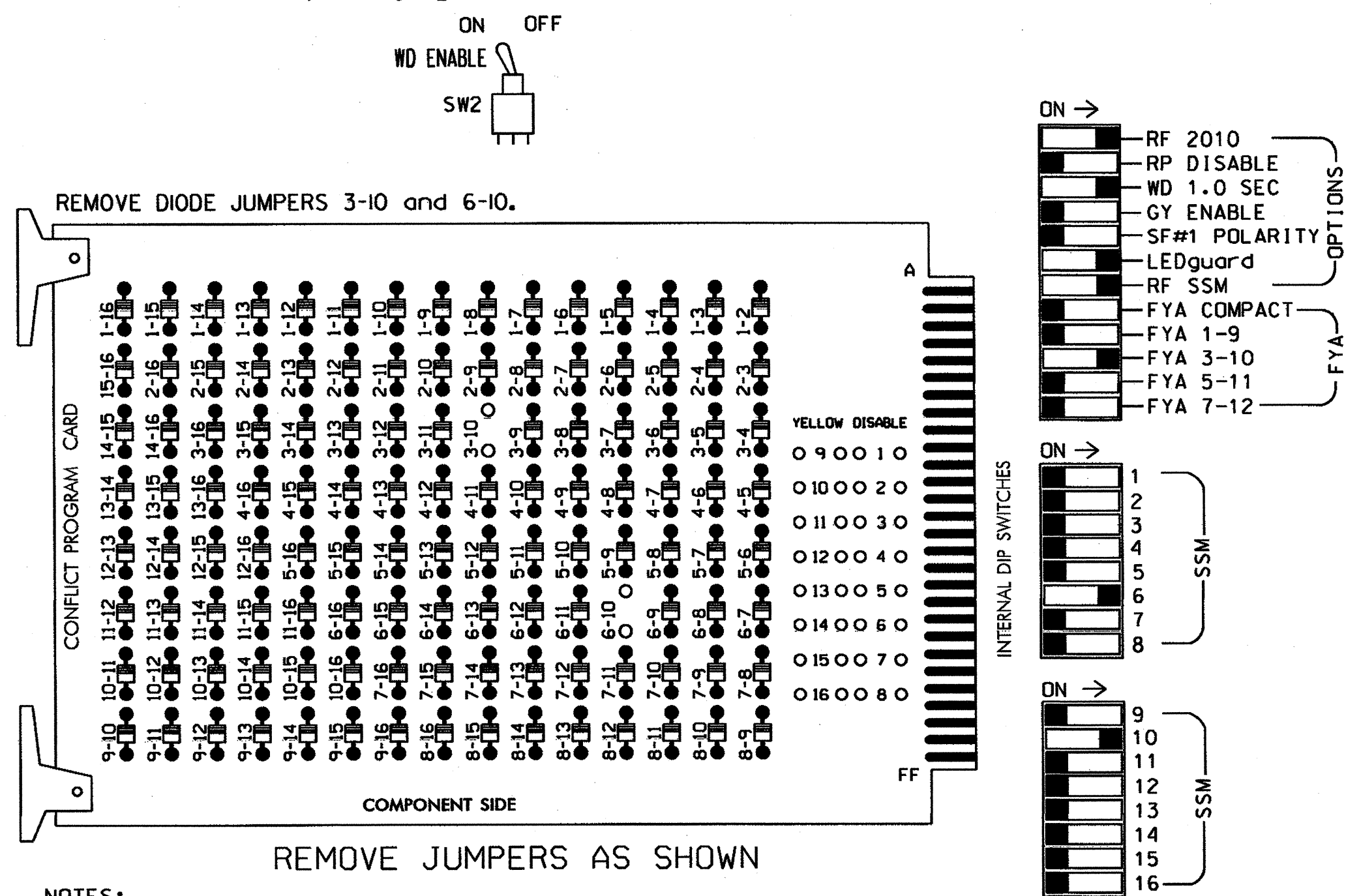


EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

INPUT FILE POSITION LAYOUT

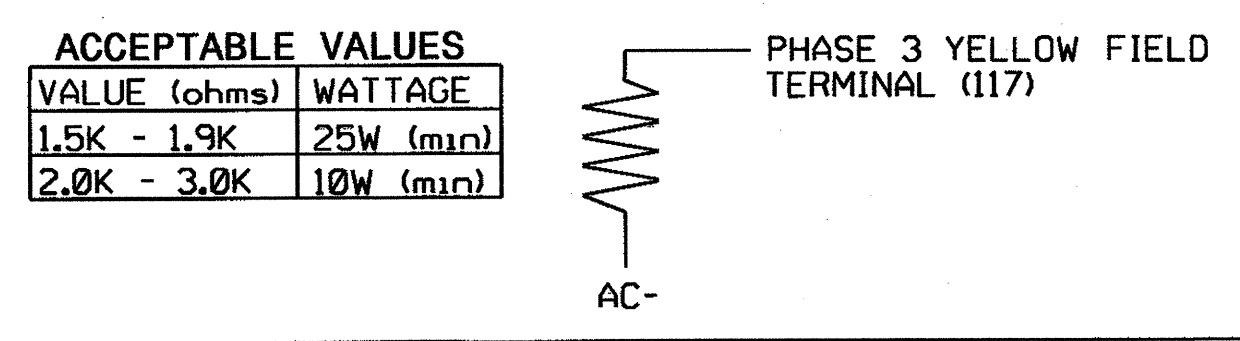
(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
FILE "I" U	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	∅ 3 3A	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	FS DC ISOLATOR ST DC ISOLATOR
FILE "J" U	←-0-0-0	∅ 6 6A	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0
	←-0-0-0	∅ 6 6B	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0	←-0-0-0

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



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 1,2,3,4,5,7,8,9,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for Variable Initial and Gap Reduction.
- Program phase 6 for Start Up In Green.
- Program phases 6 for Yellow Flash.

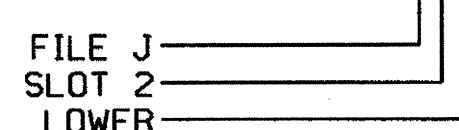
EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S3,S6,S10
 PHASES USED.....3,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....3+6
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



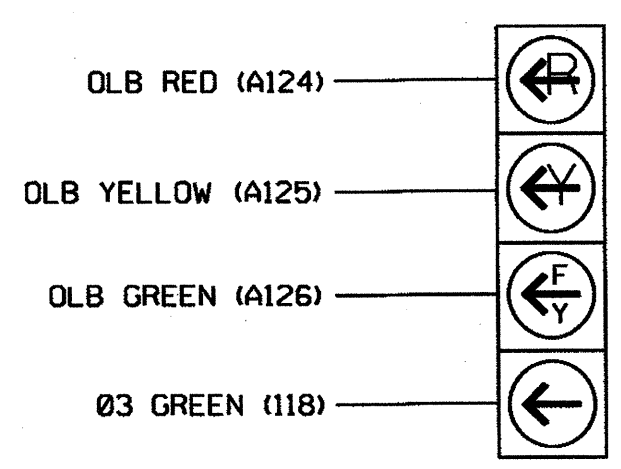
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	31*	NU	NU	NU	6L,62	NU	NU	NU	NU	NU	31*	NU	NU	NU	NU
RED								134										
YELLOW				*				135										
GREEN								136										
RED ARROW																		A124
YELLOW ARROW																		A125
FLASHING YELLOW ARROW																		A126
GREEN ARROW																		118

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

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



31

NOTE

The sequence display for signal head 31 requires special logic programming. See sheet 2 of 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2412
 DESIGNED: October 2010
 SEALED: 10/22/10
 REVISED: N/A

New Installation - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: **US 401 SB (Louisburg Road) at US 401 Business (S. Main Street)**

Division 5 Wake County Rolesville

PLAN DATE: October 2010 REVIEWED BY: T. J. J. J.

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022013 GEORGE C. BROWN

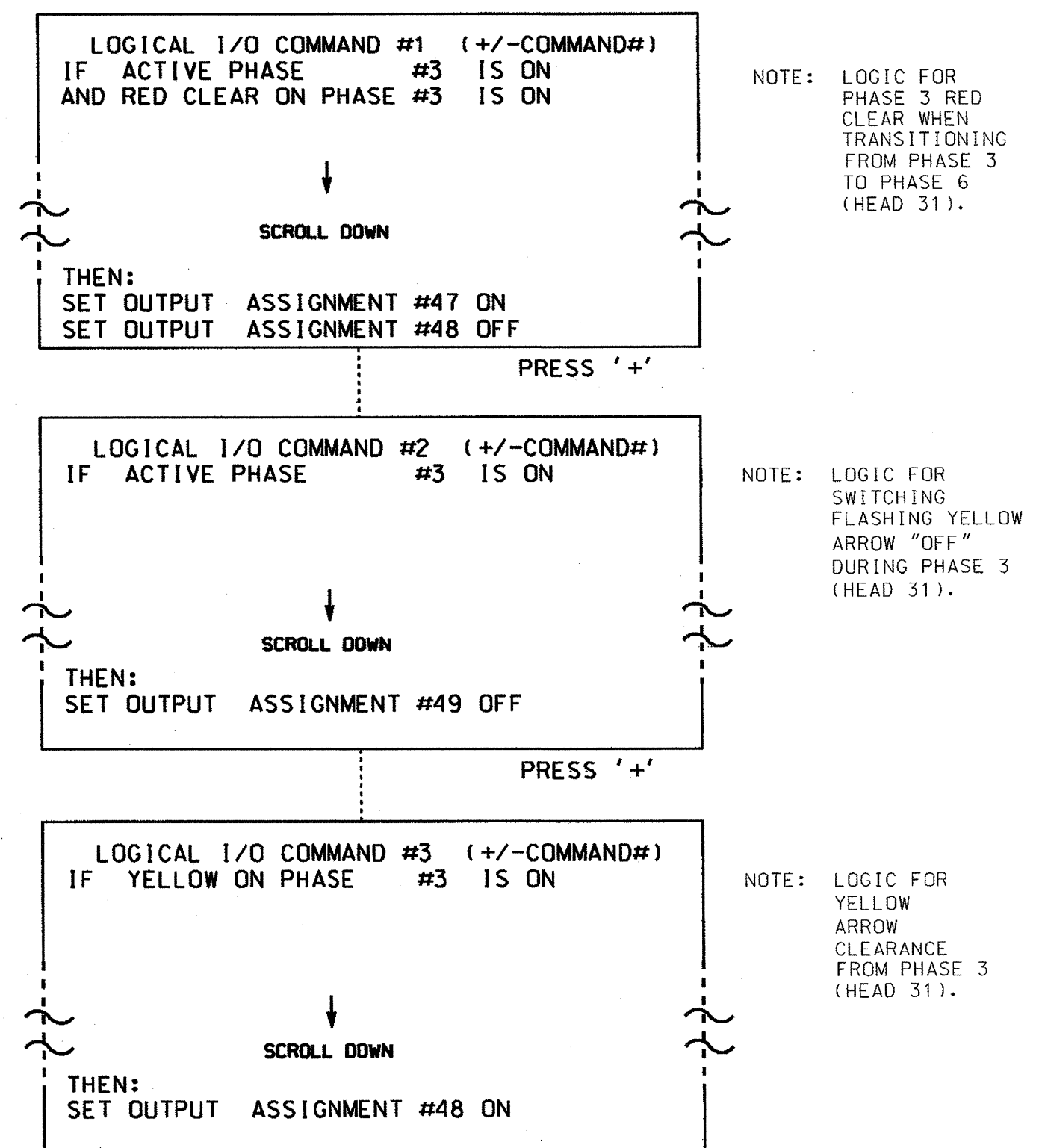
SIG. INVENTORY NO. 05-2412

26-OCT-2010 08:42 S:\IT\SS\KITS\Sig\18\Workgroups\45\10\Man\resfrong\052412-sm-01e-xxx.dgn

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' ONCE

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 05-2412
 DESIGNED: October 2010
 SEALED: 10/22/10
 REVISED: N/A

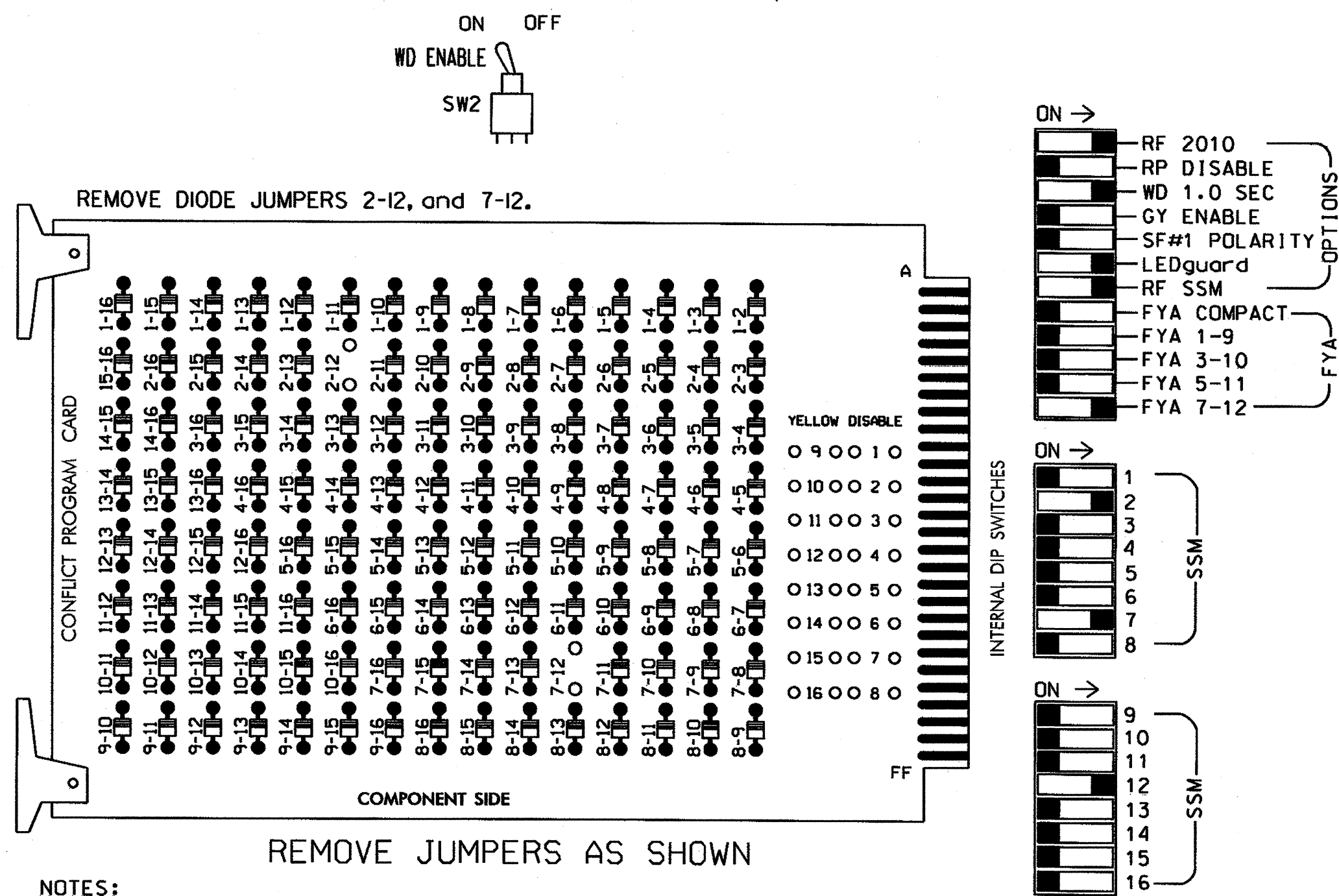
New Installation - Sheet 2 of 2

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		US 401 SB (Louisburg Road) at US 401 Business (S. Main Street)		
	Division 5	Wake County	Rolesville		
PLAN DATE: October 2010	REVIEWED BY: T. J. J.		PREPARED BY: S. Armstrong		
REVISIONS	INIT.	DATE	SIGNATURE: <i>[Signature]</i> DATE: 10/22/10		
SIG. INVENTORY NO. 05-2412			SEAL		

26-OCT-2010 06:42 S:\1156\UNIT5 Signal s\work\groups\51g Man\mstr\mstr\prog\052412.sm.ele...xxx.dgn

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,4,5,6,8,9,10,11,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Variable Initial and Gap Reduction.
- Program phase 2 for Start Up In Green.
- Program phases 2 Yellow Flash.

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	NU	NU	NU	NU	NU	71*	72,73	NU	NU	NU	NU	NU	71*	NU
RED		128									122							
YELLOW		129																
GREEN		130																
RED ARROW																		A101
YELLOW ARROW											123							A102
FLASHING YELLOW ARROW																		A103
GREEN ARROW										124	124							

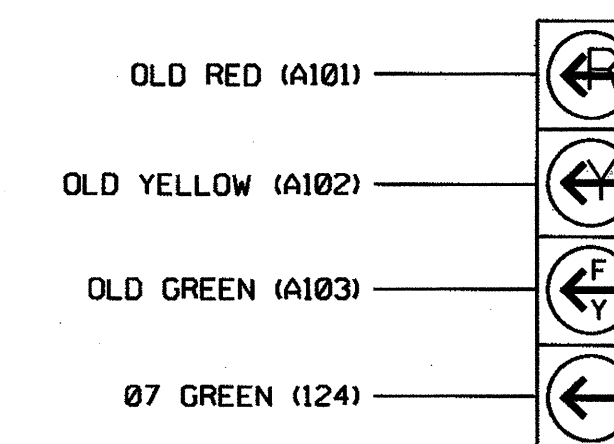
NU = Not Used
* See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S7,S13
PHASES USED.....2,7
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....2+7

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal head as shown)



71

NOTE

The sequence display for signal head 71 requires special logic programming. See sheet 2 of 2 for programming instructions.

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	S	S	S	S	S	S	S	S	FS
	∅ 2A	∅ 2B												DC ISOLATOR
FILE "J" U	S	S	S	S	∅ 7	∅ 7	S	S	S	S	S	S	S	S
					7A	7B								DC ISOLATOR
					NOT USED	∅ 7								7C

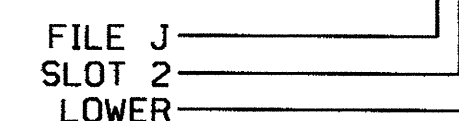
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			15
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			15
7C	TB5-11,12	J6L	46	8	18	7	Y	Y			15

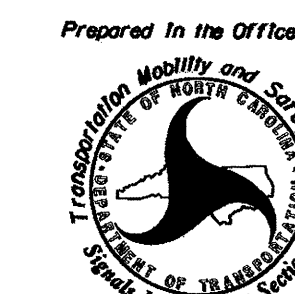
INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2390
DESIGNED: April 2010
SEALED: 10/18/10
REVISED: N/A

New Installation - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 NB (Louisburg Road) at SR 1003 (Rolesville Road)

Division 5 Wake County Rolesville

PLAN DATE: September 2010 REVIEWED BY: T. J. Joffe

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

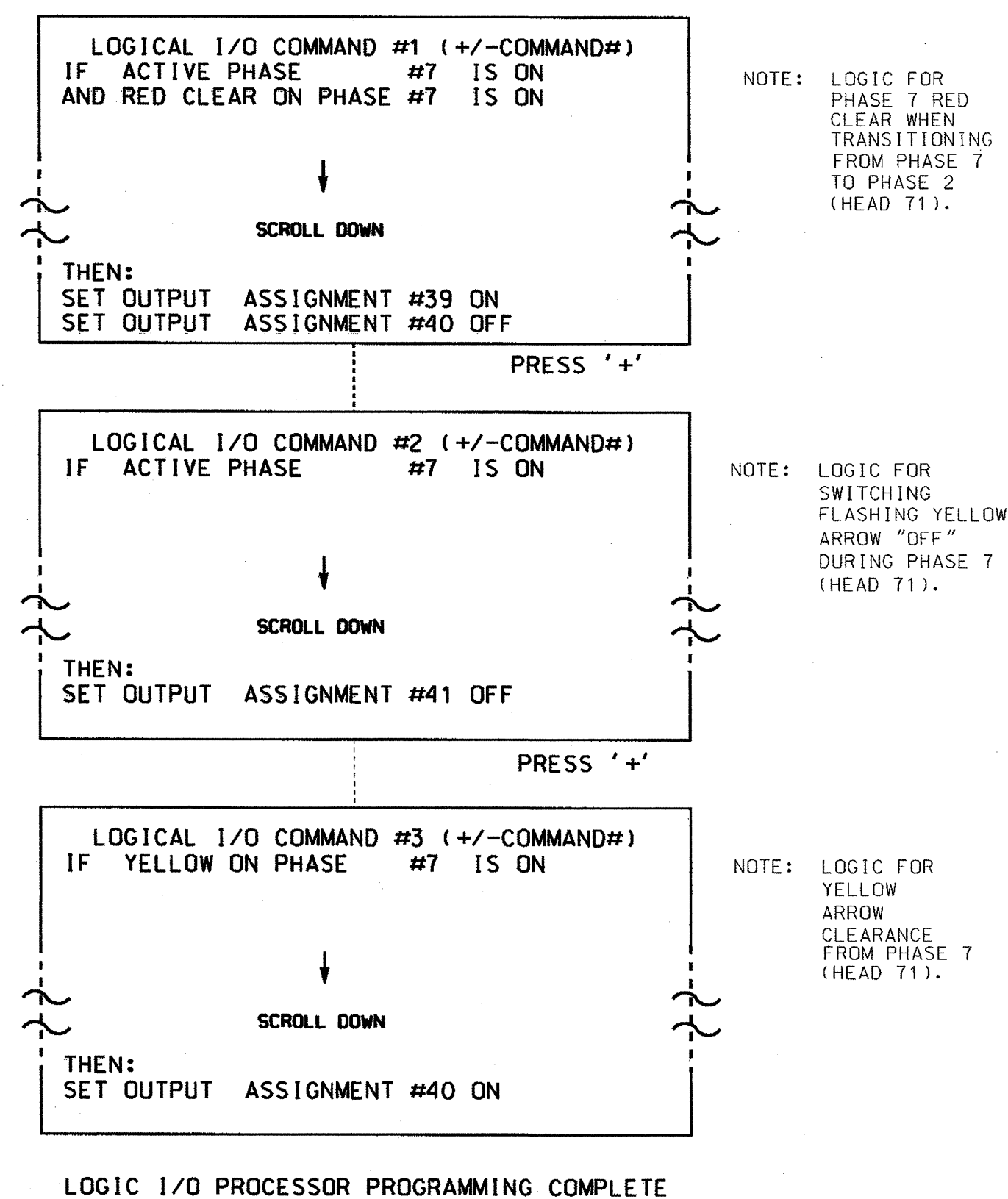
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
GEORGE C. BROWN
022013
10/22/10

SIG. INVENTORY NO. 05-2390

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

(program controller as shown below)

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



OUTPUT REFERENCE SCHEDULE	
OUTPUT 39	= Overlap D Red
OUTPUT 40	= Overlap D Yellow
OUTPUT 41	= Overlap D Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' 3 TIMES

```

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

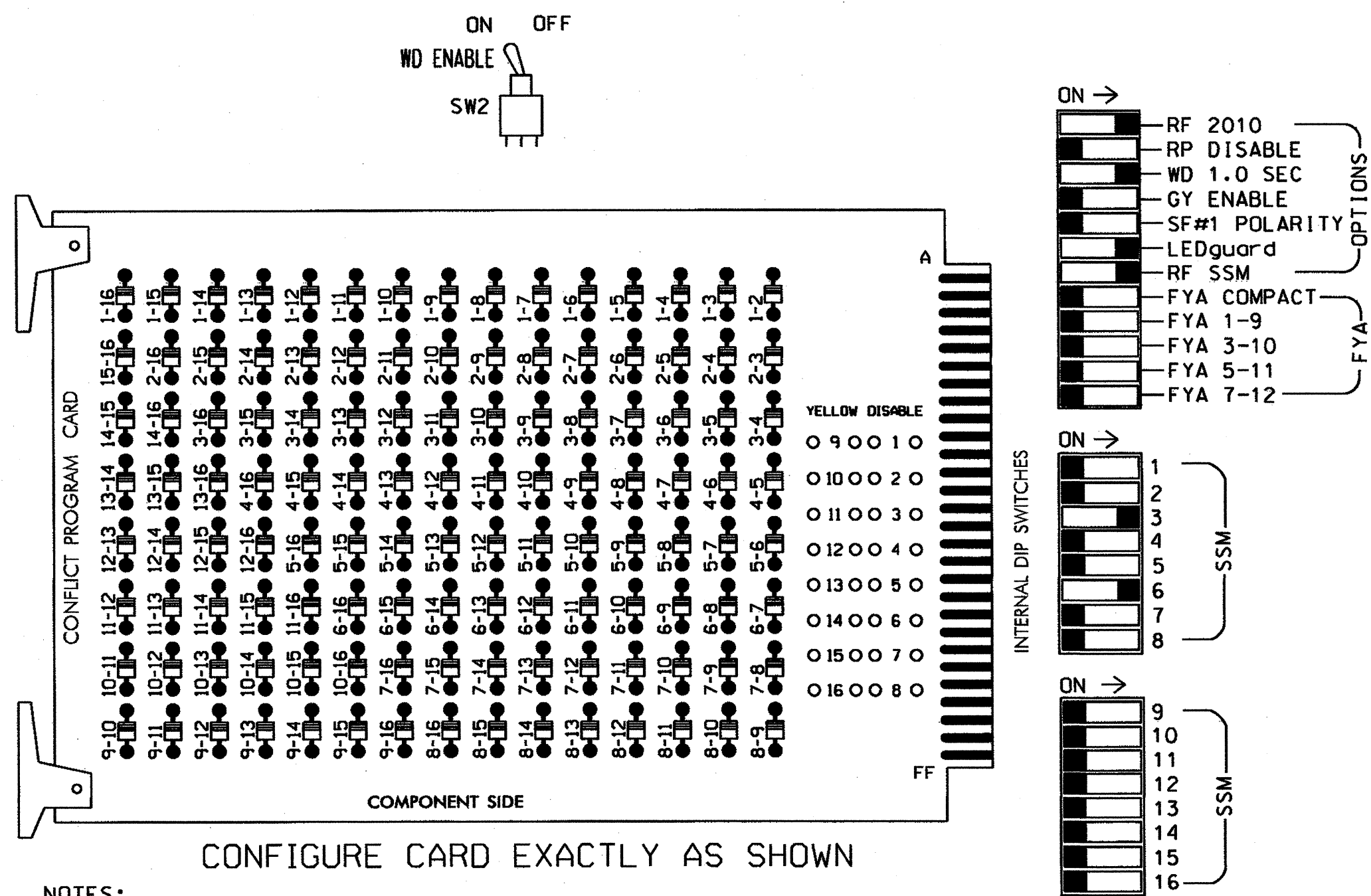
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2390
DESIGNED: April 2010
SEALED: 10/18/10
REVISED: N/A

New Installation - Sheet 2 of 2

	ELECTRICAL AND PROGRAMMING DETAILS FOR: US 401 NB (Louisburg Road) at SR 1003 (Rolesville Road)		
	Division 5 PLAN DATE: September 2010 PREPARED BY: S. Armstrong	Wake County REVIEWED BY: T. J. [Signature] REVIEWED BY:	
REVISIONS			INIT. DATE
SIGNATURE: [Signature]			DATE: 10/22/10
SIG. INVENTORY NO. 05-2390			

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,2,4,5,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for Variable Initial and Gap Reduction.
- Program phase 6 for Start Up In Green.
- Program phase 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S3,S6
 PHASES USED.....3,6
 OVERLAPS.....NONE

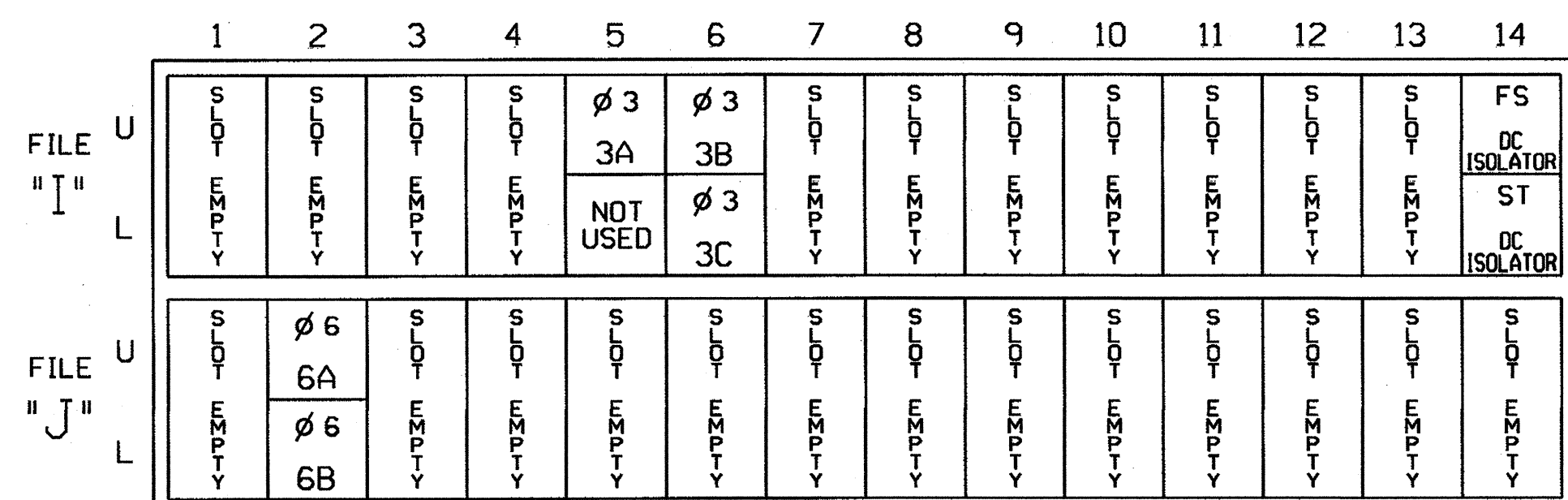
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	31,32 33	NU	NU	NU	61,62	NU	NU	NU	NU
RED								134				
YELLOW								135				
GREEN								136				
RED ARROW				116								
YELLOW ARROW				117								
GREEN ARROW				118								
Hand icon												
Person icon												

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



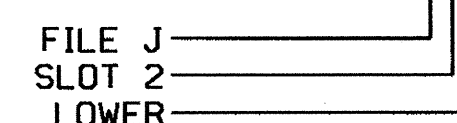
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
3A	TB4-5,6	15U	58	20	3	3	Y	Y			
3B	TB4-9,10	16U	41	3	4	3	Y	Y			
3C	TB4-11,12	16L	45	7	14	3	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

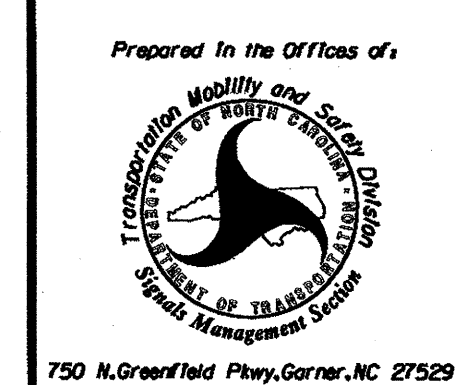
INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2391
 DESIGNED: March 2010
 SEALED: 10/18/10
 REVISED: N/A

New Installation

ELECTRICAL AND PROGRAMMING DETAILS FOR:

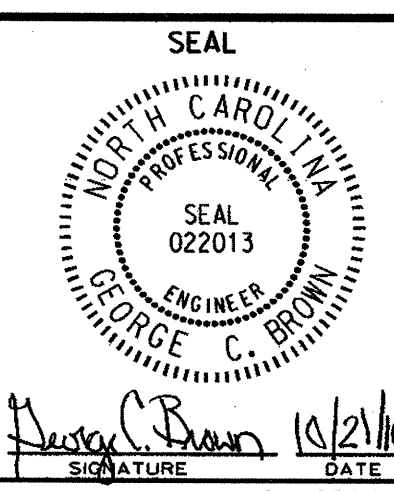


US 401 SB (Louisburg Road) at U-Turn North of SR 1003 (Rolesville Road)

Division 5 Wake County Rolesville
 PLAN DATE: September 2010 REVIEWED BY: T. J. J. J.

PREPARED BY: S. Armstrong REVIEWED BY: T. J. J. J.

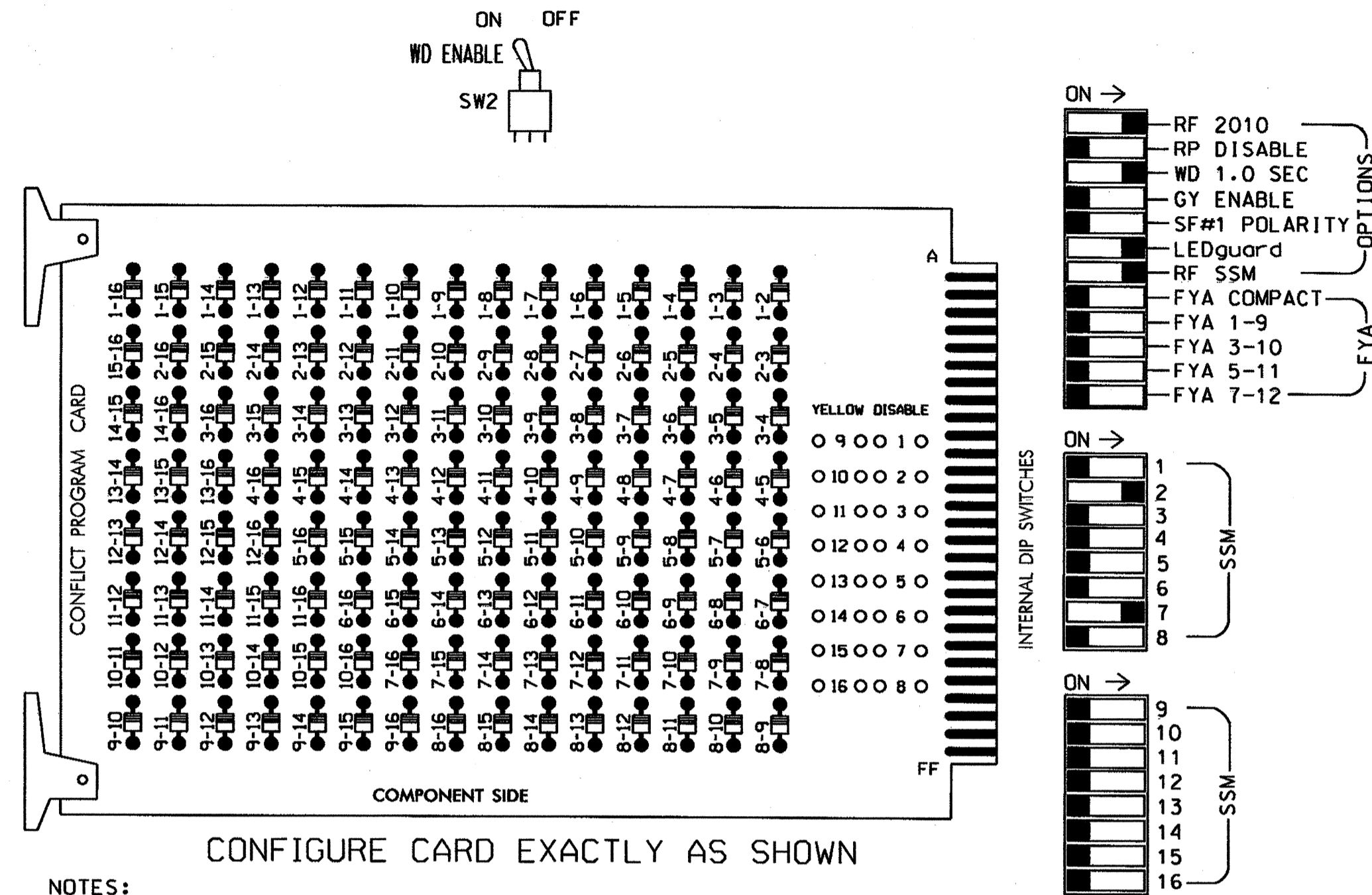
REVISIONS INIT. DATE



SIG. INVENTORY NO. 05-2391

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3, 4,5,6,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Variable Initial and Gap Reduction.
- Program phase 2 for Start Up In Green.
- Program phase 2 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S7
 PHASES USED.....2,7
 OVERLAPS.....NONE

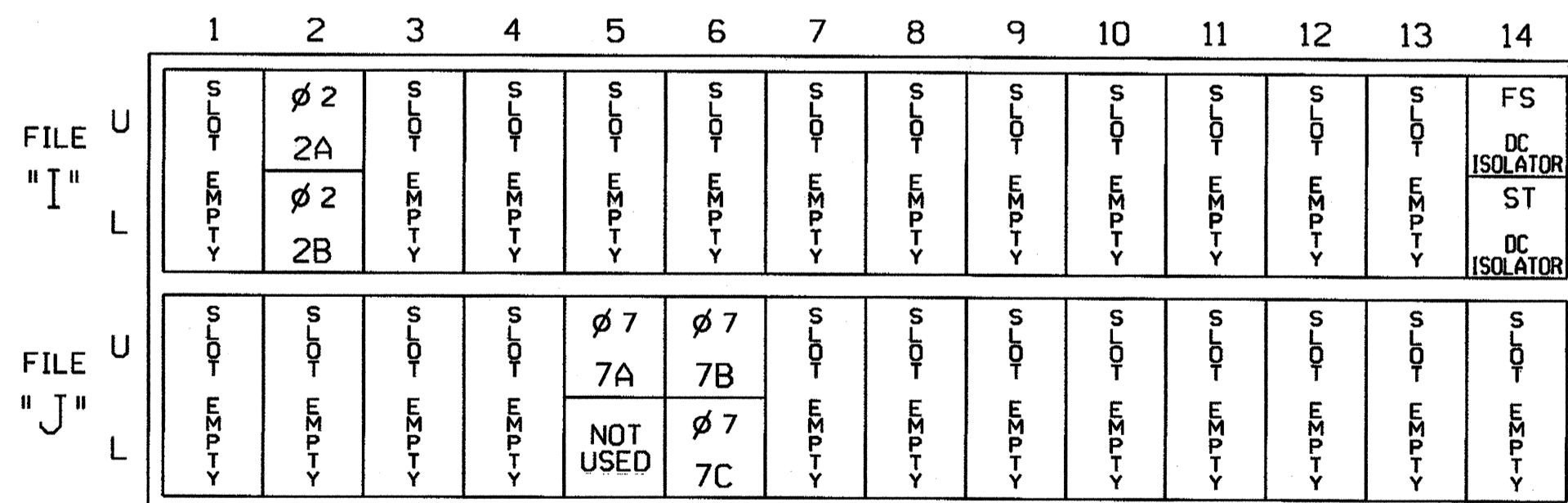
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	71,72 73	NU	NU
RED		128										
YELLOW		129										
GREEN		130										
RED ARROW											122	
YELLOW ARROW											123	
GREEN ARROW											124	

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



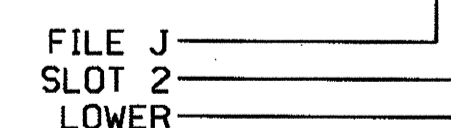
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-9,10	J6U	42	4	8	7	Y	Y			
7C	TB5-11,12	J6L	46	8	18	7	Y	Y			

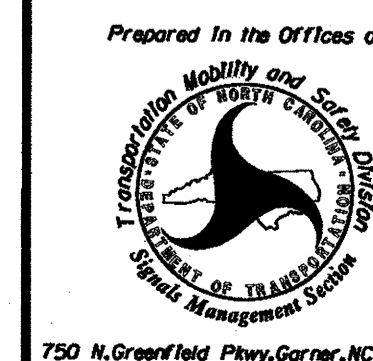
INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2392
 DESIGNED: March 2010
 SEALED: 10/18/10
 REVISED: N/A

New Installation

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 NB (Louisburg Road) at U-Turn South of US 401 Business

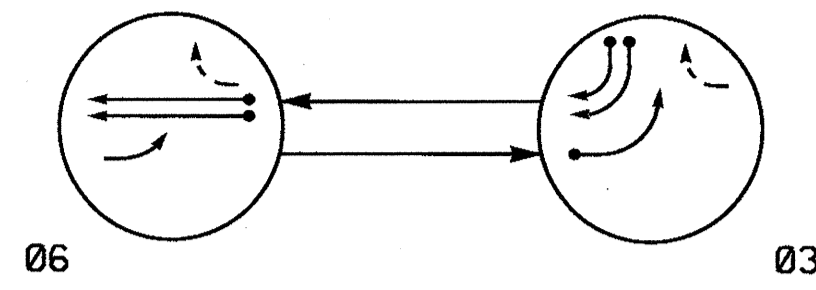
Division 5 Wake County Rolesville
 PLAN DATE: September 2010 REVIEWED BY: T. J. J...
 PREPARED BY: S. Armstrong REVIEWED BY: ...

REVISIONS	INIT.	DATE

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022013
 GEORGE C. BROWN
 SIGNATURE DATE

SIG. INVENTORY NO. 05-2392

PHASING DIAGRAM



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

SIGNAL FACE	PHASE		
	03	06	FLASH
31	←	←	←
32, 33	→	→	→
61, 62	→	→	→

← = Flashing Yellow Arrow

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

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

← = Flashing Yellow Arrow

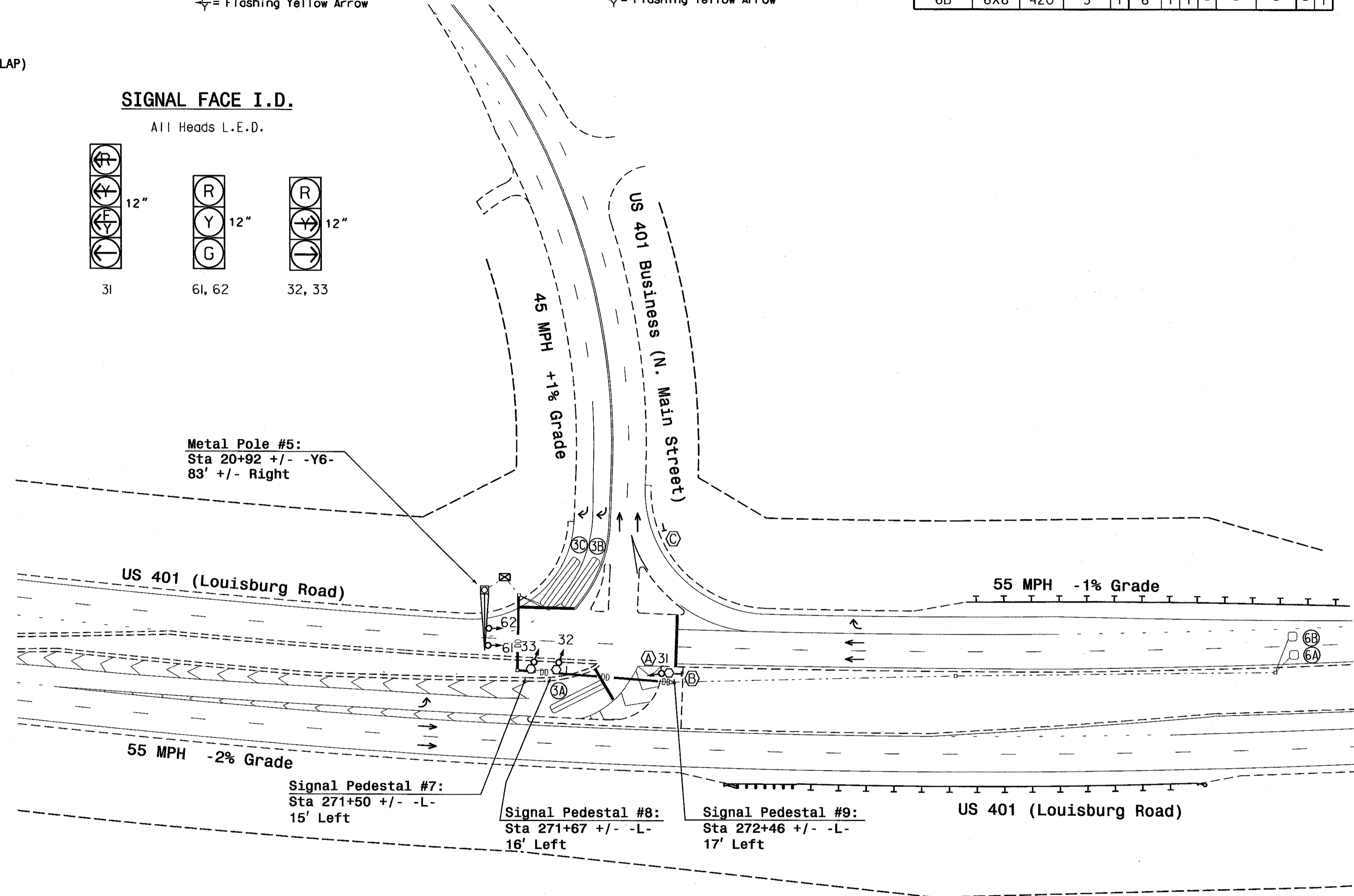
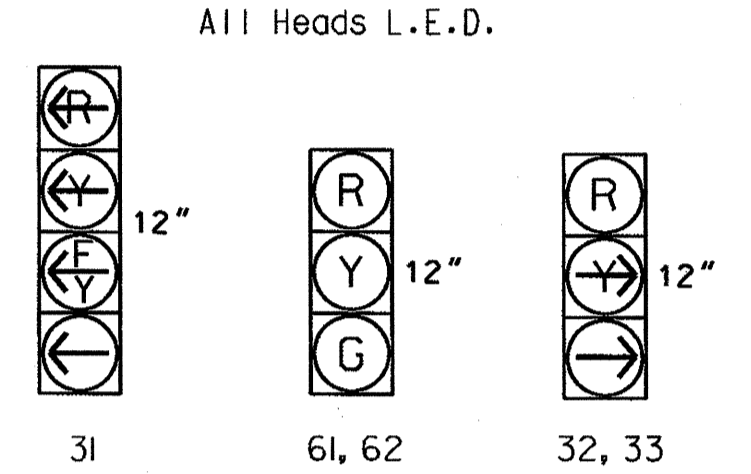
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS				DETECTOR PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	LOOP SYSTEM	NEW CARD
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
3C	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
6A	6X6	420	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	420	5	Y	6	Y	Y	-	-	-	-	Y

2 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.

SIGNAL FACE I.D.



FEATURE	PHASE	
	3	6
Min Green 1*	7	14
Extension 1*	2.0	6.0
Max Green 1*	25	90
Yellow Clearance	3.0	5.3
Red Clearance	2.1	1.4
Red Revert	2.0	2.0
Walk 1*	-	-
Don't Walk 1	-	-
Seconds Per Actuation*	-	1.5
Max Variable Initial*	-	46
Time Before Reduction*	-	15
Time To Reduce*	-	45
Minimum Gap	-	3.4
Recall Mode	-	MIN RECALL
Vehicle Call Memory	-	YELLOW
Dual Entry	-	-
Simultaneous Gap	ON	ON

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

PROPOSED	LEGEND	EXISTING
○	Traffic Signal Head	●
○	Modified Signal Head	N/A
○	Sign	-
○	Pedestrian Signal Head With Push Button & Sign	○
○	Signal Pole with Guy	○
○	Signal Pole with Sidewalk Guy	○
○	Inductive Loop Detector	○
○	Controller & Cabinet	○
○	Junction Box	○
○	2-in Underground Conduit	○
N/A	Right of Way	-
→	Directional Arrow	→
○	Metal Pole with Mastarm	○
○	Signal Pedestal	○
○	Directional Drill	N/A
N/A	Guardrail	-
○	No U-Turn Sign (R3-4)	○
○	No Left Turn Sign (R3-2)	○
○	Added Lane Sign (W4-3)	○

New Installation

US 401 SB (Louisburg Road) at US 401 Business (N. Main St.)

Division 5 Wake County Rolesville

PLAN DATE: March 2010 REVIEWED BY:

PREPARED BY: G.E. Carter REVIEWED BY:

REVISIONS: INIT. DATE

SIGNATURE: DATE

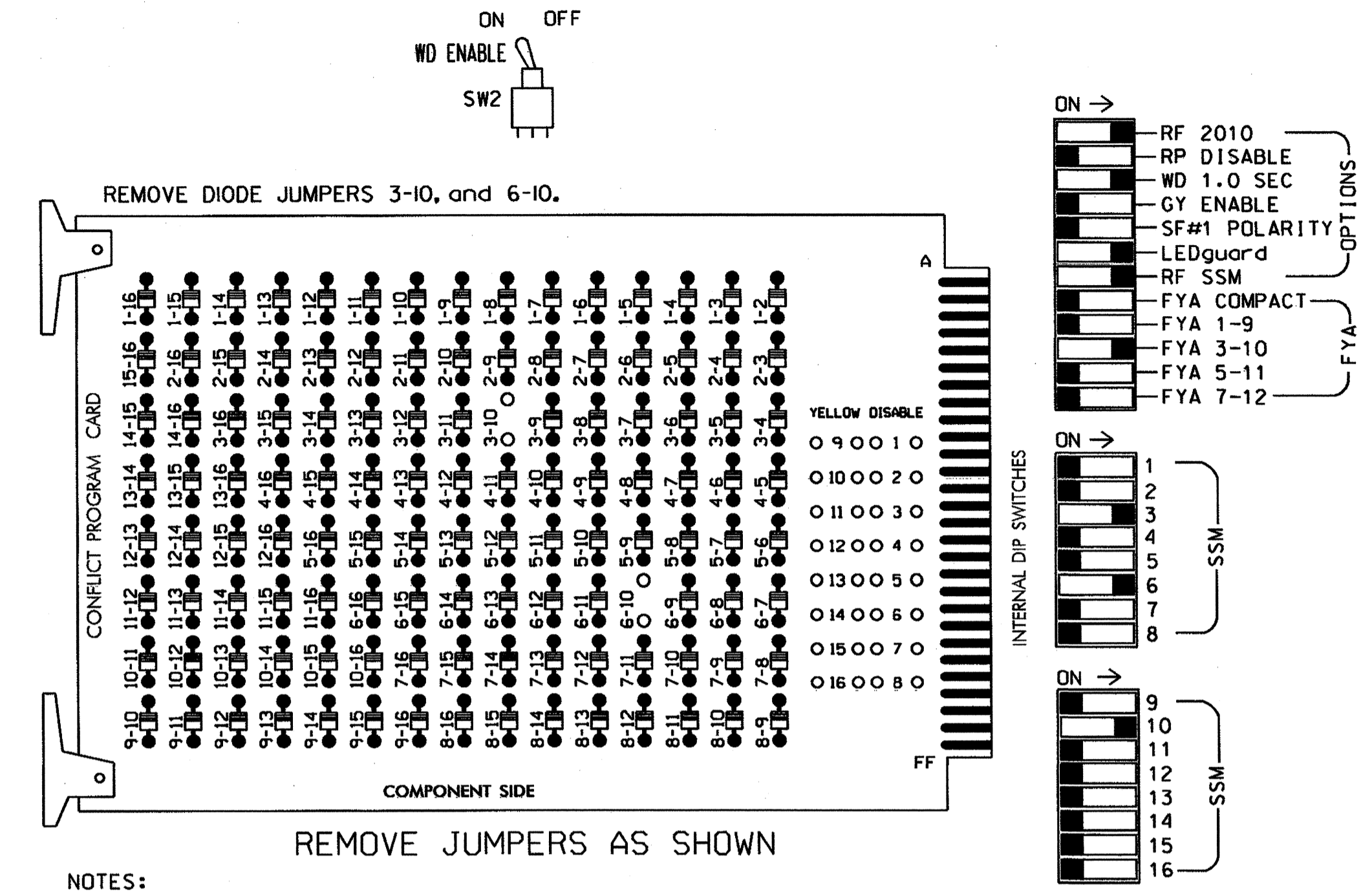
SIG. INVENTORY NO. 05-2393

SEAL

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EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,2,4,5,7,8,9,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for Variable Initial and Gap Reduction.
- Program phase 6 for Start Up In Green.
- Program phase 6 for Yellow Flash.

SIGNAL HEAD HOOK-UP CHART

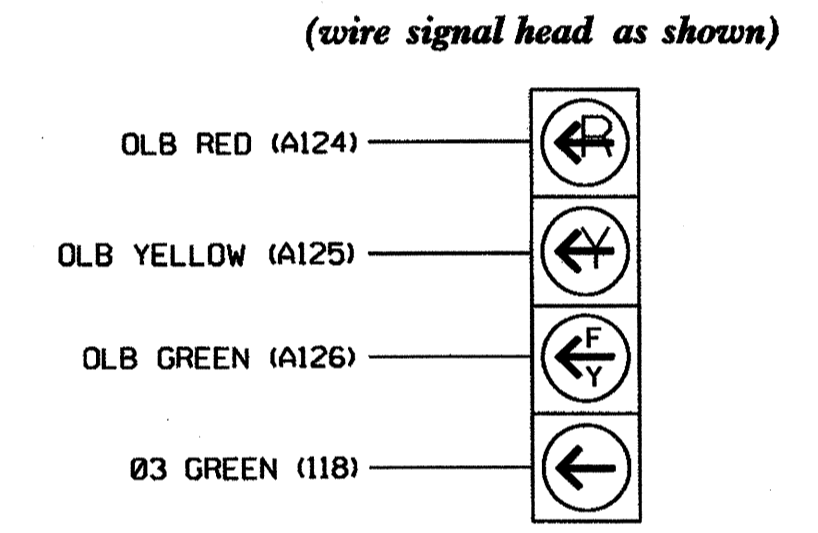
LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	NU	NU	31	32,33	NU	NU	NU	61,62	NU	NU	NU	NU	31	NU	NU	NU	NU	
RED				116				134											
YELLOW								135											
GREEN								136											
RED ARROW																		A124	
YELLOW ARROW					117														A125
FLASHING YELLOW ARROW																			A126
GREEN ARROW				118	118														

NU = Not Used
★ See pictorial of head wiring in detail below.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S3,S6,S10
PHASES USED.....3,6
OVERLAP "A".....NOT USED
OVERLAP "B".....3+6
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL



NOTE
The sequence display for signal head 31 requires special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
3A	TB4-5,6	15U	58	20	3	3	Y	Y			15
3B	TB4-9,10	16U	41	3	4	3	Y	Y			15
3C	TB4-11,12	16L	45	7	14	3	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

New Installation - Sheet 1 of 2

<p>Electrical and Programming Details For:</p> <p>Prepared In the Offices of:</p> <p>750 N. Greenleaf Pkwy, Garner, NC 27529</p>	<p>US 401 SB (Louisburg Road) at US 401 Business (N. Main St.)</p>		<p>SEAL</p>
	<p>Division 5 Wake County Rolesville</p>	<p>PLAN DATE: September 2010 REVIEWED BY: T. J. J.</p>	
	<p>PREPARED BY: S. Armstrong REVIEWED BY:</p>	<p>REVISIONS INIT. DATE</p>	
	<p>SIGNATURE: <i>S. Armstrong</i> DATE: 10/22/10</p>	<p>DATE</p>	

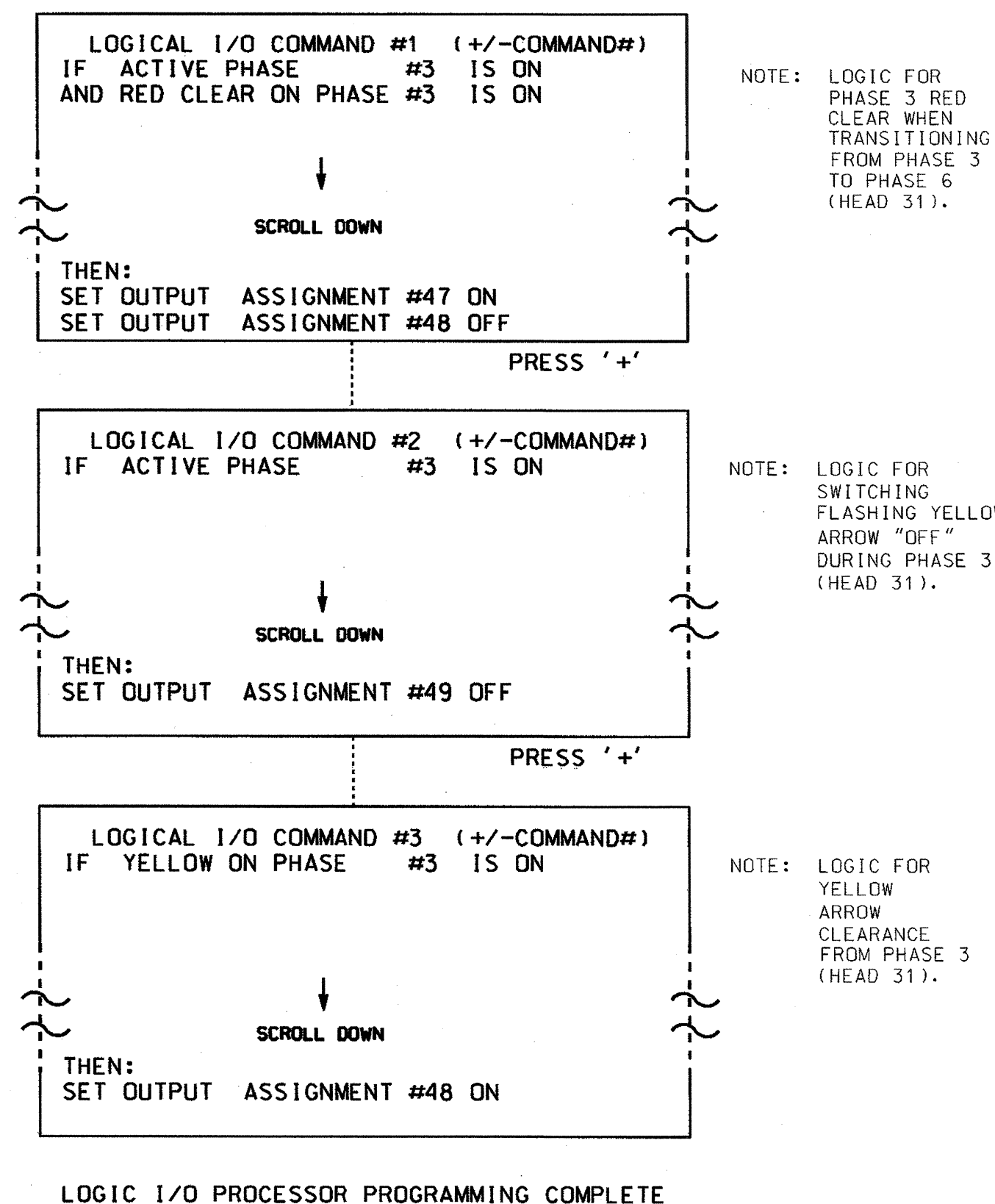
SIG. INVENTORY NO. 05-2393

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

(program controller as shown below)

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



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

OVERLAP PROGRAMMING DETAIL (program controller as shown below)

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

PRESS '+'

PAGE 1: VEHICLE OVERLAP 'B' SETTINGS

PHASE: 12345678910111213141516

VEH OVL PARENTS: X X

VEH OVL NOT VEH: :

VEH OVL NOT PED: :

VEH OVL GRN EXT: :

STARTUP COLOR: - RED - YELLOW - GREEN

FLASH COLORS: - RED - YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)

FLASH YELLOW IN CONTROLLER FLASH?...Y

GREEN EXTENSION (0-255 SEC)...0.0

YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0

RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0

OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-2393
DESIGNED: March 2010
SEALED: 10/18/10
REVISED: N/A

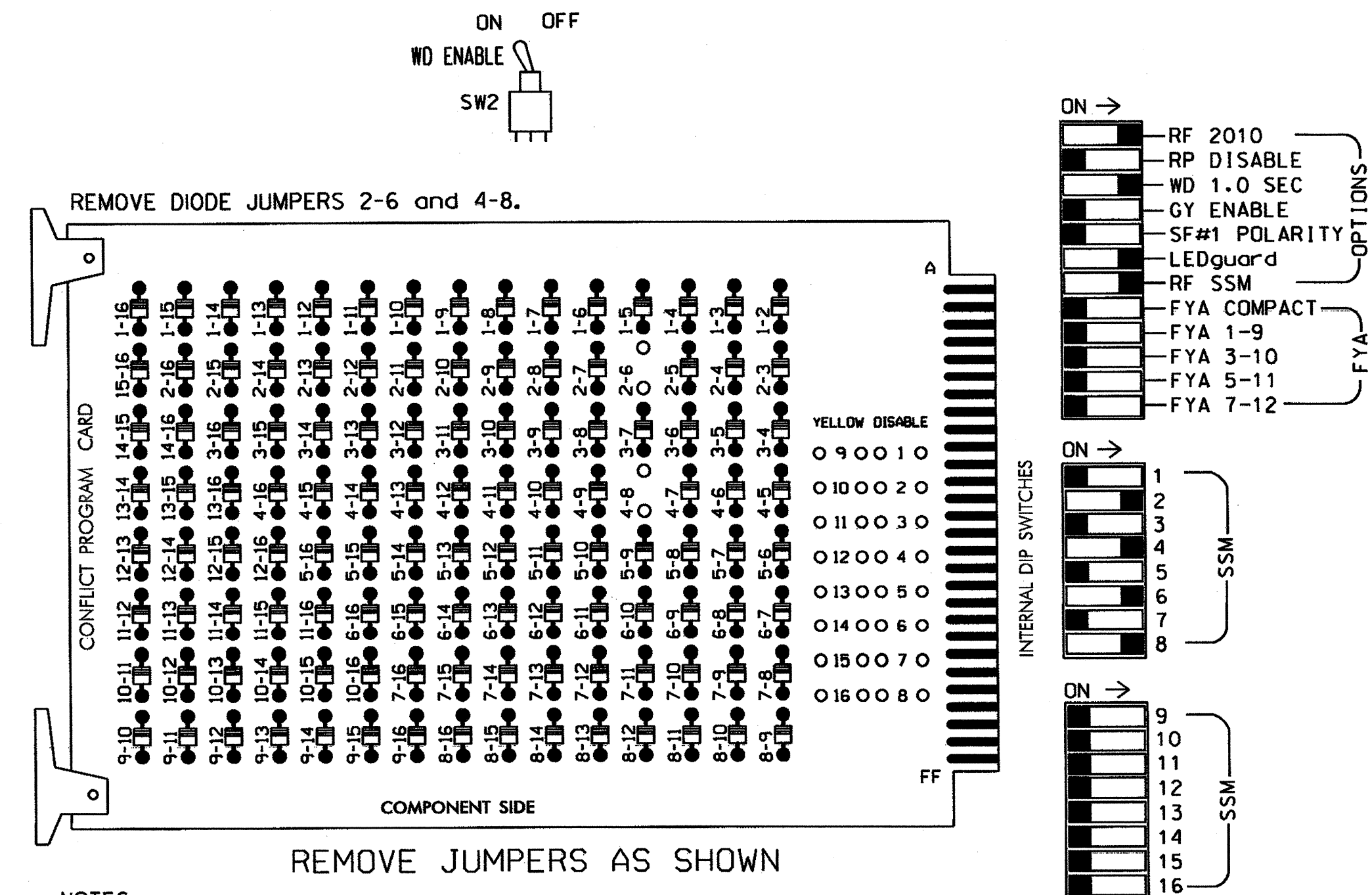
New Installation - Sheet 2 of 2

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REVISIONS	INIT.	DATE						

19-OCT-2010 08:41 S:\115ASU\ITS_Signal\workgroups\sig_mon\mstr\op\052393_sml.e...xxx.dgn sarmstrong

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Variable Initial.
6. Program phases 2, 4, 6, and 8 for Gap Reduction.
7. Program phases 2 and 6 for Start Up In Green.
8. Program phases 2 and 6 for Yellow Flash.

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 43	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

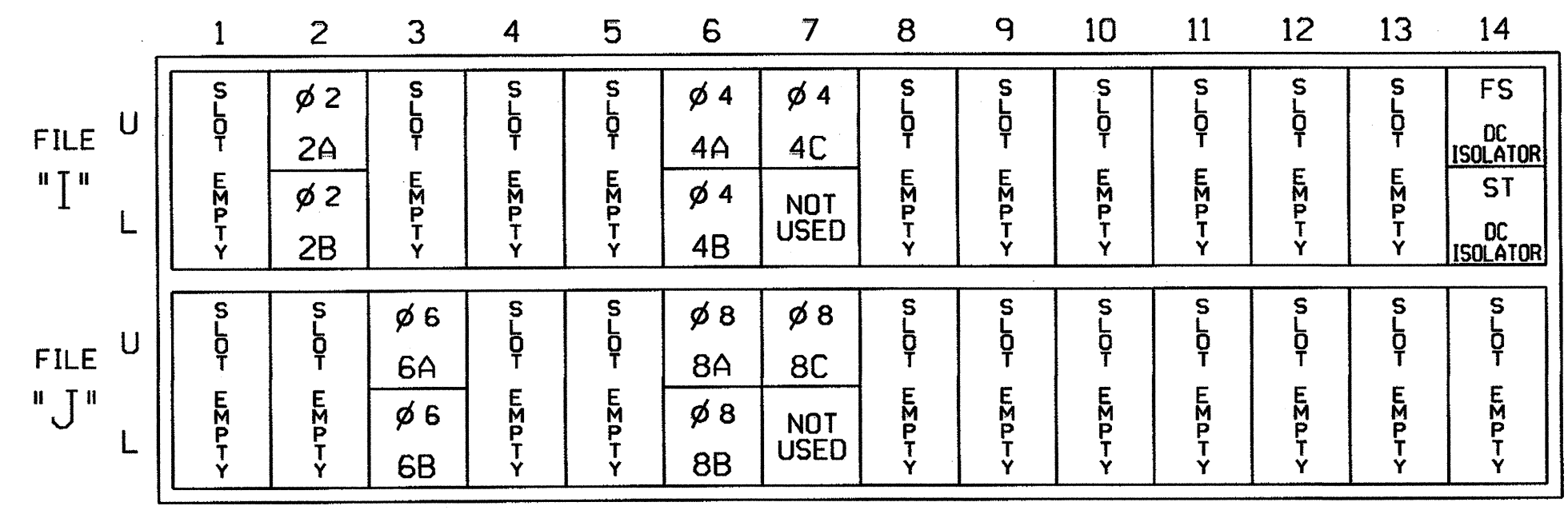
NU = Not Used

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)

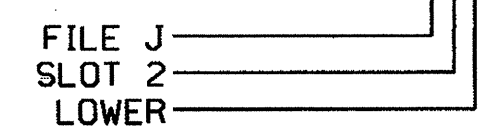


EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			3
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1146T1
 DESIGNED: August 2010
 SEALED: 10/19/10
 REVISED: N/A

Signal Upgrade - Temporary Design 1 (Construction Phase I)

Electrical and Programming Details For:

US 401 (Louisburg Road) at NC 96 (Zebulon Road)

Prepared in the Offices of:

750 N. Greenfield Pkwy, Corner, NC 27529

Division 5 Wake County Rolesville

PLAN DATE: October 2010 REVIEWED BY: T. J. J. / S. Armstrong

PREPARED BY: S. Armstrong REVIEWED BY:

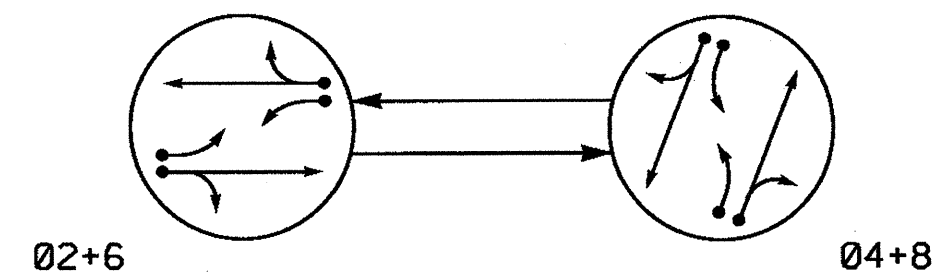
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SIGNATURE: *George C. Brown* DATE: 10/22/10

SIG. INVENTORY NO. 05-1146T1

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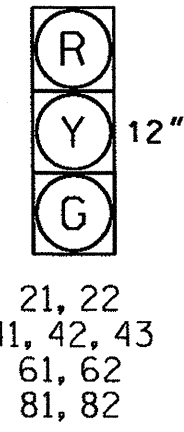
PHASING DIAGRAM



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

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42, 43	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

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

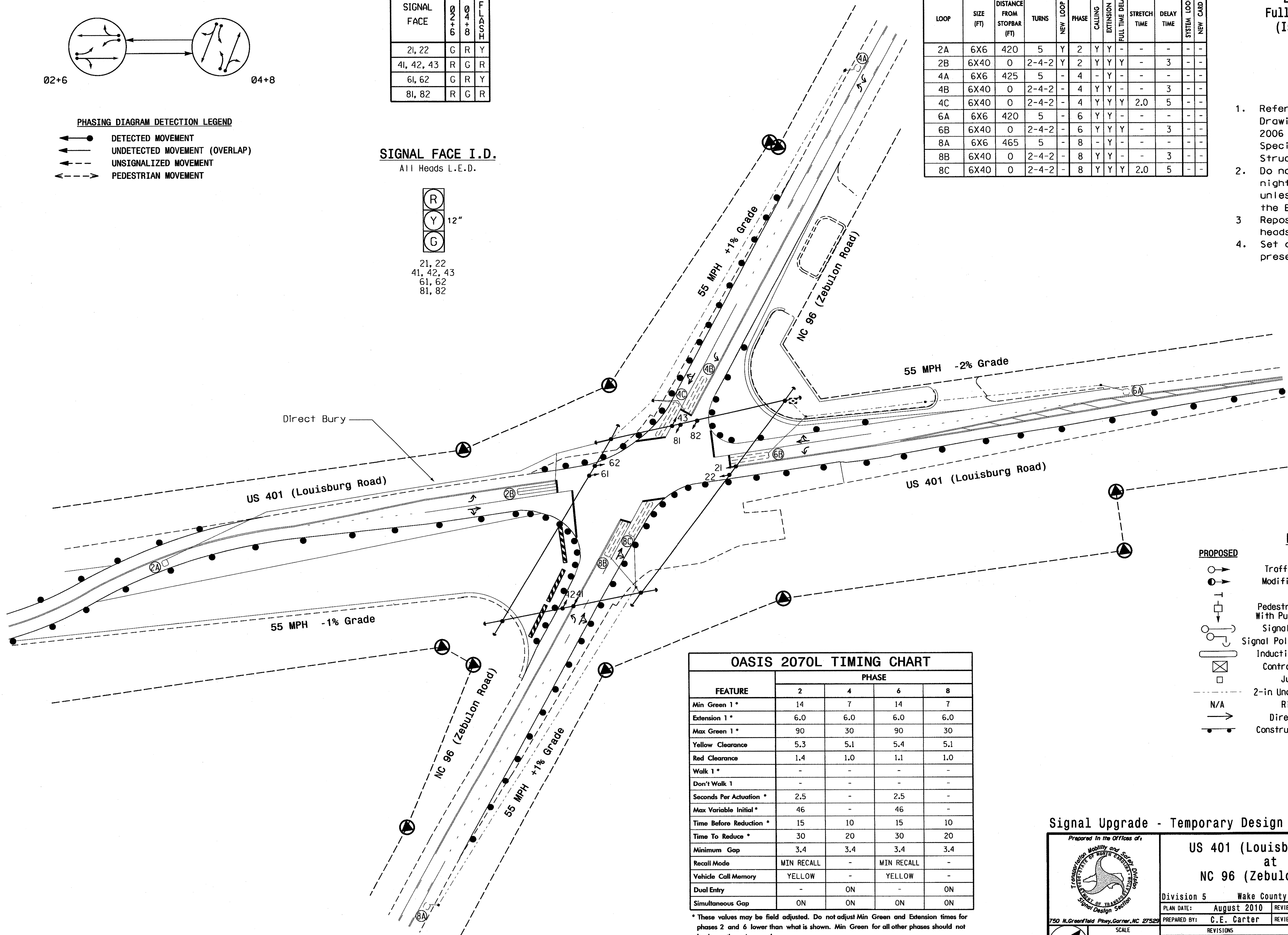


OASIS 2070L LOOP & DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME		DELAY TIME
2A	6X6	420	5	Y	2	Y	Y	-	-	-	-
2B	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-
4A	6X6	425	5	-	4	-	Y	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-
4C	6X40	0	2-4-2	-	4	Y	Y	Y	2.0	5	-
6A	6X6	420	5	-	6	Y	Y	-	-	-	-
6B	6X40	0	2-4-2	-	6	Y	Y	Y	-	3	-
8A	6X6	465	5	-	8	-	Y	-	-	-	-
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	3	-
8C	6X40	0	2-4-2	-	8	Y	Y	Y	2.0	5	-

2 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads as shown.
4. Set all detector units to presence mode.



FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	14	7	14	7
Extension 1 *	6.0	6.0	6.0	6.0
Max Green 1 *	90	30	90	30
Yellow Clearance	5.3	5.1	5.4	5.1
Red Clearance	1.4	1.0	1.1	1.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	2.5	-	2.5	-
Max Variable Initial *	46	-	46	-
Time Before Reduction *	15	10	15	10
Time To Reduce *	30	20	30	20
Minimum Gap	3.4	3.4	3.4	3.4
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
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
○ → Traffic Signal Head	● → Traffic Signal Head
○ → Modified Signal Head	N/A
○ → Sign	N/A
○ → Pedestrian Signal Head With Push Button & Sign	○ → Pedestrian Signal Head
○ → Signal Pole with Guy	○ → Signal Pole with Guy
○ → Signal Pole with Sidewalk Guy	○ → Signal Pole with Sidewalk Guy
□ → Inductive Loop Detector	□ → Inductive Loop Detector
□ → Controller & Cabinet	□ → Controller & Cabinet
□ → Junction Box	□ → Junction Box
- - - 2-in Underground Conduit	- - - 2-in Underground Conduit
N/A Right of Way	- - - Right of Way
→ Directional Arrow	→ Directional Arrow
● Construction Zone Drums	● Construction Zone Drums

Signal Upgrade - Temporary Design 2 (Construction Phase II)

Prepared In the Offices of:
 Transportation Mobility and Safety Division
 STATE OF NORTH CAROLINA
 SIGNAL DESIGN SECTION
 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Louisburg Road) at NC 96 (Zebulon Road)

Division 5 Wake County Rolesville

PLAN DATE: August 2010 PREPARED BY: C.E. Carter REVIEWED BY: [Signature]

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

SCALE: 1"=50'

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIMMERMAN 026486

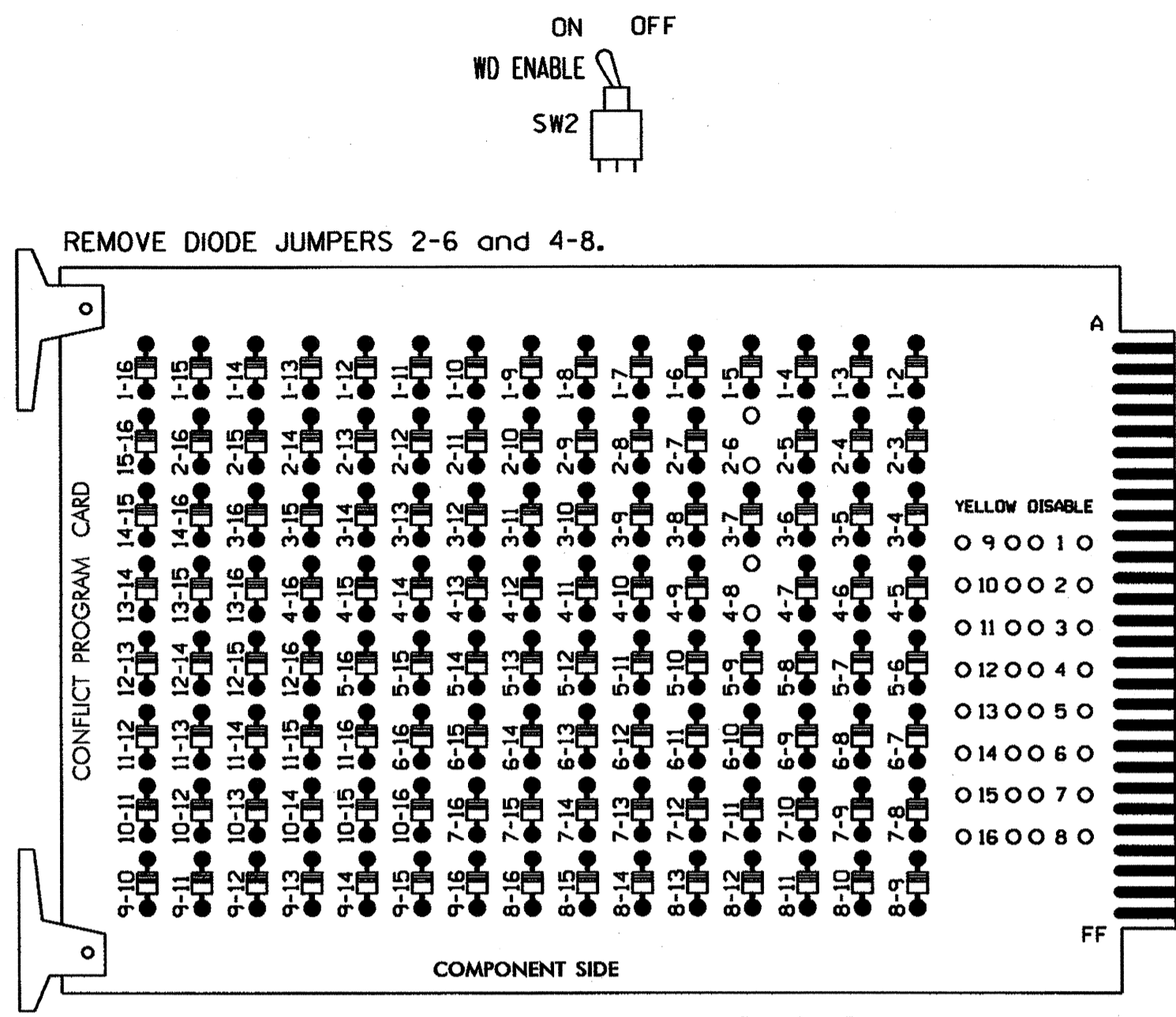
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SIG. INVENTORY NO. 05-1146T2

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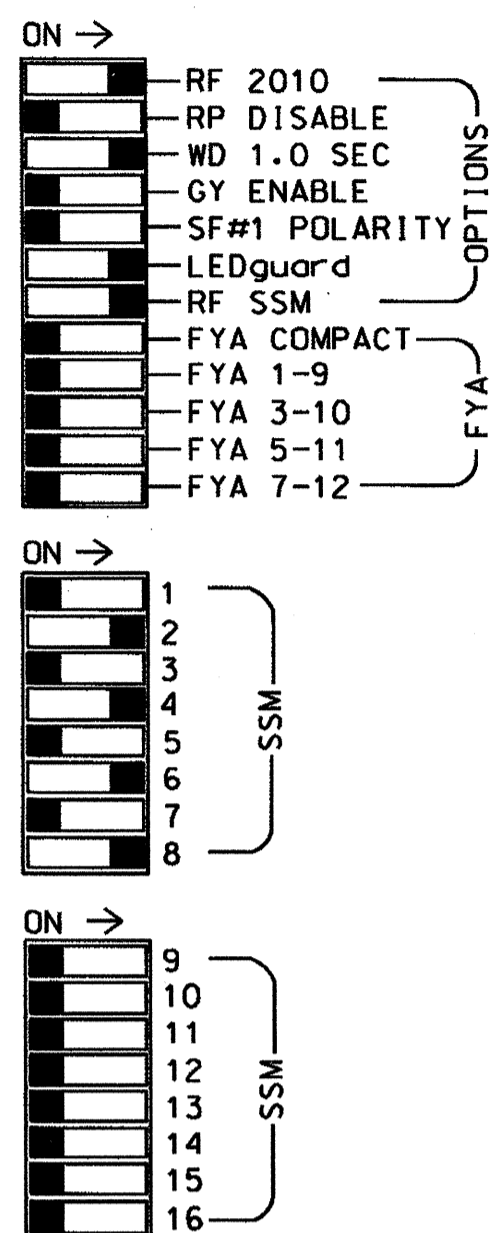
**EDI MODEL 2010ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



NOTES:

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



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Variable Initial.
6. Program phases 2, 4, 6, and 8 for Gap Reduction.
7. Program phases 2 and 6 for Start Up In Green.
8. Program phases 2 and 6 for Yellow Flash.

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 43	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

EQUIPMENT INFORMATION

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

INPUT FILE POSITION LAYOUT

(front view)

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

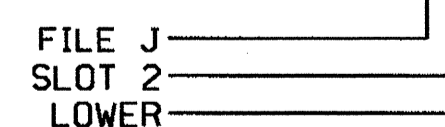
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4			Y		
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8			Y		
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			3
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1146T2
 DESIGNED: August 2010
 SEALED: 10/19/10
 REVISED: N/A

Signal Upgrade - Temporary Design 2 (Construction Phase 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 401 (Louisburg Road) at NC 96 (Zebulon Road)

Division 5 Wake County Rolesville

PLAN DATE: October 2010 REVIEWED BY: T. J. J. J.

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS

INIT. DATE

Signature: George C. Brown, 10/22/10

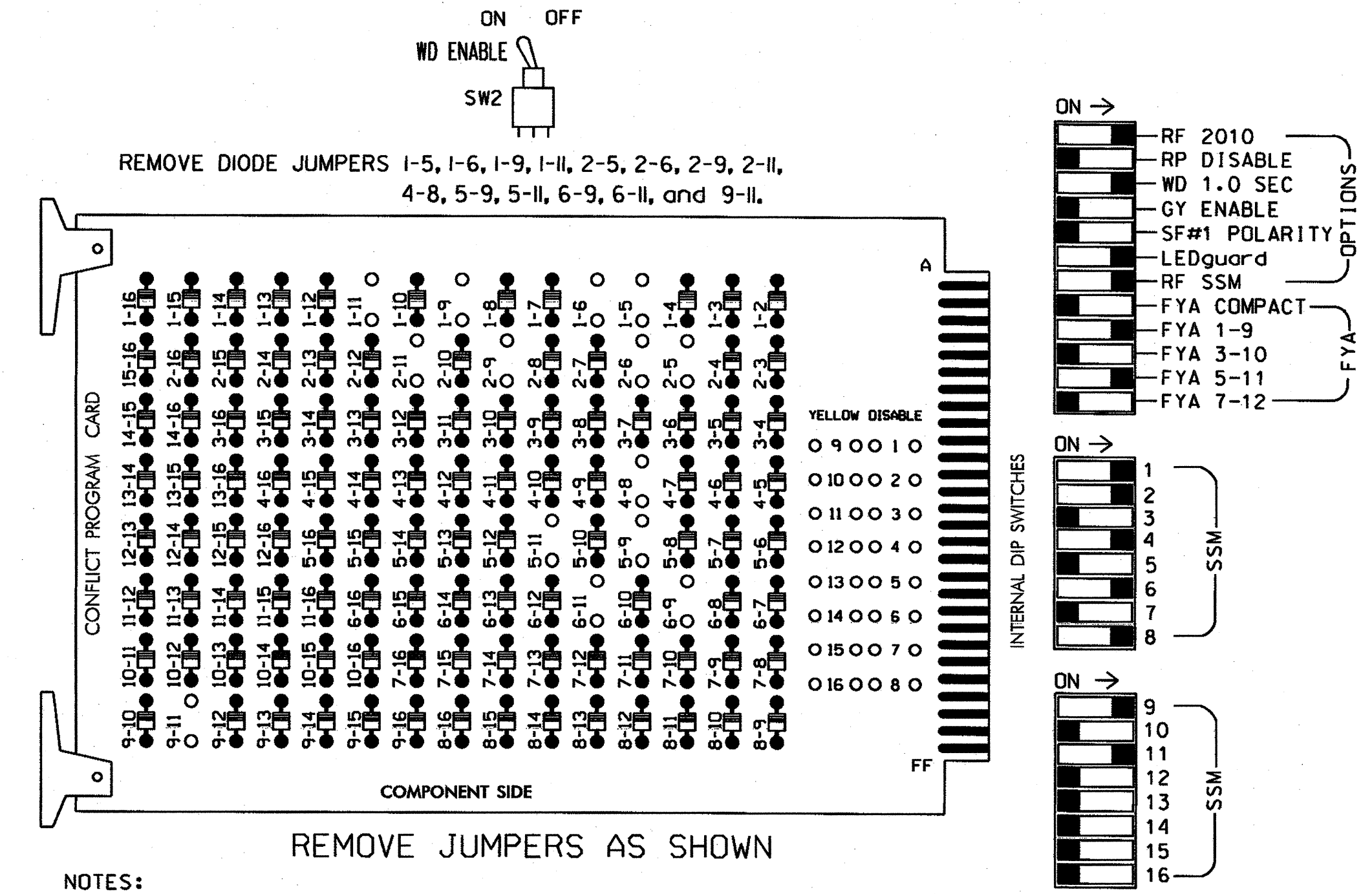
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER GEORGE C. BROWN SEAL 022013

750 N. Grandfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 05-1146T2

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11, and 9-11.

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.

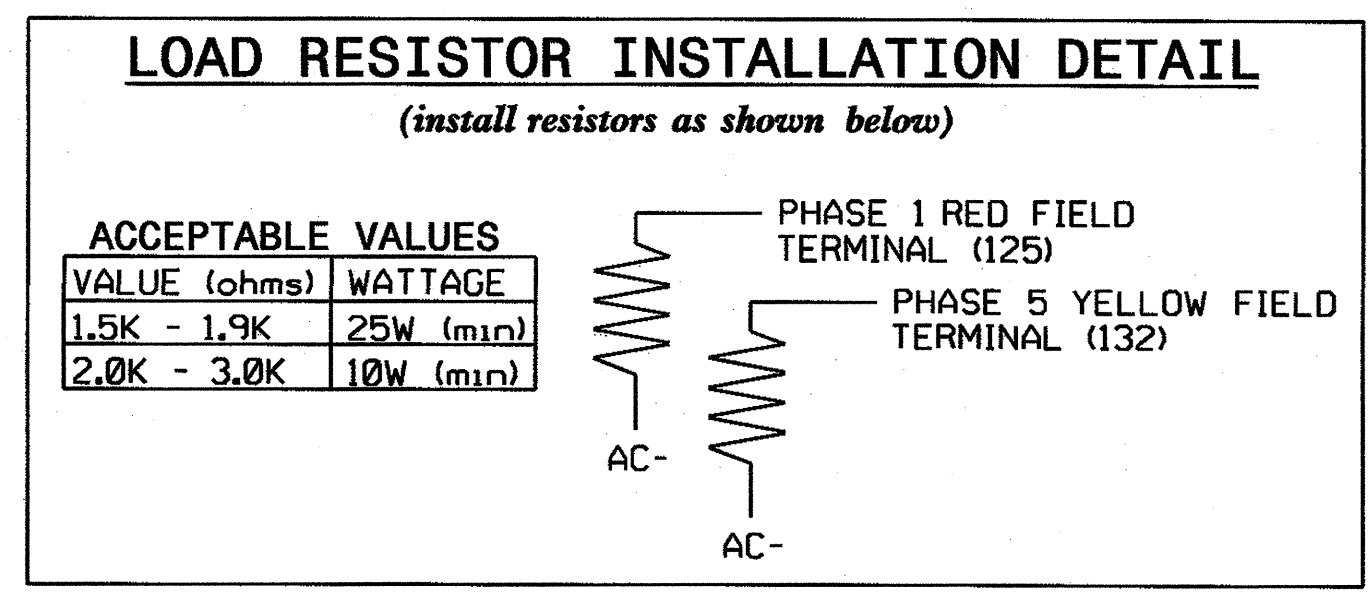
■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	∅ 1 1A	∅ 2 2A	S TOP	S TOP	∅ 4 4A	∅ 4 4C	S TOP	S TOP	S TOP	S TOP	S TOP	S TOP	S TOP	FS DC ISOLATOR
	NOT USED	∅ 1 1B	←-V3E	←-V3E	∅ 4 4B	NOT USED	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	ST DC ISOLATOR
FILE "J"	∅ 5 5A	S TOP	∅ 6 6A	S TOP	∅ 8 8A	∅ 8 8C	S TOP	S TOP	S TOP	S TOP	S TOP	S TOP	S TOP	S TOP
	NOT USED	←-V3E	NOT USED	←-V3E	∅ 8 8B	NOT USED	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E	←-V3E

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



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,5,7,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial.
- Program phases 2, 4, 6, and 8 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

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

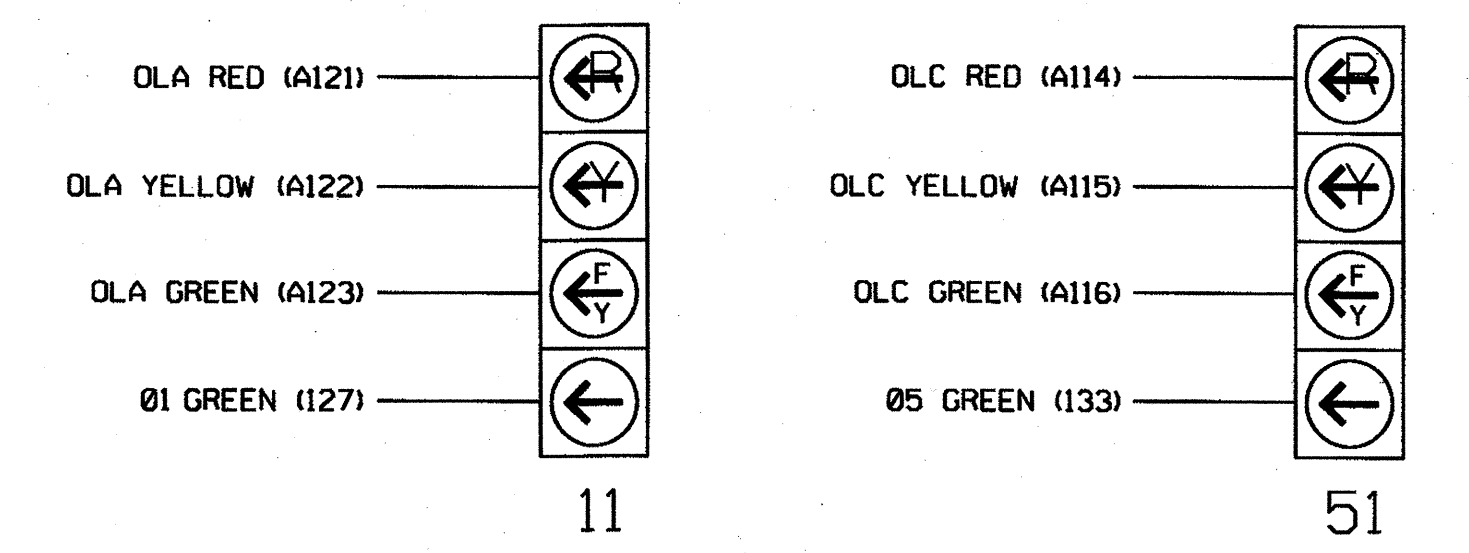
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11*	82	21,22 23	NU	41,42 43	NU	51*	61,62 63	NU	81,82 83	NU	11*	NU	NU	51*	NU	NU	NU
RED	*	128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW																A121		A114
YELLOW ARROW		126														A122		A115
FLASHING YELLOW ARROW																A123		A116
GREEN ARROW	127	127						133										

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

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



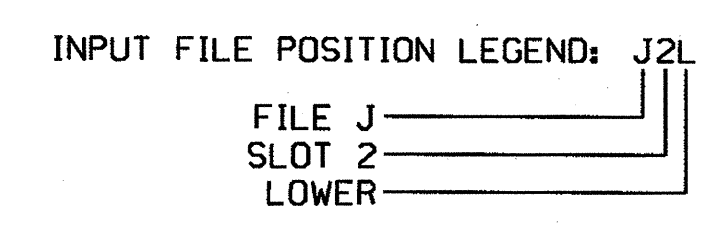
NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
		J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4		Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			3
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8		Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			3
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5

- Add jumper from I1-W to J4-W, on rear of input file.
- Add jumper from J1-W to I4-W, on rear of input file.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1146T3
 DESIGNED: November 2010
 SEALED: 11/10/10
 REVISED: N/A

Signal Upgrade - Temporary Design 3 (Construction Phase II) - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Louisburg Road) at NC 96 (Zebulon Road)

Division 5 Wake County Rolesville

PLAN DATE: November 2010 REVIEWED BY: T. J. J. J.

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS: INIT. DATE

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022013 GEORGE C. BROWN

Signature: George C. Brown 11/2/10 DATE

SIG. INVENTORY NO. 05-1146T3

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

(program controller as shown below)

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

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

↓
SCROLL DOWN

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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

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

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

↓
SCROLL DOWN

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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

PRESS '+' TWICE

← NOTICE GREEN FLASH

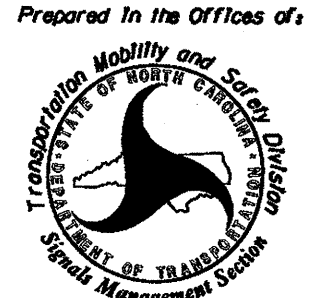
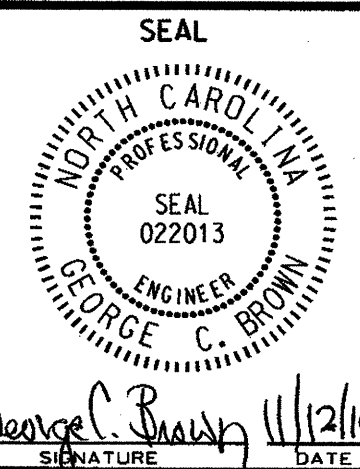
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1146T3
DESIGNED: November 2010
SEALED: 11/10/10
REVISED: N/A

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

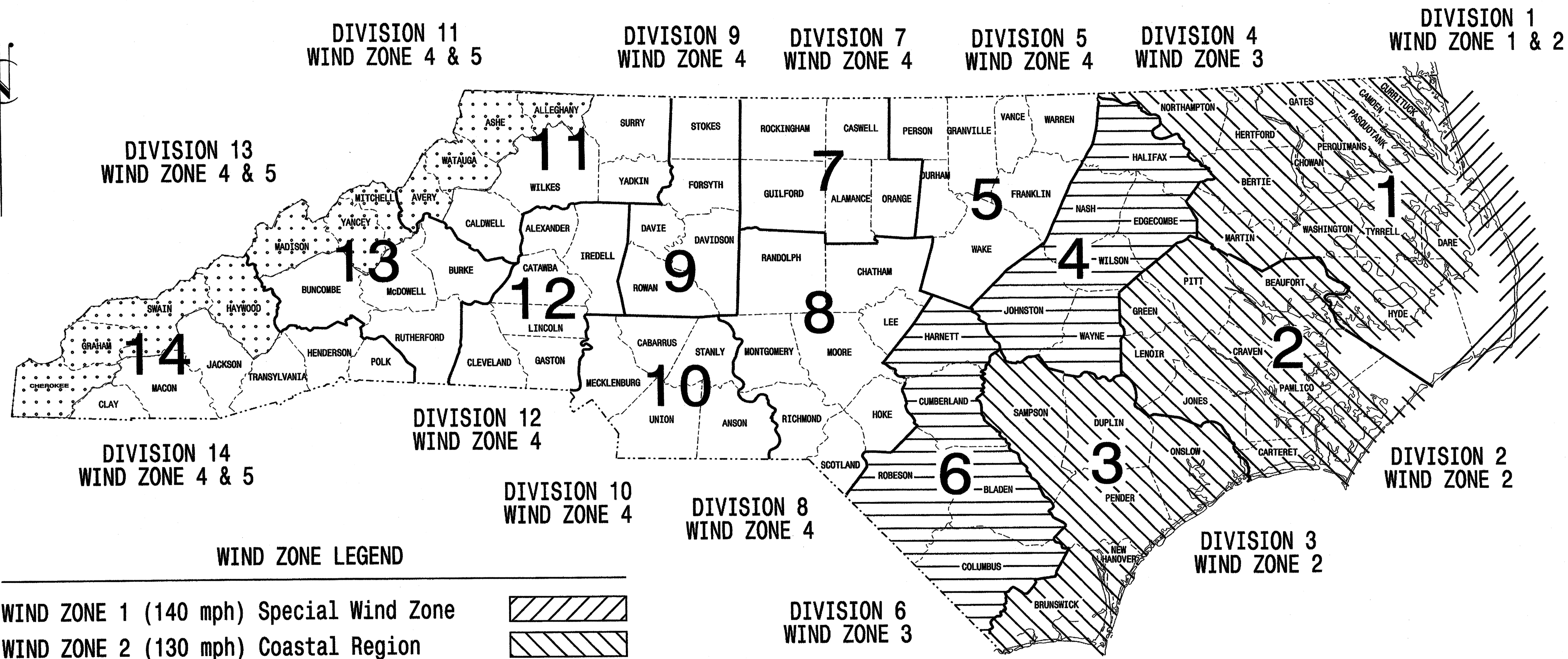
 <small>750 N. Greenfield Pkwy, Garner, NC 27529</small>	ELECTRICAL AND PROGRAMMING DETAILS FOR: US 401 (Louisburg Road) at NC 96 (Zebulon Road)		SEAL 
	Division 5 Wake County Rolesville		PREPARED BY: S. Armstrong REVIEWED BY: <i>T. V. J.</i>
	PLAN DATE: November 2010	REVISIONS	INIT. DATE

Signature: *George C. Brown* Date: _____
 SIG. INVENTORY NO. 05-1146T3

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	R-2814B	Sig. 22
F. A. PROJ. NO.	M 1	
PROJECT ID. NO.		

STANDARD DRAWINGS FOR METAL POLES



WIND ZONE LEGEND

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

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

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Designed in conformance with the 2002 Interim to the 4th Edition 2001

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

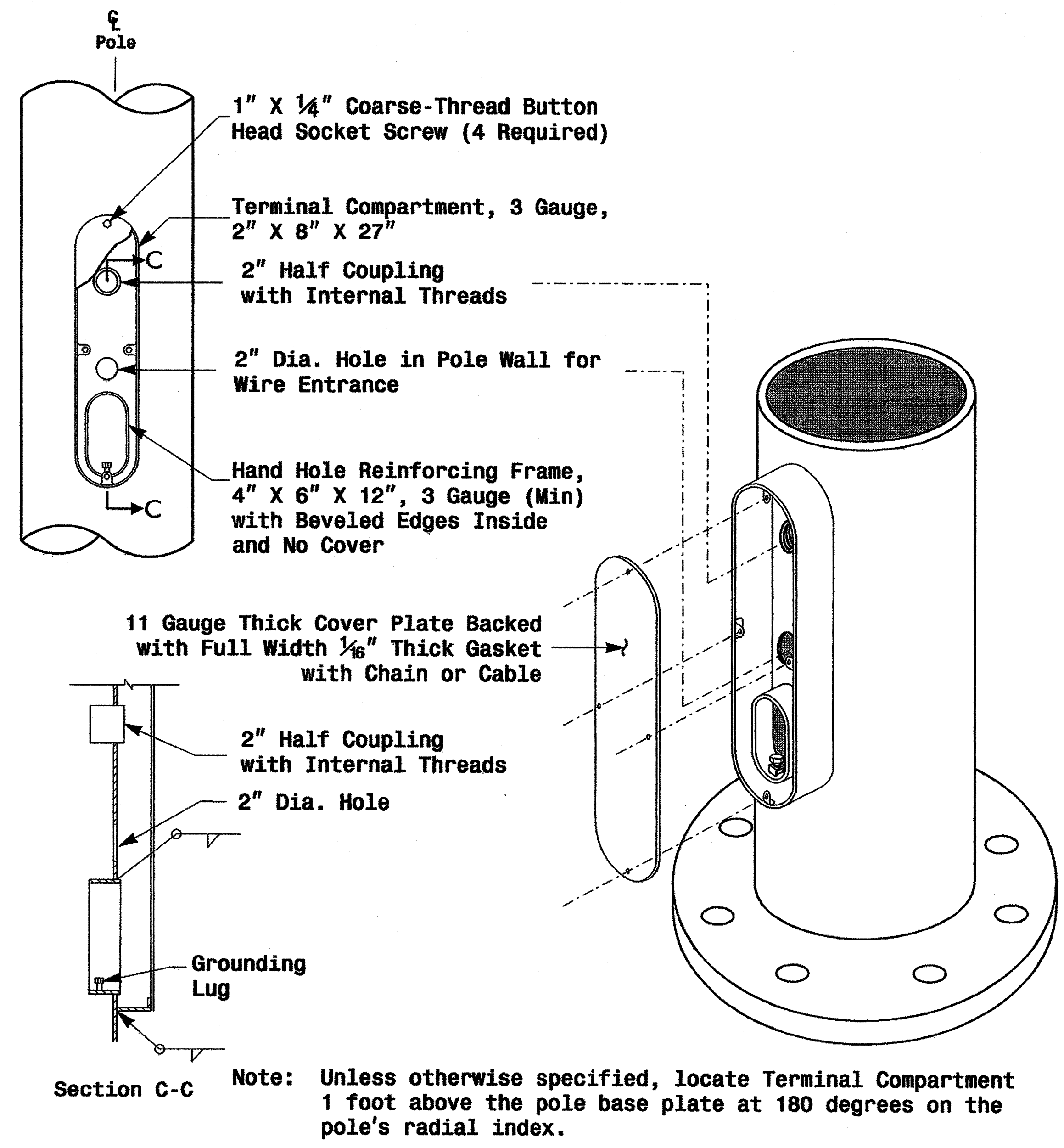
INDEX OF PLANS	
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

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

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

SEAL

D. Sarkar 7.26.2009
 SIGNATURE DATE



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

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 _____	

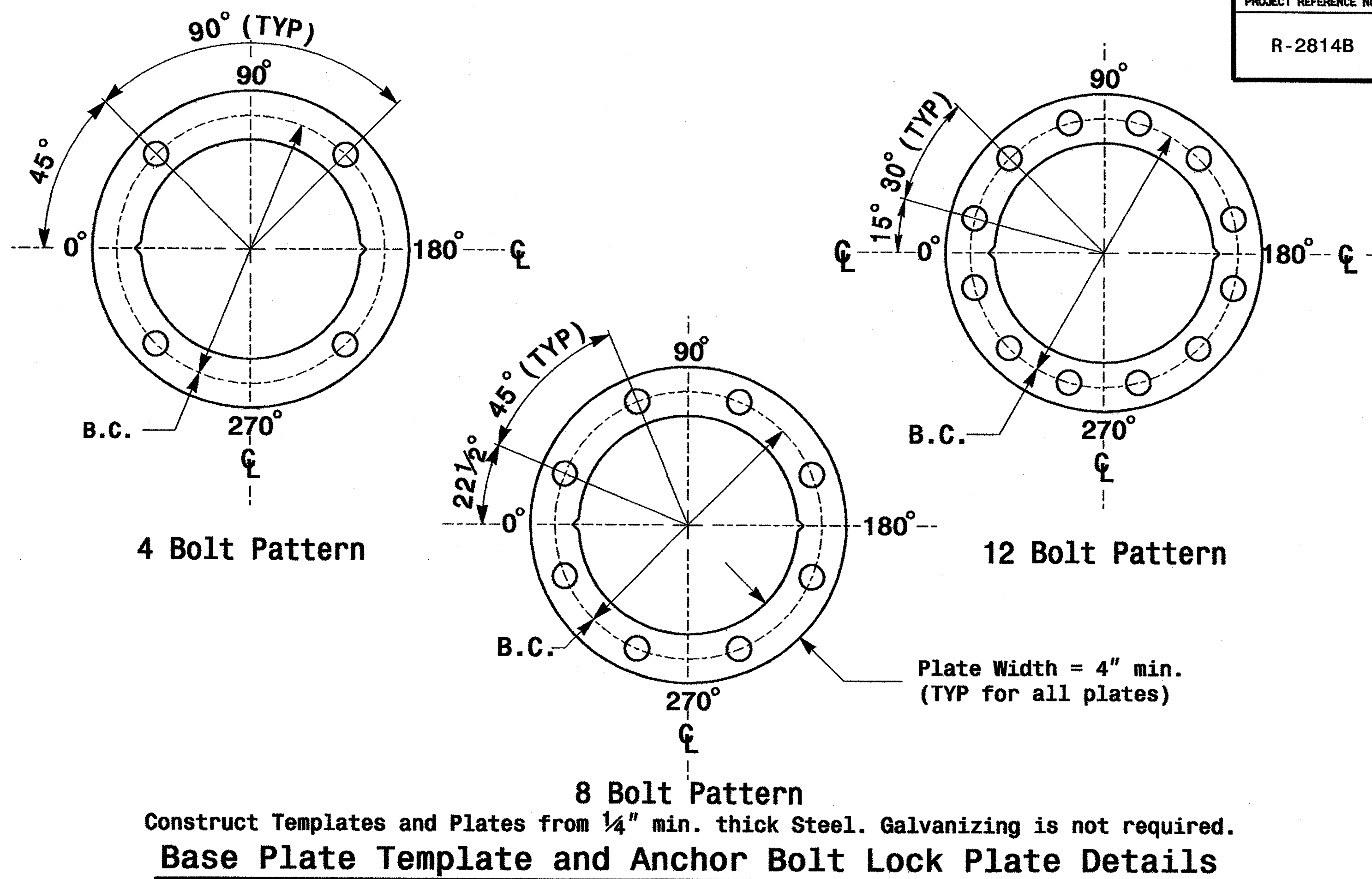
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

- 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.

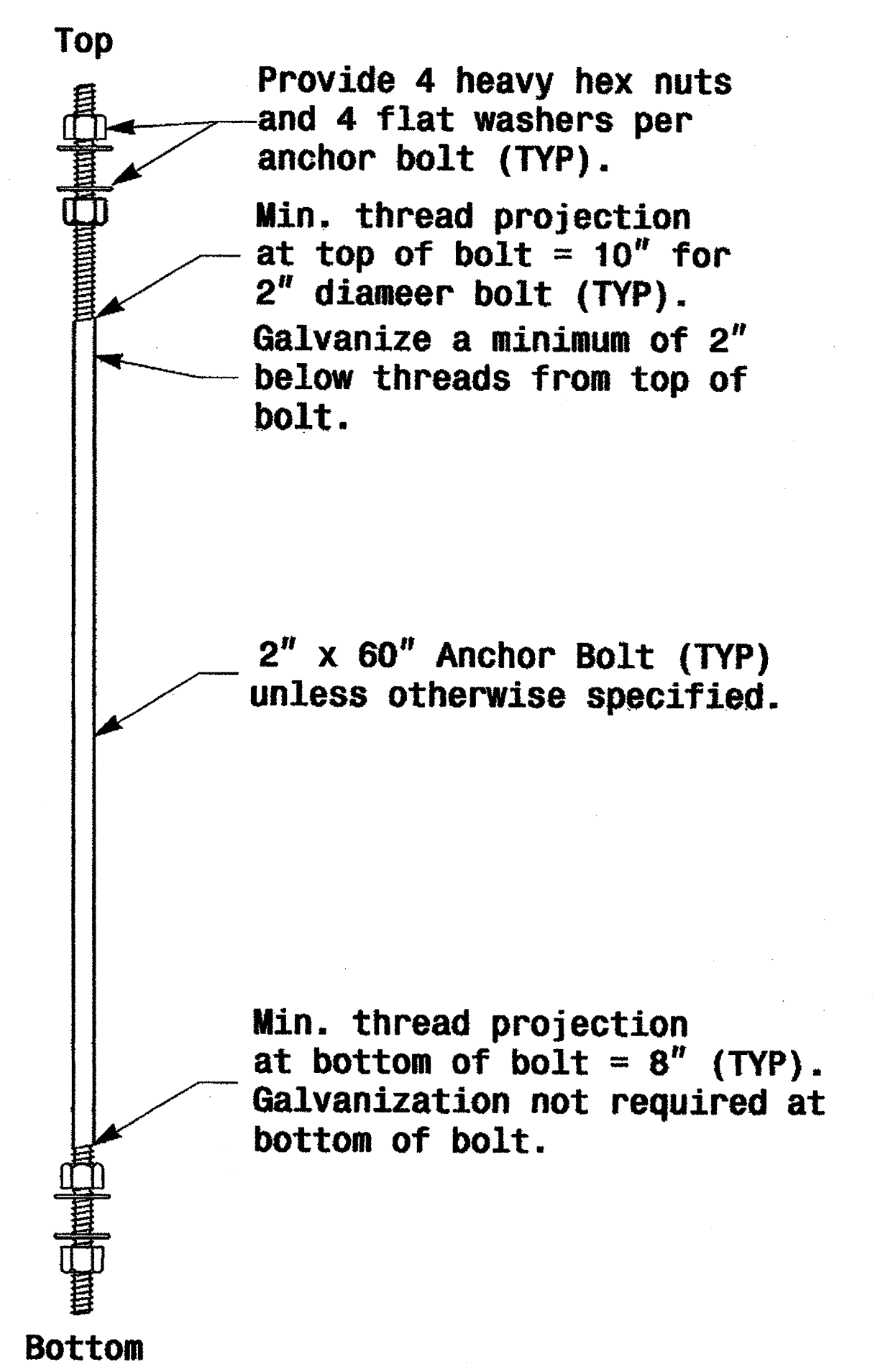
Identification Tag Details

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

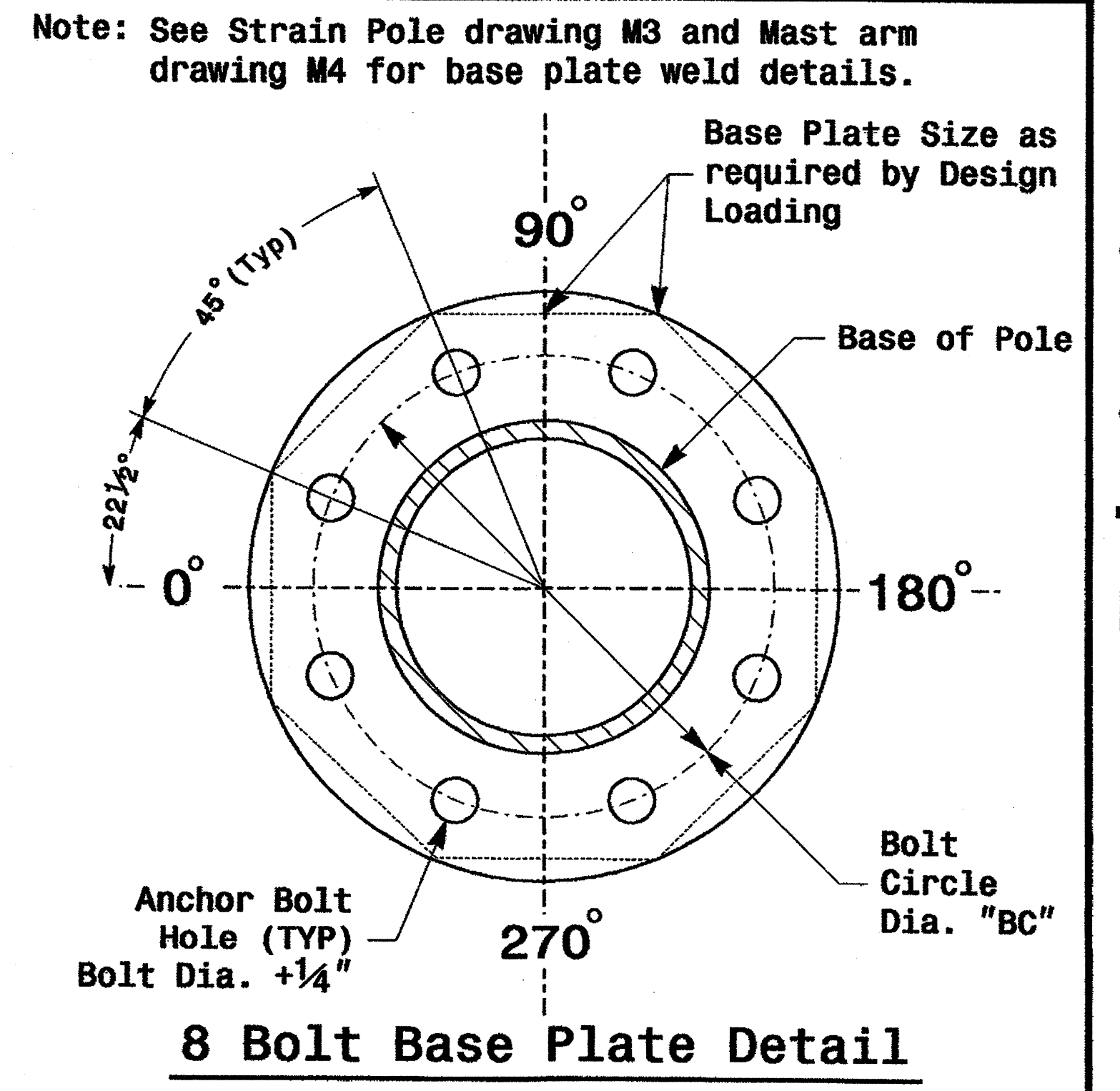
Arm I.D. Tag
(Provide on each section of a multi-section mast arm)



Base Plate Template and Anchor Bolt Lock Plate Details
Construct Templates and Plates from 1/4" min. thick Steel. Galvanizing is not required.



Anchor Bolt Detail

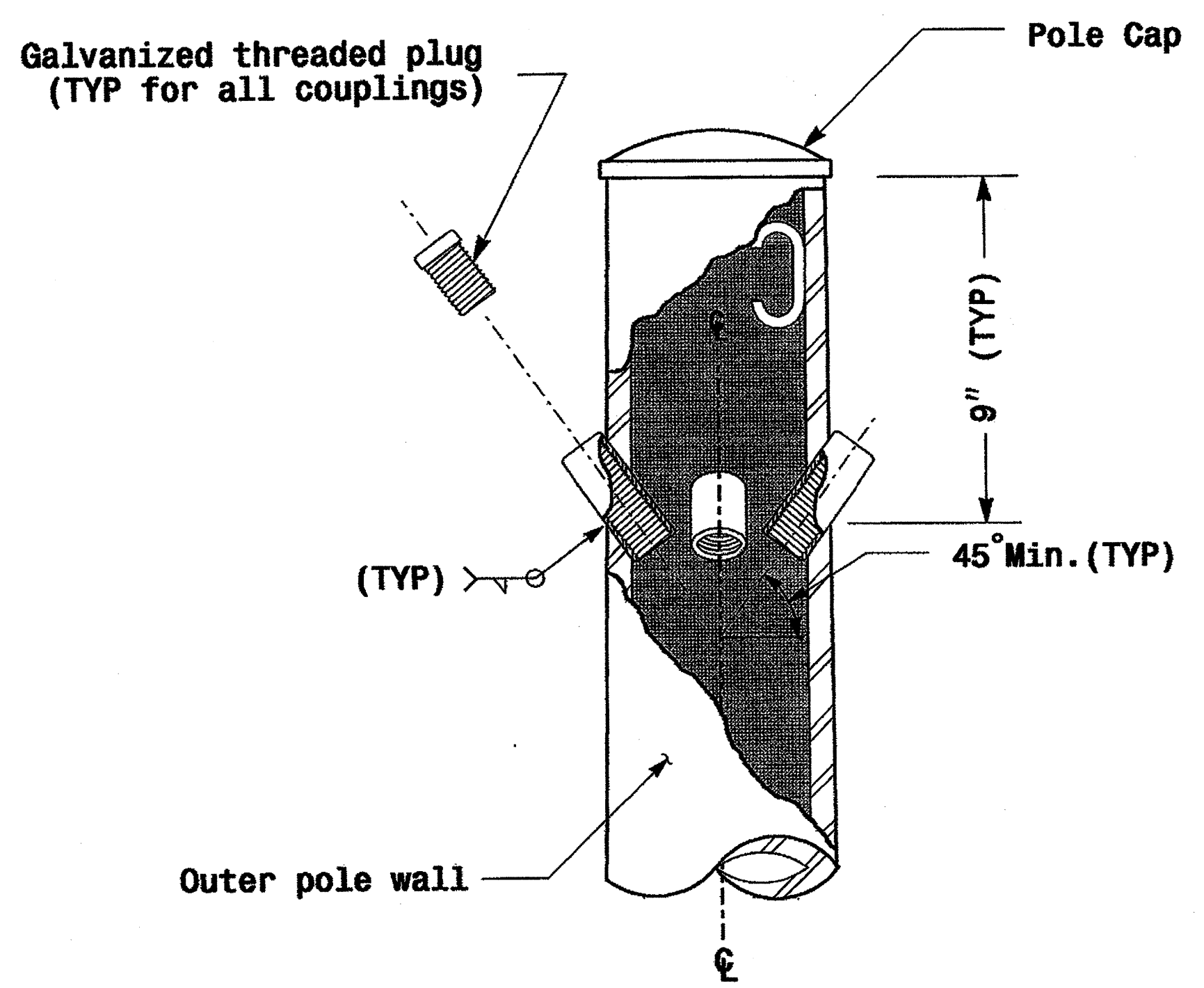


8 Bolt Base Plate Detail

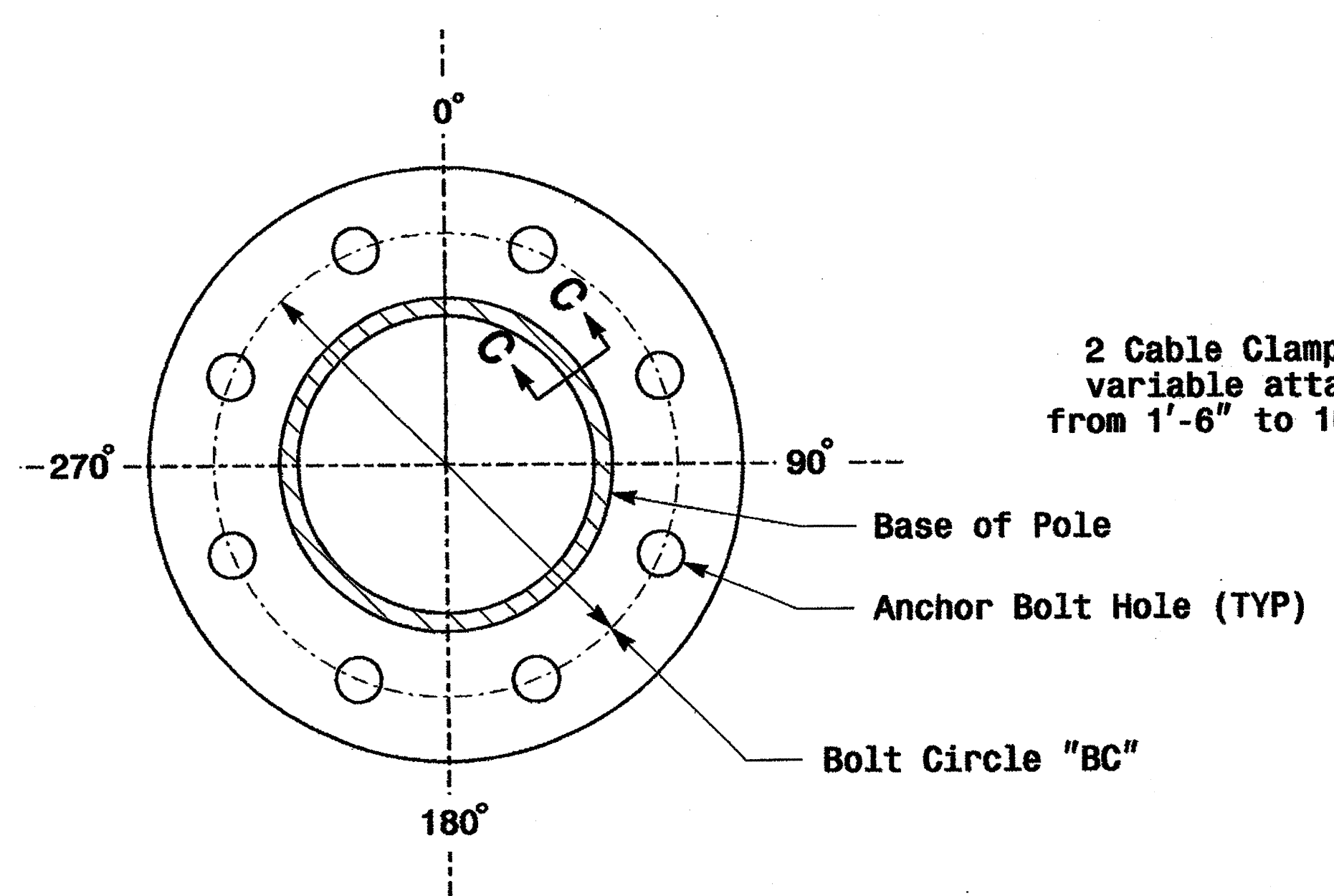
	Typical Fabrication Details Common To All Metal Poles		
	PLAN DATE: May 2005 PREPARED BY: P. L. Alexander SCALE: 0 NA NONE	REVIEWED BY: C. F. Andrews REVIEWED BY: A. M. Esposito INIT. DATE	

Fabrication Details - All Poles

01-SEP-2005 18:22 D:\2004\Metrol Pole Standard\004.mz thru m5.dgn

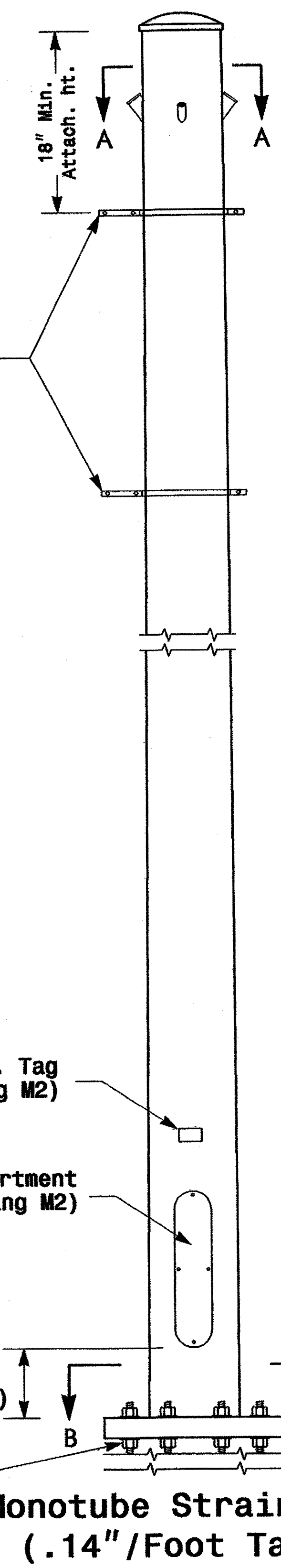


Cable Entrances at Top of Pole

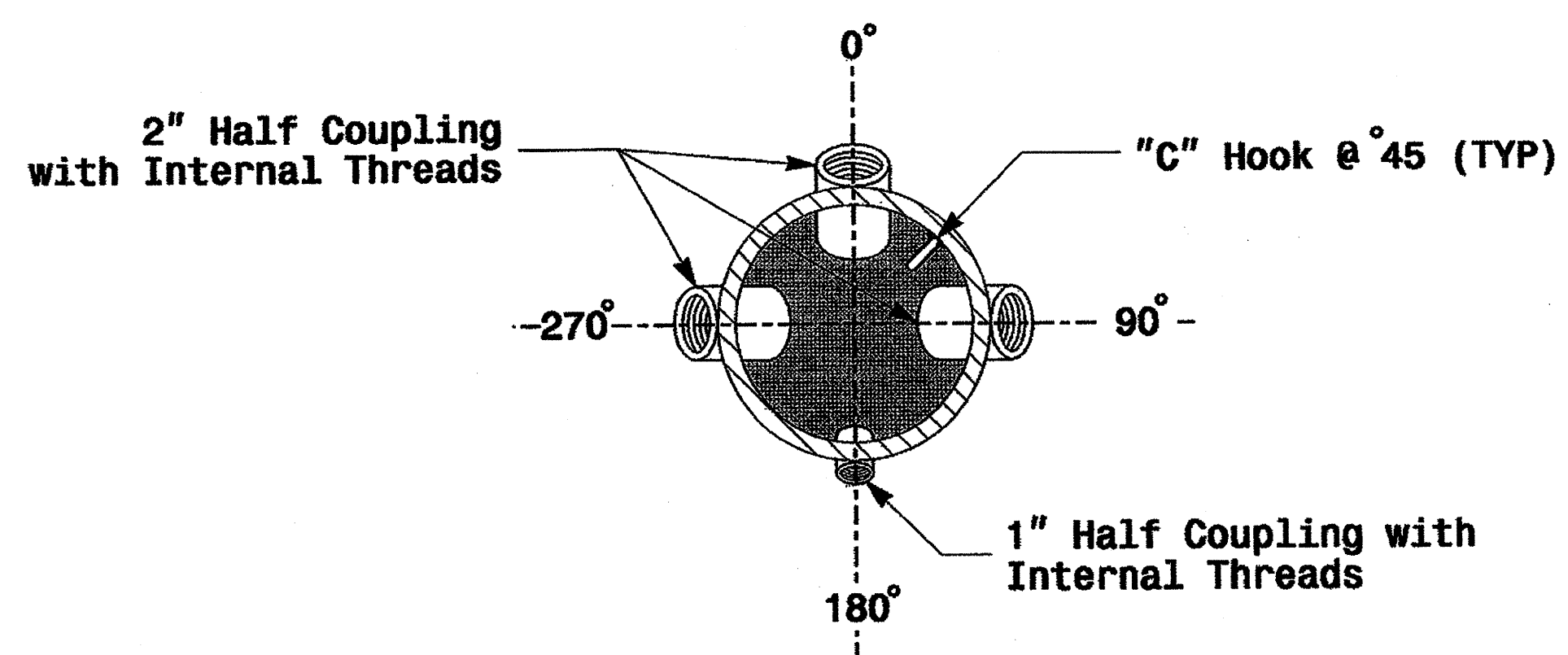


Section B-B
(See drawing M2)
Pole Base Plate

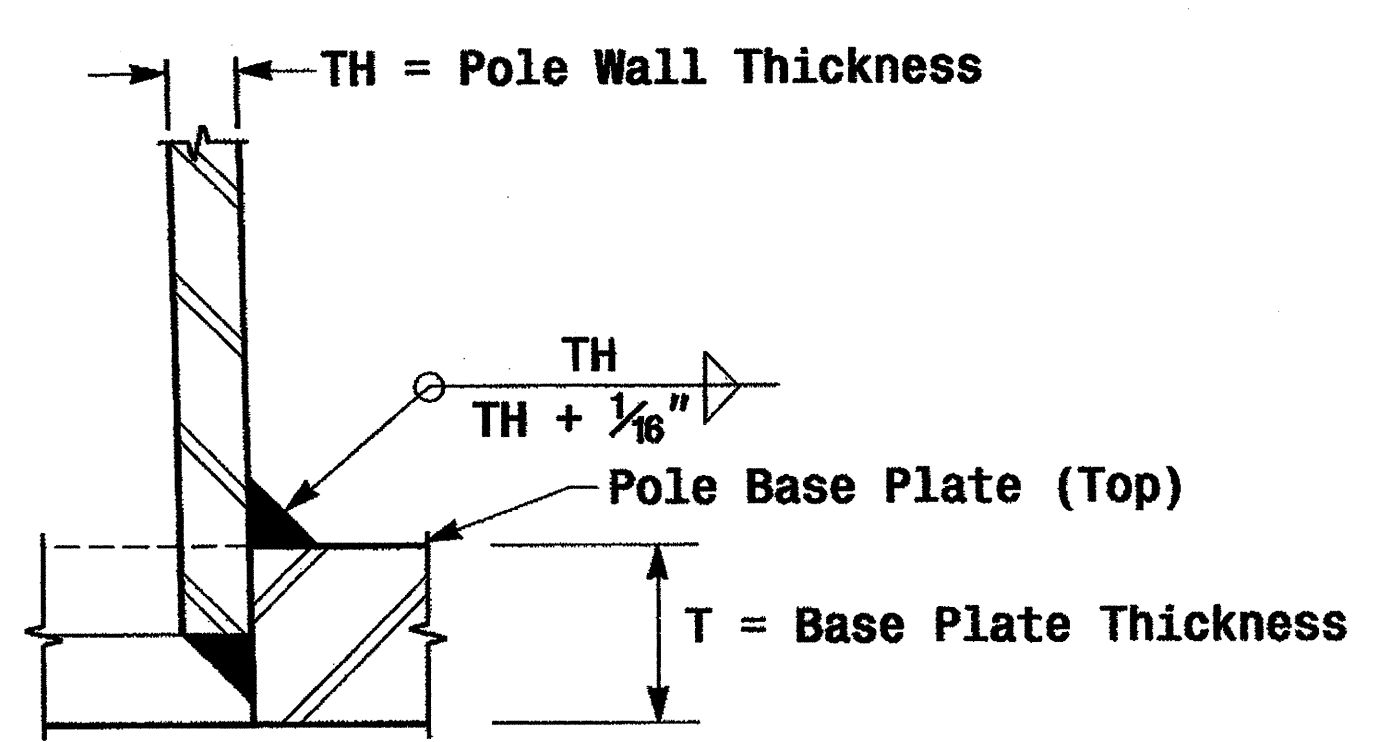
2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.



Monotube Strain Pole
(.14"/Foot Taper)



Radial Orientation for Factory Installed Accessories at Top of Pole



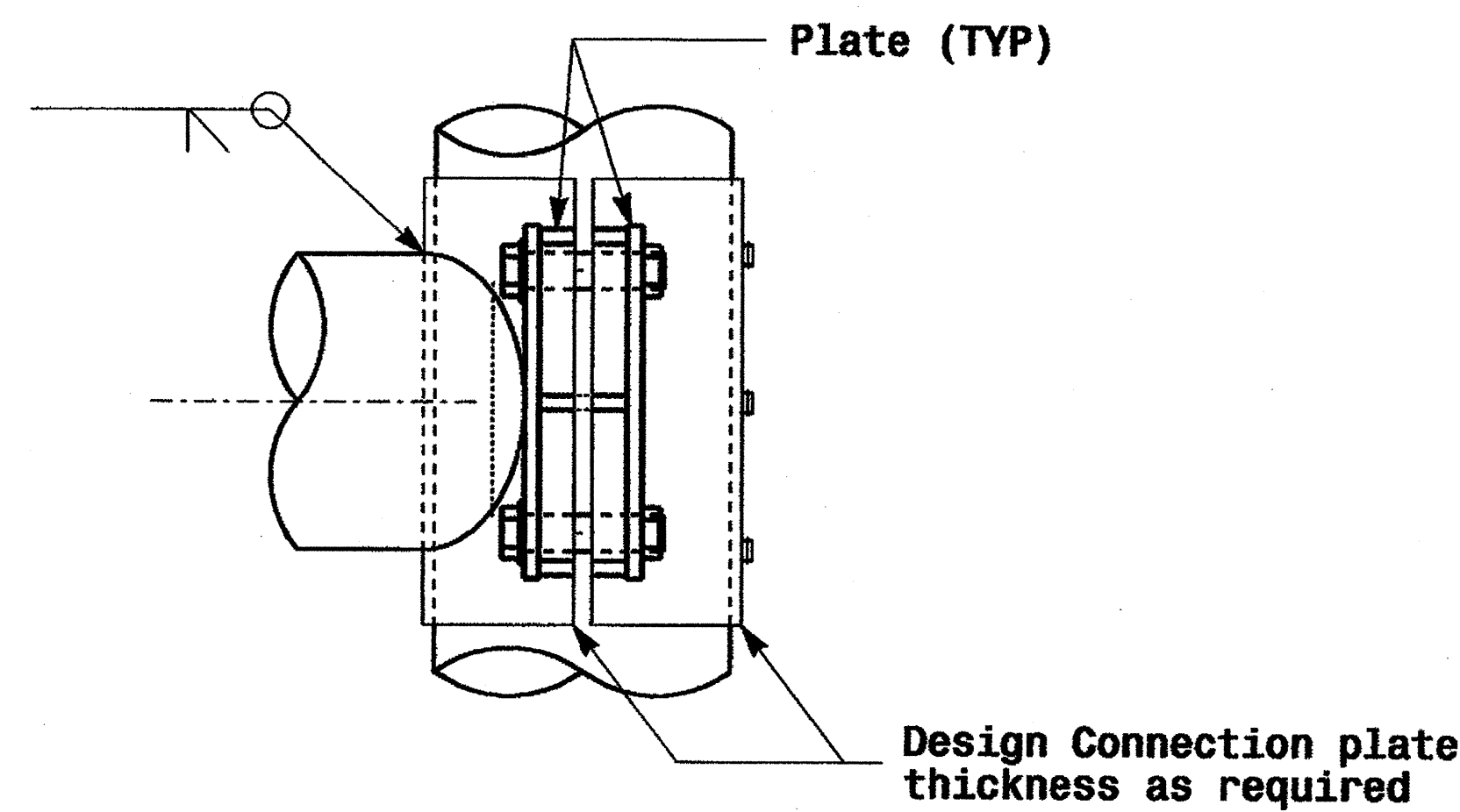
Socket Connection Weld Detail

Fabrication Details - Strain Poles

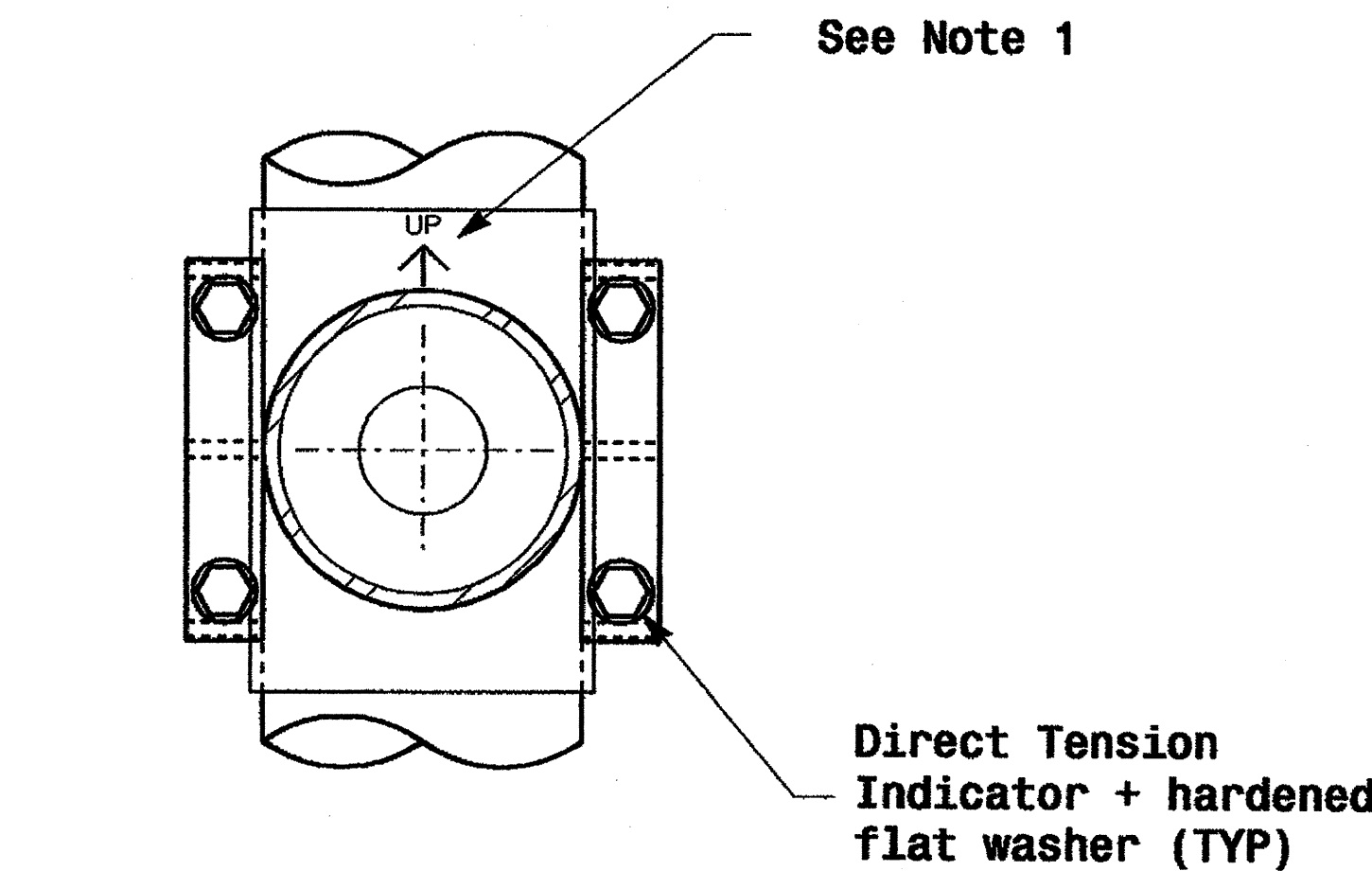
01-SEP-2005 14:07 \\jrh\work\p04\c04\m03.dgn

	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:		INVT. DATE:	SIGNATURE: <i>D. Sacker</i> DATE: 9.2.2005 SIG. INVENTORY NO.

Adjustable Clamp Type Bolted Mast Arm Connection

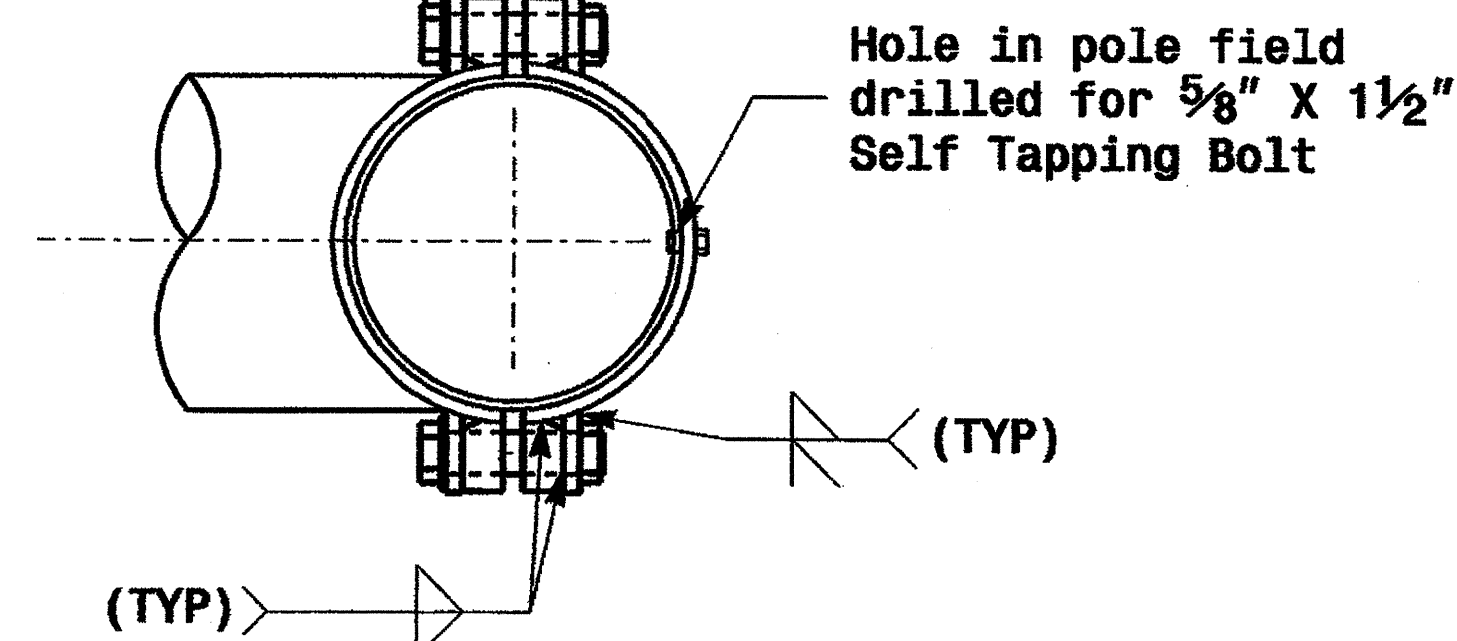


Side Elevation View



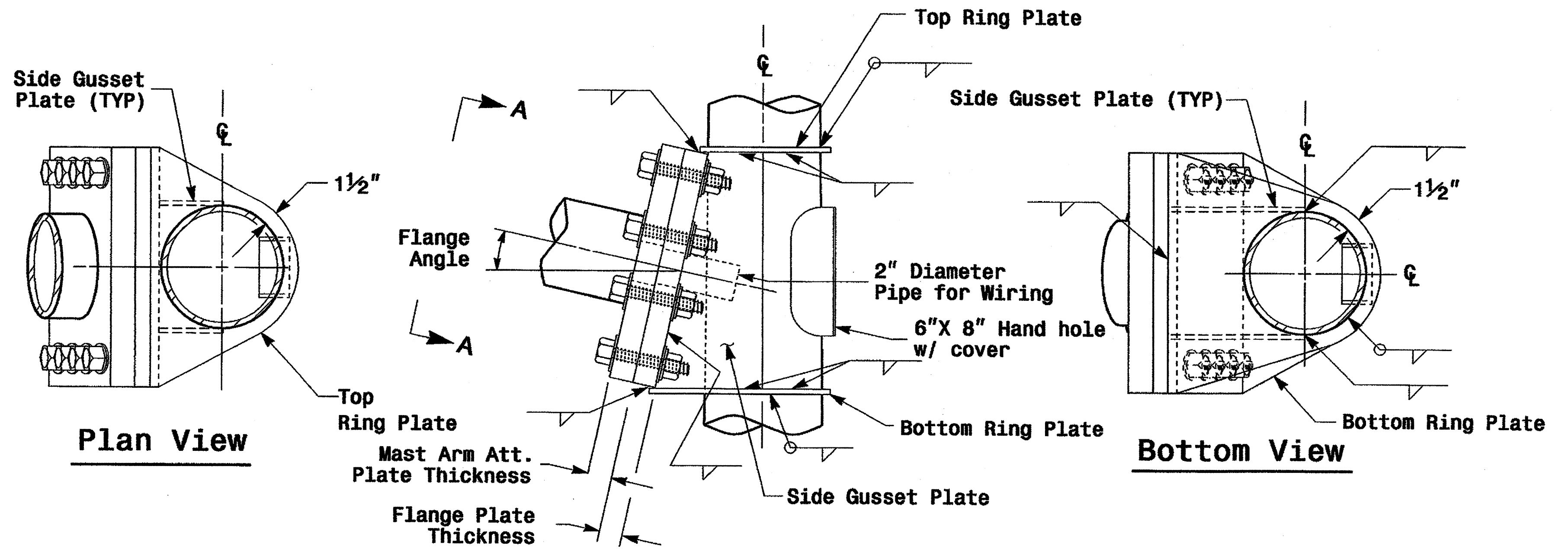
Front Elevation View

(4) - Size "E" Hex Head Bolts with (1) Hex Nuts & Washers

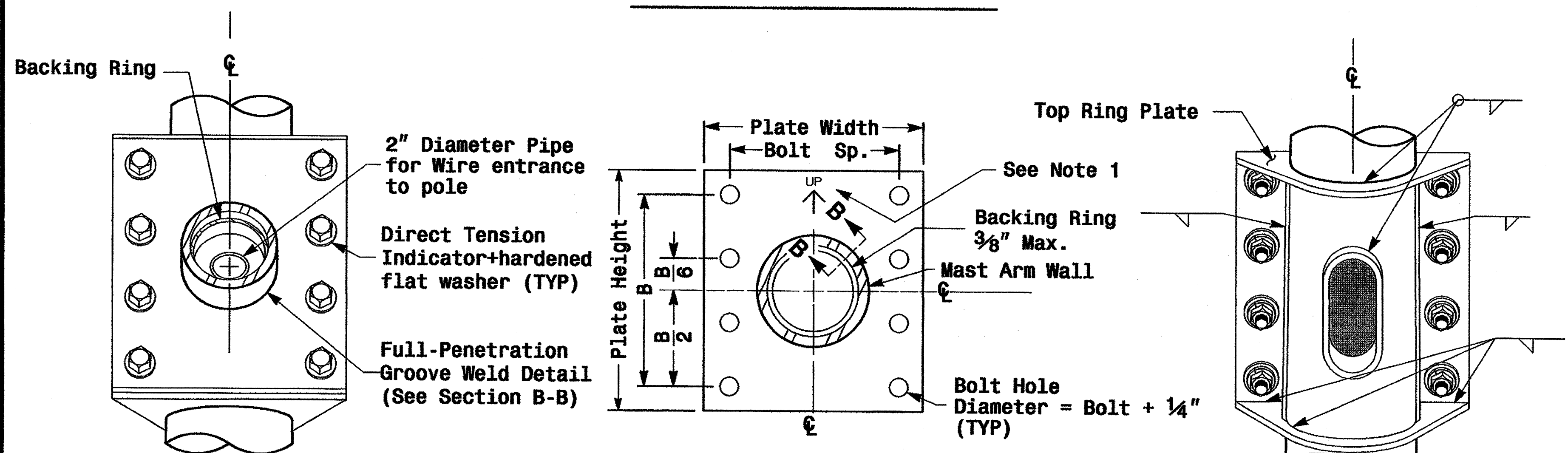


Plan View

Welded Ring Stiffened Mast Arm Connection



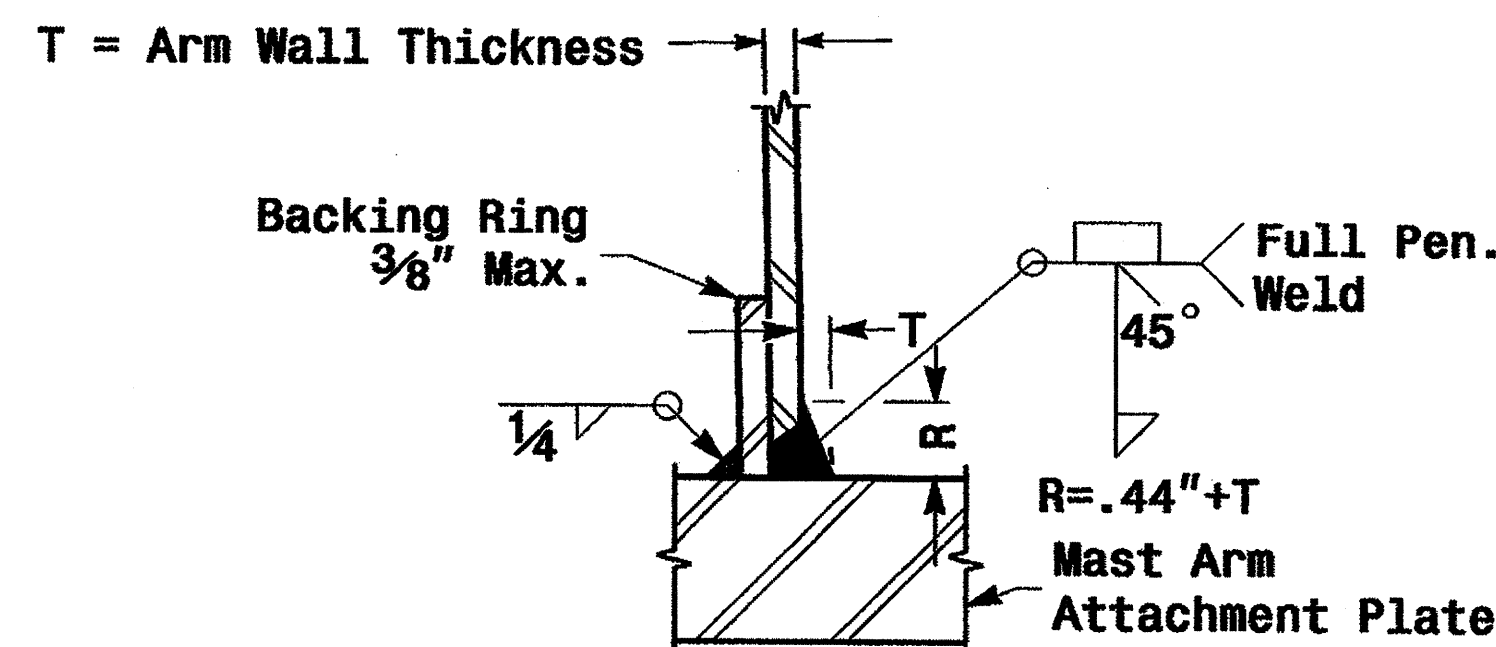
Side Elevation View



Front Elevation View

Section View A-A Mast Arm Attachment Plate

Back Elevation View



Section B-B Full-Penetration Groove Weld Detail

Notes:

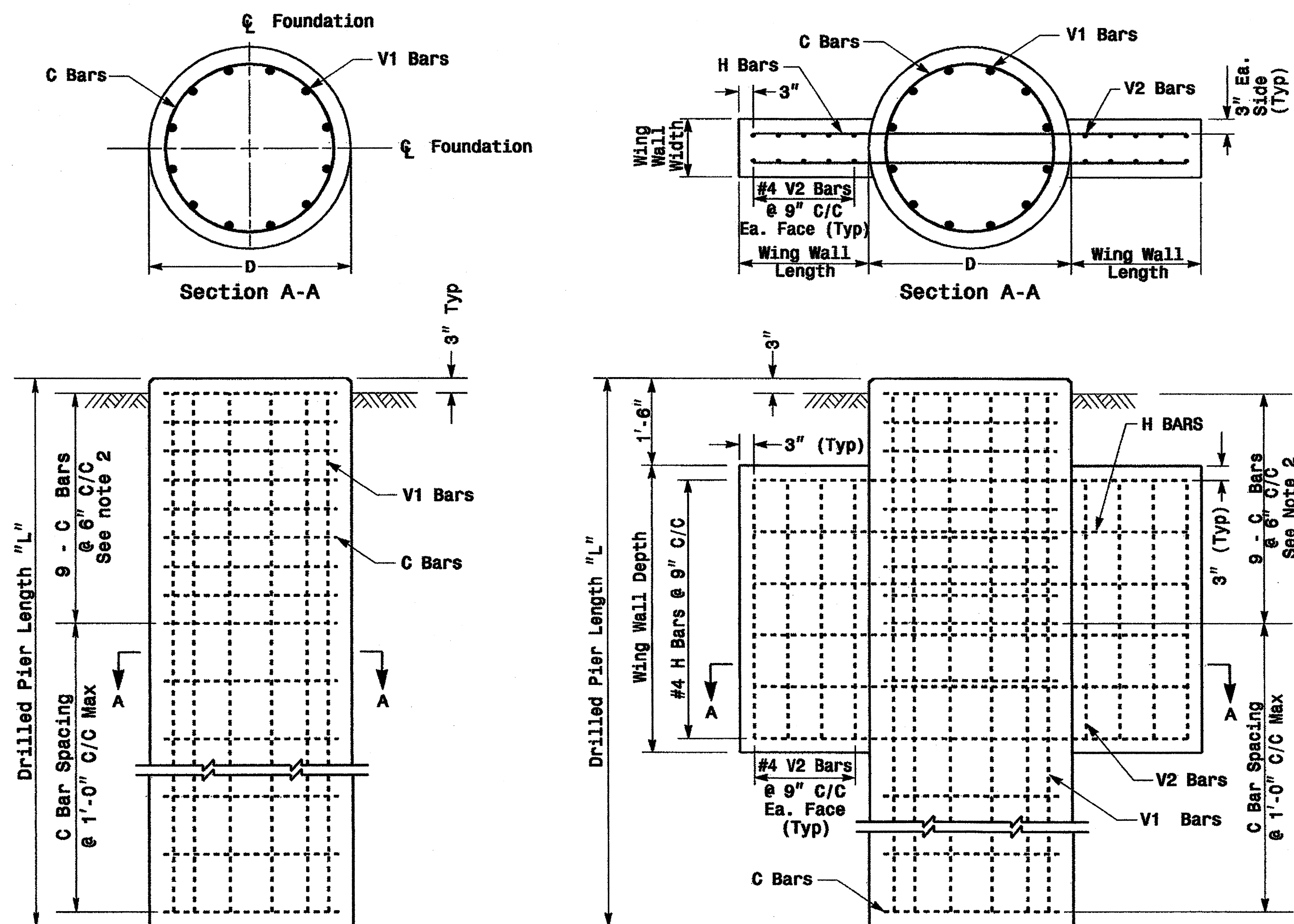
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing appropriate drainage points.

01-SEP-2005 14:11
 W:\p001\lee-un11\work\groups\004 metal pole standard\004_m5.dgn
 P:\alexander

	Fabrication Details For Mast Arm Connection To Pole		
	PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews	
SCALE: 0 NA NONE	REVISIONS:	INVT. DATE:	SIGNATURE: A. Sarkar DATE: 9.2.2005

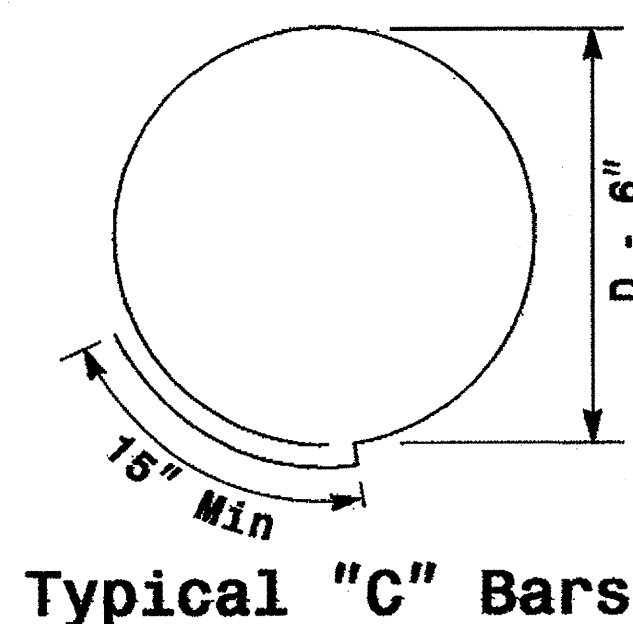
Fabrication Details - Mast Arm Poles

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"

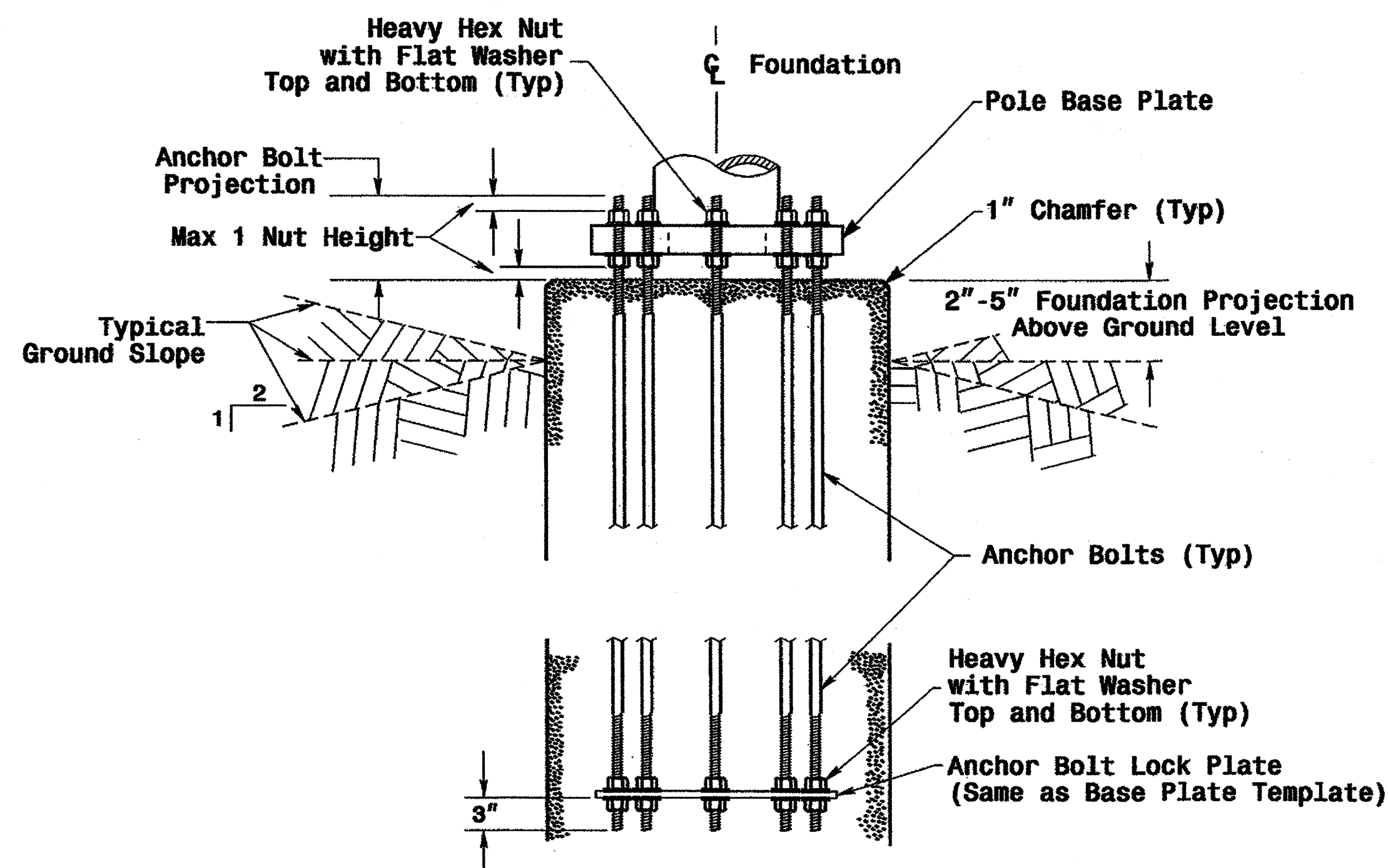
* See Note No. 1
** See Note No. 3

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

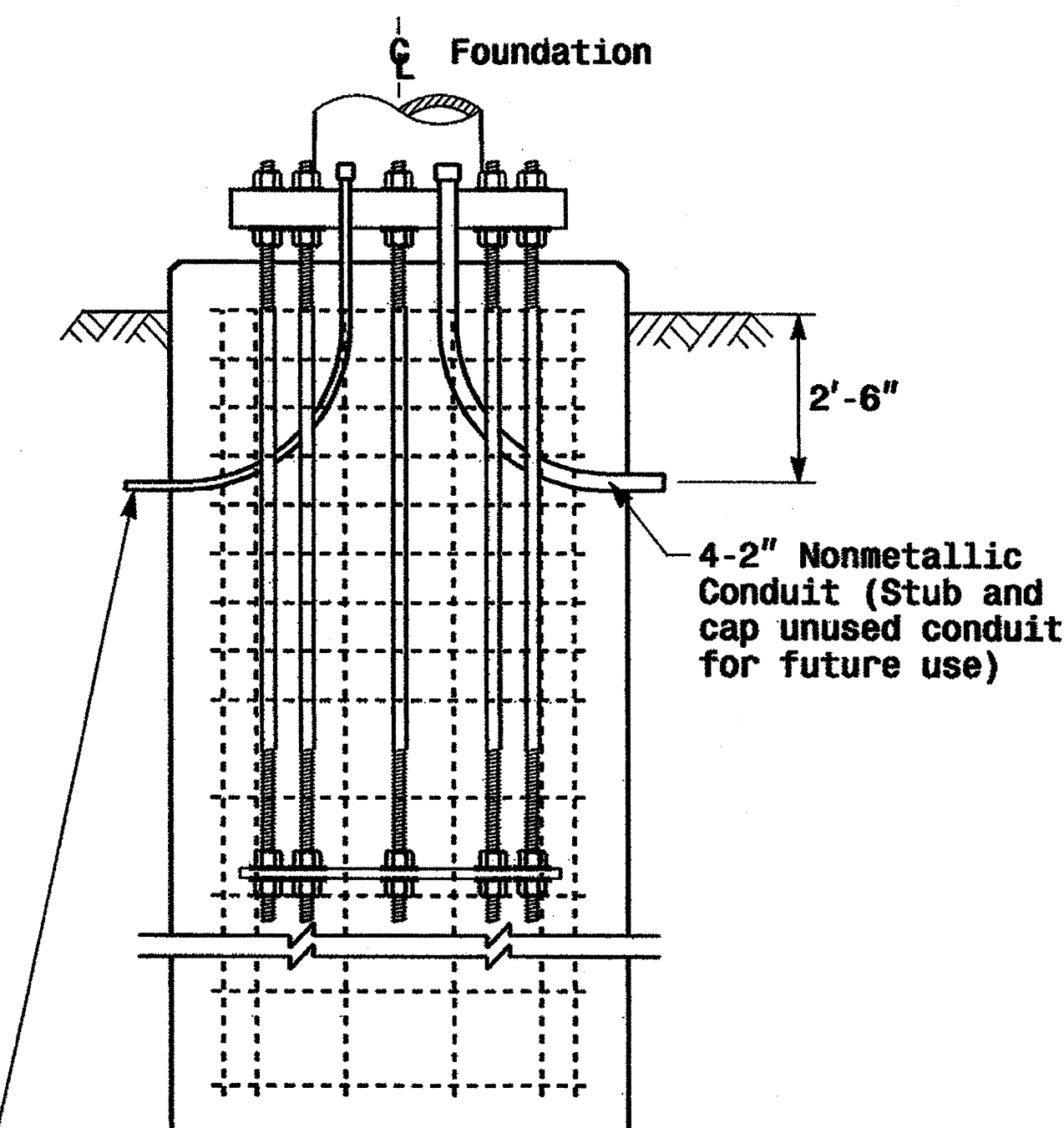
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



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

Notes

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

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


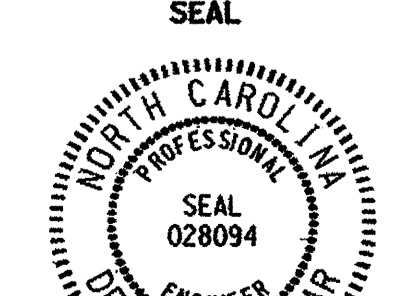
1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

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

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

SPECIAL NOTE
 The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

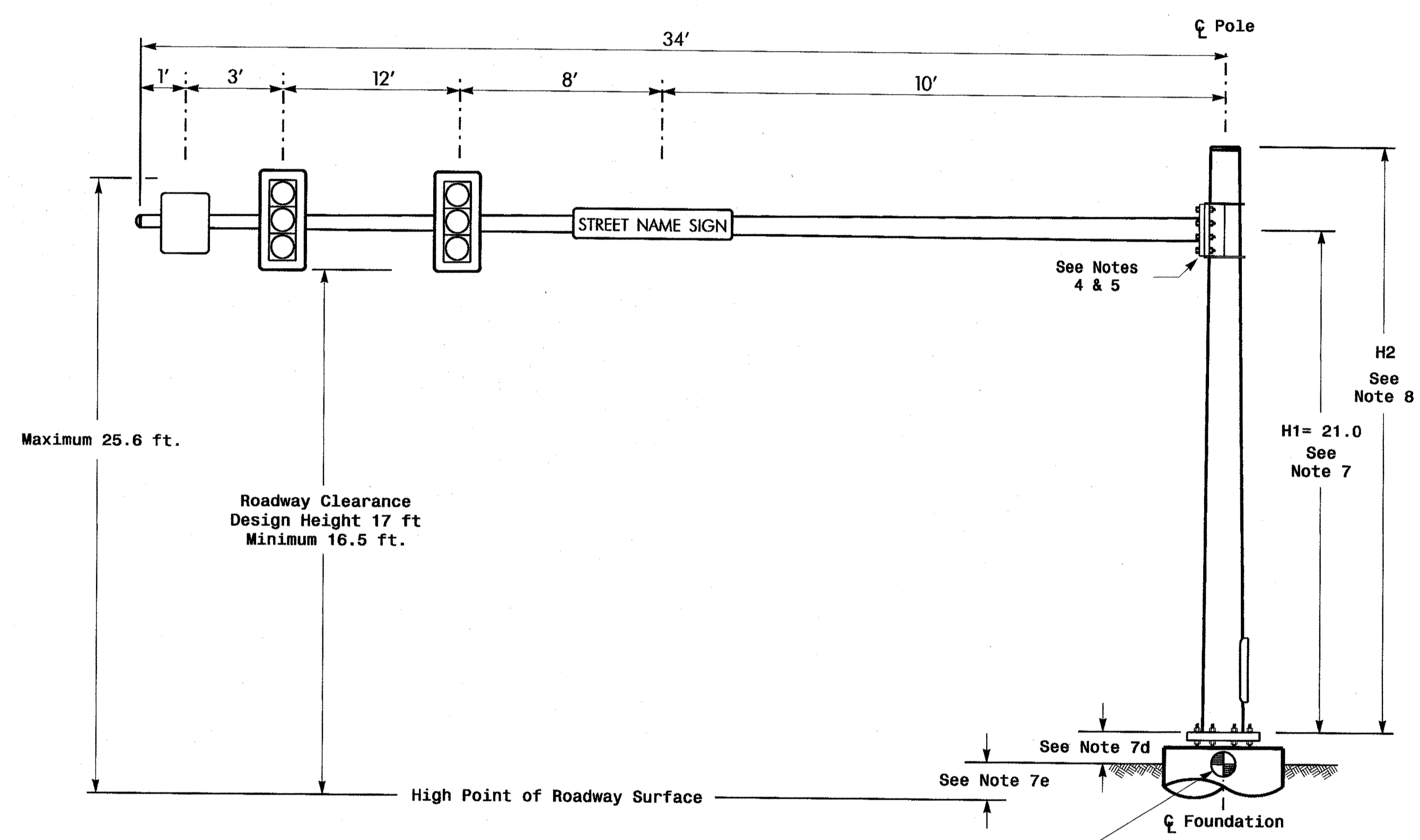
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	-
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	-
Elevation difference at High point of roadway surface	-6.4 ft.	-
Elevation difference at Edge of travelway or face of curb	N/A	-

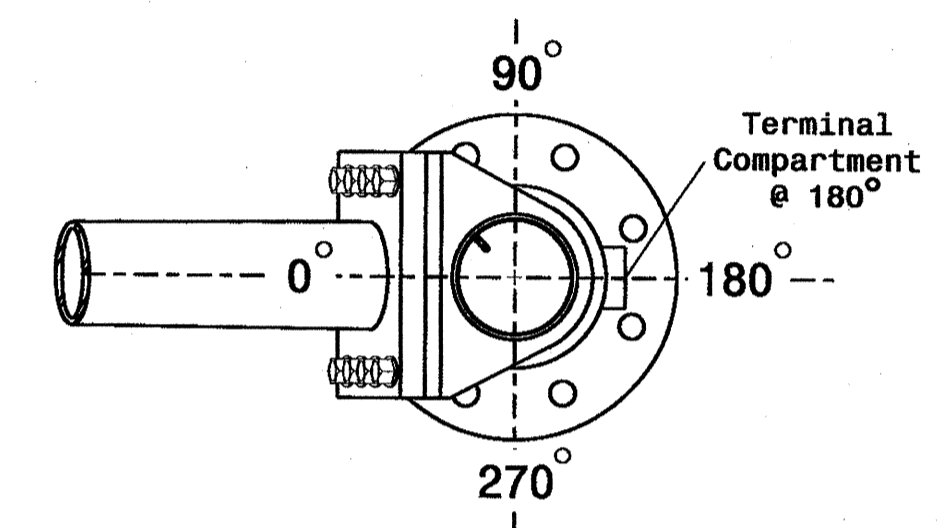
MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	7.5 S.F.	30.0" W X 36.0" L	14 LBS

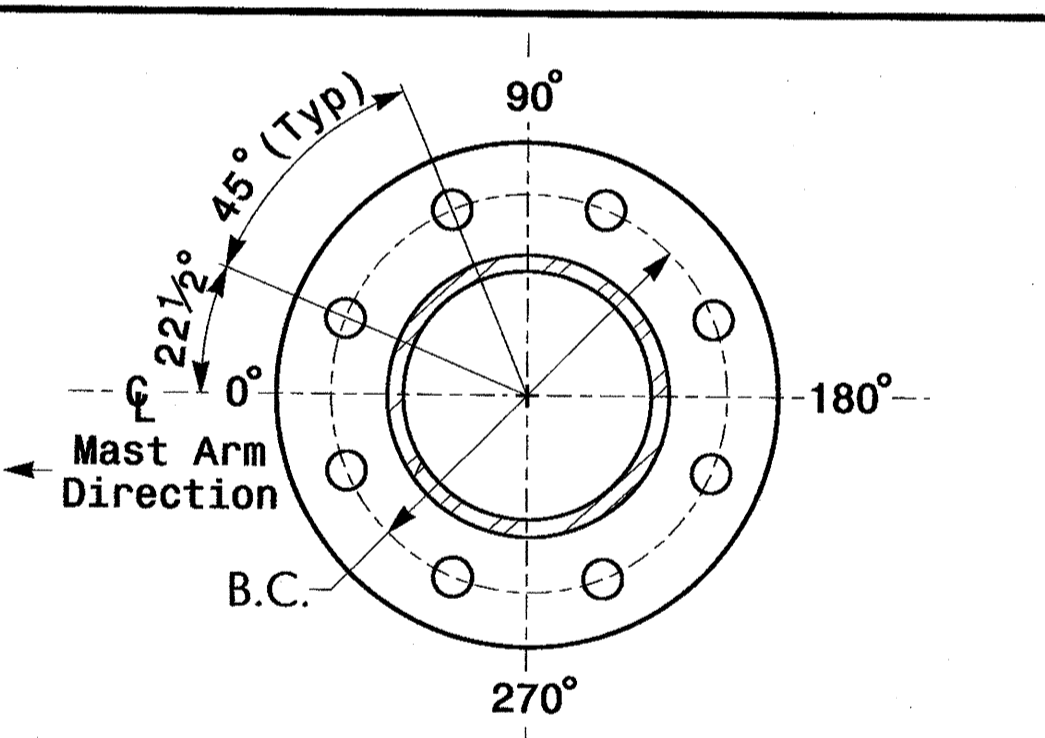
Design Loading for METAL POLE NO. 1



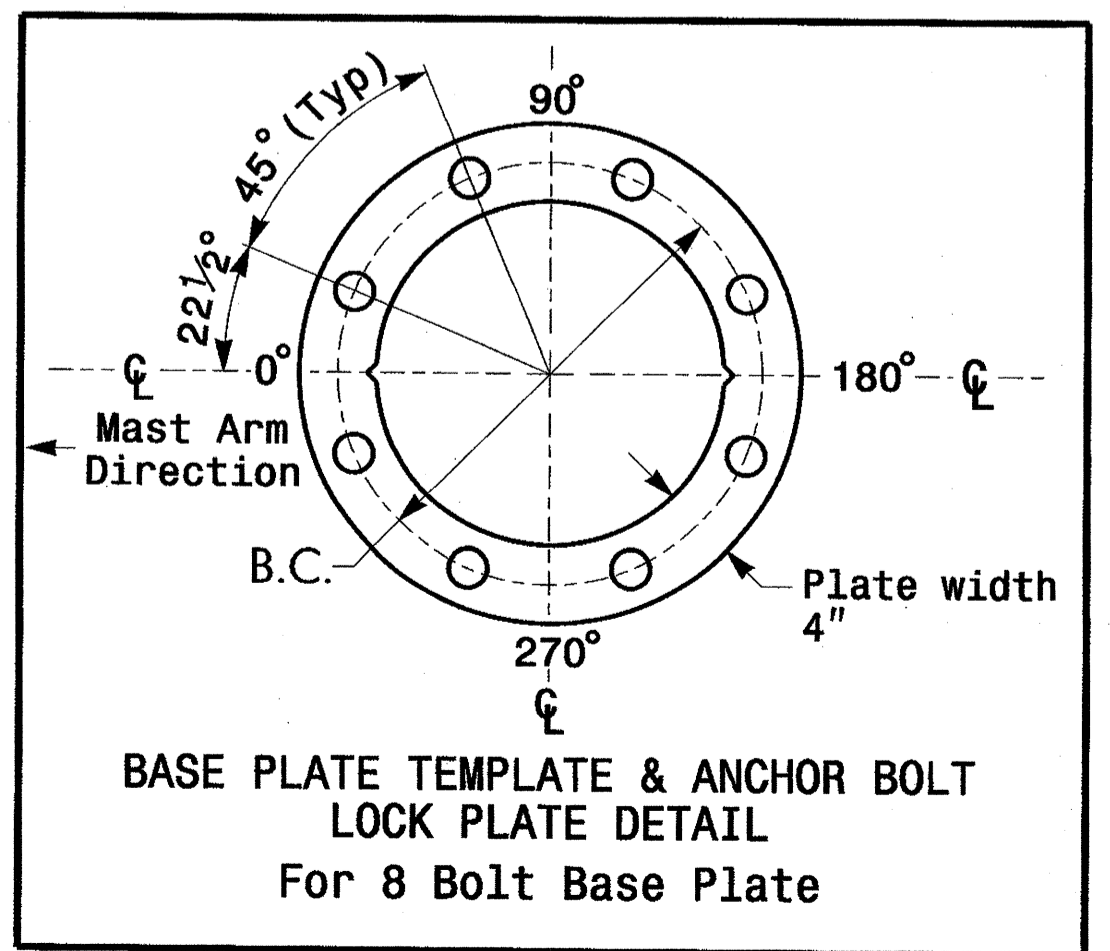
Elevation View



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2006 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

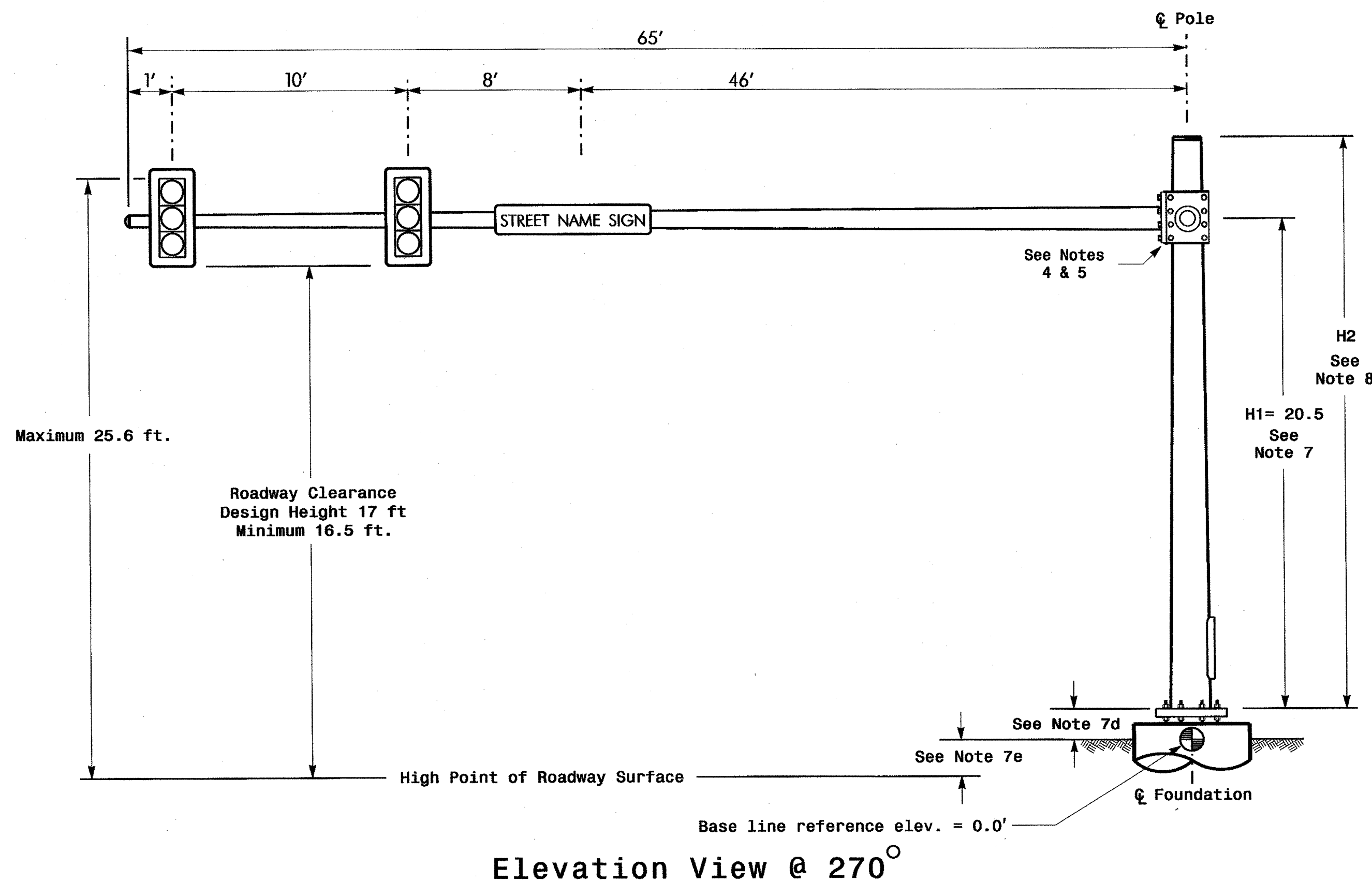
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is .75 feet above the ground elevation.
 - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

	Prepared in the Offices of: 	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 026486 ROBERT J. ZIEMBA
	US 401 SB (Louisburg Road) at US 401 Business (S. Main St.) Division 5 Wake County Rolesville PLAN DATE: October 2010 REVIEWED BY: PREPARED BY: C.E. Carter REVIEWED BY:	SCALE 0 N/A N/A

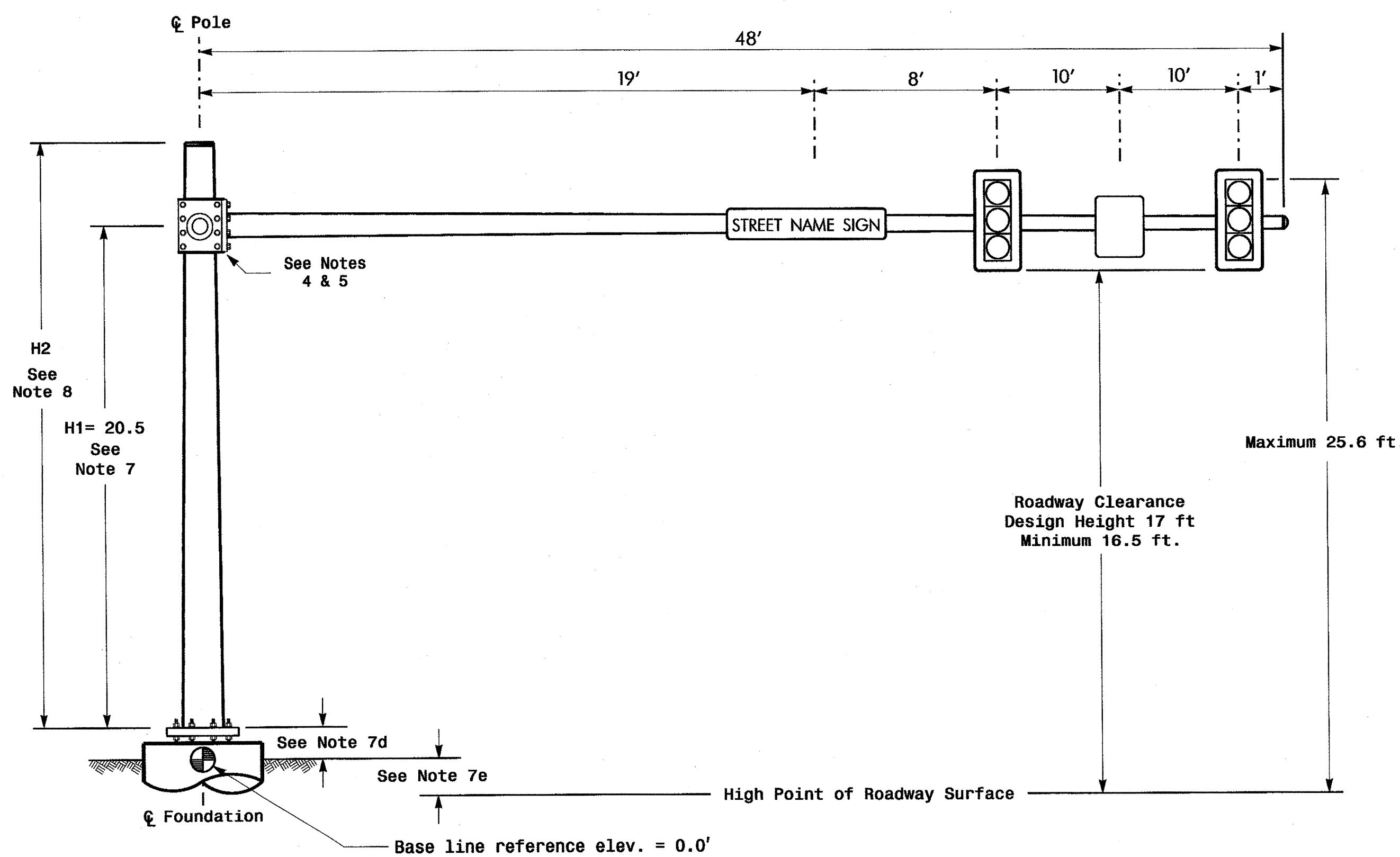
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Design Loading for METAL POLE NO. 3, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 3, MAST ARM B



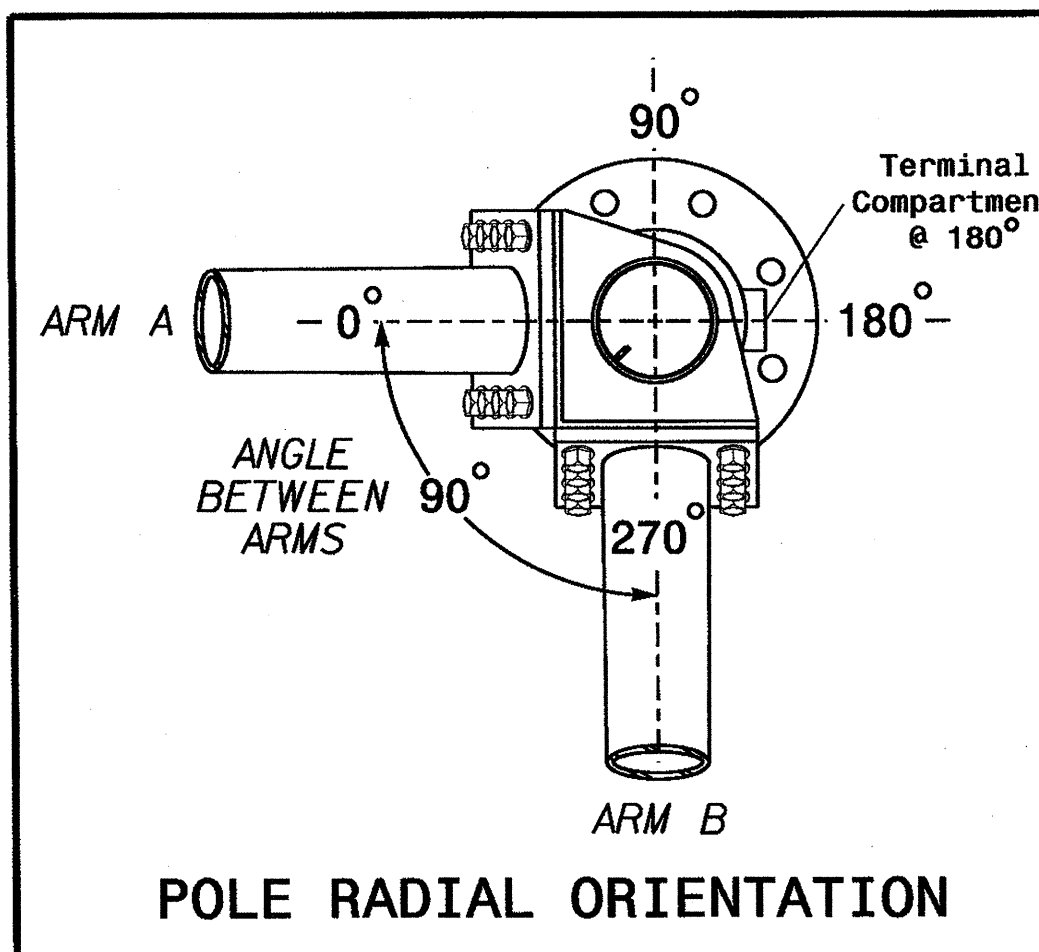
Elevation View @ 0°

SPECIAL NOTE

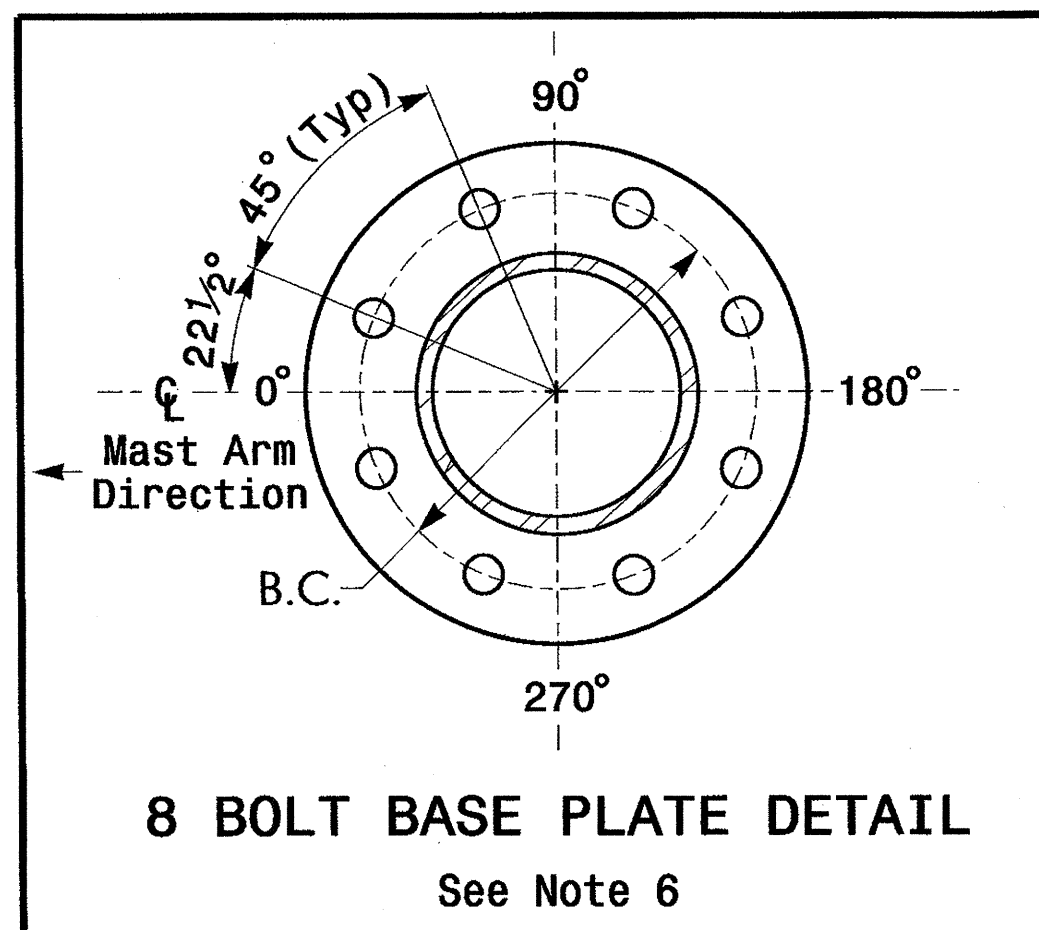
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

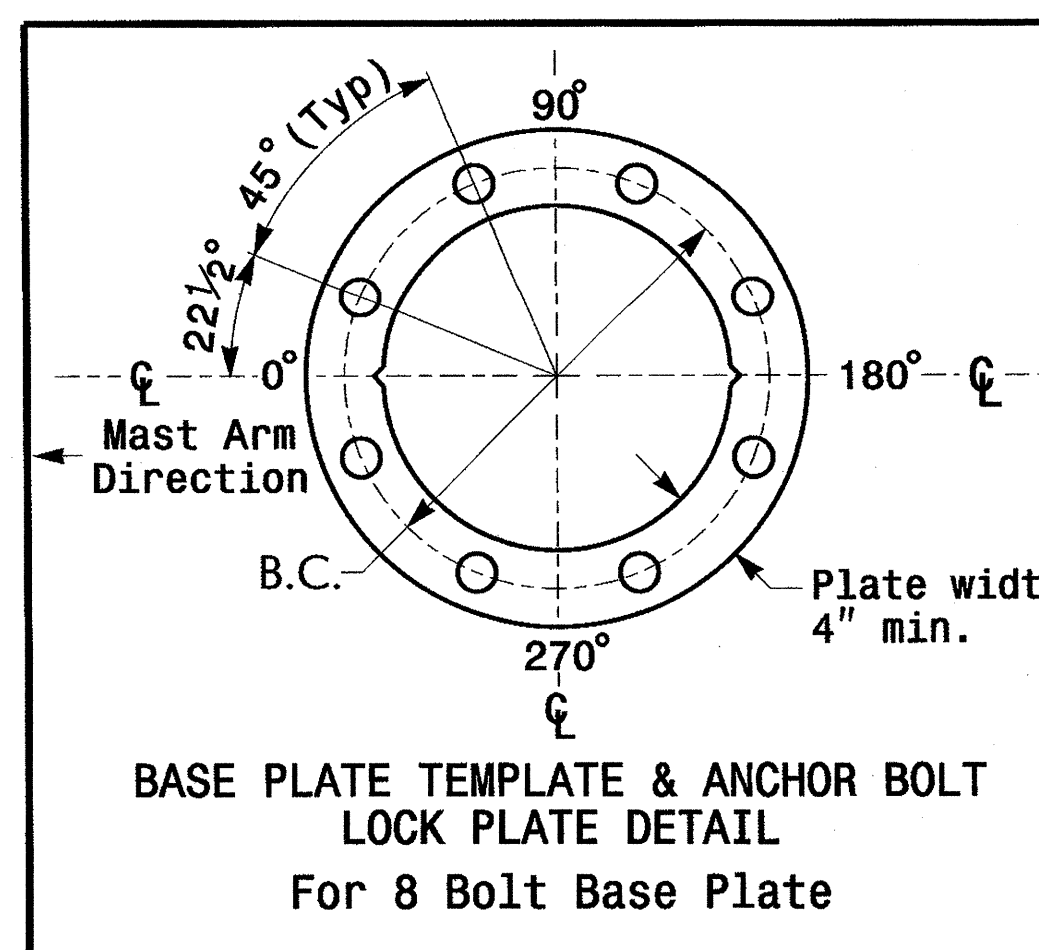
Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	N/A	+1.1 ft.
Elevation difference at Edge of travelway or face of curb	N/A	N/A



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2006 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

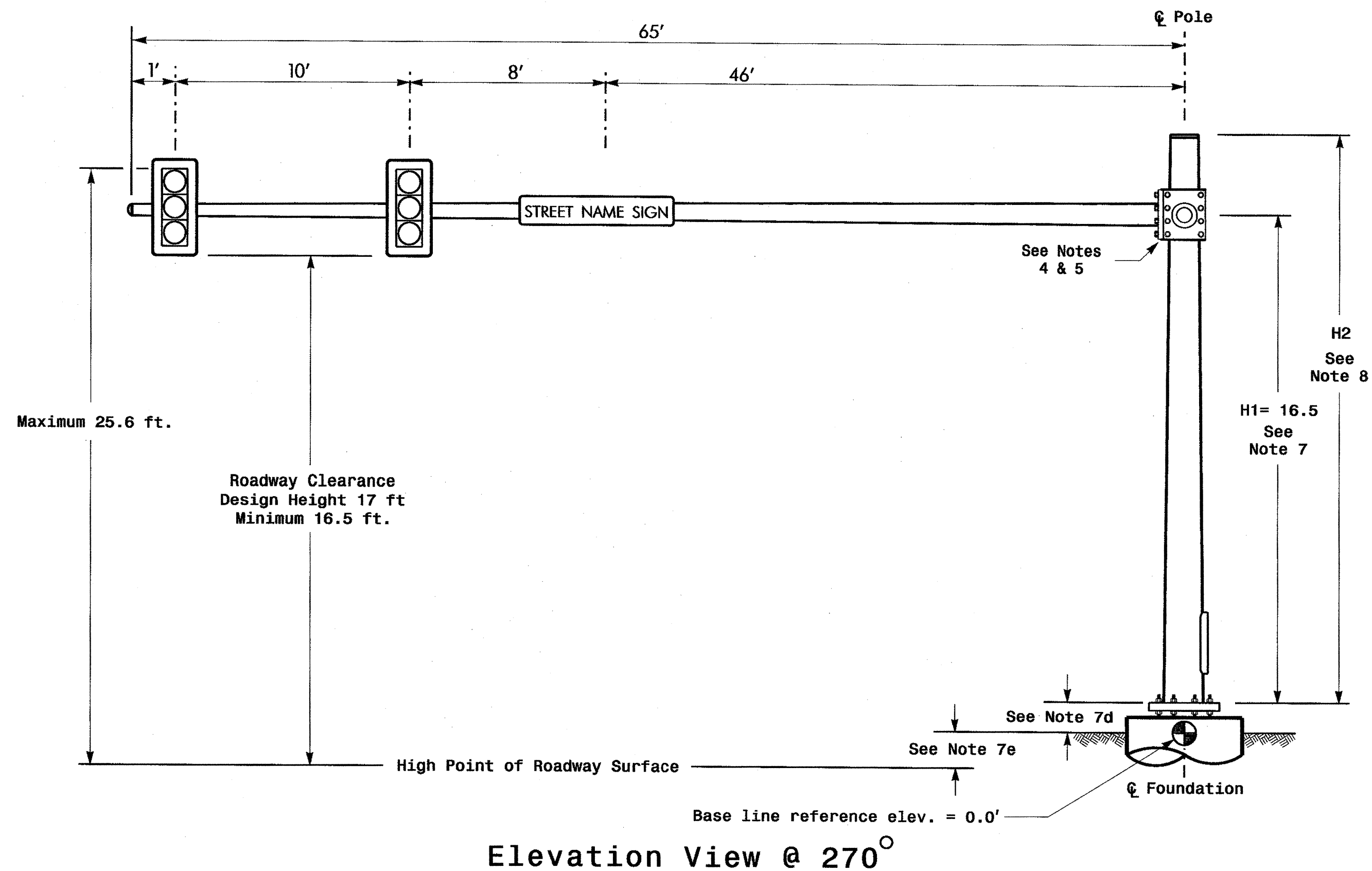
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is .75 feet above the ground elevation.
 - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm lengths shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

	US 401 SB (Louisburg Road) at U-Turn North of SR 1003 (Rolesville Road)		
	Division 5 Wake County Rolesville PLAN DATE: September 2010 REVIEWED BY: PREPARED BY: C.E. Carter REVIEWED BY:		
SCALE N/A 0 N/A	REVISIONS INIT. DATE		SIGNATURE DATE 11/10 SIG. INVENTORY NO. 05-2391

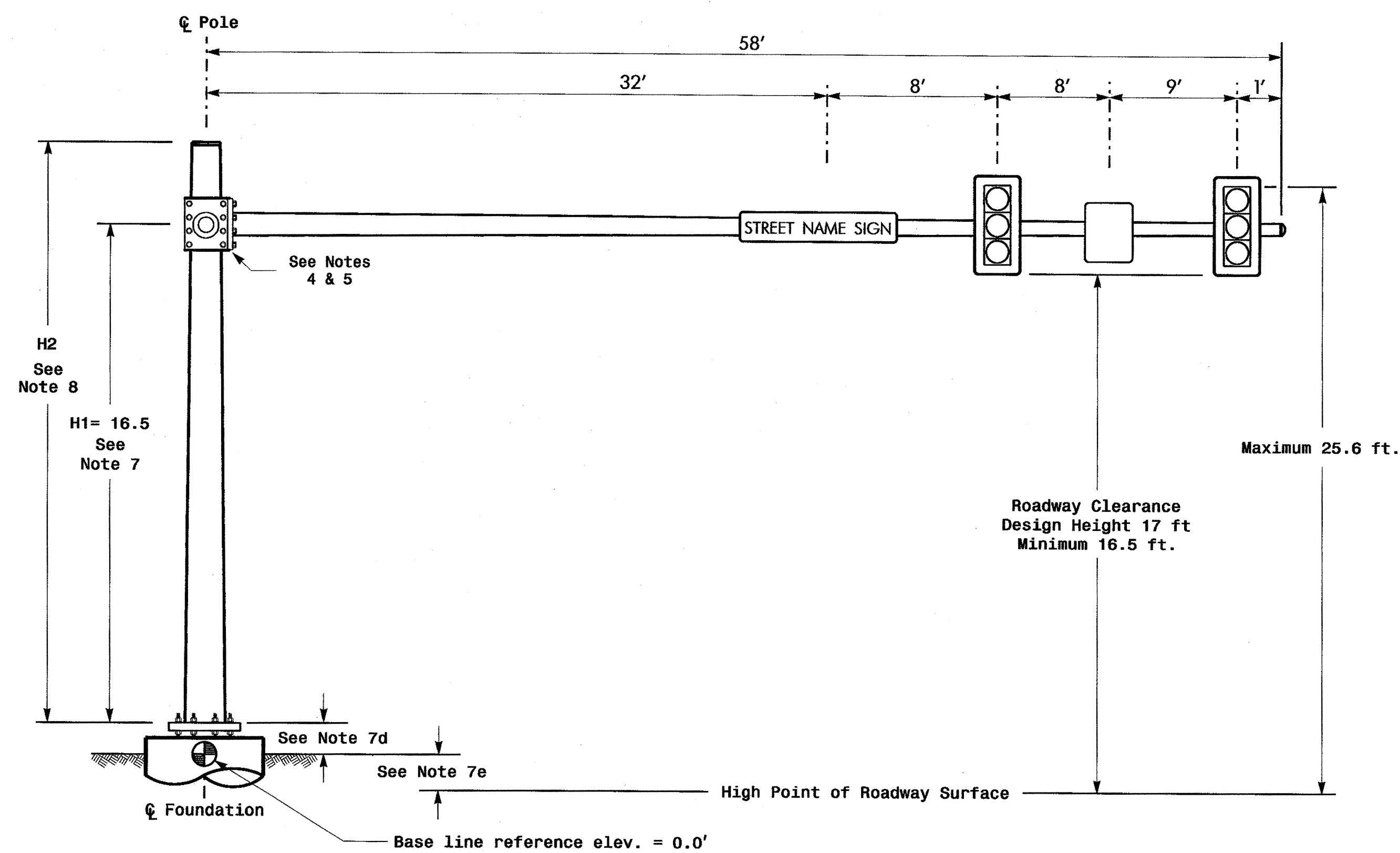
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Design Loading for METAL POLE NO. 4, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 4, MAST ARM B



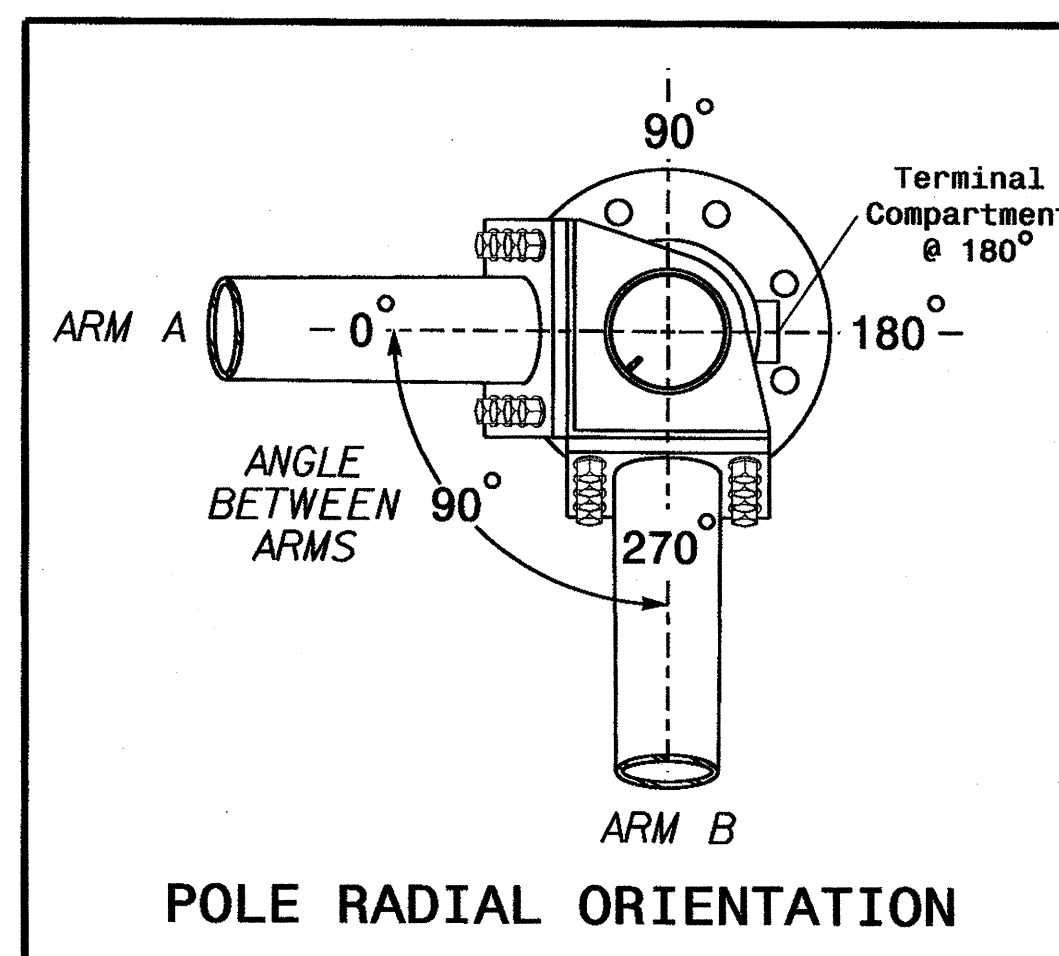
Elevation View @ 0°

SPECIAL NOTE

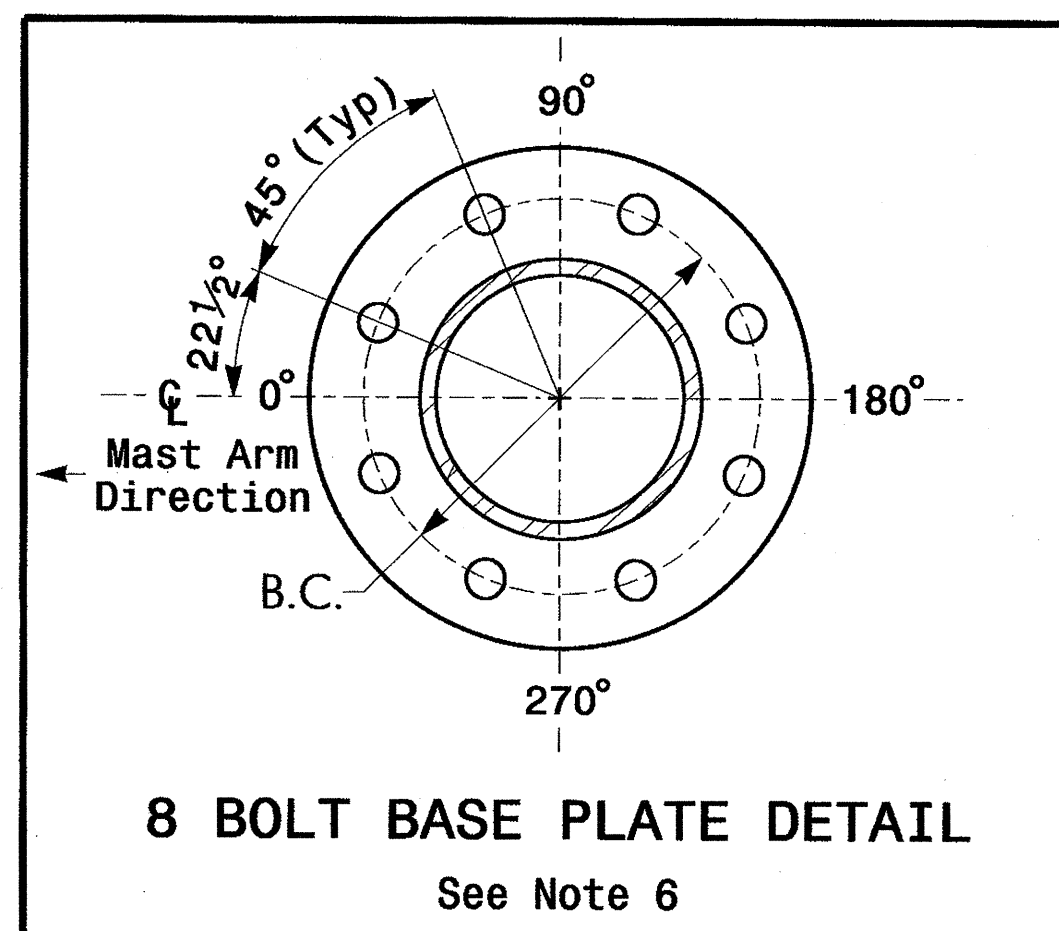
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

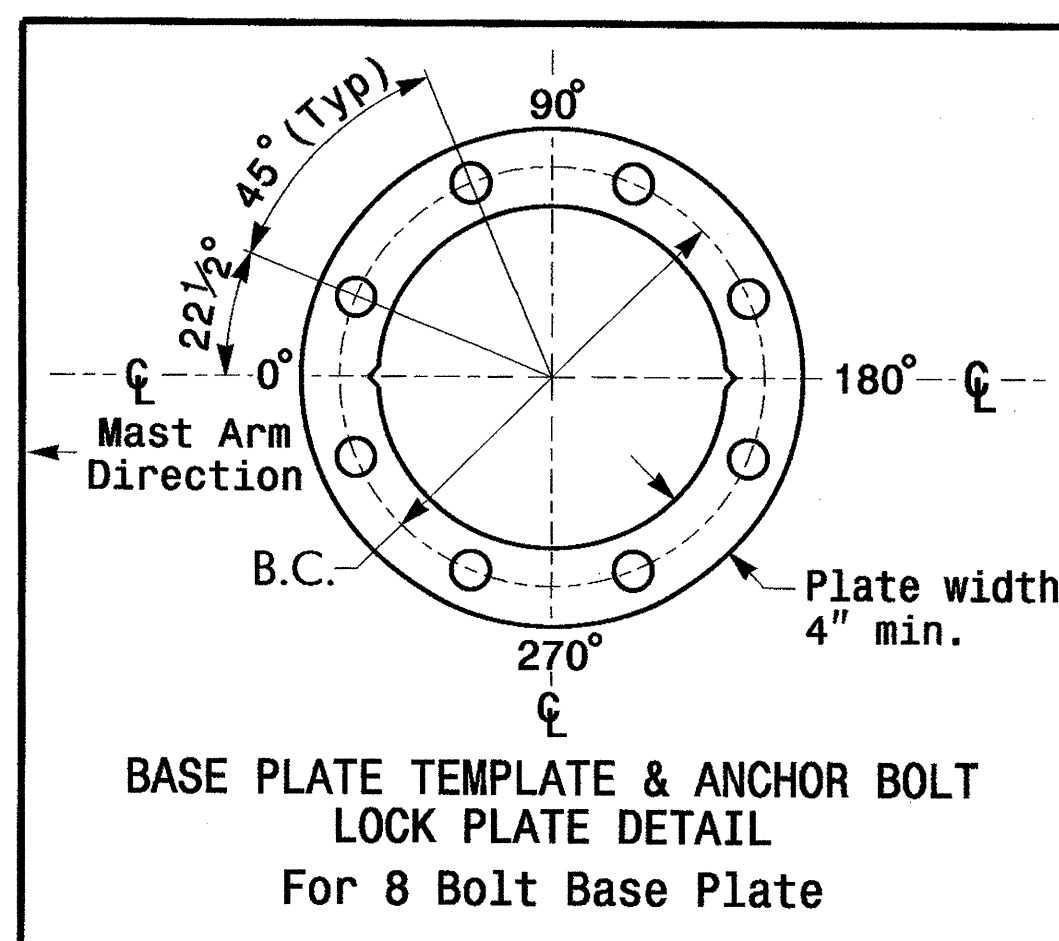
Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	N/A	-2.7 ft.
Elevation difference at Edge of travelway or face of curb	N/A	N/A



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 4

PROJECT REFERENCE NO. R-2814B SHEET NO. Sig. 33

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2006 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is .75 feet above the ground elevation.
 - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm lengths shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

	US 401 NB (Louisburg Road) at U-Turn South of US 401 Business	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIEMER LICENSE NO. 026486
	Division 5 Wake County Rolesville PLAN DATE: September 2010 REVIEWED BY: PREPARED BY: C.E. Carter REVIEWED BY:	
SCALE 0 N/A N/A	REVISIONS INIT. DATE	SIGNATURE DATE SIG. INVENTORY NO. 05-2392

01-Nov-2010 11:47
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SPECIAL NOTE
 The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

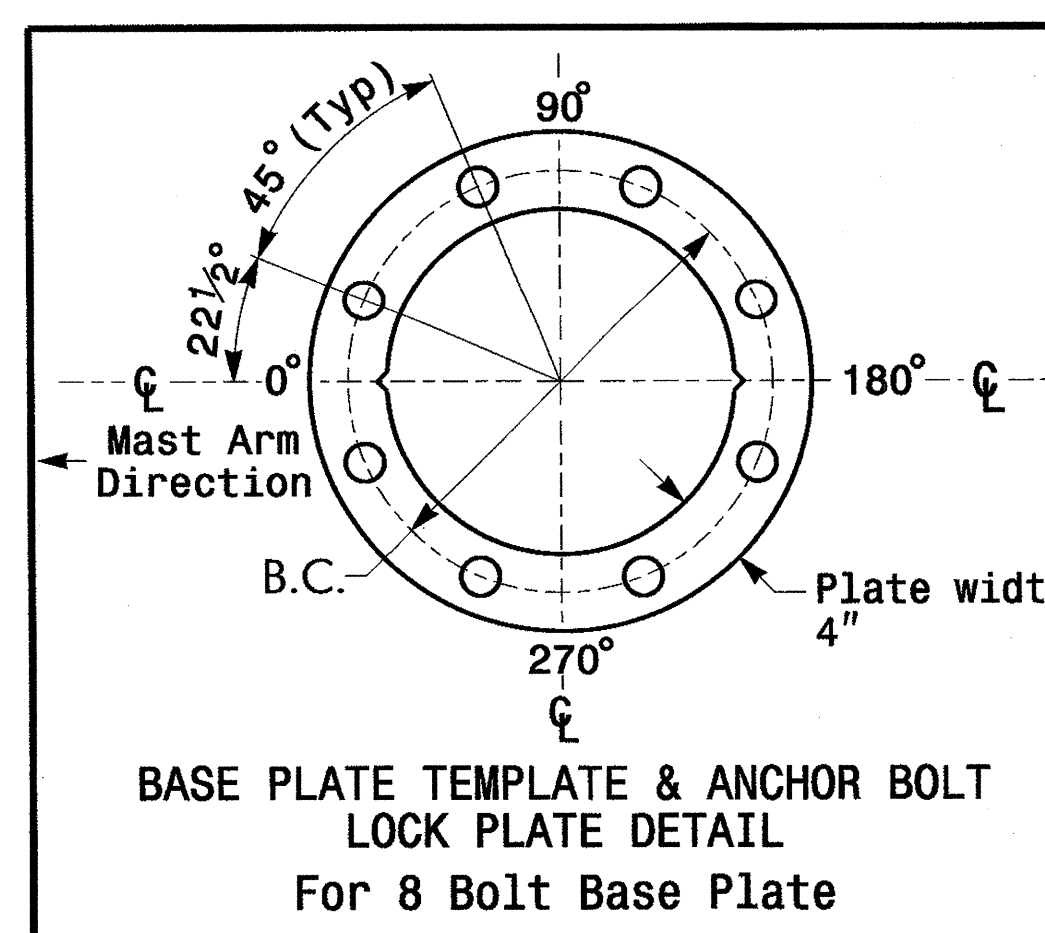
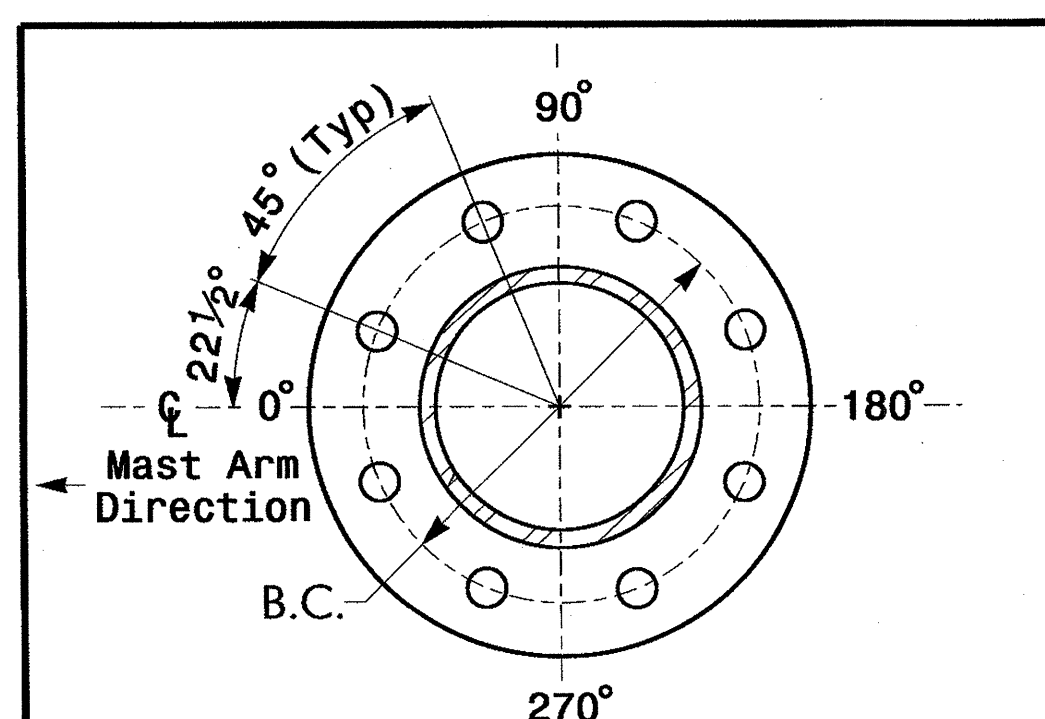
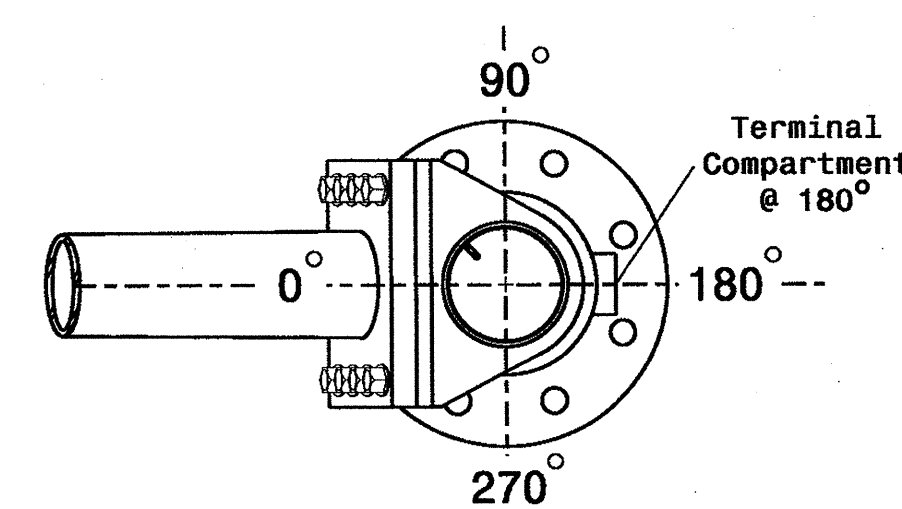
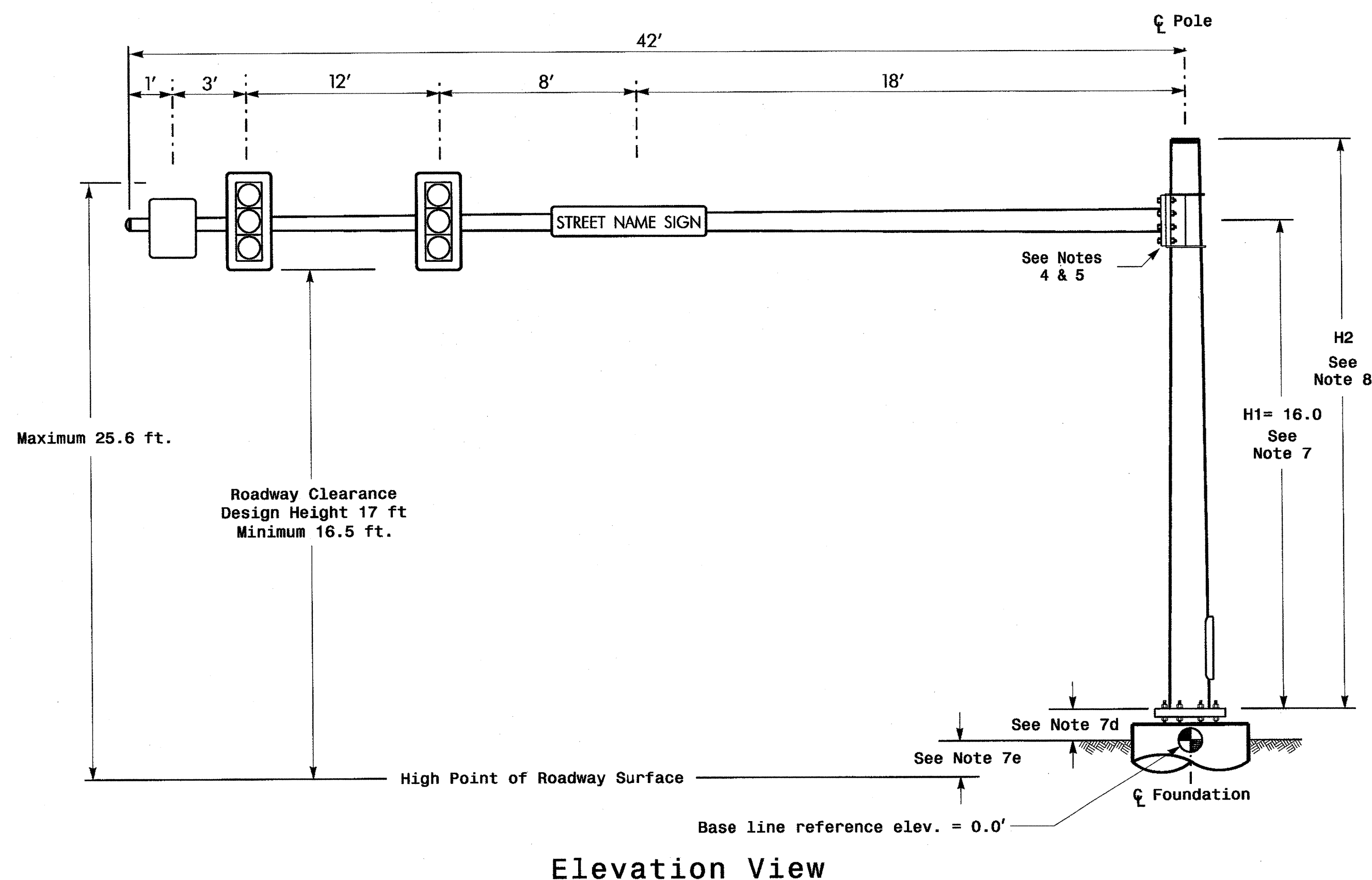
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 5	-
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	-
Elevation difference at High point of roadway surface	-3.3 ft.	-
Elevation difference at Edge of travelway or face of curb	N/A	-

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	7.5 S.F.	30.0" W X 36.0" L	14 LBS

Design Loading for METAL POLE NO. 5



NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2006 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
- Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
- The roadway clearance height for design is as shown in the elevation views.
- The top of the pole base plate is .75 feet above the ground elevation.
- Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

	US 401 SB (Louisburg Road) at US 401 Business (N. Main St.) Division 5 Wake County Rolesville PLAN DATE: September 2010 PREPARED BY: C.E. Carter SCALE: N/A	SEAL ROBERT J. ZIEMER ENGINEER 026486 DATE: 11/10 SIG. INVENTORY NO. 05-2393
	REVIEWED BY: REVISIONS INIT. DATE	

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11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

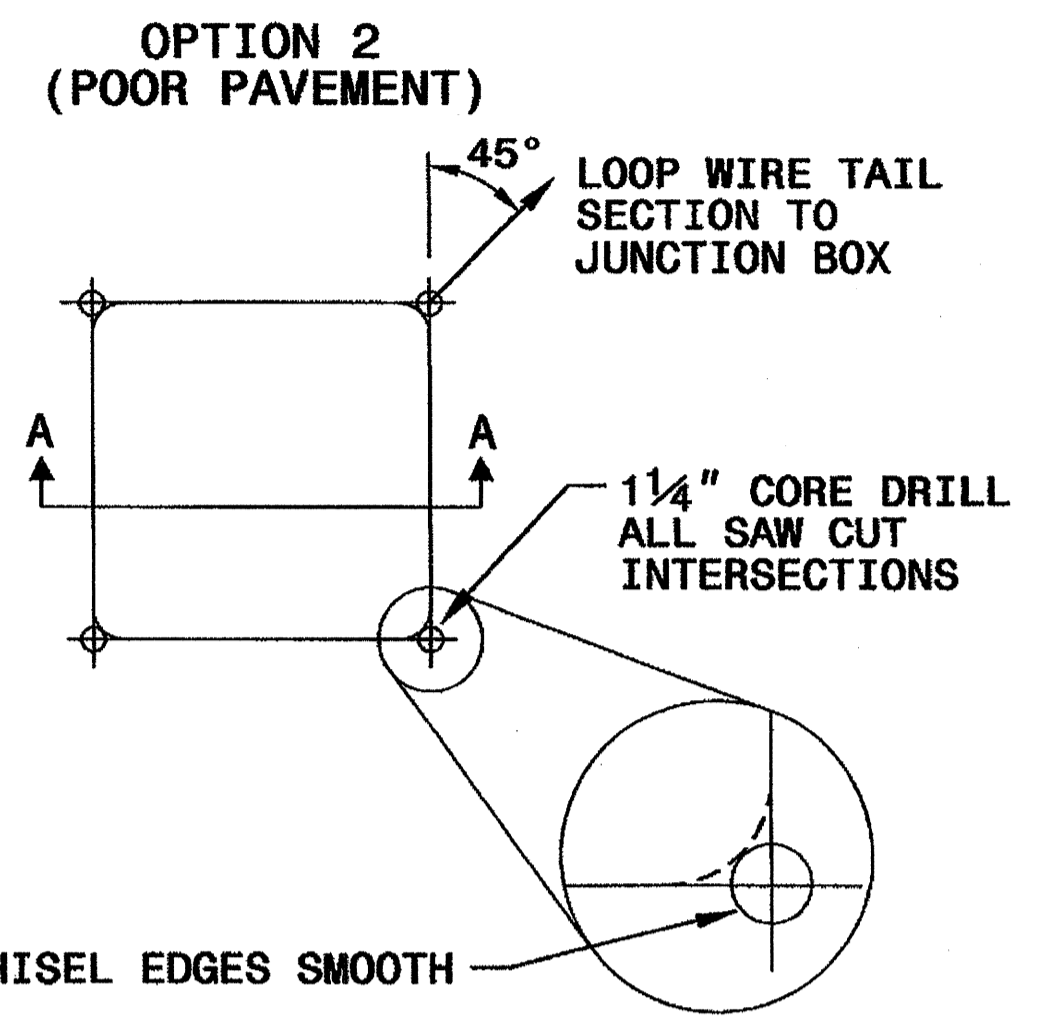
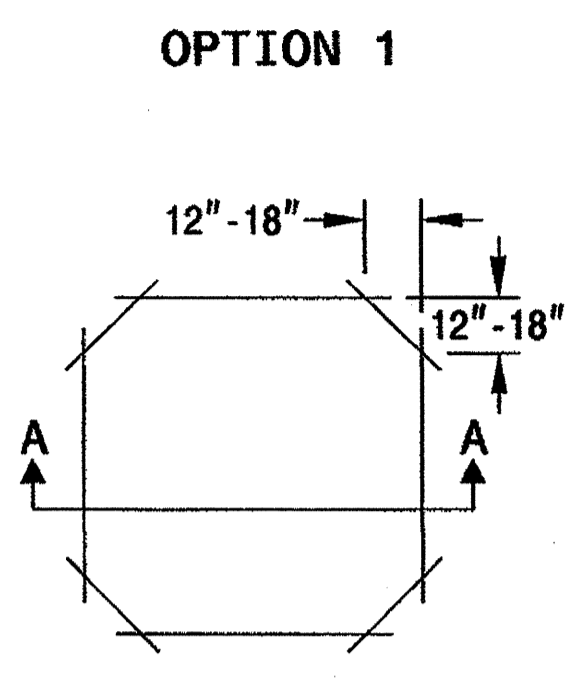
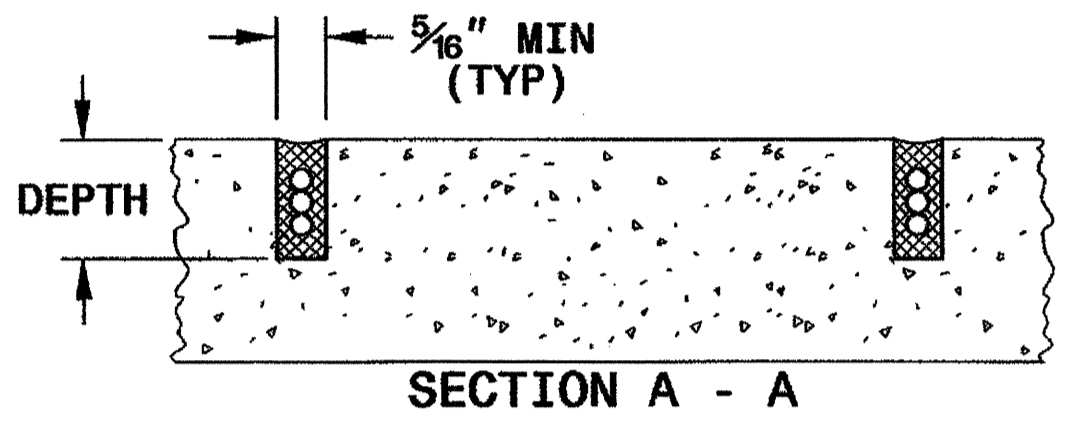
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

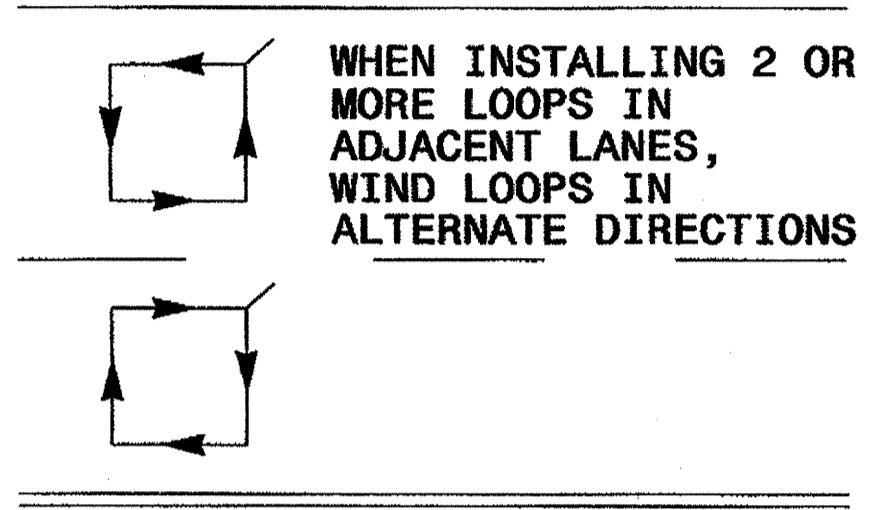
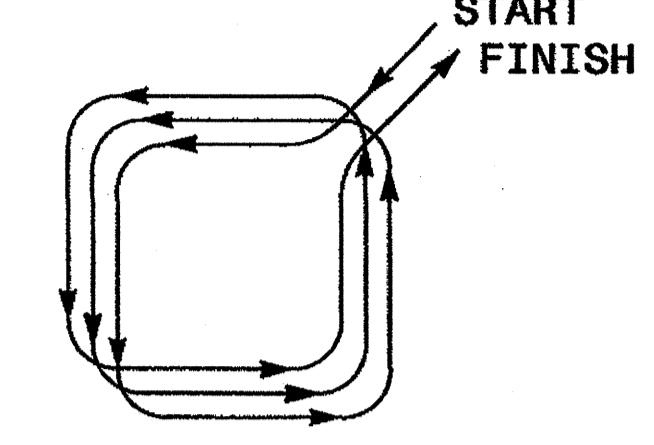
SAW CUT OPTIONS

SAW SLOT DEPTH CHART

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



LOOP WINDING METHOD



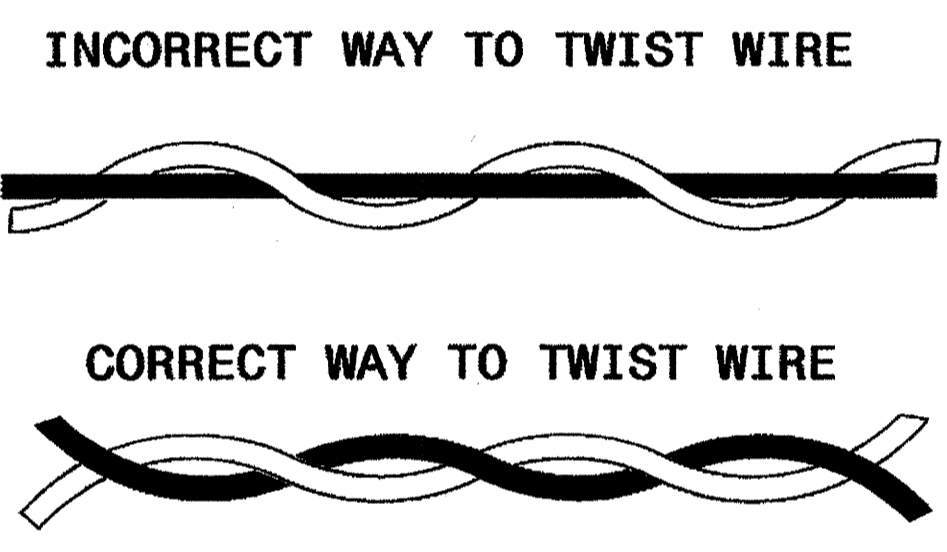
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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

LOOP WIRE TWISTING METHOD

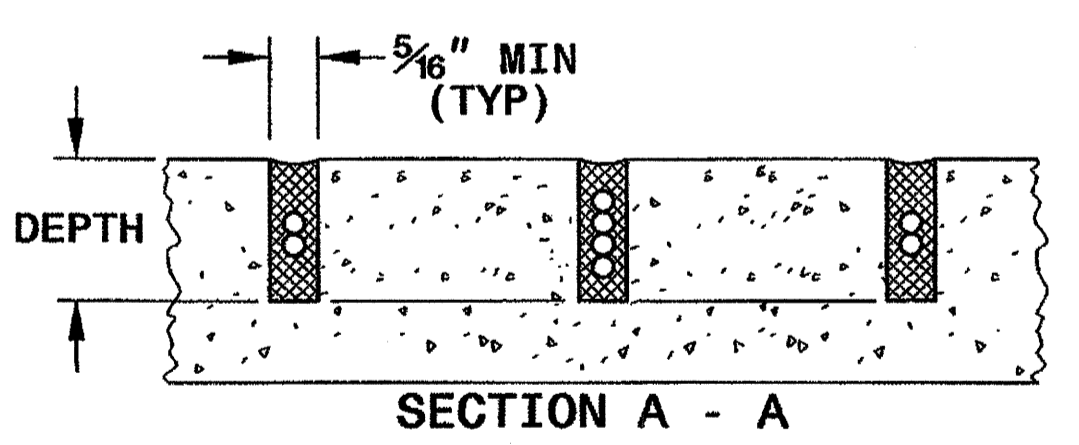
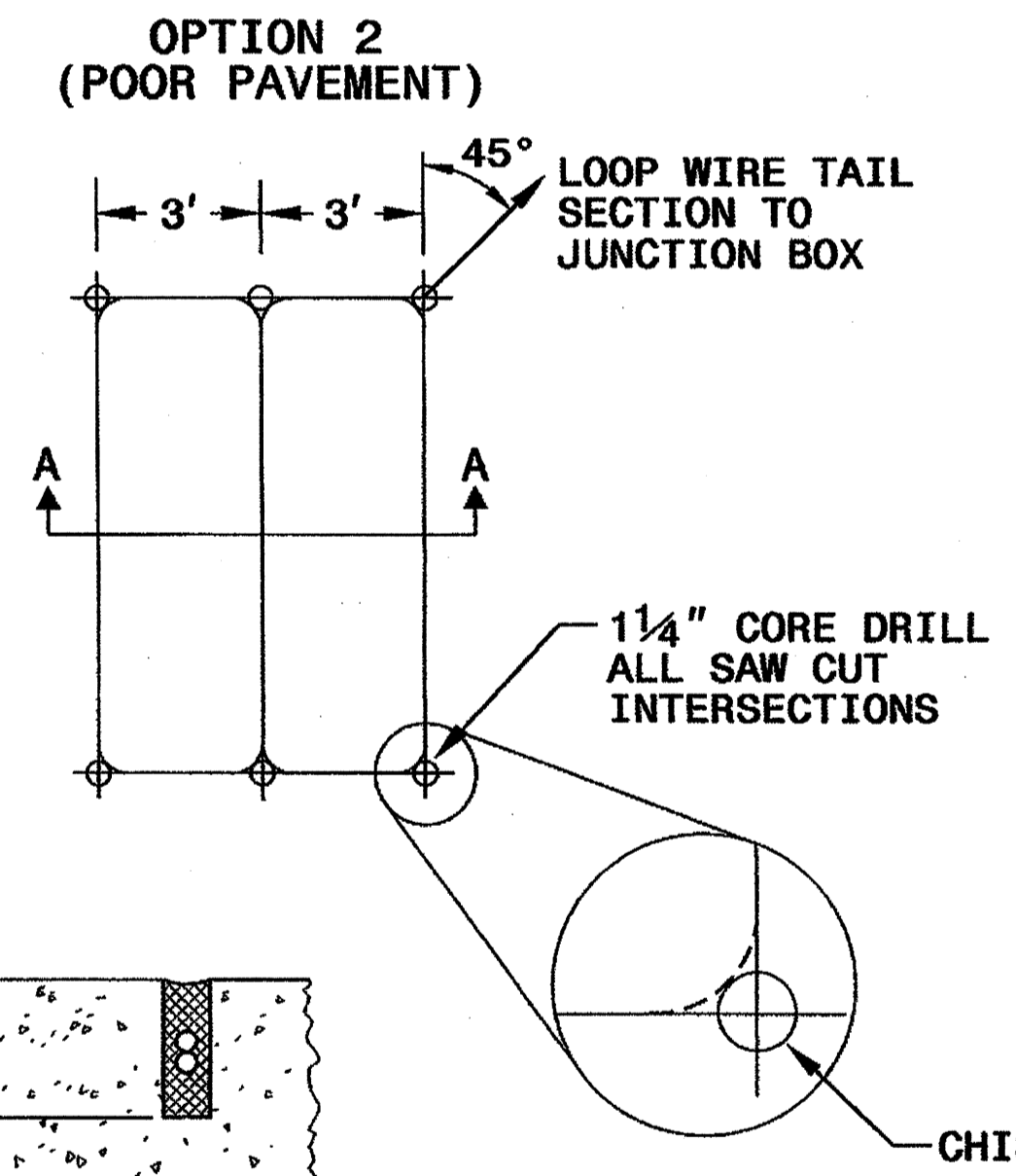
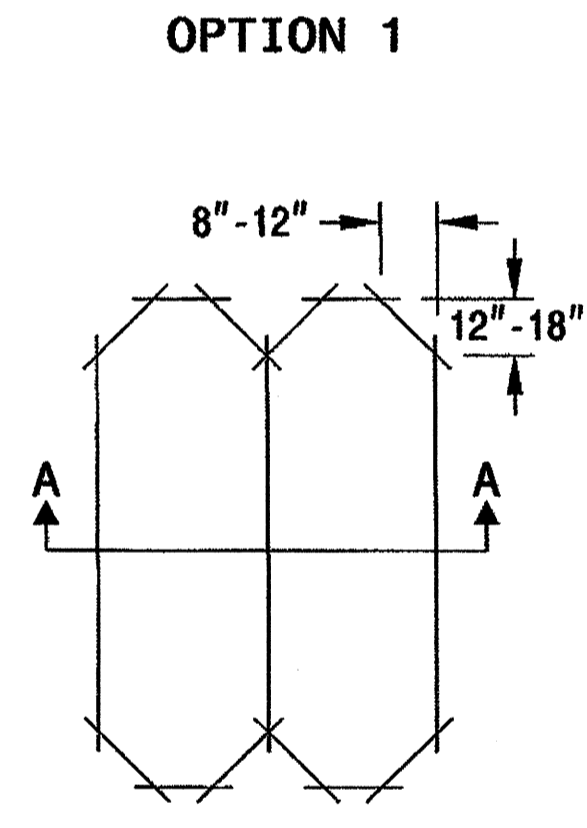


NOTES

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

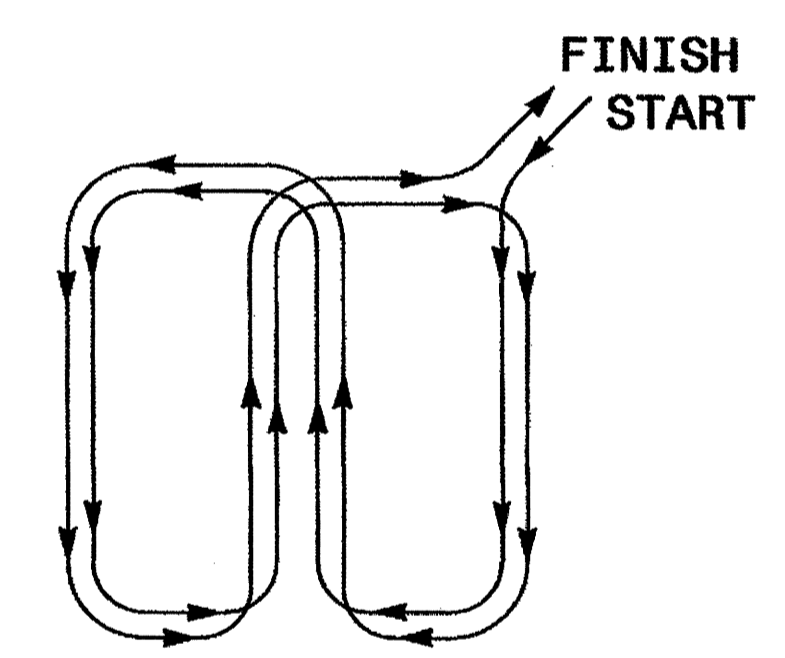
QUADRUPOLE LOOP

SAW CUT OPTIONS



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

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Milton L. Dean 11/24/08
SIGNATURE DATE

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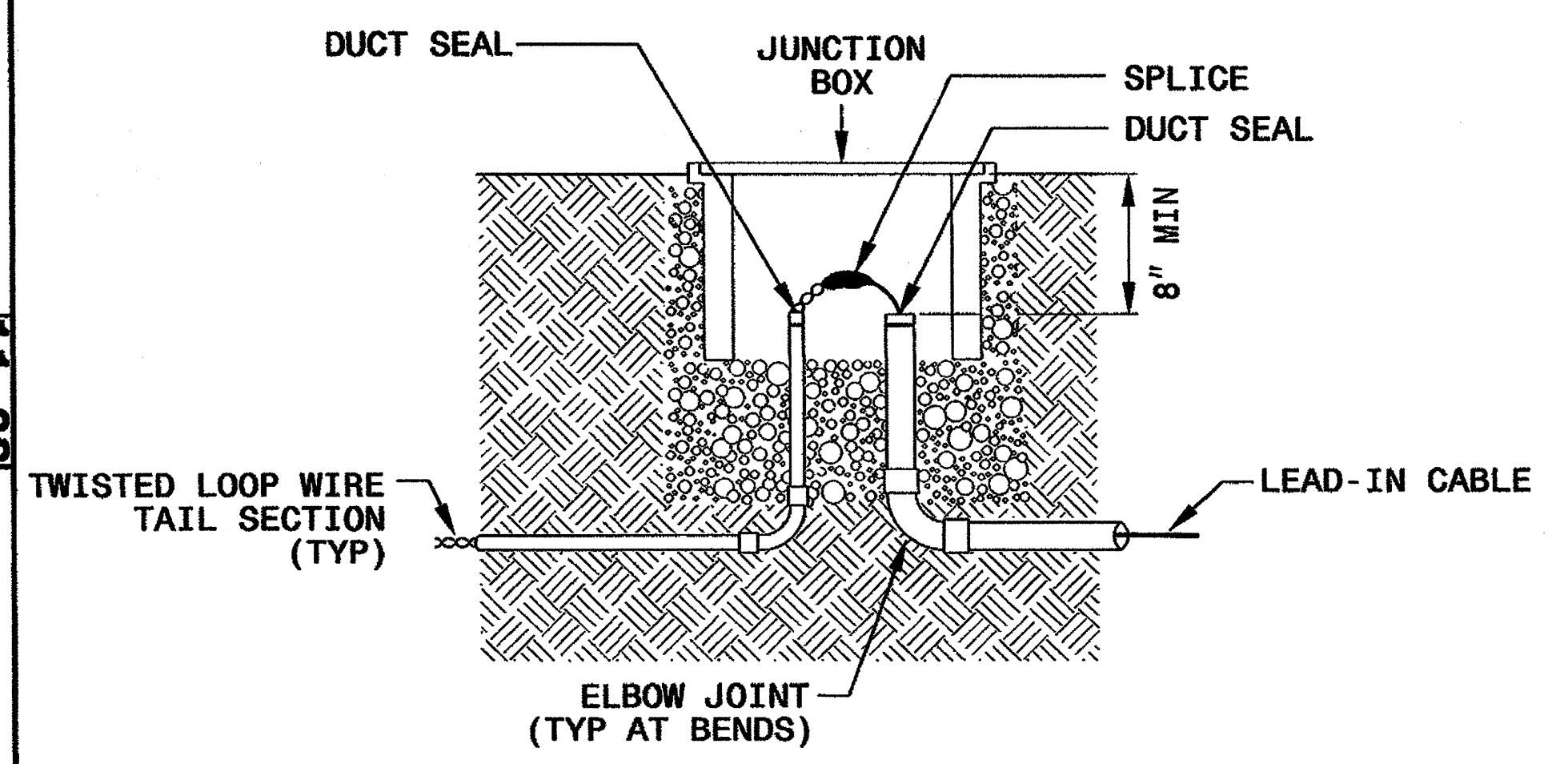
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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

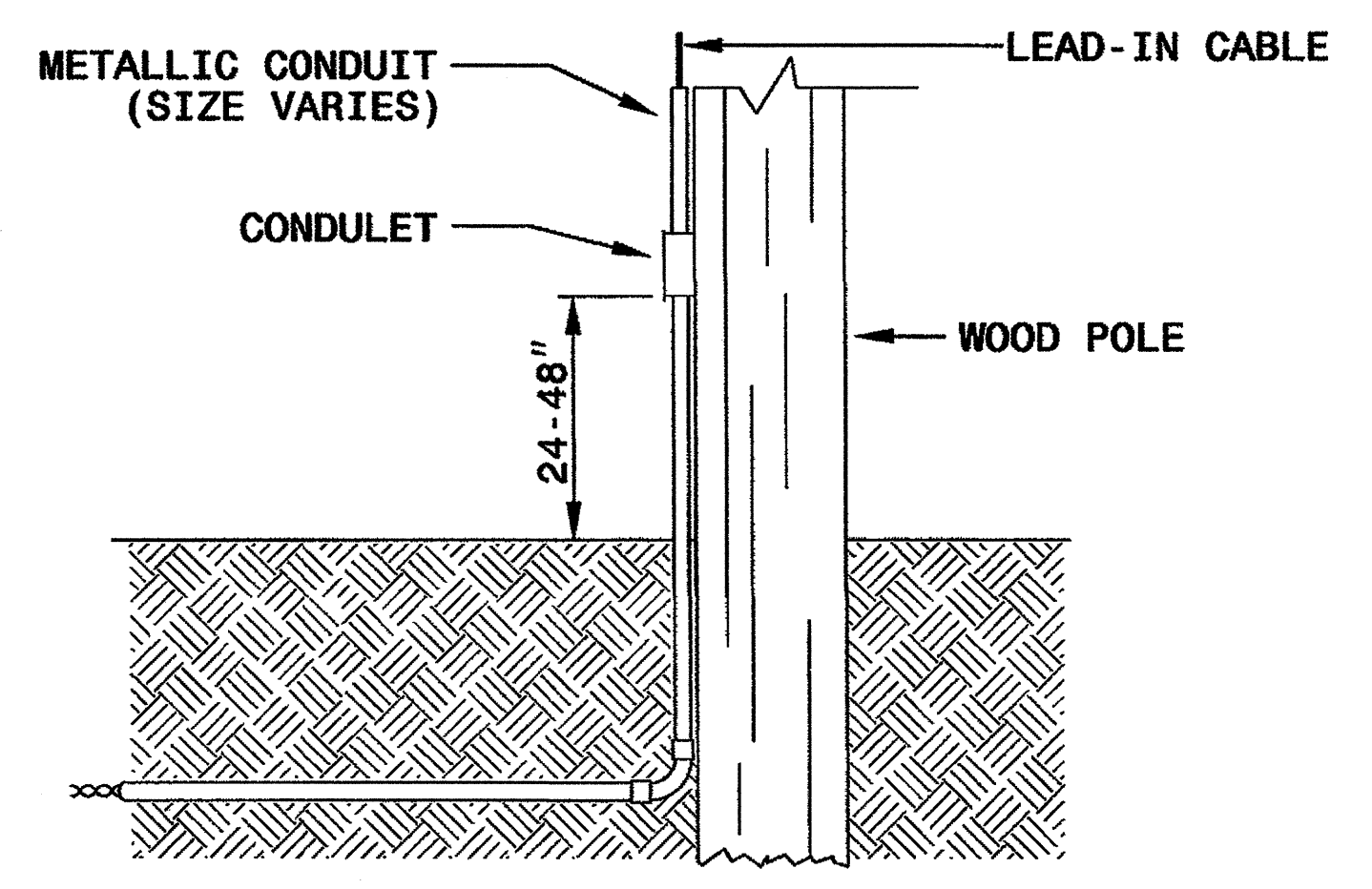
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

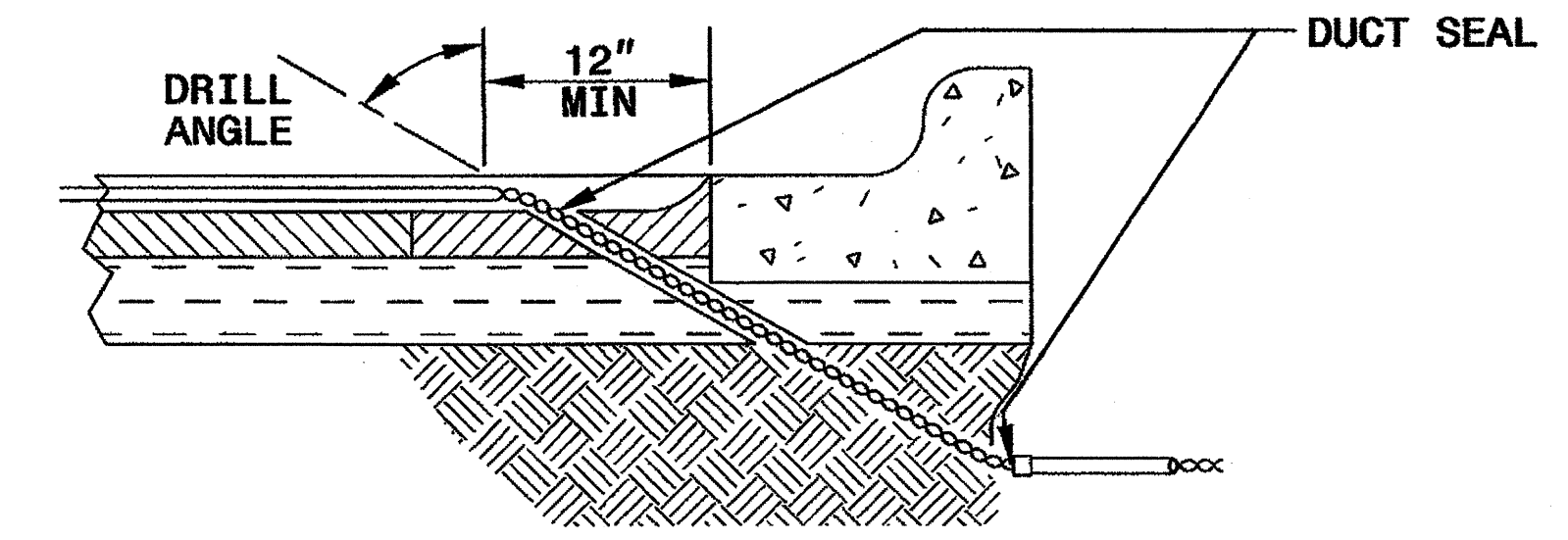


NOTE

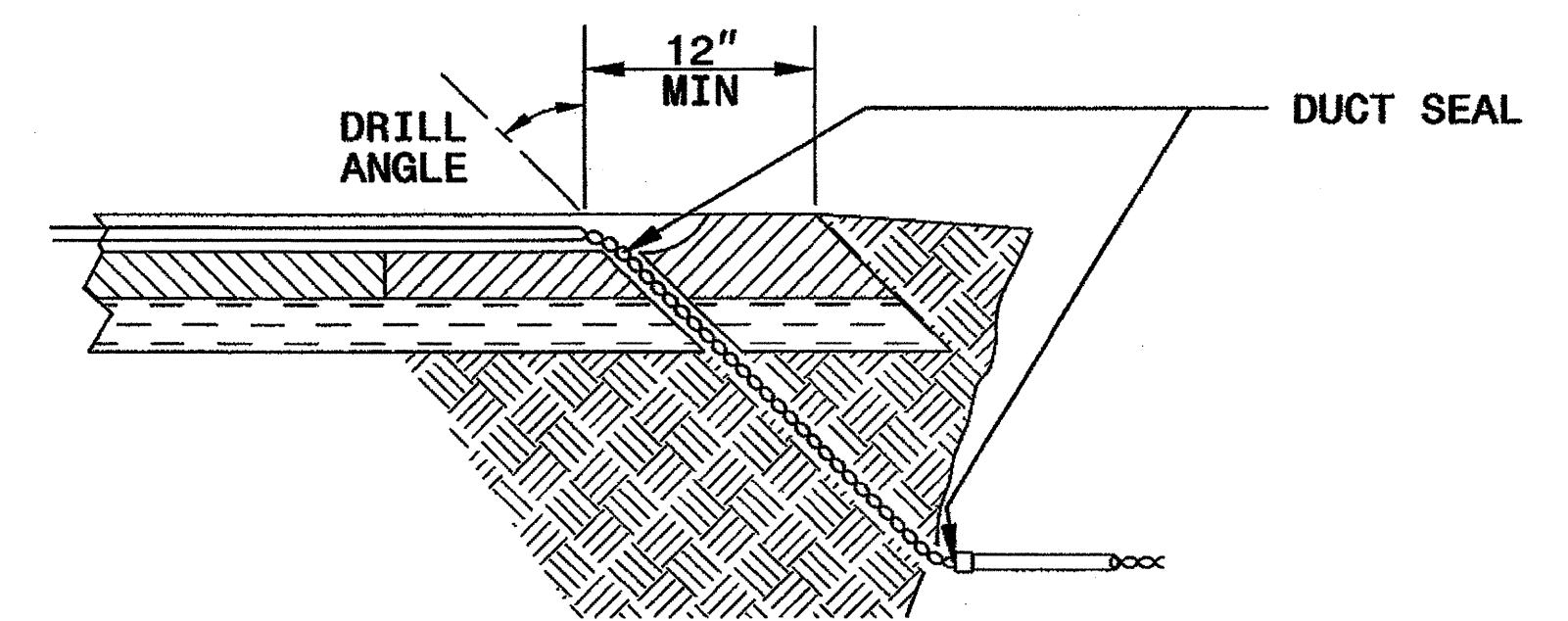
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

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

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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
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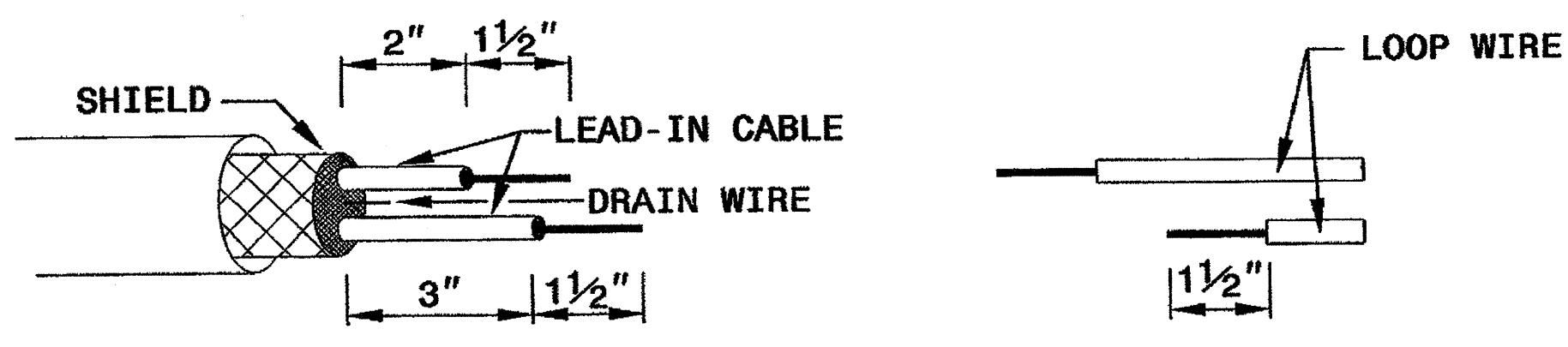
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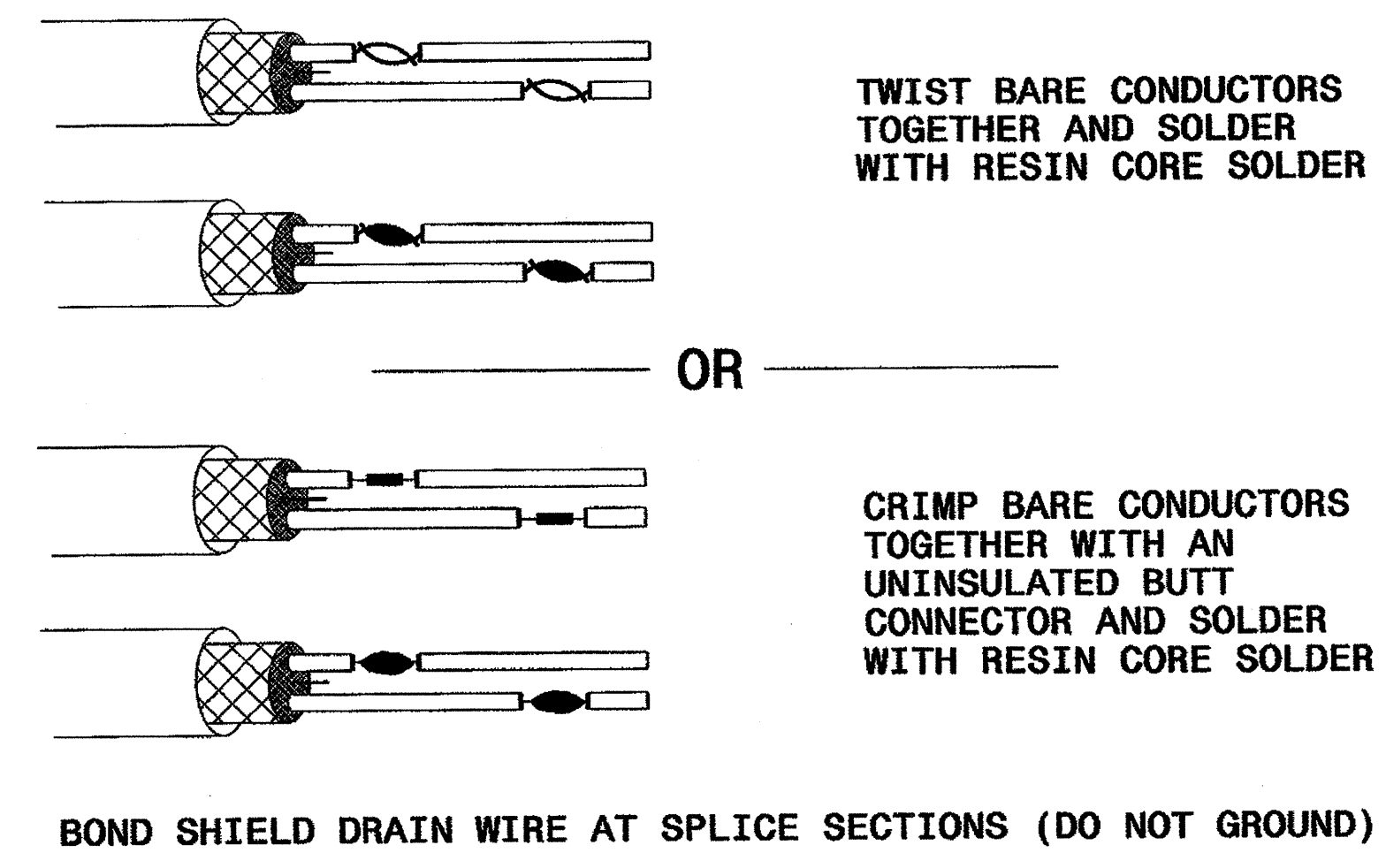
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

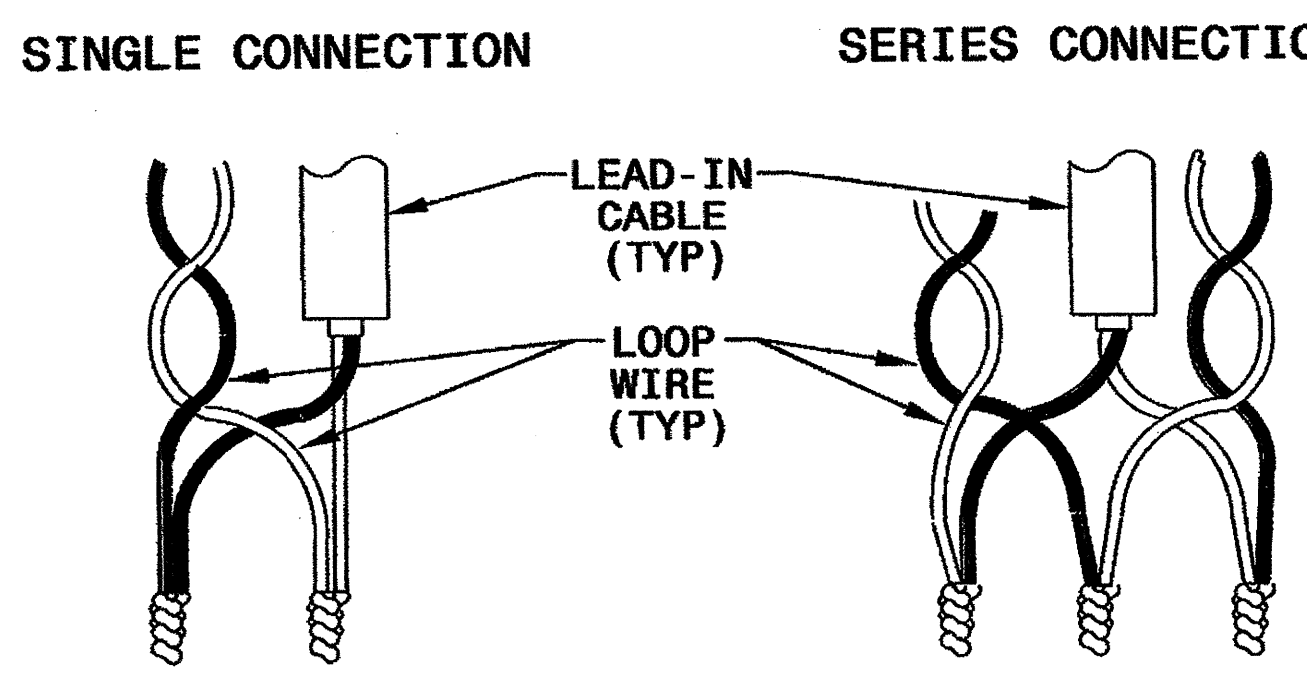
STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE



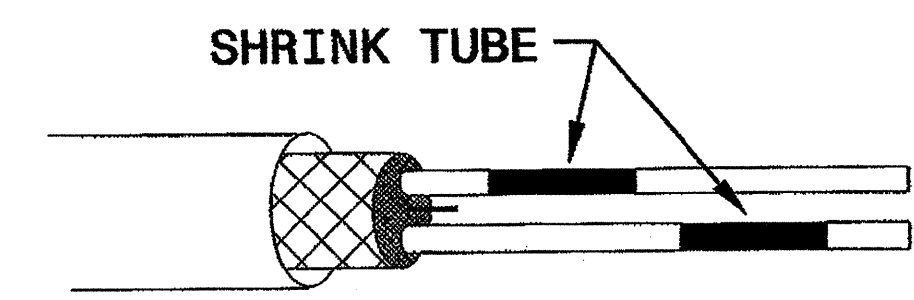
STEP 2. CONNECT AND SOLDER



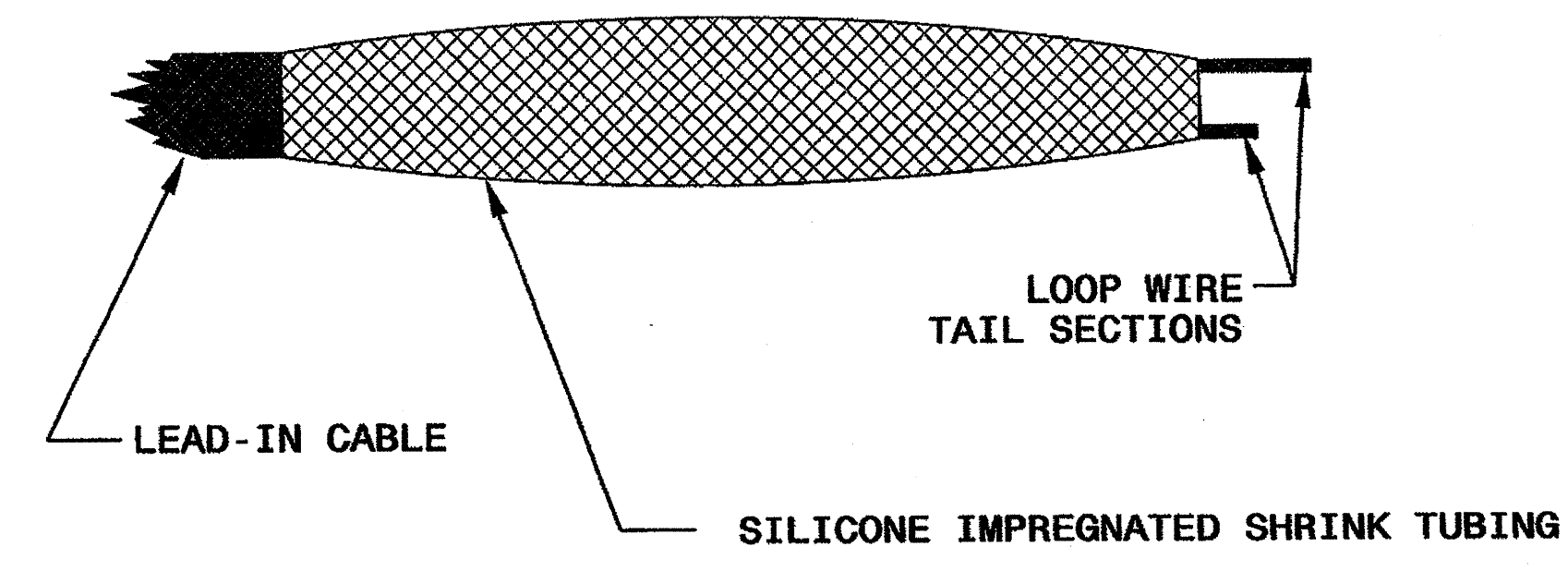
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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

SHEET 3 OF 3
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