

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

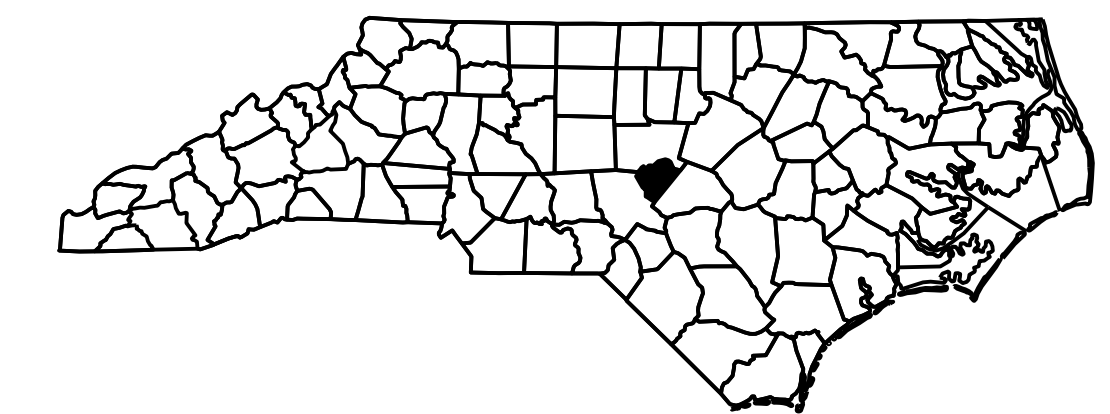
**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Project No. R-3830
Sheet No. SIG-1.0

LEE COUNTY

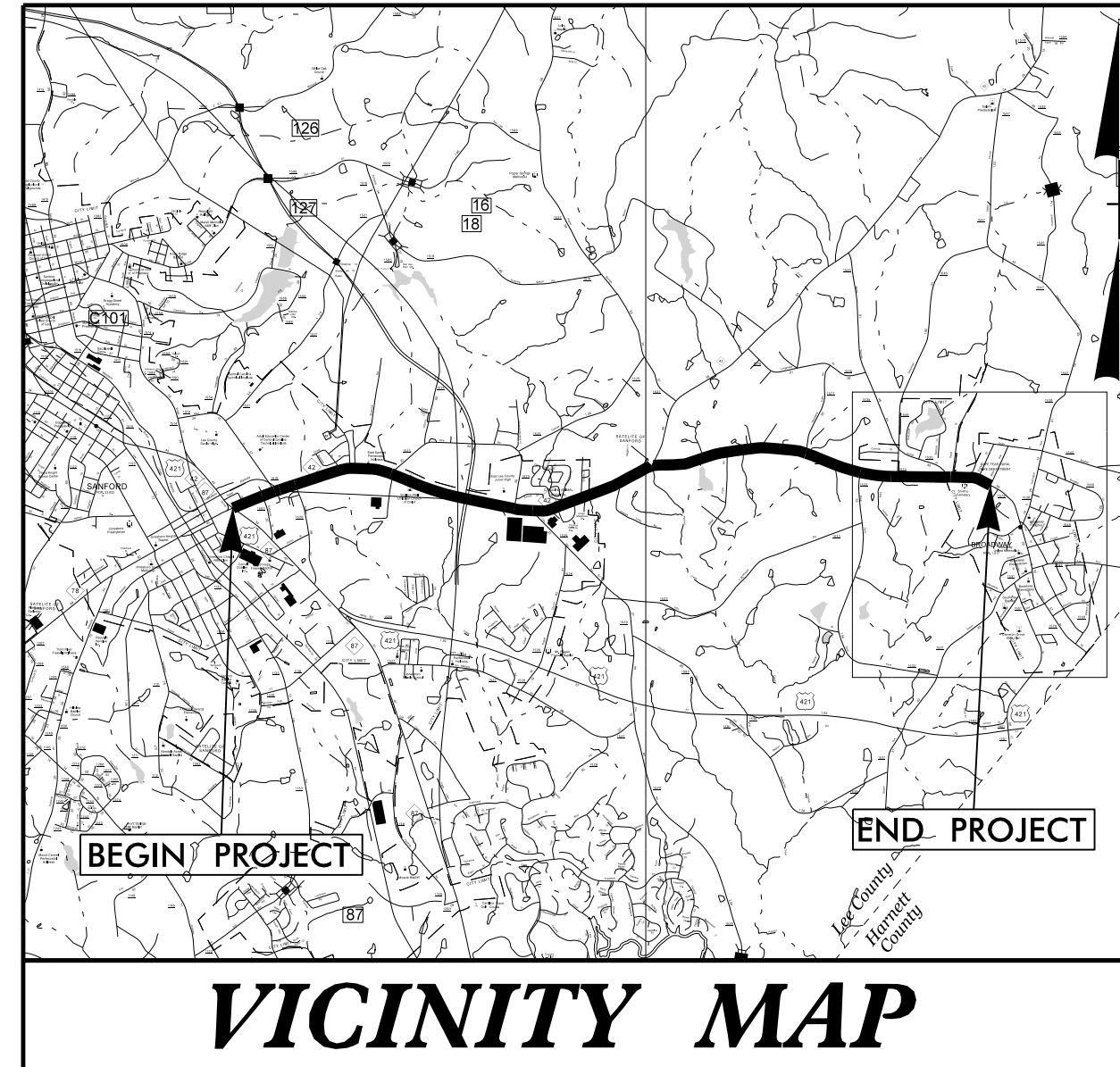


LOCATION: NC 42 (E. MAIN STREET) FROM US 421 BUSINESS/NC 78-87 (HORNER BLVD.) IN SANFORD TO SR 1529 (COX MILL ROAD)

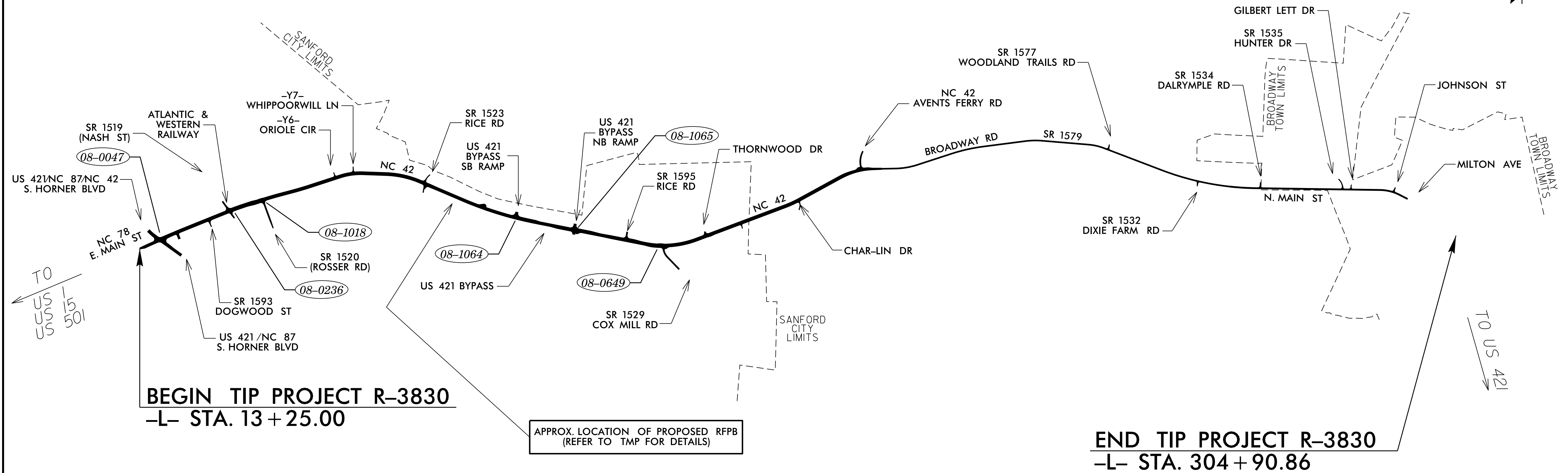
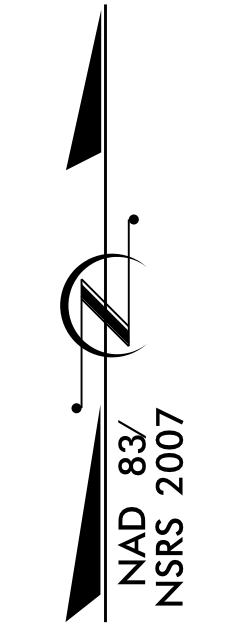
TYPE OF WORK: TRAFFIC SIGNALS & SIGNAL COMMUNICATIONS

TIP PROJECT: R-3830

CONTRACT: C204369



VICINITY MAP



LEGEND

XX-XXXX - SIGNAL INVENTORY NUMBER

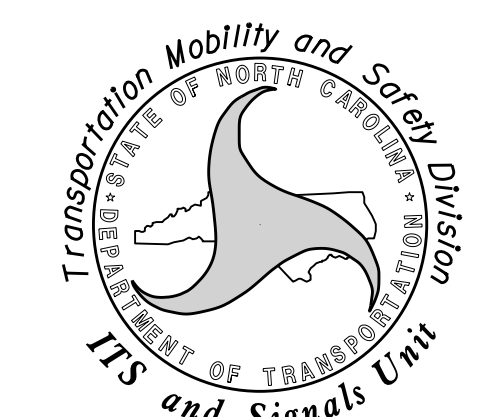
INDEX OF PLANS

| SHEET NO. | SIG. INV. # | DESCRIPTION |
|-----------------|-------------|--|
| SIG 1.0 | | Title Sheet |
| SIG 1.1 - 1.2 | | Standard Plate Sheets |
| SIG 2.0 - 4.5 | 08-0047 | US 421 Business/NC 42-87 (S. Horner Blvd.) @ NC 42-78 (E. Main Street) |
| SIG 5.0 - 7.7 | 08-0236 | NC 42 (E. Main Street) @ SR 1519 (Nash Street) |
| SIG 8.0 - 11.7 | 08-1018 | NC 42 (E. Main Street) @ SR 1520 (Rosser Road) |
| SIG 12.0 - 14.4 | 08-1064 | NC 42 (Broadway Road) @ US 421-NC 87 Bypass Southbound Ramps |
| SIG 15.0 - 17.6 | 08-1065 | NC 42 (Broadway Road) @ US 421-NC 87 Bypass Northbound Ramps/Coty Plant Entrance |
| SIG 18.0 - 22.6 | 08-0649 | NC 42 (Broadway Road) @ SR 1529 (Cox Mill Road) |
| MI - M8 | | Metal Pole Standard Drawings |
| SCP-1 - SCP-17 | | Signal Communication Plans |

TRANSPORTATION SYSTEMS MANAGEMENT AND OPERATIONS UNIT
Contacts:

- Rob Ziemba, PE**
Central Region Signals Engineer
- Todd Joyce, PE**
Signal Equipment Design Review Engineer
- Gregg Green**
Signal Communications Project Engineer

Plans Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION



750 N. Greenfield Parkway, Garner, NC 27529

Stantec

Stantec Consulting Services Inc.
801 Jones Franklin Rd-Suite 300
Raleigh, NC 27606
Tel. 919.851.6866
Fax. 919.851.7024
www.stantec.com
License No. F-0672

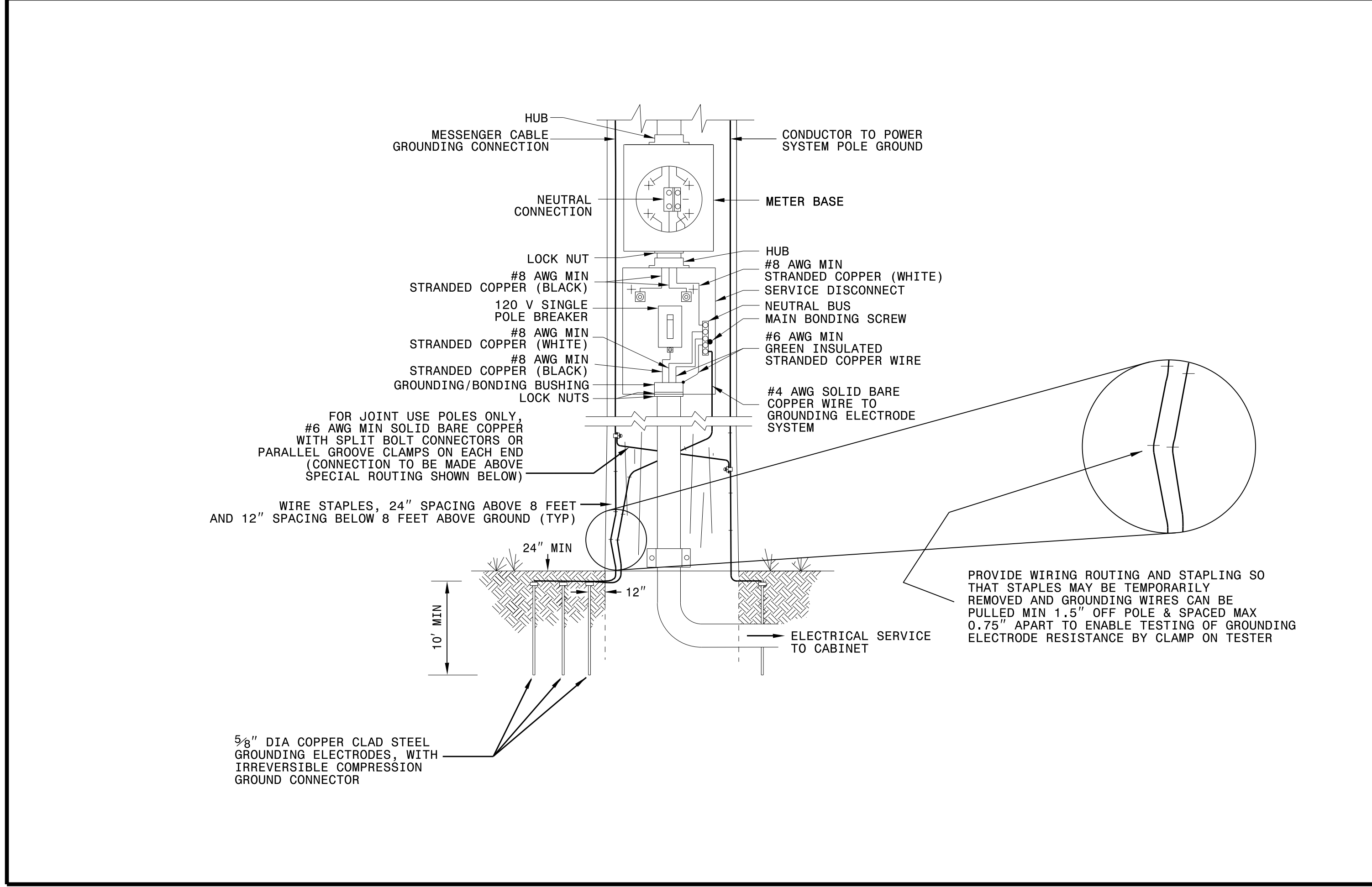
- Betsy L. Watson, PE**
Senior Principal
- Dean Harris**
Senior Transportation Designer
- Regina Muncey, PE**
Transportation Engineer

03-MAY-2022 16:37
R-3830-SIG-1-SH_Updated.dgn
RZiemba

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
ELECTRICAL SERVICE GROUNDING
GROUNDING AND BONDING

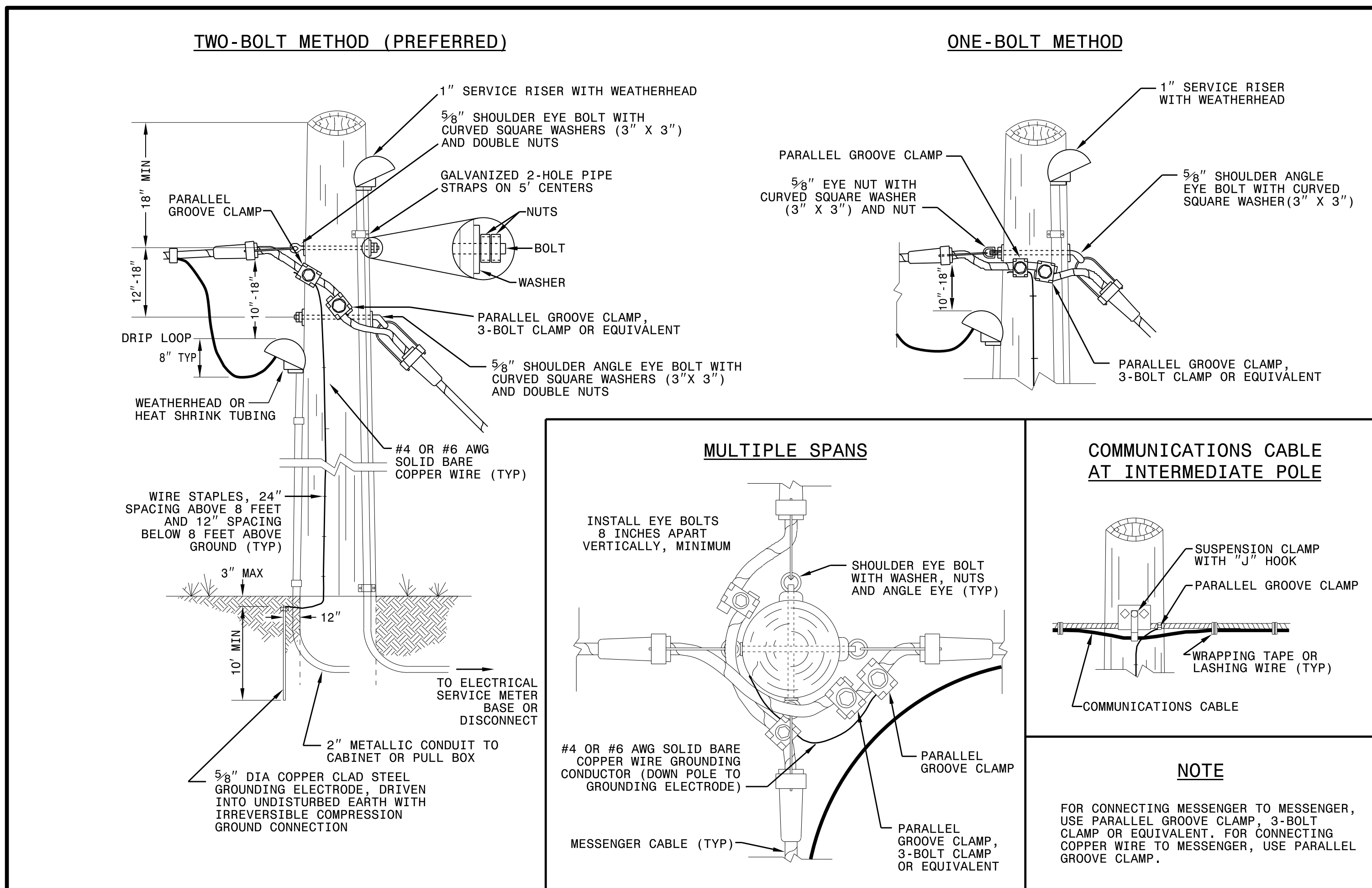
SHEET 1 OF 1
1700D01



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
WOOD POLES
METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1
1720D01

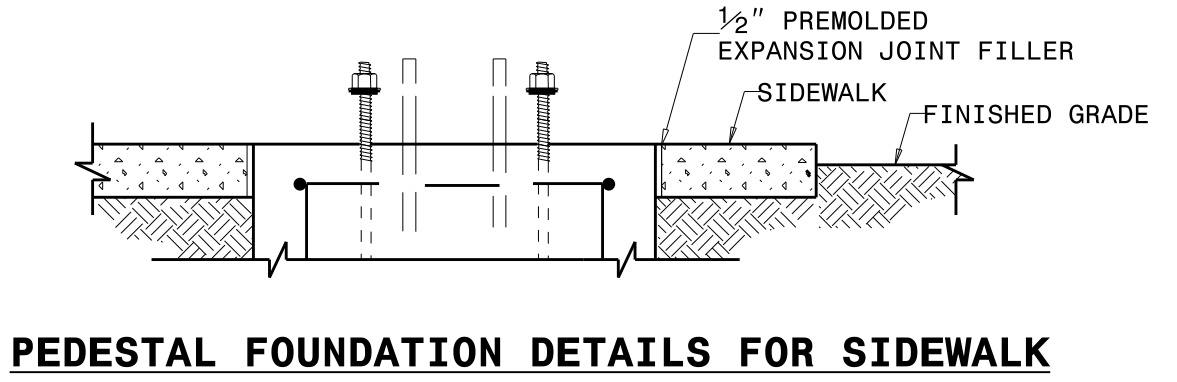
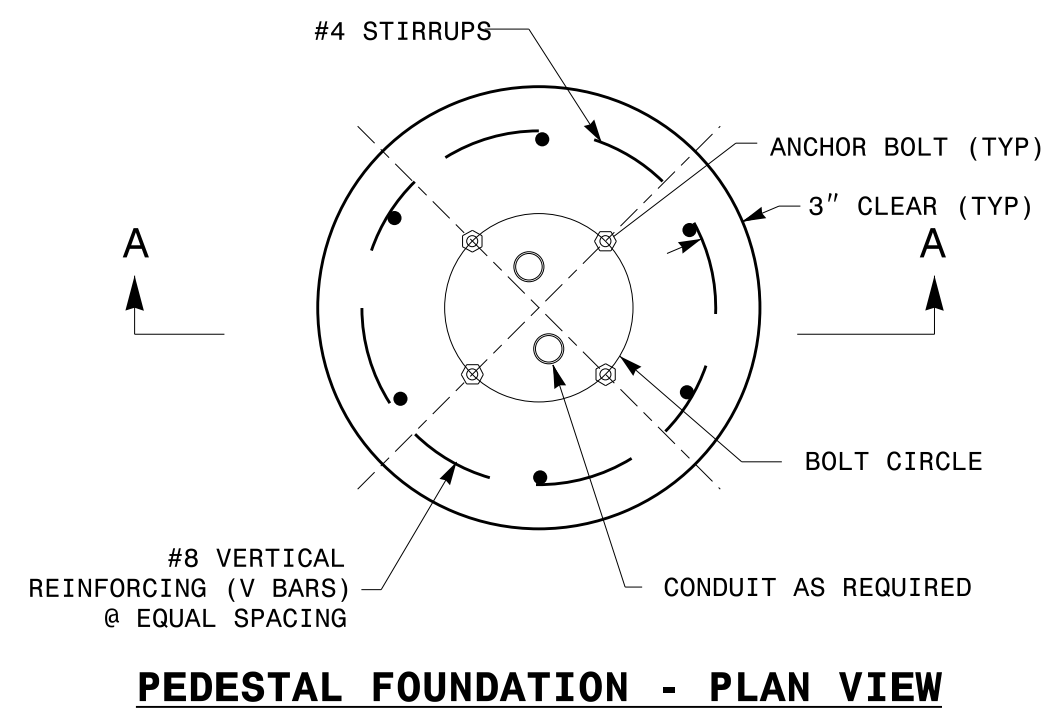


DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

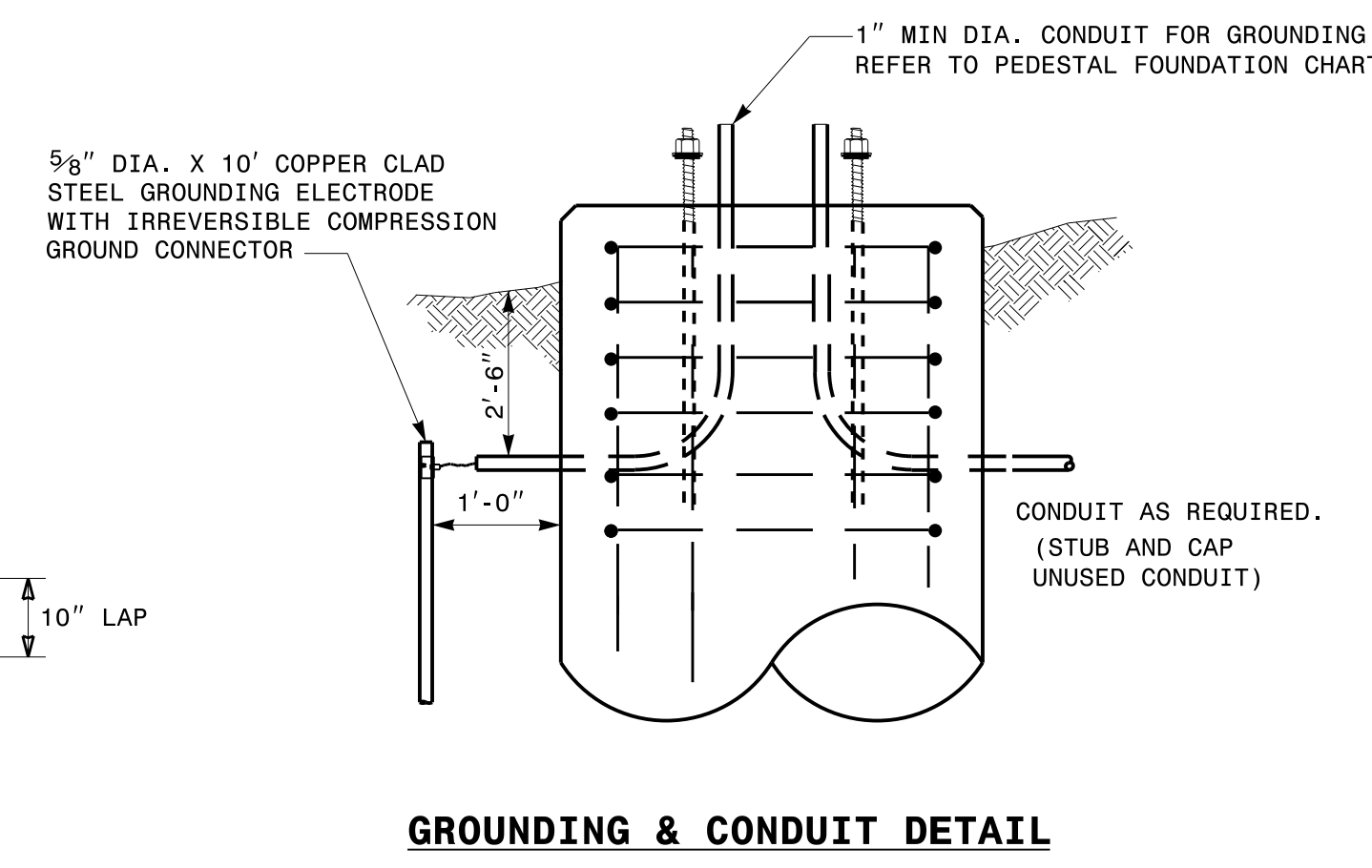
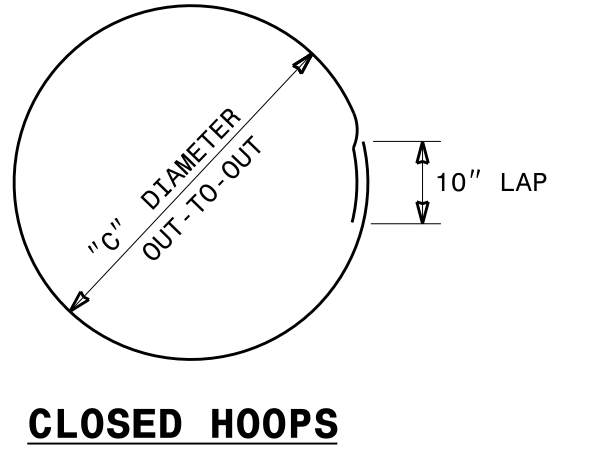
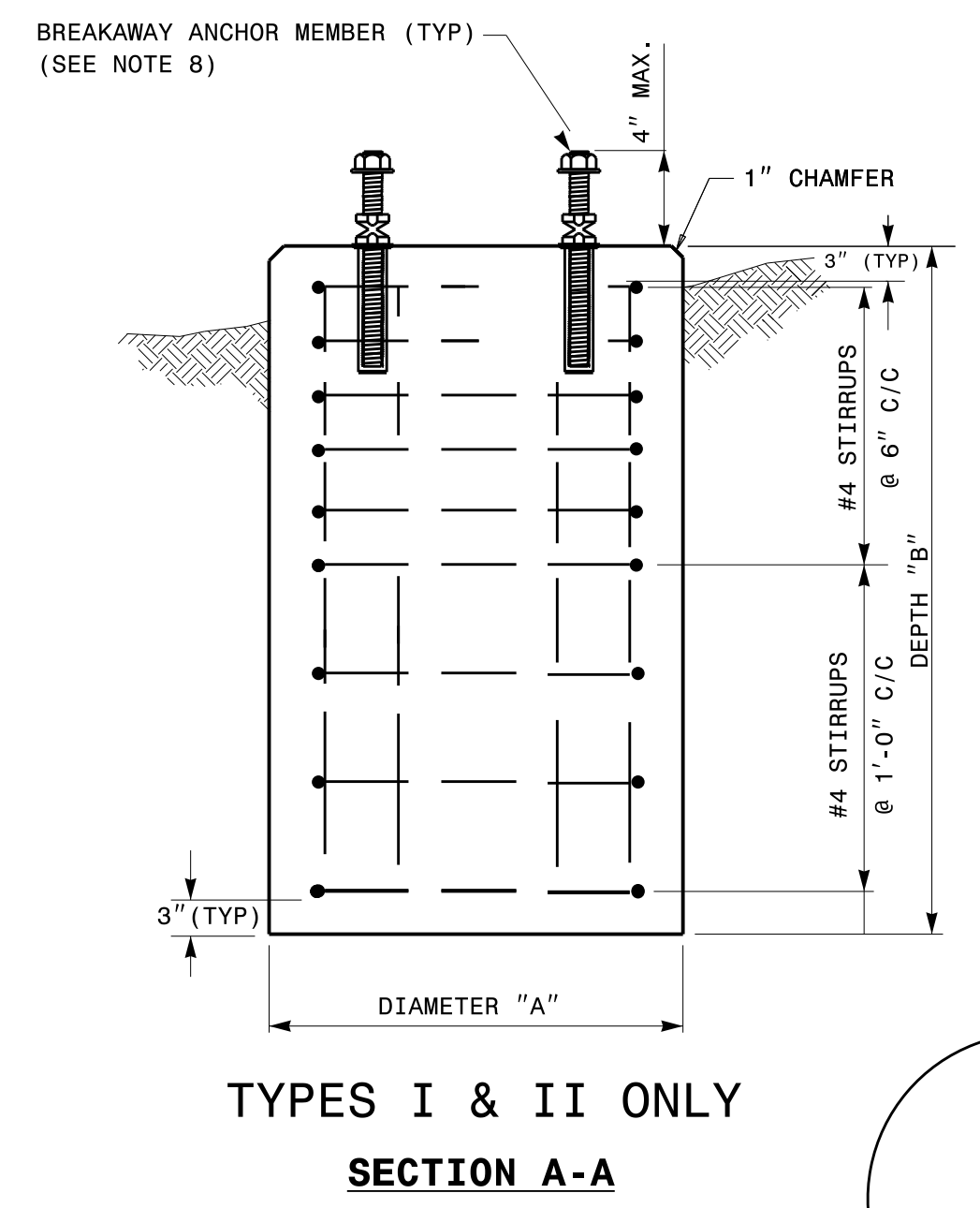
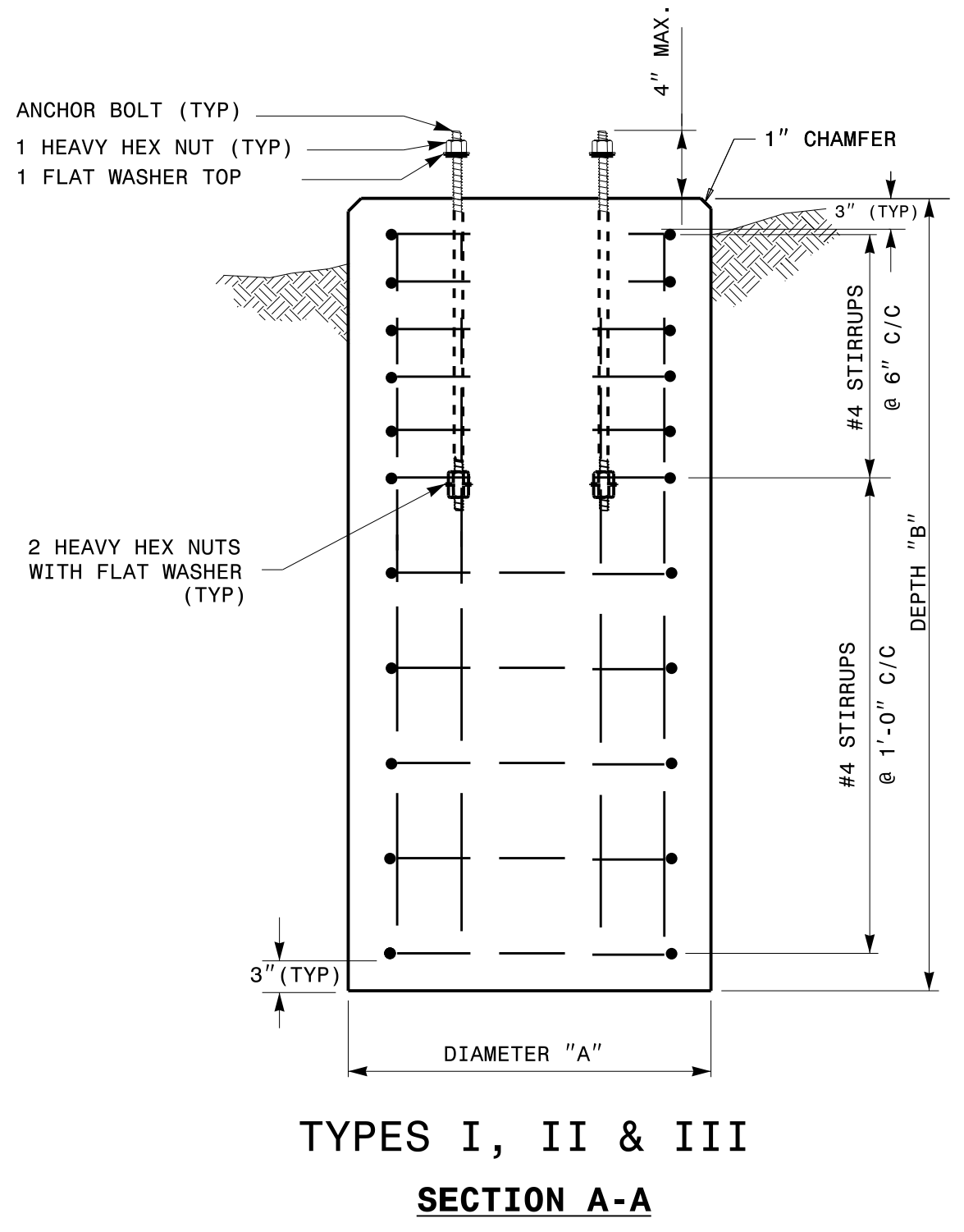
See Plate for Title

| | |
|--|---|
| <p>Prepared in the Offices of:</p> <p>750 N. Greenfield Parkway Garner, NC 27529</p> | <p>SEAL</p> <p>DocuSigned by: <i>Mohd Aslami</i></p> <p>10/11/2017 DATE</p> |
|--|---|

11-0CT-2017_08:56
U:\2018_S14_Drawing\Plate_Sheets\2018_Plate_Sheet.dgn
r:\rough



- NOTES:**
- CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
 - COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
 - USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF $F'c = 3000$ PSI (MIN.).
 - USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
 - GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
 - A. SANDY TYPE SOIL
 - B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
 - C. WIND SPEED NOT TO EXCEED 140 MPH
 IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
 - MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
 - ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
 - USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4 1/2" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6 5/8". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



| PEDESTAL FOUNDATION TYPE AND SIZE | | | | | | | |
|-----------------------------------|-----------------------|-----------------|--------------|--------------------|--------------------|--------------|-----------------------------------|
| TYPE | PEDESTAL DESCRIPTION | SIZE | | | ANCHOR BOLT | | INSTALL GROUNDING SYSTEM (YES/NO) |
| | | DIAMETER "A" FT | DEPTH "B" FT | CONCRETE VOLUME CY | DIAMETER (MIN.) IN | LENGTH FT-IN | |
| I | PEDESTRIAN PUSHBUTTON | 2'-0" | 3'-6" | .41 | 1/2 | 1'-6" | NO |
| II | NORMAL-DUTY | 2'-0" | 5'-0" | .58 | 3/4 | 2'-0" | YES |
| III | HEAVY-DUTY | 2'-6" | 7'-0" | 1.27 | 1 | 4'-0" | YES |

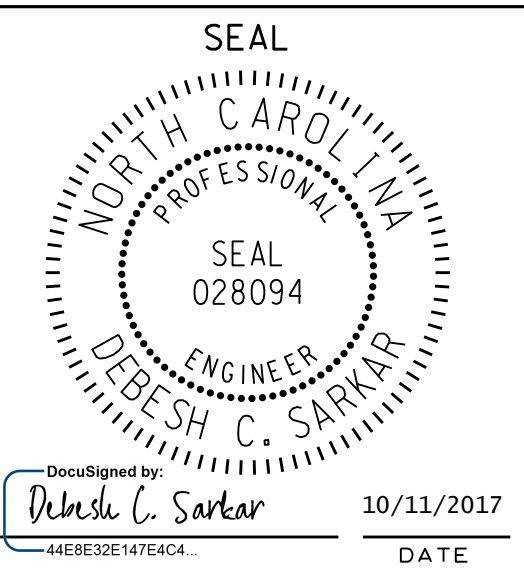
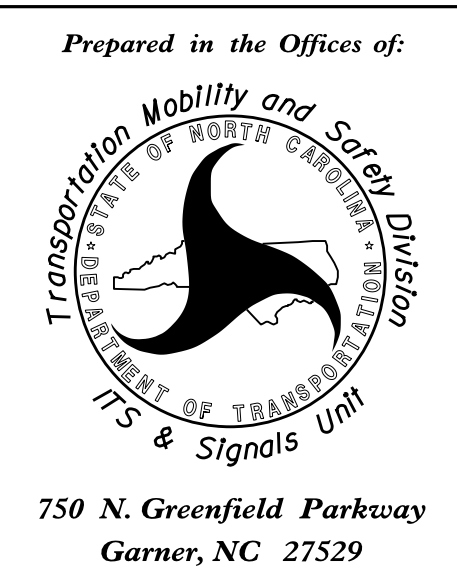
| REINFORCING STEEL SCHEDULE | | | | | | | | | | | | |
|----------------------------|--------|-----|--------|------------|--------------------------------|----------------|-------|--------|-----------------|--------------|------------|------------------------|
| TYPE | V-BAR | | | | STIRRUP | | | | | | | |
| | SIZE # | QTY | LENGTH | WEIGHT LBS | QUANTITY | | | LENGTH | DIAMETER "C" FT | OVERLAP MIN. | WEIGHT LBS | TOTAL STEEL WEIGHT LBS |
| | | | | | VERTICAL SPACING ON 6" CENTERS | ON 12" CENTERS | TOTAL | | | | | |
| I | 8 | 6 | 3'-0" | 56 | 4 | 0 | 4 | 5'-7" | 1'-6" | 0'-10" | 15 | 71 |
| II | 8 | 6 | 4'-6" | 86 | 4 | 5 | 3 | 5'-7" | 1'-6" | 0'-10" | 30 | 116 |
| III | 8 | 6 | 6'-6" | 122 | 4 | 7 | 4 | 7'-2" | 2'-0" | 0'-10" | 53 | 175 |

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

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1
1743D01

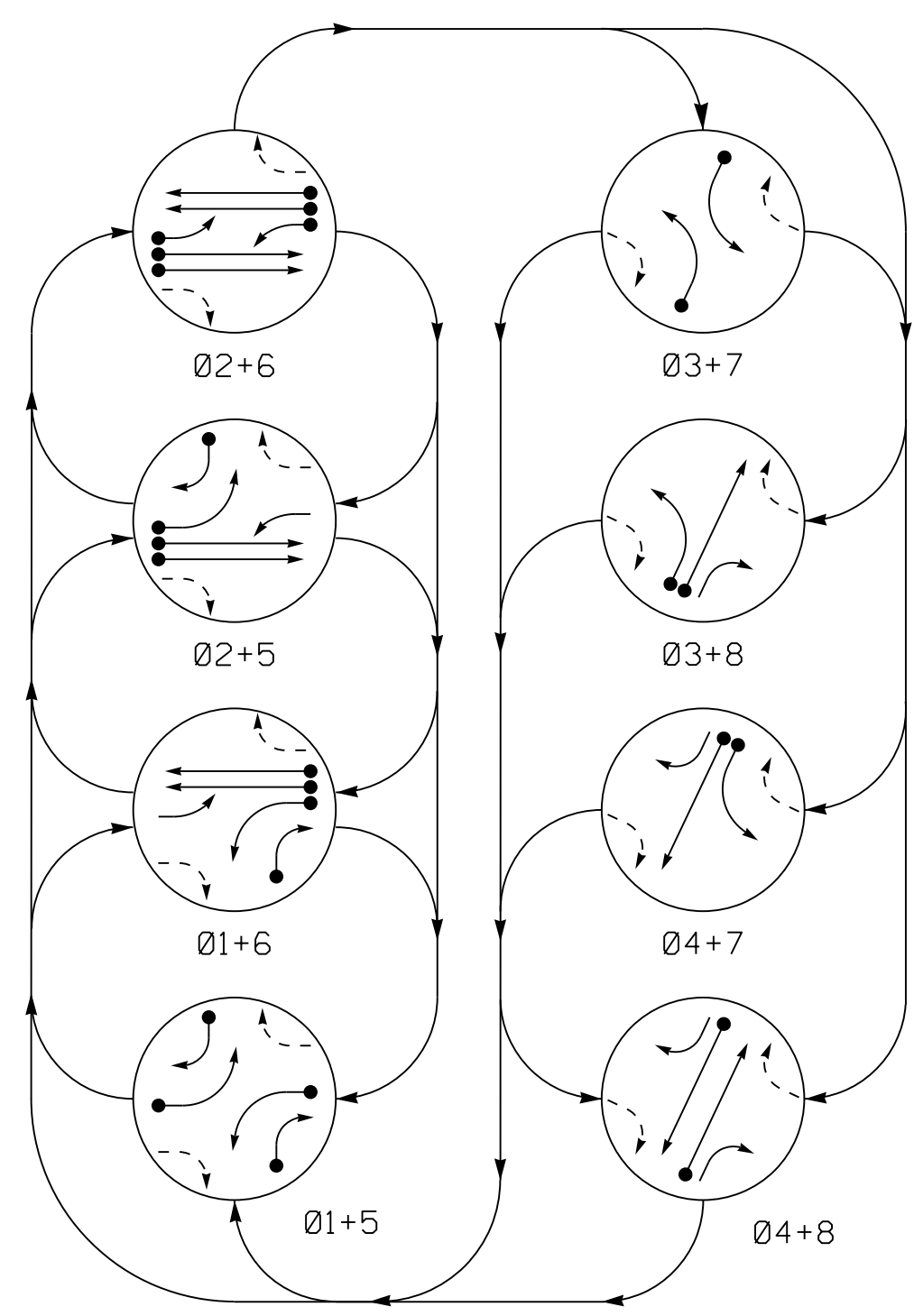
See Plate for Title



DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

11-10-2017 08:03
U:\2018 S14 Drawings\Plate Sheets\2018_Plate Sheet - .dgn
r:\rough

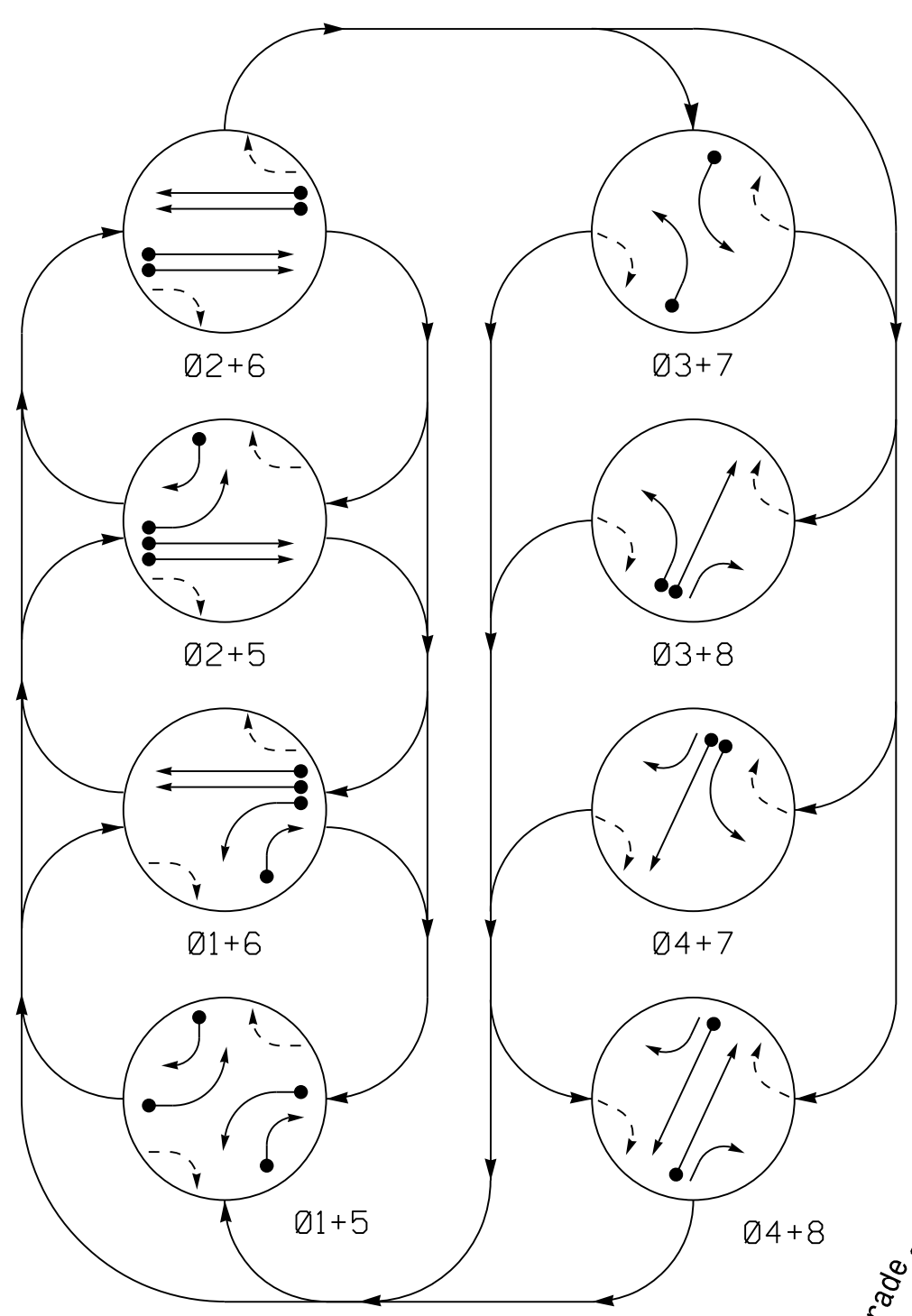
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | ← | ← | ← | ← | ← | ← | ← | ← |
| 21,22 | R | R | G | G | R | R | R | Y |
| 31 | ← | ← | ← | ← | ← | ← | ← | ← |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | R | G | G |
| 51 | ← | ← | ← | ← | ← | ← | ← | ← |
| 61,62 | R | G | R | G | R | R | R | Y |
| 71 | ← | ← | ← | ← | ← | ← | ← | ← |
| 81 | R | R | R | R | R | G | R | G |
| 82 | R | R | R | R | R | G | R | G |

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | ← | ← | ← | ← | ← | ← | ← | ← |
| 21,22 | R | R | G | G | R | R | R | Y |
| 31 | ← | ← | ← | ← | ← | ← | ← | ← |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | R | G | G |
| 51 | ← | ← | ← | ← | ← | ← | ← | ← |
| 61,62 | R | G | R | G | R | R | R | Y |
| 71 | ← | ← | ← | ← | ← | ← | ← | ← |
| 81 | R | R | R | R | R | G | R | G |
| 82 | R | R | R | R | R | G | R | G |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| ZONE | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | SYSTEM LOOP | NEW CARD |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|-------------|----------|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | | |
| 1A | 6X40 | 0 | * | * | 1 | Y | Y | - | ★15 | - |
| 1B | 6X40 | 0 | * | * | 1 | Y | Y | - | 15 | - |
| 2A | 6X6 | 300 | * | * | 2 | Y | Y | - | - | - |
| 2B | 6X6 | 300 | * | * | 2 | Y | Y | - | - | - |
| 2C | 6X40 | 0 | * | * | 2 | Y | Y | 2.0 | 5 | - |
| 2D | 6X40 | 0 | * | * | 2 | Y | Y | 2.0 | 5 | - |
| 3A | 6X40 | 0 | * | * | 3 | Y | Y | - | 3 | - |
| 4A | 6X40 | 0 | * | * | 4 | Y | Y | - | - | - |
| 5A | 6X40 | 0 | * | * | 5 | Y | Y | - | ★15 | - |
| 5B | 6X40 | 0 | * | * | 5 | Y | Y | - | 15 | - |
| 6A | 6X6 | 300 | * | * | 6 | Y | Y | - | - | - |
| 6B | 6X6 | 300 | * | * | 6 | Y | Y | - | - | - |
| 6C | 6X40 | 0 | * | * | 6 | Y | Y | 2.0 | 5 | - |
| 6D | 6X40 | 0 | * | * | 6 | Y | Y | 2.0 | 5 | - |
| 7A | 6X40 | 0 | * | * | 7 | Y | Y | - | 3 | - |
| 8A | 6X40 | 0 | * | * | 8 | Y | Y | - | - | - |

* Video Detection Area
 # Disable Phase(s) call during Alternate Phasing Operation.
 ★ Reduce delay to 3 sec during Alternate Phasing Operation.

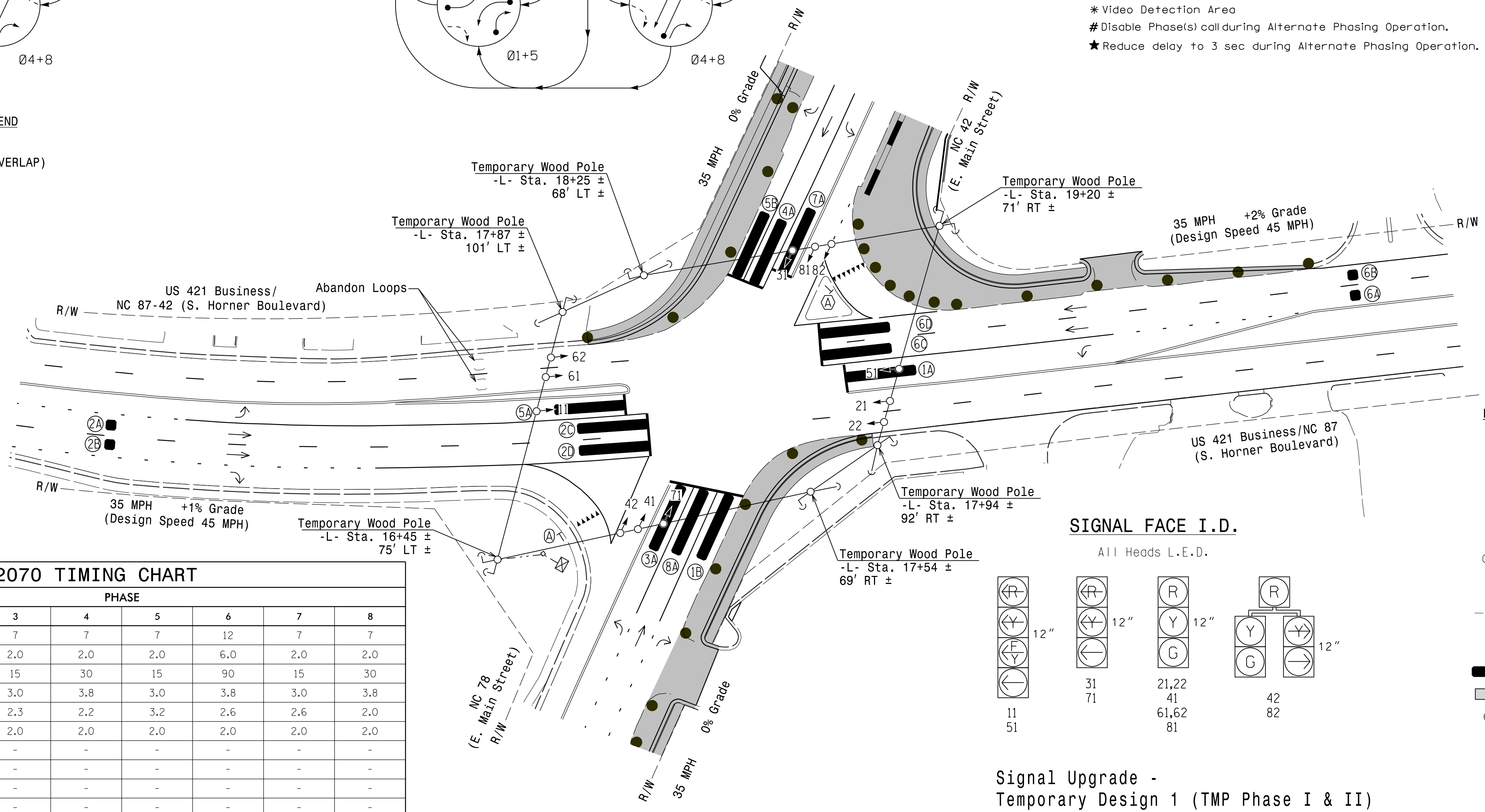
8 Phase Fully Actuated
 (US 421 Bus./NC 87-42 (Horner Blvd.) - System 2 CLS)
 Signal System #: 10802

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 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.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- This location utilizes a video detection system. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
- Closed Loop System Data: Controller Asset #: 0047

PHASING DIAGRAM DETECTION LEGEND

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

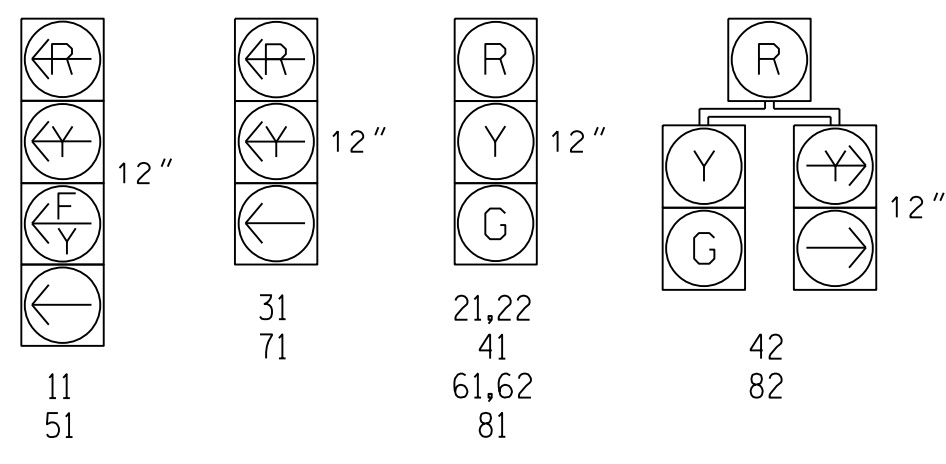


LEGEND

- | 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 | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| ○ → Inductive Loop Detector | ○ → N/A |
| ○ → Controller & Cabinet | ○ → N/A |
| ○ → Junction Box | ○ → N/A |
| ○ → 2-in Underground Conduit | ○ → N/A |
| ○ → Right of Way | ○ → N/A |
| ○ → Directional Arrow | ○ → N/A |
| ○ → Video Detection Area | ○ → N/A |
| ○ → Construction Zone | ○ → N/A |
| ○ → Drums | ○ → N/A |
| ○ → "YIELD" Sign (R1-2) | ○ → N/A |

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | | | | |
|-------------------------|-------|------------|-----|-----|------------|-----|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Min Green 1 * | 7 | 12 | 7 | 7 | 7 | 12 | 7 | 7 |
| Extension 1 * | 2.0 | 6.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Max Green 1 * | 15 | 90 | 15 | 30 | 15 | 90 | 15 | 30 |
| Yellow Clearance | 3.0 | 3.8 | 3.0 | 3.8 | 3.0 | 3.8 | 3.0 | 3.8 |
| Red Clearance | 3.3 | 2.6 | 2.3 | 2.2 | 3.2 | 2.6 | 2.6 | 2.0 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1 * | - | - | - | - | - | - | - | - |
| Don't Walk 1 | - | - | - | - | - | - | - | - |
| Seconds Per Actuation * | - | - | - | - | - | - | - | - |
| Max Variable Initial * | - | - | - | - | - | - | - | - |
| 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 | - | - | - | - | - | - | - | - |
| Dual Entry | - | - | - | - | - | - | - | - |
| Simultaneous Gap | ON | ON | ON | ON | ON | ON | ON | ON |

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

Signal Upgrade - Temporary Design 1 (TMP Phase I & II)

Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road-Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

Prepared for the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 STATE OF NORTH CAROLINA
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27526
 SCALE: 0 40
 1" = 40'

US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street)
 Division 8 Lee County Sanford
 PLAN DATE: October 2019 REVIEWED BY: D Harris
 PREPARED BY: B T Keffer REVIEWED BY: B L Watson

| REVISIONS | INIT. | DATE |
|-----------|-------|------|
| | | |

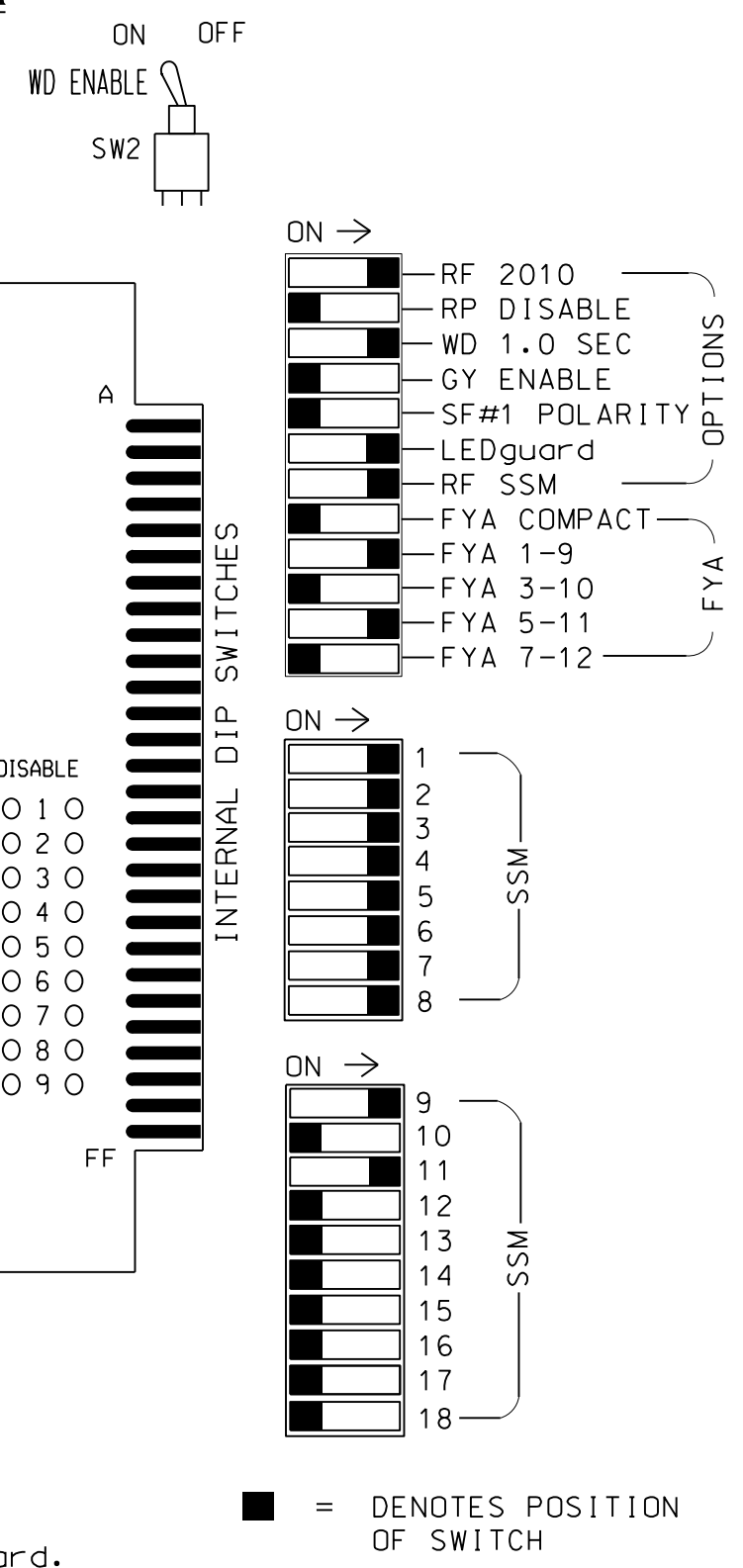
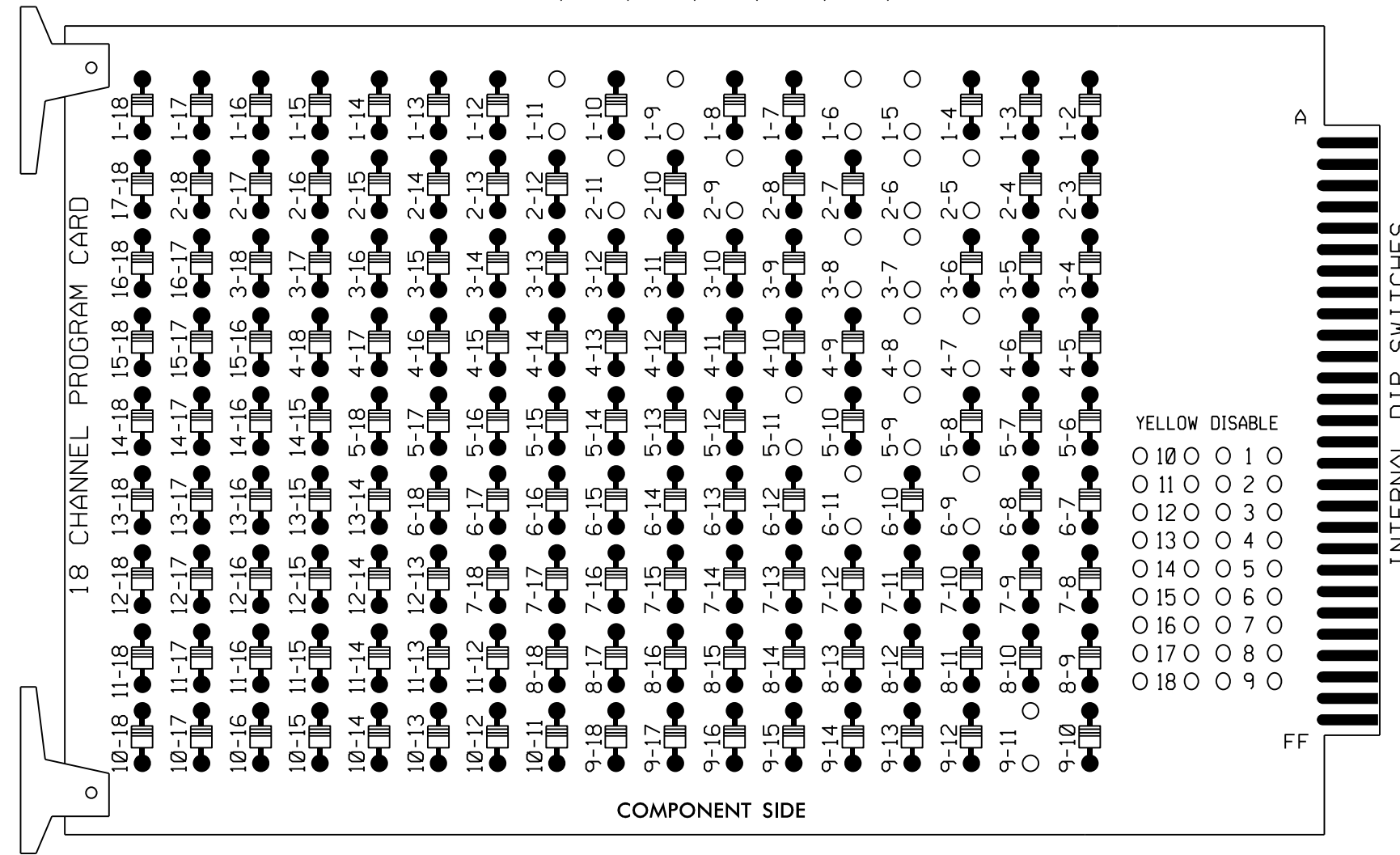
Professional Engineer Seal
 REGINA M. MUNCEY
 ENGINEER
 SEAL 43239
 REGINA M. MUNCEY 10/3/2019
 SIGNATURE DATE
 SIG. INVENTORY NO. 08-004711

43239\$SDATE\$\$\$\$\$
 User: rfmuncey
 D:\Projects\OASIS\Signal\OASIS-3830...sig_dsn_08-004711.dgn
 Date: 10/3/2019 10:30:00 AM

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8, 4-7, 4-8, 5-9, 5-11, 6-9, 6-11, and 9-11.



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 Gap Reduction.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the (US 421 Bus./NC 87-42 (Horner Blvd.) - System 2 (CLS) Signal System 10802.

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, AUXS1,AUXS4
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+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. | 11 | 82 | 21,22 | 31 | 41,42 | 51 | 42 | 61,62 | 71 | 81,82 | 11 | 11 | 11 | 11 | 11 | 51 | 11 | 11 |
| RED | * | 128 | | | 101 | | * | 134 | | 107 | | | | | | | | |
| YELLOW | | 129 | | | 102 | | | 135 | | 108 | | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | 109 | | | | | | | | |
| RED ARROW | | | | | 116 | | | | | 122 | | | A121 | | | A114 | | |
| YELLOW ARROW | 126 | | | | 117 | | | 132 | | 123 | | | A122 | | | A115 | | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | A116 | | |
| GREEN ARROW | 127 | 127 | | | 118 | | | 133 | 133 | 124 | | | | | | | | |

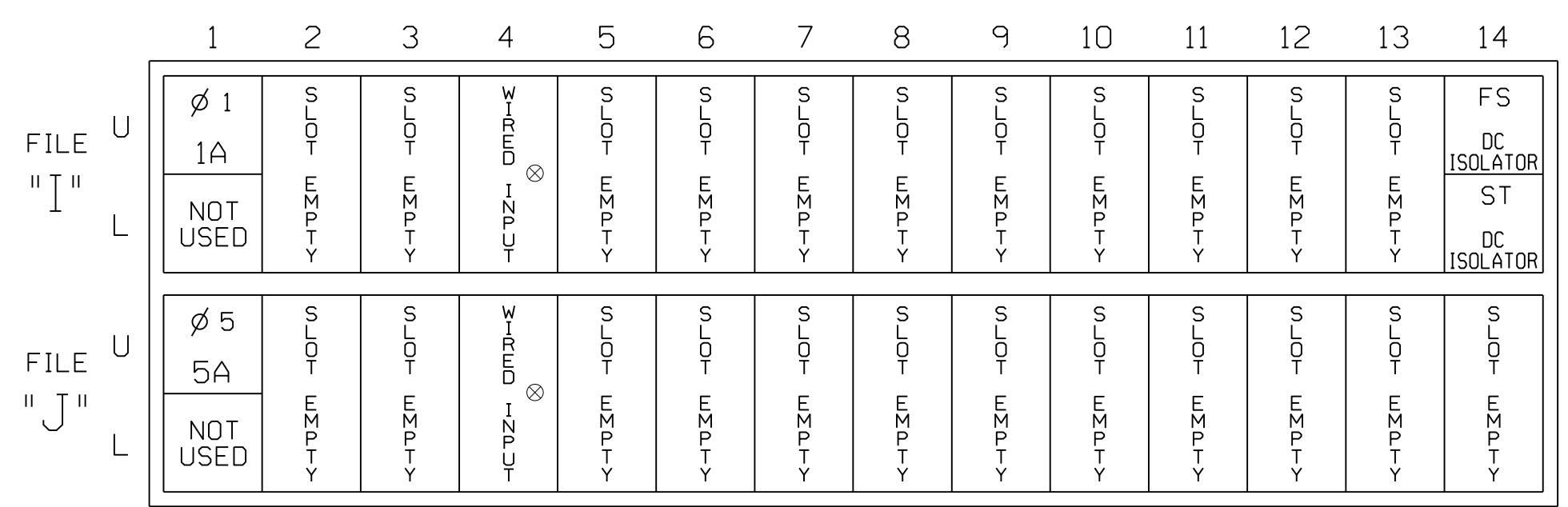
NU = Not Used

* 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)



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

⊗ Wired Inp - Do no pop la e slo i h de ec or card

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

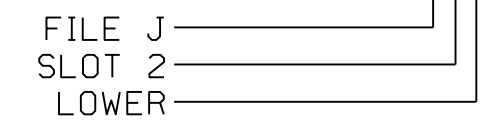
| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10★ | 26 | 6 | Y | Y | Y | | 3 |
| | - | I1U | 56 | 18★ | 51 | 1 | Y | Y | | | 3 |
| 5A ² | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | - | I4U | 47 | 9★ | 22 | 2 | Y | Y | Y | | 3 |
| | - | J1U | 55 | 17★ | 55 | 5 | Y | Y | | | 3 |

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

²Add jumper from J1-W to I4-W, on rear of input file.

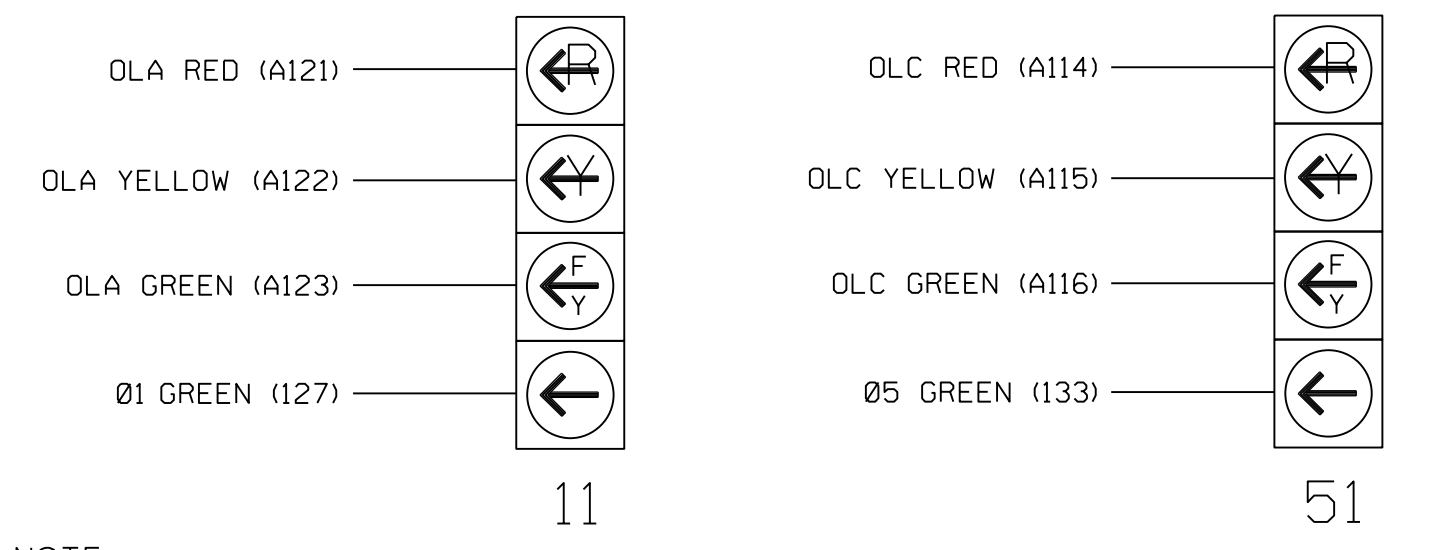
★ See Input Page Assignment programming details on sheets 3 and 4.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



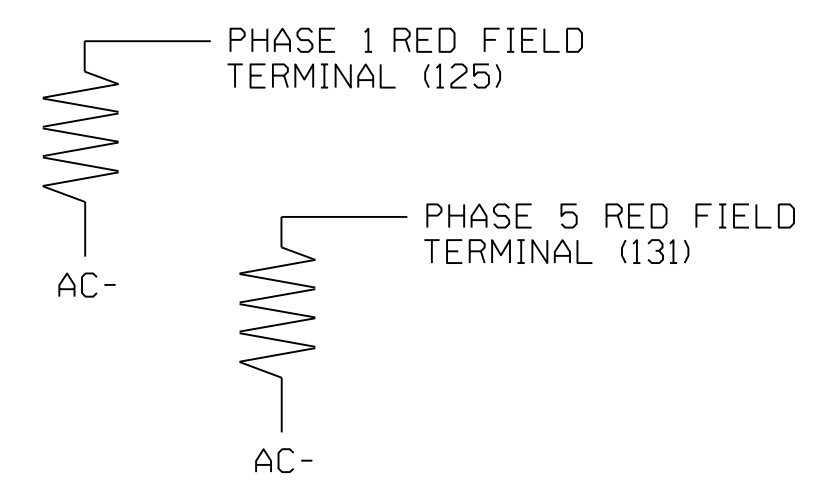
NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



DETECTOR NOTES

- For all loops 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 schemes shown on the Signal Design Plans.
- For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-004711
 DESIGNED: OCTOBER 2019
 SEALED: 10-03-2019
 REVISED:

Temporary Design 1 - (TMP Phase I & II)
Electrical Detail - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec
 Stantec Consulting Services Inc.
 801 Jones Franklin Road-Suite 300
 Raleigh, NC 27606
 Tel. (919) 851-6866
 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 421 Business/
 NC 87-42 (S. Horner Boulevard)
 at
 NC 78-42 (Main Street)
 Division 8 Lee County Sanford

PLAN DATE: October 2019 REVIEWED BY: E D Harris
 PREPARED BY: R M Muncey REVIEWED BY: -

| REVISIONS | INIT. | DATE |
|-----------|-------|------|
| | | |

SEAL
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 43239
 ENGINEER
 REGINA M. MUNCEY

DocuSigned by:
 Regina M. Muncey
 10/3/2019
 DATE
 SIG. INVENTORY NO. 08-004711

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, 3, 4, 5 AND 6.
- 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 #50 ON
SET OUTPUT ASSIGNMENT #51 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 #52 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 #51 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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
- OUTPUT 50 = Overlap A Red
- OUTPUT 51 = Overlap A Yellow
- OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(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)...0.0

← 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
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)...0.0

← NOTICE GREEN FLASH

PRESS '+' TWICE

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 → PAGE 2: 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 _ 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)...0.0

← NOTICE GREEN FLASH

PRESS '+' TWICE

NOTICE PAGE 2 → PAGE 2: 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 _ 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)...0.0

← NOTICE GREEN FLASH

PRESS '+' TWICE

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0047T1
DESIGNED: OCTOBER 2019
SEALED: 10-03-2019
REVISED:

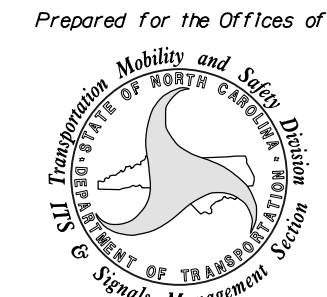
Temporary Design 1 - (TMP Phase I & II)
Electrical Detail - Sheet 2 of 5

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING
DETAILS FOR

Prepared for the Offices of:

 Department of Transportation
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

US 421 Business/
NC 87-42 (S. Horner Boulevard)
at
NC 78-42 (Main Street)
Division 8 Lee County Sanford

PLAN DATE: October 2019 REVIEWED BY: E D Harris
PREPARED BY: R M Muncie REVIEWED BY:

| REVISIONS | INIT. | DATE |
|-----------|-------|------|
| | | |
| | | |
| | | |

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
43239
ENGINEER
REGINA M. MUNCIE

DocuSigned by:
Regina M. Muncie
10/3/2019
DATE

SIG. INVENTORY NO. 08-0047T1

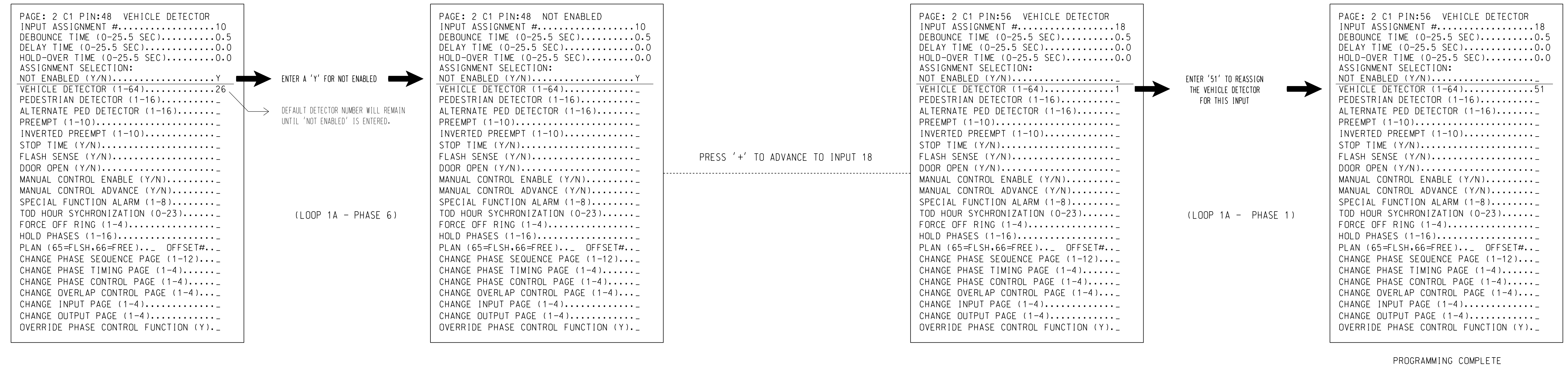
9/26/2019 10:00 AM
U:\Projects\Signal\Signal\Temporary Design\08-0047T1.dgn
User: rmmuncie

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

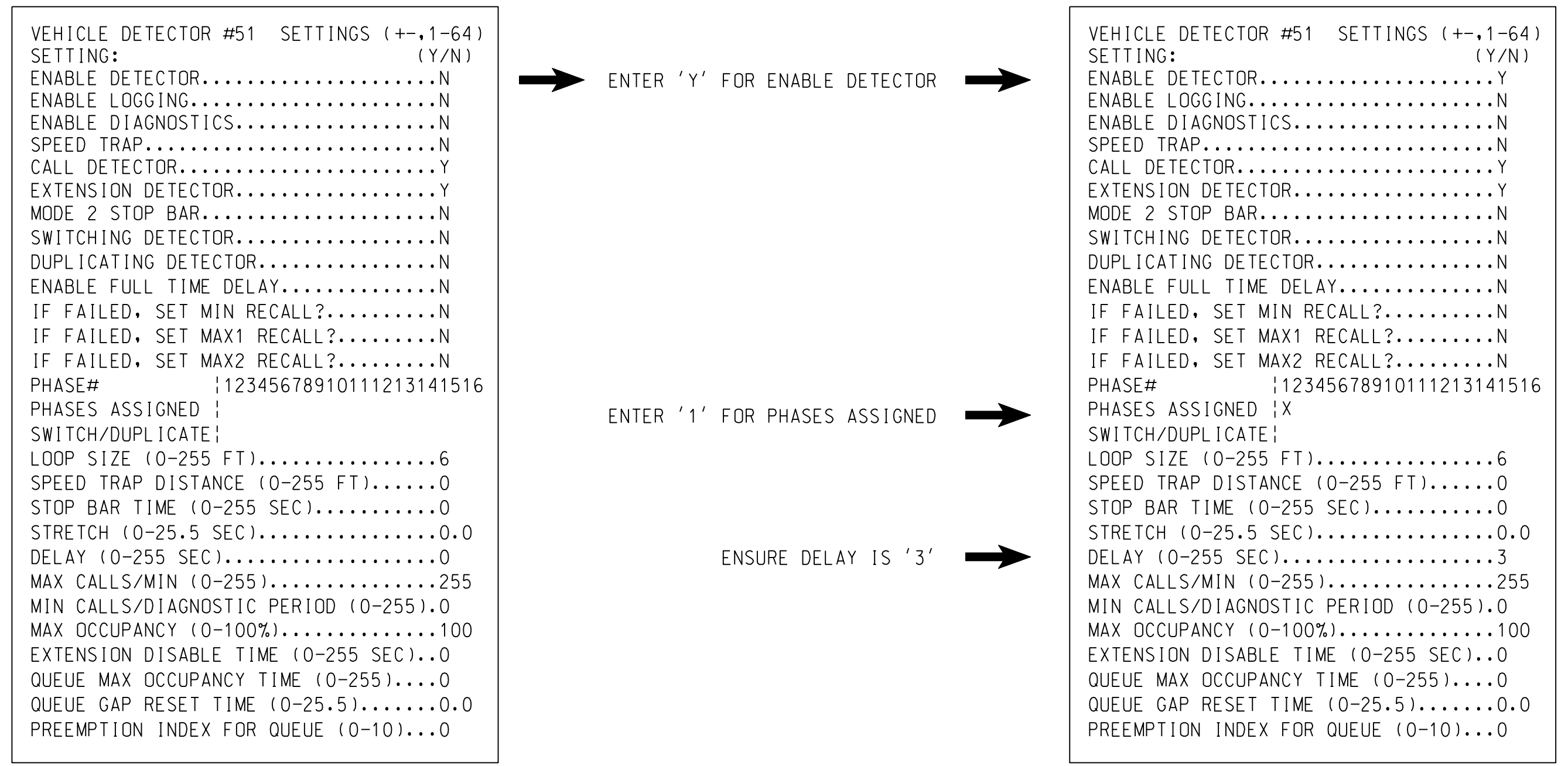
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047T1
DESIGNED: OCTOBER 2019
SEALED: 10-03-2019
REVISED:

Temporary Design 1 - (TMP Phase I & II)
Electrical Detail - Sheet 3 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

| | |
|--|-------------------------|
| US 421 Business/ NC 87-42 (S. Horner Boulevard) at NC 78-42 (Main Street) | |
| Division 8 | Lee County Sanford |
| PLAN DATE: October 2019 | REVIEWED BY: E D Harris |
| PREPARED BY: R M Muncy | REVIEWED BY: |
| REVISIONS | INIT. DATE |
| | |
| | |
| | |

Regina M. Muncy 10/3/2019
DATE
SIG. INVENTORY NO. 08-0047T1

9/26/2019 10:08 AM
D:\Projects\0819\Signal\Signal\Detail\Temporary Design\3830-sm.ele_08-0047T1.dgn
User: rmmuncy

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.

```

PAGE: 2 C1 PIN:47 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....9
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....22
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...

```

ENTER A 'Y' FOR NOT ENABLED
DEFAULT DETECTOR NUMBER WILL REMAIN UNTIL 'NOT ENABLED' IS ENTERED.

(LOOP 5A - PHASE 2)

```

PAGE: 2 C1 PIN:47 NOT ENABLED
INPUT ASSIGNMENT #.....9
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....Y
VEHICLE DETECTOR (1-64).....
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...

```

PRESS '+' TO ADVANCE TO INPUT 17

```

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....17
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....5
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...

```

ENTER '55' TO REASSIGN THE VEHICLE DETECTOR FOR THIS INPUT

(LOOP 5A - PHASE 5)

```

PAGE: 2 C1 PIN:55 VEHICLE DETECTOR
INPUT ASSIGNMENT #.....17
DEBOUNCE TIME (0-25.5 SEC).....0.5
DELAY TIME (0-25.5 SEC).....0.0
HOLD-OVER TIME (0-25.5 SEC).....0.0
ASSIGNMENT SELECTION:
NOT ENABLED (Y/N).....
VEHICLE DETECTOR (1-64).....55
PEDESTRIAN DETECTOR (1-16).....
ALTERNATE PED DETECTOR (1-16).....
PREEMPT (1-10).....
INVERTED PREEMPT (1-10).....
STOP TIME (Y/N).....
FLASH SENSE (Y/N).....
DOOR OPEN (Y/N).....
MANUAL CONTROL ENABLE (Y/N).....
MANUAL CONTROL ADVANCE (Y/N).....
SPECIAL FUNCTION ALARM (1-8).....
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4).....
HOLD PHASES (1-16).....
PLAN (65=FLSH,66=FREE)... OFFSET#...
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4).....
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)....
CHANGE INPUT PAGE (1-4).....
CHANGE OUTPUT PAGE (1-4).....
OVERRIDE PHASE CONTROL FUNCTION (Y)...

```

PROGRAMMING COMPLETE

SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.

```

VEHICLE DETECTOR #55 SETTINGS (+,-,1-64)
SETTING: (Y/N)
ENABLE DETECTOR.....N
ENABLE LOGGING.....N
ENABLE DIAGNOSTICS.....N
SPEED TRAP.....N
CALL DETECTOR.....Y
EXTENSION DETECTOR.....Y
MODE 2 STOP BAR.....N
SWITCHING DETECTOR.....N
DUPLICATING DETECTOR.....N
ENABLE FULL TIME DELAY.....N
IF FAILED, SET MIN RECALL?.....N
IF FAILED, SET MAX1 RECALL?.....N
IF FAILED, SET MAX2 RECALL?.....N
PHASE# 12345678910111213141516
PHASES ASSIGNED |
SWITCH/DUPLICATE|
LOOP SIZE (0-255 FT).....6
SPEED TRAP DISTANCE (0-255 FT).....0
STOP BAR TIME (0-255 SEC).....0
STRETCH (0-25.5 SEC).....0.0
DELAY (0-255 SEC).....0
MAX CALLS/MIN (0-255).....255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).....0
MAX OCCUPANCY (0-100%).....100
EXTENSION DISABLE TIME (0-255 SEC).....0
QUEUE MAX OCCUPANCY TIME (0-255).....0
QUEUE GAP RESET TIME (0-25.5).....0.0
PREEMPTION INDEX FOR QUEUE (0-10).....0

```

ENTER 'Y' FOR ENABLE DETECTOR

ENTER '5' FOR PHASES ASSIGNED

ENSURE DELAY IS '3'

```

VEHICLE DETECTOR #55 SETTINGS (+,-,1-64)
SETTING: (Y/N)
ENABLE DETECTOR.....Y
ENABLE LOGGING.....N
ENABLE DIAGNOSTICS.....N
SPEED TRAP.....N
CALL DETECTOR.....Y
EXTENSION DETECTOR.....Y
MODE 2 STOP BAR.....N
SWITCHING DETECTOR.....N
DUPLICATING DETECTOR.....N
ENABLE FULL TIME DELAY.....N
IF FAILED, SET MIN RECALL?.....N
IF FAILED, SET MAX1 RECALL?.....N
IF FAILED, SET MAX2 RECALL?.....N
PHASE# 12345678910111213141516
PHASES ASSIGNED | X
SWITCH/DUPLICATE|
LOOP SIZE (0-255 FT).....6
SPEED TRAP DISTANCE (0-255 FT).....0
STOP BAR TIME (0-255 SEC).....0
STRETCH (0-25.5 SEC).....0.0
DELAY (0-255 SEC).....3
MAX CALLS/MIN (0-255).....255
MIN CALLS/DIAGNOSTIC PERIOD (0-255).....0
MAX OCCUPANCY (0-100%).....100
EXTENSION DISABLE TIME (0-255 SEC).....0
QUEUE MAX OCCUPANCY TIME (0-255).....0
QUEUE GAP RESET TIME (0-25.5).....0.0
PREEMPTION INDEX FOR QUEUE (0-10).....0

```

DETECTOR PROGRAMMING COMPLETE

NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047T1
DESIGNED: OCTOBER 2019
SEALED: 10-03-2019
REVISED:

Temporary Design 1 - (TMP Phase I & II)
Electrical Detail - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stantec Consulting Services Inc.
801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
Tel. (919) 851-6866
Fax. (919) 851-7024
www.stantec.com
License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR

Prepared for the Offices of:

 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF SIGNAL MANAGEMENT

750 N. Greenfield Pkwy, Garner, NC 27529

US 421 Business/
NC 87-42 (S. Horner Boulevard)
at
NC 78-42 (Main Street)

Division 8 Lee County Sanford

PLAN DATE: October 2019 REVIEWED BY: E D Harris

PREPARED BY: R M Muncy REVIEWED BY:

| REVISIONS | INIT. | DATE |
|-----------|-------|------|
| | | |
| | | |

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
REGINA M. MUNCEY
43239

DocuSigned by:
Regina M. Muncy 10/3/2019
DATE

SIG. INVENTORY NO. 08-0047T1

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

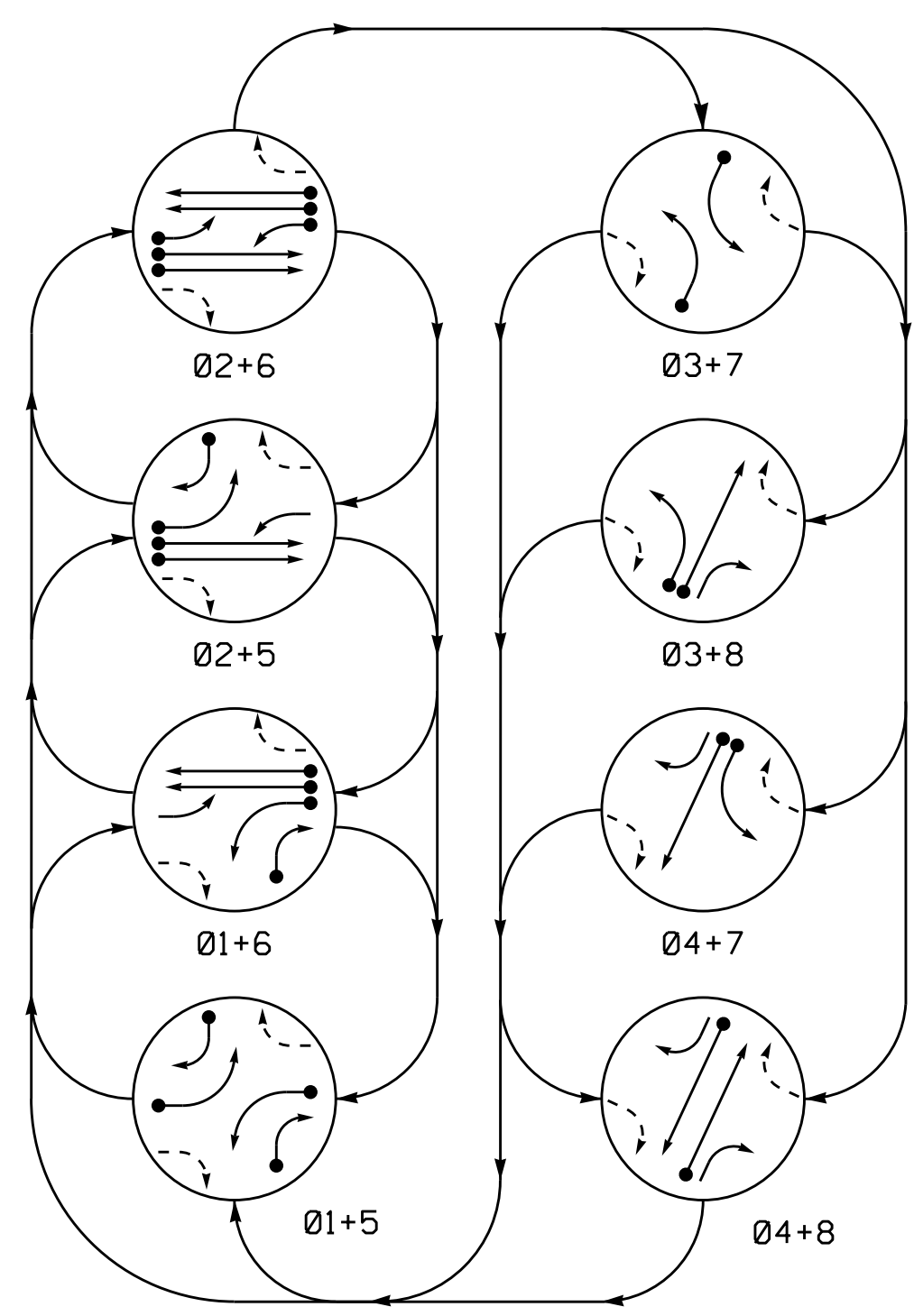
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0047T1
DESIGNED: OCTOBER 2019
SEALED: 10-03-2019
REVISED:

Temporary Design 1 - (TMP Phase I & II)
Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

| | | | |
|---|---|---|---|
| Stantec Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672 | ELECTRICAL AND PROGRAMMING DETAILS FOR Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | US 421 Business/ NC 87-42 (S. Horner Boulevard) at NC 78-42 (Main Street) Division 8 Lee County Sanford | SEAL NORTH CAROLINA PROFESSIONAL SEAL 43239 ENGINEER REGINA M. MUNCEY |
| | PLAN DATE: October 2019 REVIEWED BY: E D Harris PREPARED BY: R M Muncey REVIEWED BY: - | REVISIONS INIT. DATE _____ _____ _____ | DocuSigned by: Regina M. Muncey 10/3/2019 DATE SIG. INVENTORY NO. 08-0047T1 |

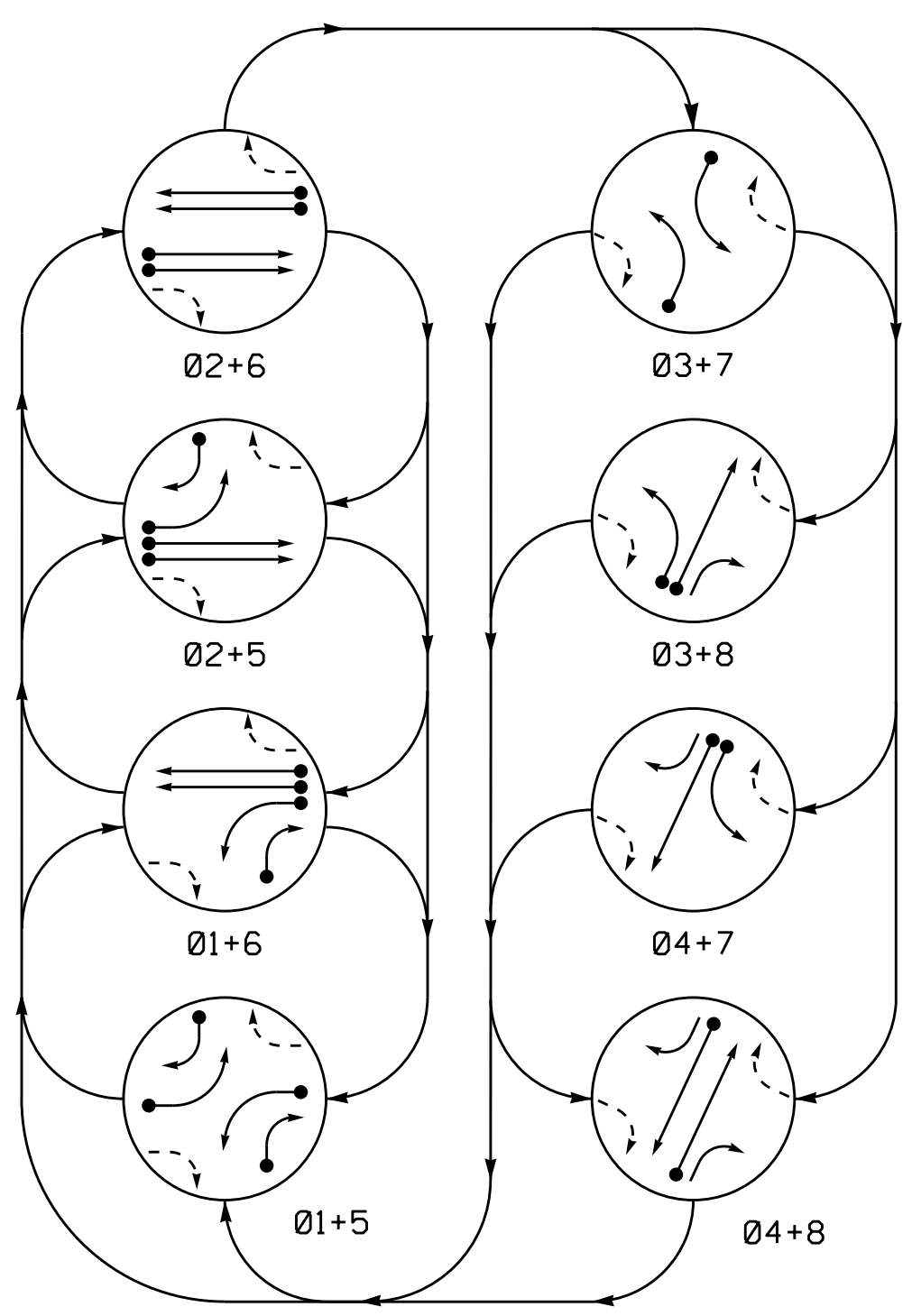
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | — | — | F | F | R | R | R | Y |
| 21, 22 | R | R | G | G | R | R | R | Y |
| 31 | R | R | R | R | — | — | — | — |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | G | G | R |
| 51 | — | F | — | F | R | R | R | Y |
| 61, 62 | R | G | R | G | R | R | R | Y |
| 71 | R | R | R | R | — | — | — | — |
| 81 | R | R | R | R | R | G | G | R |
| 82 | R | R | R | R | R | G | G | R |

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | — | — | R | R | R | R | R | Y |
| 21, 22 | R | R | G | G | R | R | R | Y |
| 31 | R | R | R | R | — | — | — | — |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | G | G | R |
| 51 | — | R | — | R | R | R | R | Y |
| 61, 62 | R | G | R | G | R | R | R | Y |
| 71 | R | R | R | R | — | — | — | — |
| 81 | R | R | R | R | R | G | G | R |
| 82 | R | R | R | R | R | G | G | R |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| ZONE | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | SYSTEM LOOP | NEW CARD |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|--------------|-------------|----------|
| | | | | | PHASE | CALLING | EXTENSION | STRETCH TIME | | |
| 1A | 6X40 | 0 | * | * | 1 | Y | Y | - | ★15 | - |
| | | | | | 6# | Y | Y | Y | - | 3 |
| 1B | 6X40 | 0 | * | * | 1 | Y | Y | - | 15 | - |
| 2A | 6X6 | 300 | * | * | 2 | Y | Y | - | - | - |
| 2B | 6X6 | 300 | * | * | 2 | Y | Y | - | - | - |
| 2C | 6X40 | 0 | * | * | 2 | Y | Y | 2.0 | 5 | - |
| 2D | 6X40 | 0 | * | * | 2 | Y | Y | 2.0 | 5 | - |
| 3A | 6X40 | 0 | * | * | 3 | Y | Y | - | - | - |
| 4A | 6X40 | 0 | * | * | 4 | Y | Y | - | - | - |
| 5A | 6X40 | 0 | * | * | 5 | Y | Y | - | ★15 | - |
| | | | | | 2# | Y | Y | Y | - | 3 |
| 5B | 6X40 | 0 | * | * | 5 | Y | Y | - | 15 | - |
| 6A | 6X6 | 300 | * | * | 6 | Y | Y | - | - | - |
| 6B | 6X6 | 300 | * | * | 6 | Y | Y | - | - | - |
| 6C | 6X40 | 0 | * | * | 6 | Y | Y | 2.0 | 5 | - |
| 6D | 6X40 | 0 | * | * | 6 | Y | Y | 2.0 | 5 | - |
| 7A | 6X40 | 0 | * | * | 7 | Y | Y | - | - | - |
| 8A | 6X40 | 0 | * | * | 8 | Y | Y | - | - | - |

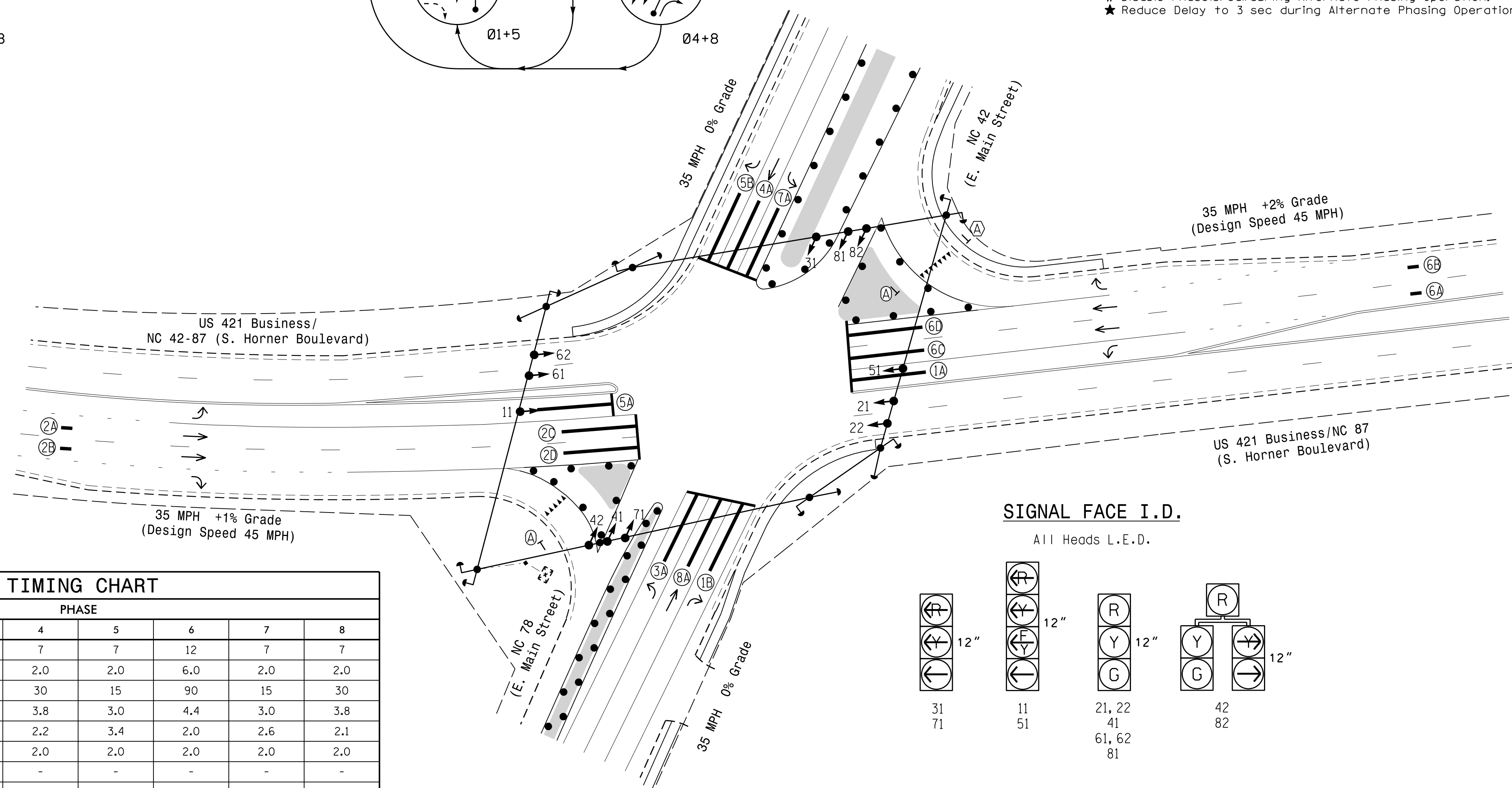
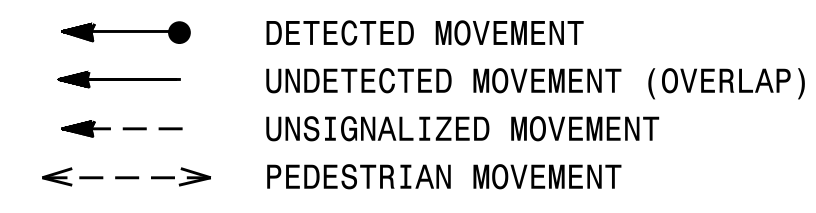
* Video Detection Zone
 # Disable Phase(s) call during Alternate Phasing Operation.
 ★ Reduce Delay to 3 sec during Alternate Phasing Operation.

8 Phase Fully Actuated (US 421 Bus./NC 87-42 (Horner Blvd.) - System 2 CLS) Signal System #: D08-02_Sanford

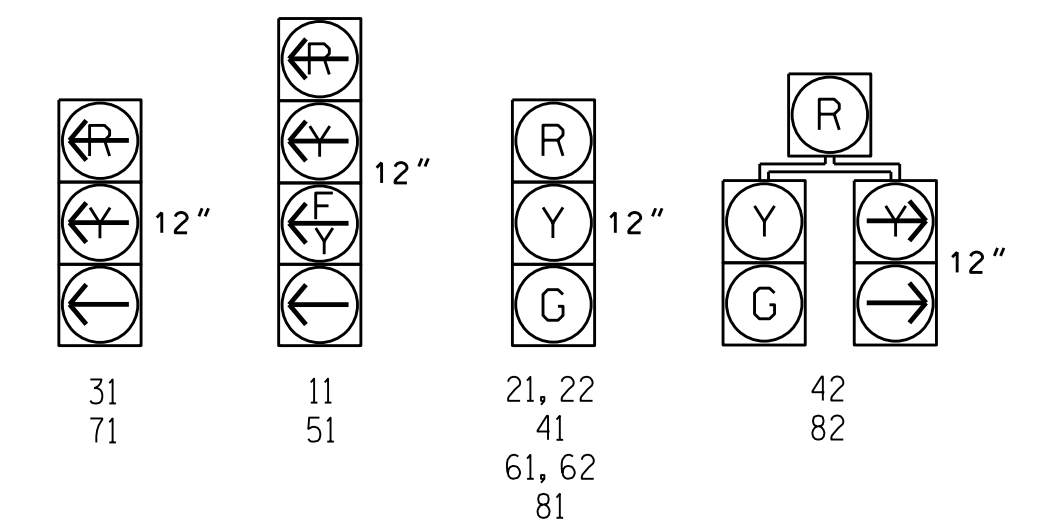
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 31, 41, 42, 71, 81, and 82.
- Set all detector units to presence mode.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- This location utilizes a video detection system. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
- Closed Loop System Data: Controller Asset #: 0047.

PHASING DIAGRAM DETECTION LEGEND



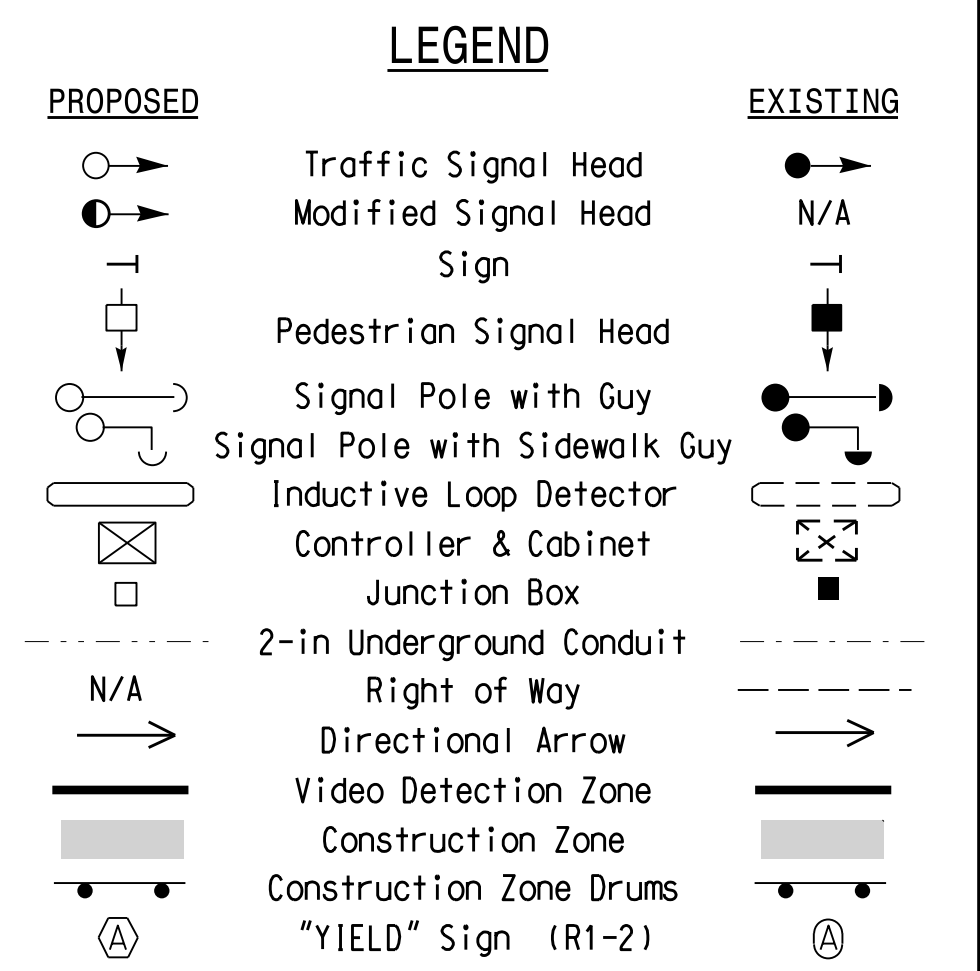
SIGNAL FACE I.D.



OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | | | | |
|------------------------|-------|------------|-----|-----|-----|------------|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Min Green 1* | 7 | 12 | 7 | 7 | 7 | 12 | 7 | 7 |
| Extension 1* | 2.0 | 6.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Max Green 1* | 15 | 90 | 15 | 30 | 15 | 90 | 15 | 30 |
| Yellow Clearance | 3.0 | 4.4 | 3.0 | 3.8 | 3.0 | 4.4 | 3.0 | 3.8 |
| Red Clearance | 3.3 | 2.0 | 2.6 | 2.2 | 3.4 | 2.0 | 2.6 | 2.1 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1* | - | - | - | - | - | - | - | - |
| Don't Walk 1 | - | - | - | - | - | - | - | - |
| Seconds Per Actuation* | - | - | - | - | - | - | - | - |
| Max Variable Initial* | - | - | - | - | - | - | - | - |
| 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 | - | - | - | - | - | - | - | - |
| Dual Entry | - | - | - | - | - | - | - | - |
| Simultaneous Gap | ON | ON | ON | ON | ON | ON | ON | ON |

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



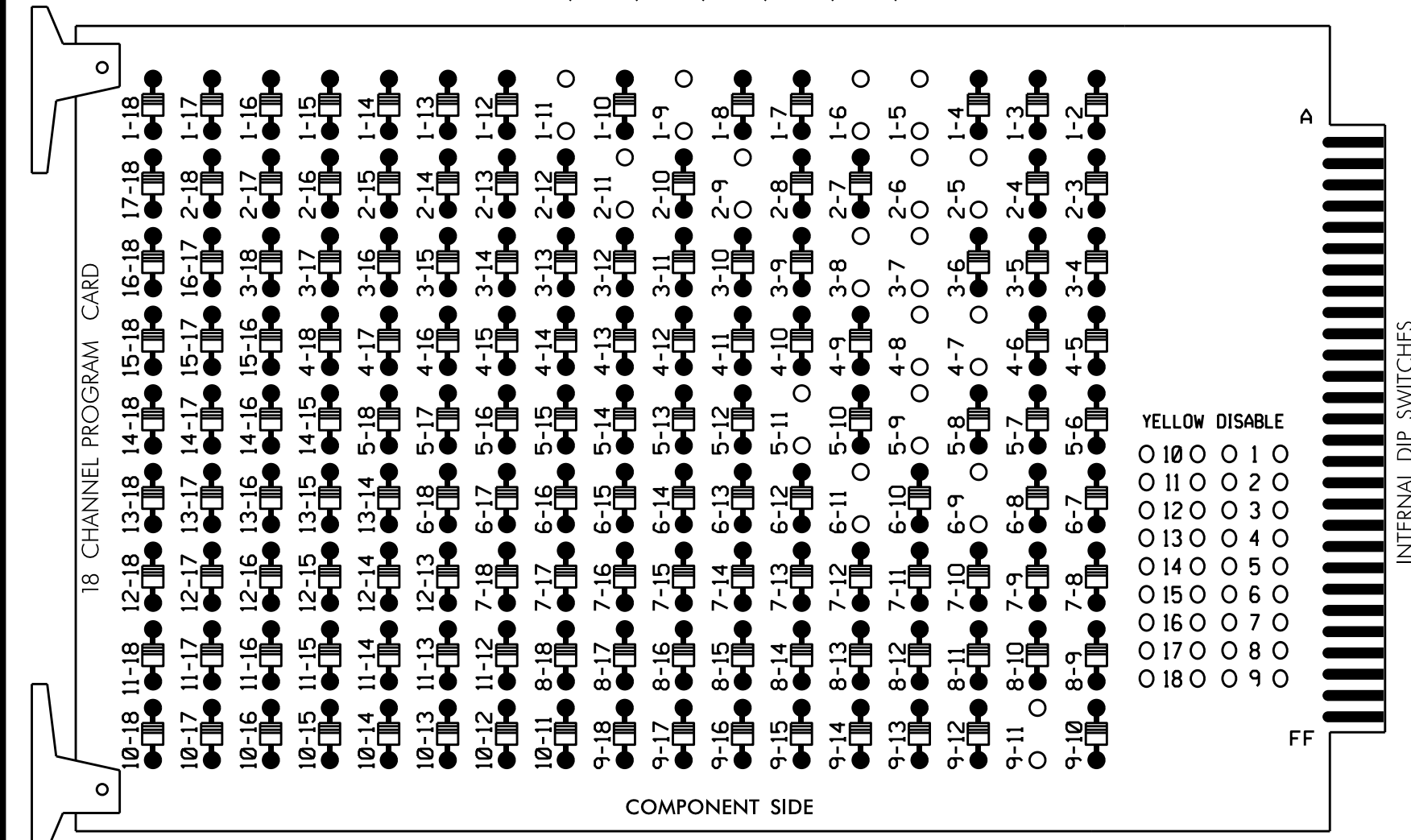
Signal Upgrade - Temporary Design 2 (TMP Phase III)

Prepared in the Offices of: **TRANSITION MOBILITY AND SAFETY SOLUTIONS**
 STATE OF NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 026486
 ROBERT J. ZIMMERMAN
 US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street)
 Division 8 Lee County Sanford
 PLAN DATE: February 2022 REVIEWED BY:
 PREPARED BY: J.A. Lohr REVIEWED BY:
 SCALE: 1" = 40'
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 SEAL
 04/19/2022
 DATE
 SIG. INVENTORY NO. 08-004772

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

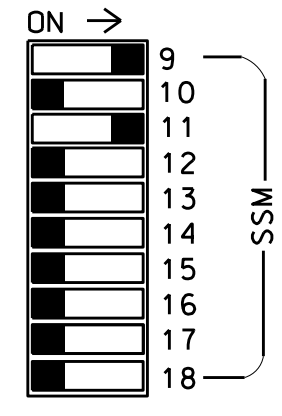
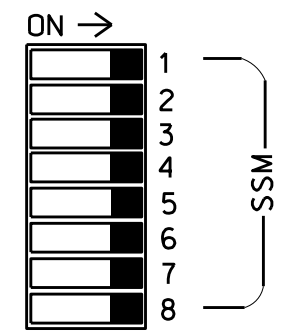
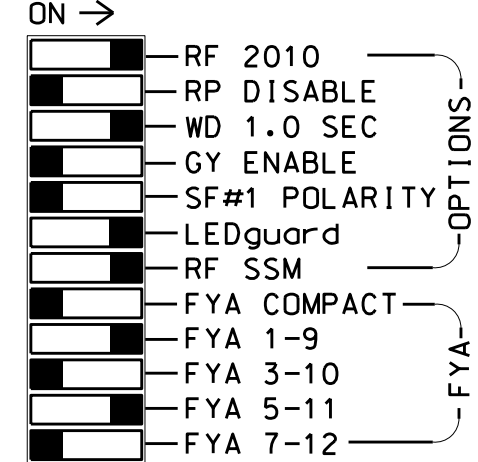
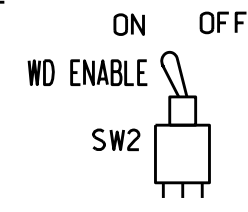
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 3-7, 3-8,
4-7, 4-8, 5-9, 5-11, 6-9, 6-11, and 9-11.



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. part 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 Gap Reduction.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the (US 421 Bus./NC 87-42 (Horner Blvd.) - System 2 CLS) Signal System #: D08-02_Sanford.

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,
 AUXS1,AUXS4
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+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. | 11★ | 82 | 21,22 | NU | 31 | 41,42 | NU | 51★ | 42 | 61,62 | NU | 71 | 81,82 | NU | 11★ | NU | 51★ | NU |
| RED | | * | 128 | | | 101 | | | * | 134 | | | 107 | | | | | |
| YELLOW | | | 129 | | | 102 | | | | 135 | | | 108 | | | | | |
| GREEN | | | 130 | | | 103 | | | | 136 | | | 109 | | | | | |
| RED ARROW | | | | | | 116 | | | | | | 122 | | | A121 | | A114 | |
| YELLOW ARROW | | 126 | | | | 117 | | | | 132 | | 123 | | | A122 | | A115 | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | | A123 | | A116 | |
| GREEN ARROW | 127 | 127 | | | | 118 | | | 133 | 133 | | 124 | | | | | | |

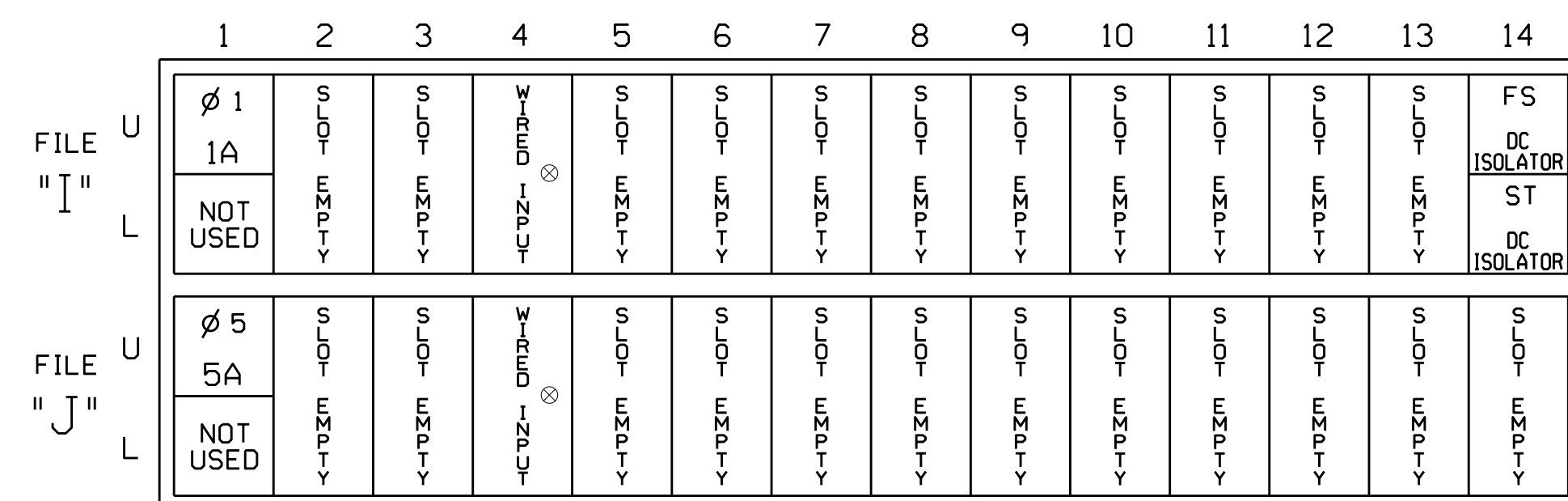
NU = Not Used

* 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)



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

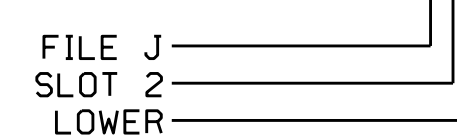
| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10★ | 26 | 6 | Y | Y | Y | | 3 |
| | - | I1U | 56 | 18★ | 51 | 1 | Y | Y | | | 3 |
| 5A ² | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | - | I4U | 47 | 9★ | 22 | 2 | Y | Y | Y | | 3 |
| | - | J1U | 55 | 17★ | 55 | 5 | Y | Y | | | 3 |

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

²Add jumper from J1-W to I4-W. on rear of input file.

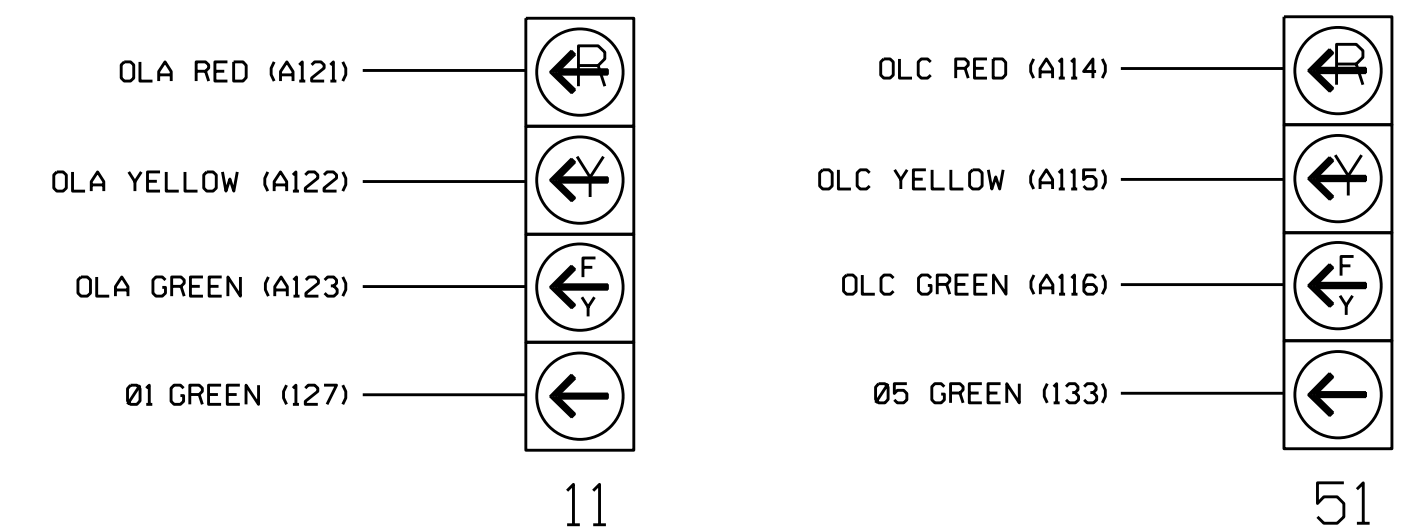
★ See Input Page Assignment programming details on sheets 3 and 4.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



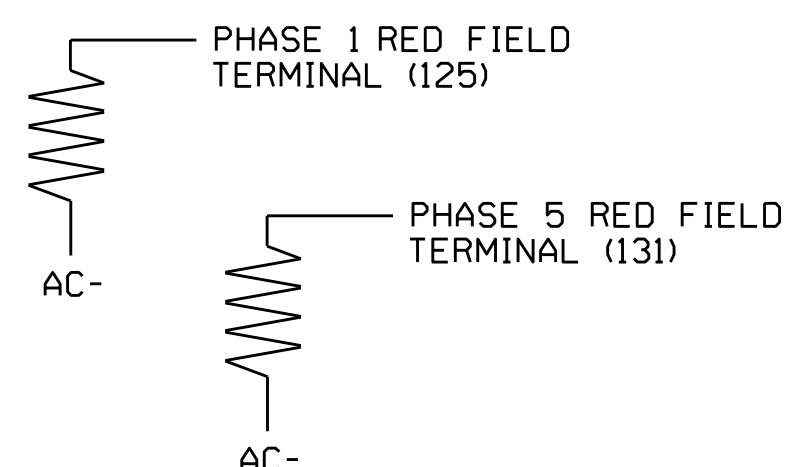
NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



DETECTOR NOTES

- For all loops 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 schemes shown on the Signal Design Plans.
- For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 3 and 4 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 08-0047t2
 DESIGNED: February 2022
 SEALED: 4/19/2022
 REVISED: N/A

| | | |
|--|---|--|
| Electrical Detail Temp Design 2 - Sheet 1 of 5 | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Lee County, Sanford | |
| Prepared In the Offices of: | SEAL | |
| 750 N. Greenfield Pkwy, Garner, NC 27529 | Division 8 PLAN DATE: March 2022 PREPARED BY: Zarrar Zafar RKA PROJ. NO: | |
| REVISIONS | INIT. | DATE |
| DocuSigned by: D. Todd Joyce | | 04/20/2022 |
| SIG. INVENTORY NO. 08-0047t2 | | DATE |

20-Apr-2022 10:51
 S:\MIS\SIG\TIS\Sig\elw\work\hous\sig\Mar\2022\Temp and final\080047t2\080047_sme\ie_2022mddr-f2.dgn

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, 3, 4, 5 AND 6.
- 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 #50 ON
SET OUTPUT ASSIGNMENT #51 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 #52 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 #51 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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 |
| OUTPUT 50 | = Overlap A Red |
| OUTPUT 51 | = Overlap A Yellow |
| OUTPUT 52 | = Overlap A Green |

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

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

PRESS '+' TWICE

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

← NOTICE GREEN FLASH

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

OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS), PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 → PAGE 2: 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 - GREEN

← NOTICE GREEN FLASH

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

PRESS '+' TWICE

NOTICE PAGE 2 → PAGE 2: 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 - GREEN

← NOTICE GREEN FLASH

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0047t2
DESIGNED: February 2022
SEALED: 4/19/2022
REVISED: N/A

Electrical Detail Temp Design 2 - Sheet 2 of 5

| | | |
|--|--|--|
| | US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Lee County Sanford | |
| | Division 8 | Lee County |
| PLAN DATE: March 2022 PREPARED BY: Zarrar Zafar | REVIEWED BY: RKA PROJ. NO: | SEAL PROFESSIONAL ENGINEER D. TODD JOYCE 04/20/2022 |
| REVISIONS | INIT. DATE | SIG. INVENTORY NO. 08-0047t2 |

750 N. Greenfield Pkwy, Garner, NC 27529

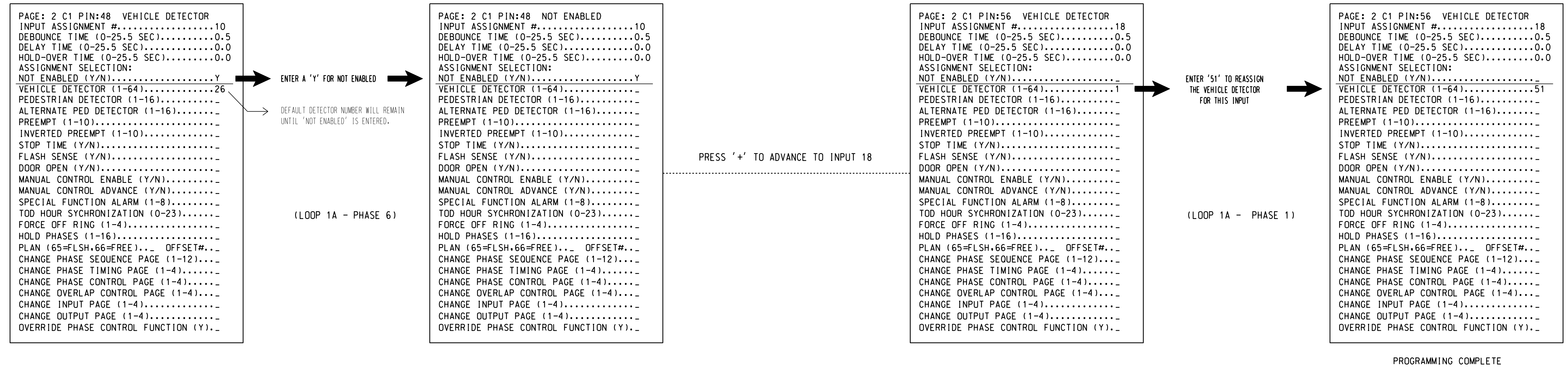
20-Apr-2022 10:52
w:\0047t2\Sigs\elr-2022\mdd-12.dgn
ZZZ

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

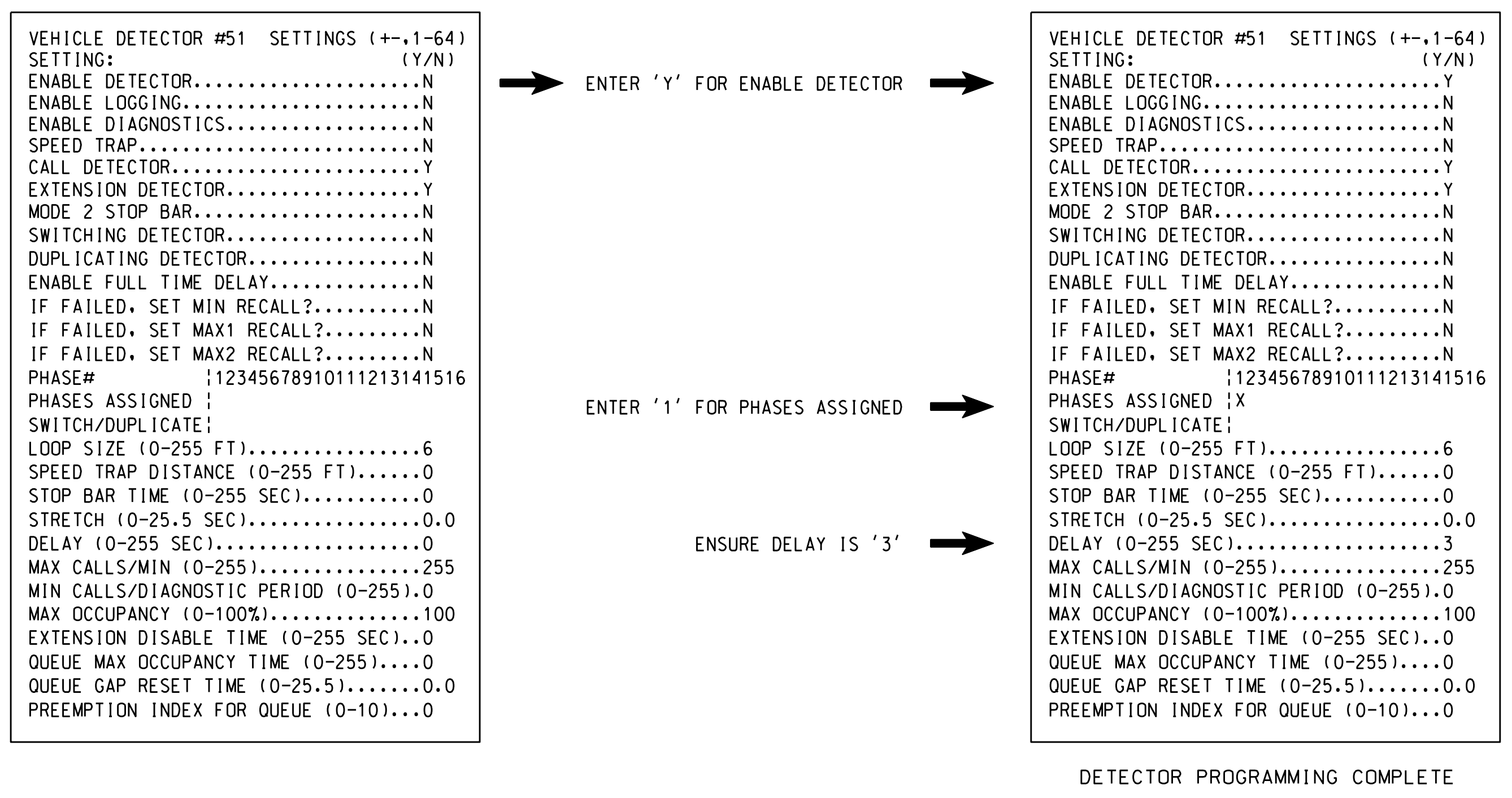
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047t2
DESIGNED: February 2022
SEALED: 4/19/2022
REVISED: N/A

20-APR-2022 10:53
W:\0047-Sig-3.3-2022\mddg-12.dgn
ZZZ

Electrical Detail Temp Design 2 - Sheet 3 of 5

| | | | |
|---|--------------|---|---------------|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | | US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Sanford | |
| Prepared In the Offices of: | | Division 8 | Lee County |
| PLAN DATE: March 2022 | REVIEWED BY: | PREPARED BY: Zarrar Zafar | RKA PROJ. NO: |
| REVISIONS | INIT. | DATE | |

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
STATE OF NORTH CAROLINA
PROFESSIONAL ENGINEER
031001
TODD JOYCE

Designed by: *D. Todd Joyce* 04/20/2022
DATE

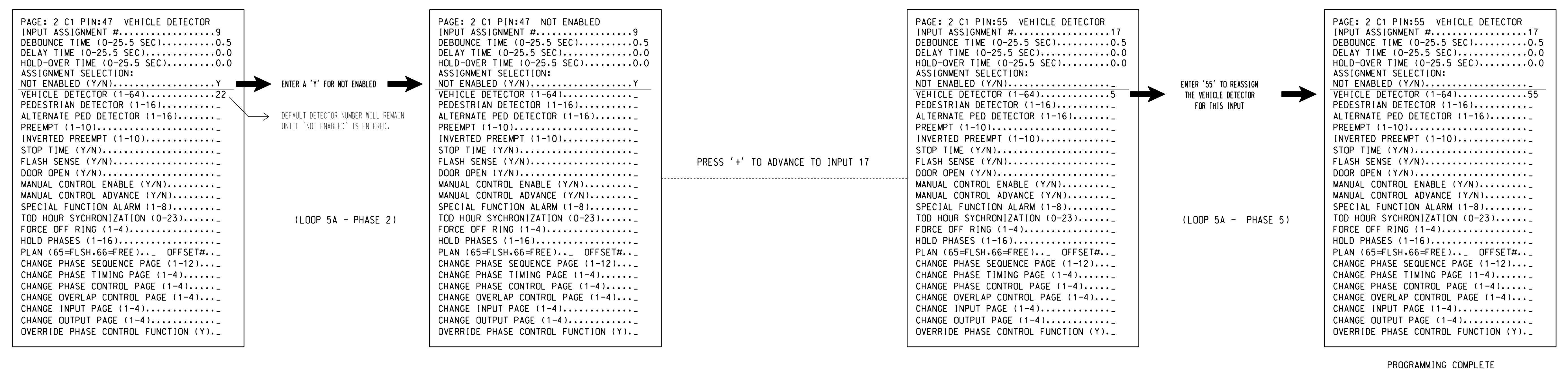
SIG. INVENTORY NO. 08-0047t2

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

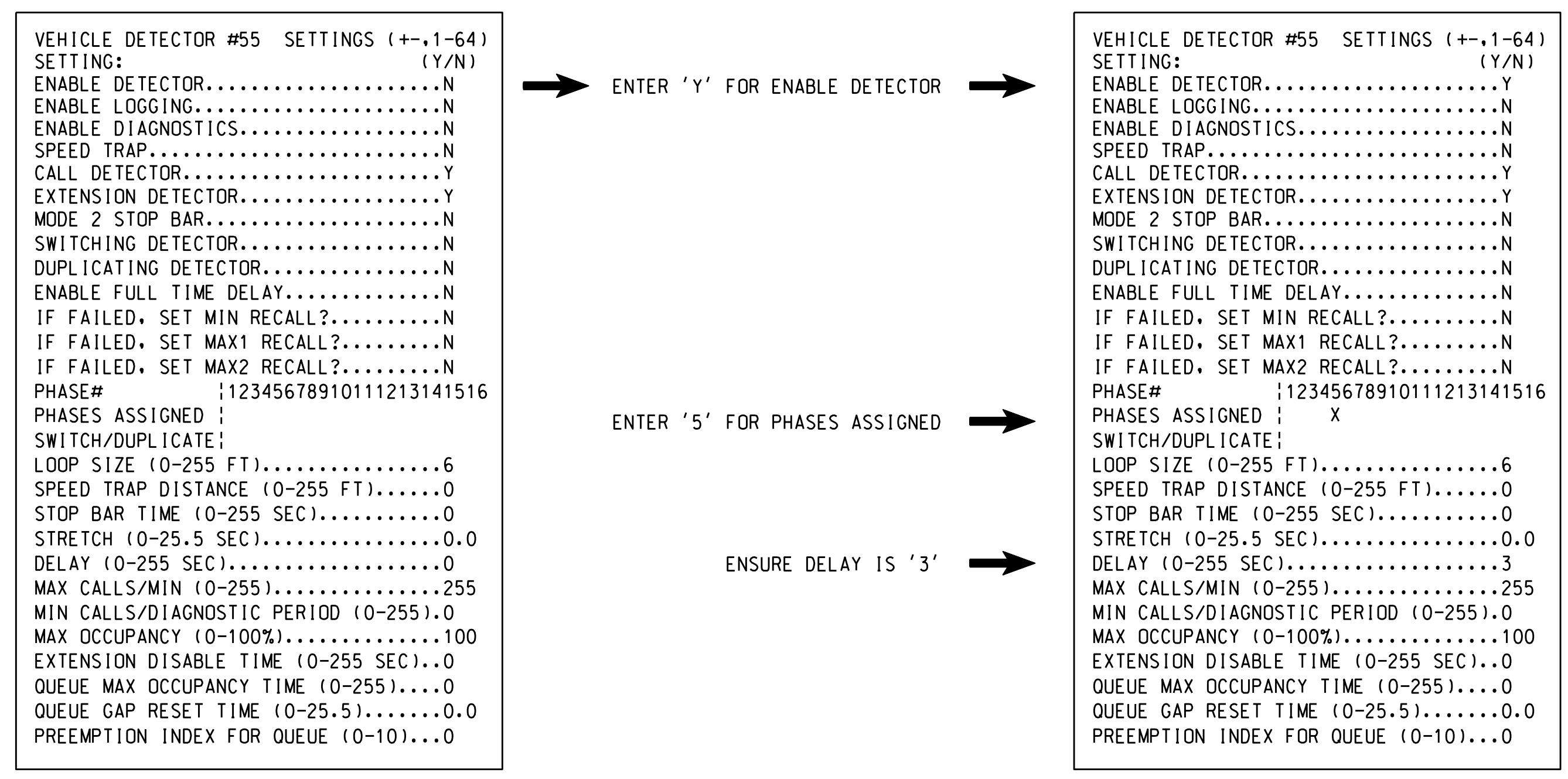
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047t2
 DESIGNED: February 2022
 SEALED: 4/19/2022
 REVISED: N/A

20-488-2022 10:54
 W:\0047 - Signal - 2022\mtd-12.dgn
 zzz

Electrical Detail Temp Design 2 - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
 G.L. Transportation, Mobility and Safety Division
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Management Section
 750 N. Greenfield Pkwy, Garner, NC 27529

US 421 Business/
 NC 87 (S. Horner Boulevard)
 at
 NC 78-42 (E. Main Street)
 Lee County Sanford

Division 8
 PLAN DATE: March 2022 REVIEWED BY:
 PREPARED BY: Zarrar Zafar RKA PROJ. NO:
 REVISIONS INIT. DATE

Seal: SEAL 031001
 ENGINEER TODD JOYCE
 Designated by: D. Todd Joyce 04/20/2022
 DATE
 SIG. INVENTORY NO. 08-0047t2

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

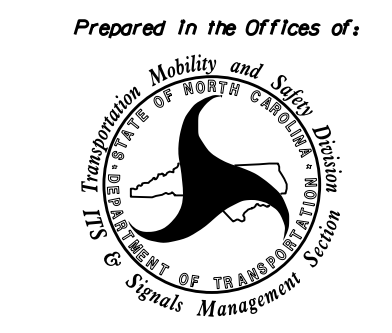
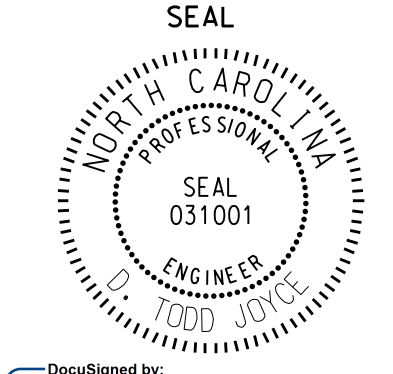
INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047+2
DESIGNED: February 2022
SEALED: 4/19/2022
REVISED: N/A

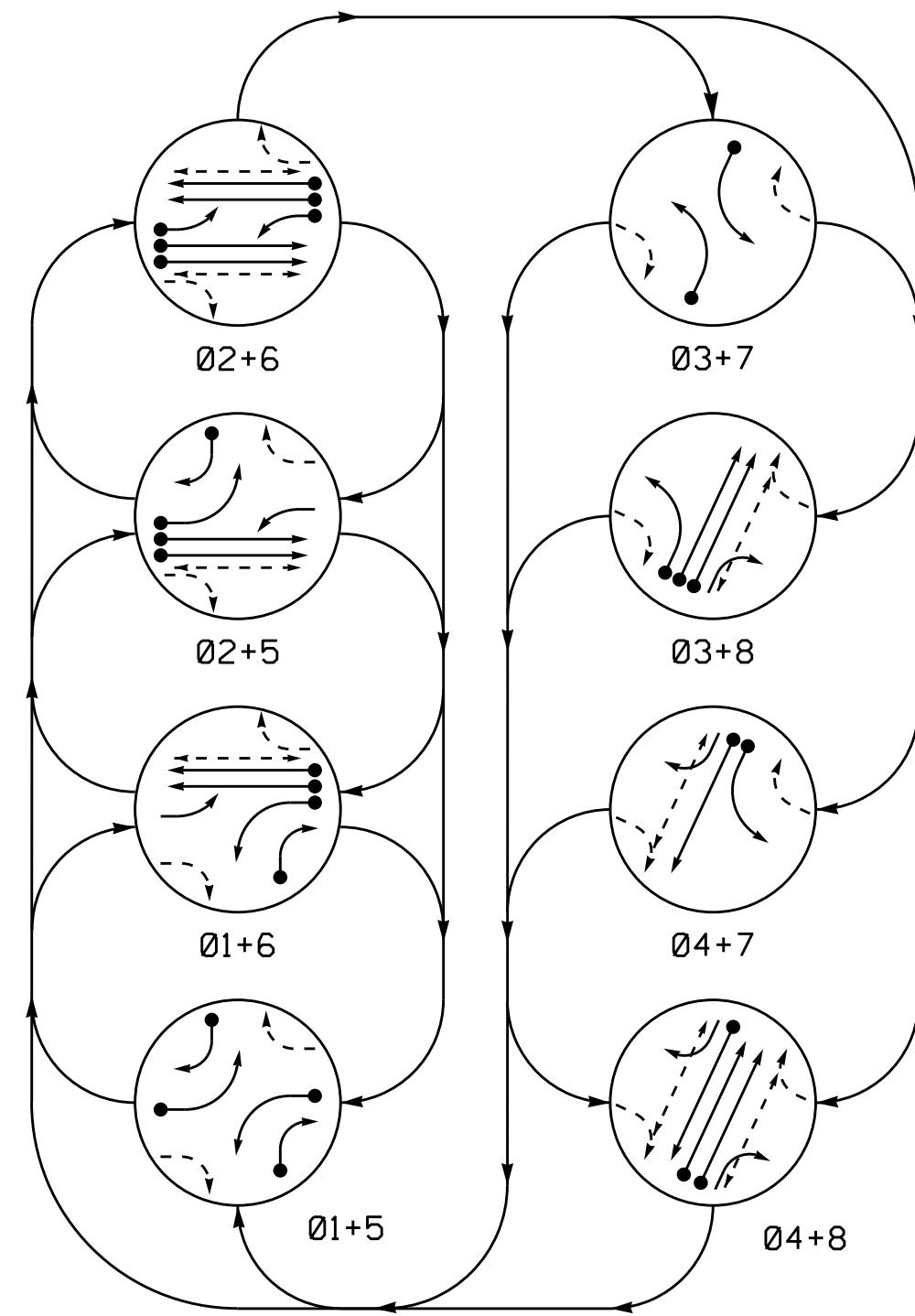
Electrical Detail Temp Design 2 - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| <p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared In the Offices of:</p>  <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p style="text-align: center;">US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Division 8 Lee County Sanford</p> <p style="font-size: x-small;">PLAN DATE: March 2022 REVIEWED BY:</p> <p style="font-size: x-small;">PREPARED BY: Zarrar Zafar RKA PROJ. NO:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: x-small;">REVISIONS</th> <th style="font-size: x-small;">INIT.</th> <th style="font-size: x-small;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table> | REVISIONS | INIT. | DATE | | | | | | | | | | <p style="text-align: center;">SEAL</p>  <p style="font-size: x-small;">DocuSigned by: <i>D. Todd Joyce</i> 04/20/2022</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 08-0047+2</p> |
|---|--|-----------|-------|------|--|--|--|--|--|--|--|--|--|--|
| REVISIONS | INIT. | DATE | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

20-Apr-2022 10:55
w:\0047-3830\08-0047+2.dgn
zzz

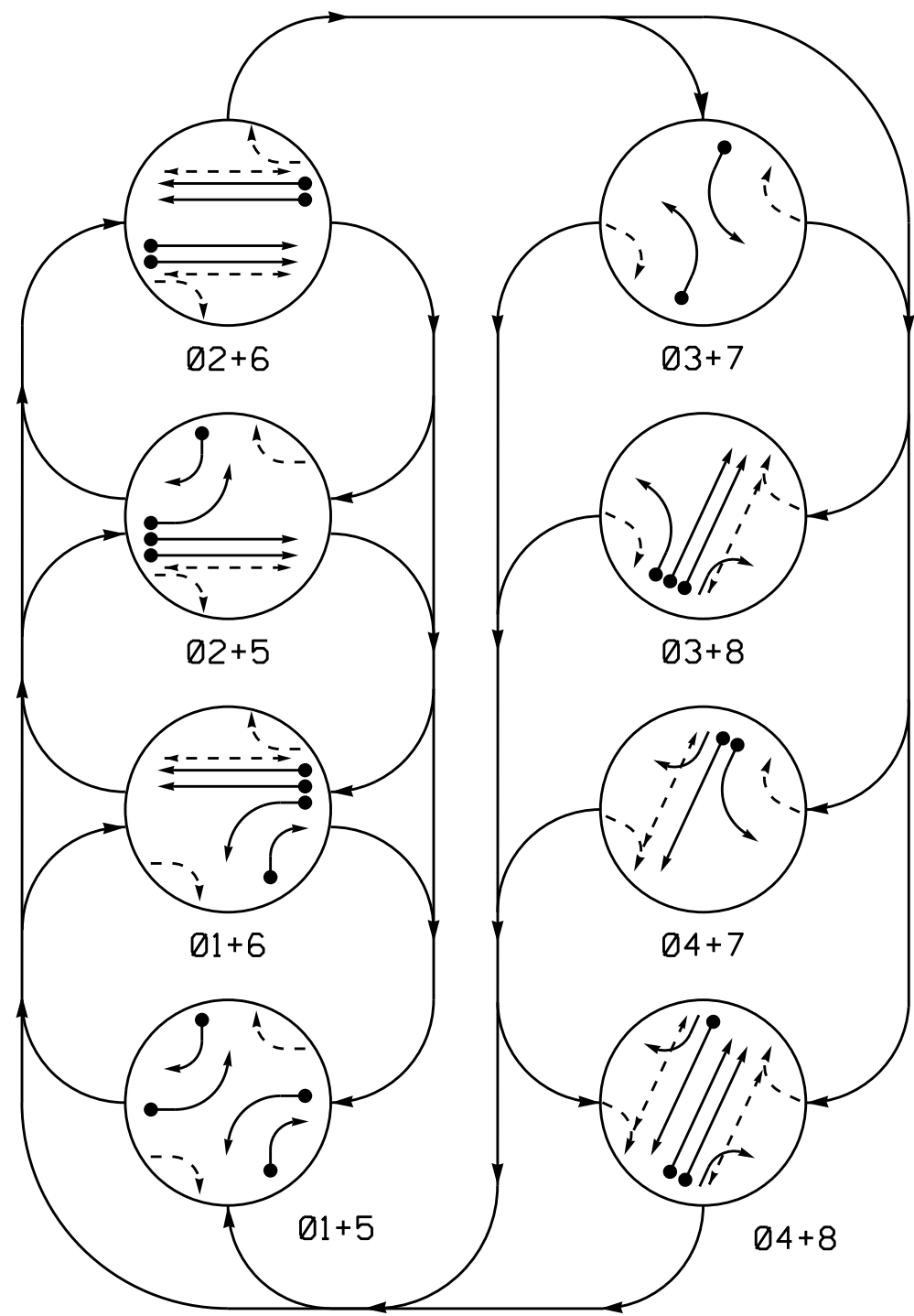
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 21, 22 | R | R | G | G | R | R | R | Y |
| 31 | --- | --- | --- | --- | --- | --- | --- | --- |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | G | G | R |
| 51 | --- | --- | --- | --- | --- | --- | --- | --- |
| 61, 62 | R | G | R | G | R | R | R | Y |
| 71 | --- | --- | --- | --- | --- | --- | --- | --- |
| 81 | R | R | R | R | R | G | G | R |
| 82 | R | R | R | R | R | G | G | R |
| P21, P22 | DW | DW | W | W | DW | DW | DW | DRK |
| P41, P42 | DW | DW | DW | DW | DW | W | W | DRK |
| P61, P62 | DW | W | DW | W | DW | DW | DW | DRK |
| P81, P82 | DW | DW | DW | DW | W | DW | W | DRK |

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | | | |
|-------------|-------|------|------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 03+7 | 03+8 | 04+7 | 04+8 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 21, 22 | R | R | G | G | R | R | R | Y |
| 31 | --- | --- | --- | --- | --- | --- | --- | --- |
| 41 | R | R | R | R | R | G | G | R |
| 42 | R | R | R | R | R | G | G | R |
| 51 | --- | --- | --- | --- | --- | --- | --- | --- |
| 61, 62 | R | G | R | G | R | R | R | Y |
| 71 | --- | --- | --- | --- | --- | --- | --- | --- |
| 81 | R | R | R | R | R | G | G | R |
| 82 | R | R | R | R | R | G | G | R |
| P21, P22 | DW | DW | W | W | DW | DW | DW | DRK |
| P41, P42 | DW | DW | DW | DW | DW | W | W | DRK |
| P61, P62 | DW | W | DW | W | DW | DW | DW | DRK |
| P81, P82 | DW | DW | DW | DW | W | DW | W | DRK |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | SYSTEM LOOP | NEW CARD | | |
|------|-----------|----------------------------|----------------|----------|----------------------|---------|-----------|-----------------|-------------|----------|---|---|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | | | | |
| 1A | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | ★15 | - | Y |
| 1B | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | 15 | - | Y |
| 2A | 6X6 | 300 | 4 | Y | 2 | Y | Y | - | - | - | - | Y |
| 2B | 6X6 | 300 | 4 | Y | 2 | Y | Y | - | - | - | - | Y |
| 3A | 6X40 | 0 | 2-4-2 | Y | 3 | Y | Y | - | - | - | - | Y |
| 4A | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | - | - | Y |
| 4B** | 6X6 | 0 | 2-4-2 Diagonal | Y | 4 | Y | Y | - | - | 10 | - | Y |
| 5A | 6X40 | 0 | 2-4-2 | Y | 5 | Y | Y | - | - | ★15 | - | Y |
| 5B | 6X40 | 0 | 2-4-2 | Y | 5 | Y | Y | - | - | 15 | - | Y |
| 6A | 6X6 | 300 | 6 | Y | 6 | Y | Y | - | - | - | - | Y |
| 6B | 6X6 | 300 | 6 | Y | 6 | Y | Y | - | - | - | - | Y |
| 7A | 6X40 | 0 | 2-4-2 | Y | 7 | Y | Y | - | - | - | - | Y |
| 8A | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | - | - | Y |
| 8B | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | - | - | Y |

Disable Phases(s) call during Alternate Phasing Operation.
 ★ Reduce Delay to 3 sec during Alternate Phasing Operation.
 ** Set sensitivity to appropriate level to detect a bicycle

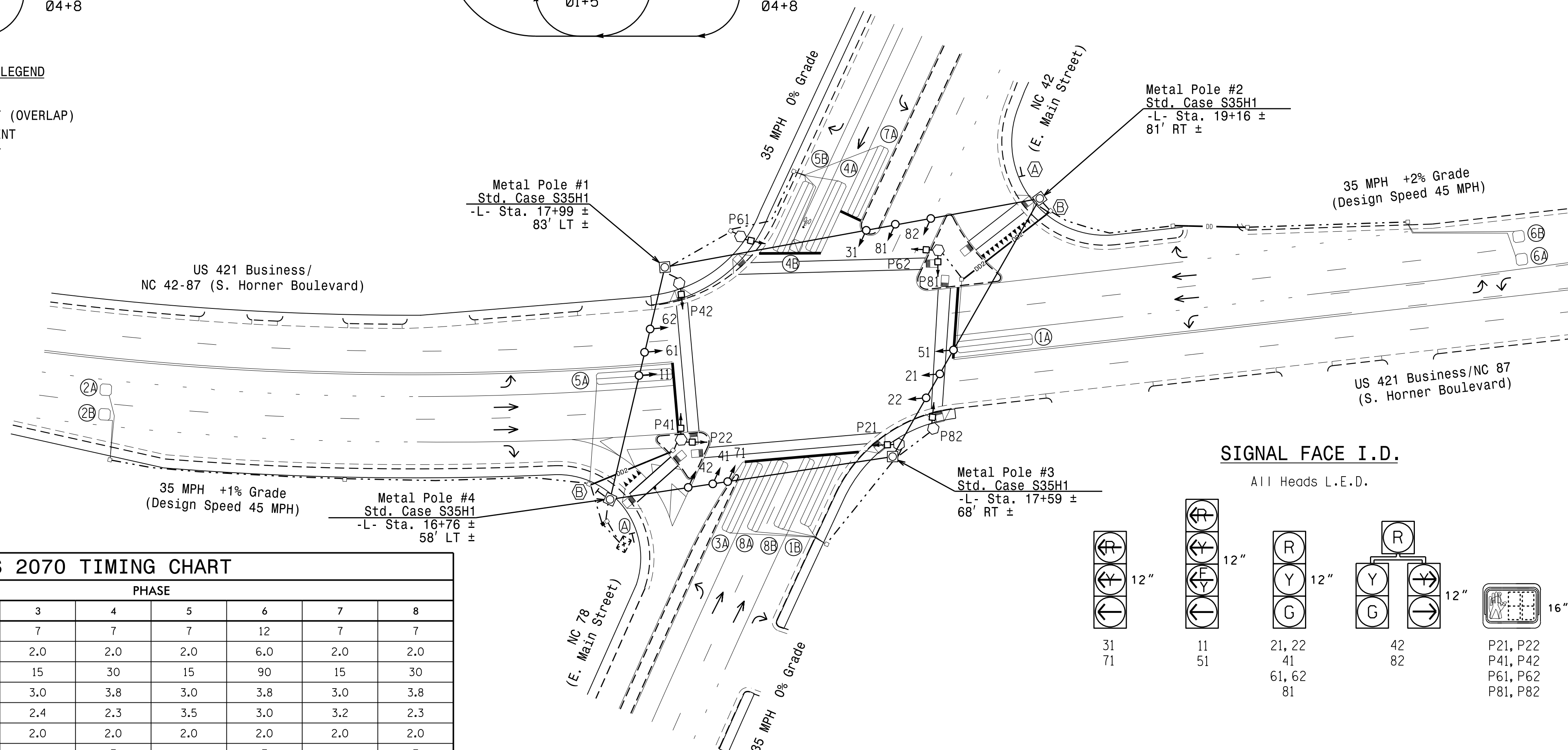
8 Phase Fully Actuated
 (US 421 Bus./NC 87-42
 (Horner Blvd.) - System 2 CLS)
 Signal System #: D08-02_Sanford

NOTES

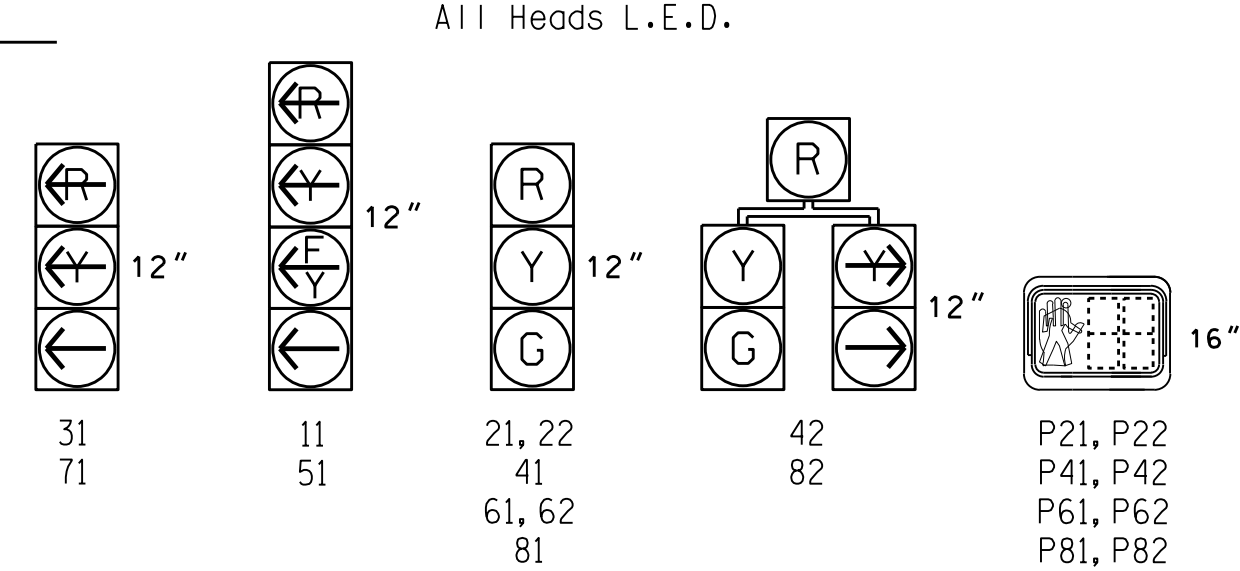
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 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 #: 0047.
- All signal heads shall be black in color with black visors.
- All metal poles shall and pedestals shall be black in color as specified in the Project Special Provisions.

PHASING DIAGRAM DETECTION LEGEND

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



SIGNAL FACE I.D.



LEGEND

- | PROPOSED | EXISTING |
|--|--|
| ○ → Traffic Signal Head | ● → Traffic Signal Head |
| ○ → Modified Signal Head | N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head | ⊥ Pedestrian Signal Head |
| ⊥ Signal Pole with Guy | ⊥ Signal Pole with Guy |
| ⊥ Signal Pole with Sidewalk Guy | ⊥ Signal Pole with Sidewalk Guy |
| ⊥ Inductive Loop Detector | ⊥ Inductive Loop Detector |
| ⊥ Controller & Cabinet | ⊥ Controller & Cabinet |
| ⊥ Junction Box | ⊥ Junction Box |
| ⊥ 2-in Underground Conduit | ⊥ 2-in Underground Conduit |
| → Directional Arrow | → Directional Arrow |
| → Curb Ramp | → Curb Ramp |
| → Directional Drill | N/A |
| ○ Metal Strain Pole | ○ Metal Strain Pole |
| ○ Type II Signal Pedestal | ○ Type II Signal Pedestal |
| ○ "YIELD" Sign (R1-2) | ○ "YIELD" Sign (R1-2) |
| ⊕ Pedestrian Crossing Sign (W11-2) w/ Diagonal Arrow Plaque (W16-7p) | ⊕ Pedestrian Crossing Sign (W11-2) w/ Diagonal Arrow Plaque (W16-7p) |

OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | | | | |
|------------------------|-------|------------|-----|-----|-----|------------|-----|-----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Min Green 1* | 7 | 12 | 7 | 7 | 7 | 12 | 7 | 7 |
| Extension 1* | 2.0 | 6.0 | 2.0 | 2.0 | 2.0 | 6.0 | 2.0 | 2.0 |
| Max Green 1* | 15 | 90 | 15 | 30 | 15 | 90 | 15 | 30 |
| Yellow Clearance | 3.0 | 3.8 | 3.0 | 3.8 | 3.0 | 3.8 | 3.0 | 3.8 |
| Red Clearance | 3.7 | 3.0 | 2.4 | 2.3 | 3.5 | 3.0 | 3.2 | 2.3 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1* | - | 7 | - | 7 | - | 7 | - | 7 |
| Don't Walk 1 | - | 24 | - | 17 | - | 25 | - | 15 |
| Seconds Per Actuation* | - | 1.5 | - | - | - | 1.5 | - | - |
| Max Variable Initial* | - | 34 | - | - | - | 34 | - | - |
| Time Before Reduction* | - | 15 | - | - | - | 15 | - | - |
| Time To Reduce* | - | 45 | - | - | - | 40 | - | - |
| Minimum Gap | - | 3.0 | - | - | - | 3.0 | - | - |
| Recall Mode | - | MIN RECALL | - | - | - | MIN RECALL | - | - |
| Vehicle Call Memory | - | YELLOW | - | - | - | YELLOW | - | - |
| Dual Entry | - | - | - | - | - | - | - | - |
| Simultaneous Gap | ON | ON | ON | ON | ON | 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 - Final Design

Prepared in the Offices of:
 Transportation Mobility and Safety Solutions
 NORTH CAROLINA PROFESSIONAL ENGINEERS AND SURVEYORS
 Signal Design Section

US 421 Business/ NC 87 (S. Horner Boulevard) at NC 42-78 (E. Main Street)
 Division 8 Lee County Sanford

PLAN DATE: March 2022 REVIEWED BY:
 PREPARED BY: J.A. Lohr REVIEWED BY:

750 N. Greenfield Pkwy, Garner, NC 27526

SCALE: 0 40 1"=40'

REVISIONS: INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEERS AND SURVEYORS SEAL 026486 ENGINEER ROBERT J. TEMPLE

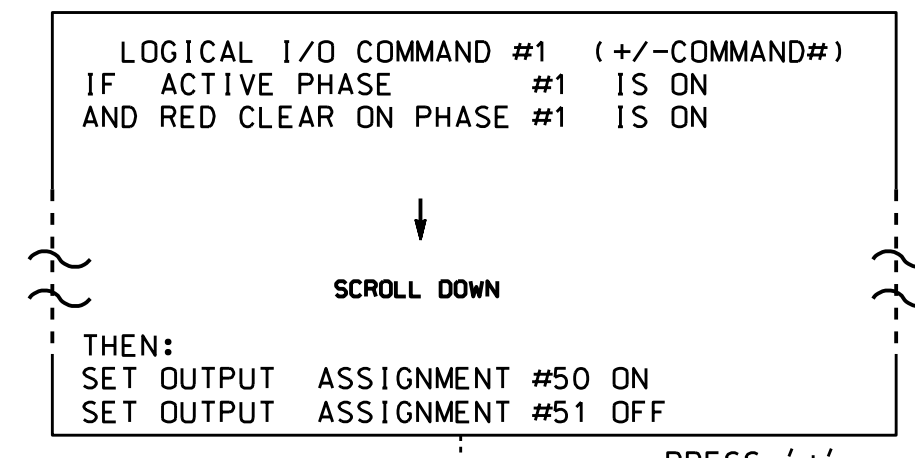
DocuSigned by: 04/19/2022 DATE
 SIG. INVENTORY NO. 08-0047

3888855\SDD\DATE: 3/18/22
 S:\PROJECTS\2022\SIG\Signal\Central_Reg\0421v_8\42-3830\2022_revisions\080047_sigs_rev_20220419.dgn
 J. Lohr

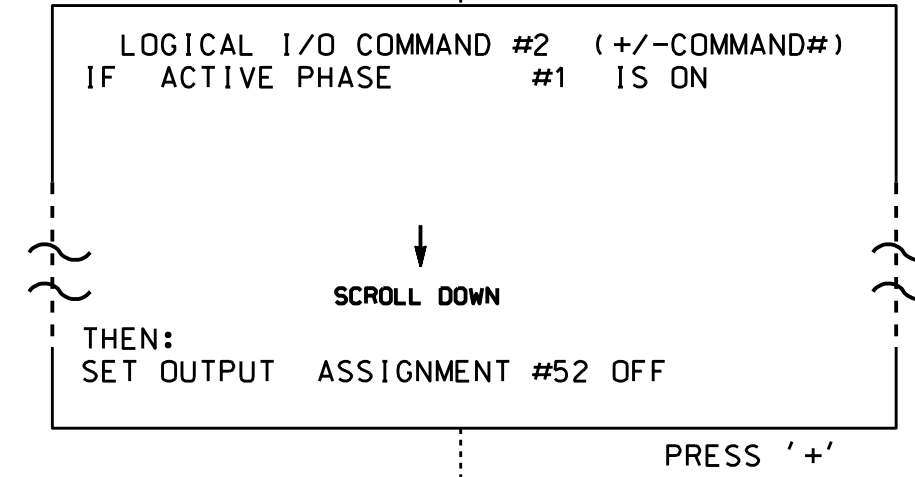
LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

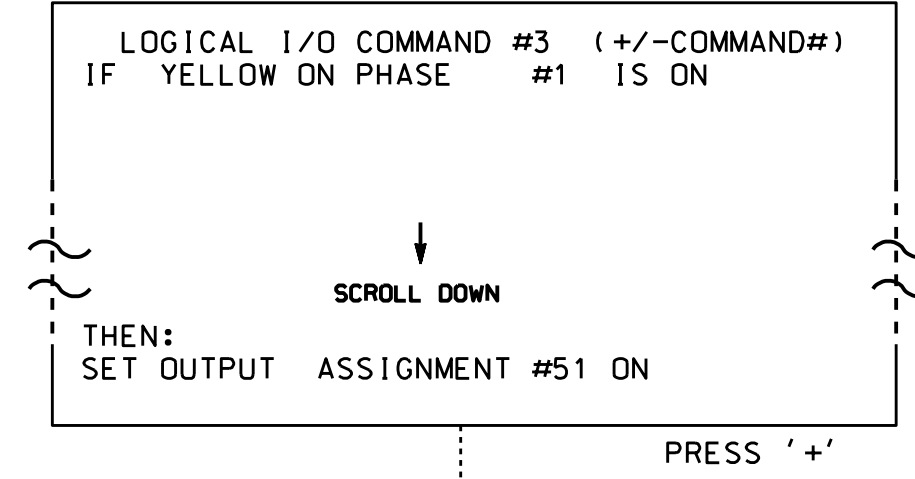
- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS), SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



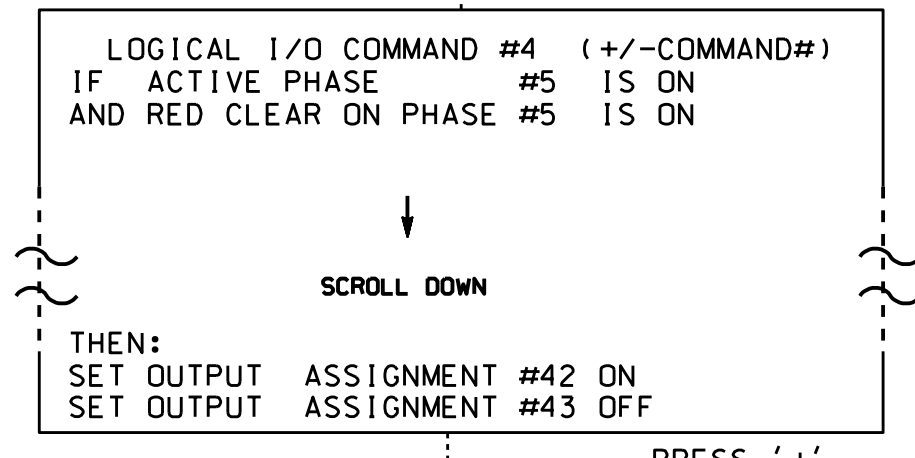
NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).



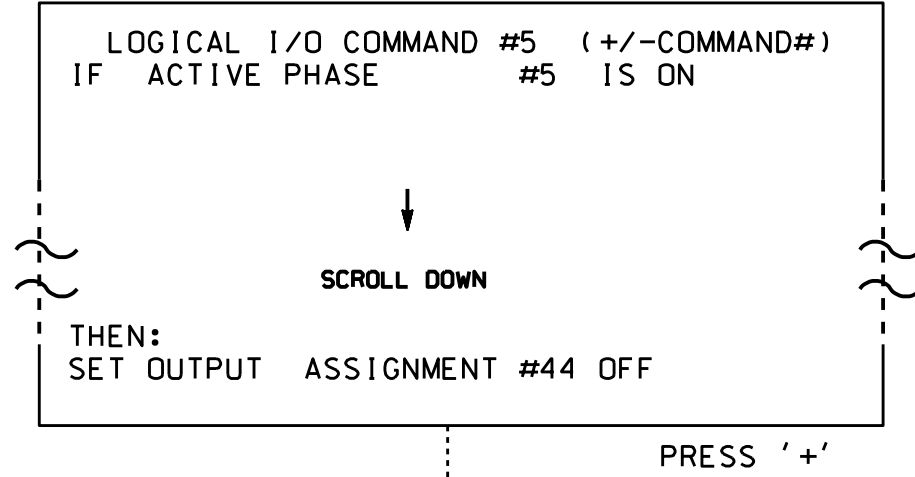
NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEAD 11).



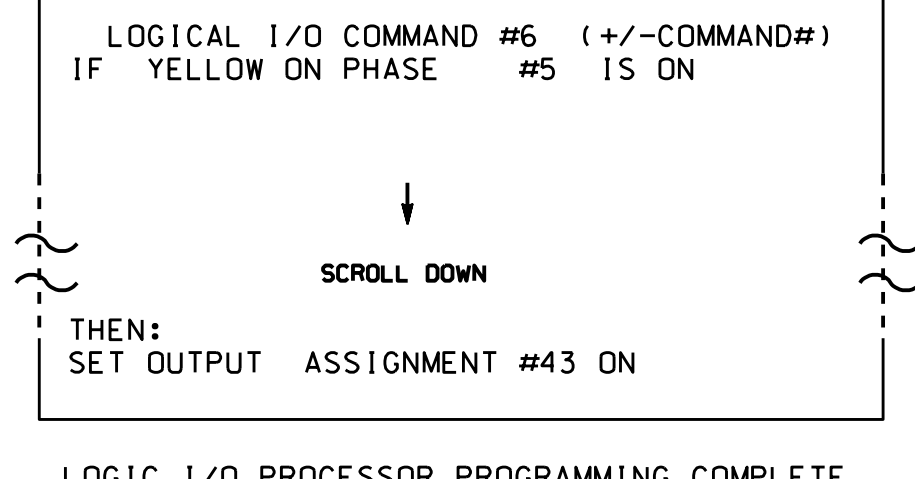
NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).



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



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



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

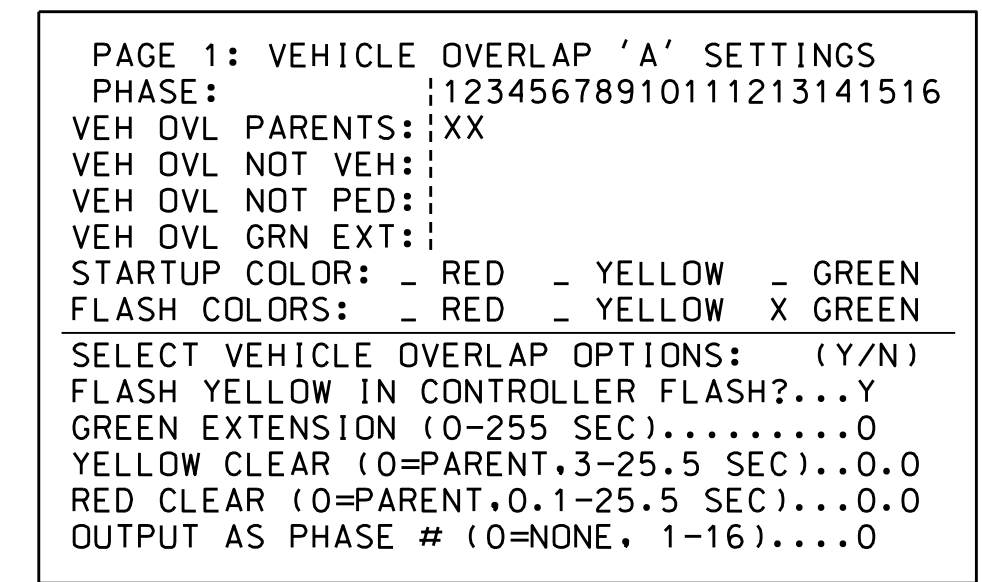
LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

| OUTPUT REFERENCE SCHEDULE | |
|---------------------------|--------------------|
| OUTPUT 42 | = Overlap C Red |
| OUTPUT 43 | = Overlap C Yellow |
| OUTPUT 44 | = Overlap C Green |
| OUTPUT 50 | = Overlap A Red |
| OUTPUT 51 | = Overlap A Yellow |
| OUTPUT 52 | = Overlap A Green |

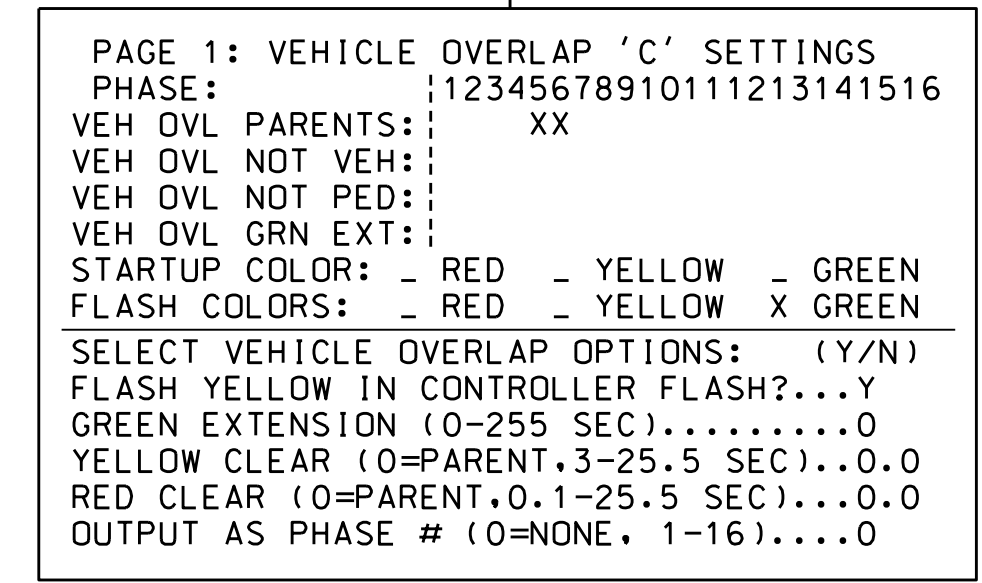
OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

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



PRESS '+' TWICE

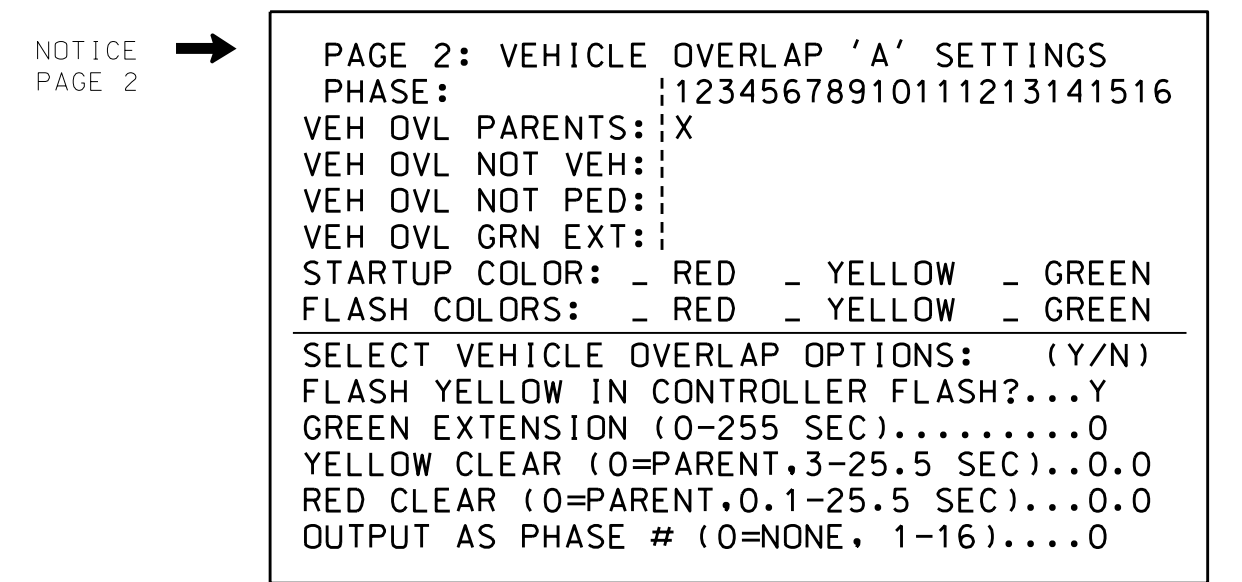


OVERLAP PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

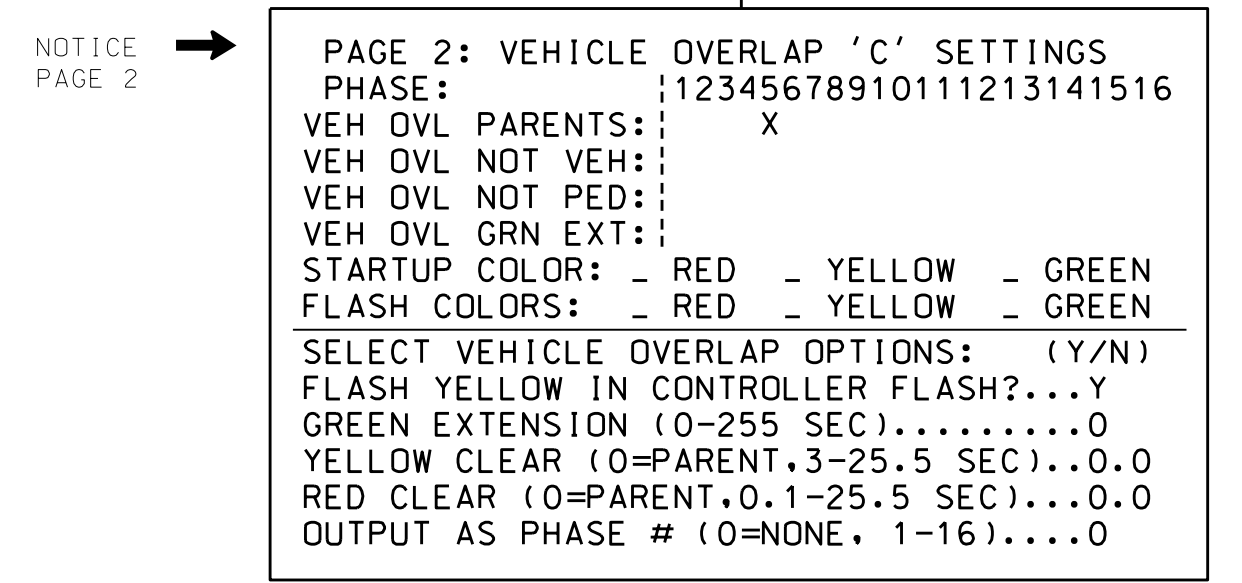
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS), PRESS 'NEXT' TO ADVANCE TO PAGE 2.



← NOTICE GREEN FLASH

PRESS '+' TWICE



← NOTICE GREEN FLASH

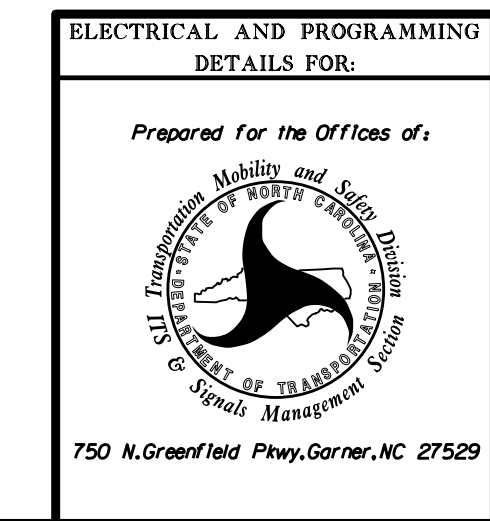
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047
DESIGNED: March 2022
SEALED: 4/19/2022
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 - Sheet 2 of 5



| | |
|--|--------------|
| US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Lee County Sanford | |
| Division 8 | Sanford |
| PLAN DATE: March 2022 | REVIEWED BY: |
| PREPARED BY: Zarrar Zafar | REVIEWED BY: |
| REVISIONS | INIT. DATE |
| | |
| | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by:
D. Todd Joyce 04/20/2022

SIG. INVENTORY NO. 08-0047

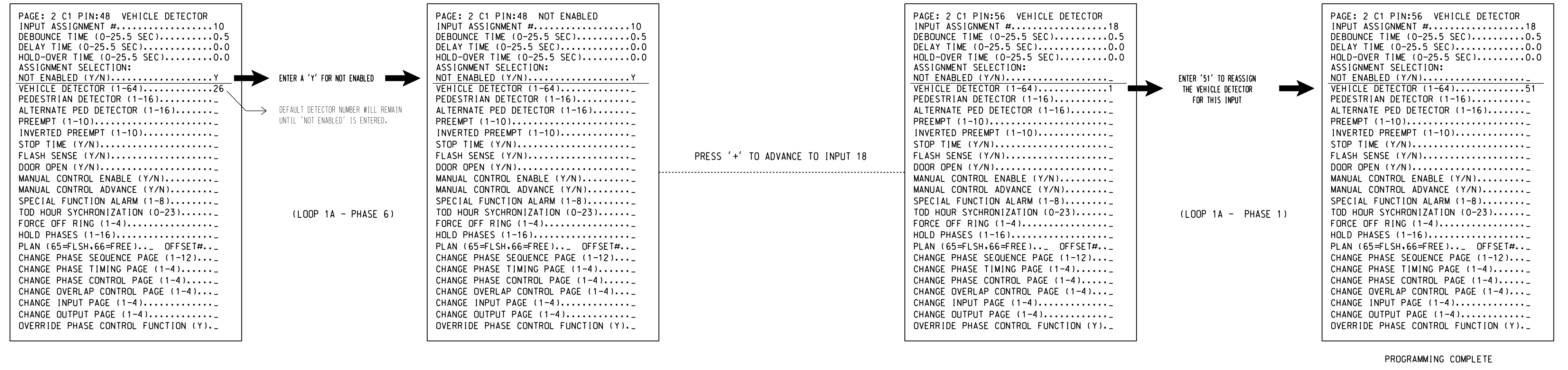
20-Apr-2022 10:16
 S:\IT\SSU\15\Sigs\Work\hgr\oups\g_MarkZafar\080047_sml.e_2022mddt.dgn
 2221gr

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

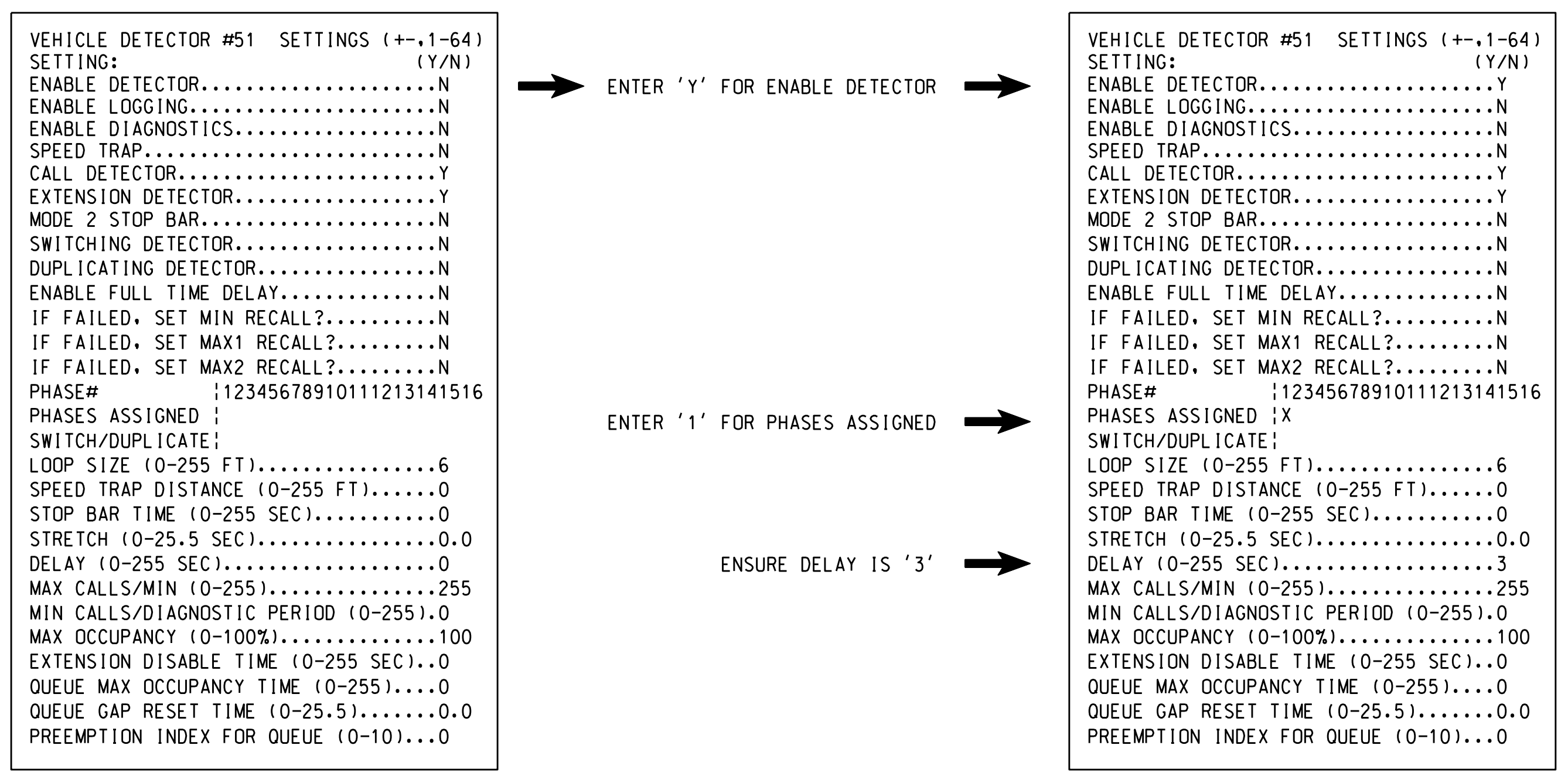
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

00-000-2022 10-16
 S:\IT\535041\S\Sig\Signal\work\hgr\oups\sig\Mar\2022\for\4\ons\80047_sme.e_2022mddt.dgn
 zzzfor

Electrical Detail - Sheet 3 of 5

| | | | |
|--|--|---|--|
| | US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) | | |
| | Division 8 PLAN DATE: March 2022 PREPARED BY: Zarrar Zafar | Lee County REVIEWED BY: REVISIONS | |

750 N. Greenfield Pkwy, Garner, NC 27529

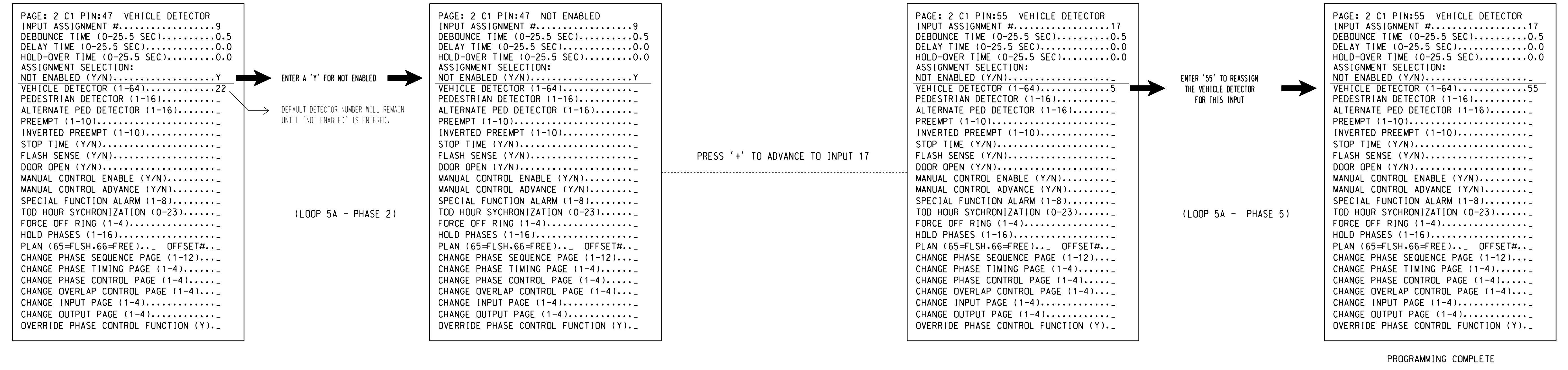
SIG. INVENTORY NO. 08-0047

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

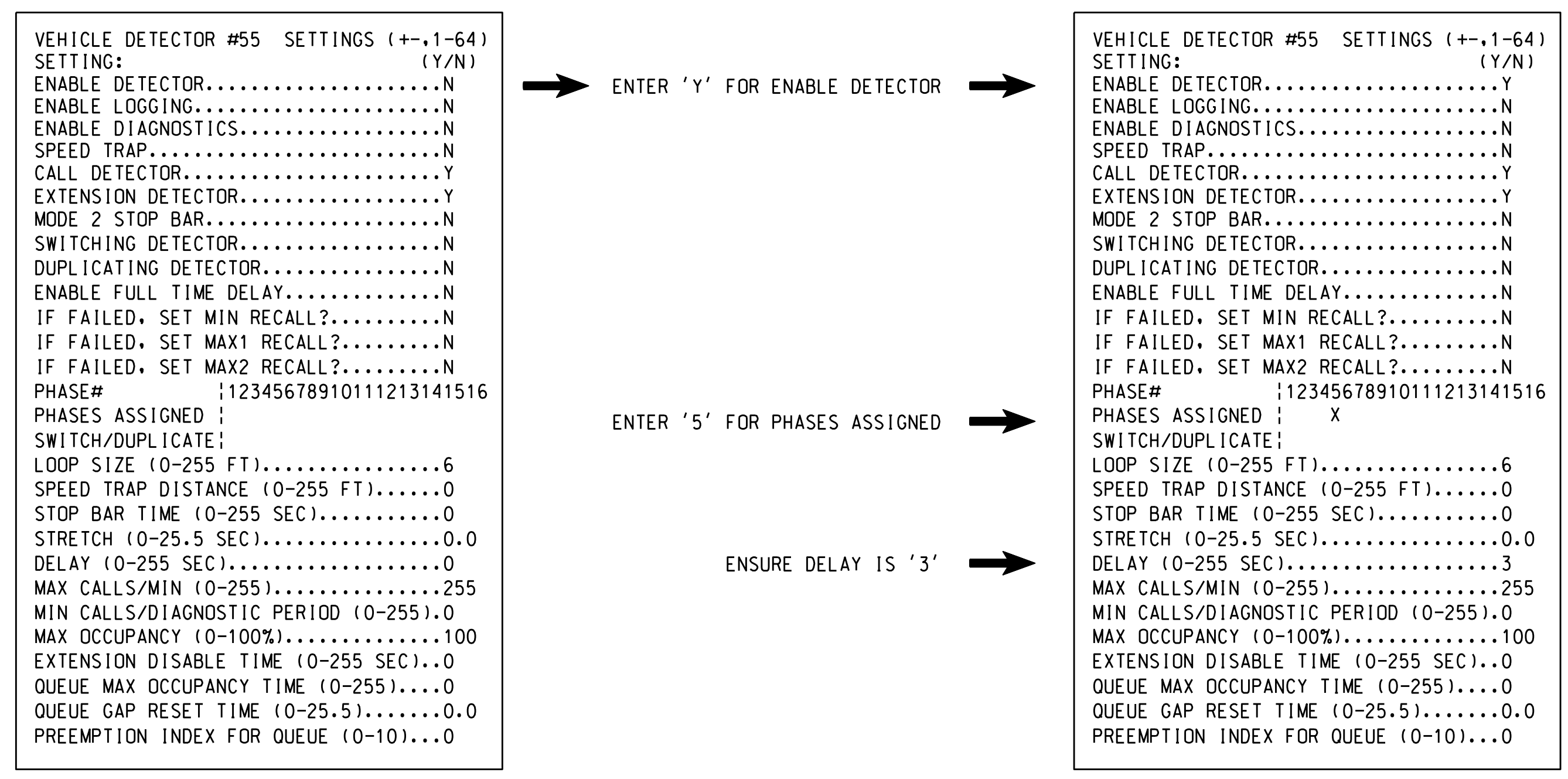
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

D:\APR-2022\18-17\SIG\TSS\0415\Sig\TSS\work\hgr\loop5a\g_Mark\Zafar\080047_1sm.eie_2022mmda.dgn

Electrical Detail - Sheet 4 of 5

| | | | |
|--|---|---|--|
| | US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) | | |
| | Division 8 Lee County Sanford PLAN DATE: March 2022 REVIEWED BY: PREPARED BY: Zarrar Zafar REVIEWED BY: | SEALS SEAL 031001 D. Todd Joyce 04/20/2022 SIG. INVENTORY NO. 08-0047 | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

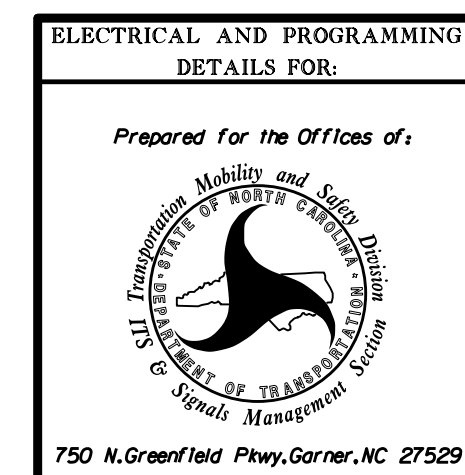
OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0047
 DESIGNED: March 2022
 SEALED: 4/19/2022
 REVISED: N/A

Electrical Detail - Sheet 5 of 5

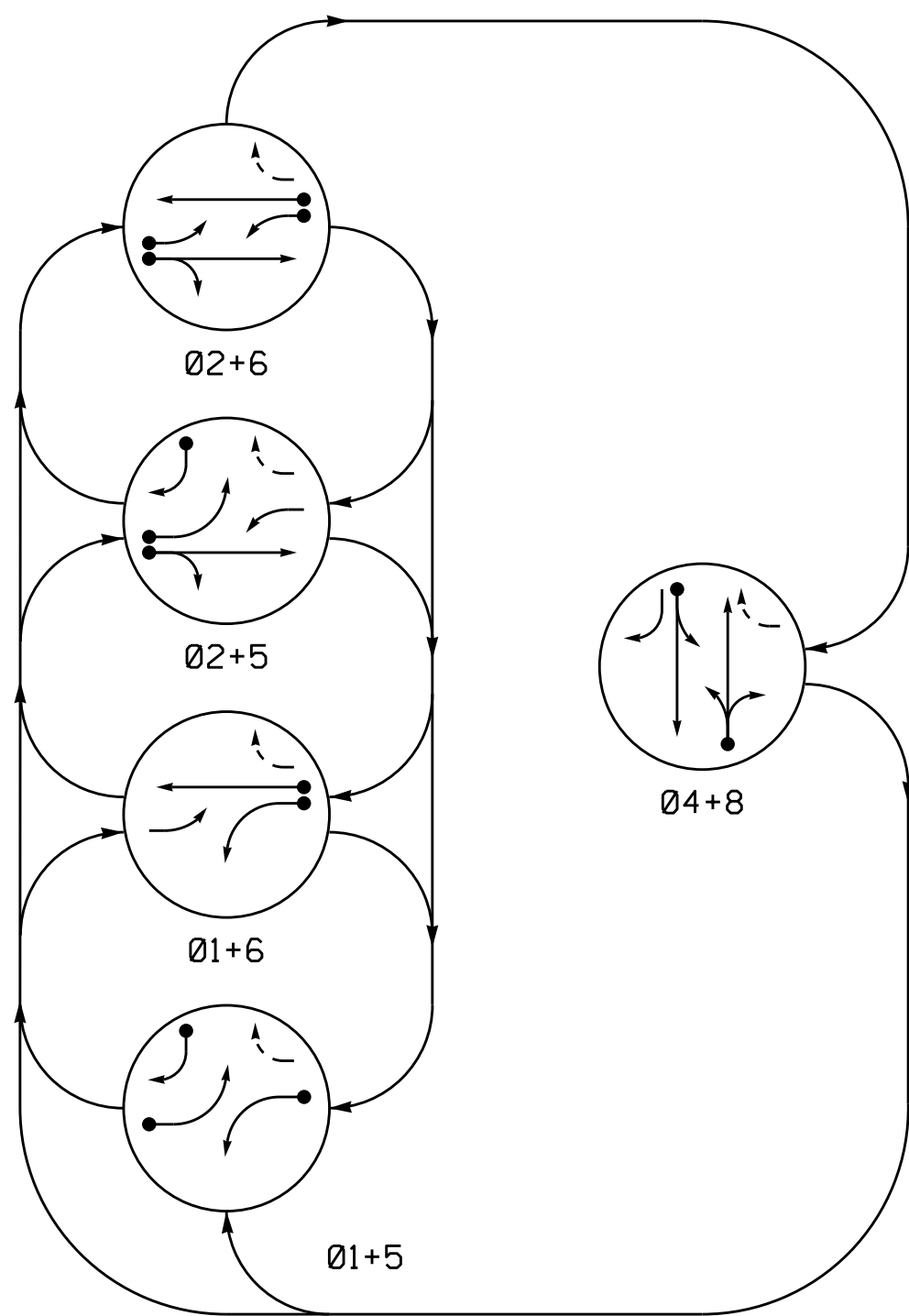


| | |
|---|--------------|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | |
| Prepared for the Offices of: | |
| US 421 Business/ NC 87 (S. Horner Boulevard) at NC 78-42 (E. Main Street) Division 8 Lee County Sanford | |
| PLAN DATE: March 2022 | REVIEWED BY: |
| PREPARED BY: Zarrar Zafar | REVIEWED BY: |
| REVISIONS | INIT. DATE |
| | |
| | |
| | |

| |
|---|
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |
| SEAL |
| DocuSigned by: D. Todd Joyce 04/20/2022 DATE |
| SIG. INVENTORY NO. 08-0047 |

20-Apr-2022 10:48
 S:\IT\SSU\TIS\Sig\Workgroups\Sig_MarkZafar\Plans\080047_sme.e_2022mdd.dgn
 zzzzfor

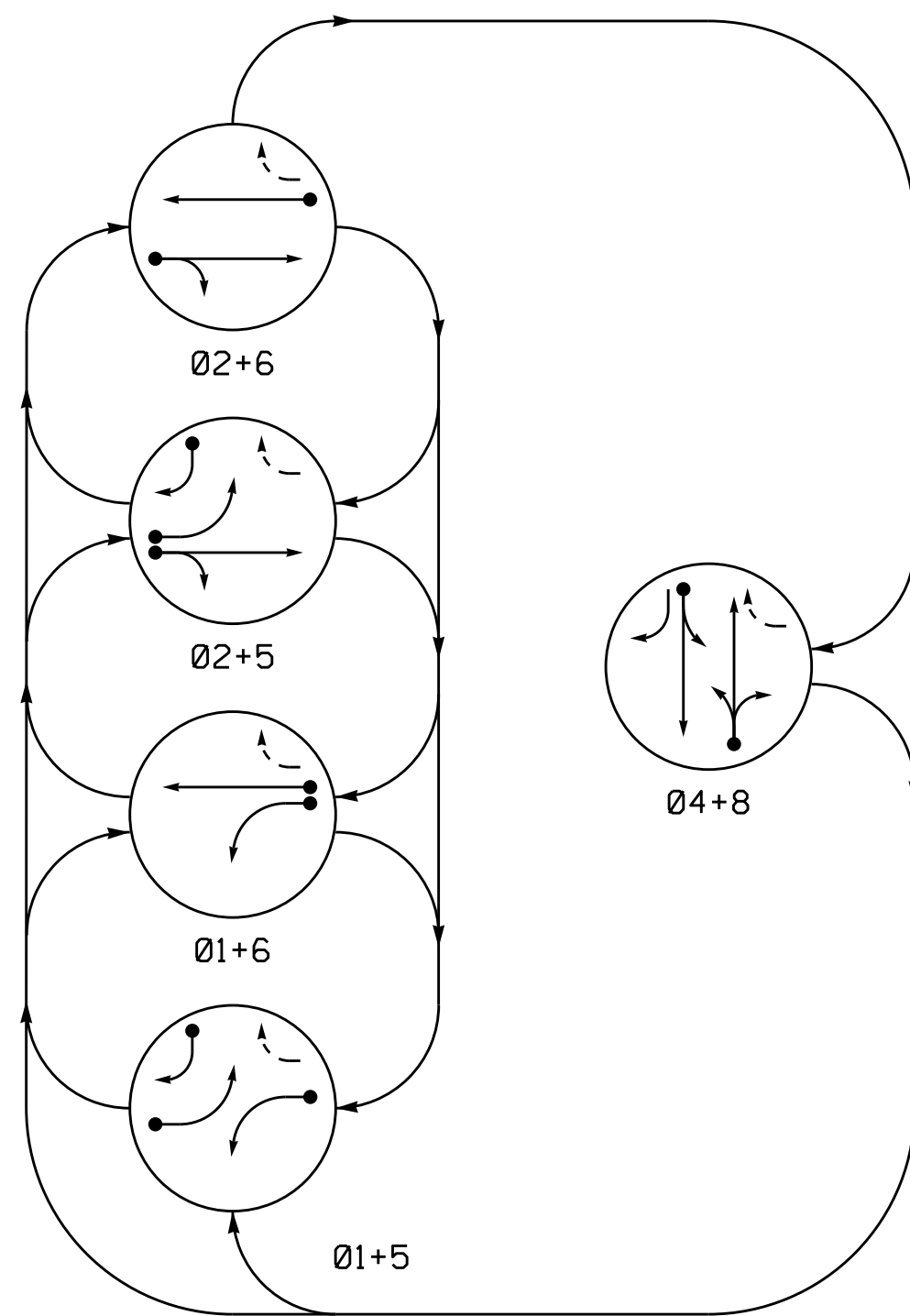
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | FLASH |
|-------------|-------|------|------|------|------|-------|
| | 01+5 | 02+5 | 02+6 | 04+8 | 01+6 | |
| 11 | --- | --- | --- | --- | --- | --- |
| 21, 22 | R | R | G | G | R | Y |
| 41 | R | R | R | R | G | R |
| 42 | R | R | R | R | G | R |
| 51 | --- | --- | --- | --- | --- | --- |
| 61, 62 | R | G | R | G | R | Y |
| 81, 82 | R | R | R | R | G | R |

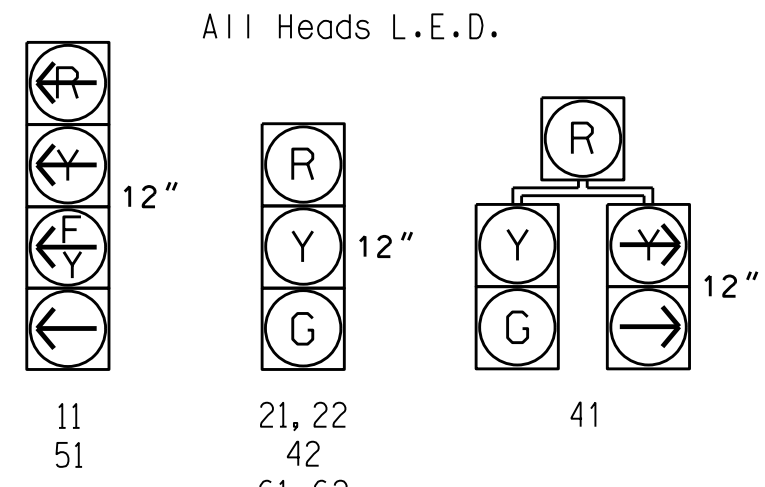
ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | FLASH |
|-------------|-------|------|------|------|------|-------|
| | 01+5 | 02+5 | 02+6 | 04+8 | 01+6 | |
| 11 | --- | --- | --- | --- | --- | --- |
| 21, 22 | R | R | G | G | R | Y |
| 41 | R | R | R | R | G | R |
| 42 | R | R | R | R | G | R |
| 51 | --- | --- | --- | --- | --- | --- |
| 61, 62 | R | G | R | G | R | Y |
| 81, 82 | R | R | R | R | G | R |

SIGNAL FACE I.D.



PHASING DIAGRAM DETECTION LEGEND

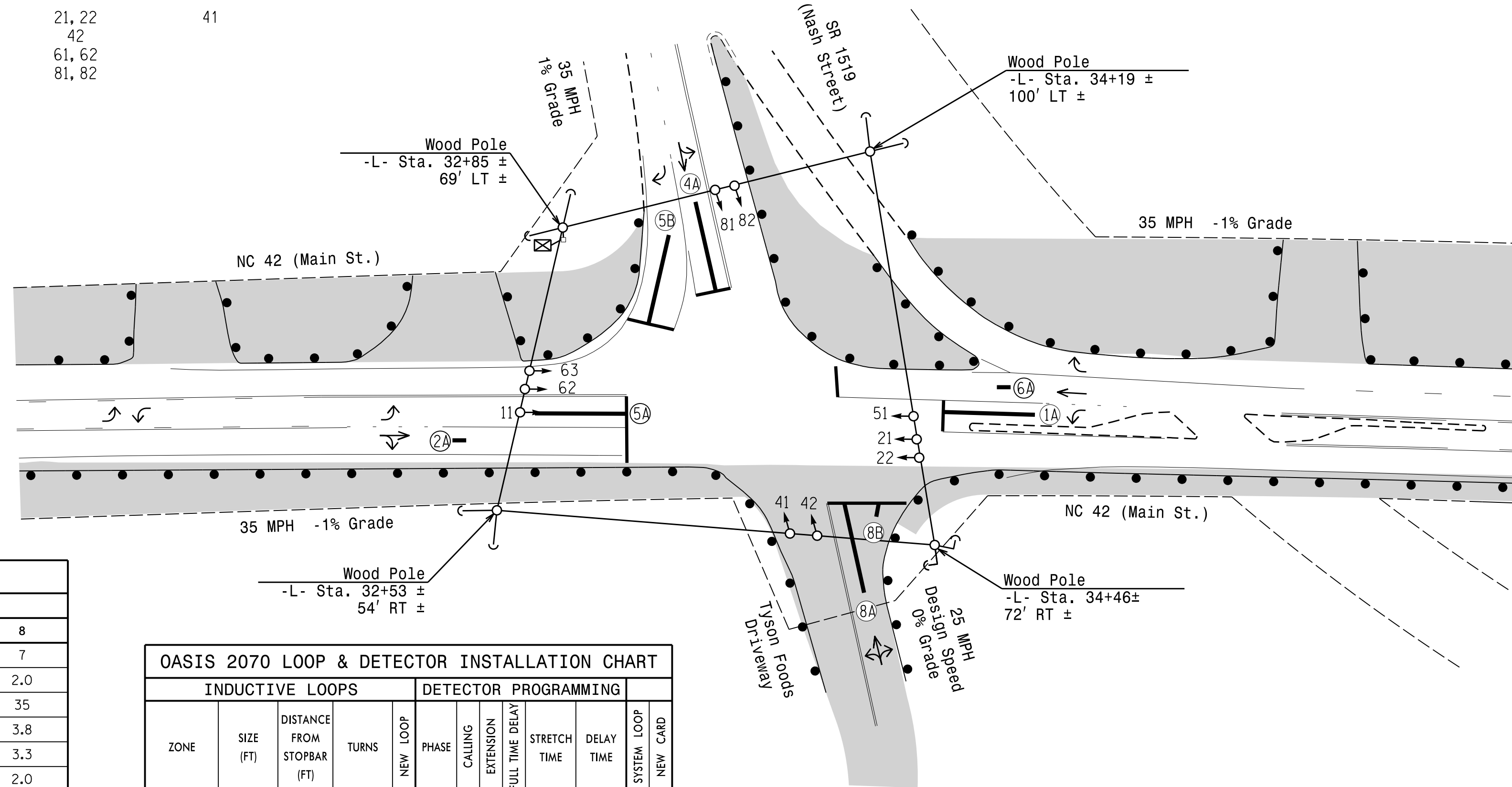
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. The Division Traffic Engineer will determine the hours of use for each phasing plan.
7. This location utilizes a video detection system. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
8. Remove existing pavement markings pertaining to railroad crossing.

LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |



OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | | | |
|-------------------------|-------|------------|-----|-----|------------|-----|--|
| | 1 | 2 | 4 | 5 | 6 | 8 | |
| Min Green 1 * | 7 | 10 | 7 | 7 | 10 | 7 | |
| Extension 1 | 2.0 | 3.0 | 2.0 | 2.0 | 3.0 | 2.0 | |
| Max Green 1 * | 25 | 60 | 35 | 25 | 60 | 35 | |
| Yellow Clearance | 3.0 | 3.9 | 3.8 | 3.0 | 3.9 | 3.8 | |
| Red Clearance | 2.3 | 2.5 | 3.3 | 1.9 | 2.5 | 3.3 | |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Walk 1 * | - | - | - | - | - | - | |
| Don't Walk 1 | - | - | - | - | - | - | |
| Dynamic Max 3 | - | - | 55 | - | - | 55 | |
| Dynamic Max Adjust | - | - | 10 | - | - | 10 | |
| Time Before Reduction * | - | - | - | - | - | - | |
| Time To Reduce * | - | - | - | - | - | - | |
| Minimum Gap | - | - | - | - | - | - | |
| Recall Mode | - | MIN RECALL | - | - | MIN RECALL | - | |
| Vehicle Call Memory | - | YELLOW | - | - | YELLOW | - | |
| Dual Entry | - | - | ON | - | - | ON | |
| Simultaneous Gap | ON | ON | ON | ON | ON | ON | |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| ZONE | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | | | |
|------|-----------|----------------------------|-------|----------|----------------------|-------------------|--------------|------------|-------------|----------|---|---|
| | | | | | PHASE | CALLING EXTENSION | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD | | |
| 1A | 6X40 | 0 | * | * | 1 | Y | Y | - | - | ★15 | - | * |
| 2A | 6X6 | 70 | * | * | 2 | Y | Y | - | - | - | - | * |
| 4A | 6X40 | 0 | * | * | 4 | Y | Y | - | - | 3 | - | * |
| 5A | 6X40 | 0 | * | * | 5 | Y | Y | - | - | ★15 | - | * |
| 5B | 6X40 | 0 | * | * | 5 | Y | Y | - | - | 15 | - | * |
| 6A | 6X6 | 70 | * | * | 6 | Y | Y | - | - | - | - | * |
| 8A | 6X40 | 0 | * | * | 8 | Y | Y | - | - | 3 | - | * |
| 8B | 6X6 | 0 | * | * | 8 | Y | Y | - | - | 10 | - | * |

* Video Detection Zone
 ★ Reduce Delay to 3 seconds during Alternate Phasing Operation.
 # Disable Phase(s) call during Alternate Phasing Operation.

Signal Upgrade - Temporary Design 1 (TMP Phase I & II)

Prepared in the Offices of:

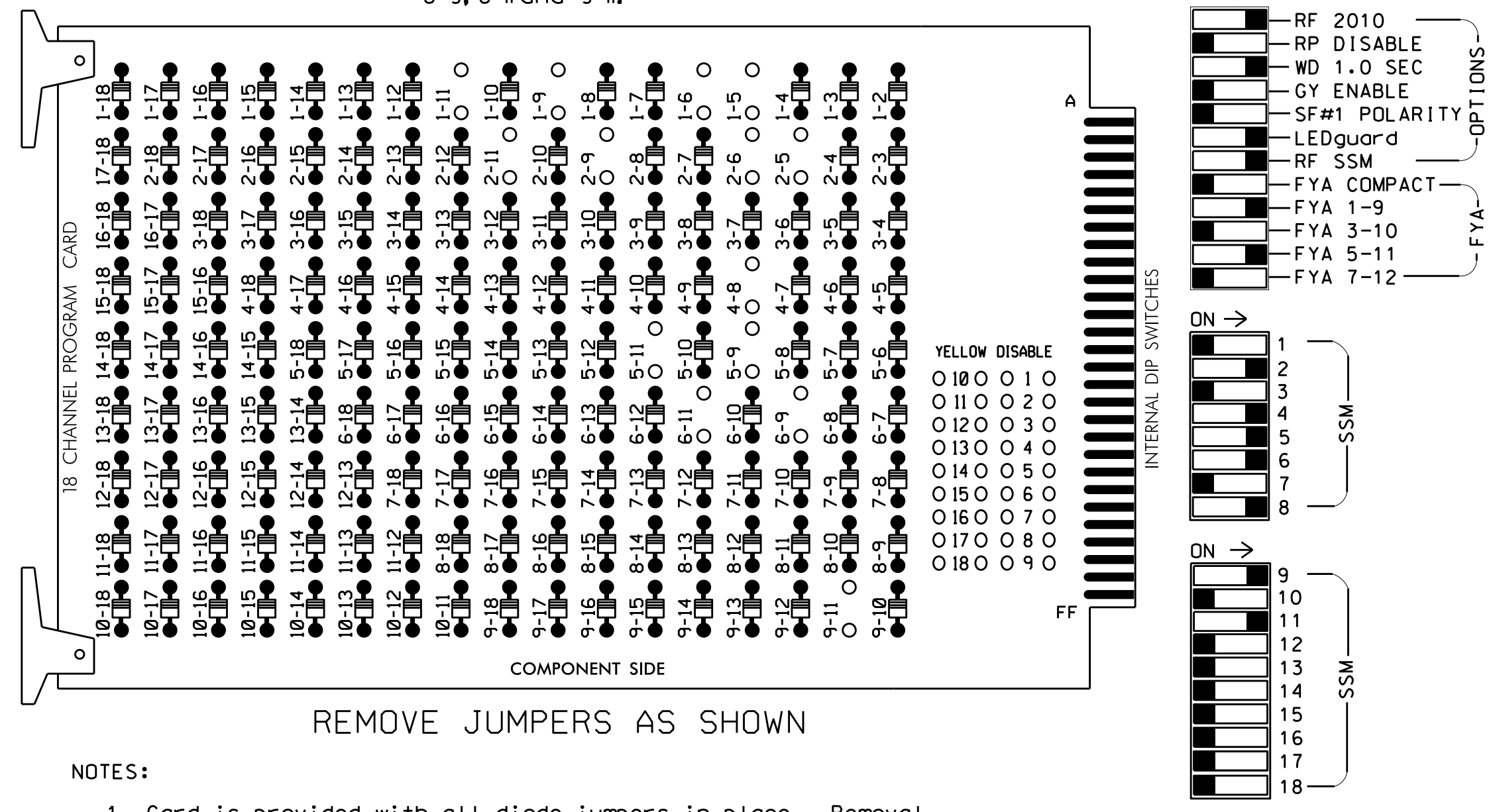
NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway
 Division 8 Lee County Sanford
 PLAN DATE: March 2022 REVIEWED BY:
 PREPARED BY: J.A. Lohr REVIEWED BY:
 SCALE: 1" = 40'
 REVISIONS: _____ INIT. DATE
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 SEAL: ROBERT J. JELENKA, ENGINEER 026486, DATE: 04/19/2022
 SIG. INVENTORY NO. 08-0236T1

488885\SIG\026486.dgn
 5:11:55 AM 1/5/2022 1:51 Signal\as\Sigonal\Central_Reg\on40\1v_84\3830\2022_revisions\080236t1_51a_rev_2022mod.dgn
 J. Lohr

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 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 4 and 8 for Dynamic Max/Max 3.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

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,S7,S8,S11,AUXS1,AUXS4
 PHASES USED.....1,2,4,5,6,8
 OVERLAP "A".....1+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. | 11 | 21,22 | NU | NU | 41,42 | NU | 51 | 41 | 61,62 | NU | NU | 81,82 | NU | 11 | 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 | 127 | | | | | | 133 | 133 | | | | | | | | | | |

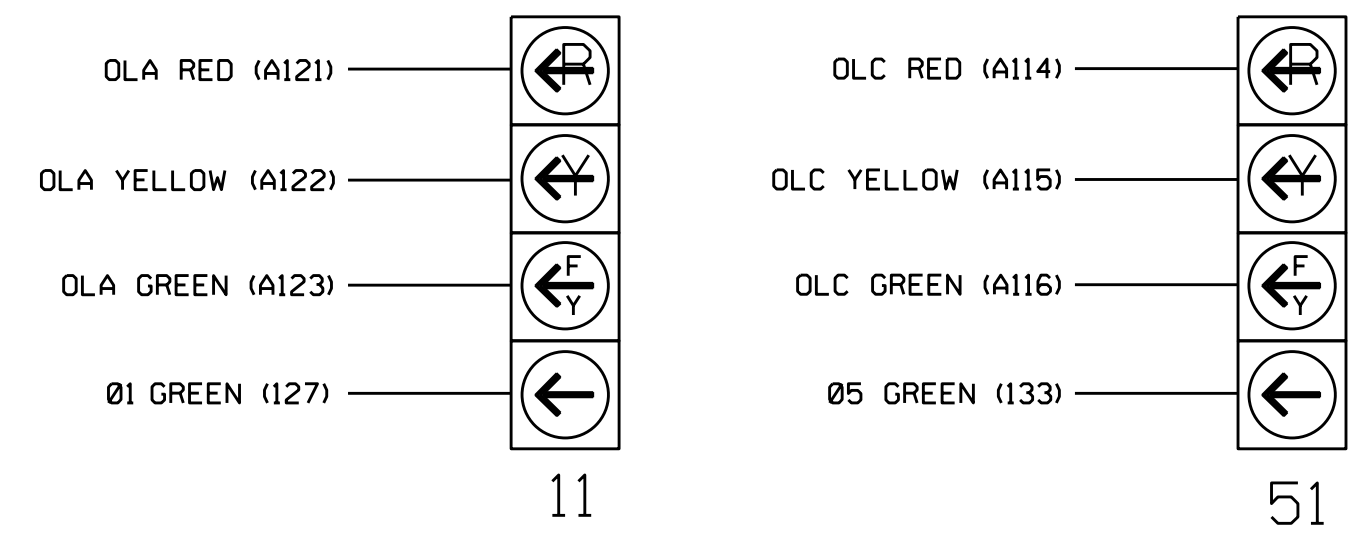
NU = Not Used

* 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 heads as shown)

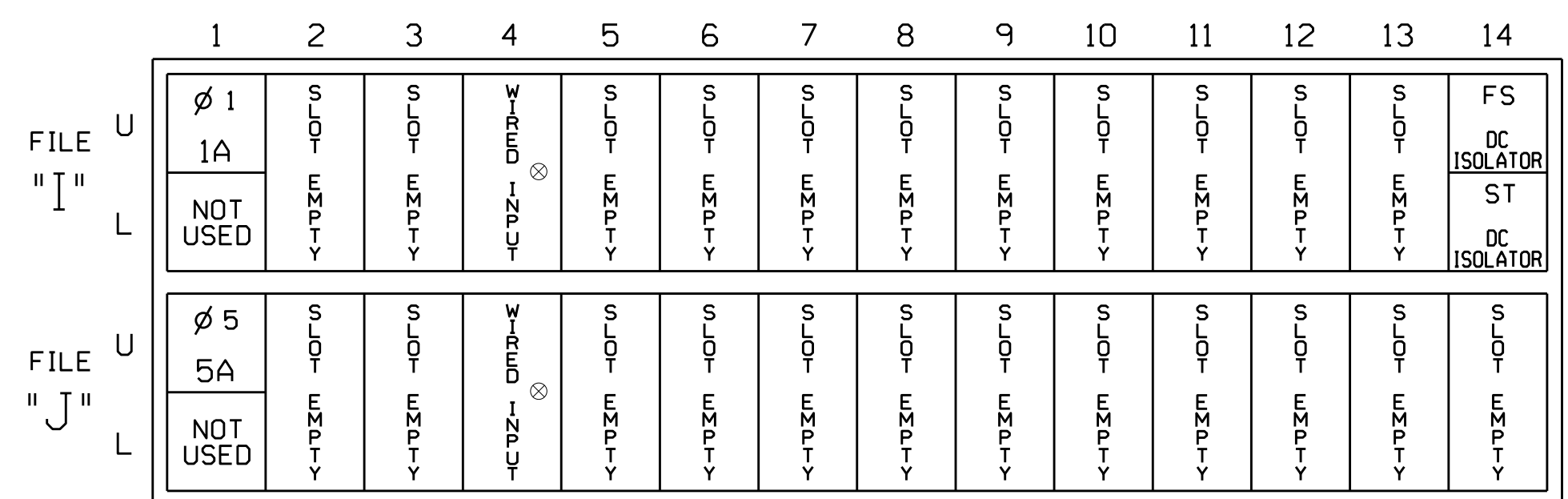


NOTE

The sequence display for signal heads 11 and 51 require special logic programming. See sheet 2 for programming instructions.

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 cord

INPUT FILE CONNECTION & PROGRAMMING CHART

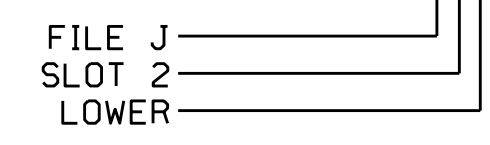
| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10★ | 26 | 6 | Y | Y | | | |
| | - | I1U | 56 | 18★ | 51 | 1 | Y | Y | | | 3 |
| 5A ² | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | - | I4U | 47 | 9★ | 22 | 2 | Y | Y | | | |
| | - | J1U | 55 | 17★ | 55 | 5 | Y | Y | | | 3 |

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

²Add jumper from J1-W to I4-W, on rear of input file.

★ See Input Page Assignment programming details on sheets 3 and 4.

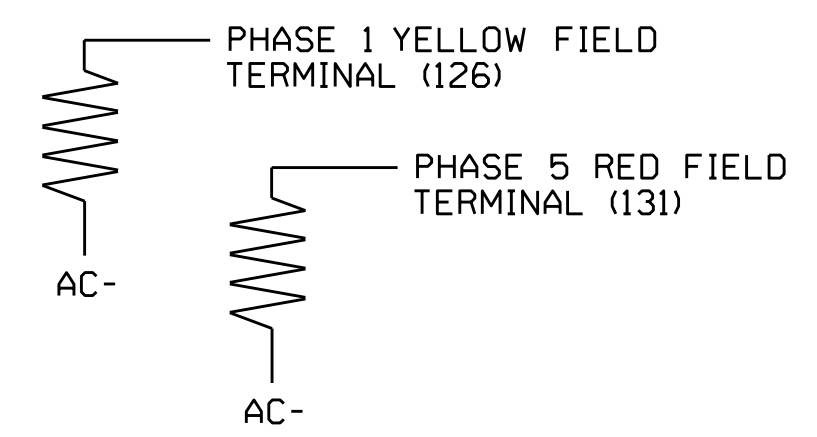
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



DETECTOR NOTES

- For all loops 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 schemes shown on the Signal Design Plans.
- For loops 1A and 5A, detector card placement and slot reserved for wired input are typical for a NCDOT installation. Input associated with these slots are compatible with time of day instructions located on sheet 3 and 4 of this electrical detail.

Temporary Design 1
 Electrical Detail - Sheet 1 of 5

| | | | | |
|---|--|--------------|--|------------------------------|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County Sanford | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL D. Todd Joyce 04/20/2022 DATE | |
| | Division 8 | REVIEWED BY: | | SIG. INVENTORY NO. 08-0236T1 |
| | PLAN DATE: April 2022 | REVIEWED BY: | | |
| | PREPARED BY: Zarrar Zafar | REVIEWED BY: | | |

**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, 3, 4, 5 AND 6.
- 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 #50 ON
SET OUTPUT ASSIGNMENT #51 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 #52 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 #51 ON

PRESS '+'

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

LOGICAL I/O COMMAND #4 (+/-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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

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 |
| OUTPUT 50 = Overlap A Red |
| OUTPUT 51 = Overlap A Yellow |
| OUTPUT 52 = Overlap A Green |

**OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING**

(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

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

OVERLAP PROGRAMMING COMPLETE

**OVERLAP PROGRAMMING DETAIL
FOR ALTERNATE PHASING**

(program controller as shown below)

- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 →

PAGE 2: 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
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+' TWICE

NOTICE PAGE 2 →

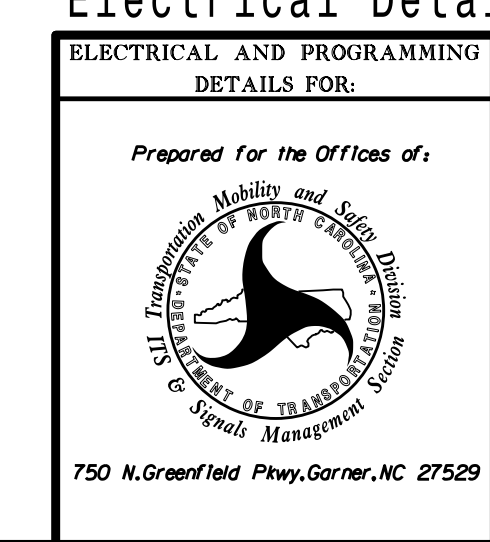
PAGE 2: VEHICLE OVERLAP 'C' SETTINGS
PHASE: :12345678910111213141516
VEH OVL PARENTS: : X
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T1
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 1
Electrical Detail - Sheet 2 of 5



| | |
|---|--------------|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | |
| Prepared for the Offices of: | |
| 750 N. Greenfield Pkwy, Garner, NC 27529 | |
| NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway | |
| Lee County Sanford | |
| PLAN DATE: April 2022 | REVIEWED BY: |
| PREPARED BY: Zarrar Zafar | REVIEWED BY: |
| REVISIONS | INIT. DATE |
| | |
| | |
| | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL 031001

DocuSigned by: D. Todd Joyce 04/20/2022

SIG. INVENTORY NO. 08-0236T1

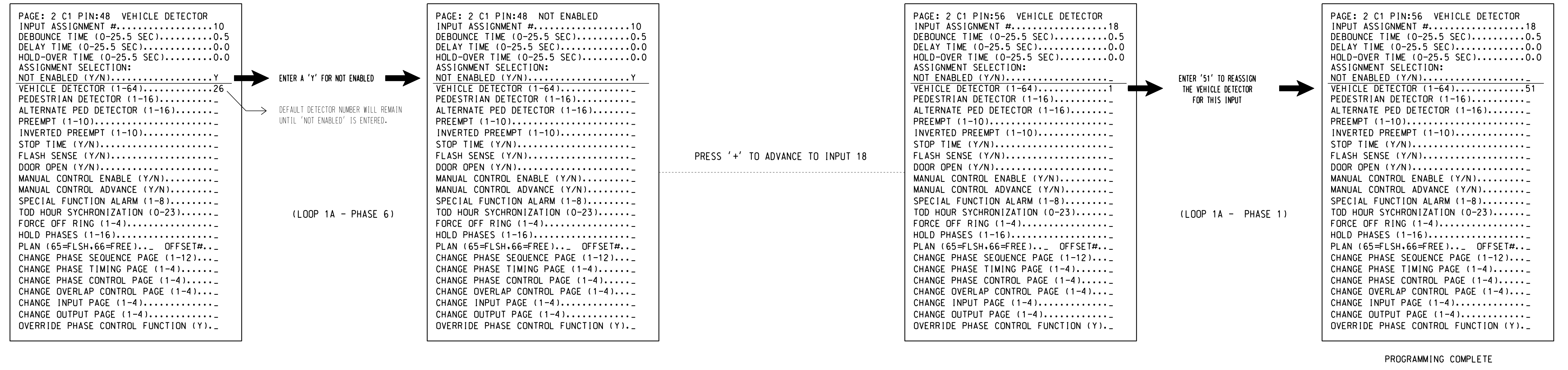
20-Apr-2022 11:57
W:\0236\08-Sig. 5.2-2022\mde-11.dgn
ZZZ

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

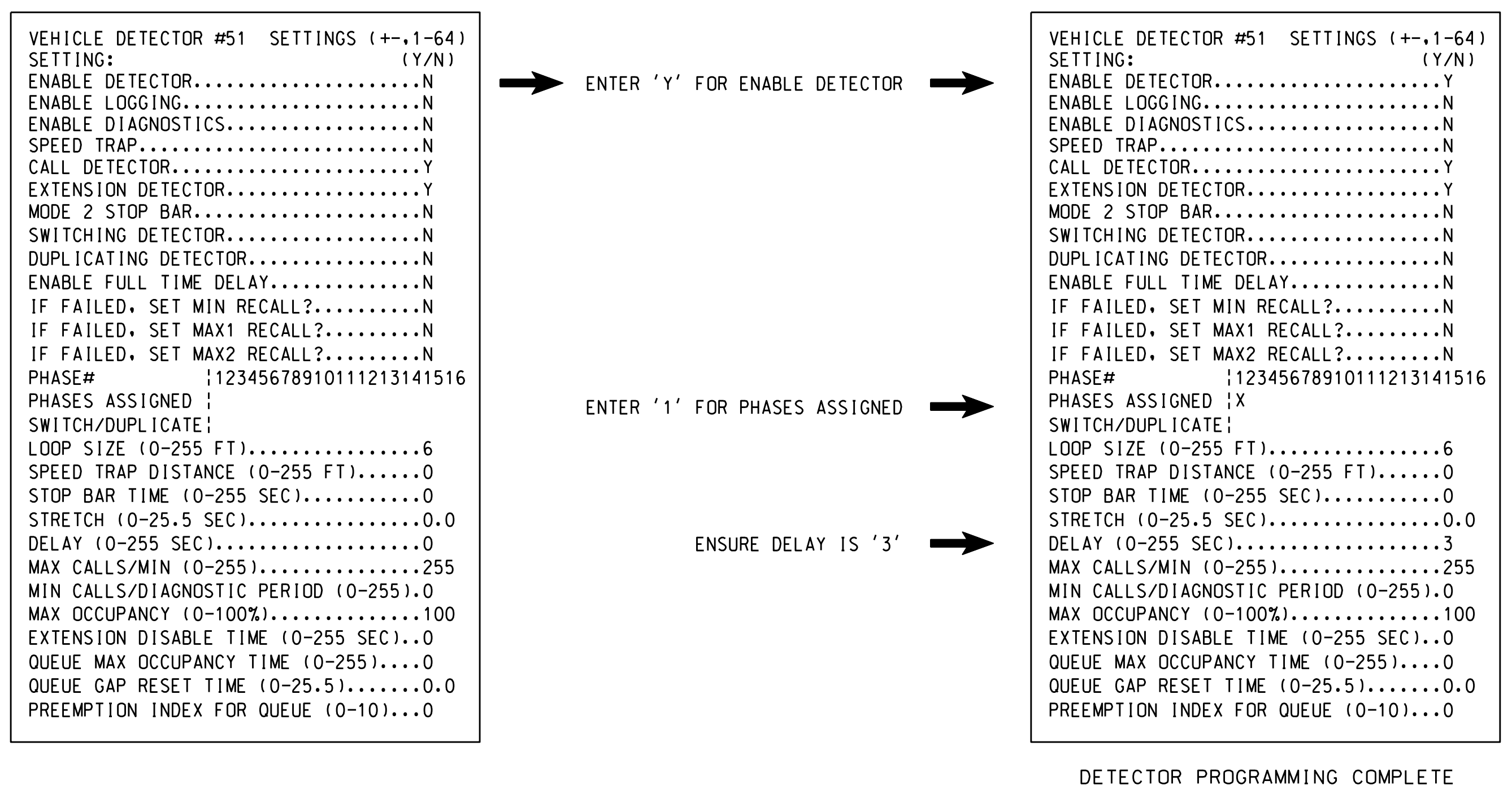
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T1
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 1
Electrical Detail - Sheet 3 of 5

NC 42 (Main Street)
at
SR 1519 (Nash Street) /
Tyson Foods Driveway
Lee County Sanford

Division 8

PLAN DATE: April 2022 REVIEWED BY: [Signature]
PREPARED BY: Zarrar Zafar REVIEWED BY: [Signature]

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
D. Todd Joyce
04/20/2022
SIG. INVENTORY NO. 08-0236T1

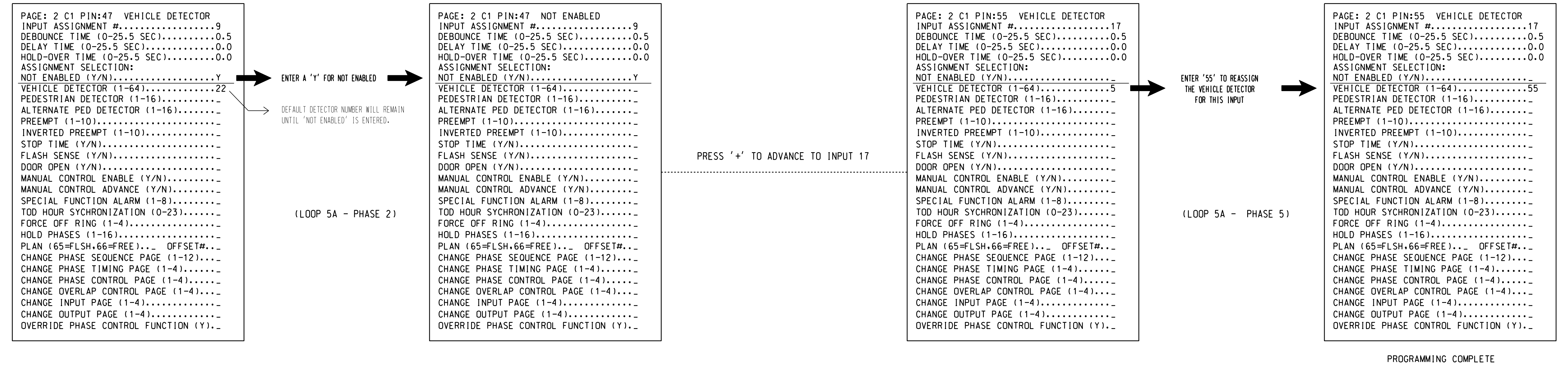
20-0495-2022-11-58
W:\0236-36-36-01-02\2022\mde-11.dgn
ZZZ

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

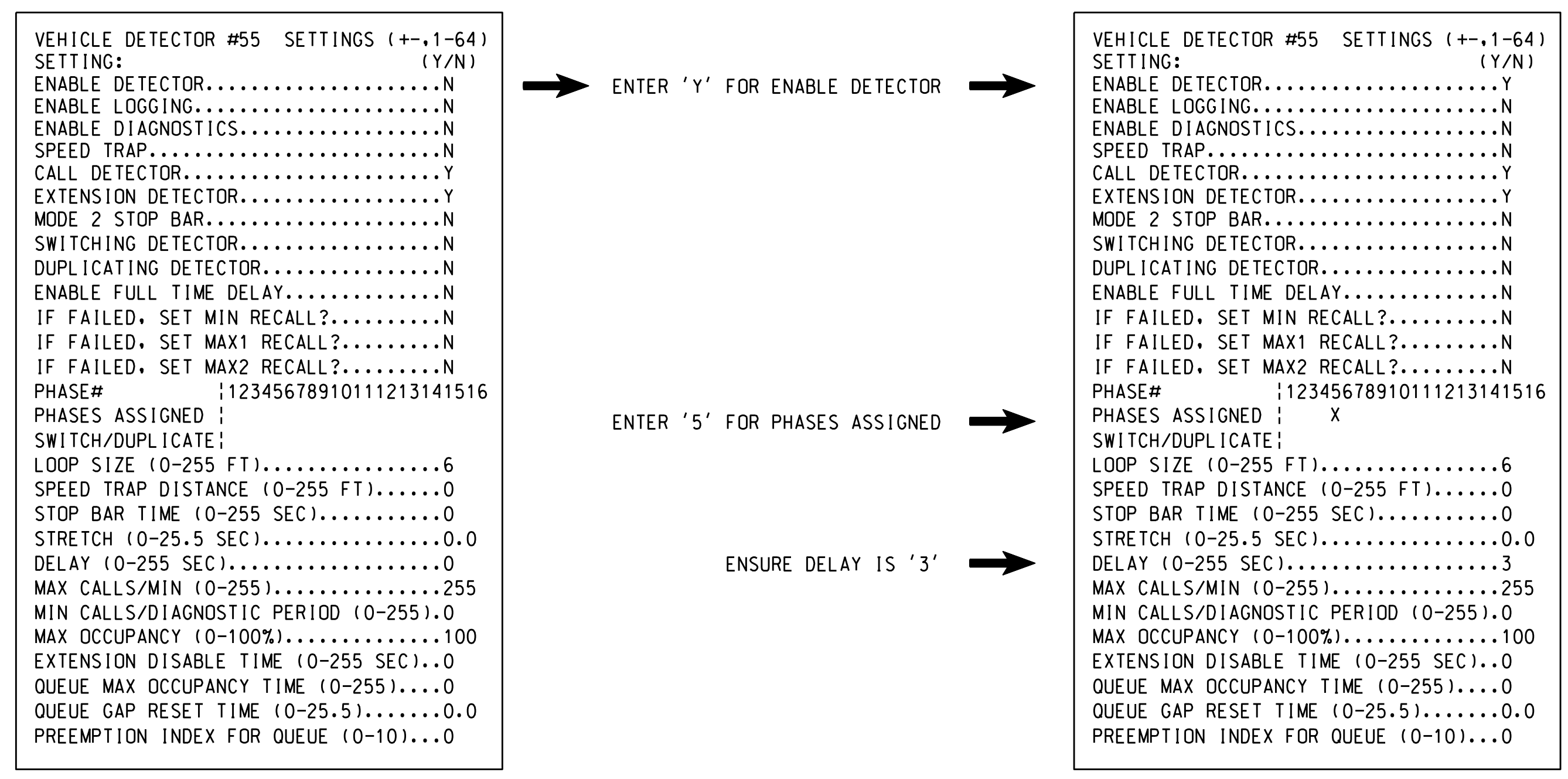
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T1
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 1
Electrical Detail - Sheet 4 of 5

NC 42 (Main Street)
at
SR 1519 (Nash Street) /
Tyson Foods Driveway
Lee County Sanford

Division 8

PLAN DATE: April 2022 REVIEWED BY:
PREPARED BY: Zarrar Zafar REVIEWED BY:
REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
STATE OF NORTH CAROLINA
PROFESSIONAL ENGINEER
D. Todd Joyce
04/20/2022
SIG. INVENTORY NO. 08-0236T1

20-0498-2022 11:59
W:\0236-08-Sig. 5.4-2022\mddg-11.dgn
ZZZ

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

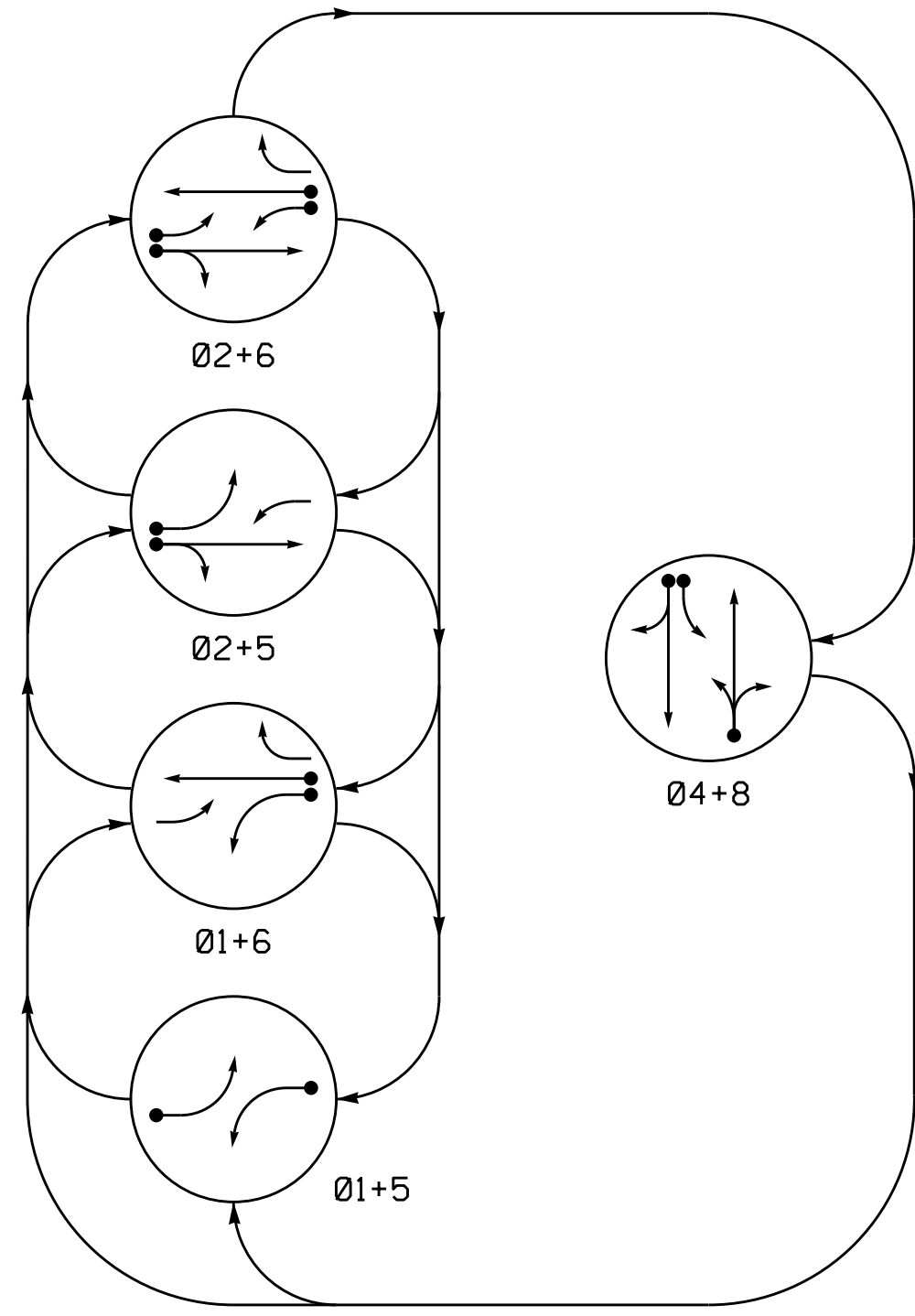
Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0236T1
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 1
Electrical Detail - Sheet 5 of 5

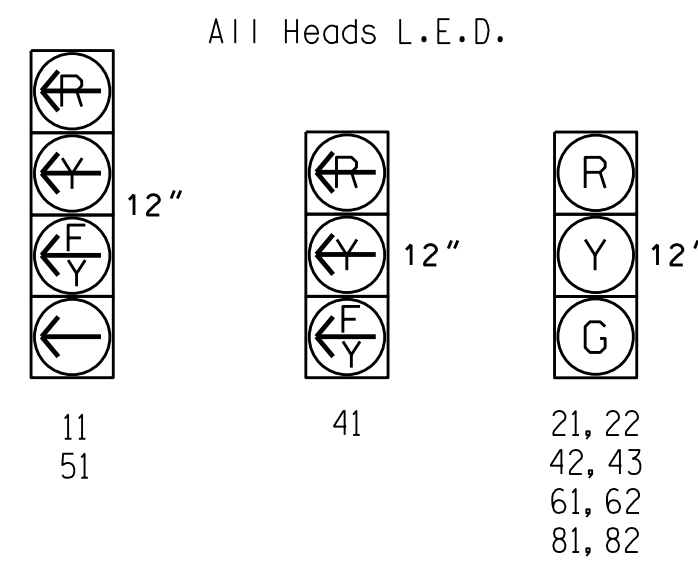
| | | | | | | | | | | | | |
|--|---|-----------------------|--------------|---------------------------|----------------|-----------|------------|--|--|--|--|---|
| <p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">Prepared for the Offices of:</p> <p style="text-align: center;">750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p style="text-align: center;">NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway</p> <p style="text-align: center;">Division 8 Lee County Sanford</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>PLAN DATE: April 2022</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: Zarrar Zafar</td> <td>REVIEWED BY: -</td> </tr> <tr> <td>REVISIONS</td> <td>INIT. DATE</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table> | PLAN DATE: April 2022 | REVIEWED BY: | PREPARED BY: Zarrar Zafar | REVIEWED BY: - | REVISIONS | INIT. DATE | | | | | <p style="text-align: center;">DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p style="text-align: center;">SEAL</p> <p style="text-align: center;">DocuSigned by: <i>D. Todd Joyce</i> 04/20/2022</p> <p style="text-align: center;">SIC. INVENTORY NO. 08-0236T1</p> |
| PLAN DATE: April 2022 | REVIEWED BY: | | | | | | | | | | | |
| PREPARED BY: Zarrar Zafar | REVIEWED BY: - | | | | | | | | | | | |
| REVISIONS | INIT. DATE | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

DEFAULT PHASING DIAGRAM

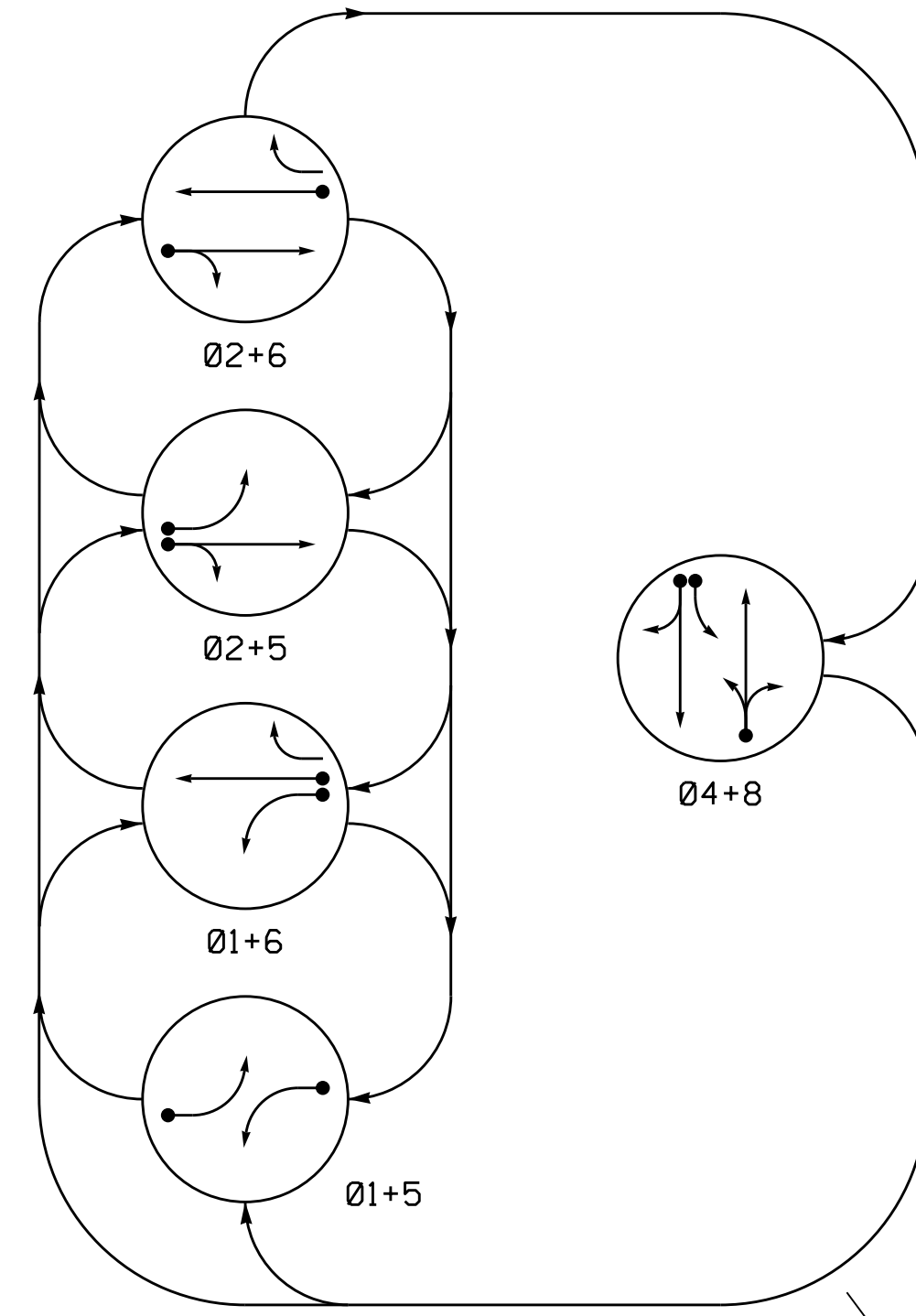


| SIGNAL FACE | PHASE | | | | | FLTS |
|-------------|-------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 04+8 | |
| 11 | ← | ← | ← | ← | ← | ← |
| 21, 22 | R | R | G | G | R | Y |
| 41 | ← | ← | ← | ← | ← | ← |
| 42, 43 | R | R | R | R | G | R |
| 51 | ← | ← | ← | ← | ← | ← |
| 61, 62 | R | G | R | G | R | Y |
| 81, 82 | R | R | R | R | G | R |

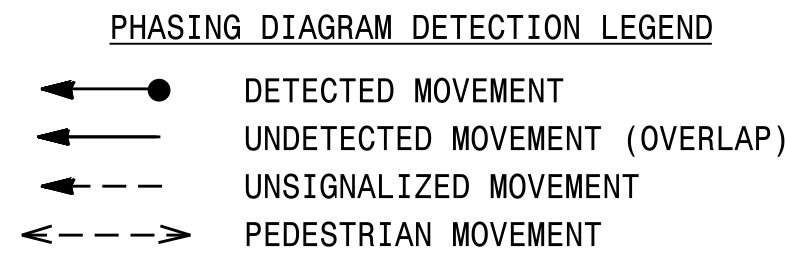
SIGNAL FACE I.D.



ALTERNATE PHASING DIAGRAM



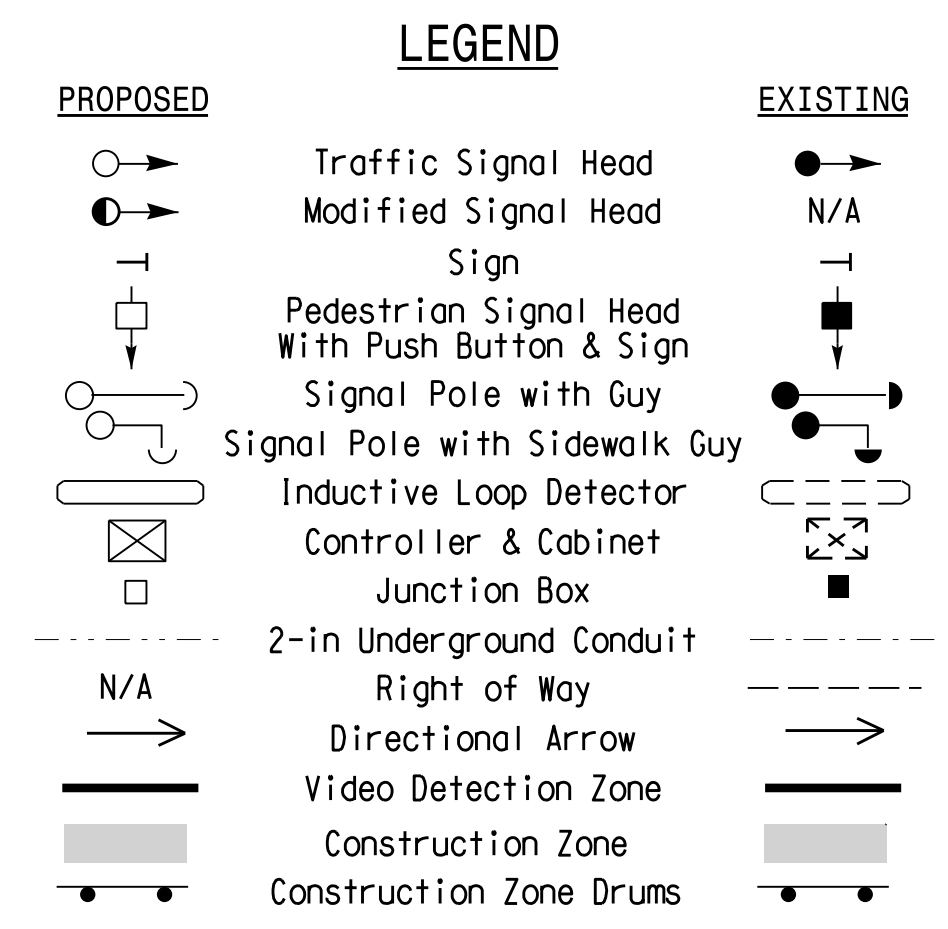
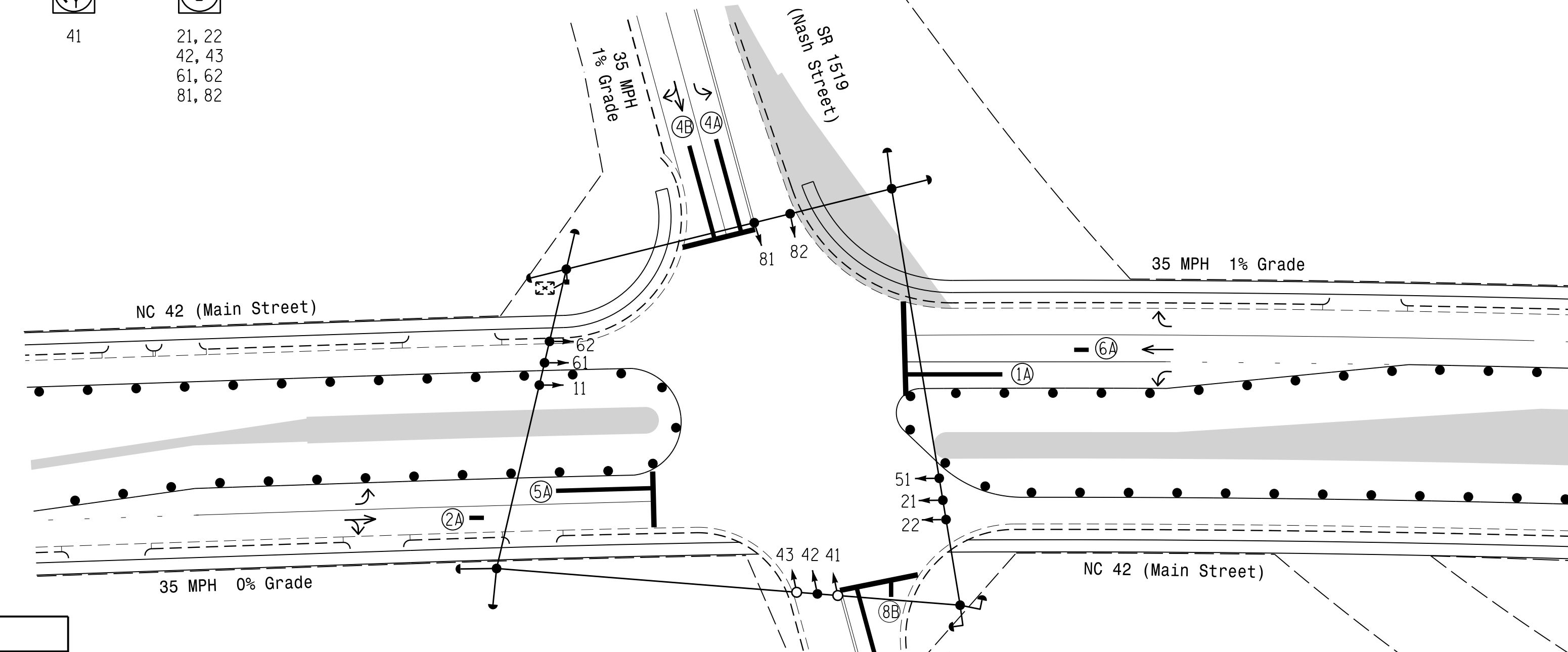
| SIGNAL FACE | PHASE | | | | | FLTS |
|-------------|-------|------|------|------|------|------|
| | 01+5 | 01+6 | 02+5 | 02+6 | 04+8 | |
| 11 | ← | ← | ← | ← | ← | ← |
| 21, 22 | R | R | G | G | R | Y |
| 41 | ← | ← | ← | ← | ← | ← |
| 42, 43 | R | R | R | R | G | R |
| 51 | ← | ← | ← | ← | ← | ← |
| 61, 62 | R | G | R | G | R | Y |
| 81, 82 | R | R | R | R | G | R |



5 Phase Fully Actuated (Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 11, 21, 22, 42, 51, 61, 62, 81, and 82.
- Set all detector units to presence mode.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This location utilizes a video detection system. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.



| FEATURE | PHASE | | | | | | |
|-------------------------|-------|------------|-----|-----|------------|-----|--|
| | 1 | 2 | 4 | 5 | 6 | 8 | |
| Min Green 1 * | 7 | 10 | 7 | 7 | 10 | 7 | |
| Extension 1 | 2.0 | 3.0 | 2.0 | 2.0 | 3.0 | 2.0 | |
| Max Green 1 * | 25 | 60 | 35 | 25 | 60 | 35 | |
| Yellow Clearance | 3.0 | 3.8 | 3.8 | 3.0 | 3.8 | 3.8 | |
| Red Clearance | 2.6 | 2.4 | 3.5 | 3.2 | 2.4 | 3.5 | |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | |
| Walk 1 * | - | - | - | - | - | - | |
| Don't Walk 1 | - | - | - | - | - | - | |
| Dynamic Max 3 | - | - | 55 | - | - | 55 | |
| Dynamic Max Adjust | - | - | 10 | - | - | 10 | |
| Time Before Reduction * | - | - | - | - | - | - | |
| Time To Reduce * | - | - | - | - | - | - | |
| Minimum Gap | - | - | - | - | - | - | |
| Recall Mode | - | MIN RECALL | - | - | MIN RECALL | - | |
| Vehicle Call Memory | - | YELLOW | - | - | YELLOW | - | |
| Dual Entry | - | - | ON | - | - | ON | |
| Simultaneous Gap | ON | ON | ON | ON | ON | ON | |

| OASIS 2070 LOOP & DETECTOR INSTALLATION CHART | | | | | | | | | | | |
|---|-----------|----------------------------|-------|----------------------|-------|---------|-----------|--------------|------------|-------------|----------|
| INDUCTIVE LOOPS | | | | DETECTOR PROGRAMMING | | | | | | | |
| ZONE | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PHASE | CALLING | EXTENSION | STRETCH TIME | DELAY TIME | LOOP SYSTEM | NEW CARD |
| 1A | 6X40 | 0 | * | * | 1 | Y | Y | - | - | ★15 | - |
| | | | | | #6 | Y | Y | - | - | - | - |
| 2A | 6X6 | 70 | * | * | 2 | Y | Y | - | - | - | - |
| 4A | 6X40 | 0 | * | * | 4 | Y | Y | - | - | 3 | - |
| 4B | 6X40 | 0 | * | * | 4 | Y | Y | - | - | 10 | - |
| 5A | 6X40 | 0 | * | * | 5 | Y | Y | - | - | ★15 | - |
| | | | | | #2 | Y | Y | - | - | - | - |
| 5B | 6X40 | 0 | * | * | 5 | Y | Y | - | - | 15 | - |
| 6A | 6X6 | 70 | * | * | 6 | Y | Y | - | - | - | - |
| 8A | 6X40 | 0 | * | * | 8 | Y | Y | - | - | 3 | - |
| 8B | 6X6 | 0 | * | * | 8 | Y | Y | - | - | 10 | - |

* Video Detection Zone
 ★ Disable Delay during Alternate Phasing Operation.
 # Disable Phase(s) call during Alternate Phasing Operation.

Signal Upgrade - Temporary Design 2 (TMP Phase III)

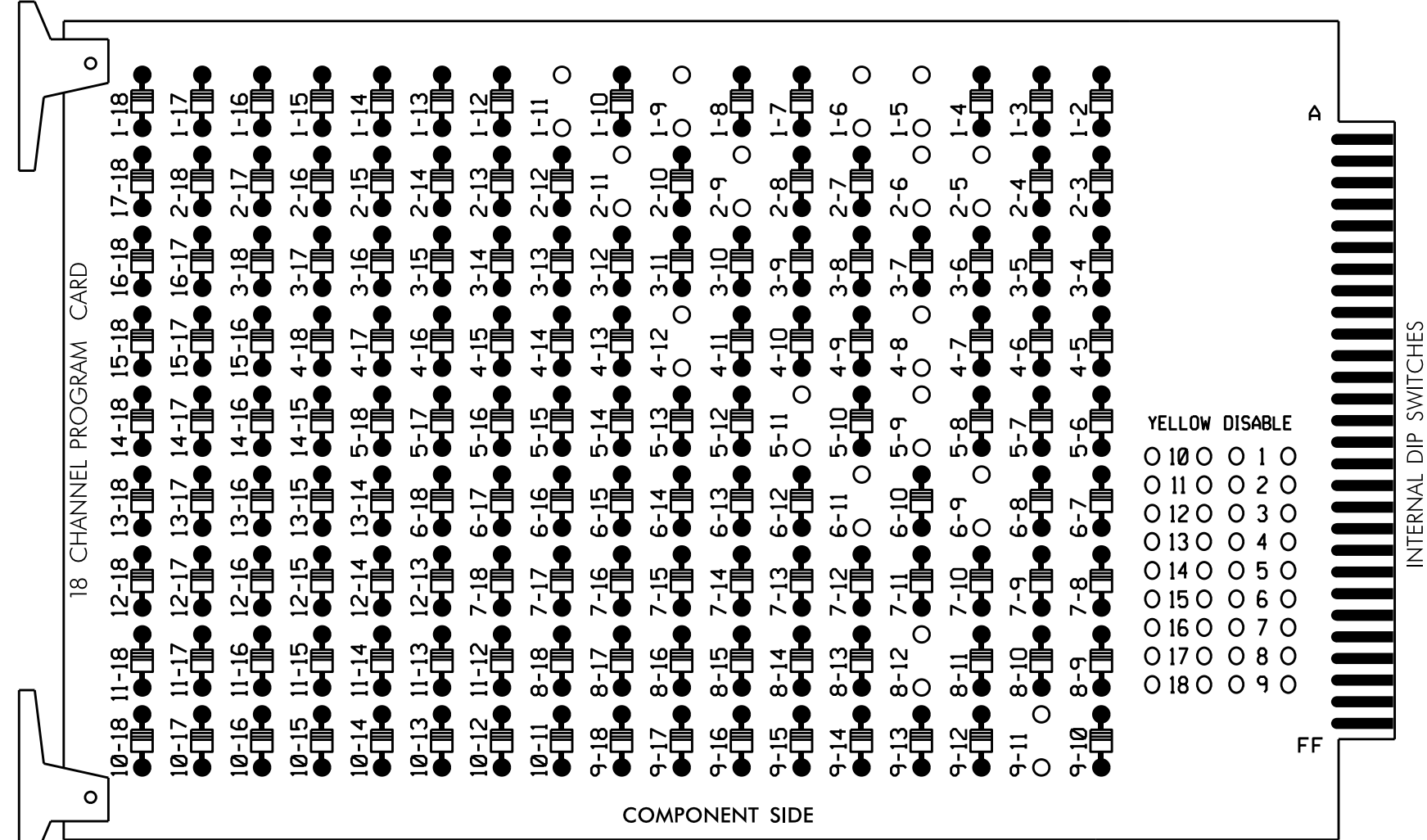
| | | |
|--|--|--|
| | NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway | |
| | Division 8 Lee County Sanford | SEAL ROBERT J. ZIEMBA PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA LICENSE NO. 026486 |
| | PLAN DATE: March 2022 PREPARED BY: J.A. Lohr | REVIEWED BY: REVIEWED BY: |

Scale: 1" = 40'

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

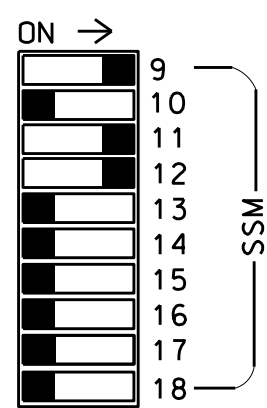
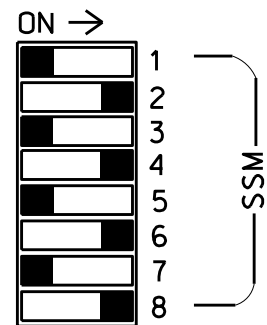
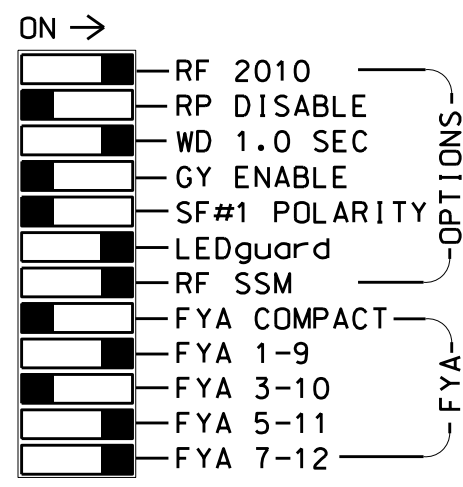
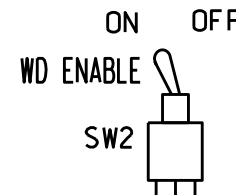
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 4-12, 5-9, 5-11, 6-9, 6-11, 8-12 and 9-11.



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.



■ = 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 4 and 8 for Dynamic Max/Max 3.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

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,S7,S8,S11,AUXS4,AUXS5
 PHASES USED.....1,2,4,5,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....8

| 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 | PED | 3 | 4 | PED | 5 | 6 | PED | 7 | 8 | PED | OLA | OLB | SPARE | OLC | OLD | SPARE |
| SIGNAL HEAD NO. | 11 | 21,22 | NU | NU | 42,43 | NU | 51 | 61,62 | NU | NU | 81,82 | NU | 11 | NU | NU | 51 | 41 | NU |
| RED | | 128 | | | 101 | | | 134 | | | 107 | | | | | | | |
| YELLOW | * | 129 | | | 102 | | * | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | A121 | | | A114 | A101 | |
| YELLOW ARROW | | | | | | | | | | | | | A122 | | | A115 | A102 | |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | A123 | | | A116 | A103 | |
| GREEN ARROW | 127 | | | | | | | 133 | | | | | | | | | | |

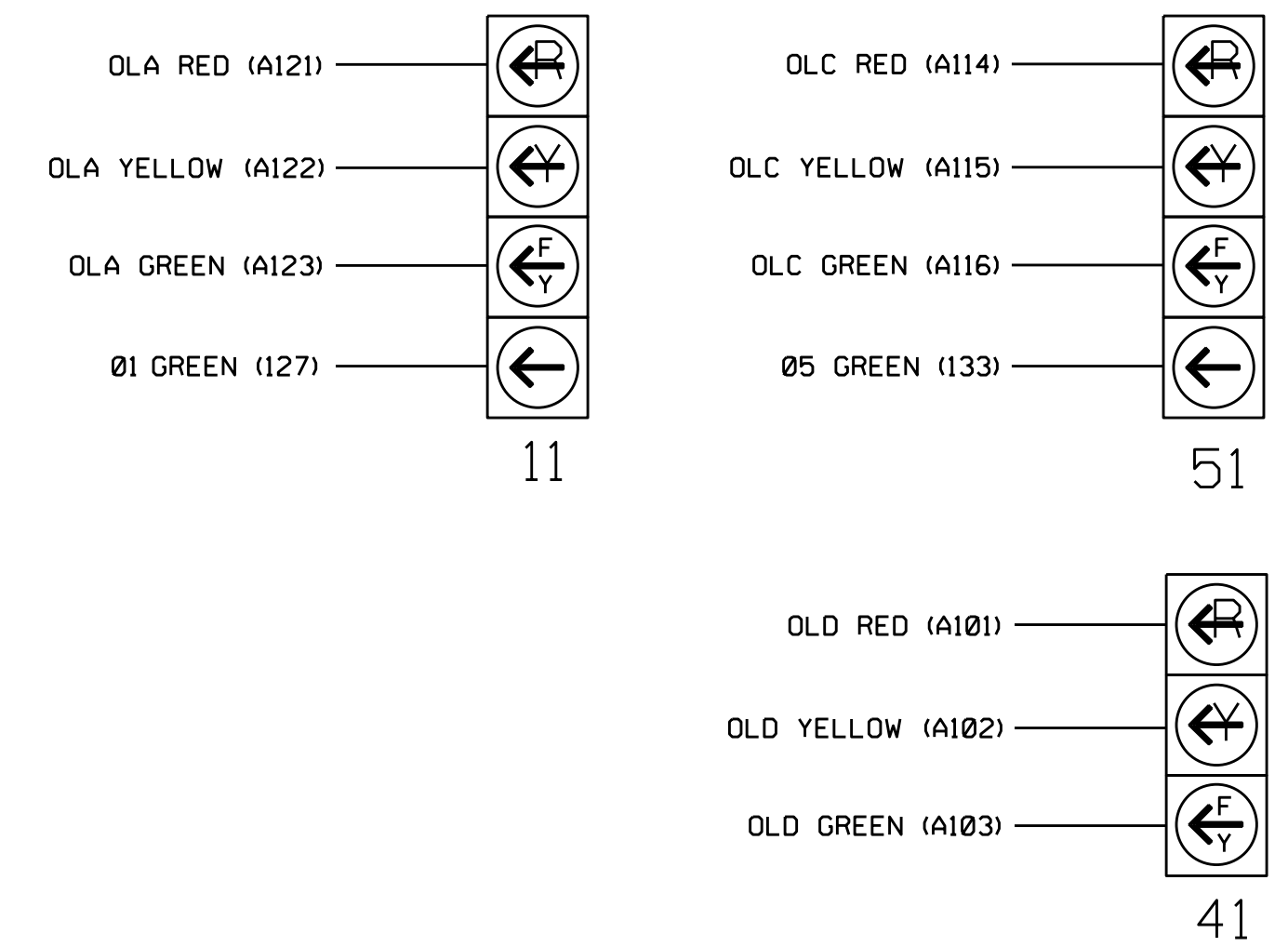
NU = Not Used

* 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 heads as shown)

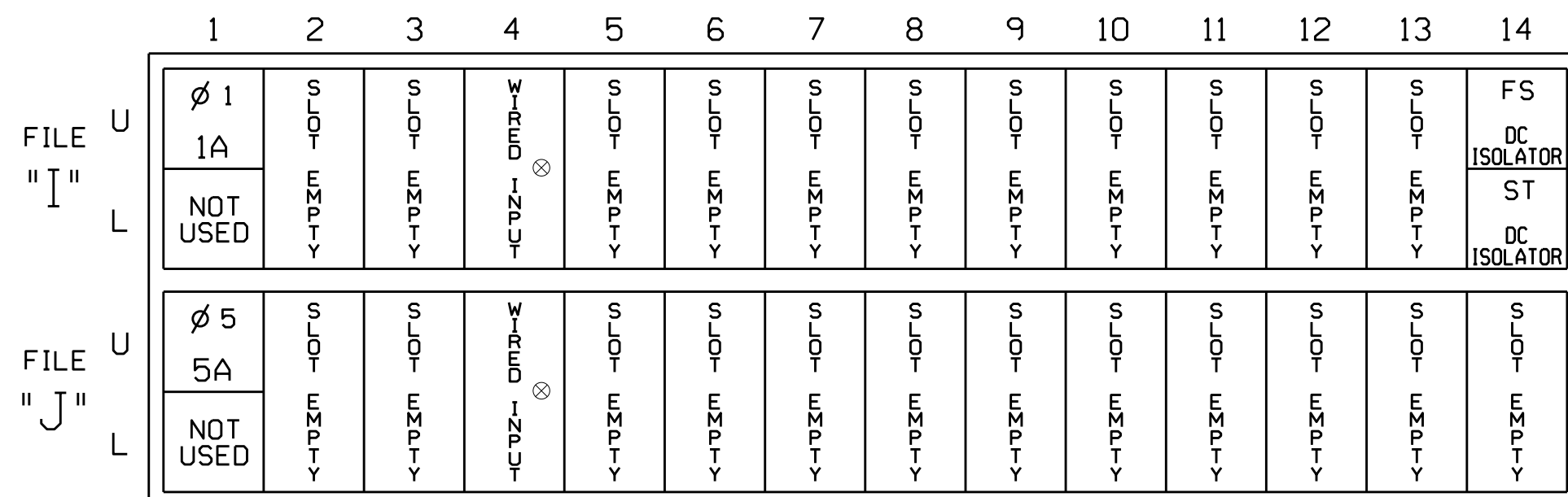


NOTE

The sequence display for signal heads 11 and 51 require special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

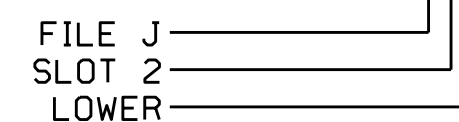
| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|-----------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10★ | 26 | 6 | Y | Y | | | |
| 5A ² | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | - | I4U | 47 | 9★ | 22 | 2 | Y | Y | | | |
| - | - | J1U | 55 | 17★ | 55 | 5 | Y | Y | | | |

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

²Add jumper from J1-W to I4-W, on rear of input file.

★ See Input Page Assignment programming details on sheets 3 and 4.

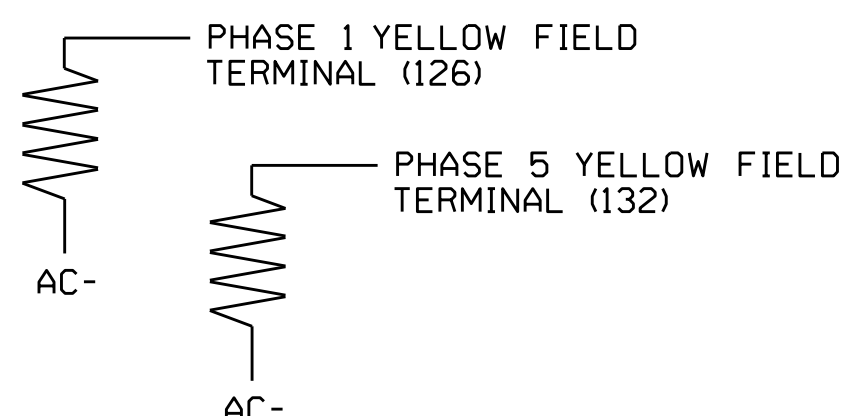
INPUT FILE POSITION LEGEND: J2L



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



DETECTOR NOTES

- For all loops 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 schemes shown on the Signal Design Plans.
- For loops 1A and 5A, detector card placement and slot reserved for wired input are typical for a NCDOT installation. Input associated with these slots are compatible with time of day instructions located on sheet 3 and 4 of this electrical detail.

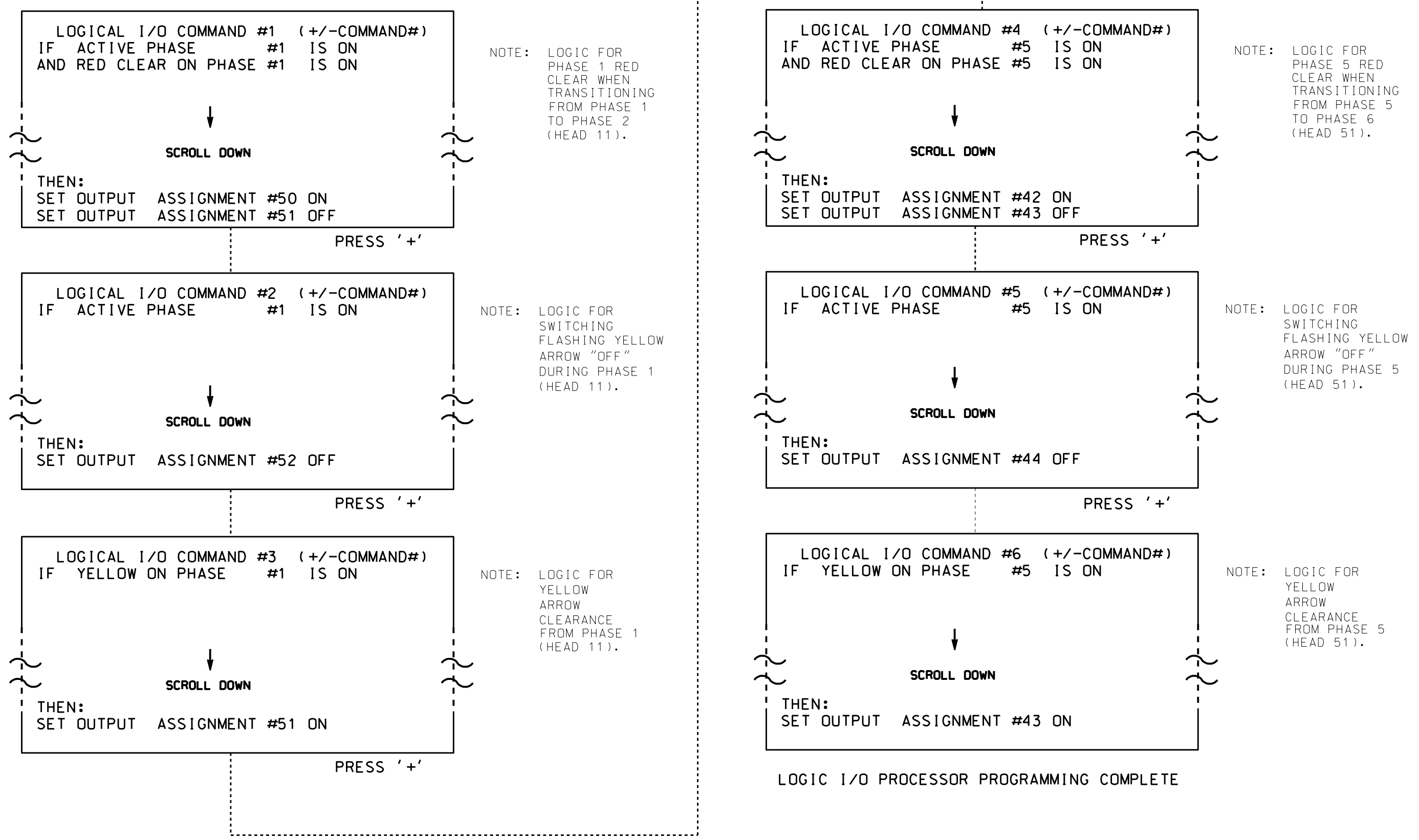
Temporary Design 2
 Electrical Detail - Sheet 1 of 5

| | | | |
|---|---|---|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County, Sanford | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL D. Todd Joyce 04/20/2022 |
| | Division 8 PLAN DATE: April 2022 PREPARED BY: Zarrar Zafar | REVIEWED BY: REVIEWED BY: REVISIONS INIT. DATE | |

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, 3, 4, 5 AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



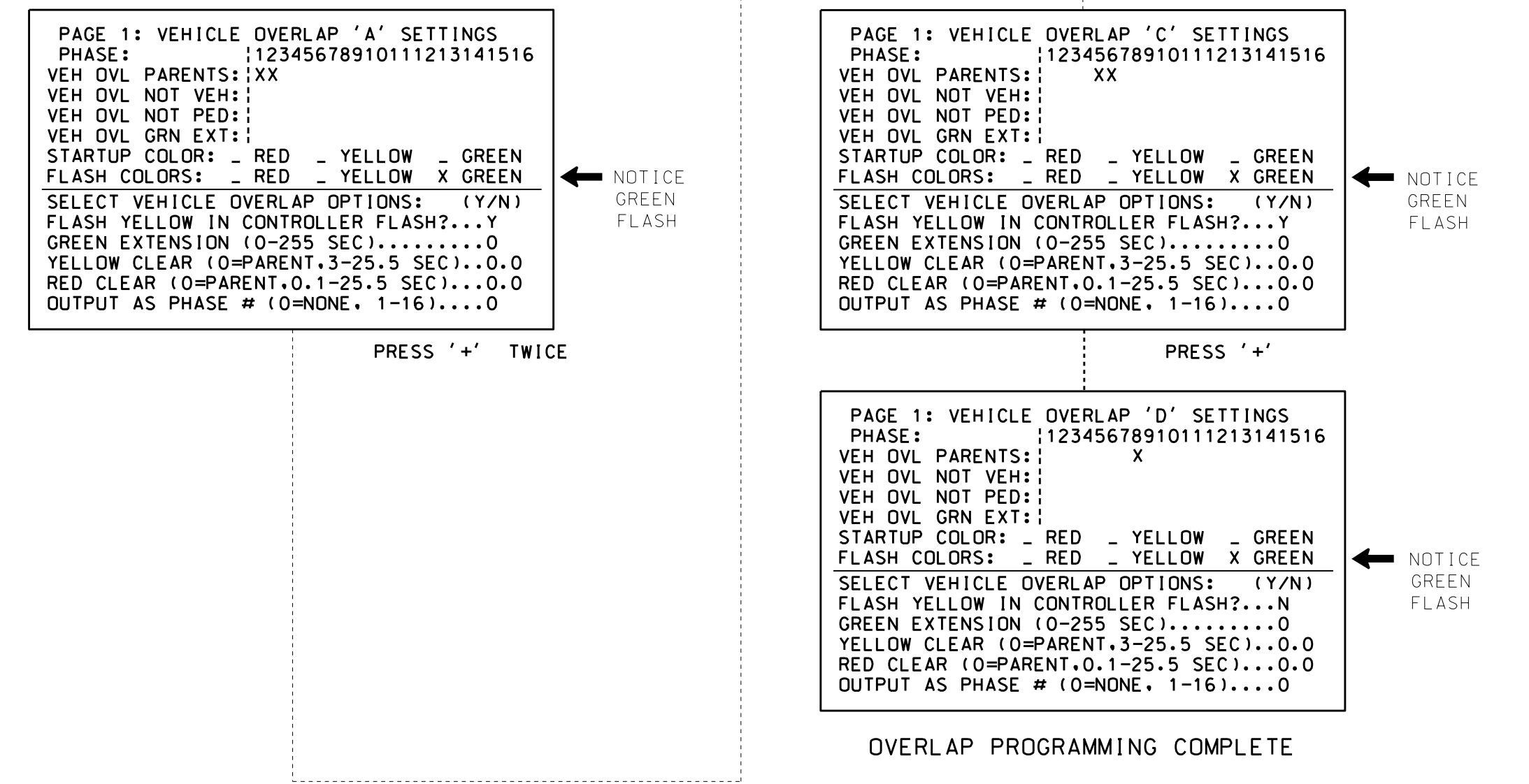
OUTPUT REFERENCE SCHEDULE

| |
|------------------------------|
| OUTPUT 42 = Overlap C Red |
| OUTPUT 43 = Overlap C Yellow |
| OUTPUT 44 = Overlap C Green |
| OUTPUT 50 = Overlap A Red |
| OUTPUT 51 = Overlap A Yellow |
| OUTPUT 52 = Overlap A Green |

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

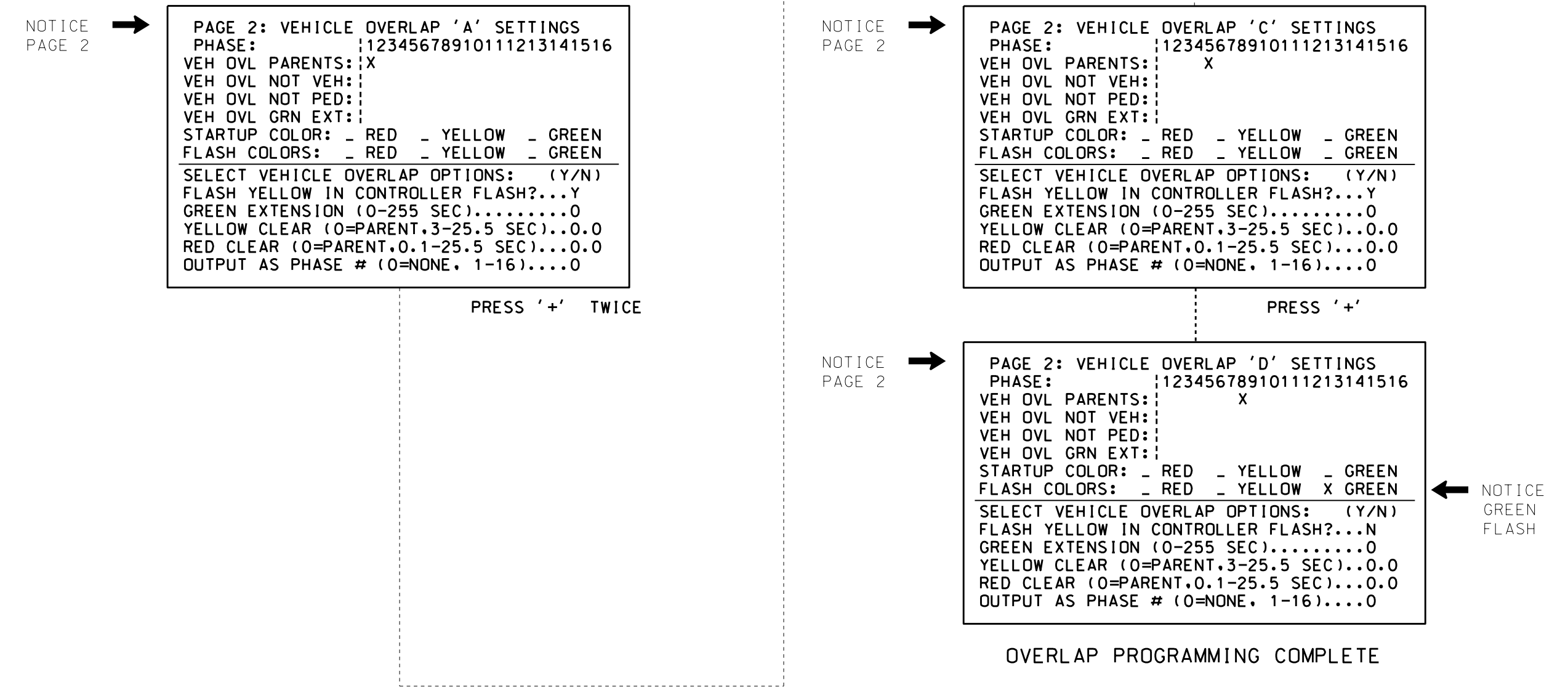
FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.



FLASHER CIRCUIT MODIFICATION DETAIL

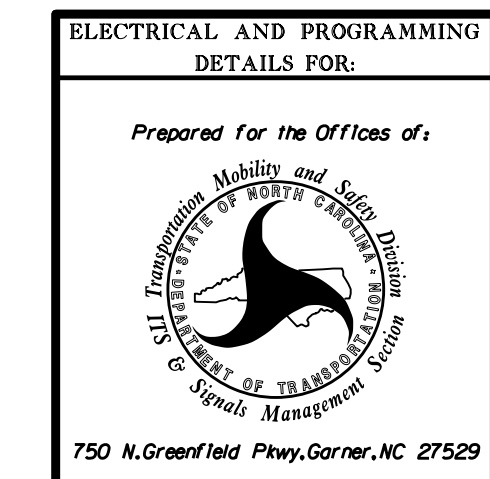
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- 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: 08-0236T2
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 2
Electrical Detail - Sheet 2 of 5



| | |
|---|--------------------|
| NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway | |
| Division 8 | Lee County Sanford |
| PLAN DATE: April 2022 | REVIEWED BY: |
| PREPARED BY: Zarrar Zafar | REVIEWED BY: |
| REVISIONS | INIT. DATE |
| | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NOTICE

SEAL 031001

ENGINEER ZARRAR ZAFAR

DocuSigned by: Zarrar Zafar 04/20/2022

SIG. INVENTORY NO. 08-0236T2

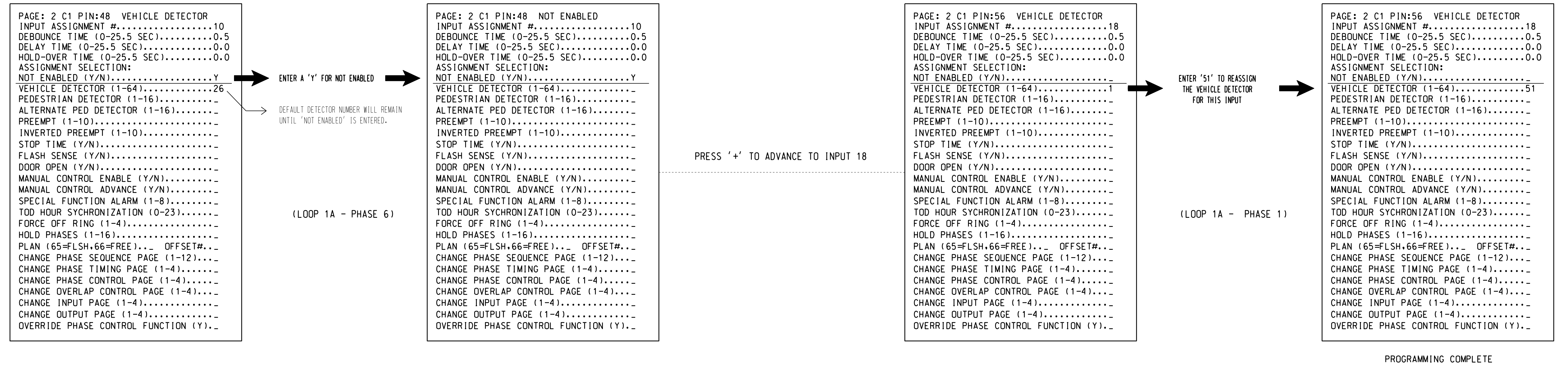
20-APR-2022 1:25Z
 S:\IT\SSU\115\Sig\08-0236T2\08-0236T2.dgn
 S:\IT\SSU\115\Sig\08-0236T2\08-0236T2.dgn
 S:\IT\SSU\115\Sig\08-0236T2\08-0236T2.dgn
 S:\IT\SSU\115\Sig\08-0236T2\08-0236T2.dgn

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

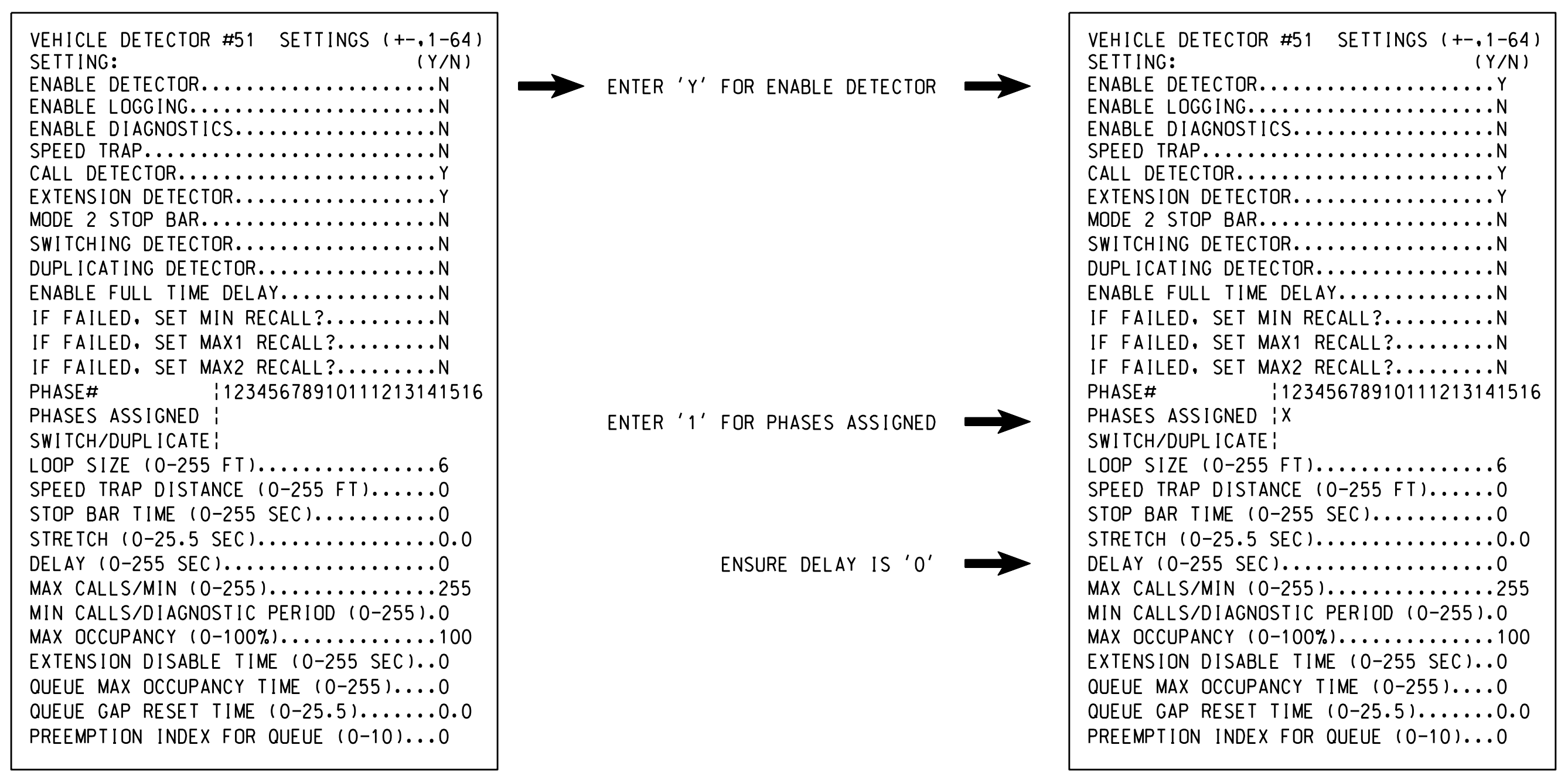
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T2
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

D:\Projects\2022\12-22\SIG\Signal\work\hgr\hgr\sig\Mar\2022\236_sml_e16_2022rmdde-12.dgn

Temporary Design 2
Electrical Detail - Sheet 3 of 5

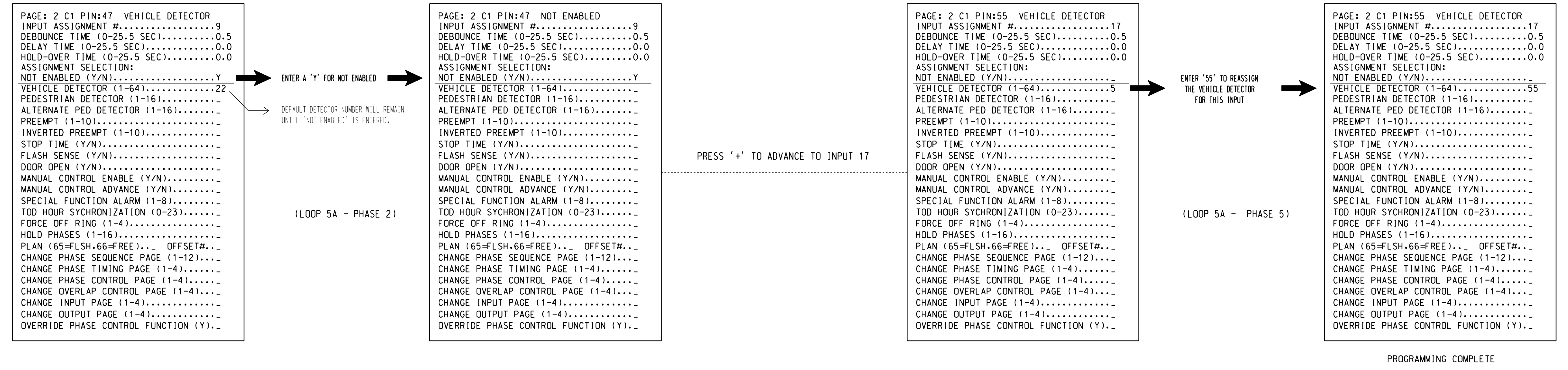
| | | | |
|---|--|---|---|
| <p>750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway</p> | | <p>SEAL STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER D. Todd Joyce 031001 04/20/2022</p> |
| | <p>Division 8 Lee County Sanford</p> | <p>PLAN DATE: April 2022 REVIEWED BY:</p> | |
| <p>REVISIONS</p> | | <p>INIT. DATE</p> | <p>SIG. INVENTORY NO. 08-0236T2</p> |

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

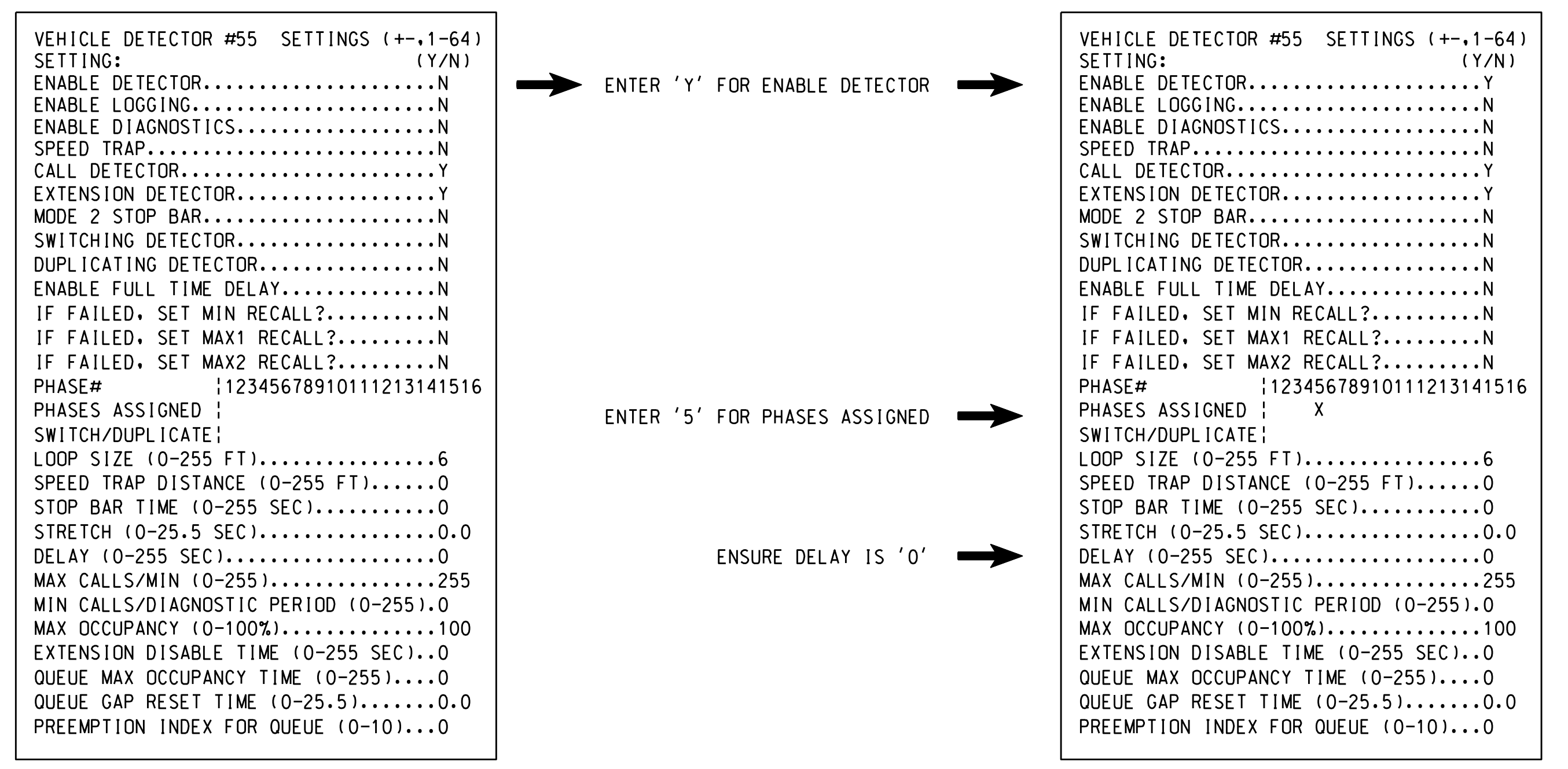
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T2
 DESIGNED: March 2022
 SEALED: 4/19/2022
 REVISED: N/A

Temporary Design 2
 Electrical Detail - Sheet 4 of 5

NC 42 (Main Street)
 at
 SR 1519 (Nash Street) /
 Tyson Foods Driveway

Division 8 Lee County Sanford

Prepared for the Offices of:
 G.L. Transportation, Mobility and Safety Division
 NORTH CAROLINA PROFESSIONAL ENGINEERS
 D. Todd Joyce
 04/20/2022

PLANNING AND PROGRAMMING DETAILS FOR:
 PLAN DATE: April 2022 REVIEWED BY:
 PREPARED BY: Zarrar Zafar REVIEWED BY:
 REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 08-0236T2

C:\Users\jz2014\OneDrive\Documents\Signal\work\housings\g_march\zafar\lane\080236_sigs\080236_sig_elec_2022\mde-12.dgn
 2/2/2022 12:53
 S:\IT\SSU\15_Signal\work\housings\g_march\zafar\lane\080236_sigs\080236_sig_elec_2022\mde-12.dgn

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

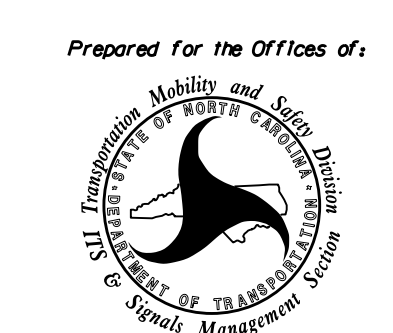
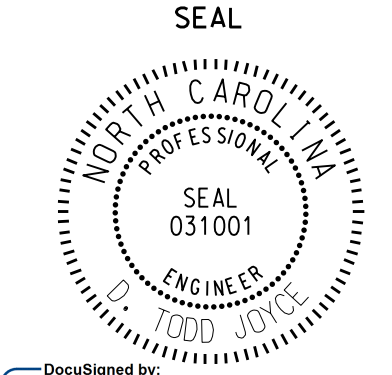
THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

- OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.
- INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

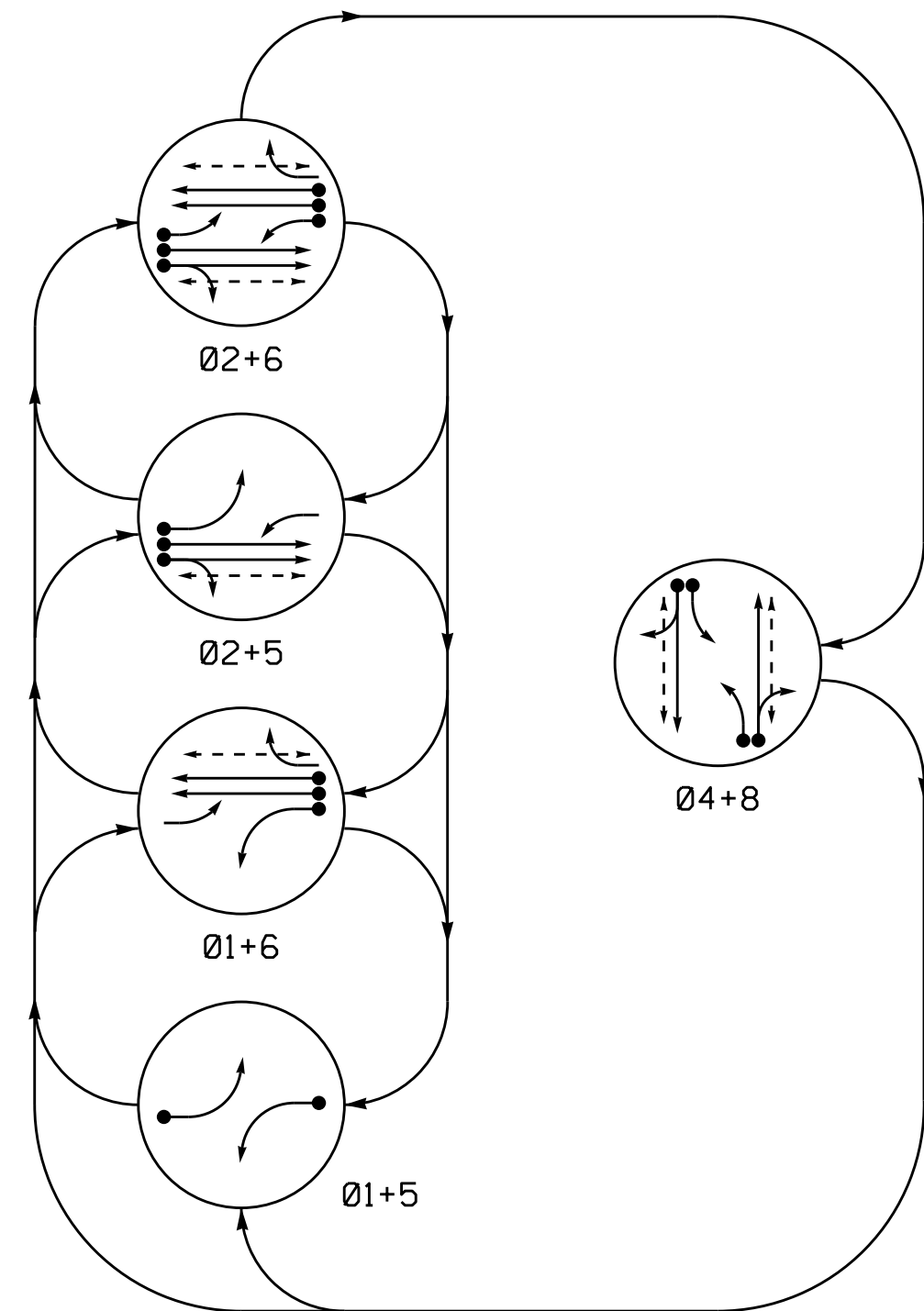
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236T2
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Temporary Design 2
Electrical Detail - Sheet 5 of 5

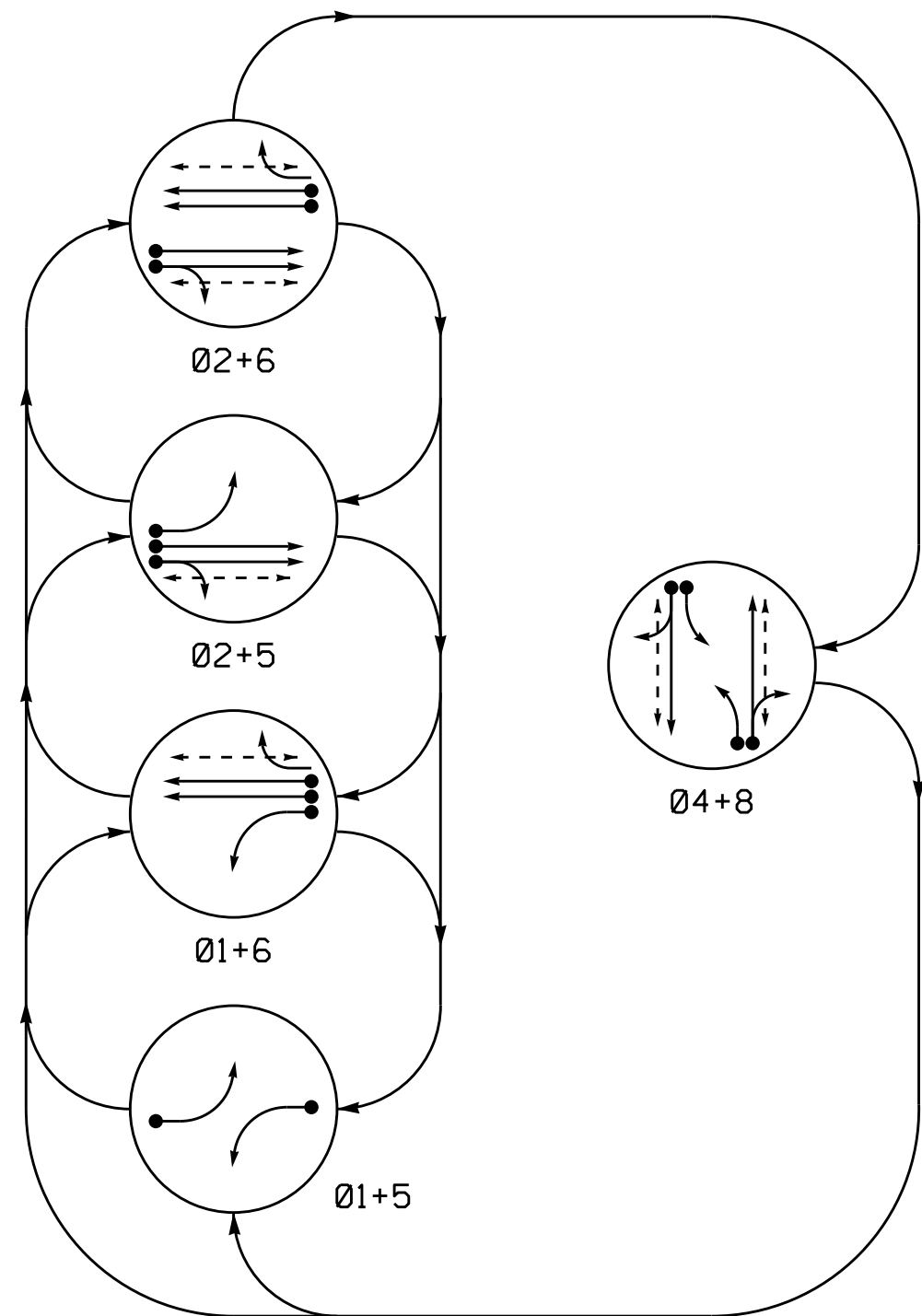
| | | |
|--|--|--|
| <p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>Prepared for the Offices of:</p>  <p>750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway</p> <p>Division 8 Lee County Sanford</p> <p>PLAN DATE: April 2022 REVIEWED BY:</p> <p>PREPARED BY: Zarrar Zafar REVIEWED BY:</p> <p>REVISIONS: _____ INIT. DATE</p> | <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p style="text-align: center;">SEAL</p>  <p>DocuSigned by: <i>D. Todd Joyce</i> 04/20/2022</p> <p>SIG. INVENTORY NO. 08-0236T2</p> |
|--|--|--|

08-0236-2022-12.dwg
 S:\IT\3830\15\SIGNAL\work\hous\sig\March\Zafar\plans\080236_sml_elec_2022\mde-12.dgn
 ZZZZ

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | FLASH |
|-------------|-------|------|------|------|------|-------|
| | 01+5 | 02+5 | 04+8 | 01+6 | 02+6 | |
| 11 | ← | ← | ← | ← | ← | Y |
| 21, 22 | R | R | G | G | R | Y |
| 41 | ← | ← | ← | ← | ← | Y |
| 42, 43 | R | R | R | R | G | R |
| 51 | ← | ← | ← | ← | ← | Y |
| 61, 62 | R | G | R | G | R | Y |
| 81 | ← | ← | ← | ← | ← | Y |
| 82, 83 | R | R | R | R | G | R |
| P21, P22 | DW | DW | W | W | DW | DRK |
| P41, P42 | DW | DW | DW | DW | W | DRK |
| P61, P62 | DW | W | DW | W | DW | DRK |
| P81, P82 | DW | DW | DW | W | DRK | |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | SYSTEM LOOP | NEW CARD | |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|-----------------|--------------|-------------|----------|------------|
| | | | | | PHASE | CALLING | EXTENSION | FULL TIME DELAY | STRETCH TIME | | | DELAY TIME |
| 1A | 6X40 | 0 | 2-4-2 | Y | 1 | Y | Y | - | - | ★15 | - | Y |
| 2A | 6X6 | 70 | 3 | Y | #6 | Y | Y | - | - | - | - | Y |
| 2B | 6X6 | 70 | 3 | Y | 2 | Y | Y | - | - | - | - | Y |
| 4A | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | 3 | - | Y |
| 4B | 6X40 | 0 | 2-4-2 | Y | 4 | Y | Y | - | - | 10 | - | Y |
| 5A | 6X40 | 0 | 2-4-2 | Y | 5 | Y | Y | - | - | ★15 | - | Y |
| 6A | 6X6 | 70 | 3 | Y | #2 | Y | Y | - | - | - | - | Y |
| 6B | 6X6 | 70 | 3 | Y | 6 | Y | Y | - | - | - | - | Y |
| 8A | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | 3 | - | Y |
| 8B | 6X40 | 0 | 2-4-2 | Y | 8 | Y | Y | - | - | 10 | - | Y |
| S1 | 6X6 | +220 | 3 | Y | - | - | - | - | - | - | - | Y |
| S2 | 6X6 | +220 | 3 | Y | - | - | - | - | - | - | - | Y |

★ Disable Delay during Alternate Phasing Operation.
Disable Phase(s) calling during Alternate Phasing Operation.

5 Phase Fully Actuated (US 421 - NC 87 (Sanford Byp) CLS) Signal System #: D08-23_Sanford

NOTES

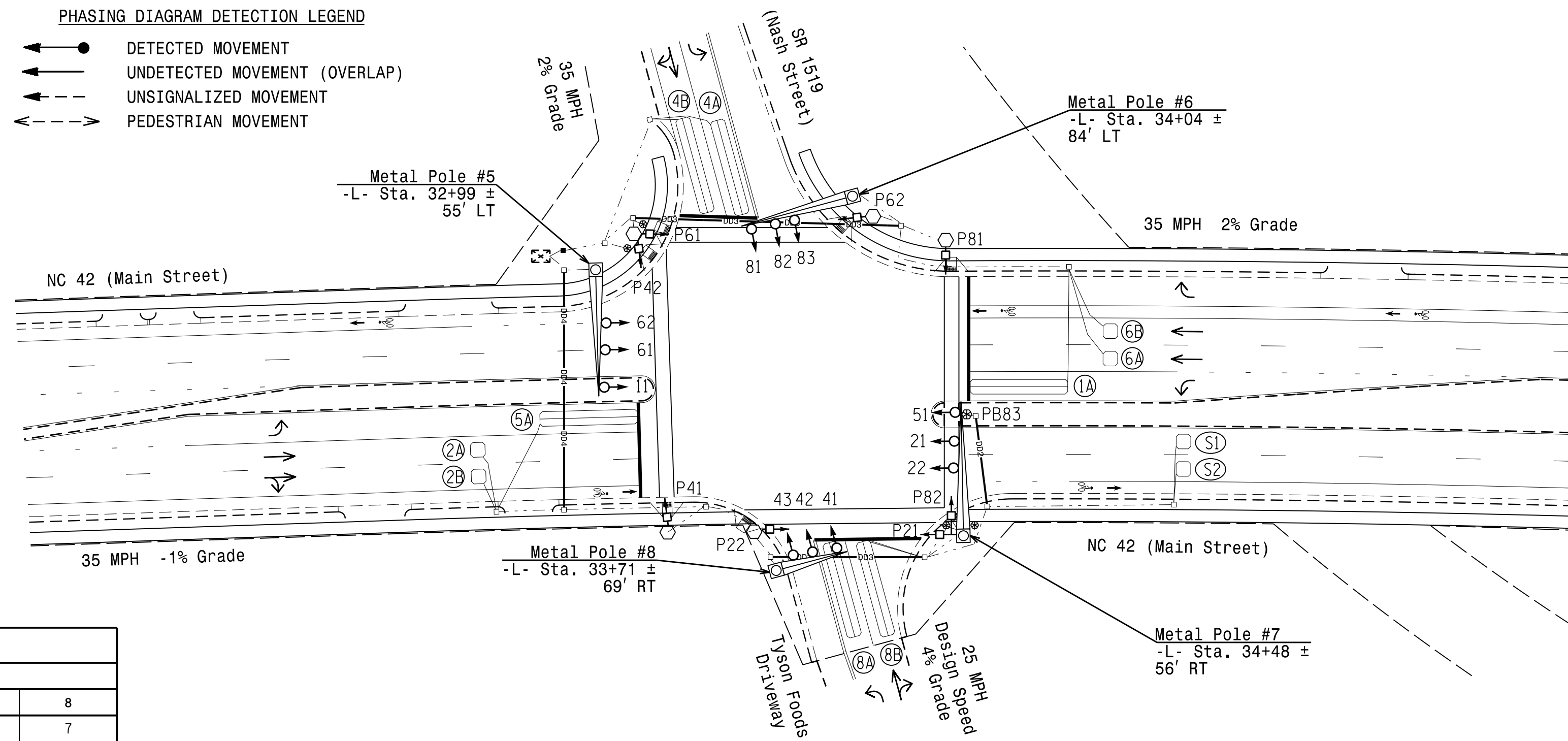
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 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 #: 0236.
- All signal heads shall be black in color with black visors.
- All metal poles and pedestals shall be black in color as specified in the project special provisions.

DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | | | FLASH |
|-------------|-------|------|------|------|------|-------|
| | 01+5 | 02+5 | 04+8 | 01+6 | 02+6 | |
| 11 | ← | ← | ← | ← | ← | Y |
| 21, 22 | R | R | G | G | R | Y |
| 41 | ← | ← | ← | ← | ← | Y |
| 42, 43 | R | R | R | R | G | R |
| 51 | ← | ← | ← | ← | ← | Y |
| 61, 62 | R | G | R | G | R | Y |
| 81 | ← | ← | ← | ← | ← | Y |
| 82, 83 | R | R | R | R | G | R |
| P21, P22 | DW | DW | W | W | DW | DRK |
| P41, P42 | DW | DW | DW | DW | W | DRK |
| P61, P62 | DW | W | DW | W | DW | DRK |
| P81, P82 | DW | DW | DW | W | DRK | |

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

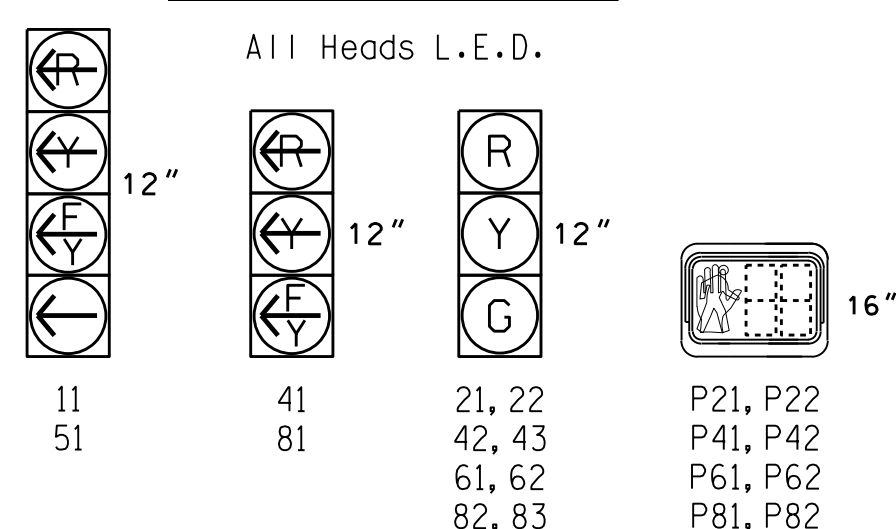
- | PROPOSED | EXISTING |
|-----------------------------------|----------|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ○ → Pedestrian Signal Head | ○ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| ○ → Inductive Loop Detector | ○ → N/A |
| ○ → Controller & Cabinet | ○ → N/A |
| ○ → Junction Box | ○ → N/A |
| ○ → 2-in Underground Conduit | ○ → N/A |
| ○ → Right of Way | ○ → N/A |
| ○ → Directional Arrow | ○ → N/A |
| ○ → Directional Drill | ○ → N/A |
| ○ → Curb Ramp | ○ → N/A |
| ○ → Type I Pushbutton Post | ○ → N/A |
| ○ → Type II Signal Pedestal | ○ → N/A |

OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | | | |
|------------------------|-------|------------|-----|-----|------------|-----|
| | 1 | 2 | 4 | 5 | 6 | 8 |
| Min Green 1* | 7 | 10 | 7 | 7 | 10 | 7 |
| Extension 1 | 2.0 | 3.0 | 2.0 | 2.0 | 3.0 | 2.0 |
| Max Green 1* | 25 | 60 | 35 | 25 | 60 | 35 |
| Yellow Clearance | 3.0 | 3.9 | 3.7 | 3.0 | 3.9 | 3.7 |
| Red Clearance | 3.1 | 2.5 | 3.3 | 3.2 | 2.5 | 3.3 |
| Red Revert | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Walk 1* | - | 7 | 7 | - | 7 | 7 |
| Don't Walk 1 | - | 19 | 25 | - | 16 | 25 |
| Dynamic Max 3 | - | - | 55 | - | - | 55 |
| Dynamic Max Adjust | - | - | 10 | - | - | 10 |
| Time Before Reduction* | - | - | - | - | - | - |
| Time To Reduce* | - | - | - | - | - | - |
| Minimum Gap | - | - | - | - | - | - |
| Recall Mode | - | MIN RECALL | - | - | MIN RECALL | - |
| Vehicle Call Memory | - | YELLOW | - | - | YELLOW | - |
| Dual Entry | - | - | ON | - | - | ON |
| Simultaneous Gap | ON | ON | ON | ON | ON | 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 FACE I.D.



Signal Upgrade - Final Design

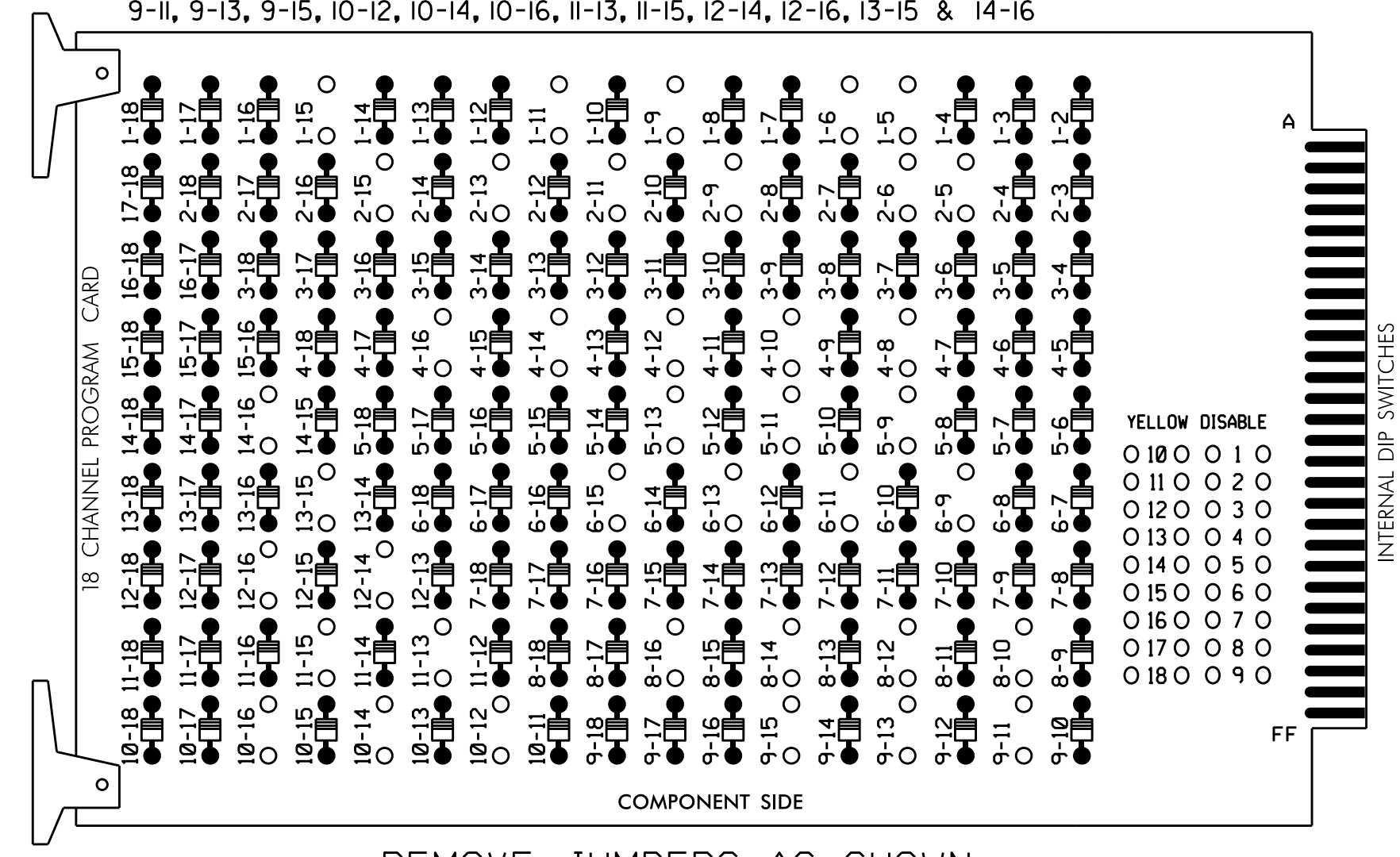
Prepared in the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27526
 SCALE: 0 40 1"=40'
 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway
 Division 8 Lee County Sanford
 PLAN DATE: March 2022 REVIEWED BY:
 PREPARED BY: J.A. Lohr REVIEWED BY:
 REVISIONS: INIT. DATE
 SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. LITTE
 SEAL: 026486
 DATE: 04/19/2022
 SIG. INVENTORY NO. 08-0236

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15 & 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.

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 4 and 8 for Dynamic Max/Max 3.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2, 4, 6, and 8 for Startup Ped Call.
7. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
8. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
9. The cabinet and controller are part of Signal System #:10823

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,S6,S7,S8,S9,S11,S12,
 AUXS1,AUXS2,AUX S4,AUXS5
 PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,8,8PED
 OVERLAP "A".....1+2
 OVERLAP "B".....4
 OVERLAP "C".....5+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 | 21,22 | P21, P22 | NU | 42,43 | P41, P42 | 51 | 61,62 | P61, P62 | NU | 82,83 | P81, P82 | 11 | 81 | NU | 51 | 41 | NU |
| RED | | 128 | | | 101 | | | 134 | | | 107 | | | | | | | |
| YELLOW | * | 129 | | | 102 | | * | 135 | | | 108 | | | | | | | |
| GREEN | | 130 | | | 103 | | | 136 | | | 109 | | | | | | | |
| RED ARROW | | | | | | | | | | | | | | A121 | A124 | | A114 | A101 |
| YELLOW ARROW | | | | | | | | | | | | | | A122 | A125 | | A115 | A102 |
| FLASHING YELLOW ARROW | | | | | | | | | | | | | | A123 | A126 | | A116 | A103 |
| GREEN ARROW | 127 | | | | | | | 133 | | | | | | | | | | |
| Hand icon | | | 113 | | | 104 | | | 119 | | | 110 | | | | | | |
| Person icon | | | | | | 106 | | | | | | | | | | | | |

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

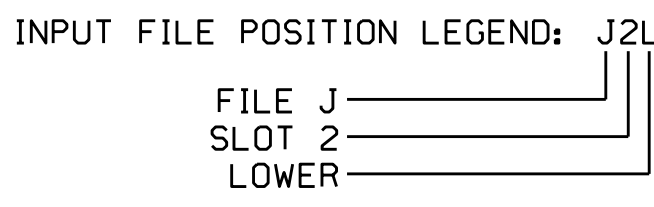
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 * Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

| LOOP NO. | LOOP TERMINAL | INPUT FILE POS. | PIN NO. | INPUT ASSIGNMENT NO. | DETECTOR NO. | NEMA PHASE | CALL | EXTEND | FULL TIME DELAY | STRETCH TIME | DELAY TIME |
|------------------|---------------|-----------------|---------|----------------------|--------------|------------|------|--------|-----------------|--------------|------------|
| 1A ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10 | 26 | 6 | Y | Y | | | |
| | - | I1U | 56 | 18 | 51 | 1 | Y | Y | | | |
| 2A | TB2-5,6 | I2U | 39 | 1 | 2 | Y | Y | | | | |
| 2B | TB2-7,8 | I2L | 43 | 5 | 12 | 2 | Y | Y | | | |
| 4A | TB4-9,10 | I6U | 41 | 3 | 4 | 4 | Y | Y | | | 3 |
| 4B | TB4-11,12 | I6L | 45 | 7 | 14 | 4 | Y | Y | | | 10 |
| 5A ² | TB3-1,2 | J1U | 55 | 17 | 5 | 5 | Y | Y | | | 15 |
| | - | I4U | 47 | 9 | 22 | 2 | Y | Y | | | |
| | - | J1U | 55 | 17 | 55 | 5 | Y | Y | | | |
| 6A | TB3-5,6 | J2U | 40 | 2 | 6 | 6 | Y | Y | | | |
| 6B | TB3-7,8 | J2L | 44 | 6 | 16 | 6 | Y | Y | | | |
| 8A | TB5-9,10 | J6U | 42 | 4 | 8 | 8 | Y | Y | | | 3 |
| 8B | TB5-11,12 | J6L | 46 | 8 | 18 | 8 | Y | Y | | | 10 |
| * S1 | TB6-9,10 | I9U | 60 | 22 | 11 | SYS | | | | | |
| * S2 | TB6-11,12 | I9L | 62 | 24 | 13 | SYS | | | | | |
| PED PUSH BUTTONS | | | | | | | | | | | |
| P21,P22 | TB8-4,6 | I12U | 67 | 29 | 2 | 2 PED | | | | | |
| P41,P42 | TB8-5,6 | I12L | 69 | 31 | 4 | 4 PED | | | | | |
| P61,P62 | TB8-7,9 | I13U | 68 | 30 | 6 | 6 PED | | | | | |
| P81,P82 | TB8-8,9 | I13L | 70 | 32 | 8 | 8 PED | | | | | |

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

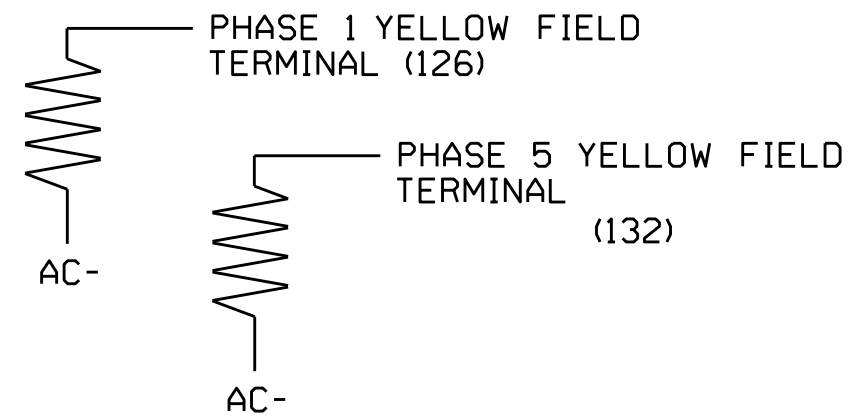
- ¹Add jumper from I1-W to J4-W, on rear of input file.
²Add jumper from J1-W to I4-W, on rear of input file.
 * See Input Page Assignment programming details on sheets 3 and 4.
 * System detector only. Remove the vehicle phase assigned to this detector in the default programming.



LOAD RESISTOR INSTALLATION DETAIL

(install resistors 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: 08-0236
 DESIGNED: March 2022
 SEALED: 4/19/2022
 REVISED: N/A

Electrical Detail - Sheet 1 of 5

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

NC 42 (Main Street)
 at
 SR 1519 (Nash Street) /
 Tyson Foods Driveway
 Lee County Sanford

Division 8

PLAN DATE: April 2022 REVIEWED BY:

PREPARED BY: Zarrar Zafar REVIEWED BY:

REVISIONS INIT. DATE

Disseminated by: D. Todd Joyce 04/20/2022

SIG. INVENTORY NO. 08-0236

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL 031001

ENGINEER D. TODD JOYCE

DATE 04/20/2022

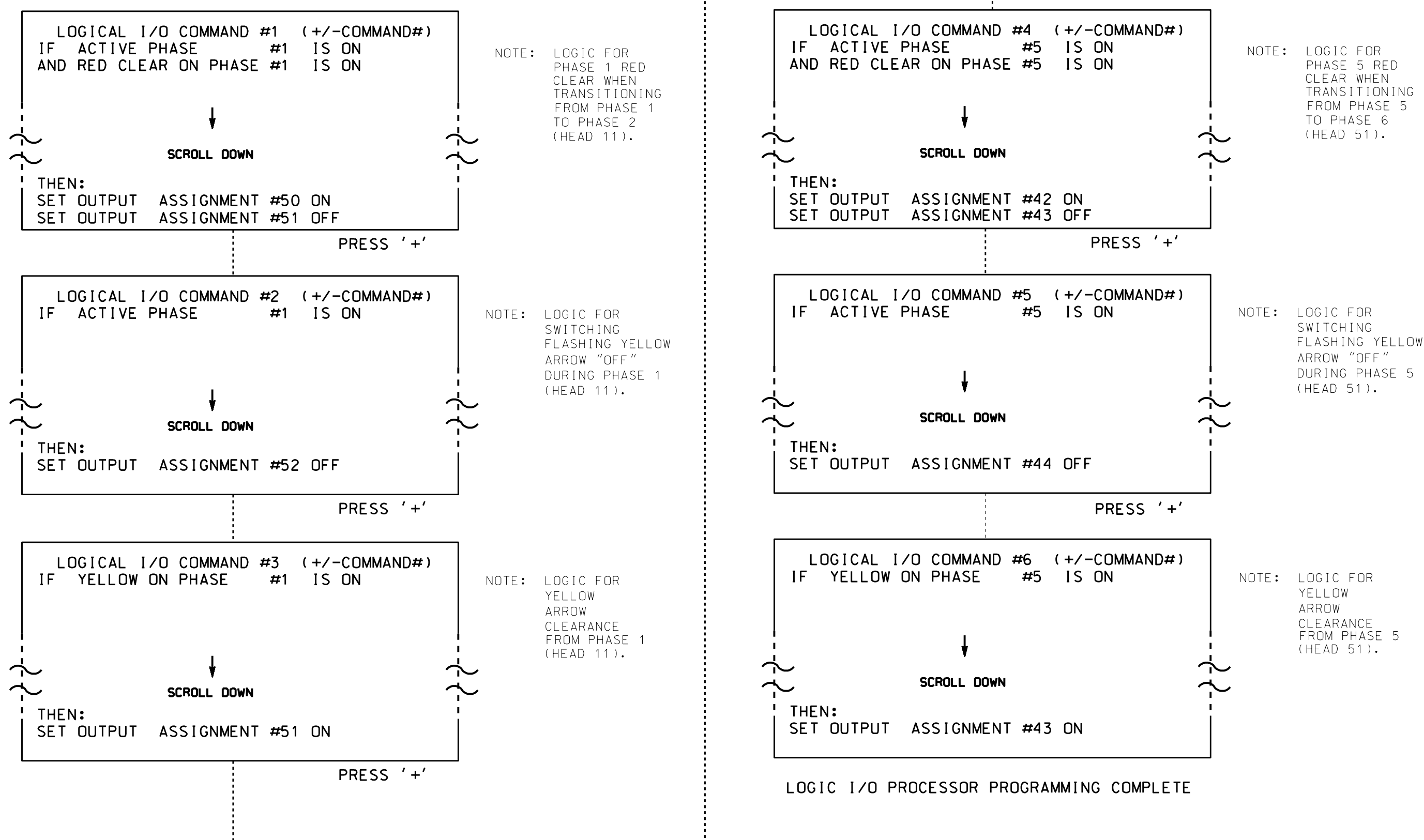
SIG. INVENTORY NO. 08-0236

20-0826-2022 12:58
 S:\MT\SASU\TIS\SIGNAL\work\hous5\g_march\zafar\lans\080236_sig_elec_2022mdds.dgn
 ZZZZ

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, 3, 4, 5 AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



| OUTPUT REFERENCE SCHEDULE | |
|---------------------------|------------------|
| OUTPUT 42 = | Overlap C Red |
| OUTPUT 43 = | Overlap C Yellow |
| OUTPUT 44 = | Overlap C Green |
| OUTPUT 50 = | Overlap A Red |
| OUTPUT 51 = | Overlap A Yellow |
| OUTPUT 52 = | Overlap A Green |

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.

FLASHER CIRCUIT MODIFICATION DETAIL

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

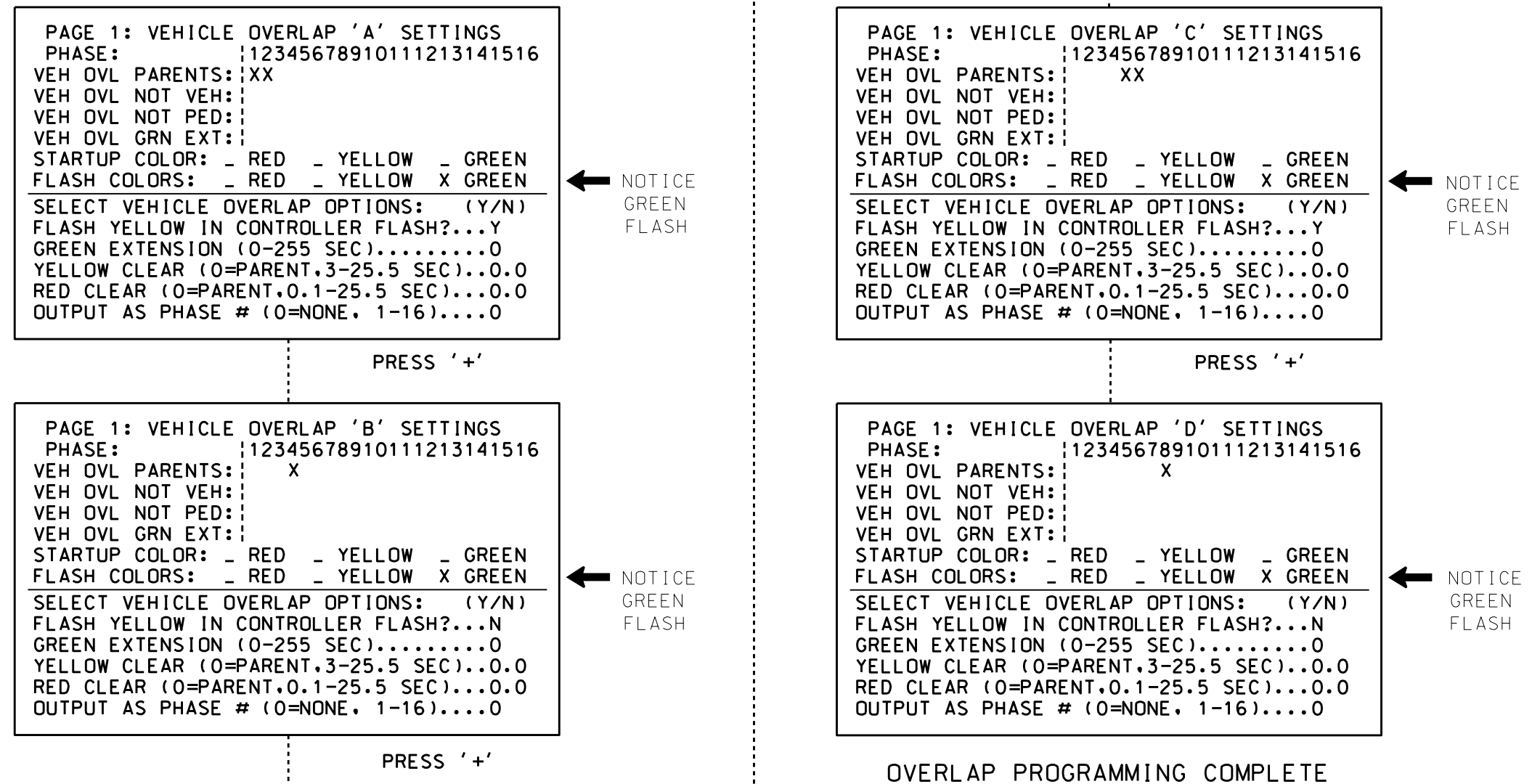
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

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

OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

(program controller as shown below)

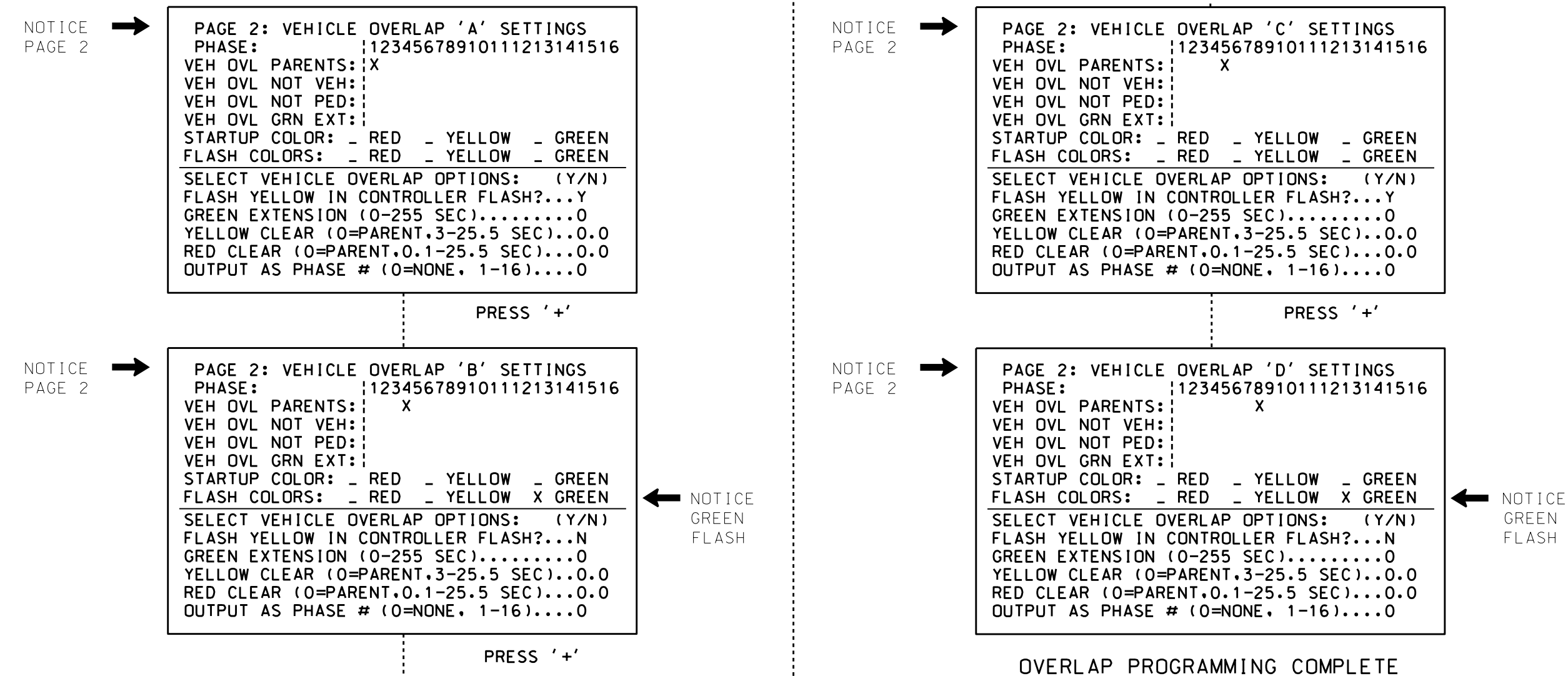
FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

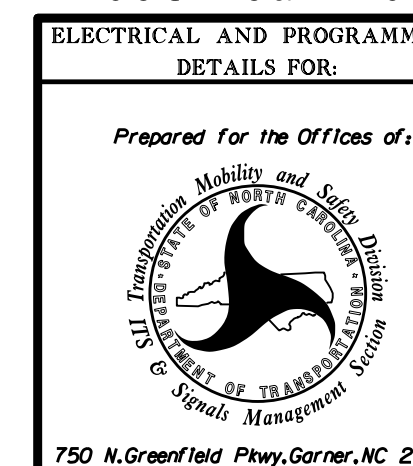
(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.



Electrical Detail - Sheet 2 of 5

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A



| |
|---|
| PLANNED FOR THE OFFICES OF: Electrical and Programming Details For: NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County, Sanford |
| PLAN DATE: April 2022 REVIEWED BY: |
| PREPARED BY: Zarrar Zafar REVIEWED BY: |
| REVISIONS |
| INIT. DATE |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

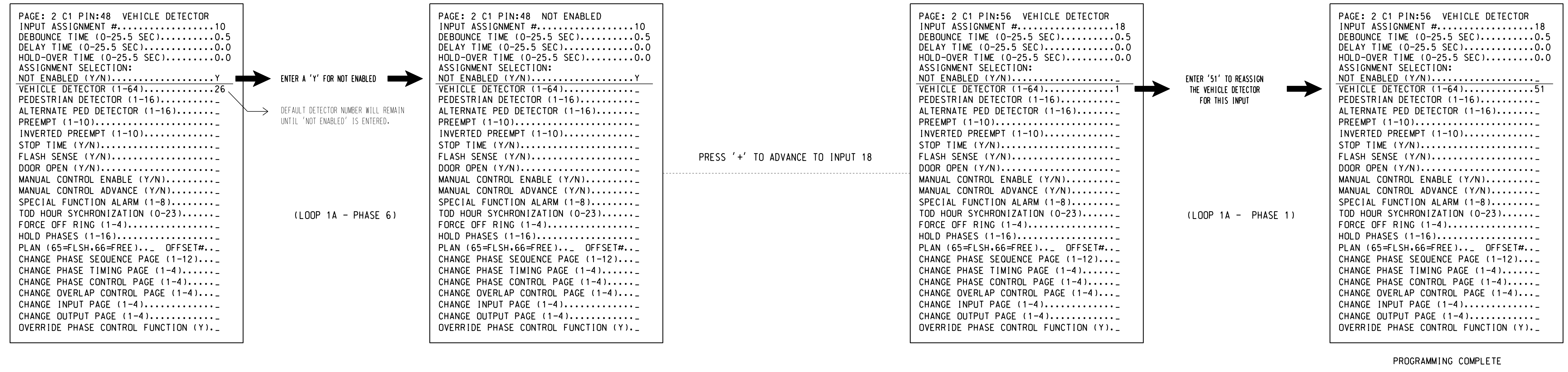
| |
|---|
| SEAL D. Todd Joyce 04/20/2022 SIC. INVENTORY NO. 08-0236 |
|---|

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

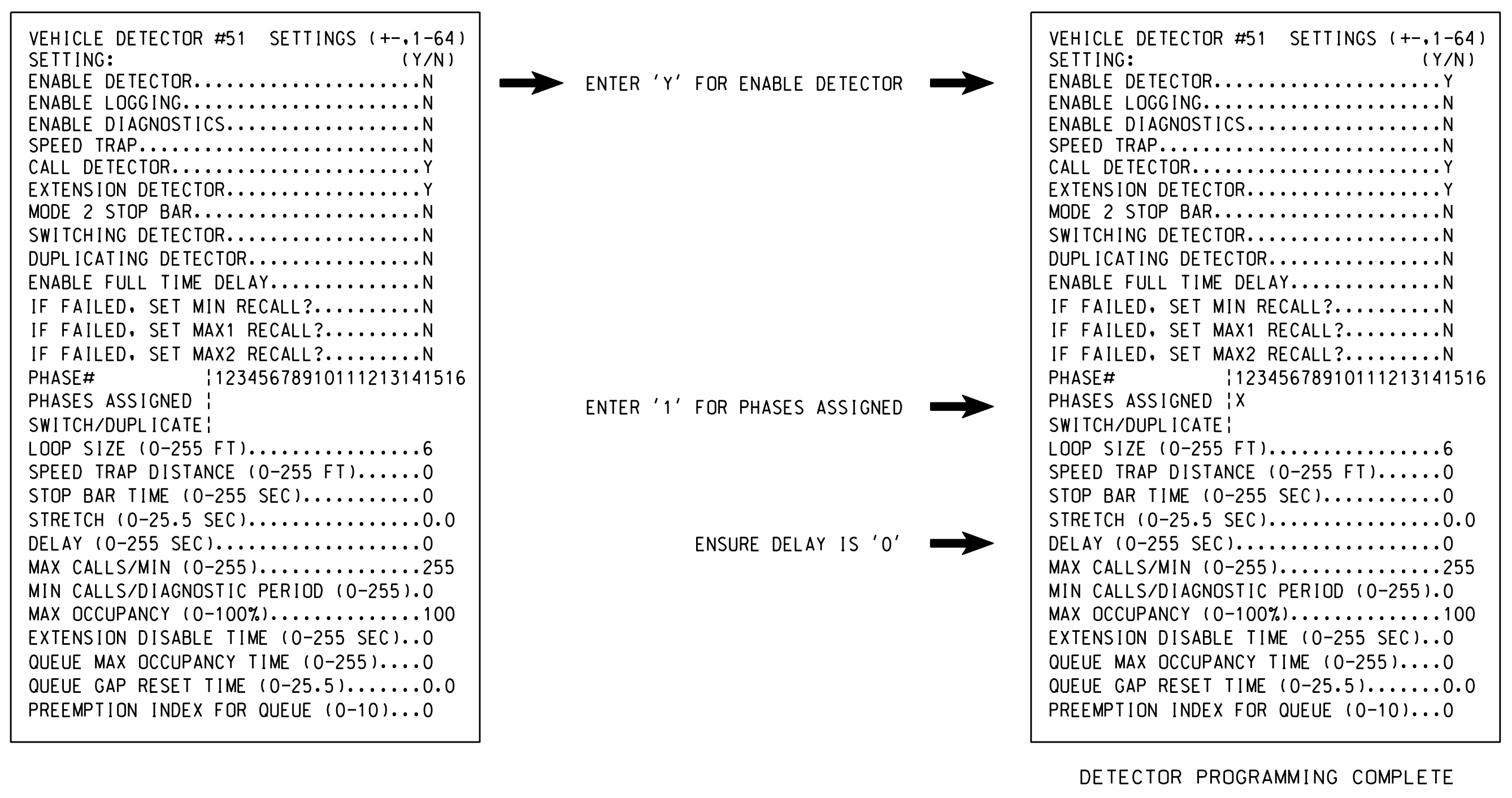
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236
 DESIGNED: March 2022
 SEALED: 4/19/2022
 REVISED: N/A

Electrical Detail - Sheet 3 of 5

NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway

Division 8 Lee County Sanford

PLAN DATE: April 2022 REVIEWED BY: Zarrar Zafar

PREPARED BY: Zarrar Zafar

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: D. Todd Joyce, Professional Engineer, License No. 031001

DocuSigned by: D. Todd Joyce 04/20/2022

SIG. INVENTORY NO. 08-0236

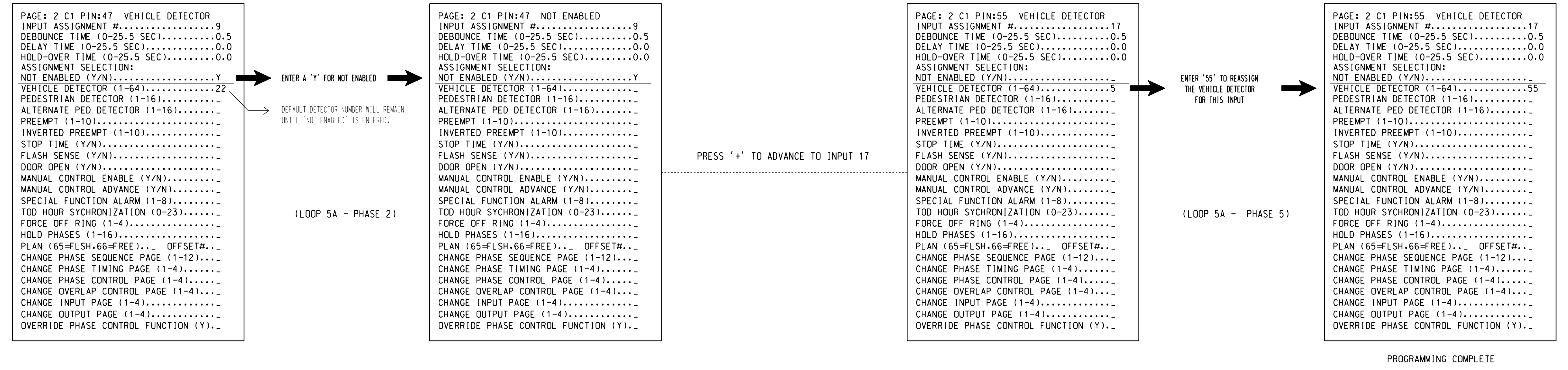
20-0498-2022 1:2:10
 W:\0236-36-36-01-2022\mde-09p
 z2210r

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 5A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #9 (DETECTOR 22) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 2 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 55 TO INPUT #17 SO THAT THE DELAY ON LOOP 5A CAN BE REDUCED FROM 15 SECONDS TO 0 SECONDS.

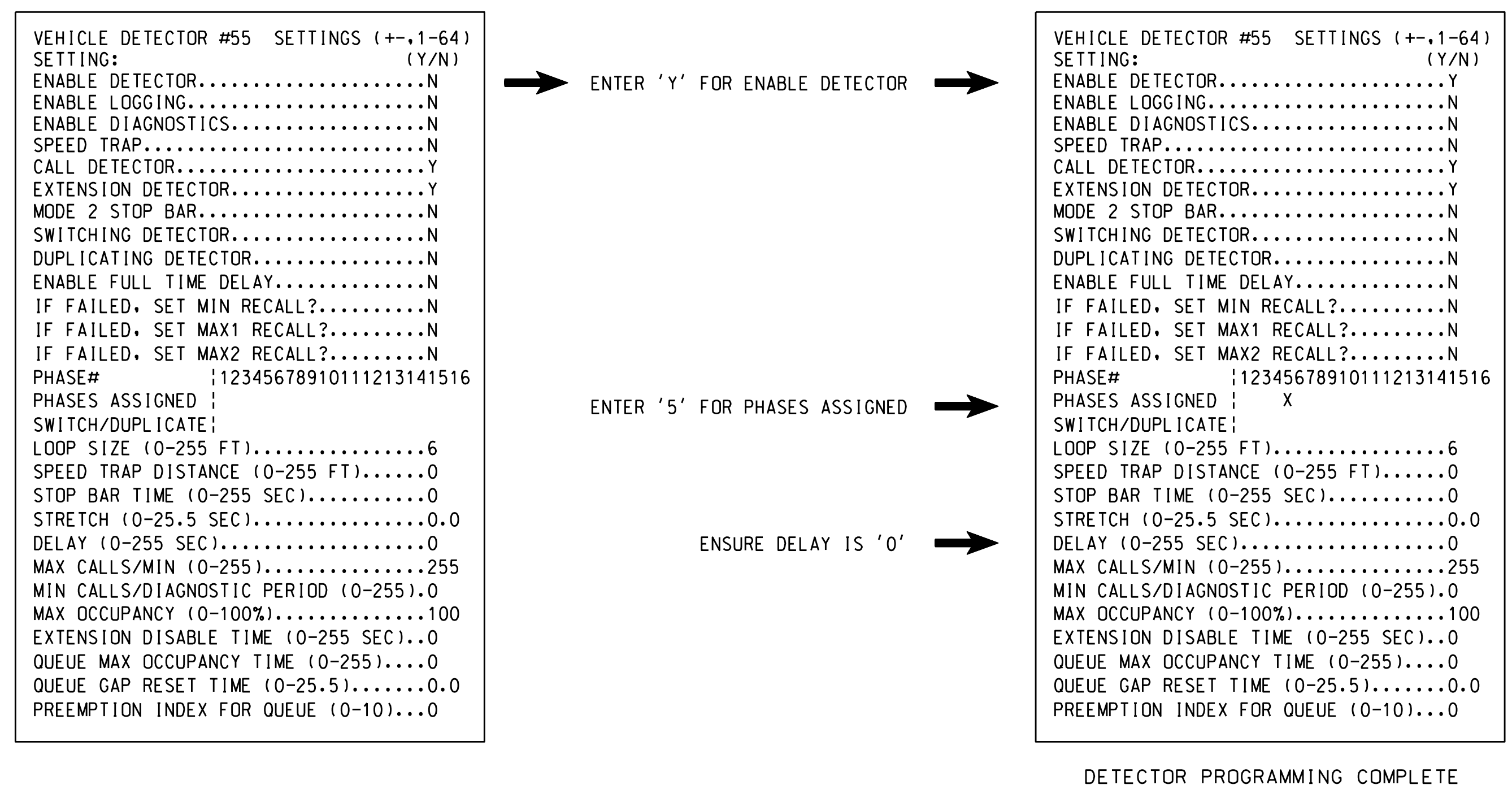
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 9 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 5A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #55.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0236
DESIGNED: March 2022
SEALED: 4/19/2022
REVISED: N/A

Electrical Detail - Sheet 4 of 5

NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway

Division 8 Lee County Sanford

PLAN DATE: April 2022 REVIEWED BY: Zarrar Zafar

PREPARED BY: Zarrar Zafar

750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL: D. Todd Joyce, Professional Engineer, License No. 031001

DATE: 04/20/2022

SIG. INVENTORY NO. 08-0236

20-Apr-2022 1:21:31
W:\0236-08-Sig-016-2022\mde-01p
ZZZ

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

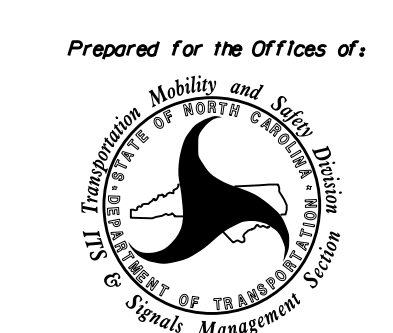
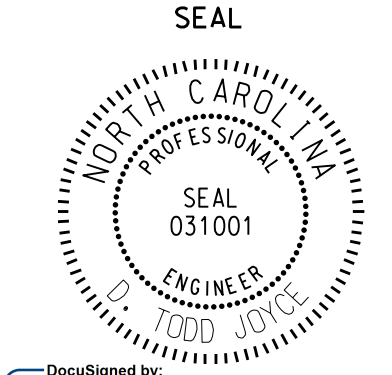
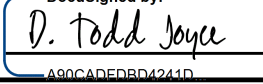
THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAPS PAGE 2: Modifies overlap parent phases for heads 11 and 51 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

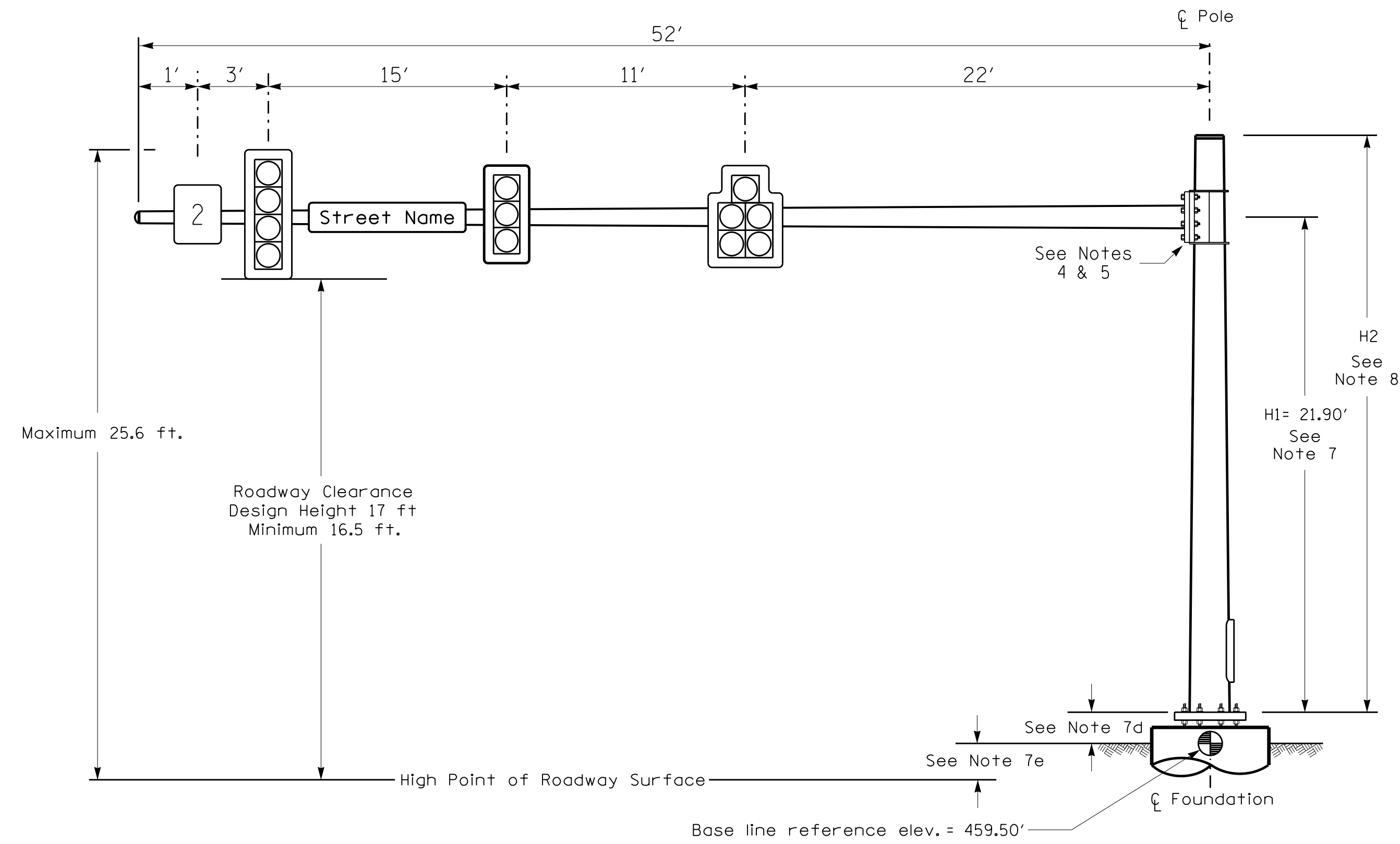
Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 08-0236
 DESIGNED: March 2022
 SEALED: 4/19/2022
 REVISED: N/A

| | | |
|---|--|--|
| Electrical Detail - Sheet 5 of 5 | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED |
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County Sanford | SEAL  ENGINEER D. TODD JOYCE |
| PLAN DATE: April 2022 REVIEWED BY: PREPARED BY: Zarrar Zafar REVIEWED BY: | | DocuSigned by:  04/20/2022 DATE |
| REVISIONS INIT. DATE | | SIG. INVENTORY NO. 08-0236 |

20-Apr-2022 12:12
 W:\0236-Sig.mxd-2022mmdd.dgn
 ZZZ

Design Loading for METAL POLE NO. 5

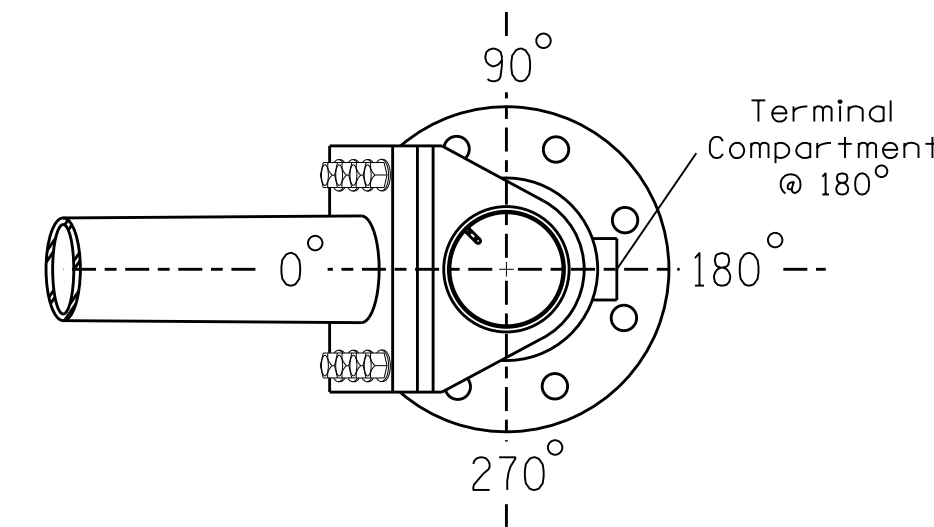


Elevation View

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.

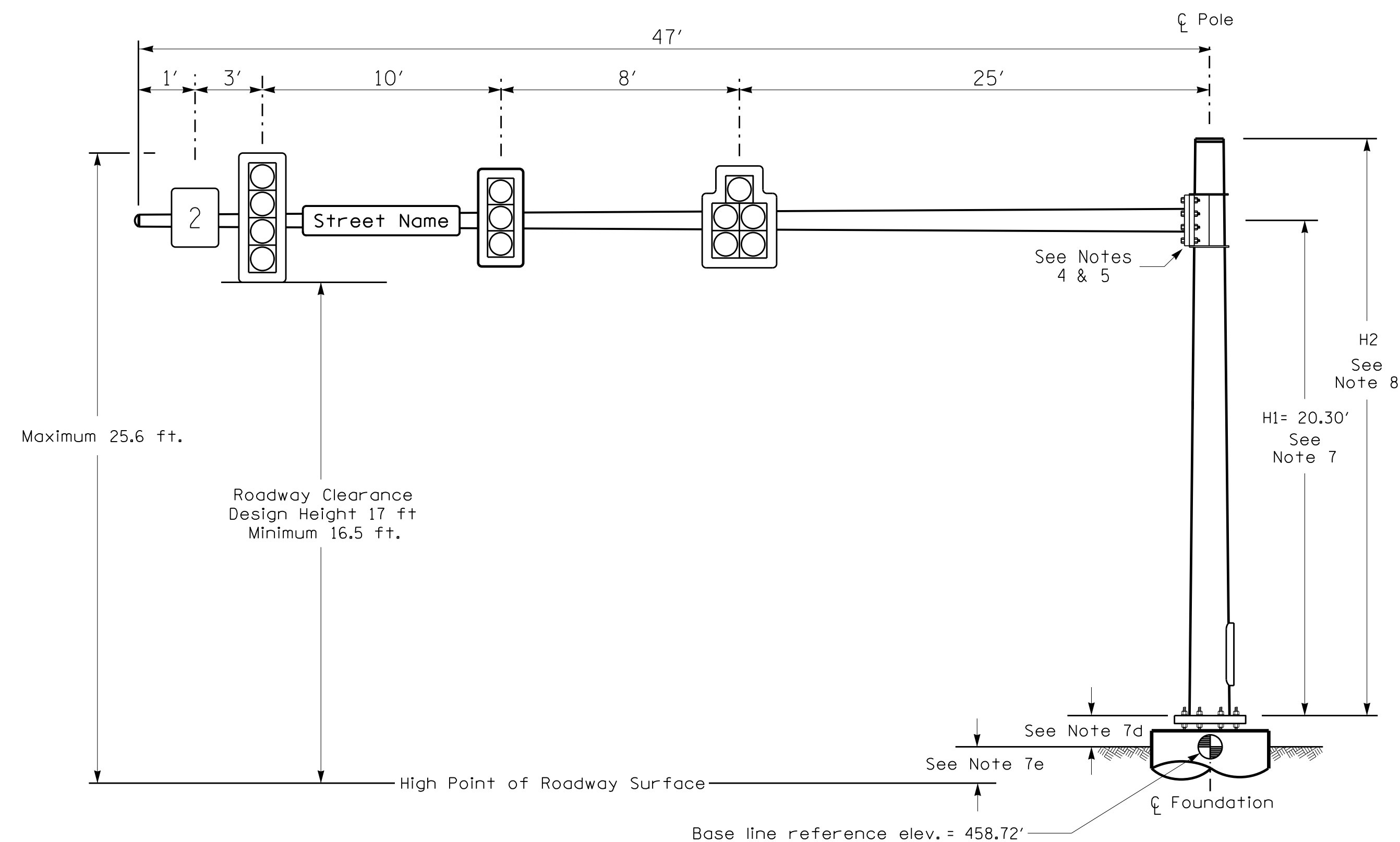
Elevation Data for Mast Arm Attachment (H1)

| Elevation Differences for: | Pole 5 | Pole 6 |
|---|------------|------------|
| Baseline reference point at ζ Foundation @ ground level | 459.50 ft. | 458.72 ft. |
| Elevation difference at High point of roadway surface | +2.86 ft. | +1.24 ft. |
| Elevation difference at Edge of travelway or face of curb | +/-0.0 ft. | +/-0.0 ft. |

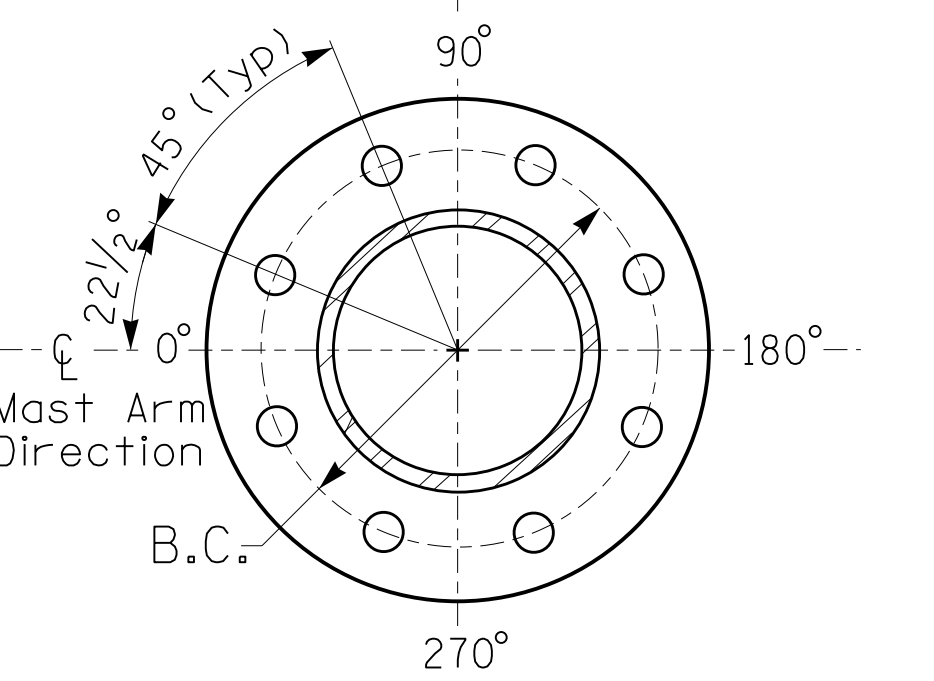


POLE RADIAL ORIENTATION

Design Loading for METAL POLE NO. 6

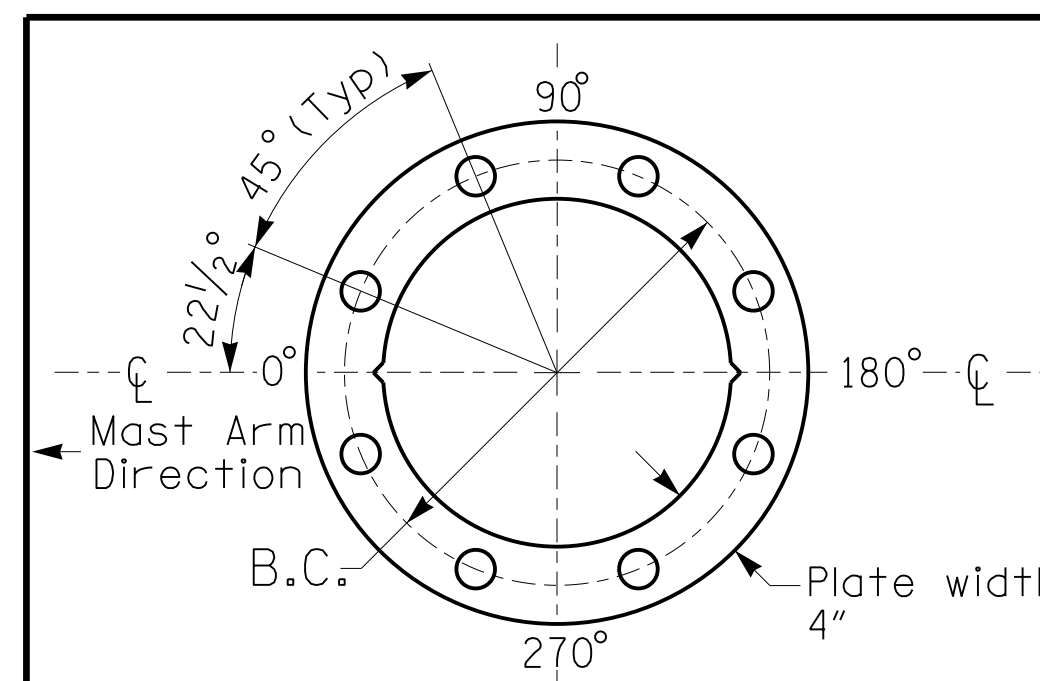


Elevation View



8 BOLT BASE PLATE DETAIL

See Note 6



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

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 |
| | RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE | 9.3 S.F. | 25.5" W X 52.5" L | 60 LBS |
| | RIGID MOUNTED SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE | 16.3 S.F. | 42.0" W X 56.0" L | 103 LBS |
| | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |
| | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 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 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2018 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

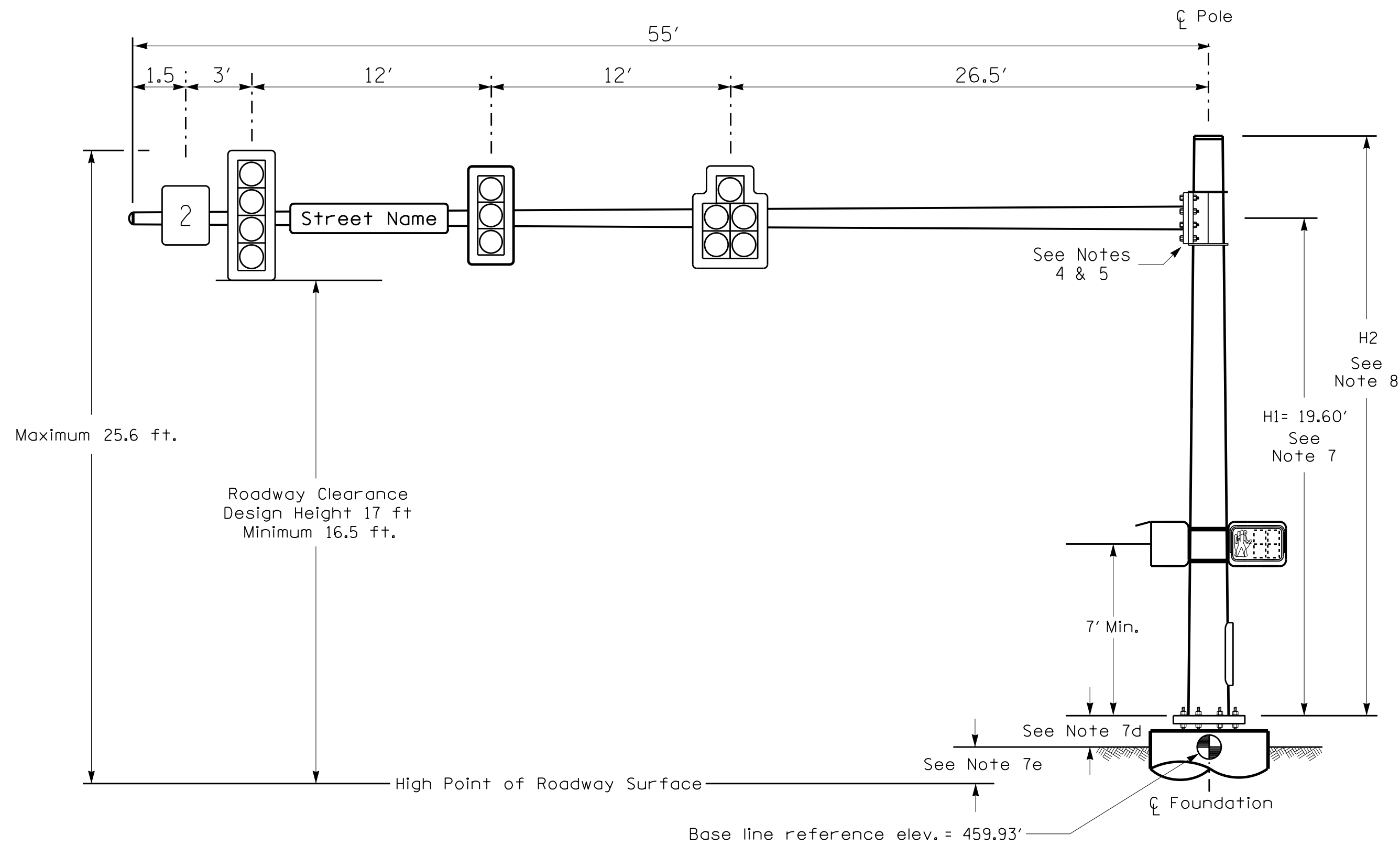
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the 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.
- 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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 4 (90 mph)

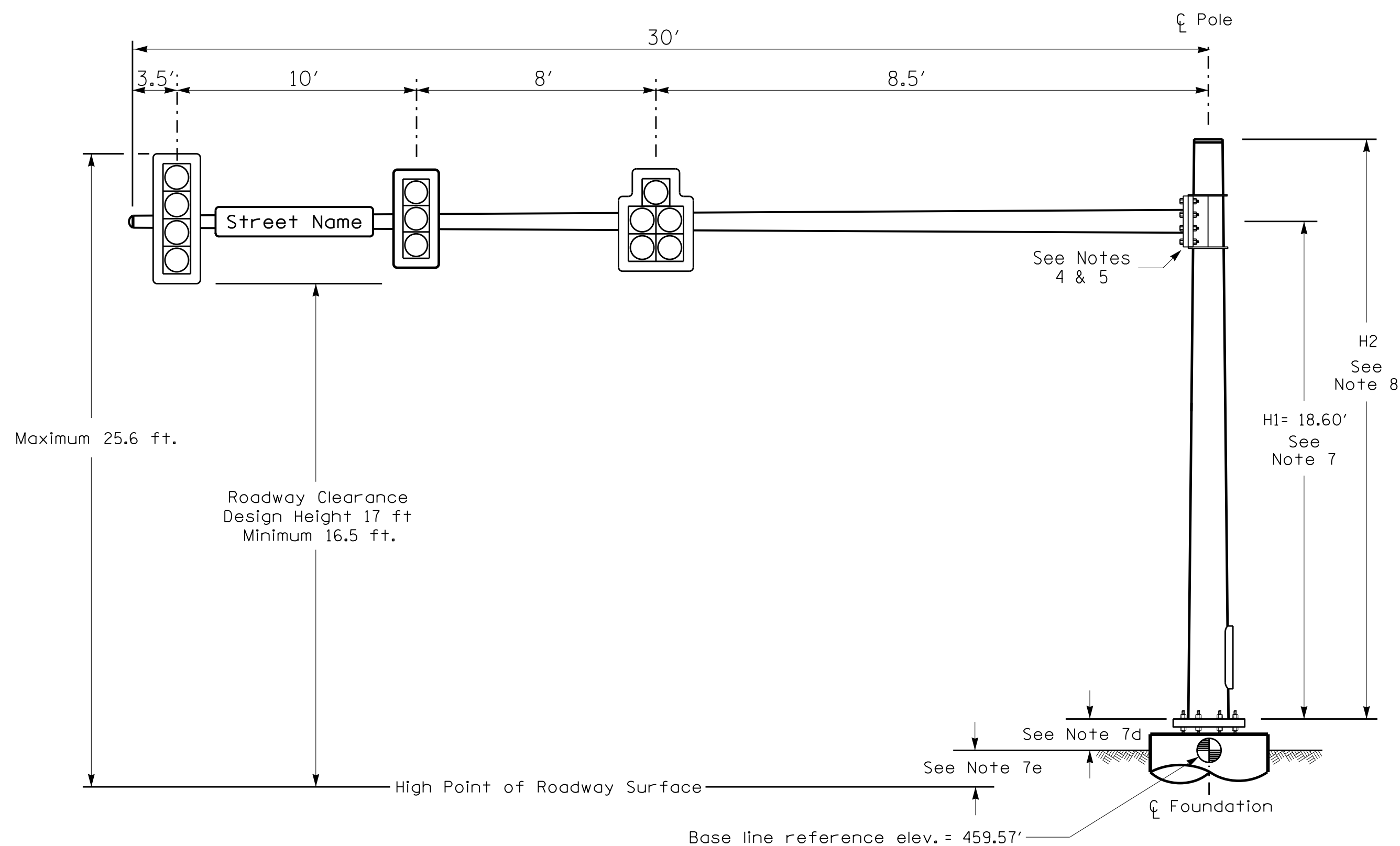
| | | | |
|---|---|--|--|
| <p>Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County Sanford</p> | | <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. ZIEGLER 04/19/2022 DATE SIG. INVENTORY NO. 08-0236</p> |
| | <p>Division 8</p> <p>PLAN DATE: March 2022</p> <p>PREPARED BY: J.A. Lohr</p> <p>SCALE: N/A</p> | <p>REVIEWED BY:</p> <p>REVISIONS</p> <p>INIT. DATE</p> | |

Design Loading for METAL POLE NO. 7



Elevation View

Design Loading for METAL POLE NO. 8



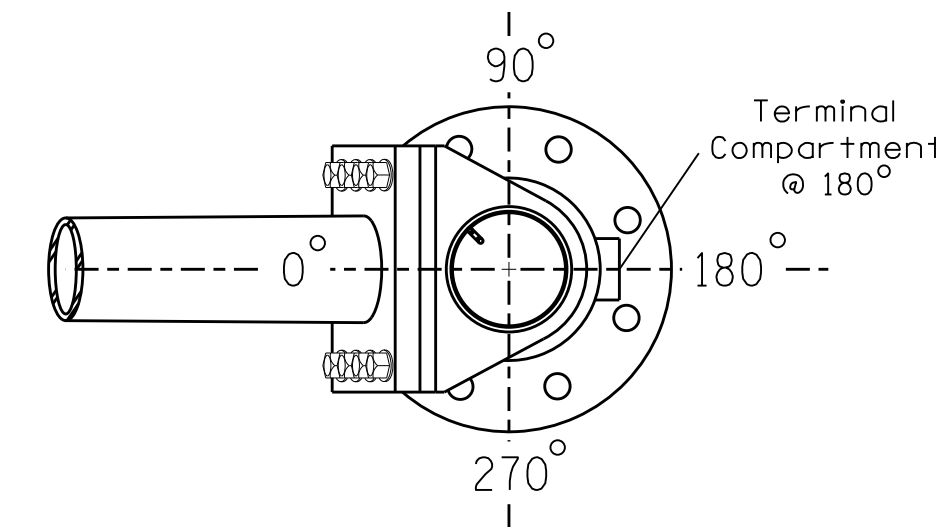
Elevation View

SPECIAL NOTE

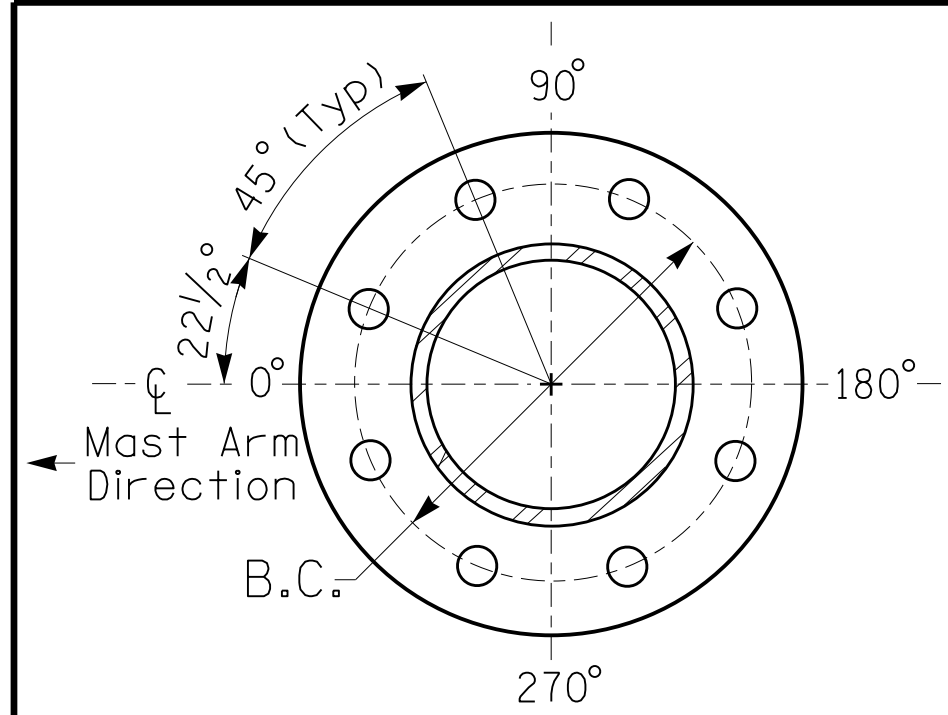
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

| Elevation Differences for: | Pole 7 | Pole 8 |
|---|------------|------------|
| Baseline reference point at Foundation @ ground level | 459.93 ft. | 459.57 ft. |
| Elevation difference at High point of roadway surface | +0.60 ft. | -0.46 ft. |
| Elevation difference at Edge of travelway or face of curb | +/-0.0 ft. | +/-0.0 ft. |

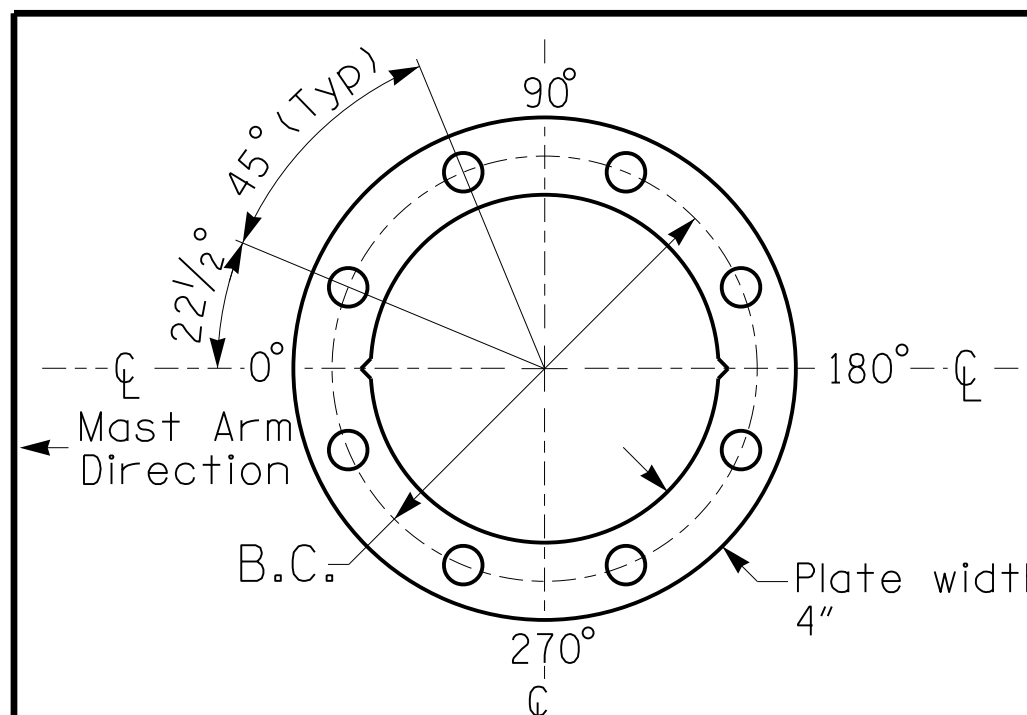


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



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

METAL POLE No. 7 and 8

| | |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| R-3830 | SIG 7.7 |

MAST ARM LOADING SCHEDULE

| LOADING SYMBOL | DESCRIPTION | AREA | SIZE | WEIGHT |
|----------------|--|-----------|-------------------------|---------|
| | RIGID MOUNTED SIGNAL HEAD 12"-5" SECTION-WITH BACKPLATE | 16.3 S.F. | 42.0" W X 56.0" L | 103 LBS |
| | RIGID MOUNTED SIGNAL HEAD 12"-4" SECTION-WITH BACKPLATE | 11.5 S.F. | 25.5" W X 66.0" L | 74 LBS |
| | RIGID MOUNTED SIGNAL HEAD 12"-3" SECTION-WITH BACKPLATE | 9.3 S.F. | 25.5" W X 52.5" L | 60 LBS |
| | STREET NAME SIGN RIGID MOUNTED | 16.0 S.F. | 24.0" W X 96.0" L | 36 LBS |
| | PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE | 2.2 S.F. | 18.5" W X 17.0" L | 21 LBS |
| | SIGN RIGID MOUNTED | 7.5 S.F. | 30.0" W X 36.0" L | 14 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 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2018 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.
- 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.

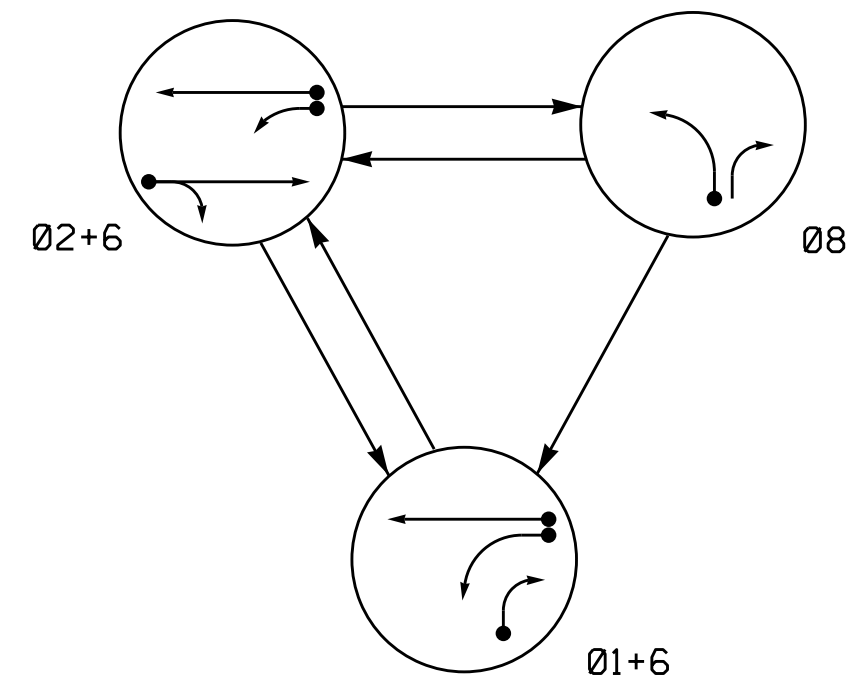
All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 4 (90 mph)

| | | |
|--|---|--|
| <p>Prepared in the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION SIGNAL DESIGN SECTION</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p> | <p>NC 42 (Main Street) at SR 1519 (Nash Street) / Tyson Foods Driveway Lee County Sanford</p> | <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. JETER 026486</p> |
| | <p>Division 8 PLAN DATE: March 2022 PREPARED BY: J.A. Lohr</p> | <p>REVIEWED BY: REVISIONS INIT. DATE</p> |
| <p>SCALE 0 N/A N/A</p> | <p>SIG. INVENTORY NO. 08-0236</p> | |

28-Apr-2022 06:35
R:\0236-3-9-mp-2022\mtds.dgn
7:01 AM

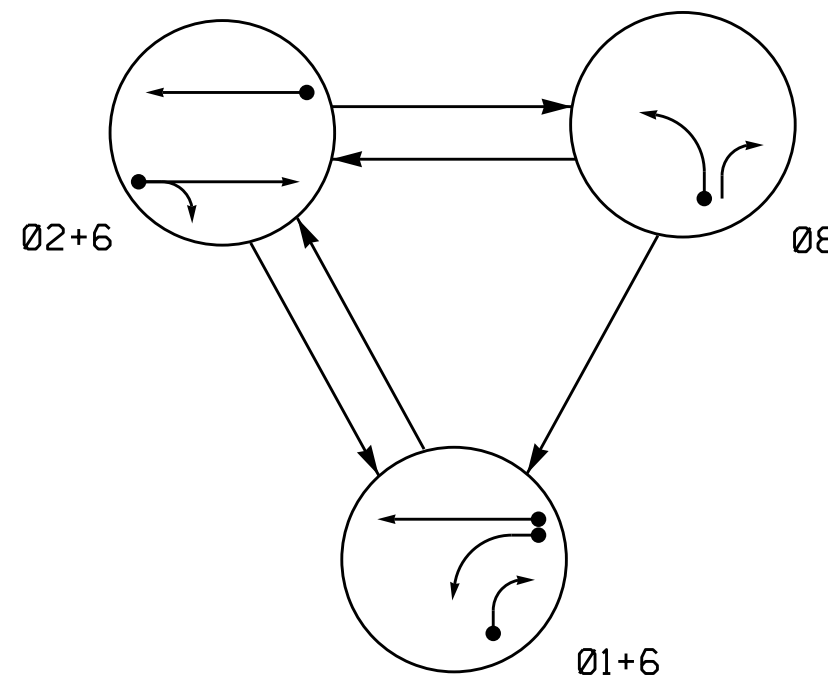
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|----|-------|
| | 01+6 | 02+6 | 08 | FLASH |
| 11 | ← | ← | ← | ← |
| 21, 22 | R | G | R | Y |
| 61, 62 | G | G | R | Y |
| 81 | R | R | G | R |
| 82 | R | R | G | R |

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

| SIGNAL FACE | PHASE | | | |
|-------------|-------|------|----|-------|
| | 01+6 | 02+6 | 08 | FLASH |
| 11 | ← | ← | ← | ← |
| 21, 22 | R | G | R | Y |
| 61, 62 | G | G | R | Y |
| 81 | R | R | G | R |
| 82 | R | R | G | R |

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

| ZONE | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | DETECTOR PROGRAMMING | | | | | | | |
|------|-----------|----------------------------|-------|----------|----------------------|---------|-----------|--------------|------------|-------------|----------|---|
| | | | | | PHASE | CALLING | EXTENSION | STRETCH TIME | DELAY TIME | SYSTEM LOOP | NEW CARD | |
| 1A | 6X40 | 0 | * | * | 1 | Y | Y | - | - | ★15 | - | * |
| 1B | 6X40 | 0 | * | * | 1 | Y | Y | - | - | 15 | - | * |
| 2A | 6X6 | 200 | * | * | 2 | Y | Y | - | - | - | - | * |
| 6A | 6X6 | 300 | * | * | 6 | Y | Y | - | - | - | - | * |
| 8A | 6X40 | 0 | * | * | 8 | Y | Y | - | - | 3 | - | * |

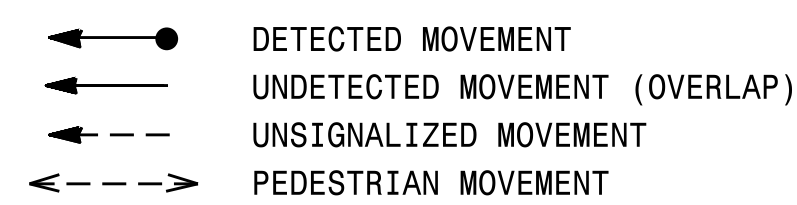
* Video Detection Zone
 ★ Reduce Delay to 3 seconds during Alternate Phasing Operation.
 # Disable Phase(s) call during Alternate Phasing Operation.

3 Phase Fully Actuated (Isolated)

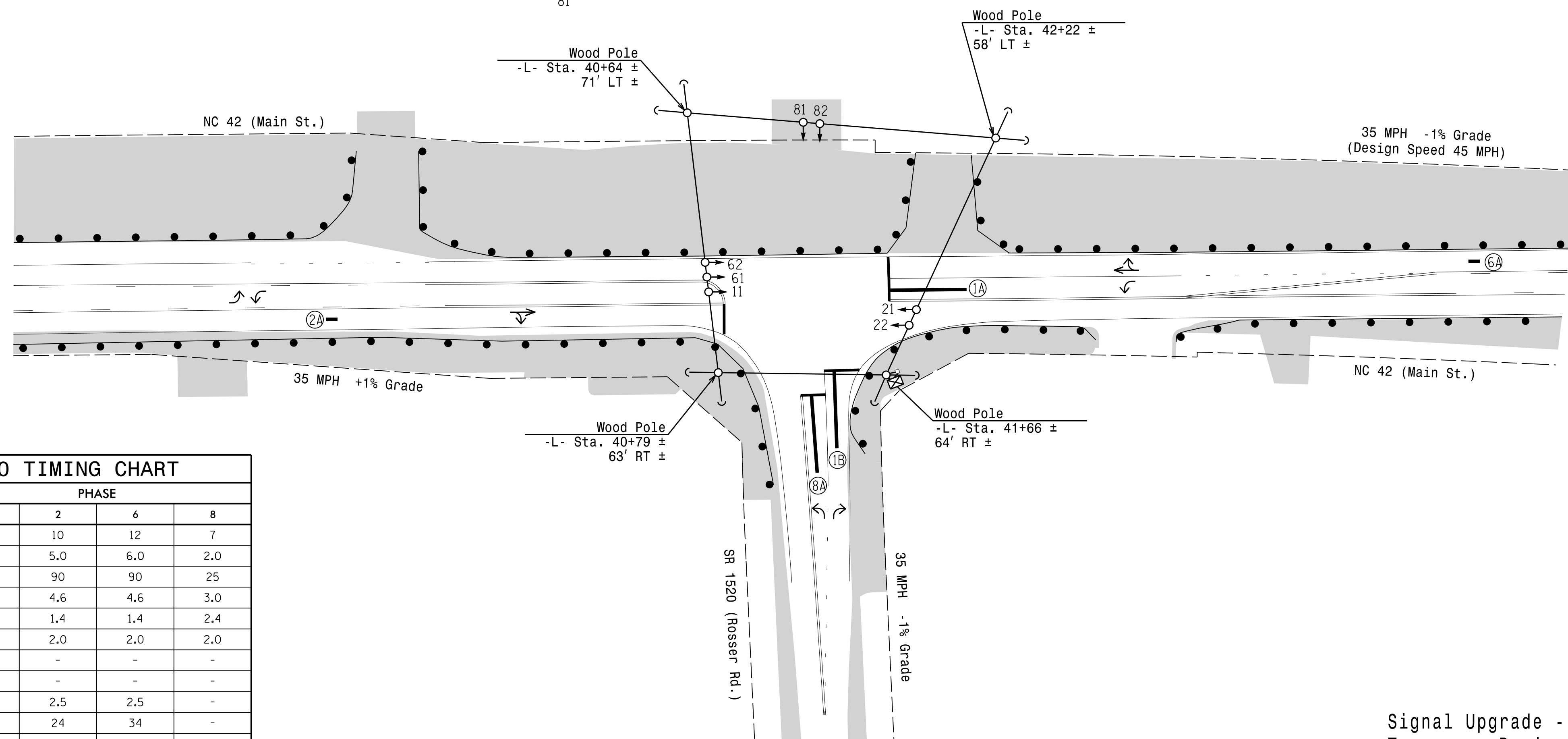
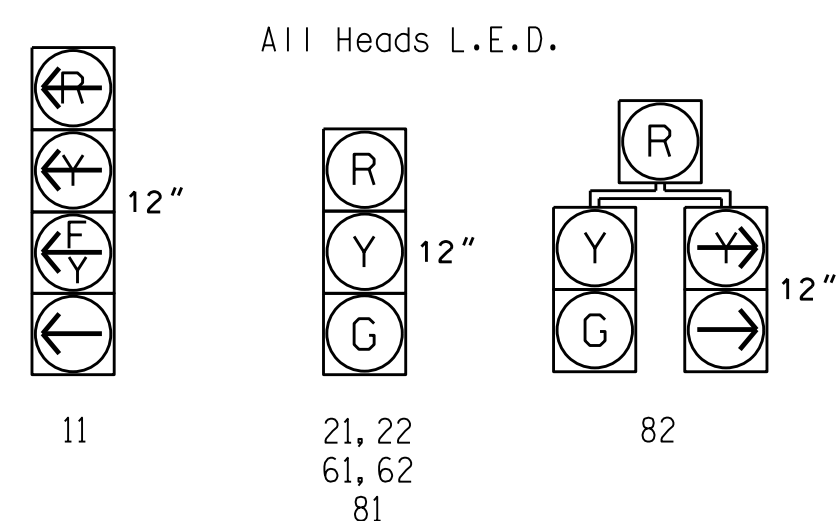
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- 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.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- This location utilizes a video detection system. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
- Remove existing pavement markings pertaining to railroad crossing.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

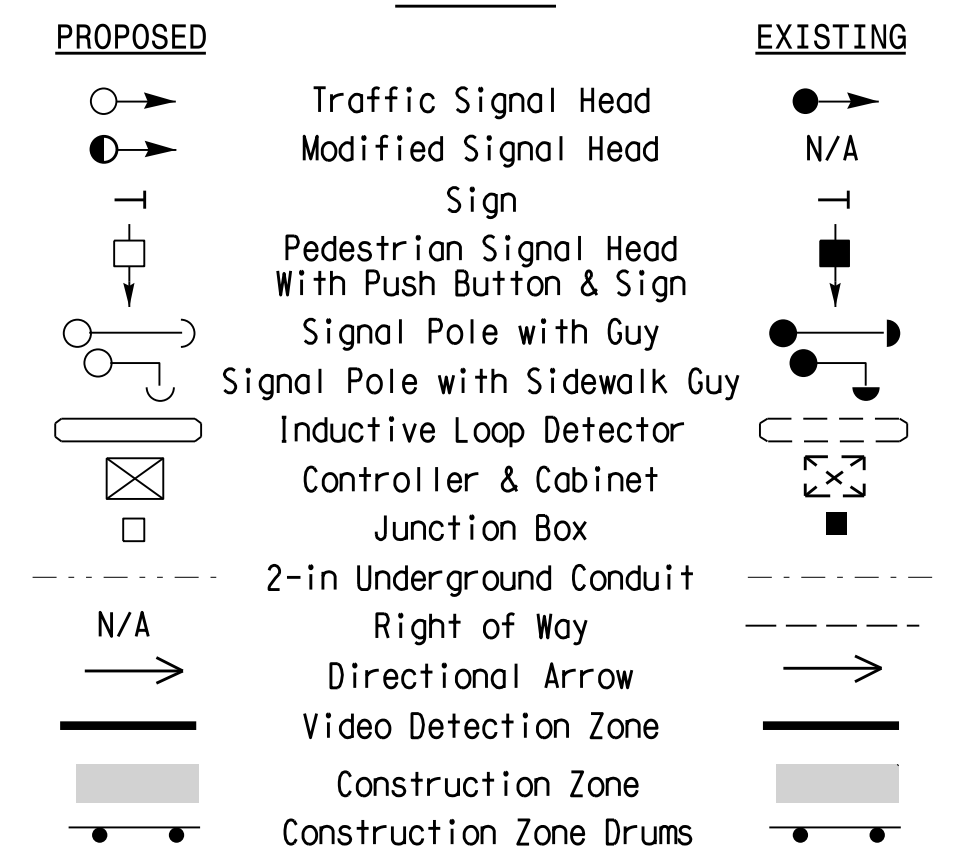


OASIS 2070 TIMING CHART

| FEATURE | PHASE | | | |
|-------------------------|-------|------------|------------|-----|
| | 1 | 2 | 6 | 8 |
| Min Green 1 * | 7 | 10 | 12 | 7 |
| Extension 1 * | 2.0 | 5.0 | 6.0 | 2.0 |
| Max Green 1 * | 15 | 90 | 90 | 25 |
| Yellow Clearance | 3.0 | 4.6 | 4.6 | 3.0 |
| Red Clearance | 1.9 | 1.4 | 1.4 | 2.4 |
| 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 * | - | 24 | 34 | - |
| Time Before Reduction * | - | 15 | 15 | - |
| Time To Reduce * | - | 34 | 34 | - |
| Minimum Gap | - | 3.0 | 3.0 | - |
| Recall Mode | - | MIN RECALL | MIN RECALL | - |
| Vehicle Call Memory | - | YELLOW | YELLOW | - |
| Dual Entry | - | - | - | - |
| Simultaneous Gap | ON | ON | ON | ON |

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

LEGEND



Signal Upgrade - Temporary Design 1 (TMP Phase I)

Prepared For the Offices of:
 Transportation Mobility and Safety Division
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27526

NC 42 (Main Street) at SR 1520 (Rosser Road)

Division 8 Lee County Sanford

PLAN DATE: January 2022 REVIEWED BY:

PREPARED BY: J.A. Lohr REVIEWED BY:

REVISIONS INIT. DATE

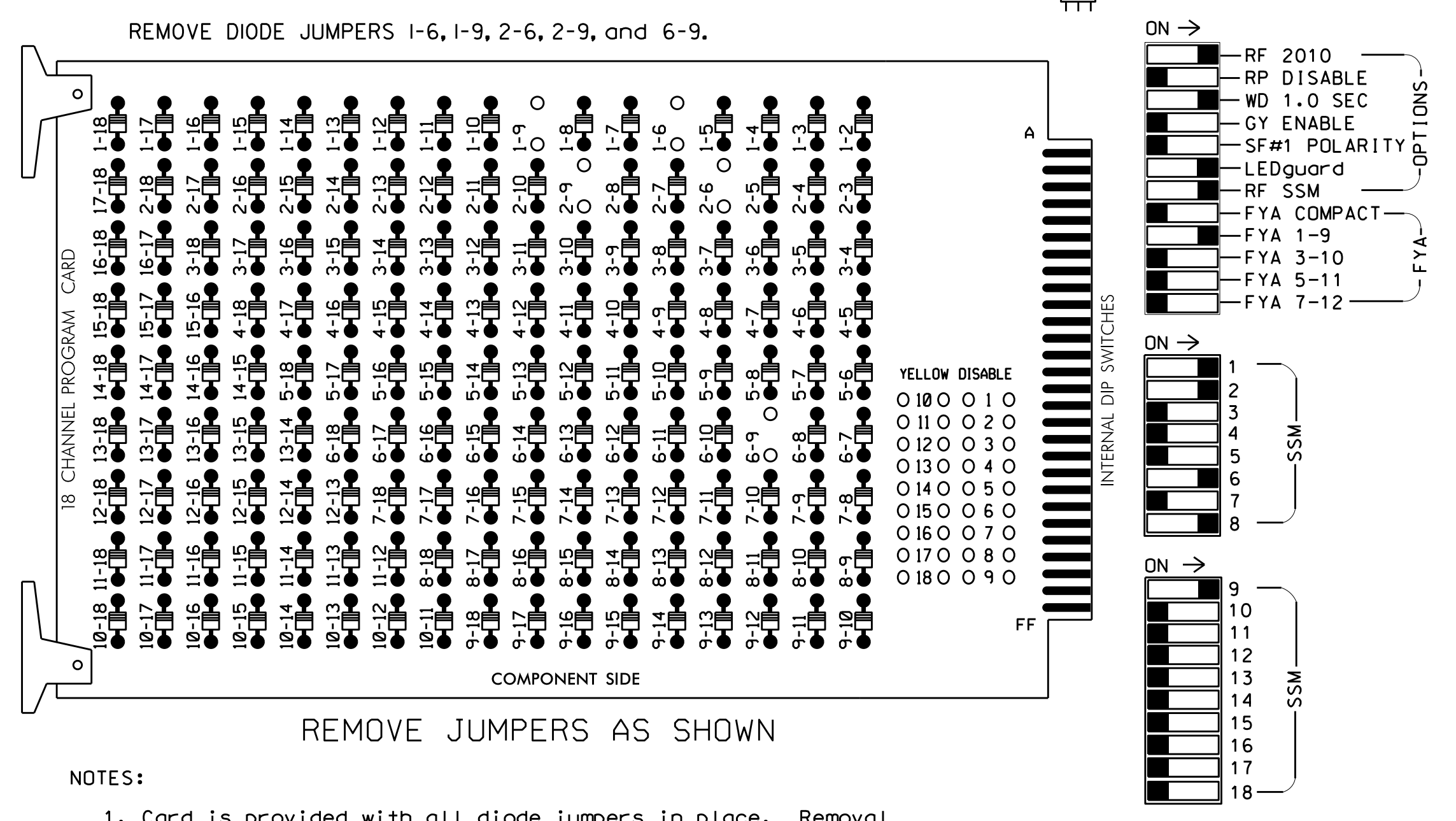
SCALE 0 40 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 026486
 ROBERT J. ZIEMBA
 04/19/2022
 DATE
 SIG. INVENTORY NO. 08-1018T1

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 Startup In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

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,AUXS1
 PHASES USED.....1,2,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "D".....NOT USED

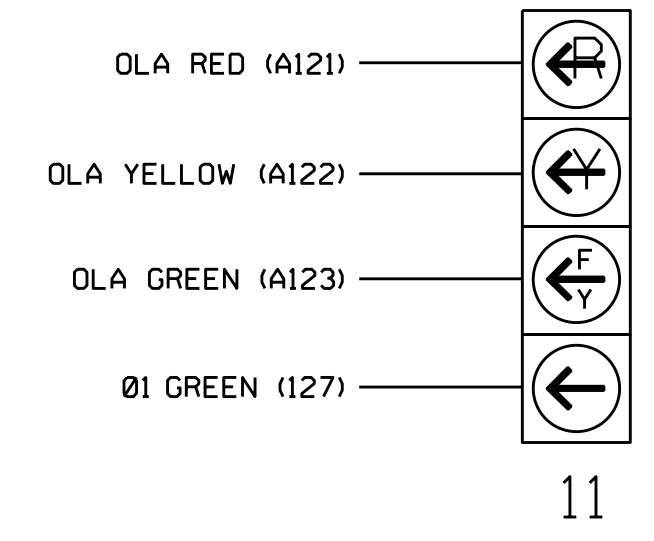
SIGNAL HEAD HOOK-UP CHART

| 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 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------|----------|---|---|---|---|---|---|---|---|----|----|----|----|-------------|
| U | ∅ 1 | - | - | - | - | - | - | - | - | - | - | - | - | FS |
| L | 1A | - | - | - | - | - | - | - | - | - | - | - | - | DC ISOLATOR |
| U | NOT USED | - | - | - | - | - | - | - | - | - | - | - | - | ST |
| L | - | - | - | - | - | - | - | - | - | - | - | - | - | DC ISOLATOR |

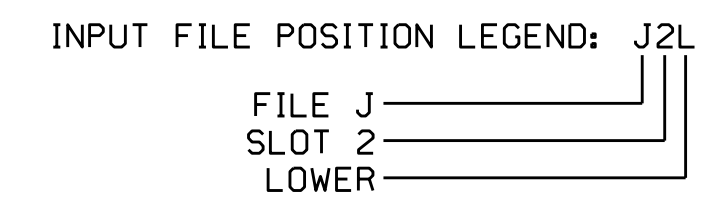
EX.: 1A, 2A, ETC. = LOOP NO.'S
 ⊗ Wired Input - Do not populate slot with detector card

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 ¹ | TB2-1,2 | I1U | 56 | 18 | 1 | 1 | Y | Y | | | 15 |
| | - | J4U | 48 | 10★ | 26 | 6 | Y | Y | Y | | 3 |
| | - | I1U | 56 | 18★ | 51 | 1 | Y | Y | | | 3 |

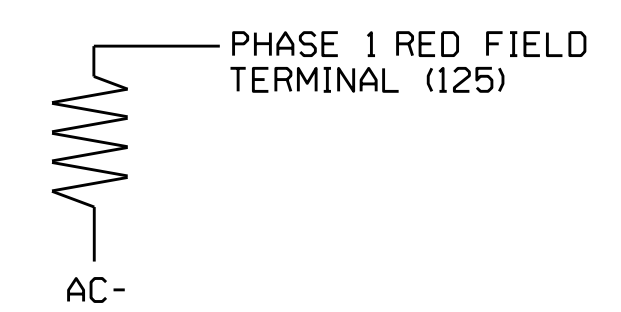
¹Add jumper from I1-W to J4-W, on rear of input file.
 ★ See Input Page Assignment programming details on sheet 3.



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



DETECTOR NOTES

- For all loops 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 schemes shown on the Signal Design Plans.
- For loop 1A, detector card placement and slot reserved for wired input are typical for a NCDOT installation. Input associated with this slot are compatible with time of day instructions located on sheet 3 of this electrical detail.

Electrical Detail - Sheet 1 of 4

| | | | |
|---|--|---|--|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529 | NC 42 (Main Street) at SR 1520 (Rosser Road) | | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL D. Todd Joyce 04/21/2022 |
| | Division 8 Lee County Sanford | PLAN DATE: April 2022 REVIEWED BY: PREPARED BY: Zarrar Zafar REVIEWED BY: REVISIONS: INIT. DATE | |

21-Apr-2022 08:56 S:\IT\5350\115_Signal\work\housas\g_MarkZafar\plans\081018_temps_and_final\081018-2022middle-11.dgn ZZZZ

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 #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON

          ↓
          SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF
    
```

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 #52 OFF
    
```

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 #51 ON
    
```

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

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 FOR DEFAULT PHASING

(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

OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS). PRESS 'NEXT' TO ADVANCE TO PAGE 2.

NOTICE PAGE 2 →

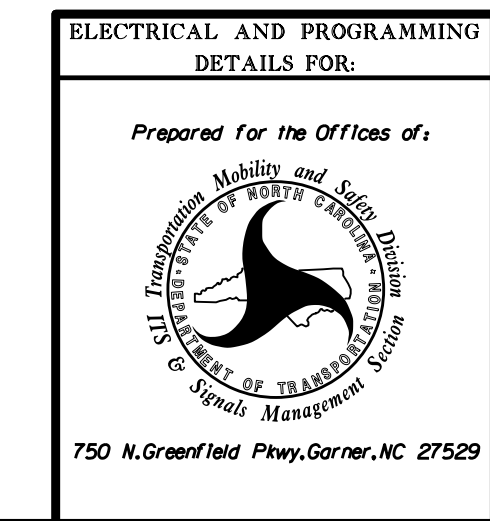
```

PAGE 2: 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 - GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).....0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
    
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-1018t1
 DESIGNED: January 2022
 SEALED: 4/19/2022
 REVISED: N/A

Electrical Detail - Sheet 2 of 4



| | | | |
|---|--------------|--|--------------|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: | | NC 42 (Main Street) at SR 1520 (Rosser Road) | |
| Prepared for the Offices of: | | Division 8 Lee County Sanford | |
| PLAN DATE: April 2022 | REVIEWED BY: | PREPARED BY: Zarrar Zafar | REVIEWED BY: |
| REVISIONS | INIT. | DATE | |
| | | | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: D. Todd Joyce 04/21/2022

SIG. INVENTORY NO. 08-1018t1

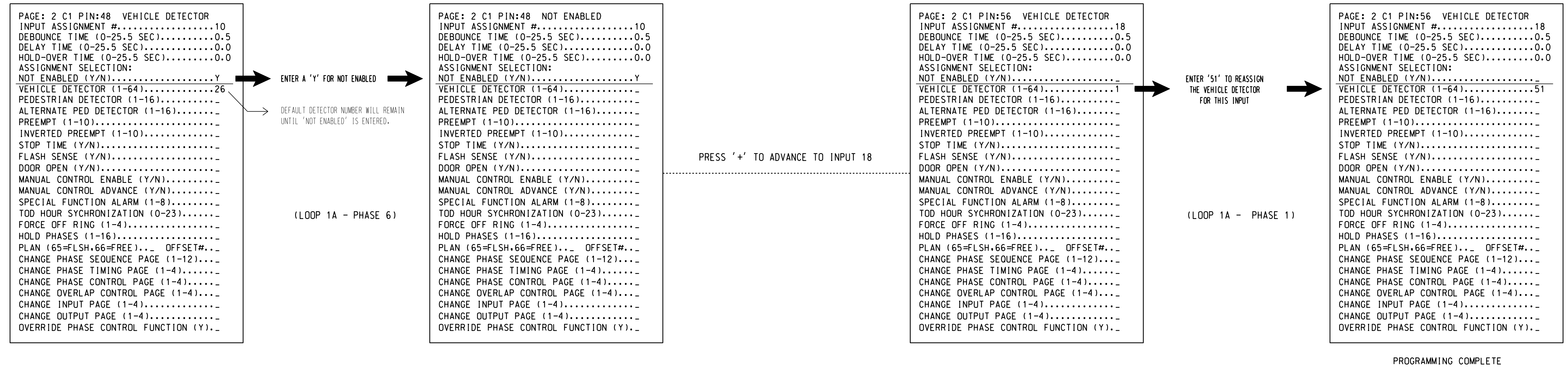
21-Apr-2022 08:57
 S:\IT\SSU\15\Sig\del\workgroups\Sig_Mark\Zafar\Plans\081018_temps_and_fina\081018-2022\middle-1.dgn
 ZZZZ

INPUT PAGE 2 ASSIGNMENT PROGRAMMING DETAIL FOR ALTERNATE PHASING - LOOP 1A

(program controller as shown below)

- NOTES: 1. THIS PROGRAMMING APPLIES FOR INPUT PAGE 2 ONLY. INPUT PAGE 1 WILL USE STANDARD DEFAULT SETTINGS. THIS PROGRAMMING IS NECESSARY FOR PROPER DETECTOR OPERATION DURING ALTERNATE PHASING OPERATION.
2. THE FIRST TASK THIS PROGRAMMING ACCOMPLISHES IS THE DISABLING OF INPUT #10 (DETECTOR 26) SO THAT A VEHICLE CALL WILL NOT BE PLACED TO PHASE 6 DURING ALTERNATE PHASING OPERATION. THE SECOND TASK THIS PROGRAMMING ACCOMPLISHES IS THAT IT REASSIGNS DETECTOR 51 TO INPUT #18 SO THAT THE DELAY ON LOOP 1A CAN BE REDUCED FROM 15 SECONDS TO 3 SECONDS.

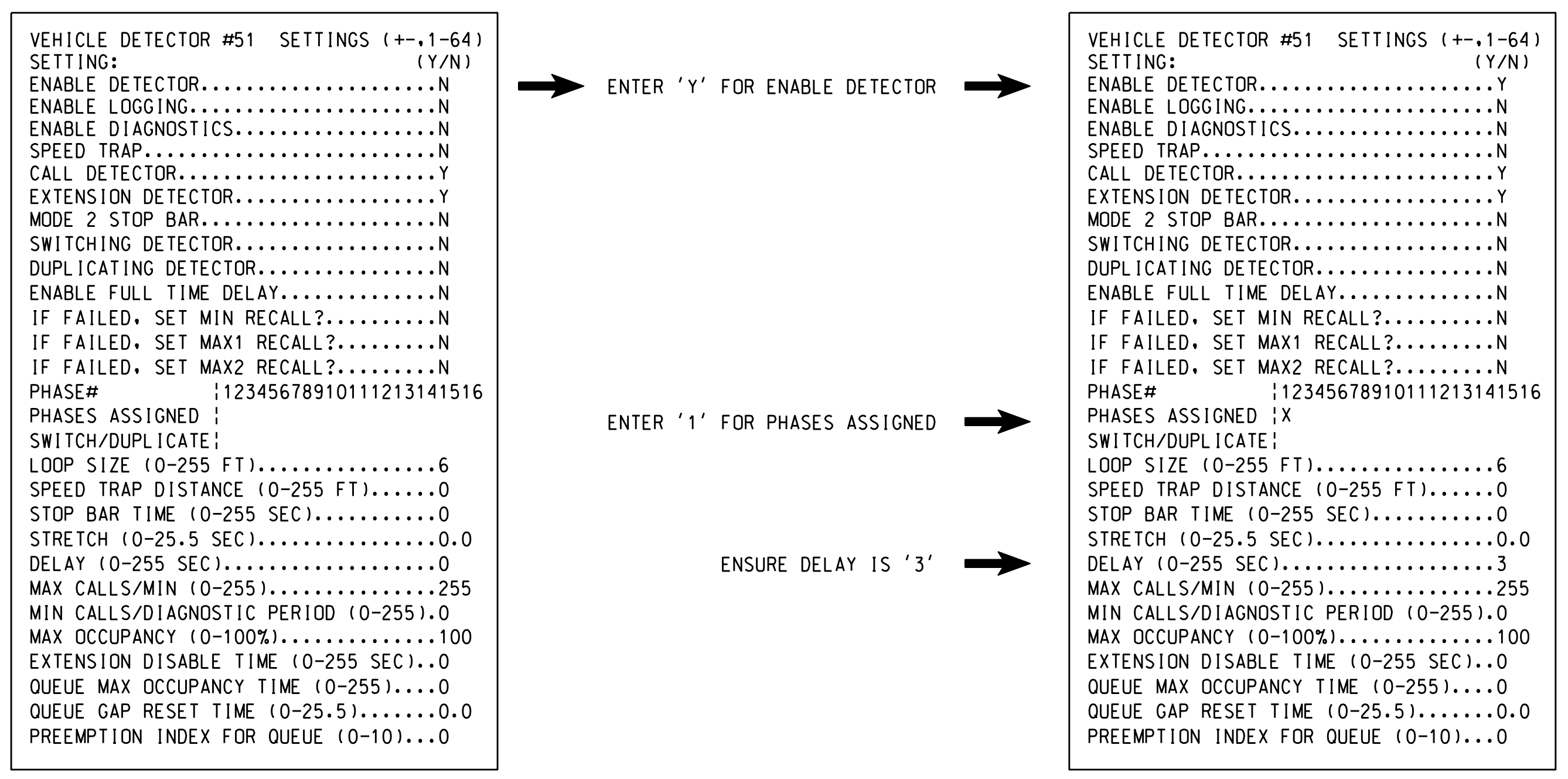
FROM MAIN MENU PRESS '5' (INPUTS), THEN PRESS 'NEXT' TO GET TO INPUT PAGE '2'. PRESS THE '+' KEY UNTIL INPUT 10 IS REACHED.



SPECIAL DETECTOR PROGRAMMING DETAIL - LOOP 1A (ALT.)

(program controller as shown below)

FROM MAIN MENU PRESS '7' (DETECTORS), THEN PRESS '1' FOR VEHICLE DETECTORS. PRESS THE '-' KEY TO GET TO VEHICLE DETECTOR #51.



NOTE: DETECTOR IS PROGRAMMED PER THE INPUT FILE CONNECTION AND PROGRAMMING CHART SHOWN ON SHEET 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-1018-t1
 DESIGNED: January 2022
 SEALED: 4/19/2022
 REVISED: N/A

08-1018-2022 08-28
 S:\IT\5830\15_Signal\work\hgr\hgr\081018_temps_and_fina\081018-2022\middle-11.dgn
 zzzfor

Electrical Detail - Sheet 3 of 4

| | | | |
|-------------------------------------|--|---|------------------|
| | NC 42 (Main Street) at SR 1520 (Rosser Road) | | |
| | Division 8 Lee County Sanford | PREPARED BY: Zarrar Zafar REVIEWED BY: | |
| PLAN DATE: April 2022 REVISIONS: | REVIEWED BY: | INIT. DATE | DATE: 04/21/2022 |

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 08-1018-t1

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING COORDINATION - SELECT ALL PAGE CHANGES (AS SHOWN BELOW) WITHIN COORDINATION PLAN PROGRAMMING.

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM PAGE CHANGES (SHOWN BELOW) IN SEPARATE TIME OF DAY EVENTS. IF PAGE 1 IS USED, NO EVENT PROGRAMMING IS NECESSARY FOR THAT PARTICULAR PAGE.

| <u>PHASING</u> | <u>INPUTS PAGE</u> | <u>OVERLAPS PAGE</u> |
|---|--------------------|----------------------|
| ACTIVE PAGES REQUIRED TO RUN <u>DEFAULT PHASING</u> | 1 | 1 |
| ACTIVE PAGES REQUIRED TO RUN <u>ALTERNATE PHASING</u> | 2 | 2 |

NOTE: PAGES NOT SHOWN (i.e. sequence, phase control, etc.) SHOULD REMAIN AS '1', OR AS DEFINED BY TIMING ENGINEER.

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY PAGE CHANGE EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN PAGE CHANGE EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING PAGE CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN THESE OVERLAP/INPUT PAGE CHANGES ACTIVATE TO CALL THE "ALTERNATE PHASING":

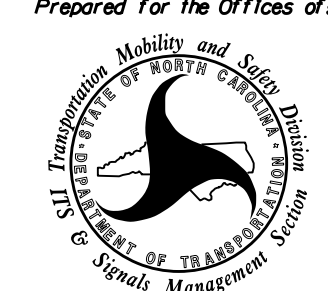
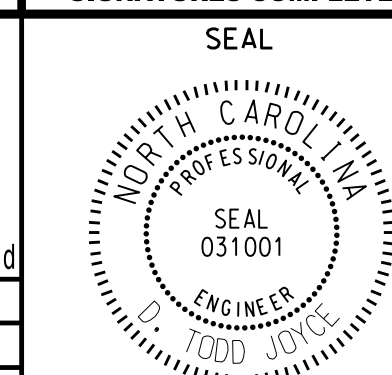

OVERLAPS PAGE 2: Modifies overlap parent phases for head 11 to run protected turns only.

INPUTS PAGE 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-1018t1
 DESIGNED: January 2022
 SEALED: 4/19/2022
 REVISED: N/A

C:\Users\zazafar\Documents\Projects\08-1018\08-1018-2022\middle-1.dgn
 2022/04/19 08:58
 S:\IT\SSU\TSS\Sig\Management\Workgroups\Sig_Man\Zafar\Plans\081018_temps_and_fina\081018-2022\middle-1.dgn
 zazafar

Electrical Detail - Sheet 4 of 4

| | | |
|---|---|---|
| ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529 | NC 42 (Main Street) at SR 1520 (Rosser Road) Division 8 Lee County Sanford | DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL  SEAL 031001 ENGINEER T. TODD JOYCE |
| PLAN DATE: April 2022 REVIEWED BY: | | DocuSigned by:  04/21/2022 DATE |
| PREPARED BY: Zarrar Zafar REVIEWED BY: | | |
| REVISIONS | | SIG. INVENTORY NO. 08-1018t1 |