

I:\Projects\2024\1128-1130\1130-Signals\Signal Design Section\Central Region\Div 8\U-3628\U-3628.sig.tsh,2024mmddd.dgn

CONTRACT: C205042

Project: U-3628

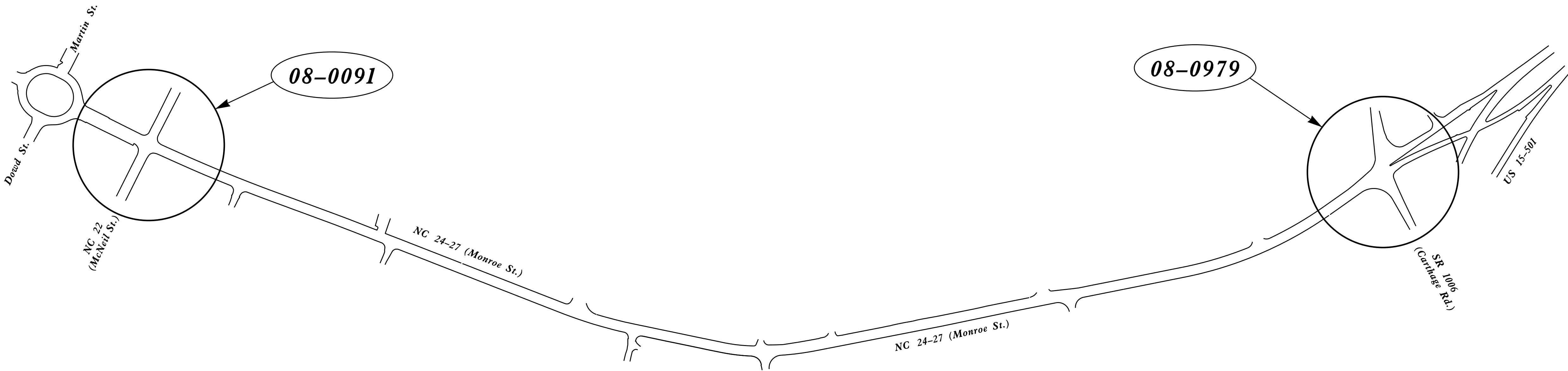
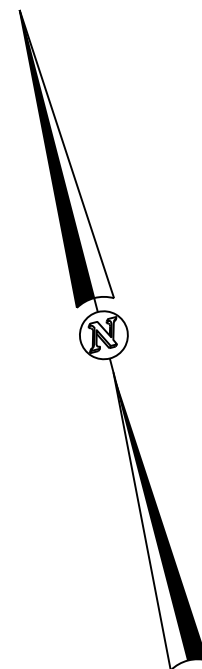
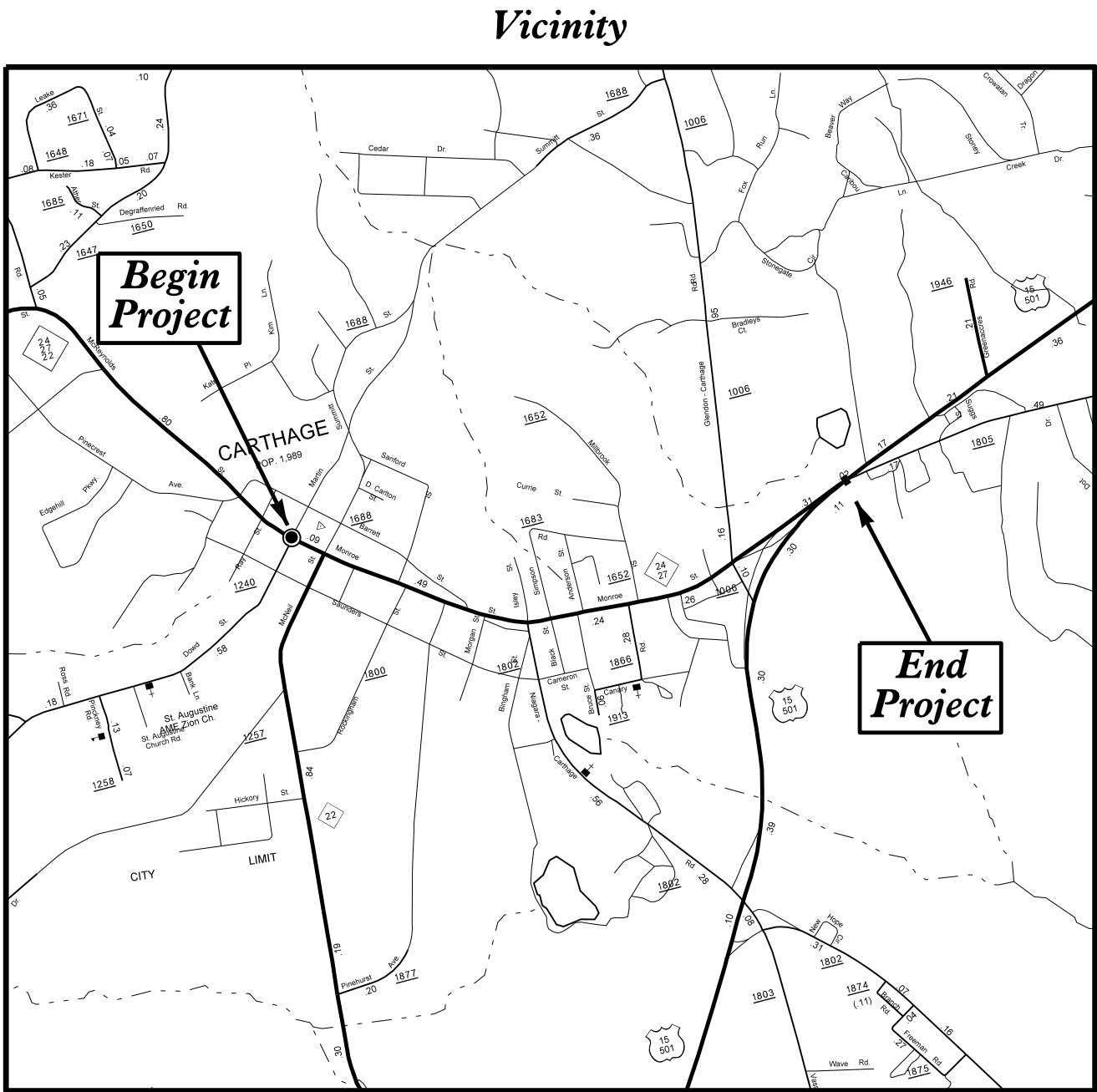
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Project No.	Sheet No.
U-3628	Sig. 1.0

MOORE COUNTY

LOCATION: NC 22-24-27 (MONROE STREET) FROM NC 22 (MCNEIL STREET)
TO SR 1006 (CARTHAGE ROAD)

TYPE OF WORK: TRAFFIC SIGNALS



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

Sheet #
Sig. 1.0
Sig. 2.0-2.1
Sig. 3.0-4.1

Reference #
08-0091
08-0979

Index of Plans

Title Sheet
NC 22-24-27 (Monroe Street) at NC 22 (McNeil Street)
NC 24-27 (Monroe Street) at SR 1006 (Carthage Road)

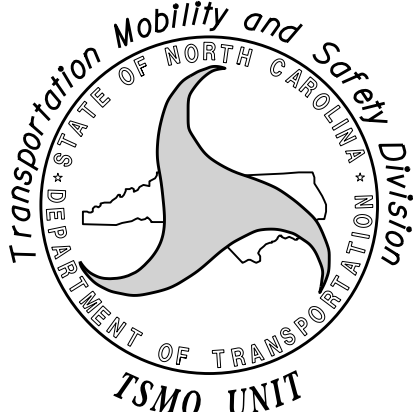
Location/Description

TRANSPORTATION SYSTEMS
MANAGEMENT & OPERATIONS UNIT

Contacts:

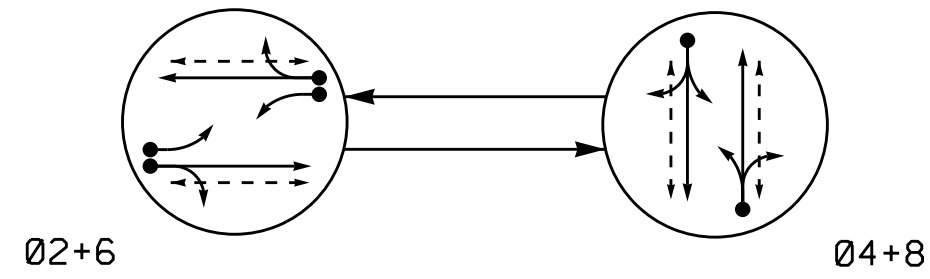
Robert J. Ziemba, PE - Central Region Signals Engineer
Ryan W. Hough, PE - Signal Equipment Design Engineer

Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY & SAFETY DIVISION



750 N. Greenfield Parkway, Garner, NC 27529

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

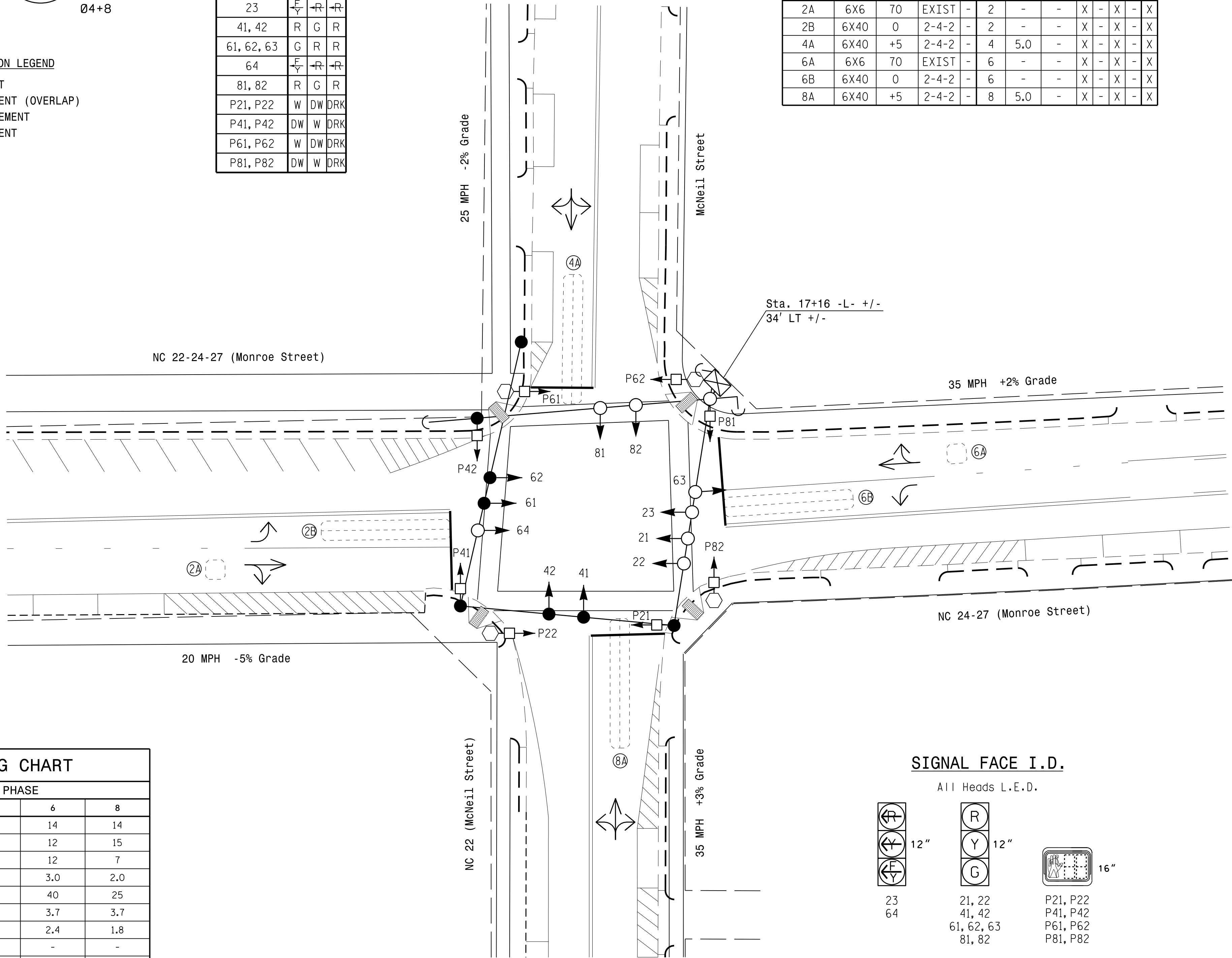
SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	R
23	F	R	R
41, 42	R	G	R
61, 62, 63	G	R	R
64	F	R	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
2A	6X6	70	EXIST	-	2	-	-	X	-	X	-
2B	6X40	0	2-4-2	-	2	-	-	X	-	X	-
4A	6X40	+5	2-4-2	-	4	5.0	-	X	-	X	-
6A	6X6	70	EXIST	-	6	-	-	X	-	X	-
6B	6X40	0	2-4-2	-	6	-	-	X	-	X	-
8A	6X40	+5	2-4-2	-	8	5.0	-	X	-	X	-

2 Phase
Fully Actuated
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 61 and 62.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing unless otherwise shown.

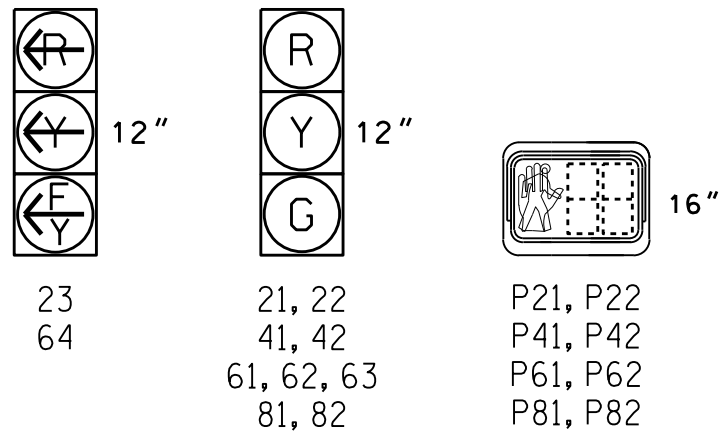


MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	14	14	14	14
Ped Clear *	17	14	12	15
Min Green *	12	7	12	7
Passage *	3.0	2.0	3.0	2.0
Max 1 *	40	25	40	25
Yellow Change	3.7	3.7	3.7	3.7
Red Clear	2.4	1.8	2.4	1.8
Added Initial *	-	-	-	-
Maximum Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Advance Walk	7	7	7	7
Non Lock Detector	-	X	-	X
Vehicle Recall	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	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 FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED	EXISTING

Signal Upgrade

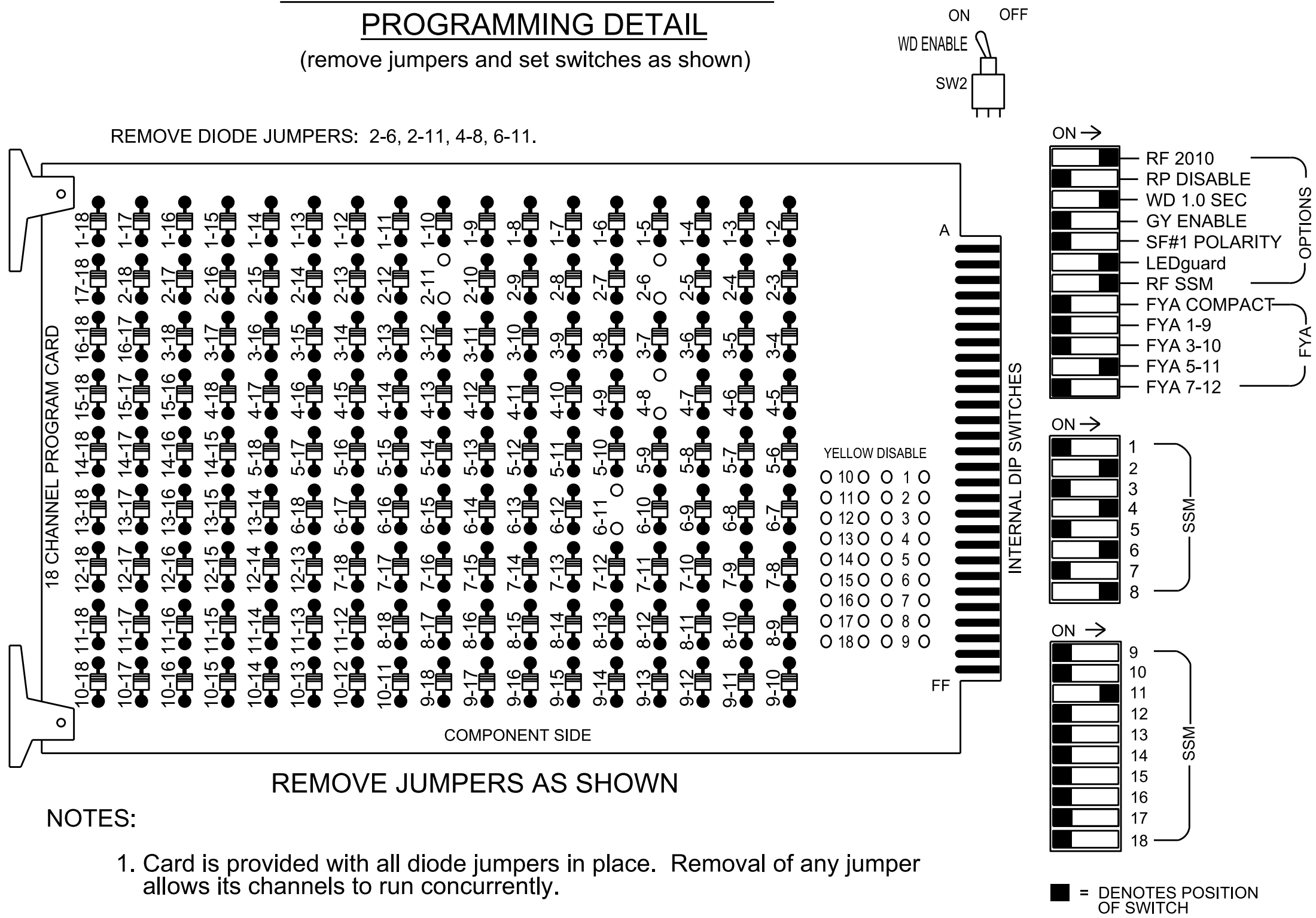
	NC 22-24-27 (Monroe Street) at NC 22 (McNeil Street)		
	Division 8 Moore County Carthage		
	PLAN DATE: July 2024	REVIEWED BY:	
	PREPARED BY: J.A. Lohr	REVIEWED BY:	
REVISIONS		INIT.	DATE
0 SCALE 20			
1"=20'			

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 08-0091

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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 the 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 plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 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.....S2, S5, S8, S11, AUX S4
Phases Used.....2, 4, 6, 8
Overlap "3".....*

* See Overlap Programming Detail on this sheet.

SIGNAL HEAD HOOK-UP CHART

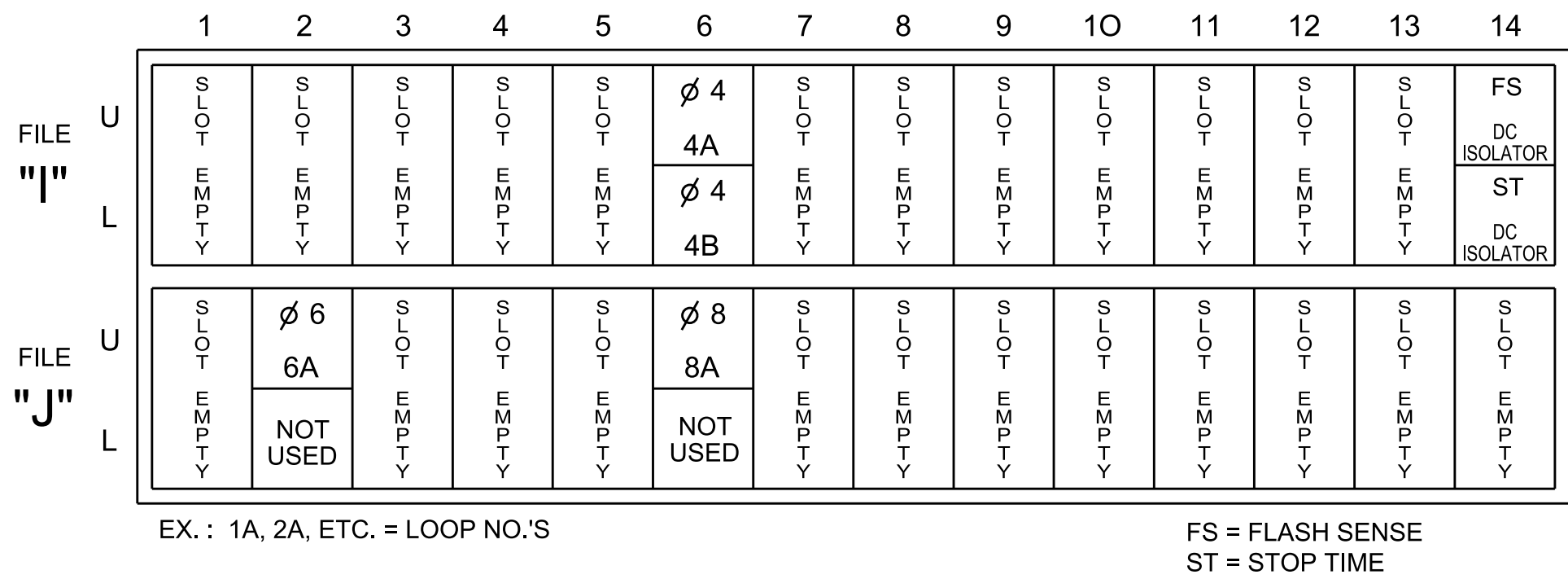
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62		NU	81,82	NU	NU	NU	NU	23★	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW																		
⬇																		
⬆																		

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

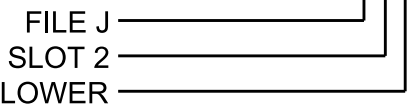
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

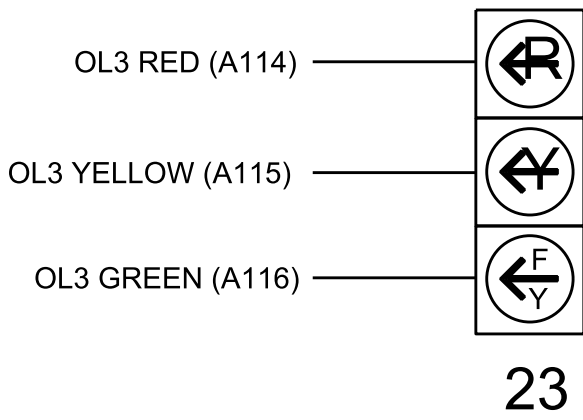
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
4A	TB4-9,10	I6U	41	3	8	4	5.0		X		X	
4B	TB4-11,12	I6L	45	7	9	4	15.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X		X	
8A	TB5-9,10	J6U	42	4	22	8	5.0		X		X	

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0979
DESIGNED: JULY 2024
SEALED: 11/27/2024
REVISED:

OVERLAP PROGRAMMING

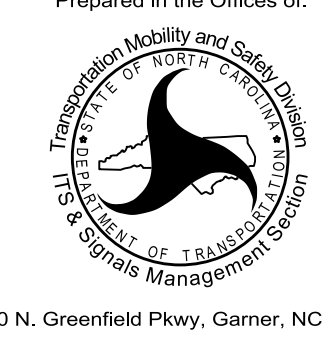
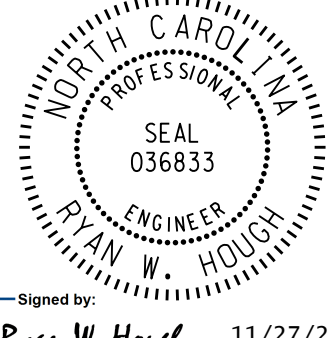
Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps

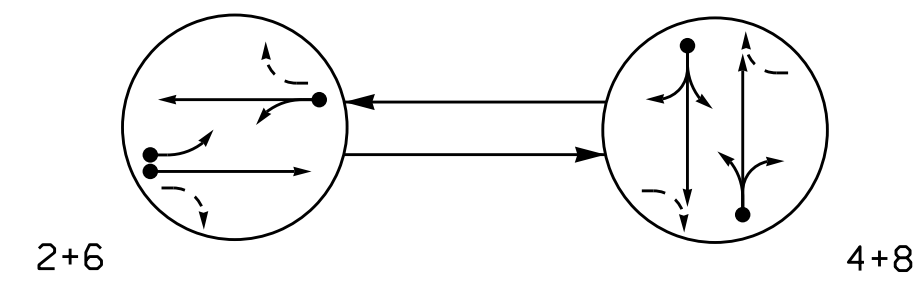
Overlap Plan 1

Overlap	3
Type	FYA 4 - Section
Included Phases	6
Modifier Phases	-
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

Electrical Detail - Temporary Design

Electrical and Programming Details For:	NC 24-27 (Monroe Street) at SR 1006 (Carthage Road)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
Prepared in the Offices of:	Division 8 Moore County Carthage	SEAL
	PLAN DATE: November 2024 REVIEWED BY: PREPARED BY: R.J. Ziemba REVIEWED BY:	
750 N. Greenfield Pkwy, Garner, NC 27529	REVISIONS INIT. DATE	Signed by: Ryan W. Houff 11/27/2024 DATE SIG. INVENTORY NO. 08-0979T

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

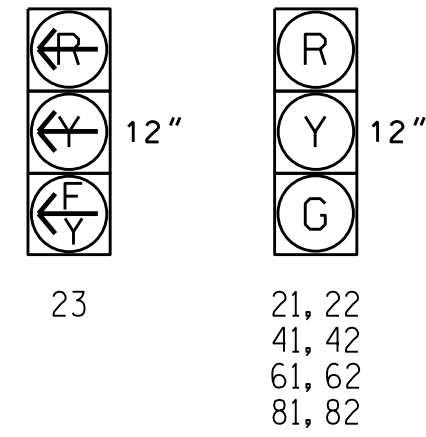
- | | |
|---|-------------------------------|
|  | DETECTED MOVEMENT |
|  | UNDETECTED MOVEMENT (OVERLAP) |
|  | UNSIGNALIZED MOVEMENT |
|  | PEDESTRIAN MOVEMENT |

TABLE OF OPERATION	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

SIGNAL FACE	PHASE		
	2 + 6	4 + 8	FLASH
21, 22	G	R	R
23	E	R	R
41, 42	R	G	R
61, 62	G	R	R
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

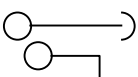
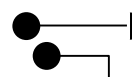
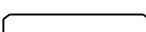
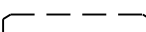
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	6X40	70	3	X	2	-	-	X	-	X	-
2B	6X6	0	2-4-2	X	2	-	-	X	-	X	-
4A	6X60	0	2-4-2	-	4	5.0	-	X	-	X	-
4B	6X6	0	EXIST	-	4	15.0	-	X	-	X	-
6A	6X6	70	EXIST	-	6	-	-	X	-	X	-
8A	6X60	0	2-4-2	-	8	5.0	-	X	-	X	-

2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current TSMO Design Manual and submit a Plan of Record to the Signal Design Section.
5. Pavement markings are existing unless otherwise shown.

LEGEND

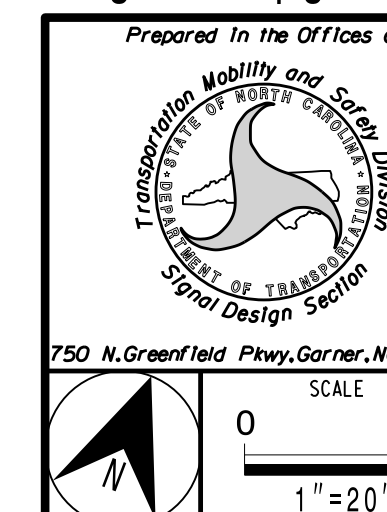
<u>PROPOSED</u>		<u>EXISTING</u>
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	Signal Pole with Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
-----	2-in Underground Conduit	-----
N/A	Right of Way	-----
	Directional Arrow	
	"YIELD" Sign (R1-2)	

MAXTIME TIMING CHART

MAXTIME TIMING CHART				
FEATURE	PHASE			
	2	4	6	8
Walk *	—	—	—	—
Ped Clear	—	—	—	—
Min Green *	10	7	10	7
Passage *	3.0	1.0	3.0	1.0
Max 1 *	40	20	40	20
Yellow Change	3.8	3.8	3.8	3.8
Red Clear	1.6	1.3	1.6	1.3
Added Initial *	—	—	—	—
Maximum Initial *	—	—	—	—
Time Before Reduction *	—	—	—	—
Time To Reduce *	—	—	—	—
Minimum Gap	—	—	—	—
Advance Walk	—	—	—	—
Non Lock Detector	—	X	—	X
Vehicle Recall	MIN RECALL	—	MIN RECALL	—
Dual Entry	—	X	—	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 - Final Design



NC 24-27 (Monroe Street)
at
SR 1006 (Carthage Road)

Division 8 Moore County Carthage

PLAN DATE:	July 2024
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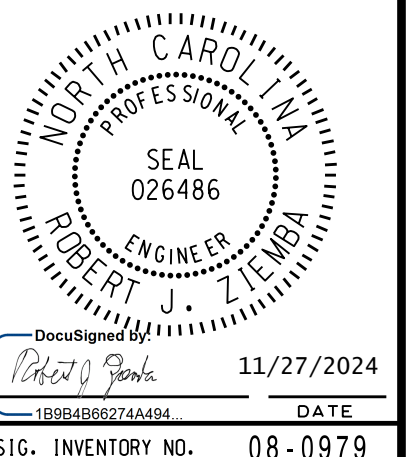
529 PREPARED BY: J.A. Lohr

	REVISIONS
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

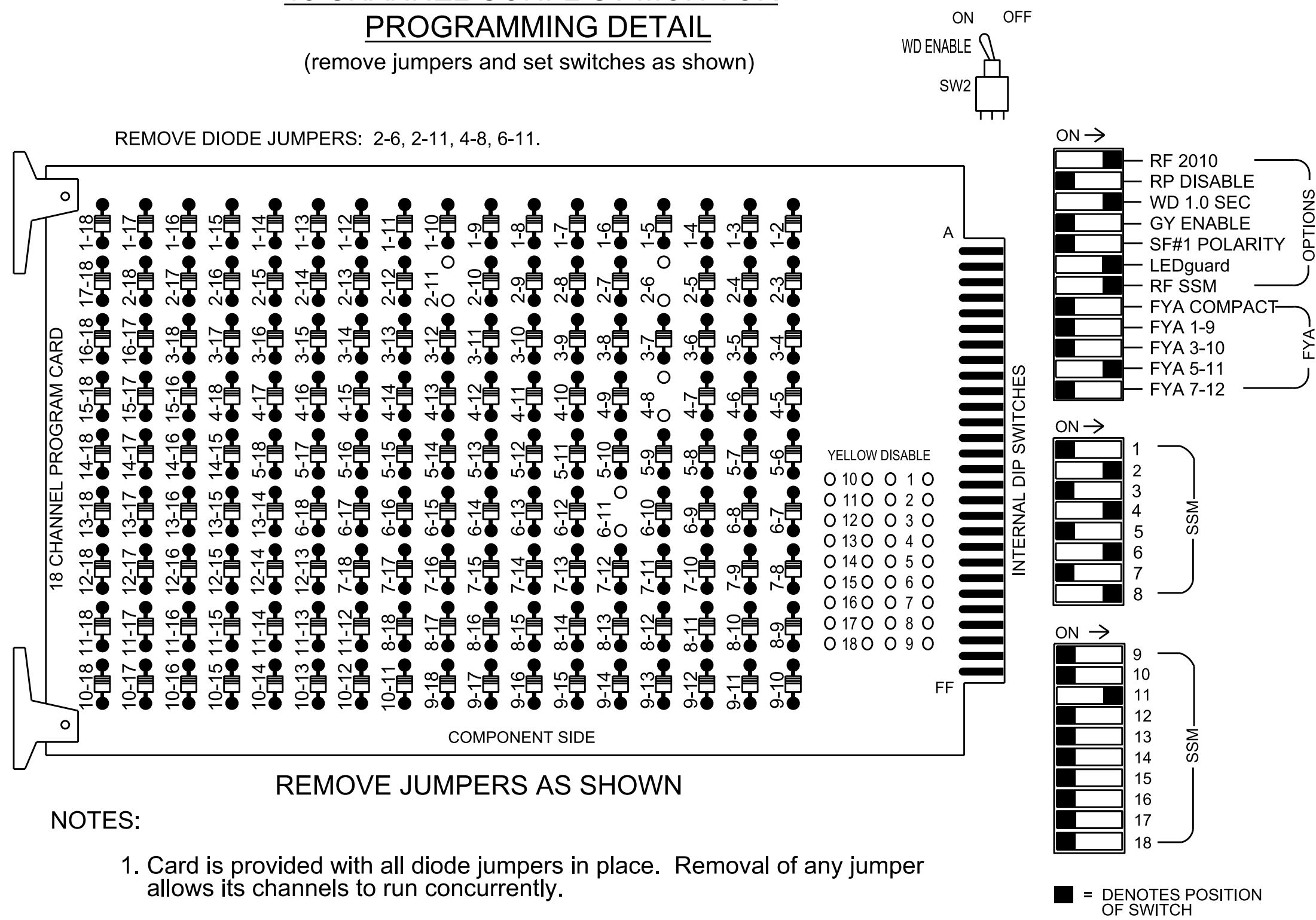
SEAL



18 CHANNEL CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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 plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. 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.....	S2, S5, S8, S11, AUX S4
Phases Used.....	2, 4, 6, 8
Overlap "3".....	*

* See Overlap Programming Detail on this sheet.

SIGNAL HEAD HOOK-UP CHART

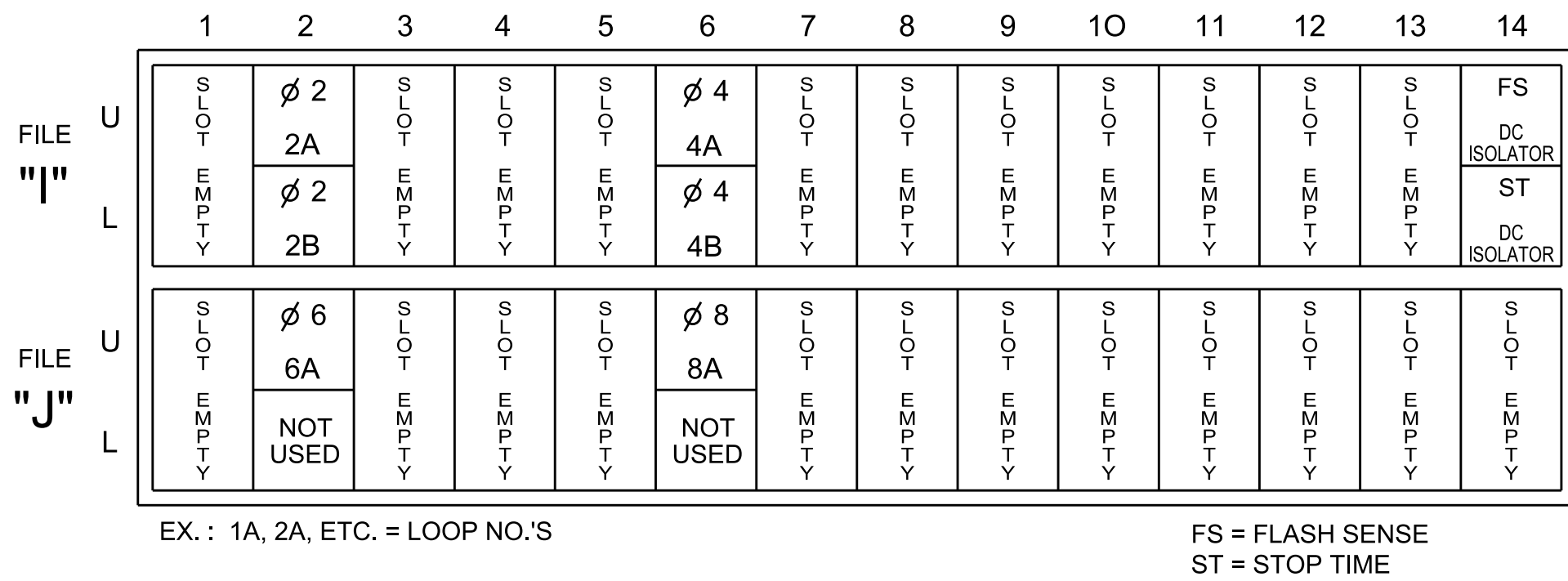
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NU = Not Used

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

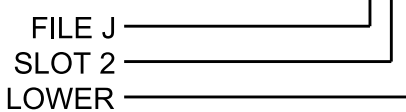
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

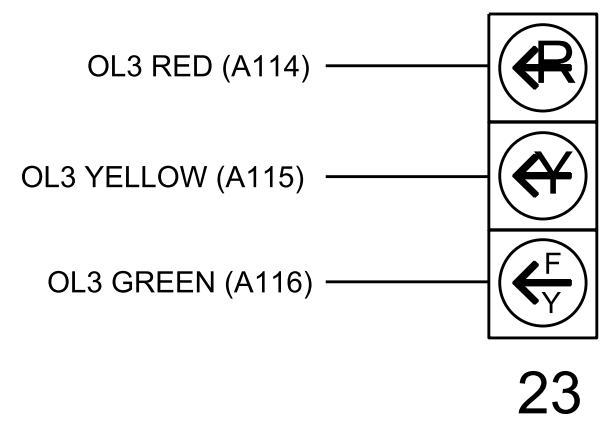
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			X		X	
2B	TB2-7,8	I2L	43	5	3	2			X		X	
4A	TB4-9,10	I6U	41	3	8	4	5.0		X		X	
4B	TB4-11,12	I6L	45	7	9	4	15.0		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X		X	
8A	TB5-9,10	J6U	42	4	22	8	5.0		X		X	

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



OVERLAP PROGRAMMING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

Overlap	3
Type	FYA 4 - Section
Included Phases	6
Modifier Phases	-
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0979
DESIGNED: JULY 2024
SEALED: 11/27/2024
REVISED:

Electrical Detail - Final Design

Electrical and Programming
Details For:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 24-27 (Monroe Street)
at
SR 1006 (Carthage Road)

Division 8 Moore County Carthage

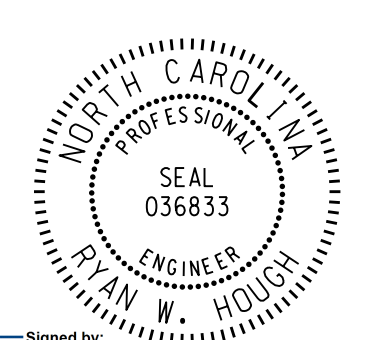
PLAN DATE: November 2024	REVIEWED BY:
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PREPARED BY: R.J. Ziemba	REVIEWED BY:
--------------------------	--------------

REVISIONS	INIT.	DATE
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DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



Signed by: 11/27/2024

Ryan W. Hough 11/27/2024
430320FAA28EAC2 DATE

430320E662854C2	DATE
SIG. INVENTORY NO.	08-0979