

09/28/09

14-MAY-2013 14:03
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rwrough

TIP PROJECT: U-2524C
CONTRACT: C203197

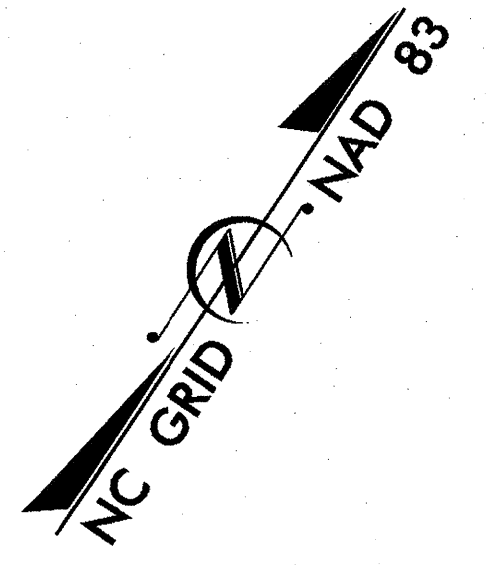
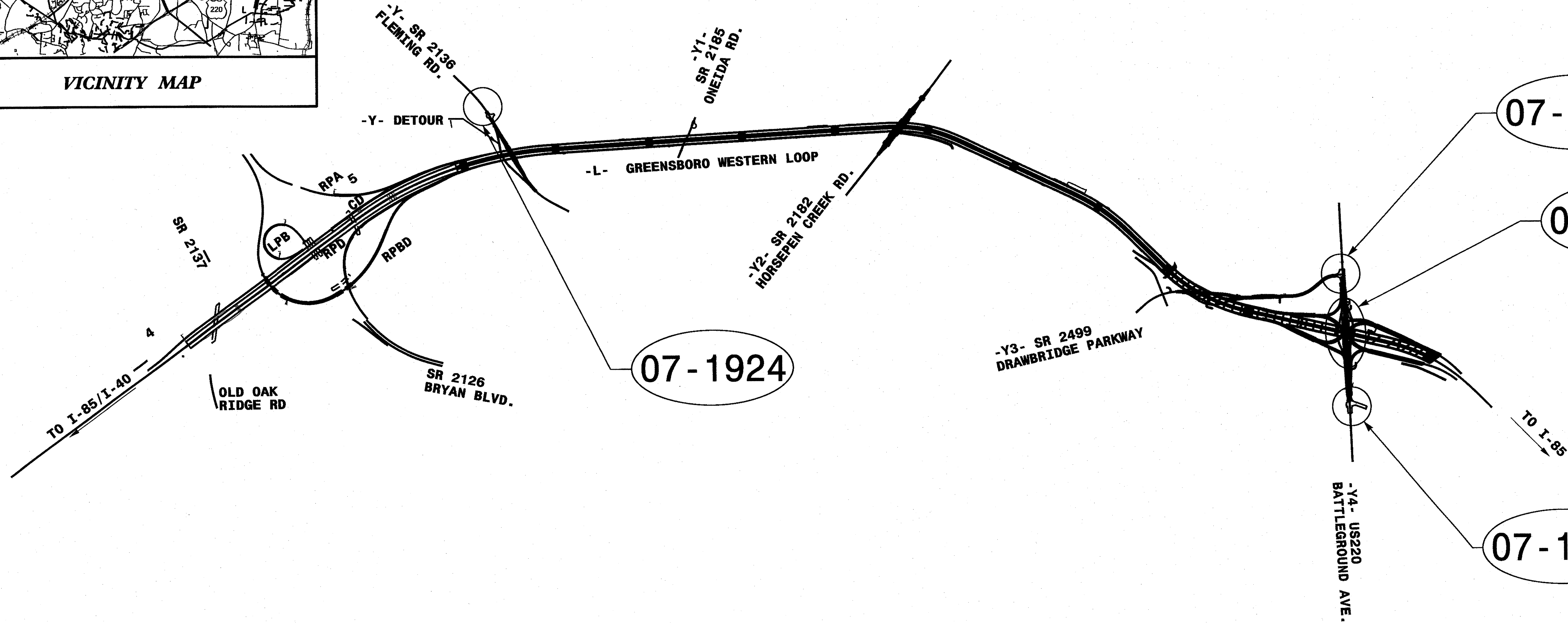
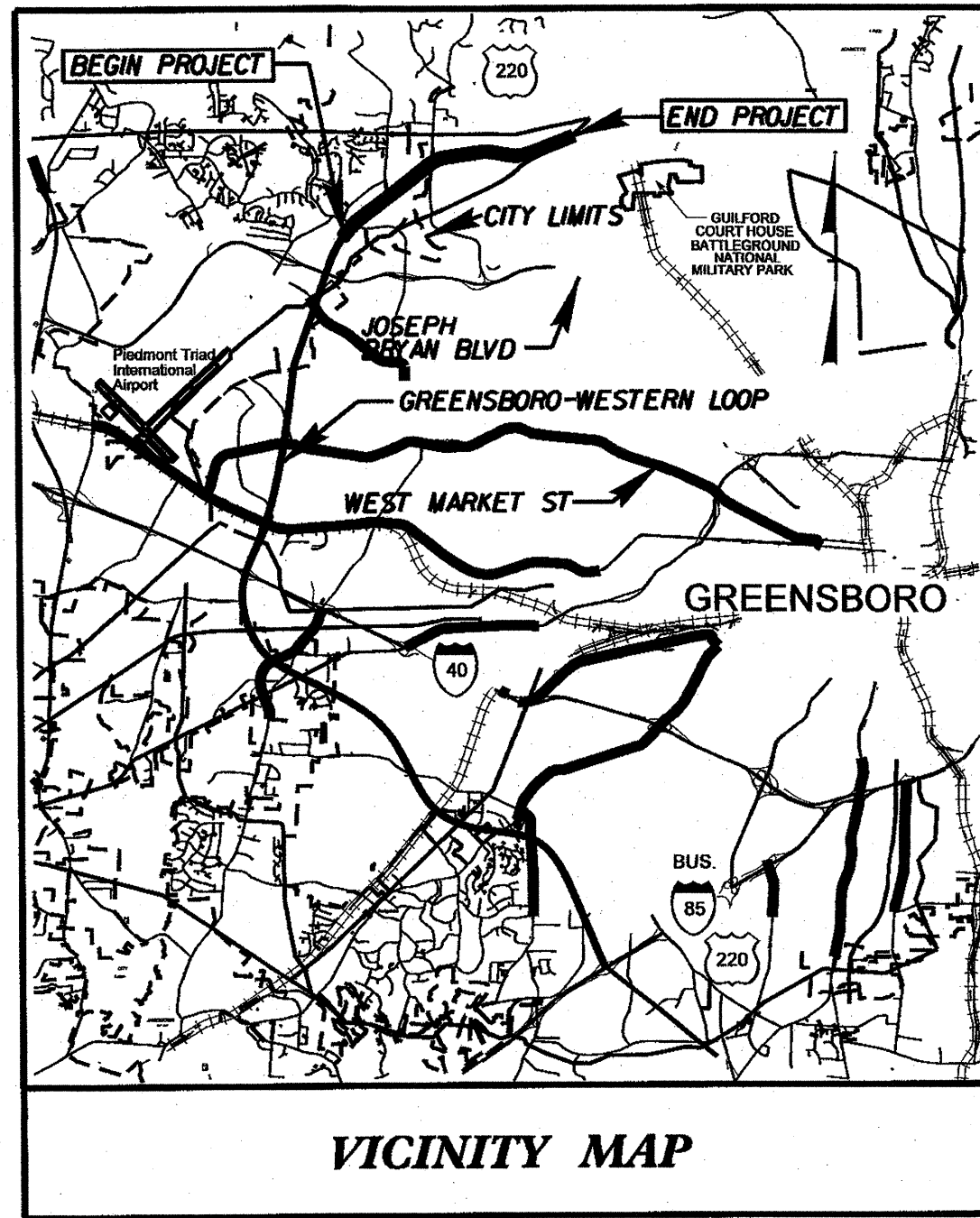
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Project No. U-2524C
Sheet No. Sig. 1

GUILFORD COUNTY

LOCATION: GREENSBORO-WESTERN LOOP FROM SOUTH OF SR 2137
(OLD OAK RIDGE ROAD) TO US 220 (BATTLEGROUND AVENUE).

TYPE OF WORK: ITS and Signals



07-1610

07-2176

07-1924

07-1484

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

Sheet #	Reference #	Location/Description
Sig. 1		Title Sheet
Sig. 2-9	07-1924	SR 2136 (Flemming Road) at SR 2124 (Lewiston Road)
Sig. 10-13	07-1610	US 220 (Battleground Avenue) at SR 2499 (Drawbridge Parkway)
Sig. 14-16	07-2176	US 220 (Battleground Avenue) at I-840 (Greensboro Western Loop) Ramps
Sig. 17-19	07-1484	US 220 (Battleground Ave.) at Cotswold Ave./Battle Crossing Driveway
Sig. 20-25	N/A	Standard Drawings for Metal Strain Poles
Sig. 26-35	N/A	Signal Communication Plans

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

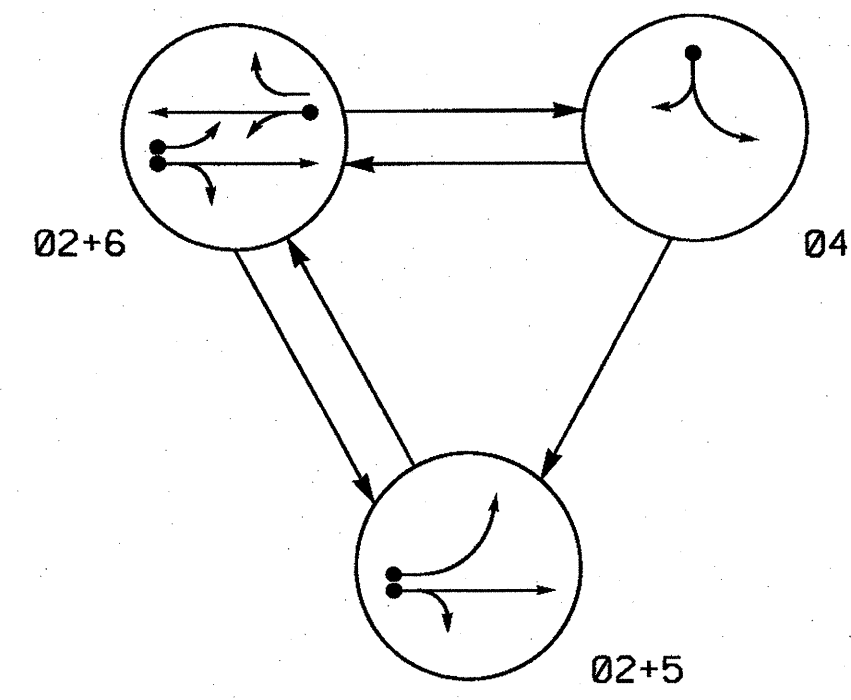
Contacts:

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

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

750 N. Greefield Parkway, Garner, NC 27529

PHASING DIAGRAM



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

Y = Flashing Yellow Arrow

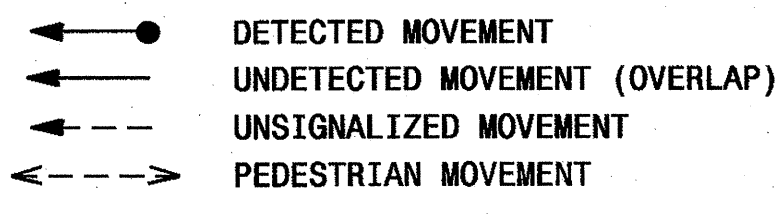
2070L LOOP & DETECTOR INSTALLATION												
LOOP	SIZE (FT)	TURNS	DISTANCE FROM STOPBAR (FT)	NEW LOOP	DETECTOR PROGRAMMING						SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME		
2A/S3	6x6	EXIST	300	-	2	Y	Y	-	1.6	-	Y	-
2B	6x6	EXIST	90	-	2	Y	Y	-	-	-	-	-
4A	6x60	2-4-2	0	-	4	Y	Y	-	-	5	-	-
4B	6x15	EXIST	+5	-	4	Y	Y	-	-	-	-	-
5A	6x60	2-4-2	+5	-	5	Y	Y	-	-	15	-	-
6A/S4	6x6	4	300	Y	6	Y	Y	-	1.6	-	Y	-
6B	6x6	4	90	Y	6	Y	Y	-	-	-	-	-

3 Phase Fully Actuated SR 2136 (Fleming Rd) CLS

NOTES

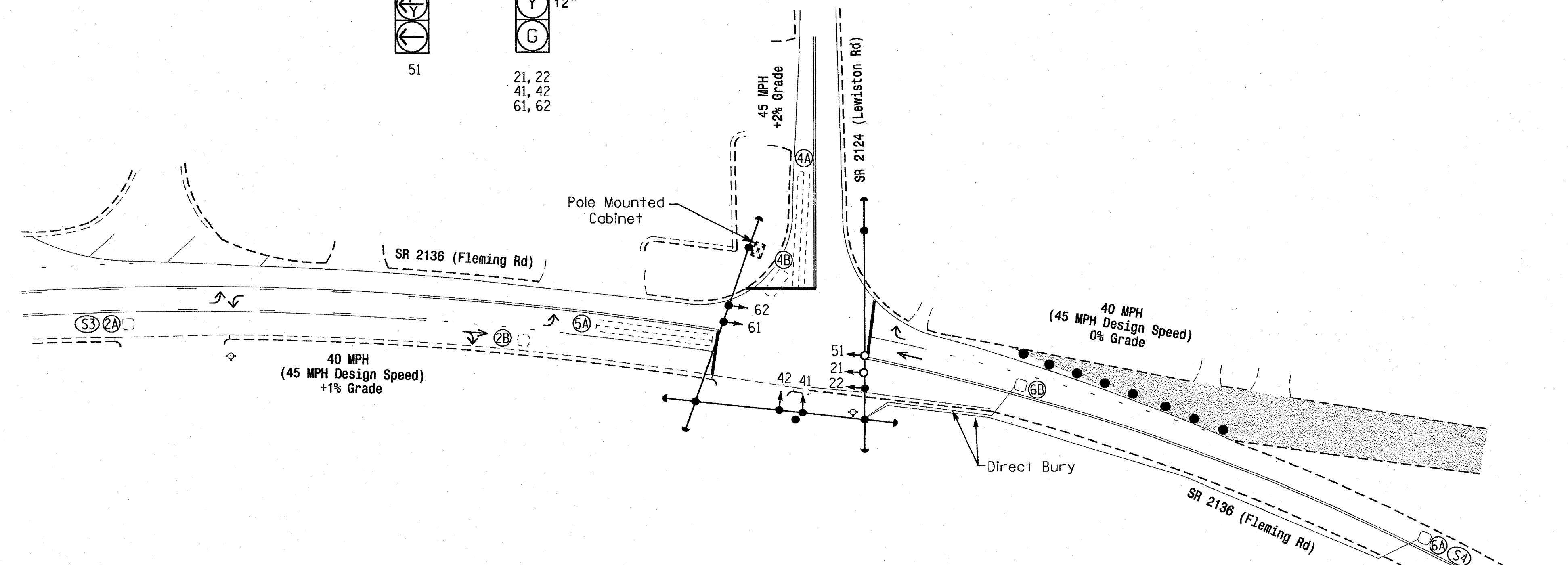
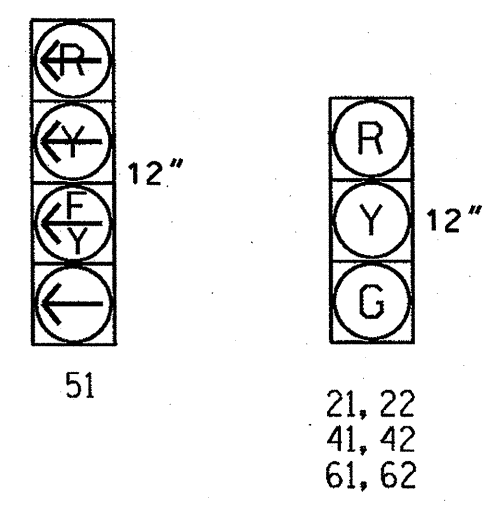
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
- Reposition existing signal heads numbered 22, 61, and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Pavement markings are existing unless otherwise shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



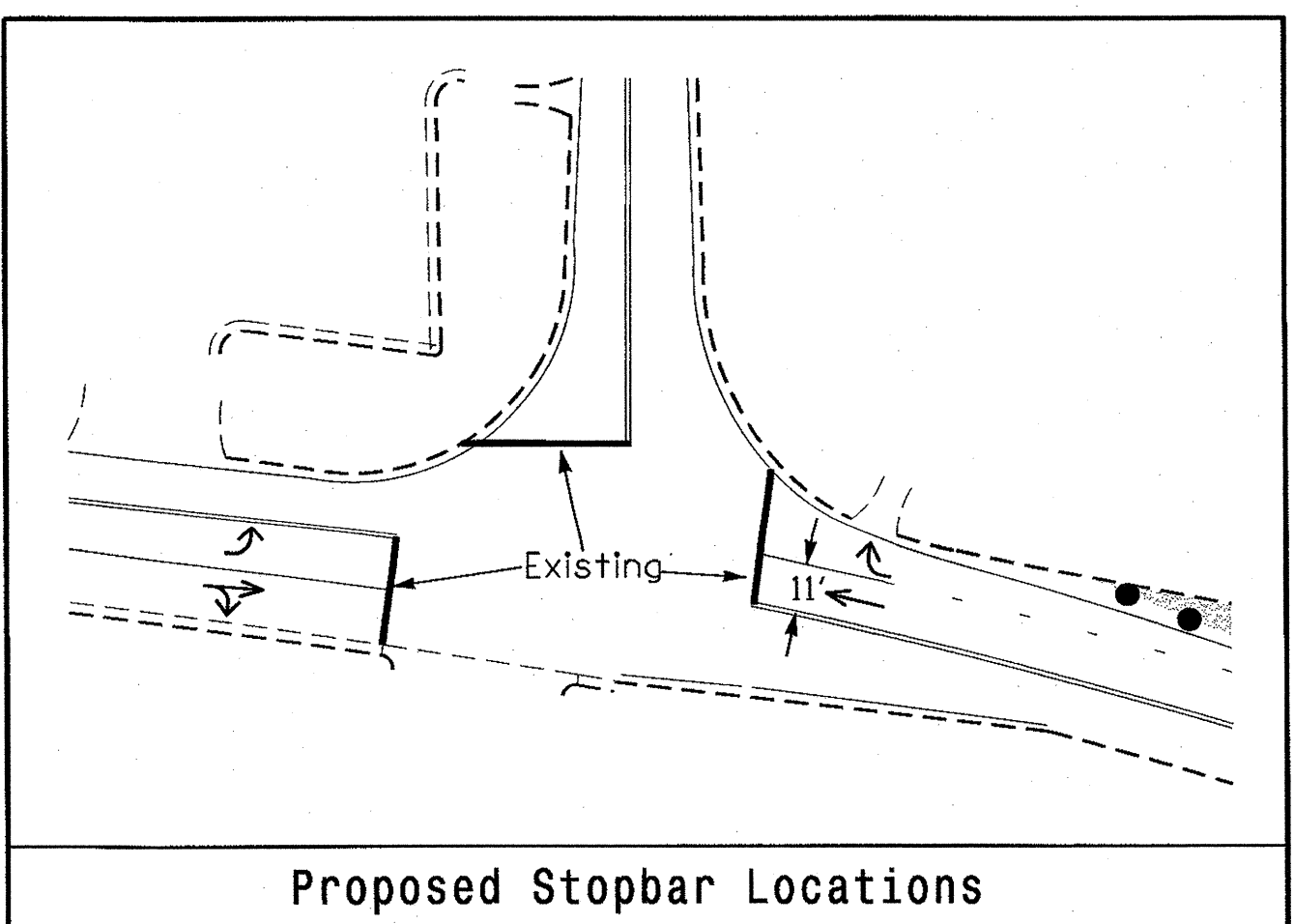
SIGNAL FACE I.D.

All Heads L.E.D.



FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	1.0	1.0	2.0
Max Green 1 *	60	25	15	60
Yellow Clearance	4.5	3.4	3.0	4.5
Red Clearance	1.3	1.5	2.1	1.3
Red Revert	5.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



LEGEND	
PROPOSED	EXISTING
	N/A

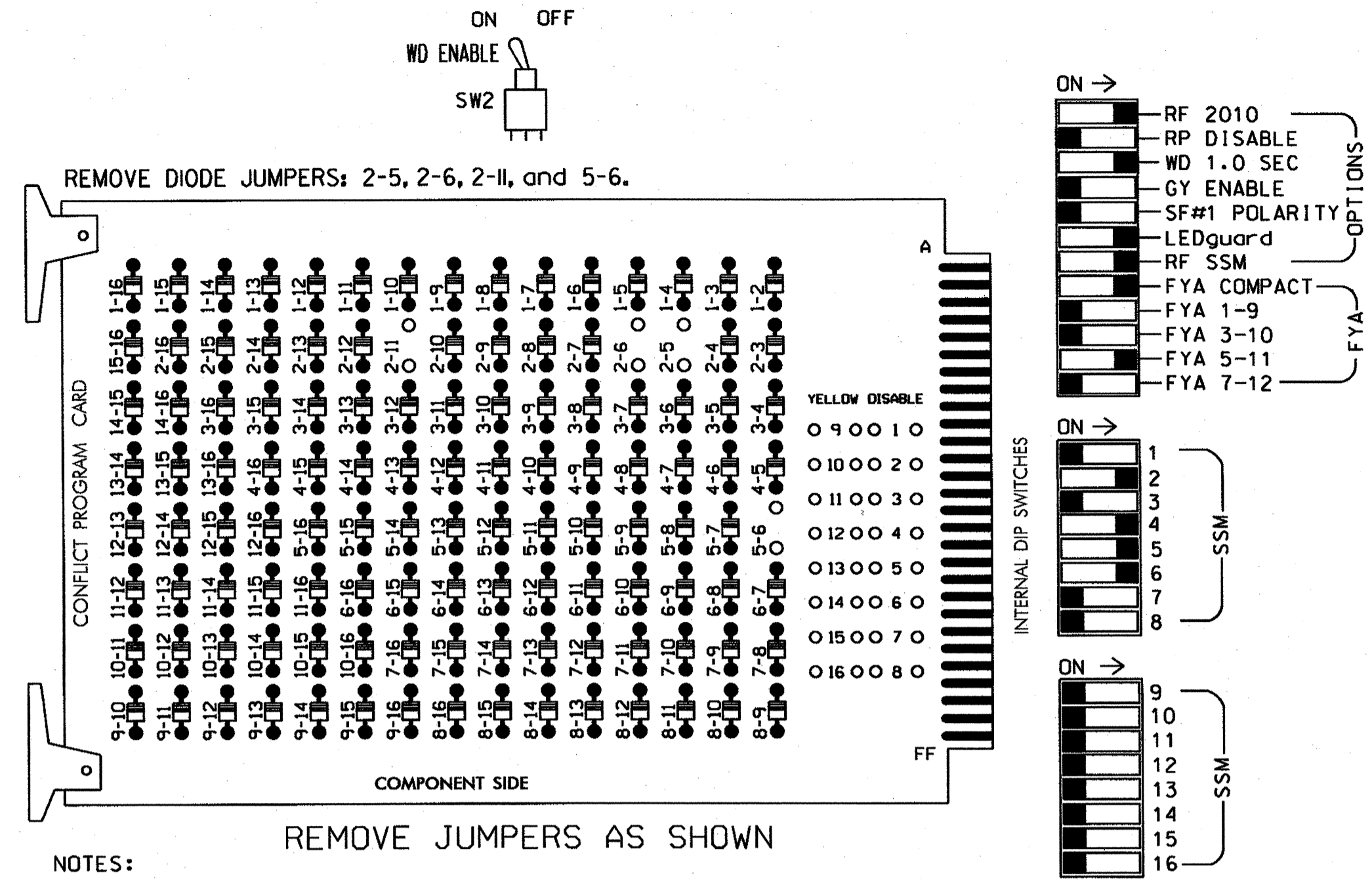
Signal Upgrade - Temporary Design (TMP Phase II)

	SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)		
	Division 7 Guilford County Greensboro PLAN DATE: March 2013 PREPARED BY: R. Hough	REVIEWED BY: REVIEWED BY:	
SCALE 1"=40' 	REVISIONS INIT. DATE	INVENTORY NO. 07-1924T	

09-MAY-2013 15:49 P:\P\PP\Proj\BCTB-U-2524C\T\off\cws\gnal\des\gnal\07-1924T-2136.dwg 20130509.dgn

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Make sure jumpers SEL2-SEL5 are present on the monitor board.
 - Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.
 - IMPORTANT!** 2010ECL-NC conflict monitor required for FYA operation.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the SR 2136 (Fleming Rd) Closed Loop System.

EQUIPMENT INFORMATION

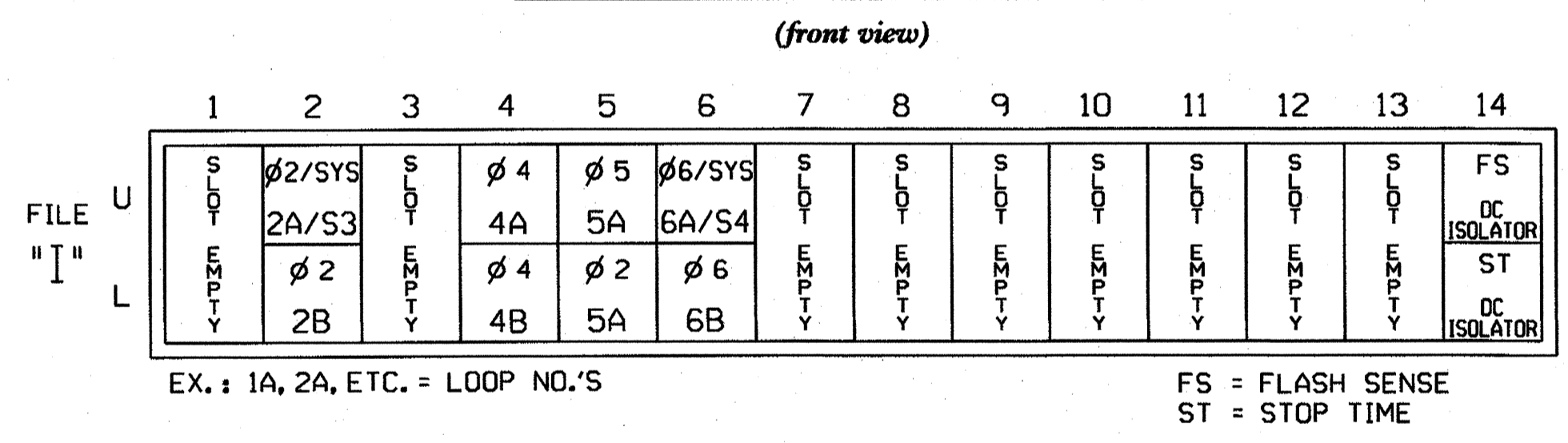
CONTROLLER.....2070L
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S4,S5,S6,S6P
 PHASES USED.....2,4,5,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	OLA	2	2 PED	3	4	4 PED	OLC	6	5 GRN	6 PED	7	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	51	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW							131					
YELLOW ARROW							132					
FLASHING YELLOW ARROW							133					
GREEN ARROW								120				
										*		

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail below.
 ★ See pictorial of head wiring in detail below.
 NOTE: Load Switches S5 and S6P require output remapping. See sheet 3 of this electrical detail for instructions.

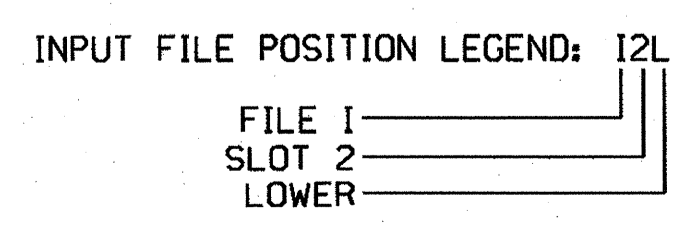
INPUT FILE POSITION LAYOUT



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A/S3	TB21-3,4	I2U	39	1	2	2/SYS	Y	Y		1.6	
2B	TB23-3,4	I2L	43	5	12	2	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			5
4B	TB23-7,8	I4L	45	7	14	4	Y	Y			
5A ¹	TB21-9,10	I5U	55	17	5	5	Y	Y			15
	TB23-9,10	I5L	48	10	26	2	Y	Y			
6A/S4	TB21-11,12	I6U	40	2	6	6/SYS	Y	Y		1.6	
6B	TB23-11,12	I6L	44	6	16	6	Y	Y			

¹Add jumpers from TB21-9 to TB23-9, and from TB21-10 to TB23-10.

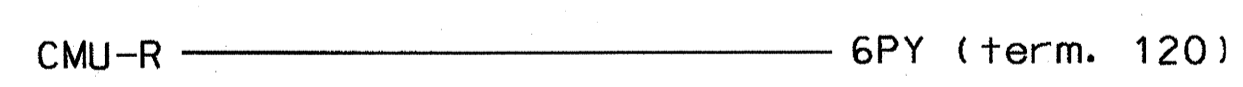


PED YELLOW CONFLICT MONITOR WIRING DETAIL

(make cabinet wiring changes as shown below)

In order to use FYA COMPACT mode on the 2010ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: from 6 PY (field term. 120) to chan. 10 green (monitor pin R).

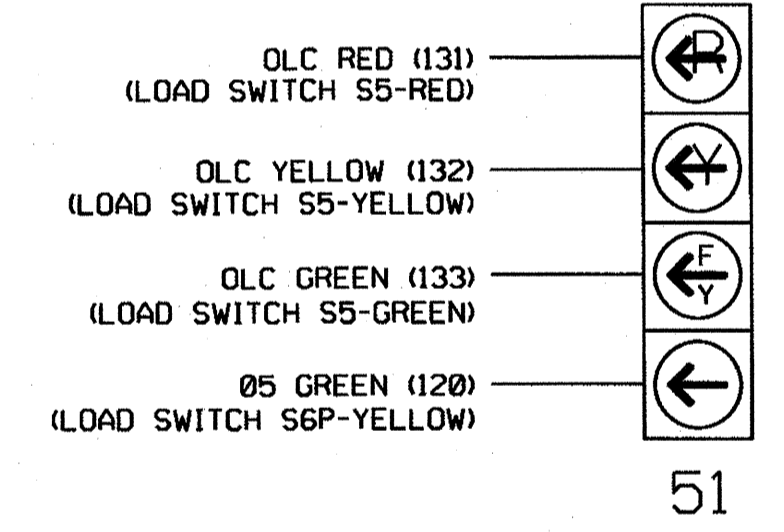
- Follow the instructions below to make the appropriate connections:
- STEP 1: Fold down rear panel of output file.
 - STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).
 - STEP 3: Find the conductors that correspond to the following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



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

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

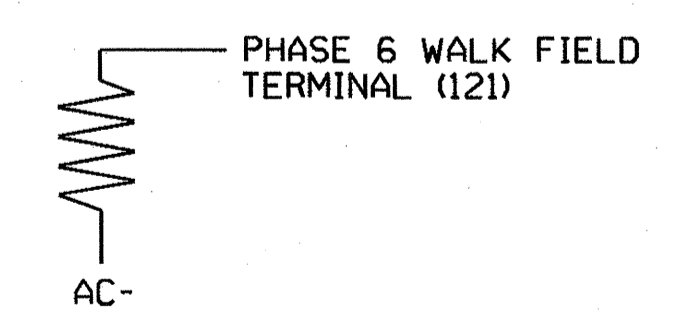


NOTE: The sequence display for signal head 51 requires special logic and output remapping. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Signal Upgrade - Temporary Design (TMP Phase II) - Sheet 1 of 3

Electrical and Programming Details For:

SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)

Division 7 Guilford County Greensboro

PLAN DATE: April 2013 REVIEWED BY: JTR

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T
 DESIGNED: March 2013
 SEALED: 5/9/13
 REVISED: N/A

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453

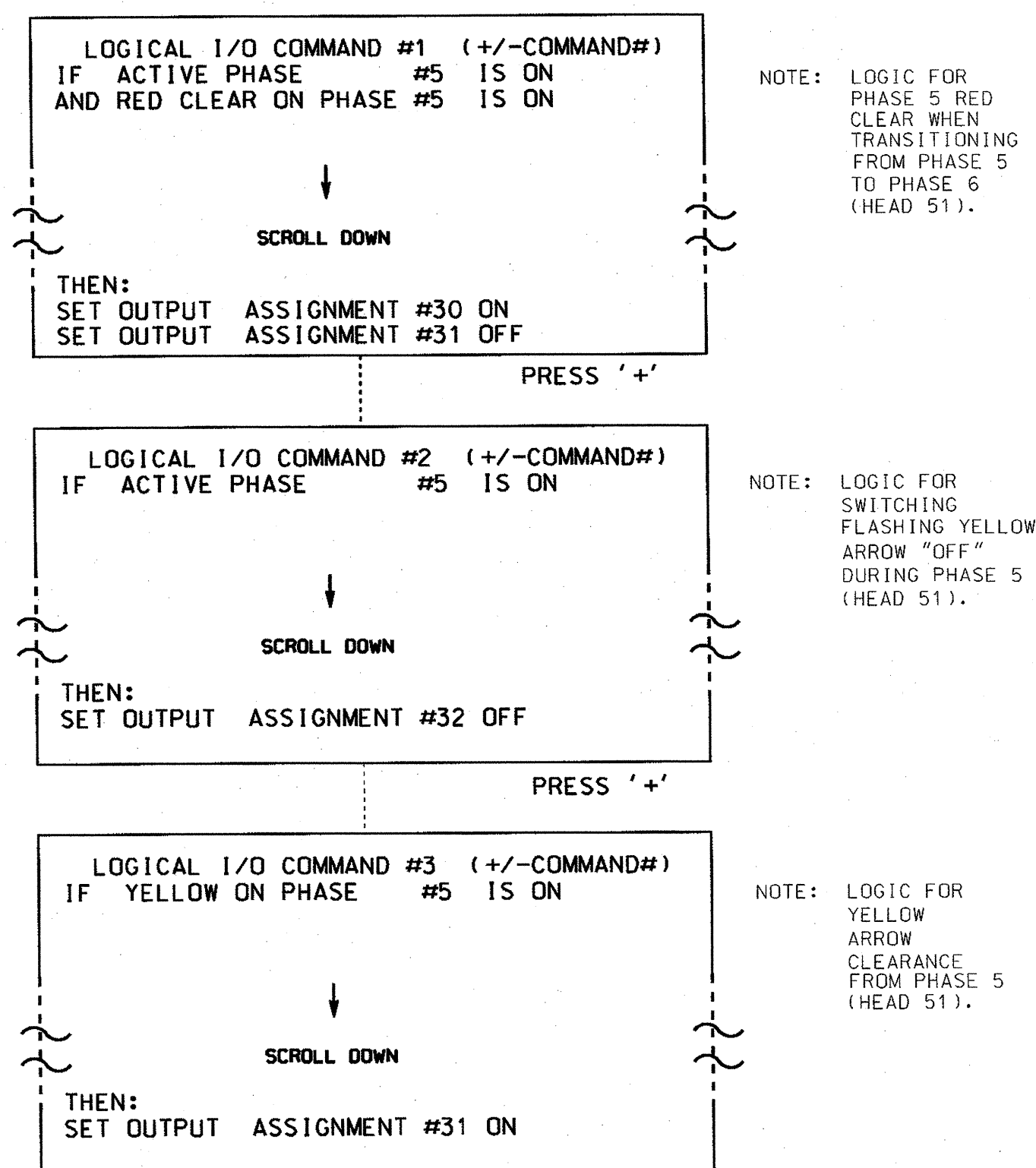
Signature: JTR DATE: 5-14-13

SIG. INVENTORY NO. 07-1924T

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

(program controller as shown below)

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



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 30	= Overlap C Red
OUTPUT 31	= Overlap C Yellow
OUTPUT 32	= Overlap C Green
OUTPUT 34	= Phase 5 Green

Note: All outputs shown above have been remapped. See sheet 3 of this electrical detail.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

- From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
- From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```

DYNAMIC/BACKUP CONTROL FUNCTION #01
OVERLAPS: ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE:
OR PHASES: 12345678910111213141516
IF PHASES ARE ON: X
OMIT PHASES: X
CALL PHASES: X
    
```

BACKUP PROTECTION PROGRAMMING COMPLETE

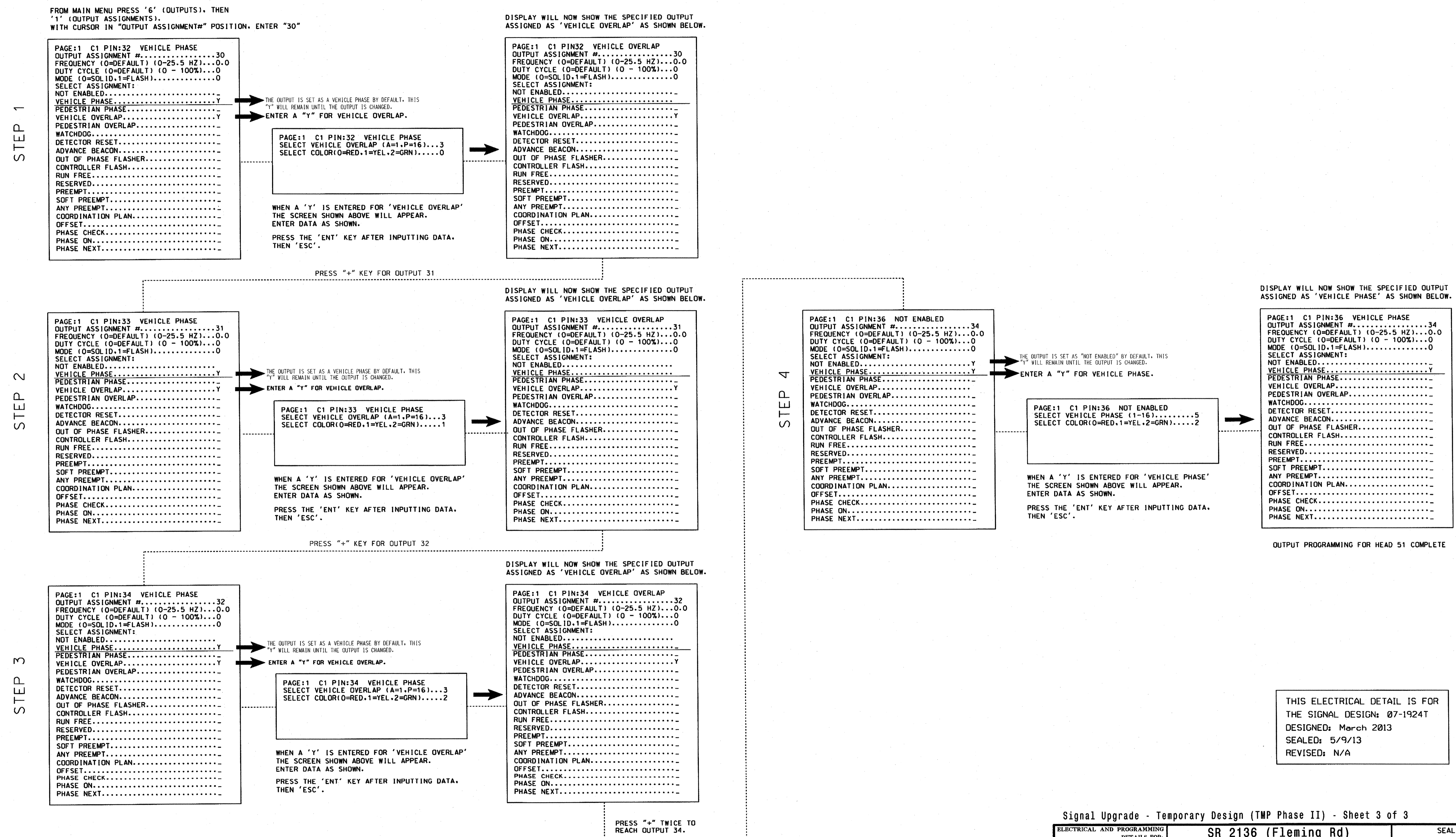
Signal Upgrade - Temporary Design (TMP Phase II) - Sheet 2 of 3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)		
	Prepared In the Offices of:	Division 7	Guilford County	Greensboro	
PLAN DATE: April 2013	PREPARED BY: S. Armstrong	REVIEWED BY: JTR	REVISIONS	INIT. DATE	SIGNATURE: John T. Rowe DATE: 5-14-13
					SIG. INVENTORY NO. 07-1924T

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 51

(program controller as shown below)



```

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

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

```

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

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

```

PAGE:1 C1 PIN:32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
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.....
    
```

```

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

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

```

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

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

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
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.....
    
```

```

PAGE:1 C1 PIN:36 NOT ENABLED
OUTPUT ASSIGNMENT #.....34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....
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 PHASE.

```

PAGE:1 C1 PIN:36 NOT ENABLED
SELECT VEHICLE PHASE (1-16).....5
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
    
```

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

```

PAGE:1 C1 PIN:36 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....
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 HEAD 51 COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

Signal Upgrade - Temporary Design (TMP Phase II) - Sheet 3 of 3

	SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)		
	Division 7 PREPARED BY: S. Armstrong	Guilford County GREENSBORO REVIEWED BY: JTR	
REVISIONS		INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529

10-MAY-2013 09:48 S:\TSS\JMS\SIG\1018\Work\Outputs\51\9 Mon\ArmsTron\071924_Sm.dwg (e.xxx.dgn) sarmstrong

PHASING DIAGRAM

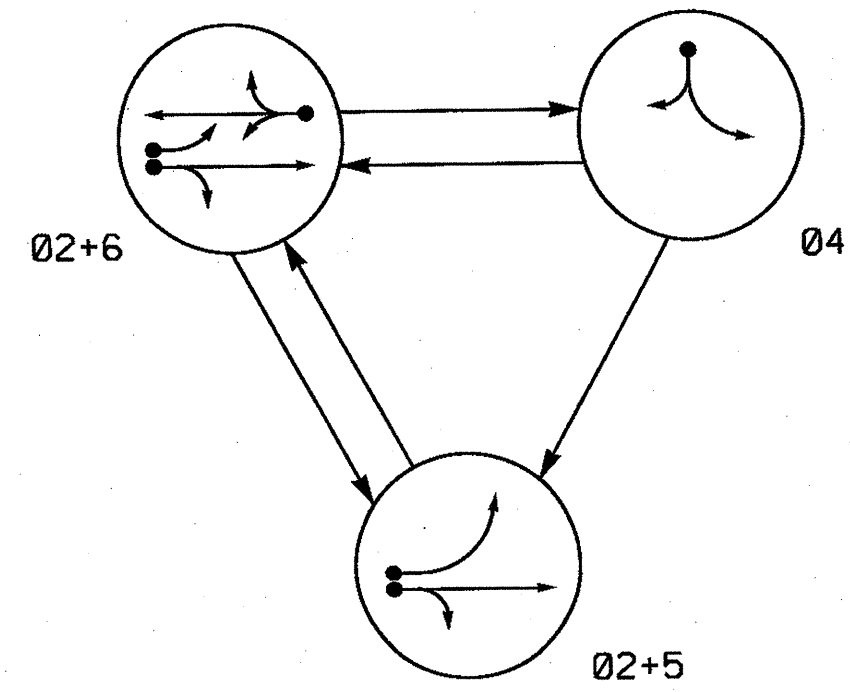


TABLE OF OPERATION

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

← = Flashing Yellow Arrow

2070L LOOP & DETECTOR INSTALLATION

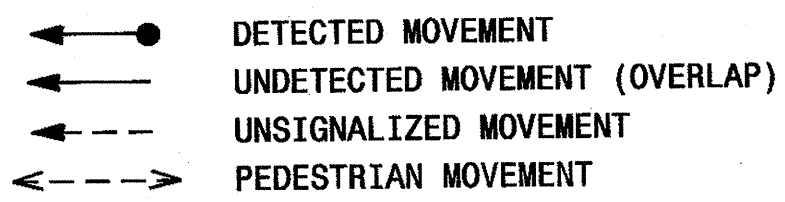
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	TURNS	DISTANCE FROM STOPBAR (FT)	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A/S3	6x6	EXIST	300	-	2	Y	Y	-	1.6	-	Y	-
2B	6x6	EXIST	90	-	2	Y	Y	-	-	-	-	-
4A	6x60	2-4-2	0	-	4	Y	Y	-	-	10	-	-
4B	6x15	EXIST	+5	-	4	Y	Y	-	-	15	-	-
5A	6x60	2-4-2	+5	-	5	Y	Y	-	-	15	-	-
6A/S4	6x6	4	300	Y	6	Y	Y	-	1.6	-	Y	-
6B	6x6	4	90	Y	6	Y	Y	-	-	-	-	-

3 Phase Fully Actuated SR 2136 (Fleming Rd) CLS

NOTES

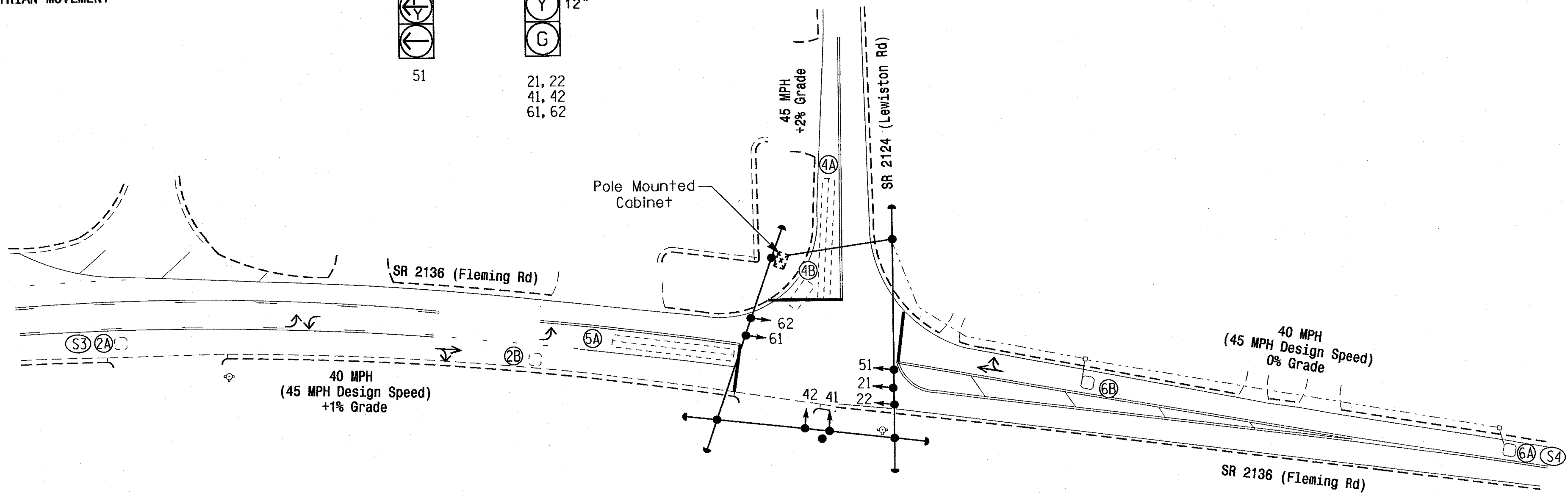
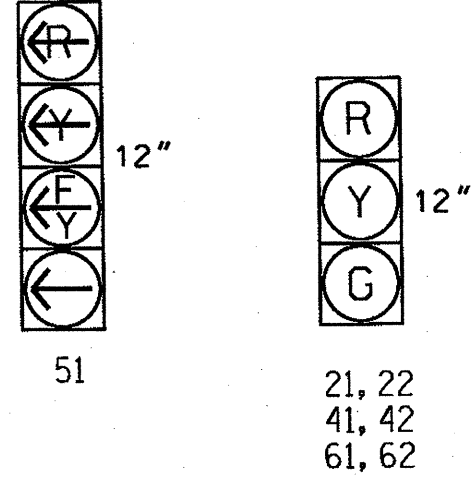
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through an all red display.
- Reposition existing signal heads numbered 61 and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Pavement markings are existing unless otherwise shown.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

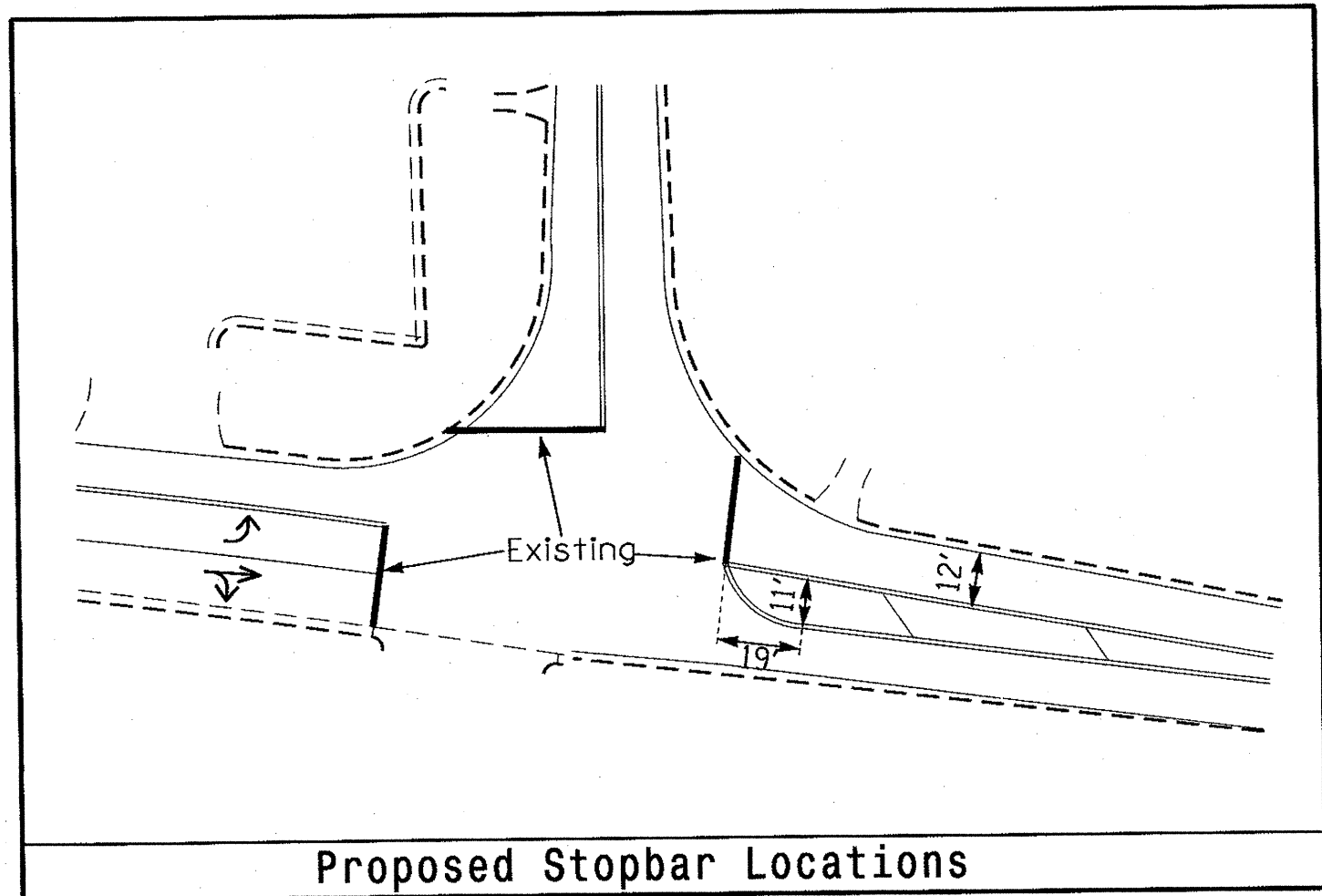
All Heads L.E.D.



OASIS 2070L TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	1.0	1.0	2.0
Max Green 1 *	60	25	15	60
Yellow Clearance	4.5	3.4	3.0	4.5
Red Clearance	1.3	1.7	2.1	1.3
Red Revert	5.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



LEGEND

PROPOSED	EXISTING

Signal Upgrade - Final Design

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)

Division 7 Guilford County Greensboro

PLAN DATE: March 2013 REVIEWED BY:

PREPARED BY: R. Hough REVIEWED BY:

SCALE: 1"=40'

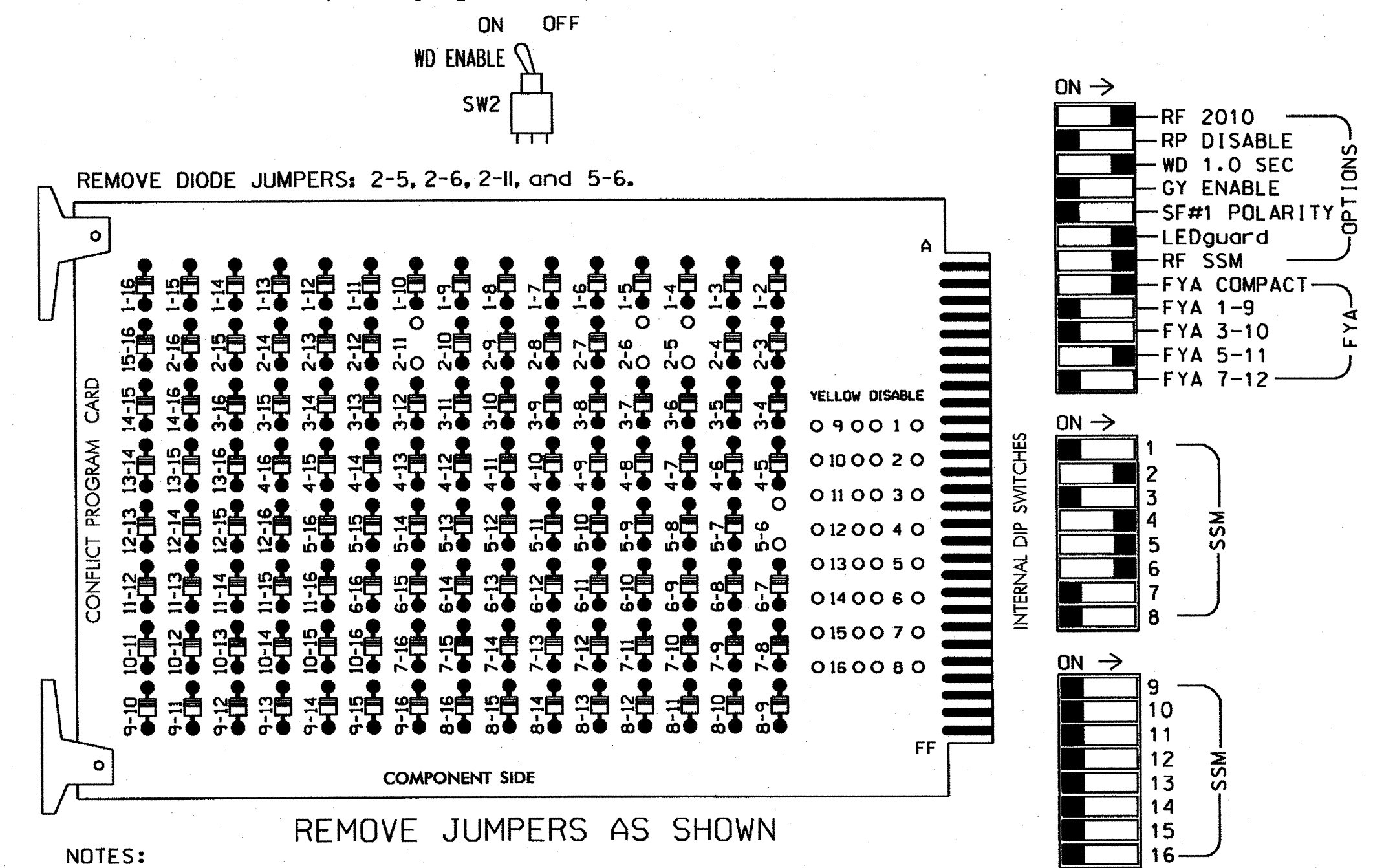
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEBBA

SIGNATURE: [Signature] DATE: 5/13

SIG. INVENTORY NO. 07-1924

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.
- Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.
- IMPORTANT!** 2010ECL-NC conflict monitor required for FYA operation.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the SR 2136 (Fleming Rd) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....336
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S4,S5,S6,S6P
PHASES USED.....2,4,5,6
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

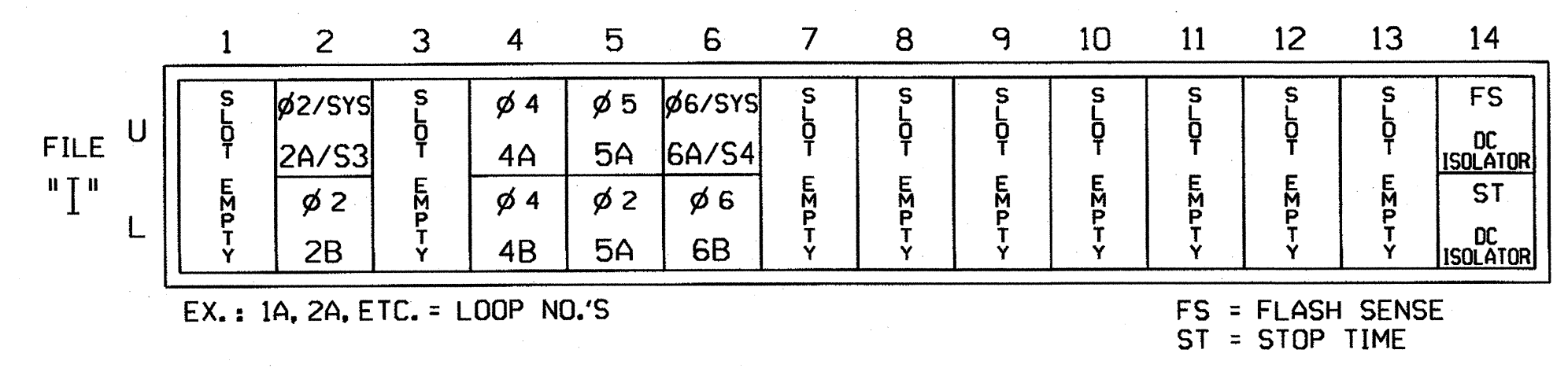
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	OLA	2	2 PED	3	4	4 PED	OLC	6	5 GRN	6 PED	7	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	51	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW								131				
YELLOW ARROW								132				
FLASHING YELLOW ARROW								133				
GREEN ARROW									120			
										*		

NU = Not Used
* Denotes install load resistor. See load resistor installation detail below.
★ See pictorial of head wiring in detail below.
NOTE: Load Switches S5 and S6P require output remapping. See sheet 3 of this electrical detail for instructions.

INPUT FILE POSITION LAYOUT

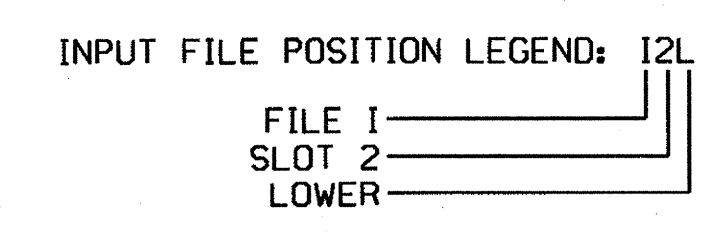
(front view)



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
2A/S3	TB21-3,4	I2U	39	1	2	2/SYS	Y	Y		1.6	
2B	TB23-3,4	I2L	43	5	12	Y	Y	Y			
4A	TB21-7,8	I4U	41	3	4	4	Y	Y			10
4B	TB23-7,8	I4L	45	7	14	4	Y	Y			15
5A ¹	TB21-9,10	I5U	55	17	5	5	Y	Y			15
	TB23-9,10	I5L	48	10	26	2	Y	Y			
6A/S4	TB21-11,12	I6U	40	2	6	6/SYS	Y	Y		1.6	
6B	TB23-11,12	I6L	44	6	16	6	Y	Y			

¹Add jumpers from TB21-9 to TB23-9, and from TB21-10 to TB23-10.

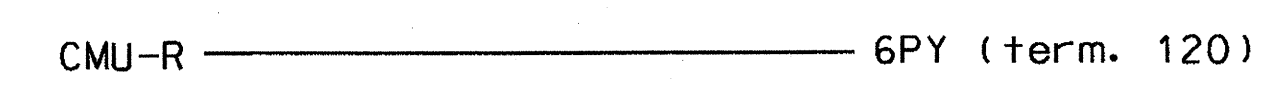


PED YELLOW CONFLICT MONITOR WIRING DETAIL

(make cabinet wiring changes as shown below)

In order to use FYA COMPACT mode on the 2010ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: from 6 PY (field term. 120) to chan. 10 green (monitor pin R).

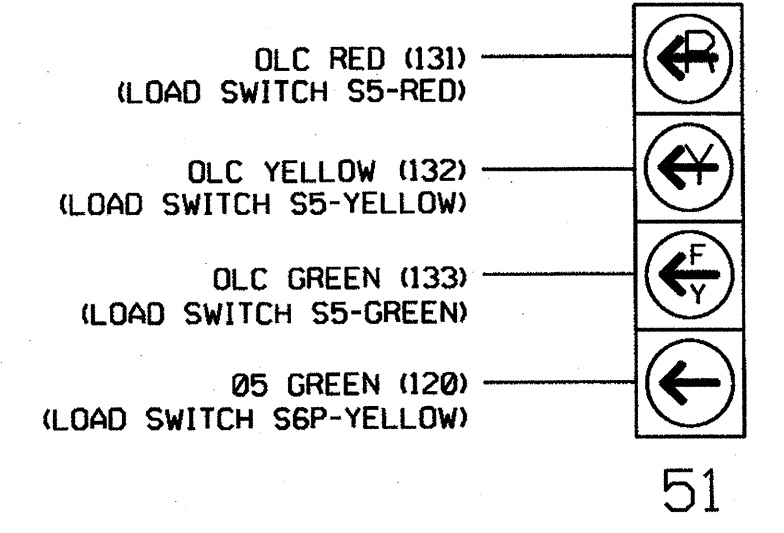
- Follow the instructions below to make the appropriate connections:
- STEP 1: Fold down rear panel of output file.
- STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).
- STEP 3: Find the conductors that correspond to the following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



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

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



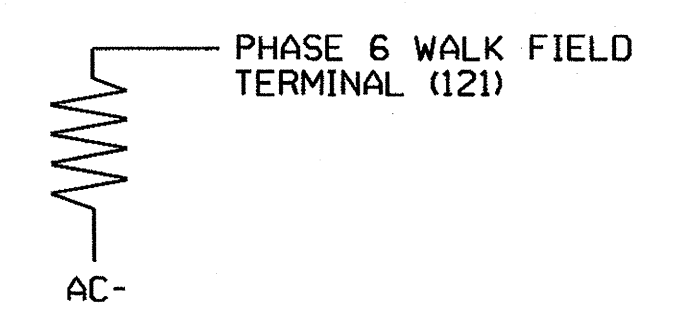
NOTE: The sequence display for signal head 51 requires special logic and output remapping. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

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



Signal Upgrade - Final Design - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 2136 (Fleming Rd)
at
SR 2124 (Lewiston Rd)

Division 7 Guilford County Greensboro

PLAN DATE: April 2013 REVIEWED BY: JFR

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

750 N. Grantfield Pkwy., Garner, NC 27529

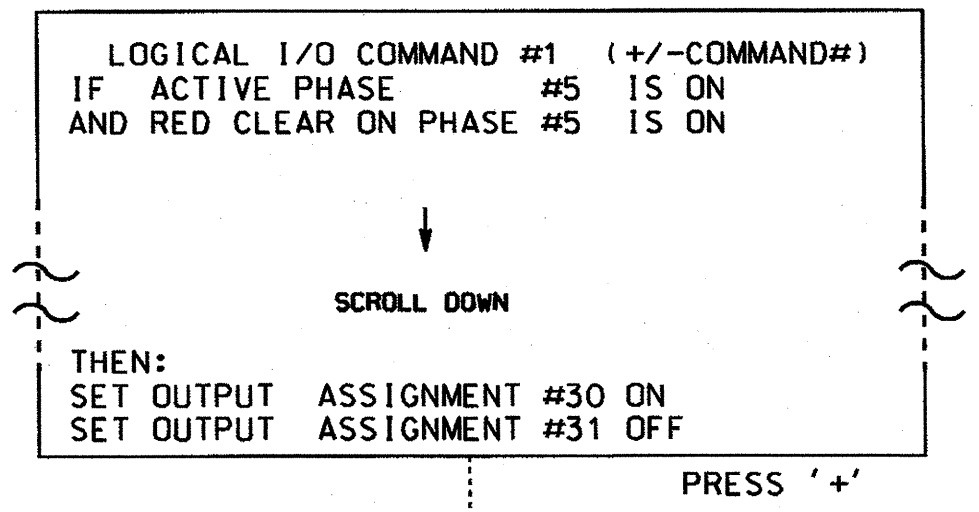
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 008453
JOHN T. ROWE
5-15-13
DATE
SIG. INVENTORY NO. 07-1924

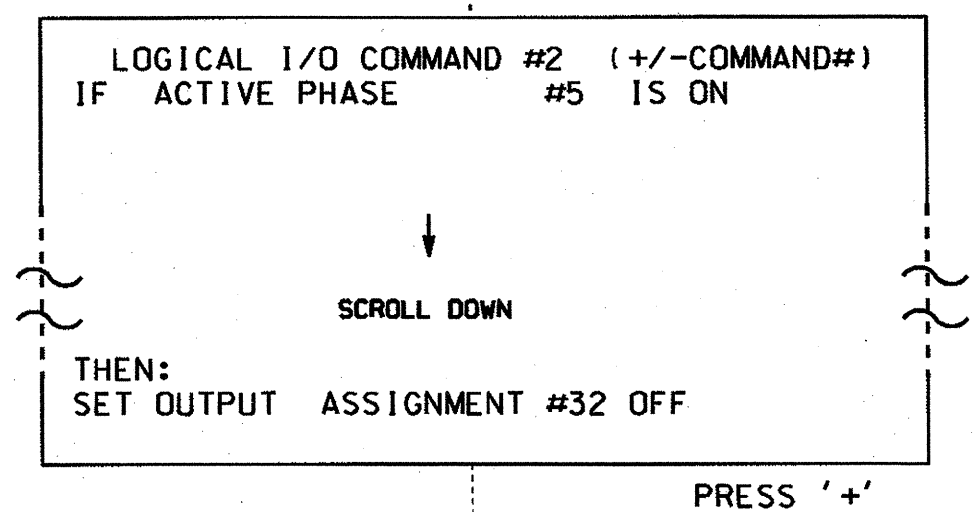
**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

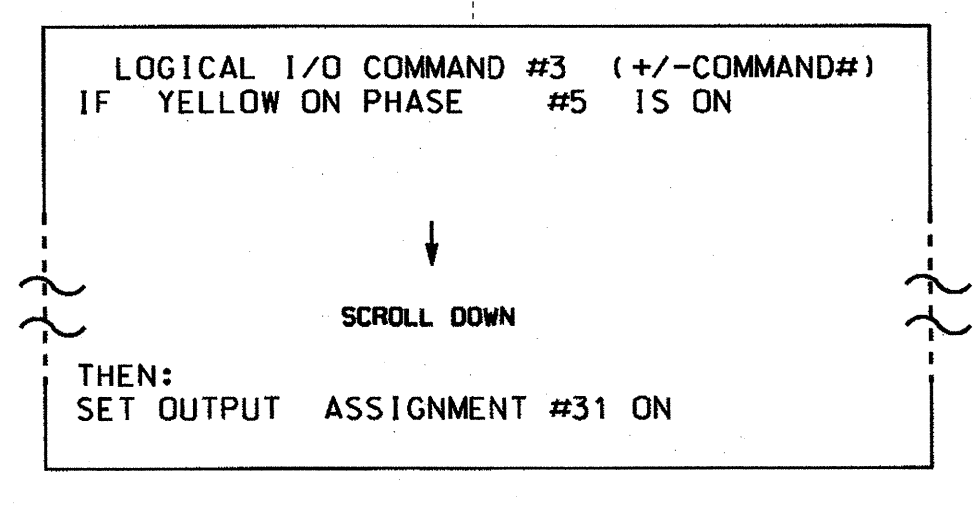
- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



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



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



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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
OUTPUT 30	= Overlap C Red
OUTPUT 31	= Overlap C Yellow
OUTPUT 32	= Overlap C Green
OUTPUT 34	= Phase 5 Green

Note: All outputs shown above have been remapped. See sheet 3 of this electrical detail.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

BACKUP PROTECTION NOTE

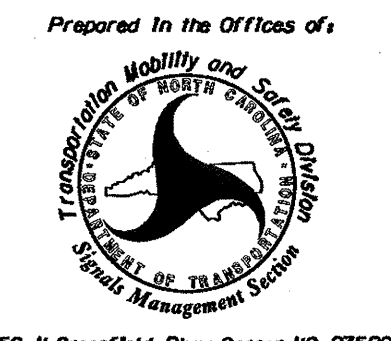
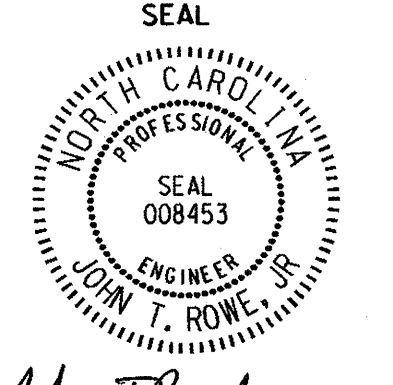
(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 2 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

13-MAY-2013 07:41:52 C:\Users\jtr\Documents\Signal\work\p0054619\North\strong071924_sml.dwg (6...xxx.dgn) JTR

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

Signal Upgrade - Final Design - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)		SEAL 
	Division 7 PLAN DATE: April 2013 PREPARED BY: S. Armstrong	Guilford County GREENSBORO REVIEWED BY: JTR	Greensboro REVIEWED BY:
REVISIONS INIT. DATE	SIG. INVENTORY NO. 07-1924		

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 51

(program controller as shown below)

STEP 1

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

```

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

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

```

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

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

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

```

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

PRESS "+" KEY FOR OUTPUT 31

STEP 2

```

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

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

```

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

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

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

```

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

PRESS "+" KEY FOR OUTPUT 32

STEP 3

```

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

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

```

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

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

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

```

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

PRESS "+" TWICE TO REACH OUTPUT 34.

STEP 4

```

PAGE:1 C1 PIN:36 NOT ENABLED
OUTPUT ASSIGNMENT #.....34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

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

```

PAGE:1 C1 PIN:36 NOT ENABLED
SELECT VEHICLE PHASE (1-16).....5
SELECT COLOR(0=RED,1=YEL,2=GRN)....2
    
```

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

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

```

PAGE:1 C1 PIN:36 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....34
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

OUTPUT PROGRAMMING FOR HEAD 51 COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

Signal Upgrade - Final Design - Sheet 3 of 3

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 2136 (Fleming Rd) at SR 2124 (Lewiston Rd)		SEAL
	Prepared in the Offices of:		Division 7 Guilford County Greensboro		
PLAN DATE: April 2013		REVIEWED BY: JTR		PREPARED BY: S. Armstrong	
REVISIONS		INIT. DATE		SIGNATURE: <i>S. Armstrong</i> 5-15-13 DATE	
SIG. INVENTORY NO. 07-1924					

13-MAY-2013 07:42 SS:1135004115 Signal s:\work\groups\sig\man\mstr\mstr\trng\071924_sht3.dgn

PHASING DIAGRAM

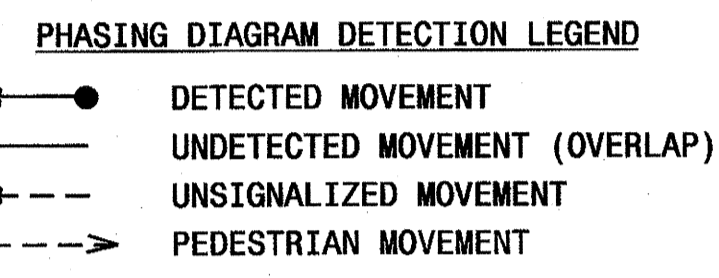
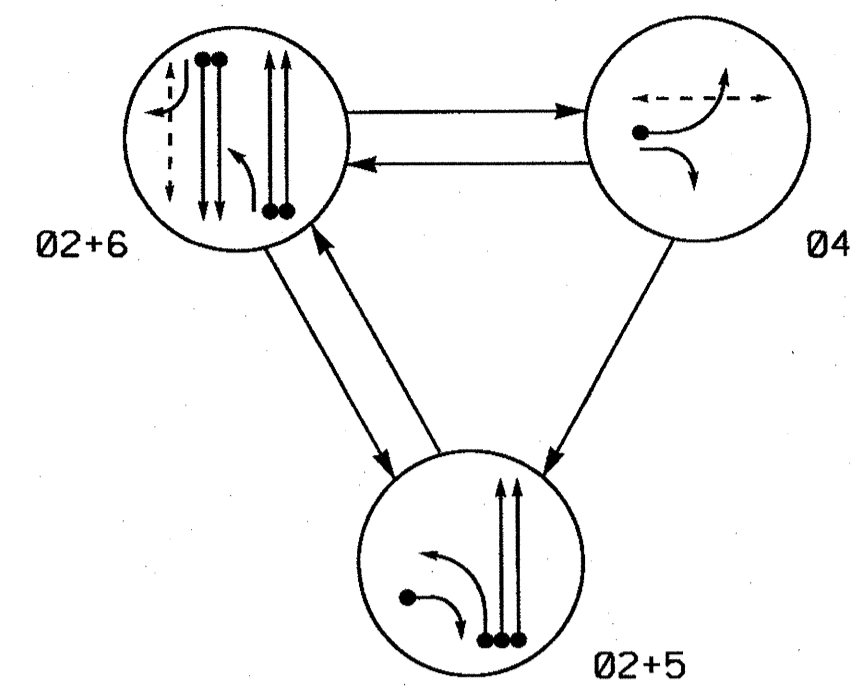
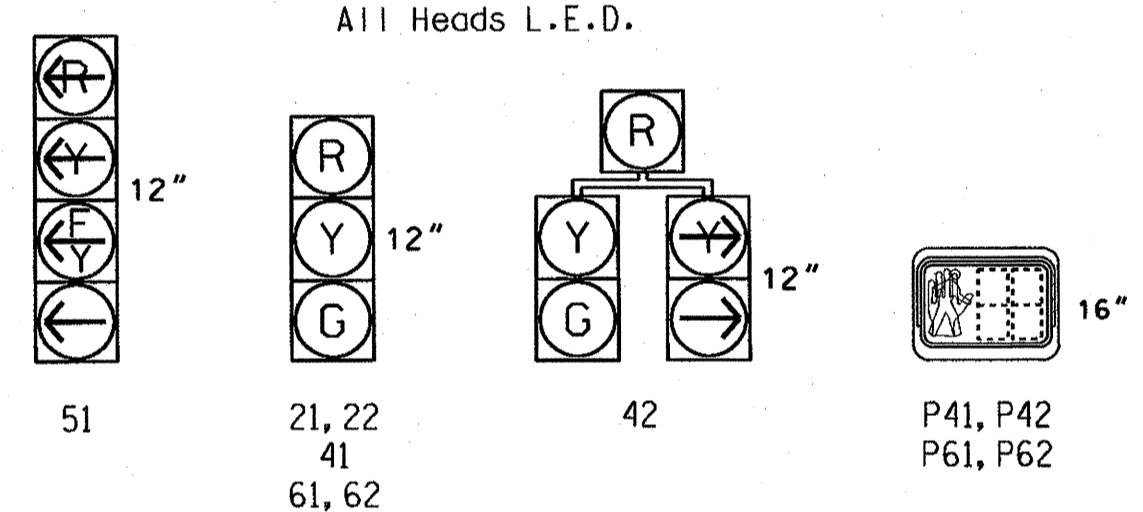


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04	FL
21, 22	G	G	R	Y
41	R	R	G	R
42	R	G	R	
51		F	R	Y
61, 62	R	G	R	Y
P41, P42	DW	DW	W	DRK
P61, P62	DW	W	DW	DRK

F = Flashing Yellow Arrow
 W - Walk
 DW - Don't Walk
 DRK - Dark

SIGNAL FACE I.D.



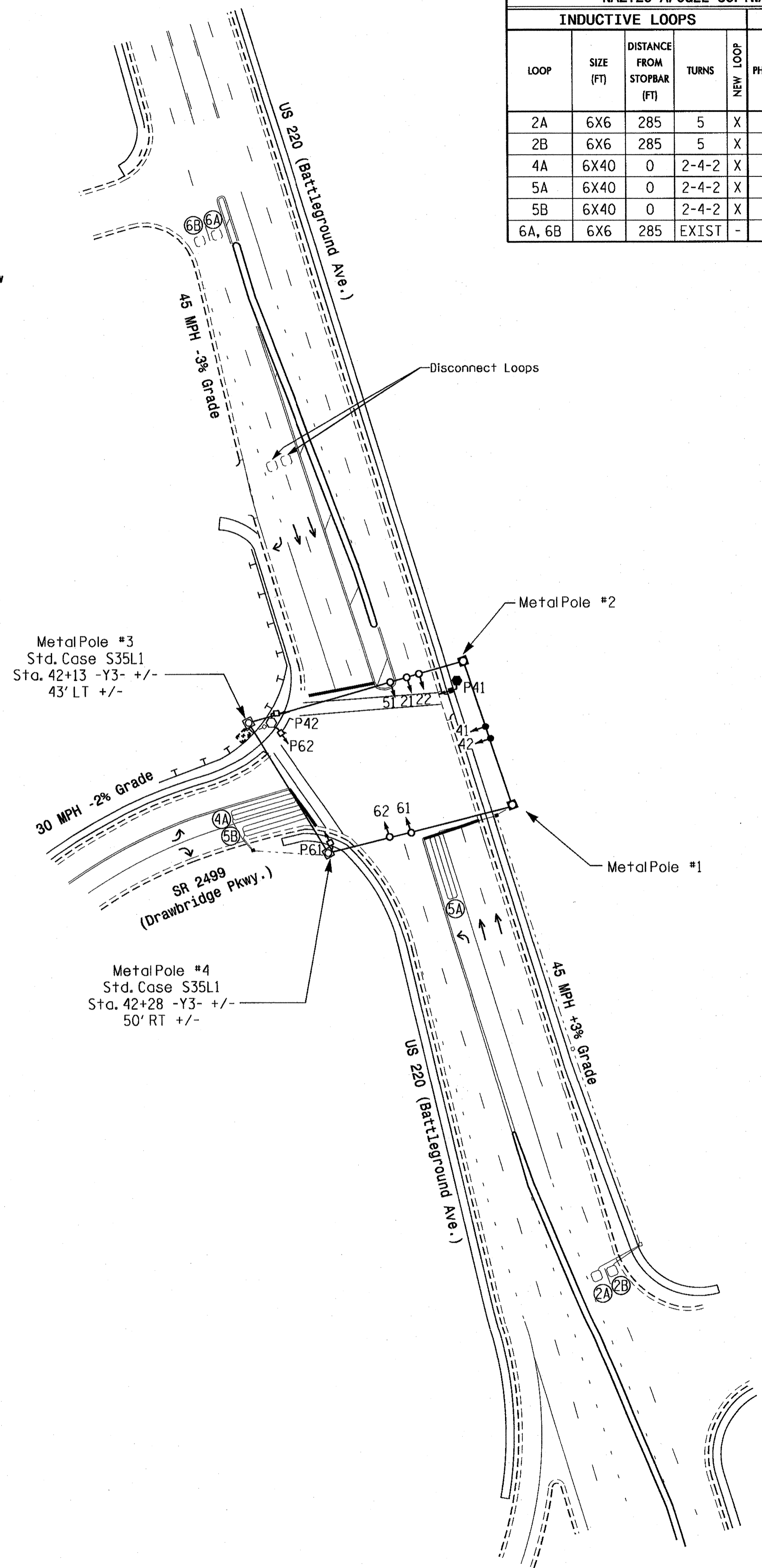
LOOP & DETECTOR UNIT INSTALLATION CHART
 NAZTEC APOGEE SOFTWARE 2070 CONTROLLER

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT	SYSTEM LOOP
2A	6X6	285	5	X	2	-	-	-	X	X	-	-
2B	6X6	285	5	X	2	-	-	-	X	X	-	-
4A	6X40	0	2-4-2	X	4	-	3	-	X	X	-	-
5A	6X40	0	2-4-2	X	5	-	15	-	X	X	-	-
5B	6X40	0	2-4-2	X	5	-	15	-	X	X	-	-
6A, 6B	6X6	285	EXIST	-	6	-	-	-	X	X	-	-

3 Phase Fully Actuated (Greensboro Signal System)

NOTES

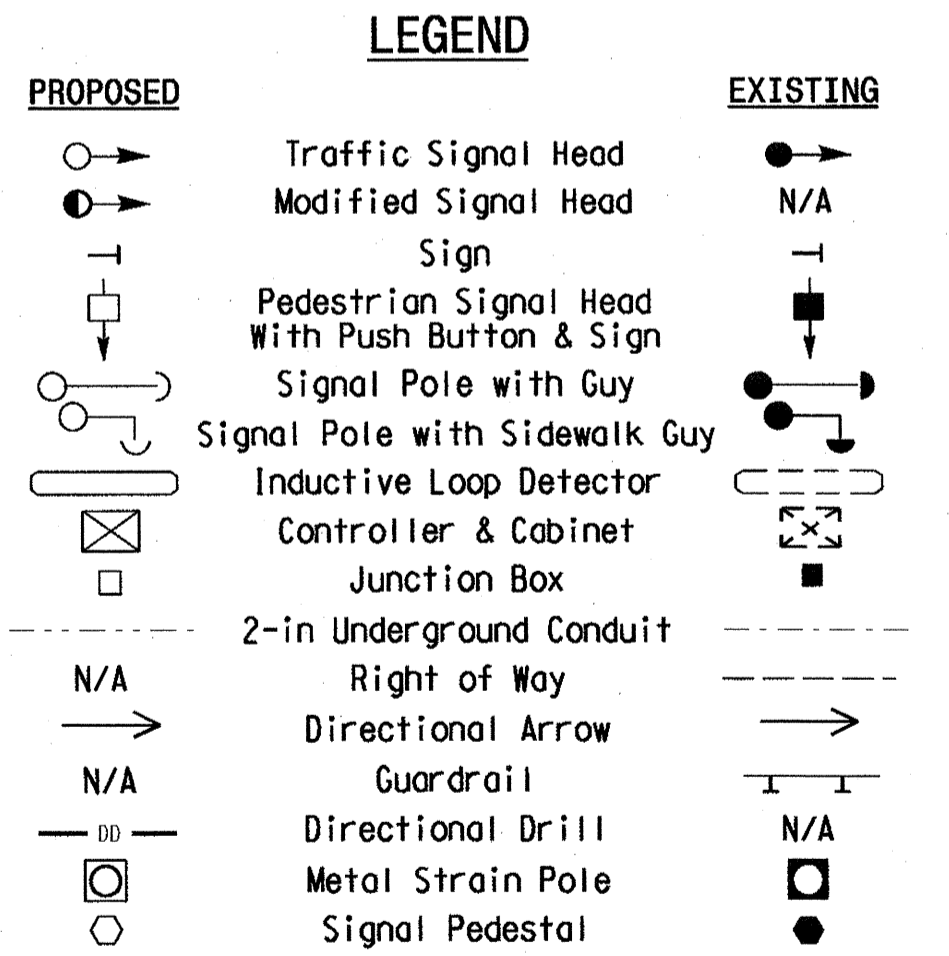
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence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



NAZTEC APOGEE 2070 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Gap, Extension *	6.0	2.0	2.0	6.0
Maximum Green 1 *	50	25	15	50
Maximum Green 2 *	-	-	-	-
Yellow Clear	4.8	3.0	3.0	4.8
Red Clear	1.8	3.1	3.1	1.8
Walk *	-	7	-	5
Pedestrian Clear	-	23	-	14
Added Initial *	1.5	-	-	1.5
Maximum Initial *	33	-	-	33
Time Before Reduction *	15	-	-	15
Time To Reduce *	40	-	-	40
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Lock Calls	YES	NO	NO	YES
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

Prepared in the Offices of:

US 220 (Battleground Ave.) at SR 2499 (Drawbridge Pkwy.)

Division 7 Guilford County Greensboro

PLAN DATE: March 2013 REVIEWED BY: R. Hough

PREPARED BY: R. Hough

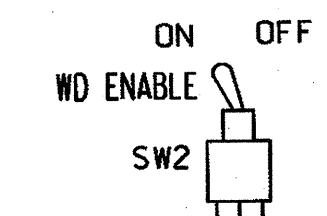
REVISIONS: _____ INIT. DATE

SCALE: 1" = 50'

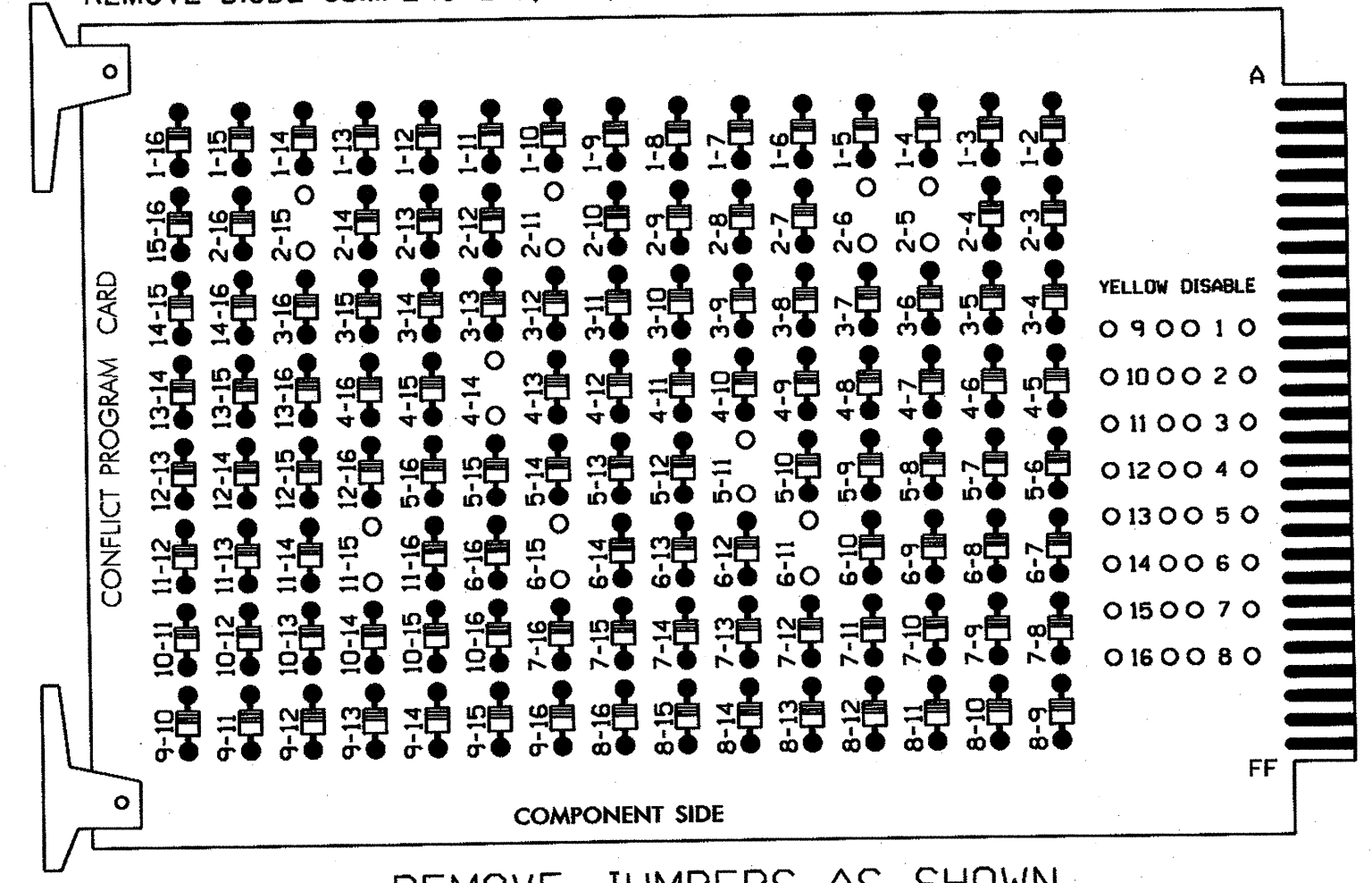
SIG. INVENTOR NO. 07-1610

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



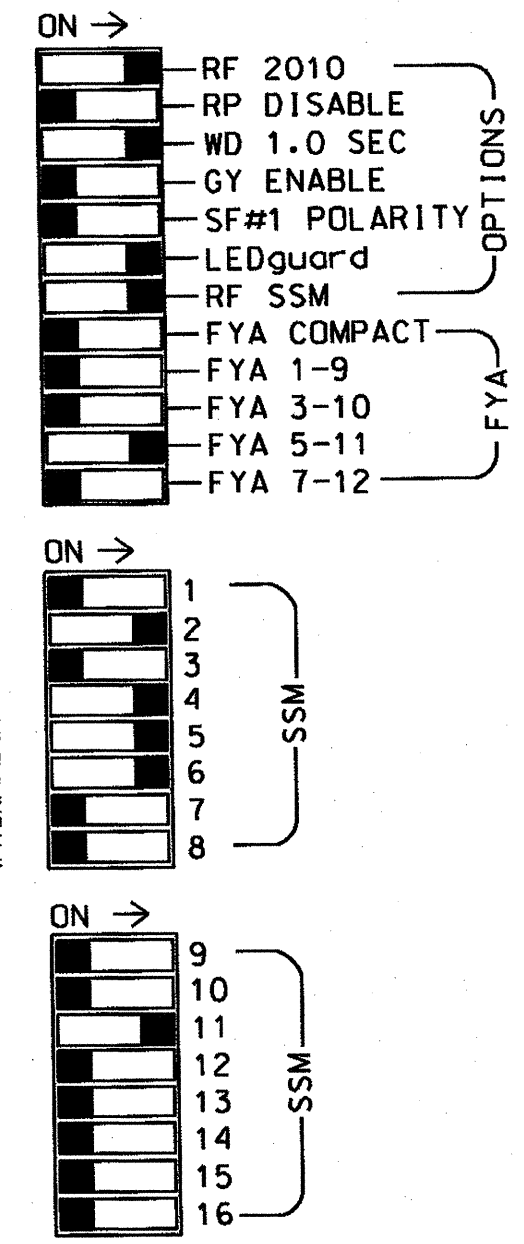
REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-15, 4-14, 5-11, 6-11, 6-15, and 11-15.



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = 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.
- To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-MODE 5. This initialization should be done prior to programming controller.
- Program phase 2 for Start Up In Green, and phase 6 for Start Up In Walk.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "ON".
- The cabinet and controller are part of the City of Greensboro Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....NAZTEC 2070L
 * CABINET.....McCAIN/CONTROL TECHNOLOGIES (DWG.NO.9500-332 W/ AUX-NC DOT)
 SOFTWARE.....NAZTEC APOGEE
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S2,S4,S4P,S5,S6,S6P,S12
 PHASES USED.....2,4,4PED,5,6,6PED
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....**
 OVERLAP D.....NOT USED
 * AUXILIARY OUTPUT FILE REQUIRED FOR FYA OPERATION
 ** SEE OVERLAP PROGRAMMING DETAIL SHEET 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	P41, P42	42	51	61,62	P61, P62	NU	NU	NU	NU	NU	51	NU	NU	
RED		128			101		*		134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW																		A114	
YELLOW ARROW								132											A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW							133	133											
Hand																			
Walking																			

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

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	2A	2A	2A	2A	2A	4A	4A	4A	4A	4A	4A	4A	4A	4A
U	∅ 5	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
L	5A	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B	6A,6B
U	∅ 5	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
L	5B													

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

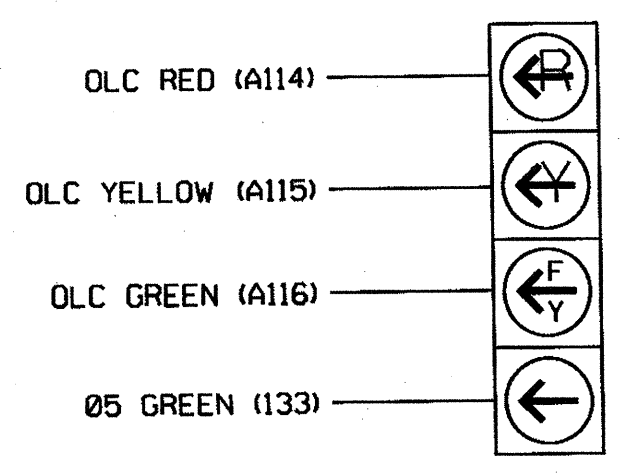
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
2A	TB2-5,6	I2U	39	2	2				X	X	
2B	TB2-7,8	I2L	43	3	2				X	X	
4A	TB4-9,10	I6U	41	8	4				X	X	
5A	TB3-5,6	J2U	40	16	5		3		X	X	
5B	TB3-7,8	J2L	44	17	5		15		X	X	
6A,6B	TB3-9,10	J3U	64	18	6				X	X	
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED						
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED						

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

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



51

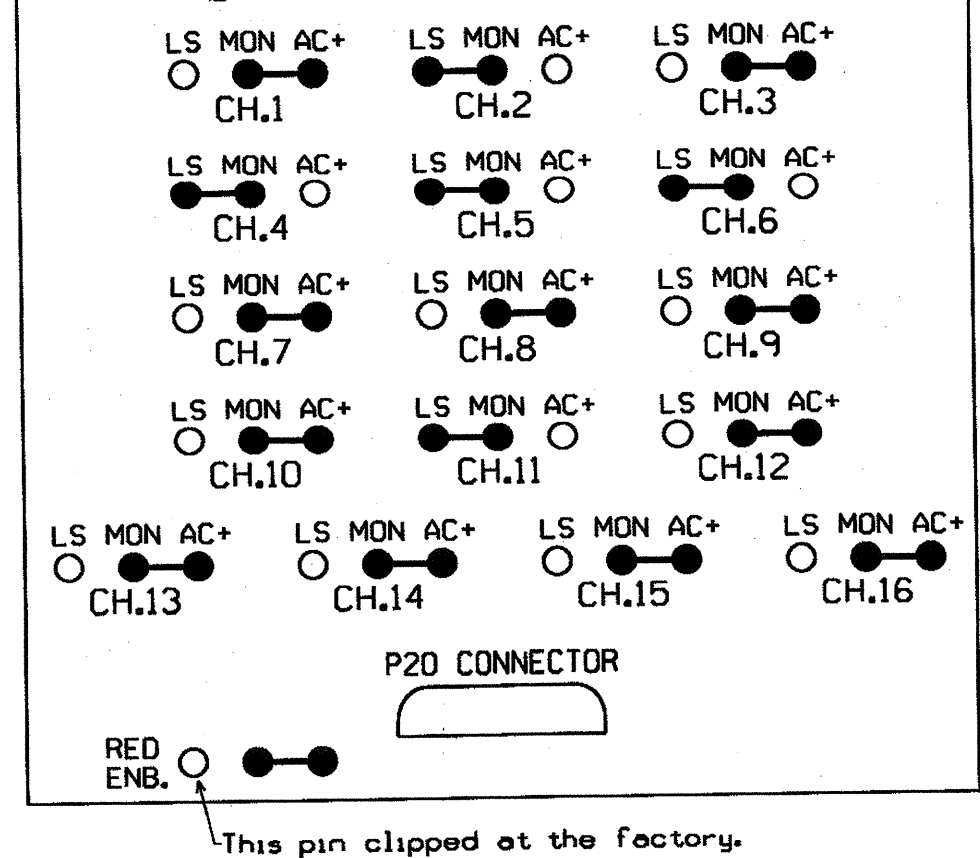
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1610
 DESIGNED: March 2013
 SEALED: 5/9/13
 REVISED: N/A

RED MONITOR BOARD PROGRAMMING

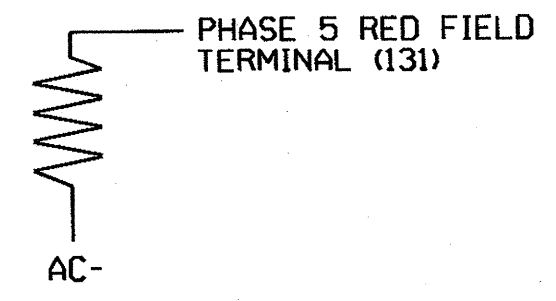
(position jumpers as shown below)



This pin clipped at the factory.

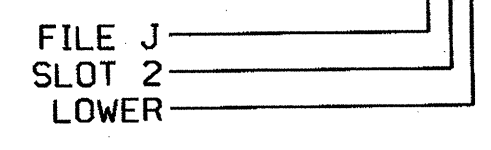
LOAD RESISTOR INSTALLATION DETAIL

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



NOTE: The purpose of this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

INPUT FILE POSITION LEGEND: J2L



Signal Upgrade - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 220 (Battleground Ave) at SR 2499 (Drawbridge Pkwy)

Division 7 Guilford County Greensboro

PLAN DATE: April 2013 REVIEWED BY: JTR

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Corner, NC 27259

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

Signature: John T. Rowe 5-14-13

SIG. INVENTORY NO. 07-1610

10-MAY-2013 08:37 S:\ITS\SSO\MTS_S\Signal\sw\kpr\pdp\sig_mon\mtr\mtr-orig\071610_sml.e16_vxx.dgn

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS "1" CONTROLLER AND THEN "5" OVERLAPS

Overlaps
 1.General Parm
 2.Program
 3.Status

General Overlap Parameters
 Lock Inhibit OFF
 Confl Lock Enable OFF
 Parent P Cirncs ON
 Extra Included Phases OFF

PRESS "ESC"

Overlaps
 1.General Parm
 2.Program
 3.Status

Enter Overlap # 3
 then press Enter

Overlap C-3
 1.Program Parm
 2.Confl Prog+
 3.Program Parm+

OvrIp C-3 Ps.....
 Included Ps 5 0 0 0 0 0 0 0
 Modifier Ps 6 0 0 0 0 0 0 0
 Type:FYA-4 Grn: 0 Yel: 3.5 Red: 1.5

Notice type FYA-4 →

PRESS "ESC"

Overlap C-3
 1.Program Parm
 2.Confl Prog+
 3.Program Parm+

OvrIp C-3 Ps.....
 Confl Ps 0 0 0 0 0 0 0 0
 Confl Ovrlps 0 0 0 0 0 0 0 0
 Confl Peds 0 0 0 0 0 0 0 0

PRESS "ESC"

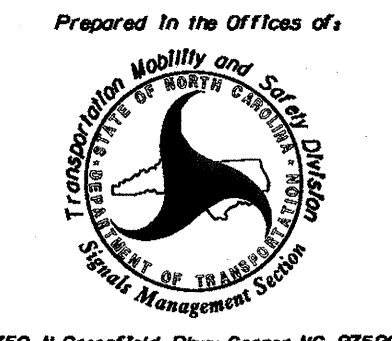
Overlap C-3
 1.Program Parm
 2.Confl Prog+
 3.Program Parm+

OvrIp C-3
 LeadGreen OFF Transit 0
 GreenExtInh 0 0 0 0 0 0 0 0

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1610
 DESIGNED: March 2013
 SEALED: 5/9/13
 REVISED: N/A

Signal Upgrade - Sheet 2 of 3

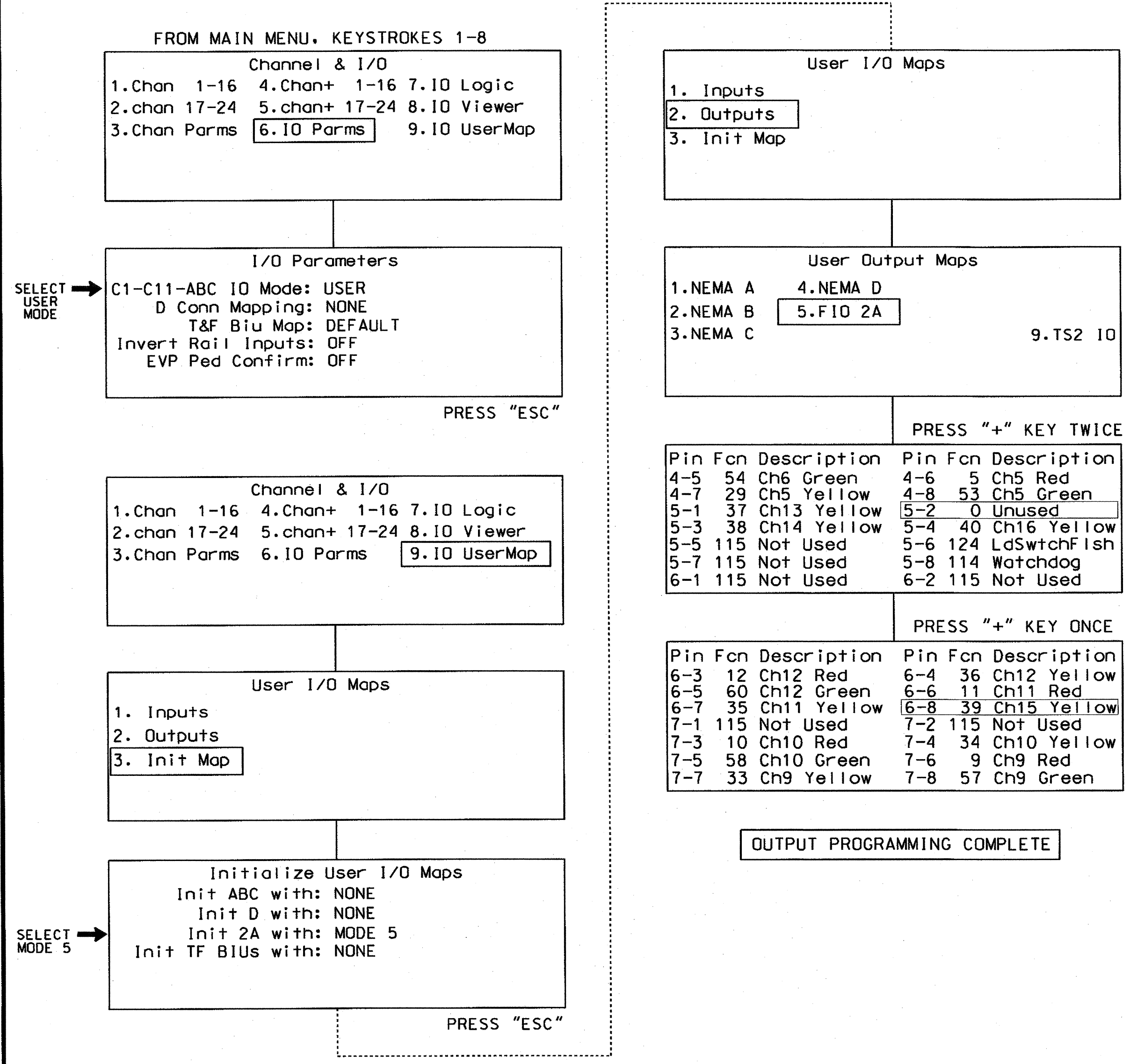
 <p>Prepared In the Office of: Transportation Mobility and Safety STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 220 (Battleground Ave) at SR 2499 (Drawbridge Pkwy)		SEAL NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, III
	Division 7 Guilford County Greensboro		PLAN DATE: April 2013 REVIEWED BY: JTR		
	PREPARED BY: S. Armstrong REVIEWED BY:		REVISIONS INIT. DATE		
				Signature: <i>[Signature]</i> DATE: 5-14-13 SIG. INVENTORY NO. 07-1610	

10-MAY-2013 08:38 S:\115304\115 Signal\smcrgroups\51g Man\mstron\071610_sm_e\p_xxx.dgn

4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

1. Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
2. The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



Pin 5-2 (C1 pin 36) = Load Switch S6P-Y
 Pin 6-8 (C1 pin 90) = Load Switch S12-G

! Press the "*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

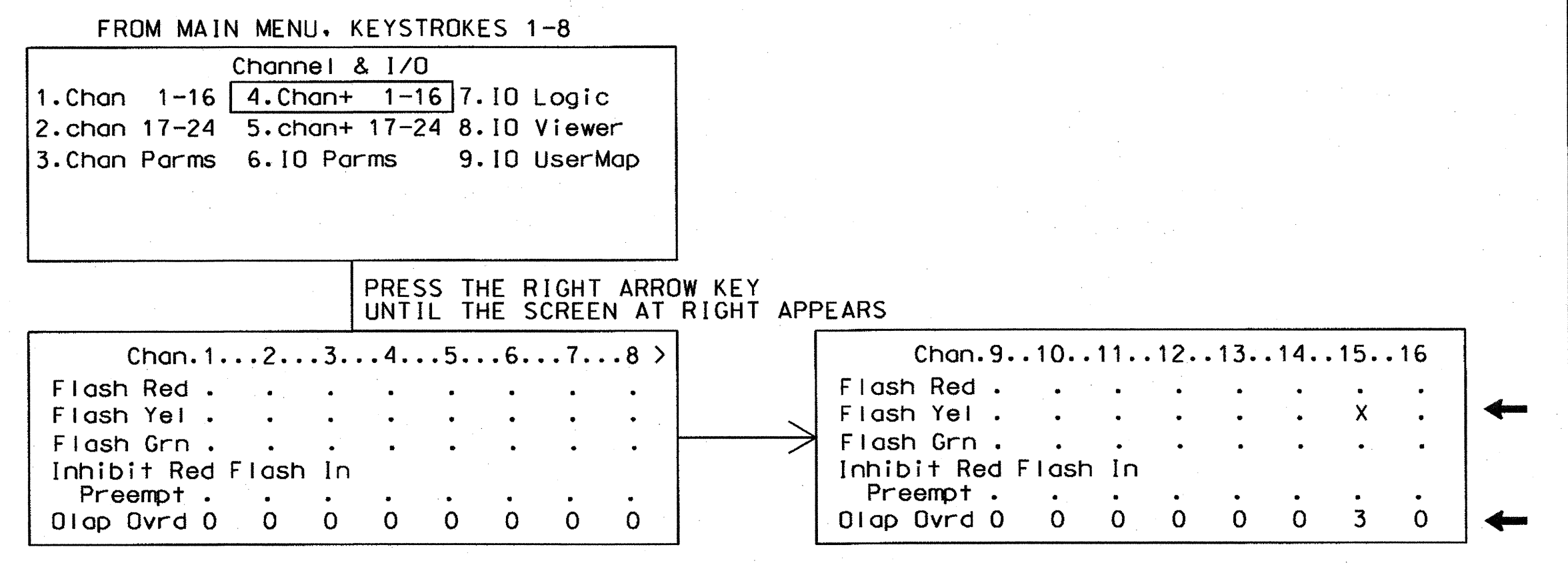
NOTE

I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.



Programming notes:

Pin	Default Fcn Description	Change To: Fcn Description
5-2	39 Ch15 Yellow	0 Unused

Programming notes:

Pin	Default Fcn Description	Change To: Fcn Description
6-8	59 Ch11 Green	39 Ch15 Yellow

Program the controller as shown above.

CHANNEL & I/O PROGRAMMING COMPLETE

NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1610
 DESIGNED: March 2013
 SEALED: 5/9/13
 REVISED: N/A

Signal Upgrade - Sheet 3 of 3

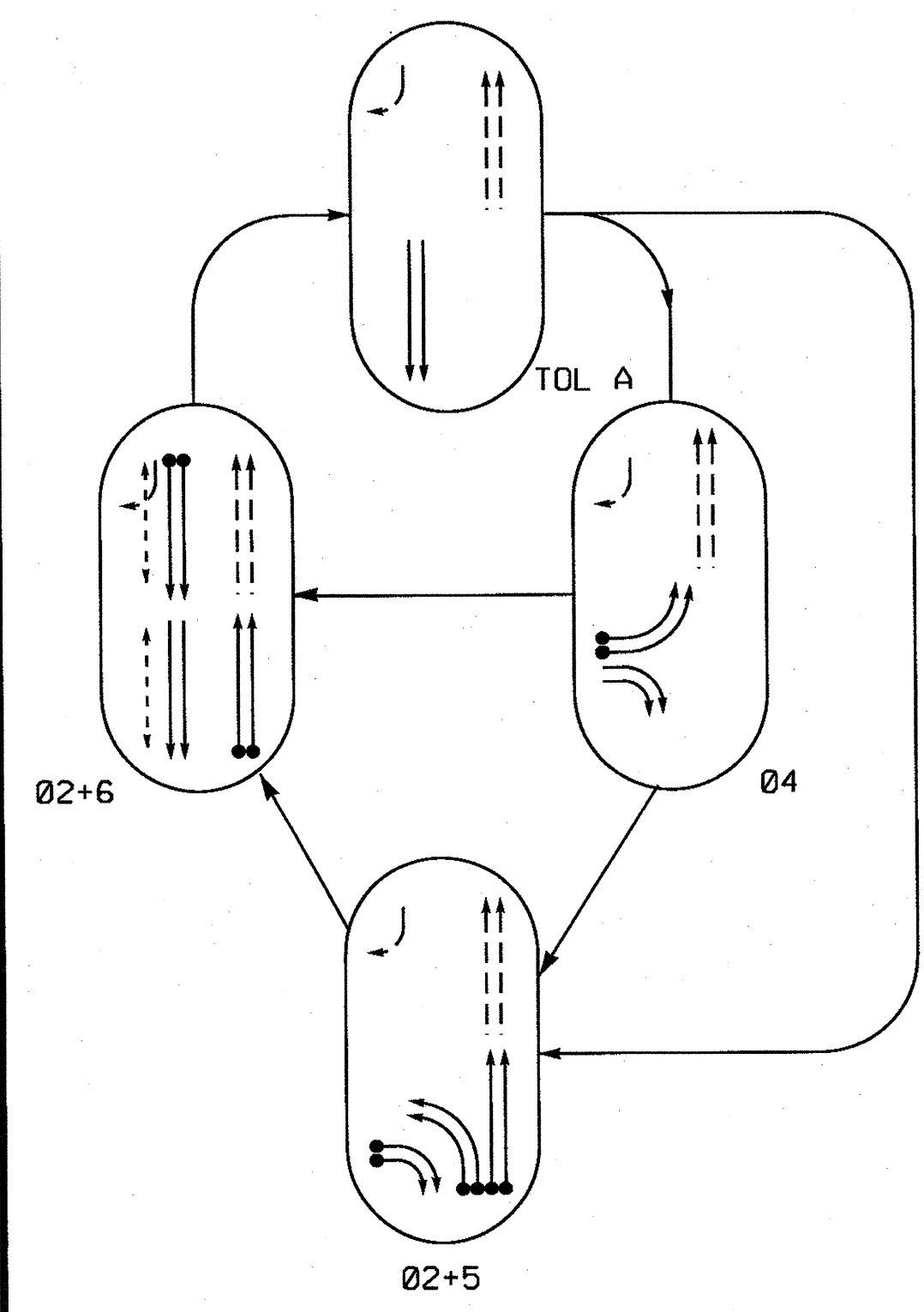
	ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 220 (Battleground Ave) at SR 2499 (Drawbridge Pkwy)		
	Prepared in the Offices of:		Division 7 Guilford County Greensboro		
	PLAN DATE: April 2013	REVIEWED BY: JTR	PREPARED BY: S. Armstrong		
	REVISIONS	INIT.	DATE		

750 N. Greenfield Pkwy, Garner, NC 27529

Signature: John T. Rowe, Date: 5-14-13, Inventory No.: 07-1610

10-MAY-2013 08:38 S:\TSS\UMTS_Signal\workgroups\651\Mon\mstrong\071610_sml\071610_xxx.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND
 - DETECTED MOVEMENT
 - UNDETECTED MOVEMENT (OVERLAP)
 - UNSIGNALIZED MOVEMENT
 - PEDESTRIAN MOVEMENT

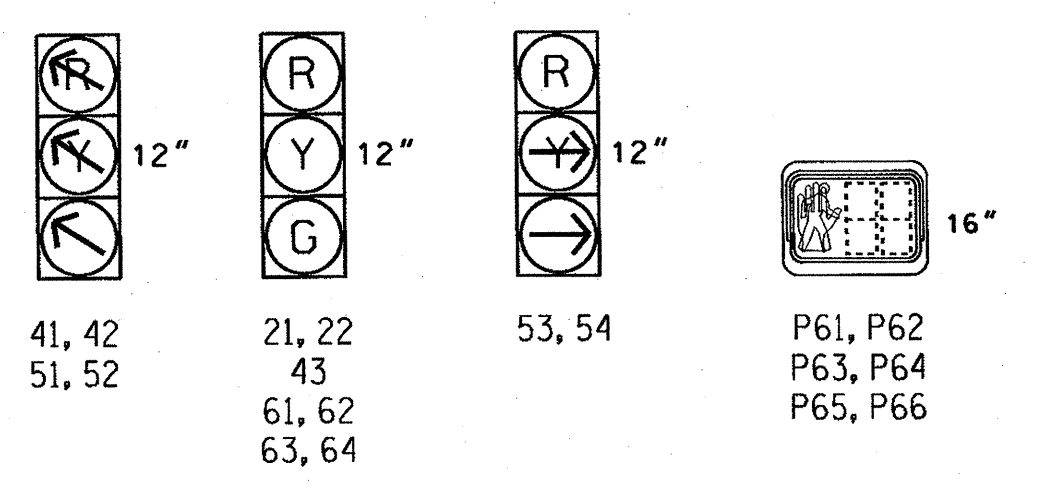
TABLE OF OPERATION

SIGNAL FACE	PHASE				
	0 2 + 5	0 2 + 6	T O L A	0 4	O L C
21, 22	G	G	R	R	Y
41, 42	X	X	X	X	X
43	R	R	R	G	R
51, 52	X	X	X	X	X
53, 54	X	R	R	X	R
61, 62	R	G	R	R	Y
63, 64	R	G	G	R	Y
P61, P62	DW	W	DW	DW	DRK
P63, P64	DW	W	DW	DW	DRK
P65, P66	DW	W	DW	DW	DRK

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

SIGNAL FACE I.D.

All Heads L.E.D.



NAZTEC APOGEE 2070 TIMING CHART

FEATURE	PHASE					TOL A	OL C
	2	4	5	6			
Min Green *	12	7	7	12		10	0
Gap, Extension *	6.0	2.0	2.0	6.0			
Maximum Green 1 *	90	30	15	90			
Maximum Green 2 *	-	-	-	-			
Yellow Clear	4.6	3.4	3.2	4.5	4.5	3.2	
Red Clear	3.2	3.8	4.5	3.6	1.3	4.5	
Walk *	-	-	-	7			
Pedestrian Clear	-	-	-	9			
Added Initial *	1.5	-	-	1.5			
Maximum 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			
Lock Calls	YES	NO	NO	YES			
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.

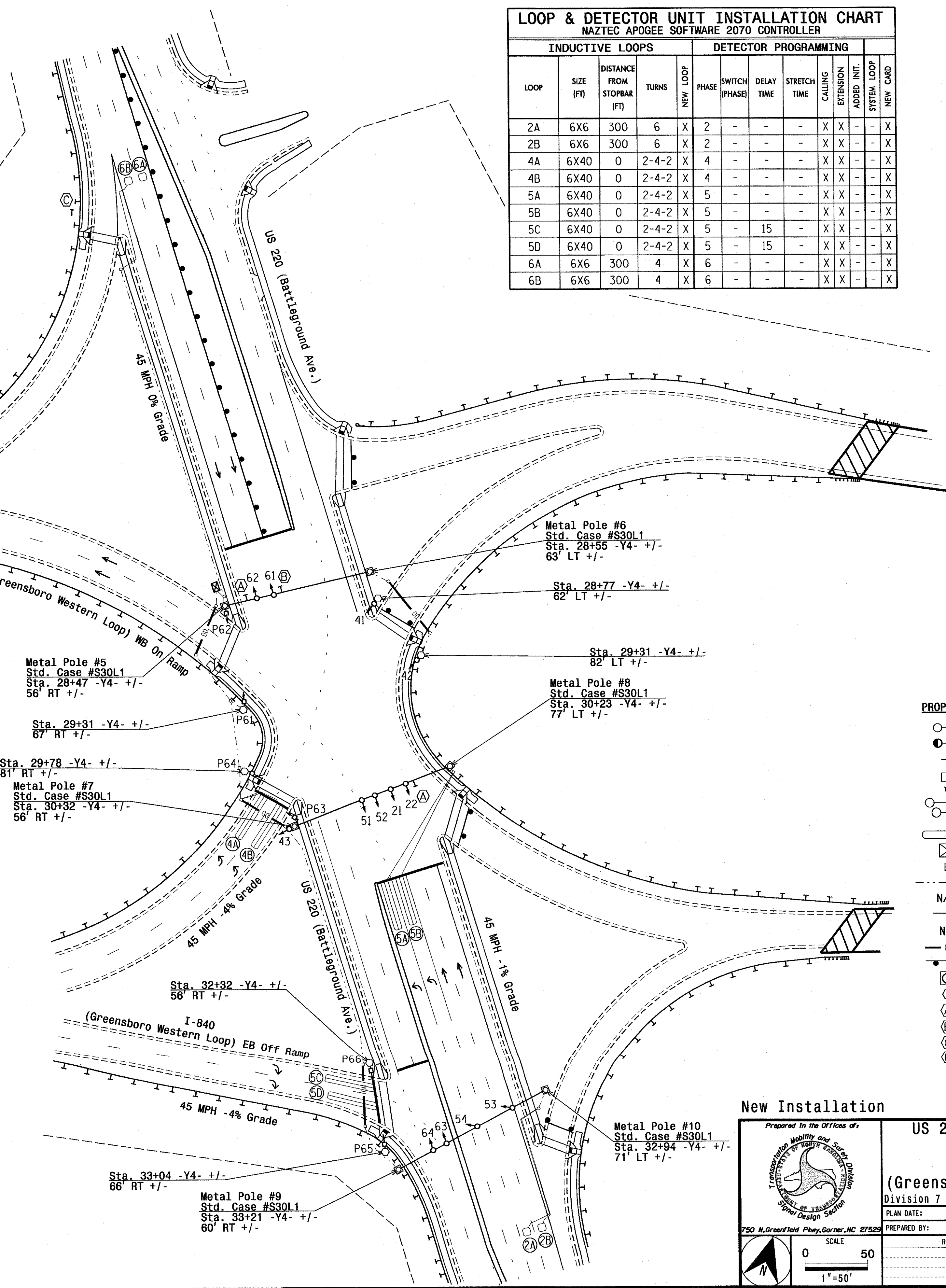
LOOP & DETECTOR UNIT INSTALLATION CHART
 NAZTEC APOGEE SOFTWARE 2070 CONTROLLER

LOOP	SIZE (FT)	INDUCTIVE LOOPS		NEW LOOP	DETECTOR PROGRAMMING							
		DISTANCE FROM STOPBAR (FT)	TURNS		PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
2A	6X6	300	6	X	2	-	-	-	X	X	-	X
2B	6X6	300	6	X	2	-	-	-	X	X	-	X
4A	6X40	0	2-4-2	X	4	-	-	-	X	X	-	X
4B	6X40	0	2-4-2	X	4	-	-	-	X	X	-	X
5A	6X40	0	2-4-2	X	5	-	-	-	X	X	-	X
5B	6X40	0	2-4-2	X	5	-	-	-	X	X	-	X
5C	6X40	0	2-4-2	X	5	-	15	-	X	X	-	X
5D	6X40	0	2-4-2	X	5	-	15	-	X	X	-	X
6A	6X6	300	4	X	6	-	-	-	X	X	-	X
6B	6X6	300	4	X	6	-	-	-	X	X	-	X

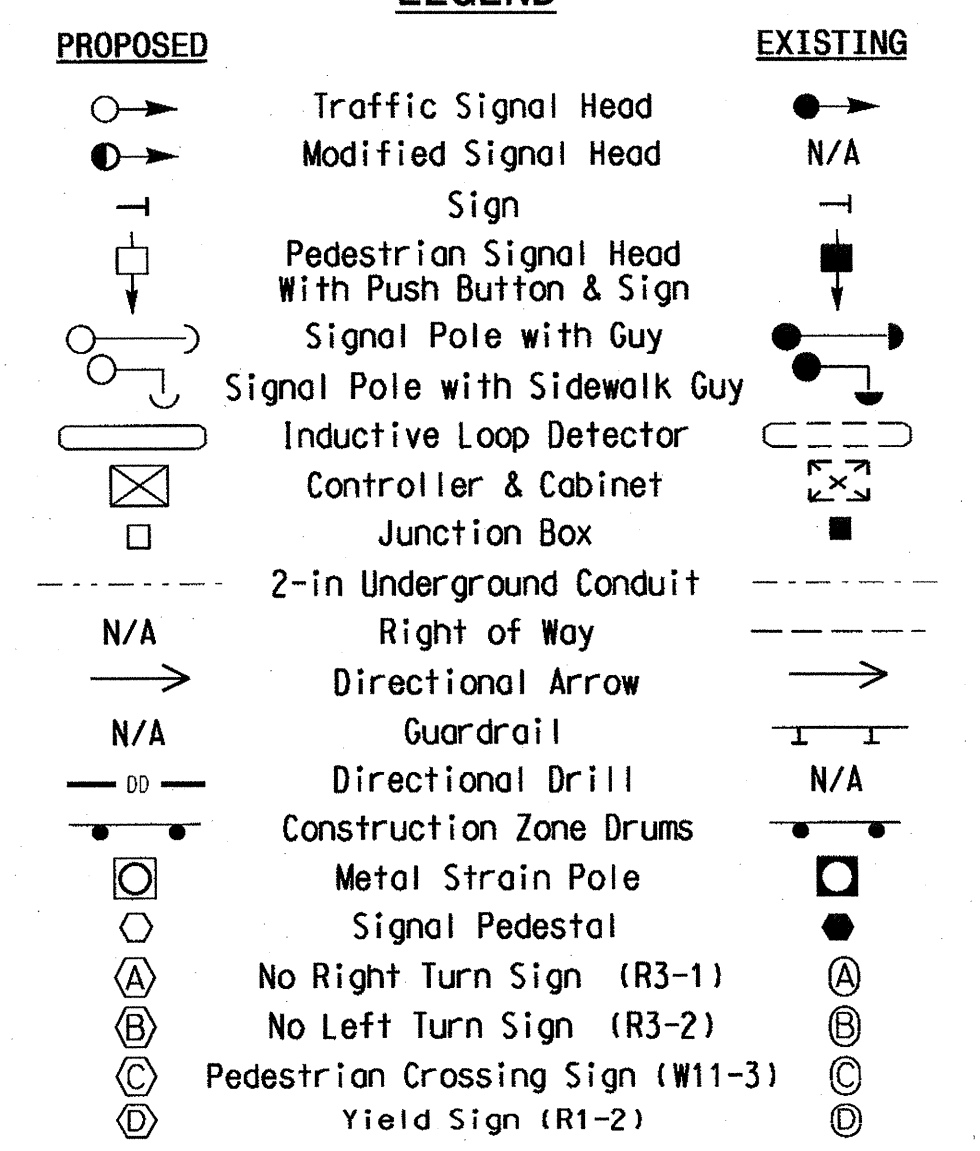
3 Phase Fully Actuated
 (Greensboro Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND



New Installation

Prepared in the Offices of:
 Transportation Mobility and Safety Division
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529

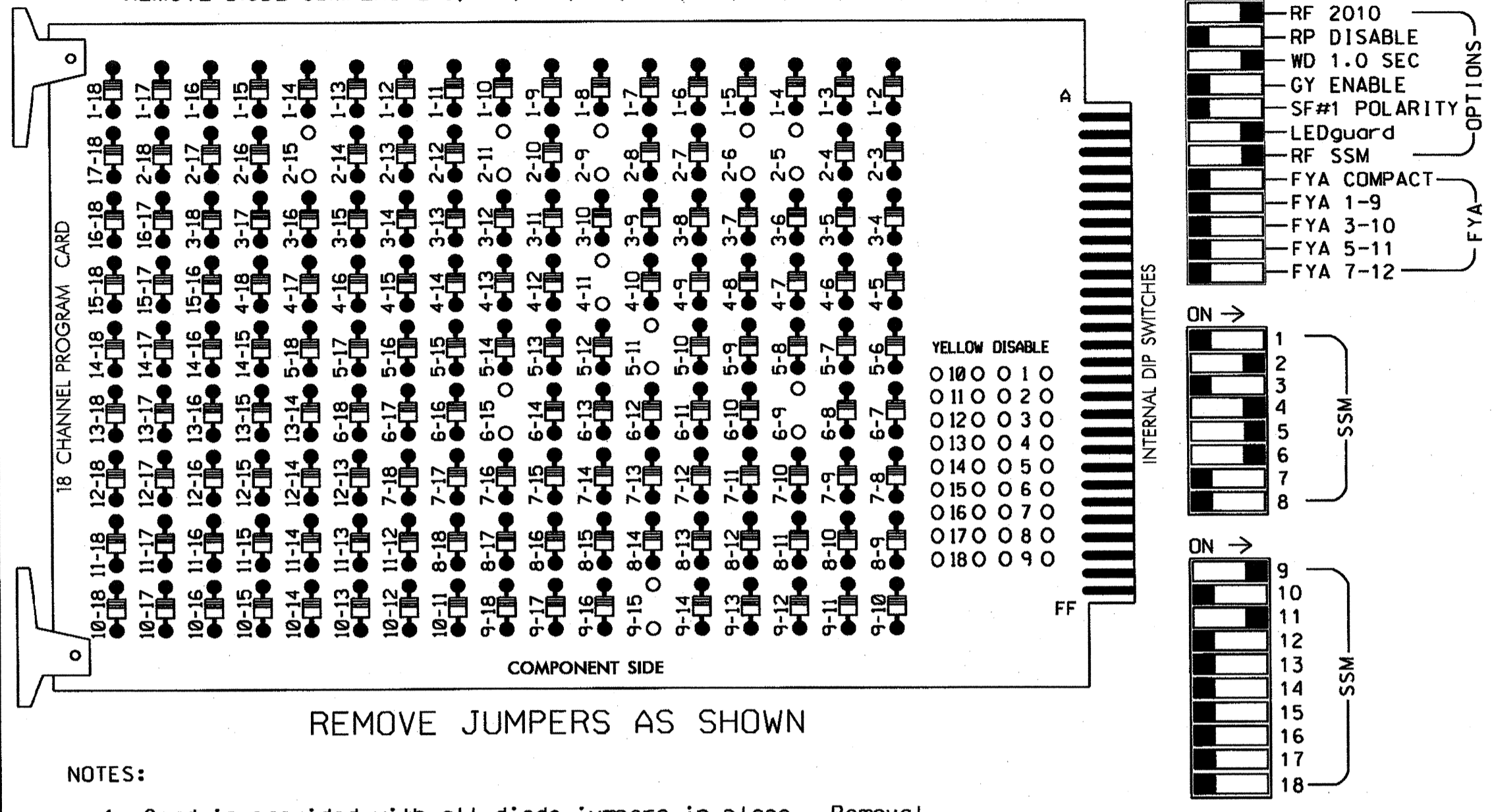
US 220 (Battleground Ave.) at I-840 (Greensboro Western Loop) Ramps
 Division 7 Guilford County Greensboro
 PLAN DATE: March 2013
 PREPARED BY: R. Hough
 REVIEWED BY: [Signature]

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 026486
 ROBERT J. ZIEGLER
 DATE: 5/9/13
 SIG. INVENTORY NO. 07-2176

SCALE: 0 50
 1"=50'

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-15, 4-11, 5-11, 6-9, 6-15, and 9-15.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 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.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-MODE 5. This initialization should be done prior to programming controller.
- Program phase 2 for Start Up In Green, and phase 6 for Start Up In Walk.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "ON".
- The cabinet and controller are part of the City of Greensboro Signal 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.	NU	21,22	NU	NU	41,42	43	NU	51,52	61,62	63,64	65,66	NU	NU	NU	63,64	NU	NU	53,54	NU	NU
RED		128			101			134					A121			A114				
YELLOW		129			102			135					A122							
GREEN		130			103			136					A123							
RED ARROW					101			131												
YELLOW ARROW					102			132											A115	
GREEN ARROW					103			133											A116	
Hand icon													119							
Walking person icon																				121

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX
 SOFTWARE.....NAZTEC APOGEE
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX FILE
 LOAD SWITCHES USED.....S2,S5,S7,S8,S9,AUX S1,AUX S4
 PHASES USED.....2,4,5,6,PED
 OVERLAP A.....6
 OVERLAP B.....NOT USED
 OVERLAP C.....4+5
 OVERLAP D.....NOT USED

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT
(front view)

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

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

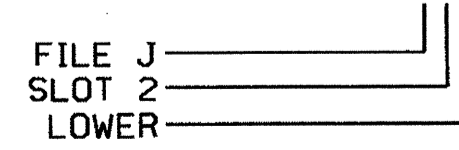
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
2A	TB2-5,6	I2U	39	2	2				X	X	
2B	TB2-7,8	I2L	43	3	2				X	X	
4A	TB4-9,10	I6U	41	8	4				X	X	
4B	TB4-11,12	I6L	45	9	4				X	X	
5A	TB3-1,2	J1U	55	15	5				X	X	
5B	TB3-5,6	J2U	40	16	5				X	X	
5C	TB3-7,8	J2L	44	17	5		15		X	X	
5D	TB3-9,10	J3U	64	18	5		15		X	X	
6A	TB3-11,12	J3L	77	19	6				X	X	
6B	TB5-1,2	J4U	48	20	6				X	X	
PED PUSH BUTTONS											
P61,P62,P63 P64,P65,P66	TB8-7,9	I13U	68	PED 6	6 PED						

NOTE:
 INSTALL DC ISOLATOR
 IN INPUT FILE SLOT 113.

INPUT FILE POSITION LEGEND: J2L



New Installation - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 220 (Battleground Ave)
 at
I-840
 (Greensboro Western Loop) Ramps

Division 7 Guilford County Greensboro

PLANNED BY: April 2013 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. ENGINEER

SIGNATURE: [Signature] DATE: 5-15-13

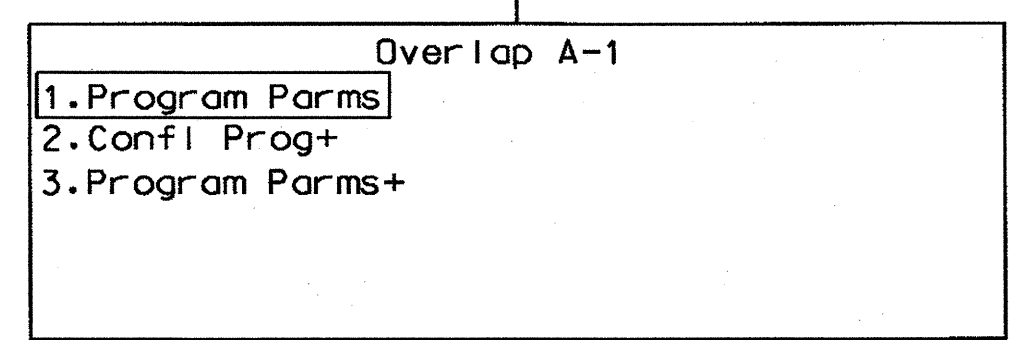
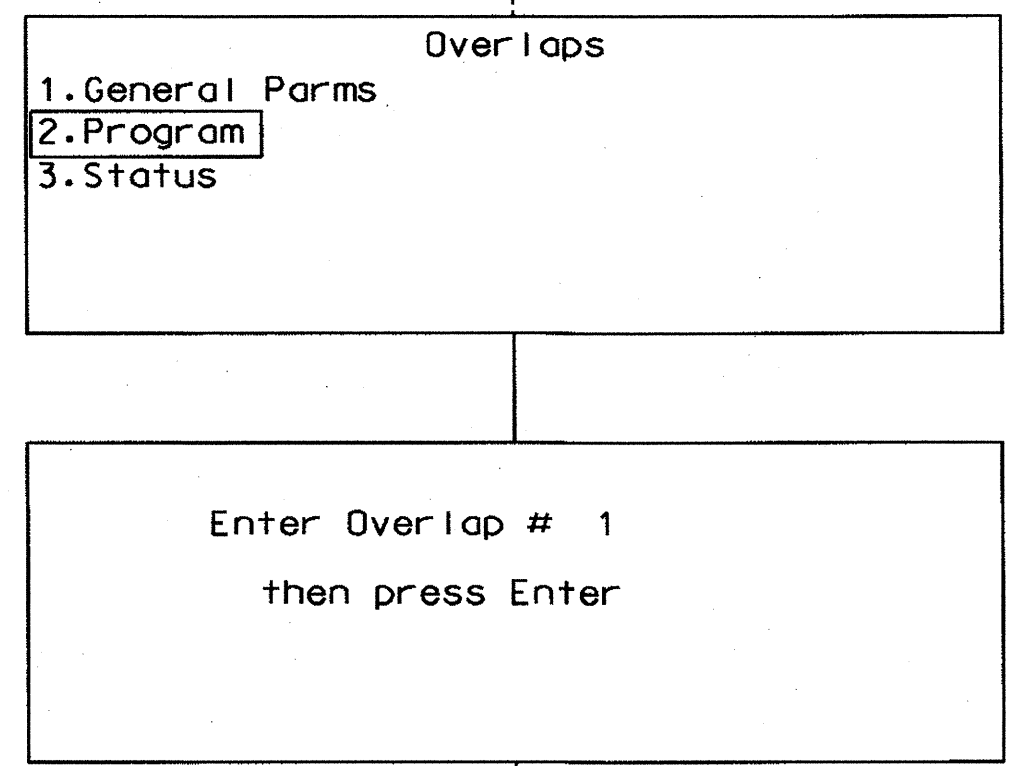
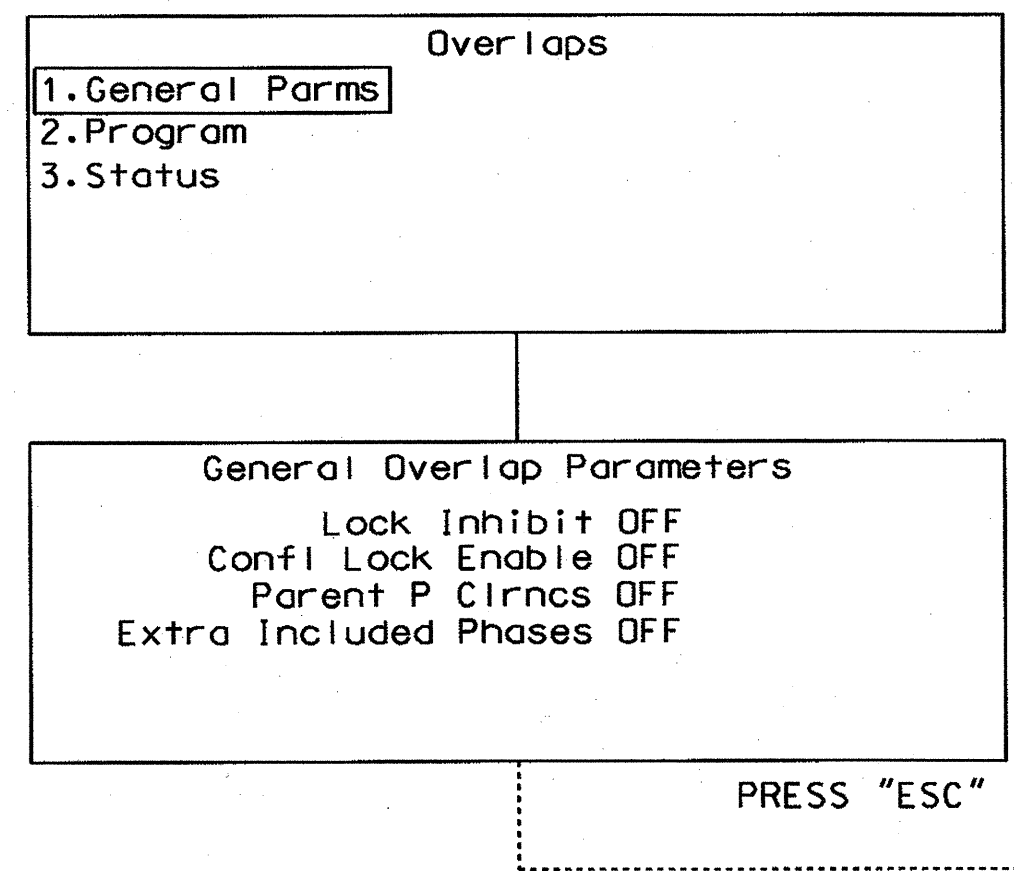
SIG. INVENTORY NO. 07-2176

15-MAY-2013 11:29 Signal Systems Group\Projects\072176_sml\08_xxx.dgn

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

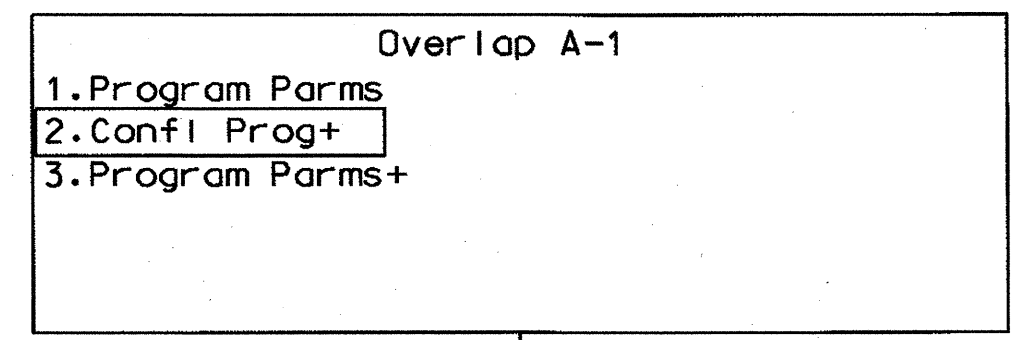
FROM MAIN MENU PRESS "1" CONTROLLER AND THEN "5" OVERLAPS



OvrIp A-1	Ps.....	
Included Ps	6 0 0 0 0 0 0 0	
Modifier Ps	0 0 0 0 0 0 0 0	
Type:NORMAL	Grn: 10 Yel: 4.5 Red: 1.3	

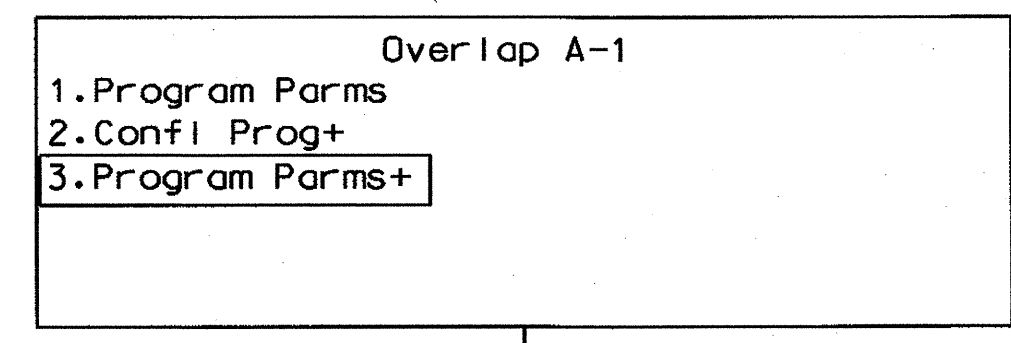
Note Grn.
Yel. Red
values for
Timed
Overlap A

PRESS "ESC"



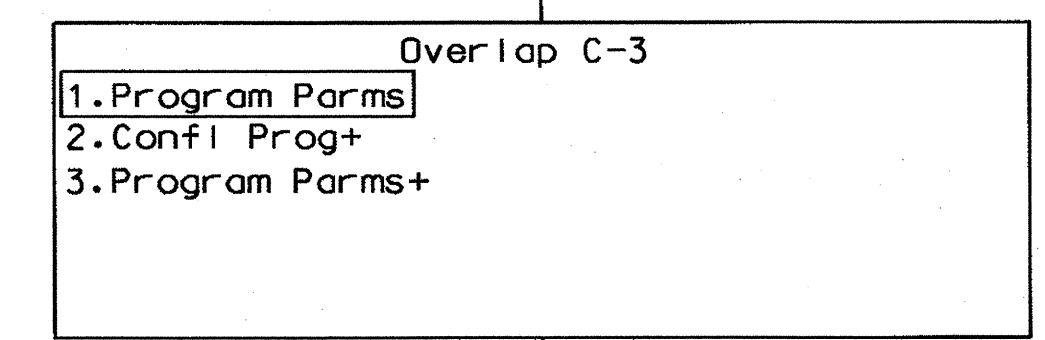
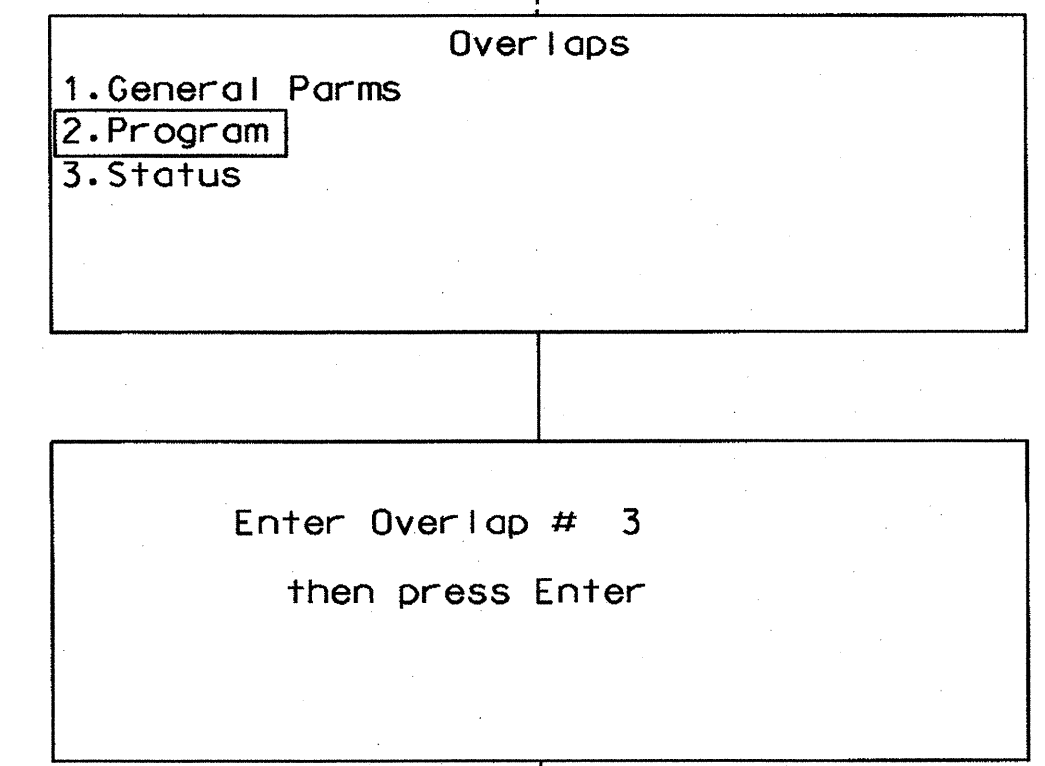
OvrIp A-1	Ps.....	
Confl Ps	0 0 0 0 0 0 0 0	
Confl Ovrlps	0 0 0 0 0 0 0 0	
Confl Peds	0 0 0 0 0 0 0 0	

PRESS "ESC"



OvrIp A-1	LeadGreen OFF	Transit 0	
GreenExtInh	0 0 0 0 0 0 0 0		

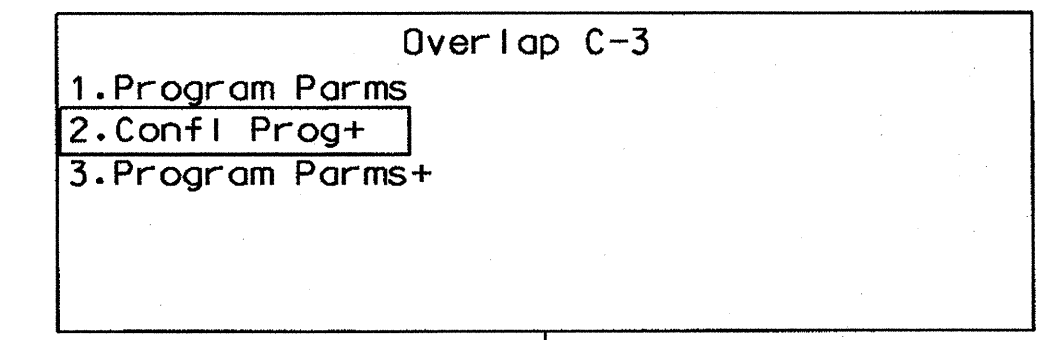
PRESS "ESC" TWICE



OvrIp C-3	Ps.....	
Included Ps	4 5 0 0 0 0 0 0	
Modifier Ps	0 0 0 0 0 0 0 0	
Type:NORMAL	Grn: 0 Yel: 3.2 Red: 4.5	

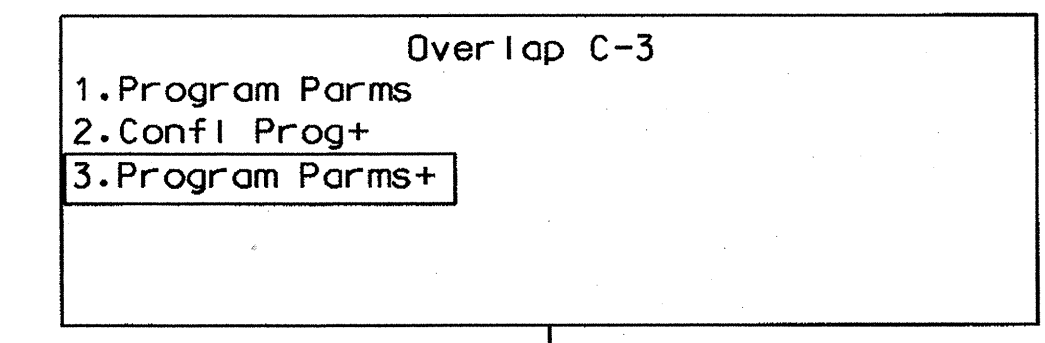
Note Yel. Red
values for
Overlap C

PRESS "ESC"



OvrIp C-3	Ps.....	
Confl Ps	0 0 0 0 0 0 0 0	
Confl Ovrlps	0 0 0 0 0 0 0 0	
Confl Peds	0 0 0 0 0 0 0 0	

PRESS "ESC"

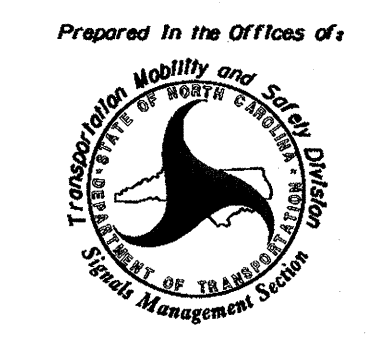
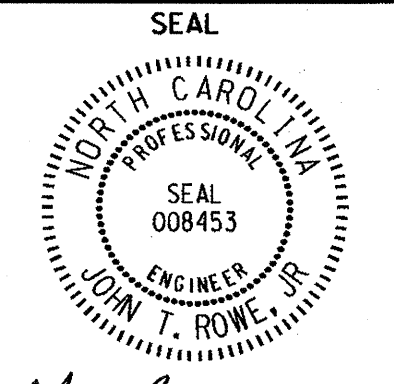


OvrIp C-3	LeadGreen OFF	Transit 0	
GreenExtInh	0 0 0 0 0 0 0 0		

OVERLAP PROGRAMMING COMPLETE

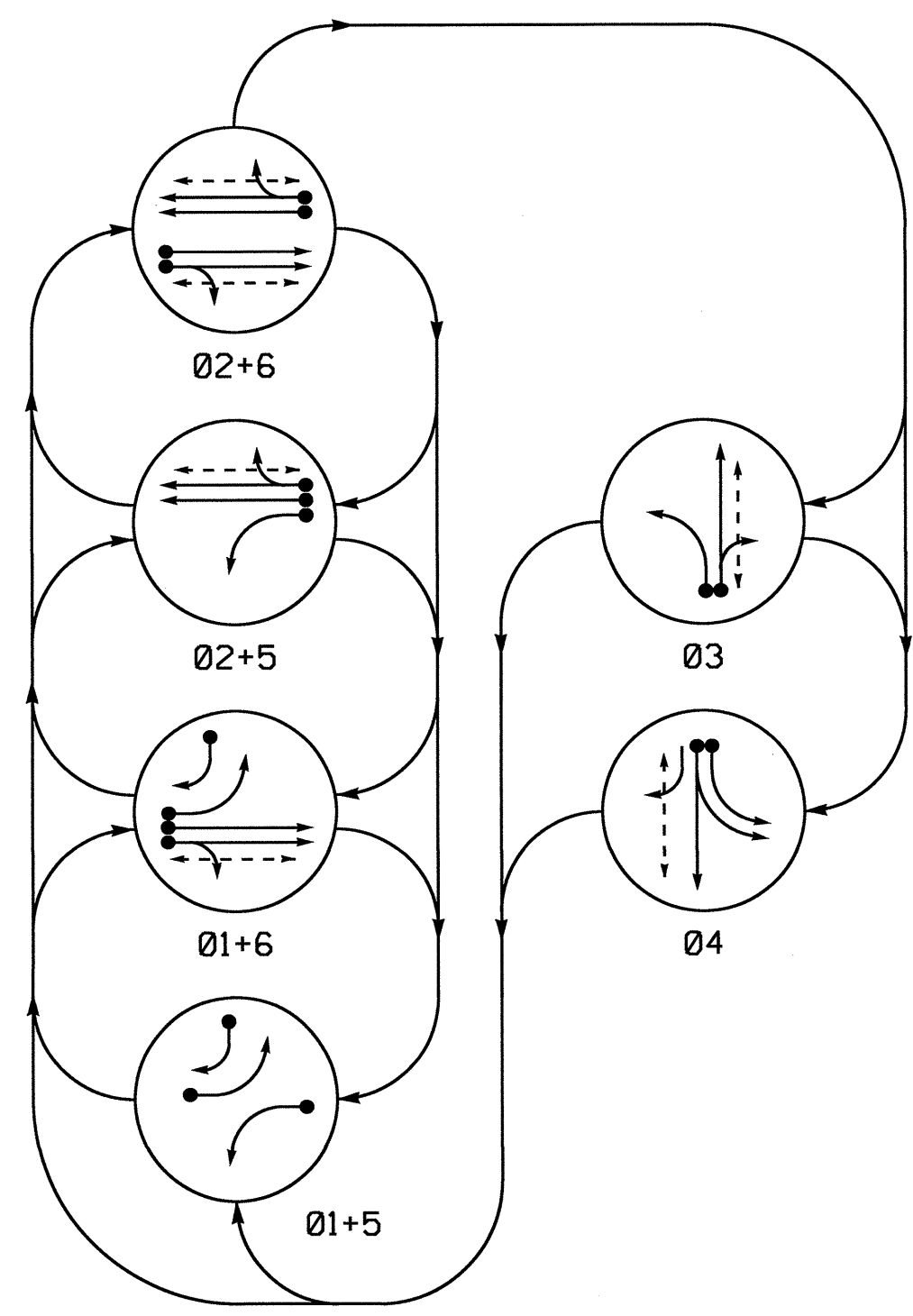
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2176
DESIGNED: March 2013
SEALED: 5/9/13
REVISED: N/A

New Installation - Sheet 2 of 2

	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>US 220 (Battleground Ave) at I-840 (Greensboro Western Loop) Ramps</p> <p>Division 7 Guilford County Greensboro</p>	<p>SEAL</p> 	
	<p>PREPARED BY: S. Armstrong</p>	<p>REVIEWED BY: JTR</p>	<p>DATE: 5-15-13</p>
	<p>REVISIONS</p>	<p>INIT.</p>	<p>DATE</p>
	<p>SIGNATURE: <i>S. Armstrong</i></p>		
<p>750 N. Greenleaf Pkwy, Garner, NC 27529</p>			

10-MAY-2013 09:04 S:\ATTS\UNITS\Sigma\10\mstr\strong\072176_sml.dwg (L:\xxx\ogn\strong)

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	04	P
11	-	-	-	-	-	-	-
21, 22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
51	-	-	-	-	-	-	-
61, 62	R	G	R	G	R	R	Y
P21, P22	DW	DW	W	W	DW	DW	DRK
P31, P32	DW	DW	DW	DW	W	DW	DRK
P41, P42	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK

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

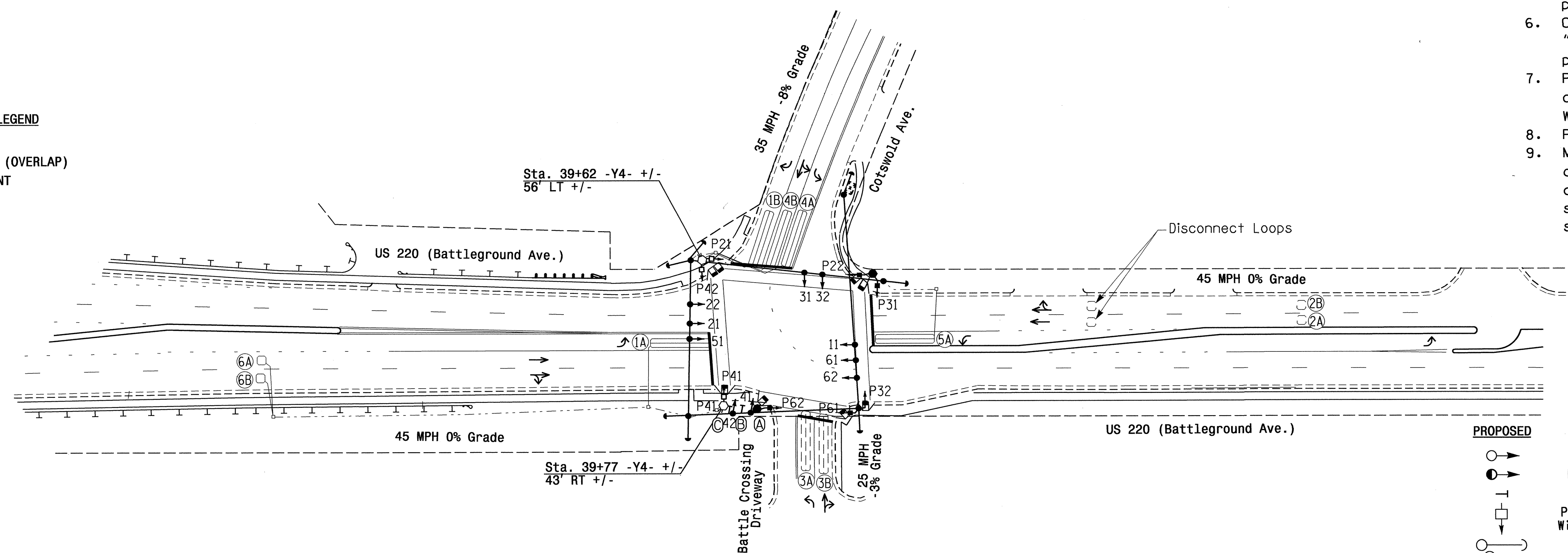
LOOP & DETECTOR UNIT INSTALLATION CHART
 NAZTEC APOGEE SOFTWARE 2070 CONTROLLER

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP
1A	6X40	0	2-4-2	X	1	-	3	-	X	X	-	-
1B	6X40	0	2-4-2	X	1	-	15	-	X	X	-	-
2A, 2B	6X6	285	EXIST	-	2	-	-	-	X	X	-	-
3A	6X40	+5	2-4-2	-	3	-	3	-	X	X	-	-
3B	6X40	+5	2-4-2	-	3	-	10	-	X	X	-	-
4A	6X40	0	2-4-2	X	4	-	3	-	X	X	-	-
4B	6X40	0	2-4-2	X	4	-	-	-	X	X	-	-
5A	6X40	0	2-4-2	X	5	-	-	-	X	X	-	-
6A	6X6	300	6	X	6	-	-	-	X	X	-	-
6B	6X6	300	6	X	6	-	-	-	X	X	-	-

6 Phase Fully Actuated (Greensboro Signal System)

NOTES

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



LEGEND

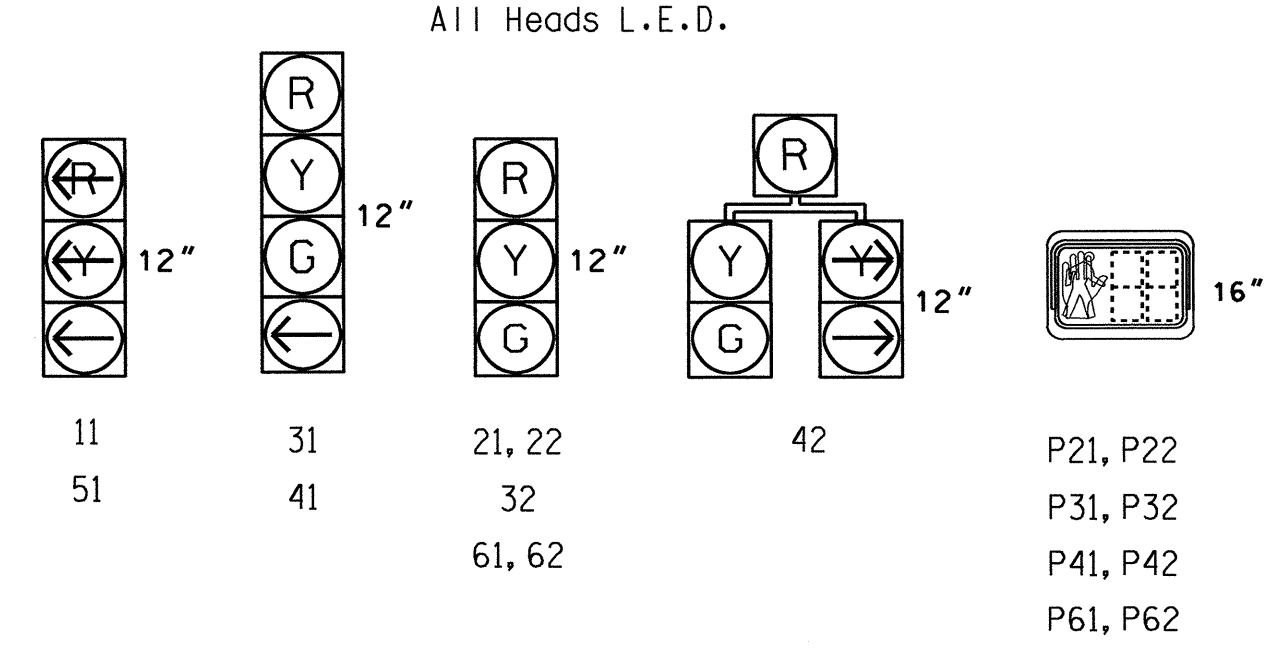
PROPOSED	EXISTING
	N/A

NAZTEC APOGEE 2070 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Gap, Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Maximum Green 1 *	25	50	15	25	20	50
Maximum Green 2 *	-	-	-	-	-	-
Yellow Clear	3.0	4.5	3.3	4.5	3.0	4.5
Red Clear	2.4	1.6	2.6	2.0	2.4	1.6
Walk *	-	7	7	7	-	7
Pedestrian Clear	-	24	20	19	-	11
Added Initial *	-	1.5	-	-	-	1.5
Maximum Initial *	-	33	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	40	-	-	-	40
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Lock Calls	NO	YES	NO	NO	NO	YES
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

SIGNAL FACE I.D.



Signal Upgrade

Prepared in the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

US 220 (Battleground Ave.) at Cotswold Avenue/ Battle Crossing Driveway
 Division 7 Guilford County Greensboro

PLAN DATE: April 2013 REVIEWED BY: [Signature]
 PREPARED BY: R. W. Hough REVIEWED BY: [Signature]

SCALE: 1"=50'

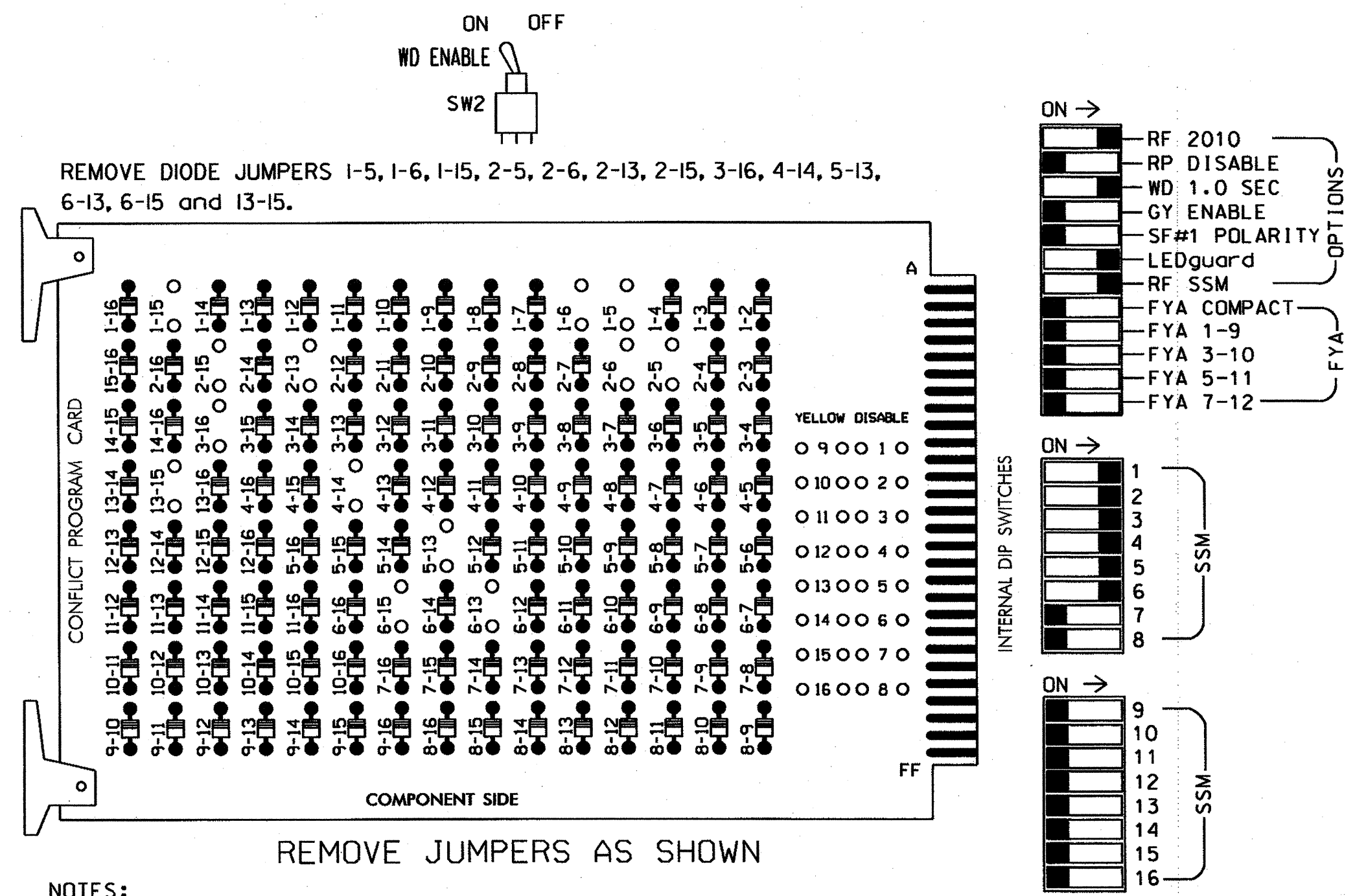
REVISIONS: [Table with columns for REVISIONS, INIT., DATE]

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIEMBA ENGINEER SEAL 026486 DATE 5/9/13

SIG. INVENTORY NO. 07-1484

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.
- To prevent red failures on unused monitor channels, see Red Monitor Board Programming Detail this sheet.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-MODE 5. This initialization should be done prior to programming controller.
- Program phases 2 and 6 for Start Up In Walk.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "ON".
- ~~Program phases 2 and 6 for Dual Entry.~~
- The cabinet and controller are part of the City of Greensboro Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	3 PED
SIGNAL HEAD NO.	11	42	21,22	P21, P22	31	32	41	42	P41, P42	51	61,62	P61, P62
RED		128		116	116	101	101			134		
YELLOW		129		117	117	102	102			135		
GREEN		130		118	118	103	103			136		
RED ARROW	125									131		
YELLOW ARROW	126	126								132		
GREEN ARROW	127	127		118		103				133		
Hand icon				113				104		119		110
Person icon				115				106		121		112

NU = Not Used

EQUIPMENT INFORMATION

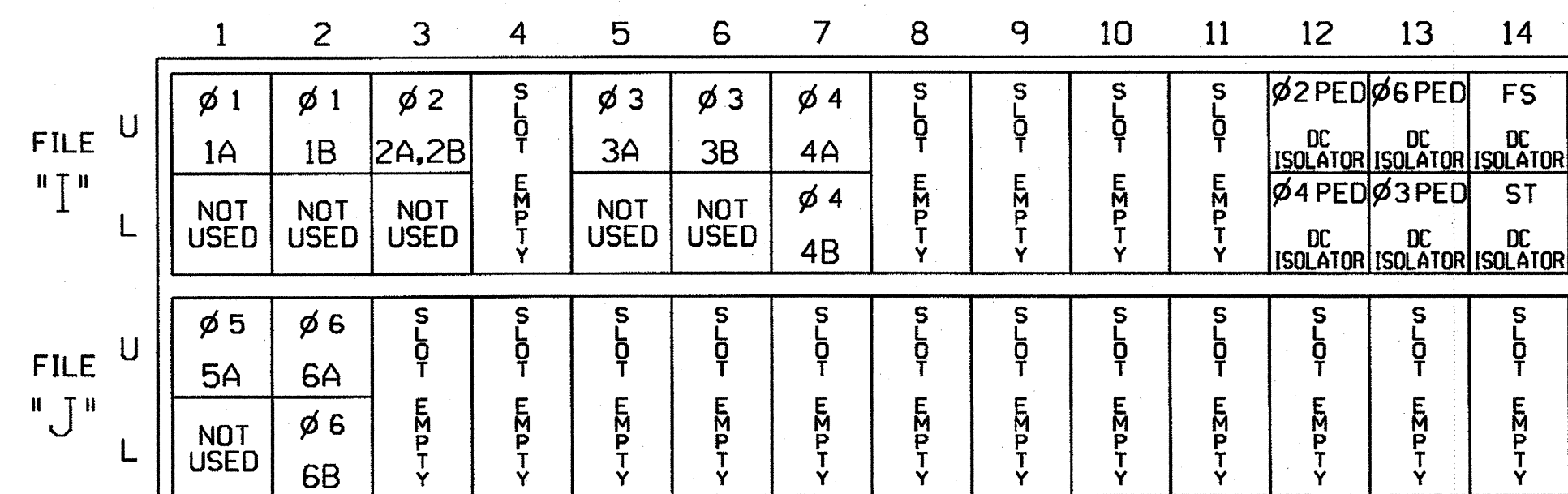
CONTROLLER.....NAZTEC 2070L
 CABINET.....McCAIN/CONTROL TECHNOLOGIES
 (DWG.NO.9500-332-NCDOT)
 SOFTWARE.....NAZTEC APOGEE
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P,S8P
 PHASES USED.....1,2,2 PED,3,3 PED,4,4 PED,5,6,6 PED
 OVERLAPS.....NONE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
1A	TB2-1,2	I1U	56	1	1		3		X	X	
1B	TB2-5,6	I2U	39	2	1		15		X	X	
2A,2B	TB2-9,10	I3U	63	4	2				X	X	
3A	TB4-5,6	I5U	58	7	3		3		X	X	
3B	TB4-9,10	I6U	41	8	3		10		X	X	
4A	TB6-1,2	I7U	65	10	4		3		X	X	
4B	TB6-3,4	I7L	78	11	4				X	X	
5A	TB3-1,2	J1U	55	15	5				X	X	
6A	TB3-5,6	J2U	40	16	6				X	X	
6B	TB3-7,8	J2L	44	17	6				X	X	
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED						
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED						
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED						
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED						

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

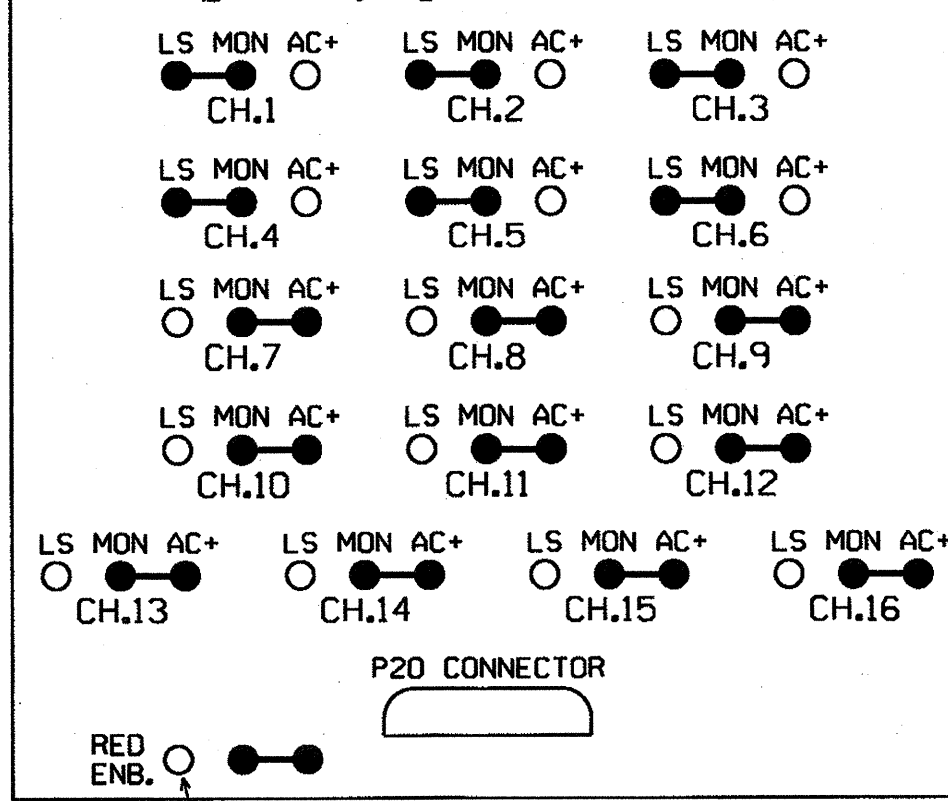
INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1484
 DESIGNED: April 2013
 SEALED: 5/9/13
 REVISED: N/A

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



This pin clipped at the factory.

Electrical Detail - Sheet 1 of 2

REVISION SEAL

Prepared in the Office of:
 TRANSPORTATION Mobility and Safety Division
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section

750 N. Greenfield Pkwy, Garner, NC 27529

Electrical and Programming Details For:
Battleground Avenue (U.S. 220) and Cotswold Avenue

Division 7 Guilford County Greensboro

PLAN DATE: July 2011 REVIEWED BY:
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS

NO.	DESCRIPTION	INIT.	DATE
1	Added phase 2 and phase 3 PEDs. SES 01/20/11	GSB	01/22/11
2	Revised phase 2/6, local removed dual entry. (WSA)	JTK	5-14-13

SEAL

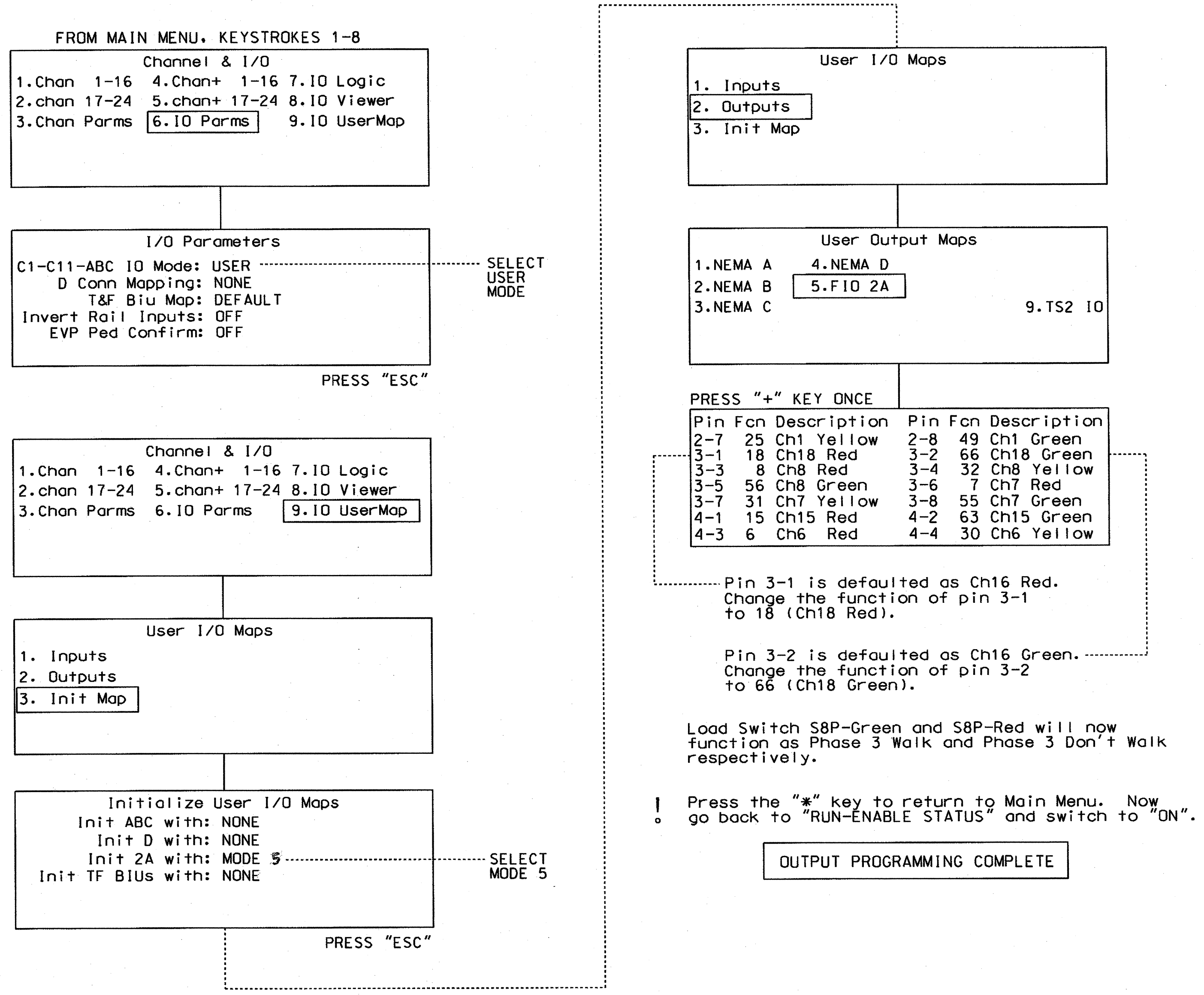
This document or originally issued and sealed by George C. Brown, #022013, on 07/22/11. This media shall not be considered a certified document.

SIGNATURE DATE
 SIG. INVENTORY NO. 07-1484

13-MAY-2013 08:33
 13-MAY-2013 08:33 Signal Management Section 071484_sml.e.le.xxx.dgn
 ssmstr009

**SIGNAL DRIVER OUTPUT PROGRAMMING
DETAIL FOR PHASE 3 PED**
(program controller as shown below)

1. Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.



**CONTROLLER PED DETECTOR
ASSIGNMENT PROGRAMMING**
(program controller as shown below)

The programming below uses Det# 8 to call phase 3.

FROM MAIN MENU PRESS 5 (Detectors)
THEN PRESS 4 (Ped Parm)

DETECTORS

1.Veh Parm	4.Ped Parm	7.Status
2.Veh Options	5.Alt Progs	8.V/O-Speed
3.Veh Parm+	6.Phas Recall	9.Copy

PRESS "+" KEY ONCE

Det#	Call	NoAct	Max Pres	ErrCnt
2	2	0	0	0
3	0	0	0	0
4	4	0	0	0
5	0	0	0	0
6	6	0	0	0
7	0	0	0	0
8	3	0	0	0

PED DETECTOR PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1484
DESIGNED: April 2013
SEALED: 5/9/13
REVISED: N/A

REVISION SEAL

SEAL 008453
ENGINEER JOHN T. ROWE, NC
Signature: John T. Rowe
Date: 5-14-13

Electrical Detail - Sheet 2 of 2

Prepared in the Office of:
Transportation Mobility and South Division
Division of Transportation Management Systems
750 N.Greenfield Pkwy,Corner,NC 27529

DETAILS FOR: Battleground Avenue (U.S. 220) and Cotswold Avenue

Division 7 Guilford County Greensboro

PLAN DATE: July 2011 REVIEWED BY:

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS	INIT.	DATE
✓ Add phase 2, ood, phase 3 PEDs. CES 07/20/11	GCB	07/22/11
✓ Revised phase 2/6, loadst removed, dual entry... (WS)	TR	5-14-13

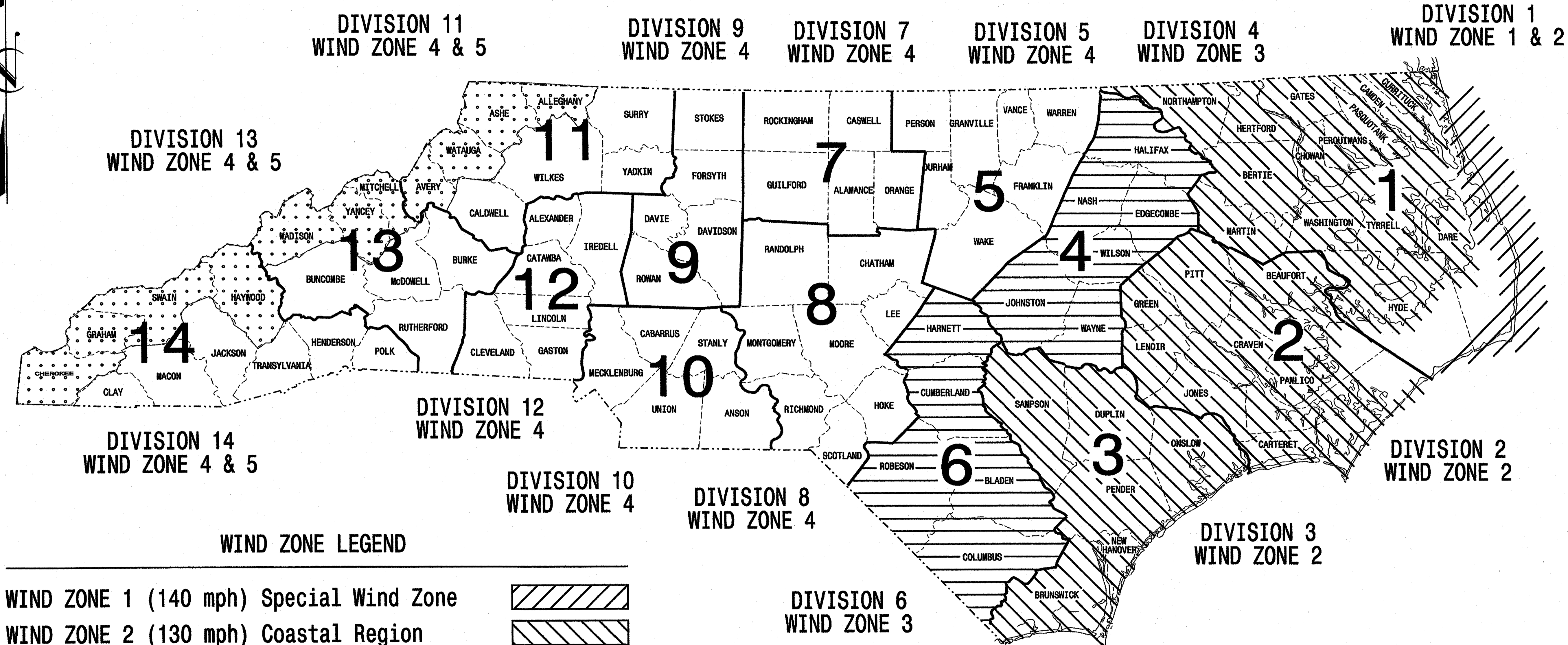
SIGNATURE DATE
SIG. INVENTORY NO. 07-1484

13-MAY-2013 08:33
U:\Signal\Work\proj\071484_sml\el_xxx.dgn
S:\BSTR000

**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

STATE	PROJECT NO.	SHEET NO.
N.C.	U-2524C	Sig. 20
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

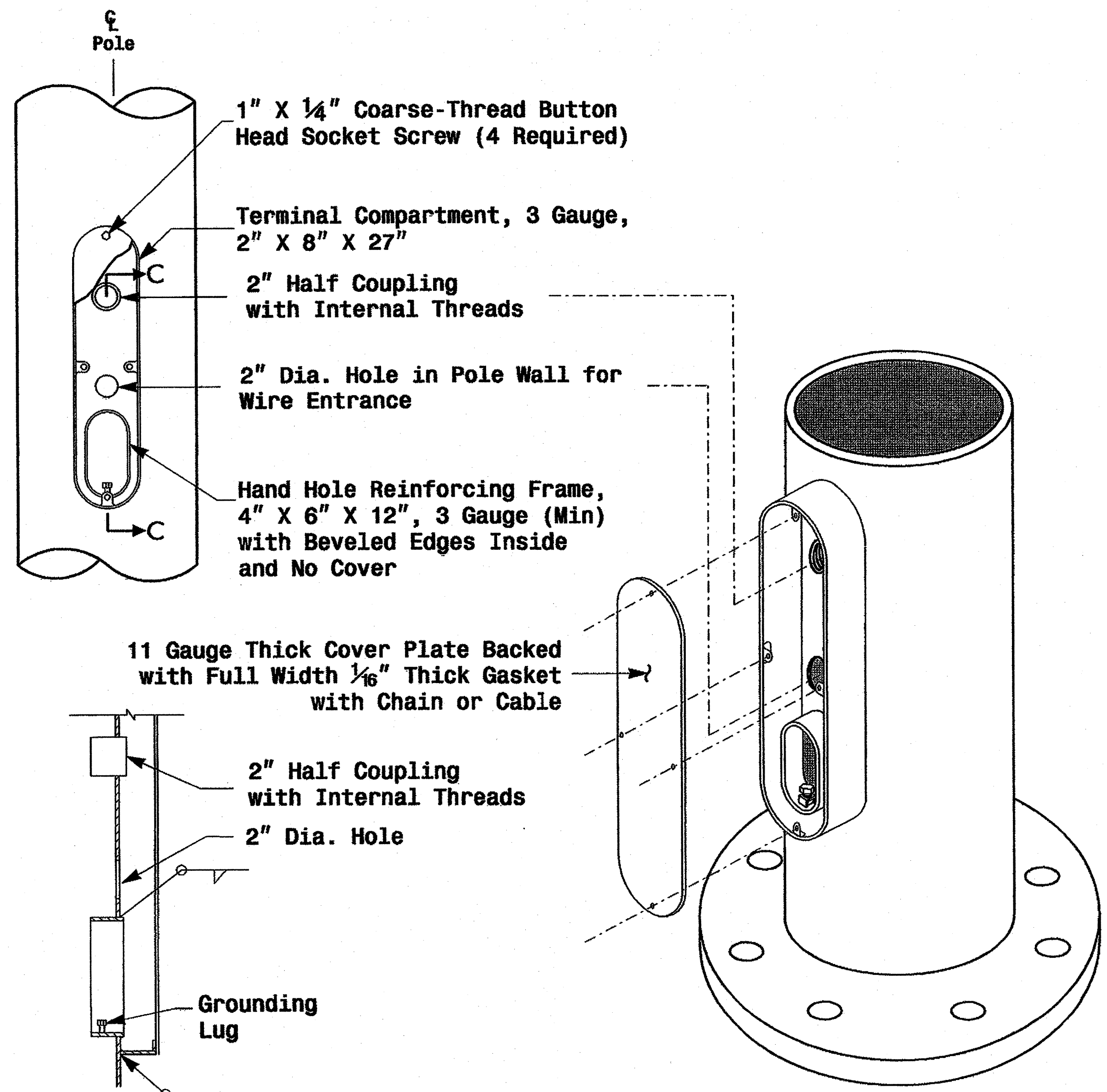
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

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

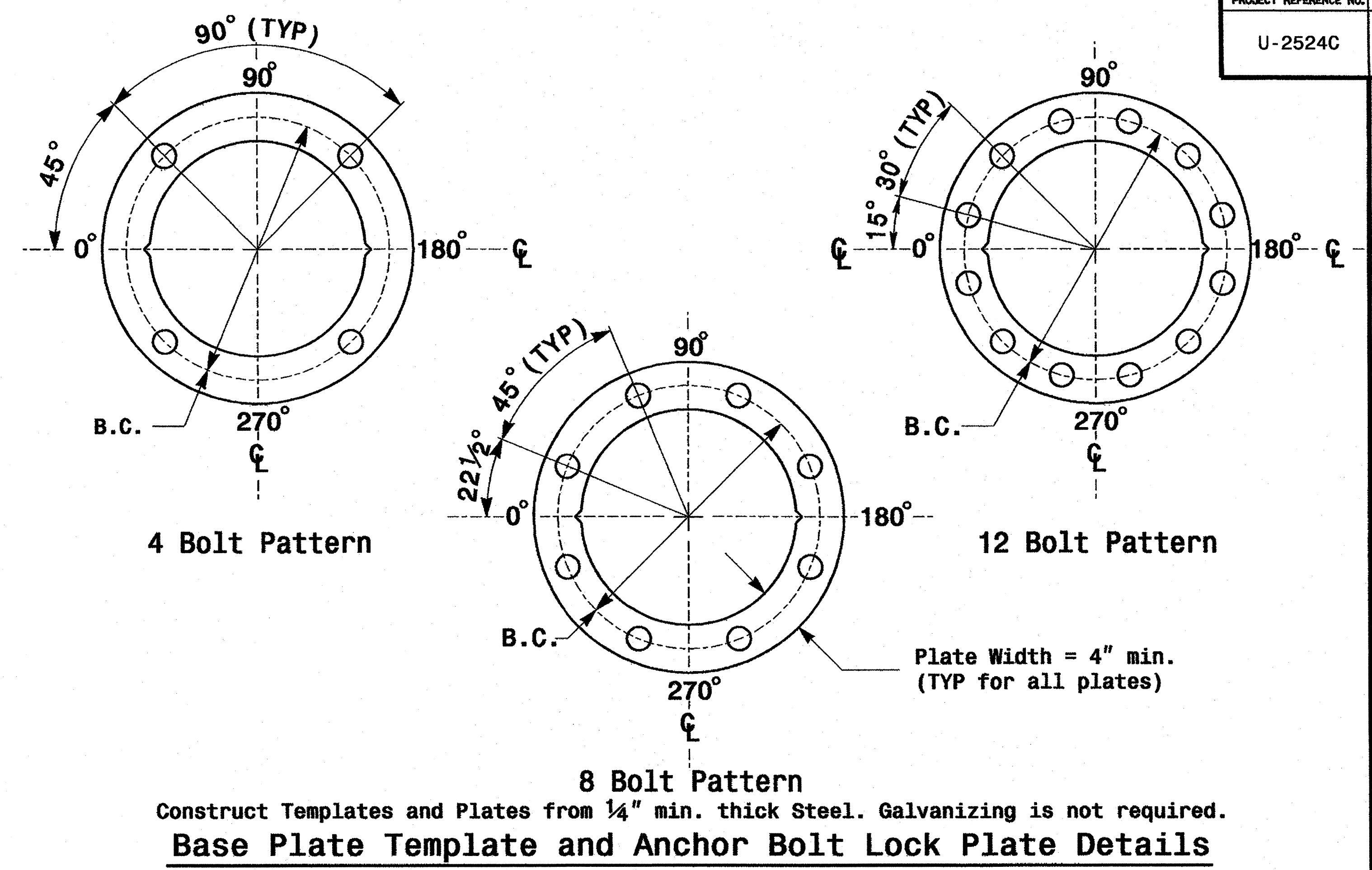
SEAL

SIGNATURE: *D. Sarkar* DATE: 7.21.2009



Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



Base Plate Template and Anchor Bolt Lock Plate Details

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 _____	

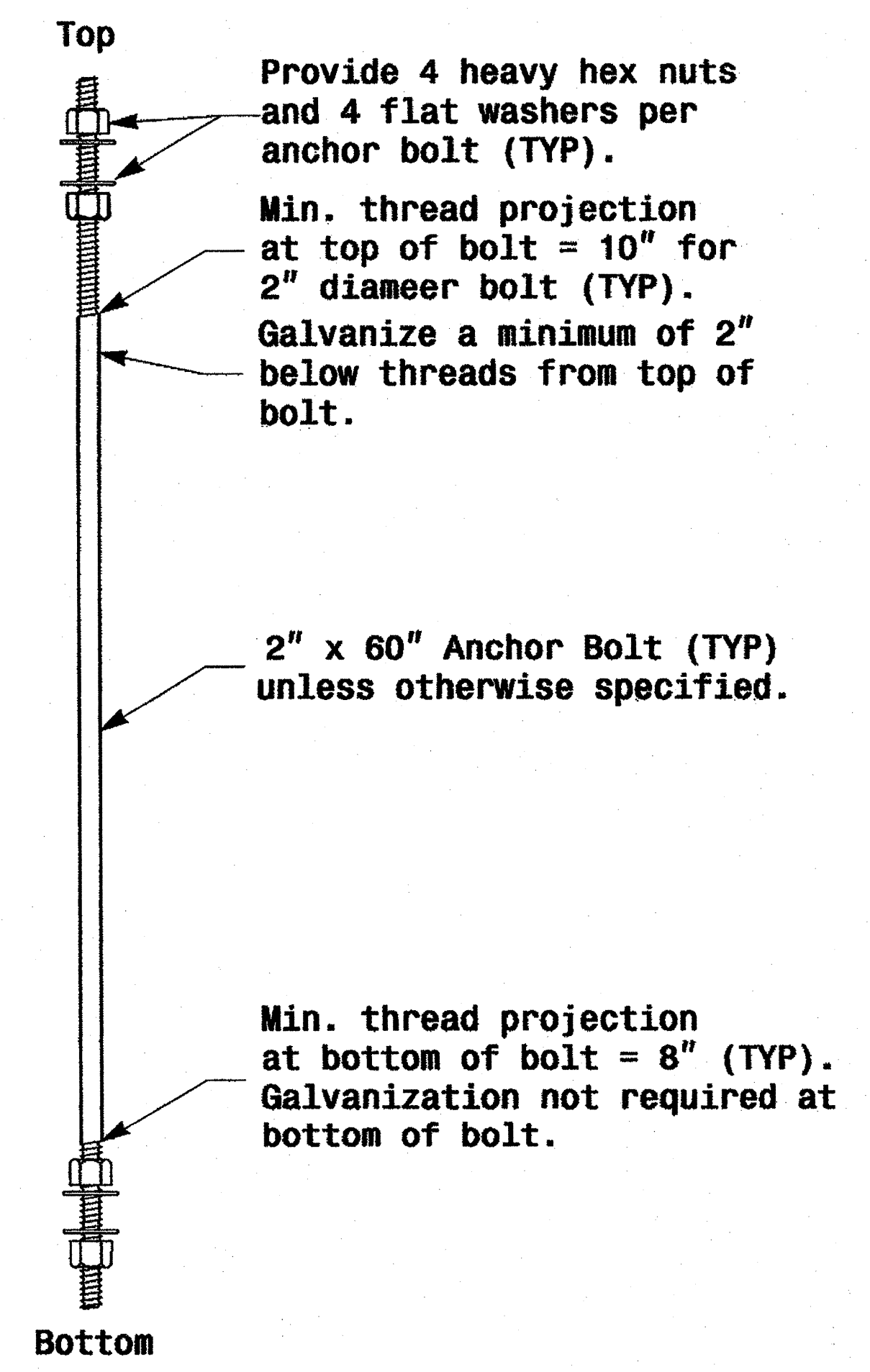
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

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

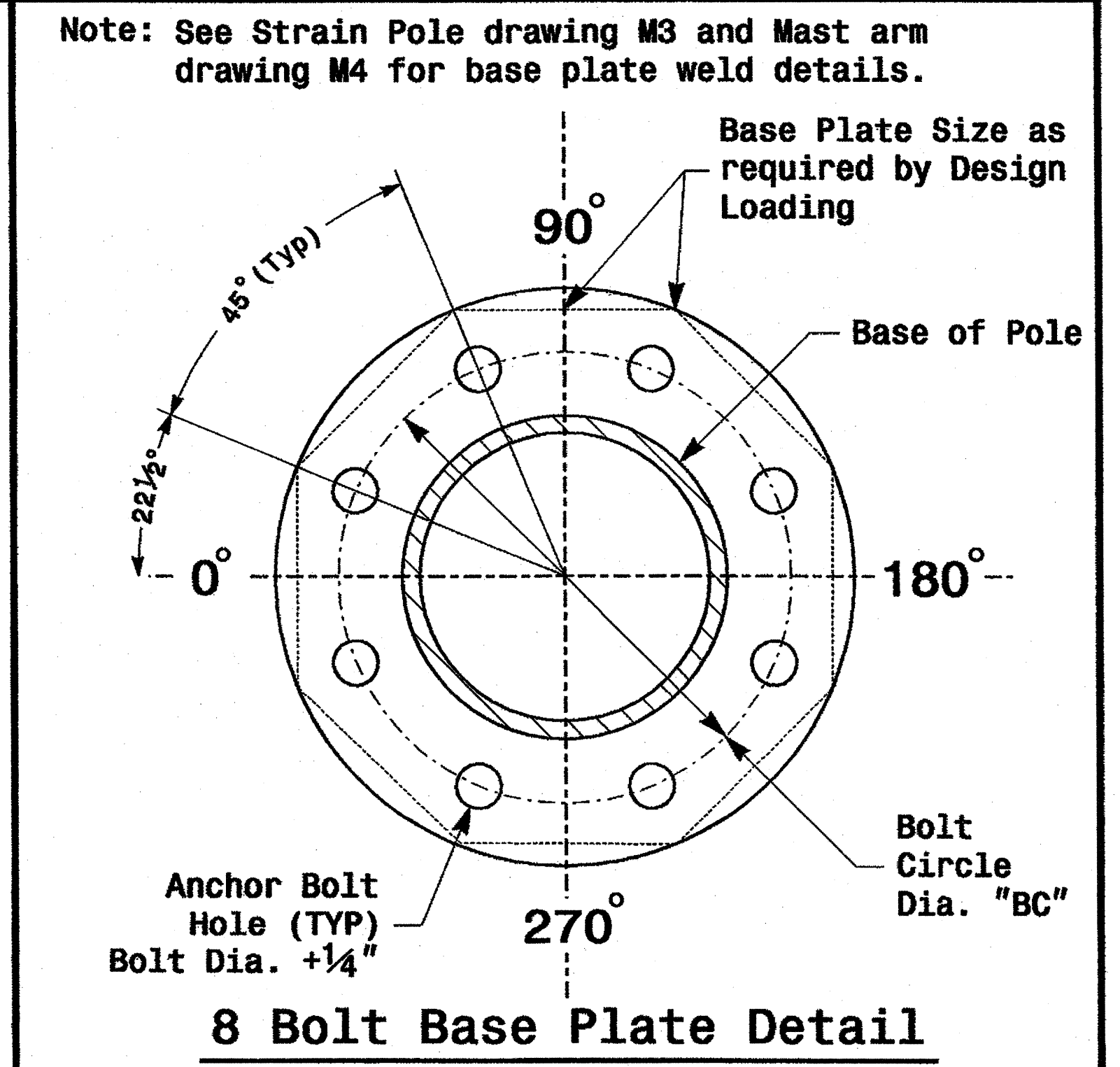
Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

- 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



Anchor Bolt Detail

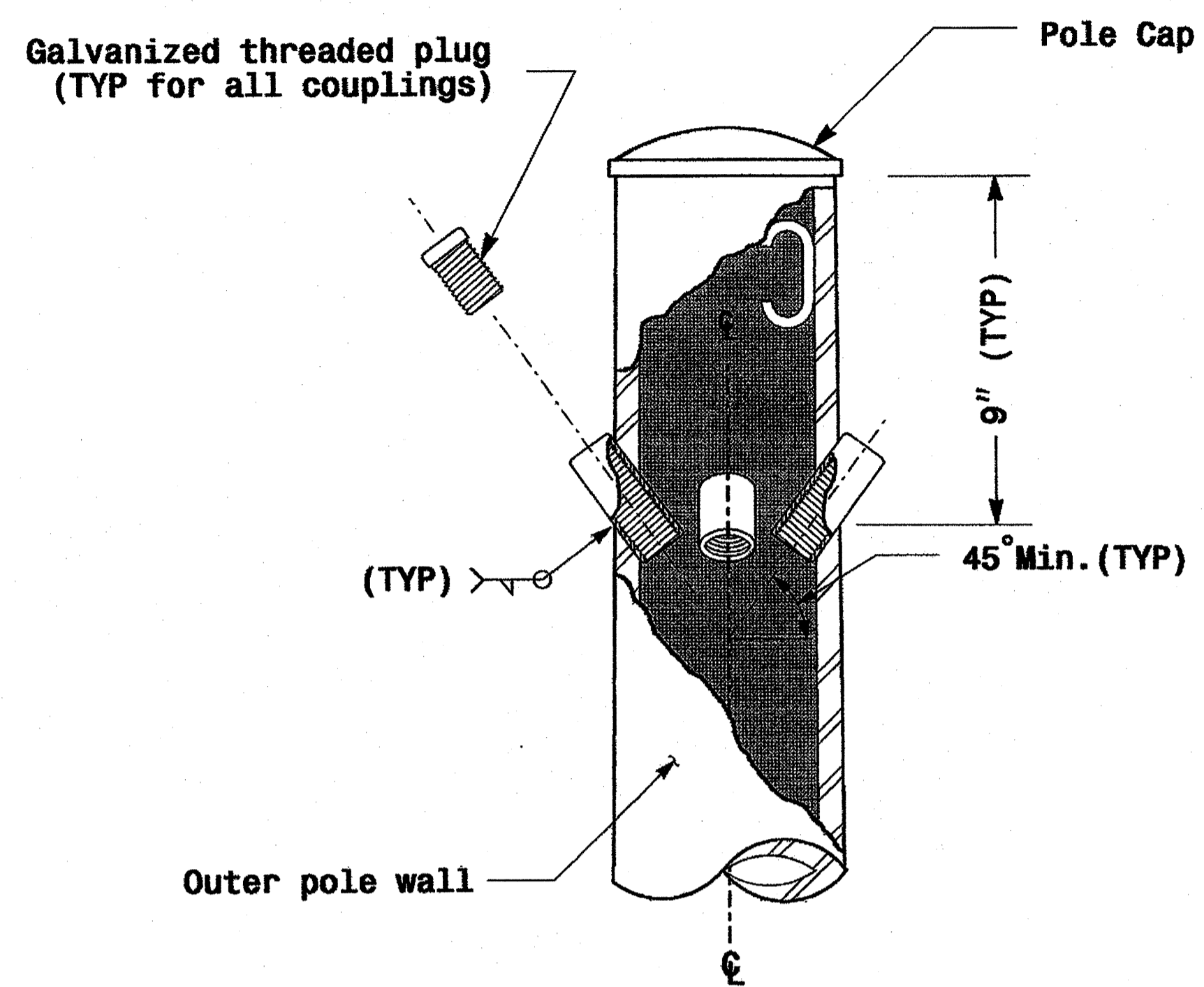


8 Bolt Base Plate Detail

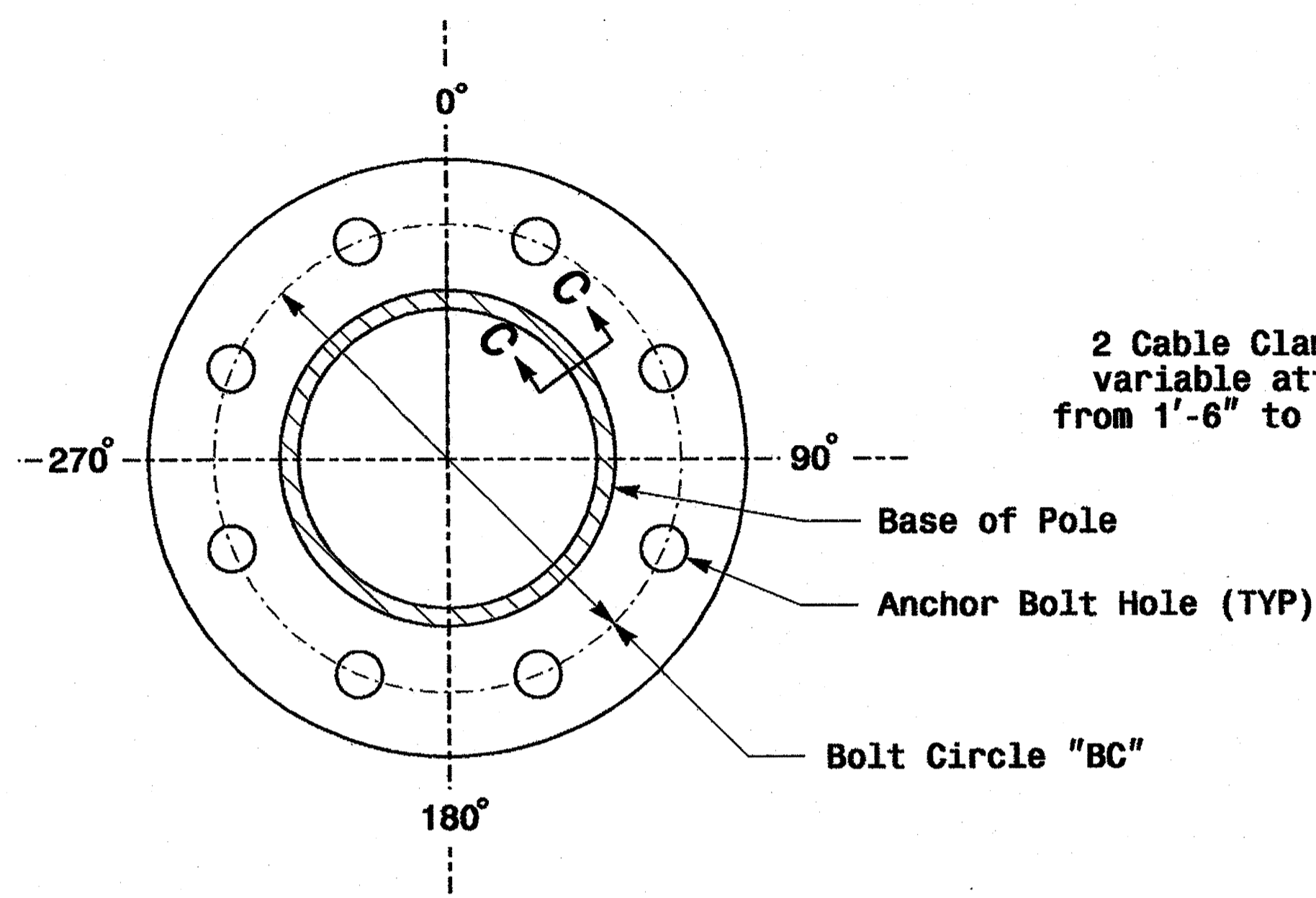
	Typical Fabrication Details Common To All Metal Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander REVISIONS: _____	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito INIT. DATE	

Fabrication Details - All Poles

01-SEP-2005 18:22 D:\2004 Metal Pole Standards\2004.mft\ru.mf.dgn

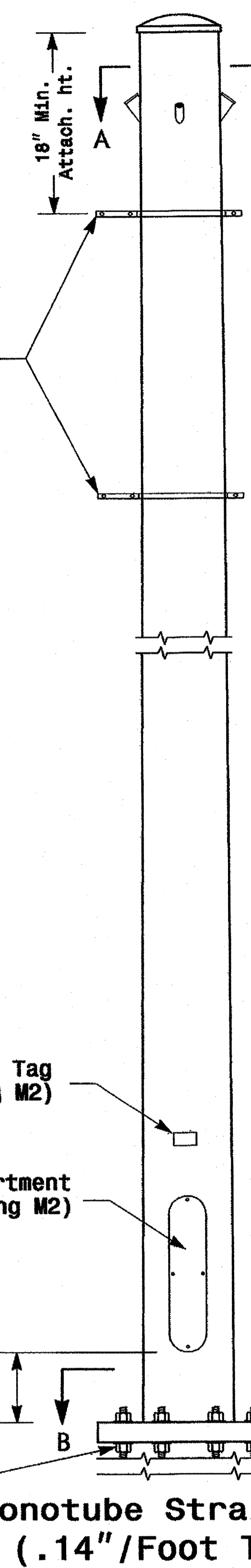


Cable Entrances at Top of Pole

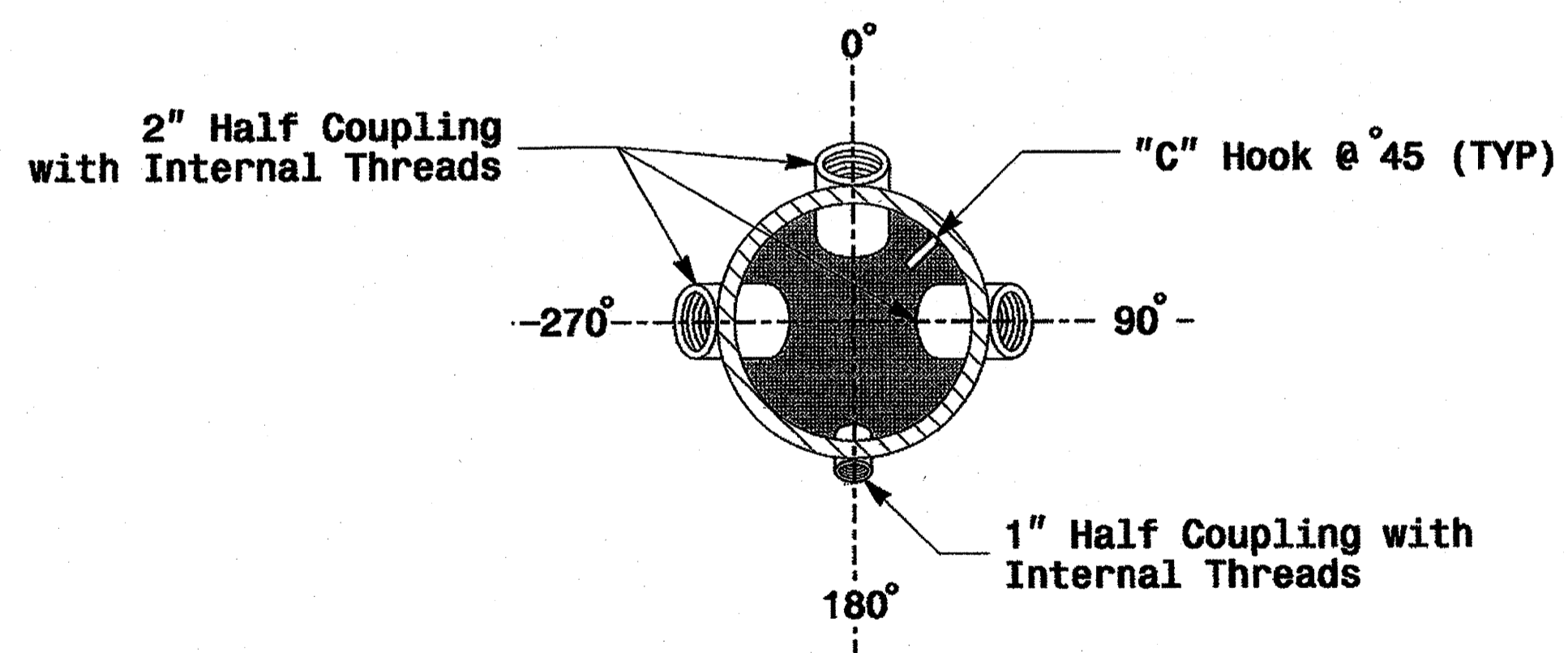


Section B-B
(See drawing M2)
Pole Base Plate

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

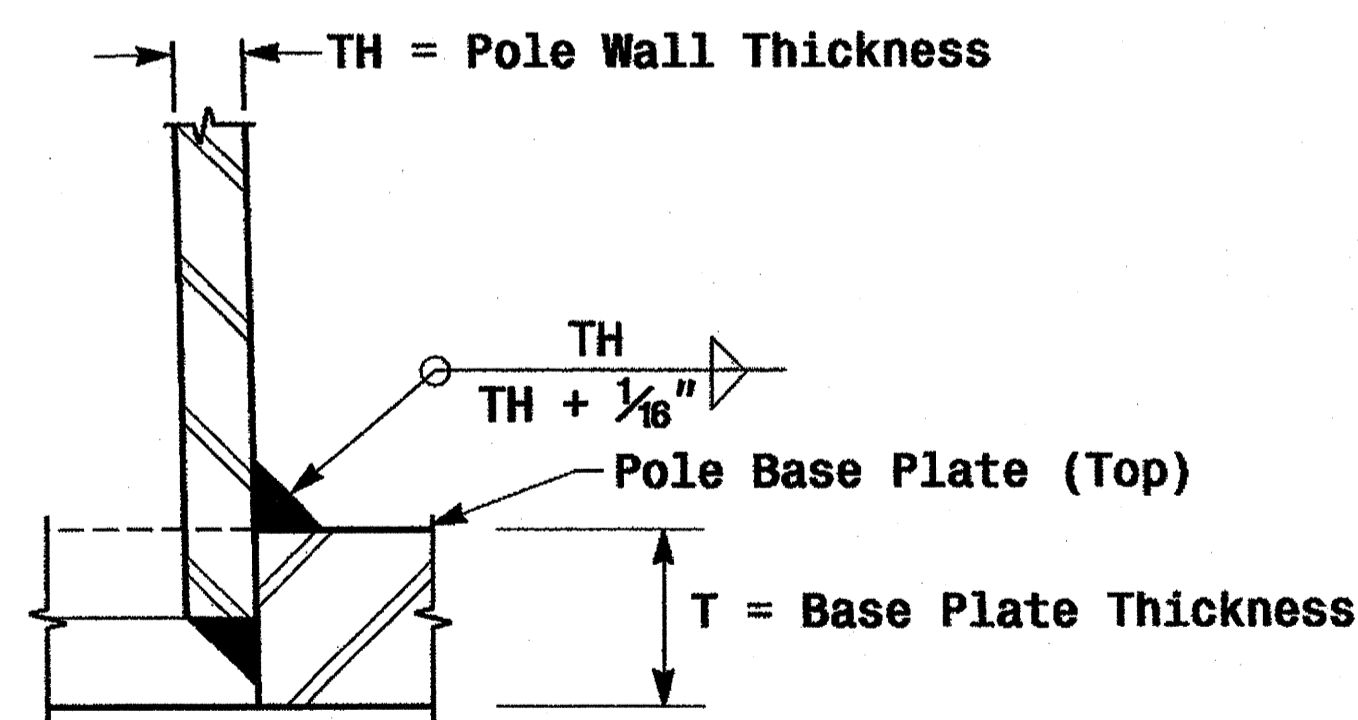


Monotube Strain Pole
(.14"/Foot Taper)



Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole

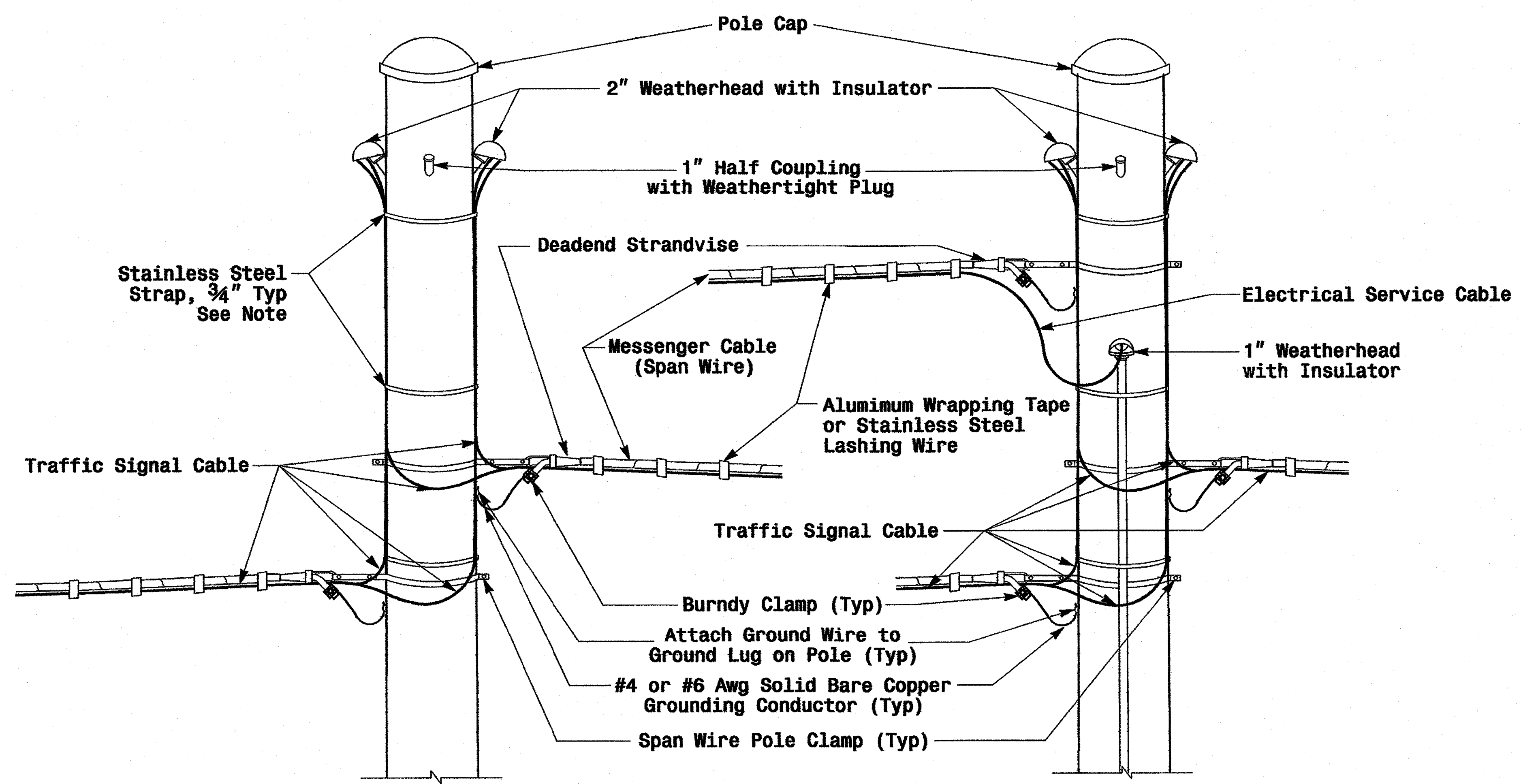


Section C-C

Socket Connection Weld Detail

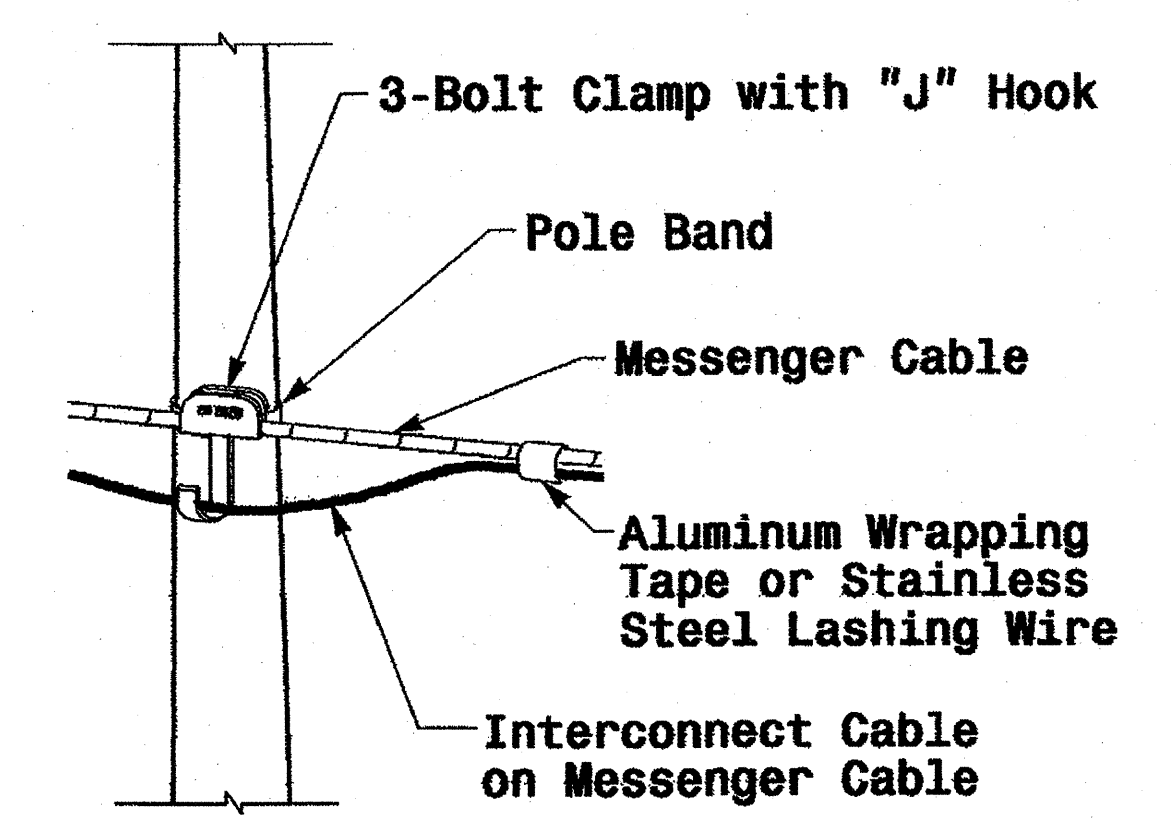
01-SEP-2005 14:07 P:\p00000000\m00000000\metal pole standard\sig2004.m3.dgn

	Typical Fabrication Details For Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
REVISIONS: _____ IMIT. DATE		SIGNATURE: <i>J. Sarker</i> DATE: 9.2.2005	
SIG. INVENTORY NO.			

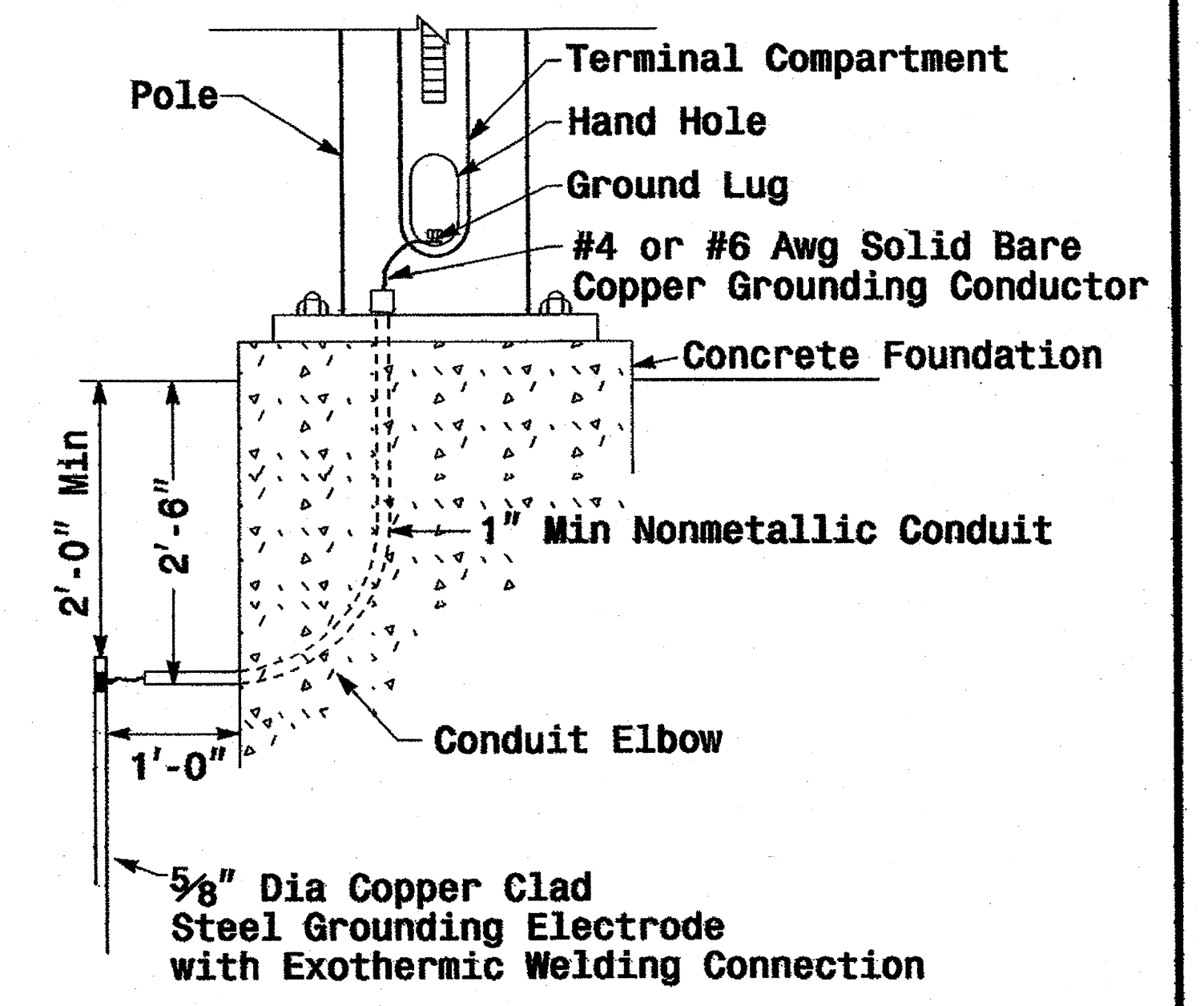


Note: Strap all signal cables to the side of the pole with 3/4\" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36\"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



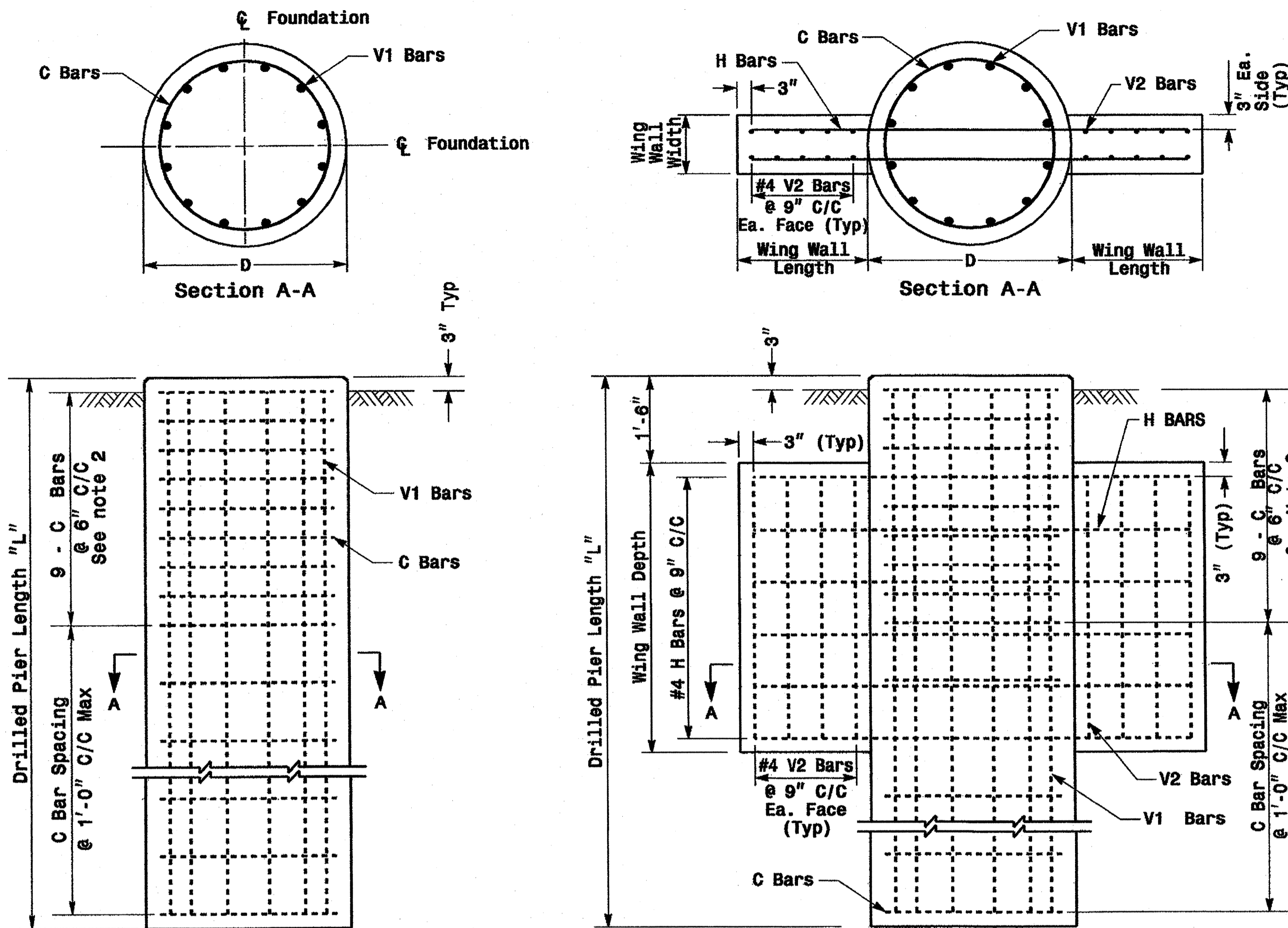
Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:33 w:\p001\ee-un\work\grcupse2004 metal pole standard\2004 m6.dgn

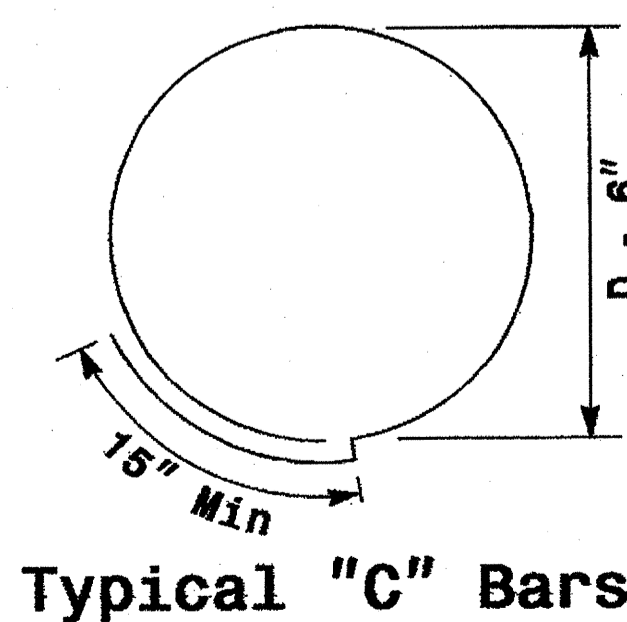
	Construction Details Strain Poles		SEAL
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR	INVT. DATE INVT. DATE
SCALE: 0 NA NONE	REVISIONS		SIG. INVENTORY NO.

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"

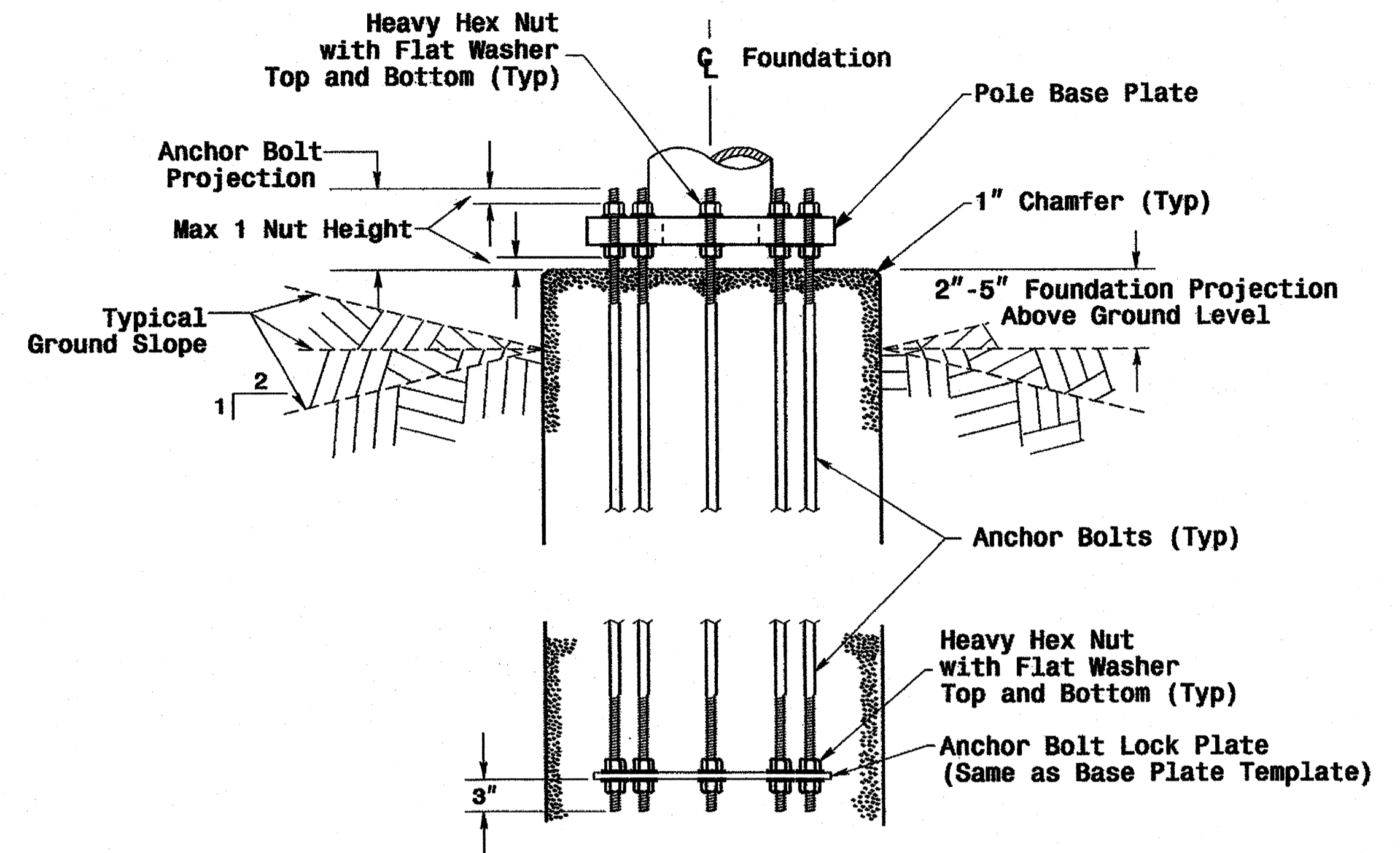
* See Note No. 1
 ** See Note No. 3

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

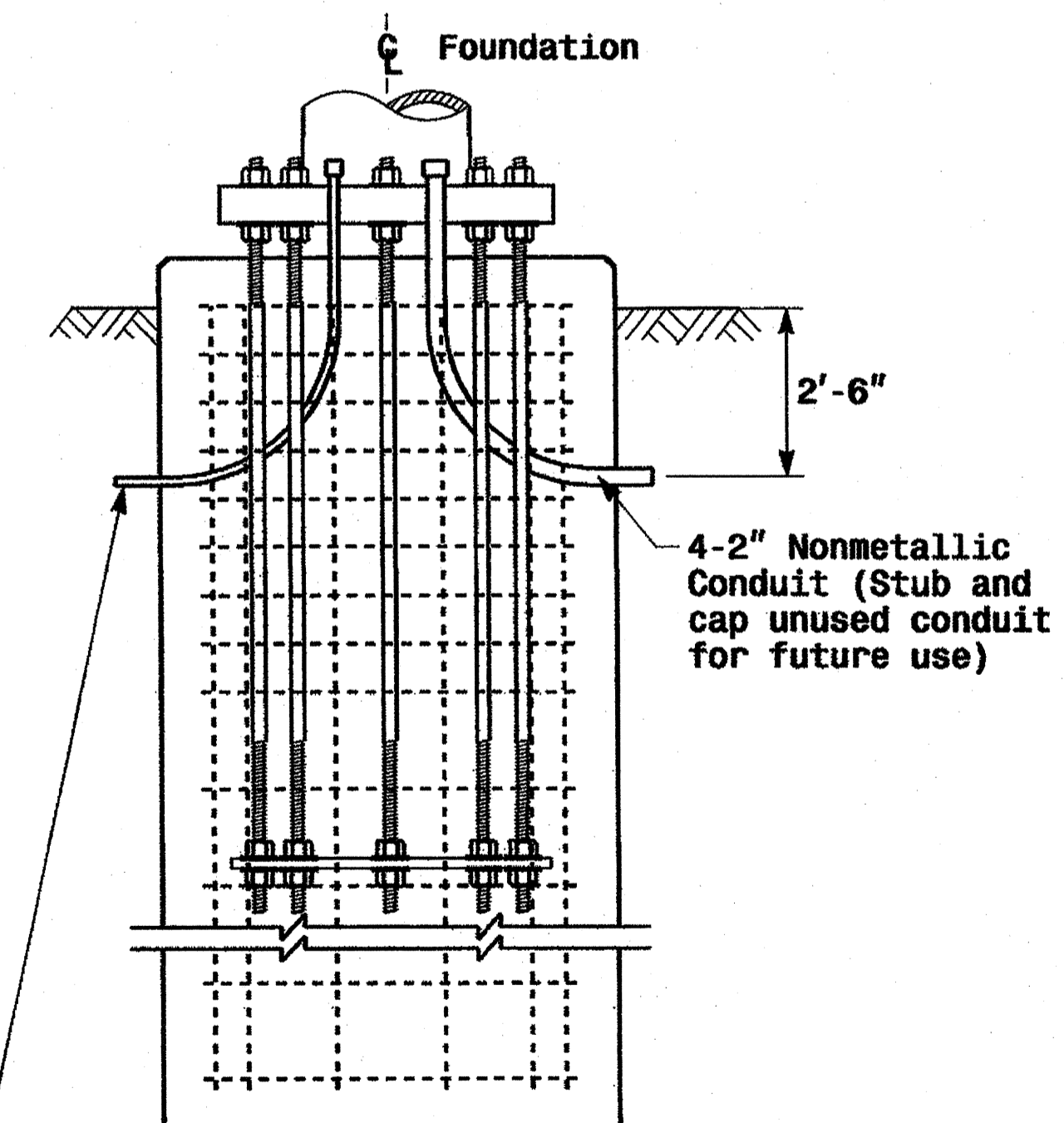
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



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

	Construction Details Foundations		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 028094 JOSEPH C. SARKAR
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.M. ESPOSITO	
SIGNATURE: <i>J. Sarkar</i> 9.2.2005 DATE:		SIG. INVENTORY NO.	

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

Concrete Volume (cubic yards)=.356 X L

Fabrication Design Notes:

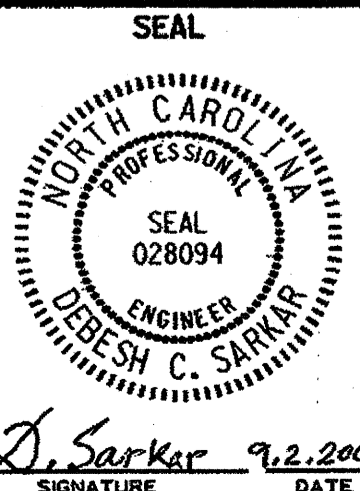
1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

Foundation Selection:

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

Standard Strain Poles

02-SEP-2005 12:42 vr:spc:tes-uni1:hw:kg:spc:2004 metal pole standar-ds0204 m8 std strain pole.dgn pol:evardr

	Standard Strain Poles and Foundations													
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.W. Esposito												
SCALE: None	REVISIONS: <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	DESCRIPTION				INITIALS: <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>INITIALS</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	INITIALS			
NO.	DATE	DESCRIPTION												
NO.	DATE	INITIALS												
SIGNATURE: <i>D. Sarker</i>		DATE: 9.2.2005												

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

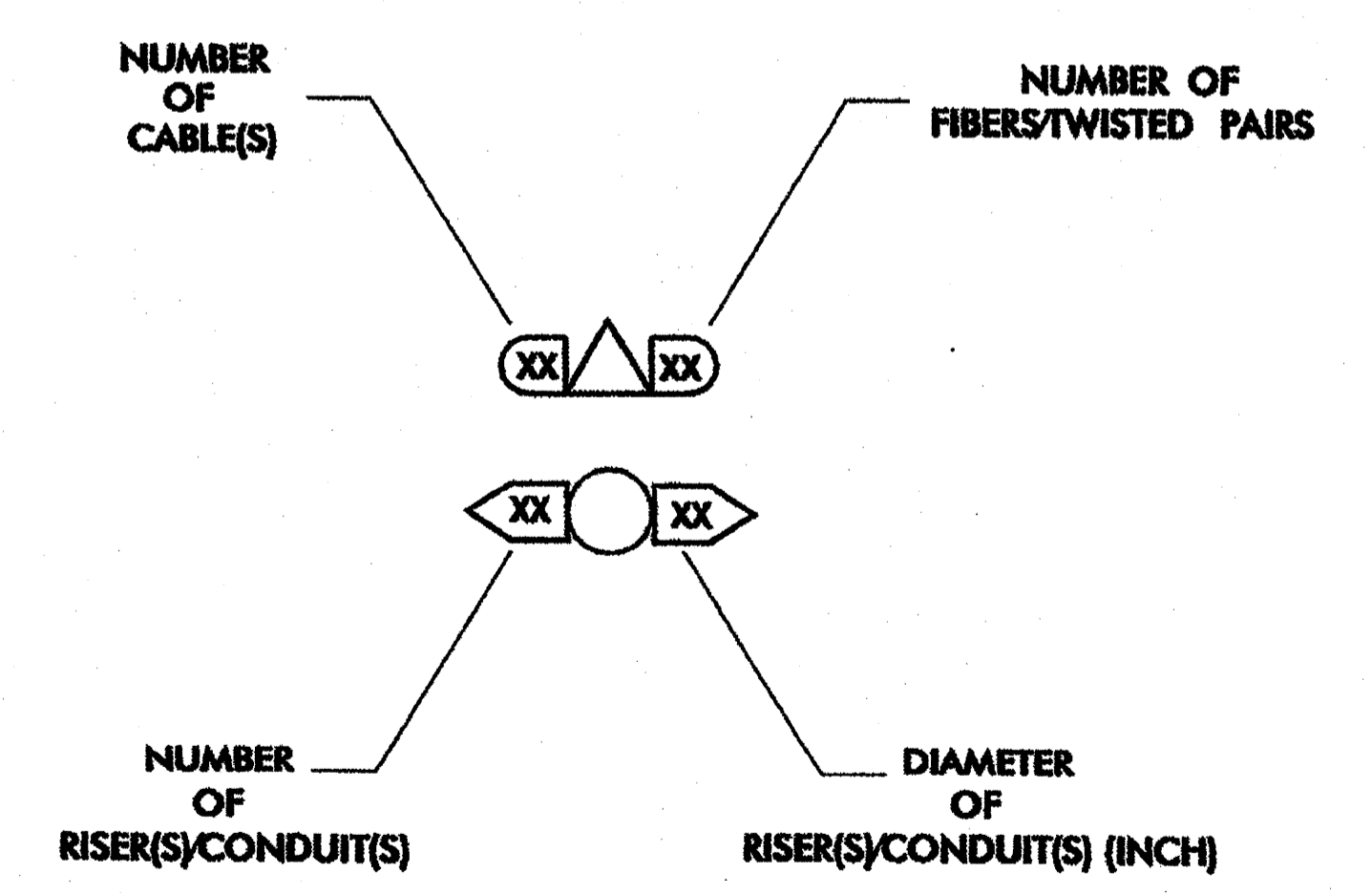
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL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

LEGEND

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

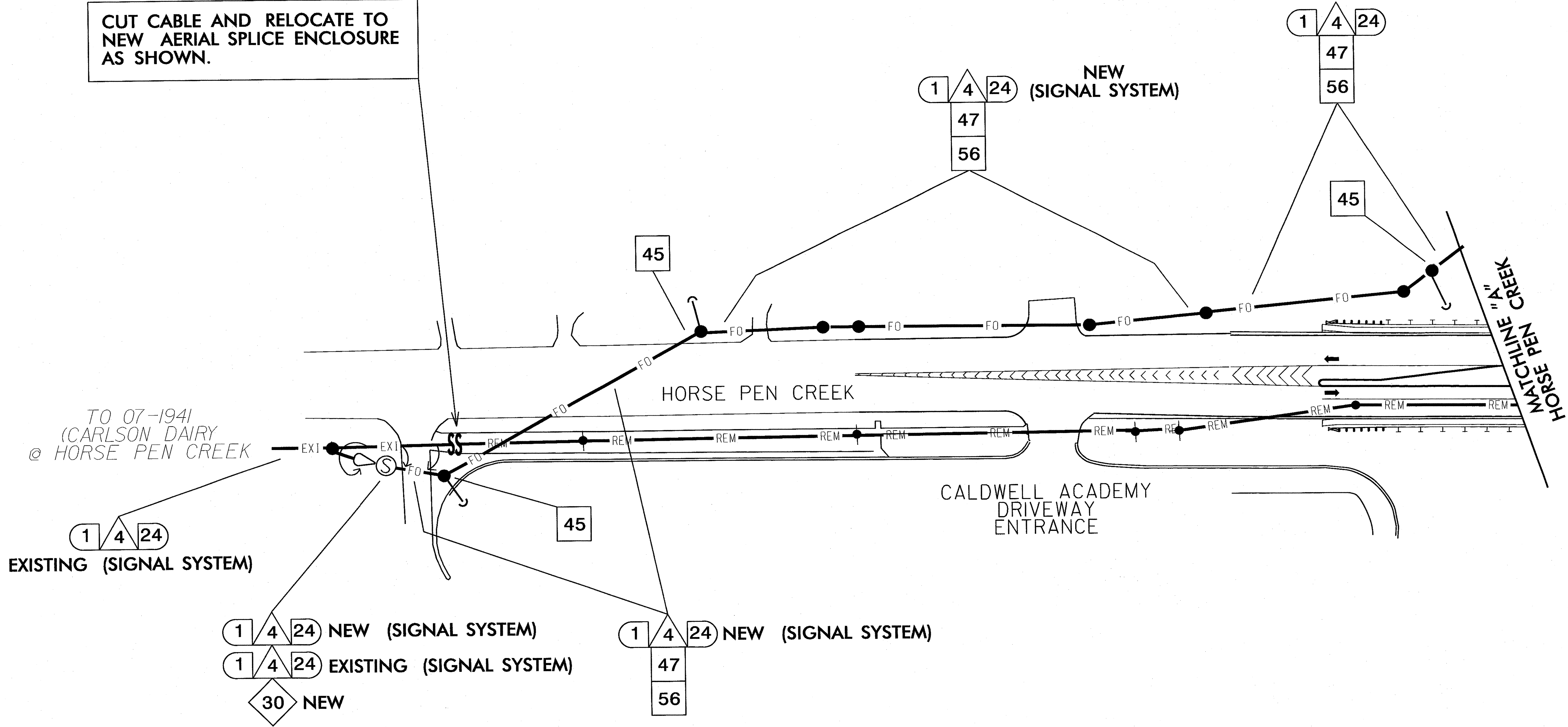
CONSTRUCTION NOTE SYMBOLOGY KEY

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



	CONSTRUCTION NOTES		
	PLAN DATE: _____ PREPARED BY: _____ SCALE: _____	REVIEWED BY: _____ REVIEWED BY: G. A. FULLER DATE: _____	

CUT CABLE AND RELOCATE TO NEW AERIAL SPLICE ENCLOSURE AS SHOWN.



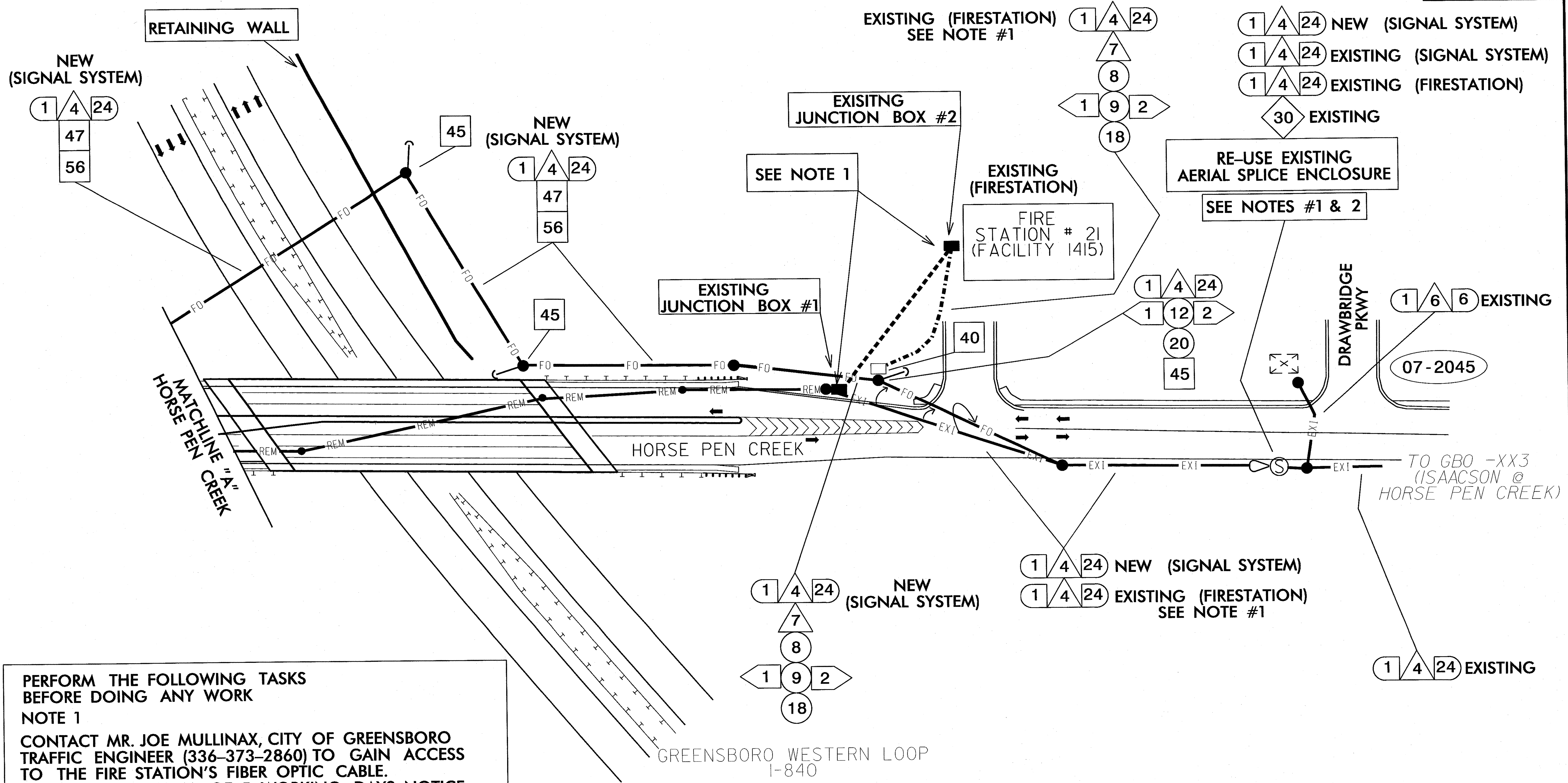
ALL NCDOT ATTACHMENT POINTS SHALL BE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

TMP PHASE I

	COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS								
	DIVISION 7 GUILFORD CO. GREENSBORO								
PLAN DATE: MAY 2013	REVIEWED BY: G. A. FULLER	<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		REVISIONS	INIT.	DATE			
REVISIONS	INIT.	DATE							
PREPARED BY: I. N. AVERY	REVIEWED BY:	<p style="text-align: right;"> 5/14/13 SIGNATURE DATE CADD FILE NO: </p>							

750 N. Greenfield Place, Greensboro, NC 27429

SCALE 0 50



PERFORM THE FOLLOWING TASKS BEFORE DOING ANY WORK

NOTE 1

CONTACT MR. JOE MULLINAX, CITY OF GREENSBORO TRAFFIC ENGINEER (336-373-2860) TO GAIN ACCESS TO THE FIRE STATION'S FIBER OPTIC CABLE. PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE.

RECORD EXISTING FIBER OPTIC TERMINATIONS CONFIGURATIONS PRIOR TO BACK PULLING THE EXISTING FIBER OPTIC CABLE FROM THE BUILDING THROUGH JUNCTION BOXES AND RISER. REROUTE THE BACK PULLED FIBER THROUGH THE NEW RISER AND CONDUIT SYSTEM AS SHOWN AND RE-TERMINATE.

DO NOT DAMAGE EXISTING FIBER.

REMOVE JUNCTION BOX #1 AND BACK FILL WITH SUITABLE MATERIAL.

REUSE JUNCTION BOX #2.

NOTE 2

RECORD EXISTING FIBER OPTIC TERMINATIONS CONFIGURATIONS PRIOR TO REMOVING THE EXISTING 24 SIGNAL SYSTEM FIBER OPTIC CABLE FROM THE EXISTING AERIAL SPLICE ENCLOSURE.

DO NOT DAMAGE EXISTING FIBER.

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

TMP PHASE I

Prepared in the Offices of:

250 N. Greenfield Place, Garner, NC 27529

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 GUILFORD CO. GREENSBORO

PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER

PREPARED BY: I. N. AVERY REVIEWED BY:

REVISIONS INIT. DATE

SCALE 0 50

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023919 GREGORY A. FULLER

Signature: Gregory A. Fuller 5/14/13 DATE

CADD File name:

**NEW AERIAL SPLICE ENCLOSURE
HORSE PEN CREEK**

(JUST NORTH OF
GREENSBORO WESTERN LOOP)

TMP PHASE I

LEGEND

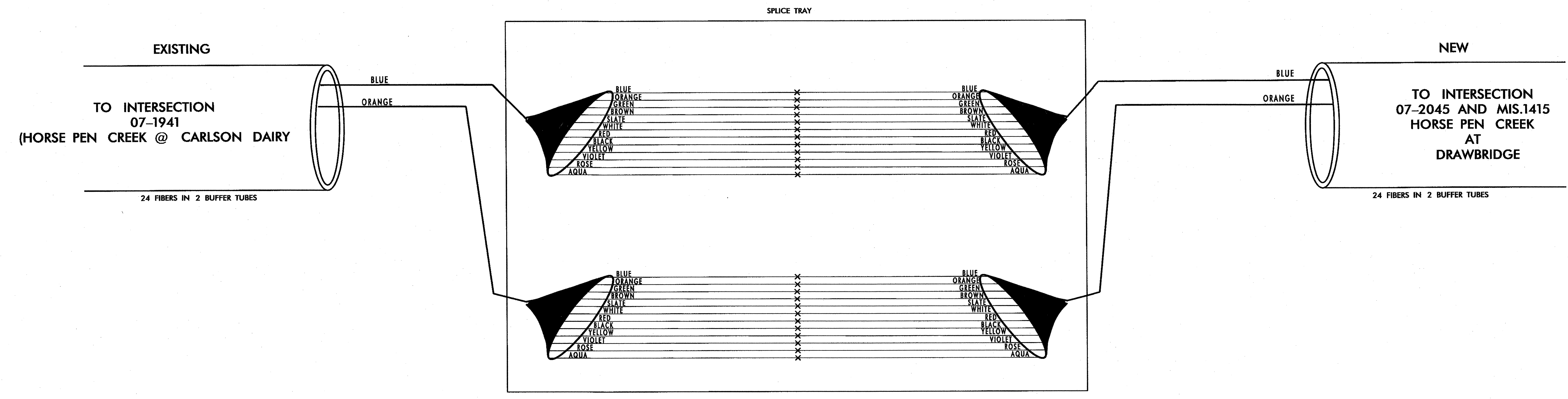
COLOR CODE
TIA/EIA 598-A

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

ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE
GENERIC. CONTRACTOR IS RESPONSIBLE FOR
DETERMINING / ENSURING PROPER TERMINATION.

X - FUSION SPLICE INDIVIDUAL FIBER

BUFFER TUBE SPLICE OR EXPRESS ENTIRE BUFFER TUBE
AS NOTED



NOTES:
1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY -
ACTUAL EQUIPMENT FORM MAY VARY.

TMP PHASE I

	SPLICE PLAN HORSE PEN CREEK		
	DIVISION 7 GUILFORD CO. GREENSBORO PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER PREPARED BY: I. N. AVERY REVIEWED BY:	REVISIONS INIT. DATE	
SCALE: 0 NA	REVISIONS INIT. DATE		SIGNATURE: <i>Gregory A. Fuller</i> 5/14/13 DATE:

CADD File name:

**HORSE PEN CREEK
AT DRAWBRIDGE
SIG. INV. 07-2045
(FACILITY 1415)**

TMP PHASE I

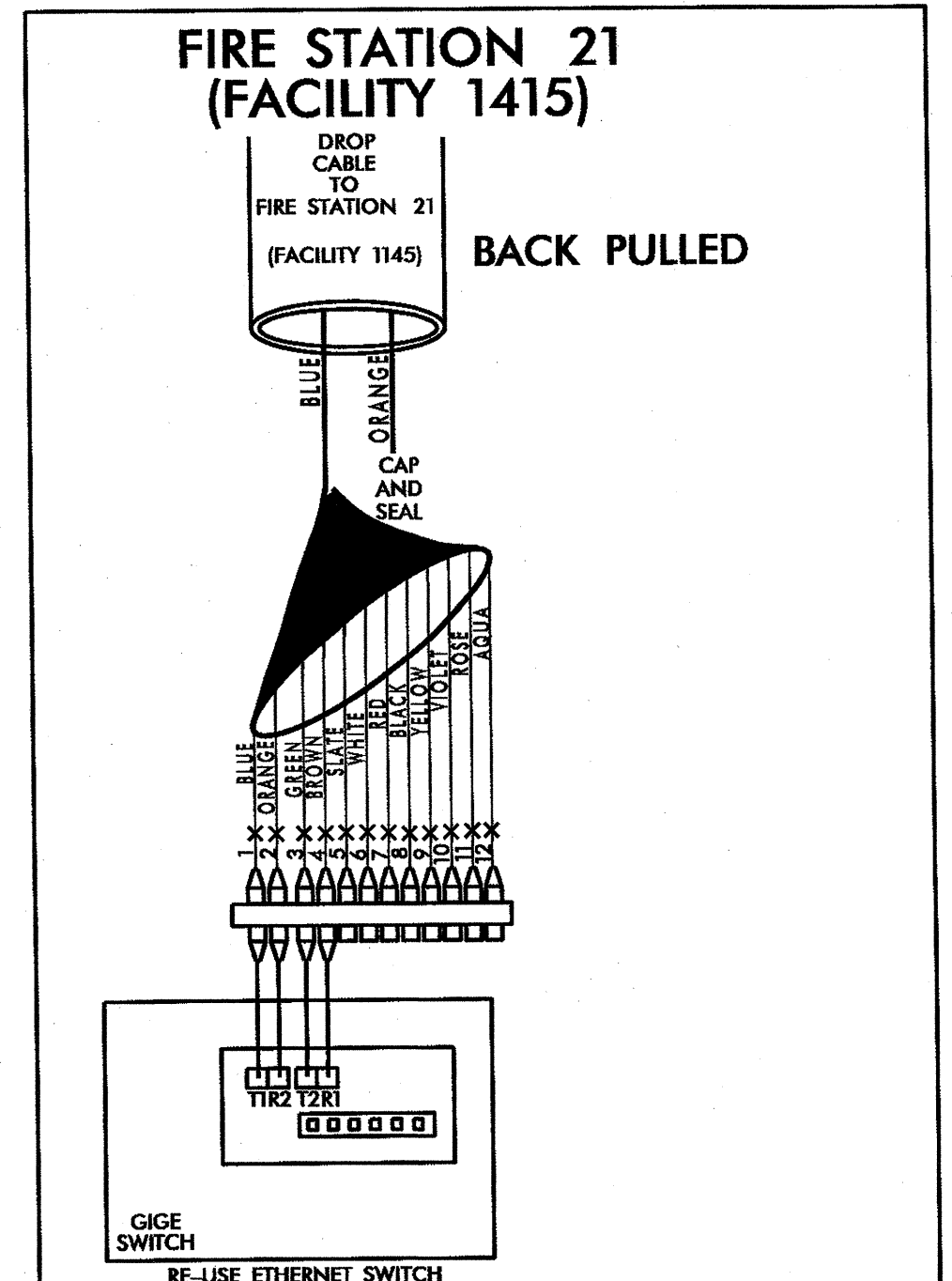
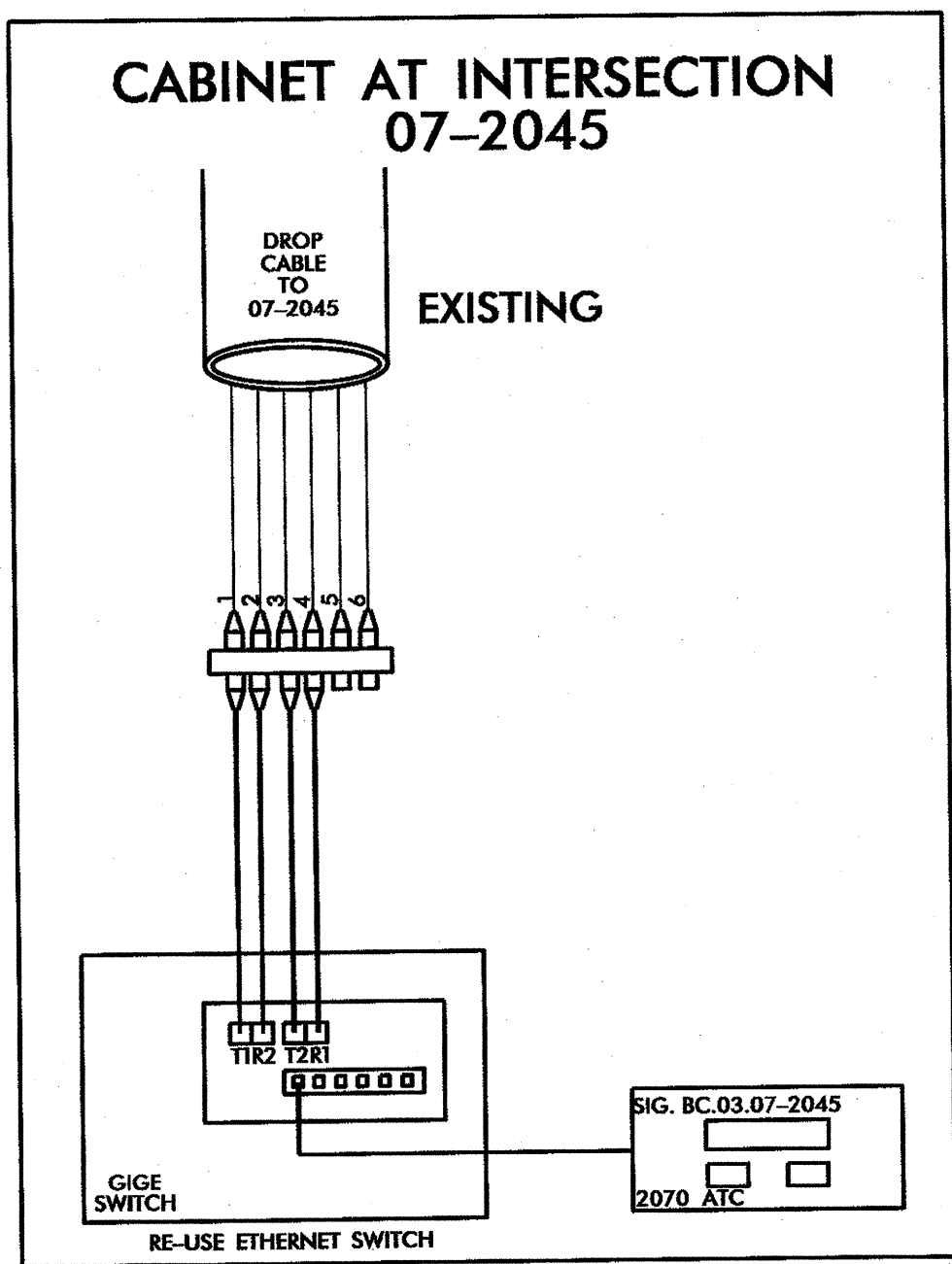
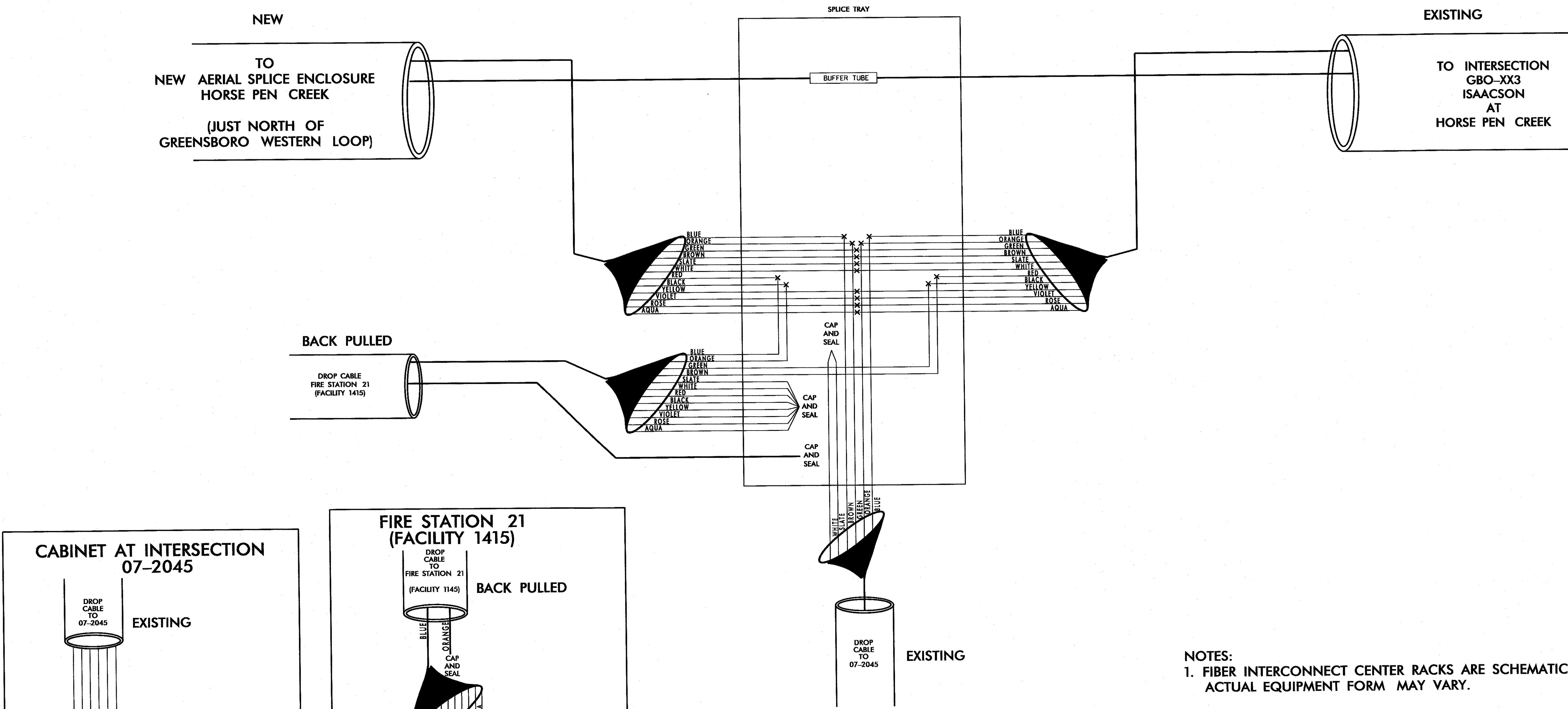
LEGEND

ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING / ENSURING PROPER TERMINATION.

X - FUSION SPlice INDIVIDUAL FIBER

BUFFER TUBE SPLICE OR EXPRESS ENTIRE BUFFER TUBE AS NOTED

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NOTES:
1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.

TMP PHASE I

Prepared in the Offices of:
Professional Mobile and Site Services
STATE OF NORTH CAROLINA
DIVISION OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

**SPLICE PLANS
HORSE PEN CREEK**

DIVISION 7 GUILFORD CO. GREENSBORO
PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER
PREPARED BY: I. N. AVERY REVIEWED BY:

SCALE: 0 NA

REVISIONS	INIT.	DATE

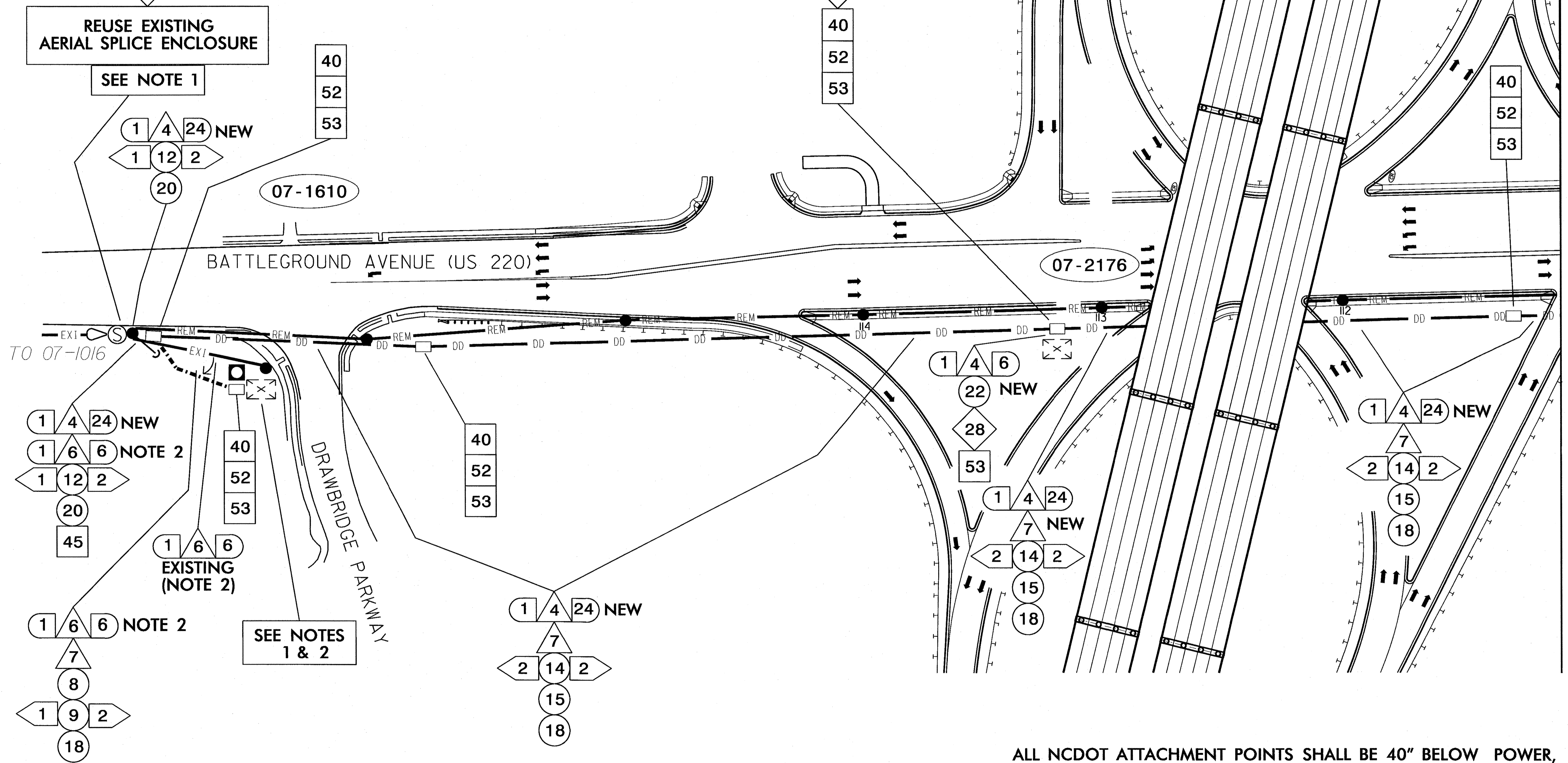
SEAL
PROFESSIONAL
SEAL
023919
ENGINEER
GREGORY A. FULLER

Signature: Gregory A. Fuller 5/14/13
DATE

CADD File Name:

- 1 4 24 NEW
- 1 4 24 EXISTING
- 1 6 6 EXISTING (NOTE 2)
- 30 EXISTING

- 2 4 24 NEW
- 1 4 6 NEW
- 29
- 40
- 52
- 53



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

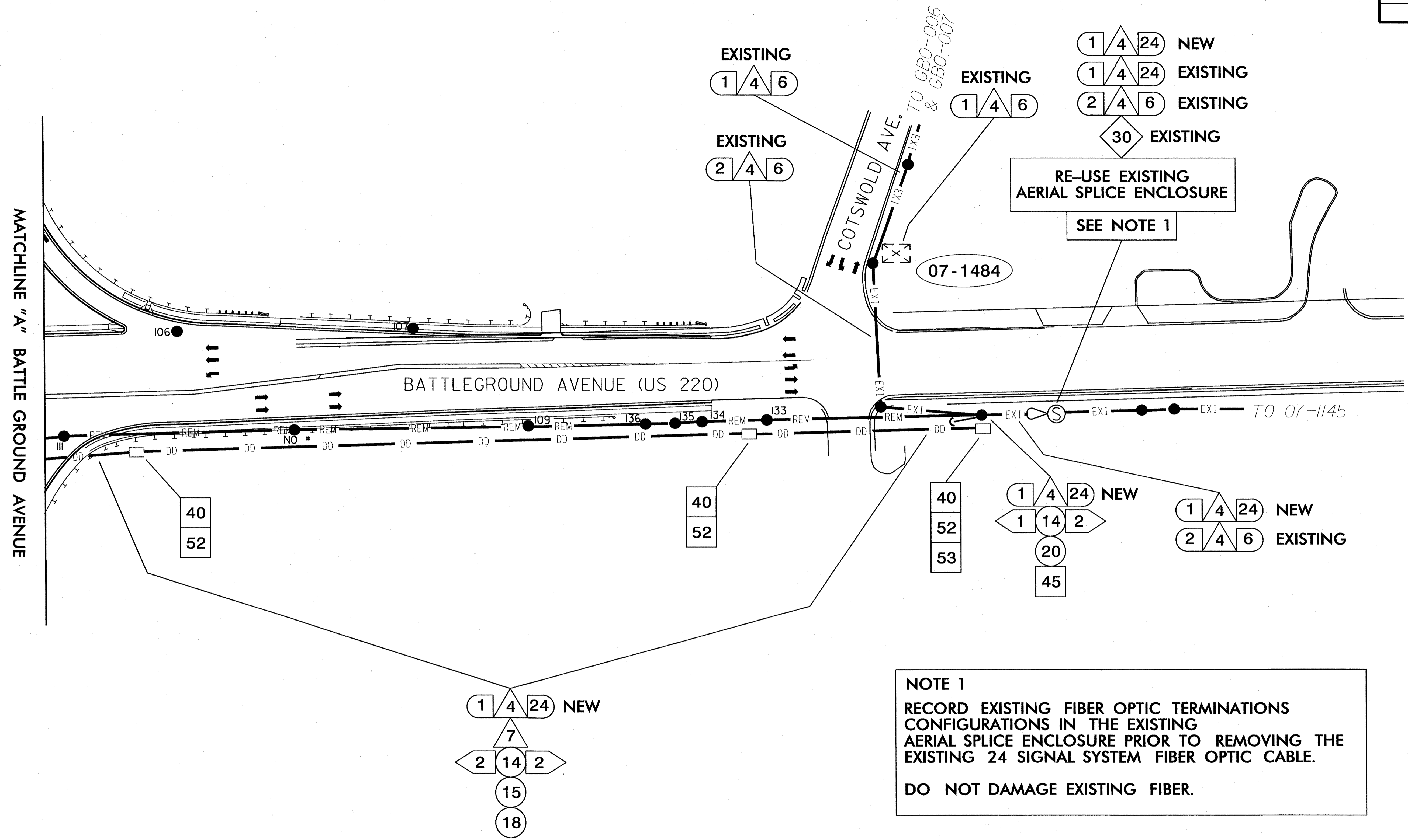
NOTE 1
 RECORD EXISTING FIBER OPTIC TERMINATIONS CONFIGURATIONS IN THE EXISTING AERIAL SPLICE ENCLOSURE PRIOR TO REMOVING THE EXISTING 24 SIGNAL SYSTEM FIBER OPTIC CABLE AND PRIOR TO BACK PULLING THE EXISTING 6 FIBER DROP CABLE TO SIGNAL CABINET (07-1610).
 DO NOT DAMAGE EXISTING FIBER.

NOTE 2
 BACK PULL 6 FIBER DROP CABLE TO AERIAL SPLICE ENCLOSURE AND RE PULL THROUGH NEW CONDUIT SYSTEM TO SIGNAL CABINET (07-1610).
 DO NOT DAMAGE EXISTING FIBER.

FINAL

	COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS		
	DIVISION 7 GUILFORD CO. GREENSBORO PLAN DATE: MAT 2013 PREPARED BY: I. N. AVERY REVISIONS: _____ INIT. DATE: _____	REVIEWED BY: G. A. FULLER REVIEWED BY: _____	

750 N. Greenfield Pkwy., Garner, NC 27529



NOTE 1
 RECORD EXISTING FIBER OPTIC TERMINATIONS CONFIGURATIONS IN THE EXISTING AERIAL SPLICE ENCLOSURE PRIOR TO REMOVING THE EXISTING 24 SIGNAL SYSTEM FIBER OPTIC CABLE.
 DO NOT DAMAGE EXISTING FIBER.

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

FINAL

	COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS		
	DIVISION 7 GUILFORD CO. GREENSBORO		
750 N. Greenfield Pkwy., Garner, NC 27529 SCALE 0 50	PLAN DATE: MAY 2013 PREPARED BY: I. N. AVERY	REVIEWED BY: G. A. FULLER REVIEWED BY:	REVISIONS INIT. DATE SIGNATURE: <i>Gregory A. Fuller</i> 5-14-13 DATE CADD FILE NO:

**BATTLEGROUND (US 220)
AT
DRAWBRIDGE
SIG. INV. 07-1610
FINAL**

LEGEND

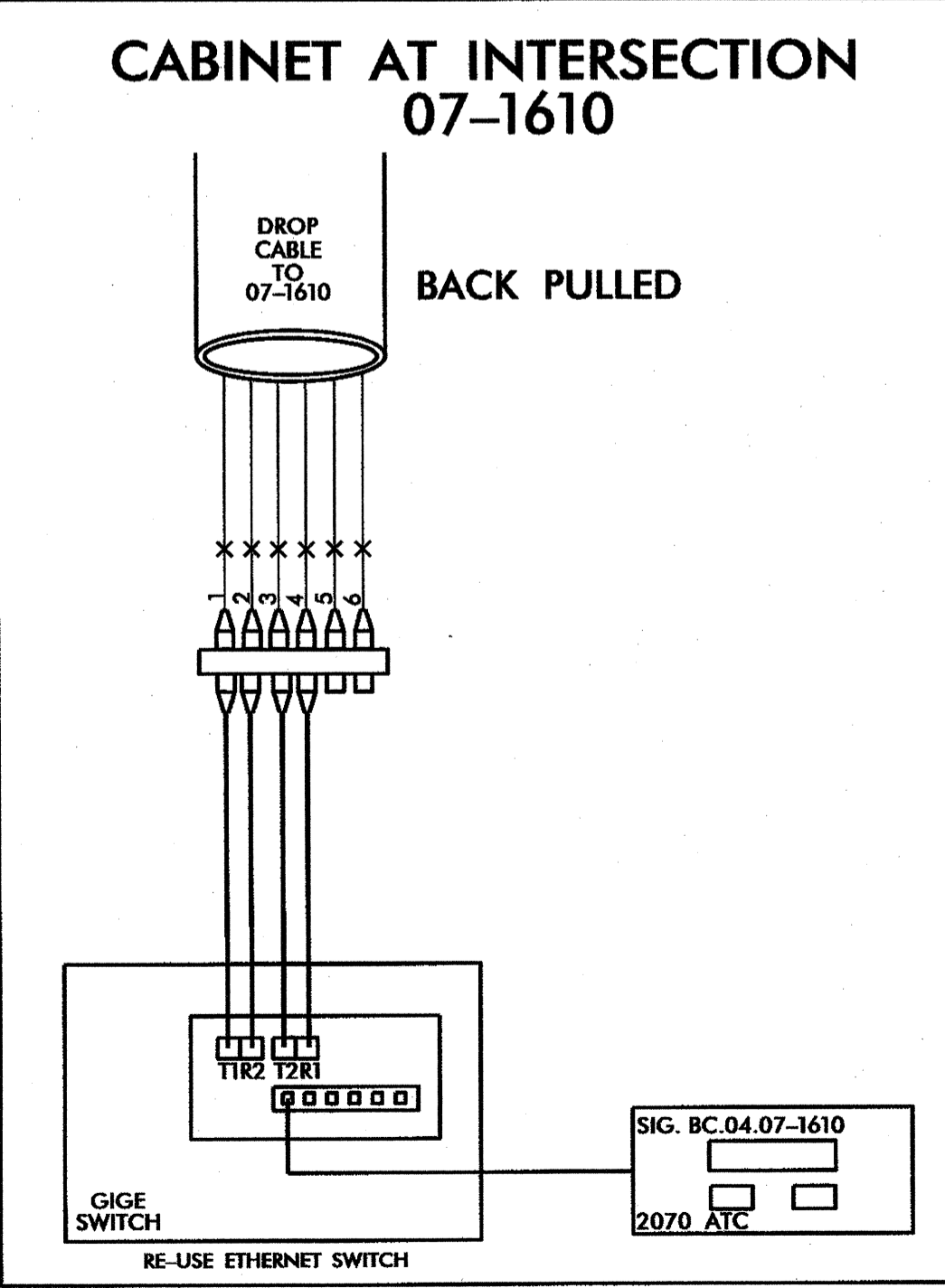
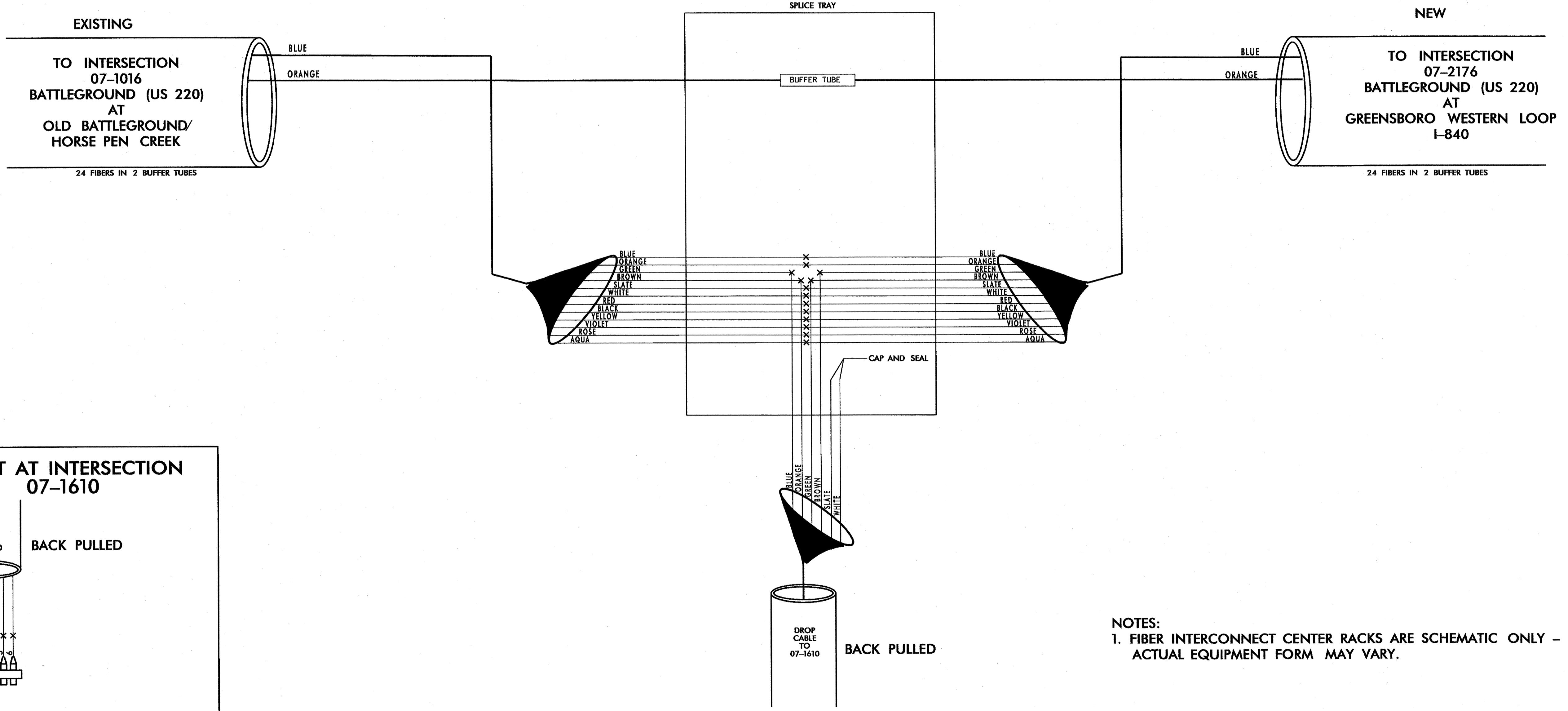
COLOR CODE TIA/EIA 598-A

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ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING / ENSURING PROPER TERMINATION.

X - FUSION SPLICE INDIVIDUAL FIBER

BUFFER TUBE - SPLICE OR EXPRESS ENTIRE BUFFER TUBE AS NOTED



NOTES:
1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.

FINAL

Prepared in the Offices of:

**SPLICE PLAN
BATTLEGROUND AVE.**

DIVISION 7 GUILFORD CO. GREENSBORO

PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER

PREPARED BY: I. N. AVERY REVIEWED BY:

REVISIONS

REVISIONS	INIT.	DATE

SCALE: 0 NA

Signature: Gregory A. Fuller 5-14-13
DATE: 5-14-13

CADD File: 07-1610

**BATTLEGROUND (US 220)
AT
GREENSBORO WESTERN LOOP
I-840**

SIG. INV. 07-2176

FINAL

LEGEND

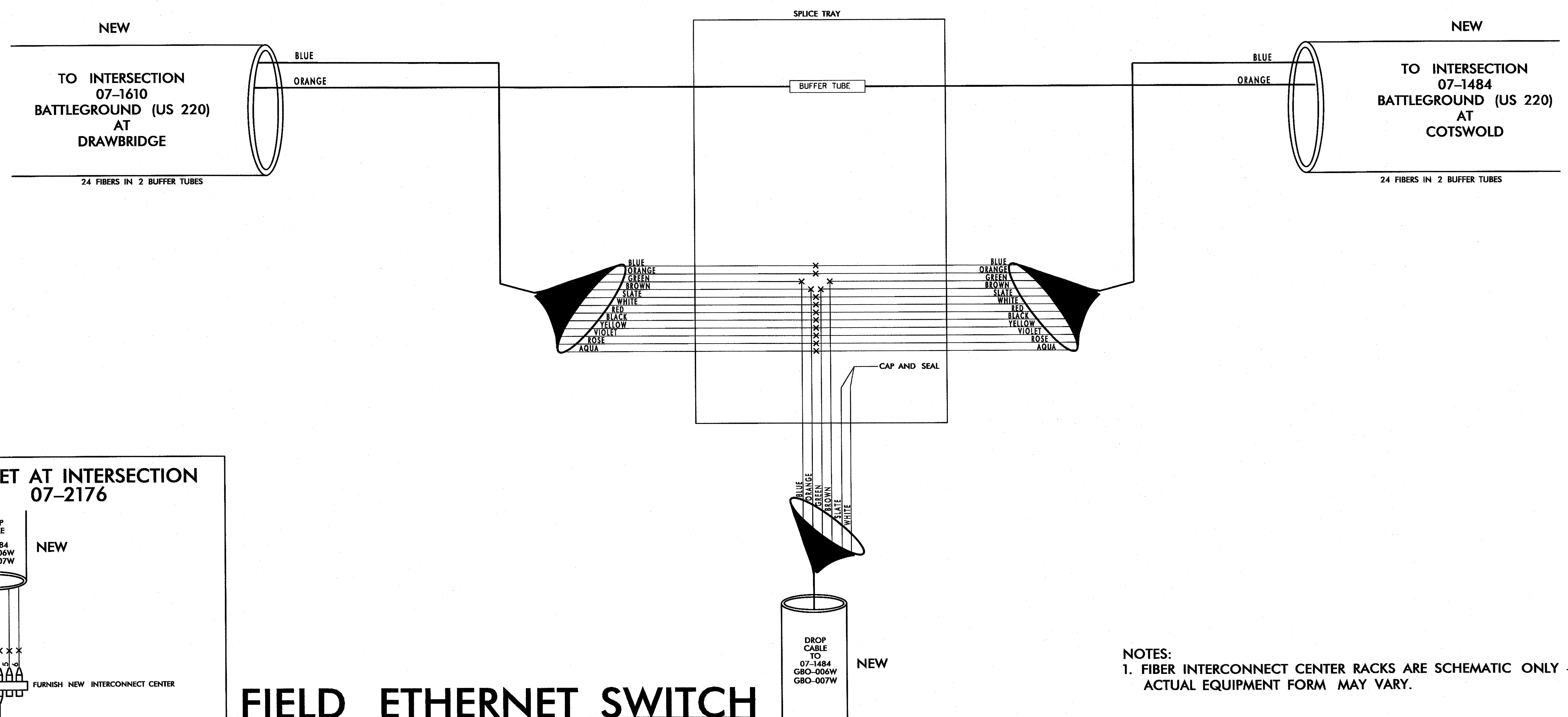
ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING / ENSURING PROPER TERMINATION.

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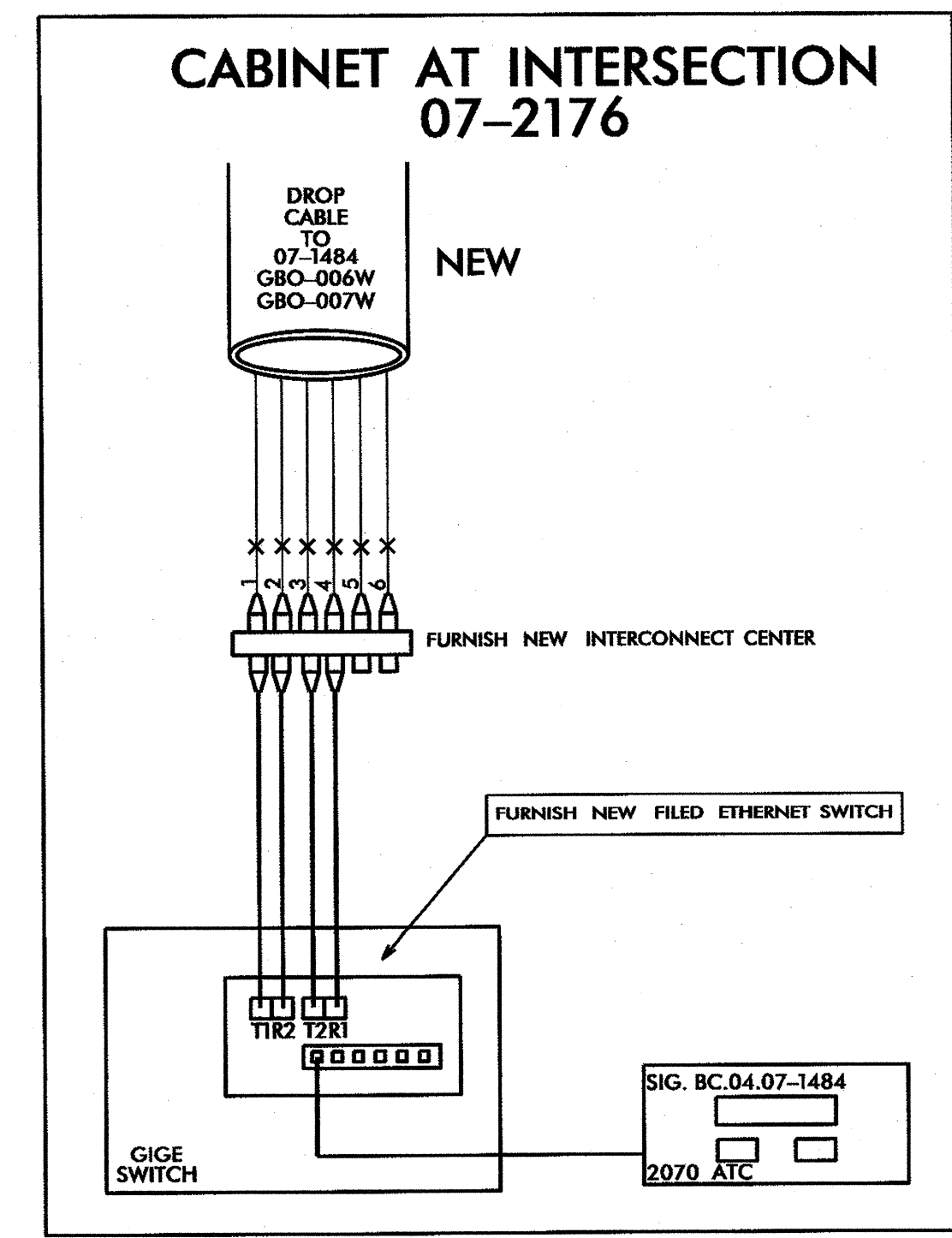


FIELD ETHERNET SWITCH

CONTACT MR. JOE MULLINAX (CITY OF GREENSBORO TRAFFIC ENGINEER) AT 336-373-2860 TO ARRANGE FOR THE CITY TO PROGRAM THE FIELD ETHERNET SWITCH WITH THE NECESSARY NETWORK CONFIGURATION DATA (INCLUDING BUT NOT LIMITED TO PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION).

PROVIDE FIVE (5) DAYS WORKING NOTICE TO THE CITY.

NOTES:
1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.



FURNISH NEW FIELD ETHERNET SWITCH

FINAL

Prepared in the Offices of:
Professional Mobility and Safety Division
STATE OF NORTH CAROLINA
TRANSPORTATION ENGINEER

**SPLICE PLAN
BATTLEGROUND AVE**

DIVISION 7 GUILFORD CO. GREENSBORO

PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER

PREPARED BY: I. N. AVERY REVIEWED BY:

SCALE: 0 NA

REVISIONS: INIT. DATE

SEAL
PROFESSIONAL ENGINEER
SEAL 023919
GREGORY A. FULLER

Signature: Gregory A. Fuller 5-14-13
DATE

CADD File Name:

**BATTLEGROUND (US 220)
AT
COTSWOLD**
SIG. INV. 07-1484

FINAL

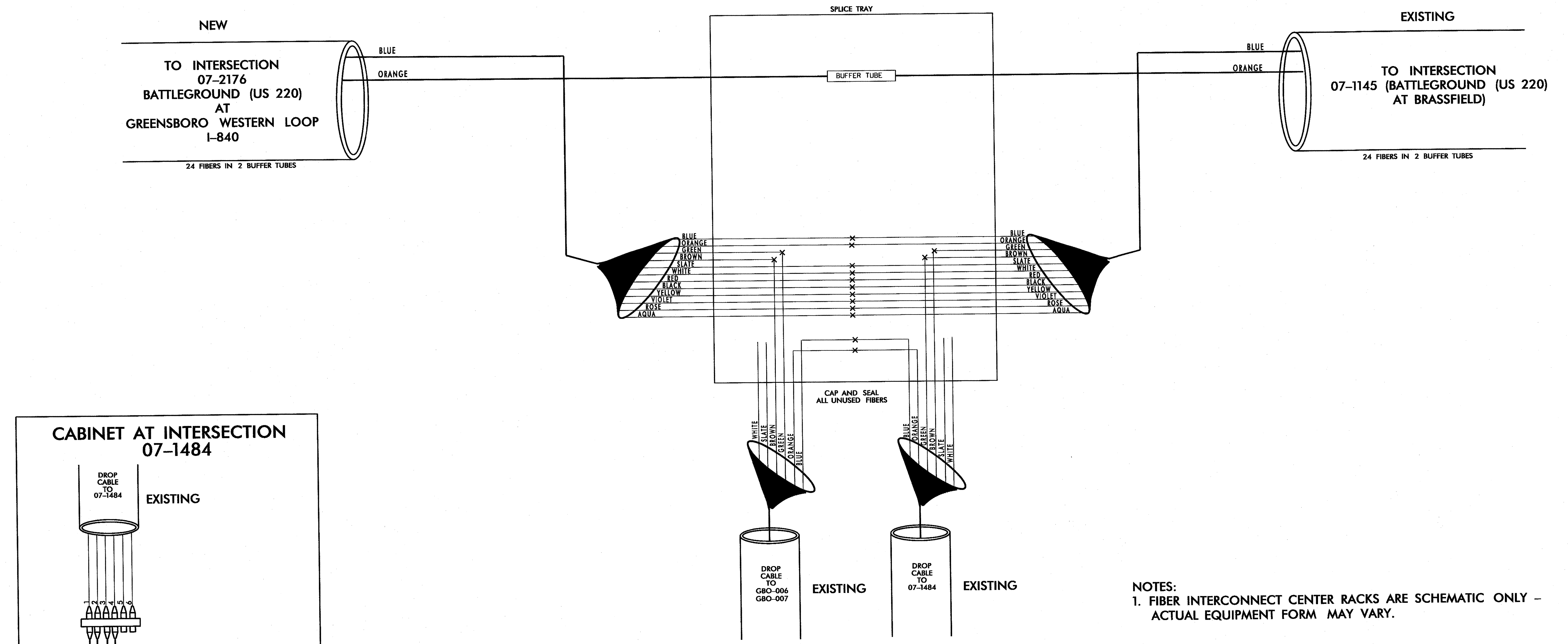
LEGEND

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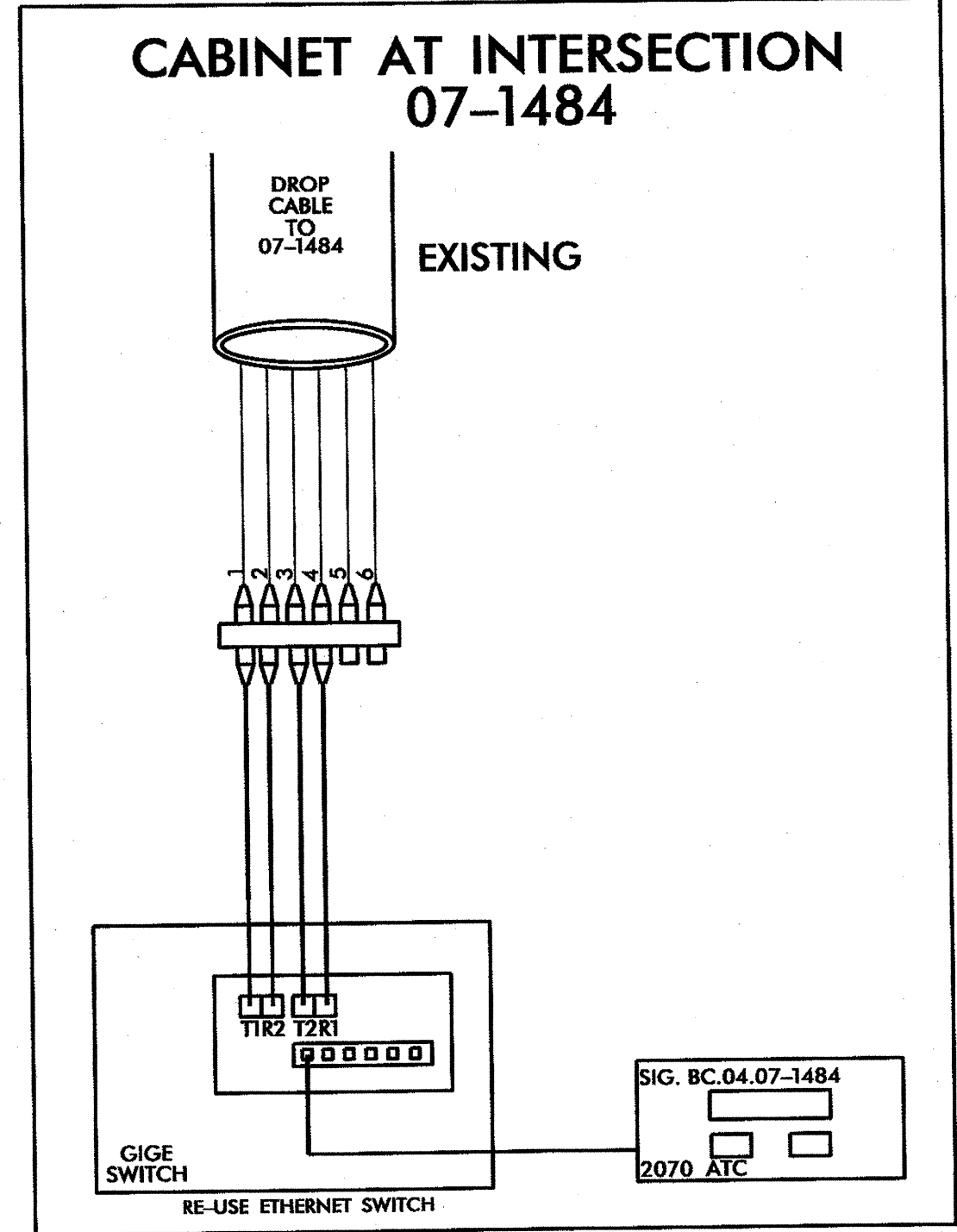
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NOTES:
1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.



FINAL

Prepared in the Office of:
Transportation, Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

**SPLICE PLAN
BATTLEGROUND AVE**

DIVISION 7 GUILFORD CO. GREENSBORO
PLAN DATE: MAY 2013 REVIEWED BY: G. A. FULLER
PREPARED BY: I. N. AVERY REVIEWED BY:

SCALE: 0 NA

REVISIONS: INIT. DATE

SEAL: PROFESSIONAL ENGINEER GREGORY A. FULLER SEAL 023919

Signature: Gregory A. Fuller 5/14/13
DATE: 5/14/13
CADD Filename: