

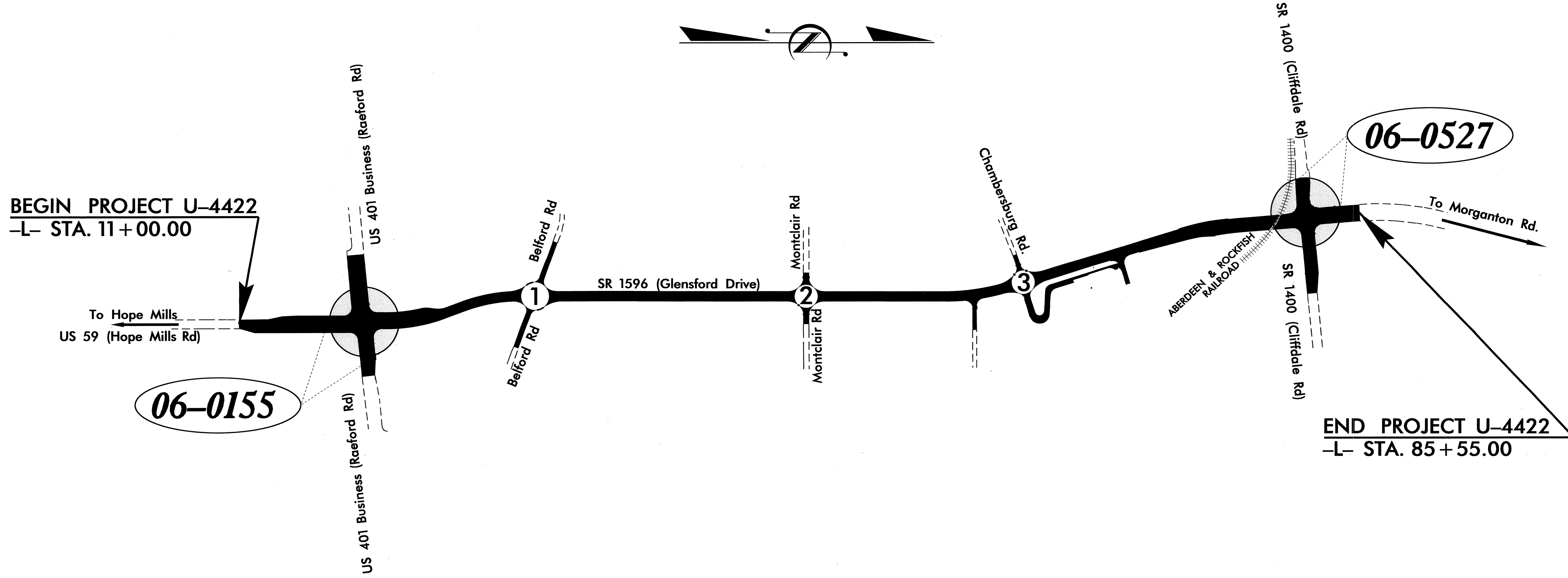
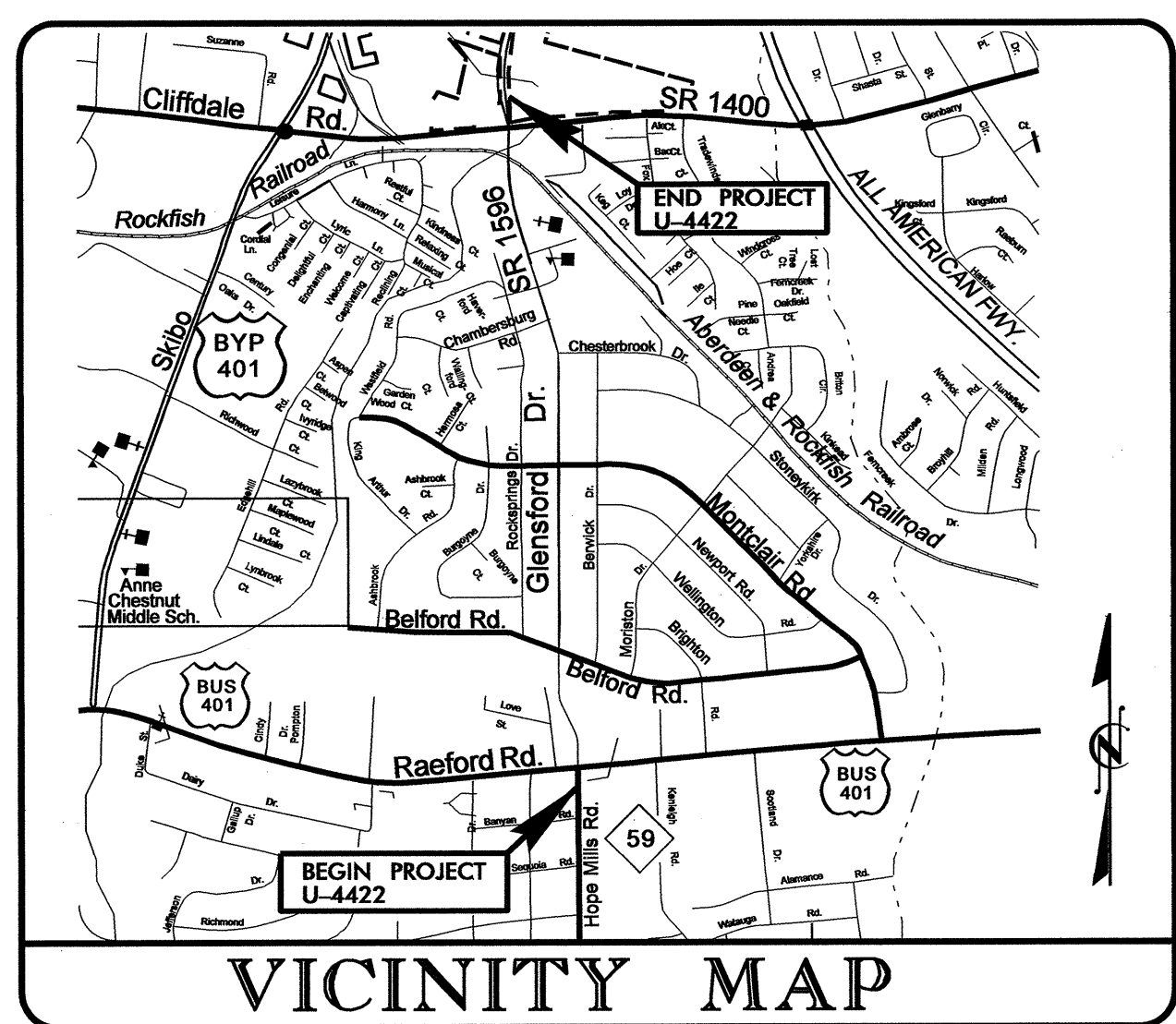
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

**LOCATION: FAYETTEVILLE - SR 1596 (GLENSFORD DRIVE)
FROM US 401 BUSINESS (RAEFORD ROAD)
TO SR 1400 (CLIFFDALE ROAD)**

TYPE OF WORK: TRAFFIC SIGNALS

Project: U-4422



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. 2-12	06-0155	US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1596 (Glensford Dr)
Sig. 13-28	06-0527	SR 1400 (Cliffdale Rd) at SR 1596 (Glensford Dr)/Glensford Dr. Extension
Sig. 29-32	-----	Cable Routing
Sig. 33-38	-----	Metal Pole Standards

Transportation Mobility and Safety Division

Contacts:

Pamela Alexander, PE - Eastern Region Signals Engineer
John Rowe, PE - Signal Equipment Design Engineer

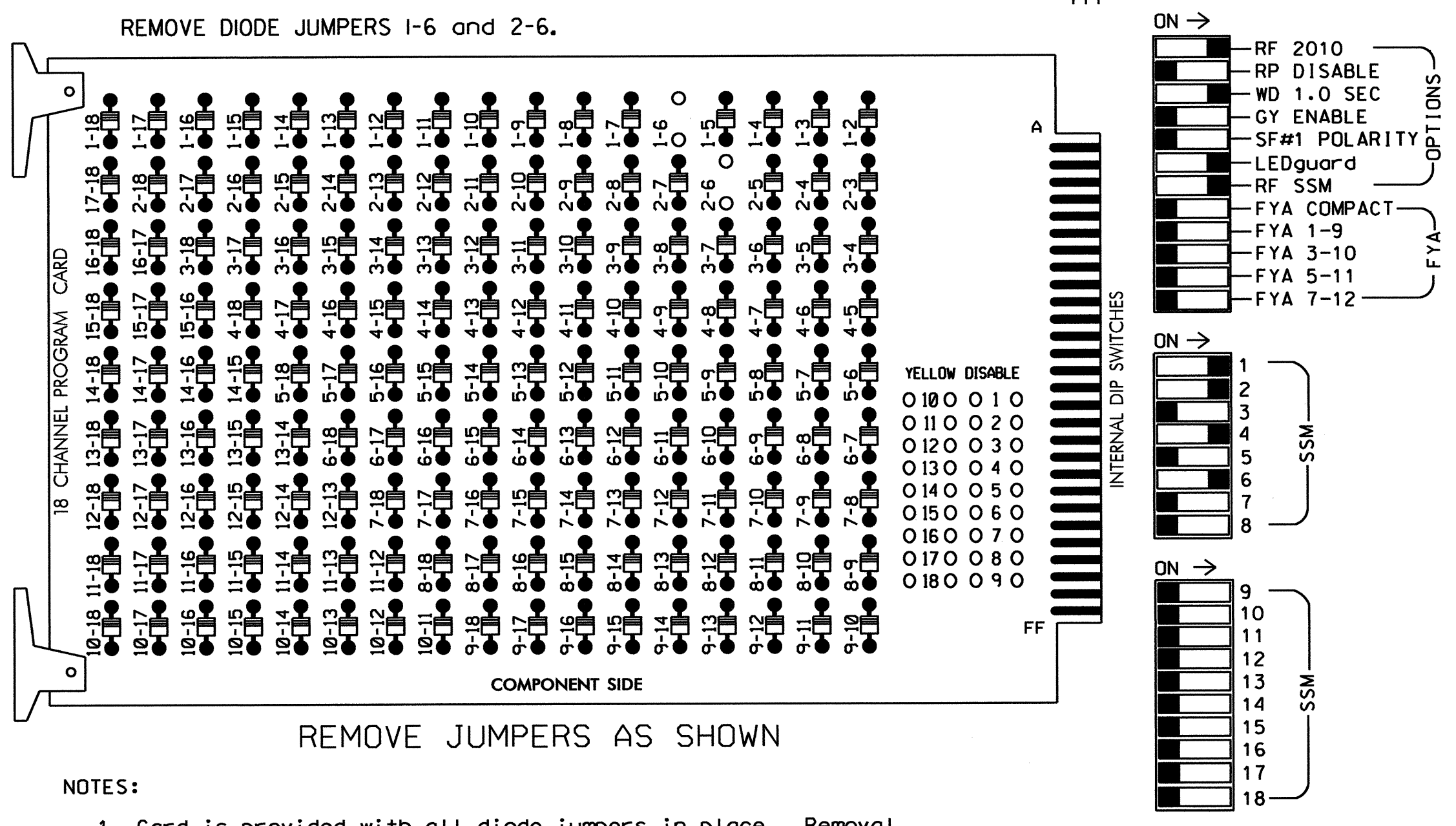
Prepared in the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

750 N. Greenfield Parkway, Garner, NC 27529

01-MAR-2012 12:35 P:\Traffic\Signals\Design\Titlesheet\U-4422-sig-1\Titlesheet_2011mdd.dgn

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22 23	NU	NU	13,14	23	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101					134								
YELLOW		129								135								
GREEN		130								136								
RED ARROW	125						101											
YELLOW ARROW	126				102	102	102											
GREEN ARROW	127				103	103	103											

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8
 PHASES USED.....1,2,4,6
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	∅ 1 1A	∅ 1 1B	∅ 2 2A,2B,2C	S ∅ 4	S ∅ 4	S ∅ 4	∅ 4 4A	S ∅ 4	∅ 1 1D	S ∅ 4	S ∅ 4	S ∅ 4	S ∅ 4	FS DC ISOLATOR
	NOT USED	∅ 1 1C	NOT USED	∅ 4 4B	∅ 4 4B	∅ 4 4B	∅ 4 4B	∅ 4 4B	NOT USED	∅ 4 4B	∅ 4 4B	∅ 4 4B	∅ 4 4B	ST DC ISOLATOR
FILE "J"	S ∅ 6	S ∅ 6	NOT USED 6A,6B,6C	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6	S ∅ 6

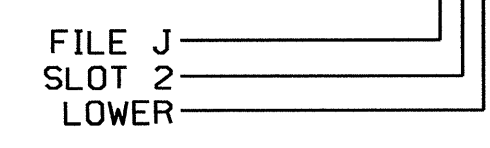
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
1D	TB6-9,10	I9U	60	22	11	1	Y	Y			15
2A,2B,2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
6A,6B,6C	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T1
 DESIGNED: June 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 1 (TCP-PHASE III)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)

Division 6 Cumberland County Fayetteville

PLAN DATE: January 2012 REVIEWED BY: JTR

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

Signature: John Rowell 2-16-12

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

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 06-0155T1

15-FEB-2012 08:21 S:\132504\TIS Signal\workgroups\Sig Man\mstron@00105.sm\le_000.dgn

PHASING DIAGRAM

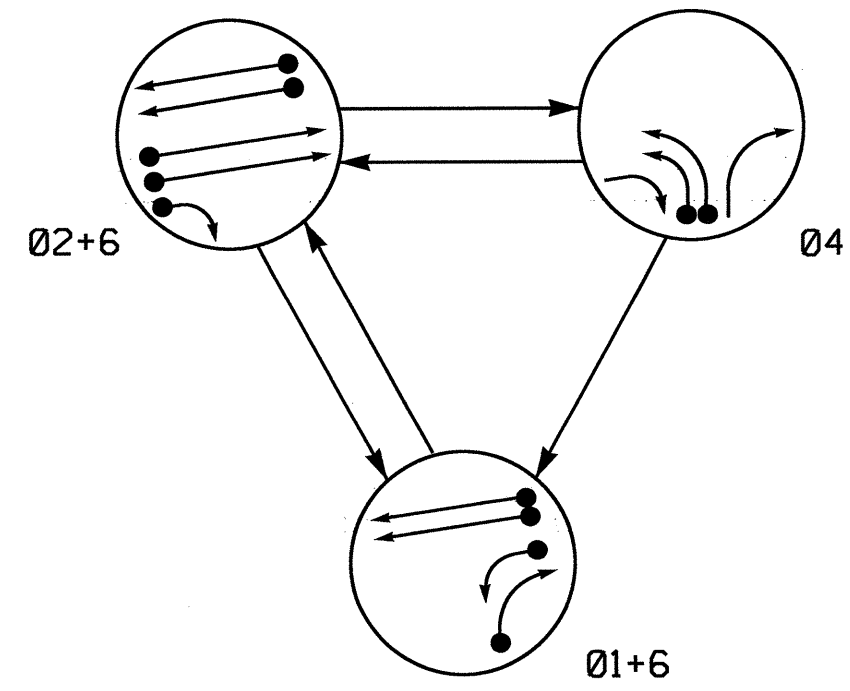
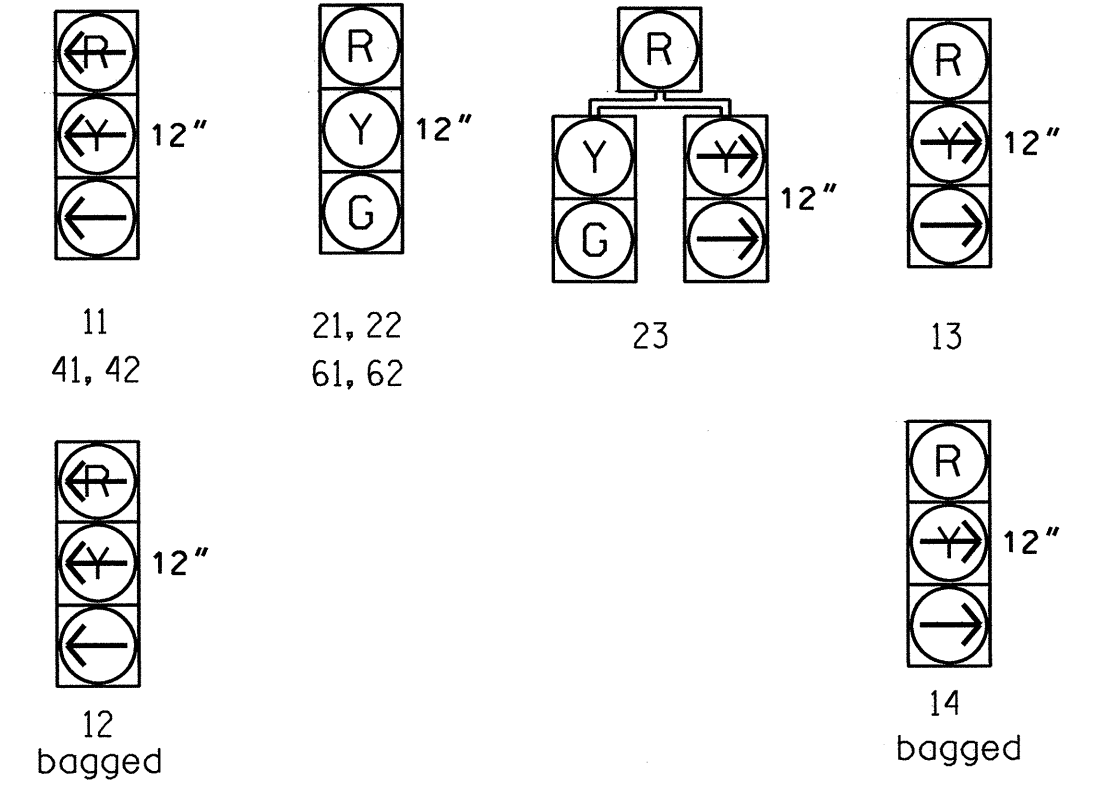


TABLE OF OPERATION

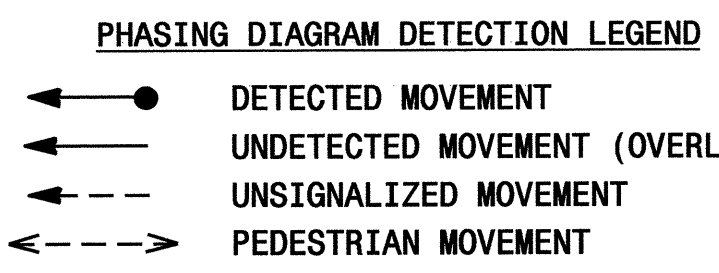
SIGNAL FACE	PHASE			
	01+6	02+6	04	FULL SIGNAL
11	→	←	→	←
13	R	R	→	R
21,22	R	G	R	Y
23	R	G	↘	Y
41,42	←	←	←	←
61,62	G	G	R	Y

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



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

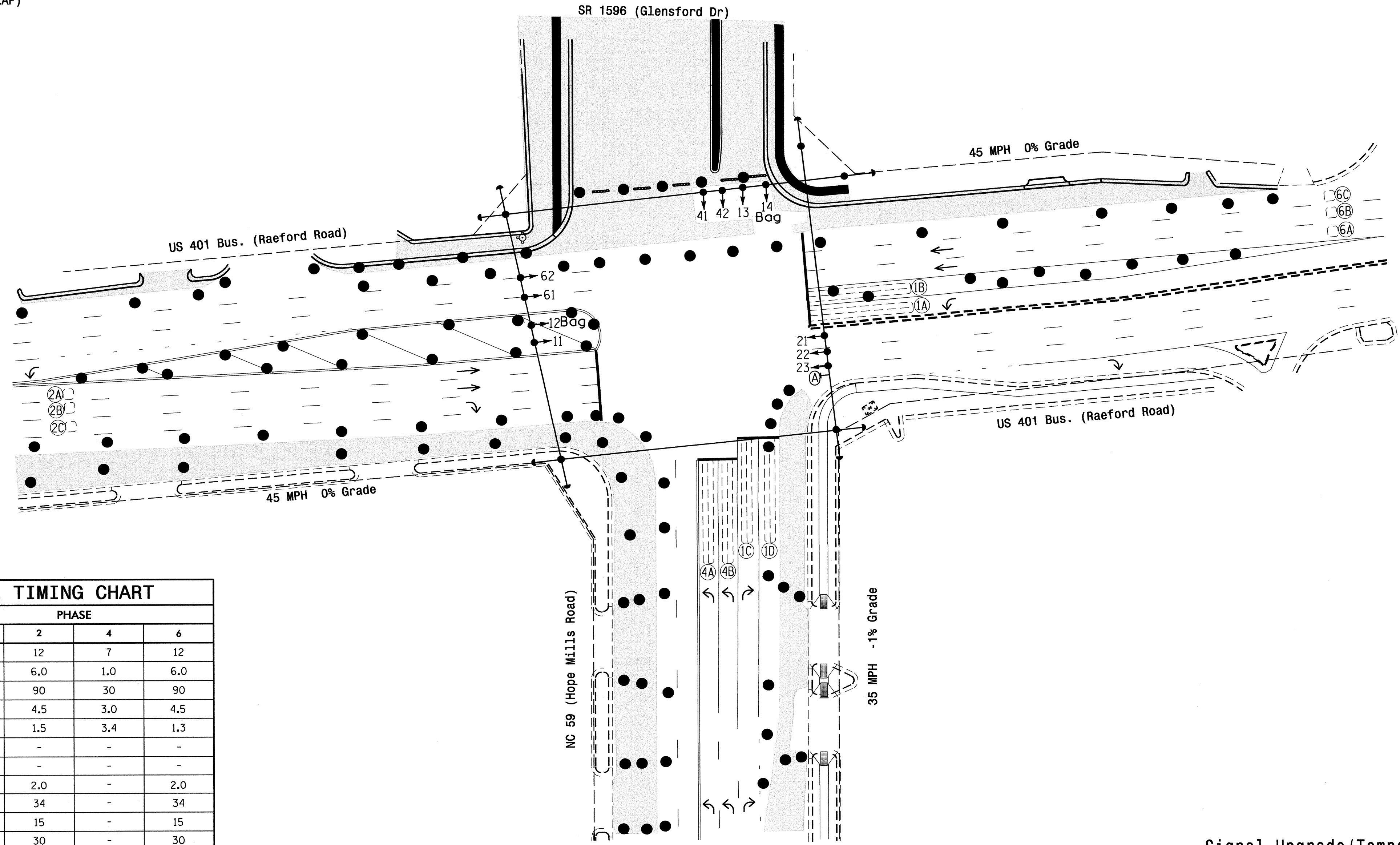
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING						
				PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Y	Y	-	-	-
1B	6X60	0	2-4-2	-	1	Y	Y	-	-	-
1C	6X60	0	2-4-2	-	1	Y	Y	-	15	-
1D	6X60	0	2-4-2	-	1	Y	Y	-	15	-
2A,2B,2C	6X6	300	4	-	2	Y	Y	-	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	3	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	-
6A,6B,6C	6X6	300	4	-	6	Y	Y	-	-	-



3 Phase Fully Actuated Fayetteville City System

NOTES

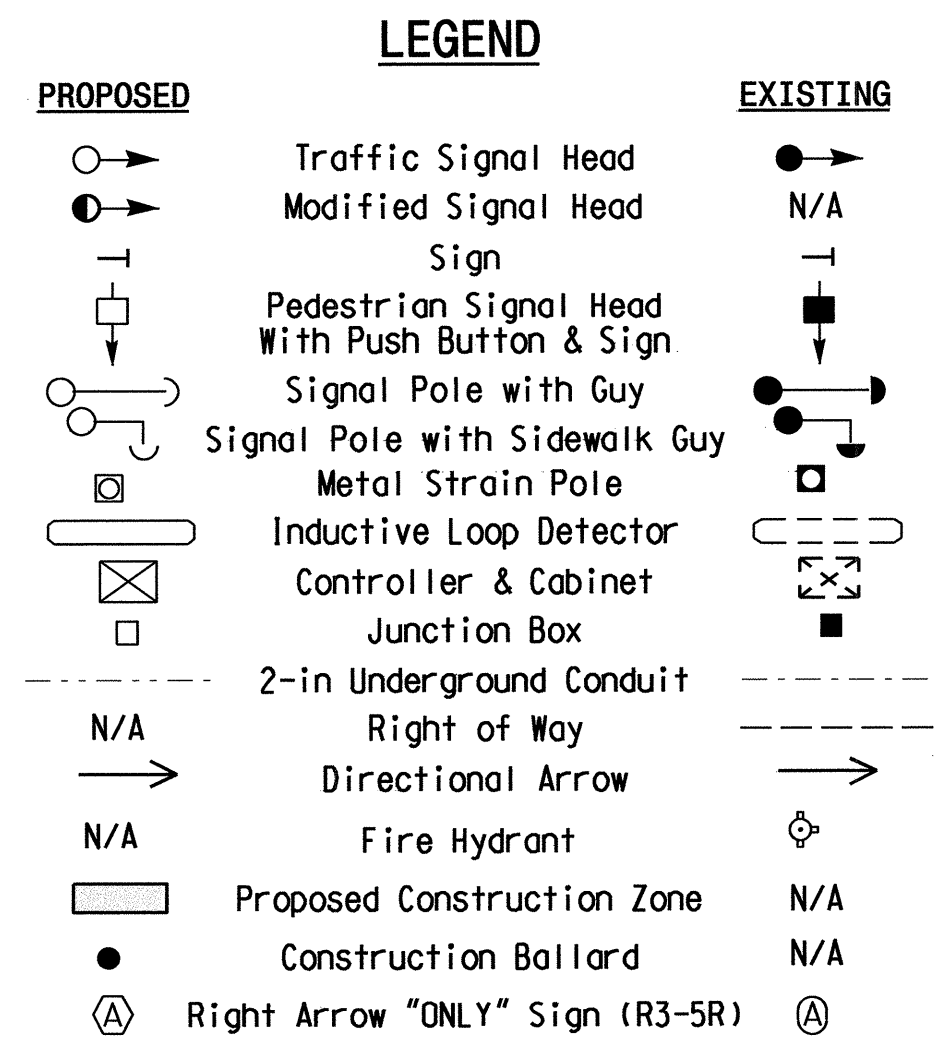
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Bag heads 12 and 14.
5. Reposition heads 21,22,23 and sign "A".
6. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Maintain detection during construction, installing new loops and temporary direct bury lead-in as directed by the engineer.



OASIS 2070L TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	1.0	6.0	1.0	6.0
Max Green 1 *	30	90	30	90
Yellow Clearance	3.0	4.5	3.0	4.5
Red Clearance	2.9	1.5	3.4	1.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	2.0	-	2.0
Max Variable Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	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.



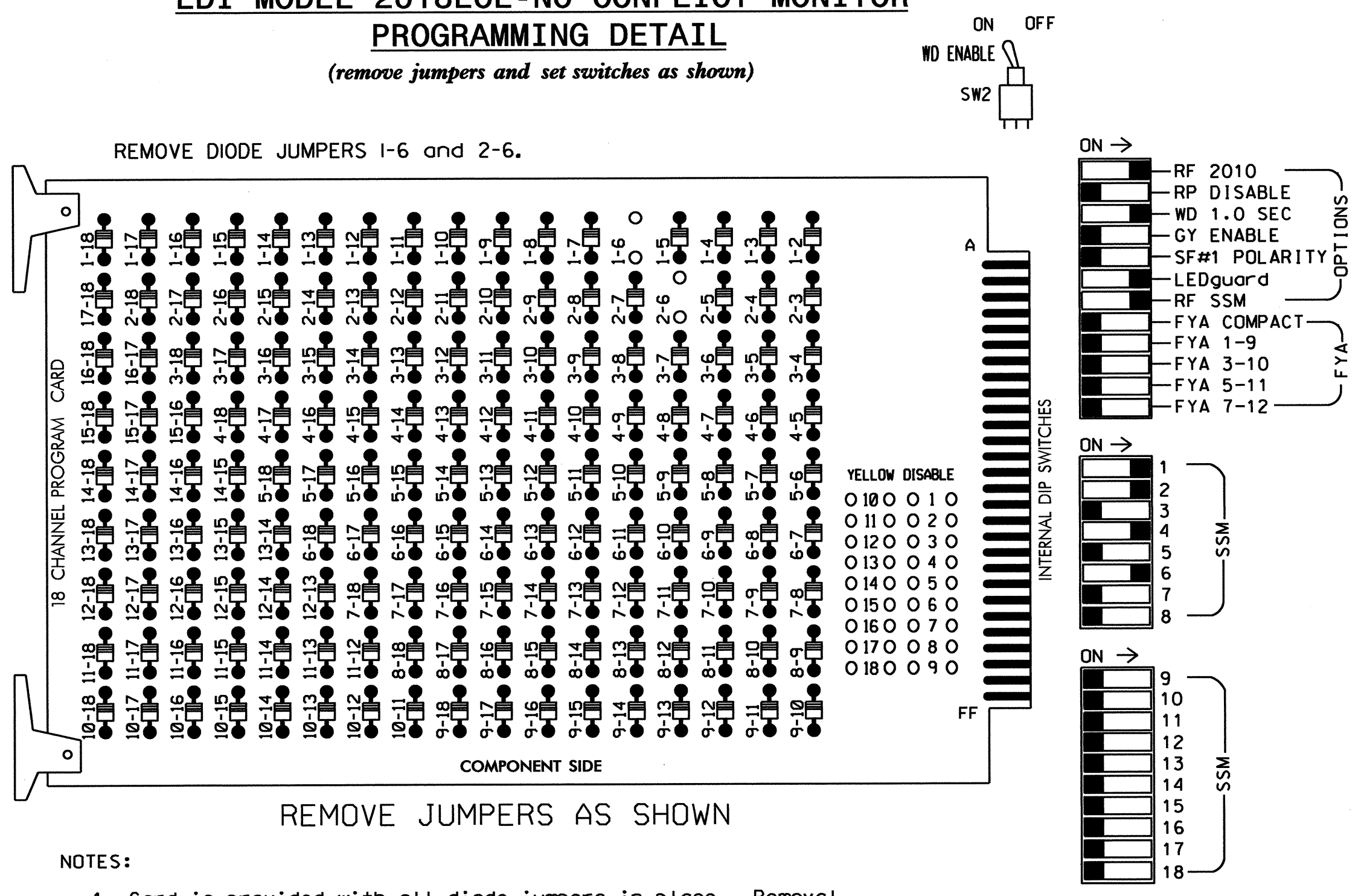
Signal Upgrade/Temporary 2 (TCP-PHASE IV)

 Prepared In the Offices of: Transportation Mobility and Safety Division Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)	SEAL SEAL 23489 PL ALEXANDER, PE	
	Division 6 Cumberland County Fayetteville		PLAN DATE: June 2011 REVIEWED BY: PL Alexander, PE
	PREPARED BY: EM Minshew		REVIEWED BY:
	REVISIONS:		INIT. DATE:
	SCALE: 1"=40' 		SIGNATURE: DATE: 2/14/12

SIG. INVENTORY NO. 06-015512

13-FEB-2012 15:07
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EDI MODEL 2018ECL-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.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- 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.
- The cabinet and controller are part of the Fayetteville City System.

SIGNAL HEAD HOOK-UP CHART

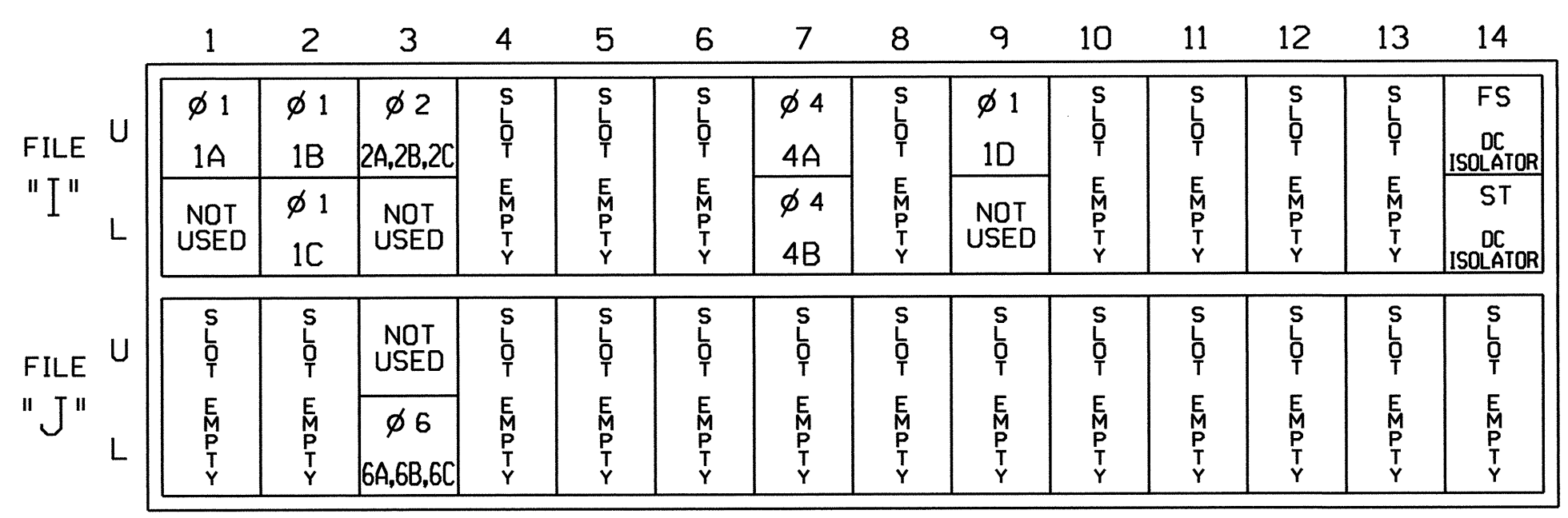
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1*	2	2 PED	3	4*	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22 23	NU	NU	13	23	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU
RED	128				101					134								
YELLOW	129									135								
GREEN	130									136								
RED ARROW	125					101												
YELLOW ARROW	126					102	102	102										
GREEN ARROW	127					103	103	103										

NU = Not Used
*NOTE: disconnect and bag signal heads 12 and 14.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S8
PHASES USED.....1,2,4,6
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT
(front view)



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			
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
1D	TB6-9,10	I9U	60	22	11	1	Y	Y			15
2A,2B,2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
6A,6B,6C	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J _____
SLOT 2 _____
LOWER _____

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T2
DESIGNED: June 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Temporary 2 (TCP PHASE IV)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)

Division 6 Cumberland County Fayetteville

PLAN DATE: January 2012 REVIEWED BY: JTR

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS _____ INIT. DATE _____

750 N. Greenfield Pkwy, Garner, NC 27529

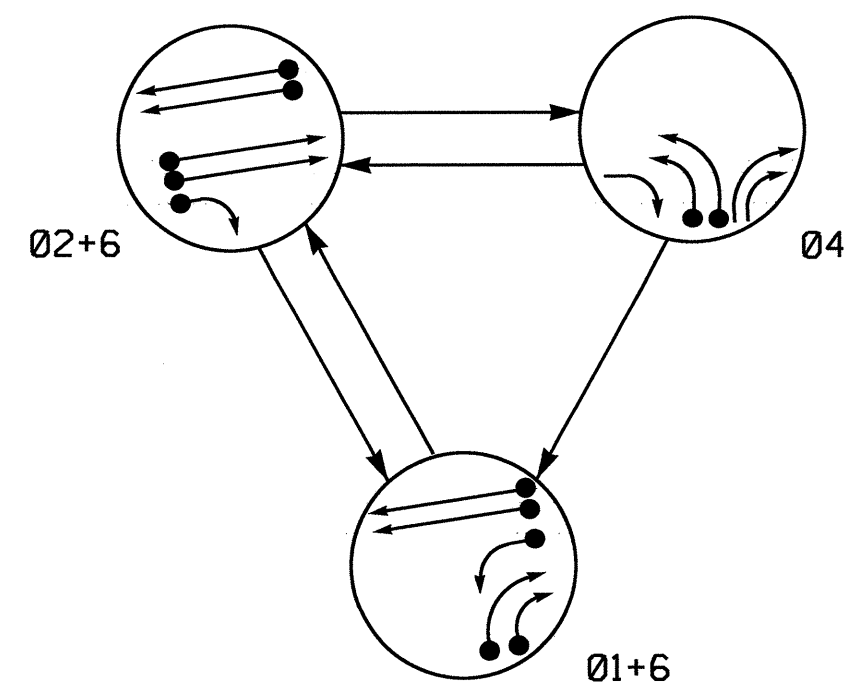
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR.

Signature: John Rowe 2-16-12 DATE: 2-16-12

SIG. INVENTORY NO. 06-0155T2

15-FEB-2012 08:22 S:\152604175_Signals\workgroups\sig_Man\mstrmstr\001055_sml.e (e.xxx.dgn) smstrmstr

PHASING DIAGRAM

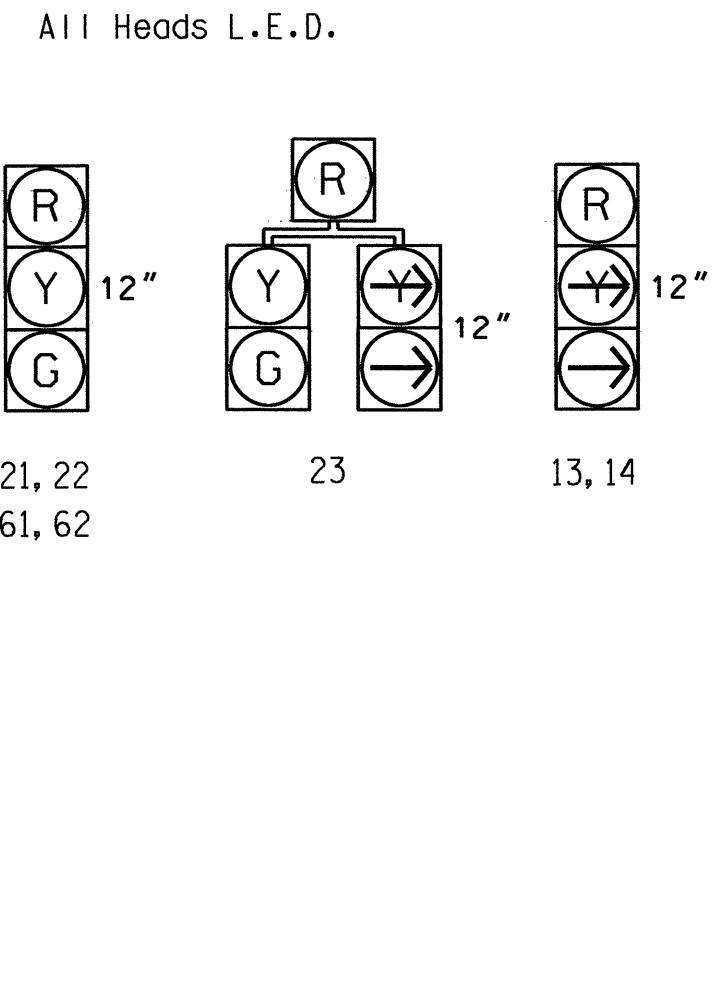


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE			
	Ø 1+6	Ø 2+6	Ø 3+6	Ø 4
11	---	R	R	R
13,14	R	R	---	R
21,22	R	G	R	Y
23	R	G	---	Y
41,42	R	R	---	R
61,62	G	G	R	Y

SIGNAL FACE I.D.



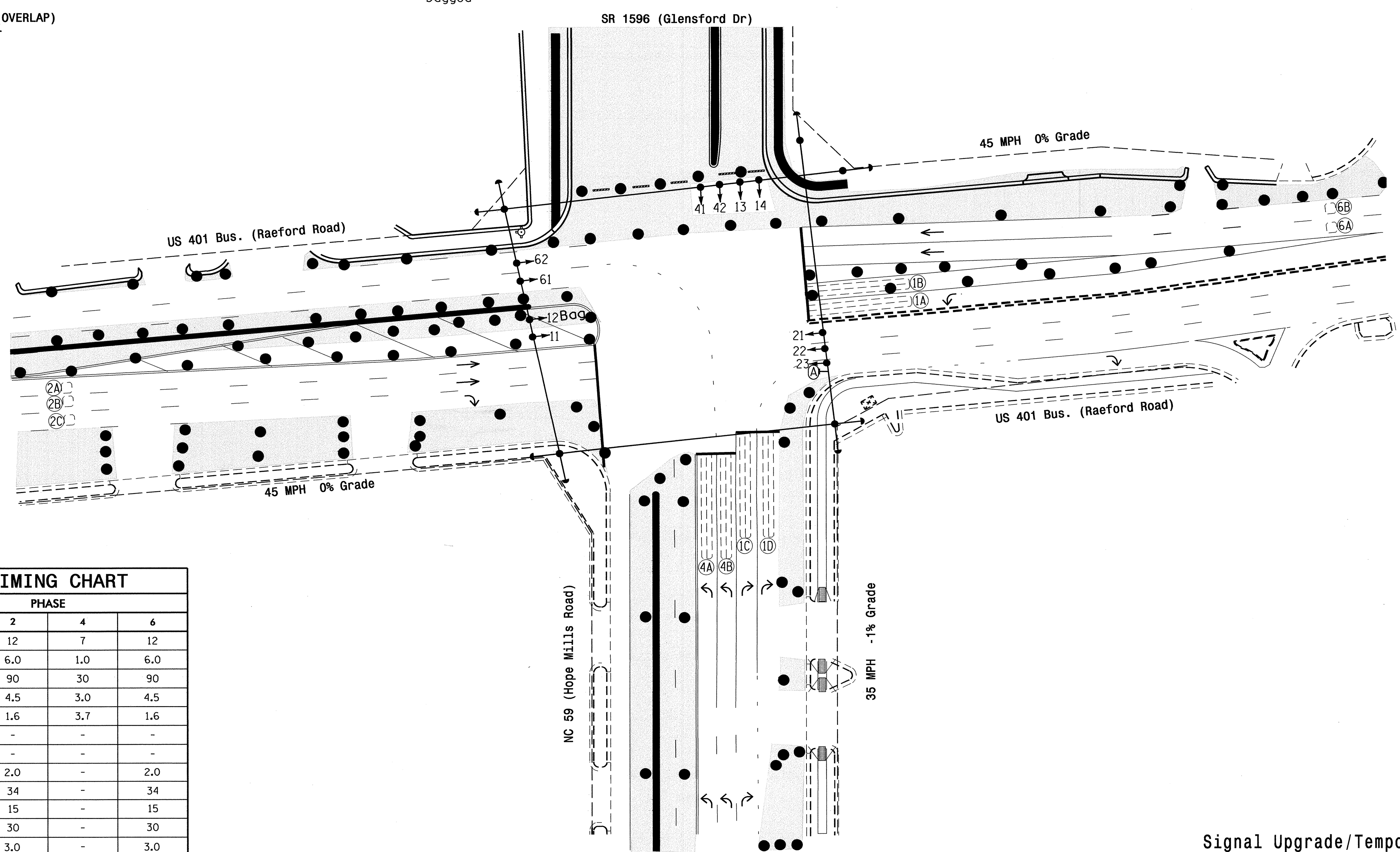
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING								
				NEW LOOP	PHASE	CALLING EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
1A	6X60	0	2-4-2	-	1	Y	Y	-	-	-	-	-
1B	6X60	0	2-4-2	-	1	Y	Y	-	-	-	-	-
1C	6X60	0	2-4-2	-	1	Y	Y	-	-	15	-	-
1D	6X60	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A,2B,2C	6X6	300	4	-	2	Y	Y	-	-	-	-	-
4A	6X60	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X60	0	2-4-2	-	4	Y	Y	-	-	-	-	-
6A,6B	6X6	300	4	-	6	Y	Y	-	-	-	-	-

3 Phase Fully Actuated Fayetteville City System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition heads 61 and 62.
5. Bag head 12.
6. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Maintain detection during construction, installing new loops and temporary direct bury lead-in as directed by the engineer.



FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	1.0	6.0	1.0	6.0
Max Green 1 *	30	90	30	90
Yellow Clearance	3.0	4.5	3.0	4.5
Red Clearance	3.5	1.6	3.7	1.6
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	2.0	-	2.0
Max Variable Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	30	-	30
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	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	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
○ Metal Strain Pole	○ 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
→ N/A Directional Arrow	→ N/A
○ N/A Fire Hydrant	○ N/A
○ Proposed Construction Zone	○ N/A
● Construction Ballard	● N/A
⊙ Right Arrow "ONLY" Sign (R3-5R)	⊙ N/A

Signal Upgrade/Temporary 3 (TCP PHASE V)

US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)

Division 6 Cumberland County Fayetteville

PLAN DATE: June 2011 REVIEWED BY: PL Alexander, PE

PREPARED BY: EM Minshew REVIEWED BY:

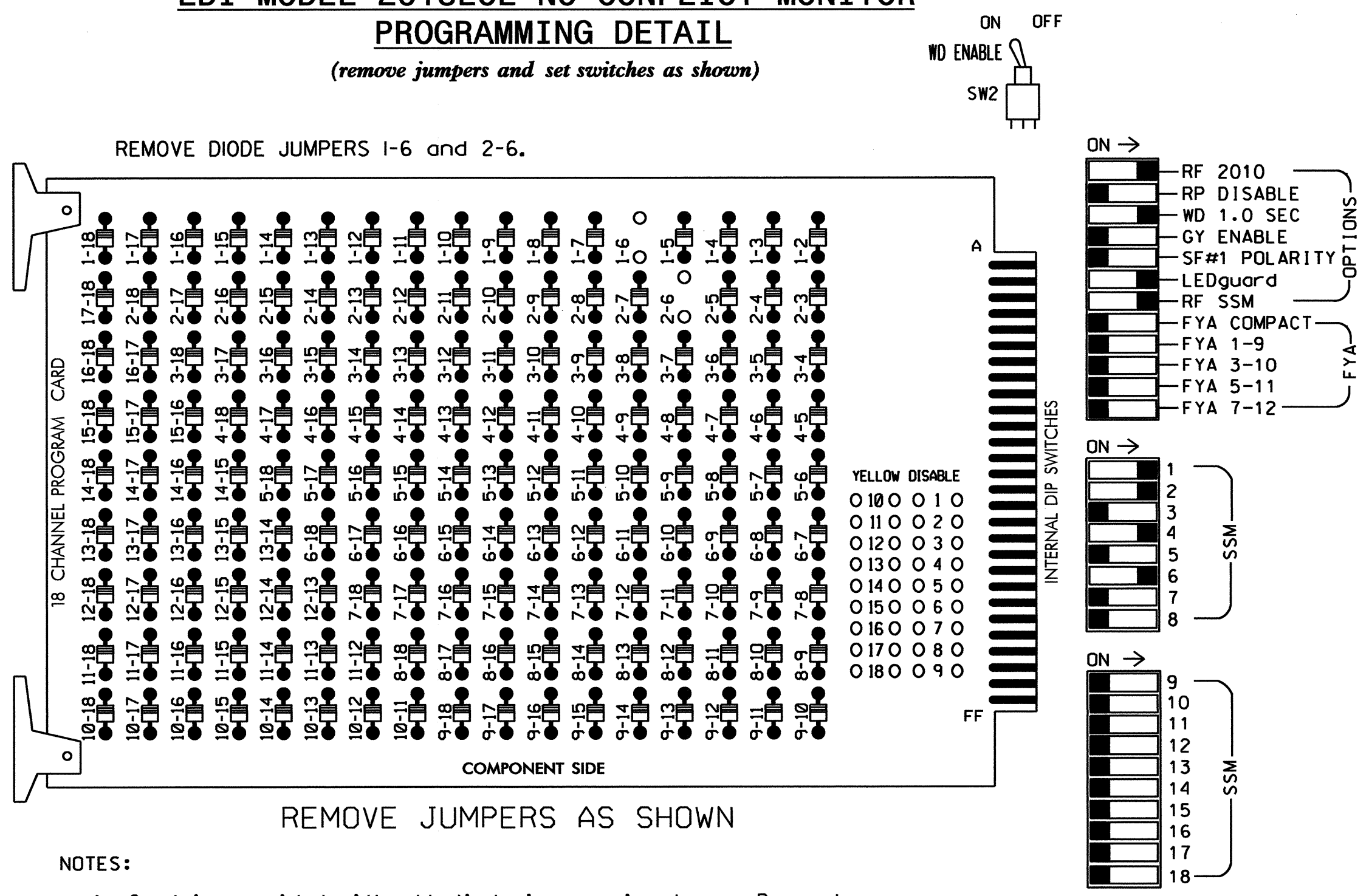
SCALE: 1"=40'

DATE: 2/14/12

SIGNATURE: [Signature]

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMJ CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1*	2	2 PED	3	4*	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22 23	NU	NU	13,14 23	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128			101				134									
YELLOW		129							135									
GREEN		130							136									
RED ARROW	125					101												
YELLOW ARROW	126				102	102	102											
GREEN ARROW	127				103	103	103											

NU = Not Used
*NOTE: reconnect and unbag signal head 14, while leaving signal head 12 disconnected and bagged.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S8
PHASES USED.....1,2,4,6
OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U	∅ 1	∅ 1	∅ 2	S	S	S	∅ 4	S	∅ 1	S	S	S	S	FS
"I"	1A	1B	2A,2B,2C	-	-	-	4A	-	1D	-	-	-	-	DC ISOLATOR
L	NOT USED	∅ 1	NOT USED	-	-	-	∅ 4	-	NOT USED	-	-	-	-	ST
FILE U	S	S	NOT USED	S	S	S	S	S	S	S	S	S	S	S
"J"	-	-	∅ 6	-	-	-	-	-	-	-	-	-	-	-
L	-	-	6A,6B	-	-	-	-	-	-	-	-	-	-	-

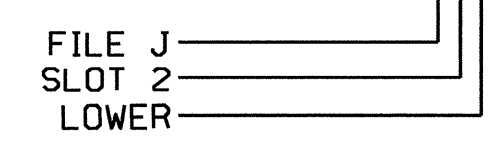
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	11U	56	18	1	1	Y	Y			
1B	TB2-5,6	12U	39	1	2	1	Y	Y			
1C	TB2-7,8	12L	43	5	12	1	Y	Y			15
1D	TB6-9,10	19U	60	22	11	1	Y	Y			15
2A,2B,2C	TB2-9,10	13U	63	25	32	2	Y	Y			
4A	TB6-1,2	17U	65	27	34	4	Y	Y			3
4B	TB6-3,4	17L	78	40	44	4	Y	Y			
6A,6B	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T3
DESIGNED: June 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Temporary 3 (TCP-PHASE 3)

Electrical and Programming Details For: US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)

Division 6 Cumberland County Fayetteville

Prepared In the Office of: Transportation Mobility and Safety

Prepared By: S. Armstrong
Reviewed By: JTR

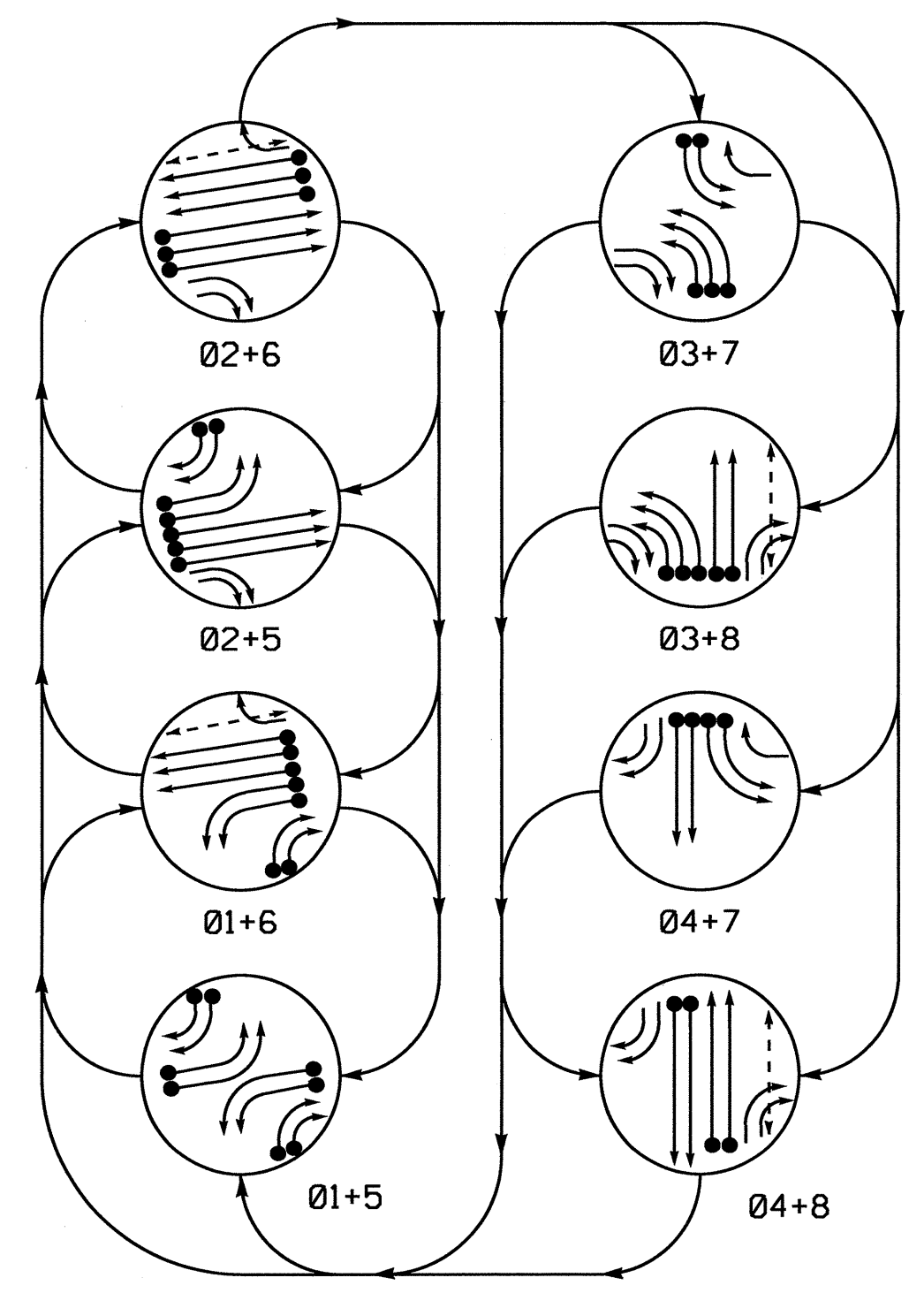
Plan Date: January 2012
Signature: John T. Rowley
Date: 2-17-12

Seal: North Carolina Professional Engineer Seal 008453

Inventory No. 06-0155T3

15-FEB-2012 10:22:22 S:\projects\sig\krc\cupas\sig\krc\mstron\060155_smc.dwg xxx.dgn somstron

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

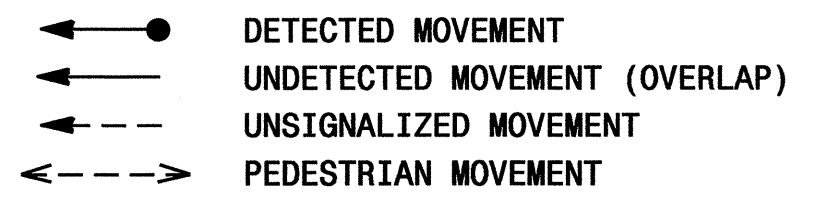
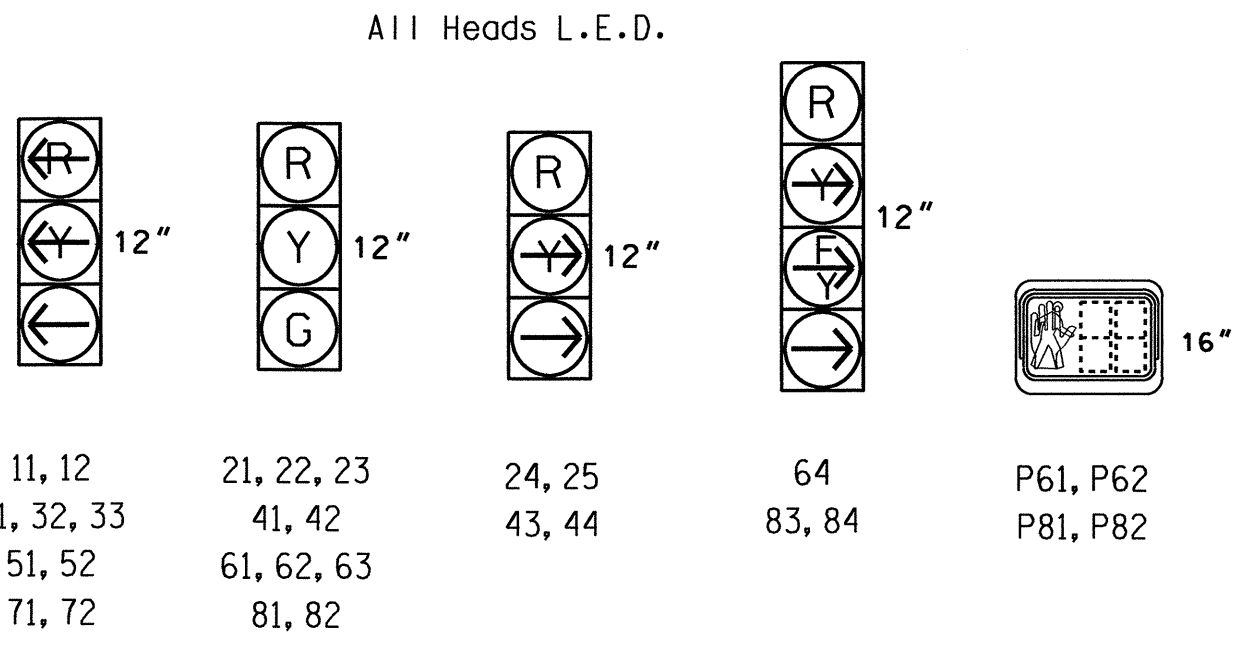


TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11,12	←	←	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R	R	Y
24,25	R	R	←	←	←	←	R	Y
31,32,33	←	←	←	←	←	←	←	←
41,42	R	R	R	R	R	R	G	G
43,44	←	R	←	R	R	←	←	R
51,52	←	←	←	←	←	←	←	←
61,62,63	R	G	R	G	R	R	R	Y
64	R	←	R	←	R	←	←	Y
71,72	←	←	←	←	←	←	←	←
81,82	R	R	R	R	R	G	R	G
83,84	←	←	R	R	R	←	←	R
P61,P62	DW	W	DW	W	DW	DW	DRK	DRK
P81,P82	DW	DW	DW	DW	DW	W	DRK	DRK

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

SIGNAL FACE I.D.



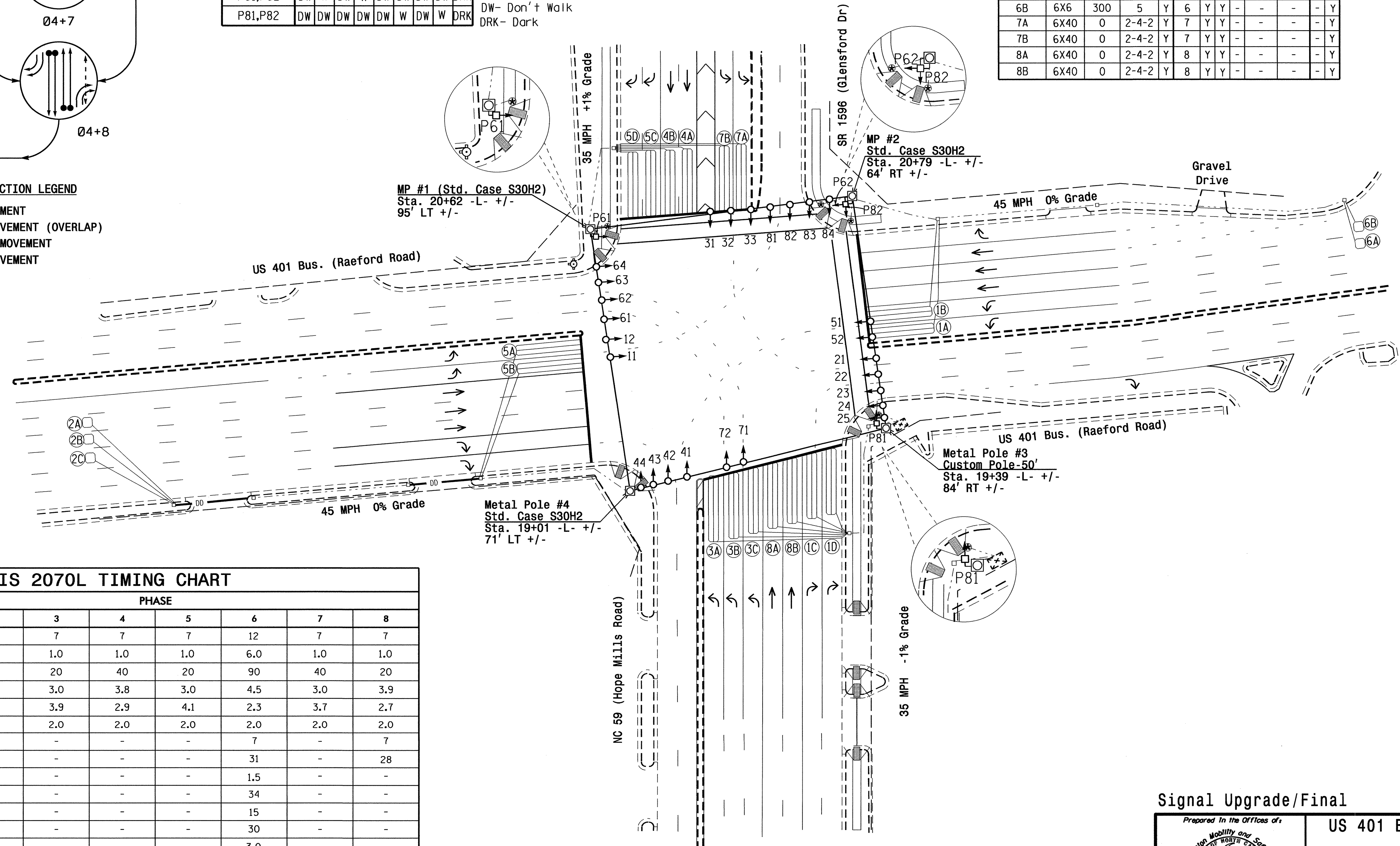
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-
1C	6X40	0	2-4-2	Y	1	Y	Y	-	-	15
1D	6X40	0	2-4-2	Y	1	Y	Y	-	-	15
2A	6X6	300	5	Y	2	Y	Y	-	-	-
2B	6X6	300	5	Y	2	Y	Y	-	-	-
2C	6X6	300	5	Y	2	Y	Y	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-
3C	6X40	0	2-4-2	Y	3	Y	Y	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-
5C	6X40	0	2-4-2	Y	5	Y	Y	-	-	15
5D	6X40	0	2-4-2	Y	5	Y	Y	-	-	15
6A	6X6	300	5	Y	6	Y	Y	-	-	-
6B	6X6	300	5	Y	6	Y	Y	-	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	-
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-

8 Phase Fully Actuated Fayetteville City System

NOTES

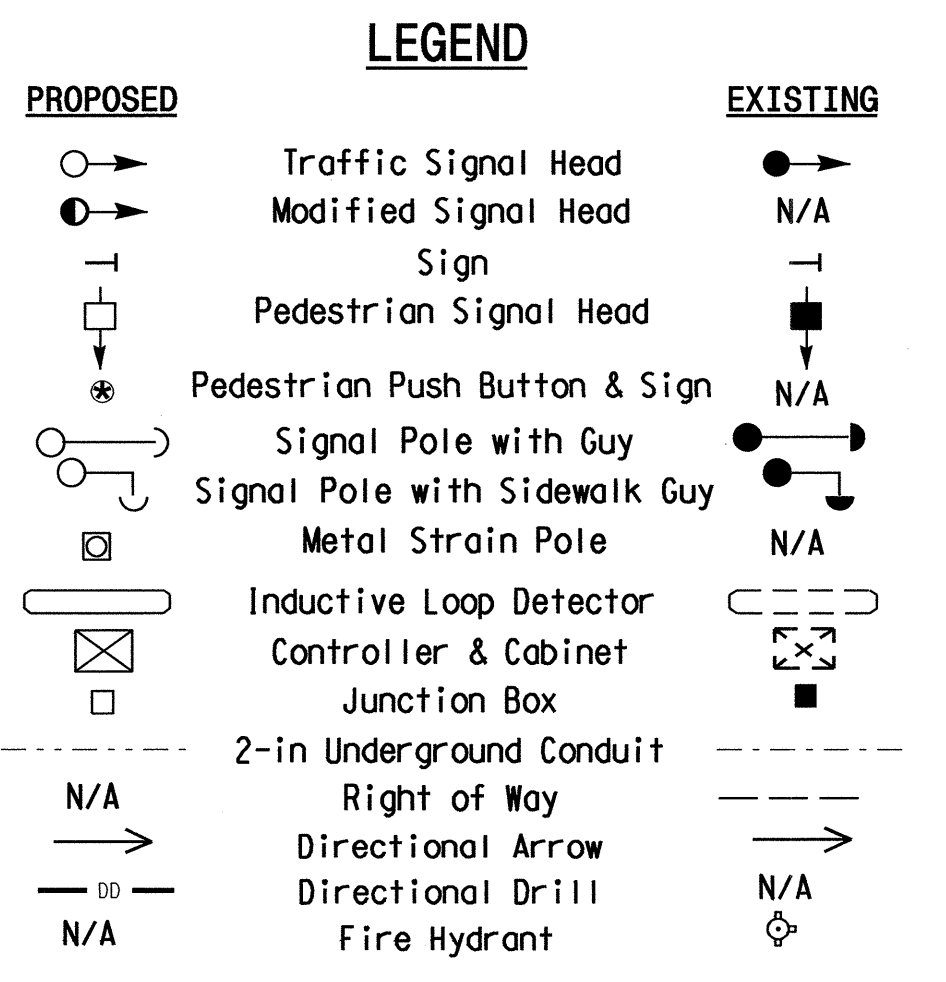
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1*	7	12	7	7	7	12	7	7
Extension 1*	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0
Max Green 1*	20	90	20	40	20	90	40	20
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.5	3.0	3.9
Red Clearance	4.1	2.5	3.9	2.9	4.1	2.3	3.7	2.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-	7	-	7
Don't Walk 1	-	-	-	-	-	31	-	28
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	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
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

Prepared in the Offices of:
 Transportation Mobility and Safety Solutions
 CONSULTING ENGINEERS
 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road) / SR 1596 (Glensford Dr)
 Division 6 Cumberland County Fayetteville

PLAN DATE: June 2011 REVIEWED BY: PL Alexander, PE
 PREPARED BY: EM Minshew REVIEWED BY:

REVISIONS: _____ INIT. DATE _____

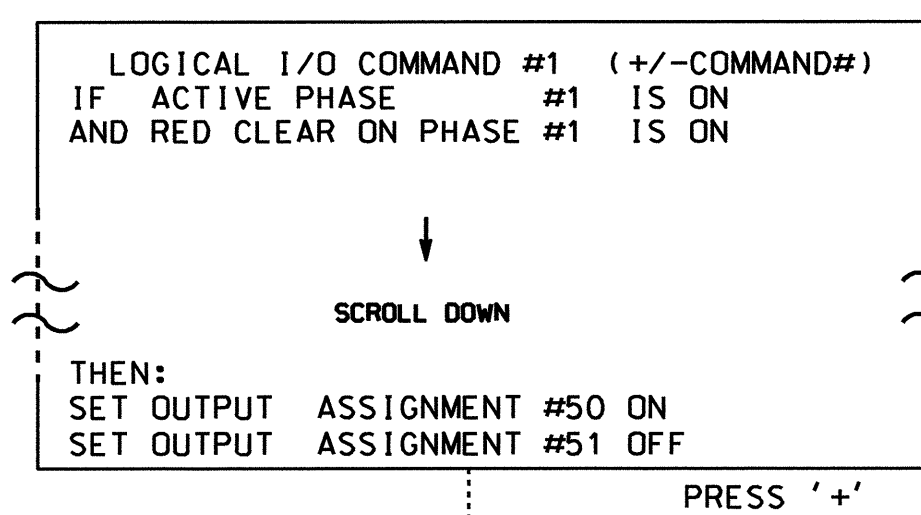
SCALE: 1" = 40'

SIGNATURE: _____ DATE: 2/14/12
 SIG. INVENTORY NO. 06-0155

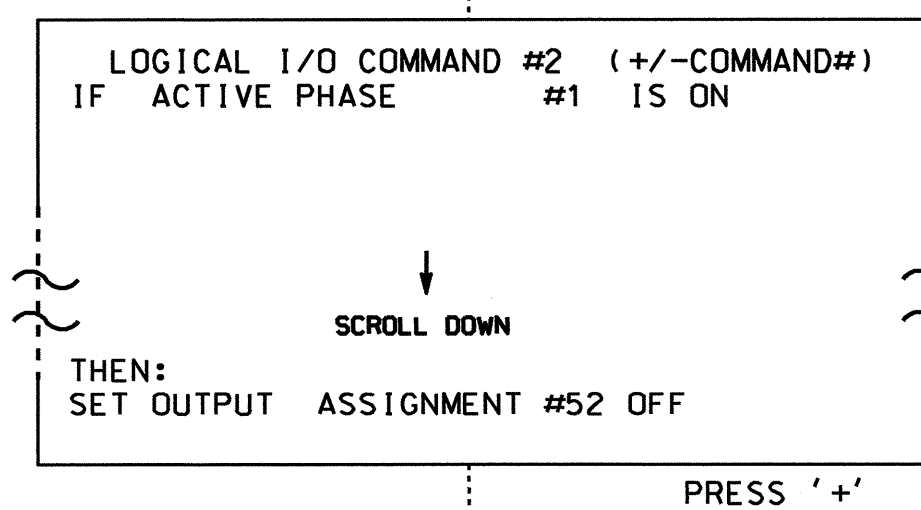
LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

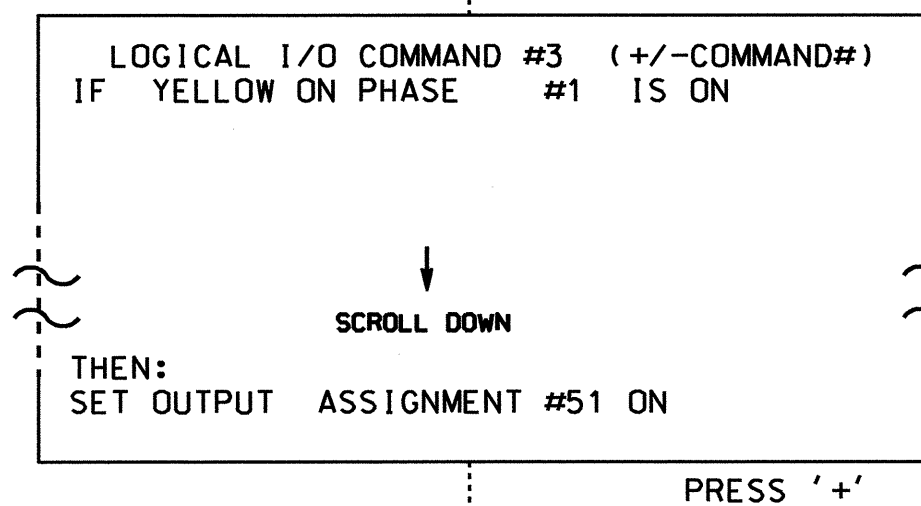
1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, AND 6.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



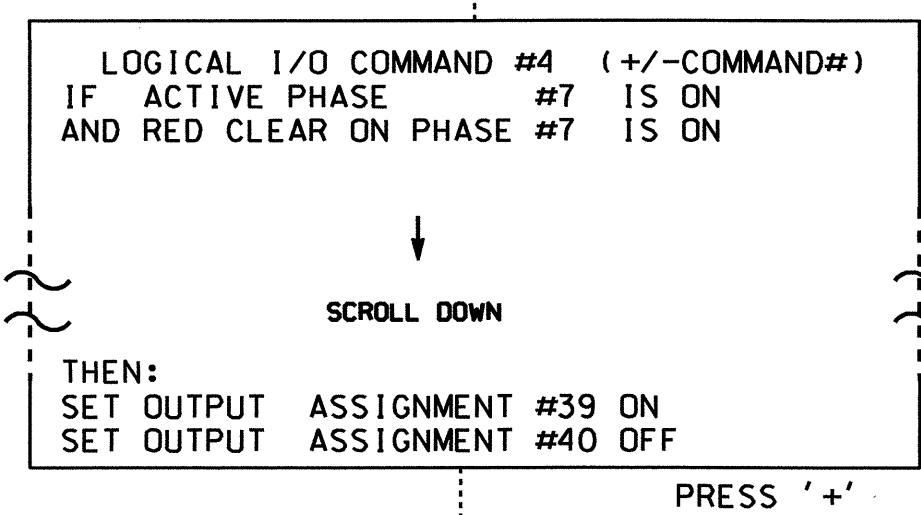
NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 8 (HEADS 83,84).



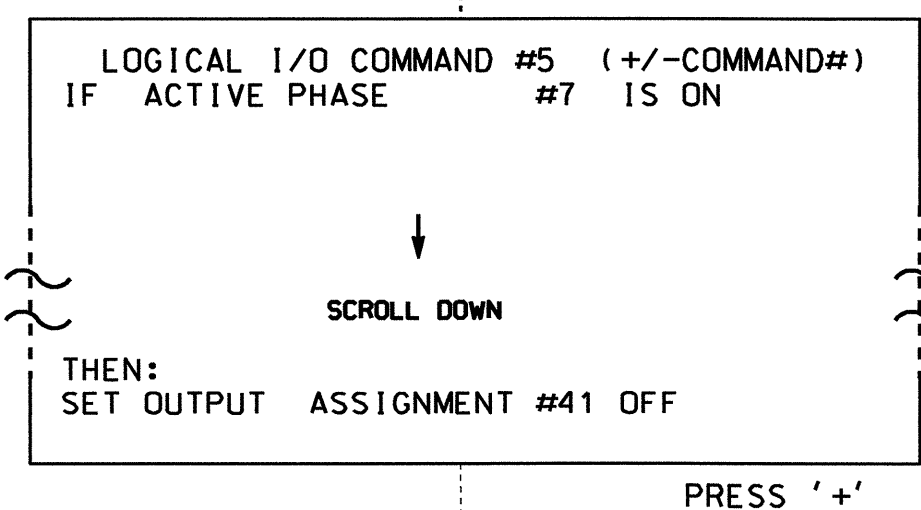
NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEADS 83,84).



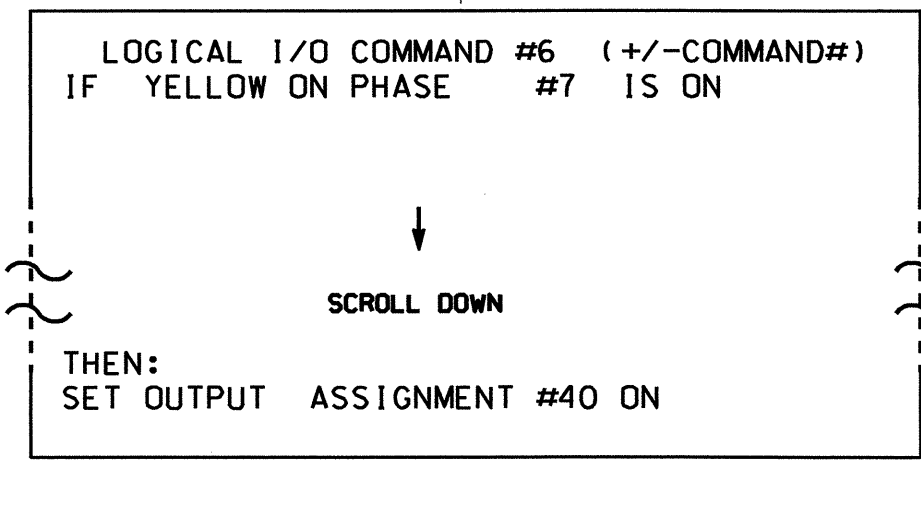
NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEADS 83,84).



NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 6 (HEAD 64).



NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 64).



NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 64).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

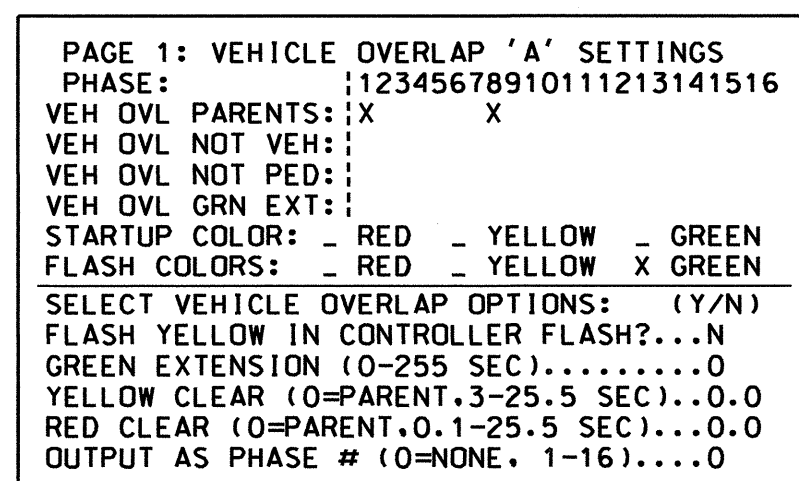
OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 39 =	Overlap D Red
OUTPUT 40 =	Overlap D Yellow
OUTPUT 41 =	Overlap D Green
OUTPUT 50 =	Overlap A Red
OUTPUT 51 =	Overlap A Yellow
OUTPUT 52 =	Overlap A Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155
DESIGNED: June 2011
SEALED: 2/14/12
REVISED: N/A

OVERLAP PROGRAMMING DETAIL

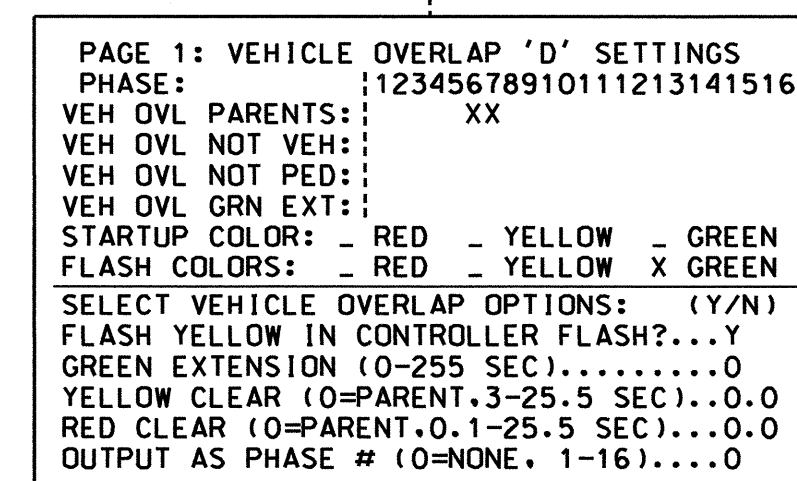
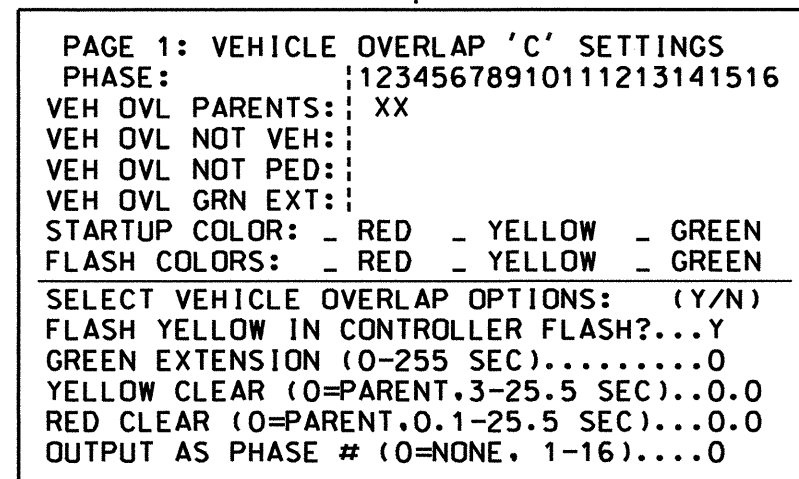
(program controller as shown below)

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



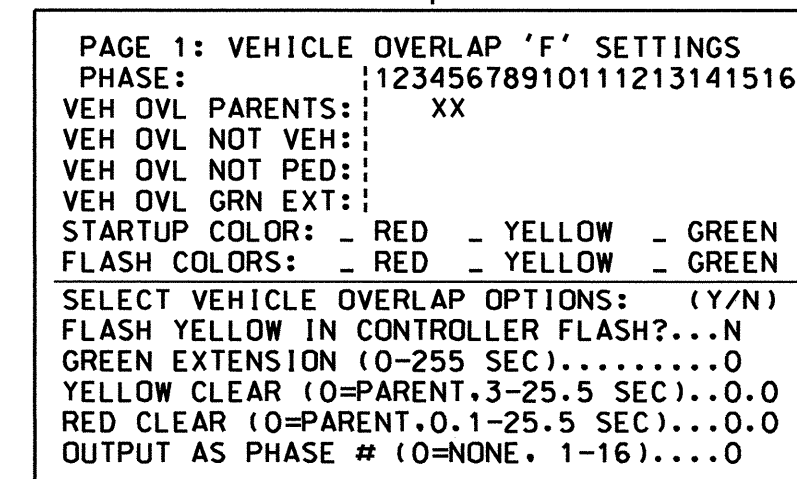
← NOTICE GREEN FLASH

PRESS '+' TWICE



← NOTICE GREEN FLASH

PRESS '+' TWICE



FLASHER CIRCUIT MODIFICATION DETAIL

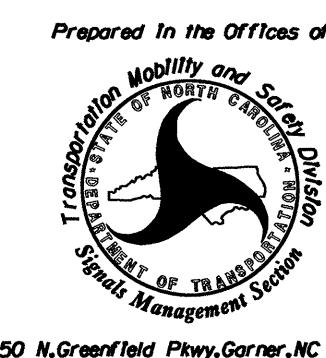
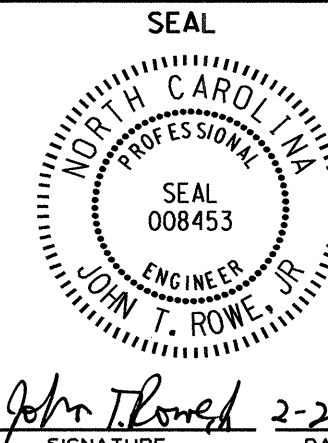
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

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

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

15-FEB-2012 06:27 S:\m\mstron\mstron\060155.sm.dwg...dgn

Signal Upgrade/Final - Sheet 2 of 3

	US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1596 (Glensford Dr)		
	Division 6 Cumberland County Fayetteville		
	PREPARED BY: S. Armstrong	REVIEWED BY: JR	
REVISIONS		INIT. DATE	SIGNATURE DATE John T. Rowley 2-20-12
			SIG. INVENTORY NO. 06-0155

OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR LOADSWITCH AUX S6 (OVERLAP F)

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "37"

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

```

PAGE:1 C1 PIN:83 NOT ENABLED
OUTPUT ASSIGNMENT #.....37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:83 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN)...0
    
```

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

```

PAGE:1 C1 PIN:83 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 38

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

```

PAGE:1 C1 PIN:84 NOT ENABLED
OUTPUT ASSIGNMENT #.....38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:84 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN)...2
    
```

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

```

PAGE:1 C1 PIN:84 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY REPEATEDLY TO REACH OUTPUT 53

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

```

PAGE:1 C1 PIN:100 NOT ENABLED
OUTPUT ASSIGNMENT #.....53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:100 NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(O=RED,1=YEL,2=GRN)...1
    
```

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

```

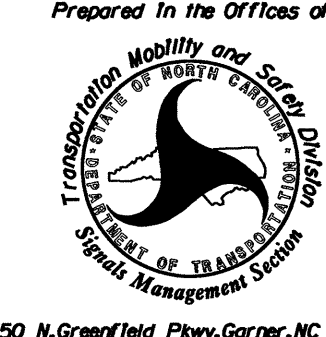
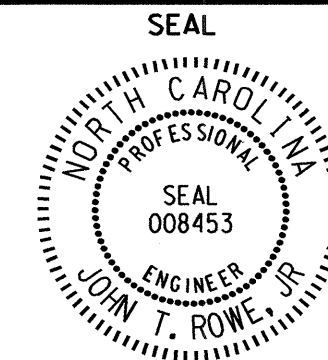
PAGE:1 C1 PIN:100 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

OUTPUT PROGRAMMING FOR LOADSWITCH AUX S6 COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155
DESIGNED: June 2011
SEALED: 2/14/12
REVISED: N/A

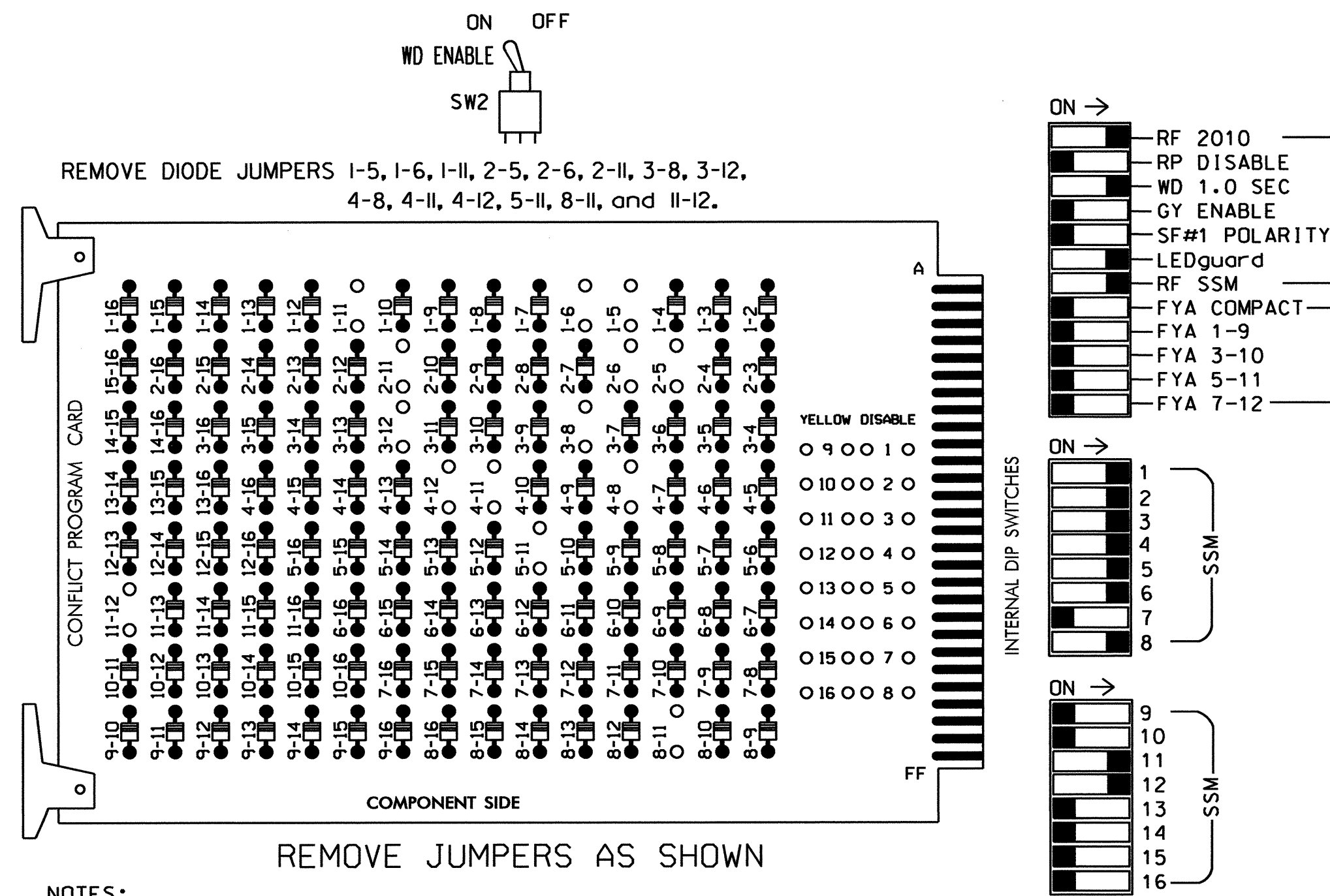
15-FEB-2012 08:27
S:\signal\sigmgr\cupas\410_MonMstrFrng\060155_sml.dwg_xxx.dgn
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Signal Upgrade/Final - Sheet 3 of 3

	<p>US 401 Bus. (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1596 (Glensford Dr)</p>	
<p>Division 6 Cumberland County Fayetteville</p>		<p>2-20-12 DATE</p>
<p>PLANNED BY: S. Armstrong REVIEWED BY: JTR</p>		
<p>PREPARED BY: S. Armstrong REVIEWED BY:</p>		<p>SIGNATURE DATE</p>
<p>REVISIONS</p>		<p>INIT. DATE</p>
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>		<p>SIG. INVENTORY NO. 06-0155</p>

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 7,9, 10,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and 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 Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX OUTPUT FILE
 SOFTWARE.....ECONOLITE OASIS V3.02.77
 OR LATEST APPROVED VERSION
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S8,S12,S13
 PHASES USED.....1,2,3,4,5,6,7*,8
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....4+5+9
 OVERLAP D.....7+9
 OVERLAP P.....1+2+3+4+5+6+7+8
 * USED FOR TIMING PURPOSES ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14					
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE					
SIGNAL HEAD NO.	11	82	21,22	NU	22	31	41,42	NU	51,52	61,62	NU	NC	81,82	NU	NU	NU	43,44	62	71,72	NU			
RED			128			101			134			107							A114				
YELLOW			129			102			135			108											
GREEN			130			103			136			109											
RED ARROW	125					116			131												A101		
YELLOW ARROW	126	126				117	117		132												A115	A102	A102
GREEN ARROW	127	127				118	118		133												A116	A103	A103

NU = Not Used
 NC = Not Connected

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 1 1B	∅ 2 2A,2B	S T	S T	∅ 3 3A	∅ 4/9 4C	S T	S T	S T	S T	S T	S T	FS DC ISOLATOR
L	NOT USED	NOT USED	NOT USED	Y T	Y T	∅ 4 4B	∅ 4/9 4D	Y T	Y T	Y T	Y T	Y T	Y T	ST DC ISOLATOR
U	∅ 5 5A	∅ 5 5B	NOT USED	S T	S T	∅ 7/9 7A	∅ 8 8A	S T	S T	S T	S T	S T	S T	PRE1 AC ISOLATOR
L	NOT USED	NOT USED	∅ 6 6A,6B	Y T	Y T	∅ 7/9 7B	NOT USED	Y T	Y T	Y T	Y T	Y T	Y T	NOT USED

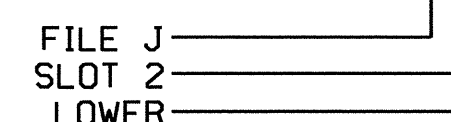
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME
 PRE1 = RR PREEMPT

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			3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A,2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4/9	Y	Y			15
4D	TB6-3,4	I7L	78	40	44	4/9	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
6A,6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7A	TB5-9,10	J6U	42	4	8	7/9	Y	Y			
7B	TB5-11,12	J6L	46	8	18	7/9	Y	Y			
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L



PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 9 for 'Omit Phase' and Phases 1,2,3,4,5,6,7, and 8 for 'Startup Calls'. This is to prevent Phase 9 from being served when not in Preempt.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T1
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 1 (TCP Phase I) - Sheet 1 of 3

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension</p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR.</p>
	<p>Division 6 Cumberland County Fayetteville</p>	<p>PREPARED BY: S. Armstrong REVIEWED BY: JTR</p>
	<p>PLANNED DATE: January 2012</p>	<p>REVISIONS</p>
	<p>INIT. DATE</p>	<p>DATE</p>

Signature: John Rowe, 2/20/12
 Date: 2/20/12
 SIG. INVENTORY NO. 06-0527T1

15-FEB-2012 09:05
 51115 51115 SignalWorkgroups\Sig_Monitor\mstron\060527_1.sm.ele.xxx.dgn
 S:\Mstron

RAILROAD PREEMPTION PROGRAMMING DETAIL

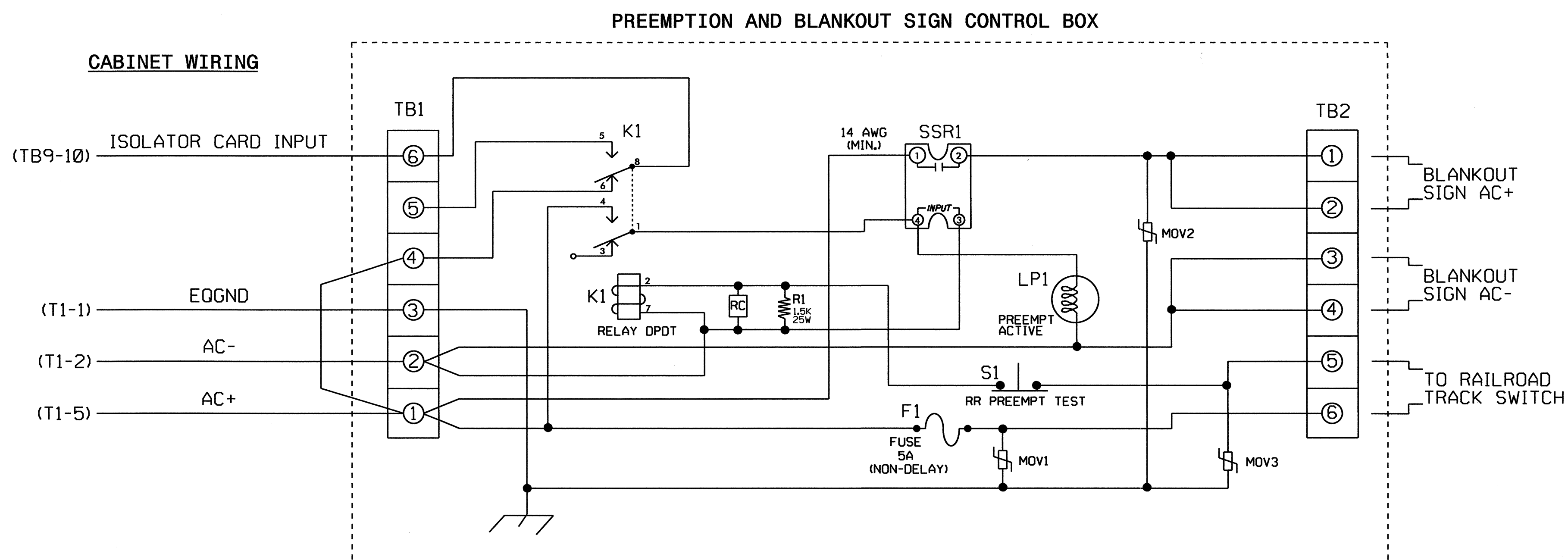
(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #1	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 23 3.8 2.6	X X
2 255 0.0 0.0	X XX X
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X
EXIT CALLS	
OPTIONS	
PRIORITY (Y/N TO SELECT)	HIGH
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	4.6
RED CLEAR BEFORE PRE (0= DEFAULT)...	1.9
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

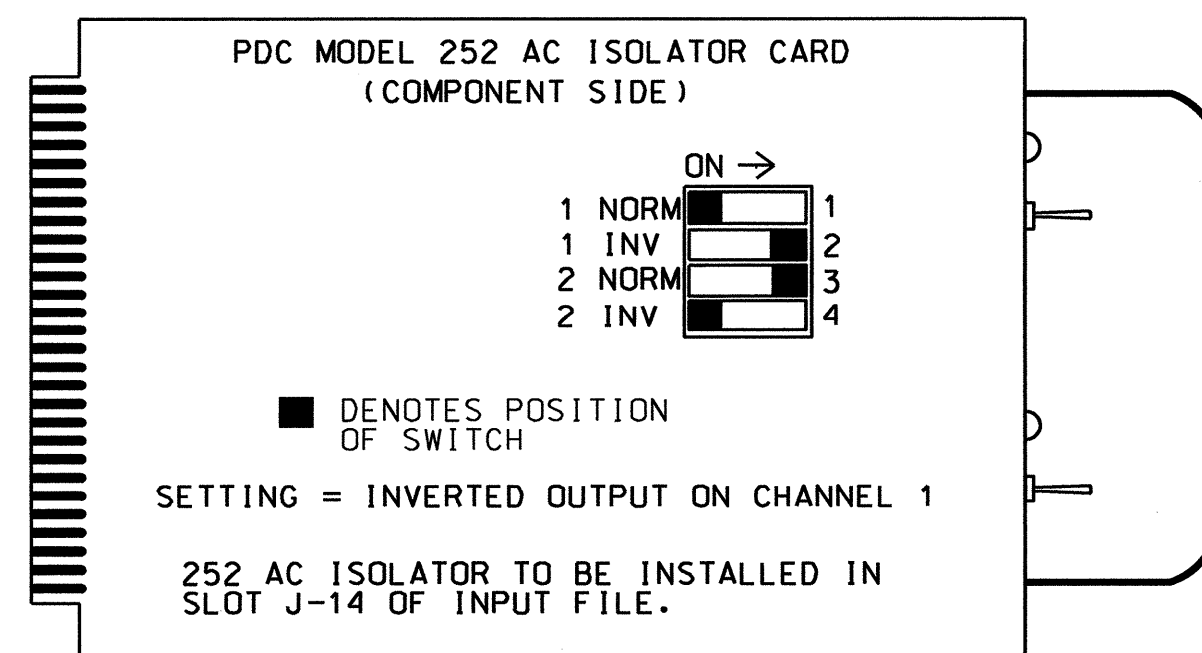


NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with an octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
- IMPORTANT!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

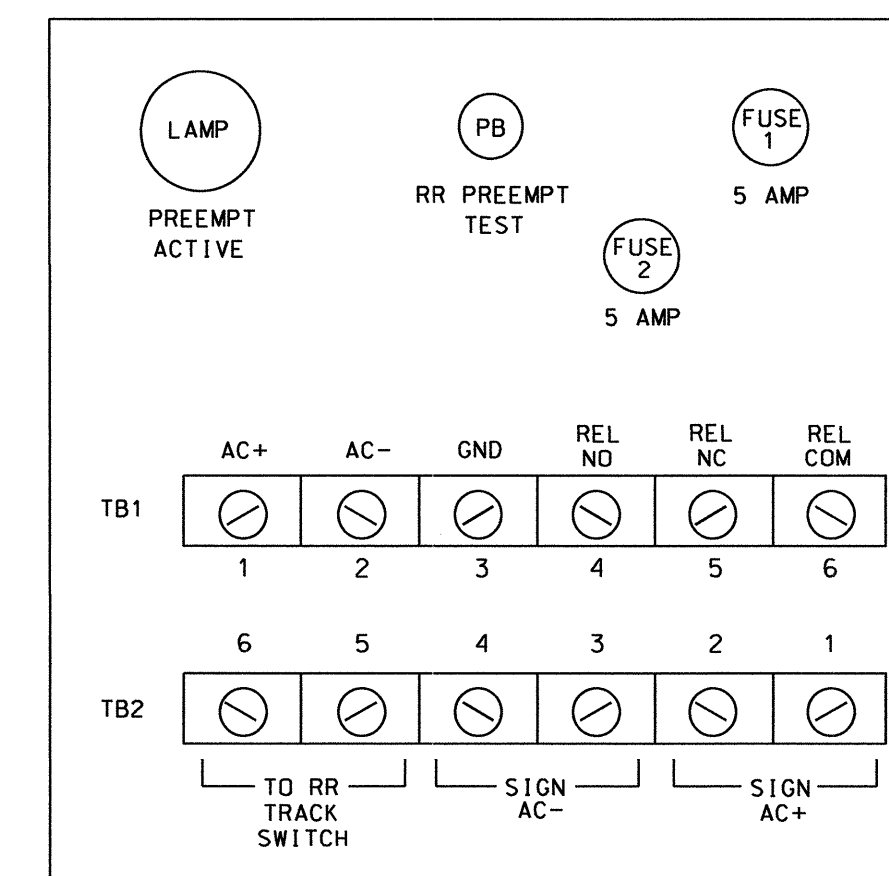
PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T1
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 1 (TCP Phase I) - Sheet 2 of 3

	ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension	SEAL
	PREPARED BY: S. Armstrong	REVIEWED BY: JTR	
REVISIONS		INIT.	DATE
750 N. Greenfield Pkwy, Garner, NC 27529		SIGNATURE: <i>John T. Rowe</i>	DATE: 2-20-12
SIG. INVENTORY NO. 06-0527T1			

15-FEB-2012 09:06: Signal\emerk\pc\cupas\sig_mom\mkrmstron\060527_srl_e1e_xxx.dgn

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

PRESS '+'

```

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

PRESS '-' FOUR TIMES

```

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

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

PHASE SEQUENCE PROGRAMMING DETAIL

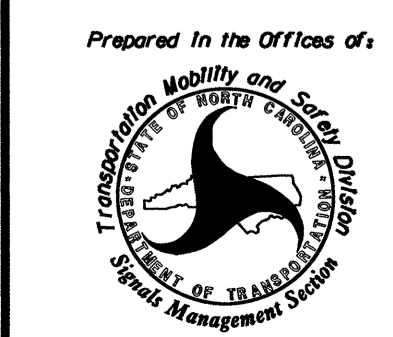
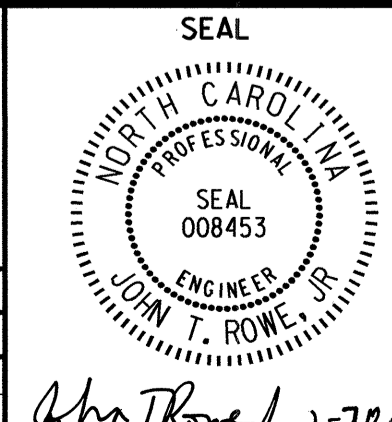
(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)										
RNG	LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG	LEAD	BARRIER 3	X-LAG	
1	1	2	0	0	3	4	0	9	0	0
2	5	6	0	0	7	8	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0

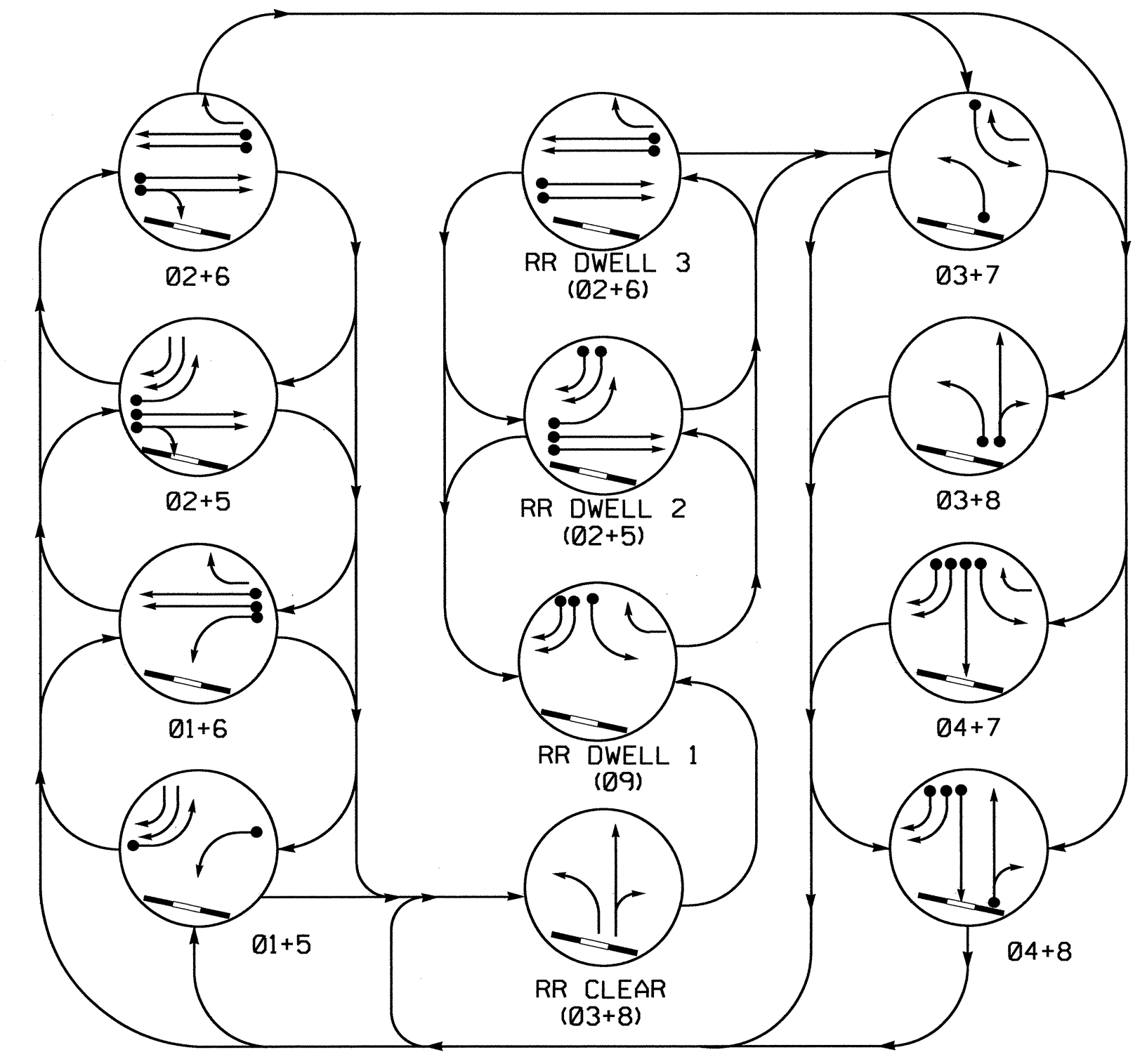
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T1
DESIGNED: September 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Temporary 1 (TCP Phase I) - Sheet 3 of 3

 <p>Prepared In the Offices of: Transportation Mobility and Safety Center North Carolina State University 750 N. Greenfield Pkwy, Garner, NC 27529</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension	SEAL  JOHN T. ROWE, PE 2-20-12
	Division 6 Cumberland County Fayetteville PLAN DATE: January 2012 REVIEWED BY: JTR PREPARED BY: S. Armstrong REVIEWED BY:	

SIG. INVENTORY NO. 06-0527T1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

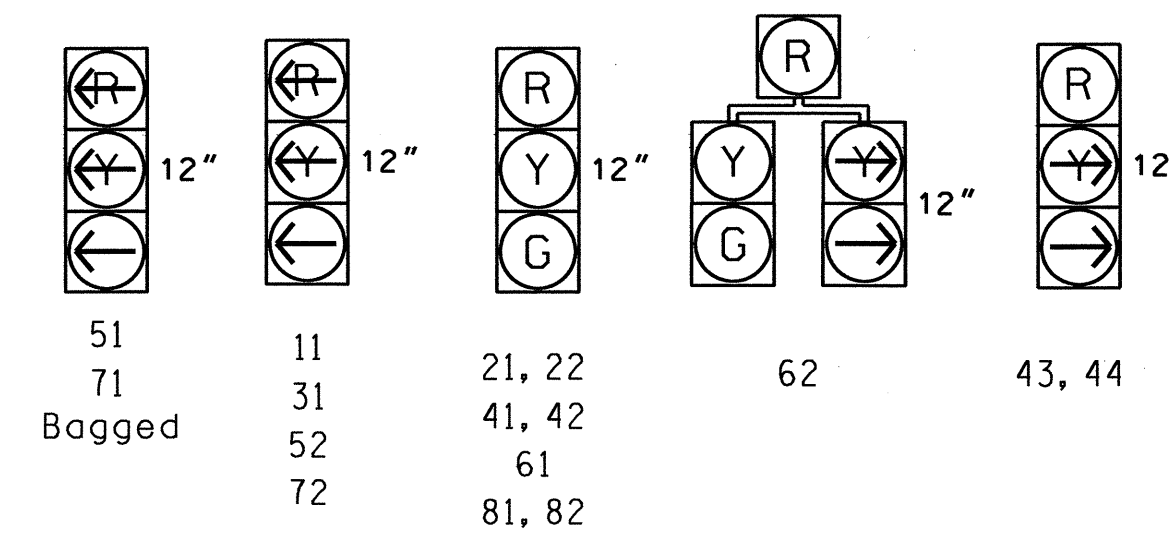
- ← ● → DETECTED MOVEMENT
- ← ○ → UNDETECTED MOVEMENT (OVERLAP)
- ← - - - → UNSIGNALIZED MOVEMENT
- ← - - - → PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE											
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	RR CLEAR (03+8)	RR DWELL 1 (09)	RR DWELL 2 (02+5)	RR DWELL 3 (02+6)
11	-	-	-	-	-	-	-	-	-	-	-	-
21,22	R	R	G	G	R	R	R	R	R	R	G	G
31	-	-	-	-	-	-	-	-	-	-	-	-
41,42	R	R	R	R	R	R	G	G	R	R	R	R
43,44	-	-	-	-	-	-	-	-	-	-	-	-
52	-	-	-	-	-	-	-	-	-	-	-	-
61	R	G	R	G	R	R	R	R	R	R	R	G
62	R	G	R	G	R	R	R	R	R	R	R	G
72	-	-	-	-	-	-	-	-	-	-	-	-
81,82	R	R	R	R	R	G	R	G	R	R	R	R
Sign "A"	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON

* See Note 8

SIGNAL FACE I.D.



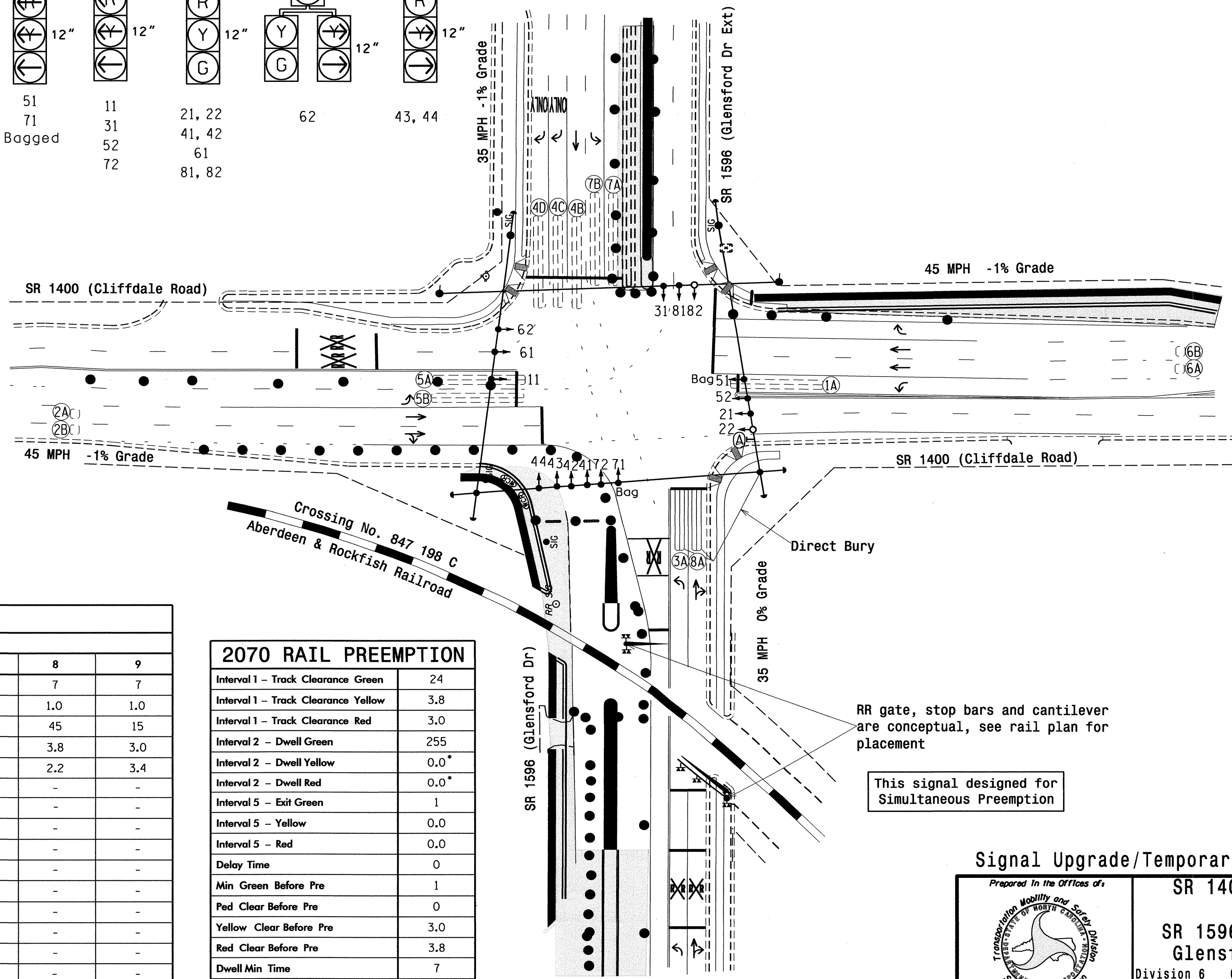
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME		
1A	6X60	+5	2-4-2	-	1	Y	Y	-	-	3	-
2A,2B	6X6	300	5	-	2	Y	Y	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-
4B	6X60	+20	2-4-2	-	4	Y	Y	-	-	-	-
4C	6X60	+20	2-4-2	-	4/9	Y	Y	-	-	15	-
4D	6X60	+20	2-4-2	-	4/9	Y	Y	-	-	15	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	-	-
5B	6X60	+5	2-4-2	-	5	Y	Y	-	-	-	-
6A,6B	6X6	300	5	-	6	Y	Y	-	-	-	-
7A	6X60	+5	2-4-2	-	7/9	Y	Y	-	-	-	-
7B	6X60	+5	2-4-2	-	7/9	Y	Y	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-

8 Phase Fully Actuated W/ RR Preemption Fayetteville City System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 or phase 5 may be lagged.
4. Phase 3 or phase 7 may be lagged.
5. Bag heads 51 and 71.
6. Reposition existing signal heads numbered 31 and 81.
7. Set all detector units to presence mode.
8. Ensure flashing operation does not alter operation of blankout signs.
9. Program parent phases for Overlap "P" for all phases used in normal operation.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Maintain detection during construction, installing new loops and temporary direct bury lead-in as directed by the engineer.



LEGEND

PROPOSED	EXISTING
○ →	● →
● →	N/A
-	-
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →
○ →	● →

OASIS 2070L TIMING CHART

FEATURE	PHASE								
	1	2	3	4	5	6	7	8	9
Min Green 1*	7	12	7	7	7	12	7	7	7
Extension 1*	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0
Max Green 1*	25	90	15	45	25	90	15	45	15
Yellow Clearance	3.0	4.6	3.0	3.9	3.0	4.6	3.0	3.8	3.0
Red Clearance	2.3	1.7	3.8	2.2	3.5	1.9	3.4	2.2	3.4
Walk 1*	-	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.0	-	-	-	2.0	-	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-	-
Time To Reduce *	-	30	-	-	-	30	-	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-	-
Dual Entry	-	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON	ON

2070 RAIL PREEMPTION

Interval 1 - Track Clearance Green	24
Interval 1 - Track Clearance Yellow	3.8
Interval 1 - Track Clearance Red	3.0
Interval 2 - Dwell Green	255
Interval 2 - Dwell Yellow	0.0*
Interval 2 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	3.0
Red Clear Before Pre	3.8
Dwell Min Time	7
Ped Clear Through Yellow	N
Omit Overlap	"P"

* Time defaults to time used for phase during normal operation.

* 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 2 (TCP) Phase II

Prepared in the Offices of:

TRANSPORTATION MOBILITY AND SAFETY DIVISION
 DIVISION OF TRANSPORTATION
 SIGNAL DESIGN SECTION

SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension

Division 6 Cumberland County Fayetteville

PLAN DATE: September 2011 REVIEWED BY: PL Alexander, PE

PREPARED BY: EM Minshew REVIEWED BY:

SCALE: 1" = 50'

REVISIONS: INIT. DATE

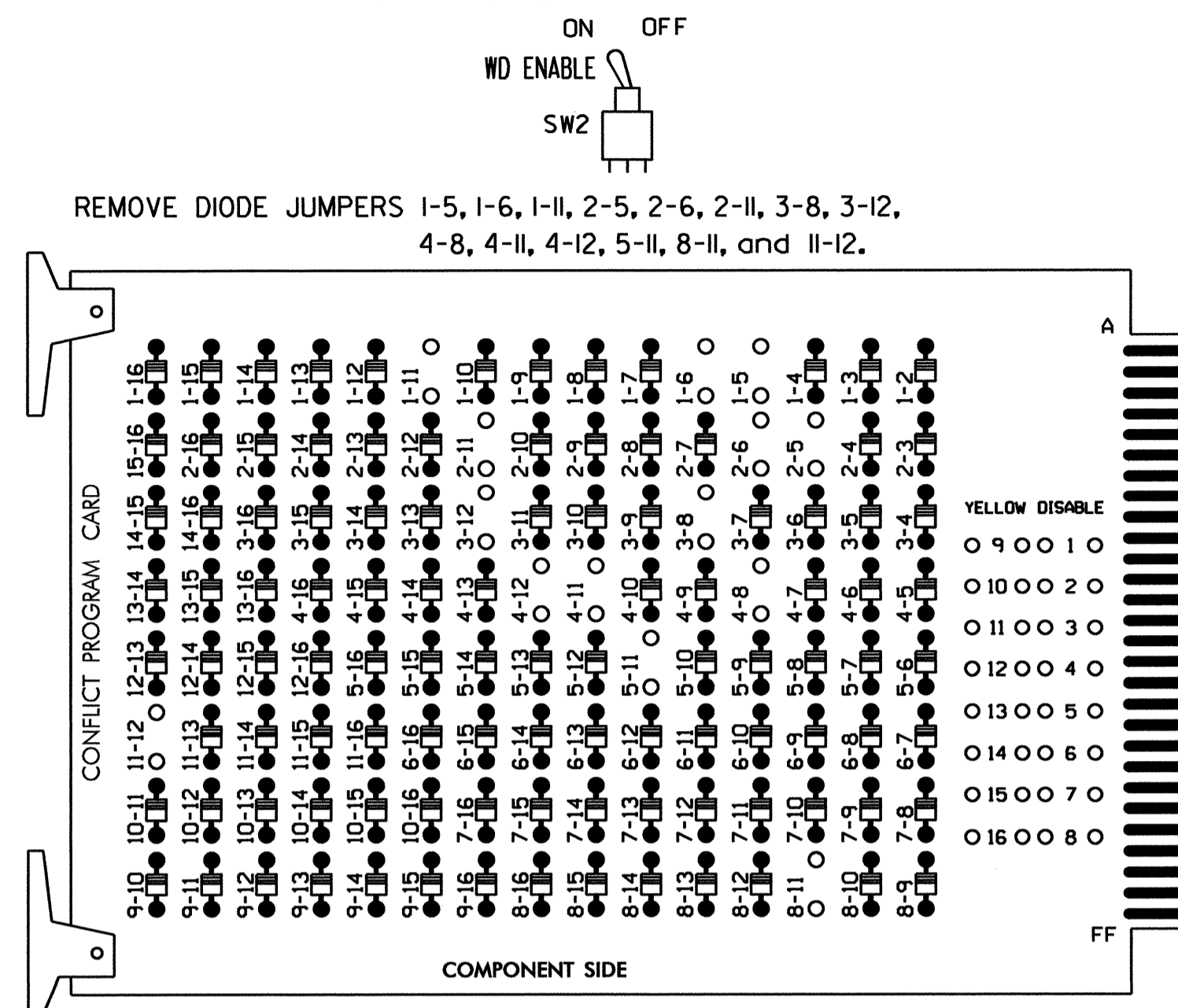
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489

SIGNATURE: [Signature] DATE: 2/14/12

SIG. INVENTORY NO. 06-052712

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 7,9, 10,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and 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 Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX OUTPUT FILE
 SOFTWARE.....ECONOLITE OASIS V3.02.77
 OR LATEST APPROVED VERSION
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S8,S12,S13
 PHASES USED.....1,2,3,4,5,6,7*,8
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....4+5+9
 OVERLAP D.....7+9
 OVERLAP P.....1+2+3+4+5+6+7+8
 * USED FOR TIMING PURPOSES ONLY

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	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	41,42	NU	52*	61,62	NU	NC	81,82	NU	NU	NU	NU	43,44	62	72*	NU
RED	128				101			134			107						A114		
YELLOW	129				102			135			108								
GREEN	130				103			136			109								
RED ARROW	125				116			131											A101
YELLOW ARROW	126				117			132											A115 A102 A102
GREEN ARROW	127				118			133											A116 A103 A103
Hand icon																			
Person icon																			

NU = Not Used

NC = Not Connected

* NOTE: disconnect and bag signal heads 51 and 71.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	∅ 2 2A,2B	∅ 3 3A	∅ 4 4A	∅ 5 5A	∅ 6 6A,6B	∅ 7/9 7A	∅ 8 8A	∅ 9 9A	∅ 10 10A	∅ 11 11A	∅ 12 12A	∅ 13 13A	FS DC ISOLATOR
L	NOT USED	NOT USED	∅ 4 4B	∅ 4/9 4D	∅ 5 5B	∅ 6 6A,6B	∅ 7/9 7B	∅ 8 8A	∅ 9 9A	∅ 10 10A	∅ 11 11A	∅ 12 12A	∅ 13 13A	ST DC ISOLATOR
U	∅ 5 5A	∅ 5 5B	NOT USED	∅ 6 6A,6B	∅ 7 7A	∅ 8 8A	∅ 9 9A	∅ 10 10A	∅ 11 11A	∅ 12 12A	∅ 13 13A	∅ 14 14A	PRE1 AC ISOLATOR	
L	NOT USED	NOT USED	∅ 6 6A,6B	∅ 7 7A	∅ 8 8A	∅ 9 9A	∅ 10 10A	∅ 11 11A	∅ 12 12A	∅ 13 13A	∅ 14 14A	∅ 15 15A	NOT USED	

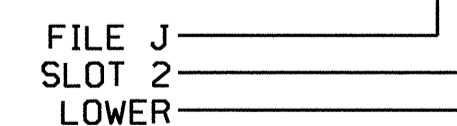
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME
 PRE1 = RR PREEMPT

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			3
2A,2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4/9	Y	Y			15
4D	TB6-3,4	I7L	78	40	44	4/9	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
6A,6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7A	TB5-9,10	J6U	42	4	8	7/9	Y	Y			
7B	TB5-11,12	J6L	46	8	18	7/9	Y	Y			
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 9 for 'Omit Phase' and Phases 1,2,3,4,5,6,7, and 8 for 'Startup Calls'. This is to prevent Phase 9 from being served when not in Preempt.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T2
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 2 (TCP Phase II) - Sheet 1 of 3

Electrical and Programming Details For:

SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/Glensford Drive Extension

Division 6 Cumberland County Fayetteville

Prepared in the Office of: Transportation Mobility and Safety

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL 008453

JOHN T. ROWE, P.E.

PREPARED BY: S. Armstrong REVIEWED BY: JTR

DATE: January 2012

REVISIONS

INIT. DATE

SIGNATURE: [Signature] DATE: 2-20-12

INVENTORY NO. 06-0527T2

RAILROAD PREEMPTION PROGRAMMING DETAIL

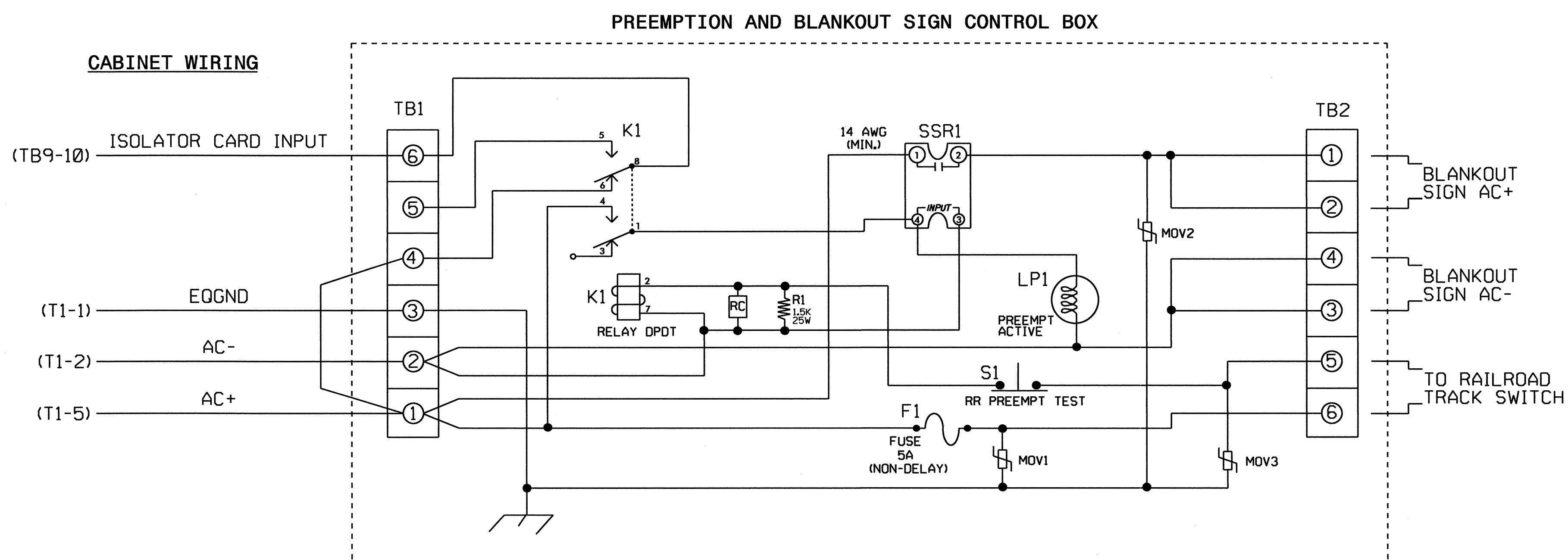
(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #1	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 24 3.8 3.0	X X
2 255 0.0 0.0	X XX X
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X
EXIT CALLS	
OPTIONS	
PRIORITY (Y/N TO SELECT)	HIGH
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	3.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	3.8
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMNPO
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

RAILROAD PREEMPTION WIRING DETAIL

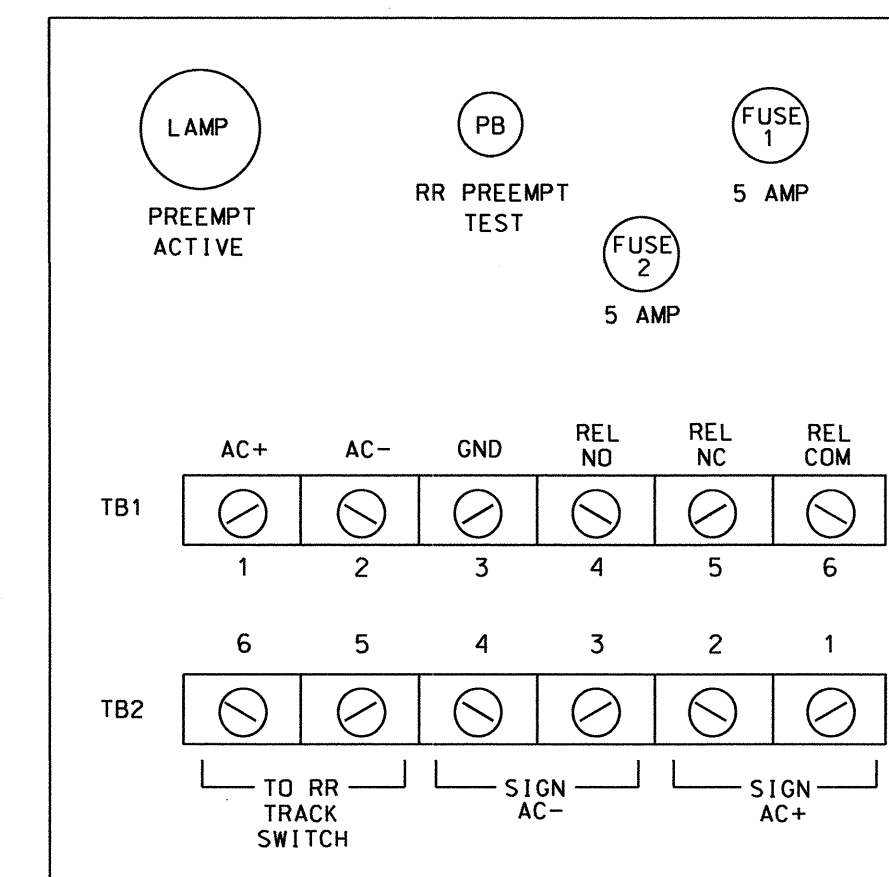
(wire as shown below)



NOTES

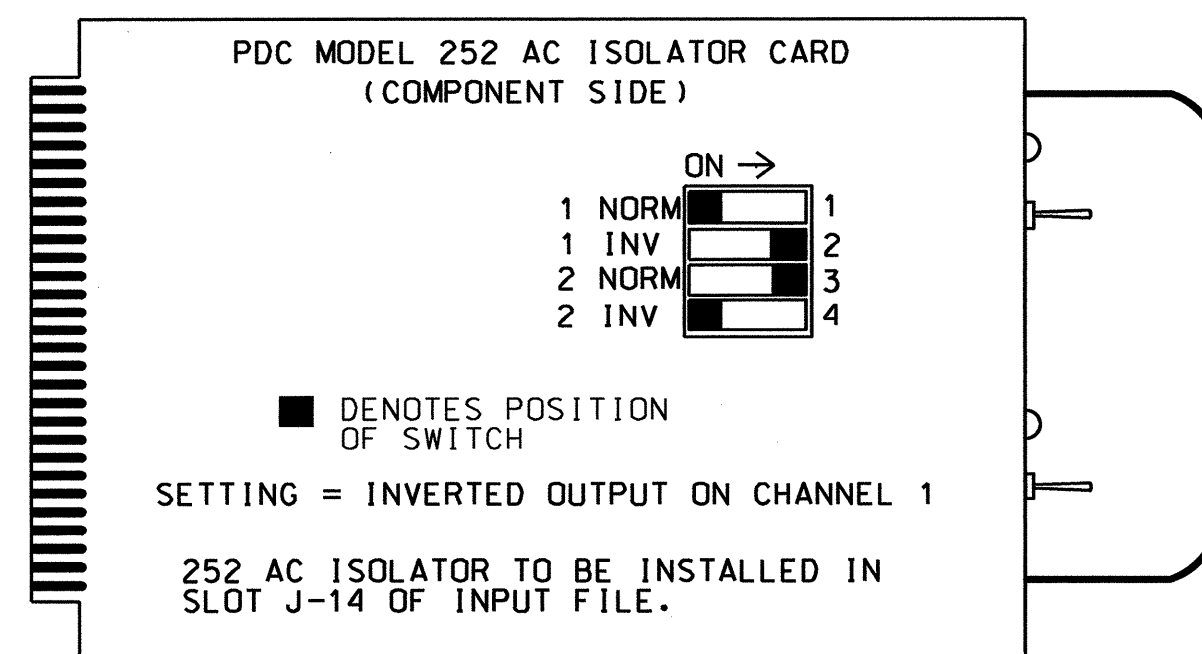
- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with an octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
- IMPORTANT!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T2
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 2 (TCP) Phase II) - Sheet 2 of 3

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE, JR. SEAL 008453
	PREPARED BY: S. Armstrong		REVIEWED BY: JTR		
DIVISION 6 Cumberland County Fayetteville		PLAN DATE: January 2012		DATE: 2-20-12	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529		SIG. INVENTORY NO. 06-0527T2		DATE	

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

PRESS '+'

```

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

PRESS '-' FOUR TIMES

```

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

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

PHASE SEQUENCE PROGRAMMING DETAIL

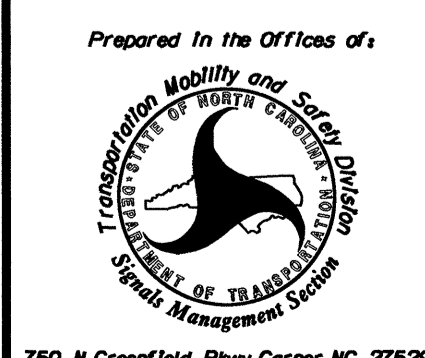
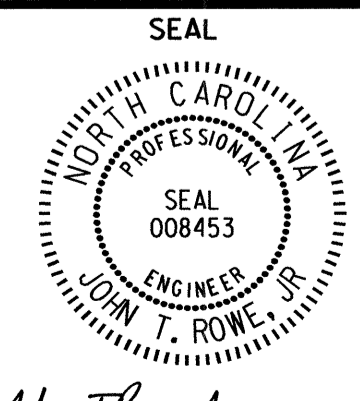
(program controller as shown below)

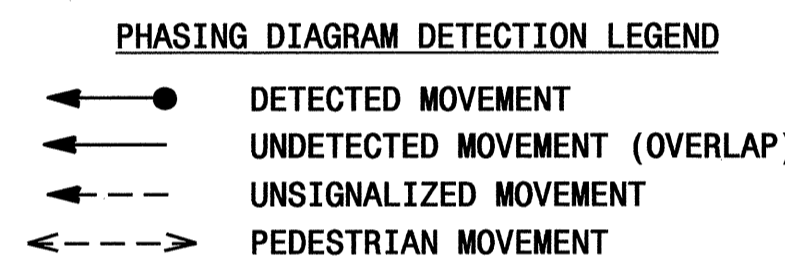
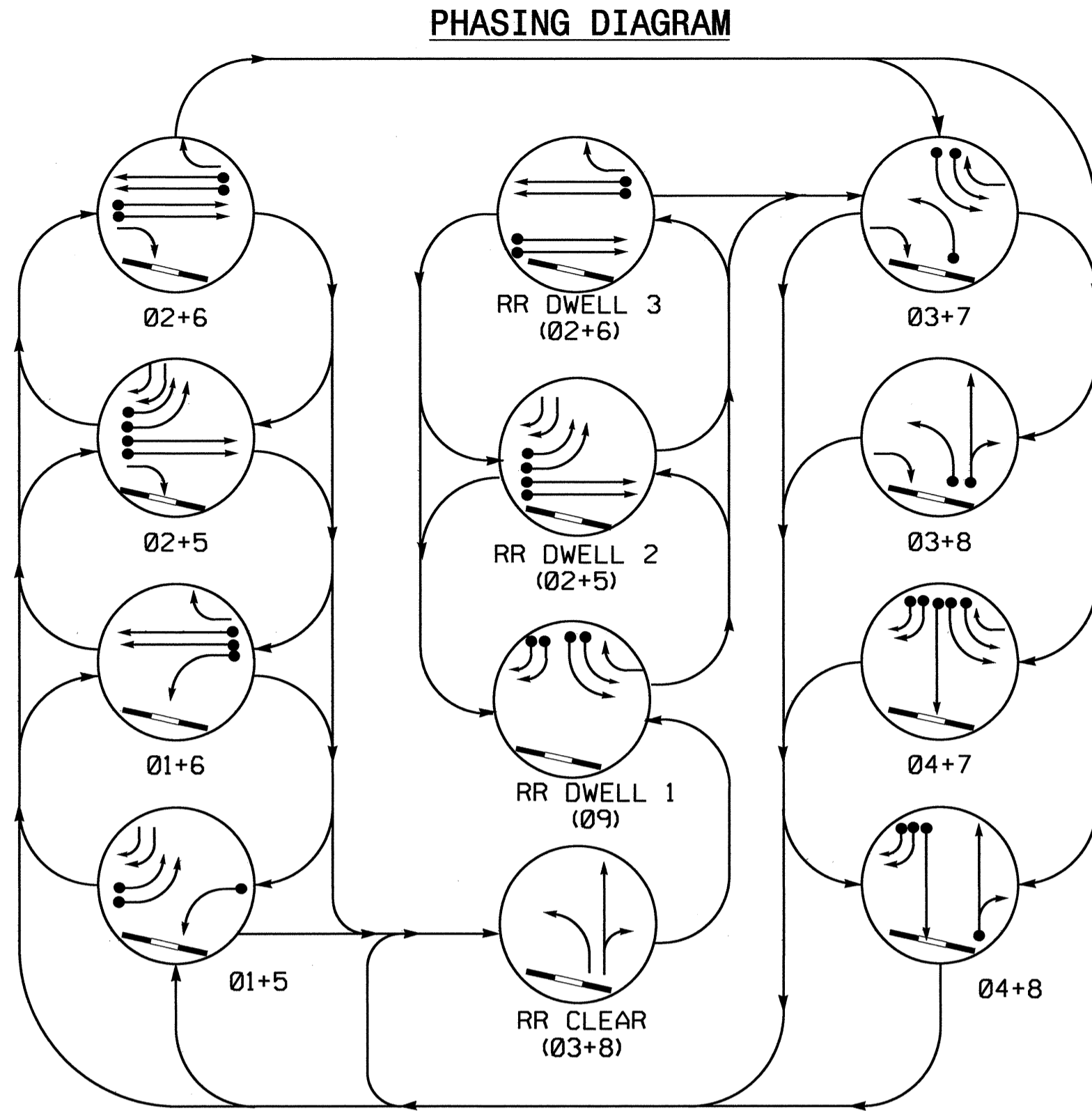
FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)										
RNG	LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG	LEAD	BARRIER 3	X-LAG	
1	1	0	0	3	4	0	9	0	0	0
2	5	6	0	7	8	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0

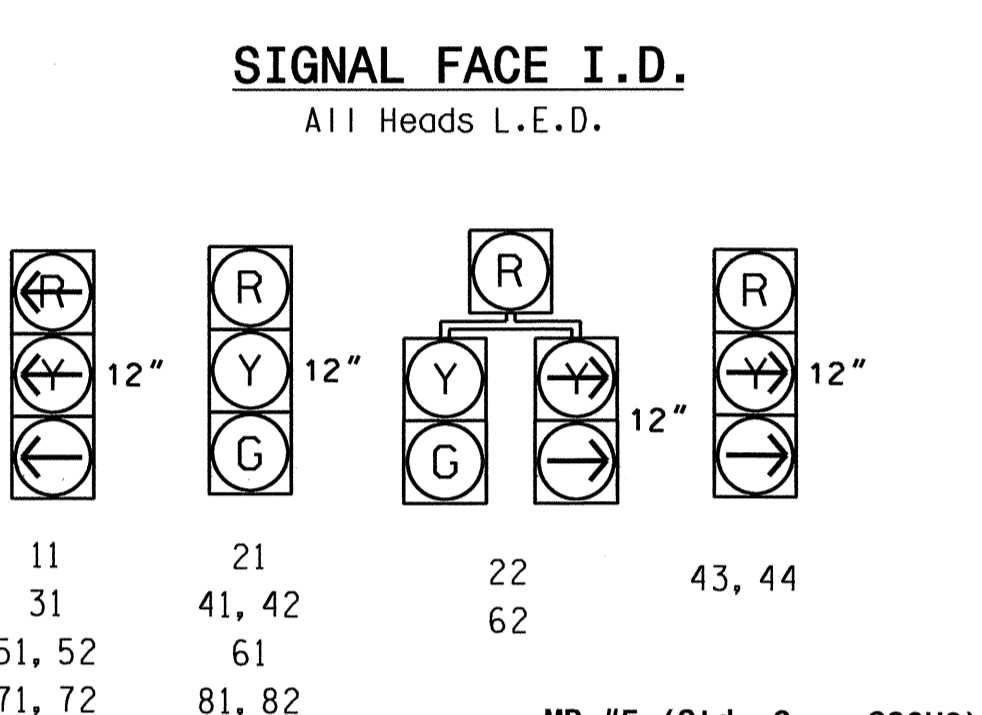
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0527T2
DESIGNED: September 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Temporary 2 (TCP) Phase II) - Sheet 3 of 3

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension		
	Division 6 Cumberland County Fayetteville		PREPARED BY: S. Armstrong REVIEWED BY: JTR		
PLAN DATE: January 2012		REVIEWED BY: JTR		SIGNATURE: <i>[Signature]</i> DATE: 2-20-12	
REVISIONS		INIT. DATE		SIG. INVENTORY NO. 06-0527T2	

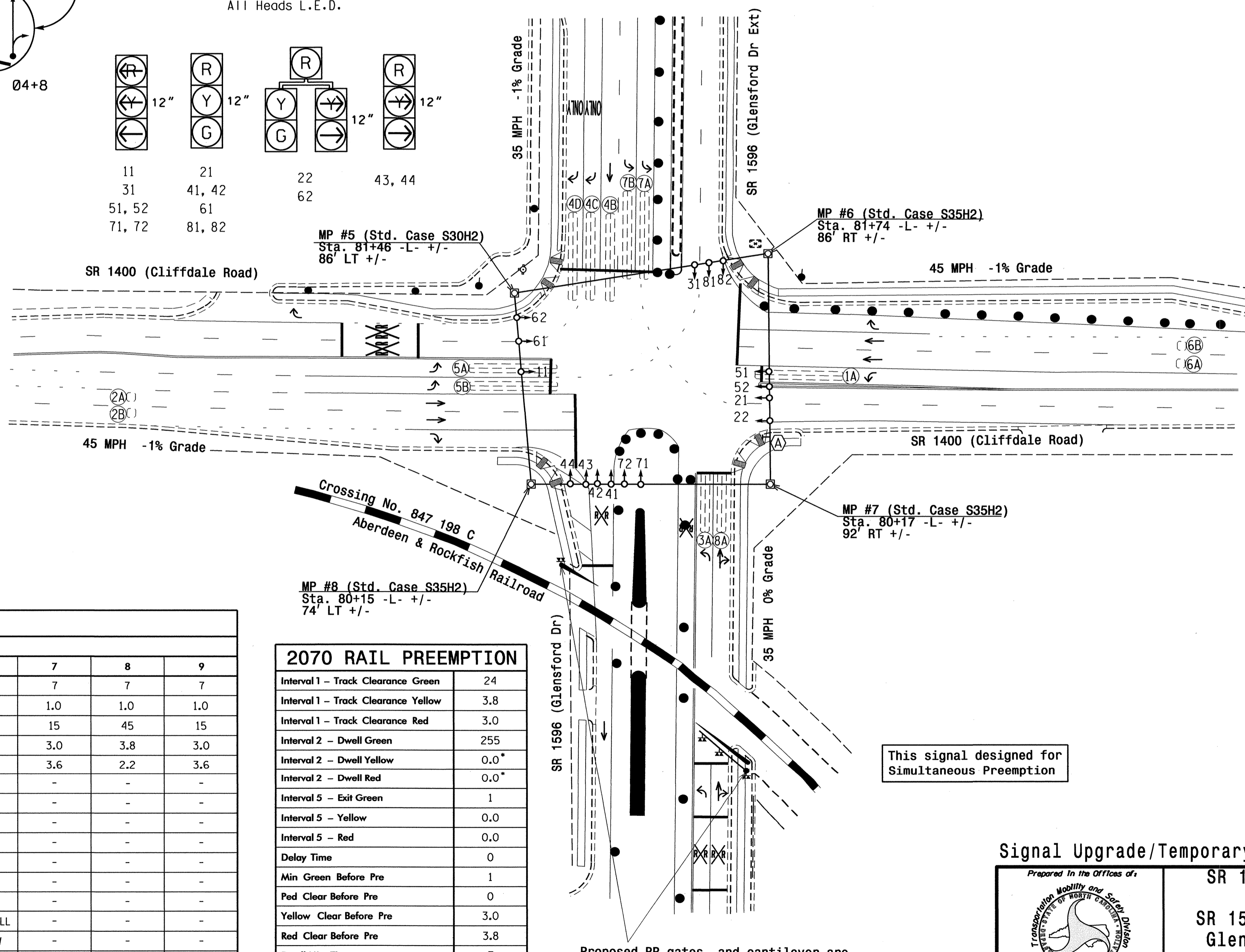


SIGNAL FACE	PHASE																
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	RR DWELL 3 (02+6)	RR DWELL 2 (02+5)	RR DWELL 1 (09)	RR CLEAR (03+8)	FLASH	FLASH	FLASH	FLASH	
11	-	-	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
21	R	R	G	G	R	R	R	R	R	R	R	G	G	Y			
22	R	R	G	G	R	R	R	R	R	R	R	G	G	Y			
31	R	R	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-
41,42	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
43,44	-	R	-	R	R	R	-	-	-	-	-	-	-	-	-	-	-
51,52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	R	G	R	G	R	R	R	R	R	R	R	R	G	Y			
62	R	G	R	G	R	R	R	R	R	R	R	R	G	Y			
71,72	R	R	R	R	-	-	-	-	-	-	-	-	-	-	-	-	-
81,82	R	R	R	R	R	G	R	G	G	R	R	R	R	R	R	R	R
Sign "A"	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	*



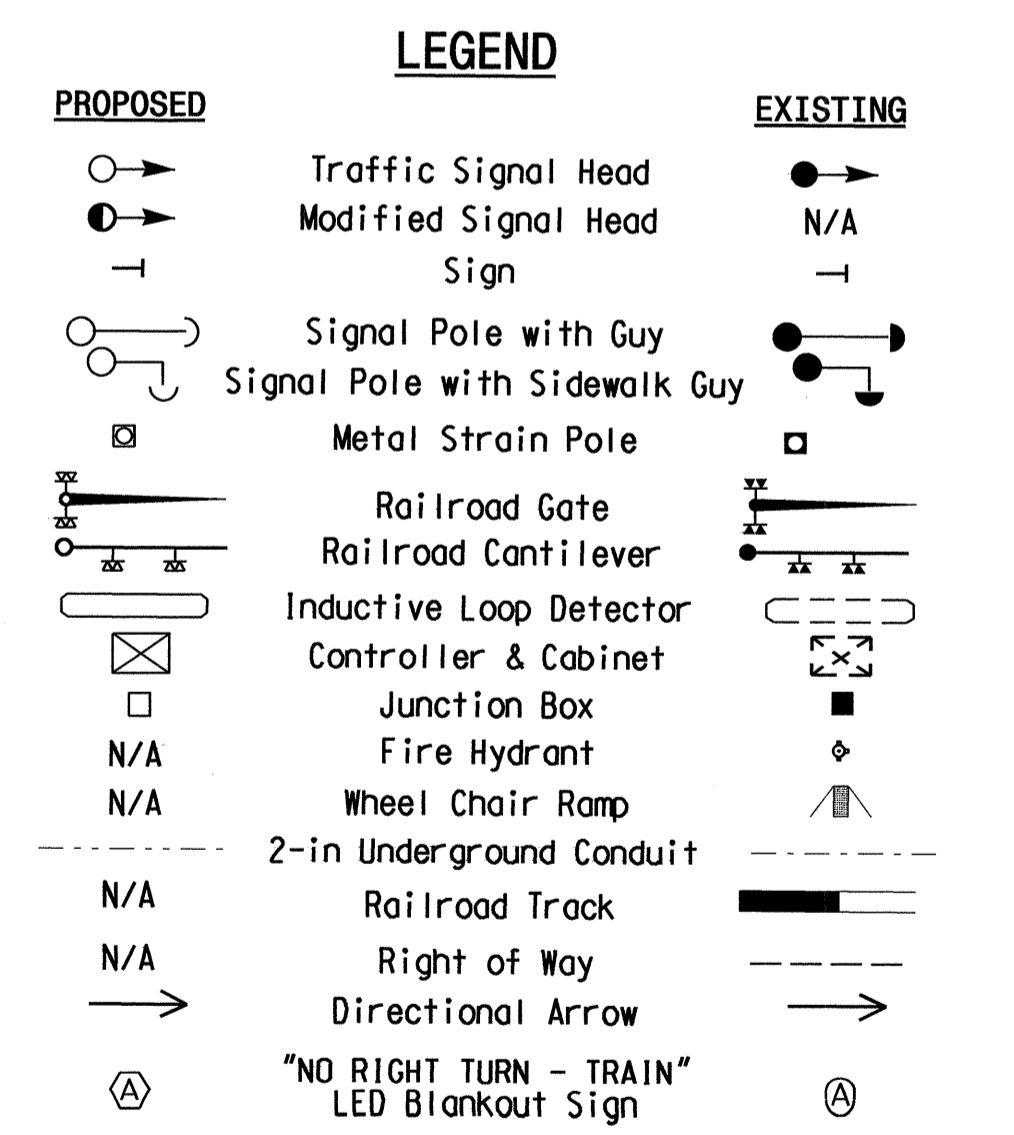
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING						SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME		
1A	6X60	+5	2-4-2	-	1	Y	Y	-	-	3	-	-
2A,2B	6X6	300	5	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
4B	6X60	+20	2-4-2	-	4	Y	Y	-	-	-	-	-
4C	6X60	+20	2-4-2	-	4/9	Y	Y	-	-	15	-	-
4D	6X60	+20	2-4-2	-	4/9	Y	Y	-	-	15	-	-
5A	6X60	+5	2-4-2	-	5	Y	Y	-	-	3	-	-
5B	6X60	+5	2-4-2	-	5	Y	Y	-	-	-	-	-
6A,6B	6X6	300	4	-	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	-	7/9	Y	Y	-	-	-	-	-
7B	6X40	0	2-4-2	-	7/9	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	-

- 8 Phase Fully Actuated W/ RR Preemption Fayetteville City System
- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
 - This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
 - Phase 1 or phase 5 may be lagged.
 - Phase 3 or phase 7 may be lagged.
 - Set all detector units to presence mode.
 - Ensure flashing operation does not alter operation of blankout signs.
 - Program parent phases for Overlap "P" for all phases used in normal operation.
 - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
 - Maintain detection during construction, installing new loops and temporary direct bury lead-in as directed by the engineer.



OASIS 2070L TIMING CHART									
FEATURE	PHASE								
	1	2	3	4	5	6	7	8	9
Min Green 1 *	7	12	7	7	7	12	7	7	7
Extension 1 *	1.0	6.0	1.0	1.0	1.0	6.0	1.0	1.0	1.0
Max Green 1 *	25	90	15	45	25	90	15	45	15
Yellow Clearance	3.0	4.6	3.0	3.9	3.0	4.6	3.0	3.8	3.0
Red Clearance	3.7	1.7	3.8	2.4	3.5	1.9	3.6	2.2	3.6
Walk 1 *	-	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.0	-	-	-	2.0	-	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-	-
Time To Reduce *	-	30	-	-	-	30	-	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-	-
Dual Entry	-	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON	ON

2070 RAIL PREEMPTION	
Interval 1 - Track Clearance Green	24
Interval 1 - Track Clearance Yellow	3.8
Interval 1 - Track Clearance Red	3.0
Interval 2 - Dwell Green	255
Interval 2 - Dwell Yellow	0.0*
Interval 2 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	3.0
Red Clear Before Pre	3.8
Dwell Min Time	7
Ped Clear Through Yellow	N
Omit Overlap	"P"



Signal Upgrade/Temporary 3 (TCP Phase III)

SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension

Division 6 Cumberland County Fayetteville

PLAN DATE: September 2011 REVIEWED BY: PL Alexander, PE

PREPARED BY: EM Minshew REVIEWED BY:

SCALE: 1"=50'

2/14/12

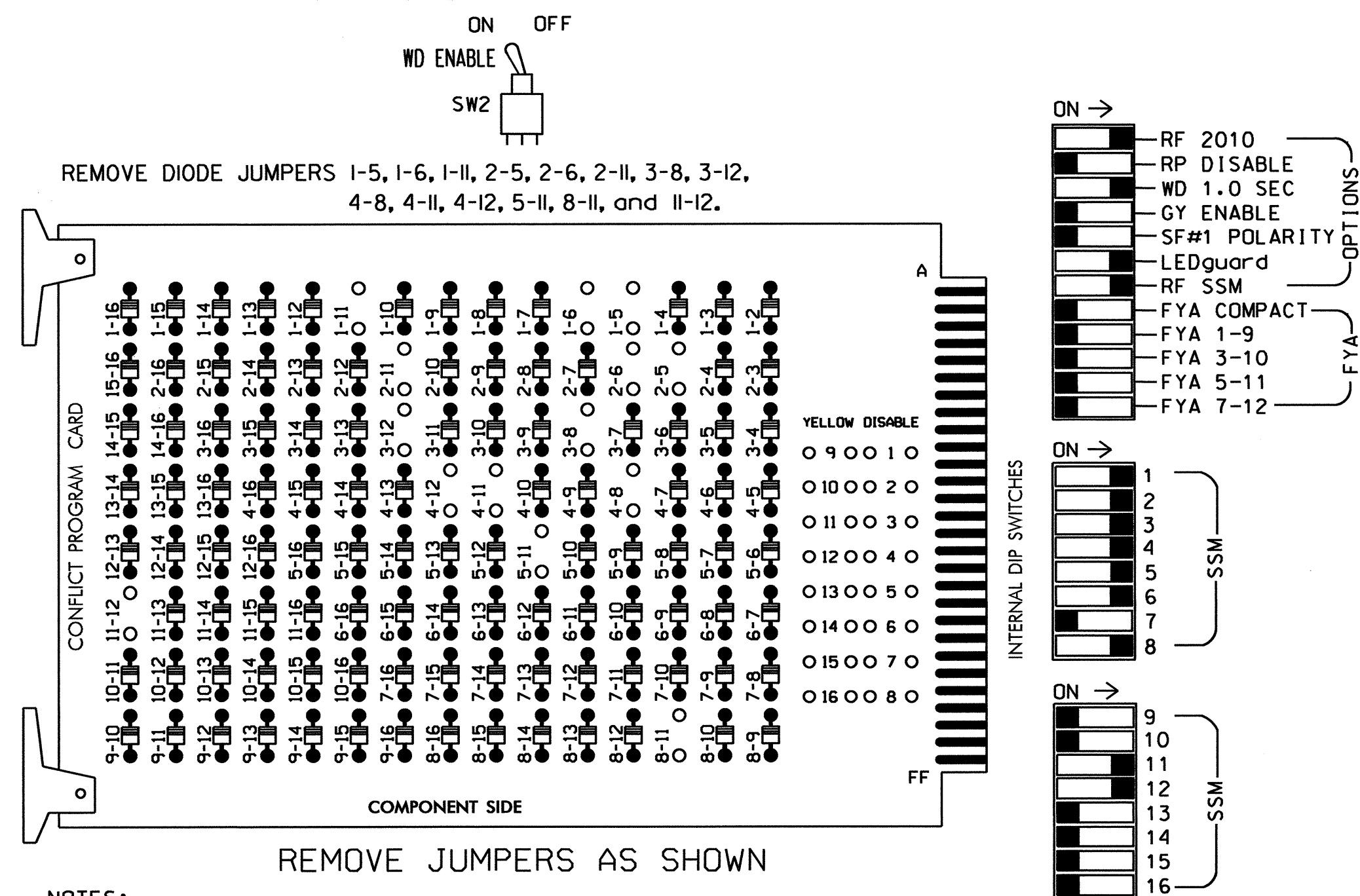
2348

06-0527J3

01-MAR-2012 11:08 \\s01\project\2011\06-0527\sig\10-4422-0527-2a.dwg

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 7,9, 10,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and 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 Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX OUTPUT FILE
 SOFTWARE.....ECONOLITE OASIS V3.02.77
 OR LATEST APPROVED VERSION
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S8,S12,S13
 PHASES USED.....1,2,3,4,5,6,7*,8
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....4+5+9
 OVERLAP D.....7+9
 OVERLAP P.....1+2+3+4+5+6+7+8

* USED FOR TIMING PURPOSES ONLY

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	51,52*	61,62	NU	NC	81,82	NU	NU	NU	43,44	62	71,72*	NU
RED	128				101			134			107					A114			
YELLOW	129				102			135			108								
GREEN	130				103			136			109								
RED ARROW	125				116			131											A101
YELLOW ARROW	126				117	117		132								A115	A102	A102	
GREEN ARROW	127				118	118		133								A116	A103	A103	
Hand icon																			
Person icon																			

NU = Not Used

NC = Not Connected

* NOTE: unbag and reconnect signal heads 51 and 71.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1 1A	S 2A,2B	S 2A,2B	S 2A,2B	S 2A,2B	∅ 3 3A	∅ 4/9 4C	S 4B	S 4D	S 4B	S 4D	S 4B	S 4D	FS DC ISOLATOR
L	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	∅ 4 4B	∅ 4/9 4D	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	ST DC ISOLATOR
U	∅ 5 5A	∅ 5 5B	NOT USED	S 6A,6B	S 6A,6B	∅ 7/9 7A	∅ 8 8A	S 7B	S 7B	S 7B	S 7B	S 7B	S 7B	PRE1 AC ISOLATOR
L	NOT USED	NOT USED	∅ 6 6A,6B	NOT USED	NOT USED	∅ 7/9 7B	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

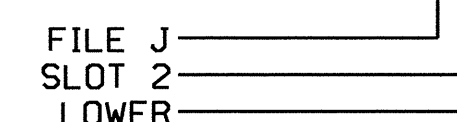
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME
 PRE1 = RR PREEMPT

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			3
2A,2B	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4/9	Y	Y			15
4D	TB6-3,4	I7L	78	40	44	4/9	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
6A,6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7A	TB5-9,10	J6U	42	4	8	7/9	Y	Y			
7B	TB5-11,12	J6L	46	8	18	7/9	Y	Y			
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 9 for 'Omit Phase' and Phases 1,2,3,4,5,6,7, and 8 for 'Startup Calls'. This is to prevent Phase 9 from being served when not in Preempt.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T3
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 3 (TCP) Phase III) - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/Glensford Drive Extension

Division 6 Cumberland County Fayetteville

Prepared In the Office of:

PLANNED BY: S. Armstrong
 REVIEWED BY: JTR

REVISIONS: _____ INIT. _____ DATE _____

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453
 JOHN T. ROWE, III
 SIGNATURE:
 DATE: 2-20-12

SIG. INVENTORY NO. 06-0527T3

RAILROAD PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

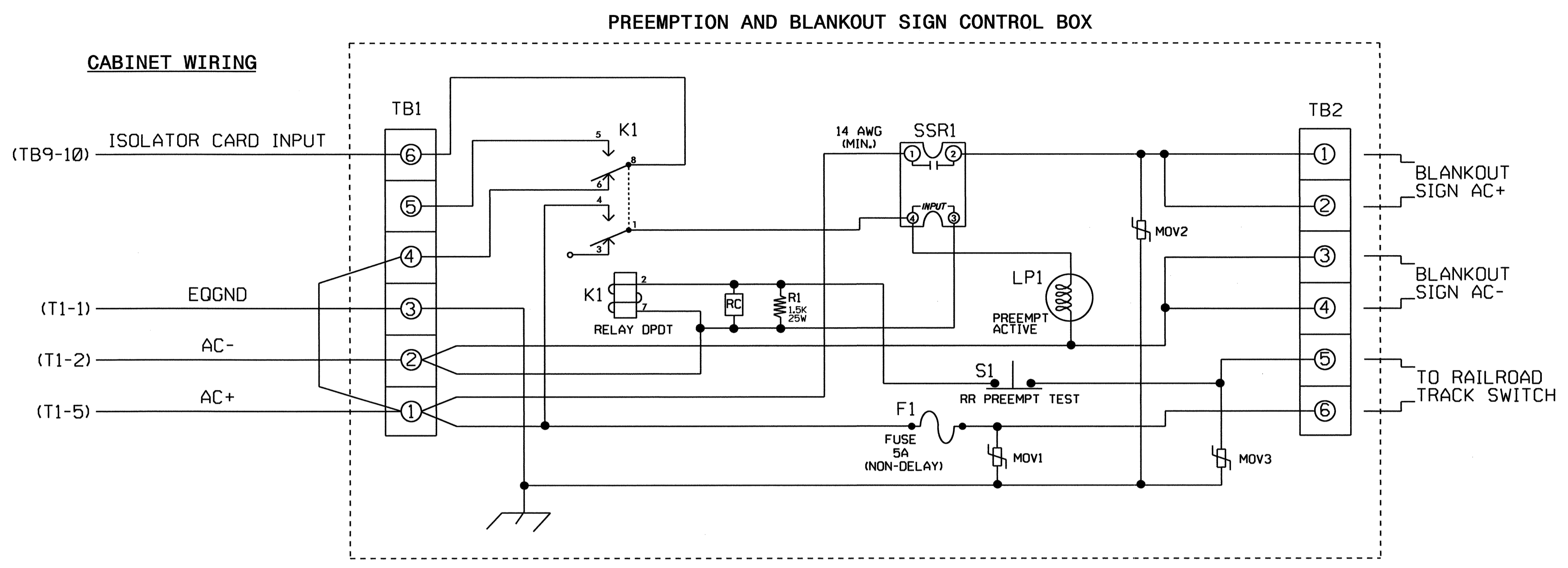
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #	INTERVAL/TIMING	SETTINGS (NEXT:1-10)	CLEAR/DWELL PHASES
GRN	YEL	RED	12345678910111213141516
1	24	3.8 3.0	X X
2	255	0.0 0.0	X XX X
3	0	0.0 0.0	
4	0	0.0 0.0	
5	1	0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	HIGH
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	3.0
RED CLEAR BEFORE PRE (0= DEFAULT)...	3.8
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN) ...	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

RAILROAD PREEMPTION WIRING DETAIL

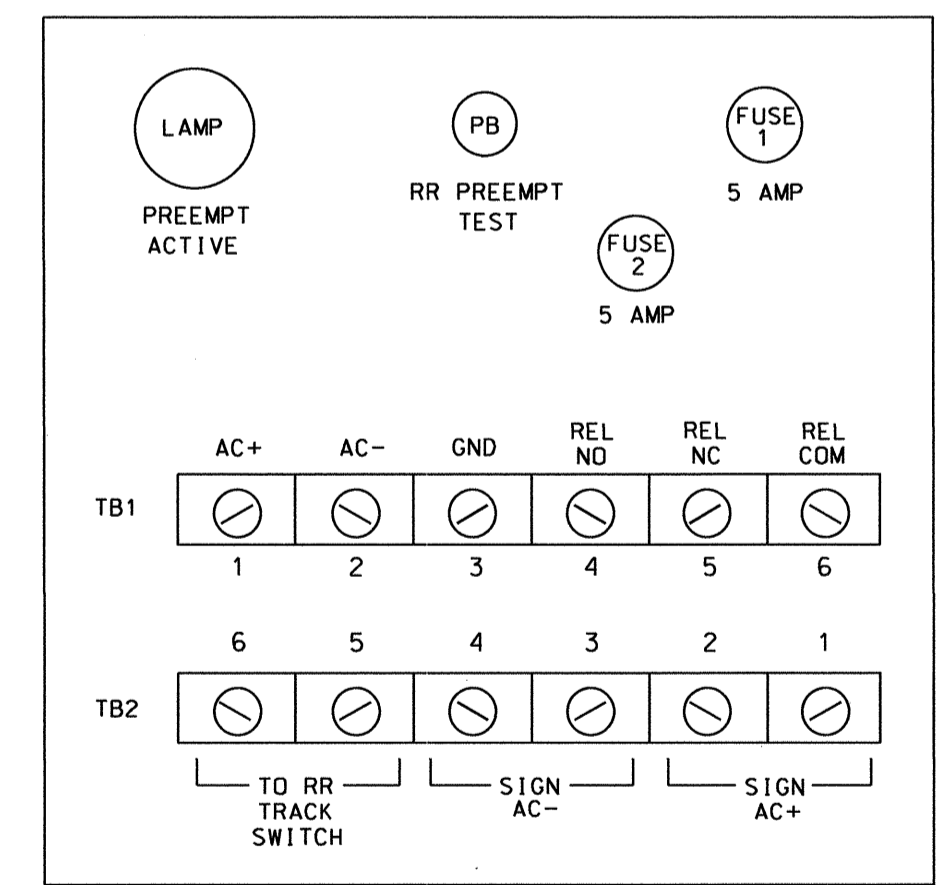
(wire as shown below)



NOTES

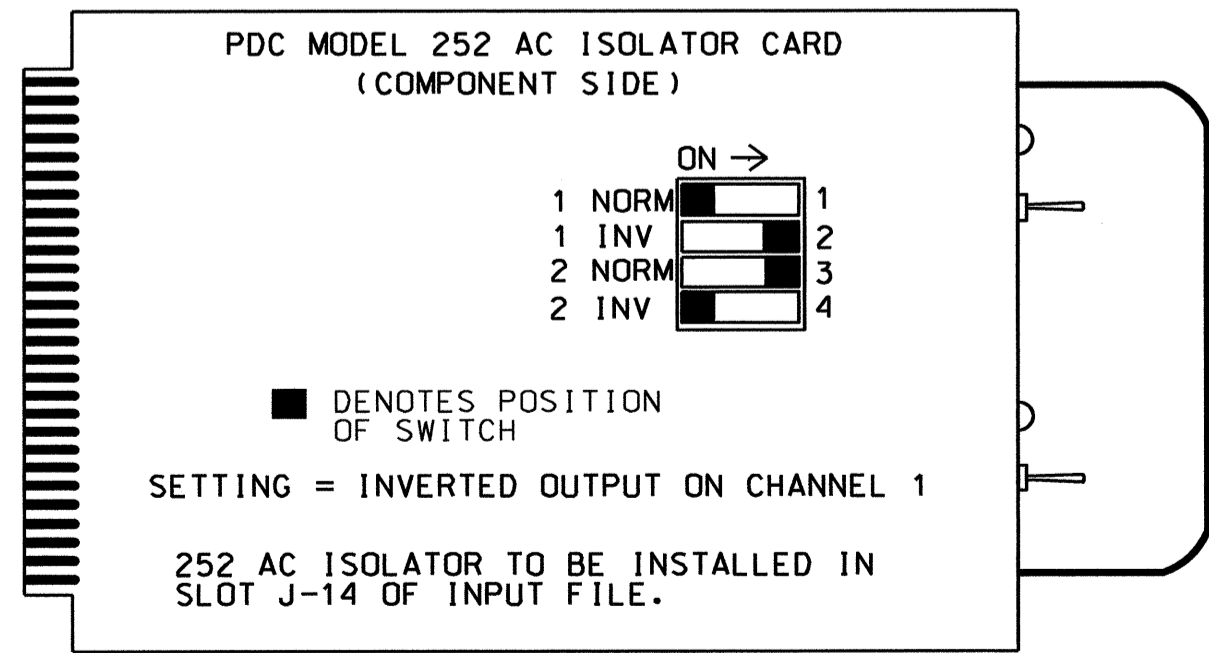
- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with an octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
- IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527T3
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Temporary 3 (TCP) Phase III) - Sheet 2 of 3

Electrical and Programming Details For: SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/Glensford Drive Extension

Division 6 Cumberland County Fayetteville

Prepared In the Offices of: Transportation Mobility and Safety Solutions, Inc. (Logo)

750 N. Greenfield Pkwy, Corner, NC 27529

PLANNING: S. Armstrong
 REVIEWED: JTR
 PREPARED BY: S. Armstrong
 REVIEWED BY: JTR

REVISIONS: _____ INIT. DATE

Signature: John T. Rowe, Engineer
 Date: 2-30-12
 Seal: NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE, JR. 008453

SIG. INVENTORY NO. 06-0527T3

15-FEB-2012 09:21:15 SignalSystem\work\cups\sig_mon\mstron\060527_tsm_e1e_vxx.dgn

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

PRESS '+'

```

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

PRESS '-' FOUR TIMES

```

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

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

- 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.

PHASE SEQUENCE PROGRAMMING DETAIL

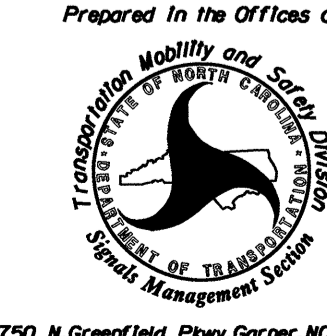
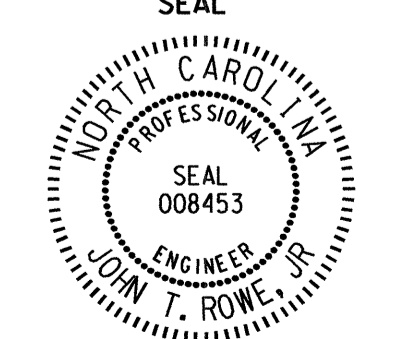
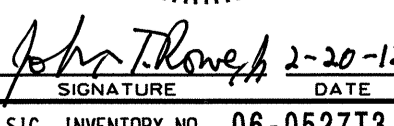
(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)										
RNG	LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG	LEAD	BARRIER 3	X-LAG	
1	1	2	0	0	3	4	0	0	0	0
2	5	6	0	0	7	8	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0

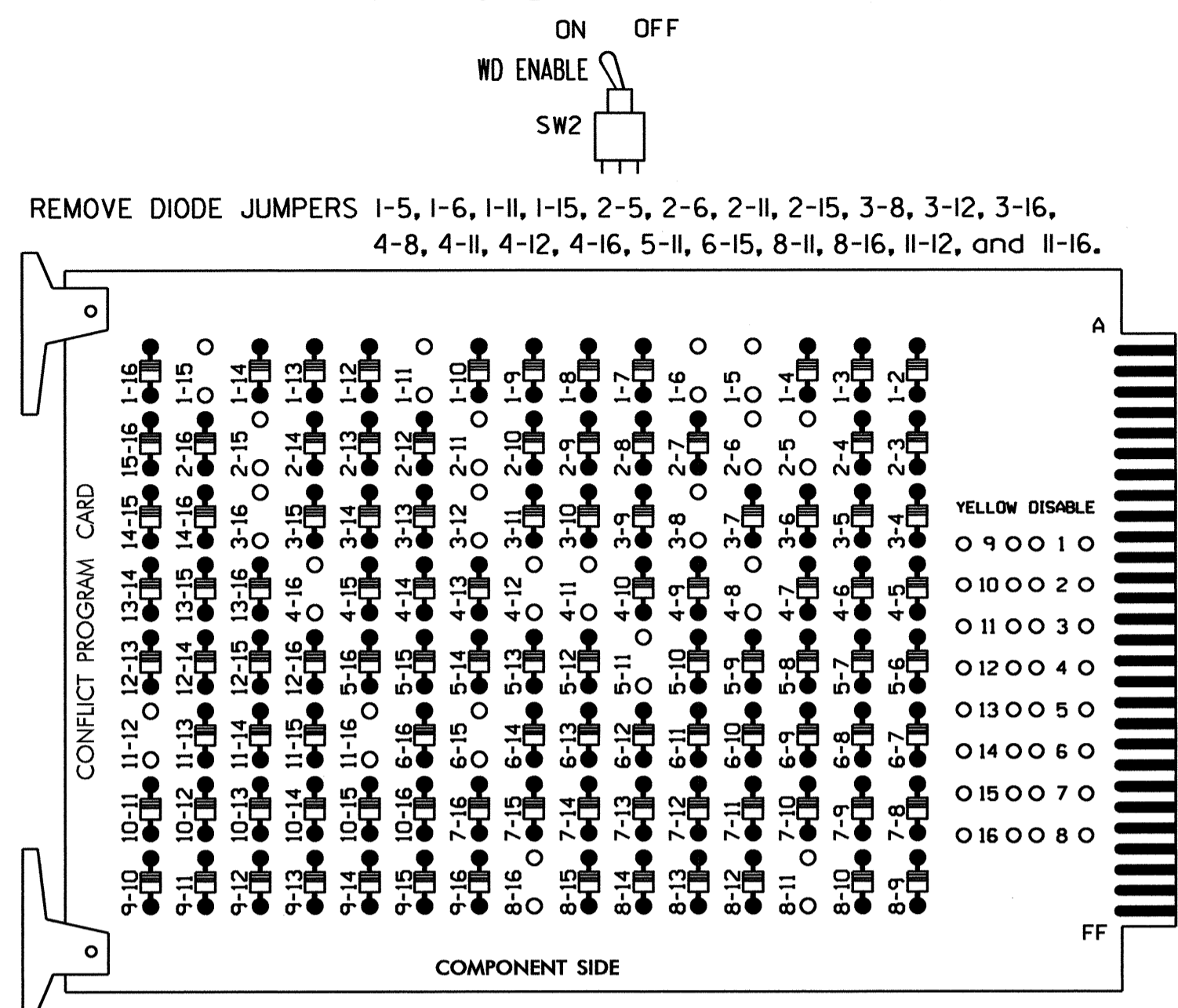
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0527T3
DESIGNED: September 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Temporary 3 (TCP) Phase III) - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension	SEAL 
	Division 6 Cumberland County Fayetteville PLAN DATE: January 2012 REVIEWED BY: JTR PREPARED BY: S. Armstrong REVIEWED BY:	SIGNATURE:  DATE: 2-20-12 SIG. INVENTORY NO. 06-0527T3

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.

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 7,9, 10,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 6 and 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX OUTPUT FILE
 SOFTWARE.....ECONOLITE OASIS V3.02.77
 OR LATEST APPROVED VERSION
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S6P,S8,S8P,
 S12,S13
 PHASES USED.....1,2,3,4,5,6,6PED,7*,8,8PED
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....4+5+9
 OVERLAP D.....7+9
 OVERLAP P.....1+2+3+4+5+6+7+8
 * USED FOR TIMING PURPOSES ONLY

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.	11,12	82	21,22	NU	22	31,32	41,42	NU	51,52	61,62	P61, P62	NC	81,82	P81, P82	NU	NU	53,54	62	71,72	NU		
RED			128			101			134			107					A114					
YELLOW			129			102			135			108										
GREEN			130			103			136			109										
RED ARROW	125					116			131											A101		
YELLOW ARROW	126	126				117	117		132											A115	A102	A102
GREEN ARROW	127	127				118	118		133											A116	A103	A103
Hand icon												119										
Person icon													112									

NU = Not Used
 NC = Not Connected

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅ 2	S	S	∅ 3	∅ 4	S	S	S	S	S	∅ 6 PED	FS
L	1A	1B	2A	S	S	3A	4A	S	S	S	S	S	DC ISOLATOR	DC ISOLATOR
U	NOT USED	∅ 1	∅ 2	S	S	∅ 3	∅ 4	S	S	S	S	S	∅ 8 PED	ST
L		1C	2B	S	S	3B	4B	S	S	S	S	S	DC ISOLATOR	DC ISOLATOR
U	∅ 5	∅ 5	∅ 5	∅ 6	S	∅ 7/9	∅ 8	S	S	S	S	S	PRE1	
L	5A	5B	5D	6B	S	7A	8A	S	S	S	S	S	AC ISOLATOR	
U	NOT USED	∅ 5	∅ 6	NOT USED	S	∅ 7/9	∅ 8	S	S	S	S	S	NOT USED	
L		5C	6A		S	7B	8B	S	S	S	S	S		

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

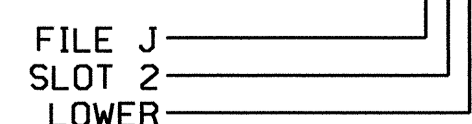
FS = FLASH SENSE
 ST = STOP TIME
 PRE1 = RR PREEMPT

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			3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			
3B	TB4-11,12	I6L	45	7	14	3	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
5D	TB3-9,10	J3U	64	26	36	5	Y	Y			15
6A	TB3-11,12	J3L	77	39	46	6	Y	Y			
6B	TB5-1,2	J4U	48	10	26	6	Y	Y			
7A	TB5-9,10	J6U	42	4	8	7/9	Y	Y			
7B	TB5-11,12	J6L	46	8	18	7/9	Y	Y			
8A	TB7-1,2	J7U	66	28	38	8	Y	Y			
8B	TB7-3,4	J7L	79	41	48	8	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 113.

INPUT FILE POSITION LEGEND: J2L



PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 9 for 'Omit Phase' and Phases 1,2,3,4,5,6,7, and 8 for 'Startup Calls'. This is to prevent Phase 9 from being served when not in Preempt.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527
 DESIGNED: September 2011
 SEALED: 2/14/12
 REVISED: N/A

Signal Upgrade/Final - Sheet 1 of 3

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE, JR. 008453
	PREPARED BY: S. Armstrong	REVIEWED BY: JTR	PLAN DATE: January 2012	REVIEWED DATE:	
REVISIONS		INIT.	DATE	SIGNATURE: <i>S. Armstrong</i> DATE: 2-21-12	
750 N. Greenfield Pkwy, Garner, NC 27529		SIG. INVENTORY NO. 06-0527		06-0527	

RAILROAD PREEMPTION PROGRAMMING DETAIL
(program controller as shown below)

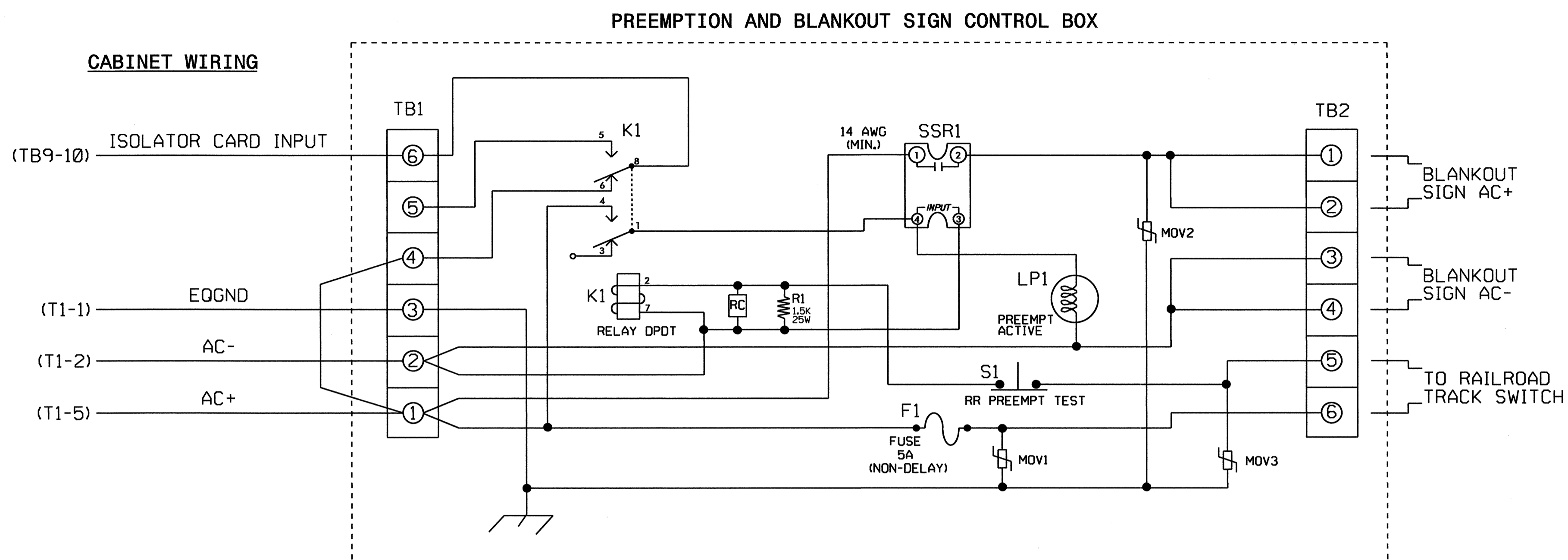
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #	INTERVAL/TIMING	SETTINGS (NEXT:1-10)	CLEAR/DWELL PHASES
GRN	YEL	RED	12345678910111213141516
1	25	3.8 2.8	X X
2	255	0.0 0.0	X XX X
3	0	0.0 0.0	
4	0	0.0 0.0	
5	1	0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	HIGH
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)...	1
PED CLEAR BEFORE PRE (0= DEFAULT)...	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)...	4.6
RED CLEAR BEFORE PRE (0= DEFAULT)...	2.3
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMN
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

RAILROAD PREEMPTION WIRING DETAIL

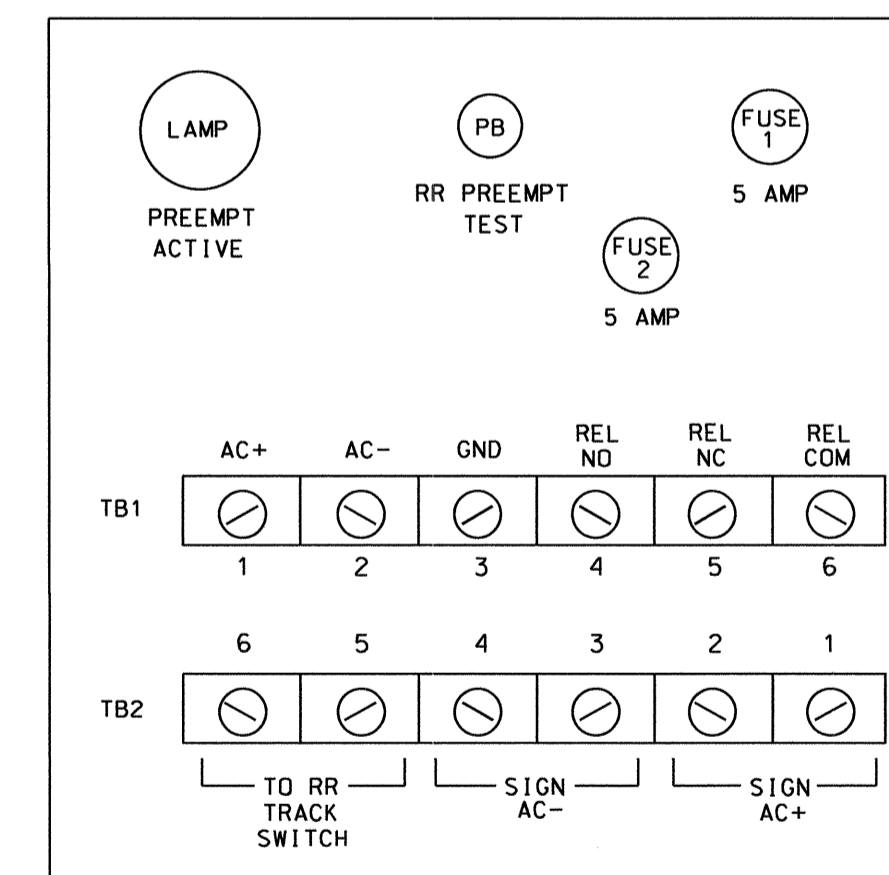
(wire as shown below)



NOTES

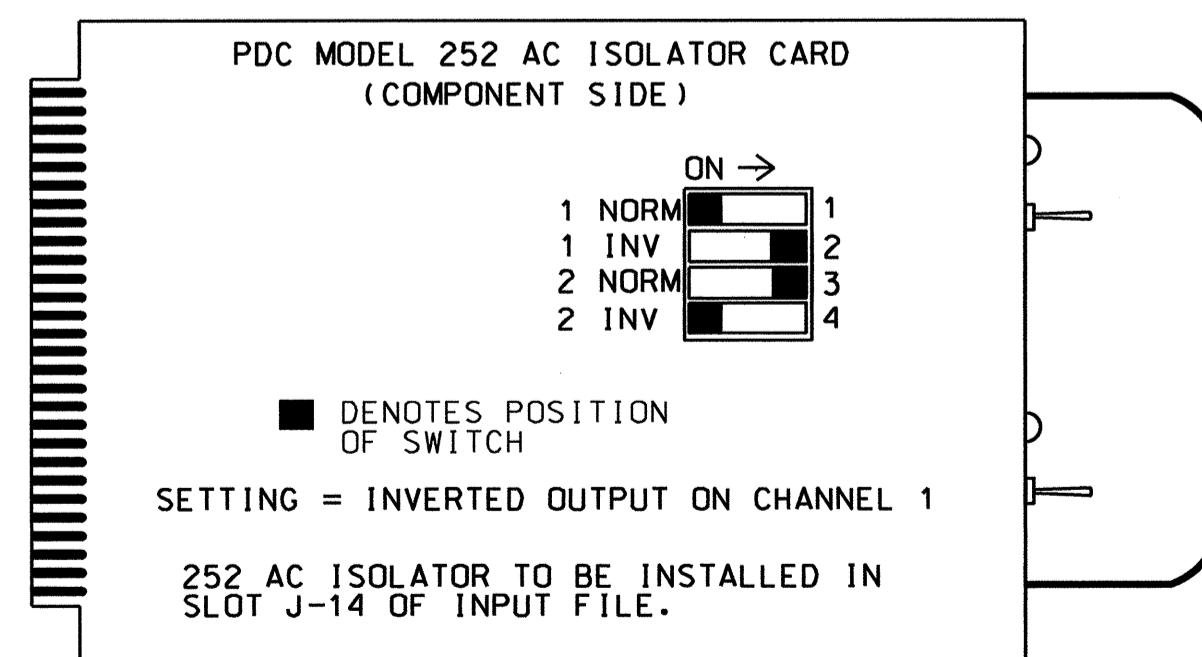
- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil with an octal base.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
- IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0527
DESIGNED: September 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Final - Sheet 2 of 3

	SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension		
	Division 6 Cumberland County Fayetteville		
	PREPARED BY: S. Armstrong	REVIEWED BY: JTR	
	REVISIONS	INIT. DATE	

Signature: Mrs. Rowe, Date: 2-21-12, Sig. Inventory No. 06-0527

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

PRESS '+'

```

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

PRESS '-' FOUR TIMES

```

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

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

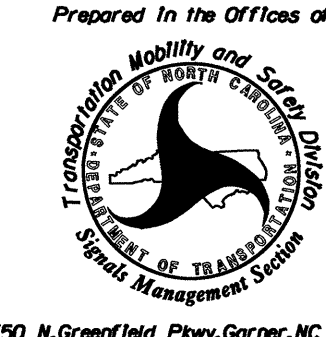
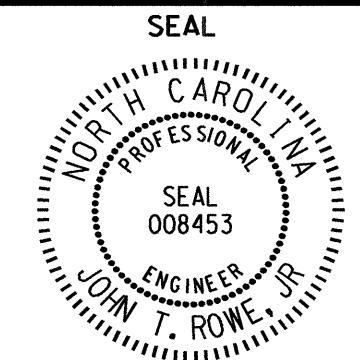
FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)										
RNG	LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG	LEAD	BARRIER 3	X-LAG	
1	1	2	0	0	3	4	0	9	0	0
2	5	6	0	0	7	8	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0

15-FEB-2012 09:36 S:\signal\work\krc\cupes\10 MonMarArmstrong\060527_sml.dwg...xxx.dgn

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0527
DESIGNED: September 2011
SEALED: 2/14/12
REVISED: N/A

Signal Upgrade/Final - Sheet 3 of 3

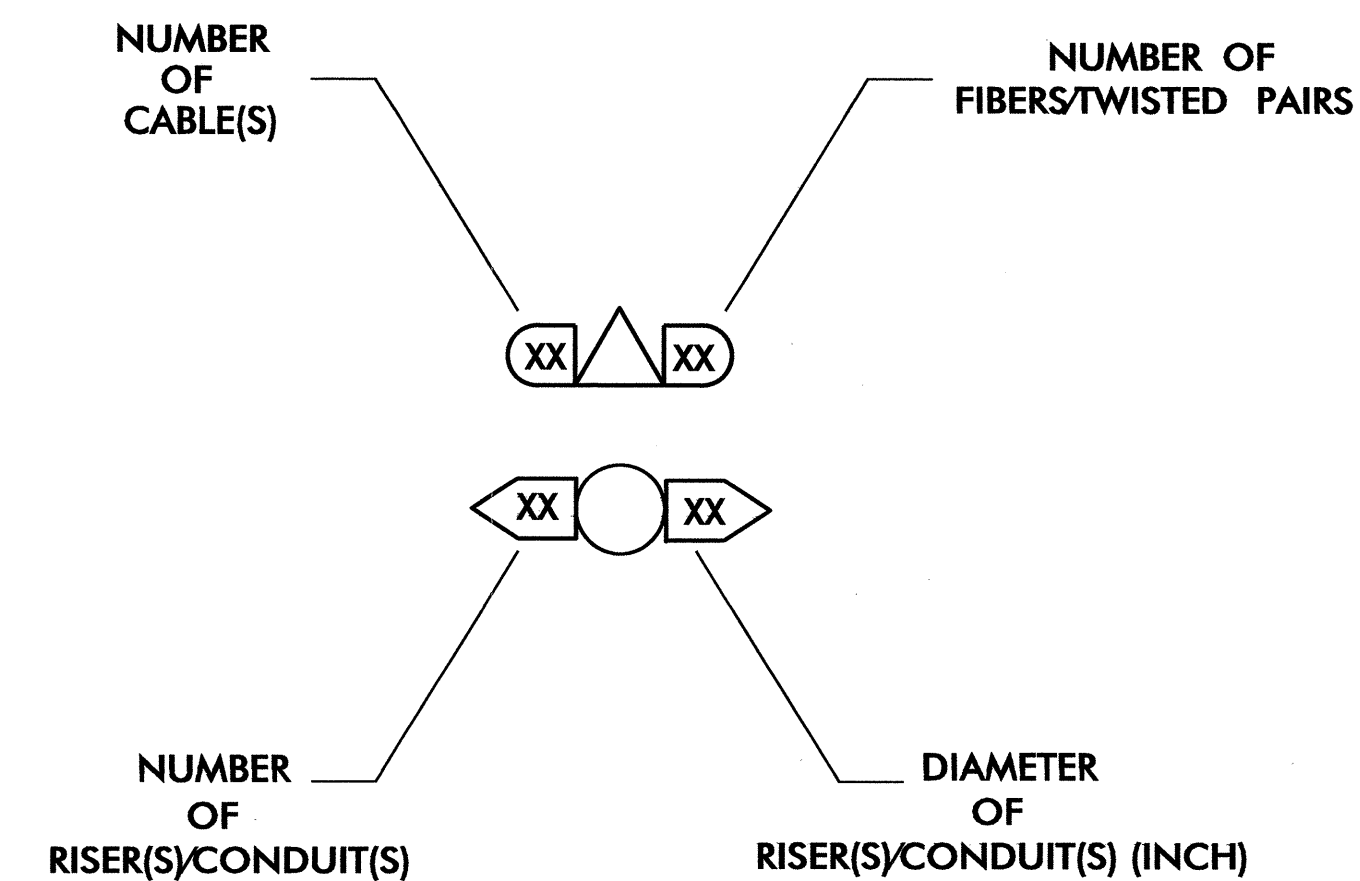
	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1400 (Cliffdale Road) at SR 1596 (Glensford Drive)/ Glensford Drive Extension		
	Prepared In the Office of:	Division 6 Cumberland County Fayetteville	PLAN DATE: January 2012	REVIEWED BY: JTK	
PREPARED BY: S. Armstrong		REVIEWED BY:		SIGNATURE: <i>John T. Rowe</i>	DATE: 2-21-12
REVISIONS		INIT.	DATE	SIG. INVENTORY NO. 06-0527	

LEGEND

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

CONSTRUCTION NOTE SYMBOLOGY KEY

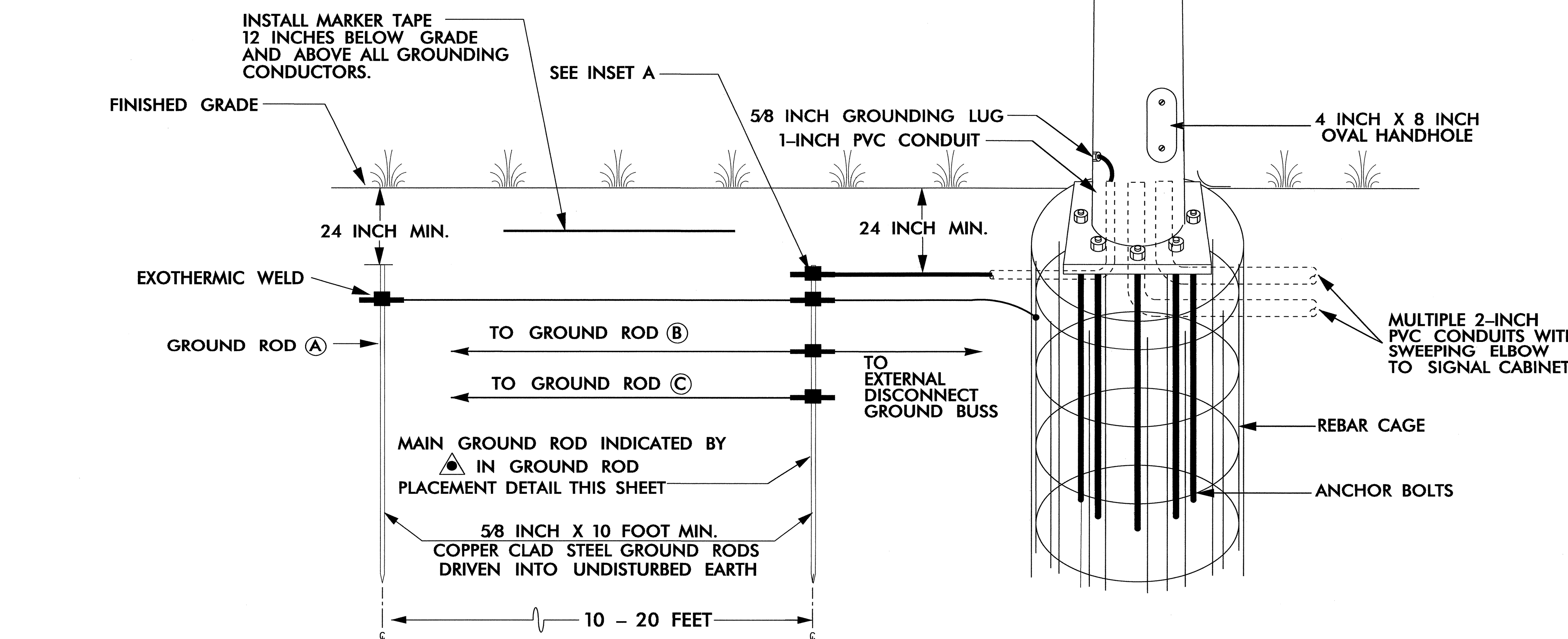
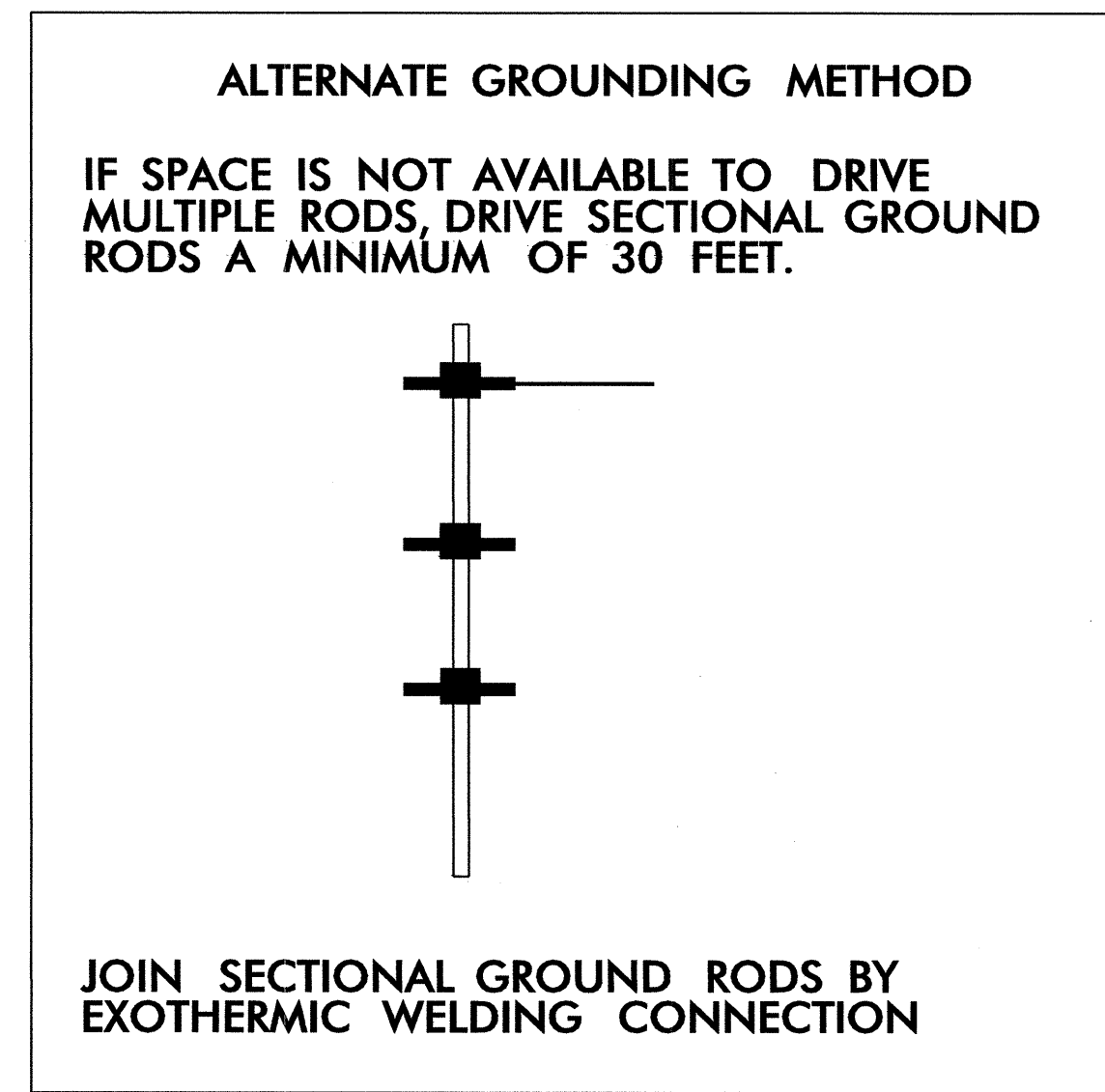
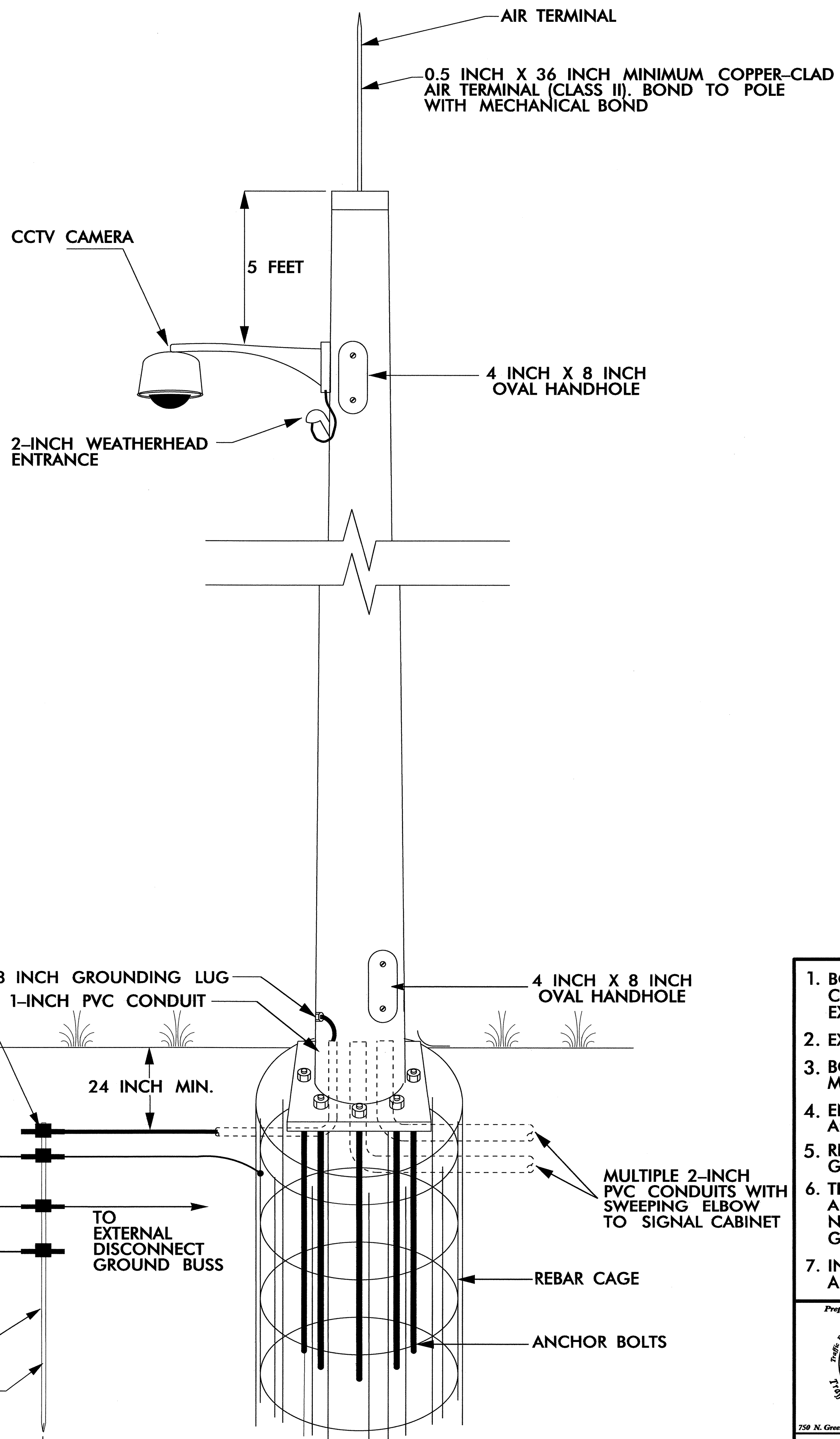
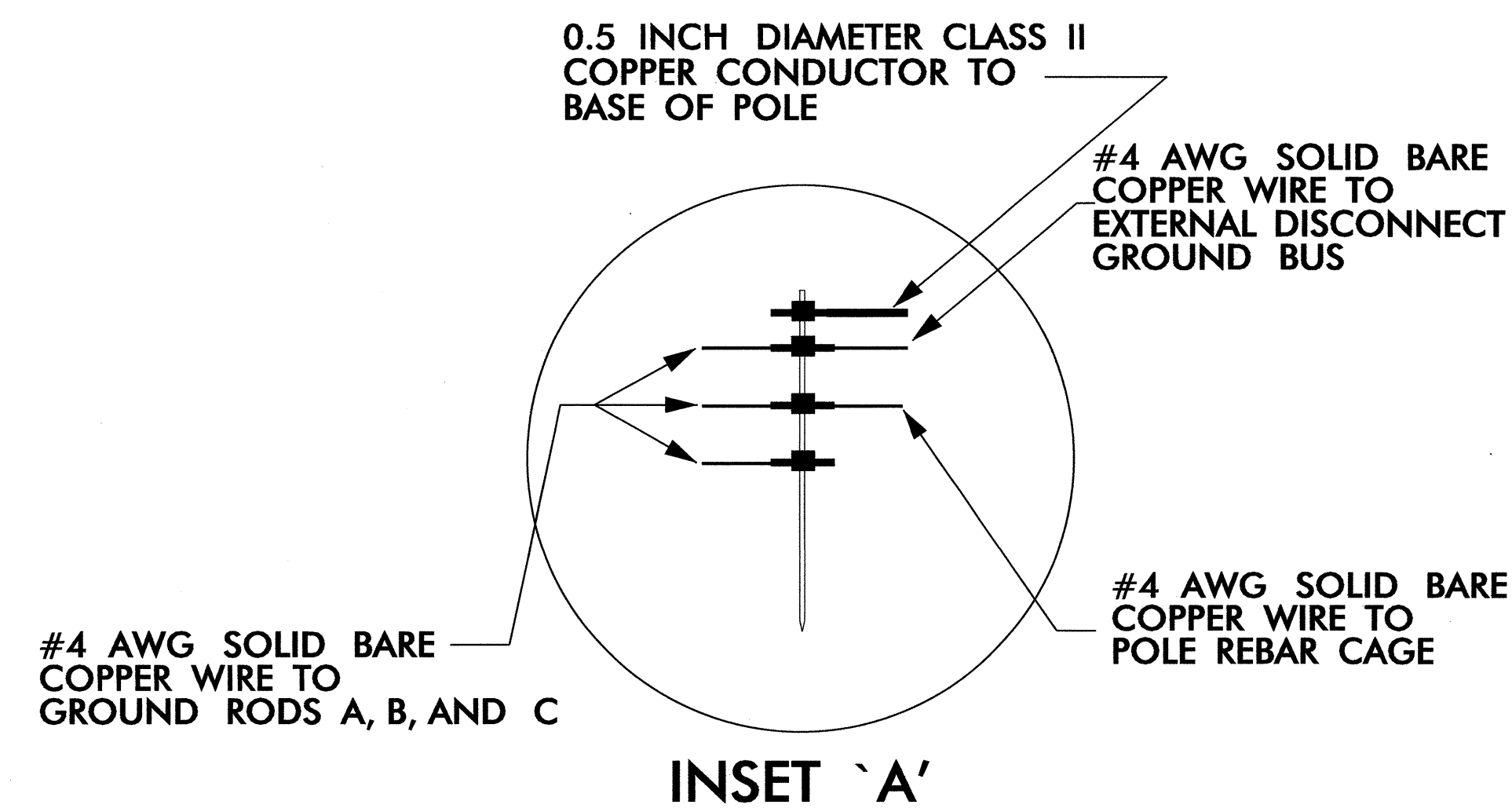
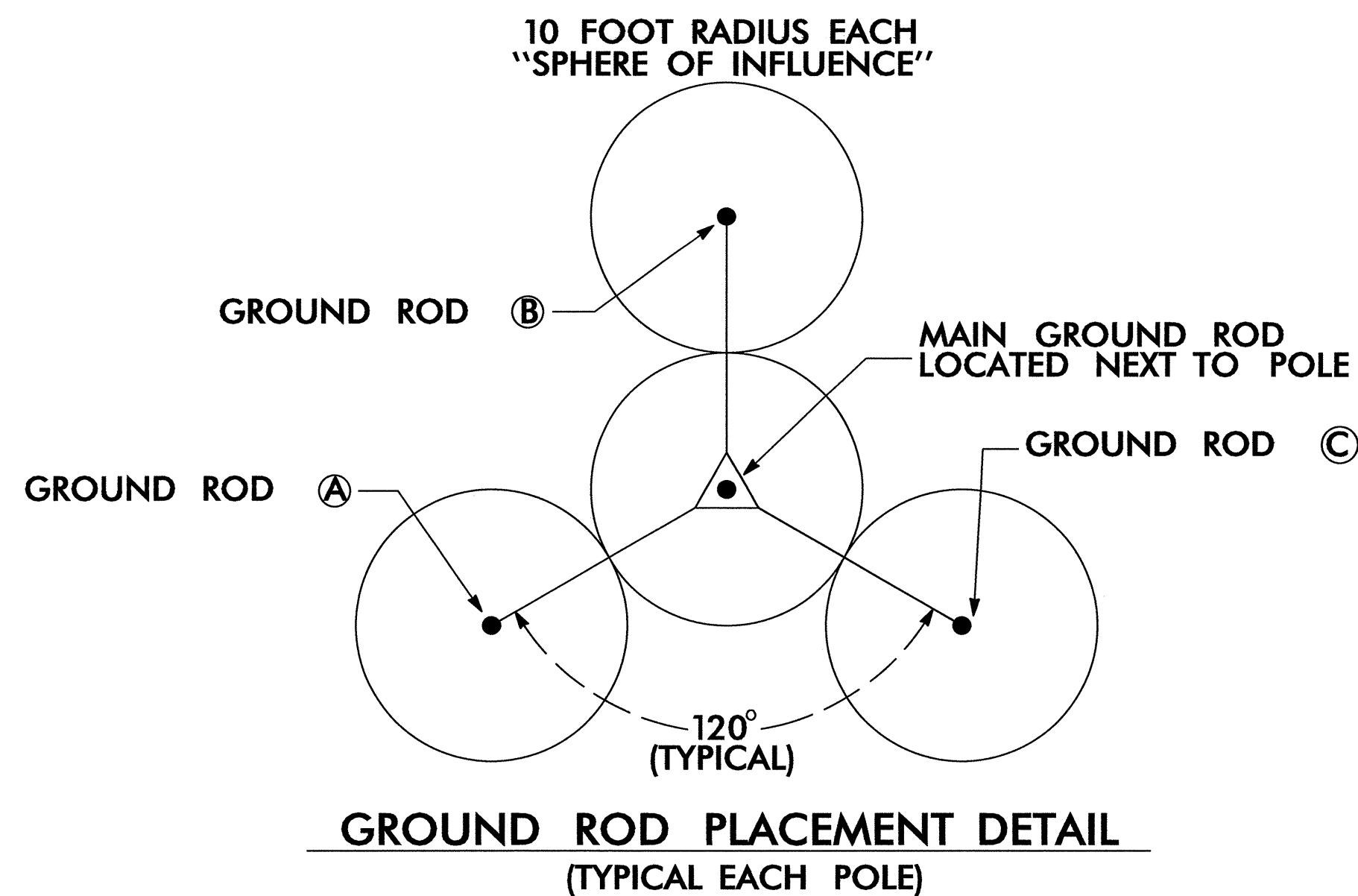
- INDICATES NUMBER OF CABLES, LOOPS, ETC.
- INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



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

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

	CONSTRUCTION NOTES		
	PLAN DATE: FEBRUARY 2012 PREPARED BY: P. C. LOUDER SCALE: 0	REVIEWED BY: I. N. AVERY REVIEWED BY: G.A. FULLER, PE	
122 N. McDowell St., Raleigh, NC 27603			SIGNATURE: <i>Gregory A. Fuller</i> 2/27/12 DATE:



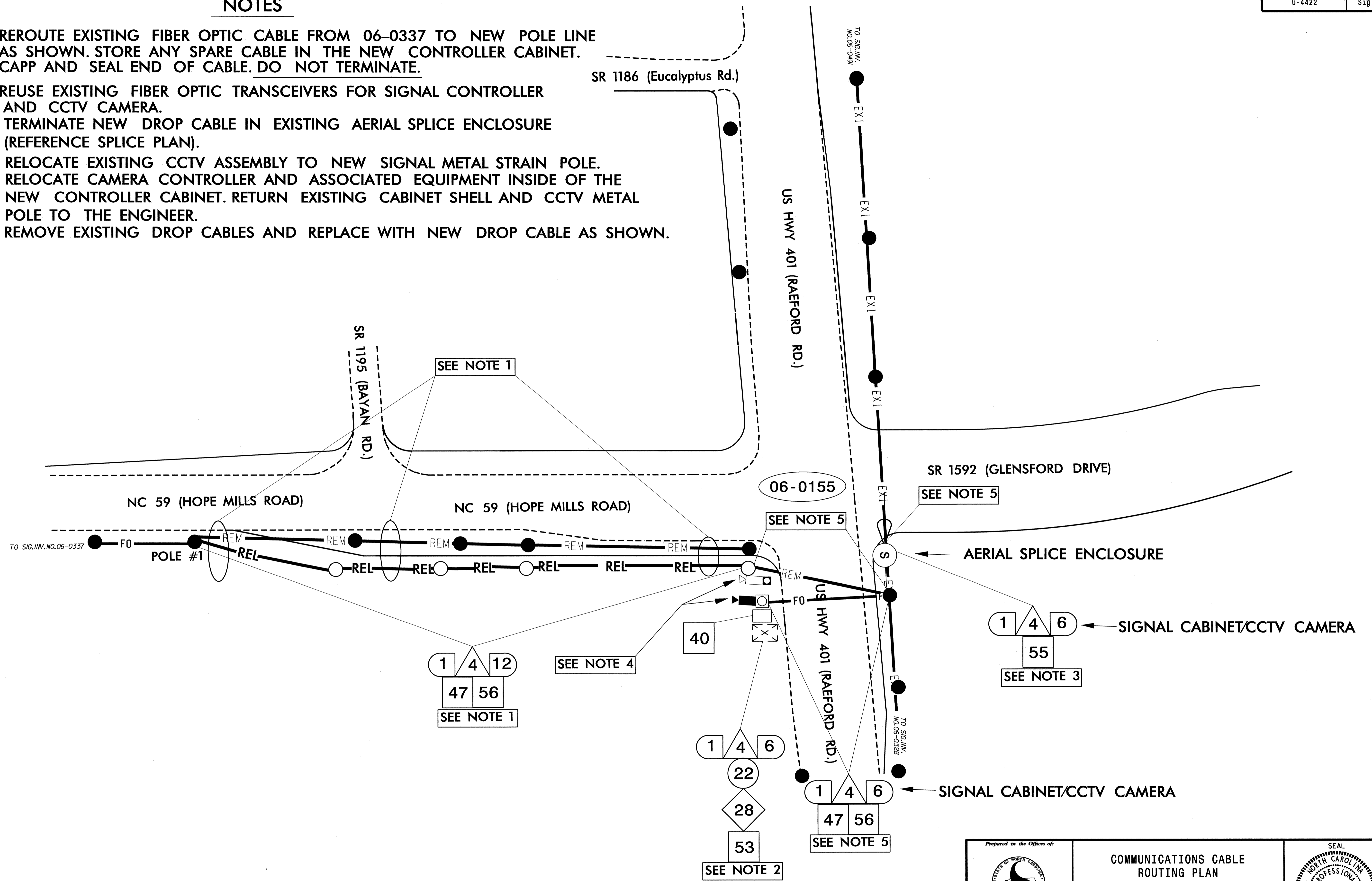
NOTES



1. BOND 0.5 INCH DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN EXOTHERMIC WELD METHOD.
2. EXOTHERMICALLY WELD ALL CONNECTIONS TO GROUND RODS.
3. BOND #4 AWG SOLID BARE COPPER WIRE TO REBAR CAGE AND THE MAIN GROUND ROD BY AN EXOTHERMIC WELD METHOD.
4. ENSURE CAMERA HOUSING, CAMERA, AND PAN -TILT UNIT ARE BONDED TO POLE.
5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUSS AND NEUTRAL BUSS.
6. THE CONTRACTOR MAY, UPON APPROVAL OF THE ENGINEER, INSTALL A 30-FOOT SECTIONAL GROUND ROD WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE 3 - RADIAL GROUND RODS.
7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.

	CCTV CAMERA INSTALLATION FOR METAL SIGNAL STRAIN POLE TYPICAL DETAIL		SEAL PROFESSIONAL ENGINEER GREGORY A. FULLER
	PLAN DATE: FEBRUARY 2012 PREPARED BY: P. C. LOUDER	REVIEWED BY: I. N. AVERY REVIEWED BY: G. A. FULLER	SCALE: 0

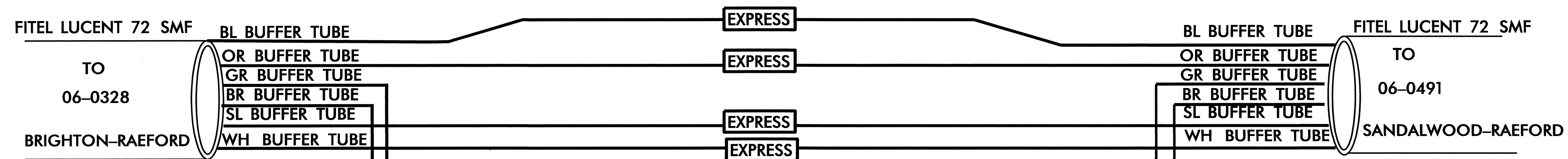
NOTES

1. REROUTE EXISTING FIBER OPTIC CABLE FROM 06-0337 TO NEW POLE LINE AS SHOWN. STORE ANY SPARE CABLE IN THE NEW CONTROLLER CABINET. CAPP AND SEAL END OF CABLE. DO NOT TERMINATE.
2. REUSE EXISTING FIBER OPTIC TRANSCEIVERS FOR SIGNAL CONTROLLER AND CCTV CAMERA.
3. TERMINATE NEW DROP CABLE IN EXISTING AERIAL SPICE ENCLOSURE (REFERENCE SPICE PLAN).
4. RELOCATE EXISTING CCTV ASSEMBLY TO NEW SIGNAL METAL STRAIN POLE. RELOCATE CAMERA CONTROLLER AND ASSOCIATED EQUIPMENT INSIDE OF THE NEW CONTROLLER CABINET. RETURN EXISTING CABINET SHELL AND CCTV METAL POLE TO THE ENGINEER.
5. REMOVE EXISTING DROP CABLES AND REPLACE WITH NEW DROP CABLE AS SHOWN.



Prepared in the Office of:  759 N. Greenfield Pkwy., Garner, NC 27529	COMMUNICATIONS CABLE ROUTING PLAN GLENSFORD DR. AT RAEFORD RD. DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE PLAN DATE: FEBRUARY 2012 REVIEWED BY: I. N. AVERY PREPARED BY: P. C. LOUDER REVIEWED BY: G. A. FULLER, PE	SEAL NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER						
	SCALE 0	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE			
REVISIONS	INIT.	DATE						
Signature: <i>G. A. Fuller</i> Date: 2/27/12 CADD Filename:								

SIG # 06-0155
 US HWY. 401 (RAEFORD RD.) AT NC 59
 (HOPE MILLS RD./SR 1592 (GLENSFORD DR.))

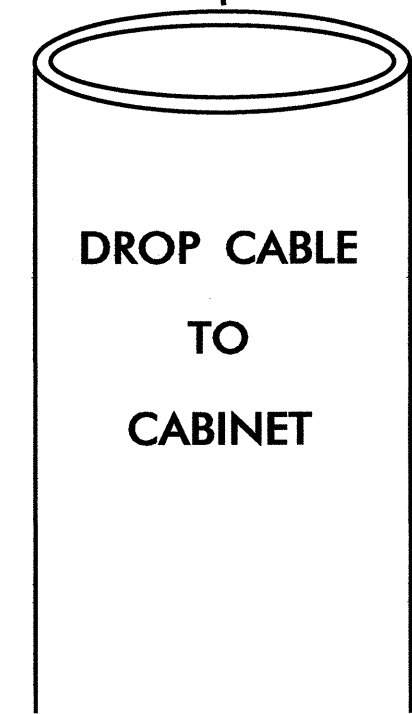
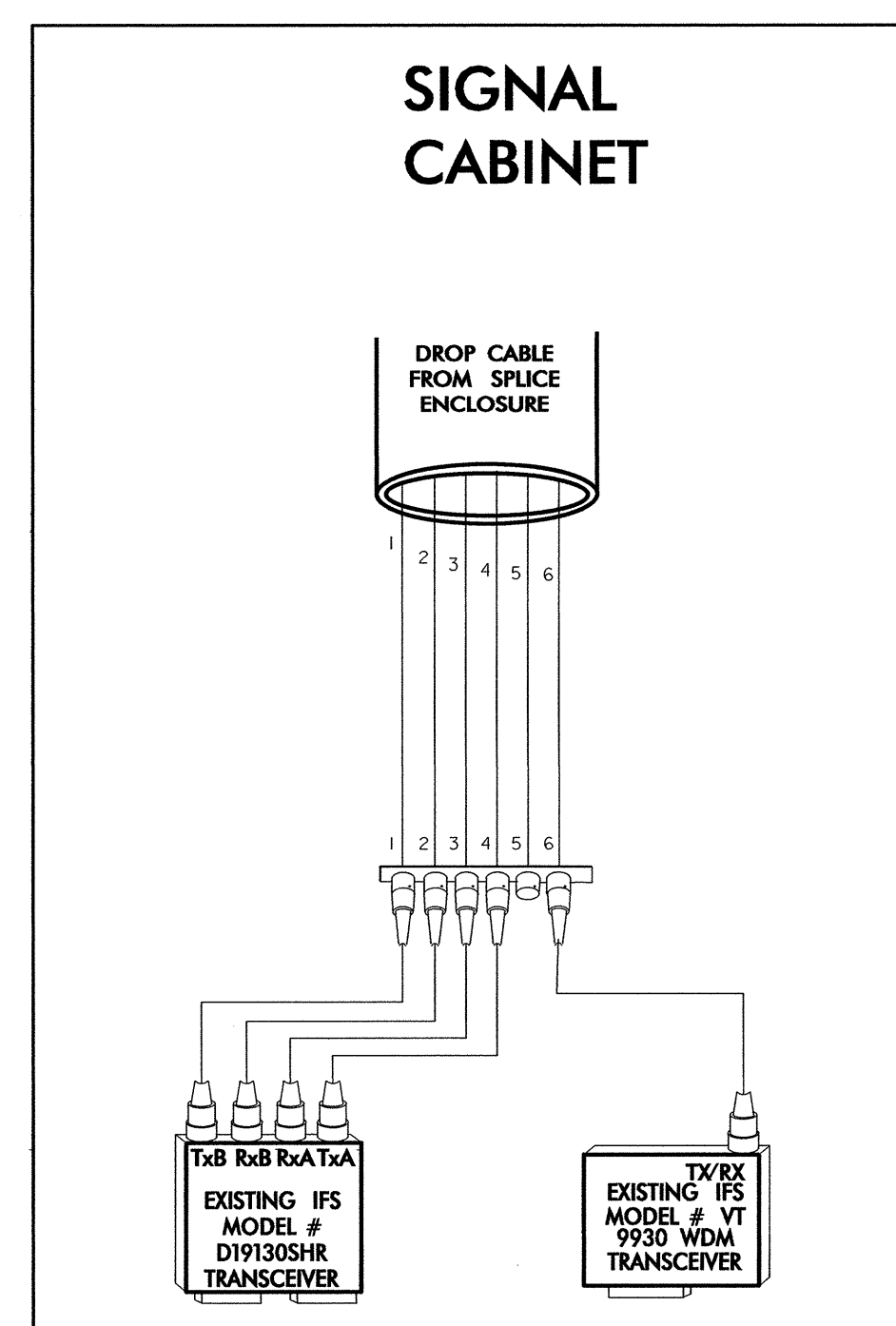


LEGEND
 X = FUSION SPLICE

COLOR CODE
 TIA/EIA 598-A

- (1) BLUE
- (2) ORANGE
- (3) GREEN
- (4) BROWN
- (5) SLATE
- (6) WHITE
- (7) RED
- (8) BLACK
- (9) YELLOW
- (10) VIOLET
- (11) ROSE
- (12) AQUA

PERFORM SPLICING
 AS SHOWN

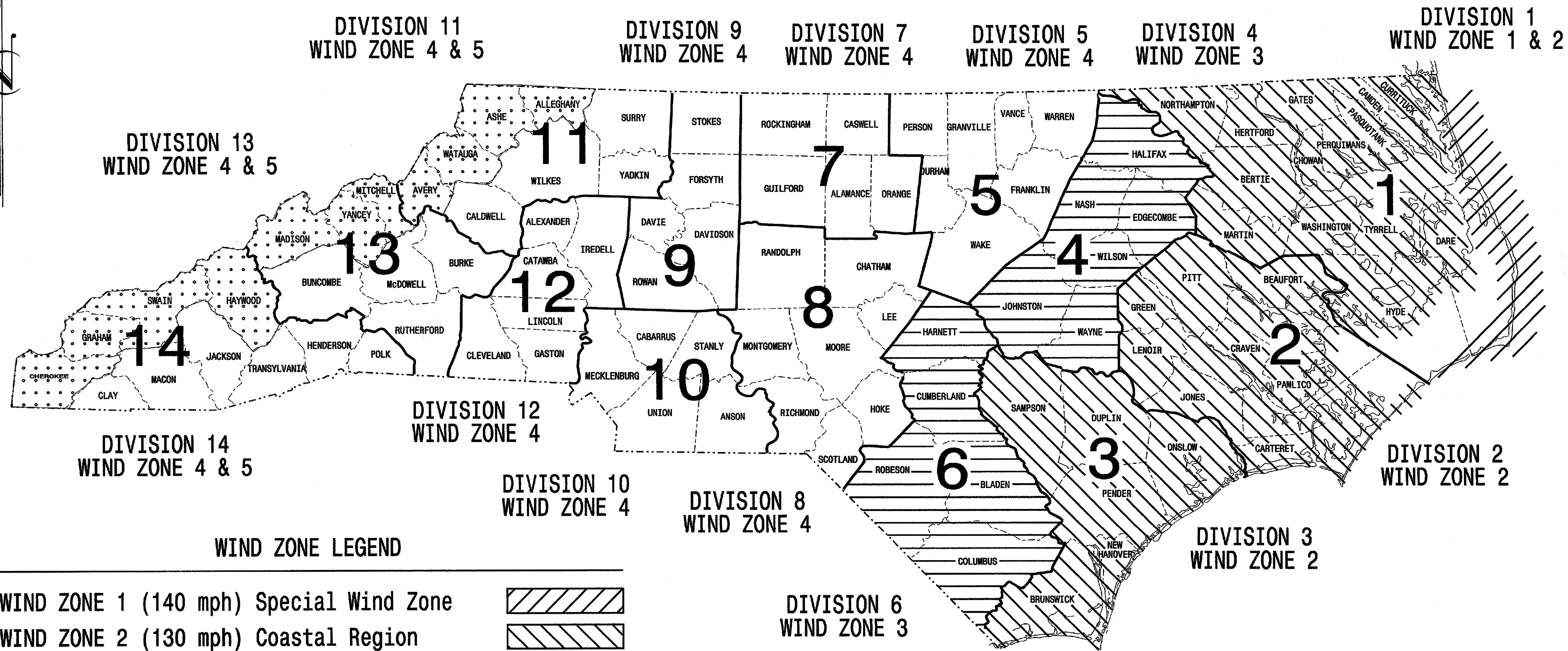


	SPLICE PLAN		
	DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE PLAN DATE: FEBRUARY 2012 REVIEWED BY: I. N. AVERY PREPARED BY: P. C. LOUDER REVIEWED BY: G. A. FULLER, PE		
750 N. Greenfield Pkwy., Garner, NC 27529 SCALE: 0	REVISIONS: _____ INIT.: _____ DATE: _____	Signature: <i>Gregory A. Fuller</i> 2/2/12 DATE: _____ CADD File Name: _____	

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.		Sig. 33
F. A. PROJ. NO.		M 1
PROJECT ID. NO.		

STANDARD DRAWINGS FOR METAL POLES

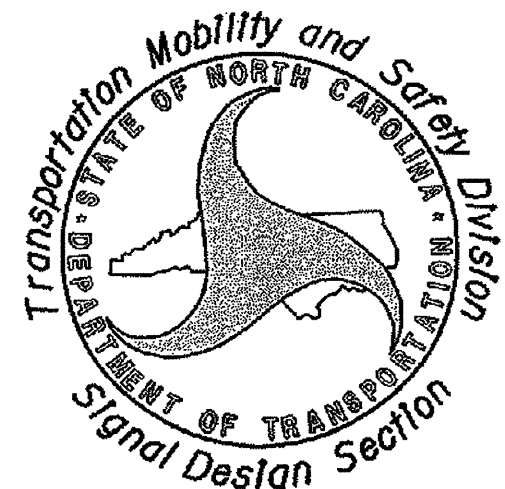


WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone		
WIND ZONE 2 (130 mph) Coastal Region		
WIND ZONE 3 (110 mph) Eastern Region		
WIND ZONE 4 (90 mph) Central & Mtn. Region		
WIND ZONE 5 (120 mph) Special Wind Zone		

<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

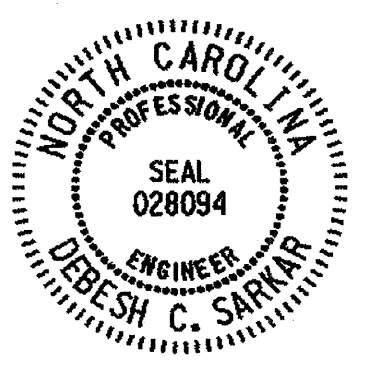
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:

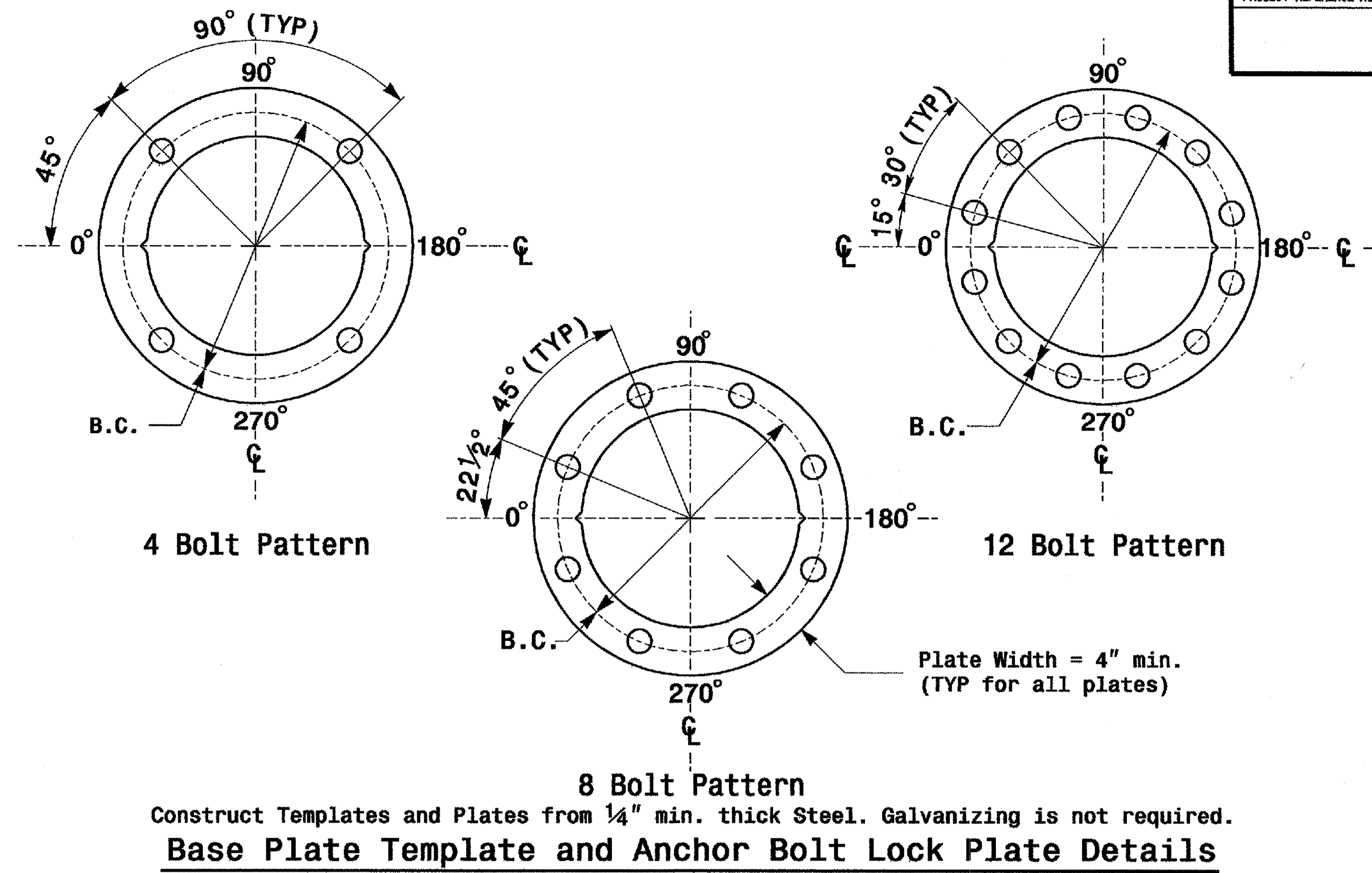
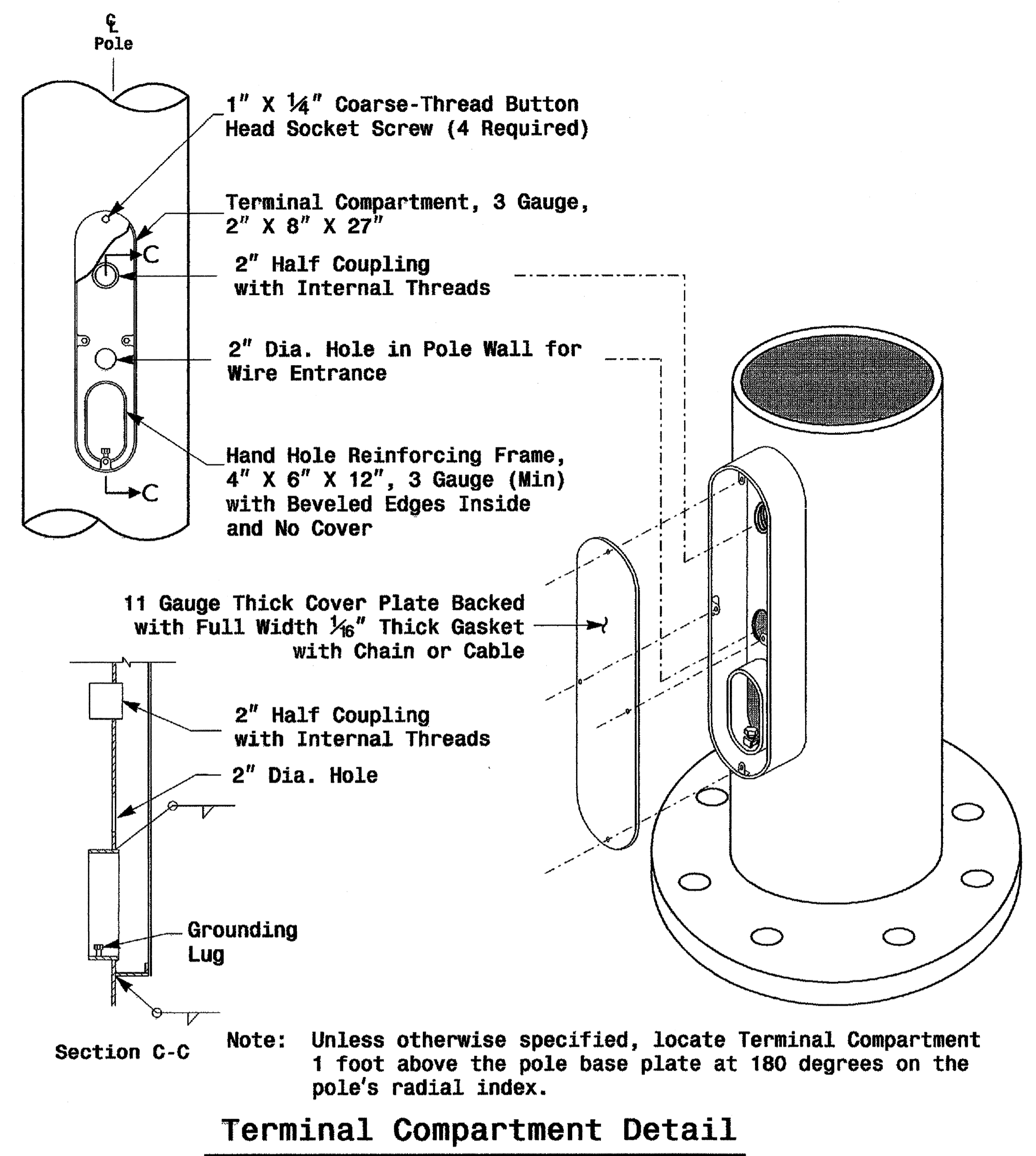
MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT

- 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



Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

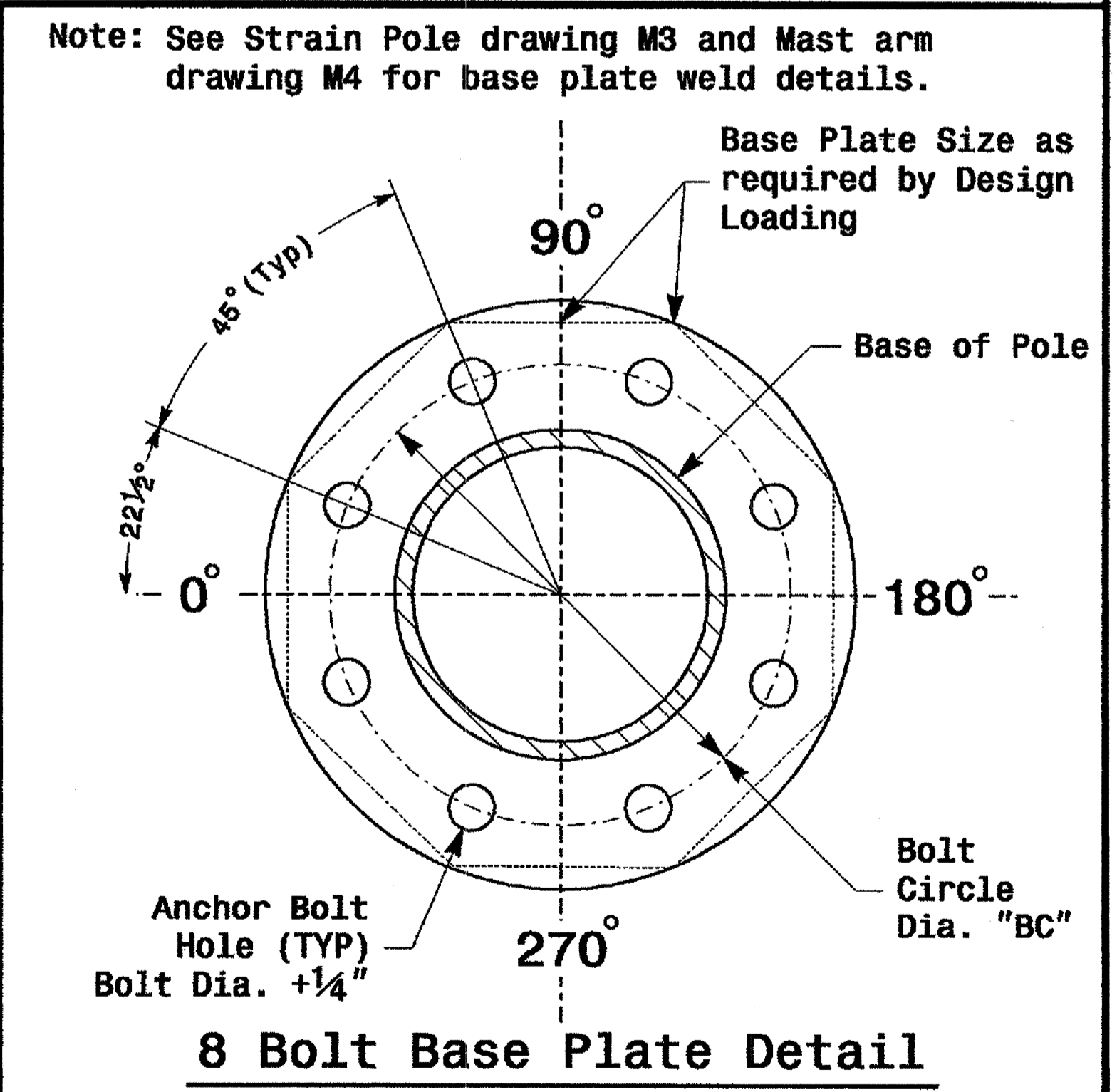
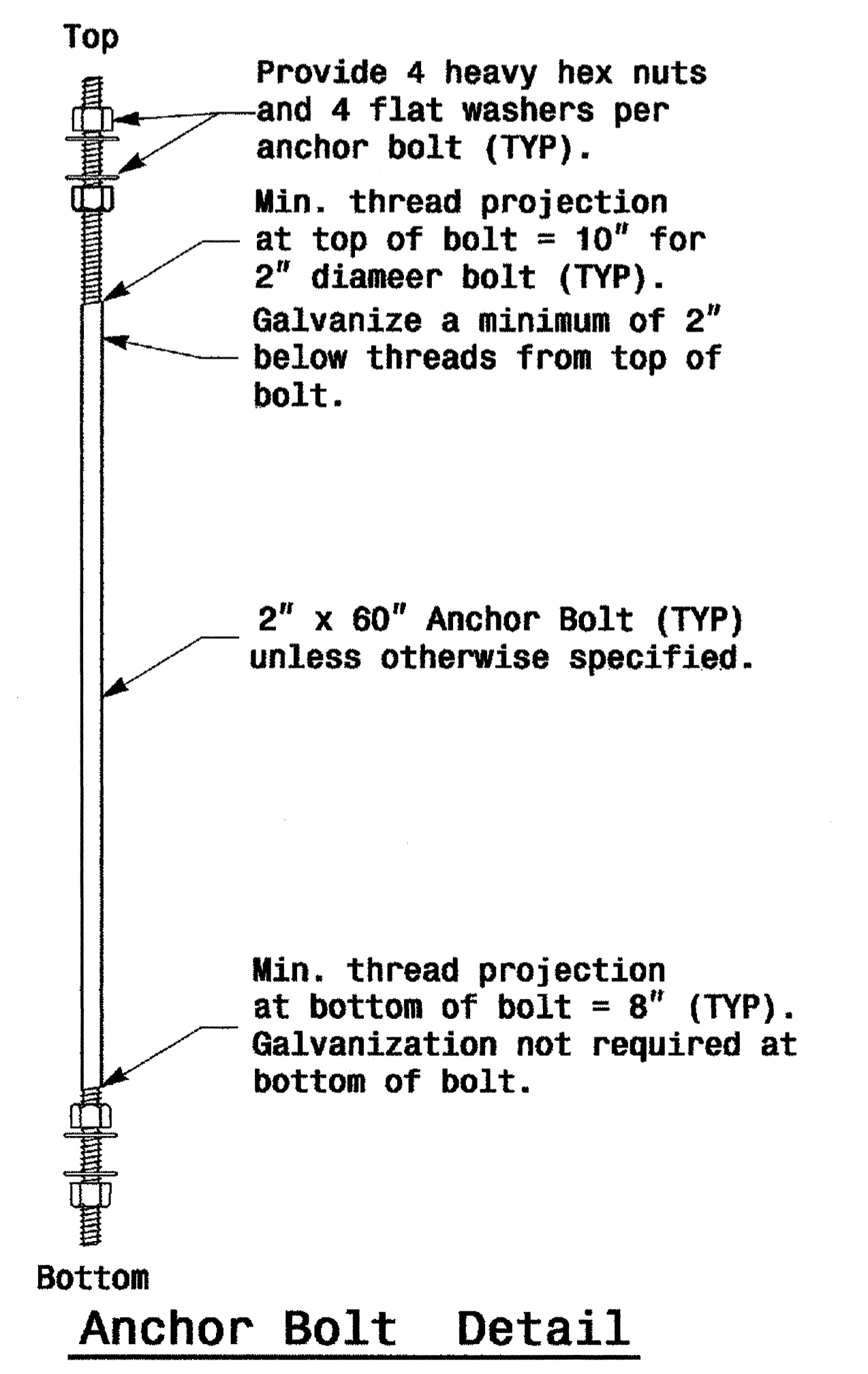
MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y _____
ARM-A D/T/L/Y _____
ARM-B D/T/L/Y _____
A.B. DIA./B.C./L/Y _____
NCDOT STANDARD _____

Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y _____
NCDOT STANDARD _____

- Notes:**
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
 - 2) A.B. = Anchor Bolt
 - 3) B.C. = Bolt Circle of Anchor Bolts
 - 4) If Custom Design, use "NCDOT STANDARD" line for plan pole I.D.
 - 5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details



Prepared in the Office of:
North Carolina State Highway Department
Department of Transportation
222 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: May 2005 REVIEWED BY: C.F. Andrews
PREPARED BY: P.L. Alexander REVIEWED BY: A.W. Esposito

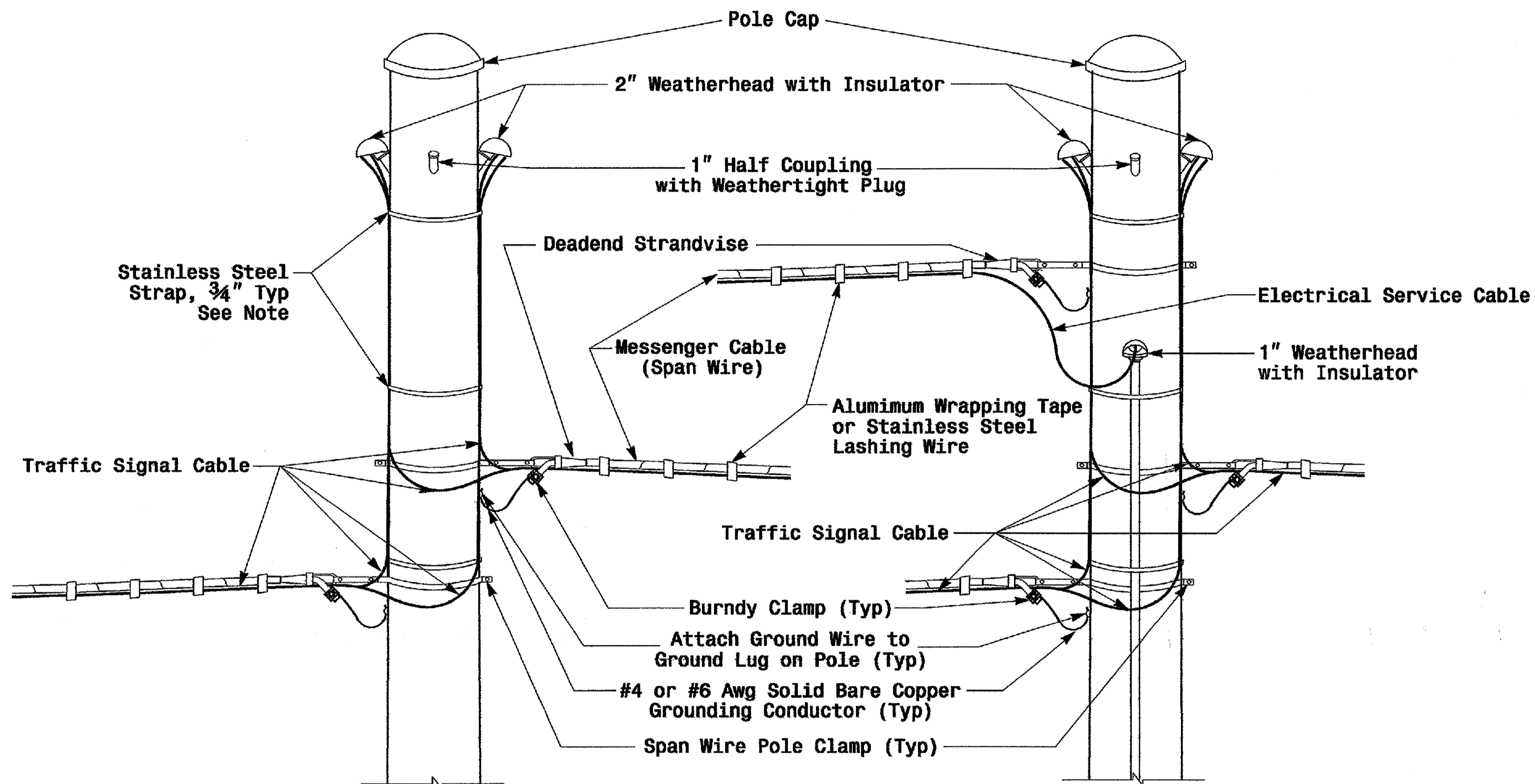
SCALE: 0 NA NONE

REVISIONS: _____ INIT. DATE

SEAL: **DEBESH C. SARKAR** ENGINEER
9.2.2005
SIG. INVENTORY NO.

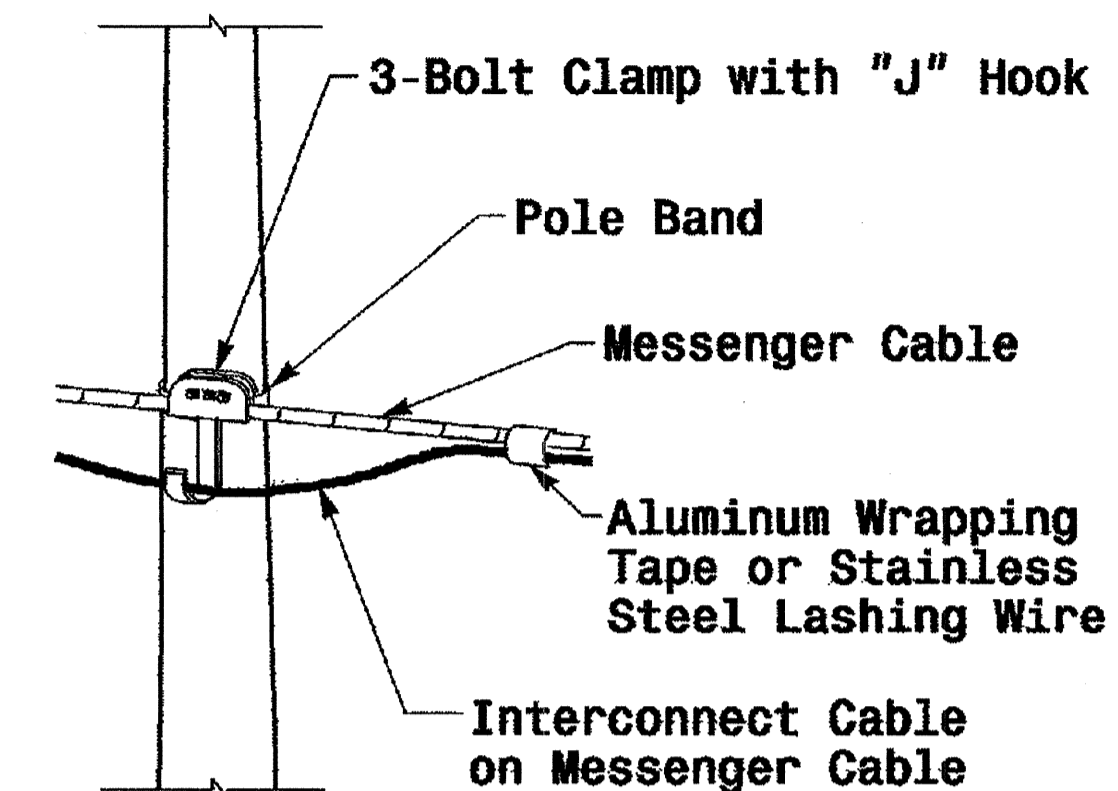
Fabrication Details - All Poles

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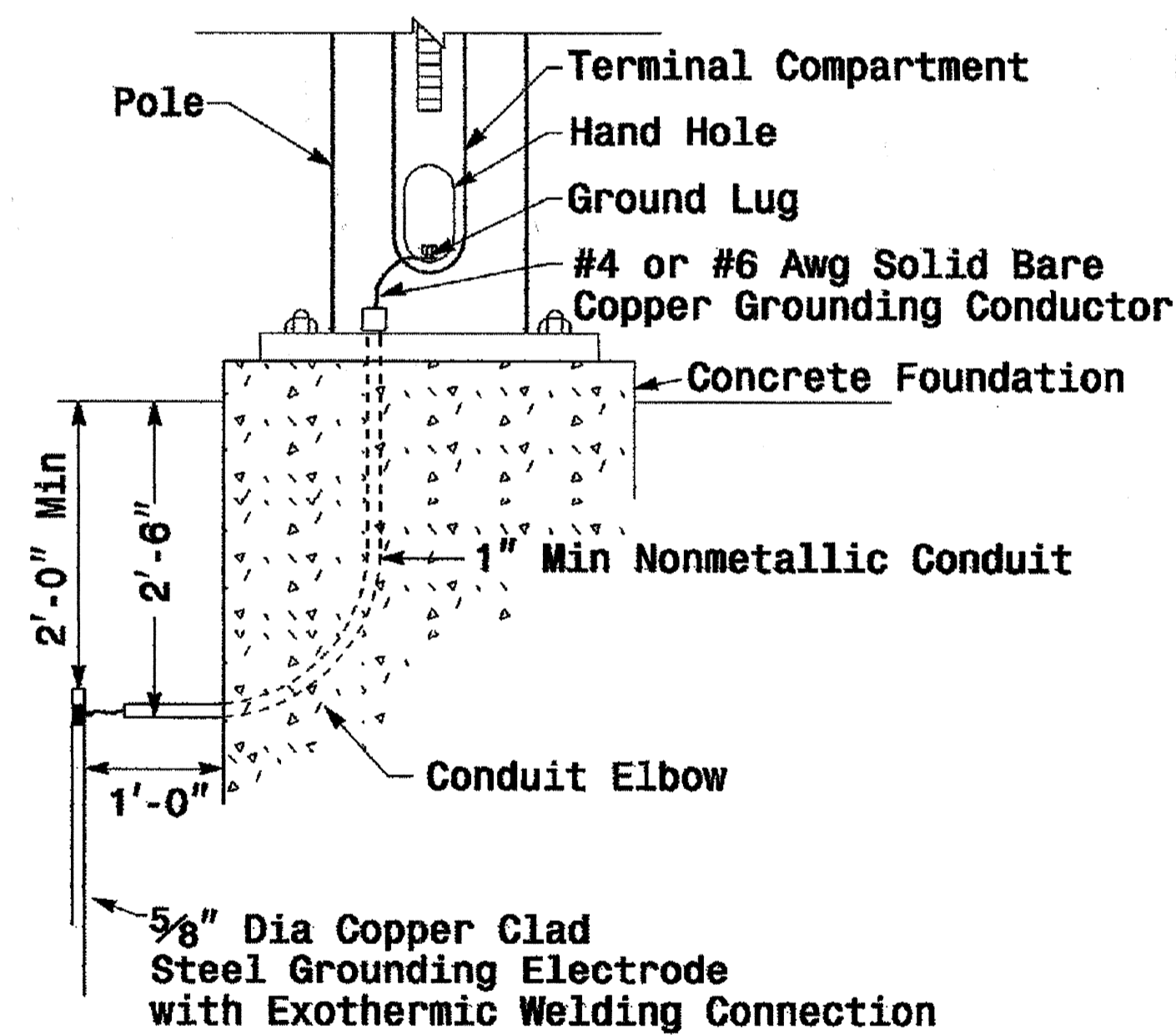


Note: Strap all signal cables to the side of the pole with 3/4\" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36\"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



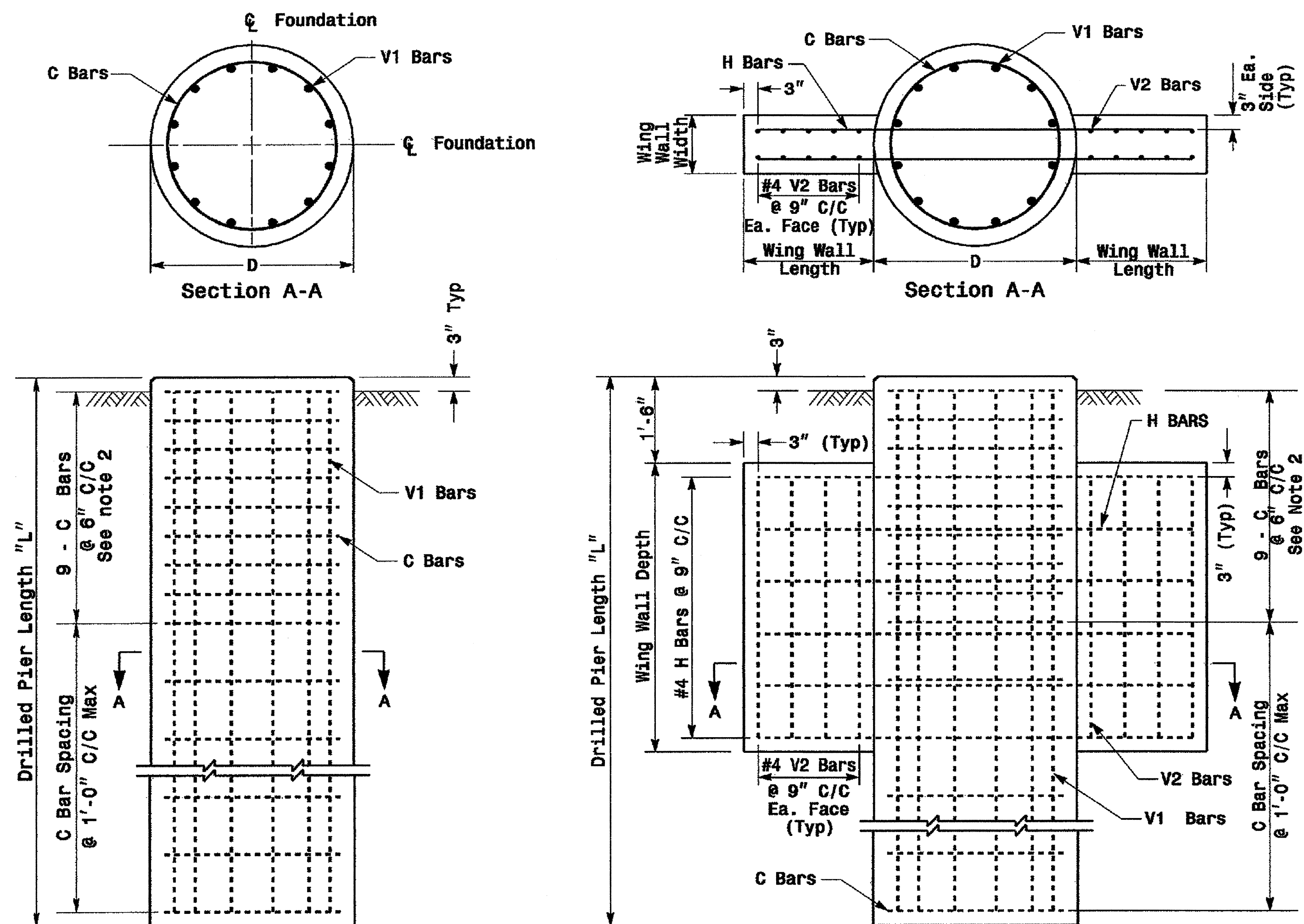
Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:33
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 polalexander

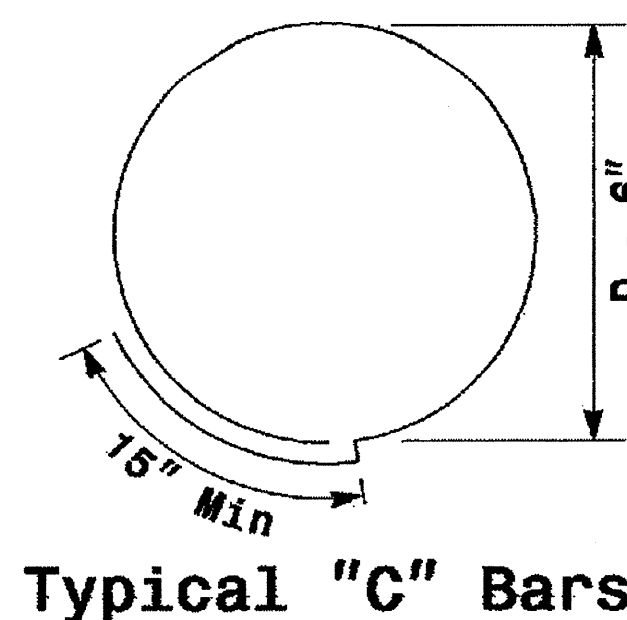
	Construction Details Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR	
SCALE: NA NONE	SIGNATURE: <i>[Signature]</i> 9-1-05 DATE		SIG. INVENTORY NO.

Reinforcing Steel Bars



REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (42" & 48" DIAMETER)						
Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	**
		C	*	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	**
		C	*	#4	CIR.	12'-6"

* See Note No. 1
** See Note No. 3



Typical "C" Bars

REINFORCING STEEL TABLE FOR STANDARD 42" and 48" DRILL PIER SHAFT WITH TYPE 1 AND TYPE 2 WING WALLS						
Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel				
		Bar Name	No.	Size	Type	Length
TYPE 1	42"	V1	9	#8	STR.	**
		V2	12	#4	STR.	2'-6"
		H	8	#4	STR.	6'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	42"	V1	9	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	48"	V1	12	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-6"
		C	*	#4	CIR.	12'-6"

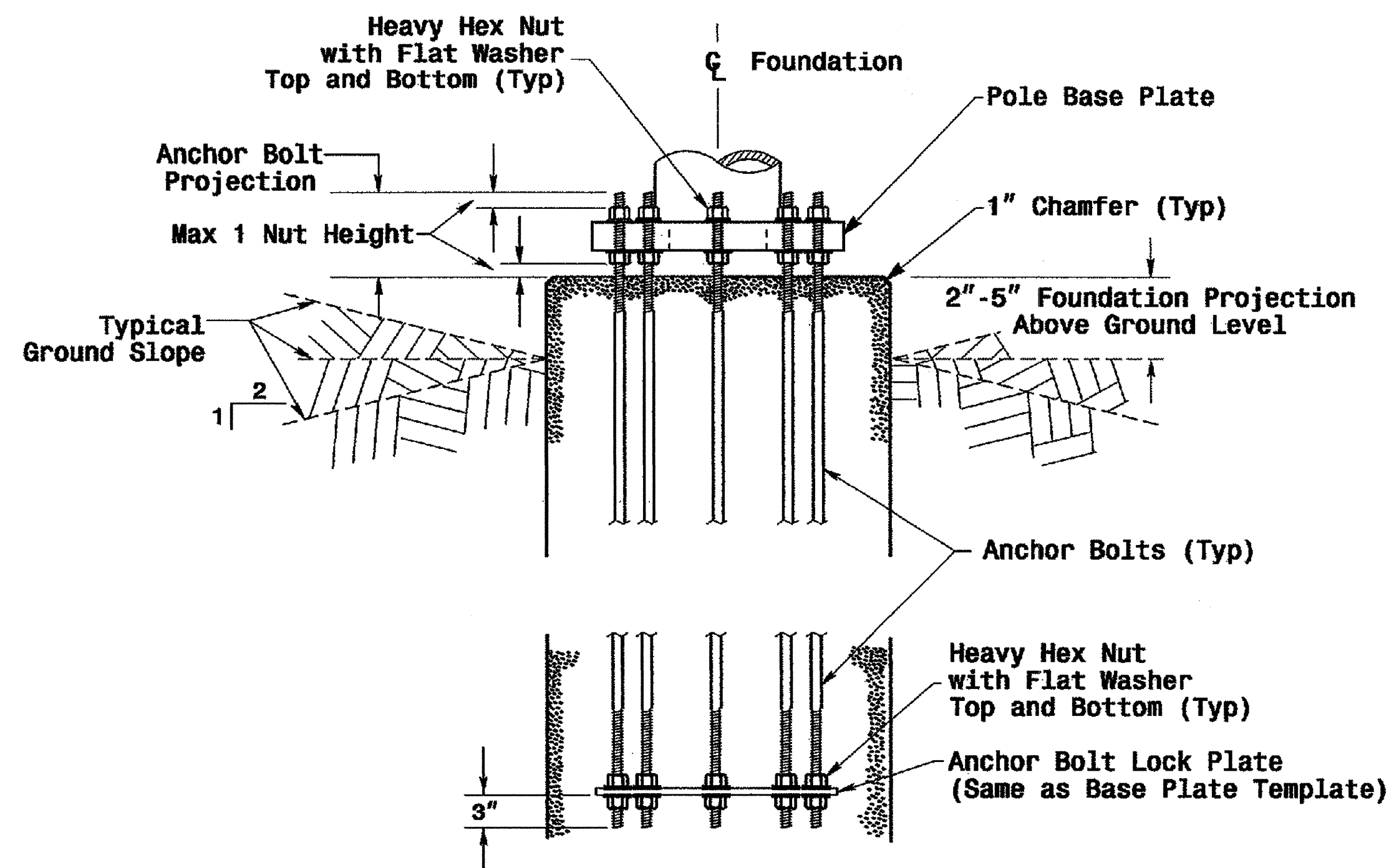
* See Note No. 1
** See Note No. 3

WING WALL DETAILS				
Wing Wall Type	Wing Wall Length (Fr.)	Wing Wall Width (Fr.)	Wing Wall Depth (Fr.)	Concrete Volume (Cu. Yds.)
TYPE 1	1'-6"	1'-0"	3'-0"	.4
TYPE 2	3'-0"	1'-0"	5'-0"	1.2

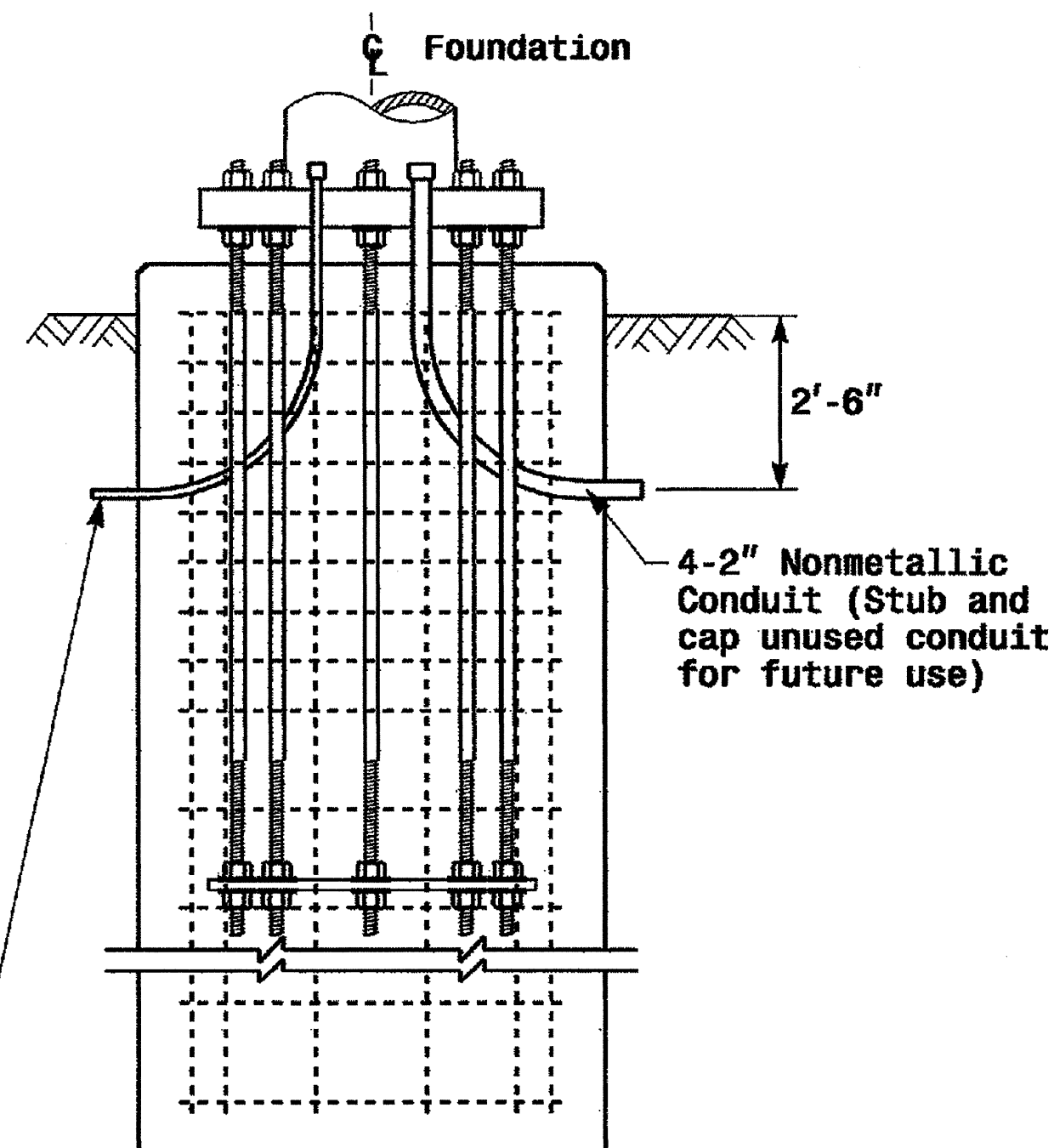
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



2-1" Nonmetallic Conduits for Electrical Service and Grounding Electrode Conductor

Notes

- The number of C-bars is based on foundation depth. For standard foundations, see sheet M 8.
- Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
- The length of V1-bars is based on foundation depth. For standard foundations, see sheet M 8.
- The quantities for steel and concrete shown in the Wing Wall Details Chart reflect the amount of material for 1 pair of wing walls (2 wing walls per drilled pier shaft.)

	Construction Details Foundations		
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS SCALE: 0 NA NONE	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.M. ESPOSITO REVISIONS: _____ INIT. DATE	

