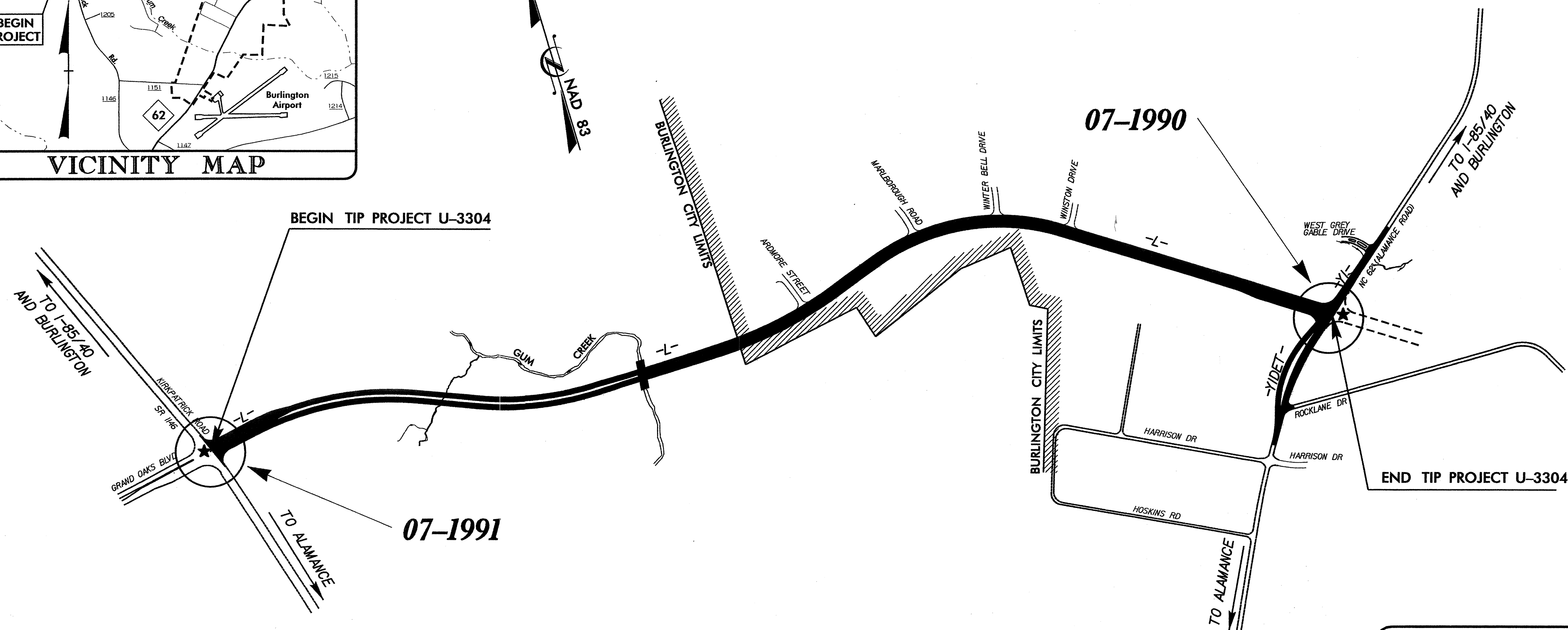
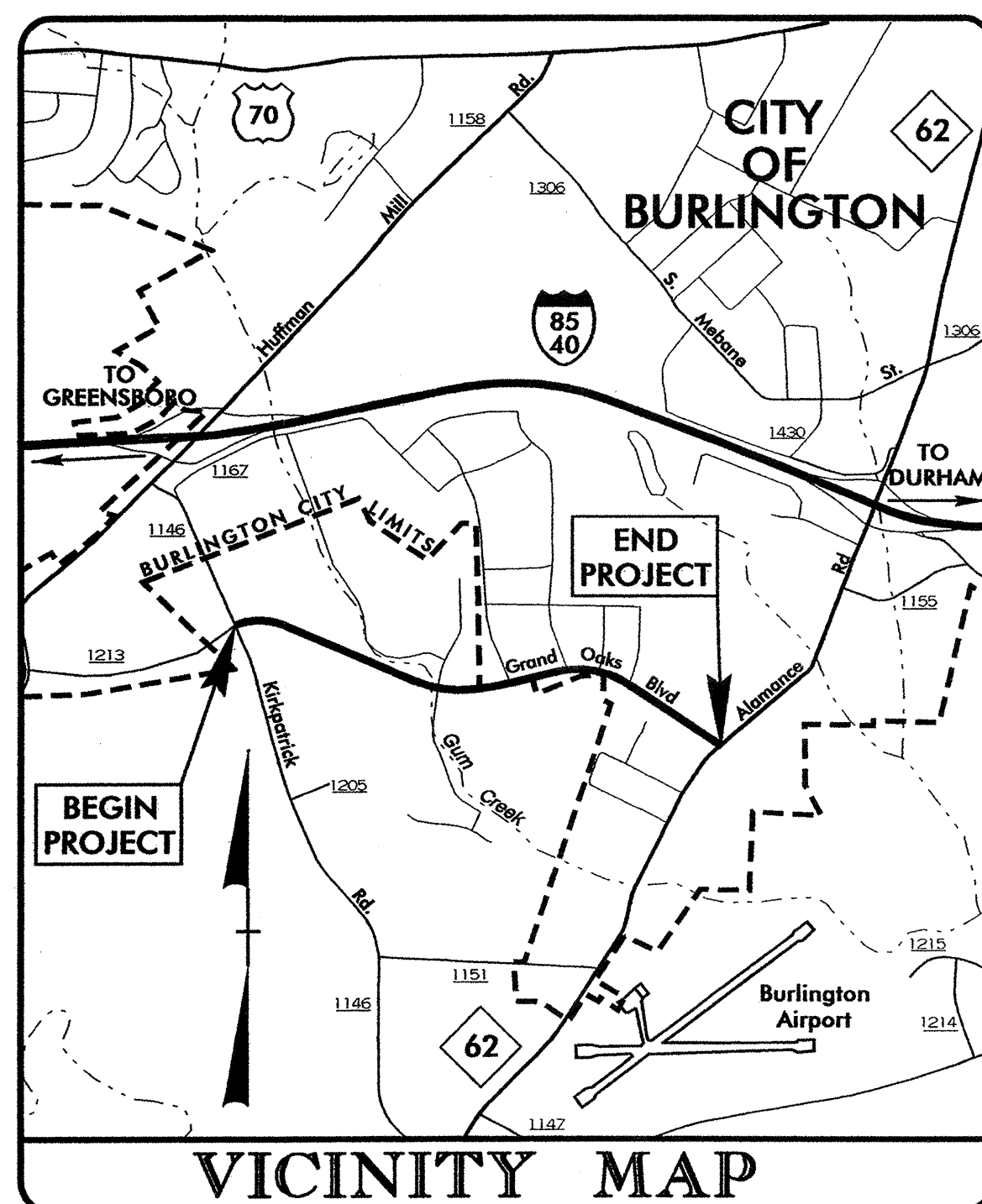


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# ALAMANCE COUNTY

**LOCATION: BURLINGTON - GRAND OAKS BLVD EXT  
FROM SR 1146 (KIRKPATRICK RD) TO  
NC 62 (ALAMANCE RD)**  
**TYPE OF WORK: TRAFFIC SIGNALS &  
COMMUNICATIONS CABLE ROUTING PLANS**

Project: U-3304



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

Sheet #	Reference #	Index of Plans Location/Description
Sig. 1		Title Sheet
Sig. 2-5	07-1991	SR 1146 (Kirkpatrick Road) at Grand Oaks Boulevard
Sig. 6-9	07-1990	NC 62 (Alamance Road) at Grand Oaks Boulevard
Sig. 10-14	N/A	Standard Drawings for Metal Poles
Sig. 15-19	N/A	Communications Cable Routing Details
Sig. 20-22	N/A	Inductive Detection Loops Details

**INTELLIGENT TRANSPORTATION AND SIGNALS UNIT**  
Contacts:  
**T. J. Williams, PE - Signals and Geometrics Contracts Engineer**  
**G. C. Brown, PE - Signal Equipment Design Engineer**  
**G. G. Murr, Jr., PE - Intelligent Transportation Systems Engineer**

Prepared In the Office of:  
DIVISION OF HIGHWAYS  
TRAFFIC ENGINEERING AND SAFETY SYSTEMS  
BRANCH

750 N. Greenfield Parkway, Garner, NC 27529

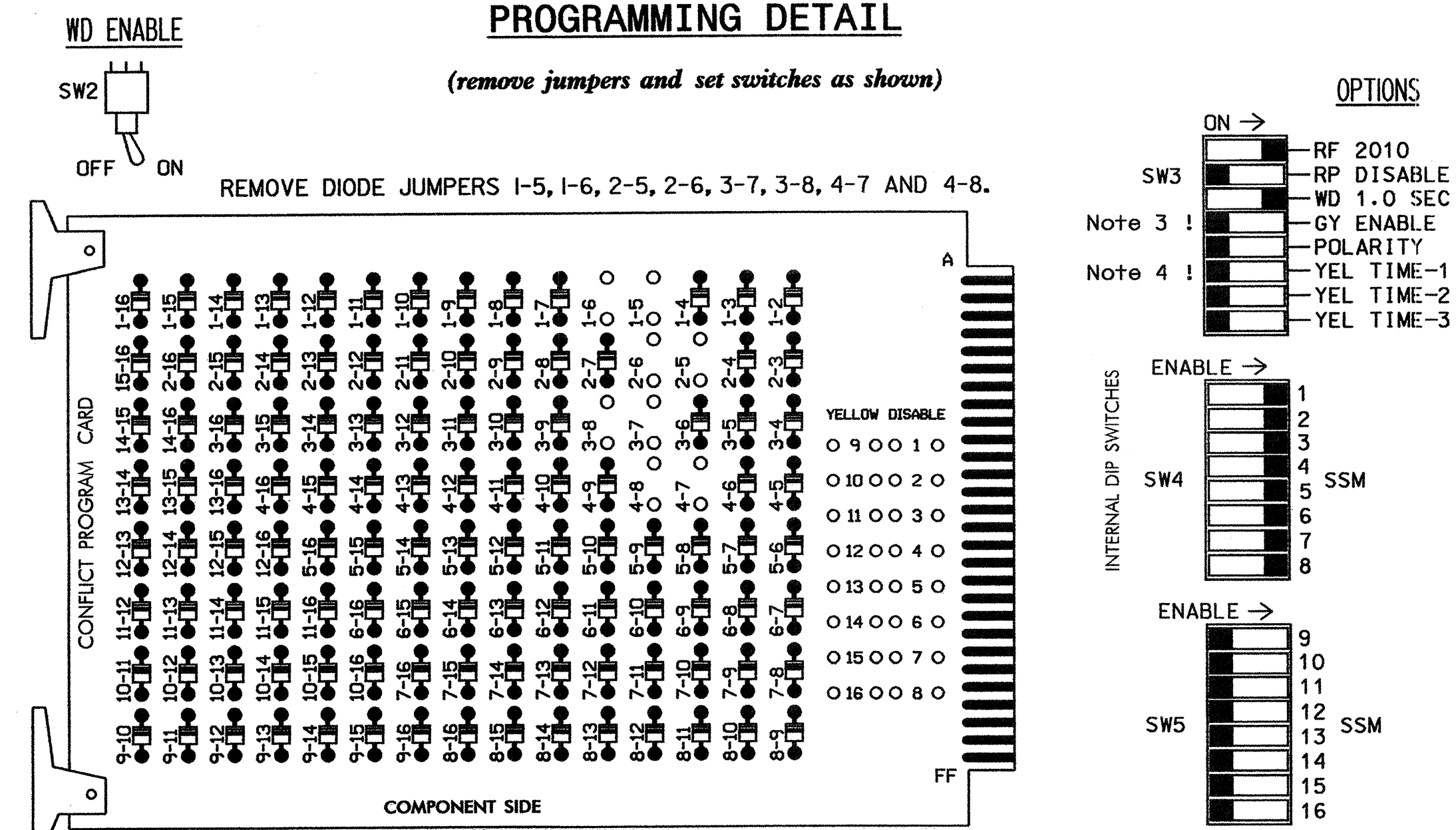
I2-MAR-2008 13:26 s:\its signals\workgroups\tip\_projects\U-3304\signals\design\titlesheet\U-3304\_tsh.dgn





**EDI MODEL 2010ECL CONFLICT MONITOR**

**PROGRAMMING DETAIL**



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.
  - Make sure switch GY Enable is in the OFF position.
  - Make sure switches YEL TIME-1, YEL TIME-2, and YEL TIME-3 are in the OFF position.

**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 9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phases 4 and 8, on controller unit, for dual entry.
- Program phases 2 and 6, on controller unit, for volume density operation.
- The cabinet and controller are part of the Burlington City Signal System.

**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21, 22, 23	NU	23, 81	41, 42	NU	21, 42	61, 62, 63	NU	41, 63	81, 82	NU
RED	*	128		*	101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126				117			132			123	
GREEN ARROW	127				118			133			124	

NU = Not Used  
\* Denotes install load resistor. See load resistor installation detail this sheet.

**EQUIPMENT INFORMATION**

CONTROLLER.....EAGLE 2070L  
CABINET.....EAGLE 332  
SOFTWARE.....SE-PAC2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...12  
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8  
PHASES USED.....1,2,3,4,5,6,7,8  
OVERLAPS.....NONE

**BACK-UP PROTECTION PROGRAMMING DETAIL**

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

SE-PAC PHASE DATA	PRESS # DESIRED
1-VEHICLE TIMES	6-N.LOCK & MISC
2-DENSITY TIMES	7-SPEC. SEQUENCE
3-PEDEST. TIMES	8-SPEC. DETECTOR
4-INIT & N.A. RESP	9-PHASE COPY
5-V & P RECALLS	0-MISC PED OPTIONS
	F-PRIOR MENU

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

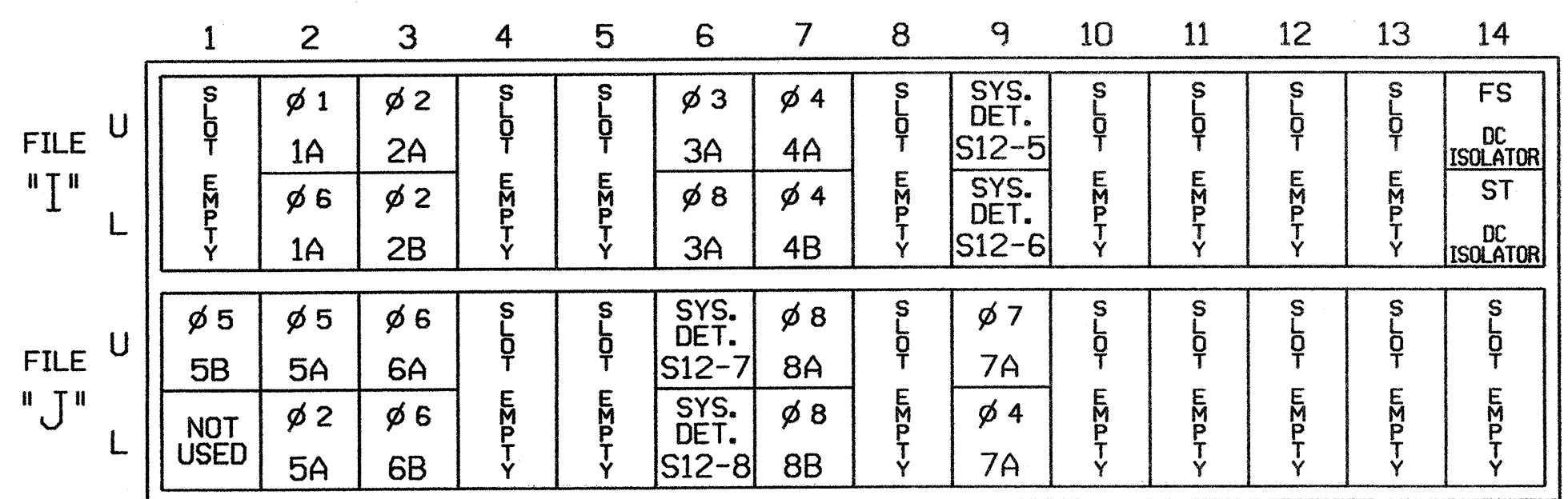
OMIT:## PHS ON OMITS THIS PHASE  
-YEL:## PHS YEL OMITS THIS PHS YEL  
OCAL: WHEN OMIT, DETS CALL## PHS

A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

Special Sequence programming complete.

**INPUT FILE POSITION LAYOUT**

(front view)



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

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A <sup>1</sup>	TB2-5,6	I2U	39	3	1	15	
	TB2-7,8	I2L	43	4	6		
2A	TB2-9,10	I3U	63	5	2		
	TB2-11,12	I3L	76	6	2		
3A <sup>2</sup>	TB4-9,10	I6U	41	11	3	15	
	TB4-11,12	I6L	45	12	8	3	
4A	TB6-1,2	I7U	65	13	4	100	2,4
	TB6-3,4	I7L	78	14	4		
5A <sup>2</sup>	TB3-5,6	J2U	40	21	5	15	
	TB3-7,8	J2L	44	22	2		
5B	TB3-1,2	J1U	55	19	5	15	
	TB3-9,10	J3U	64	23	6		
6B	TB3-11,12	J3L	77	24	6		
	TB7-9,10	J9U	59	37	7	15	
7A <sup>2</sup>	TB7-11,12	J9L	61	38	4	3	
	TB7-1,2	J7U	66	33	8	100	2,4
8B	TB7-3,4	J7L	79	34	8	10	
	*S12-5	TB6-9,10	I9U	60	17	SYS	
*S12-6	TB6-11,12	I9L	62	18	SYS		
*S12-7	TB5-9,10	J6U	42	31	SYS		
*S12-8	TB5-11,12	J6L	46	32	SYS		

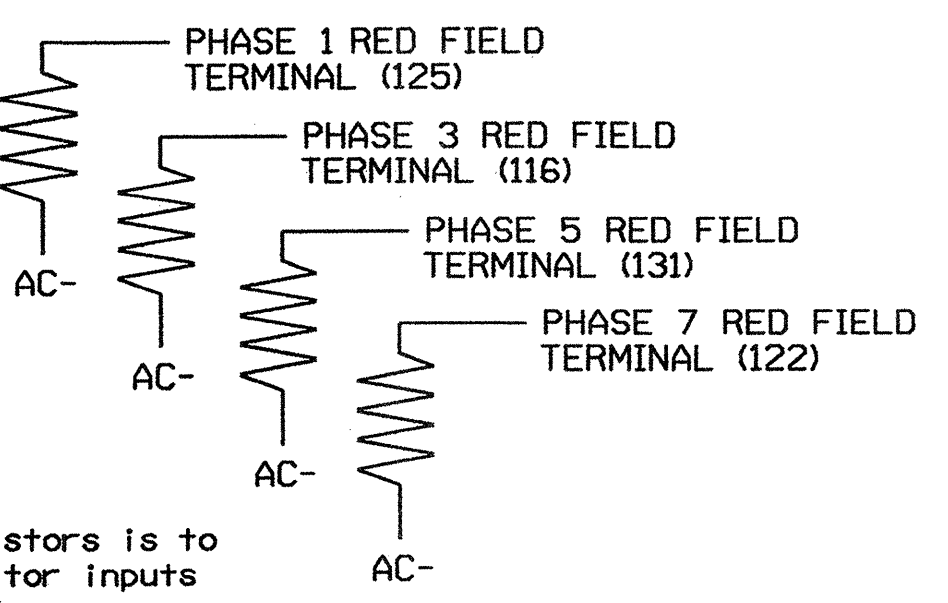
- Add jumpers from TB2-5 to TB2-7, and from TB2-6 to TB2-8.
  - Add jumpers from TB4-9 to TB4-11, and from TB4-10 to TB4-12.
  - Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.
  - Add jumpers from TB7-9 to TB7-11, and from TB7-10 to TB7-12.
- \* System Detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L



**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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1991  
DESIGNED: February 2008  
SEALED: 03/07/08  
REVISED: N/A

**Signal Upgrade**

Prepared in the Offices of:  
Signal Management Services  
750 Greenfield Parkway, Garner, NC 27529

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 022013  
GEORGE C. BROWN

Division 7  
Alamance County  
Burlington

PLAN DATE: February 2008  
REVIEWED BY: T. J. J. J.

PREPARED BY: C. Strickland  
REVIEWED BY:

REVISIONS: INIT. DATE

Signature: David C. Brown  
DATE: 07-1991  
SIG. INVENTORY NO. 07-1991



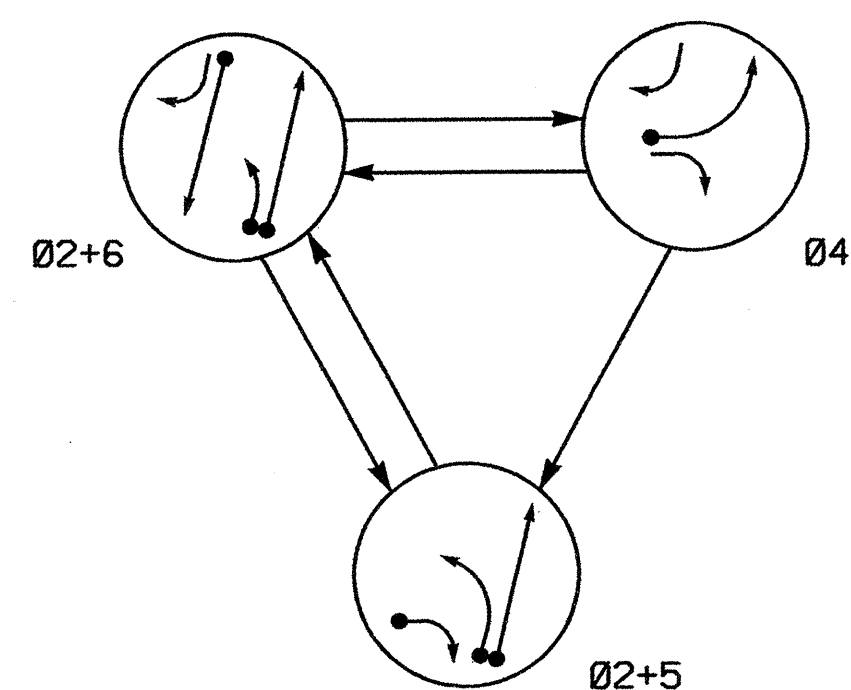








**PHASING DIAGRAM**

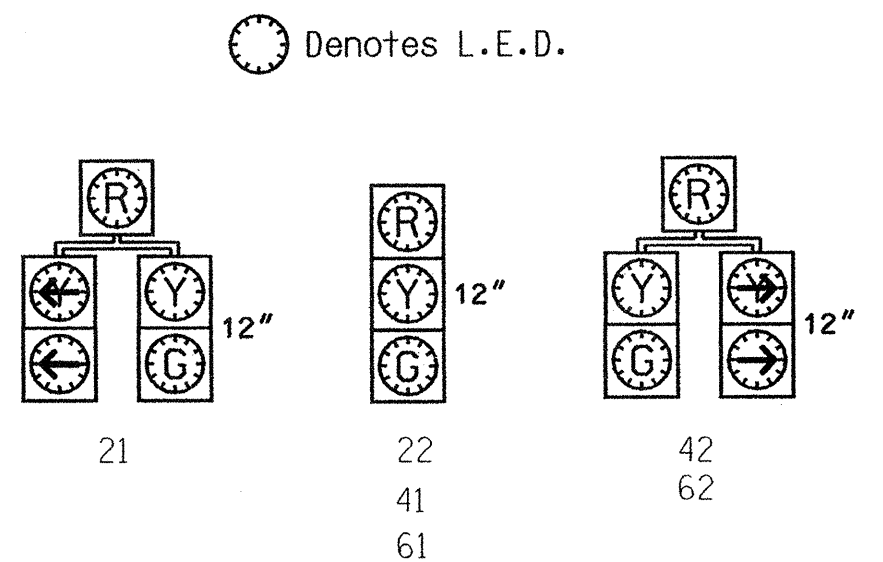


SIGNAL FACE	PHASE			
	02+6	04	02+5	F
21	G	R	Y	
22	G	R	Y	
41	R	G	R	
42	R	G	R	
61	R	G	Y	
62	R	G	Y	

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**



LOOP & DETECTOR UNIT INSTALLATION CHART																			
SE-PAC 2070 CONTROLLER WITH 170 CABINET																			
INDUCTIVE LOOPS				DETECTOR PROGRAMMING															
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	TIMING		OPERATION MODE										
							DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROTECTOR THROUGH	PROTECTOR THROUGH AND	SWITCH	SYSTEM LOOPS	STATUS	
2A	6x6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
4A	6x40	2-4-2	0	X	-	4	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
5A	6x40	2-4-2	0	X	-	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
5B	6x40	2-4-2	0	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
5C	6x15	4	0	X	-	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
6A	6x6	6	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-

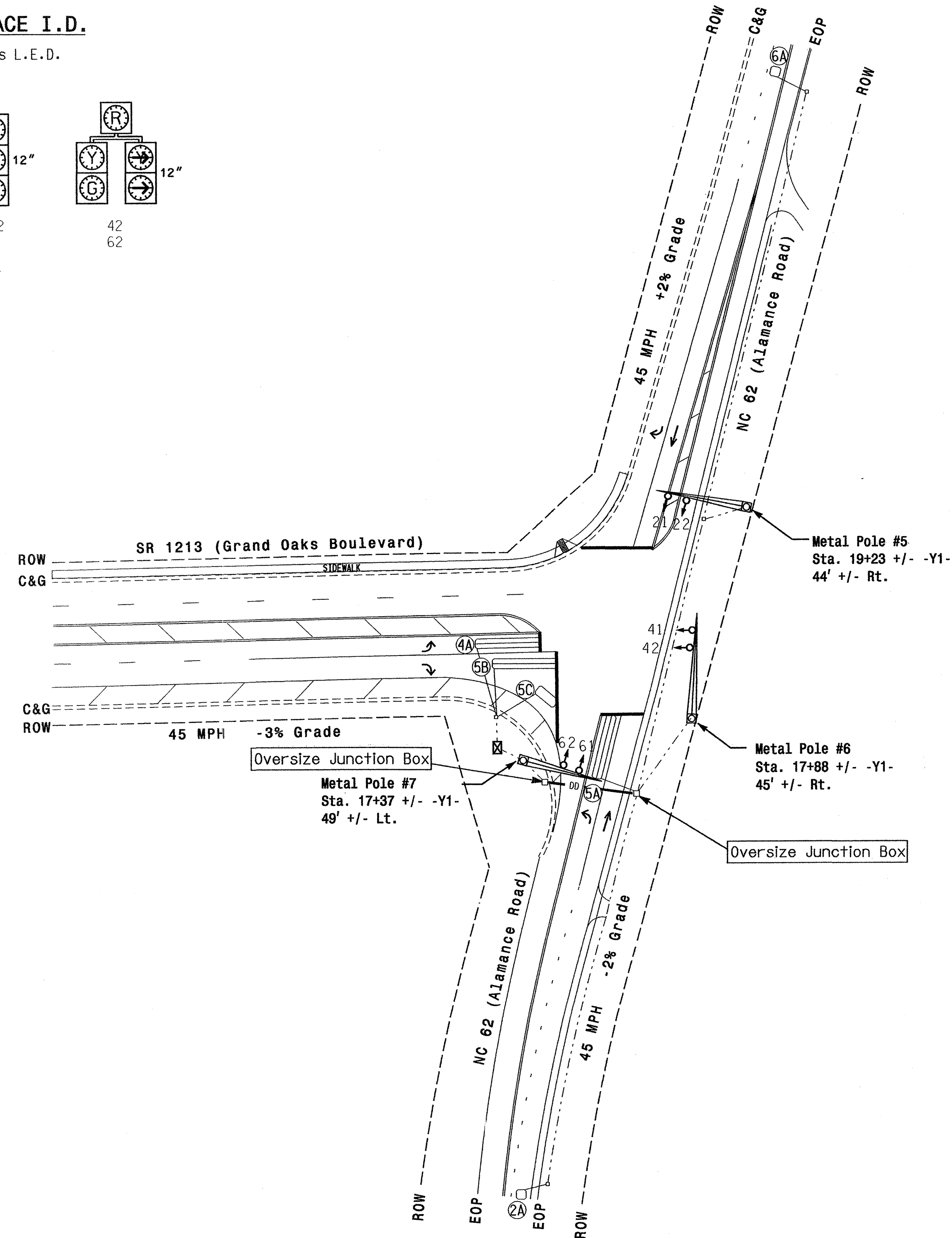
**3 Phase Fully Actuated (Burlington Signal System)**

**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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Signal system data: Intersection Zone Number 10, Port number 4, System Address number 10.

FEATURE	SE-PAC 2070 TIMING CHART			
	2	4	5	6
Min Green *	12	7	7	12
Passage Gap *	6.0	2.0	2.0	6.0
Maximum Green *	90	30	45	90
Yellow Change	4.7	3.0	3.0	4.3
Red Clear	1.3	2.9	2.3	1.4
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	2.5	-	-	2.5
Maximum Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	LOCK	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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



PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
○ → Modified Signal Head	○ → N/A
○ → Pedestrian Signal Head With Push Button & Sign	○ → N/A
○ → Signal Pole with Guy	○ → N/A
○ → Signal Pole with Sidewalk Guy	○ → N/A
□ → Inductive Loop Detector	□ → N/A
□ → Controller & Cabinet	□ → N/A
□ → Junction Box	□ → N/A
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A → Right of Way	N/A → Right of Way
→ Directional Arrow	→ Directional Arrow
→ Pavement Marking Arrow	→ Pavement Marking Arrow
▲ → Wheelchair Ramp	▲ → N/A
--- Directional Drill (2-2" Polyethylene Conduits)	--- Directional Drill (2-2" Polyethylene Conduits)
○ → Metal Pole with Mastarm	○ → Metal Pole with Mastarm

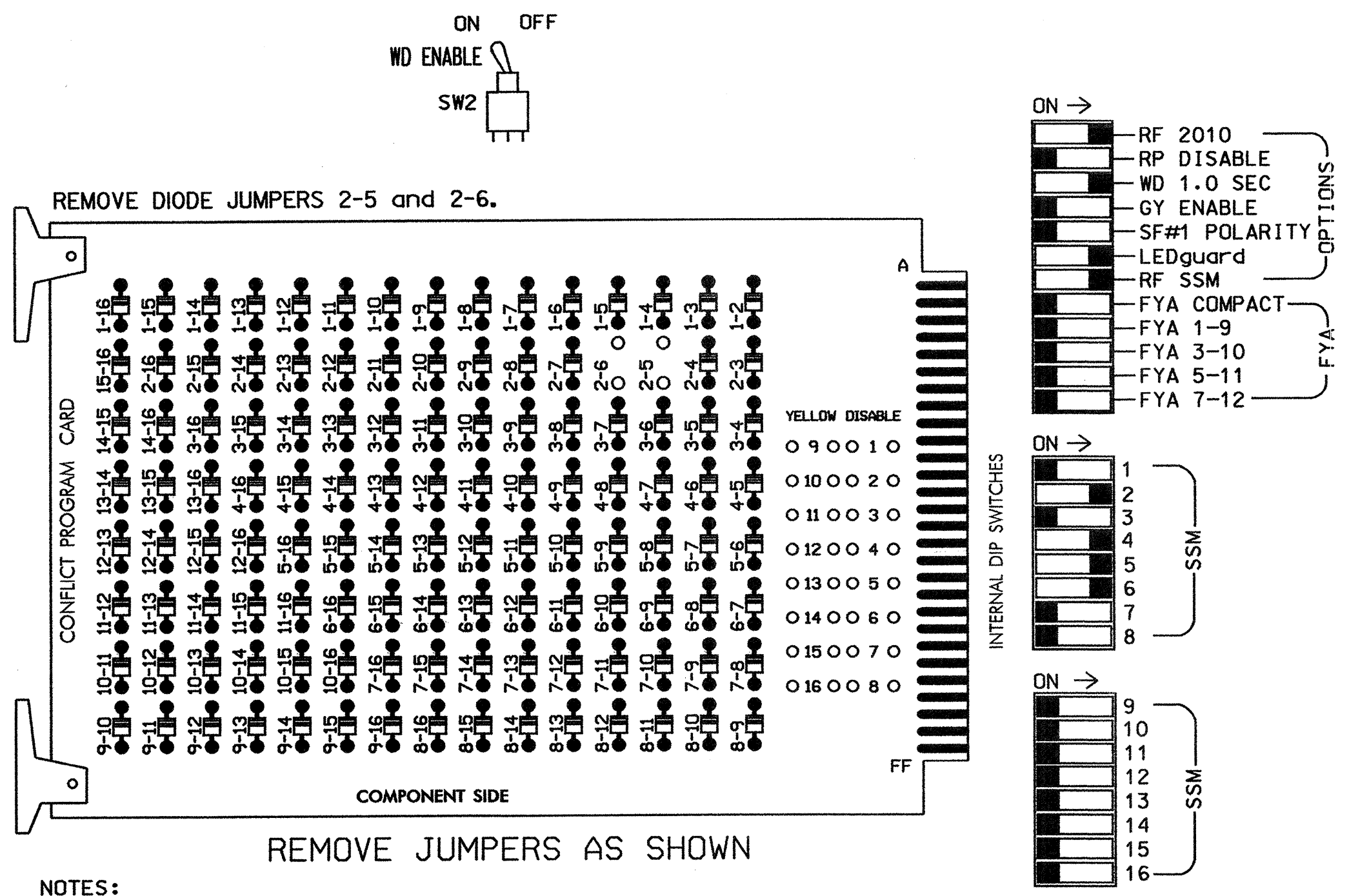
**New Installation**

	<b>NC 62 (Alamance Rd.)</b> at <b>SR 1213 (Grand Oaks Blvd.)</b>	
	Division 7 Alamance County Burlington PLAN DATE: February 2008 REVIEWED BY: T. Thigpen PREPARED BY: C. E. Pierce REVIEWED BY:	750 N. Greenfield Place, Garner, NC 27529 SCALE: 1"=50' DATE: 3/3/08



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

(remove jumpers and set switches as shown)



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

### NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phases 2 and 6, on controller unit, for volume density operation.
- The cabinet and controller are part of the Burlington City Signal System.

### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	NU	21,42	61,62	NU	NU	NU
RED		128			101		*	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW					102			132				
GREEN ARROW					103			133				

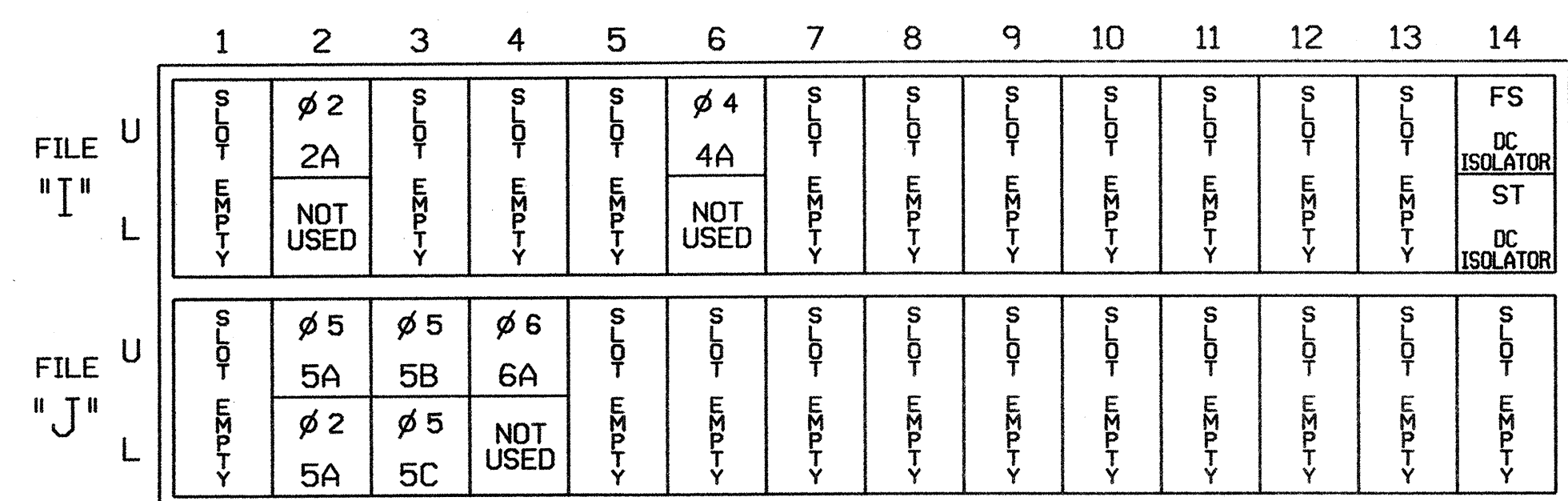
NU = Not Used  
\* Denotes install load resistor. See load resistor installation detail this sheet.

### EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
CABINET.....CONTRACTOR SUPPLIED 332  
SOFTWARE.....SE-PAC2070  
CABINET MOUNT.....BASE  
OUTPUT FILE POSITIONS...12  
LOAD SWITCHES USED.....S2,S4,S5,S6  
PHASES USED.....2,4,5,6  
OVERLAPS.....NONE

### INPUT FILE POSITION LAYOUT

(front view)

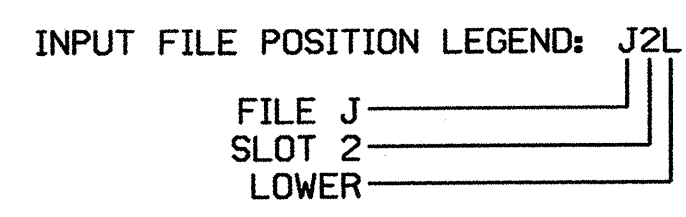


EX. : 1A, 2A, ETC. = LOOP NO.'S  
FS = FLASH SENSE  
ST = STOP TIME

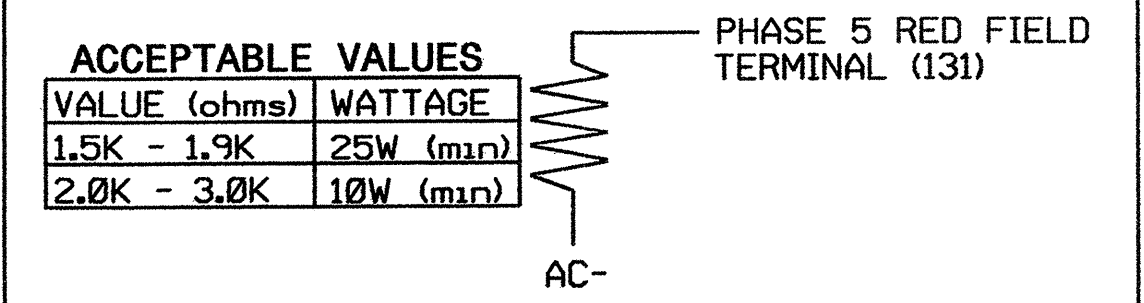
### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A	TB2-5,6	I2U	39	3	2		
4A	TB4-9,10	I6U	41	11	4	3	
5A <sup>1</sup>	TB3-5,6	J2U	40	21	5	15	
	TB3-7,8	J2L	44	22	2		
5B	TB3-9,10	J3U	64	23	5	10	
5C	TB3-11,12	J3L	77	24	5	15	
6A	TB5-1,2	J4U	48	25	6		

<sup>1</sup>Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.



### LOAD RESISTOR INSTALLATION DETAIL



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1990  
DESIGNED: February 2008  
SEALED: 03/07/08  
REVISED: N/A

New Installation

Prepared in the Office of:  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
Signal Management Section  
750 Greenfield Parkway, Garner, NC 27529

Electrical and Programming Details For:  
NC 62 (Alamance Rd.)  
at  
SR 1213 (Grand Oaks Blvd.)  
Alamance County, Burlington

Division 7  
PLAN DATE: February 2008  
REVIEWED BY: T. J. J. J.  
PREPARED BY: C. Strickland  
REVIEWED BY:

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 022013  
ENGINEER  
GEORGE C. BRUMM  
DATE

Sig. Inventory No. 07-1990

10-MAR-2008 08:10  
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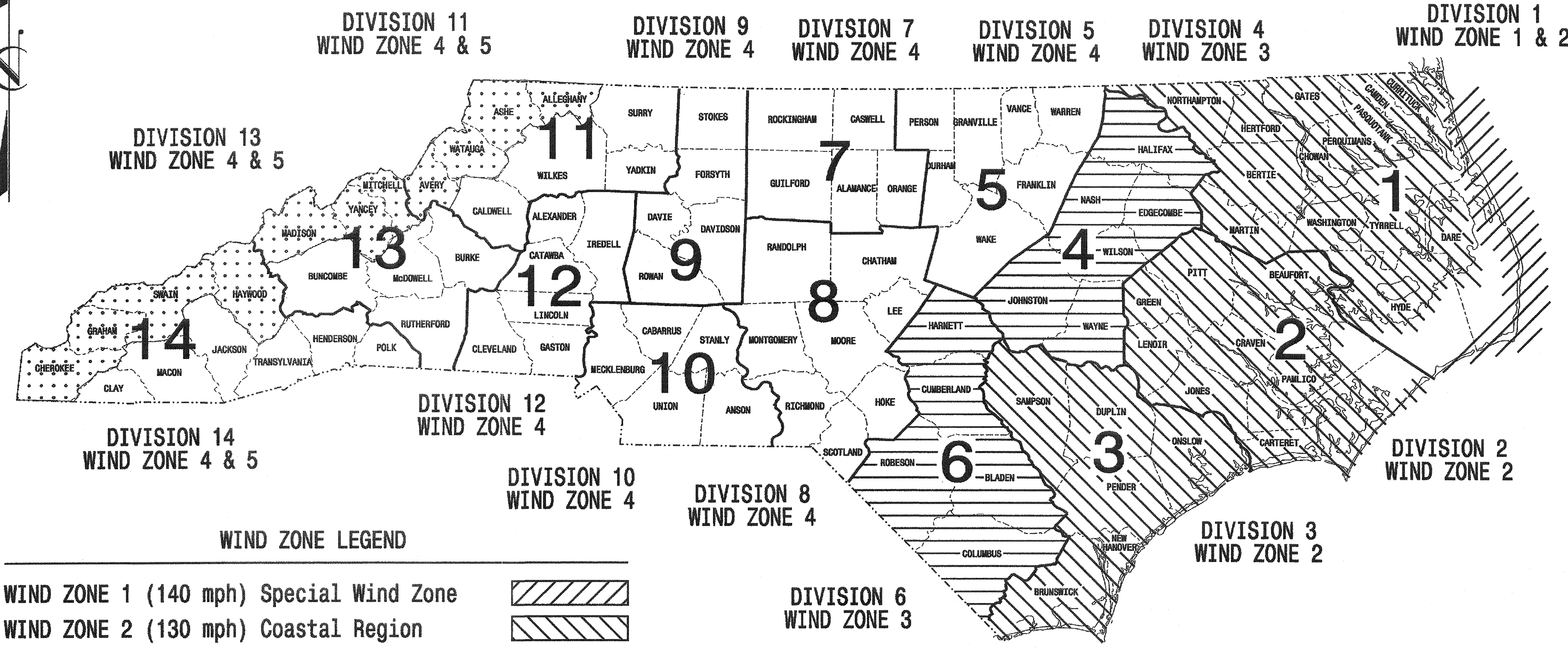




# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	U-3304	Sig. 10
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/tmssu/ws/default.htm>

Prepared in the Offices of:

122 N. McDowell St., Raleigh, NC 27603

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

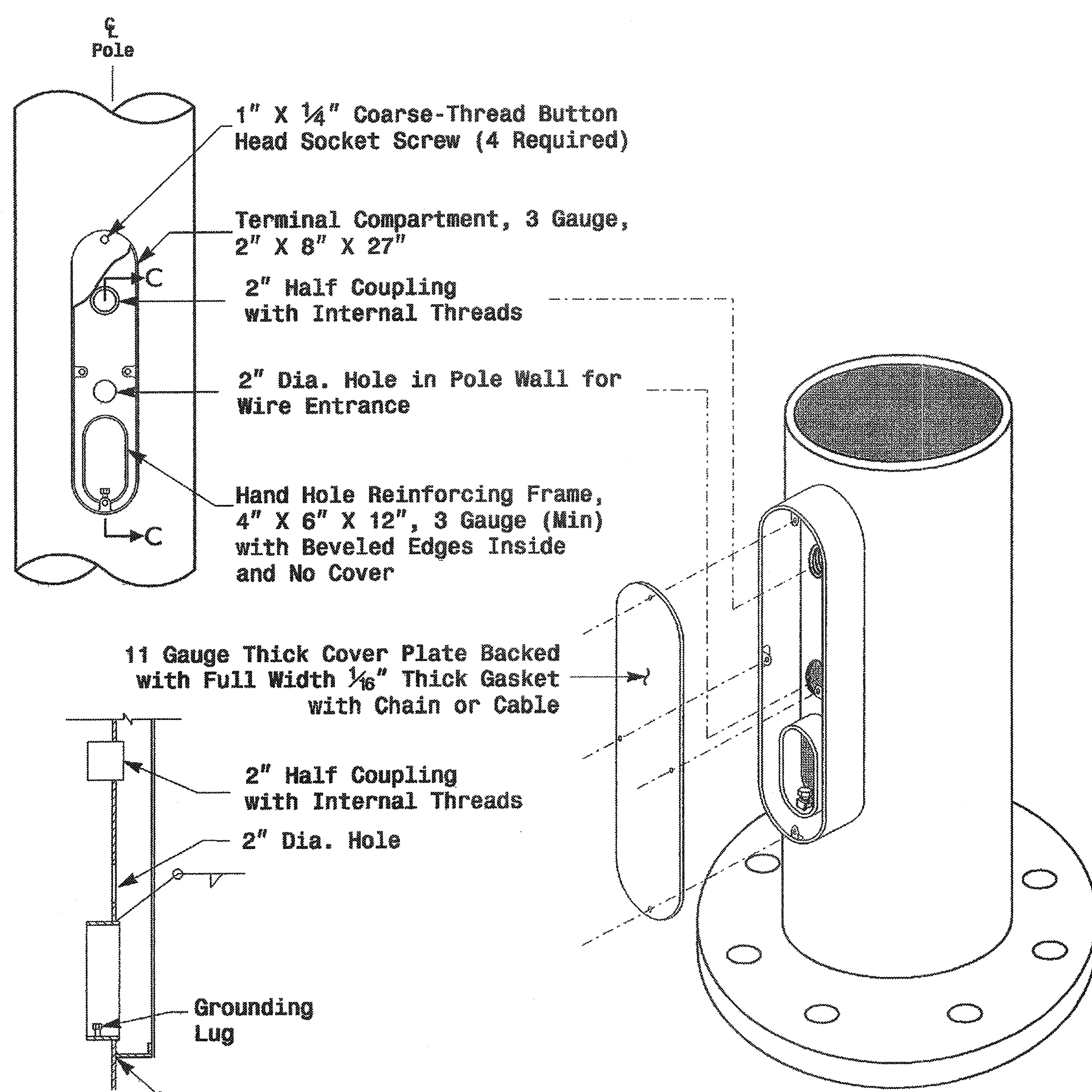
**NCDOT CONTACTS:**  
**TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH**

G. A. Fuller, P.E. - State ITS and Signals Engineer  
 R. E. Mullinax, P.E. - Signals and Geometrics Engineer  
 P. L. Alexander, P.E. - Signals and Geometrics Special Projects Engineer  
 D. C. Sarkar, P.E. - Signals and Geometrics Structural Engineer  
 A. M. Esposito, P.E. - Signals and Geometrics Project Engineer  
 C. F. Andrews, Jr. - Signals and Geometrics Project Engineer

SEAL

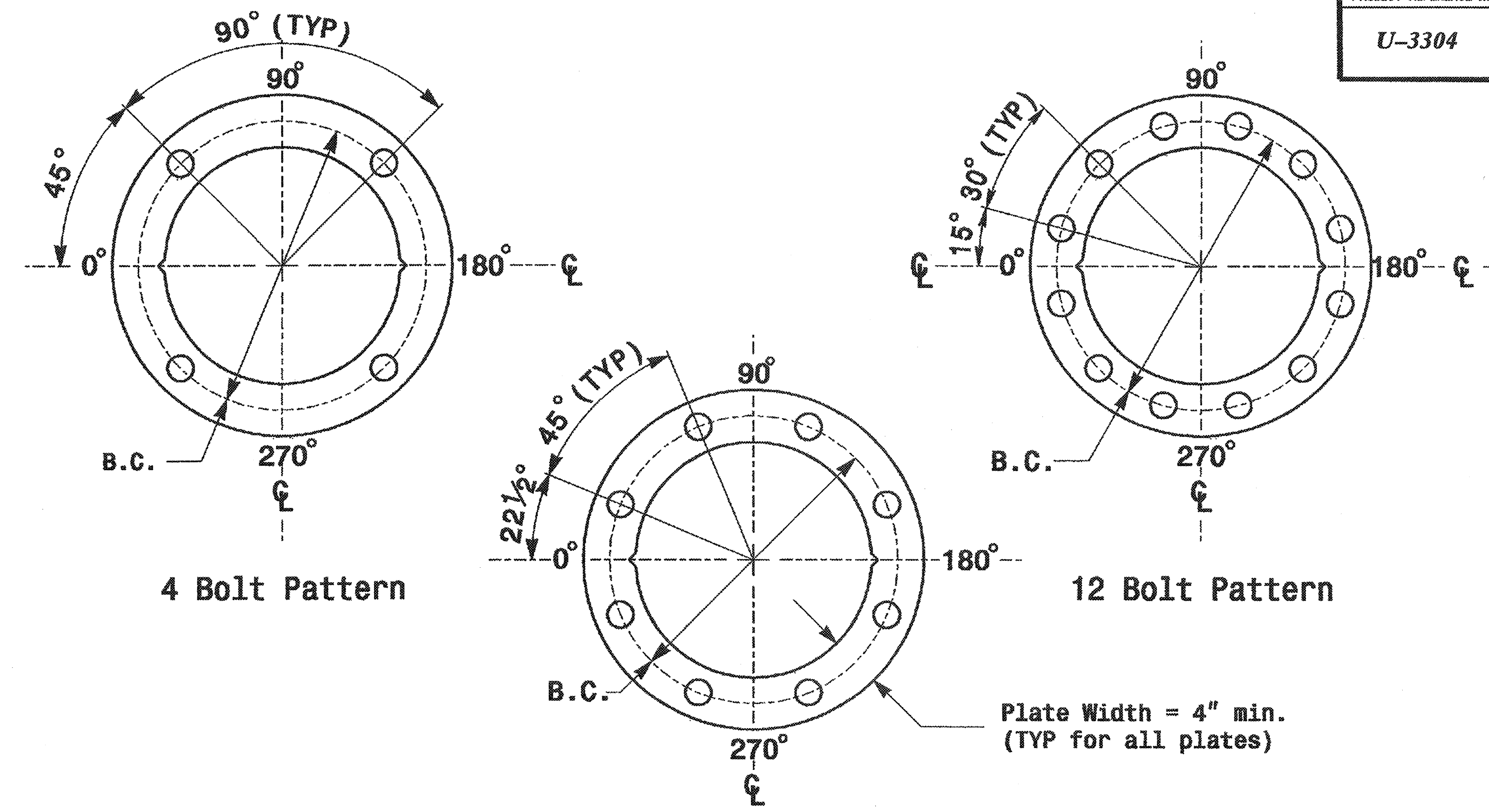
Z. Sarkar 9.2.2005  
SIGNATURE DATE





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	.....

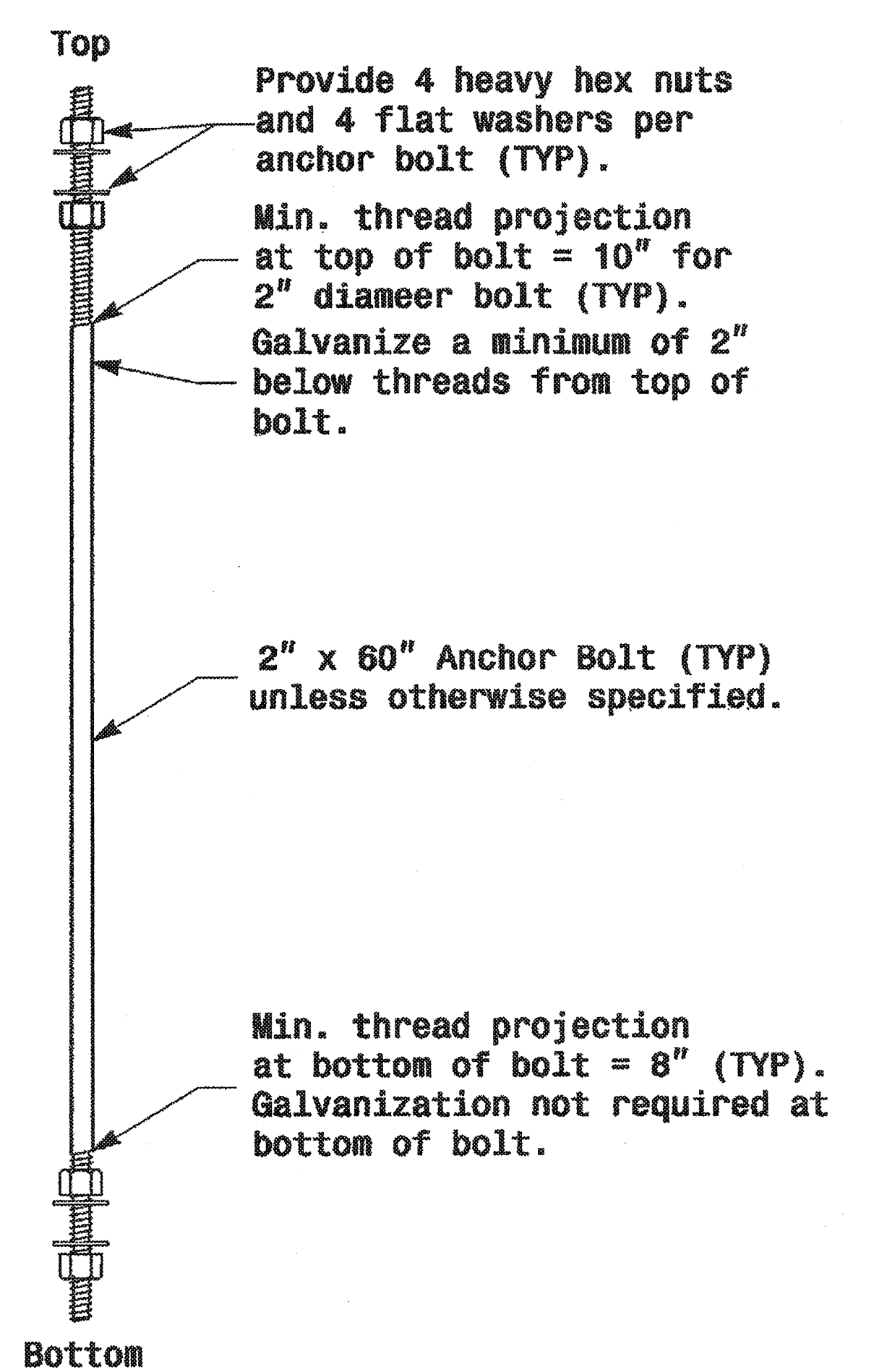
**Shaft I.D. Tag**  
(Provide on Strain Poles and Mast Arm Poles)

- 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.

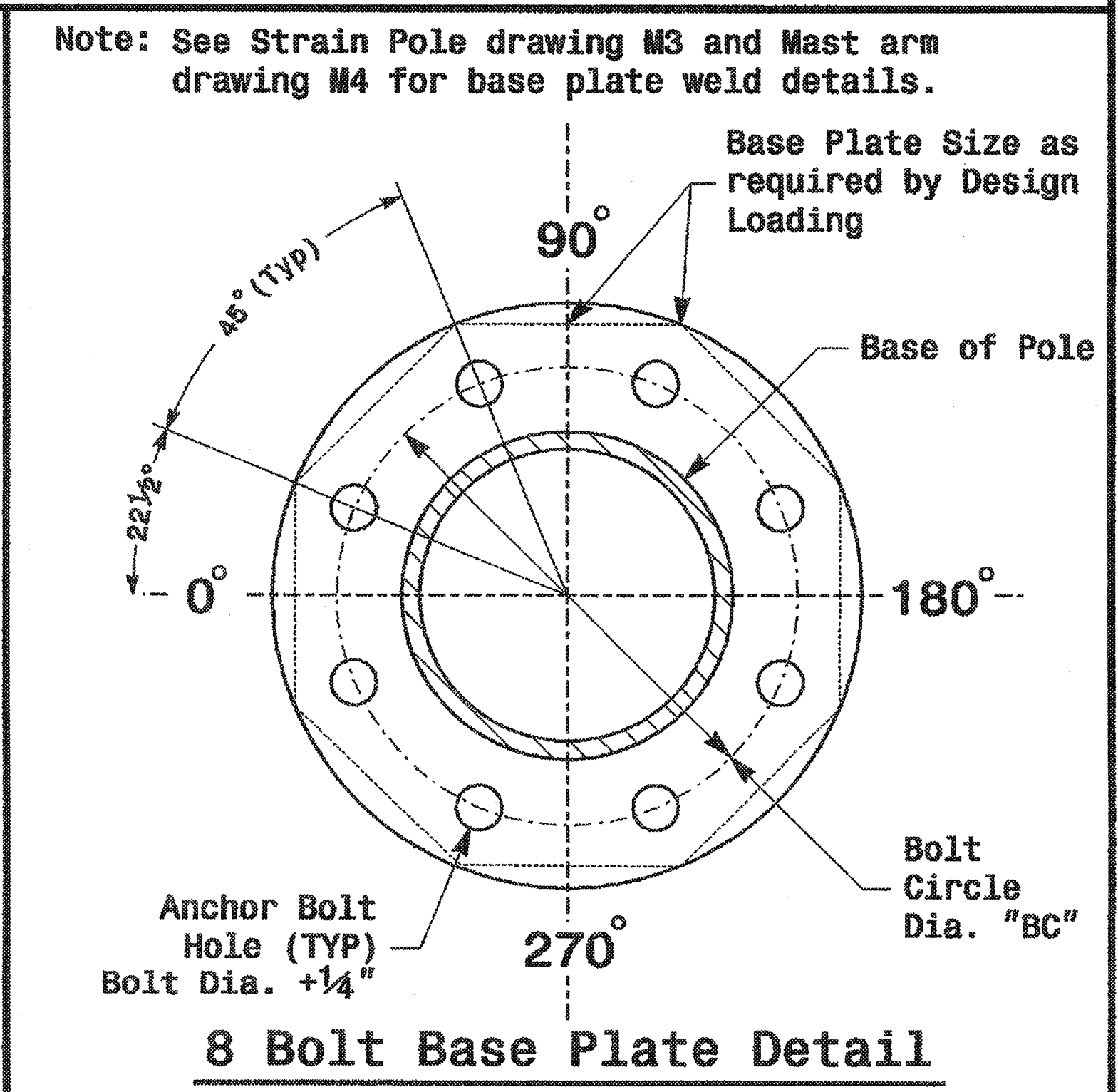
**Identification Tag Details**

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)



**Anchor Bolt Detail**



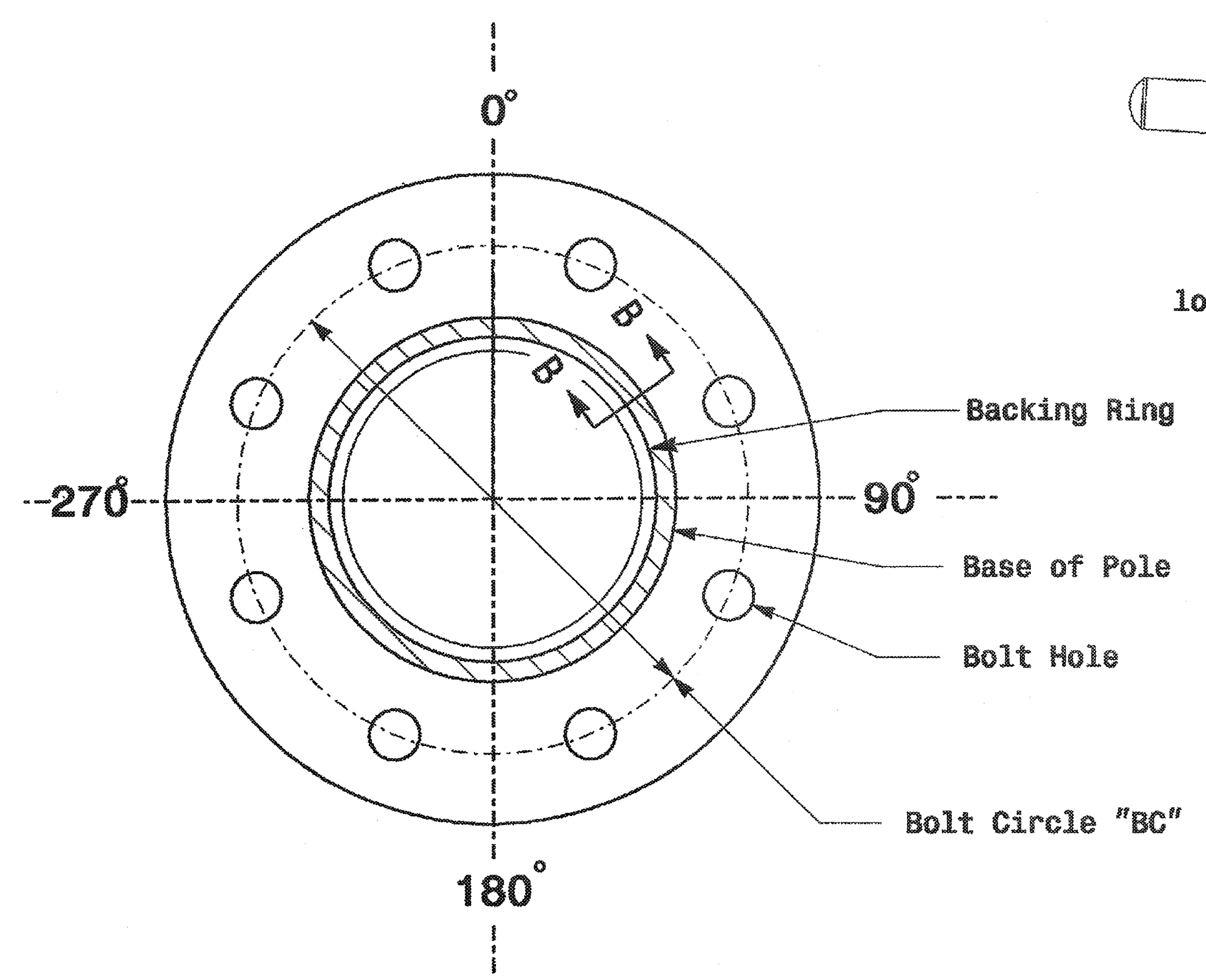
**8 Bolt Base Plate Detail**

	<b>Typical Fabrication Details Common To All Metal Poles</b>		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
122 N. McDowell St., Raleigh, NC 27603		SIGNATURE: <i>A. Sankar</i> DATE: 2.2.2005	SEAL: _____ SIG. INVENTORY NO.: _____

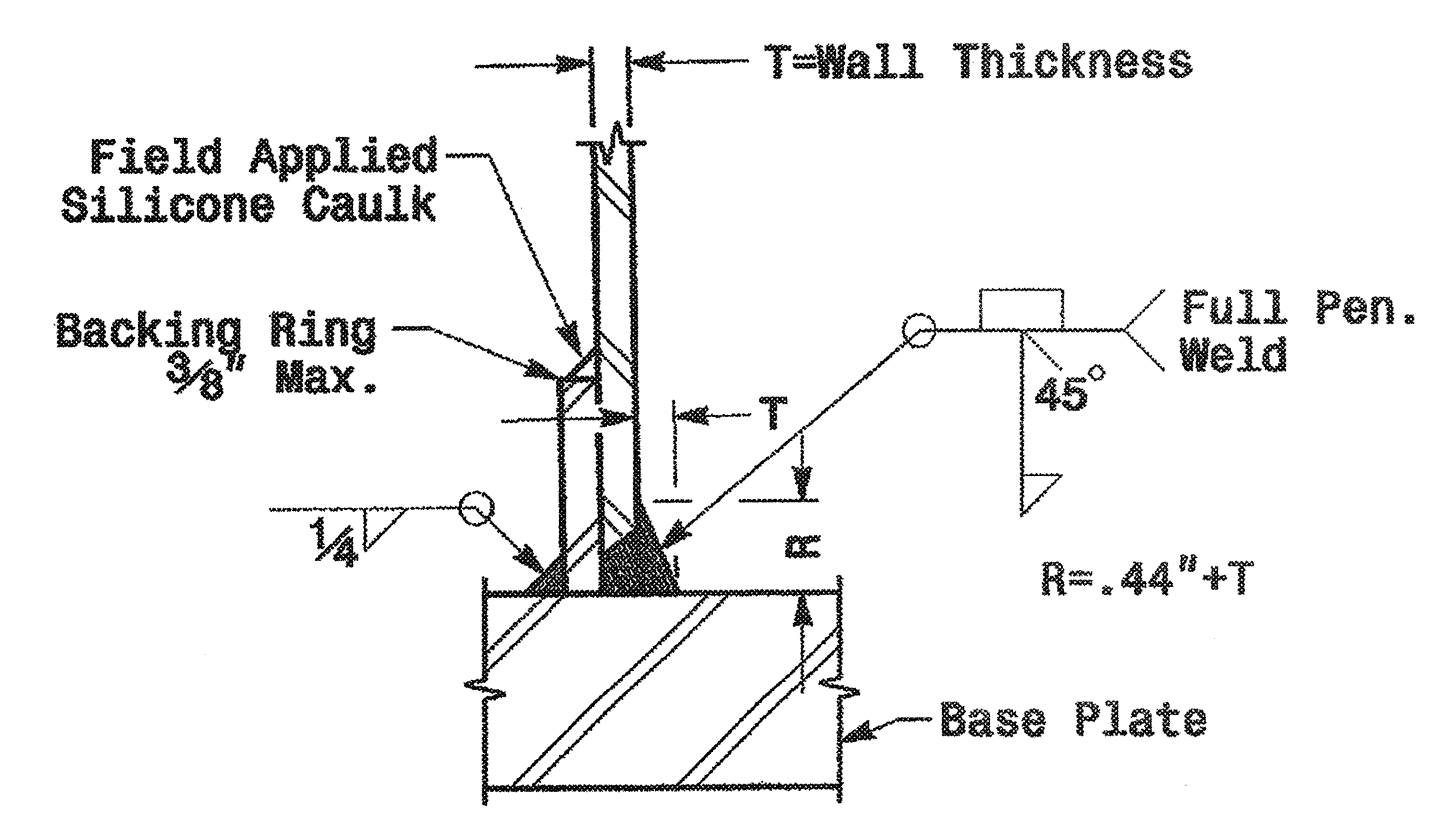
**Fabrication Details - All Poles**

01-SEP-2005, 18-22  
D:\42004\_Metal Pole Standard.dwg004.m2 thru m61.dgn  
condr:ave

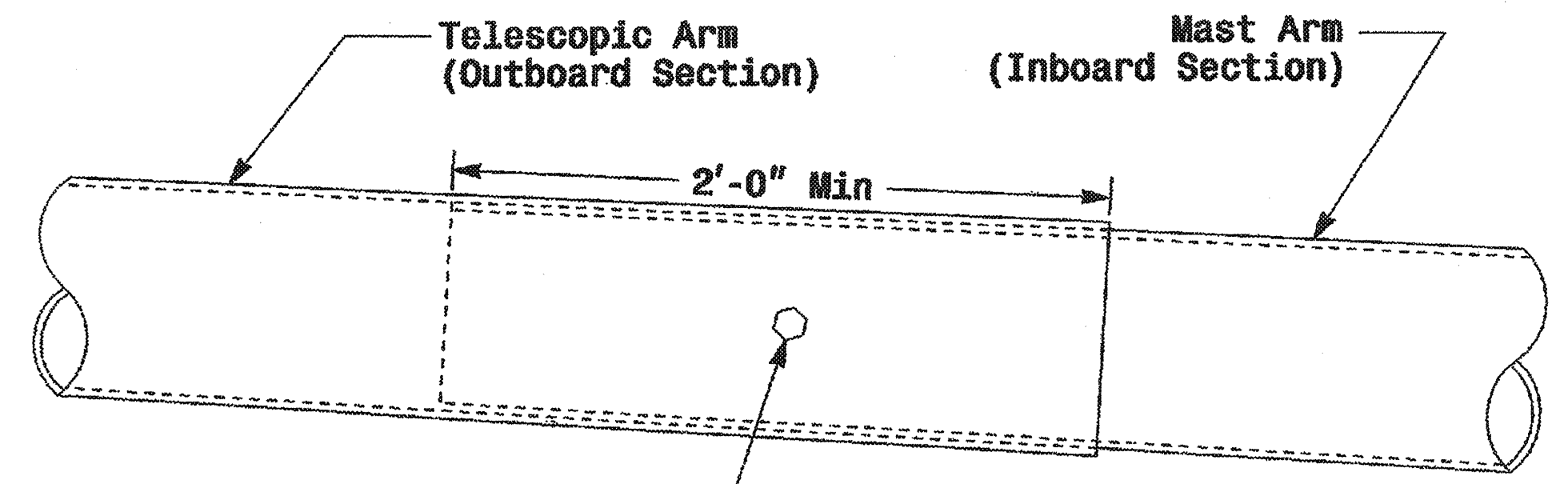
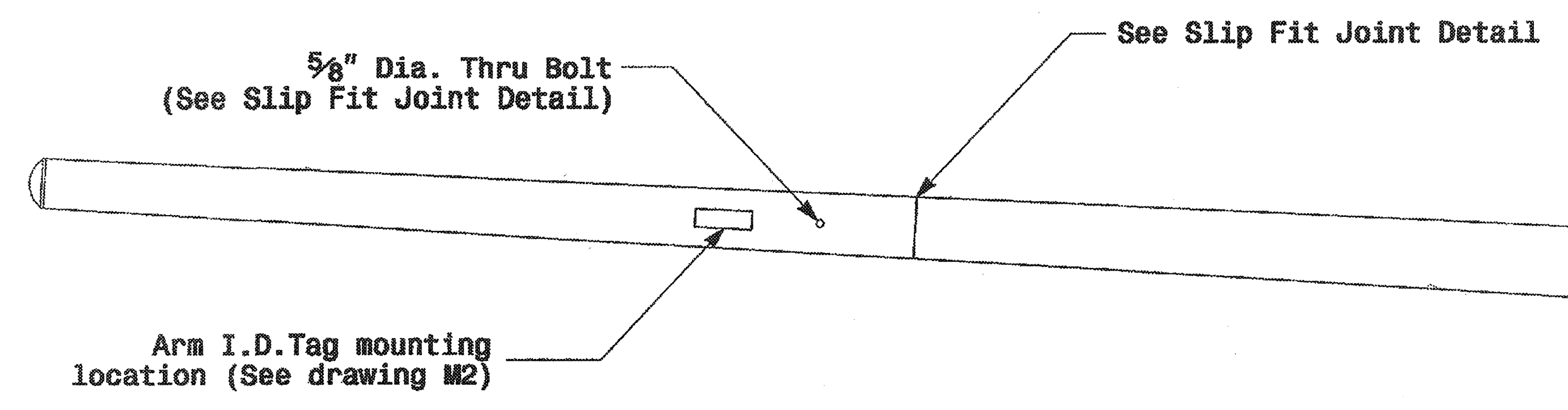




Section A-A  
(See drawing M 2)  
**Pole Base Plate**

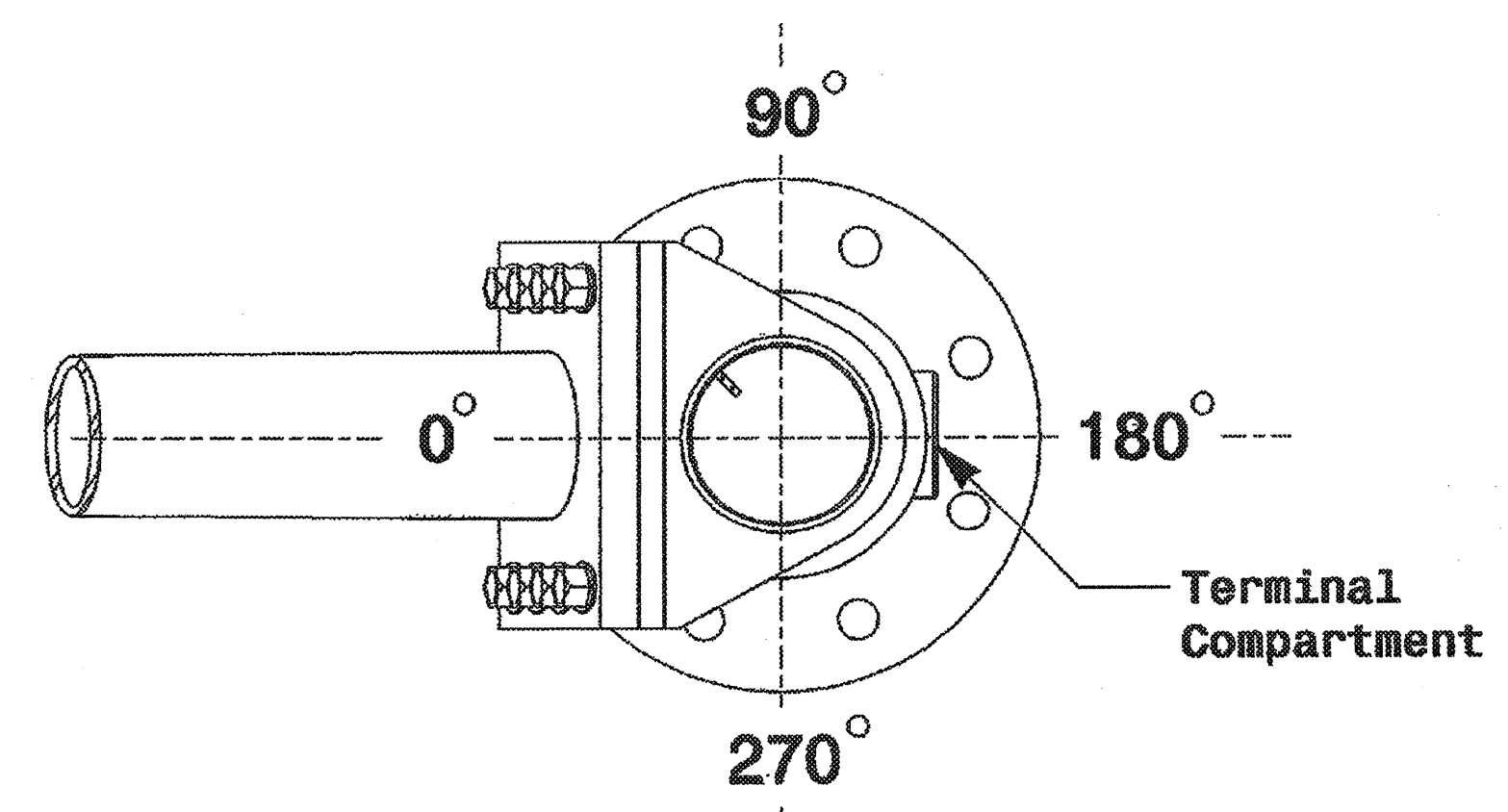


Section B-B  
(Pole Attachment to Base Plate)  
**Full-Penetration Groove Weld Detail**

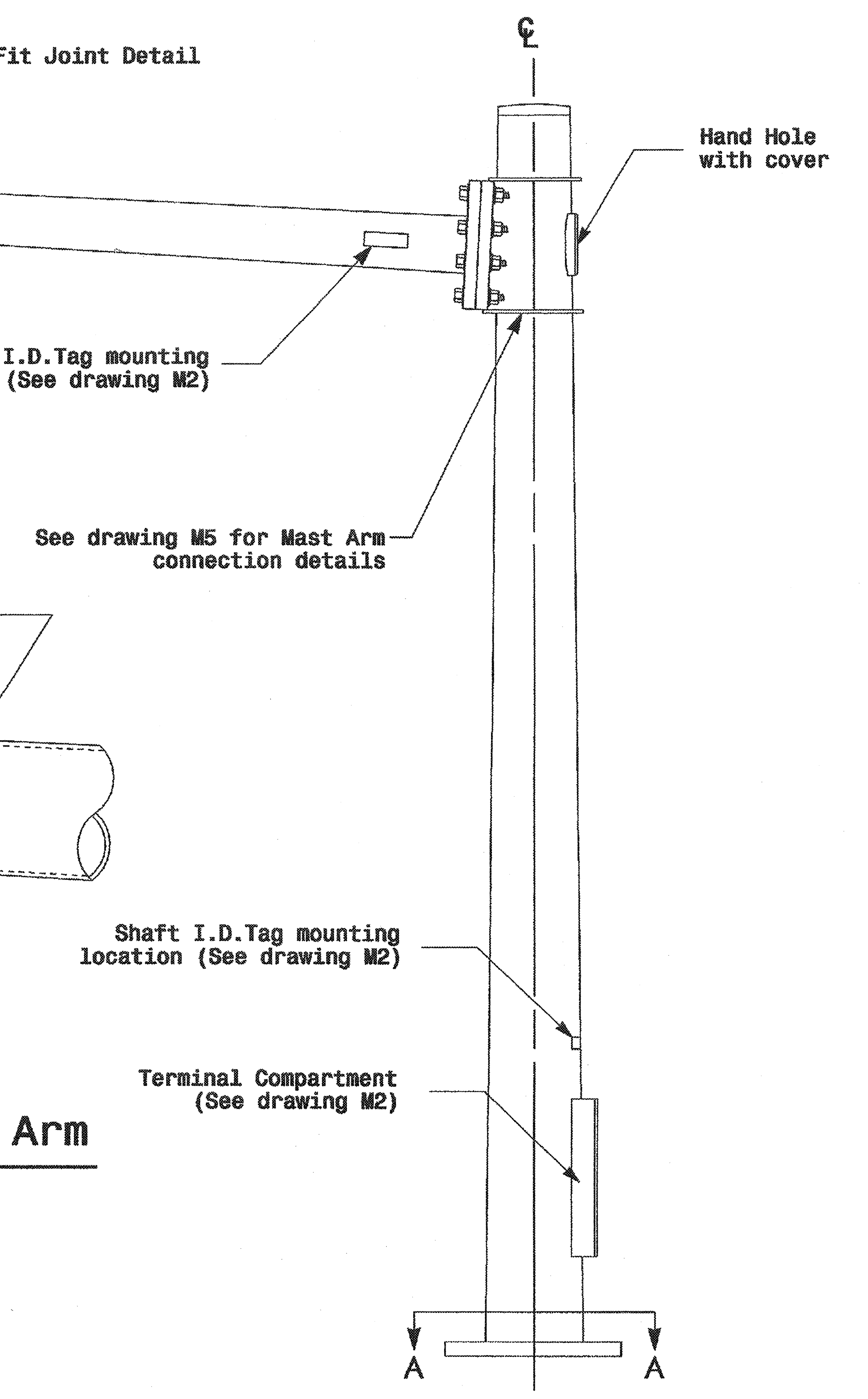


3/4" Factory Drilled Hole in Outboard Tube.  
Field Drill Inboard Tube.  
5/8" Galvanized Thru Stud with (2) Hex. Locknuts Ea.

**Slip Fit Joint Detail for Mast Arm**



**Mast Arm Radial Orientation**



Monotube Mast Arm Pole  
(.14in./ft. taper)

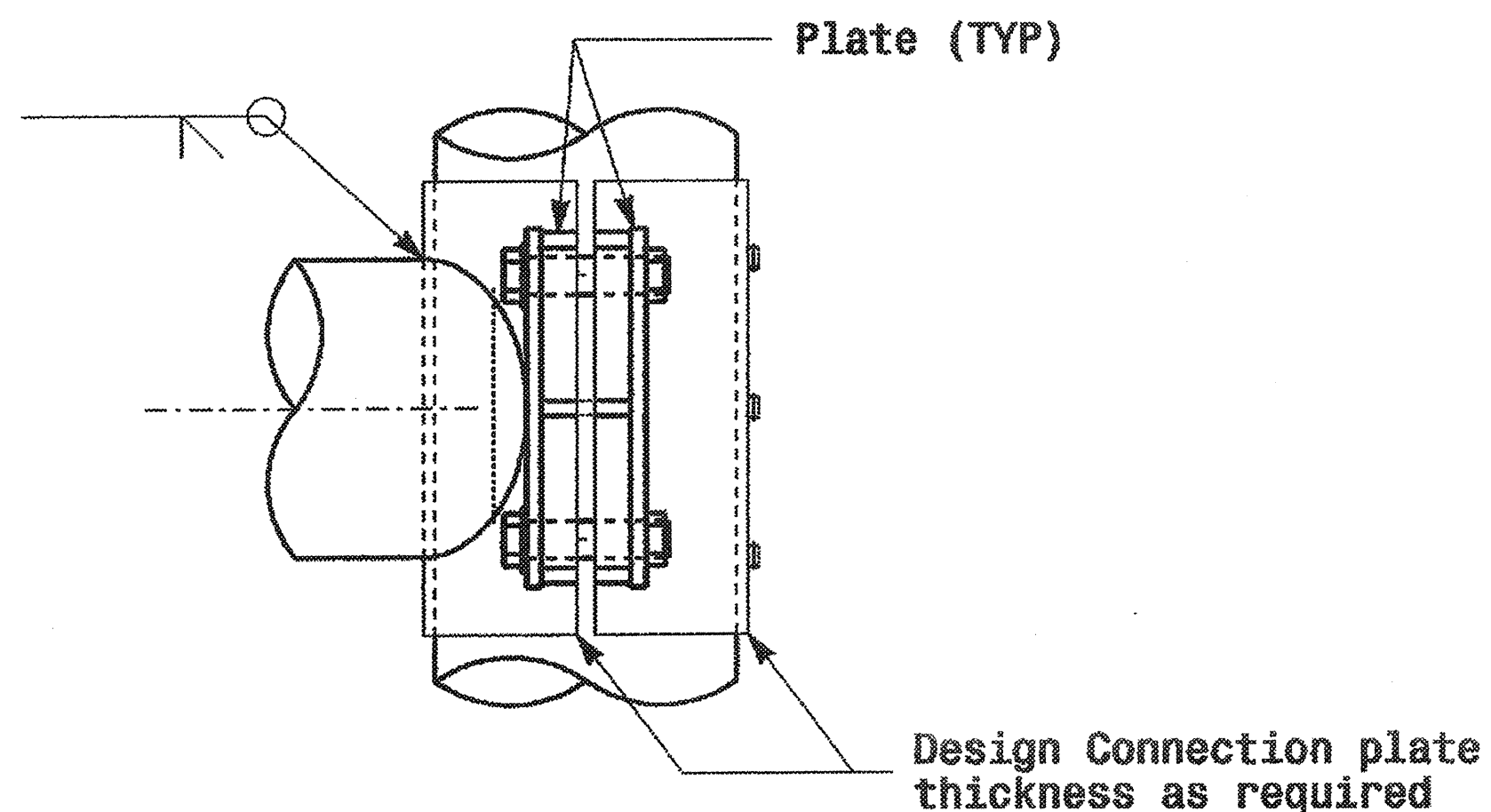
**Fabrication Details - Mast Arm Poles**

01-SEP-2005 14:08 w:\shop\lee-un1-fwcr-kgr-cupps\2004 metal pole atand\drd\2004 ml.dgn

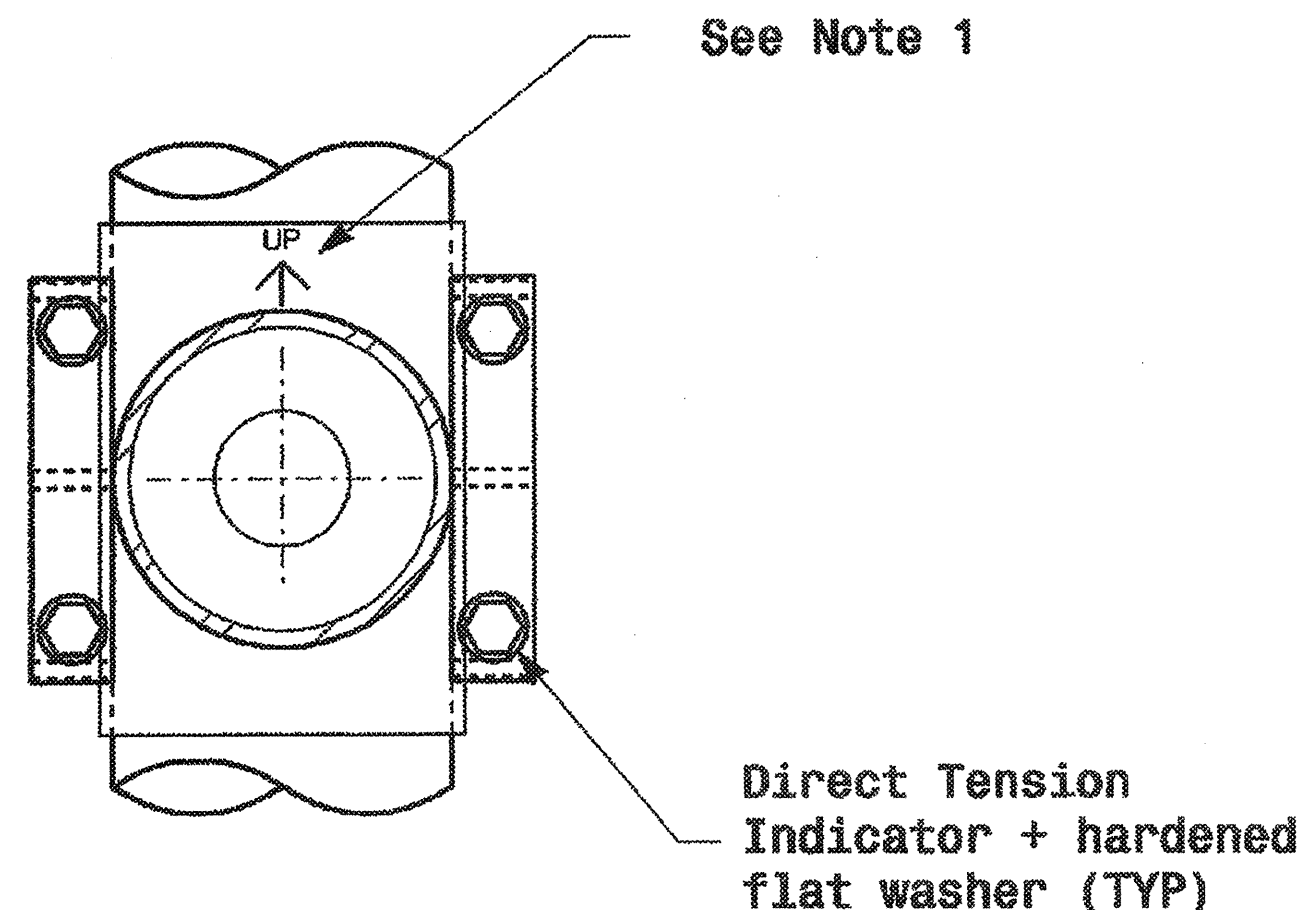
	<b>Typical Fabrication Details for Mast Arm Poles</b>		
	PLAN DATE: <b>May 2005</b> PREPARED BY: <b>P.L. Alexander</b>	REVIEWED BY: <b>C.F. Andrews</b> REVIEWED BY: <b>A.M. Esposito</b>	
SCALE: <b>NA</b> NONE		SIGNATURE: <i>P.L. Alexander</i> DATE: <b>9.2.2005</b> STG. INVENTORY NO.	



# Adjustable Clamp Type Bolted Mast Arm Connection

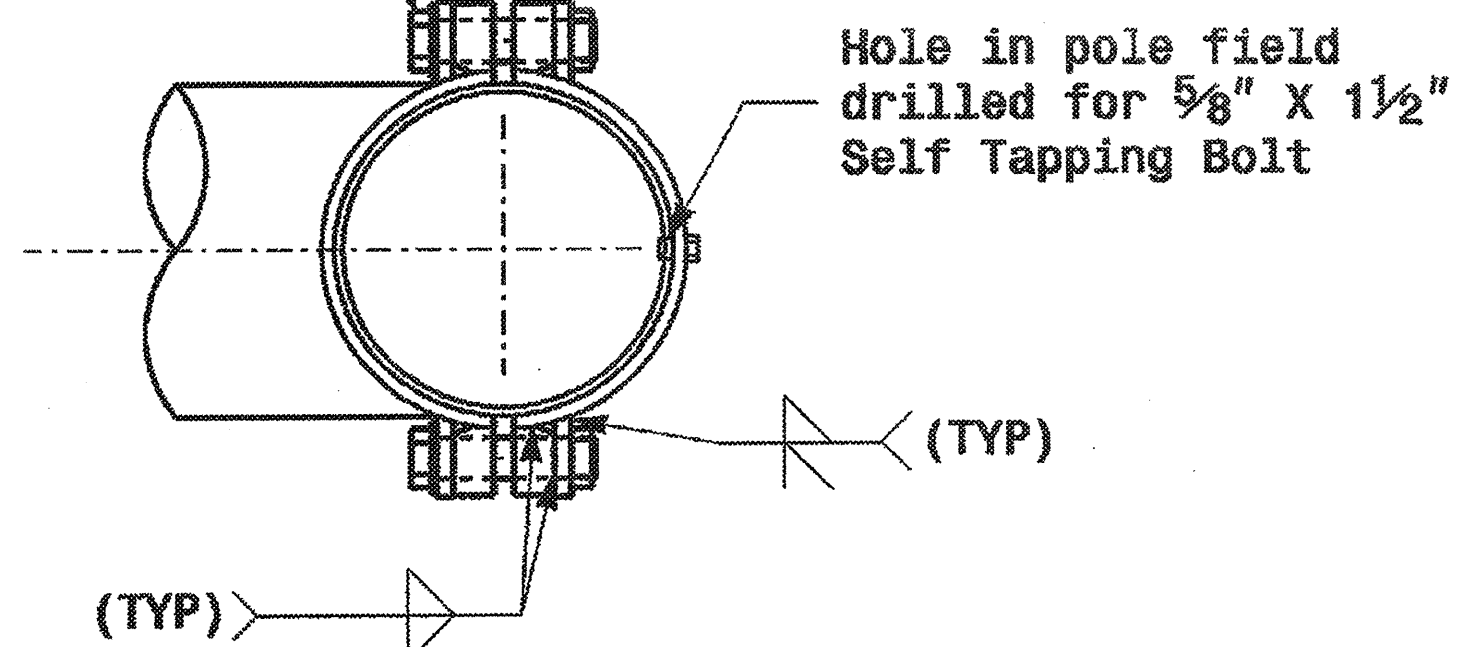


Side Elevation View



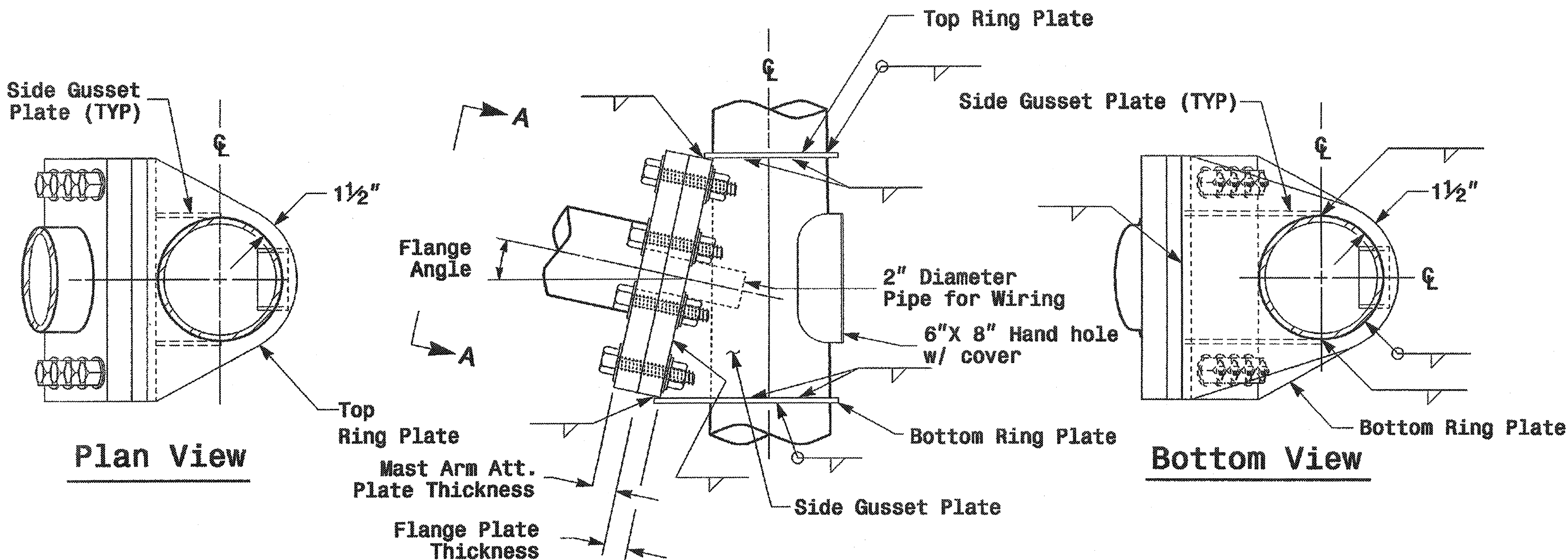
Front Elevation View

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

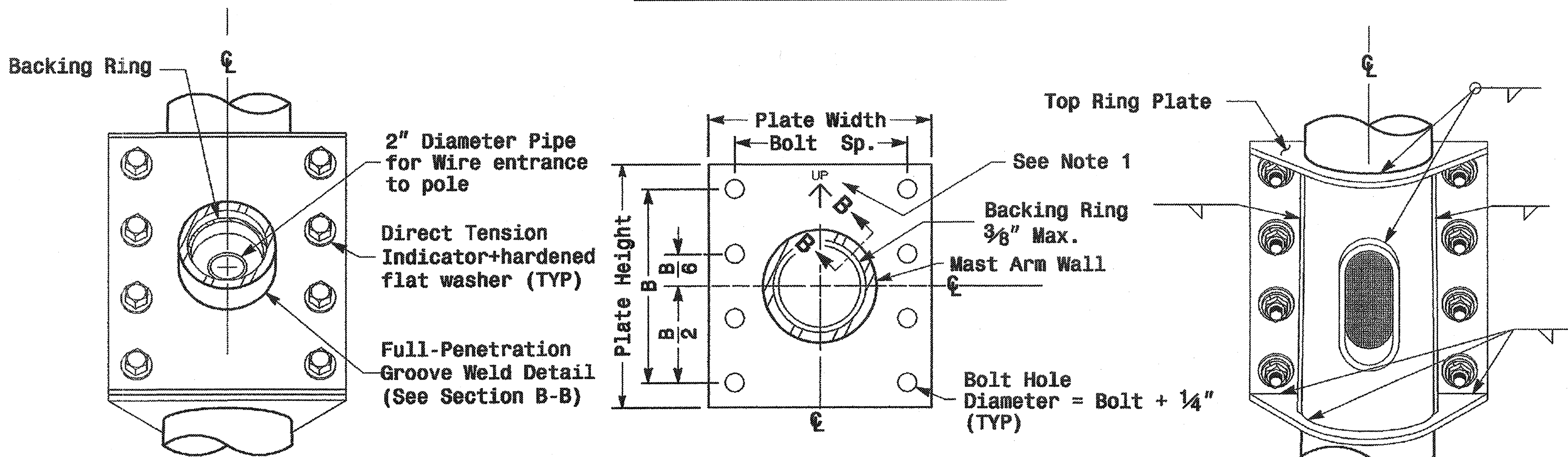


Plan View

# Welded Ring Stiffened Mast Arm Connection



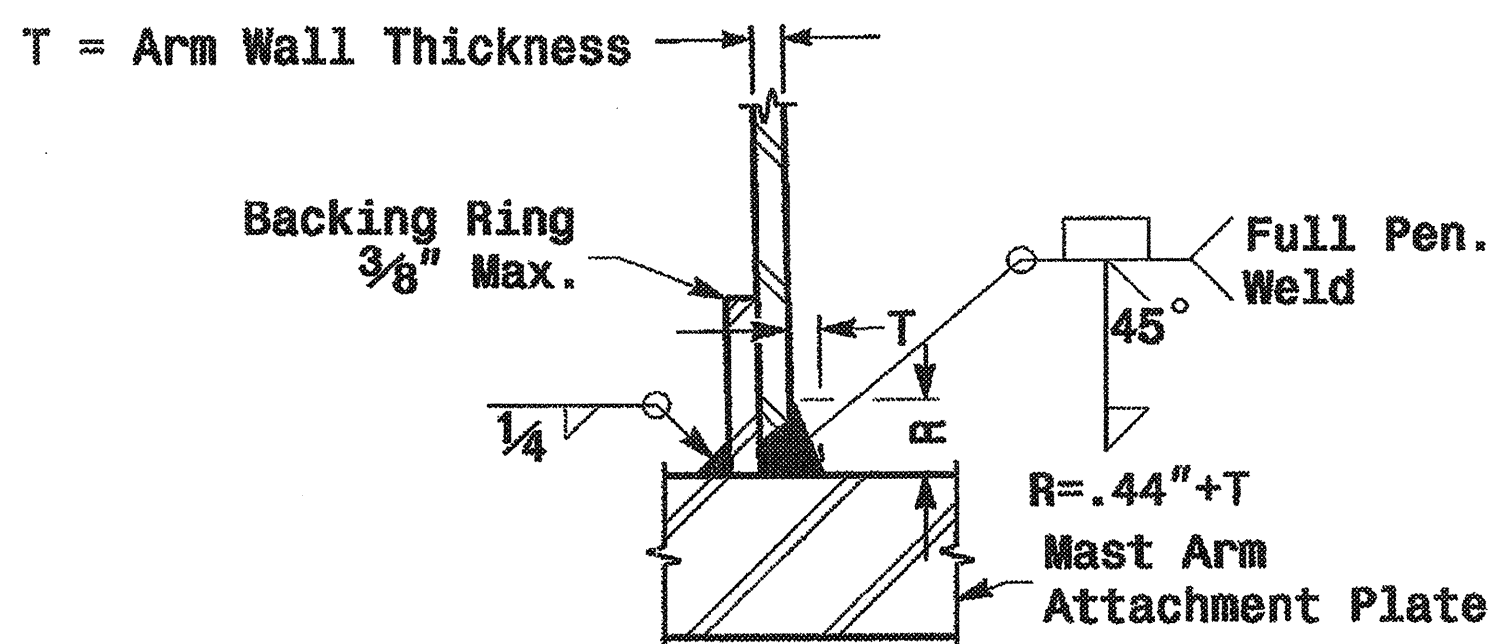
Side Elevation View



Front Elevation View

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.

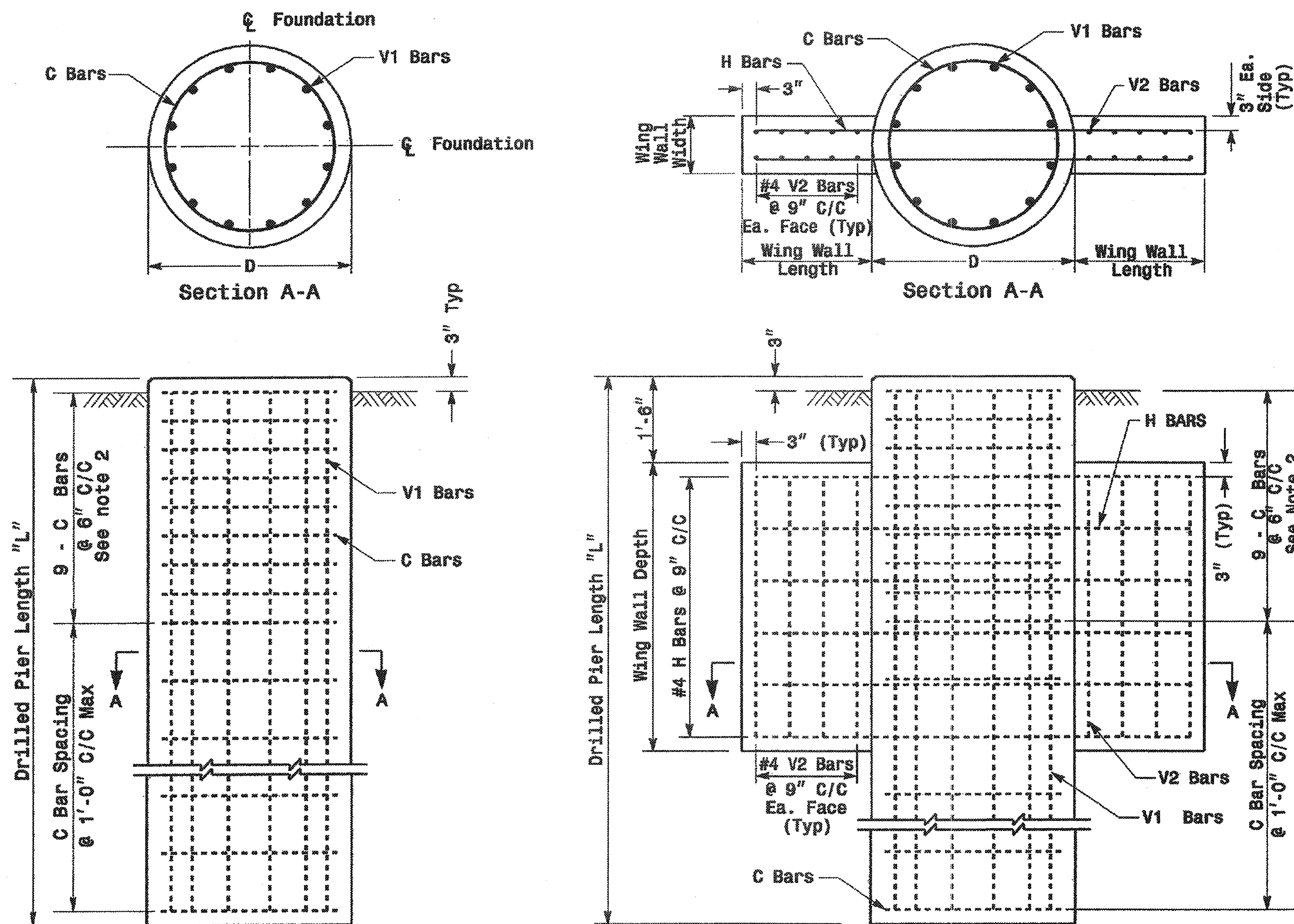
Fabrication Details - Mast Arm Poles

01-SEP-2005 14:11 w:\pdp\lee-un1\work\groups\2004 metal pole etandards\2004 as.dgn

	<b>Fabrication Details For Mast Arm Connection To Pole</b>		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander SCALE: 0 NA NONE	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito REVISIONS:	

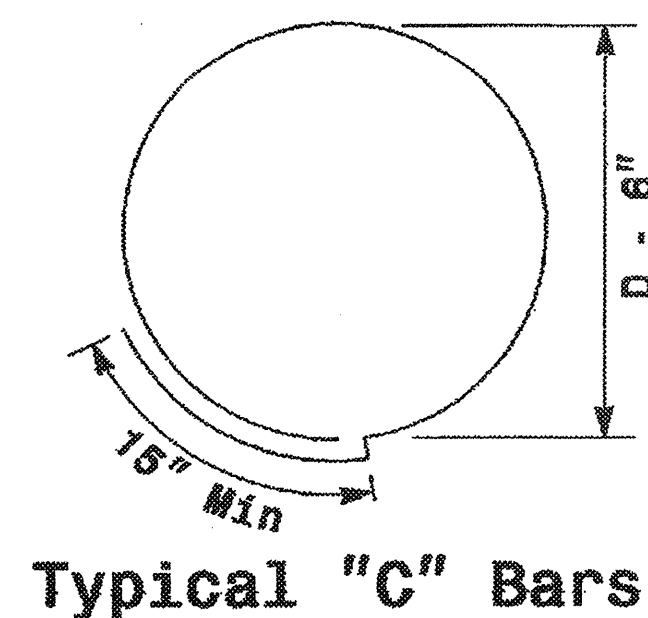


## Reinforcing Steel Bars



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

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



Typical "C" Bars

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

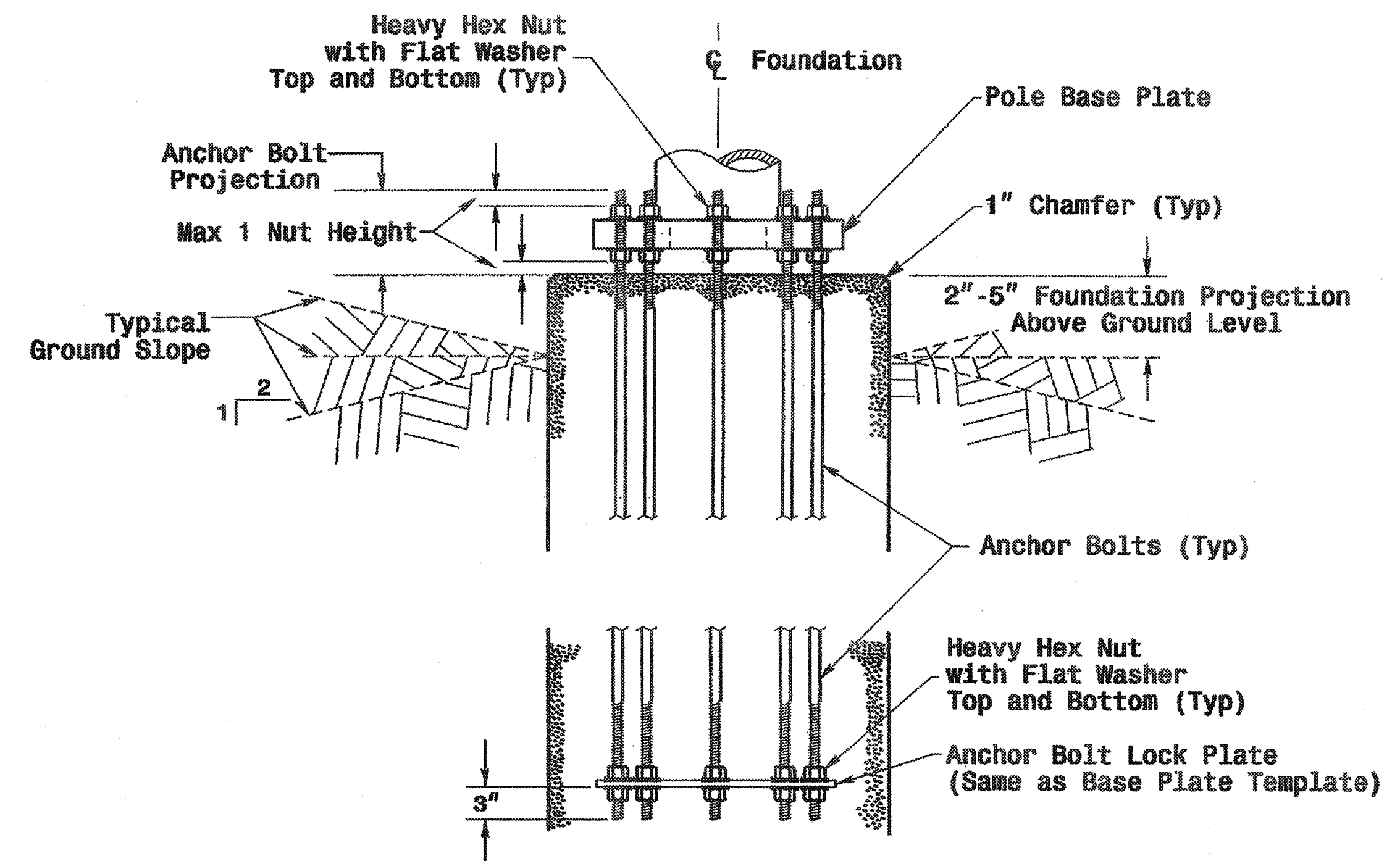
\* See Note No. 1  
\*\* See Note No. 3

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

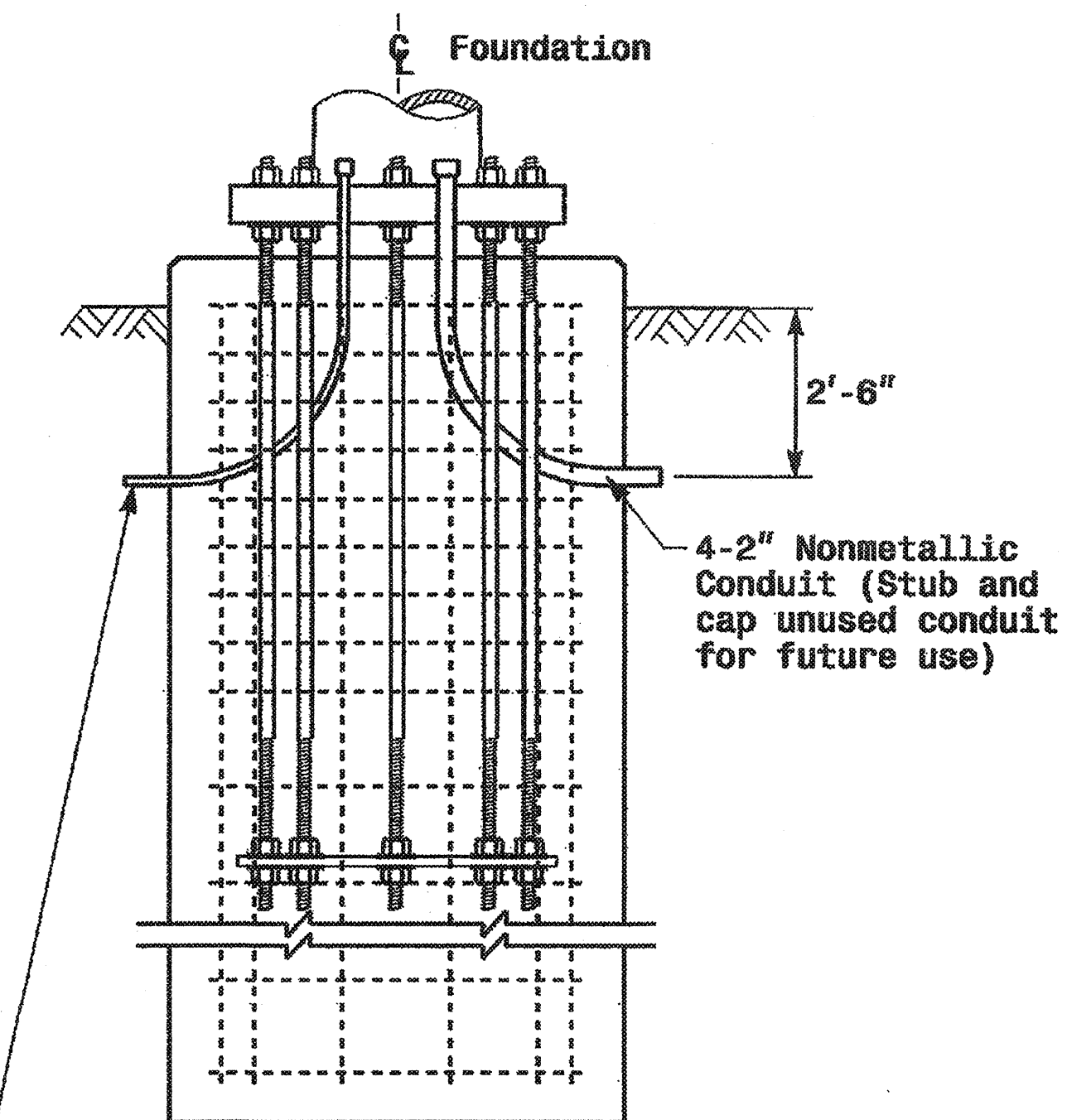
See Note No. 4

## Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



## Typical Foundation Conduit Details



## Notes

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

PROJECT REFERENCE NO. U-3304  
SHEET NO. Sig. 14 M 7

Construction Details - Foundations

01-SEP-2005 11:48 w:\p\p\185-un1\m\m\kgrouse\2004\m\c\ pole\_e\foundr-ds\2004\_m7.dgn p01.dwg

	Construction Details Foundations		
	PLAN DATE: May 2006 PREPARED BY: G.F. ANDREWS SCALE: 0 NA NONE	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.M. ESPOSITO REVISIONS:	



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

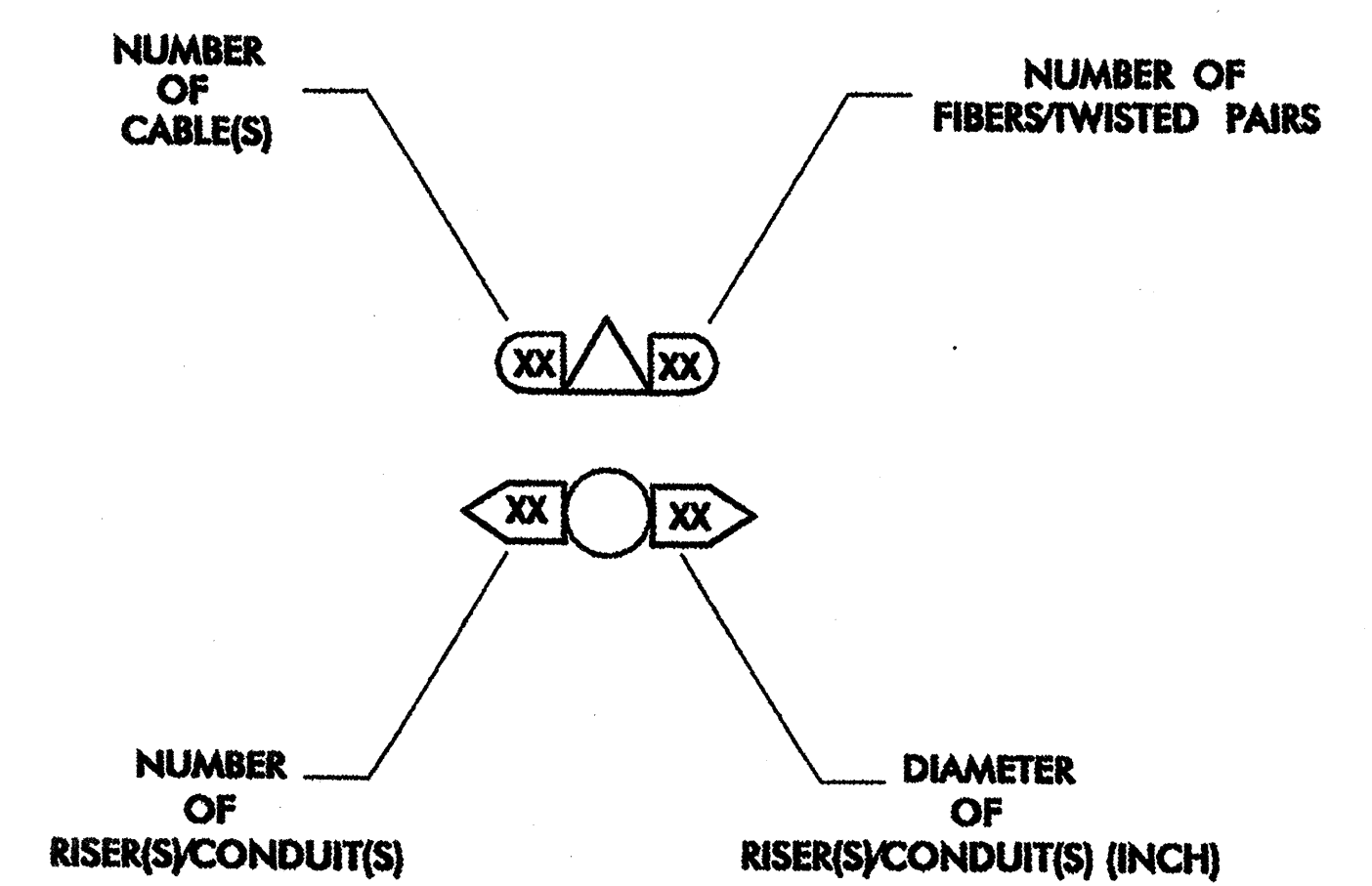
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL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

**LEGEND**

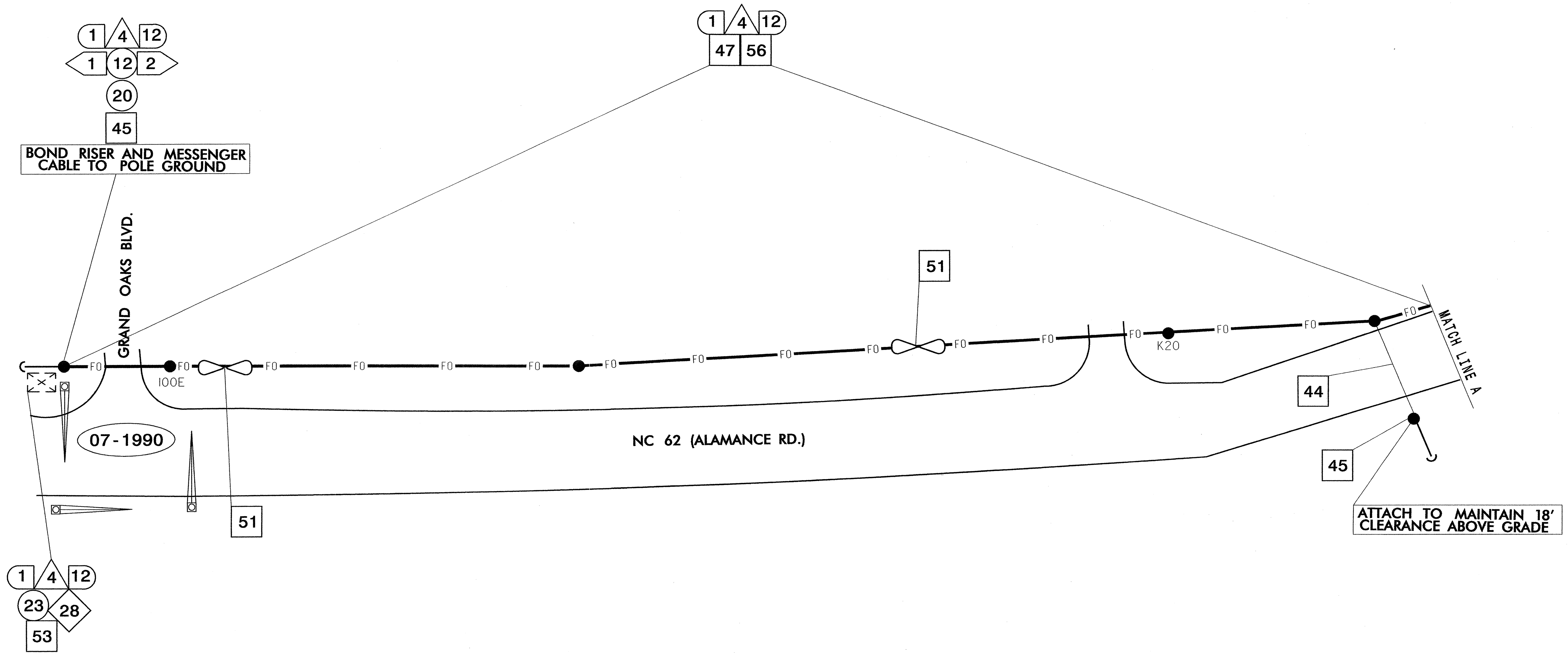
- FO NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI EXISTING COMMUNICATIONS CABLE
- REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD NEW DIRECTIONAL DRILLED CONDUIT
- B&J NEW BORED AND JACKED CONDUIT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

**CONSTRUCTION NOTE SYMBOLOGY KEY**

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



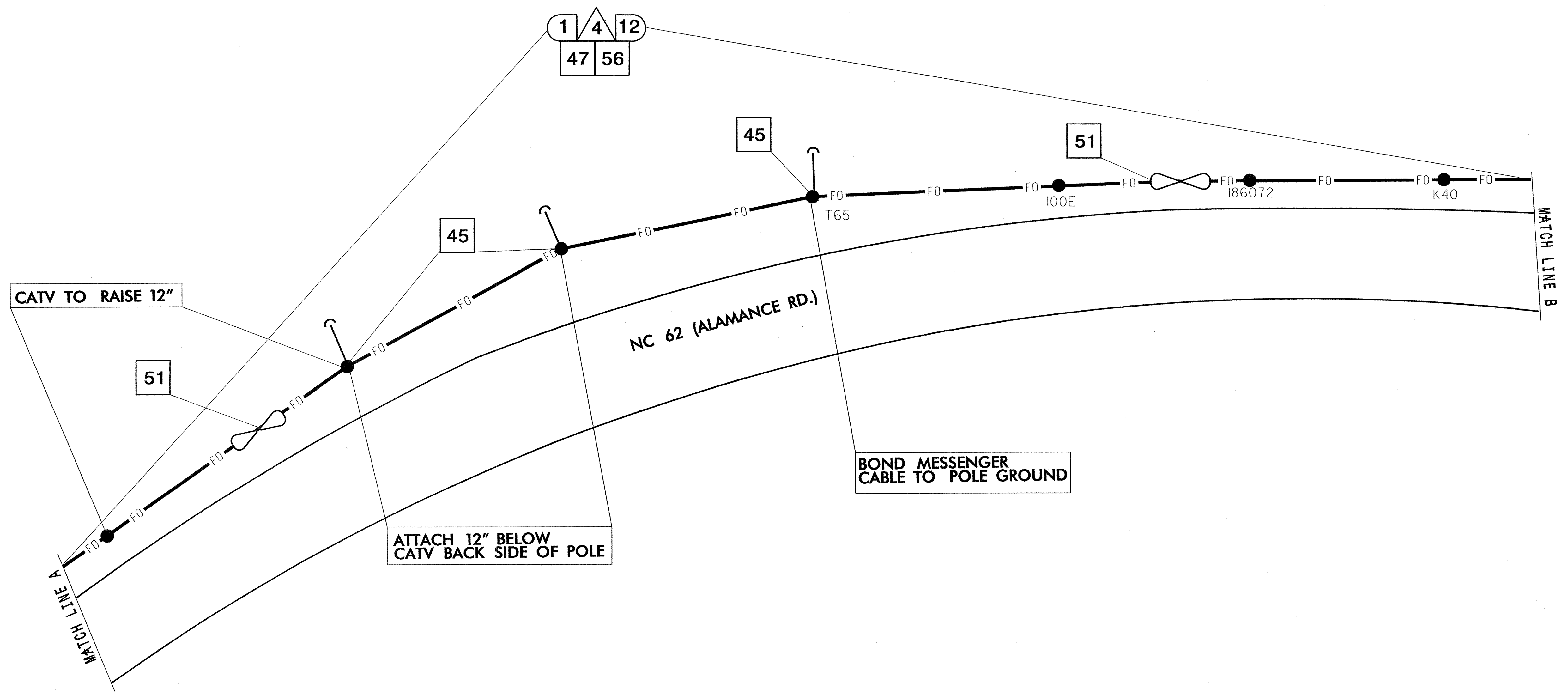
 Prepared in the Office of:  222 N. McDowell St., Raleigh, NC 27603	<b>CONSTRUCTION NOTES</b>		SEAL  GREGORY J. FULLER ENGINEER 023919
	PLAN DATE: _____ PREPARED BY: _____ SCALE: _____	REVIEWED BY: _____ REVIEWED BY: <b>G. A. FULLER</b> REVISIONS: _____ INTY. DATE: _____	



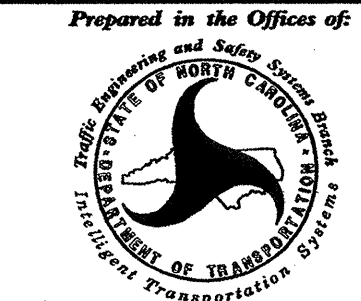
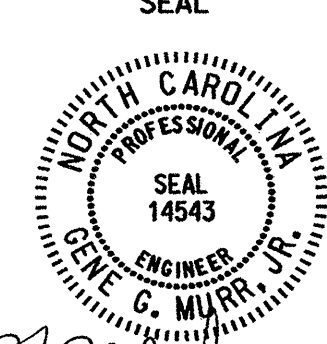
ALL NCDOT ATTACHMENT HEIGHTS ARE 12" BELOW CATV, FRONT SIDE OF POLE UNLESS OTHERWISE NOTED

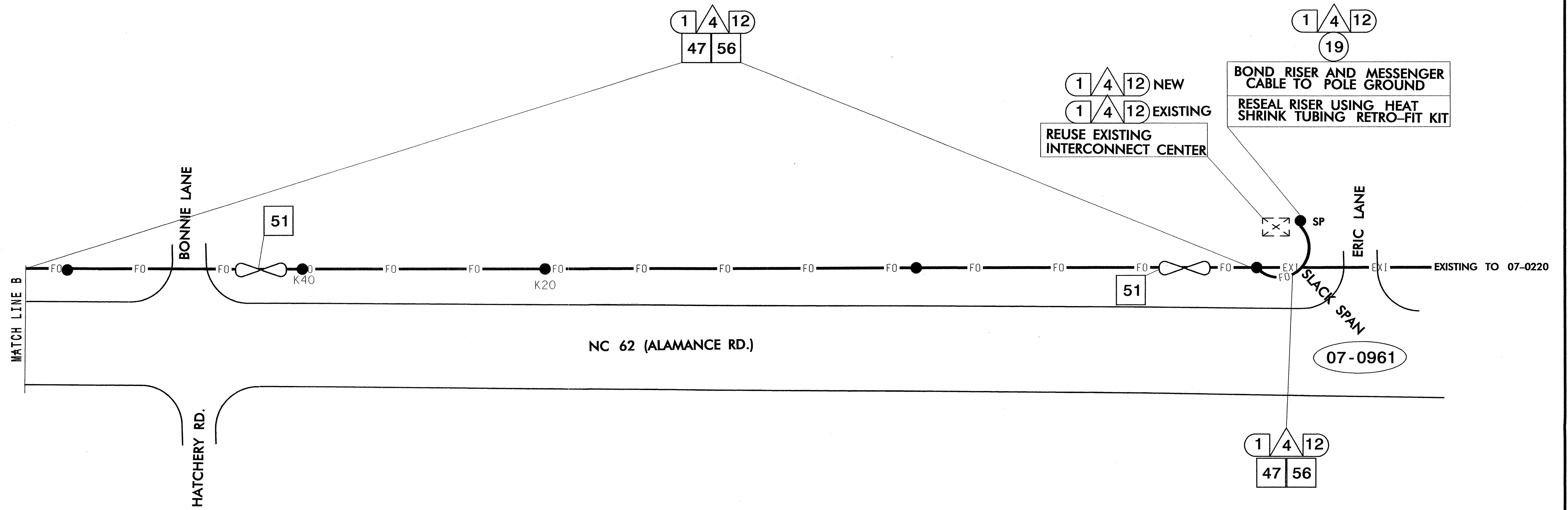
	<b>COMMUNICATIONS CABLE ROUTING PLANS ALONG NC 62 (ALAMANCE RD.) AT GRAND OAKS BLVD.</b>		<b>SEAL</b> 
	DIVISION 07 ALAMANCE COUNTY BURLINGTON	PLAN DATE: MARCH 08 REVIEWED BY: I. N. AVERY	
PREPARED BY: P. C. LOUDER	REVISIONS	INIT. DATE	REVIEWED BY: G. G. MURR, JR., PE
SCALE 	REVISIONS	INIT. DATE	SIGNATURE: <i>G. G. Murr, Jr.</i> DATE: 3-4-08





ALL NCDOT ATTACHMENT HEIGHTS ARE 12" BELOW CATV, FRONT SIDE OF POLE UNLESS OTHERWISE NOTED

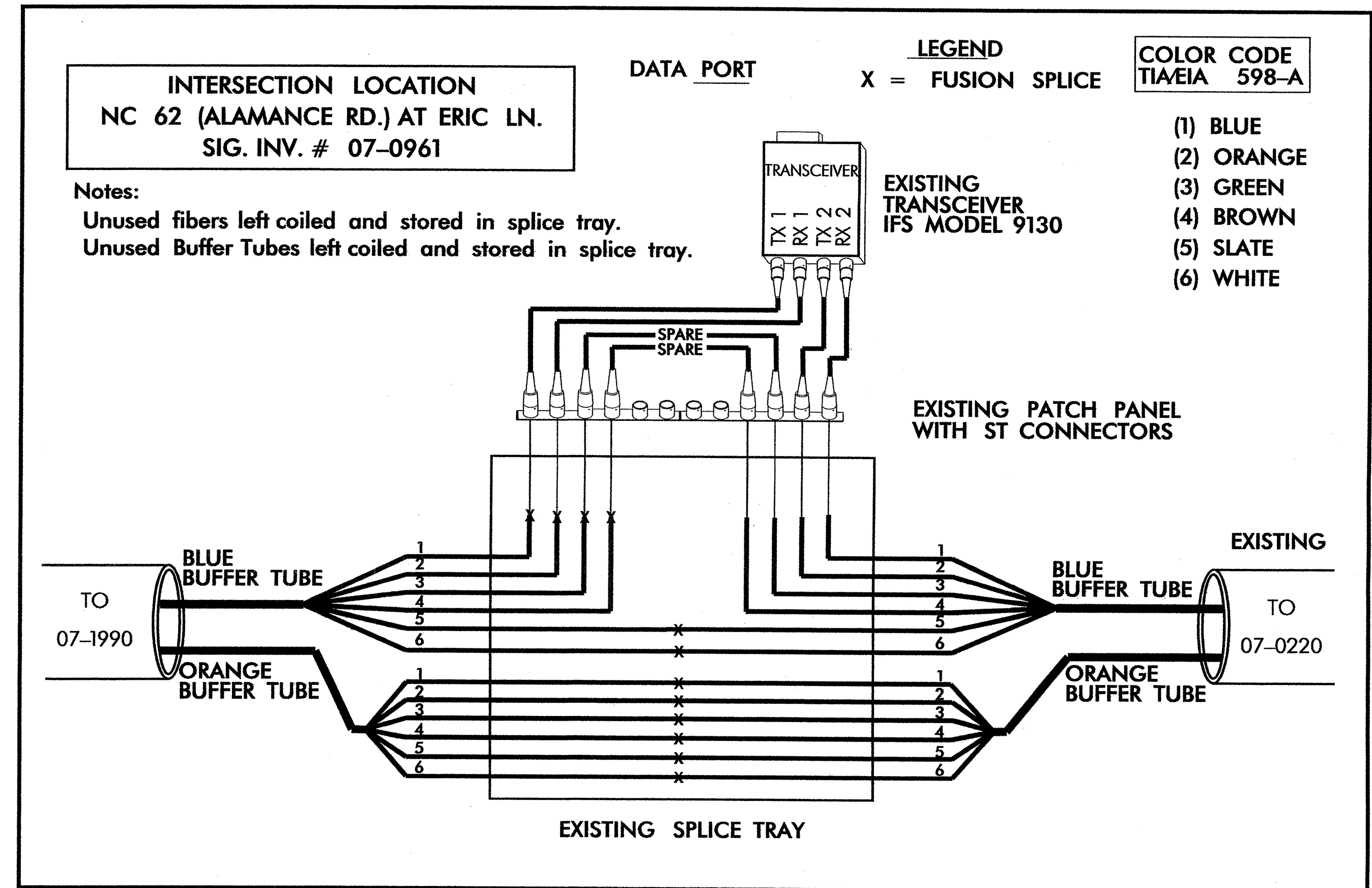
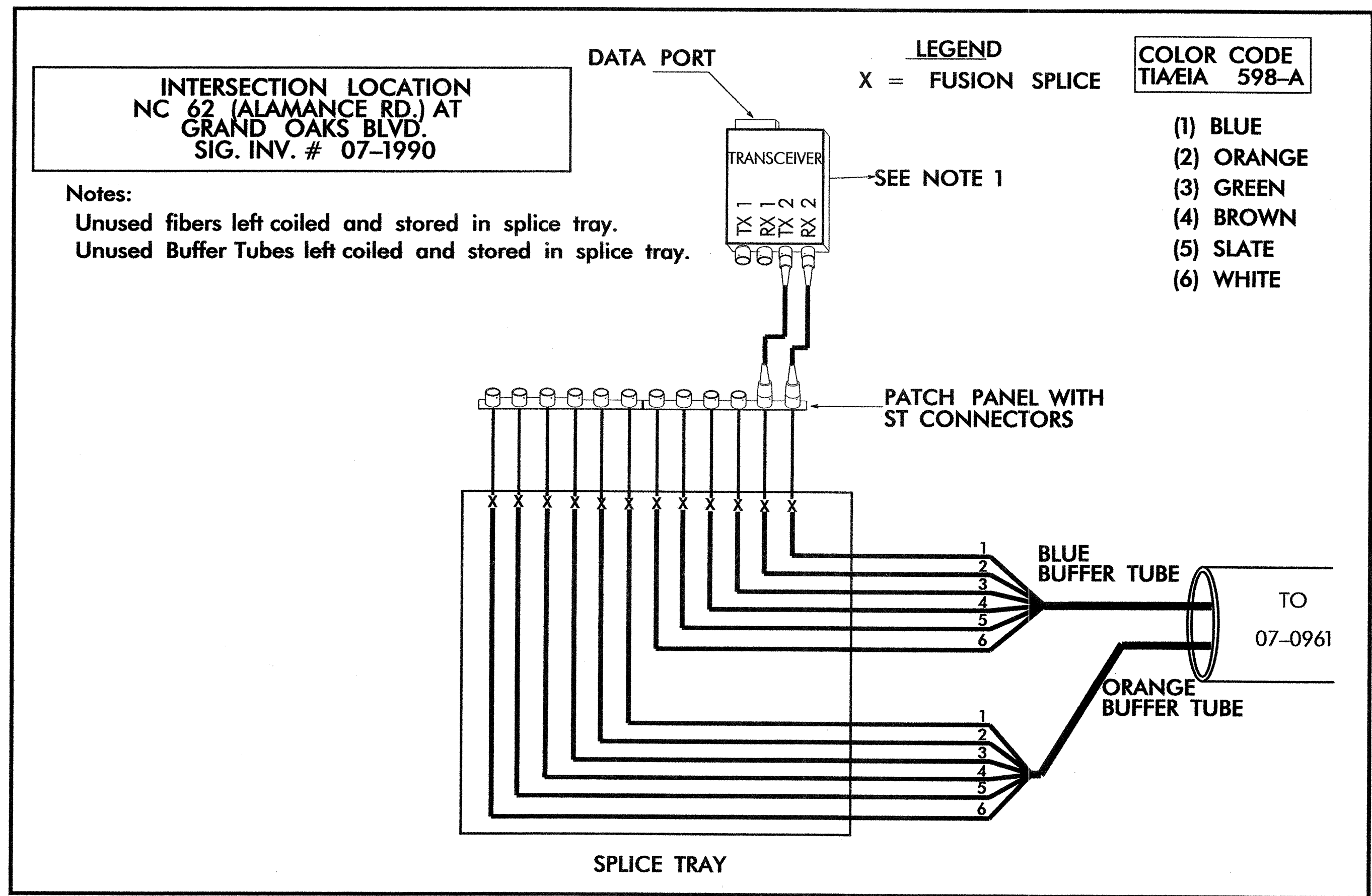
 Prepared in the Office of: Traffic Engineering and Safety Services NORTH CAROLINA DEPARTMENT OF TRANSPORTATION 750 N. Greenfield Pkwy., Garner, NC 27529	<b>COMMUNICATIONS CABLE ROUTING PLANS ALONG NC 62 (ALAMANCE RD.) AT GRAND OAKS BLVD.</b>		SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14543 GENE G. MURR, JR.
	DIVISION 07 ALAMANCE COUNTY BURLINGTON		
PLAN DATE: MARCH 08 PREPARED BY: P. C. LOUDER	REVIEWED BY: I. N. AVERY REVIEWED BY: G. G. MURR, JR., PE	REVISIONS INIT. DATE	SIGNATURE: <i>[Signature]</i> DATE: 3/4/08



ALL NCDOT ATTACHMENT HEIGHTS ARE 12" BELOW CATV, FRONT SIDE OF POLE UNLESS OTHERWISE NOTED

	<b>COMMUNICATIONS CABLE ROUTING</b> <b>PLANS ALONG</b> <b>NC 62 (ALAMANCE RD.) AT</b> <b>GRAND OAKS BLVD.</b>		SEAL 
	DIVISION 07 ALAMANCE COUNTY BURLINGTON		
PLAN DATE: MARCH 08	REVIEWED BY: I. N. AVERY		SIGNATURE: <i>[Signature]</i> DATE: 3-4-08
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.G. MURR, JR., PE		
SCALE: 0	REVISIONS:		CADD FILE NAME:





**TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATIONS.**

**NOTE: 1**  
1. CONTRACTOR TO FURNISH IFS TRANSCEIVER MODEL 9130, FOR COMPATIBILITY WITH THE BURLINGTON SIGNAL SYSTEM.

	<b>SPLICE PLANS</b> NC 62 (ALAMANCE RD.) AT GRAND OAKS BLVD.		SEAL 
	DIVISION 07 ALAMANCE COUNTY BURLINGTON		
PLAN DATE: MARCH 2008	REVIEWED BY: I. N. AVERY		SIGNATURE: <i>[Signature]</i> DATE: 4-08
PREPARED BY: P. C. LOUDER	REVIEWED BY: G. G. MURR, JR., PE		
SCALE: 0	REVISIONS	INIT.	DATE

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

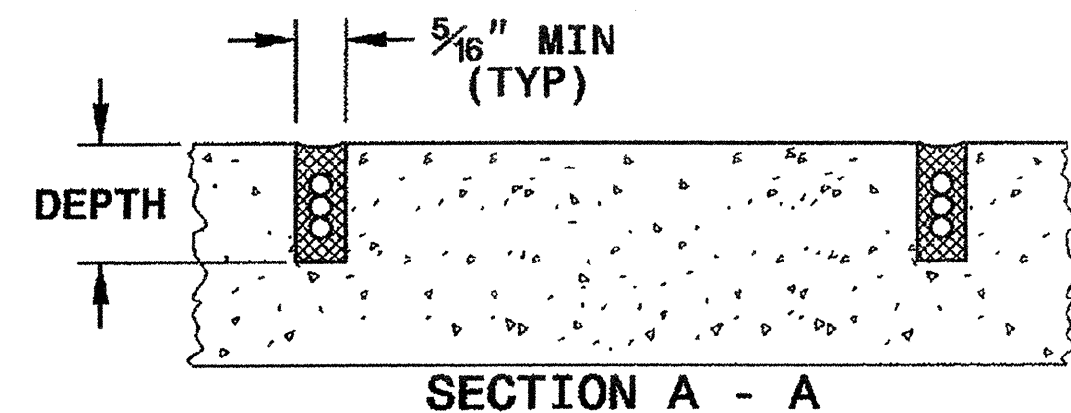
5-07

INDUCTIVE DETECTION LOOPS  
ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3  
1725D01

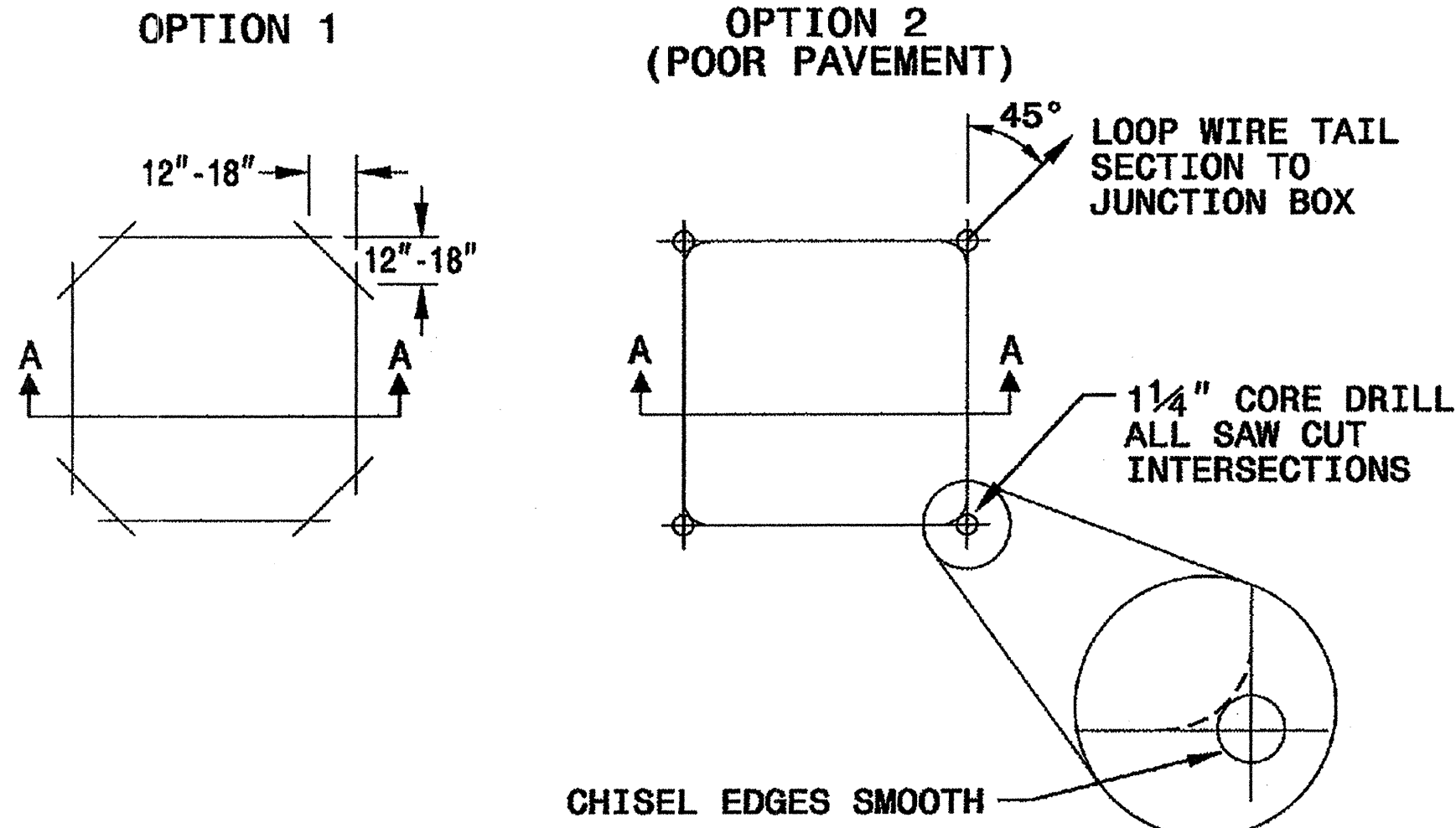
SAW SLOT DEPTH CHART

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

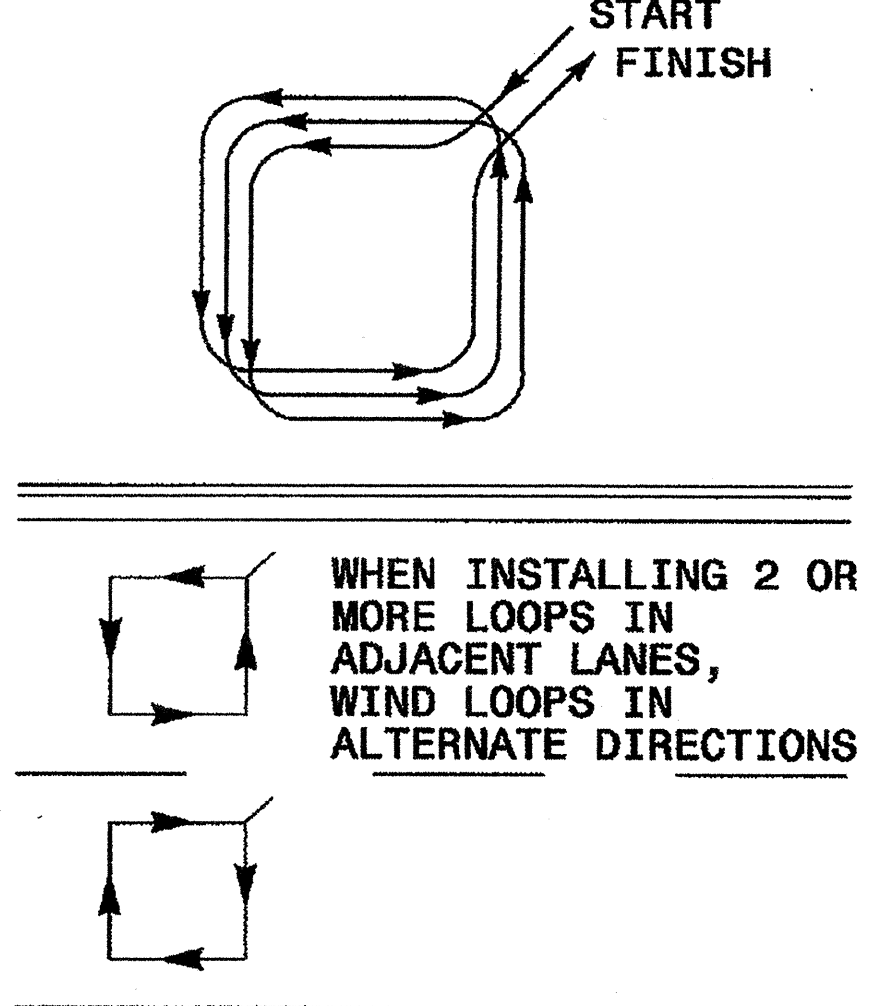


CONVENTIONAL 4-SIDED LOOP

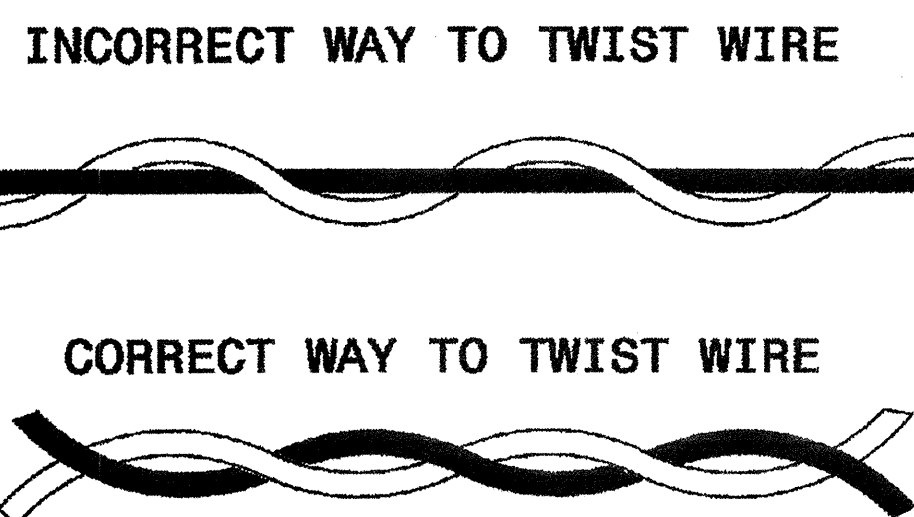
SAW CUT OPTIONS



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

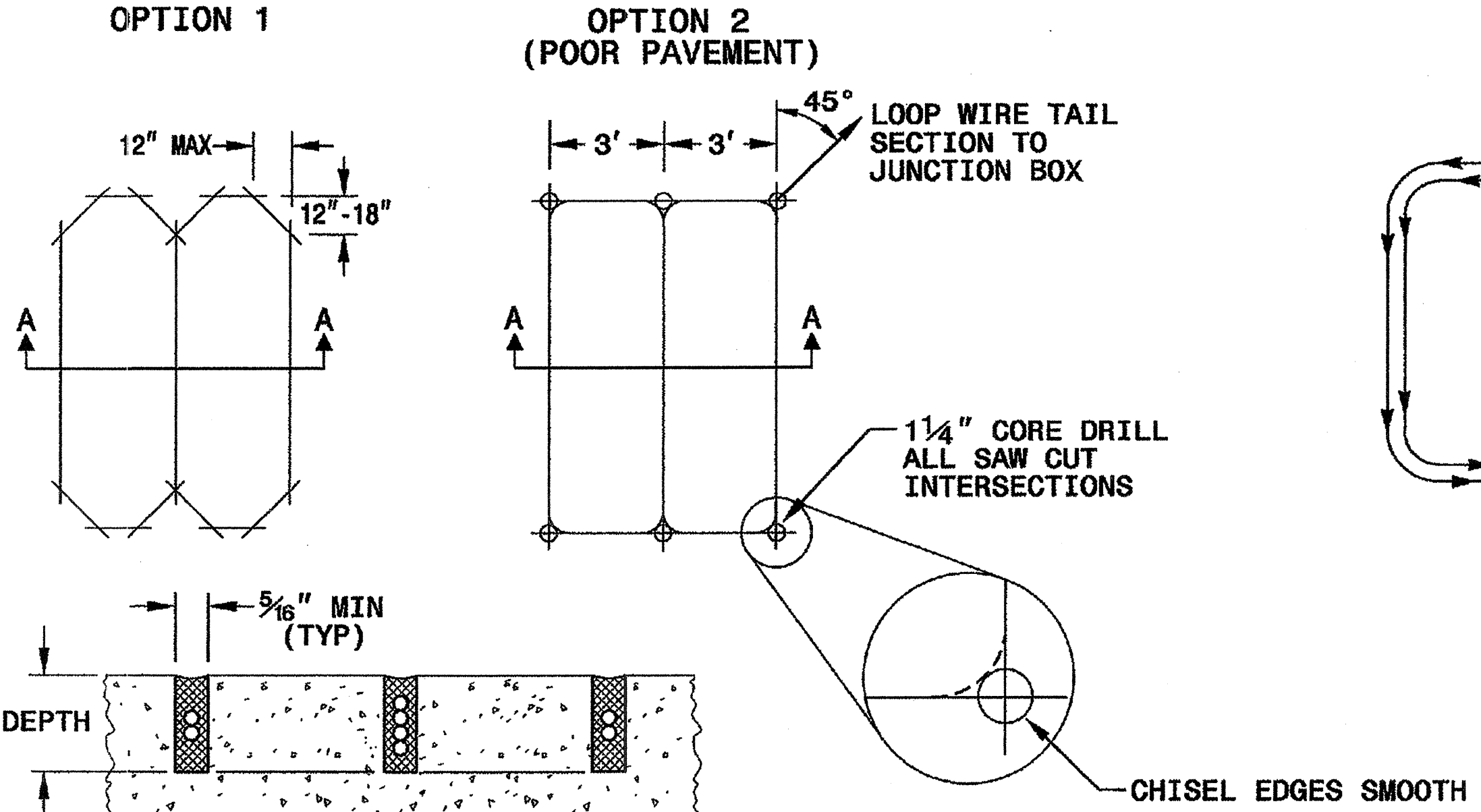


NOTES

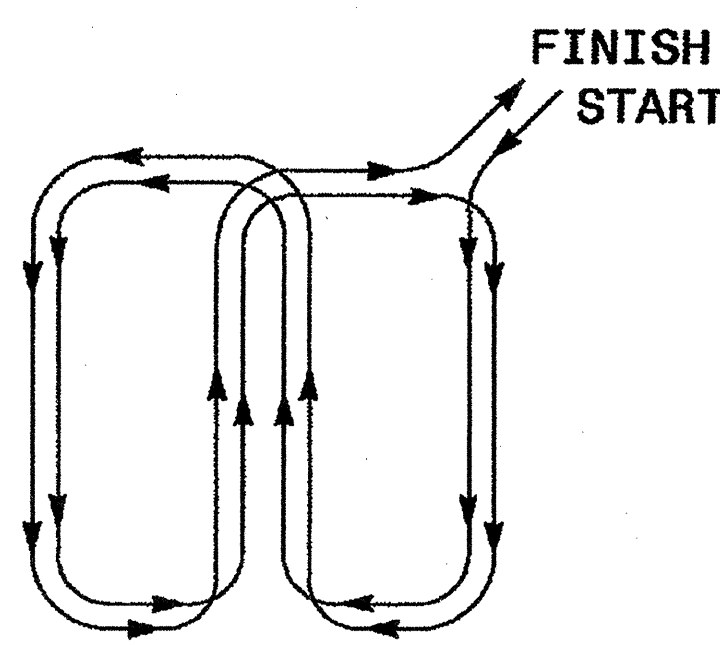
1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

QUADRUPOLE LOOP

SAW CUT OPTIONS



LOOP WINDING METHOD



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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

5-07

INDUCTIVE DETECTION LOOPS  
ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3  
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

ENGINEER  
MILTON I. DEAN  
Signature: Milton I. Dean  
DATE: 9/5/07

05-SEP-2007 14:00  
Documents and Settings\mdean\1116\_dohmedst\topostandard.metal.pole.sheets\1725D01.dwg:2307.dgn  
5/11/10



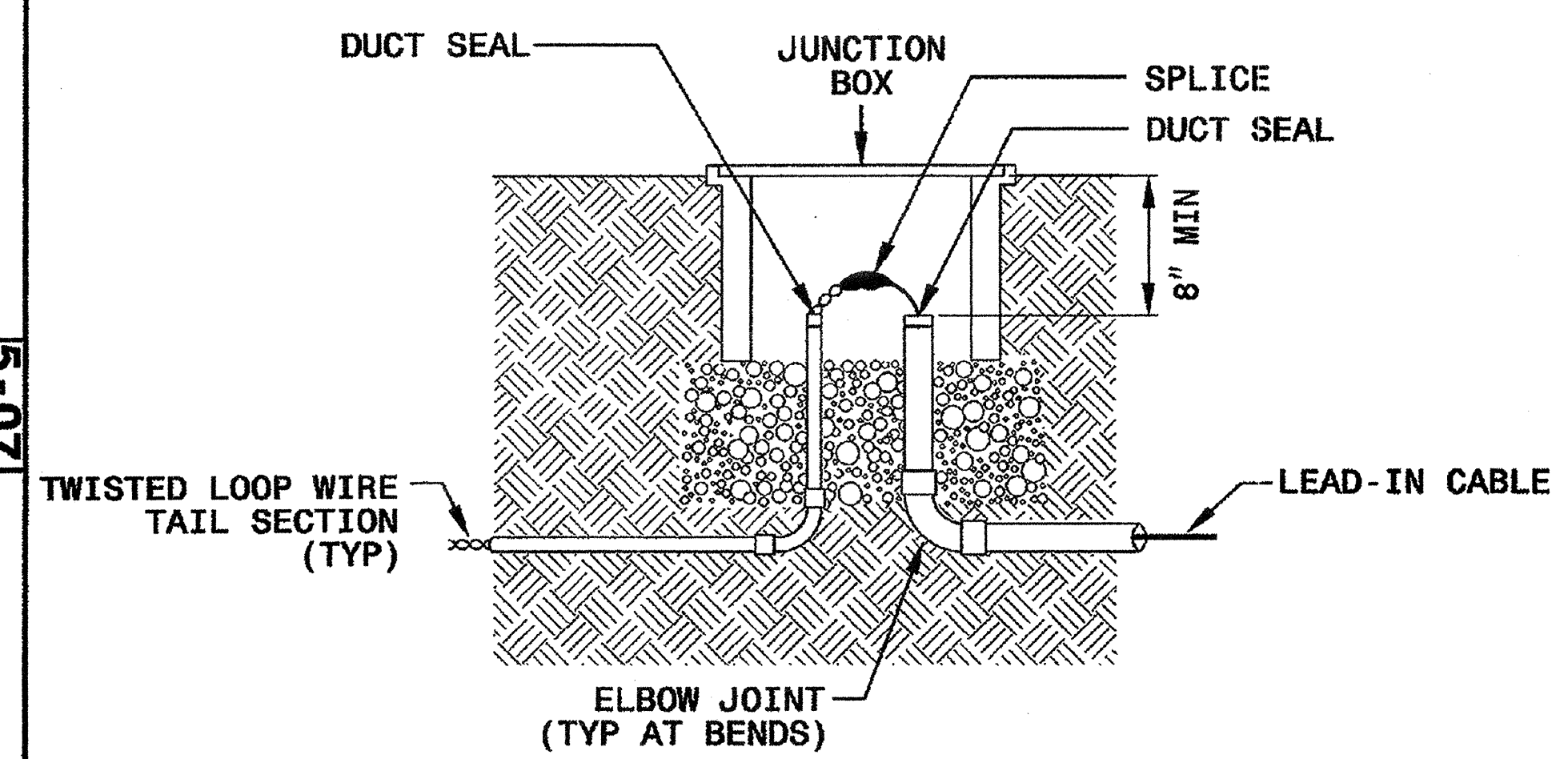
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

5-07  
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
LOOP WIRE DETAILS

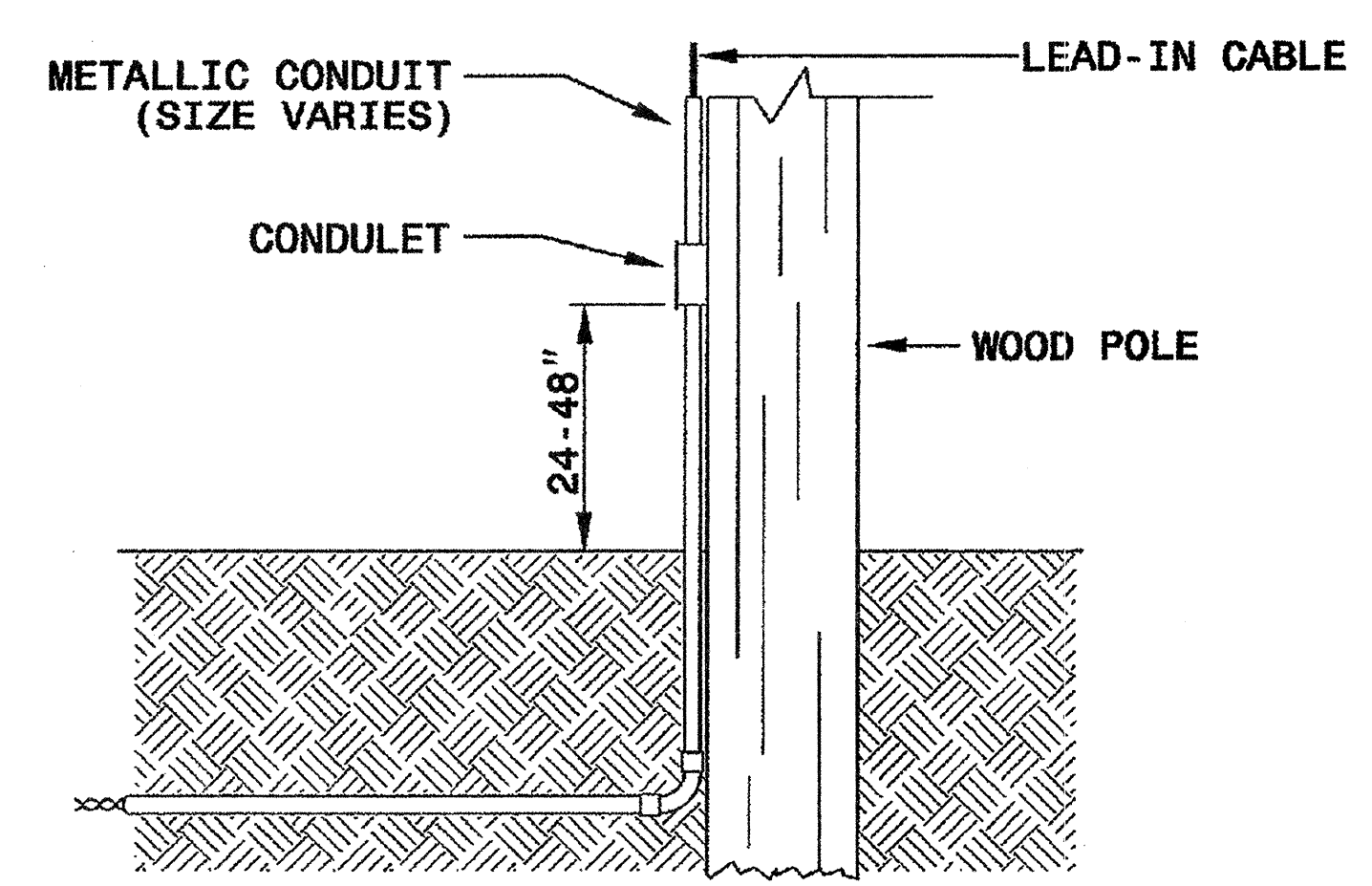
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



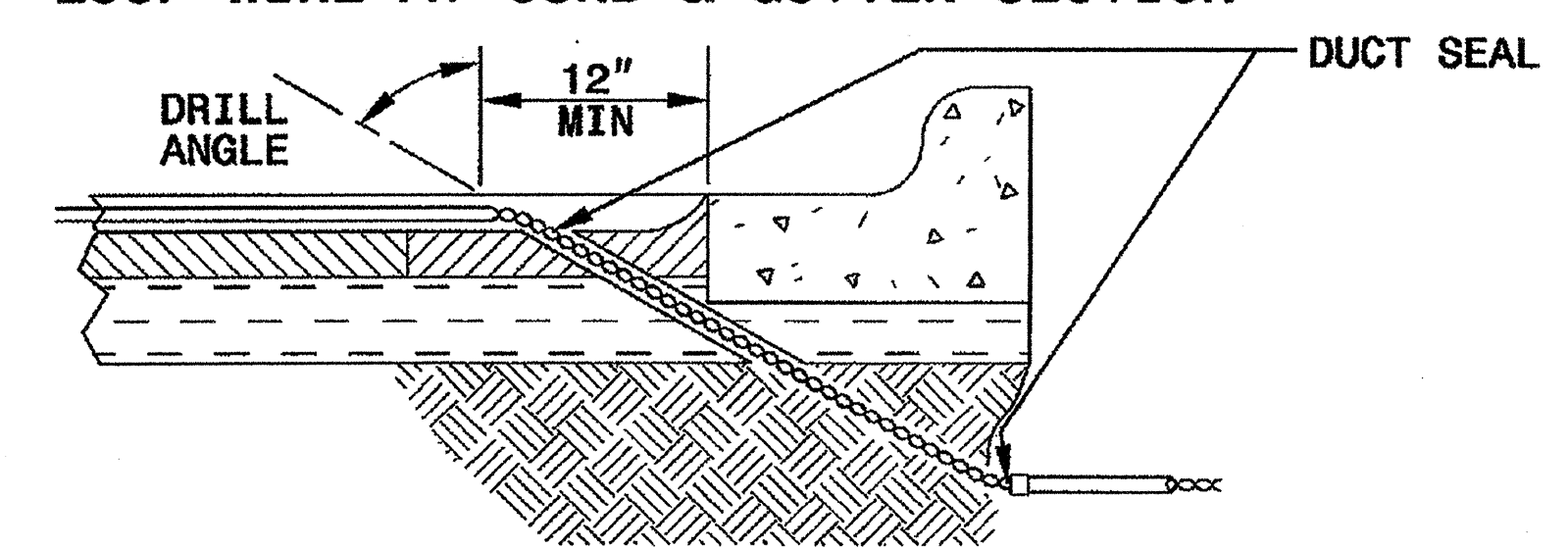
**LOOP WIRE AT POLE**



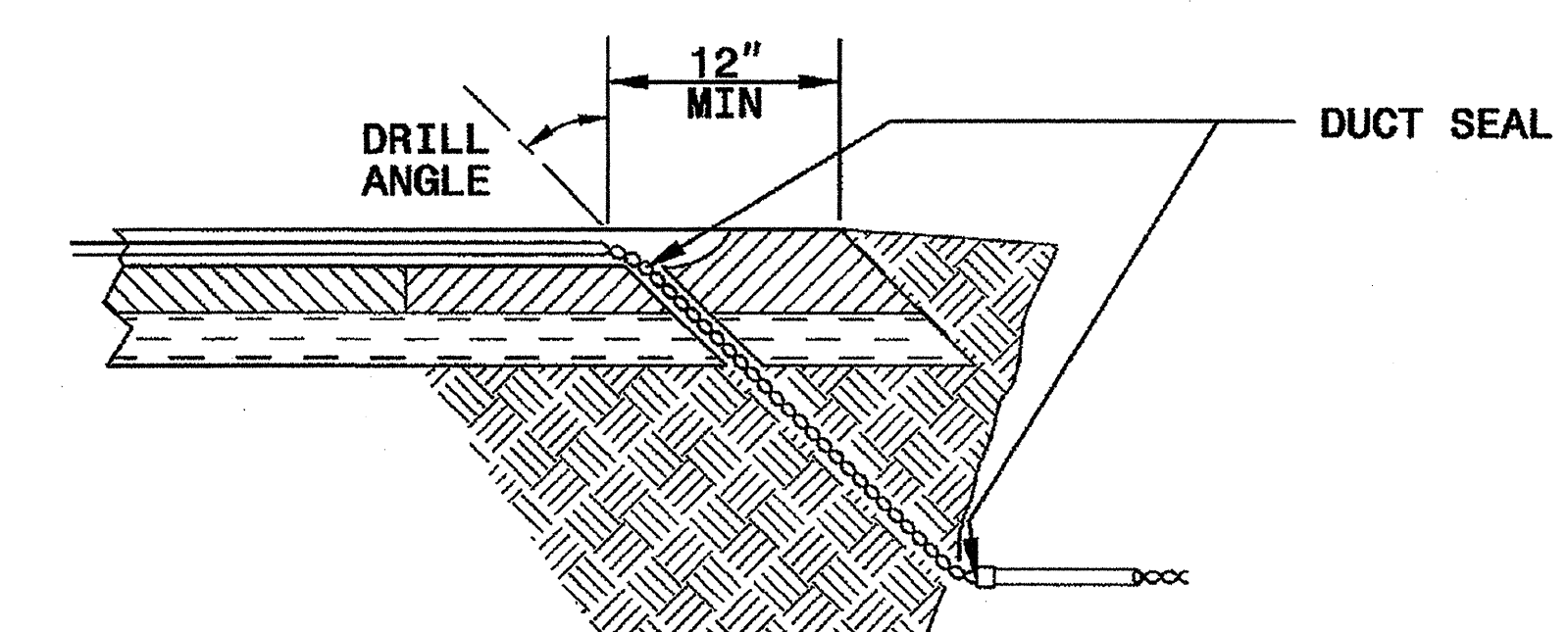
**NOTE**  
SPlice ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**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  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

5-07  
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 9/5/07  
SIGNATURE DATE

05-SEP-2007 14:00  
C:\documents and settings\zall111\ie-dow\desktop\standard metal pole sheets\1725D01.dwg 2/3/07.dgn



