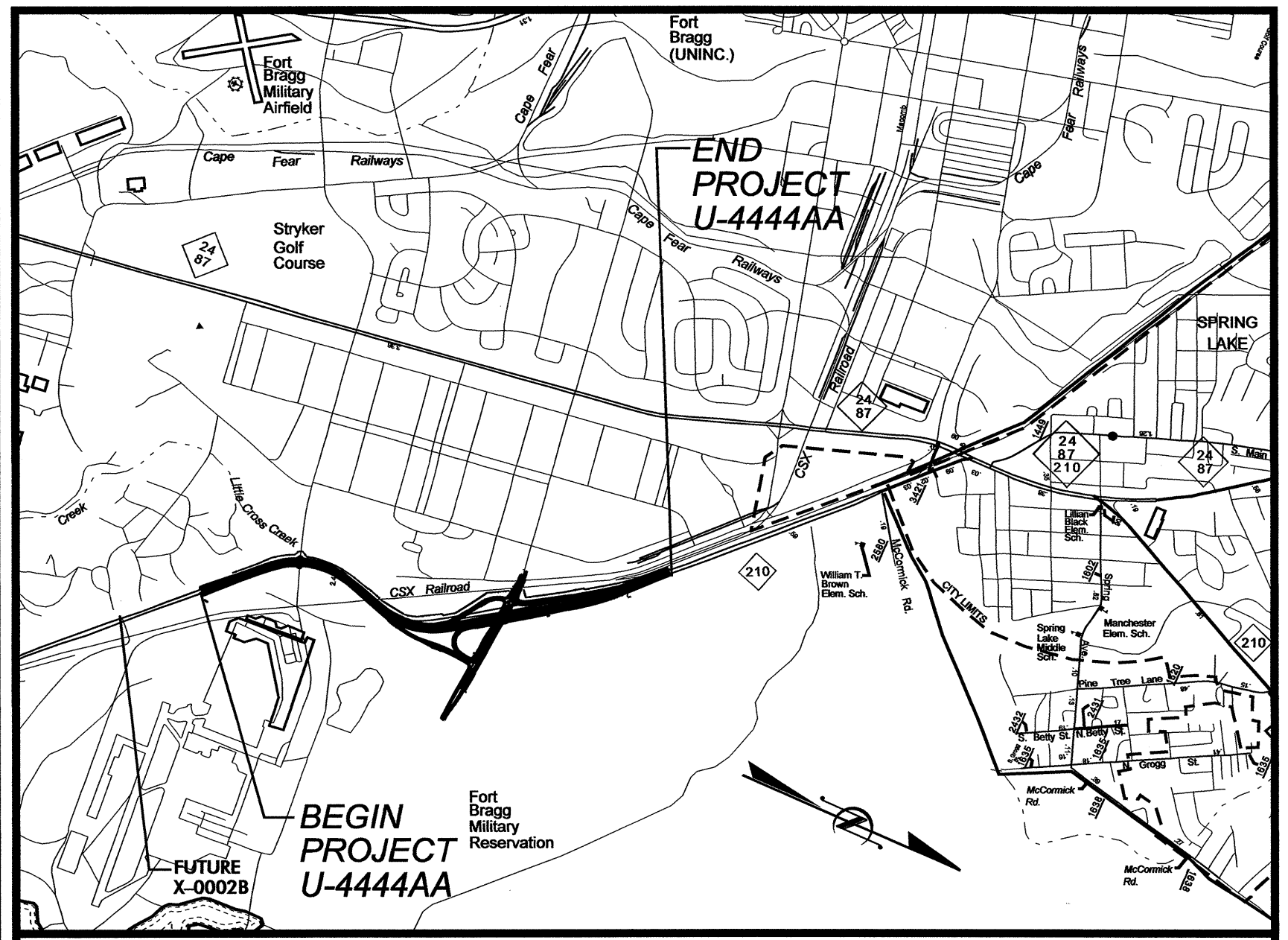
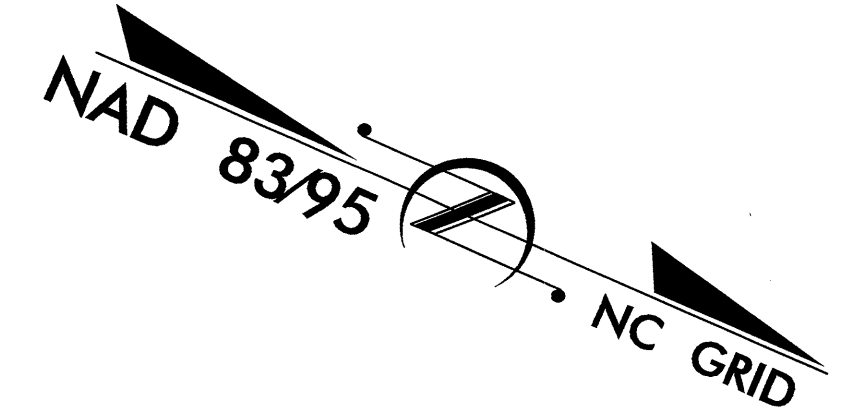


TIP: U-4444AA



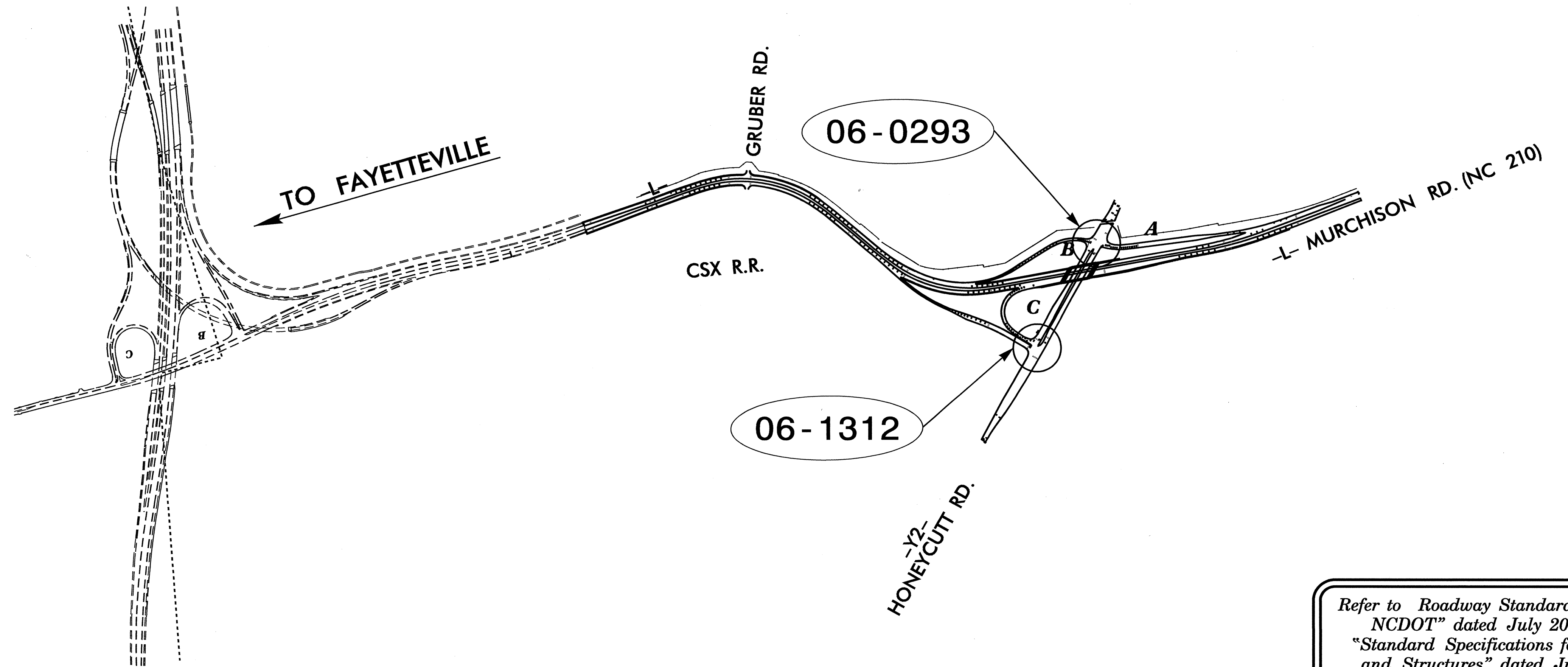
VICINITY MAP FOR STATE PROJECT U-4444AA

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
CUMBERLAND COUNTY



LOCATION: NC 210 (MURCHISON ROAD) FROM FAYETTEVILLE OUTER LOOP TO JUST NORTH OF HONEYCUTT RD.

TYPE OF WORK: TRAFFIC SIGNALS.



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

Sheet #	Reference #
Sig. 1	
Sig. 2-19	06-0293 Temps & Final
Sig. 20-21	06-1312
Sig. 22-27	N/A
Sig. 28-30	N/A
Sig. 31-34	N/A

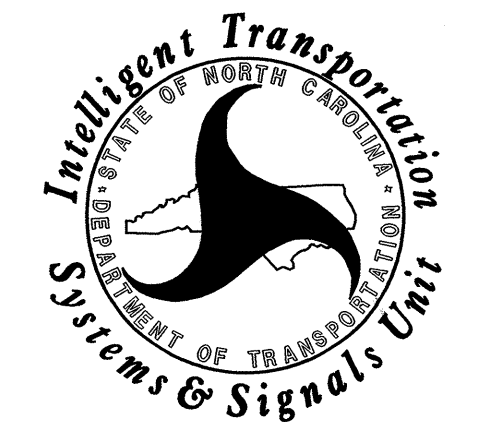
Index of Plans	Location/Description
Title Sheet	
Honeycutt Road At NC 24-87-210 (Murchison Road) SB Ramp	
Honeycutt Road At NC 24-87-210 (Murchison Road) NB Ramps	
Standard Drawings for Metal Poles	
Inductive Detection Loops Details	
Communications Cable and Conduit Routing Plans	

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

- Jason P. Galloway, PE - Eastern Region Signals Project Engineer
- George C. Brown., PE - Signal Equipment Design Engineer
- Greg Fuller, PE - State ITS and Signals Engineer

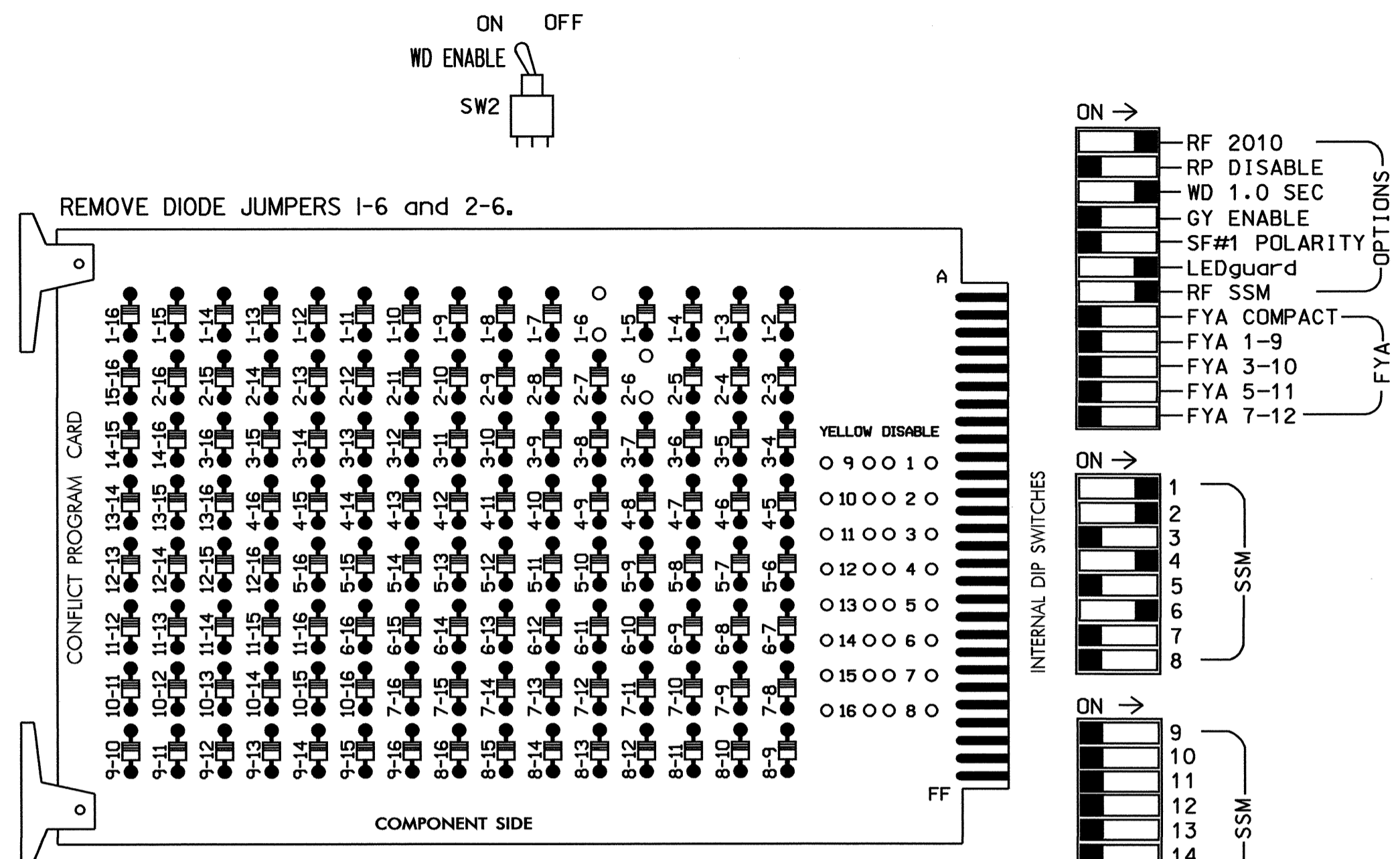
Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
BRANCH



01-JUN-2009 09:59
S:\ITS\signals\workgroups\tip_projects\U-4444aa\signals\design\titlesheet\tsheet.dgn

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- REMOVE DIODE JUMPERS 1-6 and 2-6.
- REMOVE JUMPERS AS SHOWN
- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Make sure jumpers SEL2-SEL5 are present on the monitor board.
- = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- 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 3,5,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 6, on the controller unit, for Variable Initial and phases 2, 4 and 6 for Gap Reduction.

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.	11	21, 22, 23	NU	NU	41, 42, 44, 45	NU	NU	61, 62, 63, 64	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW	125				101							
YELLOW ARROW	126				102							
GREEN ARROW	127				103							

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINET.....CONTRACTOR SUPPLIED 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S6
 PHASES USED.....1,2,4,6
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

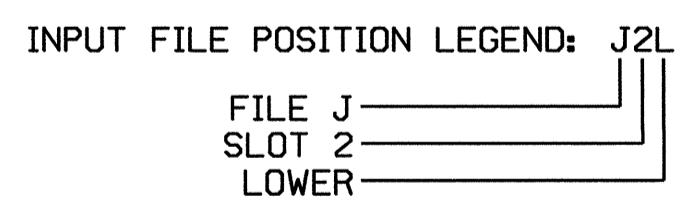
FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	FS
L	NOT USED	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	DC ISOLATOR
U	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	DC ISOLATOR
L	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	DC ISOLATOR

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
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB2-9,10	I3U	63	25	32	4		Y			
4B	TB2-11,12	I3L	76	38	42	4		Y			
4C	TB4-9,10	I6U	41	3	4	4	Y	Y			
4D	TB4-11,12	I6L	45	7	14	4	Y	Y			
4E	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
4F	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2.0	5
4G	TB6-5,6	I8U	49	11	24	4	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			



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T3
 DESIGNED: April 2009
 SEALED: 05/04/09
 REVISED: N/A

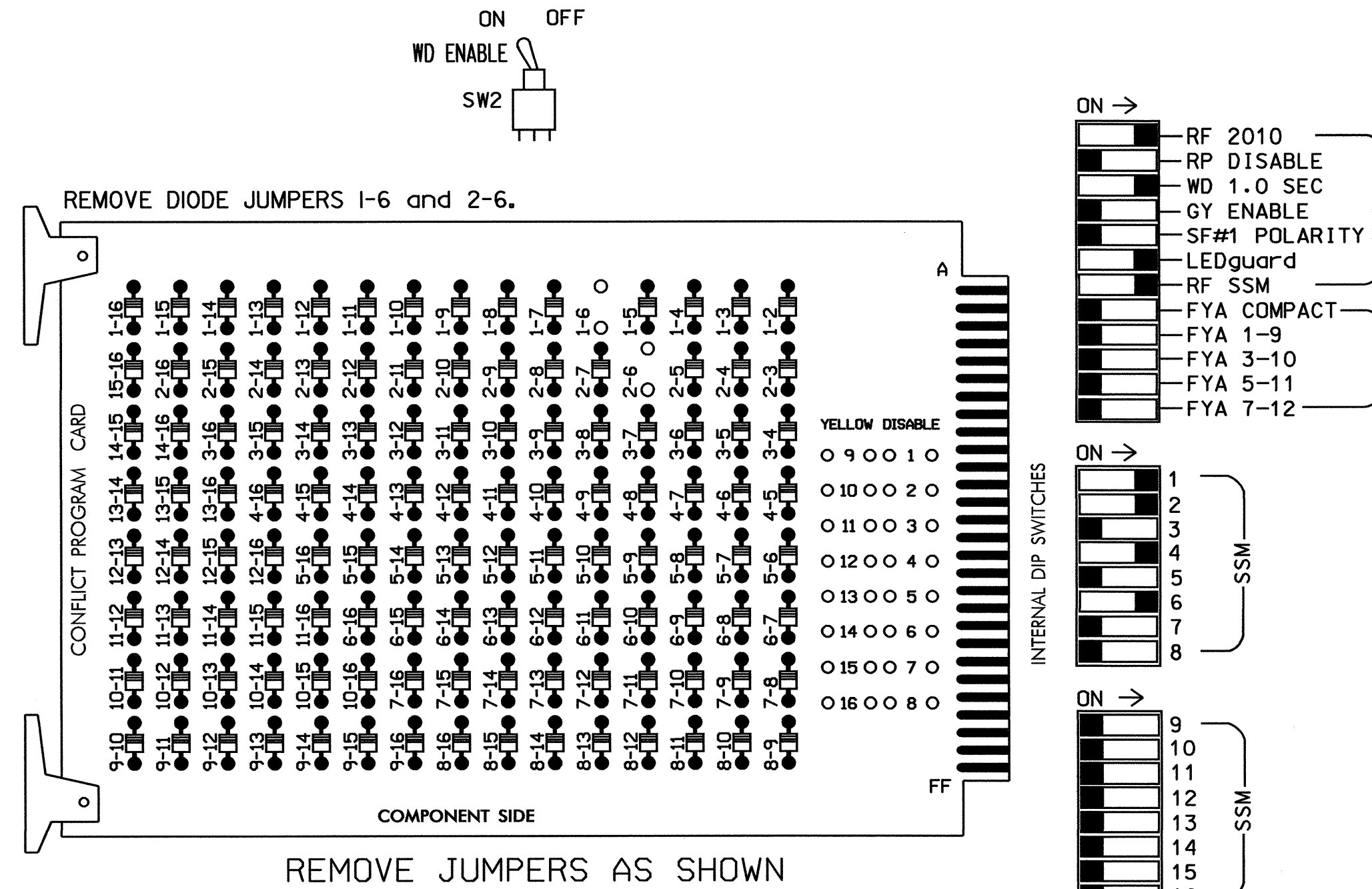
Signal Upgrade Temp 3 Phase 1 Step 3

	Electrical and Programming Details For:		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER GEORGE C. BROWN 022013
	Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps		
Prepared In the Office of:	Division 6 Cumberland County Fort Bragg	PLAN DATE: May 2009	REVIEWED BY: T. J. J...
PREPARED BY: C. Strickland	REVIEWED BY:	REVISIONS	INIT. DATE
Signature: <i>George C. Brown</i> 5/26/09			DATE:
SIG. INVENTORY NO. 06-0293T3			

21-MAY-2009 07:37
 C:\Users\jgougeon\Documents\20090521_01\20090521_01.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 3,5,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINET.....CONTRACTOR SUPPLIED 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S4,S6
 PHASES USED.....1,2,4,6
 OVERLAP P.....1+2+4+6

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.	11	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW	125											
YELLOW ARROW	126											
GREEN ARROW	127											

NU = Not Used

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

USING + OR - KEY POSITION ON OVERLAP 'P'

```

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

OVERLAP PROGRAMMING COMPLETE

The utilization of overlap P ensures consistent clearance timing during transition to preemption

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	FS
L	1A	2A	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	DC ISOLATOR
L	NOT USED	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	ST
L	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	DC ISOLATOR
U	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	PRE1
L	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	AC ISOLATOR
L	∅ 1	∅ 2	∅ 3	∅ 4	∅ 5	∅ 6	∅ 7	∅ 8	∅ 9	∅ 10	∅ 11	∅ 12	∅ 13	NOT USED

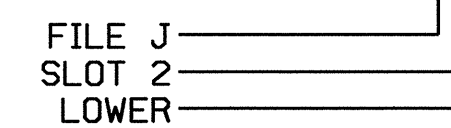
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME
 PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			5
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



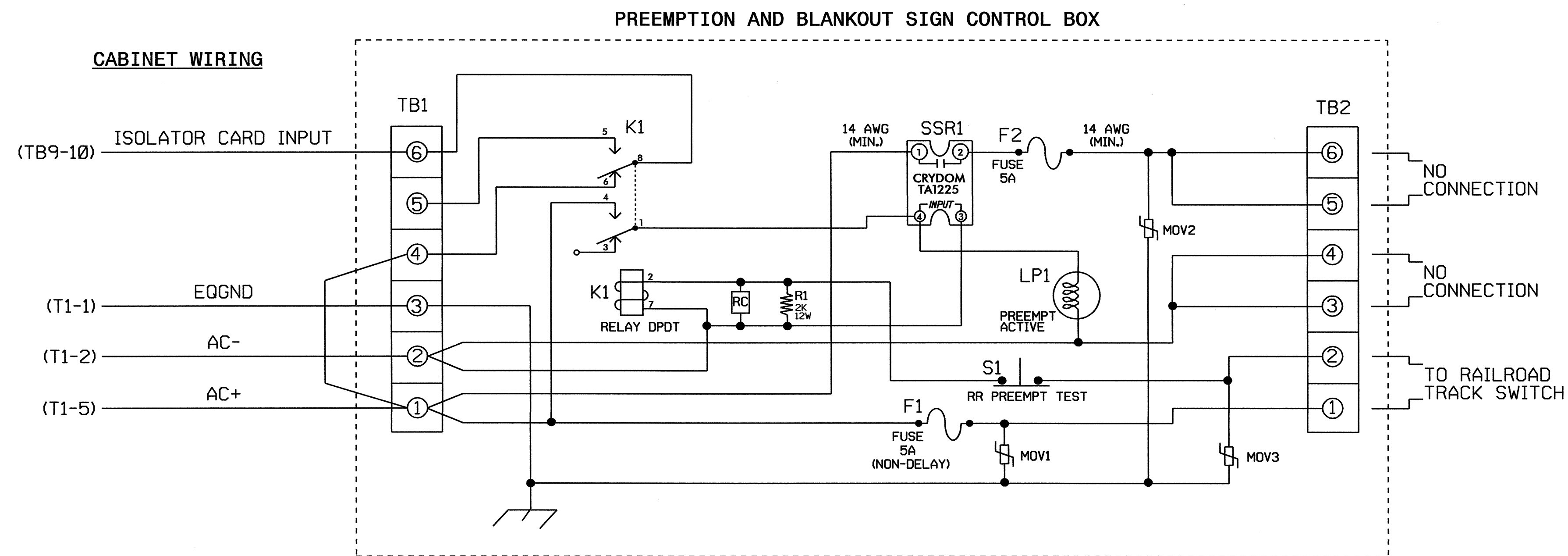
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T4
 DESIGNED: April 2009
 SEALED: 05/04/09
 REVISED: N/A

Signal Upgrade Temp 4 Phase II - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529	Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps		SEAL GEORGE C. BROWN ENGINEER No. 022013 DATE: 5/26/09
	Division 6 PLAN DATE: May 2009 PREPARED BY: C. Strickland REVIEWED BY: T. J. J.	Cumberland County Fort Bragg REVIEWED BY: T. J. J.	
REVISIONS: _____ INIT.: _____ DATE: _____			DATE: _____

**RAILROAD PREEMPTION WIRING DETAIL
USING PREEMPT CONTROL BOX**

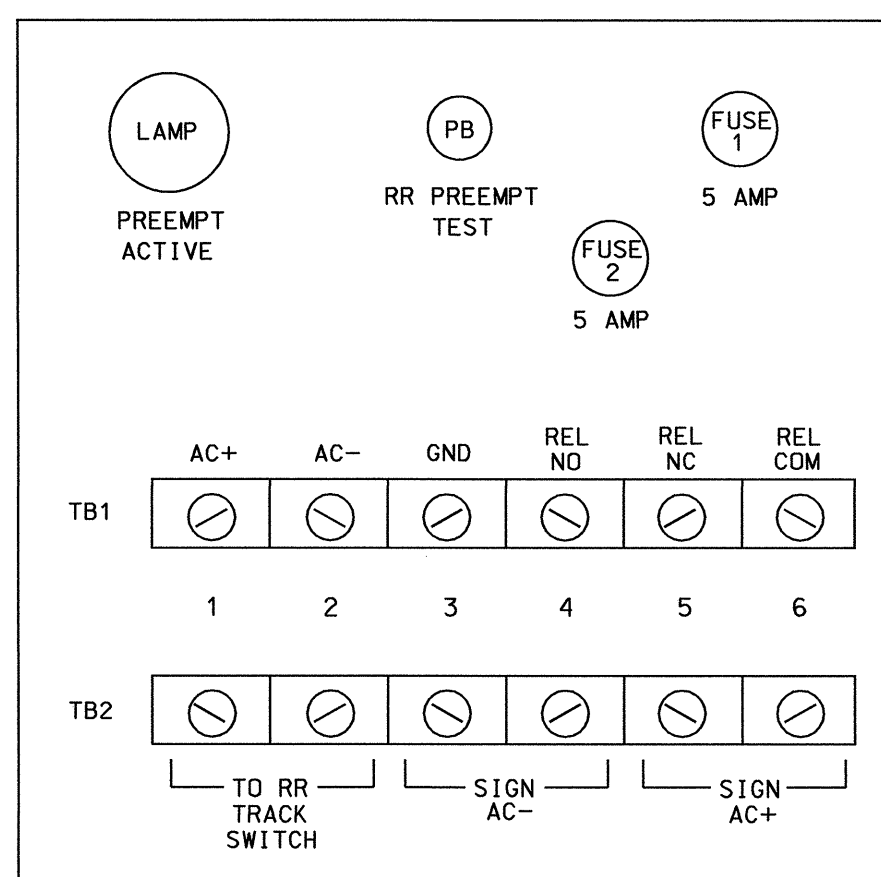
(wire as shown below)



NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
- Relay K1 is a DPDT with 120VAC coil. Potter & Brumfield KRP11AG with octal base or approved equivalent.
- Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output. Crydom TA1225 or approved equivalent.
- AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card (See detail this sheet).
- Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K or approved equivalent.
- RC network is valued at .1 microfarad, 100 ohm.
- If replacement movs are needed, GE part no. V150LA20A may be used.
- Preemption and Blankout Sign Control Box is a Control Technologies part no. 2299-101 or approved equivalent.
- IMPORTANT!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



RAILROAD PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

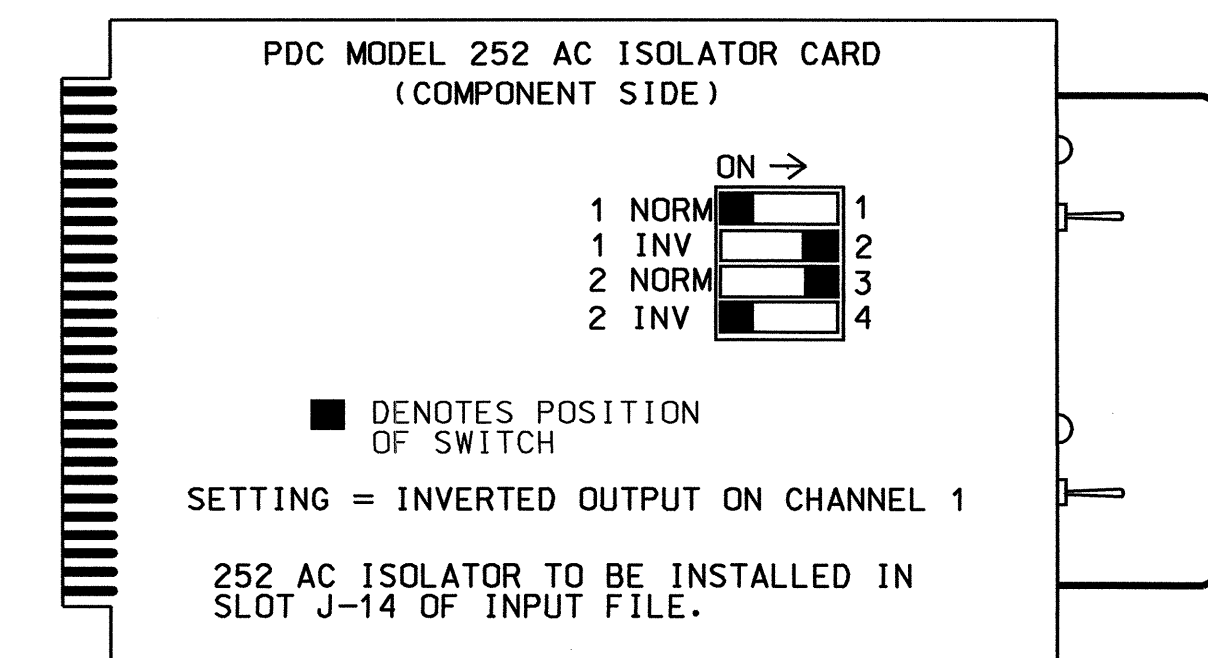
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #1	INTERVAL/TIMING	SETTINGS (NEXT:1-10)
GRN YEL RED		CLEAR/DWELL PHASES
1 37 0.0 0.0		12345678910111213141516
2 255 0.0 0.0		X X
3 0 0.0 0.0		X X
4 0 0.0 0.0		
5 1 0.0 0.0		X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	HIGH
DELAY TIMER (0-255 SEC)	0
MIN GREEN BEFORE PRE (0= DEFAULT)....	1
PED CLEAR BEFORE PRE (0= DEFAULT)....	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).3.7	0
RED CLEAR BEFORE PRE (0= DEFAULT)....	2.7
DWELL MIN TIMER (0-255 SEC)	7
DWELL MAX TIMER (0=OFF,1-255MIN) ...	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	N
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	N
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	N
OVERLAPS:	ABCDEFGHIJKLMNPO
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



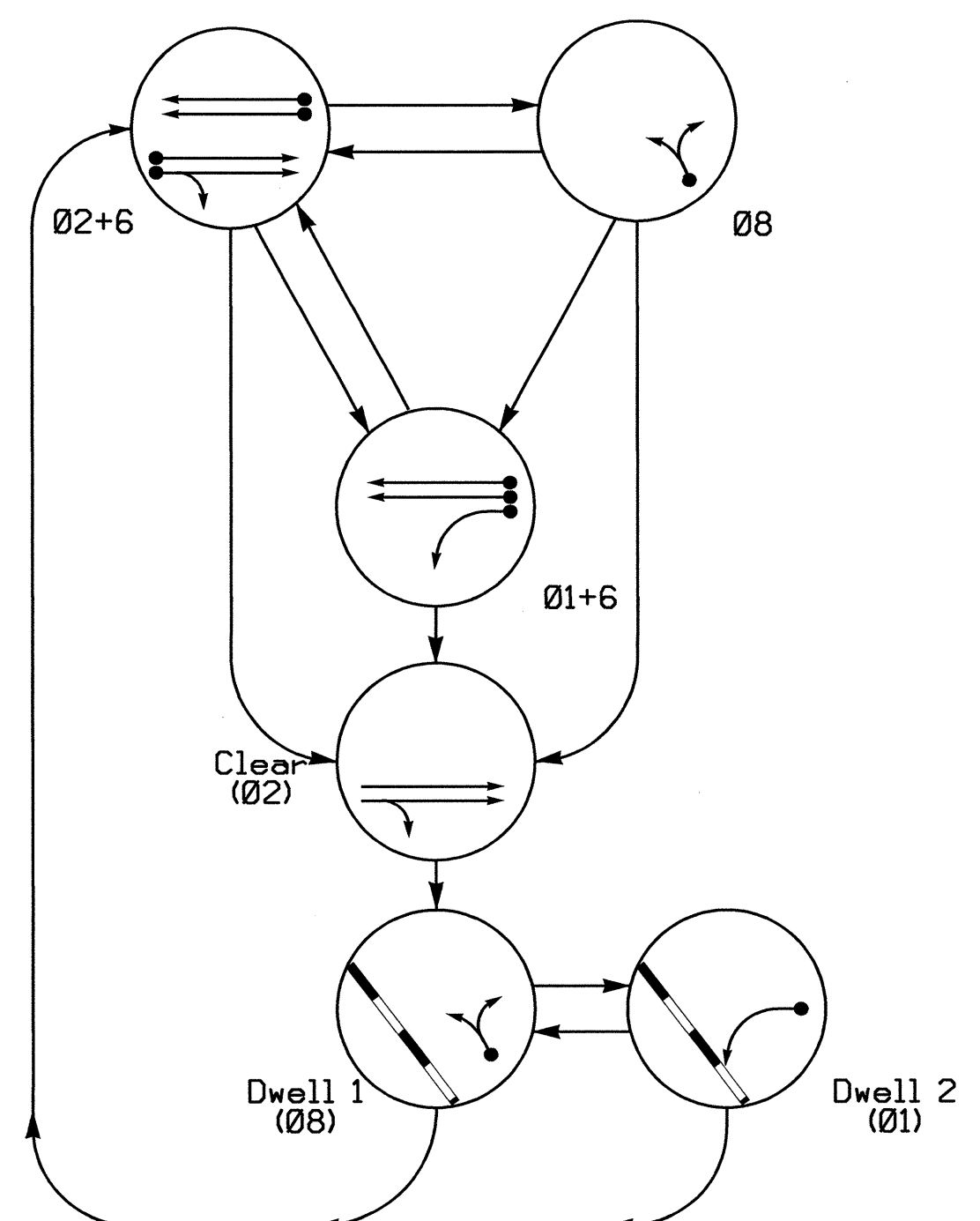
NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

Signal Upgrade Temp 4 Phase II - Sheet 2 of 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T4
DESIGNED: April 2009
SEALED: 05/04/09
REVISED: N/A

<p>Prepared In the Offices of:</p>	<p>Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps</p>		<p>SEAL</p>
	<p>Division 6 Cumberland County Fort Bragg</p>	<p>PLAN DATE: May 2009 REVIEWED BY: T. Syll</p>		PREPARED BY: C. Strickland REVIEWED BY:
<p>REVISIONS</p>		<p>INIT. DATE</p>	<p>Signature: George C. Brown Date: 5/26/09</p>
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>			

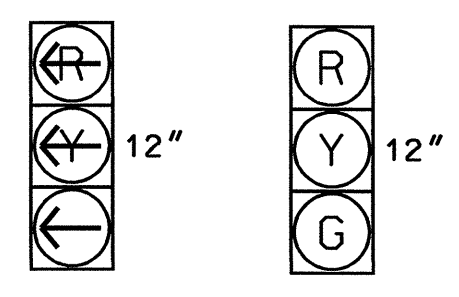
PHASING DIAGRAM



SIGNAL FACE	PHASE							
	Ø 1 + 6	Ø 2 + 6	Ø 8	Ø 1 + 6	Ø 1 + 6	Ø 1 + 6	Ø 1 + 6	Ø 1 + 6
11	—	—	—	—	—	—	—	—
21, 22	R	G	R	G	R	R	R	Y
61, 62, 63	G	G	R	R	R	R	R	Y
81, 82	R	R	G	R	G	R	R	R

SIGNAL FACE I.D.

All Heads L.E.D.



2070L LOOP & DETECTOR INSTALLATION

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	—	1	Y	Y	—	—	—	—	—
2A	6X6	300	4	—	2	Y	Y	—	—	—	—	—
2B	6X15	300	4	—	2	Y	Y	—	—	—	—	—
6A	6X6	300	5	—	6	Y	Y	—	—	—	—	—
6B	6X6	300	5	—	6	Y	Y	—	—	—	—	—
8A	6X40	0	2-4-2	Y	8	Y	Y	—	—	—	—	—

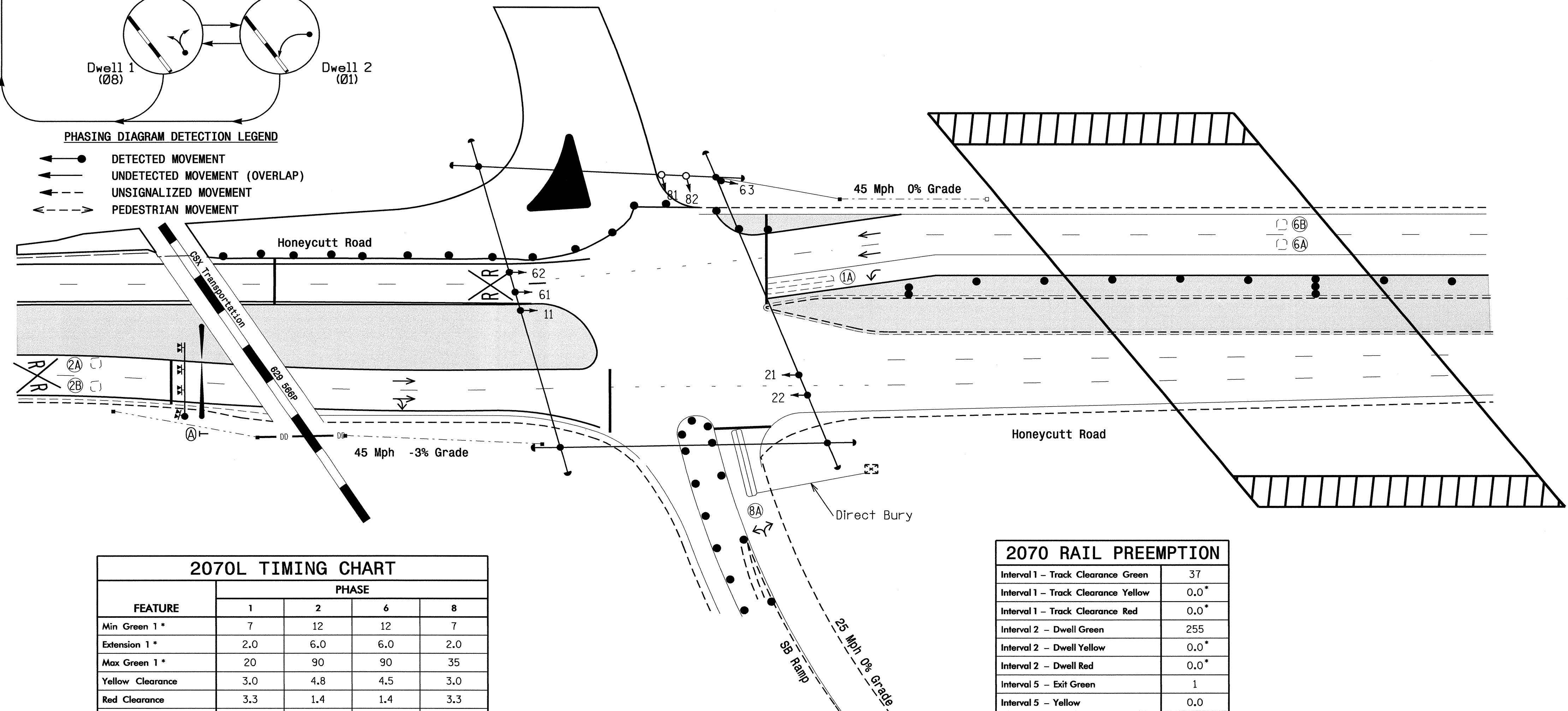
3 Phase Fully Actuated w/ RR Preemption Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Program parent phases for overlaps "P" for all phases used in normal operation.

PHASING DIAGRAM DETECTION LEGEND

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



FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	6.0	6.0	2.0
Max Green 1 *	20	90	90	35
Yellow Clearance	3.0	4.8	4.5	3.0
Red Clearance	3.3	1.4	1.4	3.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070 RAIL PREEMPTION

Interval 1 - Track Clearance Green	37
Interval 1 - Track Clearance Yellow	0.0*
Interval 1 - Track Clearance Red	0.0*
Interval 2 - Dwell Green	255
Interval 2 - Dwell Yellow	0.0*
Interval 2 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	3.0
Red Clear Before Pre	3.3
Dwell Min Time	7
Ped Clear Through Yellow	N
Omit Overlaps	P

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

This signal was designed for advanced preemption.

LEGEND

- PROPOSED: Traffic Signal Head, Modified Signal Head, Sign, Pedestrian Signal Head, Signal Pole with Guy, Signal Pole with Sidewalk Guy, Inductive Loop Detector, Controller & Cabinet, Junction Box, 2-in Underground Conduit, Right of Way, Directional Arrow, Pavement Marking Arrow, Railroad Tracks, Railroad Gate and Flasher, "DO NOT STOP ON TRACKS" Sign (R8-8)
- EXISTING: N/A, Signal Pole with Guy, Junction Box, Right of Way, Pavement Marking Arrow, Railroad Tracks, Railroad Gate and Flasher, "DO NOT STOP ON TRACKS" Sign (R8-8)

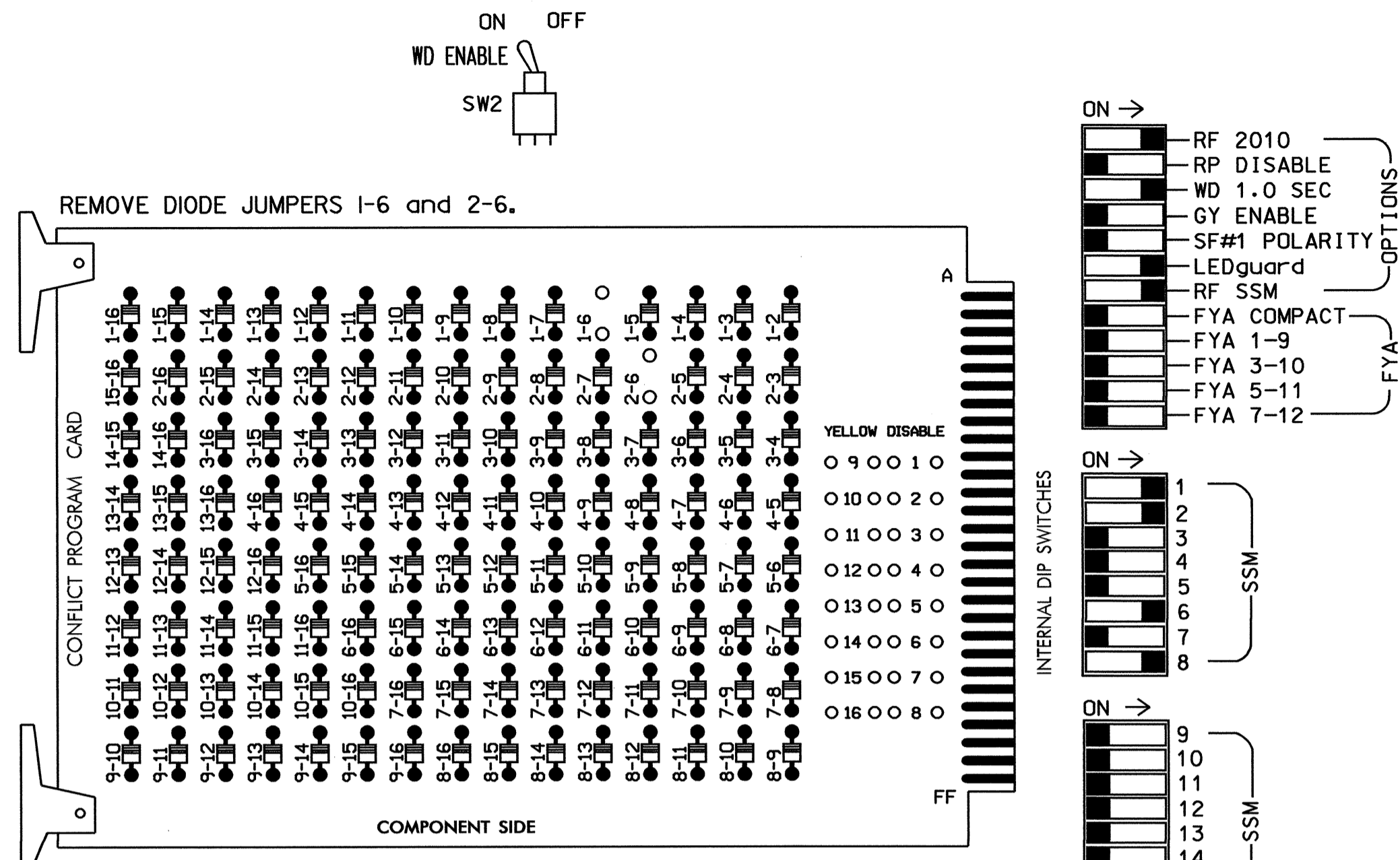
Signal Upgrade Temp 5 Phase III

Prepared in the Offices of:
Honeycutt Road At NC 24-87/NC 210 (Murchison Road) SB Ramps
 Division 6 Cumberland County Fort Bragg
 PLAN DATE: April 2009 REVIEWED BY: JPG
 PREPARED BY: IOU REVIEWED BY:
 SCALE: 1"=40'
 SIGNATURE: [Signature] DATE: 5/4/2009
 SEAL: 29904
 SIG. INVENTORY NO. 88-029315

18-MAY-2009 11:55 \\saw\krcup\p1p_projects\4444aa\sig\sig.dwg U-4444AA-Sig. 11.dwg 2009mmid.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 3,4,5, 7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.

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.	11	21,22	NU	NU	NU	NU	NU	61, 62,63	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW	125											
YELLOW ARROW	126											
GREEN ARROW	127											

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINET.....CONTRACTOR SUPPLIED 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S6,S8
 PHASES USED.....1,2,6,8
 OVERLAP P.....1+2+6+8

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

USING + OR - KEY POSITION ON OVERLAP 'P'

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

OVERLAP PROGRAMMING COMPLETE

The utilization of overlap P ensures consistent clearance timing during transition to preemption

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	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	FS
L	1A	2A	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	DC ISOLATOR
L	NOT USED	∅ 2	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	ST
L		2B	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	DC ISOLATOR
U	∅ S	∅ 6	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	PRE1
L	∅ S	6A	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	AC ISOLATOR
L	∅ S	∅ 6	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	NOT USED
L	∅ S	6B	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	∅ S	NOT USED

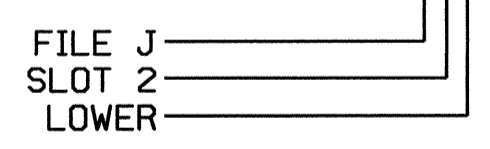
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME
 PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T5
 DESIGNED: April 2009
 SEALED: 05/04/09
 REVISED: N/A

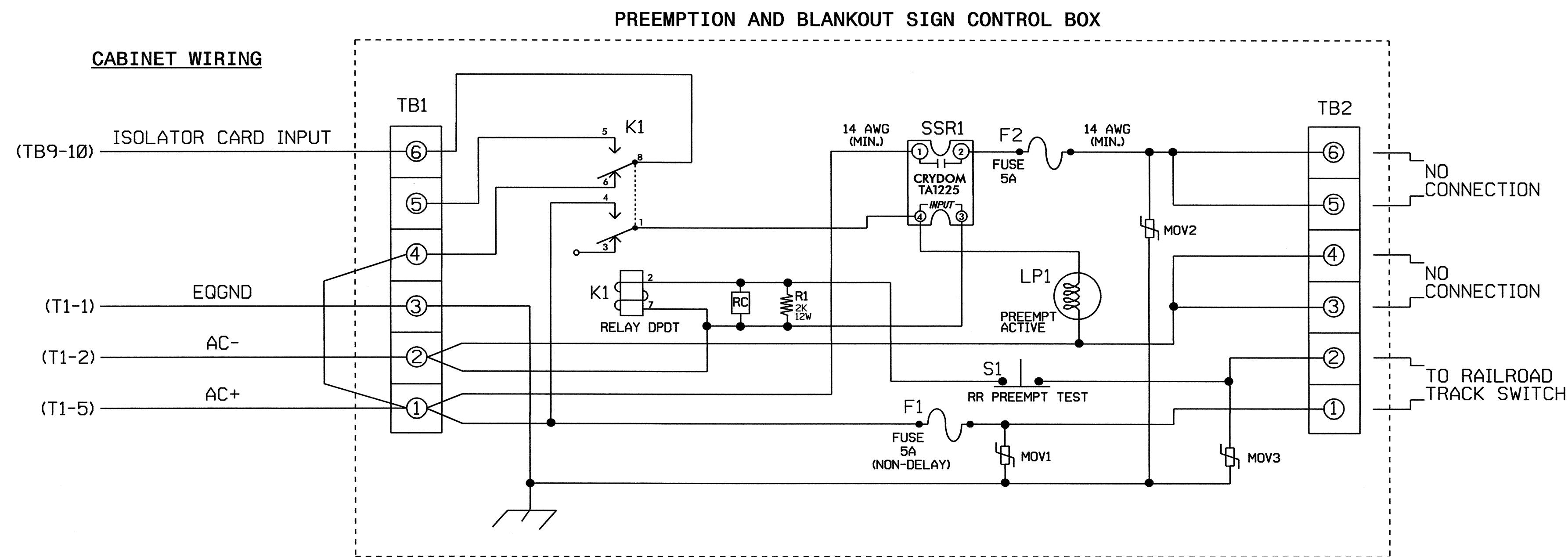
Signal Upgrade Temp 5 Phase III - Sheet 1 of 2

Electrical and Programming Details for:
Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps
 Division 6 Cumberland County Fort Bragg
 PLAN DATE: May 2009 REVIEWED BY: T. J. J.
 PREPARED BY: C. Strickland REVIEWED BY:
 REVISIONS: INIT. DATE
 Signature: George C. Brown, 022013
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER
 SIG. INVENTORY NO. 06-0293T5

21-MAY-2009 07:52:10 \\sawyer\kycupkesig\monstr\edi\conf0293t5.dgn

RAILROAD PREEMPTION WIRING DETAIL USING PREEMPT CONTROL BOX

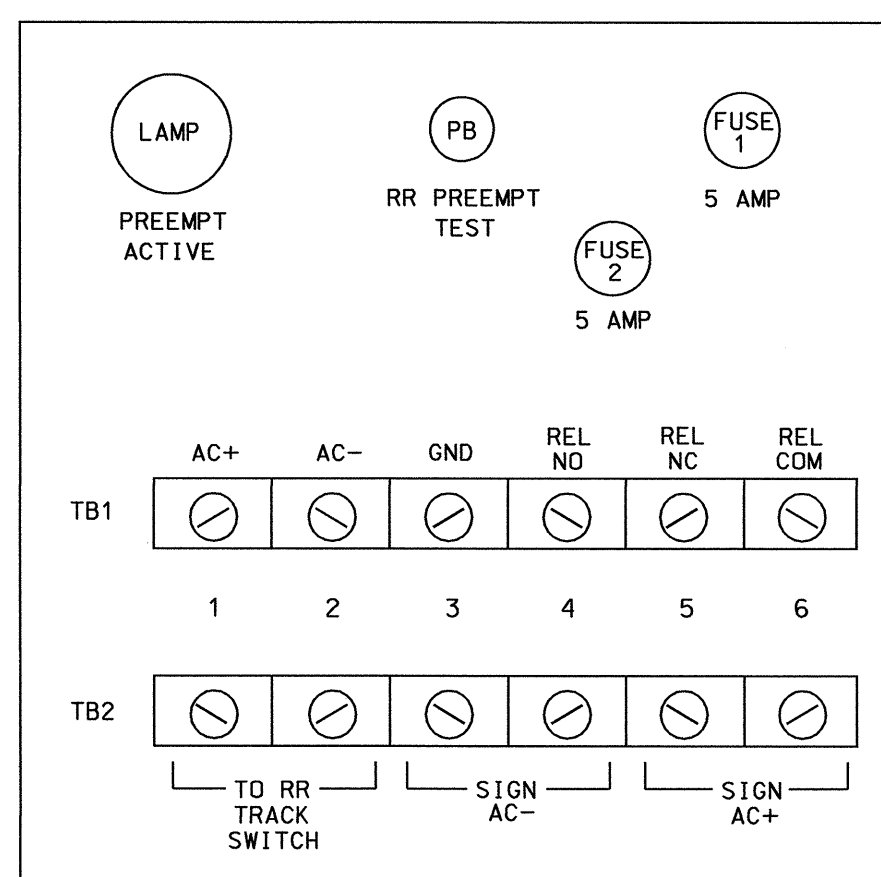
(wire as shown below)



NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
 - Relay K1 is a DPDT with 120VAC coil. Potter & Brumfield KRP11AG with octal base or approved equivalent.
 - Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output. Crydom TA1225 or approved equivalent.
 - AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card (See detail this sheet).
 - Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K or approved equivalent.
 - RC network is valued at .1 microfarad, 100 ohm.
 - If replacement movs are needed, GE part no. V150LA20A may be used.
 - Preemption and Blankout Sign Control Box is a Control Technologies part no. 2299-101 or approved equivalent.
9. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



RAILROAD PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

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

PREEMPTION #1	INTERVAL/TIMING	GRN	YEL	RED	SETTINGS (NEXT:1-10)	CLEAR/DWELL PHASES
1	37	0.0	0.0	0.0	X	X
2	255	0.0	0.0	0.0	X	X
3	0	0.0	0.0	0.0		
4	0	0.0	0.0	0.0		
5	1	0.0	0.0	0.0	X	X

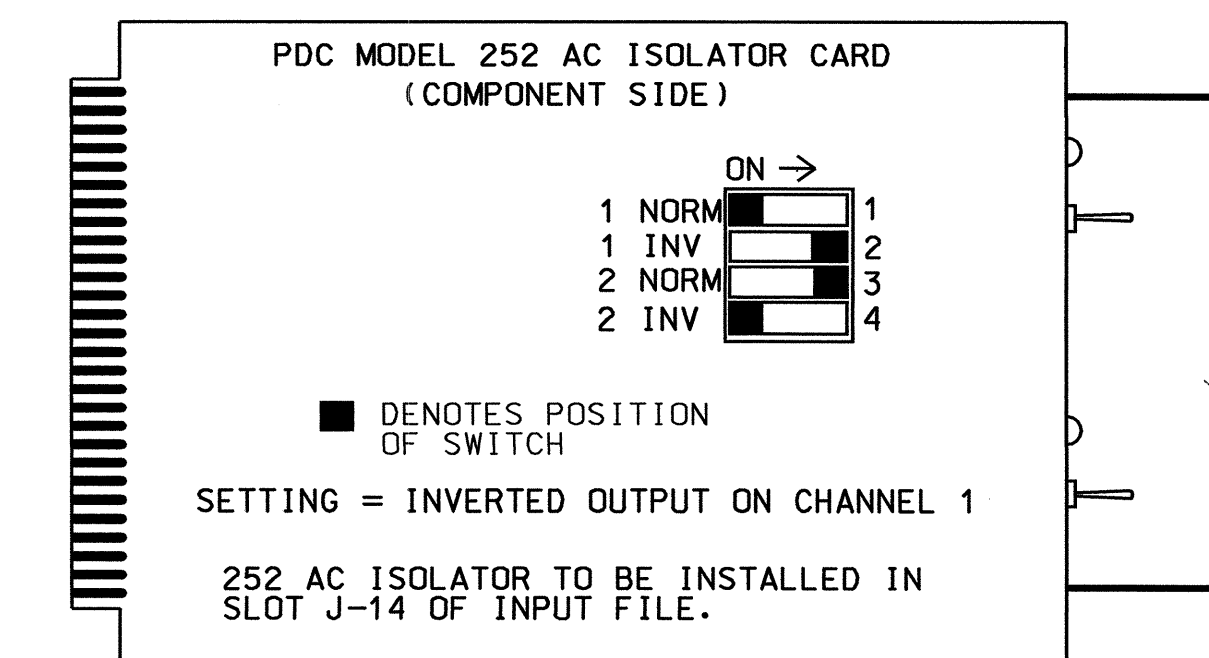
EXIT CALLS

OPTIONS	VALUES
PRIORITY (Y/N TO SELECT)	.....HIGH
DELAY TIMER (0-255 SEC)	.....0
MIN GREEN BEFORE PRE (0= DEFAULT)	....1
PED CLEAR BEFORE PRE (0= DEFAULT)	....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)	..3.0
RED CLEAR BEFORE PRE (0= DEFAULT)	...3.3
DWELL MIN TIMER (0-255 SEC)	.....7
DWELL MAX TIMER (0=OFF,1-255MIN)	....0
DWELL HOLD-OVER TIMER (0-255)	.....0
LATCH CALL?	.....N
LINK TO NEXT PREEMPT?	.....N
ENABLE BACKUP PROTECTION?	.....N
HOLD CLEAR 1 PHASES DURING DELAY?	...N
FAST GREEN FLASH DWELL PHASES?	.....N
PED CLEARANCE THROUGH YELLOW?	.....N
INHIBIT OVERLAP GREEN EXTENSION?	...N
SERVICE DURING SOFTWARE FLASH?	.....N
REST IN RED DURING DWELL INTERVAL?	..N
FLASH DWELL INTERVAL?	.....N
ALLOW PEDS IN DWELL INTERVAL?	.....N
RE-TIME DWELL INTERVAL?	.....N

OVERLAPS: ABCDEFGHIJKLMNOP
 DWELL INT FLASH YELLOW
 OMIT OVERLAPS: X

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



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

Signal Upgrade Temp 5 Phase III - Sheet 2 of 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T5
 DESIGNED: April 2009
 SEALED: 05/04/09
 REVISED: N/A

Prepared In the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps		SEAL SEAL 022013 ENGINEER GEORGE C. BROWN
	Division 6 Cumberland County Fort Bragg	PLAN DATE: May 2009 PREPARED BY: G. Strickland REVIEWED BY: T. Lynn	
ELECTRICAL AND PROGRAMMING DETAILS FOR:		REVISIONS INIT. DATE	SIGNATURE: George C. Brown DATE: 5/26/09

SIG. INVENTORY NO. 06-0293T5

PHASING DIAGRAM

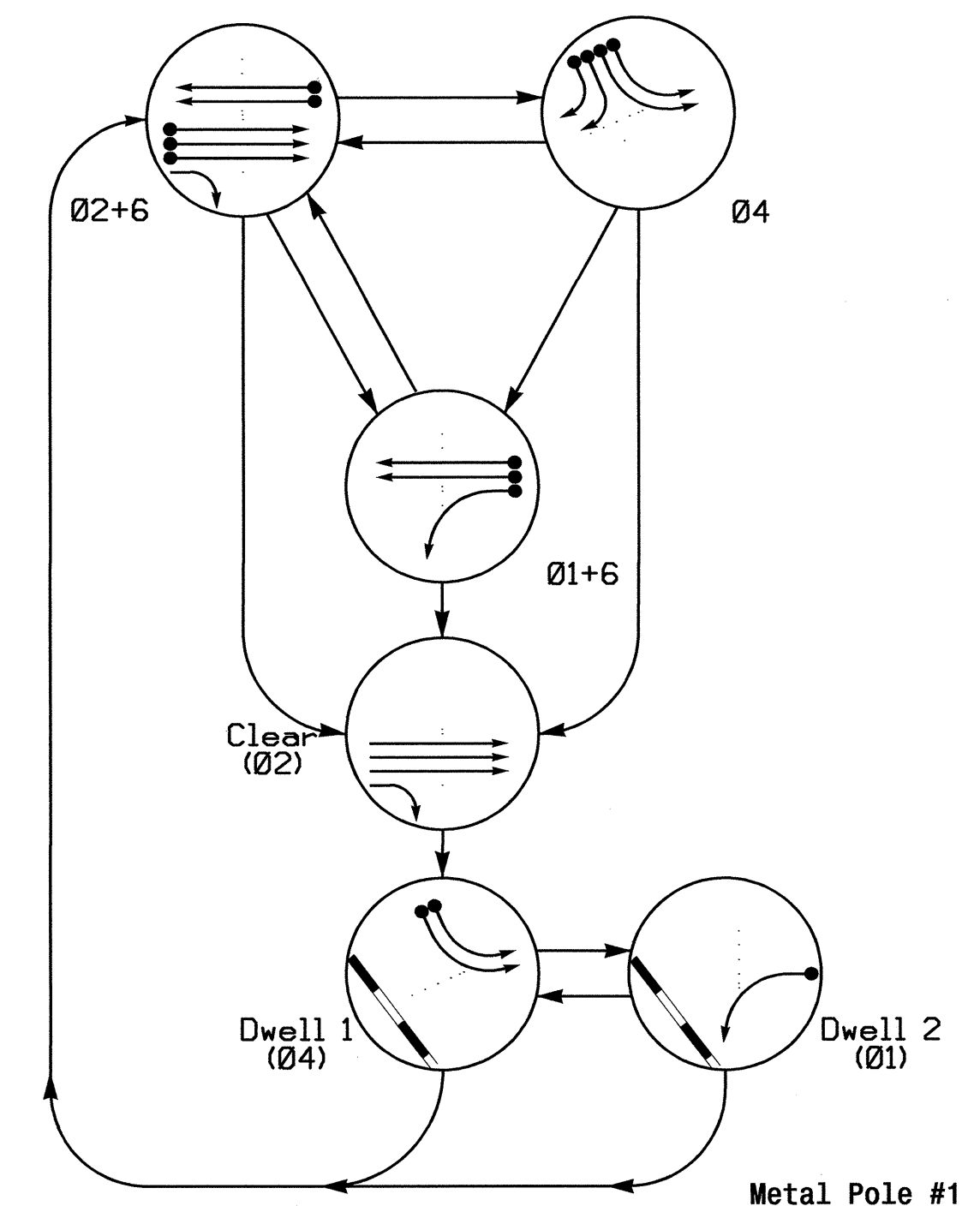
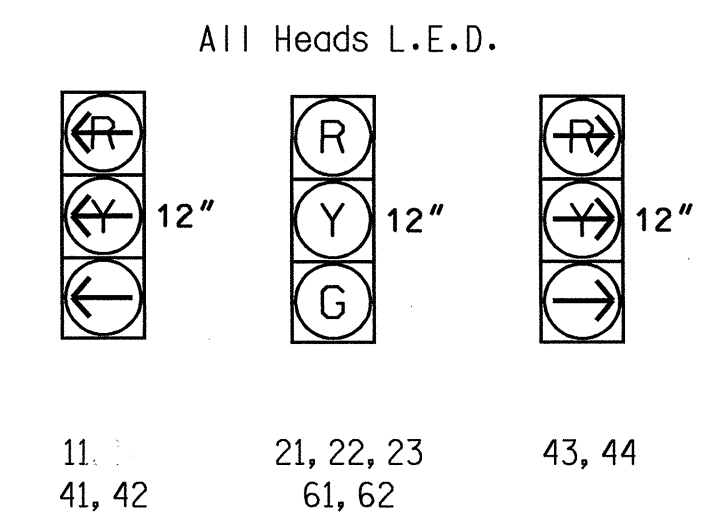


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1+6	Ø 2+6	Ø 4	Ø 1+6	Ø 1+6	FLASH
11	←	←	←	←	←	←
21, 22, 23	R	G	R	G	R	Y
41, 42	←	←	←	←	←	←
43, 44	R	R	←	←	R	R
61, 62	G	G	R	R	R	Y

SIGNAL FACE I.D.



2070L LOOP & DETECTOR INSTALLATION

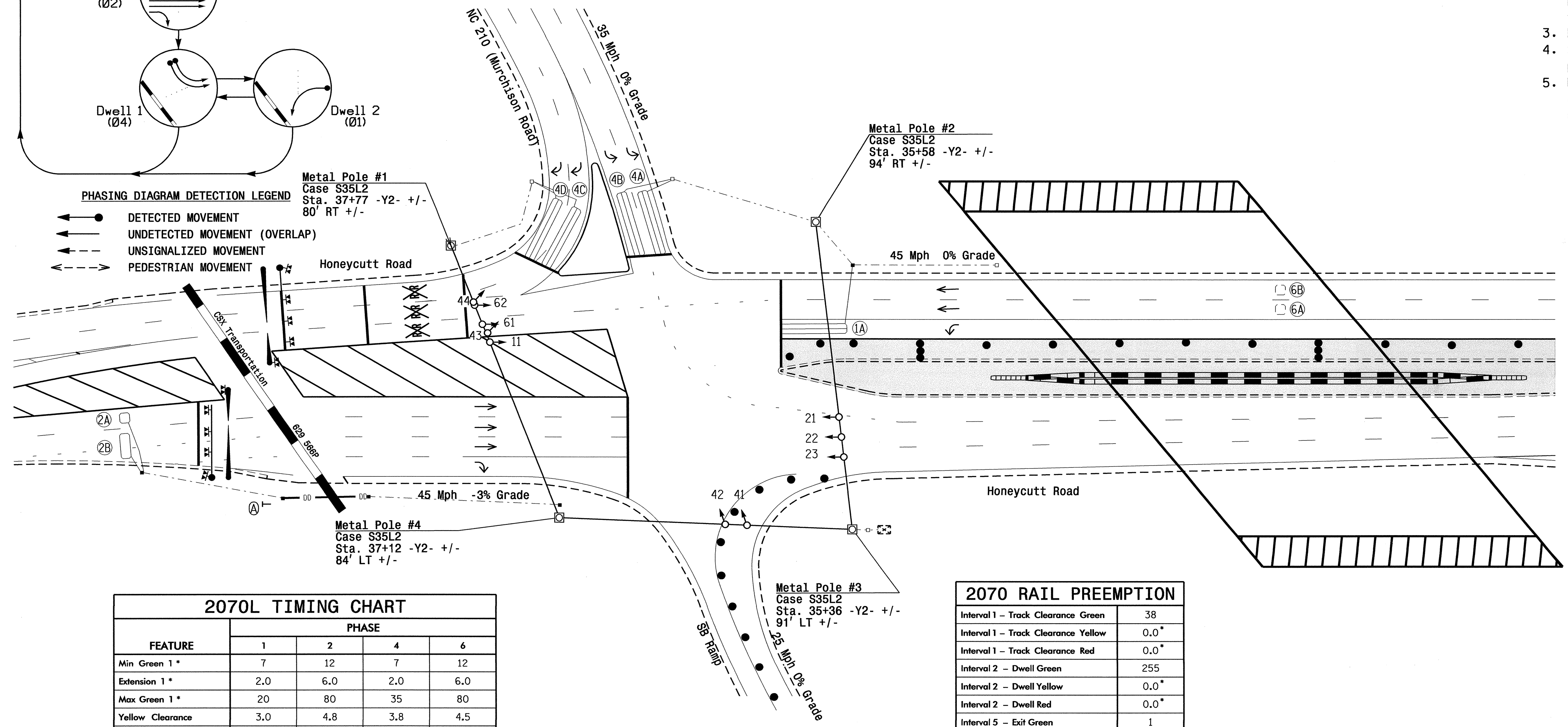
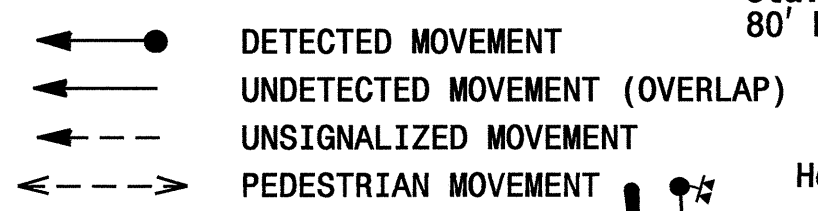
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y					
2A	6X6	300	4	Y	2	Y	Y					
2B	6X15	300	4	Y	2	Y	Y					
4A	6X40	0	2-4-2	Y	4	Y	Y					
4B	6X40	0	2-4-2	Y	4	Y	Y					
4C	6X40	0	2-4-2	Y	4	Y	Y					
4D	6X40	0	2-4-2	Y	4	Y	Y			15		Y
6A	6X6	300	5		6	Y	Y					
6B	6X6	300	5		6	Y	Y					

3 Phase Fully Actuated w/ RR Preemption Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- Program parent phases for overlaps "P" for all phases used in normal operation.

PHASING DIAGRAM DETECTION LEGEND



2070L TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green 1 *	7	12	7	12
Extension 1 *	2.0	6.0	2.0	6.0
Max Green 1 *	20	80	35	80
Yellow Clearance	3.0	4.8	3.8	4.5
Red Clearance	3.3	1.4	2.9	2.5
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	1.5	-	1.5
Max Variable Initial *	-	34	-	34
Time Before Reduction *	-	15	-	15
Time To Reduce *	-	45	-	45
Minimum Gap	-	3.0	-	3.0
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

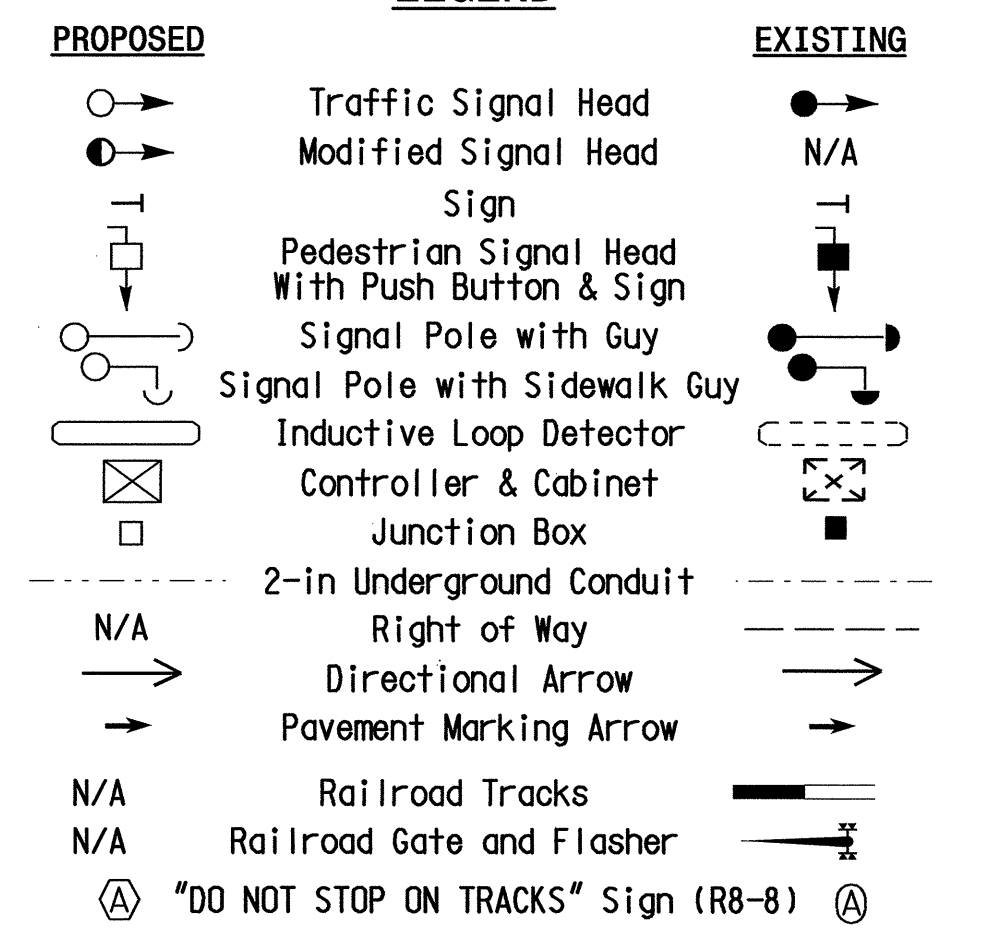
2070 RAIL PREEMPTION

Interval 1 - Track Clearance Green	38
Interval 1 - Track Clearance Yellow	0.0*
Interval 1 - Track Clearance Red	0.0*
Interval 2 - Dwell Green	255
Interval 2 - Dwell Yellow	0.0*
Interval 2 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	4.5
Red Clear Before Pre	2.5
Dwell Min Time	7
Ped Clear Through Yellow	N
Omit Overlaps	A,P

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

This signal was designed for advanced preemption.

LEGEND



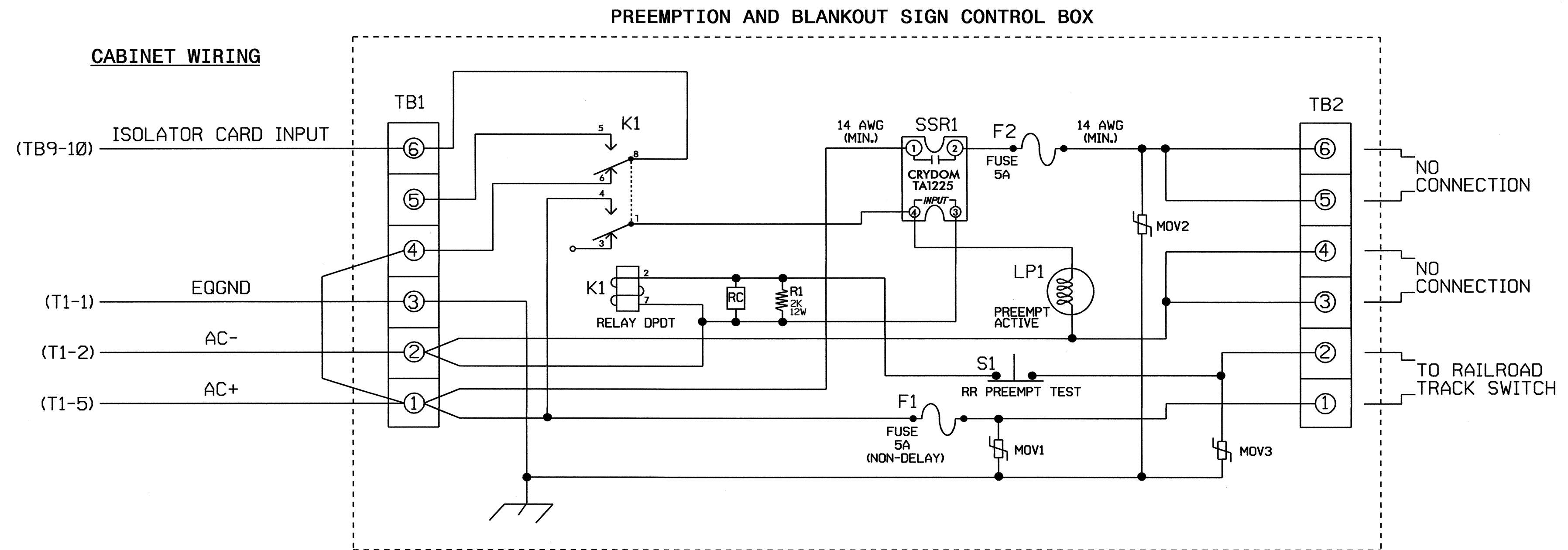
Signal Upgrade Temp 6 Phase IV

Prepared in the Office of:
Transportation Mobility and Safety Division
 HONEYCUTT ROAD
 At
 NC 24-87/NC 210
 (Murchison Road) SB Ramps
 Division 6 Cumberland County Fort Bragg
 PLAN DATE: April 2009 REVIEWED BY: JPG
 PREPARED BY: IOU REVIEWED BY: IOU
 SCALE: 1"=40'
 REVISIONS: _____ INIT. DATE
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29904
 DATE: 6/22/09
 SIG. INVENTORY NO. 06-029376

22-JUN-2009 14:22 s:\kts\signal\work\kgrcup8\p\project\knu-444\accms\gnal\sk06-029376\029376_s\g_dsn_2009\mdd-ogn\taumozur\file

RAILROAD PREEMPTION WIRING DETAIL USING PREEMPT CONTROL BOX

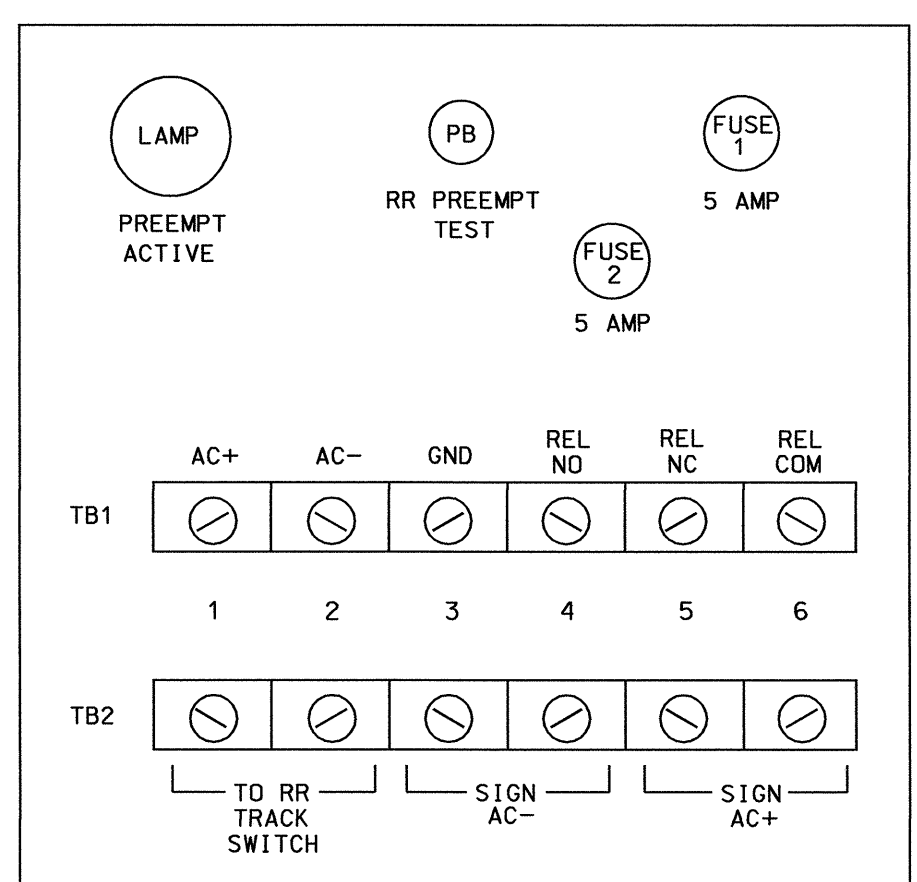
(wire as shown below)



NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
 - Relay K1 is a DPDT with 120VAC coil. Potter & Brumfield KRP11AG with octal base or approved equivalent.
 - Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output. Crydom TA1225 or approved equivalent.
 - AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card (See detail this sheet).
 - Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K or approved equivalent.
 - RC network is valued at .1 microfarad, 100 ohm.
 - If replacement movs are needed, GE part no. V150LA20A may be used.
 - Preemption and Blankout Sign Control Box is a Control Technologies part no. 2299-101 or approved equivalent.
9. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



RAILROAD PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

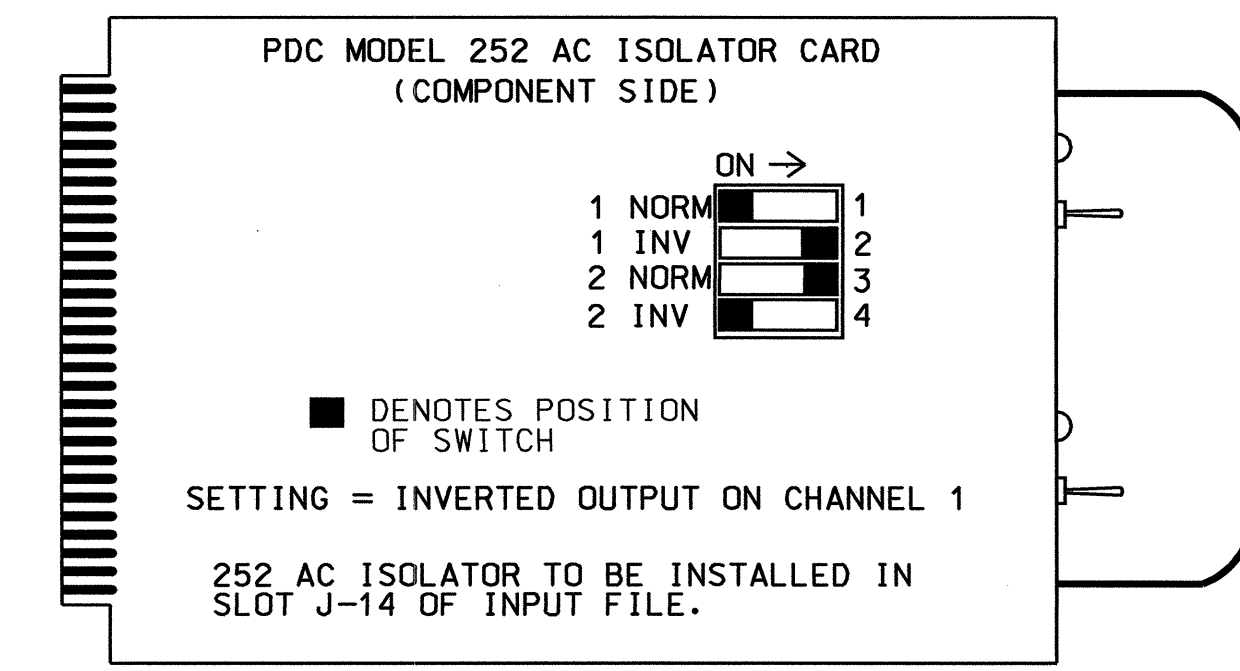
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #1	INTERVAL/TIMING	CLEAR/DWELL PHASES	SETTINGS (NEXT:1-10)
GRN	YEL	RED	12345678910111213141516
1	38	0.0 0.0	X
2	255	0.0 0.0	X X
3	0	0.0 0.0	
4	0	0.0 0.0	
5	1	0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	.....HIGH
DELAY TIMER (0-255 SEC)	.....0
MIN GREEN BEFORE PRE (0= DEFAULT)	....1
PED CLEAR BEFORE PRE (0= DEFAULT)	....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)	..4.5
RED CLEAR BEFORE PRE (0= DEFAULT)	....2.5
DWELL MIN TIMER (0-255 SEC)	.....7
DWELL MAX TIMER (0=OFF,1-255MIN)	....0
DWELL HOLD-OVER TIMER (0-255)	.....0
LATCH CALL?	.....N
LINK TO NEXT PREEMPT?	.....N
ENABLE BACKUP PROTECTION?	.....N
HOLD CLEAR 1 PHASES DURING DELAY?	...N
FAST GREEN FLASH DWELL PHASES?	.....N
PED CLEARANCE THROUGH YELLOW?	.....N
INHIBIT OVERLAP GREEN EXTENSION?	...N
SERVICE DURING SOFTWARE FLASH?	.....N
REST IN RED DURING DWELL INTERVAL?	..N
FLASH DWELL INTERVAL?	.....N
ALLOW PEDS IN DWELL INTERVAL?	.....N
RE-TIME DWELL INTERVAL?	.....N
OVERLAPS:	ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW	X
OMIT OVERLAPS:	X

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



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

Signal Upgrade Temp 6 Phase IV - Sheet 2 of 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293T6
DESIGNED: April 2009
SEALED: 06/22/09
REVISED: N/A

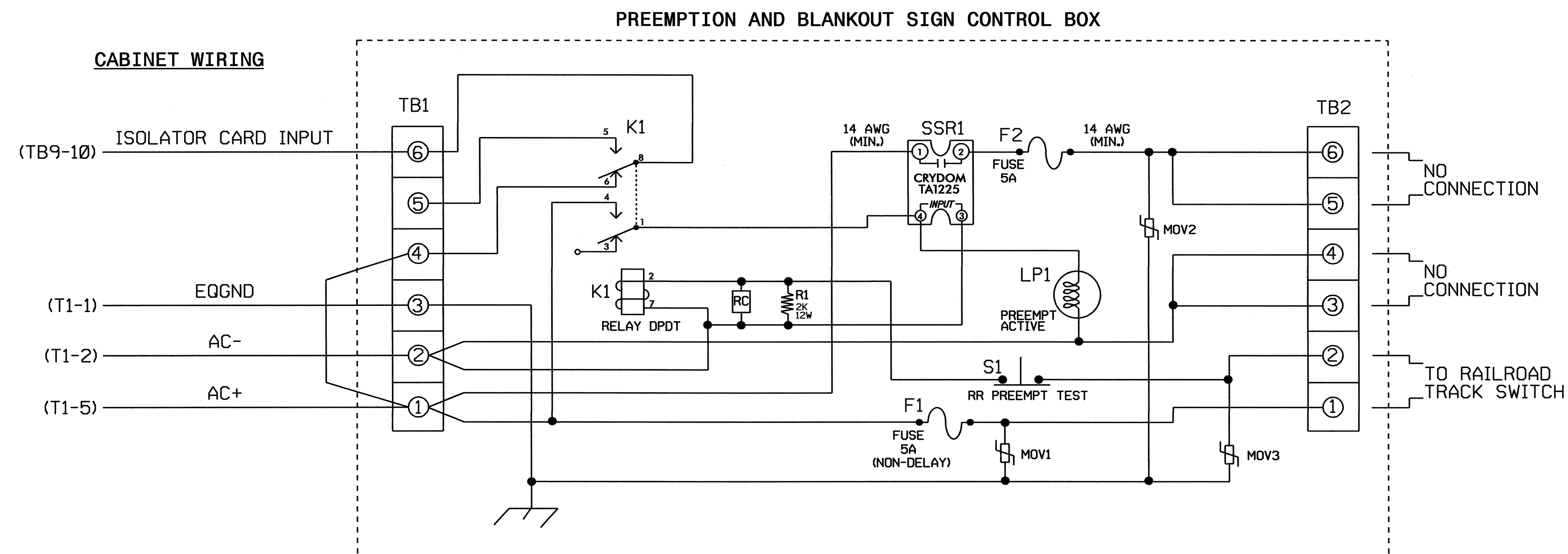
	Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022013 GEORGE C. BROWN
	Division 6 Cumberland County Fort Bragg		
	PLAN DATE: June 2009	REVIEWED BY: T. J. J.	
	PREPARED BY: C. Strickland	REVIEWED BY:	
REVISIONS	INIT.	DATE	SIGNATURE: <i>George C. Brown</i> DATE: 6/23/09

SIG. INVENTORY NO. 06-0293T6

23-JUN-2009 09:44 62#T6 61001 Sewer/Kgr/ou8#41 g. mon#6#771 ckl and#00293. sm.e fe. xxx. dgn. c68#T6 ckl and

RAILROAD PREEMPTION WIRING DETAIL USING PREEMPT CONTROL BOX

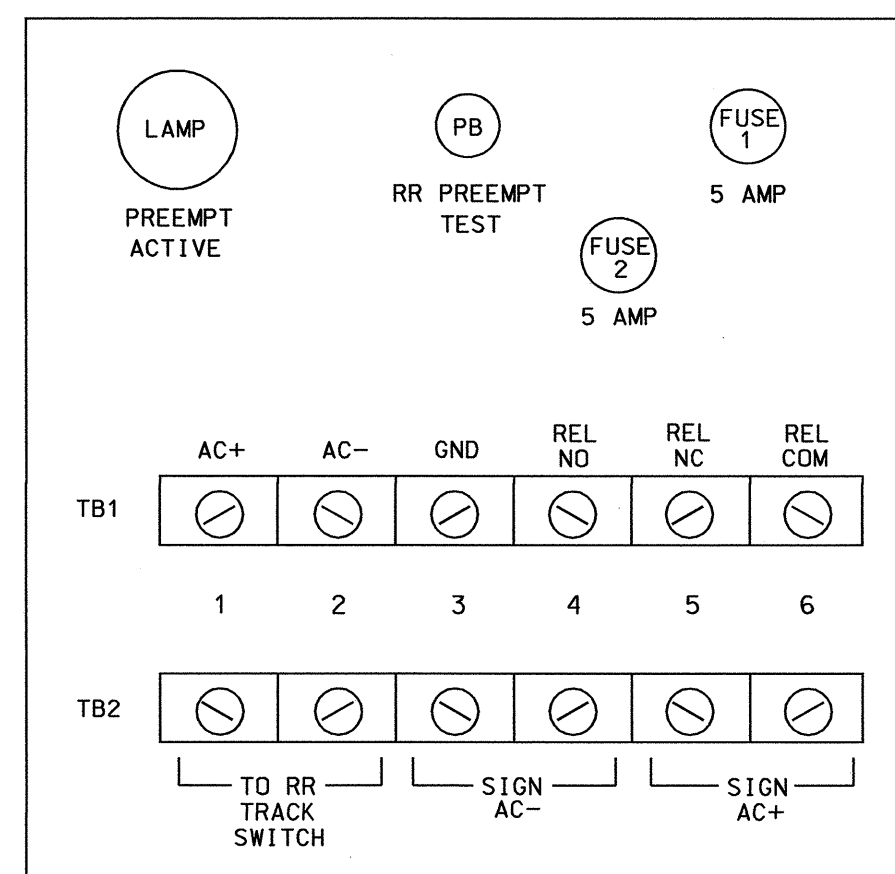
(wire as shown below)



NOTES

- Relay K1 is shown in the energized (Preempt not active) normal operation state.
 - Relay K1 is a DPDT with 120VAC coil. Potter & Brumfield KRP11AG with octal base or approved equivalent.
 - Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output. Crydom TA1225 or approved equivalent.
 - AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card (See detail this sheet).
 - Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K or approved equivalent.
 - RC network is valued at .1 microfarad, 100 ohm.
 - If replacement movs are needed, GE part no. V150LA20A may be used.
 - Preemption and Blankout Sign Control Box is a Control Technologies part no. 2299-101 or approved equivalent.
9. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



RAILROAD PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

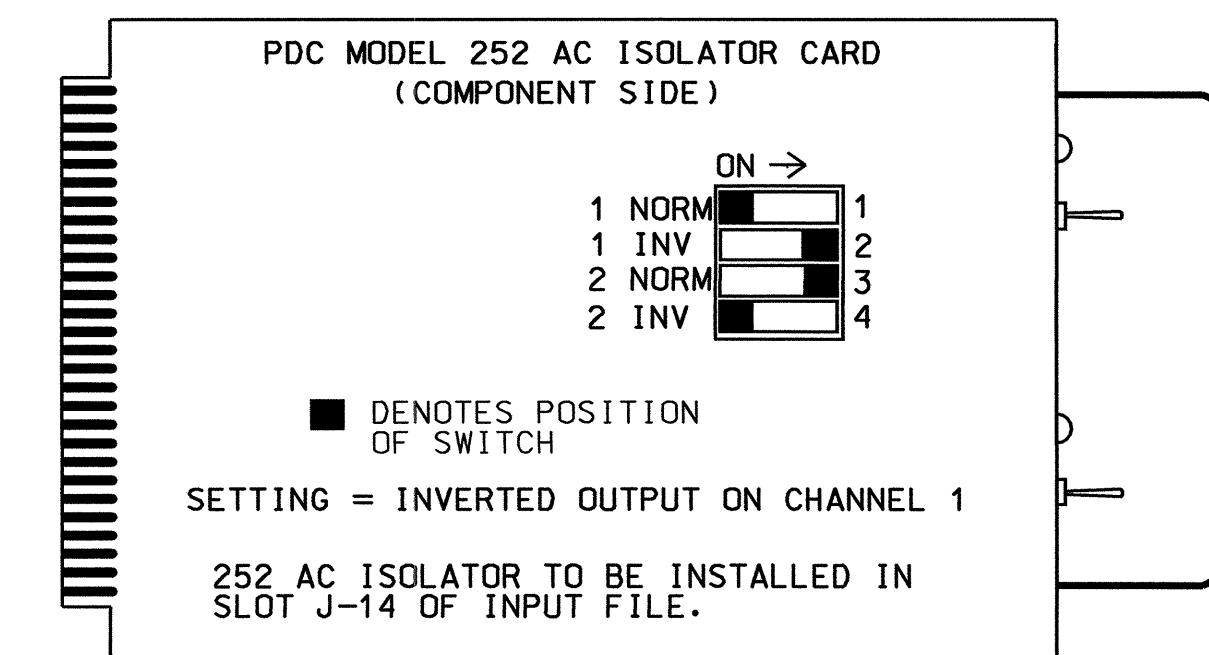
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions).

PREEMPTION #1	INTERVAL/TIMING	CLEAR/DWELL PHASES	SETTINGS (NEXT:1-10)
GRN	YEL	RED	12345678910111213141516
1	38	0.0 0.0	X
2	255	0.0 0.0	X X
3	0	0.0 0.0	
4	0	0.0 0.0	
5	1	0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	.....HIGH
DELAY TIMER (0-255 SEC)	.....0
MIN GREEN BEFORE PRE (0= DEFAULT)	...1
PED CLEAR BEFORE PRE (0= DEFAULT)	...0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)	...4.5
RED CLEAR BEFORE PRE (0= DEFAULT)	...2.5
DWELL MIN TIMER (0-255 SEC)	.....7
DWELL MAX TIMER (0=OFF,1-255MIN)	....0
DWELL HOLD-OVER TIMER (0-255)	.....0
LATCH CALL?	.....N
LINK TO NEXT PREEMPT?	.....N
ENABLE BACKUP PROTECTION?	.....N
HOLD CLEAR 1 PHASES DURING DELAY?	...N
FAST GREEN FLASH DWELL PHASES?	.....N
PED CLEARANCE THROUGH YELLOW?	.....N
INHIBIT OVERLAP GREEN EXTENSION?	...N
SERVICE DURING SOFTWARE FLASH?	.....N
REST IN RED DURING DWELL INTERVAL?	..N
FLASH DWELL INTERVAL?	.....N
ALLOW PEDS IN DWELL INTERVAL?	.....N
RE-TIME DWELL INTERVAL?	.....N
OVERLAPS:	ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW	X
OMIT OVERLAPS:	X

PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



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

Signal Upgrade Final - Sheet 2 of 2

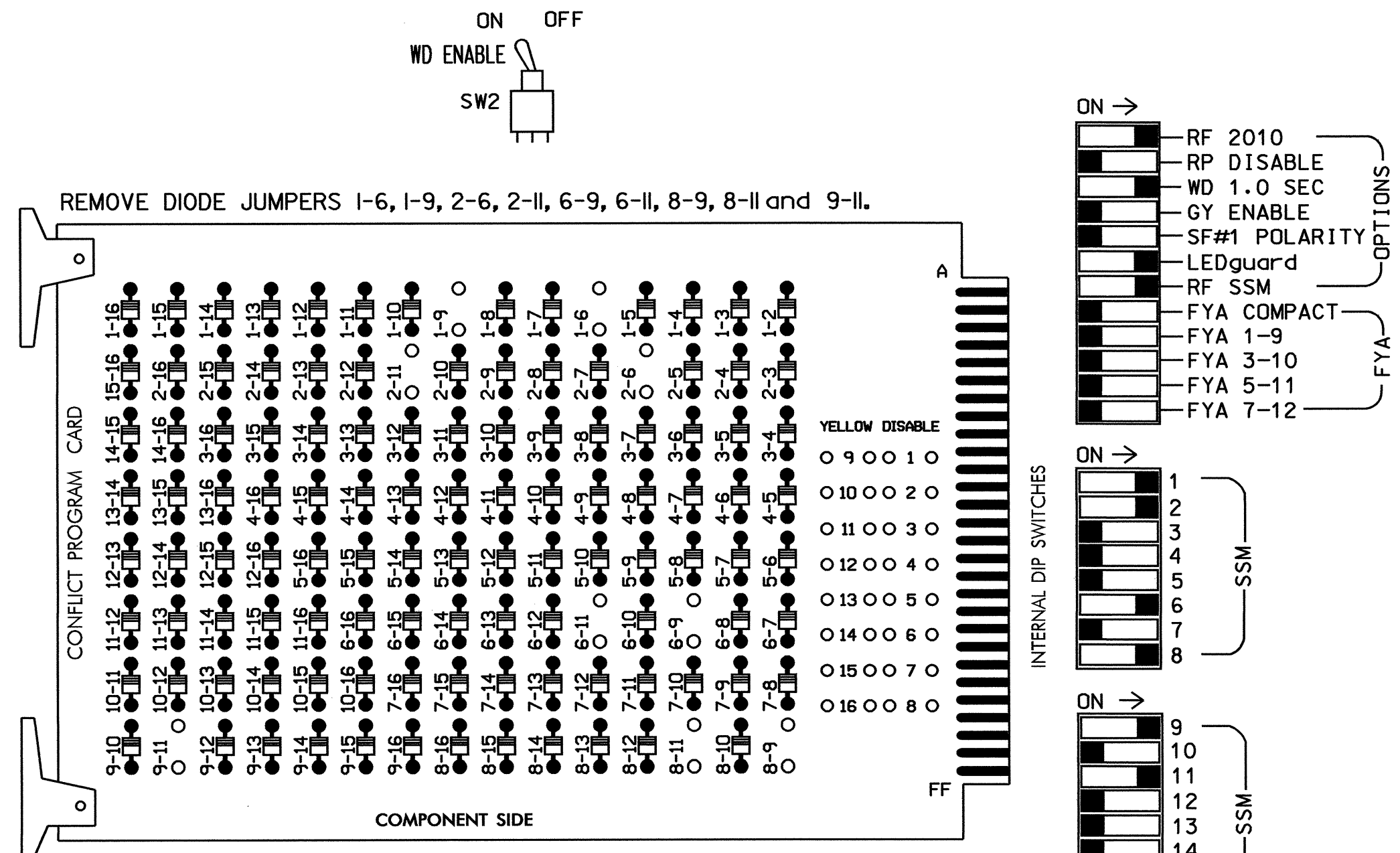
<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Electrical and Programming Details For:</p> <p>Honeycutt Road at NC 24-87/NC 210 (Murchison Road) SB Ramps</p>		<p>SEAL</p> <p>SEAL 022013 ENGINEER GEORGE C. BROWN</p>					
	<p>Division 6 Cumberland County Fort Bragg</p>							
	<p>PLAN DATE: June 2009</p>	<p>REVIEWED BY: T. J. J...</p>						
	<p>PREPARED BY: C. Strickland</p>	<p>REVIEWED BY:</p>						
<table border="1"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE				<p>SIGNATURE: George C. Brown 6/23/09</p>	<p>DATE: 6/23/09</p>
REVISIONS	INIT.	DATE						
<p>SIG. INVENTORY NO. 06-0293</p>								

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0293
DESIGNED: April 2009
SEALED: 06/22/09
REVISED: N/A

23-JUN-2009 08:58 61*118 31001 S:\work\Kjg\0608\sig_mon\strickland\060293_sml_e-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 3,4, 5,7,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
- The cabinet and controller are part of the Honeycutt Road System.

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	84	81, 82,83	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81, 82,83	NU	84	NU	NU	23,24	NU	NU
RED		128						134										
YELLOW		129						135										
GREEN		130						136										
RED ARROW	125										107		A121				A114	
YELLOW ARROW	126										108		A122				A115	
GREEN ARROW	127										109		A123				A116	

NU = Not Used
*Flash Note: Wire Overlap "A" to flash on Flasher unit #2. Circuit #1.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINETCONTRACTOR SUPPLIED 332 /W/ AUX
 SOFTWAREECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS..18 (12-STD, 6-AUX)
 LOAD SWITCHES USED....S1,S2,S6,S8,S9,S12
 PHASES USED.....1,2,6,8
 OVERLAP A.....1+8
 OVERLAP B.....NOT USED
 OVERLAP C.....2+8
 OVERLAP D.....NOT USED

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

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: :12345678910111213141516
 VEH OVL PARENTS: :X X
 VEH OVL NOT VEH: :
 VEH OVL NOT PED: :
 VEH OVL GRN EXT: :
 STARTUP COLOR: - RED - YELLOW - GREEN
 FLASH COLORS: - RED - YELLOW - GREEN
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...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

OVERLAP PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅ 2/SYS	∅ 2/SYS	∅ 1	S	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	FS
L	1A	1B	2A/S5	2C/S7	NOT USED	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	DC ISOLATOR
U	NOT USED	∅ 1	∅ 2/SYS	NOT USED	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	ST
L	1C	1C	2B/S6	NOT USED	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	∅ 1	DC ISOLATOR
U	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 6/SYS	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	S
L	6A/S8	6C/S10	6A/S8	6C/S10	8A	8C	8A	8C	8A	8C	8A	8C	8A	∅ 8
U	∅ 6/SYS	NOT USED	∅ 6/SYS	NOT USED	∅ 8	NOT USED	∅ 8	NOT USED	∅ 8	NOT USED	∅ 8	NOT USED	∅ 8	∅ 8
L	6B/S9	NOT USED	6B/S9	NOT USED	8B	NOT USED	8B	NOT USED	8B	NOT USED	8B	NOT USED	8B	∅ 8

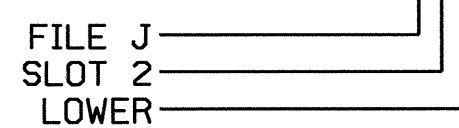
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A/S5	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B/S6	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y			
2C/S7	TB4-1,2	I4U	47	9	22	2/SYS	Y	Y			
6A/S8	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/S9	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			
6C/S10	TB3-9,10	J3U	64	26	36	6/SYS	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1312
 DESIGNED: March 2009
 SEALED: 05/04/2009
 REVISED: N/A

New Installation

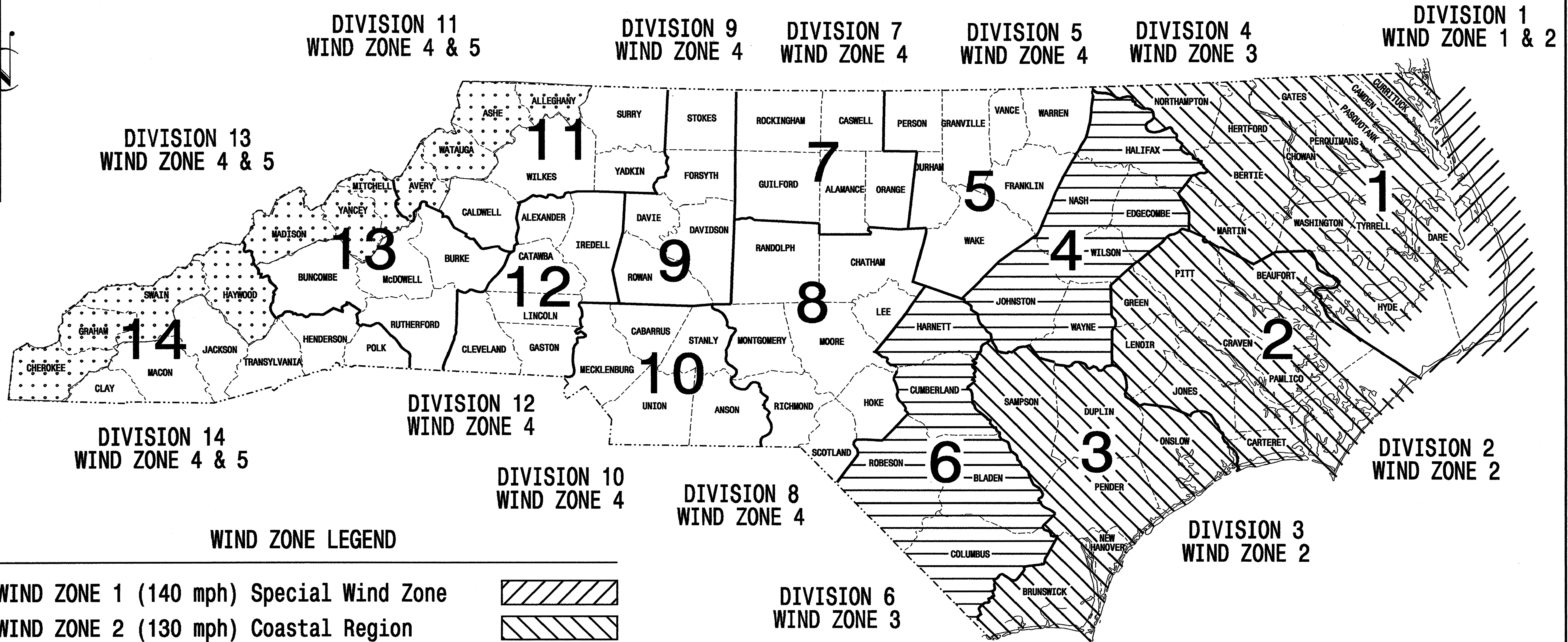
Electrical and Programming Details For:
Honeycutt Road at NC 24-87-210 (Murchison Road) NB Ramps
 Division 6 Cumberland County Fort Bragg
 Prepared In the Offices of:
 Transportation Mobility and Safety Department
 North Carolina Department of Transportation
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022013
 GEORGE C. BRUNN
 PREPARED BY: C. Strickland REVIEWED BY: T. J. J...
 REVISIONS: INIT. DATE
 SIGNATURE: DATE
 SIG. INVENTORY NO. 06-1312

20-MAY-2009 14:07
 P:\001\swkr\cgrcup\sig_mom\strickland\061312_sml\elb.xxx.dgn
 GUEST

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	U-4444AA	Sig.22
F.A.PROJ.NO.	M 1	
PROJECT ID.NO.		

STANDARD DRAWINGS FOR METAL POLES

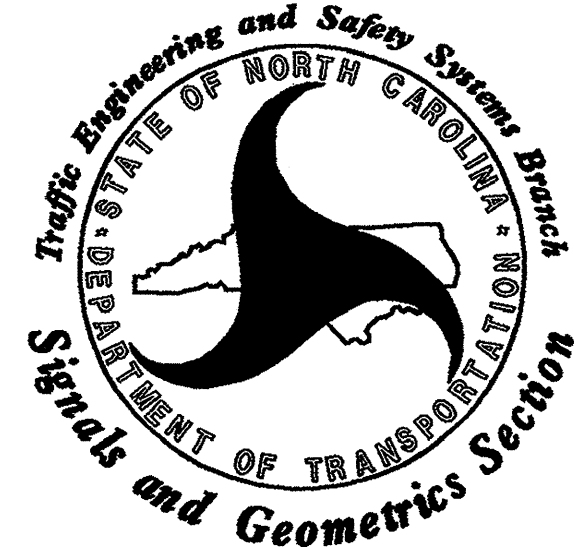


WIND ZONE LEGEND

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/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

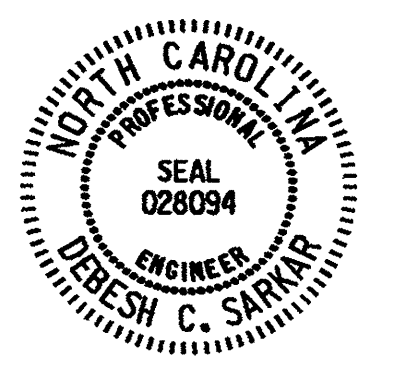
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:

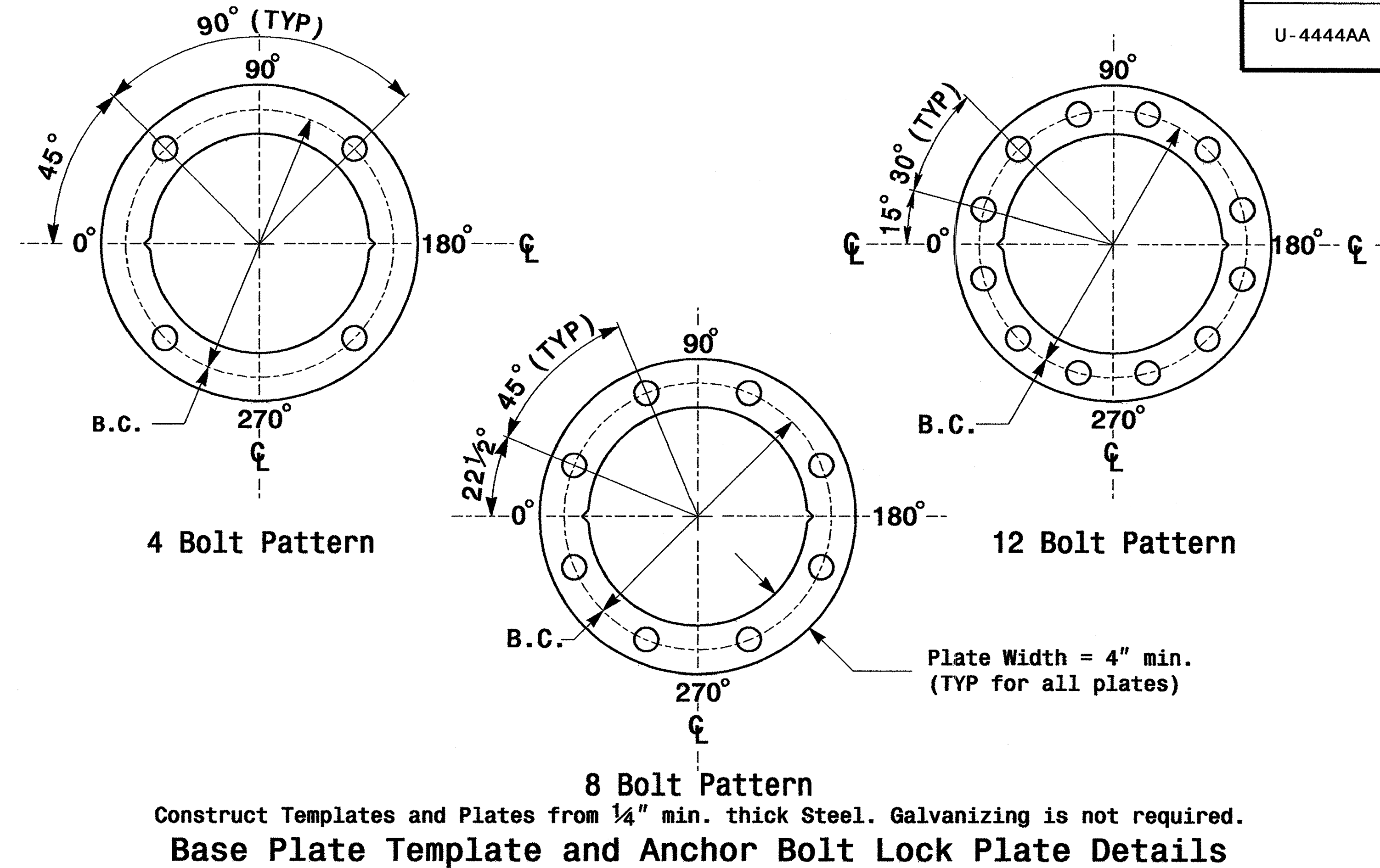
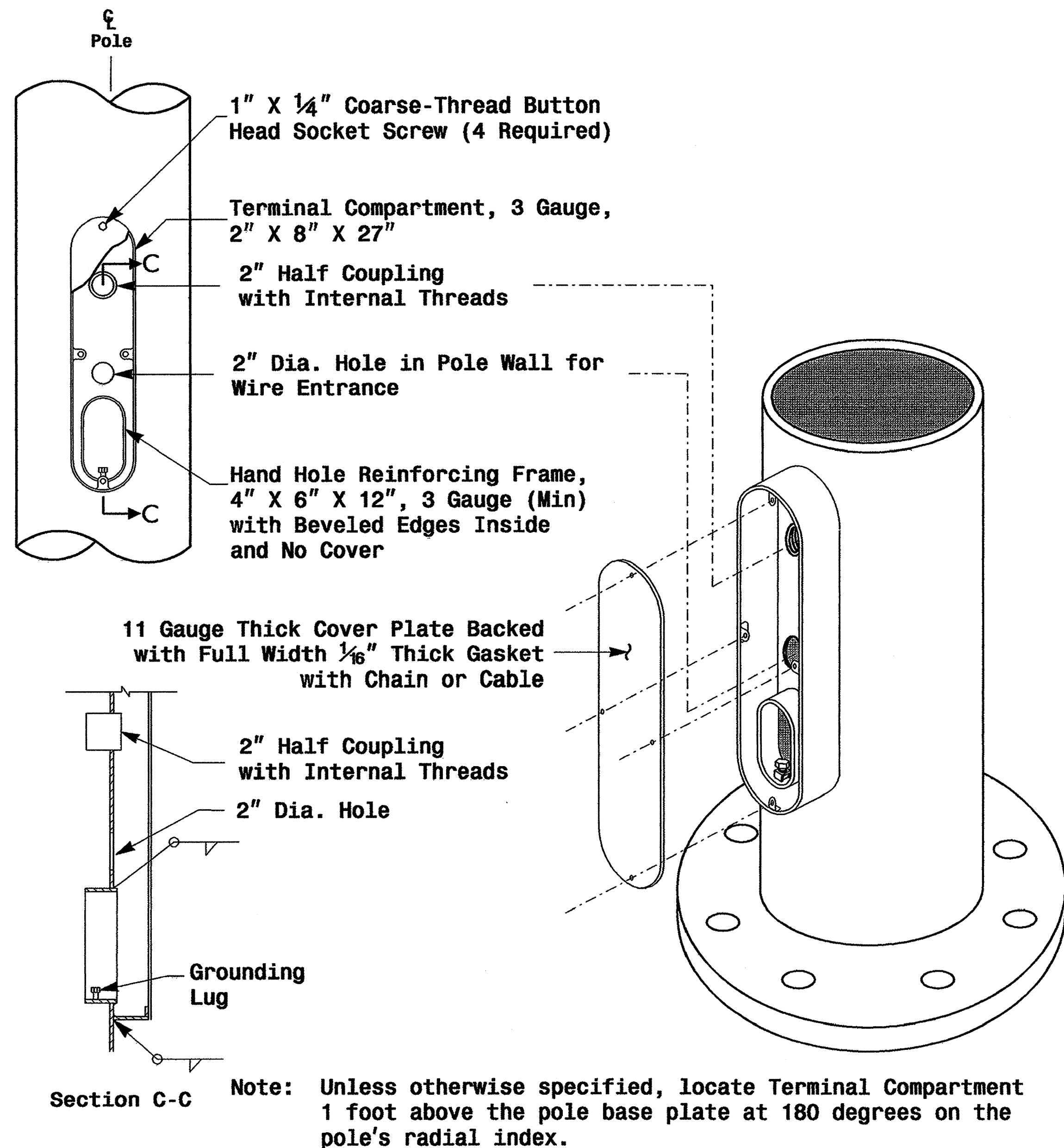
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

- 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



D. C. Sarkar 9.2.2005
SIGNATURE DATE



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

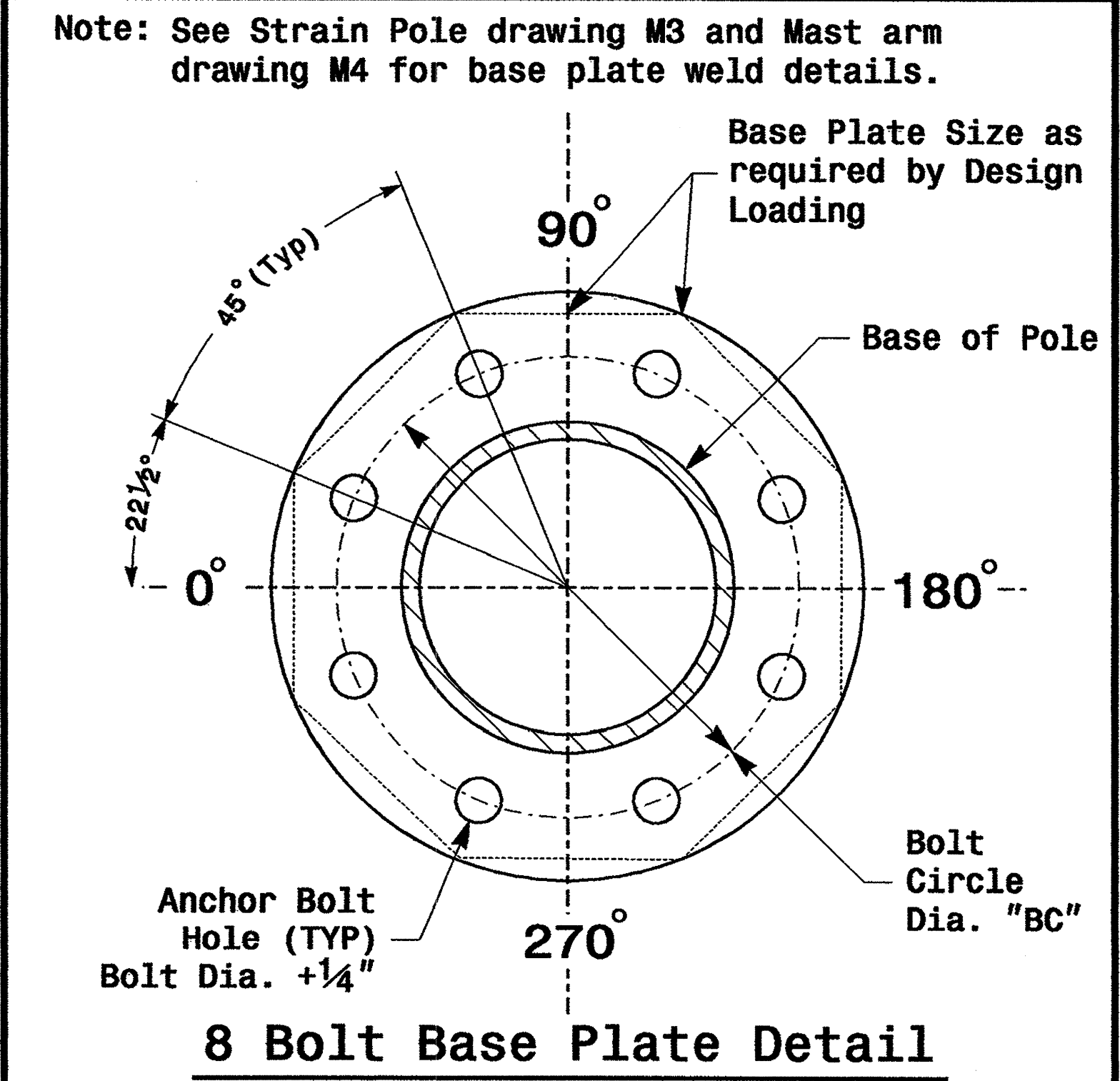
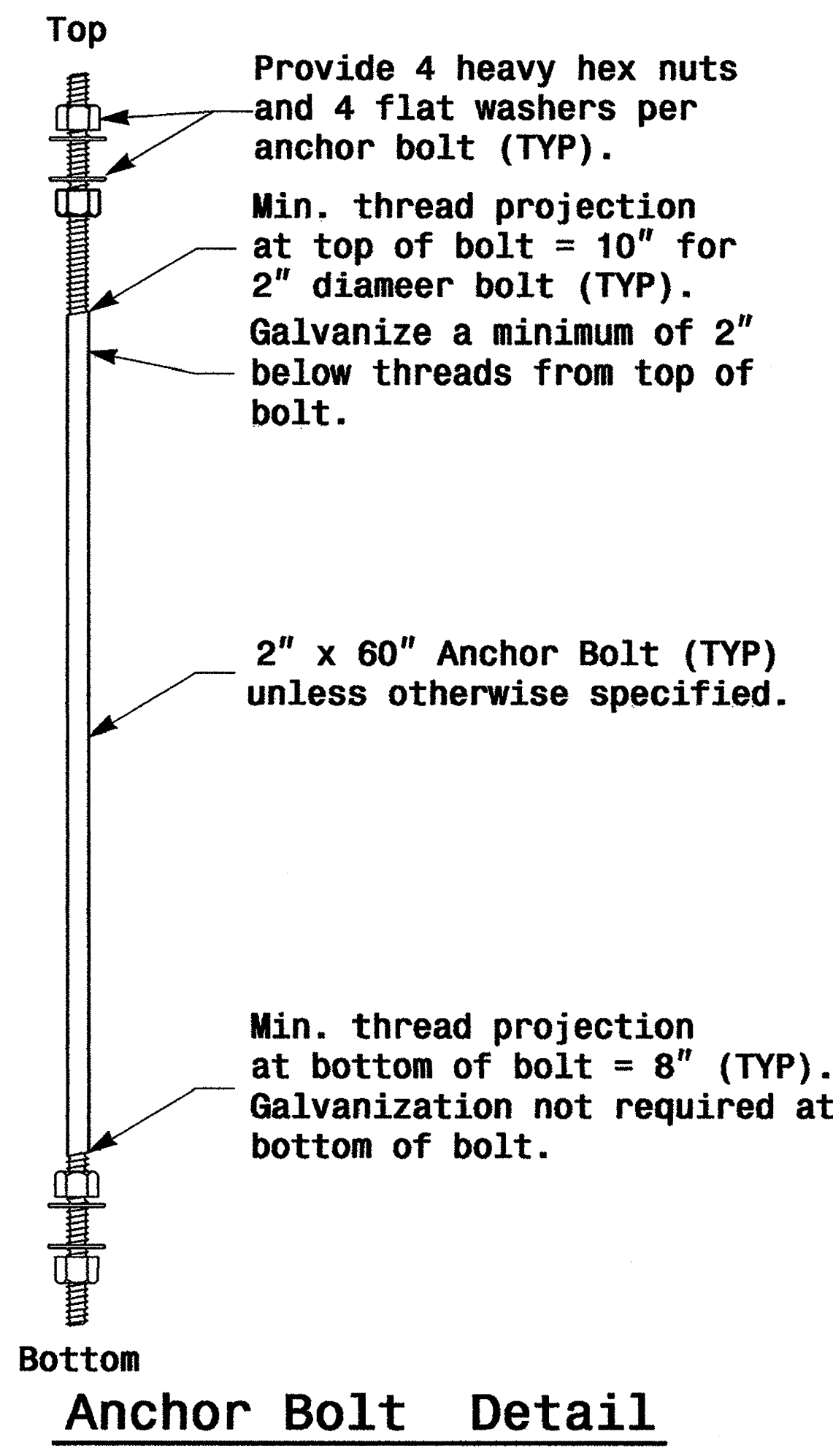
MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y _____
ARM-A D/T/L/Y _____
ARM-B D/T/L/Y _____
A.B. DIA./B.C./L/Y _____
NCDOT STANDARD _____

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

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

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

Identification Tag Details



Prepared in the Office of:

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

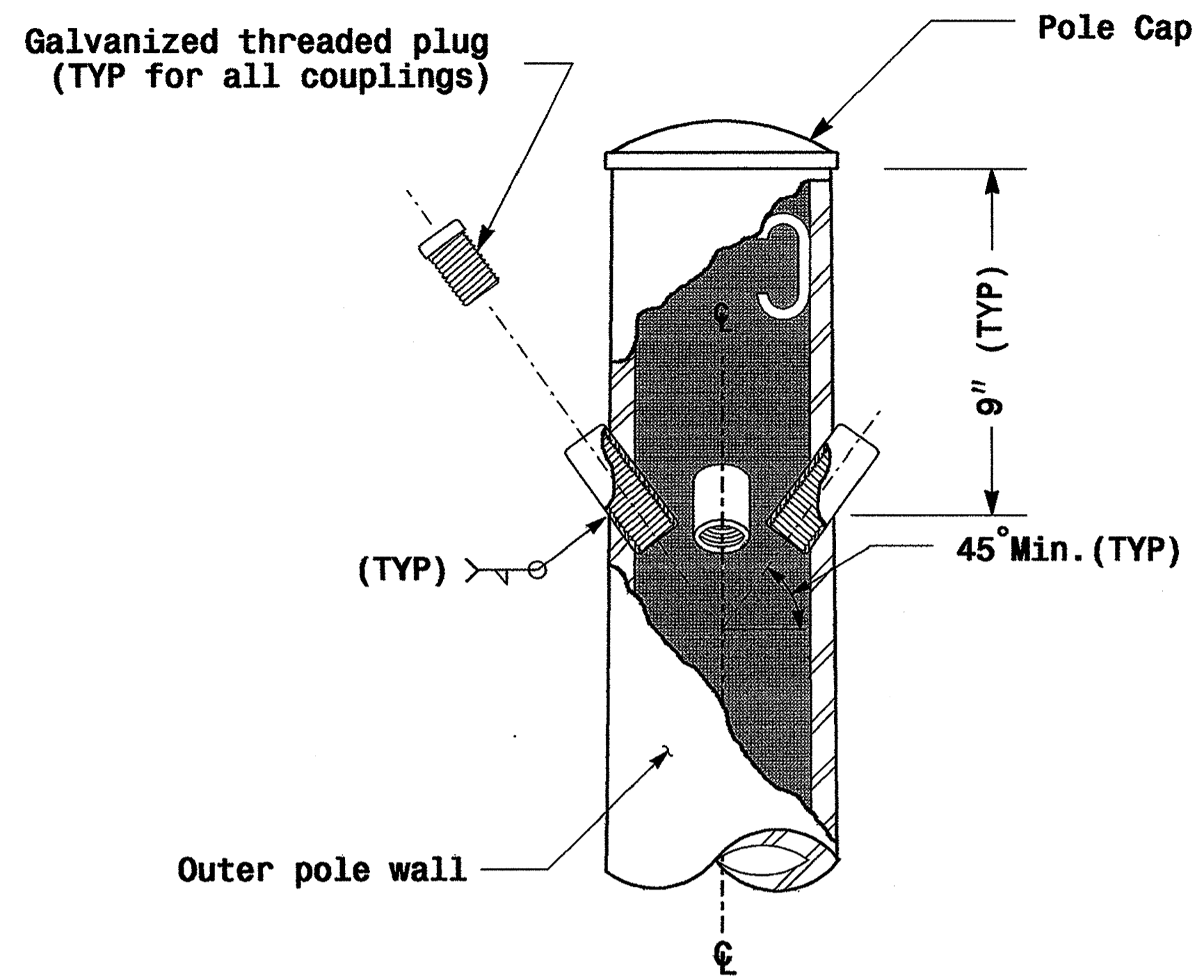
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REVISIONS: _____ INIT. DATE _____

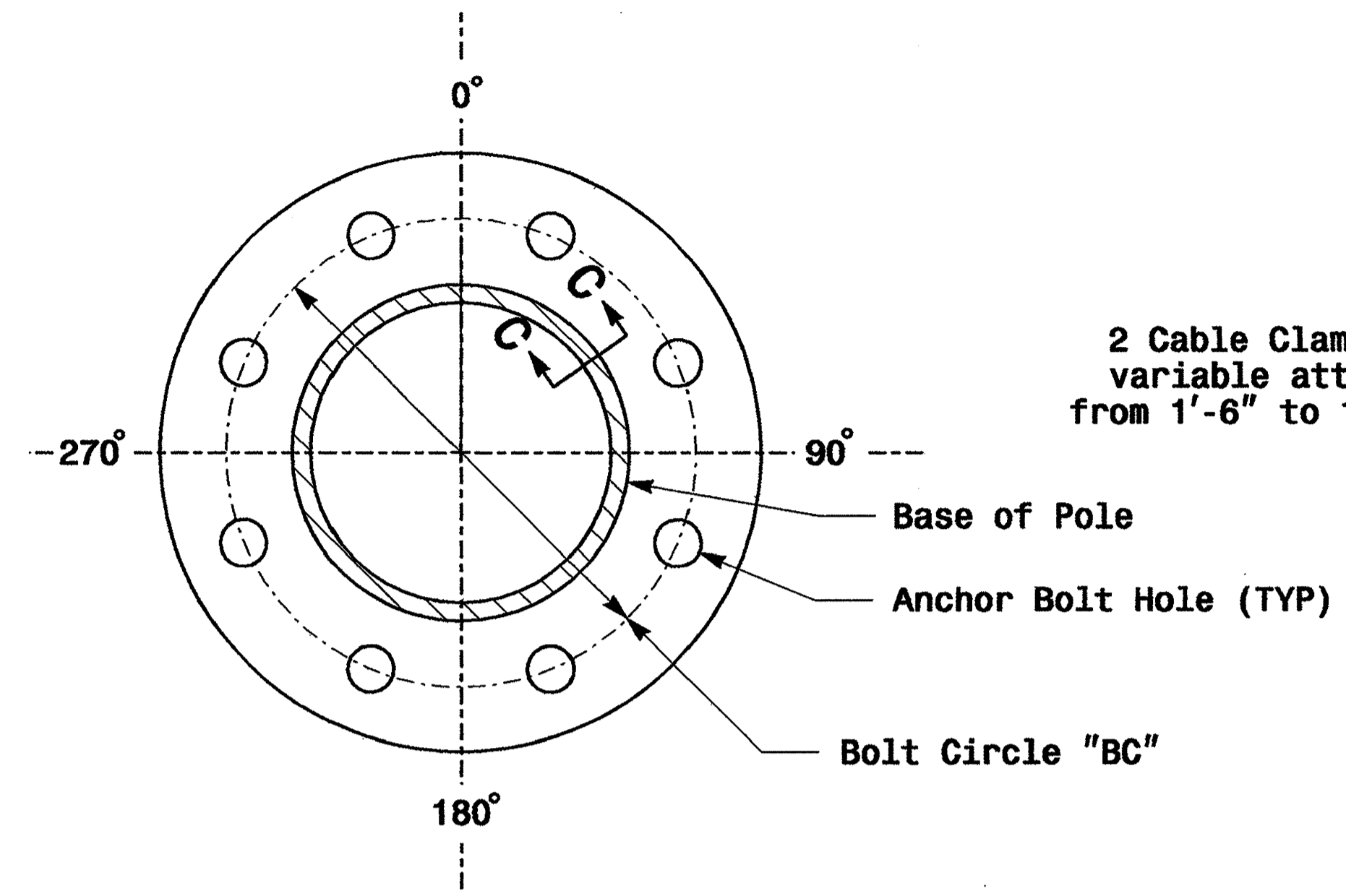
Signature: *D. Sankar* 9.2.2005
DATE: 9.2.2005
SIG. INVENTORY NO. _____

Fabrication Details - All Poles

01-SEP-2005 18:22 D:\2004_Metro_Pole_Standards\2004_m2 thru m5.dgn C:\andrews

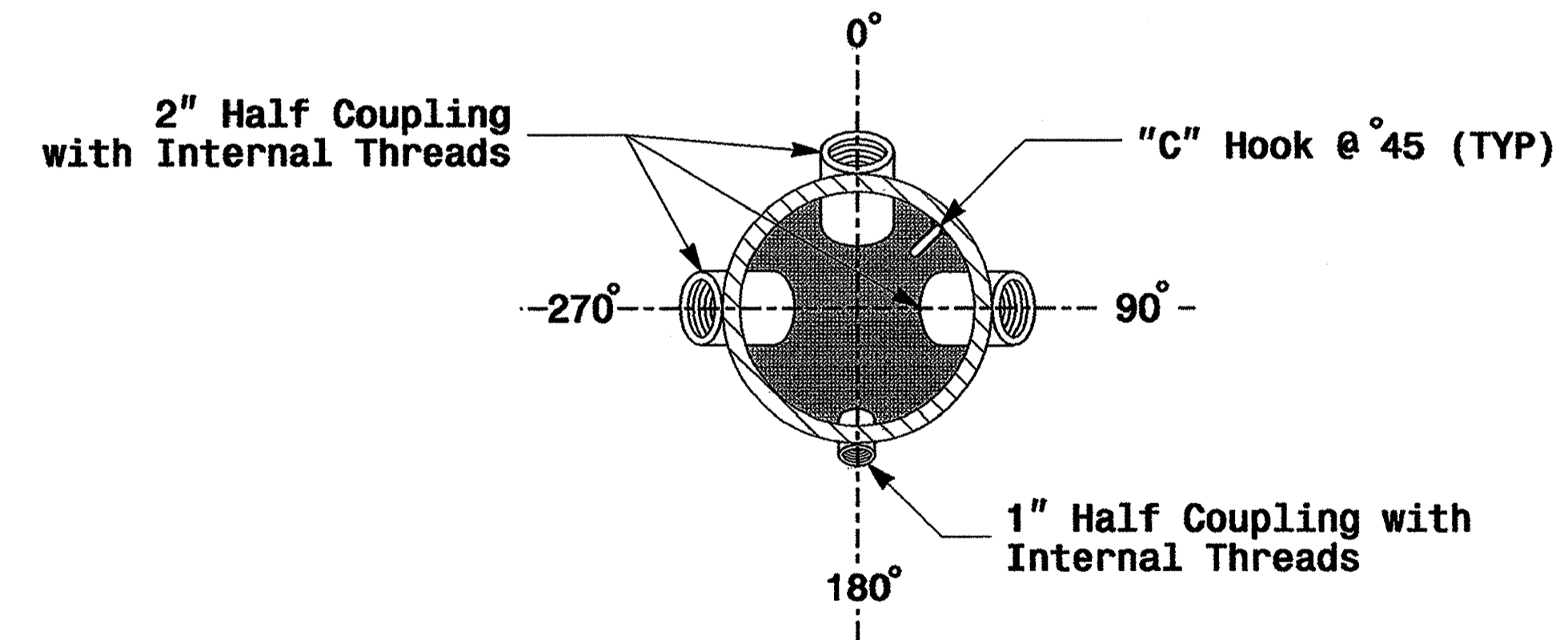
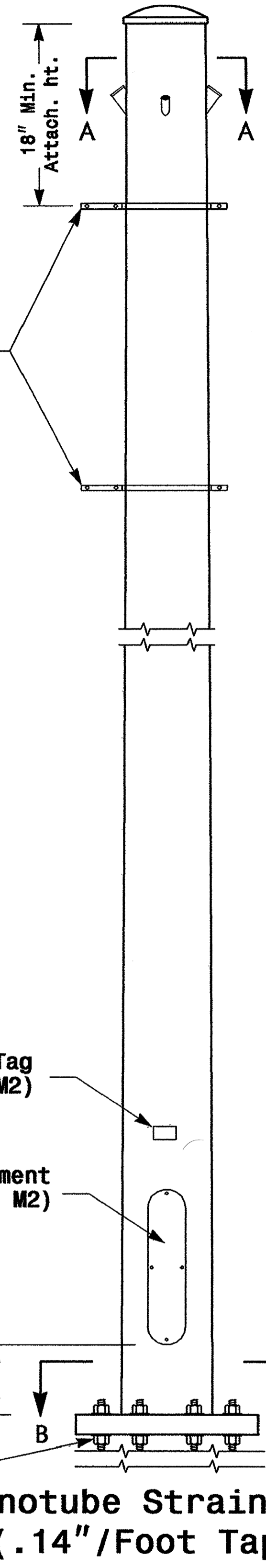


Cable Entrances at Top of Pole

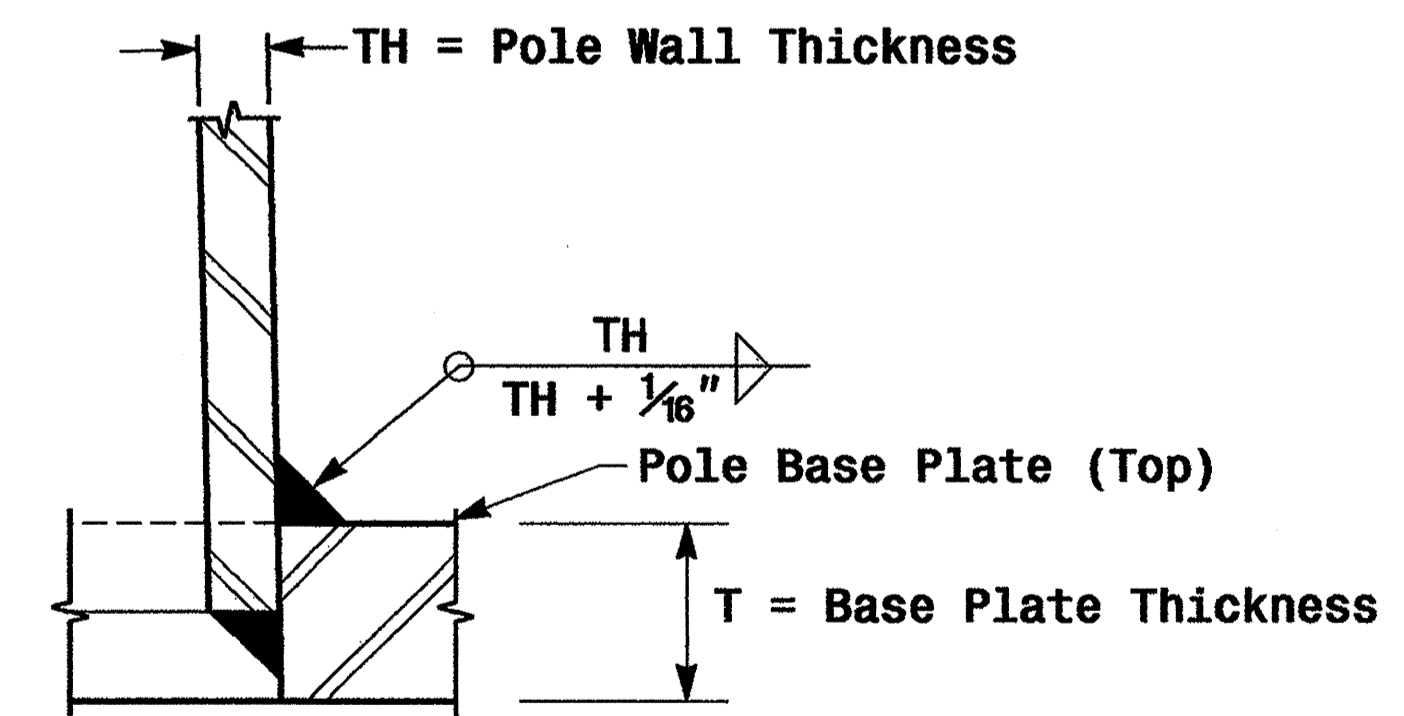


Section B-B
(See drawing M2)
Pole Base Plate

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



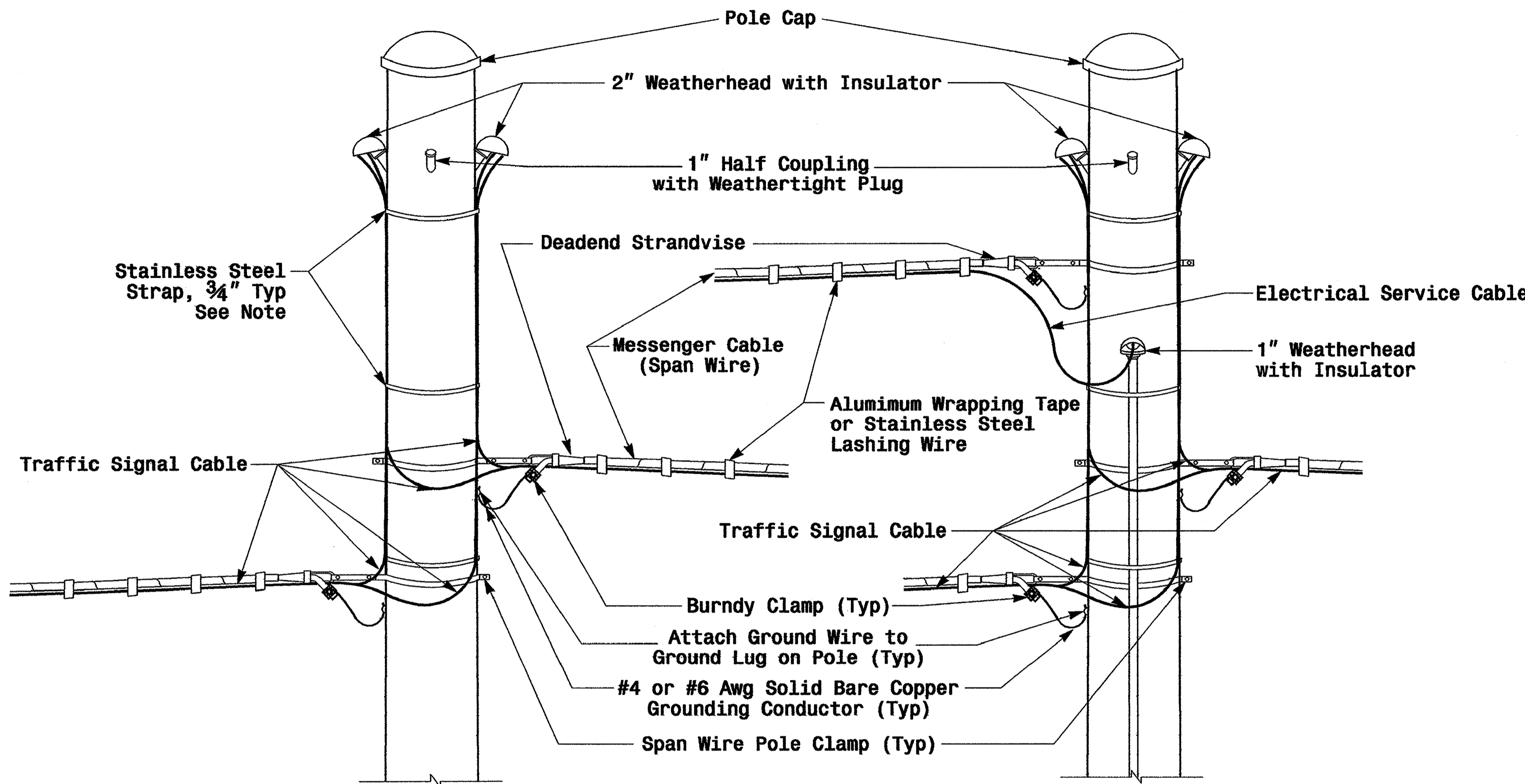
Section A-A
Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C
Socket Connection Weld Detail

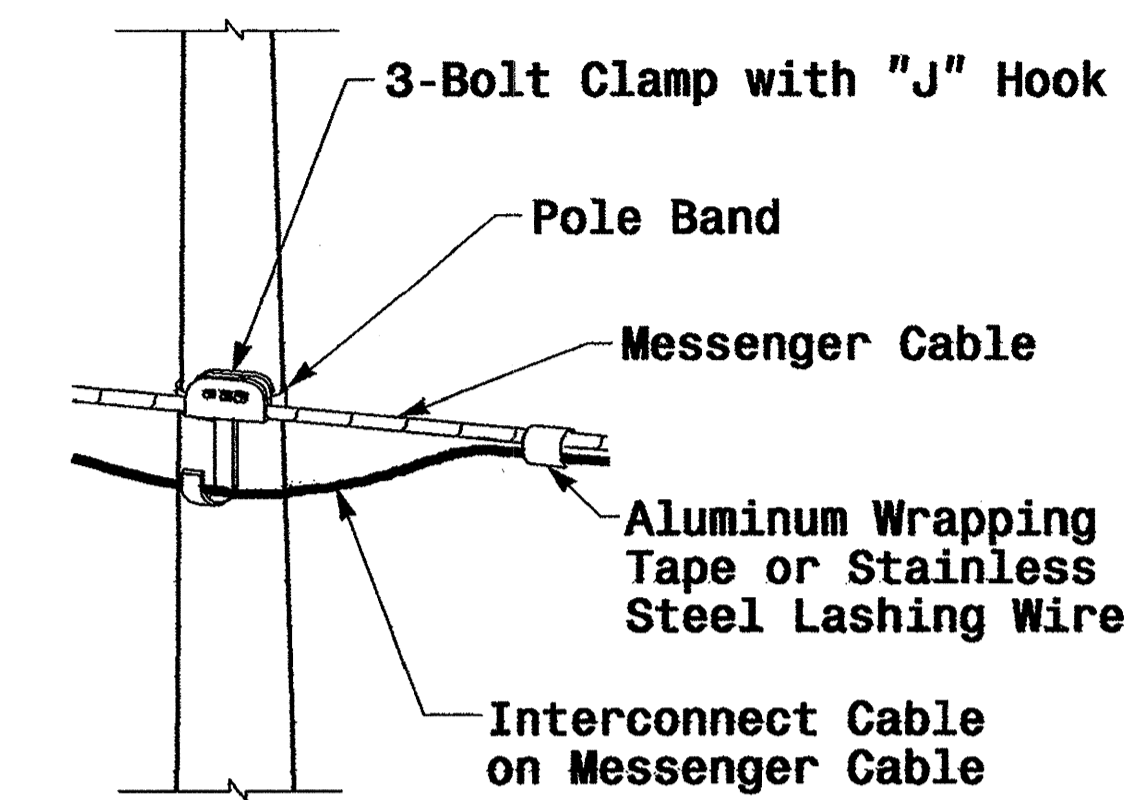
<p>122 N. McDowell St., Raleigh, NC 27603</p>	<p>Typical Fabrication Details For Strain Poles</p>		
	<p>PLAN DATE: May 2005</p> <p>PREPARED BY: P.L. Alexander</p>	<p>REVIEWED BY: C.F. Andrews</p> <p>REVIEWED BY: A.W. Esposito</p>		SCALE: NA NONE
<p>REVISIONS</p>			<p>SIGNATURE: J. Sarker</p> <p>DATE: 9.2.2005</p>

01-SEP-2005 14:07 w:\peopl18-un11\work\groups2004 metal pole standard\04 m3.dgn P.L. Alexander

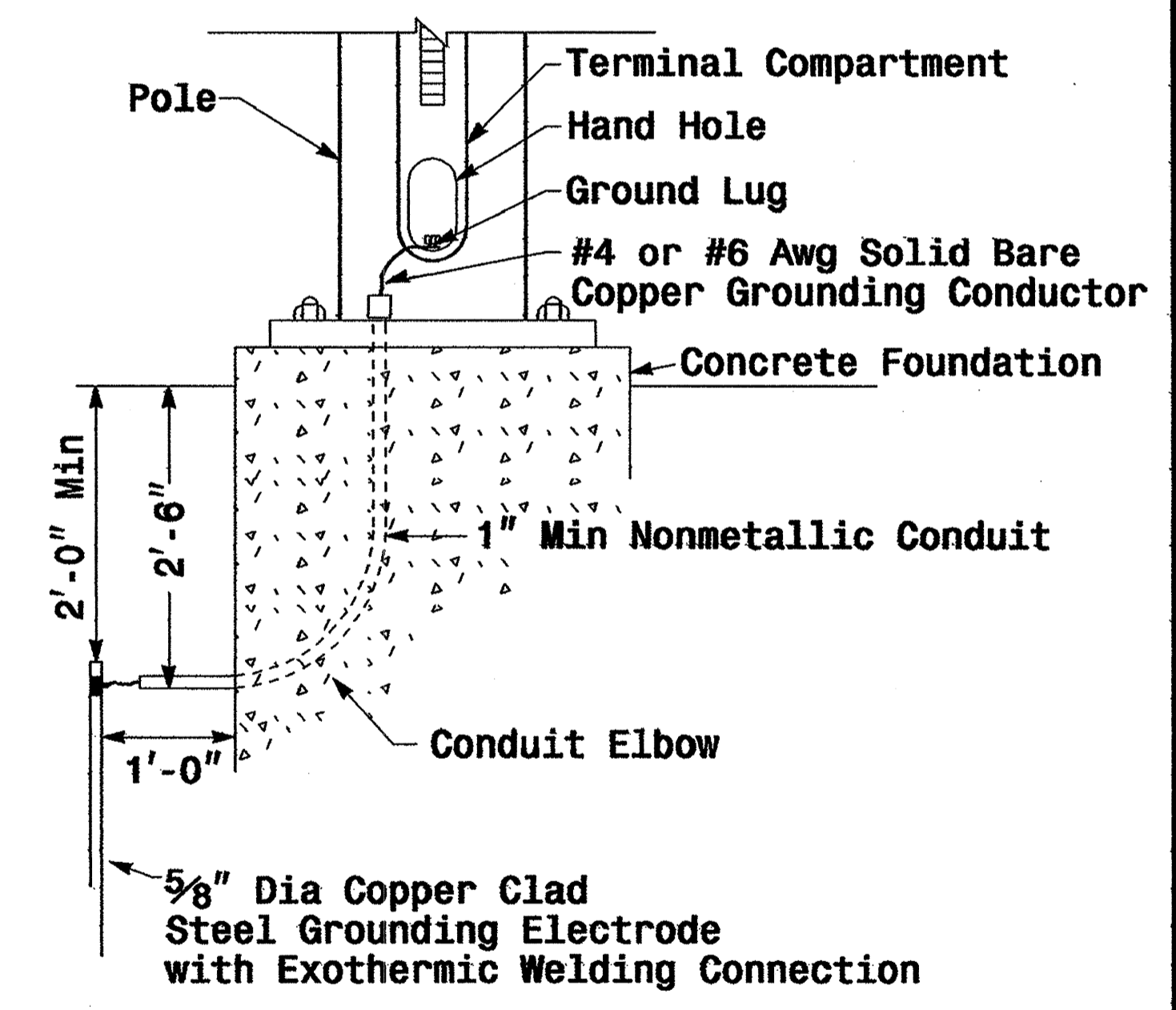


Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



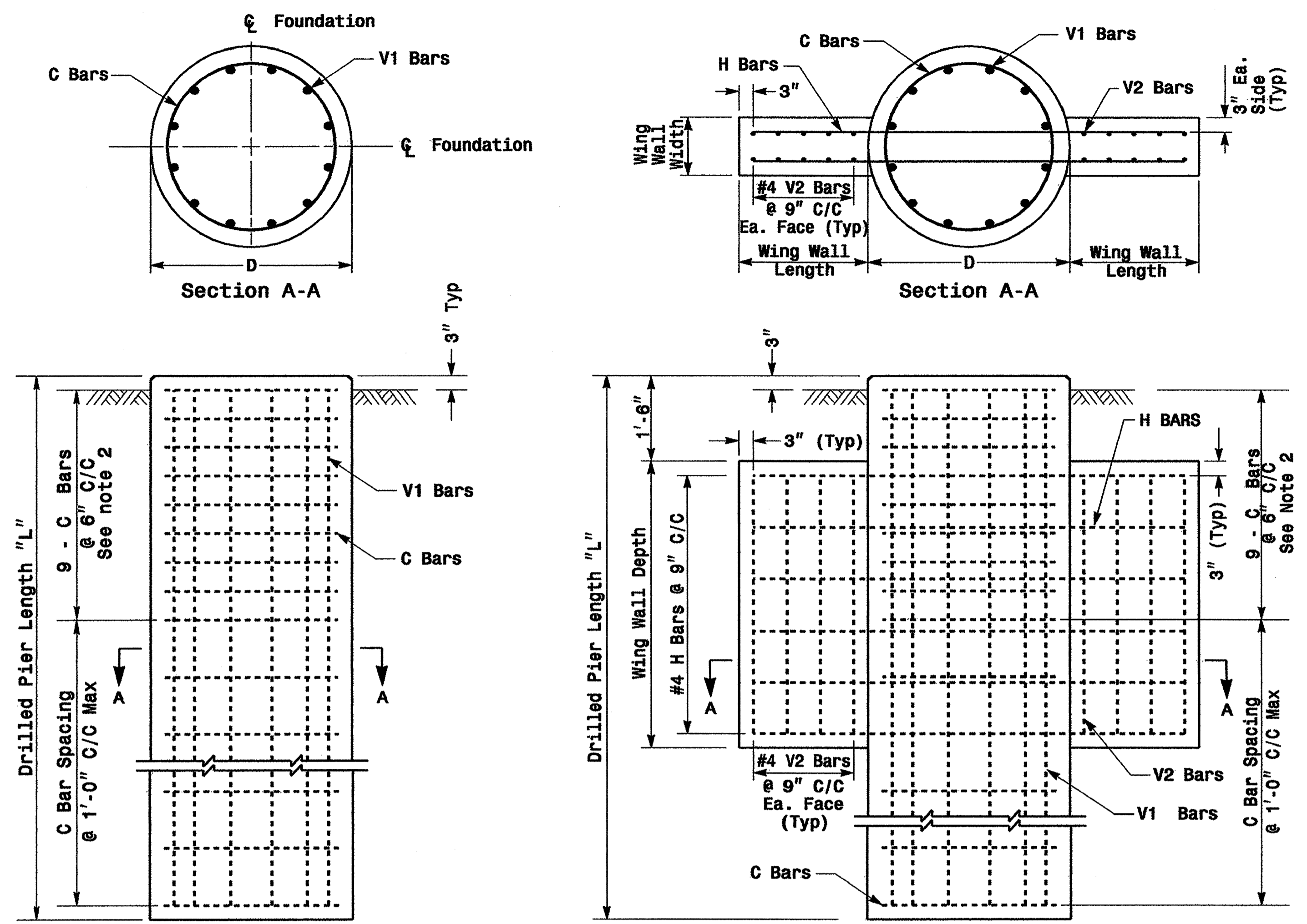
Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:33
w:\scd\lss-un\lss\workgroups\2004 metal pole standards\2004 mg.dgn
palalexander

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

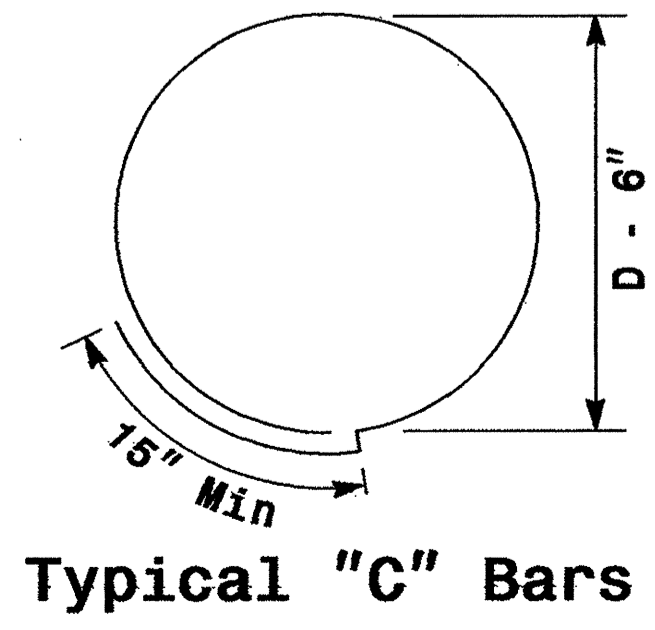
Reinforcing Steel Bars



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



REINFORCING STEEL TABLE FOR STANDARD 42" and 48" DRILL PIER SHAFT WITH TYPE 1 AND TYPE 2 WING WALLS

Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel				
		Bar Name	No.	Size	Type	Length
TYPE 1	42"	V1	9	#8	STR.	**
		V2	12	#4	STR.	2'-6"
		H	8	#4	STR.	6'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	42"	V1	9	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	48"	V1	12	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-6"
		C	*	#4	CIR.	12'-6"

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

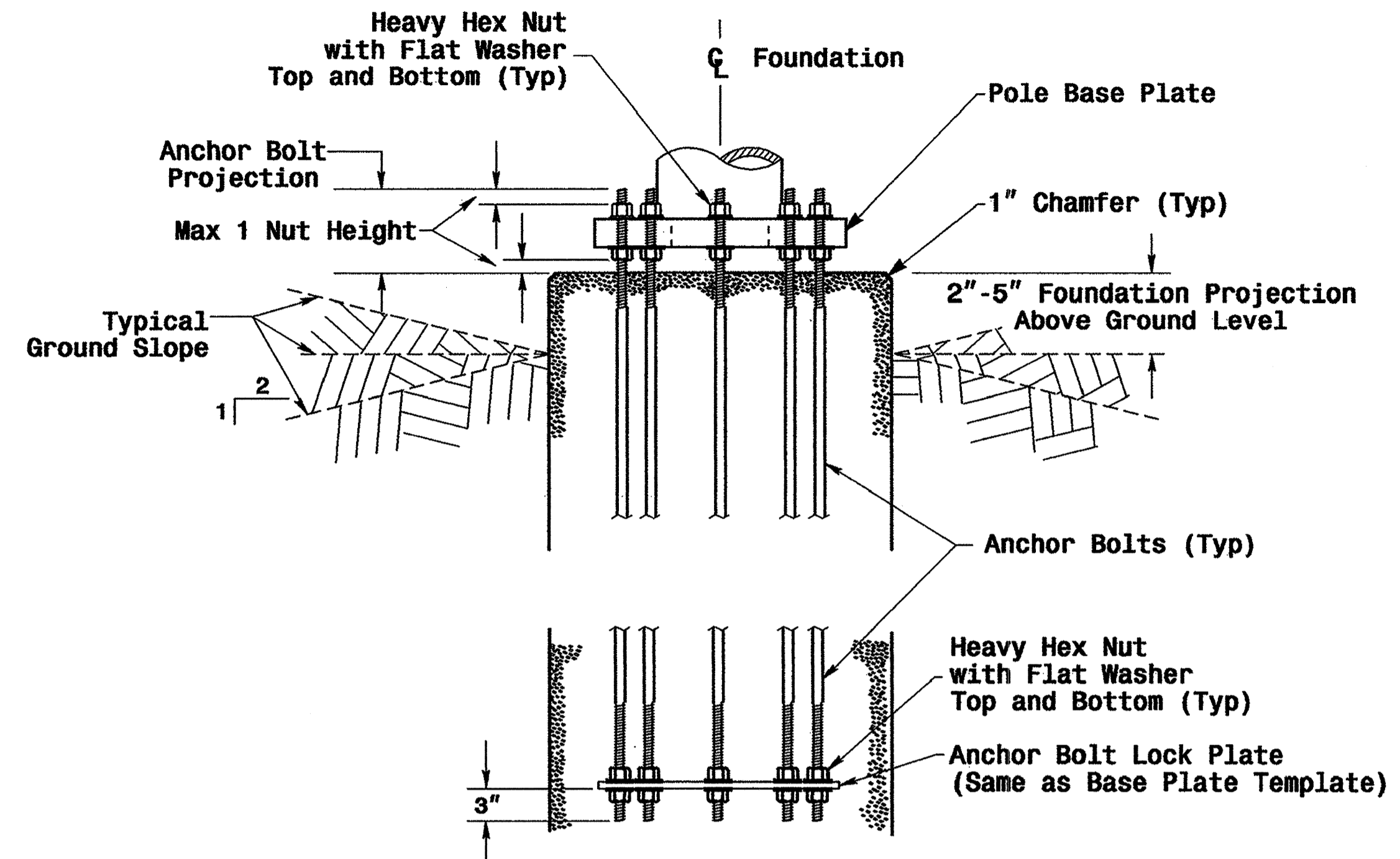
WING WALL DETAILS

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

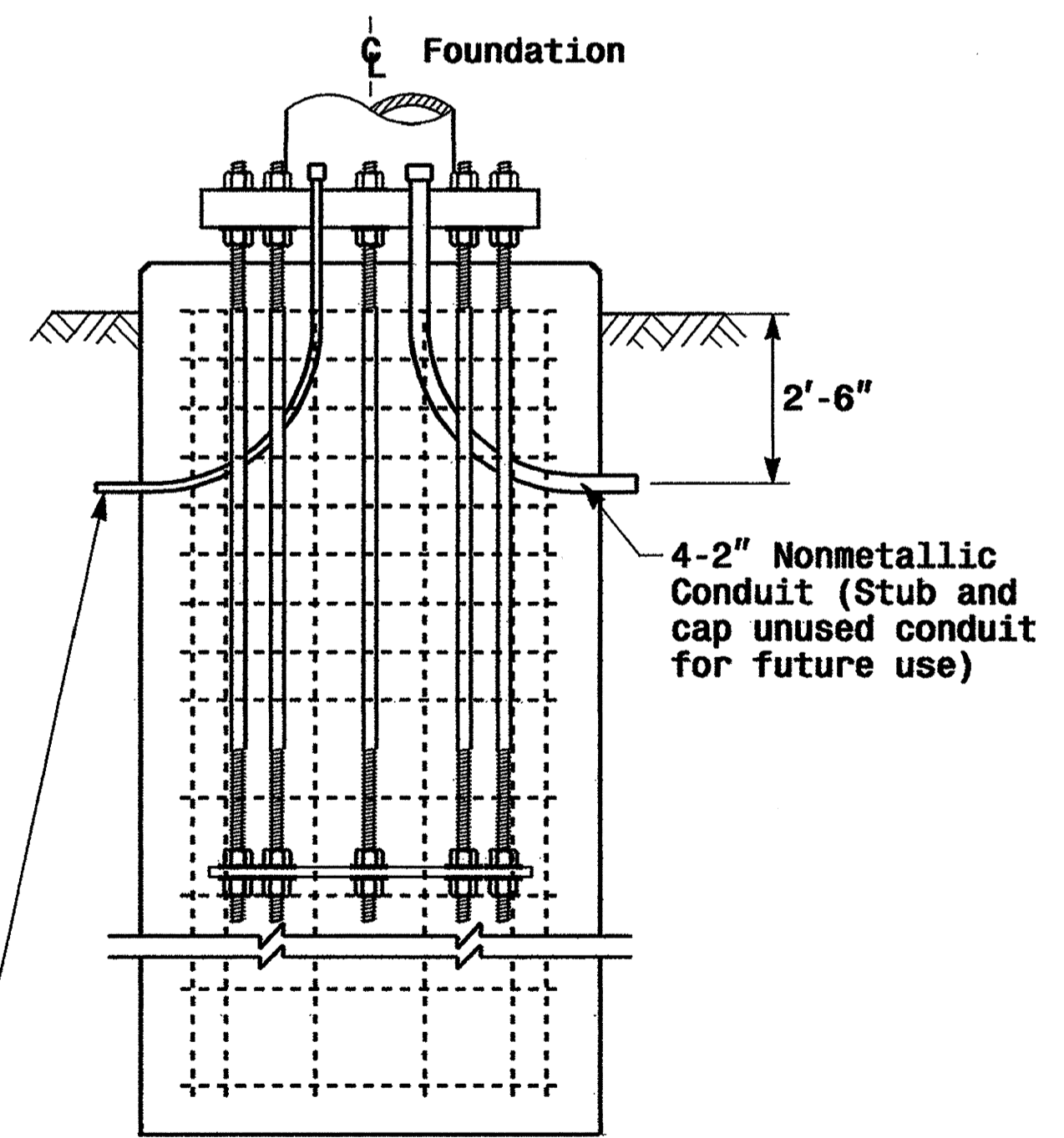
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

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

Construction Details - Foundations

01-SEP-2005 11:48 w:\pcep\es-un\m\w\kg\pcep2004\meta1.pole.standar-csk204.mf.dgn

Prepared in the Office of:

Construction Details Foundations

PLAN DATE: May 2005	REVIEWED BY: P.L. ALEXANDER
PREPARED BY: C.F. ANDREWS	REVIEWED BY: A.W. ESPOSITO

SCALE: 0 NA NONE

Signature: *D. Sarker* 9.2.2005
DATE: 9.2.2005
SIG. INVENTORY NO.

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

11-08

INDUCTIVE DETECTION LOOPS
ENGLISH DETAIL DRAWING FOR

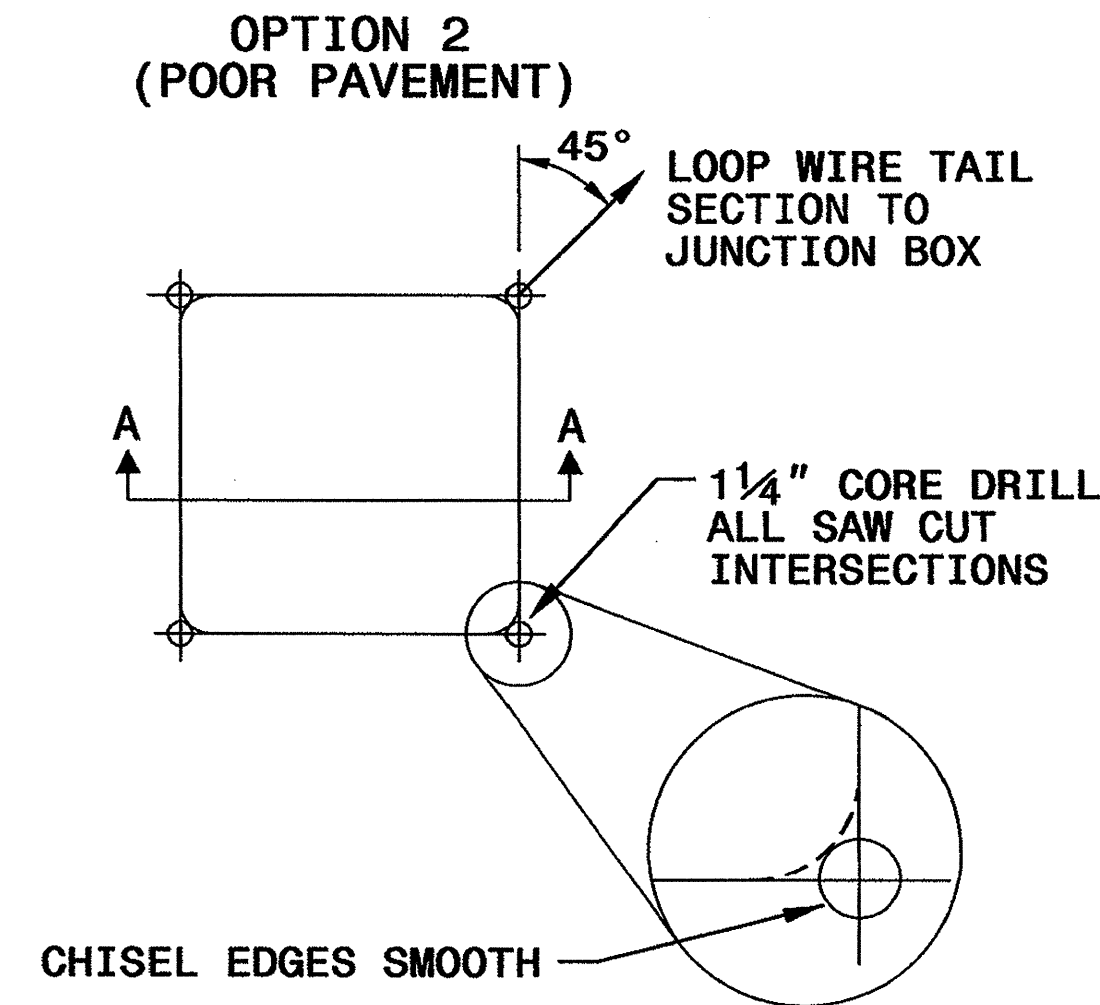
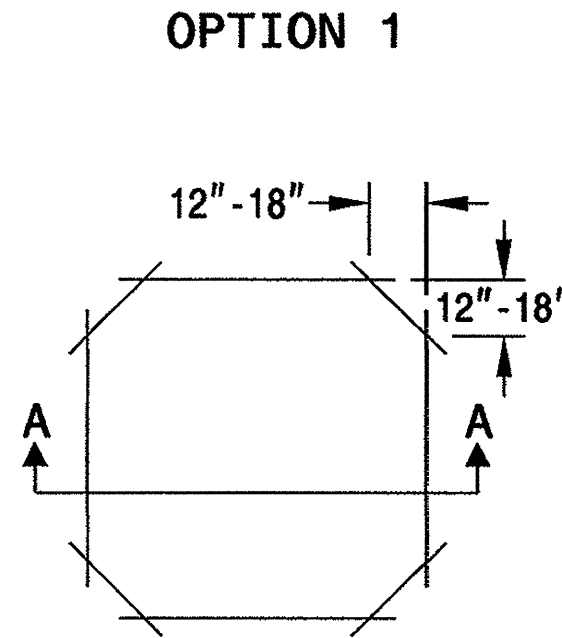
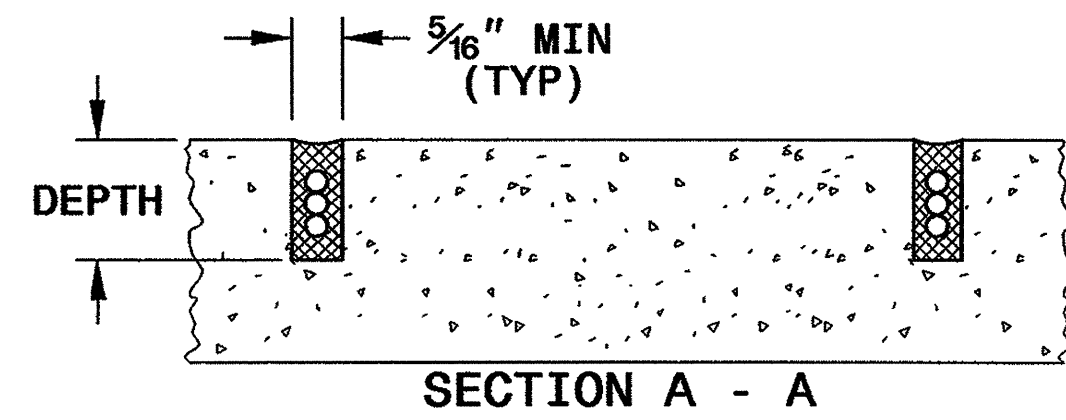
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

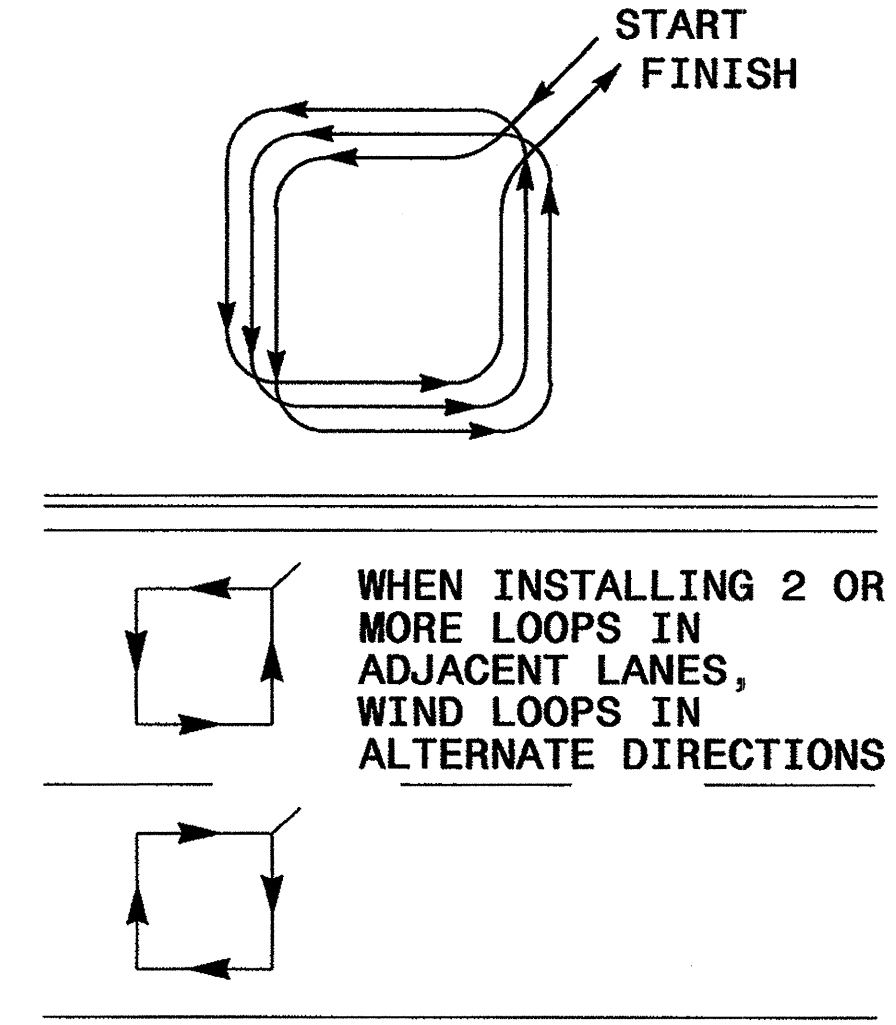
SAW CUT OPTIONS

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.

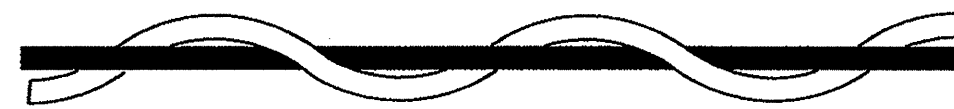
11-08

INDUCTIVE DETECTION LOOPS
ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3
1725D01

LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE



CORRECT WAY TO TWIST WIRE

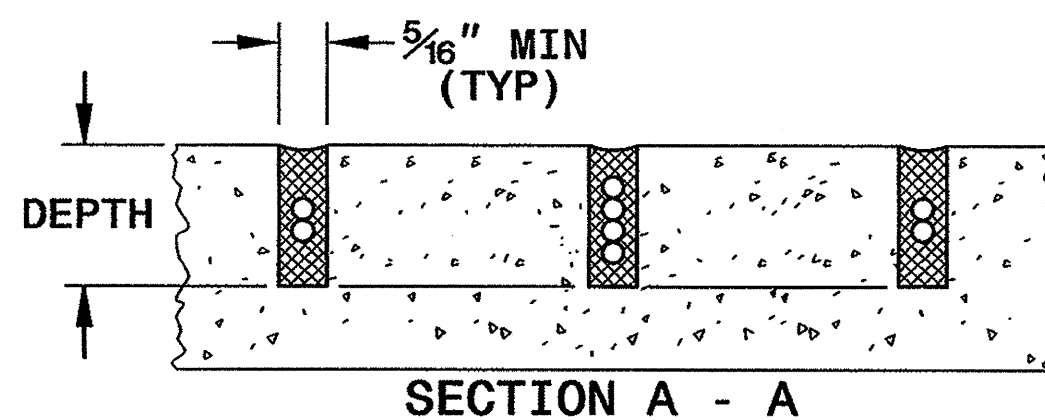
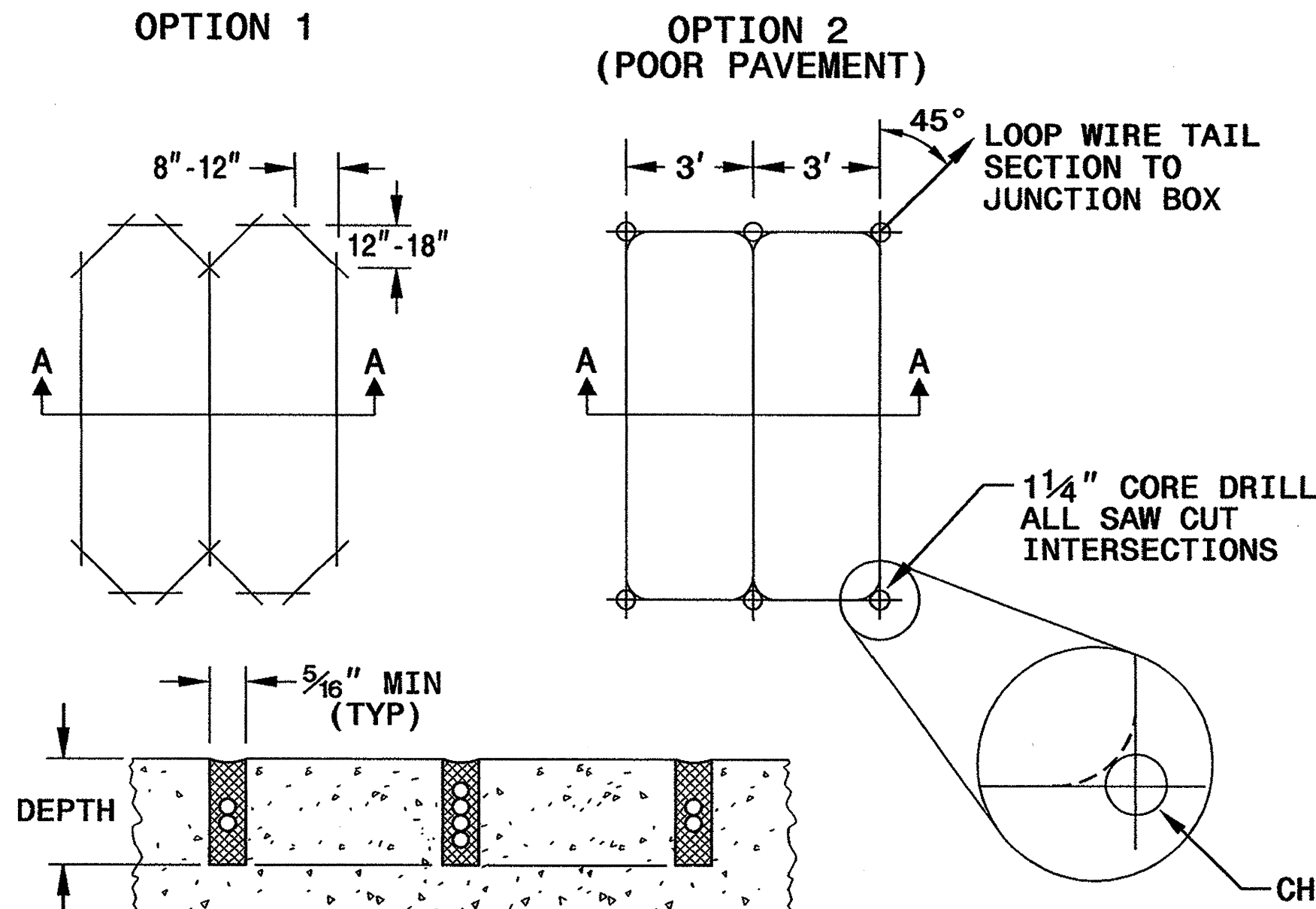
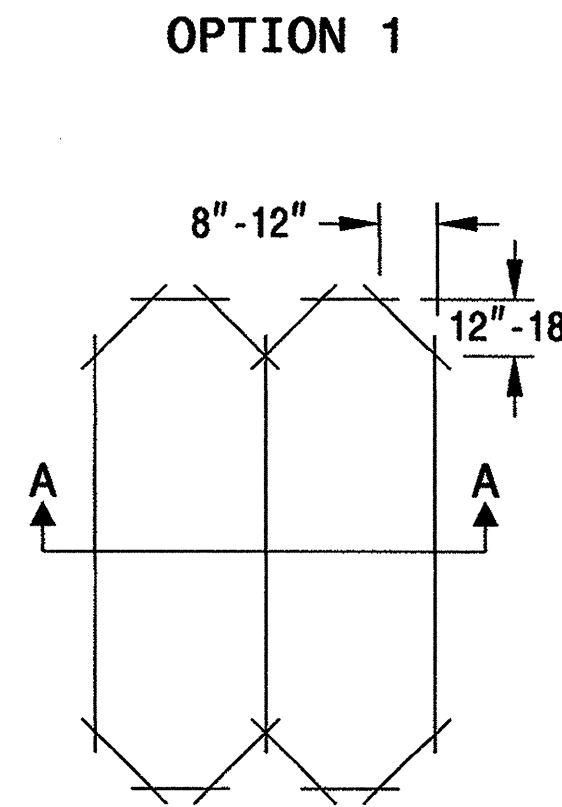


NOTES

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.

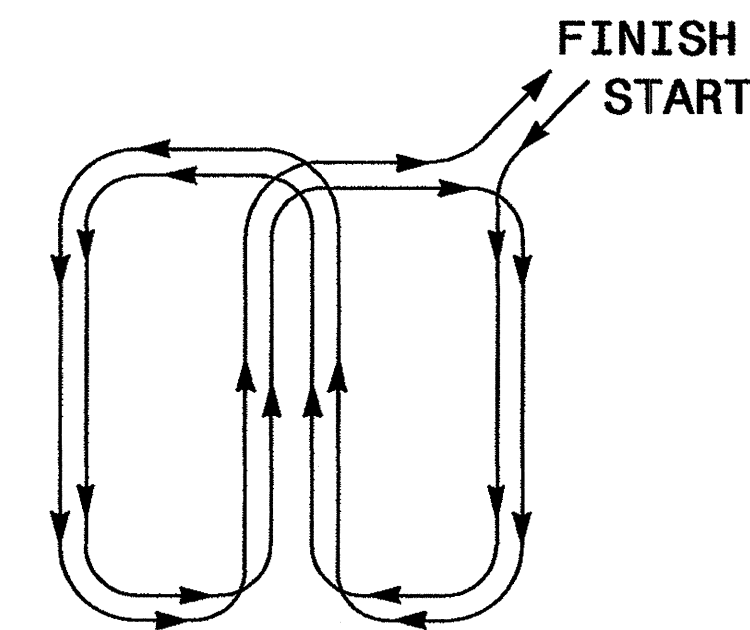
QUADRUPOLE LOOP

SAW CUT OPTIONS



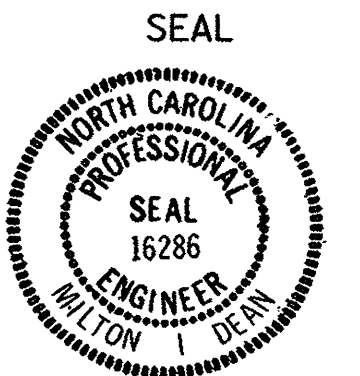
DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



See Plate for Title

Prepared in the Offices of:
Intelligent Transportation Systems & Signals Unit
750 N. Greenfield Parkway
Garner, NC 27529



Milton Dean 1/24/08
SIGNATURE DATE

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

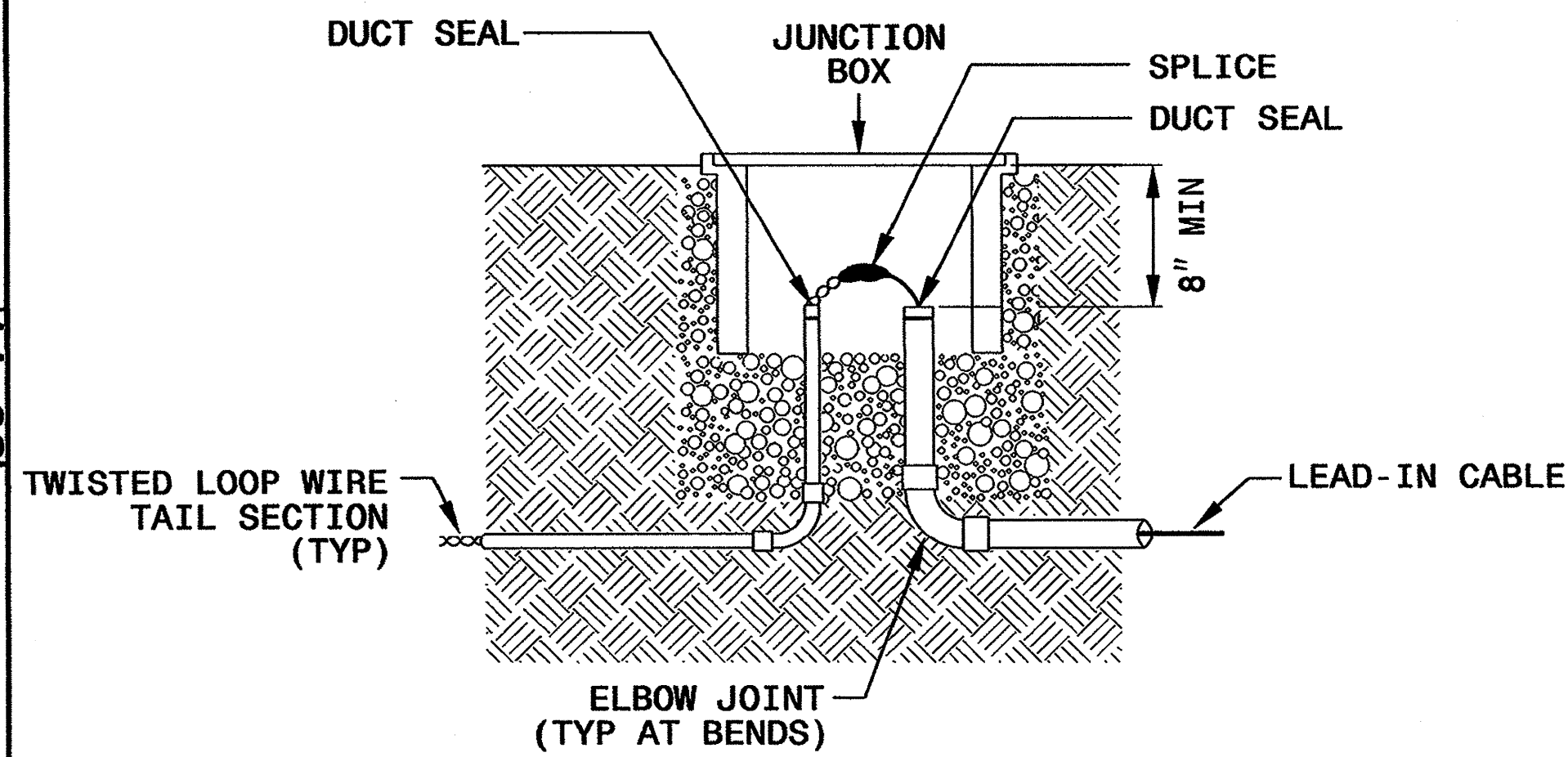
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

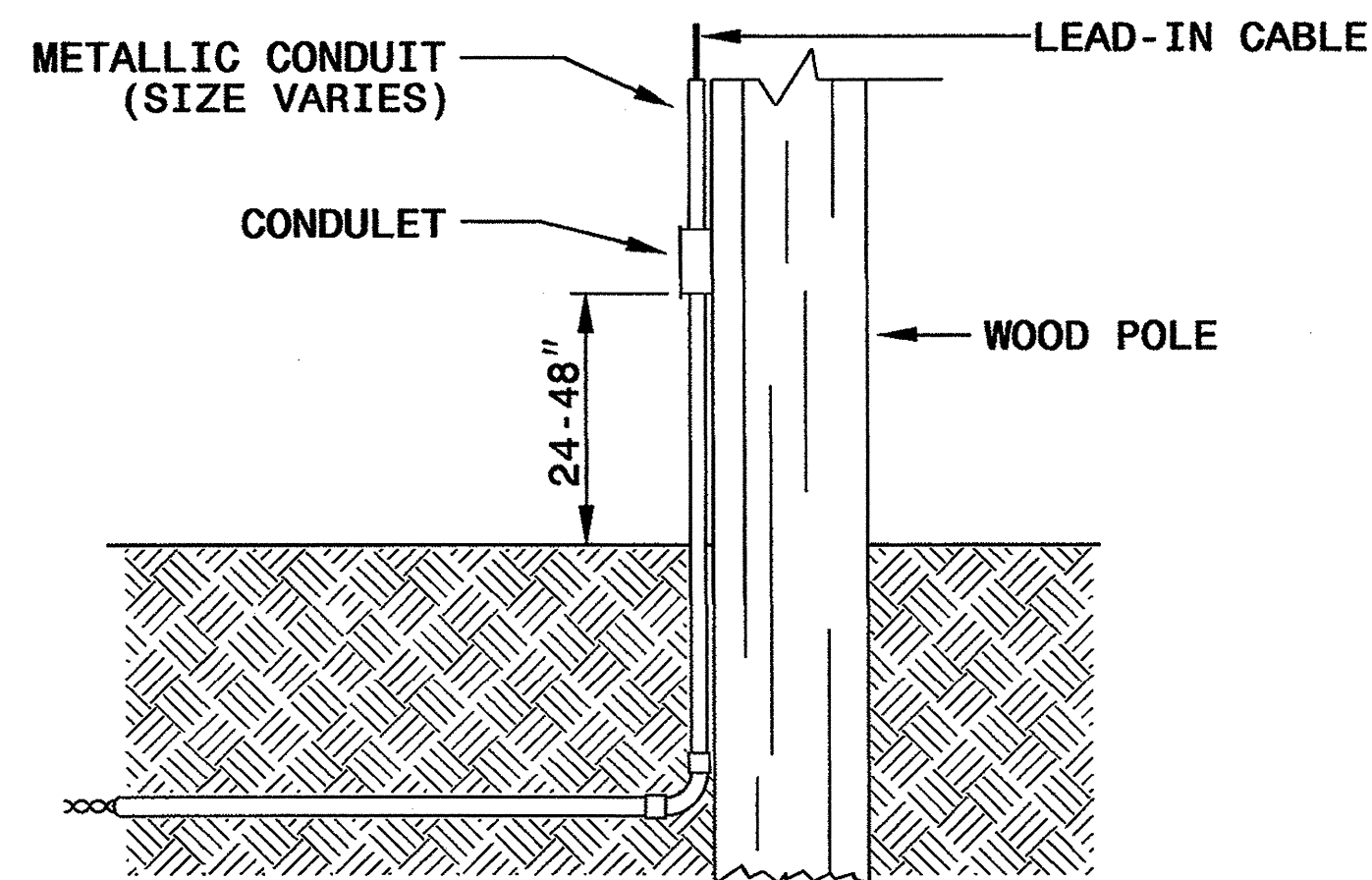
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

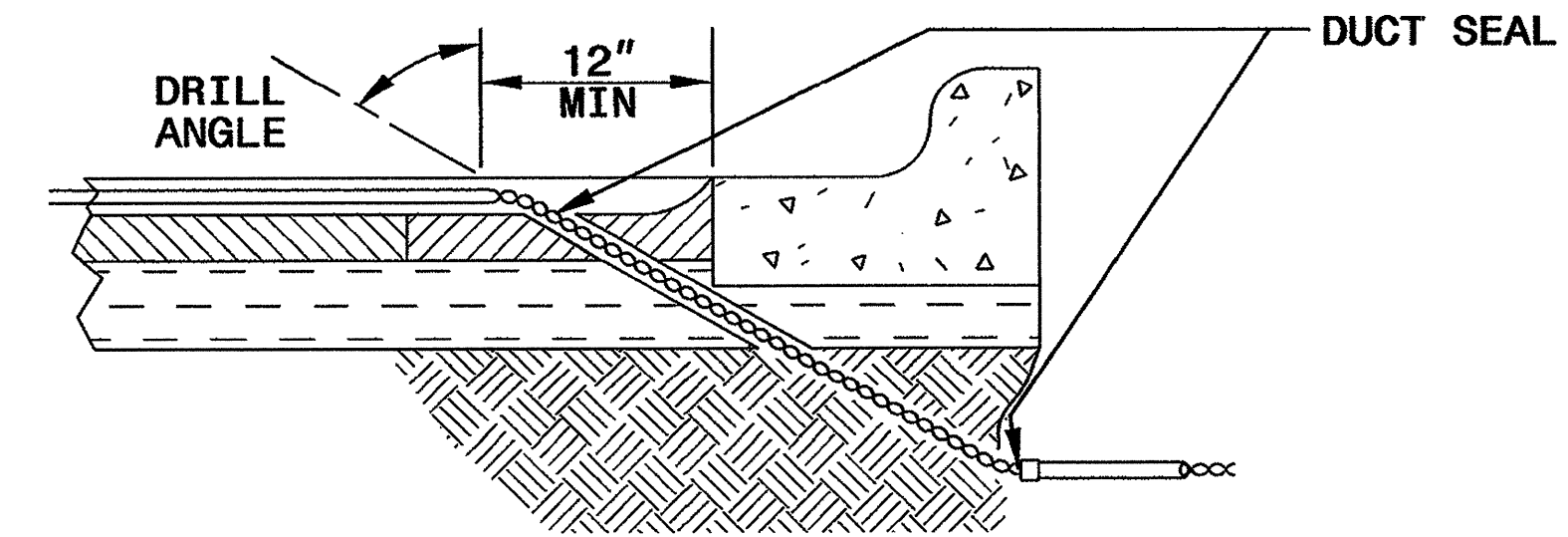


NOTE

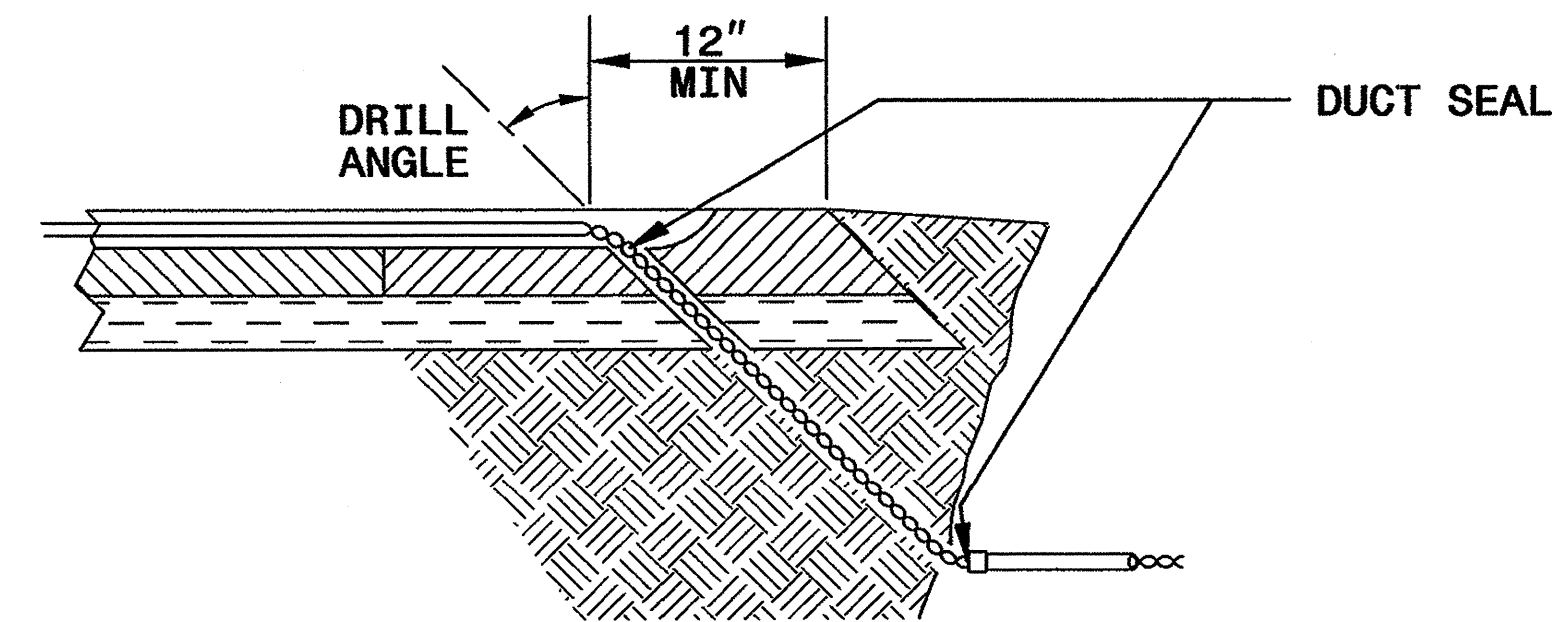
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

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

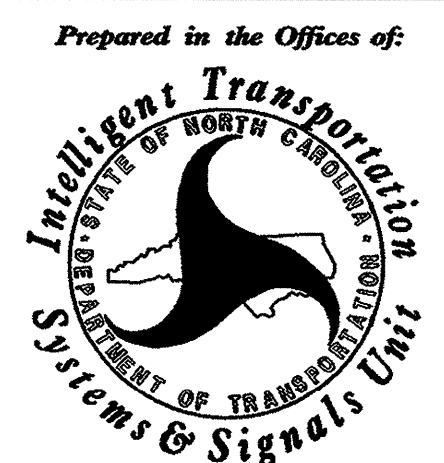
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

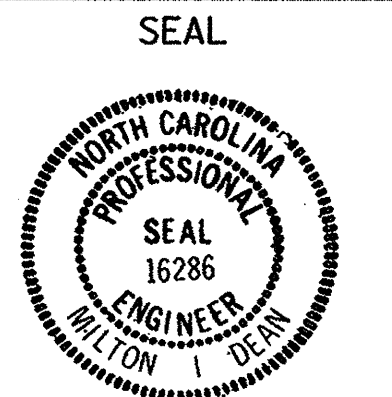
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title



750 N. Greenfield Parkway
Garner, NC 27529



Milton Dean 11/24/08
SIGNATURE DATE

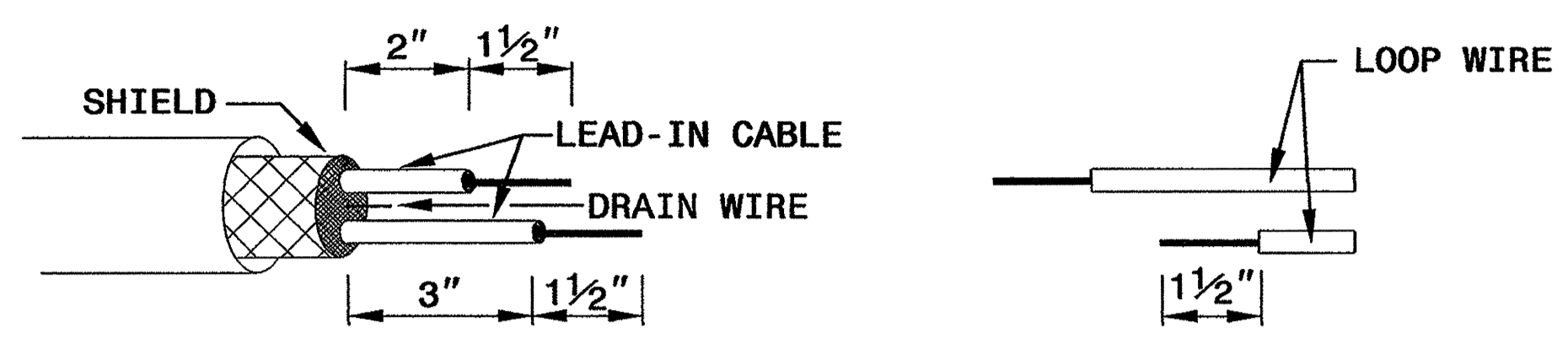
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

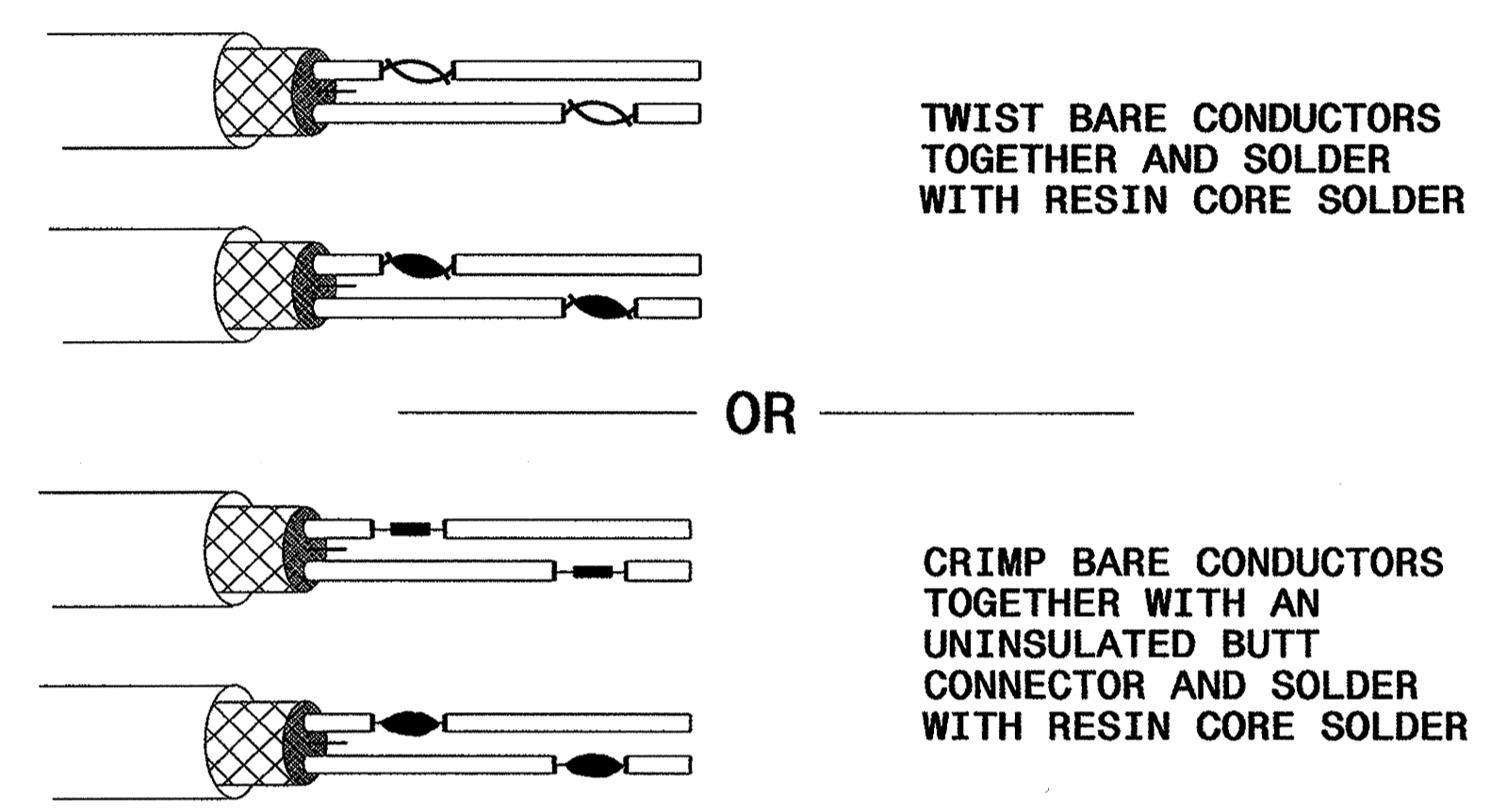
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

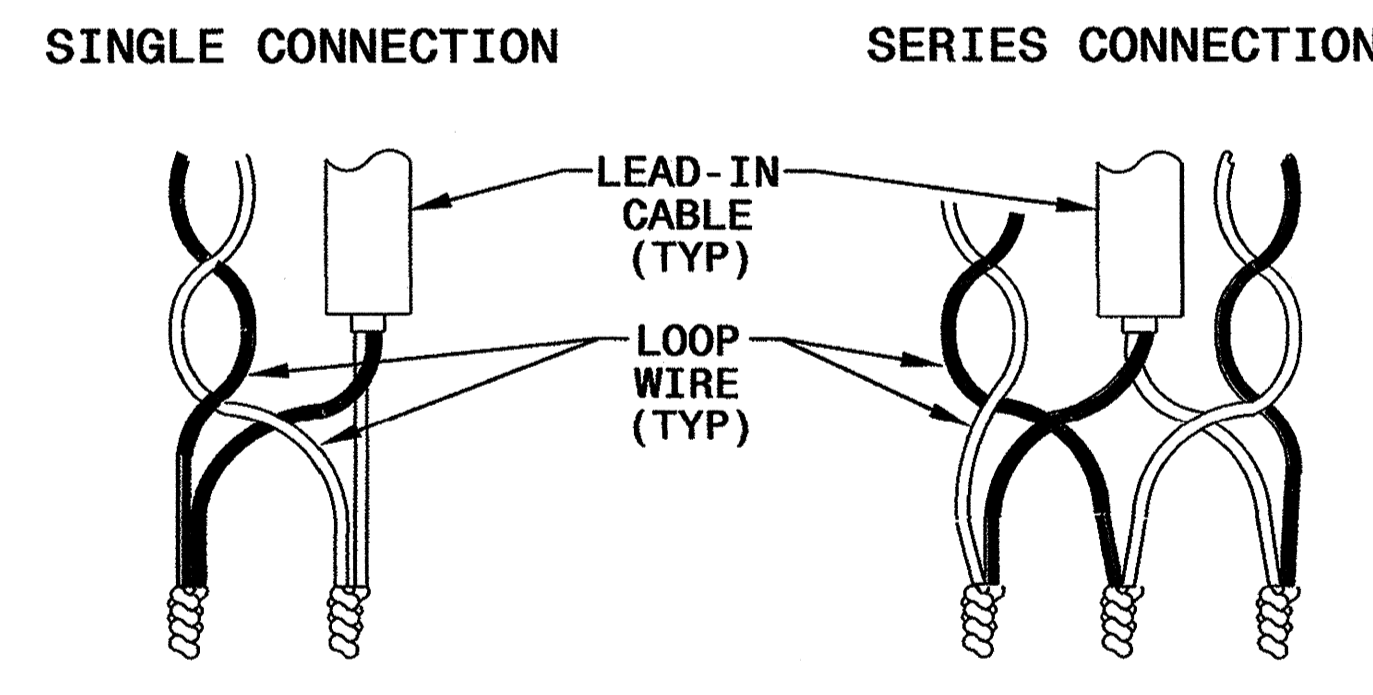


STEP 2. CONNECT AND SOLDER

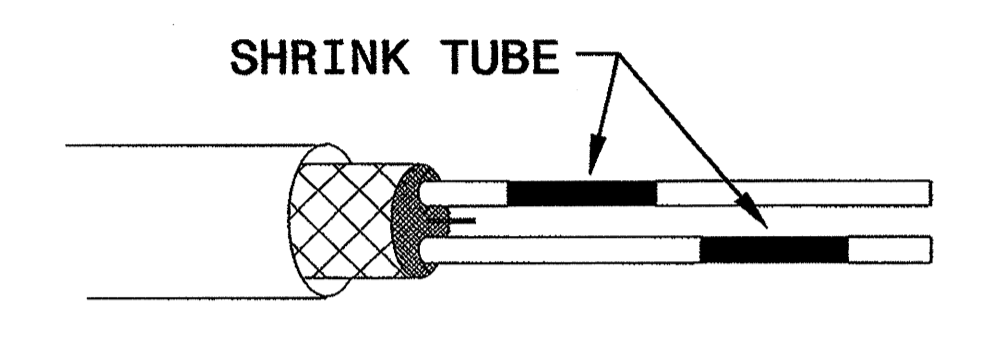


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

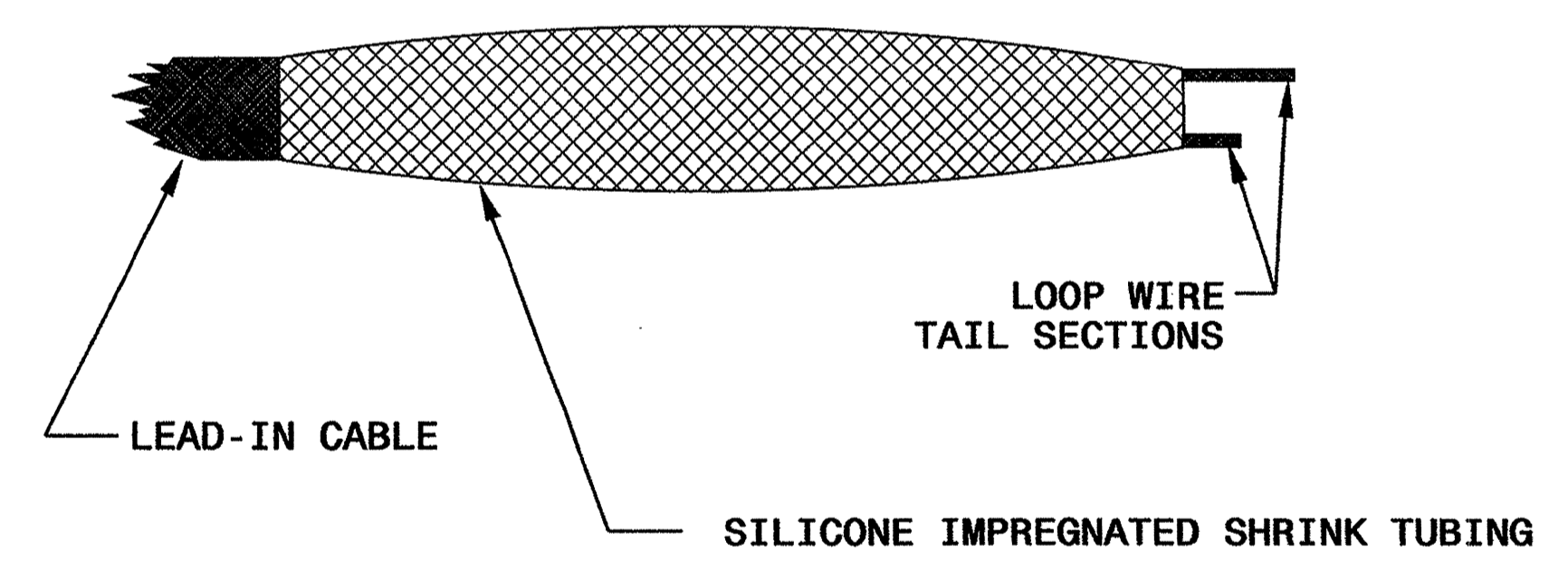
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



STATE OF NORTH CAROLINA
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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

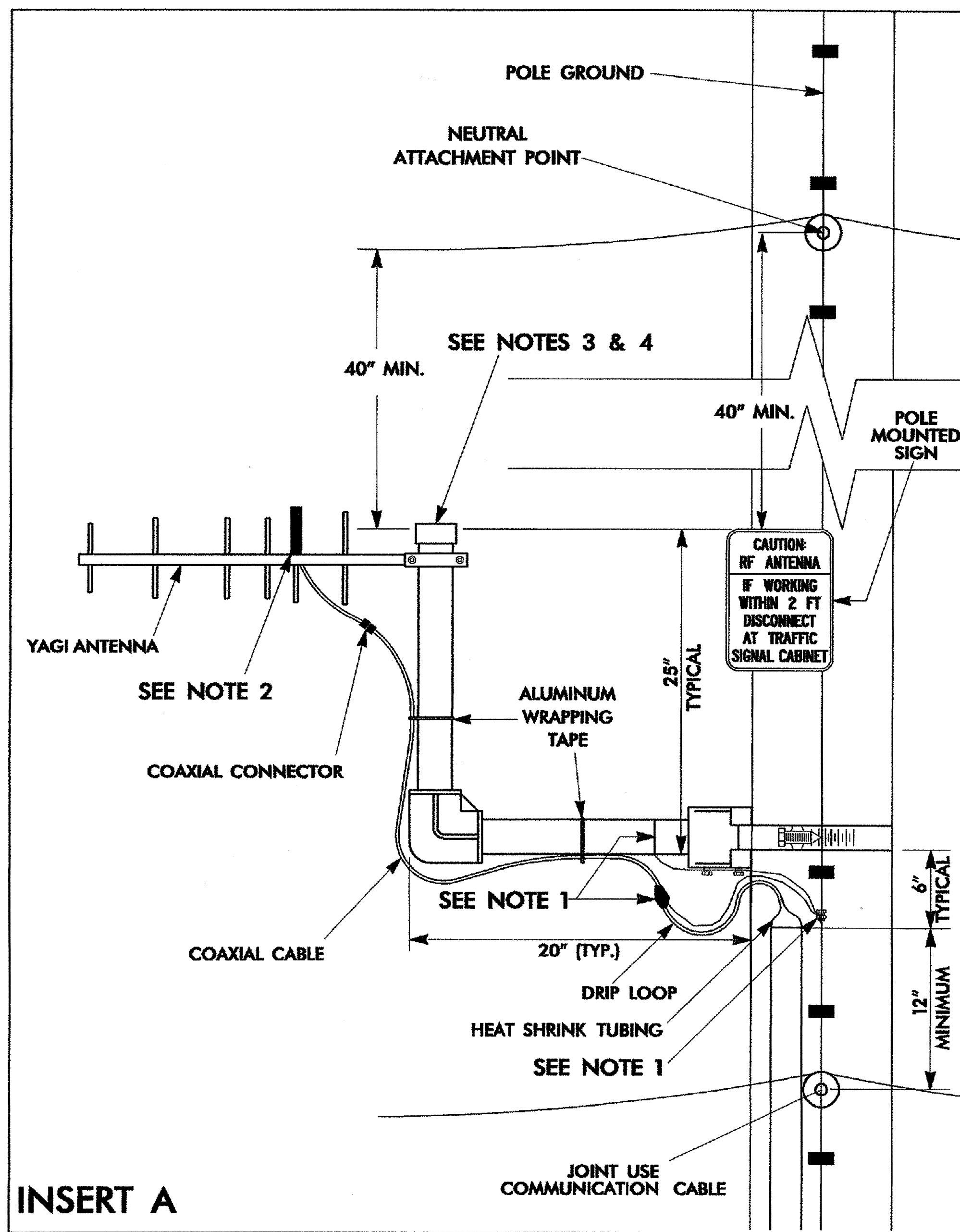
Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

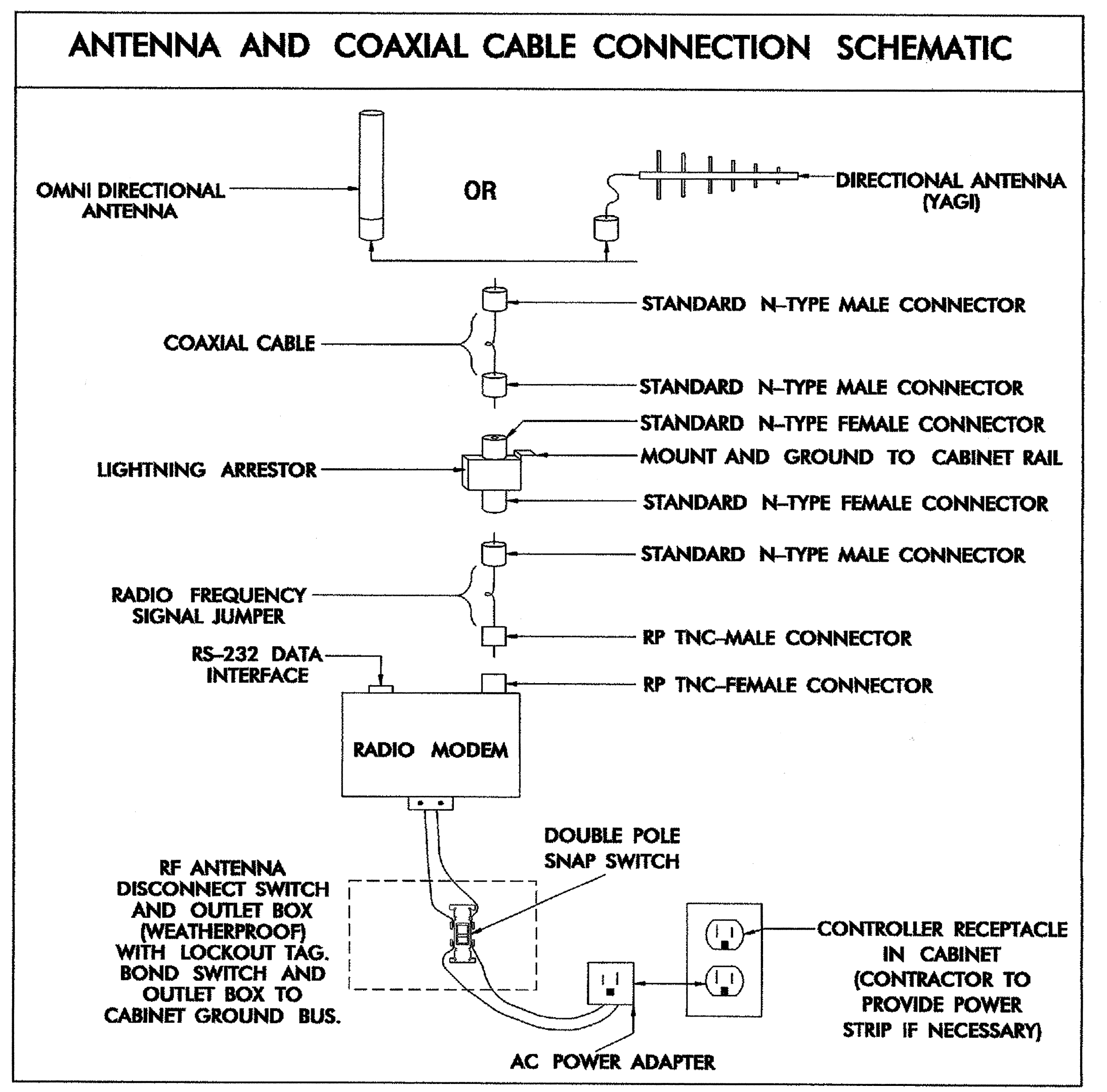
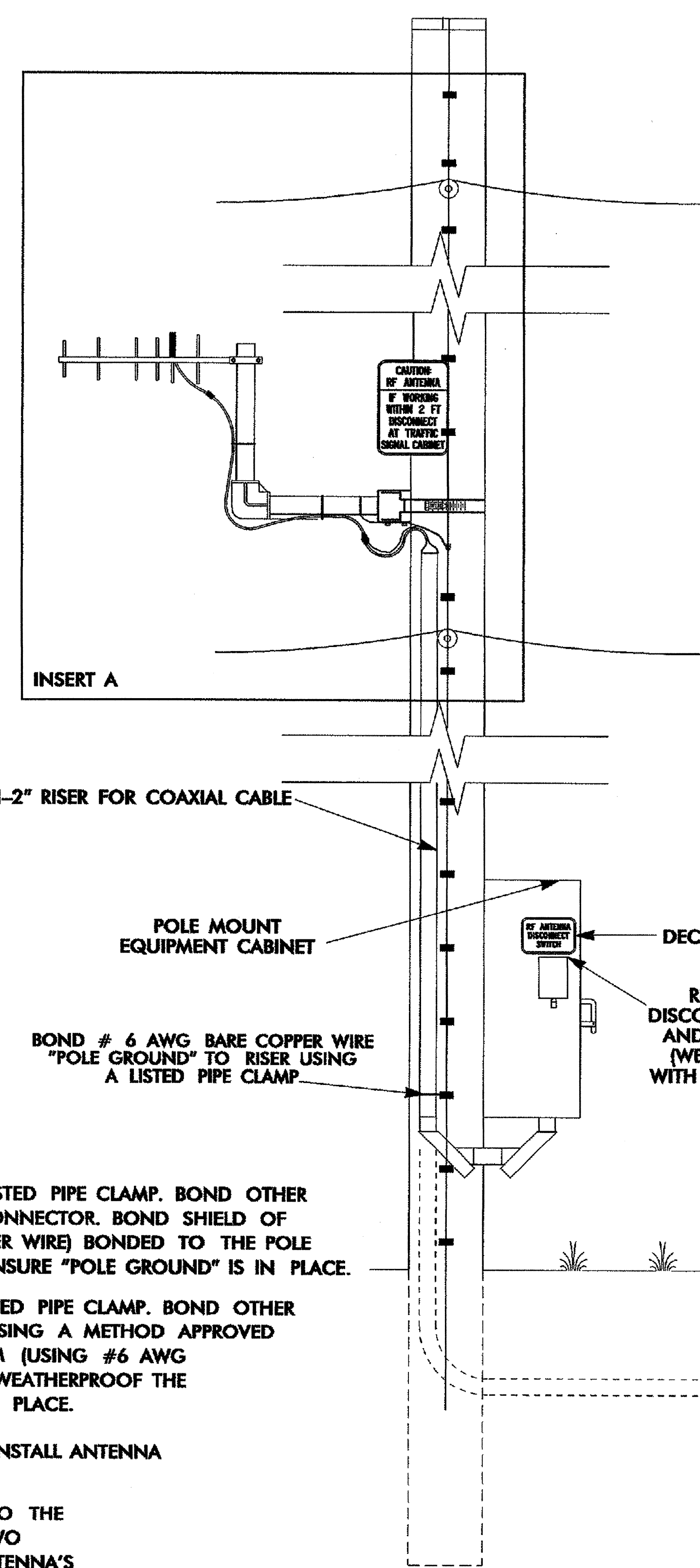
Milton I. Dean 11/24/08
SIGNATURE DATE

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NOTES

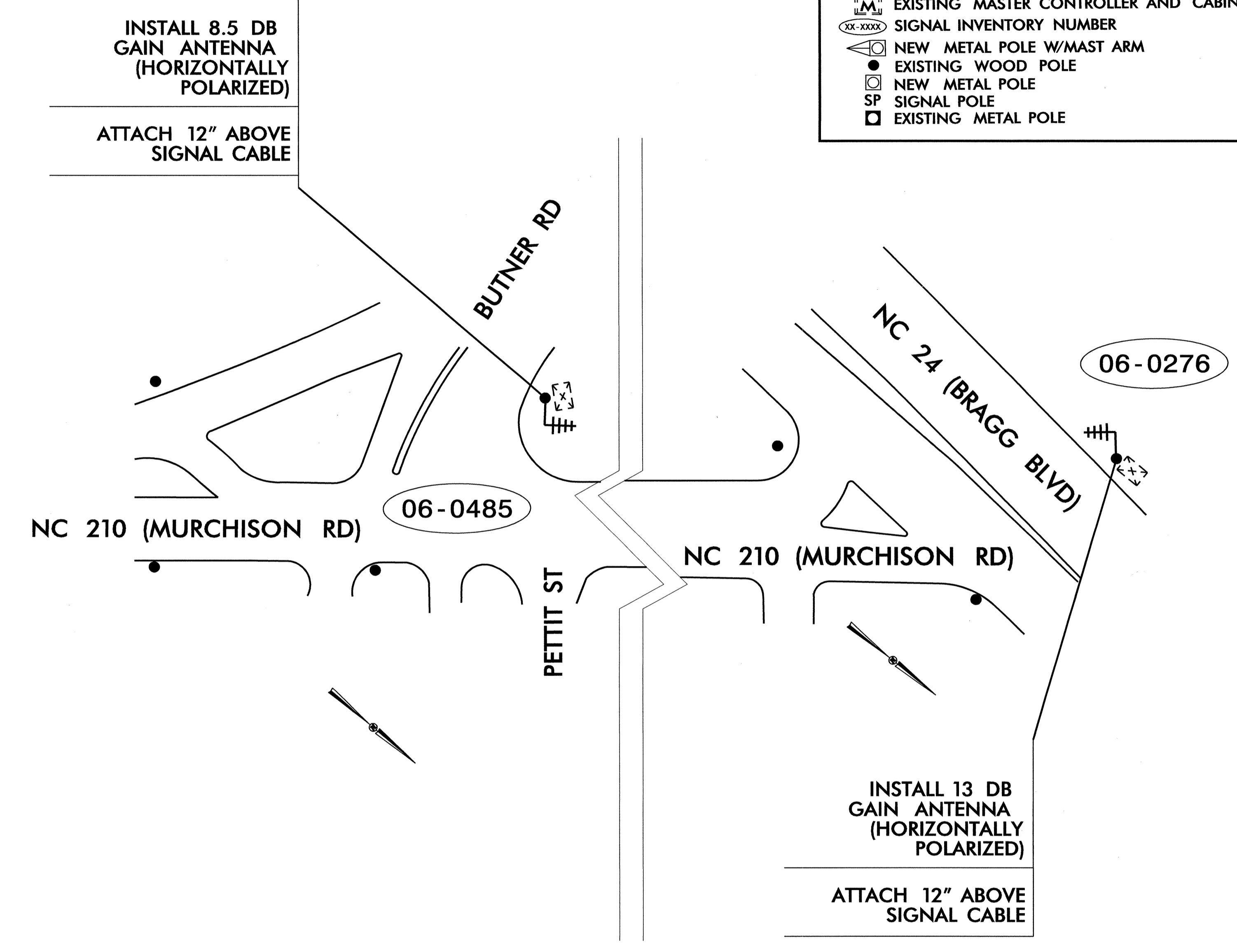
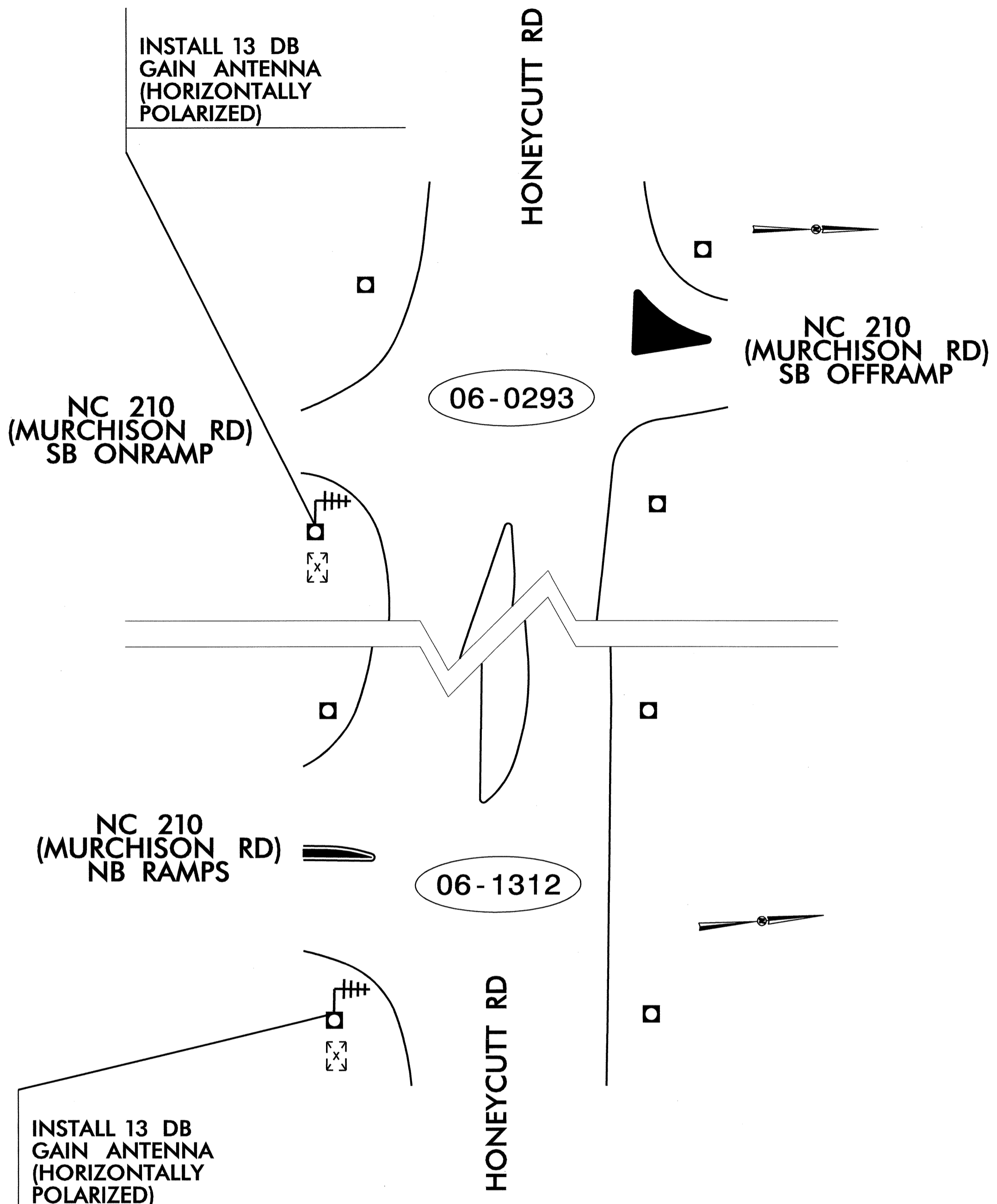
1. WOOD POLE — BOND # 6 AWG SOLID BARE COPPER WIRE TO ANTENNA SUPPORT USING LISTED PIPE CLAMP. BOND OTHER END OF # 6 AWG SOLID BARE COPPER WIRE TO THE POLE GROUND USING A SPLIT BOLT CONNECTOR. BOND SHIELD OF COAXIAL CABLE WITH AN APPROVED GROUNDING SYSTEM (USING #6 AWG STRANDED COPPER WIRE) BONDED TO THE POLE GROUND. WEATHERPROOF THE CONNECTION ONCE THE GROUNDING SYSTEM IS INSTALLED. ENSURE "POLE GROUND" IS IN PLACE.
 METAL POLE — BOND # 6 AWG SOLID BARE COPPER WIRE TO ANTENNA SUPPORT USING LISTED PIPE CLAMP. BOND OTHER END OF # 6 AWG SOLID BARE COPPER WIRE TO THE POLE OR EXISTING SYSTEM GROUND USING A METHOD APPROVED BY THE ENGINEER. BOND SHIELD OF COAXIAL CABLE WITH AN APPROVED GROUNDING SYSTEM (USING #6 AWG STRANDED COPPER WIRE) BONDED TO THE POLE BY A METHOD APPROVED BY THE ENGINEER. WEATHERPROOF THE CONNECTION ONCE THE GROUNDING SYSTEM IS INSTALLED. ENSURE "SYSTEM GROUND" IS IN PLACE.
2. YAGI ANTENNA SHOWN IN VERTICAL POLARIZATION POSITION FOR CLARIFICATION. TYPICALLY INSTALL ANTENNA IN HORIZONTAL POLARIZATION POSITION.
3. TO CONSERVE VERTICAL SPACING ON THE POLE (JOINT-USE OR SIGNAL POLE) WITH REGARDS TO THE SURROUNDING UTILITIES, INSTALL THE ANTENNA MOUNTING HARDWARE USING ONE OF THE TWO METHODS LISTED BELOW: (ENSURE THAT THE MOUNTING METHOD DOES NOT DEGRADE THE ANTENNA'S SIGNAL INTEGRITY)
 - A) ROTATE THE VERTICAL SUPPORT ARM 90 DEGREES SUCH THAT THE ANTENNA IS AT THE SAME HEIGHT AS THE HORIZONTAL SUPPORT ARM.
 - B) ELIMINATE THE VERTICAL SUPPORT ARM AND MOUNT THE ANTENNA TO THE HORIZONTAL SUPPORT ARM.
 - C) ANTENNA, ANTENNA SUPPORT ARM, AND SIGN TO MAINTAIN A 40" SEPARATION FROM NEUTRAL /POWER AND 12" FROM OTHER UTILITIES.
4. INSTALL AN END CAP TO SEAL THE EXPOSED END OF THE MOUNTING PIPE.



	WIRELESS RADIO ANTENNA TYPICAL DETAILS	
	PLAN DATE: JULY 2005 PREPARED BY: A. CREECH	REVIEWED BY: I. N. AVERY REVIEWED BY: A. T. FAULKNER
SCALE: 0	REVISIONS: UPDATE GROUNDING - COAXIAL CABLE SHIELD	DATE: 9/12/05 SIGNATURE: <i>[Signature]</i> DATE:

LEGEND

- ⦚⦚⦚ YAGI ANTENNA (DOUBLE) FOR REPEATOR OPERATION
- ⦚⦚⦚ YAGI ANTENNA (SINGLE)
- ⦚⦚⦚ OMNI ANTENNA
- ⦚⦚⦚ EXISTING CONTROLLER AND CABINET
- ⦚⦚⦚ EXISTING MASTER CONTROLLER AND CABINET
- ⦚⦚⦚ SIGNAL INVENTORY NUMBER
- ⦚⦚⦚ NEW METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- ⦚ NEW METAL POLE
- SP SIGNAL POLE
- EXISTING METAL POLE



NOTES:

1. INSTALL COAXIAL CABLE
 - A. ON WOOD POLES, INSTALL A 2" RISER WITH HEAT SHRINK TUBING TO ROUTE THE COAXIAL CABLE TO THE ANTENNA.
 - B. ON METAL POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL 1/2" HOLE WITH GROMMET THROUGH BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
 - C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND REPLACE THE WEATHERHEAD WITH HEAT SHRINK TUBING AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
 - D. BETWEEN THE POINT OF EXITING THE METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".
2. IF EXISTING SPARE RISER IS AVAILABLE, REMOVE WEATHERHEAD AND INSTALL COAXIAL CABLES. RESEAL WITH HEAT SHRINK TUBING.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN AND AIM TOWARDS MASTER. (NOTE: RF WARNING SIGN NOT REQUIRED ON NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
5. INSTALL WIRELESS SERIAL RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET. (NOTE: RF ANTENNA DISCONNECT SWITCH NOT REQUIRED ON NCDOT-OWNED POLE.)
6. REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."

Prepared in the Offices of:

WIRELESS COMMUNICATION PLANS ALONG NC 210 (MURCHISON ROAD)

DIVISION 06 CUMBERLAND CO. FORT BRAGG

PLAN DATE: MAY 2009 REVIEWED BY: I.N. AVERY

PREPARED BY: S.C. WARDLE REVIEWED BY: G.A. FULLER

SCALE: 0

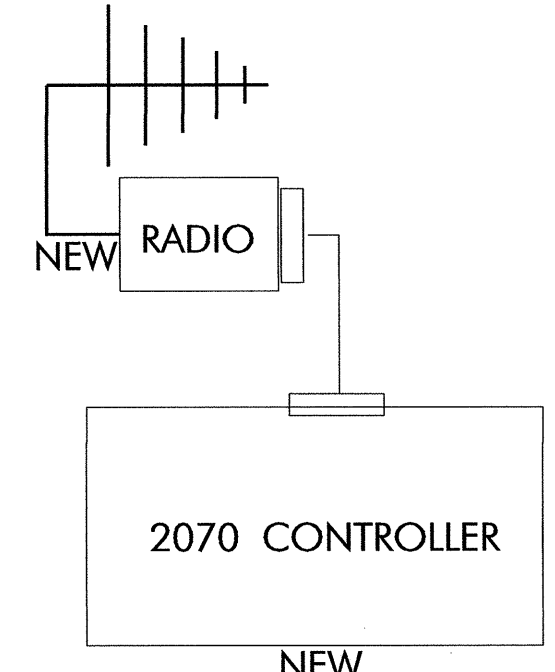
REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER GREGORY A. FULLER

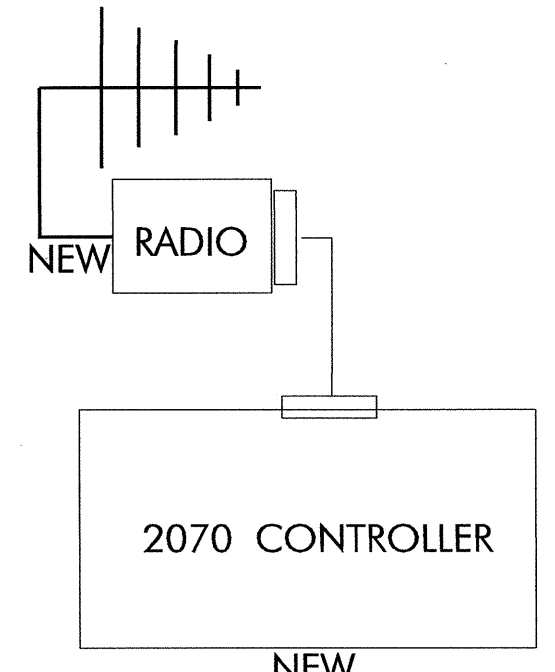
Signature: Gregory A. Fuller, Date: 6/2/09

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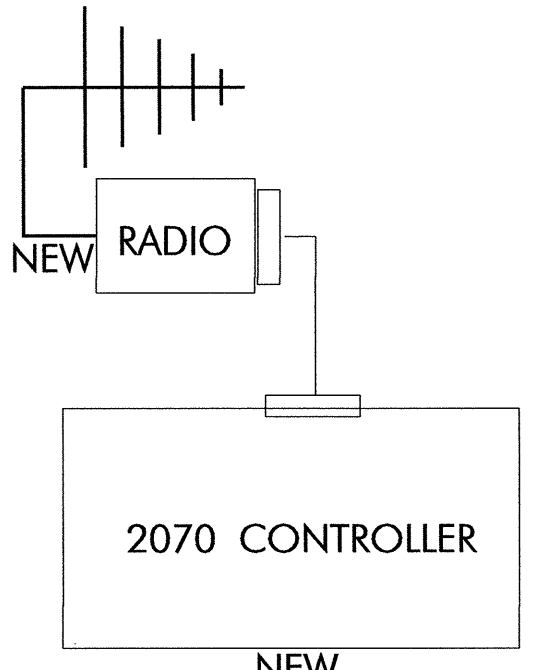
HONEYCUTT RD AT NC 210
(MURCHISON RD) SB RAMPS
SIG. INV. # 06-0293



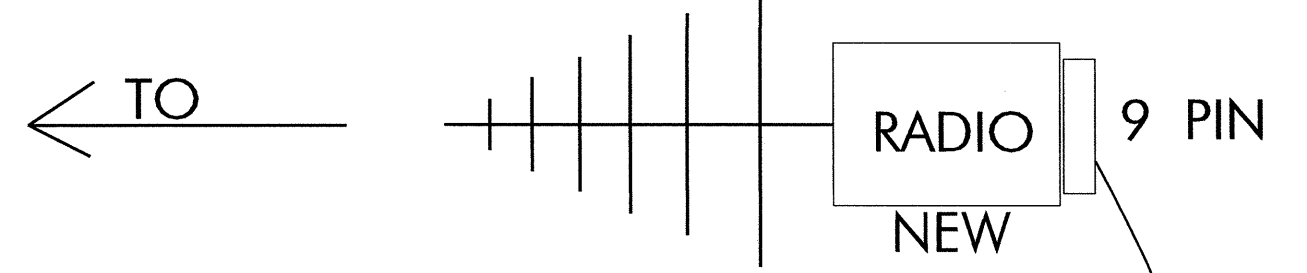
HONEYCUTT RD AT NC 210
(MURCHISON RD) NB RAMPS
SIG. INV. # 06-1312



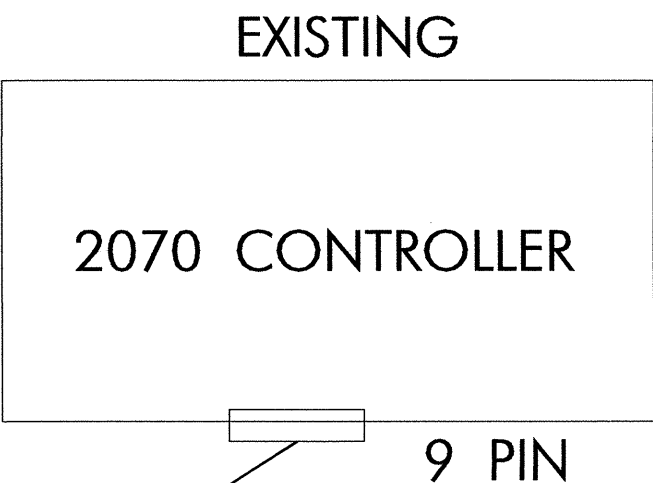
NC 210 (MURCHISON RD) AT
BUTNER RD
SIG. INV. # 06-0485



INSTALL NEW RADIO
AND 13 dB YAGI ANTENNA
AT EXISTING CABINET FOR
NC 24 (BRAGG BLVD) AT
NC 210 (MURCHISON RD)
(SEE WIRELESS COMMUNICATION PLAN)



ENCOM CABLE
(PART # CB-142)
NEW



EXISTING IN FAYETTEVILLE
SIGNAL SYSTEM (CHANNEL 25)

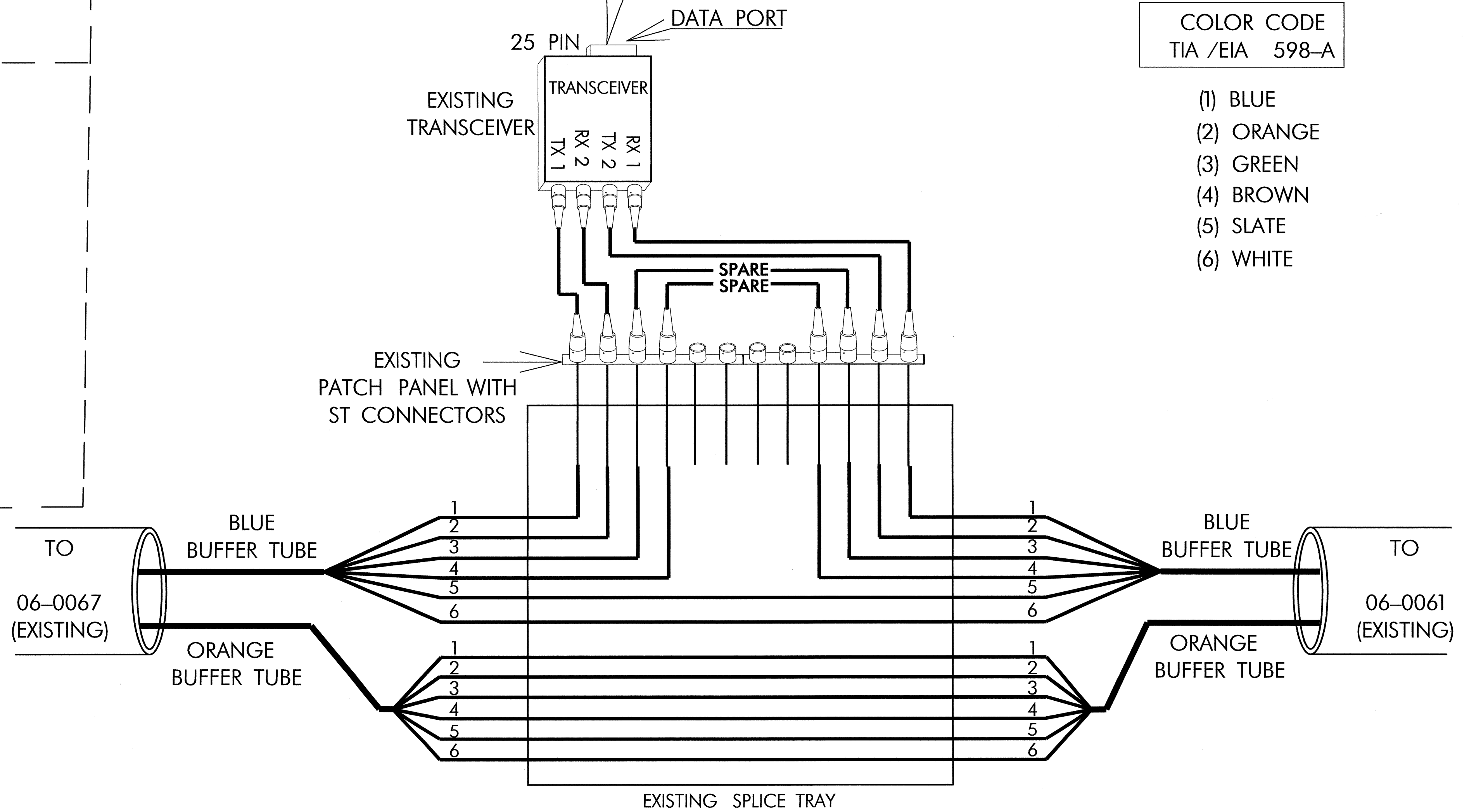
NC 24 (BRAGG BLVD) AT
NC 210 (MURCHISON RD)
SIG. INV. # 06-0276

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

COLOR CODE
TIA /EIA 598-A

- (1) BLUE
- (2) ORANGE
- (3) GREEN
- (4) BROWN
- (5) SLATE
- (6) WHITE



	<p>WIRELESS COMMUNICATION PLANS ALONG NC 210 (MURCHISON ROAD)</p>		
	<p>DIVISION 06 CUMBERLAND CO. FORT BRAGG</p>		
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>SCALE: 0</p>	<p>PLAN DATE: MAY 2009 PREPARED BY: S.C. WARDLE</p>	<p>REVIEWED BY: I.N. AVERY REVIEWED BY: G.A. FULLER</p>
<p>REVISIONS</p>		<p>INIT.</p>	<p>DATE</p>
<p>SIGNATURE: <i>S.C. Wardle</i></p>		<p>SIGNATURE: <i>G.A. Fuller</i></p>	<p>DATE: 6/2/09</p>