

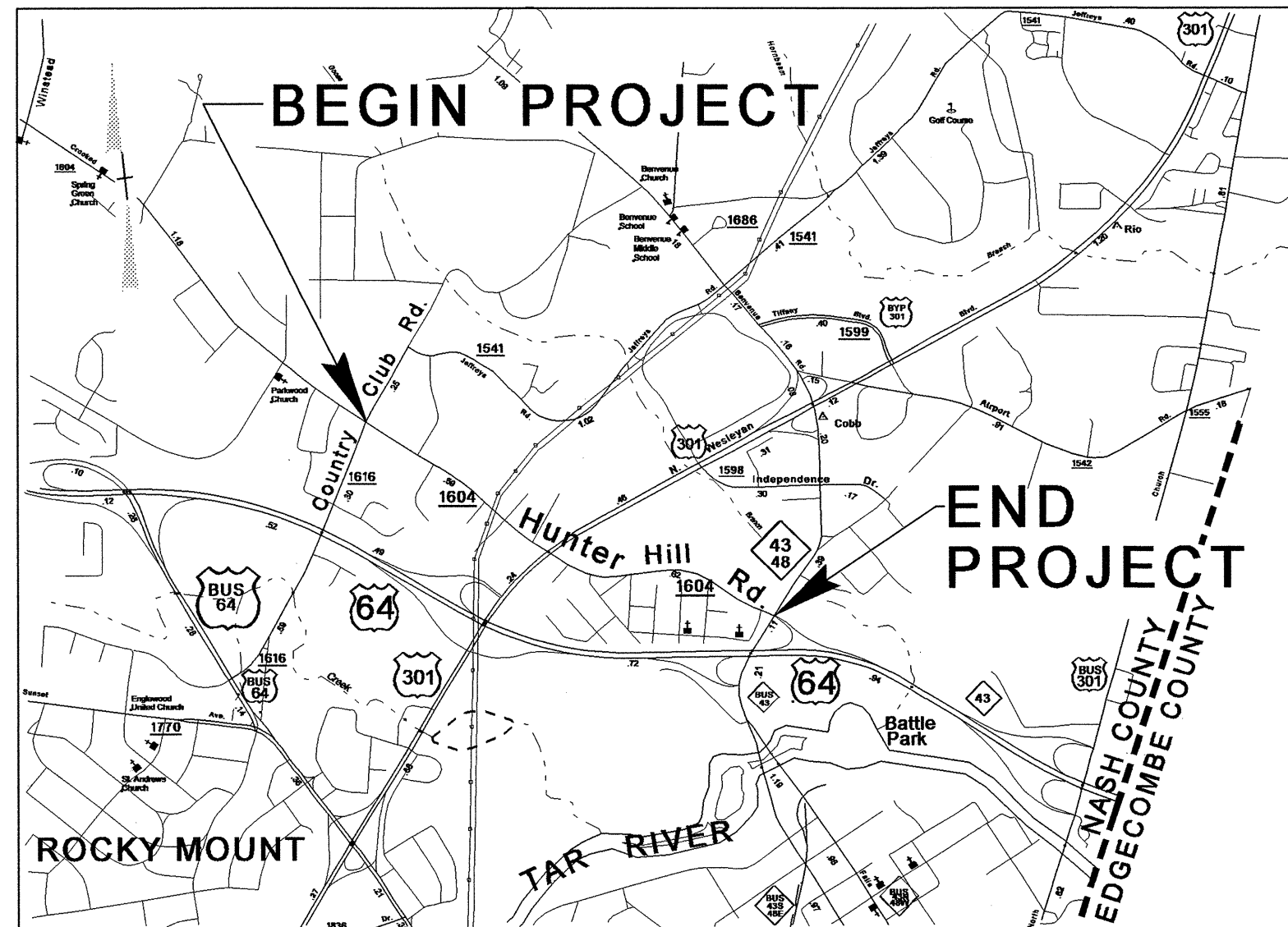
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# NASH COUNTY

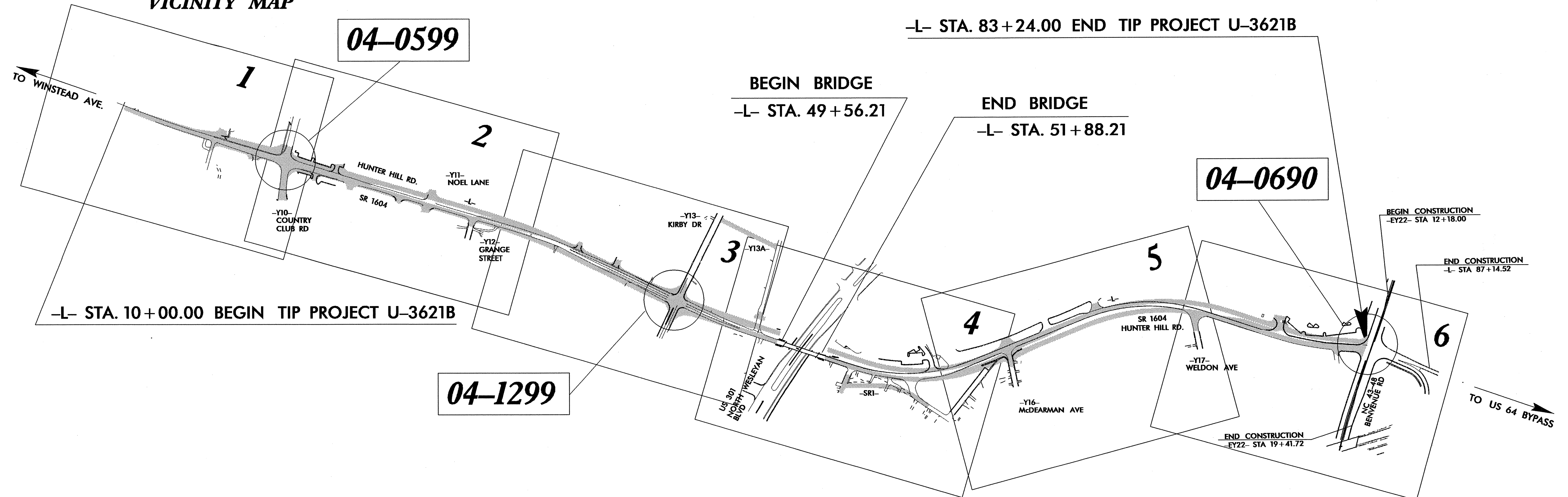
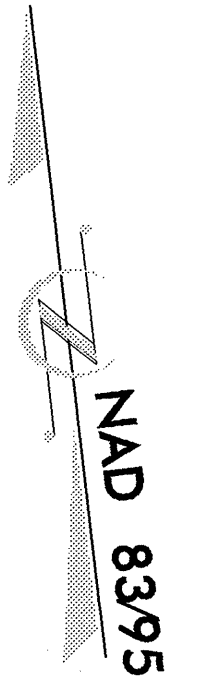
**LOCATION: SR 1604 (HUNTER HILL RD) IN ROCKY MOUNT FROM  
SR 1616 (COUNTRY CLUB RD) TO NC 43/48 (BENVENUE RD)**

**TYPE OF WORK: SIGNALS AND CABLE ROUTING**

**Project: U-3621B**



VICINITY MAP



Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1		Title Sheet	
Sig. 2-4	04-0599T1	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road) Temporary Design 1	
Sig. 5-7	04-0599T2	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road) Temporary Design 2	
Sig. 8-10	04-0599T3	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road) Temporary Design 3	
Sig. 11-13	04-0599	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road) Final Design	
Sig. 14	04-1299T1	SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Road)/Shopping Center Entrance Temporary Design 1	
Sig. 15	04-1299T2	SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Road)/Shopping Center Entrance Temporary Design 2	
Sig. 16	04-01299T3	SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Road)/Shopping Center Entrance Temporary Design 3	
Sig. 17-19	04-1299T4	SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Road)/Shopping Center Entrance Temporary Design 4	
Sig. 20-22	04-01299	SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Road)/Shopping Center Entrance Final Design	
Sig. 23	04-0690T1	NC 43-48 (Benvenue Road) at SR 1604 (Hunter Hill Road)/US 64 EB Ramps Temporary Design 1	
Sig. 24	04-0690T2	NC 43-48 (Benvenue Road) at SR 1604 (Hunter Hill Road)/US 64 EB Ramps Temporary Design 2	
Sig. 25-26	04-0690T3	NC 43-48 (Benvenue Road) at SR 1604 (Hunter Hill Road)/US 64 EB Ramps Temporary Design 3	
Sig. 27-29	04-0690	NC 43-48 (Benvenue Road) at SR 1604 (Hunter Hill Road)/US 64 EB Ramps Final Design	
Sig. 30-32	LPI-LP3	Detector Loop Details	
Sig. 33	CL-A	Cable Layout Plans Legend/General Notes	
Sig. 34	CL-B	Cable Layout Plans Construction Notes	
Sig. 35-41	CL-1 - CL-7	Cable Layout Plans	
Sig. 42	SD-1	Riser Detail	
Sig. 43	SD-2	Ground Mounted Electrical Service Detail	
Sig. 44-49	MP-1 - MP-6	Metal Pole Details	

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

**PBS&I** 1616 EAST MILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

**Melissa R. Cooney, P.E. - Project Manager**  
**Lisa M. Moon, P.E. - Senior Design Engineer**

**INTELLIGENT TRANSPORTATION AND SIGNALS UNIT**  
Contacts:  
**Pam Alexander, P.E. - Eastern Region Signals Engineer**  
**Todd Joyce, P.E. - Signal Equipment Design Engineer**  
**Neil Avery - Intelligent Transportation Systems Engineer**

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

750 N. Greenfield Parkway, Garner, NC 27529

I:\NOV-2010\4105\04-1299\195\_U-3621B\_Signals\Special\_Details\titlesheet.dgn  
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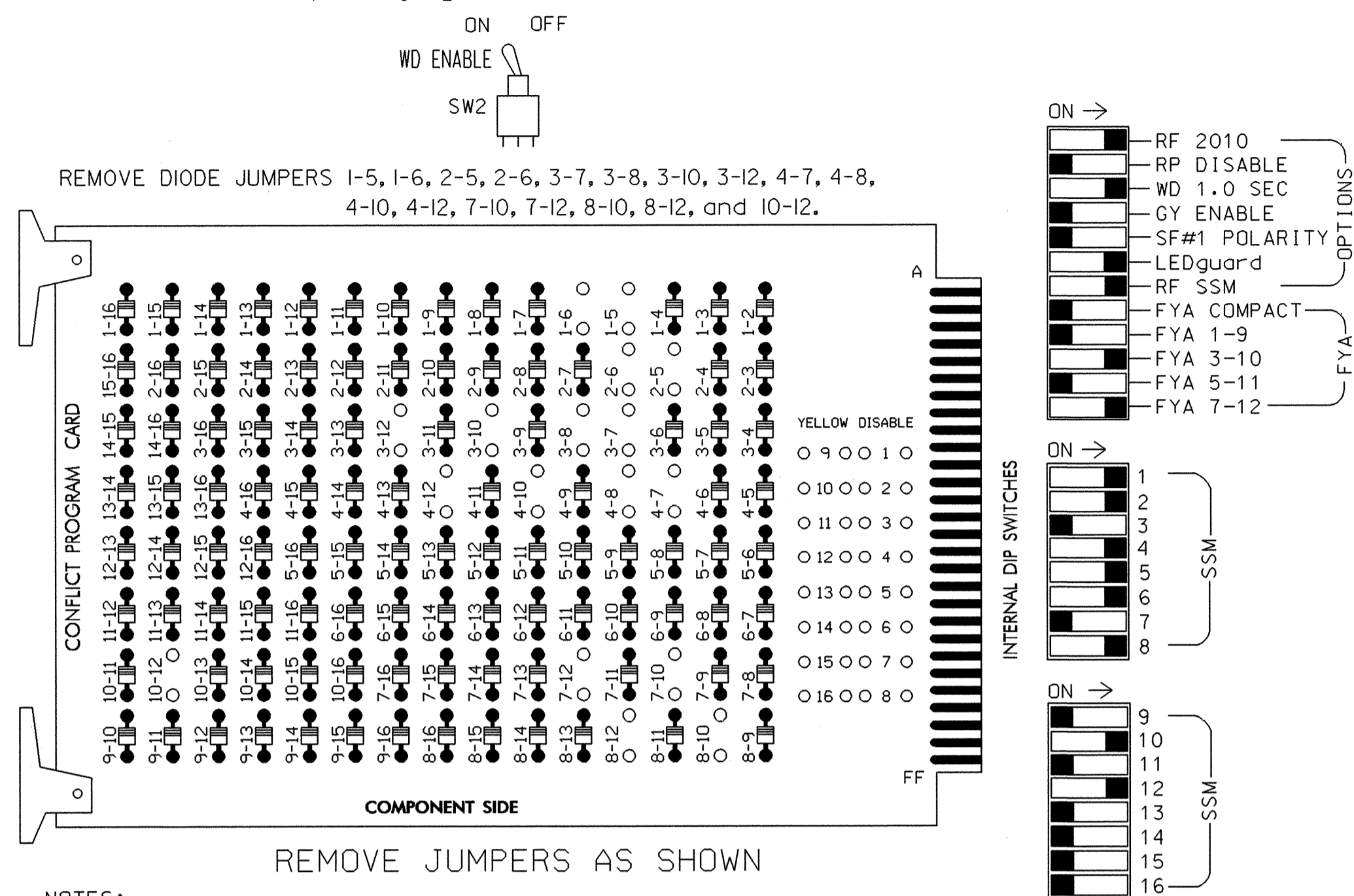






### EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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 3,7,9, 11,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 4 and 8 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31*	41,42	NU	51	61,62	NU	71*	81,82	NU	NU	31*	NU	NU	71*	NU
RED		128			101			134			107							
YELLOW				*	102			135		*	108							
GREEN		130			103			136			109							
RED ARROW	125						131							A124			A101	
YELLOW ARROW	126						132							A125			A102	
FLASHING YELLOW ARROW														A126			A103	
GREEN ARROW	127			118			133			124								

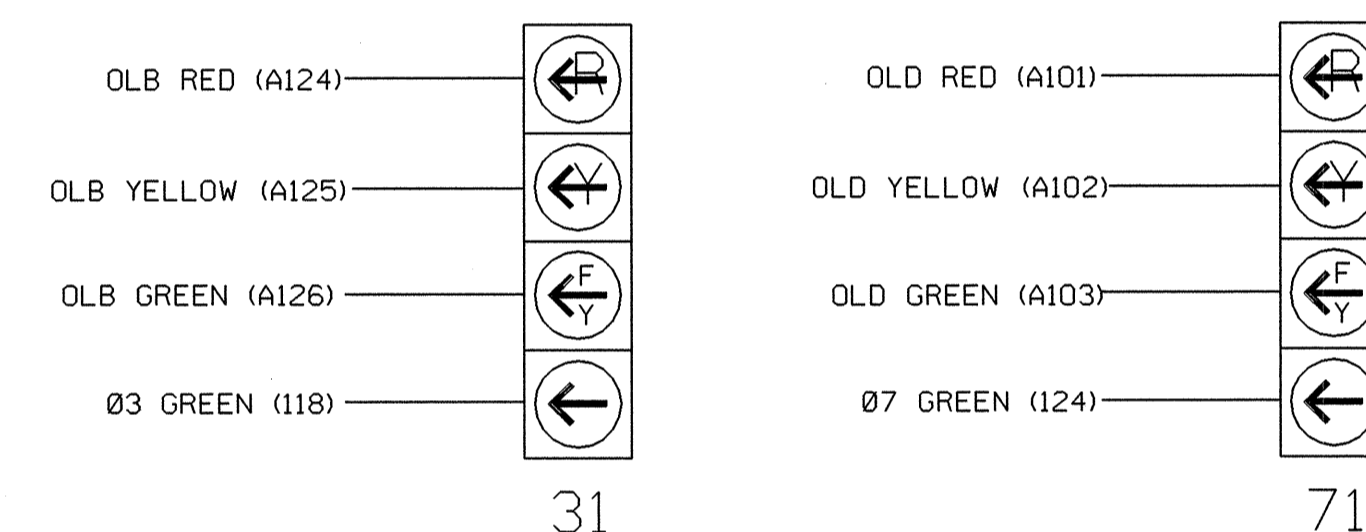
NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 ★ See pictorial of head wiring in detail below.

### EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10,S13  
 PHASES USED.....1,2,3,4,5,6,7,8.  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....3+4  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....7+8

### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

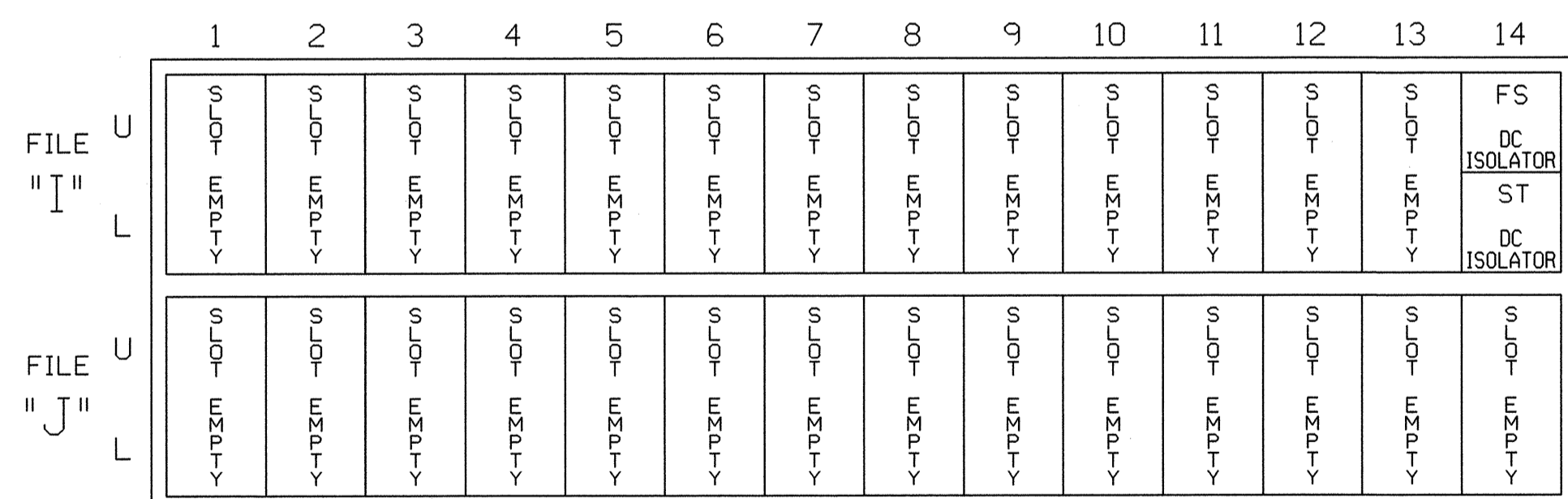


NOTE

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

### INPUT FILE POSITION LAYOUT

(front view)



### INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION

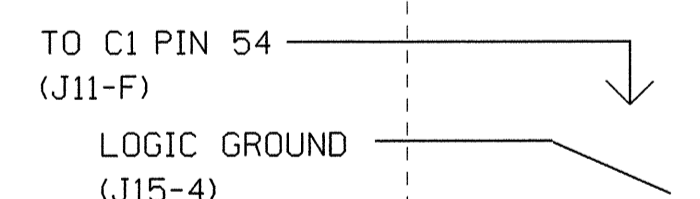
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
 INPUT ASSIGNMENT #.....16  
 DEBOUNCE TIME (0-25.5 SEC).....0.5  
 DELAY TIME (0-25.5 SEC).....0.0  
 HOLD-OVER TIME (0-25.5 SEC).....0.0  
 ASSIGNMENT SELECTION:  
 NOT ENABLED (Y/N).....  
 VEHICLE DETECTOR (1-64).....  
 PEDESTRIAN DETECTOR (1-16).....  
 ALTERNATE PED DETECTOR (1-16).....  
 PREEMPT (1-10).....  
 INVERTED PREEMPT (1-10).....  
 STOP TIME (Y/N).....  
 FLASH SENSE (Y/N).....  
 DOOR OPEN (Y/N).....  
 MANUAL CONTROL ENABLE (Y/N).....  
 MANUAL CONTROL ADVANCE (Y/N).....  
 SPECIAL FUNCTION ALARM (1-8).....  
 TOD HOUR SYNCHRONIZATION (0-23).....5  
 FORCE OFF RING (1-4).....  
 HOLD PHASES (1-16).....  
 PLAN (65=FLSH,66=FREE)... OFFSET#...  
 CHANGE PHASE SEQUENCE PAGE (1-12)....  
 CHANGE PHASE TIMING PAGE (1-4).....  
 CHANGE PHASE CONTROL PAGE (1-4)....  
 CHANGE OVERLAP CONTROL PAGE (1-4)....  
 CHANGE INPUT PAGE (1-4).....  
 CHANGE OUTPUT PAGE (1-4).....  
 OVERRIDE PHASE CONTROL FUNCTION (Y)....

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

### WIRING DETAIL FOR GPS TIME SYNCH UNIT



CONTACTS LOCATED IN GPS TIME SYNCH UNIT

NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

### SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599T1  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**PBSJ** 1616 EAST MILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

### ELECTRICAL DETAIL SHEET 1 OF 2 - Temporary Design 1

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)	SEAL 
	Division 04 Nash County Rocky Mount PLAN DATE: October 2010 REVIEWED BY: PREPARED BY: LM Moon REVIEWED BY: MR Cooney REVISIONS INIT. DATE	SIGNATURE DATE 11-17-10

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

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)  
IF ACTIVE PHASE #3 IS ON  
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON  
AND RED CLEAR ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #39 ON  
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #5 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)  
IF YELLOW ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

#### OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red  
OUTPUT 40 = Overlap D Yellow  
OUTPUT 41 = Overlap D Green  
OUTPUT 47 = Overlap B Red  
OUTPUT 48 = Overlap B Yellow  
OUTPUT 49 = Overlap B Green

### FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

NOTICE GREEN FLASH

PRESS '+' TWICE

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

NOTICE GREEN FLASH

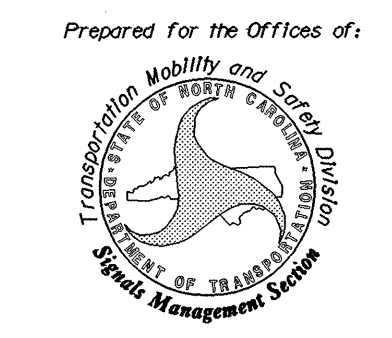

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599T1  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

17-NOV-2010 14:09:11 U-3621B Signal\Sigs\T:\img\060599T1.dgn  
13833 JAL RALDUBH1

**PBS&** 1616 EAST WILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

ELECTRICAL DETAIL SHEET 2 OF 2 - Temporary Design 1

 <p>Prepared for the Offices of: Transportation Mobility and Safety Division Department of Transportation State of North Carolina 750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Electrical and Programming Details For:</p> <p><b>SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)</b></p> <p>Division 04 Nash County Rocky Mount</p> <p>PLAN DATE: October 2010 REVIEWED BY:</p> <p>PREPARED BY: LM Moon REVIEWED BY: MR Cooney</p>	<p>SEAL</p>  <p>Melissa R. Cooney 11/17/10 SIGNATURE DATE</p> <p>SIG. INVENTORY NO. 04-0599T1</p>								
	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DESCRIPTION	INIT.	DATE					<p>DATE</p>
NO.	DESCRIPTION	INIT.	DATE							

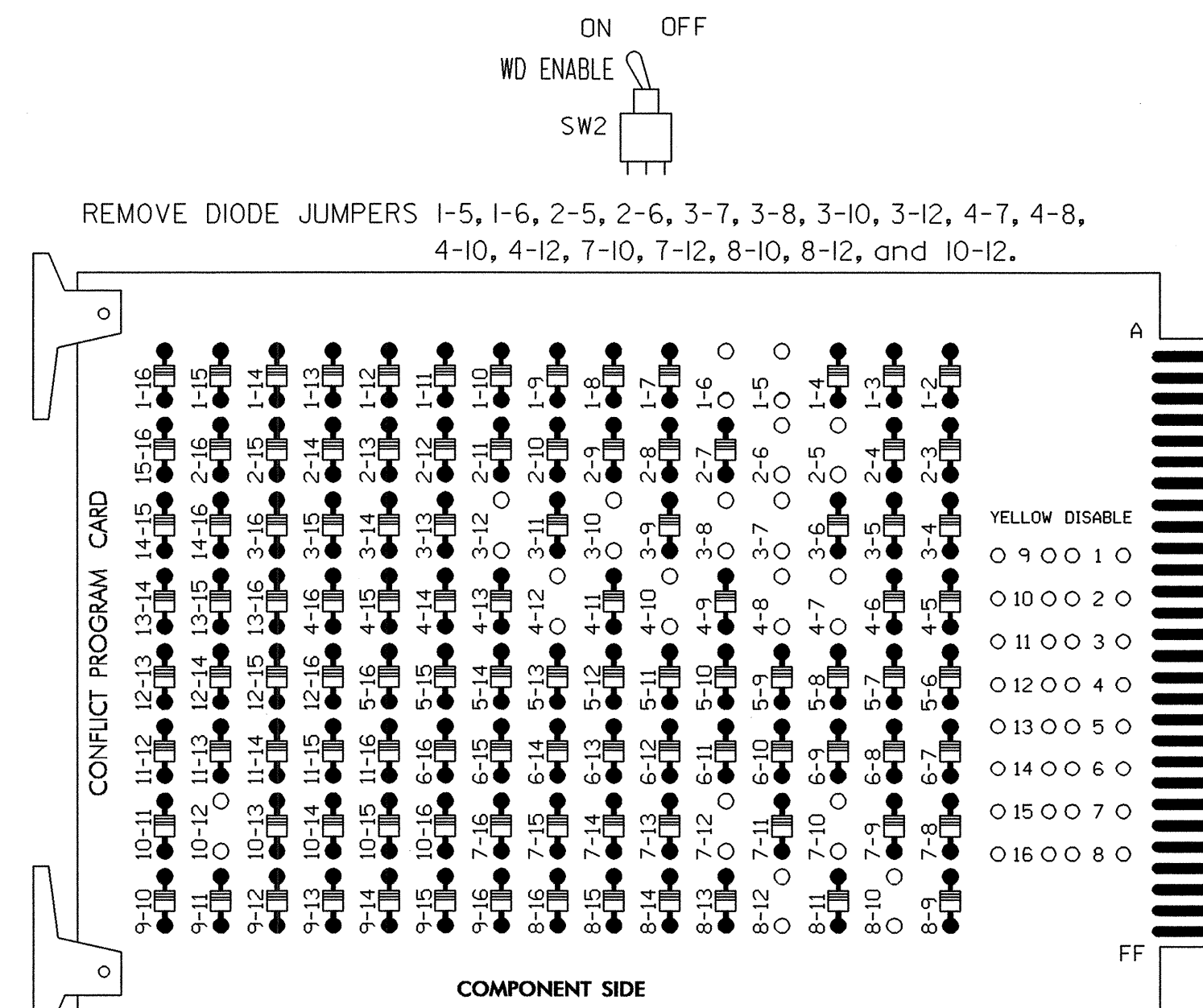






### EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

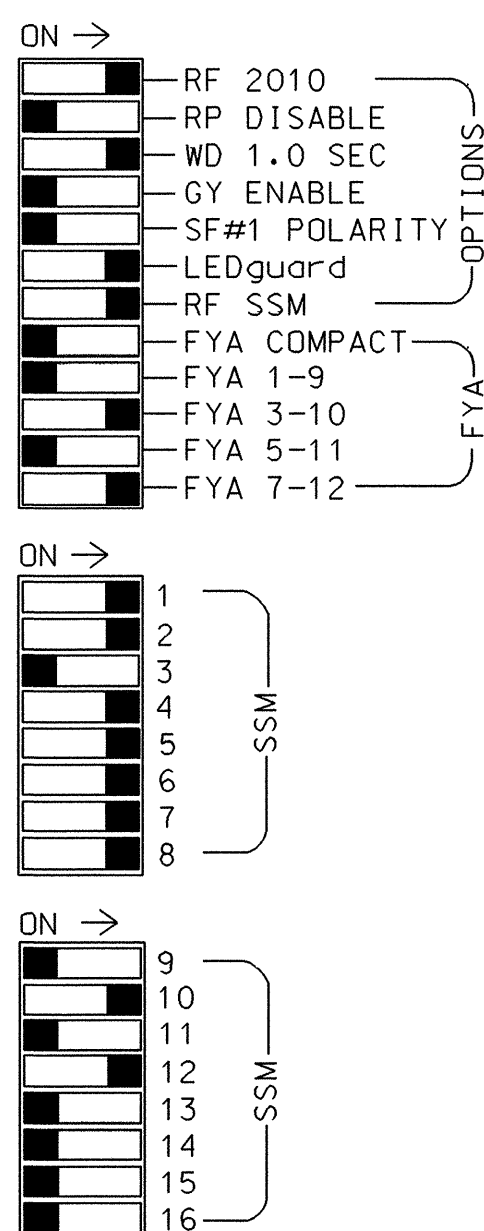
(remove jumpers and set switches as shown)



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.



■ = 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 3,9, 11,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 4 and 8 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	31*	41,42	NU	51	61,62	NU	62	71*	81,82	NU	NU	31*	NU	NU	71*	NU
RED		128			101			134		*		107							
YELLOW		129		*	102			135				108							
GREEN		130			103			136				109							
RED ARROW	125							131						A124				A101	
YELLOW ARROW	126							132			123			A125				A102	
FLASHING YELLOW ARROW														A126				A103	
GREEN ARROW	127				118			133			124	124							

NU = Not Used

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

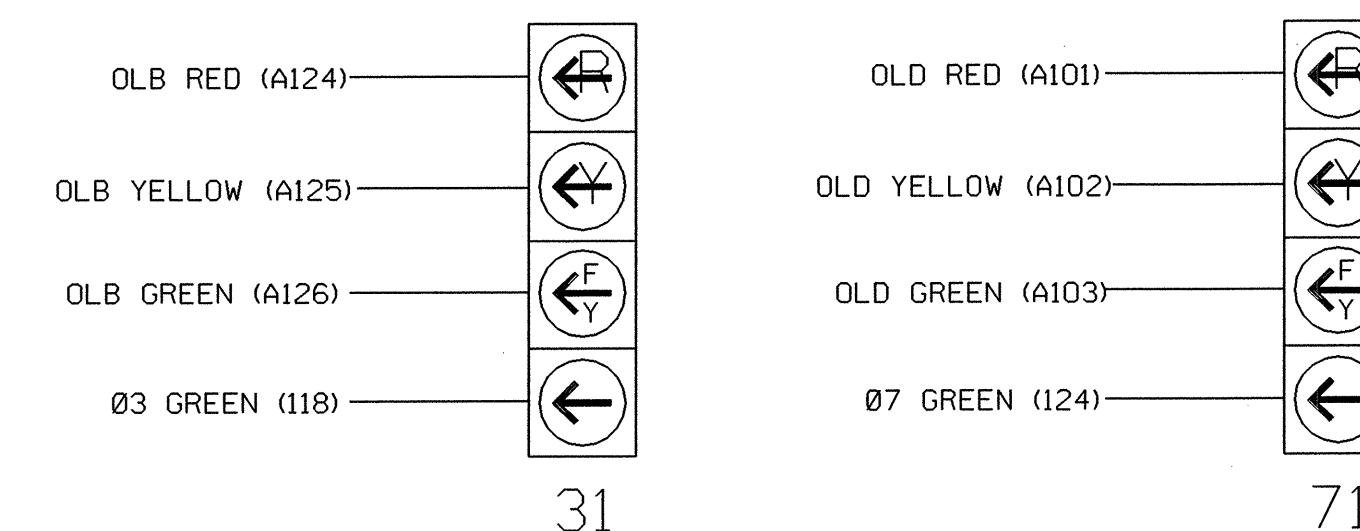
★ See pictorial of head wiring in detail below.

### EQUIPMENT INFORMATION

CONTROLLER.....EXISTING CONTRACTOR SUPPLIED 2070L  
 CABINET.....EXISTING CONTRACTOR SUPPLIED 332 /W/ AUX SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10,S13  
 PHASES USED.....1,2,3,4,5,6,7,8.  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....3+4  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....7+8

### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

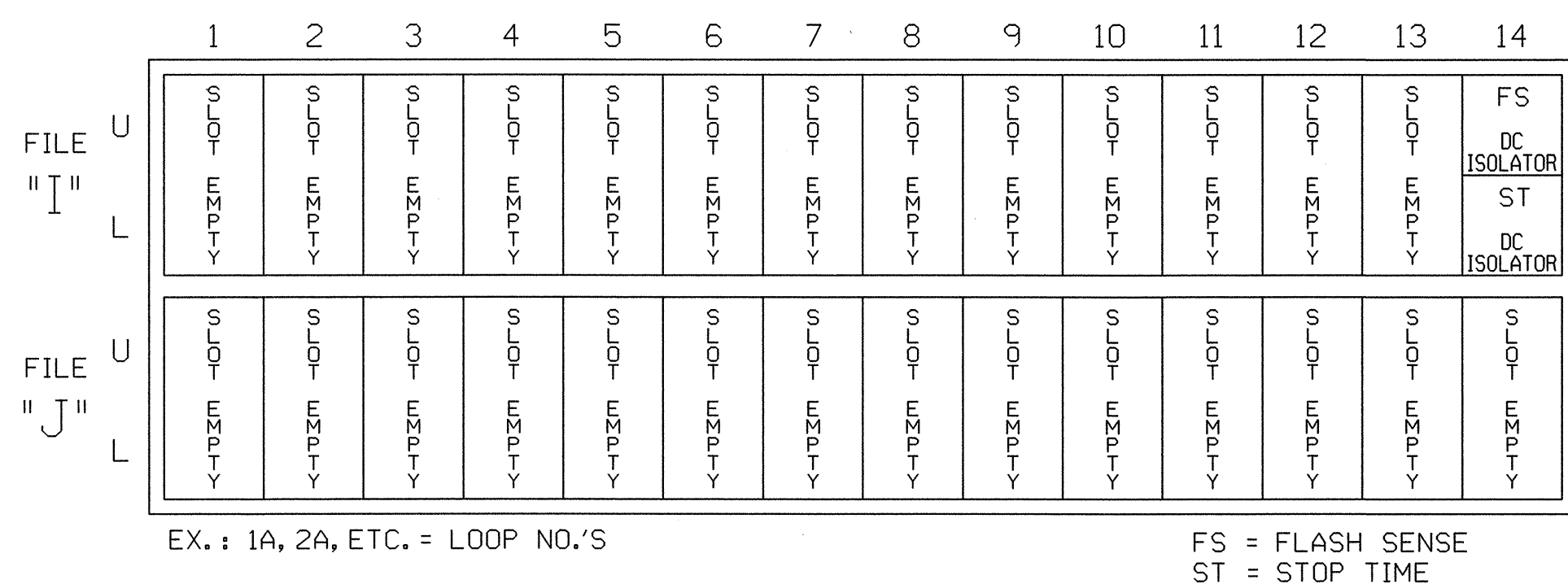


NOTE

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

### INPUT FILE POSITION LAYOUT

(from view)



### INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION

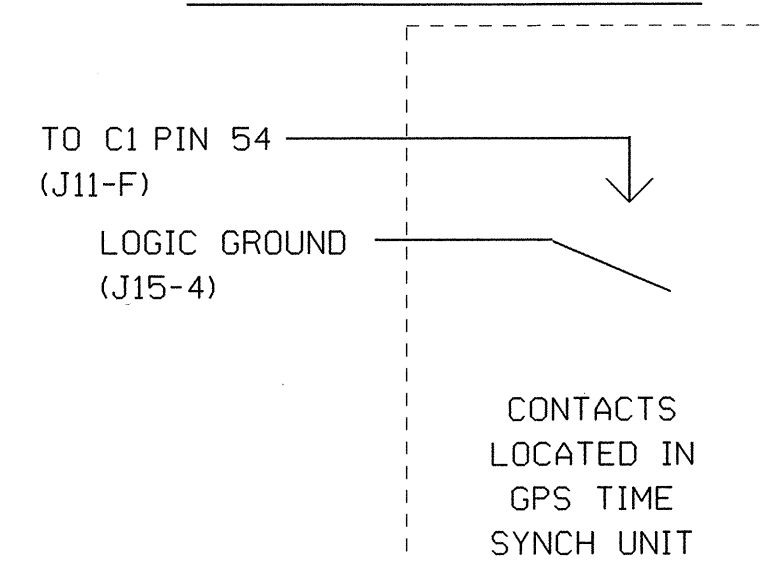
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
 INPUT ASSIGNMENT #.....16  
 DEBOUNCE TIME (0-25.5 SEC).....0.5  
 DELAY TIME (0-25.5 SEC).....0.0  
 HOLD-OVER TIME (0-25.5 SEC).....0.0  
 ASSIGNMENT SELECTION:  
 NOT ENABLED (Y/N).....  
 VEHICLE DETECTOR (1-64).....  
 PEDESTRIAN DETECTOR (1-16).....  
 ALTERNATE PED DETECTOR (1-16).....  
 PREEMPT (1-10).....  
 INVERTED PREEMPT (1-10).....  
 STOP TIME (Y/N).....  
 FLASH SENSE (Y/N).....  
 DOOR OPEN (Y/N).....  
 MANUAL CONTROL ENABLE (Y/N).....  
 MANUAL CONTROL ADVANCE (Y/N).....  
 SPECIAL FUNCTION ALARM (1-8).....  
 TOD HOUR SYNCHRONIZATION (0-23).....5  
 FORCE OFF RING (1-4).....  
 HOLD PHASES (1-16).....  
 PLAN (65=FLSH,66=FREE)... OFFSET#...  
 CHANGE PHASE SEQUENCE PAGE (1-12)...  
 CHANGE PHASE TIMING PAGE (1-4).....  
 CHANGE PHASE CONTROL PAGE (1-4).....  
 CHANGE OVERLAP CONTROL PAGE (1-4)...  
 CHANGE INPUT PAGE (1-4).....  
 CHANGE OUTPUT PAGE (1-4).....  
 OVERRIDE PHASE CONTROL FUNCTION (Y)...

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

### WIRING DETAIL FOR GPS TIME SYNCH UNIT



NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

### SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599T2  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**PBSJ** 1616 EAST HILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

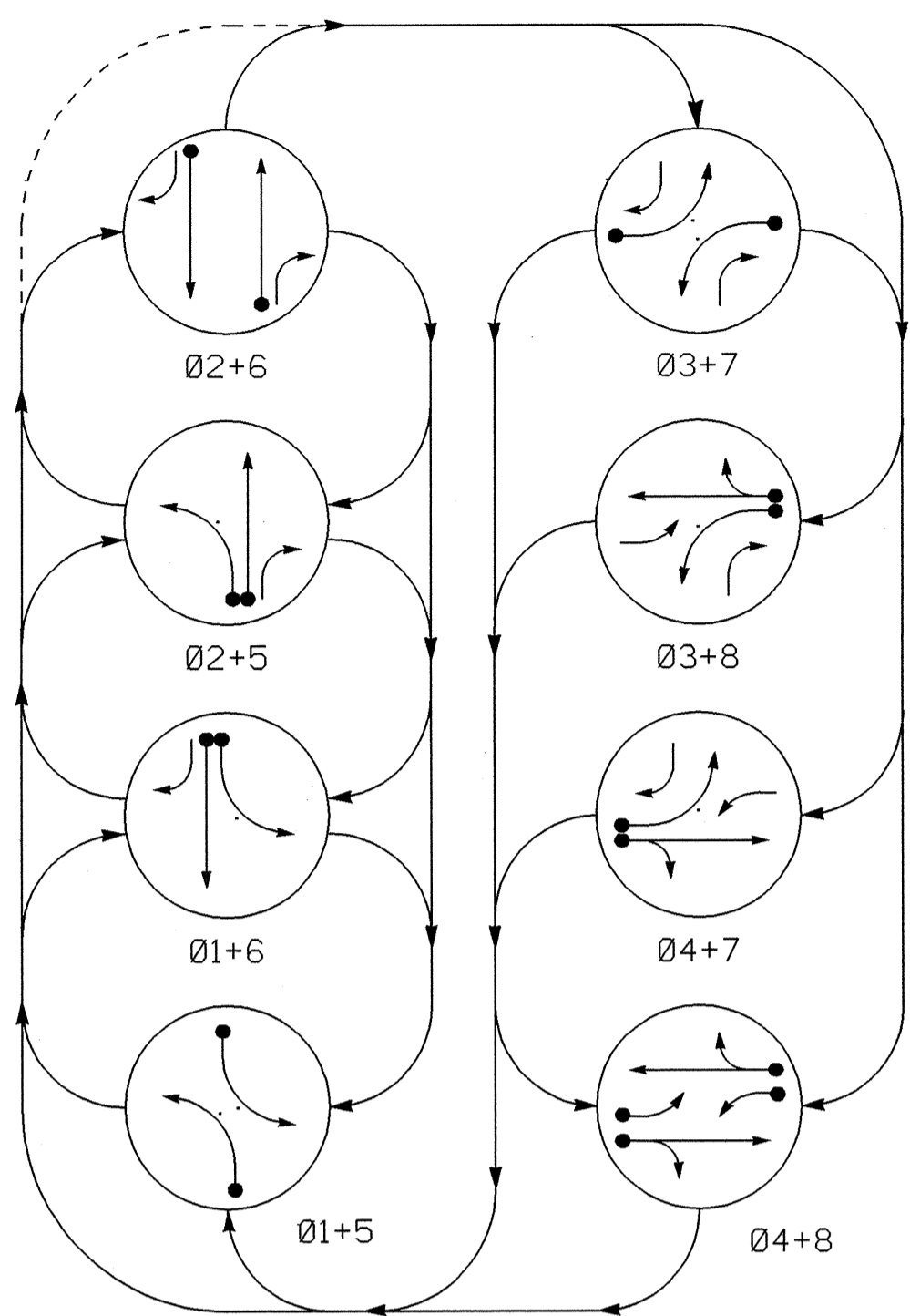
### ELECTRICAL DETAIL SHEET 1 OF 2 - Temporary Design 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)		SEAL  SIGNATURE DATE 11-17-10
	Division 04 Nash County Rocky Mount PLAN DATE: October 2010 REVIEWED BY: PREPARED BY: LM Moon REVIEWED BY: MR Cooney	REVISIONS INIT. DATE	





**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
31	R	R	G	G	R	R	R	Y
41, 42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81, 82	R	R	R	R	R	G	R	G

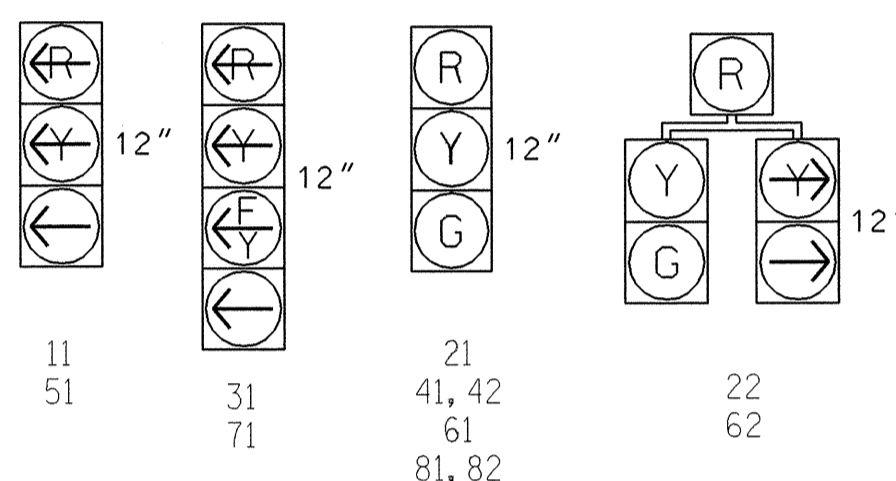
**STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL**

TO	FROM	
	1	2
1	←	←
2	←	←

◄ = Flashing Yellow Arrow

**SIGNAL FACE I.D.**

All Heads L.E.D.



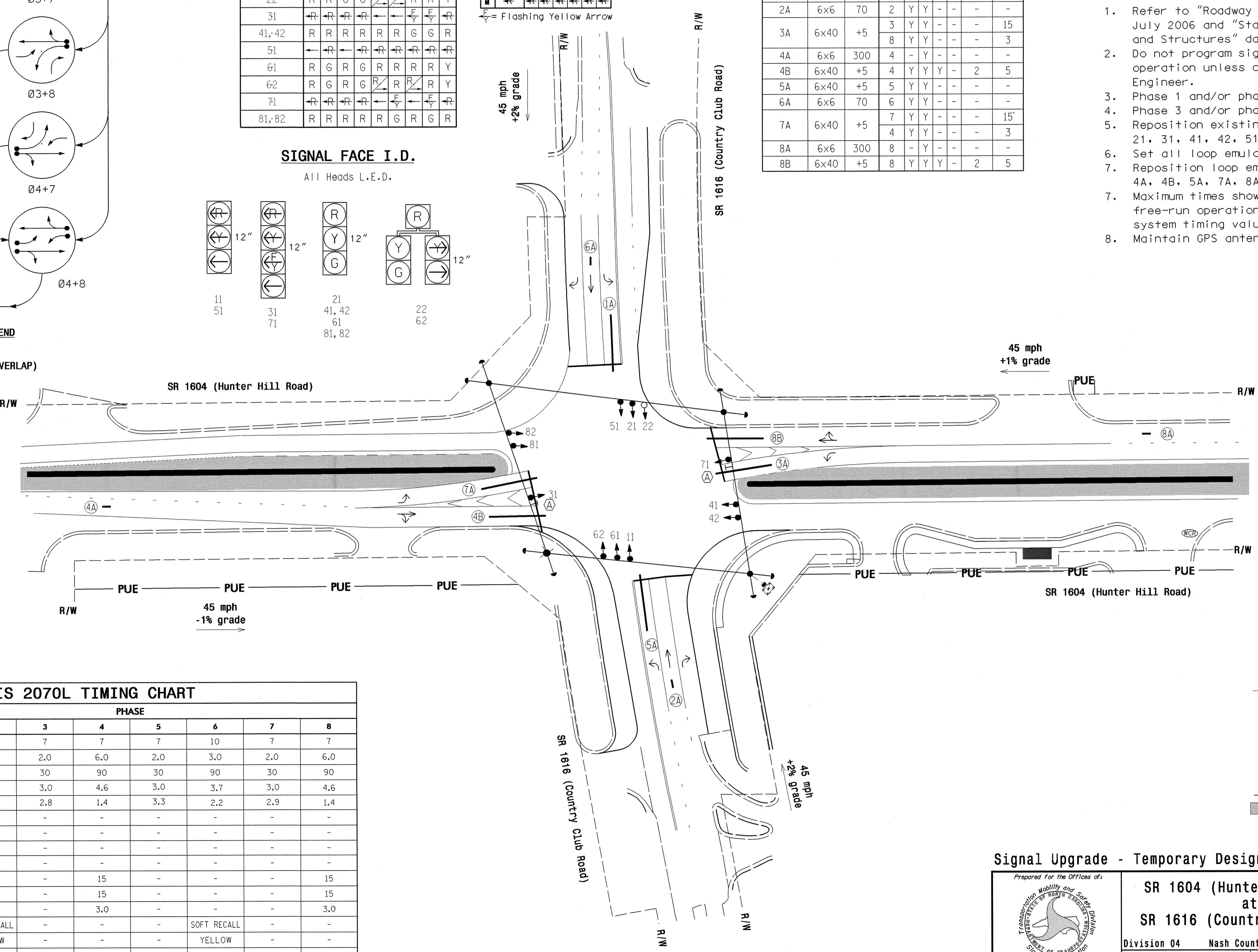
**OASIS 2070L DETECTION INSTALLATION**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING					
			PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	6x40	+5	1	Y	Y	-	-	-
2A	6x6	70	2	Y	Y	-	-	-
3A	6x40	+5	3	Y	Y	-	-	15
			8	Y	Y	-	-	3
4A	6x6	300	4	-	Y	-	-	-
4B	6x40	+5	4	Y	Y	Y	-	2 5
5A	6x40	+5	5	Y	Y	-	-	-
6A	6x6	70	6	Y	Y	-	-	-
7A	6x40	+5	7	Y	Y	-	-	15
			4	Y	Y	-	-	3
8A	6x6	300	8	-	Y	-	-	-
8B	6x40	+5	8	Y	Y	Y	-	2 5

**8 Phase Fully Actuated (Rocky Mount 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 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 21, 31, 41, 42, 51, 71, 81, & 82 as shown.
6. Set all loop emulators to presence mode.
7. Reposition loop emulator zones for 2A, 3A, 4A, 4B, 5A, 7A, 8A & 8B.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Maintain GPS antenna for time synchronization.



**OASIS 2070L TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	2.0	3.0	2.0	6.0	2.0	3.0	2.0	6.0
Max Green 1 *	30	90	30	90	30	90	30	90
Yellow Clearance	3.0	3.7	3.0	4.6	3.0	3.7	3.0	4.6
Red Clearance	3.4	2.2	2.8	1.4	3.3	2.2	2.9	1.4
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	15	-	-	-	15
Time To Reduce *	-	-	-	15	-	-	-	15
Minimum Gap	-	-	-	3.0	-	-	-	3.0
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

**LEGEND**

- |   |  |   |          |
|---|--|---|----------|
| ○ | PROPOSED                                       | ○ | EXISTING |
| ○ | Traffic Signal Head                            | ○ | N/A      |
| ○ | 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      |
| ○ | Directional Drill                              | ○ | N/A      |
| ○ | Wheelchair Ramp                                | ○ | N/A      |
| ○ | Special Sized or Over Sized Junction Box       | ○ | N/A      |
| ○ | Metal Strain Pole                              | ○ | N/A      |
| ○ | PUE - Permanent Utility Easement               | ○ | N/A      |
| ○ | Construction Zone                              | ○ | N/A      |
| ○ | "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)     | ○ | N/A      |

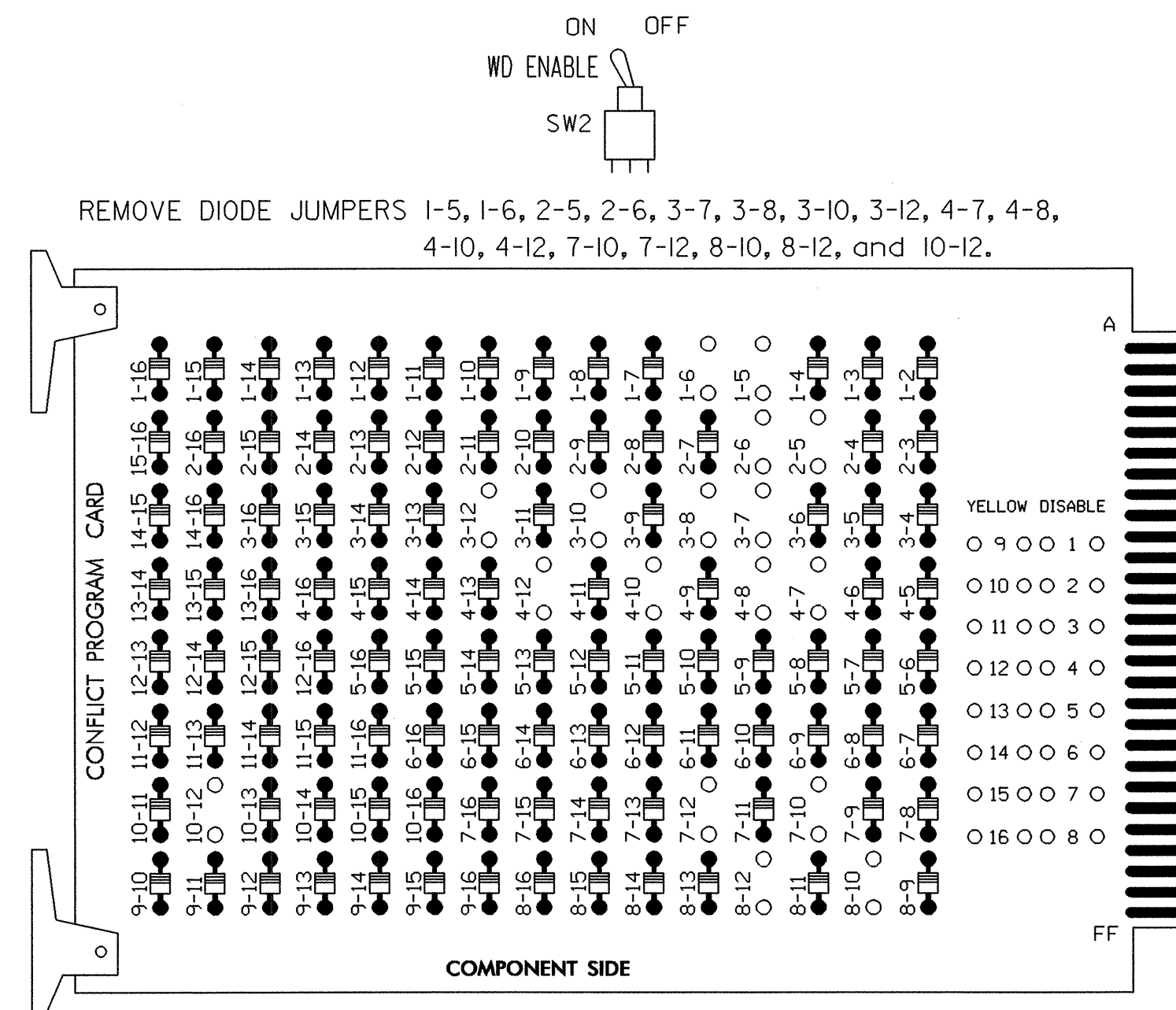
**Signal Upgrade - Temporary Design 3 - Phase 2 Step 7**

	<p>SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)</p>	
	<p>Division 04 Nash County Rocky Mount</p>	<p>PLAN DATE: October 2010 REVIEWED BY: JT Brooks</p>
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>PREPARED BY: LM Moon REVIEWED BY: MR Cooney</p>	<p>SCALE: 1"=40'</p>
<p>REVISIONS</p>	<p>INIT. DATE</p>	<p>SIGNATURE: Lisa M. Moon DATE: 11-7-10</p>
<p>SIG. INVENTORY NO. 04-0599T3</p>		<p>SEAL</p>



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

(remove jumpers and set switches as shown)

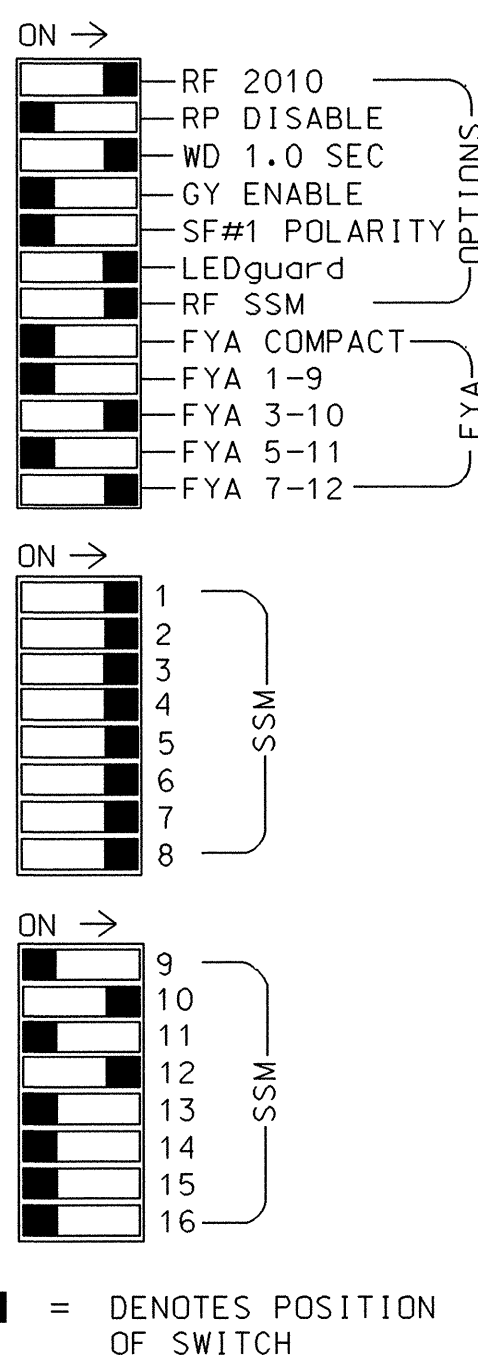


REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 3-7, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 7-10, 7-12, 8-10, 8-12, and 10-12.

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.



■ = 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 9, 11, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 4 and 8 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

**EQUIPMENT INFORMATION**

CONTROLLER.....EXISTING CONTRACTOR SUPPLIED 2070L  
 CABINET.....EXISTING CONTRACTOR SUPPLIED 332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10,S13  
 PHASES USED.....1,2,3,4,5,6,7,8.  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....3+4  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....7+8

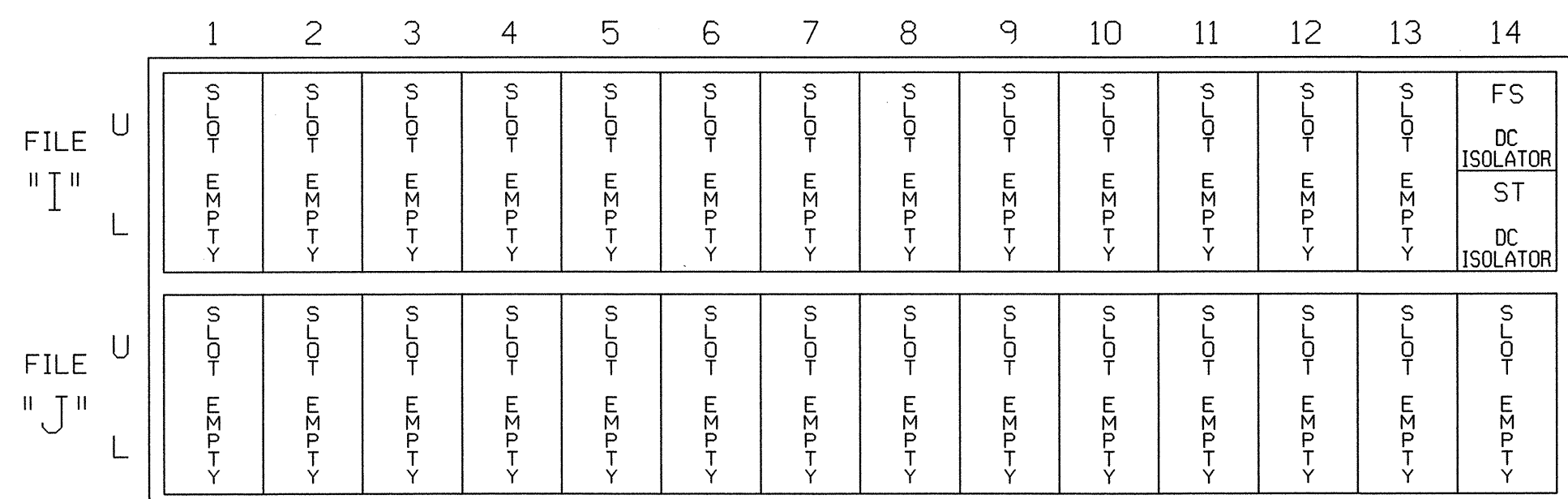
**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	22	31*	41,42	NU	51	61,62	NU	62	71*	81,82	NU	NU	31*	NU	71*	NU
RED		128		*		101			134		*		107						
YELLOW		129				102			135				108						
GREEN		130				103			136				109						
RED ARROW	125							131						A124				A101	
YELLOW ARROW	126			117				132			123			A125				A102	
FLASHING YELLOW ARROW														A126				A103	
GREEN ARROW	127			118	118			133			124	124							

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION**

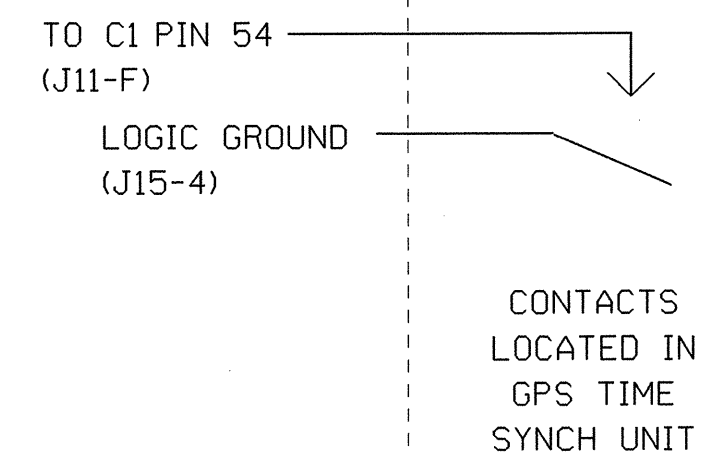
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
 INPUT ASSIGNMENT #.....16  
 DEBOUNCE TIME (0-25.5 SEC).....0.5  
 DELAY TIME (0-25.5 SEC).....0.0  
 HOLD-OVER TIME (0-25.5 SEC).....0.0  
 ASSIGNMENT SELECTION:  
 NOT ENABLED (Y/N).....  
 VEHICLE DETECTOR (1-64).....  
 PEDESTRIAN DETECTOR (1-16).....  
 ALTERNATE PED DETECTOR (1-16).....  
 PREEMPT (1-10).....  
 INVERTED PREEMPT (1-10).....  
 STOP TIME (Y/N).....  
 FLASH SENSE (Y/N).....  
 DOOR OPEN (Y/N).....  
 MANUAL CONTROL ENABLE (Y/N).....  
 MANUAL CONTROL ADVANCE (Y/N).....  
 SPECIAL FUNCTION ALARM (1-8).....  
 TOD HOUR SYNCHRONIZATION (0-23).....5  
 FORCE OFF RING (1-4).....  
 HOLD PHASES (1-16).....  
 PLAN (65=FLSH,66=FREE)... OFFSET#...  
 CHANGE PHASE SEQUENCE PAGE (1-12)...  
 CHANGE PHASE TIMING PAGE (1-4).....  
 CHANGE PHASE CONTROL PAGE (1-4).....  
 CHANGE OVERLAP CONTROL PAGE (1-4).....  
 CHANGE INPUT PAGE (1-4).....  
 CHANGE OUTPUT PAGE (1-4).....  
 OVERRIDE PHASE CONTROL FUNCTION (Y).....

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

**WIRING DETAIL FOR GPS TIME SYNCH UNIT**

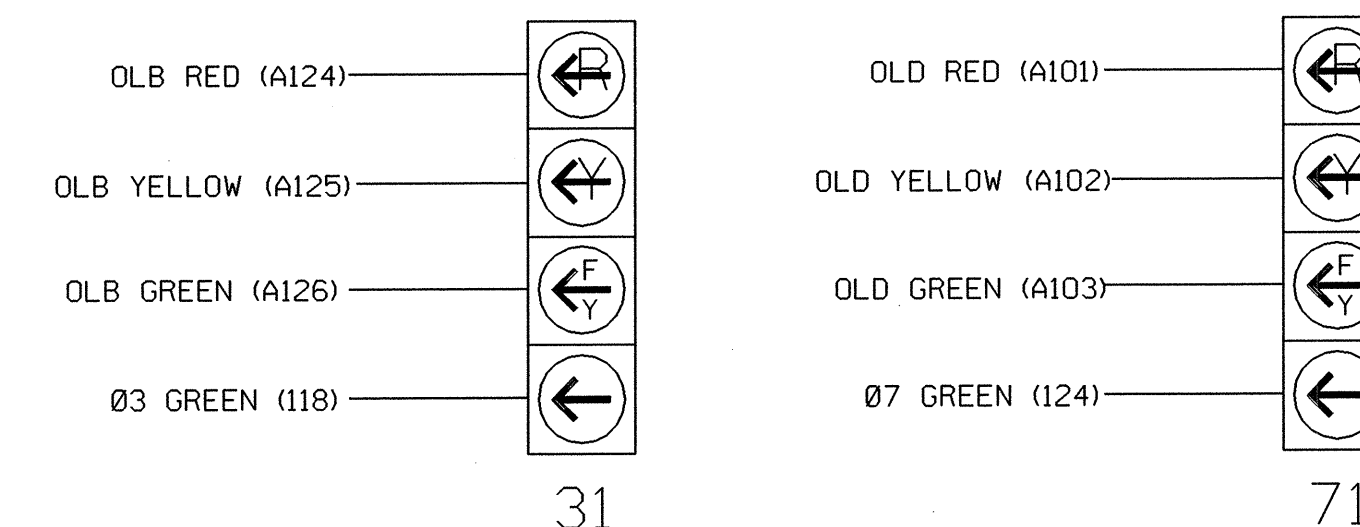


NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

**4 SECTION FYA PPLT SIGNAL WIRING DETAIL**

(wire signal heads as shown)



NOTE

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

**SPECIAL DETECTOR NOTE**

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599T3  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**PBSJ** 1616 EAST HILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

**ELECTRICAL DETAIL SHEET 1 OF 2 - Temporary Design 3**

Prepared for the Offices of: 	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)		SEAL 
	Division 04 Nash County Rocky Mount	PLAN DATE: October 2010 REVIEWED BY:	
PREPARED BY: LM Moon	REVIEWED BY: MR Cooney	REVISIONS	INIT. DATE
750 N. Greenfield Pkwy, Garner, NC 27529		SIGNATURE: <i>Delores Cooney</i> 11-17-10 DATE:	
SIG. INVENTORY NO. 04-0599T3			

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

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)  
IF ACTIVE PHASE #3 IS ON  
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON  
AND RED CLEAR ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #39 ON  
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #5 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)  
IF YELLOW ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

#### OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red  
OUTPUT 40 = Overlap D Yellow  
OUTPUT 41 = Overlap D Green  
OUTPUT 47 = Overlap B Red  
OUTPUT 48 = Overlap B Yellow  
OUTPUT 49 = Overlap B Green

### FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

NOTICE GREEN FLASH

PRESS '+' TWICE

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

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599T3  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

#### ELECTRICAL DETAIL SHEET 2 OF 2 - Temporary Design 3

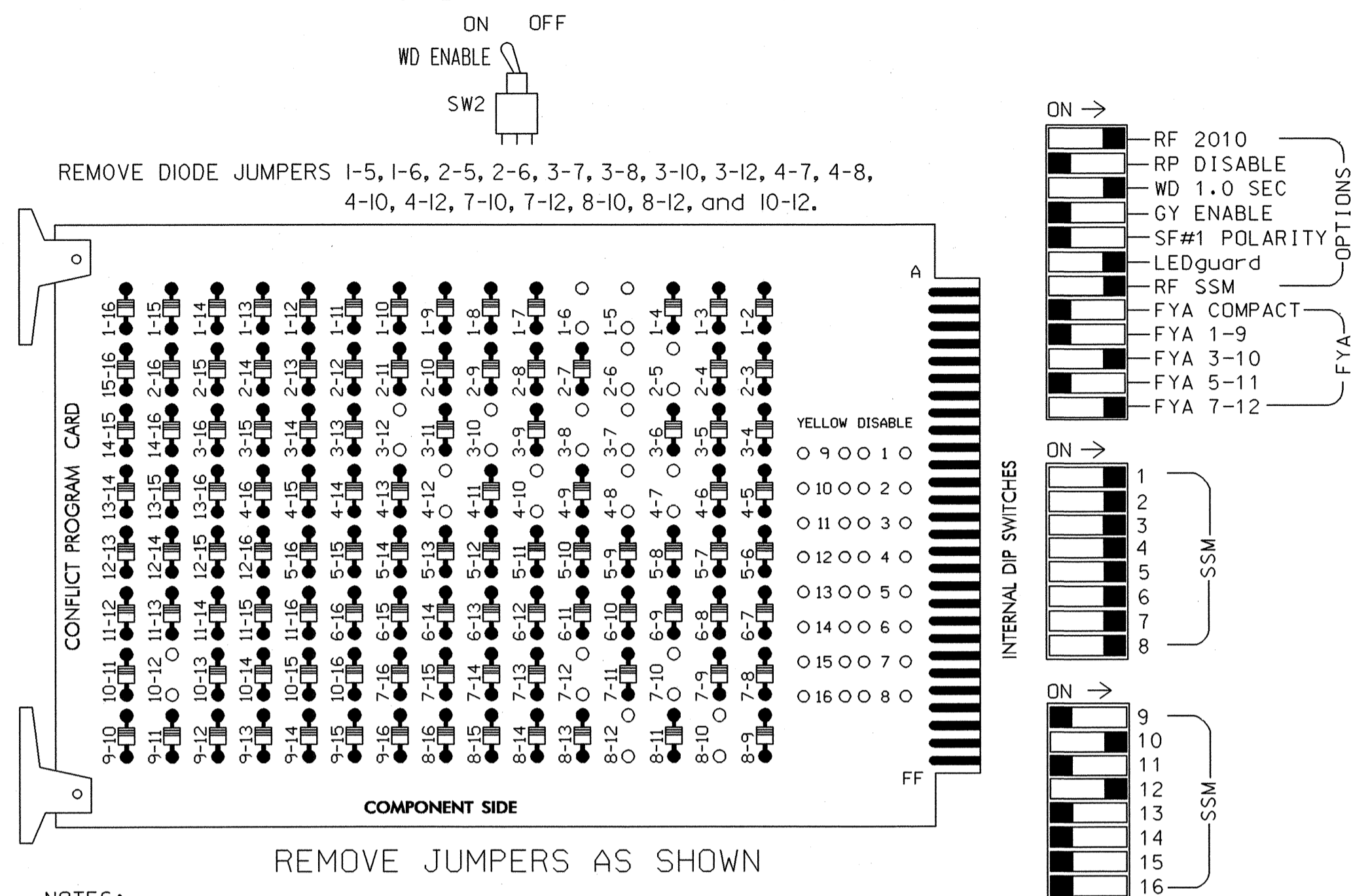
	ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1604 (Hunter Hill Road) at SR 1616 (Country Club Road)	SEAL
	Prepared for the Offices of:	Division 04 Nash County Rocky Mount	
PLAN DATE: October 2010	REVIEWED BY:	SIGNATURE: <i>Melissa R. Cooney</i> 11/17/10	
PREPARED BY: LM Moon	REVIEWED BY: MR Cooney	DATE:	SIG. INVENTORY NO. 04-0599T3
REVISIONS	INIT.	DATE	





### 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.

### INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	∅ 1 1A	∅ 2 2A	∅ 3 3A	∅ 4/SYS 4A/S1	∅ 4 4C	∅ 5 5A	∅ 6 6A	∅ 7 7A	∅ 8 8A	∅ 8 8C	∅ 8 8B	∅ 8 8D	∅ 8 8E	∅ 8 8F
FILE "J" U	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

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

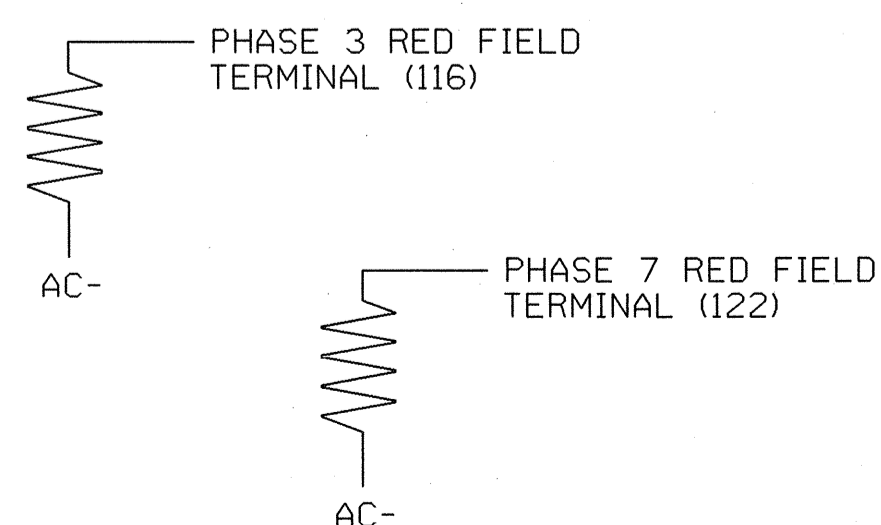
FS = FLASH SENSE  
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



### 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 9, 11, 13, 14, 15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 4 and 8 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....EXISTING CONTRACTOR SUPPLIED 2070L  
CABINET.....EXISTING CONTRACTOR SUPPLIED 332 /W/ AUX SOFTWARE.....ECONOLITE OASIS  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10,S13.  
PHASES USED.....1,2,3,4,5,6,7,8.  
OVERLAP "A".....NOT USED  
OVERLAP "B".....3+4  
OVERLAP "C".....NOT USED  
OVERLAP "D".....7+8

### INPUT FILE CONNECTION & PROGRAMMING CHART

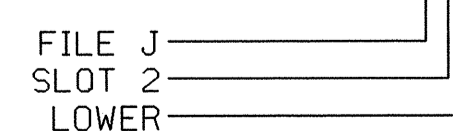
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	-
2A	TB2-5,6	I2U	39	1	2	2	Y	Y	-	-	-
3A <sup>1</sup>	TB4-5,6	I5U	58	20	3	3	Y	Y	-	-	15
	-	J8U	50	12	28	8	Y	Y	-	-	3
4A/S1	TB4-9,10	I6U	41	3	4	4/SYS	-	Y	-	-	-
4B/S2	TB4-11,12	I6L	45	7	14	4/SYS	-	Y	-	-	-
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2	5
4D	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2	5
* S3	TB6-9,10	I9U	60	22	11	SYS	-	-	-	-	-
* S4	TB6-11,12	I9L	62	24	13	SYS	-	-	-	-	-
5A	TB3-1,2	J1U	55	17	5	5	Y	Y	-	-	-
6A	TB3-5,6	J2U	40	2	6	6	Y	Y	-	-	-
7A <sup>2</sup>	TB5-5,6	J5U	57	19	7	7	Y	Y	-	-	15
	-	I8U	49	11	24	4	Y	Y	-	-	3
8A	TB5-9,10	J6U	42	4	8	8	-	Y	-	-	-
8B	TB5-11,12	J6L	46	8	18	8	-	Y	-	-	-
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2	5
8D	TB7-3,4	J7L	79	41	48	8	Y	Y	Y	2	5

<sup>1</sup>Add jumper from I5-W to J8-W, on rear of input file.

<sup>2</sup>Add jumper from J5-W to I8-W, on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L



### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	22	31	41,42	NU	51	61,62	NU	62	71	81,82	NU	31	NU	71	NU
RED		128		*	101			134		*	107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125							131						A124				A101
YELLOW ARROW	126			117				132		123				A125				A102
FLASHING YELLOW ARROW														A126				A103
GREEN ARROW	127			118	118			133		124	124							

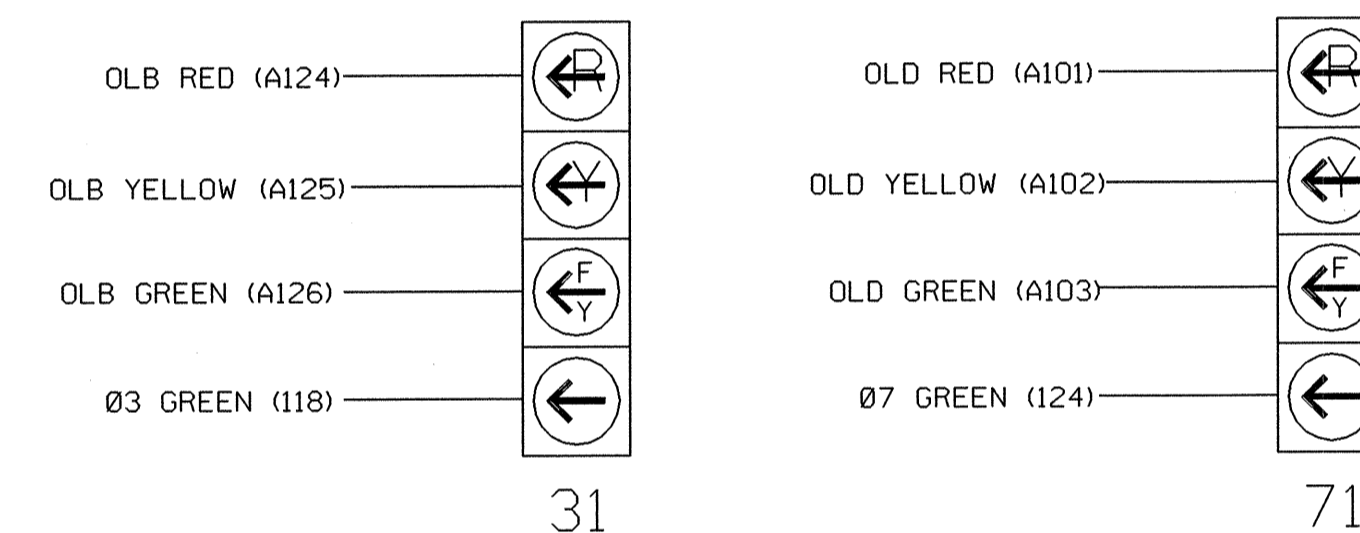
NU = Not Used

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

★ See pictorial of head wiring in detail below.

### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

### ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1604 (Hunter Hill Road)  
at  
SR 1616 (Country Club Road)

Division 04 Nash County Rocky Mount

PLAN DATE: October 2010

PREPARED BY: LM Moon

REVIEWED BY: MR Cooney

REVISIONS



750 N. Greenfield Pkwy, Garner, NC 27529

SEAL



SIGNATURE DATE

SIG. INVENTORY NO. 04-0599



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

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)  
IF ACTIVE PHASE #3 IS ON  
AND RED CLEAR ON PHASE #3 IS ON

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #49 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #48 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON  
AND RED CLEAR ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #39 ON  
SET OUTPUT ASSIGNMENT #40 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #5 (+/-COMMAND#)  
IF ACTIVE PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #41 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)  
IF YELLOW ON PHASE #7 IS ON

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #40 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

#### OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red  
OUTPUT 40 = Overlap D Yellow  
OUTPUT 41 = Overlap D Green  
OUTPUT 47 = Overlap B Red  
OUTPUT 48 = Overlap B Yellow  
OUTPUT 49 = Overlap B Green

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' ONCE

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

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

NOTICE GREEN FLASH

PRESS '+' TWICE

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

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

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

### INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION

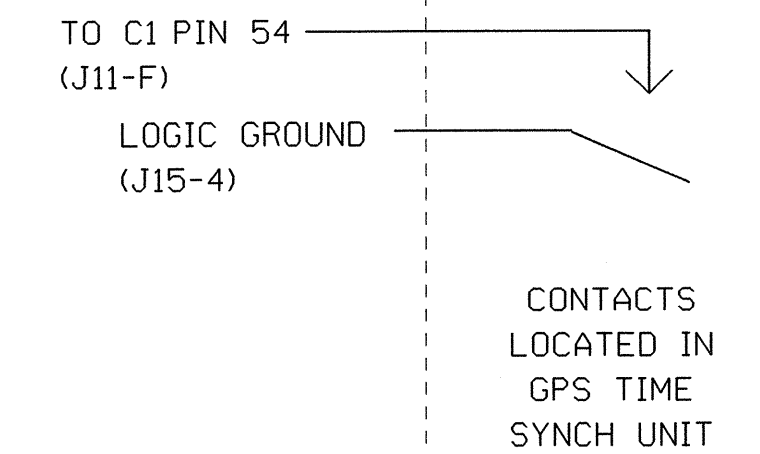
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
INPUT ASSIGNMENT #.....16  
DEBOUNCE TIME (0-25.5 SEC).....0.5  
DELAY TIME (0-25.5 SEC).....0.0  
HOLD-OVER TIME (0-25.5 SEC).....0.0  
ASSIGNMENT SELECTION:  
NOT ENABLED (Y/N).....  
VEHICLE DETECTOR (1-64).....  
PEDESTRIAN DETECTOR (1-16).....  
ALTERNATE PED DETECTOR (1-16).....  
PREEMPT (1-10).....  
INVERTED PREEMPT (1-10).....  
STOP TIME (Y/N).....  
FLASH SENSE (Y/N).....  
DOOR OPEN (Y/N).....  
MANUAL CONTROL ENABLE (Y/N).....  
MANUAL CONTROL ADVANCE (Y/N).....  
SPECIAL FUNCTION ALARM (1-8).....  
TOD HOUR SYNCHRONIZATION (0-23).....5  
FORCE OFF RING (1-4).....  
HOLD PHASES (1-16).....  
PLAN (65=FLSH,66=FREE)... OFFSET#...  
CHANGE PHASE SEQUENCE PAGE (1-12)...  
CHANGE PHASE TIMING PAGE (1-4).....  
CHANGE PHASE CONTROL PAGE (1-4).....  
CHANGE OVERLAP CONTROL PAGE (1-4)...  
CHANGE INPUT PAGE (1-4).....  
CHANGE OUTPUT PAGE (1-4).....  
OVERRIDE PHASE CONTROL FUNCTION (Y)...

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

### WIRING DETAIL FOR GPS TIME SYNCH UNIT



NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

### FLASHER CIRCUIT MODIFICATION DETAIL

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

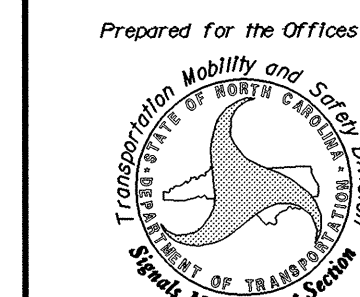
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0599  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

#### ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



SR 1604 (Hunter Hill Road)  
at  
SR 1616 (Country Club Road)

Division 04 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY:

PREPARED BY: LM Moon REVIEWED BY: MR Cooney

REVISIONS INIT. DATE

SIGNATURE DATE

SIG. INVENTORY NO. 04-0599

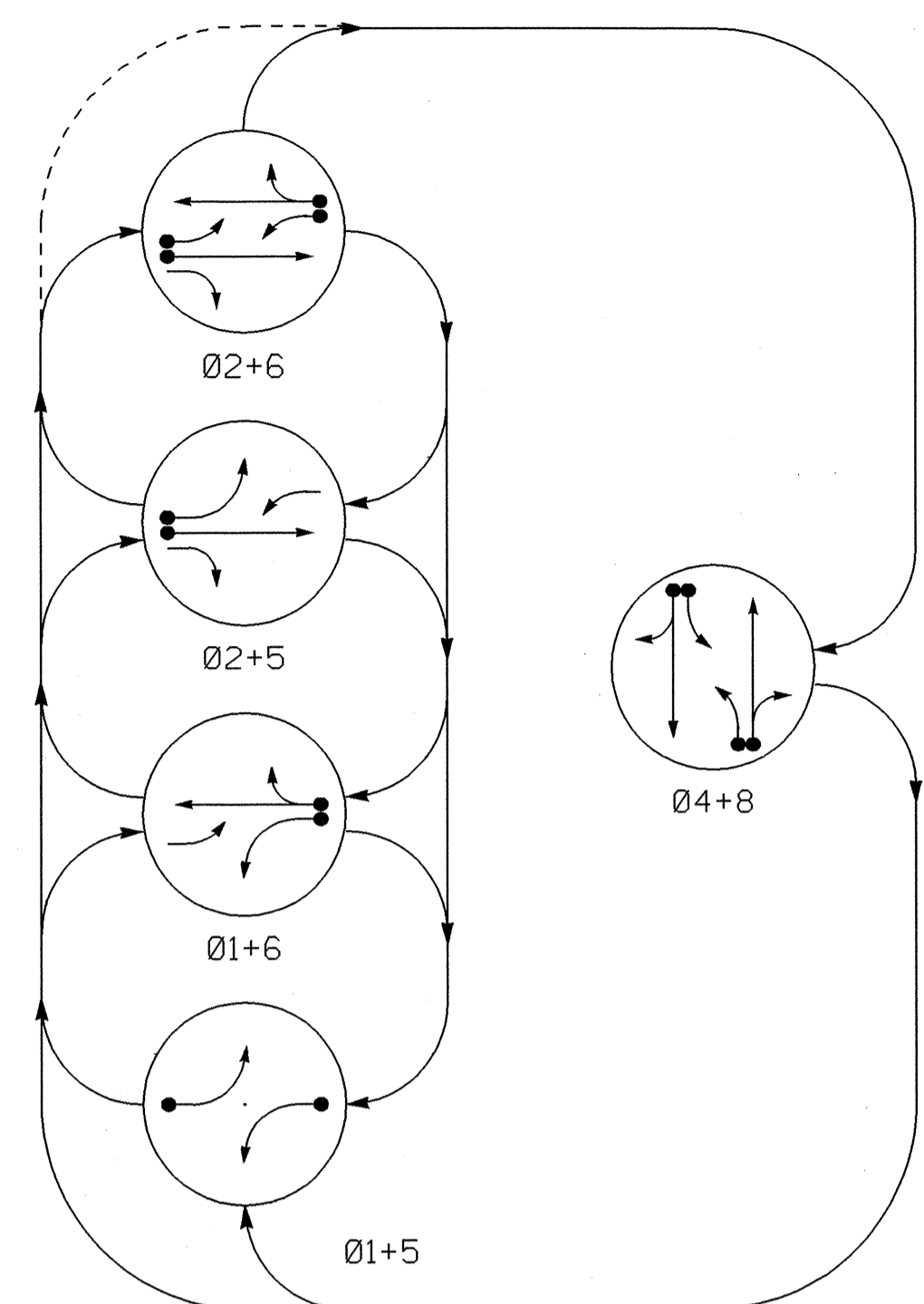
PBSJ 1616 EAST WILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326



SIGNATURE DATE

SIG. INVENTORY NO. 04-0599

**PHASING DIAGRAM**

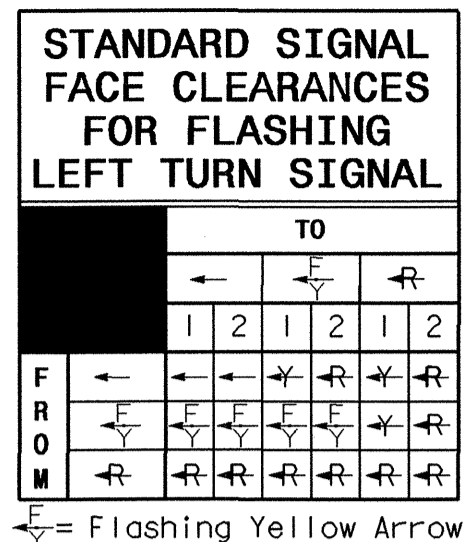


**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

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



**OASIS 2070L DETECTION INSTALLATION**

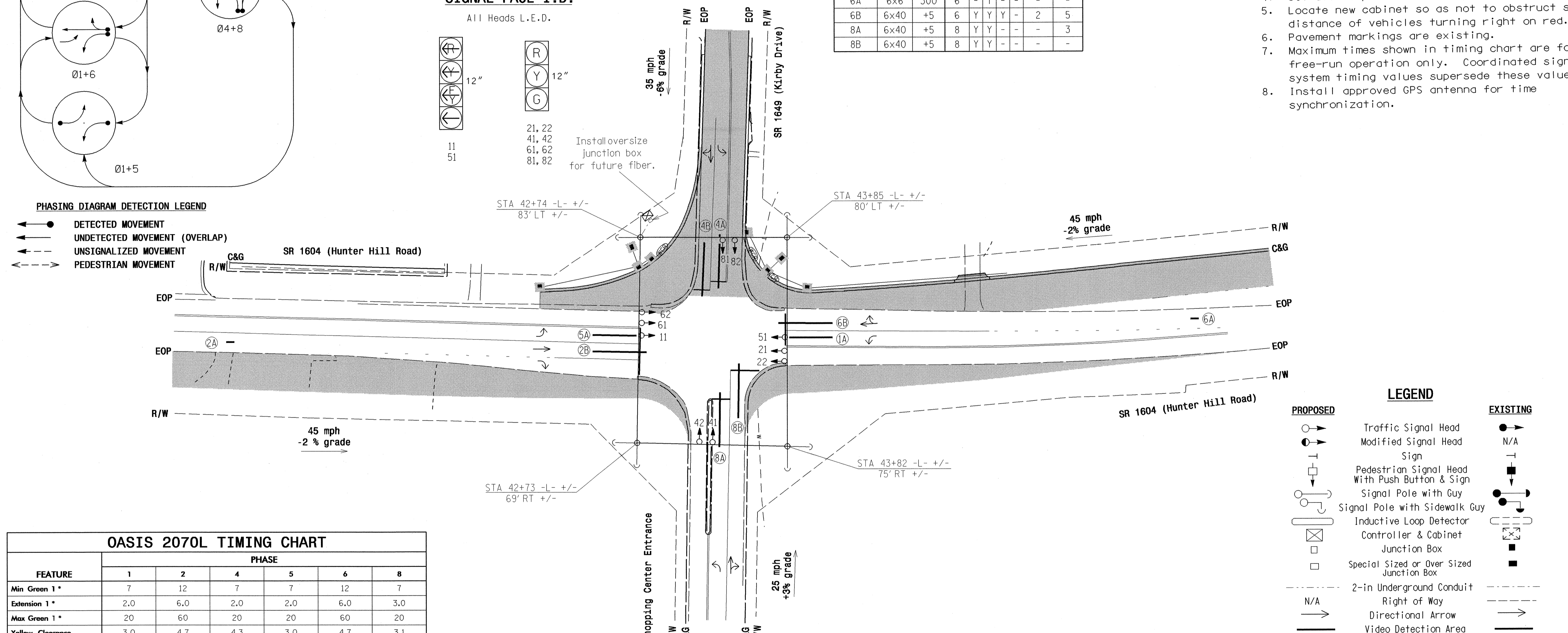
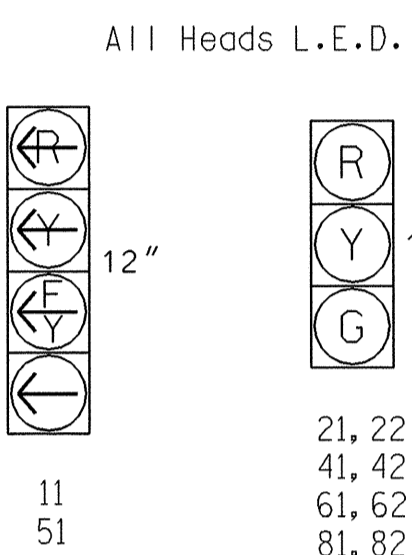
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING						
			PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME
1A	6x40	+5	1	Y	Y	-	-	-	15
2A	6x6	300	2	-	Y	-	-	-	-
2B	6x40	+5	2	Y	Y	-	-	2	5
4A	6x40	+5	4	Y	Y	-	-	-	3
4B	6x40	+5	4	Y	Y	-	-	-	-
5A	6x40	+5	5	Y	Y	-	-	-	15
6A	6x6	300	6	-	Y	-	-	-	-
6B	6x40	+5	6	Y	Y	-	-	2	5
8A	6x40	+5	8	Y	Y	-	-	-	3
8B	6x40	+5	8	Y	Y	-	-	-	-

**5 Phase Fully Actuated (Rocky Mount 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 and/or phase 5 may be lagged.
- Set all loop emulators to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red. Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Install approved GPS antenna for time synchronization.

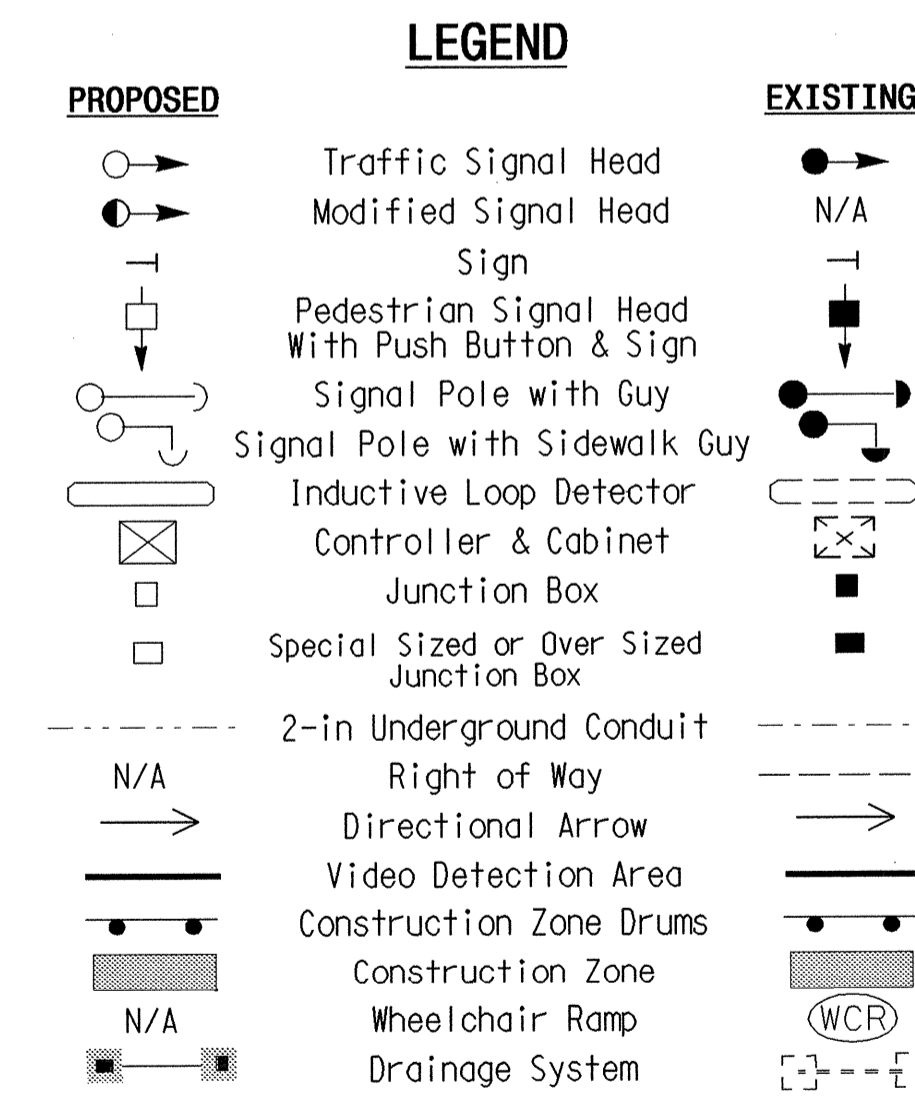
**SIGNAL FACE I.D.**



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	3.0
Max Green 1 *	20	60	20	20	60	20
Yellow Clearance	3.0	4.7	4.3	3.0	4.7	3.1
Red Clearance	2.4	1.3	1.3	2.4	1.3	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	15	-	-	15	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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



**Signal Upgrade - Temporary Design 1 - TCP Phase 1 Step 2**

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

**SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)**

Division 4 Nash County Rocky Mount  
 PLAN DATE: October 2010 REVIEWED BY: L.W. Moon  
 PREPARED BY: MR Cooney REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 1" = 40'

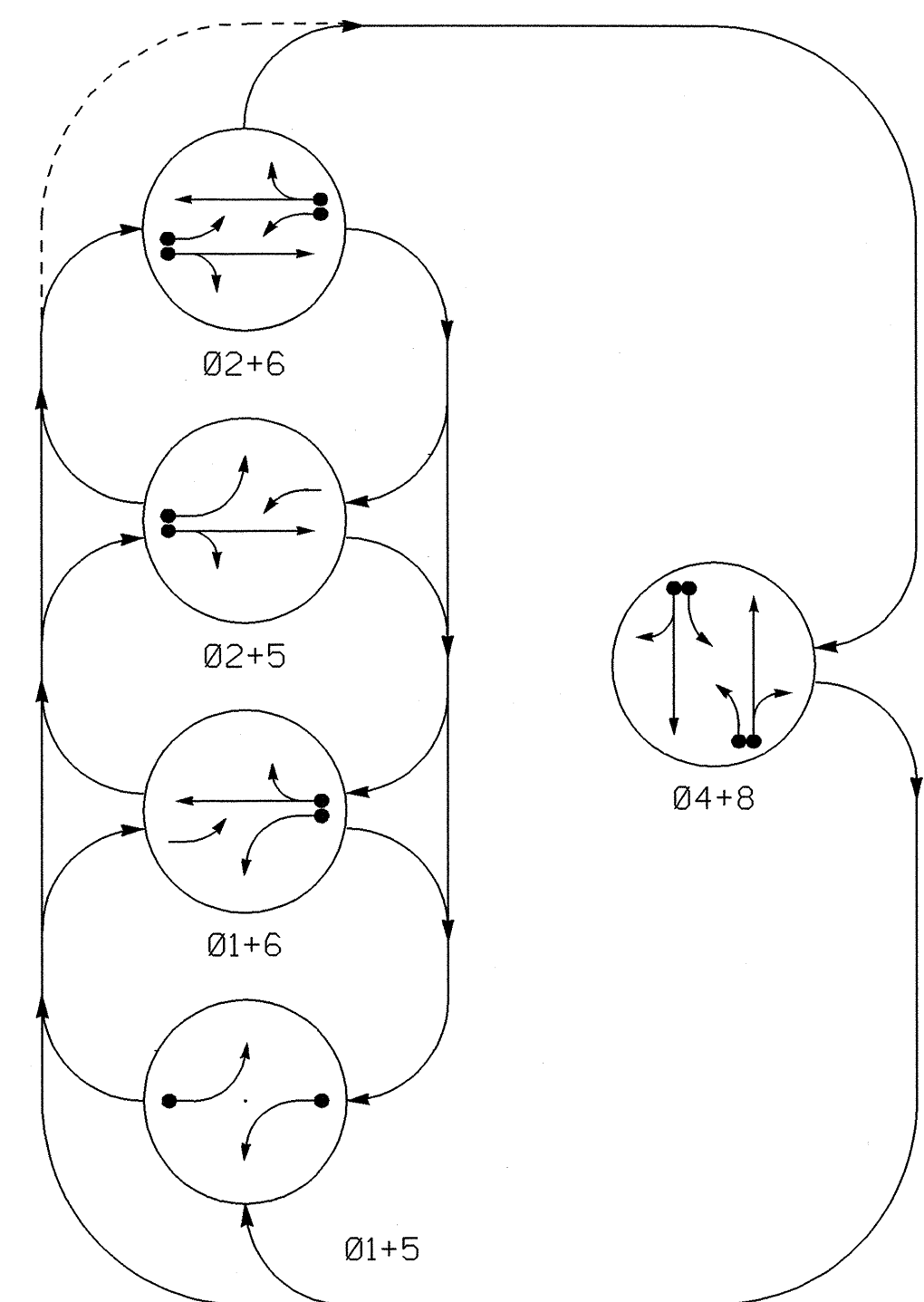
SIG. INVENTORY NO. 04-1299T1

**PBS&J** 1616 EAST MILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

17-NOV-2010 14:23:05  
 G:\IT\Cur\000071195 U-3621B Signal\sig14-1299T1.dgn  
 10/23/10 11:17:10



PHASING DIAGRAM



**TABLE OF OPERATION**

SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	F
11	←	←	←	←	←	←
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

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

	TO			
	1	2	1	2
FROM	←	←	←	←
FROM	←	←	←	←
FROM	←	←	←	←

← = Flashing Yellow Arrow

**OASIS 2070L DETECTION INSTALLATION**

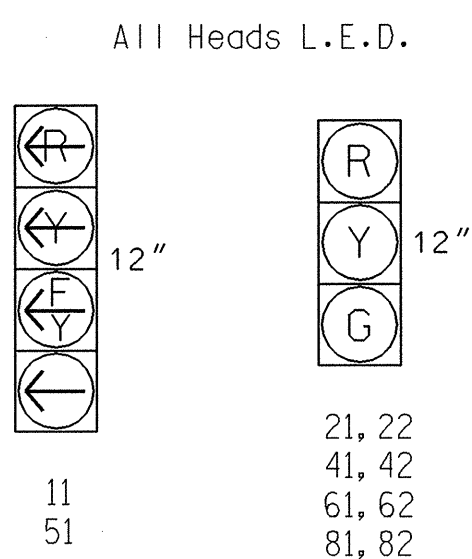
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING				
			PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP
1A	6x40	+5	1	Y	Y	-	15
2A	6x6	300	2	-	Y	-	-
2B	6x40	+5	2	Y	Y	-	5
4A	6x40	+5	4	Y	Y	-	3
4B	6x40	+5	4	Y	Y	-	-
5A	6x40	+5	5	Y	Y	-	15
6A	6x6	300	6	-	Y	-	-
6B	6x40	+5	6	Y	Y	-	5
8A	6x40	+5	8	Y	Y	-	3
8B	6x40	+5	8	Y	Y	-	-

5 Phase Fully Actuated (Rocky Mount Signal System)

NOTES

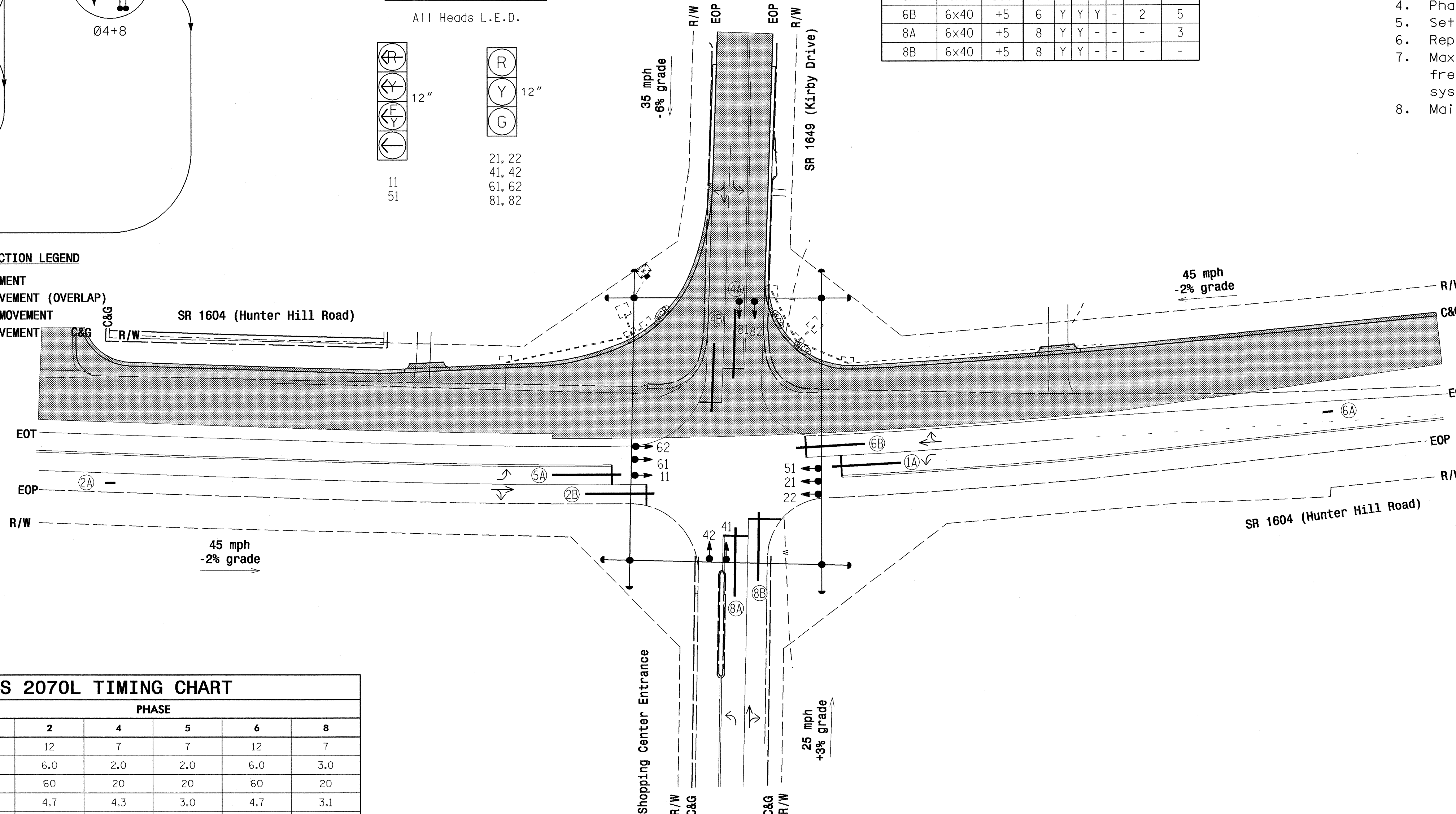
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads 11, 21, 22, 51, 61, and 62.
- Phase 1 and/or 5 may be lagged.
- Set all loop emulators to presence mode.
- Reposition all loop emulator zones.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

SIGNAL FACE I.D.



PHASING DIAGRAM DETECTION LEGEND

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



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	3.0
Max Green 1 *	20	60	20	20	60	20
Yellow Clearance	3.0	4.7	4.3	3.0	4.7	3.1
Red Clearance	2.6	1.1	1.2	2.8	1.1	1.7
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	15	-	-	15	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

**LEGEND**

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
○ → Modified Signal Head	○ → 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	⊗ Inductive Loop Detector
⊗ Controller & Cabinet	⊗ Controller & Cabinet
⊗ Junction Box	⊗ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
□ Special Sized or Over Sized Junction Box	□ Special Sized or Over Sized Junction Box
Video Detection Area	Video Detection Area
Construction Zone Drums	Construction Zone Drums
Construction Zone	Construction Zone
N/A Wheelchair Ramp	WCR Wheelchair Ramp
N/A Drainage System	Drainage System

Signal Upgrade - Temporary Design 2 - TCP Phase 1 Step 9

Prepared for the Offices of:

**SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)**

Division 4 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY: LN Moon

PREPARED BY: MR Cooney REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 1"=40'

750 N. Greenfield Pkwy, Garner, NC 27529

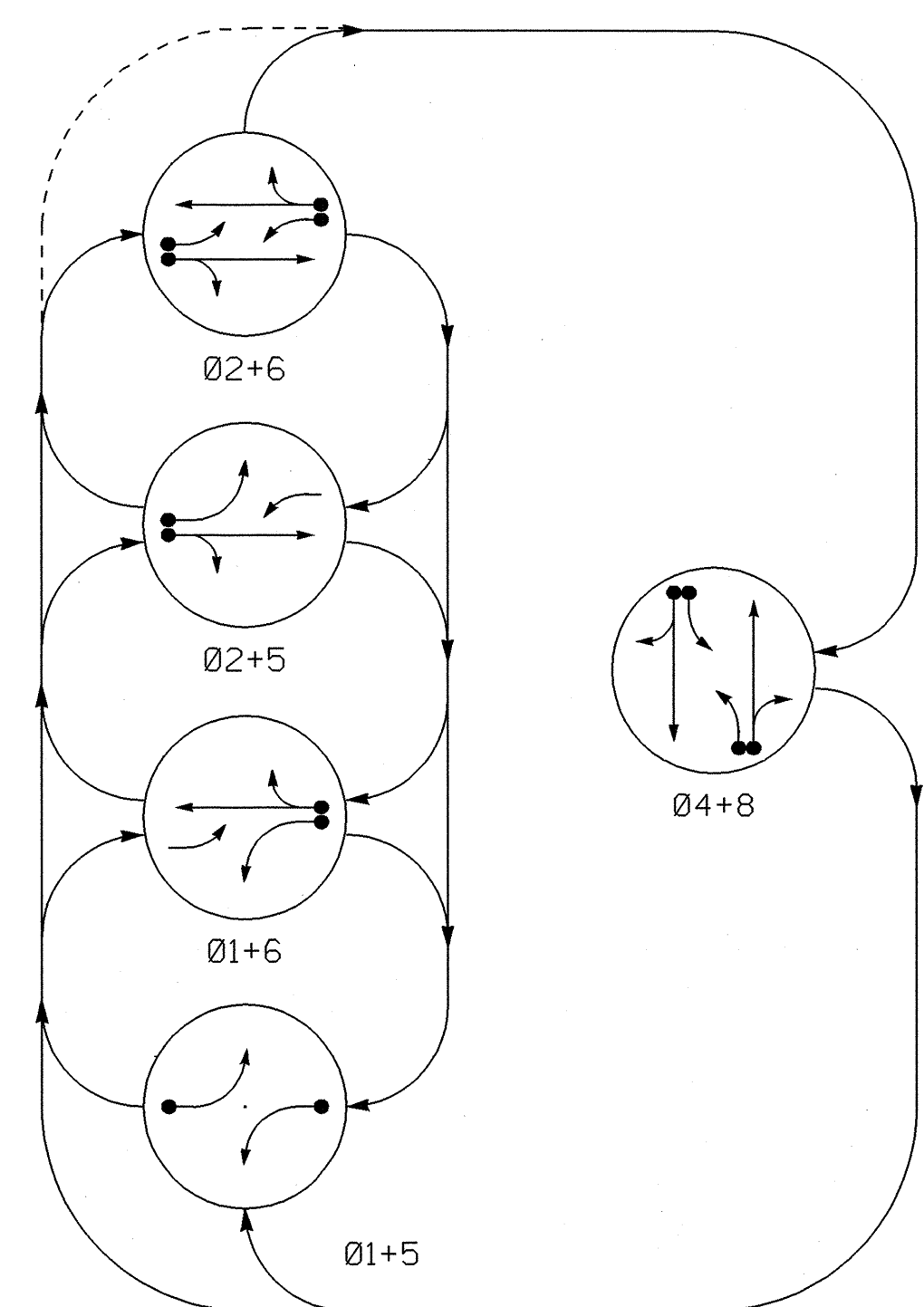
1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBELS #F-0326

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 LISA M. MOON

SIG. INVENTORY NO. 04-129912



**PHASING DIAGRAM**

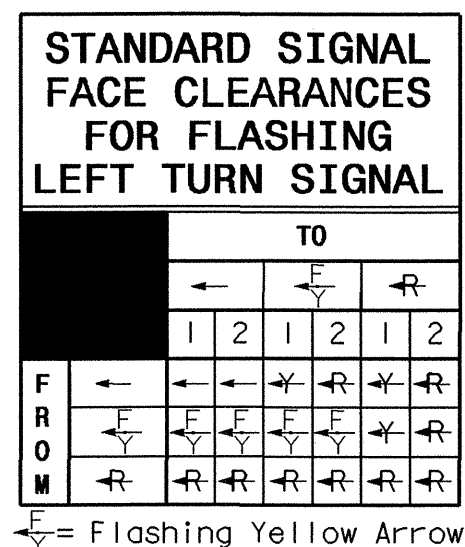


**PHASING DIAGRAM DETECTION LEGEND**

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

**TABLE OF OPERATION**

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



**OASIS 2070L DETECTION INSTALLATION**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING					
			PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME
1A	6x40	+5	1	Y	Y	-	-	15
2A	6x6	300	2	-	Y	-	-	-
2B	6x40	+5	2	Y	Y	-	-	5
4A	6x40	+5	4	Y	Y	-	-	3
4B	6x40	+5	4	Y	Y	-	-	-
5A	6x40	+5	5	Y	Y	-	-	15
6A	6x6	300	6	-	Y	-	-	-
6B	6x40	+5	6	Y	Y	-	-	5
8A	6x40	+5	8	Y	Y	-	-	3
8B	6x40	+5	8	Y	Y	-	-	-

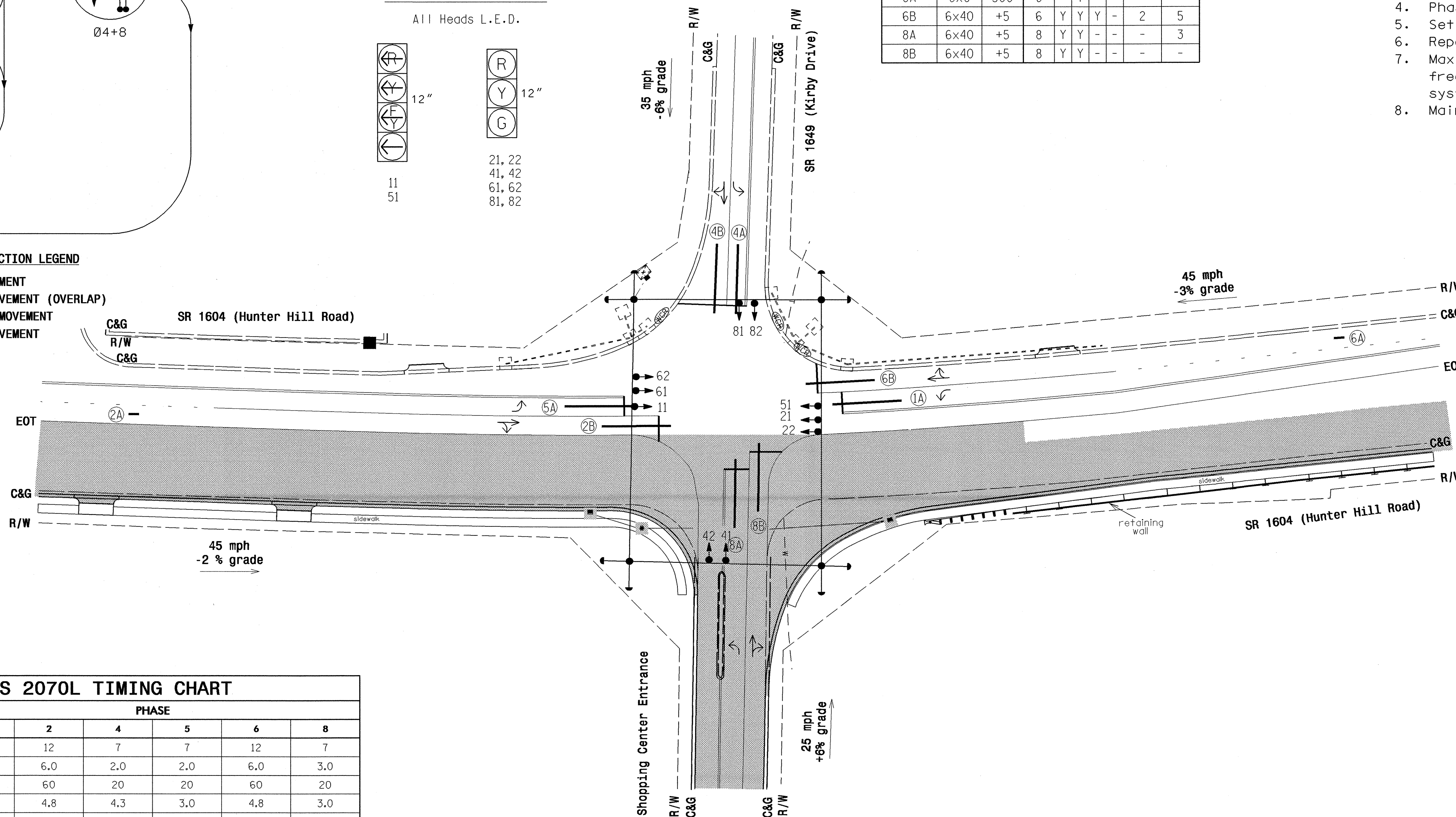
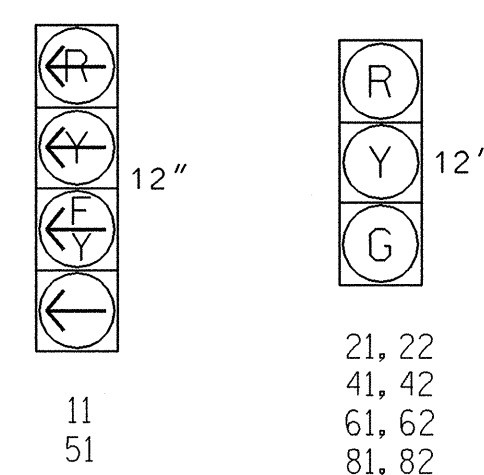
**5 Phase Fully Actuated (Rocky Mount Signal System)**

**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.
- Reposition existing signal heads 11, 21, 22, 51, 61, and 62.
- Phase 1 and/or phase 5 may be lagged.
- Set all loop emulators to presence mode.
- Reposition all loop emulator zones
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

**SIGNAL FACE I.D.**

All Heads L.E.D.



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	3.0
Max Green 1 *	20	60	20	20	60	20
Yellow Clearance	3.0	4.8	4.3	3.0	4.8	3.0
Red Clearance	2.6	1.1	1.5	2.6	1.1	1.8
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	15	-	-	15	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

**LEGEND**

PROPOSED	EXISTING
○ Traffic Signal Head	● N/A
○ 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
□ Special Sized or Over Sized Junction Box	□ N/A
--- Video Detection Area	--- N/A
--- Construction Zone Drums	--- N/A
--- Construction Zone	--- N/A
--- Wheelchair Ramp	--- (WCR)
--- Drainage System	--- (---)

**Signal Upgrade - Temporary Design 3 - TCP Phase 1A Step 8**

Prepared for the Offices of:

**SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)**

Division 4 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY: LW Moon

PREPARED BY: MR Cooney REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27529

1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-8888 NCBELS #F-0326

SCALE: 1"=40'

REVISIONS: INIT. DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 J. M. MOON

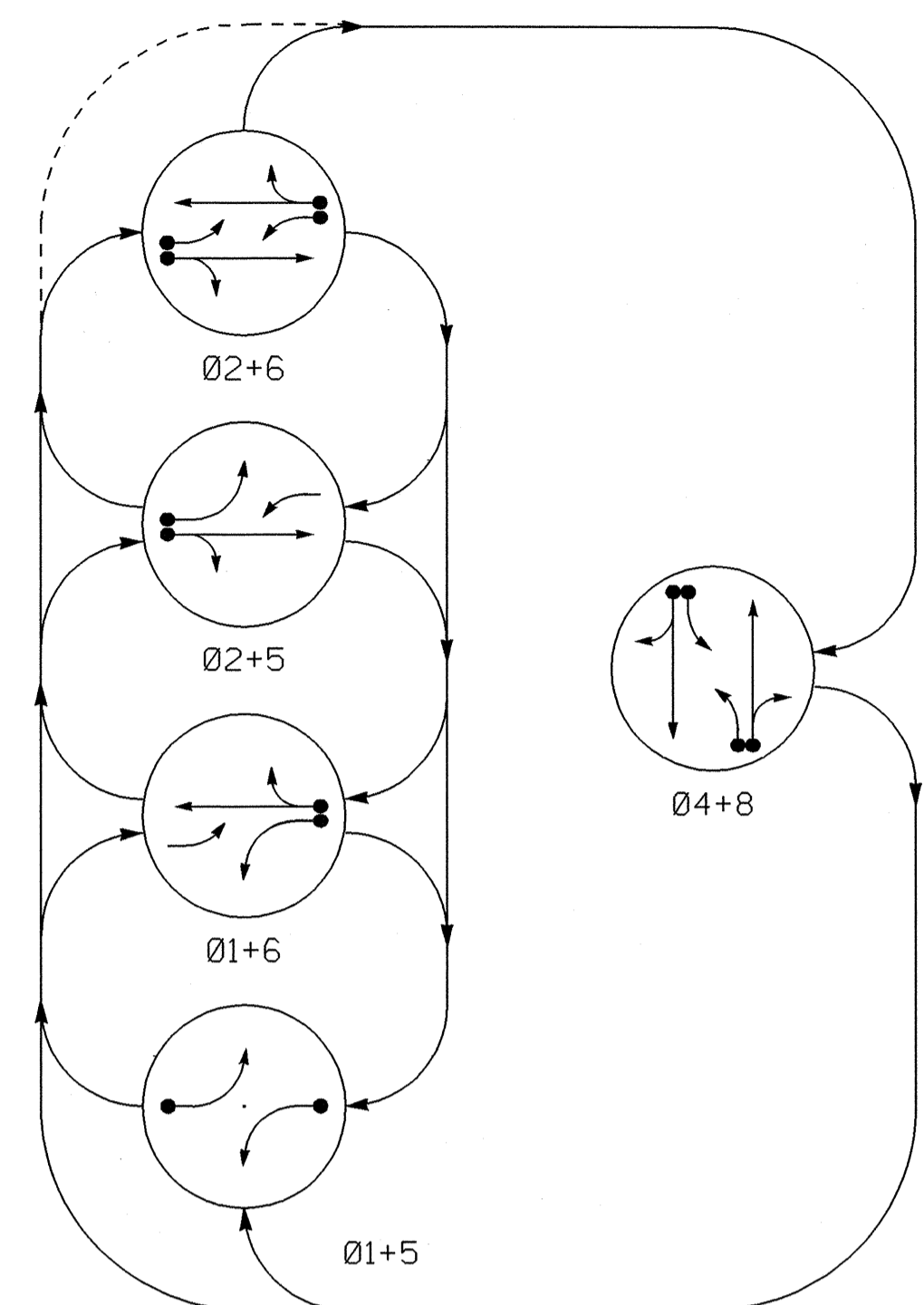
SIGNATURE: J. M. MOON DATE: 11-17-10

SIG. INVENTORY NO. 04-1299T3

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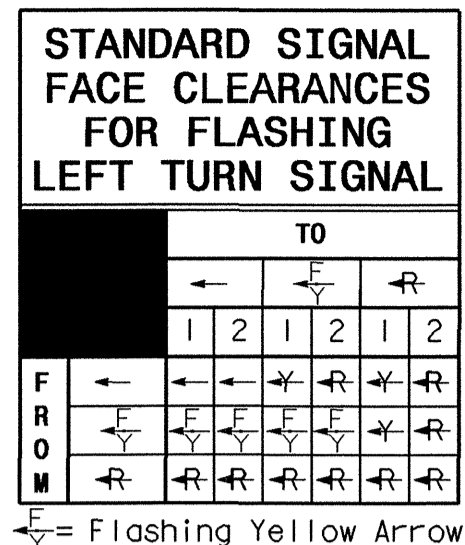


PHASING DIAGRAM



**TABLE OF OPERATION**

SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FL
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	←	←	←	←	←
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R



**OASIS 2070L DETECTION INSTALLATION**

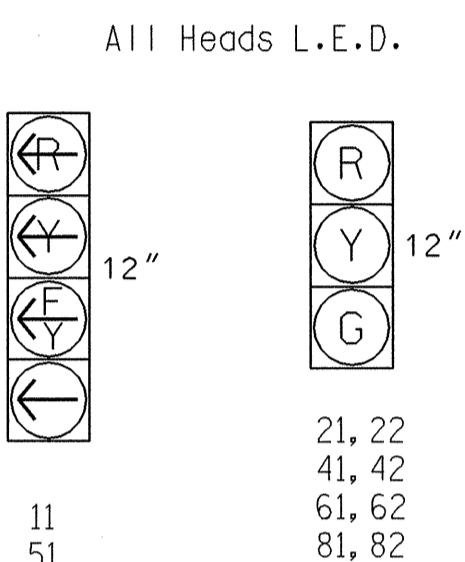
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING						
			PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME
1A	6x40	+5	1	Y	Y	-	-	15	
			6	Y	Y	Y	-	3	
2A	6x6	300	2	-	Y	-	-	-	
			2B	6x40	+5	2	Y	Y	Y
4A	6x40	+5	4	Y	Y	-	-	3	
			4B	6x40	+5	4	Y	Y	-
5A	6x40	+5	5	Y	Y	-	-	15	
			2	Y	Y	Y	-	3	
6A	6x6	300	6	-	Y	-	-	-	
			6B	6x40	+5	6	Y	Y	Y
8A	6x40	+5	8	Y	Y	-	-	-	
			8B	6x40	+5	8	Y	Y	-

**5 Phase Fully Actuated (Rocky Mount Signal System)**

NOTES

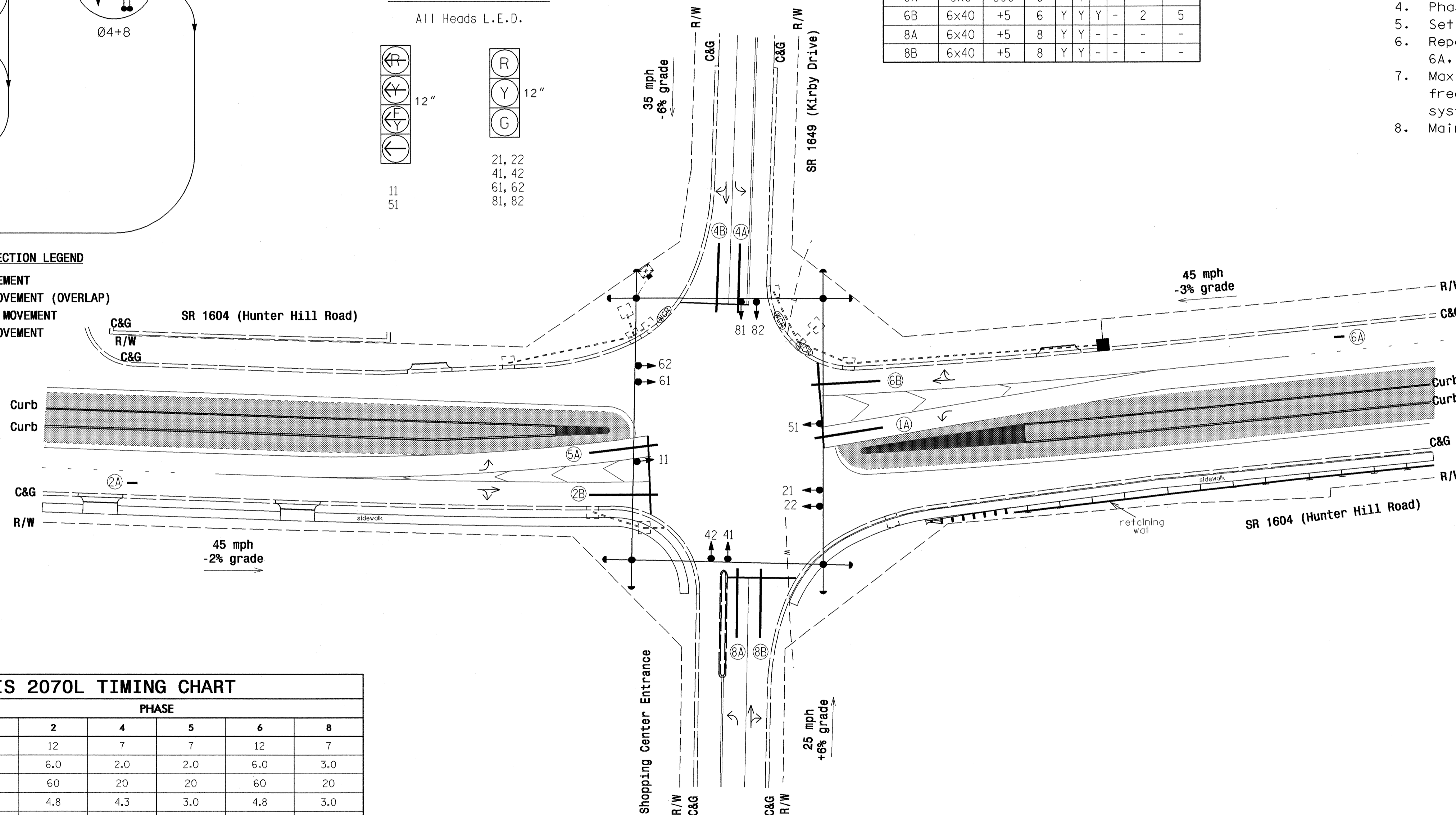
- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads 11, 21, 22, 51, 61, & 62.
- Phase 1 and/or phase 5 may be lagged.
- Set all loop emulators to presence mode.
- Reposition loop emulator zones 1A, 2A, 5A, 6A, 8A & 8B.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

SIGNAL FACE I.D.



PHASING DIAGRAM DETECTION LEGEND

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



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	3.0
Max Green 1 *	20	60	20	20	60	20
Yellow Clearance	3.0	4.8	4.3	3.0	4.8	3.0
Red Clearance	2.6	1.1	2.4	2.8	1.1	3.3
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	15	-	-	15	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

**LEGEND**

PROPOSED	EXISTING
Traffic Signal Head	N/A
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
Special Sized or Over Sized Junction Box	N/A
Video Detection Area	N/A
Construction Zone Drums	N/A
Construction Zone	N/A
N/A	Wheelchair Ramp
N/A	Drainage System

Signal Upgrade - Temporary Design 4 - TCP Phase 2 Step 7

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

**SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)**

Division 4 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY: LM Moon

PREPARED BY: MR Cooney REVIEWED BY:

REVISIONS: INIT. DATE

SCALE: 0 40  
1"=40'

17-NOV-2010 14:29:55 U-3621B Signal\sig\04-129974.dgn  
 33853 - AT RALPH PERKINS

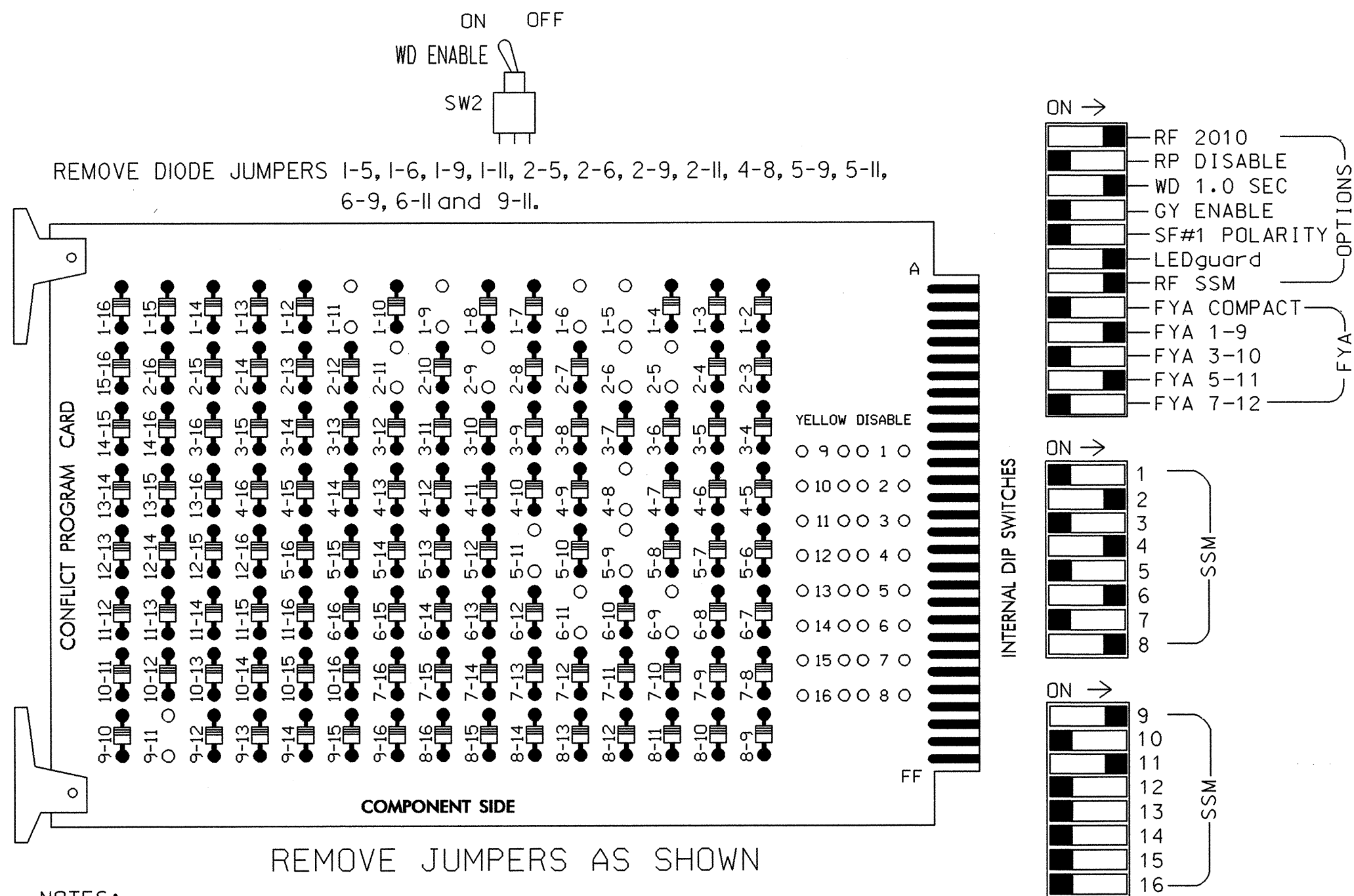
1616 EAST MILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 022516  
 LISA M. MOON

Sig. Inventory No. 04-129974

**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 1,3,5,7, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

**SIGNAL HEAD HOOK-UP CHART**

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

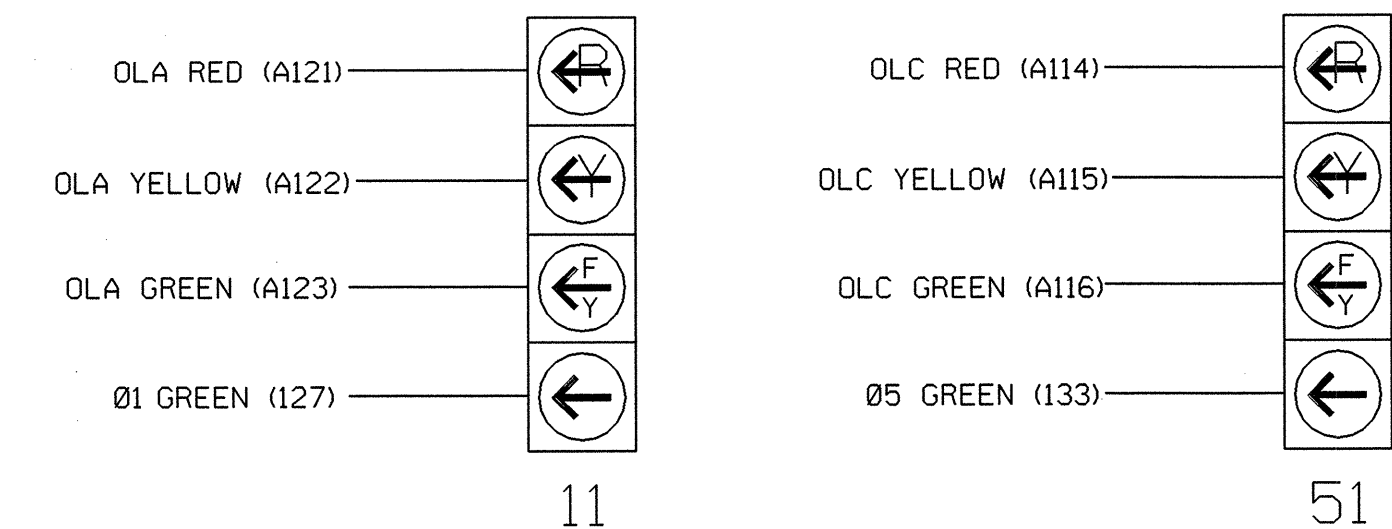
NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 ★ See pictorial of head wiring in detail below.

**EQUIPMENT INFORMATION**

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8,S9,S12.  
 PHASES USED.....1,2,4,5,6,8.  
 OVERLAP "A".....1+2  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....5+6  
 OVERLAP "D".....NOT USED

**4 SECTION FYA PPLT SIGNAL WIRING DETAIL**

(wire signal heads as shown)

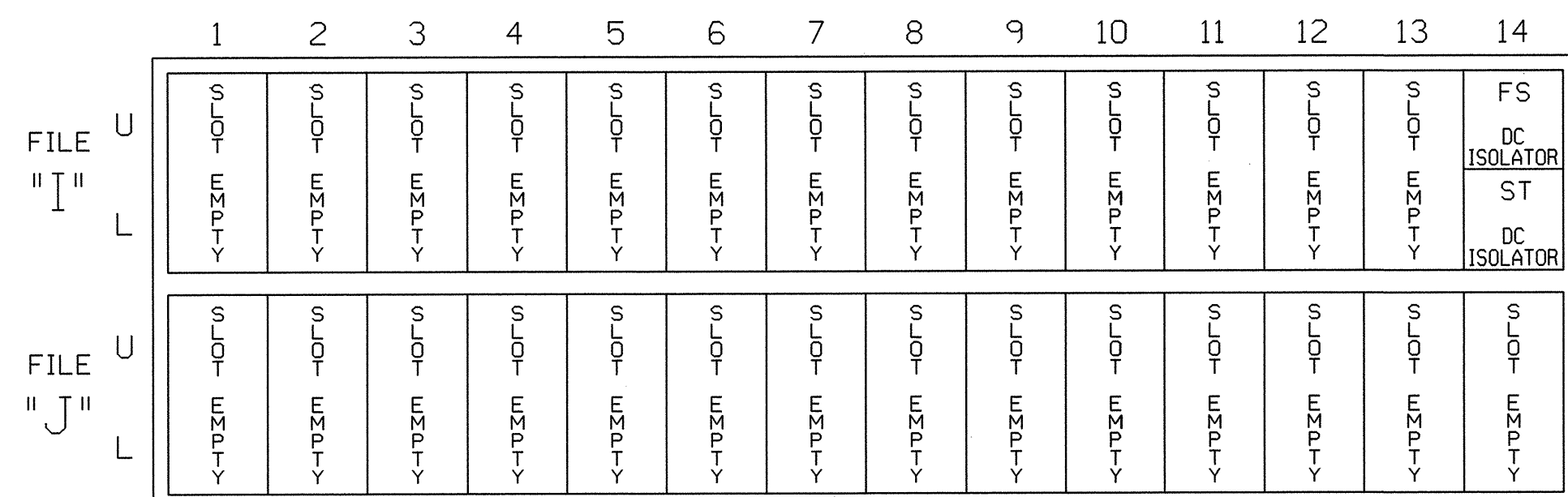


**NOTE**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

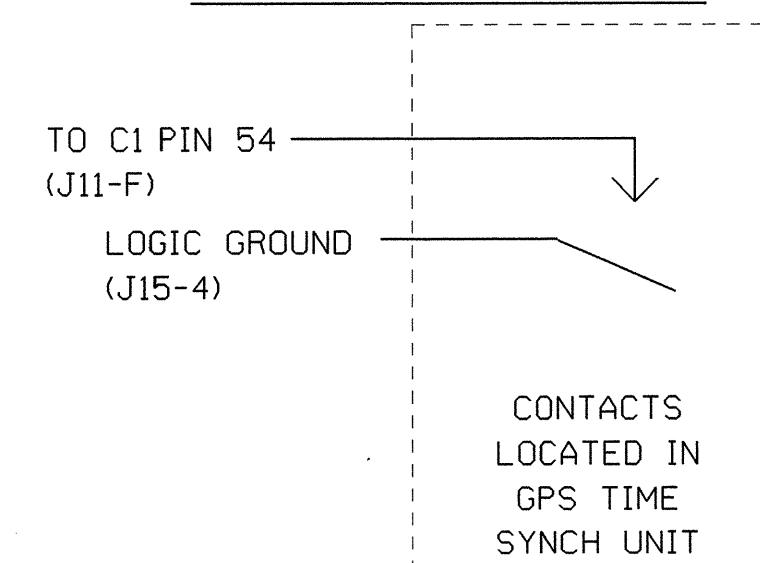
**INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION**

(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
 INPUT ASSIGNMENT #.....16  
 DEBOUNCE TIME (0-25.5 SEC).....0.5  
 DELAY TIME (0-25.5 SEC).....0.0  
 HOLD-OVER TIME (0-25.5 SEC).....0.0  
 ASSIGNMENT SELECTION:  
 NOT ENABLED (Y/N).....  
 VEHICLE DETECTOR (1-64).....  
 PEDESTRIAN DETECTOR (1-16).....  
 ALTERNATE PED DETECTOR (1-16).....  
 PREEMPT (1-10).....  
 INVERTED PREEMPT (1-10).....  
 STOP TIME (Y/N).....  
 FLASH SENSE (Y/N).....  
 DOOR OPEN (Y/N).....  
 MANUAL CONTROL ENABLE (Y/N).....  
 MANUAL CONTROL ADVANCE (Y/N).....  
 SPECIAL FUNCTION ALARM (1-8).....  
 TOD HOUR SYNCHRONIZATION (0-23).....5  
 FORCE OFF RING (1-4).....  
 HOLD PHASES (1-16).....  
 PLAN (65=FLSH,66=FREE)... OFFSET#...  
 CHANGE PHASE SEQUENCE PAGE (1-12)...  
 CHANGE PHASE TIMING PAGE (1-4).....  
 CHANGE PHASE CONTROL PAGE (1-4).....  
 CHANGE OVERLAP CONTROL PAGE (1-4)...  
 CHANGE INPUT PAGE (1-4).....  
 CHANGE OUTPUT PAGE (1-4).....  
 OVERRIDE PHASE CONTROL FUNCTION (Y)...

**WIRING DETAIL FOR GPS TIME SYNCH UNIT**



**NOTES:**

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

**SPECIAL DETECTOR NOTE**

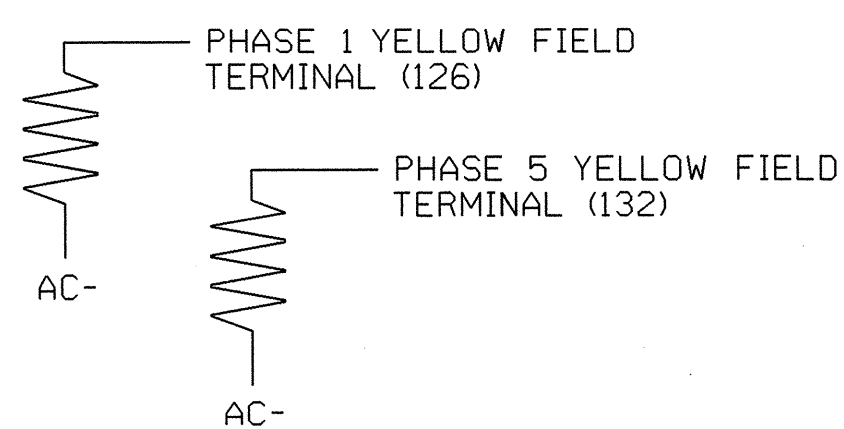
Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-1299T1, T2, T3, T4  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**LOAD RESISTOR INSTALLATION DETAIL**

(install resistors as shown below)

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



**ELECTRICAL DETAIL SHEET 1 OF 2 - Temporary Designs 1, 2, 3, & 4**

Prepared for the Offices of:  
 Transportation Mobility and Capital Operations  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 Signal Management Section  
 750 N. Greenfield Pkwy, Garner, NC 27529

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 MESSIA R. COONEY  
 025892

Division 04 Nash County Rocky Mount  
 PLAN DATE: October 2010 REVIEWED BY: LM Moon  
 PREPARED BY: MR Cooney REVIEWED BY:  
 REVISIONS INIT. DATE

Signature: Melissa R. Cooney 11/17/10  
 DATE: 11/17/10  
 INVENTORY NO. 04-1299T1, T2, T3, T4



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

(program controller as shown below)

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #50 ON  
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-COMMAND#)  
IF ACTIVE PHASE #5 IS ON  
AND RED CLEAR ON PHASE #5 IS ON

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

**OUTPUT REFERENCE SCHEDULE**

OUTPUT 42 = Overlap C Red  
OUTPUT 43 = Overlap C Yellow  
OUTPUT 44 = Overlap C Green  
OUTPUT 50 = Overlap A Red  
OUTPUT 51 = Overlap A Yellow  
OUTPUT 52 = Overlap A Green

**OVERLAP PROGRAMMING DETAIL**

(program controller as shown below)

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

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

NOTICE GREEN FLASH

PRESS '+' TWICE

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

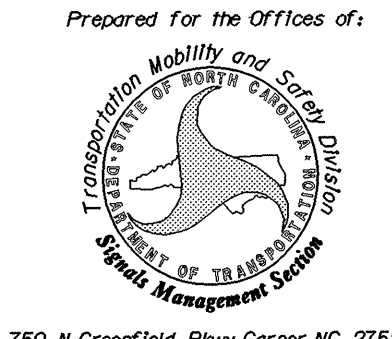

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

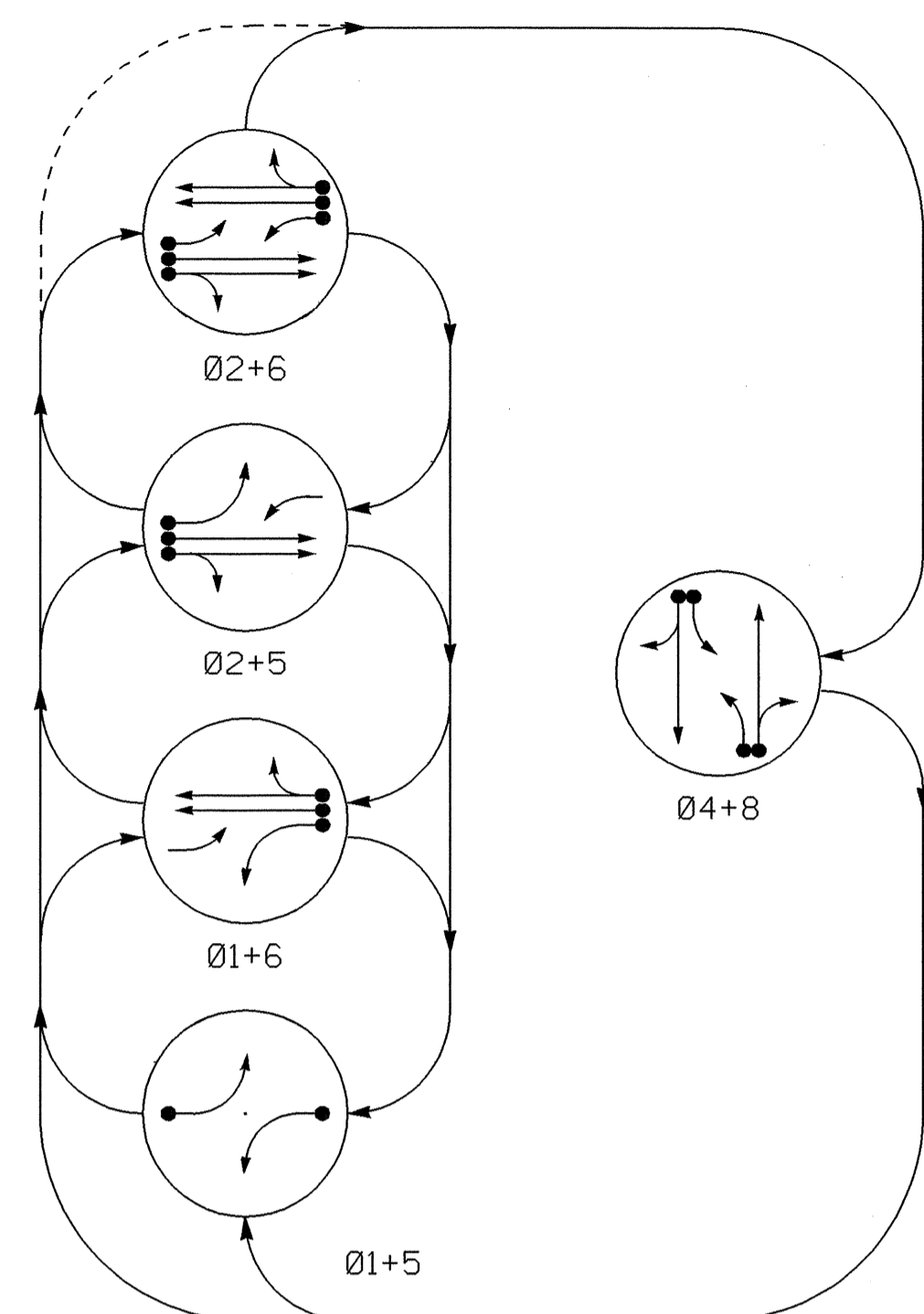
THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 04-1299T1, T2, T3, T4  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

**PBS&I** 1616 EAST MILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

ELECTRICAL DETAIL SHEET 2 OF 2 - Temporary Designs 1, 2, 3, & 4

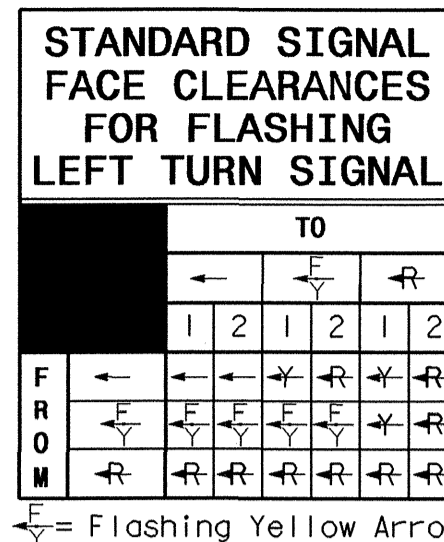
<p>Prepared for the Offices of:</p>  <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)</p>		<p>SEAL</p> 
	<p>Division 04</p> <p>PLAN DATE: October 2010</p> <p>PREPARED BY: MR Cooney</p>	<p>Wash County</p> <p>REVIEWED BY: LW Moon</p> <p>REVIEWED BY: MR Cooney</p>	<p>Rocky Mount</p> <p>INIT. DATE</p>

PHASING DIAGRAM



**TABLE OF OPERATION**

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



**OASIS 2070L LOOP & DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY				
1A	6x40	+5	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6x6	300	4	Y	2	Y	Y	-	-	-	-	Y
2B	6x6	300	4	Y	2	Y	Y	-	-	-	-	Y
4A	6x40	+5	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6x40	+5	2-4-2	Y	4	Y	Y	-	-	10	-	Y
4C	6x15	+5	3	Y	4	Y	Y	-	-	15	-	Y
5A	6x40	+5	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A	6x6	300	6	Y	6	Y	Y	-	-	-	-	Y
6B	6x6	300	6	Y	6	Y	Y	-	-	-	-	Y
8A	6x40	+5	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6x40	+5	2-4-2	Y	8	Y	Y	-	-	10	-	Y
8C	6x15	+5	3	Y	8	Y	Y	-	-	15	-	Y

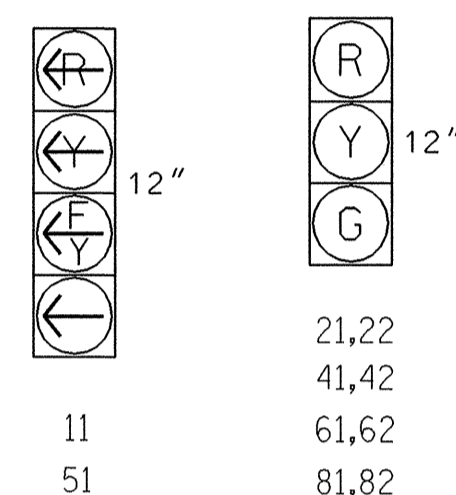
5 Phase Fully Actuated (Rocky Mount Signal System)

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 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

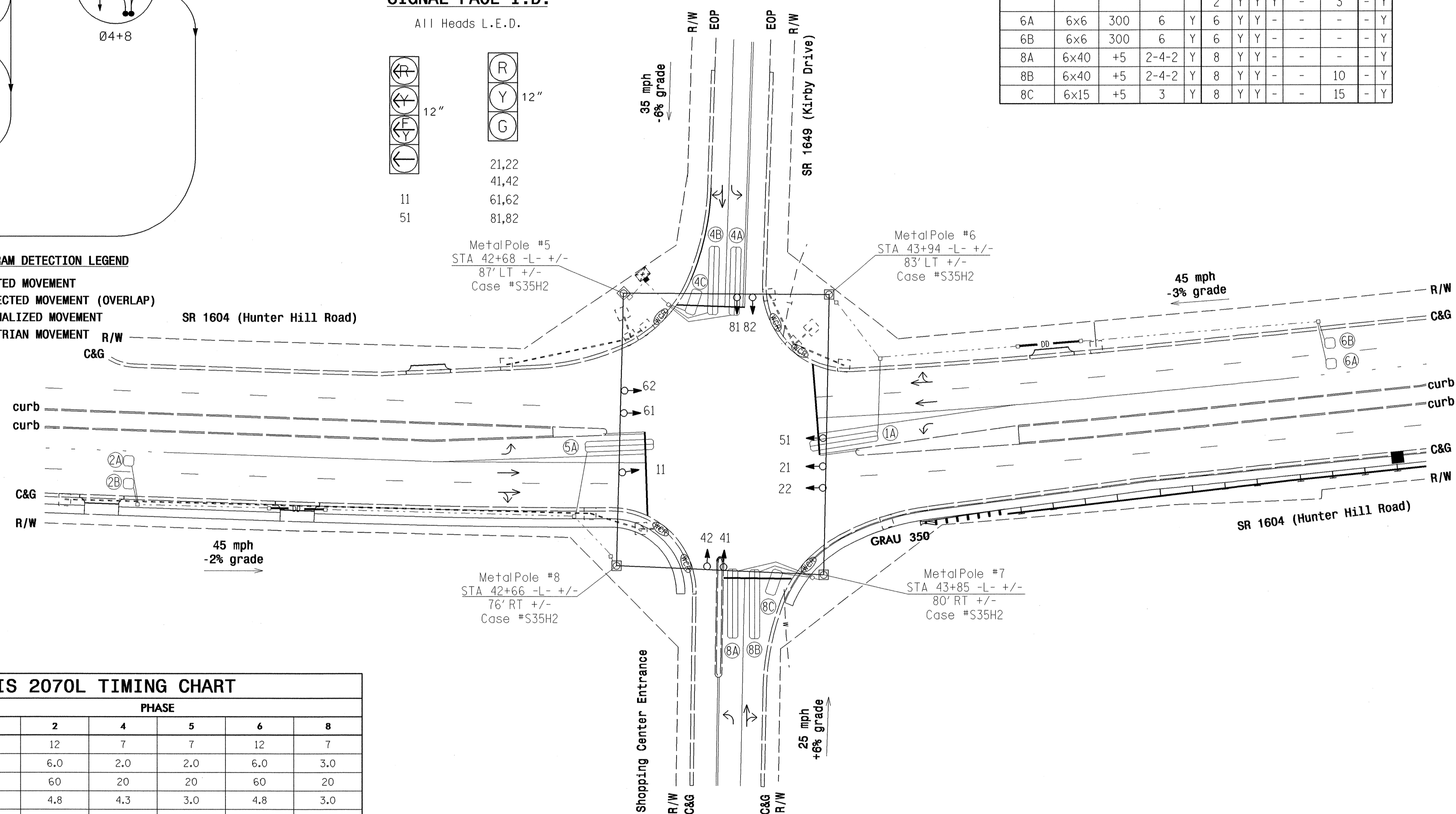
SIGNAL FACE I.D.

All Heads L.E.D.



PHASING DIAGRAM DETECTION LEGEND

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



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1*	7	12	7	7	12	7
Extension 1*	2.0	6.0	2.0	2.0	6.0	3.0
Max Green 1*	20	60	20	20	60	20
Yellow Clearance	3.0	4.8	4.3	3.0	4.8	3.0
Red Clearance	2.6	1.1	2.4	2.8	1.1	3.3
Walk 1*	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation*	-	1.5	-	-	1.5	-
Max Variable Initial*	-	34	-	-	34	-
Time Before Reduction*	-	15	-	-	15	-
Time To Reduce*	-	15	-	-	15	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
|          |          |
|          | N/A      |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
| N/A      |          |
|          |          |
|          |          |
|          |          |
| N/A      |          |
|          |          |
| N/A      |          |

Signal Upgrade - Final Design

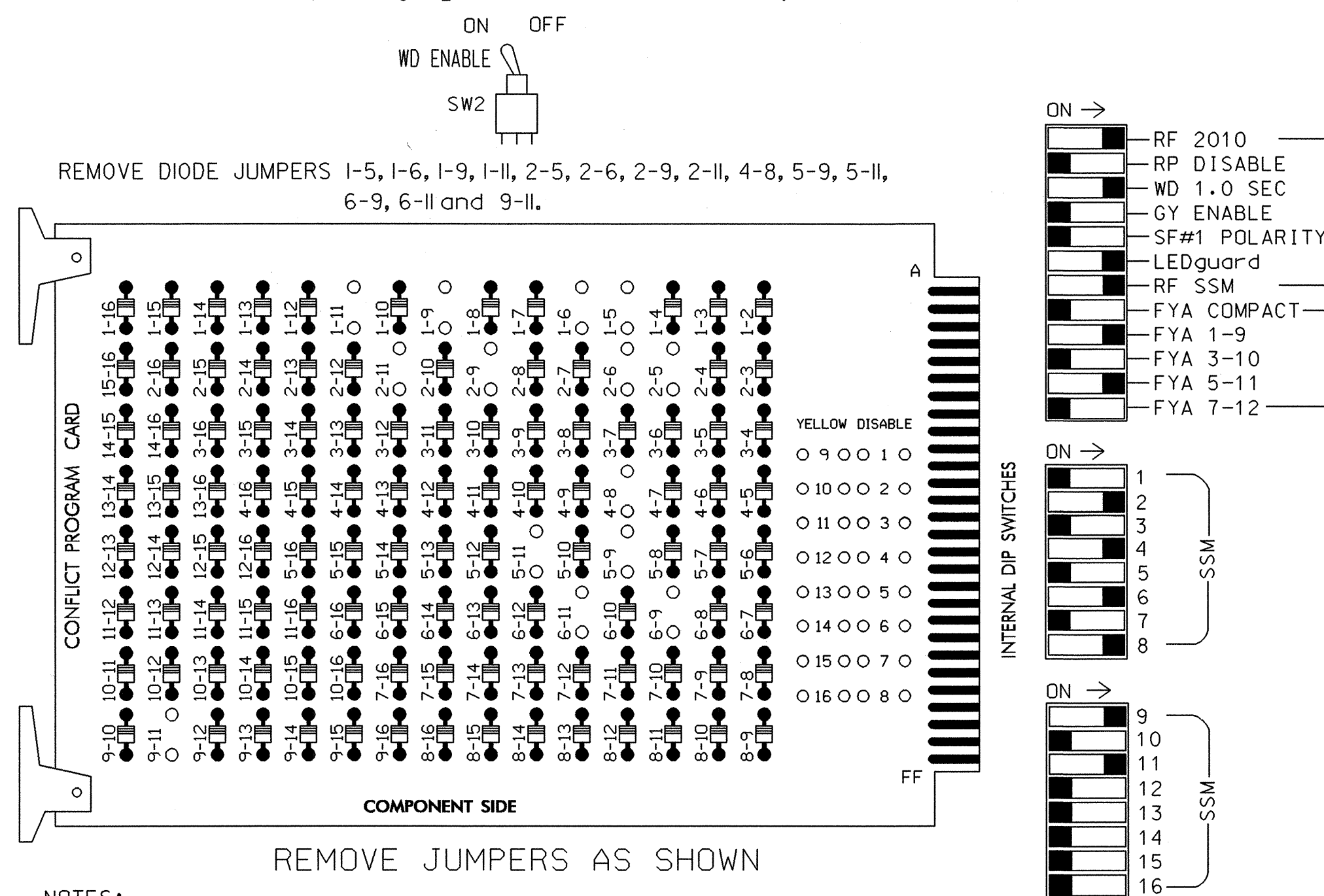
Prepared for the Offices of:  
  
**SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)**  
 Division 4 Nash County Rocky Mount  
 PLAN DATE: October 2010 REVIEWED BY: LM Moon  
 PREPARED BY: MR Cooney REVIEWED BY:  
 REVISIONS: INIT. DATE  
 SCALE: 0 40  
 1"=40'  
  
 SIGNATURE: Lisa M. Moon DATE: 11-17-10  
 SIG. INVENTORY NO. 04-1299

**PBS&I** 1616 EAST MILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326



### 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 1,3,5,7, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....EXISTING CONTRACTOR SUPPLIED 2070L CABINET.....EXISTING CONTRACTOR SUPPLIED 332 /W/ AUX SOFTWARE.....ECONOLITE OASIS CABINET MOUNT.....BASE OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8,S9,S12. PHASES USED.....1,2,4,5,6,8. OVERLAP "A".....1+2 OVERLAP "B".....NOT USED OVERLAP "C".....5+6 OVERLAP "D".....NOT USED

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	9	10	11	12	13	14
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW																A121		A114
YELLOW ARROW																A122		A115
FLASHING YELLOW ARROW																A123		A116
GREEN ARROW	127							133										

NU = Not Used

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

★ See pictorial of head wiring in detail below.

### INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14	FS
U	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	DC ISOLATOR
L	1A	2A	∅ 3	4A	5A	6A	7A	8A	9A	10A	11A	12A	13A	14A	ST
U	NOT USED	2B	∅ 3	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	DC ISOLATOR
L	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	∅ 14	∅ 15	∅ 16	∅ 17	∅ 18	
U	5A	6A	∅ 7	8A	9A	10A	11A	12A	13A	14A	15A	16A	17A	18A	
L	NOT USED	6B	∅ 7	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	

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

FS = FLASH SENSE  
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### INPUT FILE CONNECTION & PROGRAMMING CHART

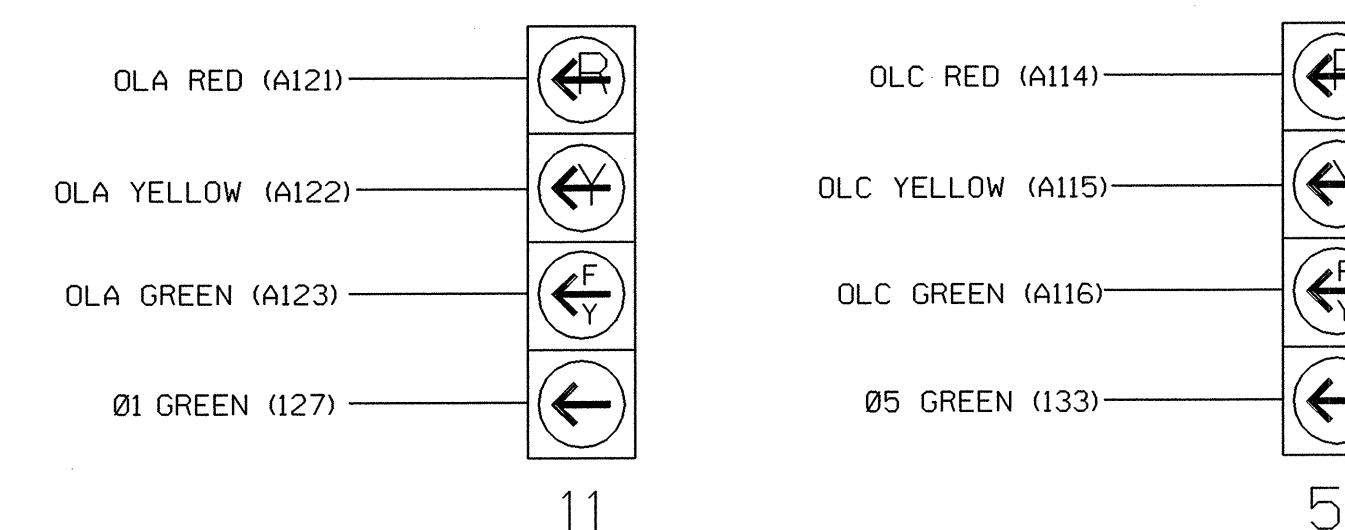
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A <sup>1</sup>	TB2-1,2	I1U	56	18	1	1	Y	Y	-	--	15
	-	J4U	48	10	26	6	Y	Y	-	--	3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y	-	--	-
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	-	--	-
4A	TB4-9,10	I6U	41	3	4	4	Y	Y	-	--	3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y	-	--	10
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	-	--	15
5A <sup>2</sup>	TB3-1,2	J1U	55	17	5	5	Y	Y	-	--	15
	-	I4U	47	9	22	2	Y	Y	Y	--	3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y	-	--	-
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	-	--	-
8A	TB5-9,10	J6U	42	4	8	8	Y	Y	-	--	-
8B	TB5-11,12	J6L	46	8	18	8	Y	Y	-	--	10
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	-	--	15

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.

<sup>2</sup>Add jumper from J1-W to I4-W, on rear of input file.

### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

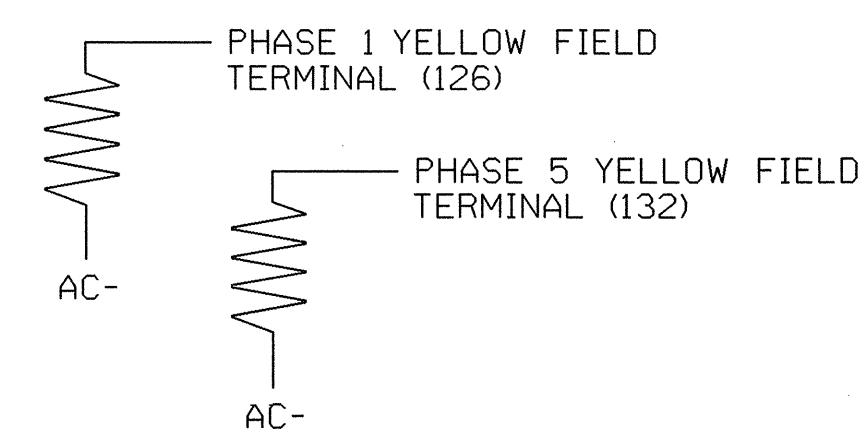
- The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-1299  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

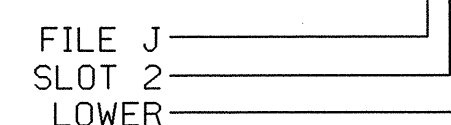
### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



### INPUT FILE POSITION LEGEND: J2L



### ELECTRICAL DETAIL SHEET 1 OF 2

Electrical and Programming Details For:

SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)

Division 04 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY: LW Moon

PREPARED BY: MR Cooney REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

1616 EAST HILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-8888 NOBELS #F-0326

SEAL

North Carolina Professional Engineer Seal 025892

Melissa R. Cooney 11/17/10

SIGNATURE DATE

SIG. INVENTORY NO. 04-1299

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

(program controller as shown below)

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #50 ON  
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-COMMAND#)  
IF ACTIVE PHASE #5 IS ON  
AND RED CLEAR ON PHASE #5 IS ON

SCROLL DOWN

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

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

SCROLL DOWN

THEN:  
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

#### OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red  
OUTPUT 43 = Overlap C Yellow  
OUTPUT 44 = Overlap C Green  
OUTPUT 50 = Overlap A Red  
OUTPUT 51 = Overlap A Yellow  
OUTPUT 52 = Overlap A Green

### INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION

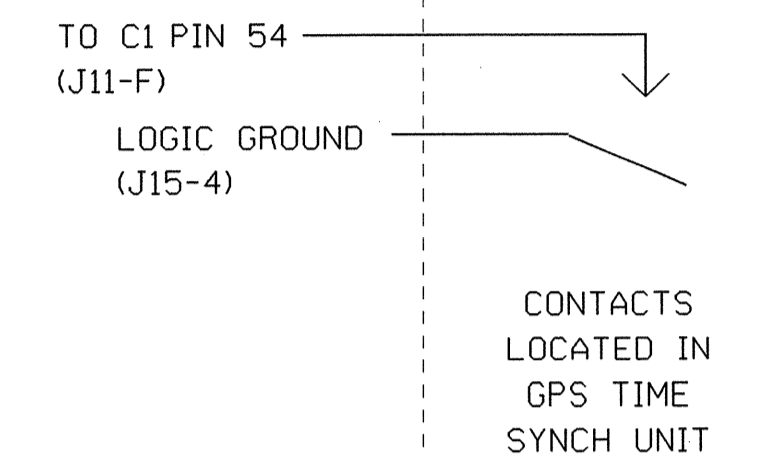
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
INPUT ASSIGNMENT #.....16  
DEBOUNCE TIME (0-25.5 SEC).....0.5  
DELAY TIME (0-25.5 SEC).....0.0  
HOLD-OVER TIME (0-25.5 SEC).....0.0  
ASSIGNMENT SELECTION:  
NOT ENABLED (Y/N).....-  
VEHICLE DETECTOR (1-64).....-  
PEDESTRIAN DETECTOR (1-16).....-  
ALTERNATE PED DETECTOR (1-16).....-  
PREEMPT (1-10).....-  
INVERTED PREEMPT (1-10).....-  
STOP TIME (Y/N).....-  
FLASH SENSE (Y/N).....-  
DOOR OPEN (Y/N).....-  
MANUAL CONTROL ENABLE (Y/N).....-  
MANUAL CONTROL ADVANCE (Y/N).....-  
SPECIAL FUNCTION ALARM (1-8).....-  
TOD HOUR SYNCHRONIZATION (0-23).....5  
FORCE OFF RING (1-4).....-  
HOLD PHASES (1-16).....-  
PLAN (65=FLSH,66=FREE)... OFFSET#...  
CHANGE PHASE SEQUENCE PAGE (1-12)...  
CHANGE PHASE TIMING PAGE (1-4).....  
CHANGE PHASE CONTROL PAGE (1-4).....  
CHANGE OVERLAP CONTROL PAGE (1-4)...  
CHANGE INPUT PAGE (1-4).....  
CHANGE OUTPUT PAGE (1-4).....  
OVERRIDE PHASE CONTROL FUNCTION (Y)..

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

### WIRING DETAIL FOR GPS TIME SYNCH UNIT



NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

NOTICE  
GREEN  
FLASH

PRESS '+' TWICE

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

NOTICE  
GREEN  
FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 04-1299  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

**PBSJ** 1616 EAST MILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

ELECTRICAL DETAIL SHEET 2 OF 2

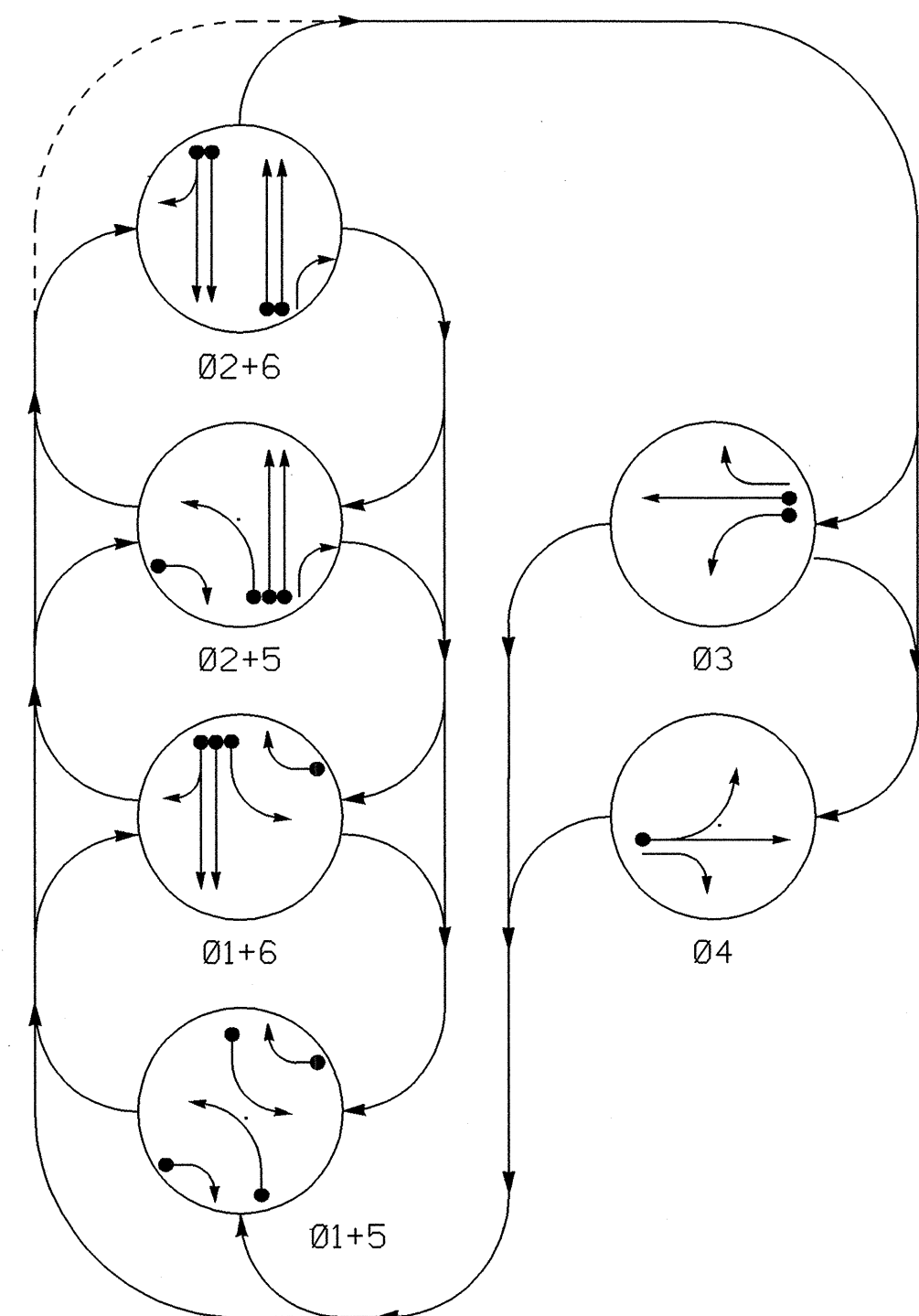
	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1604 (Hunter Hill Road) at SR 1649 (Kirby Drive)		SEAL 
	Division 04 PLAN DATE: <b>October 2010</b> PREPARED BY: <b>MR Cooney</b>	Nash County REVIEWED BY: <b>LW Moon</b> REVIEWED BY:	Rocky Mount DATE:	DATE:	
Revisions Table:		INIT.	DATE	SIGNATURE: <i>Melissa R. Cooney</i> DATE:	
750 N. Greenfield Pkwy, Garner, NC 27529		SIG. INVENTORY NO. <b>04-1299</b>		DATE:	







**PHASING DIAGRAM**

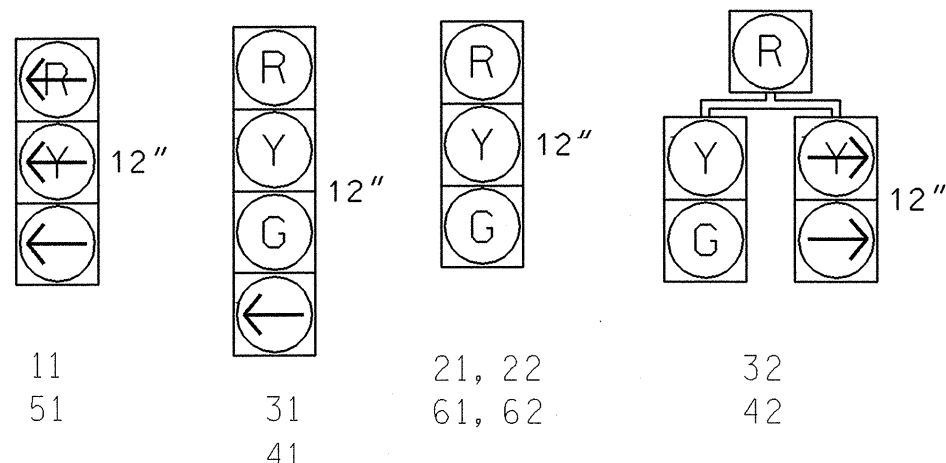


**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



SIGNAL FACE	PHASE					
	01+5	01+6	02+5	02+6	03	04
11	←	←	←	←	←	←
21,22	R	R	G	G	R	Y
31	R	R	R	G	R	R
32	R	R	R	G	R	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	Y

OASIS 2070L DETECTION INSTALLATION							
DETECTION ZONES			DETECTOR PROGRAMMING				
LOOP	SIZE	DISTANCE FROM STOPBAR (FT)	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME
1A	6x40	+5	1	Y	Y	-	-
1B	6x40	+5	1	Y	Y	-	15
2A	6x6	300	2	-	Y	-	-
2B	6x6	300	2	-	Y	-	-
2C	6x40	+5	2	Y	Y	Y	2 5
2D	6x40	+5	2	Y	Y	Y	2 5
3A	6x40	+5	3	Y	Y	-	-
3B	6x40	+5	3	Y	Y	-	-
4A	6x40	+5	4	Y	Y	-	3
5A	6x40	+5	5	Y	Y	-	-
5B	6x40	+5	5	Y	Y	-	15
6A	6x6	300	6	-	Y	-	-
6B	6x6	300	6	-	Y	-	-
6C	6x40	+5	6	Y	Y	Y	2 5
6D	6x40	+5	6	Y	Y	Y	2 5

**6 Phase Fully Actuated (Rocky Mount 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.
- Reposition existing signal heads 41 and 42.
- The order of phase 3 and phase 4 may be reversed.
- Set all loop emulators to presence mode.
- Repositions loop emulator for zones 4A & 5B.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

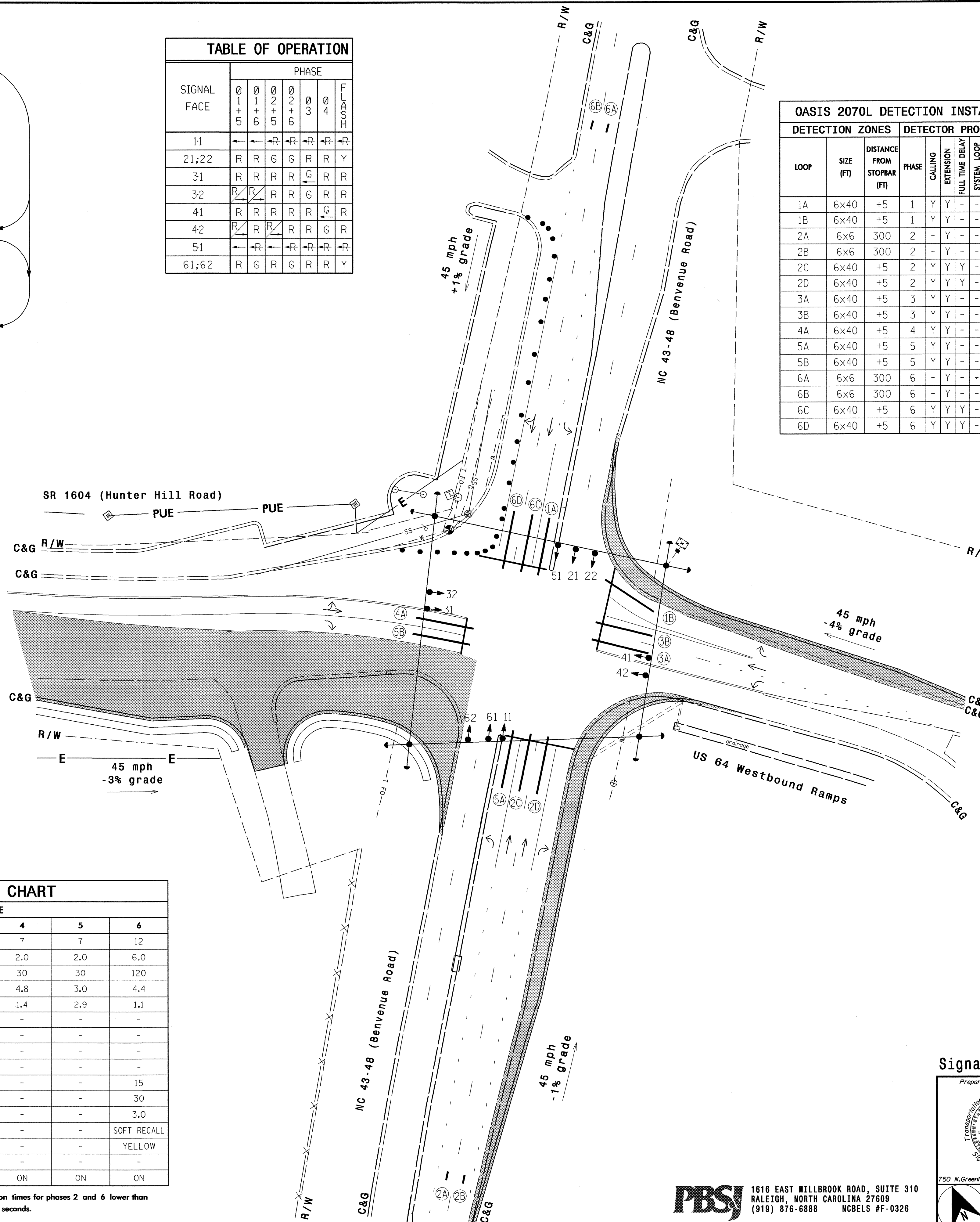
**LEGEND**

- | PROPOSED   | EXISTING                |
|--|-------------------------|
| ○ → Traffic Signal Head                            | ● → N/A                 |
| ○ → 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                 |
| N/A → Right of Way                                 | ○ → N/A                 |
| → Directional Arrow                                | → N/A                   |
| --- Directional Drill                              | --- N/A                 |
| N/A → Fence  | --- N/A                 |
| --- Video Detection Area                           | --- N/A                 |
| □ Special Sized or Over Sized Junction Box         | □ N/A                   |
| -E- Construction Easement                          | -E- N/A                 |
| -PUE- Permanent Utility Easement                   | -PUE- N/A               |
| N/A → Water  | -W- N/A                 |
| N/A → Sanitary Sewer                               | -SS- N/A                |
| N/A → Telephone Fiber Optic                        | -T FO- N/A              |
| Construction Zone                                  | Construction Zone       |
| Construction Zone Drums                            | Construction Zone Drums |

**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	30	120	30	30	30	120
Yellow Clearance	3.0	4.6	4.9	4.8	3.0	4.4
Red Clearance	2.6	1.9	1.3	1.4	2.9	1.1
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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



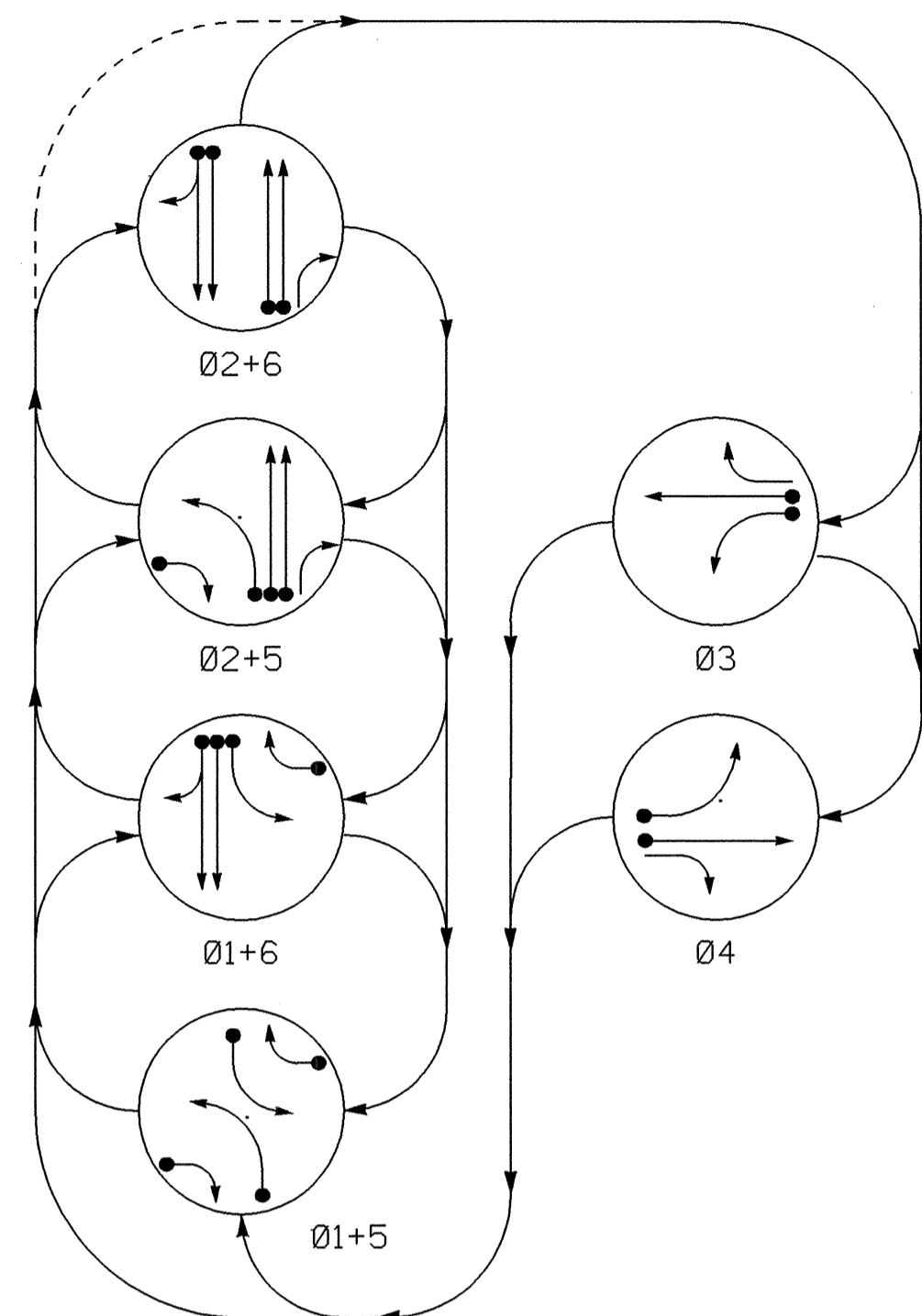
**Signal Upgrade - Temporary Design 2 - TCP Phase 1A Step 8**

	<p>US 64 Westbound Ramps/ SR 1604 (Hunter Hill Road) at NC 43-48 (Benvenue Road)</p>		
	<p>Division 04 Nash County Rocky Mount</p>	<p>PLAN DATE: October 2010 REVIEWED BY: JT Brooks</p>	
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>REVISIONS</p>	<p>INIT. DATE</p>	<p>SIGNATURE: Lisa M. Moon 11-17-10</p>
<p>SCALE: 0 40 1"=40'</p>	<p>SIG. INVENTORY NO. 04-069012</p>	<p>PBSJ 1616 EAST WILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBELS #F-0326</p>	<p>SEAL</p>

17-Nov-2010 14:23  
 E:\CADD\103001\05 U-3621B Signal\sig\1604-069012.dgn  
 53833 - AT - P:\CADD\103001



**PHASING DIAGRAM**

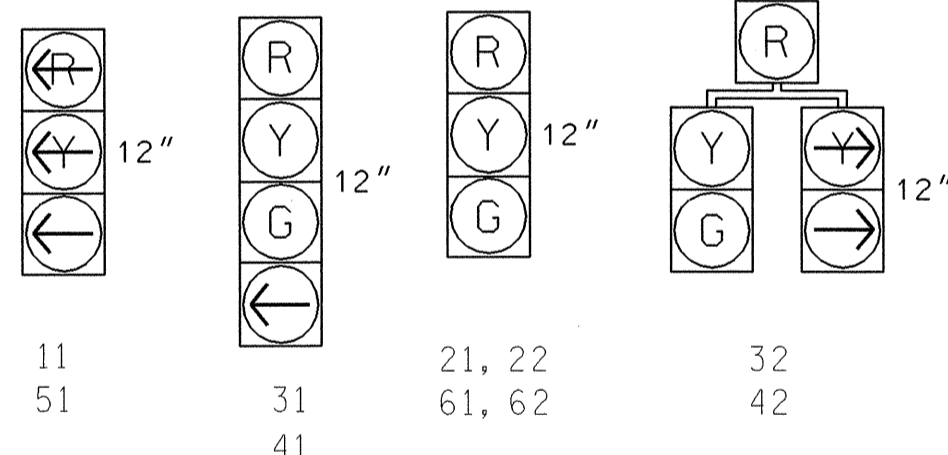


**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4
11	←	←	←	←	←	←
21,22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	G	R	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62	R	G	R	G	R	Y

OASIS 2070L DETECTION INSTALLATION								
DETECTION ZONES		DETECTOR		PROGRAMMING				
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	PHASE	CALLING	EXTENSION	FULL TIME DELAY SYSTEM LOOP	STRETCH TIME	DELAY TIME
1A	6x40	+5	1	Y	Y	-	-	-
1B	6x40	+5	1	Y	Y	-	-	15
2A	6x6	300	2	-	Y	-	-	-
2B	6x6	300	2	-	Y	-	-	-
2C	6x40	+5	2	Y	Y	Y	-	2 5
2D	6x40	+5	2	Y	Y	Y	-	2 5
3A	6x40	+5	3	Y	Y	-	-	3
3B	6x40	+5	3	Y	Y	-	-	-
4A	6x40	+5	4	Y	Y	-	-	-
4B	6x40	+5	4	Y	Y	-	-	-
5A	6x40	+5	5	Y	Y	-	-	-
5B	6x40	+5	5	Y	Y	-	-	15
6A	6x6	300	6	-	Y	-	-	-
6B	6x6	300	6	-	Y	-	-	-
6C	6x40	+5	6	Y	Y	Y	-	2 5
6D	6x40	+5	6	Y	Y	Y	-	2 5

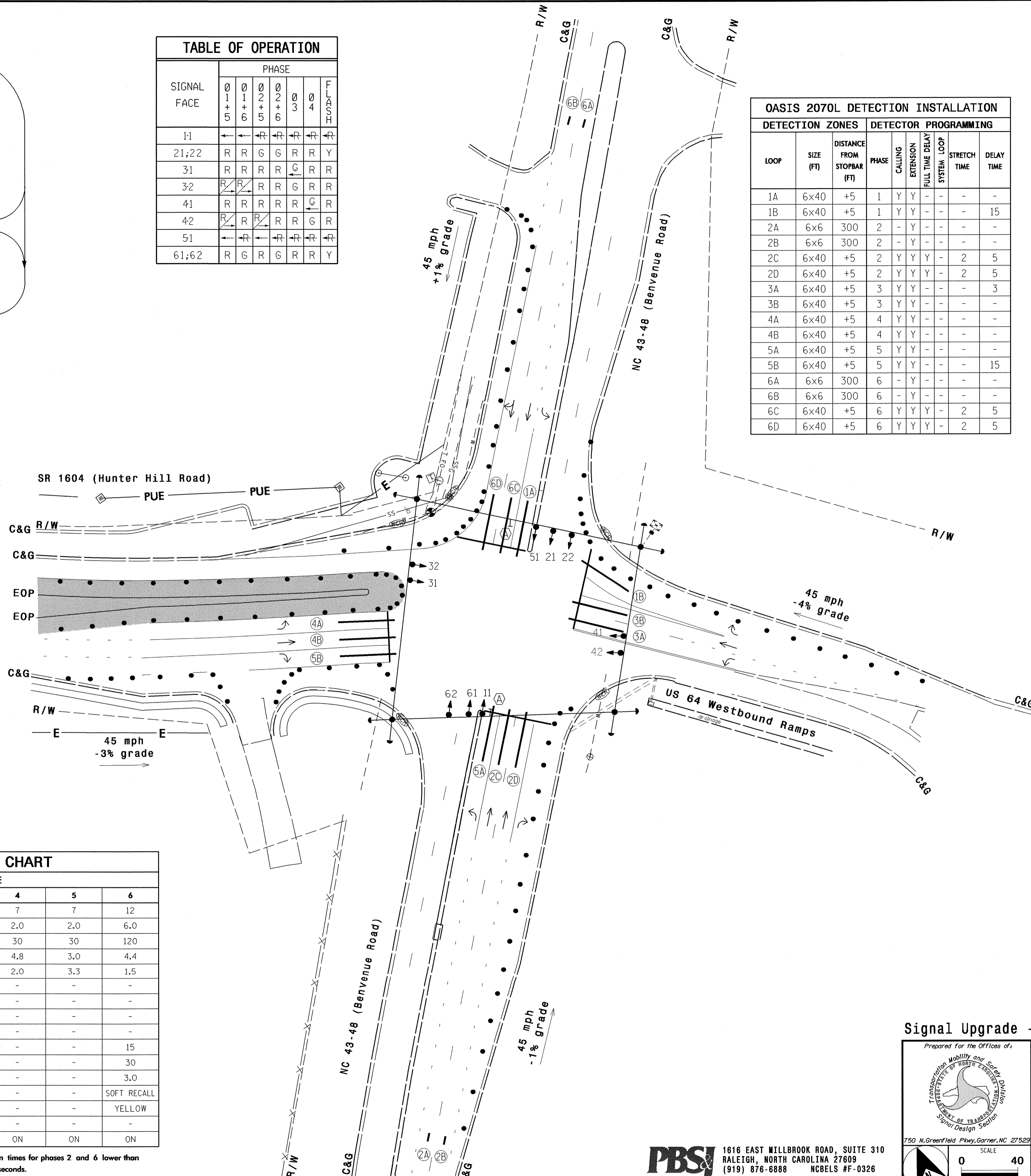
**6 Phase Fully Actuated (Rocky Mount Signal System)**

**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.
- Reposition existing signal heads 31, 32, 41, and 42
- The order of phase 3 and phase 4 may be reversed.
- Set all loop emulators to presence mode.
- Reposition loop emulators for zones 4A & 5B.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.

**LEGEND**

- | PROPOSED   | EXISTING   |
|--|--|
| ○ → Traffic Signal Head                          | ○ → N/A  |
| ● → Modified Signal Head                         | ● → N/A  |
| ⊥ Sign   | ⊥ Sign   |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head With Push Button & Sign |
| ⊥ Signal Pole with Guy                           | ⊥ Signal Pole with Guy                           |
| ⊥ Signal Pole with Sidewalk Guy                  | ⊥ Signal Pole with Sidewalk Guy                  |
| ⊥ Inductive Loop Detector                        | ⊥ Inductive Loop Detector                        |
| ⊥ Controller & Cabinet                           | ⊥ Controller & Cabinet                           |
| ⊥ Junction Box                                   | ⊥ Junction Box                                   |
| ⊥ 2-in Underground Conduit                       | ⊥ 2-in Underground Conduit                       |
| N/A Right of Way                                 | → Right of Way                                   |
| → Directional Arrow                              | → Directional Arrow                              |
| --- Directional Drill                            | N/A  |
| N/A Wheelchair Ramp                              | (WCR)  |
| N/A Video Detection Area                         | (VDA)  |
| □ Special Sized or Over Sized Junction Box       | ■ Special Sized or Over Sized Junction Box       |
| -E- Construction Easement                        | N/A  |
| -PUE- Permanent Utility Easement                 | N/A  |
| N/A Water  | -W-  |
| N/A Sanitary Sewer                               | -SS-   |
| N/A Telephone Fiber Optic                        | -T FO-   |
| Construction Zone                                | Construction Zone                                |
| Construction Zone Drums                          | Construction Zone Drums                          |
| "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)       | (A)  |



**OASIS 2070L TIMING CHART**

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	12	7	7	7	12
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0
Max Green 1 *	30	120	30	30	30	120
Yellow Clearance	3.0	4.6	4.9	4.8	3.0	4.4
Red Clearance	2.6	1.9	1.3	2.0	3.3	1.5
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

**Signal Upgrade - Temporary Design 3 - TCP Phase 2 Step 7**

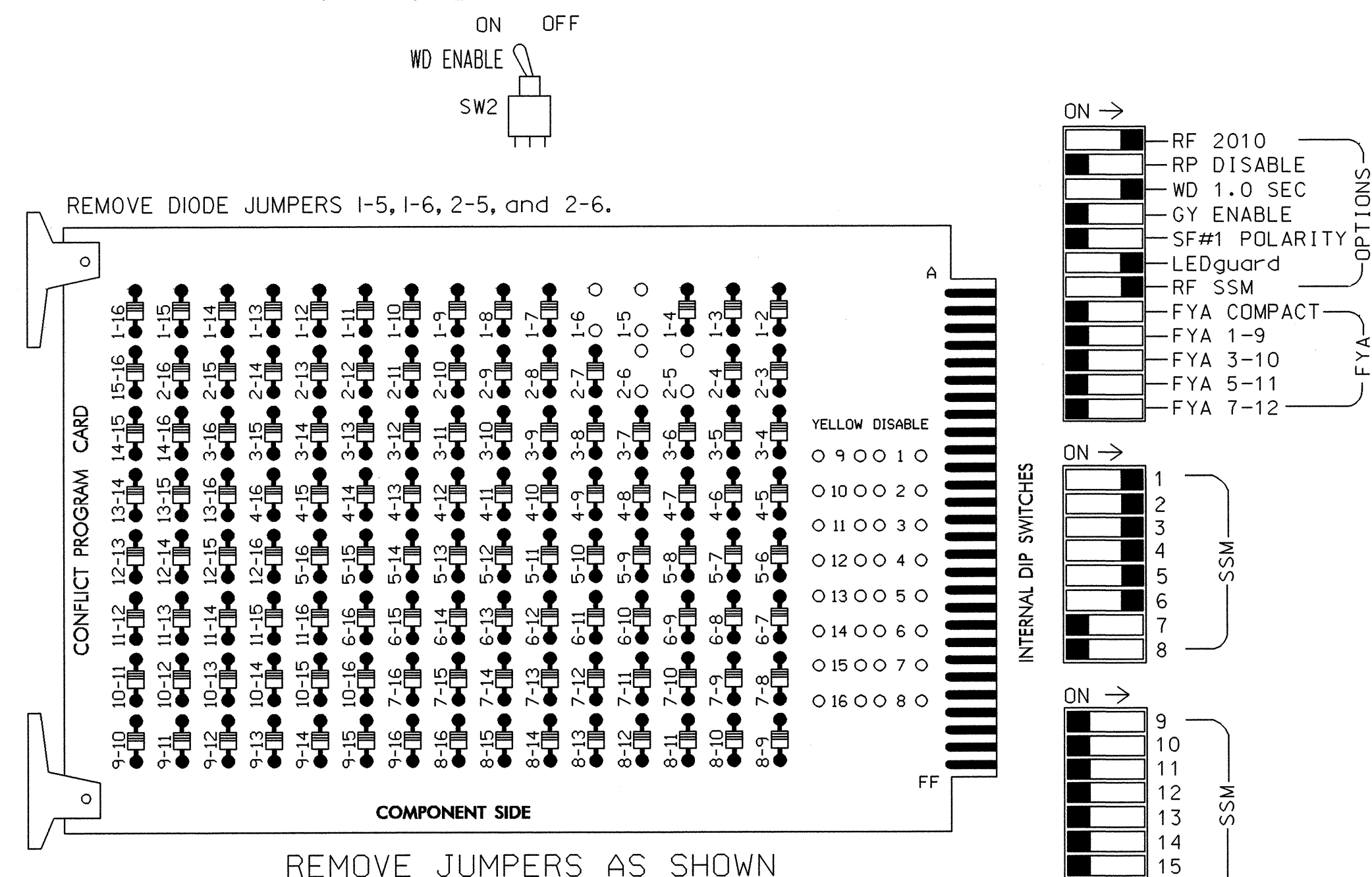
	Prepared for the Offices of: <b>US 64 Westbound Ramps/                  SR 1604 (Hunter Hill Road)                  at                  NC 43-48 (Benvenue Road)</b>		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER LISA M. MOON 022516
	Division 04 Nash County Rocky Mount PLAN DATE: October 2010 REVIEWED BY: JT Brooks PREPARED BY: LM Moon REVIEWED BY: MR Cooney	REVISIONS: _____ INIT. DATE _____ _____	
SCALE: 0 40 1"=40'		SIGNATURE: <i>Lisa M. Moon</i> 11-17-10 DATE: 11-17-10 SIG. INVENTORY NO. 04-069013	

**PBSJ** 1616 EAST MILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

17-REV-2010 144229  
 E:\COURT\PLANS\U-3621B-SIGNAL\OASIS\Signal\SR04-06S001.dgn  
 03/23/10 AT: P:\ALB\JMB

**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 7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Rocky Mount Signal System.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	32	21,22	31	32	41	42	51	61,62	71	81	91	101	111	121	131	141	151
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	126						132	132									
FLASHING YELLOW ARROW																		
GREEN ARROW	127	127		118		103		133	133									

NU = Not Used

**EQUIPMENT INFORMATION**

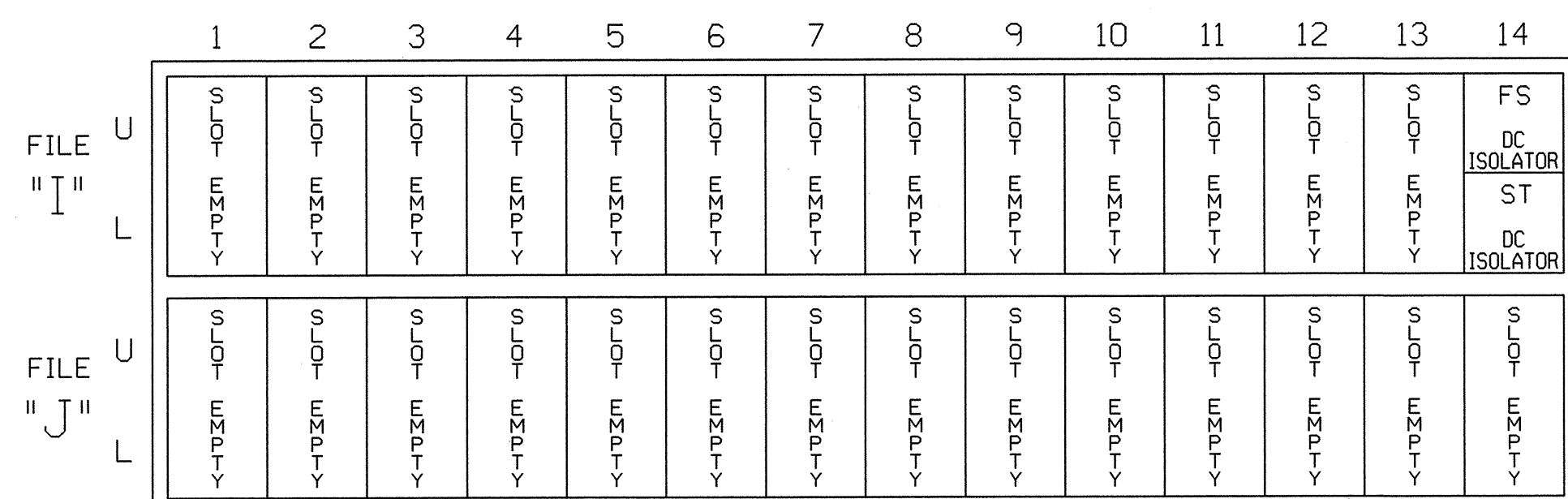
CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6.  
 PHASES USED.....1,2,3,4,5,6.  
 OVERLAP "A".....NOT USED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

**SPECIAL DETECTOR NOTE**

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

**INPUT FILE POSITION LAYOUT**

(front view)



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

FS = FLASH SENSE  
ST = STOP TIME

**INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION**

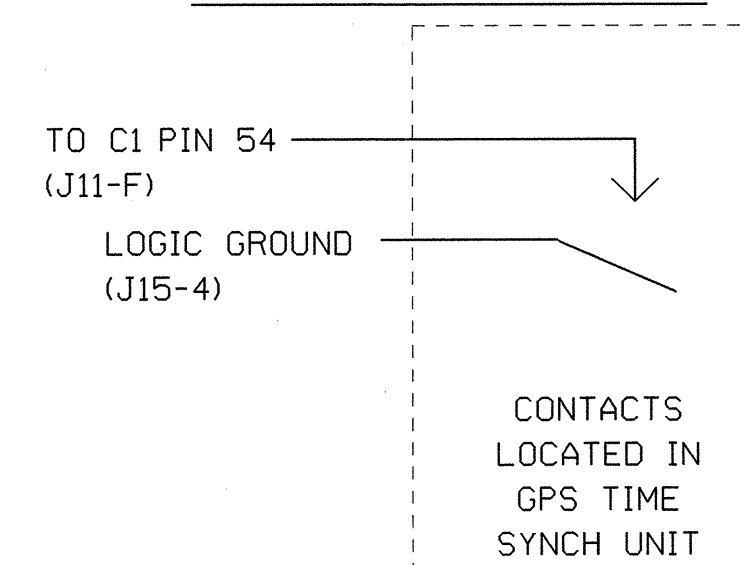
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
 INPUT ASSIGNMENT #.....16  
 DEBOUNCE TIME (0-25.5 SEC).....0.5  
 DELAY TIME (0-25.5 SEC).....0.0  
 HOLD-OVER TIME (0-25.5 SEC).....0.0  
 ASSIGNMENT SELECTION:  
 NOT ENABLED (Y/N).....  
 VEHICLE DETECTOR (1-64).....  
 PEDESTRIAN DETECTOR (1-16).....  
 ALTERNATE PED DETECTOR (1-16).....  
 PREEMPT (1-10).....  
 INVERTED PREEMPT (1-10).....  
 STOP TIME (Y/N).....  
 FLASH SENSE (Y/N).....  
 DOOR OPEN (Y/N).....  
 MANUAL CONTROL ENABLE (Y/N).....  
 MANUAL CONTROL ADVANCE (Y/N).....  
 SPECIAL FUNCTION ALARM (1-8).....  
 TOD HOUR SYNCHRONIZATION (0-23).....5  
 FORCE OFF RING (1-4).....  
 HOLD PHASES (1-16).....  
 PLAN (65=FLSH,66=FREE).... OFFSET#...  
 CHANGE PHASE SEQUENCE PAGE (1-12)....  
 CHANGE PHASE TIMING PAGE (1-4).....  
 CHANGE PHASE CONTROL PAGE (1-4).....  
 CHANGE OVERLAP CONTROL PAGE (1-4)....  
 CHANGE INPUT PAGE (1-4).....  
 CHANGE OUTPUT PAGE (1-4).....  
 OVERRIDE PHASE CONTROL FUNCTION (Y)...

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

**WIRING DETAIL FOR GPS TIME SYNCH UNIT**



NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0690 T1,T2,&T3  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**ELECTRICAL DETAIL SHEET 1 OF 1 - Temporary Designs 1, 2 & 3**

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 64 Westbound Ramps/  
SR 1604 (Hunter Hill Road)  
at  
NC 43-48 (Benvenue Road)

Division 04 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY:

PREPARED BY: LM Moon REVIEWED BY: MR Cooney

REVISIONS	INIT.	DATE

SEAL

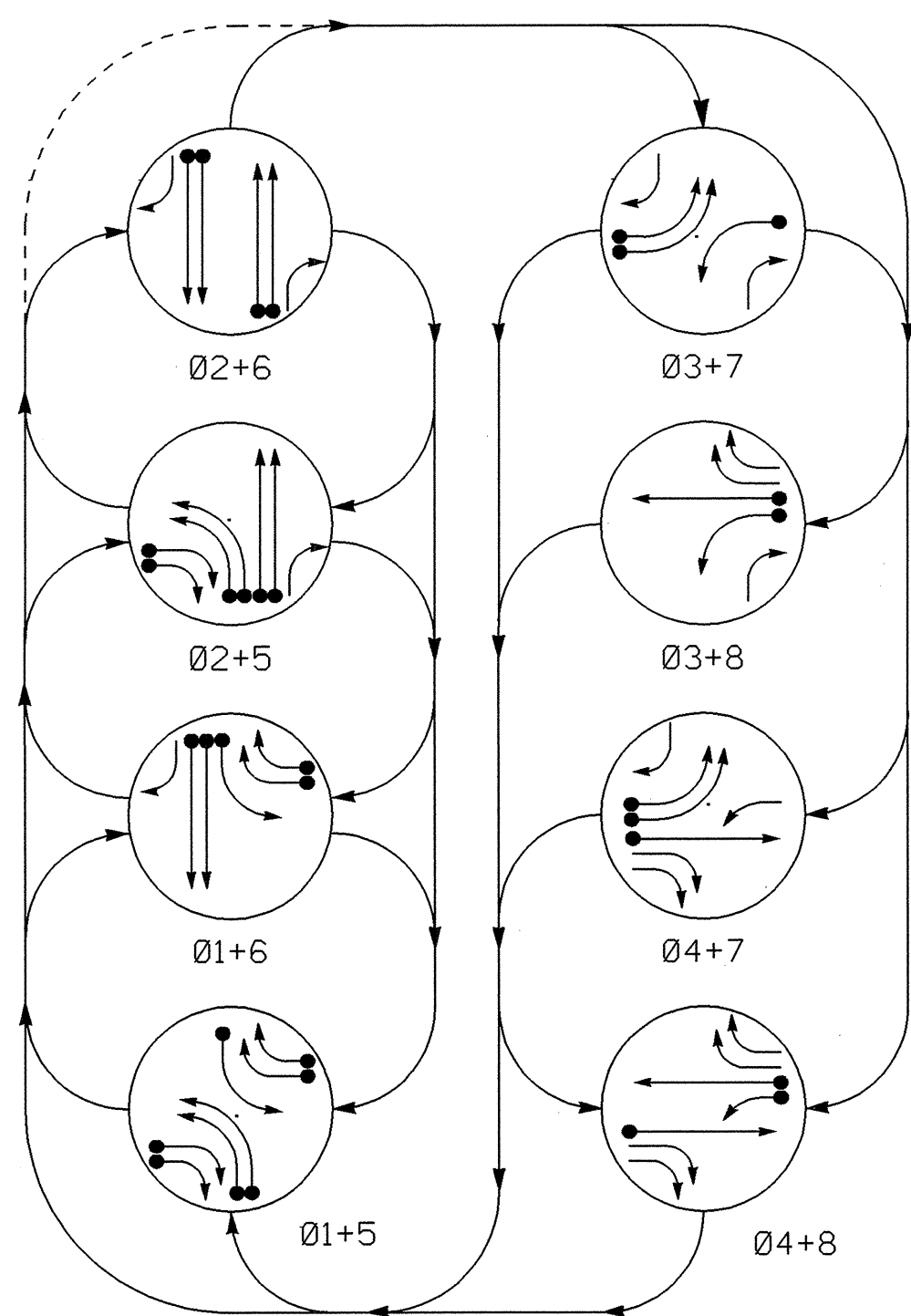


SIGNATURE: Melissa R. Cooney 11/17/10  
DATE

SIG. INVENTORY NO. 04-0690



**PHASING DIAGRAM**

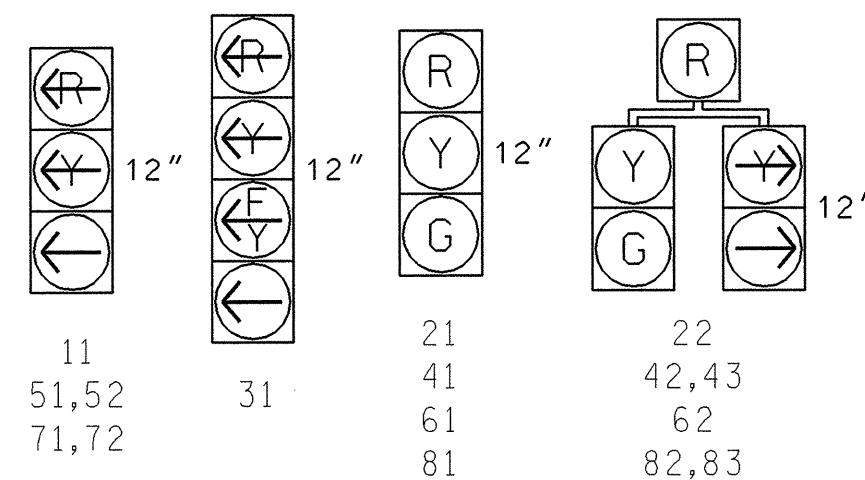


**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**

All Heads L.E.D.



**TABLE OF OPERATION**

SIGNAL FACE	PHASE								FLASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
1:1	←	←	←	←	←	←	←	←	FLASH
2:1	R	R	G	G	R	R	R	Y	
2:2	R	R	G	G	R	R	R	Y	
3:1	←	←	←	←	←	←	←	FLASH	
4:1	R	R	R	R	R	R	G	R	
4:2, 4:3	R	R	R	R	R	R	G	R	
5:1, 5:2	←	←	←	←	←	←	←	FLASH	
6:1	R	G	R	G	R	R	R	Y	
6:2	R	G	R	G	R	R	R	Y	
7:1, 7:2	←	←	←	←	←	←	←	FLASH	
8:1	R	R	R	R	R	G	R	R	
8:2, 8:3	R	R	R	R	R	G	R	R	

⇄ = Flashing Yellow Arrow

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

FROM	TO			
	1	2	1	2
1	←	←	←	←
2	←	←	←	←
3	←	←	←	←
4	←	←	←	←

⇄ = Flashing Yellow Arrow

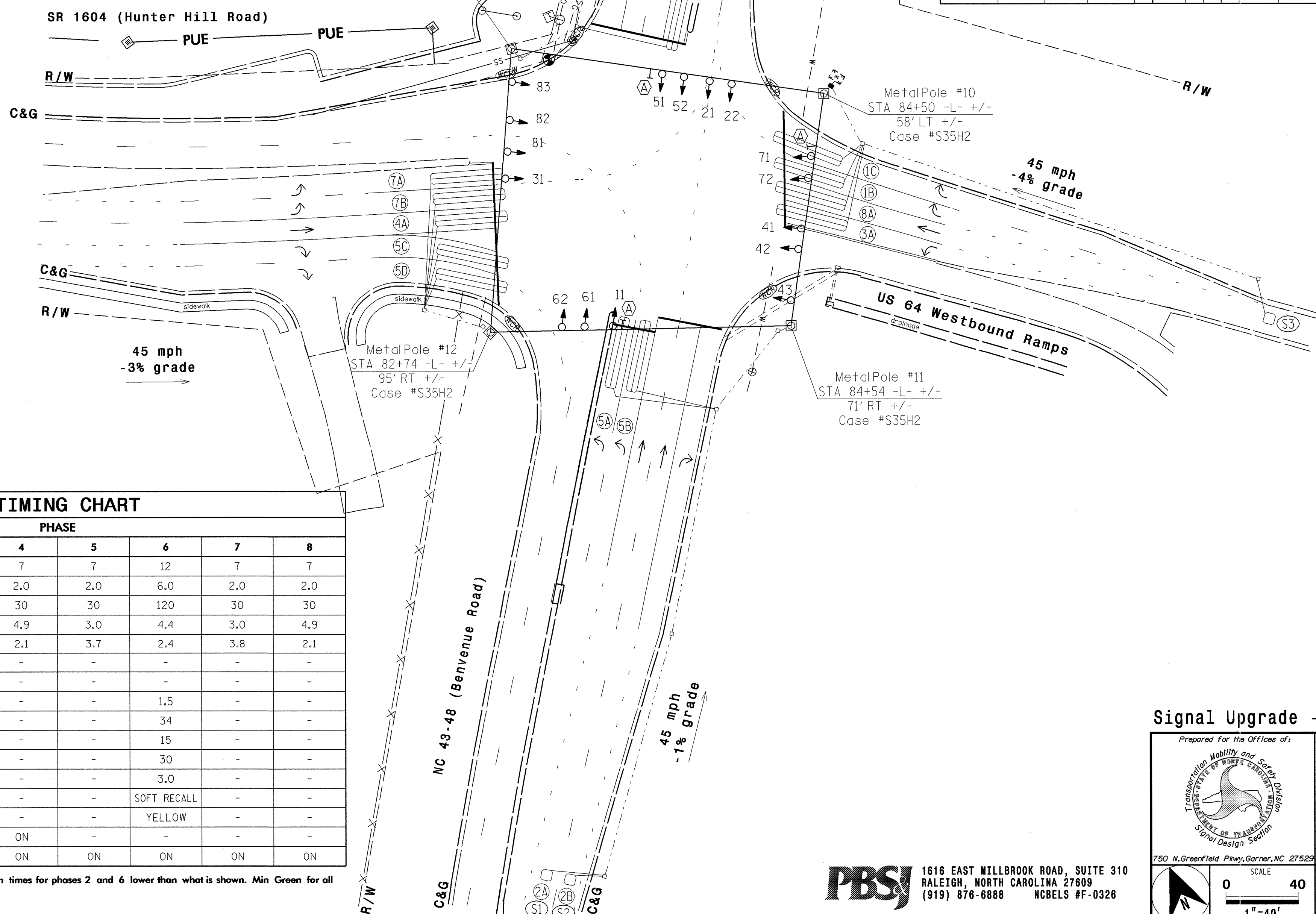
**OASIS 2070L LOOP & DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING EXTENSION	FULL TIME DELAY	STRETCH TIME				
1A	6x40	+5	2-4-2	Y	1	Y	Y	-	-	-	-	Y
1B	6x40	+5	2-4-2	Y	1	Y	Y	-	-	15	-	Y
1C	6x40	+5	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A/S1	6x6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B/S2	6x6	300	5	Y	2	Y	Y	-	-	-	-	Y
3A	6x40	+5	2-4-2	Y	3	Y	Y	-	-	15	-	Y
4A	6x40	+5	2-4-2	Y	4	Y	Y	-	-	-	-	Y
5A	6x40	+5	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5B	6x40	+5	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5C	6x40	+5	2-4-2	Y	5	Y	Y	-	-	15	-	Y
5D	6x40	+5	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A/S4	6x6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B/S5	6x6	300	5	Y	6	Y	Y	-	-	-	-	Y
7A	6x40	+5	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7B	6x40	+5	2-4-2	Y	7	Y	Y	-	-	-	-	Y
8A	6x40	+5	2-4-2	Y	8	Y	Y	-	-	-	-	Y
S3	6x6	275	4	Y	-	Y	Y	-	-	-	-	Y

**8 Phase Fully Actuated (Rocky Mount 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 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Maintain GPS antenna for time synchronization.



**LEGEND**

- | PROPOSED   | EXISTING                                     |
|--|--|
| ○ → Traffic Signal Head                            | ● → N/A                                      |
| ○ → Modified Signal Head                           | ○ → Sign                                     |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → Signal Pole with Guy                     |
| ○ → Signal Pole with Sidewalk Guy                  | ○ → Inductive Loop Detector                  |
| ○ → Controller & Cabinet                           | ○ → Junction Box                             |
| ○ → 2-in Underground Conduit                       | ○ → Right of Way                             |
| ○ → Directional Arrow                              | ○ → Directional Drill                        |
| ○ → Wheelchair Ramp                                | ○ → Special Sized or Over Sized Junction Box |
| ○ → Metal Strain Pole                              | ○ → Sanitary Sewer                           |
| ○ → Telephone Fiber Optic                          | ○ → Fence                                    |
| ○ → Water  | ○ → Drainage Pipe                            |
| ○ → "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)     |  |

**OASIS 2070L TIMING CHART**

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	30	120	30	30	30	120	30	30
Yellow Clearance	3.0	4.6	3.0	4.9	3.0	4.4	3.0	4.9
Red Clearance	3.3	1.9	3.6	2.1	3.7	2.4	3.8	2.1
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	SOFT RECALL	-	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

**Signal Upgrade - Final Design**

**US 64 Westbound Ramps/ SR 1604 (Hunter Hill Road) at NC 43-48 (Benvenue Road)**

Division 04 Nash County Rocky Mount

PLAN DATE: October 2010 REVIEWED BY: JT Brooks

PREPARED BY: LM Moon REVIEWED BY: MR Cooney

750 N. Greenfield Pkwy, Garner, NC 27529

1616 EAST WILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBELS #F-0326

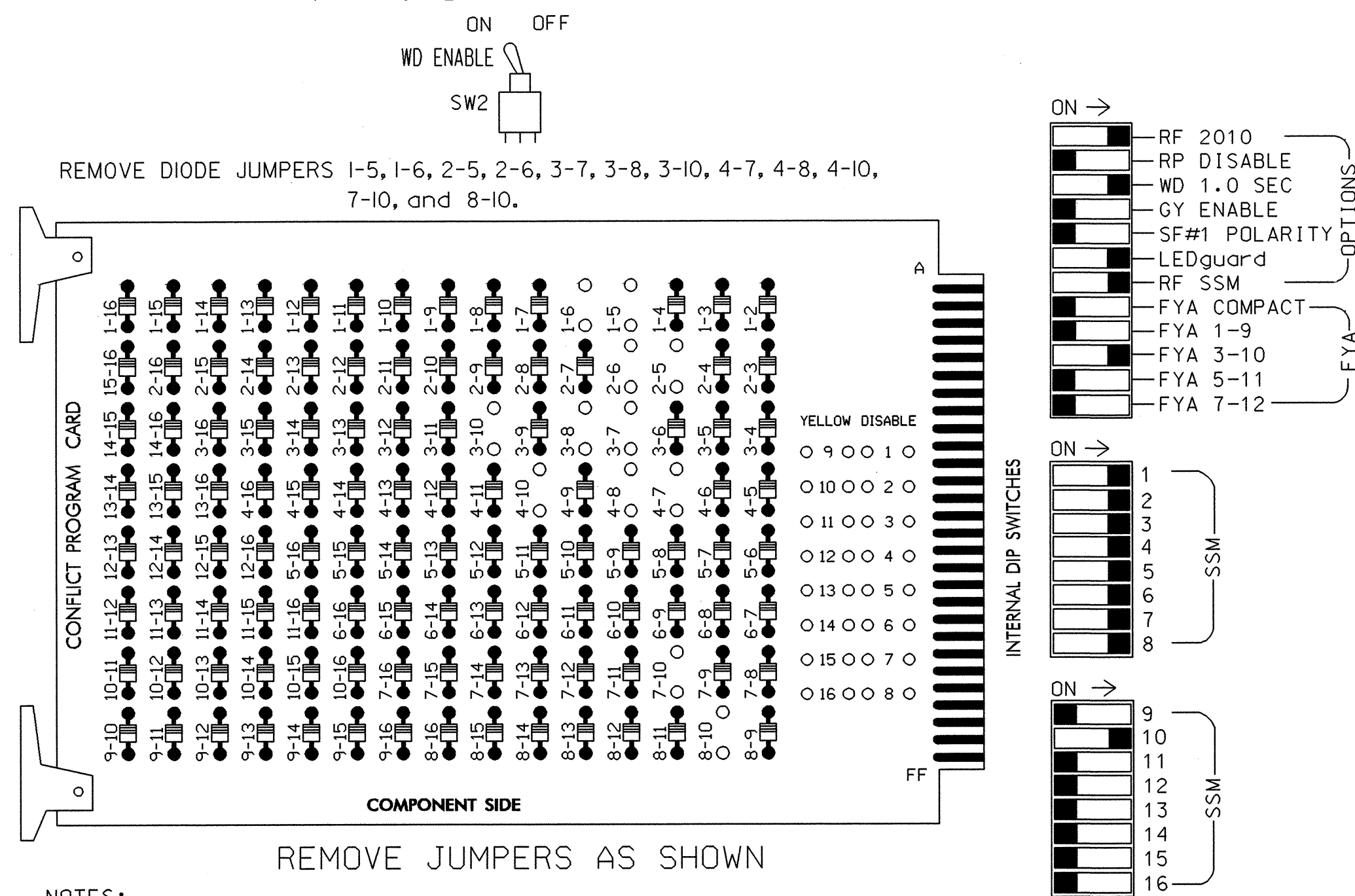
SCALE: 0 40  
1"=40'

REVISIONS: INIT. DATE

SIGNATURE: Lisa M. Moon 11-17-10  
DATE: 11-17-10

### 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.

### INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	∅ 1 1A	∅ 1 1B	∅2/SYS 2A/S1	TOP S	∅ 3 3A	∅ 4 4A	TOP S	TOP S	SYS. DET. S3	TOP S	TOP S	TOP S	TOP S	FS DC ISOLATOR
	NOT USED	∅ 1 1C	∅2/SYS 2B/S2	TOP S	NOT USED	NOT USED	TOP S	TOP S	NOT USED	TOP S	TOP S	TOP S	TOP S	ST DC ISOLATOR
FILE "J" U	∅ 5 5A	∅ 5 5C	∅6/SYS 6A/S4	TOP S	∅ 7 7A	∅ 8 8A	TOP S	TOP S	TOP S	TOP S	TOP S	TOP S	TOP S	S
	∅ 5 5B	∅ 5 5D	∅6/SYS 6B/S5	TOP S	∅ 7 7B	NOT USED	TOP S	TOP S	TOP S	TOP S	TOP S	TOP S	TOP S	TOP S

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

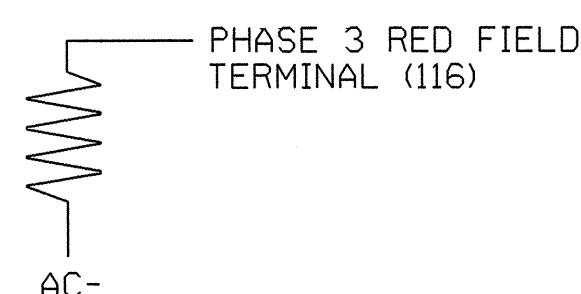
FS = FLASH SENSE  
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



### 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 9,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phase 4 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 2 as Wag Overlap.
- The cabinet and controller are part of the Rocky Mount Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....EXISTING CONTRACTOR SUPPLIED 2070L  
 CABINET.....EXISTING CONTRACTOR SUPPLIED 332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S10.  
 PHASES USED.....1,2,3,4,5,6,7,8.  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....3+4  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

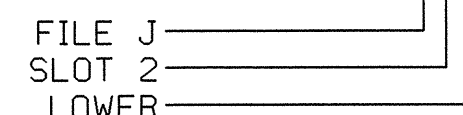
### INPUT FILE CONNECTION & PROGRAMMING CHART

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	TB2-1,2	I1U	56	18	1	1	Y	Y	-	-	-
1B	TB2-5,6	I2U	39	1	2	1	Y	Y	-	-	15
1C	TB2-7,8	I2L	43	5	12	1	Y	Y	-	-	15
2A/S1	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y	-	-	-
2B/S2	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y	-	-	-
3A <sup>1</sup>	TB4-5,6	I5U	58	20	3	3	Y	Y	-	-	15
	-	J8U	50	12	28	8	Y	Y	-	-	3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y	-	-	-
* S3	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y	-	-	-
5B	TB3-3,4	J1L	55	17	5	5	Y	Y	-	-	-
5C	TB3-5,6	J2U	40	2	6	5	Y	Y	-	-	15
5D	TB3-7,8	J2L	44	6	16	5	Y	Y	-	-	15
6A/S4	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y	-	-	-
6B/S5	TB3-11,12	J3L	77	39	46	6/SYS	Y	Y	-	-	-
7A	TB5-5,6	J5U	57	19	7	7	Y	Y	-	-	-
7B	TB5-7,8	J5L	57	19	7	7	Y	Y	-	-	-
8A	TB5-9,10	J6U	42	4	8	8	Y	Y	-	-	-

<sup>1</sup>Add jumper from I5-W to J8-W, on rear of input file.

\* SYSTEM DETECTOR ONLY. REMOVE THE VEHICLE PHASE ASSIGNED TO THIS DETECTOR IN THE DEFAULT PROGRAMMING.

### INPUT FILE POSITION LEGEND: J2L



### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82,83	21,22	22	31*	41,42 43	42,43	51,52	61,62	62	71,72	81,82 83	NU	31*	NU	NU	NU	NU
RED		128		*	101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125							131			122							A124
YELLOW ARROW	126	126			117			132	132		123	123						A125
FLASHING YELLOW ARROW																		A126
GREEN ARROW	127	127			118	118		133	133		124	124						

NU = Not Used

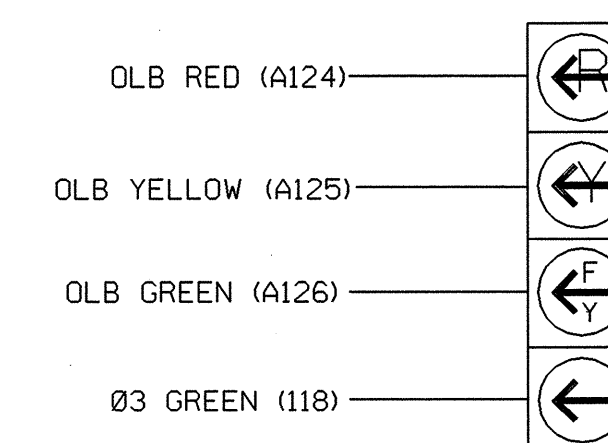
\* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

FLASH NOTE: REWIRE OVERLAP B TO FLASH ON FLASHER UNIT #2, CIRCUIT #1.

### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



31

NOTE

- The sequence display for these signals require special logic programming. See sheet 2 of 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0690  
 DESIGNED: October 2010  
 SEALED: November 17, 2010  
 REVISED:

**PBSJ** 1616 EAST WILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

### ELECTRICAL DETAIL SHEET 1 OF 2

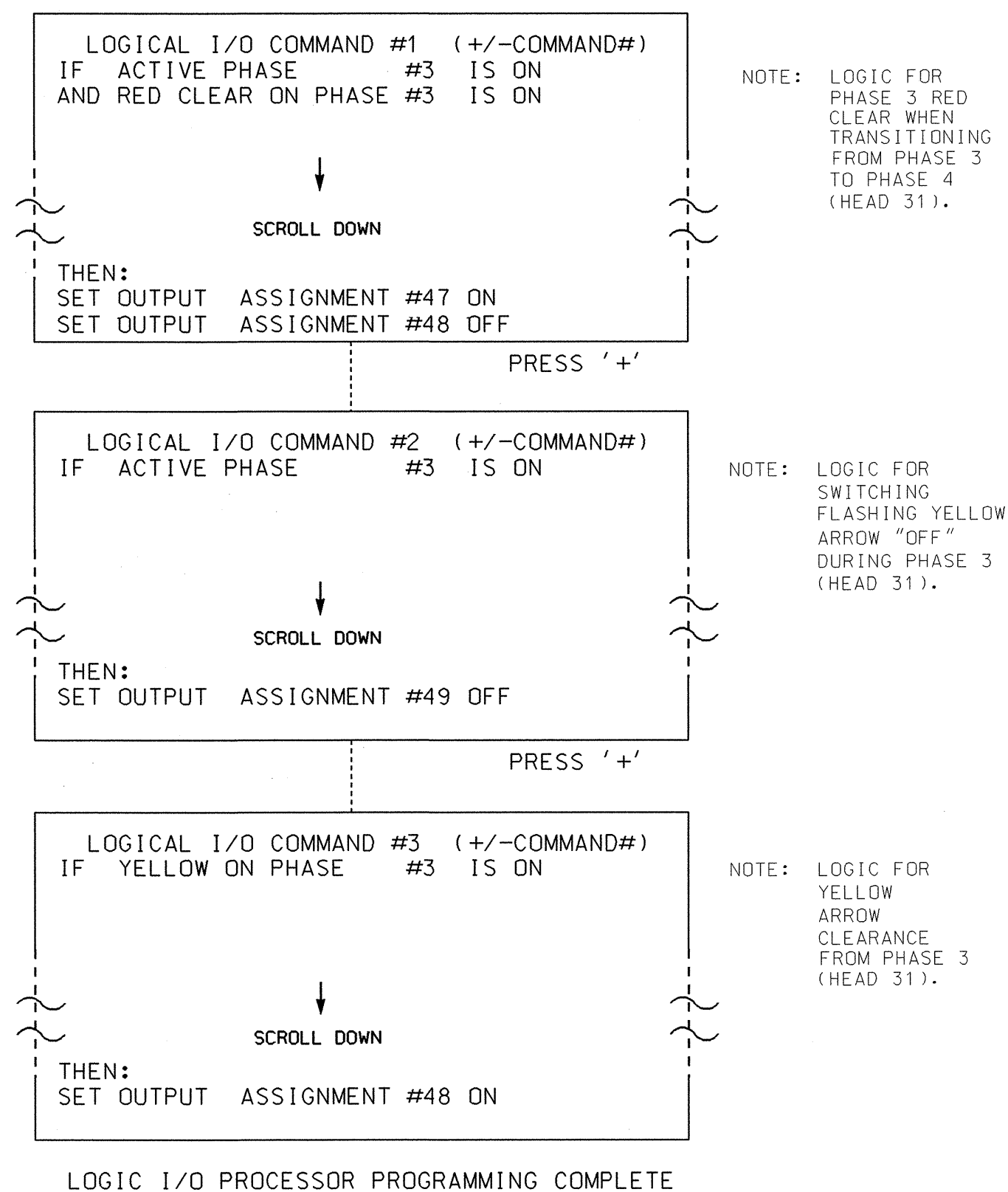
ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	US 64 Westbound Ramps/ SR 1604 (Hunter Hill Road) at NC 43-48 (Benvenue Road)		SEAL 
	Division 04 Nash County Rocky Mount PLAN DATE: October 2010 PREPARED BY: LM Moon REVISIONS: _____ INIT. DATE: _____		REVIEWED BY: MR Cooney SIGNATURE: _____ DATE: 11/17/10 SIG. INVENTORY NO. 04-0690



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

(program controller as shown below)

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



**OUTPUT REFERENCE SCHEDULE**  
USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 47	=	Overlap B Red
OUTPUT 48	=	Overlap B Yellow
OUTPUT 49	=	Overlap B Green

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' ONCE

```

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

OVERLAP PROGRAMMING COMPLETE

### INPUT ASSIGNMENT PROGRAMMING DETAIL FOR TOD HOUR SYNCHRONIZATION

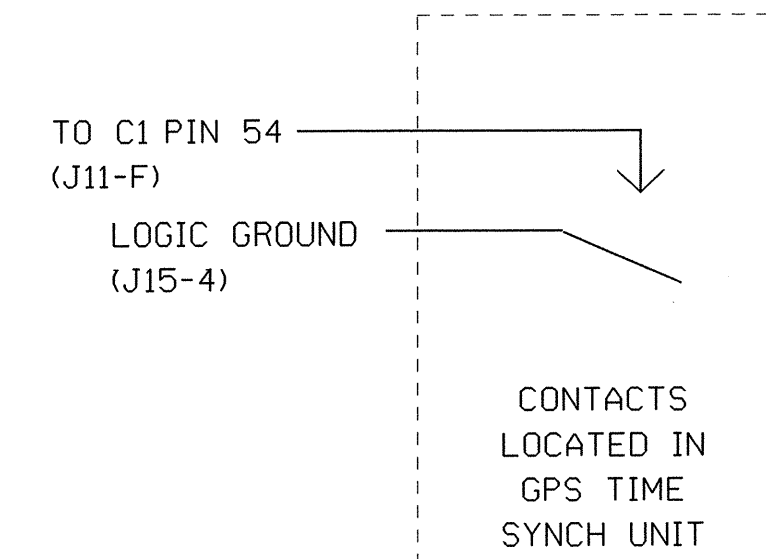
(program controller as shown below)

FROM MAIN MENU PRESS '5' (INPUTS), THEN '+' UNTIL PIN 54 (INPUT 16) IS REACHED.

PAGE: 1 C1 PIN:54  
INPUT ASSIGNMENT #.....16  
DEBOUNCE TIME (0-25.5 SEC).....0.5  
DELAY TIME (0-25.5 SEC).....0.0  
HOLD-OVER TIME (0-25.5 SEC).....0.0  
ASSIGNMENT SELECTION:  
NOT ENABLED (Y/N).....-  
VEHICLE DETECTOR (1-64).....-  
PEDESTRIAN DETECTOR (1-16).....-  
ALTERNATE PED DETECTOR (1-16).....-  
PREEMPT (1-10).....-  
INVERTED PREEMPT (1-10).....-  
STOP TIME (Y/N).....-  
FLASH SENSE (Y/N).....-  
DOOR OPEN (Y/N).....-  
MANUAL CONTROL ENABLE (Y/N).....-  
MANUAL CONTROL ADVANCE (Y/N).....-  
SPECIAL FUNCTION ALARM (1-8).....-  
TOD HOUR SYNCHRONIZATION (0-23).....5  
FORCE OFF RING (1-4).....-  
HOLD PHASES (1-16).....-  
PLAN (65=FLSH,66=FREE)... OFFSET#...-  
CHANGE PHASE SEQUENCE PAGE (1-12)...-  
CHANGE PHASE TIMING PAGE (1-4).....-  
CHANGE PHASE CONTROL PAGE (1-4).....-  
CHANGE OVERLAP CONTROL PAGE (1-4).....-  
CHANGE INPUT PAGE (1-4).....-  
CHANGE OUTPUT PAGE (1-4).....-  
OVERRIDE PHASE CONTROL FUNCTION (Y)...-

NOTE: WHEN THIS INPUT IS PULSED BY GPS TIME SYNCH UNIT, TOD CLOCK WILL RESET TO 5:00 AM.

### WIRING DETAIL FOR GPS TIME SYNCH UNIT



NOTES:

- ENABLE GPS FOR DAYLIGHT SAVINGS TIME ADJUSTMENTS.
- PROGRAM GPS AND CONTROLLER TO UPDATE TIME AT 5 AM.
- CONTACTS SHOWN ARE NORMALLY OPEN.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0690  
DESIGNED: October 2010  
SEALED: November 17, 2010  
REVISED:

### ELECTRICAL DETAIL SHEET 2 OF 2

	PREPARED FOR: <b>US 64 Westbound Ramps/ SR 1604 (Hunter Hill Road) at NC 43-48 (Benvenue Road)</b>		SEAL 
	PREPARED BY: <b>LW Moon</b>		
PLAN DATE: <b>October 2010</b>		DIVISION: <b>Wash County Rocky Mount</b>	
REVISIONS		INIT.	DATE
SIGNATURE: <i>Melissa R. Cooney</i>		DATE: <b>11/17/10</b>	
SIG. INVENTORY NO. <b>04-0690</b>			

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

5-07  
ENGLISH DETAIL DRAWING FOR  
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3  
**1725D01**

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

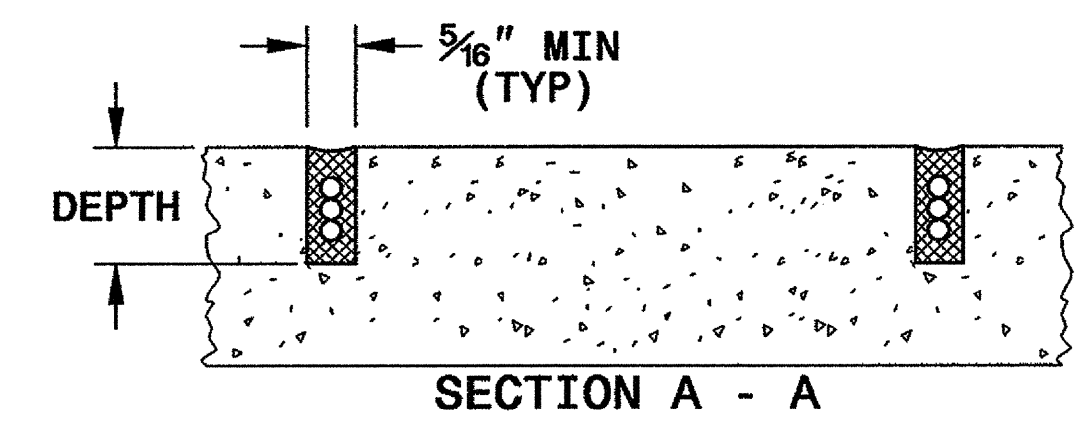
5-07  
ENGLISH DETAIL DRAWING FOR  
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3  
**1725D01**

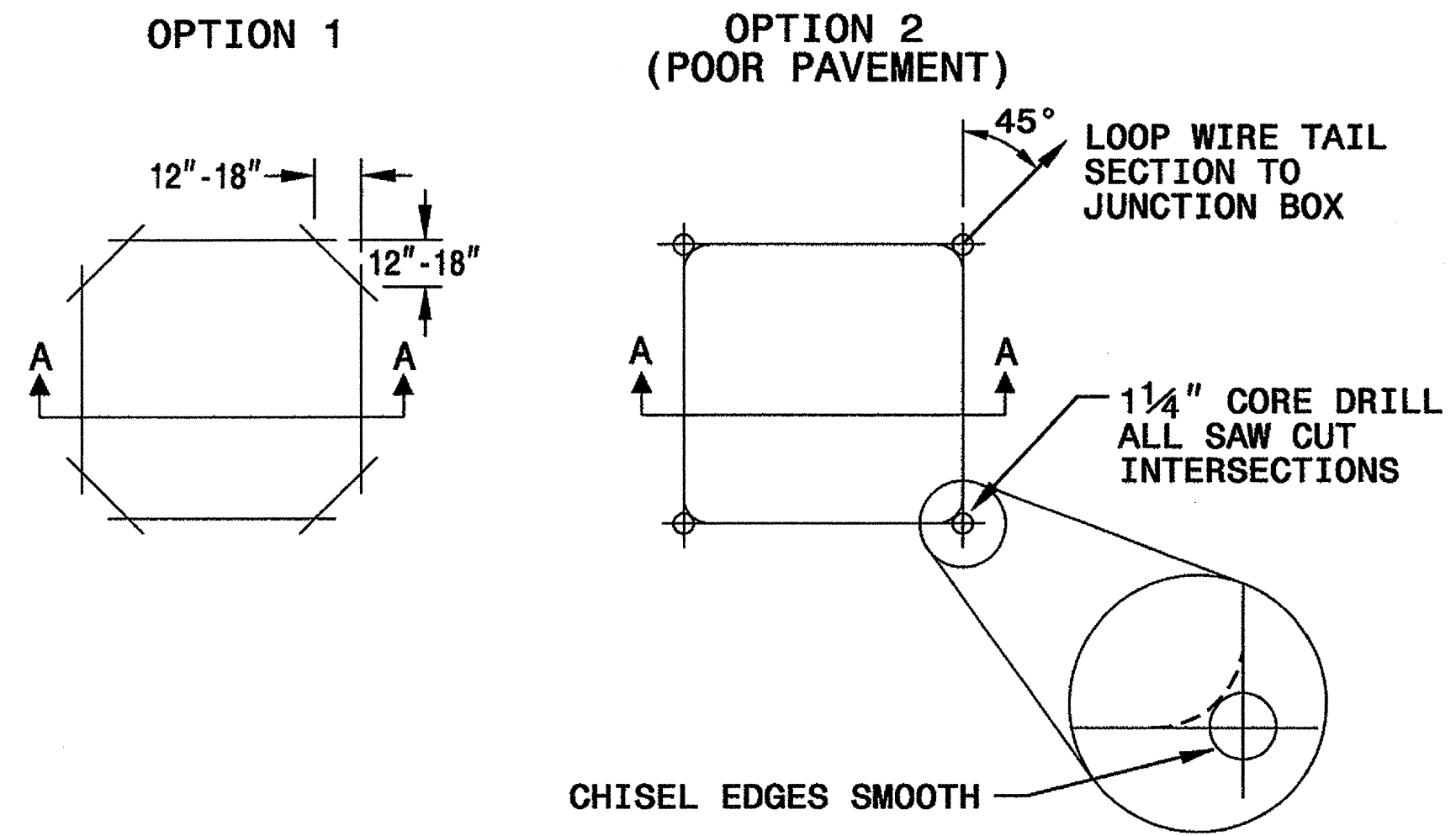
**CONVENTIONAL 4-SIDED LOOP**

**SAW SLOT DEPTH CHART**

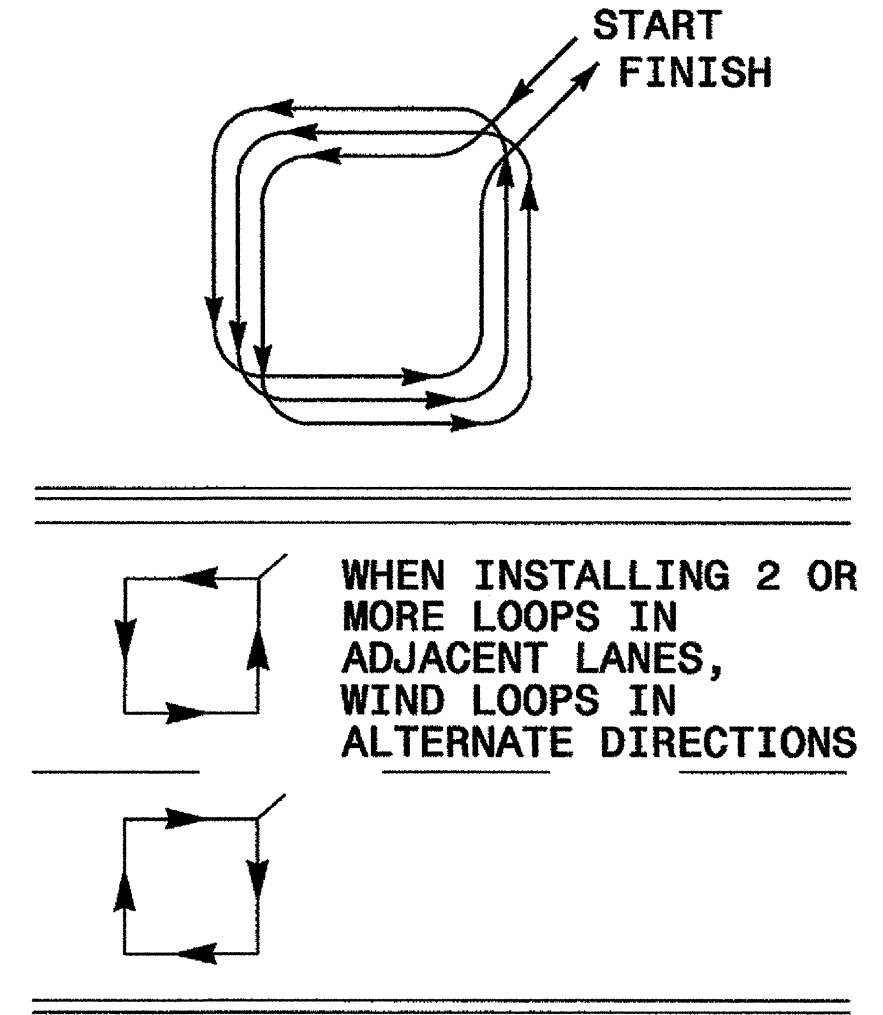
DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



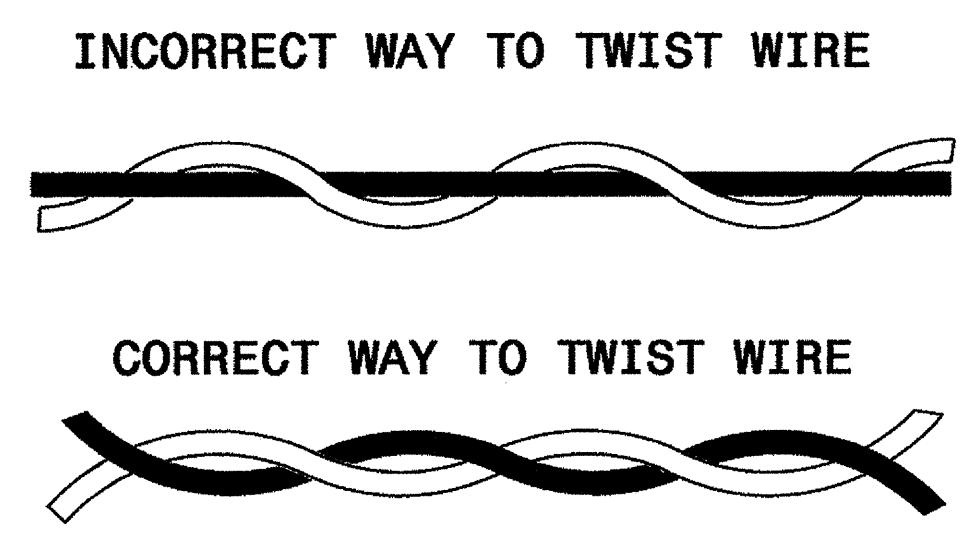
**SAW CUT OPTIONS**



**LOOP WINDING METHOD**



**LOOP WIRE TWISTING METHOD**

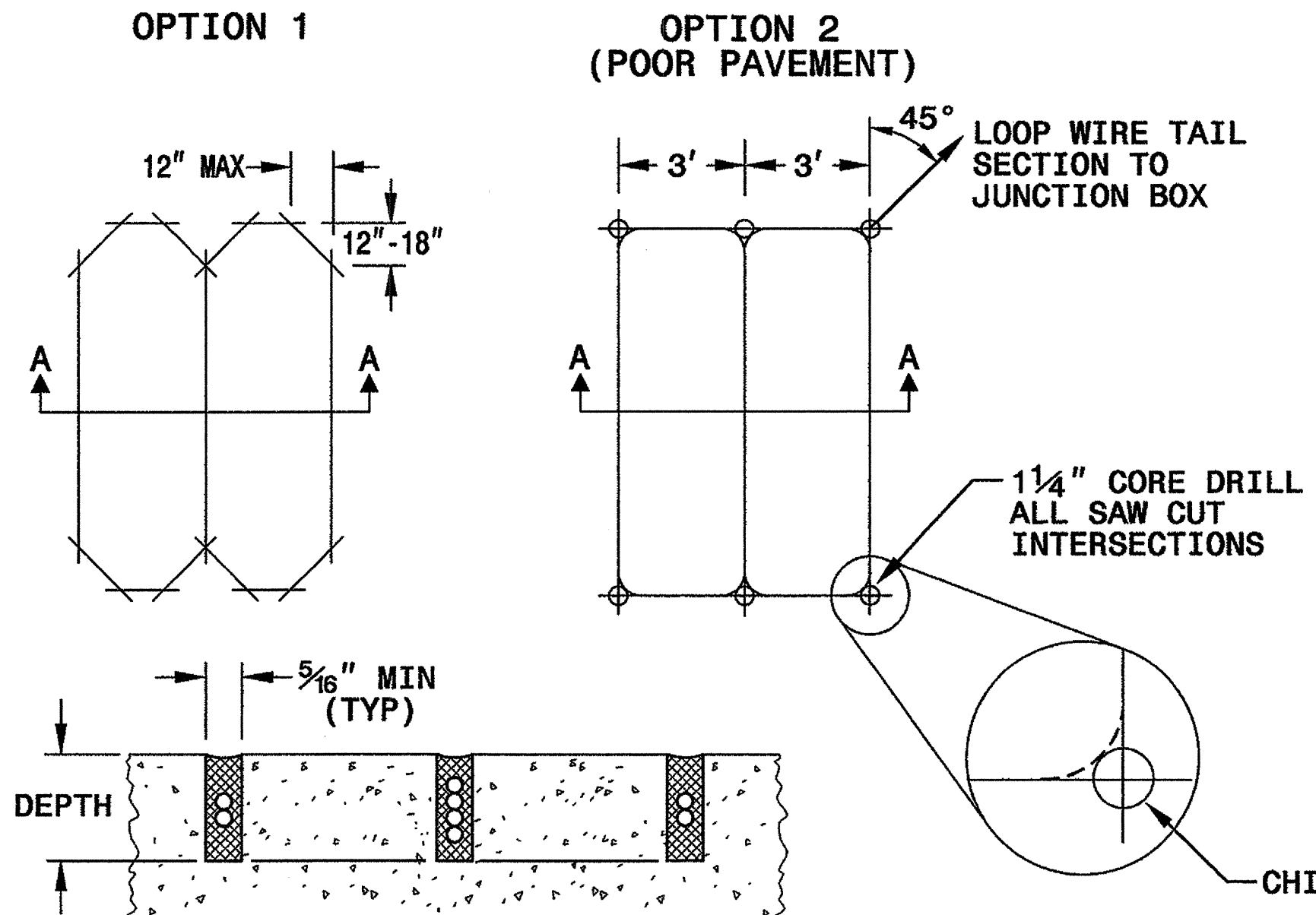


**NOTES**

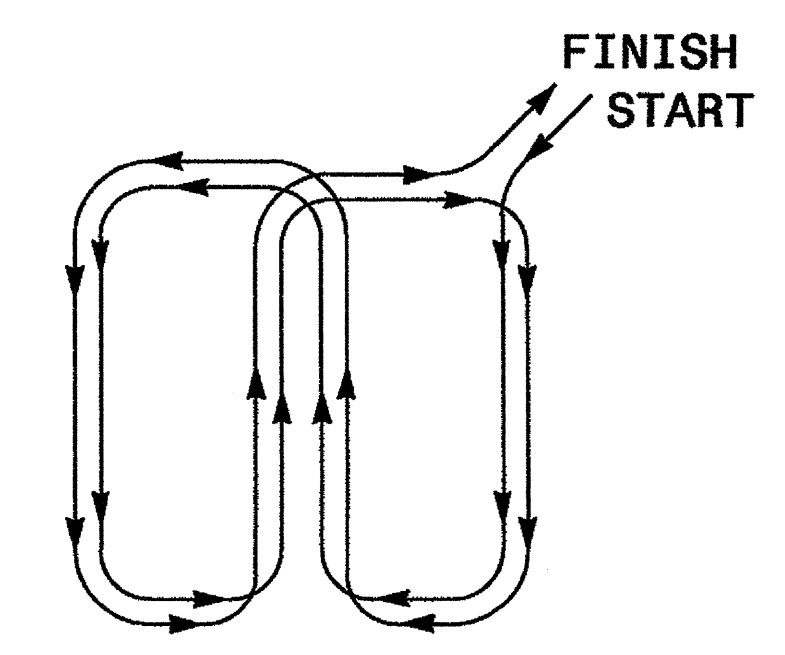
1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



**LOOP WINDING METHOD**



SECTION A - A  
DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

Milton I. Dean 9/5/07  
SIGNATURE DATE



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

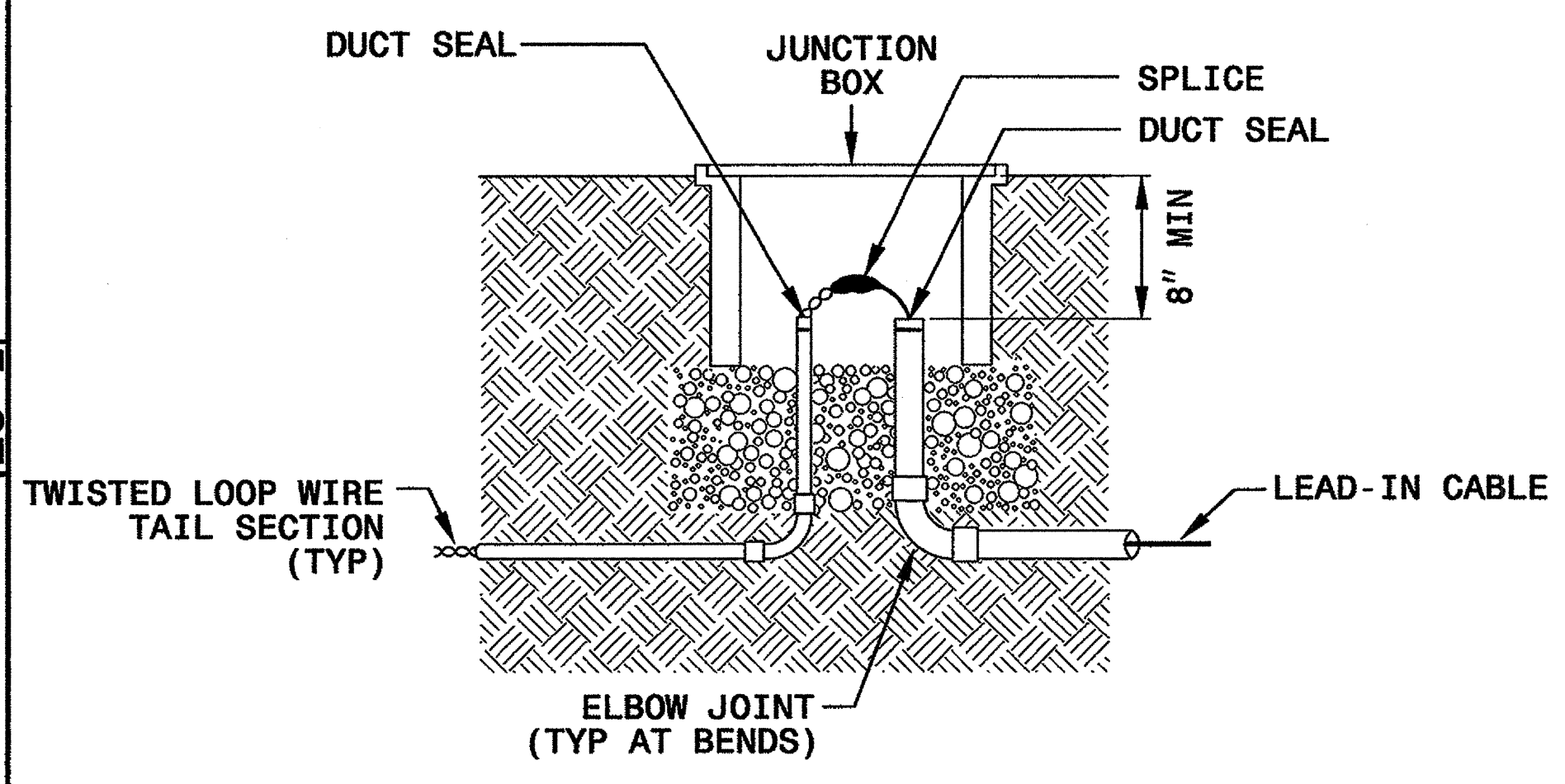
5-07

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

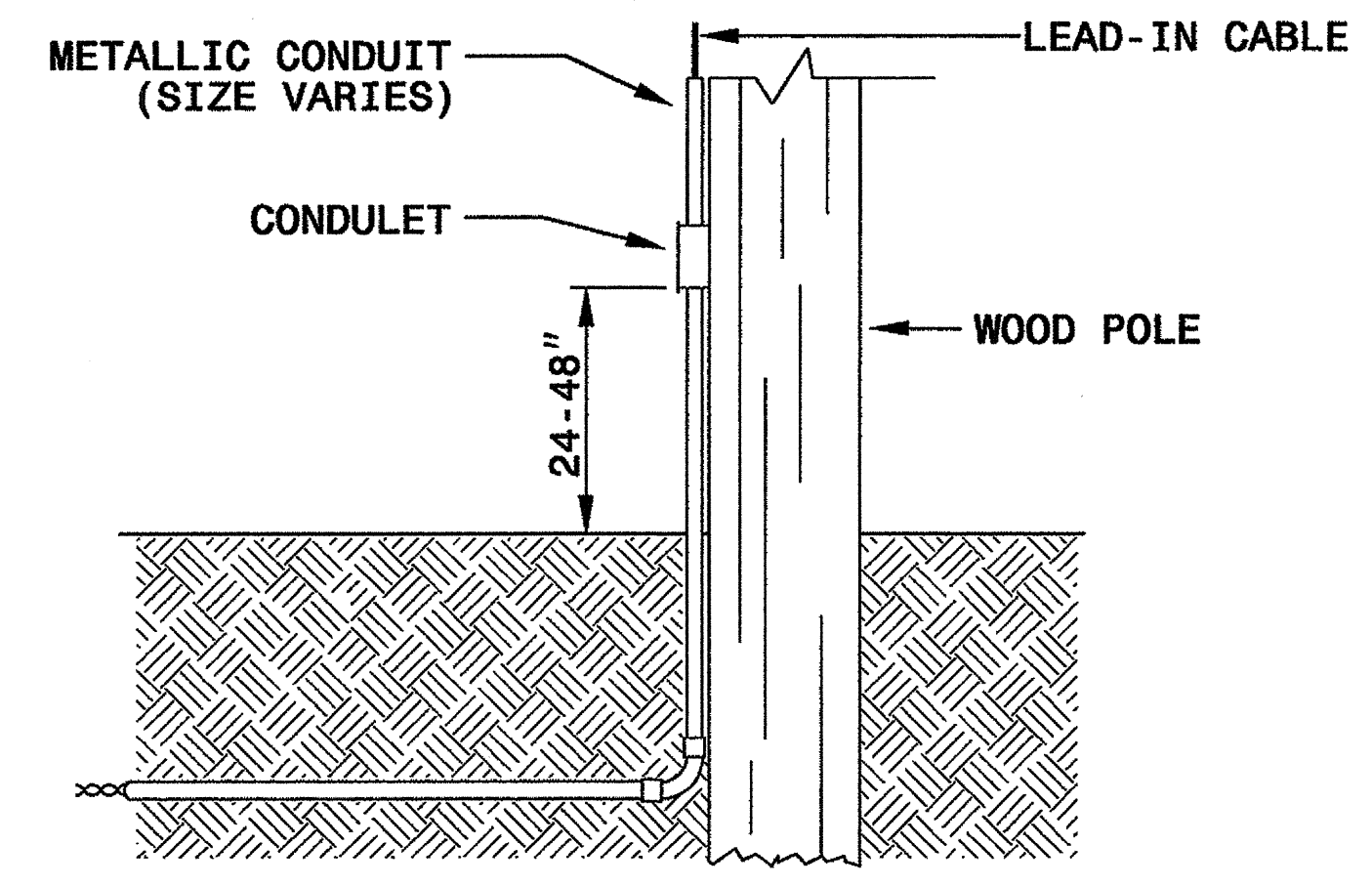
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



**LOOP WIRE AT POLE**

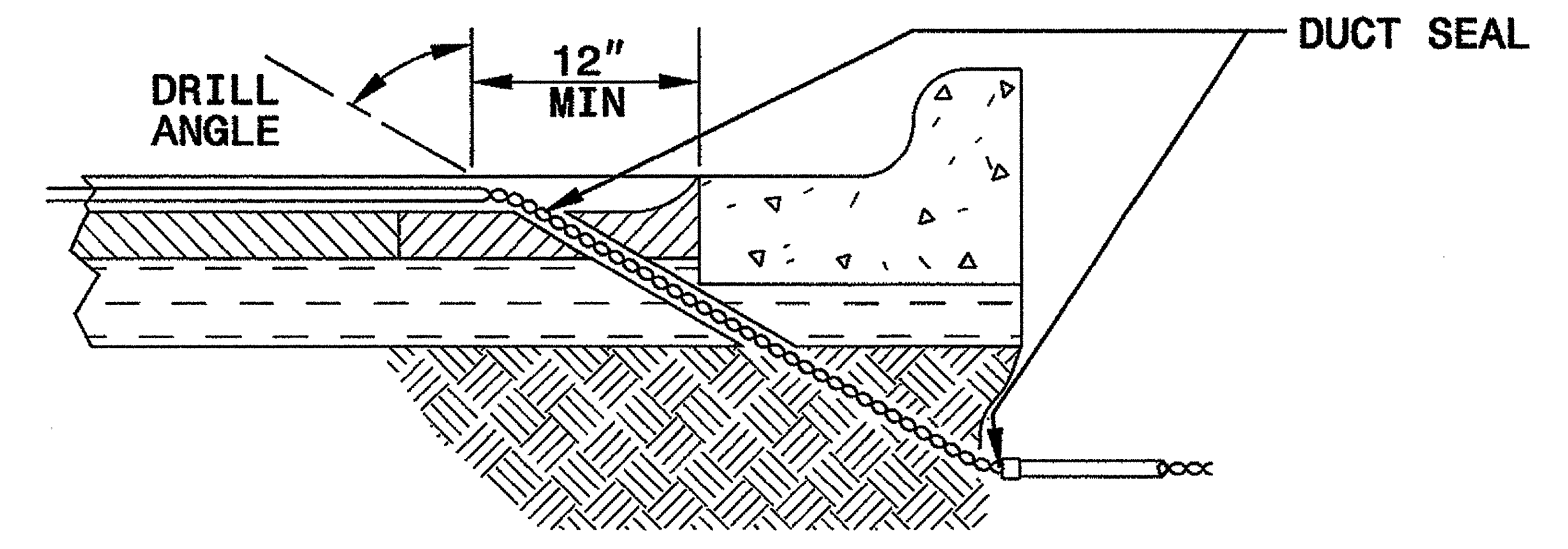


**NOTE**

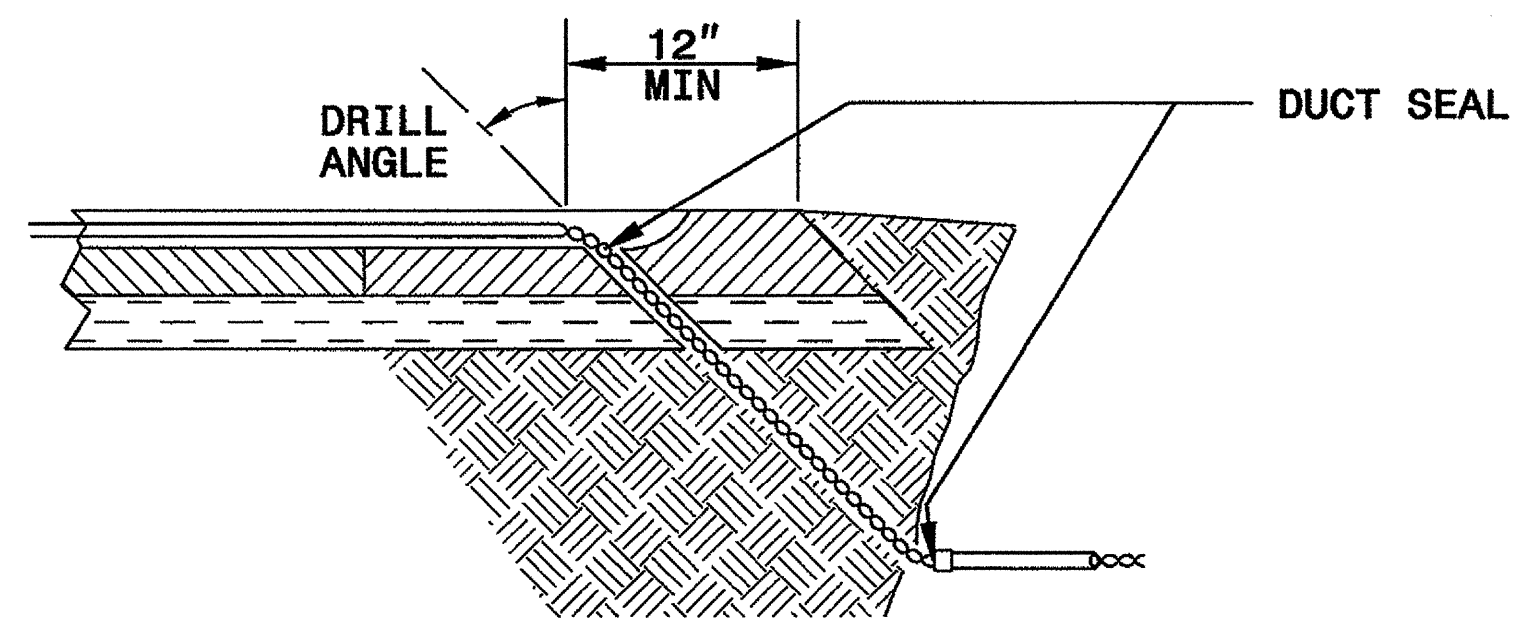
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**LOOP WIRE PAVEMENT EDGE DETAILS**

**LOOP WIRE AT CURB & GUTTER SECTION**



**LOOP WIRE AT PAVEMENT SECTION**



**NOTES**

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

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RALEIGH, N.C.

5-07

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

SHEET 2 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

Intelligent Transportation  
Systems & Signals Unit  
750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

SEAL  
016286  
ENGINEER  
MILTON I. DEAN

*Milton I. Dean* 9/5/07  
SIGNATURE DATE

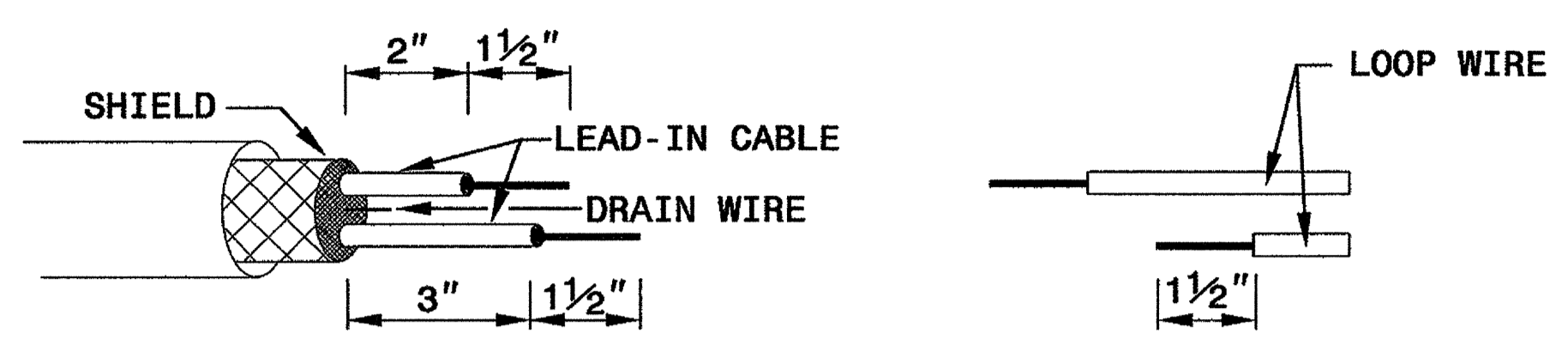
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

5-07

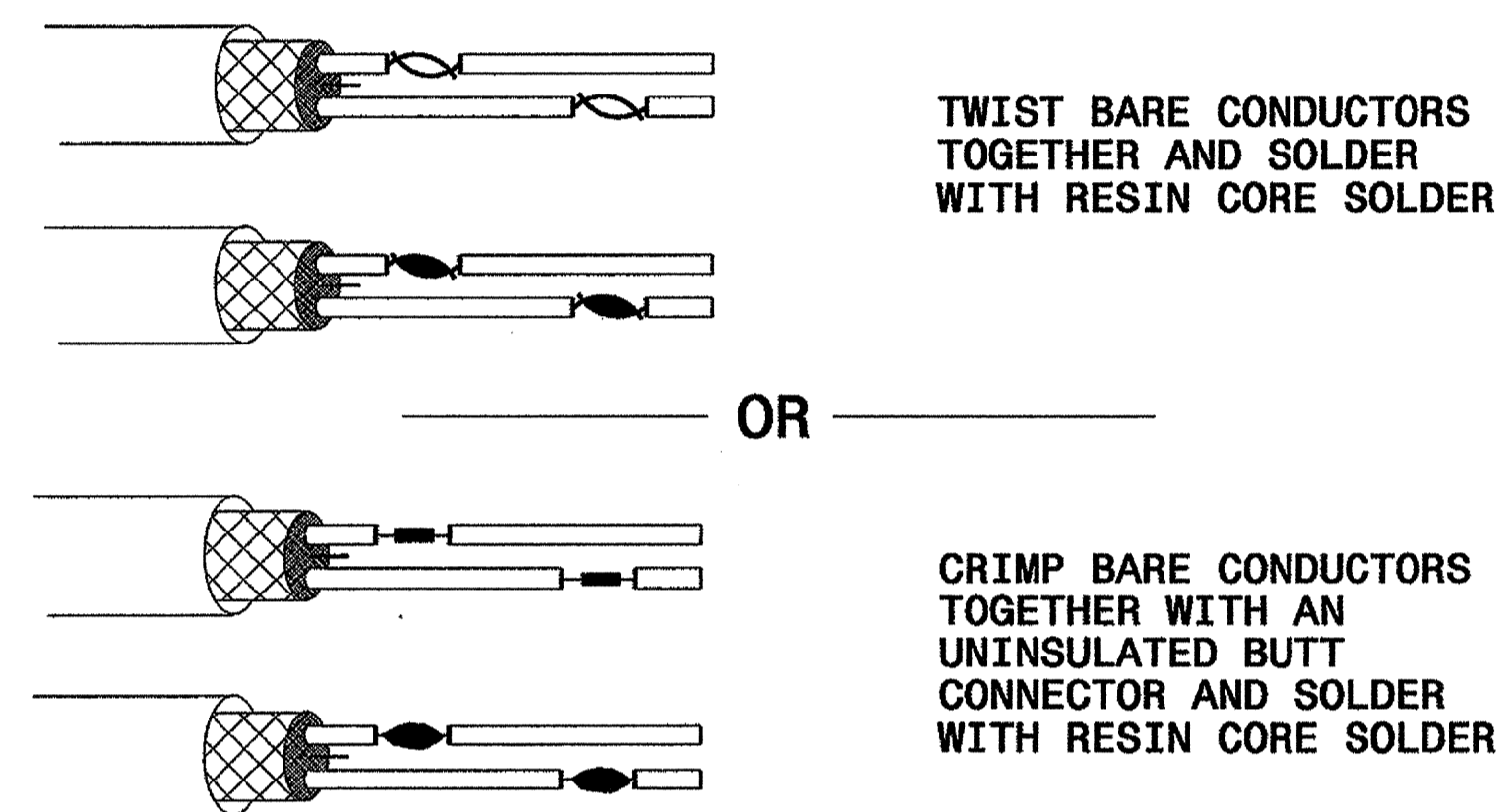
ENGLISH DETAIL DRAWING FOR  
**INDUCTION DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

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

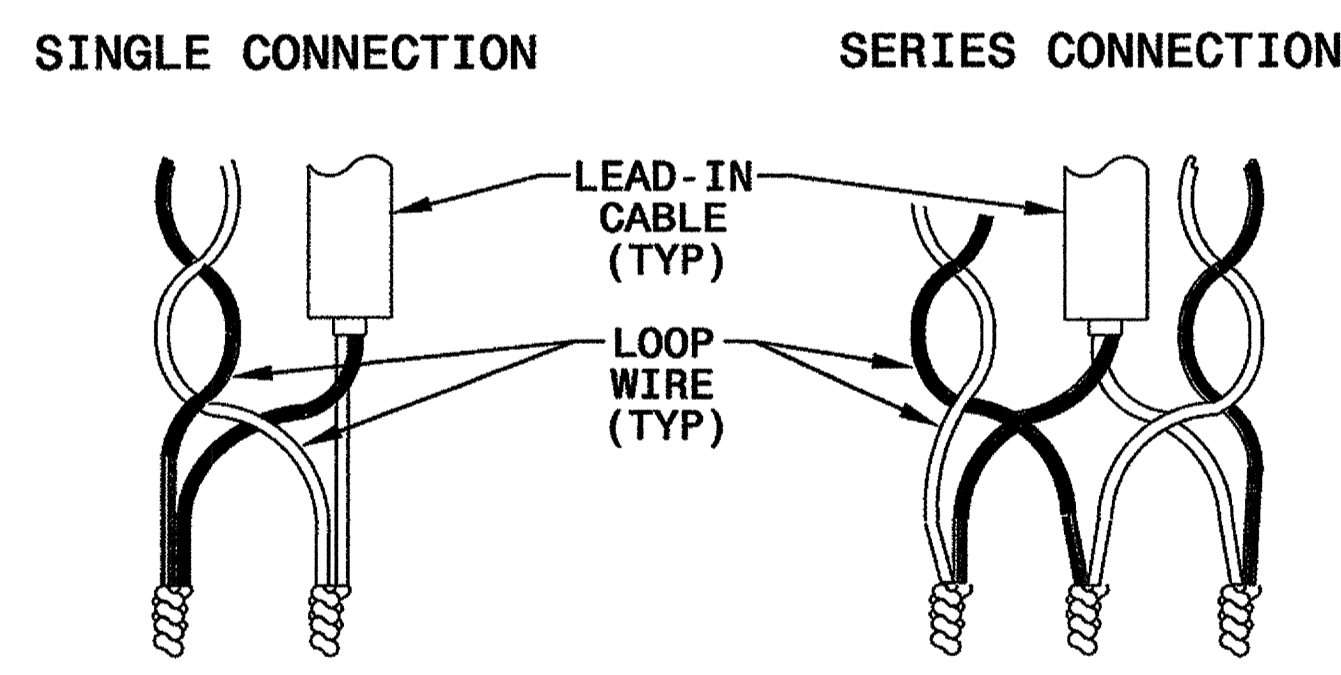


**STEP 2. CONNECT AND SOLDER**

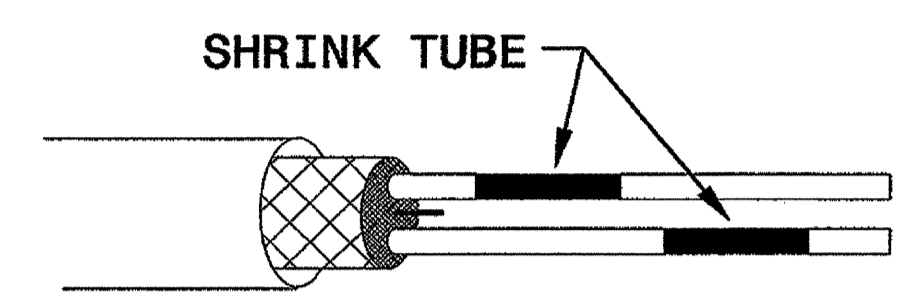


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

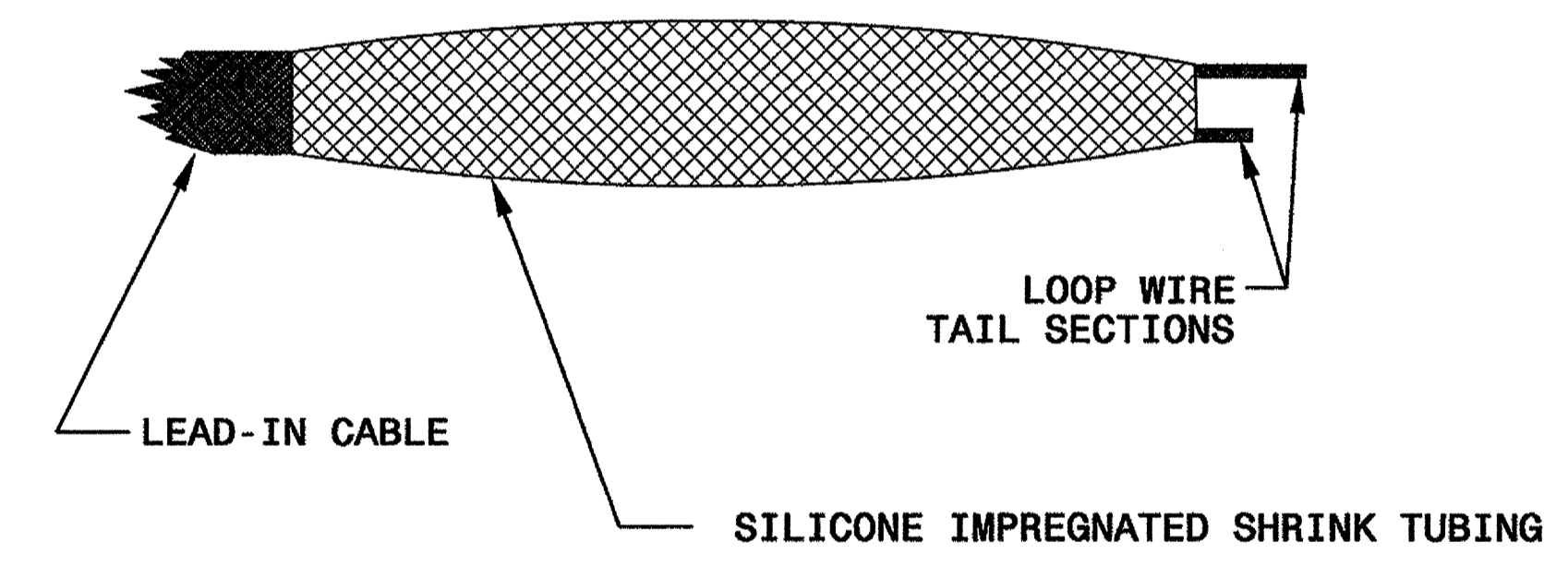
**LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS**



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



**STEP 4. ENVIRONMENTALLY PROTECT SPLICE**



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RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTION 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

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Milton I. Dean 9/5/07  
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CL-A

### LEGEND

- FO— NEW FIBER OPTIC COMMUNICATIONS CABLE
- EX1— EXISTING COMMUNICATIONS CABLE
- REM— EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AND EXISTING AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD— NEW DIRECTIONAL DRILLED CONDUIT
- B&J— NEW BORED AND JACKED CONDUIT
- NEW STANDARD JUNCTION BOX
- EXISTING STANDARD JUNCTION BOX
- NEW OVERSIZED OR SPECIAL-SIZED JUNCTION BOX
- EXISTING OVERSIZED OR SPECIAL-SIZED JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- Ⓢ NEW AERIAL SPLICE ENCLOSURE
- Ⓢ EXISTING AERIAL SPLICE ENCLOSURE
- Ⓢ NEW UNDERGROUND SPLICE ENCLOSURE
- Ⓢ NEW METAL POLE
- EXISTING METAL POLE
- ▶ NEW CCTV CAMERA ASSEMBLY
- ▶ EXISTING CCTV CAMERA ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- EXISTING STANDARD GUY ASSEMBLY
- ↪ NEW SIDEWALK GUY ASSEMBLY
- ↪ EXISTING SIDEWALK GUY ASSEMBLY
- ∞ NEW CABLE STORAGE RACKS (SNOW SHOES)
- ∞ EXISTING CABLE STORAGE RACKS (SNOW SHOES)
- ⊠ NEW CONTROLLER AND CABINET
- ⊠ EXISTING CONTROLLER AND CABINET
- Ⓢ NEW SPLICE CABINET
- Ⓢ EXISTING SPLICE CABINET
- SP SIGNAL POLE
- CRM CITY OF ROCKY MOUNT POWER POLE
- EOP EDGE OF PAVEMENT
- BOC BACK OF CURB
- EOL EDGE OF LANE
- 04-XXXX NCDOT SIGNAL INVENTORY NUMBER

### GENERAL NOTES

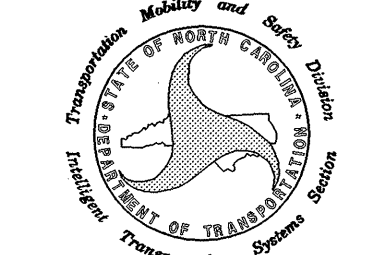
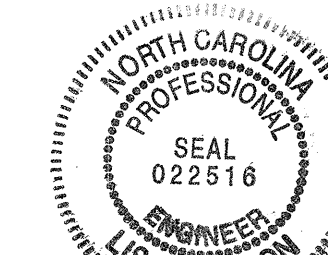

1. THESE PLANS WERE PREPARED FROM INVENTORIES AND FIELD DATA COLLECTED DURING AUGUST 2010. ACTUAL CONDITIONS IN THE FIELD AT THE TIME OF CONSTRUCTION MAY BE DIFFERENT FROM THOSE SHOWN IN THE PLANS.
2. THE FIELD LOCATION OF ANY ITEM TO BE INSTALLED AS PART OF THIS PROJECT SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
3. NEW TRAFFIC SIGNAL CONTROLLER CABINETS ARE SPECIFIED ON THE SIGNAL PLANS.
4. BURIED UTILITIES AND STRUCTURES: PIPELINES, STORM SEWERS, POWER CABLES, UTILITY CABLES, BASEMENTS, AND OTHER PUBLICLY AND PRIVATELY OWNED UNDERGROUND OBSTRUCTIONS EXIST ADJACENT TO AND WITHIN THE STREET RIGHT-OF-WAY WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT. INVESTIGATE THE LOCATION OF SUCH BURIED UTILITIES AND STRUCTURES WITH PUBLIC AND PRIVATE UTILITIES.
5. THE PLAN SHEETS HAVE BEEN DEVELOPED AS CLOSE TO SCALE AS PRACTICAL. ACTUAL FIELD CONDITIONS, HOWEVER, SHALL PROVIDE THE BASIS FOR APPLYING THE WORK SHOWN.
6. THE ROADWAY STANDARD DRAWINGS AND THE DETAILS PROVIDED IN THIS PLAN SET SHALL ALL APPLY TO ALL WORK REQUIRED IN THIS PROJECT, WHETHER A PARTICULAR DETAIL IS SPECIFICALLY REFERENCED TO A WORK ITEM OR NOT. IN THE EVENT OF A CONFLICT, THE ORDER OF PRECEDENCE SHALL BE: THE PROJECT SPECIAL PROVISIONS, THE PLAN SET - INCLUDING DETAILS - SUPPLEMENTAL SPECIFICATIONS, THE STANDARD SPECIFICATIONS, AND THEN THE ROADWAY STANDARD DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING THE PROPER DETAILS.
7. ANY OF THE CONTRACTOR'S WORK ACTIVITIES WHICH IMPACT ANY UTILITY FACILITY SHALL BE COORDINATED WITH THE OWNER OF THE AFFECTED UTILITIES. THE CONTRACTOR SHALL FOLLOW ANY AND ALL WORK PROCEDURES THE UTILITY OWNERS MAY REQUIRE.
8. ALL WORK SHOWN ON THESE PLANS SHALL BE PERFORMED BY THE CONTRACTOR UNLESS SPECIFICALLY NOTED TO BE PERFORMED BY OTHERS.
9. FIBER OPTIC CABLE/COMMUNICATIONS SYSTEM WILL BE INCORPORATED INTO THE CITY OF ROCKY MOUNT UPGRADED AND EXPANDED FIBER OPTIC SIGNAL SYSTEM PROJECT (C-5112). ENSURE COMPATIBILITY WITH FUTURE CITY SYSTEM BY COORDINATING FIBER OPTIC SIGNAL SYSTEM CABLE, EQUIPMENT AND INSTALLATION WITH C-5112. TO ENSURE COMPATIBILITY FOR CCTV CAMERAS, SPLICE ENCLOSURES, EDGE SWITCHES & ENCODERS/DECODERS FOR THE COMMUNICATIONS SYSTEM, THESE DEVICES WILL BE PROVIDED AND INSTALLED UNDER THE ROCKY MOUNT SIGNAL SYSTEM PROJECT (C-5112). ONE EXCEPTION WILL BE MADE ON US 301 (WESLEYAN BOULEVARD). TO MAINTAIN EXISTING HYBRID SMFOMMFO CABLE ALONG THE CORRIDOR, THE CONTRACTOR WILL BE REQUIRED TO BUTT SPLICE THE EXISTING SMFOMMFO WITH NEW SMFO AND MMFO. FOR THIS WORK THE CONTRACTOR SHALL SUPPLY THE SPLICE ENCLOSURES AND PERFORM THE BUTT SPLICES.
10. THE CABLE ROUTING WORK ALONG US 301 (WESLEYAN BOULEVARD) SHALL BE DONE AT THE BEGINNING OF THE PROJECT. WORK TO BE DONE IN A WAY TO DISRUPT THE EXISTING SIGNAL SYSTEM FOR LESS THAN 8 HOURS.
11. FOR THE EARLIEST POSSIBLE INTEGRATION INTO THE UPGRADED AND EXPANDED ROCKY MOUNT SIGNAL SYSTEM, INSTALL FIBER OPTIC CABLE AT THE EARLIEST POINT FEASIBLE UNDER THE U-3621B PROJECT. AFTER INSTALLATION AND SUCCESSFUL TESTING OF THE THE FIBER OPTIC CABLE, AND THE CONTRACTOR RECEIVES FINAL APPROVAL, THE FIBER OPTIC CABLE WILL BECOME THE RESPONSIBILITY OF THE DEPARTMENT.

### ATTACHMENT POINT ABBREVIATIONS

ARLT	Area Light
BS	Backside Attachment
CITY	City of Rocky Mount Signal System
CITY (IS)	City of Rocky Mount Information Systems
CRM	City of Rocky Mount Electric
CTL	CenturyLink
DL	Drip Loop
EXI	Existing Communications Cable
FS	Front Side Attachment
LIC	Lead-In Cable (Detector)
NEUT	Neutral
RSR	Riser
SEC	Secondary Power
SIG	Signal Span
STLT	Streetlight
SLC	SuddenLink Communications
TFMR	Transformer
TRI	Triplex

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 13833 AT RALBUVRH1

**PBS&I** 1616 EAST HILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

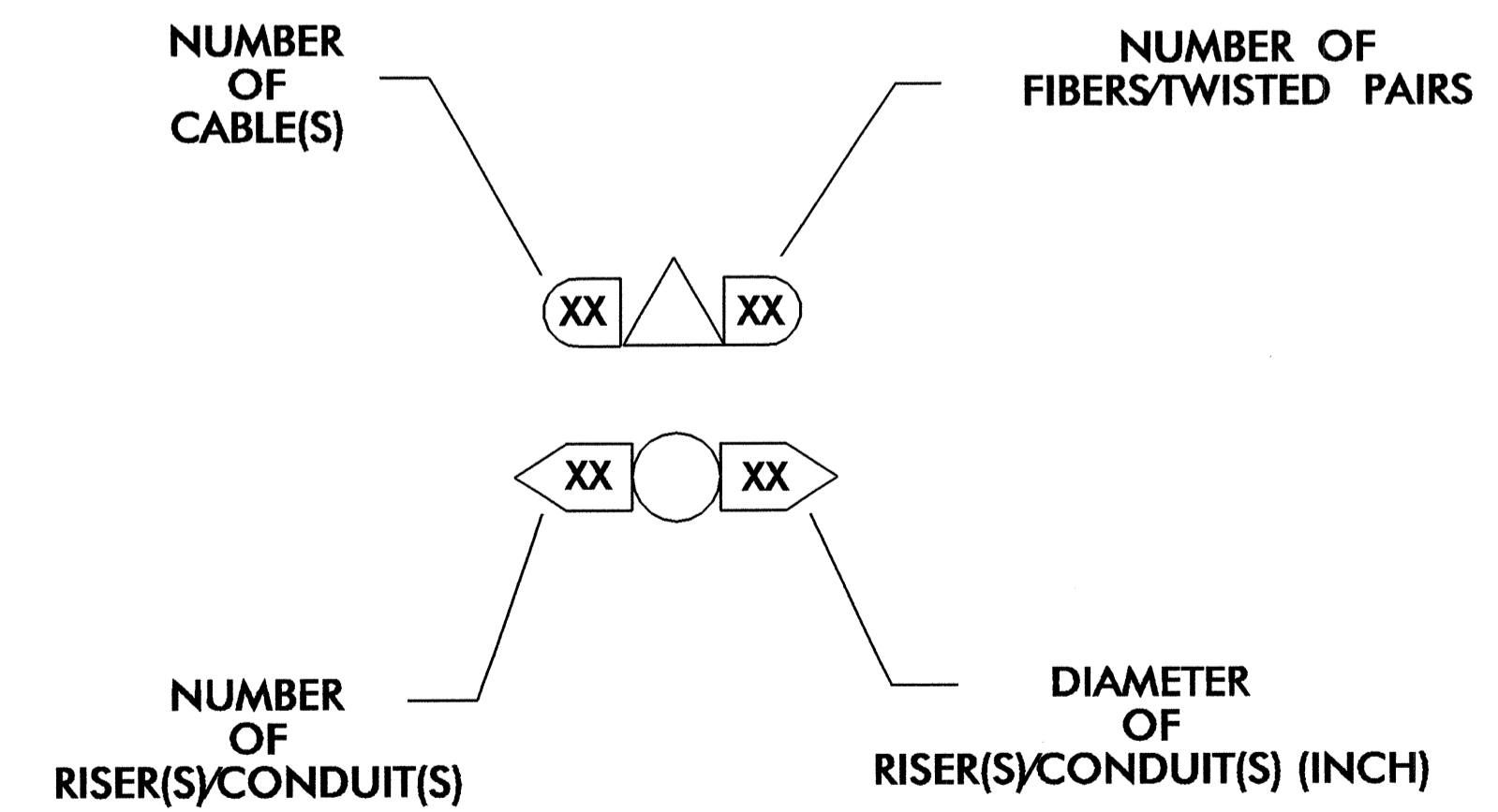
 Prepared for the Offices of: Transportation, Mobility and Safety Division DEPARTMENT OF TRANSPORTATION NORTH CAROLINA	<b>Hunter Hill Road Cable Layout Plans</b>		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022516 JSA M. MOON
	Division 04 Nash County Rocky Mount PLAN DATE: November 2010 REVIEWED BY: MR Cooney PREPARED BY: LM Moon REVIEWED BY: JT Brooks	REVISIONS INIT. DATE	
750 N. Greenfield Pkwy., Garner, NC 27529 	SCALE 0 50 NTS 1" = 50'	CADD File Name: Legend sheet.dgn	

- 1 INSTALL REA, PE - 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 2 INSTALL REA, PE - 38, (FIGURE - 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
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- 4 INSTALL SMFO CABLE
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- 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 HEAT SHRINK TUBING
- 13 INSTALL HEAT SHRINK TUBING RETROFIT KIT
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- 16 BORE AND JACK CONDUIT
- 17 INSTALL CABLE(S) IN EXISTING CONDUIT
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- 24 INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET
- 25 INSTALL NEW RISER INTO POLE MOUNTED CABINET
- 26 INSTALL FIBER-OPTIC VIDEO/DATA TRANSCEIVER
- 27 INSTALL FIBER-OPTIC TRANSCEIVER - DROP AND REPEAT
- 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 SPECIAL-SIZED 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 CABLE AND MESSENGER CABLE
- 49 REMOVE EXISTING COMMUNICATIONS CABLE
- 50 INSTALL TELEPHONE SERVICE
- 51 INSTALL CABLE STORAGE RACK(S) [SNOW SHOE(S)] AND STORE 100 FEET OF CABLE
- 52 INSTALL DELINEATOR MARKER
- 53 STORE 30 FEET OF COMMUNICATIONS CABLE (EACH 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 FOR CCTV
- 58 INSTALL NEW ELECTRICAL SERVICE FOR CCTV
- 59 INSTALL NEW POLE MOUNTED CCTV CABINET
- 60 INSTALL NEW BASE MOUNTED CCTV CABINET
- 61 INSTALL UNI-DIRECTIONAL ANTENNA
- 62 INSTALL OMNI-DIRECTIONAL ANTENNA
- 63 INSTALL ETHERNET RADIO
- 64 INTERCEPT AND REROUTE EXISTING CONDUITS

**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)



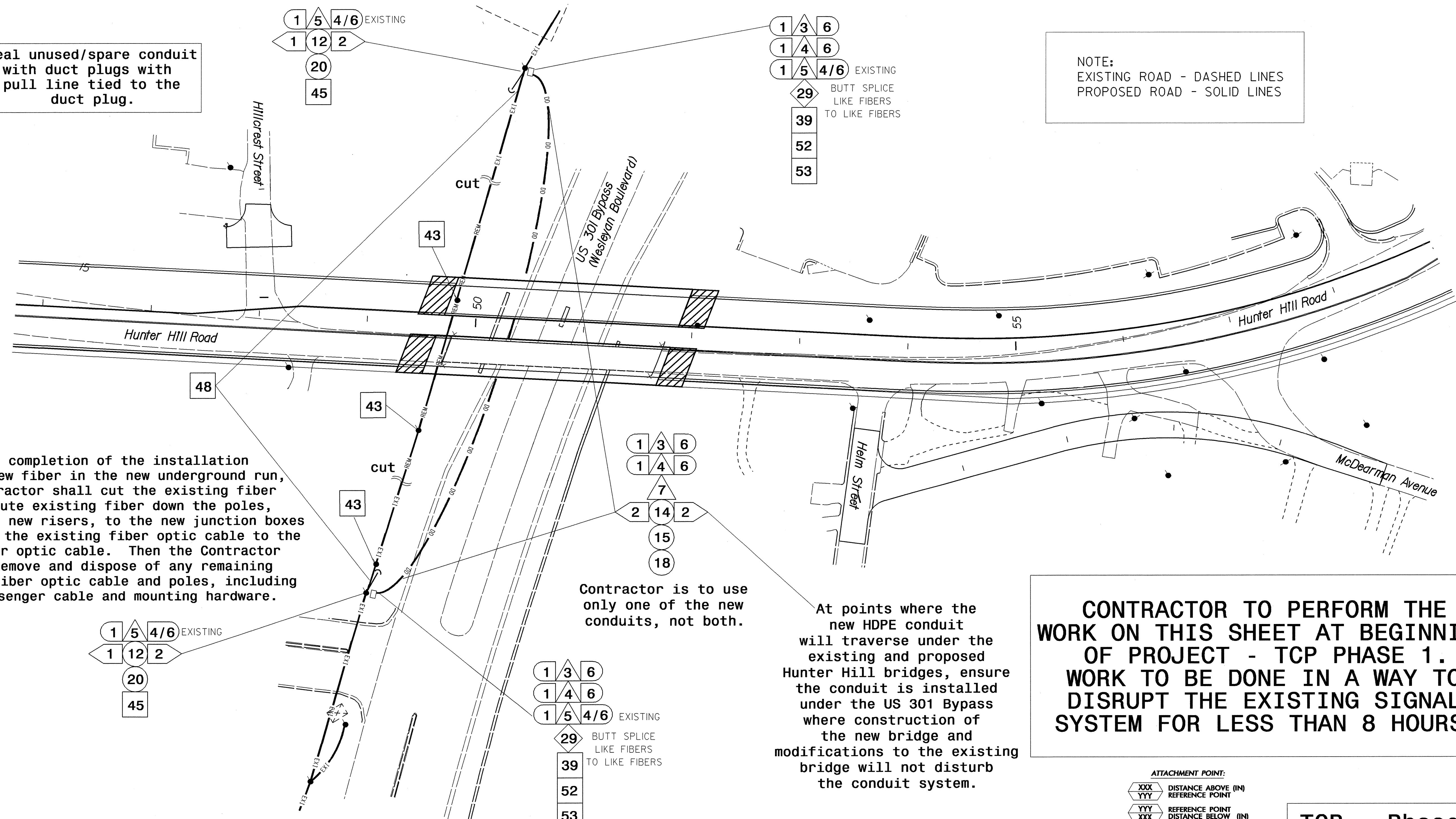
	<b>Construction Notes Hunter Hill Road</b>							
	PLAN DATE: <b>October 2010</b> PREPARED BY: <b>LM Moon</b>	REVIEWED BY: <b>JT Brooks</b> REVIEWED BY: <b>NR Cooney</b>						
SCALE: <b>NTS</b>	REVISIONS: <table border="1"> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>							INIT. DATE _____
SIGNATURE: <i>Lisa M. Moon</i> 11-17-11 DATE:		SEAL:						
CADD FILE NAME: <b>cl-b-notes.c</b>								



CL-1

Seal unused/spare conduit with duct plugs with pull line tied to the duct plug.

NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES



Upon completion of the installation of the new fiber in the new underground run, the Contractor shall cut the existing fiber and reroute existing fiber down the poles, through the new risers, to the new junction boxes and splice the existing fiber optic cable to the new fiber optic cable. Then the Contractor shall remove and dispose of any remaining existing fiber optic cable and poles, including all messenger cable and mounting hardware.

Contractor is to use only one of the new conduits, not both.

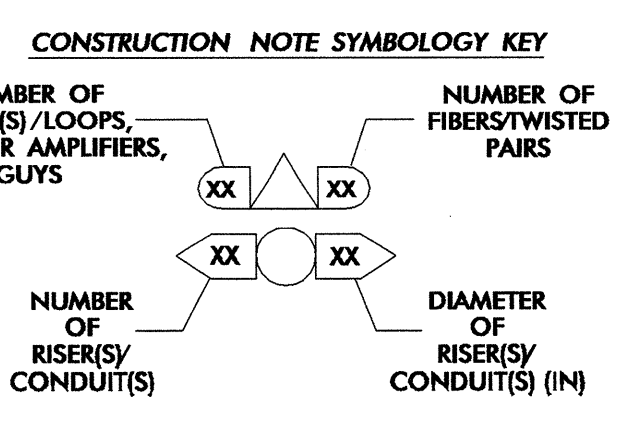
At points where the new HDPE conduit will traverse under the existing and proposed Hunter Hill bridges, ensure the conduit is installed under the US 301 Bypass where construction of the new bridge and modifications to the existing bridge will not disturb the conduit system.

**CONTRACTOR TO PERFORM THE WORK ON THIS SHEET AT BEGINNING OF PROJECT - TCP PHASE 1. WORK TO BE DONE IN A WAY TO DISRUPT THE EXISTING SIGNAL SYSTEM FOR LESS THAN 8 HOURS.**

- NOTES:
- UNLESS OTHERWISE NOTED ATTACH NEW MESSENGER CABLE 40" BELOW POWER AND ON FRONT SIDE (FS) OF POLE.
  - SEAL ALL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUNCTION BOX/CABINET ENTRANCES.

1. INSTALL REA, PE - 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	12. INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	23. INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34. INSTALL CABINET FOUNDATION	45. INSTALL STANDARD GUY ASSEMBLY	56. LASH CABLE(S) TO NEW MESSENGER CABLE
2. INSTALL REA, PE - 38, (FIGURE - 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13. INSTALL HEAT SHRINK TUBING RETROFIT KIT	24. INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	35. REMOVE EXISTING CABINET FOUNDATION	46. INSTALL SIDEWALK GUY ASSEMBLY	57. MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV
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5. INSTALL SMFOMFO HYBRID CABLE	16. BORE AND JACK CONDUIT	27. INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION	49. REMOVE EXISTING COMMUNICATIONS CABLE	60. INSTALL NEW BASE MOUNTED CCTV CABINET
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7. INSTALL TRACER WIRE	18. INSTALL CABLE(S) IN NEW CONDUIT	29. INSTALL UNDERGROUND SPLICE ENCLOSURE	40. INSTALL OVERSIZED JUNCTION BOX	51. INSTALL CABLE STORAGE RACK(S) [SNOW SHOES] AND STORE 100 FEET OF CABLE	62. INSTALL OMNI-DIRECTIONAL ANTENNA
8. TRENCH	19. INSTALL CABLE(S) IN EXISTING RISER(S)	30. INSTALL AERIAL SPLICE ENCLOSURE	41. REMOVE EXISTING JUNCTION BOX	52. INSTALL DELINEATOR MARKER	63. INSTALL ETHERNET RADIO
9. INSTALL PVC CONDUIT	20. INSTALL CABLE(S) IN NEW RISER(S)	31. INSTALL POLE MOUNTED SPLICE CABINET	42. INSTALL WOOD POLE	53. STORE 30 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	64. INTERCEPT AND REROUTE EXISTING CONDUITS
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11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	22. INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	33. REMOVE EXISTING SPLICE CABINET	44. INSTALL AERIAL GUY ASSEMBLY	55. LASH CABLE(S) TO EXISTING MESSENGER CABLE	

ATTACHMENT POINT:  
XXX DISTANCE ABOVE (IN) REFERENCE POINT  
YYY REFERENCE POINT  
XXX DISTANCE BELOW (IN)



TCP - Phase 1

**PBSJ** 1616 EAST WILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-8888 NCBELS #F-0326

Prepared for the Offices of:  
North Carolina Department of Transportation

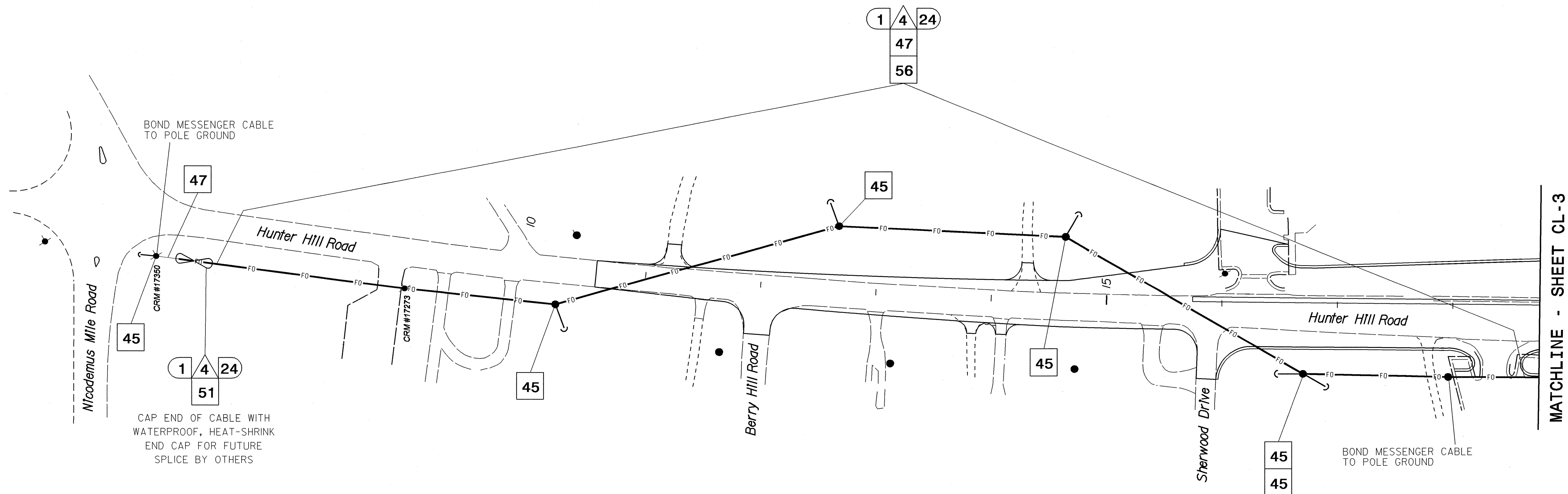
Hunter Hill Road Cable Layout Plans

Division 04 Nash County Rocky Mount  
PLAN DATE: November 2010 REVIEWED BY: MR Cooney  
PREPARED BY: LW Moon REVIEWED BY: JT Brooks

SCALE: 1"=50'

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER LISA M. MOON 022516  
DATE: 11-17-10  
CAD FILE NAME: c101a.dgn

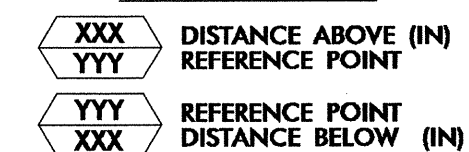
NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES



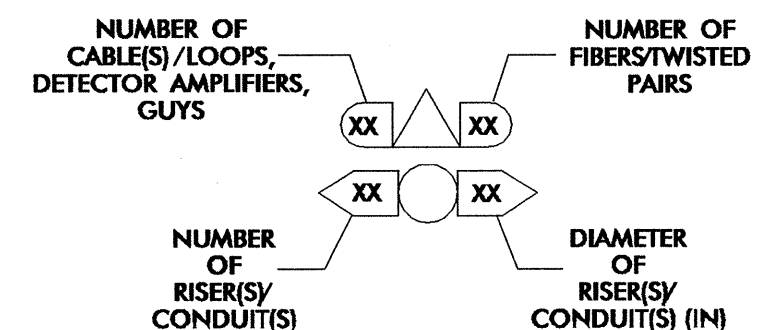
MATCHLINE - SHEET CL-3

NOTES:  
1. UNLESS OTHERWISE NOTED ATTACH NEW MESSENGER CABLE 40" BELOW POWER AND ON FRONT SIDE (FS) OF POLE.  
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ATTACHMENT POINT:



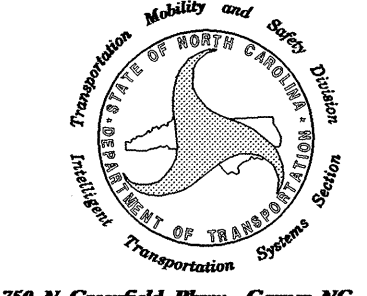
CONSTRUCTION NOTE SYMBOLY KEY



**PBS** 1616 EAST WILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

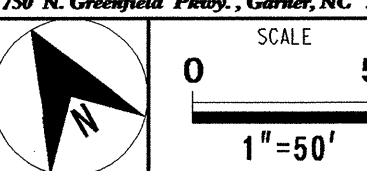
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Prepared for the Offices of:



750 N. Greenfield Pkwy., Garner, NC 27529

<b>Hunter Hill Road Cable Layout Plans</b>	
Division 04 Nash County Rocky Mount	
PLAN DATE: November 2010	REVIEWED BY: MR Cooney
PREPARED BY: LM Moon	REVIEWED BY: JT Brooks
REVISIONS	INIT. DATE



SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
LISA M. MOON  
022516  
11-17-10  
DATE  
Signature: Lisa M. Moon  
CADD File Name: c101.dgn



CL-3

NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES

The Contractor is NOT responsible for splice enclosures, splicing, edge switches & encoders/decoders for fiber optic cable shown on these plans. These items provided and installed by others under Rocky Mount Signal System Project (C-5112)

FUTURE  
Fiber optic cable to be installed by others under Rocky Mount Signal System Project (C-5112)

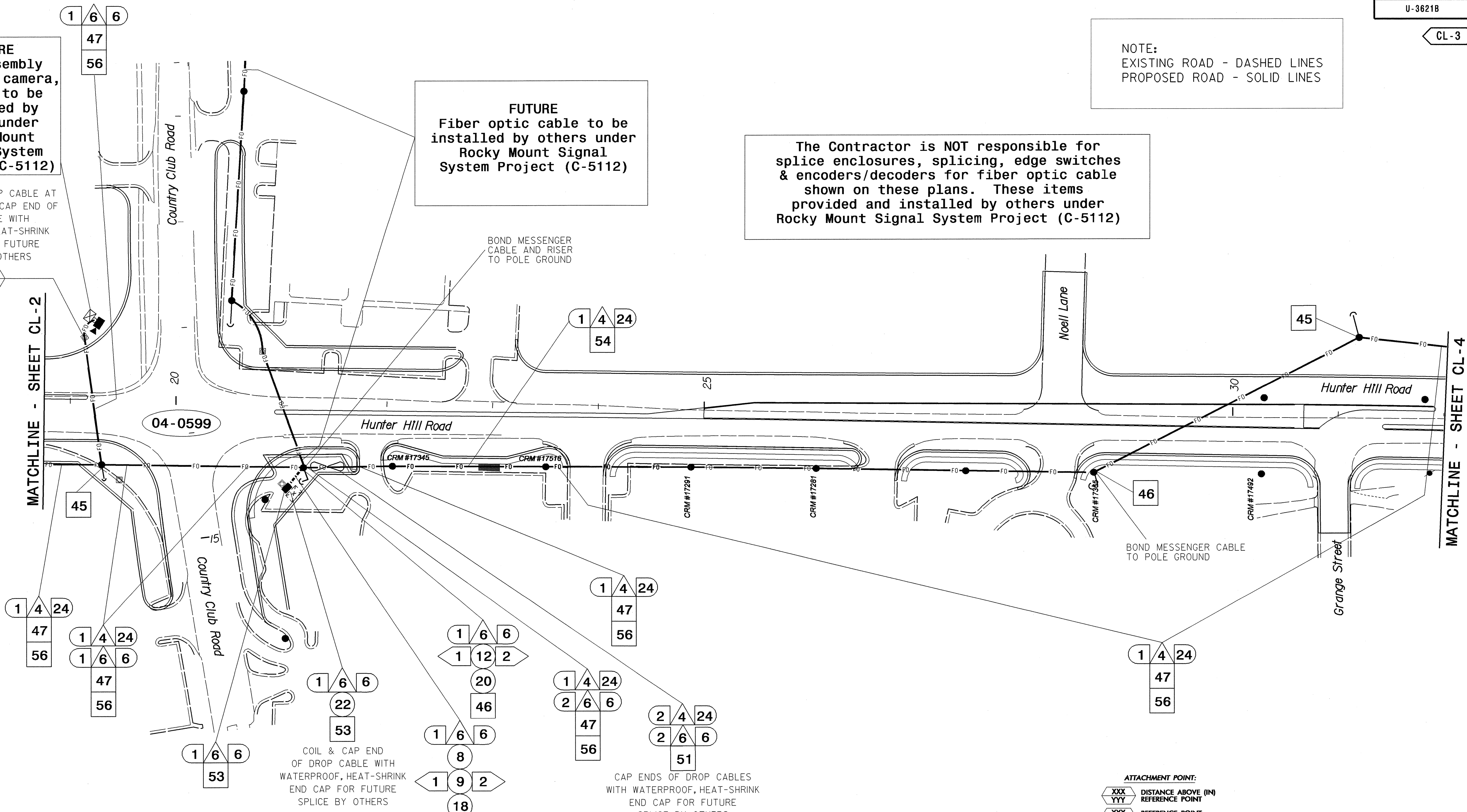
FUTURE  
CCTV assembly (cabinet, camera, & pole) to be installed by others under Rocky Mount Signal System Project (C-5112)

COIL 150' OF DROP CABLE AT TOP OF POLE & CAP END OF DROP CABLE WITH WATERPROOF, HEAT-SHRINK END CAP FOR FUTURE SPLICE BY OTHERS

12" SIG

MATCHLINE - SHEET CL-2

MATCHLINE - SHEET CL-4



- NOTES:  
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XXX DISTANCE ABOVE (IN) REFERENCE POINT  
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XXX DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOLOGY KEY  
NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS  
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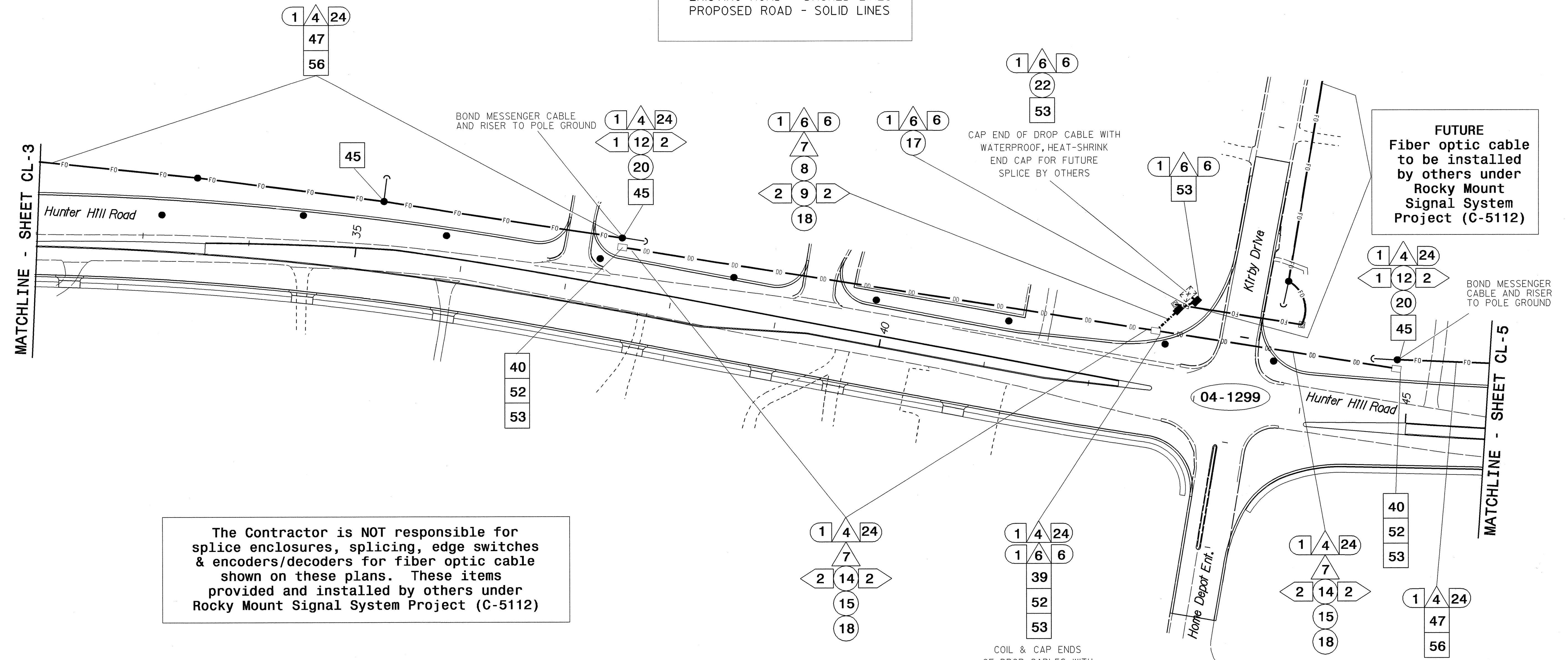
**PBS&J** 1616 EAST HILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
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Prepared for the Offices of:  
North Carolina Department of Transportation  
Division 04 Nash County Rocky Mount  
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PLAN DATE: November 2010 REVIEWED BY: MR Cooney  
PREPARED BY: LM Moon REVIEWED BY: JT Brooks  
SCALE: 1"=50'  
DATE: 11-17-10  
SIGNATURE: Lisa M. Moon  
DATE: 11-17-10  
CAD FILE NAME: c102.dgn

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CL-4

NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES

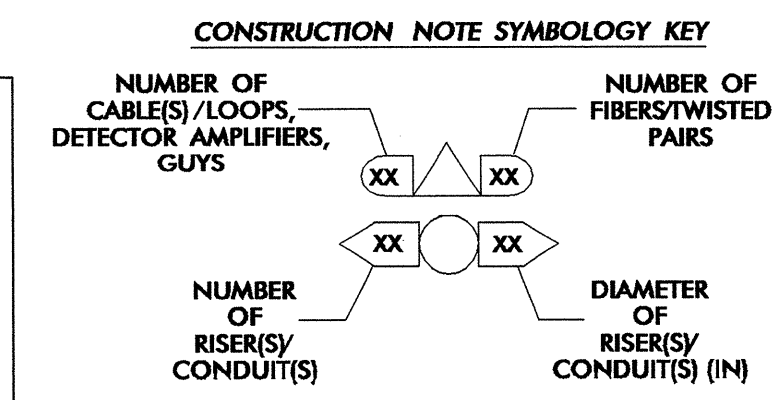
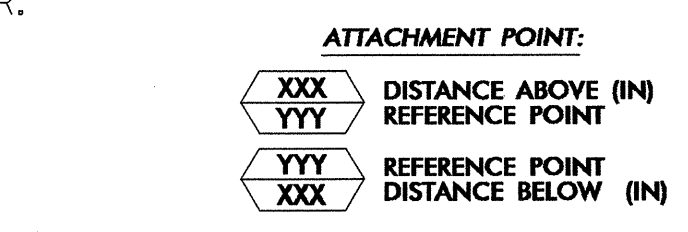


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3. INSTALL MMFO CABLE	14. INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	25. INSTALL NEW RISER INTO POLE MOUNTED CABINET	36. INSTALL CCTV CAMERA ASSEMBLY	47. INSTALL MESSENGER CABLE	58. INSTALL NEW ELECTRICAL SERVICE FOR CCTV
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5. INSTALL SMFOMMFO HYBRID CABLE	16. BORE AND JACK CONDUIT	27. INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION	49. REMOVE EXISTING COMMUNICATIONS CABLE	60. INSTALL NEW BASE MOUNTED CCTV CABINET
6. INSTALL FIBER-OPTIC DROP CABLE	17. INSTALL CABLE(S) IN EXISTING CONDUIT	28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	39. INSTALL SPECIAL-SIZED JUNCTION BOX	50. INSTALL TELEPHONE SERVICE	61. INSTALL UNI-DIRECTIONAL ANTENNA
7. INSTALL TRACER WIRE	18. INSTALL CABLE(S) IN NEW CONDUIT	29. INSTALL UNDERGROUND SPLICE ENCLOSURE	40. INSTALL OVERSIZED JUNCTION BOX	51. INSTALL CABLE STORAGE RACK(S) [SNOW SHOE(S)] AND STORE 100 FEET OF CABLE	62. INSTALL OMNI-DIRECTIONAL ANTENNA
8. TRENCH	19. INSTALL CABLE(S) IN EXISTING RISER(S)	30. INSTALL AERIAL SPLICE ENCLOSURE	41. REMOVE EXISTING JUNCTION BOX	52. INSTALL DELINEATOR MARKER	63. INSTALL ETHERNET RADIO
9. INSTALL PVC CONDUIT	20. INSTALL CABLE(S) IN NEW RISER(S)	31. INSTALL POLE MOUNTED SPLICE CABINET	42. INSTALL WOOD POLE	53. STORE 30 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	64. INTERCEPT AND REROUTE EXISTING CONDUITS
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT	21. INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	32. INSTALL BASE MOUNTED SPLICE CABINET	43. REMOVE EXISTING WOOD POLE	54. LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	22. INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	33. REMOVE EXISTING SPLICE CABINET	44. INSTALL AERIAL GUY ASSEMBLY	55. LASH CABLE(S) TO EXISTING MESSENGER CABLE	



**PBSI** 1616 EAST WILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

Prepared for the Offices of:  
Transportation, Mobility and Safety Division  
Division of Transportation Systems

### Hunter Hill Road Cable Layout Plans

Division 04 Nash County Rocky Mount

PLAN DATE: November 2010 REVIEWED BY: MR Cooney  
PREPARED BY: LM Moon REVIEWED BY: JT Brooks

759 N. Greenfield Place, Cary, NC 27529

SCALE: 1"=50'

Signature: Lisa M. Moon 11-17-10  
DATE: 11-17-10  
CAD FILE NAME: c103.dgn

24-NOV-2010 14:43 C:\TECH\CURR\100017095 U-3621B Signal\skl\c103.dgn



CL-5

\*FOR THIS CONDUIT RUN, AT THE CONTRACTOR'S DISCRETION, HE MAY INSTALL UNDERGROUND CONDUIT BY ANY METHOD ALLOWABLE IN THE SPECIAL PROVISIONS FOR THE UNIT COST PER LINEAR FOOT OF TRENCHING (2)(2")

DO NOT CUT 24 FIBER CABLE. BRING THE 24 FIBER CABLE INTO EXISTING JUNCTION BOX, COIL 90' OF CABLE FOR FUTURE SPLICE BY OTHERS, AND ROUTE 24 FIBER CABLE BACK TO POLE LINE ALONG HUNTER HILL ROAD.

**FUTURE**  
Fiber optic cable to be installed by others under Rocky Mount Signal System Project (C-5112)

**FUTURE**  
Fiber optic cable to be installed by others under Rocky Mount Signal System Project (C-5112)

The Contractor is NOT responsible for splice enclosures, splicing, edge switches & encoders/decoders for fiber optic cable shown on these plans. These items provided and installed by others under Rocky Mount Signal System Project (C-5112)

NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES

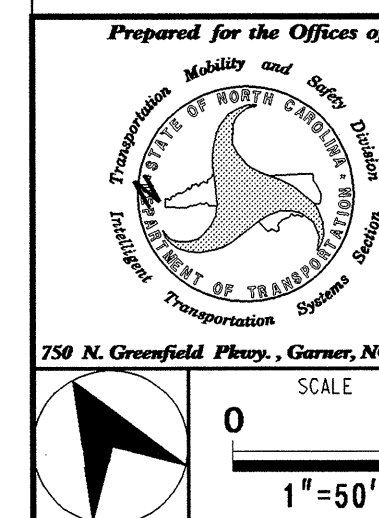
ATTACHMENT POINT:  
XXX DISTANCE ABOVE (IN) REFERENCE POINT  
YYY REFERENCE POINT  
XXX DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLY KEY  
NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS  
NUMBER OF FIBERS/TWISTED PAIRS  
NUMBER OF RISER(S)/CONDUIT(S)  
DIAMETER OF RISER(S)/CONDUIT(S) (IN)

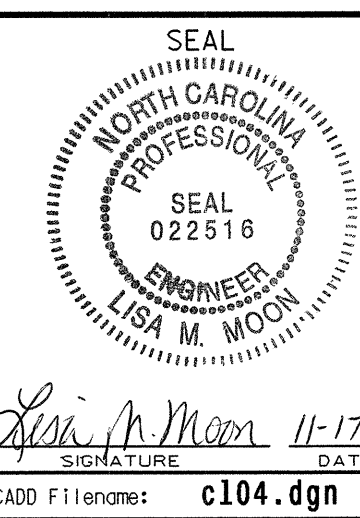
**PBSJ** 1616 EAST WILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

- NOTES:  
1. UNLESS OTHERWISE NOTED ATTACH NEW MESSENGER CABLE 40" BELOW POWER AND ON FRONT SIDE (FS) OF POLE.  
2. SEAL ALL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUNCTION BOX/CABINET ENTRANCES.

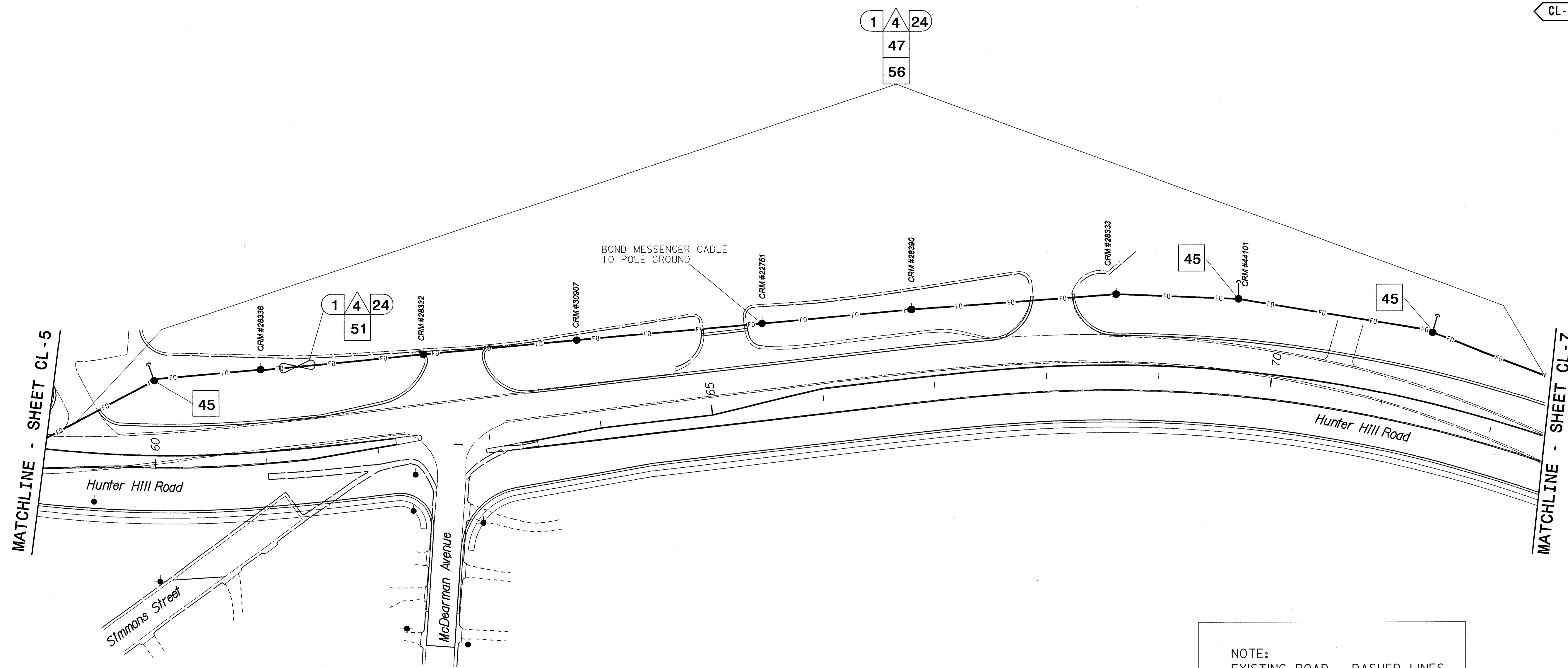
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<b>Hunter Hill Road Cable Layout Plans</b>	
Division 04	Nash County
PLAN DATE: November 2010	REVIEWED BY: MR Cooney
PREPARED BY: LM Moon	REVIEWED BY: JT Brooks
REVISIONS	INIT. DATE



24-NOV-2010 14:11 G:\EG\cl\p\00017195 U-3621B S1gnal\cl\CL04.dgn 13833 AT RALBYVXRHT



NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES

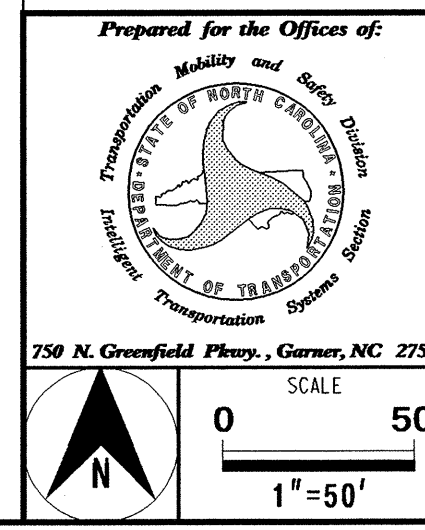
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ATTACHMENT POINT:  
XXX DISTANCE ABOVE (IN)  
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CONSTRUCTION NOTE SYMBOLOGY KEY  
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**PBSJ** 1616 EAST HILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
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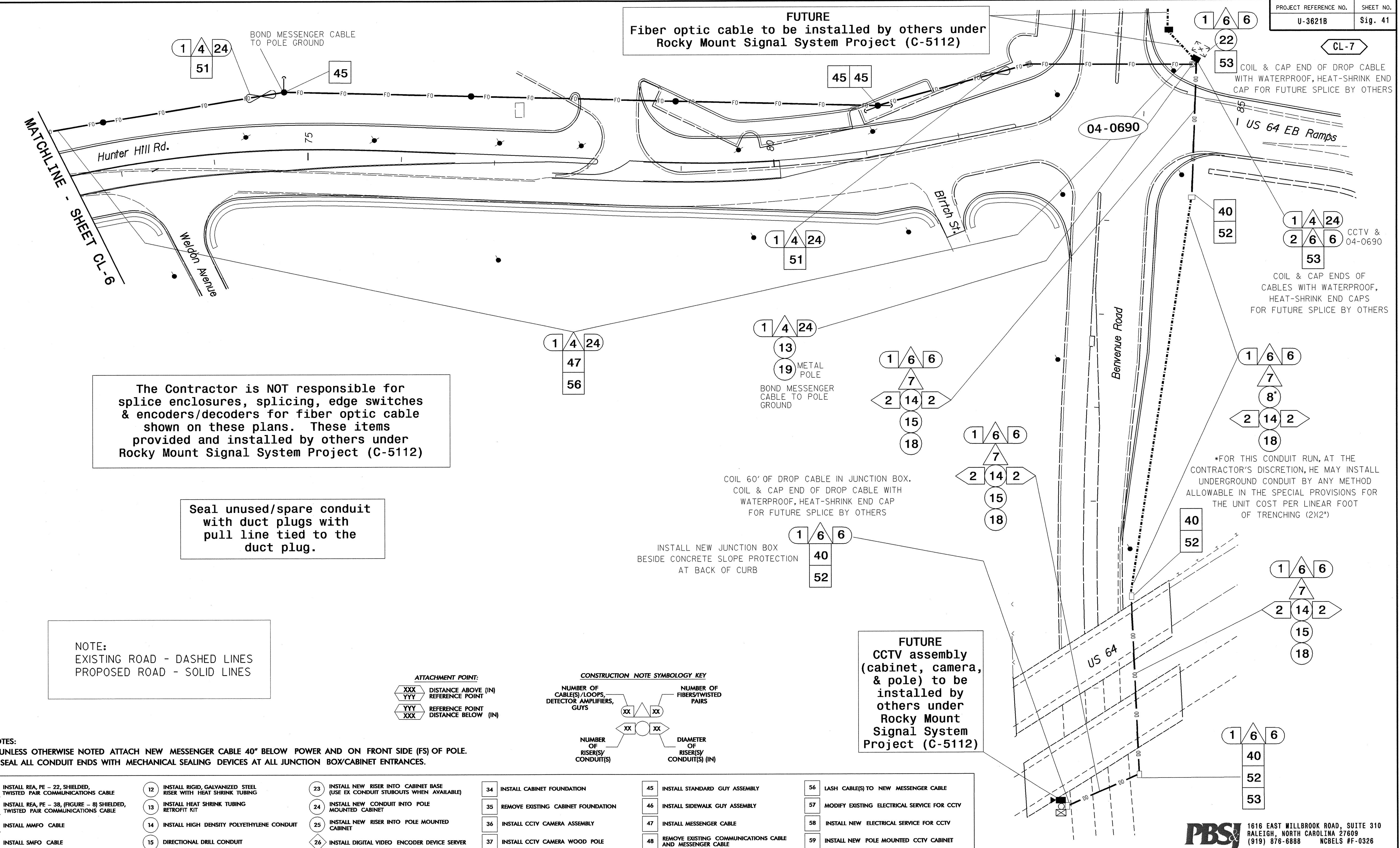


**Hunter Hill Road Cable Layout Plans**  
Division 04 Nash County Rocky Mount  
PLAN DATE: November 2010 REVIEWED BY: MR Cooney  
PREPARED BY: LM Moon REVIEWED BY: JT Brooks

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
LISA M. MOON  
022516  
SIGNATURE DATE  
11-17-10  
c105.dgn

17-NDV-2010.14:10 G:\TECH\OUT\00017195 U-3621B S:\gn\lsc\cl\c105.dgn 13833 AT RALBUVRH





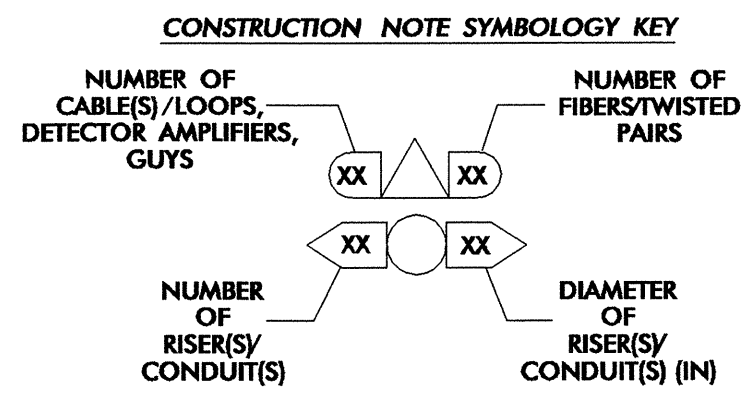
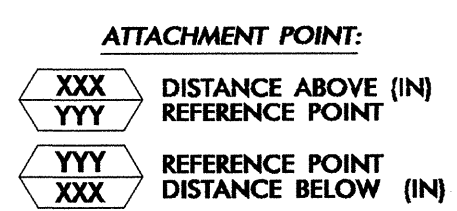
**FUTURE**  
Fiber optic cable to be installed by others under Rocky Mount Signal System Project (C-5112)

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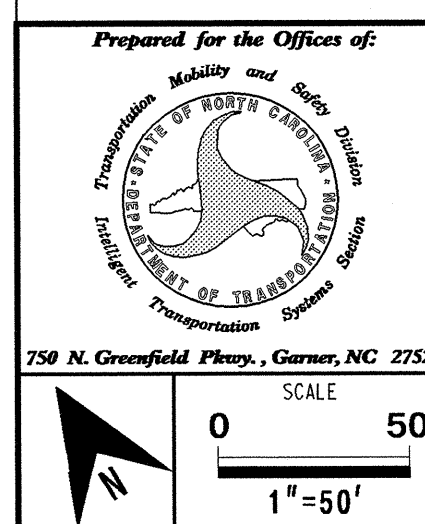
Seal unused/spare conduit with duct plugs with pull line tied to the duct plug.

NOTE:  
EXISTING ROAD - DASHED LINES  
PROPOSED ROAD - SOLID LINES

- NOTES:**
- UNLESS OTHERWISE NOTED ATTACH NEW MESSENGER CABLE 40" BELOW POWER AND ON FRONT SIDE (FS) OF POLE.
  - SEAL ALL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUNCTION BOX/CABINET ENTRANCES.



- |   |  |  |   |  |   |
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**Hunter Hill Road Cable Layout Plans**

Division 04 Nash County Rocky Mount

PLAN DATE: November 2010 REVIEWED BY: WR Cooney

PREPARED BY: LW Moon REVIEWED BY: JT Brooks

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 1"=50'

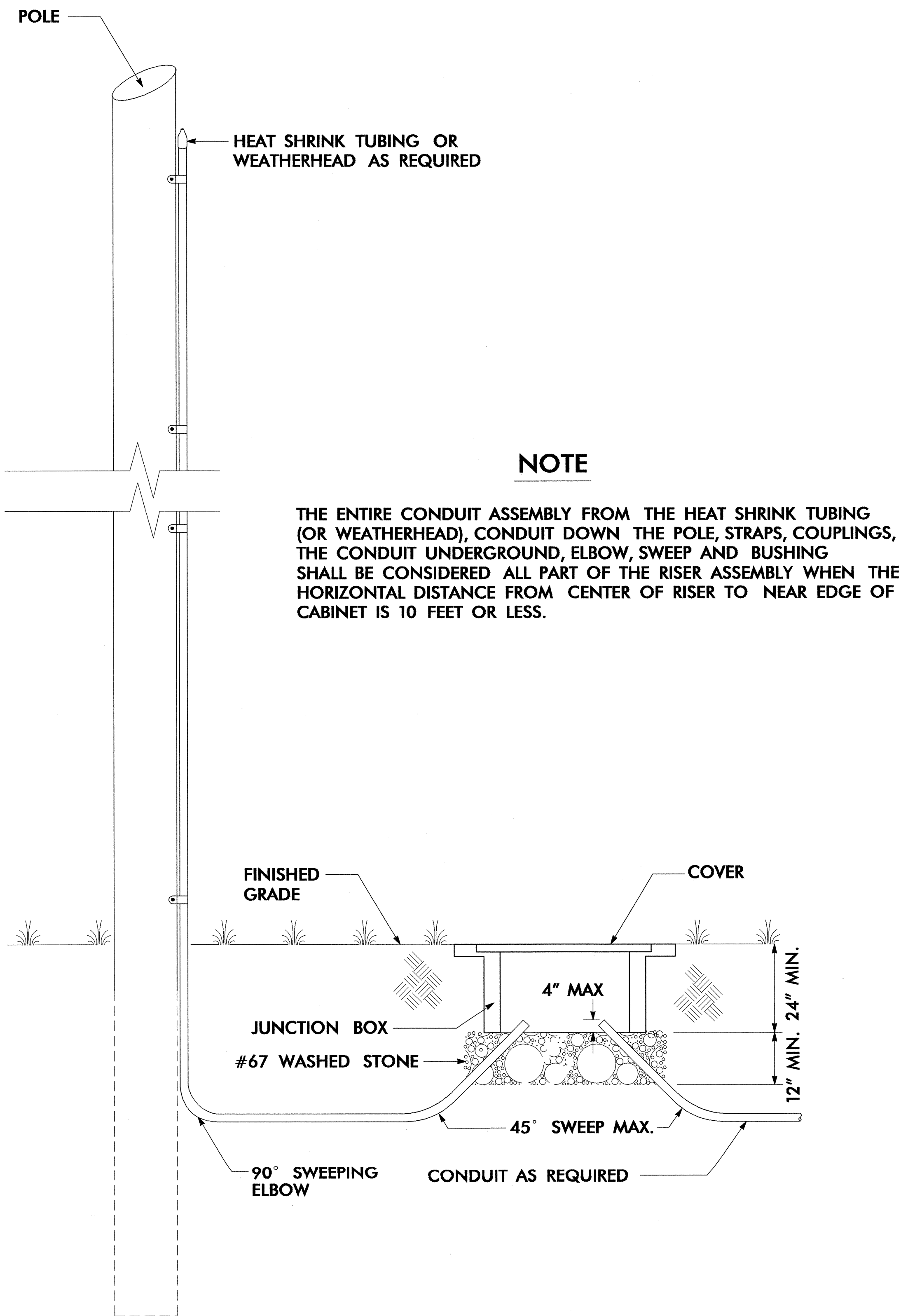
1616 EAST MILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
LISA M. MOON  
DATE: 11-17-10  
CAD FILE NAME: c106.dgn

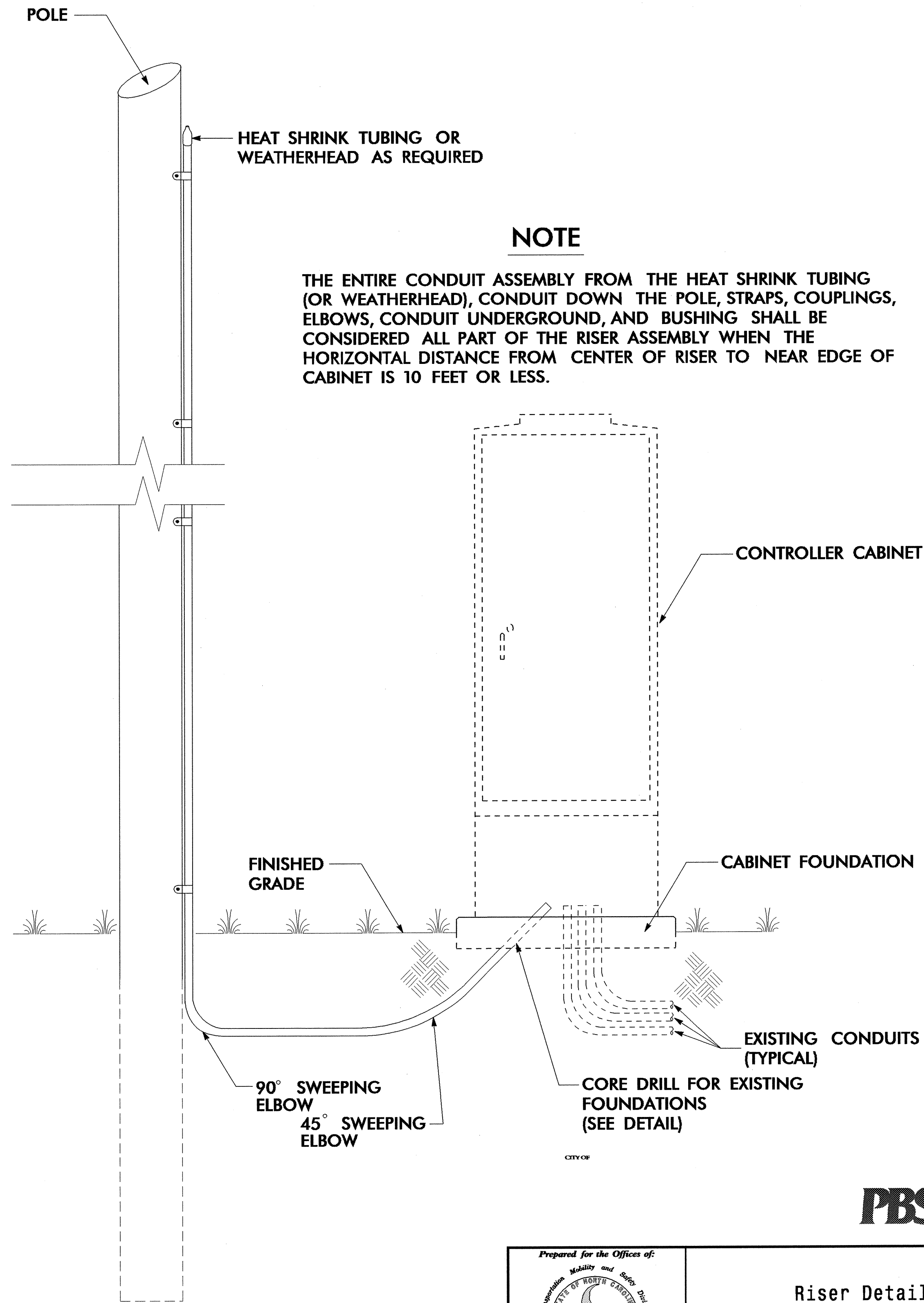
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TYPICAL RISER DETAILS

RISER TO JUNCTION BOX

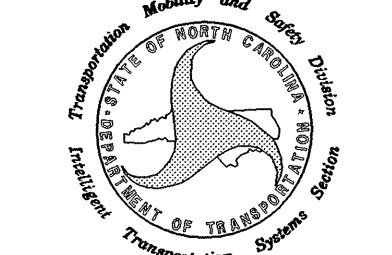
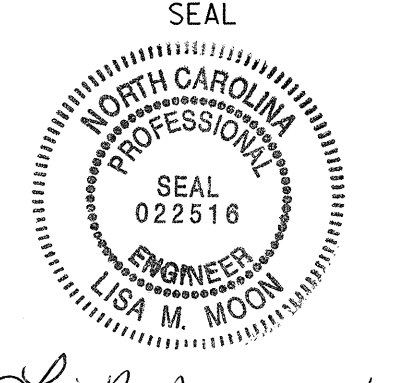
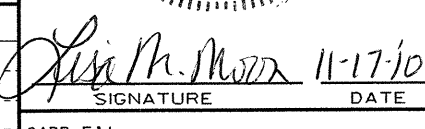


RISER TO CABINET FOUNDATION



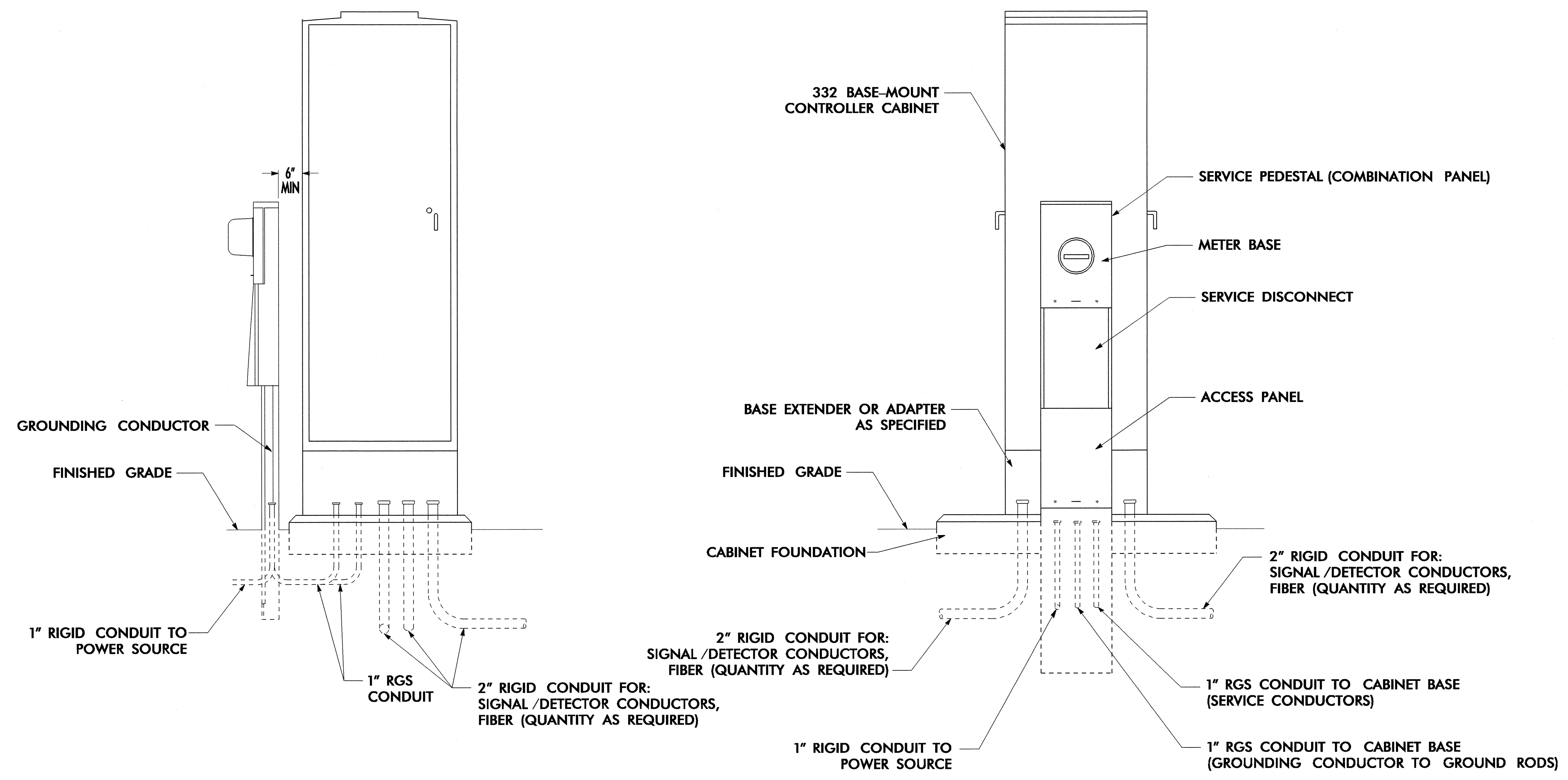
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**PBS&J** 1616 EAST HILLBROOK ROAD, SUITE 310  
RALEIGH, NORTH CAROLINA 27609  
(919) 876-6888 NCBELS #F-0326

Prepared for the Offices of:  Department of Transportation		<b>Riser Detail</b>		SEAL  ENGINEER LISA M. MOON 022516
Division 04 Nash County Rocky Mount		PLAN DATE: November 2010 REVIEWED BY: MR Cooney		
750 N. Greenfield Hwy., Garner, NC 27529		PREPARED BY: LM Moon	REVIEWED BY: JT Brooks	 SIGNATURE DATE CAD FILENAME:
SCALE: NONE	REVISIONS:	INIT.	DATE	



## GROUND MOUNTED ELECTRICAL SERVICE DETAIL



### NOTES

1. TEST GROUNDING SYSTEM USING AN APPROVED METHOD IN ACCORDANCE WITH SPECIAL PROVISIONS. INSTALL GROUND RODS AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
2. REMOVE ANY EXISTING GROUND RODS IN CONCRETE CABINET FOUNDATION BY CUTTING OFF FLUSH WITH FOUNDATION SURFACE.
3. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
4. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO "EQUIPMENT GROUND".
5. INSTALL RIGID GALVANIZED STEEL CONDUIT (MINIMUM 1") BETWEEN DISCONNECT AND CABINET.
6. SERVICE DISCONNECT GROUND BUS BAR SHALL PROVIDE FOR 2 #4 AWG CONNECTIONS.
7. IF CONDITIONS REQUIRE SERVICE PEDESTAL TO BE INSTALLED IN FRONT OR REAR OF CABINET, MAINTAIN SUFFICIENT CLEARANCE FOR DOOR TO FULLY OPEN.

**PBSJ** 1616 EAST HILLBROOK ROAD, SUITE 310  
 RALEIGH, NORTH CAROLINA 27609  
 (919) 876-6888 NCBELS #F-0326

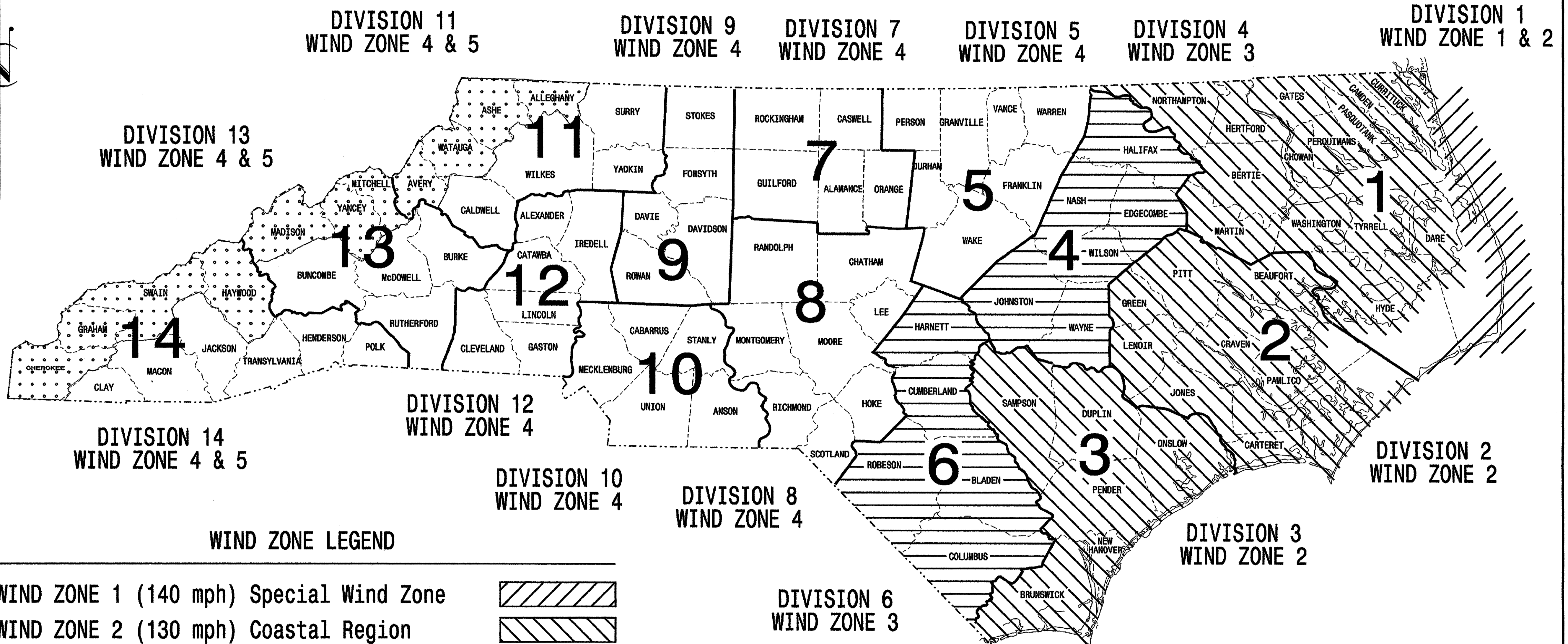
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 13833 AT RALBU\YXHH

	<b>Ground Mounted Electrical Service Detail</b>		
	Division 04    Nash County    Rocky Mount		
Prepared for the Offices of: Transportation Mobility and Safety Division NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 750 N. Greenfield Pkwy., Garner, NC 27529	PLAN DATE: <b>November 2010</b> PREPARED BY: <b>LM Moon</b>	REVIEWED BY: <b>MR Cooney</b> REVIEWED BY: <b>JT Brooks</b>	SEAL 022516 LISA M. MOON ENGINEER
SCALE NONE	REVISIONS	INIT.    DATE	SIGNATURE    DATE <i>Lisa M. Moon</i> 11-17-10

# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE N.C.	PROJECT NO.	SHEET NO. Sig. 44
F. A. PROJ. NO.		
PROJECT ID. NO.		

## STANDARD DRAWINGS FOR METAL POLES



<http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Designed in conformance with the 2002 Interim to the 4th Edition 2001 **AASHTO** Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS	
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

**NCDOT CONTACTS:**  
**MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT**

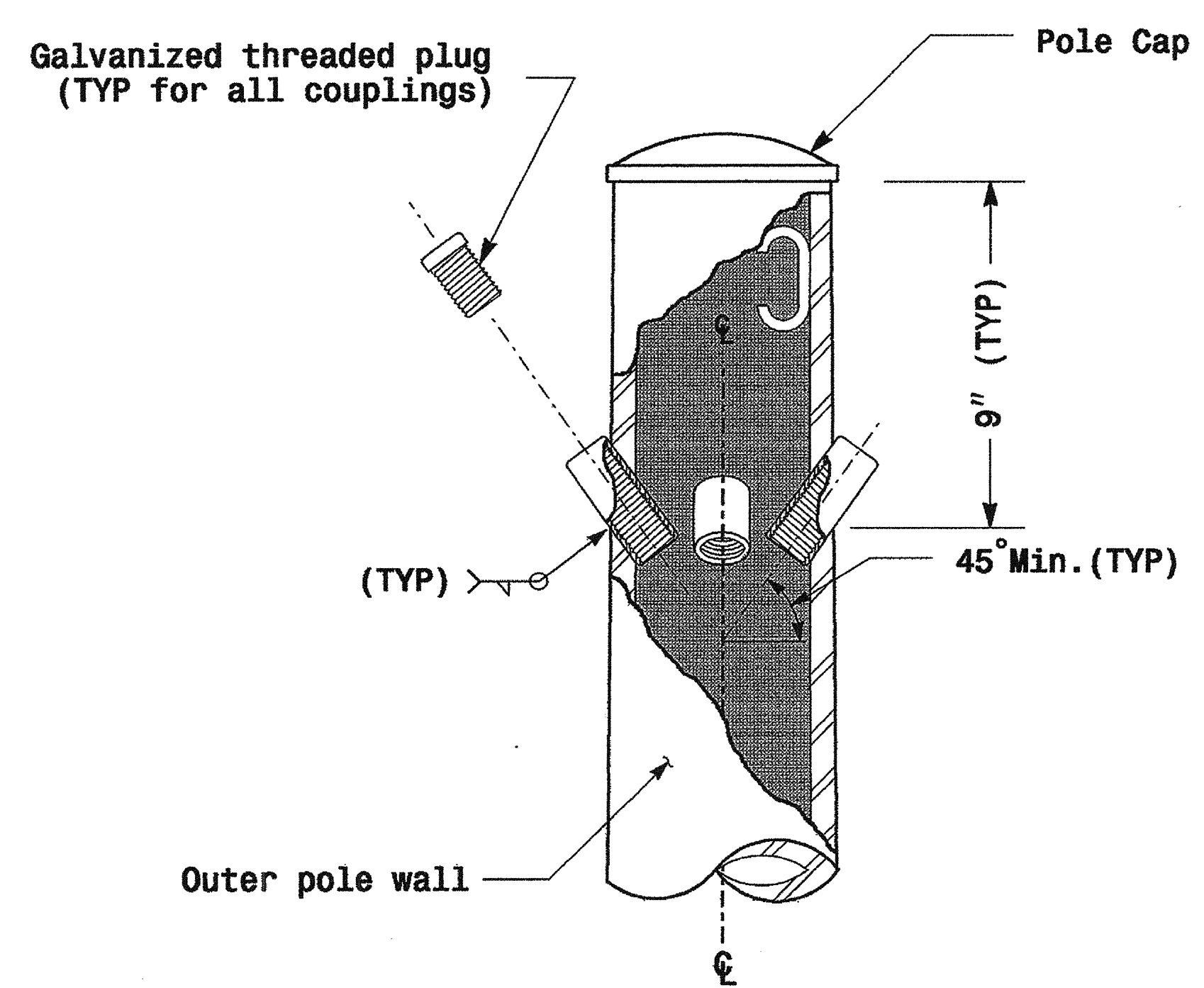
G. A. Fuller, P.E. - State ITS and Signals Engineer  
 G. G. Murr, Jr., P.E. - State Signals Engineer  
 D. C. Sarkar, P.E. - ITS and Signals Senior Structural Engineer  
 C. F. Andrews, Jr. - ITS and Signals Structural Project Engineer  
 M. Aslam - ITS and Signals Structural Project Engineer  
 N. Bitting, P.E. - ITS and Signals Structural Project Engineer

SEAL

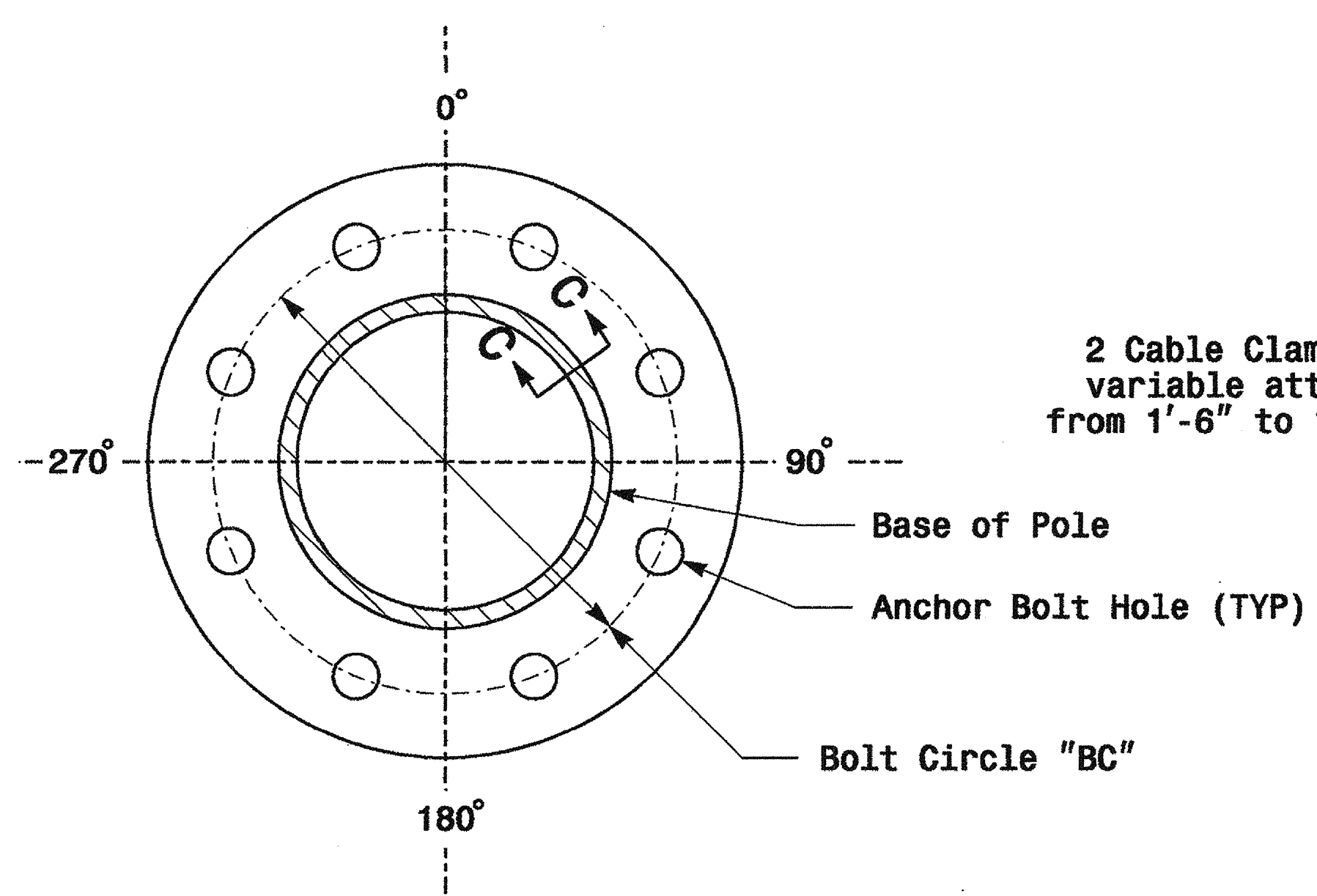
D. Sarkar 7.21.2009  
SIGNATURE DATE





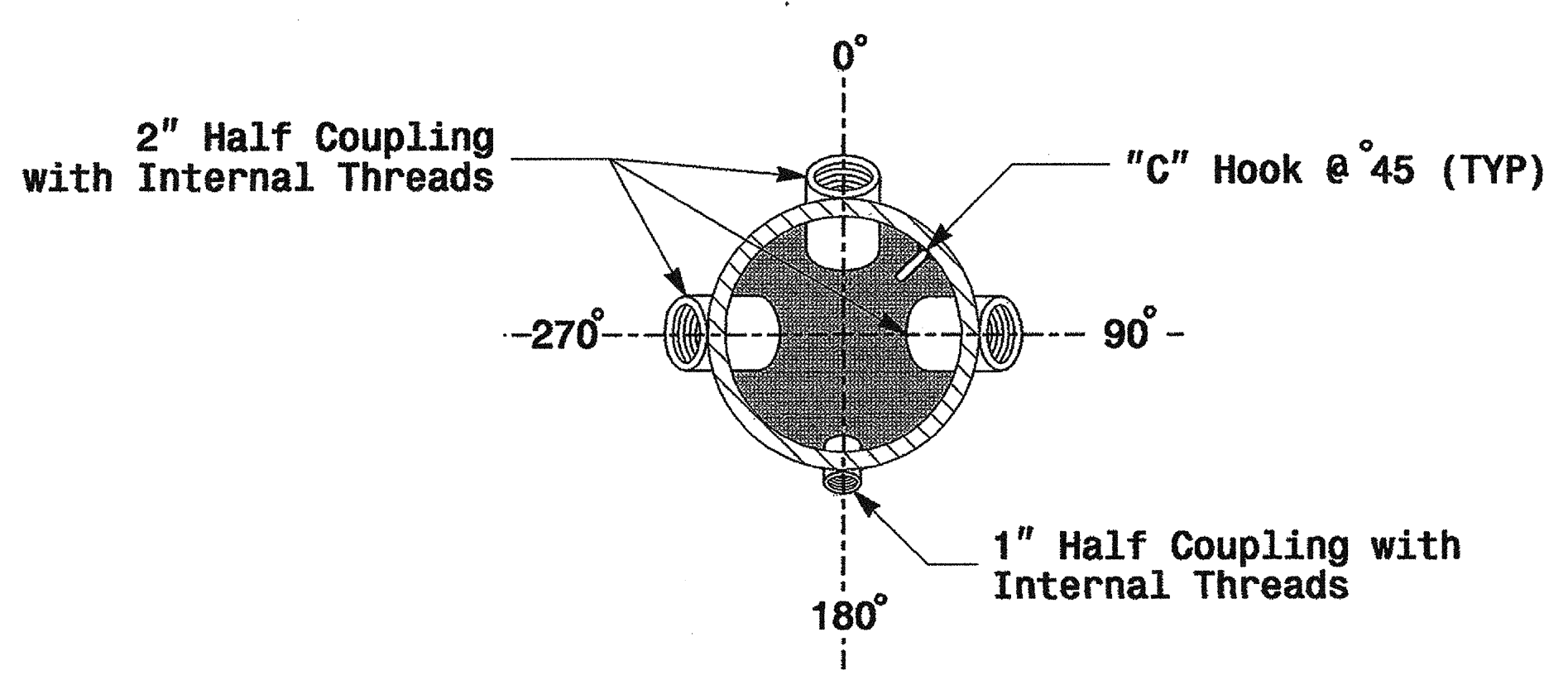
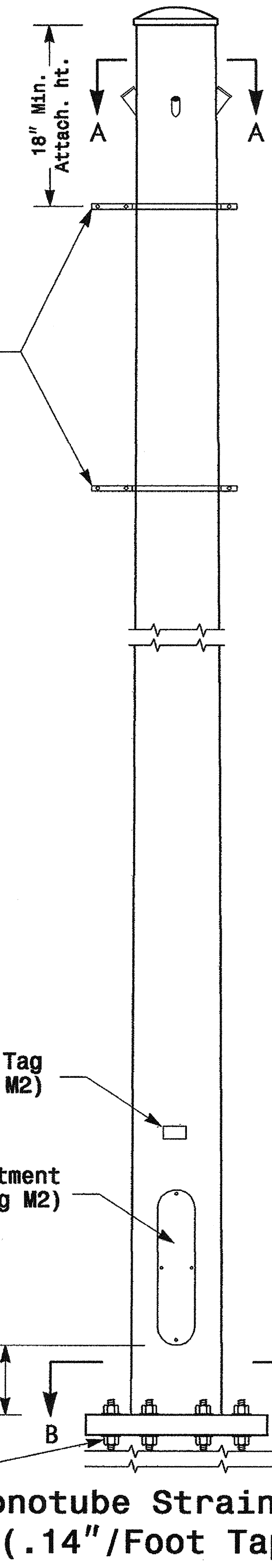


**Cable Entrances at Top of Pole**

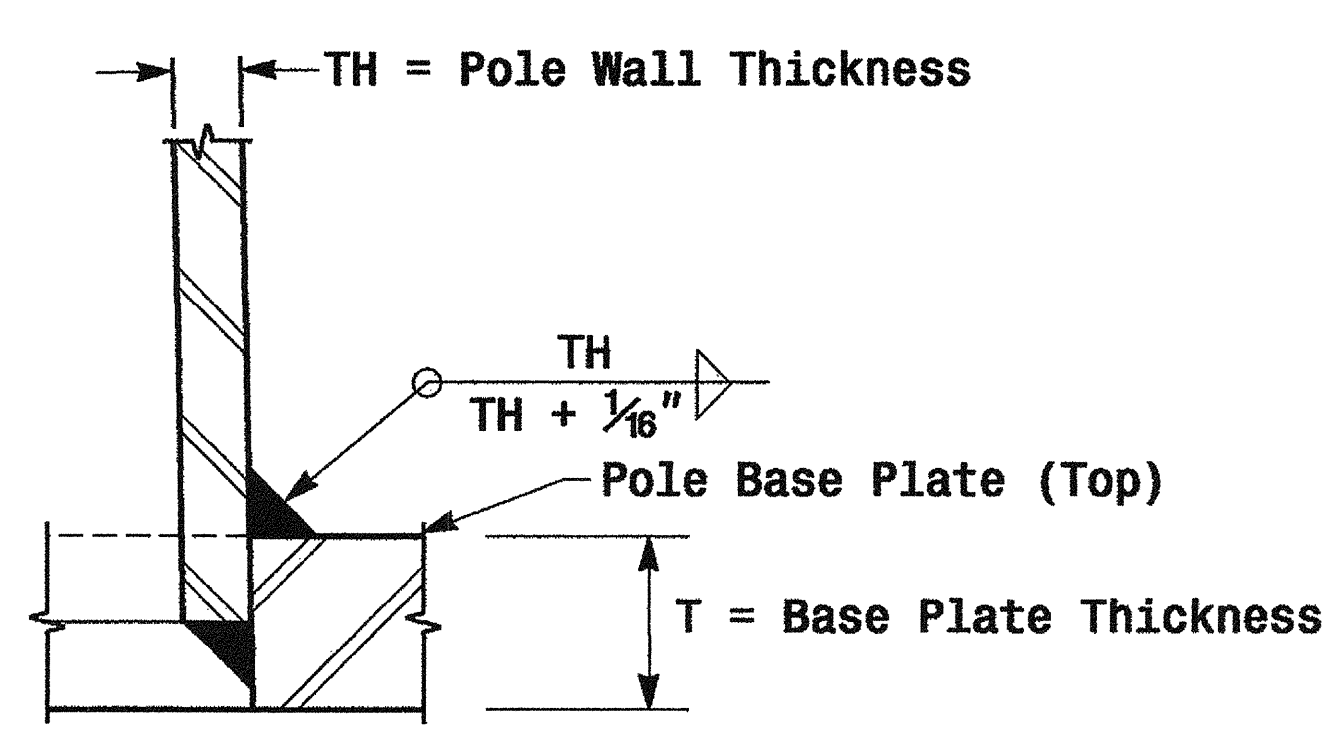


**Section B-B**  
(See drawing M2)  
**Pole Base Plate**

2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' blow the top of the pole.



**Section A-A**  
**Radial Orientation for Factory Installed Accessories at Top of Pole**



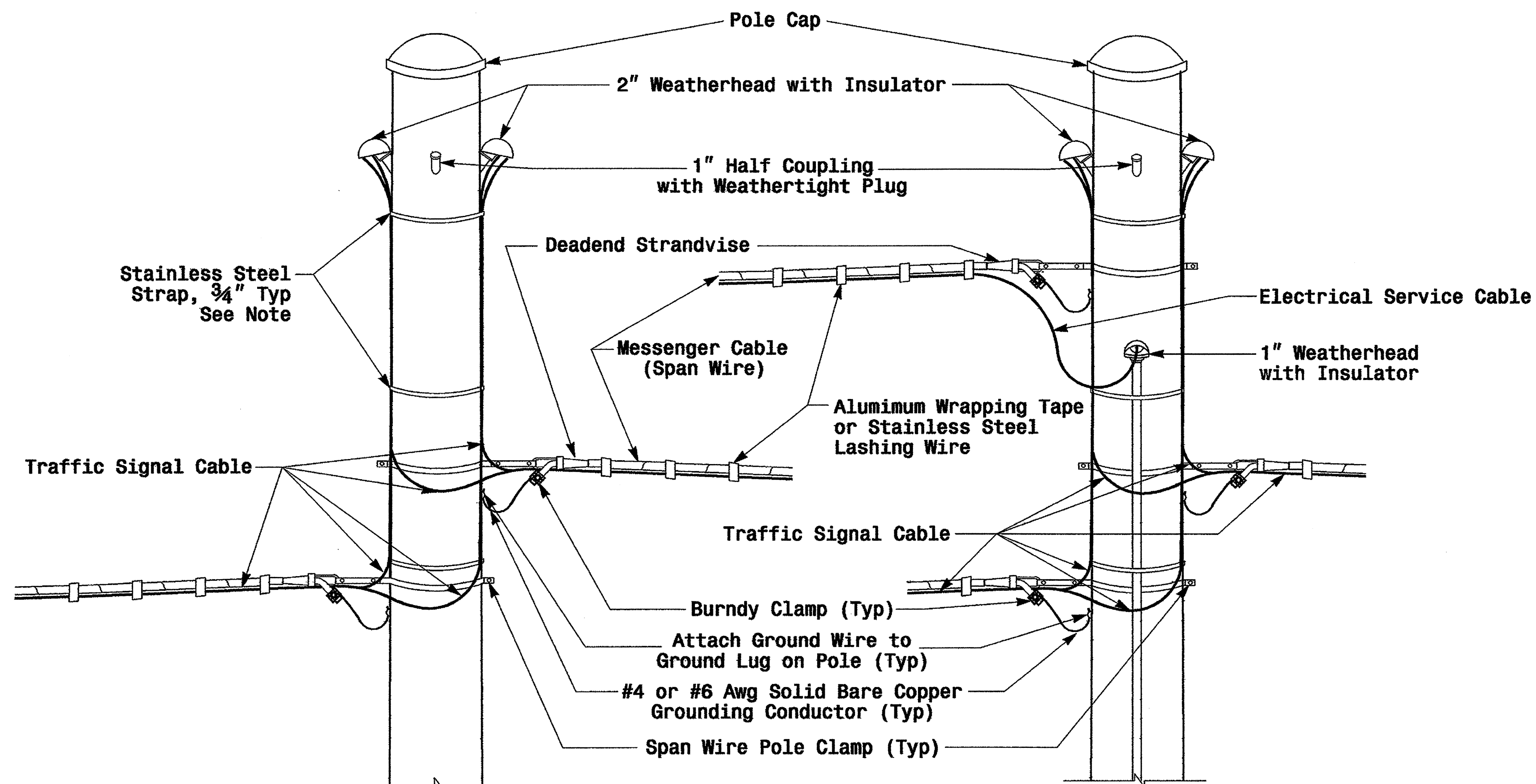
**Section C-C**  
**Socket Connection Weld Detail**

<p>Prepared in the Office of: The State of North Carolina Department of Transportation 122 N. McDowell St., Raleigh, NC 27603</p>	<p><b>Typical Fabrication Details For Strain Poles</b></p>		<p>SEAL</p>
	<p>PLAN DATE: May 2005</p>	<p>REVIEWED BY: C.F. Andrews</p>	
<p>SCALE: 0 NA NONE</p>	<p>PREPARED BY: P.L. Alexander</p>	<p>REVIEWED BY: A.W. Esposito</p>	<p>INIT. DATE</p>
<p>SIGNATURE: <i>D. Sarker</i> 9.2.2005</p>			<p>DATE</p>
<p>SIG. INVENTORY NO.</p>			

**Fabrication Details - Strain Poles**

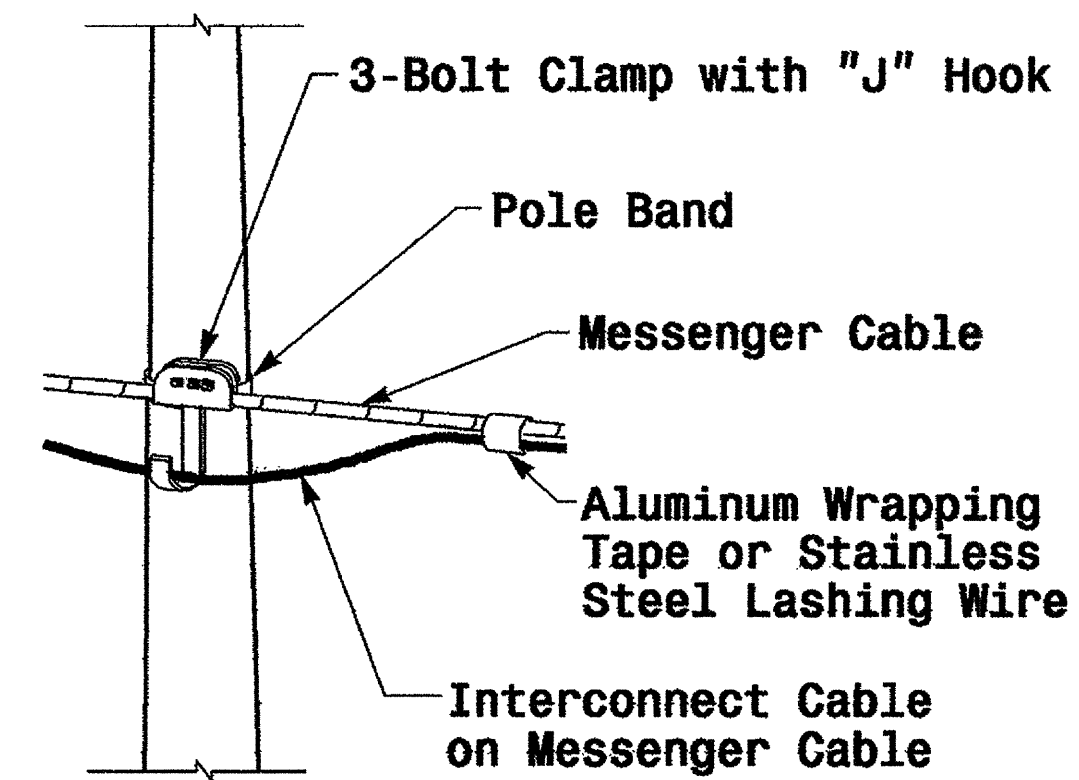
01-SEP-2005 14:07 w:\p001\es-un1\workgroups\2004 metal pole standards\2004 m3.dgn p.l.alexander



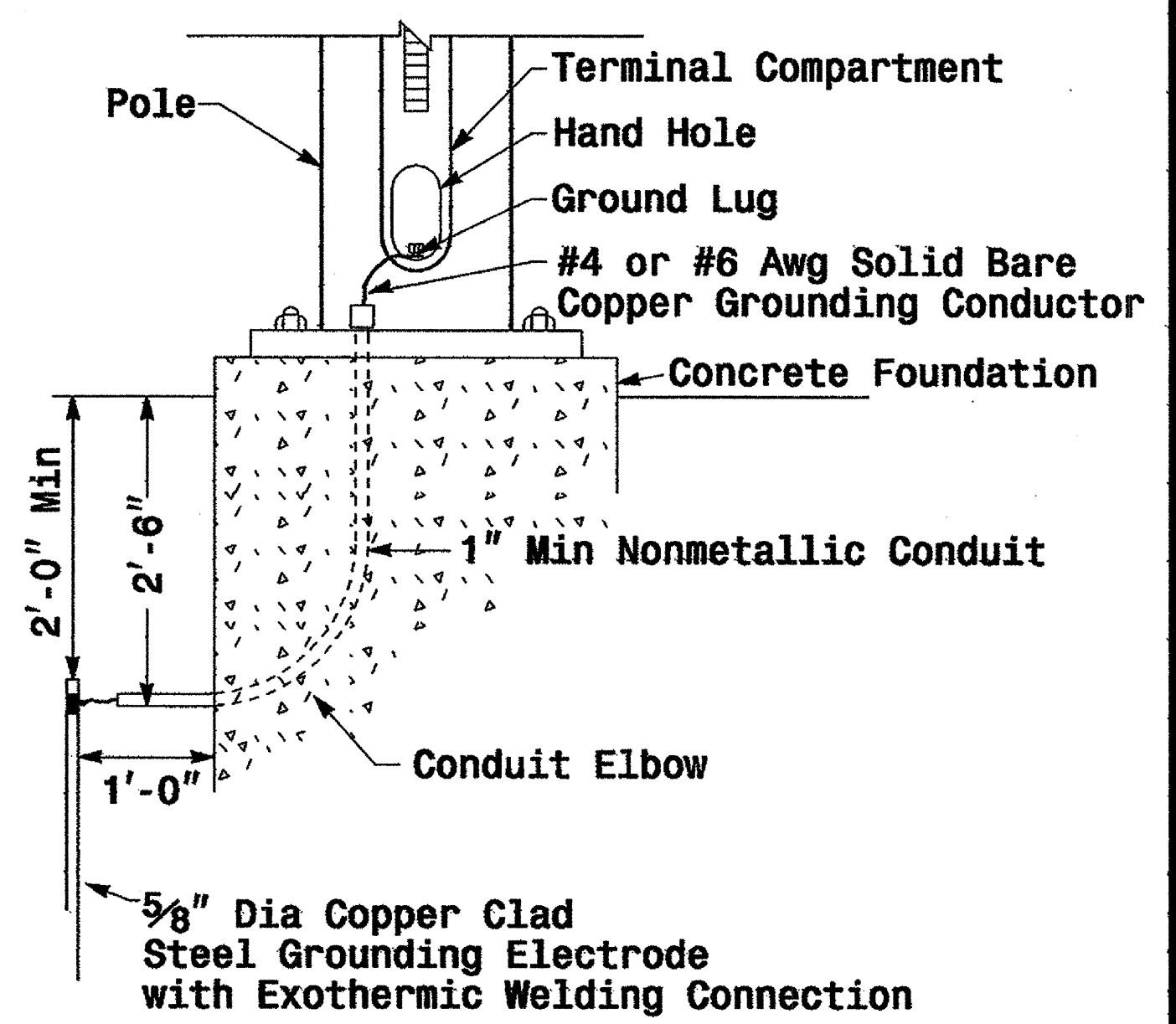


Note: Strap all signal cables to the side of the pole with  $\frac{3}{4}$ " stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

**Strain Pole Attachments**



**Attachment of Cable to Intermediate Metal Pole**



**Metal Pole Grounding Detail**

**Construction Details - Strain Poles**

01-SEP-2005 16:33 p:\projects\100-111\work\grdw052004 metal pole station\ds62004.mxd

	<b>Construction Details Strain Poles</b>		SEAL 
	PLAN DATE: <b>May 2005</b> PREPARED BY: <b>C.F. ANDREWS</b>	REVIEWED BY: <b>P.L. ALEXANDER</b> REVIEWED BY: <b>D.C. SARKAR</b>	
SCALE: <b>NA</b> NONE	SIGNATURE: <i>[Signature]</i> <b>9-1-05</b> DATE		SIG. INVENTORY NO.





		STANDARD STRAIN POLES				STANDARD FOUNDATIONS 42" Diameter Drilled Pier Length (L) - Feet						
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Moment at the Pole Base (ft-kp)	Clay				Sand		
						Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30
WIND ZONE 1	LIGHT	S26L3	26	25	280	20.5	14.0	11.5	9.5	18.0	16.0	14.0
		S30L3	30	25	310	21.0	14.5	11.5	9.5	18.5	16.5	14.5
		S35L3	35	25	350	22.5	15.0	12.0	10.0	19.5	17.5	15.5
	HEAVY	S30H3	30	29	450	25.5	16.5	13.0	11.0	21.0	18.5	16.5
		S35H3	35	29	540	26.0	17.0	13.5	11.5	22.0	19.5	17.0
WIND ZONE 2	LIGHT	S26L2	26	23	250	19.5	13.5	11.0	9.0	18.0	15.5	14.0
		S30L2	30	23	290	20.0	14.0	11.5	9.5	18.5	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	9.5	19.0	16.5	14.5
	HEAVY	S30H2	30	29	415	24.5	16.0	13.0	10.5	21.0	18.5	16.0
		S35H2	35	29	485	25.5	16.5	13.5	11.0	21.5	19.0	16.5
WIND ZONE 3	LIGHT	S26L2	26	23	250	18.5	13.0	10.5	9.0	17.5	15.0	13.5
		S30L2	30	23	290	19.5	13.5	11.0	9.0	18.0	15.5	14.0
		S35L2	35	23	315	20.0	14.0	11.5	9.5	18.5	16.0	14.5
	HEAVY	S30H2	30	29	415	23.0	15.5	12.5	10.0	20.5	17.5	16.0
		S35H2	35	29	485	24.0	16.0	13.0	10.5	21.0	18.0	16.5
WIND ZONE 4	LIGHT	S26L1	26	22	195	18.0	13.0	10.5	9.0	16.5	14.5	13.0
		S30L1	30	22	225	18.5	13.0	10.5	9.0	17.0	15.0	13.5
		S35L1	35	22	255	19.0	13.5	11.0	9.0	17.5	15.5	14.0
	HEAVY	S30H1	30	25	330	22.0	15.0	12.0	9.5	19.5	17.0	15.0
		S35H1	35	25	385	23.0	15.5	12.5	10.0	20.0	17.5	15.5
WIND ZONE 5	LIGHT	S26L2	26	23	250	19.0	13.5	10.5	9.0	17.5	15.5	13.5
		S30L2	30	23	290	20.0	14.0	11.0	9.5	18.0	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	10.0	19.0	16.5	14.5
	HEAVY	S30H2	30	29	415	23.5	15.5	12.5	10.5	21.0	18.0	16.0
		S35H2	35	29	485	25.0	16.5	13.0	11.0	21.5	18.5	16.5

Concrete Volume (cubic yards) = .356 X L

**Fabrication Design Notes:**

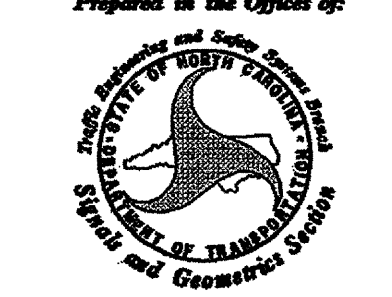
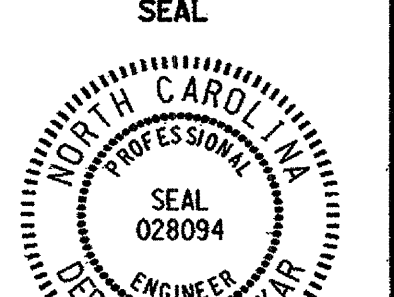
1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

**Foundation Selection:**

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from sheet M 1.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate pole case load number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case. The foundation depth is the value where the column and the row intersect.

Standard Strain Poles

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vs:\p01\strains\unit\strains\std\std strain poles.dgn  
patalexander

	<b>Standard Strain Poles and Standard Foundations</b>		
	PLAN DATE: <b>May 2005</b> PREPARED BY: <b>P.L. Alexander</b>	REVIEWED BY: <b>C.F. Andrews</b> REVIEWED BY: <b>A.M. Esposito</b>	
SCALE: <b>NA</b> None		SIGNATURE: <i>D. Sarkar</i> <b>9.2.2005</b> DATE	