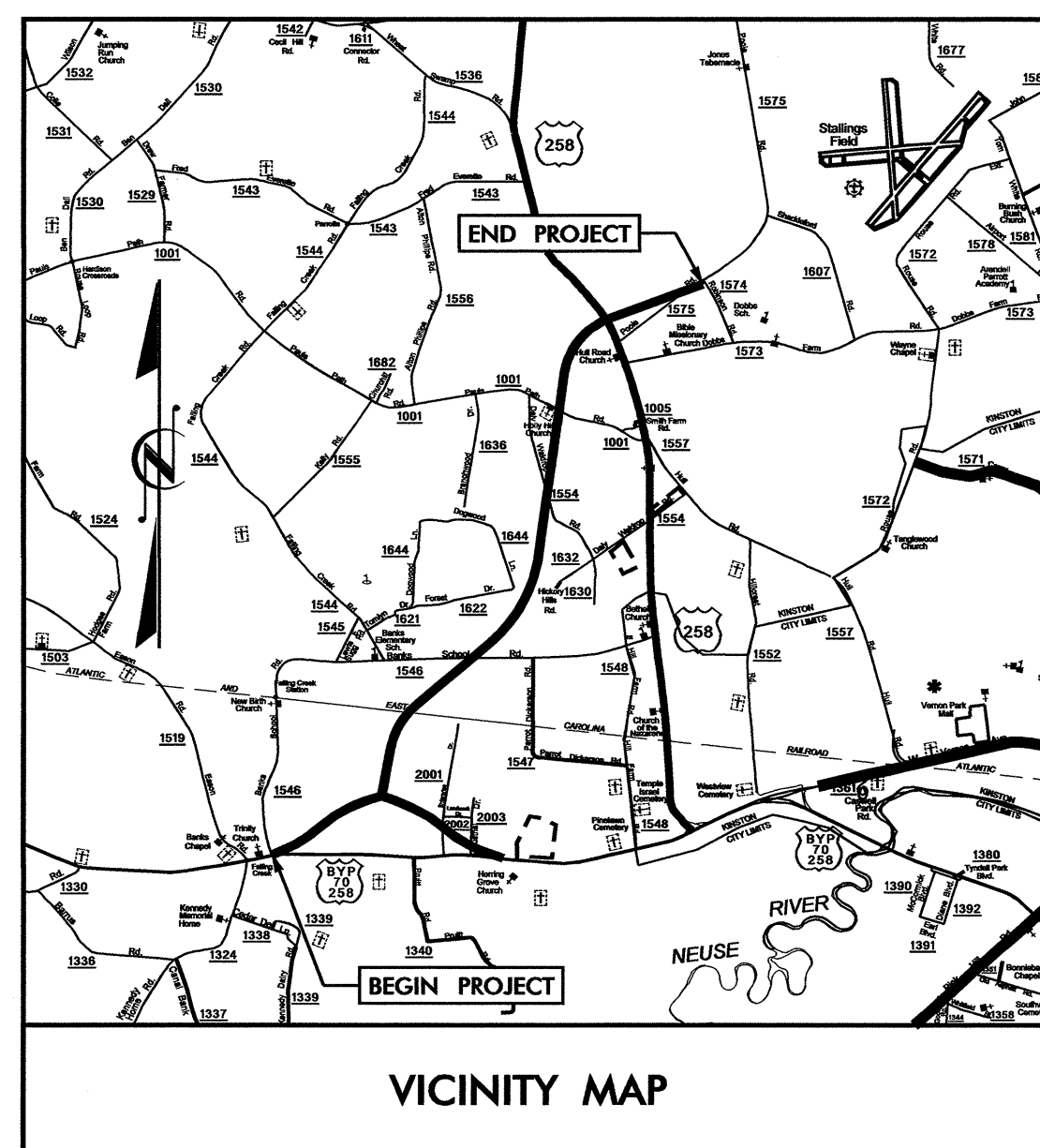


TIP: R-2719A

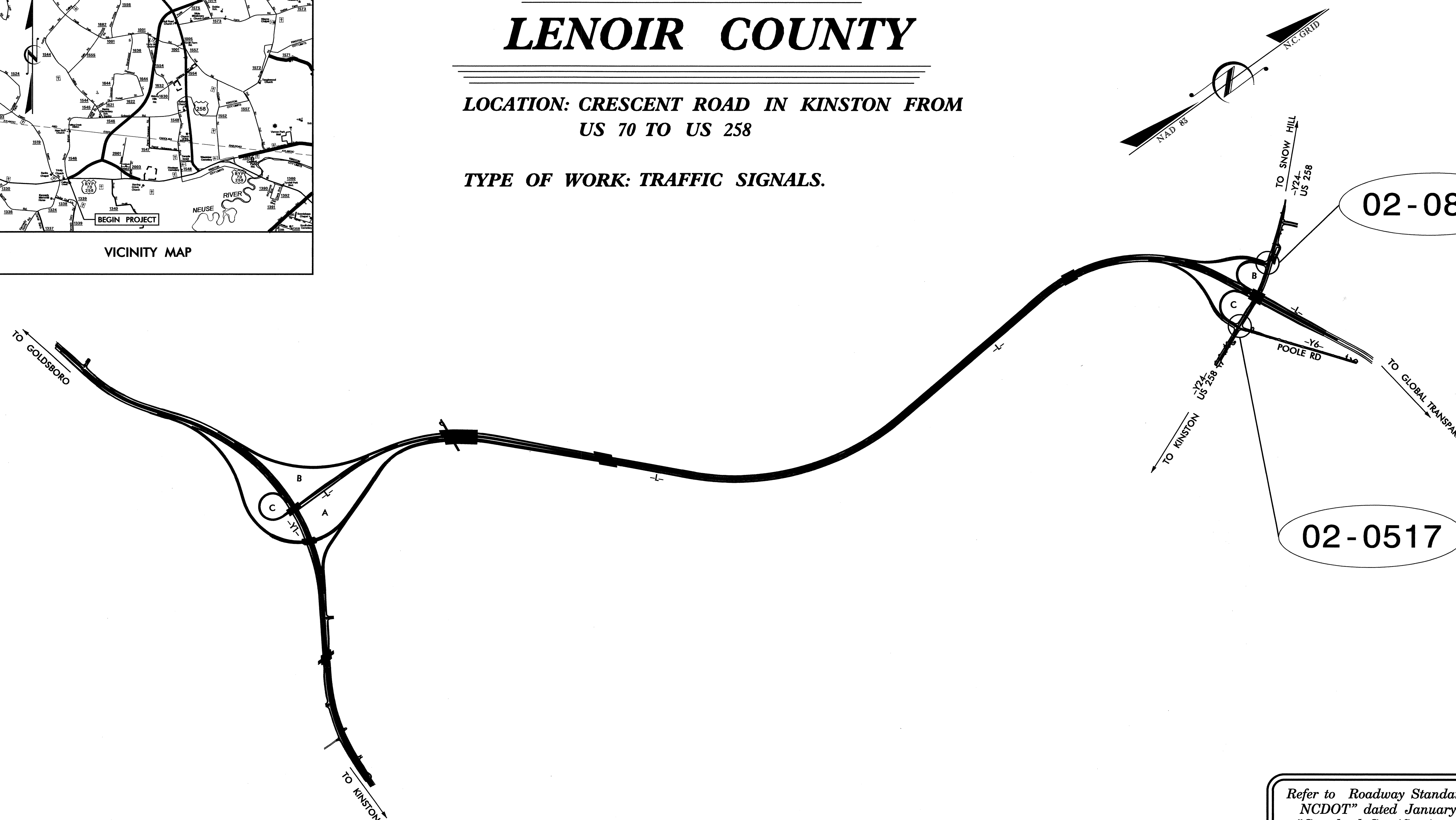


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LENOIR COUNTY

LOCATION: CRESCENT ROAD IN KINSTON FROM
US 70 TO US 258

TYPE OF WORK: TRAFFIC SIGNALS.



GRADING & STRUCTURES ONLY

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

Index of Plans

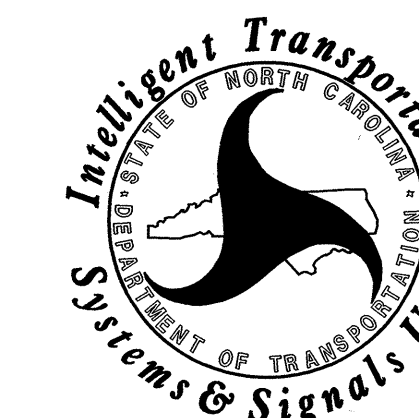
| Sheet # | Reference # | Location/Description |
|------------|-------------|---|
| Sig. 1 | | Title Sheet |
| Sig. 2-3 | 02-0890 | US 258 at Crescent Road-Ramp B |
| Sig. 4-7 | 02-0517 | US 258 at Crescent Road-Ramp C/SR 1575 (Poole Road) |
| Sig. 8-13 | N/A | Standard Drawings for Metal Poles |
| Sig. 14-18 | N/A | Communications Cable and Conduit Routing Plans |
| Sig. 19-21 | N/A | Inductive Detection Loops Details |

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Jason P. Galloway, PE - East Region Signal Project Engineer
John T. Rowe Jr., PE - Signal Equipment Design Engineer
G. G. Murr, Jr., PE - ITS Engineer

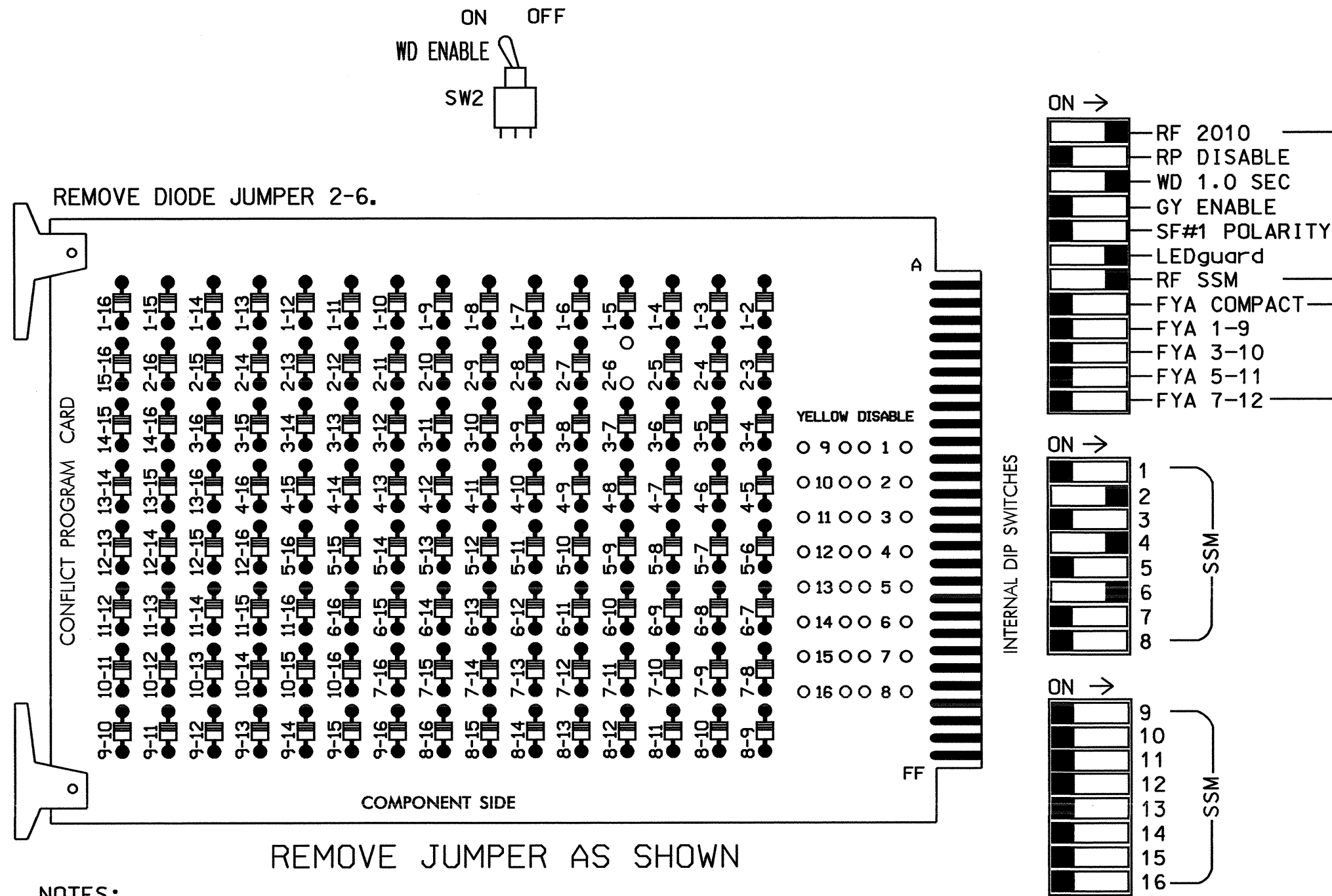
Prepared In the Office of:
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY SYSTEMS
BRANCH



750 N. Greenfield Parkway, Garner, NC 27529

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 1,3,5, 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.
- The cabinet and controller are part of the Kinston City Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
 CABINETCONTRACTOR SUPPLIED 332
 SOFTWAREECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS..18 (12-STD, 6-AUX)
 LOAD SWITCHES USED....S2,S4,S6
 PHASES USED.....2,4,6
 OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S2P | S3 | S4 | S4P | S5 | S6 | S6P | S7 | S8 | S8P | S9 | S10 | S11 | S12 | S13 | S14 | |
|-----------------|----|-------|-------|----|-----------|-------|----|-------|-------|----|----|-------|-----|-----|-------|-----|-----|-------|-----|
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | 5 | 6 | 6 PED | 7 | 8 | 8 PED | OLA | OLB | SPARE | OLC | OLD | SPARE | |
| SIGNAL HEAD NO. | NU | 21,22 | NU | NU | 41, 42,43 | NU | NU | 61,62 | NU | NU | NU | NU | NU | NU | NU | NU | NU | NU | |
| RED | | 128 | | | | | | 134 | | | | | | | | | | | |
| YELLOW | | 129 | | | | | | 135 | | | | | | | | | | | |
| GREEN | | 130 | | | | | | 136 | | | | | | | | | | | |
| RED ARROW | | | | | | | | | | | | | | | | | | 101 | |
| YELLOW ARROW | | | | | | | | | | | | | | | | | | | 102 |
| GREEN ARROW | | | | | | | | | | | | | | | | | | | 103 |

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|----------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 2B | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | |
| 4C | TB6-1,2 | I7U | 65 | 27 | 34 | 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 | | | |

INPUT FILE POSITION LEGEND: J2L

FILE J
 SLOT 2
 LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 02-0890
 DESIGNED: January 2009
 SEALED: 01/26/09
 REVISED: N/A

28-JAN-2009 11:49 s**t*s:6:ignl S**w**r**g**o**p**e**s**g** m**n**e**r**t**t**o**k**i**o**n**o**0**0**9**0**s**m**e**l**e**t**a...120**e**s**t**o**n...d**g**n
 G:\SIGNAL\2009\02\0890\02-0890-01.dwg

New Installation - Final (Grading Only)

| | | | |
|---|---|---|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 750 N. Greenfield Place, Garner, NC 27529 | US 258 at Crescent Road-Ramp B | | SEAL GEORGE C. BROWN PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA License No. 12869 |
| | Division 2 PLAN DATE: January 2009 PREPARED BY: C. Strickland | Lenoir County Kinston REVIEWED BY: T. J. G. REVIEWED BY: | |

SIG. INVENTORY NO. 02-0890

PHASING DIAGRAM

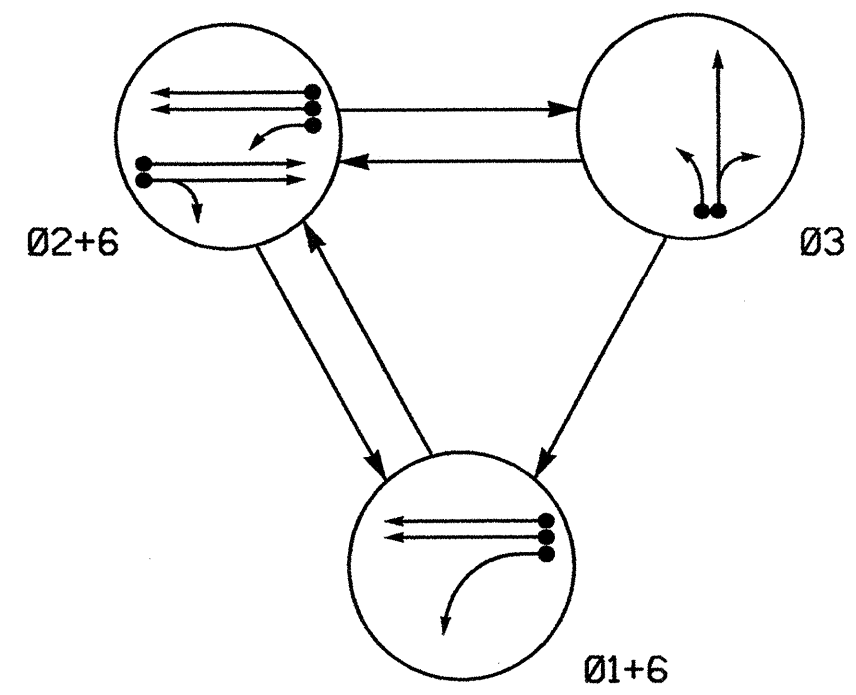
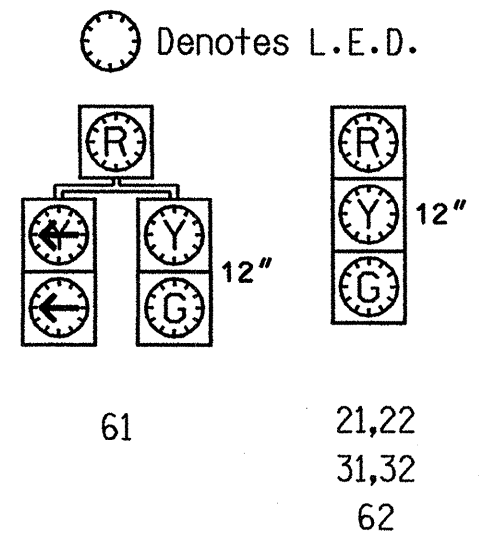


TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|---------|---------|-----|-----------|
| | Ø 1 + 6 | Ø 2 + 6 | Ø 3 | F LECTIVE |
| 21,22 | R | G | R | Y |
| 31,32 | R | R | G | R |
| 61 | - | G | R | Y |
| 62 | G | G | 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 | +5 | 2-4-2 | Y | 1 | Y | Y | - | - | 20 | - | Y |
| 2A | 6X6 | 300 | 5 | Y | 2 | Y | Y | - | - | - | - | Y |
| 2B | 6X6 | 300 | 5 | Y | 2 | Y | Y | - | - | - | - | Y |
| 3A | 6X40 | +5 | 2-4-2 | Y | 3 | Y | Y | - | - | - | - | Y |
| 3B | 6X40 | +5 | 2-4-2 | Y | 3 | Y | Y | - | - | 10 | - | Y |
| 3C | 6X15 | +10 | 4 | Y | 3 | Y | Y | - | - | 15 | - | Y |
| 6A | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | Y |
| 6B | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | Y |

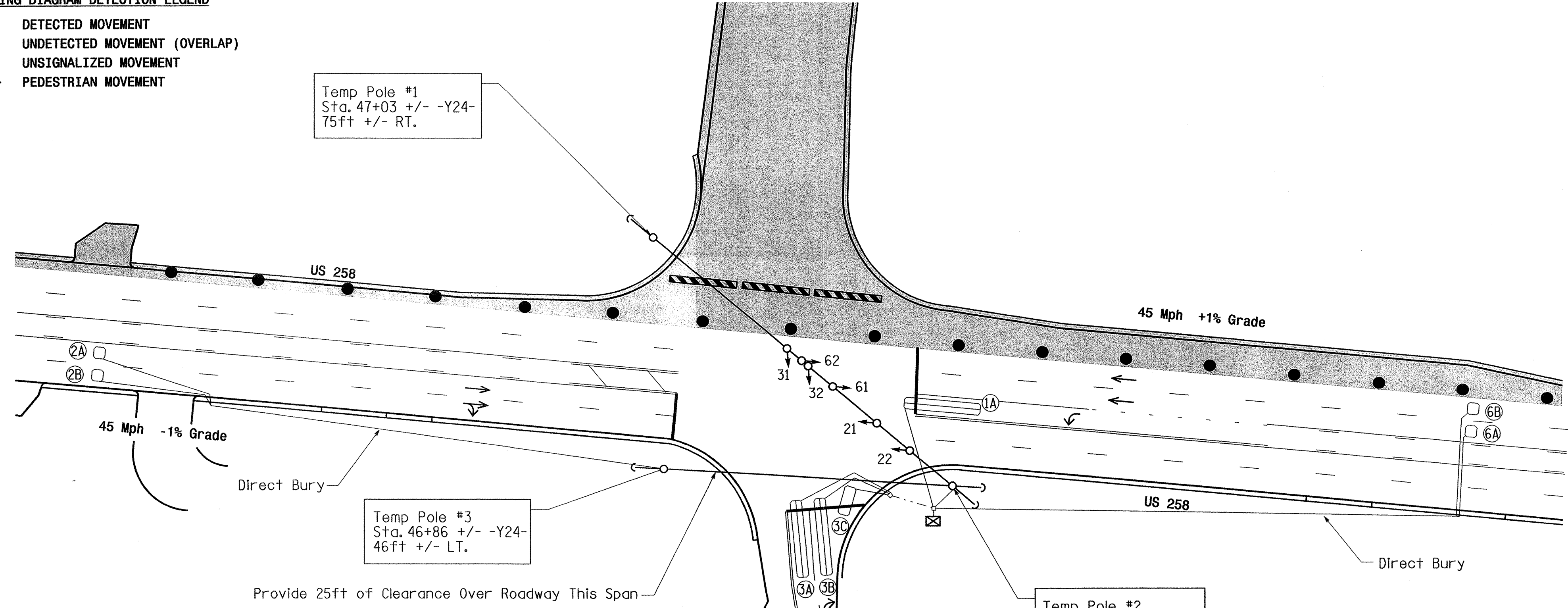
3 Phase Fully Actuated Isolated

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. Phase 1 may be lagged.
- 4. Set all detector units to presence mode.
- 5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.

PHASING DIAGRAM DETECTION LEGEND

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



2070L TIMING CHART

| FEATURE | PHASE | | | |
|-------------------------|-------|------------|-----|------------|
| | 1 | 2 | 3 | 6 |
| Min Green 1 * | 7 | 12 | 7 | 12 |
| Extension 1 * | 2.0 | 6.0 | 2.0 | 6.0 |
| Max Green 1 * | 20 | 90 | 25 | 90 |
| Yellow Clearance | 3.0 | 4.6 | 3.0 | 4.4 |
| Red Clearance | 2.8 | 1.6 | 2.8 | 1.6 |
| Walk 1 * | - | - | - | - |
| Don't Walk 1 | - | - | - | - |
| Seconds Per Actuation * | - | 1.8 | - | 1.8 |
| 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.

LEGEND

- | | |
|-----------------|-----------------|
| PROPOSED | EXISTING |
| ○ | ● |
| ⊕ | N/A |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| ⊕ | ⊕ |
| N/A | --- |
| → | → |
| → | → |
| ▒ | ▒ |
| ▒ | ▒ |

New Installation - Phase II Step 2

US 258
At
Crescent Road - Ramp C
SR 1575 (Poole Road)

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
29904

Division 2 Lenoir County Kinston

PLAN DATE: January 2009 REVIEWED BY: PLA

PREPARED BY: JPG REVIEWED BY:

SCALE 0 40
1" = 40'

REVISIONS INIT. DATE

750 N. Greenfield Place, Garner, NC 27529

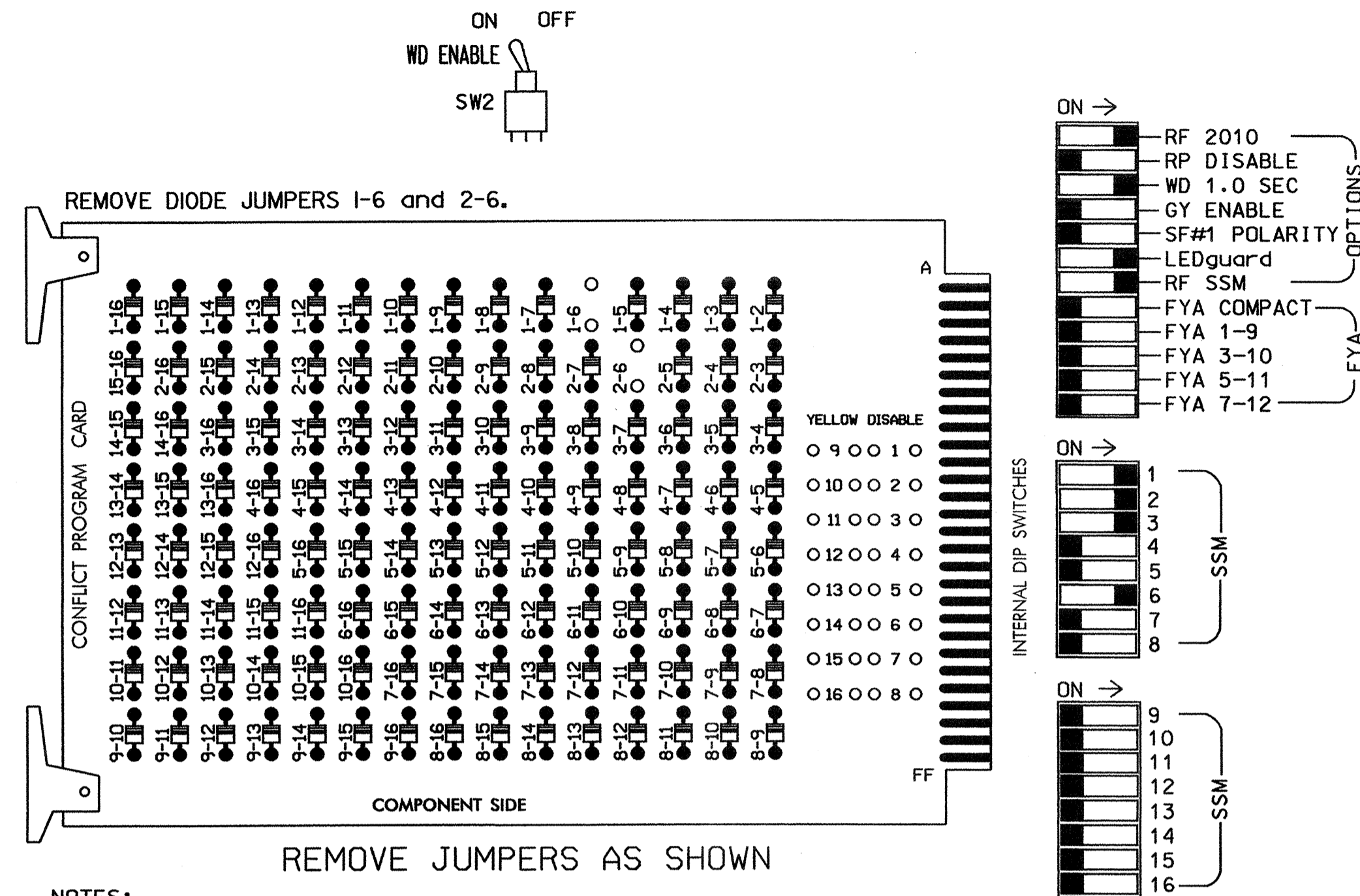
1/21/09

SIG. INVENTORY NO. 02-0517T

23-JAN-2009 16:48 s:\1114\signal\work\graves\1114\project\2719\sig\02-0517\sig_dsn_2009mod.dgn gollway

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 4,5,7,8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. 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,S3,S6
 PHASES USED.....1,2,3,6
 OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

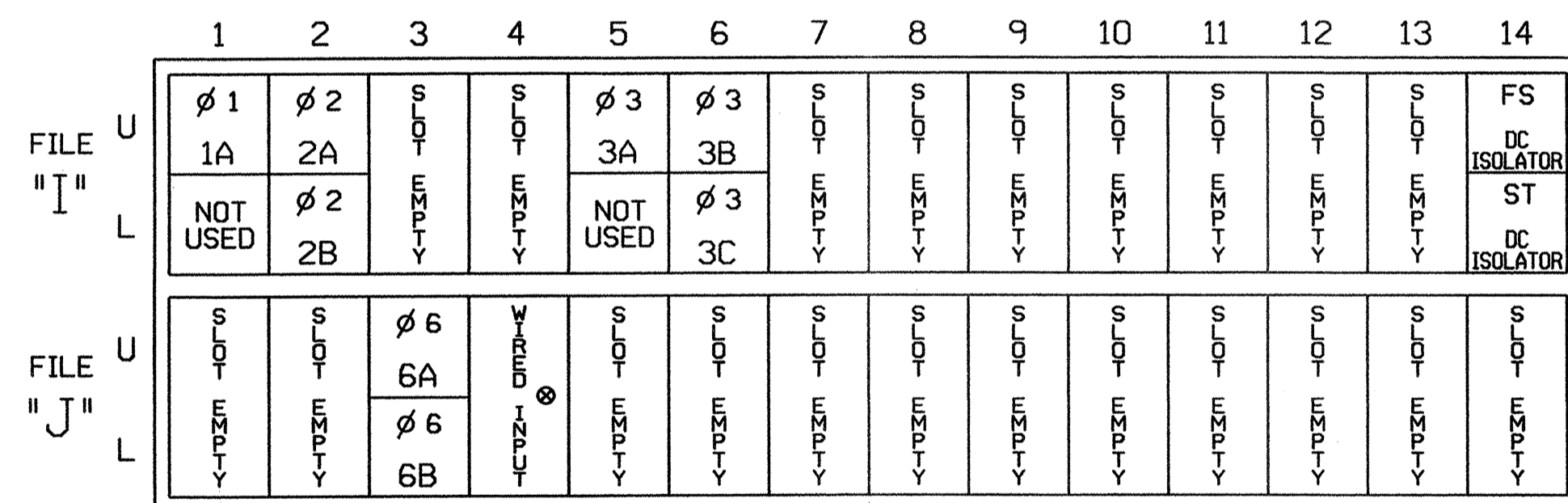
| LOAD SWITCH NO. | S1 | S2 | S2P | S3 | S4 | S4P | S5 | S6 | S6P | S7 | S8 | S8P |
|-----------------|-----|-------|-------|-------|----|-------|----|-------|-------|----|----|-------|
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | 5 | 6 | 6 PED | 7 | 8 | 8 PED |
| SIGNAL HEAD NO. | 61 | 21,22 | NU | 31,32 | NU | NU | NU | 61,62 | NU | NU | NU | NU |
| RED | * | 128 | | 116 | | | | 134 | | | | |
| YELLOW | | 129 | | 117 | | | | 135 | | | | |
| GREEN | | 130 | | 118 | | | | 136 | | | | |
| RED ARROW | | | | | | | | | | | | |
| YELLOW ARROW | 126 | | | | | | | | | | | |
| GREEN ARROW | 127 | | | | | | | | | | | |

NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

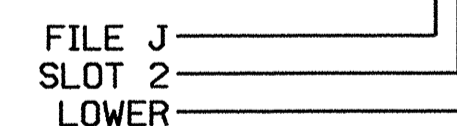
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 20 |
| | | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 2B | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 3A | TB4-5,6 | I5U | 58 | 20 | 3 | 3 | Y | Y | | | |
| 3B | TB4-9,10 | I6U | 41 | 3 | 4 | 3 | Y | Y | | | 10 |
| 3C | TB4-11,12 | I6L | 45 | 7 | 14 | 3 | 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 | | | |

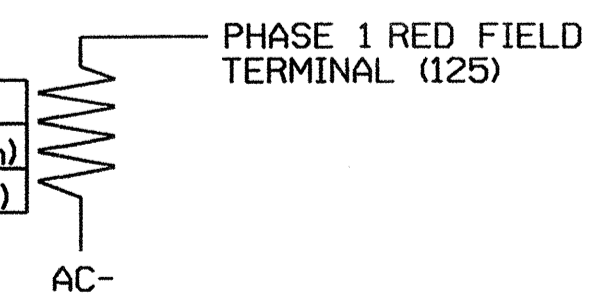
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

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

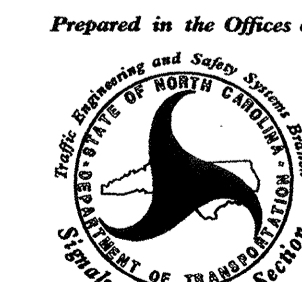


NOTE: The purpose of this resistor is to load the channel red monitor input in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 02-0517T
 DESIGNED: January 2009
 SEALED: 01/21/09
 REVISED: N/A

New Installation - Phase II Step 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

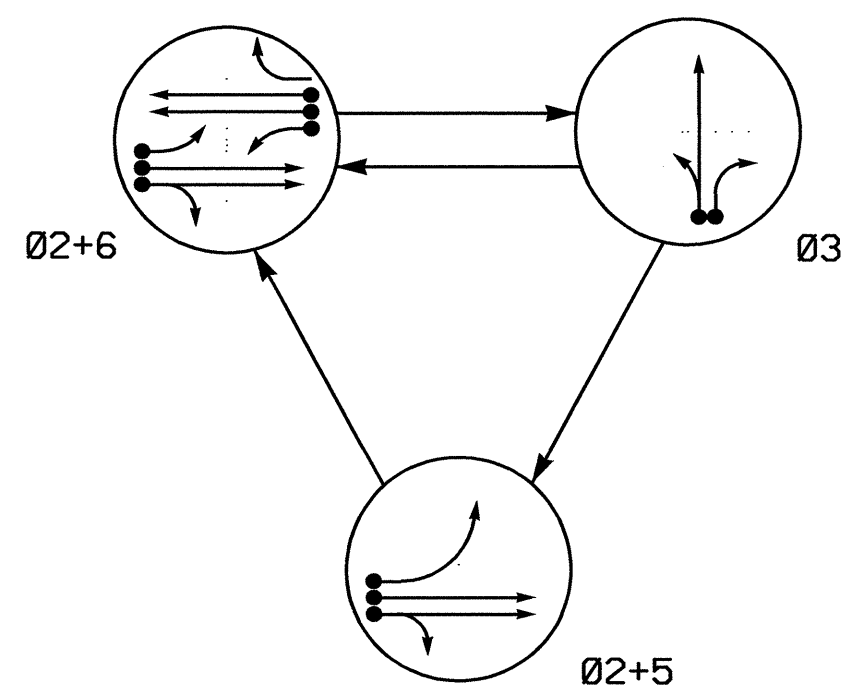


750 N. Greenfield Place, Garner, NC 27529

| | |
|---|-----------------------|
| US 258 at Crescent Road - Ramp C SR 1575 (Poole Road) | |
| Division 2 | Lenoir County Kinston |
| PLAN DATE: January 2009 | REVIEWED BY: T. J. J. |
| PREPARED BY: C. Strickland | REVIEWED BY: |
| REVISIONS | INIT. DATE |

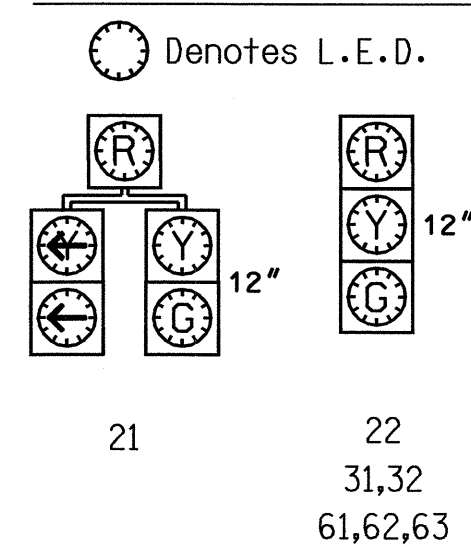
SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 022013
 ENGINEER
 GEORGE C. BROWN
 SIGNATURE DATE 1/22/09
 SIG. INVENTORY NO. 02-0517T

PHASING DIAGRAM



| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|----|-------|
| | 02+5 | 02+6 | 03 | FLUSH |
| 21 | G | G | R | Y |
| 22 | G | G | R | Y |
| 31,32 | R | R | G | R |
| 61,62,63 | R | G | R | Y |

SIGNAL FACE I.D.



2070L LOOP & DETECTOR INSTALLATION

| LOOP | INDUCTIVE LOOPS | | | | DETECTOR PROGRAMMING | | | | | | | |
|------|-----------------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| 2A | 6X6 | 300 | 5 | Y | 2 | Y | Y | - | - | - | - | - |
| 2B | 6X6 | 300 | 5 | Y | 2 | Y | Y | - | - | - | - | - |
| 3A | 6X40 | +5 | 2-4-2 | - | 3 | Y | Y | - | - | - | - | - |
| 3B | 6X40 | +5 | 2-4-2 | - | 3 | Y | Y | - | - | 10 | - | - |
| 3C | 6X15 | +10 | 4 | - | 3 | Y | Y | - | - | 15 | - | - |
| 5A | 6X40 | +5 | 2-4-2 | Y | 5 | Y | Y | - | - | 15 | - | Y |
| 6A | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | - |
| 6B | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | - |
| 6C | 6X40 | +5 | 2-4-2 | Y | 6 | Y | Y | - | - | 3 | - | - |

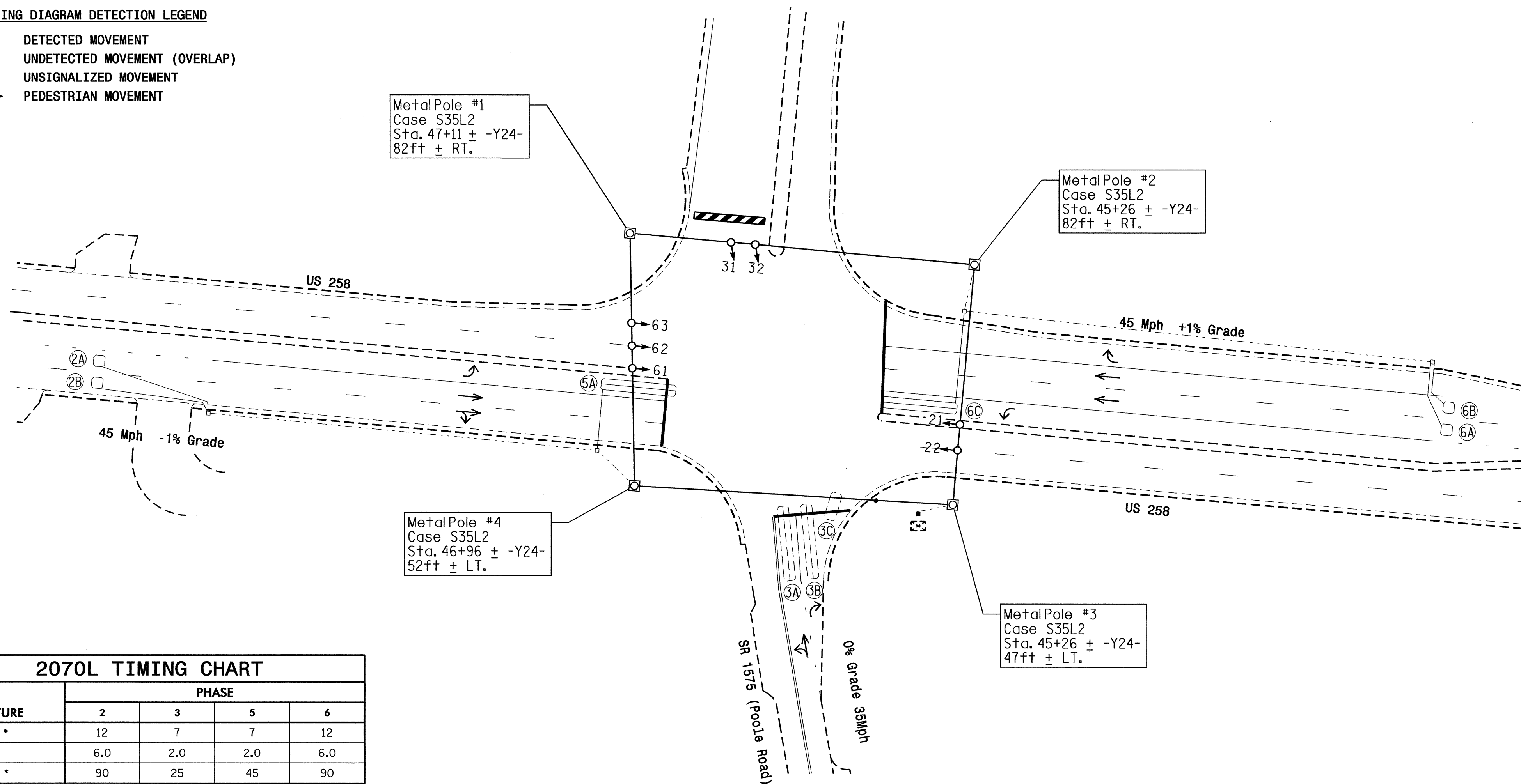
3 Phase Fully Actuated Kinston City Signal System

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. Omit phase 5 during phase 6 on.
4. Program controller to clear from phase 2+6 to phase 2+5 by progressing through phase 3 (see Electrical Details).
5. Set all detector units to presence mode.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #0517.

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT



| FEATURE | PHASE | | | |
|-------------------------|------------|-----|-----|------------|
| | 2 | 3 | 5 | 6 |
| Min Green 1 * | 12 | 7 | 7 | 12 |
| Extension 1 * | 6.0 | 2.0 | 2.0 | 6.0 |
| Max Green 1 * | 90 | 25 | 45 | 90 |
| Yellow Clearance | 4.6 | 3.8 | 3.0 | 4.4 |
| Red Clearance | 1.6 | 2.3 | 2.8 | 1.5 |
| Walk 1 * | - | - | - | - |
| Don't Walk 1 | - | - | - | - |
| Seconds Per Actuation * | 1.8 | - | - | 1.8 |
| Max Variable Initial * | 34 | - | - | 34 |
| Time Before Reduction * | 15 | - | - | 15 |
| Time To Reduce * | 30 | - | - | 30 |
| Minimum Gap | 3.0 | - | - | 3.0 |
| Recall Mode | MIN RECALL | - | - | MIN RECALL |
| Vehicle Call Memory | 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

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → Traffic Signal Head |
| ○ → Modified Signal Head | N/A |
| ○ → Sign | N/A |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → Pedestrian Signal Head With Push Button & Sign |
| ○ → Signal Pole with Guy | ○ → Signal Pole with Guy |
| ○ → Signal Pole with Sidewalk Guy | ○ → Signal Pole with Sidewalk Guy |
| ○ → Inductive Loop Detector | ○ → Inductive Loop Detector |
| ○ → Controller & Cabinet Junction Box | ○ → Controller & Cabinet Junction Box |
| ○ → 2-in Underground Conduit | ○ → 2-in Underground Conduit |
| N/A | ○ → Right of Way |
| → | → Directional Arrow |
| → | → Pavement Marking Arrow |

New Installation - Final (Grading Only)

US 258 At Crescent Road - Ramp C SR 1575 (Poole Road)

Division 2 Lenoir County Kinston

PLAN DATE: January 2009 REVIEWED BY: PLA

PREPARED BY: JPG REVIEWED BY:

SCALE: 1" = 40'

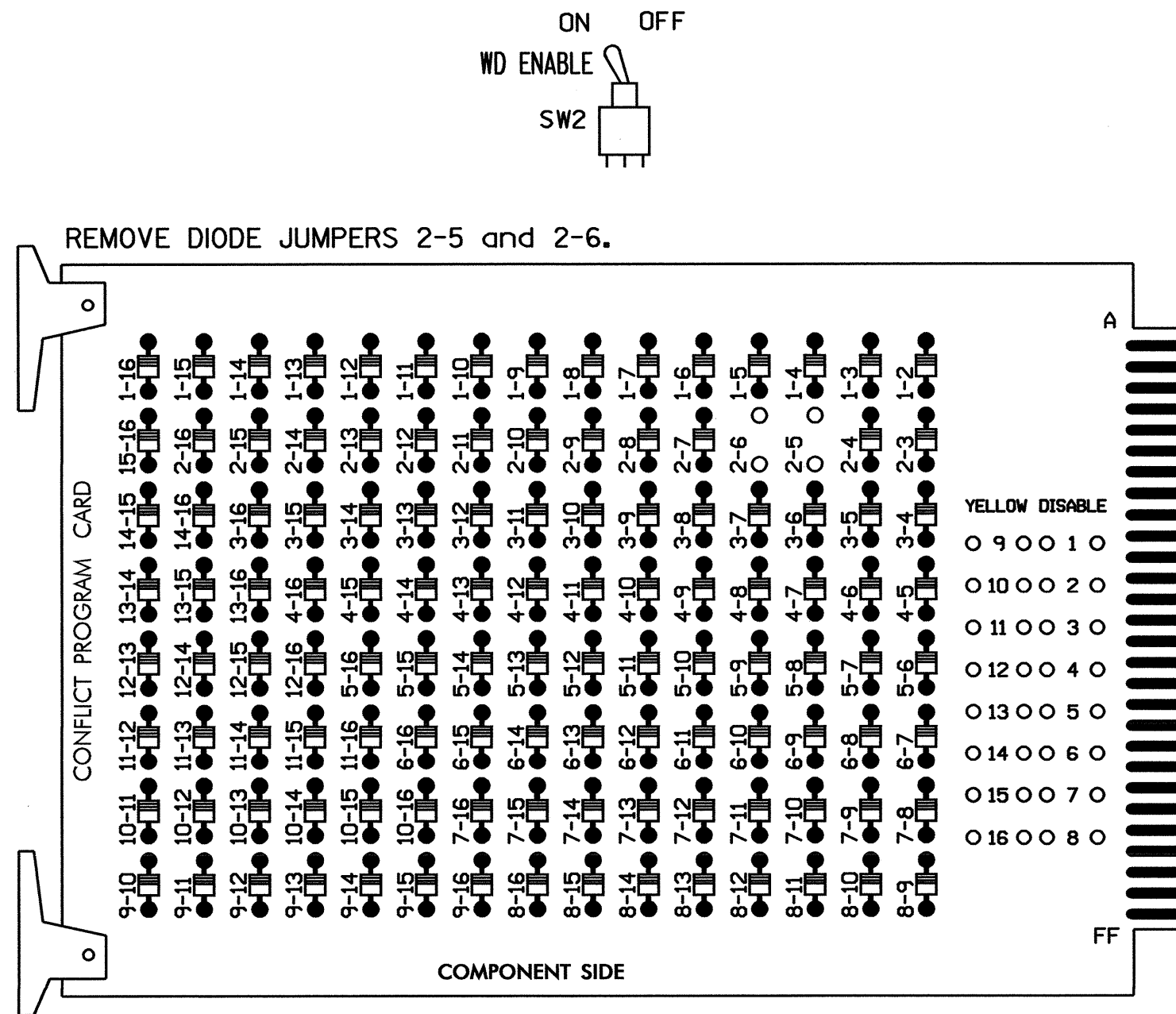
REVISIONS:

| NO. | DATE | INIT. | DATE |
|-----|------|-------|------|
| | | | |

SIG. INVENTORY NO. 02-0517

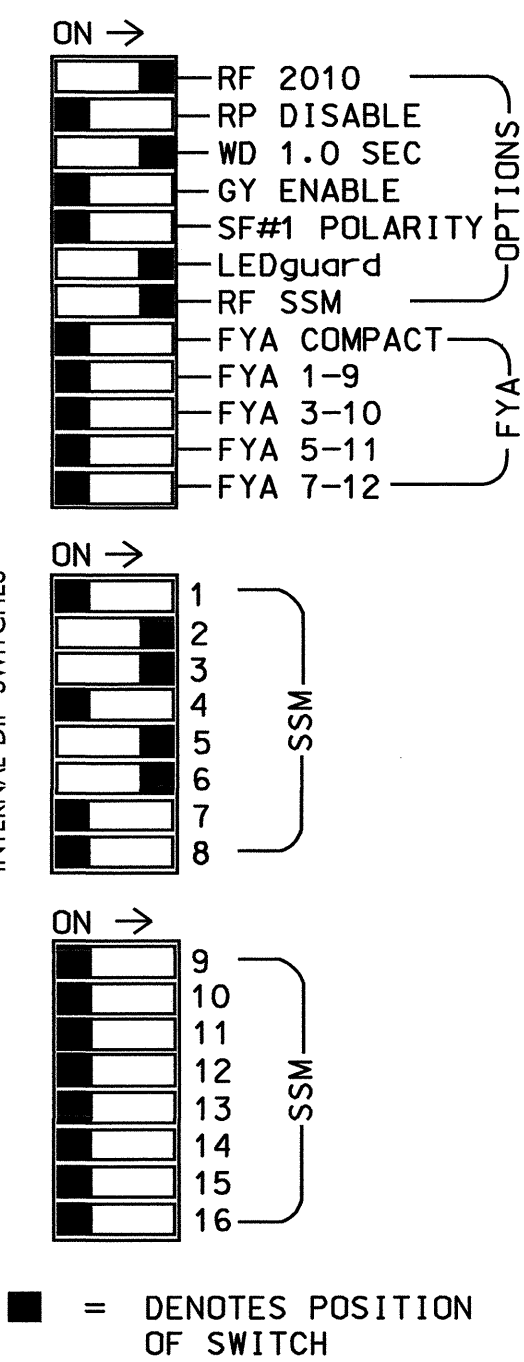
EDI MODEL 2010ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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



NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6
PHASES USED.....2,3,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S2P | S3 | S4 | S4P | S5 | S6 | S6P | S7 | S8 | S8P |
|-----------------|----|-------|-------|-------|----|-------|----|-----------|-------|----|----|-------|
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | 5 | 6 | 6 PED | 7 | 8 | 8 PED |
| SIGNAL HEAD NO. | NU | 21,22 | NU | 31,32 | NU | NU | 21 | 61, 62,63 | NU | NU | NU | NU |
| RED | | 128 | | 116 | | | * | 134 | | | | |
| YELLOW | | 129 | | 117 | | | | 135 | | | | |
| GREEN | | 130 | | 118 | | | | 136 | | | | |
| RED ARROW | | | | | | | | | | | | |
| YELLOW ARROW | | | | | | | | 132 | | | | |
| GREEN ARROW | | | | | | | | 133 | | | | |

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

INPUT FILE POSITION LAYOUT

(front view)

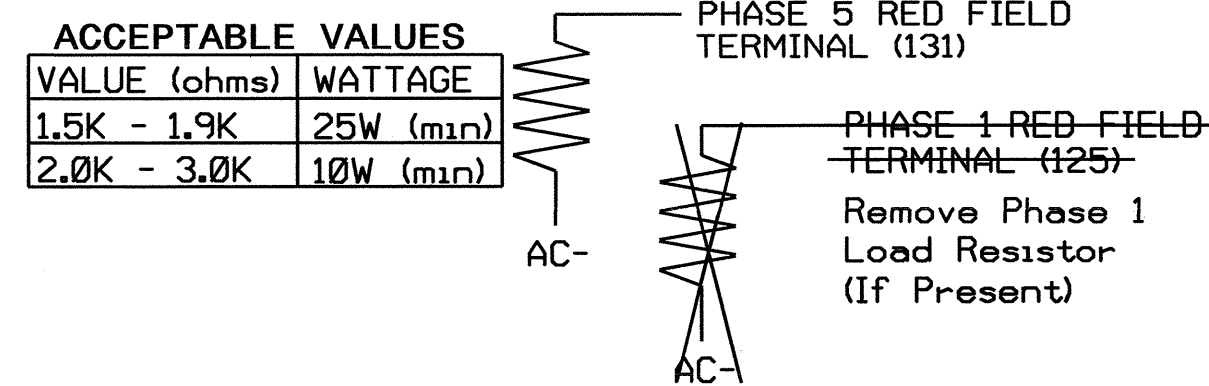
| FILE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|
| U | S | Ø 2 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | Ø 3 | FS |
| I | 2A | 2A | 3A | 3B | 3C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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL



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

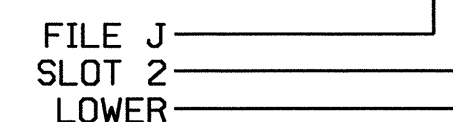
INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 2B | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 3A | TB4-5,6 | I5U | 58 | 20 | 3 | 3 | Y | Y | | | |
| 3B | TB4-9,10 | I6U | 41 | 3 | 4 | 3 | Y | Y | | | 10 |
| 3C | TB4-11,12 | I6L | 45 | 7 | 14 | 3 | Y | Y | | | 15 |
| 5A ¹ | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | | I4U | 47 | 9 | 22 | 2 | Y | Y | Y | | 3 |
| 6A | TB3-9,10 | J3U | 64 | 26 | 36 | 6 | Y | Y | | | |
| 6B | TB3-11,12 | J3L | 77 | 39 | 46 | 6 | Y | Y | | | |
| 6C | TB3-7,8 | J2L | 44 | 6 | 16 | 6 | Y | Y | Y | | 3 |

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

NOTE: If present, remove jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

- 1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
- 2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

DYNAMIC/BACKUP CONTROL FUNCTION #01
OVERLAPS: ABCDEFGHIJKLMNP
IF OVERLAPS ARE ACTIVE :
OR PHASES: 12345678910111213141516
IF PHASES ARE ON: X
OMIT PHASES : X
CALL PHASES : X

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 02-0517
DESIGNED: January 2009
SEALED: 01/26/09
REVISED: N/A

New Installation - Final (Grading Only)

ELECTRICAL AND PROGRAMMING DETAILS FOR:
Prepared in the Offices of:
Signal Management Systems
750 N. Greenfield Place, Garner, NC 27529

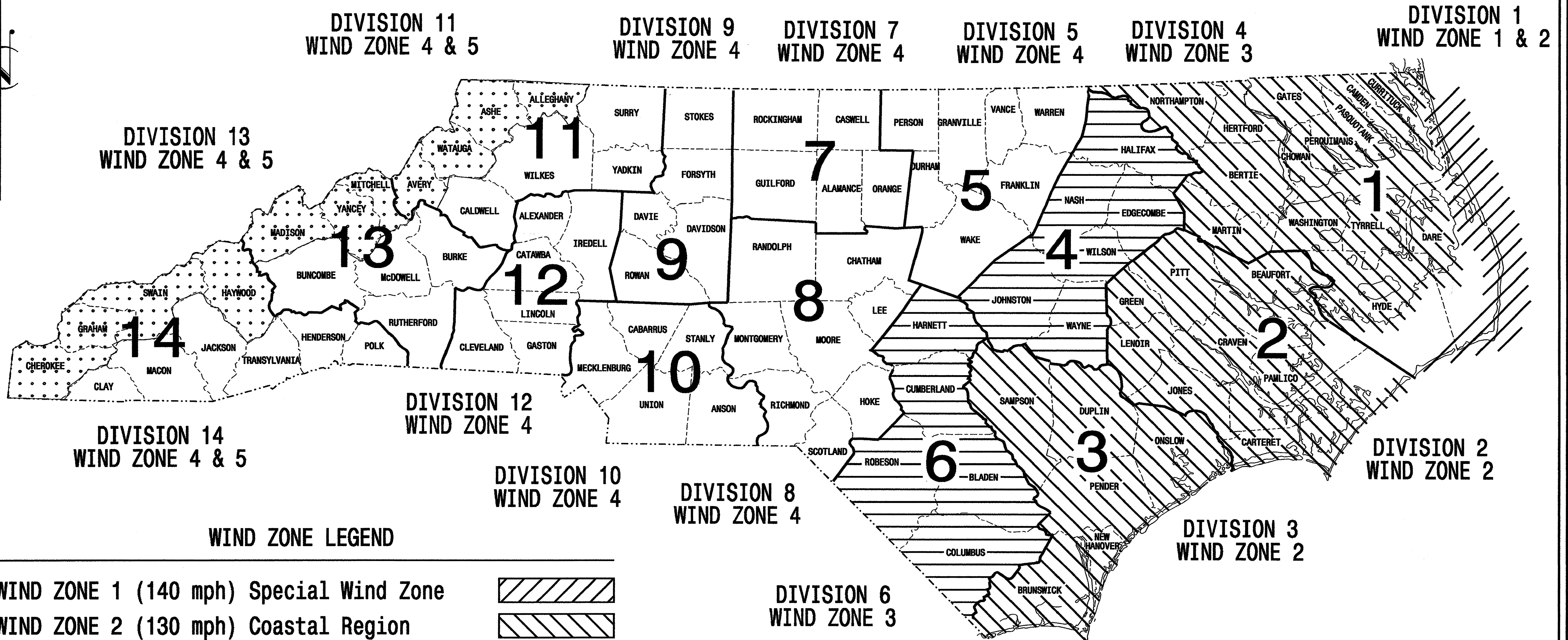
US 258
at
Crescent Road - Ramp C
SR 1575 (Poole Road)
Division 2 Lenoir County Kinston
PLAN DATE: January 2009 REVIEWED BY: T. V. J.
PREPARED BY: C. Strickland REVIEWED BY:
REVISIONS INIT. DATE
SIGNATURE DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 022013
GEORGE C. BROWN
SIGNATURE DATE 1/28/09
SIG. INVENTORY NO. 02-0517

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

| | | |
|-----------------|-------------|-----------|
| STATE | PROJECT NO. | SHEET NO. |
| N.C. | R-2719A | Sig. 8 |
| F.A. PROJ. NO. | M 1 | |
| PROJECT ID. NO. | | |

STANDARD DRAWINGS FOR METAL POLES

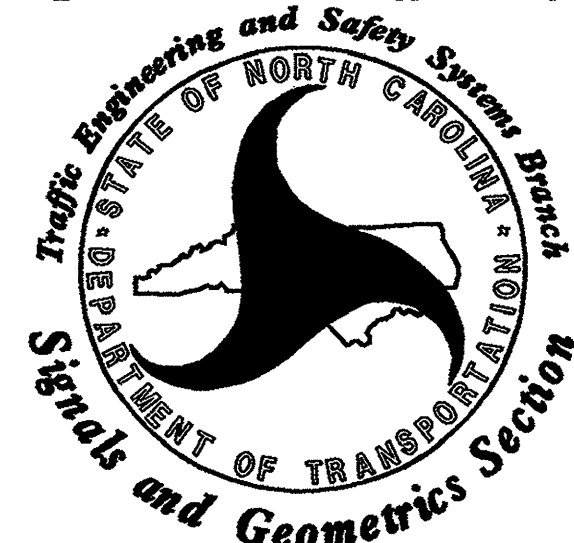


WIND ZONE LEGEND

| | |
|--|--|
| 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

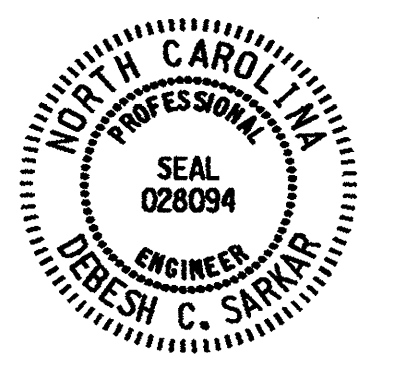
| DRAWING NUMBER | DESCRIPTION |
|----------------|--------------------------------------|
| M 1 | Title Sheet |
| M 2 | Fabrication Details - All Poles |
| M 3 | Fabrication Details - Strain Poles |
| M 4,5 | Fabrication Details - Mast Arm Poles |
| M 6 | Construction Details - Strain Poles |
| M 7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

NCDOT CONTACTS:

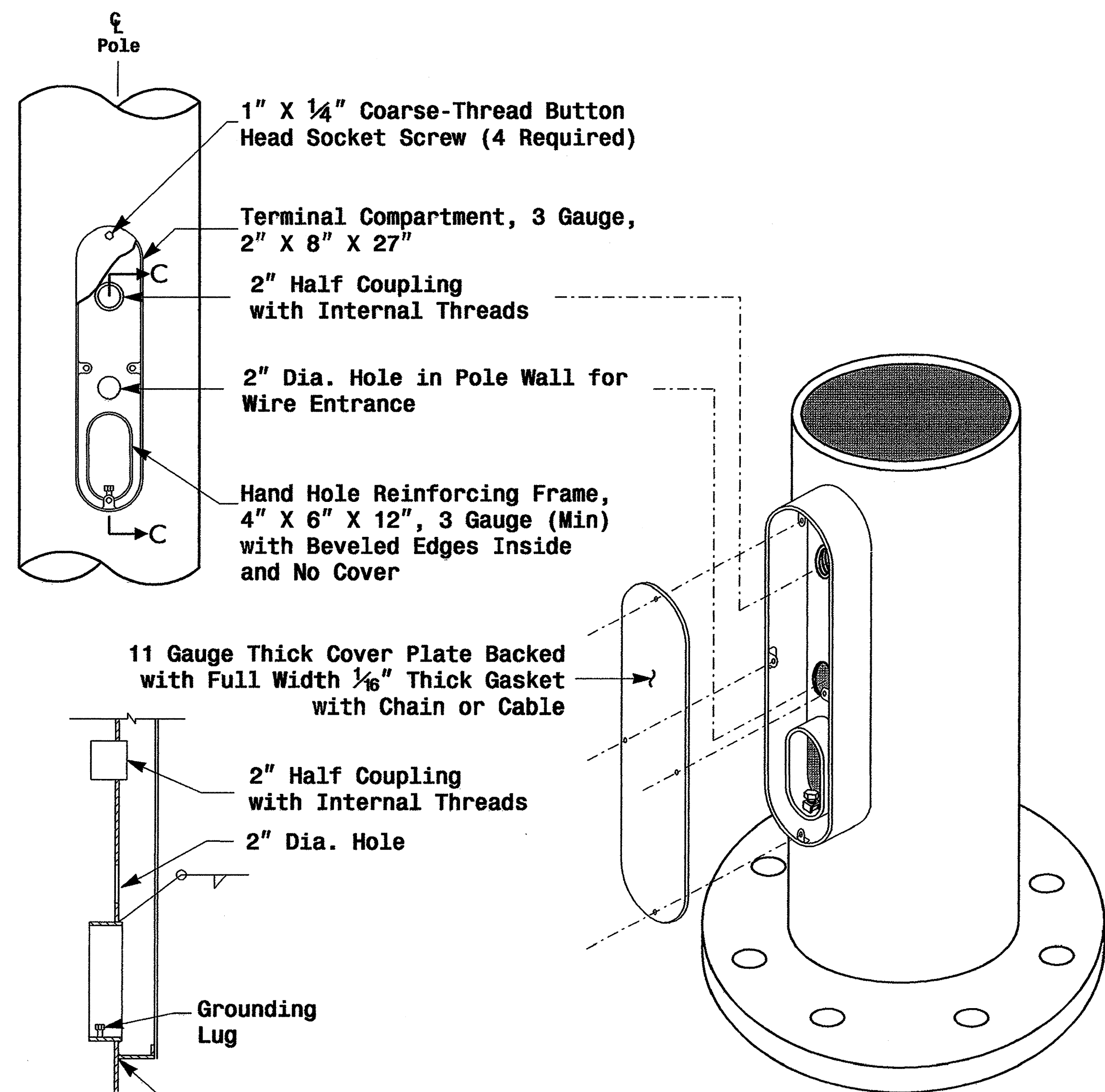
TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

- 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

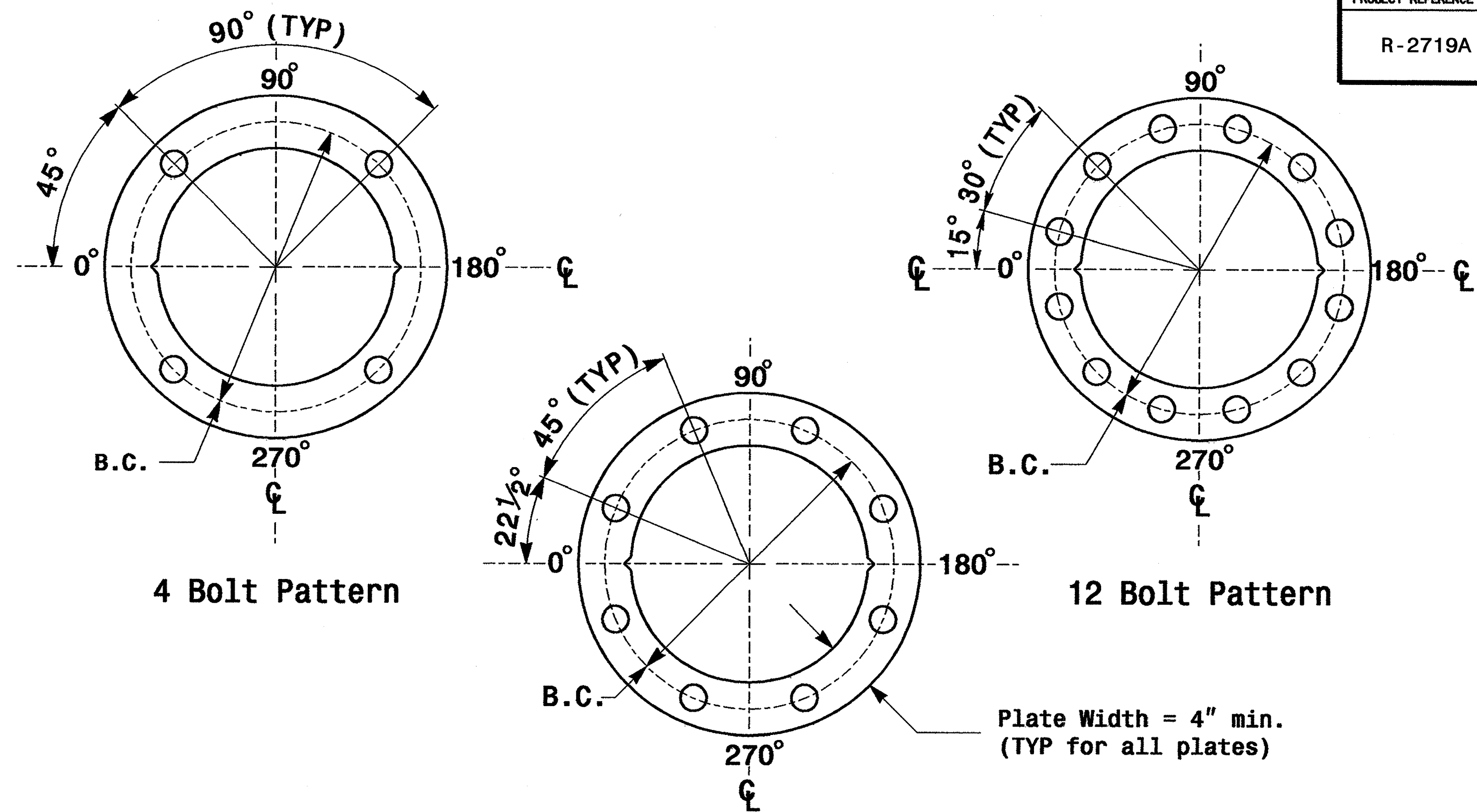


D. Sarkar 9.2.2005
SIGNATURE DATE



Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



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

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

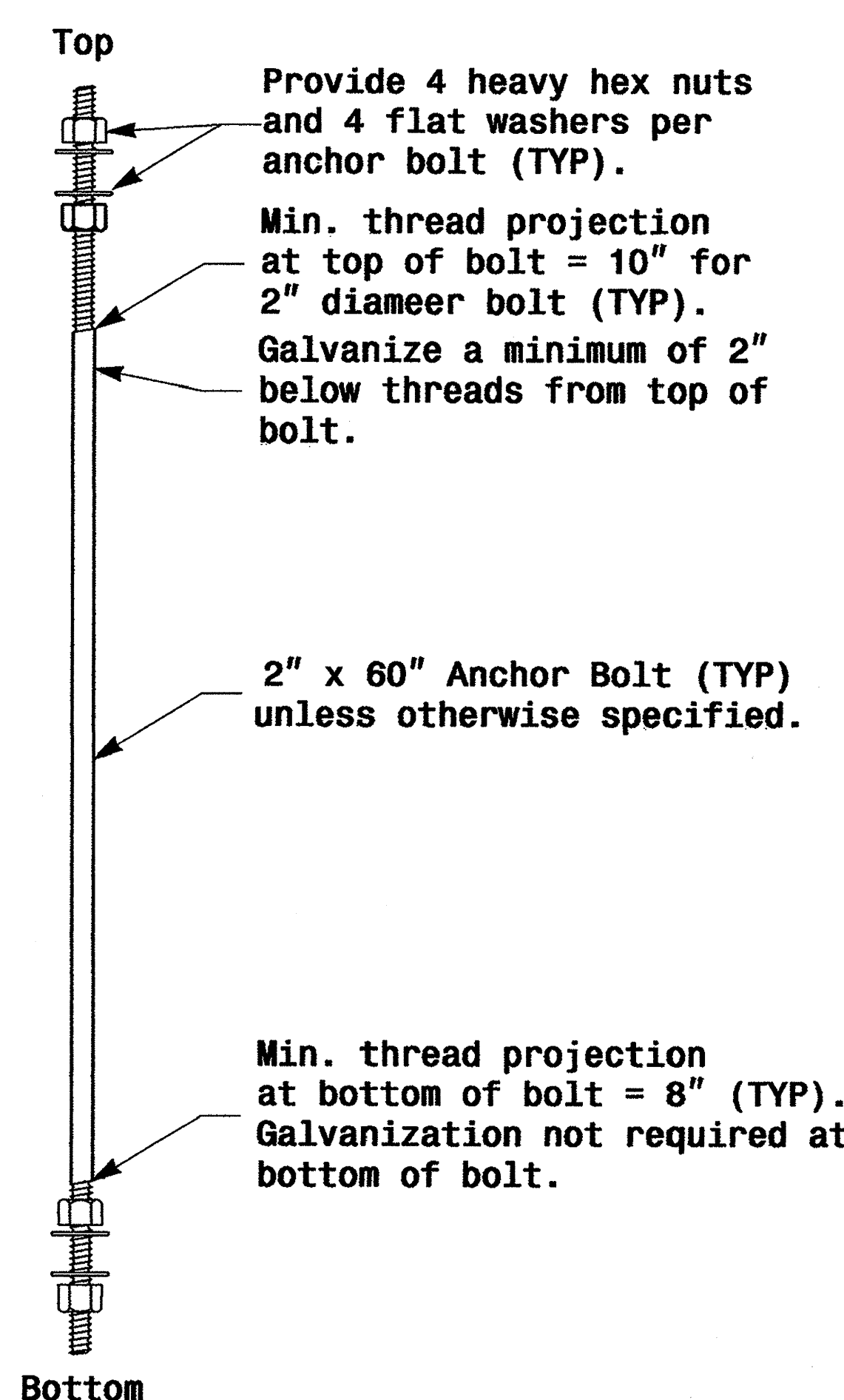
Shaft I.D. Tag
 (Provide on Strain Poles and Mast Arm Poles)

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

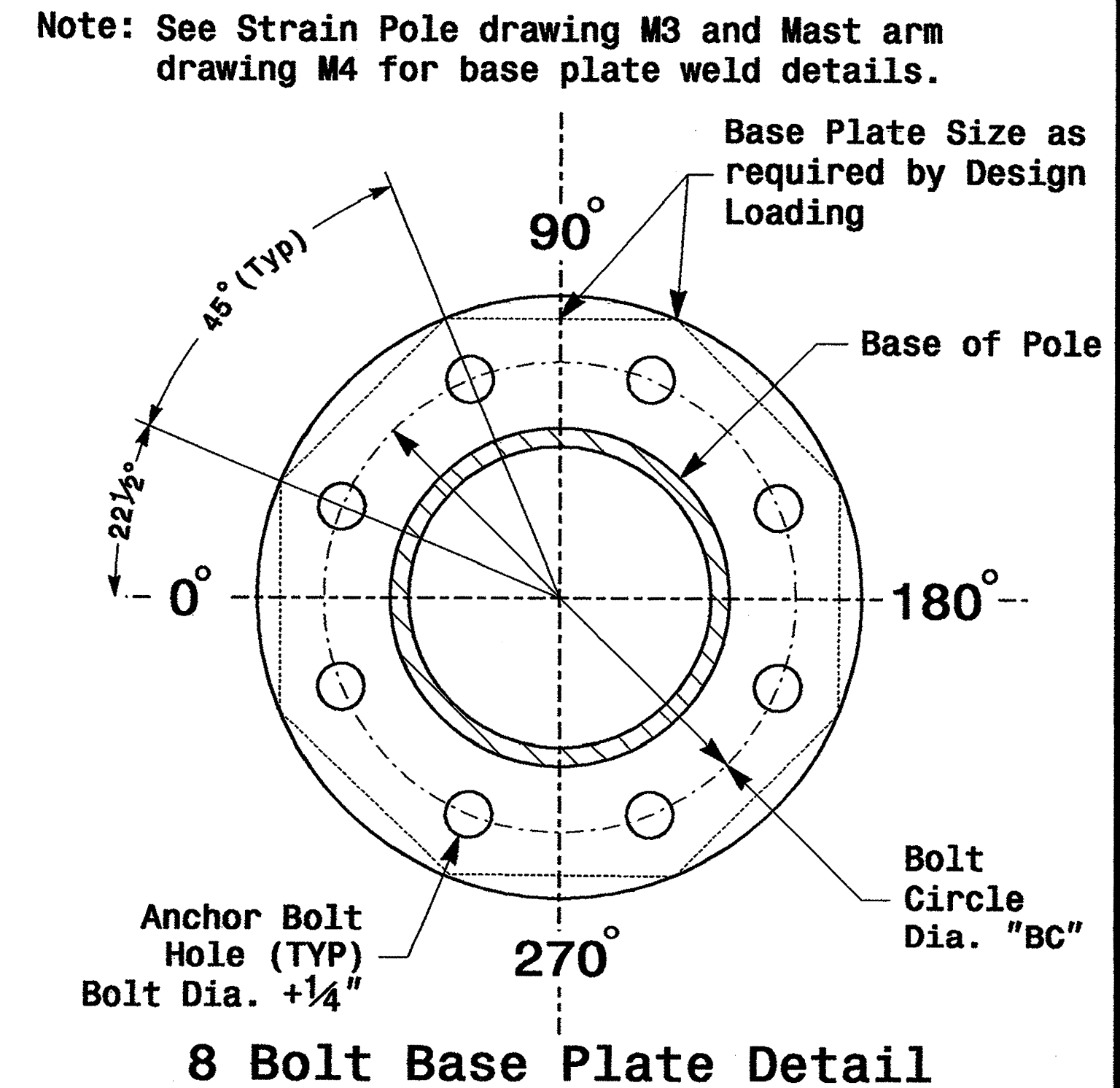
Identification Tag Details

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

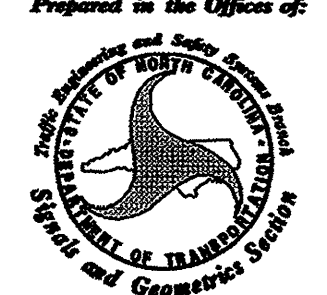
Arm I.D. Tag
 (Provide on each section of a multi-section mast arm)



Anchor Bolt Detail



8 Bolt Base Plate Detail

Prepared in the Office of:

 NORTH CAROLINA STATE UNIVERSITY
 DEPARTMENT OF TRANSPORTATION
 STATE AND GEOMETRIC DIVISION
 122 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: May 2005 REVIEWED BY: C.F. Andrews
 PREPARED BY: P.L. Alexander REVIEWED BY: A.M. Esposito

SCALE: NONE

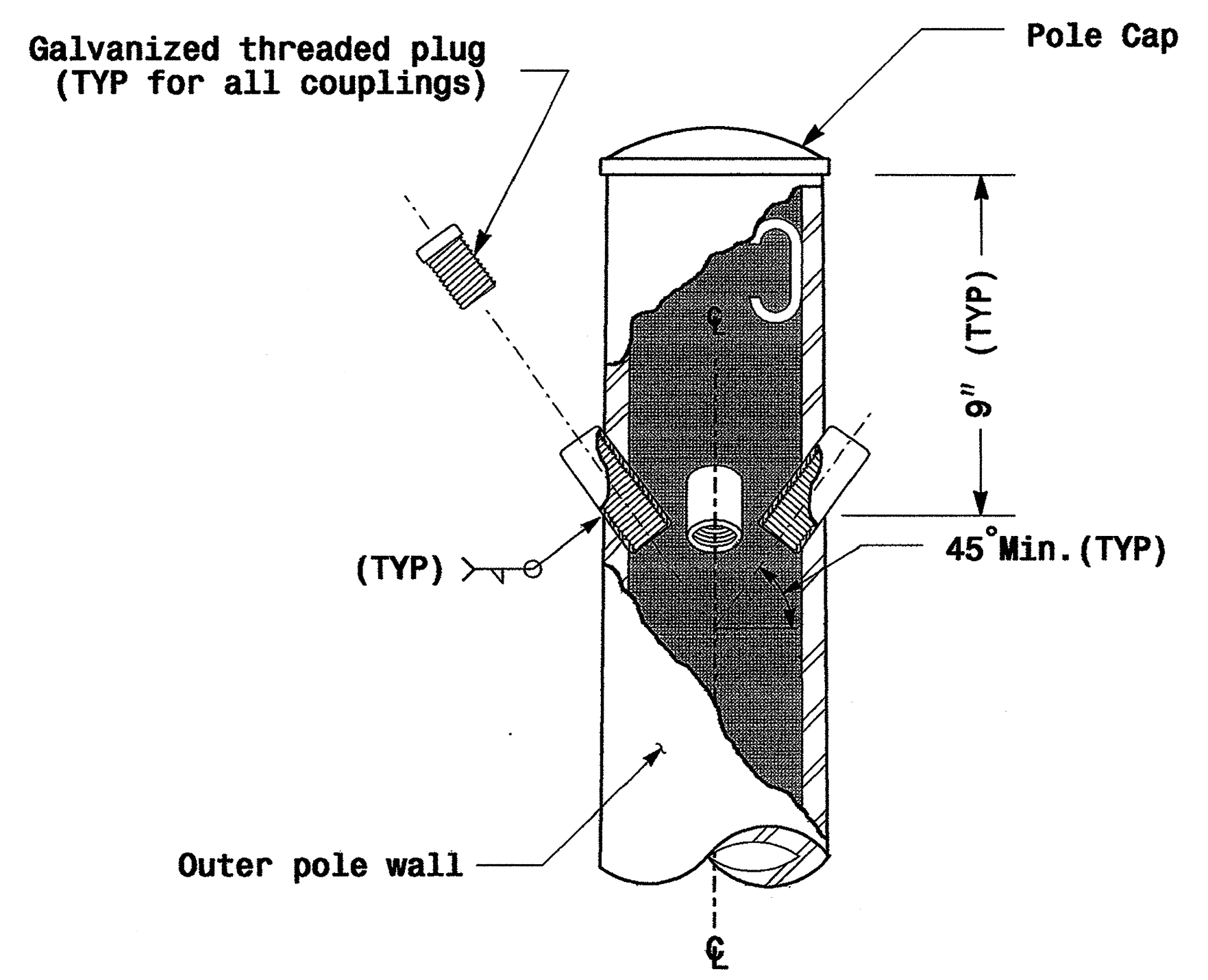
REVISIONS: _____ INIT. DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 ENGINEER DEBESH C. SARKAR

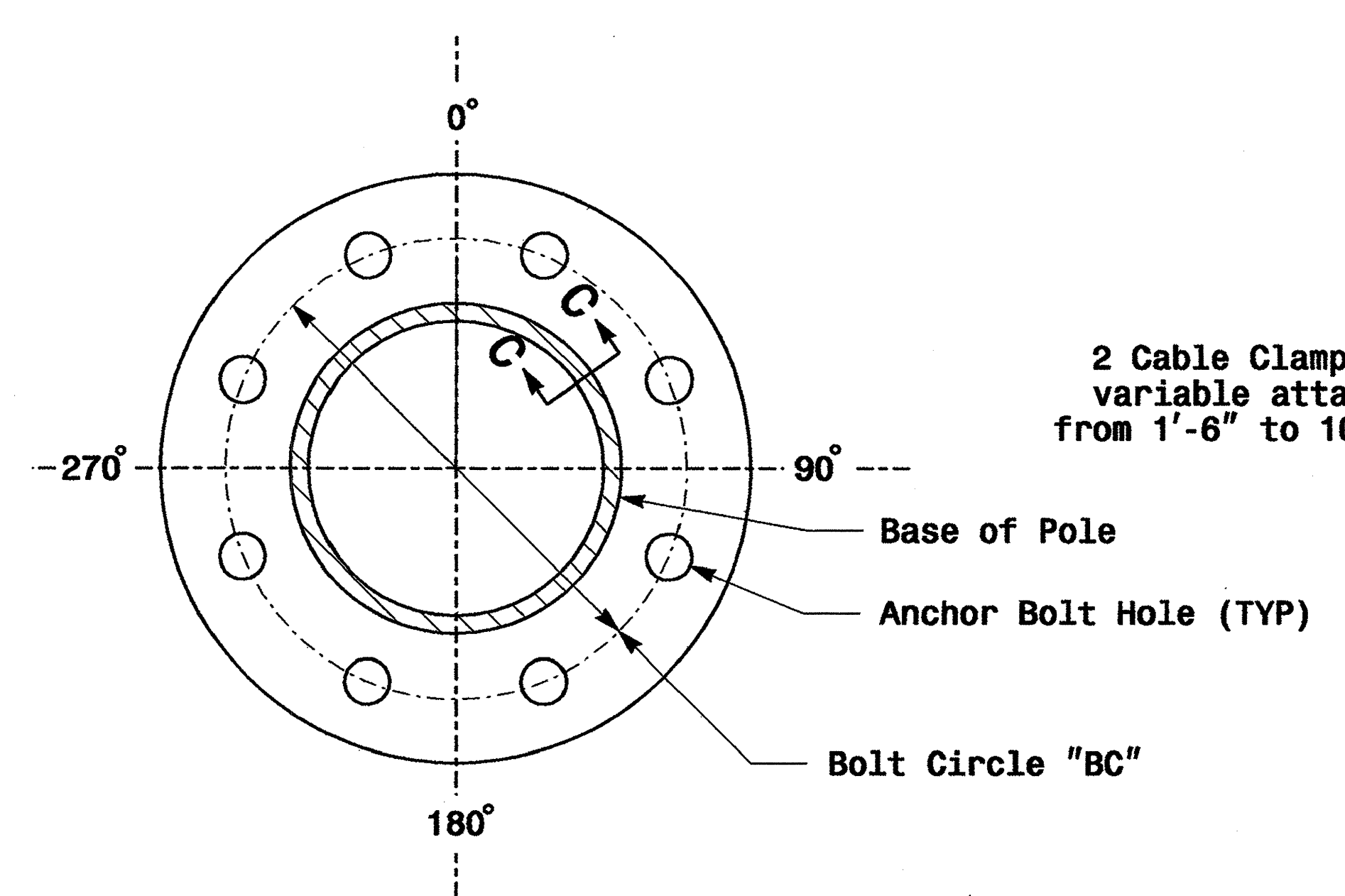
SIGNATURE: D. Sankar DATE: 9.2.2005
 SIG. INVENTORY NO. _____

Fabrication Details - All Poles

01-SEP-2005 18:22 D:\2004 Metal Pole Standard\dwg2004.m2 thru m6.dgn condrews

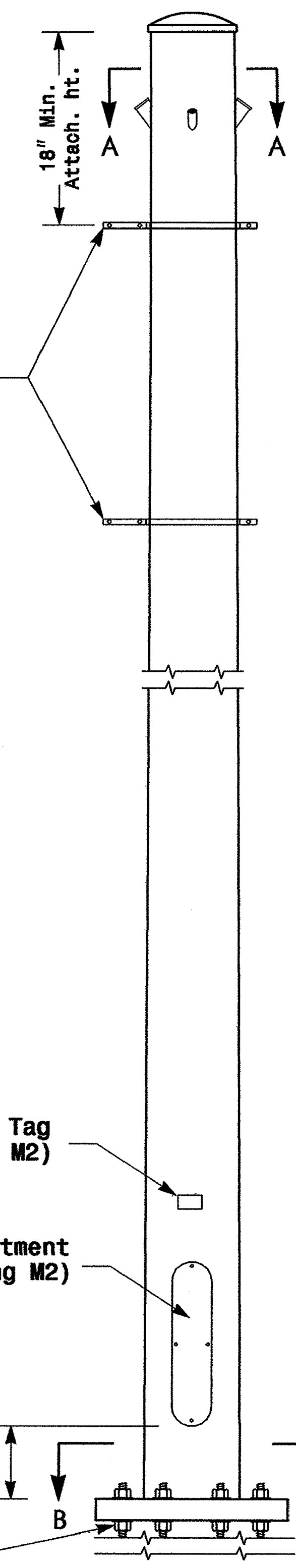


Cable Entrances at Top of Pole

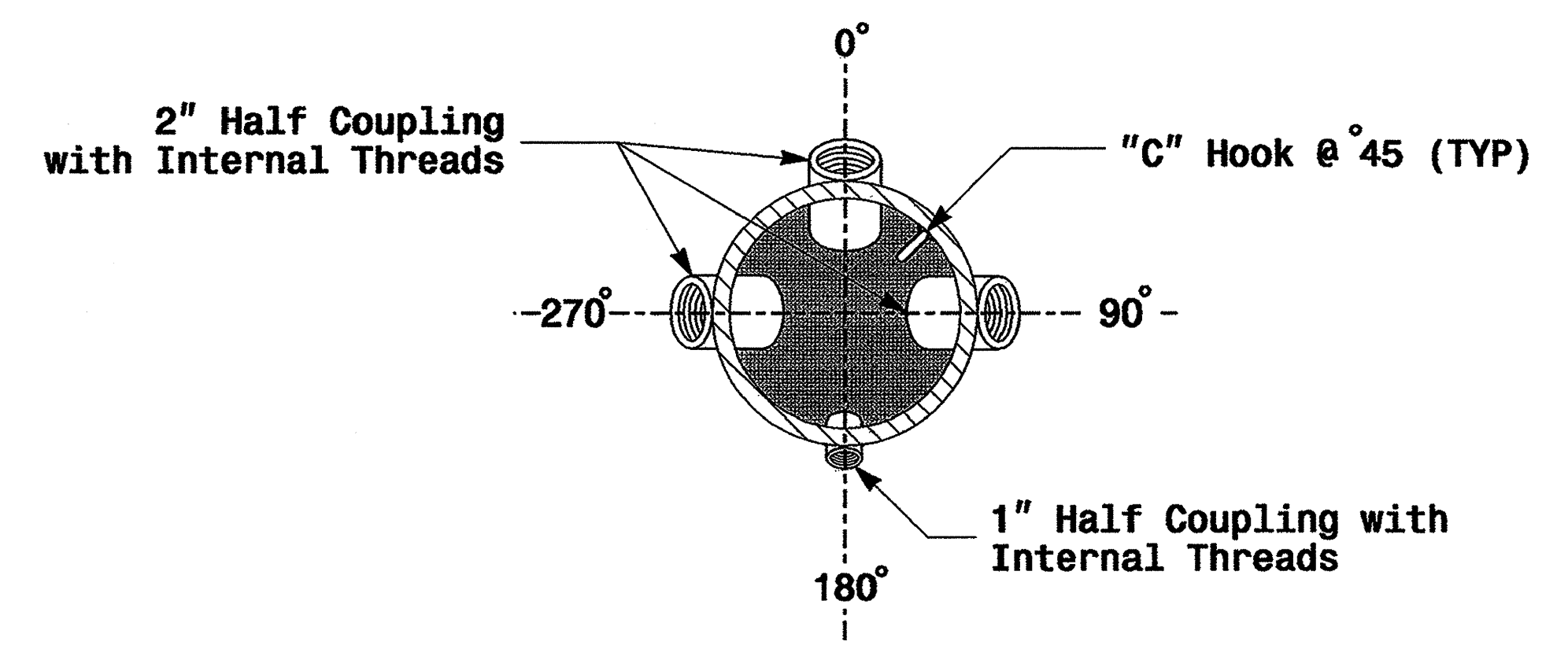


Section B-B
(See drawing M2)
Pole Base Plate

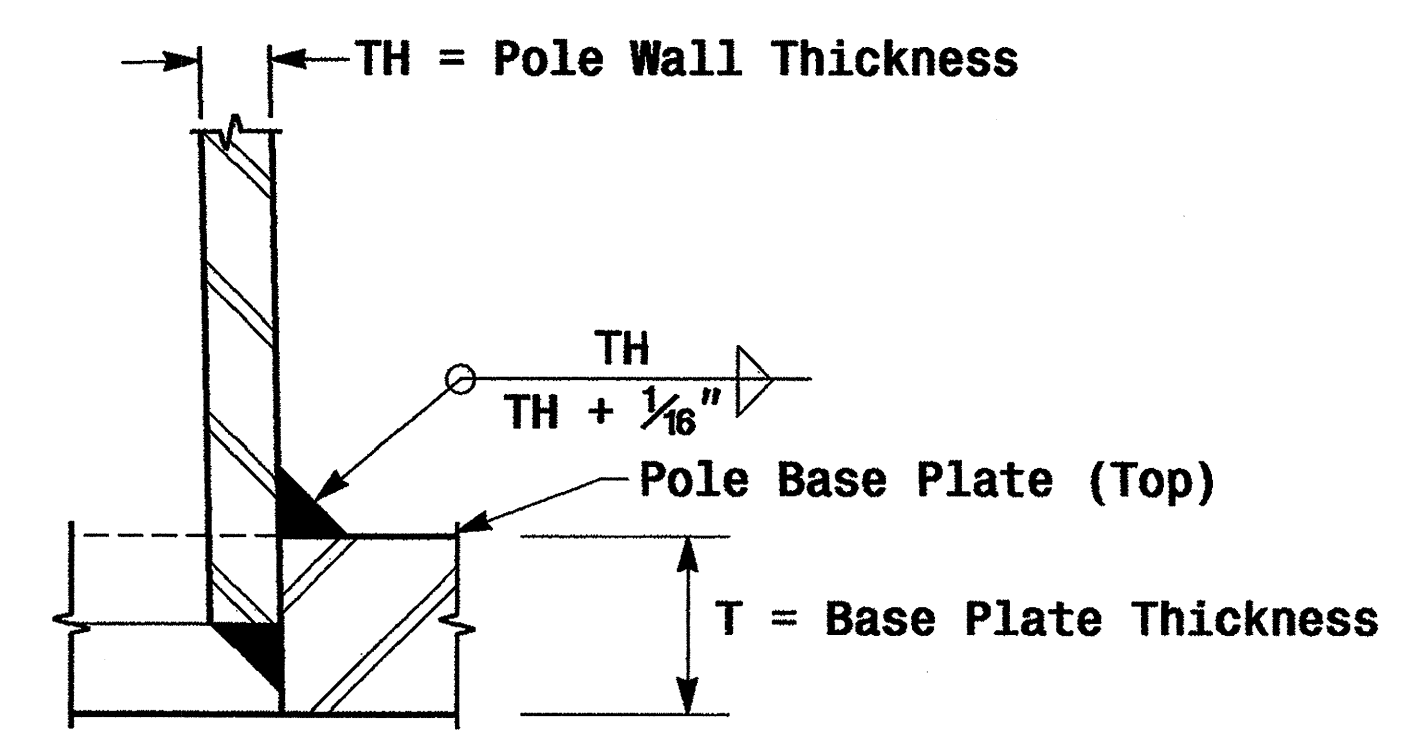
2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.



Monotube Strain Pole
(.14"/Foot Taper)



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

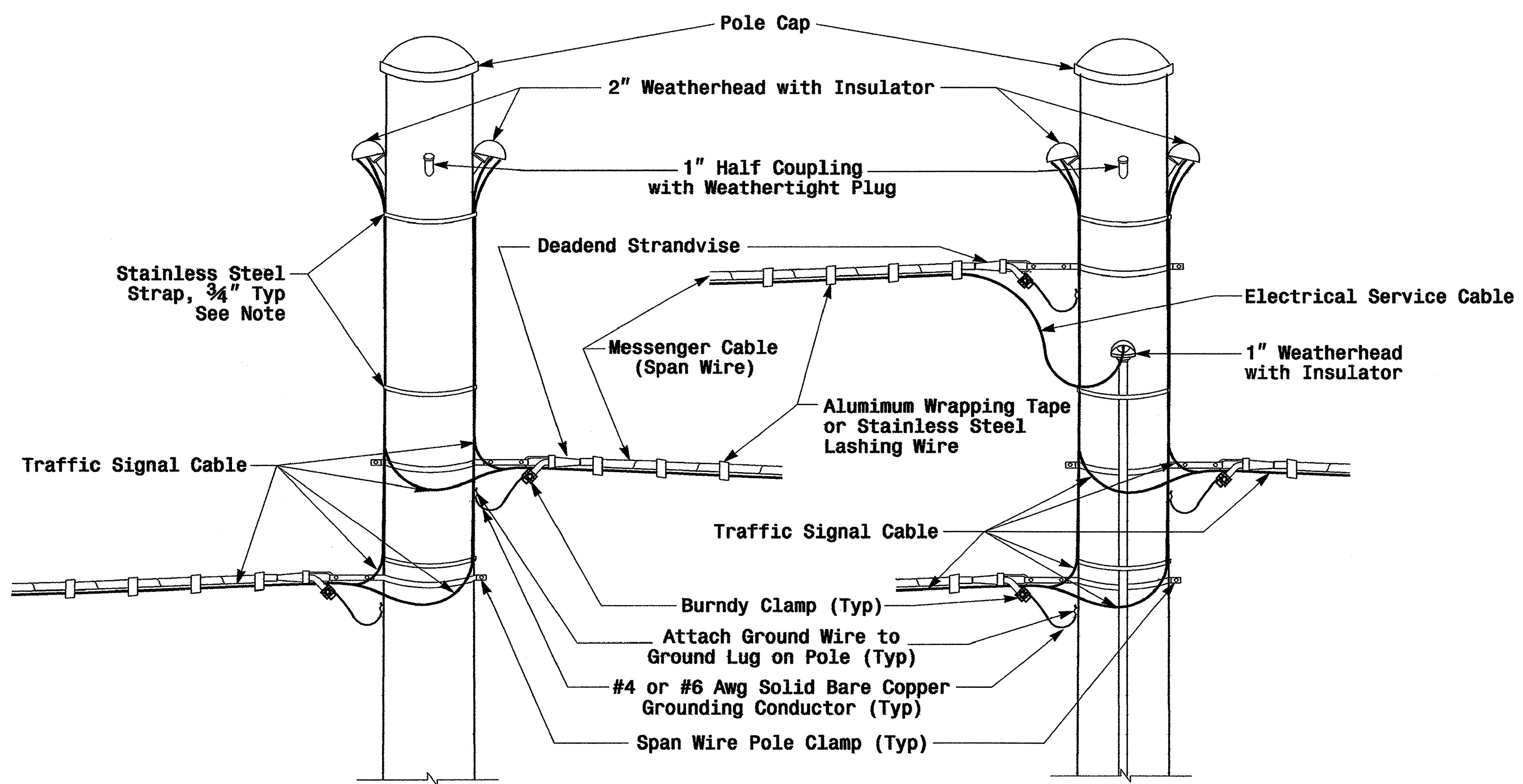


Section C-C
Socket Connection Weld Detail

Fabrication Details - Strain Poles

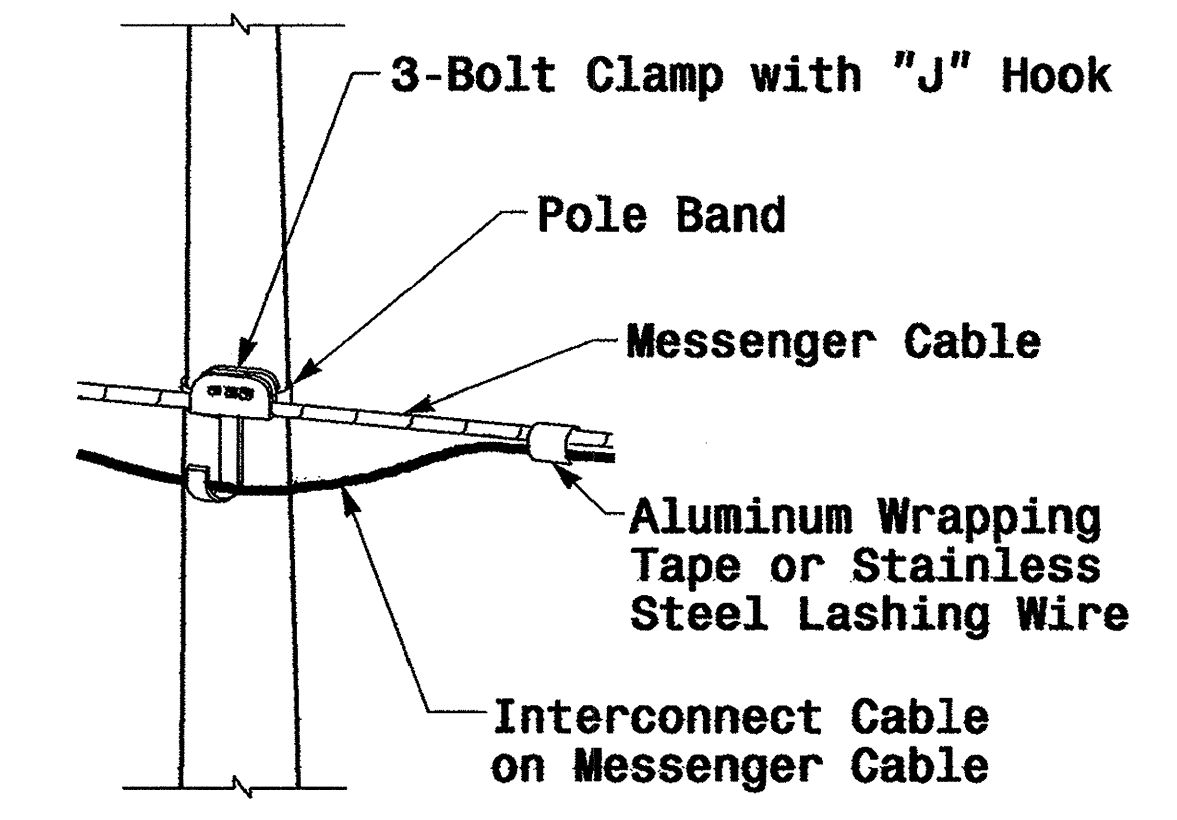
01-SEP-2005 14:07
w:\peop\lee-un\11\work\groups\2004 metal pole standard\2004 m3.dgn
p2\alexander

| | | | |
|----------------------------|--|---|--|
| | Typical Fabrication Details For Strain Poles | | |
| | PLAN DATE: May 2005 PREPARED BY: P.L. Alexander | REVIEWED BY: C.F. Andrews REVIEWED BY: A.W. Esposito | |
| SCALE: 0 NA NONE | | SIGNATURE: <i>P.L. Alexander</i> 9.2.2005 DATE | |

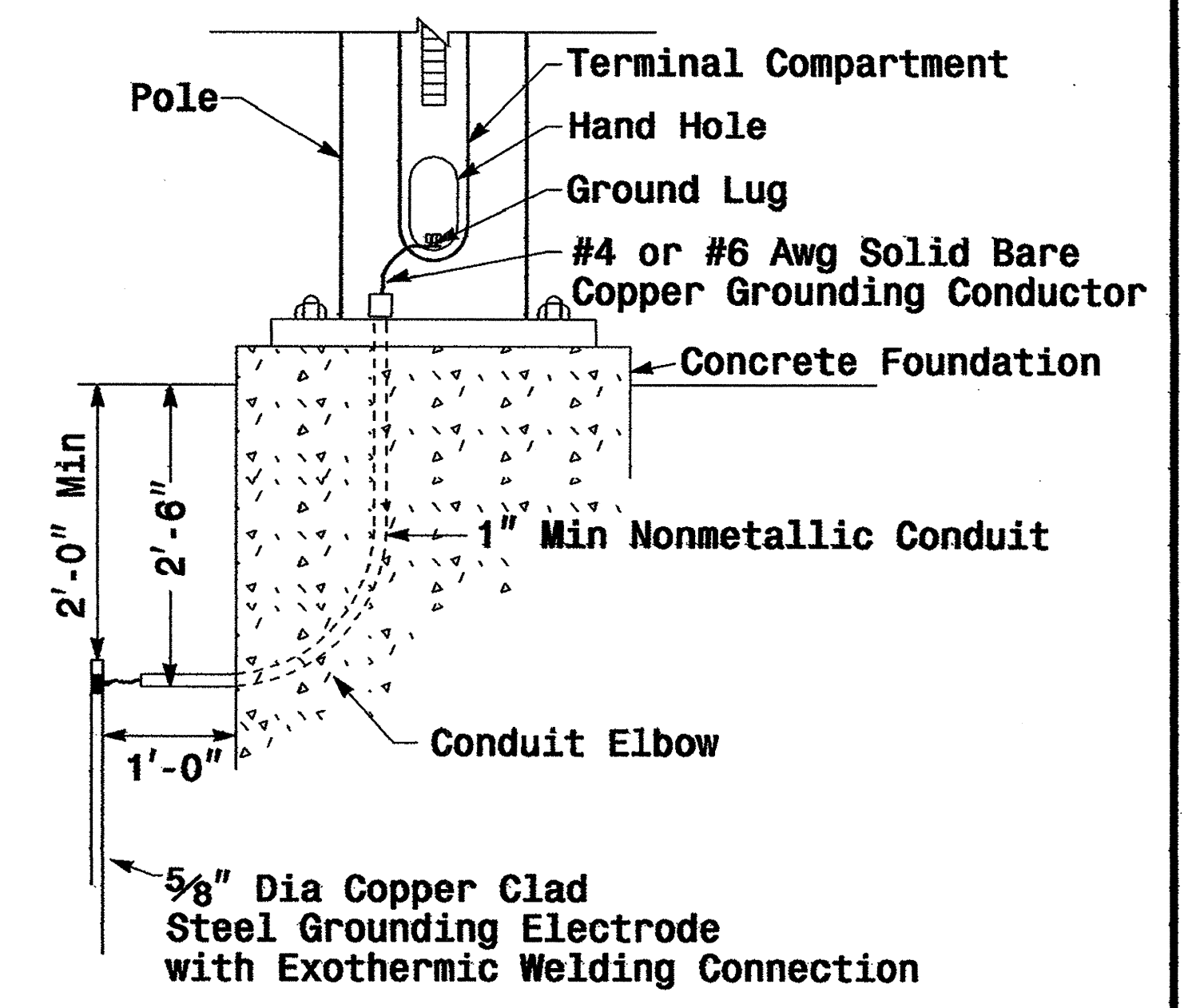


Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



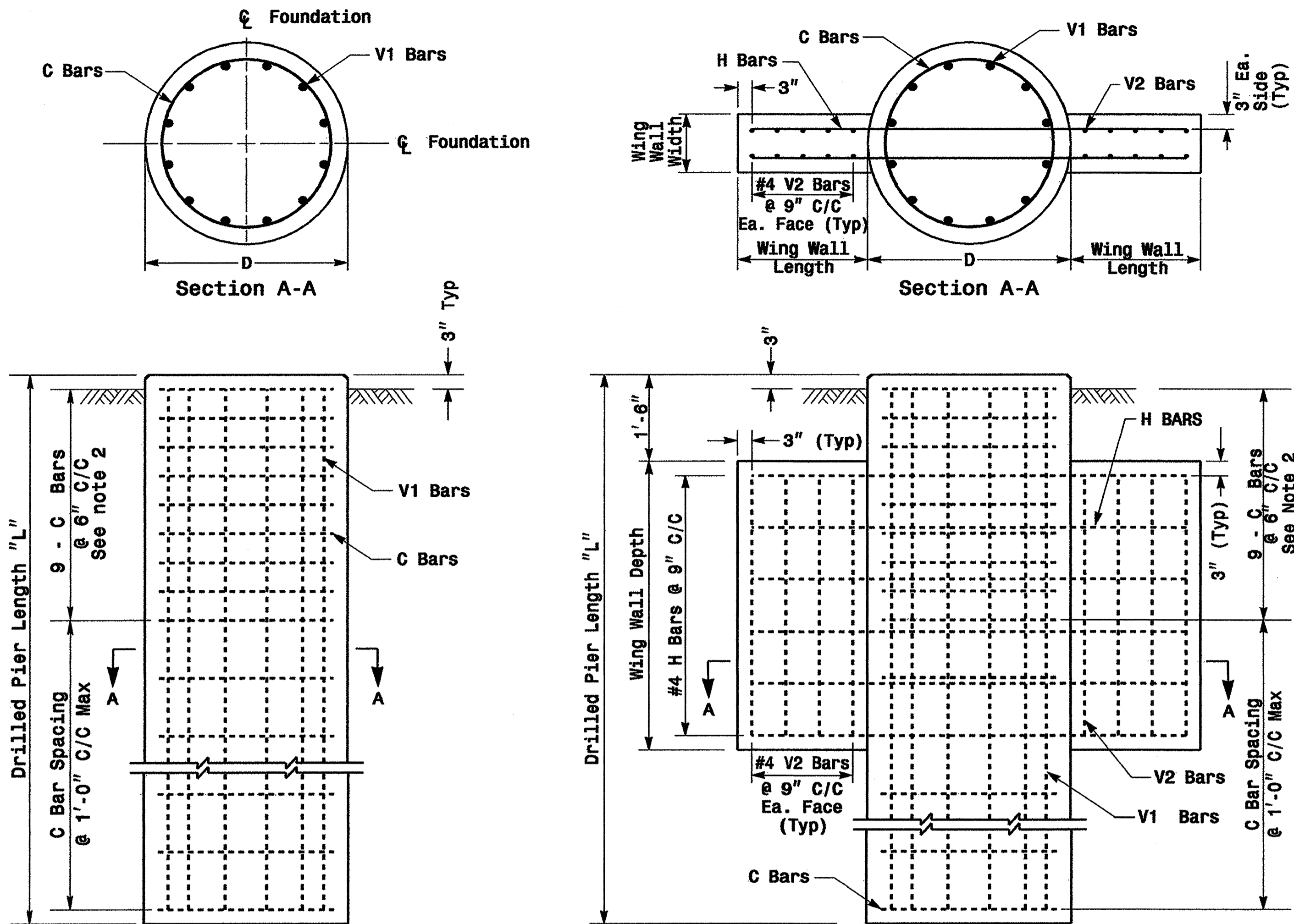
Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:33
w:\projects\sig-unit11\mark\sig\2004 metal pole.stndr.dwg
pa excldr

| | | | |
|----------------------------|--|---|--|
| | Construction Details Strain Poles | | |
| | PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS | REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR | |
| SCALE: 0 NA NONE | SIGNATURE: <i>[Signature]</i> 9-1-05 DATE | | SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016286 WILTON I. DEAN |

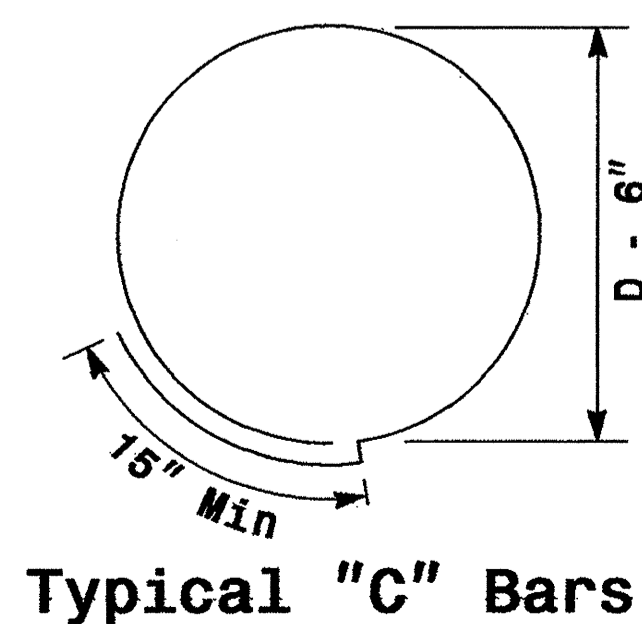
Reinforcing Steel Bars



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

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

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



Typical "C" Bars

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

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

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

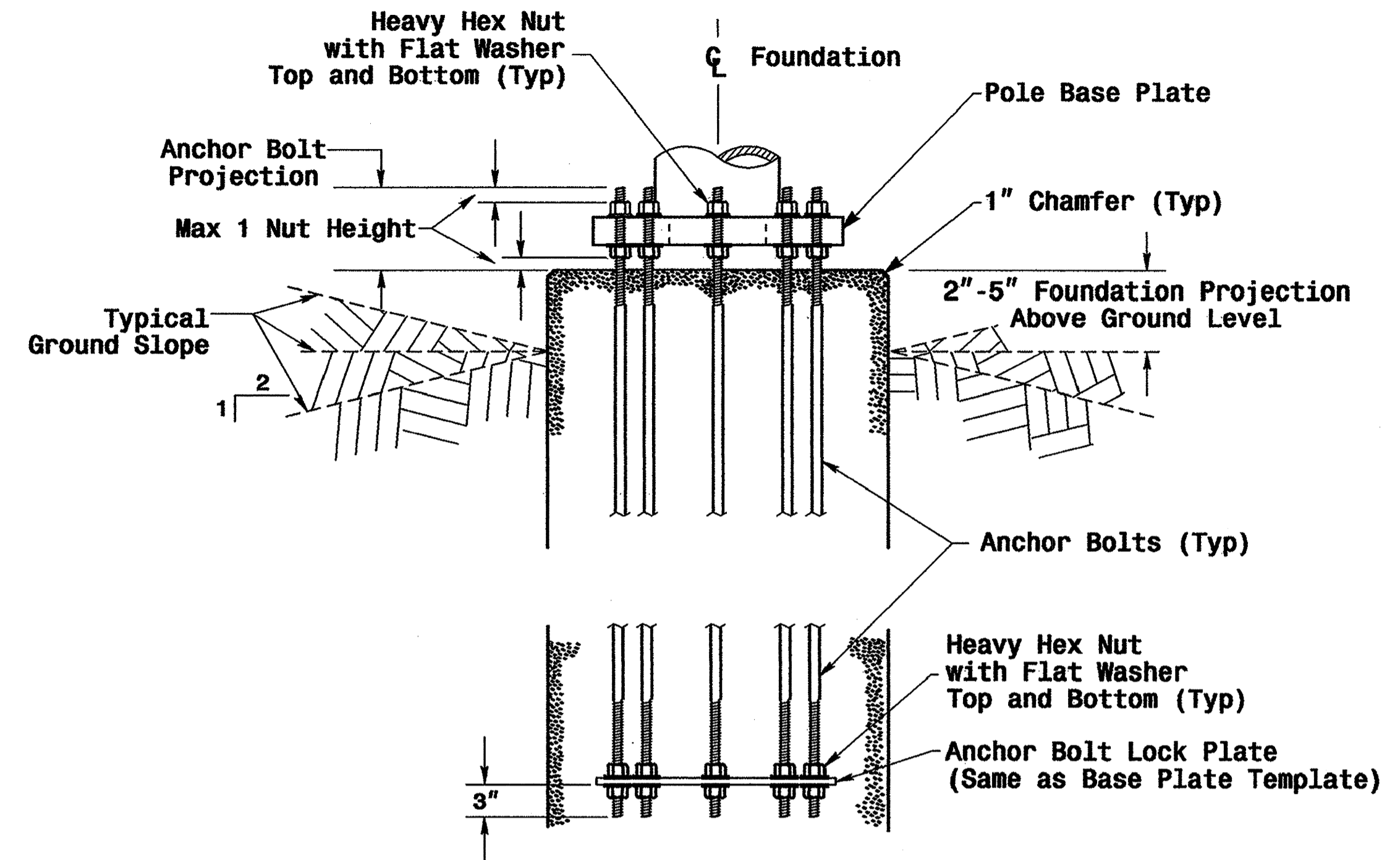
WING WALL DETAILS

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

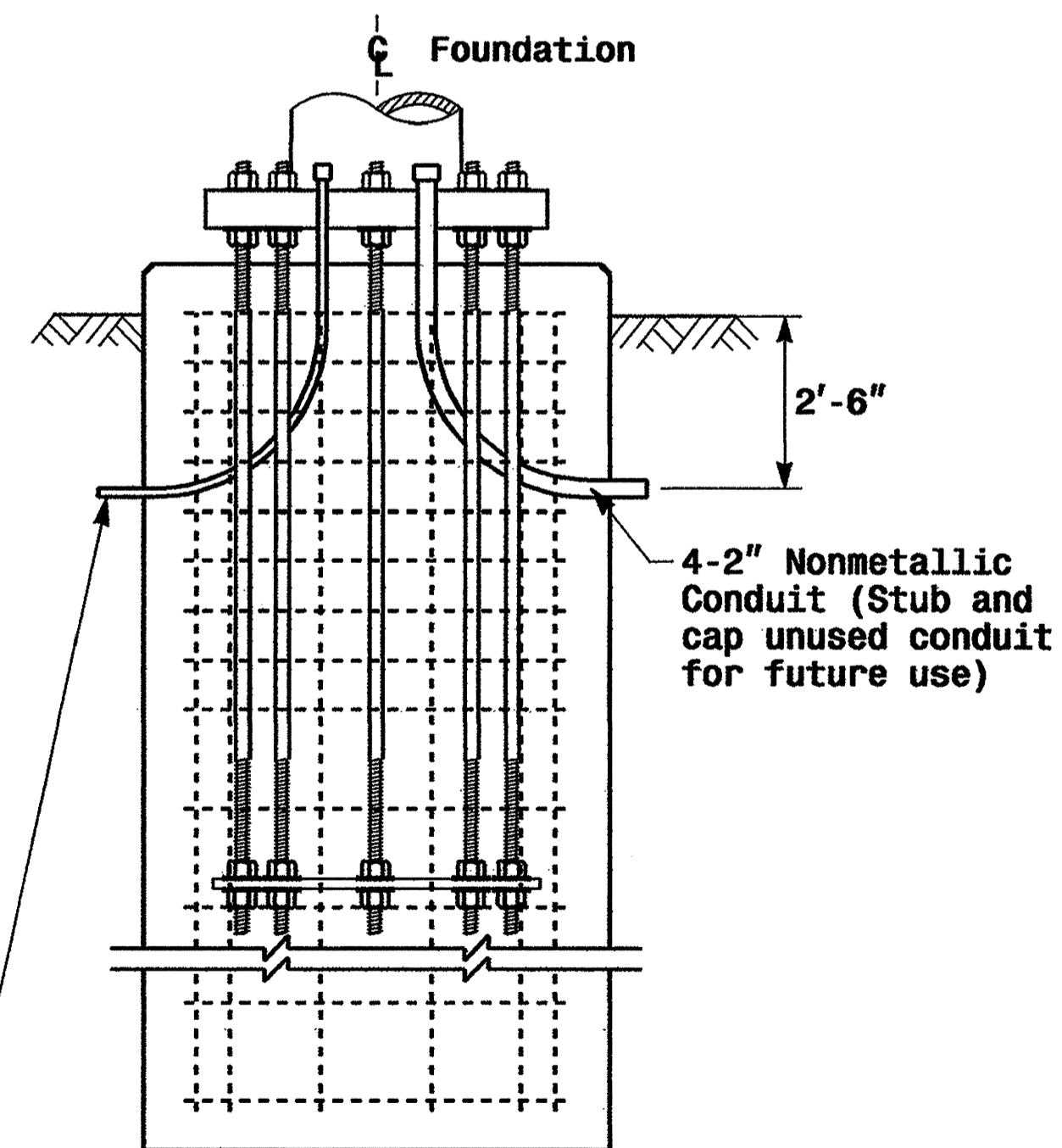
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



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

Notes

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

PROJECT REFERENCE NO. R-2719A SHEET NO. Sig. 12 M 7

Construction Details - Foundations

Prepared in the Offices of:

Construction Details Foundations

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

SCALE: NONE

SIGNATURE: D. Sarker 9.2.2005
 DATE: 9.2.2005
 SIG. INVENTORY NO.

| | | STANDARD STRAIN POLES | | | | STANDARD FOUNDATIONS 42" Diameter Drilled Pier Length (L) - Feet | | | | | | |
|-------------|-------------|-----------------------|-------------------|---------------------|---------------------------------|---|--------------------|--------------------------|------------------|--------------------|----------------------|-------------------|
| | | Case No. | Pole Height (Ft.) | Base Plate BC (In.) | Moment at the Pole Base (ft-kp) | Clay | | | | Sand | | |
| | | | | | | Medium N-Value 4-8 | Stiff N-Value 9-15 | Very Stiff N-Value 16-30 | Hard N-Value >30 | Loose N-Value 4-10 | Medium N-Value 11-30 | Dense N-Value >30 |
| WIND ZONE 1 | LIGHT | S26L3 | 26 | 25 | 280 | 20.5 | 14.0 | 11.5 | 9.5 | 18.0 | 16.0 | 14.0 |
| | | S30L3 | 30 | 25 | 310 | 21.0 | 14.5 | 11.5 | 9.5 | 18.5 | 16.5 | 14.5 |
| | | S35L3 | 35 | 25 | 350 | 22.5 | 15.0 | 12.0 | 10.0 | 19.5 | 17.5 | 15.5 |
| | HEAVY | S30H3 | 30 | 29 | 450 | 25.5 | 16.5 | 13.0 | 11.0 | 21.0 | 18.5 | 16.5 |
| | | S35H3 | 35 | 29 | 540 | 26.0 | 17.0 | 13.5 | 11.5 | 22.0 | 19.5 | 17.0 |
| | WIND ZONE 2 | LIGHT | S26L2 | 26 | 23 | 250 | 19.5 | 13.5 | 11.0 | 9.0 | 18.0 | 15.5 |
| 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

02-SEP-2005 12:42 v:\p\p\res-unit\work\p\p\004 metal pole standard\std strain pole.dgn polalexander

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

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

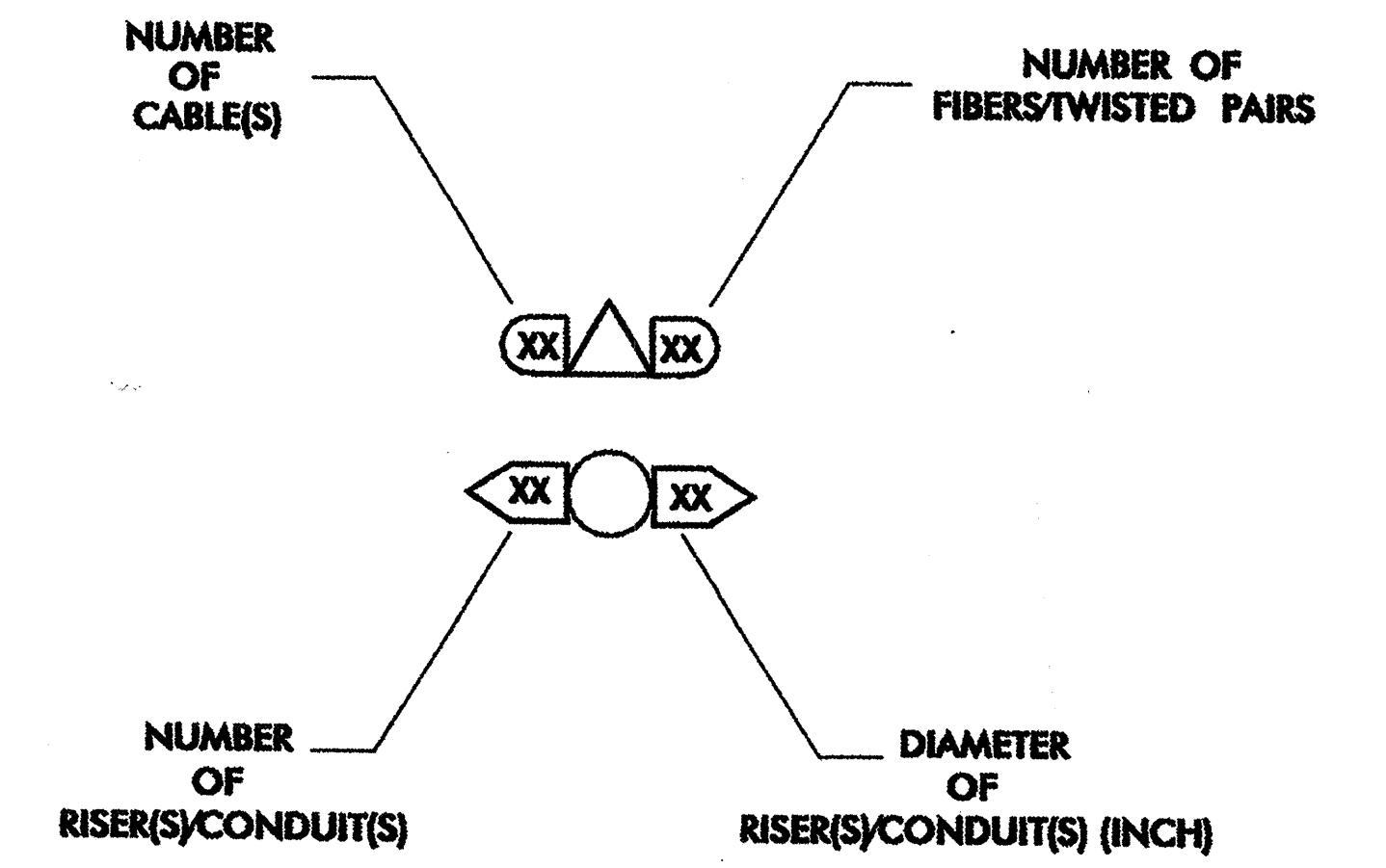
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL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

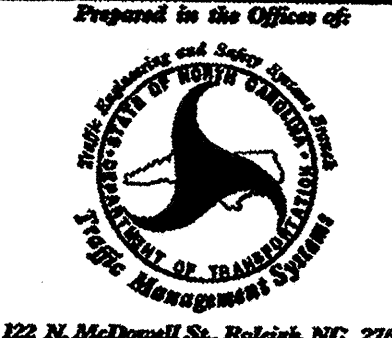
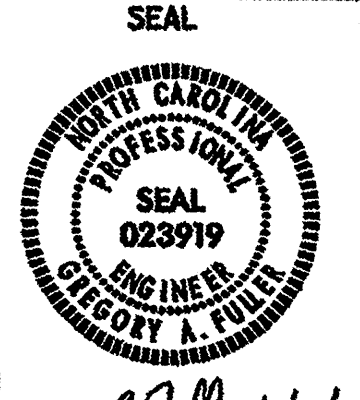
LEGEND

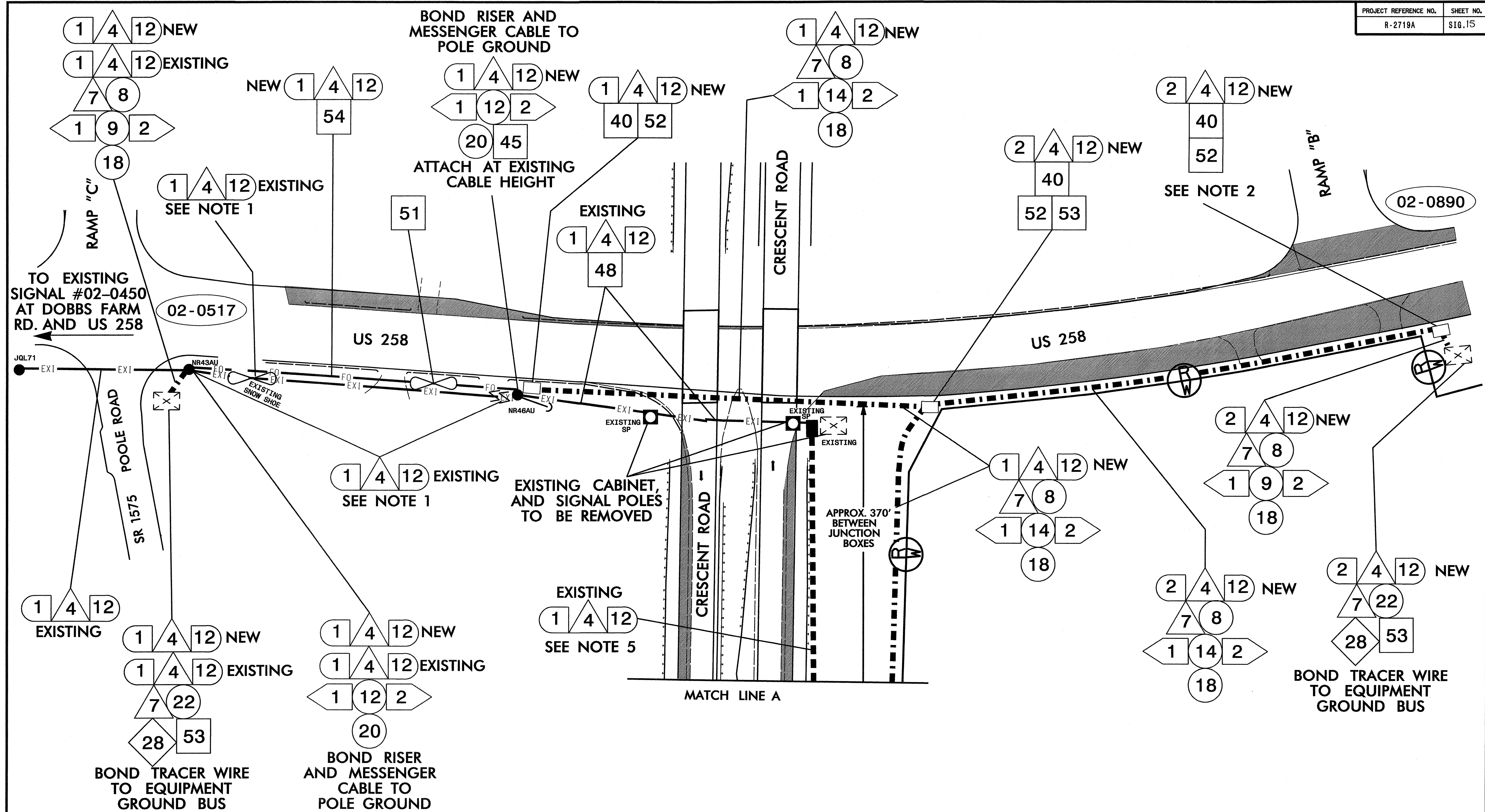
- FO NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI EXISTING COMMUNICATIONS CABLE
- REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD NEW DIRECTIONAL DRILLED CONDUIT
- B&J NEW BORED AND JACKED CONDUIT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

CONSTRUCTION NOTE SYMBOLOGY KEY

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



| | | | |
|---|--|---|--|
|  Prepared in the Office of: 222 N. McDowell St., Raleigh, NC 27602 | CONSTRUCTION NOTES | | SEAL  GREGORY A. FULLER ENGINEER No. 023919 |
| | PLAN DATE: _____ PREPARED BY: _____ SCALE: _____ REVISIONS: _____ | REVIEWED BY: _____ REVIEWED BY: G. A. FULLER INT. DATE: _____ DATE: _____ | |

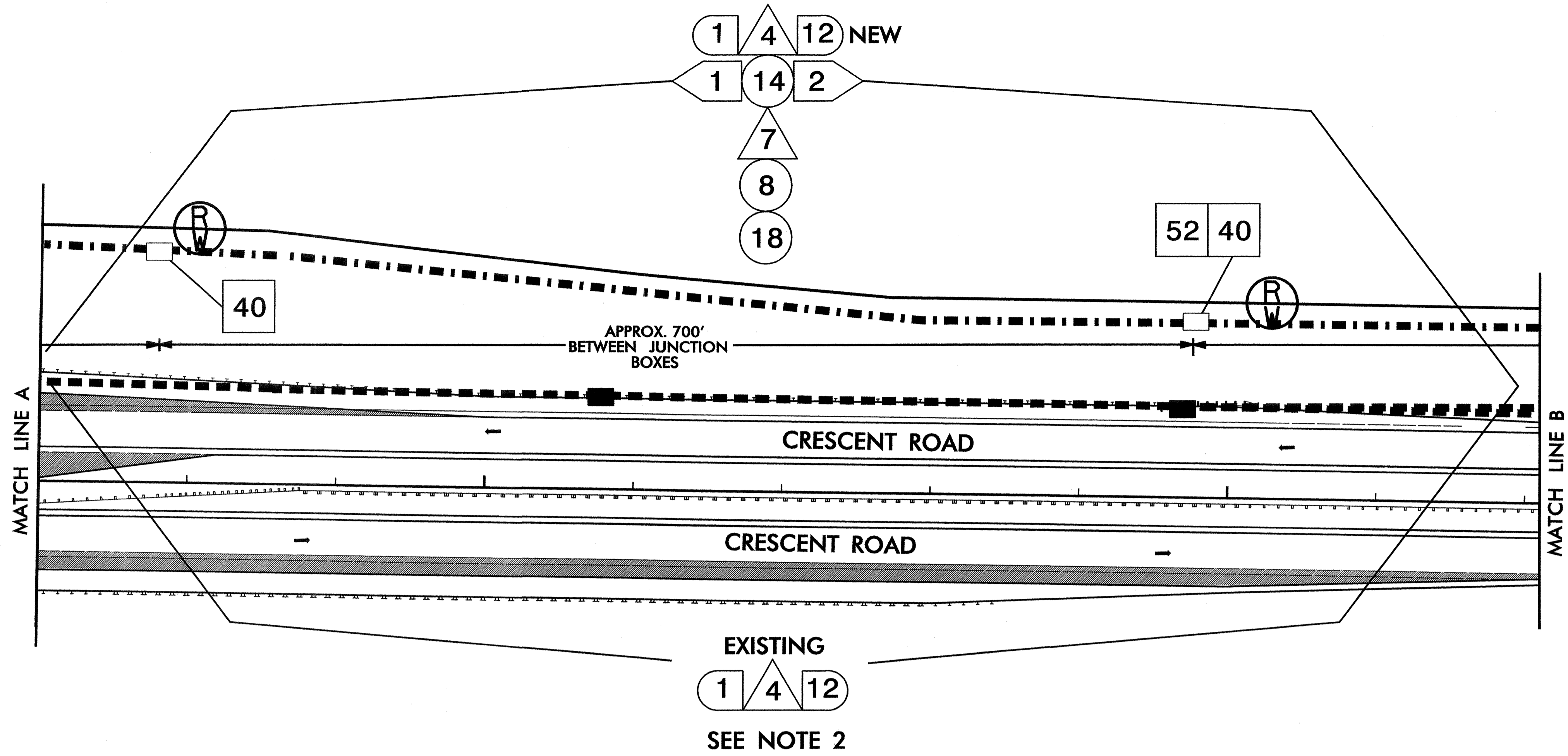


NOTES:

1. CUT EXISTING 12-FIBER CABLE AND DELASH FROM MESSENGER CABLE. BACK PULL AND TERMINATE CABLE IN SIGNAL CABINET (SIG. #02-0517). STORE 100 FEET OF EXISTING 12-FIBER CABLE BACK ON EXISTING SNOW SHOE.
2. STORE 100' OF SPARE SMFO CABLE.
3. SEAL ALL CONDUIT ENTRANCES INTO JUNCTION BOXES WITH MECHANICAL SEALING DEVICES.
4. ALL CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.
5. ABANDON FIBER AND CONDUIT; REMOVE JUNCTION BOX AND RESTORE GRADE.

CONTACT CLARISE BRYANT, CITY OF KINSTON (252-939-3243), PRIOR TO CUTTING FIBER OPTIC CABLE.

| <p>Prepared in the Office of:</p> <p>750 N. Greenfield Pkwy., Garner, NC 27529</p> | <p>COMMUNICATIONS CABLE ROUTING AND CONDUIT ROUTING AT CRESCENT RD. & US 258 RAMPS</p> | | <p>SEAL</p> <p>GENE C. MURR, JR. ENGINEER 14543</p> | | | | | |
|--|---|--|---|-----------|-------|------|--|--|
| | <p>DIVISION 02 LENOIR CO. KINSTON</p> <p>PLAN DATE: JULY 2008 REVIEWED BY: I.N.AVERY</p> <p>PREPARED BY: H.T.BERGGREN REVIEWED BY: G.G.MURR, JR. PE</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 | | |
| REVISIONS | INIT. | DATE | | | | | | |
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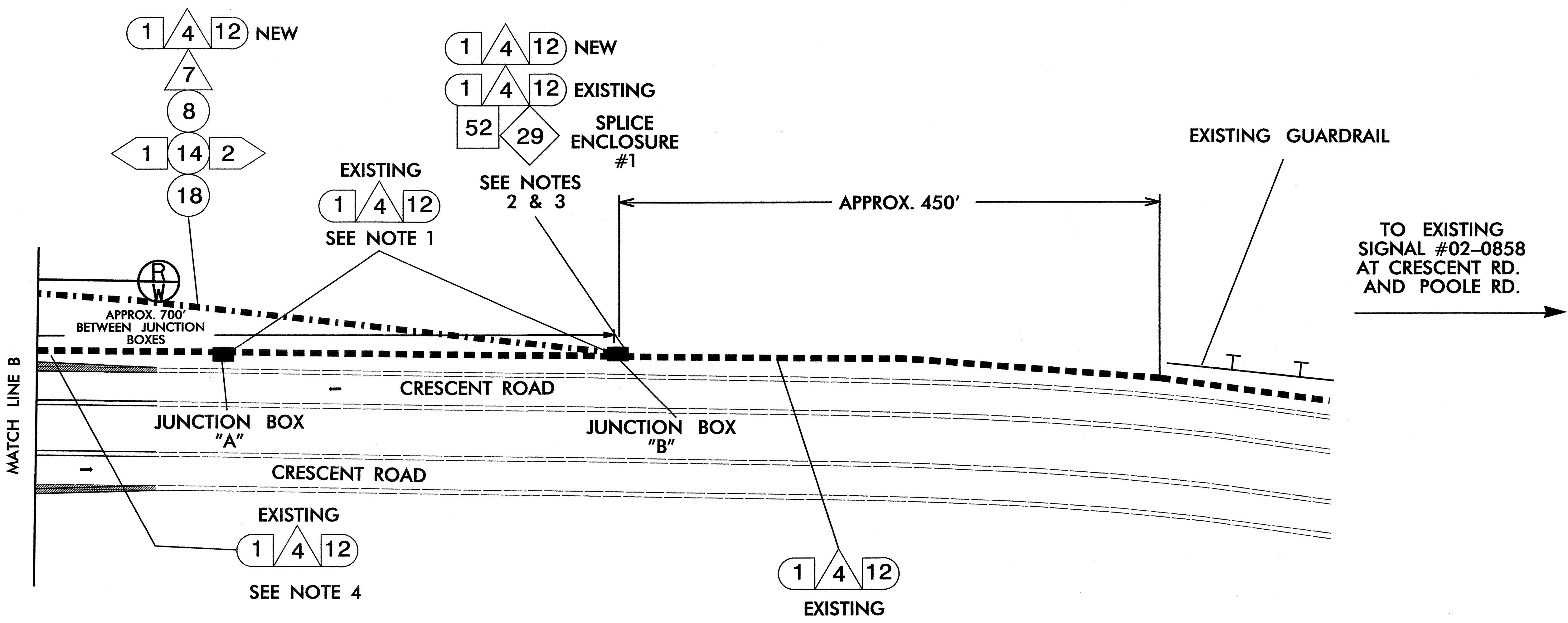


CONTACT CLARISE BRYANT, CITY OF KINSTON (252-939-3243), PRIOR TO CUTTING FIBER OPTIC CABLE.

NOTES:

1. SEAL ALL CONDUIT ENTRANCES INTO JUNCTION BOXES WITH MECHANICAL SEALING DEVICES.
2. ABANDON FIBER AND CONDUIT; REMOVE JUNCTION BOX AND RESTORE GRADE.

| | | | |
|--|--|--|--|
| Prepared in the Offices of: 750 N. Greenfield Pkwy., Garner, NC 27529 | COMMUNICATIONS CABLE ROUTING AND CONDUIT ROUTING AT CRESCENT RD. & US 258 RAMPS | | SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14543 G. G. MURR, JR. |
| | DIVISION 02 LENOIR CO. KINSTON | PLAN DATE: JULY 2008 REVIEWED BY: I. N. AVERY | |
| PREPARED BY: H. T. BERGGREN | REVIEWED BY: G. G. MURR, JR., PE | REVISIONS INIT. DATE | |
| SCALE: 0' = 1" | | SIGNATURE: <i>[Signature]</i> DATE: 8-4-08 | |



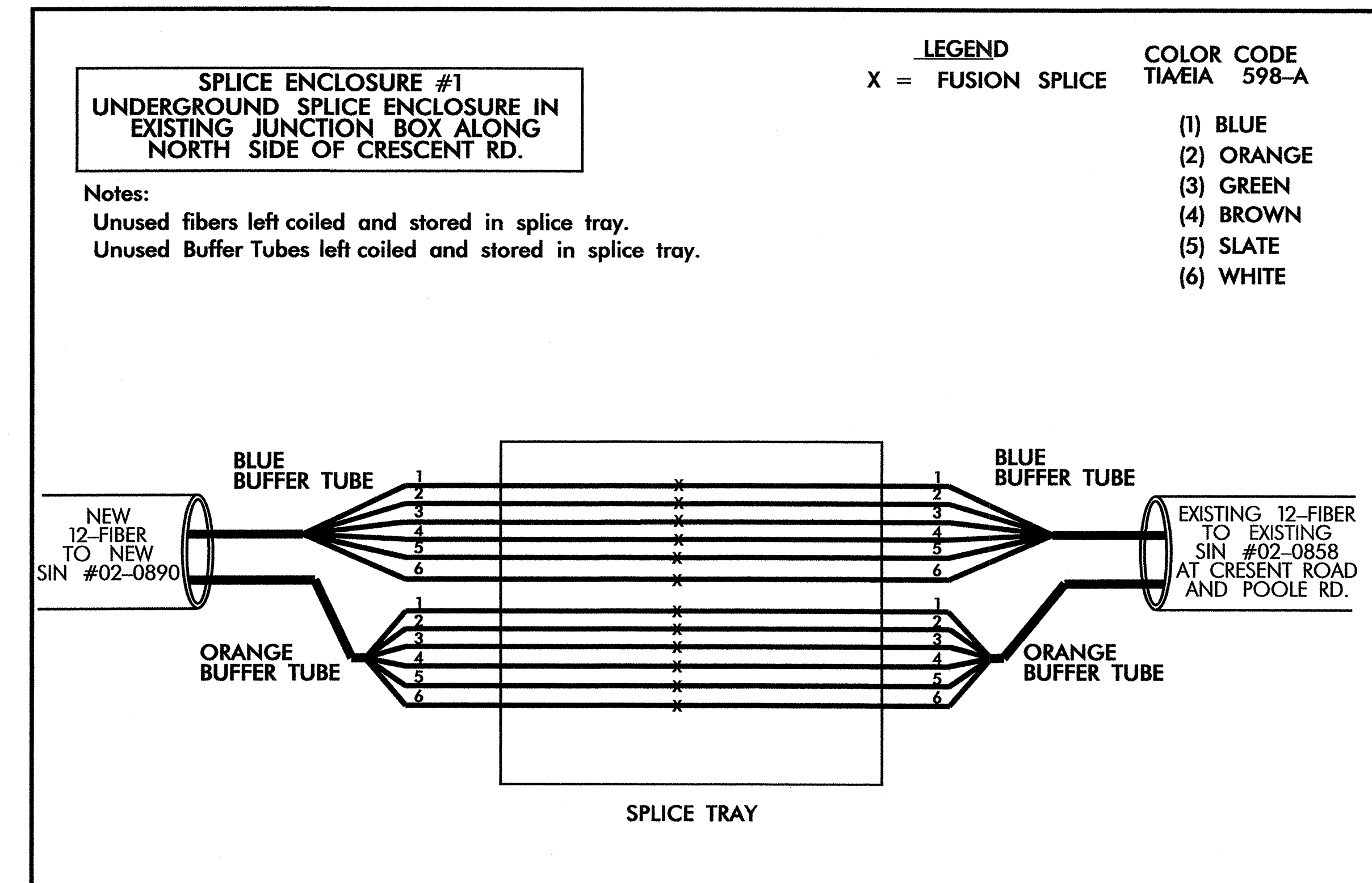
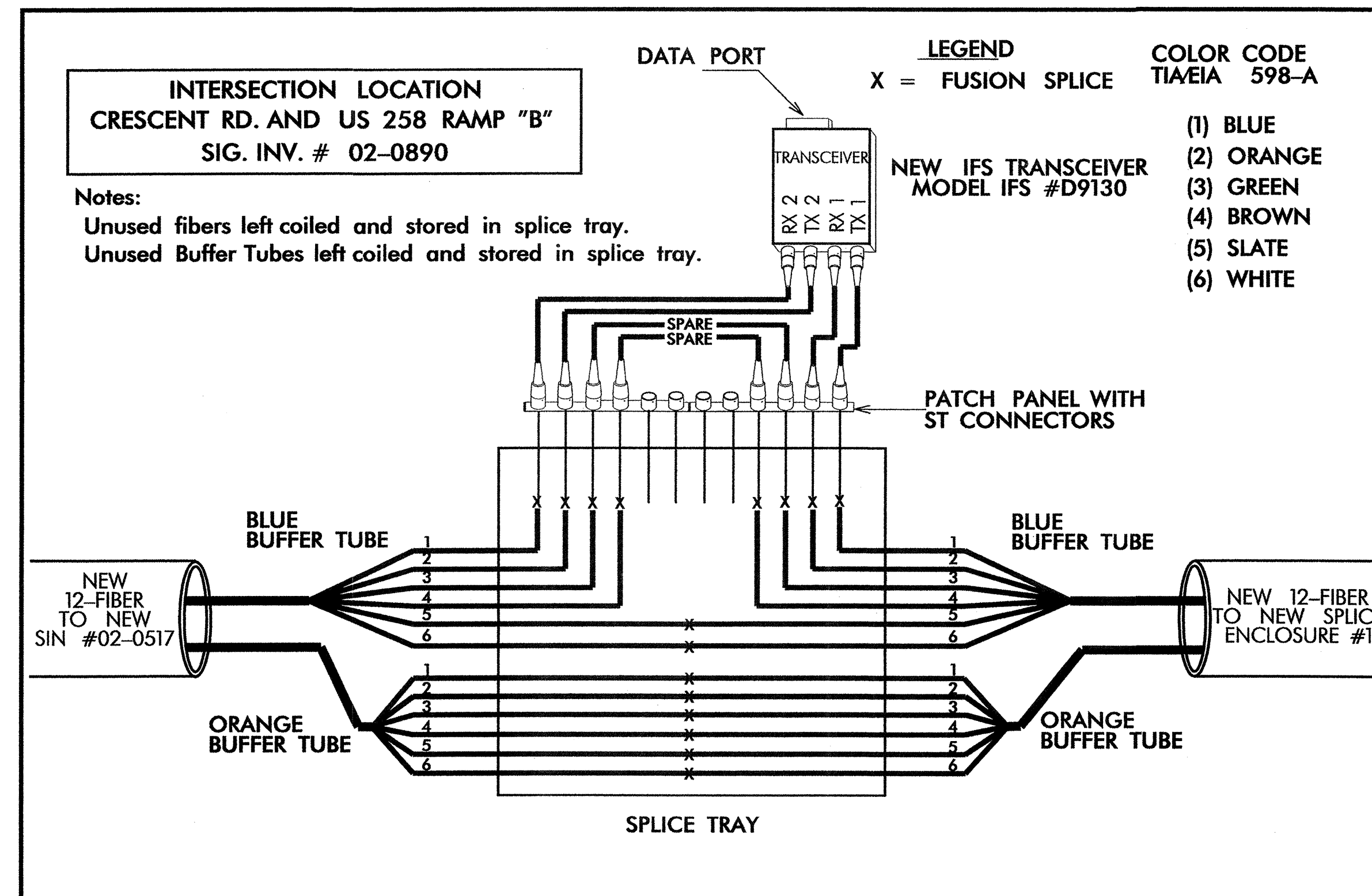
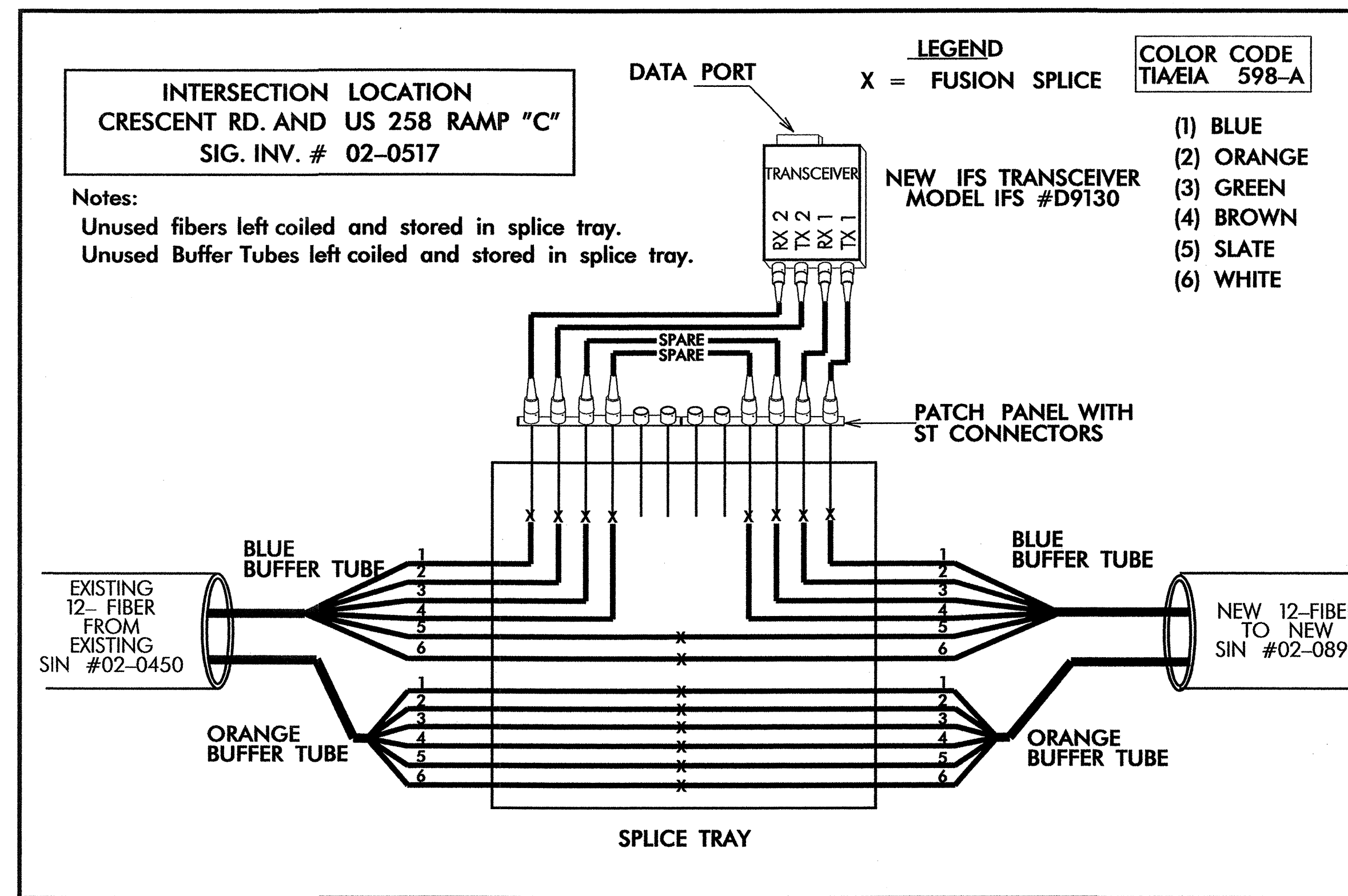
NOTES:

1. CUT EXISTING 12-FIBER CABLE AT EXISTING JUNCTION BOX "A" AND BACK PULL TO JUNCTION BOX "B".
2. INSTALL NEW UNDERGROUND SPLICE ENCLOSURE (SPLICE ENCLOSURE #1) AND SPLICE NEW 12-FIBER CABLE AND EXISTING 12-FIBER CABLE.
3. STORE 100' OF SPARE SMFO CABLE.
4. ABANDON FIBER AND CONDUIT; REMOVE JUNCTION BOX AND RESTORE GRADE.

CONTACT CLARISE BRYANT, CITY OF KINSTON (252-939-3243), PRIOR TO CUTTING FIBER OPTIC CABLE.

| | | |
|-----------|--|--|
| | COMMUNICATIONS CABLE ROUTING AND CONDUIT ROUTING AT CRESCENT RD. & US 258 RAMPS | |
| | DIVISION 02 PLAN DATE: JULY 2008 PREPARED BY: H.T. BERGGREN | LENOIR CO. REVIEWED BY: I.N. AVERY REVIEWED BY: G.G. MURR, JR., PE |
| SCALE | SIGNATURE: <i>[Signature]</i> DATE: 8-4-08 CADD File name: | |

FIBER OPTIC CABLE



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

| | | | | |
|----------------------------|----------------------------------|-------------------------|------|---------|
| | SPLICE PLANS | | | |
| | CRESCENT RD. AND 258 RAMPS C & B | | | |
| | DIVISION 02 | LENOIR CO. | | KINSTON |
| | PLAN DATE: JULY 2008 | REVIEWED BY: I.N. AVERY | | |
| PREPARED BY: H.T. BERGGREN | REVIEWED BY: G.G. MURR, JR. PE | | | |
| SCALE: 0 | REVISIONS | INIT. | DATE | |
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8-4-08
 SIGNATURE DATE
 CADD File name:

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

11-08

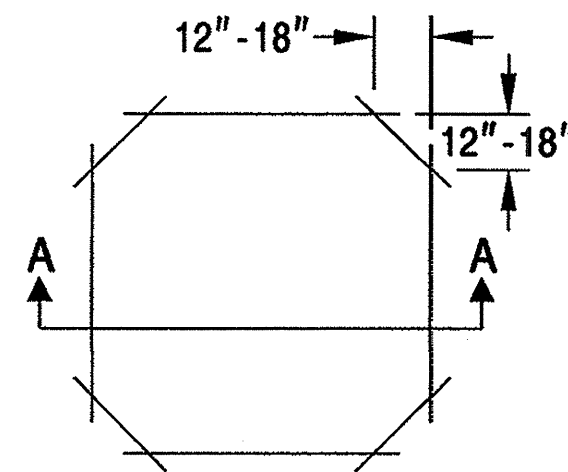
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

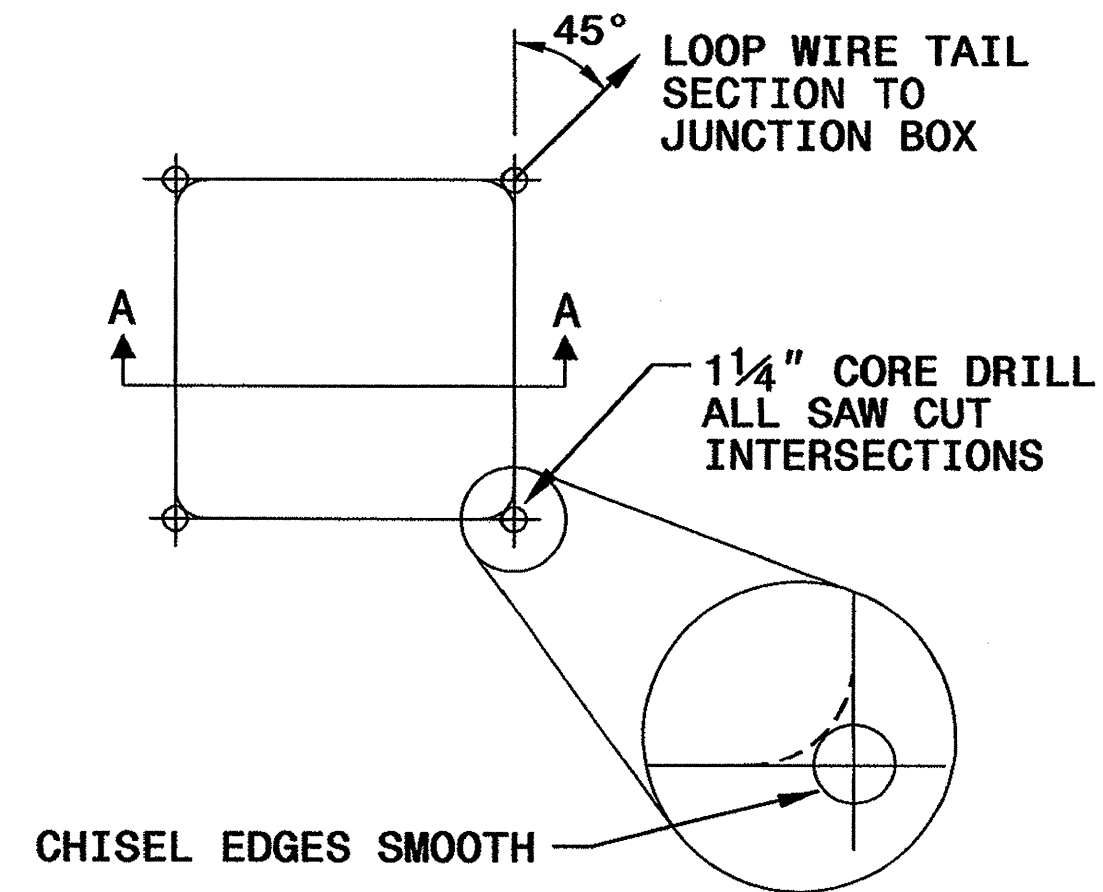
CONVENTIONAL 4-SIDED LOOP

SAW CUT OPTIONS

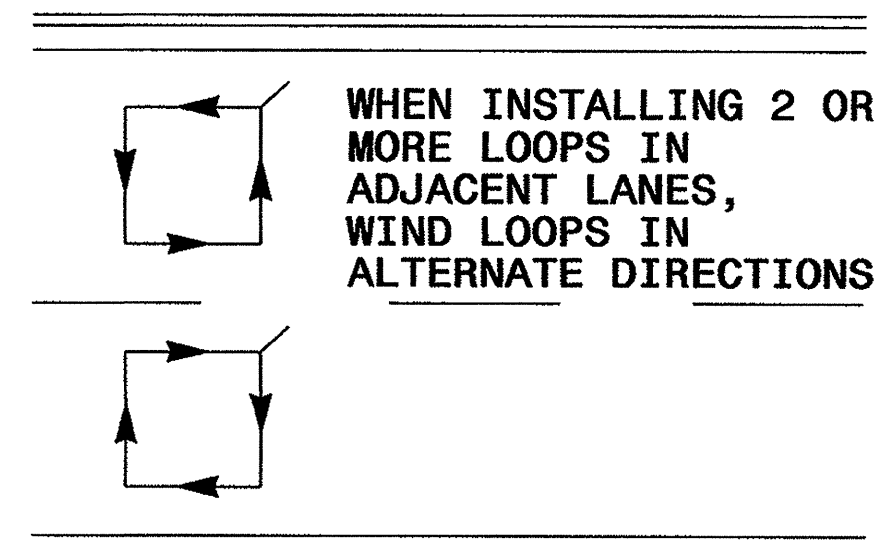
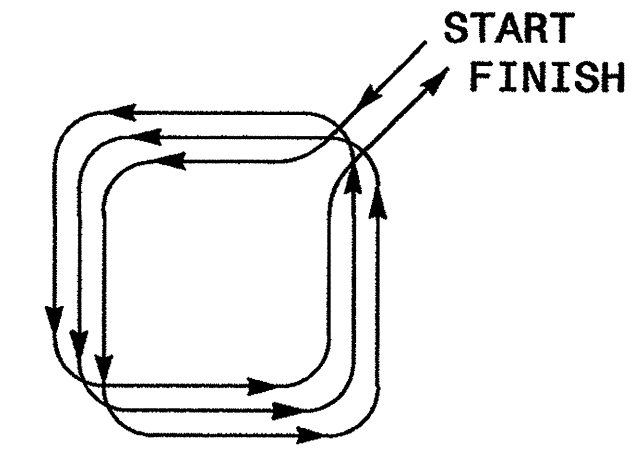
OPTION 1



OPTION 2 (POOR PAVEMENT)

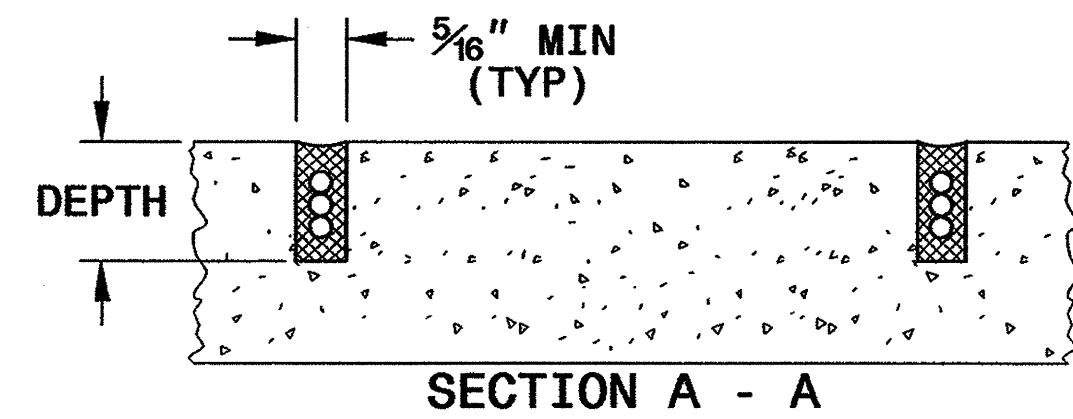


LOOP WINDING METHOD



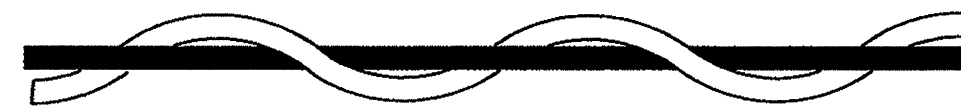
SAW SLOT DEPTH CHART

| 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 WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE



CORRECT WAY TO TWIST WIRE



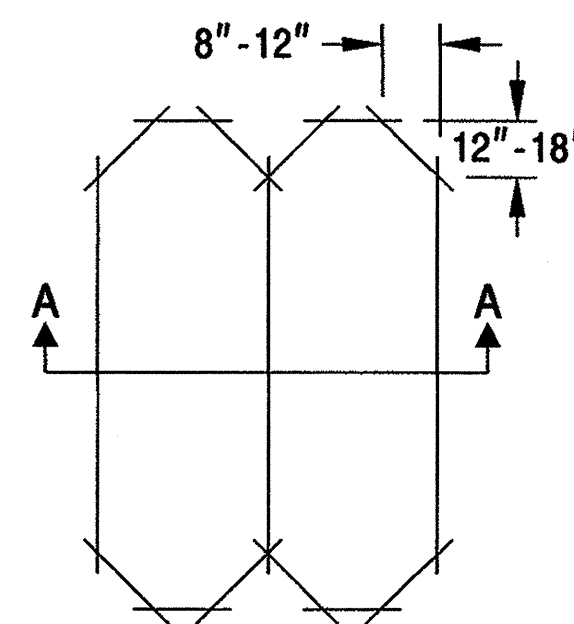
NOTES

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.

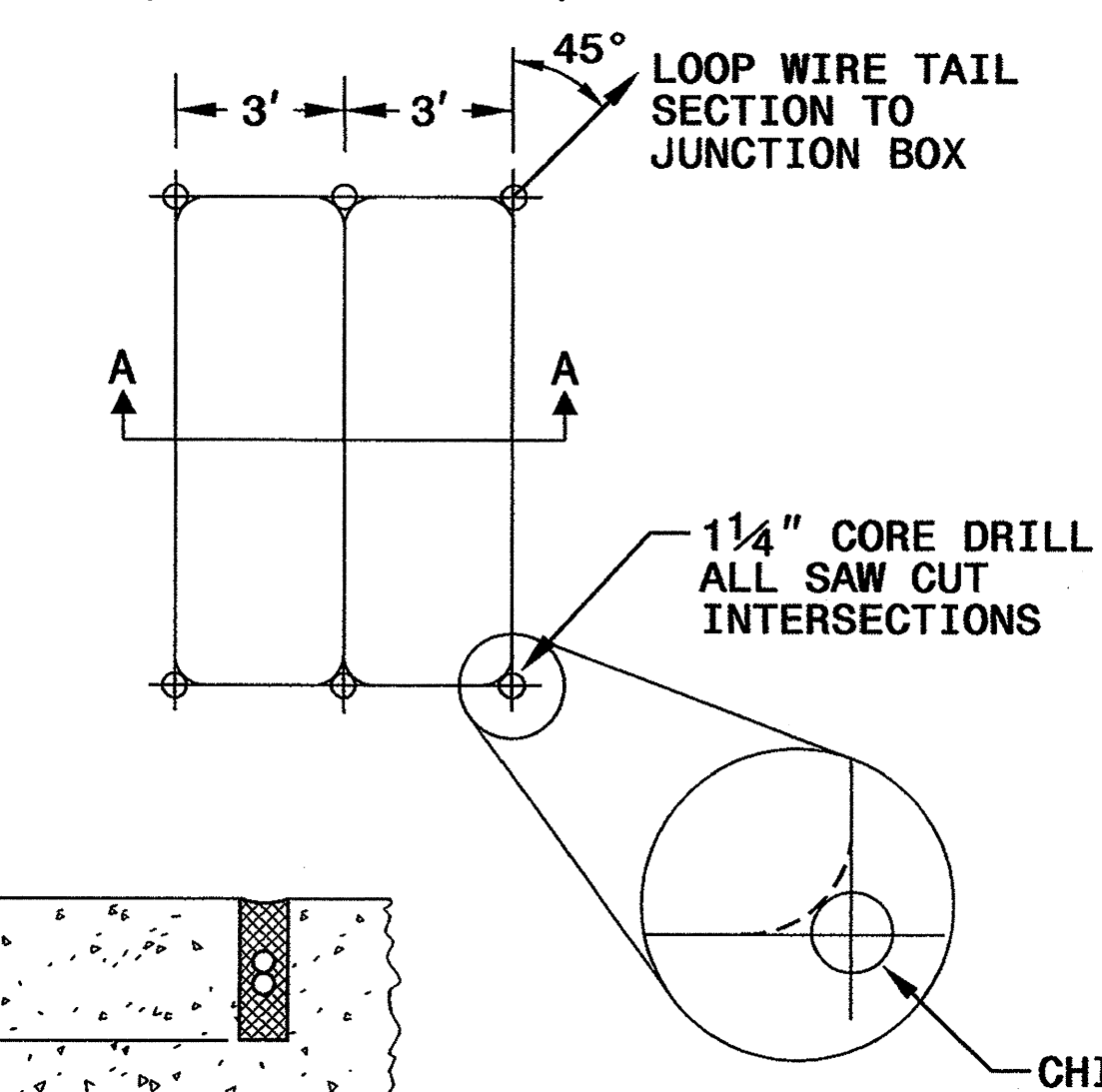
QUADRUPOLE LOOP

SAW CUT OPTIONS

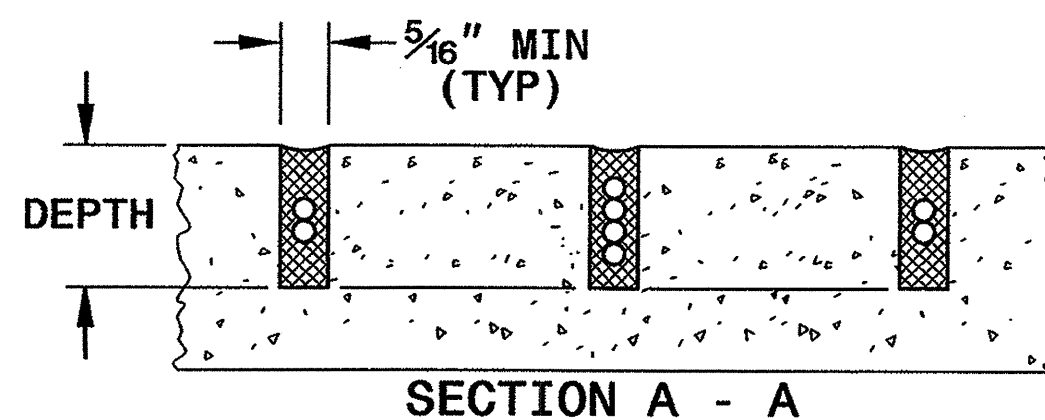
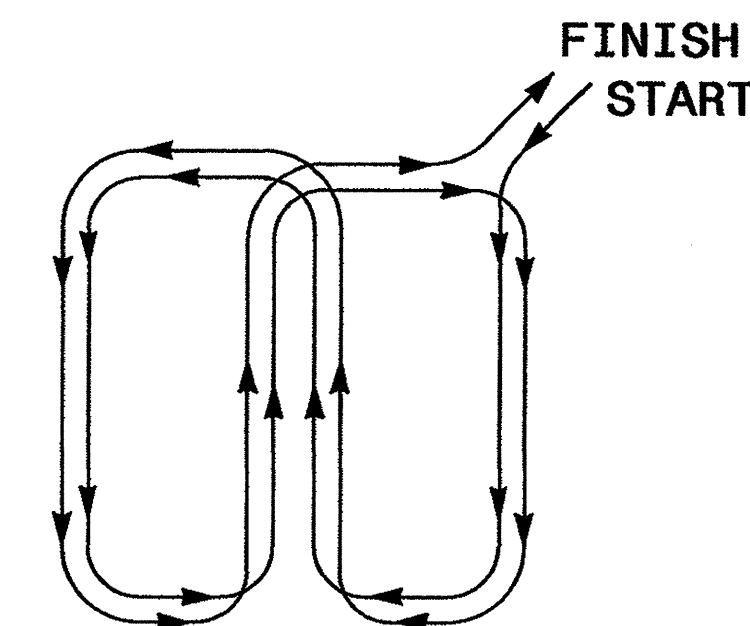
OPTION 1



OPTION 2 (POOR PAVEMENT)



LOOP WINDING METHOD



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

Milton Dean 11/24/08
SIGNATURE DATE

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

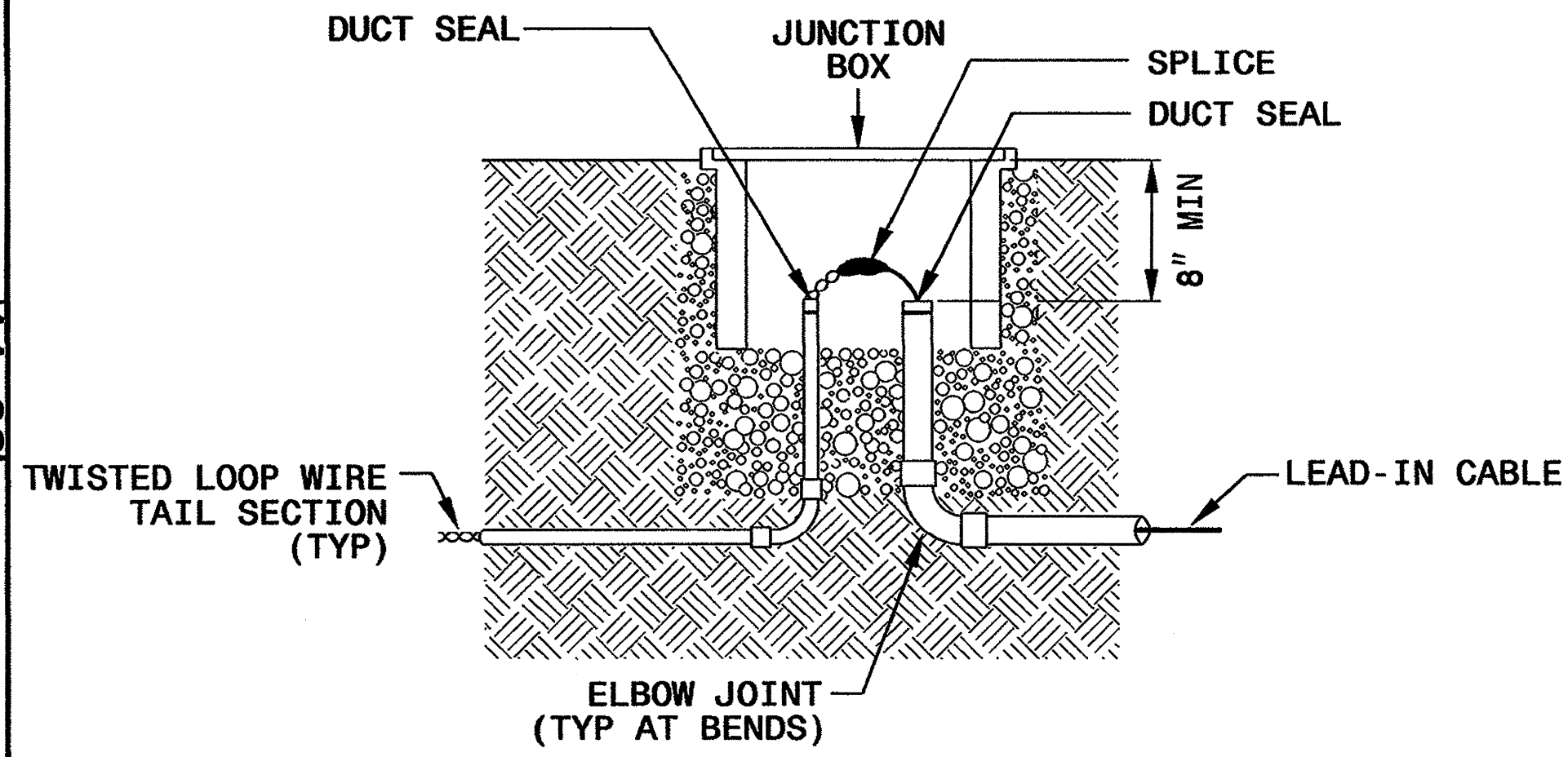
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

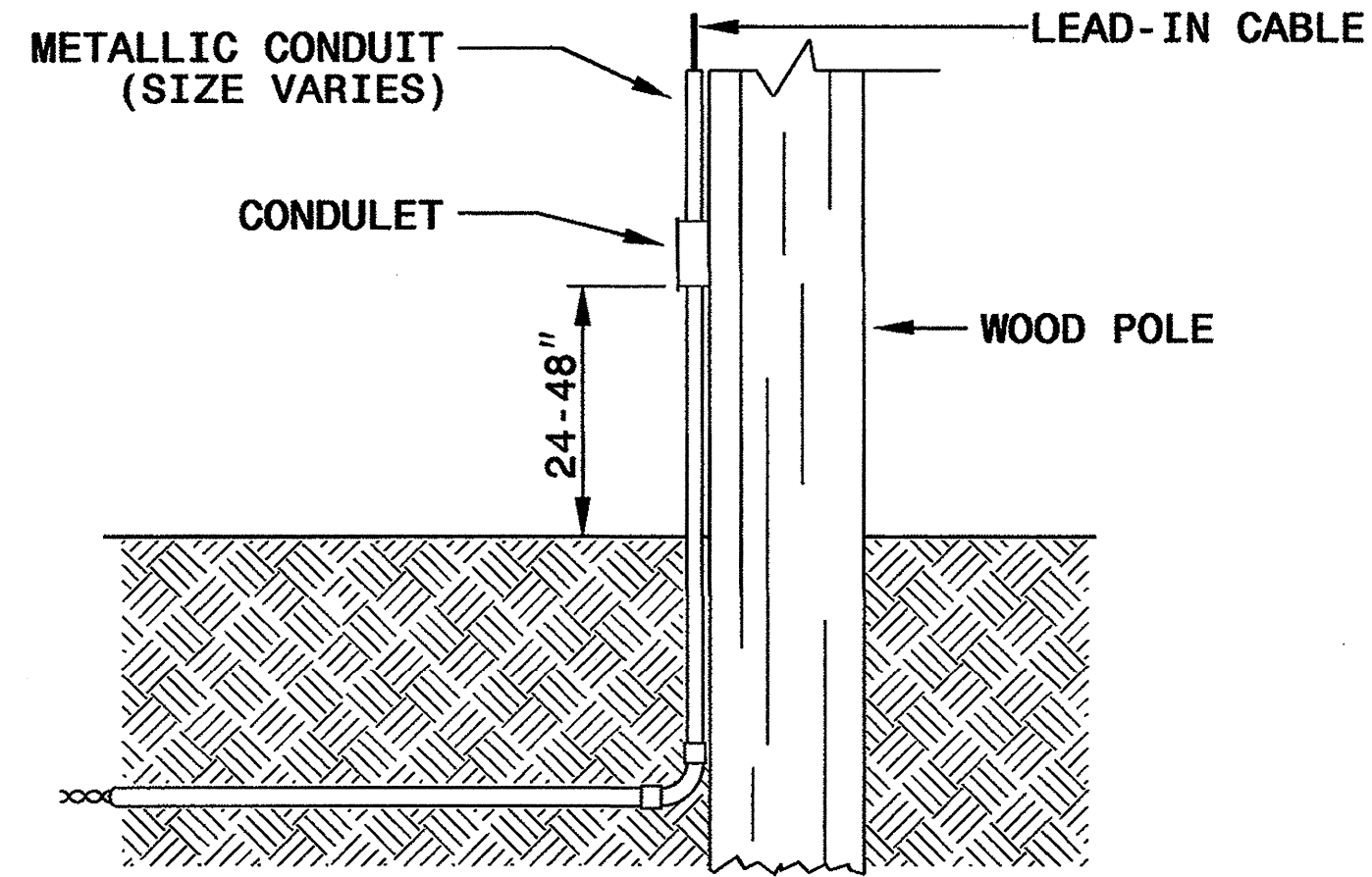
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

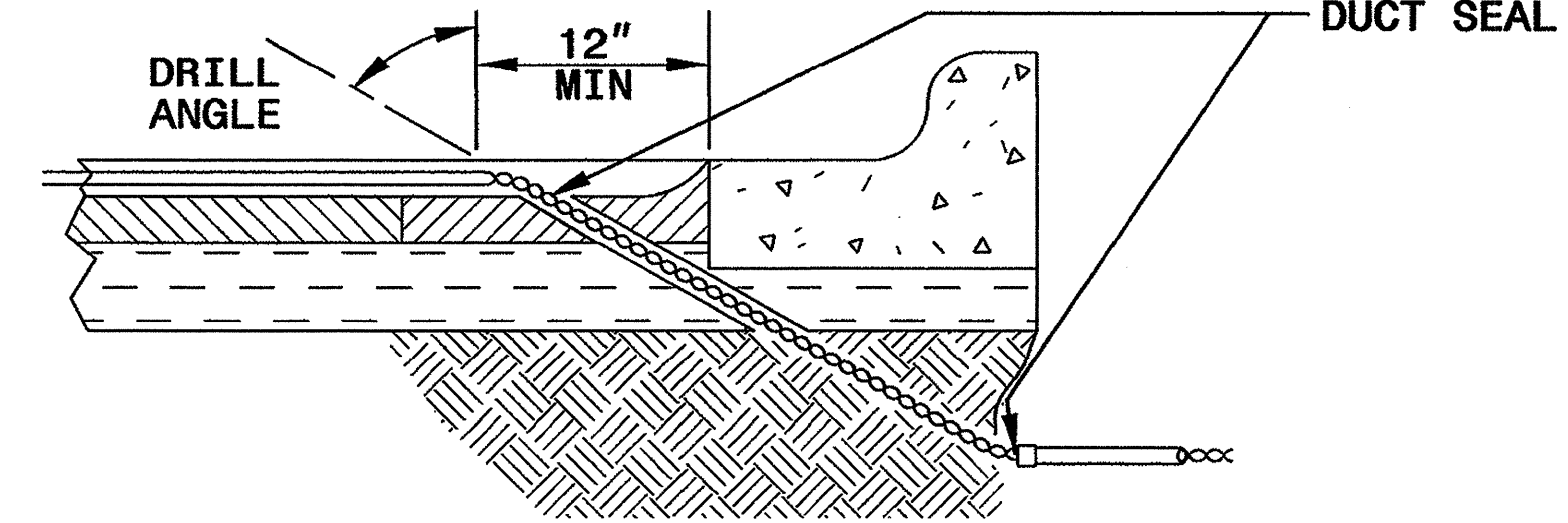


NOTE

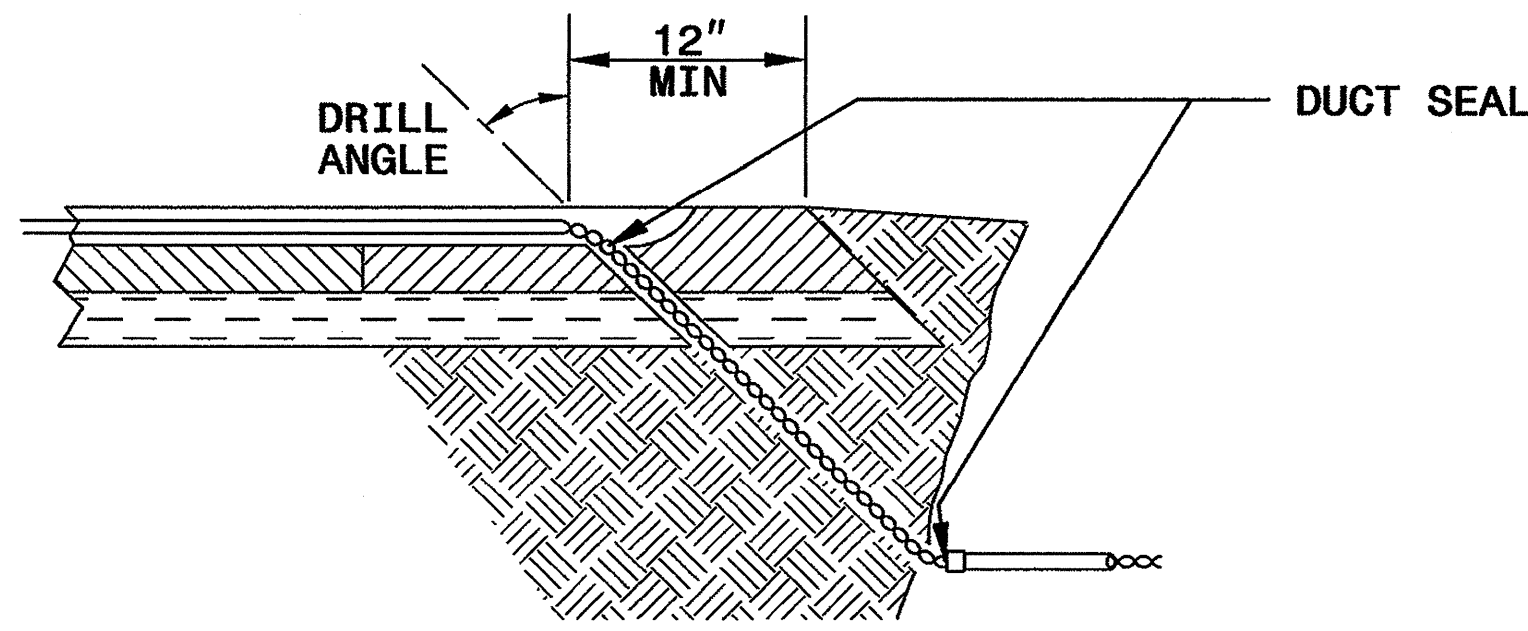
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

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.

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 RALEIGH, N.C.

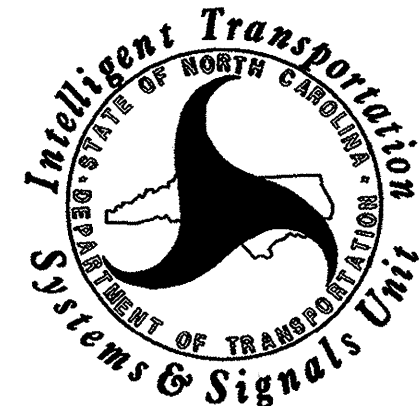
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:



750 N. Greenfield Parkway
 Garner, NC 27529

SEAL



Milton A. Dean 11/24/08
 SIGNATURE DATE

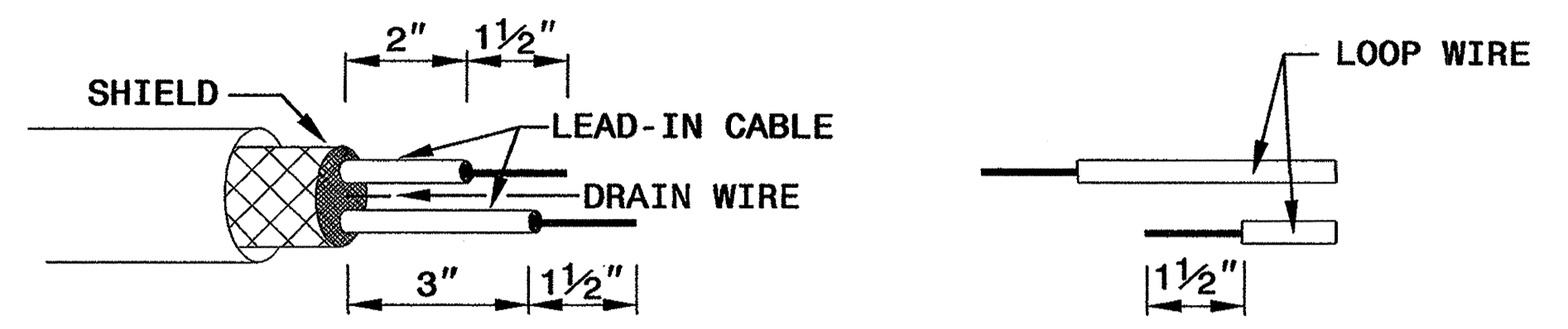
STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

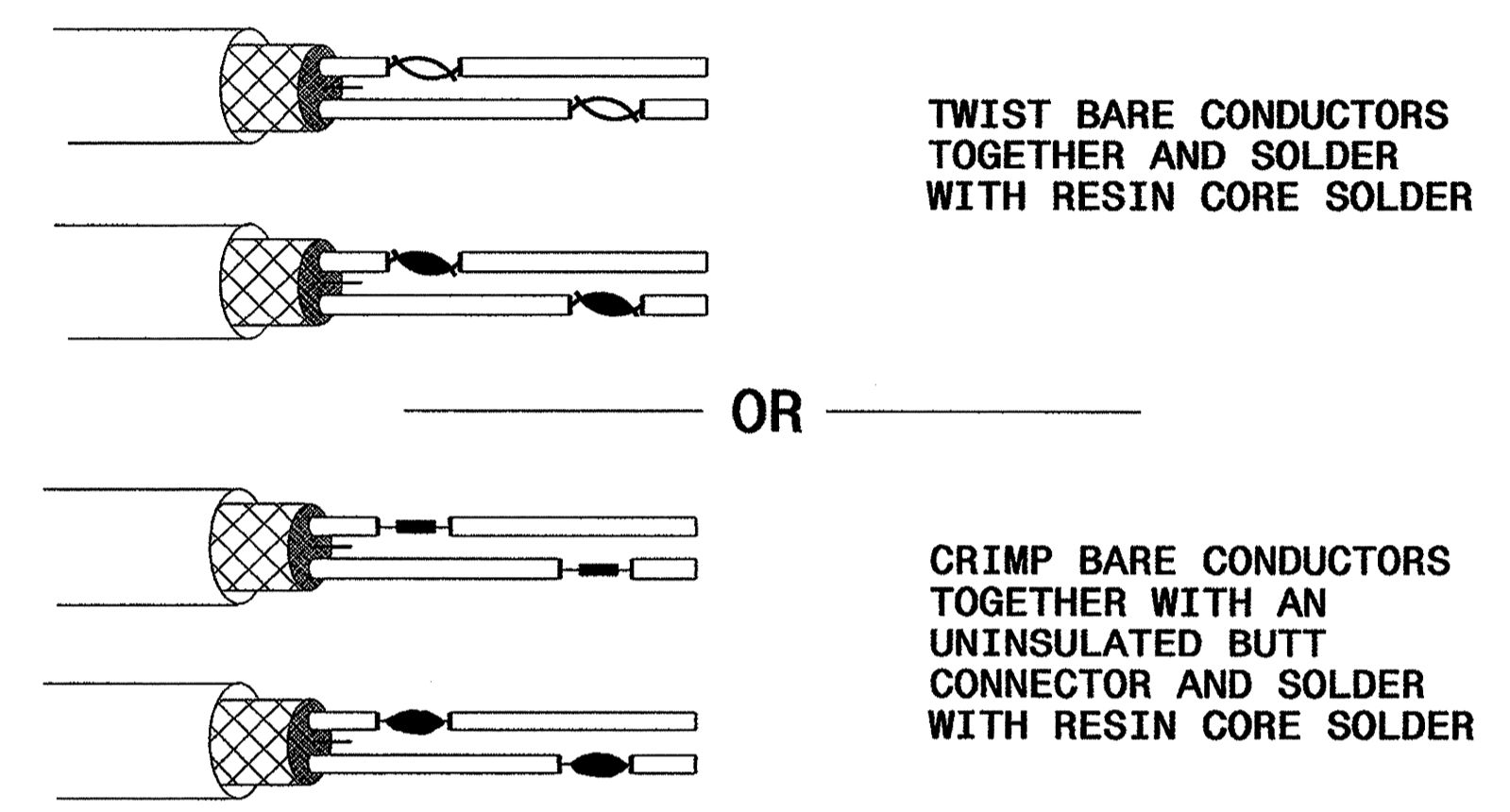
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

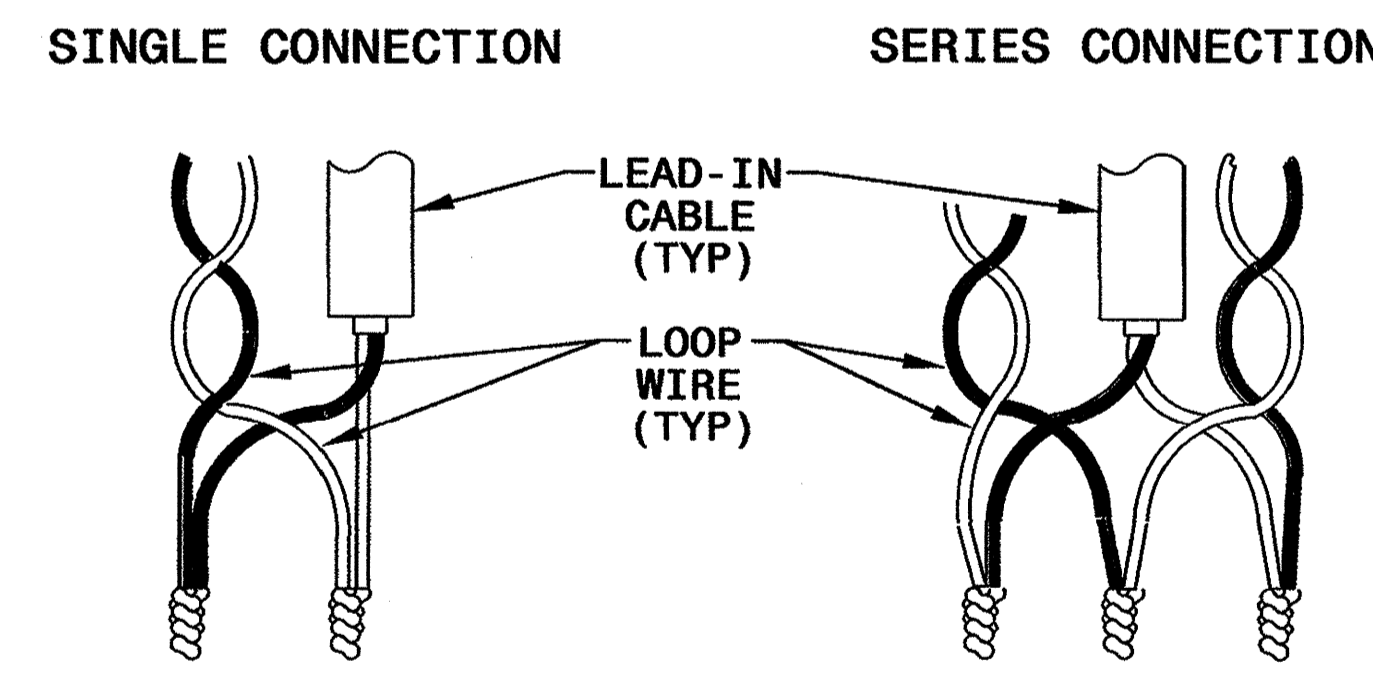


STEP 2. CONNECT AND SOLDER

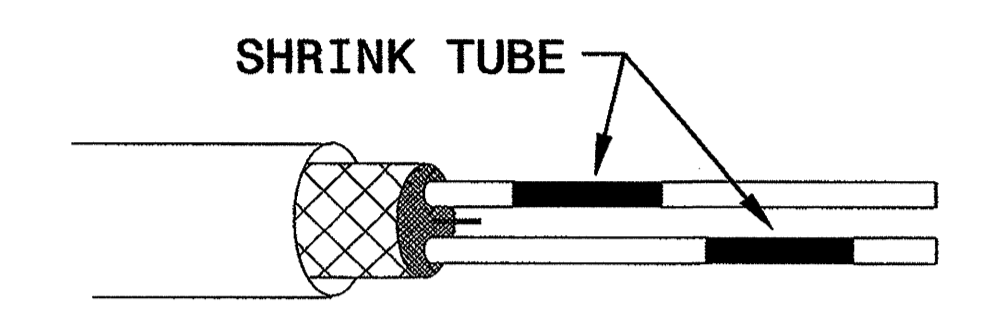


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

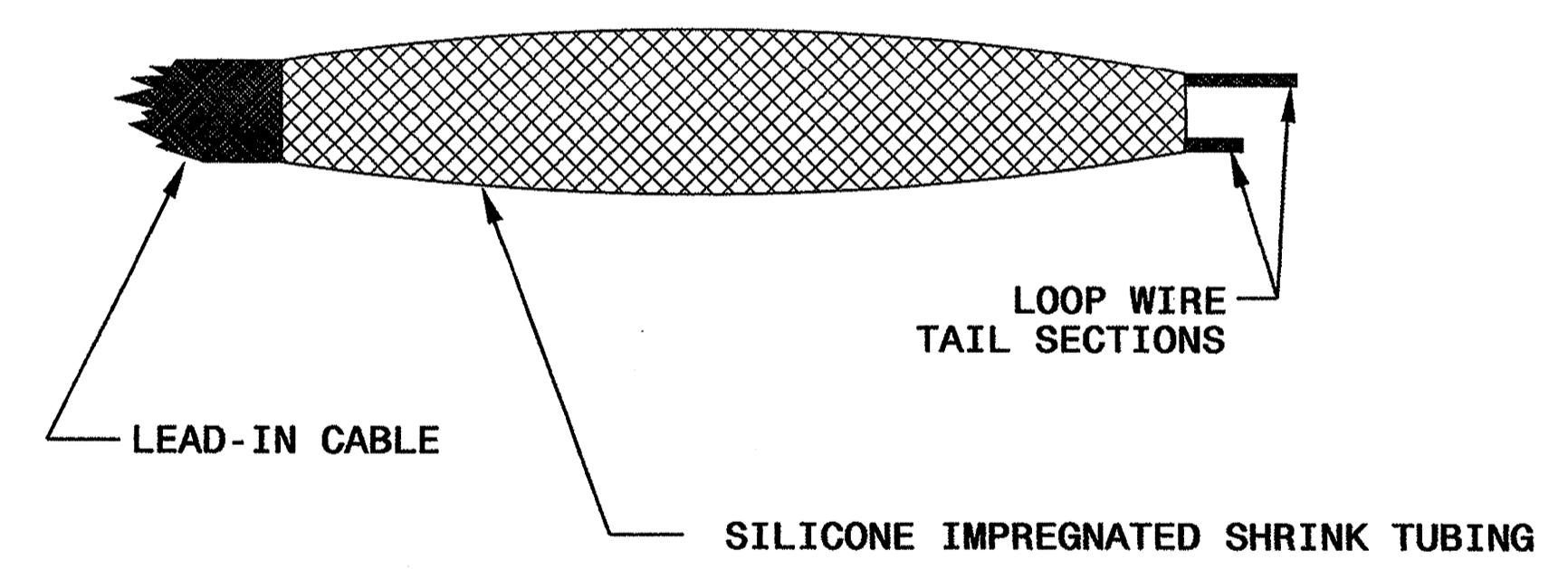
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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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:

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Garner, NC 27529

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Milton J. Dean 11/24/08
SIGNATURE DATE

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