

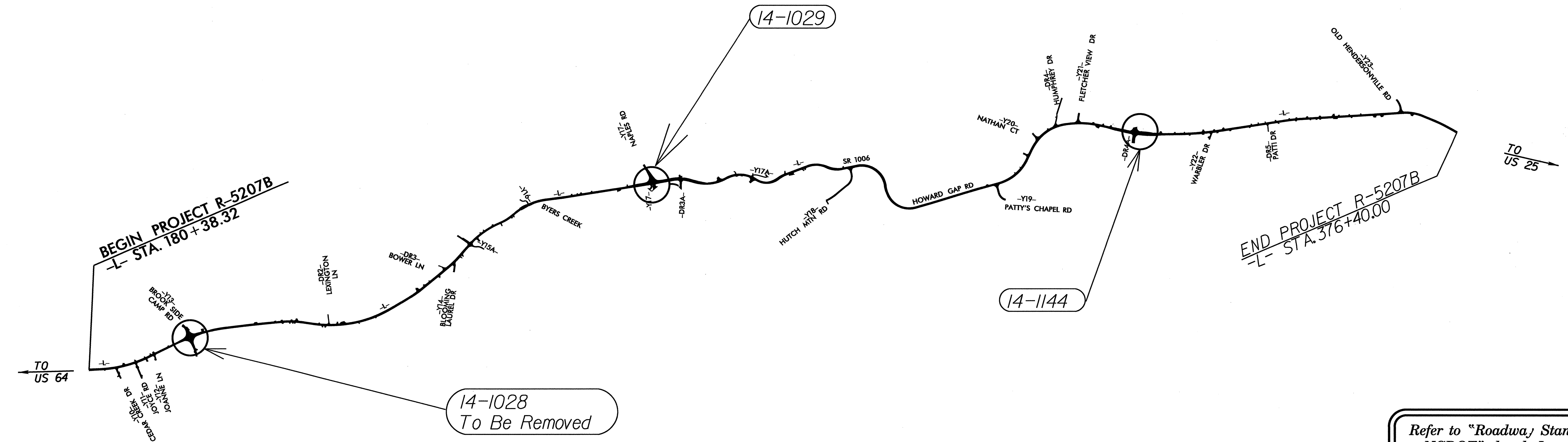
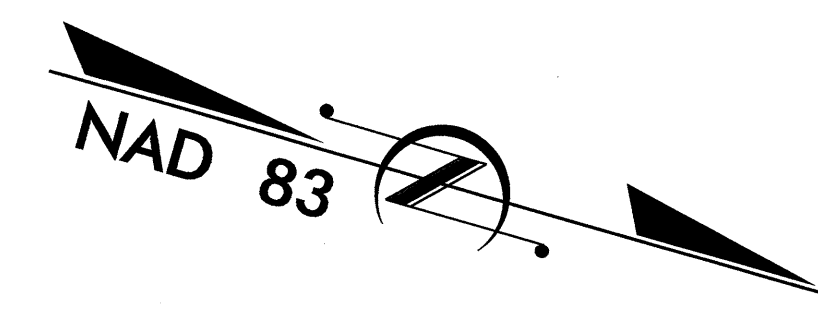
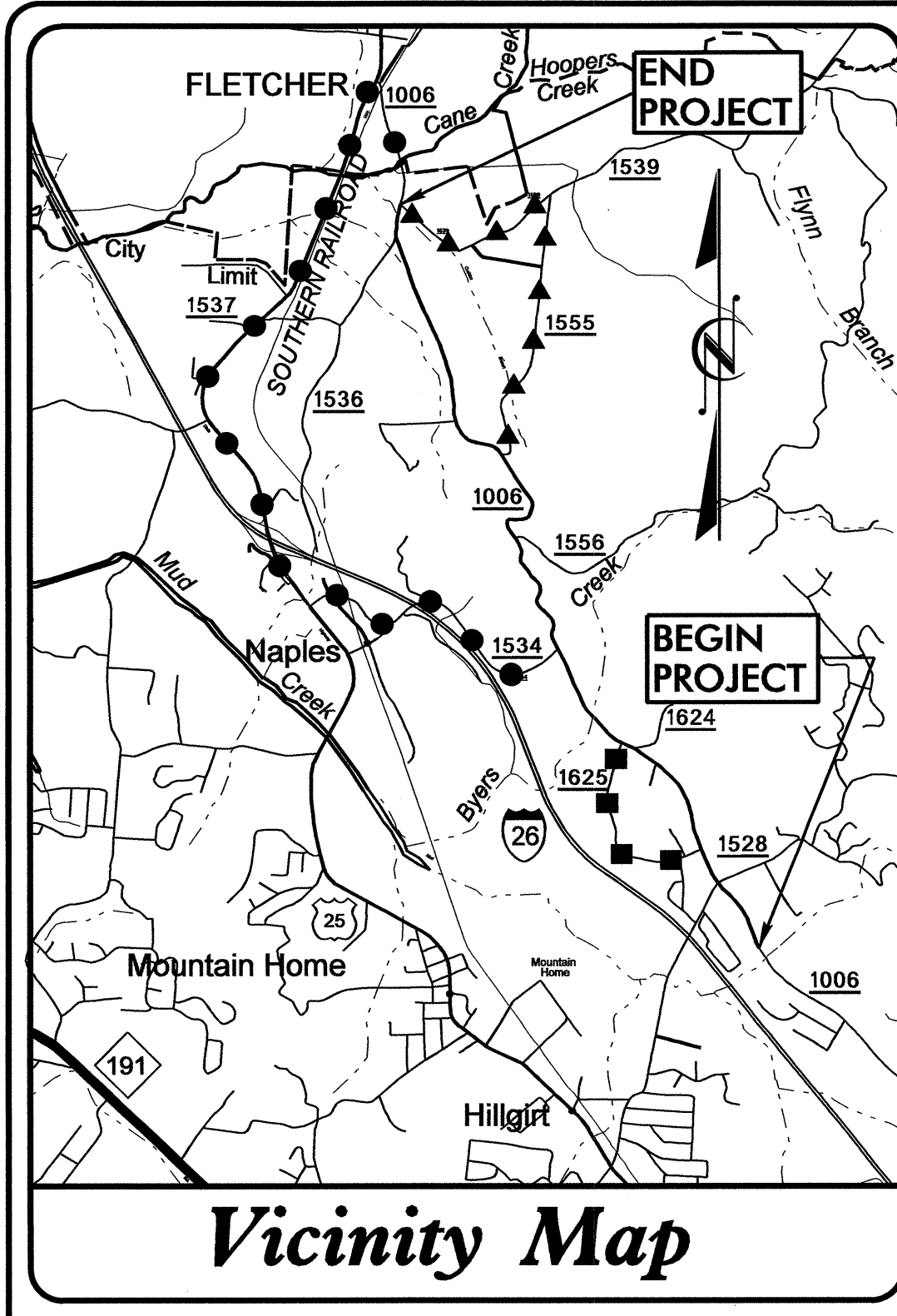
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

**LOCATION: SR 1006 (HOWARD GAP RD.) FROM US 64 EAST
TO NCDOT PROJECT (B-3662)**

TYPE OF WORK: TRAFFIC SIGNALS

TIP: R-5207B



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

Sheet #	Reference #	Location/Description
Sig. 1		Title Sheet
Sig. 2-3	14-1029 T	SR 1006 (Howard Gap Road) at SR 1534 (Naples Road) /Church Entrance
Sig. 4-6	14-1029	SR 1006 (Howard Gap Road) at SR 1534 (Naples Road) /Church Entrance
Sig. 7-9	14-1144	SR 1006 (Howard Gap Road) at Fletcher Elementary School Entrance /Fox Glen Drive
Sig. 10-15	N/A	Metal Strain Pole Standard Sheet
Sig. 16-18	N/A	Inductive Detection Loop Wire Details

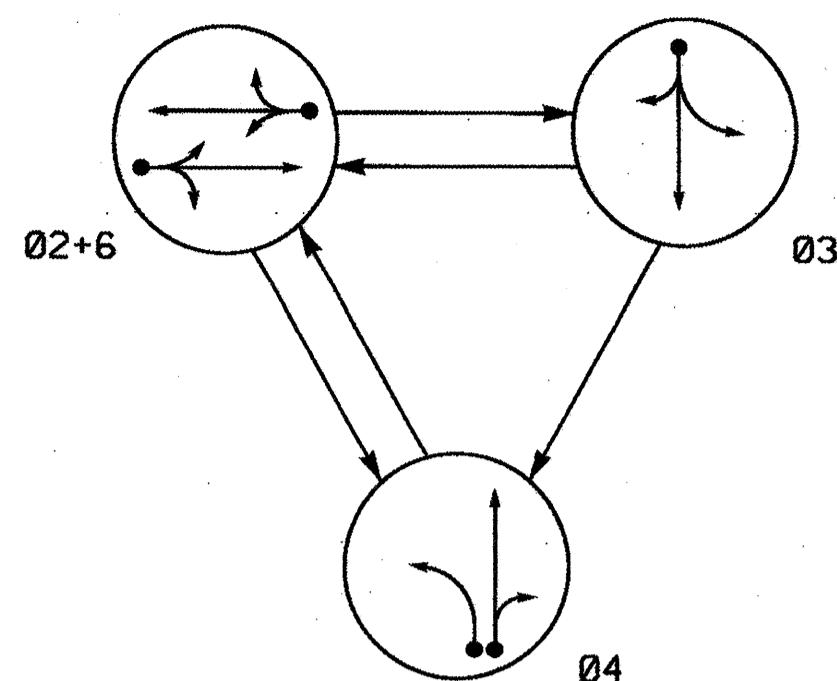
INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:
Timothy J. Williams, PE - Western Region Signals Engineer
George C. Brown, PE - Signal Equipment Design Engineer

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

750 N. Greenfield Parkway, Garner, NC 27529

28-MAY-2012 13:22 S:\115500\115 Signals\Signal Design Section\Western Region\Div-14\R-5207B\Sig1\14-R-5207B-TITLE SHEET.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

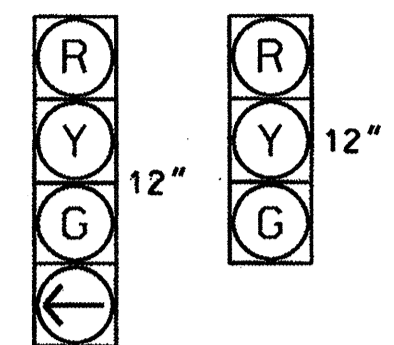
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE				FLASH
	Ø 2 + 6	Ø 3	Ø 4	Ø 4	
21, 22	G	R	R	Y	
31	R	G	R	R	
32	R	G	R	R	
41	R	R	G	R	
42	R	R	G	R	
61, 62	G	R	R	Y	

SIGNAL FACE I.D.

All Heads L.E.D.



31 21, 22
41 32
42
61, 62

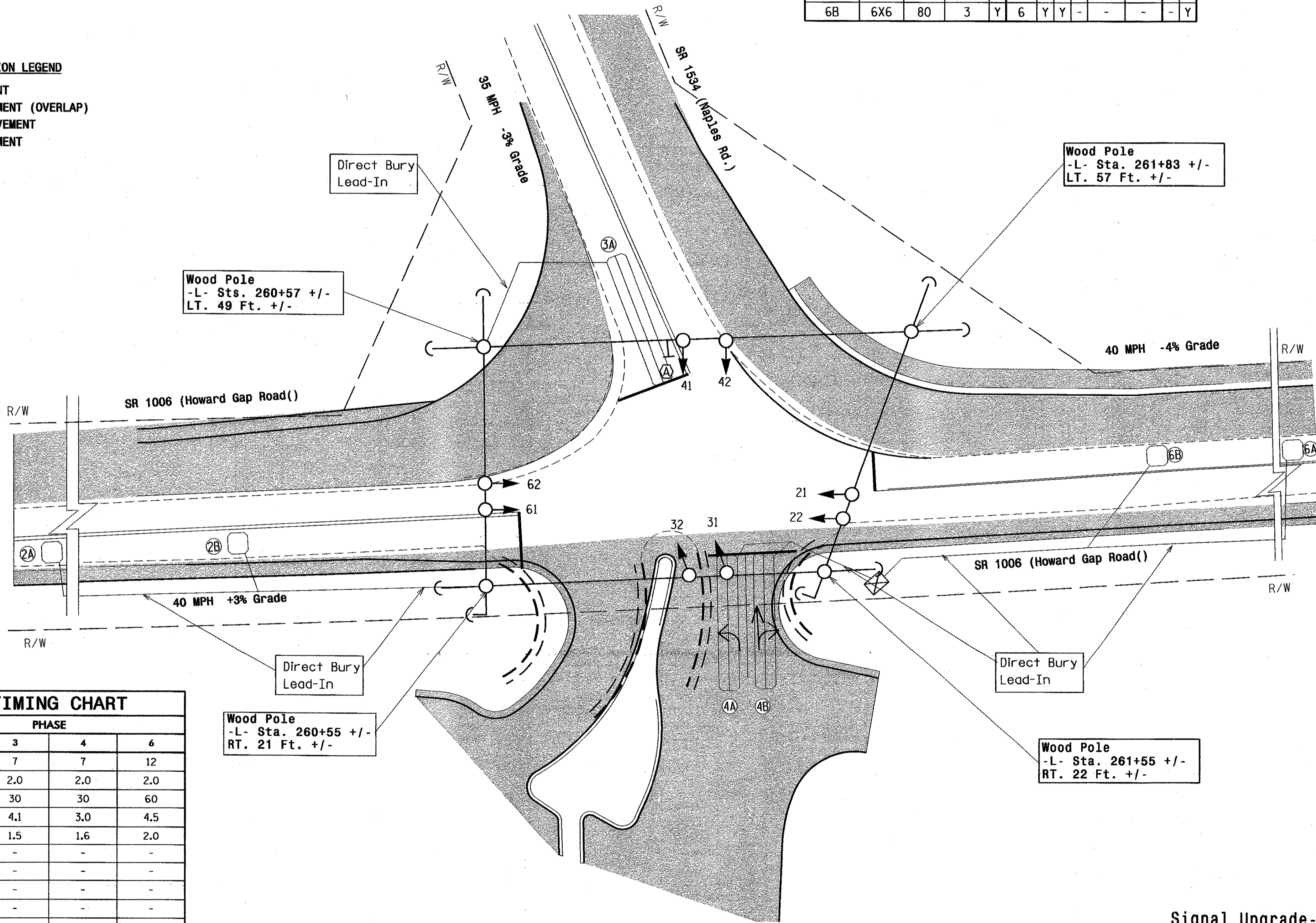
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

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
2A	6X6	250	4	Y	2	Y	Y	-	1.3	-	-	Y
2B	6X6	80	3	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	10	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
6A	6X6	250	4	Y	6	Y	Y	-	1.3	-	-	Y
6B	6X6	80	3	Y	6	Y	Y	-	-	-	-	Y

3 Phase Fully Actuated Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Contractor shall maintain all lead-in cable during construction.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.



OASIS 2070L TIMING CHART

FEATURE	PHASE			
	2	3	4	6
Min Green 1 *	12	7	7	12
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	60	30	30	60
Yellow Clearance	4.5	4.1	3.0	4.5
Red Clearance	2.0	1.5	1.6	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds For Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

- | | | | |
|--|--|--|----------|
| | Traffic Signal Head | | EXISTING |
| | Modified Signal Head | | N/A |
| | Sign | | 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 | | N/A |
| | Right of Way with Marker | | N/A |
| | Directional Arrow | | N/A |
| | Construction Zone | | N/A |
| | Left Arrow "ONLY" Sign (R3-SL) | | N/A |

Signal Upgrade- Temporary Design (TCP Phase-I)

SR 1006 (Howard Gap Road) at SR 1534 (Naples Road) / Church Entrance

Division 14 Henderson County Hendersonville

PLAN DATE: July 2011 REVIEWED BY: M. Mahbooba

PREPARED BY: M. Mahbooba REVIEWED BY:

REVISIONS: _____ INIT: _____ DATE: _____

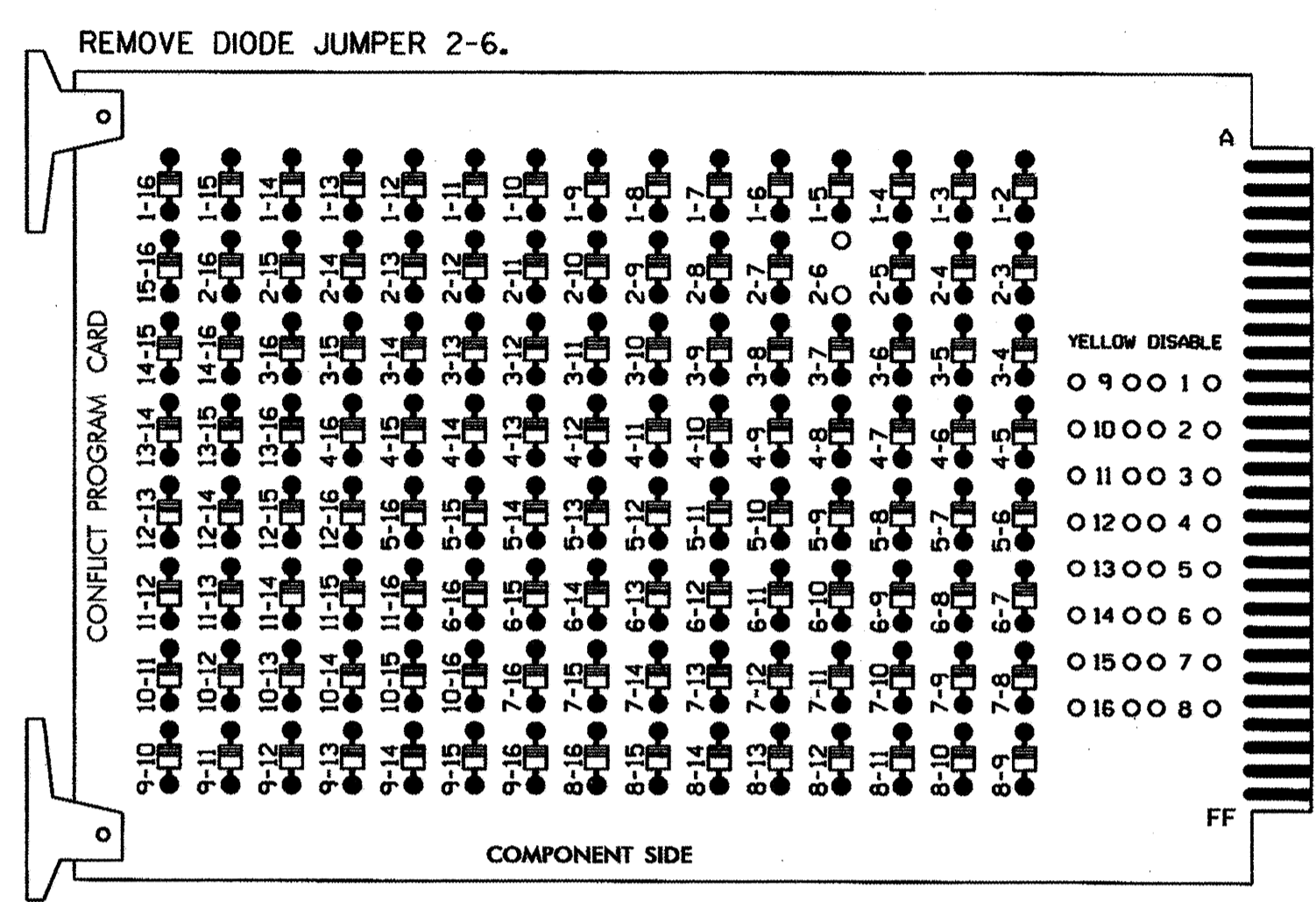
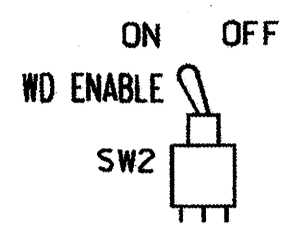
SCALE: 1"=20'

SIGNATURE: *M. Mahbooba* DATE: 8/29/11

SIG. INVENTORY NO. 14-1029 T

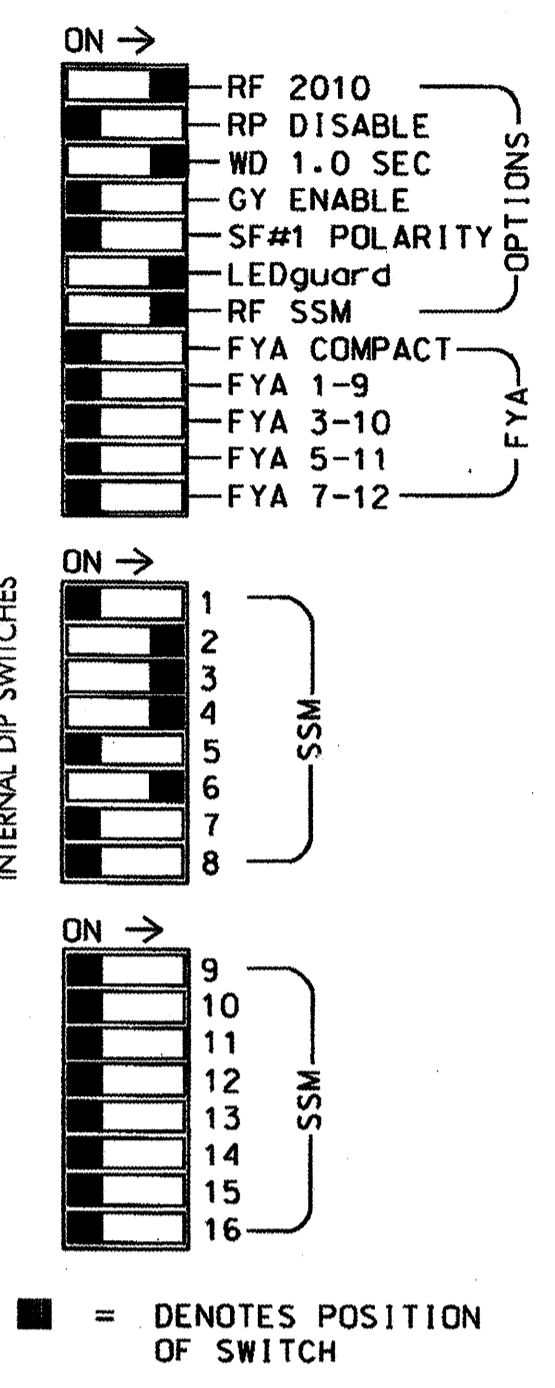
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumper 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 1,5,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....207OL
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S3,S4,S6
 PHASES USED.....2,3,4,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

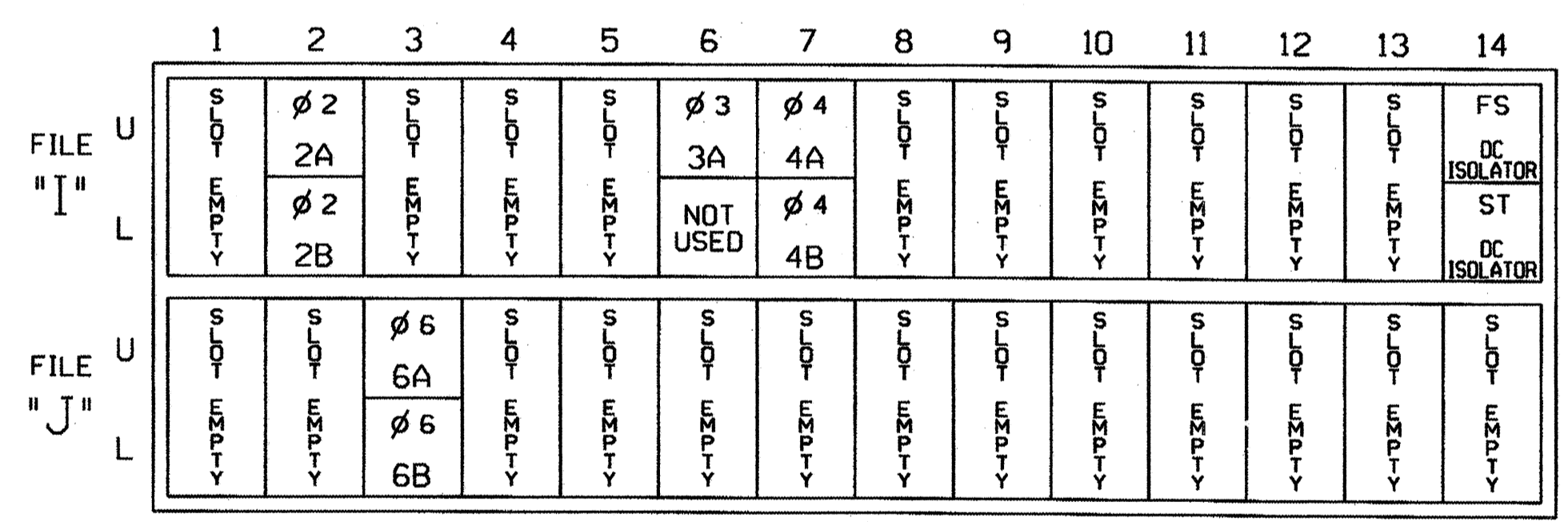
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	31	32	41	42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU
RED		128		116	116	101	101			134								
YELLOW		129		117	117	102	102			135								
GREEN		130		118	118	103	103			136								
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW				118		103												

NU = Not Used

INPUT FILE POSITION LAYOUT

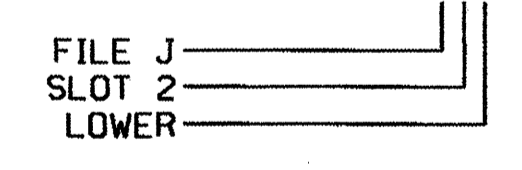
(from view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	J2U	39	1	2	2	Y	Y		1.3	
2B	TB2-7,8	J2L	43	5	12	2	Y	Y			
3A	TB4-9,10	J6U	41	3	4	3	Y	Y		10	
4A	TB6-1,2	J7U	65	27	34	4	Y	Y			
4B	TB6-3,4	J7L	78	40	44	4	Y	Y			
6A	TB3-9,10	J3U	64	26	36	6	Y	Y		1.3	
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-1029T
 DESIGNED: July 2011
 SEALED: 08/29/11
 REVISED:

Electrical Detail - Temporary Design

Prepared in the Offices of:
 Transportation Mobility and Safety Division
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Center
 750 N. Greenfield Pkwy, Corner, NC 27529

SR 1006 (Howard Gap Road) at SR 1534 (Naples Road) / Church Entrance

Division 14 Henderson County Hendersonville
 PLAN DATE: August 2011 REVIEWED BY: T. V. J.
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS: INIT. DATE

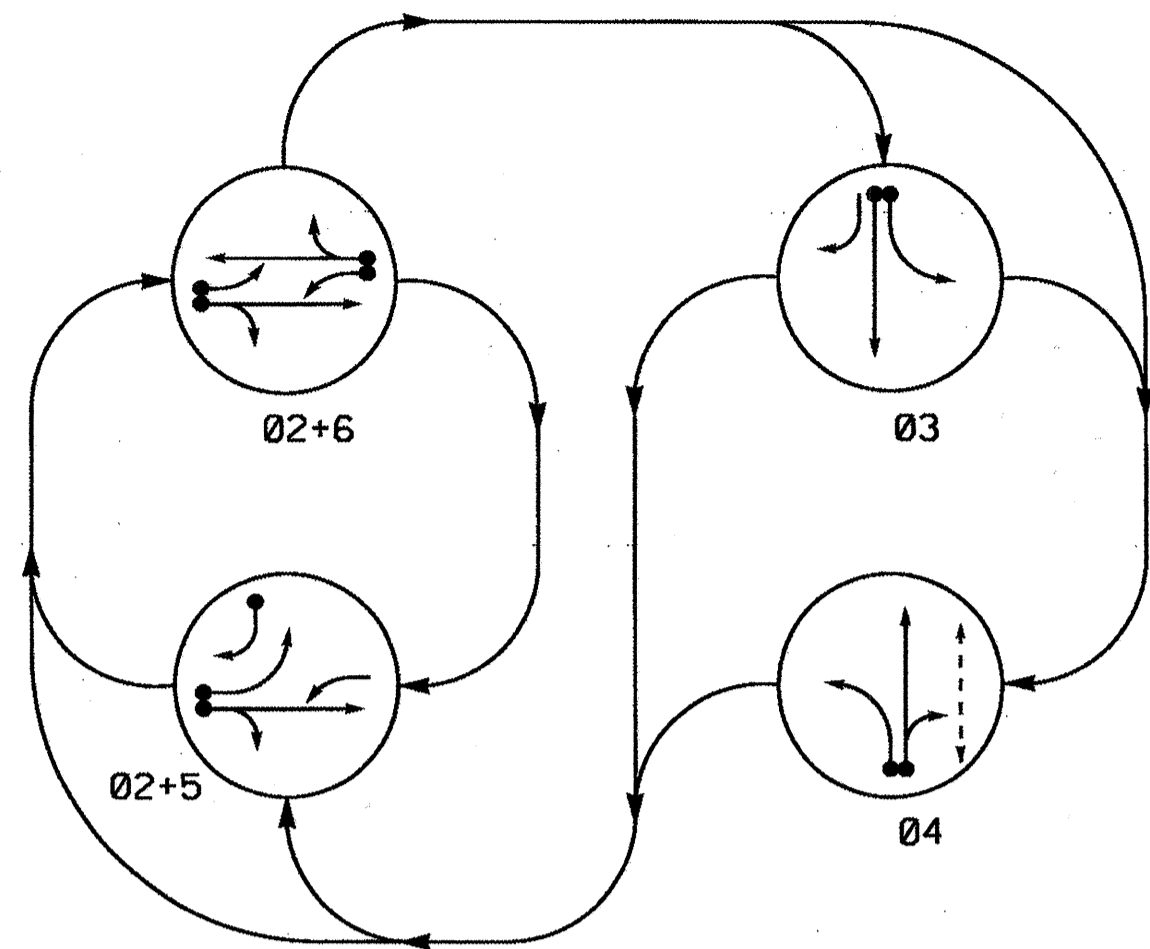
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE: George C. Brown 8/30/11 DATE: 8/30/11

SIG. INVENTORY NO. 14-1029T

25-AUG-2011 15:19 S:\TSCS\JMTS\SIGNAL\SR1006\SR1006.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE				FLASH
	Ø 2+5	Ø 2+6	Ø 3	Ø 4	
21, 22	G	G	R	R	Y
31	R	R	G	R	R
32, 33	R	R	G	R	R
34	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
51	F	F	R	R	Y
61	F	F	R	R	Y
62, 63	R	G	R	R	Y
P41, P42	DW	DW	DW	W	DRK

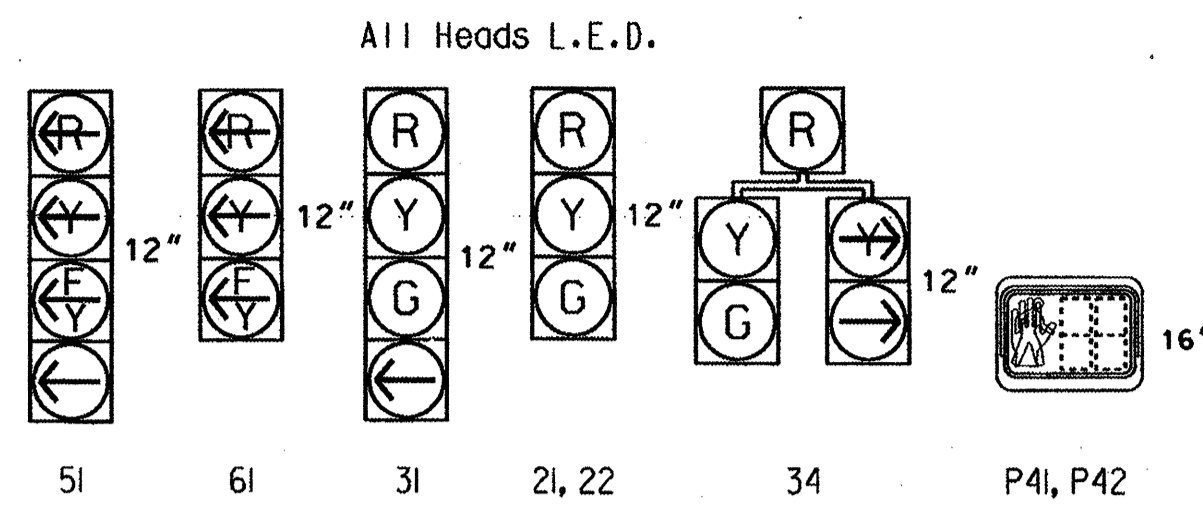
F = Flashing Yellow Arrow
 W - Walk
 DW - Don't Walk
 DRK - Dark

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

	TO				
	1	2	1	2	1
F	←	←	←	←	←
R	→	→	→	→	→
O	←	←	←	←	←
M	←	←	←	←	←

F = Flashing Yellow Arrow

SIGNAL FACE I.D.



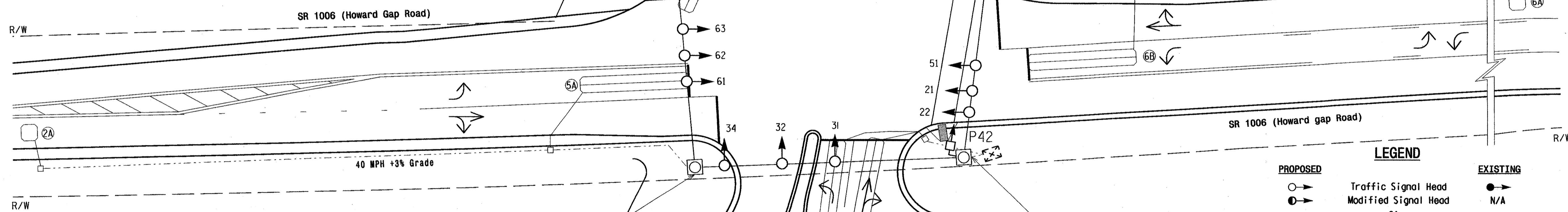
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY		
2A	6X6	250	4	Y	2	Y	Y	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	3	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	15	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	15	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	15	Y
6A	6X6	250	4	Y	6	Y	Y	-	-	-
6B	6X40	0	2-4-2	Y	6	Y	Y	-	3	Y

4 Phase Fully Actuated Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.



FEATURE	PHASE				
	2	3	4	5	6
Min Green 1*	12	7	7	7	12
Extension 1*	6.0	2.0	2.0	2.0	6.0
Max Green 1*	90	30	30	15	90
Yellow Clearance	4.5	4.1	3.0	3.0	4.5
Red Clearance	2.3	1.5	2.9	2.6	2.3
Walk 1*	-	-	7	-	-
Don't Walk 1	-	-	13	-	-
Seconds Per Actuation*	2.5	-	-	-	2.5
Max Variable Initial*	29	-	-	-	29
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	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

Metal pole # 3
 -L- Sta. 260+64 +/-
 Standard Case # S30 L1

Metal pole # 4
 -L- Sta. 261+63 +/-
 Standard Case # S30 L1

LEGEND

- | | | | |
|-----|---|-----|---|
| ○ | PROPOSED Traffic Signal Head | ● | EXISTING Traffic Signal Head |
| ○ | PROPOSED Modified Signal Head | N/A | EXISTING Modified Signal Head |
| ○ | PROPOSED Sign | N/A | EXISTING Sign |
| ○ | PROPOSED Pedestrian Signal Head With Push Button & Sign | ○ | EXISTING Pedestrian Signal Head |
| ○ | PROPOSED Signal Pole with Guy | ○ | EXISTING Signal Pole with Guy |
| ○ | PROPOSED Signal Pole with Sidewalk Guy | ○ | EXISTING Signal Pole with Sidewalk Guy |
| ⊠ | PROPOSED Inductive Loop Detector | ⊠ | EXISTING Inductive Loop Detector |
| ⊠ | PROPOSED Controller & Cabinet | ⊠ | EXISTING Controller & Cabinet |
| ⊠ | PROPOSED Junction Box | ⊠ | EXISTING Junction Box |
| --- | PROPOSED 2-in Underground Conduit | --- | EXISTING 2-in Underground Conduit |
| N/A | PROPOSED Right of Way | --- | EXISTING Right of Way |
| → | PROPOSED Directional Arrow | → | EXISTING Directional Arrow |
| N/A | PROPOSED Wheelchair Ramp | → | EXISTING Wheelchair Ramp |
| ⊠ | PROPOSED Metal Strain Pole | ⊠ | EXISTING Metal Strain Pole |
| ⊠ | PROPOSED Left Arrow "ONLY" Sign (R3-SL) | ⊠ | EXISTING Left Arrow "ONLY" Sign (R3-SL) |

Signal Upgrade - Final

750 N. Grandfield Pkwy, Garner, NC 27529

**SR 1006 (Howard Gap Road)
 at
 SR 1534 (Naples Road) /
 Church Entrance**

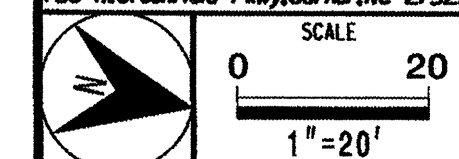
Division 14 Henderson County Hendersonville

PLAN DATE: July 2011 REVIEWED BY:

PREPARED BY: M. Mahbooba REVIEWED BY:

REVISIONS INIT. DATE

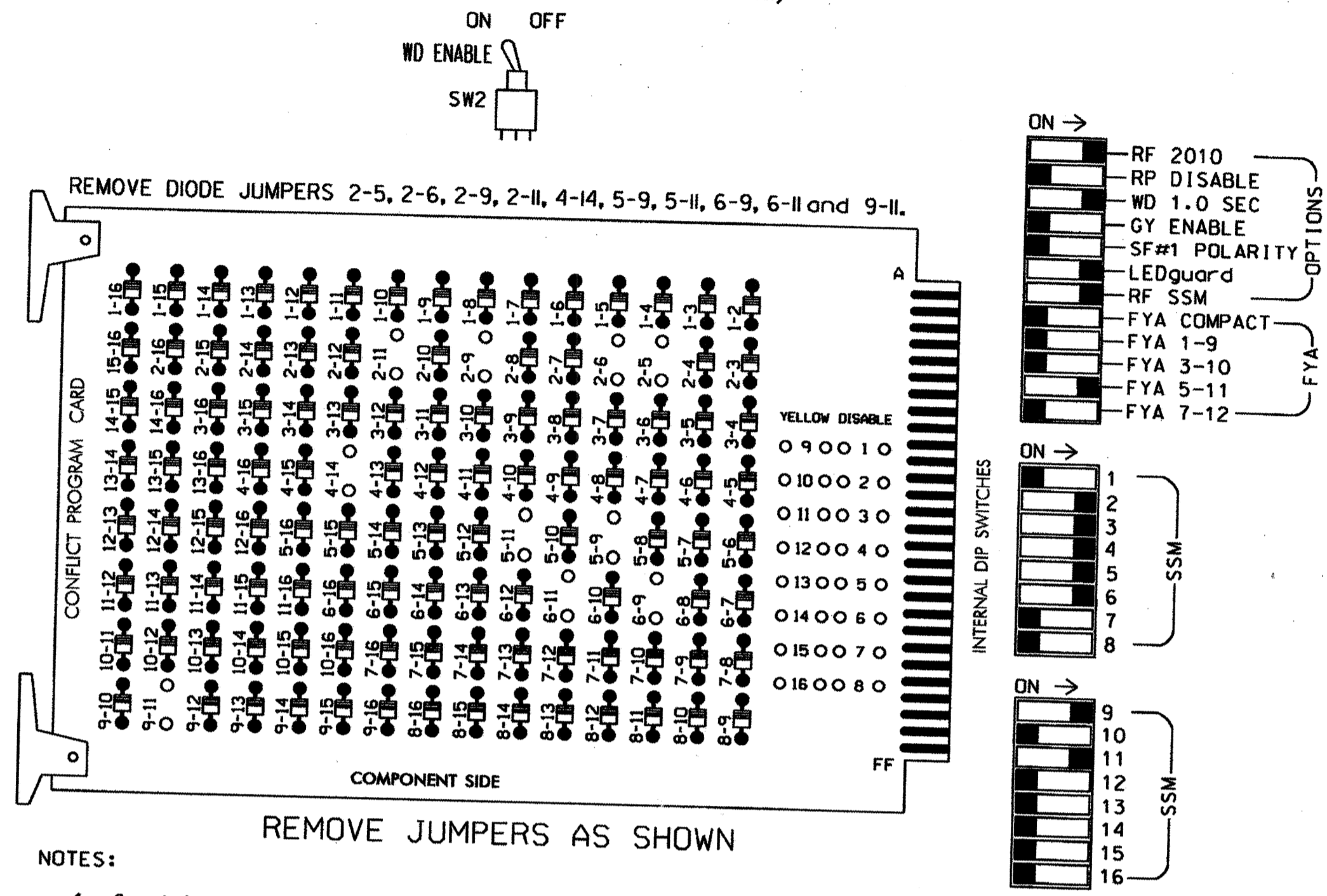
SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 24593
 TIMOTHY J. WILLIAMS
 ENGINEER
 7.1.11
 DATE
 SIG. INVENTORY NO. 14-1029



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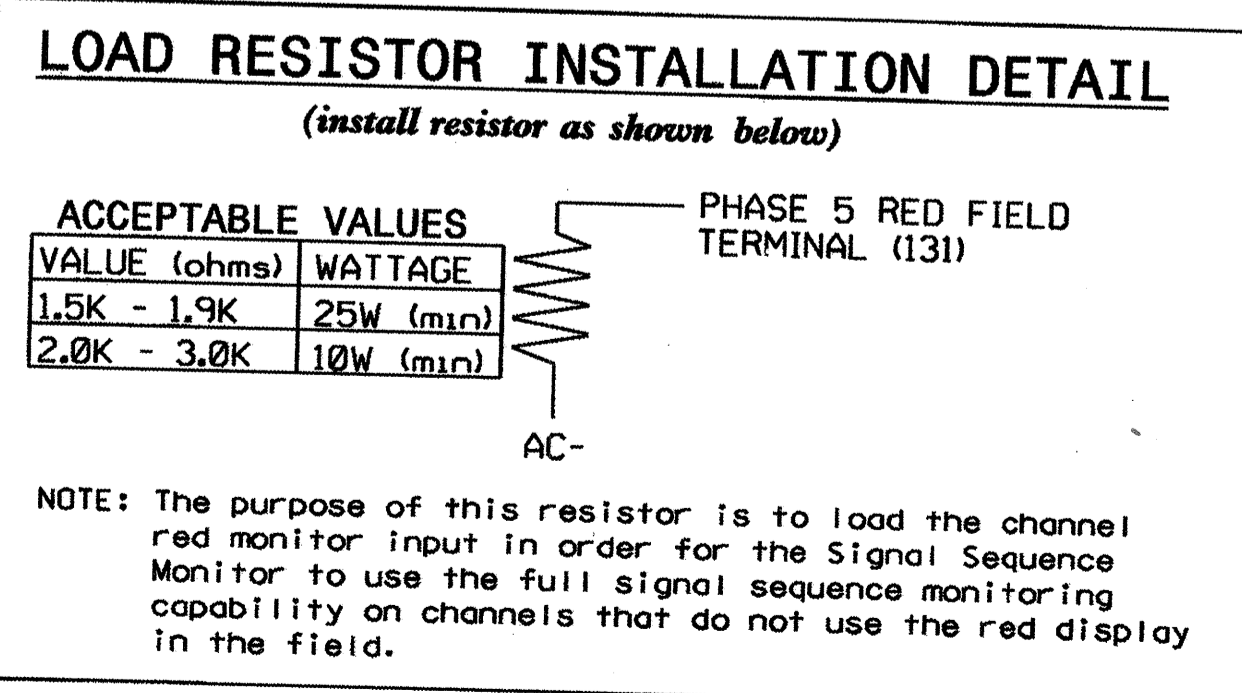
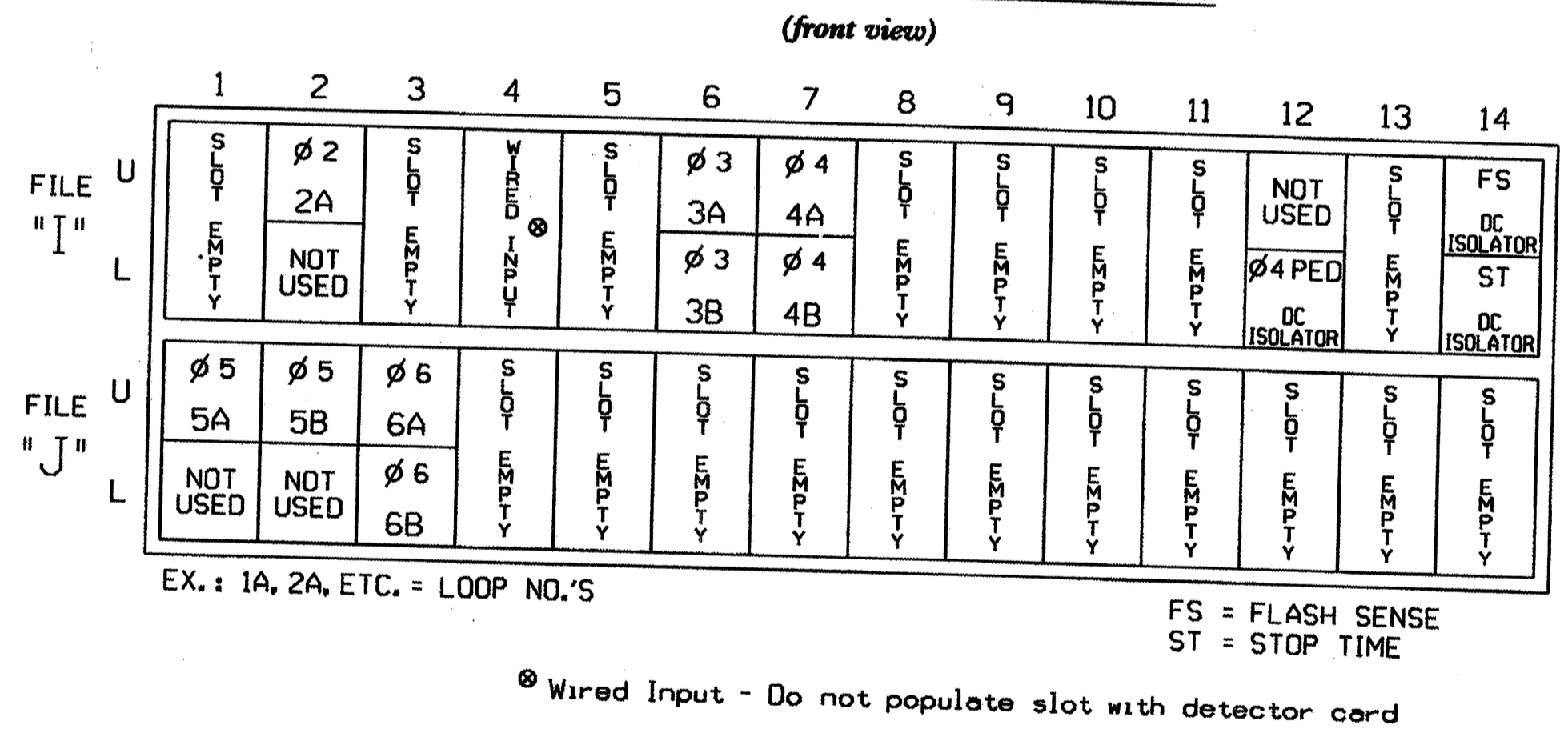
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

INPUT FILE POSITION LAYOUT



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 1,7, 8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phase 4 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

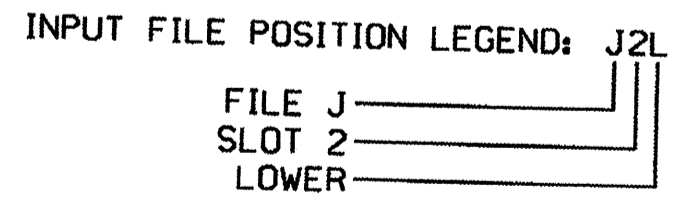
CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S3,S4,S4P,S5,S6,S9,S12
 PHASES USED.....2,3,4,4 PED,5,6
 OVERLAP "A".....2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-9,10	I6U	41	3	4	3	Y	Y			3
3B	TB4-11,12	I6L	45	7	14	3	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A'	TB3-1,2	J1U	55	17	5	5	Y	Y			15
			14U	47	9	22	2	Y	Y	Y	3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y	Y		3
PED PUSH BUTTONS											
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

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

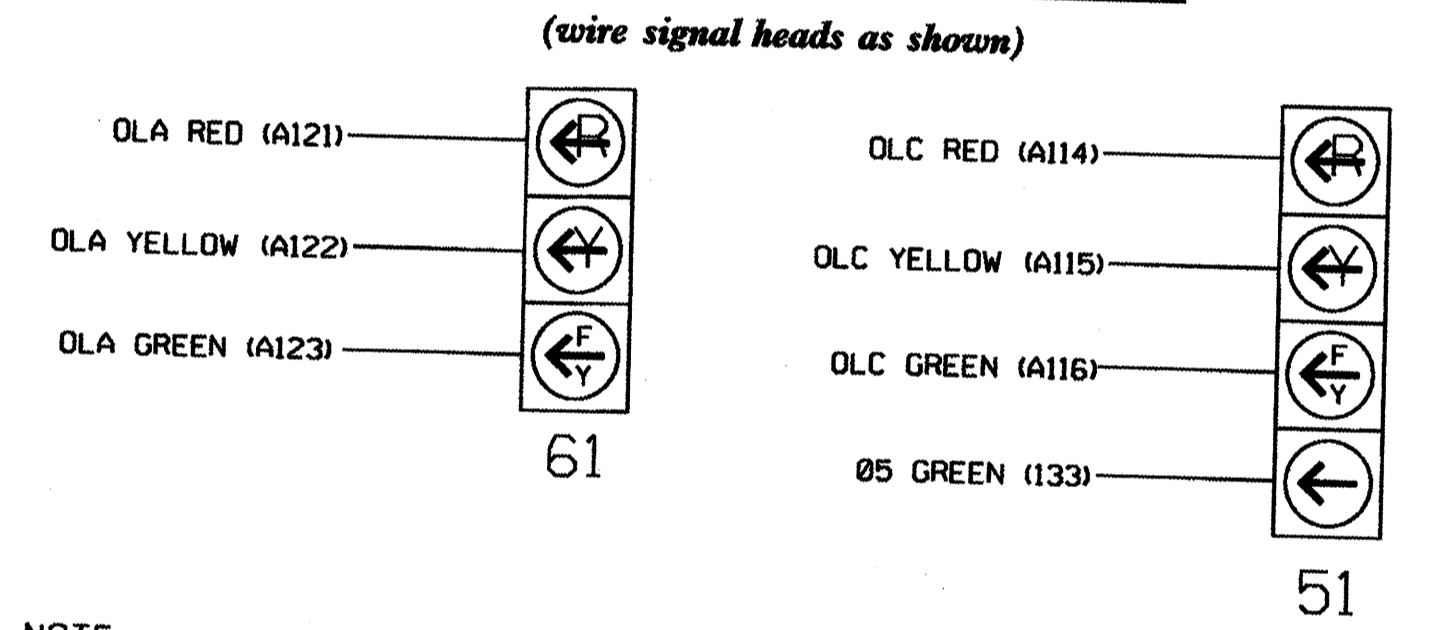


SIGNAL HEAD HOOK-UP CHART

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	9	10	11	12	13	14
SIGNAL HEAD NO.	NU	21,22	NU	31	32, 33,34	41	42	P41, P42	34	51*	62,63	NU	NU	NU	NU	61*	NU	NU
RED		128		116	116	101	101		*		134							
YELLOW		129		117	117	102	102				135							
GREEN		130		118	118	103	103				136							
RED ARROW																		
YELLOW ARROW								132								A121		A114
FLASHING YELLOW ARROW																A122		A115
GREEN ARROW																A123		A116
Hand																		
Person																		
									104									
									106									

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

FYA SIGNAL WIRING DETAIL



- NOTE
- The sequence display for signal head 51 requires special logic programming. See sheet 2 of 2 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ELECTRICAL DETAIL SHEET 1 OF 2

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-1029
 DESIGNED: July 2011
 SEALED: 08/29/11
 REVISED:

SR 1006 (Howard Gap Road) at SR 1534 (Naples Road)/ Church Entrance

Division 14 Henderson County Hendersonville

PLAN DATE: August 2011 REVIEWED BY: T. J. J...
 PREPARED BY: C. Strickland REVIEWED BY: T. J. J...
 REVISIONS

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022013
 GEORGE C. BROWN

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

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

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

SCROLL DOWN

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

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

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

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: XX
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...0.0
RED CLEAR (0=PARENT.0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

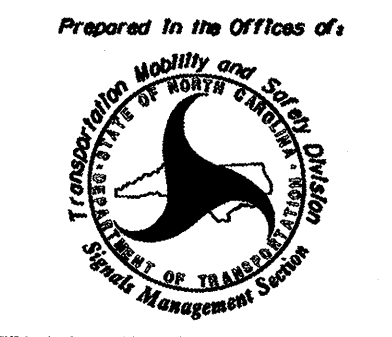
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 14-1029
DESIGNED: July 2011
SEALED: 08/29/11
REVISED:

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

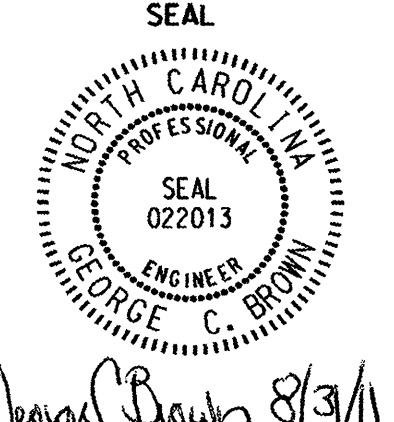
Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1006 (Howard Gap Road)
at
SR 1534 (Naples Road)/
Church Entrance
Hendersonville

Division 14 Henderson County Hendersonville

PLAN DATE: August 2011 REVIEWED BY: T. J. M.
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS	INIT.	DATE


 SIGNATURE: George C. Brown DATE: 8/31/11
 SIG. INVENTORY NO. 14-1029

10-1029-2011.dwg
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PHASING DIAGRAM

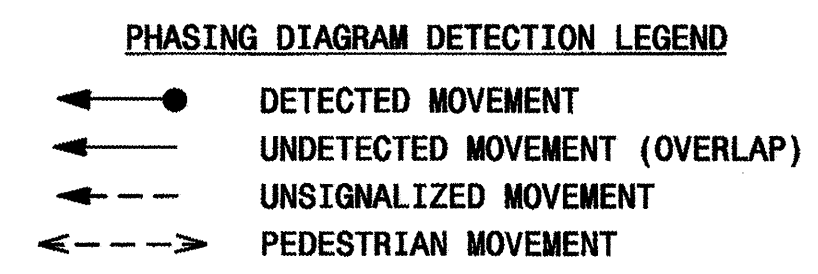
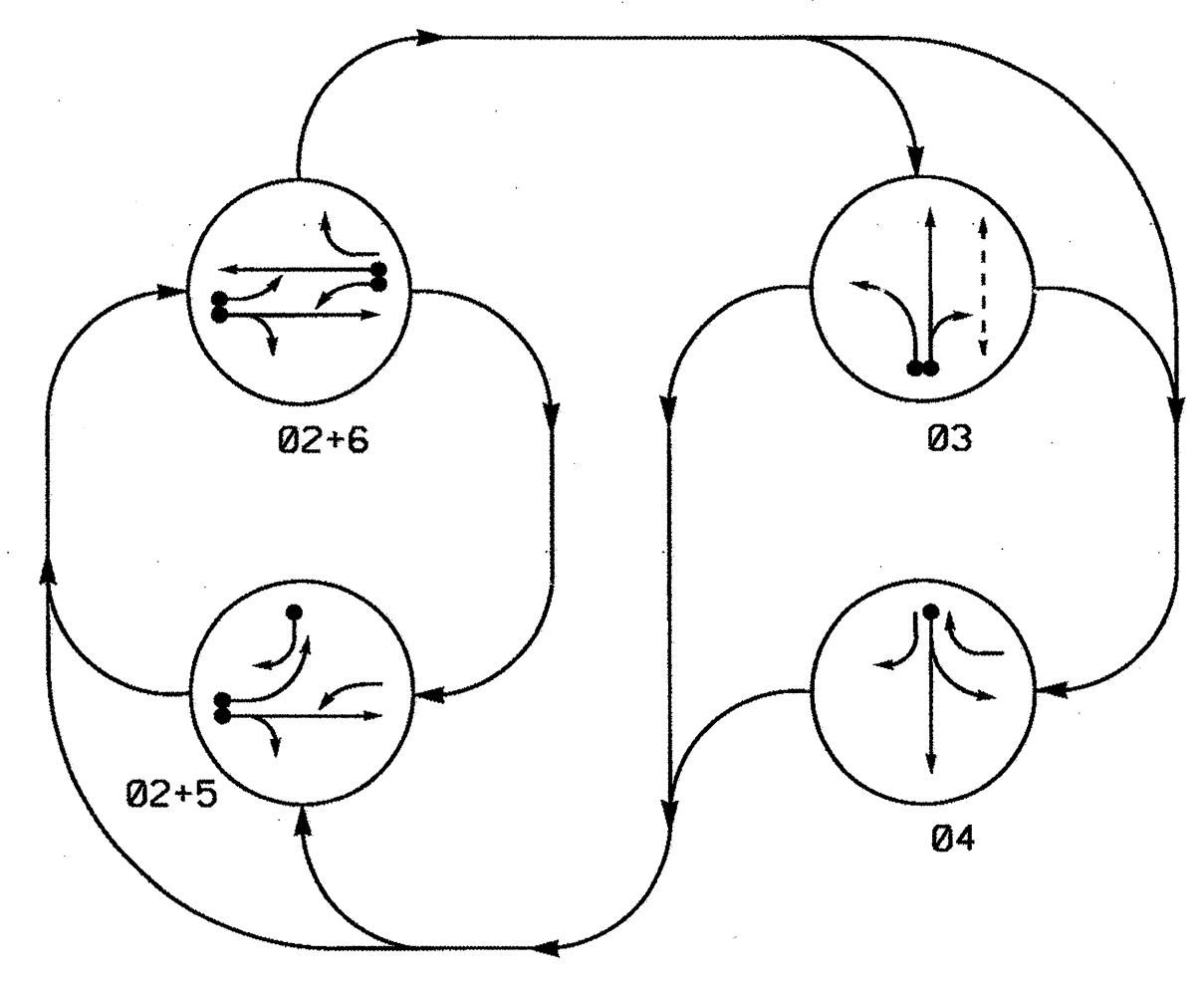


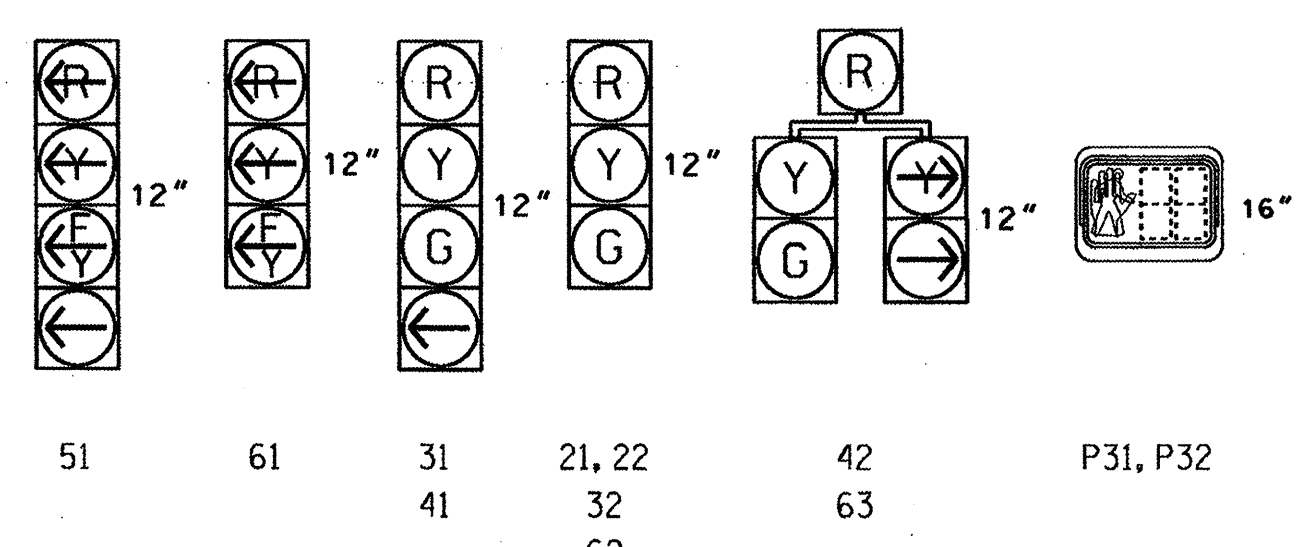
TABLE OF OPERATION

SIGNAL FACE	PHASE				
	Ø 2+5	Ø 2+6	Ø 3	Ø 4	F LASH
21, 22	G	G	R	R	Y
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42		R	R	G	R
51					
61					
62	R	G	R	R	Y
63	R	G	R		Y
P31, P32	DW	DW	W	DW	DRK

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

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING						
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CADD
2A	6X6	250	4	Y	2	Y	Y	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	3	-
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	10	-
3C	6X6	0	3	Y	3	Y	Y	-	-	15	-
4A	6X40	+5	2-4-2	Y	4	Y	Y	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-
5B	6X40	+5	2-4-2	Y	5	Y	Y	-	-	15	-
6A	6X6	250	4	Y	6	Y	Y	-	-	-	Y
6B	6X60	0	2-4-2	Y	6	Y	Y	-	-	3	-

4 Phase Fully Actuated Isolated

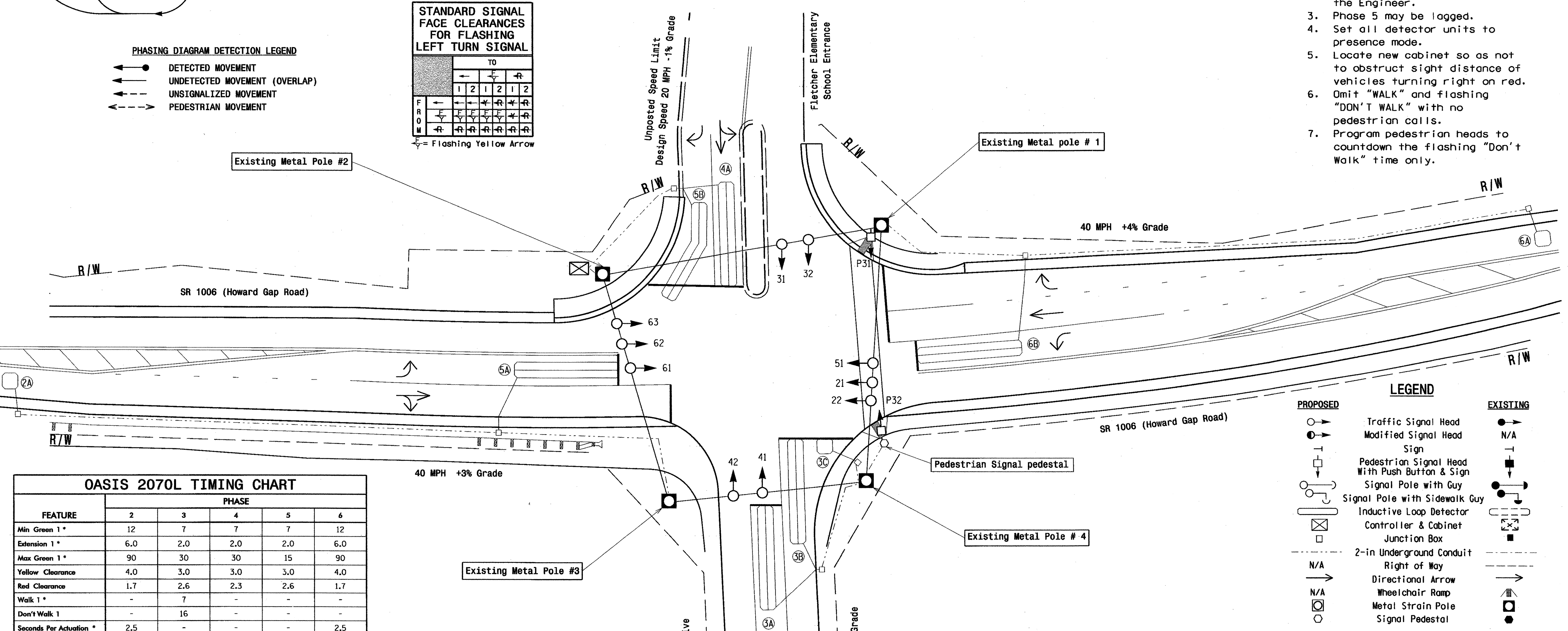
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

	TO					
	1	2	1	2	1	2
F						
R						
O						
M						

= Flashing Yellow Arrow

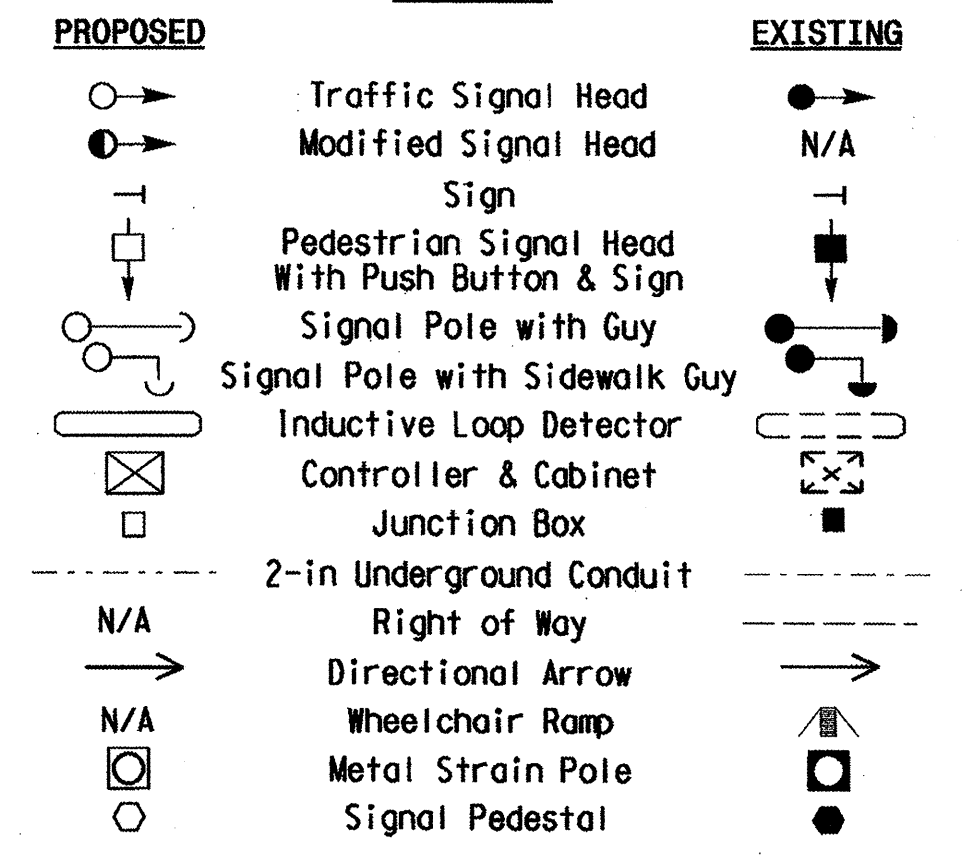


OASIS 2070L TIMING CHART

FEATURE	PHASE				
	2	3	4	5	6
Min Green 1*	12	7	7	7	12
Extension 1*	6.0	2.0	2.0	2.0	6.0
Max Green 1*	90	30	30	15	90
Yellow Clearance	4.0	3.0	3.0	3.0	4.0
Red Clearance	1.7	2.6	2.3	2.6	1.7
Walk 1*	-	7	-	-	-
Don't Walk 1	-	16	-	-	-
Seconds Per Actuation*	2.5	-	-	-	2.5
Max Variable Initial*	29	-	-	-	29
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	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

LEGEND



Signal Upgrade - Final Design

750 H. Greenfield Pkwy, Garner, NC 27529

SR 1006 / (Howard Gap Road) at Fletcher Elementary Sch. Ent / Fox Glen Drive

Division 14 Henderson County Fletcher

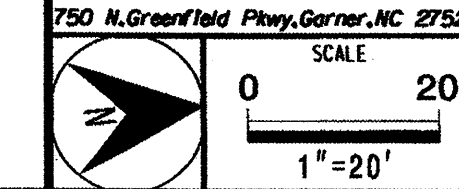
PLAN DATE: July 2011 REVIEWED BY: [Signature]

PREPARED BY: M. Mahbooba REVIEWED BY: [Signature]

REVISIONS: [Table]

THOMAS WILLIAMS

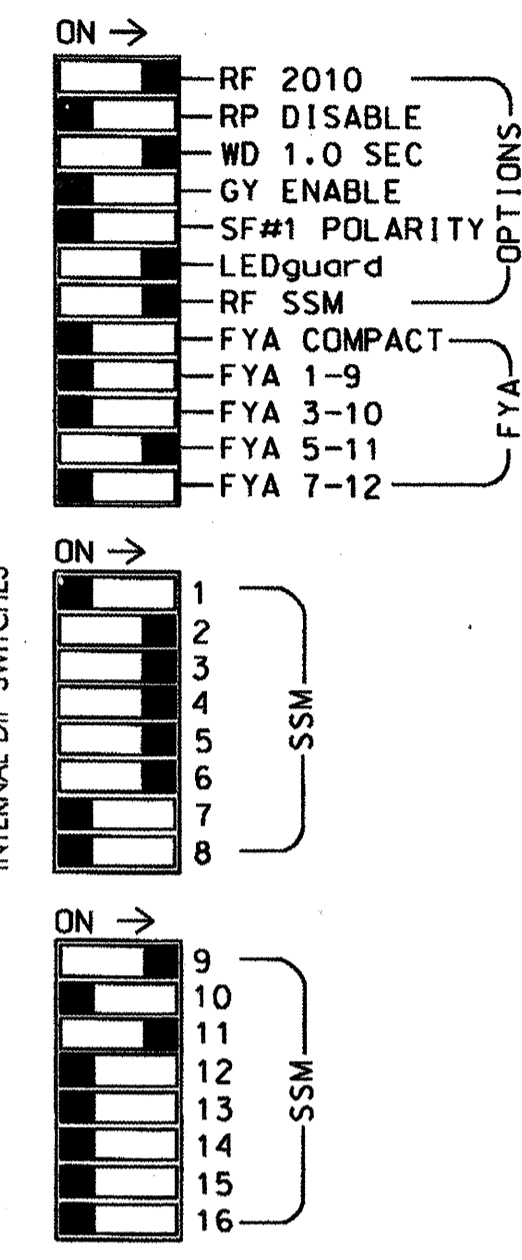
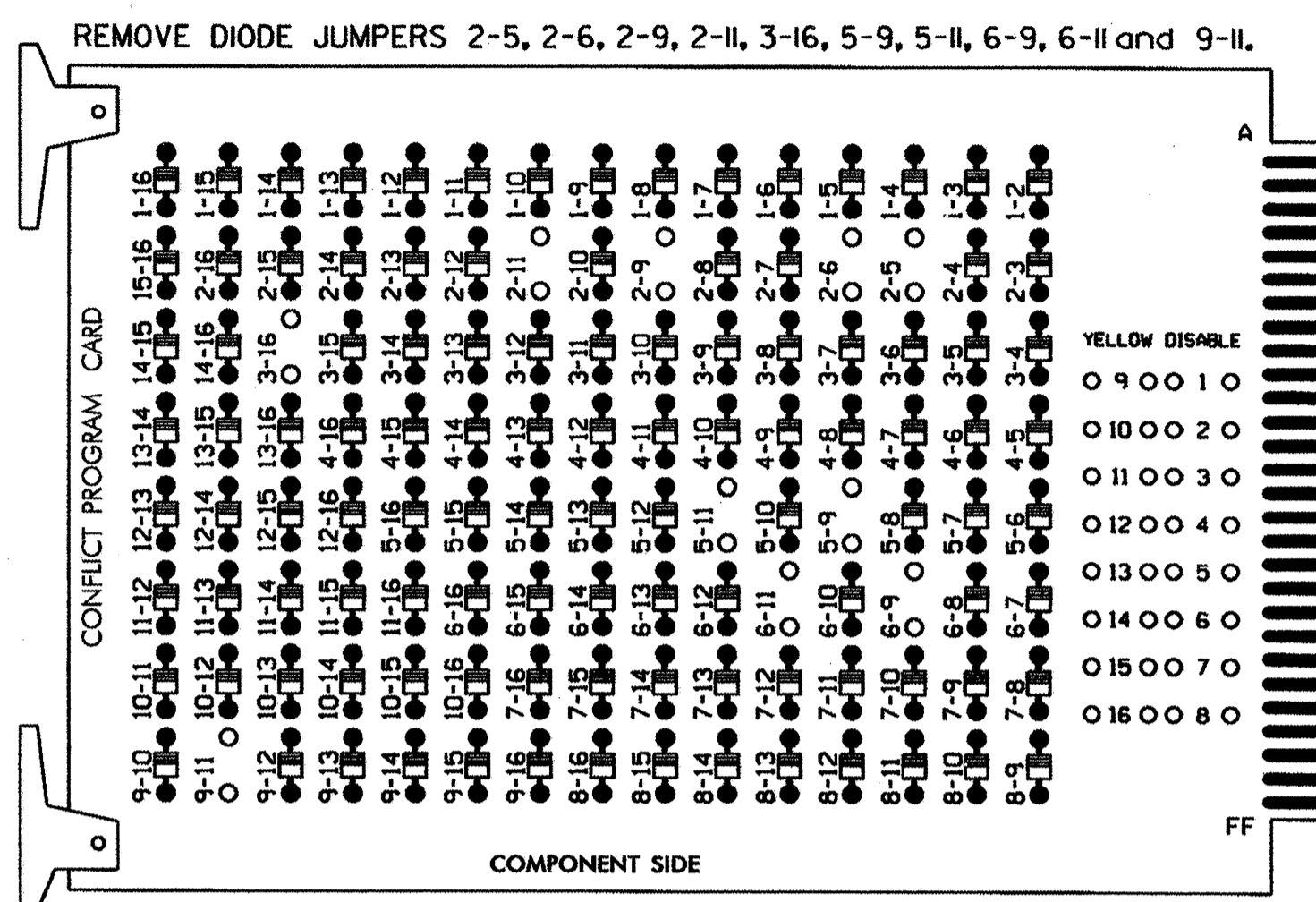
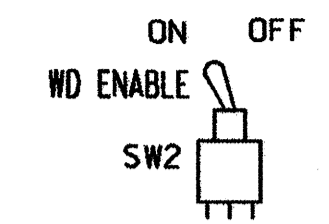
8/29/11



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EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



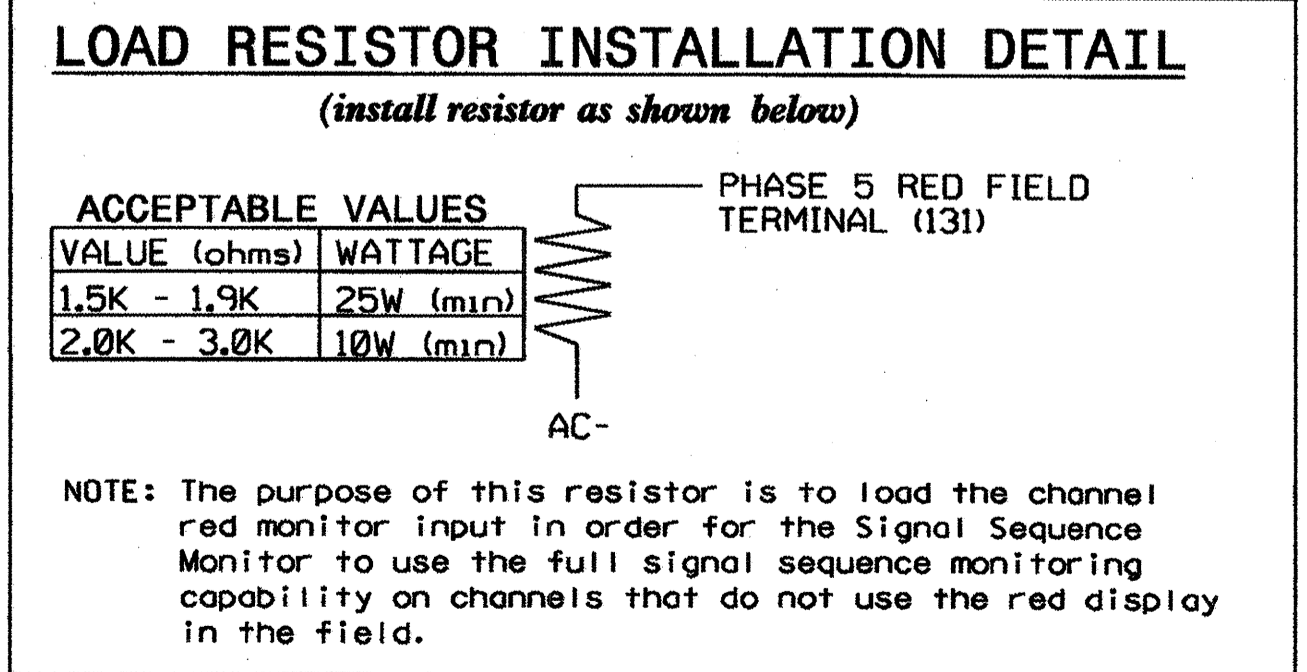
- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Make sure jumpers SEL2-SEL5 are present on the monitor board.

INPUT FILE POSITION LAYOUT

(front view)

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

EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 * Wired Input - Do not populate slot with detector card



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 1,7, 8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phase 3 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 /W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S3,S4,S5,S6,S8P,S9,S12
 PHASES USED.....2,3,3 PED,4,5,6
 OVERLAP "A".....2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14					
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE					
SIGNAL HEAD NO.	NU	21,22	NU	31	32	41	42	63	NU	42	51*	62,63	NU	NU	NU	P31, P32	61*	NU	NU	51*	NU	NU	
RED		128		116	116	101	101			*		134											
YELLOW		129		117	117	102	102					135											
GREEN		130		118	118	103	103					136											
RED ARROW																							
YELLOW ARROW								102		132													
FLASHING YELLOW ARROW																							
GREEN ARROW																							
Hand																							
Person																							

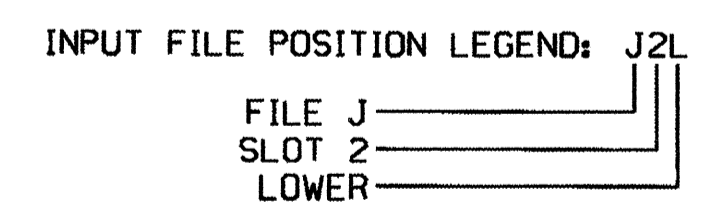
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail below.

INPUT FILE CONNECTION & PROGRAMMING CHART

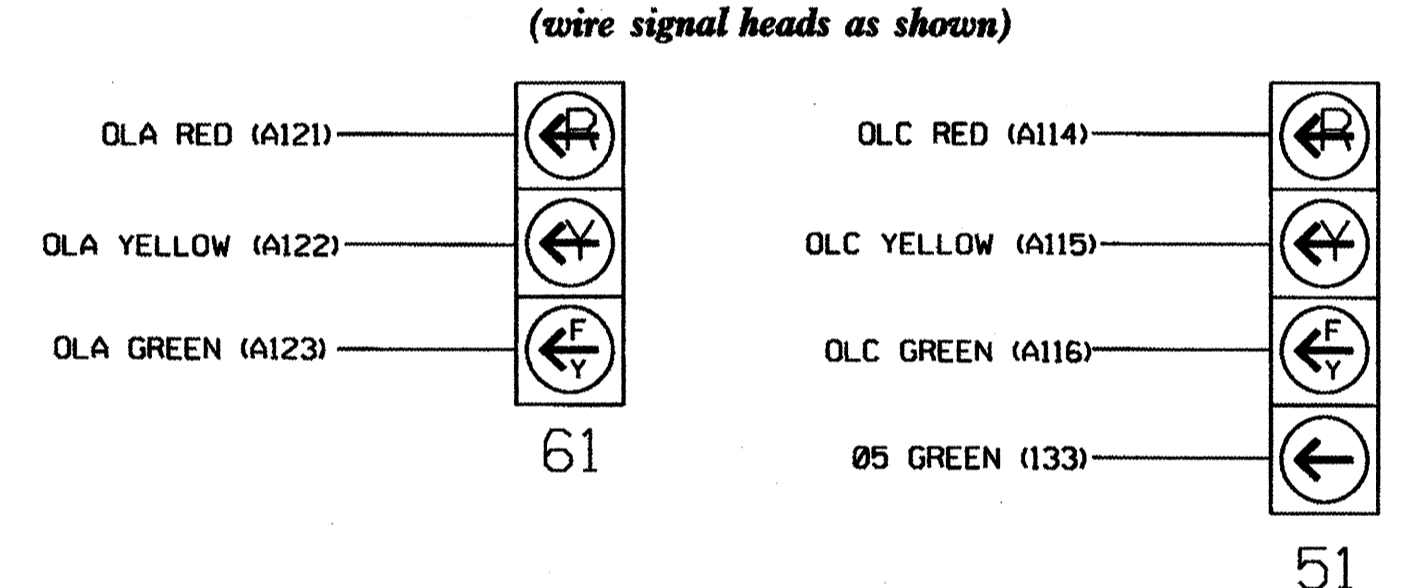
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			3
3B	TB4-9,10	I6U	41	3	4	3	Y	Y			10
3C	TB4-11,12	I6L	45	7	14	3	Y	Y			15
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y	Y		3
PED PUSH BUTTONS											
P31,P32	TB8-8,9	I13L	70	32	PED 8	3 PED					

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT 113.

¹Add jumper from J1-W to I4-W, on rear of input file.



FYA SIGNAL WIRING DETAIL



NOTE: 1. The sequence display for signal head 51 requires special logic programming. See sheet 2 of 2 for programming instructions.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

ELECTRICAL DETAIL SHEET 1 OF 2

Electrical and Programming Details For: SR 1006/(Howard Gap Road) at Fletcher Elementary Sch. Ent/ Fox Glen Drive

Division 14 Henderson County Fletcher

PLAN DATE: August 2011 REVIEWED BY: T. J. Strickland

PREPARED BY: C. Strickland REVIEWED BY: T. J. Strickland

750 N. Greenfield Hwy, Garner, NC 27529

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-1144
 DESIGNED: July 2011
 SEALED: 08/29/11
 REVISED:

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER GEORGE C. BROWN SEAL 022013

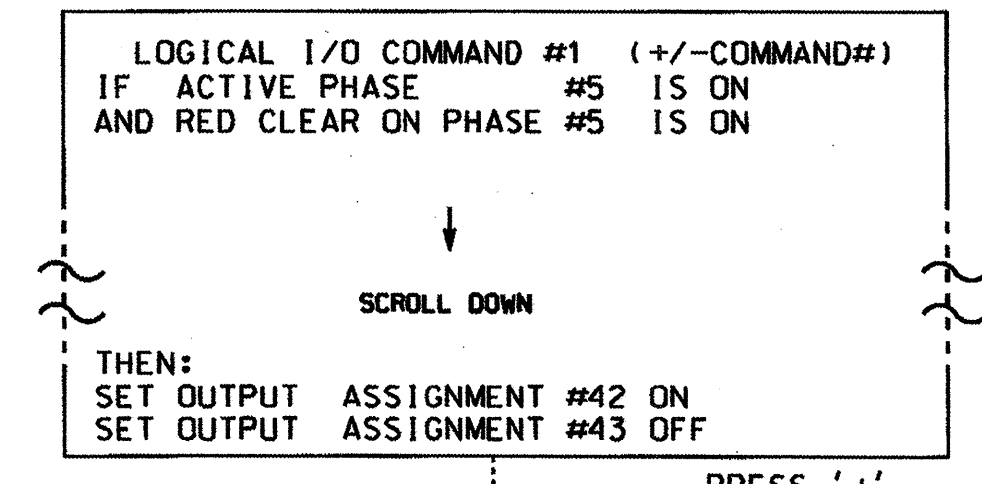
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SIG. INVENTORY NO. 14-1144

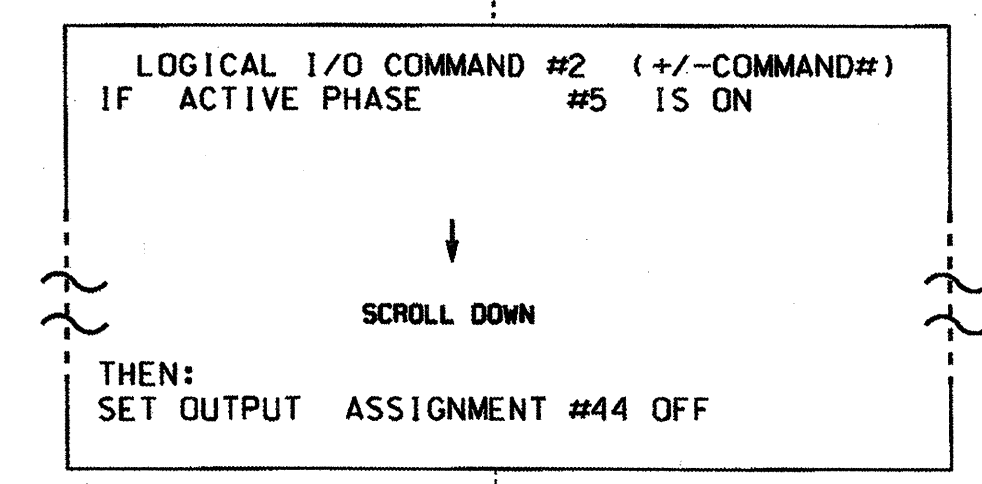
**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

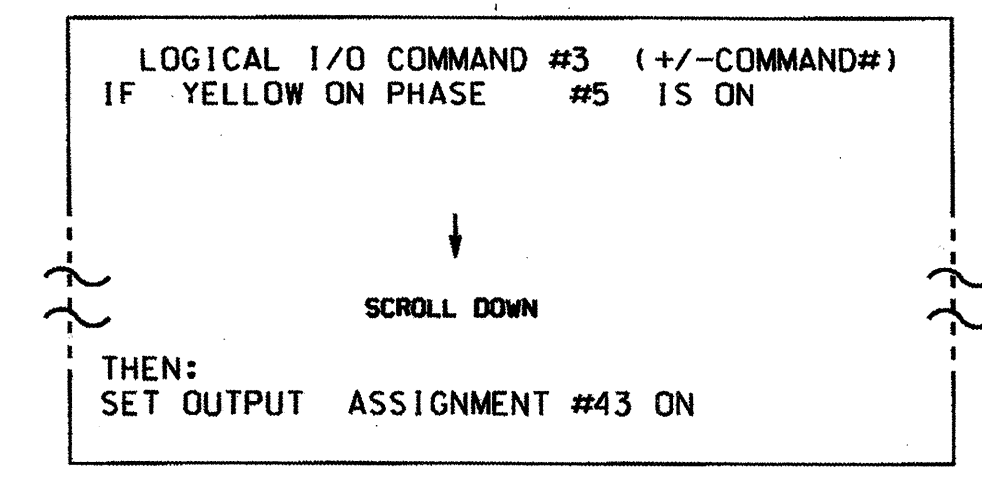
- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS), SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



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



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



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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

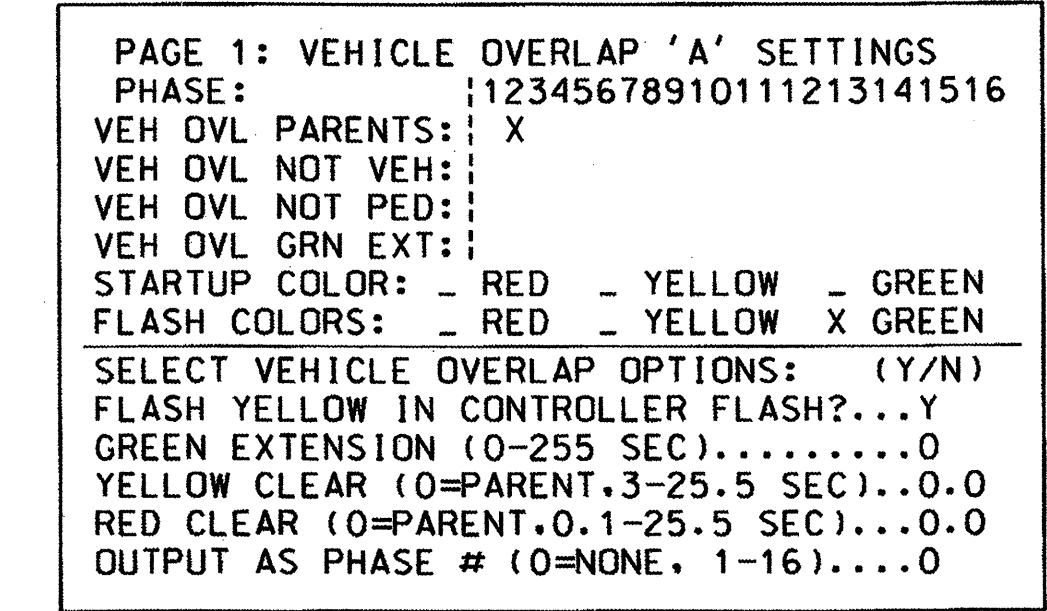
OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

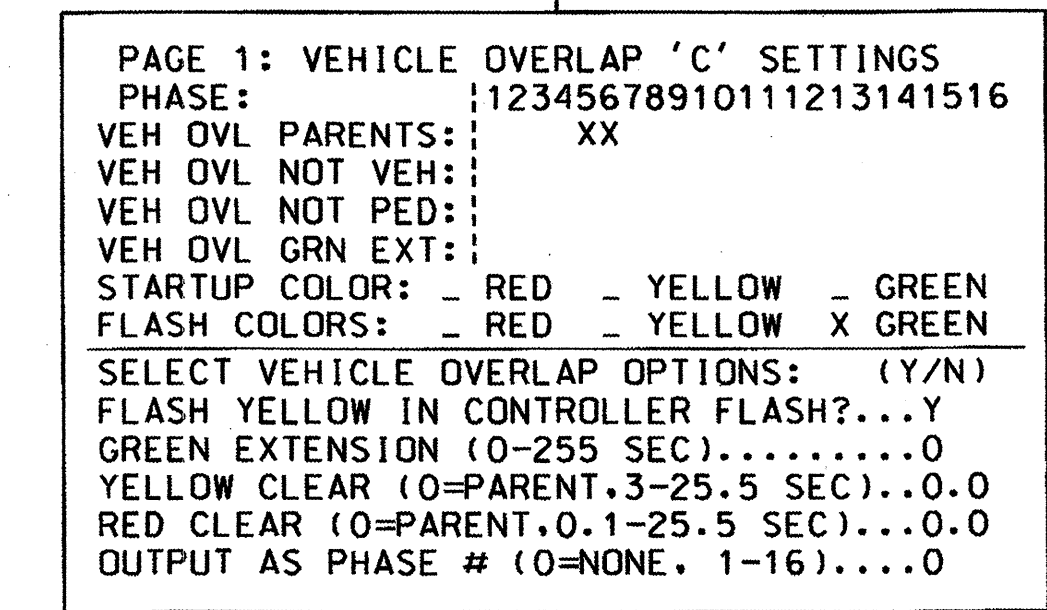
(program controller as shown below)

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



← NOTICE GREEN FLASH

PRESS '+' TWICE



← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

PED 3 PROGRAMMING DETAIL

(program controller as shown below)

CHANGING OUTPUT ASSIGNMENTS

- FROM MAIN MENU SELECT '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS)
- ENTER 17 (PHASE 8 DW) FOR OUTPUT ASSIGNMENT #.
- SCROLL DOWN TO 'PEDESTRIAN PHASE' AND ENTER 'Y' **REGARDLESS OF DEFAULT PROGRAMMING**
- ENTER '3' FOR 'SELECT PEDESTRIAN PHASE'. NO CHANGE NEEDED FOR 'SELECT COLOR'
- BACKUP TO 'OUTPUT ASSIGNMENTS AND SETTINGS MENU:' BY PRESSING THE 'ESC' BUTTON ON KEYBOARD.
- SELECT '1' (OUTPUT ASSIGNMENTS)
- ENTER 18 (PHASE 8 W) FOR OUTPUT ASSIGNMENT #.
- REPEAT STEPS # 3 AND # 4.

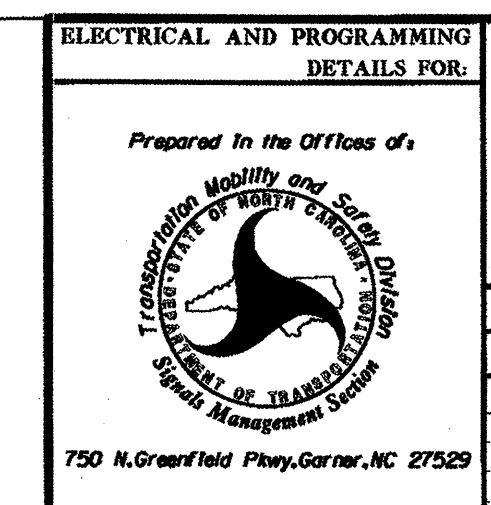
CHANGING INPUT ASSIGNMENTS

- FROM MAIN MENU SELECT '7' (DETECTORS), THEN '2' (PEDESTRIAN DETECTOR ASSIGNMENTS)
- CYCLE TO PED DETECTOR #8 BY REPEATEDLY DEPRESSING '+' KEY
- MODIFY PHASE ASSIGNED TO PED DETECTOR # 8 FROM PHASE 8 TO PHASE 3

PROGRAMMING COMPLETE

ELECTRICAL DETAIL SHEET 2 OF 2

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-1144
DESIGNED: July 2011
SEALED: 08/29/11
REVISED:



SR 1006/(Howard Gap Road) at Fletcher Elementary Sch. Ent/ Fox Glen Drive

Division 14	Henderson County	Fletcher
PLAN DATE: August 2011	REVIEWED BY: T. Siga	
PREPARED BY: C. Strickland	REVIEWED BY:	
REVISIONS	INIT.	DATE

SIGNATURE: *George C. Brown* 8/30/11
DATE: 8/30/11

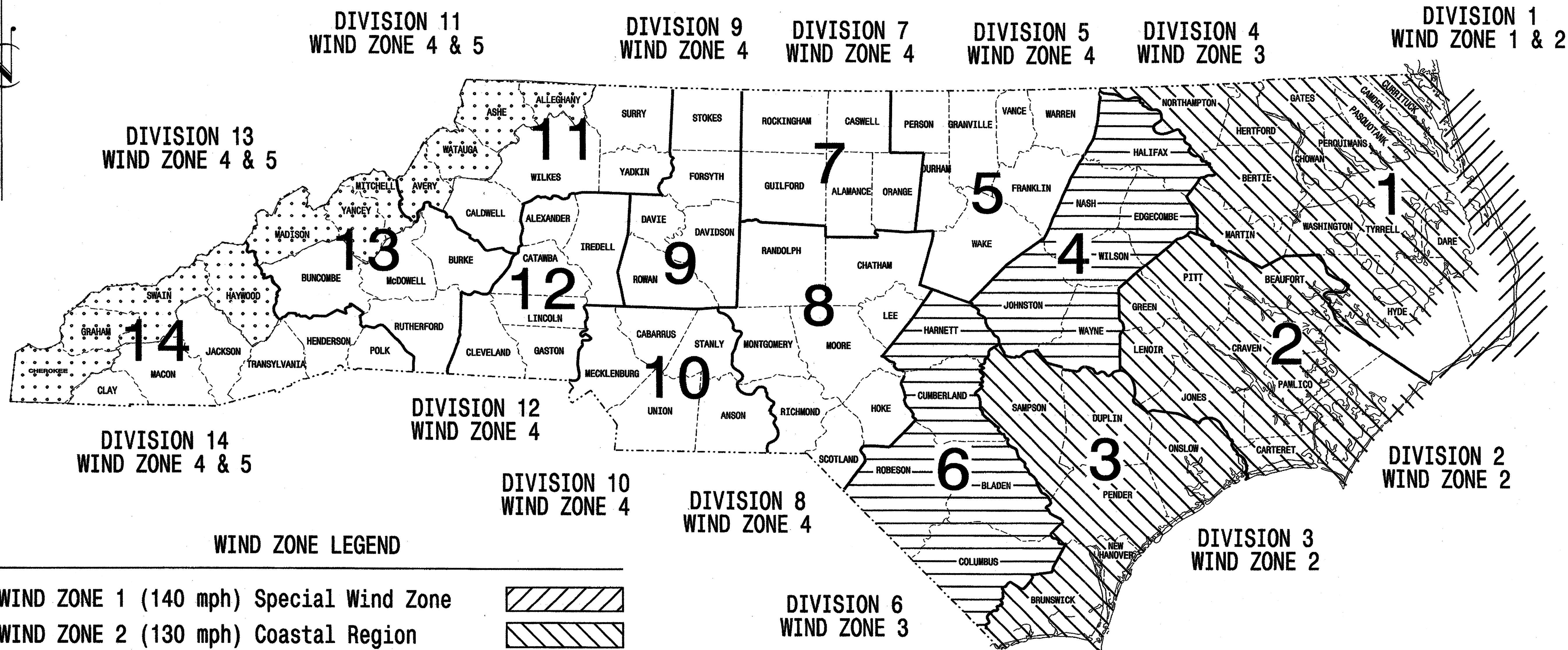
SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL 022013
GEORGE C. BROWN
SIG. INVENTORY NO. 14-1144

29 AUG 2011 14:45
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**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

STATE	PROJECT NO.	SHEET NO.
N.C.	R-5207 B	Sig. 10
F. A. PROJ. NO.		M 1
PROJECT ID. NO.		

STANDARD DRAWINGS FOR METAL POLES

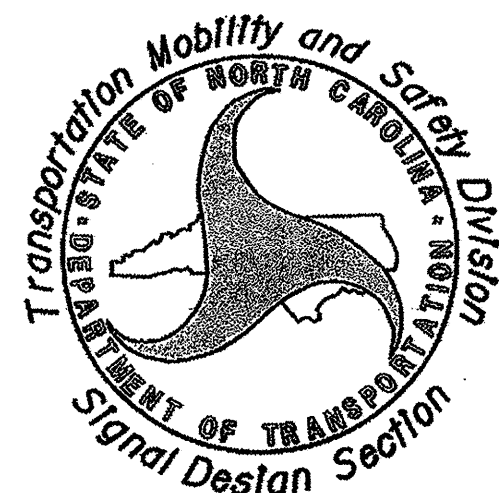


WIND ZONE LEGEND

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/ITSS/ws/mpoles/poles.html>

Prepared In the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

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

AASHTO

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

INDEX OF PLANS

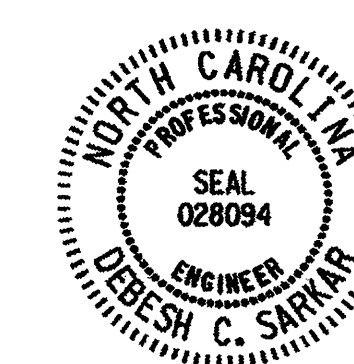
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:

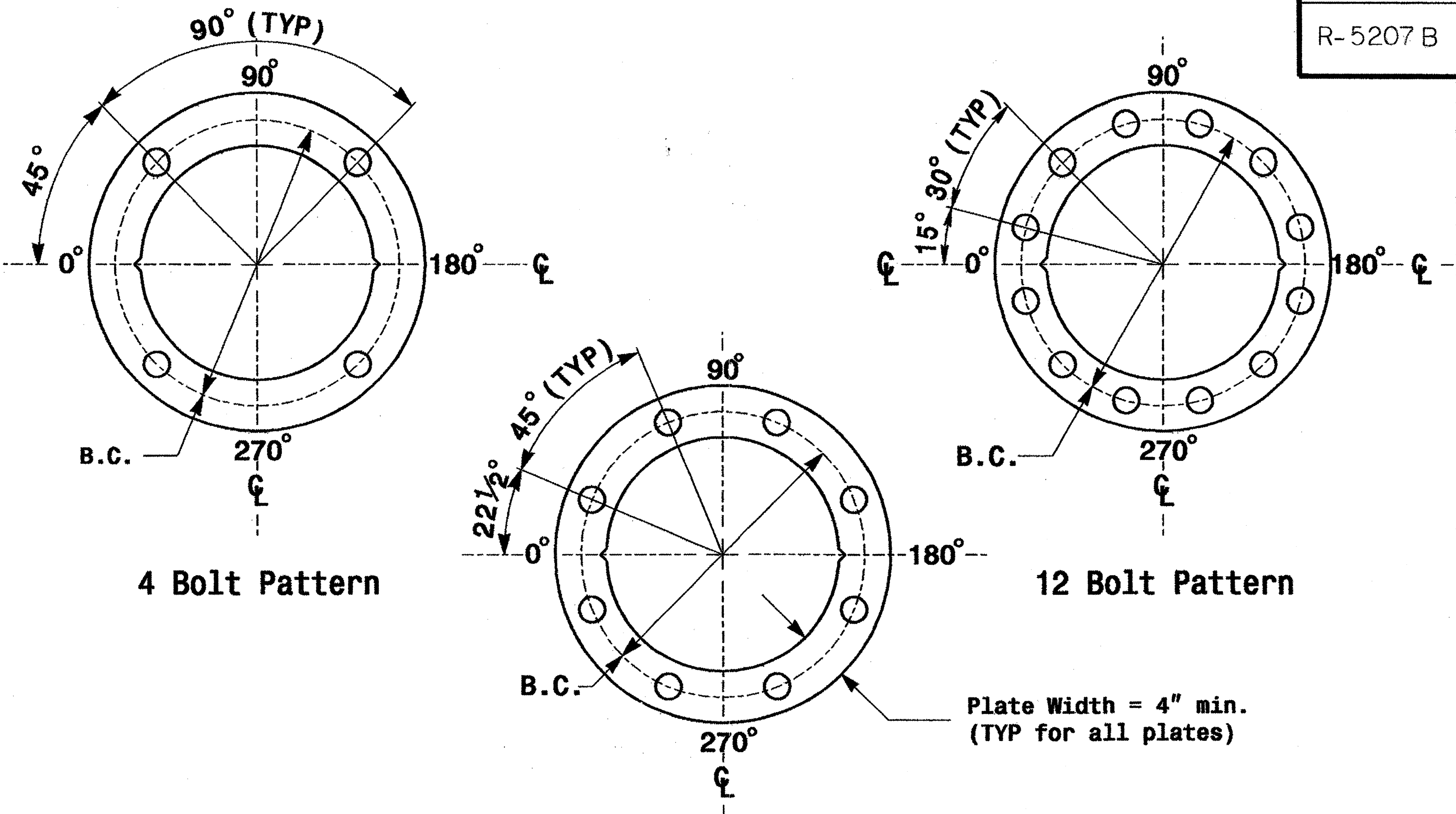
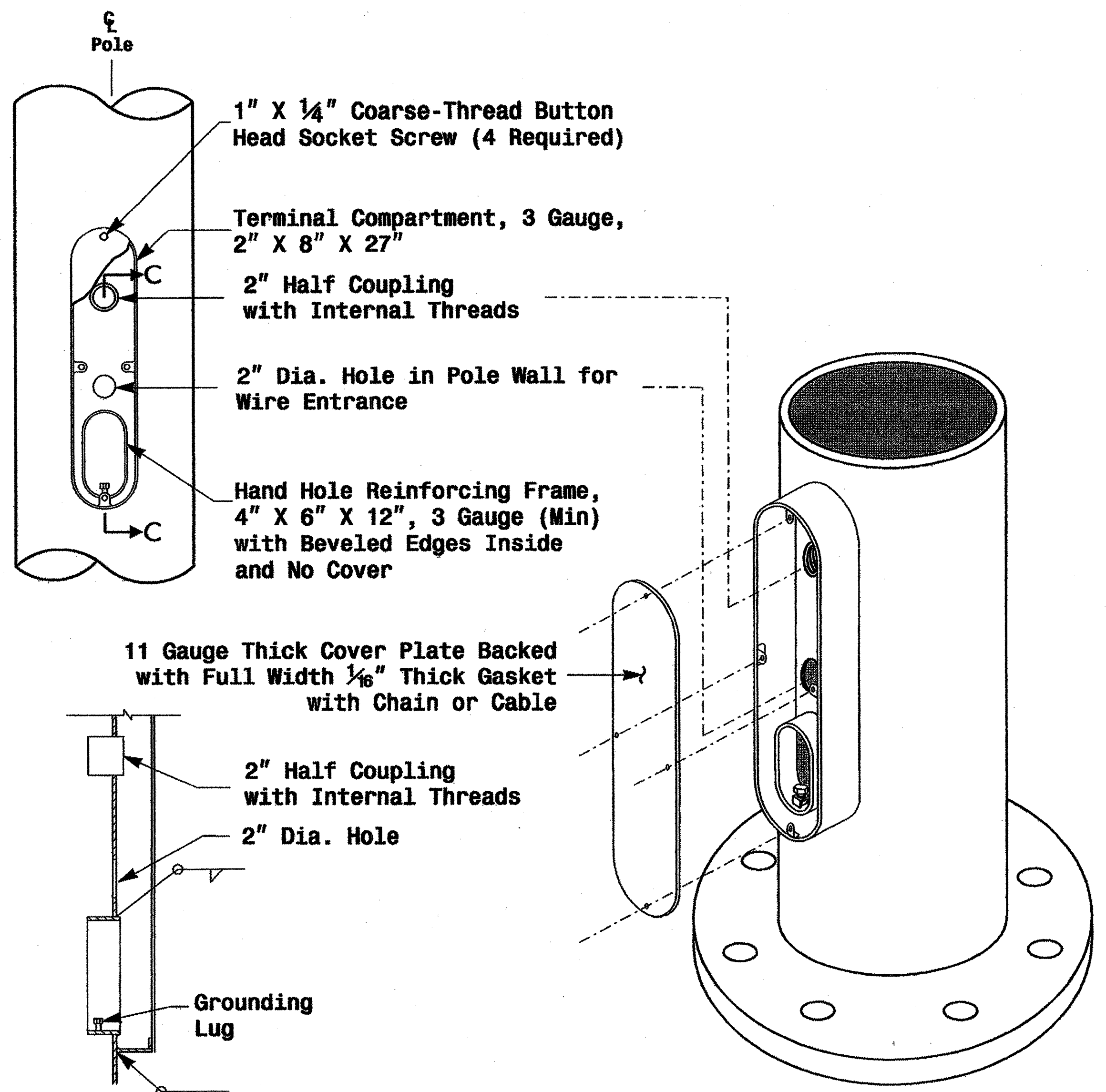
MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT

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

SEAL



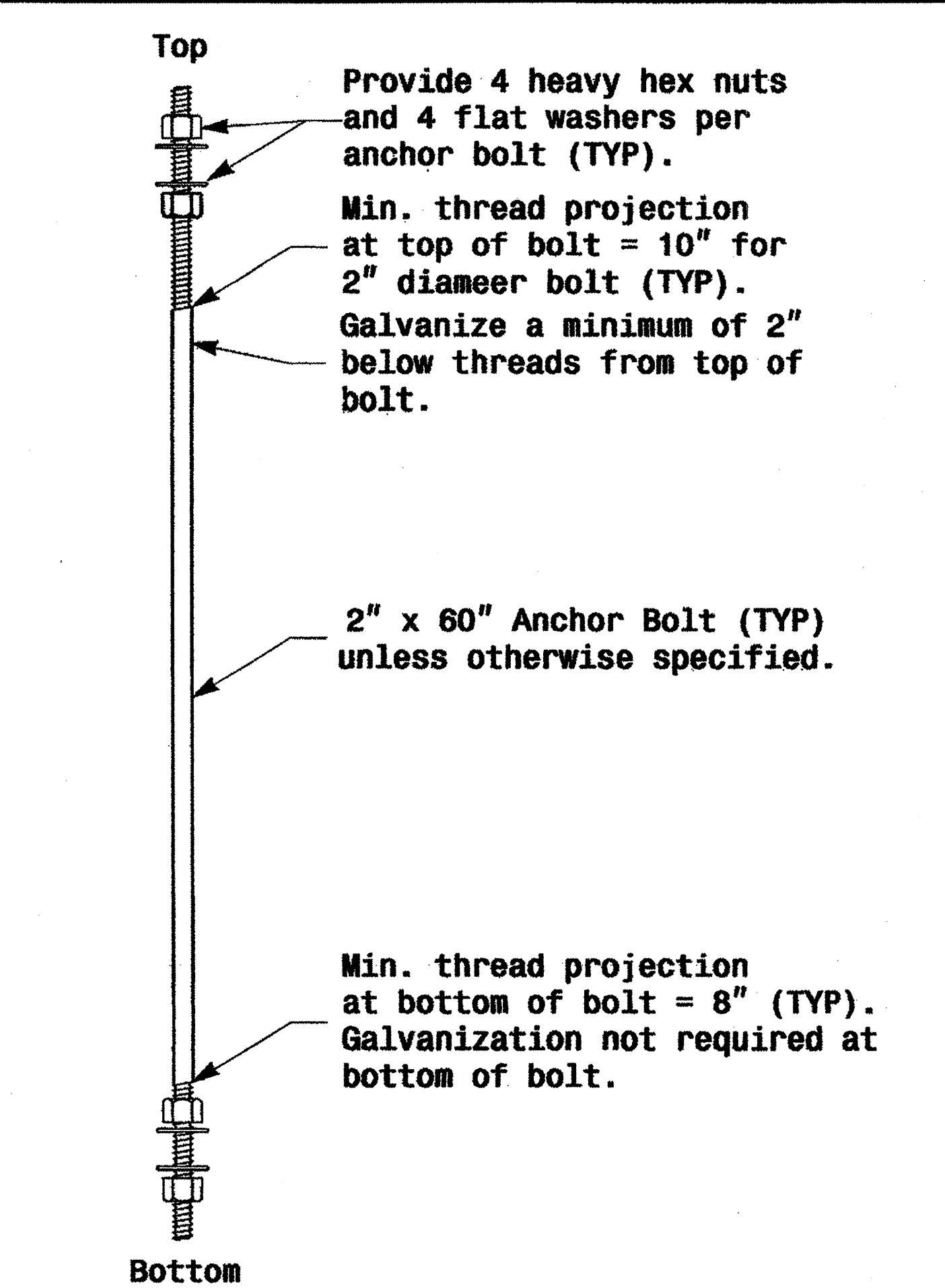
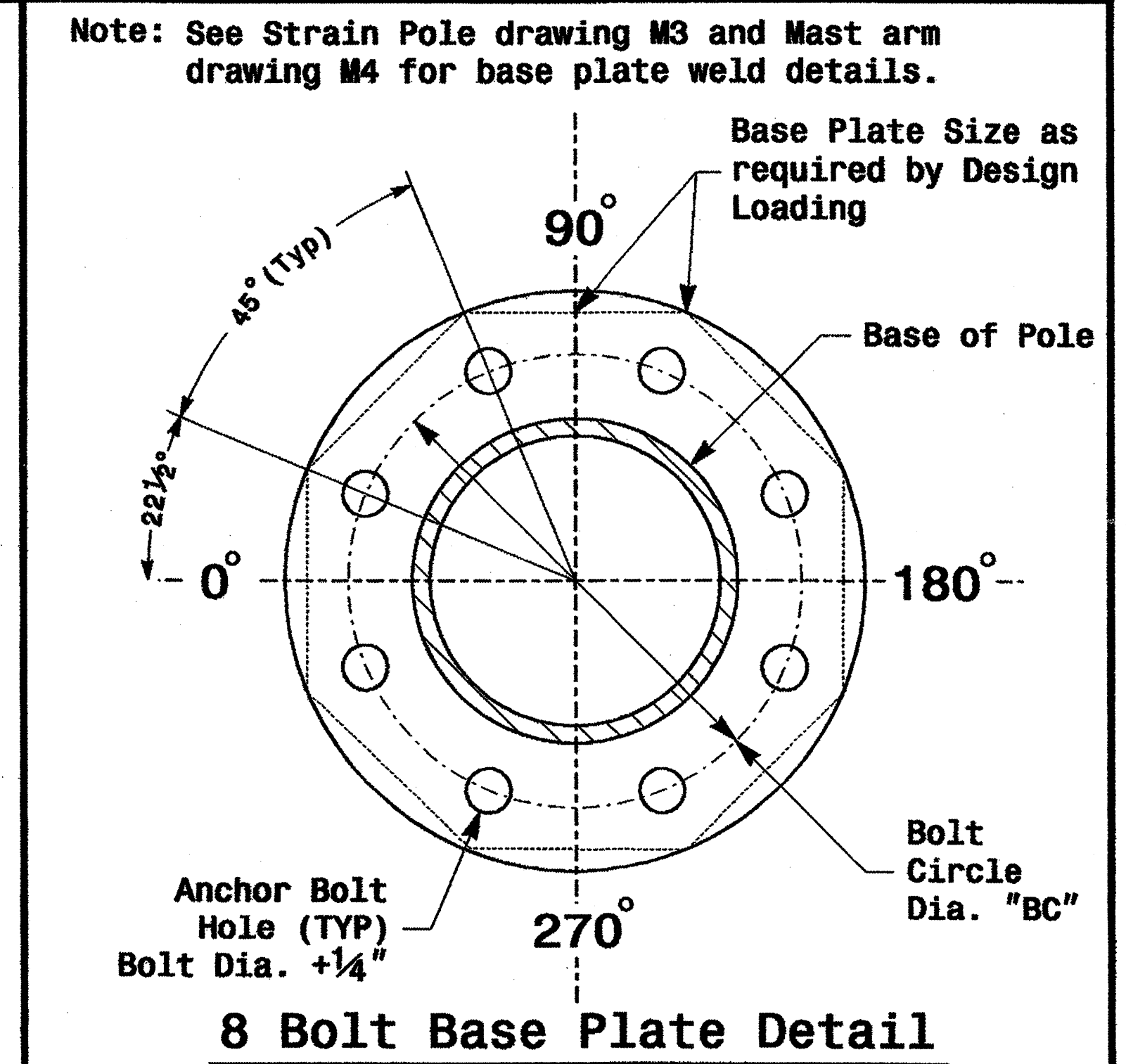
D. Sarkar 7.26.2009
SIGNATURE DATE



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



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

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

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

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

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

Identification Tag Details

Prepared in the Office of

SEAL

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: May 2005 REVISIONS: _____

PREPARED BY: P.L. Alexander ENGINEER REVIEWED BY: C.F. Andrews DATE: _____

REVISIONS: _____ IMIT. DATE: _____

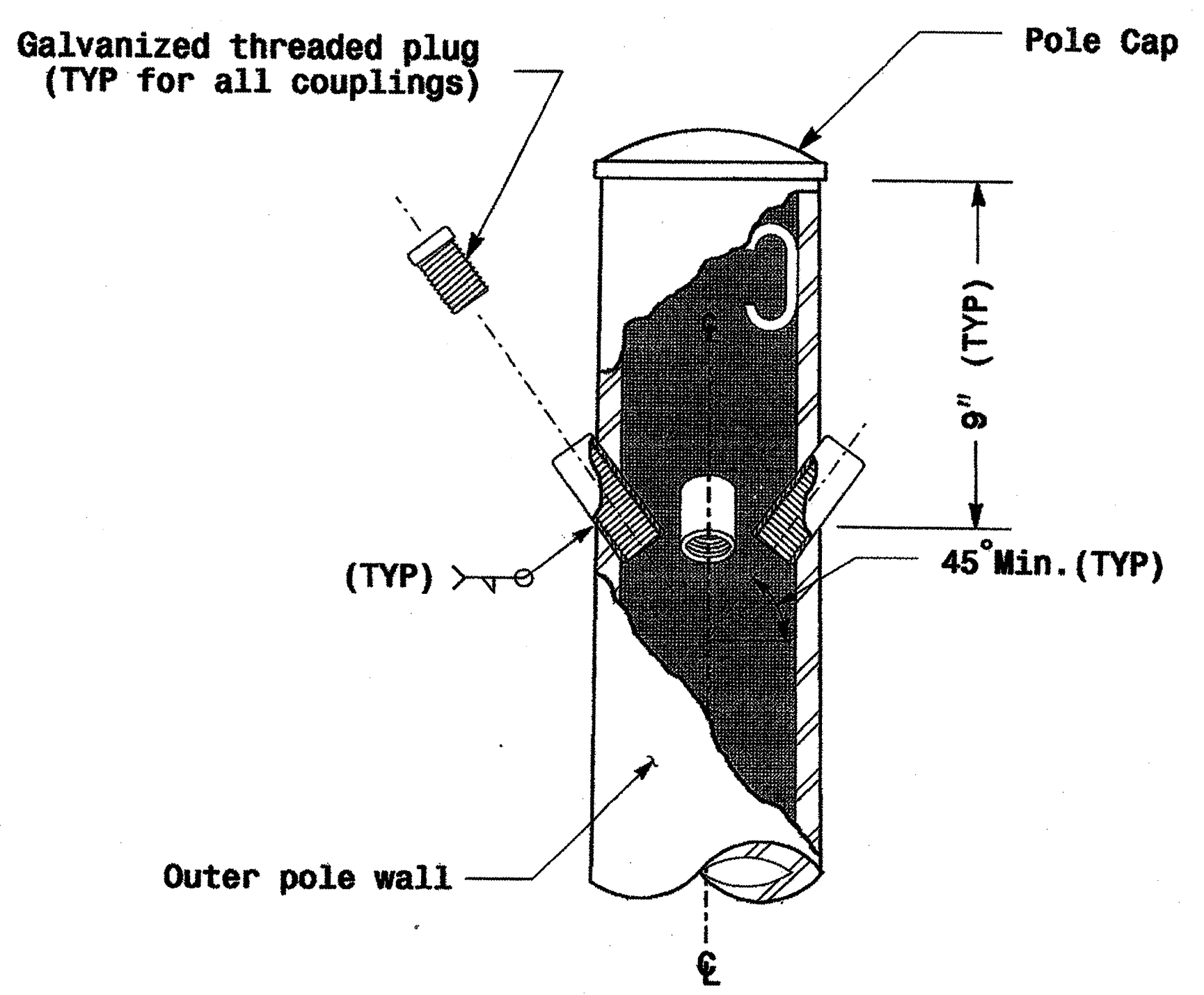
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Signature: *D. Sarker* 22.2005 DATE

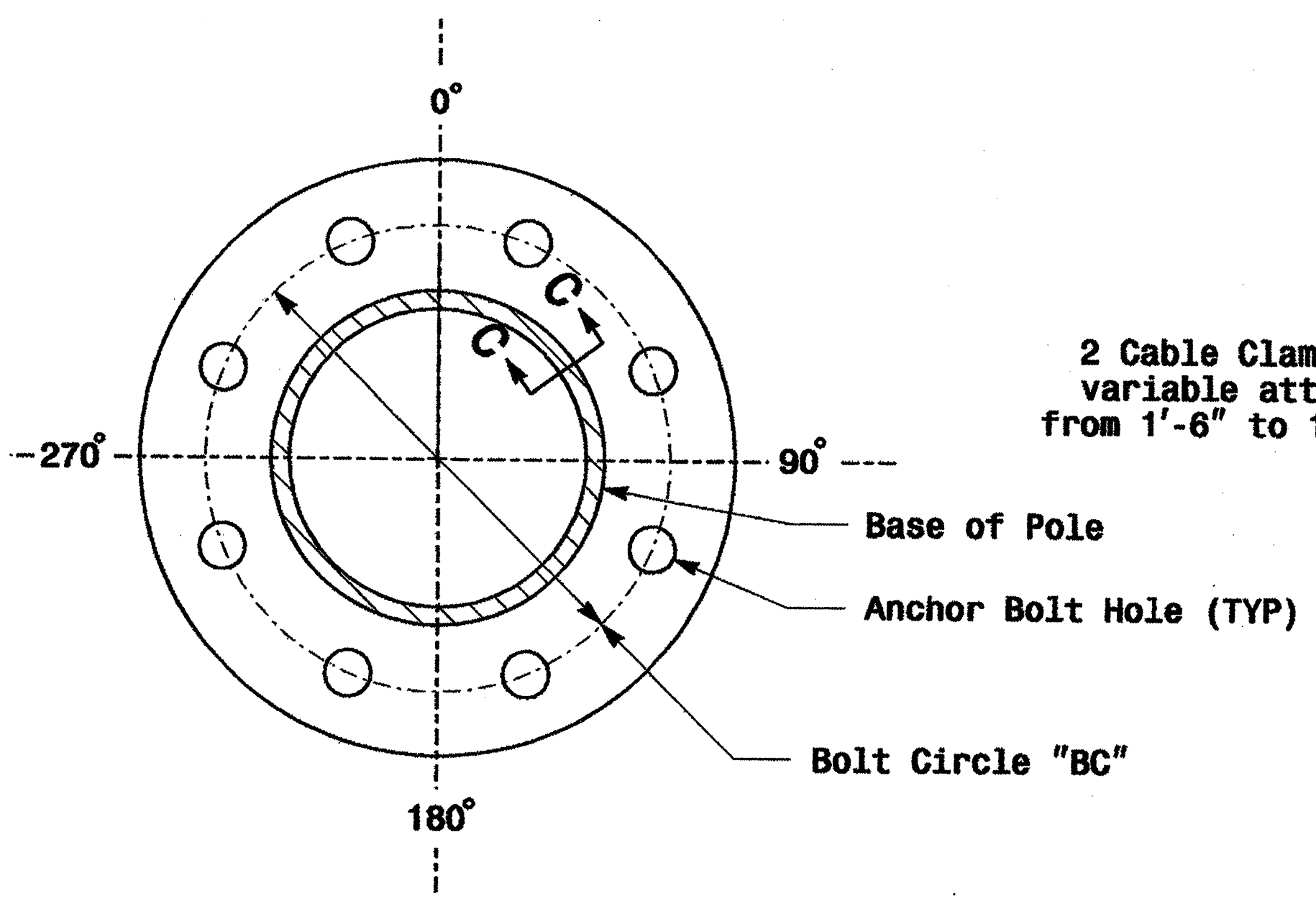
SIG. INVENTORY NO. _____

Fabrication Details - All Poles

01-SEP-2005 18:22 01-SEP-2005 18:22 01-SEP-2005 18:22

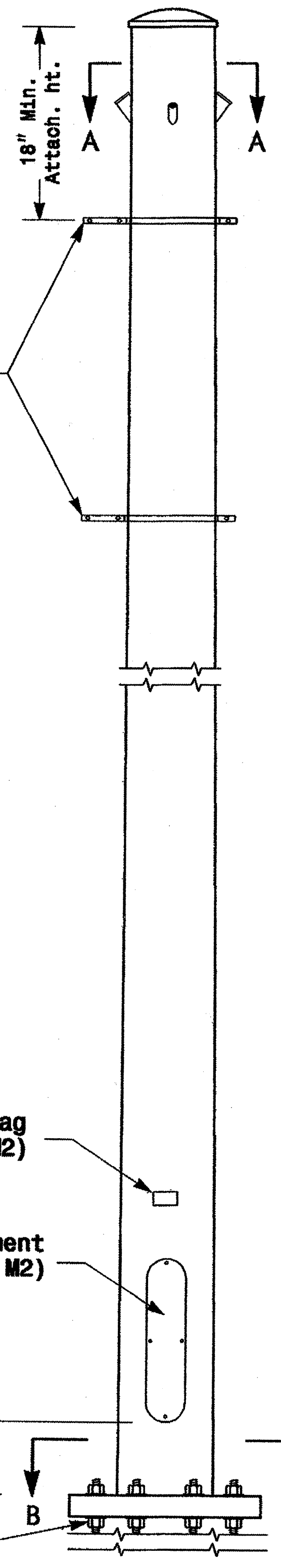


Cable Entrances at Top of Pole

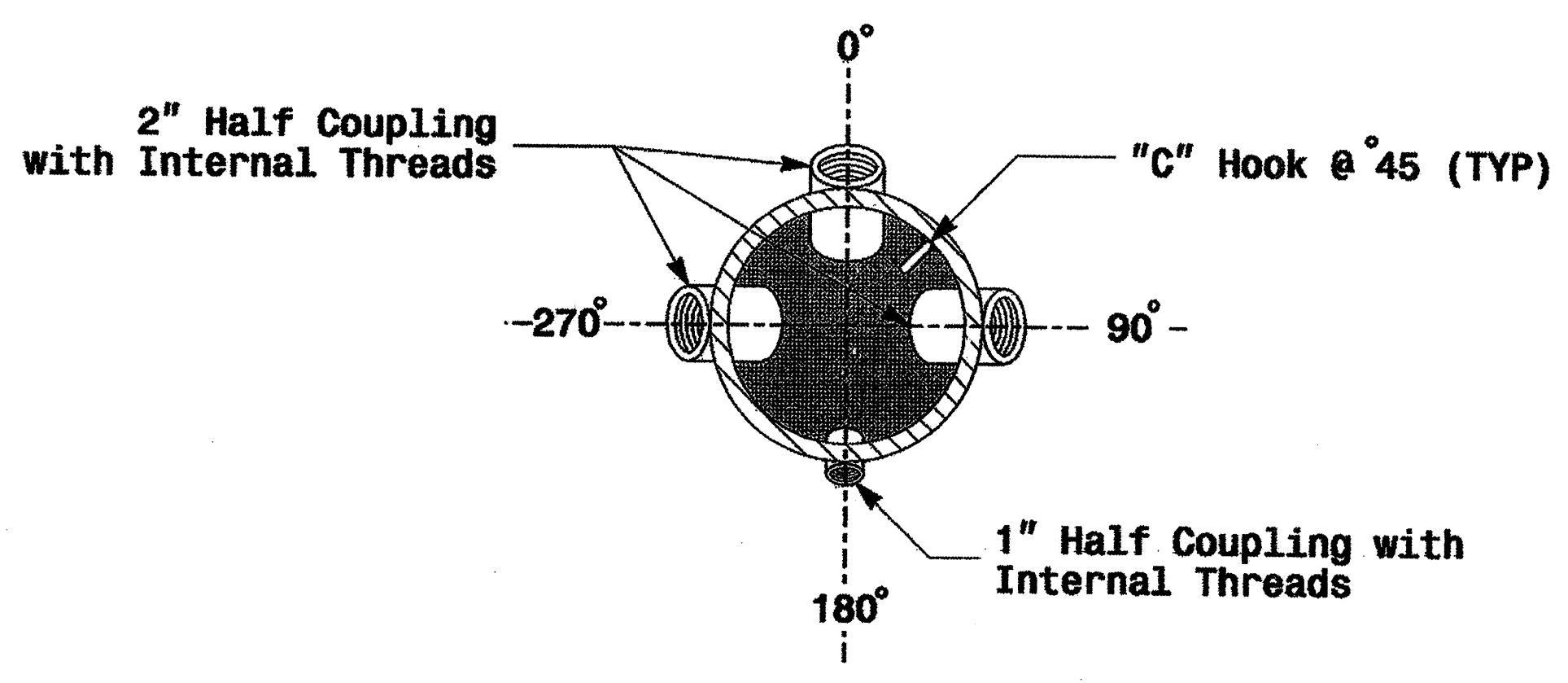


**Section B-B
(See drawing M2)
Pole Base Plate**

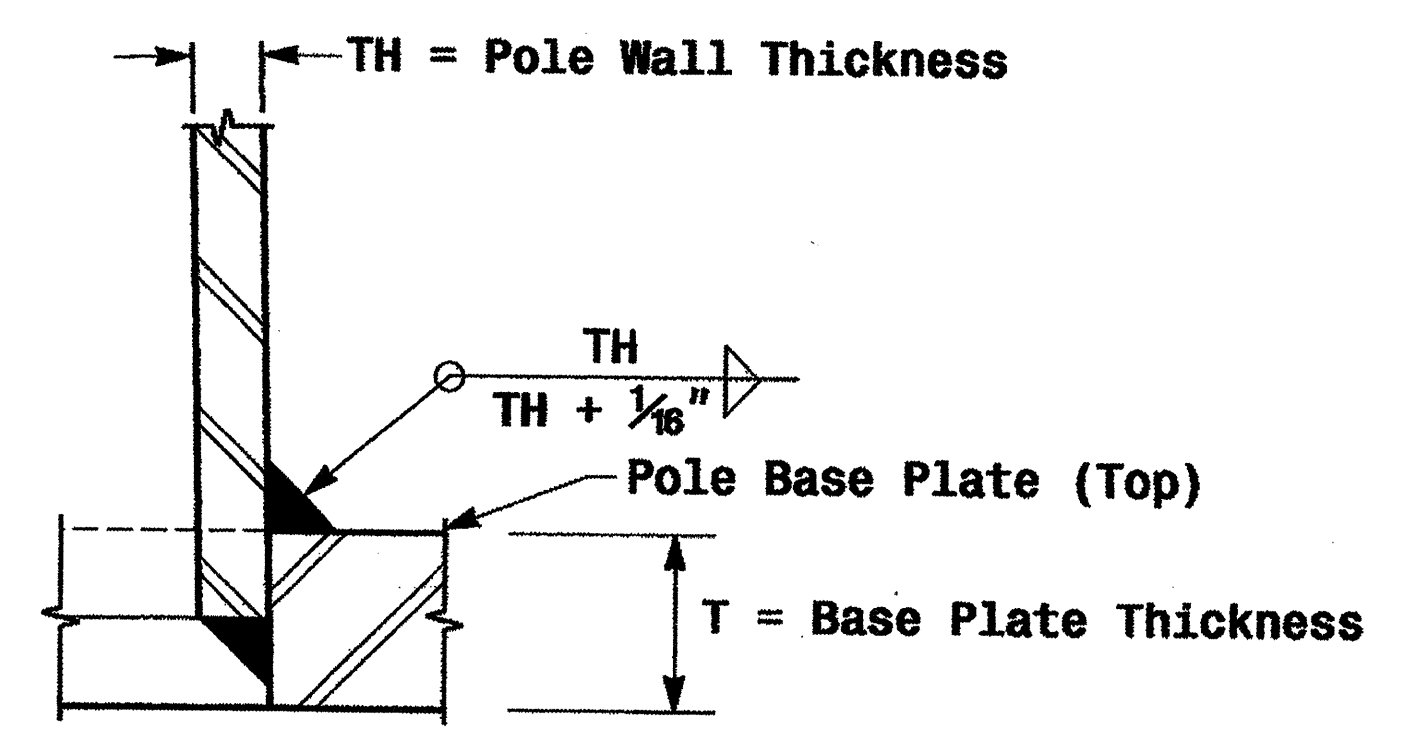
2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.



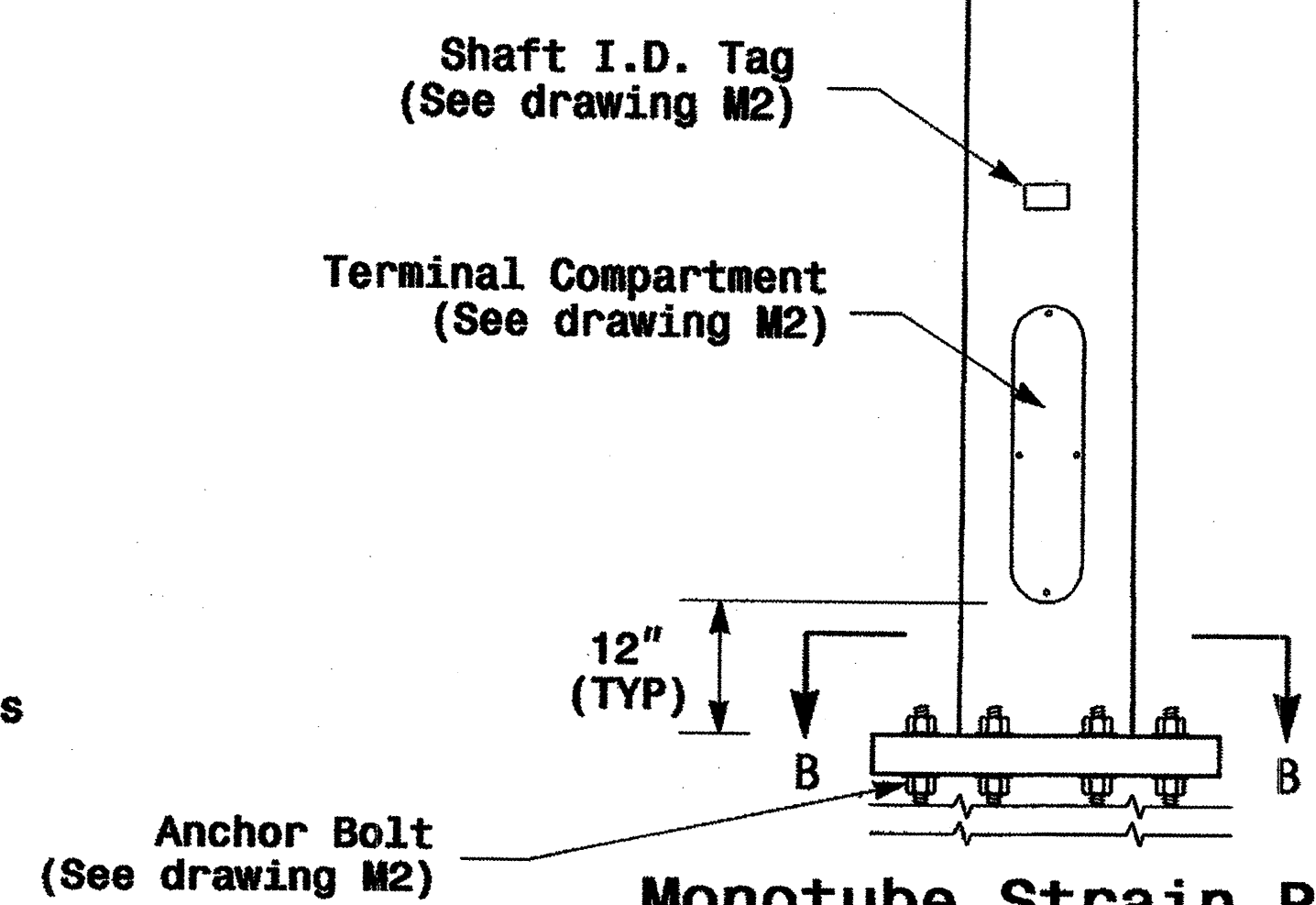
**Monotube Strain Pole
(.14"/Foot Taper)**



Radial Orientation for Factory Installed Accessories at Top of Pole



Socket Connection Weld Detail

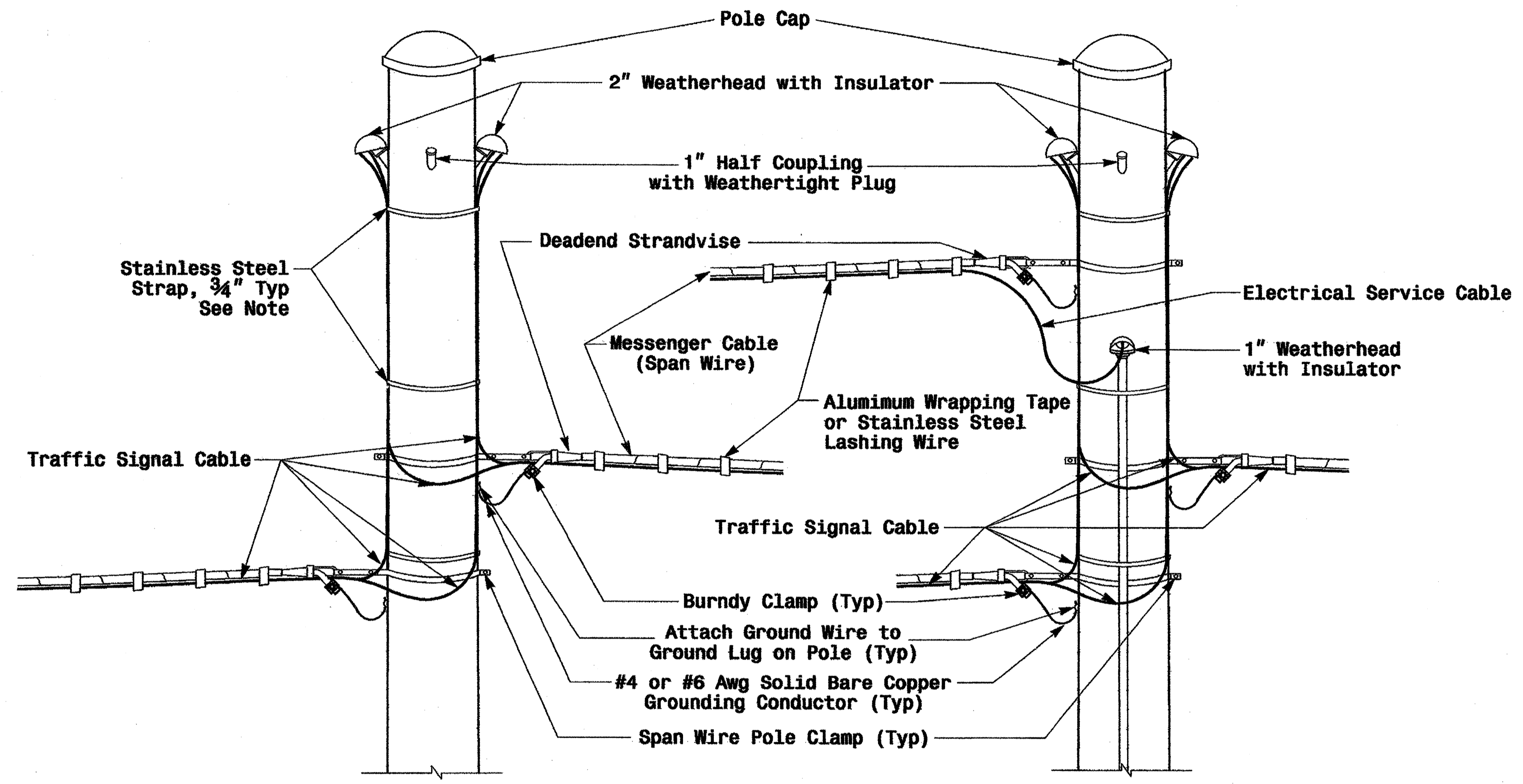


Anchor Bolt (See drawing M2)

01-SEP-2005 14:07 w:\p00\lee-unl\mccorkgroup\p00\m01 pole standard\004 m3.dgn

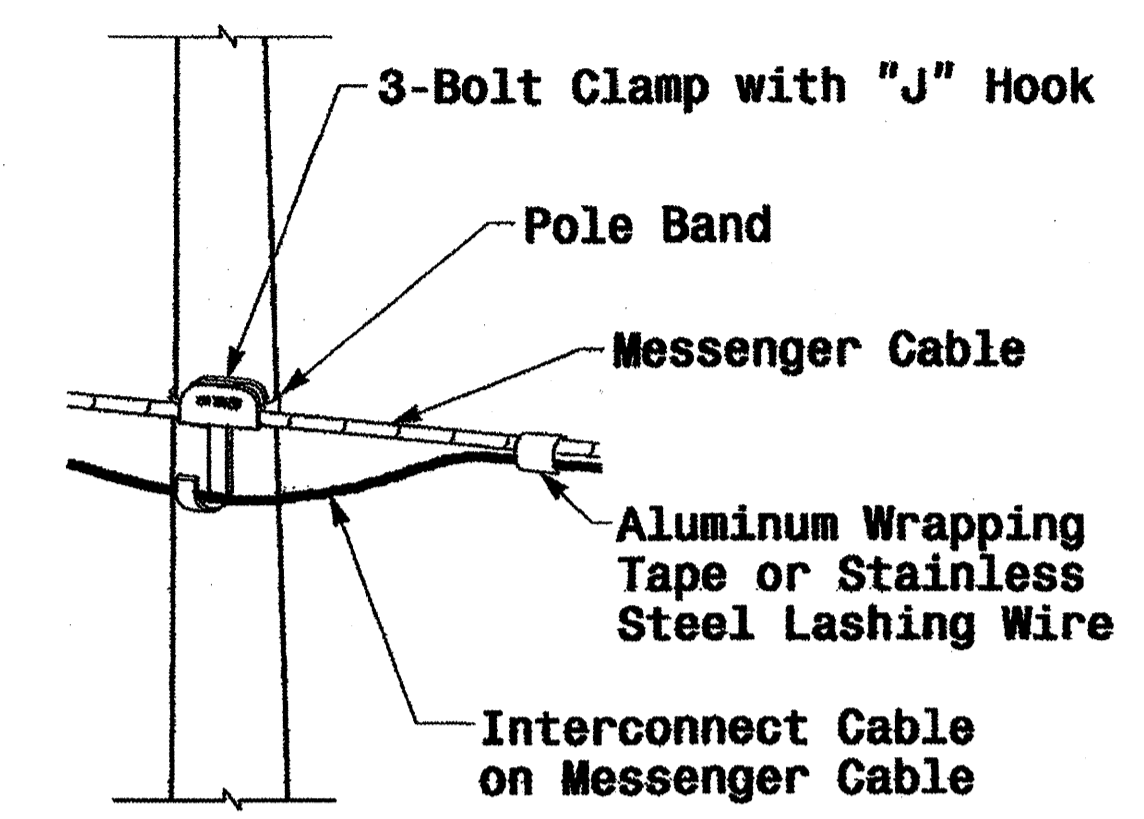
	Typical Fabrication Details For Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
SCALE: 0 NA		SIGNATURE: <i>P.L. Alexander</i> DATE: 9.2.2005	

Construction Details - Strain Poles

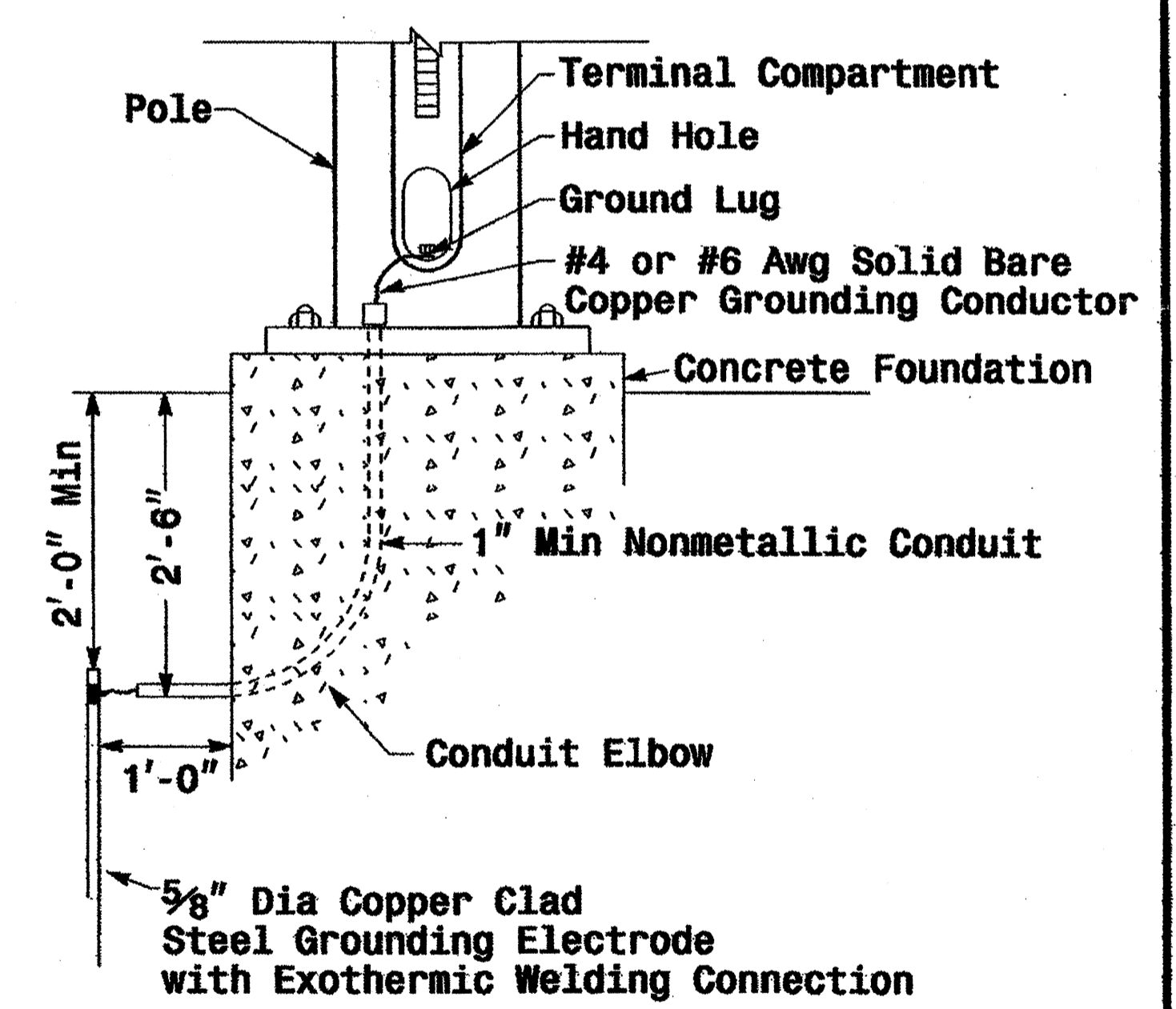


Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole

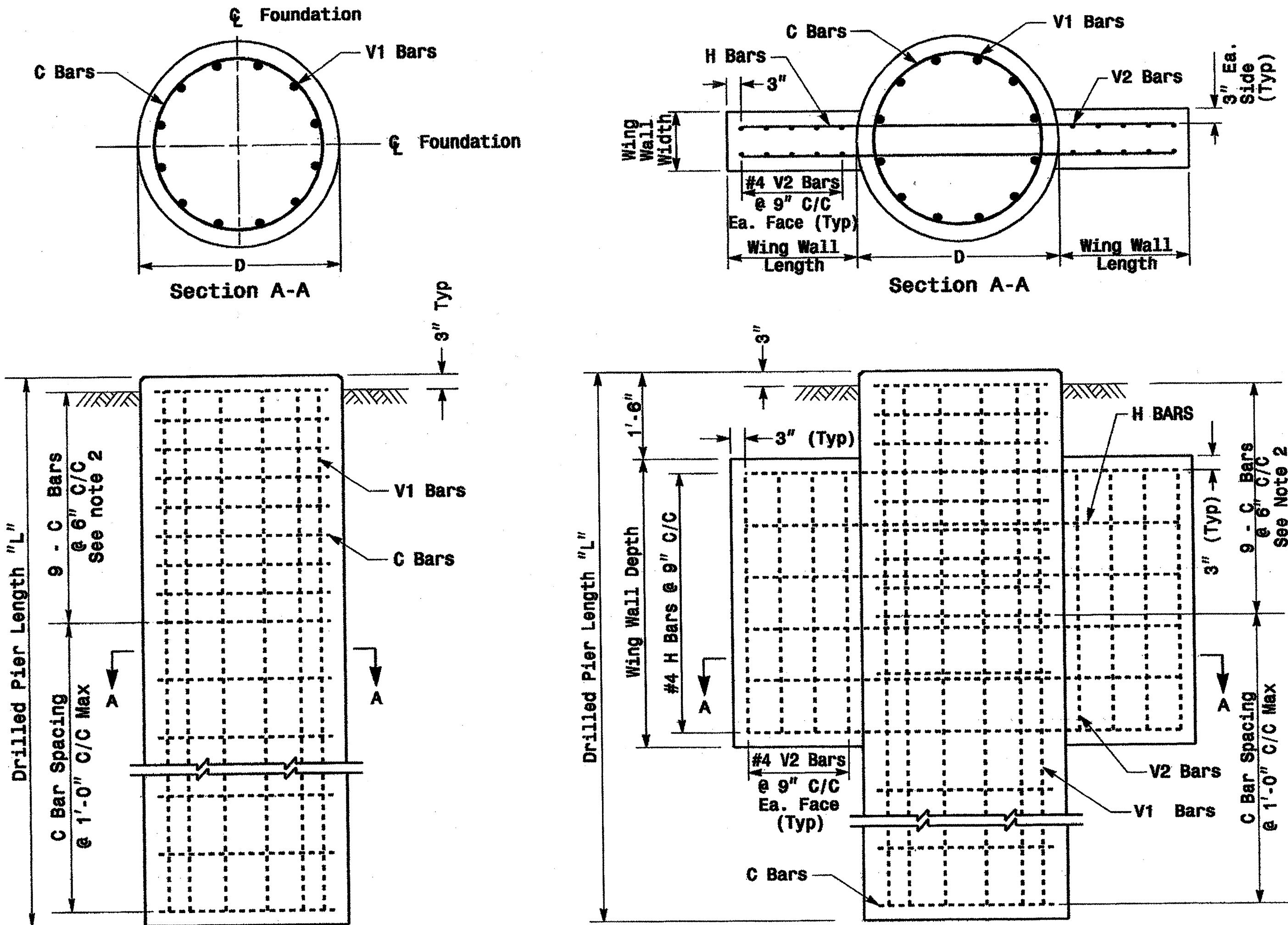


Metal Pole Grounding Detail

01-SEP-2005 16:33 w:\p01\es-un1\work\groups\2004 metal pole standards\2004 rd.dgn p01\alexander

	Construction Details Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR	
REVISIONS:		INIT. DATE	SIGNATURE: <i>P.L. Alexander</i> 9-1-05 DATE
STG. INVENTORY NO.			

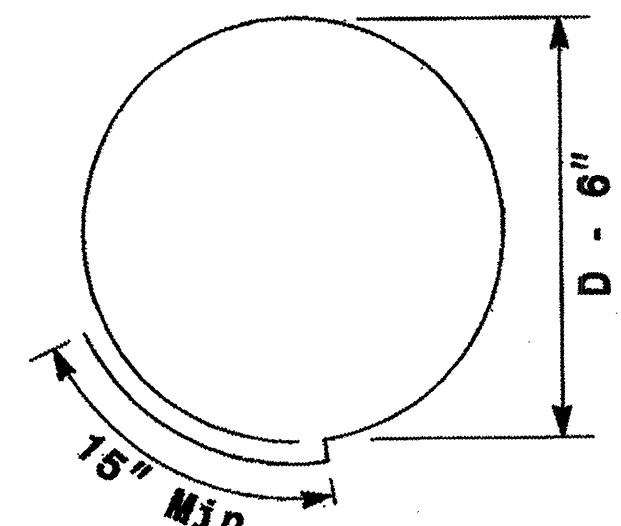
Reinforcing Steel Bars



REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (42" & 48" DIAMETER)

Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	**
		C	*	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	**
		C	*	#4	CIR.	12'-6"

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



Typical "C" Bars

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

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

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

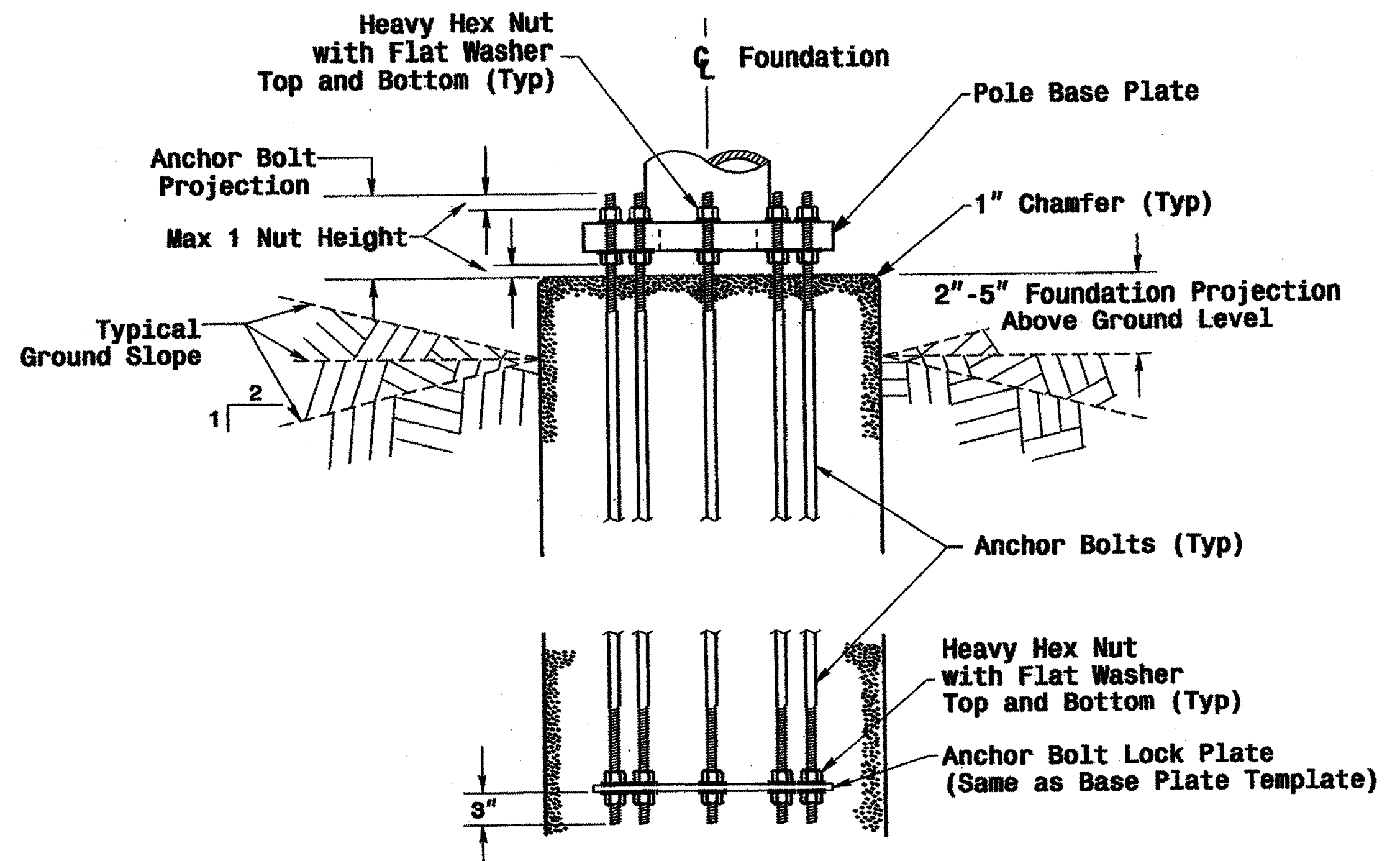
WING WALL DETAILS

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

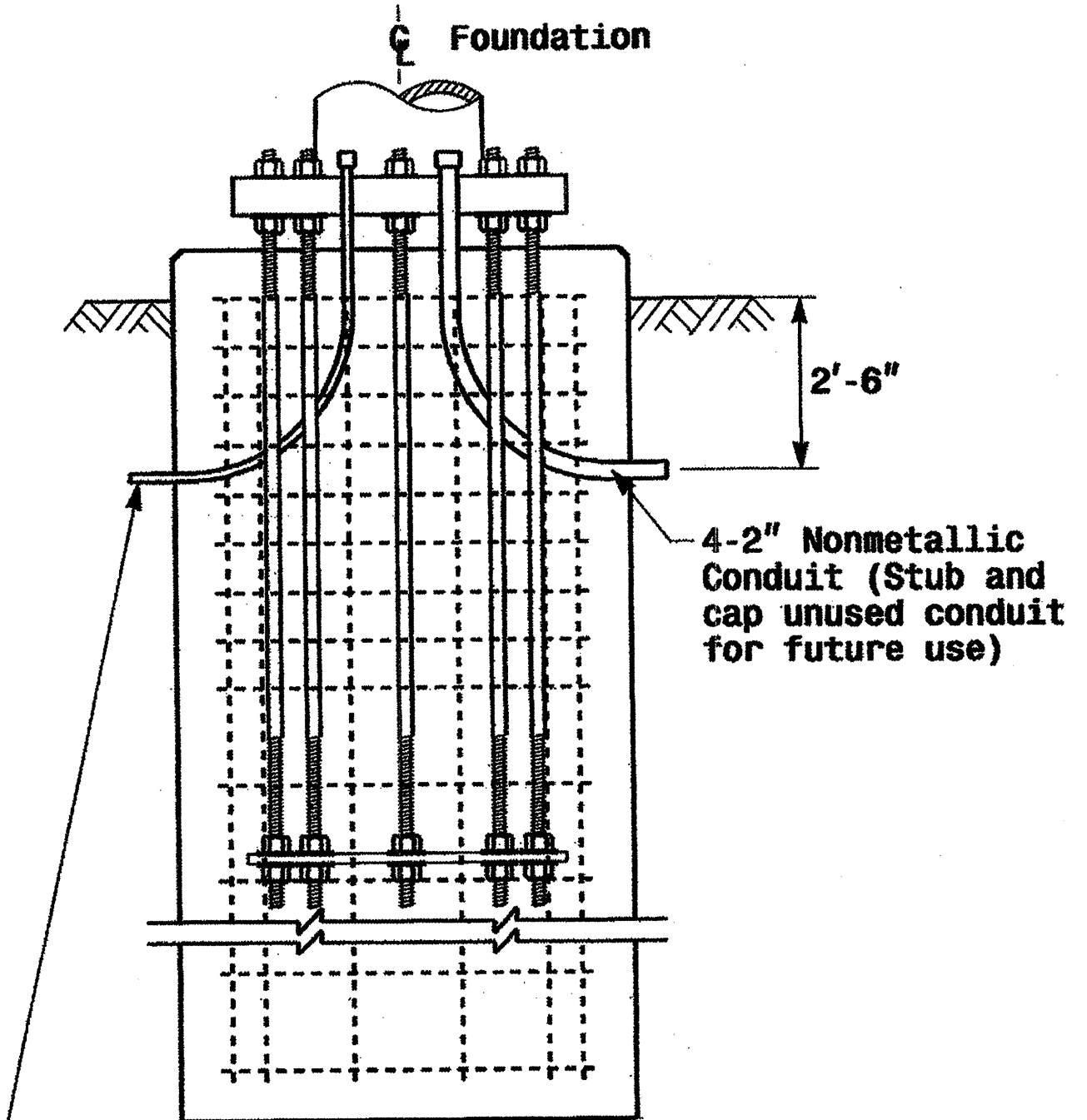
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

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

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.M. ESPOSITO

SCALE: 0 NA NONE

Signature: D. Sarkar 9.2.2005
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER JOSEPH C. CARRAS

Construction Details - Foundations

1-SEP-2005 11:48 :p000100-un1:ncw:gr-cups#2004 metal pole standar-ds#204 m1.dgn

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

Concrete Volume (cubic yards) = .356 X L

Fabrication Design Notes:



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

Foundation Selection:

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

Standard Strain Poles

-SEP-2005 12:42
p:\p05\12-11\work\p05\p052004.mxd str.in.pole.dgn
12/11/05

	Standard Strain Poles and Standard Foundations		
	PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews	
PREPARED BY: P.L. Alexander		REVIEWED BY: A.M. Esposito	DATE: 9.2.2005
SCALE: None		REVISIONS:	INIT. DATE:

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

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

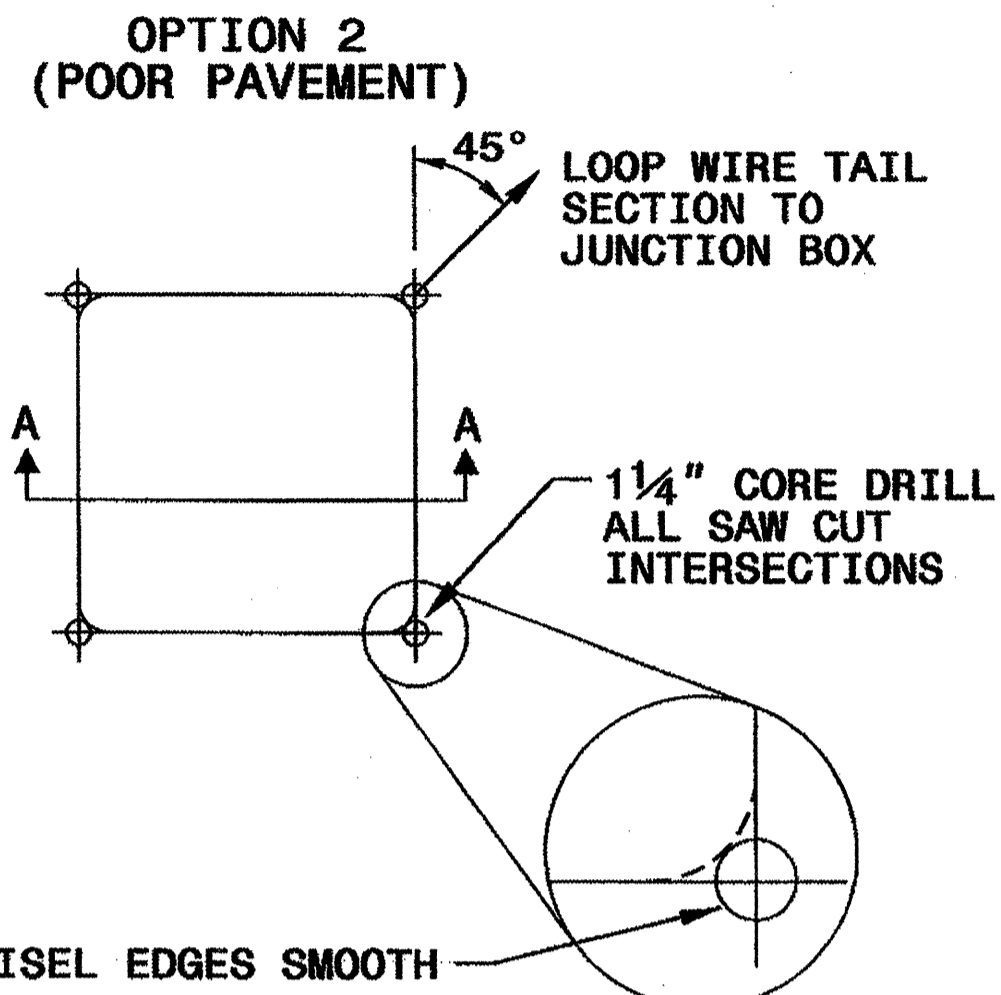
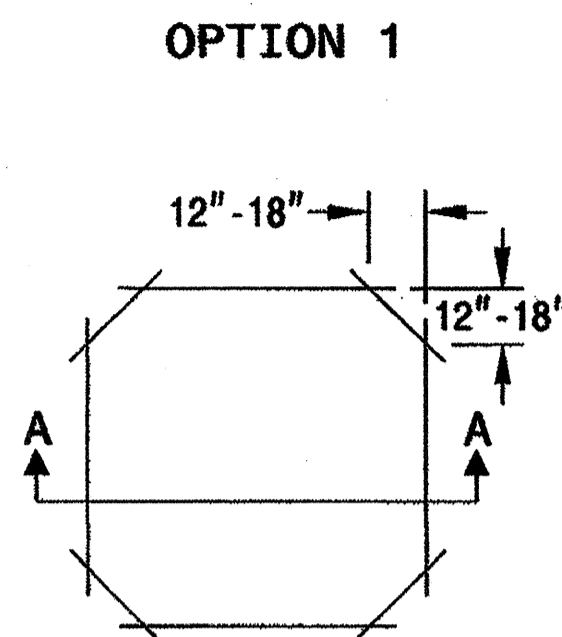
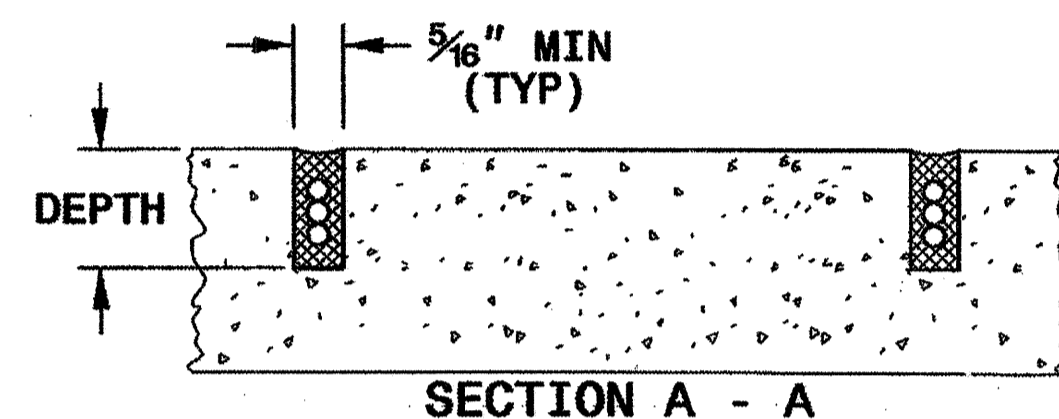
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

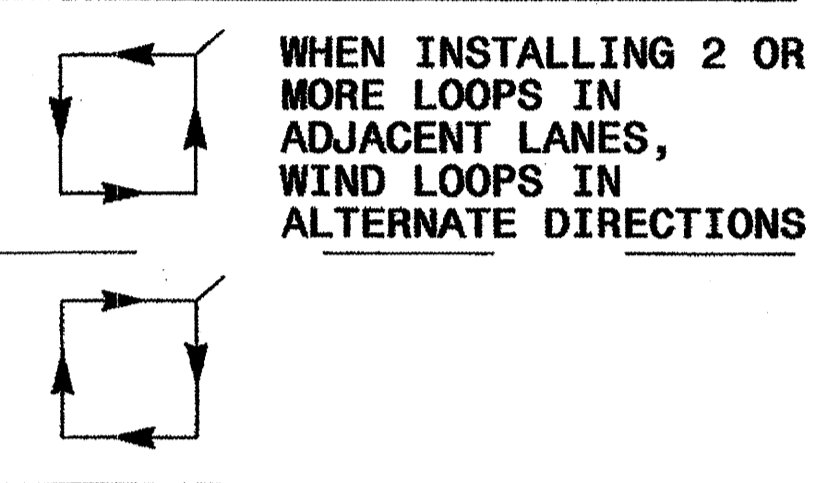
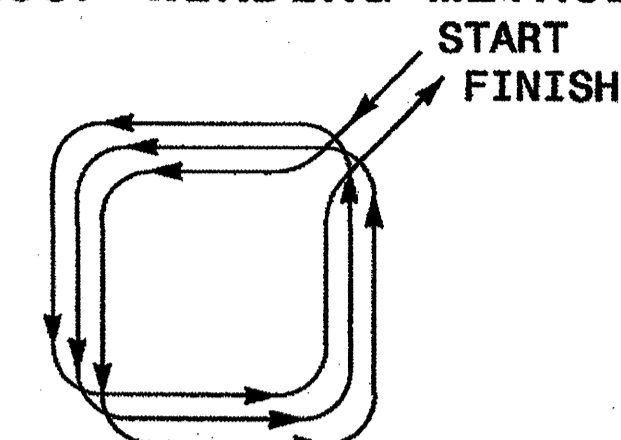
SAW CUT OPTIONS

SAW SLOT DEPTH CHART

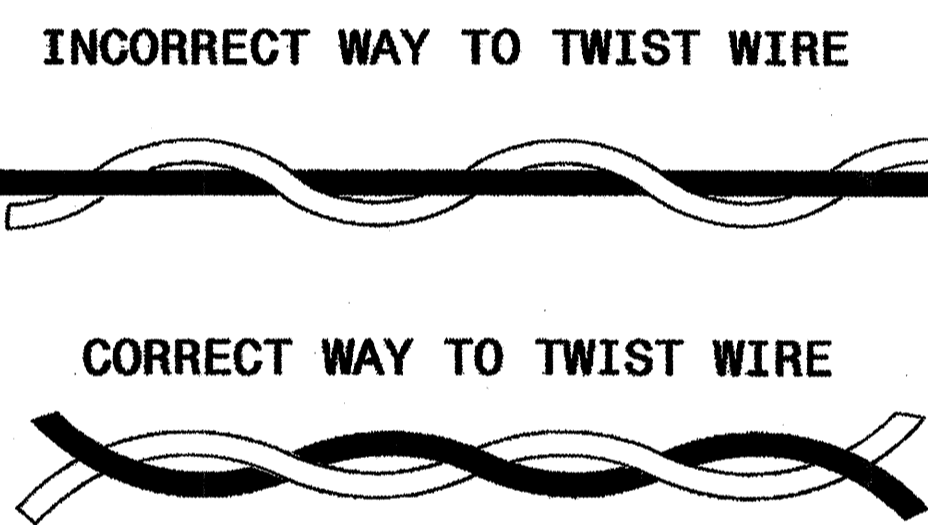
DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

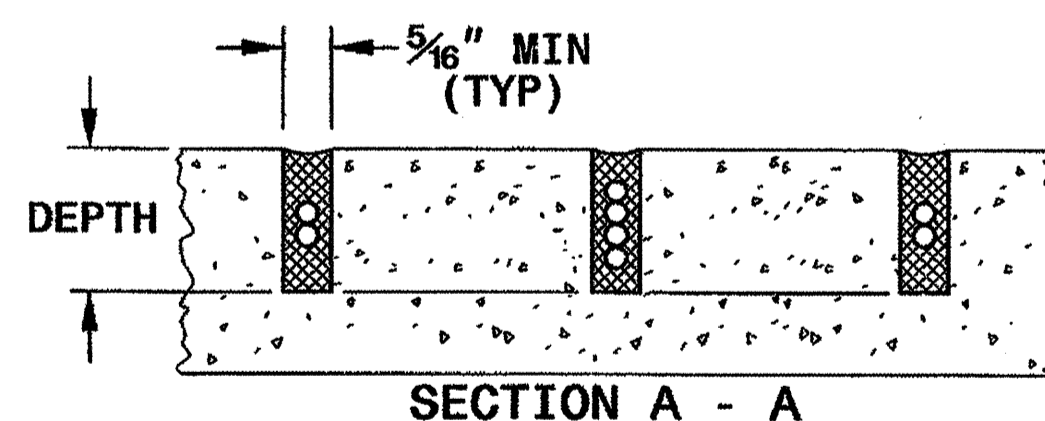
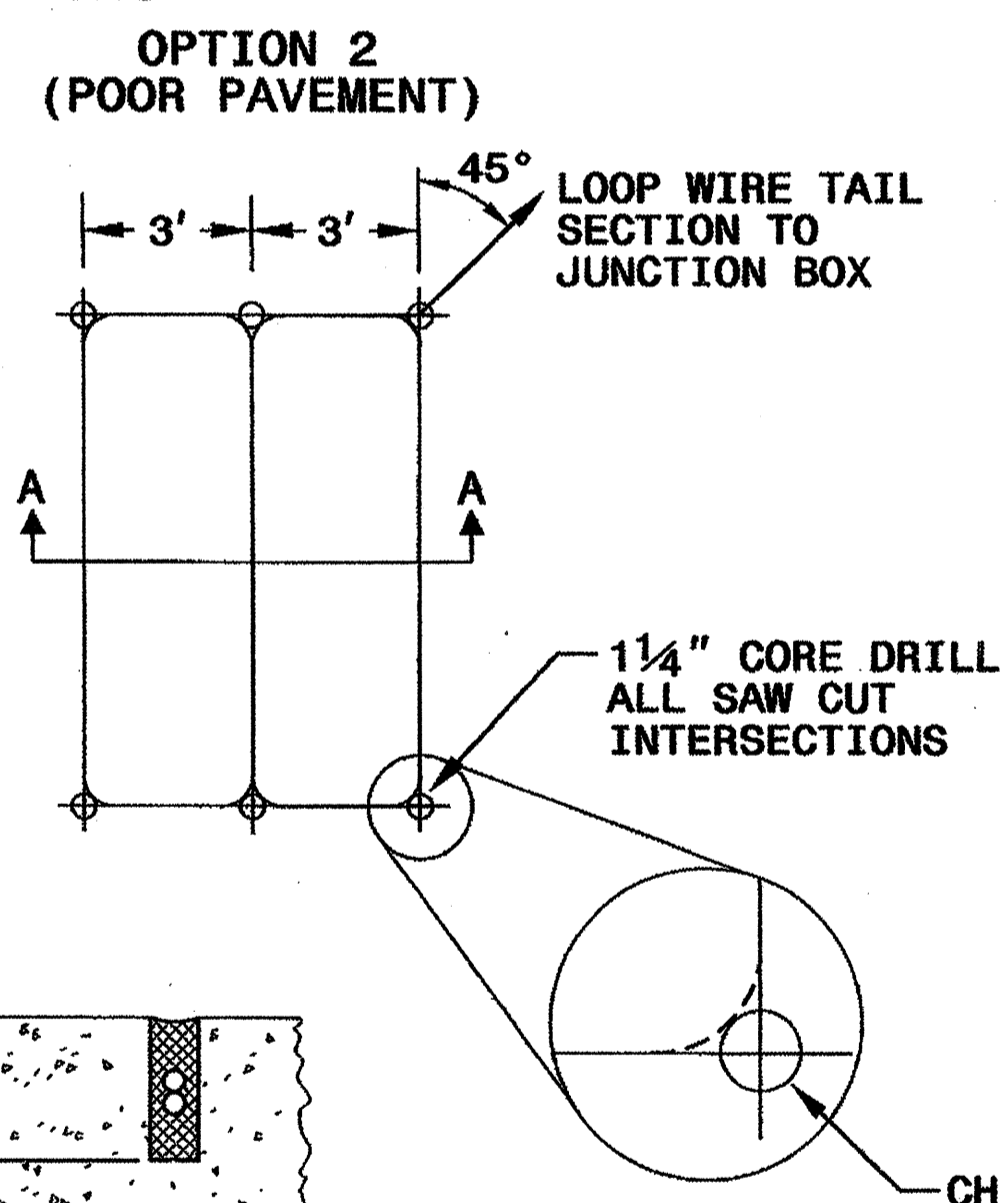
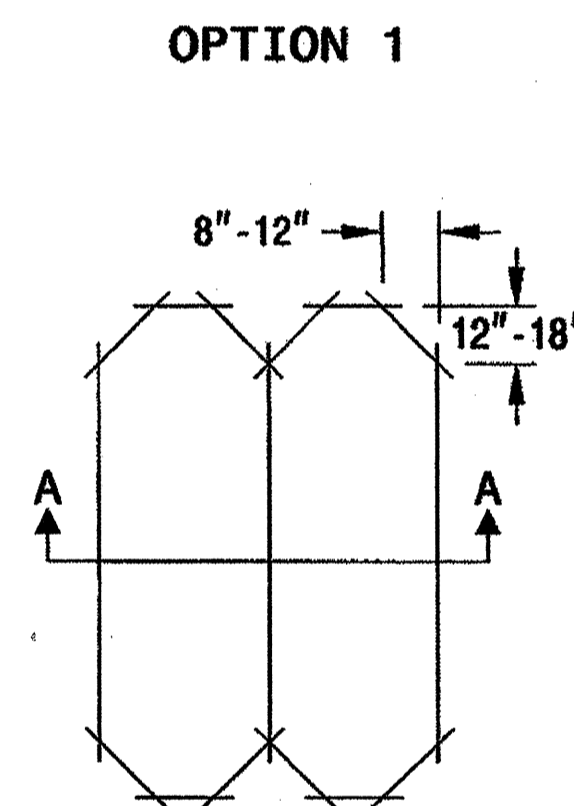


NOTES

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

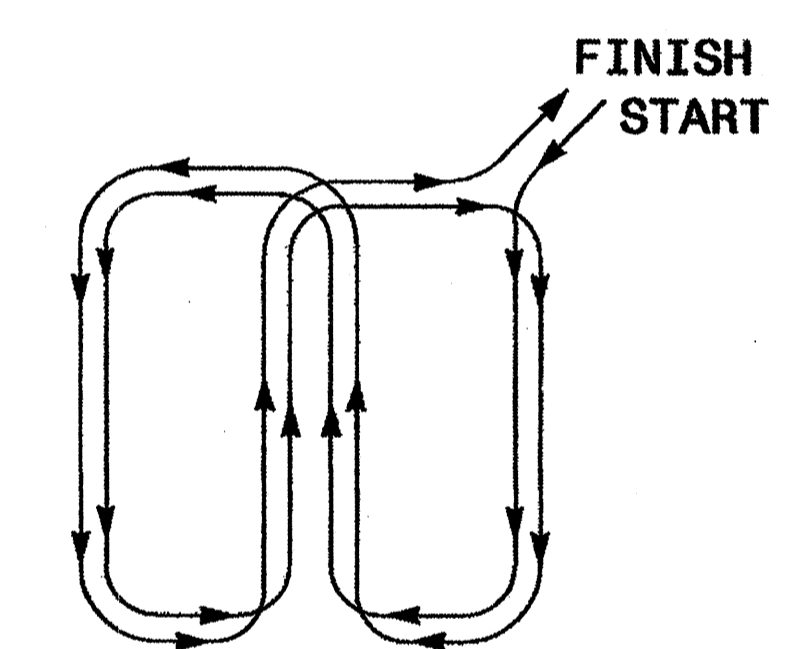
QUADRUPOLE LOOP

SAW CUT OPTIONS



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



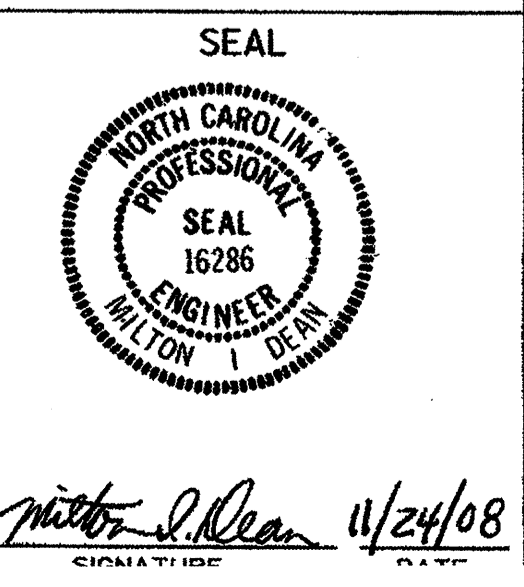
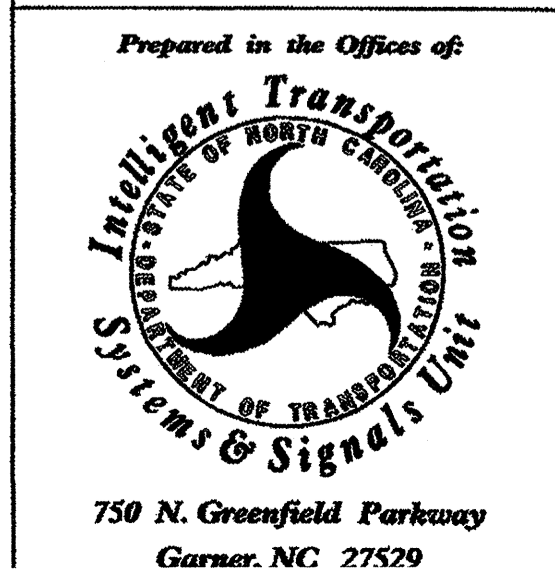
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

See Plate for Title



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11/16

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

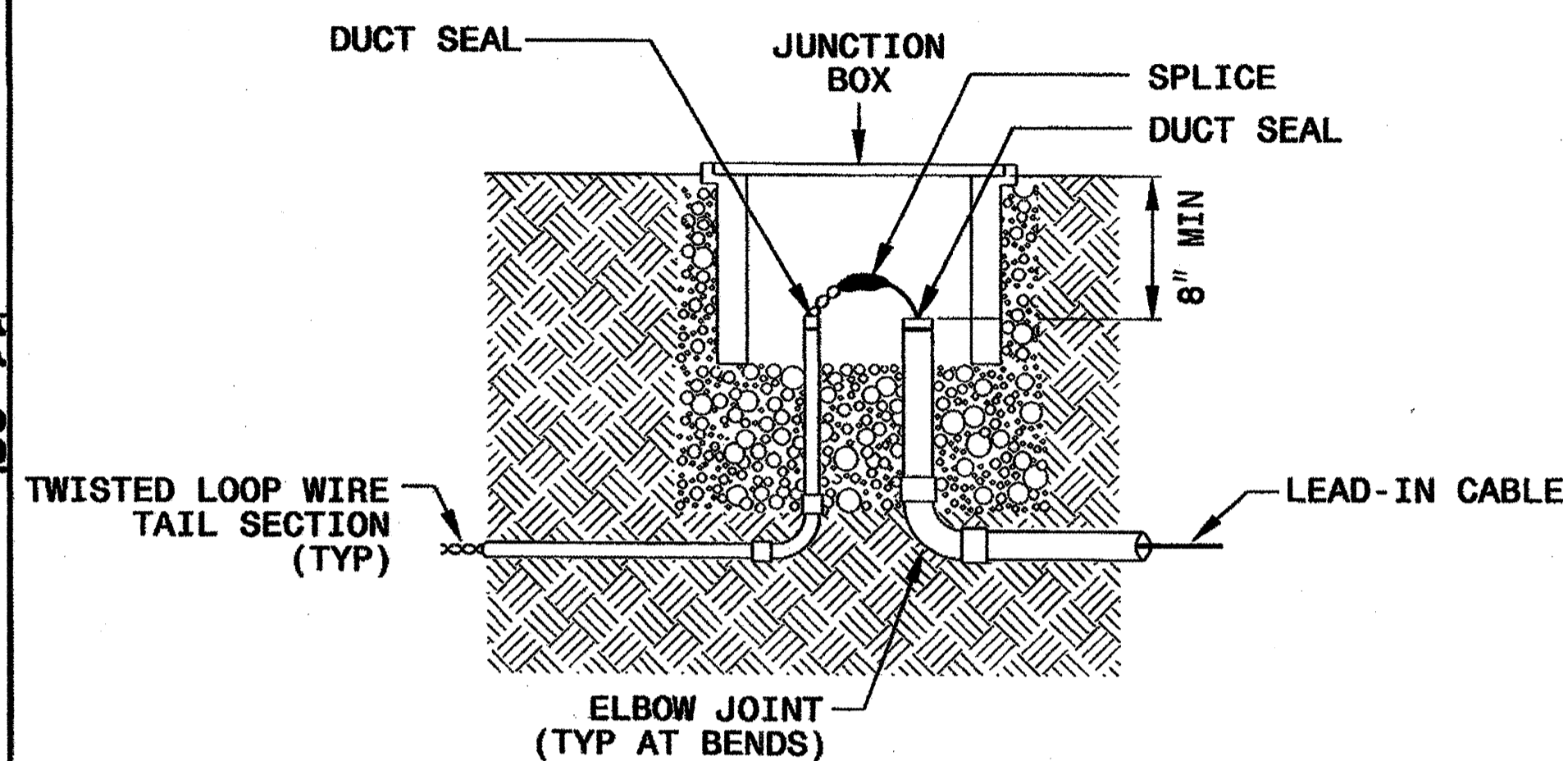
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

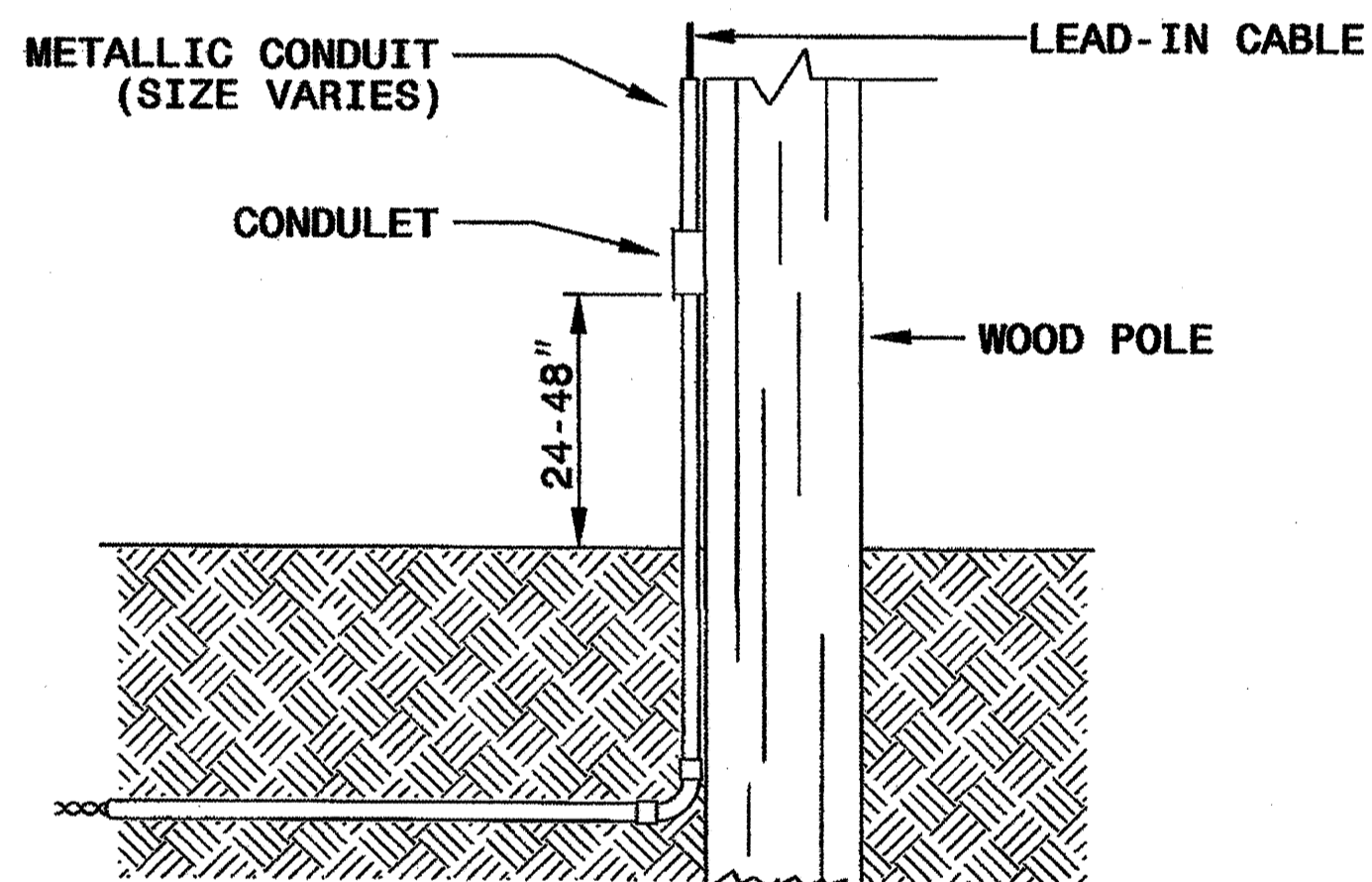
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

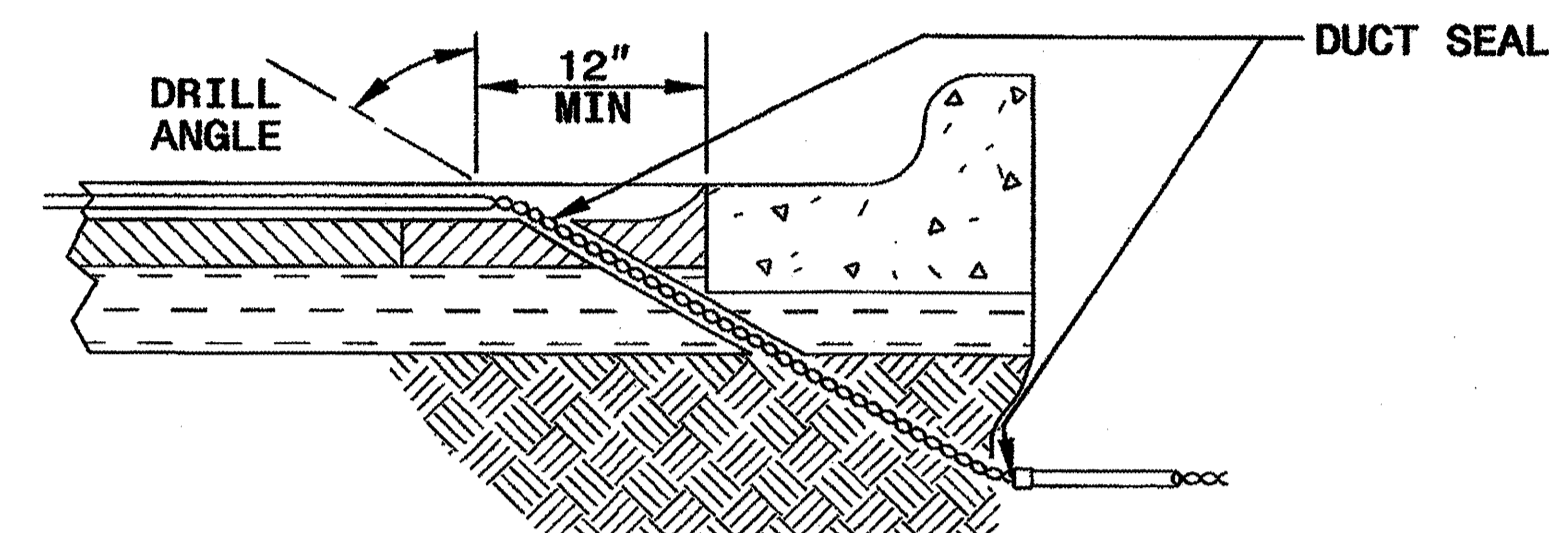


NOTE

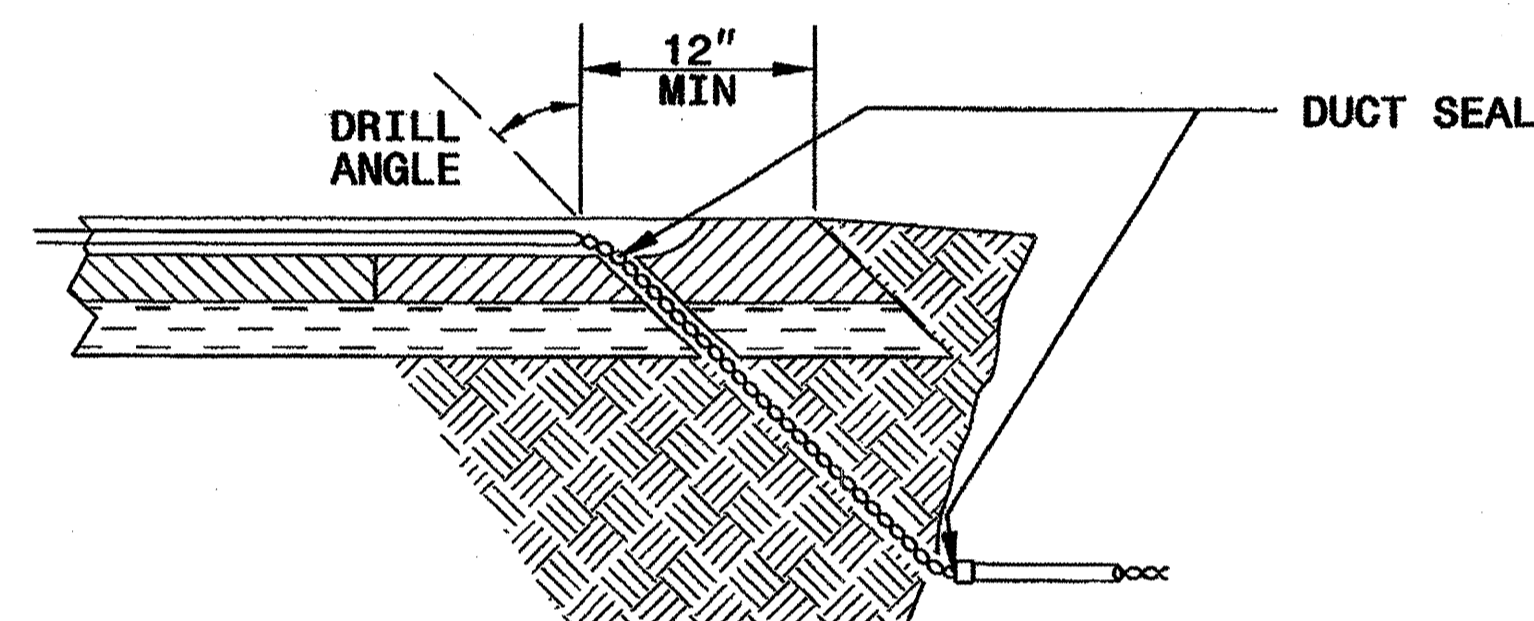
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

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

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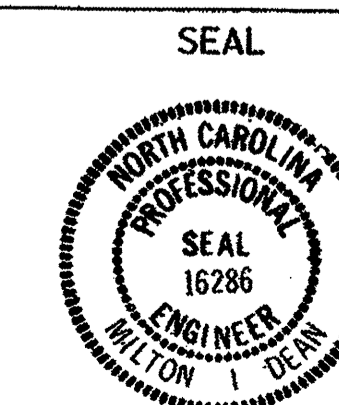
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title



750 N. Greenfield Parkway
Garner, NC 27529



Milton J. Dean 11/24/08
SIGNATURE DATE

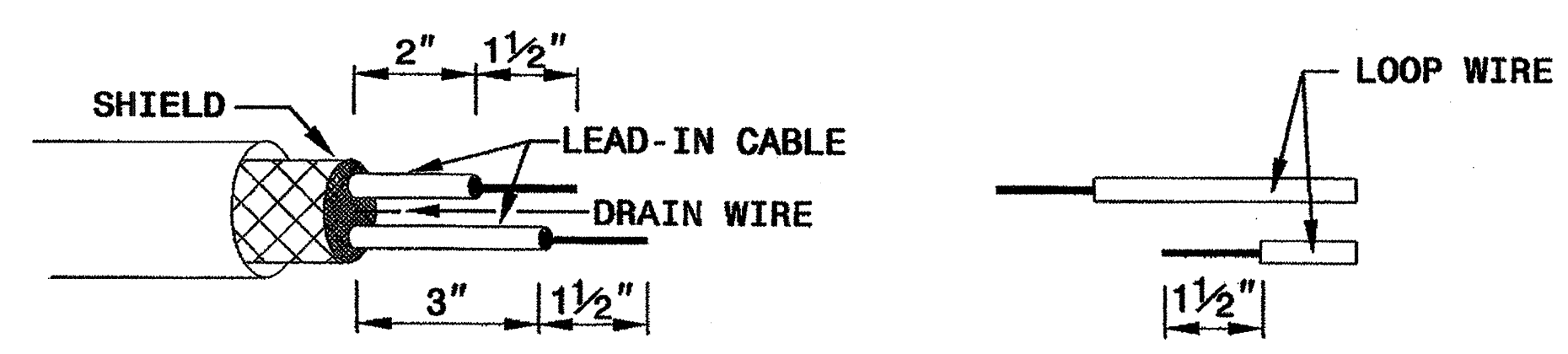
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

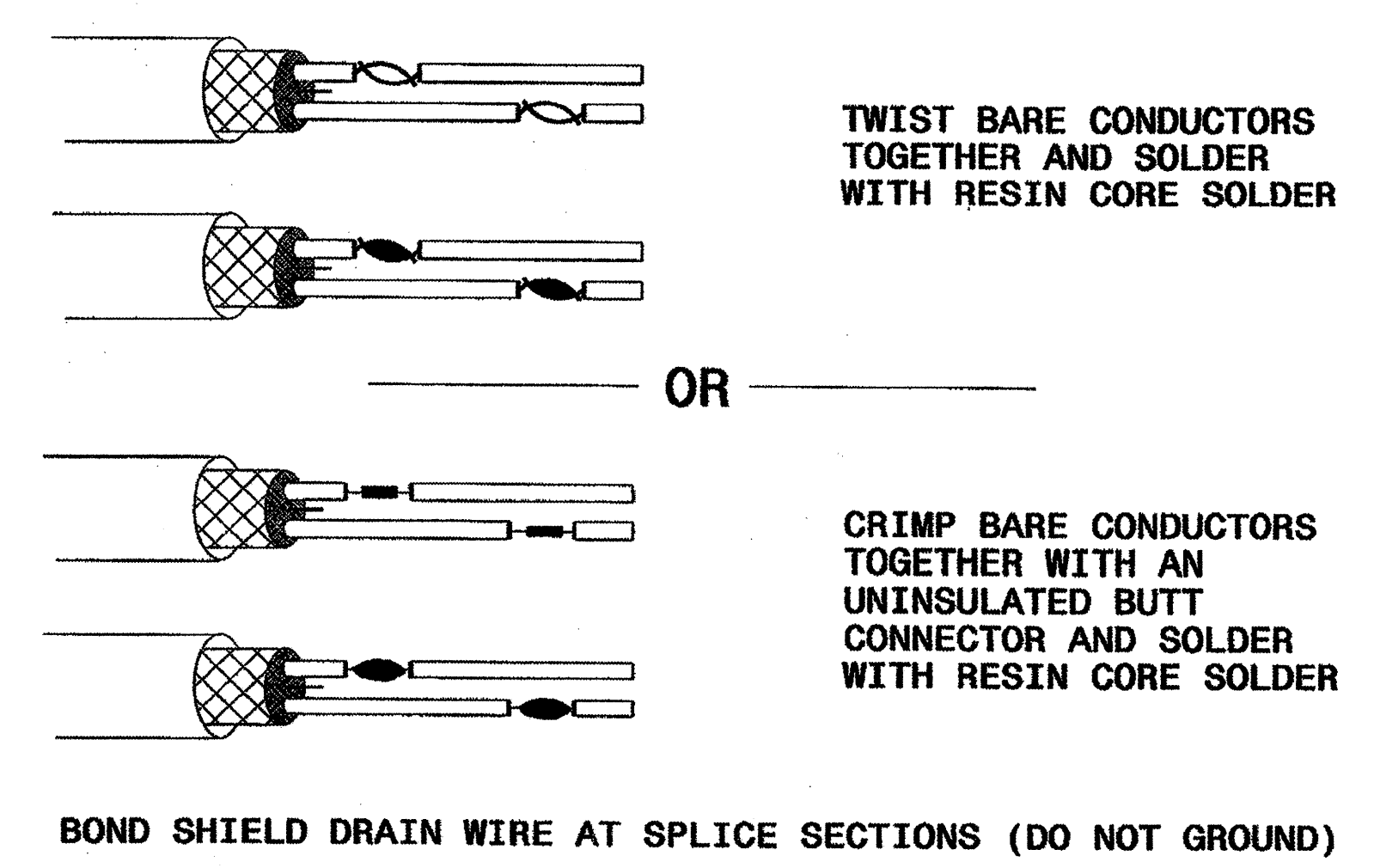
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

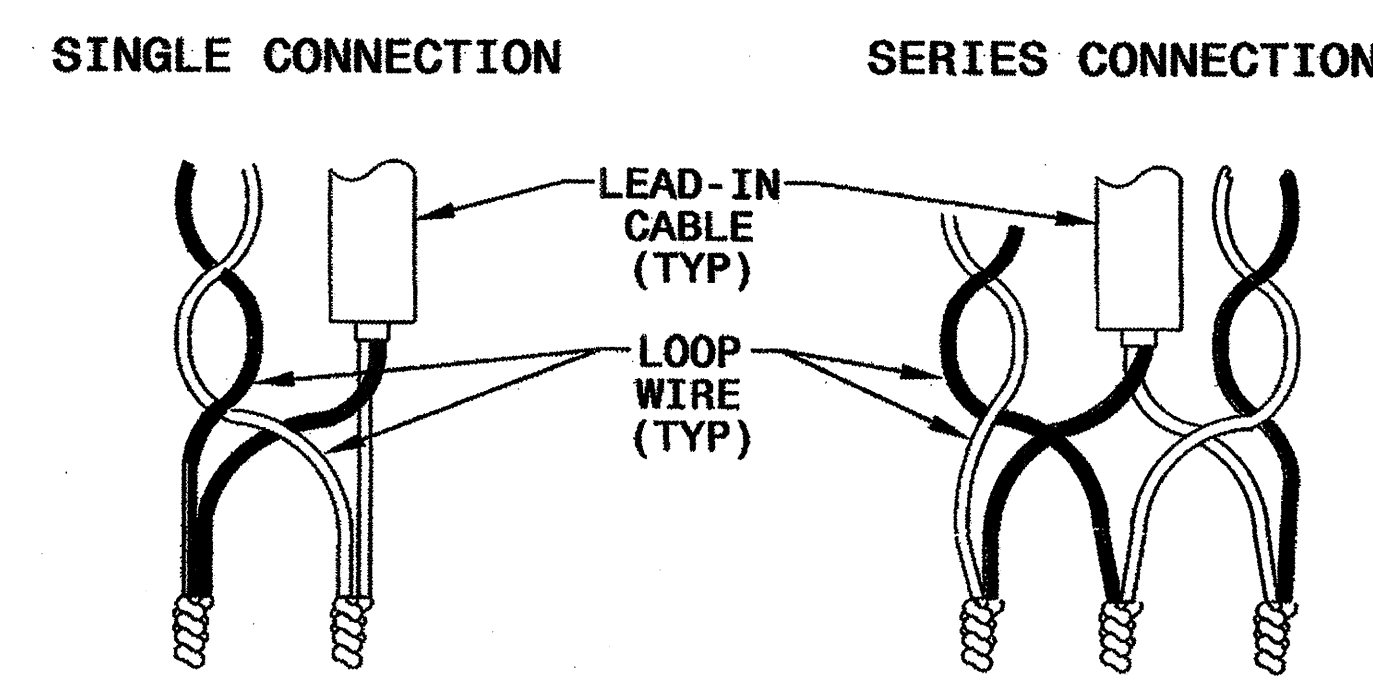
STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE



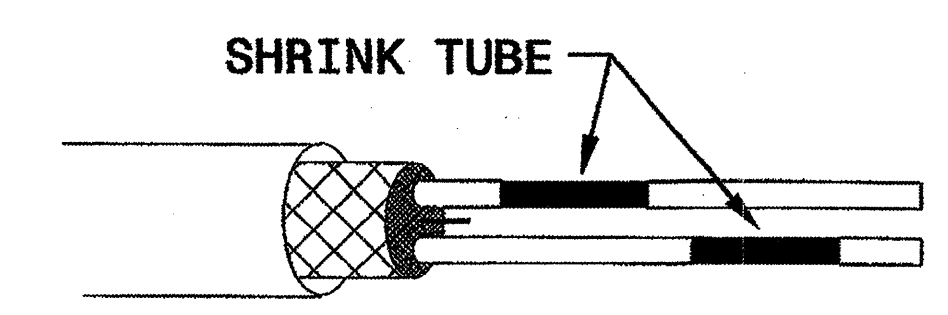
STEP 2. CONNECT AND SOLDER



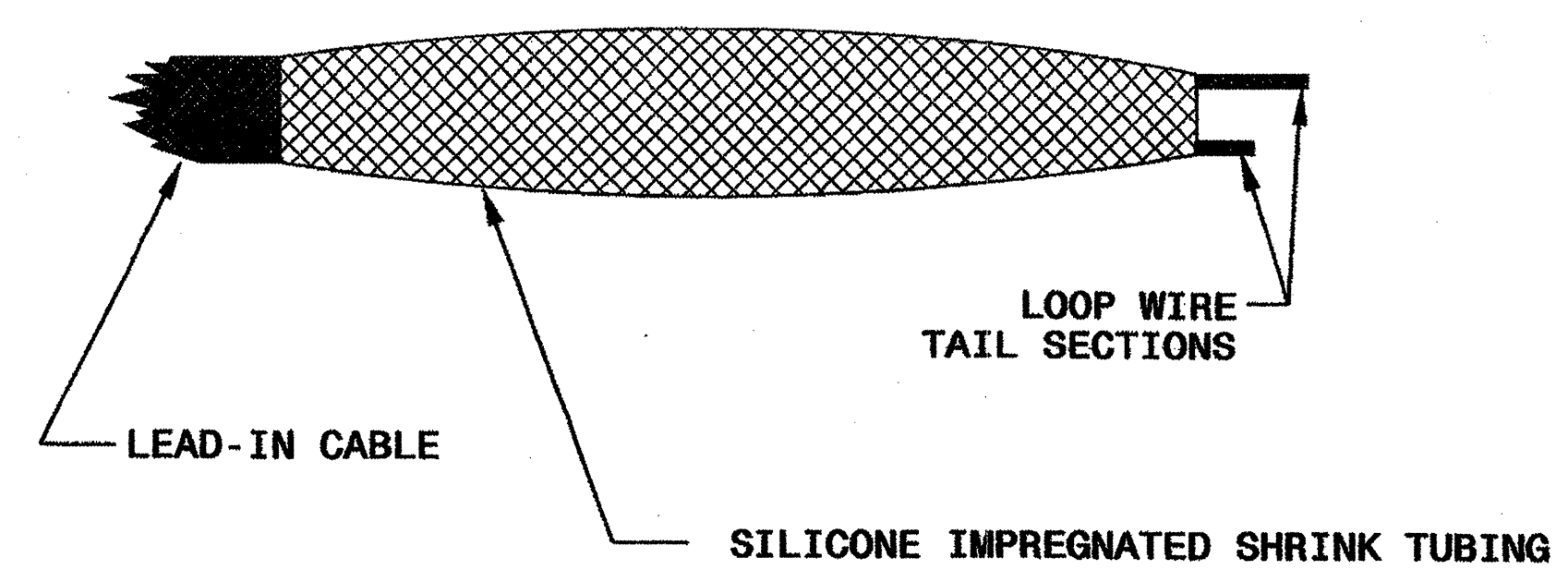
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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

11-08

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

SHEET 3 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Gurner, NC 27529

SEAL

Milton I. Dean 11/24/08

24-Nov-2008 09:36
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zmlittle