

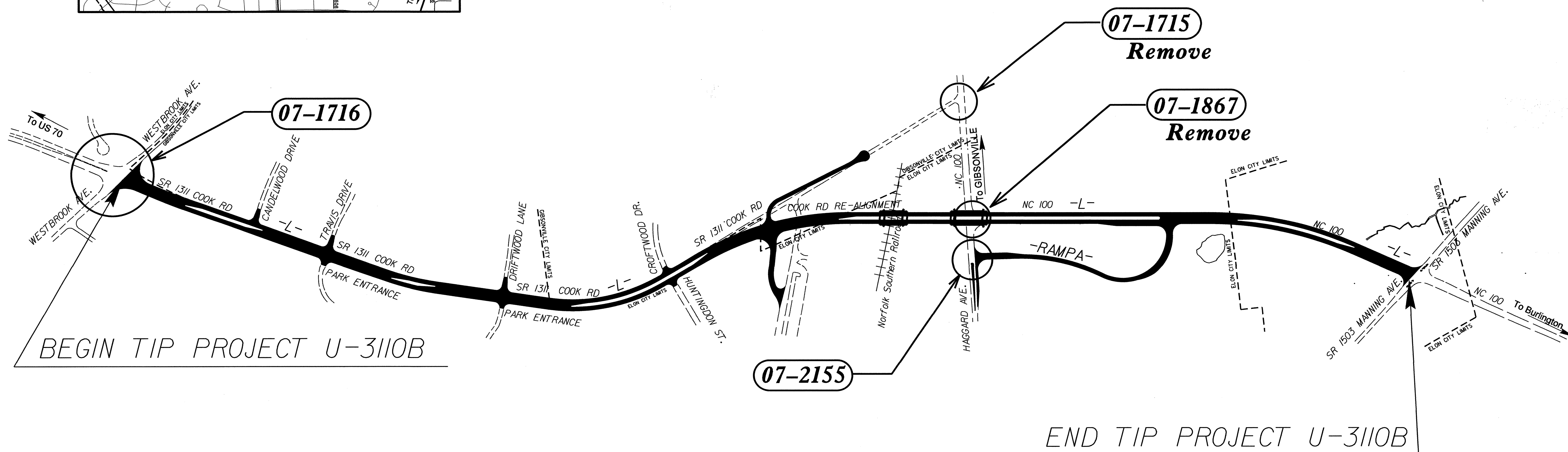
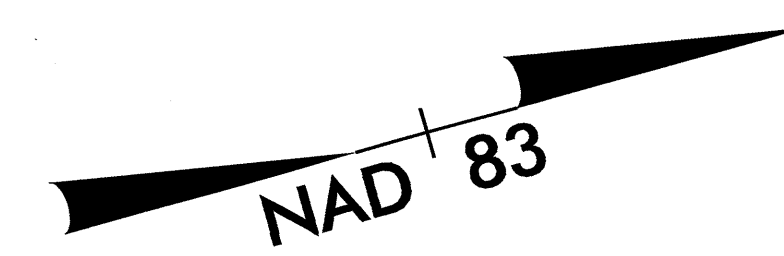
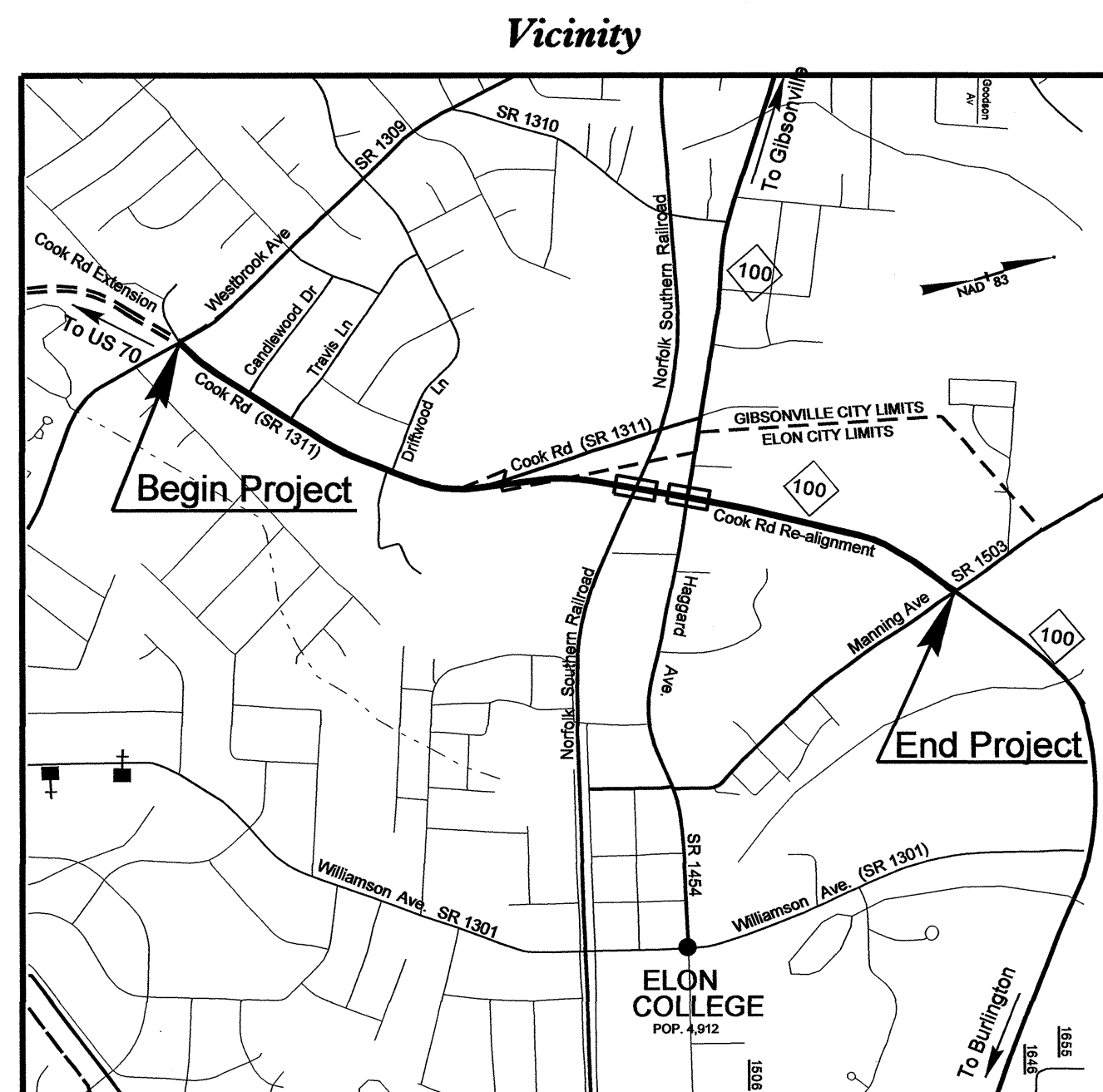
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALAMANCE COUNTY

**LOCATION: SR 1311 (COOK ROAD/UNIVERSITY DRIVE)
FROM SR 1909 (WEST BROOK AVENUE)
TO NC 100 IN ELON**

TYPE OF WORK: Traffic Signals & Fiber Optic Splice Details

Project: U-3110B



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

WBS: 34901.1.1

Sheet #	Reference #	Index of Plans Location/Description
Sig. 1		Title Sheet
Sig. 2-8	07-1716	SR 1311 (University Dr.)/SR 1311 (Cook Rd.) at SR 1309 (West Brook Ave.)/SR 1309 (Alamance St.)
Sig. 9-11	07-2155	NC 100/SR 1454 (W. Haggard Ave.) at NC 100 Ramp and Gas Station
Sig. 12-14	N/A	Inductive Detection Loops Details
Sig. 15-20	N/A	Metal Pole Standard Drawings and Loading Details
Sig. 21	N/A	Fiber Optic Splice Details
Remove	07-1715	NC 100 at SR 1311 (Cook Rd.)
Remove	07-1867	NC 100 at NC 100/SR 1454 (Haggard Ave.)

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:
Robert J. Ziemba, P.E. - Central Region Signals Project Engineer
John T. Rowe, Jr., P.E. - Signal Equipment Design Engineer
I. Neil Avery - Signal Communications Project Engineer

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

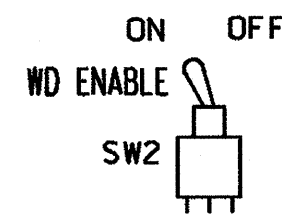
750 N. Greenfield Parkway, Garner, NC 27529

C:\Users\j... \Documents\Projects\U-3110B\SIGNALS\Design\T1\T1sheet\U-3110B-rdy-tsh.dgn

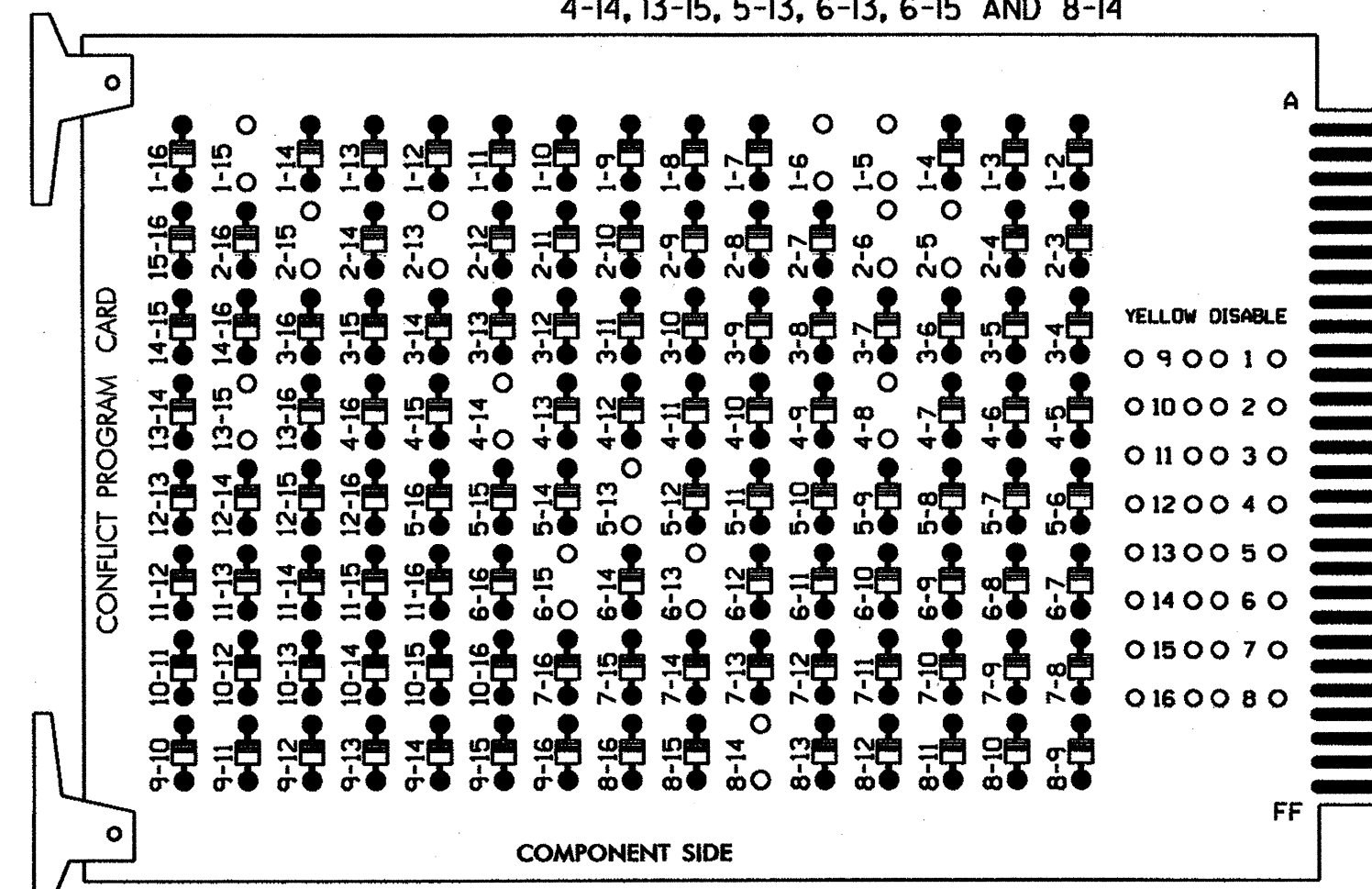
EDI MODEL 2010ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



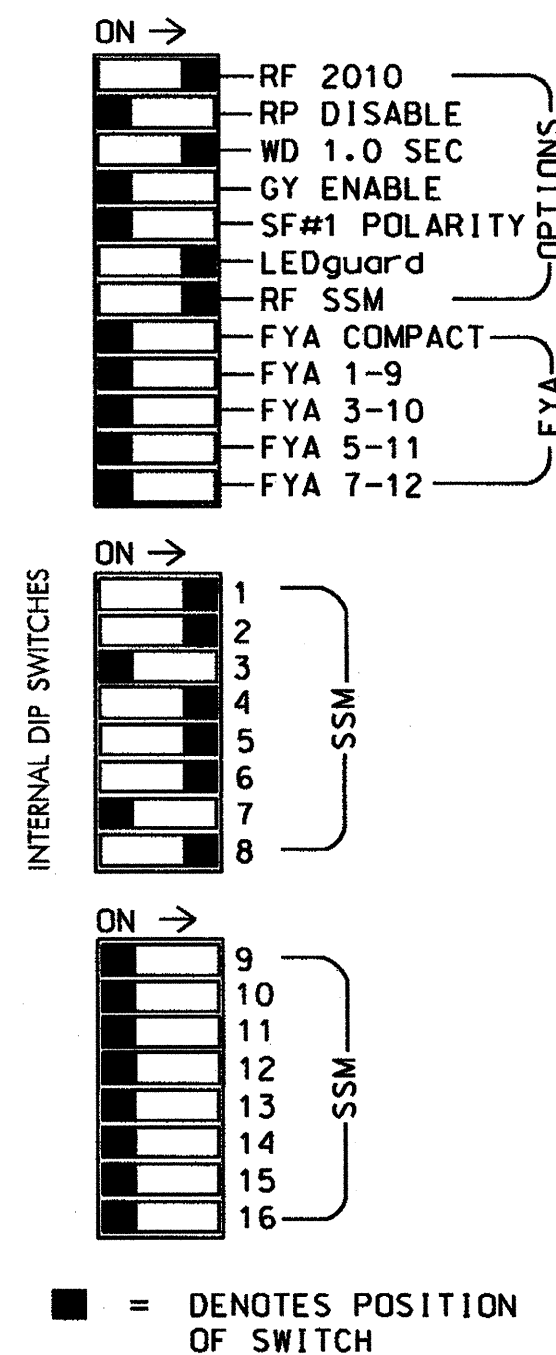
REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 13-15, 5-13, 6-13, 6-15 AND 8-14



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. Verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7,9,10,11,12,13,14,15 & 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 Start-Up in Green.
- Set all detector card channels to 'PRESENCE' mode.
- The cabinet and controller are part of the Burlington-Graham Signal System. Intersection Zone #: 13 System Address #: 605

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINET.....CONTRACTOR SUPPLIED 332A W/AUX
 SOFTWARE.....SE-PAC2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD,6-AUX)
 LOAD SWITCHES USED.....S1,S2,S2P,S4,S4P,S5,S6,S6P,S8
 PHASES USED.....1,2,4,5,6,8,2PED,4PED,6PED
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

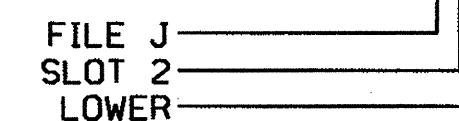
SE-PAC INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A ¹	TB2-1,2	I1U	56	1	1	15	
	-	J4U	48	25	6		1.6
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
4A	TB4-9,10	I6U	41	11	4	3	
4B	TB4-11,12	I6L	45	12	4	5	
4C	TB6-1,2	I7U	65	13	4	15	
5A ²	TB3-1,2	J1U	55	19	5	15	
	-	I4U	47	7	2		1.6
6A,6B	TB3-5,6	J2U	40	21	6		
6C,6D	TB3-7,8	J2L	44	22	6		
8A	TB5-9,10	J6U	42	31	8	3	
8B	TB5-11,12	J6L	46	32	8	5	
8C	TB7-1,2	J7U	66	33	8	15	

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

- 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.

INPUT FILE POSITION LEGEND: J2L



INPUT FILE POSITION LAYOUT

(front view)

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

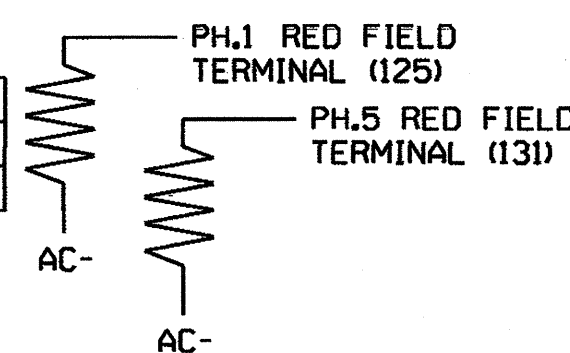
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

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



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

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.	61	21,22	P21, P22	NU	41,42	P41, P42	21	61,62, 63	P61, P62	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	126							132										
FLASHING YELLOW ARROW																		
GREEN ARROW	127							133										
Hand icon				113		104		119										
Person icon				115		106		121										

NU = Not Used ** ** **
 * Denotes install load resistor. See Load Resistor Installation Detail this sheet.
 ** See 'Countdown Pedestrian Signal Operation' note this sheet.

BACK-UP PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 3 (PHASE DATA)

EPAC PHASE DATA	PRESS # DESIRED
1- VEHICLE TIMES	5- V & P RECALLS
2- DENSITY TIMES	6- N. LOCK & MISC
3- PEDEST. TIMES	7- SPEC. SEQUENCE
4- INITIALIZE & N.A. RESPONSE	8- SPEC. DETECTOR
	9- PHASE COPY
	F- PRIOR MENU

PHASE.....	1	2	3	4	5	6	7	8
OMIT	2	0	0	0	6	0	0	0
-YEL	0	0	0	0	0	0	0	0
OCAL	4	0	0	0	4	0	0	0

OMIT: ### PHS ON OMITS THIS PHASE
 -YEL: ### PHS YEL OMITS THIS PHS YEL
 OCAL: WHEN OMIT, DETS CALL ### PHS
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

SPECIAL SEQUENCE PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE TEMPORARY SIGNAL DESIGN: 07-171611
 DESIGNED: APRIL 2010
 SEALED: 6/3/10
 REVISED: N/A

Temporary Design 1 (Construction Phase I)

ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1311 (University Drive) / SR 1311 (Cook Rd) at SR 1309 (West Brook Avenue) / SR 1309 (Alamance Street)

Division 07 Alamance County Burlington

PLAN DATE: May 2010 REVIEWED BY: [Signature]

PREPARED BY: F.E. RUSS REVIEWED BY: [Signature]

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

750 H. Greenfield Pkwy, Garner, NC 27529

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

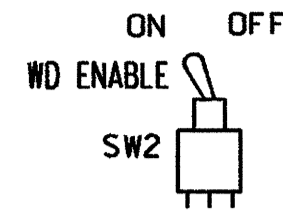
DATE: 6-10-10

SIG. INVENTORY NO. 07-171611

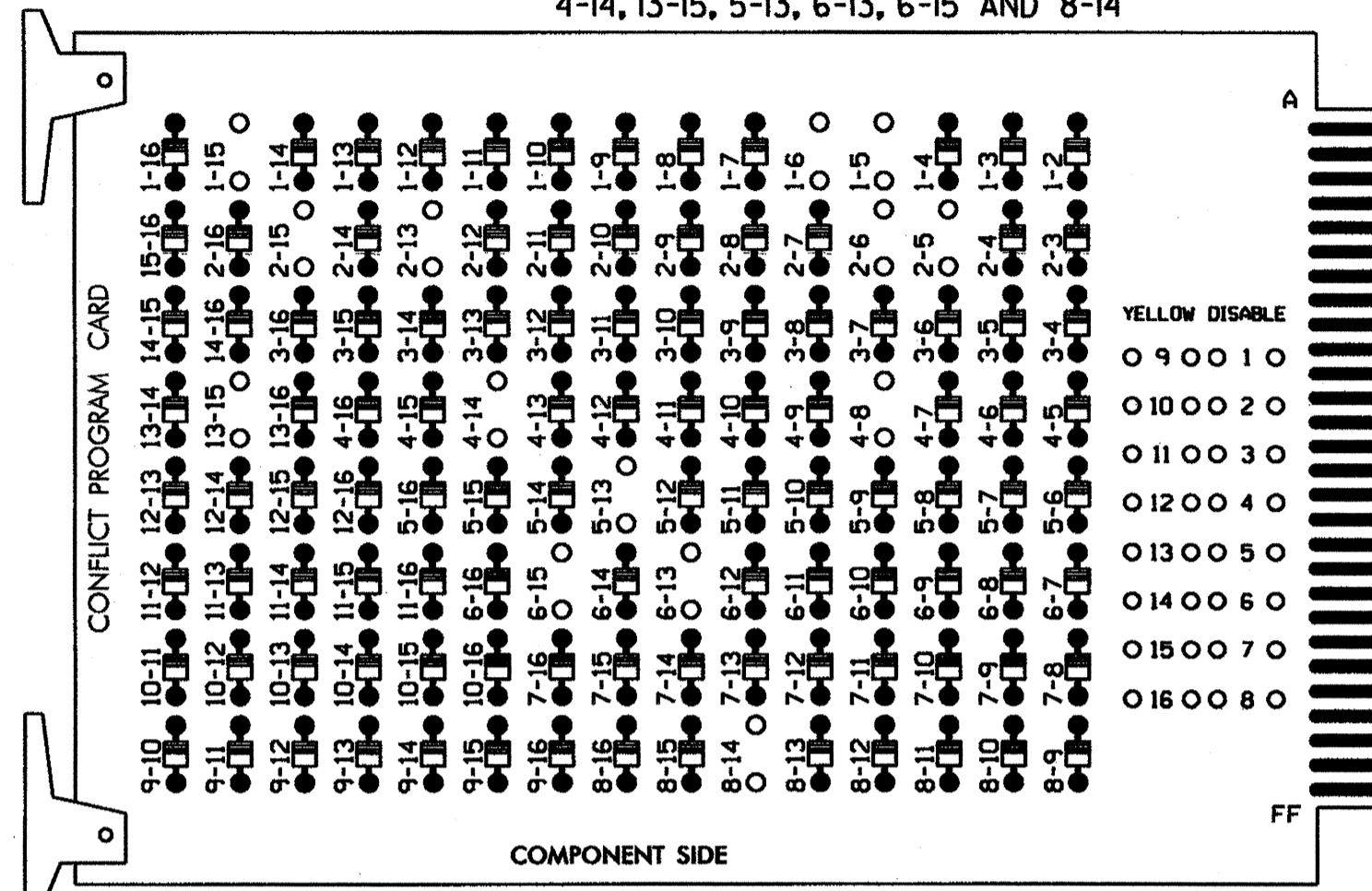
10-JUN-2010 09:42 S:\MIS Signal\mcr\pcr\cases\51g\Monitor\uss2070dws\071716.sm.e.201006xx.dgn

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

(remove jumpers and set switches as shown)



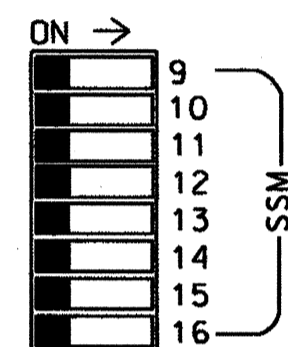
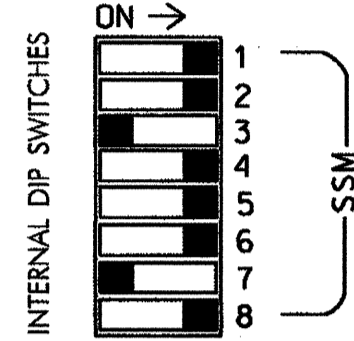
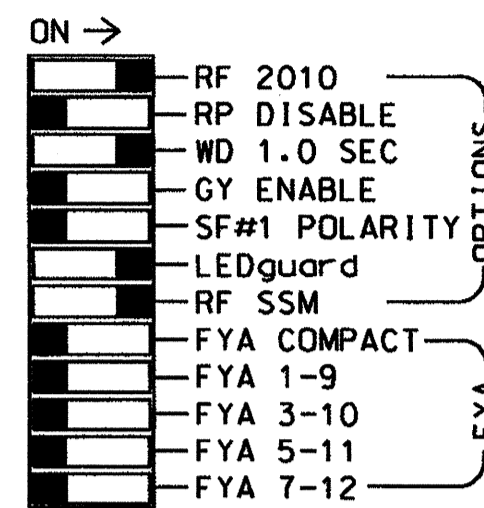
REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-14, 13-15, 5-13, 6-13, 6-15 AND 8-14



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)

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

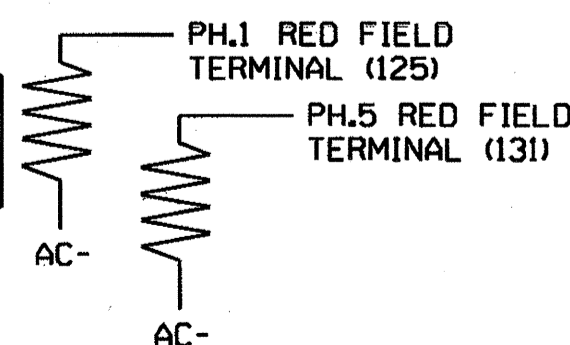
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

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



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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. Verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7, 9,10,11,12,13,14,15 & 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 Start-Up in Green.
- Set all detector card channels to 'PRESENCE' mode.
- The cabinet and controller are part of the Burlington-Graham Signal System. Intersection Zone #: 13
System Address #: 605

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L*
 CABINET.....CONTRACTOR SUPPLIED 332A W/AUX*
 SOFTWARE.....SE-PAC2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD,6-AUX)
 LOAD SWITCHES USED.....S1,S2,S2P,S4,S4P,S5,S6,S6P,S8
 PHASES USED.....1,2,4,5,6,8,2PED,4PED,6PED
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

*INSTALLED UNDER TEMP T1

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

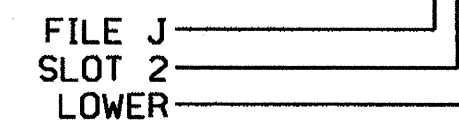
SE-PAC INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A ¹	TB2-1,2	I1U	56	1	1	15	
		J4U	48	25	6		
2A	TB2-5,6	I2U	39	3	2		1.6
2B	TB2-7,8	I2L	43	4	2		
4A	TB4-9,10	I6U	41	11	4	3	
4B	TB4-11,12	I6L	45	12	4	5	
4C	TB6-1,2	I7U	65	13	4	15	
5A ²	TB3-1,2	J1U	55	19	5	15	
		I4U	47	7	2		
6A	TB3-5,6	J2U	40	21	6		1.6
6B,6C	TB3-7,8	J2L	44	22	6		
8A	TB5-9,10	J6U	42	31	8	3	
8B	TB5-11,12	J6L	46	32	8	5	
8C	TB7-1,2	J7U	66	33	8	15	

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

- 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.

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.	61	21,22	P21, P22	NU	41,42	P41, P42	21	61,62	P61, P62	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134			107							
YELLOW					102			135			108							
GREEN					103			136			109							
RED ARROW																		
YELLOW ARROW	126							132										
FLASHING YELLOW ARROW																		
GREEN ARROW	127							133										
⬇																		
⬇																		

NU = Not Used ** ** *

* Denotes install load resistor. See Load Resistor Installation Detail this sheet.

** See 'Countdown Pedestrian Signal Operation' note this sheet.

BACK-UP PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS 3 (PHASE DATA)

EPAC PHASE DATA	PRESS # DESIRED
1- VEHICLE TIMES	5- V & P RECALLS
2- DENSITY TIMES	6- N.LOCK & MISC
3- PEDEST. TIMES	7- SPEC. SEQUENCE
4- INITIALIZE & N.A. RESPONSE	8- SPEC. DETECTOR
	9- PHASE COPY
	F- PRIOR MENU

PHASE.....1...2...3...4...5...6...7...8							
OMIT	2	0	0	0	6	0	0
-YEL	0	0	0	0	0	0	0
OCAL	4	0	0	0	4	0	0

OMIT: ### PHS ON OMITS THIS PHASE
 -YEL: ### PHS YEL OMITS THIS PHS YEL
 OCAL: WHEN OMIT. DETS CALL ### PHS
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

SPECIAL SEQUENCE PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE
 TEMPORARY SIGNAL DESIGN: 07-1716T2
 DESIGNED: APRIL 2010
 SEALED: 6/3/10
 REVISED: N/A

Temporary Design 2 (Construction Phase II)

	ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1311 (University Drive) / SR 1311 (Cook Rd) at SR 1309 (West Brook Avenue) / SR 1309 (Alamance Street)	
	Division 07	Alamance County	Burlington	
	PLAN DATE: May 2010	REVIEWED BY: JJP		
	PREPARED BY: F.E. RUSS	REVIEWED BY:		
REVISIONS		INIT.	DATE	

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER

SEAL 008453

JOHN T. ROWE, JR.

6-10-10

SIGNATURE DATE

SIG. INVENTORY NO. 07-1716T2

10-JUN-2010 09:43 S:\MITS Signal\mcr\gr\coups\1g_MonFluss207Downs\07116_sm.eie.201006xx.dgn

**FLASHING YELLOW ARROW PROTECTED/PERMITTED
SPECIAL SEQUENCE PROGRAMMING DETAIL**
(program controller as shown below)

SELECT (4) FROM MAIN MENU

SE-PAC UNIT DATA		PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES	
2- REMOTE FLASH	7- PORT 1 DATA	
3- OVERLAP STANDARD	8- I/O MISC	
4- OVERLAP SPECIAL	9- SIG DRV OUT	
5- RING STRUCTURE		F- PRIOR MENU

SE-PAC UNIT DATA		PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES	
2- REMOTE FLASH	7- PORT 1 DATA	
3- OVERLAP STANDARD	8- I/O MISC	
4- OVERLAP SPECIAL	9- SIG DRV OUT	
5- RING STRUCTURE		F- PRIOR MENU

Do NOT enter any OVL PHASES! →

SE-PAC OVERLAP - A		(0-NO / 1-YES)
OVL PHASES: 00000000 0000000		
PHS/CHN: 123456789 0123456789 01234		
OVL CHN(S): 000000000 0001000000 00000		
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU		
PRESS 'B' TWICE		

SE-PAC OVL P.A...B...C...D...E...F...G...H.		
TR GRN	0 0 0 0 0 0 0 0	
YEL/10	40 40 40 40 40 40 40 40	
RED/10	20 20 20 20 20 20 20 20	
-G/Y	1 0 5 0 0 0 0 0	
+GRN	2 0 6 0 0 0 0 0	
(-) #-PH G/Y KILLS OVL P= (+) #-PH G STRT		
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU		

← PROTECTED PHASES
← PERMITTED PHASES

Do NOT enter any OVL PHASES! →

SE-PAC OVERLAP - C		(0-NO / 1-YES)
OVL PHASES: 00000000 0000000		
PHS/CHN: 123456789 0123456789 01234		
OVL CHN(S): 000000000 0000010000 00000		
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU		

end of programming

NOTE: THIS PROGRAMMING IS REQUIRED FOR SIGNAL HEADS 11 AND 51 SO THAT THE SOLID GREEN ARROW TURNS ON EXCLUSIVELY DURING THE PROTECTED GREEN INTERVALS OF PHASES 1 & 5. THE FLASHING YELLOW ARROW FOR SIGNAL HEADS 11 AND 51 ONLY TURNS ON EXCLUSIVELY DURING PERMITTED GREEN PHASES 2 & 6.

select F - return to Unit Data menu

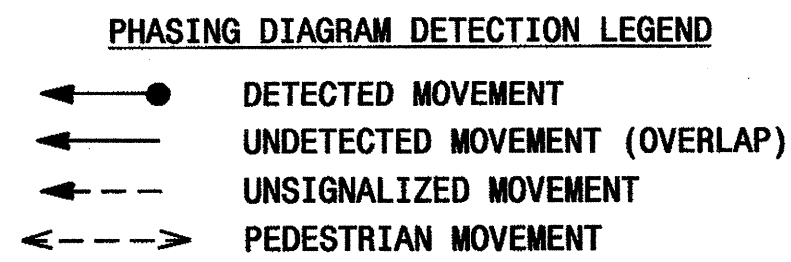
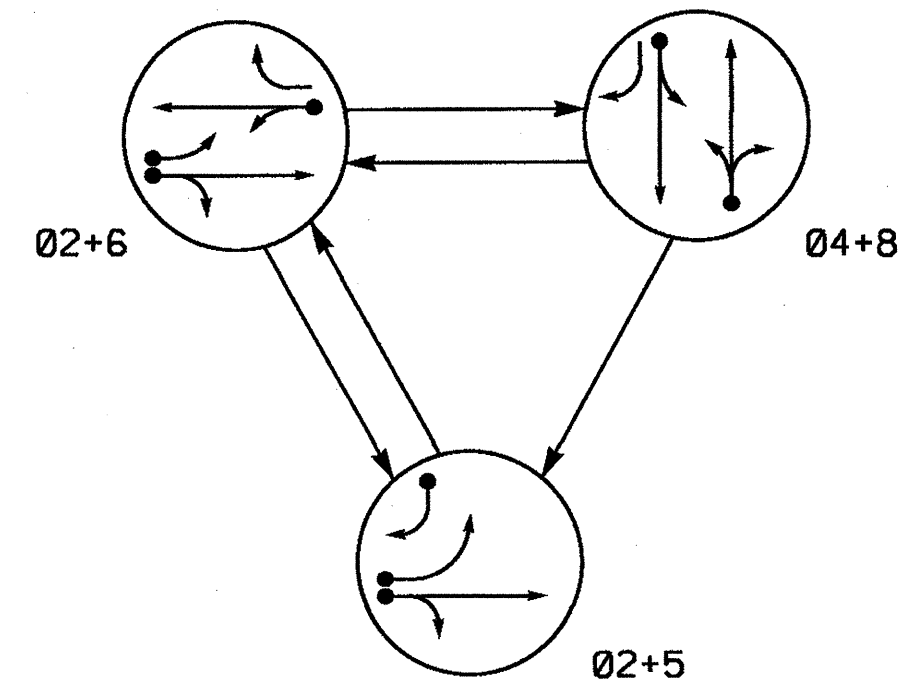
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1716
DESIGNED: APRIL 2010
SEALED: 6/3/10
REVISED: N/A

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Final Design - Electrical Detail Sheet 2 of 2

	ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1311 (University Drive)/ SR 1311 (Cook Rd) at SR 1309 (West Brook Avenue)/ SR 1309 (Alamance Street)		SEAL
	Prepared In the Office of: F. E. RUSS 750 N. Greenfield Pkwy, Garner, NC 27529	Division 07 Alamance County Burlington PLAN DATE: May 2010 REVIEWED BY: JFR PREPARED BY: F. E. RUSS REVIEWED BY:	

PHASING DIAGRAM

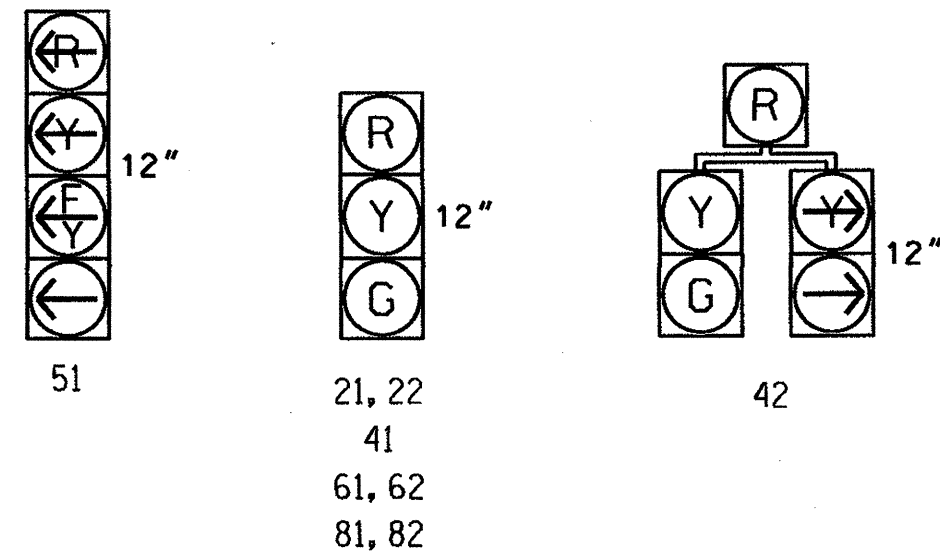


SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21, 22	G	R	Y	
41	R	R	G	R
42	R	R	G	R
51	-	-	-	-
61, 62	R	G	R	Y
81, 82	R	R	G	R

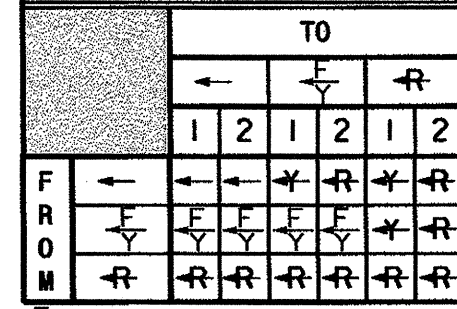
F = Flashing Yellow Arrow

SIGNAL FACE I.D.

All Heads L.E.D.



STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL



F = Flashing Yellow Arrow

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

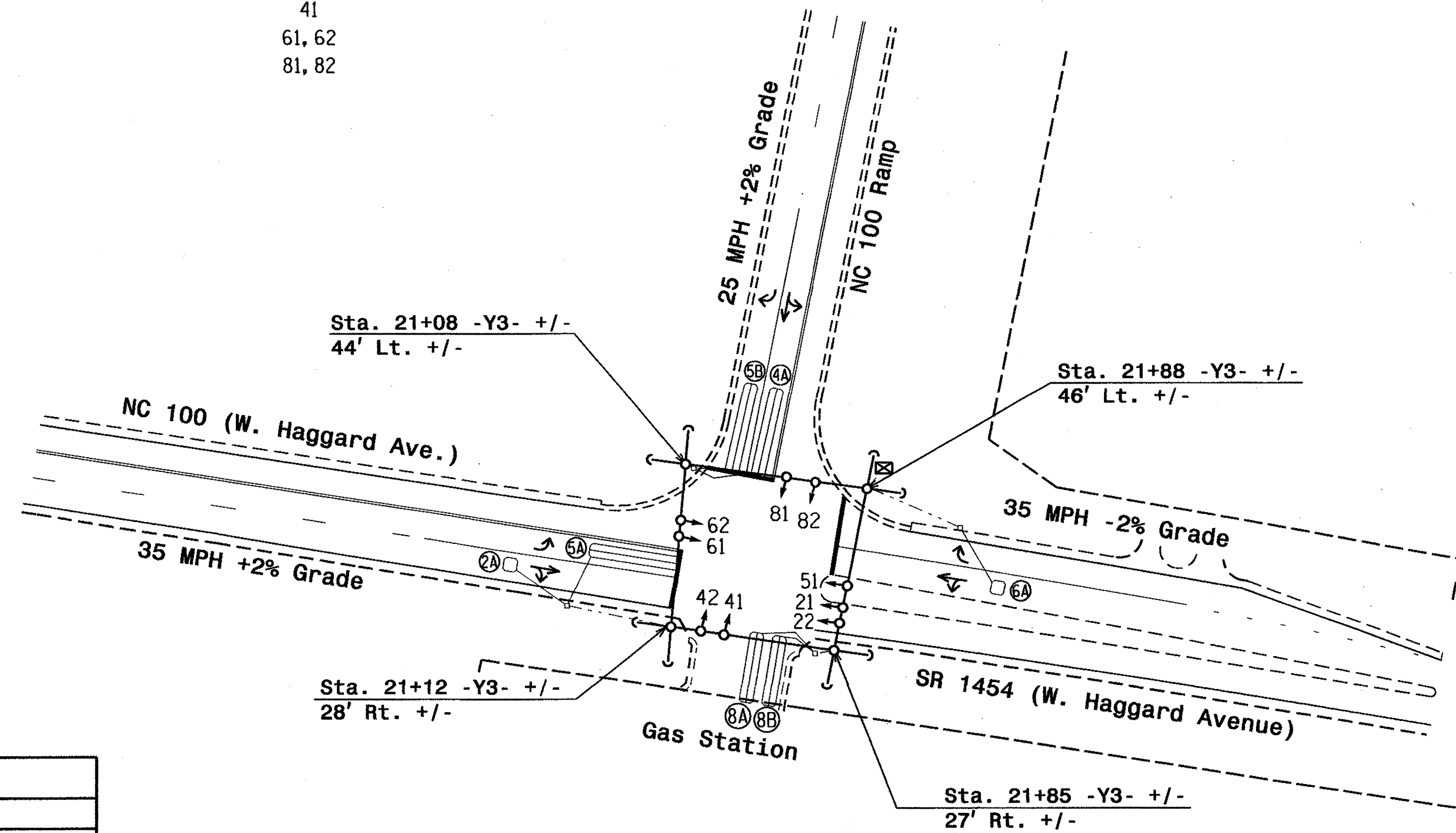
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
2A	6X6	70	4	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
5B	6X40	0	2-4-2	Y	2	Y	Y	-	-	-	-	Y
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	Y
8A	6X30	0*	2-4-2	Y	8	Y	Y	-	-	5	-	Y
8B	6X30	0*	2-4-2	Y	8	Y	Y	-	-	10	-	Y

* Located at Edge of Travel Way

3 Phase Fully Actuated (Isolated)

NOTES

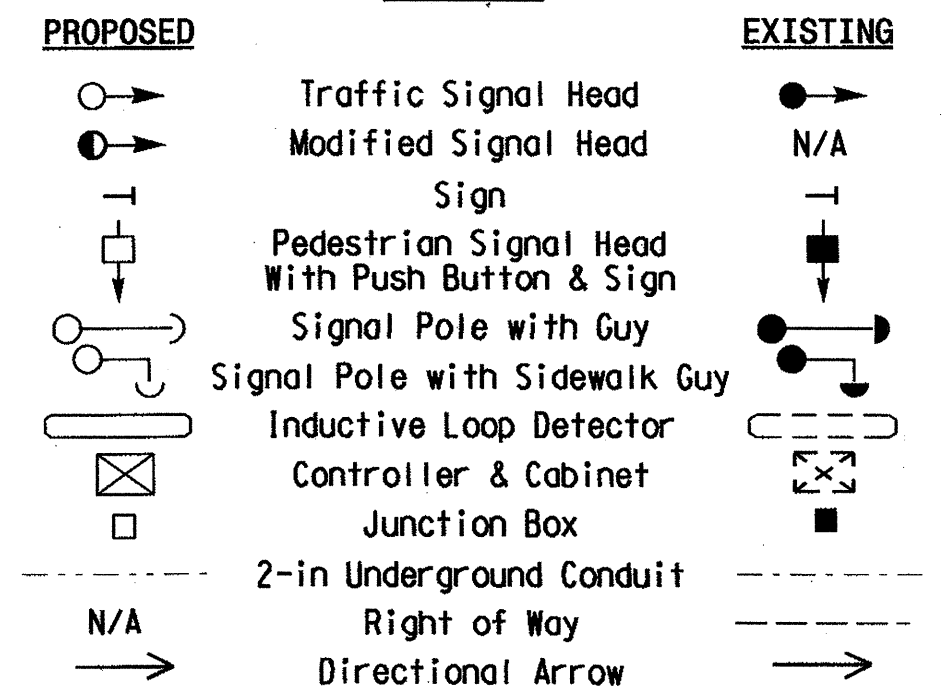
1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable backup protect for phase 2 to allow the controller to clear from phase 2+6 to phase 2+5 by processing through all red display.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.



FEATURE	PHASE				
	2	4	5	6	8
Min Green 1*	10	7	7	10	7
Extension 1*	3.0	2.0	2.0	3.0	2.0
Max Green 1*	45	25	20	45	25
Yellow Clearance	4.0	3.1	3.0	4.0	3.0
Red Clearance	1.2	2.0	1.8	1.2	1.9
Red Revert	5.0	2.0	2.0	2.0	2.0
Walk 1*	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation*	-	-	-	-	-
Max Variable Initial*	-	-	-	-	-
Time Before Reduction*	-	-	-	-	-
Time To Reduce*	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

LEGEND



Temporary Signal

NC 100/SR 1454 (W. Haggard Ave.) at NC 100 Ramp

Division 7 Alamance County E10n

PLAN DATE: April 2010 REVIEWED BY: TS Thigpen

PREPARED BY: TS Thigpen

REVISIONS	INIT.	DATE

SIGNATURE: DATE: 6/9/10

SIG. INVENTORY NO. 07-2155

07-MAY-2010 11:46:11 AM C:\Users\paul\Documents\Projects\3110B\GIS\Signal\Signal Design Section\Signal Design Section.dgn

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.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```

LOGICAL I/O COMMAND #1 (+/-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
    
```

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

PRESS '+'

```

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
    ↓
    SCROLL DOWN
    ↓
THEN:
SET OUTPUT ASSIGNMENT #44 OFF
    
```

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

PRESS '+'

```

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON
    ↓
    SCROLL DOWN
    ↓
THEN:
SET OUTPUT ASSIGNMENT #43 ON
    
```

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

END OF PROGRAMMING

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
 OUTPUT 43 = Overlap C Yellow
 OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PAGE THRU UNTIL OVERLAP 'C' IS REACHED.

```

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: 07-2155
 DESIGNED: APRIL 2010
 SEALED: 6/9/10
 REVISED: N/A

Temporary Signal - Electrical Detail Sheet 2 of 2

<p style="font-size: 8px;">750 N. Greenfield Phry, Garner, NC 27529</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 100/SR 1454 (W. Haggard Ave.) at NC 100 Ramp		SEAL
	Prepared In the Offices of:		Division 07 Alamance County E10n		
		PLAN DATE: June 2010	REVIEWED BY: <i>[Signature]</i>		
		PREPARED BY: F.E. RUSS	REVIEWED BY:		
		REVISIONS	INIT.	DATE	
		<i>[Signature]</i> 6-11-10			
		SIGNATURE DATE			
				SIG. INVENTORY NO. 07-2155	

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

11-08

INDUCTIVE DETECTION LOOPS
ENGLISH DETAIL DRAWING FOR

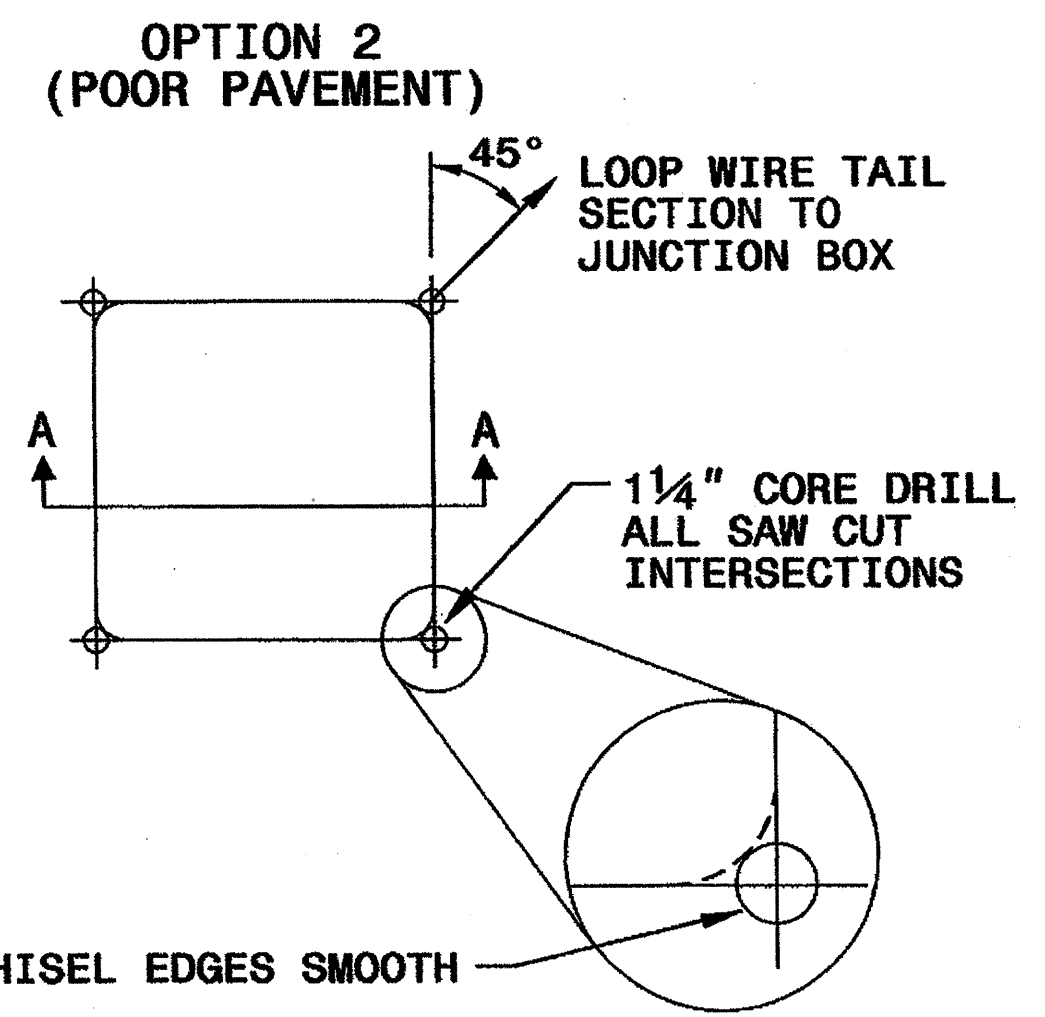
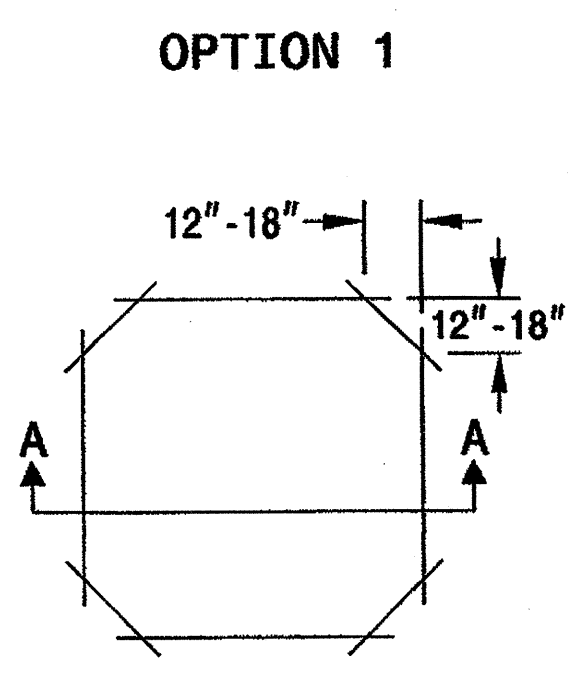
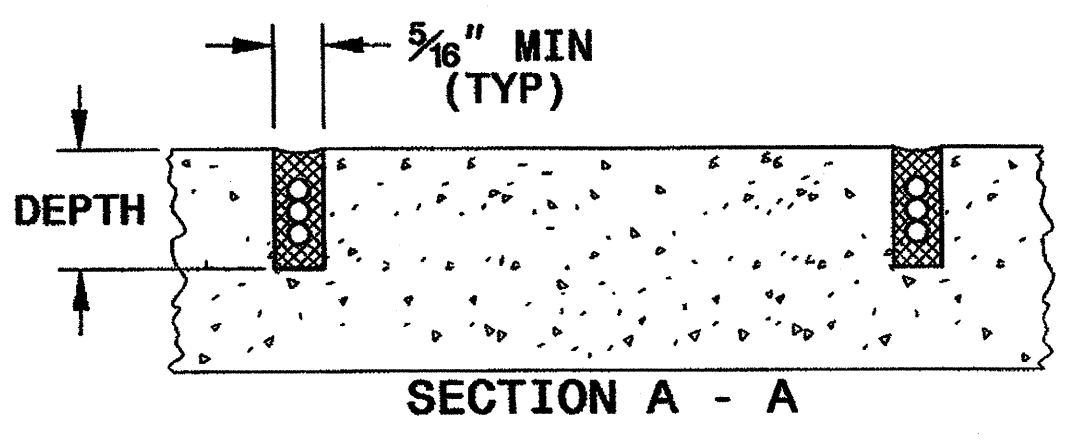
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

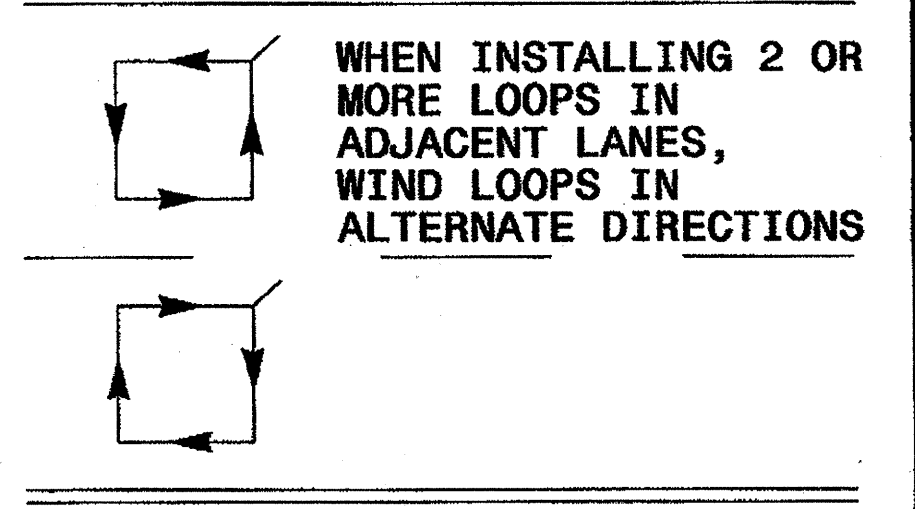
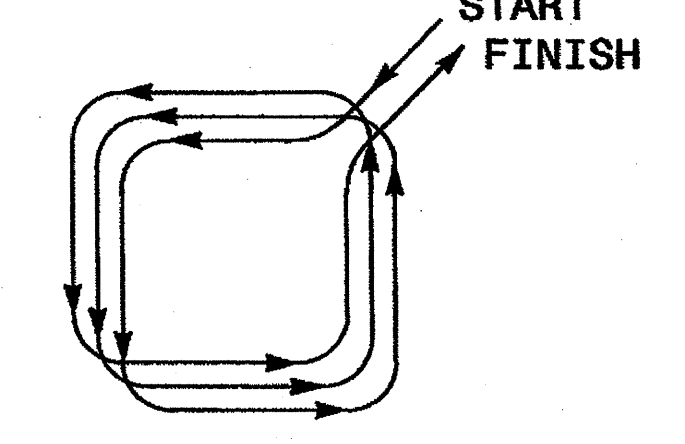
SAW CUT OPTIONS

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



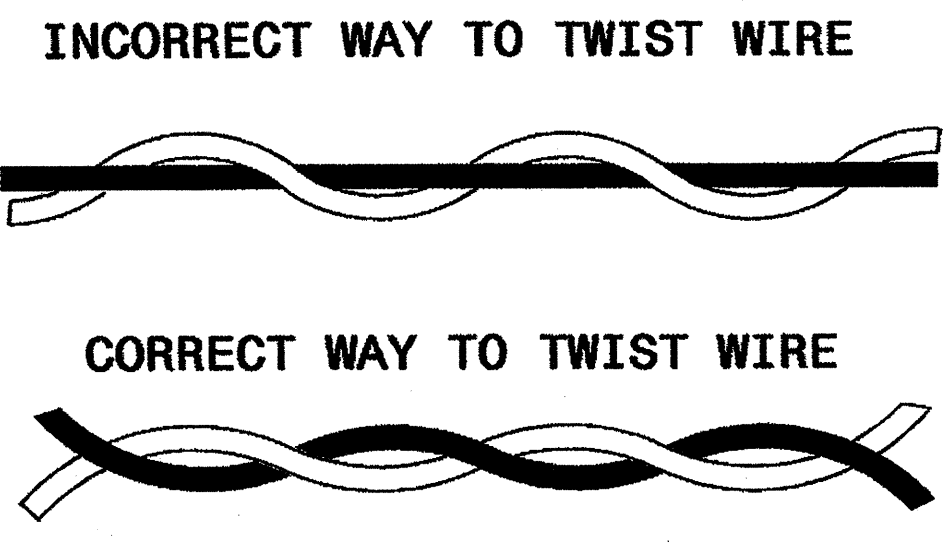
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

INDUCTIVE DETECTION LOOPS
ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3
1725D01

LOOP WIRE TWISTING METHOD

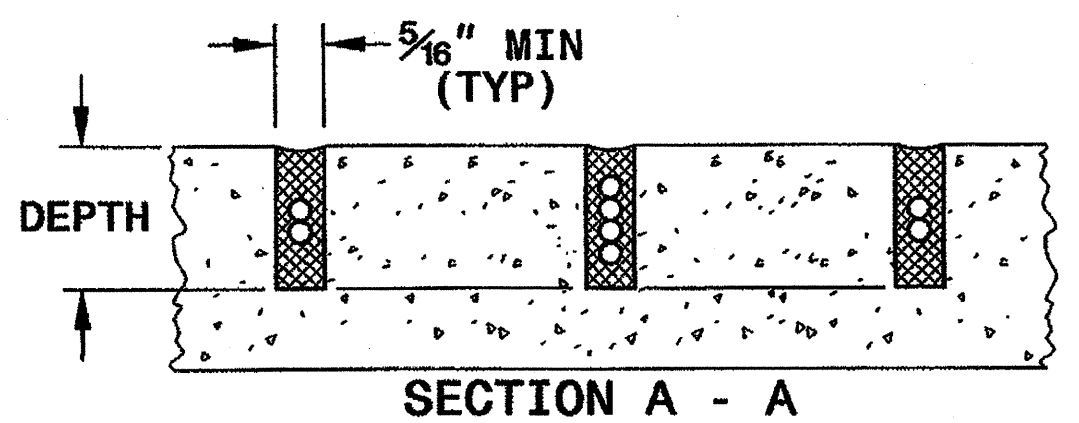
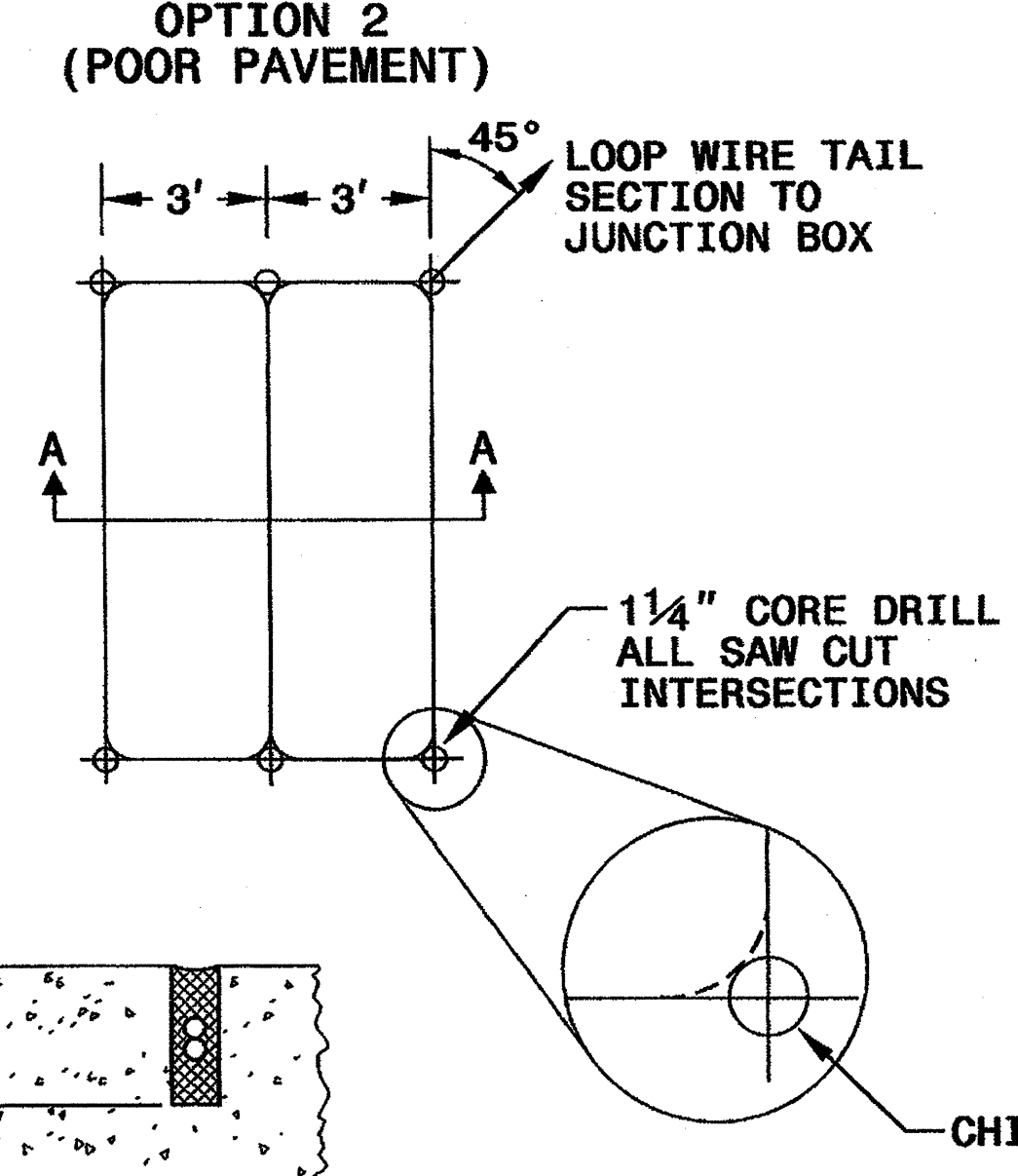
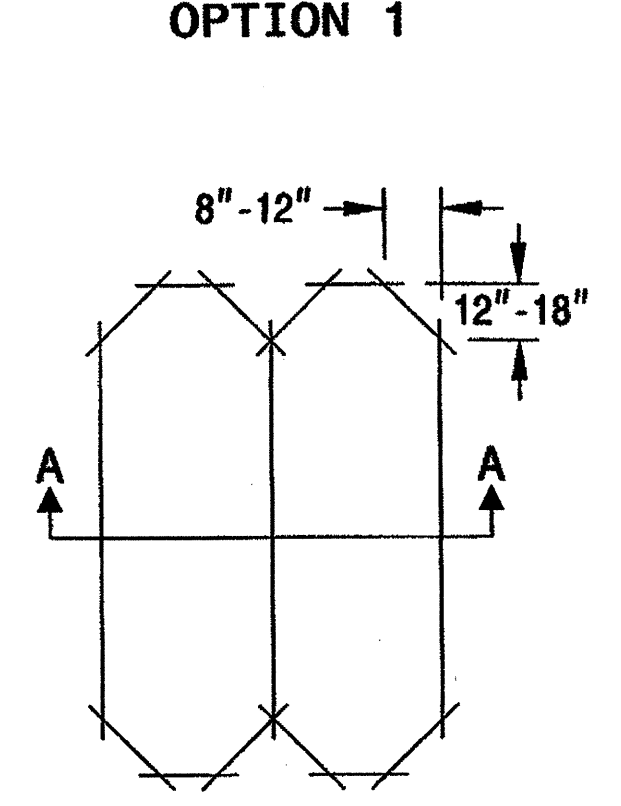


NOTES

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

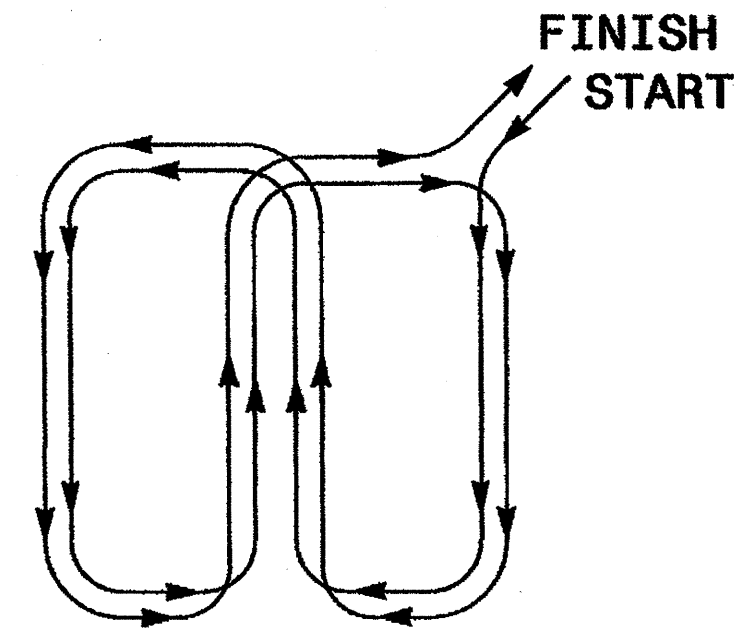
QUADRUPOLE LOOP

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

SEAL

Milton I. Dean 11/24/08
SIGNATURE DATE

24-Nov-2008 08:28
d:\work\1116850-standard plate sheets\1725D01.mxd\2307.dgn
zmittle

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

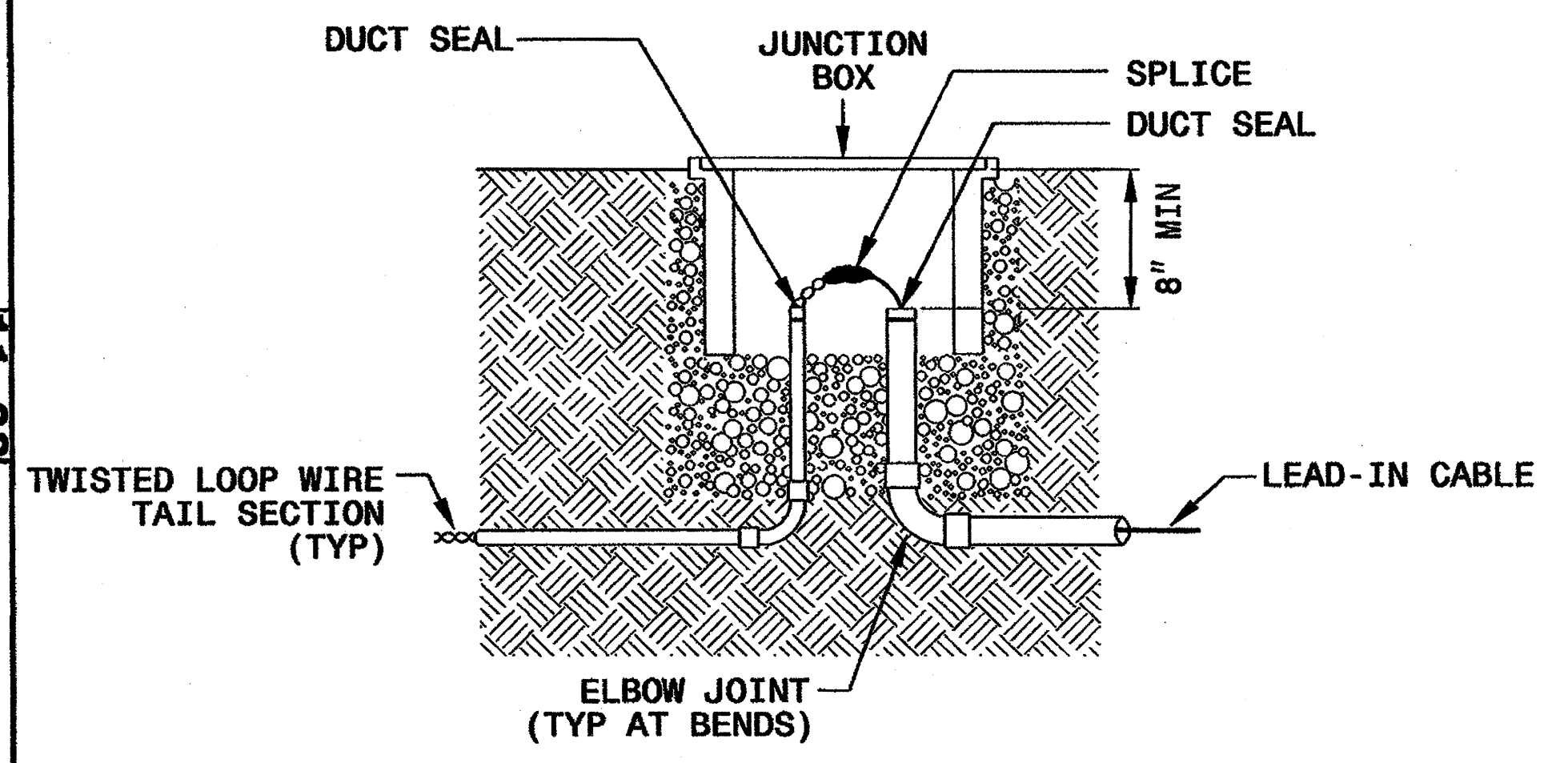
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

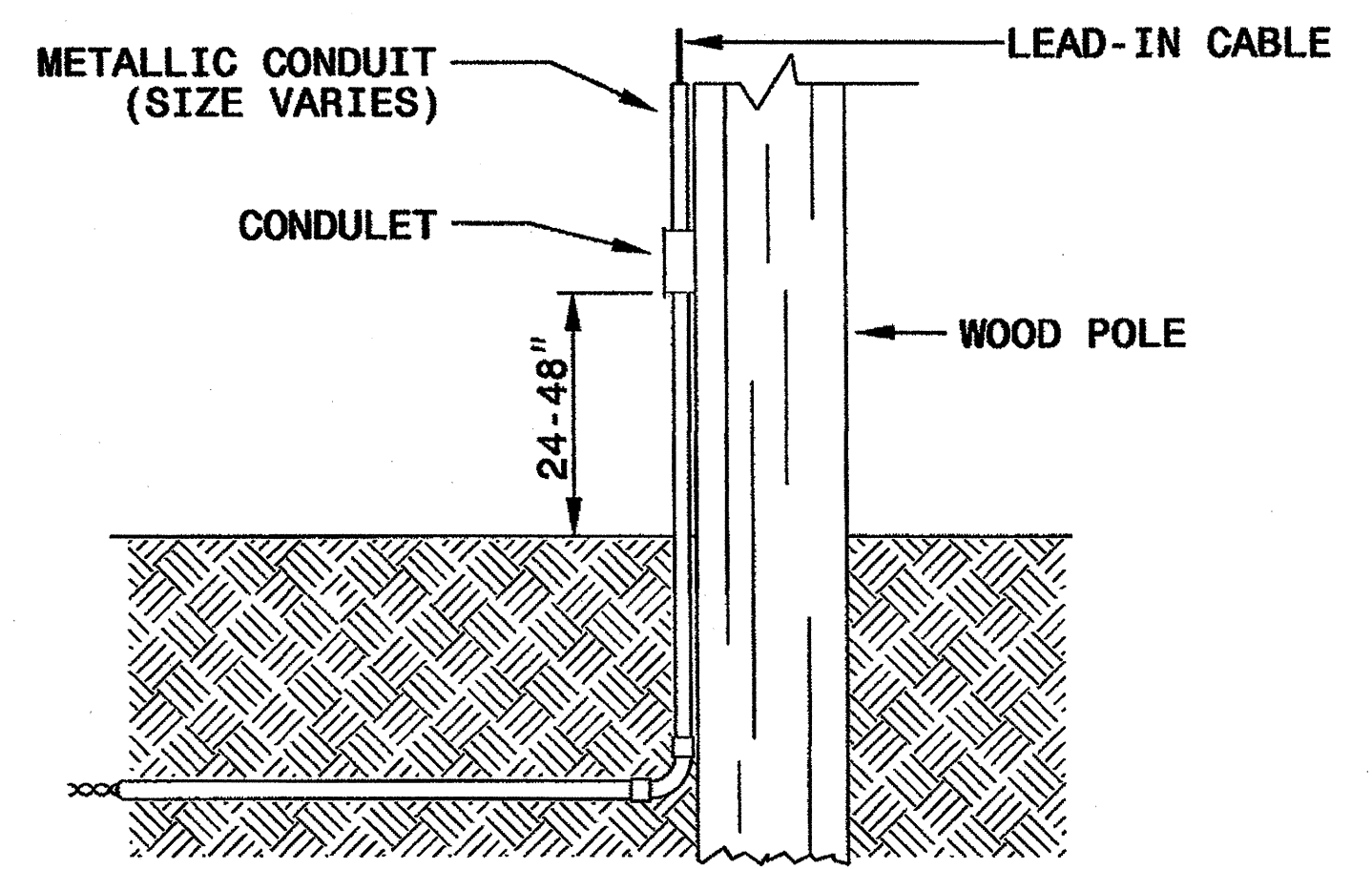
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

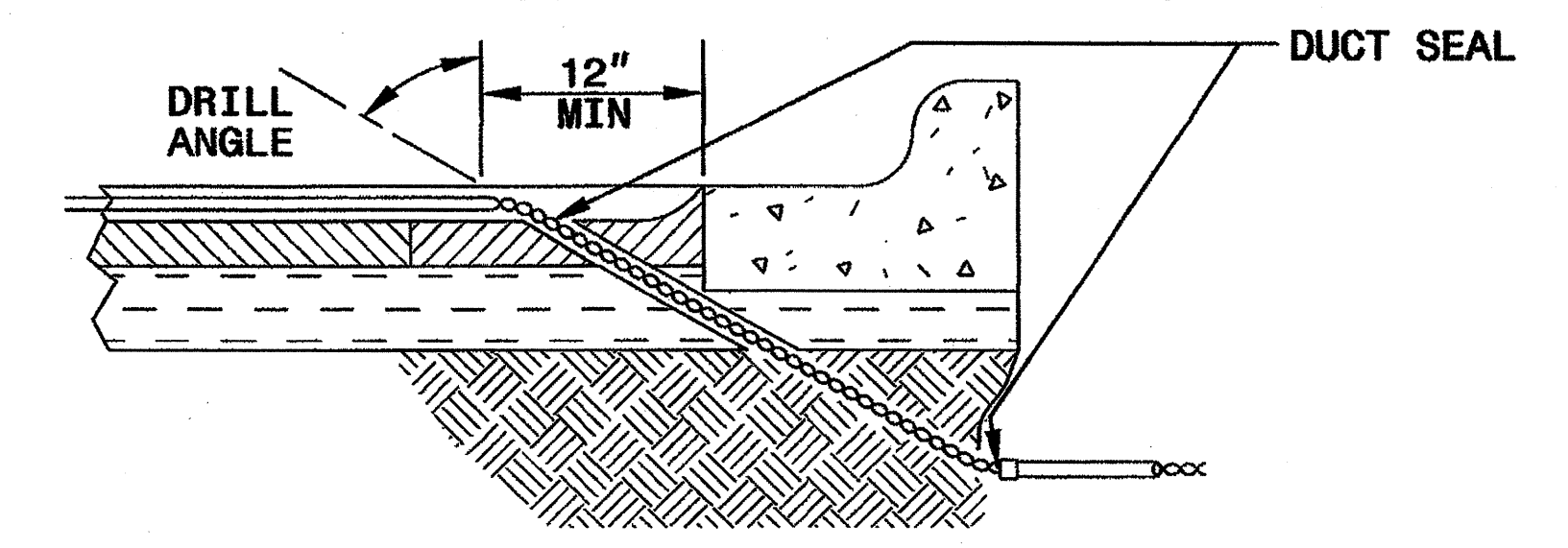


NOTE

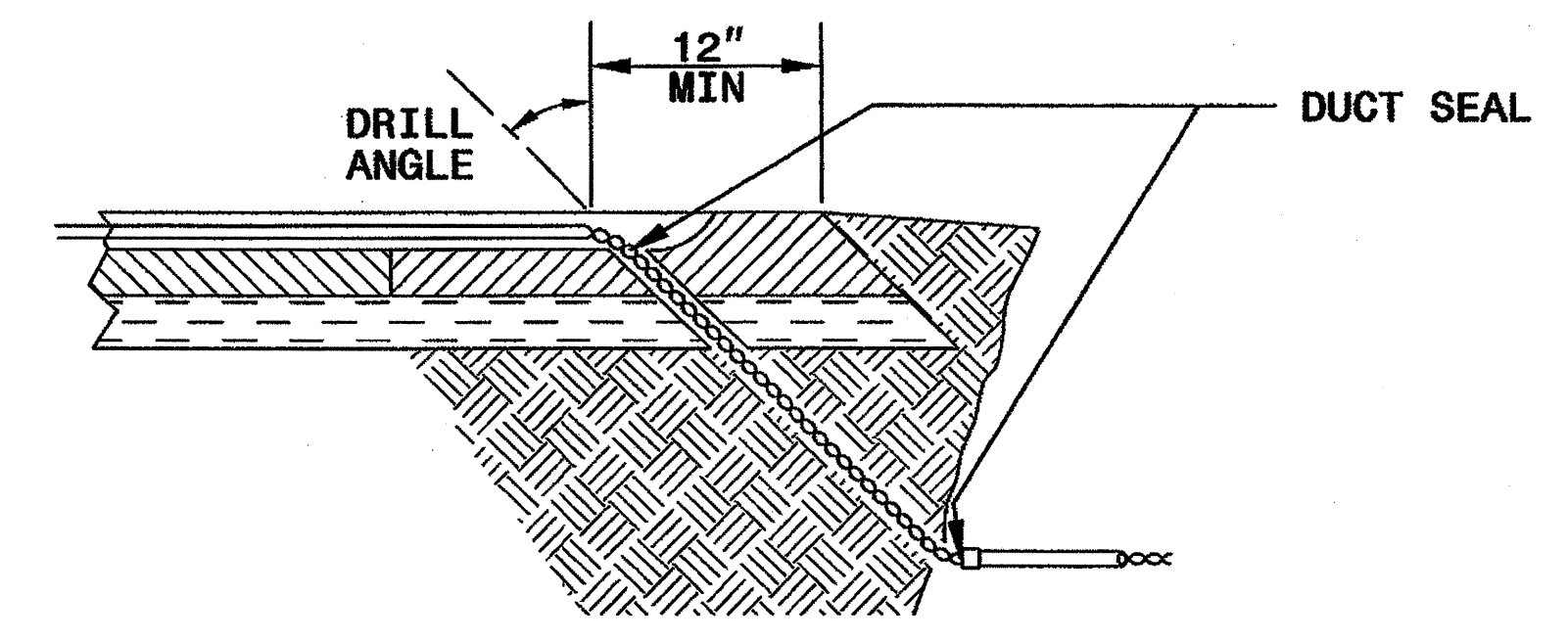
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

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.

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

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

Milton I. Dean 11/24/08
SIGNATURE DATE

24-4017-2005_08/29
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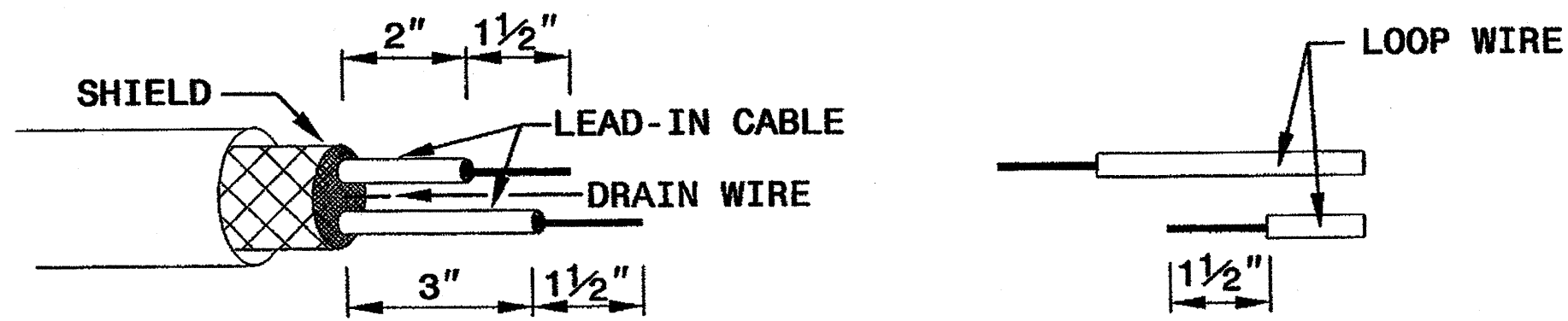
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

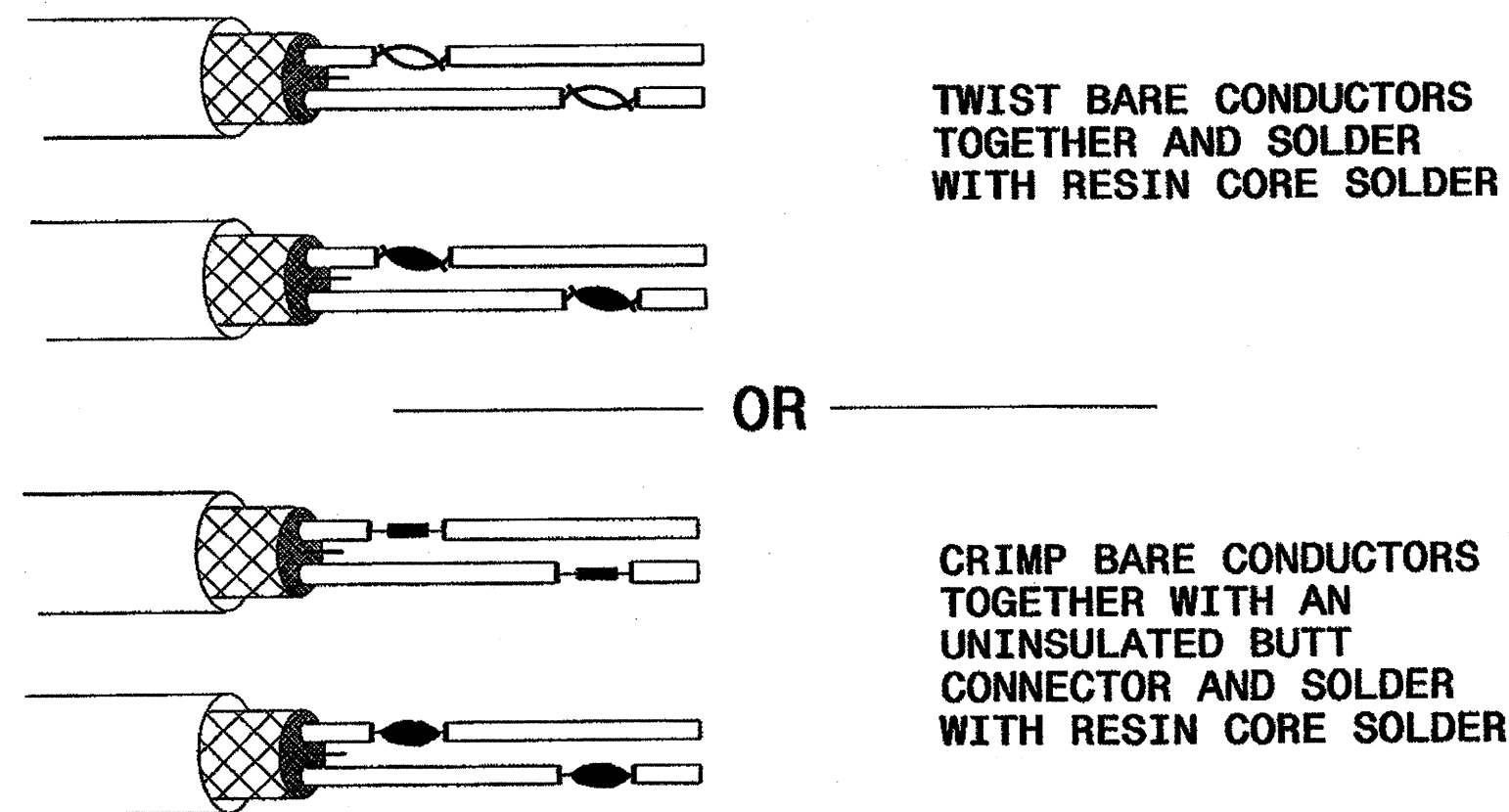
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

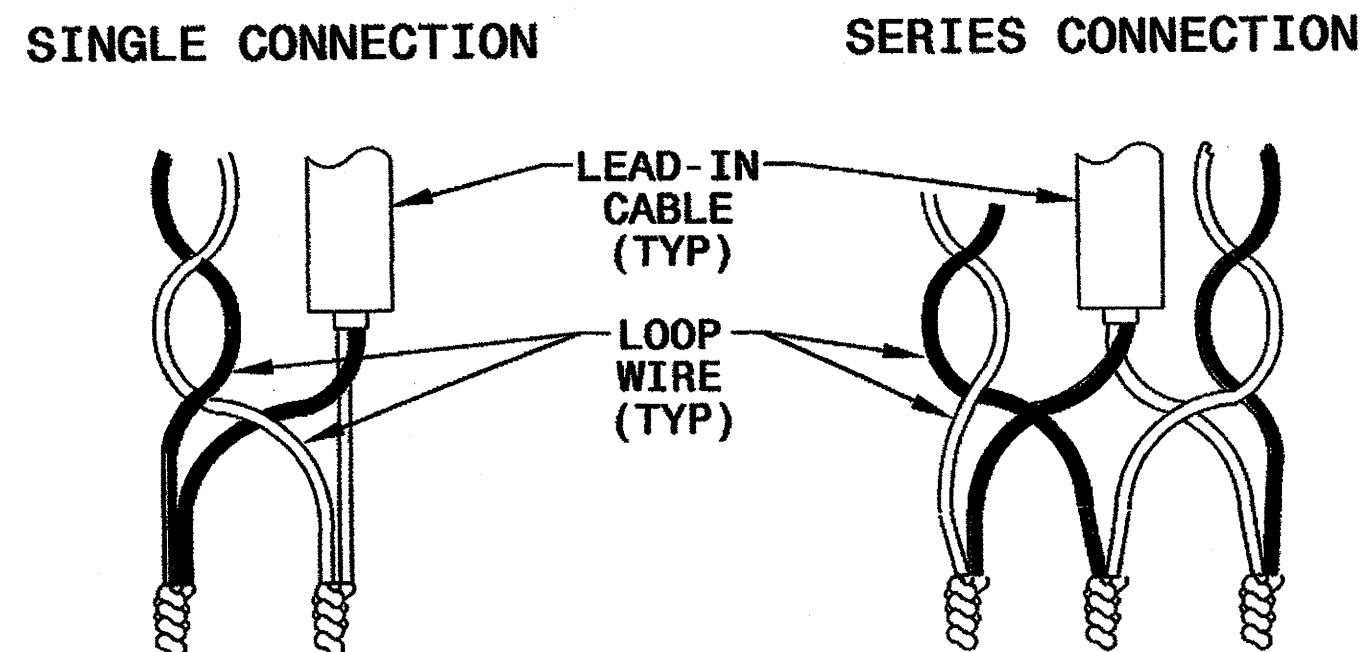


STEP 2. CONNECT AND SOLDER

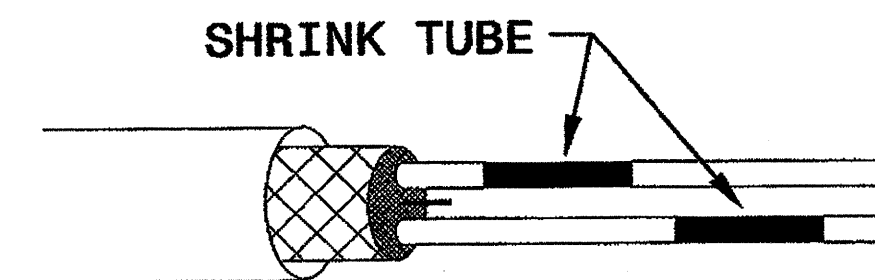


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

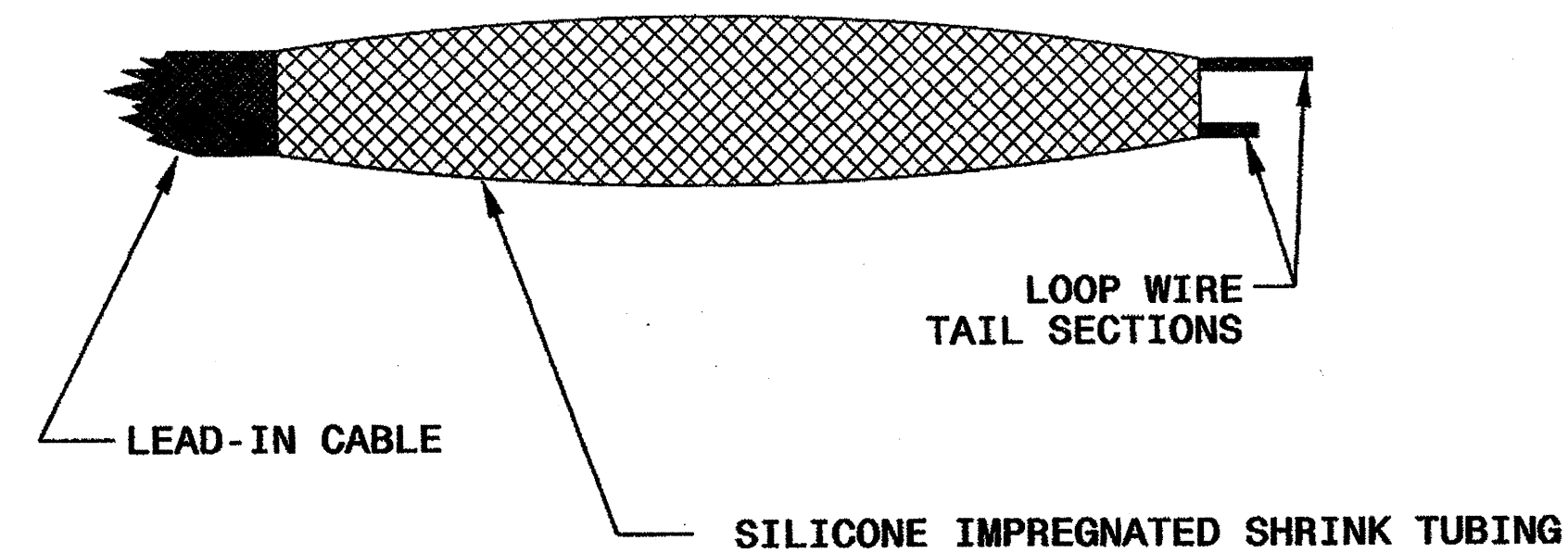
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



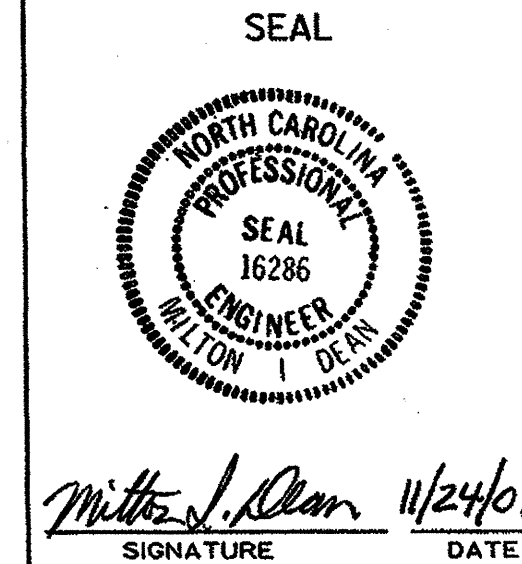
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

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

SHEET 3 OF 3
1725D01

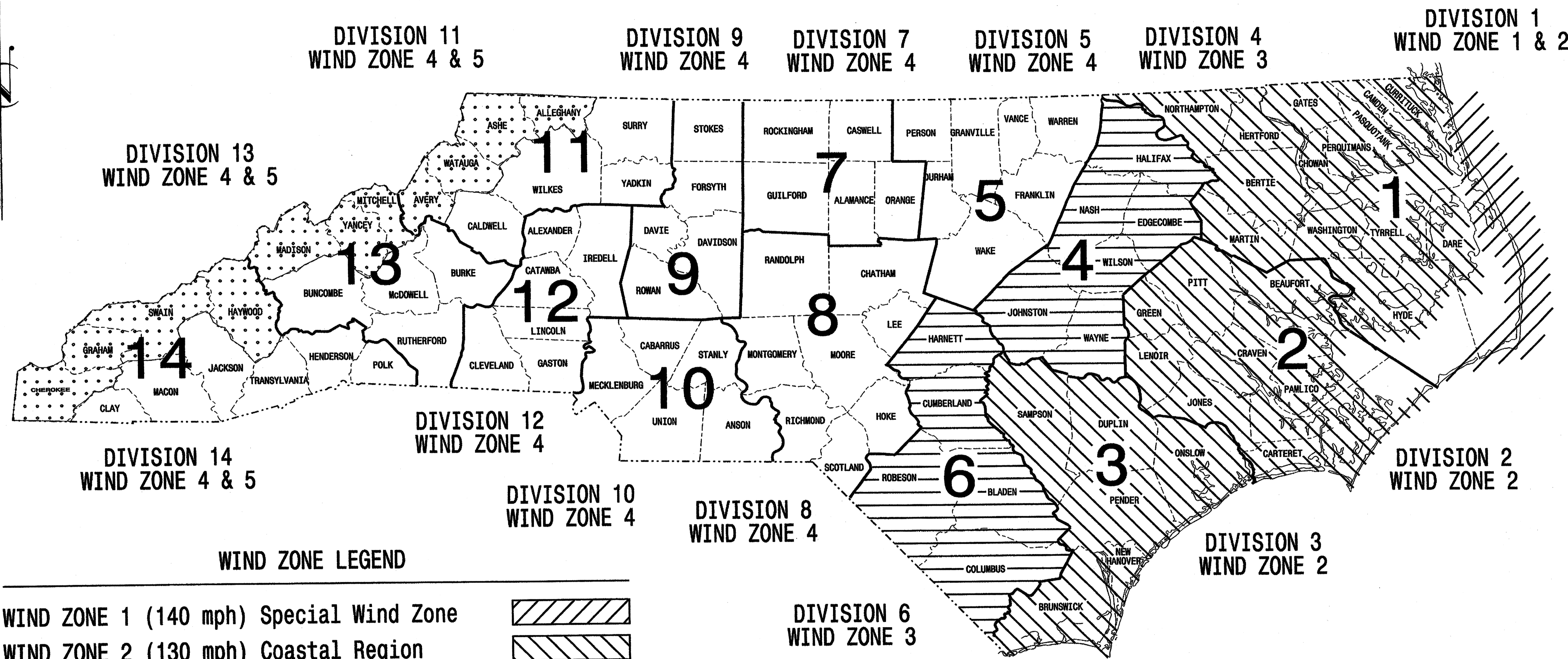
See Plate for Title



STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	U-3110B	Sig. 15
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

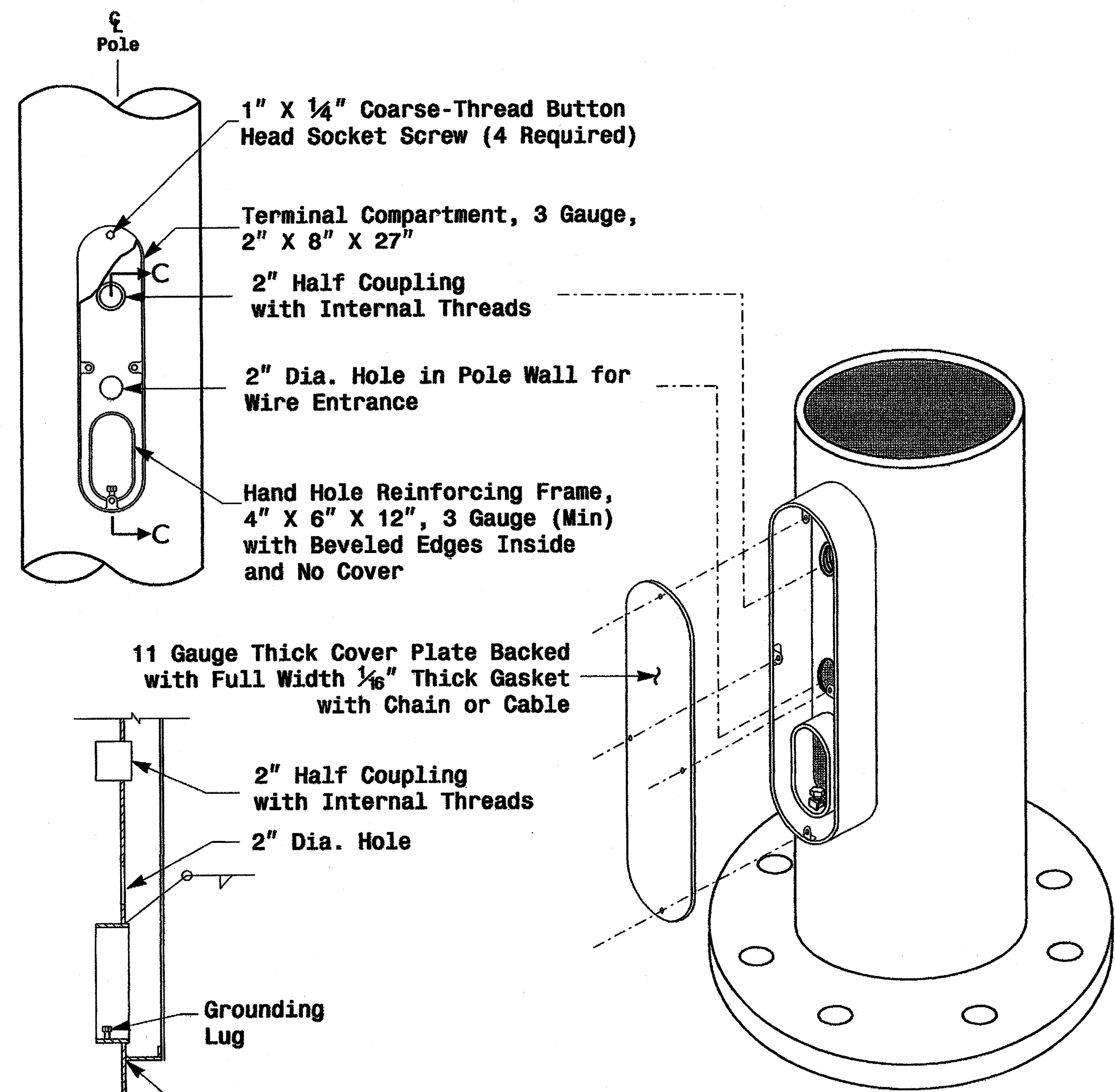
INDEX OF PLANS	
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

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

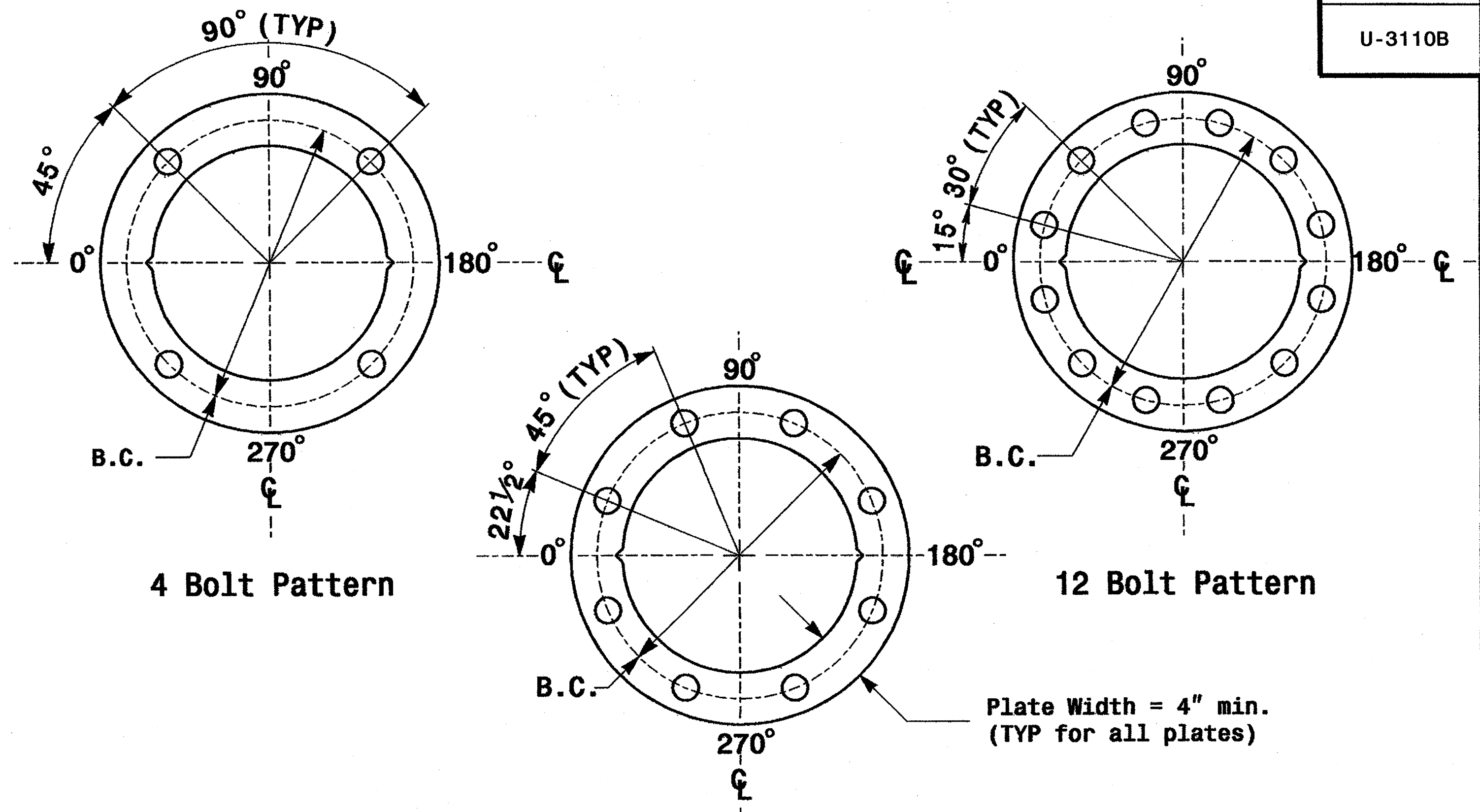
SEAL

D. Sarkar
 SIGNATURE DATE 7.21.2009



Section C-C 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



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

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

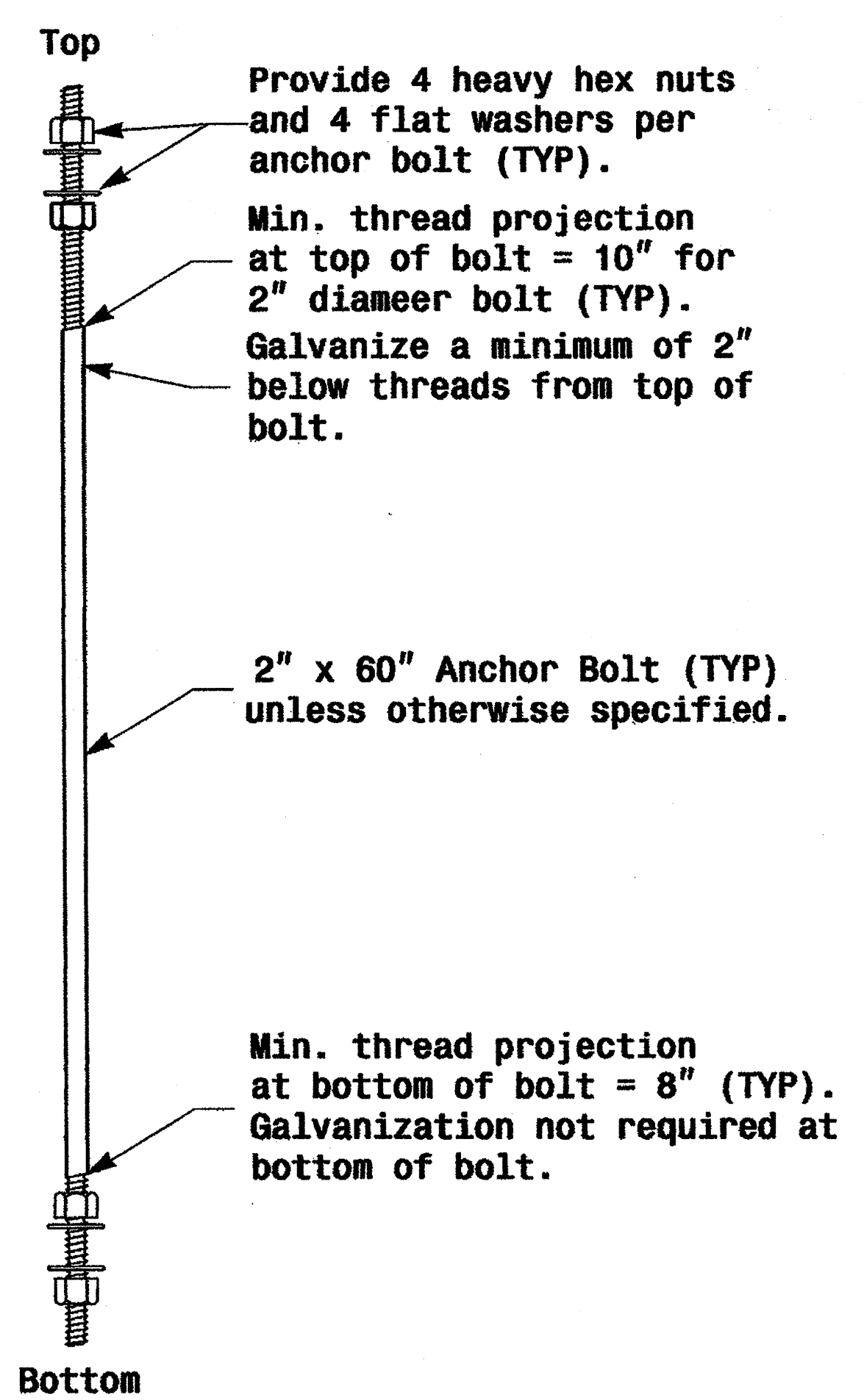
MFG _____ MFG. DATE: MM/YY
 SECTION D/T/L/Y _____
 NCDOT STANDARD _____

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

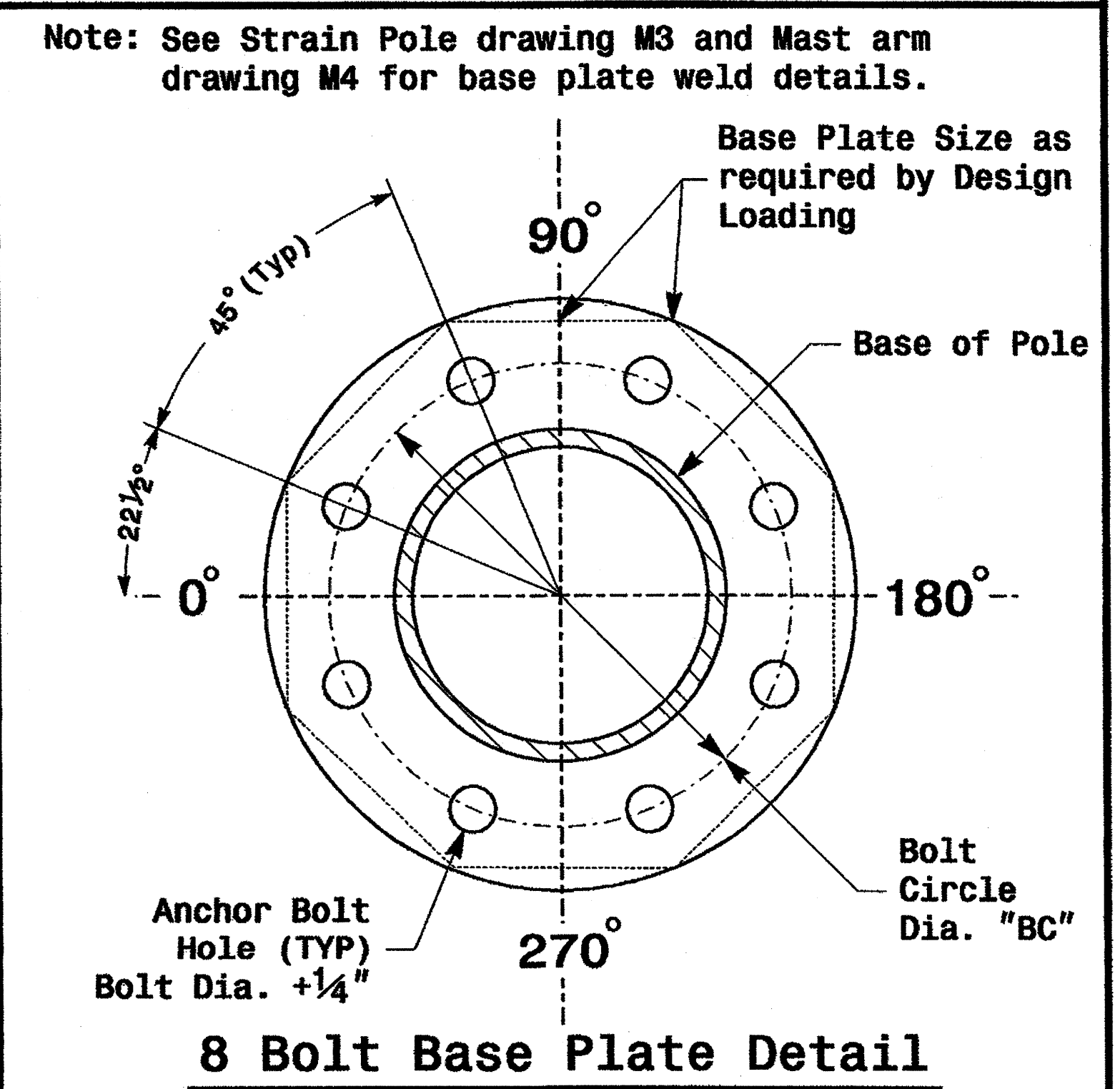
Shaft I.D. Tag
 (Provide on Strain Poles and Mast Arm Poles)

- 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



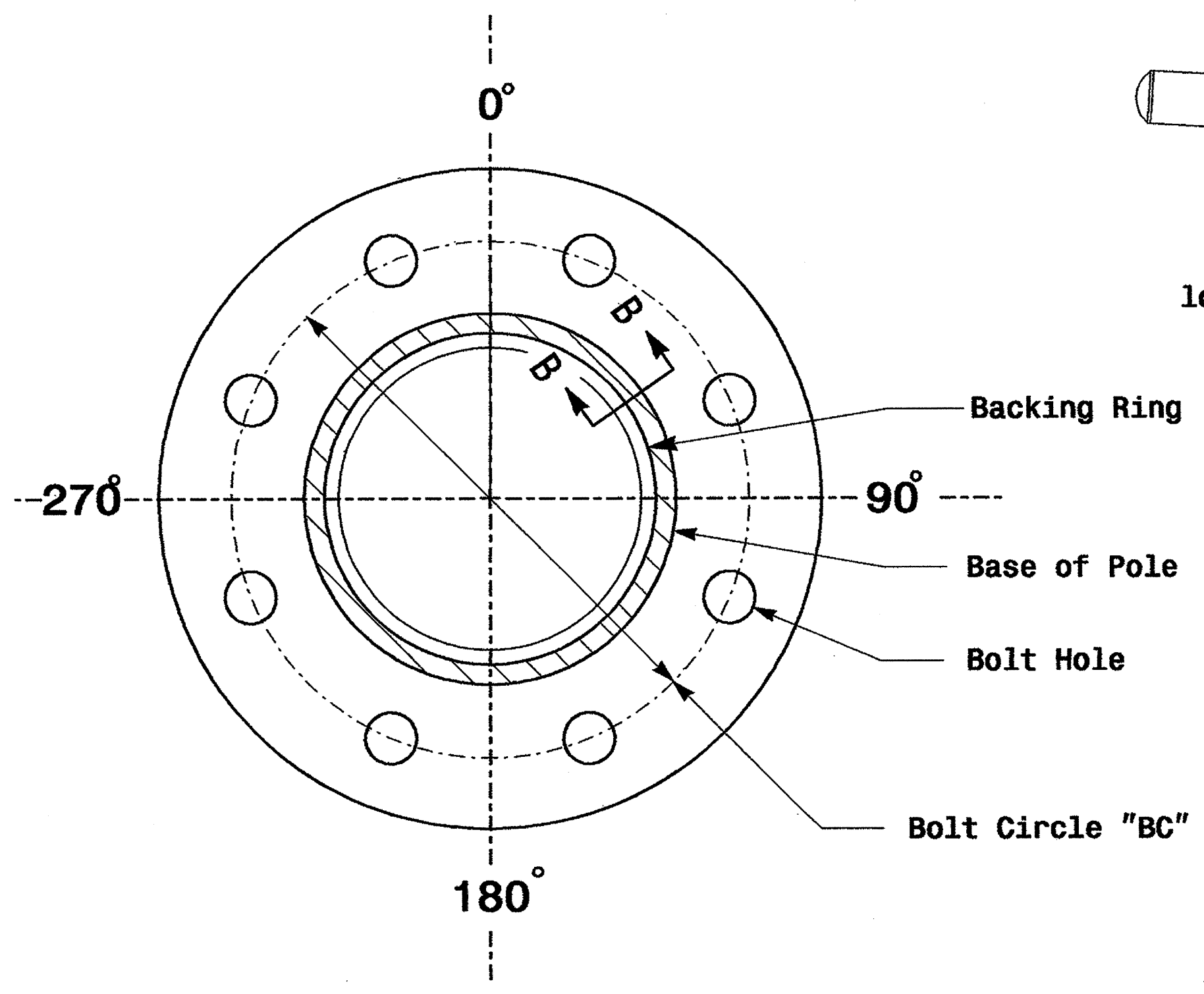
Anchor Bolt Detail



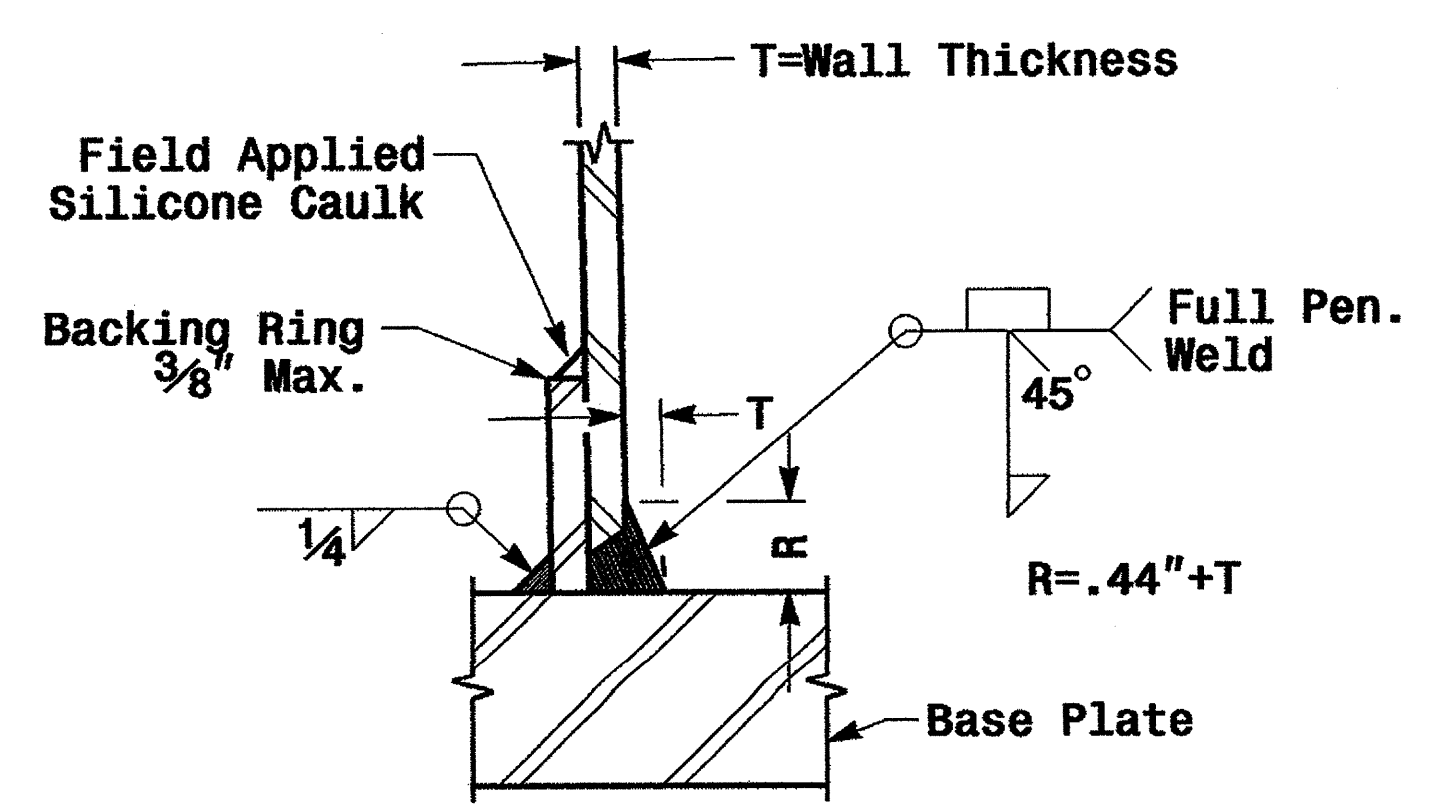
Prepared in the Office of: **North Carolina Department of Transportation**
Typical Fabrication Details Common To All Metal Poles
 PLAN DATE: May 2005 REVIEWED BY: C.F. Andrews
 PREPARED BY: P.L. Alexander REVIEWED BY: A.M. Esposito
 SCALE: 0 NA NONE
 REVISIONS: _____ INIT.: _____ DATE: _____
 Signature: *D. Sarkar* 2.2.2005
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094
 SIG. INVENTORY NO.

Fabrication Details - All Poles

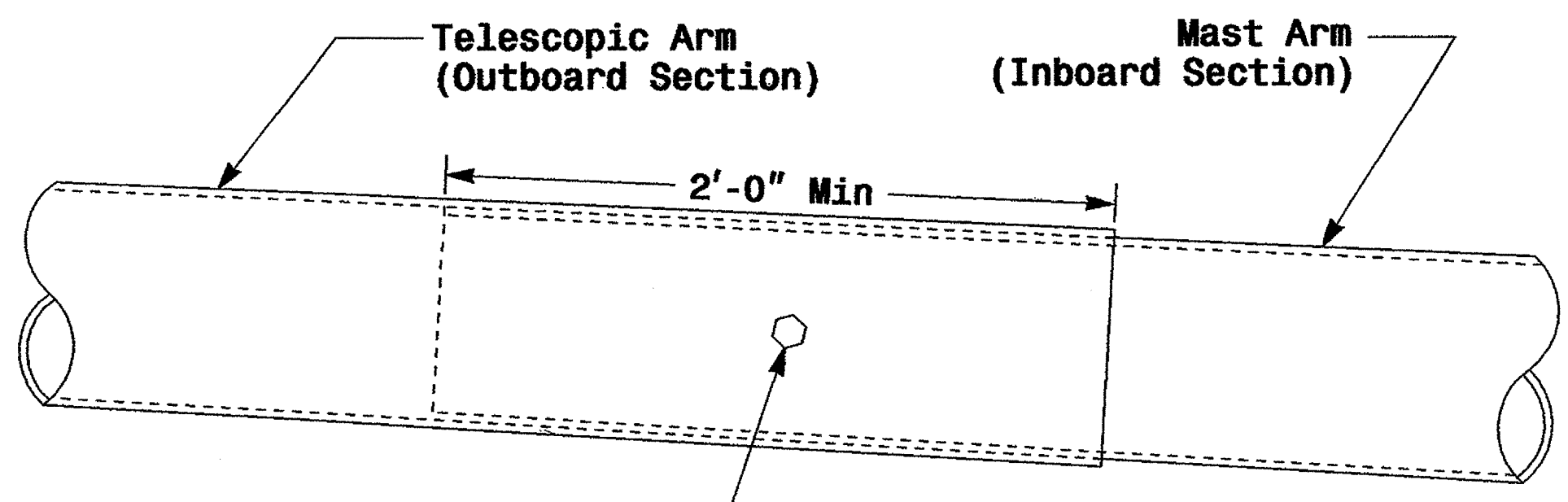
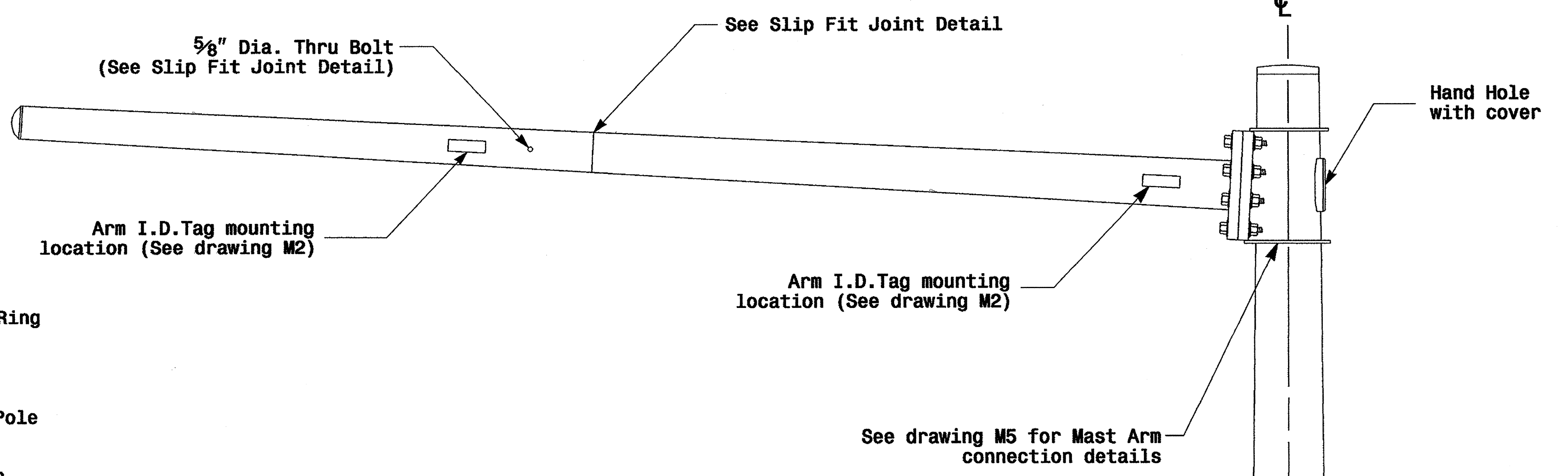
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Section A-A
(See drawing M 2)
Pole Base Plate

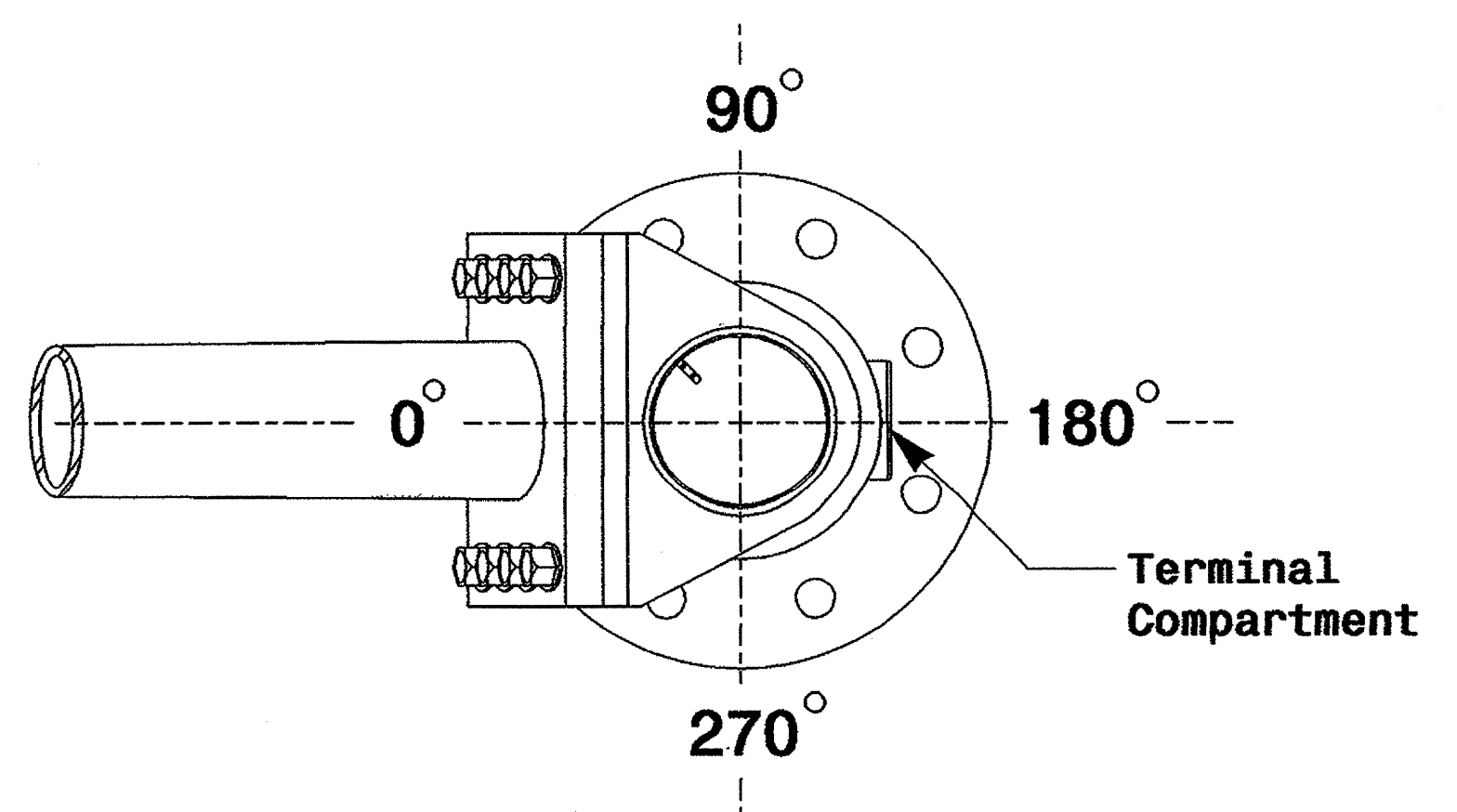


Section B-B
(Pole Attachment to Base Plate)
Full-Penetration Groove Weld Detail

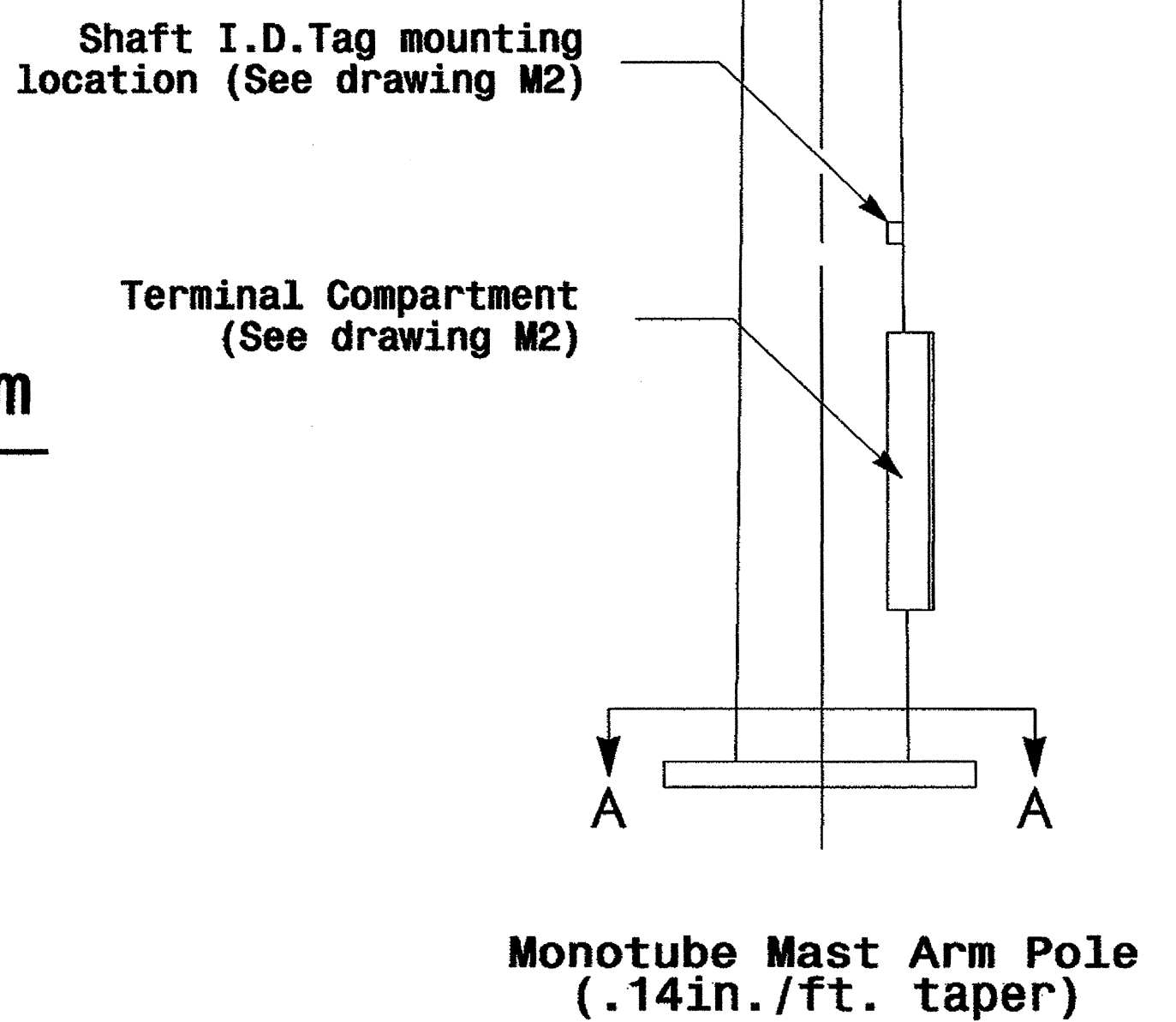


3/4" Factory Drilled Hole in Outboard Tube. Field Drill Inboard Tube. 5/8" Galvanized Thru Stud with (2) Hex. Locknuts Ea.

Slip Fit Joint Detail for Mast Arm



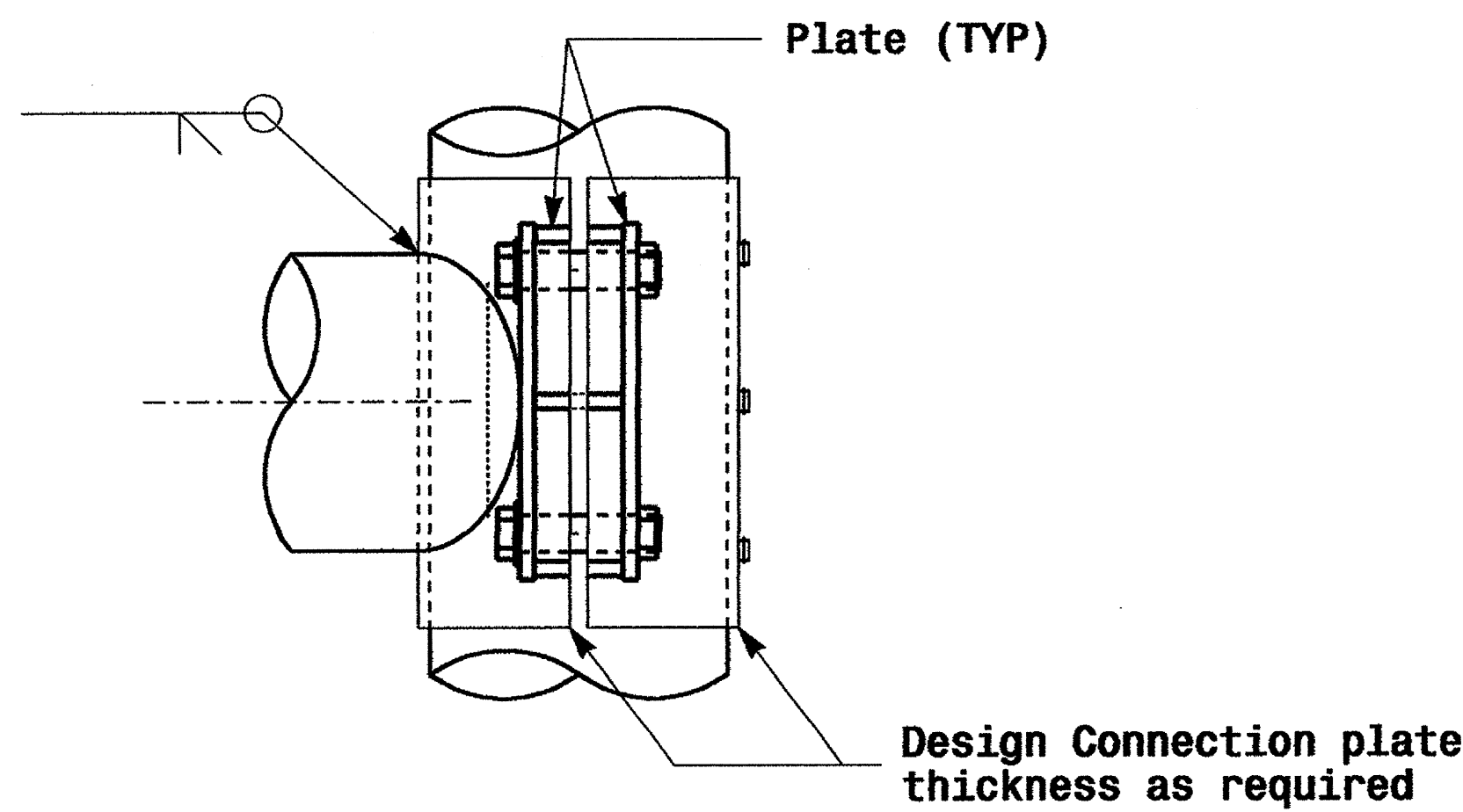
Mast Arm Radial Orientation



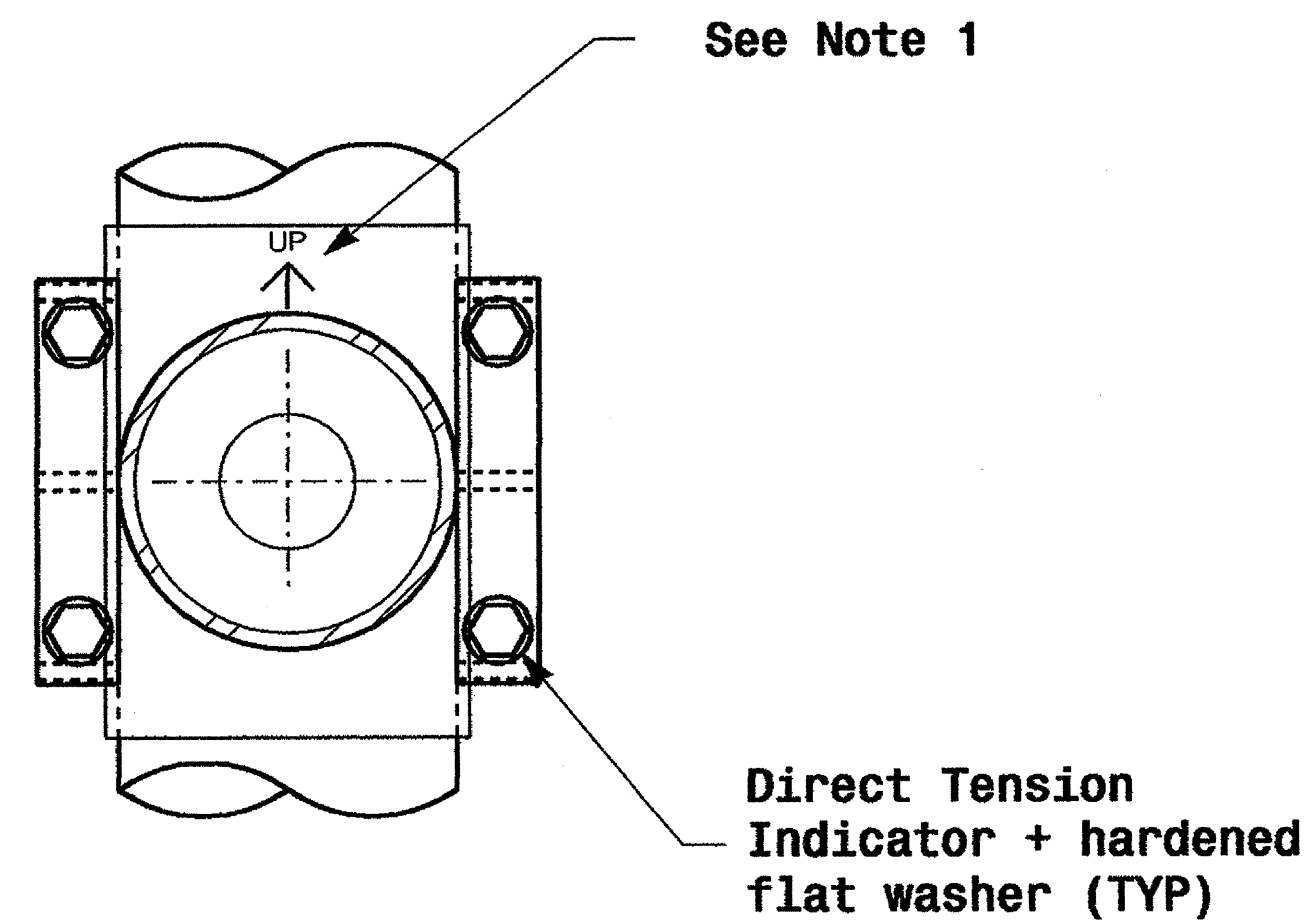
	Typical Fabrication Details for Mast Arm Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
SCALE: 0 NA NONE	REVISIONS:	INIT. DATE:	SIG. INVENTORY NO.:

01-SEP-2005 14:08 w:\ppl\lee-un1\workgroups\2004 metal pole standards\2004 mh-dgn.plt

Adjustable Clamp Type Bolted Mast Arm Connection

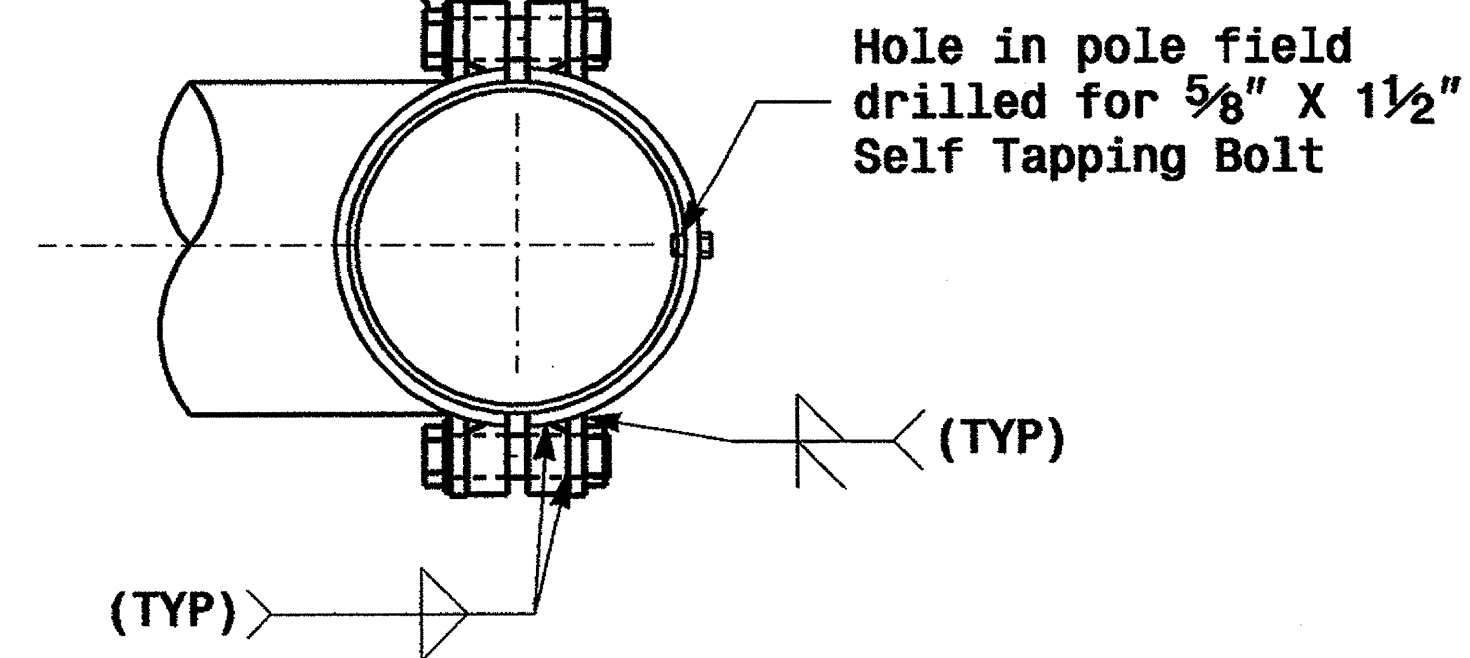


Side Elevation View



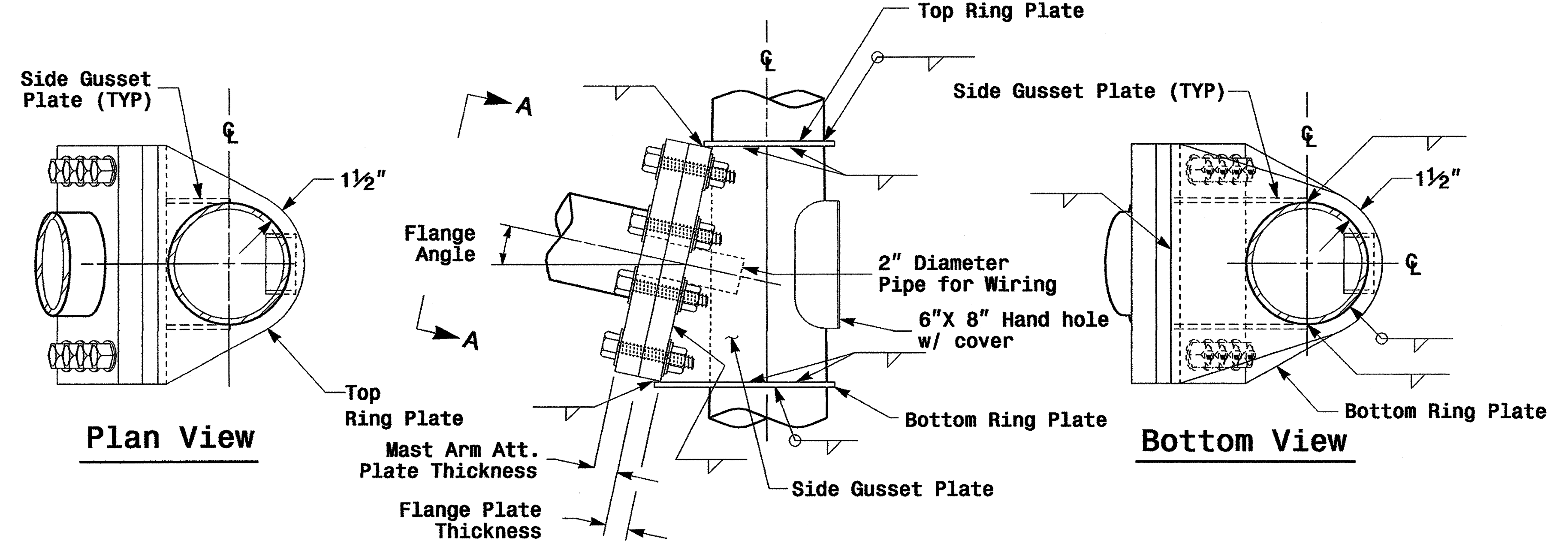
Front Elevation View

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

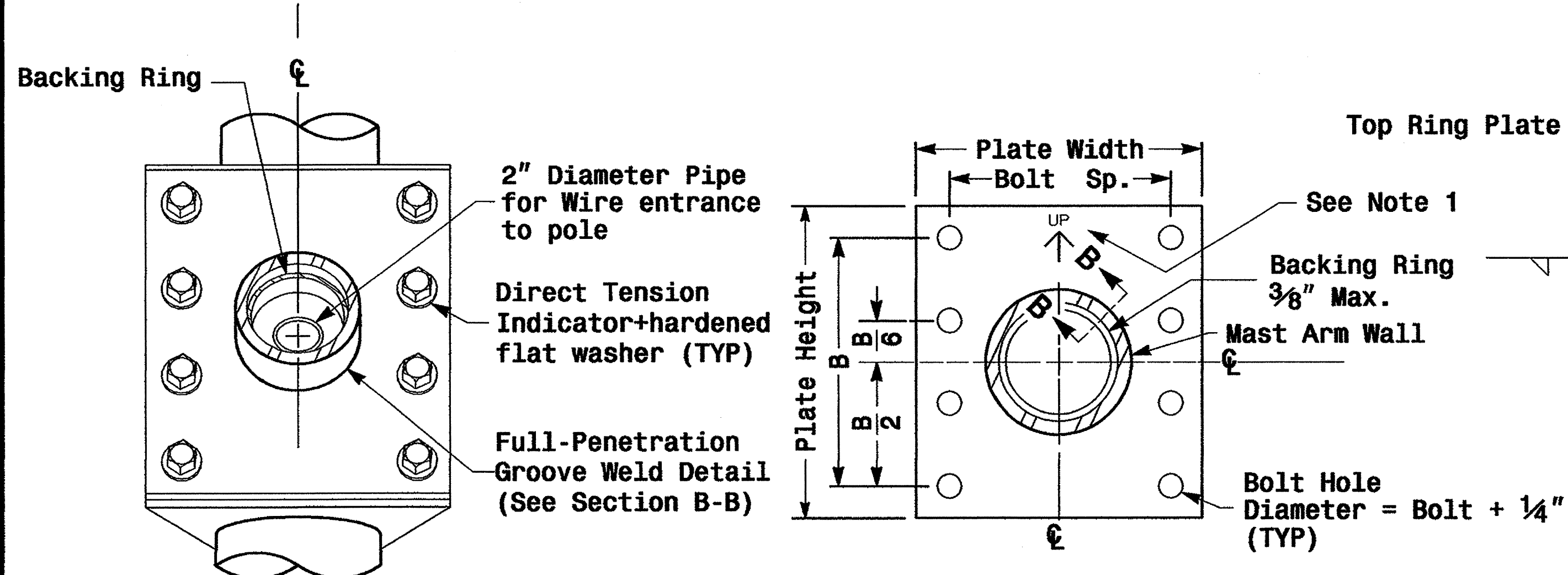


Plan View

Welded Ring Stiffened Mast Arm Connection



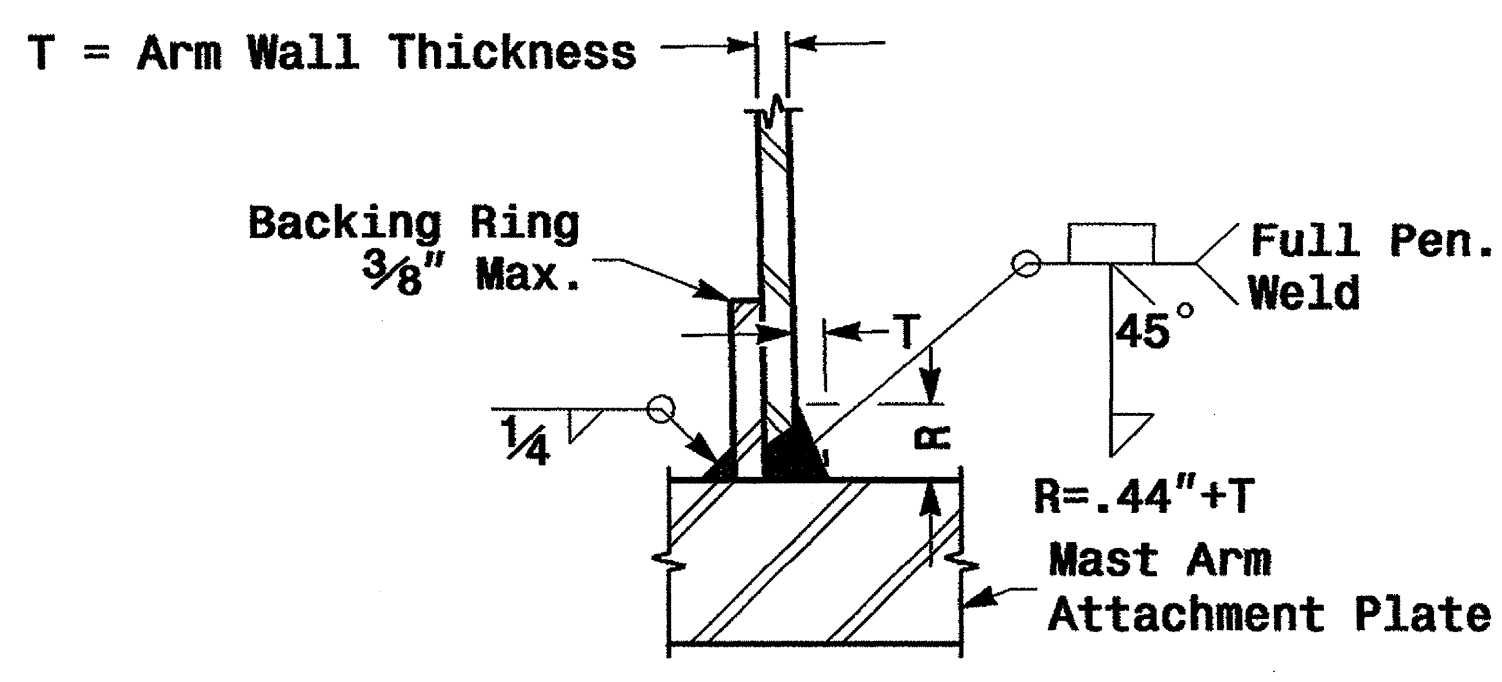
Side Elevation View



Front Elevation View

Mast Arm Attachment Plate

Back Elevation View



Full-Penetration Groove Weld Detail

Notes:

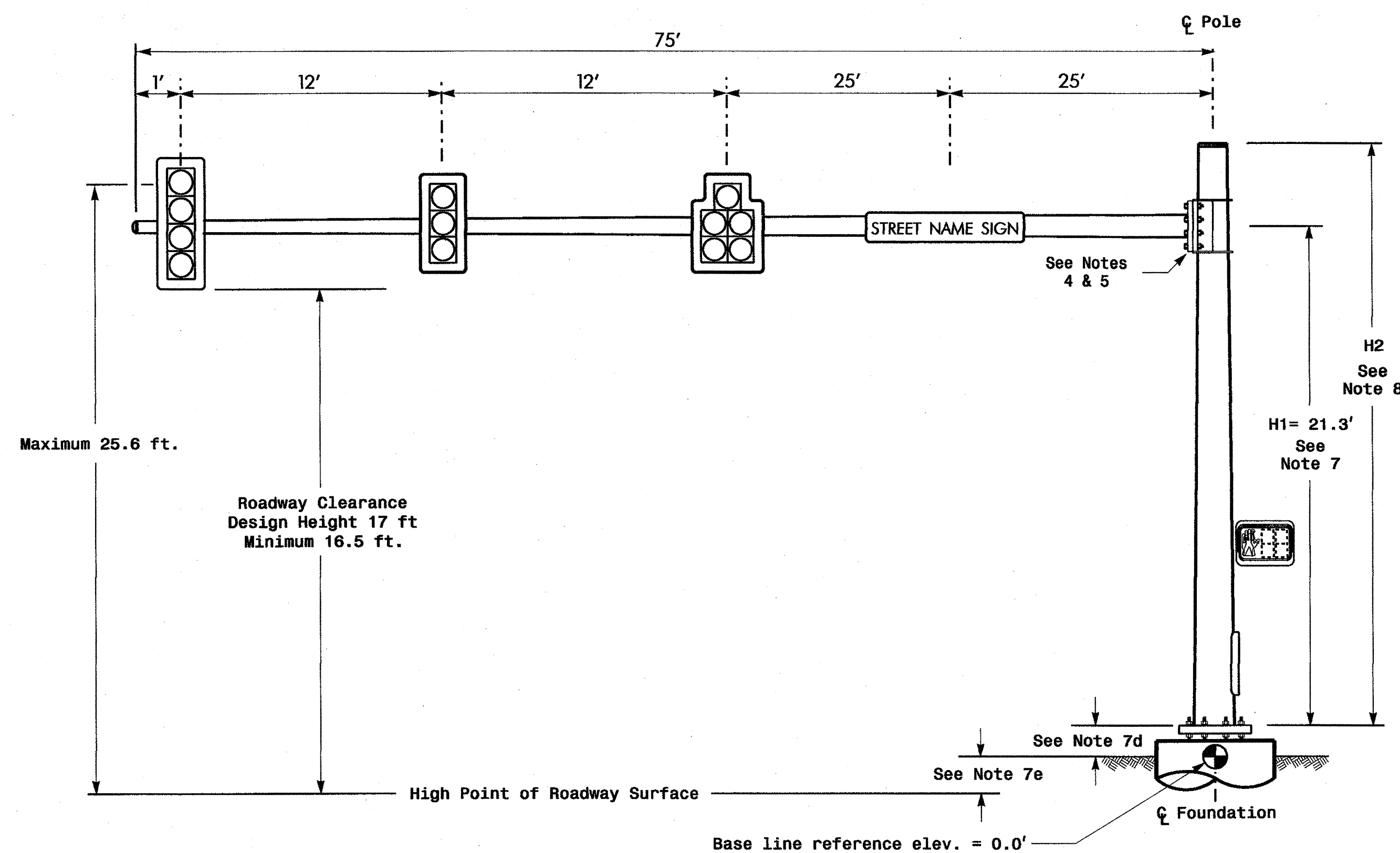
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing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

Fabrication Details - Mast Arm Poles

01-SEP-2005 14:11 w:\p001\ee-unit\tech\groups\2004 metal pole standard\ds0204.m5.dgn

	Fabrication Details For Mast Arm Connection To Pole		
	PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews	
SCALE: NONE	REVISIONS:	INIT. DATE:	SIGNATURE: <i>P.L. Alexander</i> 9.2.2005
222 N. McDowell St., Raleigh, NC 27603			SIG. INVENTORY NO.

Design Loading for METAL POLE NO. 1

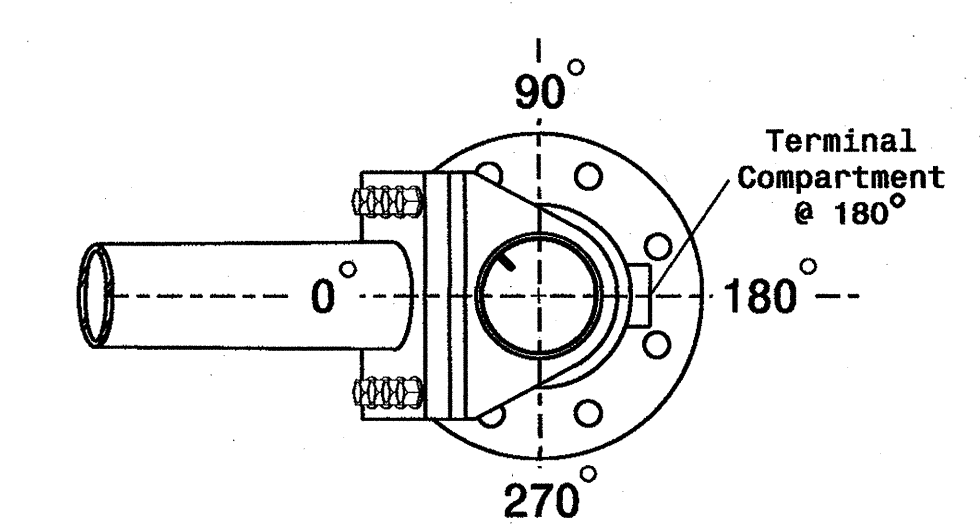


Elevation View

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.

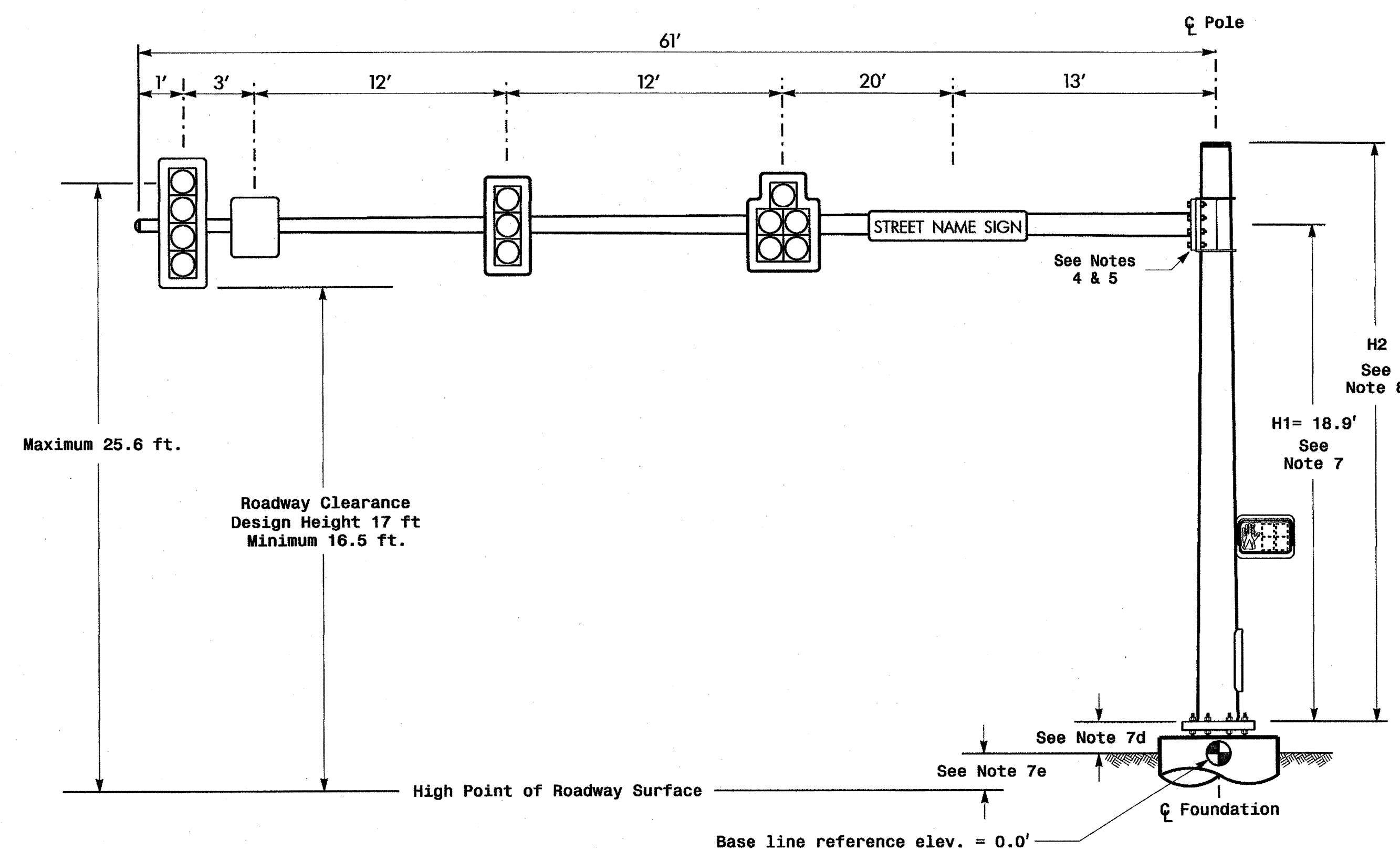
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.49 ft.	-0.24 ft.
Elevation difference at Edge of travelway or face of curb	n/a	n/a

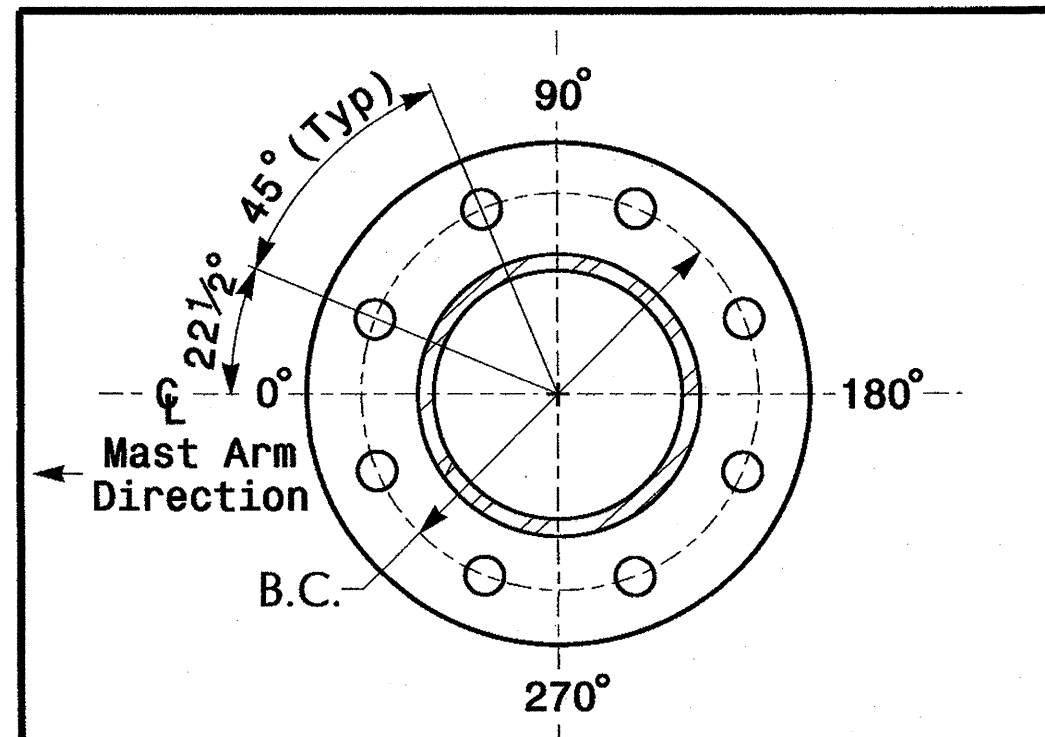


POLE RADIAL ORIENTATION

Design Loading for METAL POLE NO. 2

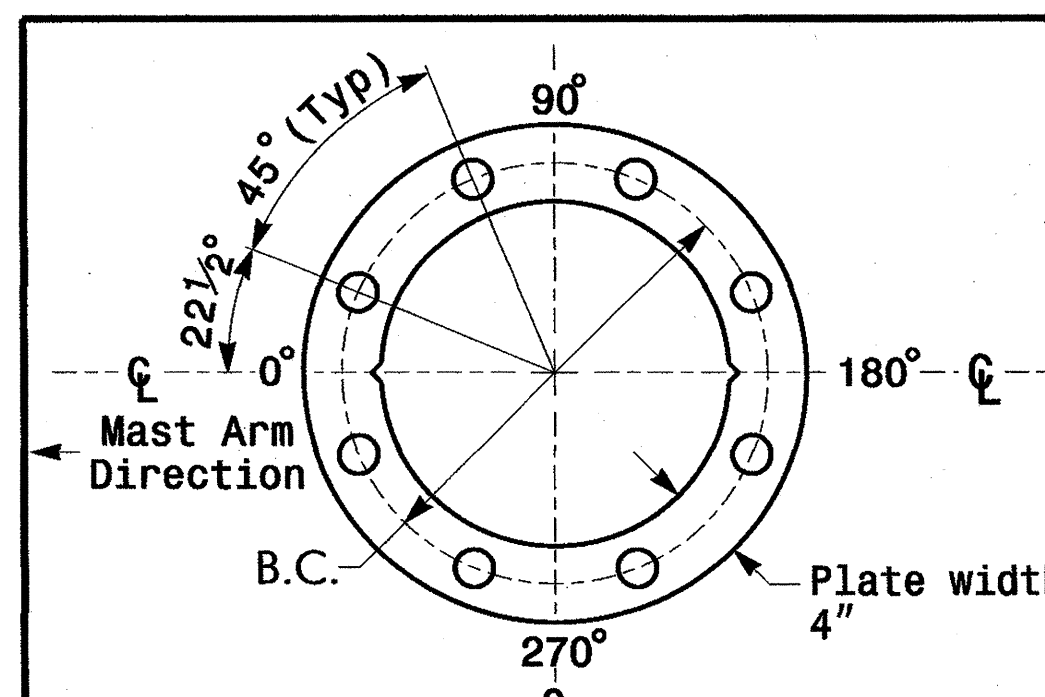


Elevation View



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
	12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	RIGID MOUNTED WITH ASTRO-SIGN-BRAC	5.0 S.F.	24.0" W X 30.0" L	11 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 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.

Design Requirements

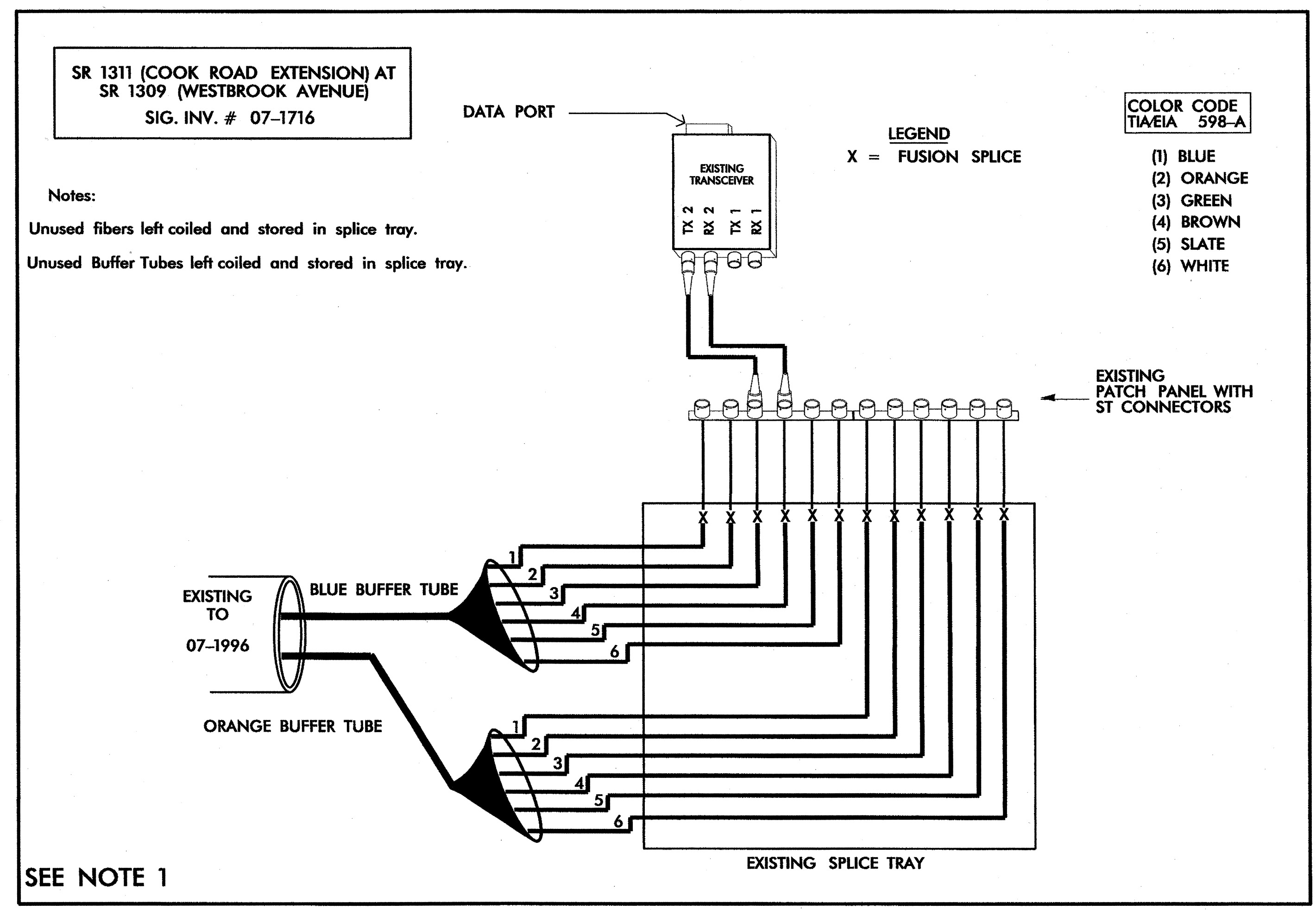
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the 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 & Geometrics 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)

	SR 1311 (University Drive) / SR 1311 (Cook Road) at SR 1309 (West Brook Avenue) / SR 1309 (Alamance Street)	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIEMBA 026486 6/8/10
	Division 7 Alamance County Burlington PLAN DATE: May 2010 REVIEWED BY: PREPARED BY: TS Thigpen REVIEWED BY:	
SCALE 0 N/A N/A	REVISIONS INIT. DATE	SIGNATURE DATE

15-JUN-2010 10:29 S:\TSS\Signal\Projects\3110B\Signal\Drawings\116\116.dwg P2.dwg

FIBER OPTIC CABLE



NOTE 1:
 CONTRACTOR TO RECORD EXISTING FIBER OPTIC SPLICES IN THE INTERCONNECT CENTER AND JUMPER CONFIGURATIONS PRIOR TO REMOVING THE CABINET FROM THE FOUNDATION.
 DO NOT DAMAGE THE INTERCONNECT CENTER AND FIBER WHILE RELOCATING THE EQUIPMENT FROM THE EXISTING CABINET TO THE NEW CABINET.
 RECONNECT JUMPERS AS PREVIOUSLY RECORDED.
 REUSE EXISTING FIBER OPTIC TRANSCEIVER.

	ZONE 13 SPLICE PLAN		
	DIVISION 7 ALAMANCE COUNTY ELON COLLEGE PLAN DATE: JUNE 2010 REVIEWED BY: I. N. AVERY PREPARED BY: P. C. LOUDER REVIEWED BY: G.A. FULLER, PE		
SCALE 	REVISIONS _____ _____ _____	INIT. DATE _____ _____ _____	SIGNATURE DATE _____ _____