

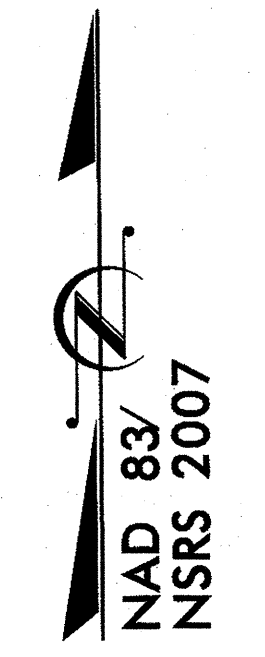
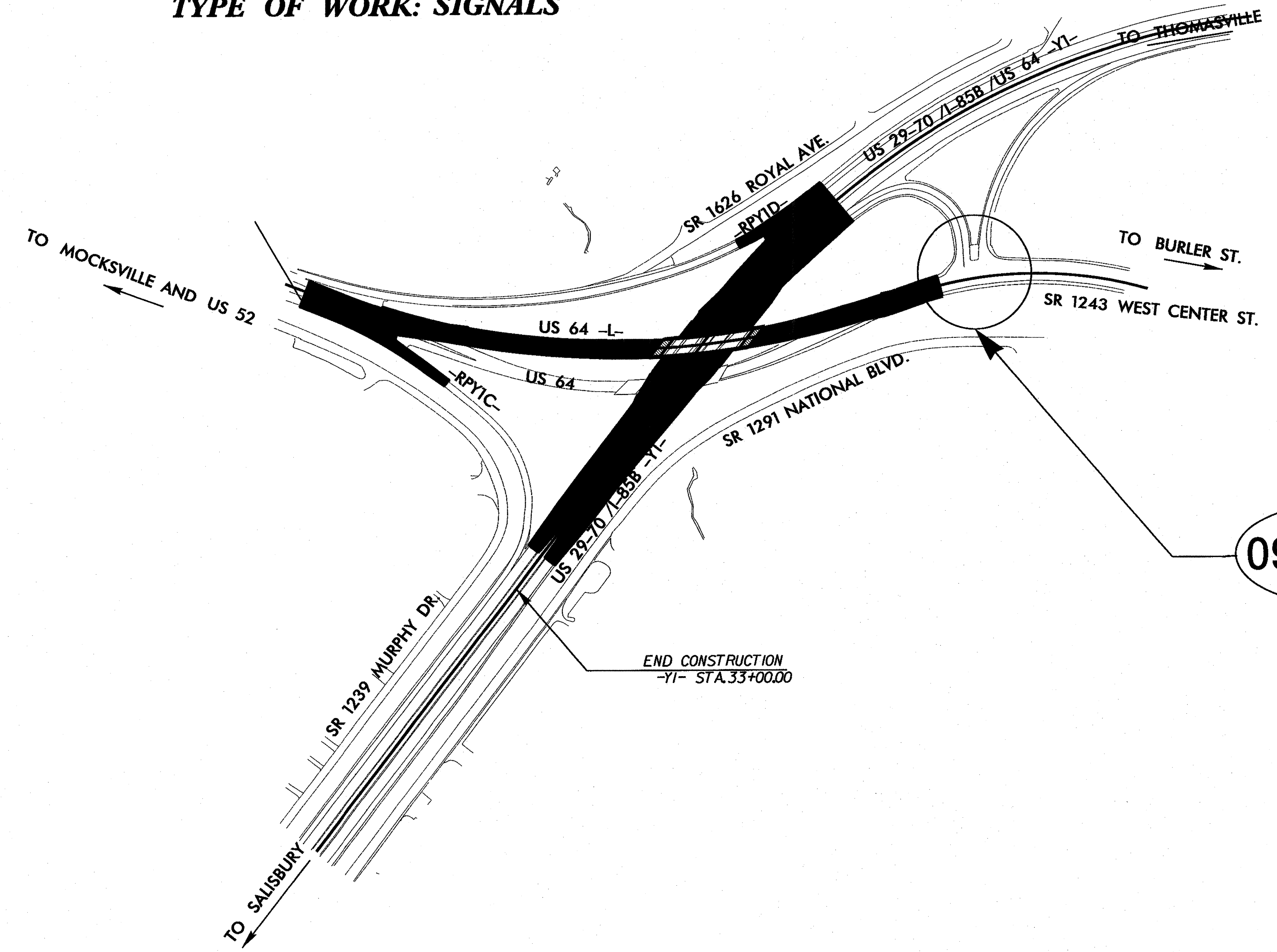
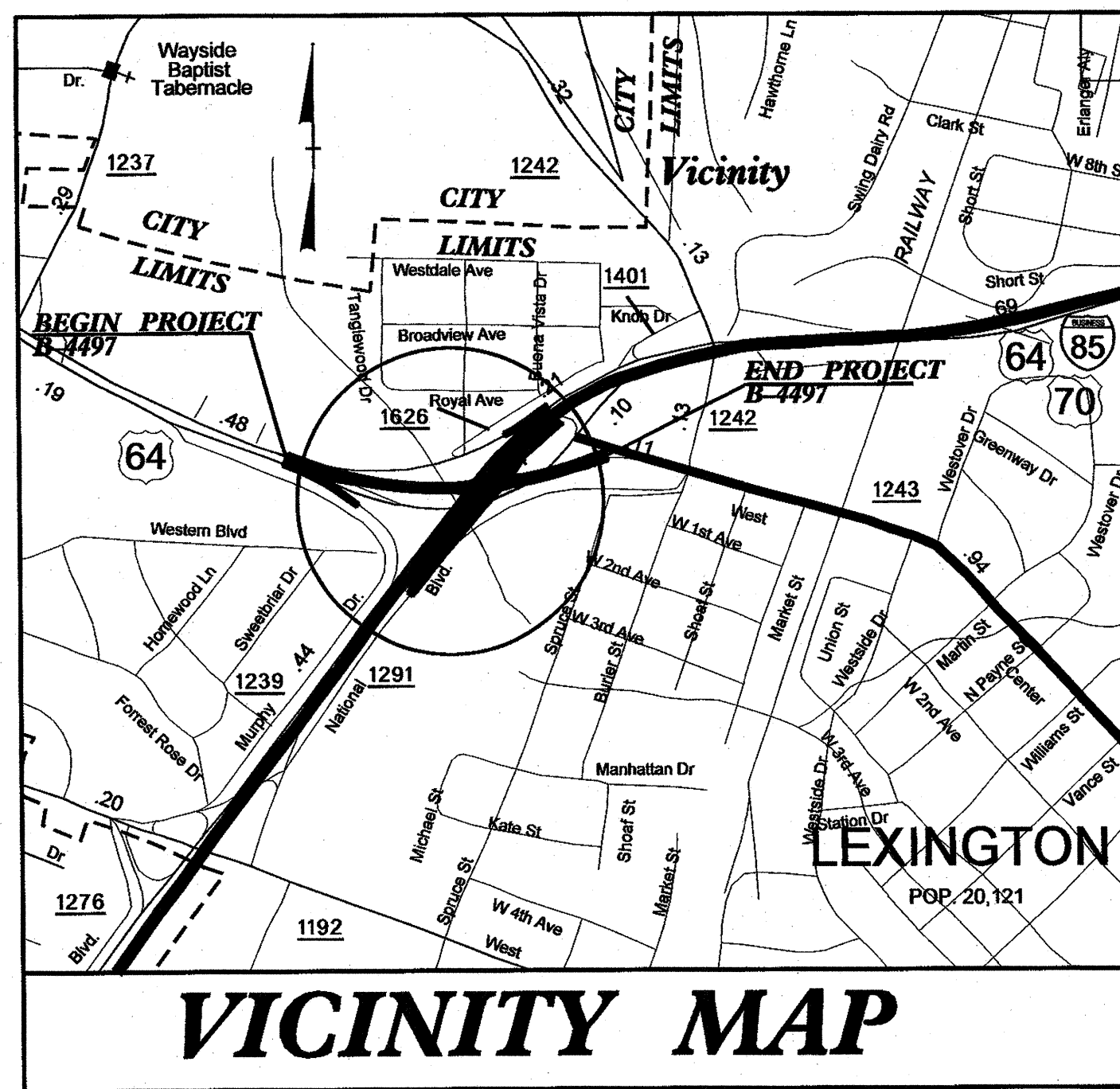
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**DAVIDSON COUNTY**

**LOCATION: REPLACE BRIDGE 39 OVER US 29-70 / I-85 BUS  
ON US 64**

**TYPE OF WORK: SIGNALS**

**Project: B-4497**



09-1285

**CONTRACT: C202951**

21-AUG-2012 11:51 S:\ITS\SUK\1151\_Signals\Signal Design Section\Central Region\Div 9\B-4497\B-4497\_rdy\_tsh.dgn

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

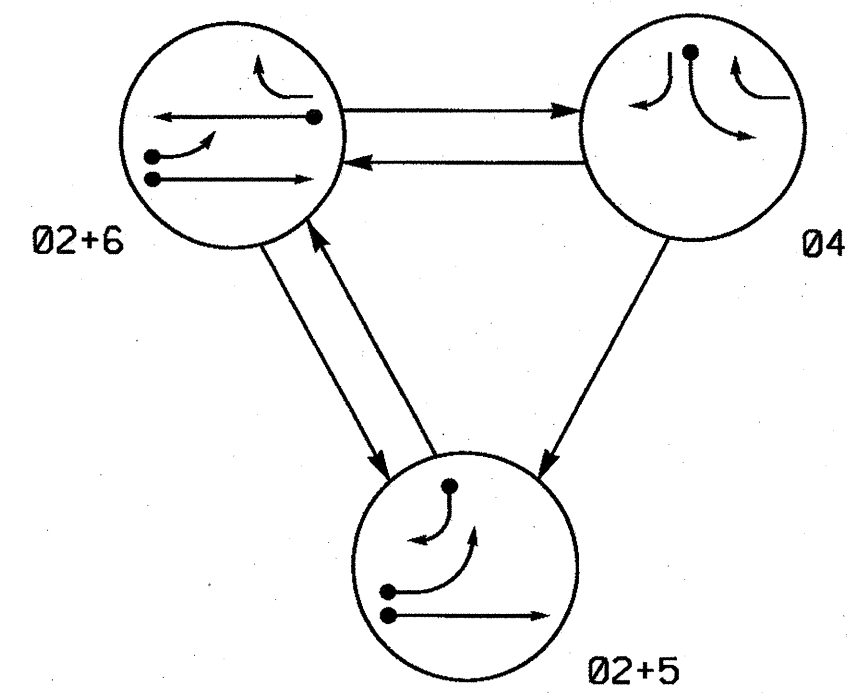
Index of Plans		
Sheet #	Reference #	Location/Description
Sig. 1		Title Sheet
Sig. 2-4	09-1285	US 64/SR 1243 (W. Center St.) at I-85 Bus/US 29 NB-US 64-70 EB Ramp

**INTELLIGENT TRANSPORTATION AND SIGNALS UNIT**  
Contacts:  
**Robert J. Ziemba, PE - Central Region Signals Project Engineer**  
**John T. Rowe, Jr. PE - Signal Equipment Design Engineer**

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

750 N. Greenfield Parkway, Garner, NC 27529

**PHASING DIAGRAM**

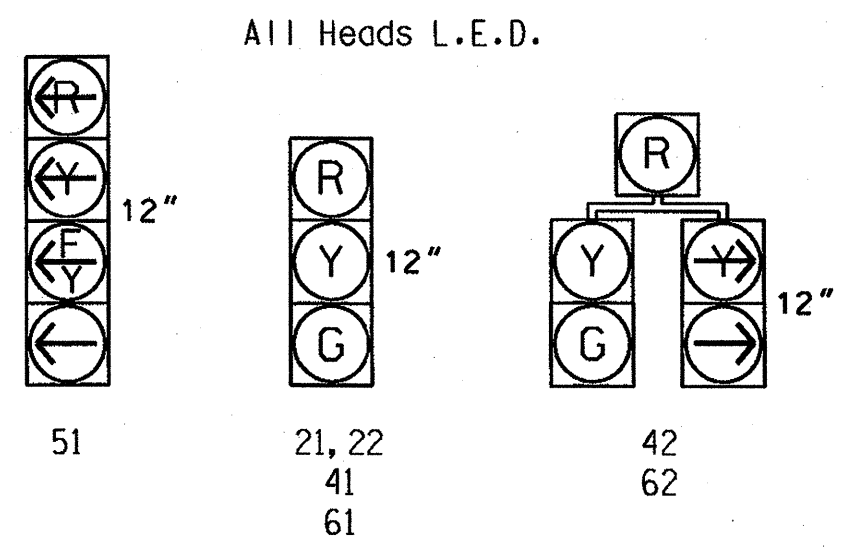


**PHASING DIAGRAM DETECTION LEGEND**  
 ● ← DETECTED MOVEMENT  
 ○ ← UNDETECTED MOVEMENT (OVERLAP)  
 - - - ← UNSIGNALIZED MOVEMENT  
 - - - ← PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51	-	F	R	Y
61	R	G	R	Y
62	R	G	R	Y

F = Flashing Yellow Arrow

**SIGNAL FACE I.D.**



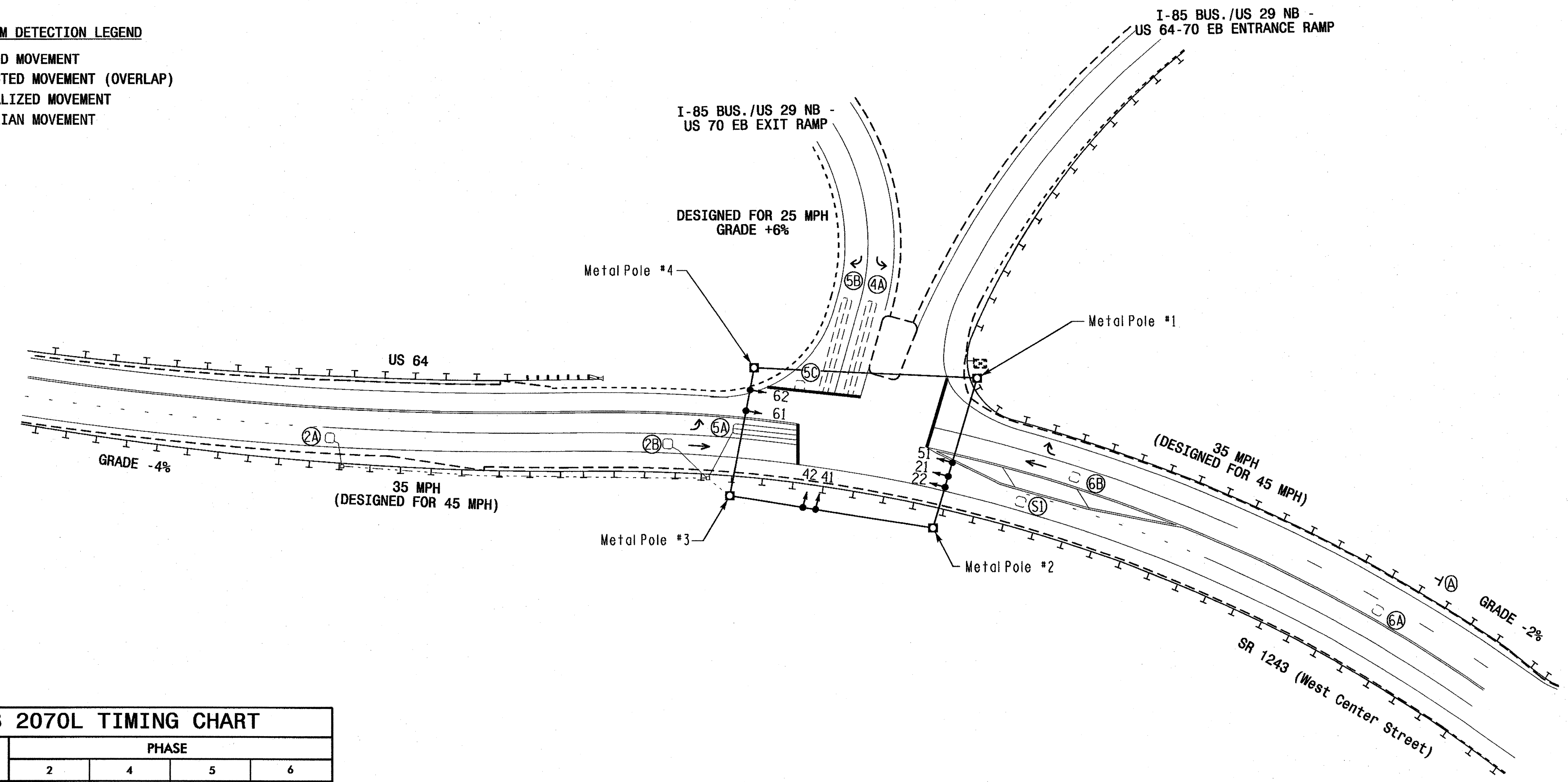
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	SIZE (FT)	TURNS	DISTANCE FROM STOPBAR (FT)	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
2A	6X6	6	300	Y	2	Y	Y	-	-	1.6	-	-
2B	6X6	5	90	Y	2	Y	Y	-	-	-	-	-
4A	6X60	2-4-2	0	-	4	Y	Y	-	-	-	-	-
5A	6X60	2-4-2	0	Y	5	Y	Y	-	-	-	15	-
5B	6X60	2-4-2	0	-	5	Y	Y	-	-	-	15	-
5C	6X6	EXIST	0	-	5	Y	Y	-	-	-	15	-
6A	6X6	EXIST	300	-	6	Y	Y	-	-	1.6	-	-
6B	6X6	EXIST	90	-	6	Y	Y	-	-	-	-	-
S1	6X6	EXIST	+150	-	-	-	-	Y	-	-	-	-

**3 Phase Fully Actuated (US 64 (W. Center Street) CLS)**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.
- Closed loop system data: Controller Asset #: 1285.



FEATURE	PHASE			
	2	4	5	6
Min Green 1*	12	7	7	12
Extension 1*	2.0	1.0	1.0	2.0
Max Green 1*	35	30	20	35
Yellow Clearance	4.7	3.0	3.0	4.7
Red Clearance	1.3	2.1	1.4	1.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation*	-	-	-	-
Max Variable Initial*	-	-	-	-
Time Before Reduction*	-	-	-	-
Time To Reduction*	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

PROPOSED	LEGEND	EXISTING
○ →	Traffic Signal Head	● →
○ →	Modified Signal Head	N/A
⊥	Sign	⊥
⊥	Pedestrian Signal Head With Push Button & Sign	⊥
⊥	Signal Pole with Guy	⊥
⊥	Signal Pole with Sidewalk Guy	⊥
⊥	Inductive Loop Detector	⊥
⊥	Controller & Cabinet	⊥
⊥	Junction Box	⊥
- - -	2-in Underground Conduit	- - -
N/A	Right of Way with Marker	△
→	Directional Arrow	→
⊠	Metal Strain Pole	⊠
N/A	Guardrail	⊥
⊠	"RIGHT LANE MUST TURN RIGHT" Sign (R3-TR)	⊠

**Signal Upgrade**

**US 64/SR 1243 (W. Center St.) at I-85 Bus./US 29 NB - US 64-70 EB Ramp**

Division 9 Davidson County Lexington

PLAN DATE: August 2012 REVIEWED BY: R. Hough

PREPARED BY: R. Hough REVIEWED BY:

SEAL

ROBERT J. ZIEMER

ENGINEER

026486

8/20/12

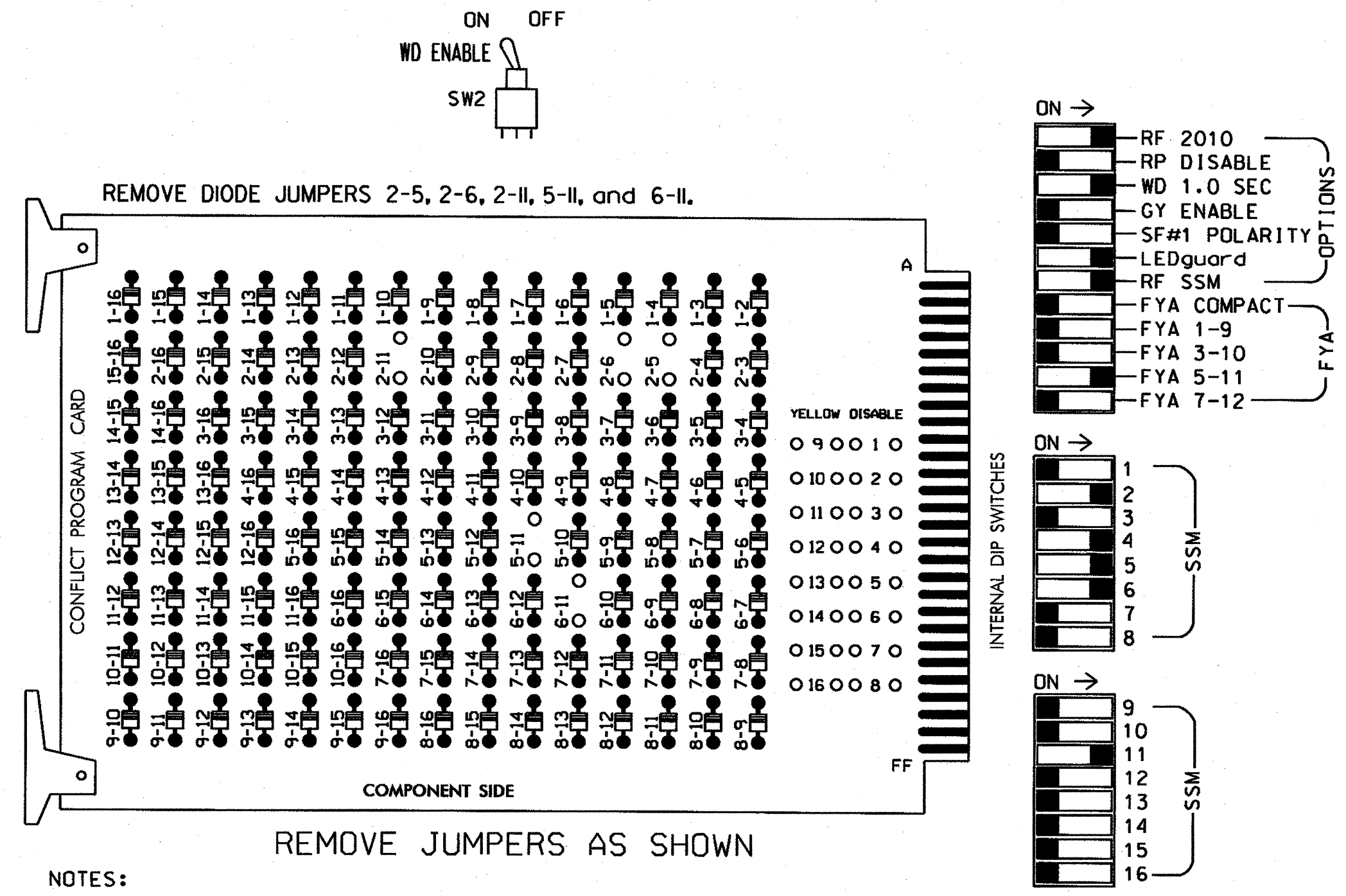
SCALE: 1" = 50'

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

21-AUG-2012 12:06 S:\1136310\113\_Signal\Signal Design Section\Central Region\01v 948-4497\091285.s1g\_dsn\_20120820.dgn

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

(remove jumpers and set switches as shown)



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

- ### NOTES
- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
  - Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
  - Enable Simultaneous Gap-Out for all phases.
  - Program phases 2 and 6 for Start Up In Green.
  - Program phases 2 and 6 for Yellow Flash.
  - The cabinet and controller are part of the US 64 (W. Center Street) Closed Loop System.

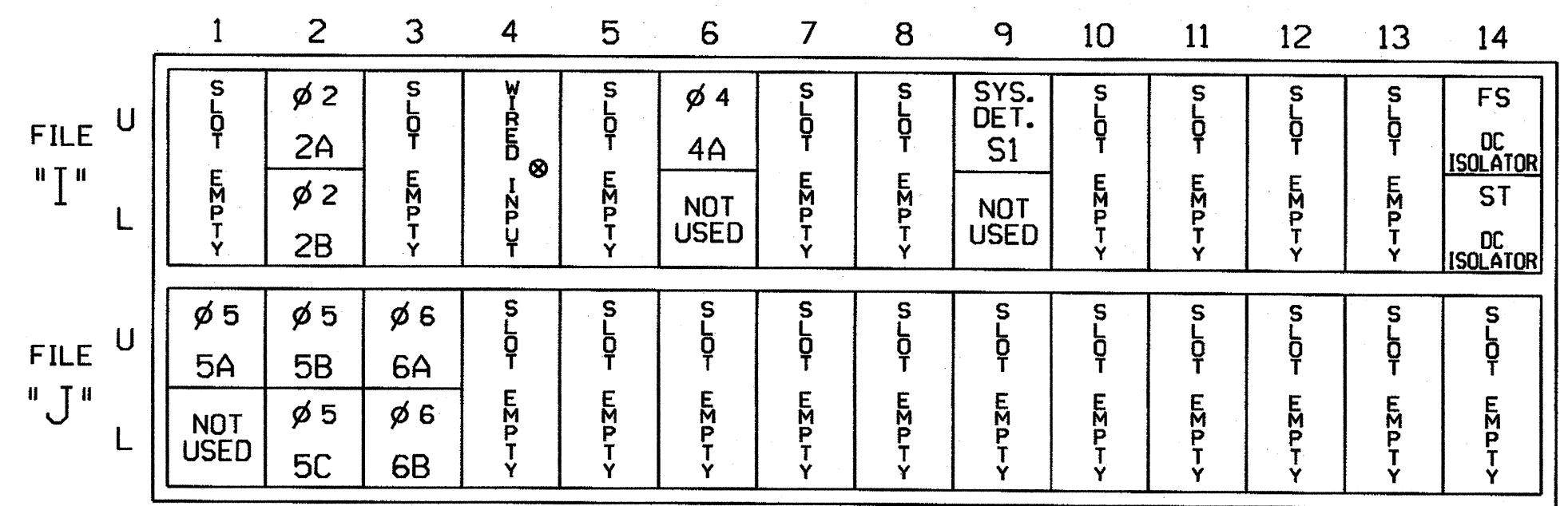
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	42	51*	61,62	NU	NU	NU	NU	NU	51*	NU	NU
RED		128			101		*		134									
YELLOW		129			102				135									
GREEN		130			103				136									
RED ARROW																		A114
YELLOW ARROW						102	132											A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW						103	133	133										

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

### INPUT FILE POSITION LAYOUT

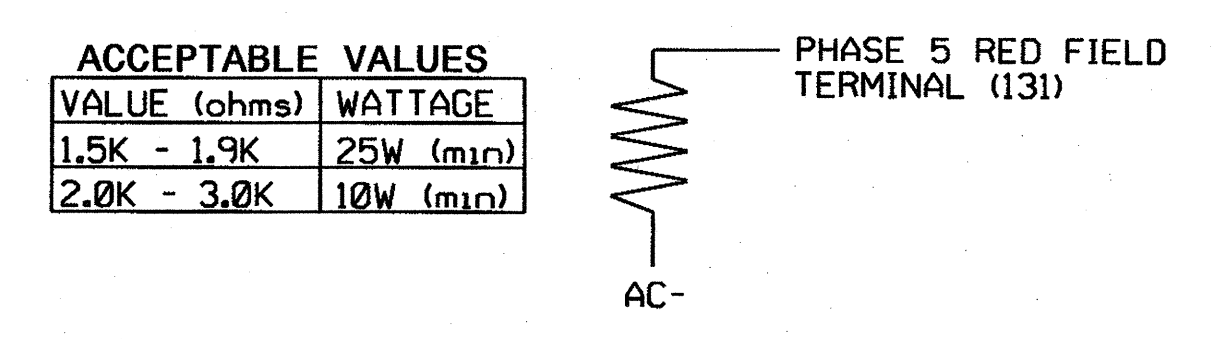
(front view)



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

### LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



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

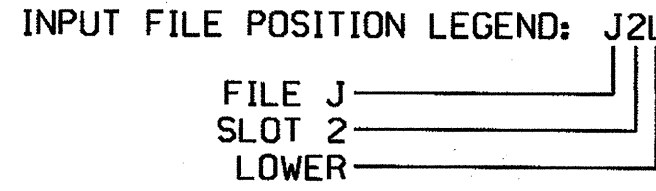
### EQUIPMENT INFORMATION

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

### INPUT FILE CONNECTION & PROGRAMMING CHART

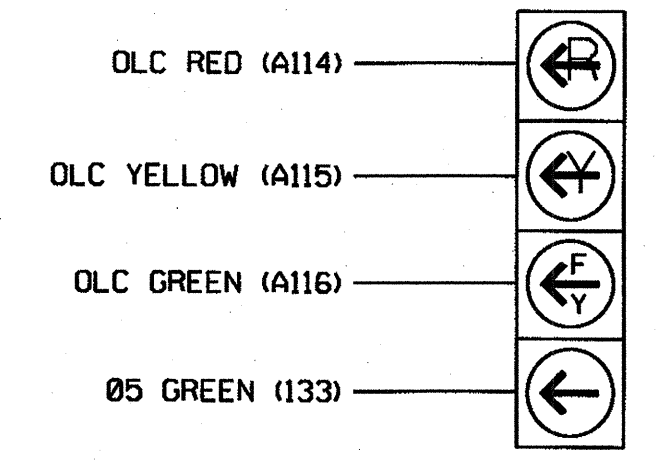
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y		1.6	
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A <sup>1</sup>	TB3-1,2	J1U	55	17	5	5	Y	Y			15
			14U	9	22	2	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y		1.6	
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
* S1	TB6-9,10	I9U	60	22	11	SYS					

- <sup>1</sup>Add jumper from J1-W to I4-W. on rear of input file.  
 \* System detector only. Remove the vehicle phase assigned to this detector in the default programming.



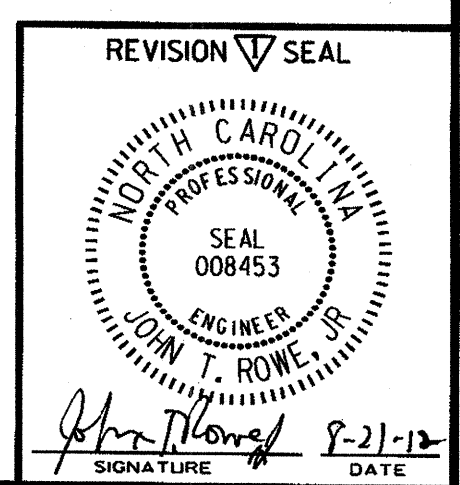
### 4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 09-1285  
 DESIGNED: August 2012  
 SEALED: 8/20/12  
 REVISED: N/A



Signal Upgrade - Sheet 1 of 2

Electrical and Programming Details For: **US 64/SR 1243 (W. Center St.)**  
 at **I-85 Bus./US 29 NB - US 64-70 EB Ramp**

Division 9 Davidson County Lexington

Prepared by: **S. Armstrong** Reviewed by: **T. Joyce**

Plan Date: **December 2009** Revisions: **INIT. DATE**

Revisions: **V** Loops 2A, 2B, 5A were re-cut electrical changes. (USA) **JTK 8-21-12**

Not a certified document as to the Original Document but only as to the Revisions - This document originally issued and sealed by George C. Brown, #022013, on 12/17/09. This document is only certified as to the revisions.

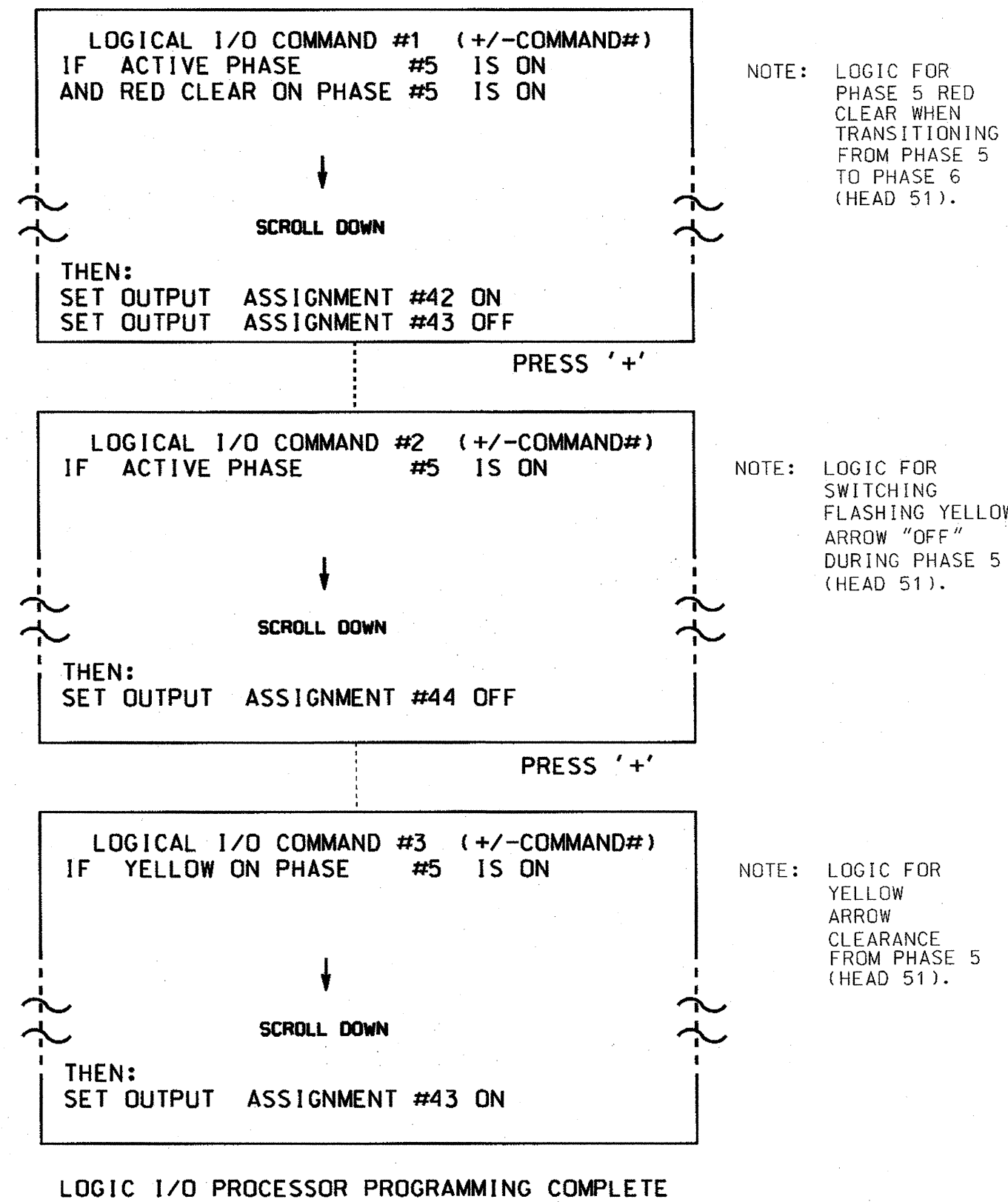
SIGNATURE DATE

SIG. INVENTORY NO. 09-1285

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

(program controller as shown below)

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



<b>OUTPUT REFERENCE SCHEDULE</b>
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

## OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

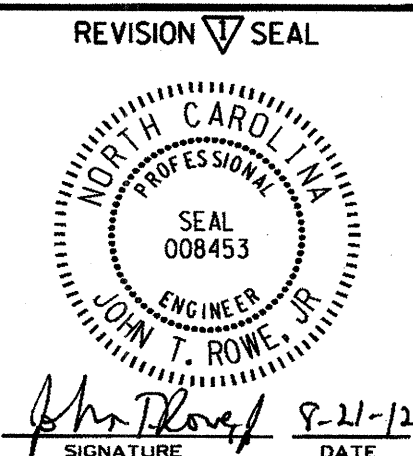
PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS	
PHASE:	12345678910111213141516
VEH OVL PARENTS:	XX
VEH OVL NOT VEH:	
VEH OVL NOT PED:	
VEH OVL GRN EXT:	
STARTUP COLOR:	- RED - YELLOW - GREEN
FLASH COLORS:	- RED - YELLOW X GREEN
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: 09-1285  
DESIGNED: August 2012  
SEALED: 8/20/12  
REVISED: N/A



Signal Upgrade - Sheet 2 of 2							
	<p style="text-align: center;"><b>US 64/SR 1243 (W. Center St.)</b> at <b>I-85 Bus./US 29 NB -</b> <b>US 64-70 EB Ramp</b></p> <p style="text-align: right;">Lexington</p> <p>Division 9 PLAN DATE: December 2009    REVIEWED BY: T. Joyce PREPARED BY: S. Armstrong    REVIEWED BY:</p> <table border="1" style="width: 100%; font-size: small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td>▽ Loops 2A, 2B, 5A were re-cut to electrical charges. (USA)</td> <td>JTR</td> <td>8-21-12</td> </tr> </table>	REVISIONS	INIT.	DATE	▽ Loops 2A, 2B, 5A were re-cut to electrical charges. (USA)	JTR	8-21-12
REVISIONS	INIT.	DATE					
▽ Loops 2A, 2B, 5A were re-cut to electrical charges. (USA)	JTR	8-21-12					
<p>750 N. Greenfield Pkwy, Corner, NC 27529</p>	<p>SEAL</p> <p>Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by George C. Brown #022013, on 12/17/09. This document is only certified as to the revisions.</p> <p>SIGNATURE _____ DATE _____</p> <p>SIG. INVENTORY NO. 09-1285</p>						

21-AUG-2012 06:51 S:\MITS\SUM\TIS\Sig\01\work\p09\091285\_sml.e (e.xxx.dgn) S:\MITS\SUM\TIS\Sig\01\work\p09\091285\_sml.e (e.xxx.dgn) S:\MITS\SUM\TIS\Sig\01\work\p09\091285\_sml.e (e.xxx.dgn)