

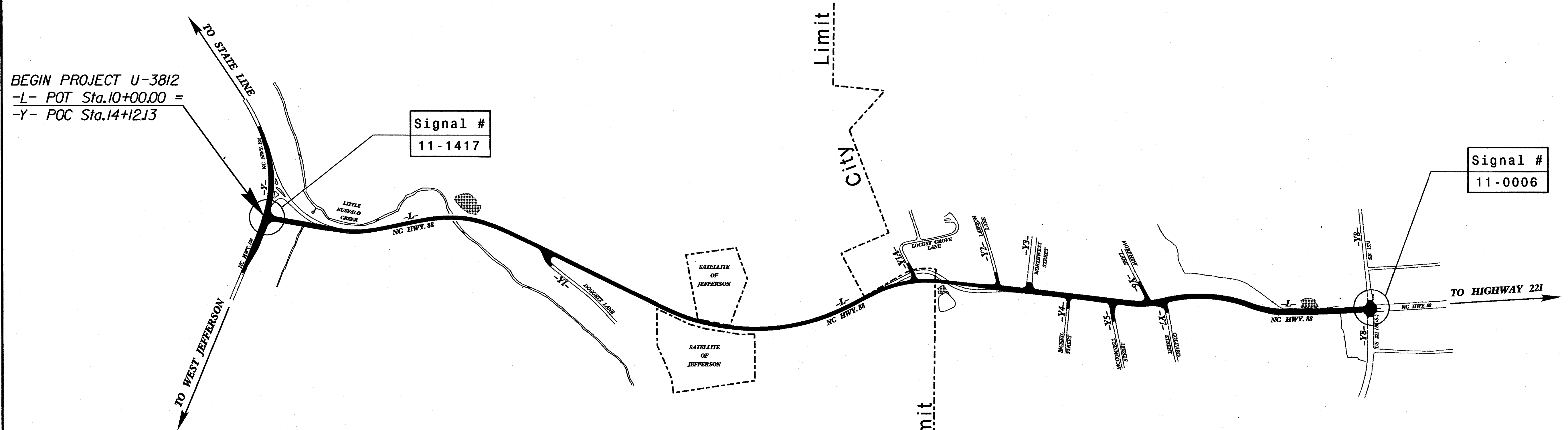
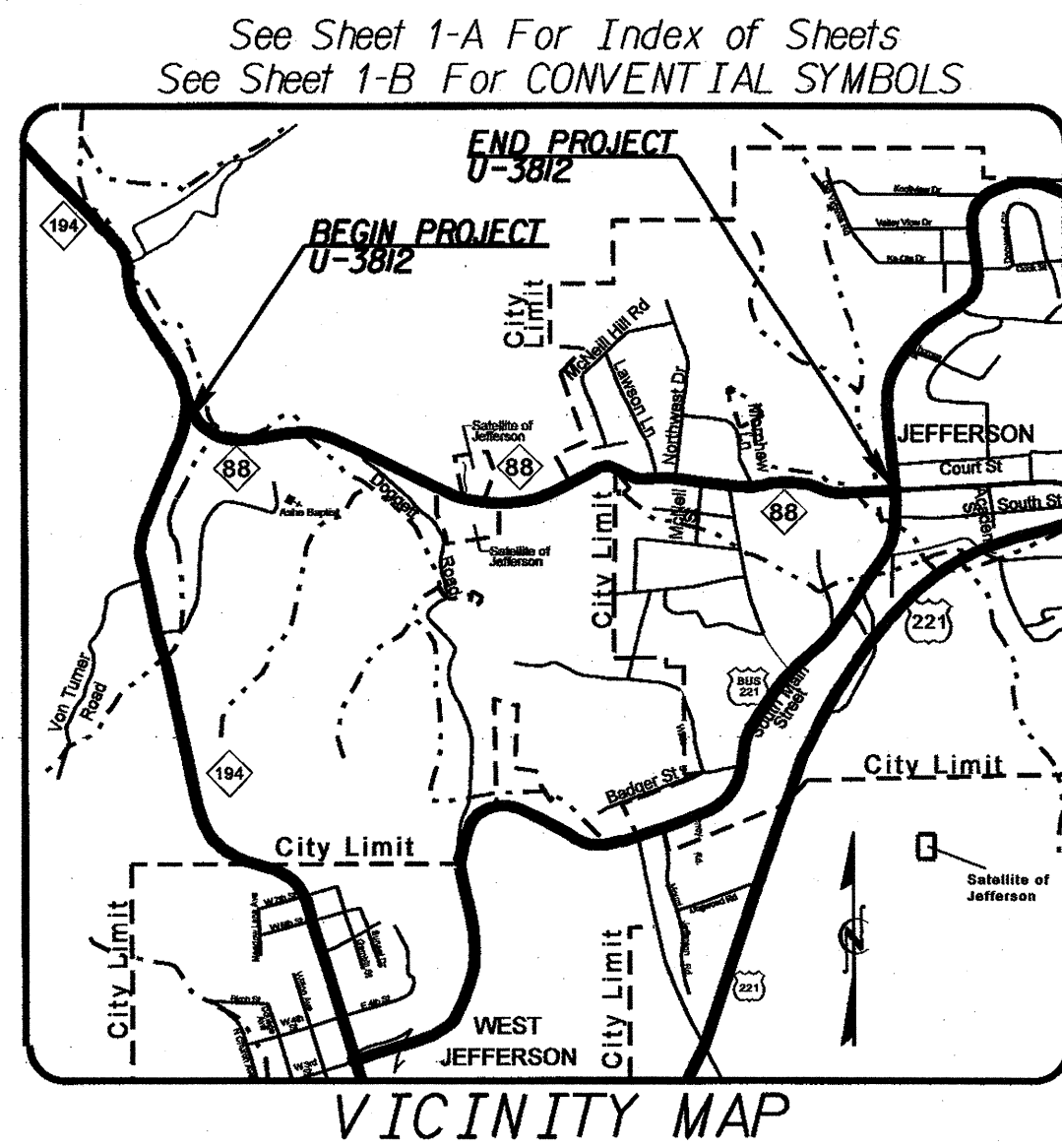
| | | | |
|-----------------|-----------------------------|-------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | U-3812 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| | | | |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ASHE COUNTY

LOCATION: NC 88 (WEST MAIN ST.) FROM NC 194
TO US 221 BUSINESS (SOUTH MAIN ST.).

TYPE OF WORK: TRAFFIC SIGNALS



TIP PROJECT: U-3812

CONTRACT: 34977.1.1

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

| Sheet # | Reference # | Location/Description |
|------------|-------------|---|
| Sig. 1 | | Title Sheet |
| Sig. 2-4 | 11-1417 | NC 194 at NC 86 |
| Sig. 5-9 | 11-0006 | US 221 Bus./NC 88 at US 221 Bus. (South Main St.)/SR 1573 (North Main Street) |
| Sig. 10-15 | N/A | Standard Metal Pole Details Sheets |
| Sig. 16-18 | N/A | Loop Detail Sheets |

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

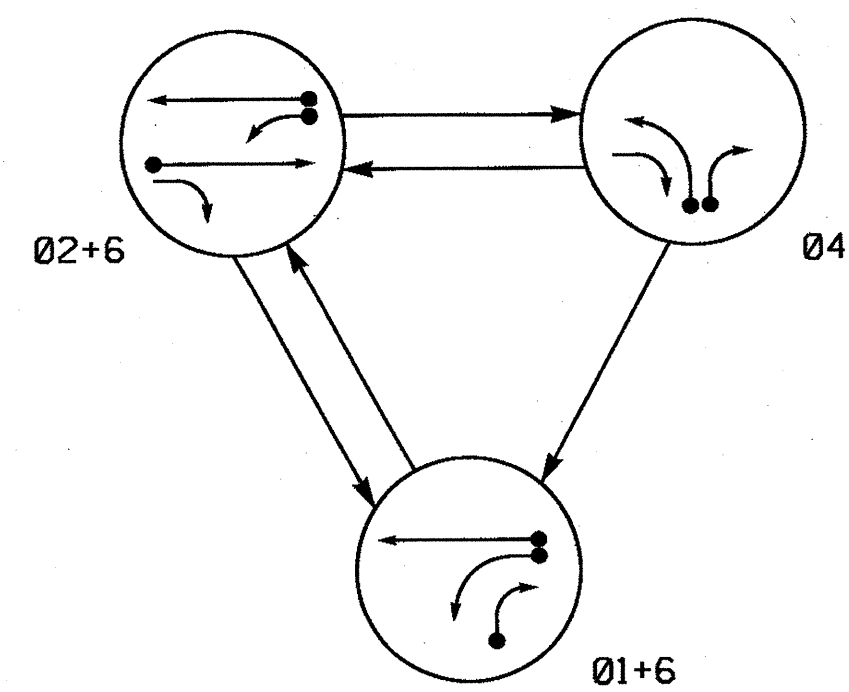
Contacts:

Z.M. Little, PE - Western Region Signals Project Engineer
G. C. Brown, PE - Signal Equipment Design Engineer

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

PHASING DIAGRAM



| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|----|-------|
| | 01+6 | 02+6 | 04 | FLASH |
| 11 | ← | ← | ← | ← |
| 21 | R | G | R | Y |
| 22 | R | G | R | Y |
| 41 | R | R | G | R |
| 42 | R | R | G | R |
| 61,62 | G | G | R | Y |

| 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 |
| 1A | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | 15 | - | Y |
| | | | | | 6 | Y | Y | Y | - | 3 | - | Y |
| 1B | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | 15 | - | Y |
| 2A | 6X6 | 300 | 6 | Y | 2 | Y | Y | - | - | - | - | Y |
| 4A | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | 3 | - | Y |
| 6A | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | Y |

3 Phase Fully Actuated (Isolated)

NOTES

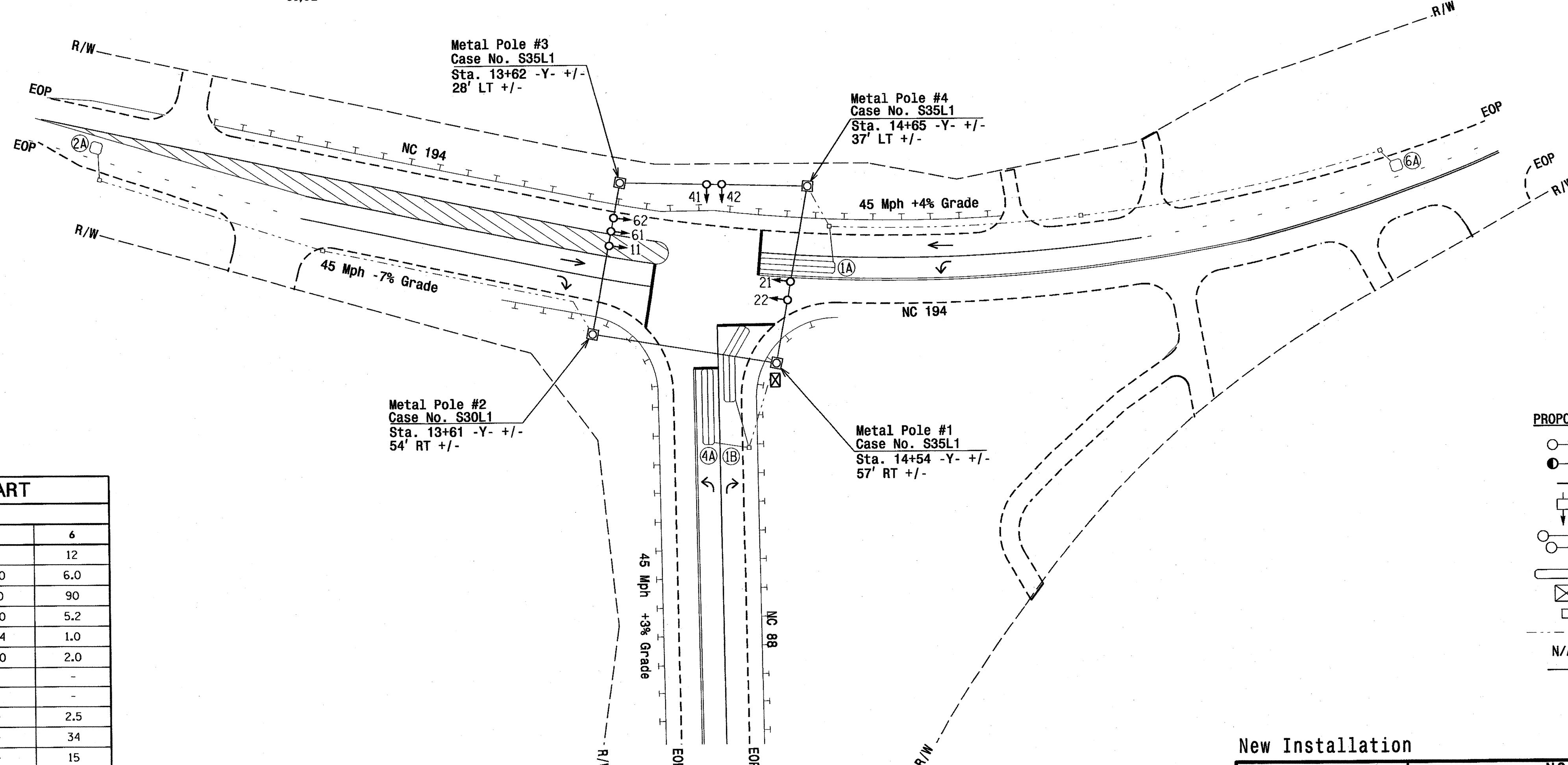
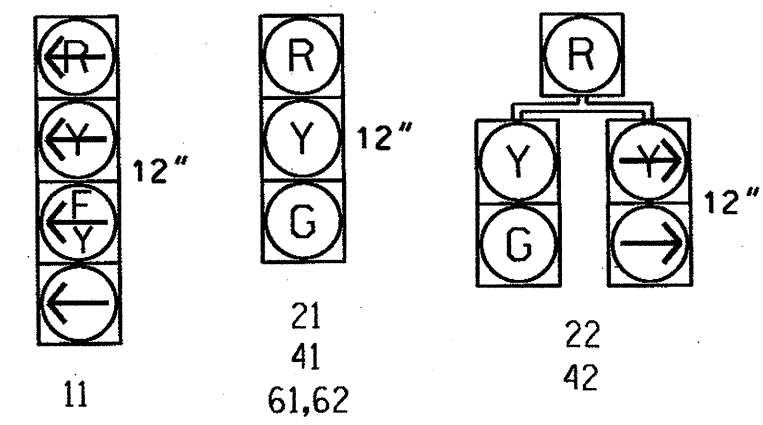
1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet 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

SIGNAL FACE I.D.

All Heads L.E.D.



| OASIS 2070L TIMING CHART | | | | |
|--------------------------|-------|------------|-----|------------|
| FEATURE | PHASE | | | |
| | 1 | 2 | 4 | 6 |
| Min Green 1 * | 7 | 12 | 7 | 12 |
| Extension 1 * | 2.0 | 6.0 | 2.0 | 6.0 |
| Max Green 1 * | 15 | 90 | 30 | 90 |
| Yellow Clearance | 3.0 | 5.2 | 3.0 | 5.2 |
| Red Clearance | 1.8 | 1.0 | 2.4 | 1.0 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1 * | - | - | - | - |
| Don't Walk 1 | - | - | - | - |
| Seconds Per Actuation * | - | 2.5 | - | 2.5 |
| Max Variable Initial * | - | 34 | - | 34 |
| Time Before Reduction * | - | 15 | - | 15 |
| Time To Reduce * | - | 45 | - | 45 |
| Minimum Gap | - | 3.0 | - | 3.0 |
| Recall Mode | - | MIN RECALL | - | MIN RECALL |
| Vehicle Call Memory | - | YELLOW | - | YELLOW |
| Dual Entry | - | - | - | - |
| Simultaneous Gap | ON | ON | ON | ON |

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

| PROPOSED | | EXISTING | |
|----------|--|----------|-----|
| ○→ | Traffic Signal Head | ●→ | N/A |
| ●→ | 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 | → | N/A |
| → | Directional Arrow | → | N/A |

New Installation

Prepared in the Office of:
NC 194 at NC 88

Division 11 Asheville County Jefferson

PLAN DATE: July 2011 REVIEWED BY: [Signature]

PREPARED BY: B.E. Wynn REVIEWED BY: [Signature]

750 N. Greenfield Pkwy, Corner, NC 27520

SCALE: 0 40
1"=40'

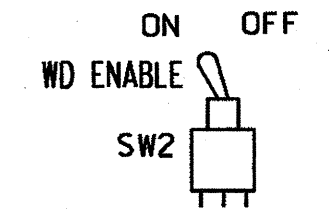
REVISIONS: [Table with columns for REVISIONS, INIT., DATE]

SIGNATURE: [Signature] DATE: 11-14-11

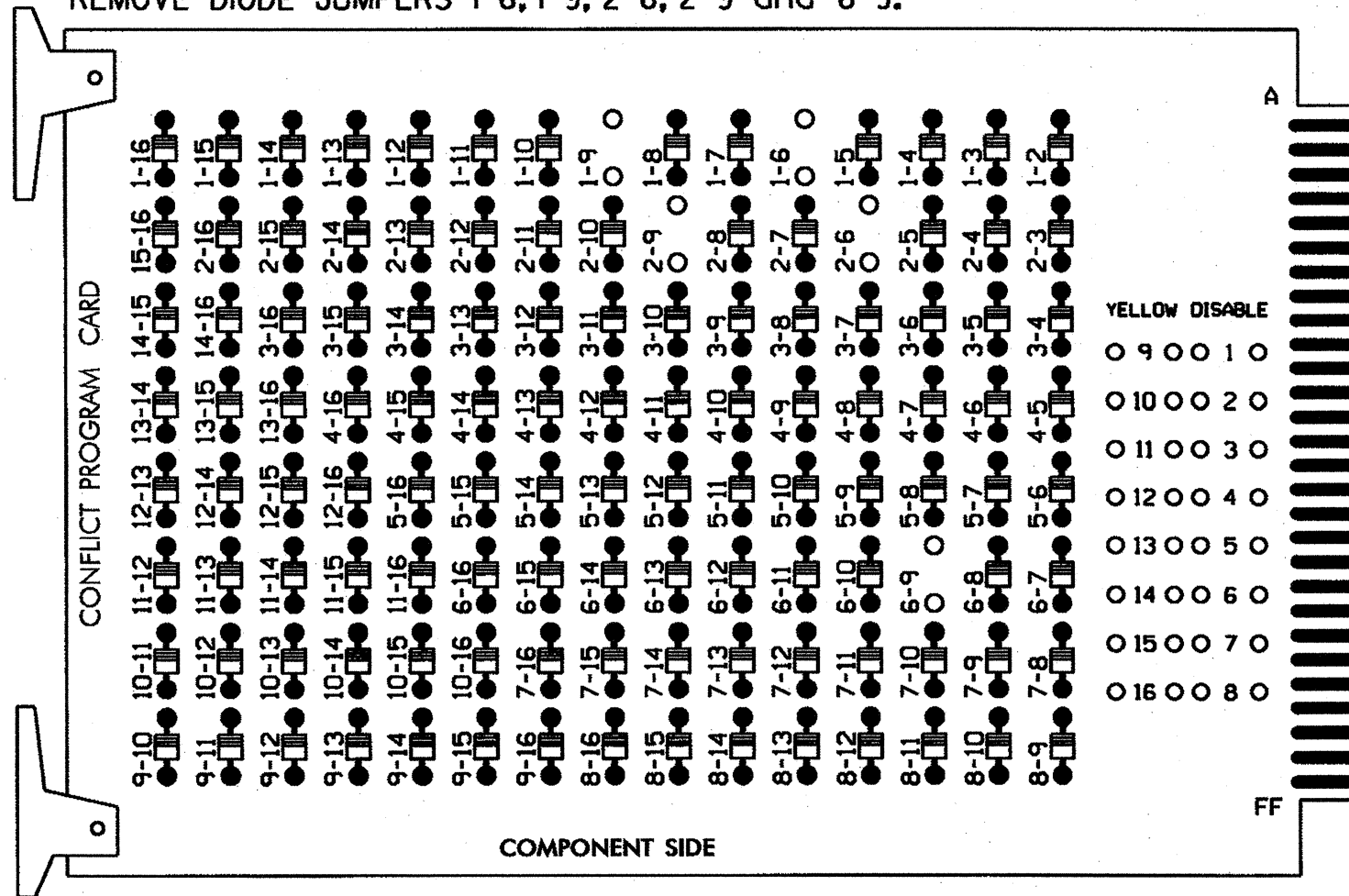
SIG. INVENTORY NO. 11-1417

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



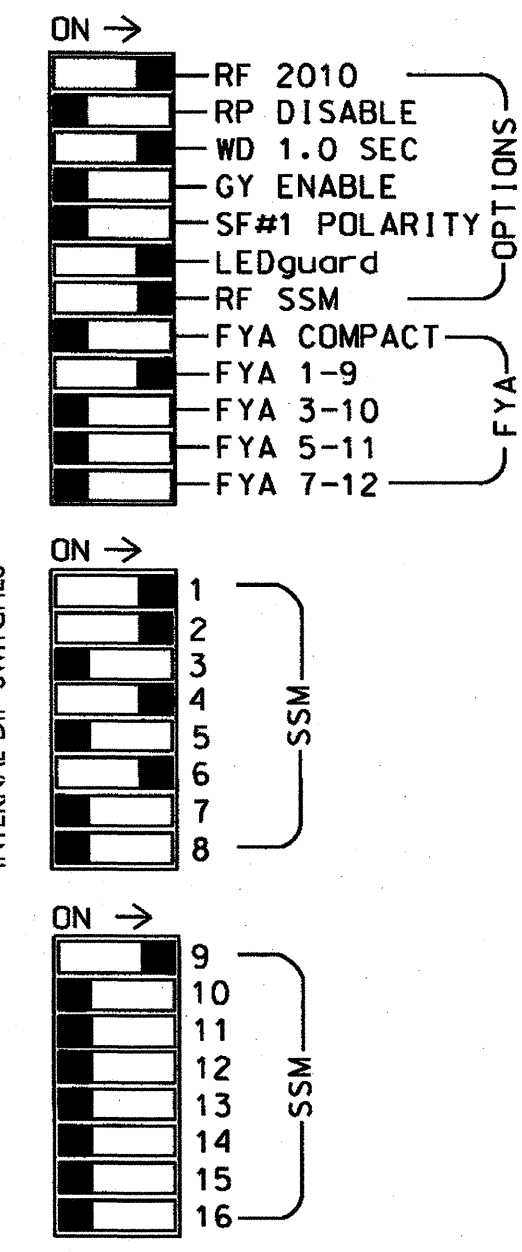
REMOVE DIODE JUMPERS 1-6, 1-9, 2-6, 2-9 and 6-9.



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

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

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. | 11* | 42 | 21,22 | NU | 22 | 41,42 | NU | 61,62 | NU | NU | NU | NU | 11* | NU | NU | NU | NU | NU | |
| RED | * | 128 | | | 101 | | | 134 | | | | | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | | | | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | | | | | | | | | |
| RED ARROW | | | | | | | | | | | | | | | | | | A121 | |
| YELLOW ARROW | | 126 | | | 102 | | | | | | | | | | | | | | A122 |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | | | | | | A123 |
| GREEN ARROW | 127 | 127 | | | 103 | | | | | | | | | | | | | | |

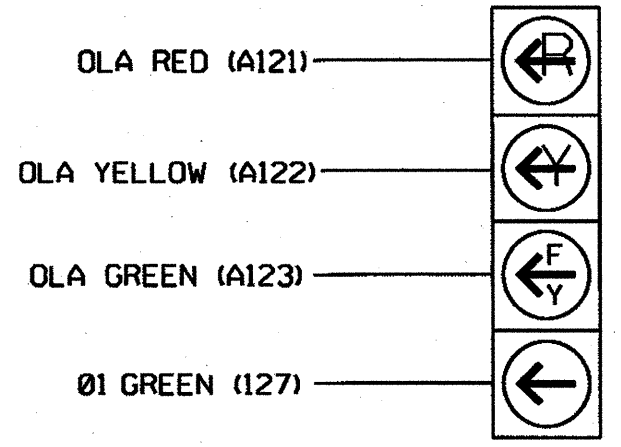
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail below.

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.....S1,S2,S4,S6,S9
 PHASES USED.....1,2,4,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



11

NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
 ST = STOP TIME

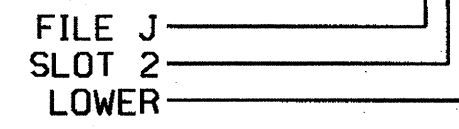
⊗ Wired Input - Do not populate slot with detector card

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' | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 1B | TB2-5,6 | I2U | 39 | 1 | 2 | 1 | Y | Y | | | 15 |
| 2A | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | 3 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |

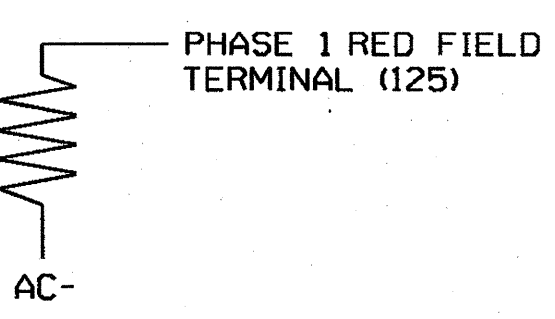
'Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

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



NOTE: The purpose of 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.

ELECTRICAL DETAIL SHEET 1 OF 2

Electrical and Programming Details For:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 194 at NC 88

Division 11 Ashe County Jefferson

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

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS: INIT. DATE

Signature: George C. Brown, 9/2/11

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

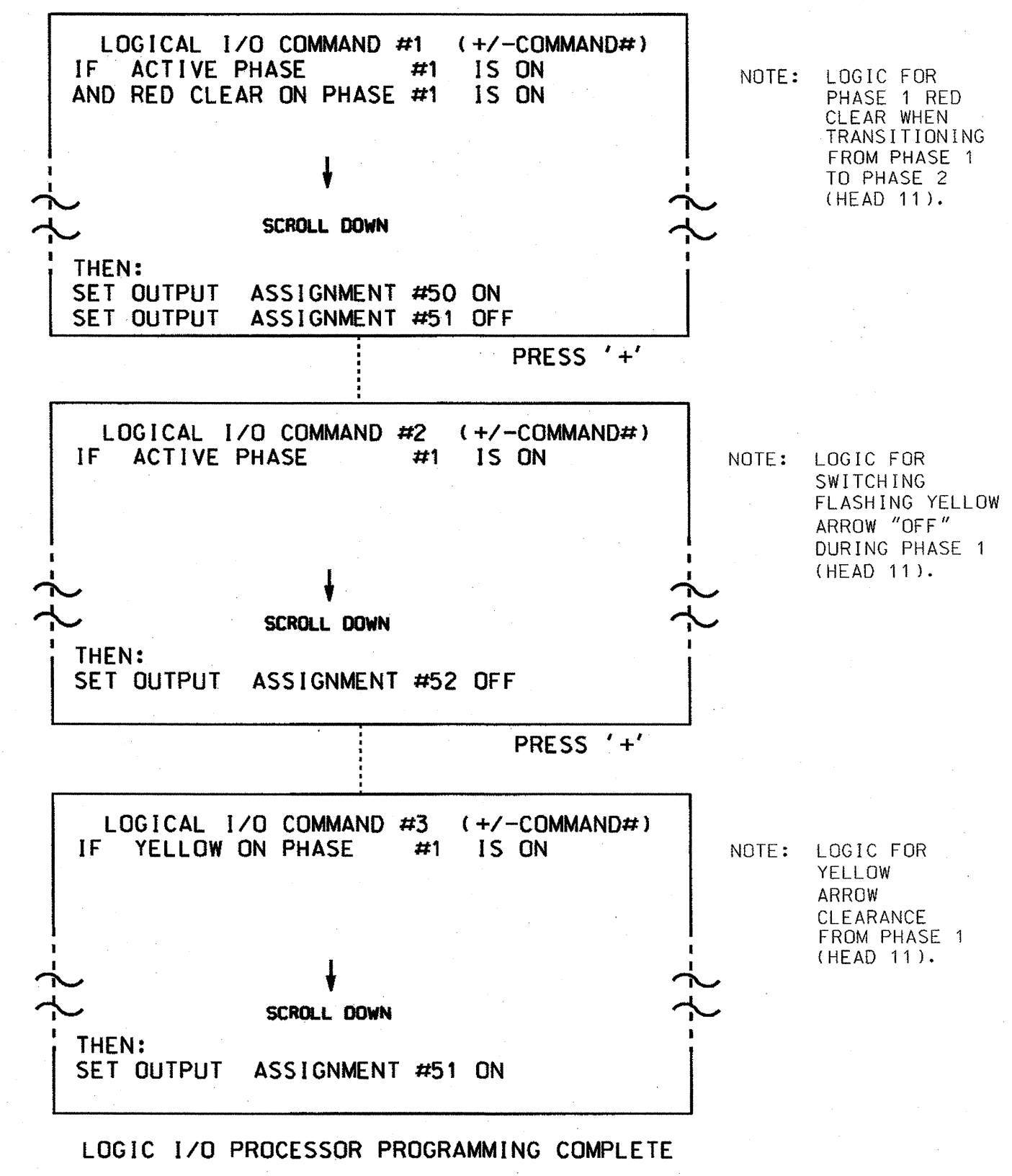
SIG. INVENTORY NO. 11-1417

30-AUG-2011 12:21 S:\115ASUM\TFS Signal\work\grcupass\519 Mon\STR-OK\arok\11417_sml_e_...xxx.dgn

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

(program controller as shown below)

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



| OUTPUT REFERENCE SCHEDULE | |
|----------------------------------|------------------|
| OUTPUT 50 = | Overlap A Red |
| OUTPUT 51 = | Overlap A Yellow |
| OUTPUT 52 = | Overlap A 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: {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: 11-1417
DESIGNED: July 2011
SEALED: 08/30/11
REVISED:

ELECTRICAL DETAIL SHEET 2 OF 2

| | | | | |
|--|---|---|---------------------------|--|
| Prepared In the Office of: 750 N. Greenfield Pkwy, Corner, NC 27529 | NC 194 at NC 88 | | SEAL | |
| | Division 11 PLAN DATE: August 2011 PREPARED BY: C. Strickland | Ashe County REVIEWED BY: T. J. [Signature] REVIEWED BY: | Jefferson REVIEWED BY: | SIGNATURE: [Signature] 9/2/11 DATE: |
| | REVISIONS INIT. DATE | REVISIONS INIT. DATE | REVISIONS INIT. DATE | REVISIONS INIT. DATE |

SIG. INVENTORY NO. 11-1417

30-AUG-2011 12:23
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PHASING DIAGRAM

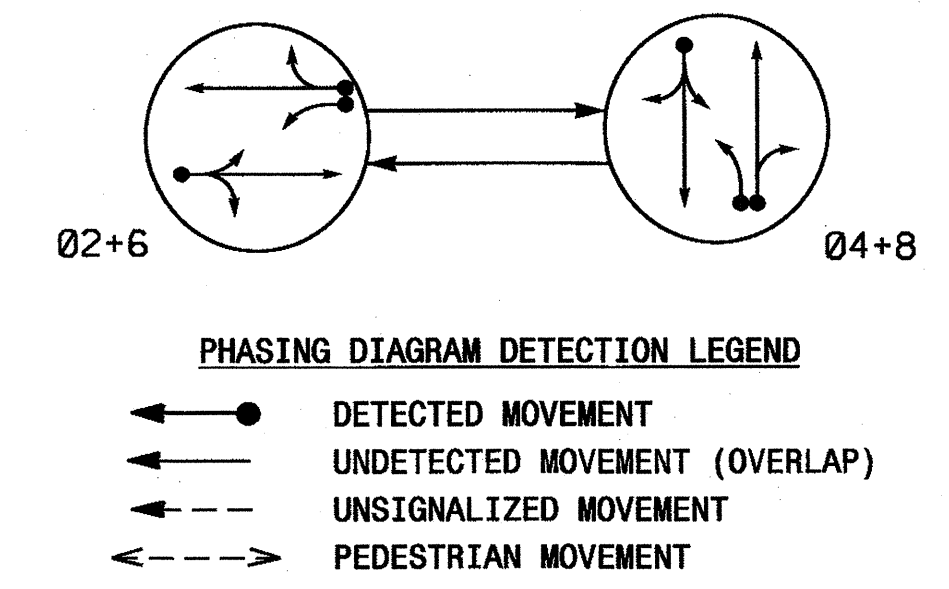


TABLE OF OPERATION

| SIGNAL FACE | PHASE | | |
|-------------|-------|------|--------|
| | 02+6 | 04+8 | F LUSH |
| 22,23 | G | R | Y |
| 41,42 | R | G | R |
| 61,62 | G | R | Y |
| 81,82 | R | G | R |

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

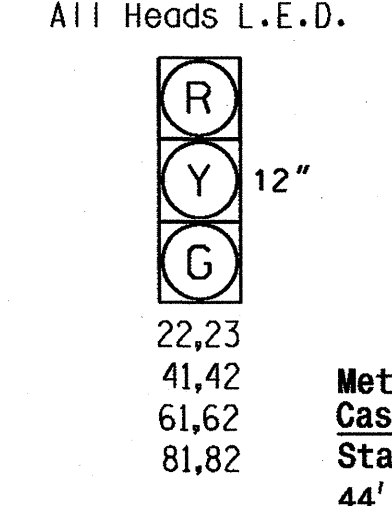
| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | SYSTEM LOOP | NEW CARD | |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|-------------|----------|------------|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

2 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.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- The cabinet should be designed to include an Auxiliary Output file for future use.

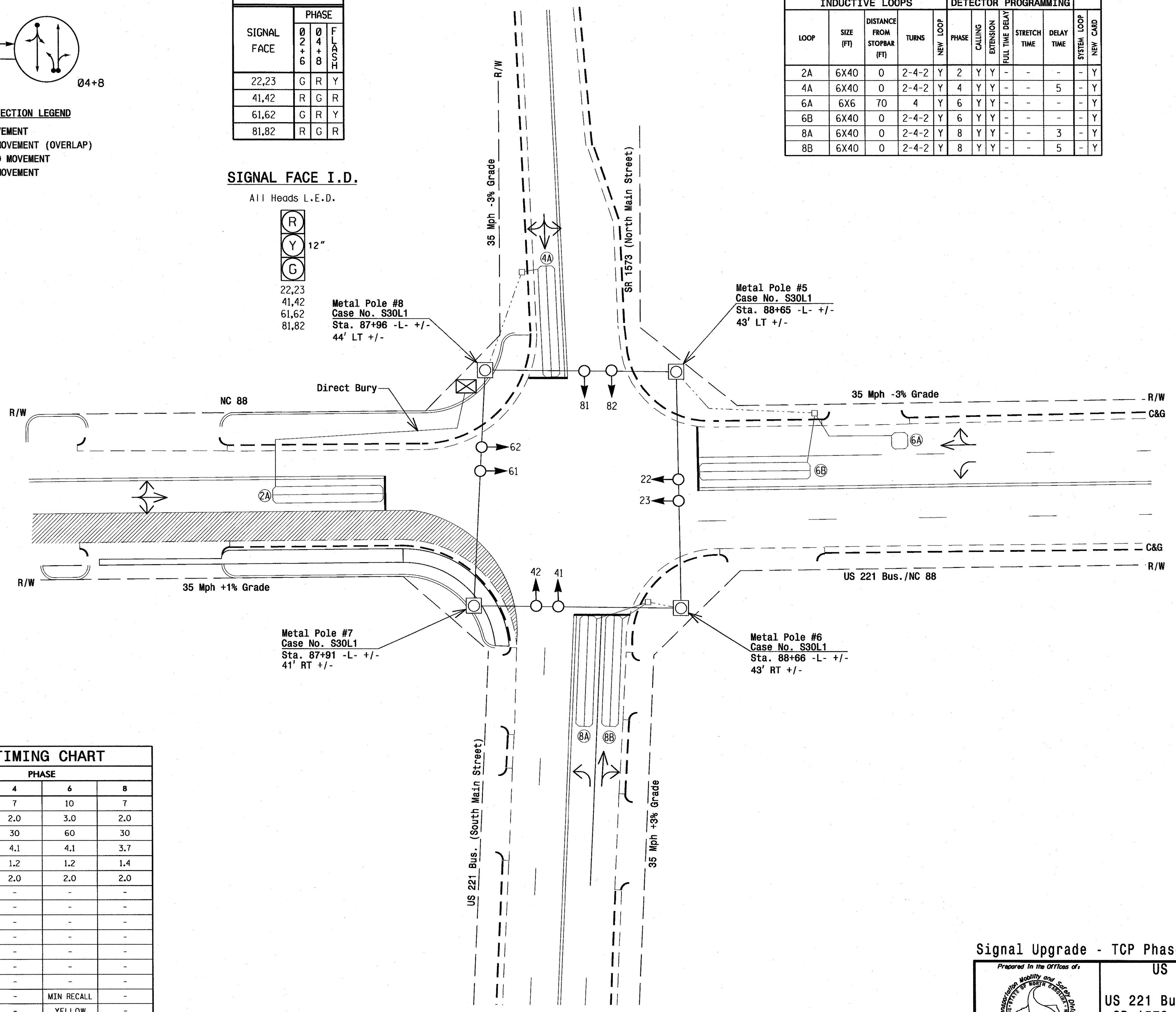
SIGNAL FACE I.D.



OASIS 2070L TIMING CHART

| FEATURE | PHASE | | | |
|------------------------|------------|-----|------------|-----|
| | 2 | 4 | 6 | 8 |
| Min Green 1* | 10 | 7 | 10 | 7 |
| Extension 1* | 3.0 | 2.0 | 3.0 | 2.0 |
| Max Green 1* | 60 | 30 | 60 | 30 |
| Yellow Clearance | 3.8 | 4.1 | 4.1 | 3.7 |
| Red Clearance | 1.8 | 1.2 | 1.2 | 1.4 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1* | - | - | - | - |
| Don't Walk 1 | - | - | - | - |
| Seconds Per Actuation* | - | - | - | - |
| Max Variable Initial* | - | - | - | - |
| Time Before Reduction* | - | - | - | - |
| Time To Reduce* | - | - | - | - |
| Minimum Gap | - | - | - | - |
| Recall Mode | MIN RECALL | - | MIN RECALL | - |
| Vehicle Call Memory | YELLOW | - | YELLOW | - |
| Dual Entry | - | ON | - | ON |
| Simultaneous Gap | ON | ON | ON | ON |

* 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 |
| ○ → 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 | □ → Controller & Cabinet |
| □ → Junction Box | □ → Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A | --- Right of Way |
| → | → Directional Arrow |

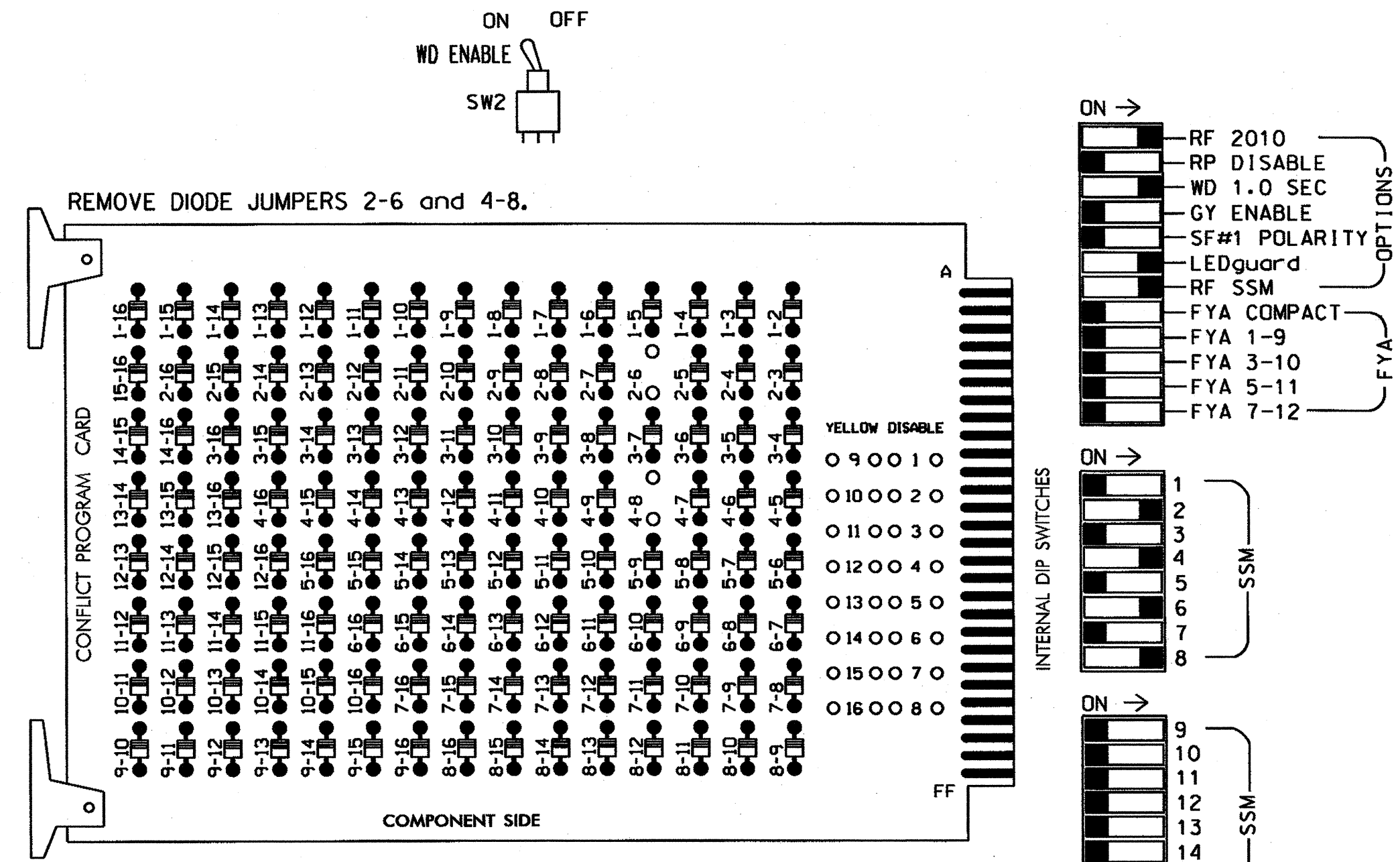
Signal Upgrade - TCP Phase II

Prepared in the Offices of:
US 221 Bus./NC 88 at SR 1573 (North Main Street)
 Division 11 Ashe County Jefferson
 PLAN DATE: July 2011 REVIEWED BY:
 PREPARED BY: B.E. Wynn REVIEWED BY:
 SCALE: 1"=20'
 REVISIONS: _____ INIT. DATE
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 30530
 SIGNATURE: _____ DATE: 8/30/11
 SIG. INVENTORY NO. II-0006TI

31-AUG-2011 09:47
 S:\Projects\1045\1045.dwg
 31-AUG-2011 09:47
 S:\Projects\1045\1045.dwg

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6 and 4-8.

REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

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,S4,S6,S8
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

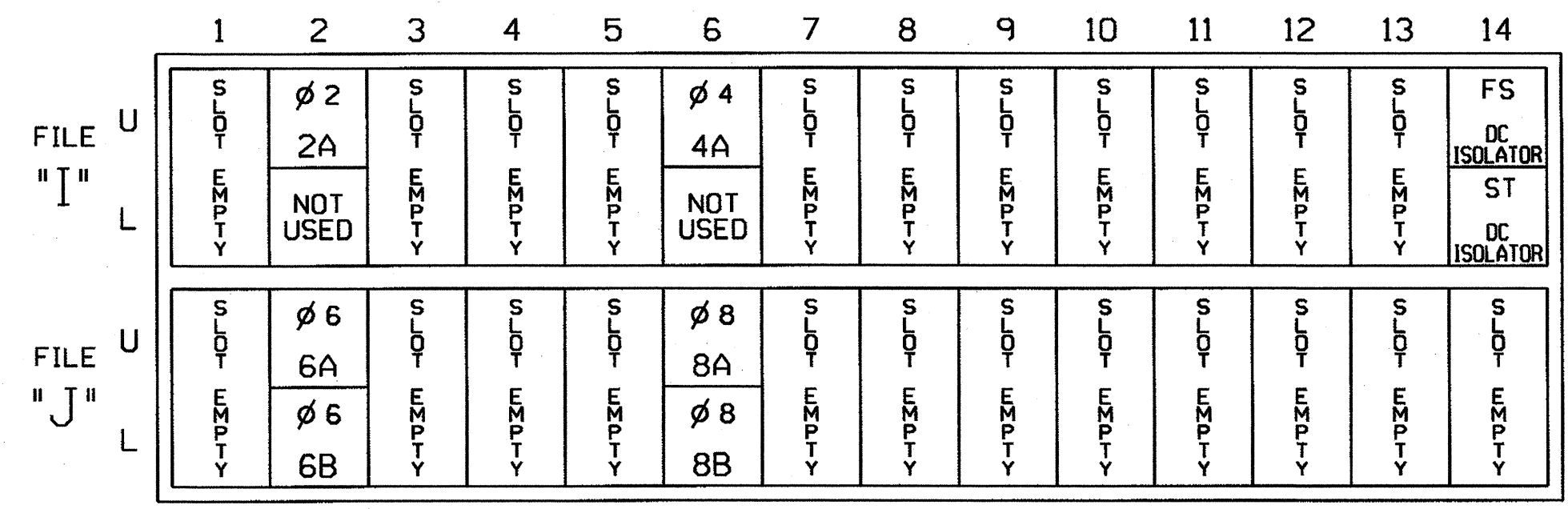
SIGNAL HEAD HOOK-UP CHART

| 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 | 22,23 | NU | NU | 41,42 | NU | NU | 61,62 | NU | NU | 81,82 | NU | NU | NU | NU | NU | NU | NU |
| RED | | 128 | | | 101 | | | 134 | | | 107 | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | | | | | | |
| YELLOW ARROW | | | | | | | | | | | | | | | | | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | | | | | |
| GREEN ARROW | | | | | | | | | | | | | | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT

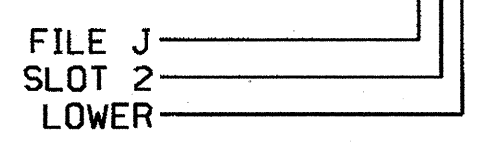
(front view)



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 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | 5 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 6B | TB3-7,8 | J2L | 44 | 6 | 16 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |
| 8B | TB5-11,12 | J6L | 46 | 8 | 18 | 8 | Y | Y | | | 5 |

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0006 T1
 DESIGNED: July 2011
 SEALED: 08/30/11
 REVISED:

Electrical Detail Temporary Design

US 221 Bus./NC 88 at US 221 Bus. (South Main St.)/SR 1573 (North Main Street)

Division 11 Ashe County Jefferson

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

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

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

Sig. Inventory No. 11-0006 T1

31-AUG-2011 09:30 S:\MITSAS\MTS\SIGNALS\WORKGROUPS\S1Q\MonWS\Trick and\10006_sml.ele...xxx.dgn

PHASING DIAGRAM

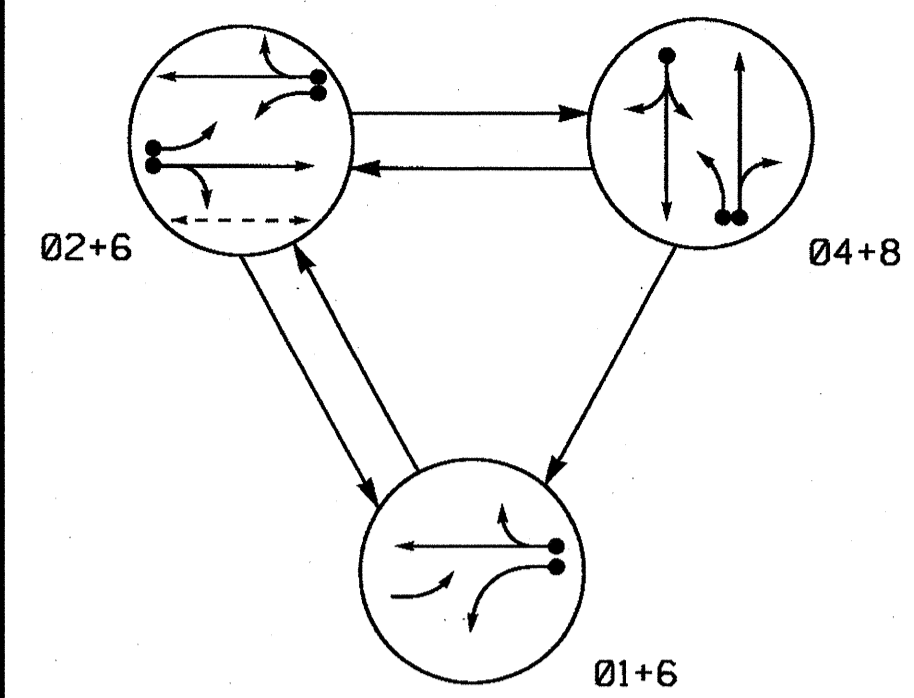
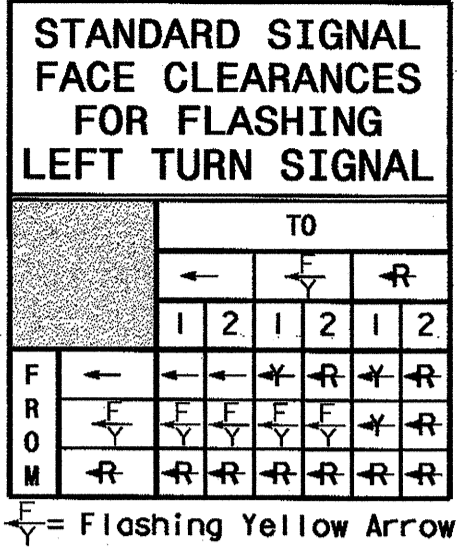


TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|---------|---------|---------|-------|
| | Ø 1 + 6 | Ø 2 + 6 | Ø 4 + 8 | FLASH |
| 11 | ← | ← | ← | ← |
| 21 | ← | ← | ← | ← |
| 22,23 | R | G | R | Y |
| 41,42 | R | R | G | R |
| 61,62 | G | G | R | Y |
| 81,82 | R | R | G | R |
| P21,P22 | DW | W | DW | DRK |



W - Walk
DW - Don't Walk
DRK - Dark

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | SYSTEM LOOP | NEW CARD | |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|-------------|----------|--------------|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | | | STRETCH TIME |
| 1A | 6X40 | 0 | 2-4-2 | - | 1 | Y | Y | - | - | 15 | - |
| | | | | | 6 | Y | Y | - | - | - | - |
| 2A | 6X6 | 70 | 4 | Y | 2 | Y | Y | - | - | - | - |
| 2B | 6X40 | 0 | 2-4-2 | Y | 2 | Y | Y | - | - | - | - |
| 4A | 6X40 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | 5 | - |
| 6A | 6X6 | 70 | 4 | - | 6 | Y | Y | - | - | - | - |
| 8A | 6X40 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | 3 | - |
| 8B | 6X40 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | 5 | - |

3 Phase Fully Actuated (Isolated)

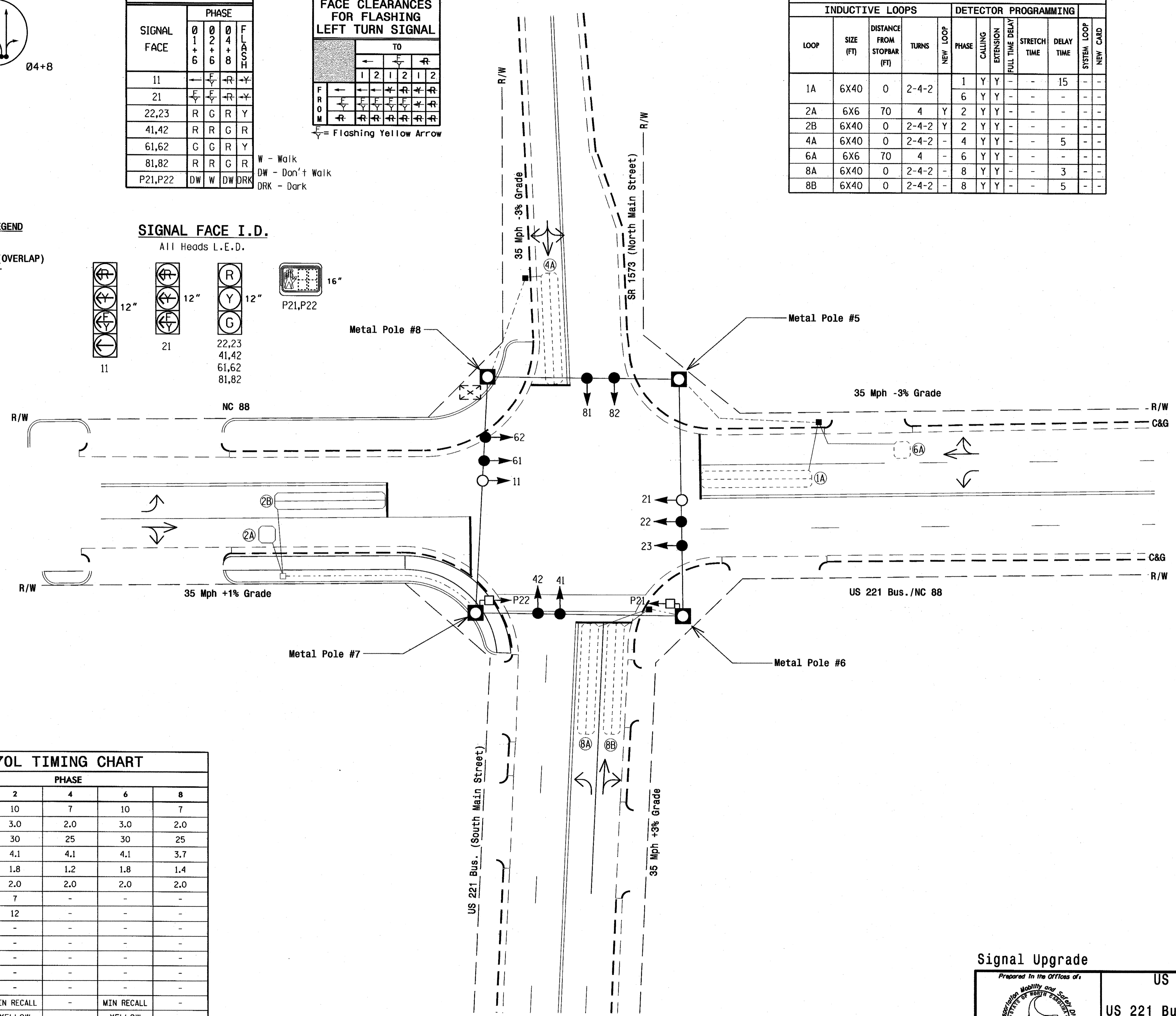
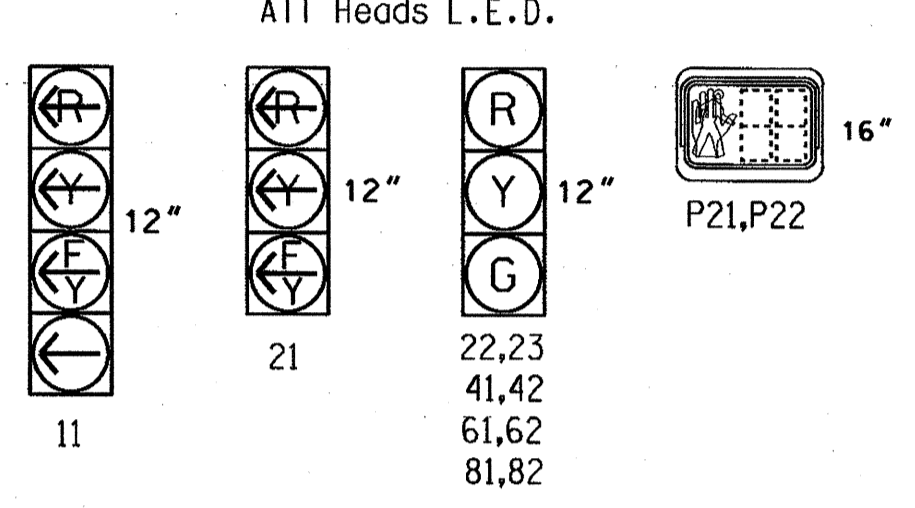
NOTES

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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.

PHASING DIAGRAM DETECTION LEGEND

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

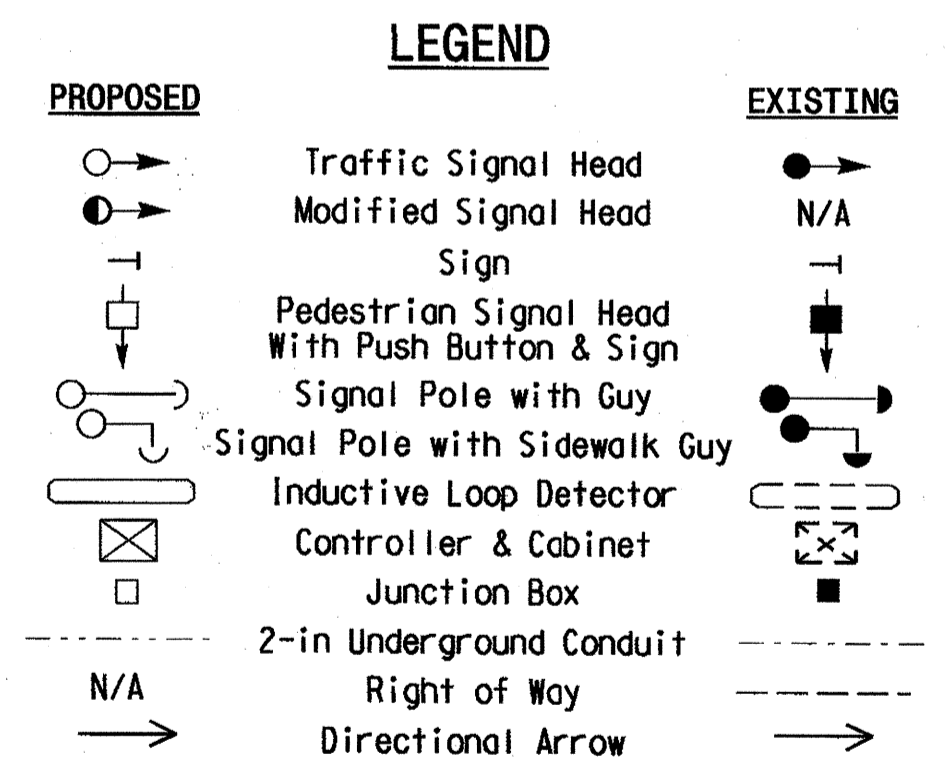
SIGNAL FACE I.D.



OASIS 2070L TIMING CHART

| FEATURE | PHASE | | | | |
|------------------------|-------|------------|-----|------------|-----|
| | 1 | 2 | 4 | 6 | 8 |
| Min Green 1* | 7 | 10 | 7 | 10 | 7 |
| Extension 1* | 2.0 | 3.0 | 2.0 | 3.0 | 2.0 |
| Max Green 1* | 15 | 30 | 25 | 30 | 25 |
| Yellow Clearance | 3.0 | 4.1 | 4.1 | 4.1 | 3.7 |
| Red Clearance | 1.9 | 1.8 | 1.2 | 1.8 | 1.4 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1* | - | 7 | - | - | - |
| Don't Walk 1 | - | 12 | - | - | - |
| Seconds Per Actuation* | - | - | - | - | - |
| Max Variable Initial* | - | - | - | - | - |
| Time Before Reduction* | - | - | - | - | - |
| Time To Reduce* | - | - | - | - | - |
| Minimum Gap | - | - | - | - | - |
| Recall Mode | - | MIN RECALL | - | MIN RECALL | - |
| Vehicle Call Memory | - | YELLOW | - | YELLOW | - |
| Dual Entry | - | - | ON | - | ON |
| Simultaneous Gap | ON | ON | ON | ON | ON |

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



Signal Upgrade

Prepared in the Offices of:

US 221 Bus./NC 88 at US 221 Bus. (South Main St.)/ SR 1573 (North Main Street)

Division 11 Ashe County Jefferson

PLAN DATE: July 2011 REVIEWED BY:

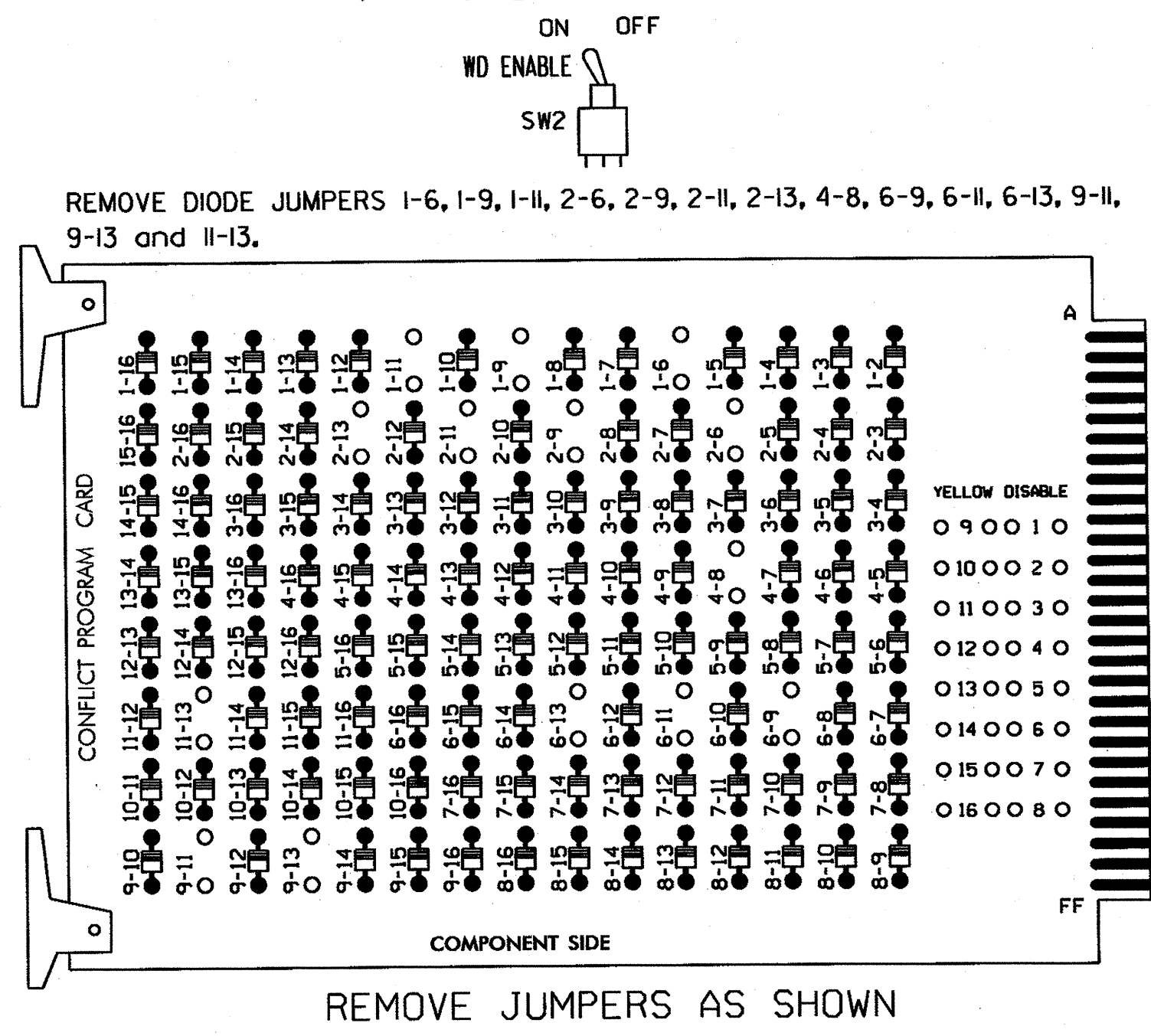
PREPARED BY: B.E. Wynn REVIEWED BY:

SCALE: 1"=20'

REVISIONS: INIT. DATE

SIG. INVENTORY NO. II-0006

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL
(remove jumpers and set switches as shown)



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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5, 7,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phase 2 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.....S1,S2,S2P,S4,S6,S8,S9,S12
PHASES USED.....1,2,2 PED,4,6,8
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....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 | 8 PED | OLA | OLB | SPARE | OLC | OLD | SPARE | |
| SIGNAL HEAD NO. | 11★ | 22,23 | P21, P22 | NU | 41,42 | NU | NU | 61,62 | NU | NU | 81,82 | NU | 11★ | NU | NU | 21★ | NU | NU | |
| RED | 128 | | | 101 | | | | 134 | | | 107 | | | | | | | | |
| YELLOW | * | 129 | | 102 | | | | 135 | | | 108 | | | | | | | | |
| GREEN | | 130 | | 103 | | | | 136 | | | 109 | | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | A114 | | | |
| YELLOW ARROW | | | | | | | | | | | | | | A122 | | | A115 | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | A123 | | | A116 | | |
| GREEN ARROW | 127 | | | | | | | | | | | | | | | | | | |
| Hand | | | | | | | | | | | | | | | | | | 113 | |
| Person | | | | | | | | | | | | | | | | | | | 115 |

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

INPUT FILE POSITION LAYOUT
(front view)

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

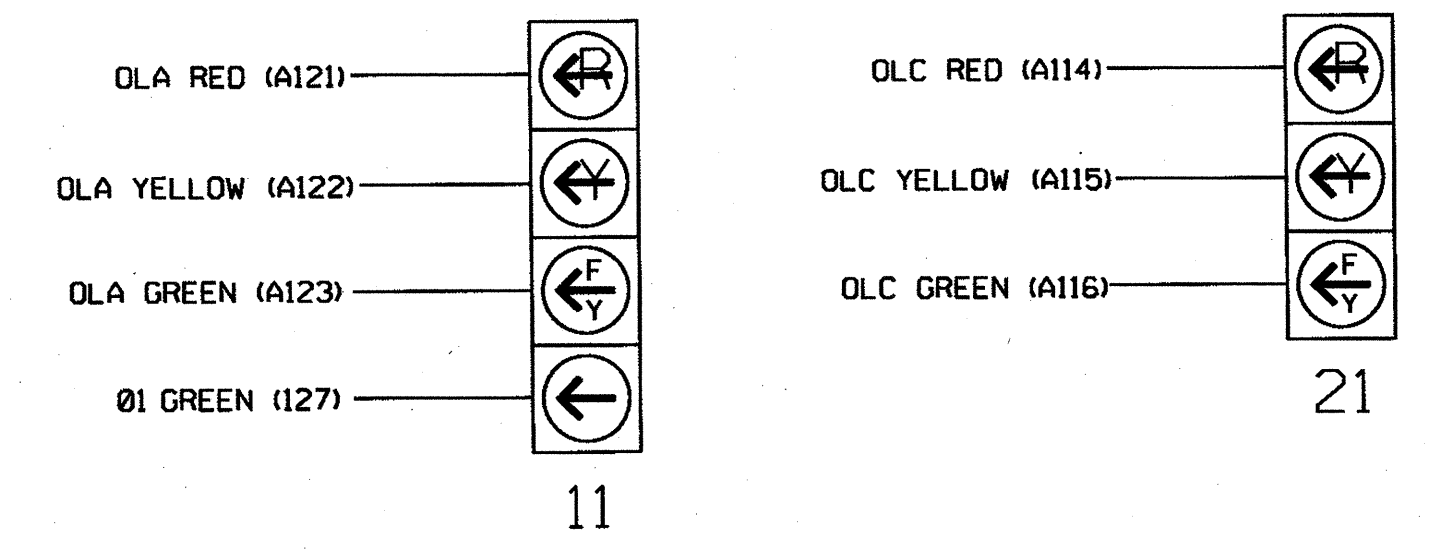
EX.: 1A, 2A, ETC. = LOOP NO.'S
FS = FLASH SENSE
ST = STOP TIME
⊗ Wired Input - Do not populate slot with detector card

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 | | | 15 |
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 2B | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | 5 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |
| 8B | TB5-11,12 | J6L | 46 | 8 | 18 | 8 | Y | Y | | | 5 |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | PED 2 | 2 PED | | | | | |

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT 112.
¹Add jumper from I1-W to J4-W, on rear of input file.
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL
(wire signal heads as shown)

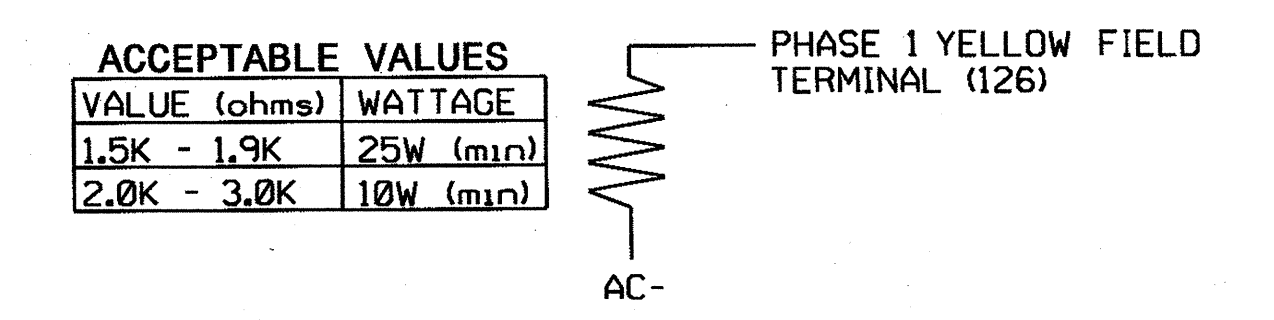


NOTE
1. The sequence display for signal head 11 requires special logic programming. See sheet 2 of 2 for programming instructions.

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.

LOAD RESISTOR INSTALLATION DETAIL
(install resistor as shown below)



ELECTRICAL DETAIL SHEET 1 OF 2

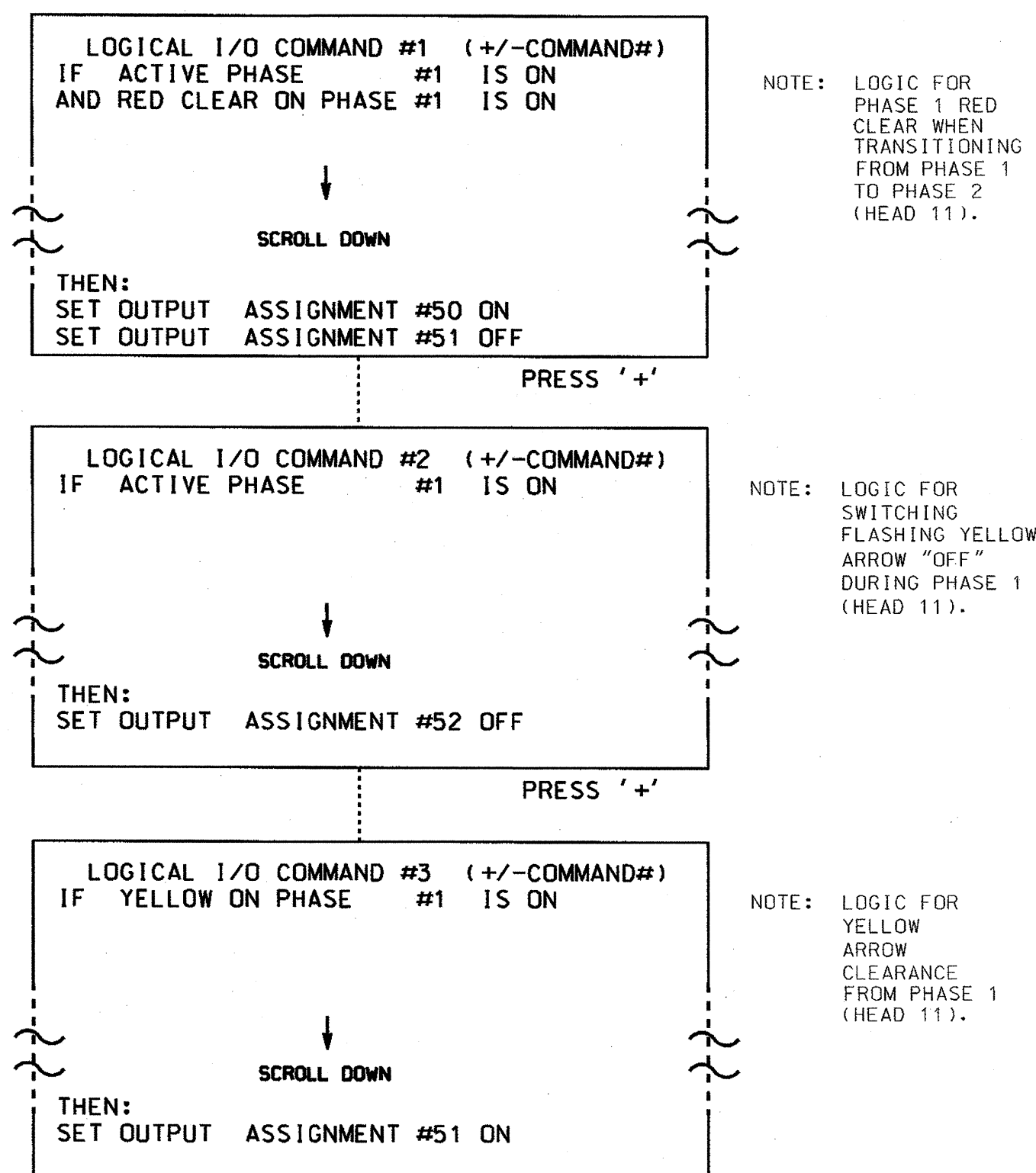
Prepared in the Offices of:

 US 221 Bus./NC 88
 at
 US 221 Bus. (South Main St.) / SR 1573 (North Main Street)
 Division 11 Ashe County Jefferson
 PLAN DATE: August 2011 REVIEWED BY: T. J. J.
 PREPARED BY: C. Strickland REVIEWED BY:
 REVISIONS: _____ INIT. DATE: _____
 750 N. Greenfield Pkwy, Garner, NC 27529
 THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0006
 DESIGNED: July 2011
 SEALED: 08/30/11
 REVISED:
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 GEORGE C. BROWN
 022013
 9/2/11
 SIGNATURE DATE
 Sig. INVENTORY NO. 11-0006

**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).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A 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: XX
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN ← NOTICE GREEN FLASH
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

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' 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 ← NOTICE GREEN FLASH
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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0006
DESIGNED: July 2011
SEALED: 08/30/11
REVISED:

ELECTRICAL DETAIL SHEET 2 OF 2

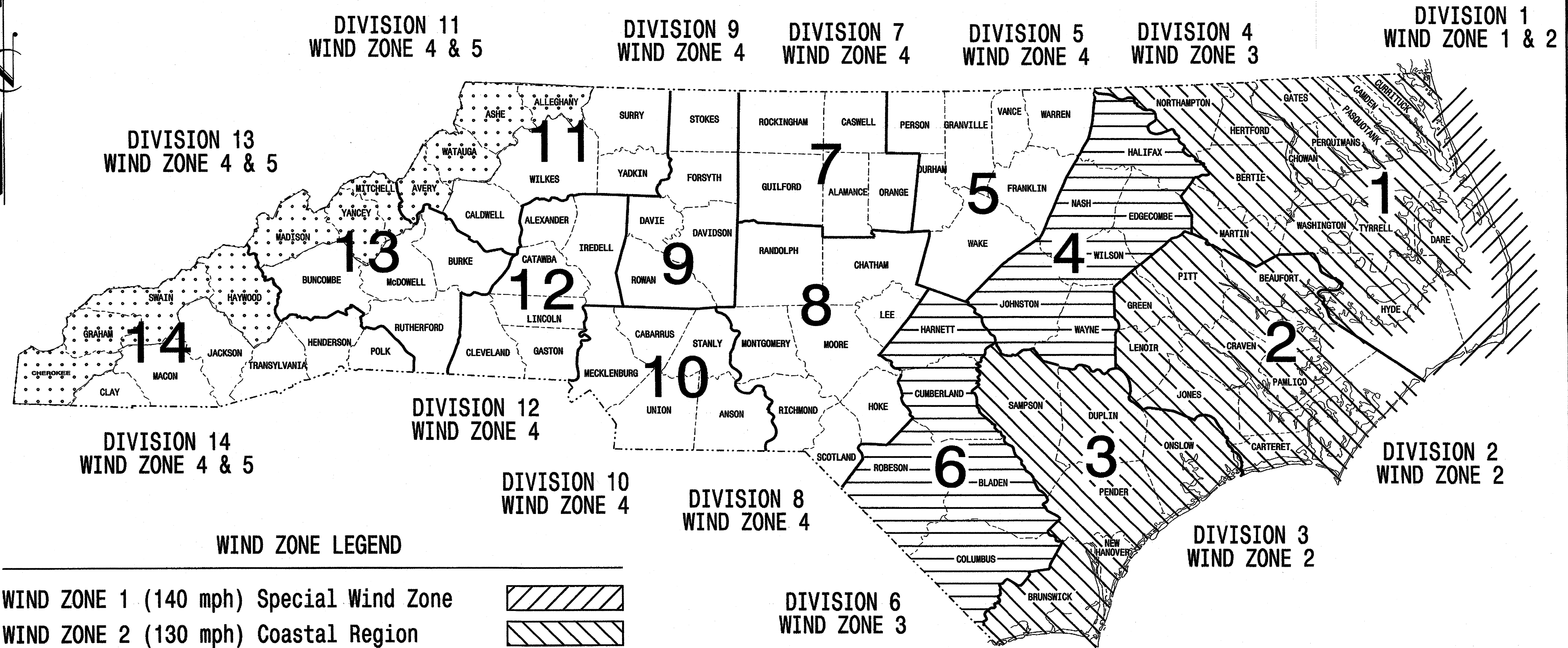
| | | | |
|---|---|--|-----------|
| | US 221 Bus./NC 88 at US 221 Bus. (South Main St.)/ SR 1573 (North Main Street) | | |
| | Division 11 Ashe County Jefferson | PLAN DATE: August 2011 REVIEWED BY: T. J. J. | |
| PREPARED BY: C. Strickland REVIEWED BY: | | REVISIONS | INT. DATE |
| SIGNATURE: <i>C. Strickland</i> DATE: | | SIG. INVENTORY NO. 11-0006 | |

31-AUG-2011 07:47 S:\TSC\JMTS\Sigal\emorkgr\pases\g\hans\tr\ck\and\110006_sht.eia...xxx.dgn

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

| | | |
|-----------------|-------------|-----------|
| STATE | PROJECT NO. | SHEET NO. |
| N.C. | U-3812 | 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

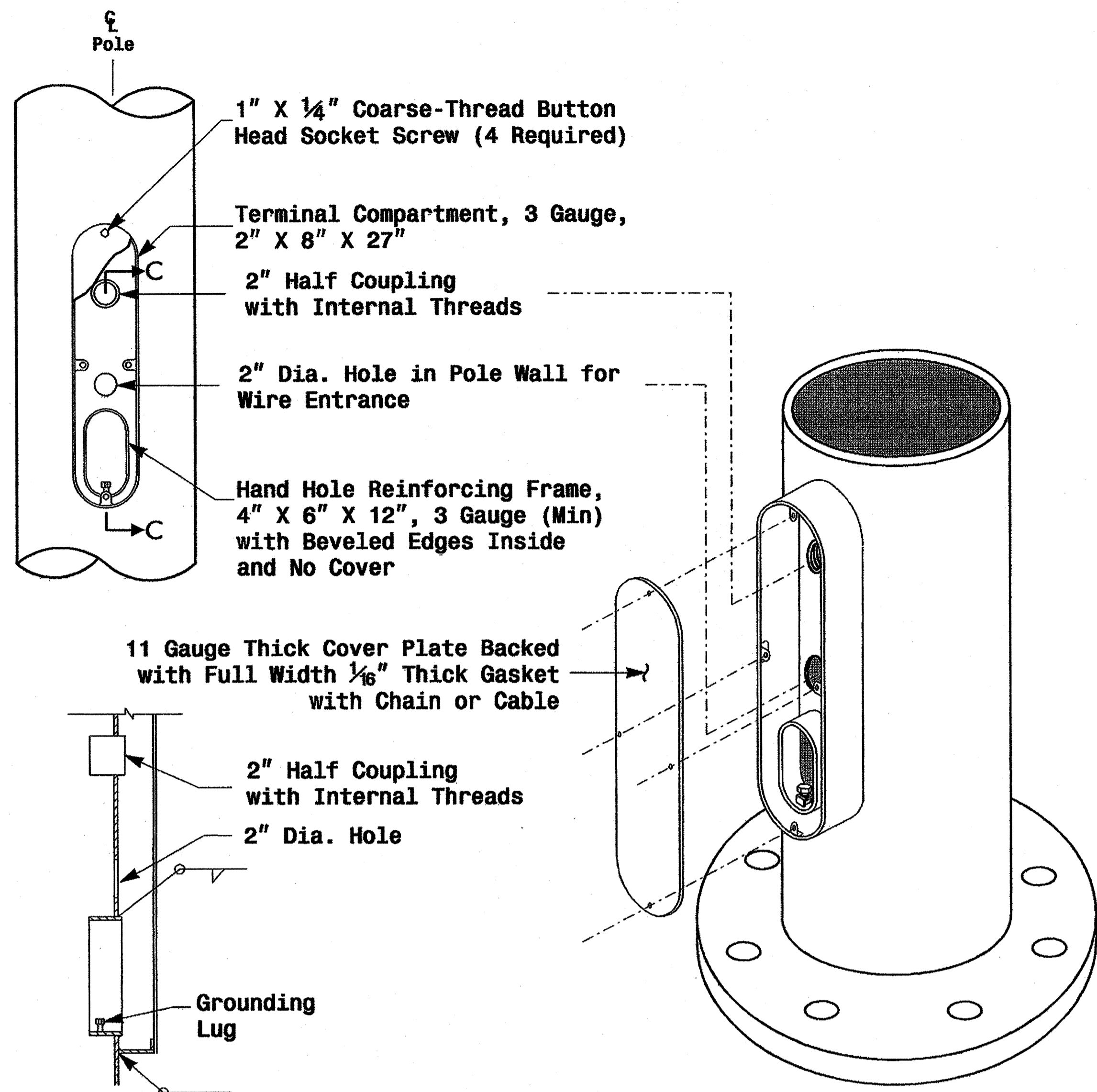
| INDEX OF PLANS | |
|----------------|--------------------------------------|
| DRAWING NUMBER | DESCRIPTION |
| M 1 | Title Sheet |
| M 2 | Fabrication Details - All Poles |
| M 3 | Fabrication Details - Strain Poles |
| M 4,5 | Fabrication Details - Mast Arm Poles |
| M 6 | Construction Details -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

NCDOT CONTACTS:
MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT

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 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 7.21.2009
 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

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

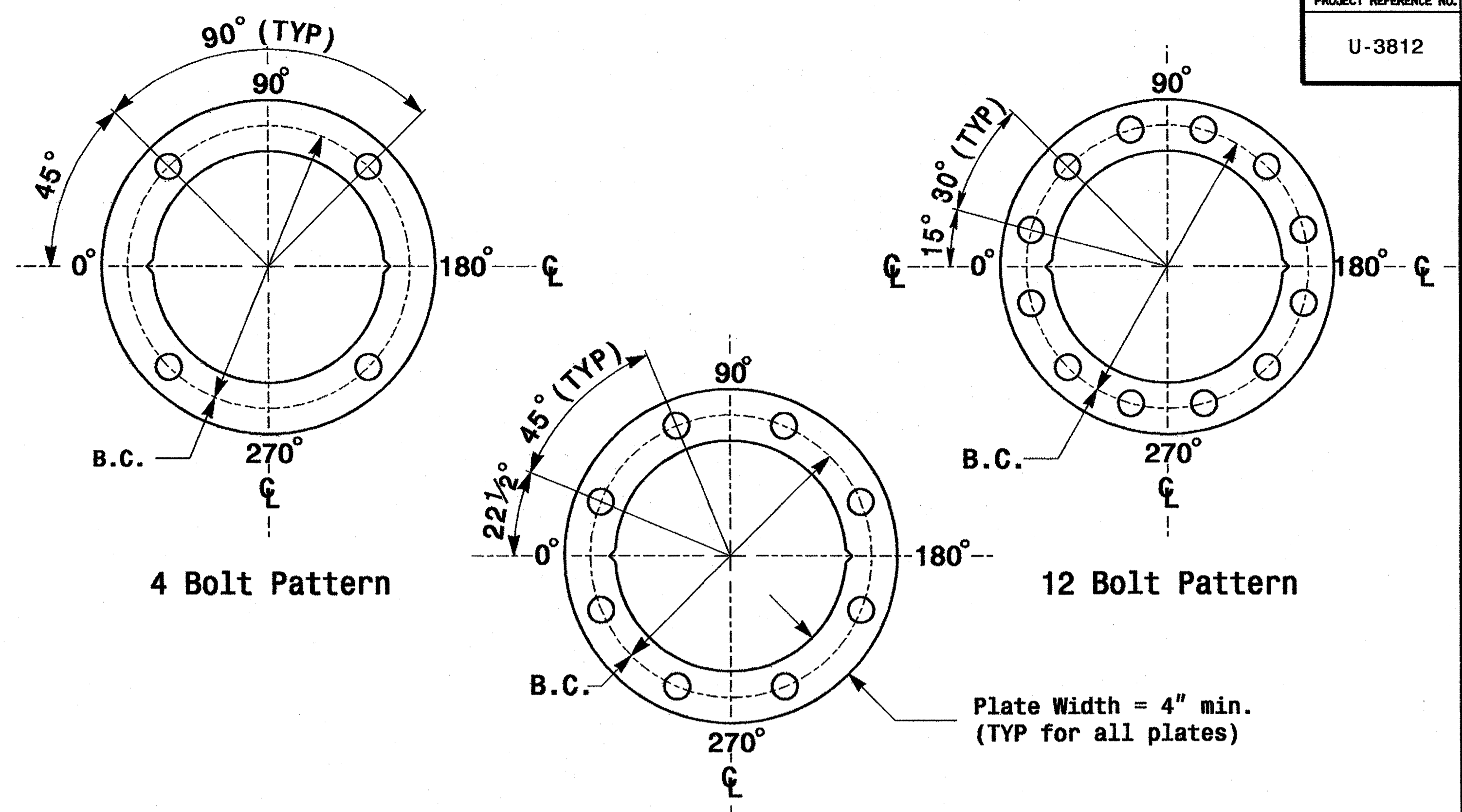
| | |
|-----------------------|------------------------|
| MFG _____ | MFG. DATE: MM/YY _____ |
| SECTION D/T/L/Y _____ | |
| NCDOT STANDARD _____ | |

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

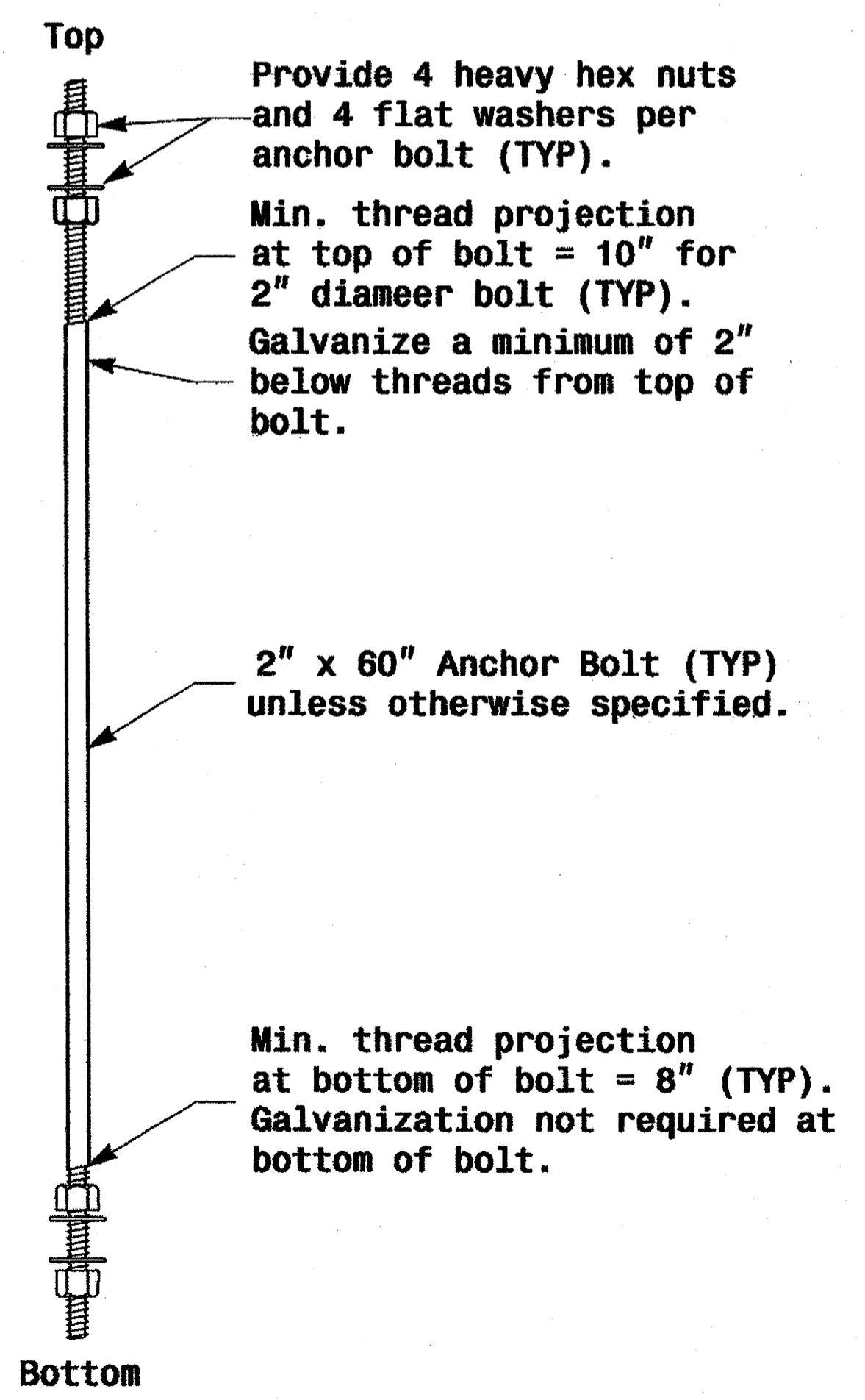
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

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

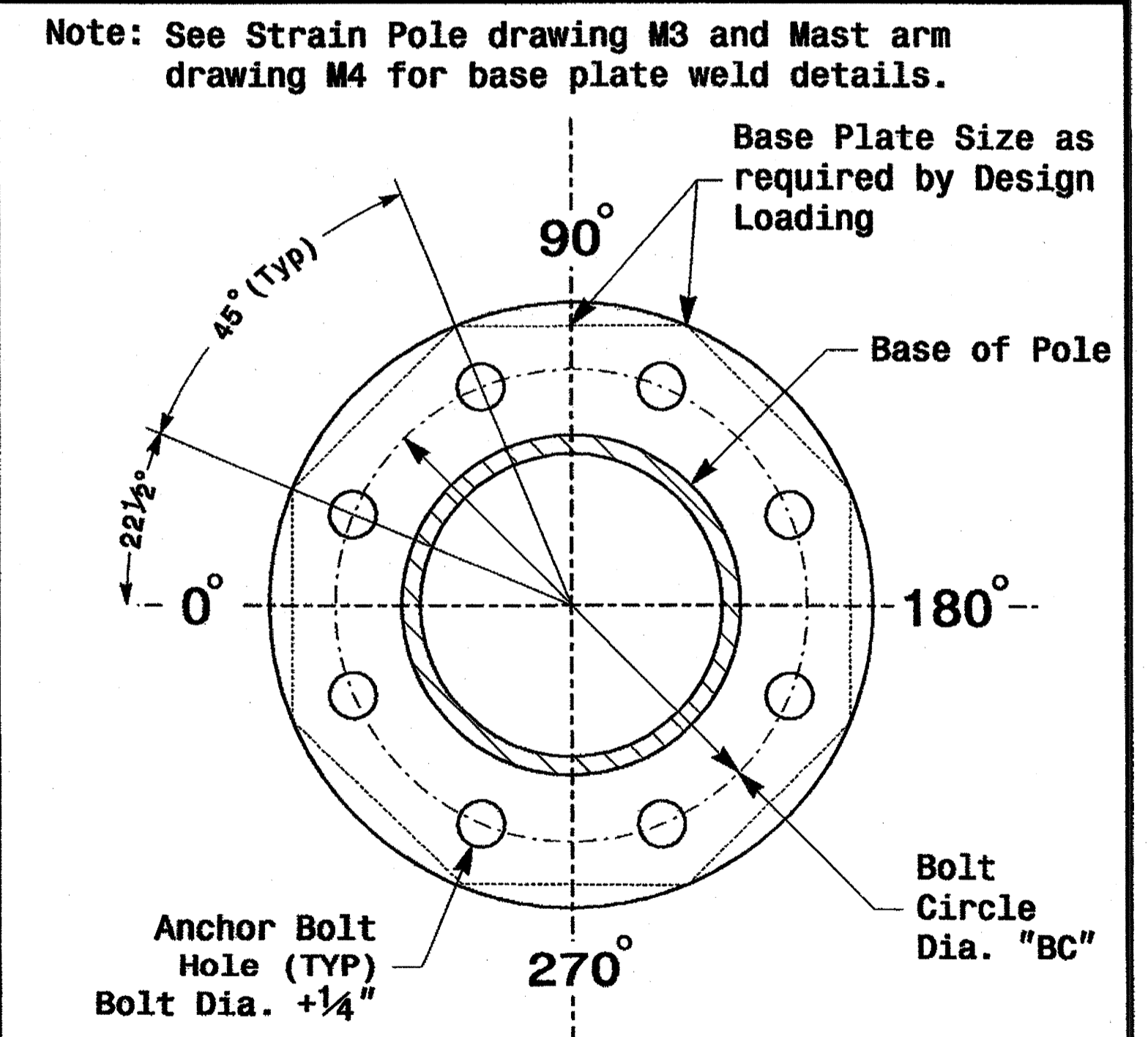
Identification Tag Details



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



Anchor Bolt Detail



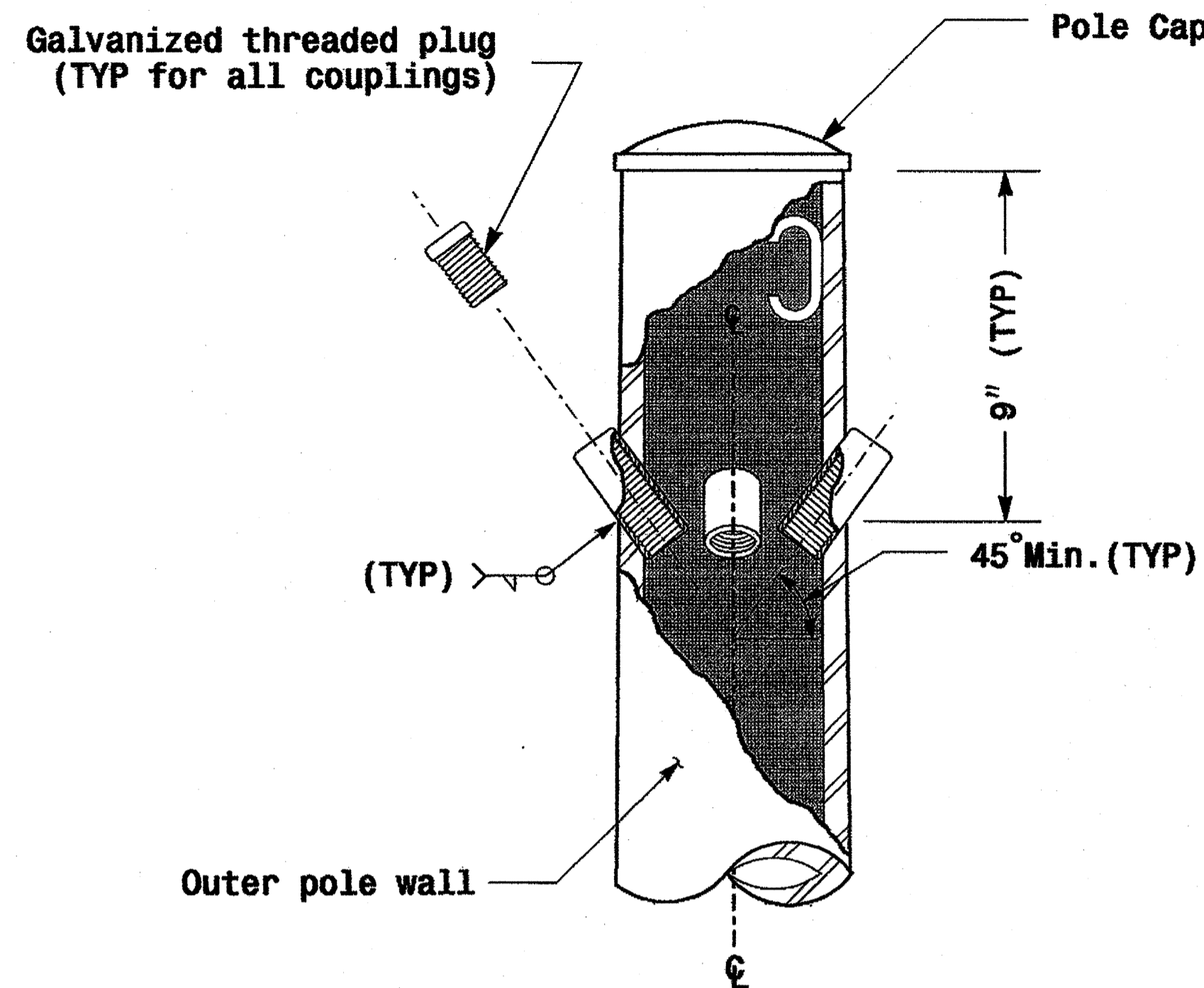
8 Bolt Base Plate Detail

| | | | |
|--|---|--|--|
| | Typical Fabrication Details Common To All Metal Poles | | |
| | PLAN DATE: May 2005 PREPARED BY: P.L. Alexander SCALE: NONE | REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito REVISIONS: _____ INIT. DATE: _____ | |

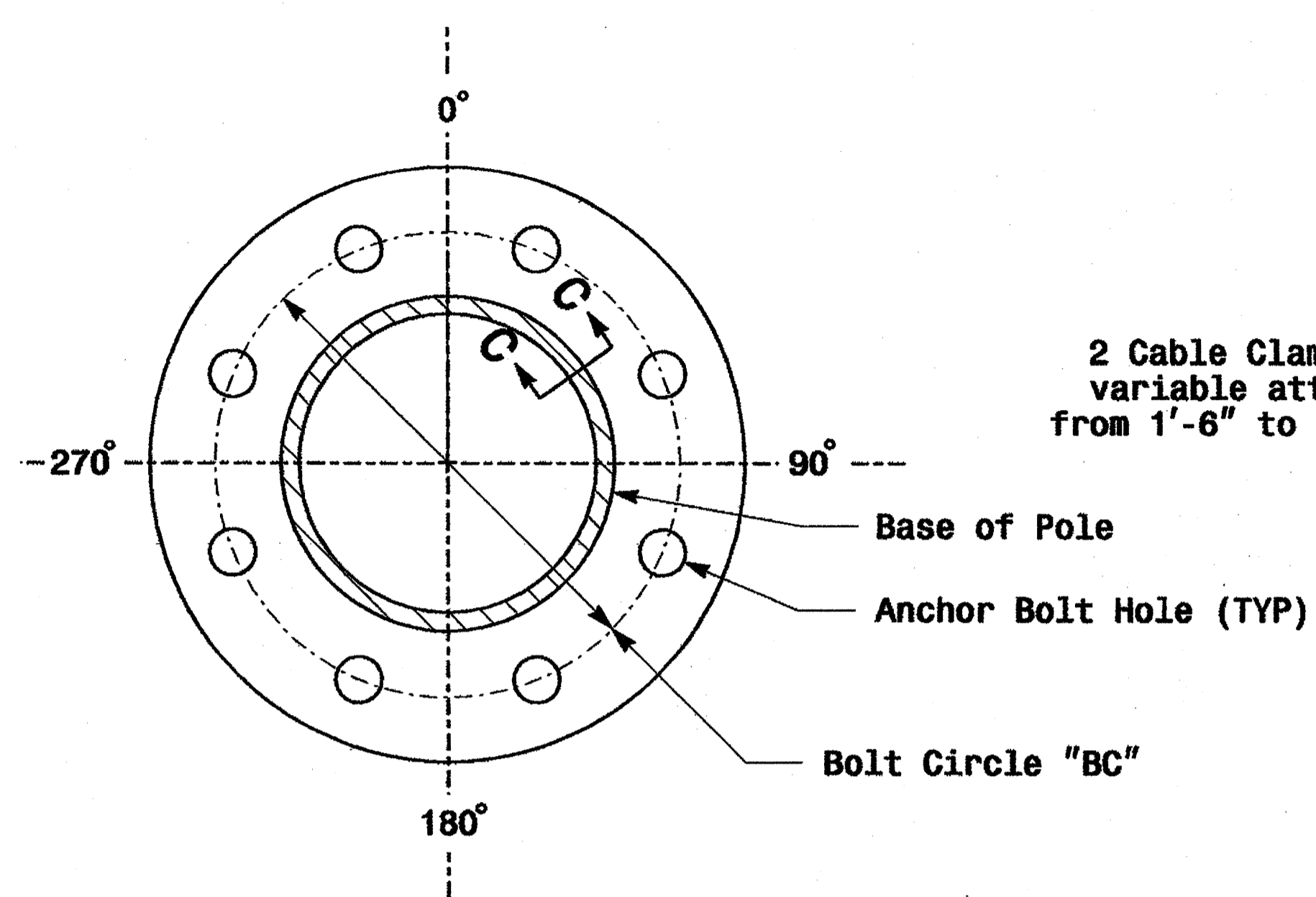
Fabrication Details - All Poles

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

Fabrication Details - Strain Poles

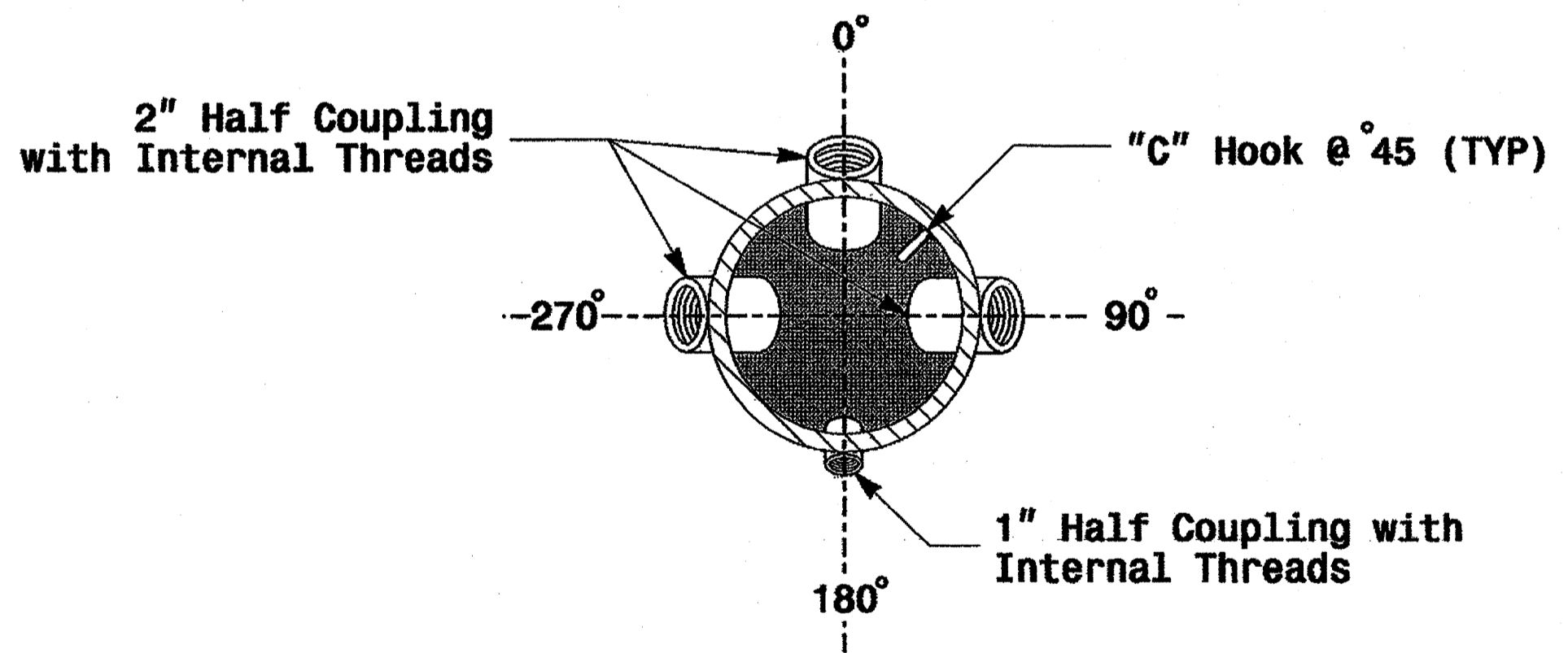
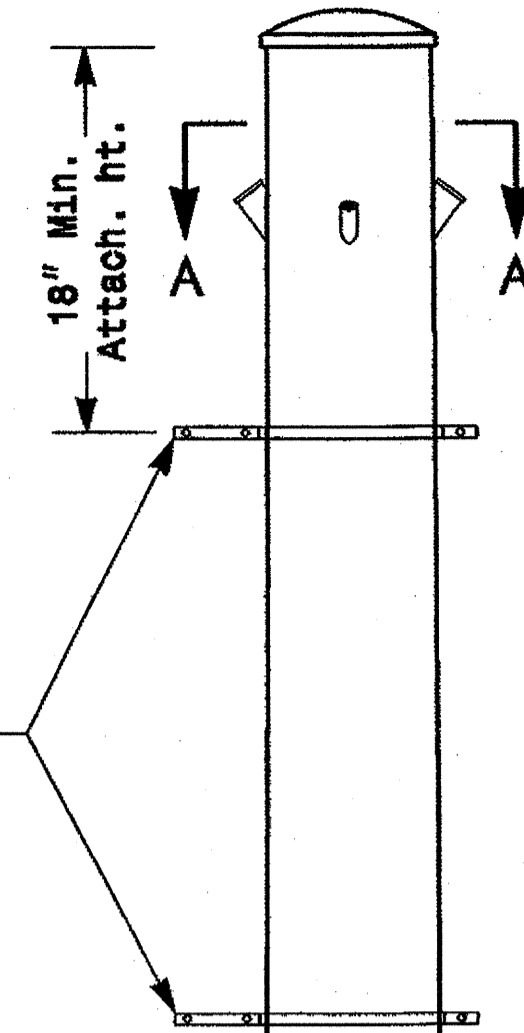


Cable Entrances at Top of Pole

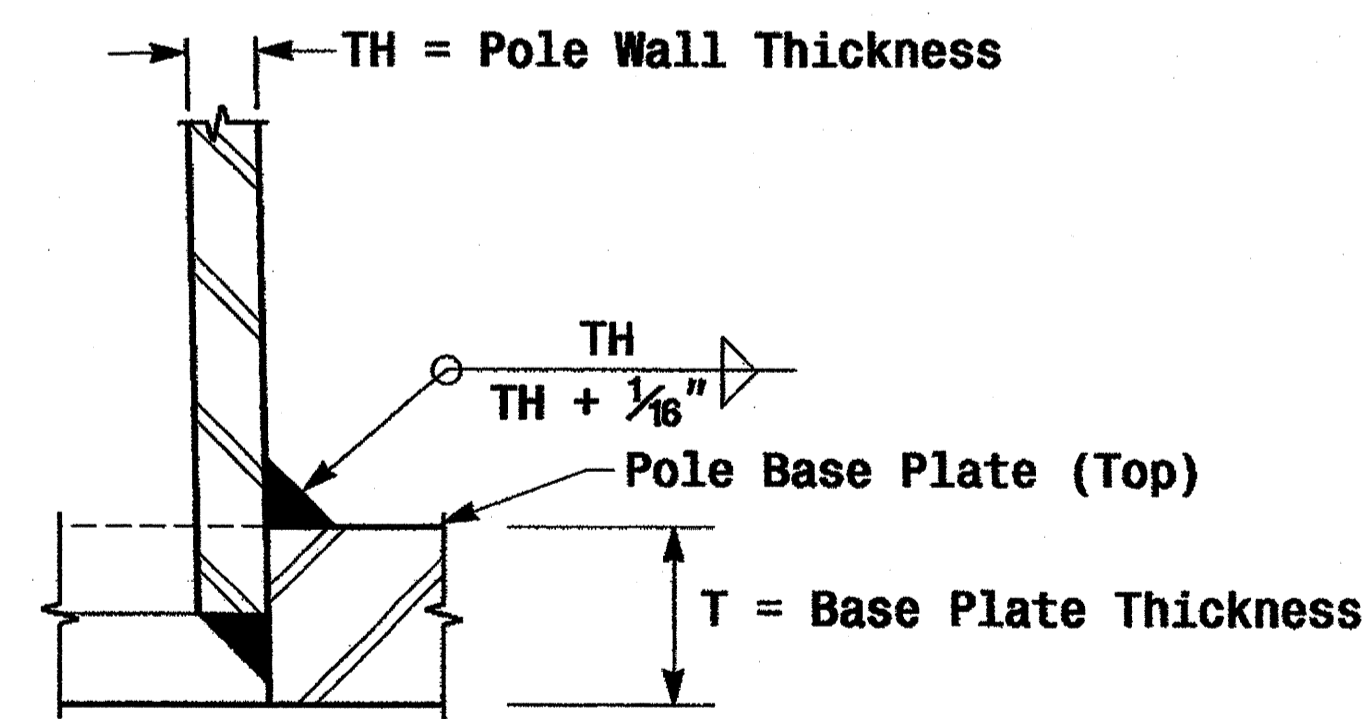


Section B-B
(See drawing M2)
Pole Base Plate

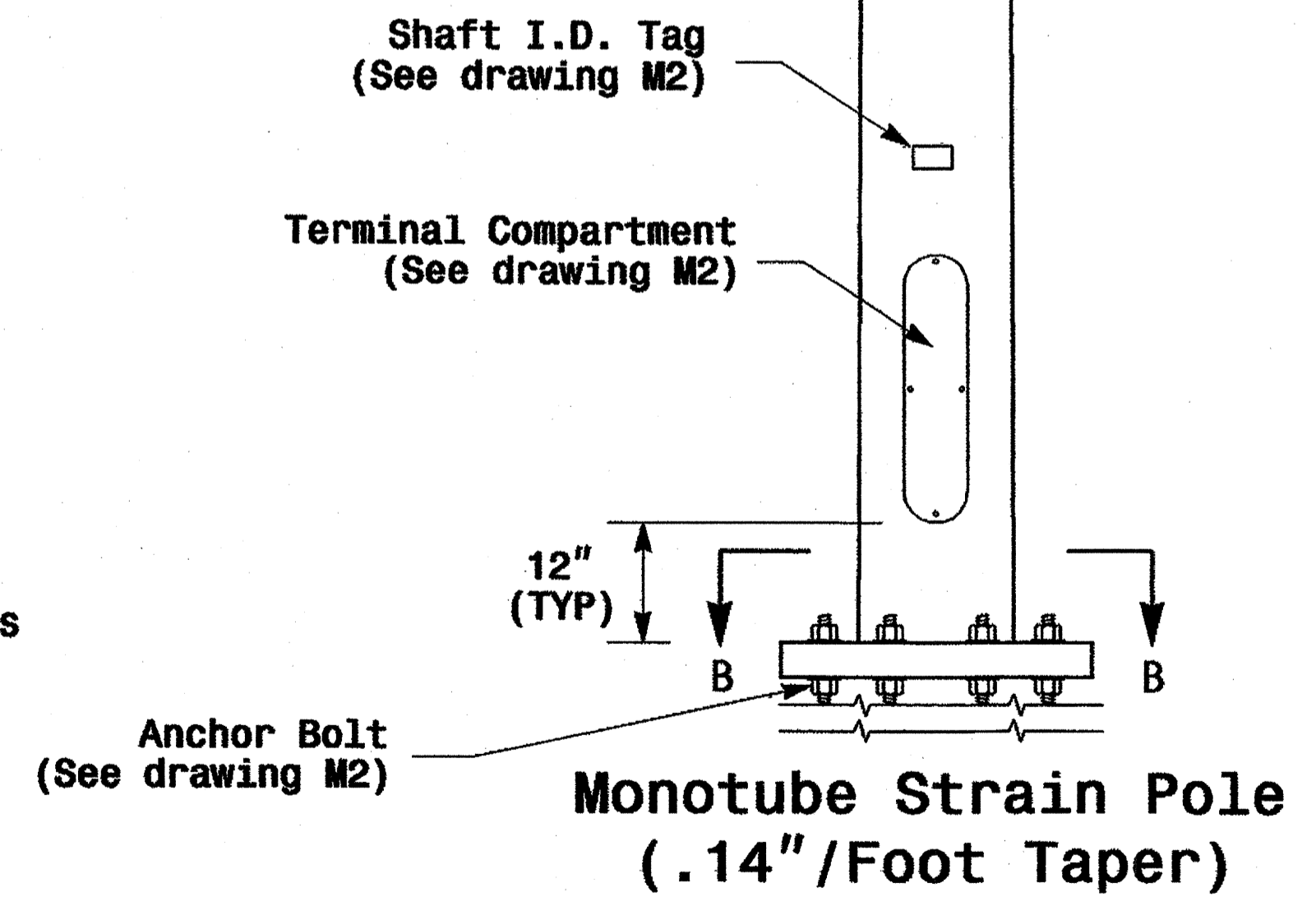
2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.



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

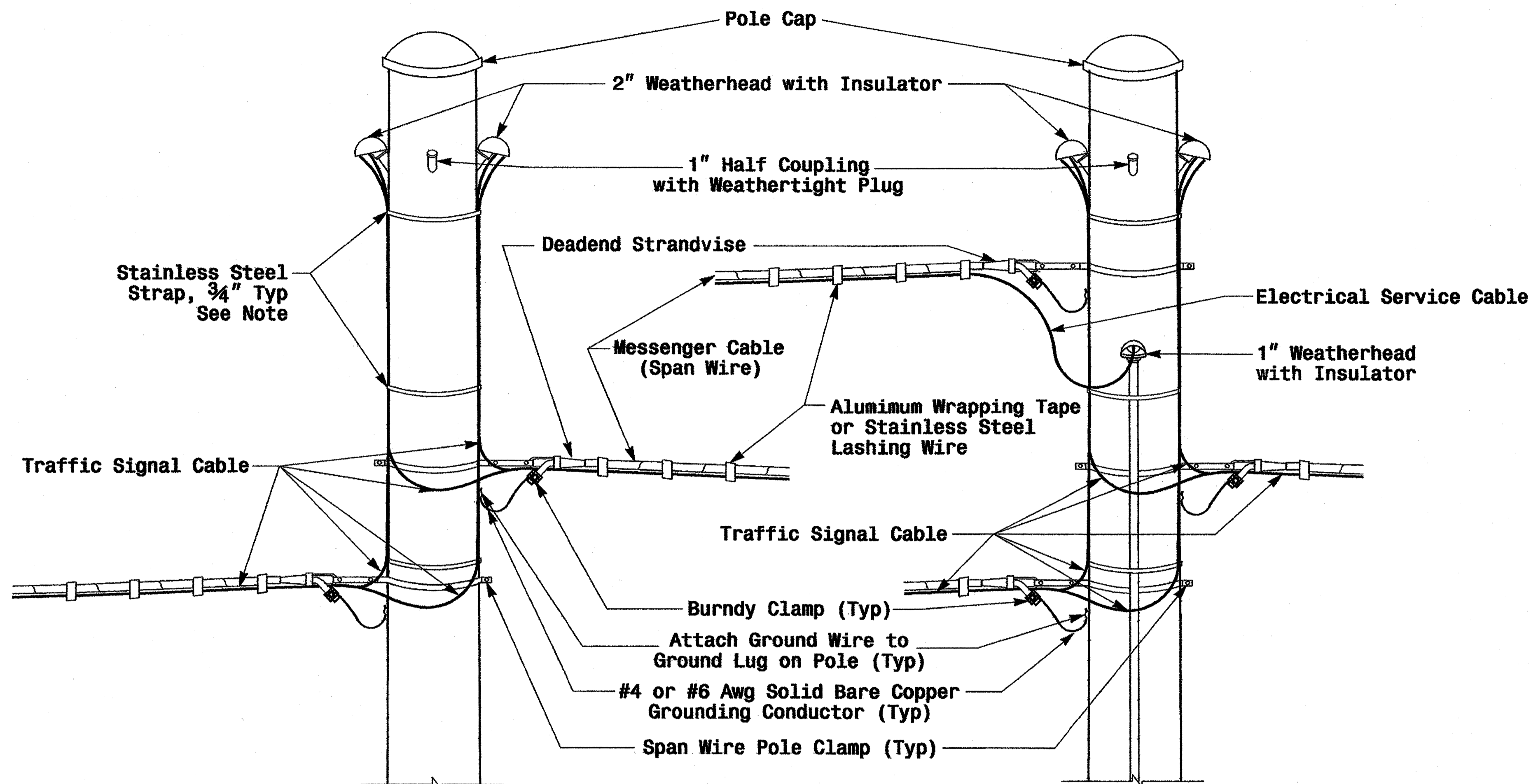


Section C-C
Socket Connection Weld Detail



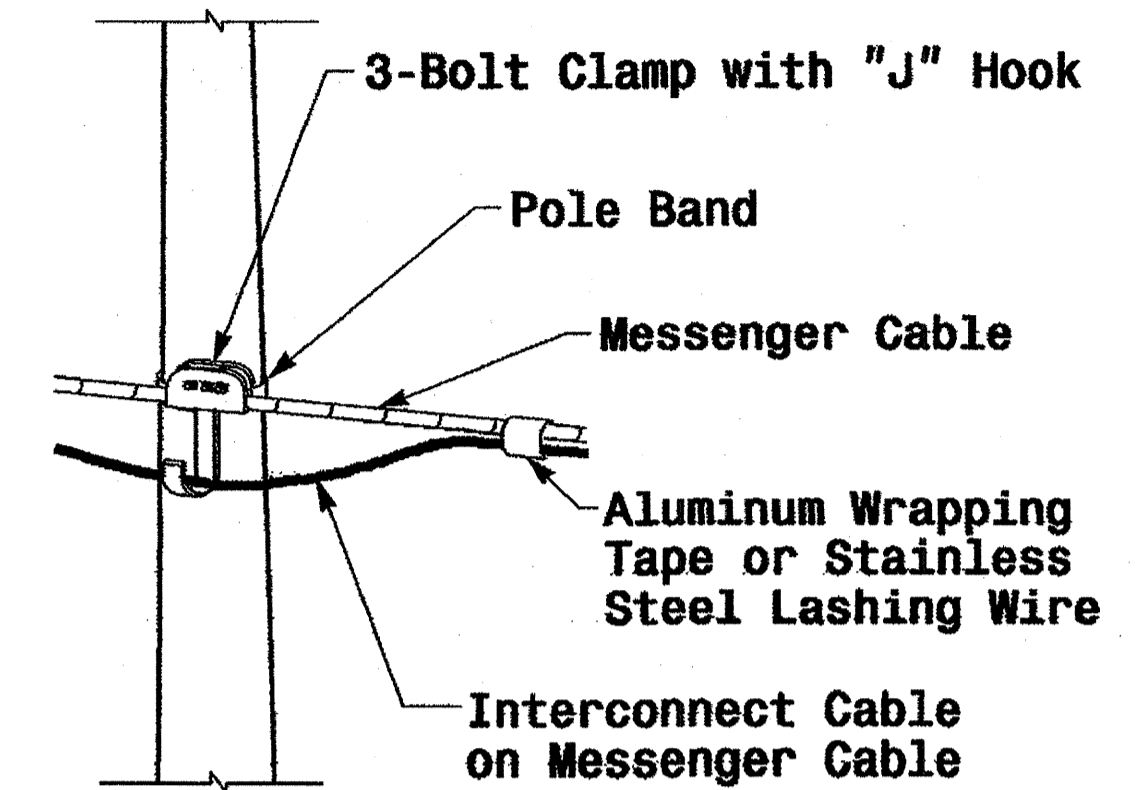
01-SEP-2005 14:07 w:\p00\les-unl\work\p00\couple2004 meta pole standard\m2004 m3.dgn p01 Alexander

| | | | |
|---|---|--|--------------------------------------|
| <p>222 N. McDowell St., Raleigh, NC 27603</p> | <p>Typical Fabrication Details For Strain Poles</p> | | <p>SEAL</p> <p>DEBORAH C. SARKER</p> |
| | <p>PLAN DATE: May 2005</p> <p>PREPARED BY: P.L. Alexander</p> <p>SCALE: 0 NA NONE</p> | <p>REVIEWED BY: C.F. Andrews</p> <p>REVIEWED BY: A.M. Esposito</p> | |

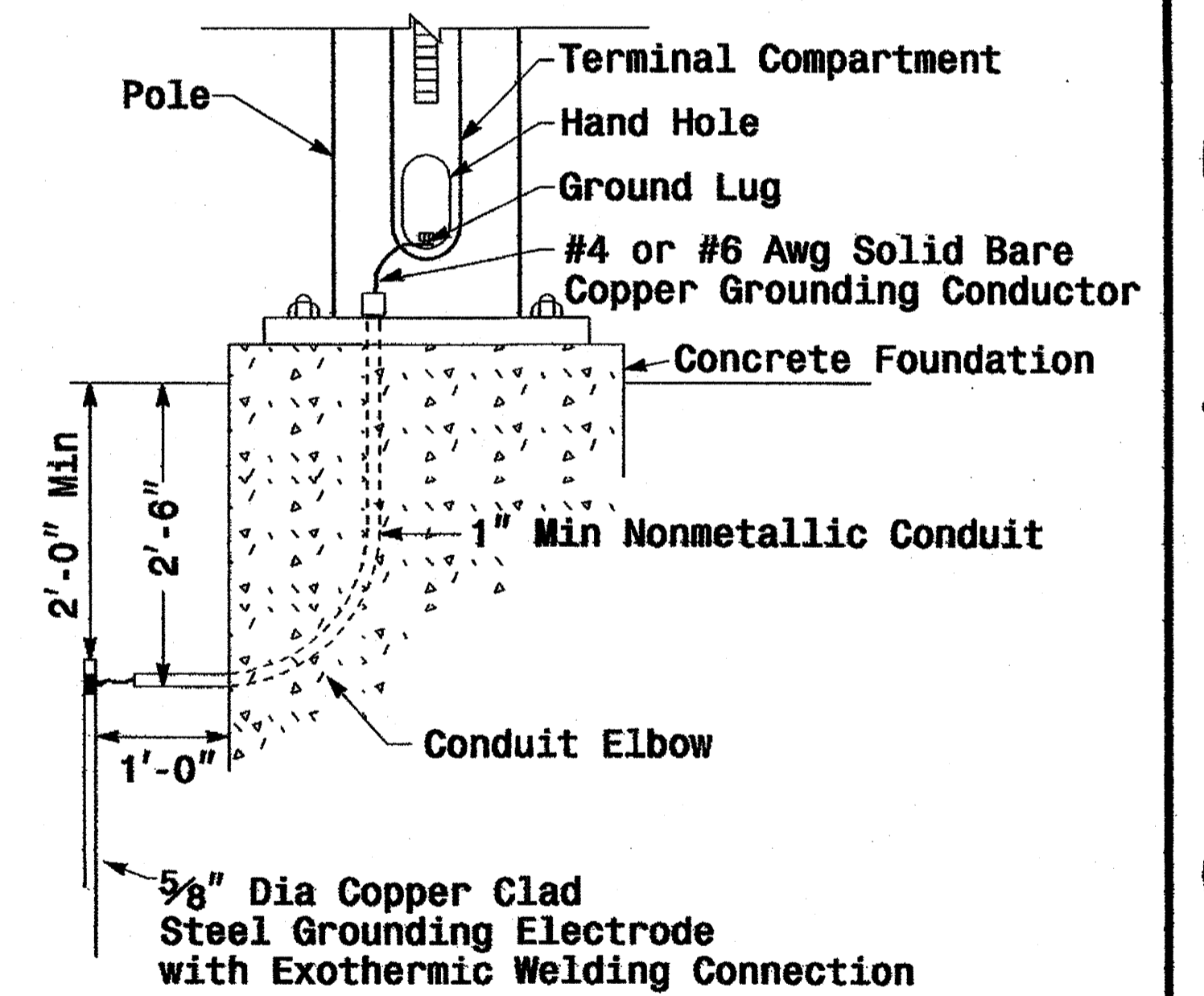


Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



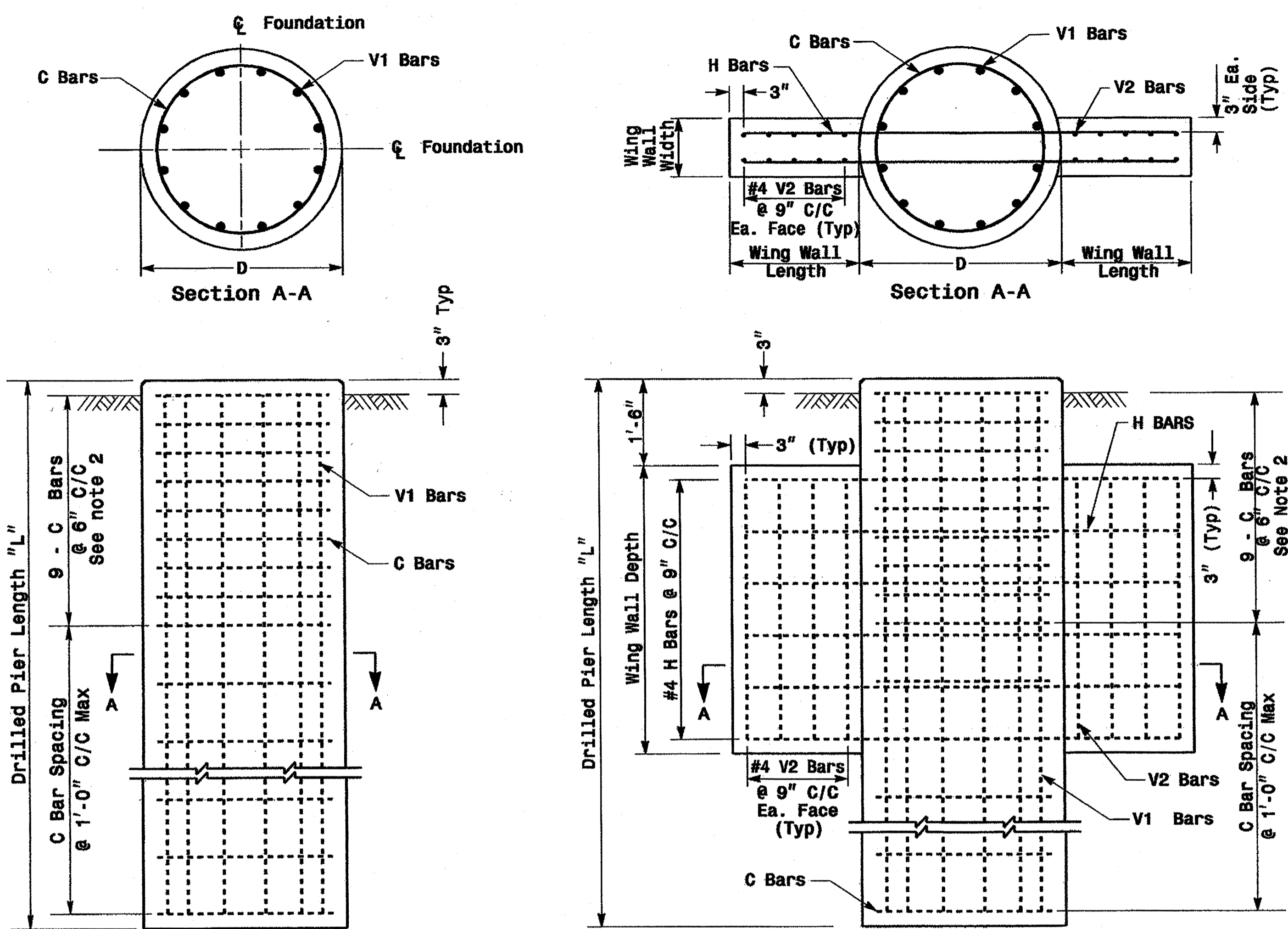
Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:13 w:\p2005\16-111\h1\workgroups\2004 metal pole standards\62004.mf.dgn

| | | | |
|---------------------------|--|---|--------------------------------------|
| | Construction Details Strain Poles | | SEAL |
| | PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS | REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR | |
| SCALE 0 NA NONE | REVISIONS DATE | INIT. DATE | 9-1-05 DATE SIG. 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

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

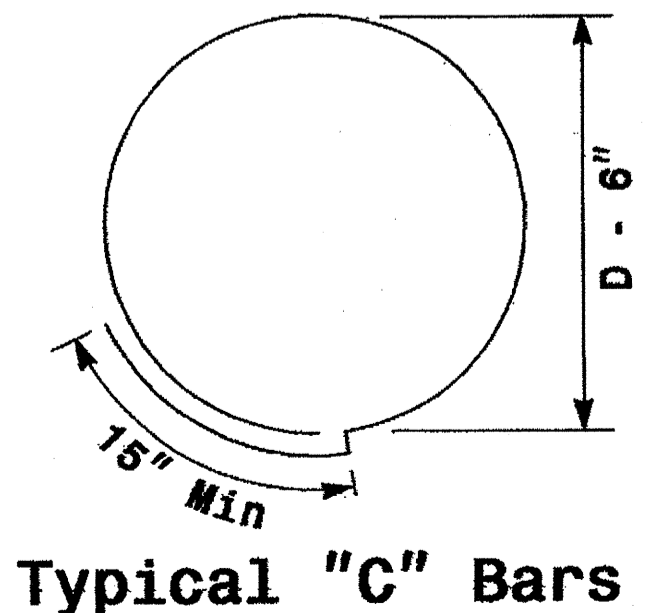
| Wing Wall Type | Drill Pier Shaft Dia. (in.) | Reinforcing Steel | | | | |
|----------------|-----------------------------|-------------------|-----|------|------|--------|
| | | Bar Name | No. | Size | Type | Length |
| TYPE 1 | 42" | V1 | 9 | #8 | STR. | ** |
| | | V2 | 12 | #4 | STR. | 2'-6" |
|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

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

WING WALL DETAILS

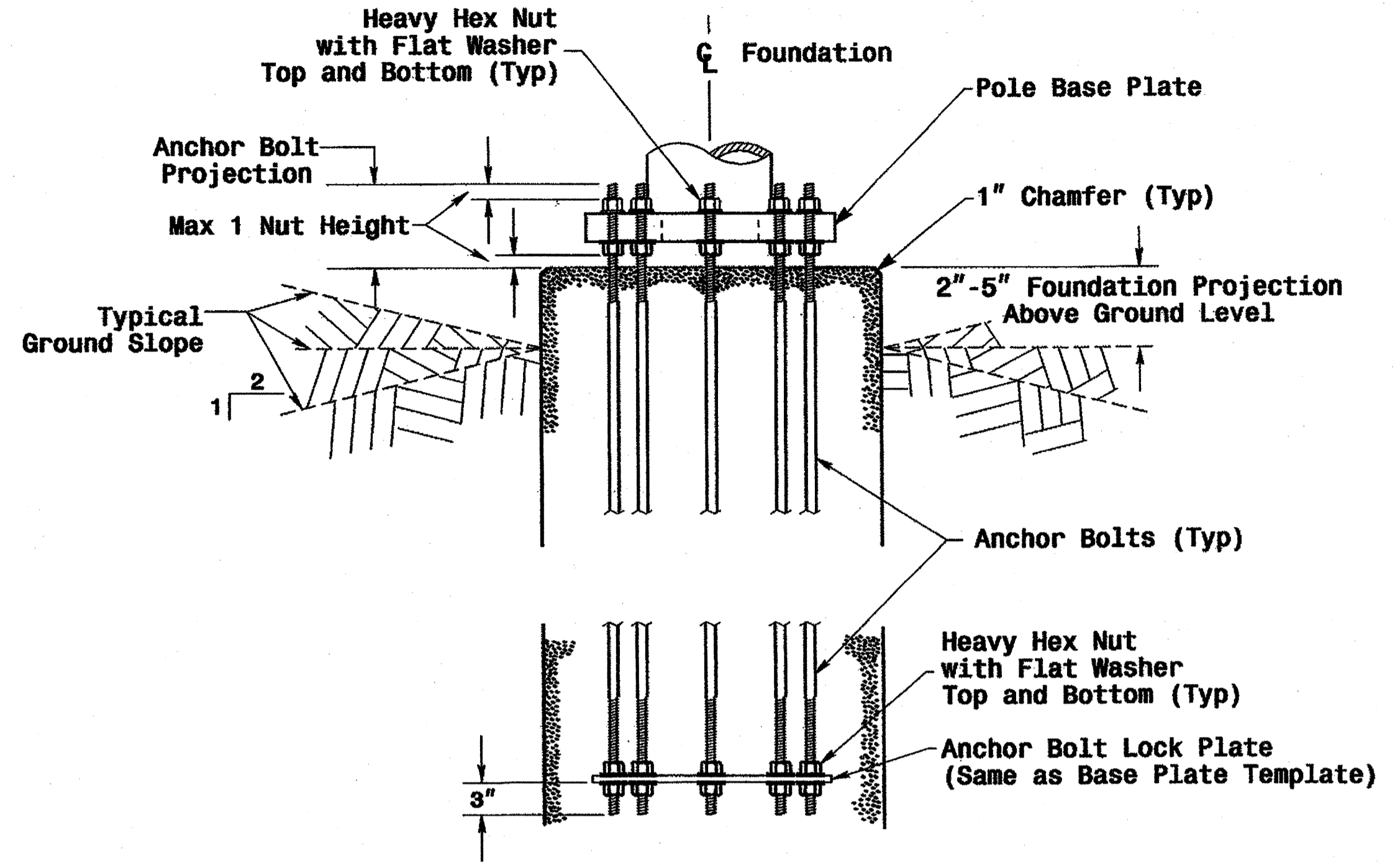
| Wing Wall Type | Wing Wall Length (Ft.) | Wing Wall Width (Ft.) | Wing Wall Depth (Ft.) | Concrete Volume (Cu. Yds.) |
|----------------|------------------------|-----------------------|-----------------------|----------------------------|
| TYPE 1 | 1'-6" | 1'-0" | 3'-0" | .4 |
| TYPE 2 | 3'-0" |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

See Note No. 4

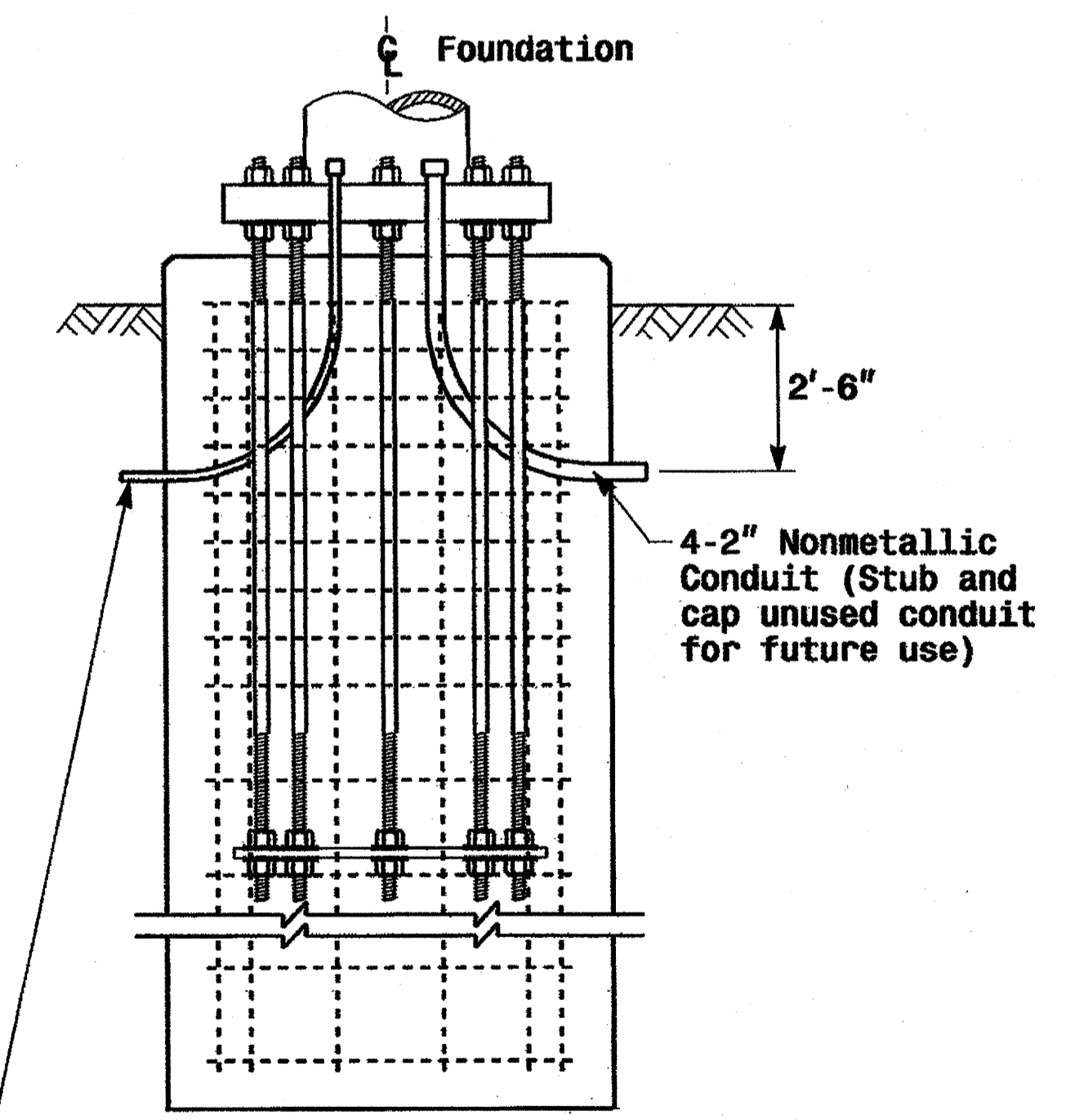


Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

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

Construction Details - Foundations

01-SEP-2005 11:48 W:\p\p\ee-un\1\new\groups\4004_metal_pole_standards\2004_mf.dgn

| | | |
|--|---|---|
| | Construction Details Foundations | |
| | PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS SCALE: 0 NA NONE | REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.W. ESPOSITO REVISIONS: _____ INIT. _____ DATE _____ |

| | | 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.

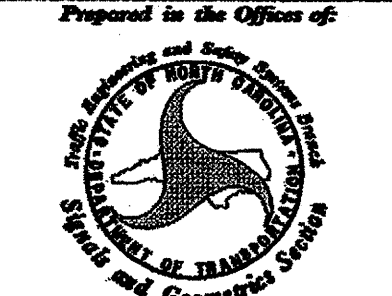
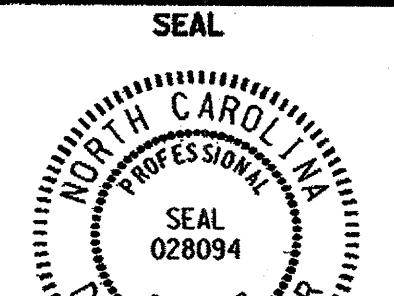
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.

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

04-SEP-2005 15:42 \\saw01\p01\proj\mfg\cupse2004\metal pole standard\std04.mfg std strcn pole.dgn P.L. Alexander

| | | | |
|---|---|--------------------------------------|---|
|  | Standard Strain Poles and Standard Foundations | |  |
| | PLAN DATE: May 2005 | REVIEWED BY: C.F. Andrews | |
| PREPARED BY: P.L. Alexander | | REVIEWED BY: A.W. Esposito | |
| SCALE: 0 NA None | REVISIONS: | INIT. | DATE |
| | | D. Sarker 9.2.2005 SIGNATURE DATE | |

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RALEIGH, N.C.

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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS

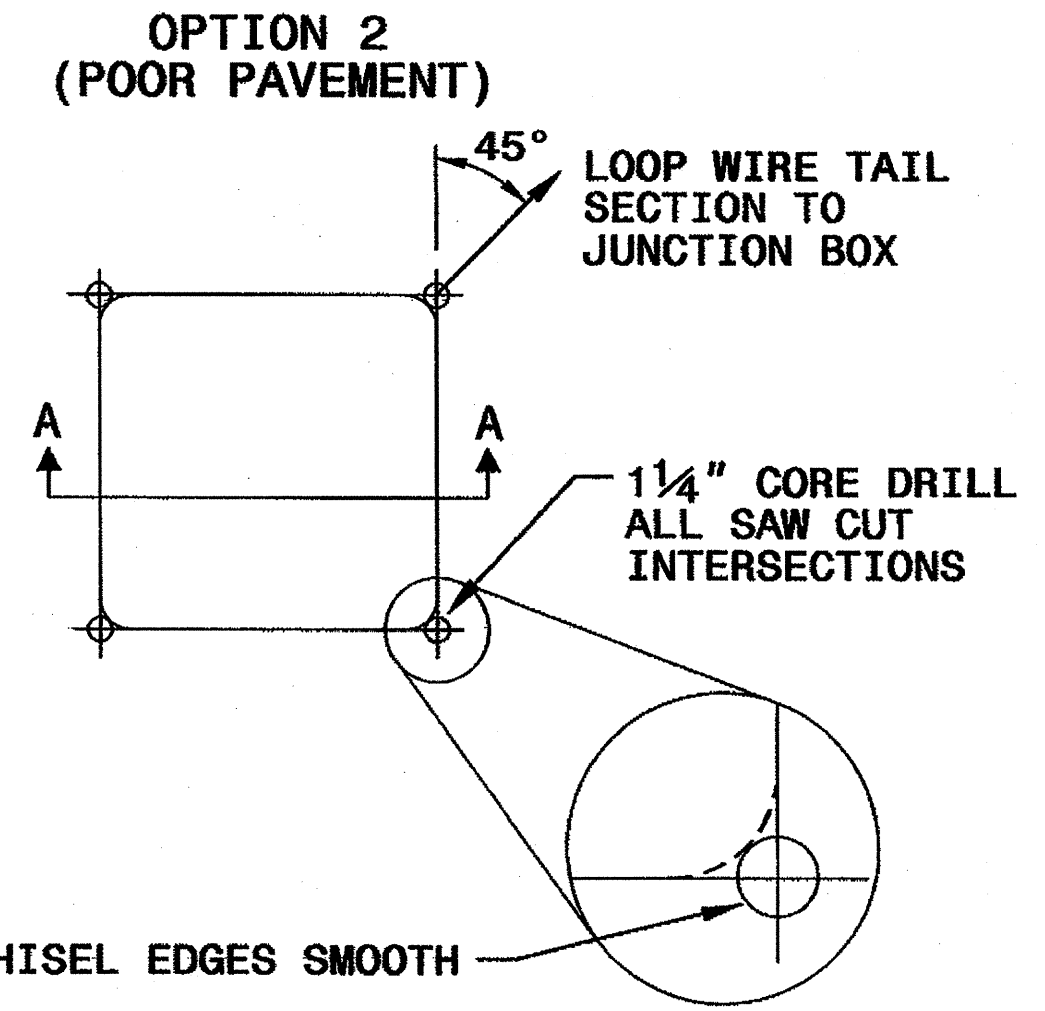
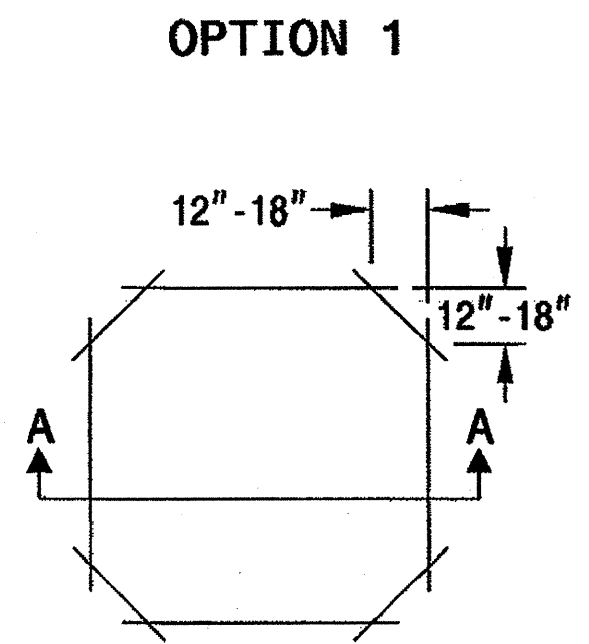
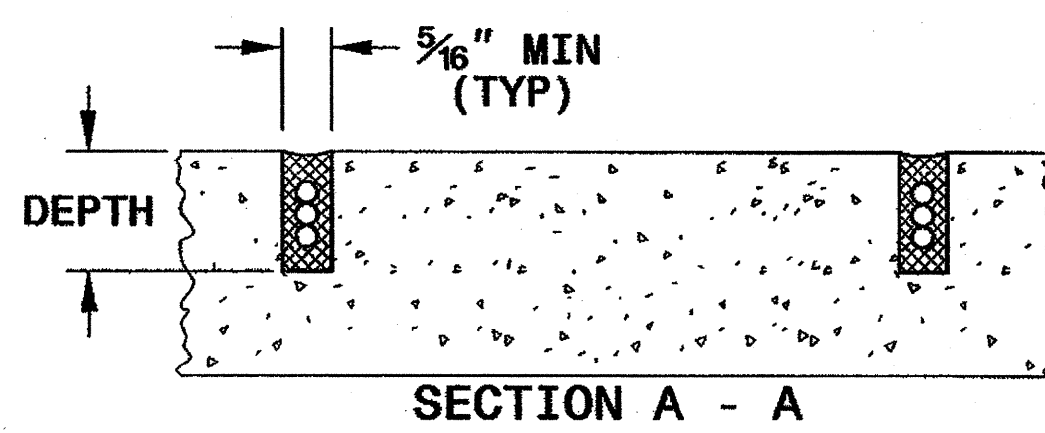
SHEET 1 OF 3
1725D01

CONVENTIONAL 4-SIDED LOOP

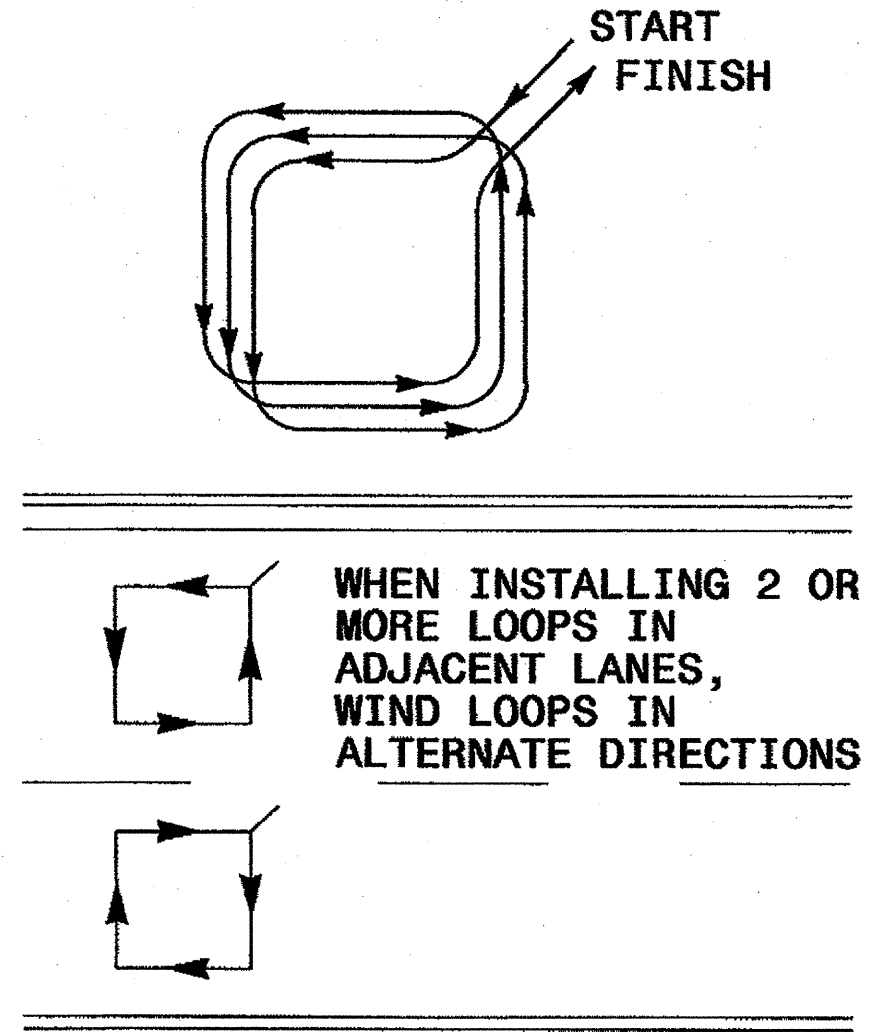
SAW CUT OPTIONS

SAW SLOT DEPTH CHART

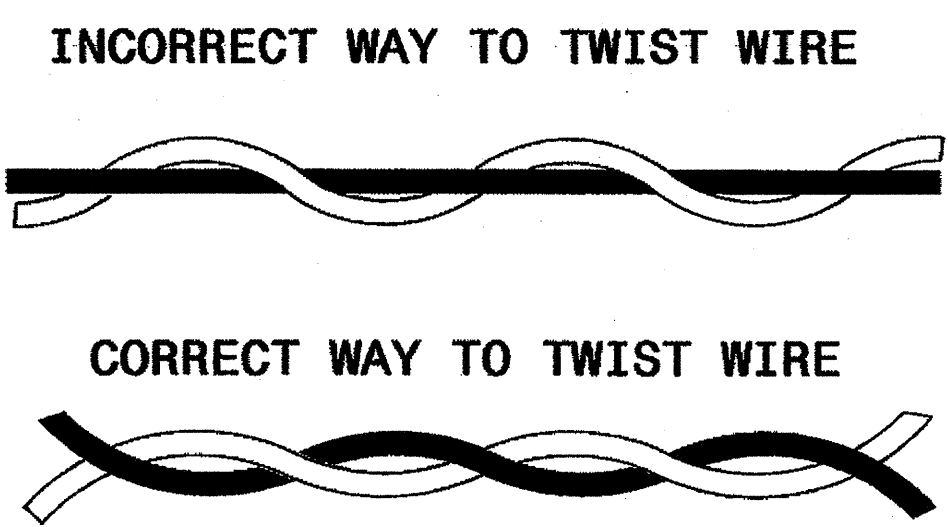
| DEPTH (IN) | NO. OF WIRE TURNS | | | | |
|------------|-------------------|-----|-----|-----|-----|
| | 2 | 3 | 4 | 5 | 6 |
| CONCRETE | 2.0 | 2.0 | 2.5 | 2.5 | 3.0 |
| ASPHALT | 2.0 | 2.5 | 3.0 | 3.0 | 3.0 |



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

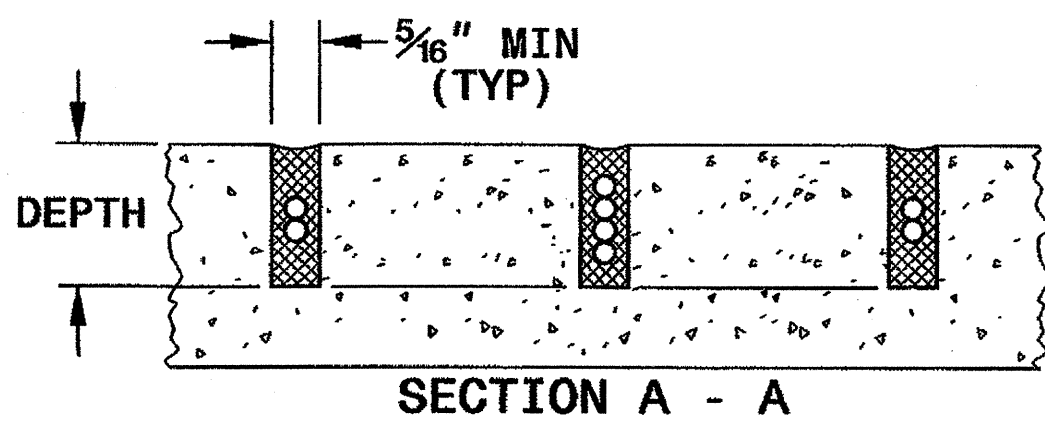
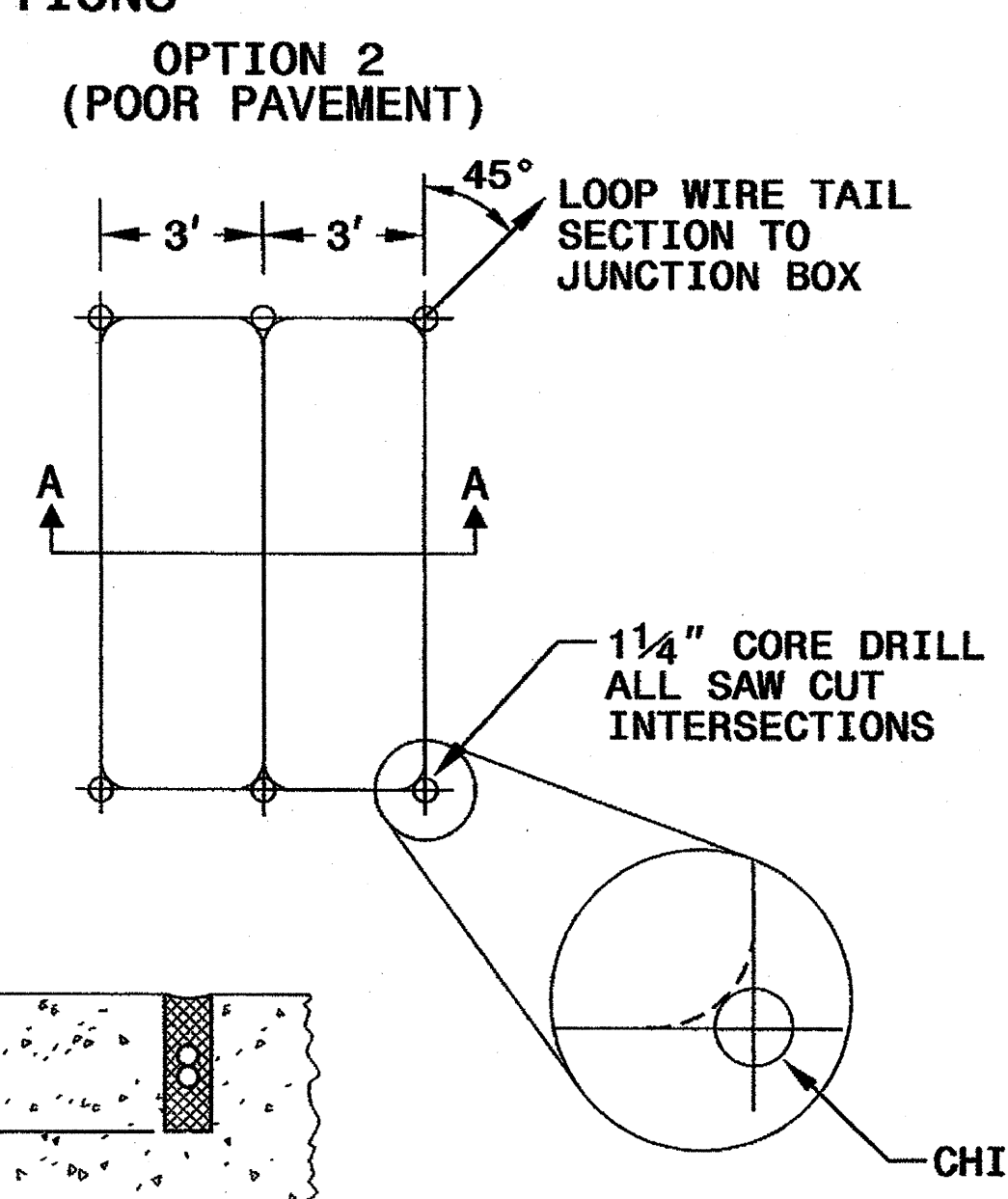
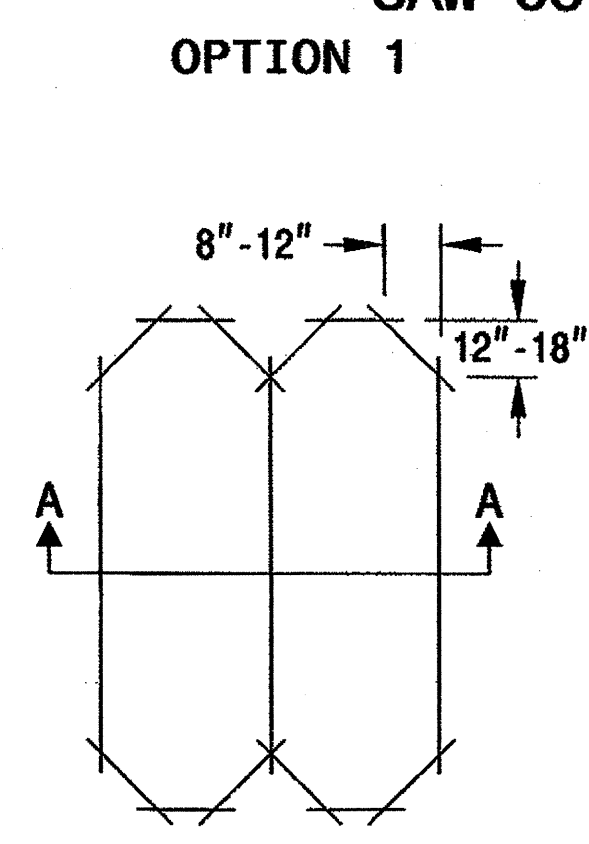


NOTES

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.

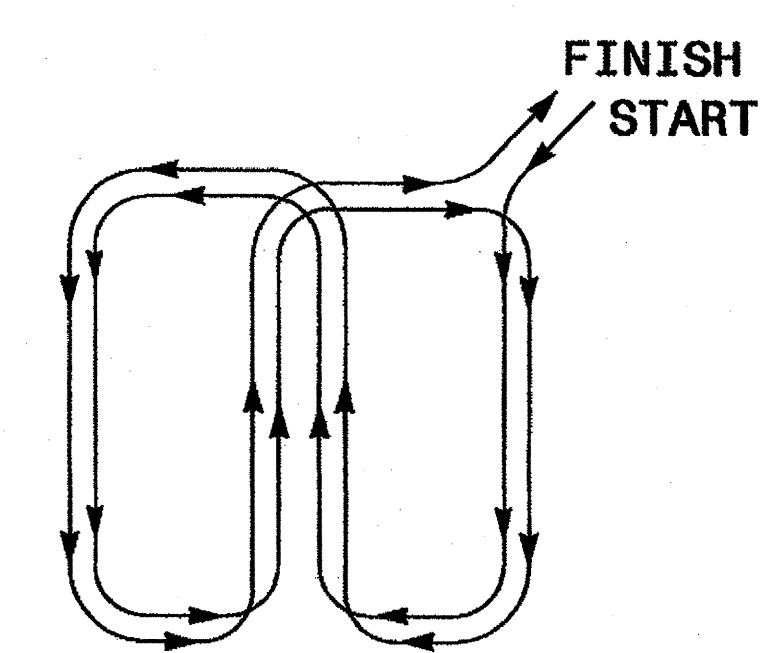
QUADRUPOLE LOOP

SAW CUT OPTIONS



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

LOOP WINDING METHOD



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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

Michael Dean 11/24/08
SIGNATURE DATE

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

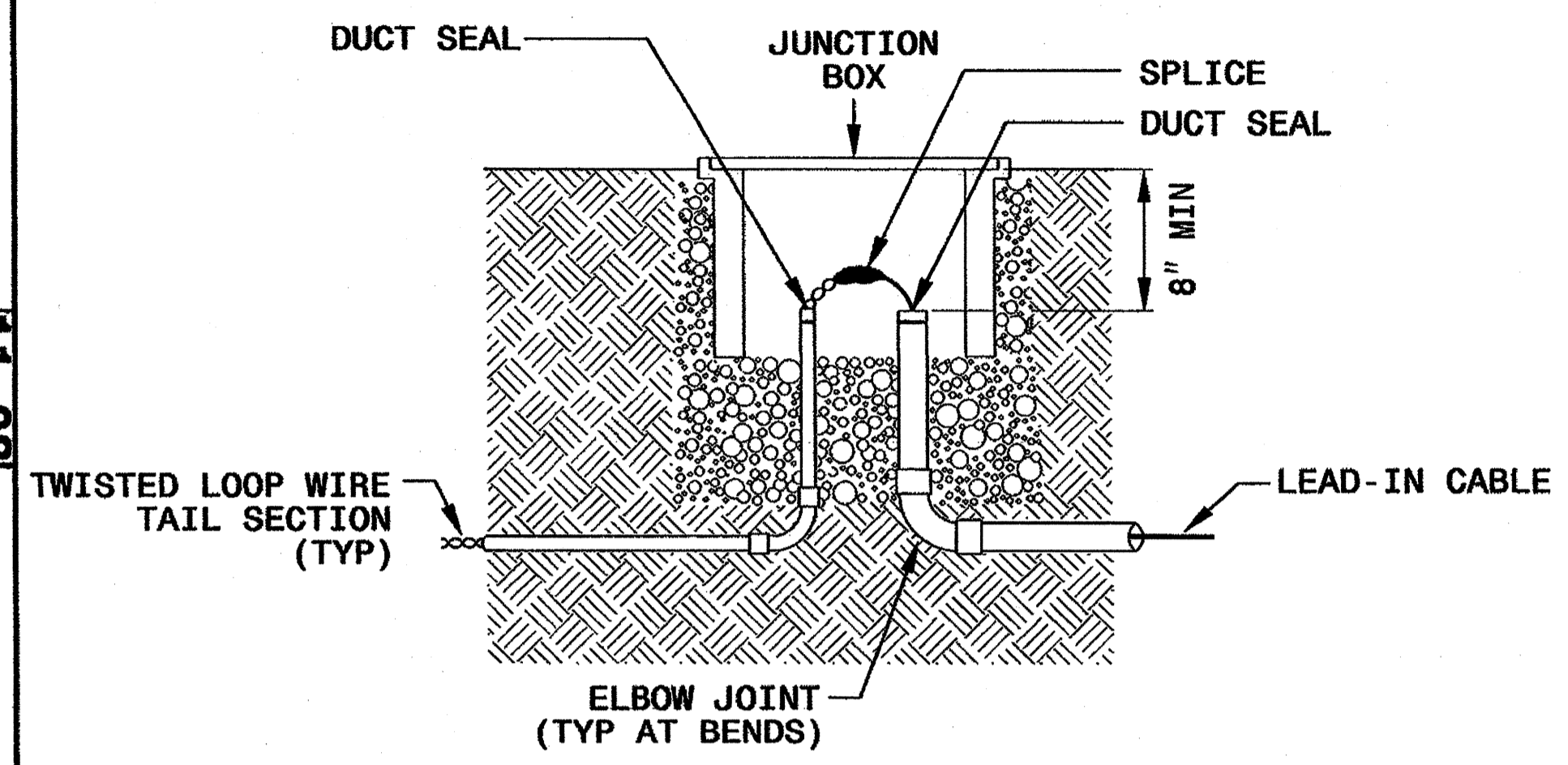
11-08

ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

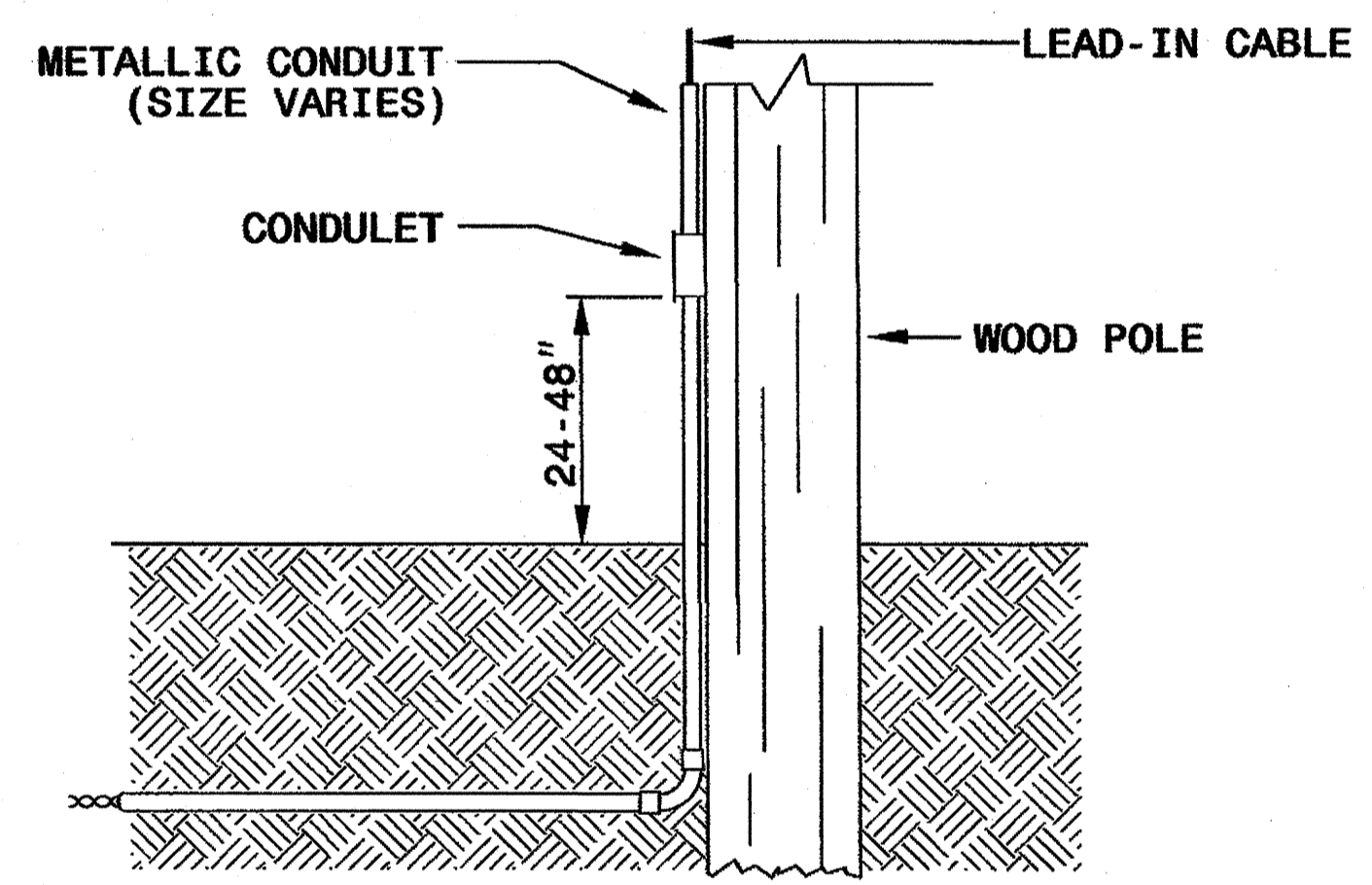
SHEET 2 OF 3
1725D01

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

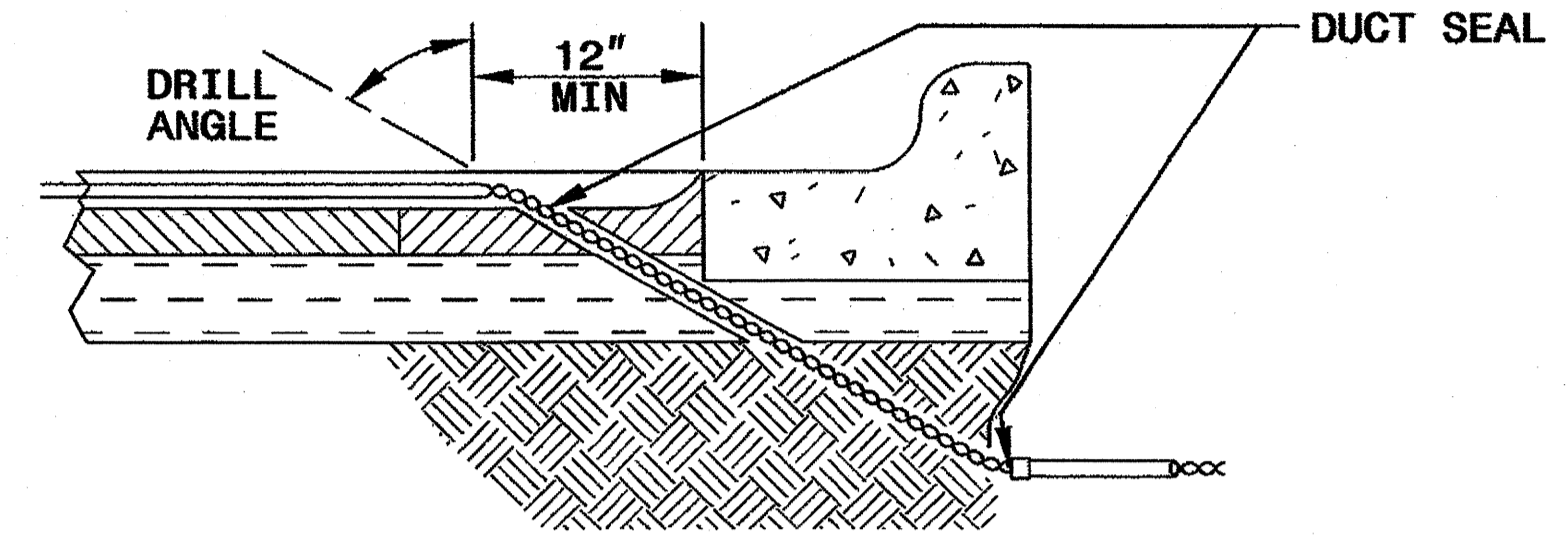


NOTE

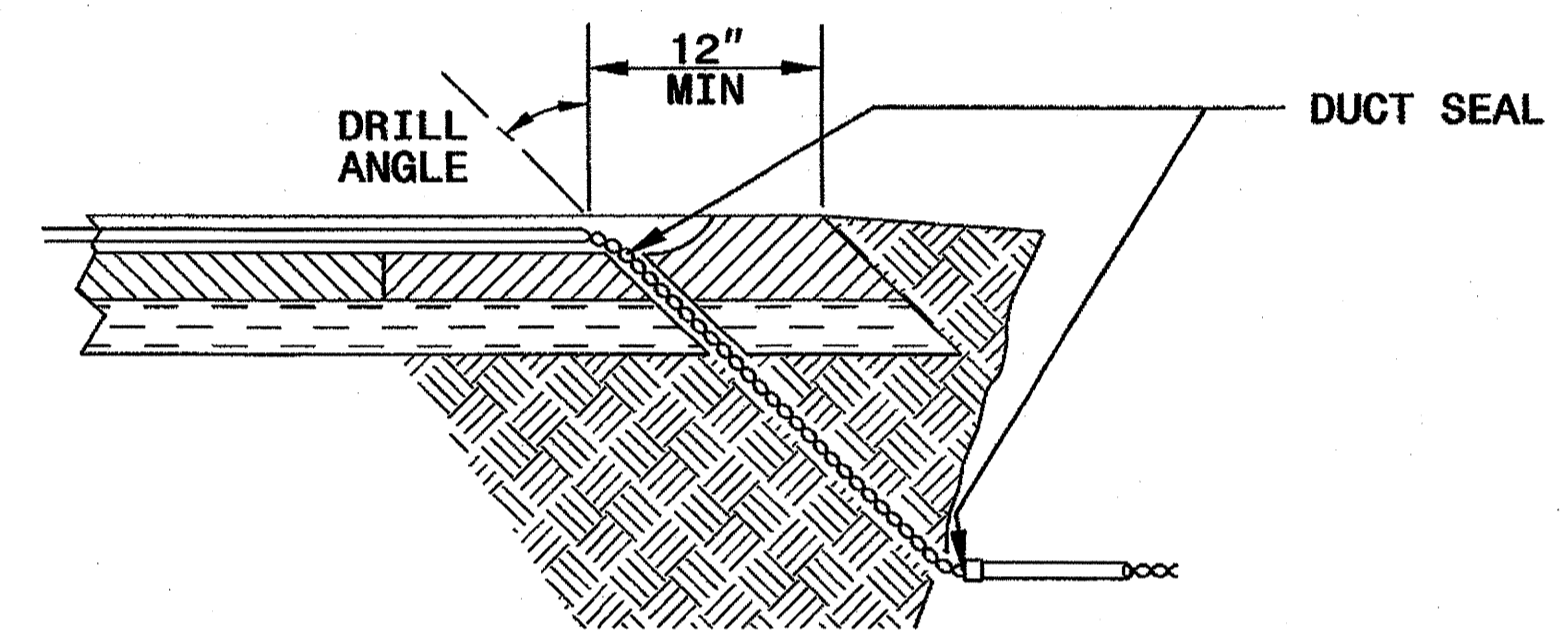
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

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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ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
 LOOP WIRE DETAILS

SHEET 2 OF 3
1725D01

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
 Garner, NC 27529

SEAL

Milton I. Dean 11/24/08
 SIGNATURE DATE

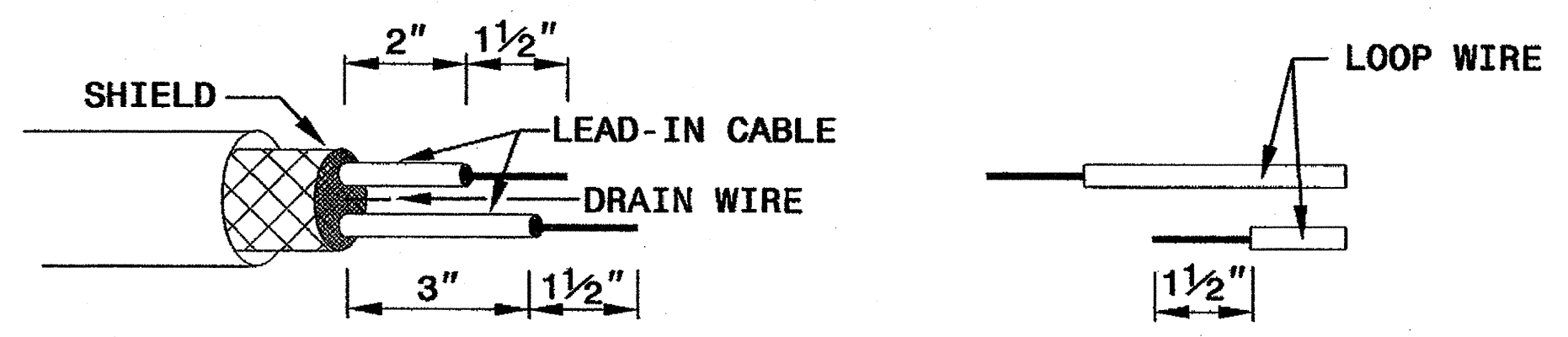
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

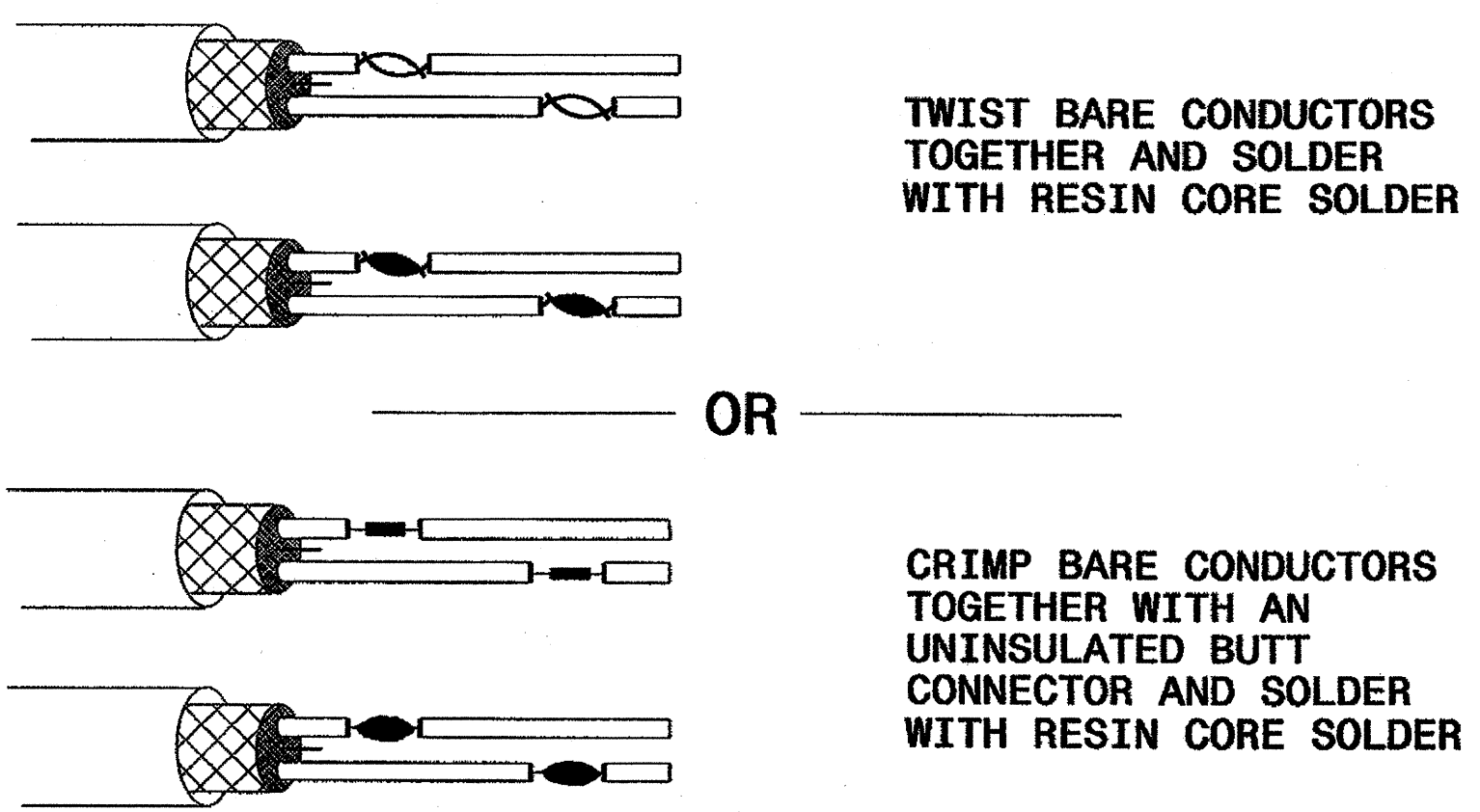
ENGLISH DETAIL DRAWING FOR
INDUCTIVE DETECTION LOOPS
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3
1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE

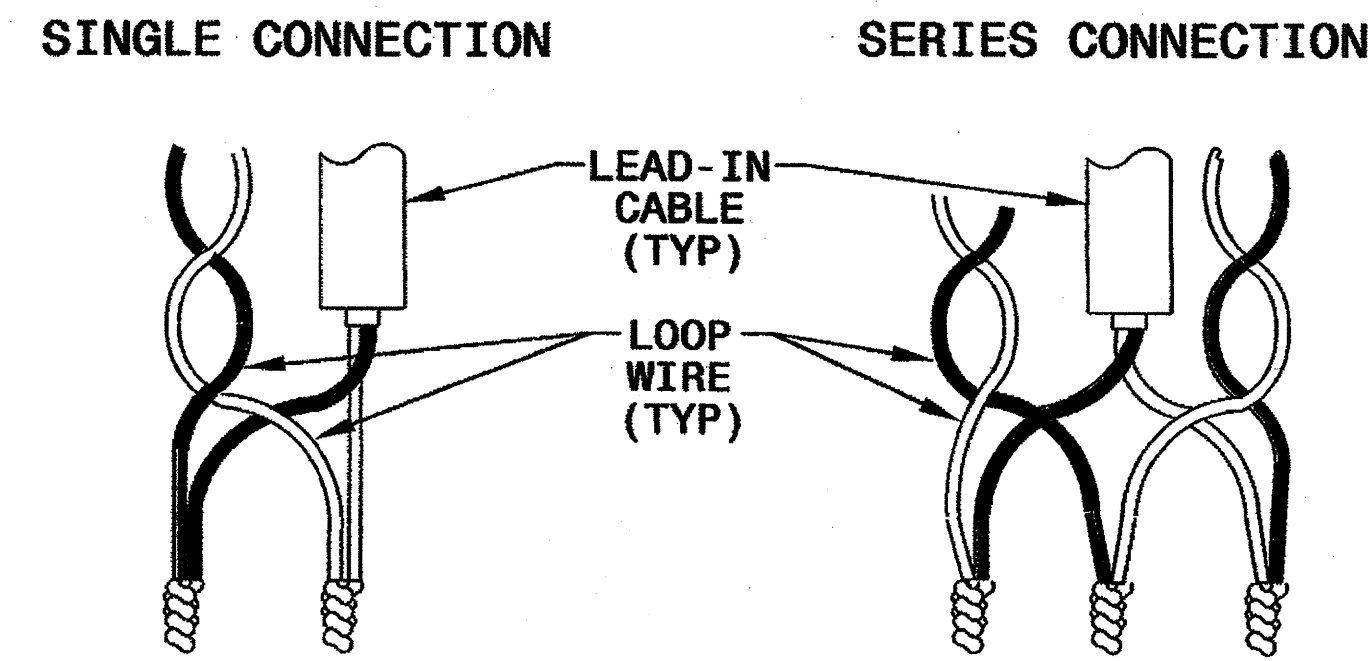


STEP 2. CONNECT AND SOLDER

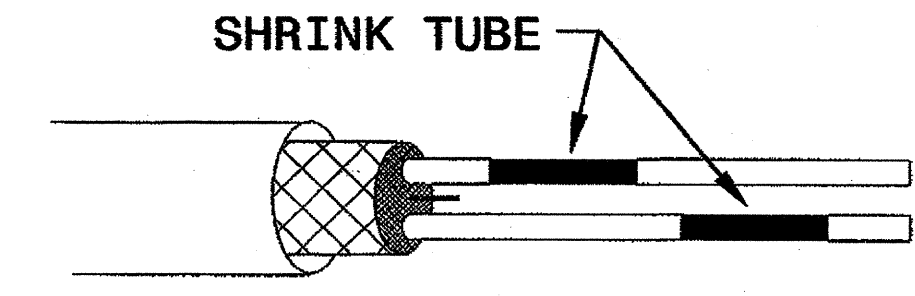


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

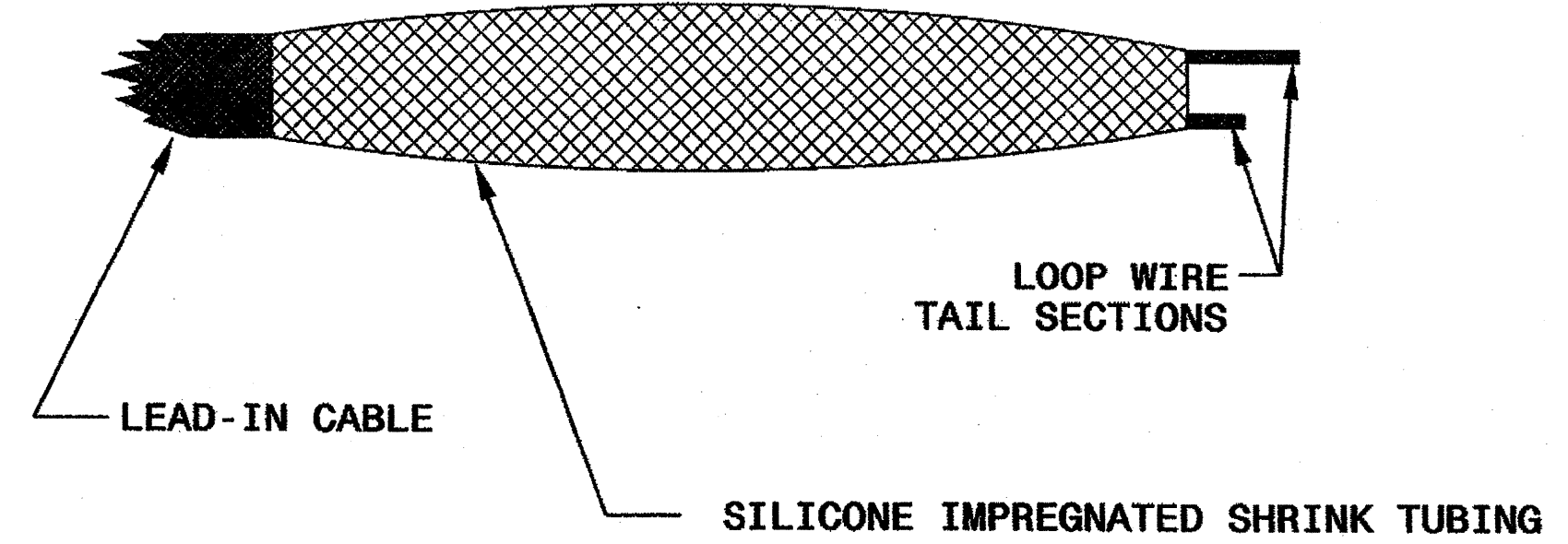
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE



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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

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SIGNATURE DATE

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