

8 Phase
Fully Actuated
W/ EVP
NC 51 (Pineville) CLS

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/pages/its-and-signals.aspx>
- 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.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- The Division Traffic Engineer will determine the Delay before Preempt and Preempt Dwell Min Green time for the emergency vehicle preemption timing.

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/13/2025

DocuSigned by:
Matthew Cowley
ITS & Signals Unit

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS				DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	LOOP NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	3	-
2A	6X6	65	EXIST	-	2	Y	Y	-	-	-	-
2B	6X6	65	EXIST	-	2	Y	Y	-	-	-	-
3A	6X40	+10	2-4-2	-	3	Y	Y	-	-	3	-
3B	6X40	+10	2-4-2	-	3	Y	Y	-	-	-	-
4A	6X40	+5	2-4-2	-	4	Y	Y	-	-	-	-
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	3	-
5B	6X40	+5	2-4-2	-	5	Y	Y	-	-	15	-
6A	6X6	60	EXIST	-	6	Y	Y	-	-	-	-
6B	6X6	60	EXIST	-	6	Y	Y	-	-	-	-
7A	6X40	+5	2-4-2	-	7	Y	Y	-	-	3	-
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-
S3	6X6	+175	EXIST	-	-	-	-	-	-	-	-
S4	6X6	+175	EXIST	-	-	-	-	-	-	-	-
S5	6X6	+165	EXIST	-	-	-	-	-	-	-	-
S6	6X6	+165	EXIST	-	-	-	-	-	-	-	-

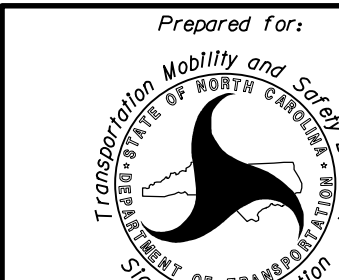
OASIS 2070 EV PREEMPT	
FUNCTION	PRE 2
Interval 1 – Dwell Green	255
Interval 1 – Dwell Yellow	0.0*
Interval 1 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Exit Phase(s)	4, 7
Priority	Medium
Delay Time	**
Min Green Before Pre	1
Ped Clear Before Pre	0 *
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	**
Enable Backup Protection	N
Ped Clear Through Yellow	Y
Omit Overlaps	A
Preempt Extend	-

* Time defaults to time used for phase during normal operation
** See note 10.

LEGEND

PROPOSED	EXISTING
	N/A
N/A	
N/A	

Signal Upgrade



750 N. Greenfield Pkwy, Garner, NC 27529



SCALE
0 40
1"=40'

NC 51 (Main Street) /
NC 51 (Pineville-Matthews Road)
at
SR 4982 (Polk Street)
Division 10 Mecklenburg County Pineville
PLAN DATE: April 2025 REVIEWED BY: N.E. Burns
PREPARED BY: C. McDonald IMPACT NO: 23110

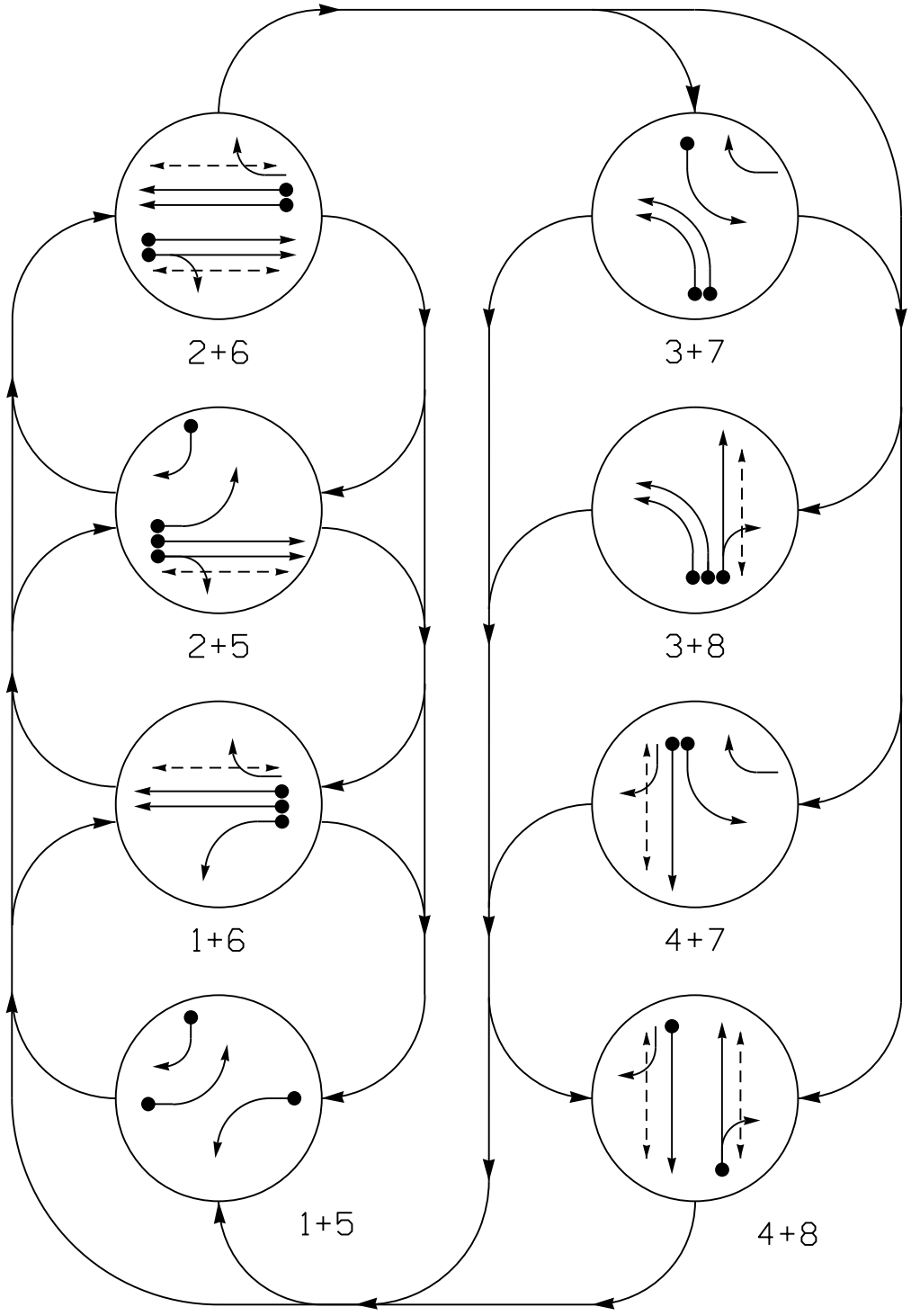
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



Signed by:
Nicholas E. Burns 4/30/2025
152489FPC8442 DATE
SIG. INVENTORY NO. 10-0254

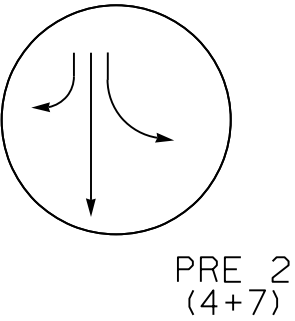
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

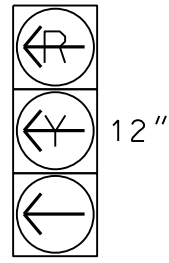
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

EV PREEMPT PHASES
(Medium Priority)

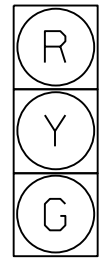


SIGNAL FACE I.D.

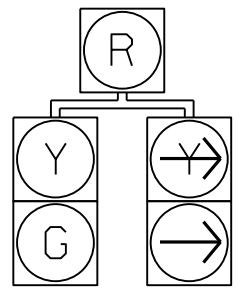
All Heads L.E.D.



11
31,32
51
71

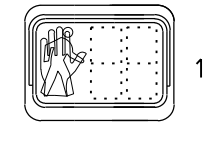


21,22
41
61
81,82



42
62

Accessible
Pedestrian
Signal



P21,P22
P41,P42
P61,P62
P81,P82

TABLE OF OPERATION

SIGNAL FACE	PHASE										
	1 + 5	1 + 6	2 + 5	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8	P R E 2	F L E E T	F L E E T
11	←	←	→	→	→	→	→	→	→	→	→
21,22	R	R	G	G	R	R	R	R	R	R	R
31,32	→	→	→	→	←	←	→	→	R	→	→
41	R	R	R	R	R	R	G	G	G	R	R
42	R	R	R	R	R	R	G	G	G	R	R
51	←	→	→	→	→	→	→	→	→	→	→
61	R	G	R	G	R	R	R	R	R	R	R
62	R	G	R	G	R	R	R	R	R	R	R
71	→	→	→	→	←	←	→	→	→	→	→
81,82	R	R	R	R	R	G	R	G	R	R	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK	DRK	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK	DRK	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK	DRK	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK	DRK	DRK

OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	10	7	7	7	10	7	7
Extension 1 *	3.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max Green 1 *	25	90	30	60	25	90	30	60
Yellow Clearance	3.0	3.8	3.0	3.7	3.0	3.8	3.0	3.7
Red Clearance	2.9	2.3	3.6	2.3	3.1	2.3	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	-	15	-	15	-	20	-	21
Advanced Walk *	-	7	-	6	-	7	-	6
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

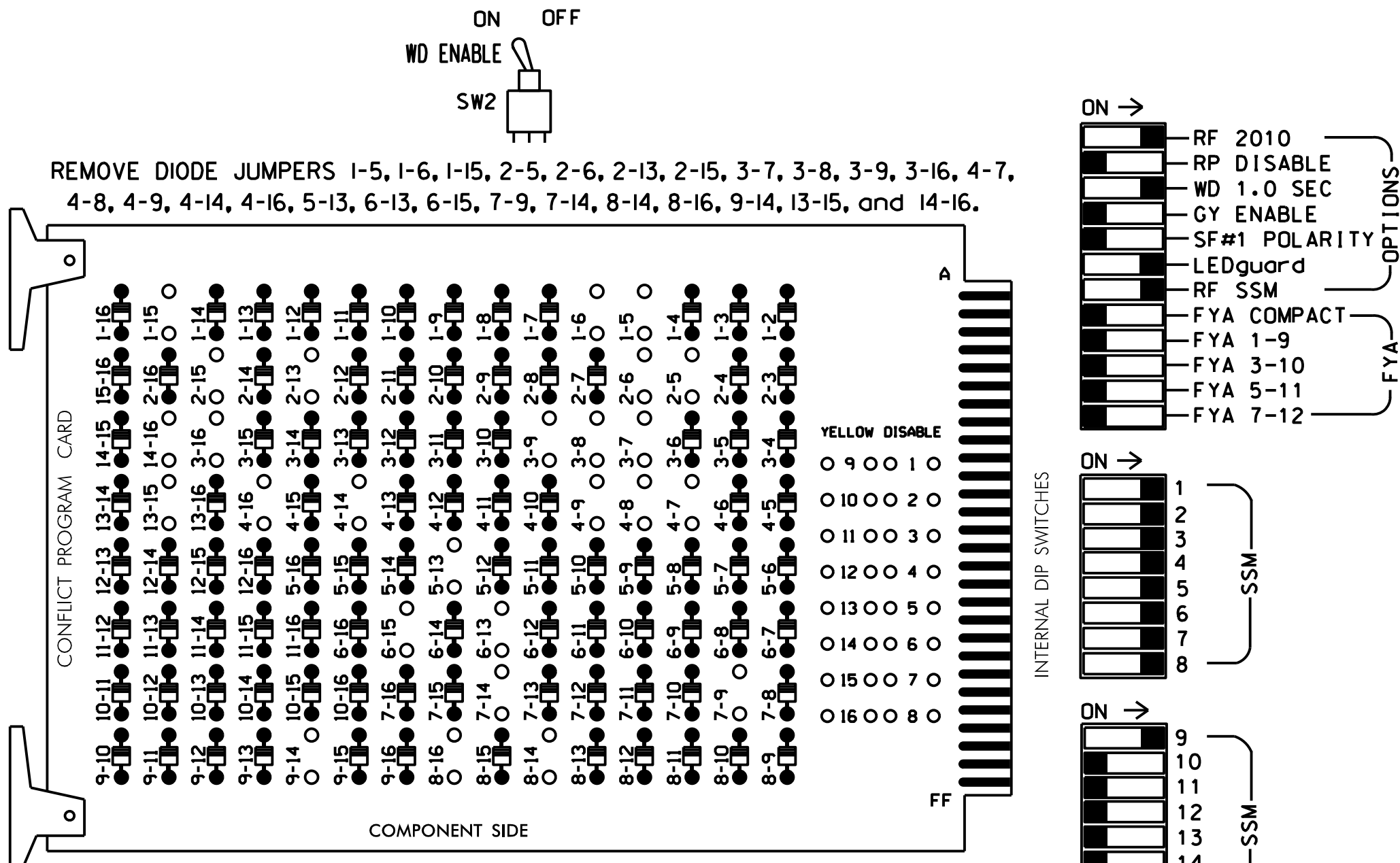
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION

SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Polk.
P22	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Polk.
P41	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Main.
P42	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Main.
P61	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Polk.
P62	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Polk.
P81	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Pineville-Matthews.
P82	-	X	Walk	(Percussive Tone)
	X	-	Flashing Don't Walk / Don't Walk	Wait, wait to cross Pineville-Matthews.

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 10,11, 12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Disable all phases for Start Up In Green.
- Disable all phases for Startup Ped Call.
- Disable all phases for Yellow Flash.
- Program phases 2 and 6 for First Phases.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the NC 51 (Pineville) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET332 w/ AUX
SOFTWAREECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS..18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,**S2P,S3,S4,S4P,
S5,S6,S6P,S7,S8,S8P,S9
PHASES USED.....1,2,2 PED,3,4,4 PED,
5,6,6 PED,7,8,8 PED
OVERLAP "A".....7
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED
** DENOTES S2P IS ALSO USED FOR FIRE HOUSE PREEMPT PILOT LAMP CONTROL

PROJECT REFERENCE NO.	SHEET NO.
36249.4892	Sig. 1.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	FIRE PILOT LAMP	31,32	41,42	P41, P42	42	51	61,62	P61, P62	71	81,82	P81, P82	62	NU	NU	NU
RED		128			101				134			107	*					
YELLOW		129			102				135			108						
GREEN		130			103				136			109						
RED ARROW	125			116				131			122							
YELLOW ARROW	126			117			132	132			123			A122				
GREEN ARROW	127			118			133	133			124			A123				
PEDESTRIAN			113			104			119			110						
PED YELLOW				*														
PEDESTRIAN			115			106			121			112						

NU = Not Used

* Denotes install load resistor. See load resistor installation detail on sheet 3.

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

- Install push buttons and APS equipment per manufacturer's instructions.
- Provide a dedicated cable to each push button per manufacturer's instructions.
- If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
- Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
- Place manufacturer's instructions in cabinet with cabinet prints, signal plans, and electrical details.
- An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
- A push button with a single tactile arrow that points in both directions of travel shall be installed if the median separates two parallel crosswalks.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Ø 1	Ø 2	Ø 3	Ø 4	S	S	S	S	SYS. DET. S3	S	S	Ø 2 PED	Ø 6 PED	FS
	1A	2A	3A	4A	S	S	S	S	SYS. DET. S4	S	S	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
	NOT USED	Ø 2	Ø 3	NOT USED	S	S	S	S	SYS. DET. S5	S	S	Ø 4 PED	Ø 8 PED	ST
		2B	3B		S	S	S	S	SYS. DET. S6	S	S	DC ISOLATOR	DC ISOLATOR	DC ISOLATOR
FILE "J"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	S	Ø 5	Ø 6	Ø 7	S	Ø 8	S	S	SYS. DET. S5	S	S	S	S	NOT USED
	S	5A	6A	7A	S	8A	S	S	SYS. DET. S6	S	S	S	S	PRE2
	S	Ø 5	Ø 6	NOT USED	S	NOT USED	S	S	SYS. DET. S6	S	S	S	S	DC ISOLATOR
		5B	6B		S		S	S	SYS. DET. S6	S	S	S	S	

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB2-9,10	I3U	63	25	32	3	Y	Y			3
3B	TB2-11,12	I3L	76	38	42	3	Y	Y			
4A	TB4-1,2	I4U	47	9	22	4	Y	Y			
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			3
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7A	TB5-1,2	J4U	48	10	26	7	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
* S3	TB6-9,10	I9U	60	22	11	SYS					
* S4	TB6-11,12	I9L	62	24	13	SYS					
* S5	TB7-9,10	J9U	59	21	15	SYS					
* S6	TB7-11,12	J9L	61	23	17	SYS					
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:

INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
112 AND 113.

- * System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

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.

ADVANCED WALK NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phases 2, 4, 6, and 8 for 'Advanced Walk'. Make sure the Advance Walk times shown on the Signal Design plan are programmed in the 'Phase Timing' menu.

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Office of: SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Management Section	NC 51 (Main Street)/ NC 51 (Pineville-Matthews Road) at SR 4982 (Polk Street)		SEAL NORTH CAROLINA PROFESSIONAL SEAL 046300 ENGINEER NICHOLAS E. BURNS
	Division 10 PLAN DATE: April 2025 PREPARED BY: C. McDonald	Mecklenburg County REVIEWED BY: N.E. Burns IMPACT NO: 23110	
IMPACT PO BOX 3728 MOORESVILLE, NC 28117 C-4720		SIGNED BY: Nicholas E. Burns 1524B9F1FC8442 DATE 4/30/2025 SIC. INVENTORY NO. 10-0254	

PROJECT REFERENCE NO.	SHEET NO.
36249.4892	Sig. 1.2

EMERGENCY VEHICLE PREEMPTION
PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' as needed to advance to Preempt 2.

PREEMPTION #2	SETTINGS (NEXT:1-10)
INTERVAL/TIMING	CLEAR/DWELL PHASES
GRN YEL RED	12345678910111213141516
1 255 0.0 0.0	X X
2 0 0.0 0.0	
3 0 0.0 0.0	
4 0 0.0 0.0	
5 1 0.0 0.0	X X

EXIT CALLS	OPTIONS
PRIORITY (Y/N TO SELECT)	MED
DELAY TIMER (0-255 SEC)	*
MIN GREEN BEFORE PRE (0= DEFAULT)....	1
PED CLEAR BEFORE PRE (0= DEFAULT)....	0
YELLOW CLEAR BEFORE PRE (0= DEFAULT)....	0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....	0.0
DWELL MIN TIMER (0-255 SEC)	*
DWELL MAX TIMER (0=OFF,1-255MIN)	0
DWELL HOLD-OVER TIMER (0-255)	0
LATCH CALL?	Y
LINK TO NEXT PREEMPT?	N
ENABLE BACKUP PROTECTION?	N
HOLD CLEAR 1 PHASES DURING DELAY? ...	N
FAST GREEN FLASH DWELL PHASES?	N
PED CLEARANCE THROUGH YELLOW?	Y
INHIBIT OVERLAP GREEN EXTENSION? ...	N
SERVICE DURING SOFTWARE FLASH?	N
REST IN RED DURING DWELL INTERVAL? ..	N
FLASH DWELL INTERVAL?	N
ALLOW PEDS IN DWELL INTERVAL?	N
RE-TIME DWELL INTERVAL?	Y
OVERLAPS:	ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW	
OMIT OVERLAPS:	X

PROGRAMMING COMPLETE
* Denotes timing to be determined in field.

PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)

MODEL 252 AC ISOLATOR CARD (COMPONENT SIDE)	
ON →	
1 NORM	1
1 INV	2
2 NORM	3
2 INV	4

■ DENOTES POSITION OF SWITCH

SETTING = INVERTED OUTPUT ON CHANNEL 2.

252 AC ISOLATOR TO BE INSTALLED IN SLOT J-14 OF INPUT FILE.

NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0254 DESIGNED: Apr 2025 SEALED: 4/30/2025 REVISED:	NC Dept of Transportation Division of Highways Final Drawing Date: 5/13/2025 DocuSigned by: Matthew E. Burns ITS & Signals Unit
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Electrical Detail - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of:  750 N. Greenfield Pkwy, Corner, NC 27529	NC 51 (Main Street)/ NC 51 (Pineville-Matthews Road) at SR 4982 (Polk Street) Division 10 Mecklenburg County Pineville PLAN DATE: April 2025 REVIEWED BY: N.E. Burns PREPARED BY: C. McDonald IMPACT NO: 23110	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 046300 NICHOLAS E. BURNS SIGNED BY: Nicholas E. Burns DATE: 4/30/2025 SIC. INVENTORY NO. 10-0254
	REVISIONS INIT. DATE	DATE

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
FOR INDICATOR LAMP CONTROL

(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 AND 2.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#) IF INPUT ASSIGNMENT #14 IS ON OR ACTIVE PREEPTION #2 IS ON	NOTE: FIRE HOUSE PILOT LAMP LOGIC.
↓ SCROLL DOWN	
THEN: SET OUTPUT ASSIGNMENT #33 ON	
PRESS '+'	
LOGICAL I/O COMMAND #2 (+/-COMMAND#) IF INPUT ASSIGNMENT #14 IS OFF AND ACTIVE PREEMPTION #2 IS OFF	NOTE: FIRE HOUSE PILOT LAMP LOGIC.
↓ SCROLL DOWN	
THEN: SET OUTPUT ASSIGNMENT #33 OFF	
END OF PROGRAMMING	

OUTPUT REFERENCE SCHEDULE
USE TO INTERPRET LOGIC PROCESSOR
INPUT 14 = Preempt 2
OUTPUT 33 = Phase 2 PED Yellow

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

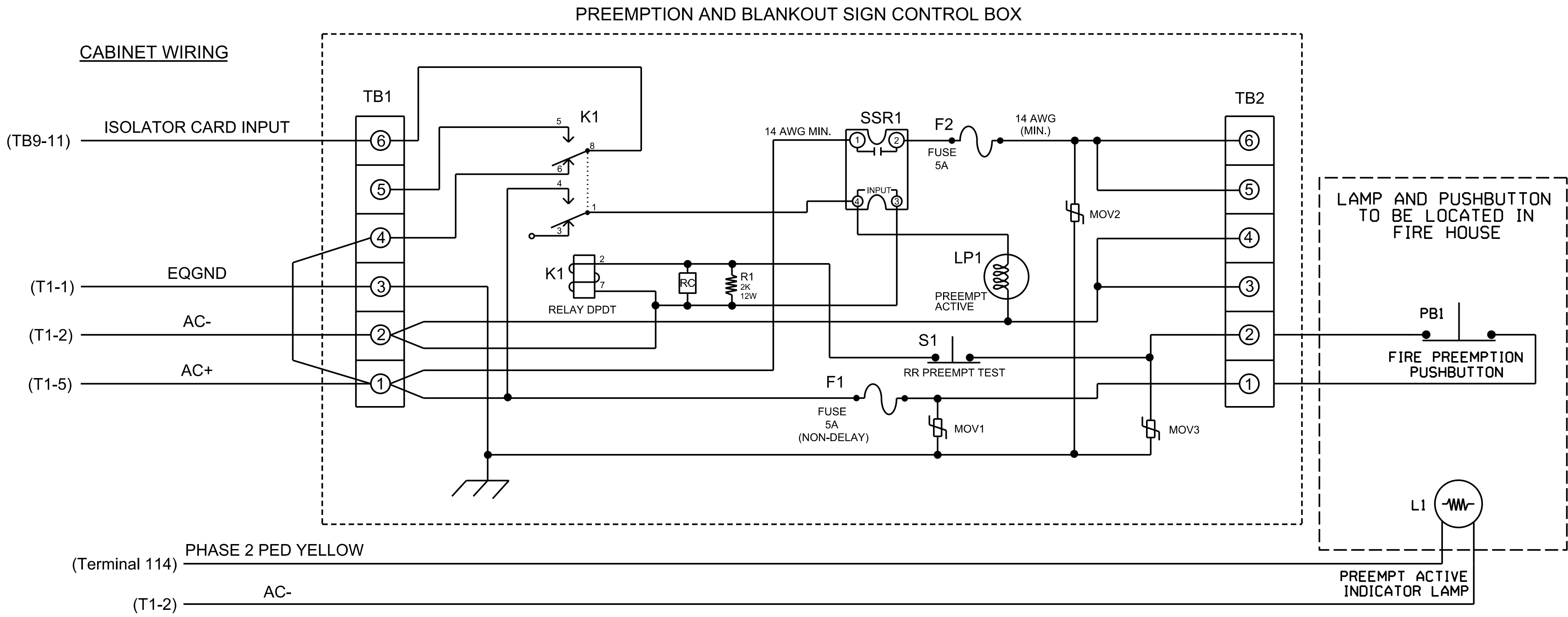
FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW _ GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
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

EV Preemption Control Box Wiring Detail

(wire as shown below)



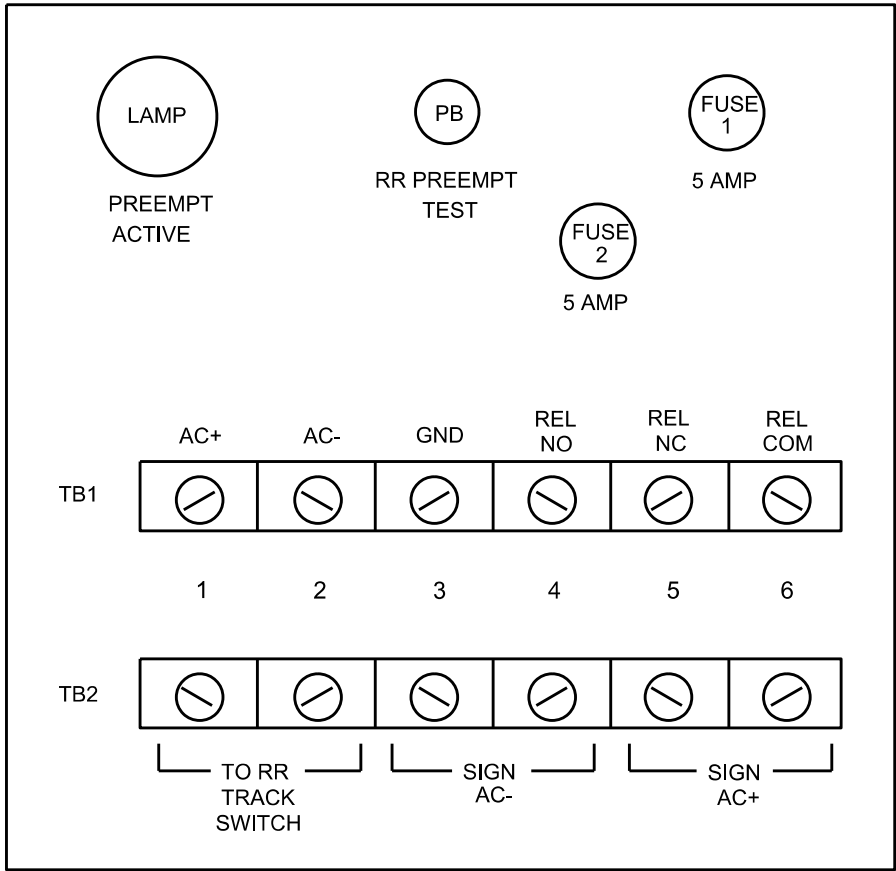
LAMP NOTES

1. Make sure load resistor is in place as shown in the Load Resistor Installation Detail on this sheet.
2. Install a loadswitch in Output File Slot S2P.
3. If field terminal 114 has a conflict monitor wire attached, remove, tape and label wire.

NOTES

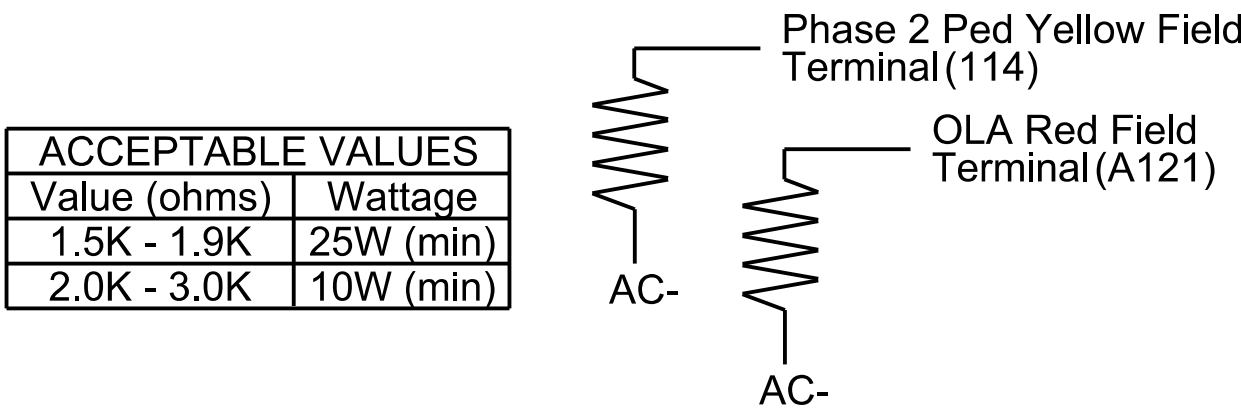
1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-0254

DESIGNED: Apr 2025

SEALED: 4/30/2025

REVISED:

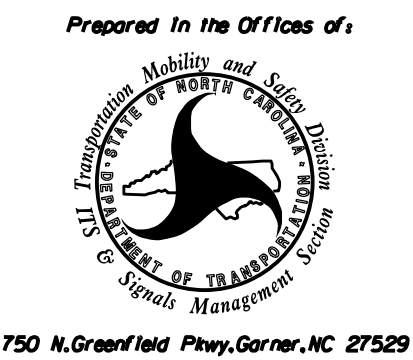
NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/13/2025

DocuSigned by:
Matthew E. Burns
ITS & Signals Unit

Electrical Detail - Sheet 3 of 3

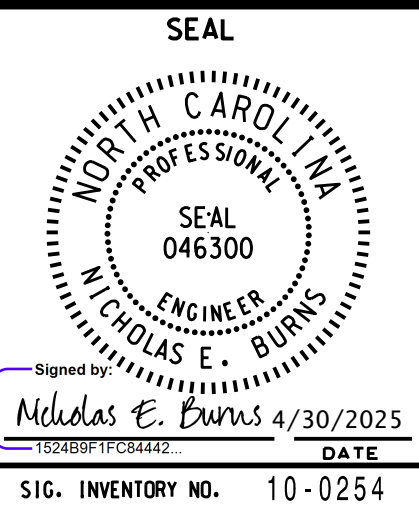
ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Corner, NC 27529

NC 51 (Main Street)/ NC 51 (Pineville-Matthews Road) at SR 4982 (Polk Street)	
Division 10	Mecklenburg County
PLAN DATE: April 2025	REVIEWED BY: N.E. Burns
PREPARED BY: C. McDonald	IMPACT NO: 23110
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

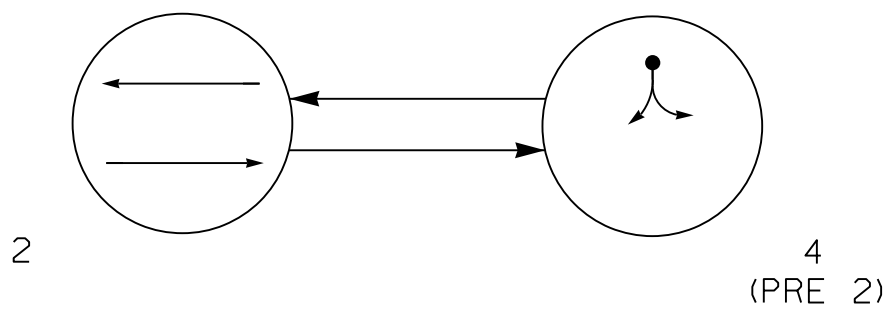


IMPACT

PO BOX 3728
MOORESVILLE, NC 28117
C-4720

PROJECT REFERENCE NO.	SHEET NO.
36249.4892	Sig-2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

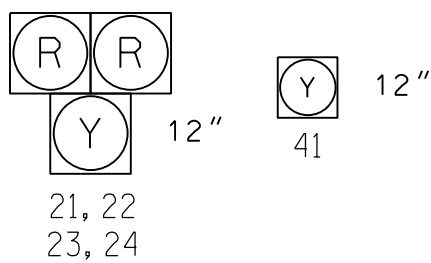
- ←●→ DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←— UN SIGNALIZED MOVEMENT
- ←—> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE					
	02	03	04	05	06	07
21, 22	DRK	FY	Y	R	FR*	Y
23, 24	DRK	FY	Y	R	FR*	Y
41	DRK	DRK	DRK	DRK	FY	DRK

* - Alternating Flash
Y - Steady Yellow
FY - Flashing Yellow
R - Steady Red
FR - Flashing Red
DRK - Dark

SIGNAL FACE I.D.

All Heads L.E.D.



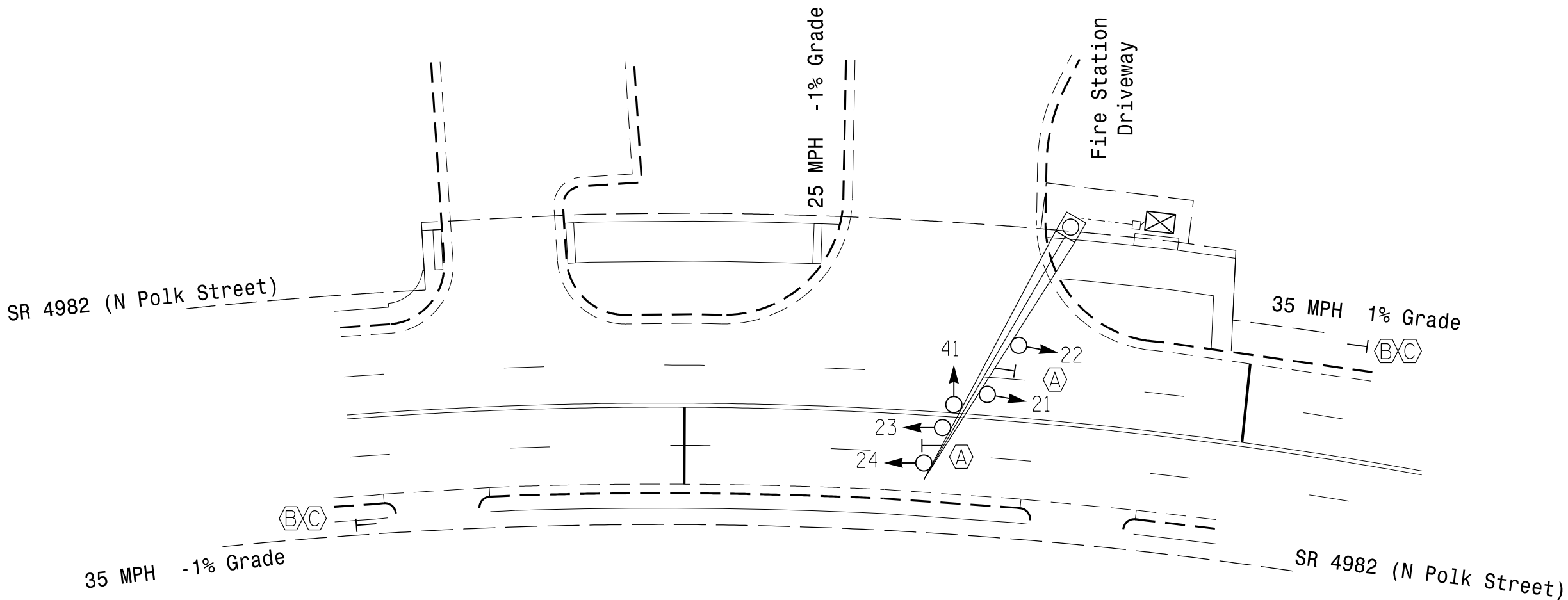
OASIS 2070 EV PREEMPT	
FUNCTION	PRE 2
Interval 1 - Dwell Green	255
Interval 1 - Dwell Yellow	0.0*
Interval 1 - Dwell Red	0.0*
Interval 5 - Exit Green	1
Interval 5 - Yellow	0.0
Interval 5 - Red	0.0
Exit Phase(s)	2
Priority	MEDIUM
Delay Time	* *
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	* *
Enable Backup Protection	N
Ped Clear Through Yellow	N
Omit Overlaps	-
Preempt Extend	-

* Time defaults to time used for phase during normal operation
** See Note #5

2 Phase
Semi Actuated
Emergency Hybrid Beacon
Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024 and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website:
<https://connect.ncdot.gov/resources/safety/pages/its-and-signals.aspx>
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Locate emergency vehicle preemption switch in Pineville Fire Station and use wired interconnect.
- The Division Traffic Engineer will determine the Delay Time and Dwell Min Time for the emergency vehicle preemption timing.
- The Division Traffic Engineer shall locate signs B and C in conformance with section 2C of the 2009 MUTCD.
- Signal Head 41 shall remain dark except during the phase 4 green interval (flashing yellow display).



NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/13/2025

DocuSigned by:
Matthew Cowley
ITS & Signals Unit

LEGEND

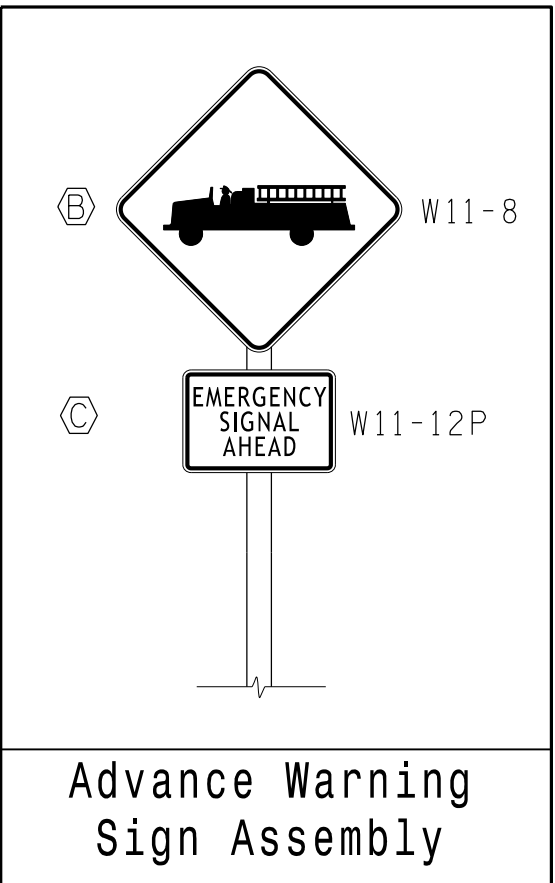
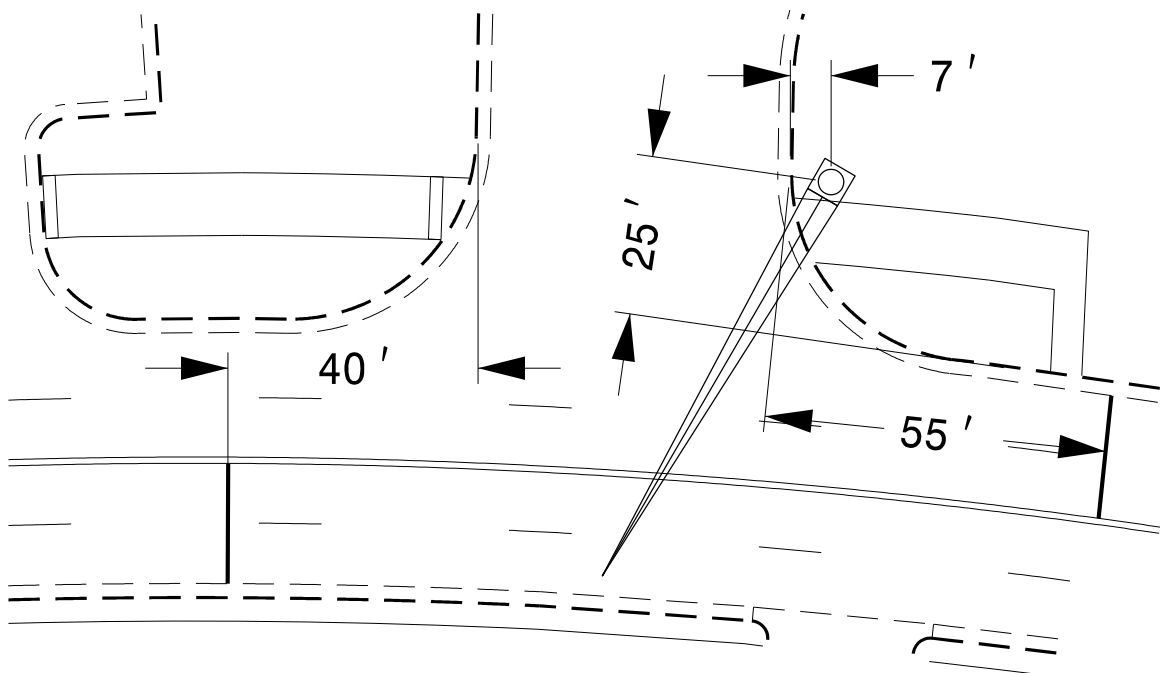
PROPOSED	EXISTING
○→ Traffic Signal Head	→ N/A
●→ Modified Signal Head	→ N/A
□ Pedestrian Signal Head	→ N/A
○→ Signal Pole with Guy	→ N/A
○→ Signal Pole with Sidewalk Guy	→ N/A
□ Inductive Loop Detector	→ N/A
□ Controller & Cabinet	→ N/A
□ Junction Box	→ N/A
2-in Underground Conduit	→ N/A
N/A Right of Way	→ N/A
→ Directional Arrow	→ N/A
(A) "EMERGENCY SIGNAL STOP ON FLASHING RED" Sign (R10-14a)	(A) N/A
(B) Emergency Vehicle Sign (W11-8)	(B) N/A
(C) "EMERGENCY SIGNAL AHEAD" Sign (W11-12P)	(C) N/A

OASIS 2070 TIMING CHART			
FEATURE	PHASE		
	2	OLA	4 (PRE 2)
Min Green 1 *	10	5	7
Extension 1 *	0.0		0.0
Max Green 1 *	30		30
Yellow Clearance	5.0	3.9	3.0
Red Clearance	2.0	5.0	0.0
Walk 1 *	-		-
Don't Walk 1	-		-
Seconds Per Actuation *	-		-
Max Variable Initial *	-		-
Time Before Reduction *	-		-
Time To Reduce *	-		-
Minimum Gap	-		-
Recall Mode	MIN RECALL		-
Vehicle Call Memory	-		-
Dual Entry	-		-
Simultaneous Gap	ON		ON

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

- Serves as Steady Yellow Clearance Time
- Serves as Steady Red Clearance Time
- Serves as Flashing Yellow Time

Pavement Marking and Pole Locations

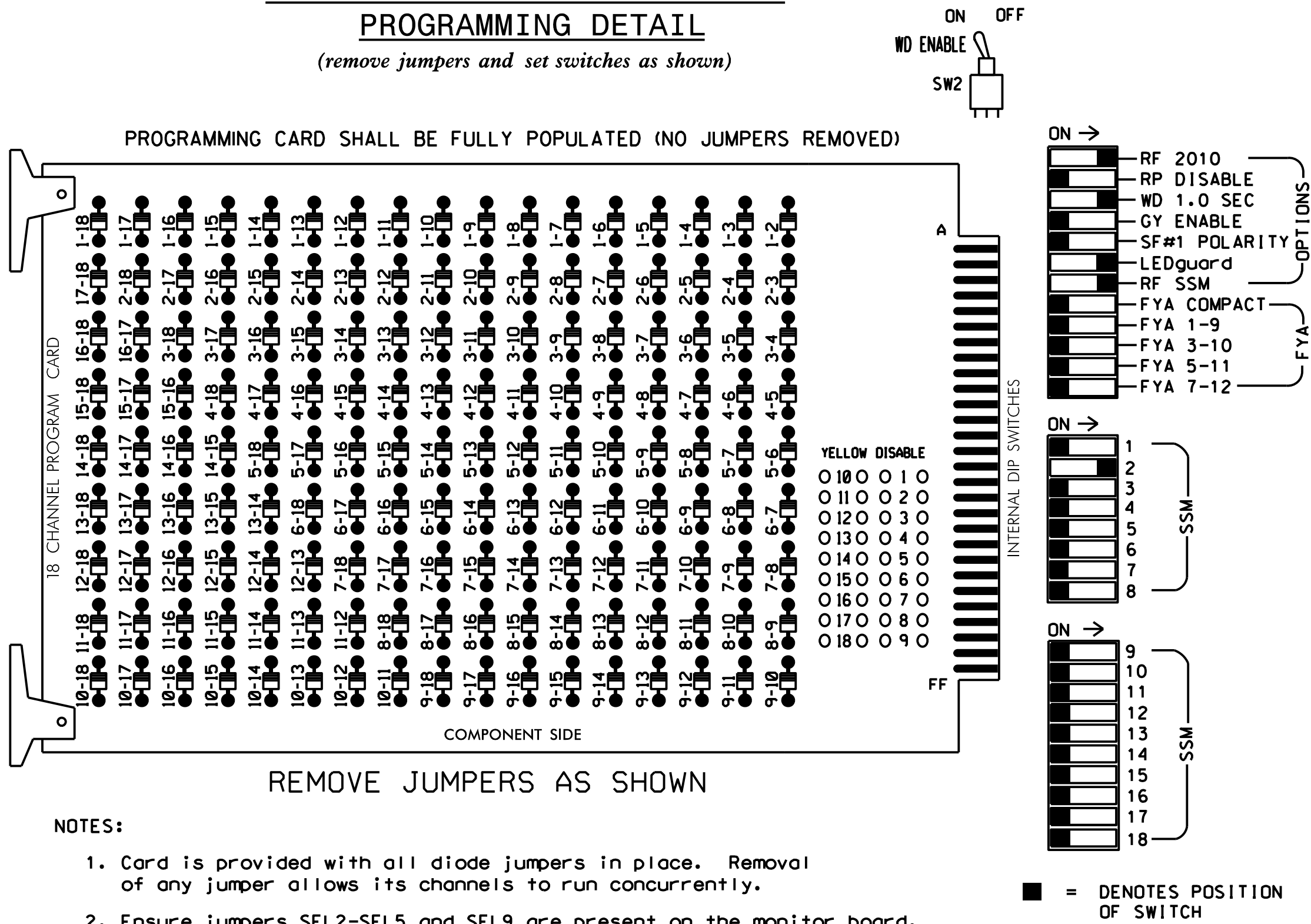


New Installation

Prepared For: Transportation Mobility and Safety Division DIVISION OF TRANSPORTATION Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529		SR 4982 (N Polk Street) at Fire Station Driveway		SEAL NORTH CAROLINA SEAL 046300 ENGINEER NICHOLAS E. BURNS SIGNED BY: <i>Nicholas E. Burns</i> 4/30/2025 DATE SIG. INVENTORY NO. 10-2567
Division 10 Union County Pineville		PLAN DATE: April 2025 REVIEWED BY: NE Burns		REVISIONS
PREPARED BY: C McDonald IMPACT NO: 23110		INIT. DATE		
IMPACT		SCALE 0 30 1"=30'		DATE
PO BOX 3728 MOORESVILLE, NC 28117 C-4720		1"=30'		

18 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- Insert yellow flash program blocks for phases 1 and 2. Insert red flash program blocks for all remaining unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phase 2 for START UP IN GREEN.
- Program phase 2 for YELLOW FLASH.
- Program phase 2 for STARTUP CALLS.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S5,**S6
PHASES USED.....2,4
OVERLAP "A".....2*
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

* DENOTES PHASE USED TO CONTROL CLEARANCE INTERVALS.
** Denotes S6 is also used for Fire House Preempt Pilot Lamp control

OPERATIONAL NOTES

- In order for controller to perform the "Emergency Veh. Hybrid Beacon" (aka. HAWK signal) sequence, special logic and output programming is necessary. See programming details on sheets 2 and 3 of this electrical detail.
- This sequence uses PHASE 2 YELLOW to produce "flashing yellow clearance" and also uses overlap "A" assigned as phase 2 to provide "steady yellow" clearance interval. Time for this interval shall be implemented in "OL A YELLOW CLEAR" timing. See signal plan for timing.
- Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal. This is necessary so that when flashing yellow clear ends, the steady yellow clear begins.

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

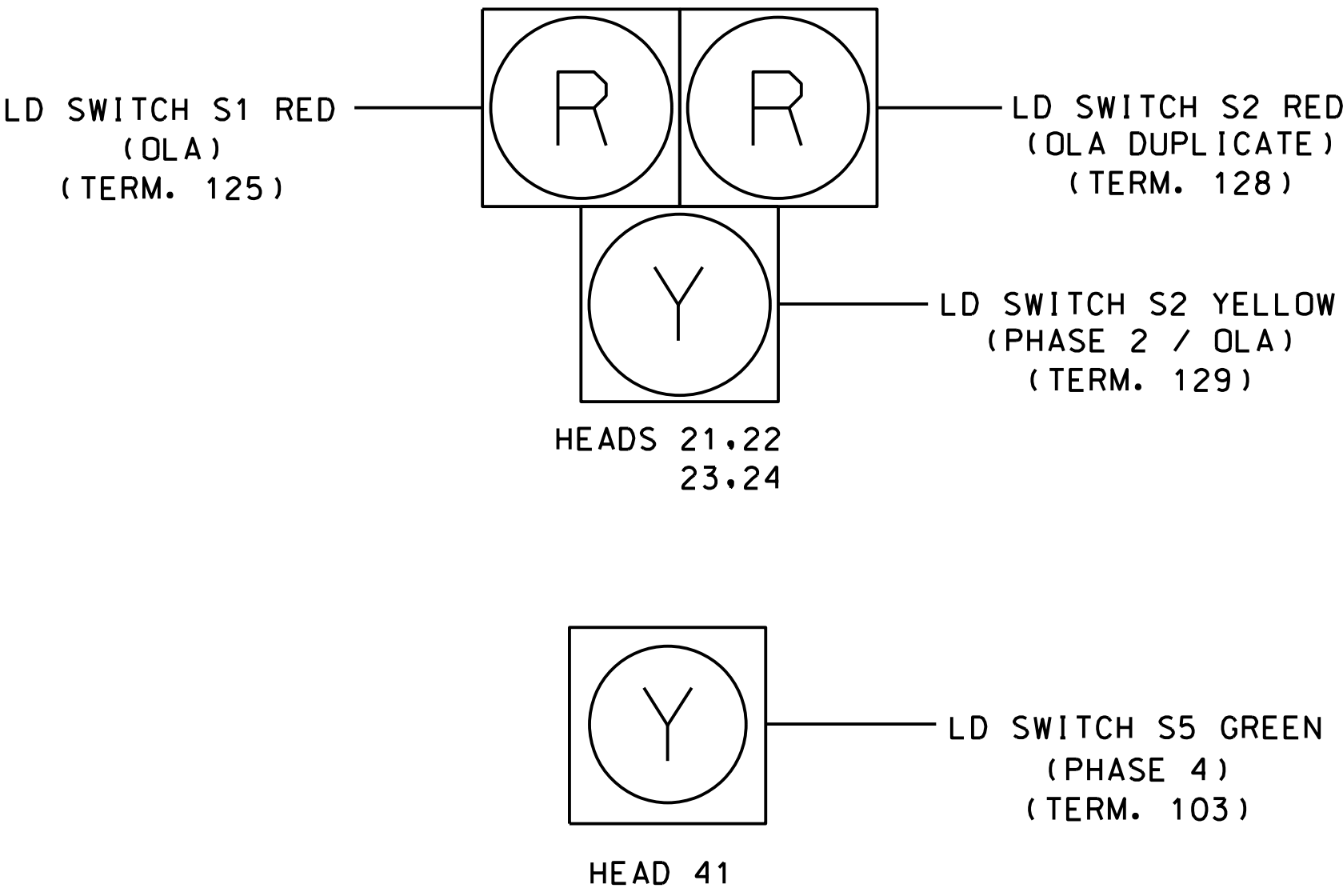
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT: X
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW - GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).....5
YELLOW CLEAR (0=PARENT.3-25.5 SEC)...3.9
RED CLEAR (0=PARENT.0.1-25.5 SEC)...5.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0

NOTICE
TIMING
INTERVALS

OVERLAP PROGRAMMING COMPLETE

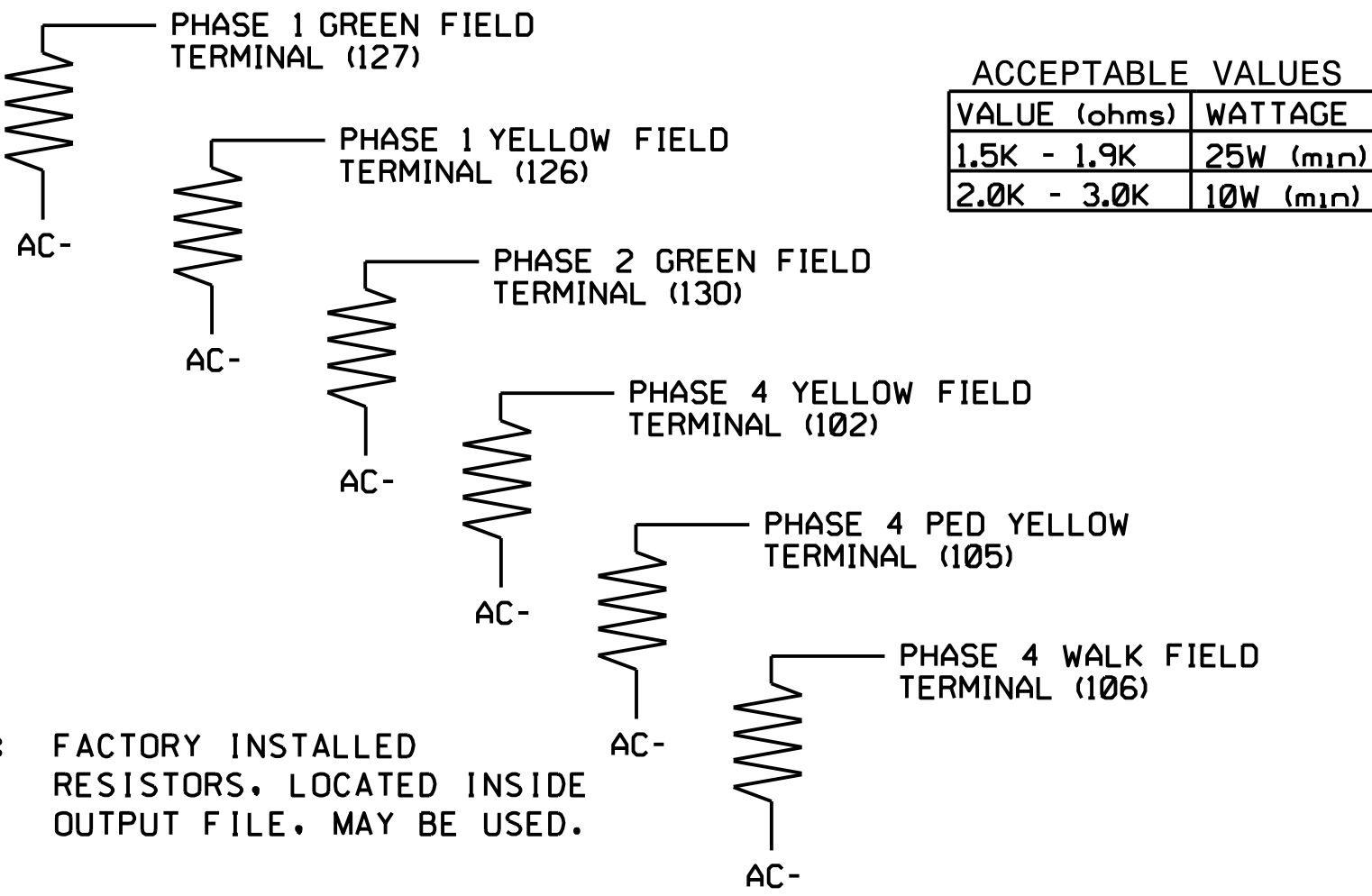
SIGNAL HEAD WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



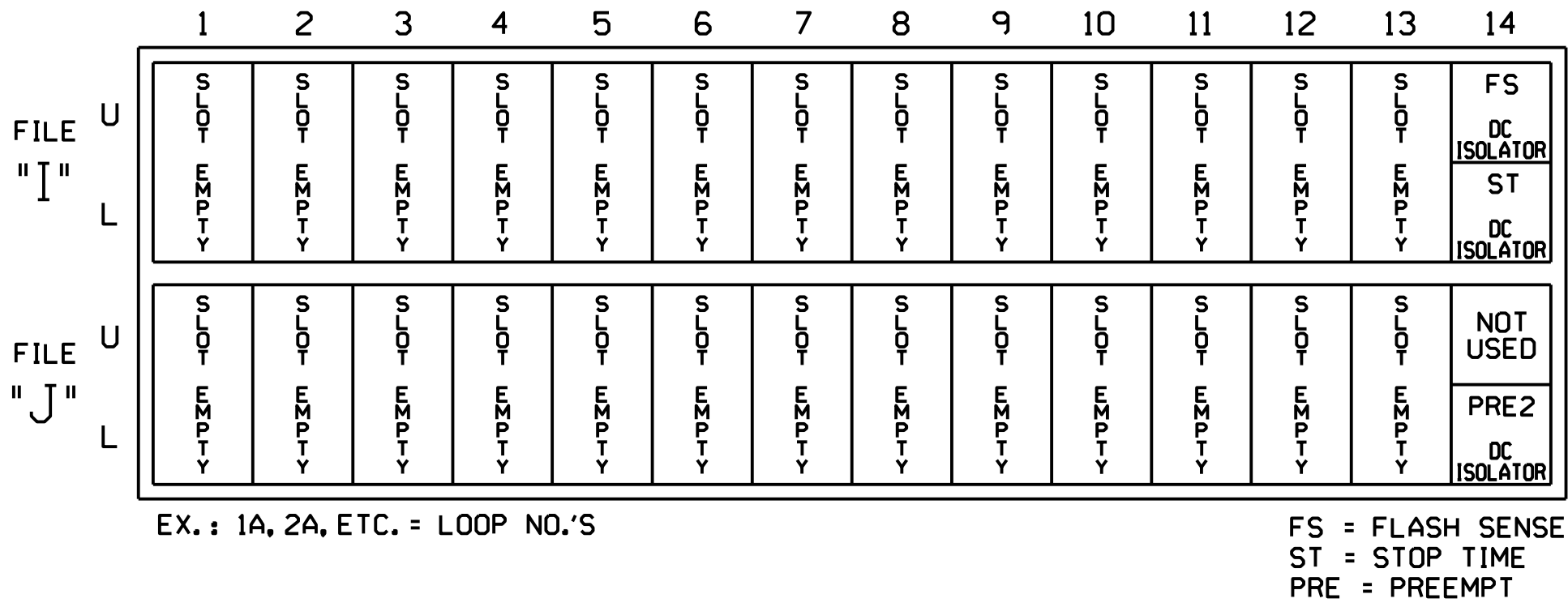
NOTE: FACTORY INSTALLED RESISTORS, LOCATED INSIDE OUTPUT FILE, MAY BE USED.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-2567
DESIGNED: Apr 2025
SEALED: 4/30/2025
REVISED:

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/13/2025
Signed by: *Matthew E. Burns*
ITS & Signals Unit

INPUT FILE POSITION LAYOUT

(front view)



TIMING INTERVAL SCHEDULE

PHASE 2 YELLOW CLEAR TIME = FLASHING YELLOW CLEARANCE INTERVAL
OVERLAP "A" YELLOW CLEAR TIME = STEADY YELLOW CLEARANCE INTERVAL
OVERLAP "A" RED CLEAR TIME = ALL RED CLEARANCE INTERVAL

NOTE: Phase 2 YELLOW CLEARANCE and OLA GREEN EXTENSION times must be equal.

Electrical Detail
Sheet 1 of 4

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 4982 (N Polk Street) at Fire Station Driveway		SEAL NORTH CAROLINA PROFESSIONAL SEAL 046300 ENGINEER MATTHEW E. BURNS Signed by: <i>Matthew E. Burns</i> 4/30/2025 DATE SIG. INVENTORY NO. 10-2567
	Division 10 Union County Pineville		
	PLAN DATE: April 2025	REVIEWED BY: NE Burns	
	PREPARED BY: C McDonald	IMPACT NO: 23110	
REVISIONS		INIT.	DATE
IMPACT PO BOX 3728 MOORESVILLE, NC 28117 C-4720			

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL EMERGENCY VEH. HYBRID BEACON SEQUENCE

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #33 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #11 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4.

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #4 IS ON
AND OUTPUT ASSIGNMENT #33 IS OFF

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #14 OFF

NOTE: LOGIC TO WIG-WAG THE RED INDICATIONS ON HEADS 21, 22, 23 & 24 DURING PHASE 4.

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF GREEN ON OVERLAP #1 IS ON
OR GRN EXT ON OVERLAP #1 IS ON
OR YELLOW ON OVERLAP #1 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #11 OFF
SET OUTPUT ASSIGNMENT #14 OFF

NOTE: LOGIC TO ENSURE THAT RED INDICATIONS OF HEADS 21,22,23,24 REMAIN DARK UNTIL YELLOW CLEARANCE INTERVALS ARE FINISHED TIMING.

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF INPUT ASSIGNMENT #14 IS ON
OR ACTIVE PREEMPTION #2 IS ON

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #35 ON

NOTE: FIREHOUSE PILOT LAMP LOGIC.

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

IO REFERENCE SCHEDULE

OUTPUT 11 = OLA RED
OUTPUT 14 = OLA RED (DUPLICATE)
OUTPUT 33 = OUT OF PHASE FLASHER
OUTPUT 34 = ADVANCE BEACON 1
OUTPUT 35 = PED 4 YEL (PILOT LAMP)
INPUT 14 = PREEMPT 2 IN

Note: Outputs 11, 14, 33 & 34 have been remapped. See detail on sheet 3.

EMERGENCY VEHICLE PREEMPTION
PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press the 'Next' key to advance to Preempt 2:

PRE2:

PREEMPTION	#2	SETTINGS (NEXT:1-10)
INTERVAL/TIMING		CLEAR/DWELL PHASES
GRN YEL RED		12345678910111213141516
1 255 0.0 0.0		X
2 0 0.0 0.0		
3 0 0.0 0.0		
4 0 0.0 0.0		
5 1 0.0 0.0		X

EXIT CALLS

OPTIONS

PRIORITY (Y/N TO SELECT)MED
DELAY TIMER (0-255 SEC)*
MIN GREEN BEFORE PRE (0= DEFAULT)...1
PED CLEAR BEFORE PRE (0= DEFAULT)...0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)...0.0
DWELL MIN TIMER (0-255 SEC)*
DWELL MAX TIMER (0=OFF,1-255MIN)0
DWELL HOLD-OVER TIMER (0-255)0
LATCH CALL?Y
LINK TO NEXT PREEMPT?N
ENABLE BACKUP PROTECTION?N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES?N
PED CLEARANCE THROUGH YELLOW?N
INHIBIT OVERLAP GREEN EXTENSION?N
SERVICE DURING SOFTWARE FLASH?N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL?N
ALLOW PEDS IN DWELL INTERVAL?N
RE-TIME DWELL INTERVAL?N
OVERLAPS: ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW
OMIT OVERLAPS:

PROGRAMMING COMPLETE

* DENOTES TIMING TO BE DETERMINED IN FIELD

ADVANCE BEACON PROGRAMMING DETAIL

(program controller as shown below)

1. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '2' (OUTPUT BEACON SETTINGS).

OUTPUT BEACON SETTINGS				
TRIGGER PHASES:	12345678910111213141516			
BEACON #1 OFF	X			
BEACON #2 OFF				
BEACON #3 OFF				
BEACON #4 OFF				
BEACON	1	2	3	4
OFF DELAY TIME (0-255);	0	0	0	0
ON DELAY TIME (0-255);	0	0	0	0
STOP-TIME HOLD (0-255);	0	0	0	0

NOTE: ADVANCE BEACON IS USED TO CONTROL THE WIG-WAG RED INDICATION OF HEADS 21, 22, 23 AND 24. OUTPUTS HAVE TO BE ASSIGNED APPROPRIATELY. SEE SHEET 3 OF THIS ELECTRICAL DETAIL.

GREEN INTERVAL FLASH PROGRAMMING DETAIL

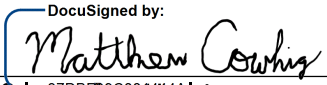
IN ORDER TO MAKE SIGNAL HEAD 41 FLASH DURING PREEMPTION DWELL, PHASE 4 WILL HAVE TO BE PROGRAMMED FOR "GREEN INTERVAL FLASH."

FROM THE OASIS MAIN MENU PRESS 2 (PHASE CONTROL) THEN "1" (PHASE CONTROL FUNCTIONS). SCROLL DOWN 15 ROWS TO ARRIVE AT THE "GREEN INT FLASH" FUNCTION - ENABLE PHASE 4.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2567
DESIGNED: Apr 2025
SEALED: 4/30/2025
REVISED:

NC Dept of Transportation
Division of Highways

Final Drawing Date: 5/13/2025

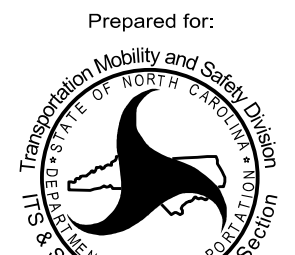
Signed by: 
ITS & Signals Unit

Electrical Detail
Sheet 2 of 4

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for:



750 N. Greenfield Pkwy, Garner, NC 27529

SR 4982 (N Polk Street)
at
Fire Station Driveway

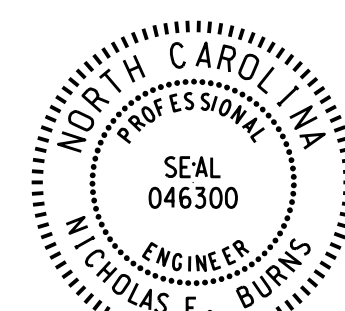
Division 10 Union County Pineville

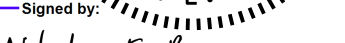
PLAN DATE: April 2025 REVIEWED BY: NE Burns

PREPARED BY: C McDonald IMPACT NO: 23110

REVISIONS INIT. DATE

SEAL



Signed by: 

Nicholas E. Burns 4/30/2025

152489F1FC8442 DATE

SIG. INVENTORY NO. 10-2567

IMPACT

PO BOX 3728
MORRISVILLE, NC 28117
C-4720

OUTPUT REMAPPING DETAIL FOR
SPECIAL EMERGENCY VEHICLE HYBRID BEACON SEQUENCE
(program controller as shown)

START HERE

FROM MAIN MENU PRESS '6' (OUTPUTS), THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION, ENTER "11"

PAGE:1 C1 PIN:12 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....11
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

PAGE:1 C1 PIN:12 VEHICLE PHASE
SELECT VEHICLE OVERLAP (A=1,P=16)...1
SELECT COLOR(O=RED,1=YEL,2=GRN)...0

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

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED
TO DRIVE LOAD SWITCH S2 RED.

PRESS "+" KEY TO ADVANCE TO OUTPUT 12

PAGE:1 C1 PIN:13 VEHICLE PHASE
OUTPUT ASSIGNMENT #.....12
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...50
MODE (O=SOLID,1=FLASH)...1
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y

MODIFY DATA AS SHOWN
TO MAKE OUTPUT 12 A
FLASHING OUTPUT

NOTE: THIS MODIFIES THE PHASE 2 YELLOW
LOAD SWITCH DRIVER TO FLASH, WHICH
WILL PROVIDE THE FLASHING YELLOW
CLEARANCE INTERVAL.

PRESS "+" KEY TWICE TO ADVANCE TO OUTPUT 14

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

THIS OUTPUT IS DEFAULTED AS A VEHICLE PHASE.
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR VEHICLE OVERLAP.

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

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

NOTE: THIS CHANGE REMAPS OVERLAP "A" RED
TO DRIVE LOAD SWITCH S1 RED.

PRESS "+" KEY TO MULTIPLE TIMES TO ADVANCE TO OUTPUT 51

CHANGE C1 PIN NUMBER FROM 98 TO 13 AS SHOWN

PAGE:1 C1 PIN:13 VEHICLE OVERLAP
OUTPUT ASSIGNMENT #.....51
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...0
MODE (O=SOLID,1=FLASH)...0
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y

NOTE: THIS CHANGE REMAPS THE OVERLAP "A"
YELLOW DRIVER TO THE SAME PIN AS PHASE
2 YELLOW, WHICH WILL PROVIDE THE OUTPUT
FOR THE STEADY YELLOW CLEARANCE.

PRESS "-" MULTIPLE TIMES TO ADVANCE TO OUTPUT 33

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

THIS OUTPUT IS DEFAULTED AS "NOT ENABLED."
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR OUT OF PHASE FLASHER.

PAGE:1 C1 PIN:35 NOT ENABLED
SELECT OUTPUT ASSIGNMENT (1-64).....34

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

PRESS "+" KEY ONCE TO ADVANCE TO OUTPUT 34

NOTE: THIS CHANGE ALLOWS THE OUT OF PHASE
FLASHER TO DRIVE LOAD SWITCH S1 RED
(THROUGH LOGIC PROGRAMMING),
WHICH WILL PROVIDE THE WIG-WAG RED.

PAGE:1 C1 PIN:36 NOT ENABLED
OUTPUT ASSIGNMENT #.....34
FREQUENCY (O=DEFAULT) (0-25.5 HZ)...1.0
DUTY CYCLE (O=DEFAULT) (0 - 100%)...50
MODE (O=SOLID,1=FLASH)...1
SELECT ASSIGNMENT:
NOT ENABLED.....Y
VEHICLE PHASE.....Y
PEDESTRIAN PHASE.....Y
VEHICLE OVERLAP.....Y
PEDESTRIAN OVERLAP.....Y
WATCHDOG.....Y
DETECTOR RESET.....Y
ADVANCE BEACON.....Y
OUT OF PHASE FLASHER.....Y
CONTROLLER FLASH.....Y
RUN FREE.....Y
RESERVED.....Y
PREEMPT.....Y
SOFT PREEMPT.....Y
ANY PREEMPT.....Y
COORDINATION PLAN.....Y
OFFSET.....Y
PHASE CHECK.....Y
PHASE ON.....Y
PHASE NEXT.....Y

MODIFY DATA AS SHOWN
TO MAKE OUTPUT 34 A FLASHING OUTPUT

THIS OUTPUT IS DEFAULTED AS "NOT ENABLED."
THIS SETTING WILL REMAIN UNTIL CHANGE IS MADE.

ENTER A "Y" FOR ADVANCE BEACON.

PAGE:1 C1 PIN:36 NOT ENABLED
SELECT BEACON INDEX (1-4).....1

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

NOTE: THIS CHANGE ALLOWS THE ADVANCE
BEACON TO DRIVE LOAD SWITCH S2 RED
(THROUGH LOGIC PROGRAMMING),
WHICH WILL PROVIDE THE WIG-WAG RED.

OUTPUT PROGRAMMING COMPLETE

Electrical Detail
Sheet 3 of 4

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2567
DESIGNED: Apr 2025
SEALED: 4/30/2025
REVISED:

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/13/2025
DocuSigned by:
Matthew Cowley
ITS & Signals Unit

IMPACT
PO BOX 3728
MOORESVILLE, NC 28117
C-4720

ELECTRICAL AND PROGRAMMING
DETAILS FOR:
Prepared for:
750 N. Greenfield Pkwy, Garner, NC 27529

SR 4982 (N Polk Street)
at
Fire Station Driveway

Division 10 Union County Pineville

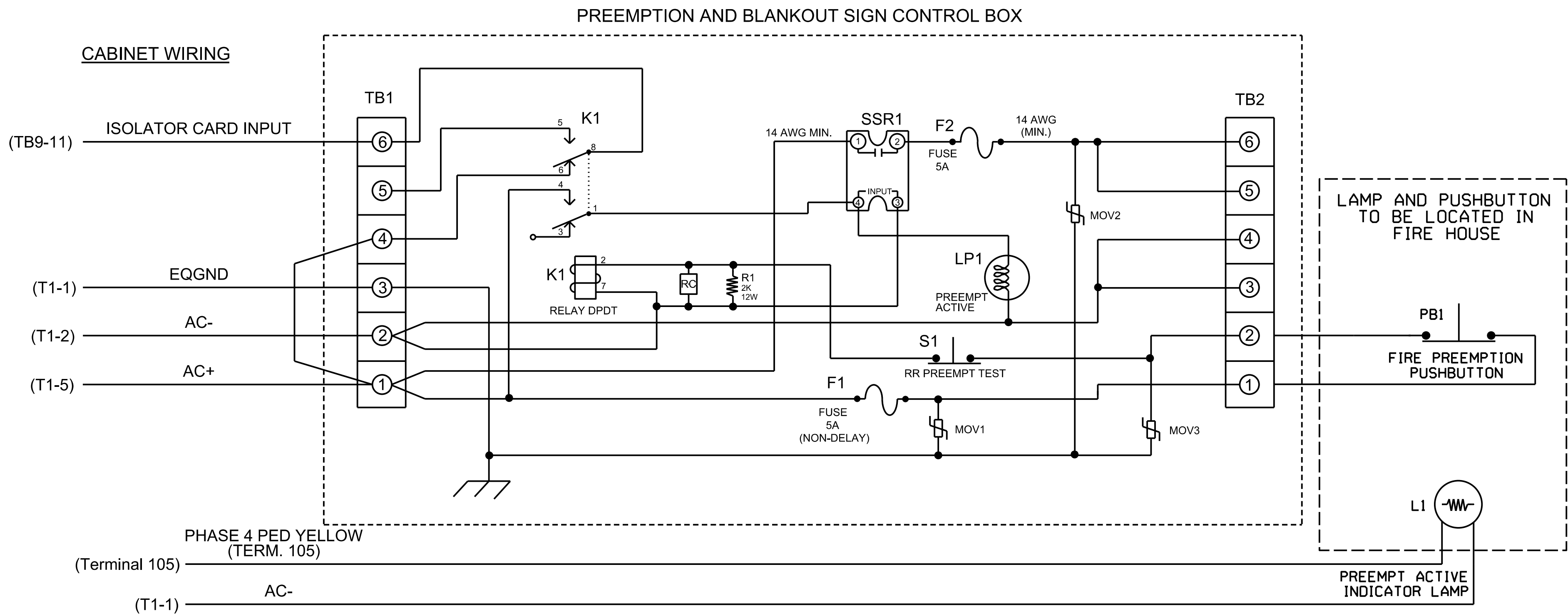
PLAN DATE: April 2025 REVIEWED BY: NE Burns

PREPARED BY: C McDonald IMPACT NO: 23110

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
046300
ENGINEER
MICHAEL E. BURNS
Signed by:
Michael E. Burns 4/30/2025
DATE
SIG. INVENTORY NO. 10-2567

(wire as shown below)



1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.

5. **IMPORTANT!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

Diagram of the RR Preempt Test circuit. The circuit includes a LAMP, a PB (Push Button), FUSE 1 (5 AMP), and FUSE 2 (5 AMP). The LAMP is labeled "PREEMPT ACTIVE".

The terminal block TB1 is connected to TB2 as follows:

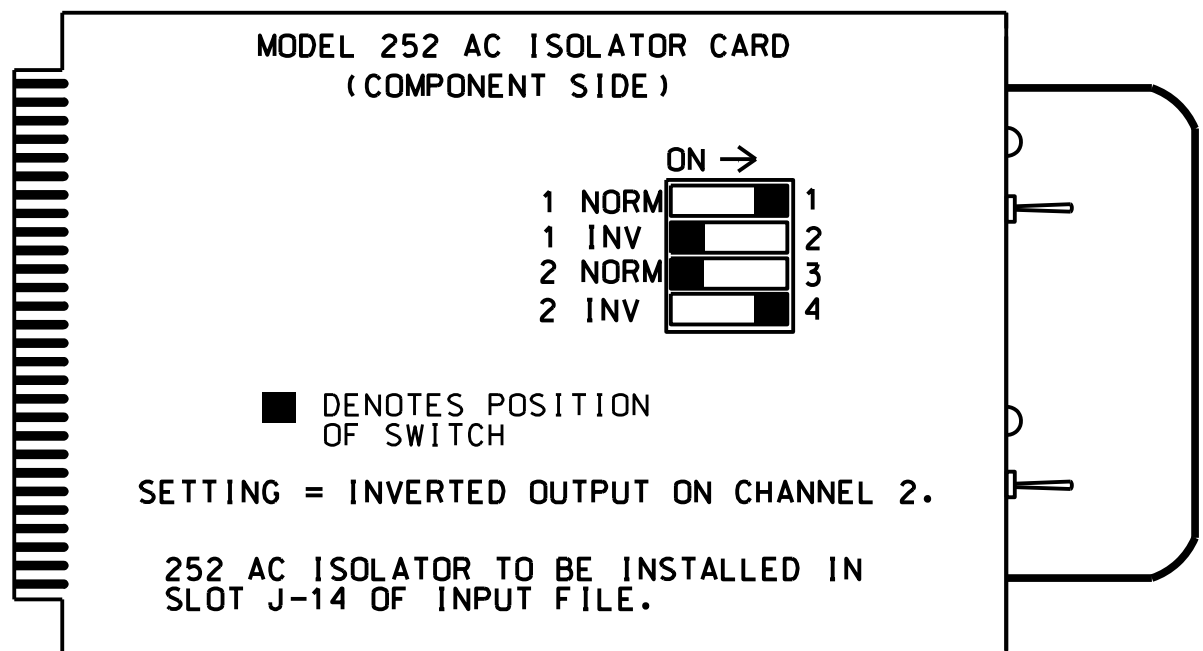
- AC+ connects to terminal 1
- AC- connects to terminal 2
- GND connects to terminal 3
- REL NO connects to terminal 4
- REL NC connects to terminal 5
- REL COM connects to terminal 6

Labels for TB2 terminals:

- Terminals 1, 2, and 3 are labeled "TO RR TRACK SWITCH".
- Terminals 4 and 5 are labeled "SIGN AC-".
- Terminal 6 is labeled "SIGN AC+".

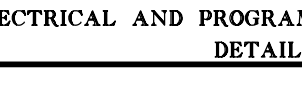
1. Make sure load resistor is in place as shown in the Load Resistor Installation Detail on sheet 1.
2. Install a loadswitch in Output File Slot S6.
3. If field terminal 105 has a conflict monitor wire attached, remove, tape and label wire.

(set **DIP** switches as shown below)

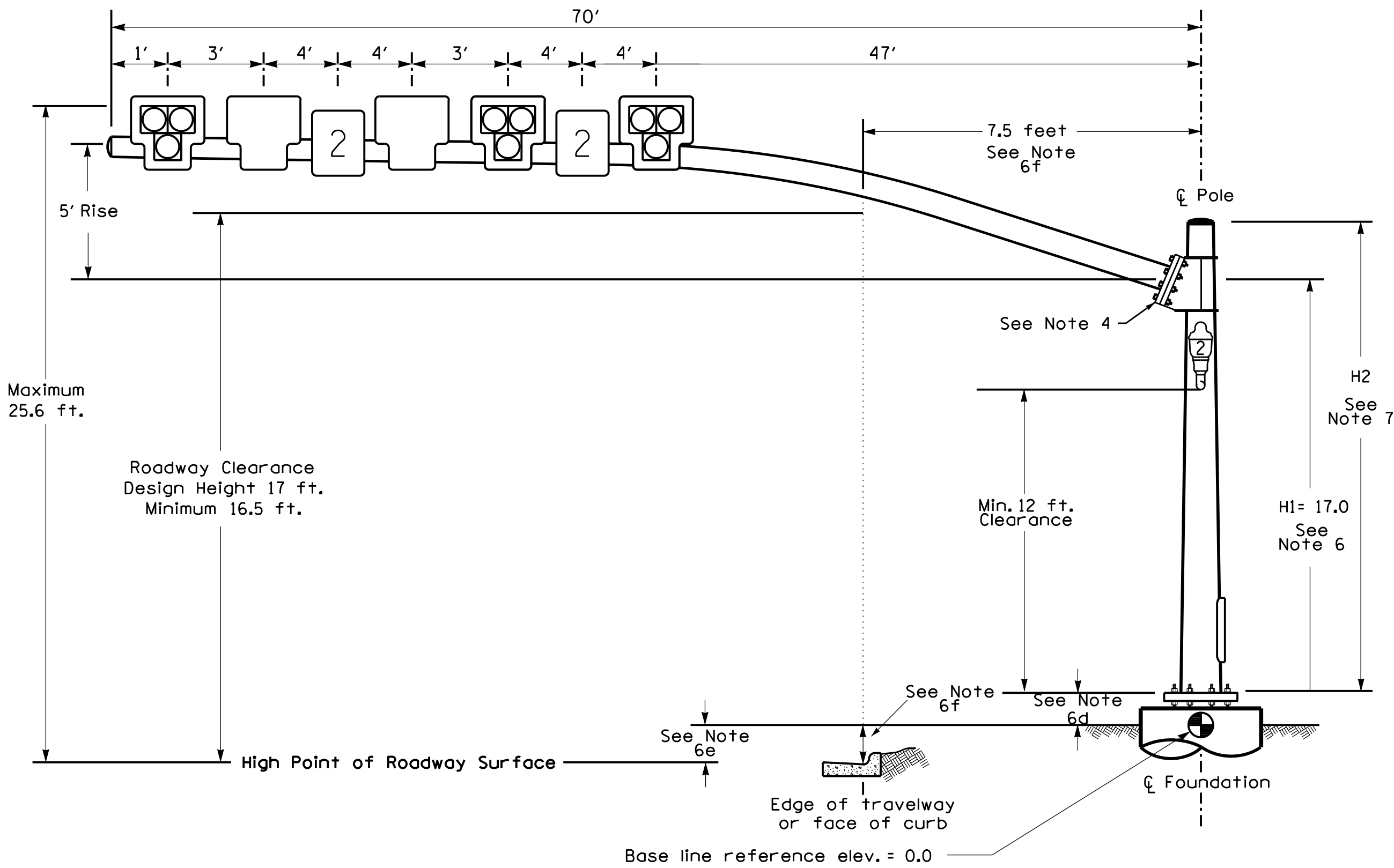


NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED,
OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

Electrical Detail
Sheet 4 of 4

Sheet 4 of 4		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED																																											
ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared for:		SR 4982 (N Polk Street) at Fire Station Driveway <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Division 10</td> <td style="width: 33%;">Union County</td> <td style="width: 33%;">Pineville</td> </tr> <tr> <td>PLAN DATE: April 2025</td> <td>REVIEWED BY: NE Burns</td> <td></td> </tr> <tr> <td>PREPARED BY: C McDonald</td> <td>IMPACT NO: 23110</td> <td></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">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> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <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>		Division 10	Union County	Pineville	PLAN DATE: April 2025	REVIEWED BY: NE Burns		PREPARED BY: C McDonald	IMPACT NO: 23110		REVISIONS	INIT.	DATE																														
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Design Loading for METAL POLE NO. 1



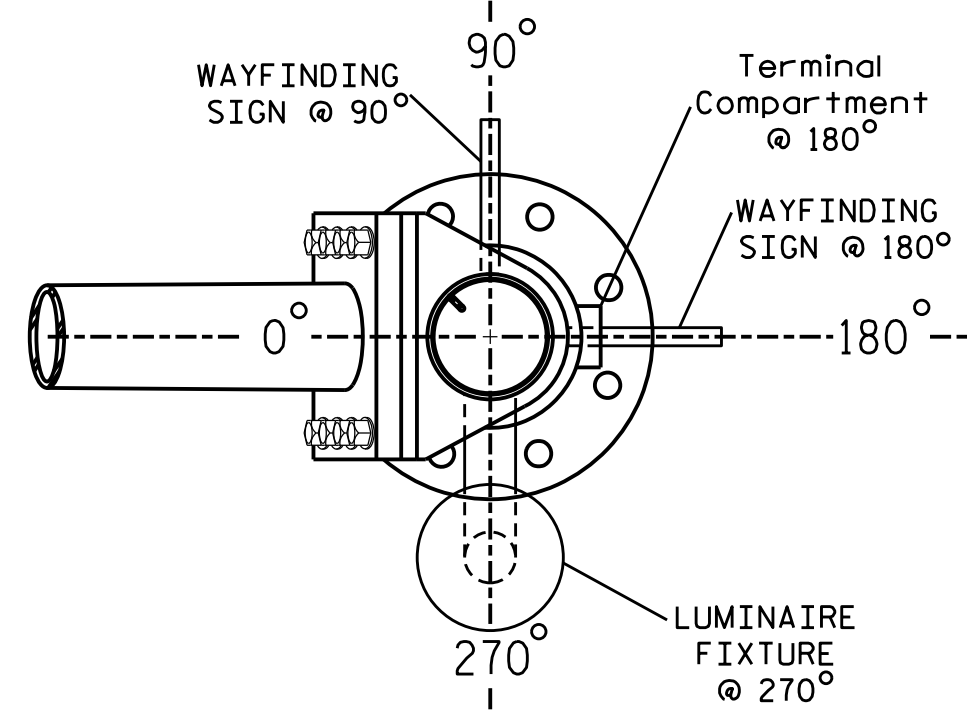
Elevation View

SPECIAL NOTE

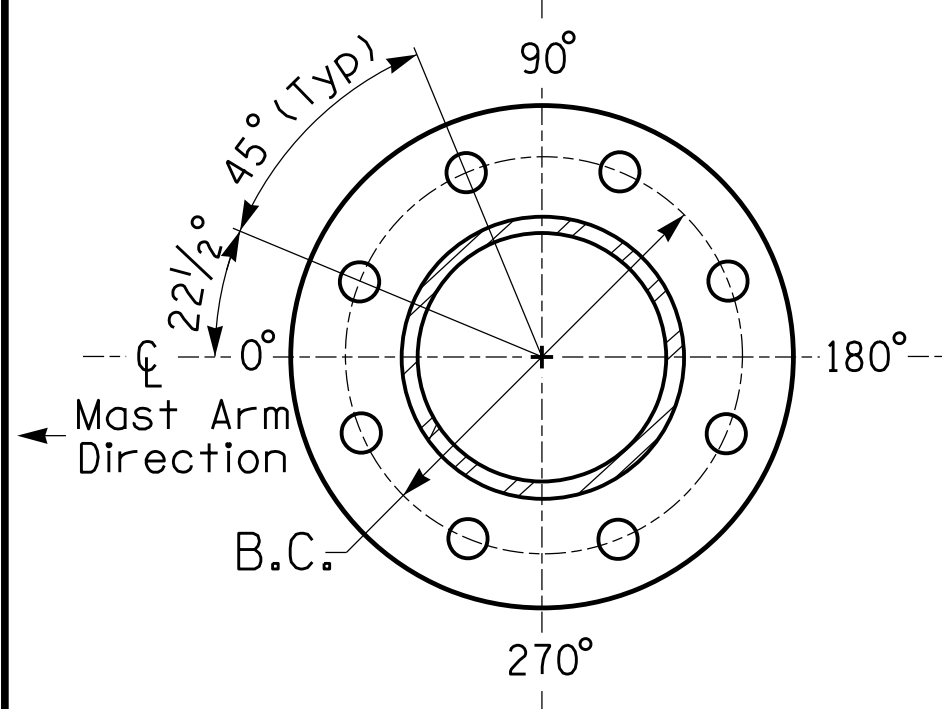
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	POLE 1	
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+/-1.0 ft.	
Elevation difference at Edge of travelway or face of curb	+/-1.0 ft.	

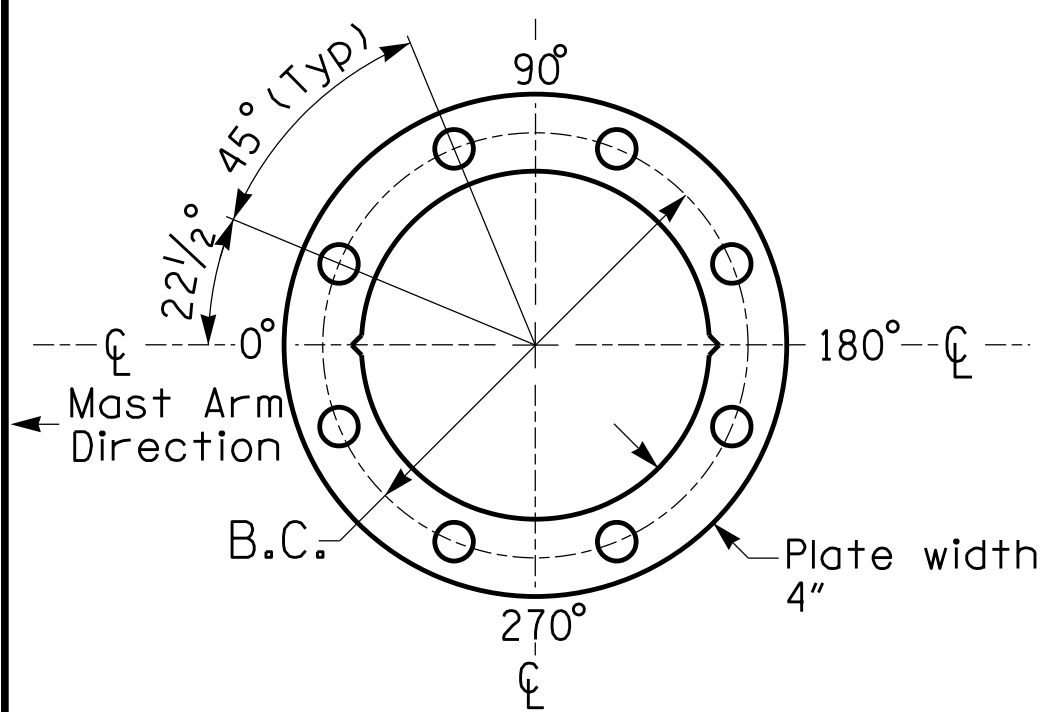


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
36249.4892	Sig-2.5

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	16.3 S.F.	42.0"W X 42.0"L	90 LBS
	DECORATIVE OUTDOOR POLE-MOUNTED LUMINAIRE	1.4 S.F.	31.0"W X 13.0"L	47 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 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2024 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

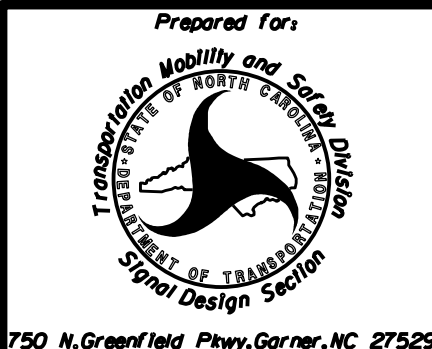
- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using force ratios that do not exceed 0.9.
- 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:
 - Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
 - 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.
 - Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the arm.
- 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.

- A black protective coating shall be used on all metal poles and arms as specified in the project special provisions.
- All metal poles are required to be fluted as specified in the project special provisions.
- See the intersection of NC 51 (Main Street) and Johnston Drive for reference.

NC Dept of Transportation
Division of Highways
Final Drawing Date: 5/13/2025

ITS & Signal Design Unit

NCDOT Wind Zone 5 (110 mph)



SR 4982 (N Polk Street)
at
Fire Station Driveway

Division 10 Union County Pineville
PLAN DATE: April 2025 REVIEWED BY: N.E. Burns
PREPARED BY: C. McDonald IMPACT NO: 23110

SCALE
0 N/A
N/A

REVISIONS	INIT.	DATE

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FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
046300
ENGINEER
NICHOLAS E. BURNS
Signed by:
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