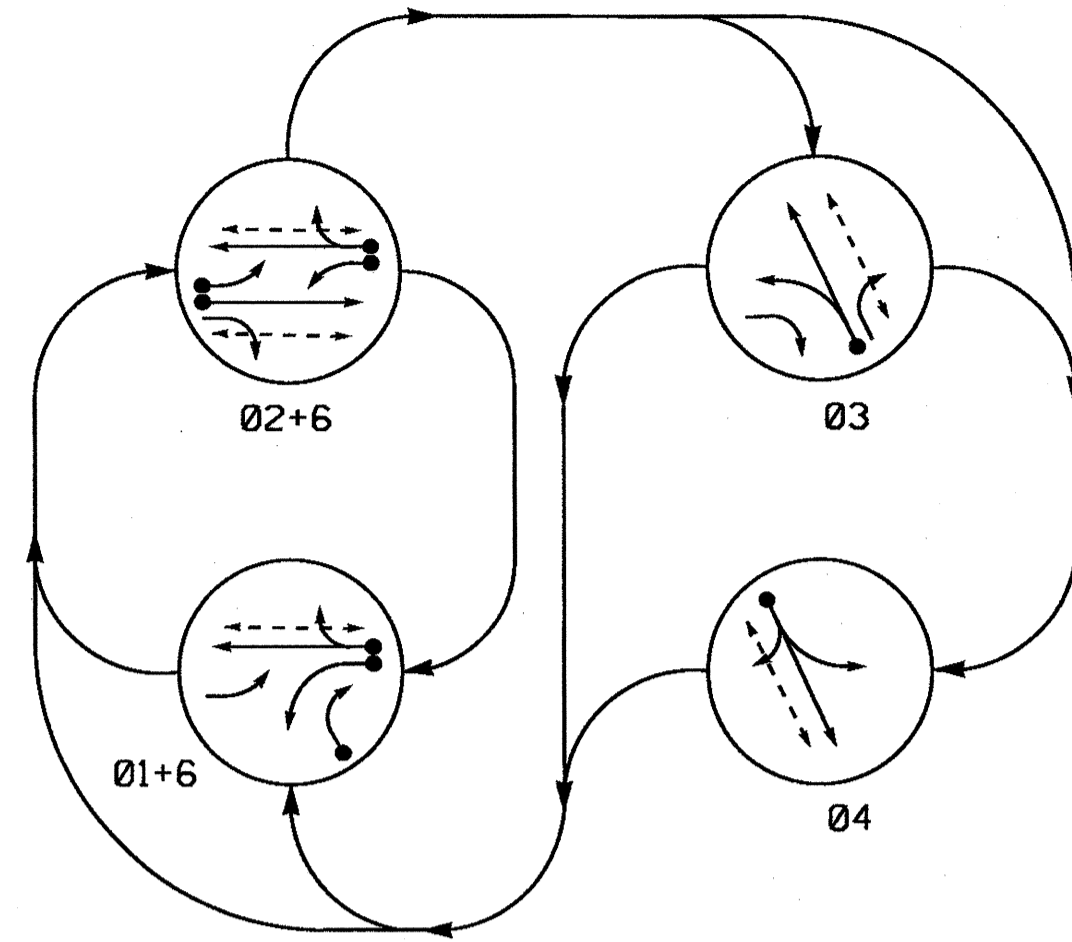
ELECTRICAL DETAIL SHEET 4 OF 4

 <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Prepared In the Offices of:</p> <p><b>NC 86 (S. Columbia Street)</b> at <b>Mason Farm Road/ Westwood Drive</b></p>		<p>SEAL</p> 				
	<p>Division 7 Orange County Chapel Hill</p> <p>PLAN DATE: July 2011 REVIEWED BY: JTK</p> <p>PREPARED BY: James Peterson REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		NO.	INIT.	DATE	
NO.	INIT.	DATE					

SIGNATURE: *John T. Rowe, Jr.* DATE: 8-3-11  
SIG. INVENTORY NO. 07-0573T2

03-AUG-2011 09:05 STARTSASUNIT5 Signal.sdw\krcopus61g Man\PeterPeterson\070673L.sm.dwg e...xxx.dgn JPeterson

**PHASING DIAGRAM**



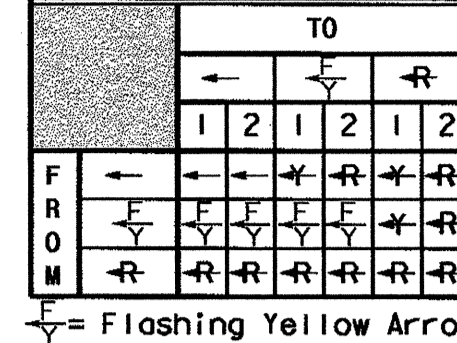
**PHASING DIAGRAM DETECTION LEGEND**

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

SIGNAL FACE	PHASE				LAYOUT
	01+6	02+6	03	04	
11	-	F	R	R	Y
21	R	G	R	R	Y
22	R	G	R	R	Y
23	F	F	R	R	Y
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
61, 62	G	G	R	R	Y
P21, P22	DW	W	DW	DRK	
P31, P32	DW	DW	W	DRK	
P41, P42	DW	DW	DW	DRK	
P61, P62	W	W	DW	DRK	

F = Flashing Yellow Arrow

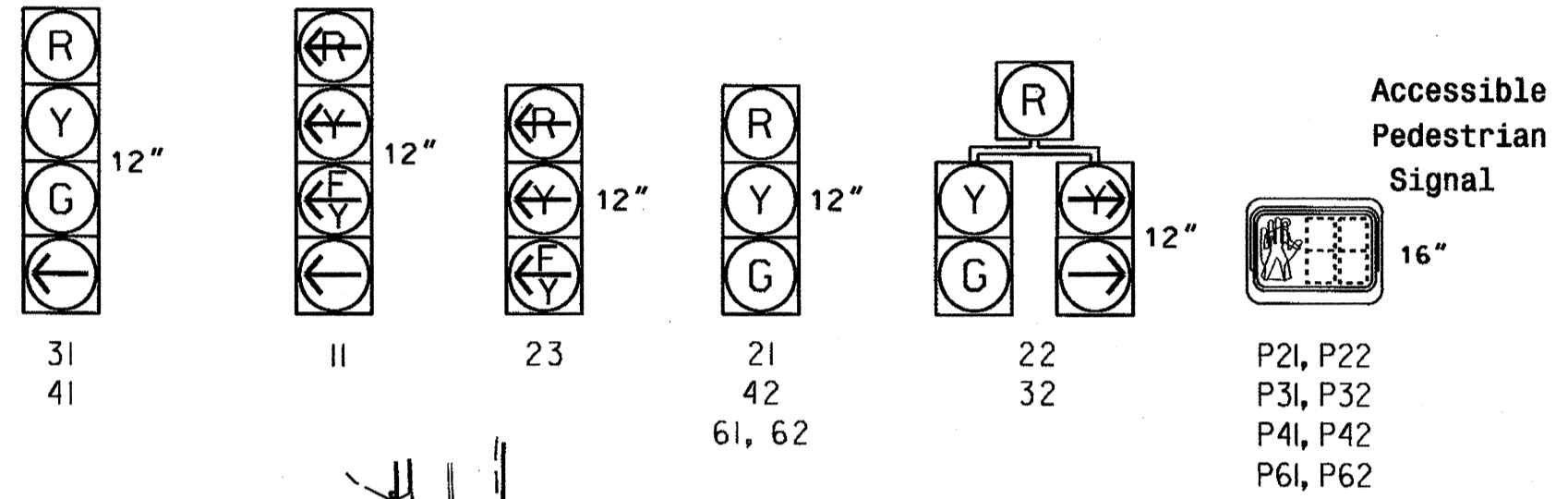
**STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL**



F = Flashing Yellow Arrow

**SIGNAL FACE I.D.**

All Heads L.E.D.



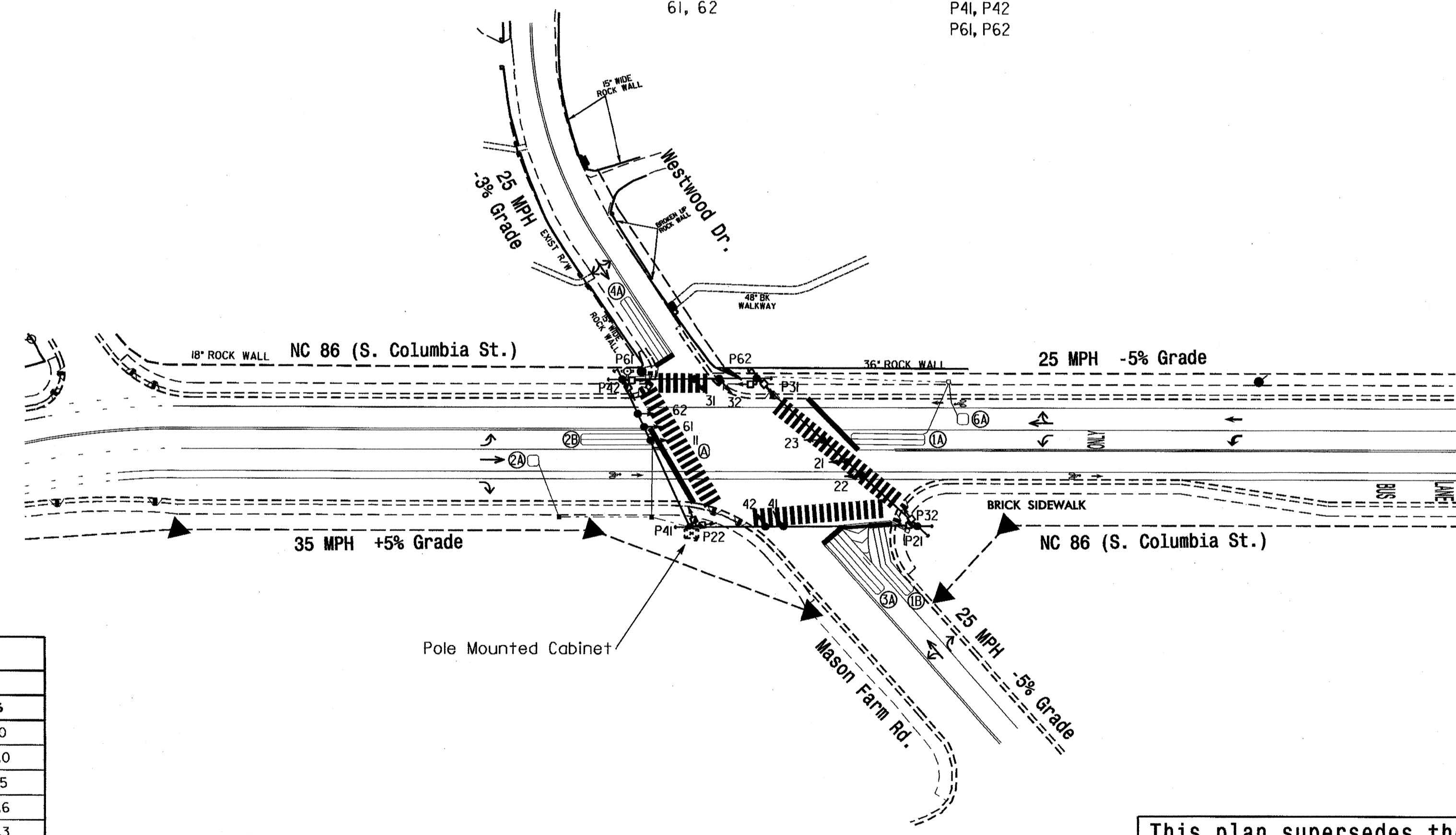
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	70	3	Y	2	Y	Y	-	-	-	-	-
2B	6X40	0	2-4-2	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	-
6A	6X6	70	3	Y	6	Y	Y	-	-	-	-	-

**4 Phase Fully Actuated (Chapel Hill - Carrboro Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Signal P21, P22, P31, P32, P41, P42, P61 and P62 are accessible pedestrian signal heads. See sheet #2 for pedestrian speech messages.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE				
	1	2	3	4	6
Min Green 1*	7	10	7	7	10
Extension 1*	2.0	3.0	2.0	2.0	3.0
Max Green 1*	15	45	30	30	45
Yellow Clearance	3.1	3.6	3.5	3.3	3.6
Red Clearance	1.8	23	2.9	3.0	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	4	4	4	4
Don't Walk 1	-	21	23	18	7
Seconds Per Actuation*	-	-	-	-	-
Max Variable Initial*	-	-	-	-	-
Time Before Reduction*	-	-	-	-	-
Time To Reduce*	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

**LEGEND**

- |  |   |  |   |
|--|---|--|---|
|  | PROPOSED Traffic Signal Head            |  | EXISTING Traffic Signal Head            |
|  | PROPOSED Modified Signal Head           |  | EXISTING N/A                            |
|  | PROPOSED Pedestrian Signal Head         |  | EXISTING N/A                            |
|  | PROPOSED Modified Pedestrian Head       |  | EXISTING N/A                            |
|  | PROPOSED Signal Pole with Guy           |  | EXISTING N/A                            |
|  | PROPOSED Signal Pole with Sidewalk Guy  |  | EXISTING N/A                            |
|  | PROPOSED Inductive Loop Detector        |  | EXISTING Inductive Loop Detector        |
|  | PROPOSED Junction Box                   |  | EXISTING Junction Box                   |
|  | PROPOSED 2-in Underground Conduit       |  | EXISTING 2-in Underground Conduit       |
|  | PROPOSED Right of Way                   |  | EXISTING Right of Way                   |
|  | PROPOSED Directional Arrow              |  | EXISTING Directional Arrow              |
|  | PROPOSED Left Arrow "ONLY" Sign (R3-5L) |  | EXISTING Left Arrow "ONLY" Sign (R3-5L) |

This plan supersedes the plan signed and sealed on 4/9/09.

**Signal Upgrade - Final Design (Sheet 1 of 2)**

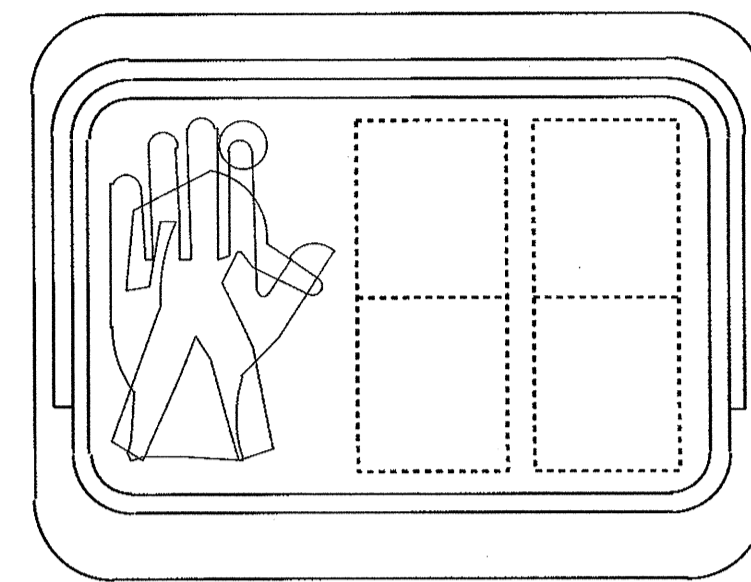
	<p>NC 86 (S. Columbia Street) at Mason Farm Rd/ Westwood Drive</p>		<p>SEAL 026486 ROBERT J. ZIEBELL ENGINEER</p>
	<p>Division 7 Orange County Chapel Hill</p>	<p>PLAN DATE: July 2011</p>	
<p>750 N. Greenfield Plaza, Garner, NC 27529</p>	<p>PREPARED BY: Sterling</p>	<p>REVIEWED BY:</p>	<p>DATE: 8/2/11</p>
<p>SCALE: 1"=50'</p>	<p>REVISIONS:</p>	<p>INIT. DATE:</p>	<p>SIGNATURE: [Signature]</p>
<p>SIG. INVENTORY NO. 07-0573</p>			<p>DATE: 8/2/11</p>

02-AUG-2011 18:20  
 0:MT:PP:Projects:U:\0624\Final\Drawings\Signal\0624-Final\07-0573.dgn  
 07-0573.dgn



# Accessible Pedestrian Signal

\*Volume should be set to 5 dB over the ambient noise level



16"

## NOTES

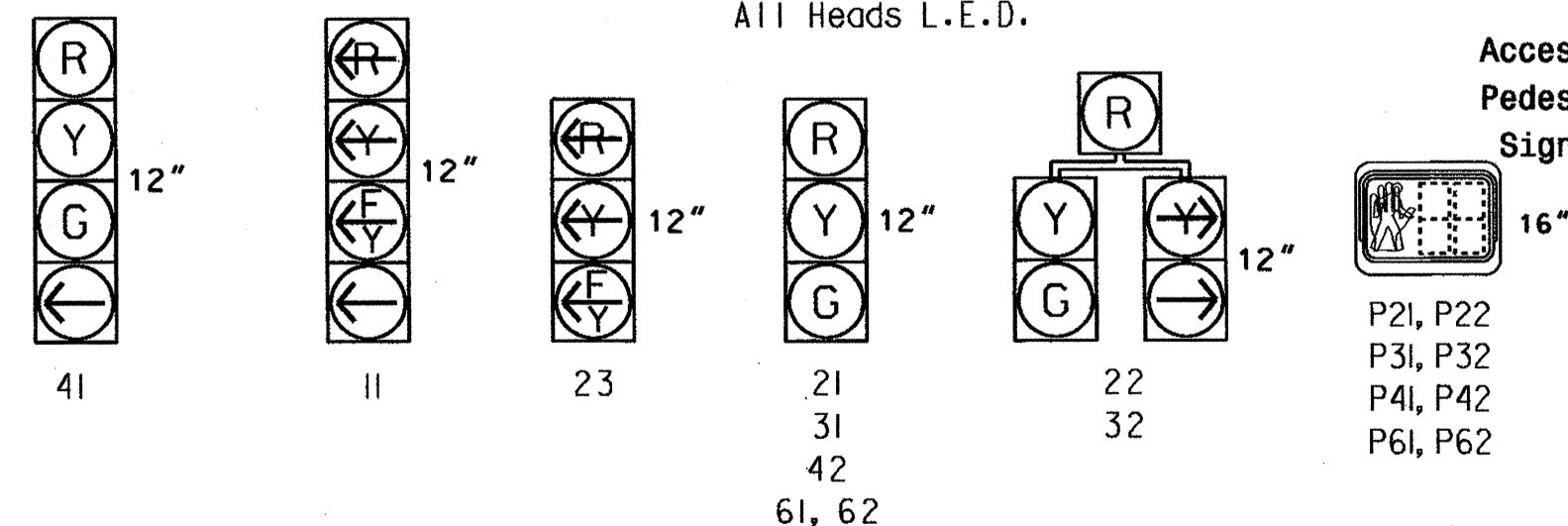
1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Signal P21, P22, P31, P32, P41, P42, P61 and P62 are accessible pedestrian signal heads. See sheet #2 for pedestrian speech messages.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

## ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	INTERVAL	SPEECH MESSAGE
P21, P22	Walk	Mason Farm. Walk sign is on to cross Mason Farm.
	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Mason Farm.
P31, P32	Walk	Columbia. Walk sign is on to cross Columbia.
	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Columbia.
P41, P42	Walk	Columbia. Walk sign is on to cross Columbia.
	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Columbia.
P61, P62	Walk	Westwood. Walk sign is on to cross Westwood.
	Flashing Don't Walk / Don't Walk	Wait. Wait to cross Westwood.

### SIGNAL FACE I.D.

All Heads L.E.D.



This plan supersedes the plan signed and sealed on 4/9/09.

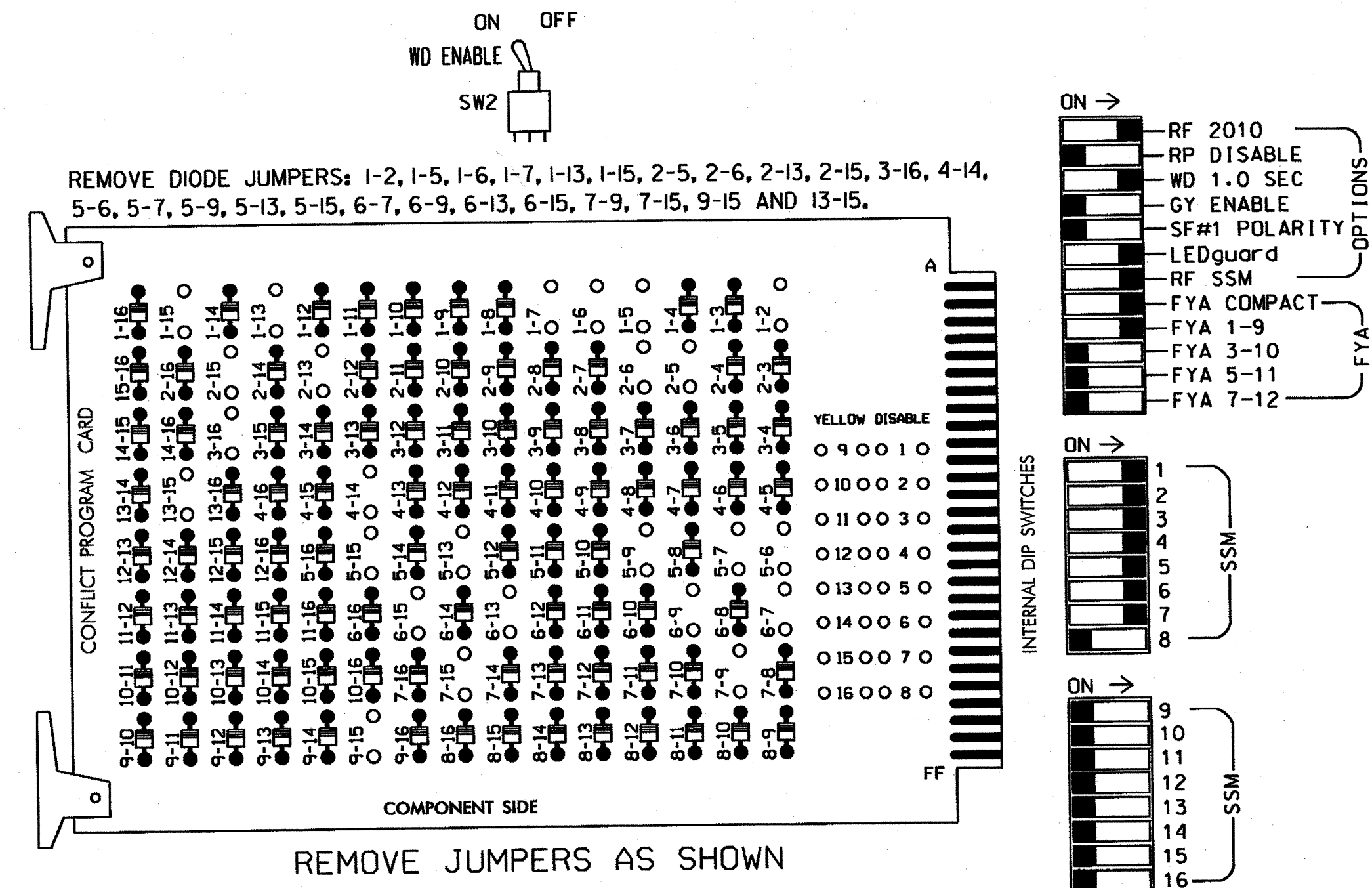
Signal Upgrade - Final Design (Sheet 2 of 2)

	<p>NC 86 (S. Columbia Street) at Mason Farm Road/ Westwood Drive</p>		<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEEMBA</p>
	<p>Division 7 Orange County Chapel Hill</p>		<p>8/2/11</p>
	<p>PLAN DATE: July 2011</p>	<p>REVIEWED BY:</p>	
<p>PREPARED BY: Sterling</p>		<p>REVIEWED BY:</p>	
<p>SCALE: NA</p>		<p>REVISIONS</p>	
<p>0 NA</p>		<p>DATE</p>	
<p>NA</p>		<p>SIGNATURE</p>	
		<p>SIG. INVENTORY NO. 07-0573</p>	

### EDI MODEL 2010ECL-NC CONFLICT MONITOR

#### PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS: 1-2, 1-5, 1-6, 1-7, 1-13, 1-15, 2-5, 2-6, 2-13, 2-15, 3-16, 4-14, 5-6, 5-7, 5-9, 5-13, 5-15, 6-7, 6-9, 6-13, 6-15, 7-9, 7-15, 9-15 AND 13-15.

REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.
- Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.

■ = DENOTES POSITION OF SWITCH

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 8,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2, 3, 4 and 6 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Chapel Hill - Caroboro Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070L  
 CABINET.....336  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....POLE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P,S7,S8P.  
 PHASES USED.....1,2,3,4,6,2 PED,4 PED,6 PED,3 PED.  
 OVERLAP "A".....1+2+6  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....6  
 OVERLAP "D".....NOT USED  
 OVERLAP "E".....1

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P			
PHASE	1	2	2 PED 1 ORN	3	4	4 PED	5	6	6 PED	8	8 PED	3 PED			
SIGNAL HEAD NO.	OLA	21,22	P21,P22 11	22	31	32	41	42	P41, P42	23	61,62	P61, P62	32	NU	P31, P32
RED		128		116	116	101	101			134		*			
YELLOW		129		117	117	102	102			135					
GREEN		130		118	118	103	103			136					
RED ARROW	125									131					
YELLOW ARROW	126			117						132			123		
FLASHING YELLOW ARROW	127									133					
GREEN ARROW		114	118	118	103					104			119		110
		115								106			121		112

NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 \* See pictorial of head wiring in detail below.  
 NOTE: Load Switches S1, S2P, S5 require output remapping. See sheets 3 and 4 of this electrical detail for instructions.

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 3	∅ 4	S	∅ 4	S	S	S	S	S	∅ 2 PED	∅ 6 PED	FS
L	1A	2A	3A	4A	NOT USED	6A	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
	WIRED INPUT	∅ 2	∅ 1	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
		2B	1B											ST

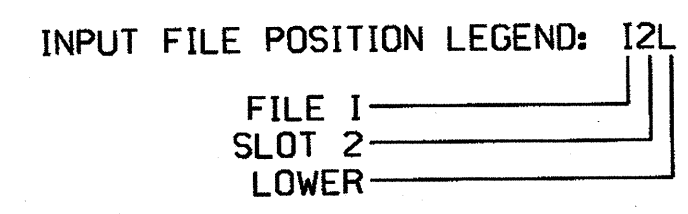
EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 \* Wired Input - turn off Channel 2.

### 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 <sup>1</sup>	TB21-1,2	I1U	56	18	1	1	Y	Y			15
		I1L	47	9	22	6	Y	Y			
2A	TB21-3,4	I2U	39	1	2	2	Y	Y			
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
3A	TB21-5,6	I3U	58	20	3	3	Y	Y			3
1B	TB23-5,6	I3L	49	11	24	1	Y	Y			15
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			10
6A	TB21-11,12	I6U	40	2	6	6	Y	Y			

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

<sup>1</sup>Add jumper from I1-F to I1-W. on rear of input file.



### PED YELLOW CONFLICT MONITOR WIRING DETAIL

(make cabinet wiring changes as shown below)

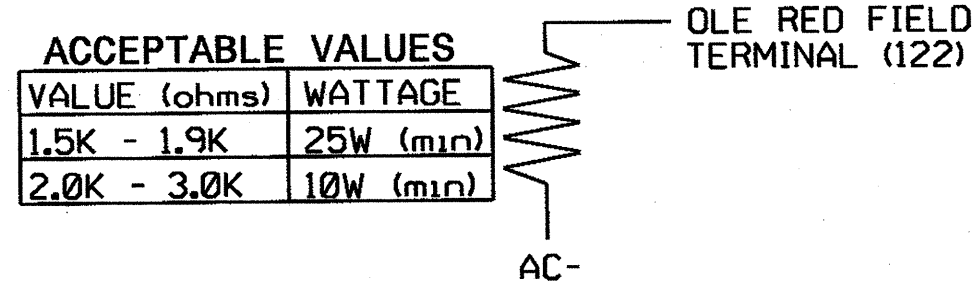
In order to use FYA COMPACT mode on the 2010ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 2 PY (field term. 114) to chan. 9 green (monitor pin 13).

Follow the instructions below to make the appropriate connections:

- STEP 1: Fold down rear panel of output file.  
 STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).  
 STEP 3: Find the conductors that correspond to the following conflict monitor card edge pins and solder wire to the appropriate terminal on the rear of the output file as shown below:  
 CMU-13 ----- 2PY (term. 114)

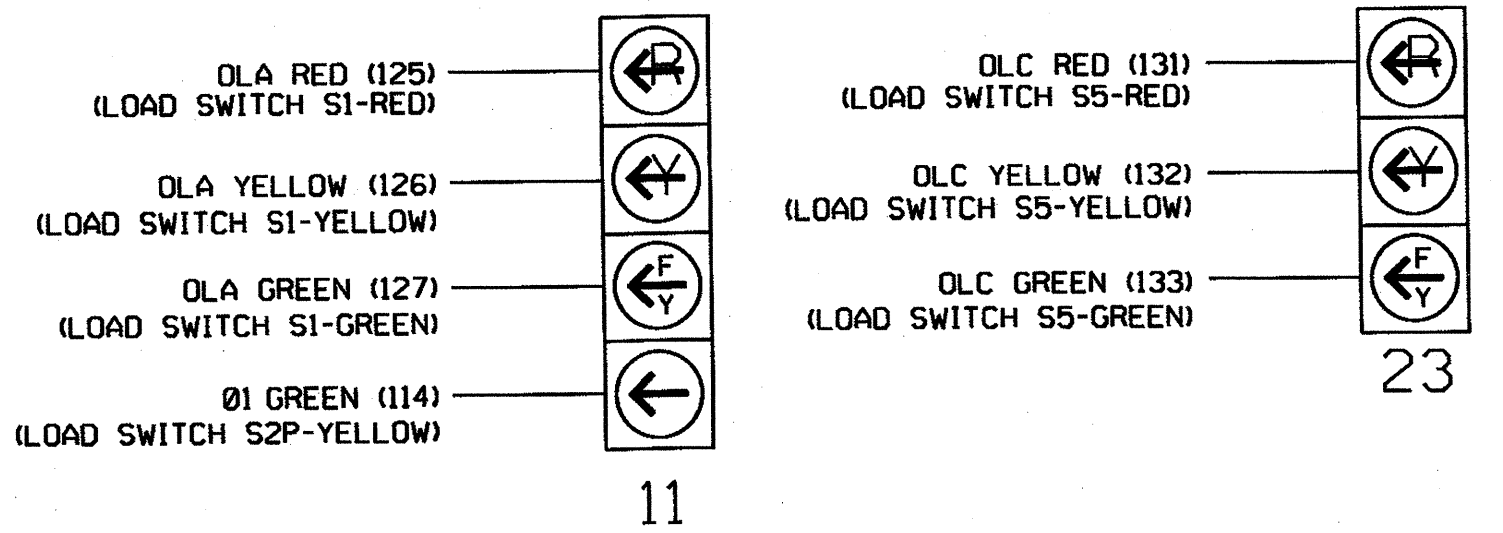
NOTE: Some cabinet manufacturers use a molex plug to accomplish this wiring configuration. If connectors are used, simply plug the two connectors together that are labeled with the pin-out as shown above.

### LOAD RESISTOR INSTALLATION DETAIL



### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



**NOTE**

- The sequence display for this signal requires special logic and output remapping. See sheet 2 of 4 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573  
 DESIGNED: July 2011  
 SEALED: 8-02-11  
 REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

ELECTRICAL DETAIL SHEET 1 OF 4

Prepared In the Offices of:  
 T. Corporation Mobility and Signal Management Services  
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 86 (S. Columbia Street) at Mason Farm Road/Westwood Drive

Division 7 Orange County Chapel Hill  
 PLAN DATE: July 2011 REVIEWED BY: JPK  
 PREPARED BY: James Peterson REVIEWED BY:  
 REVISIONS INIT. DATE

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, INC. SIGNATURE DATE 8-3-11 SIG. INVENTORY NO. 07-0573



**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 #1 IS ON  
 AND RED CLEAR ON PHASE #1 IS ON

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

SCROLL DOWN

THEN:  
 SET OUTPUT ASSIGNMENT #14 ON  
 SET OUTPUT ASSIGNMENT #15 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
 SET OUTPUT ASSIGNMENT #16 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
 SET OUTPUT ASSIGNMENT #15 ON

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE**

OUTPUT 14 = Overlap A Red  
 OUTPUT 15 = Overlap A Yellow  
 OUTPUT 16 = Overlap A Green

**OVERLAP PROGRAMMING DETAIL**

(program controller as shown below)

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

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS  
 PHASE: 12345678910111213141516  
 VEH OVL PARENTS: XX X  
 VEH OVL NOT VEH: :  
 VEH OVL NOT PED: :  
 VEH OVL GRN EXT: :  
 STARTUP COLOR: - RED - YELLOW - GREEN  
 FLASH COLORS: - RED - YELLOW X GREEN

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS  
 PHASE: 12345678910111213141516  
 VEH OVL PARENTS: X  
 VEH OVL NOT VEH: :  
 VEH OVL NOT PED: :  
 VEH OVL GRN EXT: :  
 STARTUP COLOR: - RED - YELLOW - GREEN  
 FLASH COLORS: - RED - YELLOW X GREEN

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'E' SETTINGS  
 PHASE: 12345678910111213141516  
 VEH OVL PARENTS: X  
 VEH OVL NOT VEH: :  
 VEH OVL NOT PED: :  
 VEH OVL GRN EXT: :  
 STARTUP COLOR: - RED - YELLOW - GREEN  
 FLASH COLORS: - RED - YELLOW - 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)...7

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR  
 THE SIGNAL DESIGN: 07-0573  
 DESIGNED: July 2011  
 SEALED: 8-02-11  
 REVISED: N/A

This Electrical Detail supersedes  
 the detail sealed on 4/15/09.

**PED 3 PROGRAMMING DETAIL**

(program controller as shown below)

**CHANGING OUTPUT ASSIGNMENTS**

1. FROM MAIN MENU SELECT '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS)
2. ENTER 17 (PHASE 8 DW) FOR OUTPUT ASSIGNMENT #.
3. SCROLL DOWN TO 'PEDESTRIAN PHASE' AND ENTER 'Y' **REGARDLESS OF DEFAULT PROGRAMMING!**
4. ENTER '3' FOR 'SELECT PEDESTRIAN PHASE'. NO CHANGE NEEDED FOR 'SELECT COLOR'
5. BACKUP TO 'OUTPUT ASSIGNMENTS AND SETTINGS MENU:' BY PRESSING THE 'ESC' BUTTON ON KEYBOARD.
6. SELECT '1' (OUTPUT ASSIGNMENTS)
7. ENTER 18 (PHASE 8 W) FOR OUTPUT ASSIGNMENT #.
8. REPEAT STEPS # 3 AND # 4.

**CHANGING INPUT ASSIGNMENTS**

1. FROM MAIN MENU SELECT '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS)
2. CYCLE TO PED DETECTOR #8 BY REPEATEDLY DEPRESSING '+' KEY
3. MODIFY PHASE ASSIGNED TO PED DETECTOR # 8 FROM PHASE 8 TO PHASE 3

PROGRAMMING COMPLETE

**ACCESSIBLE PEDESTRIAN SIGNAL (APS)  
 INSTALLATION NOTES**

1. Provide a dedicated pair of wires from the cabinet to each push button.
2. Mount Fail-Safe Interconnect Terminal Board on right rear side of cabinet (above service panel).
3. Wire push buttons and Central Control Unit (CCU) per Polara Installation Manual instructions.
4. Use Controller Receptacle to power CCU. Do not use Equipment Receptacle which is a GFCI outlet.
5. Never attempt to operate a standard contact closure push button with the Polara system unless cabinet is re-wired for standard button operation.

ELECTRICAL DETAIL SHEET 2 OF 4

ELECTRICAL AND PROGRAMMING DETAILS FOR: NC 86 (S. Columbia Street) at Mason Farm Road/Westwood Drive

Division 7 Orange County Chapel Hill

PLAN DATE: July 2011 REVIEWED BY: JTK

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

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

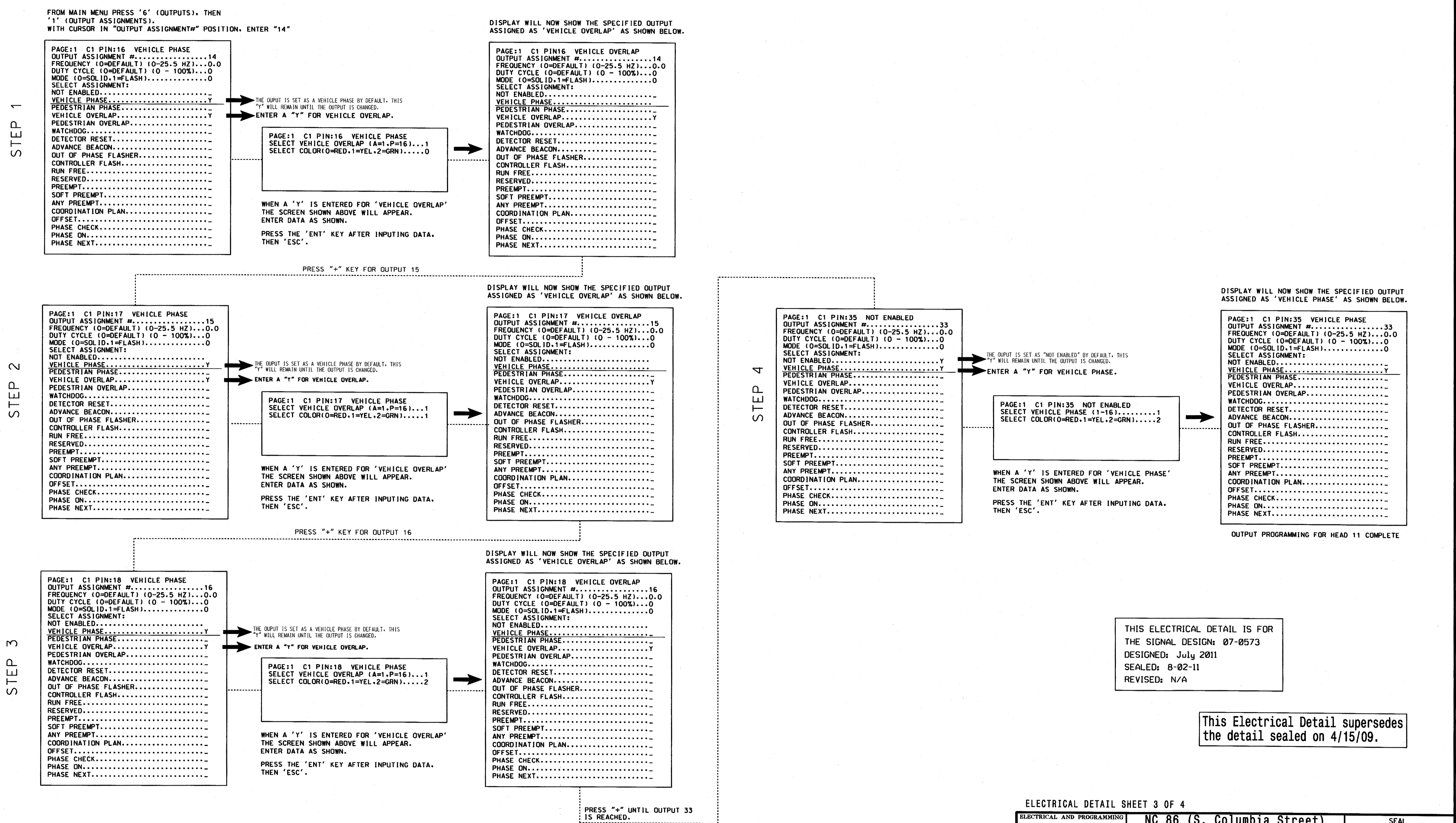
SIGNATURE: [Signature] DATE: 8-3-11

SIG. INVENTORY NO. 07-0573

03-AUG-2011 09:11 5:41:58AM ITS Signal @wncrgroup@sigsig.com Peterson, JTK

**FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL  
FOR SIGNAL HEAD 11**

(program controller as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0573  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

ELECTRICAL DETAIL SHEET 3 OF 4

	NC 86 (S. Columbia Street) at Mason Farm Road/ Westwood Drive		SEAL 	
	Division 7 Prepared by: James Peterson	Orange County Reviewed by: JTR		Chapel Hill Date: July 2011
	Revisions:	Date:		Signature:
	Date:	Date:		Date:

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 07-0573

03-AUG-2011 09:12  
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J.Peterson



# FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 23

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN  
'1' (OUTPUT ASSIGNMENTS).  
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

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

STEP 1

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...0
    
```

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

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

```

PAGE:1 C1 PIN32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 31

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

STEP 2

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...1
    
```

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

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

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 32

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

STEP 3

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
    
```

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

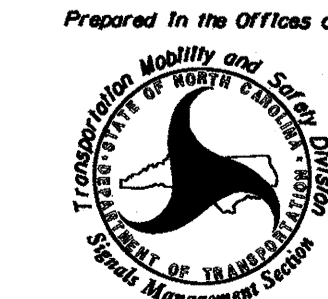
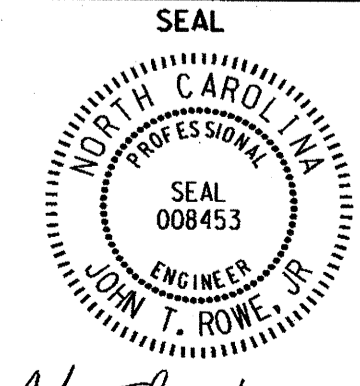

PRESS THE 'ENT' KEY AFTER INPUTING DATA,  
THEN 'ESC'.

```

PAGE:1 C1 PIN:34 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 07-0573  
DESIGNED: July 2011  
SEALED: 8-02-11  
REVISED: N/A

This Electrical Detail supersedes  
the detail sealed on 4/15/09.

ELECTRICAL DETAIL SHEET 4 OF 4										
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>NC 86 (S. Columbia Street)</b> at <b>Mason Farm Road/ Westwood Drive</b>  Division 7      Orange County      Chapel Hill PLAN DATE: July 2011      REVIEWED BY: JTK PREPARED BY: James Peterson      REVIEWED BY:	SEAL  SEAL 008453 ENGINEER JOSEPH T. ROWE, JR. SIGNATURE      DATE  8-3-11 DATE								
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REVISIONS	INIT.	DATE								
SIC INVENTORY NO. 07-0573										

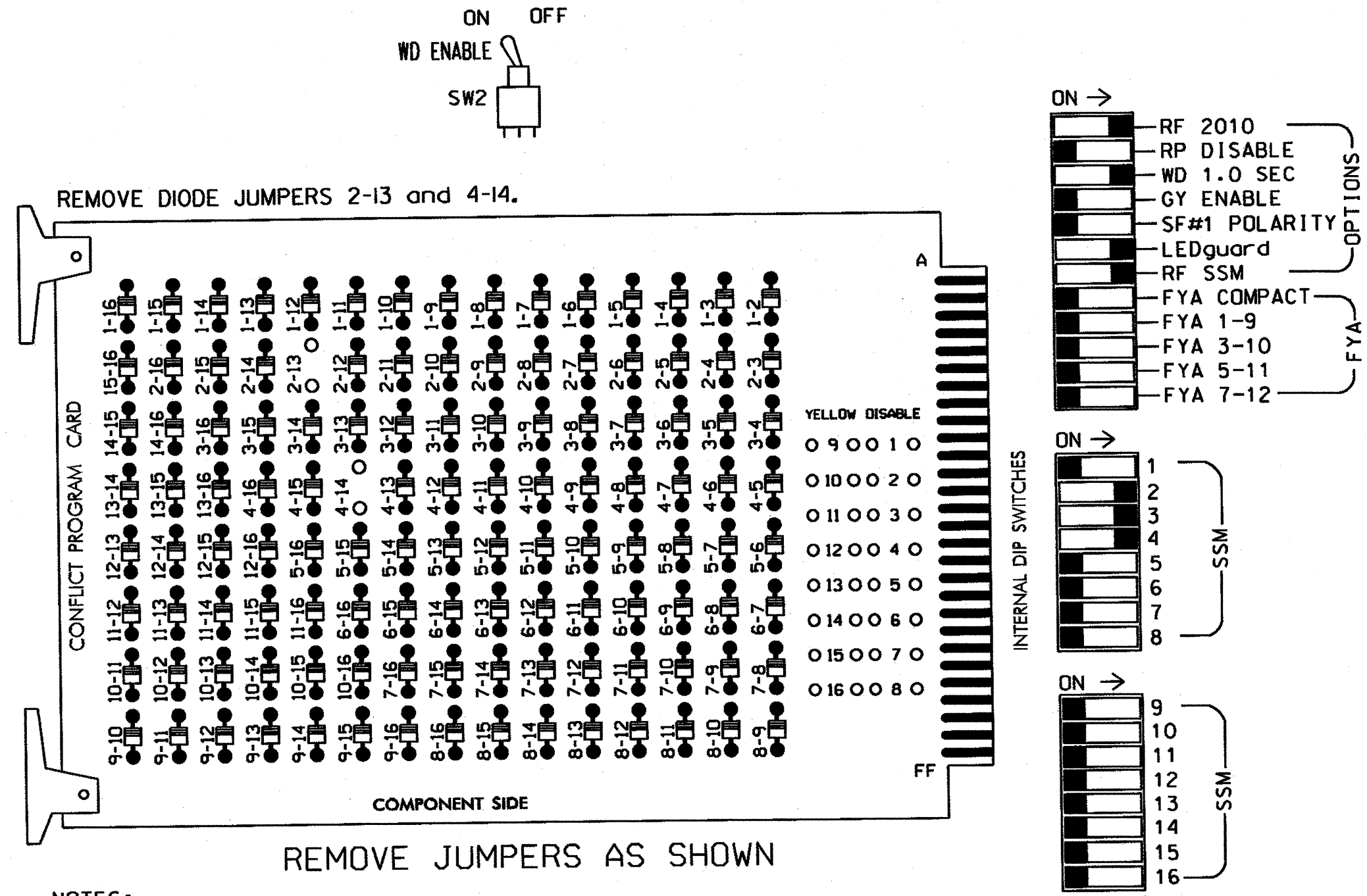
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J.Peterson





**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. 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 1,5,6, 7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phase 2, 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 4 for 'STARTUP PED CALL'.
6. Program phase 2 for Yellow Flash.
7. The cabinet and controller are part of the Chapel Hill - Carrboro Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S2P,S3,S4,S4P  
 PHASES USED.....2,3,4,2 PED,4 PED  
 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.	NU	21,22	P21,P22 P23,P24	22	31	32,33	41,42	P41,P42 P43,P44	NU	NU	NU	NU
RED		128			116	101						
YELLOW		129				102						
GREEN		130				103						
RED ARROW					116							
YELLOW ARROW				117	117	117						
GREEN ARROW				118	118	118						
Hand icon			113					104				
Walking person icon			115					106				

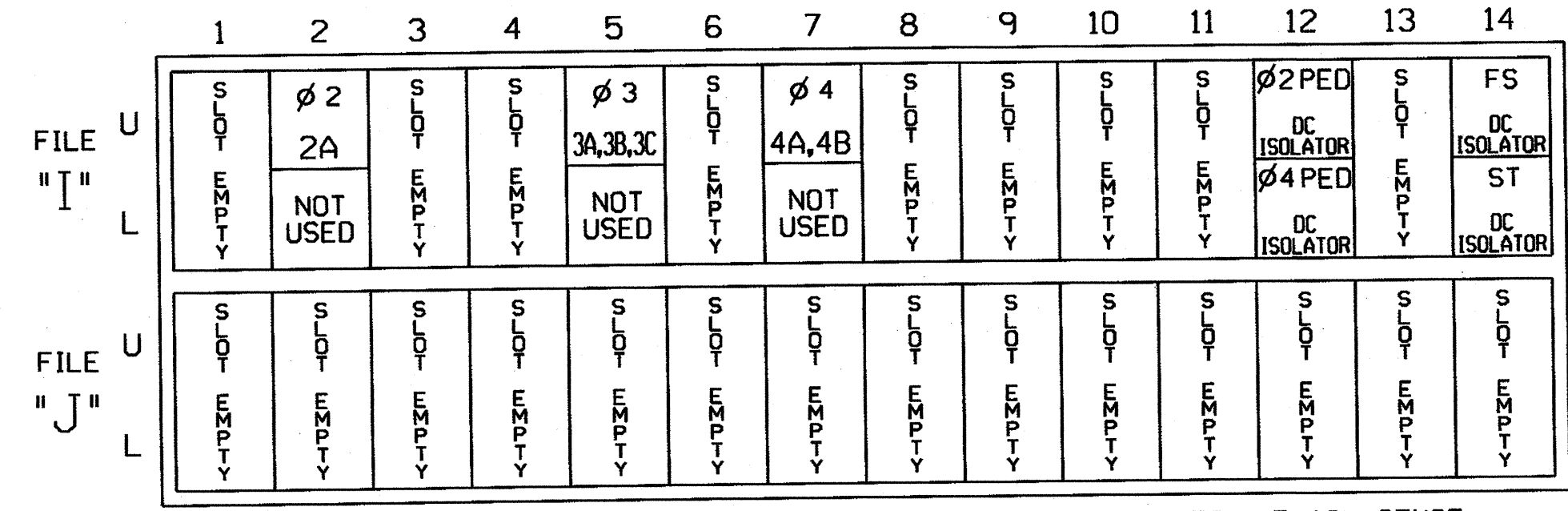
NU = Not Used

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A,3B,3C	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A,4B	TB6-1,2	I7U	65	27	34	4	Y	Y			
PED PUSH BUTTONS											
P21,P22,P23,P24	TB8-4,6	I12U	67	29		PED 2					
P41,P42,P43,P44	TB8-5,6	I12L	69	31		PED 4					

NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOT 112.

INPUT FILE POSITION LEGEND: J2L  
 FILE J  
 SLOT 2  
 LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0520T1  
 DESIGNED: July 2011  
 SEALED: 8-01-11  
 REVISED: N/A

Signal Upgrade - Temporary Design 1

Prepared In the Offices of:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529

**NC 86 (S. Columbia Street) at S. Pittsboro Street/ SR 1902 (Manning Drive)**

Division 7 Orange County Chapel Hill

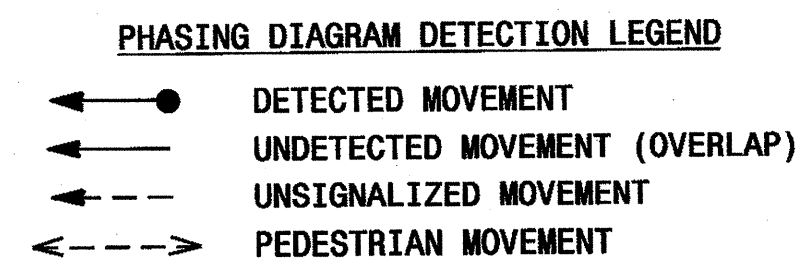
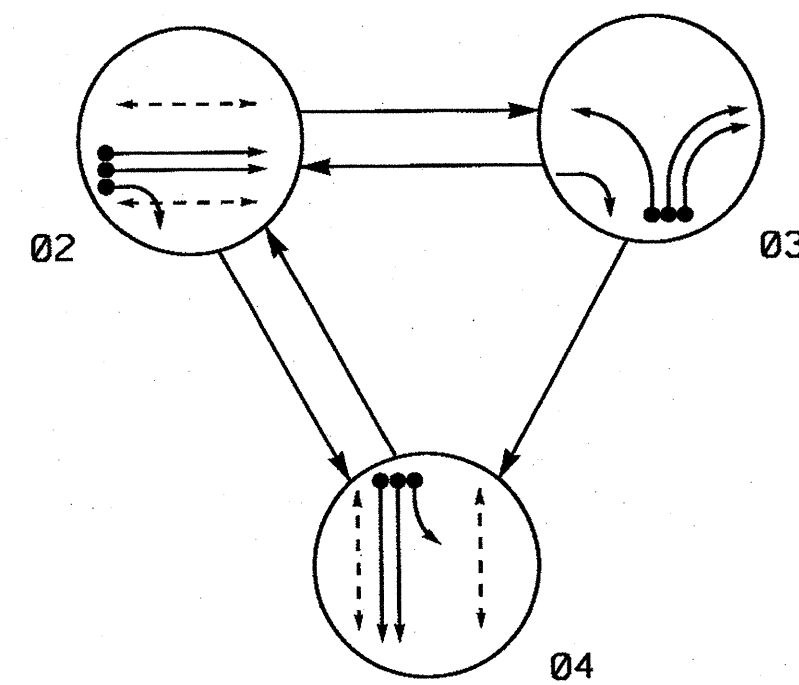
PLAN DATE: July 2011 REVIEWED BY: JTK  
 PREPARED BY: James Peterson REVIEWED BY:

REVISIONS: INIT. DATE

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 008453  
 JAMES T. ROWE, III  
 8-2-11  
 SIGNATURE DATE

SIG. INVENTORY NO. 07-0520T1

**PHASING DIAGRAM**



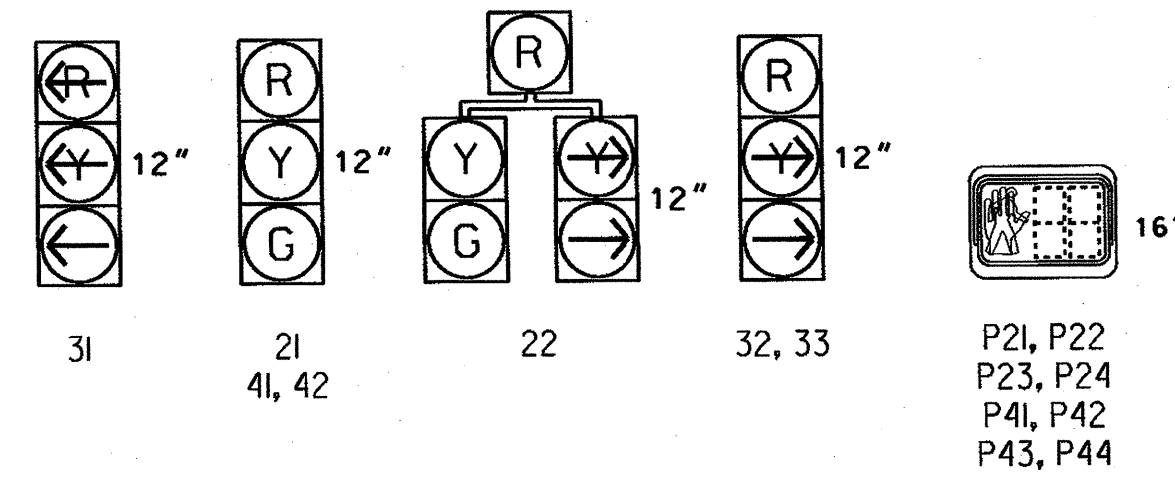
**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	02	03	04	PEDESTRIAN
21	G	R	R	Y
22	G	R	R	Y
31	R	R	R	R
32, 33	R	R	R	R
41, 42	R	R	G	R
P21, P22	W	DW	DW	DRK
P23, P24	W	DW	DW	DRK
P41, P42	DW	DW	W	DRK
P43, P44	DW	DW	W	DRK

W - Walk  
 DW - Don't Walk  
 DRK - Dark

**SIGNAL FACE I.D.**

All Heads L.E.D.



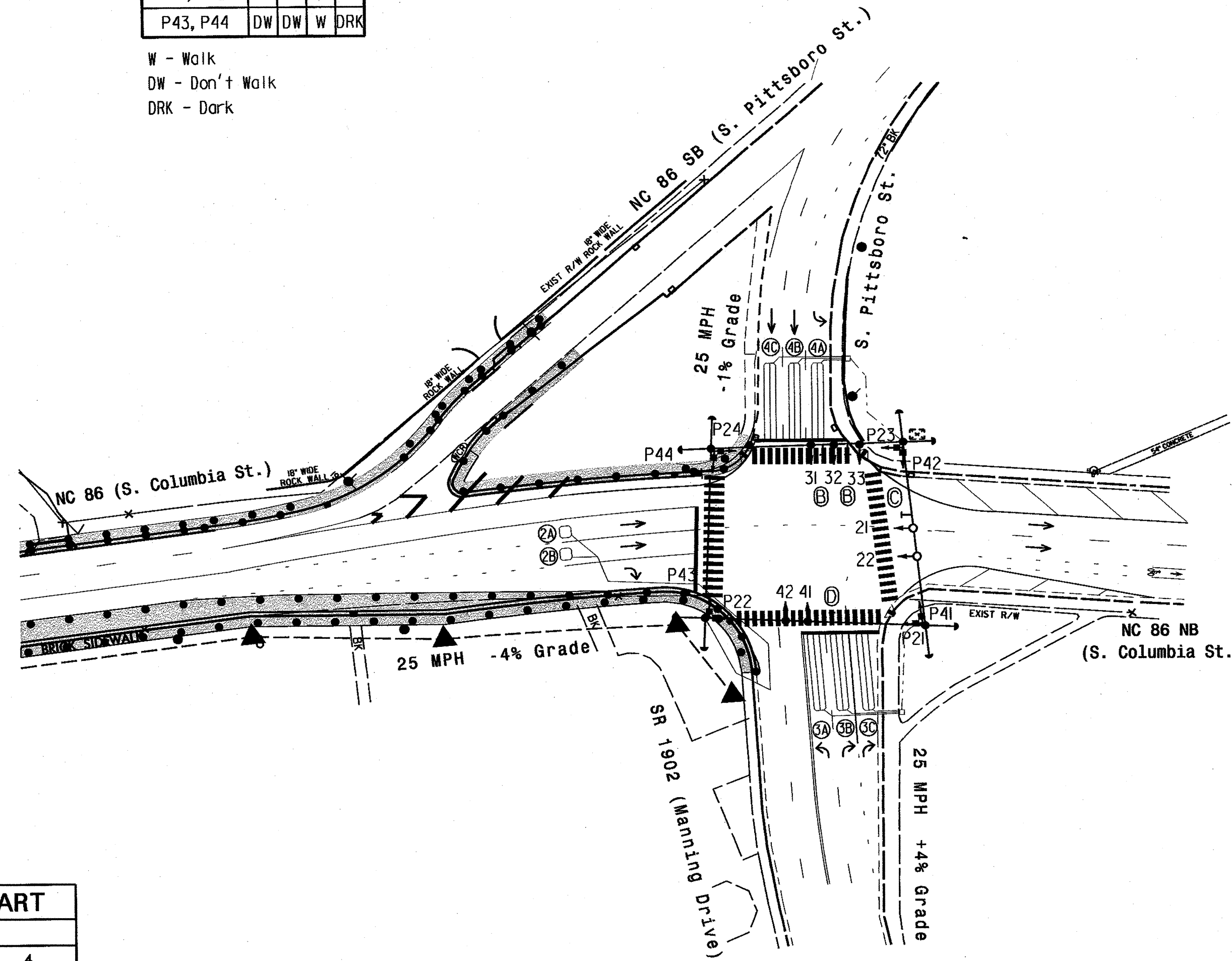
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A, 2B	6X6	70	4	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	-
3C	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y

**3 Phase Fully Actuated (Chapel Hill - Carrboro Signal System)**

**NOTES**

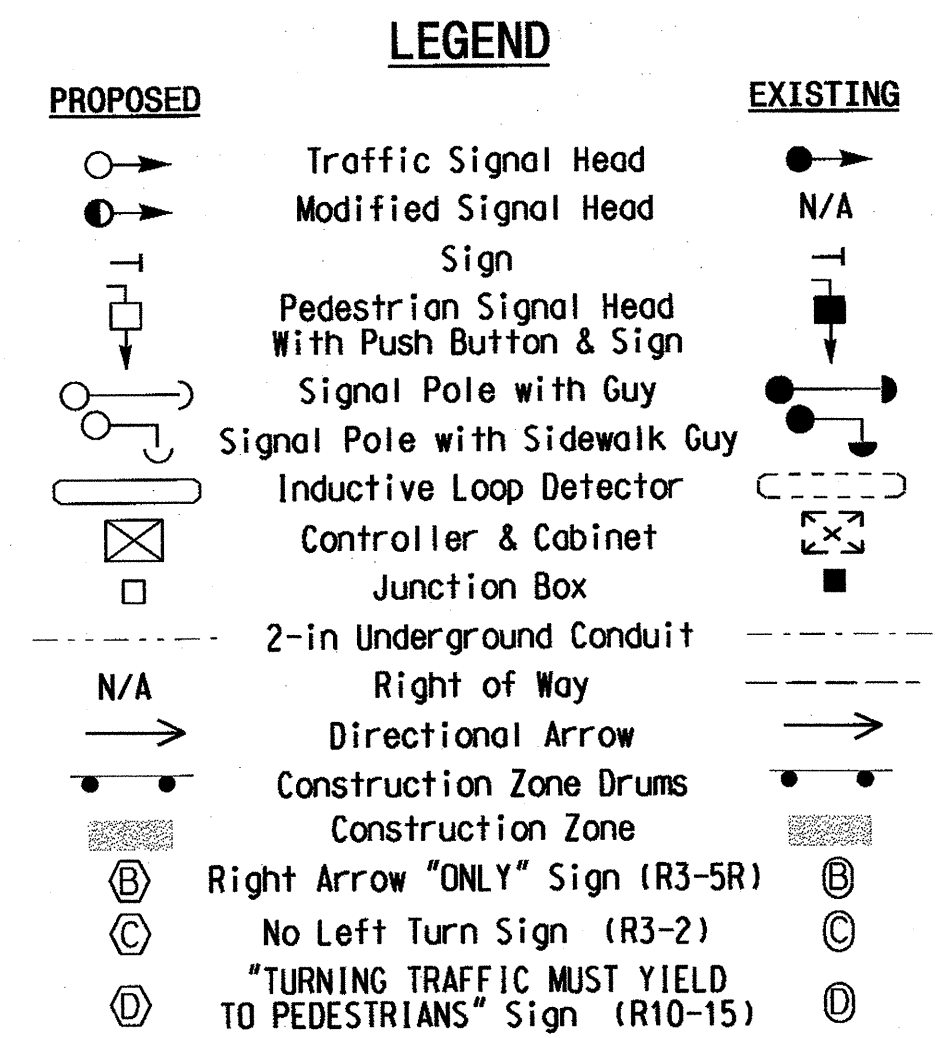
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal timing values supersede these values.
- Pavement markings are existing unless otherwise shown.



**OASIS 2070L TIMING CHART**

FEATURE	PHASE		
	2	3	4
Min Green 1*	10	7	7
Extension 1*	3.0	2.0	2.0
Max Green 1*	30	30	20
Yellow Clearance	3.4	3.0	3.2
Red Clearance	2.6	2.9	2.5
Walk 1*	4	-	4
Don't Walk 1	19	-	19
Seconds Per Actuation*	-	-	-
Max Variable Initial*	-	-	-
Time Before Reduction*	-	-	-
Time To Reduce*	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	-
Vehicle Call Memory	YELLOW	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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



This plan supersedes the Temporary plan signed and sealed on 4/9/09.

Signal Upgrade - Temporary Design 2 (Construction Phase II)

Prepared in the Offices of:  
 Transportation Mobility and Safety Division  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

NC 86 (S. Columbia Street) at S. Pittsboro Street / SR 1902 (Manning Drive)

Division 7 Orange County Chapel Hill

PLAN DATE: March 2009 PREPARED BY: Sterling REVIEWED BY:

REVISIONS: INIT. DATE

SCALE: 1"=50'

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT ZILMERA

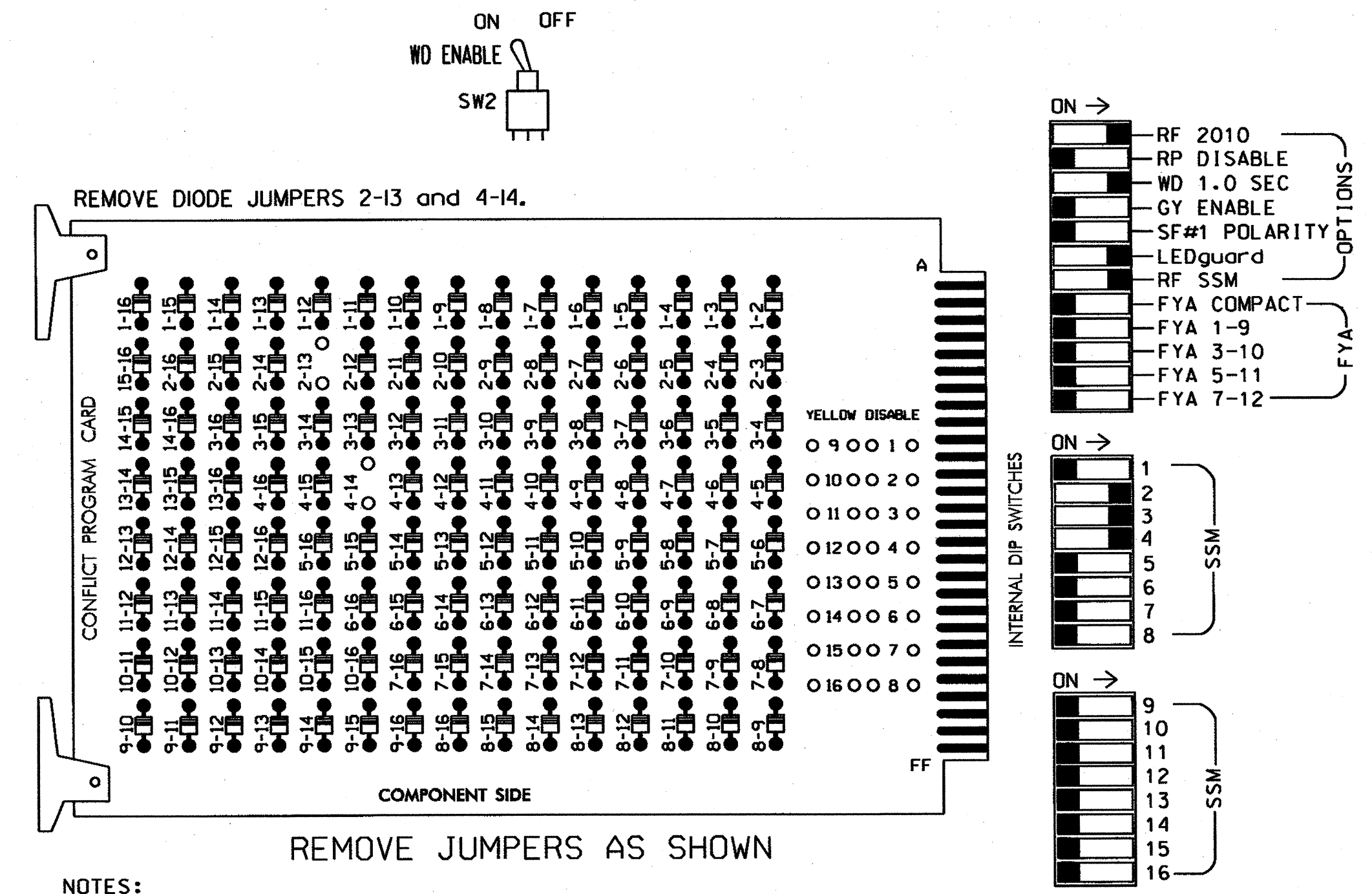
SIGNATURE: DATE: SIG. INVENTORY NO. 07-0520T2

01-AUG-2011 15:57 01-KTTPFO-BC18-JUN0624-MT-offi-cms1gna1e007-0520emps 1and2407-052072\_e1g\_ssn-20110801.dgn



**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



**NOTES:**

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

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 1,5,6,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phase 2, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 4 for 'STARTUP PED CALL'.
- Program phase 2 for Yellow Flash.
- The cabinet and controller are part of the Chapel Hill - Carrboro Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....CONTRACTOR SUPPLIED 207L  
 CABINET.....CONTRACTOR SUPPLIED 332  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S2P,S3,S4,S4P  
 PHASES USED.....2,3,4,2 PED,4 PED  
 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.	NU	21,22	P21,P22 P23,P24	22	31	32,33	41,42	P41,P42 P43,P44	NU	NU	NU	NU
RED		128			116	101						
YELLOW		129				102						
GREEN		130				103						
RED ARROW				116								
YELLOW ARROW			117	117	117							
GREEN ARROW			118	118	118							
Hand			113				104					
Walker			115				106					

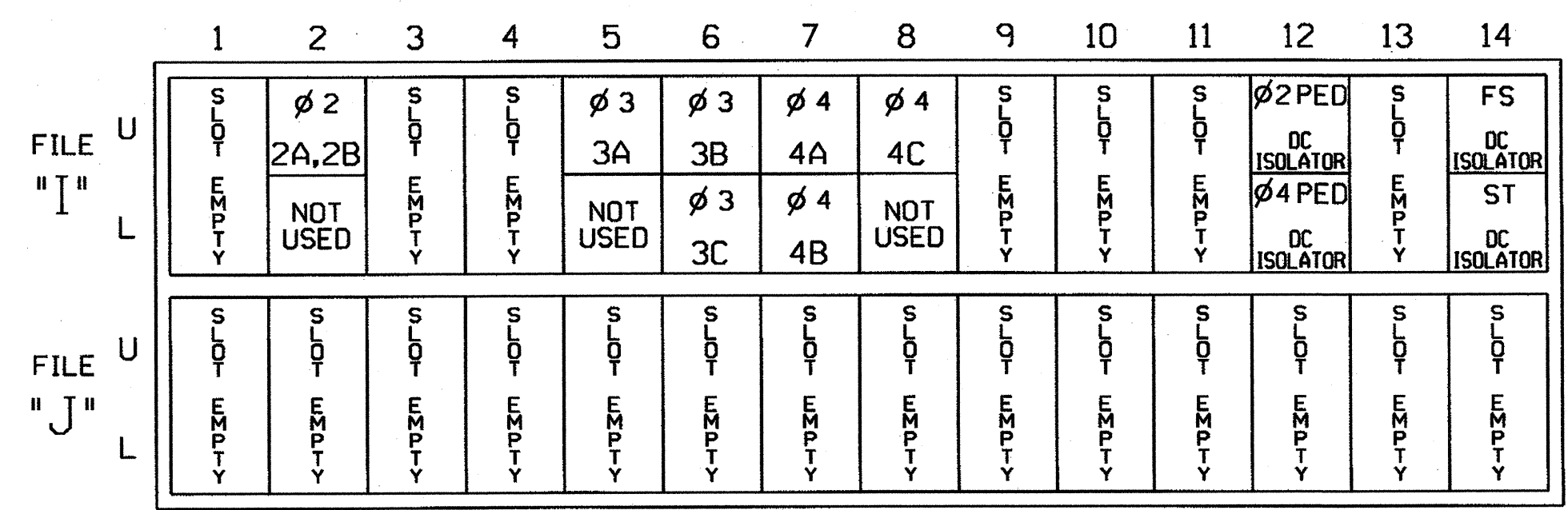
NU = Not Used

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

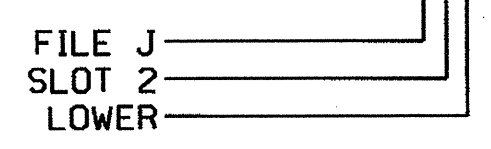
FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			15
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
4C	TB6-5,6	I8U	49	11	24	4	Y	Y			
PED PUSH BUTTONS											
P21,P22,P23,P24	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42,P43,P44	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:  
 INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

**INPUT FILE POSITION LEGEND: J2L**



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0520T2  
 DESIGNED: March 2009  
 SEALED: 8-01-11  
 REVISED: N/A

This Electrical Detail supersedes the detail sealed on 4/15/09.

02-AUG-2011 12:10 3:41:53 PM Signal\work\projects\519\_Matthew\070520\_Sig.19\_201108xx.dgn

Signal Upgrade - Temporary Design 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: **NC 86 (S. Columbia Street) at S. Pittsboro Street/ SR 1902 (Manning Drive)**

Division 7 Orange County Chapel Hill

PLAN DATE: July 2011 REVIEWED BY: JTK

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS: INIT. DATE

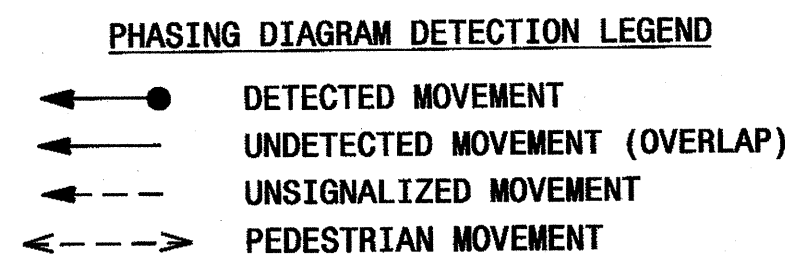
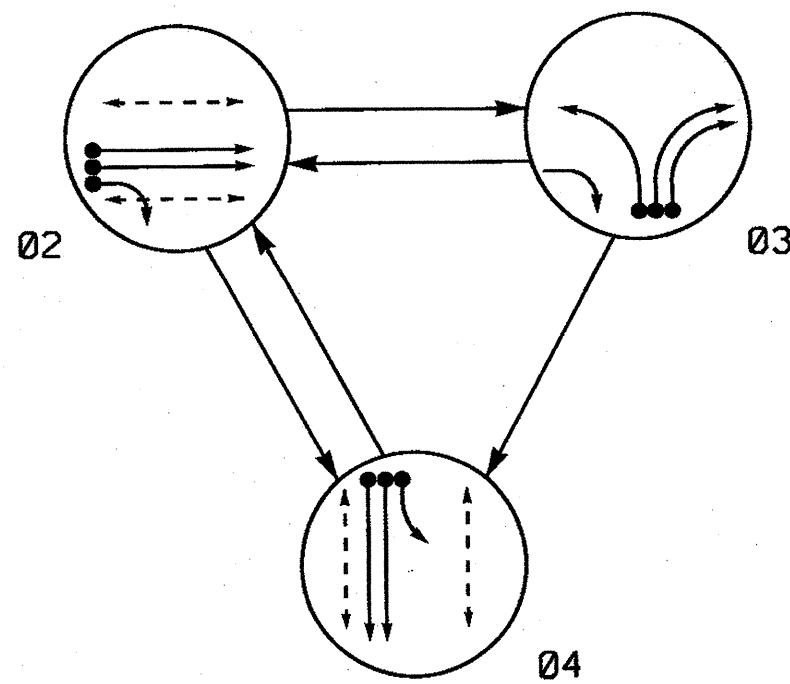
750 N. Greenfield Pkwy, Garner, NC 27529

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

Signature: *John T. Rowe, Jr.* DATE: 8-2-11

SIG. INVENTORY NO. 07-0520T2

**PHASING DIAGRAM**



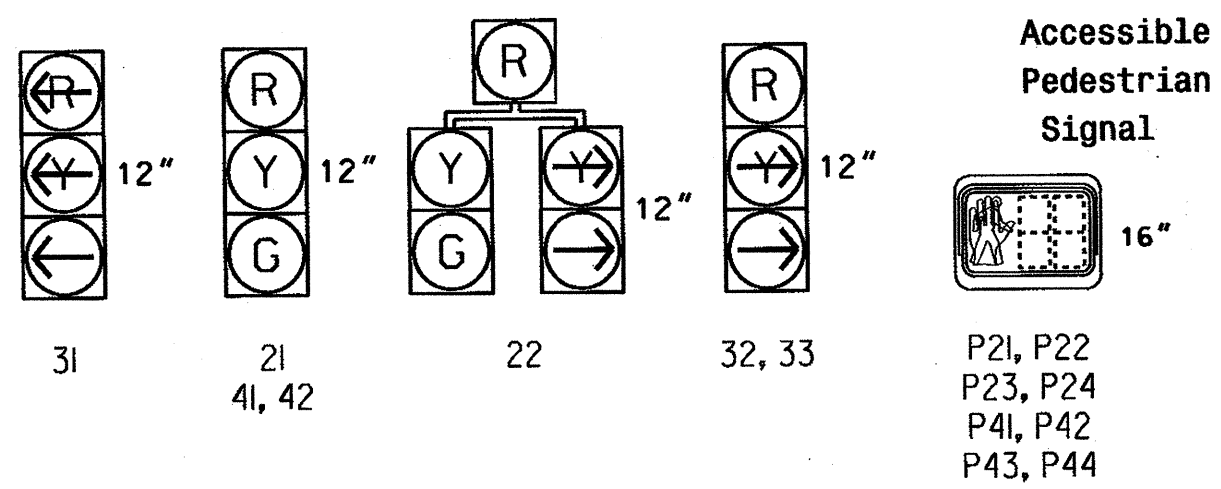
**TABLE OF OPERATION**

SIGNAL FACE	PHASE				HEADS
	02	03	04	F	
21	G	R	R	Y	
22	G	R	R	Y	
31	R	R	R	R	
32, 33	R	R	R	R	
41, 42	R	R	G	R	
P21, P22	W	DW	DW	DRK	
P23, P24	W	DW	DW	DRK	
P41, P42	DW	DW	W	DRK	
P43, P44	DW	DW	W	DRK	

W - Walk  
 DW - Don't Walk  
 DRK - Dark

**SIGNAL FACE I.D.**

All Heads L.E.D.



Accessible Pedestrian Signal  
 16"

P21, P22  
 P23, P24  
 P41, P42  
 P43, P44

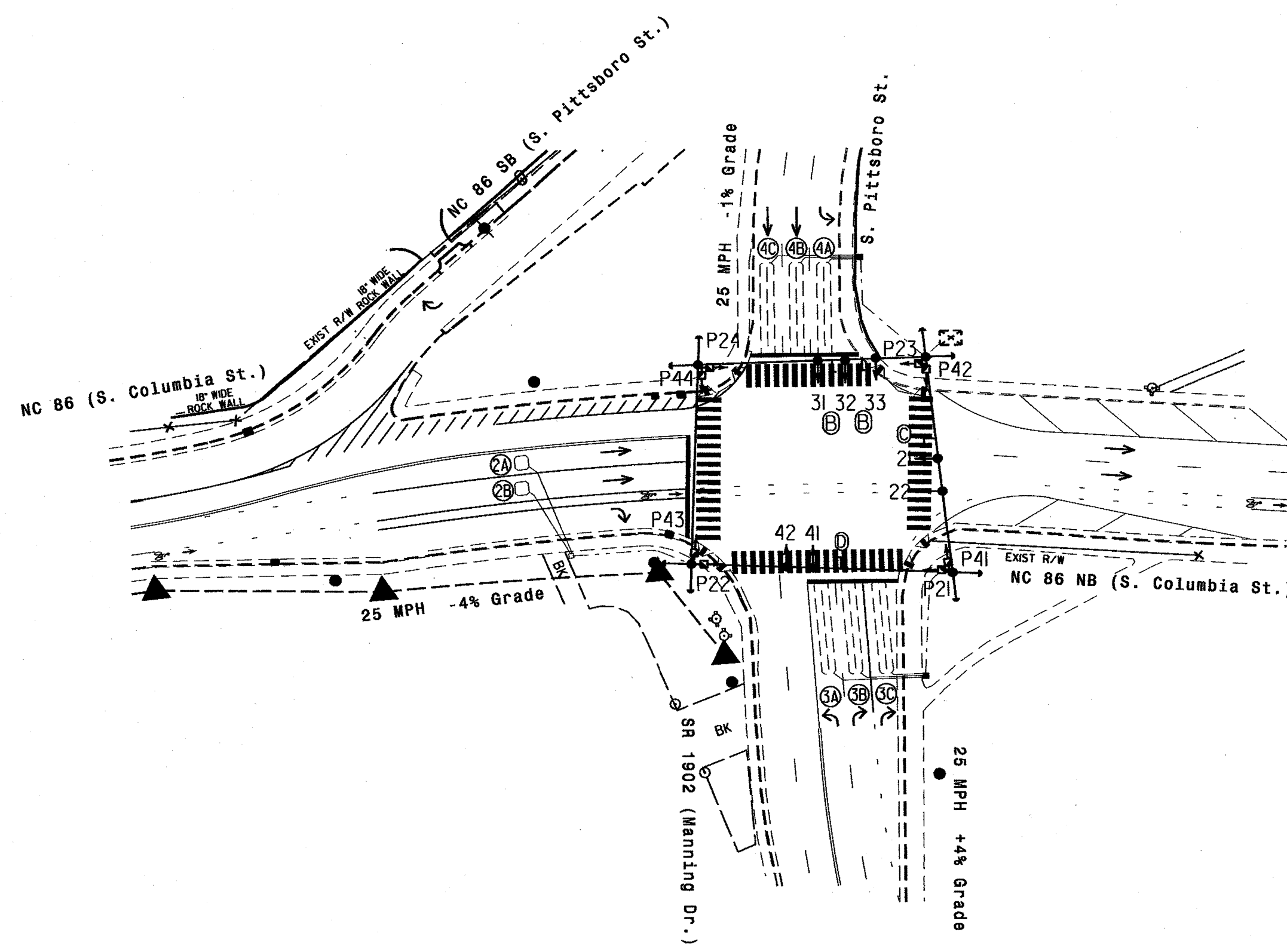
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	SIZE (FT)	INDUCTIVE LOOPS		DETECTOR PROGRAMMING								
		DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	PULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A, 2B	6X6	70	3	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
3C	6X40	0	2-4-2	-	3	Y	Y	-	-	15	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4C	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-

**3 Phase Fully Actuated (Chapel Hill - Carrboro Signal System)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Signal heads P21, P22, P23, P24, P41, P42, P43, and P44 are accessible pedestrian signal heads. See sheet #2 for speech messages.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

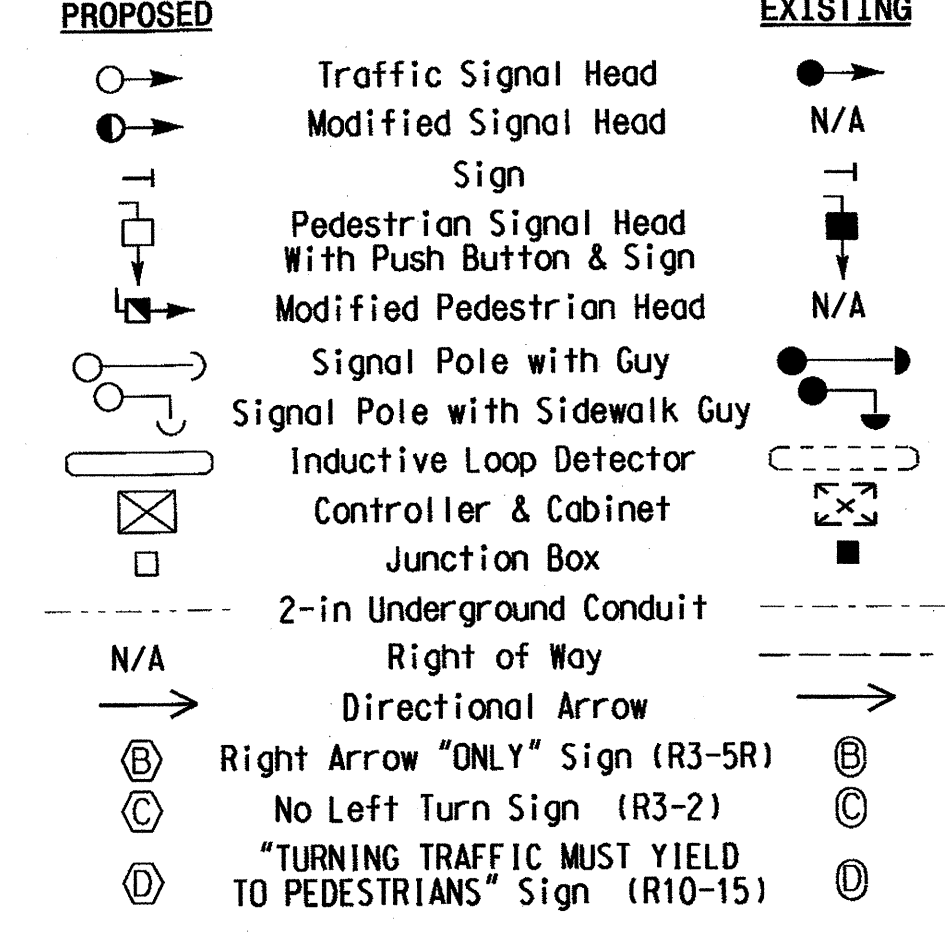


**OASIS 2070L TIMING CHART**

FEATURE	PHASE		
	2	3	4
Min Green 1*	10	7	7
Extension 1*	3.0	2.0	2.0
Max Green 1*	30	15	30
Yellow Clearance	3.4	3.0	3.2
Red Clearance	2.8	2.9	2.5
Walk 1*	4	-	4
Don't Walk 1	19	-	16
Seconds Per Actuation*	-	-	-
Max Variable Initial*	-	-	-
Time Before Reduction*	-	-	-
Time To Reduce*	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	-
Vehicle Call Memory	YELLOW	-	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

**LEGEND**



This plan supersedes the plan signed and sealed on 4/9/09.

Signal Upgrade - Final Design (Sheet 1 of 2)

	NC 86 (S. Columbia Street) at S. Pittsboro Street/ SR 1902 (Manning Drive)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEMBA
	Division 7 Orange County Chapel Hill PLAN DATE: July 2011 PREPARED BY: Sterling	REVIEWED BY: REVIEWED BY:	

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 1"=50'

SIG. INVENTORY NO. 07-0520

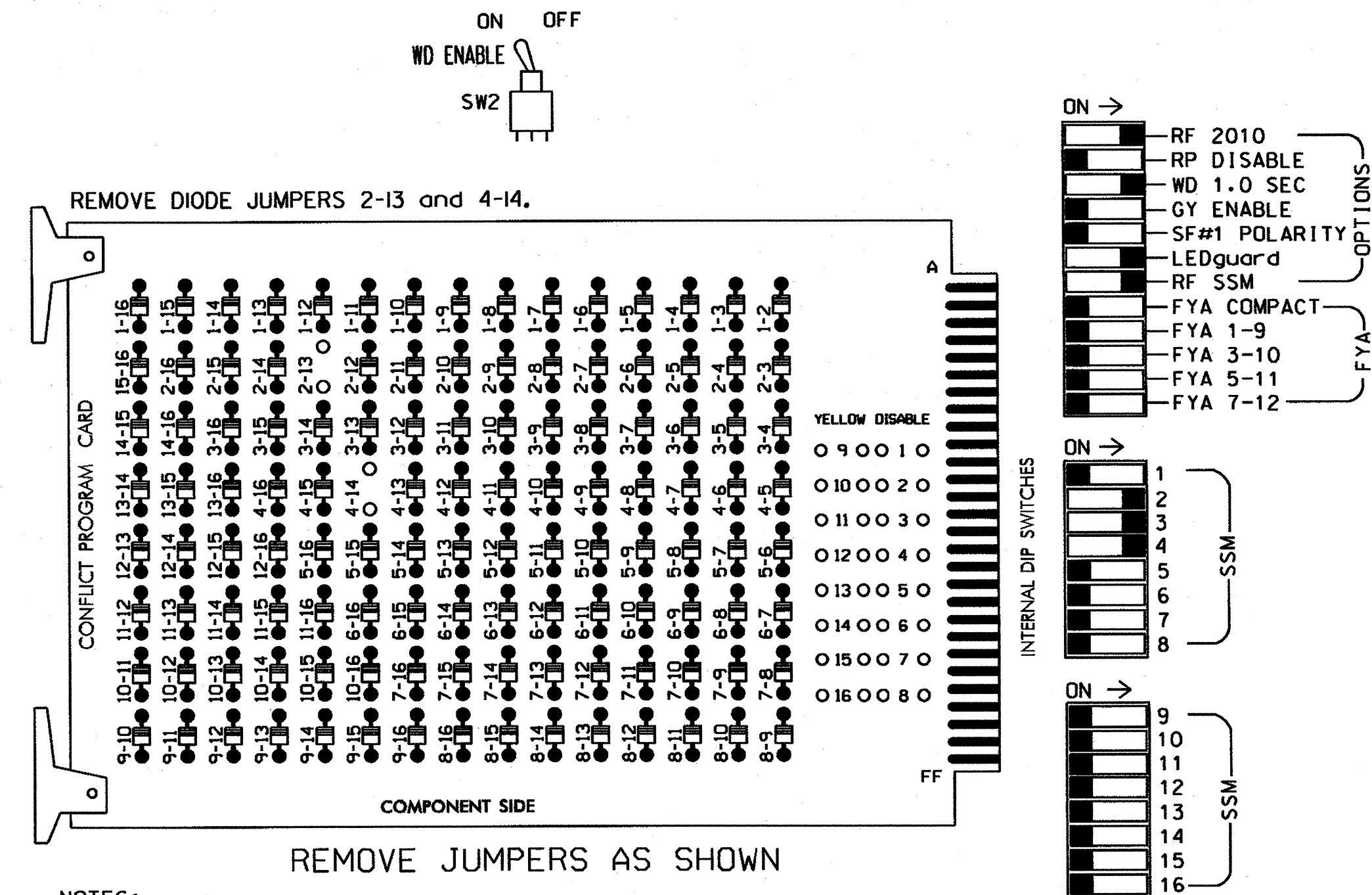
01-AUG-2011 16:12:21  
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 22 10:00





**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 1,5,6,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phase 2, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 4 for 'STARTUP PED CALL'.
- Program phase 2 for Yellow Flash.
- The cabinet and controller are part of the Chapel Hill - Carrboro Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S2P,S3,S4,S4P  
 PHASES USED.....2,3,4,2 PED,4 PED  
 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.	NU	21,22	P21,P22 P23,P24	22	31	32,33	41,42	P41,P42 P43,P44	NU	NU	NU	NU
RED		128			116	101						
YELLOW		129				102						
GREEN		130				103						
RED ARROW					116							
YELLOW ARROW				117	117	117						
GREEN ARROW				118	118	118						
Hand			113					104				
Person			115					106				

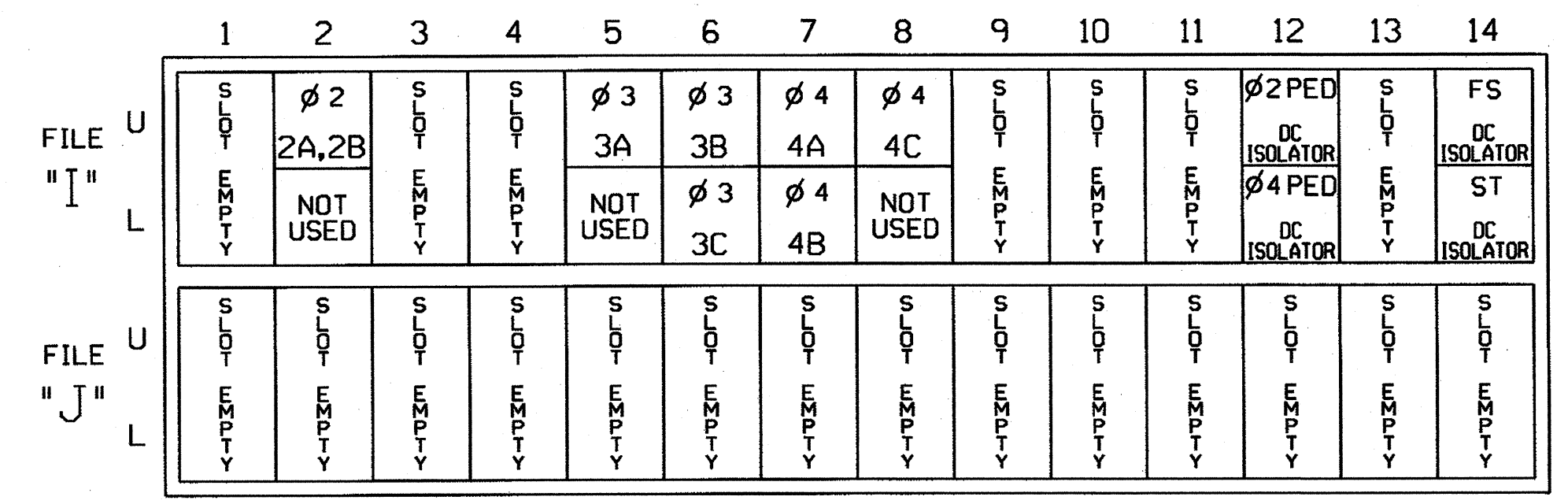
NU = Not Used

**COUNTDOWN PEDESTRIAN SIGNAL OPERATION**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

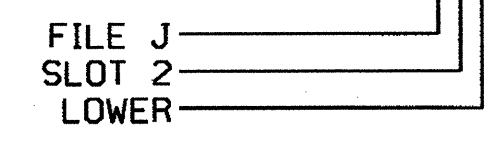
FS = FLASH SENSE  
ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			15
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
4C	TB6-5,6	I8U	49	11	24	4	Y	Y			
PED PUSH BUTTONS											
P21,P22,P23,P24	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42,P43,P44	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:  
INSTALL DC ISOLATORS IN INPUT FILE SLOT 112.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0520  
 DESIGNED: July 2011  
 SEALED: 8-01-11  
 REVISED: N/A

**ACCESSIBLE PEDESTRIAN SIGNAL (APS) INSTALLATION NOTES**

- Provide a dedicated pair of wires from the cabinet to each push button.
- Mount Fail-Safe Interconnect Terminal Board on right rear side of cabinet (above service panel).
- Wire push buttons and Central Control Unit (CCU) per Polara Installation Manual instructions.
- Use Controller Receptacle to power CCU. Do not use Equipment Receptacle which is a GFCI outlet.
- Never attempt to operate a standard contact closure push button with the Polara system unless cabinet is re-wired for standard button operation.

This Electrical Detail supersedes the detail sealed on 4/15/09.

Signal Upgrade - Final

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 86 (S. Columbia Street) at S. Pittsboro Street/ SR 1902 (Manning Drive)

Division 7 Orange County Chapel Hill

PLAN DATE: July 2011 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS

INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453

ENGINEER JOHN T. ROWE

SIGNATURE DATE

SIG. INVENTORY NO. 07-0520

02-AUG-2011 12:11  
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STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

11-08

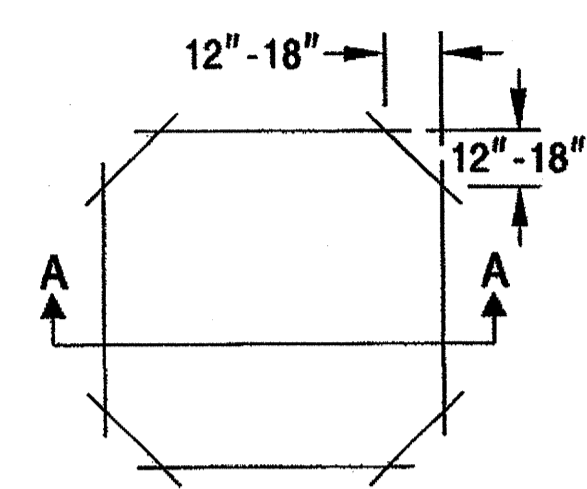
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

SHEET 1 OF 3  
**1725D01**

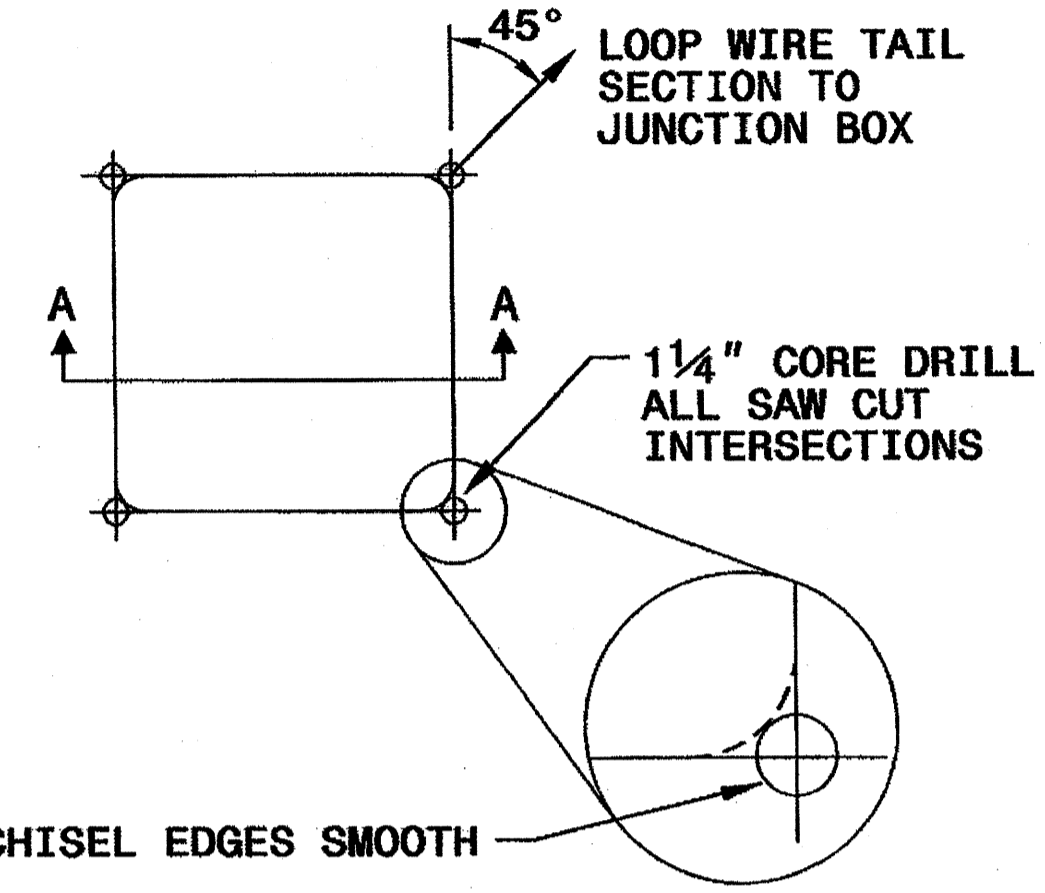
**CONVENTIONAL 4-SIDED LOOP**

**SAW CUT OPTIONS**

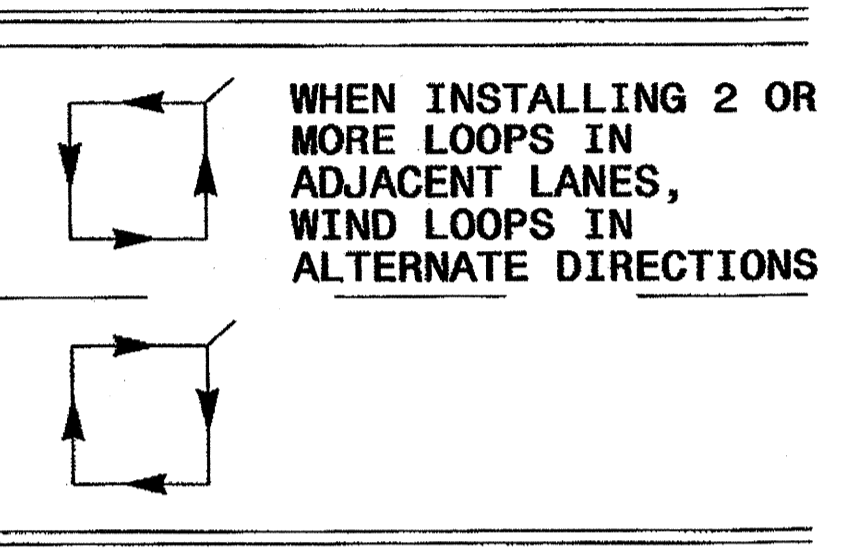
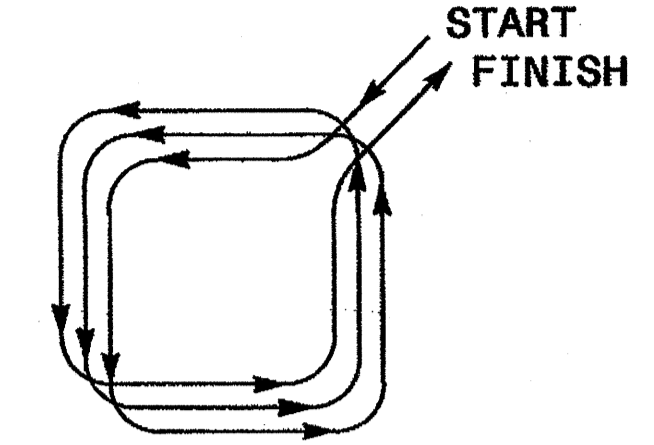
OPTION 1



OPTION 2  
(POOR PAVEMENT)

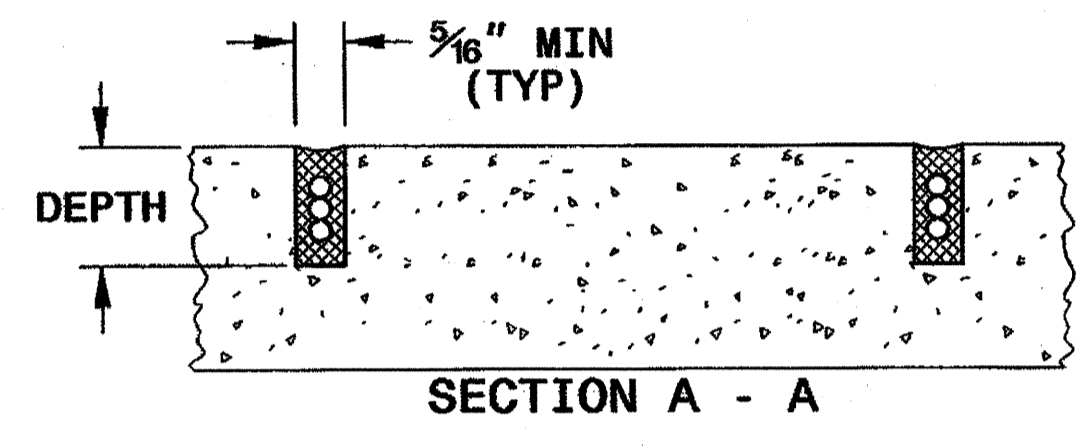


**LOOP WINDING METHOD**

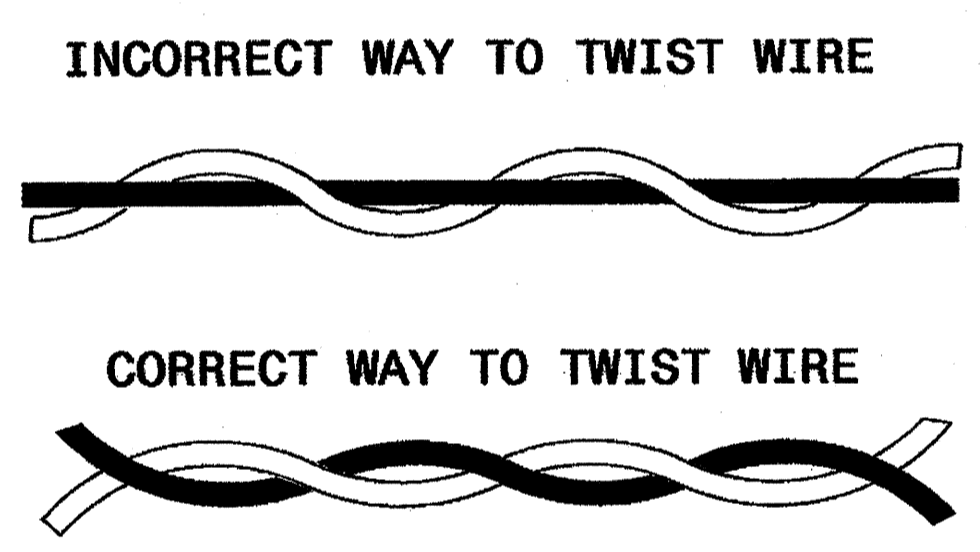


**SAW SLOT DEPTH CHART**

DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



**LOOP WIRE TWISTING METHOD**



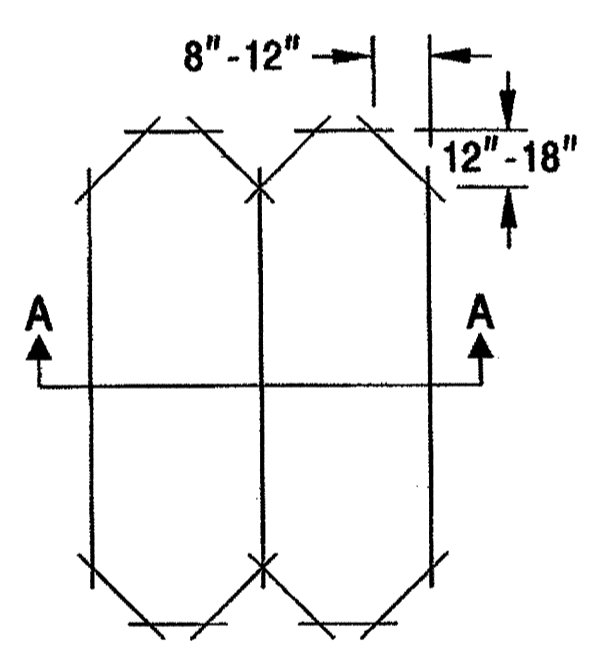
**NOTES**

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

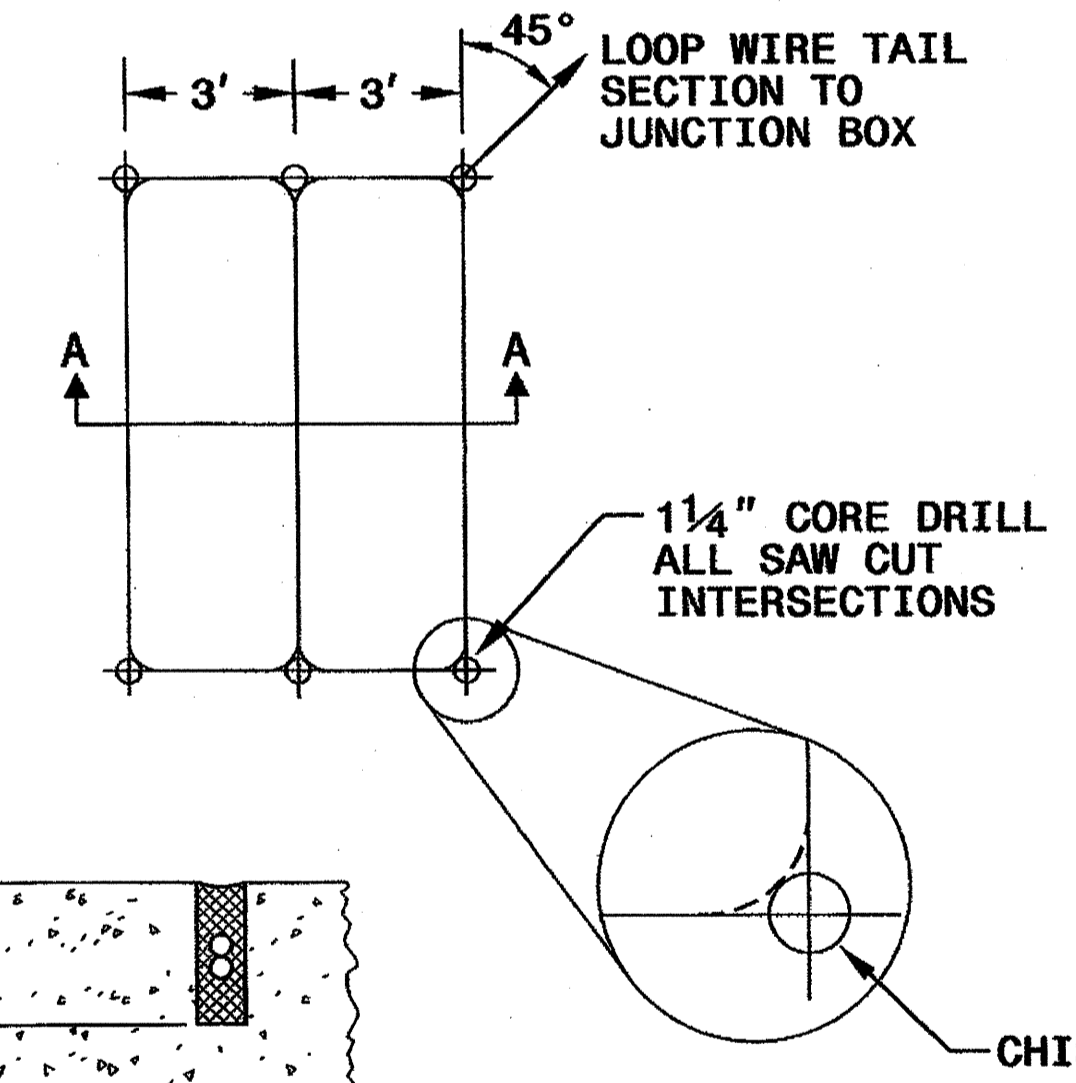
**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**

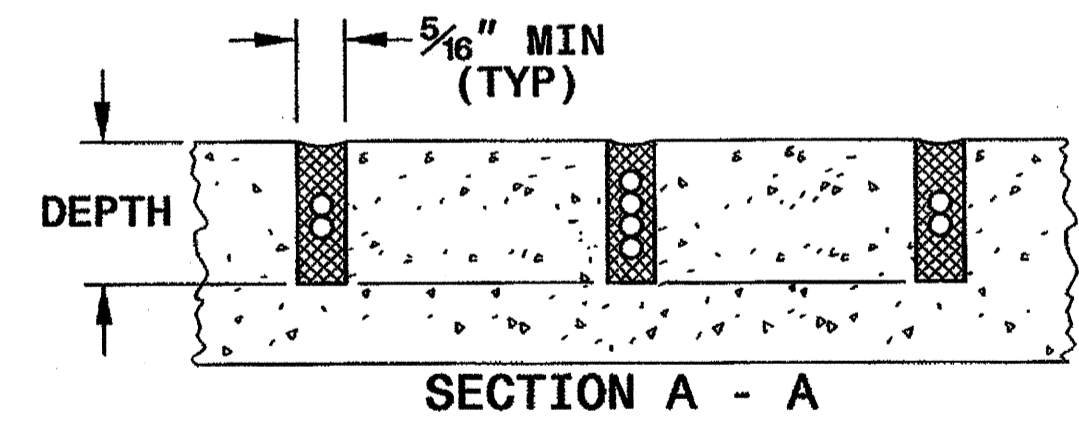
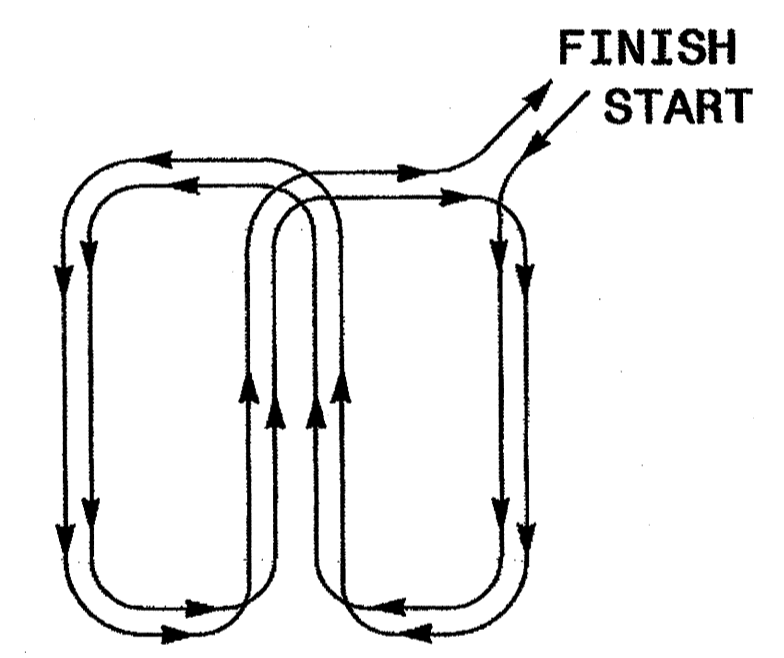
OPTION 1



OPTION 2  
(POOR PAVEMENT)



**LOOP WINDING METHOD**



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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

11-08

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

SHEET 1 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

*Milton Dean* 1/24/08  
SIGNATURE DATE

24-INDV-2008 08:28  
c:\work\files\standard plate sheets\1725D01\_mey2307.dgn  
zml 1/16

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

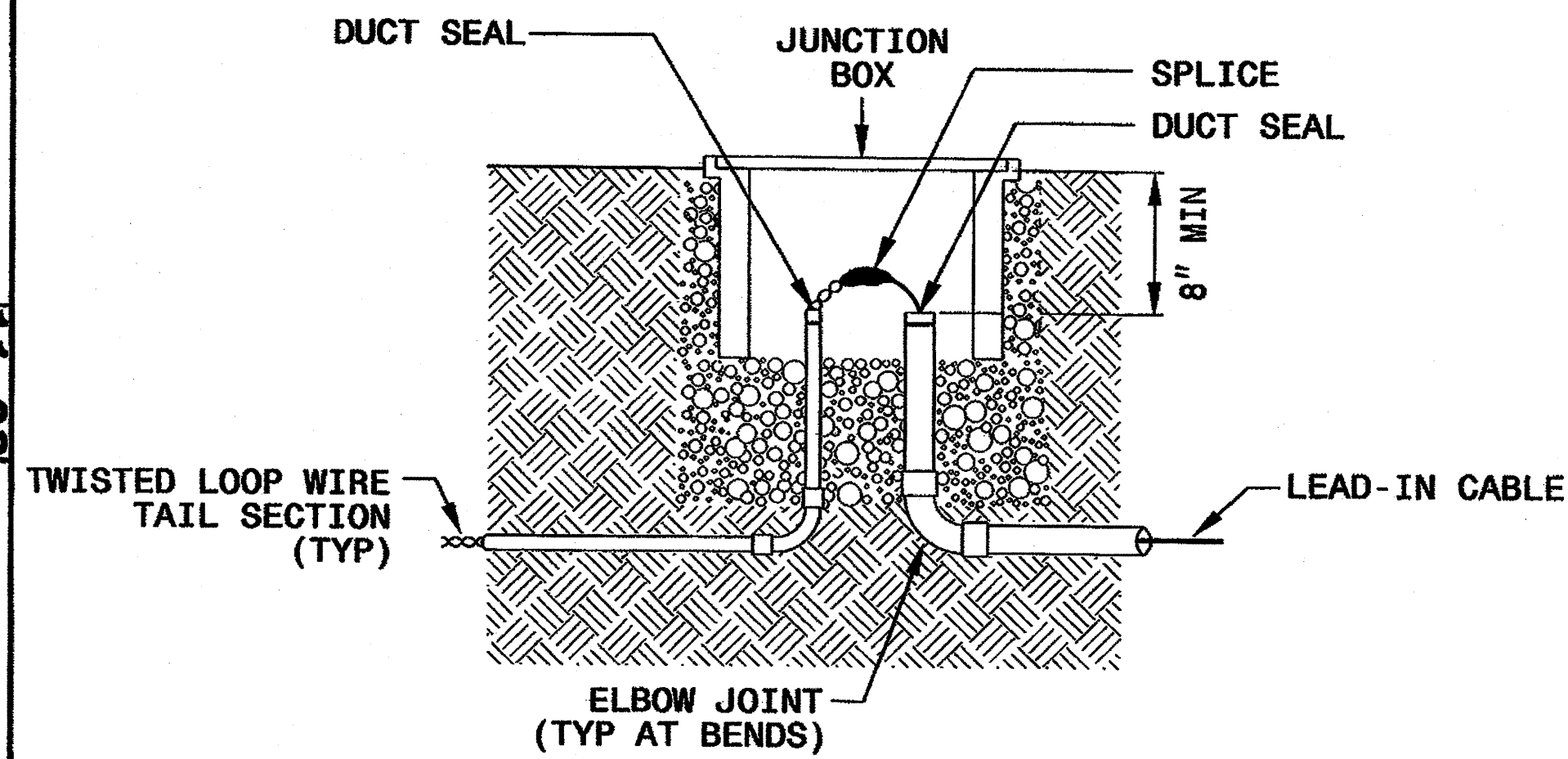
11-08

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 LOOP WIRE DETAILS

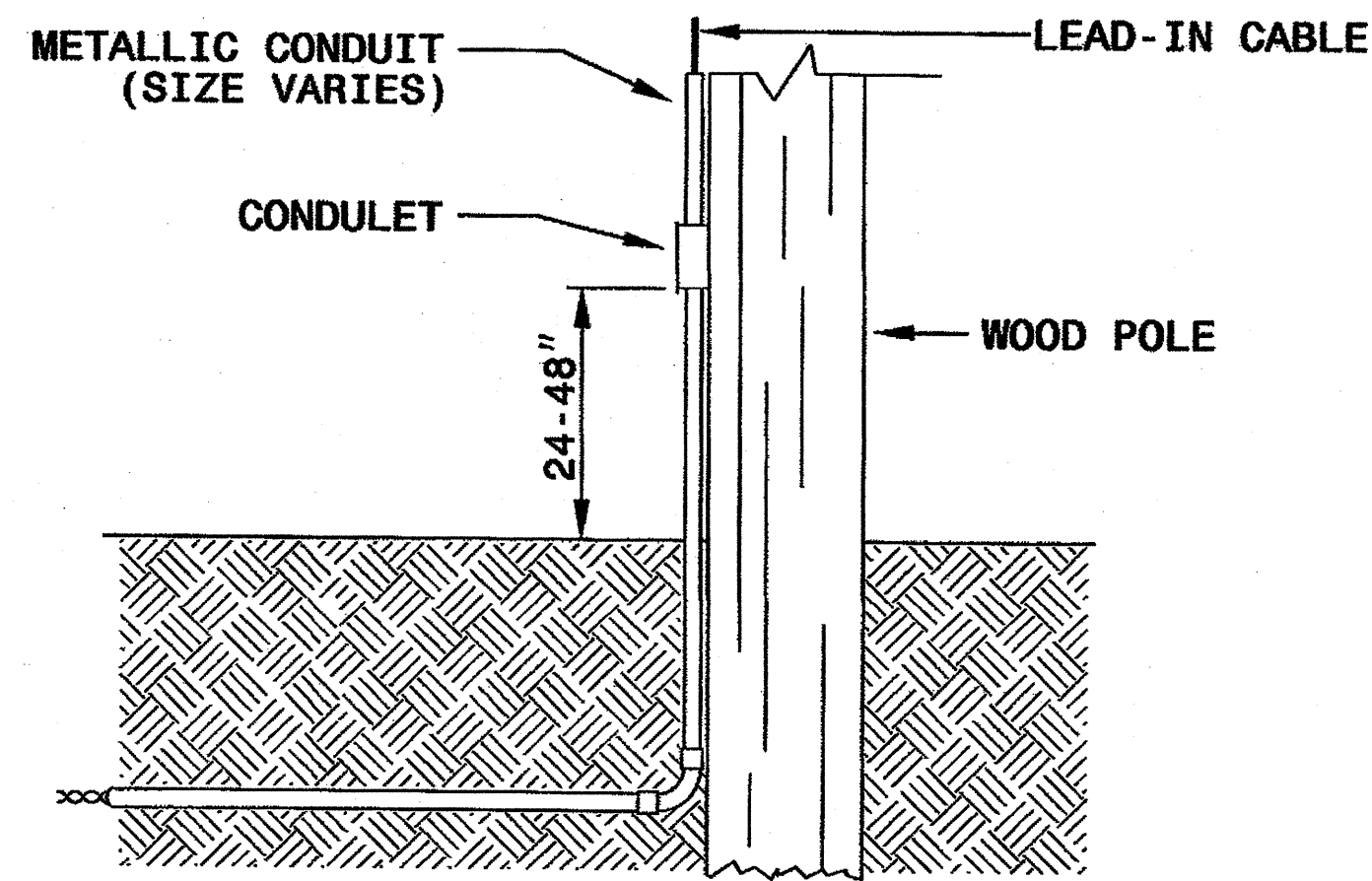
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



**LOOP WIRE AT POLE**

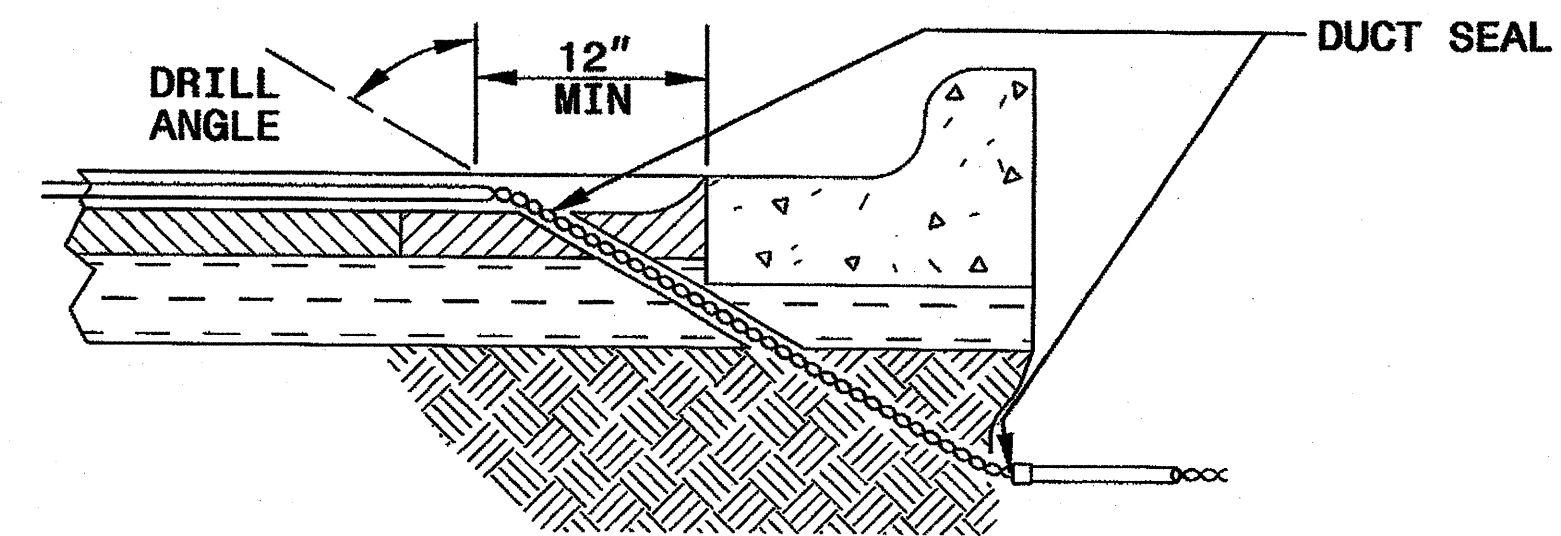


**NOTE**

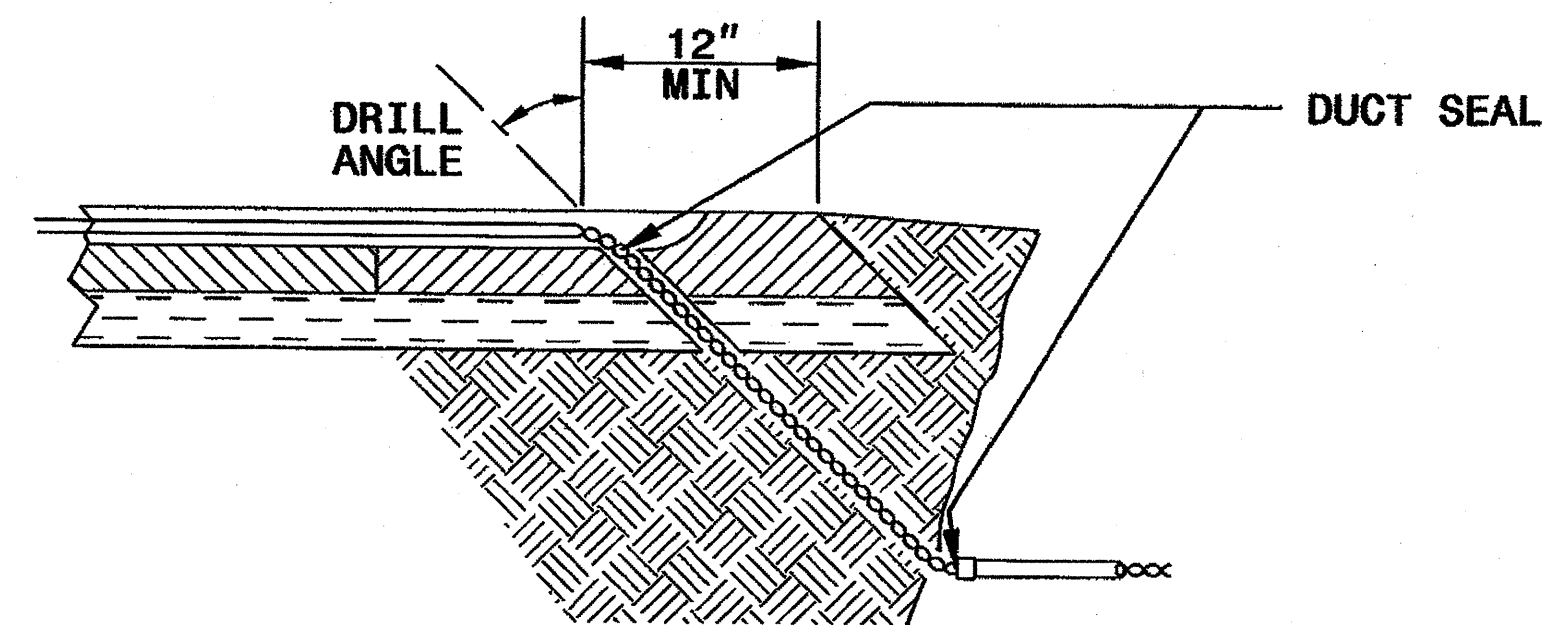
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**LOOP WIRE PAVEMENT EDGE DETAILS**

**LOOP WIRE AT CURB & GUTTER SECTION**



**LOOP WIRE AT PAVEMENT SECTION**



**NOTES**

- DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
- TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
- BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

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

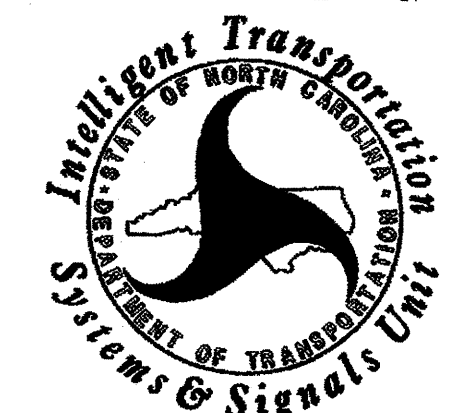
11-08

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 LOOP WIRE DETAILS

SHEET 2 OF 3  
**1725D01**

See Plate for Title

Prepared in the Office of:



750 N. Greenfield Parkway  
 Garner, NC 27529

SEAL



Milton J. Dean 11/24/08  
 SIGNATURE DATE



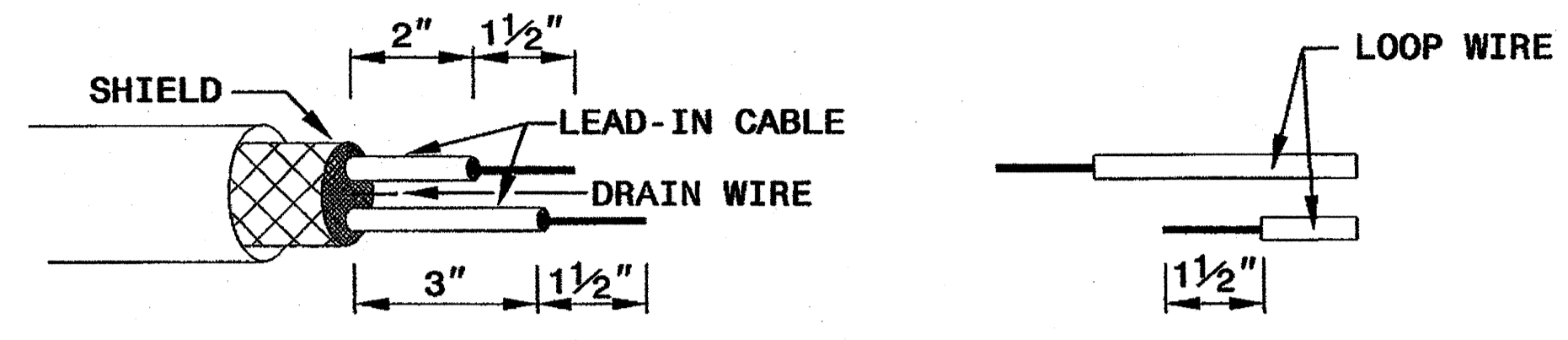
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

11-08

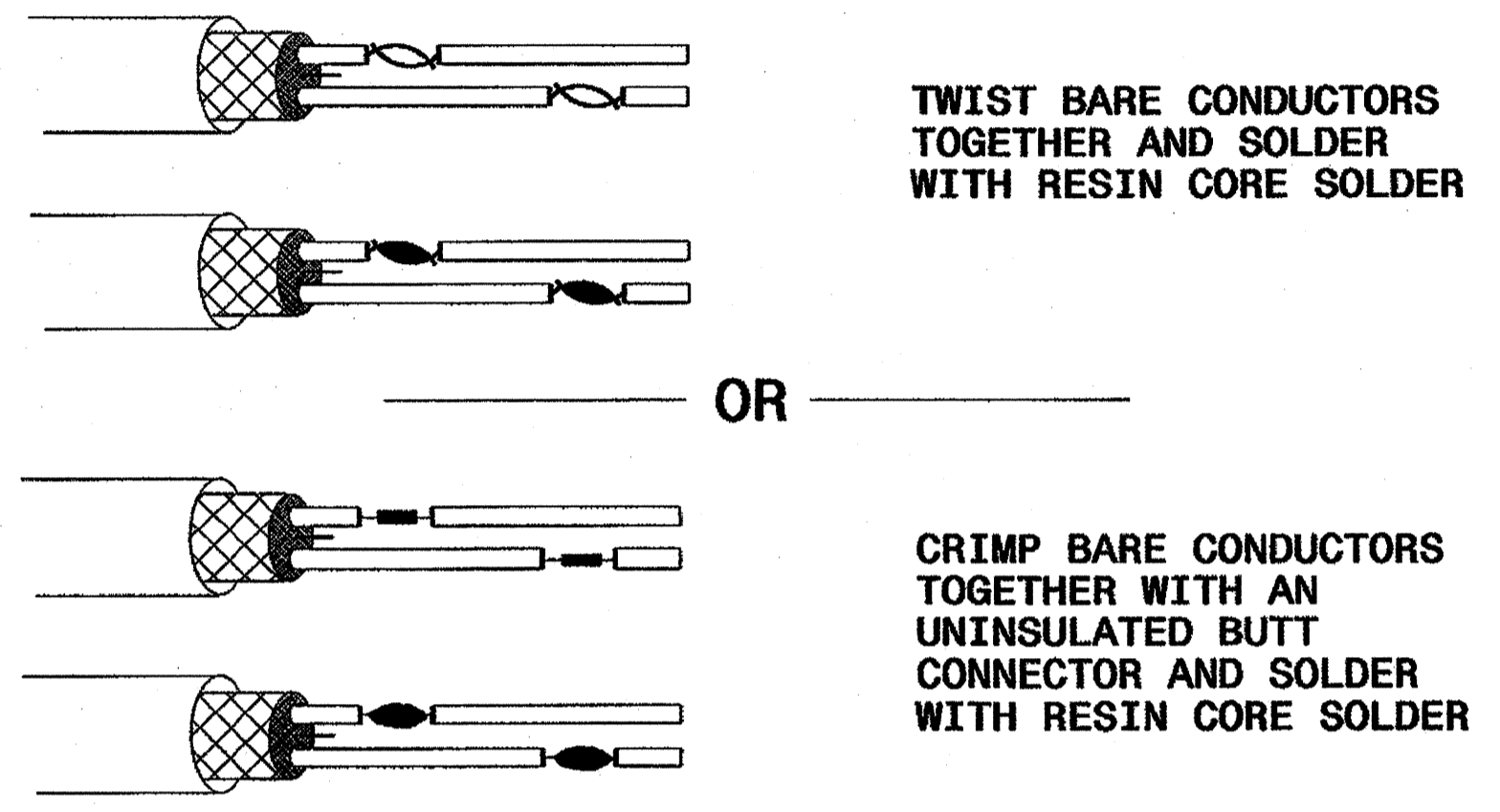
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

**STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE**

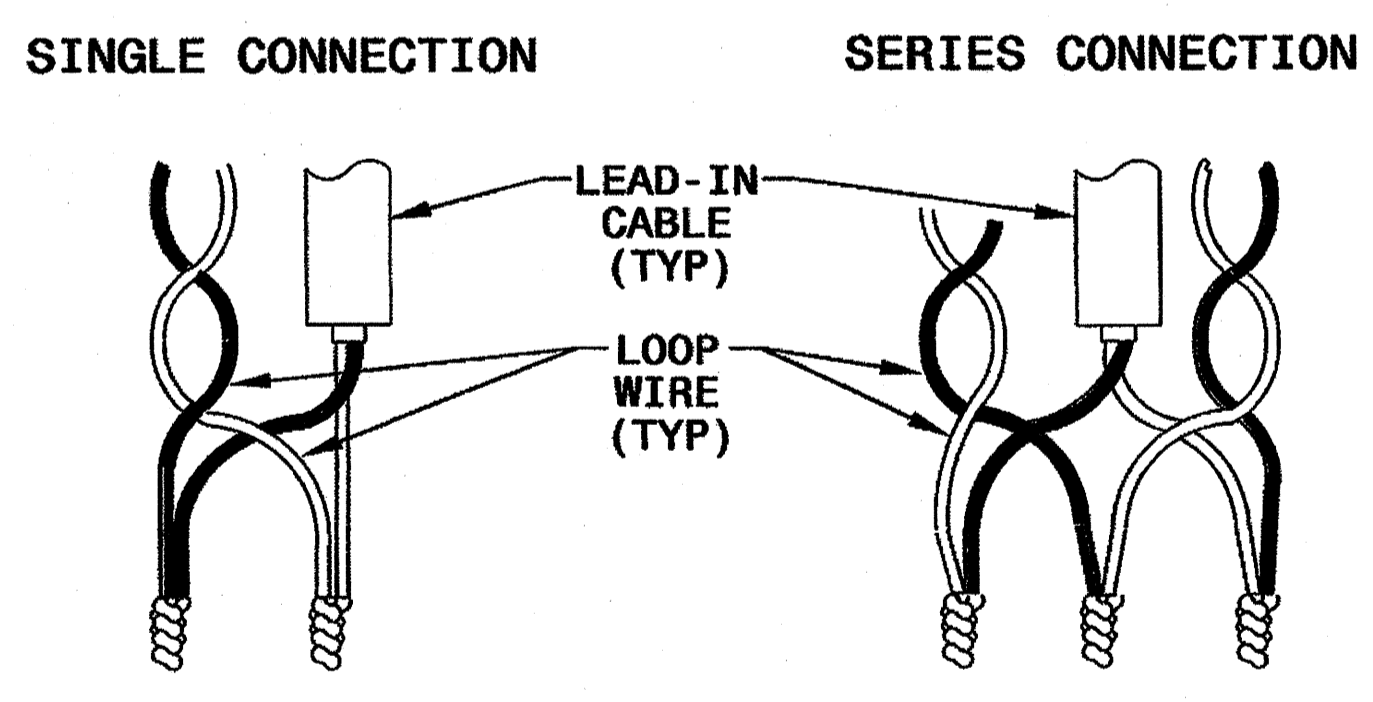


**STEP 2. CONNECT AND SOLDER**

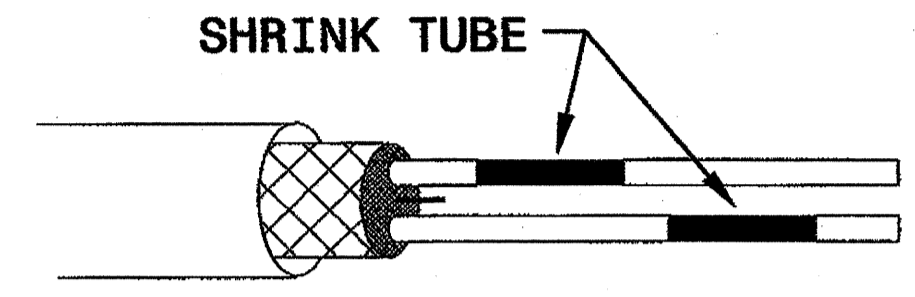


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

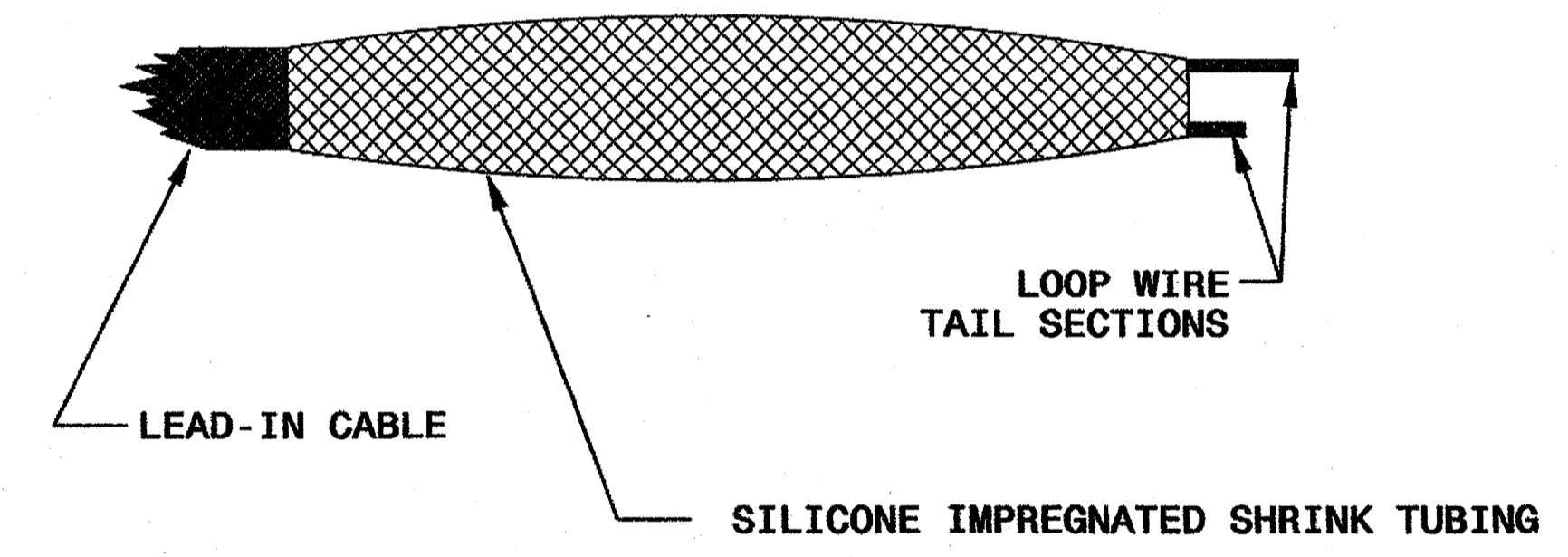
**LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS**



**STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY**



**STEP 4. ENVIRONMENTALLY PROTECT SPLICE**



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

11-08

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

*Milton Dean* 11/24/08  
SIGNATURE DATE

24-Nov-2008 09:38  
c:\temp\standard plots\sheet1725D01.dwg  
24111111

- 1 INSTALL REA, PE - 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 2 INSTALL REA, PE - 38, (FIGURE 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 3 INSTALL REA, PE - 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 4 INSTALL SMFO CABLE
- 5 INSTALL MMFO CABLE
- 6 INSTALL FIBER OPTIC DROP CABLE
- 7 INSTALL TRACER WIRE
- 8 TRENCH
- 9 INSTALL PVC CONDUIT
- 10 INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- 13 INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
- 14 INSTALL POLYETHYLENE CONDUIT
- 15 DIRECTIONAL DRILL CONDUIT
- 16 BORE AND JACK CONDUIT
- 17 INSTALL CABLE(S) IN EXISTING CONDUIT
- 18 INSTALL CABLE(S) IN NEW CONDUIT
- 19 INSTALL CABLE(S) IN EXISTING RISER
- 20 INSTALL CABLE(S) IN NEW RISER
- 21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
- 22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 24 INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
- 25 INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
- 26 TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- 27 INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- 28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPlice CABLE IN CABINET
- 29 INSTALL UNDERGROUND SPlice ENCLOSURE
- 30 INSTALL AERIAL SPlice ENCLOSURE
- 31 INSTALL POLE MOUNTED SPlice CABINET
- 32 INSTALL BASE MOUNTED SPlice CABINET
- 33 REMOVE EXISTING SPlice CABINET

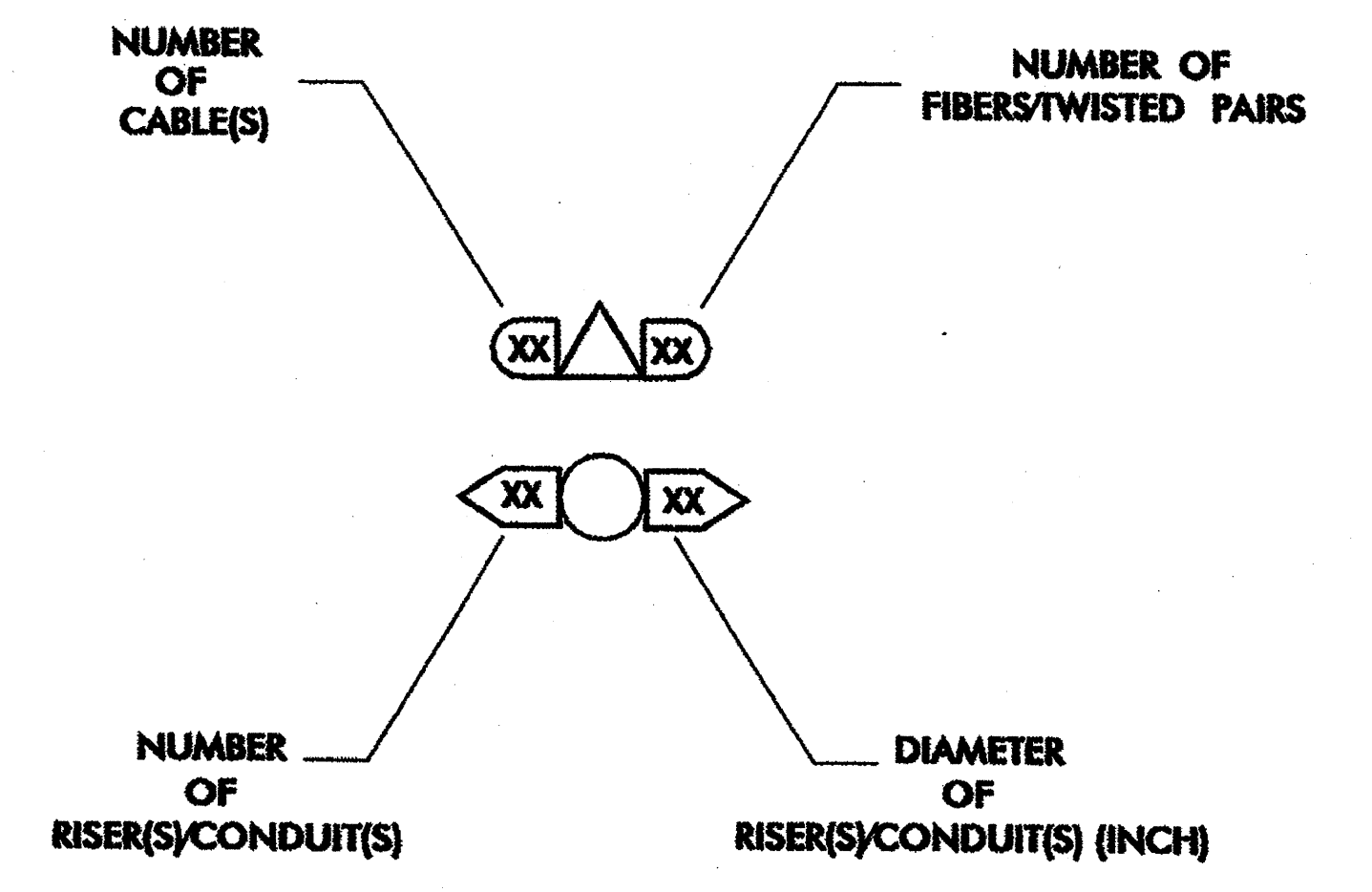
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL WOOD POLE
- 43 REMOVE EXISTING WOOD POLE
- 44 INSTALL AERIAL GUY ASSEMBLY
- 45 INSTALL STANDARD GUY ASSEMBLY
- 46 INSTALL SIDEWALK GUY ASSEMBLY
- 47 INSTALL MESSENGER CABLE
- 48 REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
- 49 REMOVE EXISTING MESSENGER CABLE
- 50 INSTALL TELEPHONE SERVICE
- 51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52 INSTALL DELINEATOR MARKER
- 53 STORE 20 FEET OF COMMUNICATIONS CABLE
- 54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
- 55 LASH CABLE(S) TO EXISTING MESSENGER CABLE
- 56 LASH CABLE(S) TO NEW MESSENGER CABLE
- 57 MODIFY EXISTING ELECTRICAL SERVICE
- 58 INSTALL NEW ELECTRICAL SERVICE

**LEGEND**

- FO NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI EXISTING COMMUNICATIONS CABLE
- REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD NEW DIRECTIONAL DRILLED CONDUIT
- B&J NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- AERIAL SPlice ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- EXISTING SPlice CABINET
- NEW SPlice CABINET
- SP SIGNAL POLE
- XX-XXXX SIGNAL INVENTORY NUMBER

**CONSTRUCTION NOTE SYMBOLOGY KEY**

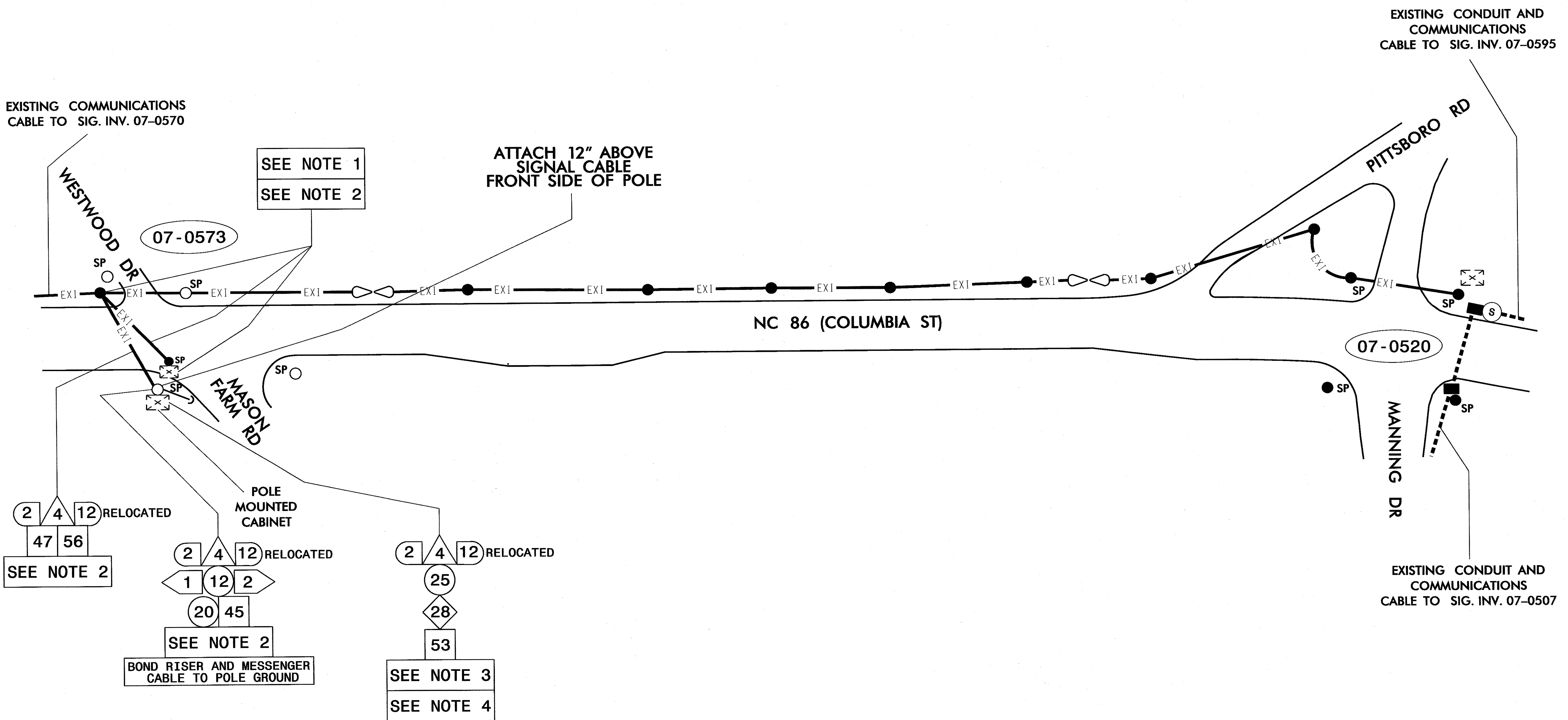
- XX INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



	<b>CONSTRUCTION NOTES</b>		
	PLAN DATE: _____ PREPARED BY: _____ SCALE: 0 _____	REVIEWED BY: _____ REVIEWED BY: <b>G. A. FULLER</b> REVISIONS: _____ INIT.: _____ DATE: _____	



CONTACT KUMAR NEPPALLI, PROJECT MANAGER – TOWN OF CHAPEL HILL TRAFFIC ENGINEERING (919-969-5093), PRIOR TO REMOVING ANY CABLE. PROVIDE 5 DAYS ADVANCE NOTICE PRIOR TO BEGINNING WORK.



**NOTES:**

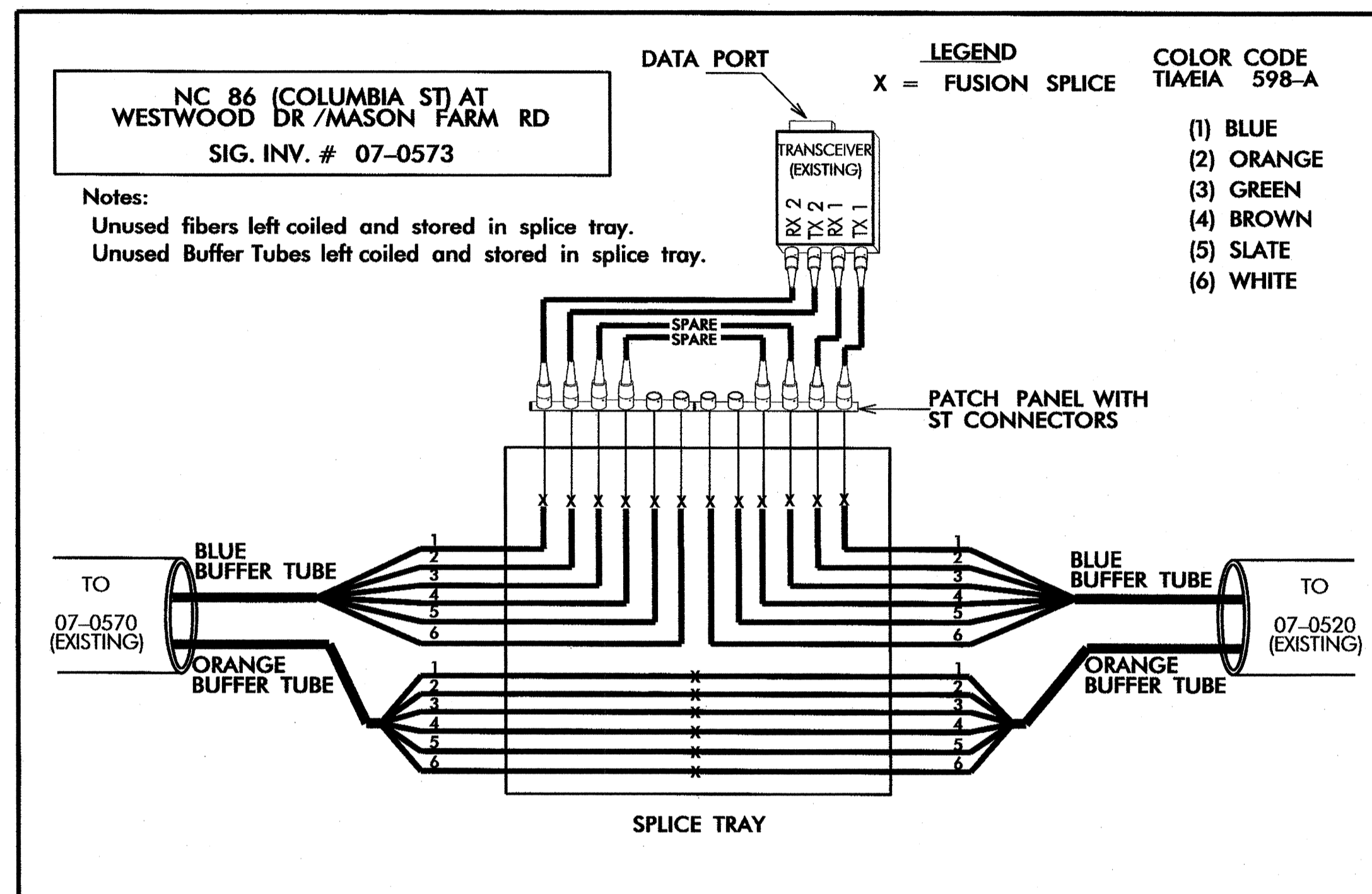
1. PRIOR TO REMOVING FIBER OPTIC CABLE FROM CABINET, RECORD EXISTING SPLICES AND COMPARE TO PROVIDED SPLICE PLAN FOR 07-0573. IF DIFFERENCES BETWEEN THE RECORDED INFORMATION & THE PROVIDED INFORMATION EXIST, SPLICE BACK TO RECORDED INFORMATION. PROVIDE AS-BUILT PLANS TO THE ENGINEER.
2. REMOVE EXISTING FIBER OPTIC CABLES FROM EXISTING SIGNAL CABINET AND BACK PULL TO NEAREST DUKE POWER POLE.
3. RELOCATE EXISTING CABLES TO NEW SIGNAL POLE AND NEW POLE MOUNTED SIGNAL CABINET AS SHOWN. TERMINATE RELOCATED CABLES IN NEW INTERCONNECT CENTER. REUSE EXISTING TRANSCEIVER IN NEW CABINET.
4. ENSURE THAT FIBER OPTIC CABLE IS RETERMINATED AND OPERATIONAL WITHIN 48 HOURS OF RELOCATING CABLE.

ALL NCDOT ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

**CONSTRUCTION PHASE I**

	COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS ALONG NC 86 (COLUMBIA STREET)		SEAL 
	DIVISION 07 ORANGE COUNTY CHAPEL HILL		
PREPARED BY: S.C. WARDLE REVIEWED BY: G.A. FULLER	PLAN DATE: JULY 2011 REVIEWED BY: I.N. AVERY		
SCALE: 0	REVISIONS:	INIT.:	DATE:
Signature: <i>[Handwritten Signature]</i>			DATE: 7/29/11

# FIBER OPTIC CABLE



**CONTACT KUMAR NEPELLI, PROJECT MANAGER – TOWN OF CHAPEL HILL TRAFFIC ENGINEERING (919-969-5093), PRIOR TO REMOVING ANY CABLE. PROVIDE 5 DAYS ADVANCE NOTICE PRIOR TO BEGINNING WORK.**

**NOTES:**

1. REUSE EXISTING TRANSCEIVER AND INSTALL WITH NEW INTERCONNECT CENTER.
2. PRIOR TO REMOVING FIBER OPTIC CABLE FROM CABINET, RECORD EXISTING SPLICES AND COMPARE TO PROVIDED SPLICE PLAN FOR 07-0573. IF DIFFERENCES BETWEEN THE RECORDED INFORMATION & THE PROVIDED INFORMATION EXIST, SPLICE BACK TO RECORDED INFORMATION. PROVIDE AS-BUILT PLANS TO THE ENGINEER.
4. ENSURE THAT FIBER OPTIC CABLE IS RETERMINATED AND OPERATIONAL WITHIN 48 HOURS OF RELOCATING CABLE.

**TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS**

**CONSTRUCTION PHASE I**

	<b>SLICE PLAN</b> <b>ALONG NC 86 (COLUMBIA STREET)</b>		
	DIVISION 07 ORANGE COUNTY CHAPEL HILL PLAN DATE: JULY 2011 REVIEWED BY: I.N. AVERY PREPARED BY: S.C. WARDLE REVIEWED BY: G.A. FULLER	SCALE: 0 REVISIONS: _____ INIT. DATE: _____ SIGNATURE: <i>Gregory A. Fuller</i> 7/29/11 DATE: _____	