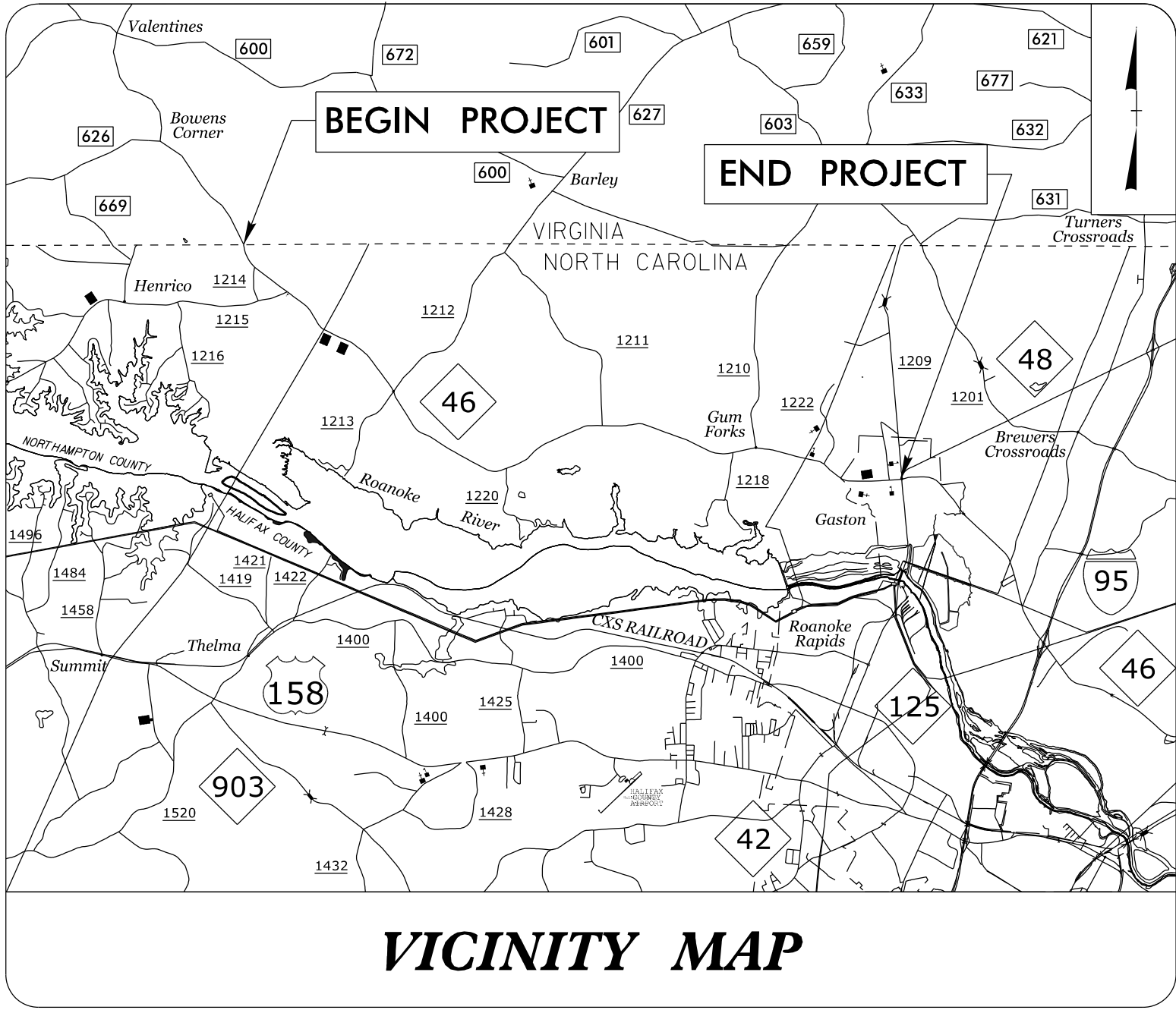


09/08/24

TIP PROJECT: R-5739

CONTRACT:



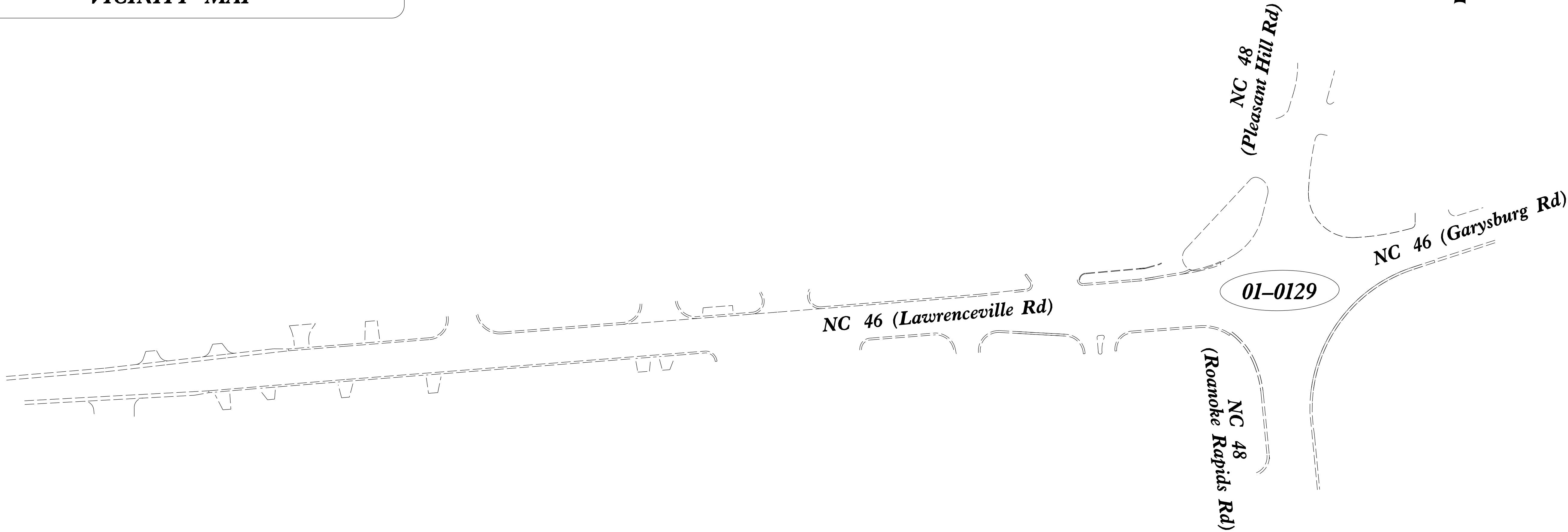
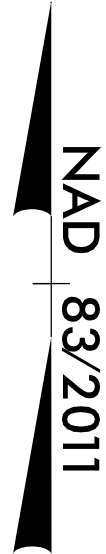
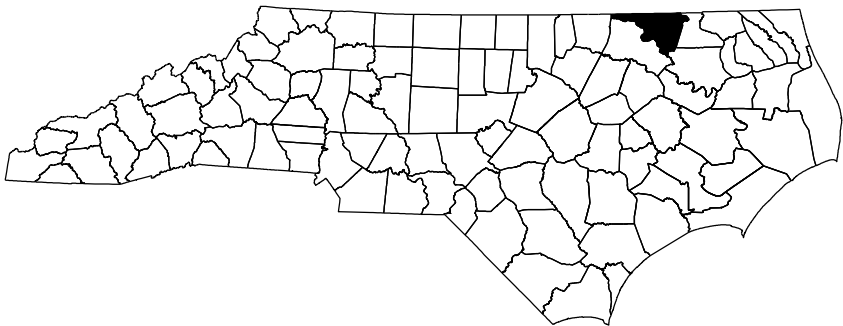
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NORTHAMPTON COUNTY

LOCATION: NC 46 FROM NC 48 IN GASTON TO
THE VIRGINIA STATE LINE

TYPE OF WORK: TRAFFIC SIGNAL



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

INDEX OF PLANS

Sheet #	Reference #	Location /Description
Sig. 1.0	-----	Title Sheet
Sig. 2.0-2.1	01-0129	NC 46(Lawrenceville Rd /Garysburg Rd) at NC 48 (Pleasant Hill Rd /Roanoke Rapids Rd)

LEGEND

- #### SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

Zachary Little, PE – Eastern Region Signals Engineer
Todd Joyce, PE – Signal Equipment Design Engineer

Prepared for the North Carolina Department of Transportation
In the Office of:



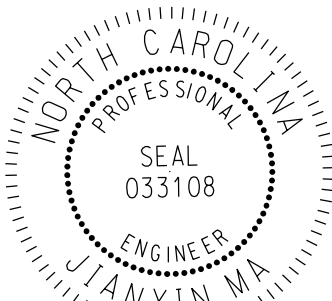
VHB Engineering NC, P.C. (C-3705)
940 Main Campus Drive, Suite 500
Raleigh, NC 27606
919.829.0328

Refer to Roadway Standard
Drawings NCDOT” dated
January 2024 and Standard
Specifications for Roads
and Structures” dated
January 2024.

Burke Evans, PE
PROJECT ENGINEER

Jianxin(Justine) Ma, PE PTOE
PROJECT DESIGN ENGINEER

SEAL



DocuSigned by
Jianxin Ma
027E195308144AF...
SIGNATURE
10/28/2024
DATE

DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY
AND SAFETY DIVISION



750 N. Greenfield Parkway, Garner, NC 27529

8 Phase
Fully Actuated
Isolated

NOTES

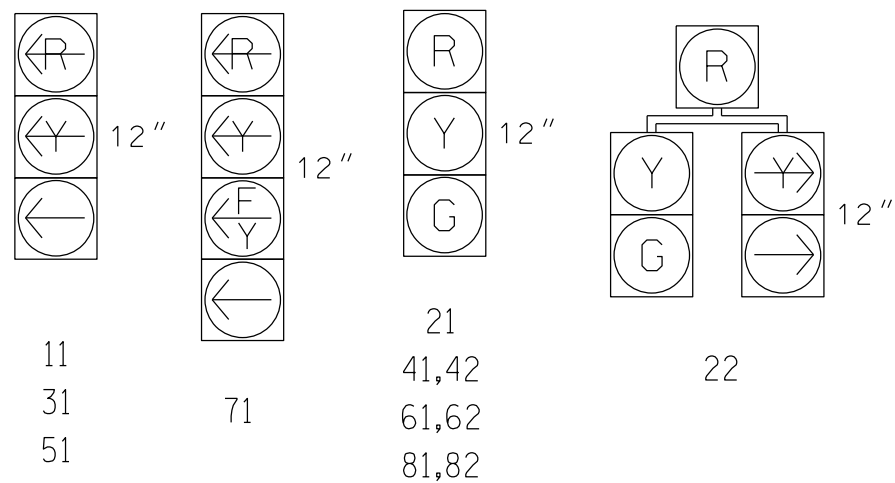
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024, "Standard Specifications for Roads and Structures" dated January 2024, and all applicable sections of the latest version of the generic Project Special Provisions.
- Do not program signal for late night flashing operation unless otherwise 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.
- In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
- Reposition existing signal heads 51, 21 and 22.
- Install new controller in existing cabinet.
- Refer to Pavement Marking Plans for pavement markings.

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A	6X40	0	2-4-2	-	1	3.0	-	X	-	X	-
2A	6X40	0	2-4-2	X	2	-	-	X	-	X	-
3A	6X40	0	2-4-2	-	3	3.0	-	X	-	X	-
4A	6X40	0	2-4-2	-	4	10.0	-	X	-	X	-
5A	6X40	0	2-4-2	X	5	3.0	-	X	-	X	-
6A	6X40	0	2-4-2	-	6	-	-	X	-	X	-
6B	6X40	0	2-4-2	-	6	-	-	X	-	X	-
7A	6X40	0	2-4-2	-	7	15.0	-	X	-	X	-
8A	6X40	0	2-4-2	-	8	3.0	-	X	-	X	-

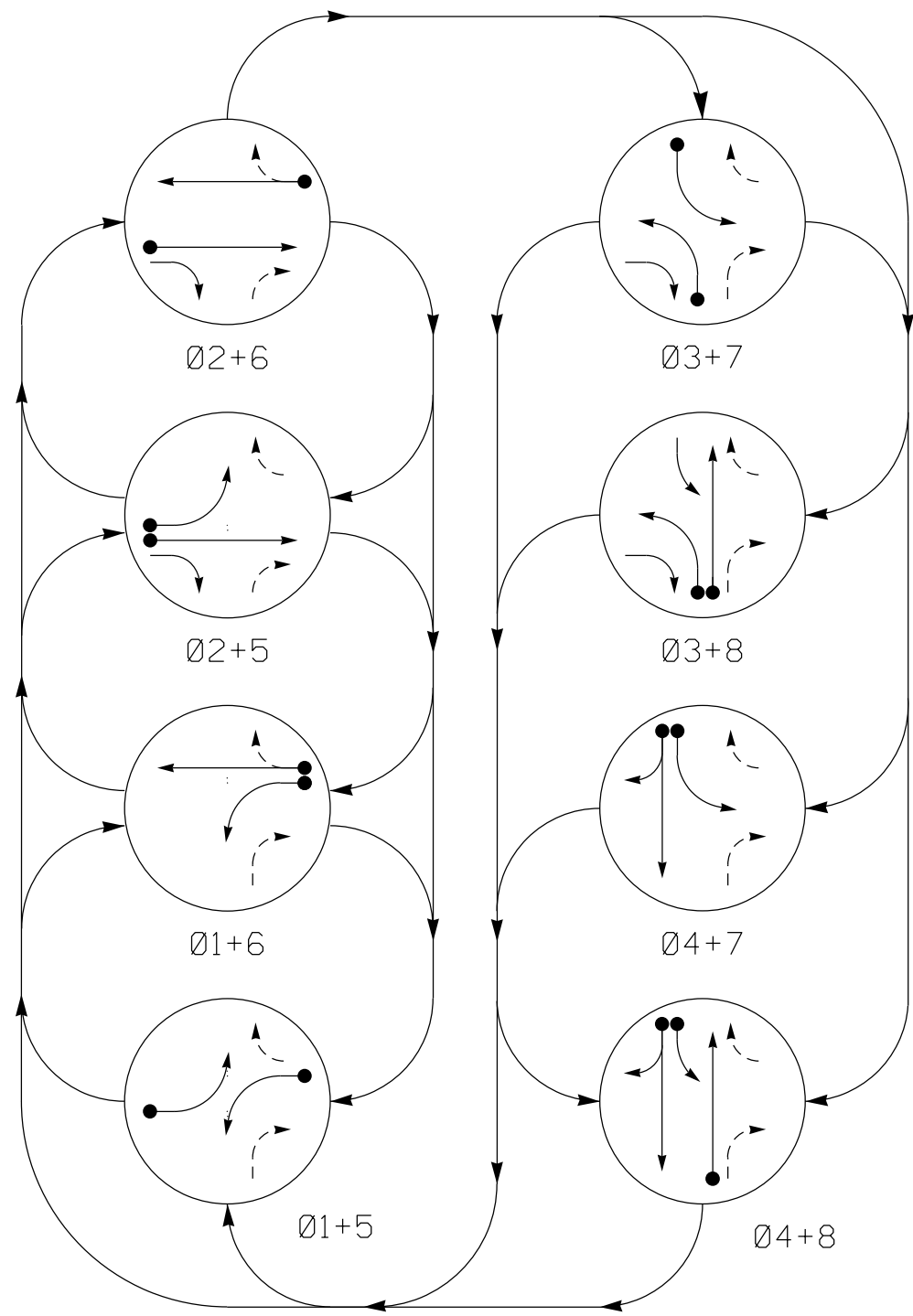
TABLE OF OPERATION											
SIGNAL FACE	PHASE										
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8	PEDESTAL	PEDESTAL	PEDESTAL
11	←	←	←	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	R	R	R	R
22	R	R	G	G	R	R	R	R	R	R	R
31	←	←	←	←	←	←	←	←	←	←	←
41,42	R	R	R	R	R	R	G	G	R	R	R
51	←	←	←	←	←	←	←	←	←	←	←
61,62	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

SIGNAL FACE I.D.

All Heads L.E.D.

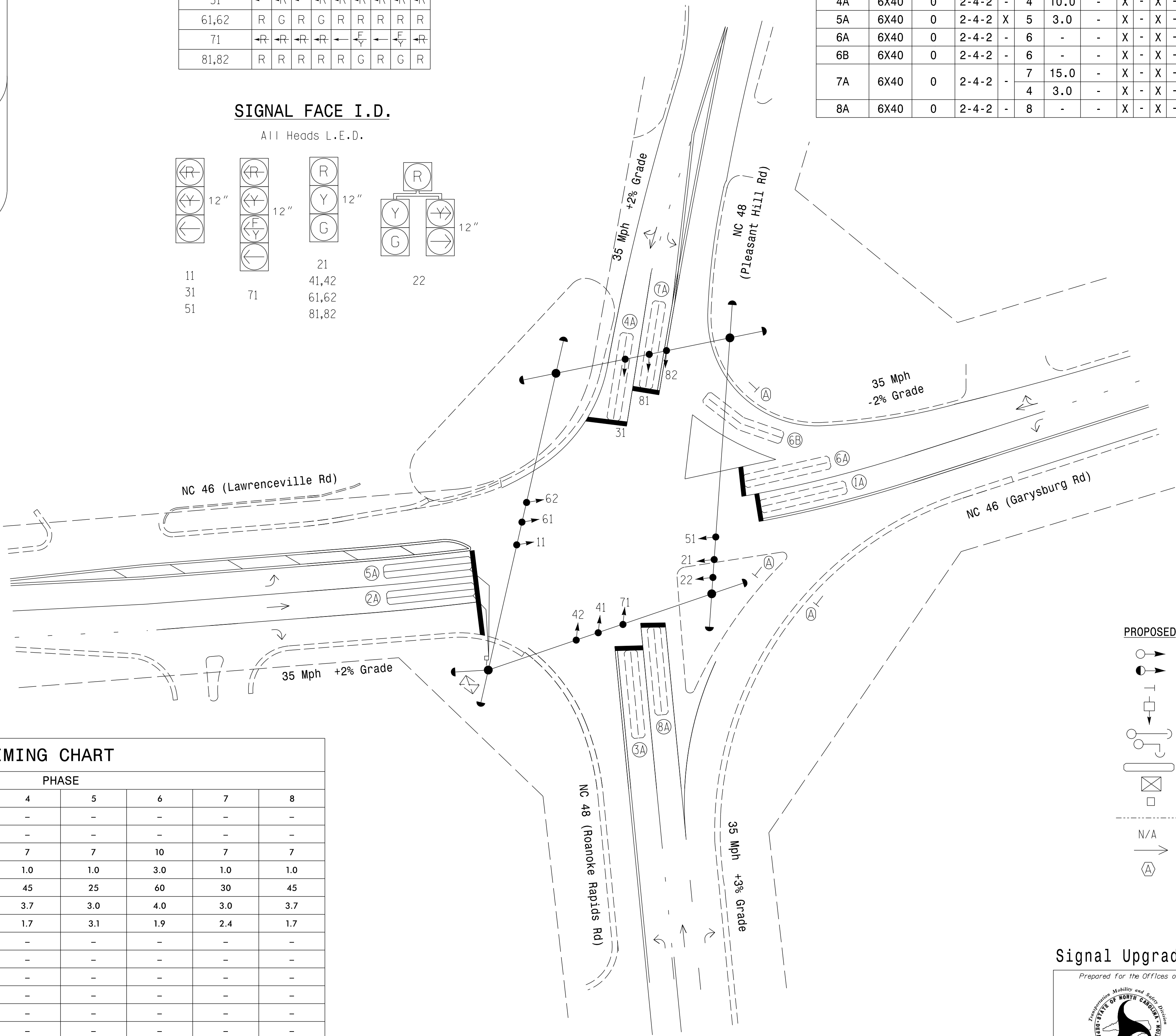


PHASING DIAGRAM



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 |
| "YIELD" Sign (R1-2) | N/A |

MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Min Green *	7	10	7	7	7	10	7	7
Passage *	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
Max 1 *	25	60	30	45	25	60	30	45
Yellow Change	3.0	4.0	3.0	3.7	3.0	4.0	3.0	3.7
Red Clear	2.8	1.9	2.3	1.7	3.1	1.9	2.4	1.7
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	X

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

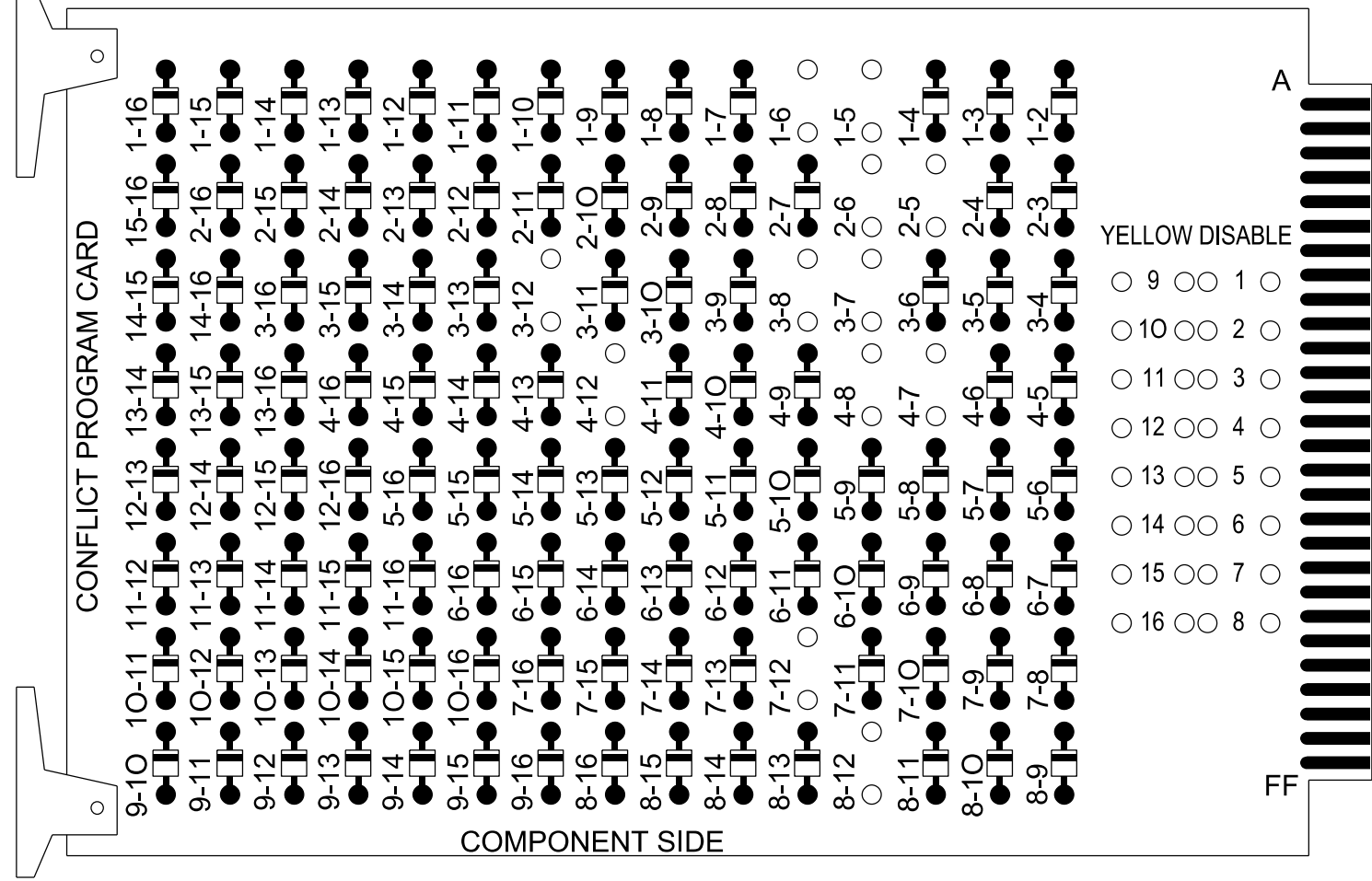
Signal Upgrade

Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529		NC 46(Lawrenceville Rd /Garysburg Rd) at NC 48 (Pleasant Hill Rd /Roanoke Rapids Rd) Division 1 Northampton County Gaston PLAN DATE: October 2024 REVIEWED BY: J. L. Lewis PREPARED BY: J. Ma REVIEWED BY: REVISIONS INIT. DATE SCALE 0 30 1"=30'		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 033108 JANXIN MA 10/28/2024 DATE SIG. INVENTORY NO. 01-0129	
--	--	--	--	---	--

16 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 3-7, 3-8, 3-12, 4-7, 4-8, 4-12, 7-12, and 8-12.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and phase 6 Green No Walk.
- 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.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1,S2,S4,S5,S7,S8,S10,S11,AUXS5
Phases Used.....1,2,3,4,5,6,7,8
Overlap "4".....*

*See overlap programming detail on this sheet.

SIGNAL HEAD HOOK-UP CHART

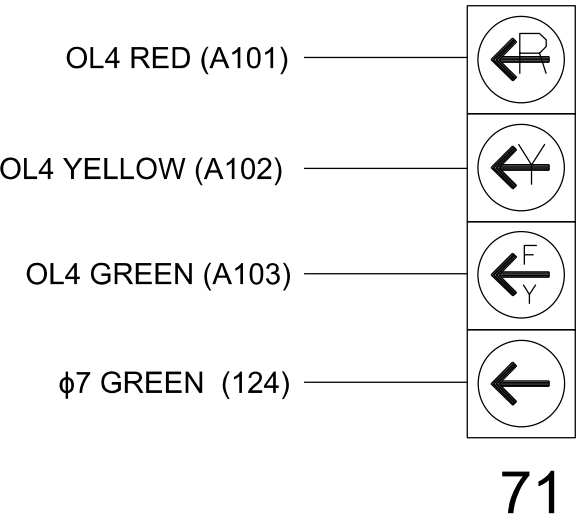
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	22	31	41,42	NU	51	61,62	NU	71	81,82	NU	NU	NU	NU	71	NU
RED		128				101			134			107						
YELLOW		129				102			135		*	108						
GREEN		130				103			136			109						
RED ARROW	125				116			131									A101	
YELLOW ARROW	126			117	117			132									A102	
FLASHING YELLOW ARROW																	A103	
GREEN ARROW	127			118	118			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.

FYA SIGNAL WIRING DETAIL

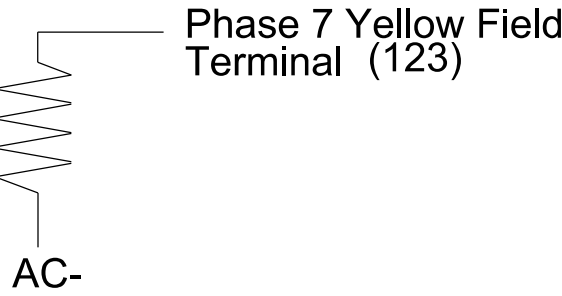
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	1A	2A	SLOT	SLOT	3A	4A	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	FS
L	NOT USED	NOT USED	EMPTY	EMPTY	NOT USED	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	DC ISOLATOR
FILE "J" U	5A	6A	SLOT	SLOT	7A	8A	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	SLOT	DC ISOLATOR
L	NOT USED	6B	EMPTY	EMPTY	NOT USED	NOT USED	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY	EMPTY

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

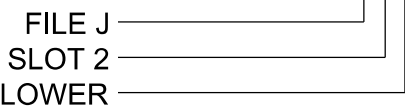
FS = FLASH SENSE
ST = STOP TIME

⊗ Remove jumper in place from J5-W to I8-W, on rear of input file.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1	3.0		X		X	
2A	TB2-5,6	I2U	39	1	2	2			X		X	
3A	TB4-5,6	I5U	58	20	7	3	3.0		X		X	
4A	TB4-9,10	I6U	41	3	8	4	10.0		X		X	
5A	TB3-1,2	J1U	55	17	15	5	3.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X		X	
6B	TB3-7,8	J2L	44	6	17	6			X		X	
7A	TB5-5,6	J5U	57	19	21	7	15.0		X		X	
				-	32	4	3.0		X		X	
8A	TB5-9,10	J6U	42	4	22	8			X		X	

INPUT FILE POSITION LEGEND: J2L



OVERLAP PROGRAMMING

Front Panel

Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	4
Type	FYA 4 - Section
Included Phases	8
Modifier Phases	7
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

MAXTIME STARTUP AND SOFTWARE FLASH
PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Unit

Web Interface

Home >Controller >Unit

Modify parameters as shown below and save changes.

Start Up Parameters

StartUp Clearance Hold
6

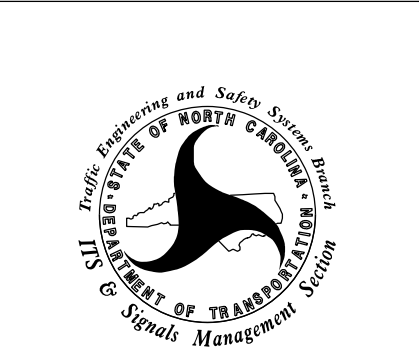
Unit Flash Parameters

All Red Flash Exit Time
6

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0129
DESIGNED: October 2024
SEALED: 10/28/2024
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING
DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 46(Lawrenceville Rd
/Garysburg Rd) at
NC 48 (Pleasant Hill Rd
/Roanoke Rapids Rd)

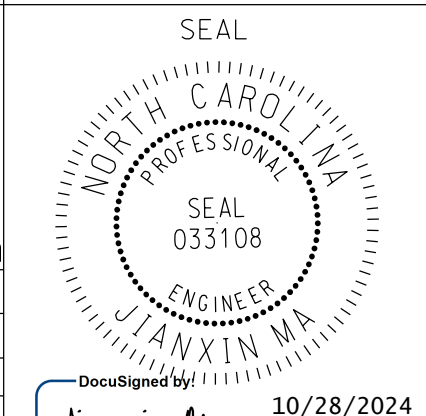
Division 1 Northampton County Gaston

PLAN DATE: October 2024 REVIEWED BY: J. L. Lewis

PREPARED BY: J. Ma REVIEWED BY:

REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



DocuSigned by: 10/28/2024

SIG. INVENTORY NO. 01-0129