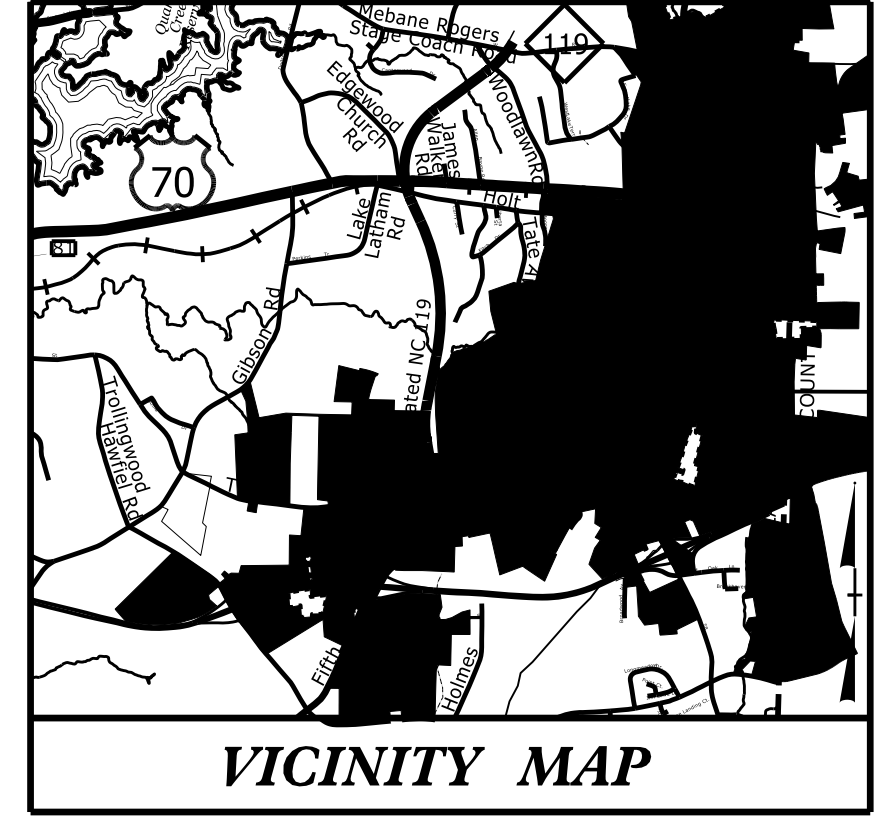
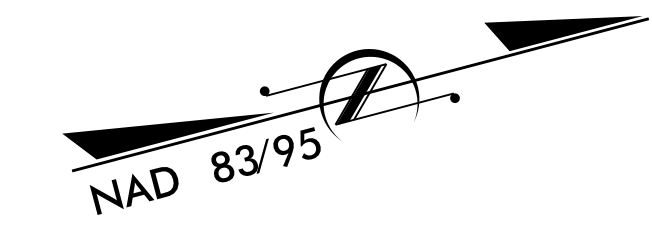


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

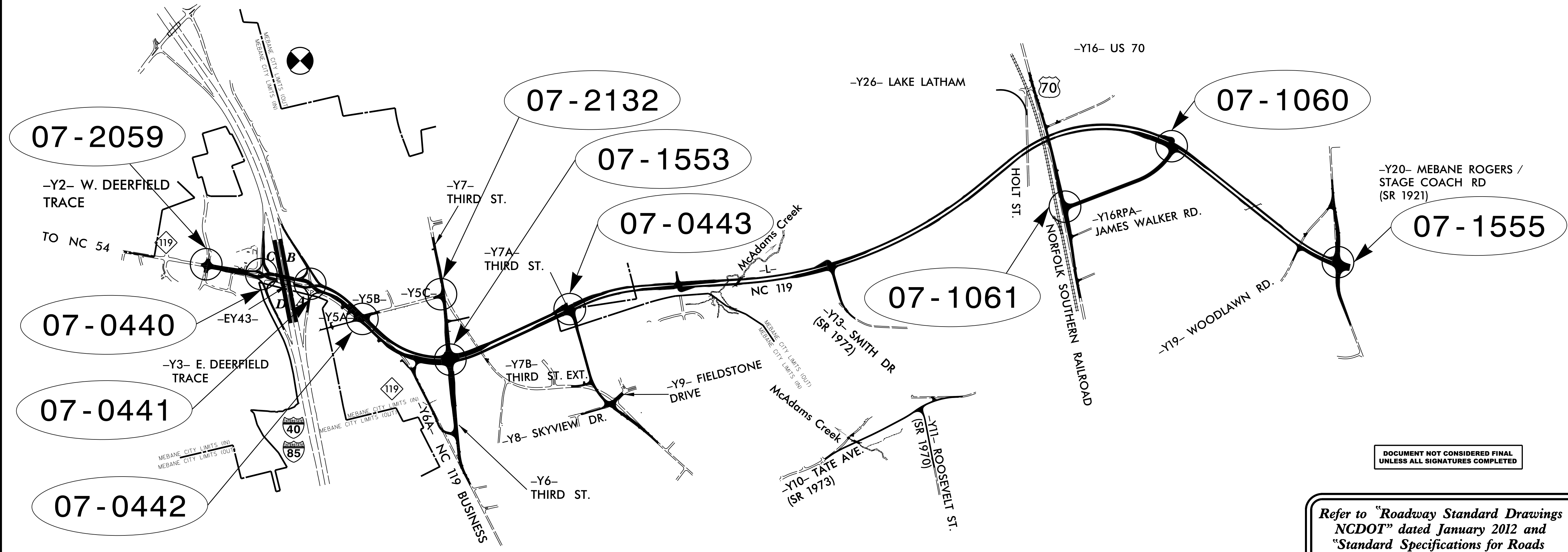
ALAMANCE COUNTY

LOCATION: NC 119 RELOCATION FROM I-40 /85 TO SR 1921
(MEBANE ROGERS ROAD /STAGE COACH ROAD)

TYPE OF WORK: SIGNALS AND SIGNAL COMMUNICATION PLANS



CONTRACT: C203844 TIP PROJECT: U-3109A



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Refer to "Roadway Standard Drawings
NCDOT" dated January 2012 and
"Standard Specifications for Roads
and Structures" dated January 2012.

| Sheet # | Reference # | Location/Description |
|----------------|-------------|--|
| Sig. 1.0 | | Title Sheet |
| Sig. 2.0-4.2 | 07-2059 | NC 119 at Deerfield Trace and Lowe's Boulevard |
| Sig. 5.0-8.1 | 07-0440 | NC 119 at I-40 EB/I-85 NB Ramps |
| Sig. 9.0-12.1 | 07-0441 | NC 119 at I-40 WB/I-85 SB Ramps |
| Sig. 13.0-14.2 | 07-0442 | NC 119 at SR 1980 (Holmes Road) |
| Sig. 15.0-17.1 | 07-1553 | NC 119 at NC 119 Bus. (S. 5th Street) and SR 1962 (3rd Street) |
| Sig. 18.0-20.2 | 07-2132 | SR 1962 (S. Third Street) at SR 1980 (Holmes Road) |
| Sig. 21.0-21.4 | 07-0443 | NC 119 at SR 1962 (3rd Street) |
| Sig. 22.0-22.1 | 07-1061 | NC 119 at James Walker Road |
| Sig. 23.0-23.1 | 07-1060 | US 70 (W. Center Street) at James Walker Road |
| Sig. 24.0-24.2 | 07-1555 | SR 1921 (Mebane Rogers Road) at NC 119 |
| M1-M8 | | Standard Drawing For Metal Poles |
| P1-P3 | | Pedestrian Pushbutton Location Details |
| SCP 1-15 | | Signal Communications Plans |

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

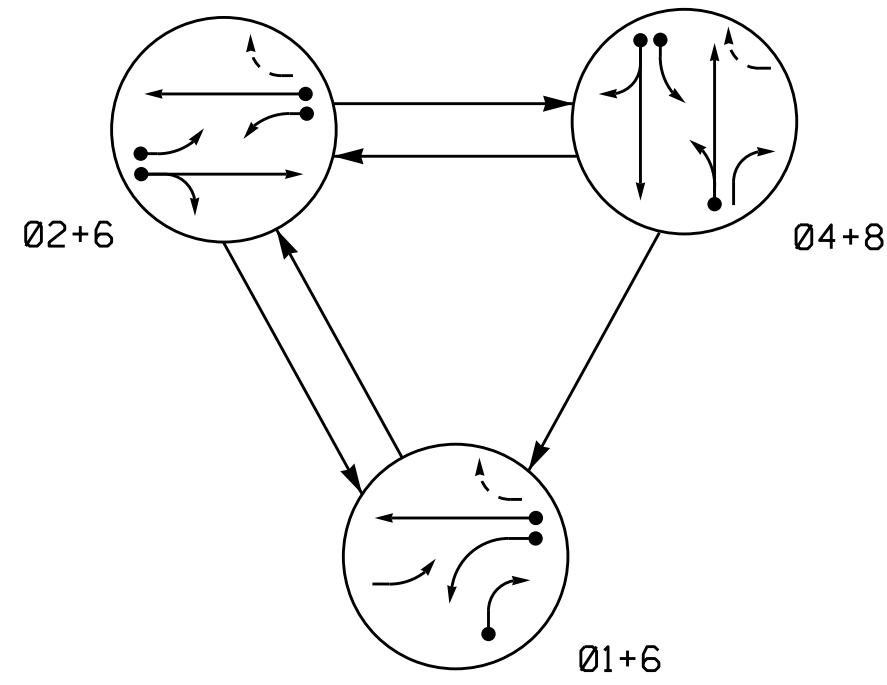
Robert J. Ziemba, PE – Central Region Signals Engineer
Keith M. Mims, PE – Signal Equipment Design Engineer
I. Neil Avery – Signal Communication Project Engineer

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

750 N. Greenfield Parkway, Garner, NC 27529

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PHASING DIAGRAM

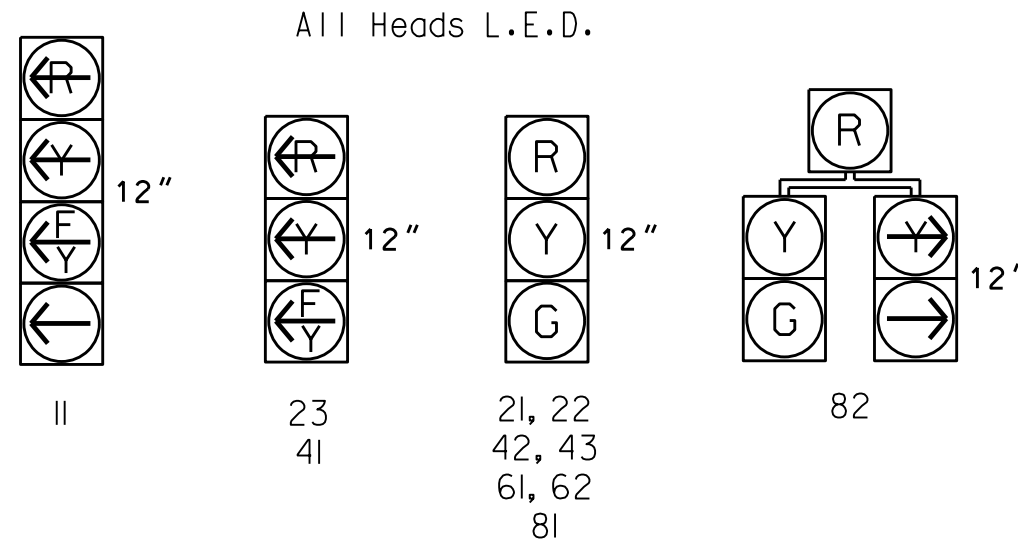


PHASING DIAGRAM DETECTION LEGEND

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

| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|------|------|
| | 01+6 | 02+6 | 04+8 | 01+6 |
| II | ← | ← | ← | ← |
| 21, 22 | R | G | R | Y |
| 23 | ← | ← | ← | ← |
| 41 | ← | ← | ← | ← |
| 42, 43 | R | R | G | R |
| 61, 62 | G | G | R | Y |
| 81 | R | R | G | R |
| 82 | ← | ← | ← | ← |

SIGNAL FACE I.D.

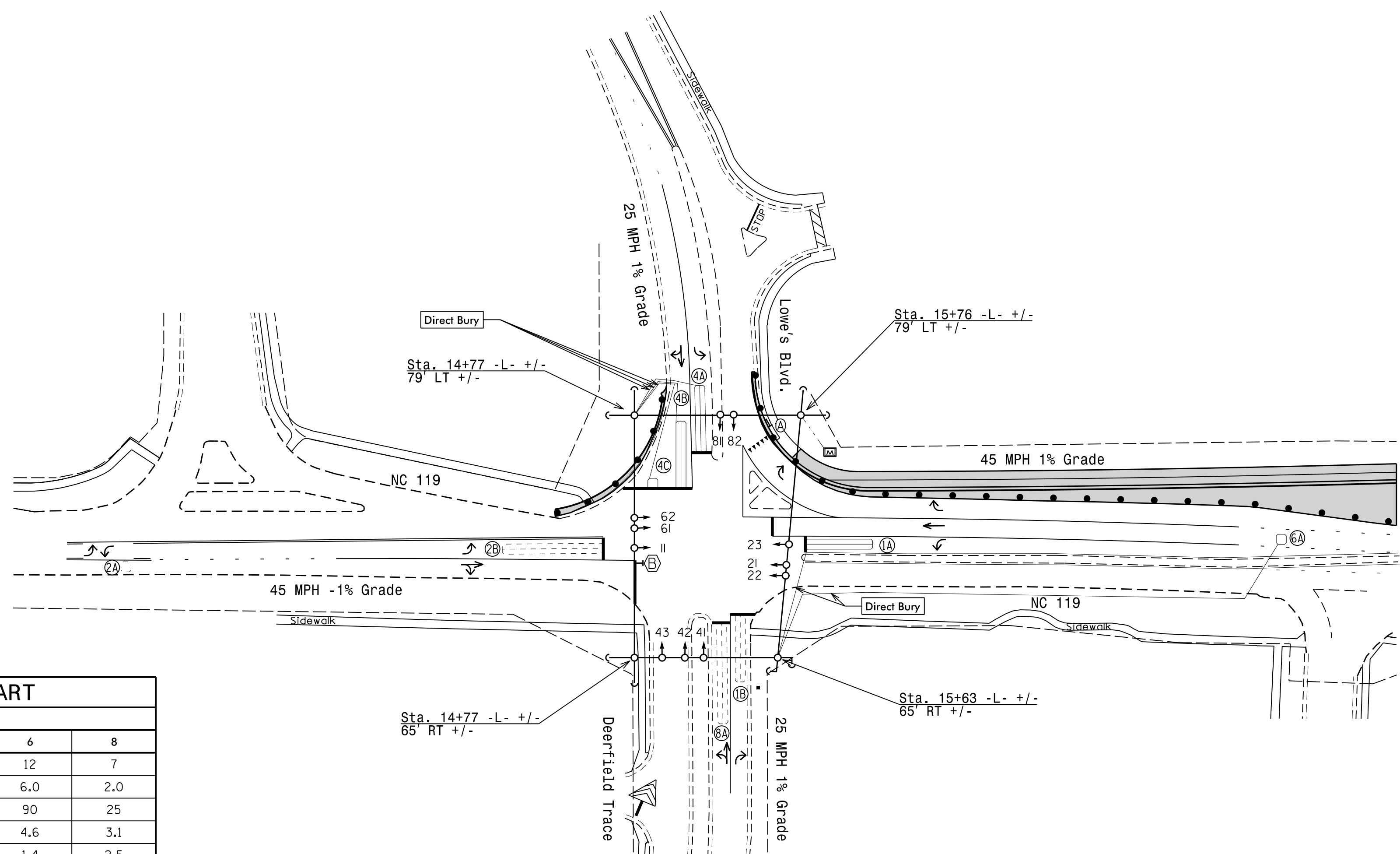


| INDUCTIVE LOOPS | | | | DETECTOR PROGRAMMING | | | | | | | | |
|-----------------|-----------|----------------------------|-------|----------------------|-------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| IA | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | 15 | - | Y |
| IB | 6X40 | 0 | 2-4-2 | - | 1 | Y | Y | - | - | 15 | - | Y |
| 2A | 6X6 | 300 | 4 | - | 2 | Y | Y | - | - | - | - | Y |
| 2B | 6X60 | 0 | 2-4-2 | - | 2 | Y | Y | Y | - | 3 | - | Y |
| 4A | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | - | - | Y |
| 4B | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | 10 | - | Y |
| 4C | 6X6 | 0 | 4 | Y | 4 | Y | Y | - | - | 15 | - | Y |
| 6A | 6X6 | 300 | 4 | Y | 6 | Y | Y | - | - | - | - | Y |
| 8A | 6X60 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | - | - | Y |

3 Phase Fully Actuated (NC 119 CLS)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Master Asset #: 10726, Controller Asset #: 2059.



| FEATURE | PHASE | | | | |
|-------------------------|-------|------------|-----|------------|-----|
| | 1 | 2 | 4 | 6 | 8 |
| Min Green 1 * | 7 | 12 | 7 | 12 | 7 |
| Extension 1 * | 2.0 | 6.0 | 2.0 | 6.0 | 2.0 |
| Max Green 1 * | 15 | 90 | 25 | 90 | 25 |
| Yellow Clearance | 3.0 | 4.6 | 3.1 | 4.6 | 3.1 |
| Red Clearance | 2.8 | 1.4 | 2.5 | 1.4 | 2.5 |
| Red Revert | 2.0 | 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 * | - | 30 | - | 30 | - |
| Minimum Gap | - | 3.0 | - | 3.0 | - |
| 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.

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ↓ Pedestrian Signal Head With Push Button & Sign | ↓ N/A |
| ○ → Signal Pole with Guy | ● → Signal Pole with Guy |
| ○ → Signal Pole with Sidewalk Guy | ● → Signal Pole with Sidewalk Guy |
| □ → Inductive Loop Detector | □ → Inductive Loop Detector |
| □ → Master Controller & Cabinet | □ → Master Controller & Cabinet |
| □ → Junction Box | □ → Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A → Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| ■ Construction Zone | ■ Construction Zone |
| ○ Construction Zone Drums | ○ Construction Zone Drums |
| Ⓐ "YIELD" Sign (R1-2) | Ⓐ "YIELD" Sign (R1-2) |
| Ⓑ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | Ⓑ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) |

Signal Upgrade Temporary Design 1 (TMP Phase I)

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at Deerfield Trace and Lowe's Boulevard

Division 7 Alamance County Mebane

PLAN DATE: November 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 0 50 1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

ROBERT J. ZIEMBA

ENGINEER

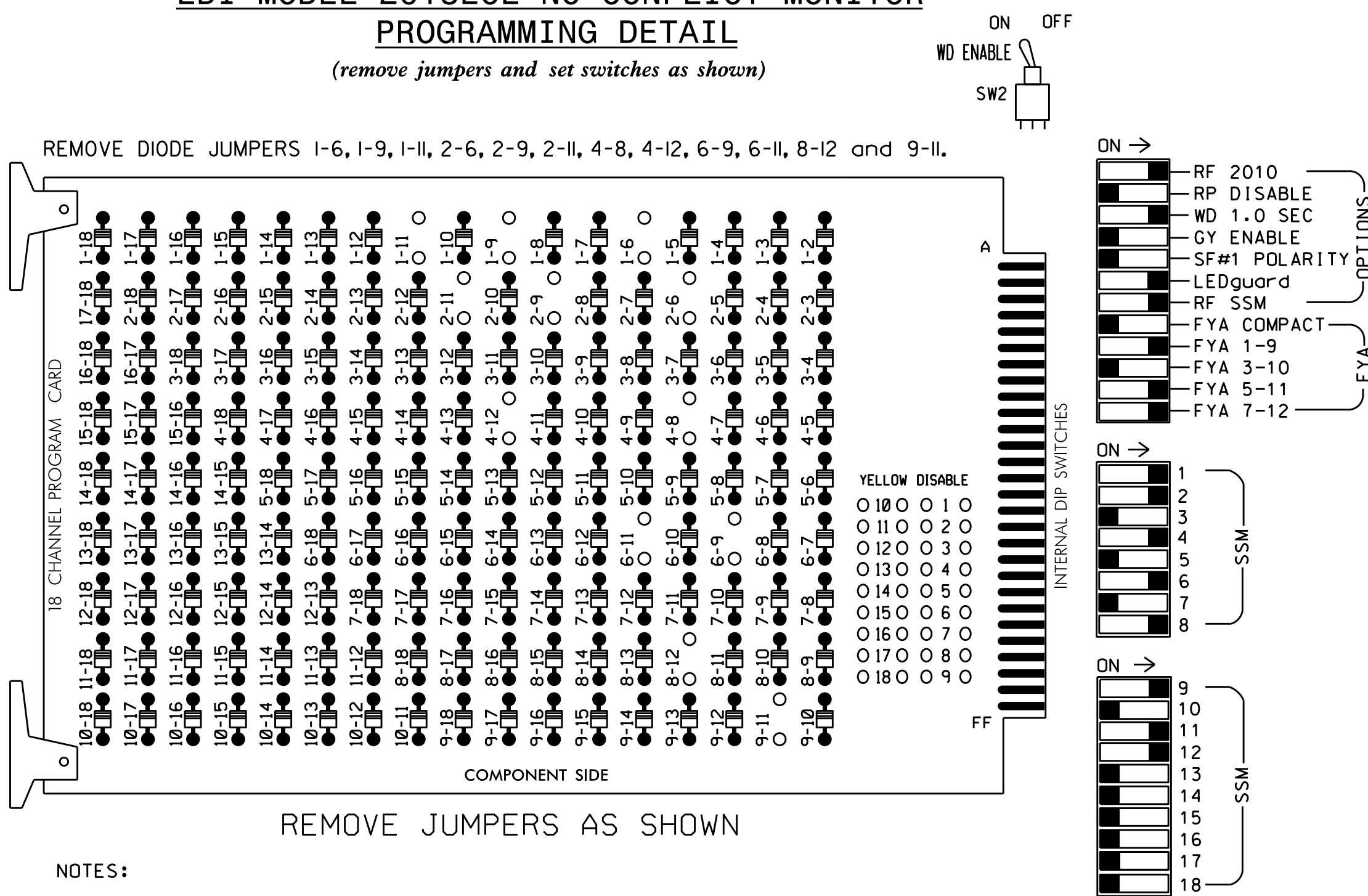
1/25/2017

SIG. INVENTORY NO. 07-2059T1

05-1116-2017_13101
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EDI MODEL 2018ECL-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.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- Program phases 4 and 8 for Dual Entry.
- 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.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11,AUX S1,AUX S4,
 AUX S5
 PHASES USED.....1,2,4,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....8

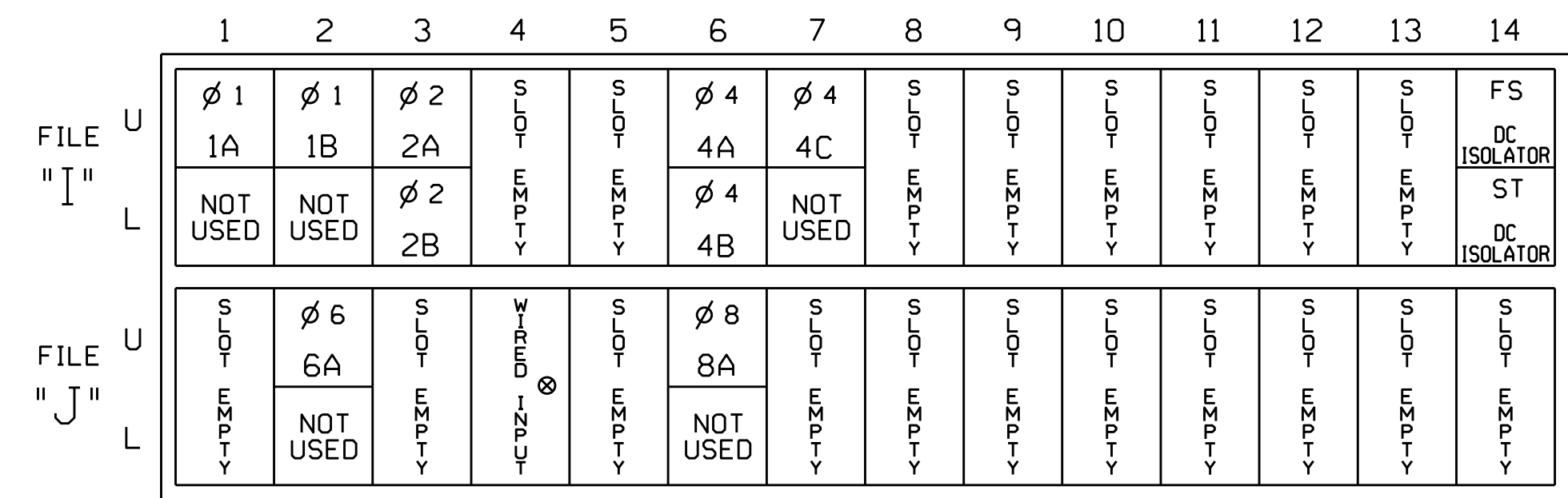
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 | |
|-----------------------|-----|-----|-------|----|-----|-------|----|-----|-------|-----|-----|-------|--------|--------|--------|--------|--------|--------|----|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 | |
| 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 | 82 | 21,22 | NU | NU | 42,43 | NU | NU | 61,62 | NU | NU | 81,82 | NU | 11 | NU | NU | 23 | 41 | NU |
| RED | * | 128 | | | 101 | | | 134 | | | 107 | | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | | 108 | | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | A114 | A101 | | |
| YELLOW ARROW | | 126 | | | | | | | | | | | A122 | | | A115 | A102 | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | A116 | A103 | | |
| GREEN ARROW | 127 | 127 | | | | | | | | | | | | | | | | | |

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)



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

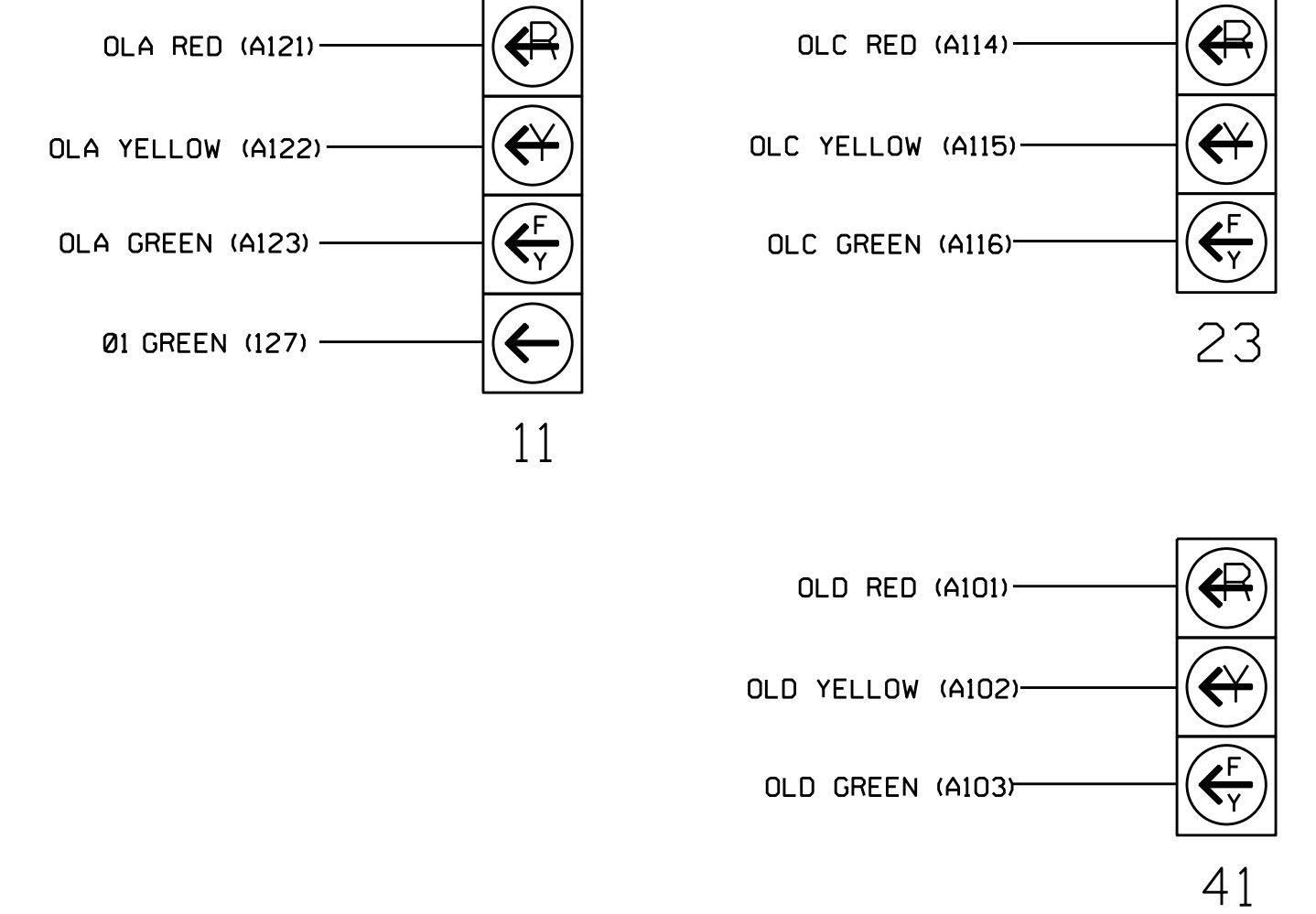
INPUT FILE CONNECTION & PROGRAMMING CHART

| 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 | TB2-9,10 | I3U | 63 | 25 | 32 | 2 | Y | Y | | | |
| 2B | TB2-11,12 | I3L | 76 | 38 | 42 | 2 | Y | Y | Y | | 3 |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | 10 |
| 4C | TB6-1,2 | I7U | 65 | 27 | 34 | 4 | Y | Y | | | 15 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |

^ Add 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)

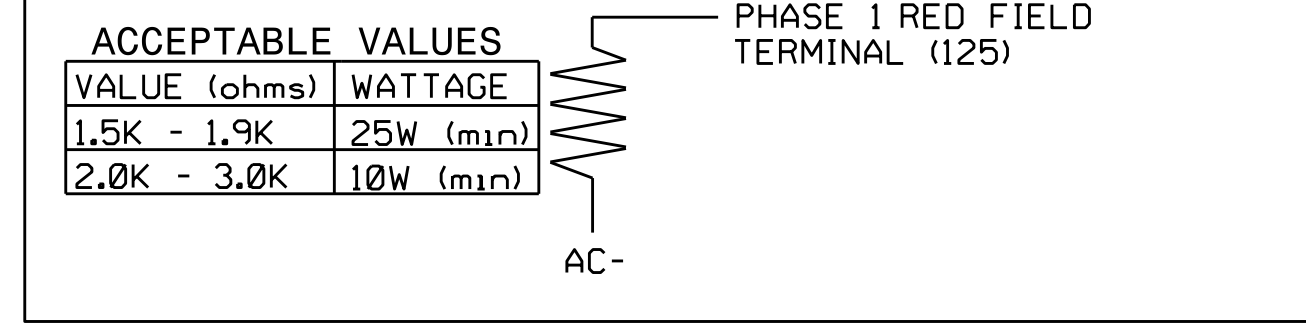


NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059T1
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED:

Electrical Detail - Temp 1 - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at Deerfield Trace and Lowe's Boulevard
 Division 7 Alamance County Mebane
 PLAN DATE: January 2017 REVIEWED BY: T. Joyce
 PREPARED BY: C. Strickland REVIEWED BY:

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530
 JACUARY M. LITTLE

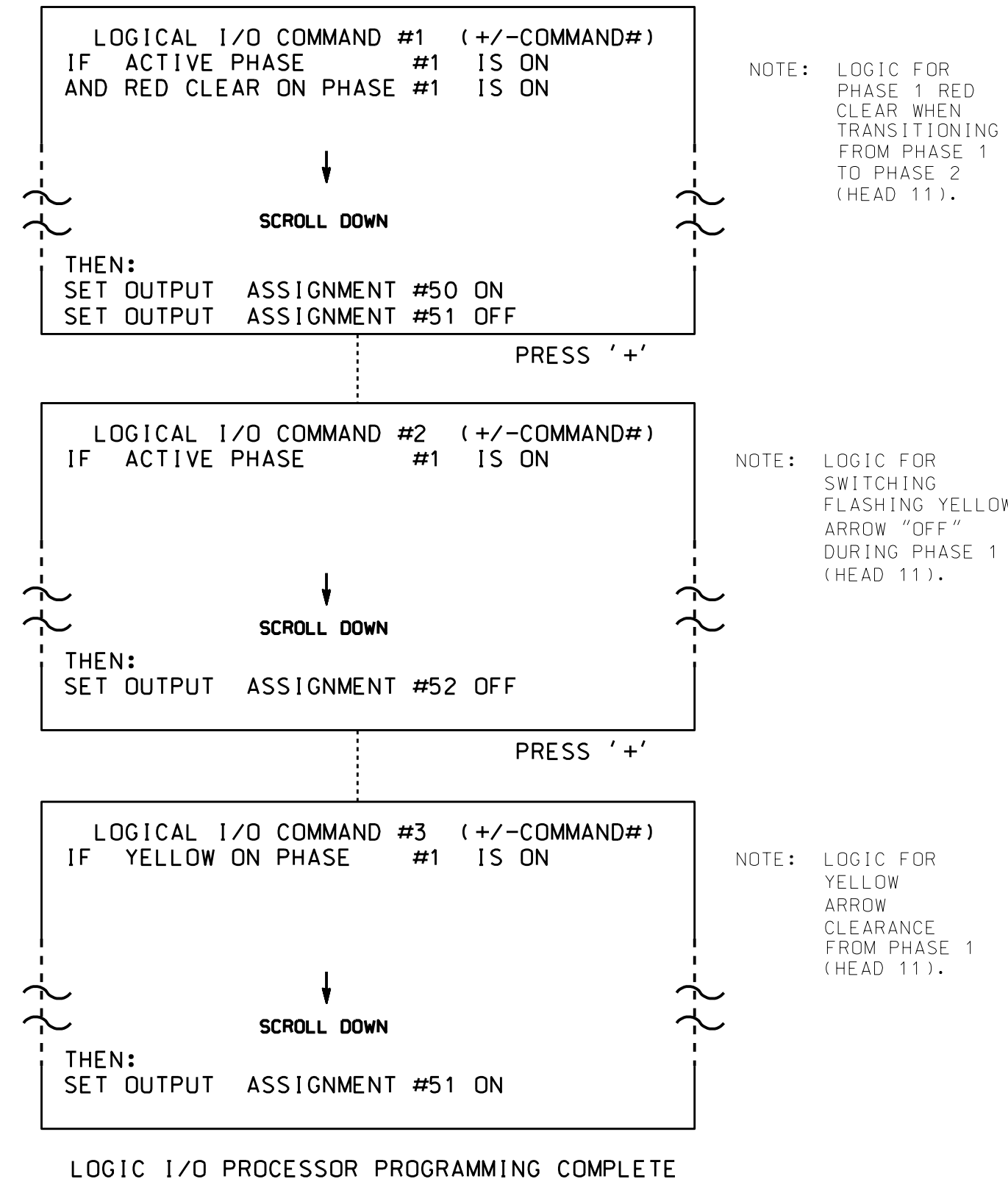
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 SIG. INVENTORY NO. 07-2059T1

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**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).



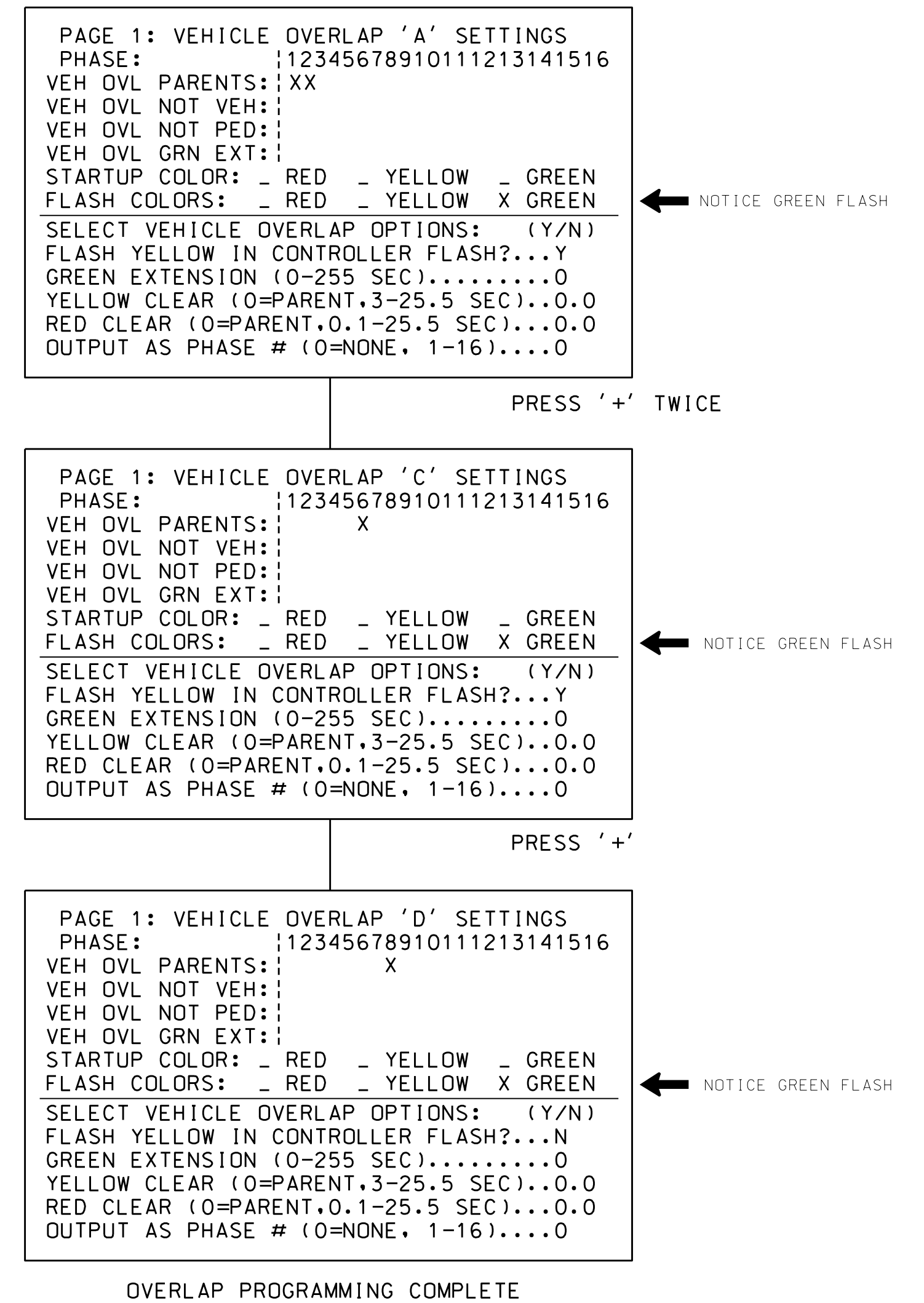
OUTPUT REFERENCE SCHEDULE

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).



FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059T1
DESIGNED: November 2016
SEALED: 1/25/2017
REVISED:

Electrical Detail - Temp 1 - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
STATE OF NORTH CAROLINA
Signal Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

NC 119
at
Deerfield Trace and
Lowe's Boulevard

Division 7 Alamance County Mebane
PLAN DATE: January 2017 REVIEWED BY: T. Joyce
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by:
Cary M. Little 1/26/2017
0021EFD04F5341F DATE

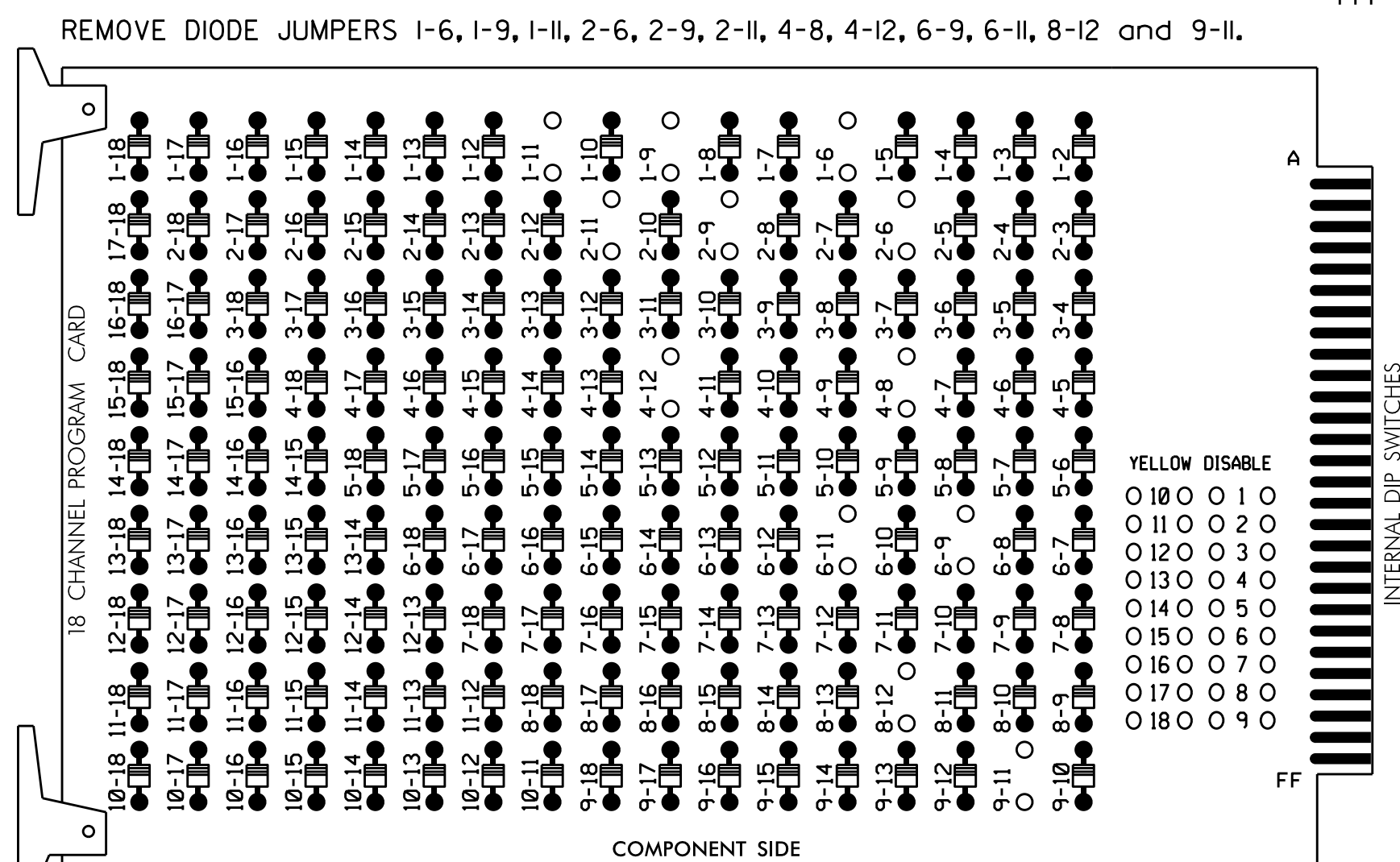
SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
030530
CARY M. LITTLE

SIG. INVENTORY NO. 07-2059T1

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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

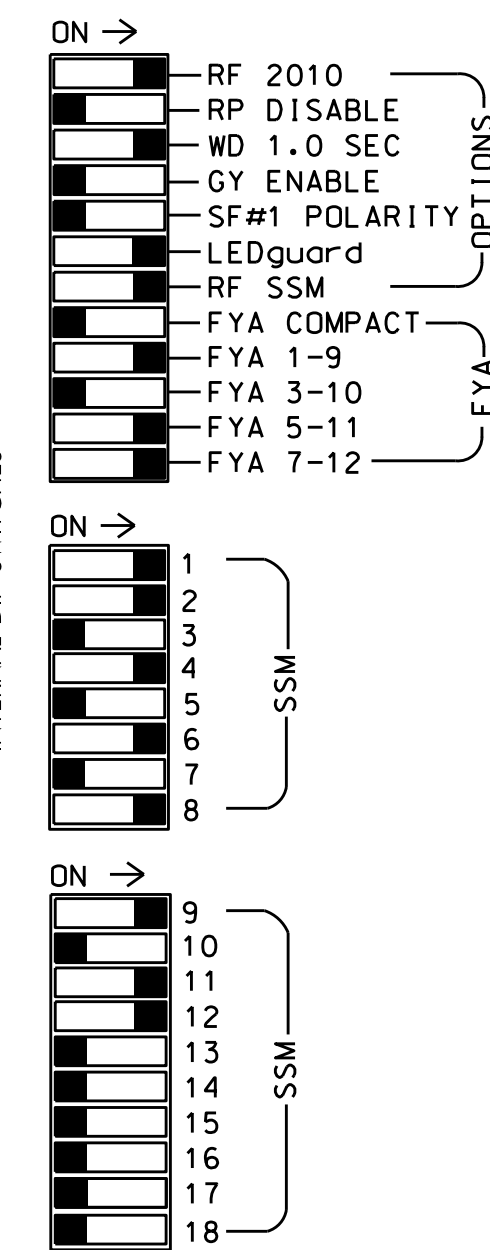
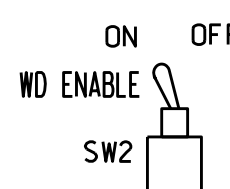


REMOVE JUMPERS AS SHOWN

NOTES:

- 1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that Red Enable is active at all times during normal operation.
- 4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH



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. Program phases 4 and 8 for Dual Entry.
- 3. Enable Simultaneous Gap-Out for all phases.
- 4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
- 5. Program phases 2 and 6 for Start Up In Green.
- 6. Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
- 7. The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11,AUX S1,AUX S4, AUX S5
 PHASES USED.....1,2,4,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 | |
|-----------------------|-----|-----|-------|----|----|-------|----|----|-------|-----|-----|-------|--------|--------|--------|--------|--------|--------|------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 | |
| 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* | 82 | 21,22 | NU | NU | 42,43 | NU | NU | 61,62 | NU | NU | 81,82 | NU | 11* | NU | NU | 23 | 41* | NU |
| RED | * | 128 | | | | 101 | | | 134 | | | 107 | | | | | | | |
| YELLOW | | 129 | | | | 102 | | | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | | 103 | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | | | | A121 | | A114 | A101 |
| YELLOW ARROW | | 126 | | | | | | | | | | | | | | A122 | | A115 | A102 |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | | | A123 | | A116 | A103 |
| GREEN ARROW | 127 | 127 | | | | | | | | | | | | | | | | | |

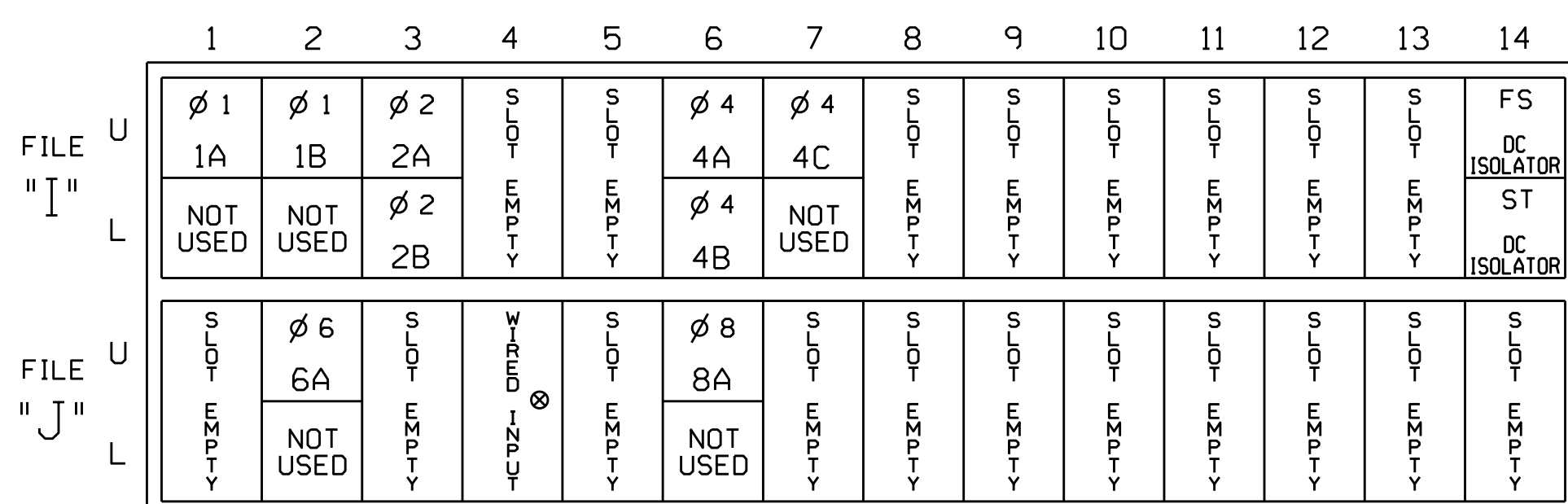
NU = Not Used

* 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)



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

FS = FLASH SENSE
 ST = STOP TIME

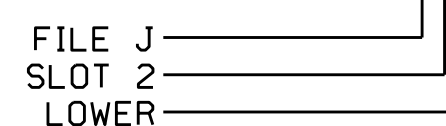
⊗ Wired Input - Do not populate slot with detector card

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 |
| | - | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 1B | TB2-5,6 | I2U | 39 | 1 | 2 | 1 | Y | Y | | | 15 |
| 2A | TB2-9,10 | I3U | 63 | 25 | 32 | 2 | Y | Y | | | |
| 2B | TB2-11,12 | I3L | 76 | 38 | 42 | 2 | Y | Y | Y | | 3 |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | 10 |
| 4C | TB6-1,2 | I7U | 65 | 27 | 34 | 4 | Y | Y | | | 15 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |

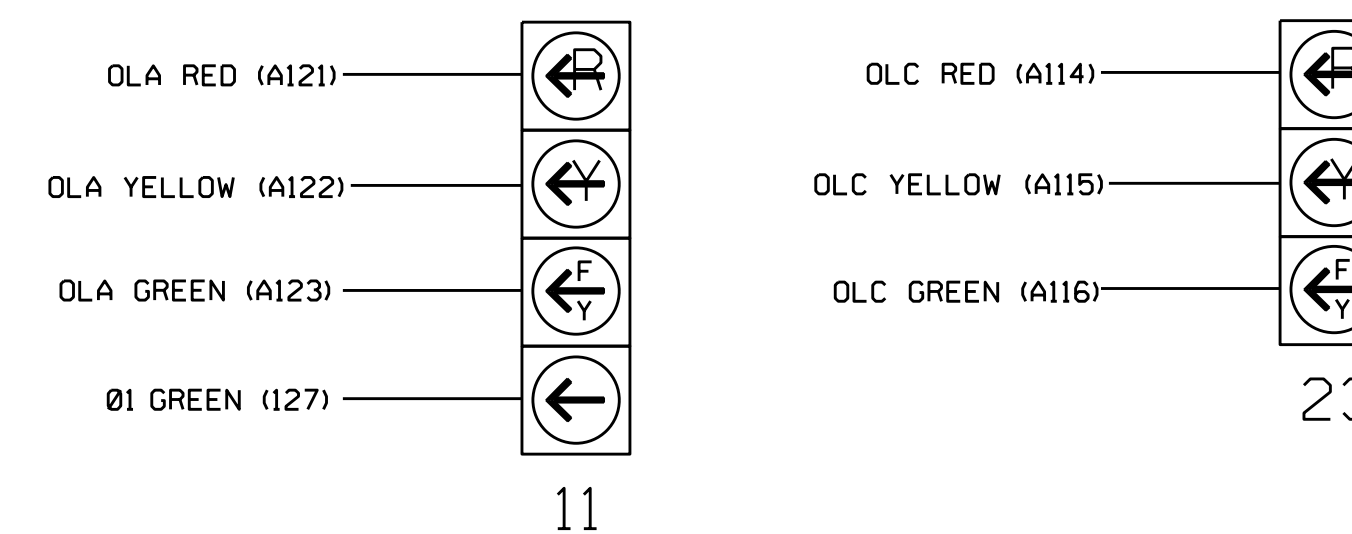
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

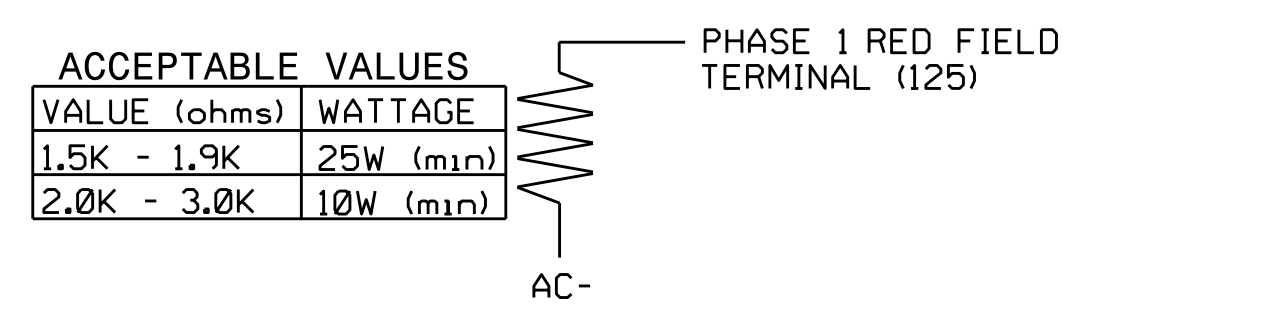


NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059T2
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED:

Electrical Detail - Temp 2 - Sheet 1 of 2

Electrical and Programming Details For: NC 119 at Deerfield Trace and Lowe's Boulevard

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: T. Joyce

PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS: INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: PROFESSIONAL ENGINEER SEAL 030530 JACOBARY M. LITTLE

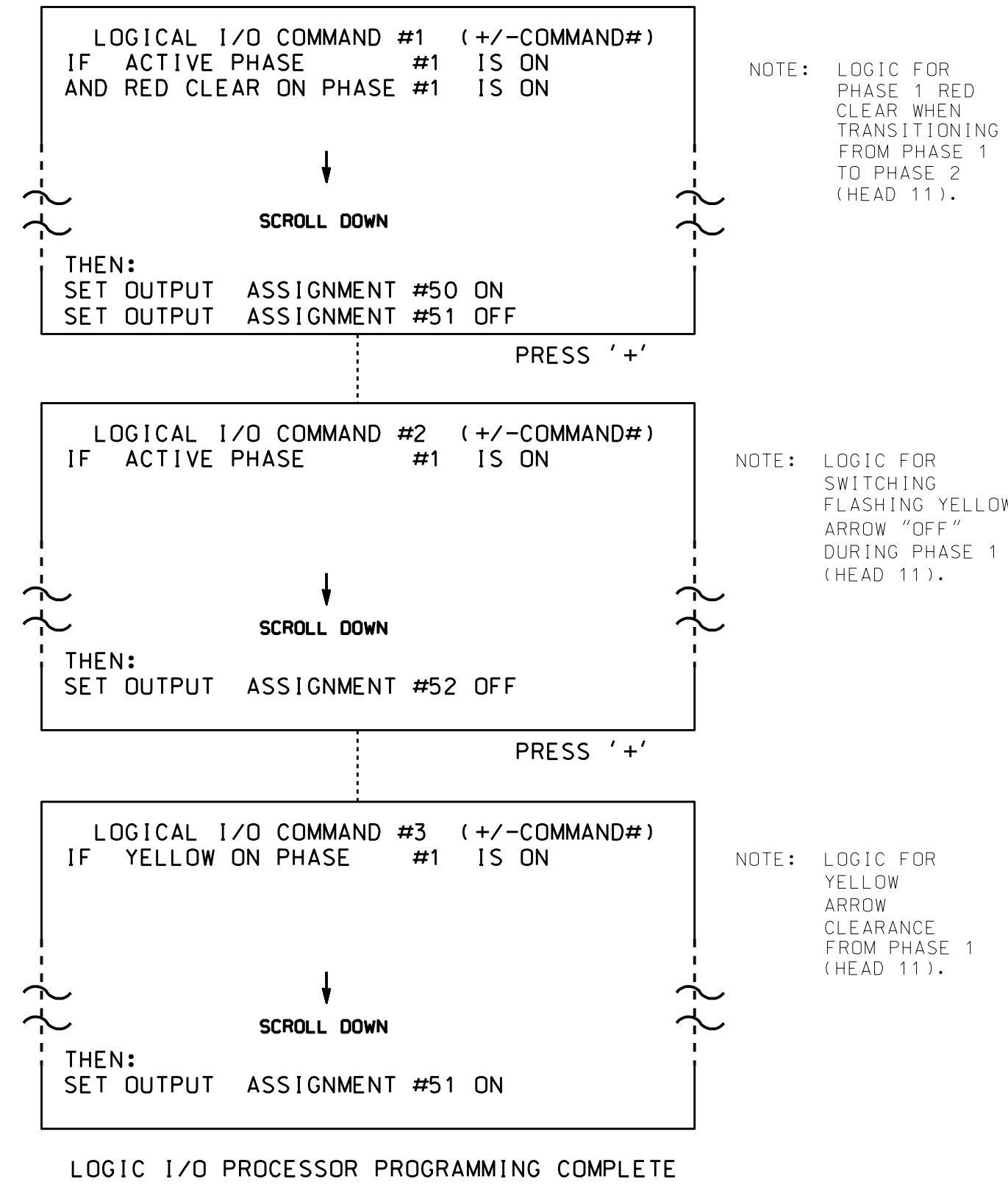
DocuSigned by: Jacobary M. Little 1/26/2017

SIG. INVENTORY NO. 07-2059T2

**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).



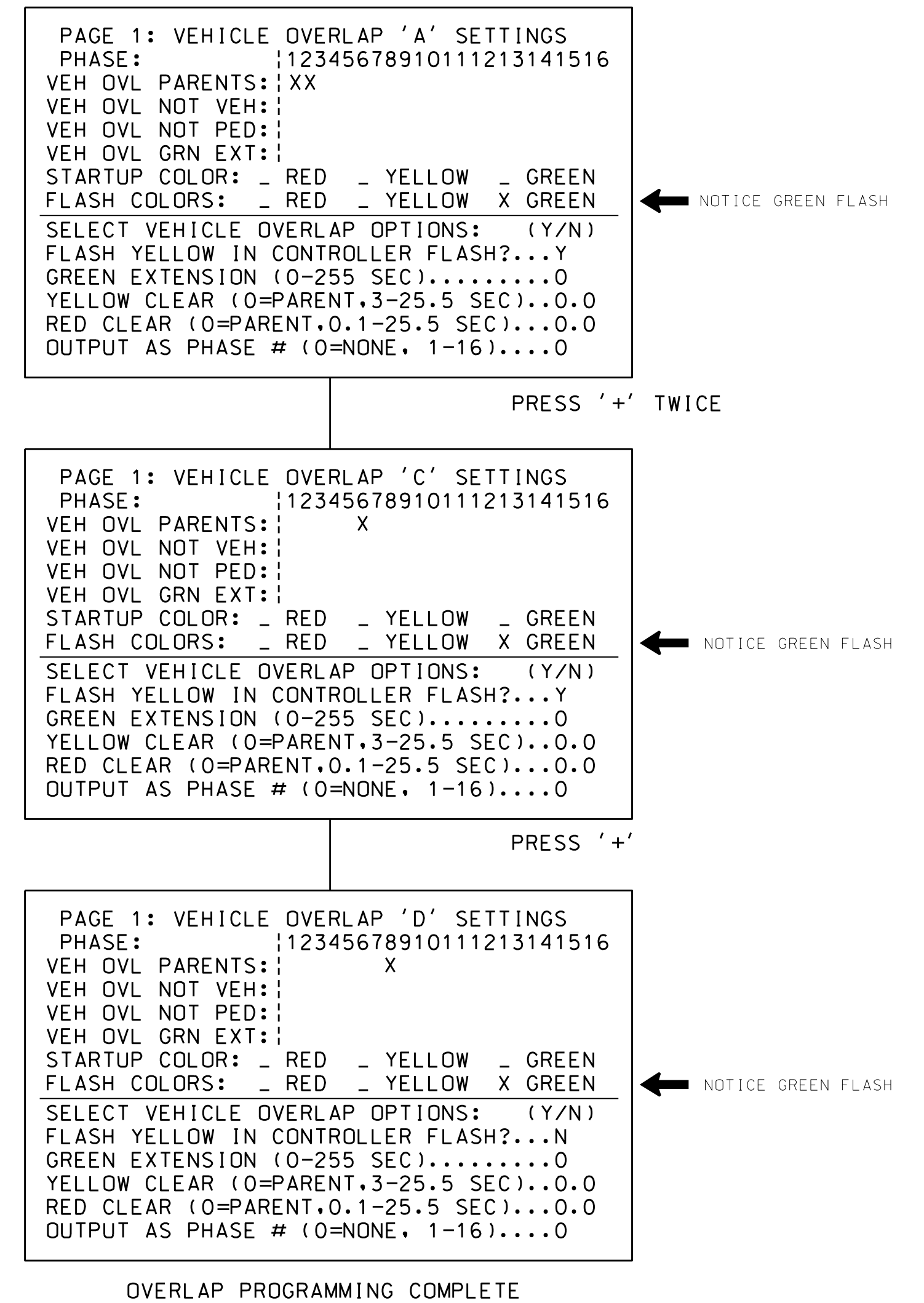
OUTPUT REFERENCE SCHEDULE

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).



FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059T2
DESIGNED: November 2016
SEALED: 1/25/2017
REVISED:

Electrical Detail - Temp 2 - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
STATE OF NORTH CAROLINA
Signal Management Section
750 N. Greenfield Pkwy, Garner, NC 27529

NC 119
at
Deerfield Trace and
Lowe's Boulevard

Division 7 Alamance County Mebane
PLAN DATE: January 2017 REVIEWED BY: T. Joyce
PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

Seal of North Carolina Professional Engineer
SEAL 030530
JACUARY M. LITTLE

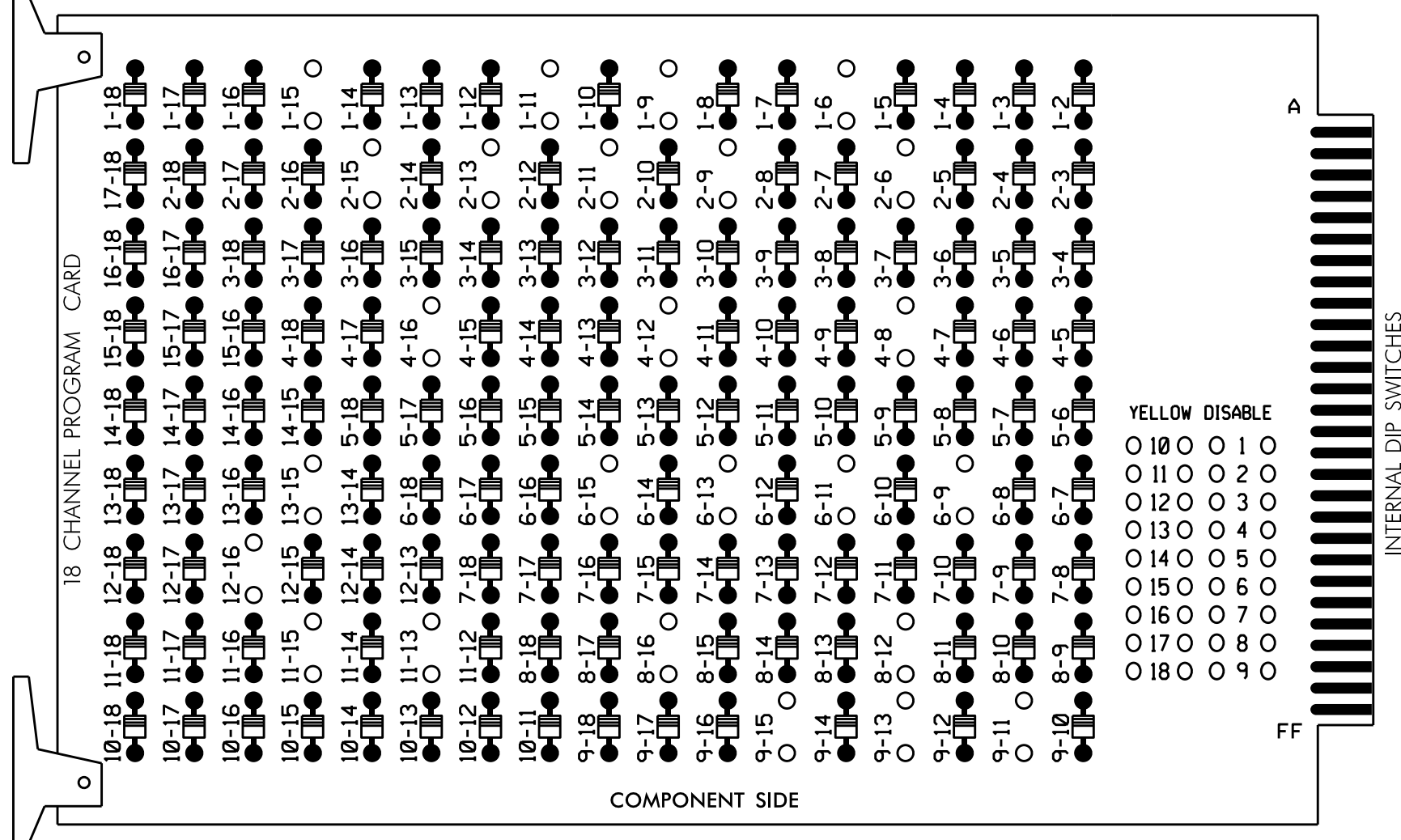
DocuSigned by:
C. Strickland
1/26/2017
0021EFD04F3341F DATE

SIG. INVENTORY NO. 07-2059T2

06-1116-2017_07-50
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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 1-15, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-12, 4-16, 6-9, 6-11, 6-13, 6-15, 8-12, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 12-16 and 13-15.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = 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.
- Program phases 4 and 8 for Dual Entry.
- 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, 6 and 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

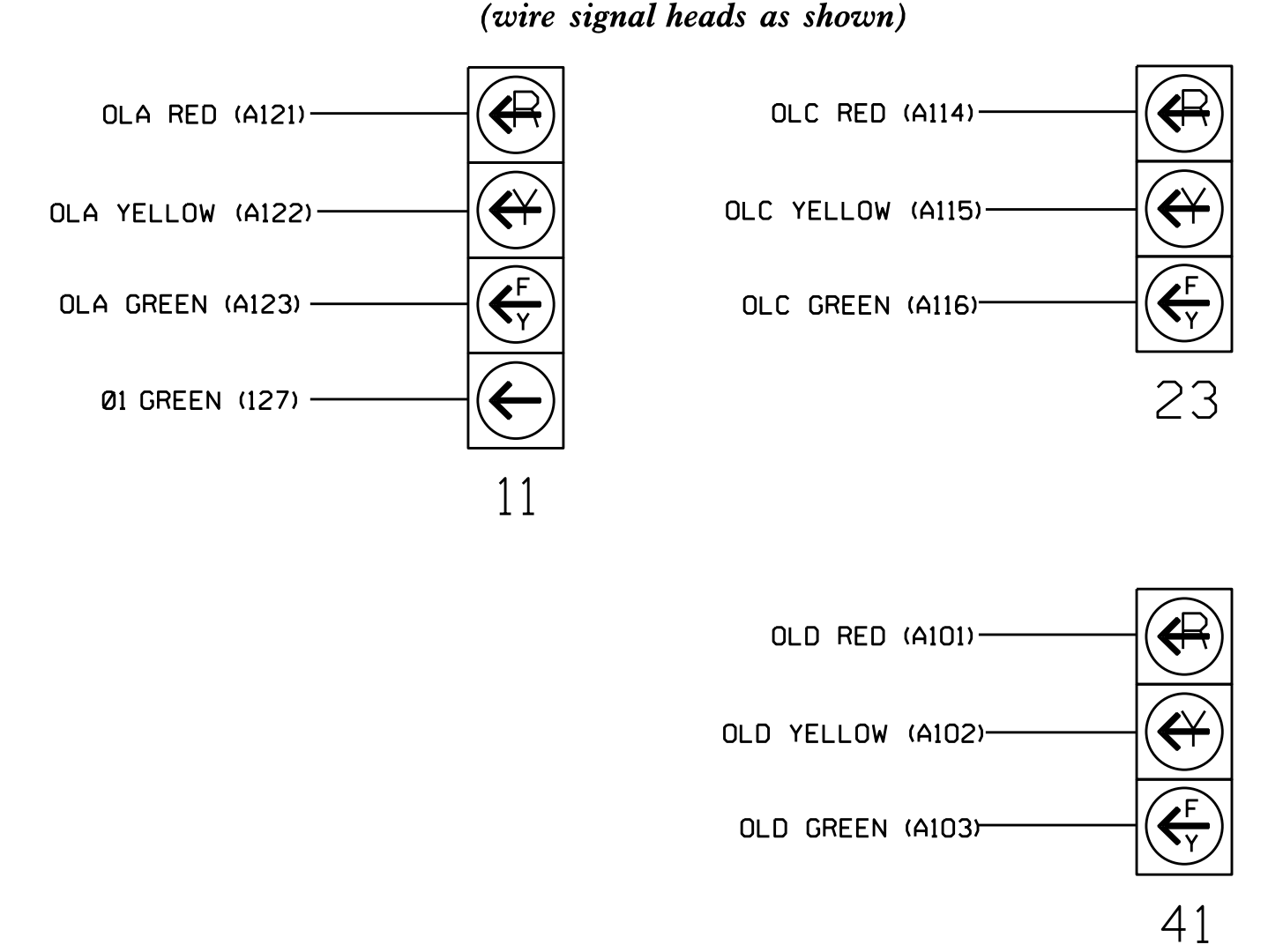
CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED..... S1,S2,S3,S5,S8,S9,S11,S12,
 AUX S1,AUX S4,AUX S5
 PHASES USED.....1,2,2 PED,4,6,6 PED,8,8 PED
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....8

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------------|-----|-----|----------------|----|-------|-------|----|-------|----------|-----|-------|----------|--------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | 5 | 6 | 6 PED | 7 | 8 | 8 PED | OLA | DLB | SPARE | OLC | OLD | SPARE |
| SIGNAL HEAD NO. | 11★ | 82 | 21,22 P21, P22 | NU | 42,43 | NU | NU | 61,62 | P61, P62 | NU | 81,82 | P81, P82 | 11★ | NU | NU | 23 | 41★ | NU |
| RED | * | 128 | | | 101 | | | 134 | | | 107 | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | A114 | A101 | |
| YELLOW ARROW | 126 | | | | | | | | | | | | A122 | | | A115 | A102 | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | A116 | A103 | |
| GREEN ARROW | 127 | 127 | | | | | | | | | | | | | | | | |
| Hand | | | | | | | | | | | | | | | | | | |
| Person | | | | | | | | | | | | | | | | | | |

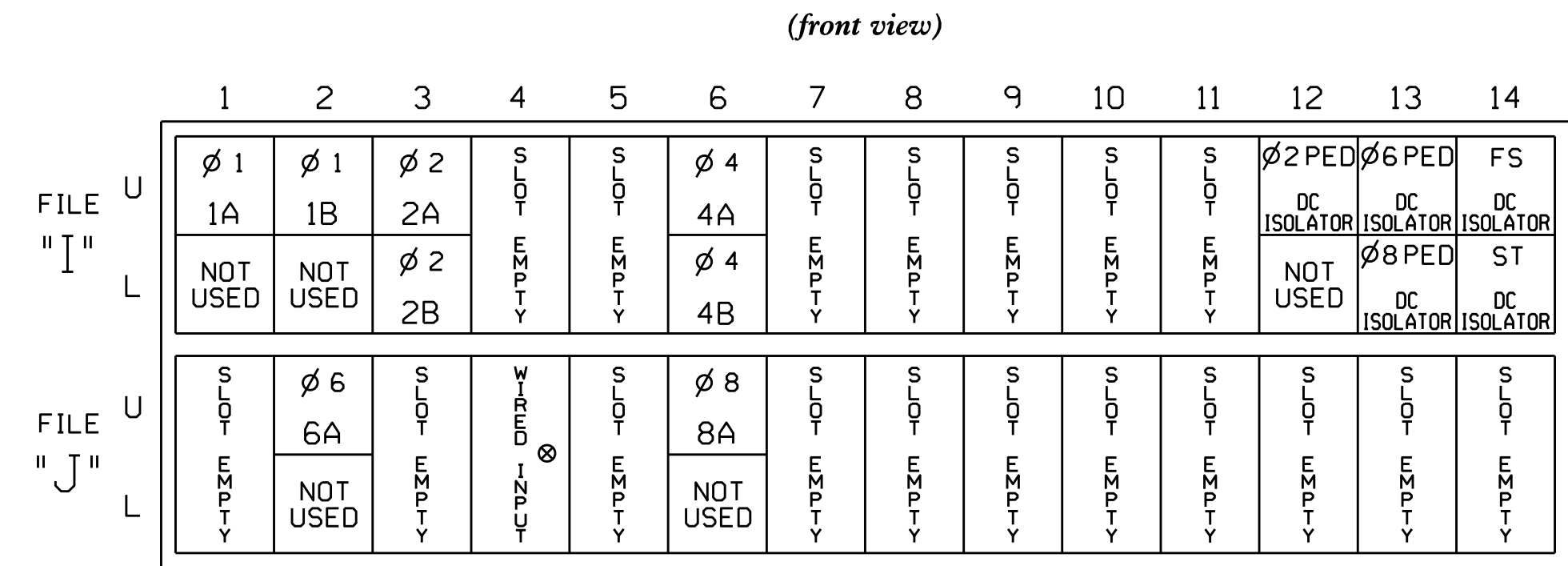
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail below.

FYA SIGNAL WIRING DETAIL



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

INPUT FILE POSITION LAYOUT



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

⊗ Wired Input - Do not populate slot with detector card

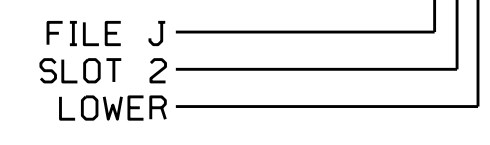
INPUT FILE CONNECTION & PROGRAMMING CHART

| 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 |
| | - | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 1B | TB2-5,6 | I2U | 39 | 1 | 2 | 1 | Y | Y | | | 15 |
| 2A | TB2-9,10 | I3U | 63 | 25 | 32 | 2 | Y | Y | | | |
| 2B | TB2-11,12 | I3L | 76 | 38 | 42 | 2 | Y | Y | Y | | 3 |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | 10 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | PED 2 | 2 PED | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | PED 6 | 6 PED | | | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | PED 8 | 8 PED | | | | | |

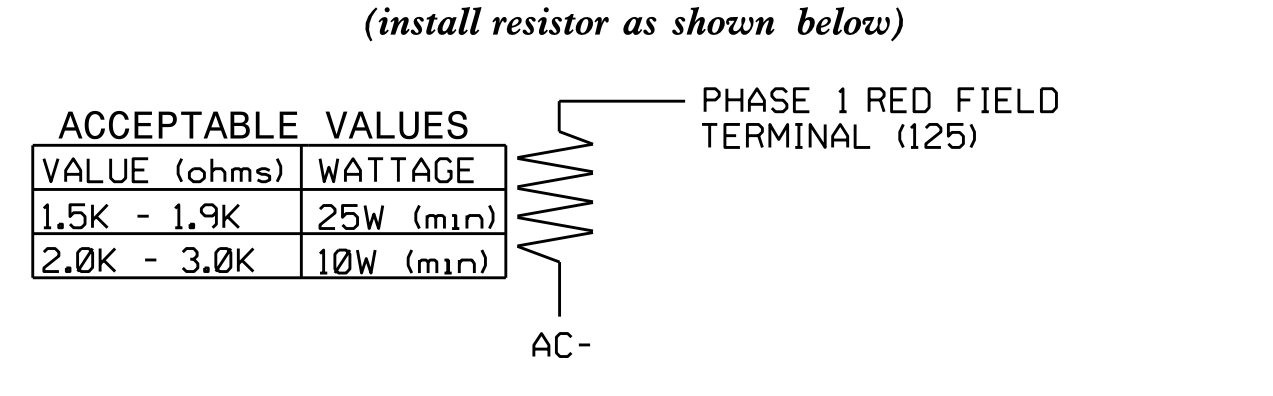
NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

¹Add 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) |

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED:

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:
 Transportation Mobility and Safety Solutions
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at Deerfield Trace and Lowe's Boulevard

Division 7 Alamance County Webauc
 PLAN DATE: January 2017 REVIEWED BY: T. Joyce
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

Seal of Cary M. Little, Professional Engineer, License No. 030530, State of North Carolina.

DocuSigned by: Cary M. Little 1/26/2017
 021EFD8F5341F DATE

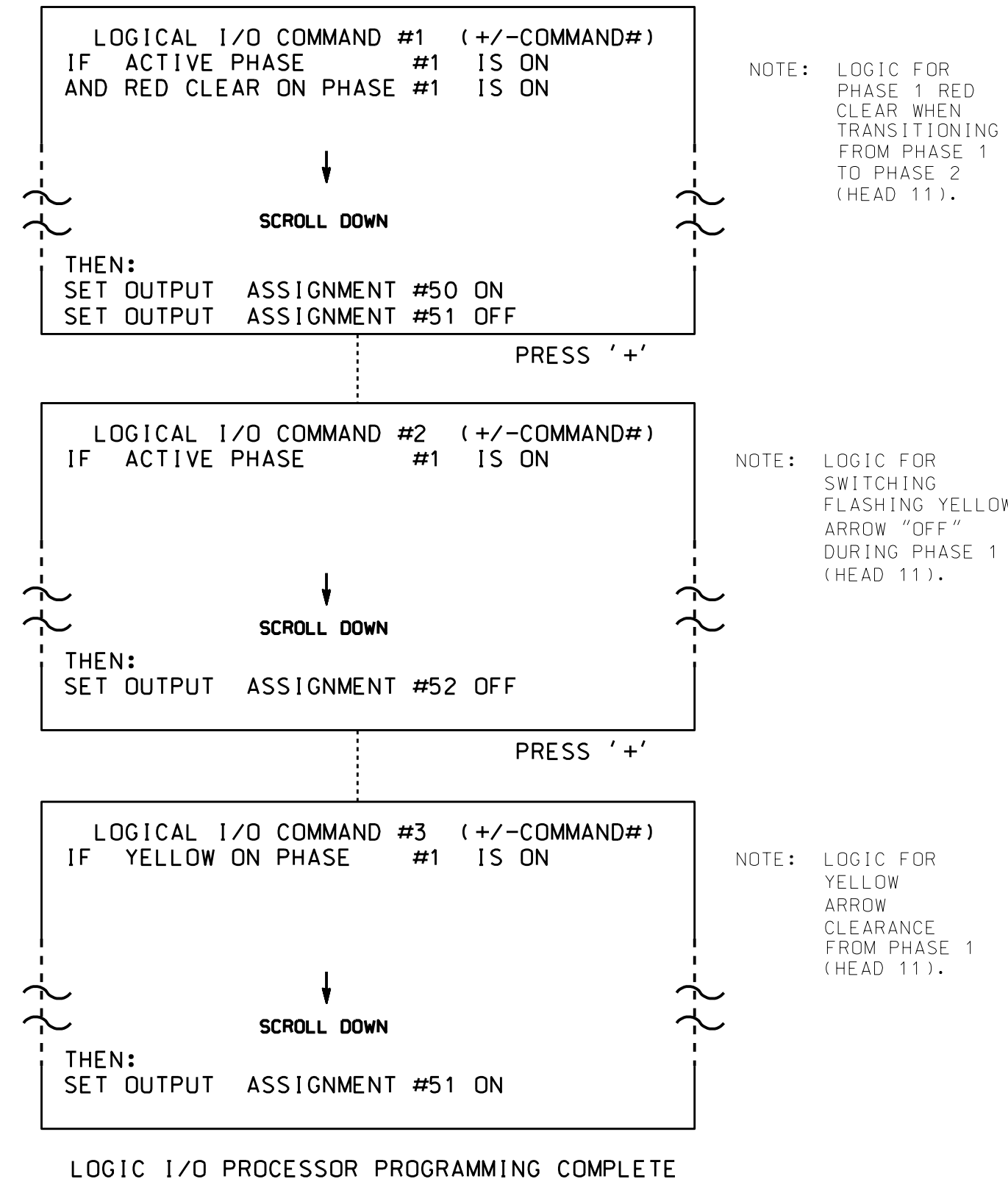
SIG. INVENTORY NO. 07-2059

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**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).



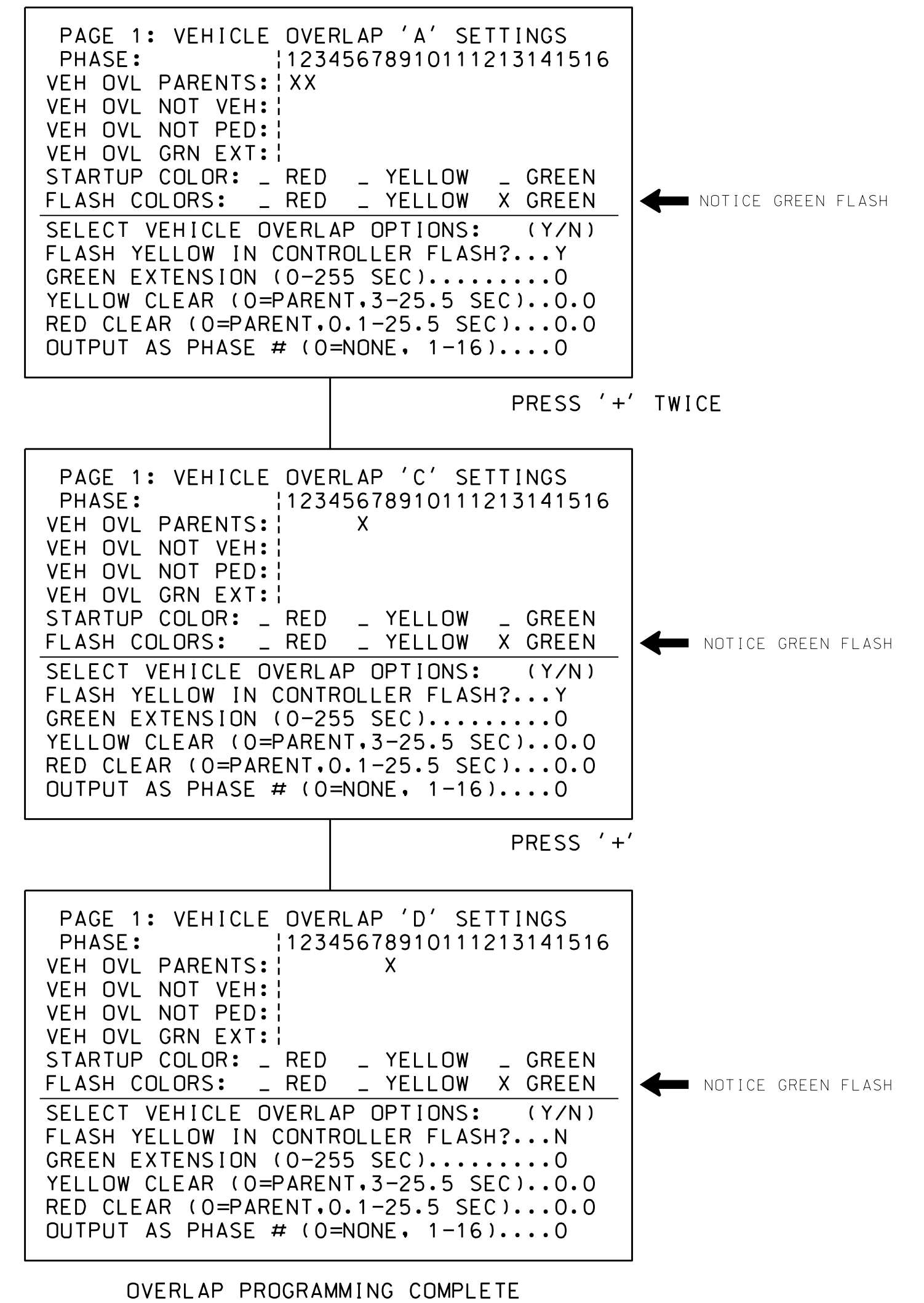
OUTPUT REFERENCE SCHEDULE

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).



FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-2059
DESIGNED: November 2016
SEALED: 1/25/17
REVISED:

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | | | |
|--|--|---|-----------------------------------|
| <p>Prepared In the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 119 at Deerfield Trace and Lowe's Boulevard</p> | | |
| | <p>Division 7 PLAN DATE: January 2017 PREPARED BY: C. Strickland</p> | <p>Alamance County REVIEWED BY: T. Joyce REVIEWED BY:</p> | |
| <p>REVISIONS</p> | | | <p>INIT. DATE</p> |
| <p>DocuSigned by: C. Strickland 1/26/2017 10:21:45 AM</p> | | | <p>SIG. INVENTORY NO. 07-2059</p> |

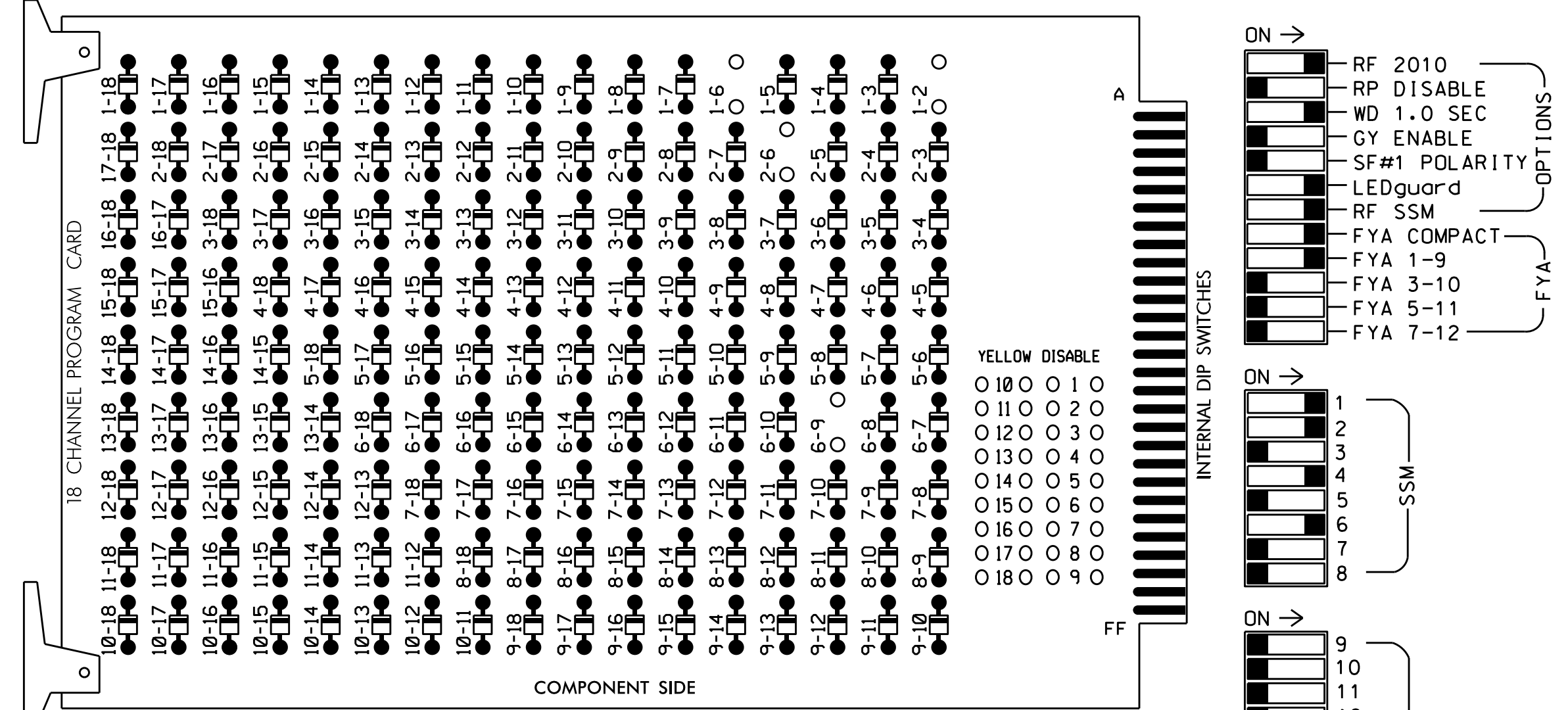
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EDI MODEL 2018ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



- NOTES:**
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.
 - Special cabinet wiring is required to utilize FYA COMPACT mode. See Ped Yellow Conflict Monitor Wiring Detail on this sheet.

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.
- 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.
- The cabinet and controller are part of the NC 119 CLS.

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 |
|-----------------------|-----|-------------|------|-------|----|-------|-------|----|-------|-------|-----|-------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 |
| PHASE | OLA | 2 | IGRN | 2 PED | 3 | 4 | 4 PED | 5 | 6 | 6 PED | 7 | 8 PED |
| SIGNAL HEAD NO. | 11* | 21,22 23 | 11* | NU | NU | 41,42 | NU | NU | 61,62 | NU | NU | NU |
| RED | 128 | | | | | 101 | | | 134 | | | |
| YELLOW | | 129 | | | | 102 | | | 135 | | | |
| GREEN | | 130 | | | | 103 | | | 136 | | | |
| RED ARROW | 125 | | | | | | | | | | | |
| YELLOW ARROW | 126 | | | | | | | | | | | |
| FLASHING YELLOW ARROW | 127 | | | | | | | | | | | |
| GREEN ARROW | | | 114 | | | | | | | | | |
| | | | | | | * | | | | | | |

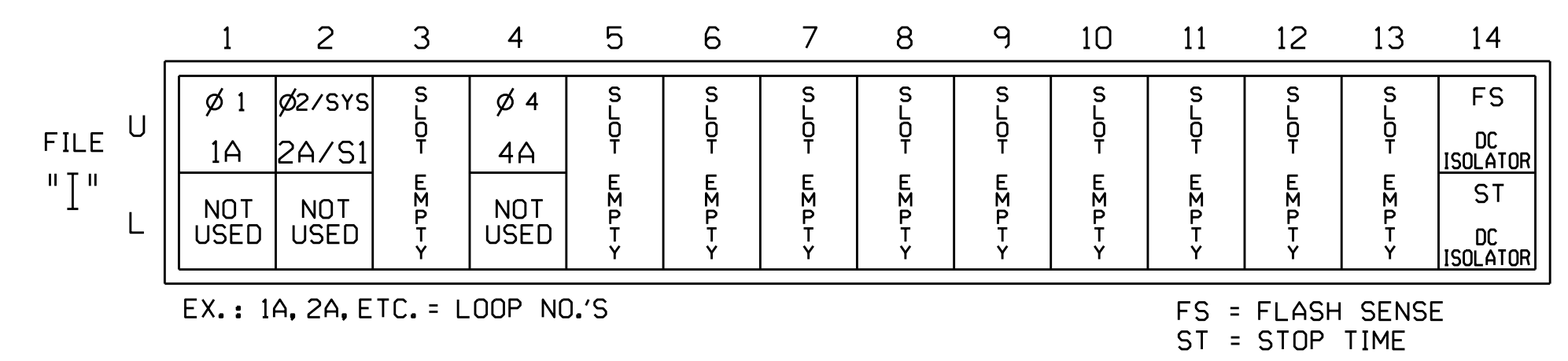
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail below.
 NOTE: Load Switches S1 and S3 require output remapping. See sheet 3 of this electrical detail for instructions.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S5,S8
 PHASES USED.....1,2,4,6
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

INPUT FILE POSITION LAYOUT

(front view)



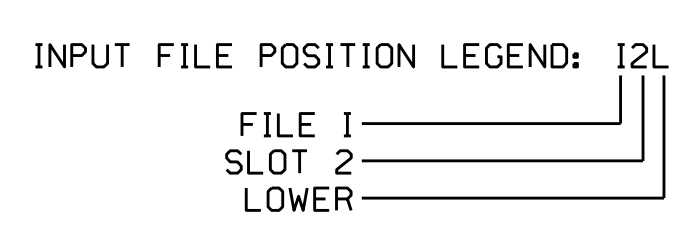
SPECIAL DETECTOR NOTE

Install a Multizone Microwave detection system for loop 6A for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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 | TB21-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | - | 59 | 21 | 15 | 6 | Y | Y | Y | | 3 |
| 2A/S1 | TB21-3,4 | I2U | 39 | 1 | 2 | 2/SYS | Y | Y | | | |
| 4A | TB21-7,8 | I4U | 41 | 3 | 4 | 4 | Y | Y | | | |

¹Add jumper from I1-F to I1-SP on rear of input file.



PED YELLOW CONFLICT MONITOR WIRING DETAIL

(make cabinet wiring changes as shown below)

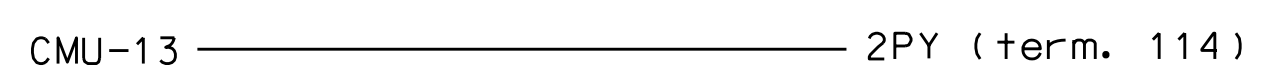
In order to use FYA COMPACT mode on the 2018ECL-NC Monitor, the cabinet must be wired such that the (unused) Ped Yellow load switch outputs are wired to the conflict monitor as follows: From 2 PY (field term. 114) to chan. 9 green (monitor pin 13).

Follow the instructions below to make the appropriate connections:

STEP 1: Fold down rear panel of output file.

STEP 2: Find unused wiring harness from conflict monitor card edge connector (which should be tied and bundled together).

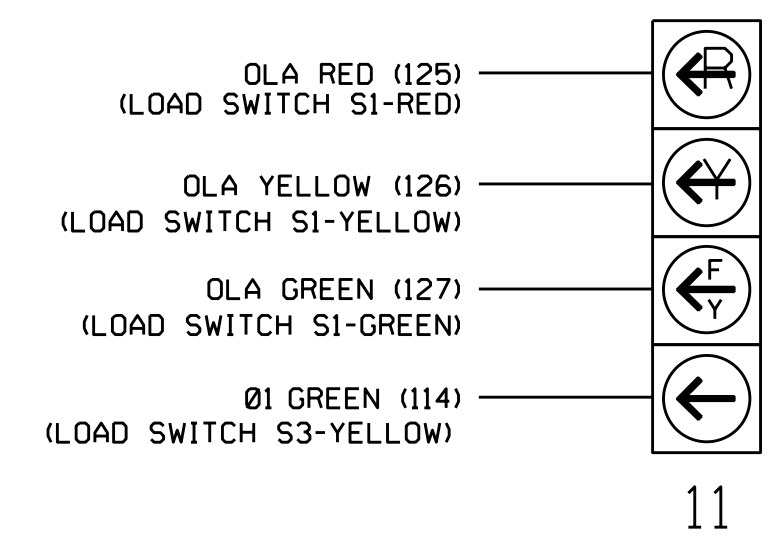
STEP 3: Find the conductors that correspond to the following conflict monitor card edge pins and solder wire to the appropriate terminal on the rear of the output file as shown below:



NOTE: Some cabinet manufacturers use a keyed plug to accomplish this wiring configuration. If connectors are used, simply plug the two connectors together that are labeled with the pin-out as shown above.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)

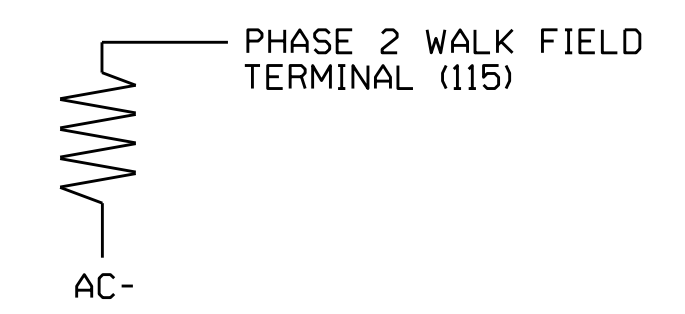


NOTE: The sequence display for this signal requires special logic and output remapping. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0440T1
 DESIGNED: September 2016
 SEALED: 1/25/17
 REVISED: N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail - Temp 1 (TMP Phase I) - Sheet 1 of 3

Prepared In the Offices of:
 Transportation Mobility and Safety Solutions
 Signal Management System

NC 119 at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JACUARY M. LITTLE

DocuSign by: 1/30/2017

SIG. INVENTORY NO. 07-0440T1

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 bjsimmons

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE
AND TO INVERT INPUT FROM MICROWAVE DETECTOR**

(program controller as shown below)

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #14 ON
SET OUTPUT ASSIGNMENT #15 OFF

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #16 OFF

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #15 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 14 = Overlap A Red
OUTPUT 15 = Overlap A Yellow
OUTPUT 16 = Overlap A Green
OUTPUT 33 = Phase 1 Green

Note: All Inputs and Outputs shown above have been remapped. See sheet 3 of this electrical detail.

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
    
```

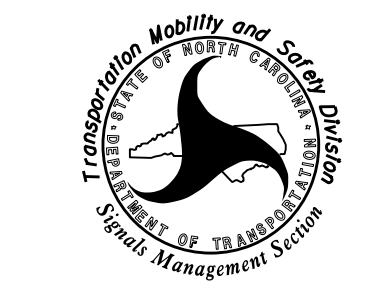
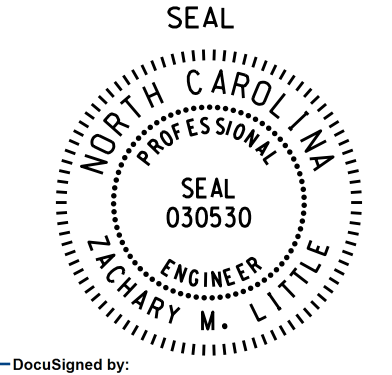
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-0440T1
DESIGNED: September 2016
SEALED: 1/25/17
REVISED: N/A

C:\Users\simons\Documents\Signal\Working Folder\Electrical Detail\Division 07\070440_sme_ele_xxx.dgn
 01/25/2017 11:43
 S:\IT\ASST\BJS\Signal\Working Folder\Electrical Detail\Division 07\070440_sme_ele_xxx.dgn
 bjs/simons

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

| | | | |
|--|--|---|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | NC 119 at I-40 EB/I-85 NB Ramps | | SEAL  SEAL 030530 ENGINEER GREGORY M. LITTLE |
| | Division 7 PLAN DATE: January 2017 PREPARED BY: B. SIMMONS | Alamance County REVIEWED BY: BAS REVIEWED BY: | Mebane REVISIONS INIT. DATE 1/30/2017 DATE 07-0440T1 |

**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE
AND TO INVERT INPUT FROM MICROWAVE DETECTOR**

(program controller as shown below)

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #14 ON
SET OUTPUT ASSIGNMENT #15 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #16 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #15 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 14 = Overlap A Red
OUTPUT 15 = Overlap A Yellow
OUTPUT 16 = Overlap A Green
OUTPUT 33 = Phase 1 Green

Note: All Inputs and Outputs shown above have been remapped. See sheet 3 of this electrical detail.

OVERLAP PROGRAMMING DETAIL
(program controller as shown below)

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

```

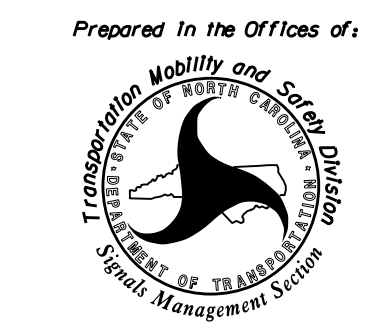
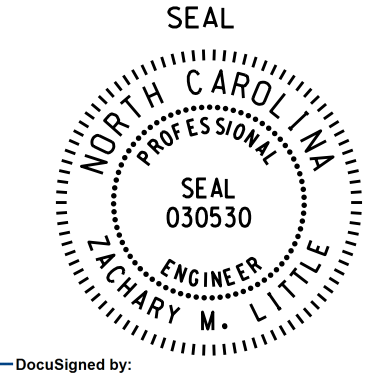
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS:  - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
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: 07-0440T2
DESIGNED: September 2016
SEALED: 1/25/17
REVISED: N/A

Electrical Detail - Temp 2 (TMP Phase II & III) - Sheet 2 of 3

| | | | |
|--|---|---|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | NC 119 at I-40 EB/I-85 NB Ramps | | SEAL  SEAL 030530 ENGINEER CARY M. LITTLE |
| | Division 7 Alamance County Mebane | PLAN DATE: January 2017 REVIEWED BY: BAS | PREPARED BY: B. SIMMONS REVIEWED BY: |
| REVISIONS INIT. DATE | | SIG. INVENTORY NO. 07-0440T2 | |

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

06-11-2017 11:45
 C:\IT\SS\TSS\Sig_Mgmt\Working_Folder\Electrical_Detail\070440_tm2_ele_xxx.dgn
 bjsimmons

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR SIGNAL HEAD 11

(program controller as shown below)

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "14"

```
PAGE:1 C1 PIN:16 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1 C1 PIN:16 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1 C1 PIN:16 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....14
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

PRESS "+" KEY FOR OUTPUT 15

STEP 2

```
PAGE:1 C1 PIN:17 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....15
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1 C1 PIN:17 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1 C1 PIN:17 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....15
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

PRESS "+" KEY FOR OUTPUT 16

STEP 3

```
PAGE:1 C1 PIN:18 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1 C1 PIN:18 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1 C1 PIN:18 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....16
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

PRESS "+" UNTIL OUTPUT 33 IS REACHED.

STEP 4

```
PAGE:1 C1 PIN:35 NOT ENABLED
OUTPUT ASSIGNMENT #.....33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

THE OUTPUT IS SET AS "NOT ENABLED" BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE PHASE.

```
PAGE:1 C1 PIN:35 NOT ENABLED
SELECT VEHICLE PHASE (1-16)...1
SELECT COLOR(0=RED,1=YEL,2=GRN)...2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE PHASE' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN. PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE PHASE' AS SHOWN BELOW.

```
PAGE:1 C1 PIN:35 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....33
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
```

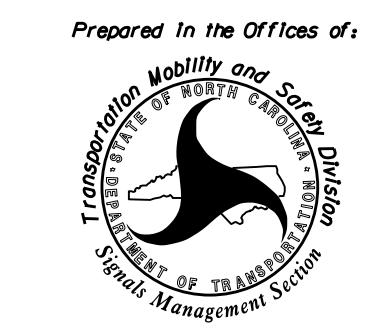
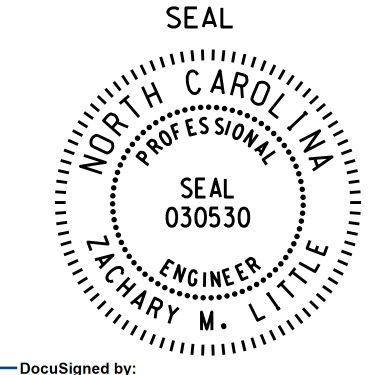
OUTPUT PROGRAMMING FOR HEAD 11 COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0440T2
DESIGNED: September 2016
SEALED: 1/25/17
REVISED: N/A

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1/25/17 11:46
S:\TAS\simmons\Working Folder\Electrical Detail\070440_Sm_ele_xxx.dgn
bjsimmons

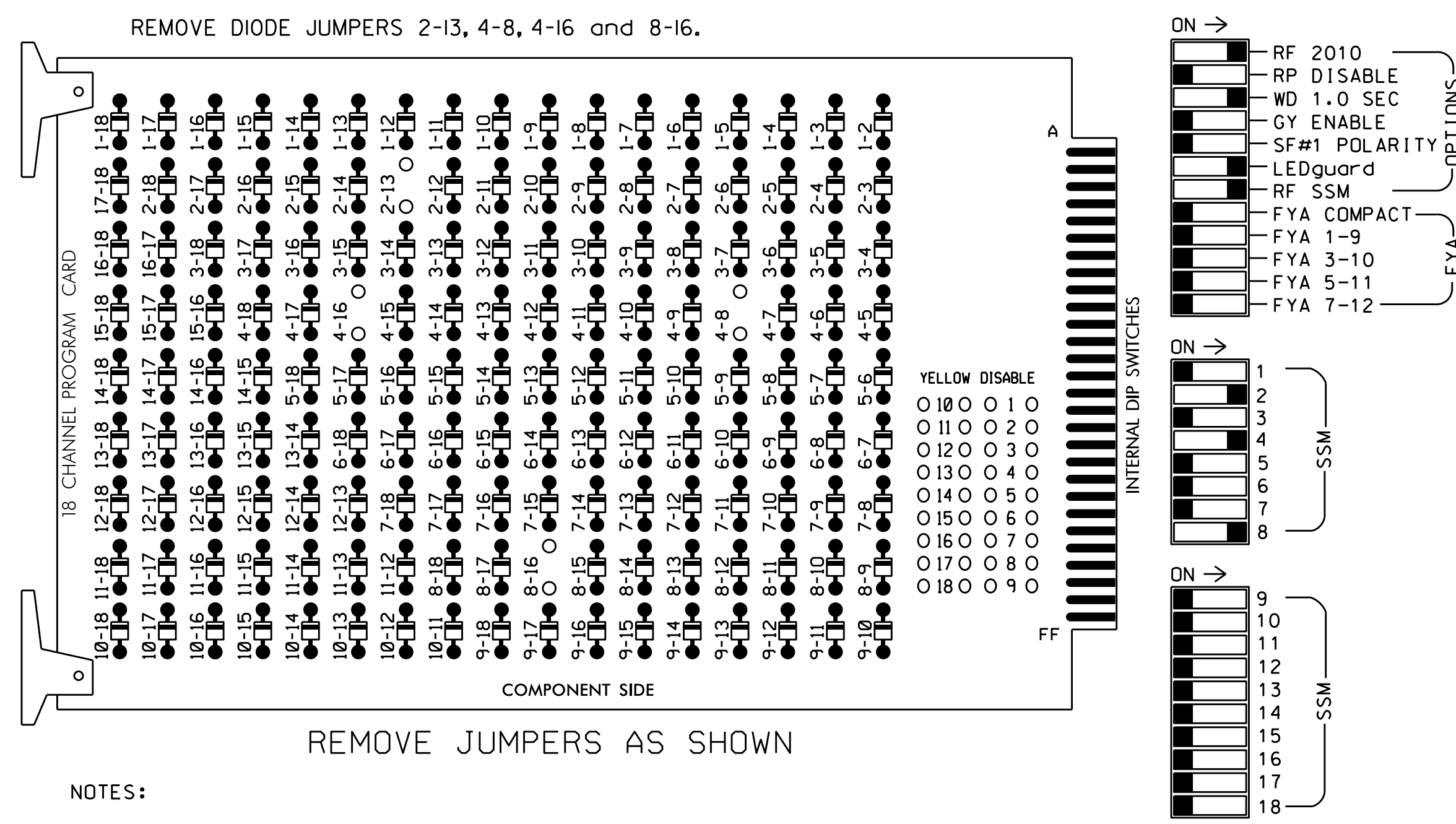
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Electrical Detail - Temp 2 (TMP Phase II & III) - Sheet 3 of 3

| | | | |
|---|---|--|---|
|  | PREPARED BY: B. SIMMONS REVIEWED BY: BAS | |  |
| | REVISIONS: _____ INIT: _____ DATE: _____ | | |
| NC 119 at I-40 EB/I-85 NB Ramps Division 7 Alamance County Mebane | | | SEAL 1/30/2017 DATE |
| 750 N. Greenfield Pkwy, Garner, NC 27529 | | | SIG. INVENTORY NO. 07-0440T2 |

EDI MODEL 2018ECL-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.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Gap Reduction.
- Program phase 2 for Start Up In Green.
- Program phases 2 and 8 for 'STARTUP PED CALL'.
- Program phases 2, 4 and 8 for Red Rest.
- The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD; 6-AUX)
 LOAD SWITCHES USED.....S2,S3,S5,S11,S12
 PHASES USED.....2,2 PED,4,8,8 PED
 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 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|-----|-------|-------|----------|-----|-----------|----|----|-------|-----|-------|-------|----------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 24 | P21, P22 | NU | 41,42, 43 | NU | NU | NU | NU | 81,82 | 83 | P81, P82 | NU | NU | NU | NU | NU |
| RED | 128 | | | | | | | | | | 107 | | | | | | | |
| YELLOW | 129 | | | | | | | | | | 108 | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | | | |
| RED ARROW | | 128 | | | 101 | | | | | | 107 | | | | | | | |
| YELLOW ARROW | | 129 | | | 102 | | | | | | 108 | | | | | | | |
| GREEN ARROW | 130 | 130 | | | 103 | | | | | 109 | 109 | | | | | | | |
| Hand icon | | | | | 113 | | | | | | | | 110 | | | | | |
| Person icon | | | | | 115 | | | | | | | | 112 | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

| FILE "I" | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|----------|--------|--------|----------|----|--------|--------|--------|--------|--------|--------|--------|--------------------|----------|----------------|
| U | ∅2/SYS | ∅2/SYS | NOT USED | ∅2 | ∅2/SYS | ∅4 | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2 PED DC ISOLATOR | NOT USED | FS DC ISOLATOR |
| L | 2A/S1 | 2A/S1 | 2E | 2E | 4A | 4A | 4A | 4A | 4A | 4A | 4A | 4A | 4A | 4A |
| U | ∅2/SYS | ∅2 | NOT USED | ∅4 | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS | ∅2/SYS |
| L | 2B/S2 | 2D | USED | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B | 4B |
| U | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 |
| L | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A | 8A |
| U | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 | ∅8 |
| L | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B | 8B |

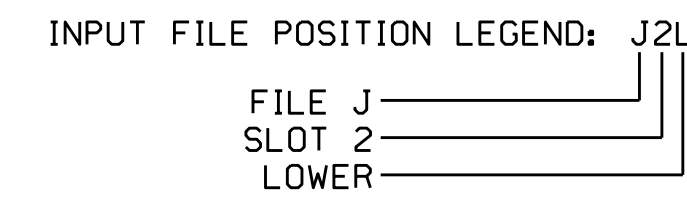
EX.: 1A, 2A, ETC. = LOOP NO.'S

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/S1 | TB2-5,6 | I2U | 39 | 1 | 2 | 2/SYS | | Y | | | |
| 2B/S2 | TB2-7,8 | I2L | 43 | 5 | 12 | 2/SYS | | Y | | | |
| 2D | TB2-11,12 | I3L | 76 | 38 | 42 | 2 | Y | Y | | | |
| 2E | TB4-1,2 | I4U | 47 | 9 | 22 | 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 | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| 8B | TB5-11,12 | J6L | 46 | 8 | 18 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | PED 2 | 2 PED | | | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | PED 8 | 8 PED | | | | | |

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0440T3
 DESIGNED: November 2016
 SEALED: 1/25/17
 REVISED: N/A

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Temp 3 (TMP Phase IIB)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY CONSULTANTS
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS

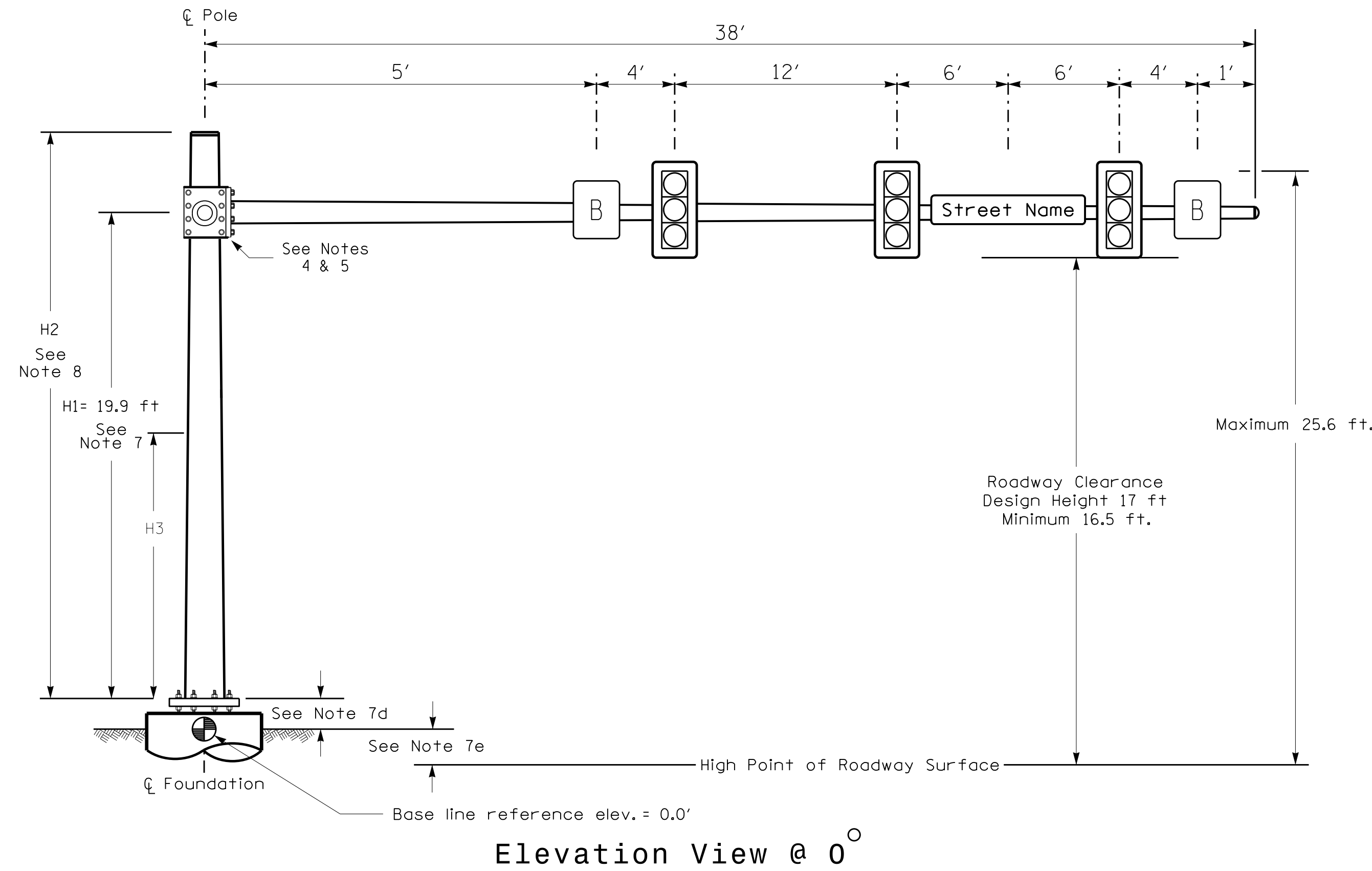
INIT. DATE

Sealed by: *Victoria M. Little* 1/30/2017

SIG. INVENTORY NO. 07-0440T3

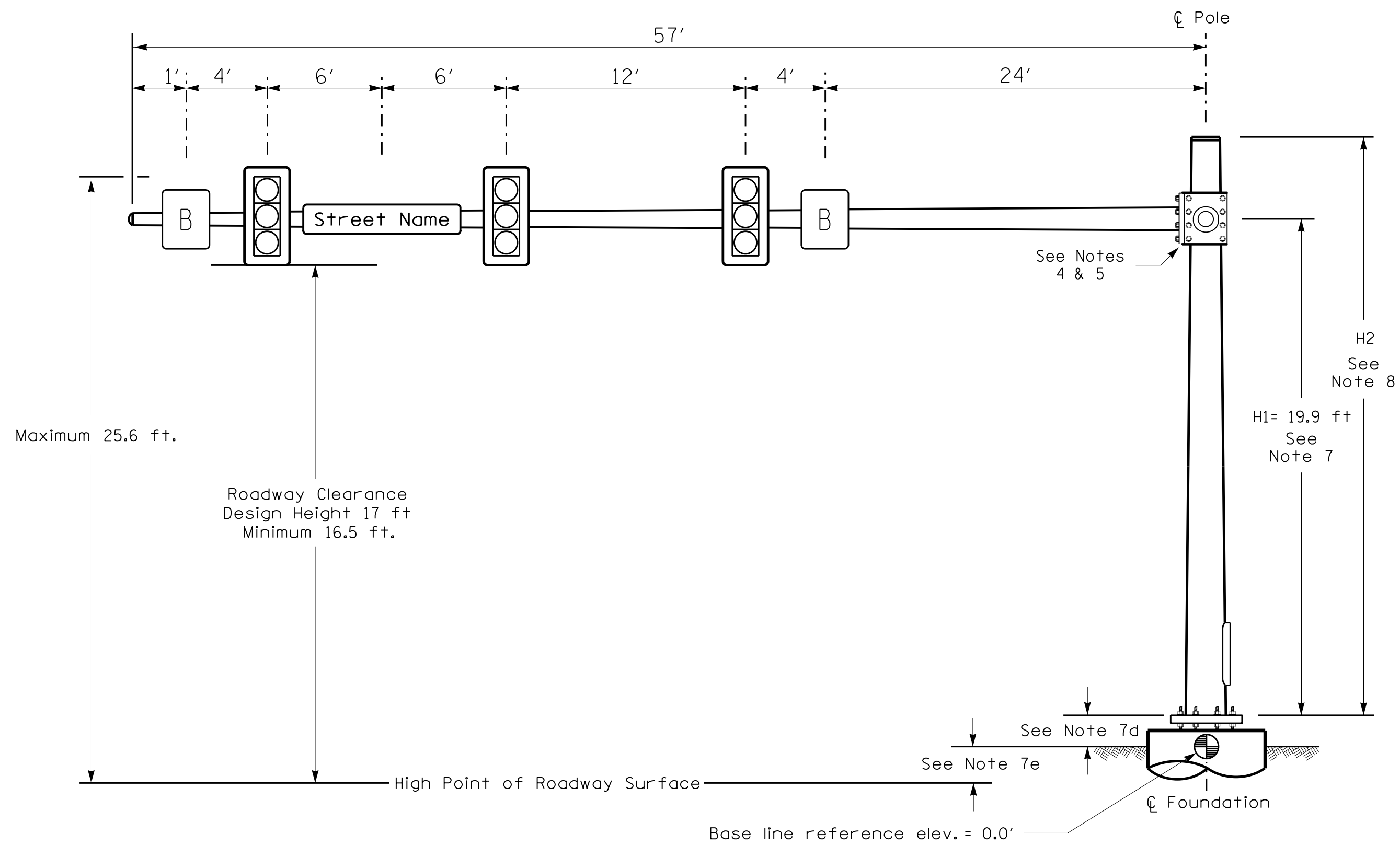
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Design Loading for METAL POLE NO. 5, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 5, MAST ARM B



Elevation View @ 270°

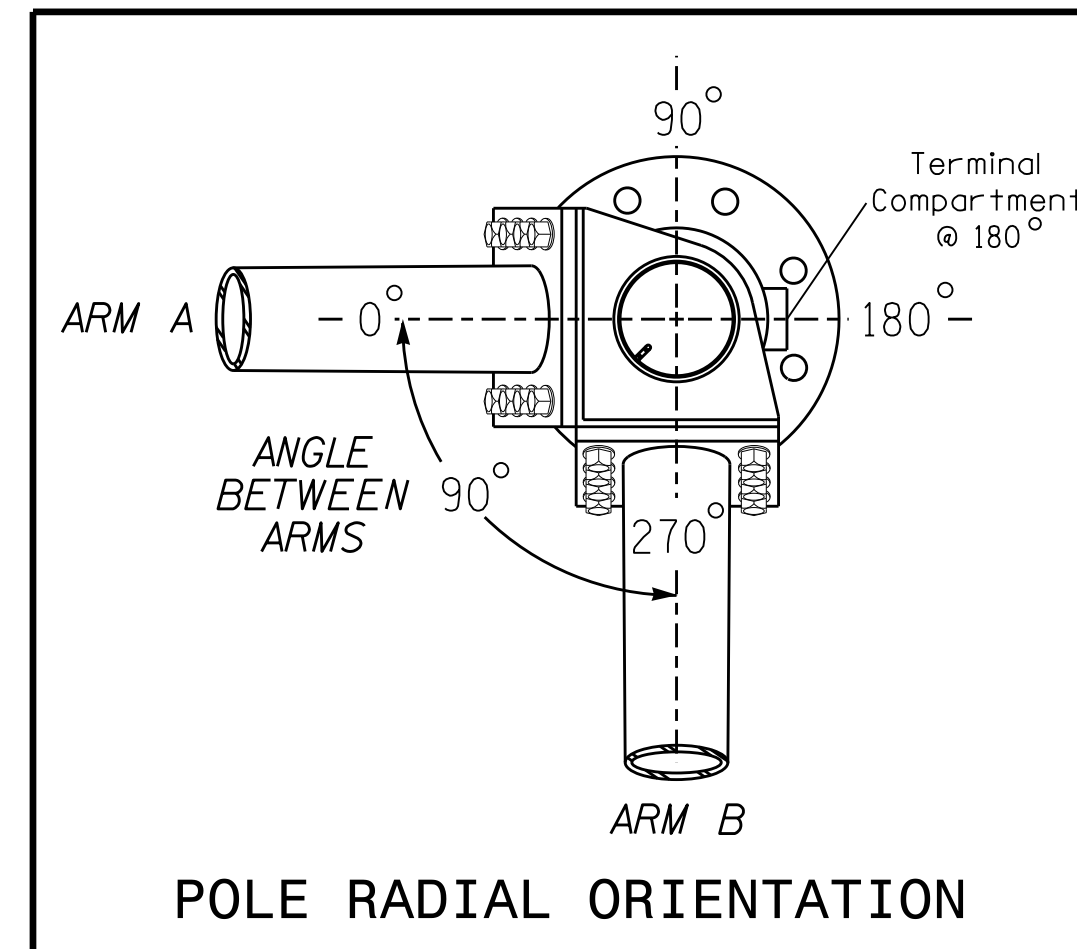
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SPECIAL NOTE

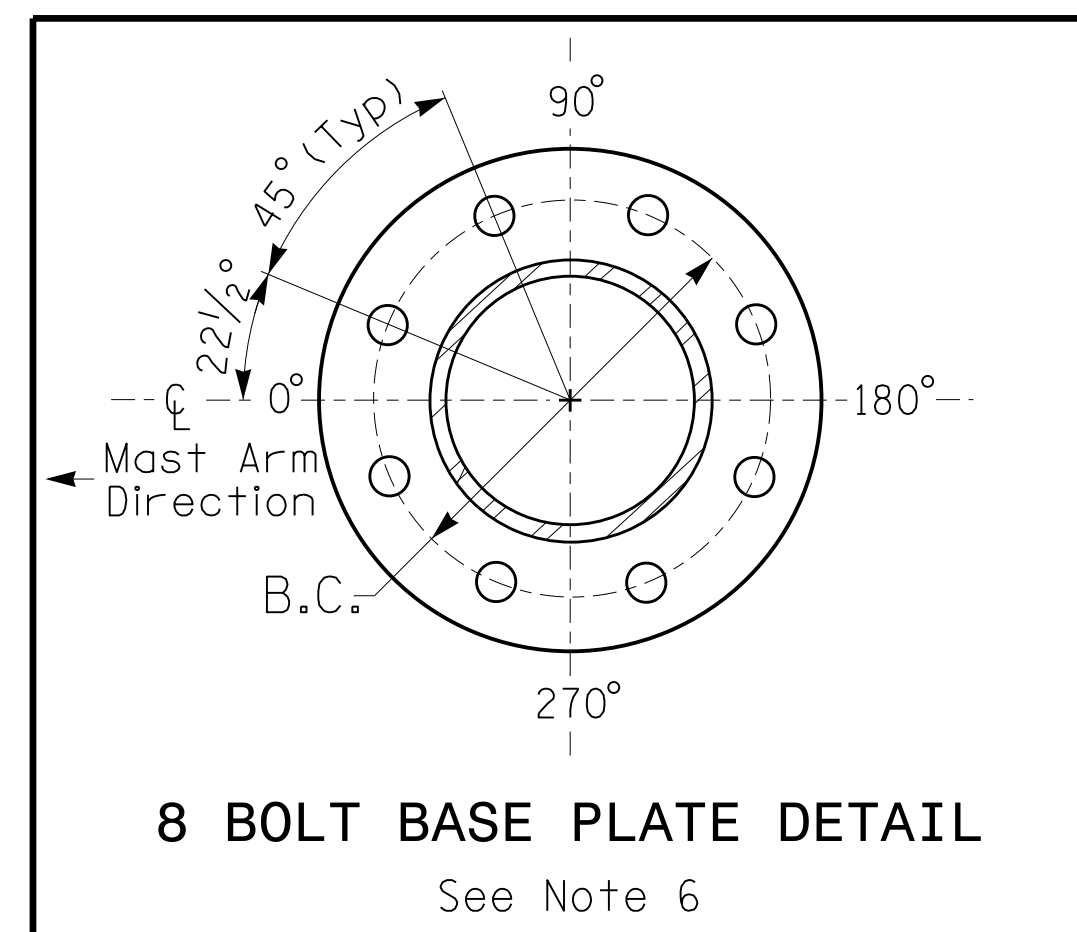
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

| Elevation Differences for: | Pole A | Pole B |
|--|----------|----------|
| Baseline reference point at Foundation @ ground level | 0.0 ft. | 0.0 ft. |
| Elevation difference at High point of roadway surface | +0.9 ft. | +0.9 ft. |
| Elevation difference at Edge of travelway or face of curb | N/A | N/A |

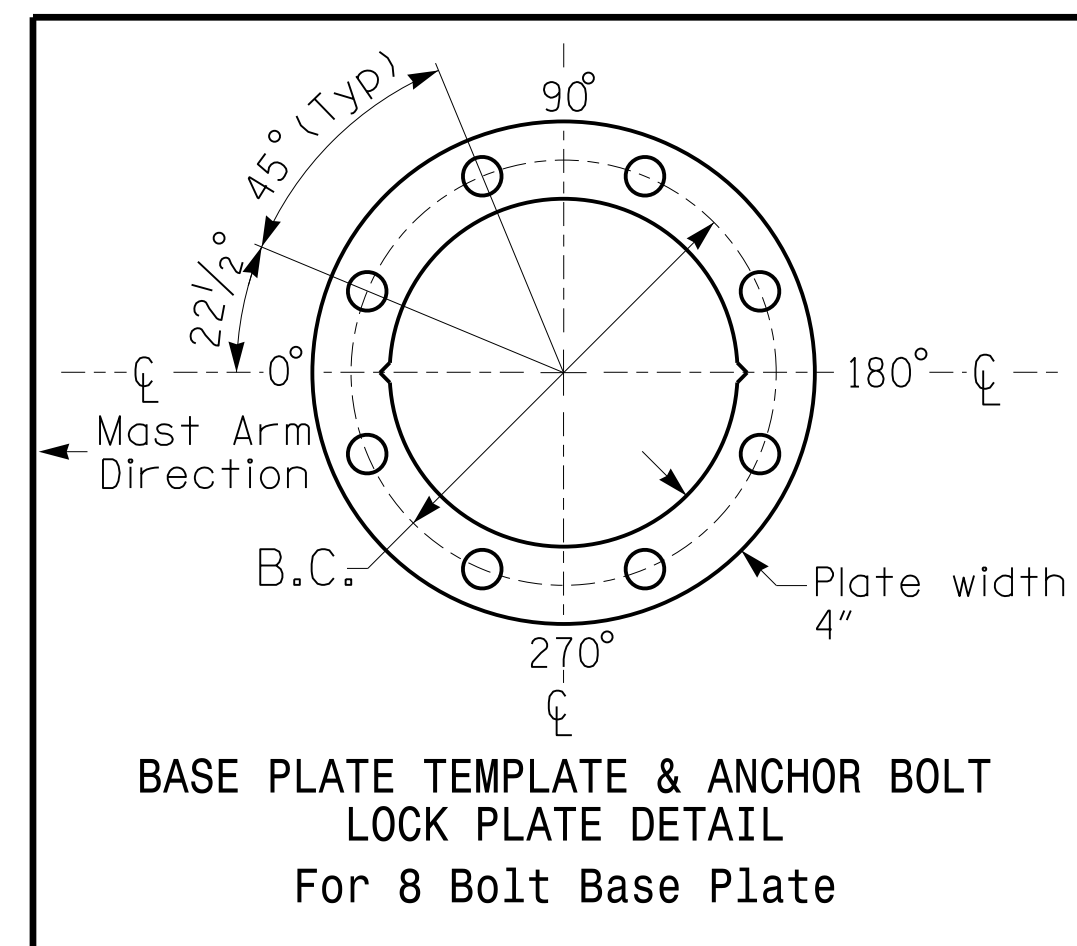


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

METAL POLE No. 5

MAST ARM LOADING SCHEDULE

| LOADING SYMBOL | DESCRIPTION | AREA | SIZE | WEIGHT |
|----------------|---|-----------|-------------------------|--------|
| | RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE | 9.3 S.F. | 25.5" W X 52.5" L | 60 LBS |
| A | SIGN RIGID MOUNTED | 5.0 S.F. | 24.0" W X 30.0" L | 11 LBS |
| B | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 LBS |
| | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 MPH)

| <p>Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 119 at I-40 EB/I-85 NB Ramps</p> | | <p>SEAL</p> | | |
|---|---|---|-----------------------------------|-------|------|
| | <p>Division 7 Alamance County Mebane</p> <p>PLAN DATE: September 2016 REVIEWED BY:</p> <p>PREPARED BY: I. O. Umozurike REVIEWED BY:</p> | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> </tbody> </table> | | INIT. | DATE |
| INIT. | DATE | | | | |
| | | | | | |
| <p>SCALE</p> <p>0 N/A</p> <p>N/A</p> | <p>DocuSigned by: I. O. Umozurike 1/30/2017 10:58:48 AM</p> | | <p>SIG. INVENTORY NO. 07-0440</p> | | |

SPECIAL NOTE
 The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

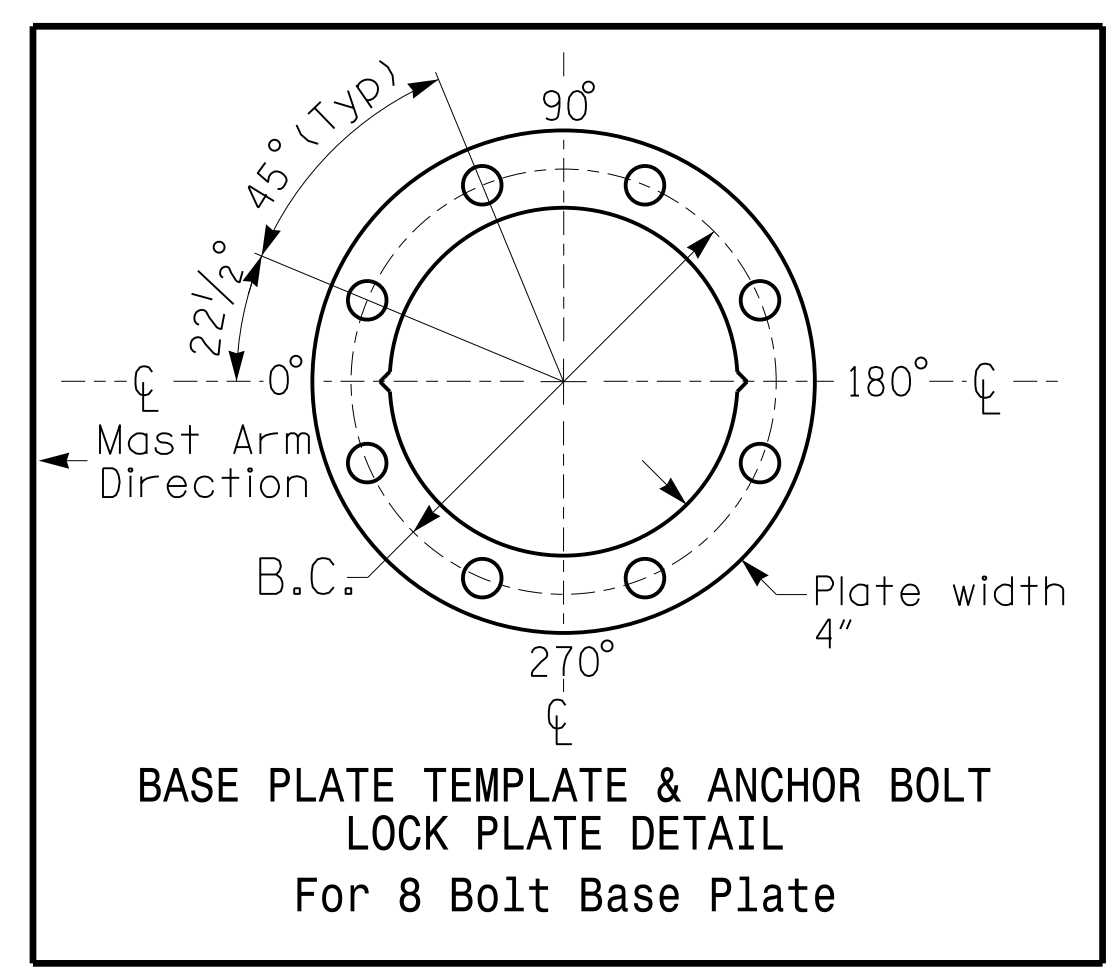
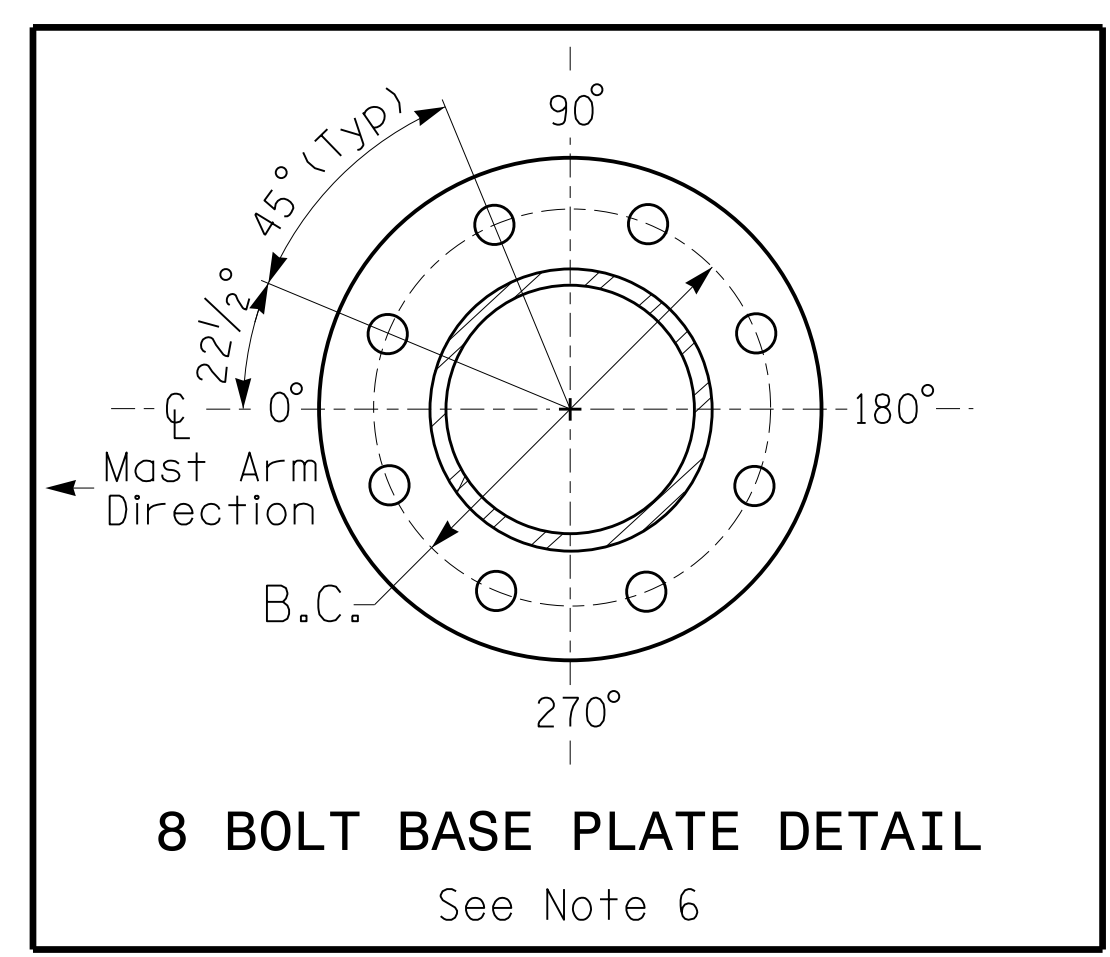
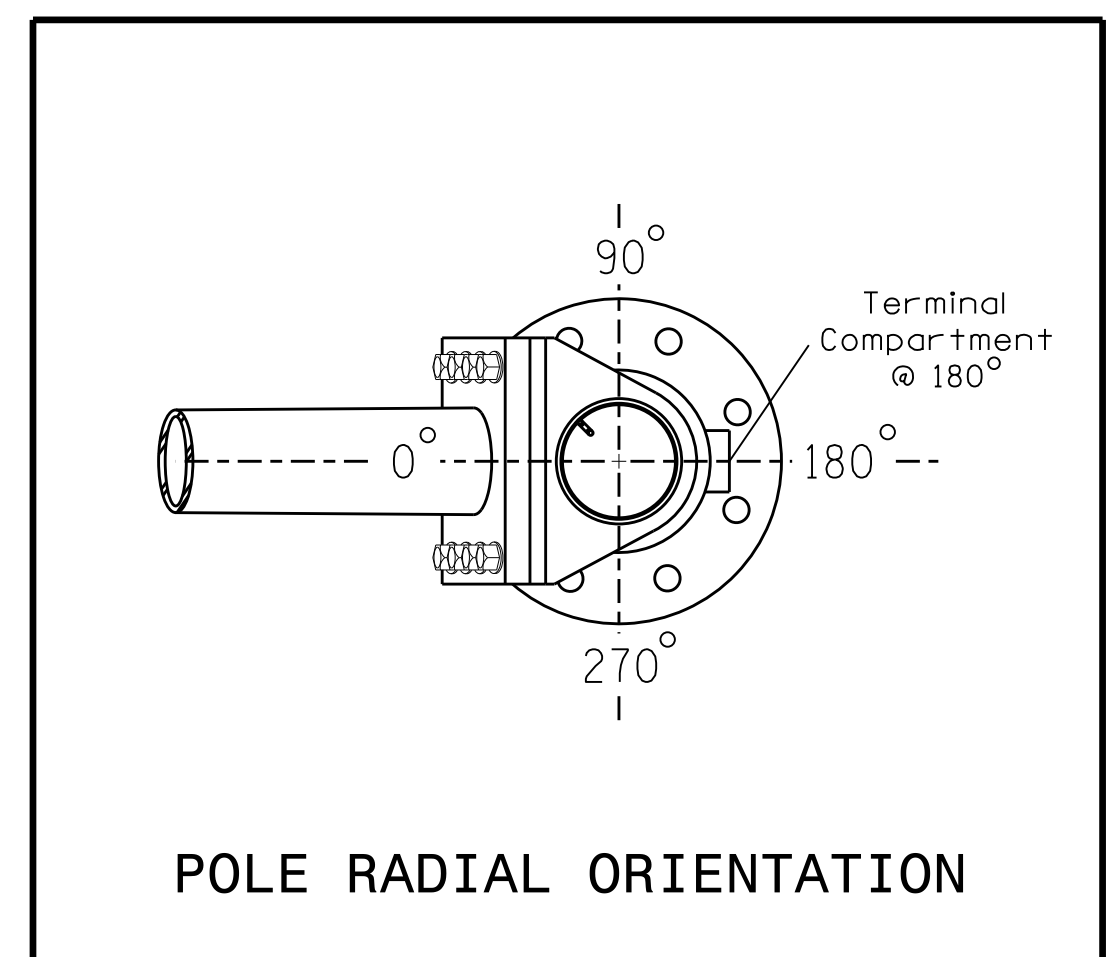
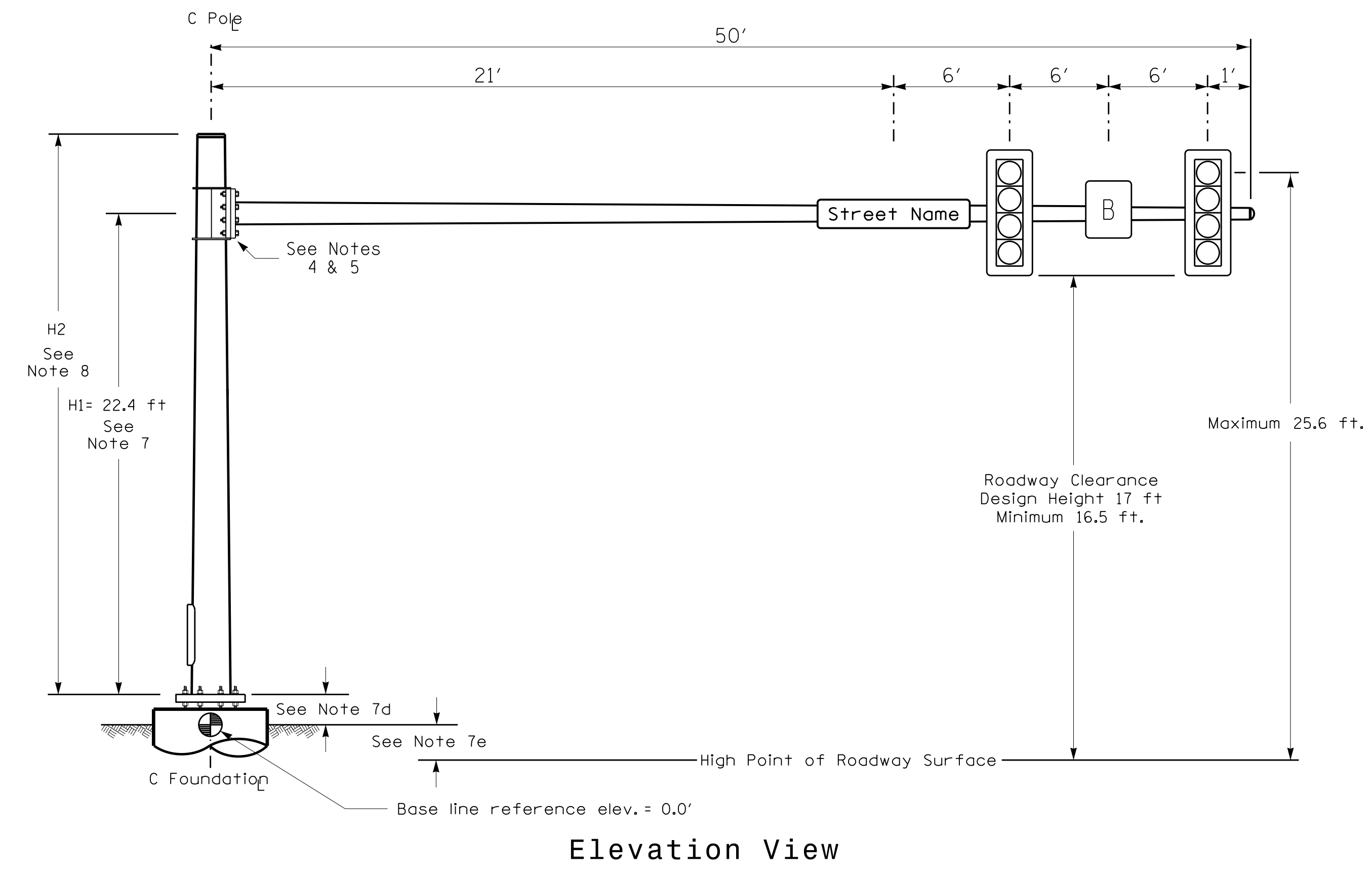
Elevation Data for Mast Arm Attachment (H1)

| | |
|---|---------------|
| Elevation Differences for: | Pole 1 |
| Baseline reference point at \odot Foundation @ ground level | 0.0 ft. |
| Elevation difference at High point of roadway surface | +3.4 ft. |
| Elevation difference at Edge of travelway or face of curb | N/A |

MAST ARM LOADING SCHEDULE

| LOADING SYMBOL | DESCRIPTION | AREA | SIZE | WEIGHT |
|----------------|---|-----------|-------------------------|--------|
| | RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE | 11.5 S.F. | 25.5" W X 66.0" L | 74 LBS |
| | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 LBS |
| | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |

Design Loading for METAL POLE NO. 6



NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 MPH)

| | | | |
|---|---|------------------------------------|--|
| <p>Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 119 at I-40 EB/I-85 NB Ramps</p> | | <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>SEAL</p> |
| | <p>Division 7 Alamance County Mebane</p> <p>PLAN DATE: September 2016 REVIEWED BY:</p> <p>PREPARED BY: I. O. Umozurike REVIEWED BY:</p> | <p>REVISIONS</p> <p>INIT. DATE</p> | |
| <p>SCALE: N/A</p> | <p>1/30/2017</p> | | <p>SIG. INVENTORY NO. 07-0440</p> |

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PHASING DIAGRAM

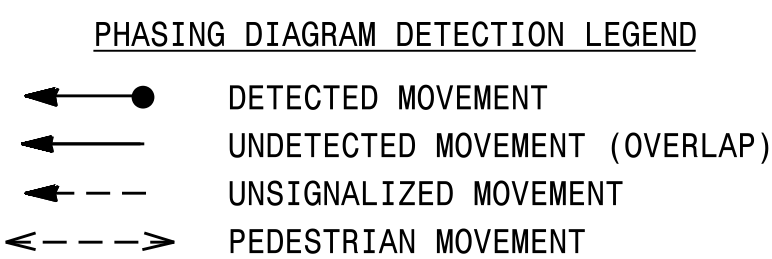
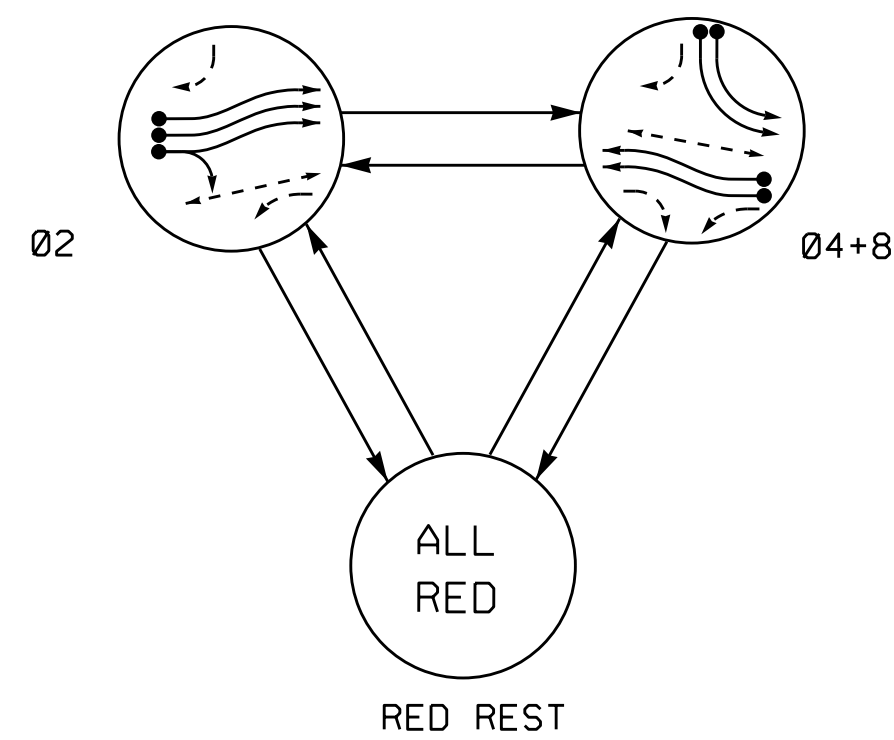
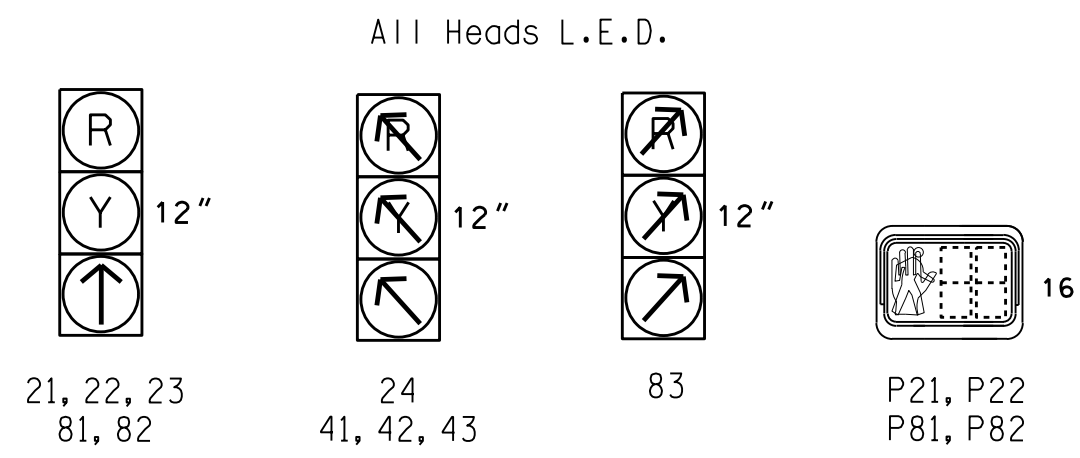


TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|------|-------|
| | 02 | 04+8 | WALK | FLUSH |
| 21, 22, 23 | ↑ | R | R | R |
| 24 | ↘ | R | R | R |
| 41, 42, 43 | ↘ | ↑ | R | R |
| 81, 82 | R | ↑ | R | R |
| 83 | ↘ | ↘ | ↘ | ↘ |
| P21, P22 | W | DW | DW | DRK |
| P81, P82 | DW | W | DW | DRK |

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

SIGNAL FACE I.D.



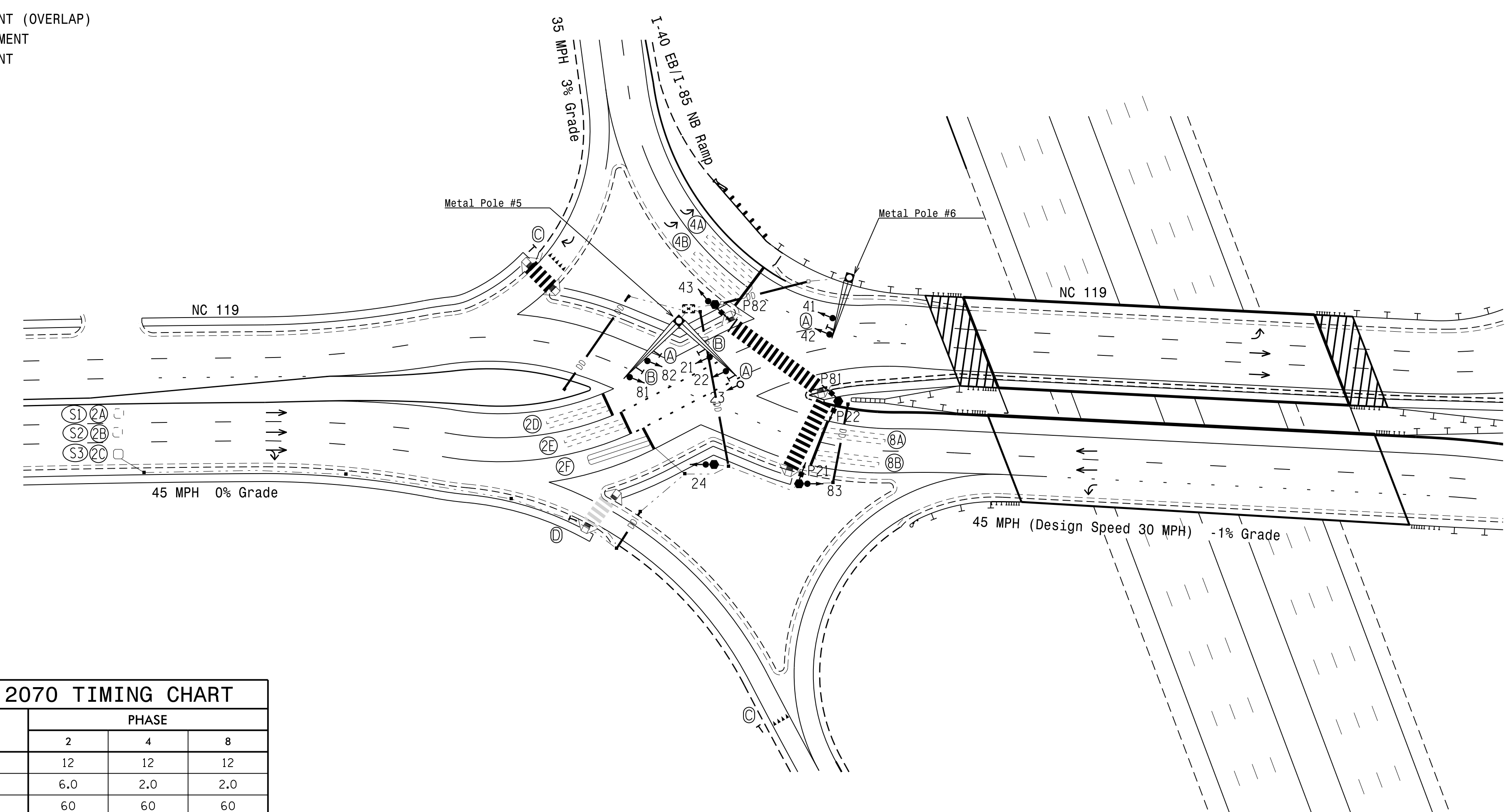
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | | | |
|-------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| 2A/S1 | 6X6 | 300 | 5 | - | 2 | - | Y | - | - | - | Y | - |
| 2B/S2 | 6X6 | 300 | 5 | - | 2 | - | Y | - | - | - | Y | - |
| 2C/S3 | 6X6 | 300 | 5 | Y | 2 | - | Y | - | - | - | Y | Y |
| 2D | 6X40 | 0 | 2-4-2 | - | 2 | Y | Y | - | - | - | - | - |
| 2E | 6X40 | 0 | 2-4-2 | - | 2 | Y | Y | - | - | - | - | - |
| 2F | 6X40 | 0 | 2-4-2 | Y | 2 | Y | Y | - | - | - | - | Y |
| 4A | 6X40 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | - | - | - |
| 4B | 6X40 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | - | - | - |
| 8A | 6X40 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | - | - | - |
| 8B | 6X40 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | - | - | - |

2 Phase Fully Actuated (NC 119 CLS)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Program all phases for Red Rest.
- Program controller to start up in phase 2 green.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0440.

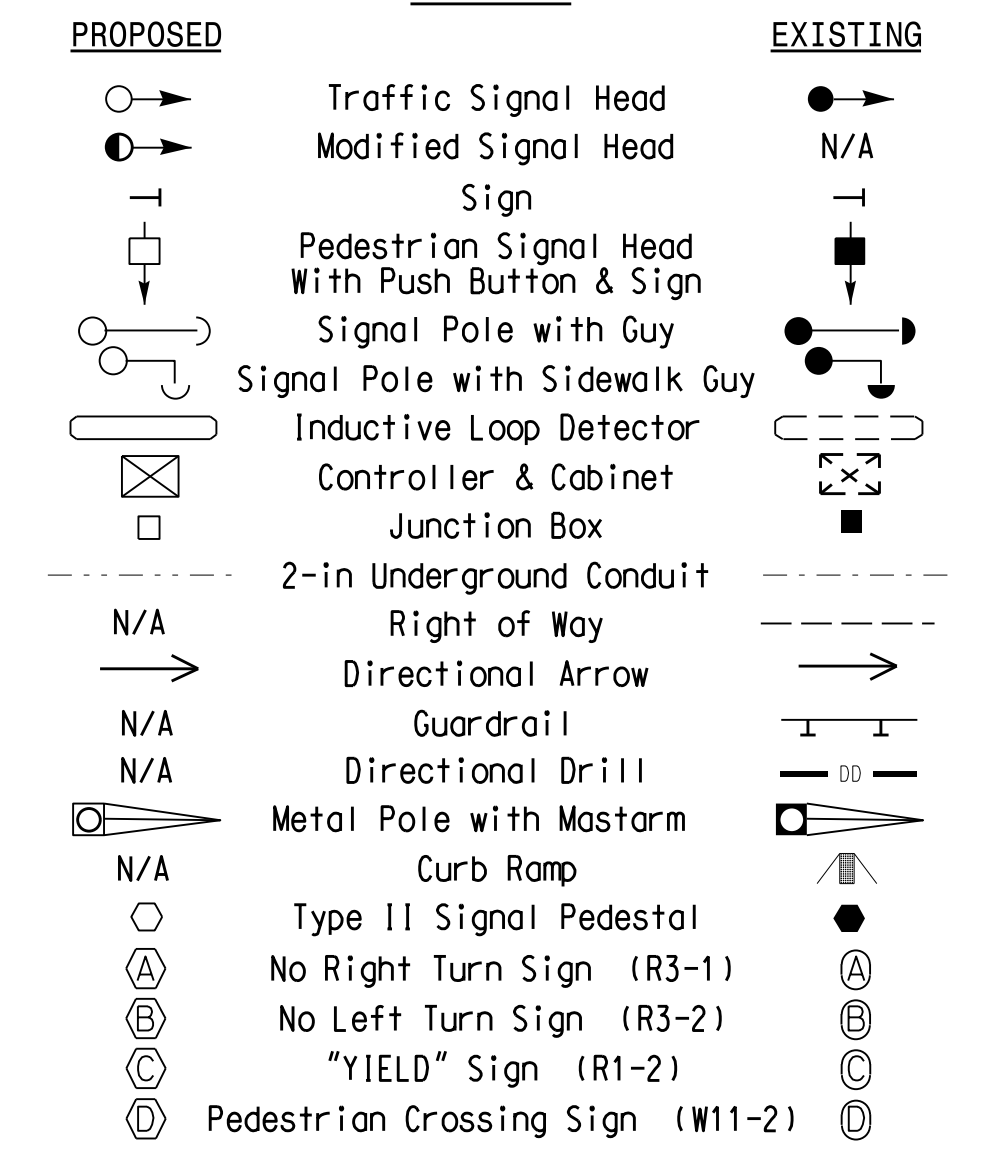


OASIS 2070 TIMING CHART

| FEATURE | PHASE | | |
|-------------------------|-------|-----|-----|
| | 2 | 4 | 8 |
| Min Green 1 * | 12 | 12 | 12 |
| Extension 1 * | 6.0 | 2.0 | 2.0 |
| Max Green 1 * | 60 | 60 | 60 |
| Yellow Clearance | 4.5 | 3.7 | 3.6 |
| Red Clearance | 3.1 | 1.3 | 3.0 |
| Walk 1 * | 4 | - | 4 |
| Don't Walk 1 | 9 | - | 15 |
| Seconds Per Actuation * | - | - | - |
| Max Variable Initial * | - | - | - |
| Time Before Reduction * | 15 | - | - |
| Time To Reduce * | 30 | - | - |
| Minimum Gap | 3.0 | - | - |
| Recall Mode | - | - | - |
| Vehicle Call Memory | - | - | - |
| Dual Entry | - | ON | ON |
| Simultaneous Gap | ON | ON | ON |
| Red Rest | ON | ON | ON |

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

LEGEND



Signal Upgrade - Final Design

750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Mebane

PLAN DATE: September 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

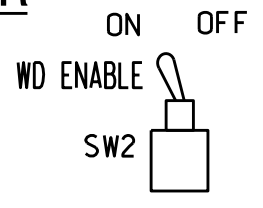
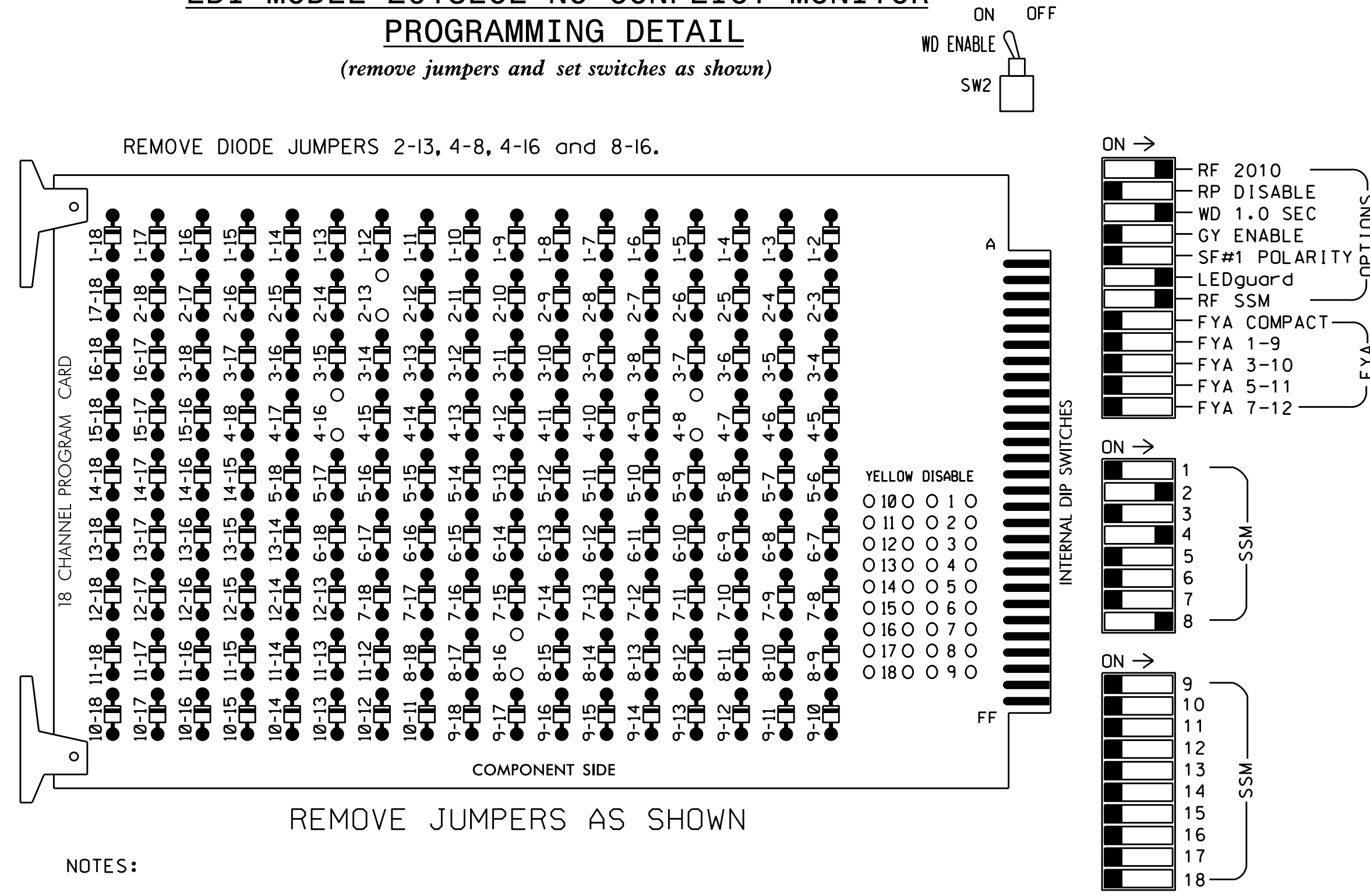
1/25/2017

SIG. INVENTORY NO. 07-0440

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EDI MODEL 2018ECL-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.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

- ### 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.
 - Program phases 4 and 8 for Dual Entry.
 - Enable Simultaneous Gap-Out for all phases.
 - Program phase 2 for Gap Reduction.
 - Program phase 2 for Start Up In Green.
 - Program phases 2 and 8 for 'STARTUP PED CALL'.
 - Program phases 2, 4 and 8 for Red Rest.
 - The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

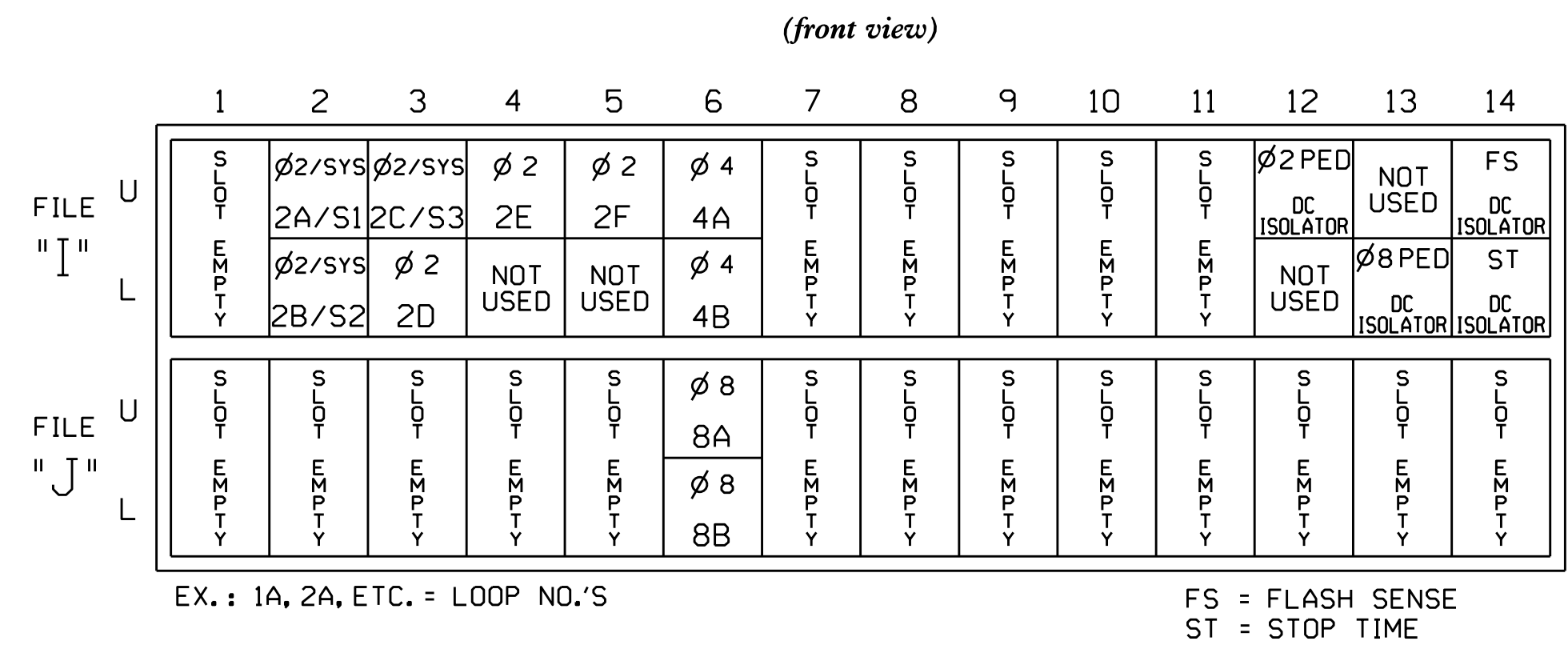
CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD; 6-AUX)
 LOAD SWITCHES USED.....S2,S3,S5,S11,S12
 PHASES USED.....2,2 PED,4,8,8 PED
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|-----|----------|-------|----------|-----|----------|----|----|-------|-----|-------|-------|----------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 21,22,23 | 24 | P21, P22 | NU | 41,42,43 | NU | NU | NU | NU | 81,82 | 83 | P81, P82 | NU | NU | NU | NU | NU |
| RED | 128 | | | | | | | | | | 107 | | | | | | | |
| YELLOW | 129 | | | | | | | | | | 108 | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | | | |
| RED ARROW | | 128 | | | 101 | | | | | | 107 | | | | | | | |
| YELLOW ARROW | | 129 | | | 102 | | | | | | 108 | | | | | | | |
| GREEN ARROW | 130 | 130 | | | 103 | | | | | 109 | 109 | | | | | | | |
| Hand icon | | | | | 113 | | | | | | | | 110 | | | | | |
| Person icon | | | | | 115 | | | | | | | | 112 | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT

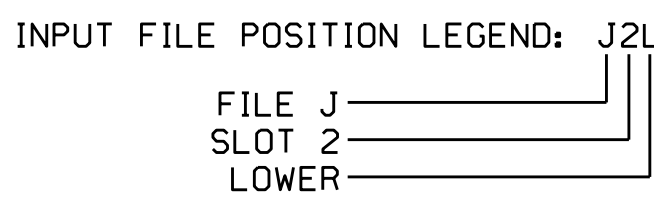


EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

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/S1 | TB2-5,6 | I2U | 39 | 1 | 2 | 2/SYS | | Y | | | |
| 2B/S2 | TB2-7,8 | I2L | 43 | 5 | 12 | 2/SYS | | Y | | | |
| 2C/S3 | TB2-9,10 | I3U | 63 | 25 | 32 | 2/SYS | | Y | | | |
| 2D | TB2-11,12 | I3L | 76 | 38 | 42 | 2 | Y | Y | | | |
| 2E | TB4-1,2 | I4U | 47 | 9 | 22 | 2 | Y | Y | | | |
| 2F | TB4-5,6 | I5U | 58 | 20 | 3 | 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 | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| 8B | TB5-11,12 | J6L | 46 | 8 | 18 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | | PED 2 | | 2 PED | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | | PED 8 | | 8 PED | | | |

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0440
 DESIGNED: September 2016
 SEALED: 1/25/17
 REVISED: N/A

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY
 NORTH CAROLINA
 SIGNAL MANAGEMENT SECTION
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 EB/I-85 NB Ramps

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS INIT. DATE

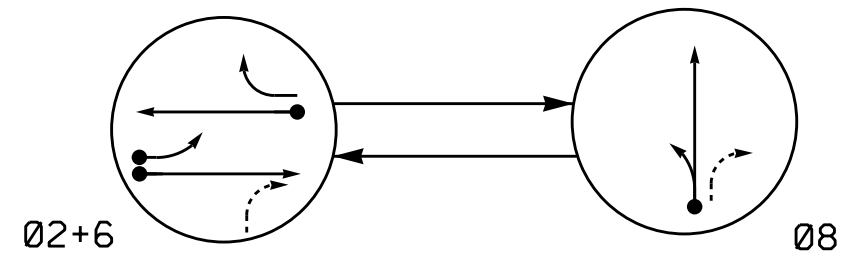
Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 VICTORY M. LITTLE

DocuSigned by: Zachary M. Little 1/30/2017

SIG. INVENTORY NO. 07-0440

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 bjs/simmons

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

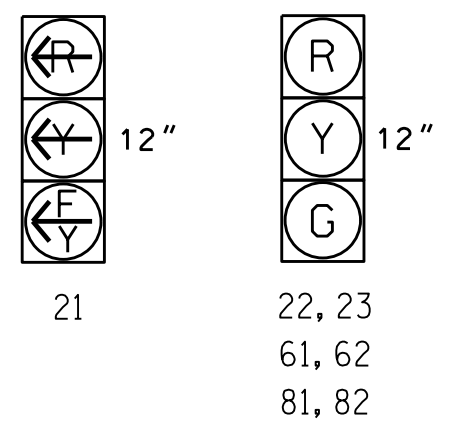
- ←● DETECTED MOVEMENT
- ←○ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

| SIGNAL FACE | PHASE | | |
|-------------|---------|-----|---------|
| | Ø 2 + 6 | Ø 8 | F Heads |
| 21 | F | R | Y |
| 22, 23 | G | R | Y |
| 61, 62 | G | R | Y |
| 81, 82 | R | G | R |

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

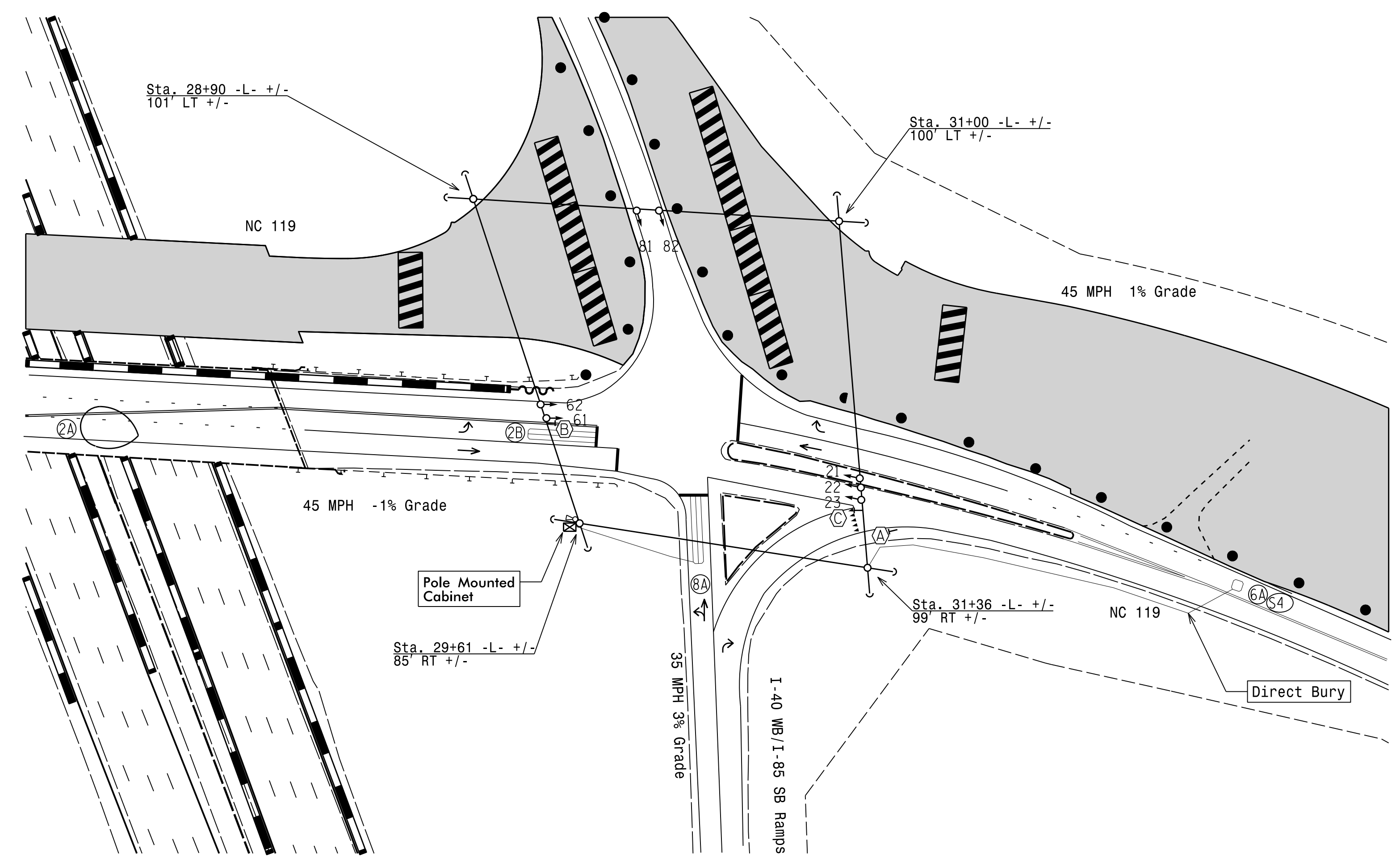
| LOOP | INDUCTIVE LOOPS | | | | DETECTOR PROGRAMMING | | | | | | | |
|-------|-----------------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| 2A | * | 300 | * | Y | 2 | Y | Y | - | - | - | - | Y |
| 2B | 6X40 | 0 | 2-4-2 | Y | 2 | Y | Y | Y | - | 3 | - | Y |
| 6A/S4 | 6X6 | 300 | 4 | Y | 6 | Y | Y | - | - | - | Y | Y |
| 8A | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | - | - | Y |

* Microwave Detection Zone

2 Phase Fully Actuated (NC 119 CLS)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
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.
5. Program controller to operate using FYA compact 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 #: 0441.



OASIS 2070 TIMING CHART

| FEATURE | PHASE | | |
|-------------------------|------------|------------|-----|
| | 2 | 6 | 8 |
| Min Green 1 * | 12 | 12 | 7 |
| Extension 1 * | 6.0 | 6.0 | 2.0 |
| Max Green 1 * | 90 | 90 | 25 |
| Yellow Clearance | 4.6 | 4.6 | 3.7 |
| Red Clearance | 1.0 | 1.0 | 1.3 |
| Red Revert | 2.0 | 2.0 | 2.0 |
| Walk 1 * | - | - | - |
| Don't Walk 1 | - | - | - |
| Seconds Per Actuation * | 1.5 | 1.5 | - |
| Max Variable Initial * | 34 | 34 | - |
| Time Before Reduction * | 15 | 15 | - |
| Time To Reduce * | 45 | 45 | - |
| Minimum Gap | 3.0 | 3.0 | - |
| Recall Mode | MIN RECALL | MIN RECALL | - |
| Vehicle Call Memory | YELLOW | YELLOW | - |
| Dual Entry | - | - | - |
| Simultaneous Gap | ON | ON | ON |

* 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 | ●→ N/A |
| ●→ Modified Signal Head | ○→ N/A |
| ⊥ Sign | ⊥ N/A |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ N/A |
| ○ 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 | N/A Right of Way |
| N/A Guardrail | N/A Guardrail |
| ○ Microwave Detector | ○ Microwave Detector |
| ○ Microwave Detection Zone | ○ Microwave Detection Zone |
| ■ Construction Zone | ■ Construction Zone |
| ○ Construction Zone Drums | ○ Construction Zone Drums |
| (A) "YIELD" Sign (R1-2) | (A) "YIELD" Sign (R1-2) |
| (B) No U-Turn/No Left Turn Sign (R3-18) | (B) No U-Turn/No Left Turn Sign (R3-18) |
| (C) No Right Turn Sign (R3-2) | (C) No Right Turn Sign (R3-2) |

Signal Upgrade Temporary Design 1 (TMP Phase I)

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 WB/I-85 SB Ramps

Division 7 Alamance County Mebane

PLAN DATE: November 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 0 50
1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

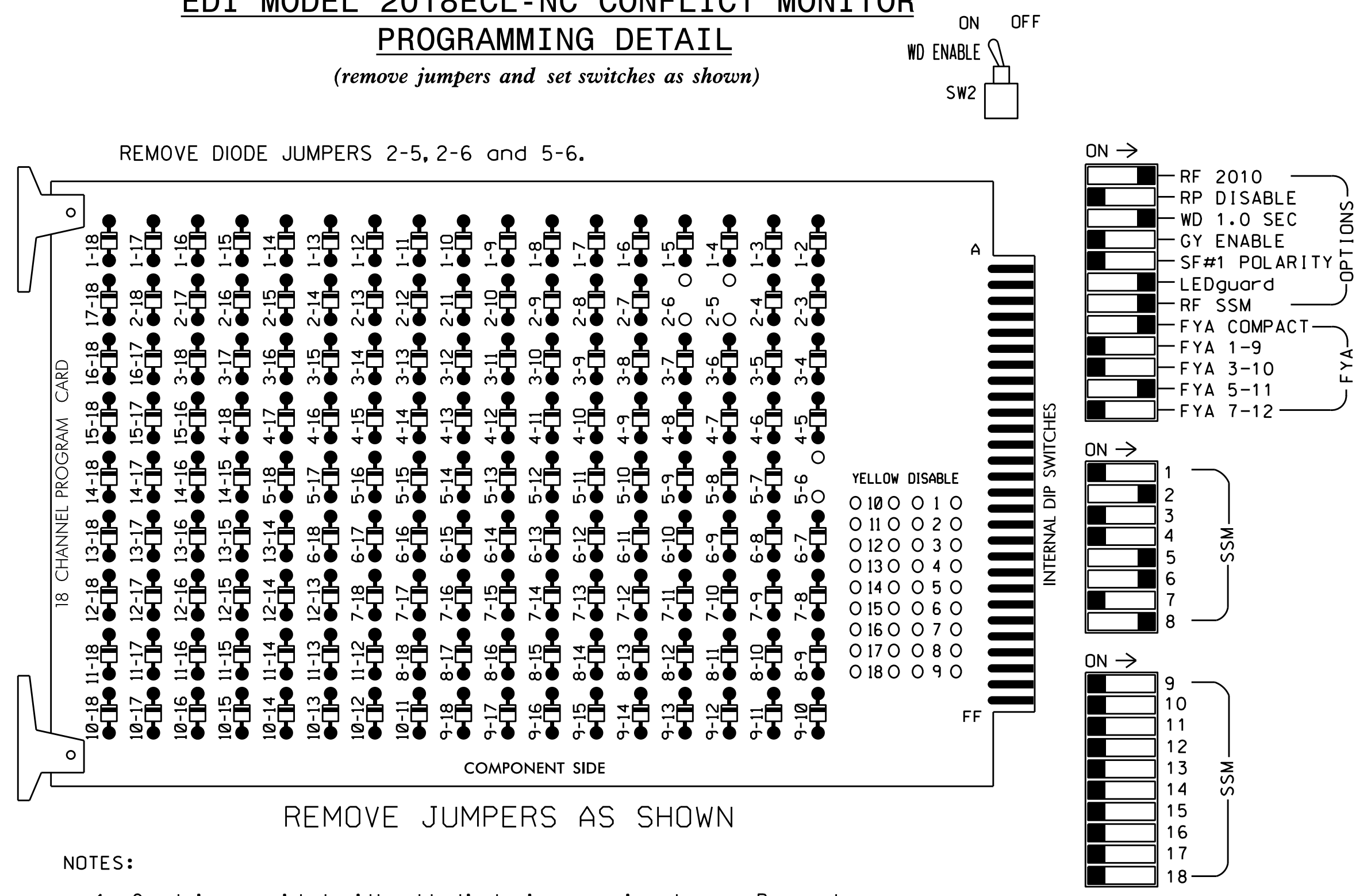
1/25/2017

SIG. INVENTORY NO. 07-044111

06-1116-2017_09:15
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EDI MODEL 2018ECL-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.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- 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.
- The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S7,S8,S11
 PHASES USED.....2,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....NOT USED

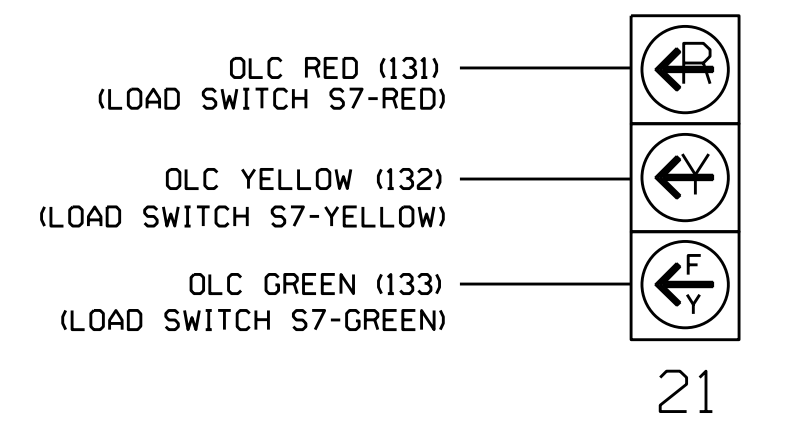
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 |
|-----------------------|----|-------|-------|----|----|-------|-----|-------|-------|-----|-------|-------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 |
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | OLC | 6 | 6 PED | 7 | 8 | 8 PED |
| SIGNAL HEAD NO. | NU | 22,23 | NU | NU | NU | NU | 21* | 61,62 | NU | NU | 81,82 | NU |
| RED | | 128 | | | | | | 134 | | | 107 | |
| YELLOW | | 129 | | | | | | 135 | | | 108 | |
| GREEN | | 130 | | | | | | 136 | | | 109 | |
| RED ARROW | | | | | | | | 131 | | | | |
| YELLOW ARROW | | | | | | | | 132 | | | | |
| FLASHING YELLOW ARROW | | | | | | | | 133 | | | | |
| GREEN ARROW | | | | | | | | | | | | |

NU = Not Used
 * See pictorial of head wiring in detail below.
 NOTE: Load Switch S7 requires output remapping. See sheet 2.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



INPUT FILE POSITION LAYOUT

(front view)

| FILE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------|----|----------|----|----|----|----------|----|----------|----|----|----|----|----|----|
| U | FS | NOT USED | FS | FS | FS | 6A/S4 | FS | 8A | FS | FS | FS | FS | FS | FS |
| L | FS | 2B | FS | FS | FS | NOT USED | FS | NOT USED | FS | FS | FS | FS | FS | FS |

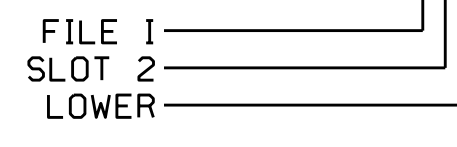
EX.: 1A, 2A, ETC. = LOOP NO.'S

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 |
|----------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2B | TB23-3,4 | I2L | 43 | 5 | 12 | 2 | Y | Y | Y | | 3 |
| 6A/S4 | TB21-11,12 | I6U | 40 | 2 | 6 | 6/SYS | Y | Y | | | |
| 8A | TB22-1,2 | I8U | 42 | 4 | 8 | 8 | Y | Y | | | |

INPUT FILE POSITION LEGEND: I2L



SPECIAL DETECTOR NOTE

Install a Microwave detection system for loop 2A for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

Electrical Detail - Temp 1 (TMP Phase I) - Sheet 1 of 2

| | | | |
|---|---|---|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC. Signal Management Solutions 750 N. Greenfield Pkwy, Garner, NC 27529 | NC 119 at I-40 WB/I-85 SB Ramps | | SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JACOBARY M. LITTLE |
| | Division 7 Alamance County Mebane PLAN DATE: January 2017 REVIEWED BY: BAS PREPARED BY: B. SIMMONS REVIEWED BY: | DocuSigned by: Jacobary M. Little 1/30/2017 DATE: 1/30/2017 SIG. INVENTORY NO. 07-0441T1 | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

06-1416-2017 10:32
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 bjs/simmons

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR LOADSWITCH S7 (SIGNAL HEAD 21)

(program controller as shown below)

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

STEP 1

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:16 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

```

PAGE:1 C1 PIN:32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 31

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

STEP 2

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:17 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 32

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

STEP 3

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:18 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

```

PAGE:1 C1 PIN:34 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

OUTPUT PROGRAMMING FOR HEAD 21 COMPLETE

OVERLAP PROGRAMMING DETAIL (program controller as shown below)

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

PRESS '+' TWICE

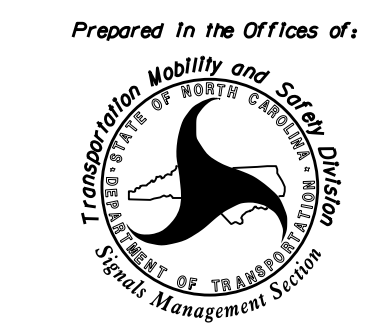
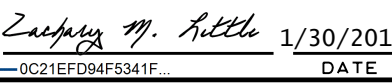
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PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

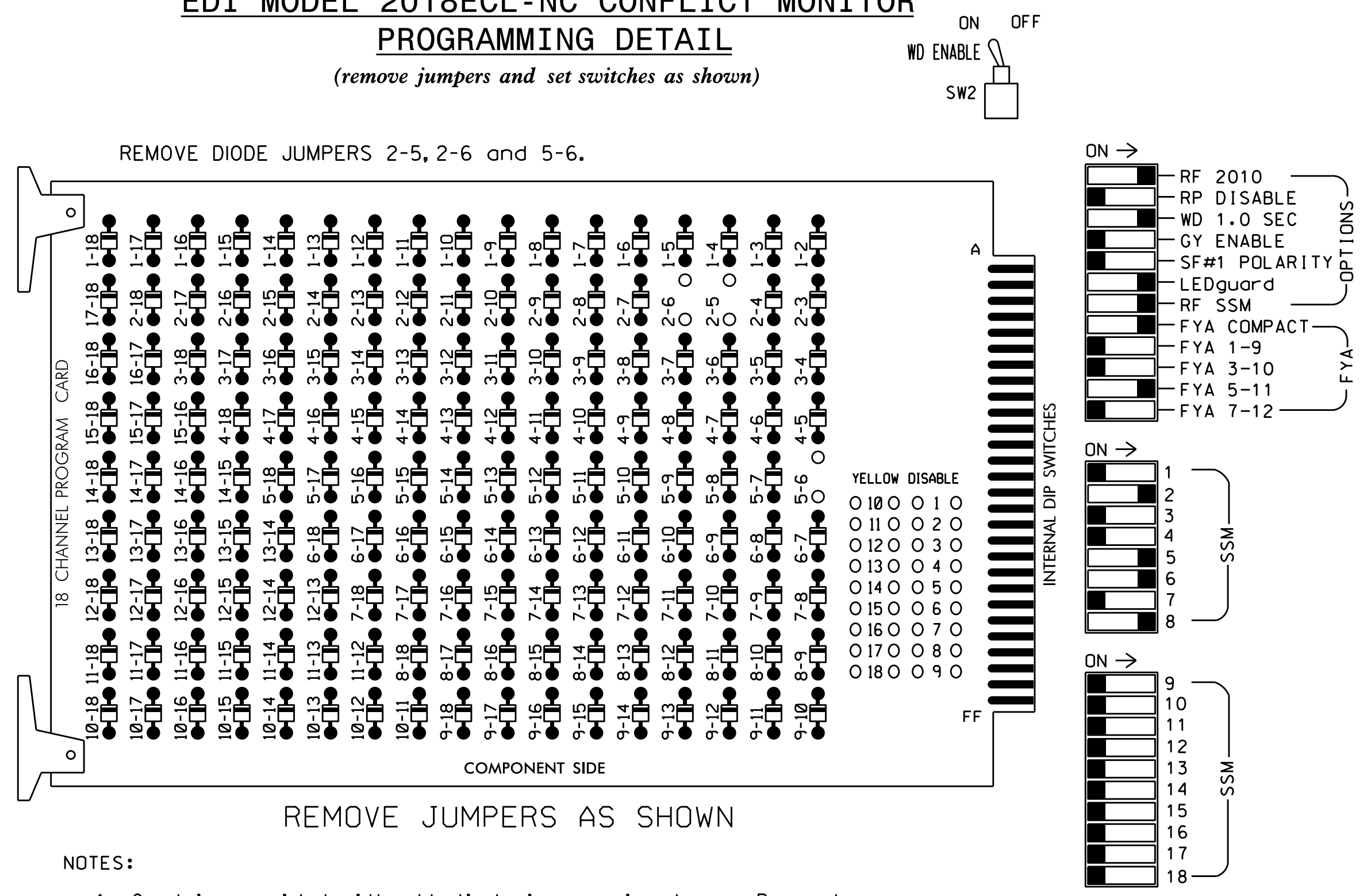
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0441T1
DESIGNED: November 2016
SEALED: 1/25/17
REVISED: N/A

| | | | | |
|--|--|--|--|---|
| Electrical Detail - Temp 1 (TMP Phase I) - Sheet 2 of 2 | | NC 119 at I-40 WB/I-85 SB Ramps | | SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JACUARY M. LITTLE |
| Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | | Division 7 Alamance County Mebane | | DocuSigned by:  1/30/2017 0021EFD04F5341F DATE |
| DETAILS FOR: | | PLAN DATE: January 2017 REVIEWED BY: BAS | | |
| REVISIONS | | INIT. DATE | | |
| PREPARED BY: B. SIMMONS | | REVIEWED BY: | | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | | SIC. INVENTORY NO. 07-0441T1 | | |

C:\Users\simmons\Documents\Signal\Working Folder\Electrical Detail\0441T1\smc_ele_xxx.dgn
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bjs/simmons

EDI MODEL 2018ECL-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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....336
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....POLE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S7,S8,S11
 PHASES USED.....2,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 |
|-----------------------|----|-------|-------|----|----|-------|-----|-------|-------|-----|-------|-------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 |
| PHASE | 1 | 2 | 2 PED | 3 | 4 | 4 PED | OLC | 6 | 6 PED | 7 | 8 | 8 PED |
| SIGNAL HEAD NO. | NU | 22,23 | NU | NU | NU | NU | 21* | 61,62 | NU | NU | 81,82 | NU |
| RED | | 128 | | | | | | 134 | | | 107 | |
| YELLOW | | 129 | | | | | | 135 | | | 108 | |
| GREEN | | 130 | | | | | | 136 | | | 109 | |
| RED ARROW | | | | | | | | 131 | | | | |
| YELLOW ARROW | | | | | | | | 132 | | | | |
| FLASHING YELLOW ARROW | | | | | | | | 133 | | | | |
| GREEN ARROW | | | | | | | | | | | | |

NU = Not Used
 * See pictorial of head wiring in detail below.
 NOTE: Load Switch S7 requires output remapping. See sheet 2.

INPUT FILE POSITION LAYOUT

(front view)

| FILE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------|----|----------|----|----|----|----------|----|----------|----|----|----|----|----|----|
| U | FS | NOT USED | FS | FS | FS | 6A/S4 | FS | 8A | FS | FS | FS | FS | FS | FS |
| L | FS | 2B | FS | FS | FS | NOT USED | FS | NOT USED | FS | FS | FS | FS | FS | FS |

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

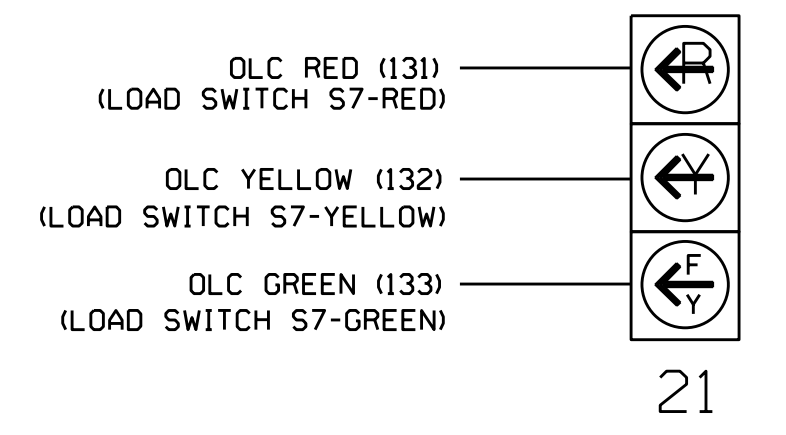
INPUT FILE CONNECTION & PROGRAMMING CHART

| 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 |
|----------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2B | TB23-3,4 | I2L | 43 | 5 | 12 | 2 | Y | Y | Y | | 3 |
| 6A/S4 | TB21-11,12 | I6U | 40 | 2 | 6 | 6/SYS | Y | Y | | | |
| 8A | TB22-1,2 | I8U | 42 | 4 | 8 | 8 | Y | Y | | | |

INPUT FILE POSITION LEGEND: I2L
 FILE 1
 SLOT 2
 LOWER

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



SPECIAL DETECTOR NOTE

Install a Microwave detection system for loop 2A for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0441T2
 DESIGNED: November 2016
 SEALED: 1/25/17
 REVISED: N/A

Electrical Detail - Temp 2 (TMP Phase II) - Sheet 1 of 2

Electrical and Programming Details for: **NC 119 at I-40 WB/I-85 SB Ramps**

Prepared in the Offices of: **Transporatio Mobility and Safety Solutions**

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS INIT. DATE

Sealed by: **Victoria M. Little** 1/30/2017

Seal: **SEAL 030530 ENGINEER VICTORIA M. LITTLE**

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 07-0441T2

C:\Users\simmons\Documents\Signal Management\Working Folder\Electrical\Details\070441T2_smc_elec_xxxx.dgn
 01/30/2017 10:37
 C:\Users\simmons\Documents\Signal Management\Working Folder\Electrical\Details\070441T2_smc_elec_xxxx.dgn
 bjsimmons

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL FOR LOADSWITCH S7 (SIGNAL HEAD 21)

(program controller as shown below)

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '1' (OUTPUT ASSIGNMENTS), WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "30"

```

PAGE:1 C1 PIN:32 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:16 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```

PAGE:1 C1 PIN:32 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....30
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

PRESS "+" KEY FOR OUTPUT 31

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

STEP 2

```

PAGE:1 C1 PIN:33 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:17 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

PRESS "+" KEY FOR OUTPUT 32

```

PAGE:1 C1 PIN:33 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....31
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

STEP 3

```

PAGE:1 C1 PIN:34 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

THE OUTPUT IS SET AS A VEHICLE PHASE BY DEFAULT, THIS "Y" WILL REMAIN UNTIL THE OUTPUT IS CHANGED.
ENTER A "Y" FOR VEHICLE OVERLAP.

```

PAGE:1 C1 PIN:18 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...3
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
    
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP' THE SCREEN SHOWN ABOVE WILL APPEAR. ENTER DATA AS SHOWN.
PRESS THE 'ENT' KEY AFTER INPUTTING DATA, THEN 'ESC'.

```

PAGE:1 C1 PIN:34 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....32
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID,1=FLASH).....0
SELECT ASSIGNMENT:
NOT ENABLED.....
VEHICLE PHASE.....
PEDESTRIAN PHASE.....
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....
WATCHDOG.....
DETECTOR RESET.....
ADVANCE BEACON.....
OUT OF PHASE FLASHER.....
CONTROLLER FLASH.....
RUN FREE.....
RESERVED.....
PREEMPT.....
SOFT PREEMPT.....
ANY PREEMPT.....
COORDINATION PLAN.....
OFFSET.....
PHASE CHECK.....
PHASE ON.....
PHASE NEXT.....
    
```

OUTPUT PROGRAMMING FOR HEAD 21 COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' TWICE

```

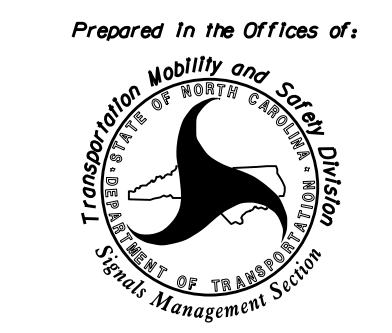
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0441T2
DESIGNED: November 2016
SEALED: 1/25/17
REVISED: N/A

Electrical Detail - Temp 2 (TMP Phase II) - Sheet 2 of 2

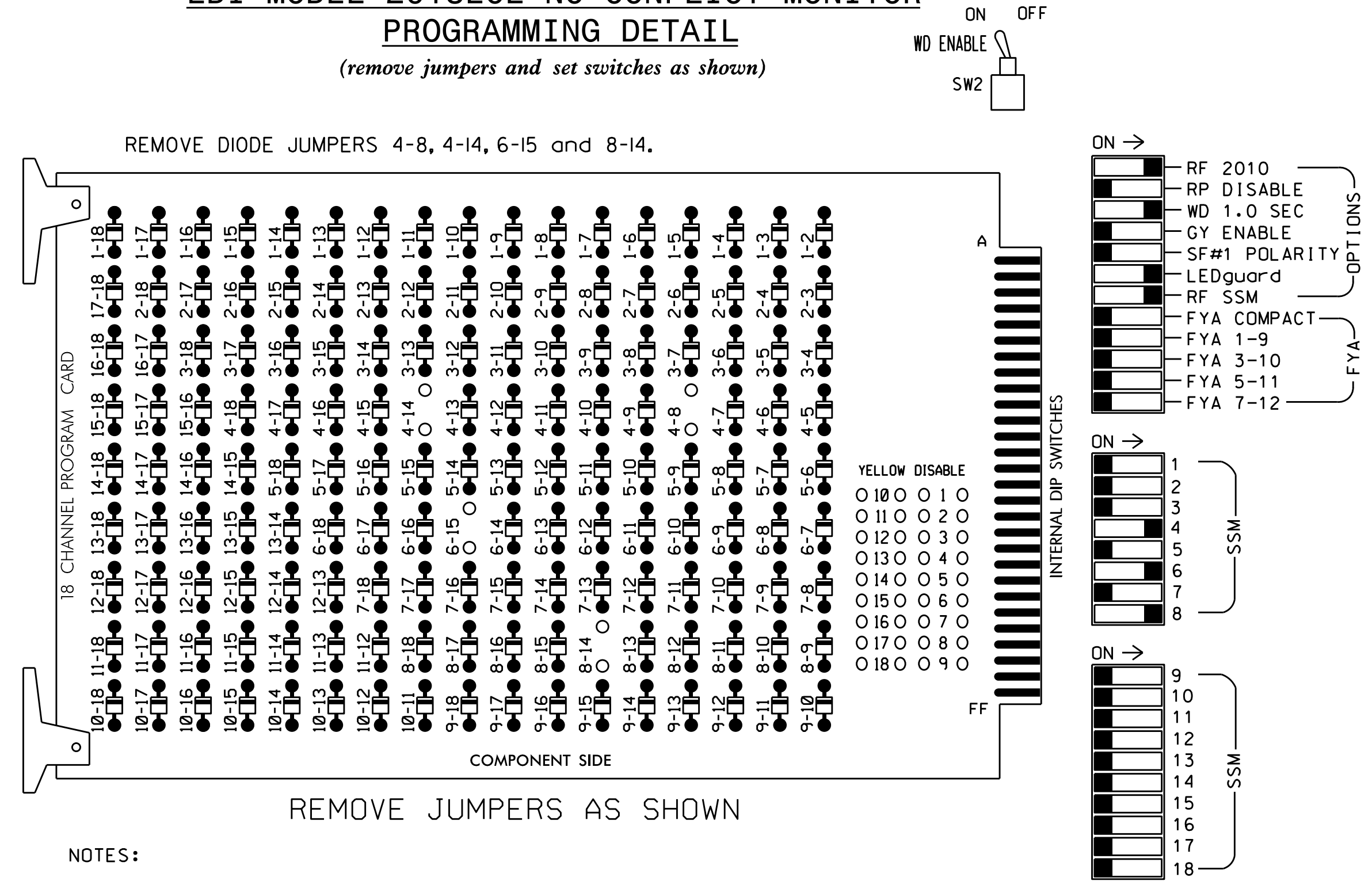
| | | |
|---|--|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | NC 119 at I-40 WB/I-85 SB Ramps | SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530 JACOBARY M. LITTLE |
|  | Division 7 Alamance County Mebane | Documented by: <i>Zachary M. Little</i> 1/30/2017 DATE |
| Prepared In the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | PLAN DATE: January 2017 REVIEWED BY: BAS PREPARED BY: B. SIMMONS REVIEWED BY: | SIG. INVENTORY NO. 07-0441T2 |

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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EDI MODEL 2018ECL-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.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for Gap Reduction.
- Program phase 6 for Start Up In Green.
- Program phases 4 and 6 for 'STARTUP PED CALL'.
- Program phases 4, 6 and 8 for Red Rest.
- The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD; 6-AUX)
 LOAD SWITCHES USED.....S5,S6,S8,S9,S11
 PHASES USED.....4,4 PED,6,6 PED,8
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

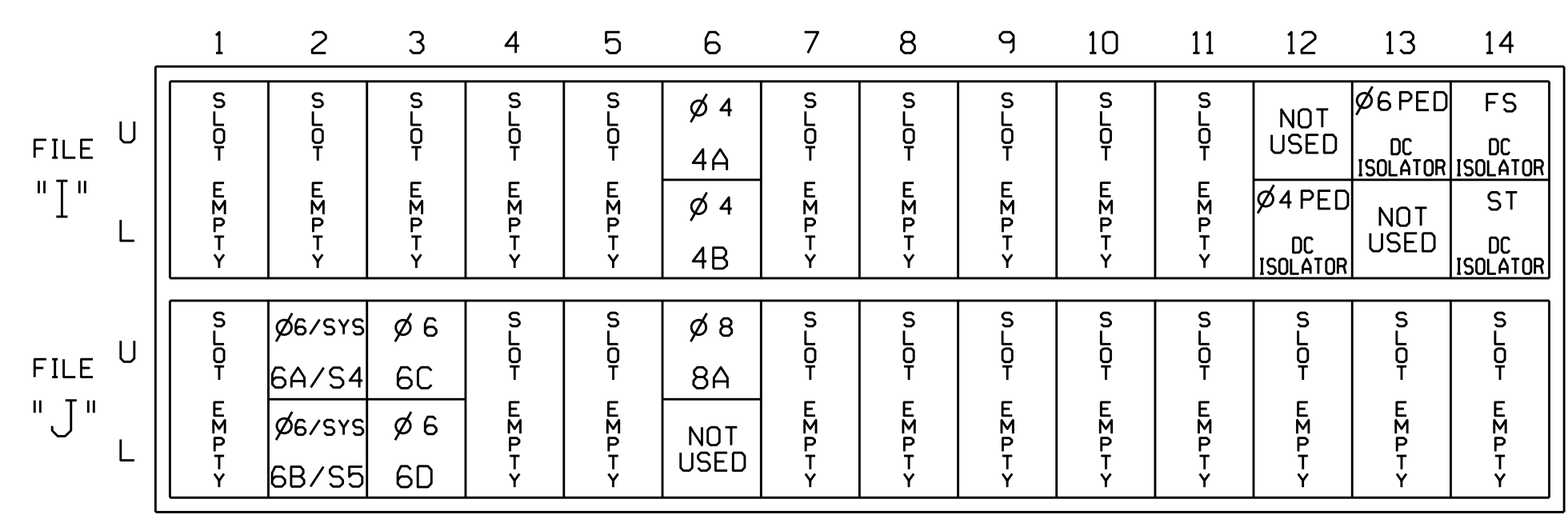
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|----|----|-------|----|-------|-------|----------|----|-------|-----|----------|-------|-------------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | NU | NU | NU | 42,43 | 44 | P41, P42 | NU | 61,62 | 63 | P61, P62 | NU | 81,82 83 | NU | NU | NU | NU | NU |
| RED | | | | | 101 | | | | 134 | | | | | | | | | |
| YELLOW | | | | | 102 | | | | 135 | | | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | | | |
| RED ARROW | | | | | 101 | | | | 134 | | 107 | | | | | | | |
| YELLOW ARROW | | | | | 102 | | | | 135 | | 108 | | | | | | | |
| GREEN ARROW | | | | | 103 | 103 | | | 136 | 136 | 109 | | | | | | | |
| Hand icon | | | | | | | 104 | | | | 119 | | | | | | | |
| Person icon | | | | | | | 106 | | | | 121 | | | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

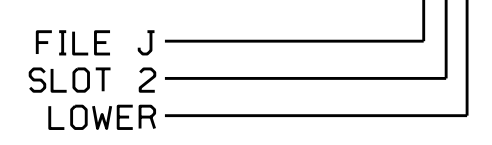
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|------------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | |
| 6A/S4 | TB3-5,6 | J2U | 40 | 2 | 6 | 6/SYS | | Y | | | |
| 6B/S5 | TB3-7,8 | J2L | 44 | 6 | 16 | 6/SYS | | Y | | | |
| 6C | TB3-9,10 | J3U | 64 | 26 | 36 | 6 | Y | Y | | | |
| 6D | TB3-11,12 | J3L | 77 | 39 | 46 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P41,P42 | TB8-5,6 | I12L | 69 | 31 | PED 4 | 4 PED | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | PED 6 | 6 PED | | | | | |

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0441T3
 DESIGNED: November 2016
 SEALED: 1/25/17
 REVISED: N/A

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Temp 3 (TMP Phase IIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 WB/I-85 SB Ramps

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS INIT. DATE

Sealed by: *Elizabeth M. Little* 1/30/2017

SIG. INVENTORY NO. 07-0441T3

30-1116-2017_08-18
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 bjs/simmons

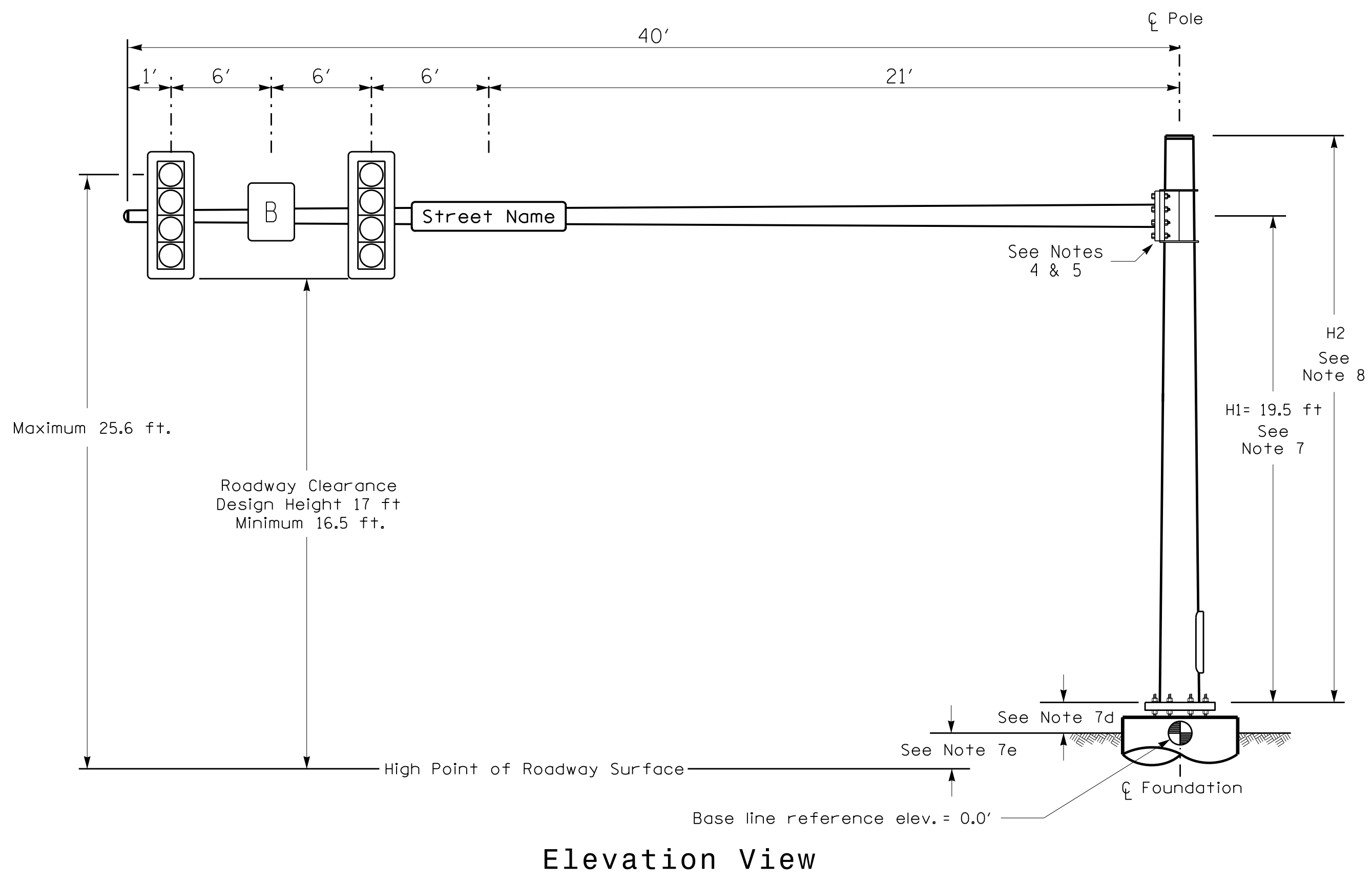
SPECIAL NOTE
 The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

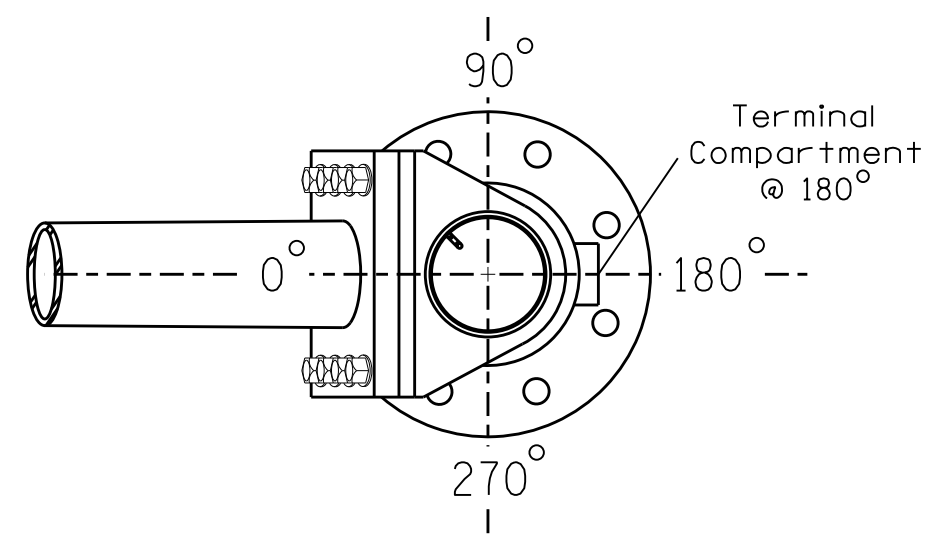
| | |
|--|----------|
| Elevation Differences for: | Pole 7 |
| Baseline reference point at ϕ Foundation @ ground level | 0.0 ft. |
| Elevation difference at High point of roadway surface | +0.5 ft. |
| Elevation difference at Edge of travelway or face of curb | N/A |

| MAST ARM LOADING SCHEDULE | | | | |
|---------------------------|---|-----------|-------------------------|--------|
| LOADING SYMBOL | DESCRIPTION | AREA | SIZE | WEIGHT |
| | RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE | 11.5 S.F. | 25.5" W X 66.0" L | 74 LBS |
| | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 LBS |
| | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |

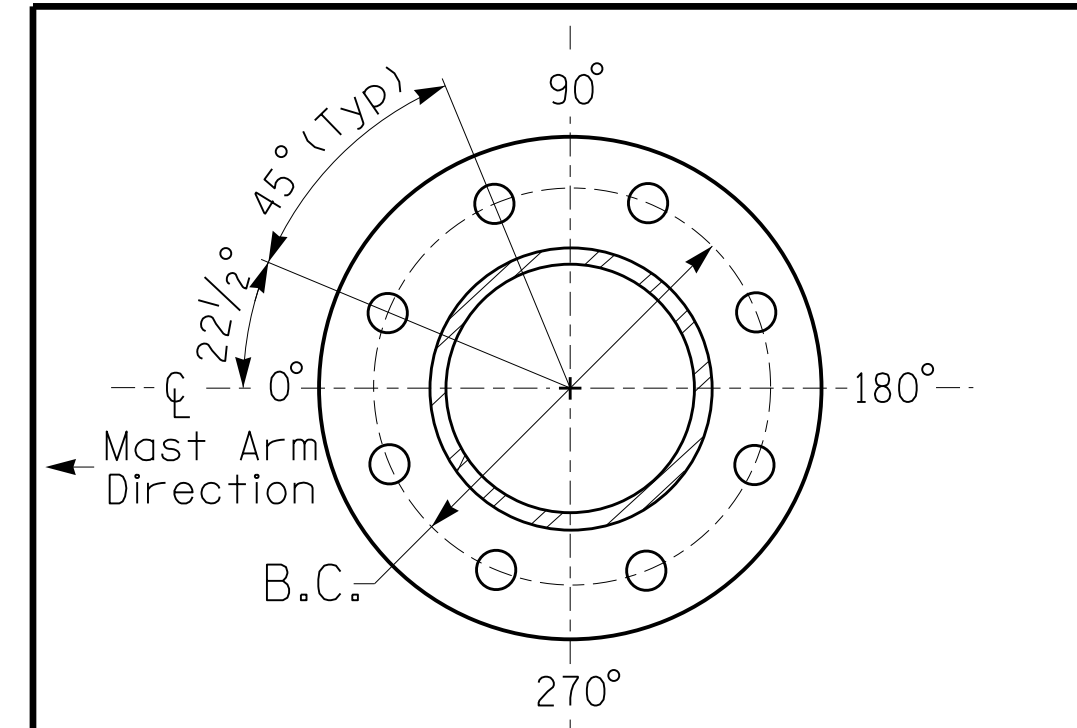
Design Loading for METAL POLE NO. 7



Elevation View

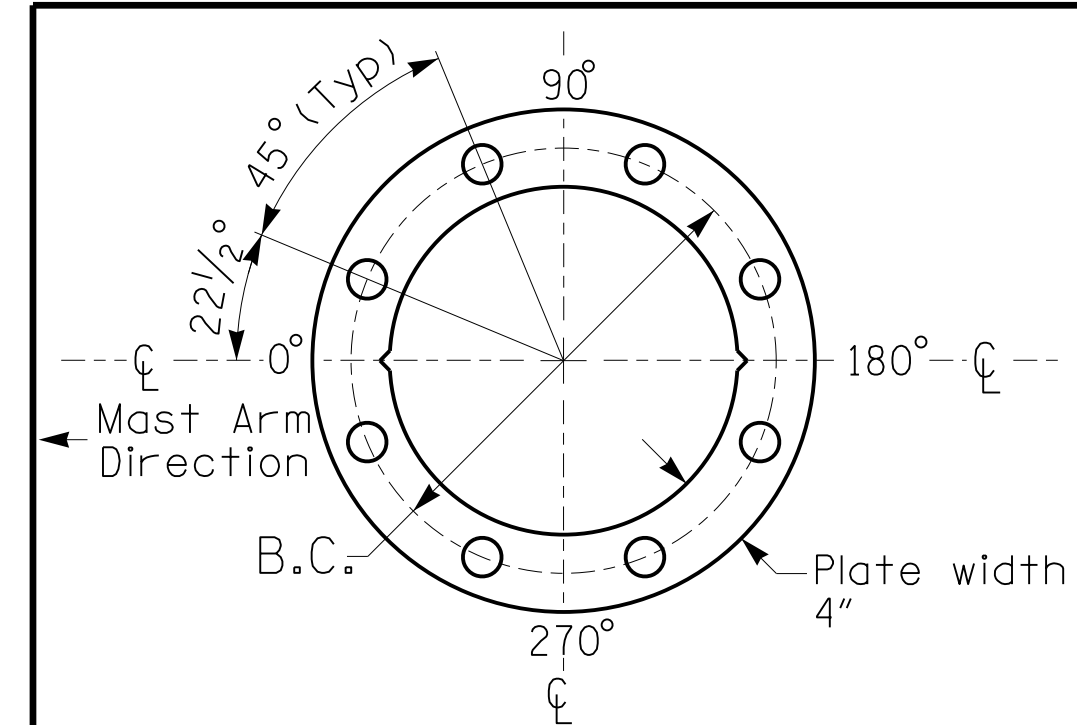


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
 For 8 Bolt Base Plate

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
- Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

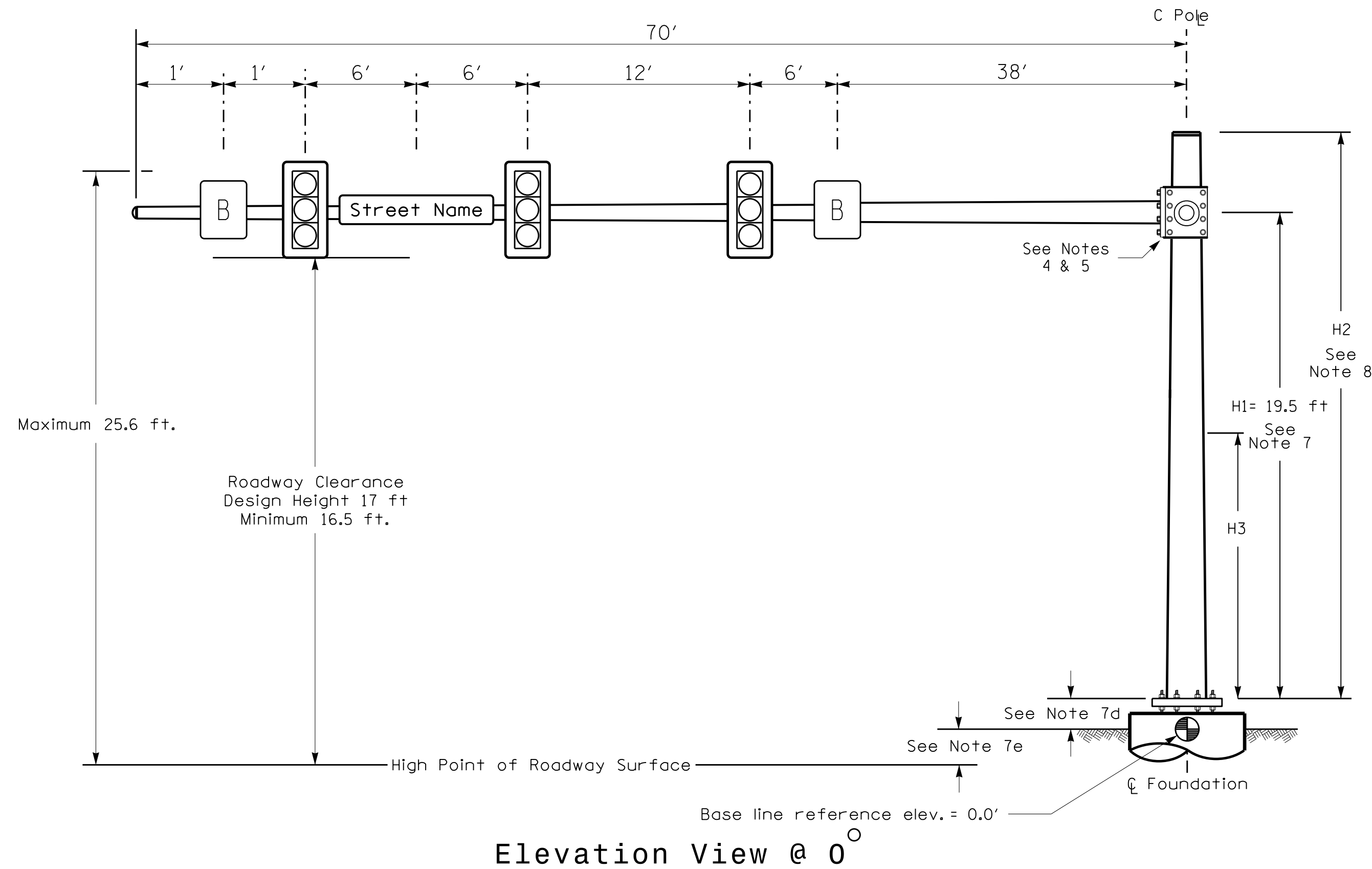
NCDOT Wind Zone 4 (90 MPH)

| | | | |
|---|--|--|--|
| Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION DIVISION OF WORKS CONSTRUCTION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529 | NC 119 at I-40 WB/I-85 SB Ramps | | SEAL ROBERT J. ZIEMBA ENGINEER 026486 |
| | Division 7 Alamance County Mebane PLAN DATE: January 2017 REVIEWED BY: PREPARED BY: I. O. Umozurike REVIEWED BY: | REVISIONS INIT. DATE _____ _____ | |
| SCALE 0 N/A N/A | 1/30/2017 DATE | | SIG. INVENTORY NO. 07-0441 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

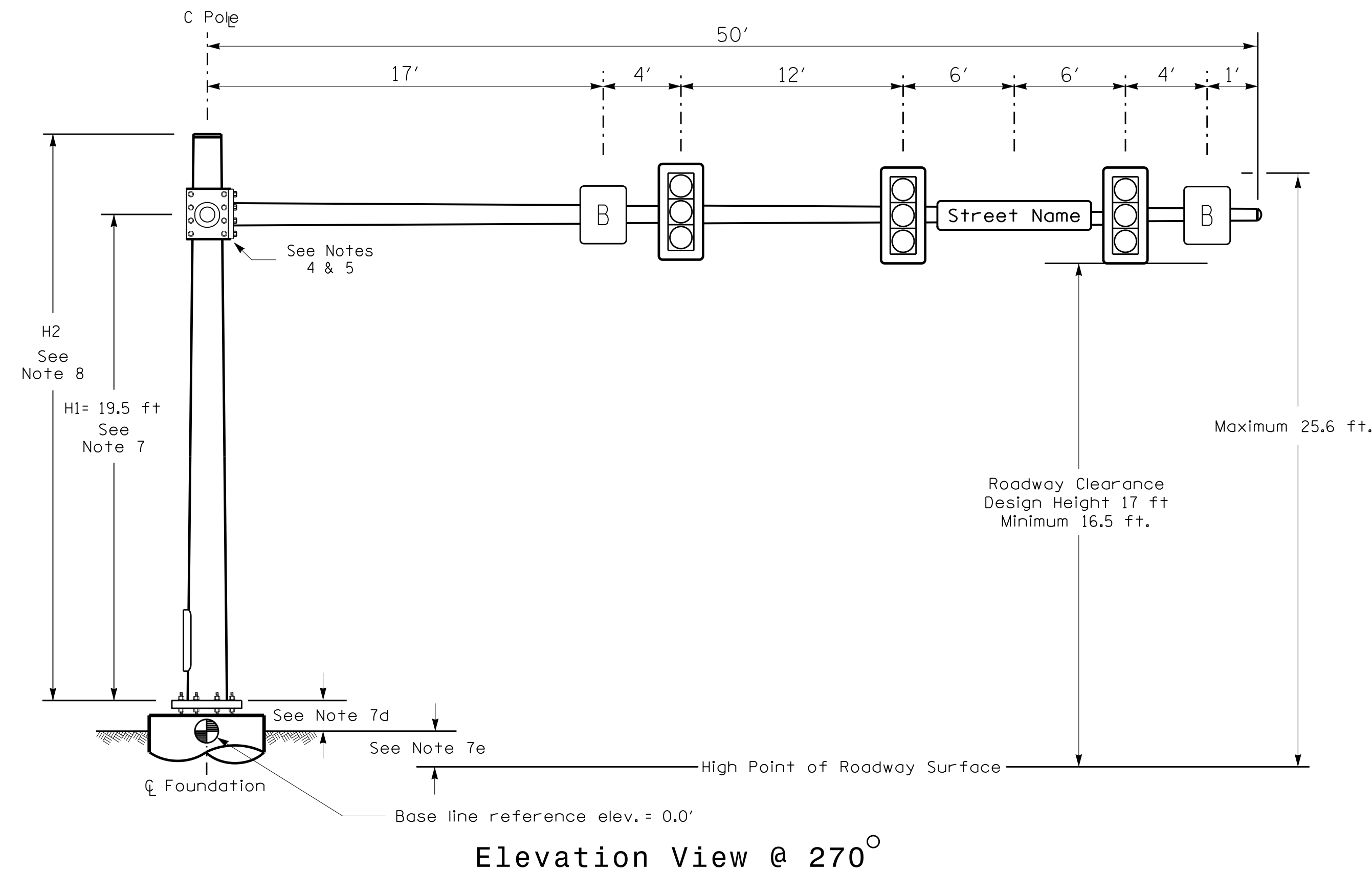
3D-1116-2017-14225
 R:\Projects\1116\1116.dwg
 RZ:tergo

Design Loading for METAL POLE NO. 8, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 8, MAST ARM B



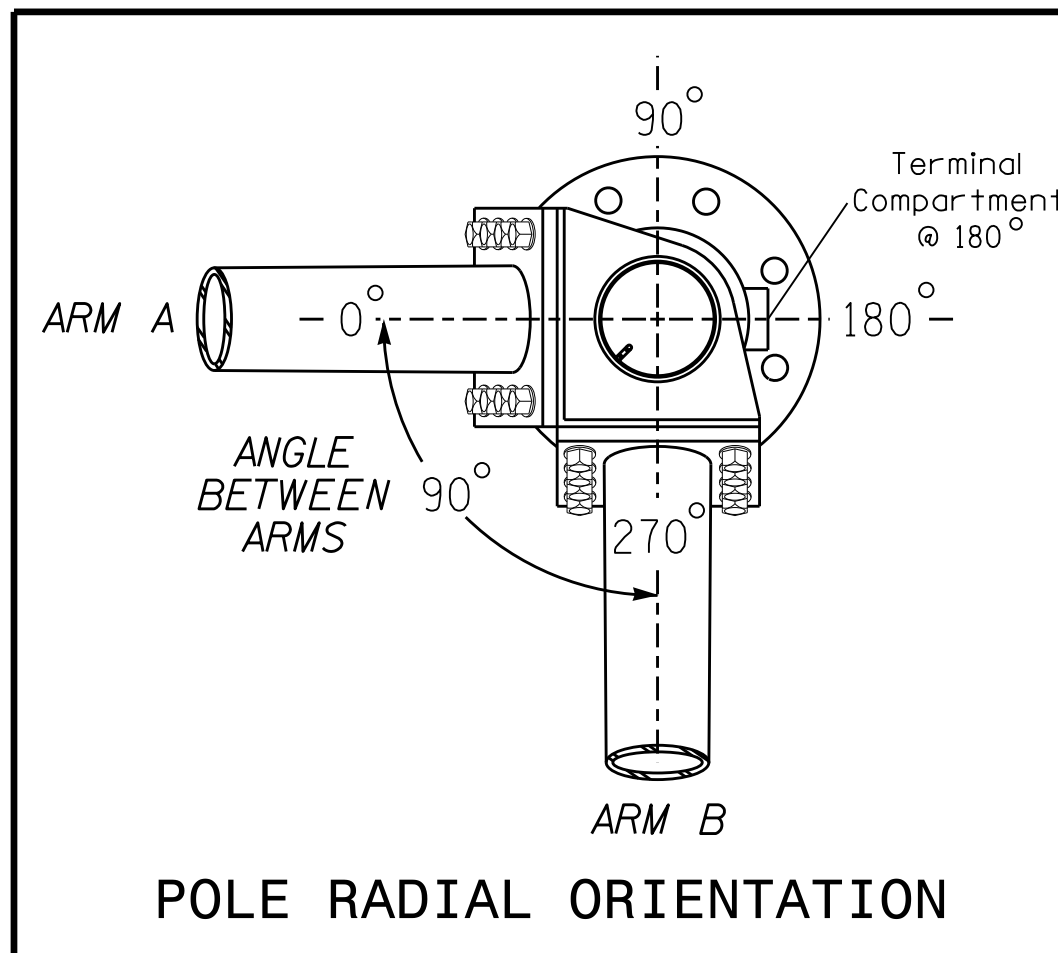
Elevation View @ 270°

SPECIAL NOTE

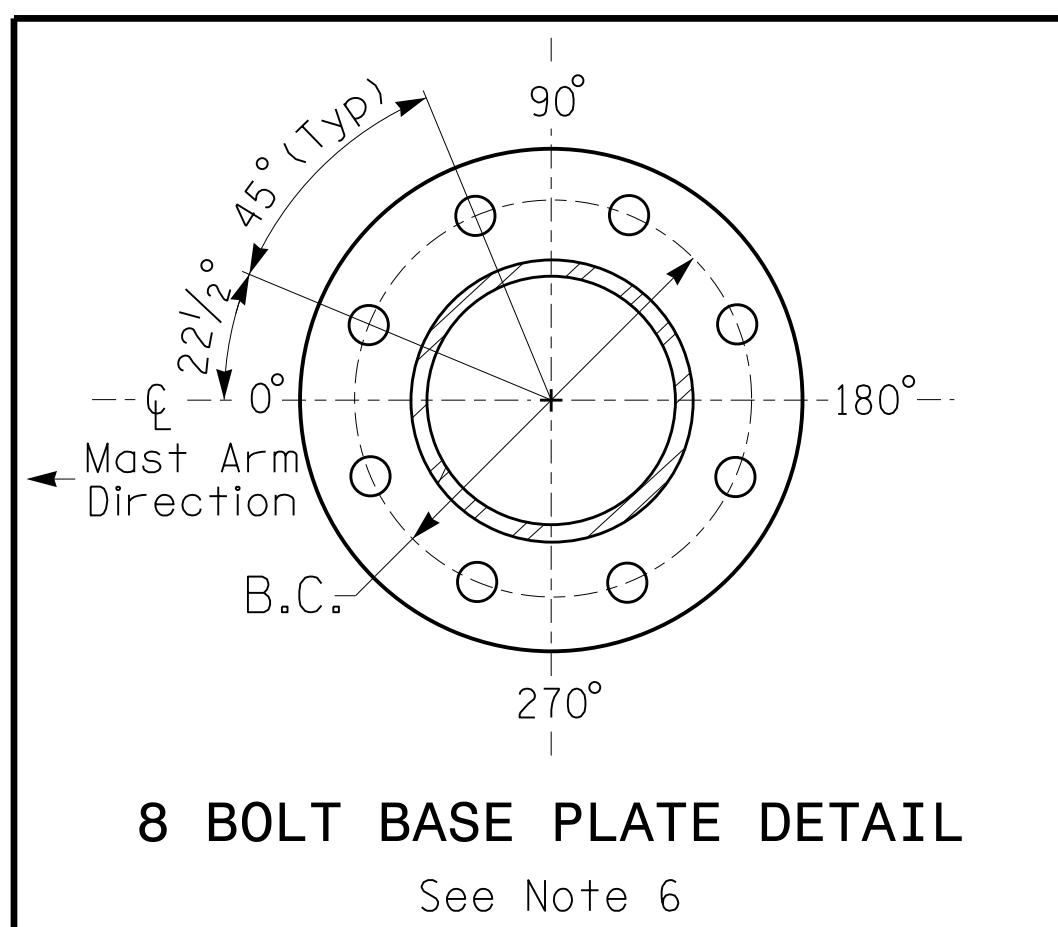
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

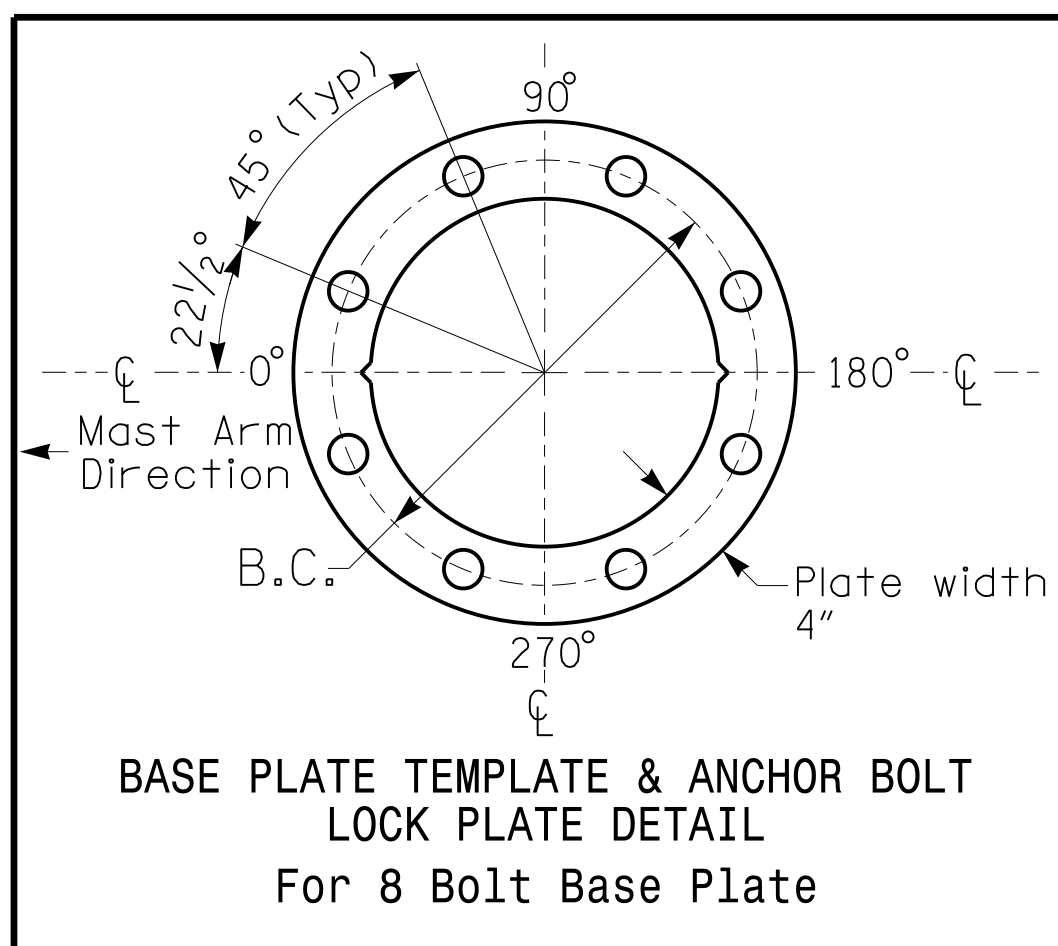
| Elevation Differences for: | Pole A | Pole B |
|---|----------|----------|
| Baseline reference point at Foundation @ ground level | 0.0 ft. | 0.0 ft. |
| Elevation difference at High point of roadway surface | +0.5 ft. | +0.5 ft. |
| Elevation difference at Edge of travelway or face of curb | N/A | N/A |



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL For 8 Bolt Base Plate

METAL POLE No. 8

MAST ARM LOADING SCHEDULE

| LOADING SYMBOL | DESCRIPTION | AREA | SIZE | WEIGHT |
|---------------------------|--|-----------|-------------------|--------|
| [Signal Head Symbol] | RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE | 9.3 S.F. | 25.5" W X 52.5" L | 60 LBS |
| [Sign Symbol] | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 LBS |
| [Street Name Sign Symbol] | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 MPH)

Prepared In the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 WB/I-85 SB Ramps
 Division 7 Alamance County Mebane
 PLAN DATE: January 2017 REVIEWED BY:
 PREPARED BY: I. O. Umzurike REVIEWED BY:
 REVISIONS INIT. DATE
 SCALE N/A
 N/A

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

 SEAL 026486
 ROBERT J. ZIEMBA
 ENGINEER
 1/30/2017
 DATE
 SIG. INVENTORY NO. 07-0441

30-1116-2017_14258
 R:\Projects\170130\170130.dgn
 RZ:tergo

PHASING DIAGRAM

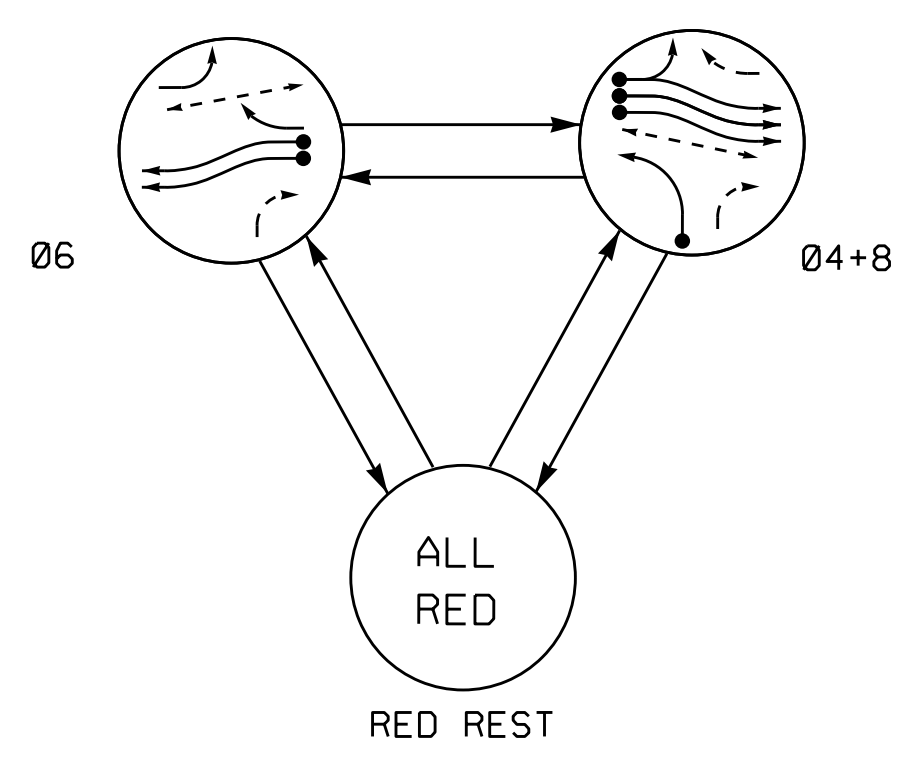
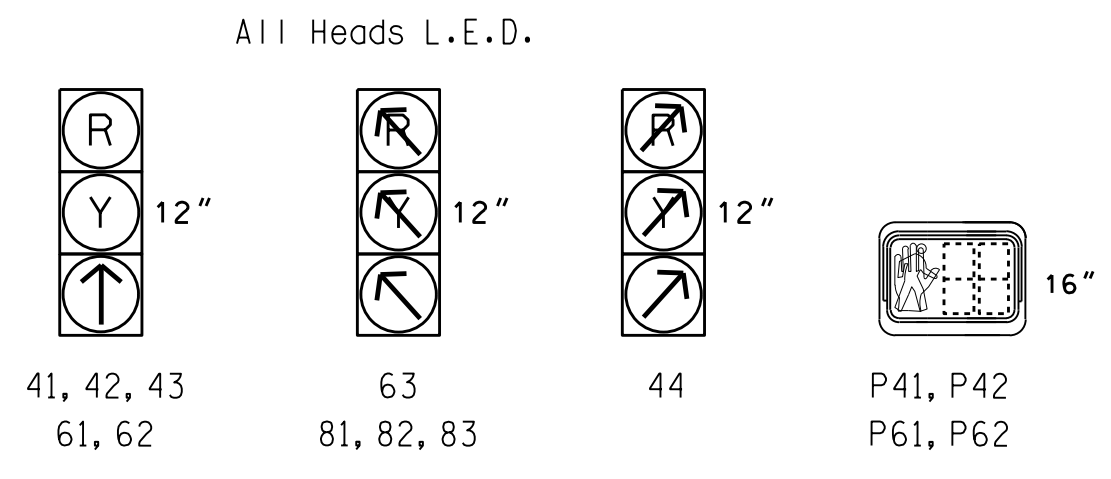


TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|------|---------|
| | 06 | 04+8 | WALK | ALL RED |
| 41, 42, 43 | R | ↑ | R | R |
| 44 | ↗ | ↘ | ↗ | ↘ |
| 61, 62 | ↑ | R | R | R |
| 63 | ↘ | ↗ | ↘ | ↗ |
| 81, 82, 83 | ↗ | ↘ | ↗ | ↘ |
| P41, P42 | DW | W | DW | DRK |
| P61, P62 | W | DW | DW | DRK |

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

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

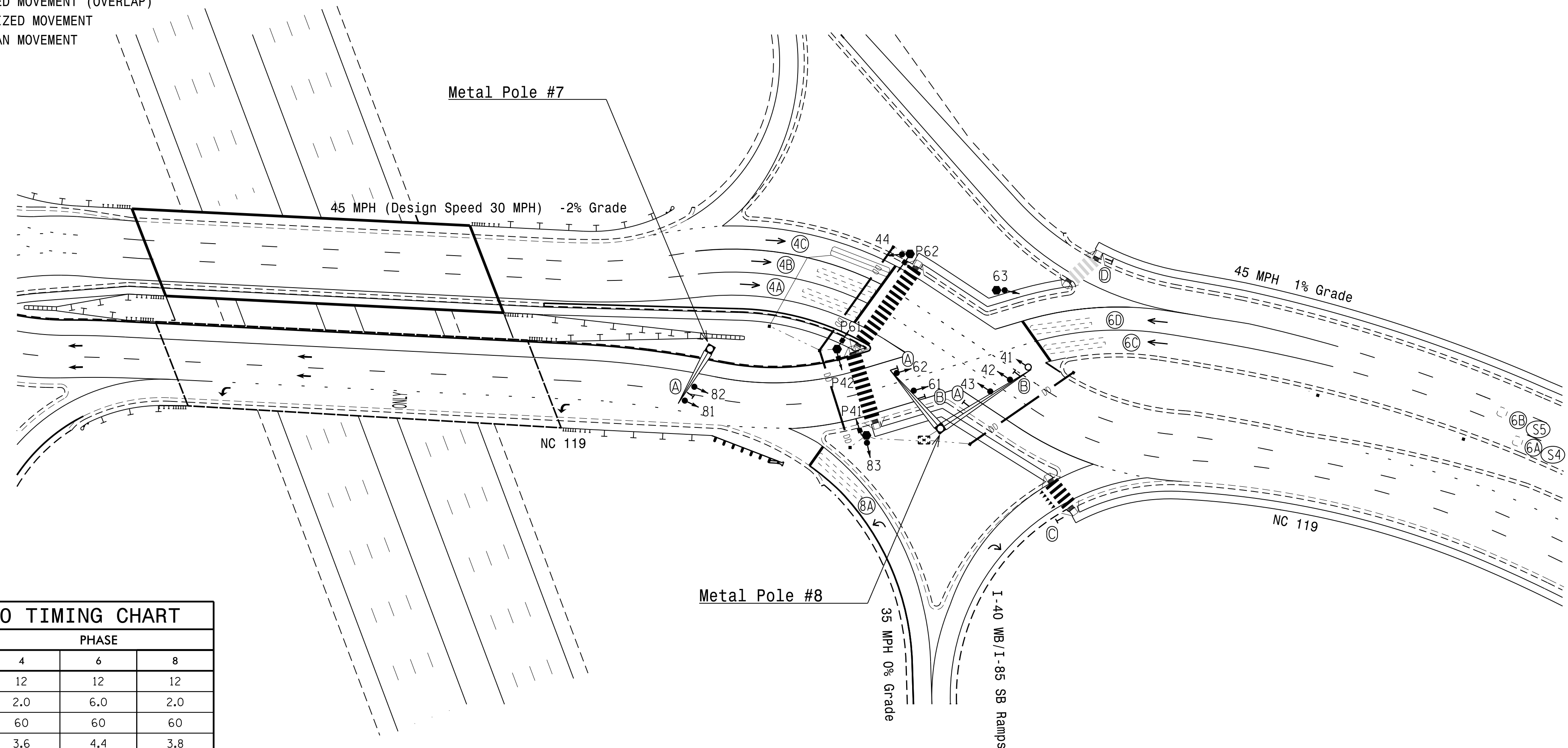
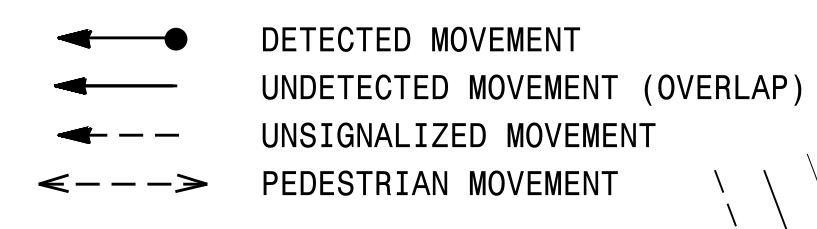
| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | | | |
|-------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD |
| 4A | 6X40 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | - | - | - |
| 4B | 6X40 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | - | - | - |
| 4C | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | - | - | - |
| 6A/S4 | 6X6 | 300 | 5 | - | 6 | - | Y | - | - | - | - | Y |
| 6B/S5 | 6X6 | 300 | 5 | - | 6 | - | Y | - | - | - | - | Y |
| 6C | 6X40 | 0 | 2-4-2 | - | 6 | Y | Y | - | - | - | - | - |
| 6D | 6X40 | 0 | 2-4-2 | - | 6 | Y | Y | - | - | - | - | - |
| 8A | 6X40 | 0 | 2-4-2 | - | 8 | Y | Y | - | - | - | - | - |

2 Phase Fully Actuated (NC 119 CLS)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Program all phases for Red Rest.
- Program controller to start up in phase 6 green.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0441.

PHASING DIAGRAM DETECTION LEGEND

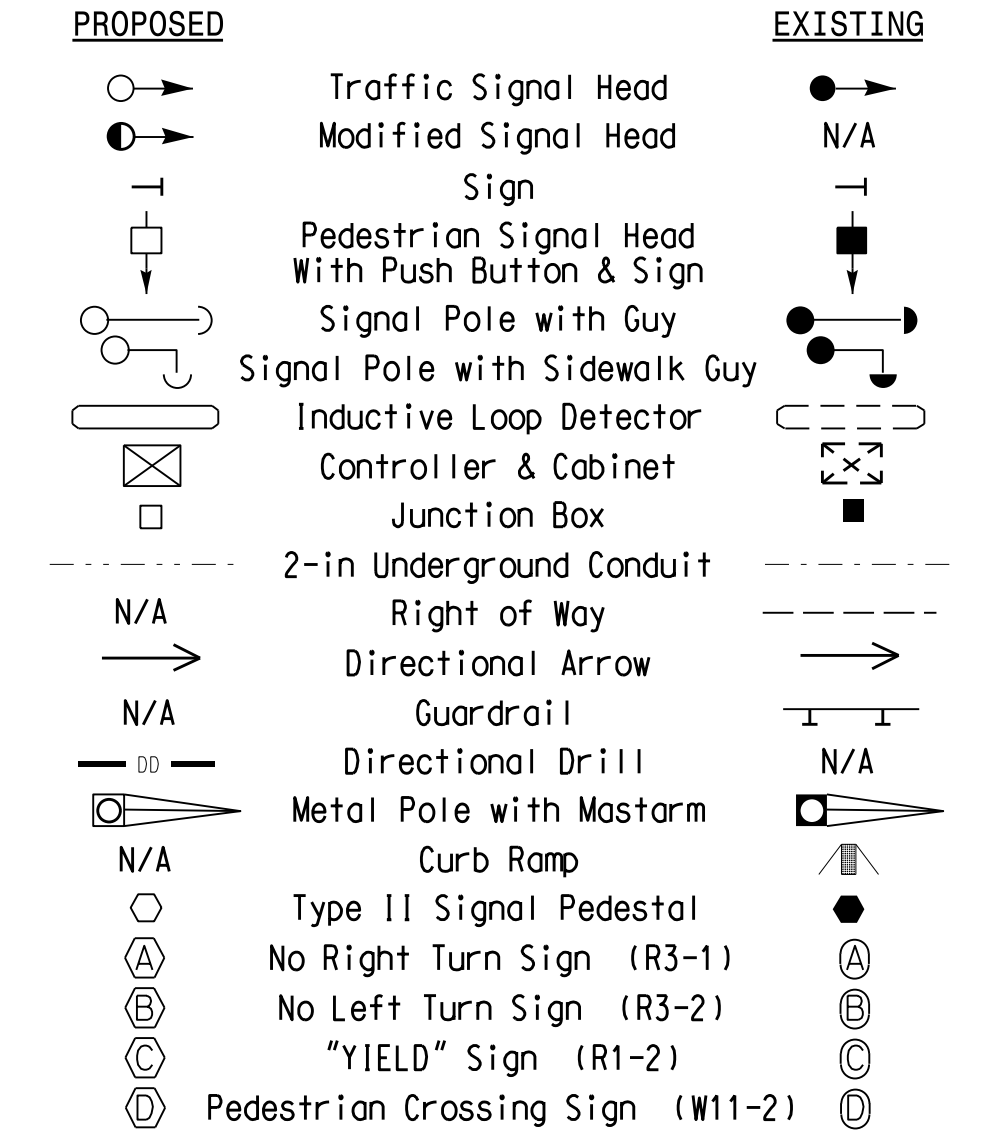


OASIS 2070 TIMING CHART

| FEATURE | PHASE | | |
|------------------------|-------|-----|-----|
| | 4 | 6 | 8 |
| Min Green 1* | 12 | 12 | 12 |
| Extension 1* | 2.0 | 6.0 | 2.0 |
| Max Green 1* | 60 | 60 | 60 |
| Yellow Clearance | 3.6 | 4.4 | 3.8 |
| Red Clearance | 2.3 | 3.7 | 1.0 |
| Red Revert | 2.0 | 2.0 | 2.0 |
| Walk 1* | 4 | 4 | - |
| Don't Walk 1 | 9 | 24 | - |
| Seconds Per Actuation* | - | - | - |
| Max Variable Initial* | - | - | - |
| Time Before Reduction* | - | 15 | - |
| Time To Reduce* | - | 30 | - |
| Minimum Gap | - | 3.0 | - |
| Recall Mode | - | - | - |
| Vehicle Call Memory | - | - | - |
| Dual Entry | ON | - | ON |
| Simultaneous Gap | ON | ON | ON |
| Red Rest | ON | ON | ON |

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

LEGEND



Signal Upgrade - Final Design

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 WB/I-85 SB Ramps

Division 7 Alamance County Mebane

PLAN DATE: November 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE: 0 50 1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

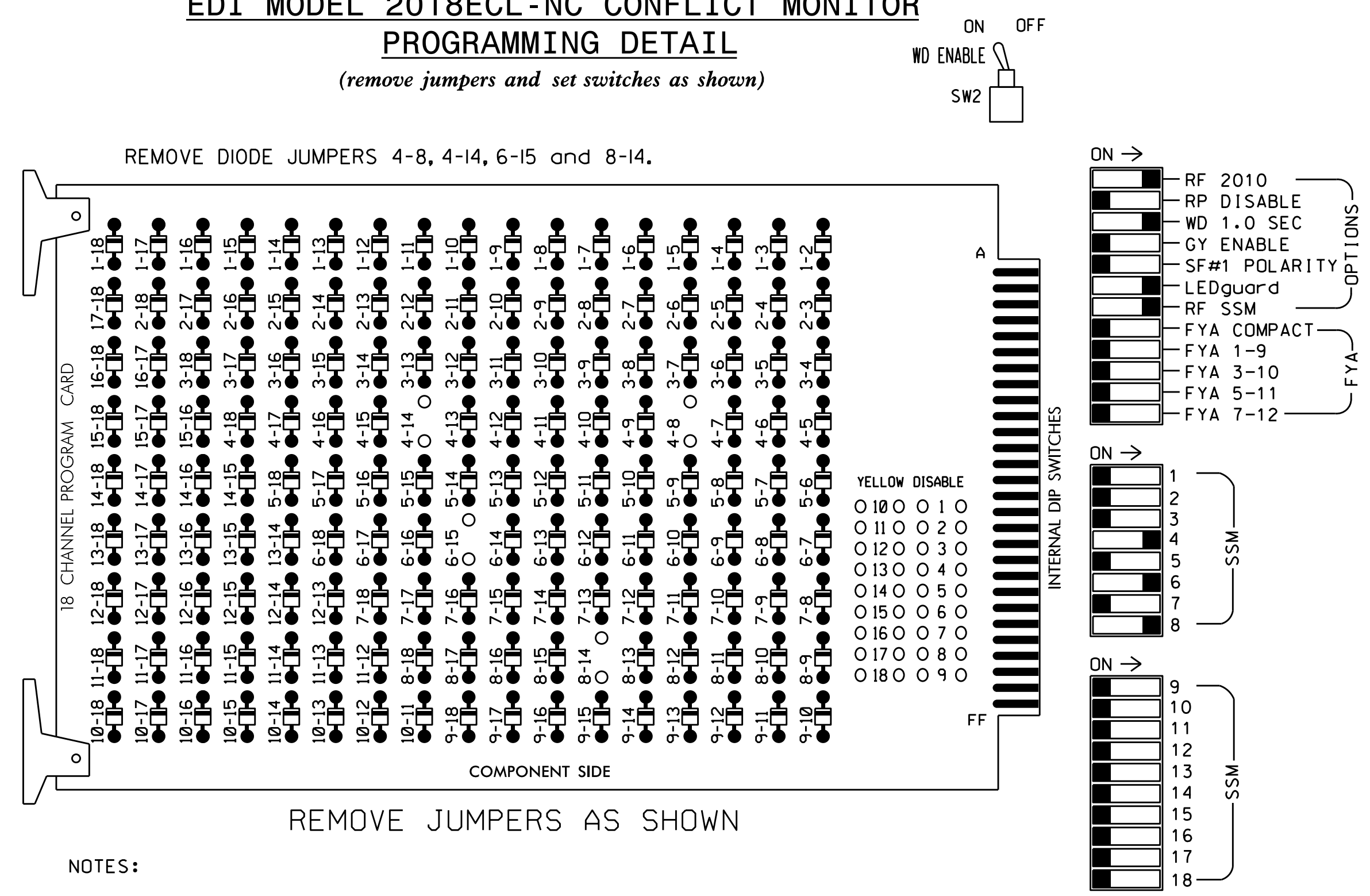
1/25/2017

SIG. INVENTORY NO. 07-0441

27-1116-2017_12251
 R:\Projects\2017\12251\12251.dwg
 R:\Projects\2017\12251\12251.dwg
 R:\Projects\2017\12251\12251.dwg

EDI MODEL 2018ECL-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.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 6 for Gap Reduction.
- Program phase 6 for Start Up In Green.
- Program phases 4 and 6 for 'STARTUP PED CALL'.
- Program phases 4, 6 and 8 for Red Rest.
- The cabinet and controller are part of the NC 119 CLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD; 6-AUX)
 LOAD SWITCHES USED.....S5,S6,S8,S9,S11
 PHASES USED.....4,4 PED,6,6 PED,8
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

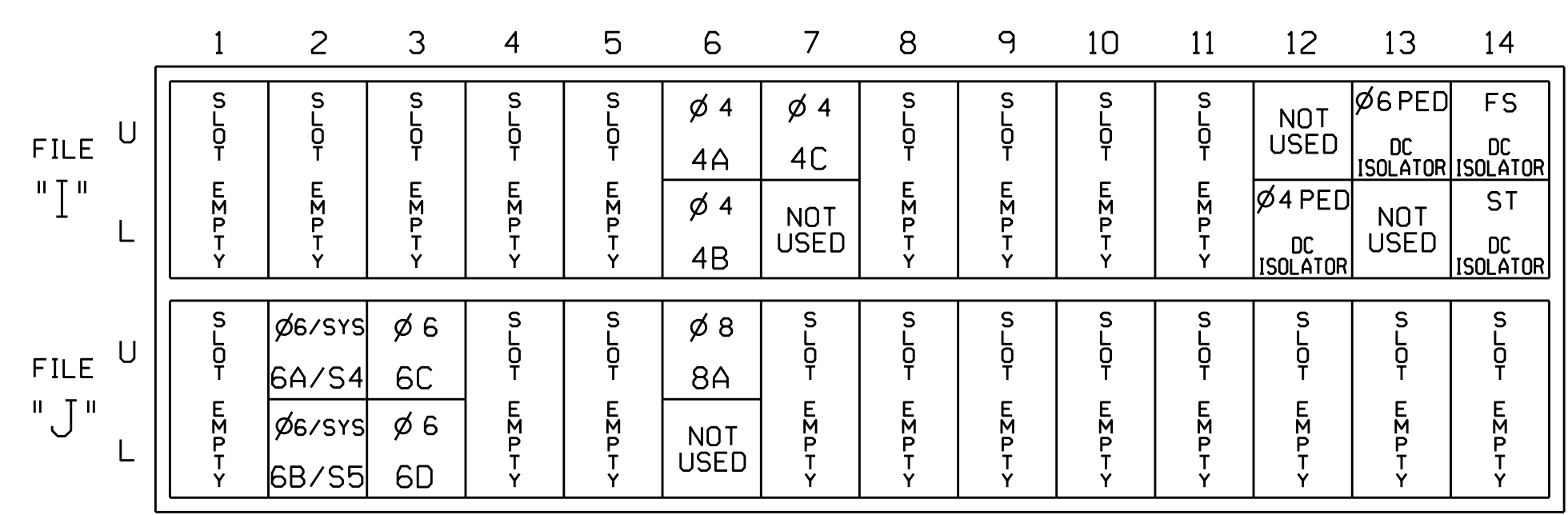
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|----|----|-------|----|----------|-------|----------|----|-------|-----|----------|-------|----------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | NU | NU | NU | 41,42,43 | 44 | P41, P42 | NU | 61,62 | 63 | P61, P62 | NU | 81,82,83 | NU | NU | NU | NU | NU |
| RED | | | | | 101 | | | | 134 | | | | | | | | | |
| YELLOW | | | | | 102 | | | | 135 | | | | | | | | | |
| GREEN | | | | | | | | | | | | | | | | | | |
| RED ARROW | | | | | 101 | | | | 134 | | | 107 | | | | | | |
| YELLOW ARROW | | | | | 102 | | | | 135 | | | 108 | | | | | | |
| GREEN ARROW | | | | | 103 | 103 | | | 136 | 136 | | 109 | | | | | | |
| Hand icon | | | | | | | 104 | | | | 119 | | | | | | | |
| Person icon | | | | | | | 106 | | | | 121 | | | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

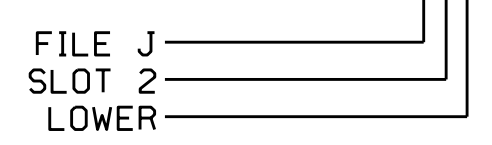
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|------------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 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 | | | |
| 6A/S4 | TB3-5,6 | J2U | 40 | 2 | 6 | 6/SYS | | Y | | | |
| 6B/S5 | TB3-7,8 | J2L | 44 | 6 | 16 | 6/SYS | | Y | | | |
| 6C | TB3-9,10 | J3U | 64 | 26 | 36 | 6 | Y | Y | | | |
| 6D | TB3-11,12 | J3L | 77 | 39 | 46 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P41,P42 | TB8-5,6 | I12L | 69 | 31 | PED 4 | 4 PED | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | PED 6 | 6 PED | | | | | |

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0441
 DESIGNED: November 2016
 SEALED: 1/25/17
 REVISED: N/A

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

Electrical Detail - Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY
 NORTH CAROLINA PROFESSIONAL ENGINEERS
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at I-40 WB/I-85 SB Ramps

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: B. SIMMONS REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: *Elizabeth M. Little* 1/30/2017

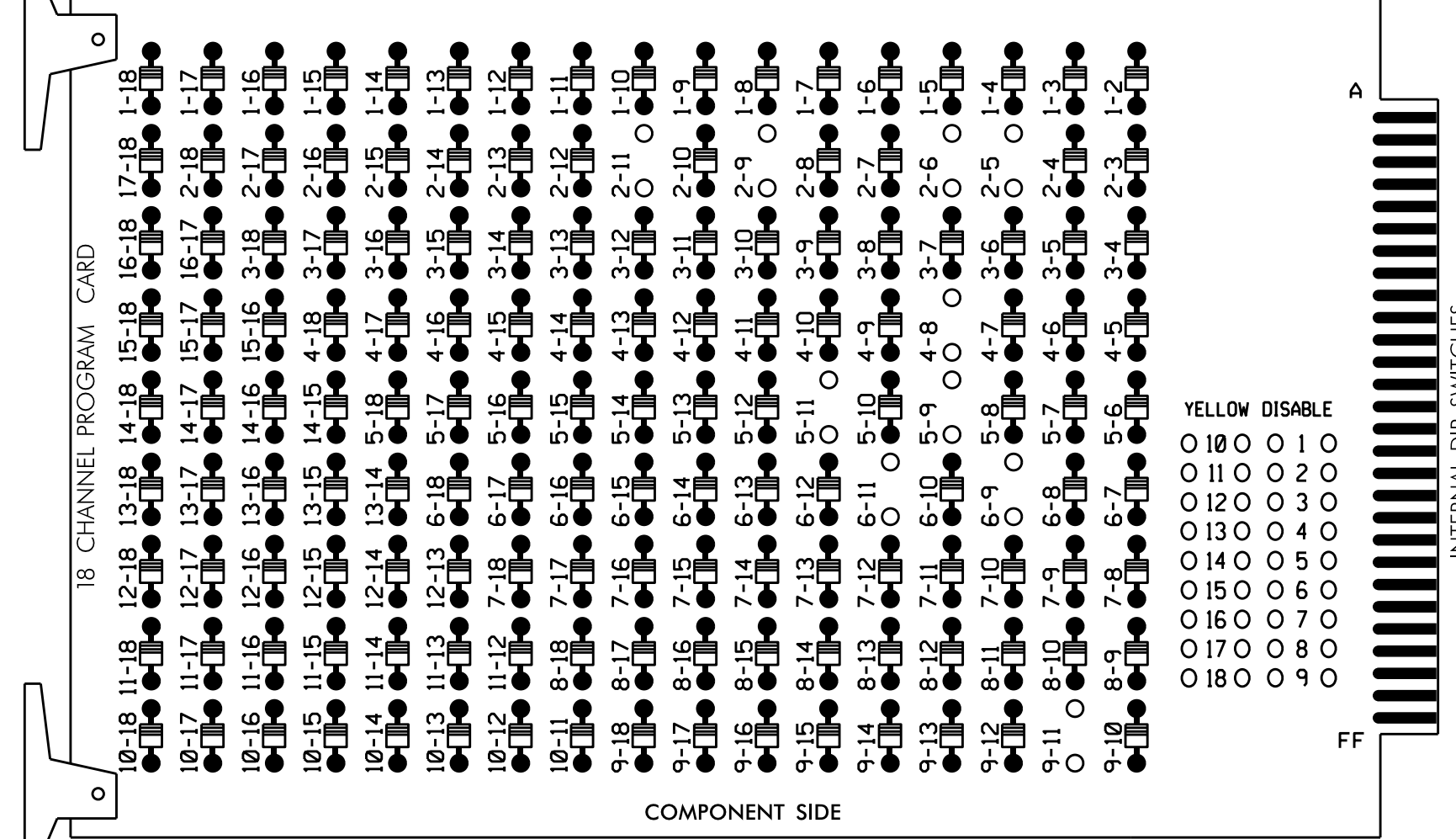
SIG. INVENTORY NO. 07-0441

30-1116-2017_08-17
 S:\IT\SS\115\Sig\Signal\working\07-0441_smc.ele.xxx.dgn
 bjs/simmons

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

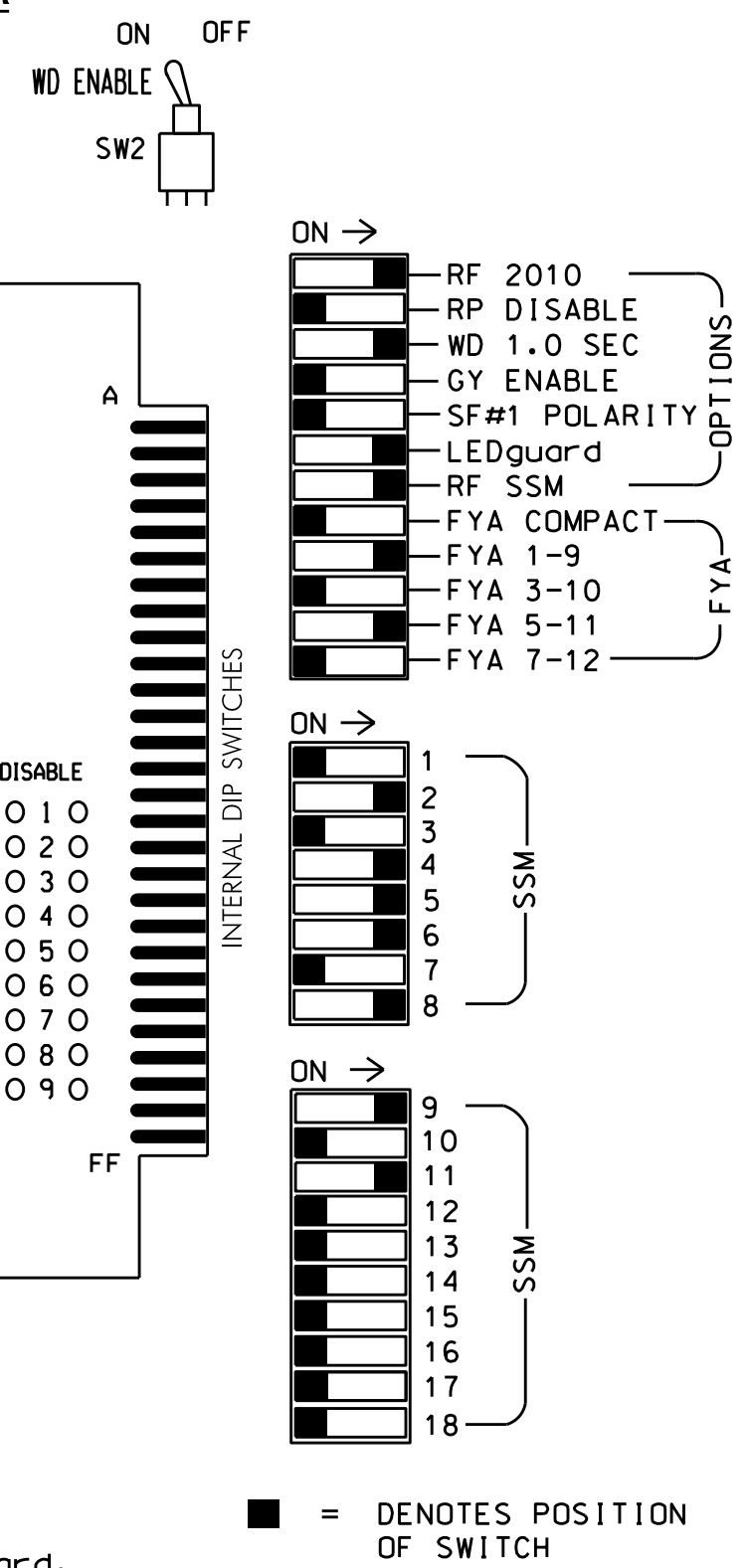
REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.



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.
- Program phases 4 and 8 for Dual Entry.
- 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.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S7,S8,S11,AUX S1,AUX S4
 PHASES USED.....2,4,5,6,8
 OVERLAP "A".....2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

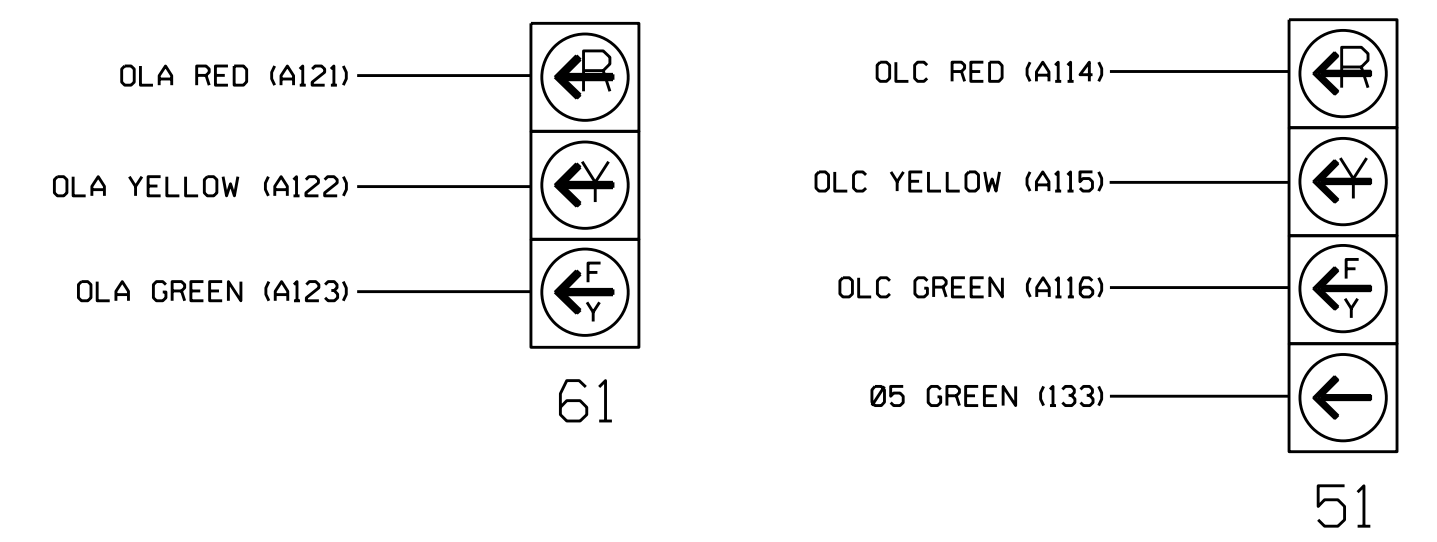
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------------|----|-------|-------|----|-----------|-------|----|-----|-------|-----|-----|-----------|--------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 42 | 51 | 62,63 | NU | NU | 81, 82,83 | NU | 61 | NU | NU | 51 | 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 | | | | | | | | 133 | 133 | | | | | | | | | |

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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
 ST = STOP TIME

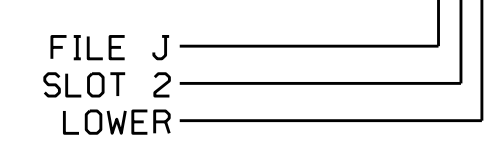
⊗ Wired Input - Do not populate slot with detector card

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 |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2B/S7 | TB2-7,8 | I2L | 43 | 5 | 12 | 2/SYS | Y | Y | | | |
| 2C/S8 | TB2-9,10 | I3U | 63 | 25 | 32 | 2/SYS | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | Y | Y | | | | 3 |
| 5A ¹ | TB3-1,2 | J1U | 55 | 17 | 5 | Y | Y | | | | 15 |
| | - | I4U | 47 | 9 | 22 | Y | Y | Y | | | 3 |
| 5B | TB4-11,12 | I6L | 45 | 7 | 14 | Y | Y | | | | 15 |
| 6A/S9 | TB3-5,6 | J2U | 40 | 2 | 6 | 6/SYS | Y | Y | | | |
| 6B | TB3-7,8 | J2L | 44 | 6 | 16 | 6 | Y | Y | Y | | 3 |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 5 |

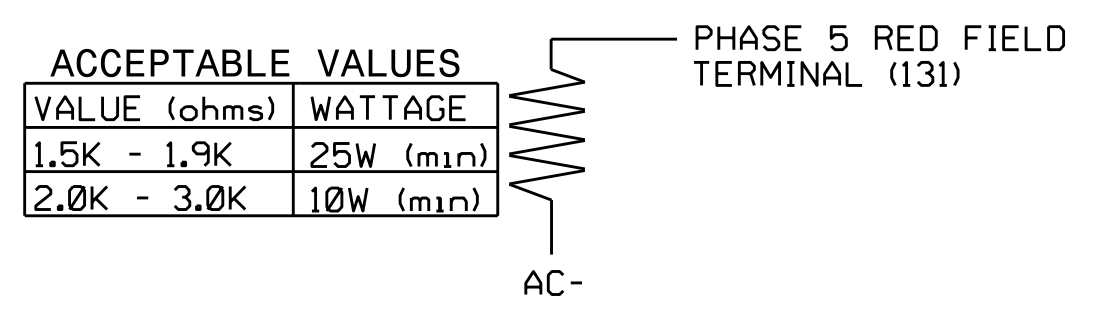
¹Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0442T
 DESIGNED: November 2016
 SEALED: 1/24/2017
 REVISED:

Electrical Detail - Temp - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 Transportation Mobility and Safety
 NORTH CAROLINA PROFESSIONAL SEAL 030530
 JACOBARY M. LITTLE ENGINEER

NC 119 at SR 1980 (Holmes Road)

Division 7 Alamance County Mebane
 PLAN DATE: January 2017 REVIEWED BY: T. Joyce
 PREPARED BY: C. Strickland REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DocuSigned by: *Carlynn M. Little* 1/26/2017
 DATE: 1/26/2017
 SIG. INVENTORY NO. 07-0442T

26-1116-2017 10:41
 S:\IT\501\115\Sig\01\work\hous\51g_Maps\1116\1042_sml_e.xxx.dgn
 C:\Users\jckland

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

(program controller as shown below)

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

```

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

      ↓
      SCROLL DOWN

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

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

```

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

      ↓
      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF
    
```

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

```

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

      ↓
      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON
    
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

```

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


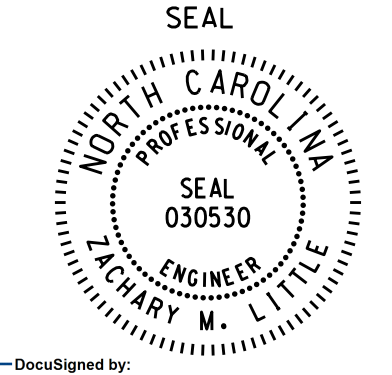
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0442T
 DESIGNED: November 2016
 SEALED: 1/24/2017
 REVISED:

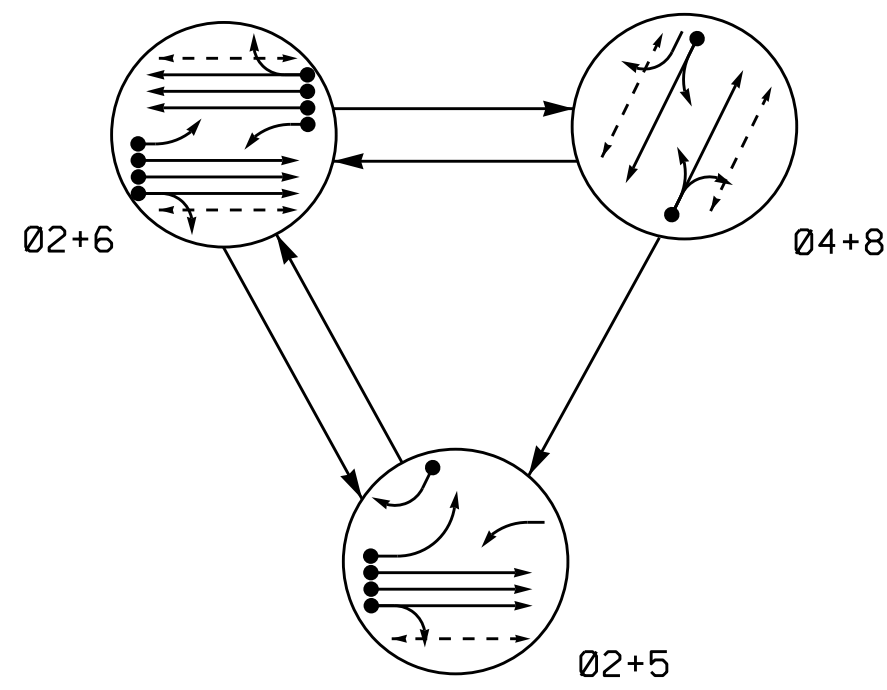
Electrical Detail - Temp - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

| | | | |
|--|---|--|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of:  | NC 119 at SR 1980 (Holmes Road) | | SEAL  |
| | Division 7 PLAN DATE: January 2017 PREPARED BY: C. Strickland | Alamance County REVIEWED BY: T. Joyce REVIEWED BY: | Mebane 1/26/2017 DATE |

05-1116-2017_07-50
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 cbsr:ckland

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

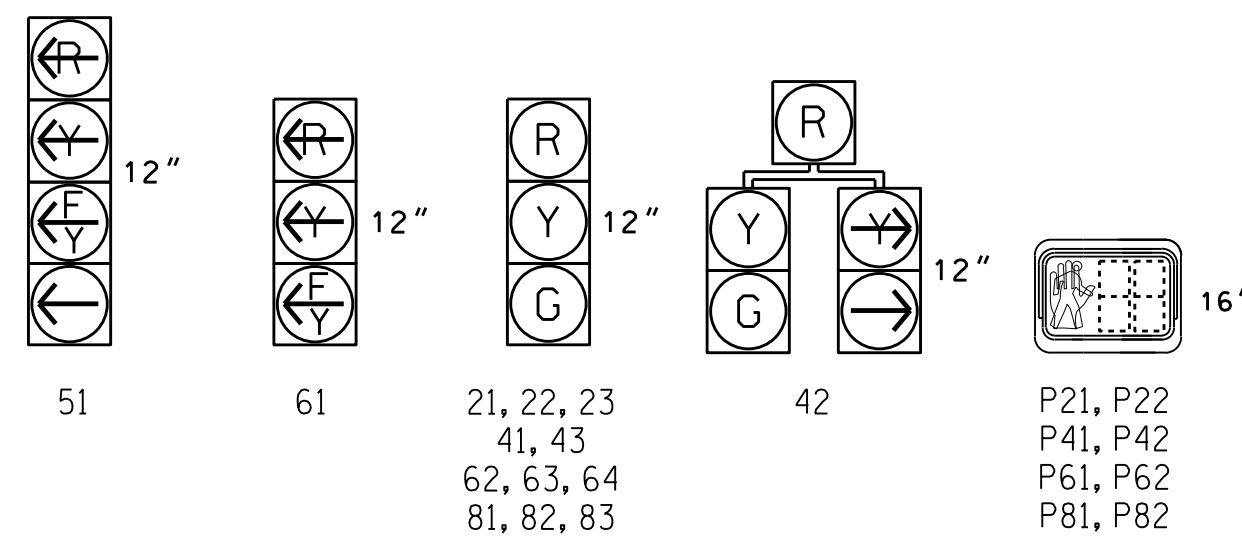
TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | FLASH |
|-------------|-------|-------|-------|-------|-------|
| | Ø 2+5 | Ø 2+6 | Ø 4+8 | Ø 2+5 | |
| 21, 22, 23 | G | R | G | R | Y |
| 41, 43 | R | R | G | R | |
| 42 | R | R | G | R | |
| 51 | --- | --- | --- | --- | --- |
| 61 | --- | --- | --- | --- | --- |
| 62, 63, 64 | R | G | R | Y | |
| 81, 82, 83 | R | R | G | R | |
| P21, P22 | W | W | DW | DRK | |
| P41, P42 | DW | DW | W | DRK | |
| P61, P62 | DW | W | DW | DRK | |
| P81, P82 | DW | DW | W | DRK | |

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

SIGNAL FACE I.D.

All Heads L.E.D.



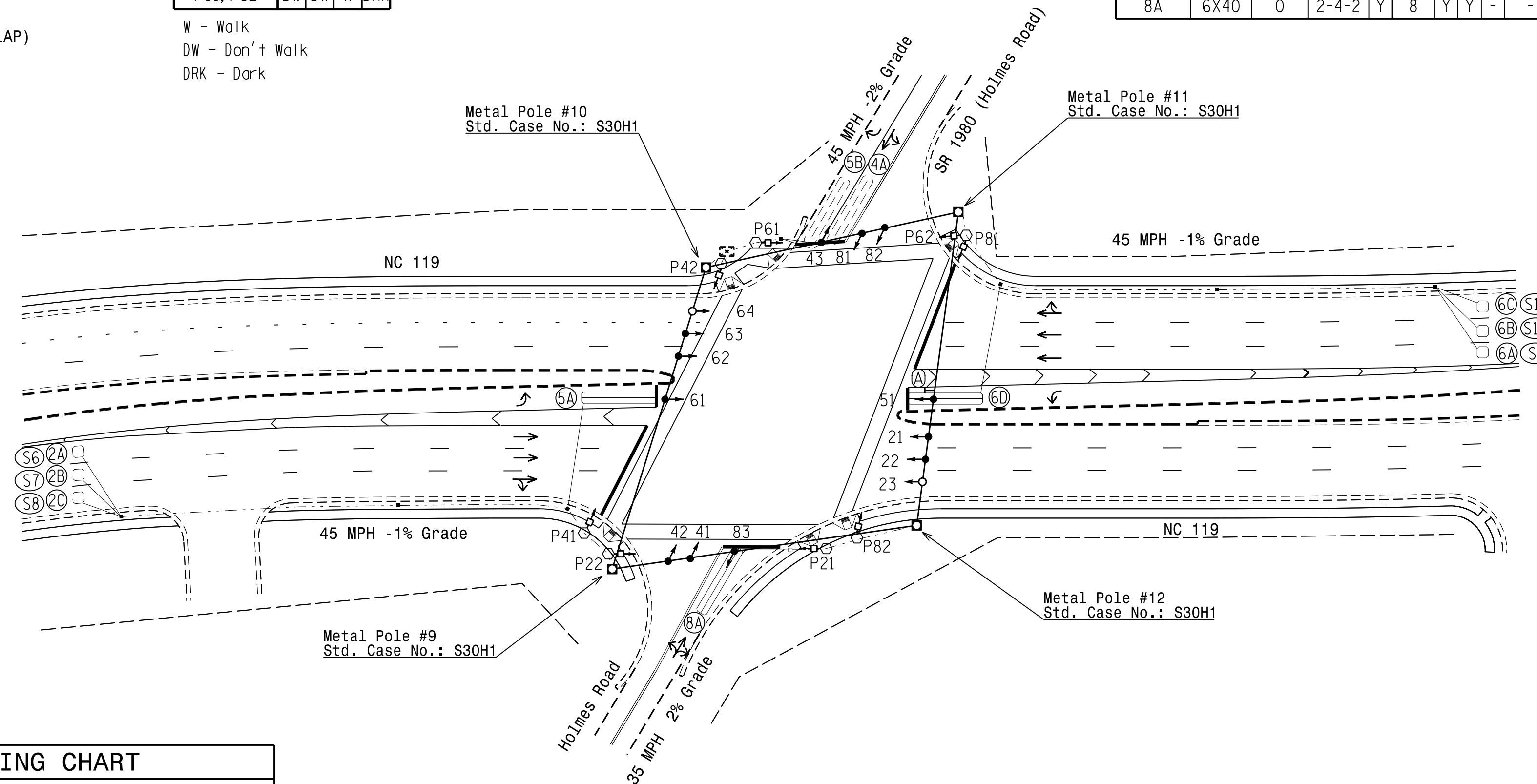
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| 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/S6 | 6X6 | 300 | 5 | Y | 2 | Y | Y | - | - | - | Y |
| 2B/S7 | 6X6 | 300 | 5 | - | 2 | Y | Y | - | - | - | - |
| 2C/S8 | 6X6 | 300 | 5 | - | 2 | Y | Y | - | - | - | - |
| 4A | 6X6 | 0 | 2-4-2 | - | 4 | Y | Y | - | - | 3 | - |
| 5A | 6X40 | 0 | 2-4-2 | Y | 5 | Y | Y | - | - | 15 | - |
| 5B | 6X6 | 0 | 2-4-2 | - | 5 | Y | Y | - | - | 15 | - |
| 6A/S9 | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - |
| 6B/S10 | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | Y |
| 6C/S11 | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | Y |
| 6D | 6X40 | 0 | 2-4-2 | Y | 6 | Y | Y | Y | - | 3 | - |
| 8A | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | 5 | - |

3 Phase Fully Actuated (NC 119 CLS)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Reposition existing signal heads 21, 22, 51, 61, 62, and 63.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #: 0442.



OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | |
|-------------------------|------------|-----|-----|------------|-----|
| | 2 | 4 | 5 | 6 | 8 |
| Min Green 1 * | 12 | 7 | 7 | 12 | 7 |
| Extension 1 * | 6.0 | 2.0 | 2.0 | 6.0 | 2.0 |
| Max Green 1 * | 90 | 15 | 25 | 90 | 25 |
| Yellow Clearance | 4.6 | 3.0 | 3.0 | 4.6 | 3.7 |
| Red Clearance | 2.1 | 3.7 | 3.7 | 2.1 | 4.2 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1 * | 7 | 7 | - | 7 | 7 |
| Don't Walk 1 | 26 | 37 | - | 22 | 41 |
| Seconds Per Actuation * | 2.5 | - | - | 2.5 | - |
| 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 | - | 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.

LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ 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 | ⊥ Controller & Cabinet |
| ⊥ Junction Box | ⊥ Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| N/A Curb Ramp | → Curb Ramp |
| ○ Metal Strain Pole | ○ Metal Strain Pole |
| ○ Type II Signal Pedestal | ○ Type II Signal Pedestal |
| ⊥ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | ⊥ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) |

Signal Upgrade - Final Design

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at SR 1980 (Holmes Road)

Division 7 Alamance County Mebane

PLAN DATE: November 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 0 50
1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

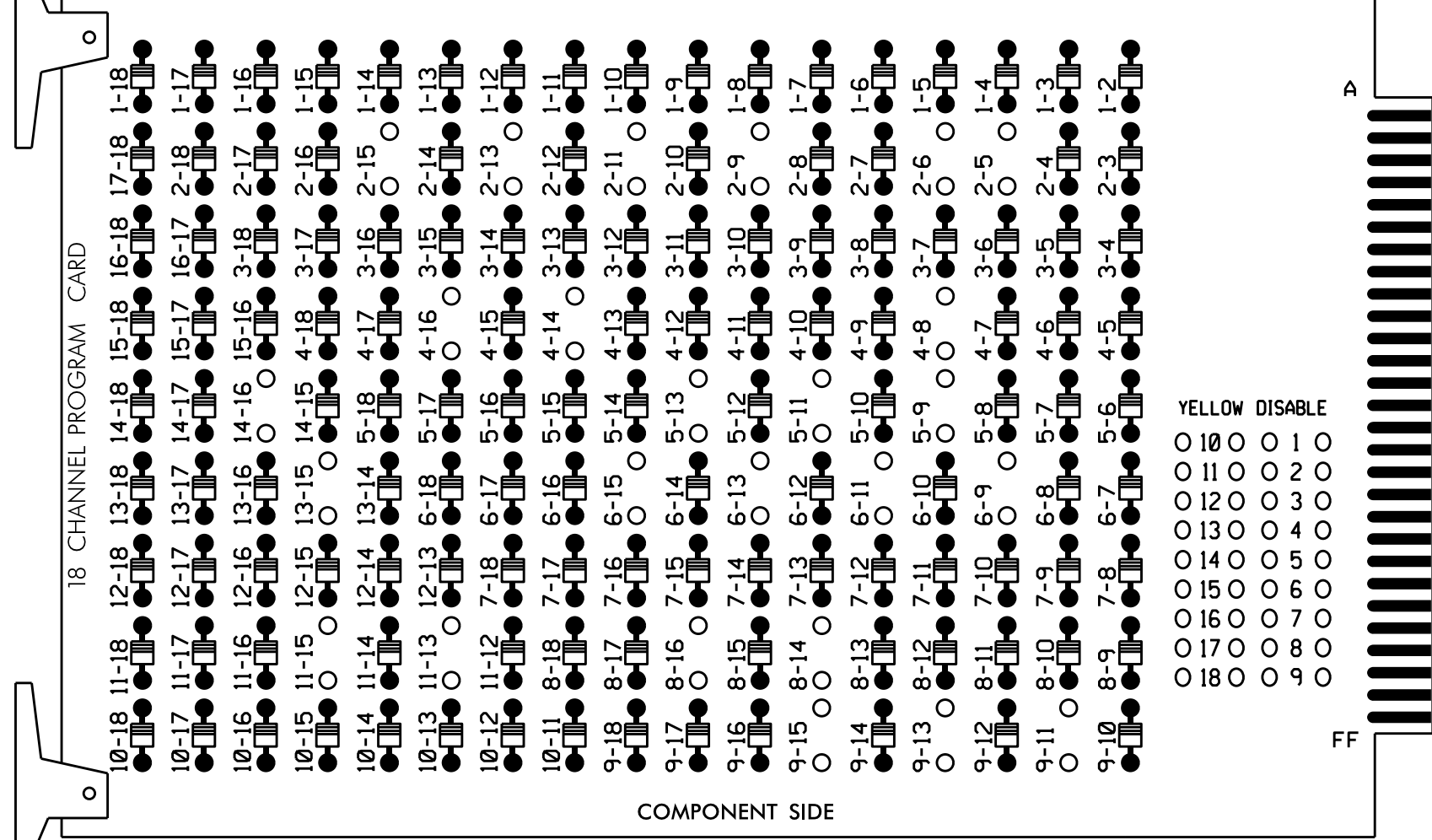
1/24/2017

SIG. INVENTORY NO. 07-0442

EDI MODEL 2018ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 13-15 and 14-16.

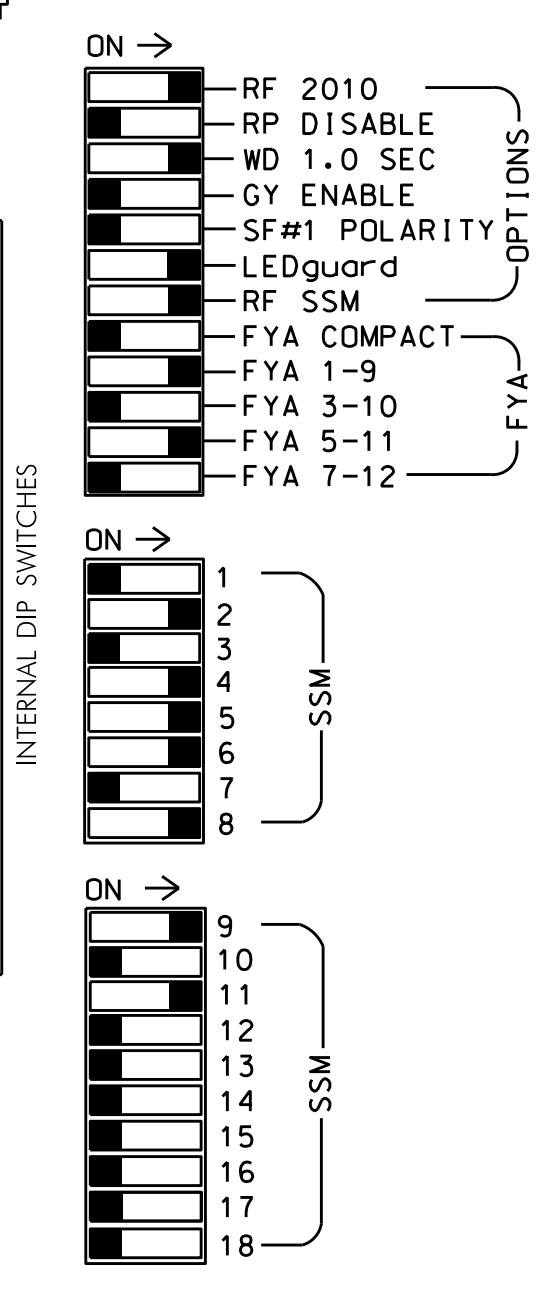


REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH



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. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S3,S5,S6,S7,S8,S9,S11,S12,
 AUX S1,AUX S4
 PHASES USED.....2,2 PED,4,4 PED,5,6,6 PED,8,8 PED
 OVERLAP "A".....2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

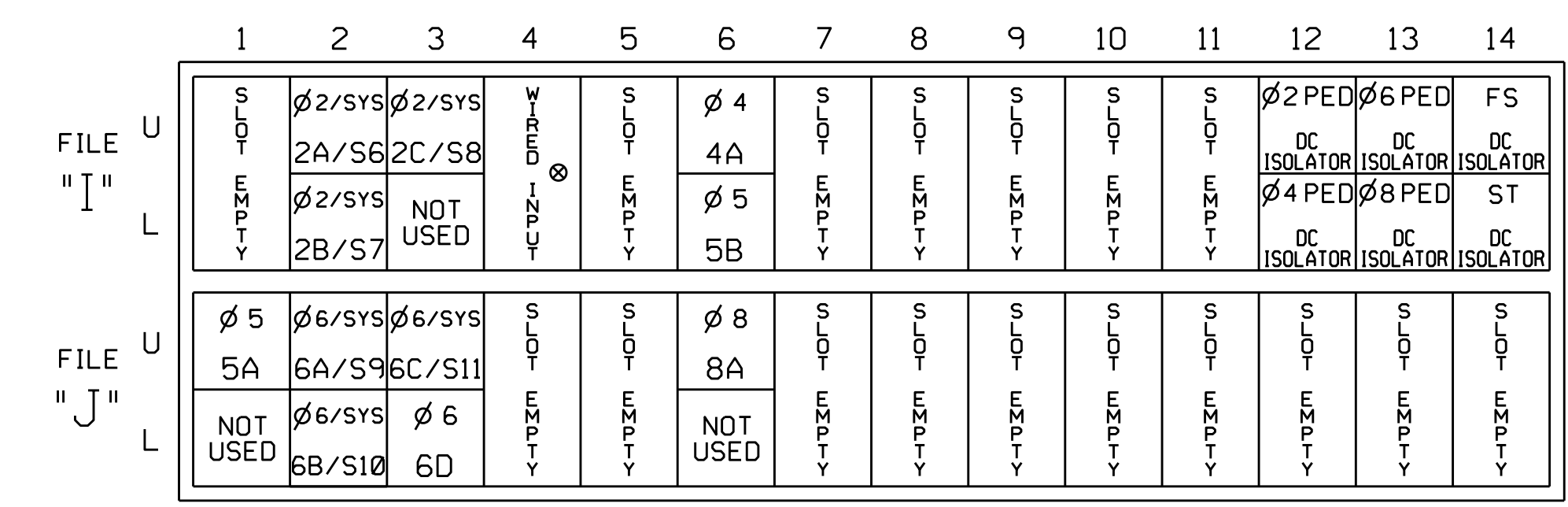
SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------------|----|------------|----------|-----|------------|----------|-----|-----|------------|----------|-----|------------|----------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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, 23 | P21, P22 | NU | 41, 42, 43 | P41, P42 | 42 | 51 | 62, 63, 64 | P61, P62 | NU | 81, 82, 83 | P81, P82 | 61 | NU | 51 | NU | NU |
| RED | | 128 | | | 101 | | * | | 134 | | | 107 | | | | | | |
| YELLOW | | 129 | | | 102 | | | | 135 | | | 108 | | | | | | |
| GREEN | | 130 | | | 103 | | | | 136 | | | 109 | | | | | | |
| RED ARROW | | | | | | | | | | | | | | A121 | | | A114 | |
| YELLOW ARROW | | | | | | | | 132 | | | | | | A122 | | | A115 | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | A123 | | | A116 | |
| GREEN ARROW | | | | | | | 133 | 133 | | | | | | | | | | |
| Hand | | | | 113 | | | 104 | | | 119 | | 110 | | | | | | |
| Person | | | | 115 | | | 106 | | | 121 | | 112 | | | | | | |

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)



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

⊗ Wired Input - Do not populate slot with detector card

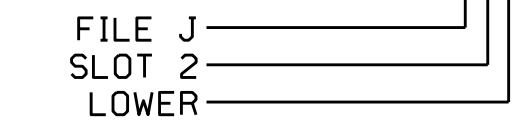
INPUT FILE CONNECTION & PROGRAMMING CHART

| 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 |
|------------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 2A/S6 | TB2-5,6 | I2U | 39 | 1 | 2 | 2/SYS | Y | Y | | | |
| 2B/S7 | TB2-7,8 | I2L | 43 | 5 | 12 | 2/SYS | Y | Y | | | |
| 2C/S8 | TB2-9,10 | I3U | 63 | 25 | 32 | 2/SYS | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | Y | Y | | | | 3 |
| 5A ¹ | TB3-1,2 | J1U | 55 | 17 | 5 | Y | Y | Y | | | 15 |
| | | I4U | 47 | 9 | 22 | Y | Y | Y | | | 3 |
| 5B | TB4-11,12 | I6L | 45 | 7 | 14 | Y | Y | Y | | | 15 |
| 6A/S9 | TB3-5,6 | J2U | 40 | 2 | 6 | 6/SYS | Y | Y | | | |
| 6B/S10 | TB3-7,8 | J2L | 44 | 6 | 16 | 6/SYS | Y | Y | | | |
| 6C/S11 | TB3-9,10 | J3U | 64 | 26 | 36 | 6/SYS | Y | Y | | | |
| 6D | TB3-11,12 | J3L | 77 | 39 | 46 | 6 | Y | Y | Y | | 3 |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 5 |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | | PED 2 | | | | | |
| P41,P42 | TB8-5,6 | I12L | 69 | 31 | | PED 4 | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | | PED 6 | | | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | | PED 8 | | | | | |

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

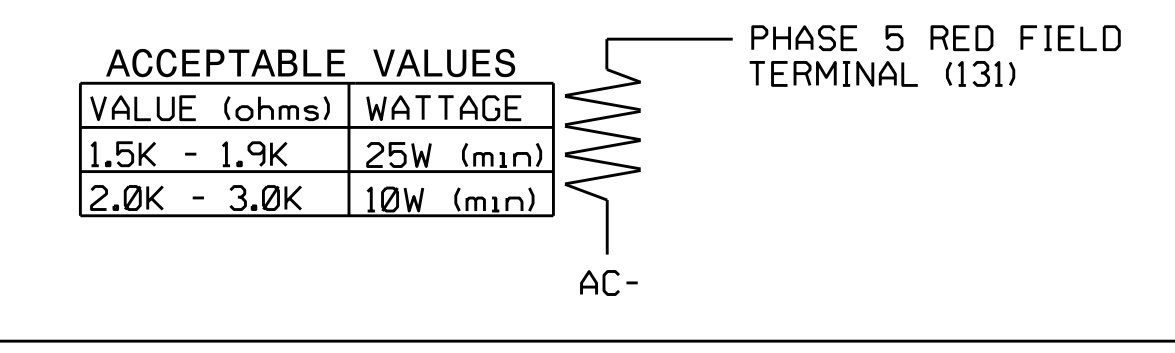
¹Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



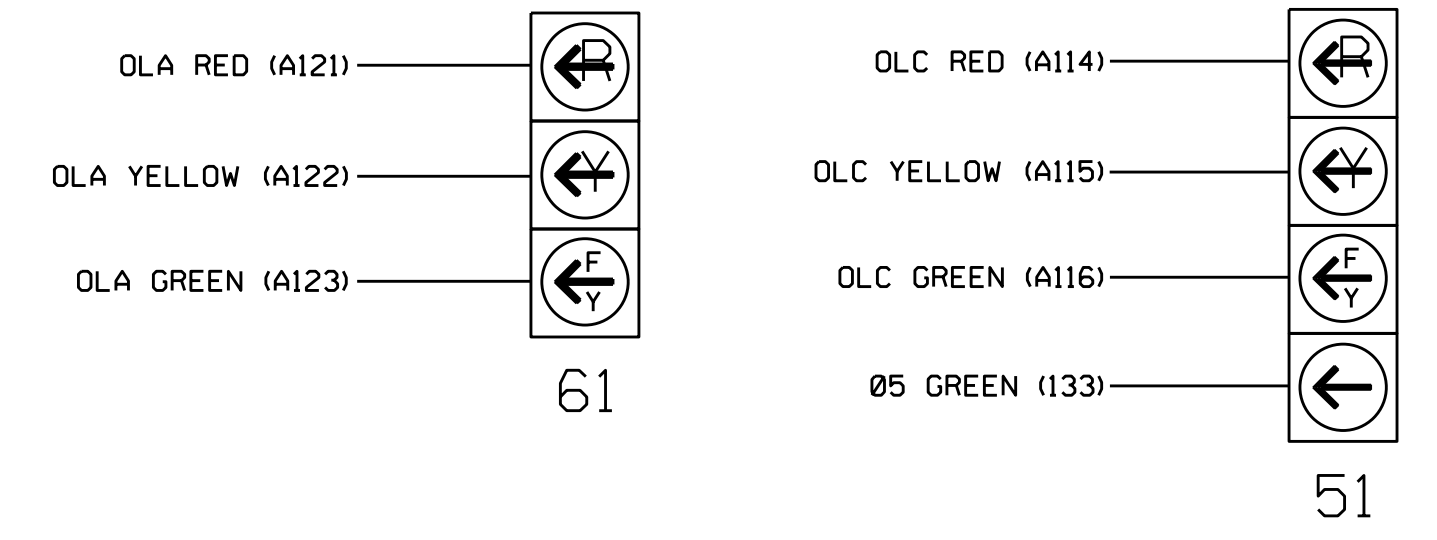
LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE
 The sequence display for signal head 51 requires special logic programming. See sheet 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-0442
 DESIGNED: November 2016
 SEALED: 1/24/2017
 REVISED:

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at SR 1980 (Holmes Road)

Division 7 Alamance County Mebane
 PLAN DATE: January 2017 REVIEWED BY: T. Joyce
 PREPARED BY: C. Strickland REVIEWED BY:

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030530
 JACUARY M. LITTLE

DocuSigned by:
 Zachary M. Little 1/26/2017
 0C21EF04F5341F DATE

SIG. INVENTORY NO. 07-0442

26-1116-2017 10-18
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**LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE**

(program controller as shown below)

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

```

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

      ↓
      SCROLL DOWN

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

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

```

      ↓
      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF
    
```

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

```

      ↓
      SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON
    
```

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL
(program controller as shown below)

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

```

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

```

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

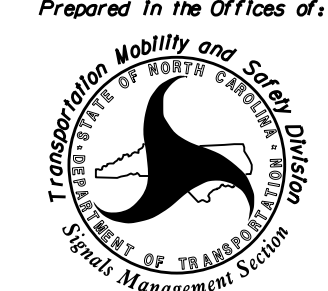
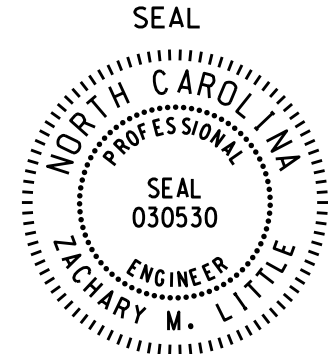
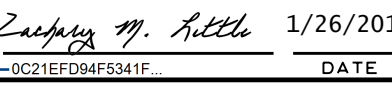
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-0442
 DESIGNED: November 2016
 SEALED: 1/24/2017
 REVISED:

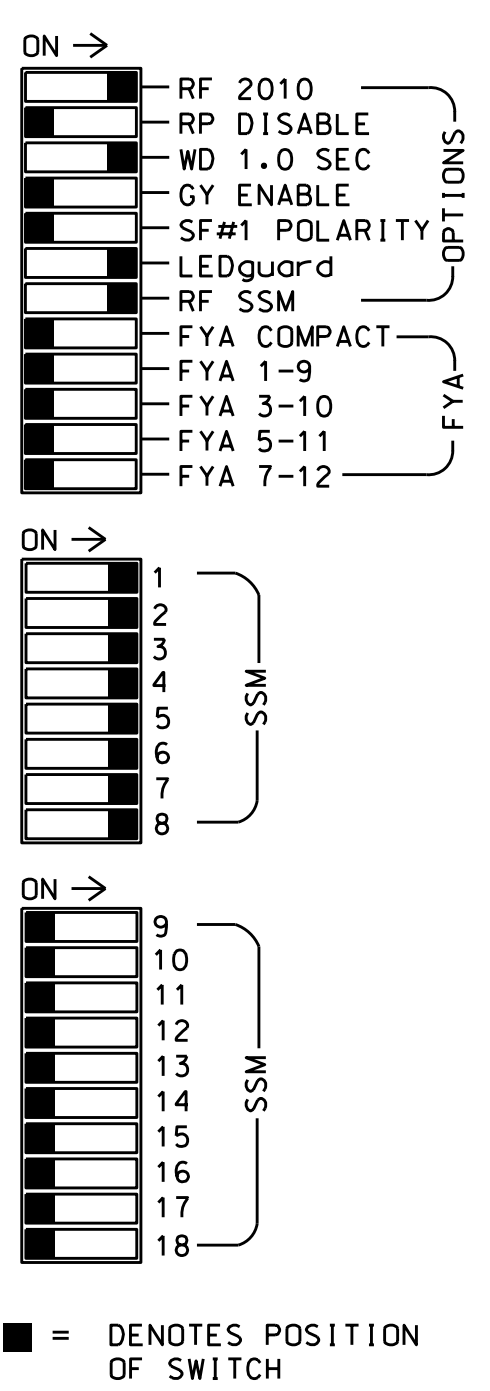
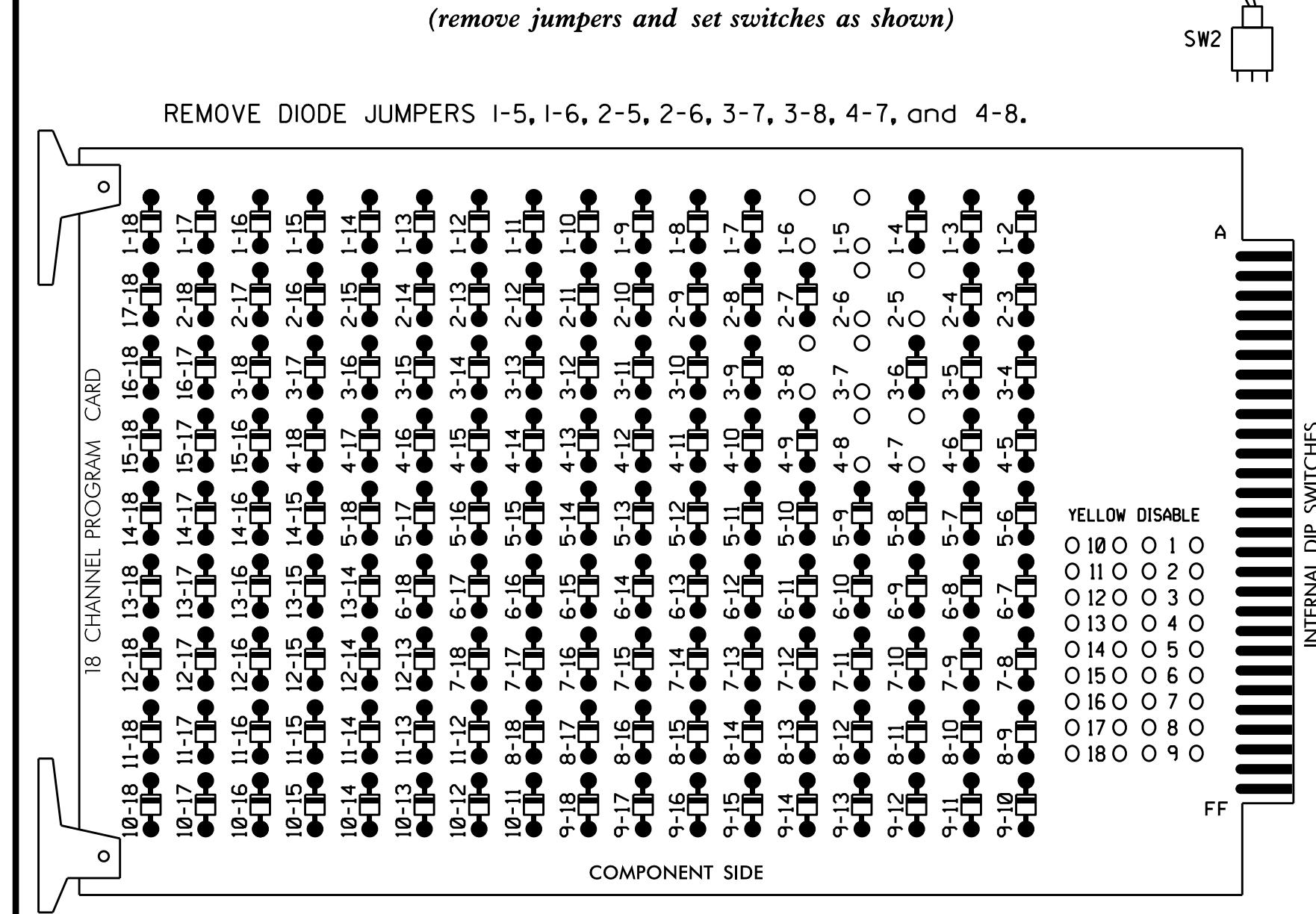
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

| | | | |
|--|---|----------------------------|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | NC 119 at SR 1980 (Holmes Road) | | SEAL  |
| | Division 7 Alamance County Mebane PLAN DATE: January 2017 REVIEWED BY: T. Joyce PREPARED BY: C. Strickland REVIEWED BY: | REVISIONS INIT. DATE | DocuSigned by:  1/26/2017 DATE |
| | | SIG. INVENTORY NO. 07-0442 | |

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 cbsstrickland

EDI MODEL 2018ECL-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.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- 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.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

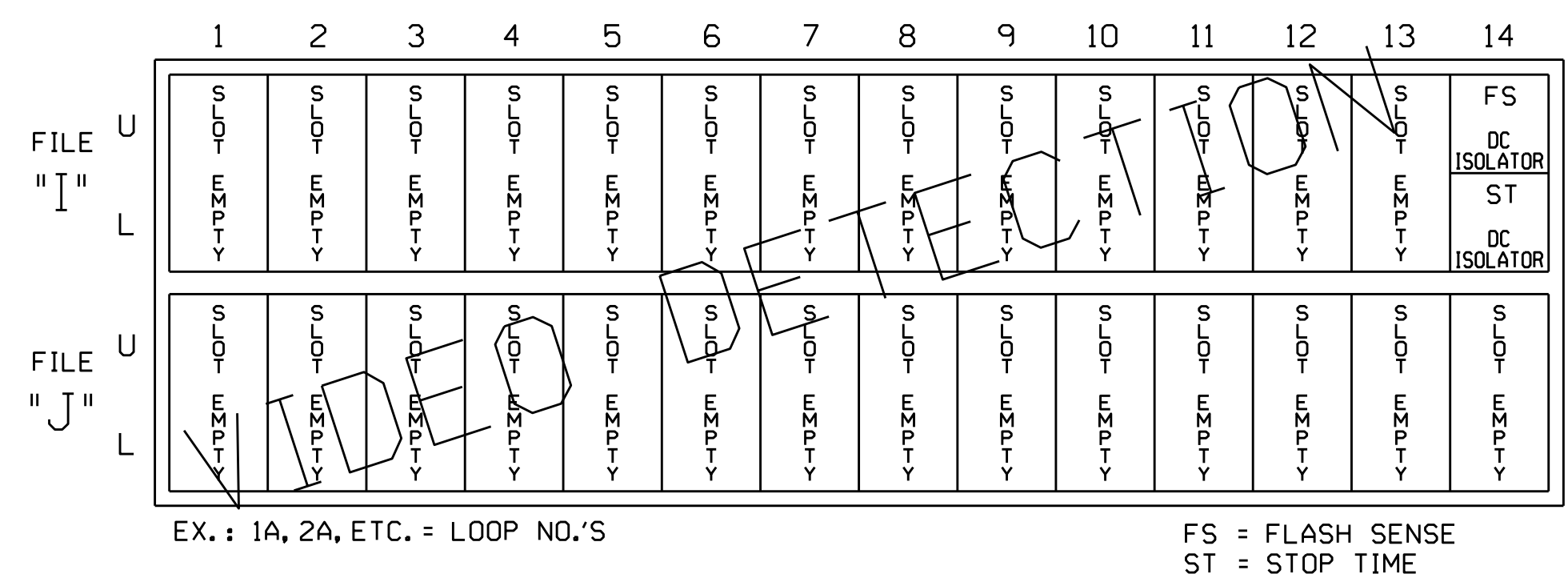
CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|-----|-----|-------------|----|-------|-------------|----|----|-------|-------------|-----|-------|-------------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 82 | 21,22 24 | NU | 31,32 | 41,42 43 | NU | 42 | 51 | 61,62 64 | NU | 71 | 81,82 83 | NU | NU | NU | NU | NU |
| RED | | 128 | | | 101 | | | | | 134 | | | 107 | | | | | |
| YELLOW | | | 129 | | | 102 | | | | | | | | 108 | | | | |
| GREEN | | | | | | | | | | | | | | | | | | |
| RED ARROW | 125 | | | | 116 | | | | | 131 | | | | | | | | |
| YELLOW ARROW | 126 | 126 | | | | 117 | | | 132 | 132 | | | | | | | | |
| GREEN ARROW | 127 | 127 | | | | | | | | 133 | 133 | | | | | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT
(front view)



SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1553T1
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED: N/A

Electrical Detail - Temp Design 1 (TMP Phase II)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at NC 119 Bus. (S. 5th Street) and SR 1962 (3rd Street)

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS
 PREPARED BY: S. Armstrong REVIEWED BY:

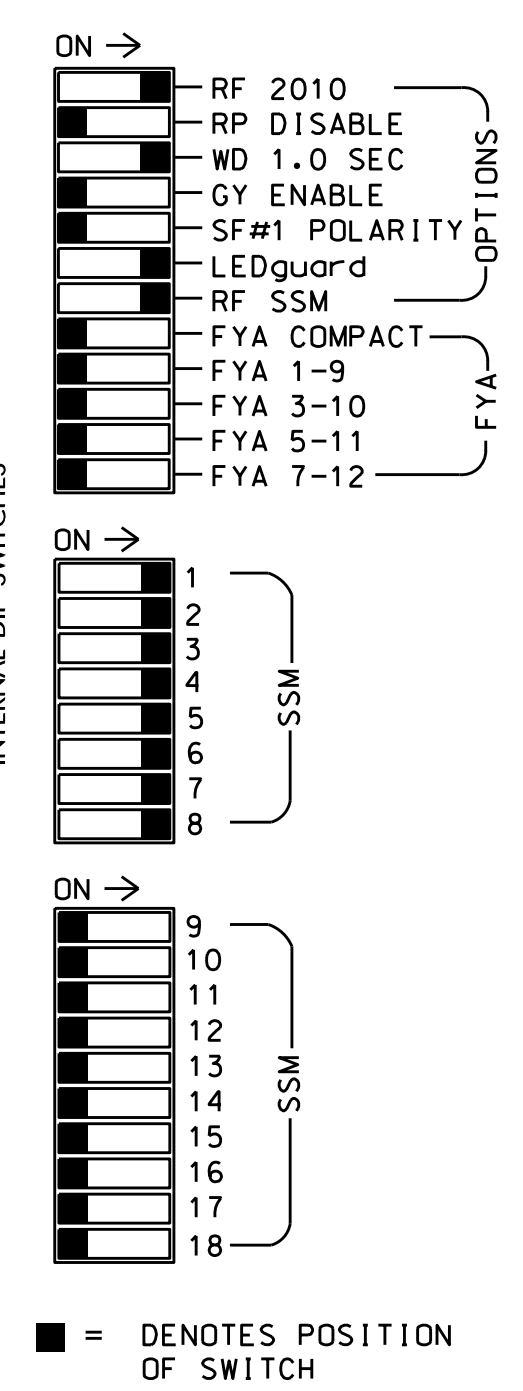
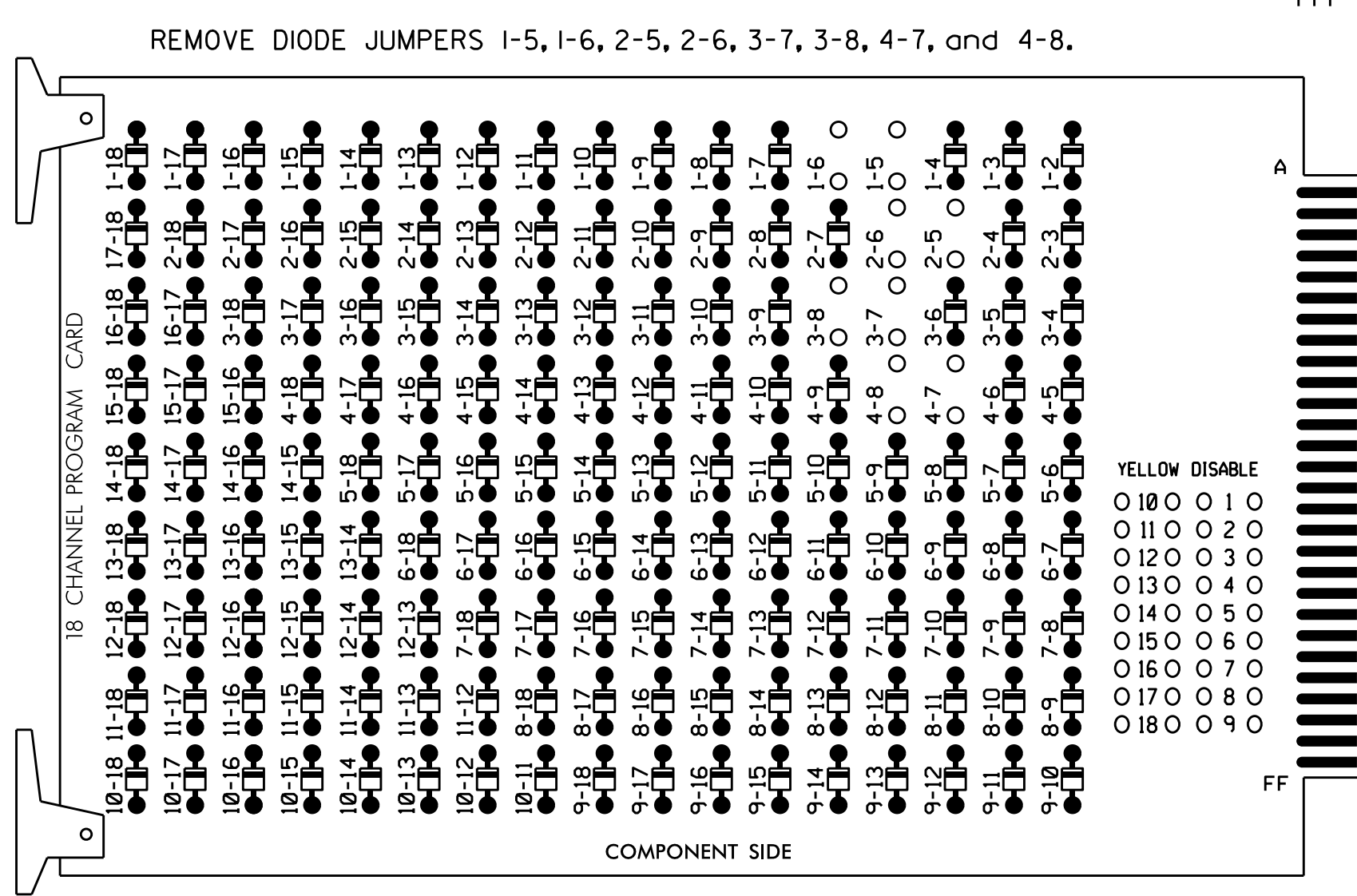
REVISIONS INIT. DATE

DocuSigned by:
 Keith M. Mims 1/26/2017
 2F80786EC0344S DATE

SIG. INVENTORY NO. 07-1553T1

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EDI MODEL 2018ECL-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.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

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.
- 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.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

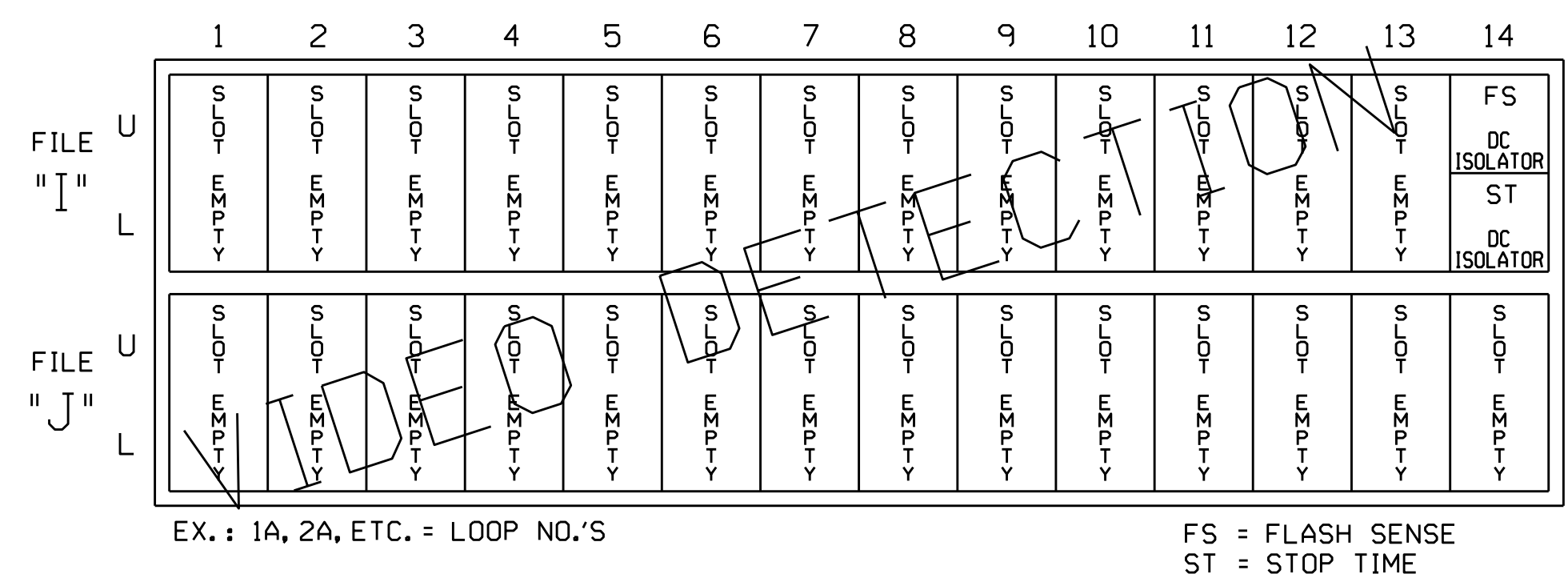
CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP 'A'.....NOT USED
 OVERLAP 'B'.....NOT USED
 OVERLAP 'C'.....NOT USED
 OVERLAP 'D'.....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------|-----|-----|-------------|----|-------|-------------|----|----|-------|-------------|-----|-------|--------|-------------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 82 | 21,22 24 | NU | 31,32 | 41,42 43 | NU | 42 | 51 | 61,63 64 | NU | 63 | 71 | 81,82 83 | NU | NU | NU | NU |
| RED | | 128 | | | 101 | | | | | 134 | | | | 107 | | | | |
| YELLOW | | 129 | | | 102 | | | | | 135 | | | | 108 | | | | |
| GREEN | | 130 | | | 103 | | | | | 136 | | | | 109 | | | | |
| RED ARROW | 125 | | | | 116 | | | | | 131 | | | | 122 | | | | |
| YELLOW ARROW | 126 | 126 | | | 117 | | | | | 132 | 132 | | | 123 | 123 | | | |
| GREEN ARROW | 127 | 127 | | | 118 | | | | | 133 | 133 | | | 124 | 124 | | | |

NU = Not Used

INPUT FILE POSITION LAYOUT
(front view)



SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection scheme shown on the Signal Design Plan.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1553T2
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED: N/A

Electrical Detail - Temp Design 2 (TMP Phase III)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at NC 119 Bus. (S. 5th Street) and SR 1962 (3rd Street)

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS
 PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

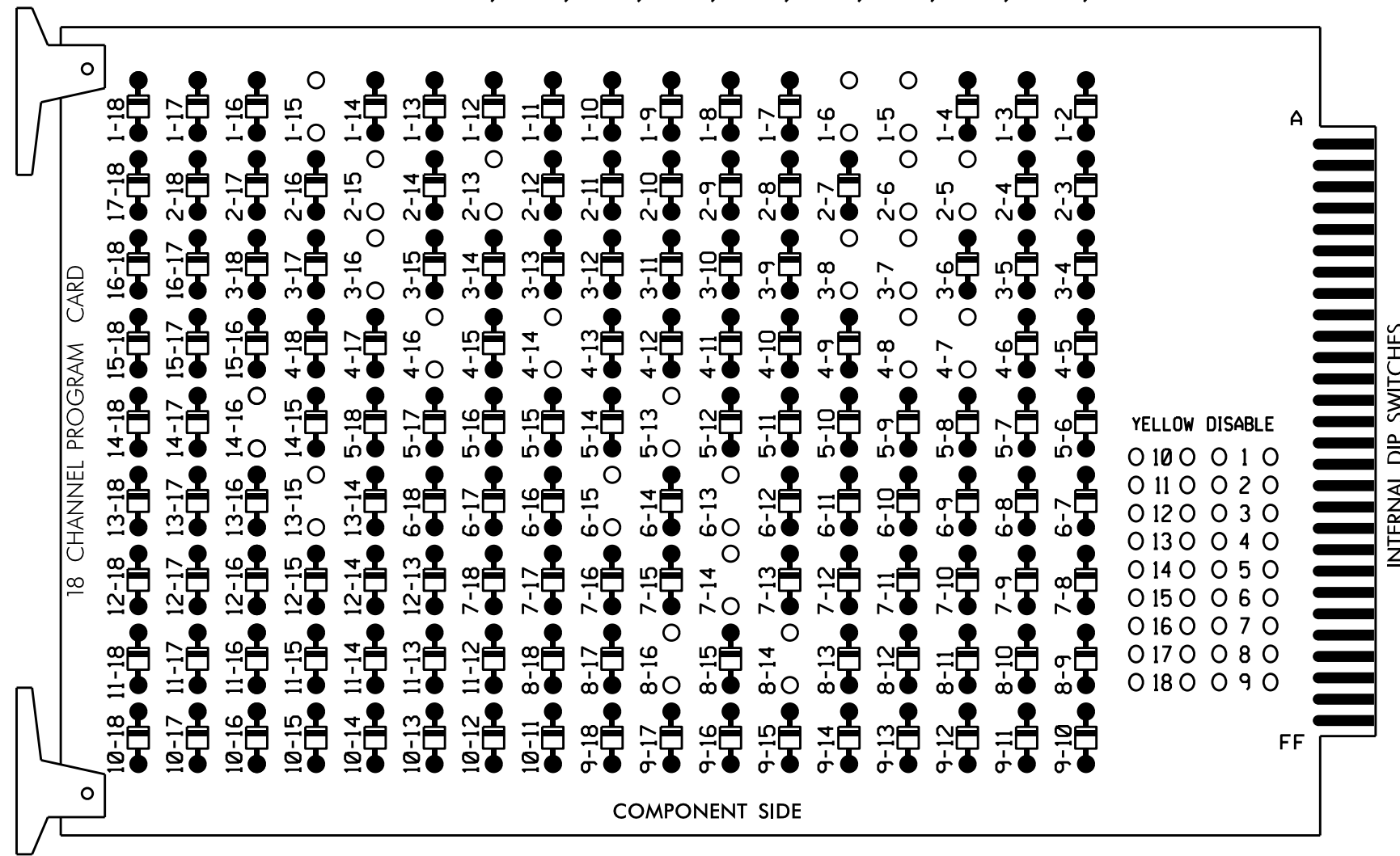
DocuSigned by:
 Keith M. Mims 1/26/2017
 2F807868BCD3448 DATE

SIG. INVENTORY NO. 07-1553T2

26-Jan-2017 08:18
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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL
(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = 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.
- 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, 4, 6 and 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the NC 119 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,
 S9,S10,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8,8PED
 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 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 | |
|---------------------|-------|-----|----------------|-------------|-----|-------|-------------|-------------|-------|-----|----------------|-------------|--------|--------|-------------|-------------|--------|--------|----|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 | |
| 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. | 11,12 | 82 | 21,22 23,24 | P21, P22 | 23 | 31,32 | 41,42 43 | P41, P42 | 42 | 51 | 61,62 63,64 | P61, P62 | 63 | 71 | 81,82 83 | P81, P82 | NU | NU | NU |
| RED | | 128 | | | 101 | | | 134 | | | 107 | | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | | 108 | | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | | |
| RED ARROW | 125 | | | 116 | | | 131 | | | 122 | | | | | | | | | |
| YELLOW ARROW | 126 | 126 | | 117 | 117 | | 132 | 132 | | 123 | 123 | | | | | | | | |
| GREEN ARROW | 127 | 127 | | 118 | 118 | | 133 | 133 | | 124 | 124 | | | | | | | | |
| Hand icon | | | | 113 | | | 104 | | | 119 | | | 110 | | | | | | |
| Walking person icon | | | | 115 | | | 106 | | | 121 | | | 112 | | | | | | |

NU = Not Used

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.

INPUT FILE POSITION LAYOUT

(front view)

| FILE | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------|----------|-----|---------|----------|-----|----------|---|---|---|----|----|-------------|-------------|-------------|
| U | ∅ 1 | ∅ 1 | ∅ 2/SYS | ∅ 2/SYS | ∅ 3 | ∅ 4 | S | S | S | S | S | ∅ 2 PED | ∅ 6 PED | FS |
| I | 1A | 1B | 2A/S6 | 2C/S8 | 3A | 4A | ← | ← | ← | ← | ← | DC ISOLATOR | DC ISOLATOR | DC ISOLATOR |
| L | NOT USED | ∅ 1 | ∅ 2/SYS | NOT USED | ∅ 3 | NOT USED | ← | ← | ← | ← | ← | ∅ 4 PED | ∅ 8 PED | ST |
| U | | | | | | | | | | | | DC ISOLATOR | DC ISOLATOR | DC ISOLATOR |
| J | | | | | | | | | | | | | | |
| L | | | | | | | | | | | | | | |
| U | | | | | | | | | | | | | | |
| J | | | | | | | | | | | | | | |
| L | | | | | | | | | | | | | | |

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

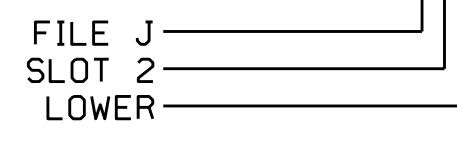
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|------------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | |
| 1B | TB2-5,6 | I2U | 39 | 1 | 2 | 1 | Y | Y | | | |
| 1C | TB2-7,8 | I2L | 43 | 5 | 12 | 1 | Y | Y | | | 15 |
| 2A/S6 | TB2-9,10 | I3U | 63 | 25 | 32 | 2/SYS | Y | Y | | | |
| 2B/S7 | TB2-11,12 | I3L | 76 | 38 | 42 | 2/SYS | Y | Y | | | |
| 2C/S8 | TB4-1,2 | I4U | 47 | 9 | 22 | 2/SYS | Y | Y | | | |
| 3A | TB4-5,6 | I5U | 58 | 20 | 3 | 3 | Y | Y | | | |
| 3B | TB4-7,8 | I5L | 58 | 20 | 3 | 3 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | |
| 5A | TB3-5,6 | J2U | 40 | 2 | 6 | 5 | Y | Y | | | |
| 5B | TB3-7,8 | J2L | 44 | 6 | 16 | 5 | Y | Y | | | 15 |
| 6A/S9 | TB3-9,10 | J3U | 64 | 26 | 36 | 6/SYS | Y | Y | | | |
| 6B/S10 | TB3-11,12 | J3L | 77 | 39 | 46 | 6/SYS | Y | Y | | | |
| 6C/S11 | TB5-1,2 | J4U | 48 | 10 | 26 | 6/SYS | Y | Y | | | |
| 7A | TB5-5,6 | J5U | 57 | 19 | 7 | 7 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | PED 2 | 2 PED | | | | | |
| P41,P42 | TB8-5,6 | I12L | 69 | 31 | PED 4 | 4 PED | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | PED 6 | 6 PED | | | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | PED 8 | 8 PED | | | | | |

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L



INPUT FILE CONNECTION & PROGRAMMING CHART

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1553
 DESIGNED: November 2016
 SEALED: 1/25/2017
 REVISED: N/A

Electrical Detail - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS
 750 N. Greenfield Pkwy, Garner, NC 27529

NC 119 at NC 119 Bus. (S. 5th Street) and SR 1962 (3rd Street)

Division 7 Alamance County Mebane

PLAN DATE: January 2017 REVIEWED BY: BAS

PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: Keith M. Minns 1/26/2017

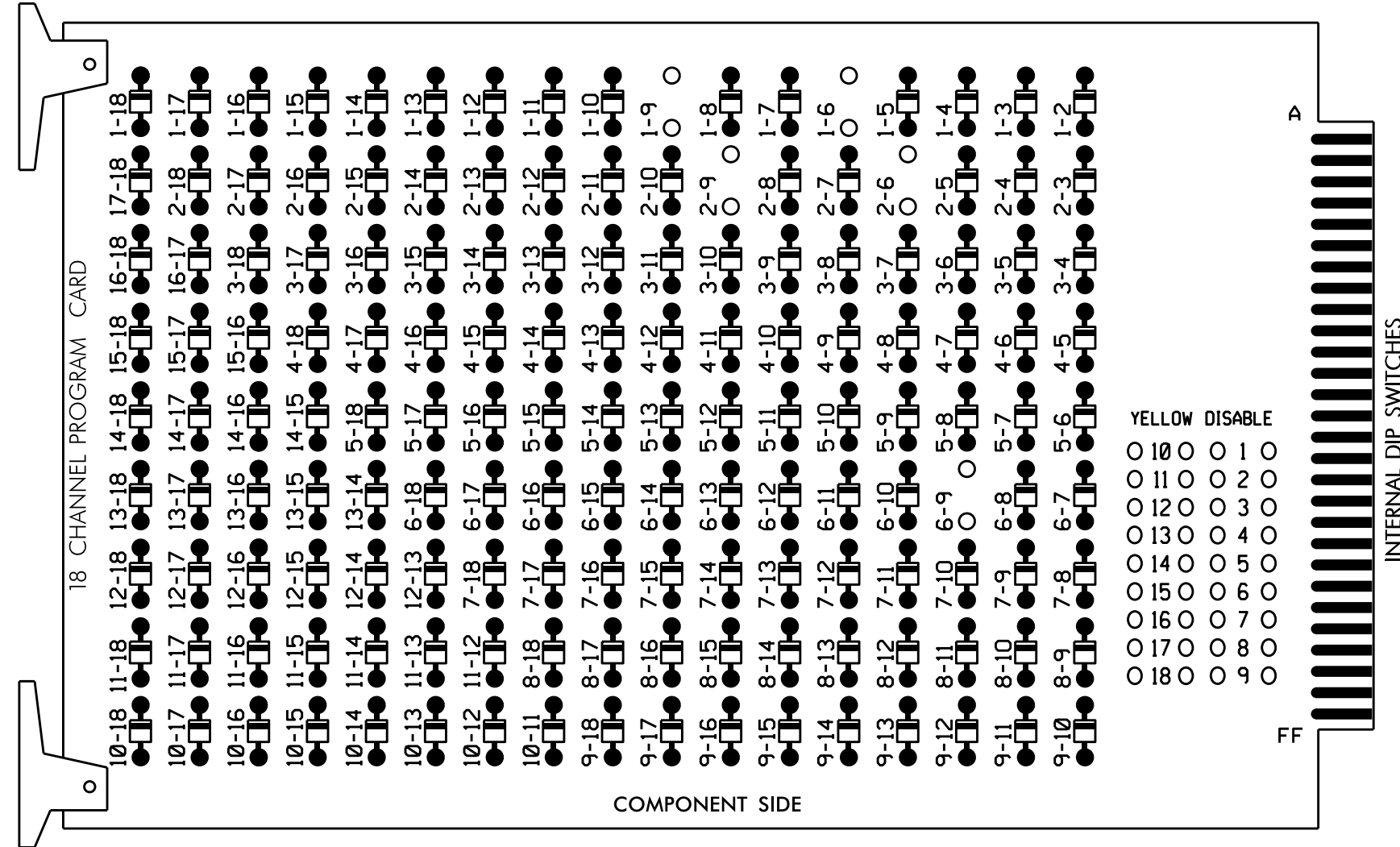
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**EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(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:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1
 PHASES USED.....1,2,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------------|-----|-----|-------|----|----|-------|----|-------|-------|-----|-------|-------|--------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 82 | 21,22 | NU | NU | NU | NU | 61,62 | NU | NU | 81,82 | NU | 11 | NU | NU | NU | NU | NU |
| RED | * | 128 | | | | | | 134 | | | 107 | | | | | | | |
| YELLOW | | 129 | | | | | | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | | | |
| YELLOW ARROW | 126 | | | | | | | | | | | | A122 | | | | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | | | |
| GREEN ARROW | 127 | 127 | | | | | | | | | | | | | | | | |

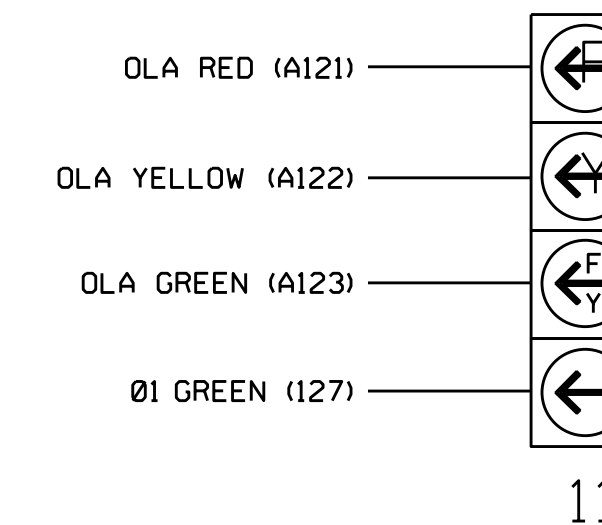
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

| FILE "I" | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| U | ∅ 1 | ∅ 2 | ∅ 1 | S | S | S | S | S | S | S | S | S | S | FS |
| L | 1A | 2A | 1B | -OF | -OF | -OF | -OF | -OF | -OF | -OF | -OF | -OF | -OF | DC ISOLATOR |
| U | NOT USED | NOT USED | ∅ 1 | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | DC ISOLATOR |
| L | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF |
| U | ←-1-03ZF | ∅ 6 | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF |
| L | ←-1-03ZF | 6A | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF |
| U | ←-1-03ZF | NOT USED | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF |
| L | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF | ←-1-03ZF |

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

FS = FLASH SENSE
 ST = STOP TIME

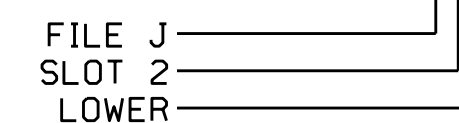
⊗ Wired Input - Do not populate slot with detector card

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 |
| | - | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 1B | TB2-9,10 | I3U | 63 | 25 | 32 | 1 | Y | Y | | | 15 |
| 1C | TB2-11,12 | I3L | 76 | 38 | 42 | 1 | Y | Y | | | 15 |
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | 2 | Y | Y | | | |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |

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

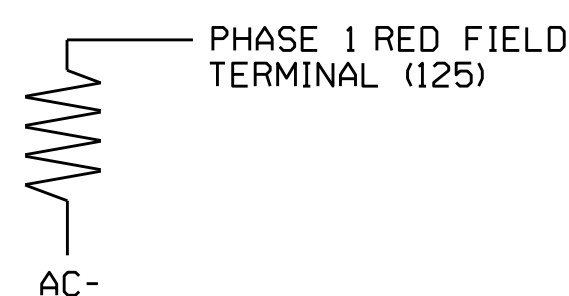
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Temp 1 (TMP Phase I) - Sheet 1 of 2

Electrical and Programming Details For:
 Prepared in the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1962 (S. Third Street)
 at
 SR 1980 (Holmes Road)

Division 7 Alamance County Mebane
 PLAN DATE: January 2017 REVIEWED BY: BAS
 PREPARED BY: S. Armstrong REVIEWED BY:
 REVISIONS INIT. DATE
 DocuSigned by:
 Keith M. Mins 1/26/2017
 2F80766EC02445 DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

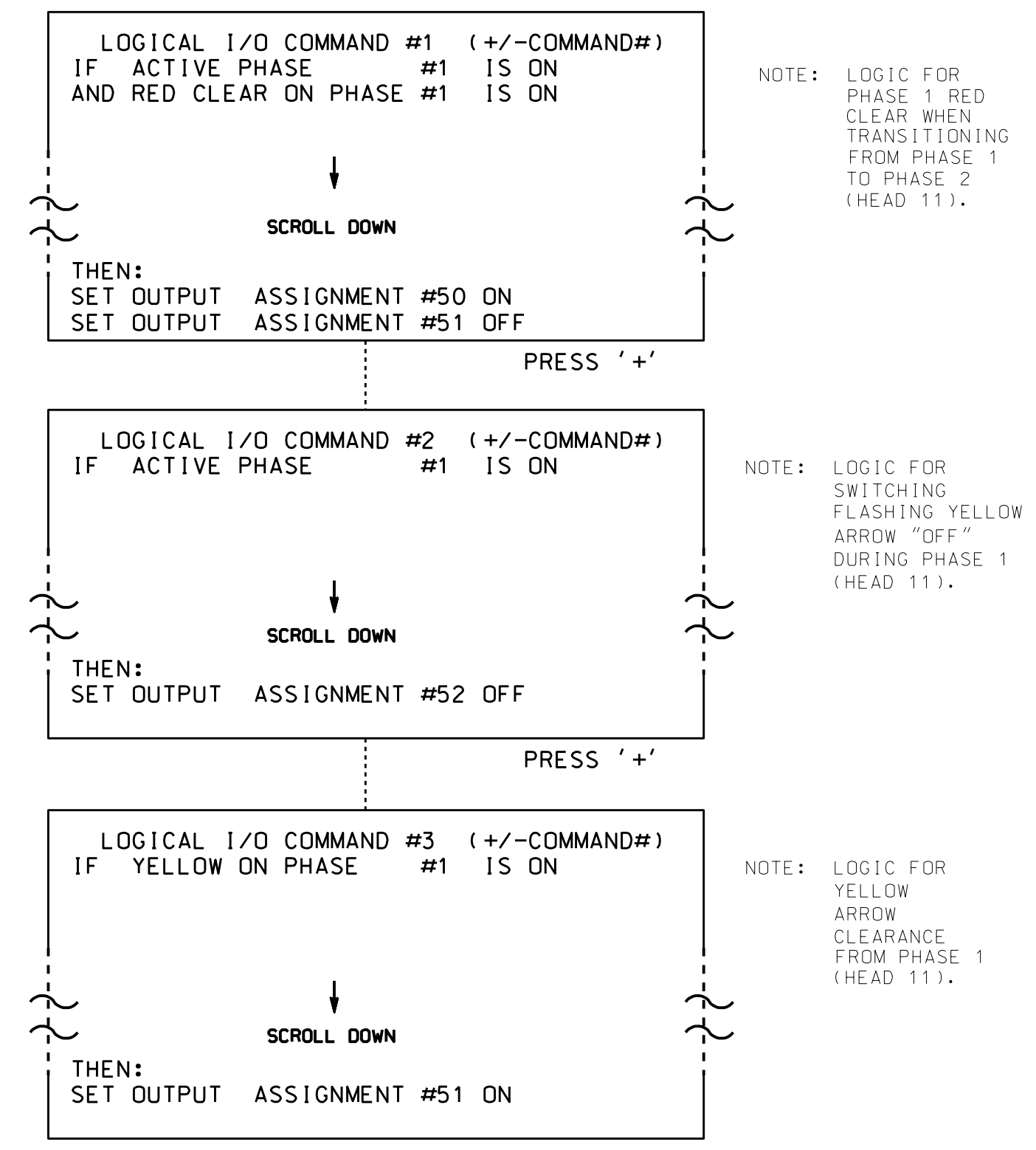
SEAL

 Keith M. Mins
 ENGINEER
 STATE OF NORTH CAROLINA
 License No. 036880

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

← NOTICE GREEN FLASH

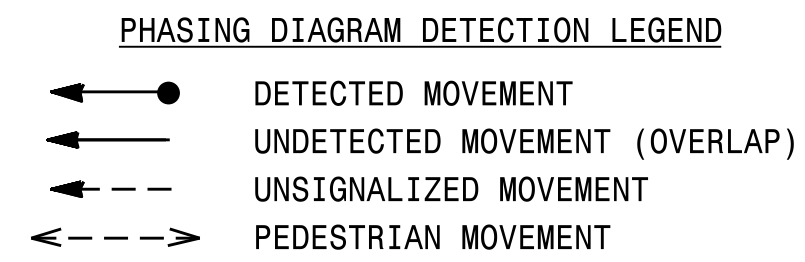
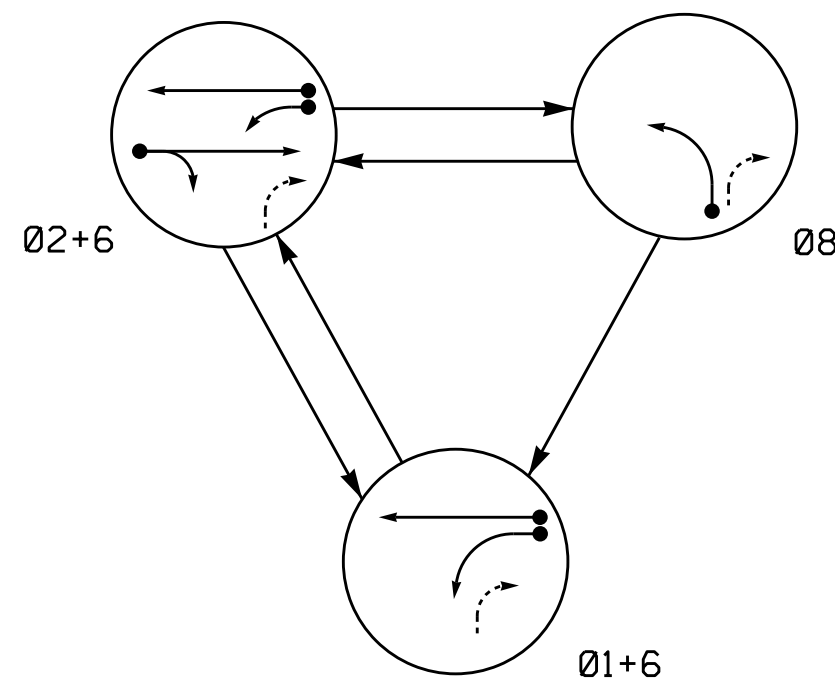
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-2132T1
DESIGNED: November 2016
SEALED: 1/24/2017
REVISED: N/A

05-11-2017 08:46 C:\IT\SSU\ITS\Sig\Workgroups\Sig_Mark\mstron072132_sm.ele.xxx.dgn sarmstrong

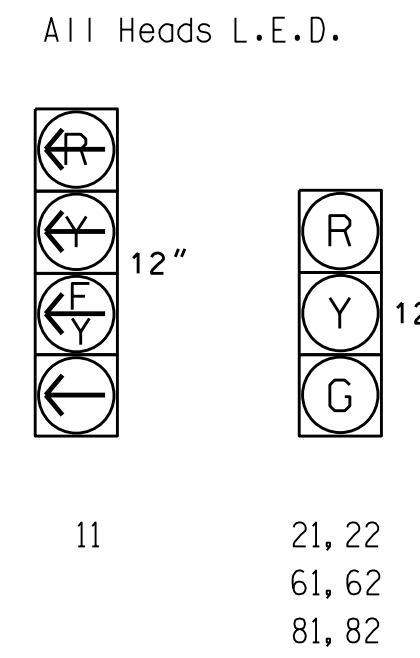
| | | |
|---|---|--|
| Electrical Detail - Temp 1 (TMP Phase I) - Sheet 2 of 2 | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: | SR 1962 (S. Third Street) at SR 1980 (Holmes Road) | SEAL |
| | Division 7 Alamance County Mebane PLAN DATE: January 2017 REVIEWED BY: BAS PREPARED BY: S. Armstrong REVIEWED BY: | REVISIONS INIT. DATE |

PHASING DIAGRAM



| SIGNAL FACE | PHASE | | | |
|-------------|---------|---------|-----|---------|
| | Ø 1 + 6 | Ø 2 + 6 | Ø 8 | F L R Y |
| 11 | ← | ← | ← | ← |
| 21, 22 | R | G | R | Y |
| 61, 62 | G | G | R | Y |
| 81, 82 | R | R | G | R |

SIGNAL FACE I.D.

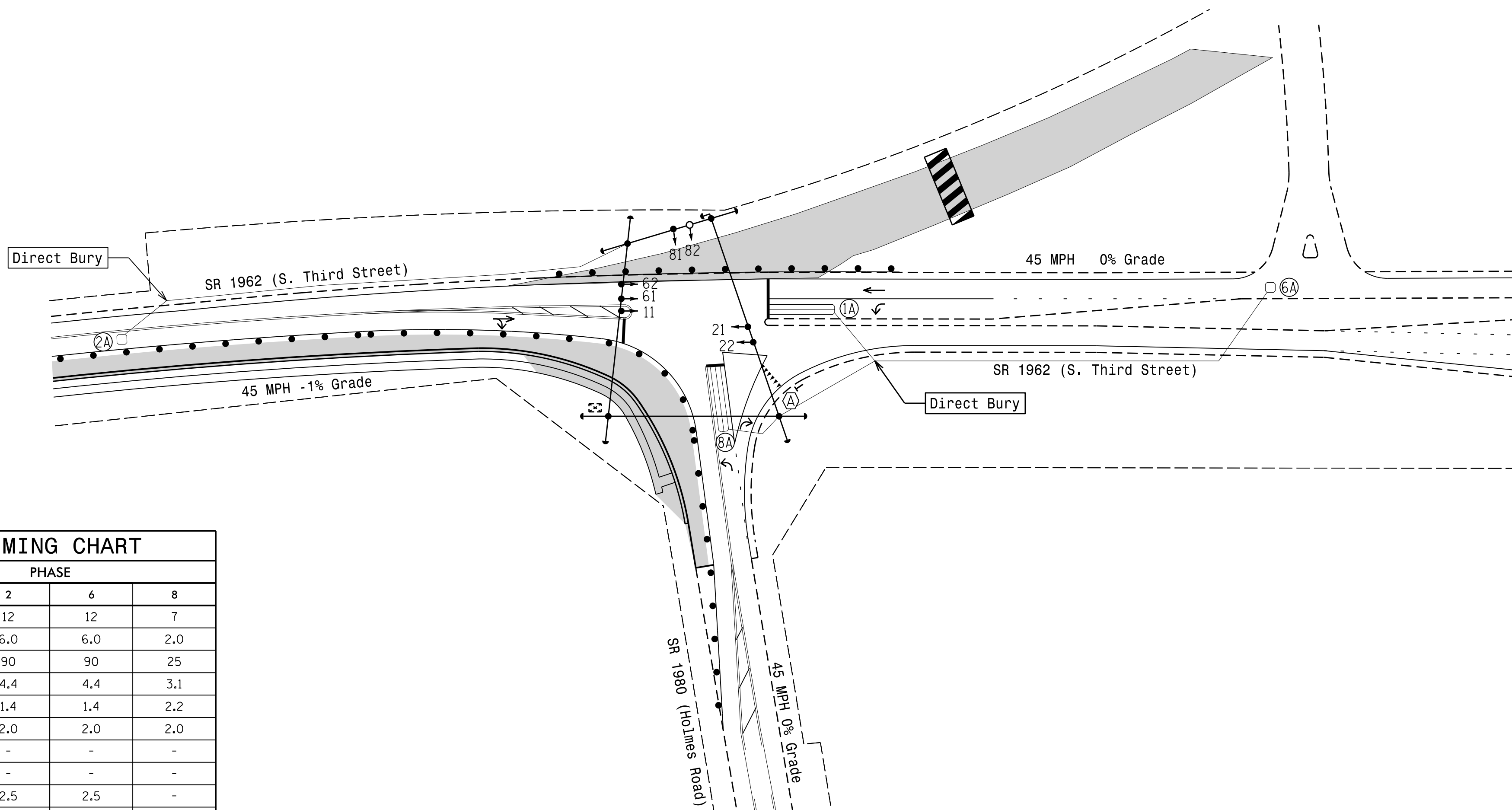


| OASIS 2070 LOOP & DETECTOR INSTALLATION CHART | | | | | | | | | | | | |
|---|-----------|----------------------------|-------|----------------------|-------|---------|-----------|-----------------|--------------|------------|-------------|----------|
| INDUCTIVE LOOPS | | | | DETECTOR PROGRAMMING | | | | | | | | |
| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | 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 | - | - |
| 2A | 6X6 | 300 | 5 | Y | 2 | Y | Y | Y | - | 3 | - | - |
| 6A | 6X6 | 300 | 5 | Y | 6 | Y | Y | - | - | - | - | - |
| 8A | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | 3 | - | - |

3 Phase Fully Actuated (Isolated)

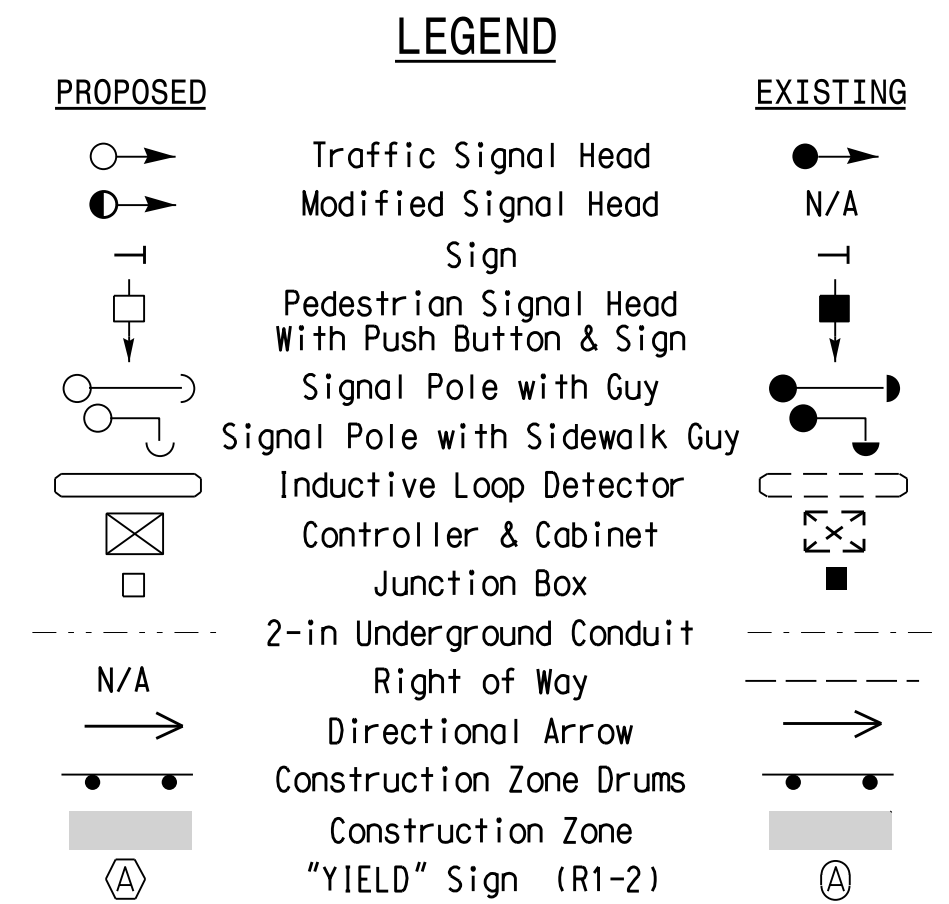
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Reposition existing signal heads as shown.
5. Set all detector units to presence mode.



| OASIS 2070 TIMING CHART | | | | |
|-------------------------|-------|------------|------------|-----|
| FEATURE | PHASE | | | |
| | 1 | 2 | 6 | 8 |
| Min Green 1 * | 7 | 12 | 12 | 7 |
| Extension 1 * | 2.0 | 6.0 | 6.0 | 2.0 |
| Max Green 1 * | 15 | 90 | 90 | 25 |
| Yellow Clearance | 3.0 | 4.4 | 4.4 | 3.1 |
| Red Clearance | 2.6 | 1.4 | 1.4 | 2.2 |
| 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 * | - | 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.



Signal Upgrade Temporary Design 2 (TMP Phase IIB)

SR 1962 (S. Third Street) at SR 1980 (Holmes Road)

Division 7 Alamance County Mebane

PLAN DATE: November 2016 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS: _____ INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 50 1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIEGLER

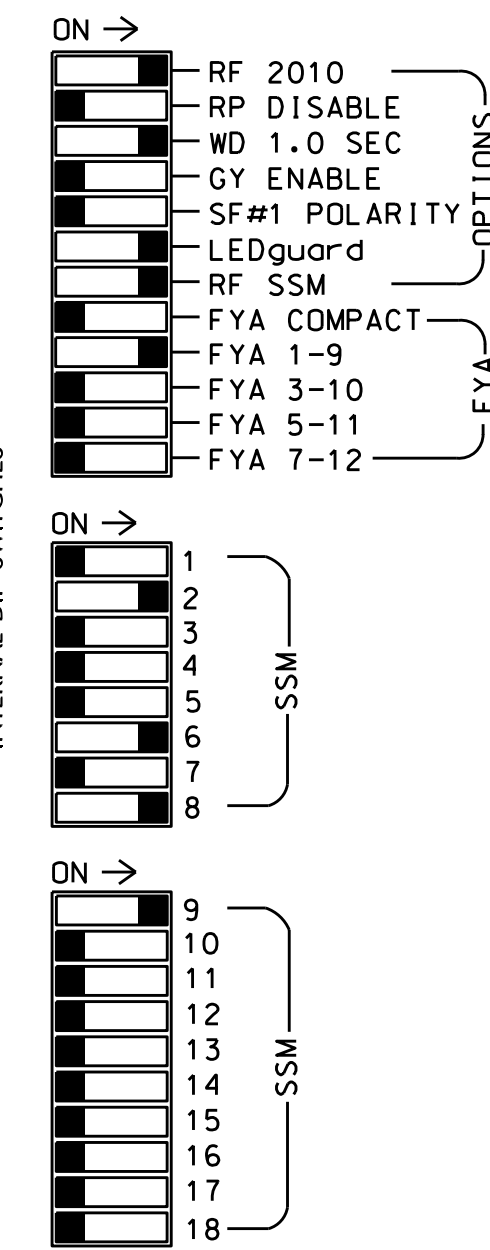
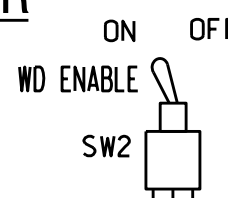
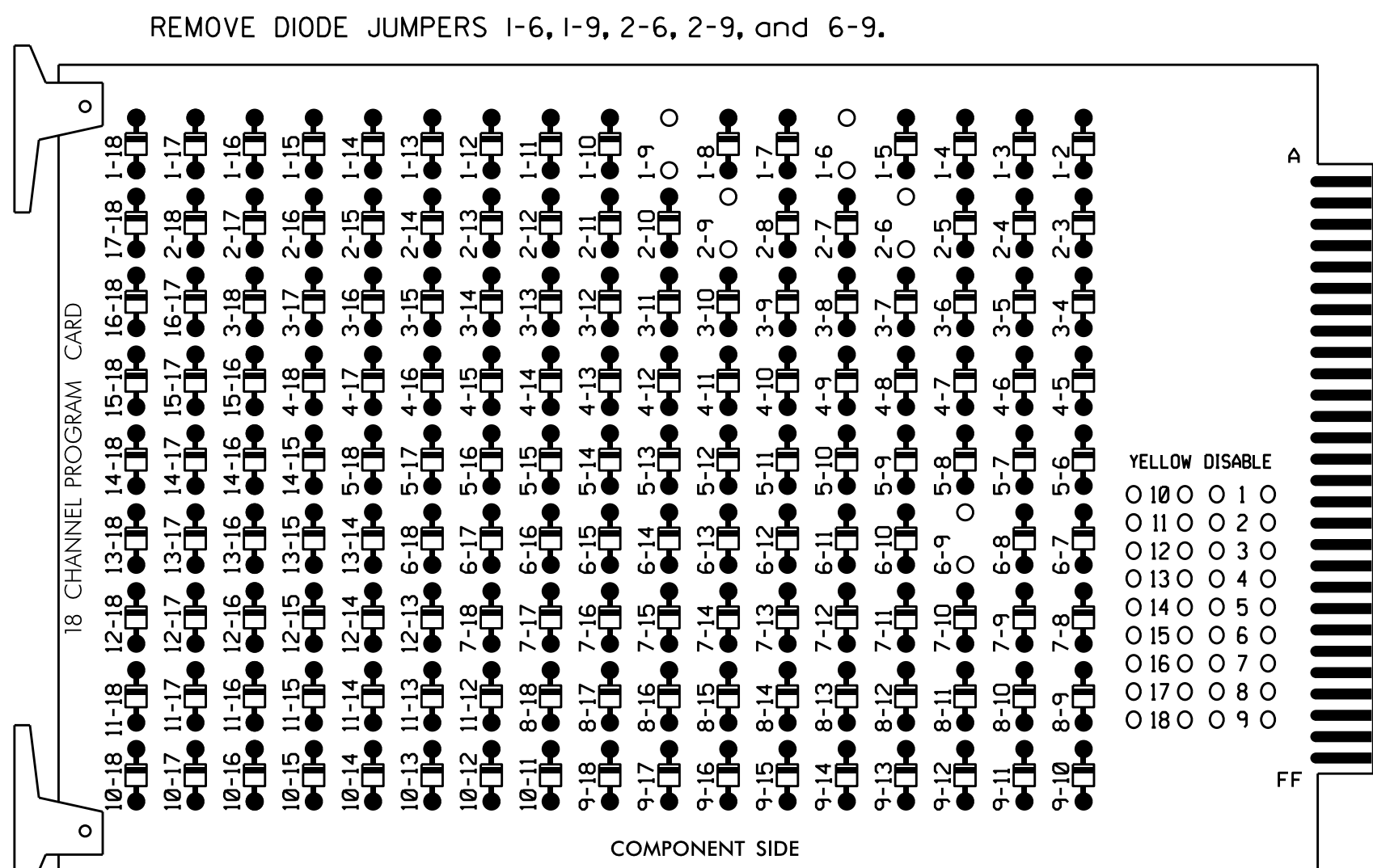
1/24/2017

SIG. INVENTORY NO. 07-2132T2

24-1116-2017_18-22
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 R:\Projects\2017\18-22\Drawings\Signal\19-01\19-01.dwg
 R:\Projects\2017\18-22\Drawings\Signal\19-01\19-01.dwg

**EDI MODEL 2018ECL-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. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1
 PHASES USED.....1,2,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

| LOAD SWITCH NO. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 | S11 | S12 | AUX S1 | AUX S2 | AUX S3 | AUX S4 | AUX S5 | AUX S6 |
|-----------------------|-----|-------|-------|----|----|-------|----|-------|-------|-----|-------|-------|--------|--------|--------|--------|--------|--------|
| CMU CHANNEL NO. | 1 | 2 | 13 | 3 | 4 | 14 | 5 | 6 | 15 | 7 | 8 | 16 | 9 | 10 | 17 | 11 | 12 | 18 |
| 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 | 21,22 | NU | NU | NU | NU | NU | 61,62 | NU | NU | 81,82 | NU | 11 | NU | NU | NU | NU | NU |
| RED | | 128 | | | | | | 134 | | | 107 | | | | | | | |
| YELLOW | * | 129 | | | | | | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | | | |
| YELLOW ARROW | | | | | | | | | | | | | A122 | | | | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | | | |
| GREEN ARROW | 127 | | | | | | | | | | | | | | | | | |

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

| FILE "I" | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------|
| U | ∅ 1 | ∅ 2 | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | FS |
| L | 1A | 2A | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | DC ISOLATOR |
| U | NOT USED | NOT USED | ∅ 3 | ∅ 4 | ∅ 5 | ∅ 6 | ∅ 7 | ∅ 8 | ∅ 9 | ∅ 10 | ∅ 11 | ∅ 12 | ∅ 13 | ST |
| L | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | DC ISOLATOR |
| U | ∅ 1 | ∅ 2 | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- |
| L | ∅ 6 | ∅ 7 | ∅ 8 | ∅ 9 | ∅ 10 | ∅ 11 | ∅ 12 | ∅ 13 | ∅ 14 | ∅ 15 | ∅ 16 | ∅ 17 | ∅ 18 | ∅ 19 |
| U | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED | NOT USED |
| L | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- | -OR- |

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

FS = FLASH SENSE
 ST = STOP TIME

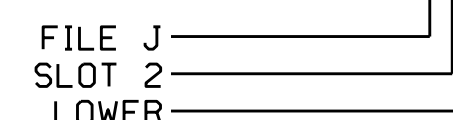
⊗ Wired Input - Do not populate slot with detector card

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 | J4U | 48 | 10 | 26 | 6 | Y | Y | Y | | 3 |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |

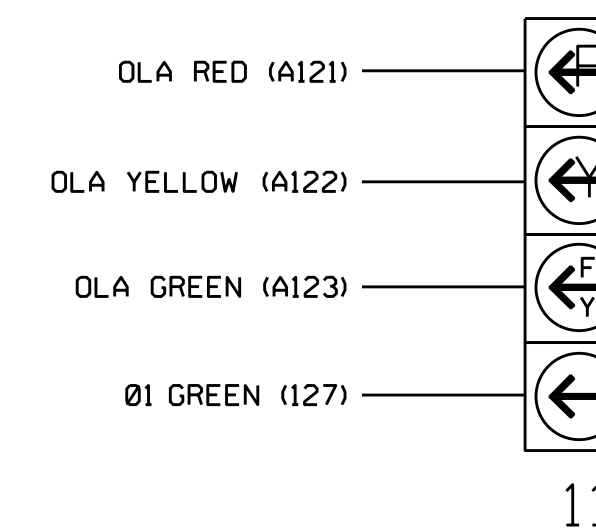
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



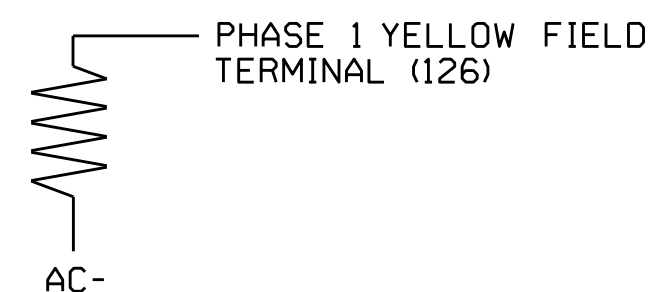
NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



IMPORTANT! Remove resistor from phase 1 red terminal, if present.

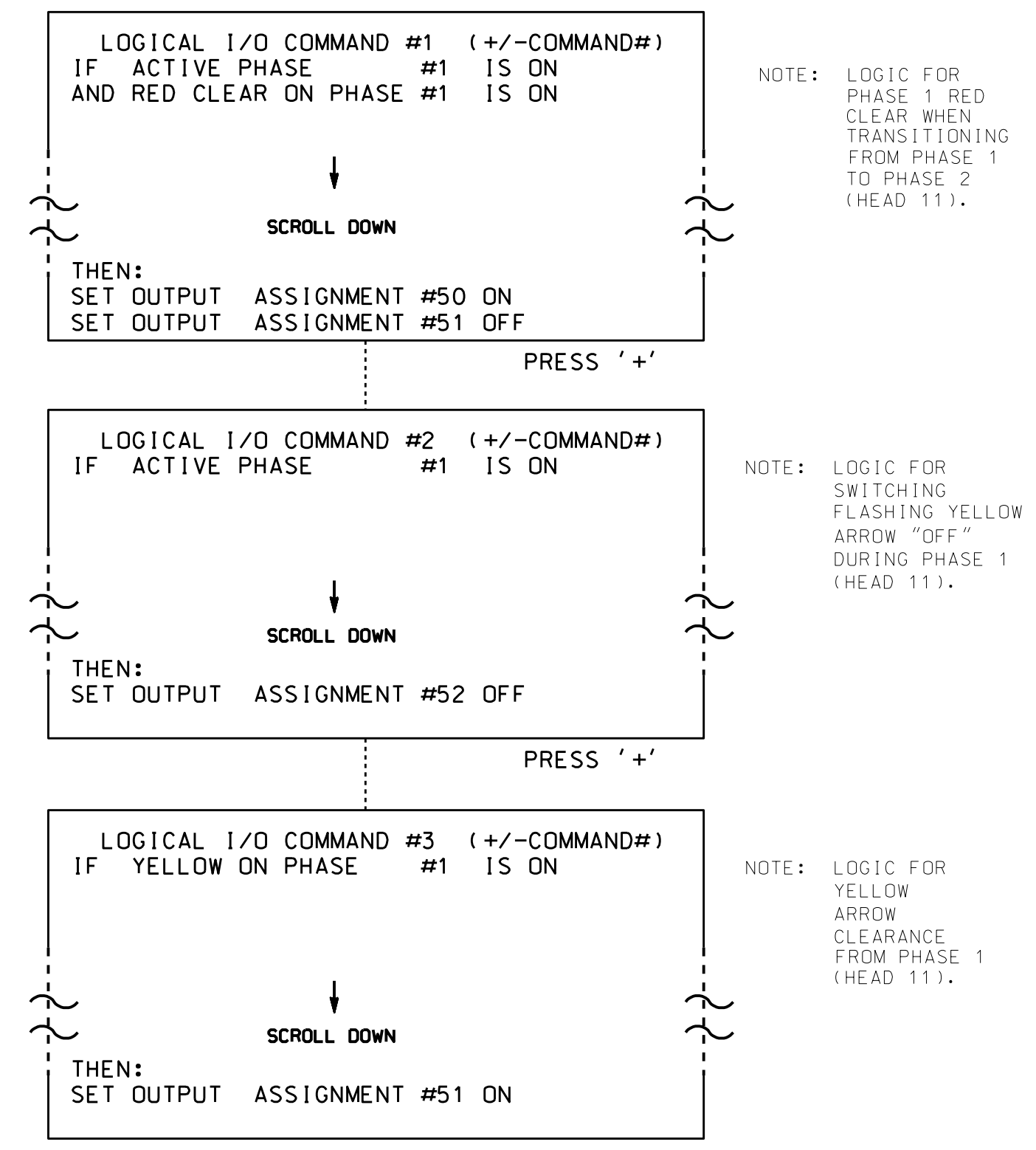
Electrical Detail - Temp 2 (TMP Phase IIB) - Sheet 1 of 2

| | | | |
|--|--|---|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | SR 1962 (S. Third Street) at SR 1980 (Holmes Road) | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |
| | Division 7 PLAN DATE: January 2017 PREPARED BY: S. Armstrong | Alamance County REVIEWED BY: BAS REVIEWED BY: | Mebane SEAL NORTH CAROLINA PROFESSIONAL ENGINEER KEITH M. MINS SEAL 036880 |
| REVISIONS INIT. DATE | | DocuSigned by: Keith M. Mins 1/26/2017 DATE | SIG. INVENTORY NO. 07-2132T2 |

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

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 07-2132T2
 DESIGNED: November 2016
 SEALED: 1/24/2017
 REVISED: N/A

05-11-2017 08:47
 C:\IT\SSU\ITS\Sig\Workgroups\Sig_Mark\mstron072132_sm.ele.xxx.dgn
 sarmstrong

Electrical Detail - Temp 2 (TMP Phase IIB) - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | | | |
|--|---|----------------------------------|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of: | SR 1962 (S. Third Street) at SR 1980 (Holmes Road) | | SEAL |
| | Division 7 Alamance County Mebane PLAN DATE: January 2017 PREPARED BY: S. Armstrong | REVIEWED BY: BAS REVIEWED BY: | |
| REVISIONS INIT. DATE | REVISIONS INIT. DATE | REVISIONS INIT. DATE | DocuSigned by: Keith M. Mins 1/26/2017 2F807868EC23445 DATE SIG. INVENTORY NO. 07-2132T2 |

