

09/20/2022


TIP PROJECT: I-5987B

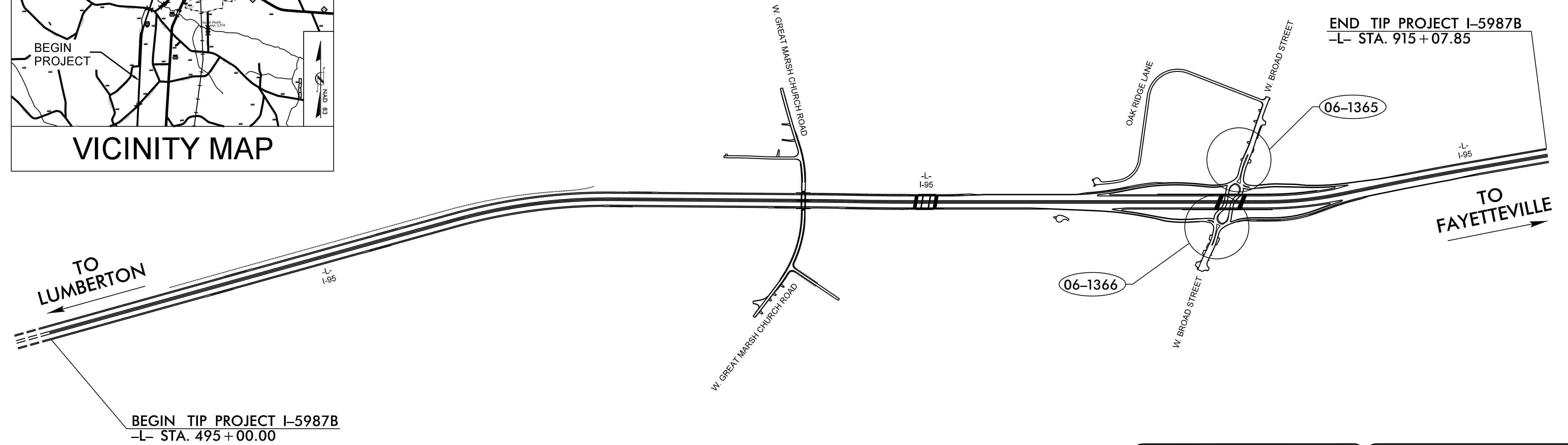
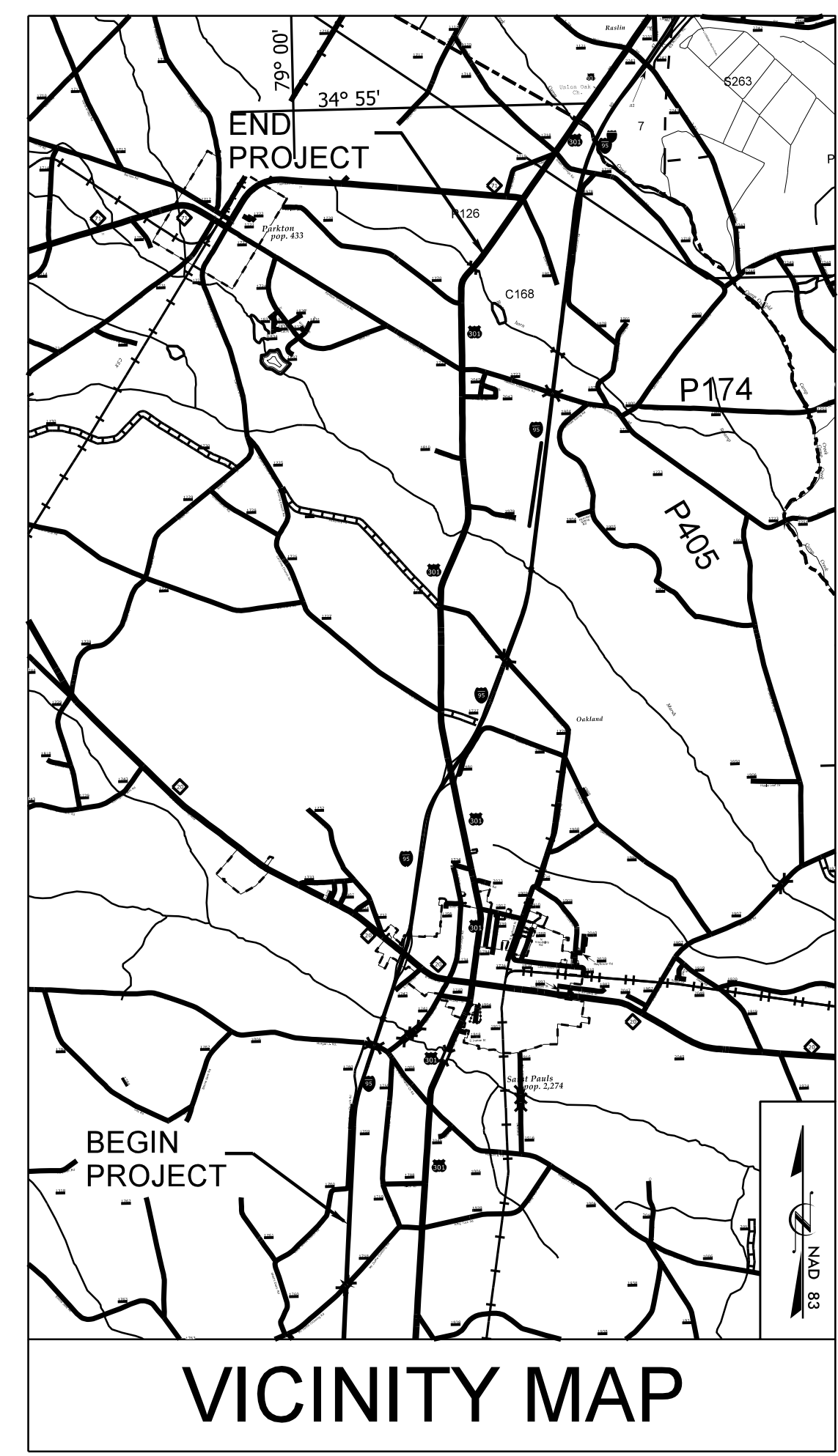
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ROBESON COUNTY

**LOCATION: I-95 IMPROVEMENTS FROM
NORTH OF SR 1758 (McDUFFIE CROSSING RD.)
TO NORTH OF SR 1723 (PARKTON TOBEMORY RD.)**

TYPE OF WORK: SIGNALS

PROJECT REFERENCE NO. I-5987B	SHEET NO. Sig 1.0
APPROVED BY: <i>William J. Hamilton</i>	
DATE: 02/25/2022	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PLANS PREPARED BY:

W. Jason Hamilton, P.E., PTOE - Project Manager

Timothy S. Popelka, P.E. - Project Engineer

INDEX OF PLANS

Sheet Number	SIN	Location/Description
Sig. 1.0	-	Title Sheet
Sig. 2.0-7.2	06-1365	NC 20 (W. Broad Street) at I-95 SB Ramps
Sig. 8.0-11.2	06-1366	NC 20 (W. Broad Street) at I-95 NB Ramps
Sig. 12.0	-	2018 Standard 1700D01_1720D01 Plate Sheet

Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.



RKA
RAMEY KEMP ASSOCIATES
5808 Farrington Place Raleigh, North Carolina 27609
Phone: 919-872-5115 | www.rameykemp.com | NC License No. C-0910

LEGEND

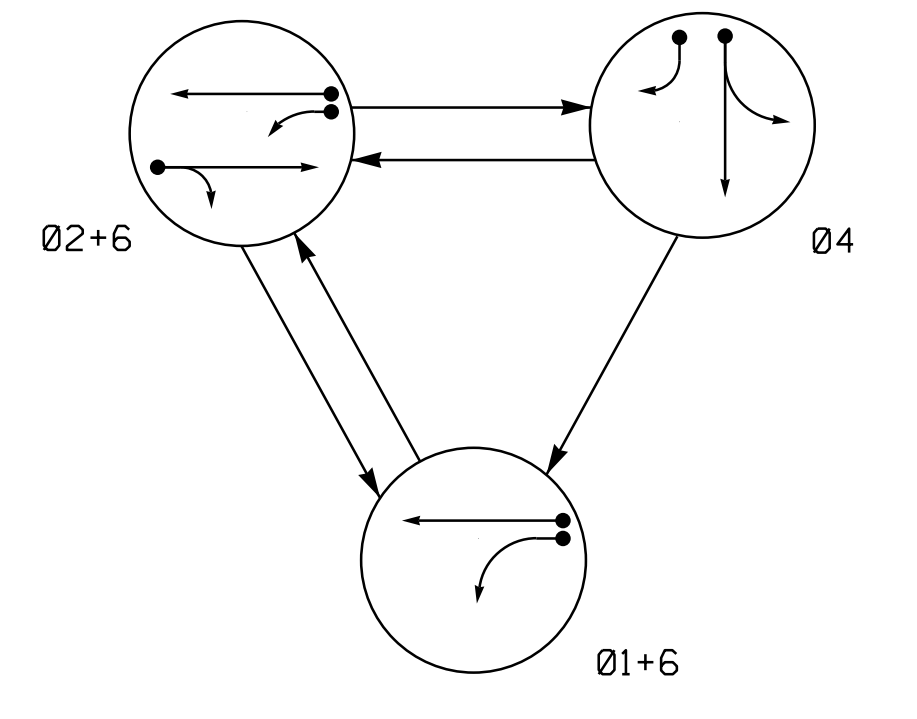
(XX-XXXX) TRAFFIC SIGNAL

**INTELLIGENT TRANSPORTATION
AND SIGNALS UNIT**

Contacts:
Meghan E. LeBlanc, P.E. - Eastern Region Signals Project Engineer
D. Todd Joyce, P.E. - Signal Equipment Design Review Engineer

\$\$\$\$\$ SYSTEM \$\$\$\$\$\$ DDN \$\$\$\$\$\$ USER NAME \$\$\$\$\$\$

PHASING DIAGRAM



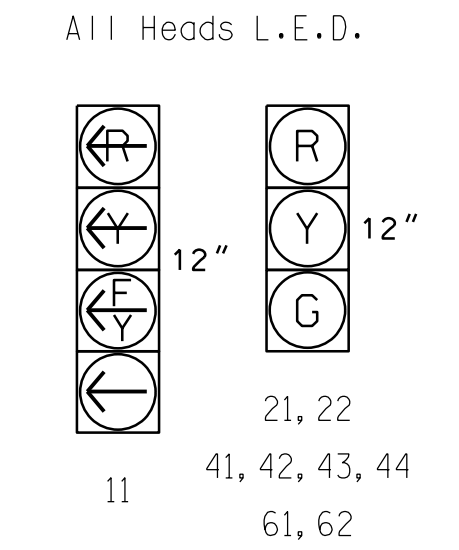
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø4	LOCAL
11	R	G	R	Y
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

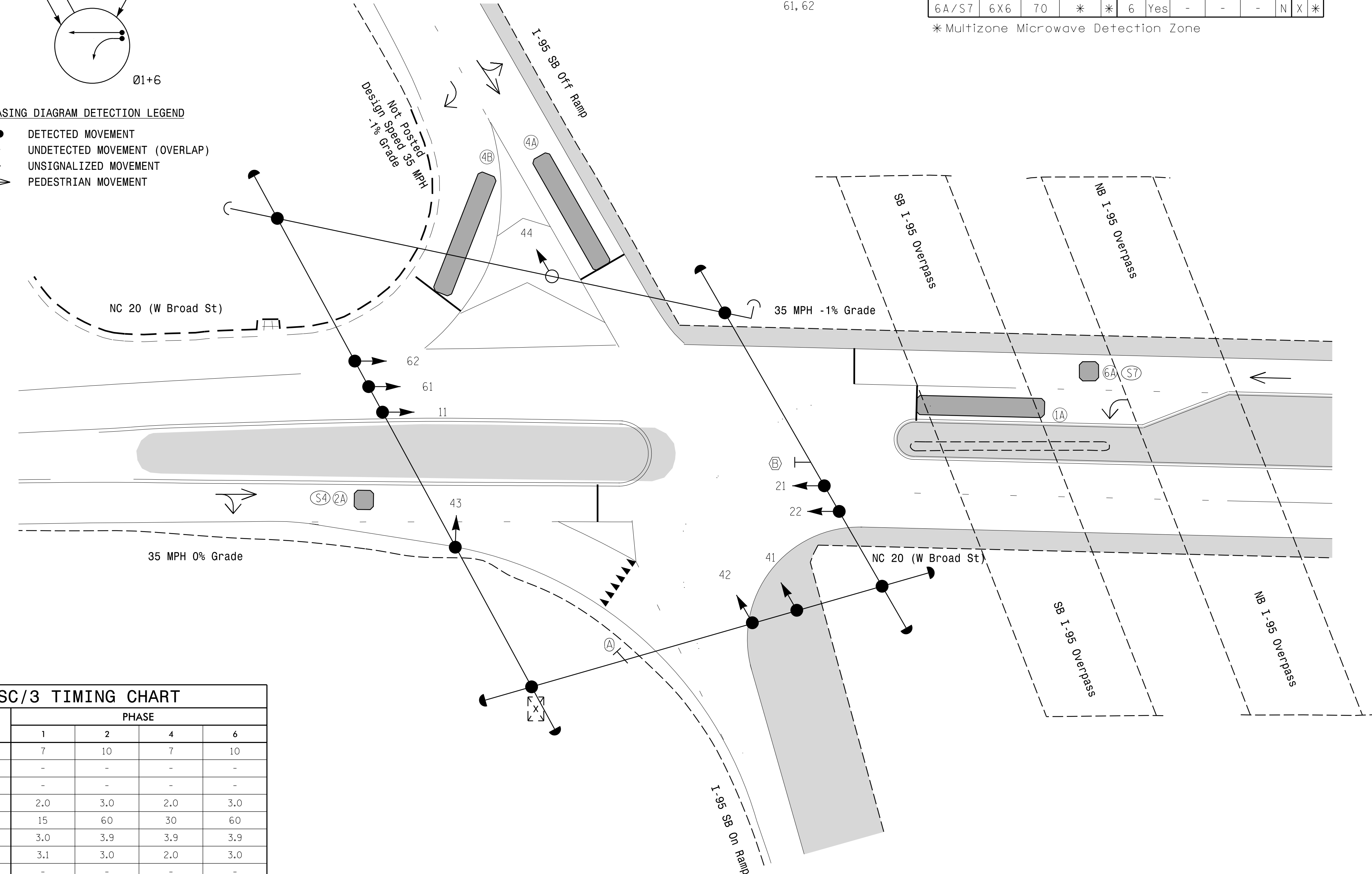
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Yes	-	15	-	N	-	*
2A/S4	6X6	70	*	*	2	Yes	-	-	-	N	X	*
4A	6X40	0	*	*	4	Yes	-	-	-	N	-	*
4B	6X40	0	*	*	4	Yes	-	15	-	N	-	*
6A/S7	6X6	70	*	*	6	Yes	-	-	-	N	X	*

* Multizone Microwave Detection Zone

**3 Phase Fully Actuated
D06-21 St. Pauls**

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.
- Reposition existing signals heads numbered 11, 21, 22, 41, 42, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1365.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	15	60	30	60
Yellow	3.0	3.9	3.9	3.9
Red Clear	3.1	3.0	2.0	3.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
● → Modified Signal Head	○ → N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head
○ Signal Pole with Guy	● Signal Pole with Guy
⊥ Signal Pole with Sidewalk Guy	⊥ Signal Pole with Sidewalk Guy
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Controller & Cabinet
⊥ Junction Box	⊥ Junction Box
⊥ 2-in Underground Conduit	⊥ 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
⊙ "YIELD" Sign (R1-2)	⊙ "YIELD" Sign (R1-2)
⊙ No Left Turn Sign (R3-2)	⊙ No Left Turn Sign (R3-2)
⊥ Microwave Detection Zone	N/A
Construction Zone	N/A

**Signal Upgrade
Temporary Design 1 - (TMP Phase I)**

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

750 N. Greenfield Pkwy, Garner, NC 27529

**NC 20 (W. Broad St.)
at
I-95 SB Ramps**

Division 6 Robeson County St. Pauls

PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton

PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)

SEAL

WILLIAM J. HAMILTON
ENGINEER

0 SCALE 20
1" = 20'

REVISIONS	INIT.	DATE

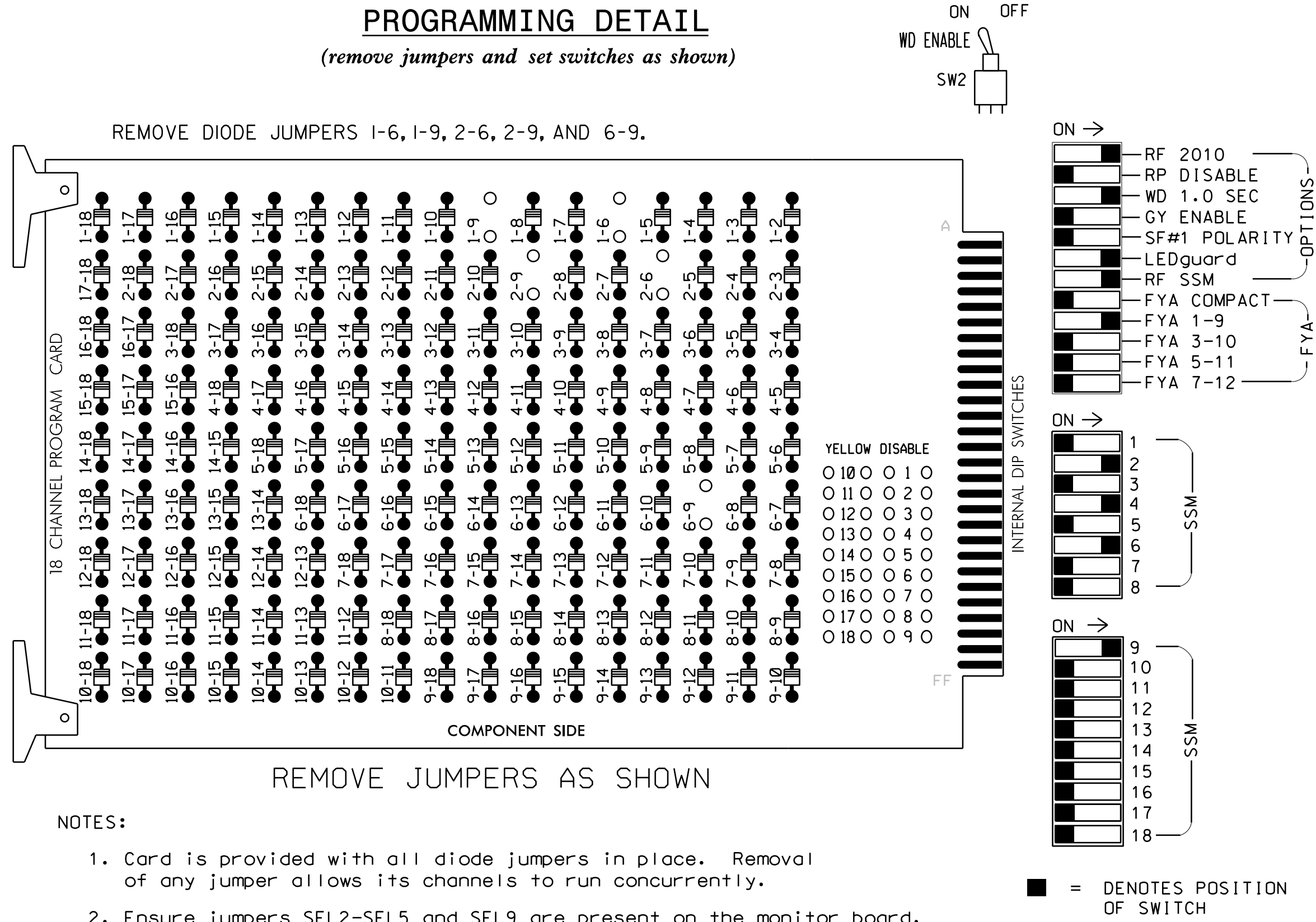
02/25/2022
DATE

SIGNATURE

SIG. INVENTORY NO. 06-136511

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

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, 43,44	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU	
RED		128			101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

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

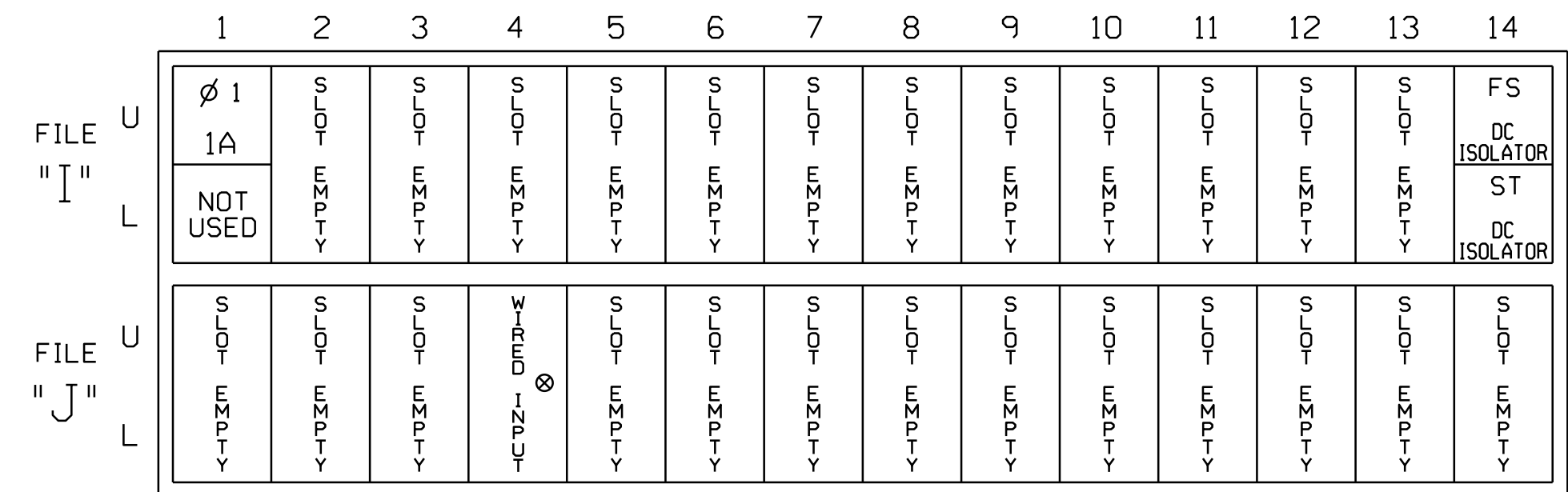
EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



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

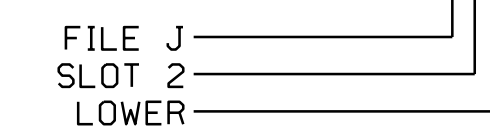
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

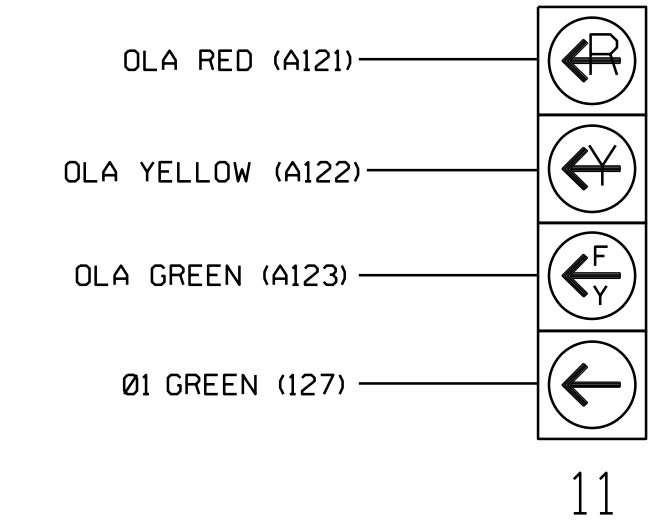
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



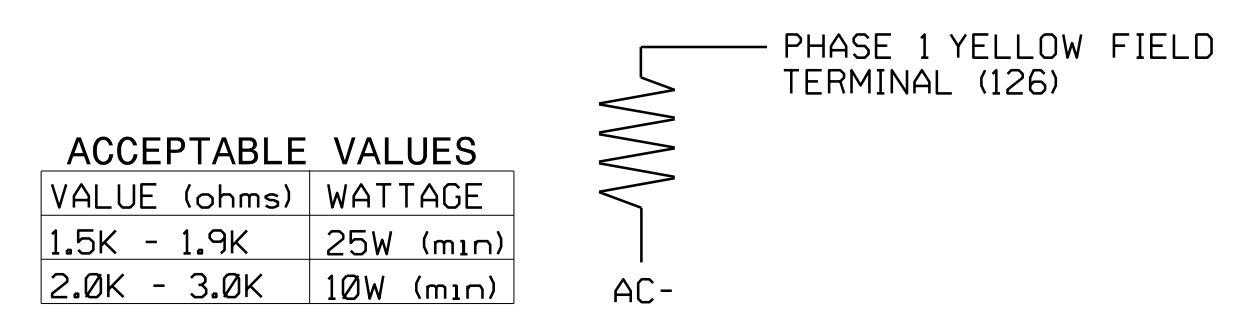
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T1
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-545-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL William J. Hamilton ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE _____ _____ _____	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

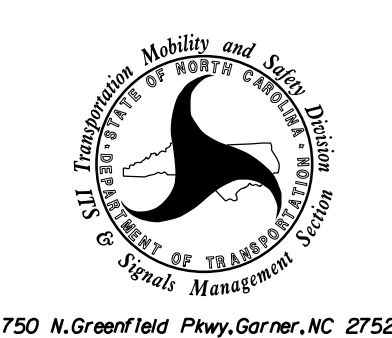
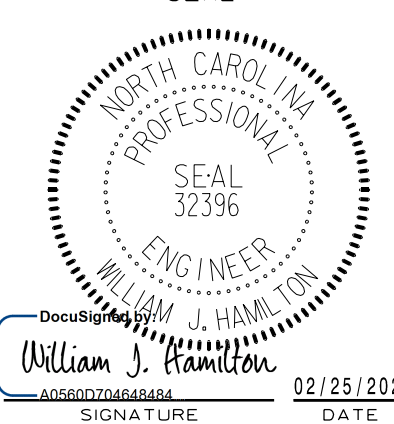

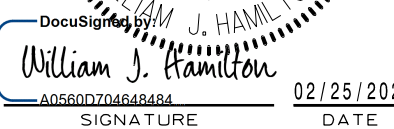
TMG VEH OVLP... [A] TYPE:	PPLT FYA
PROTECTED PHASE (LEFT TURN).....	1
PERMISSIVE PHASE (OPPOSING THRU)....	2
FLASHING ARROW OUTPUT.....CH9	ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE.....	0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1365T1
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

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

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

	NC 20 (W. Broad St.) at I-95 SB Ramps		
	Division 6 Robeson County St. Pauls		
PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton		PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	
REVISIONS	INIT.	DATE	
		DocuSign  SIGNATURE DATE: 02/25/2022	
750 N. Greenfield Pkwy, Garner, NC 27529		SIG. INVENTORY NO. 06-1365T1	

PHASING DIAGRAM

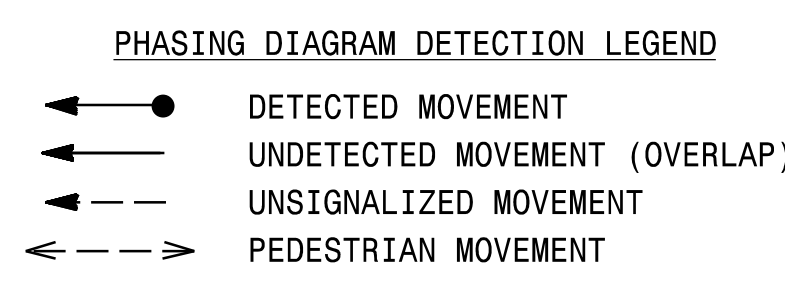
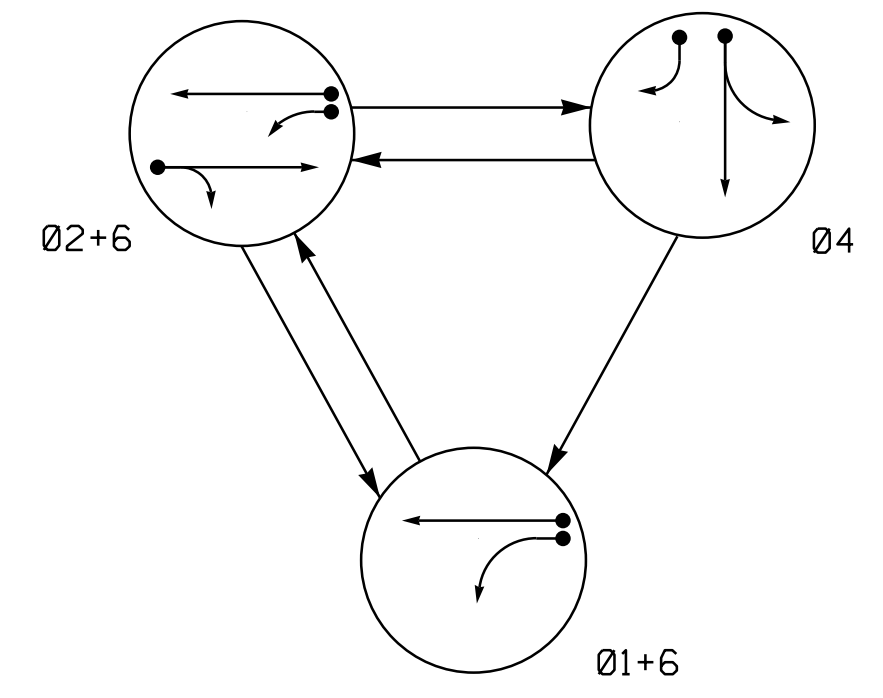
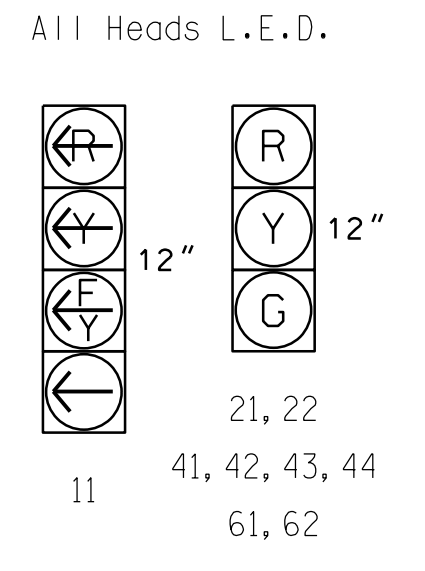


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø4	LEGEND
11	←	←	←	←
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

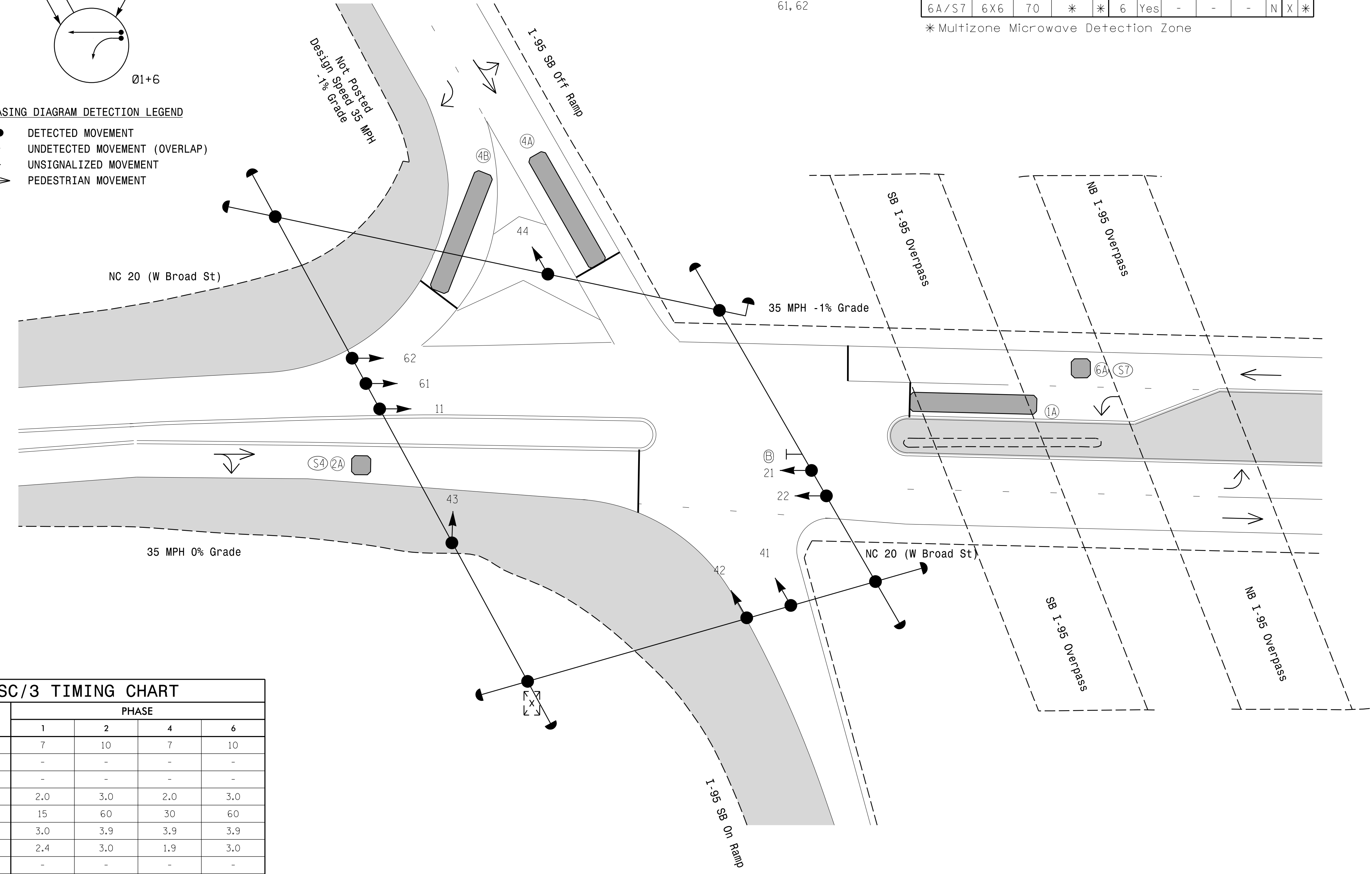
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Yes	-	15	-	N	-	*
2A/S4	6X6	70	*	*	2	Yes	-	-	-	N	X	*
4A	6X40	0	*	*	4	Yes	-	-	-	N	-	*
4B	6X40	0	*	*	4	Yes	-	15	-	N	-	*
6A/S7	6X6	70	*	*	6	Yes	-	-	-	N	X	*

* Multizone Microwave Detection Zone

**3 Phase Fully Actuated
06-21 St. Pauls**

NOTES

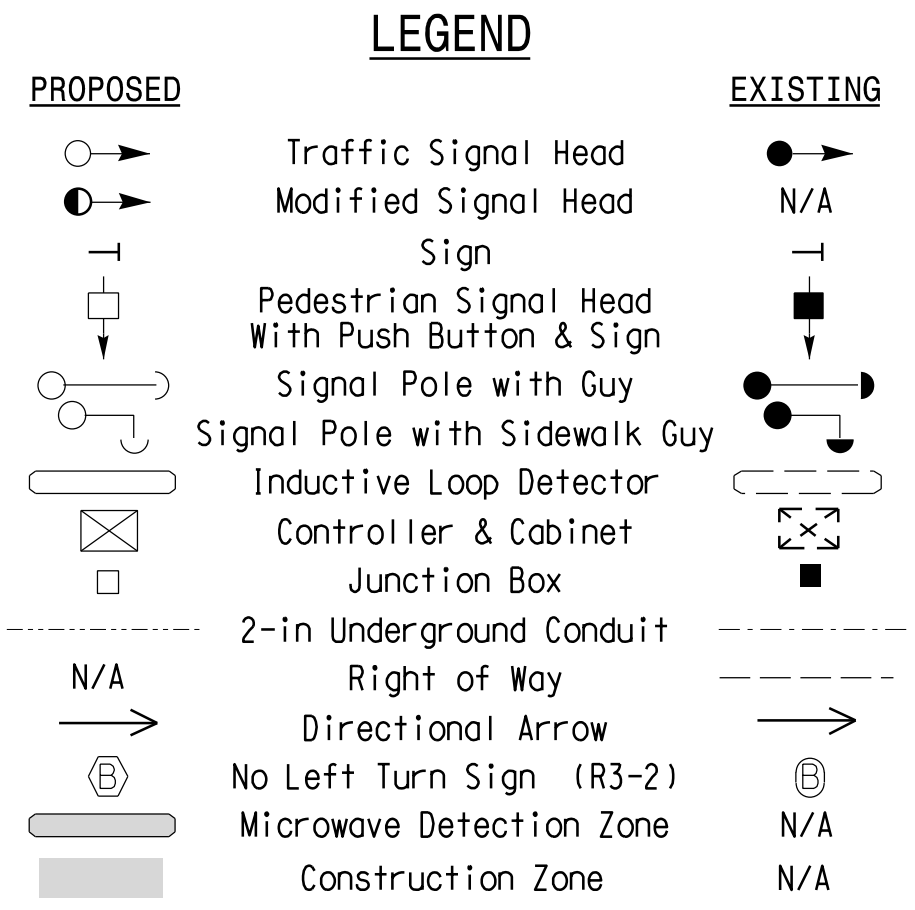
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signals heads numbered 21, 22, 41 and 42.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1365.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.
- Reposition existing sign B.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	15	60	30	60
Yellow	3.0	3.9	3.9	3.9
Red Clear	2.4	3.0	1.9	3.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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.



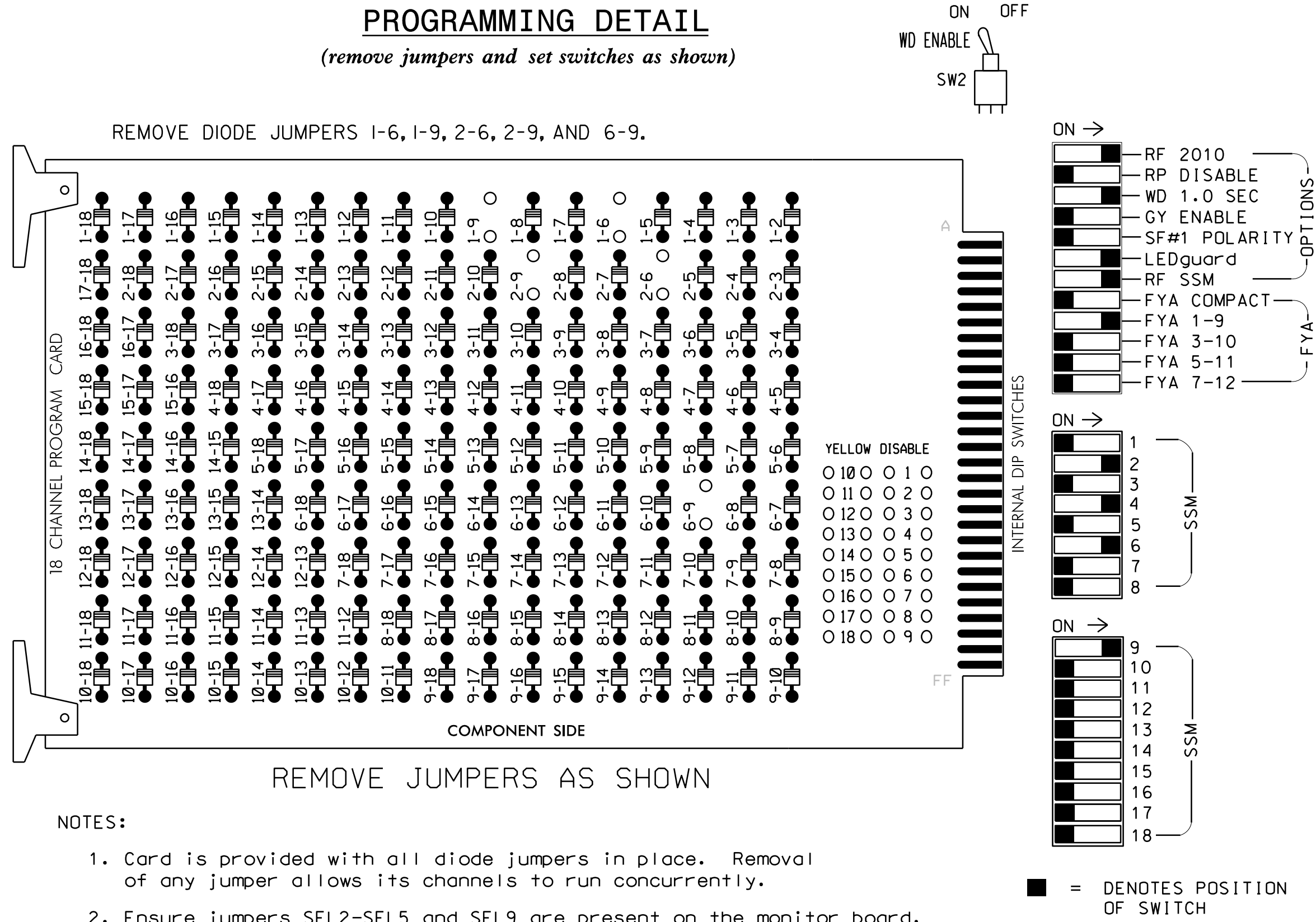
**Signal Upgrade
Temporary Design 2 - (TMP Phase 2.1)**

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>RKA RAMEY KEMP ASSOCIATES</p>	<p>Prepared for: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION</p>		<p>SEAL</p> <p>WILLIAM J. HAMILTON ENGINEER</p>					
	<p>NC 20 (W. Broad St.) at I-95 SB Ramps</p> <p>Division 6 Robeson County St. Pauls</p> <p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p> <p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)</p>							
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>0 SCALE 0 20 1"=20'</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	INIT.	DATE				<p>DATE: 02/25/2022</p> <p>SIGNATURE: </p> <p>SIG. INVENTORY NO. 06-136512</p>
NO.	INIT.	DATE						

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

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, 43,44	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU	
RED		128			101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

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

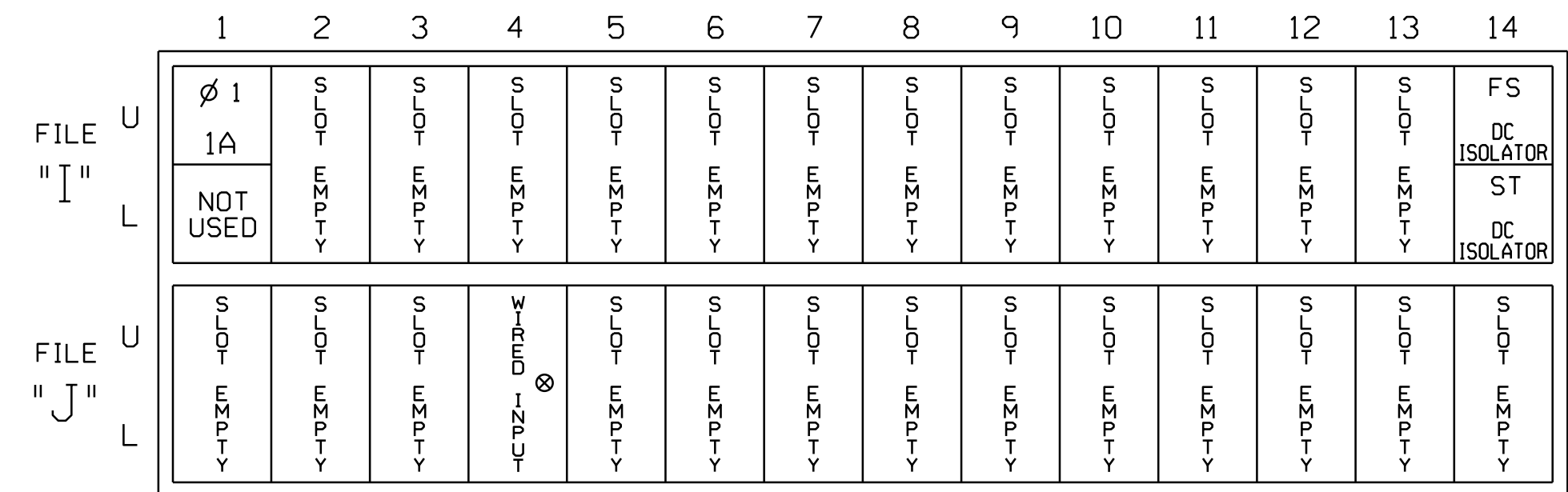
EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



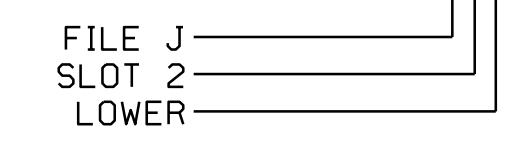
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME
 ⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

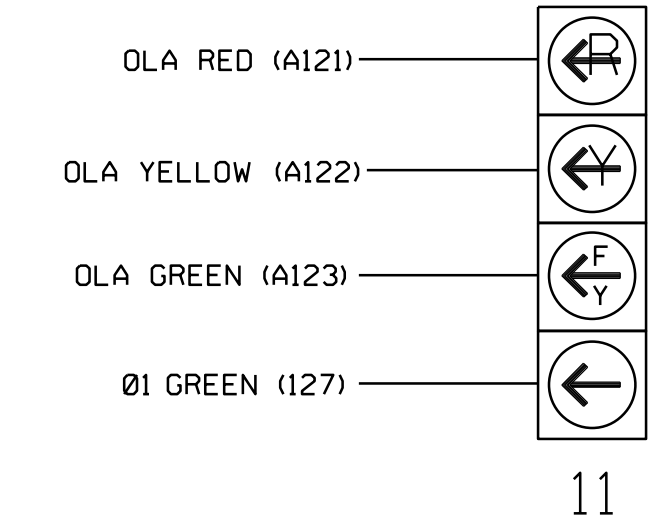
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



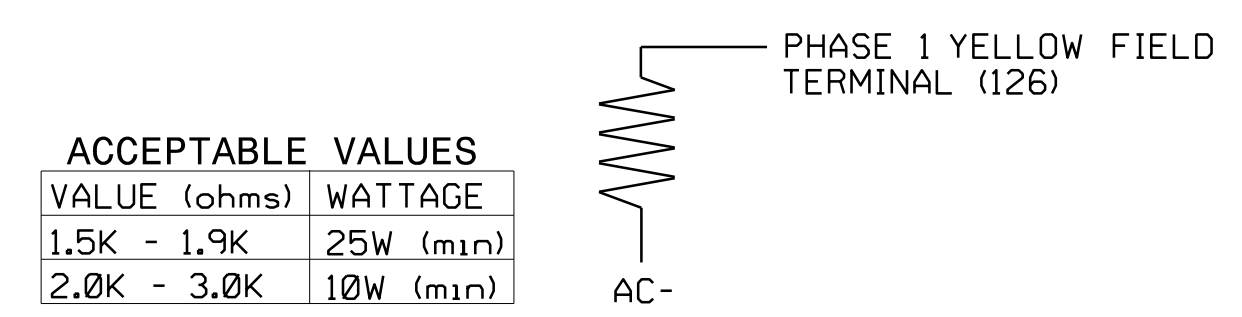
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T2
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 1 of 2
 Temporary Design 2 - (TMP Phase 2.1)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	SIGNATURE: _____ DATE: 02/25/2022 SIG. INVENTORY NO. 06-1365T2	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```

TMG VEH OVLP...[A] TYPE: .....[PPLT FYA]
PROTECTED PHASE (LEFT TURN)..... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0

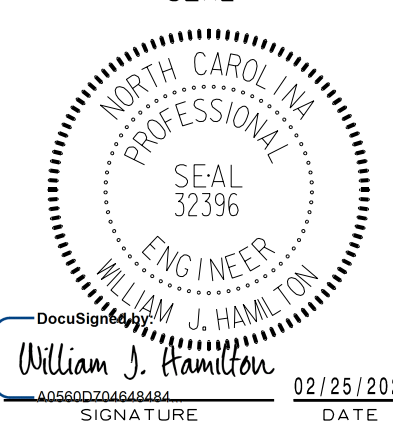

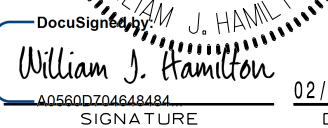
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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1365T2
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 2 of 2
 Temporary Design 2 - (TMP Phase 2.1)

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UNLESS ALL SIGNATURES COMPLETED**

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p>	<p>NC 20 (W. Broad St.) at I-95 SB Ramps</p> <p>Division 6 Robeson County St. Pauls</p>	<p>SEAL</p> 										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>PLAN DATE: February 2022</td> <td>REVIEWED BY: WJ Hamilton</td> </tr> <tr> <td>PREPARED BY: TS Popelka</td> <td>RKA PROJ. NO.: 21031 (040)</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: February 2022	REVIEWED BY: WJ Hamilton	PREPARED BY: TS Popelka	RKA PROJ. NO.: 21031 (040)	REVISIONS	INIT. DATE					<p style="font-size: x-small;"> DocuSign  SIGNATURE DATE 02/25/2022 </p>
PLAN DATE: February 2022	REVIEWED BY: WJ Hamilton											
PREPARED BY: TS Popelka	RKA PROJ. NO.: 21031 (040)											
REVISIONS	INIT. DATE											
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>		<p>SIG. INVENTORY NO. 06-1365T2</p>										



PHASING DIAGRAM

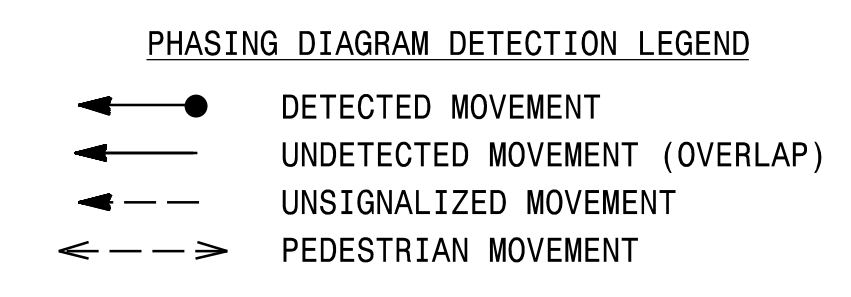
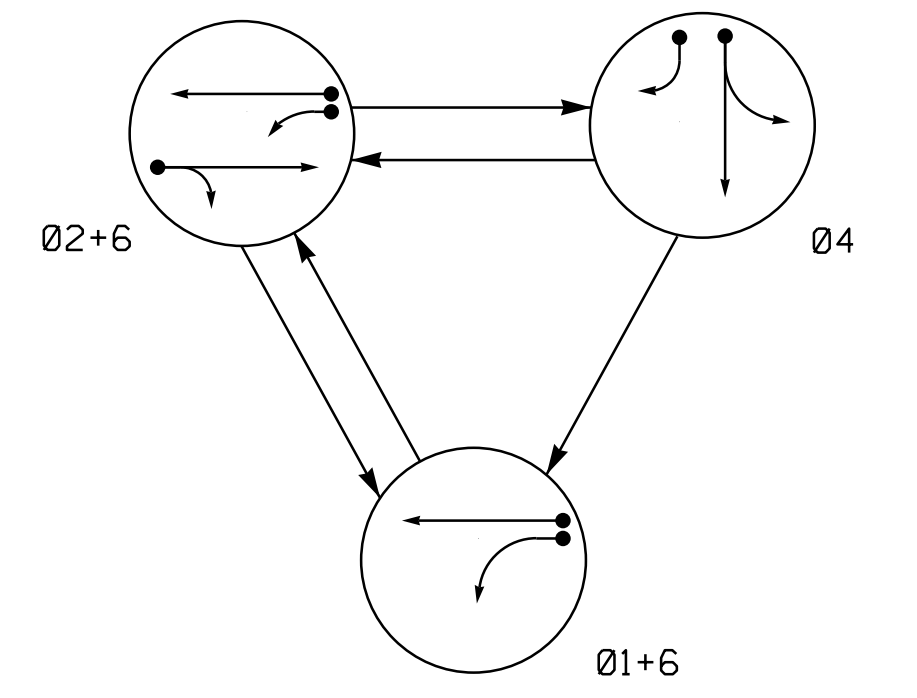
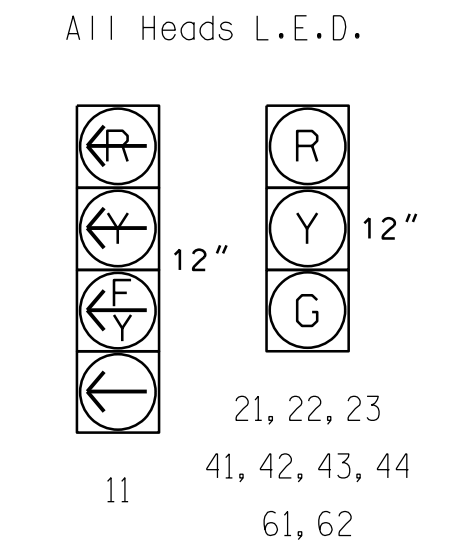


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	LOCAL
11	←	←	←	←
21, 22, 23	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

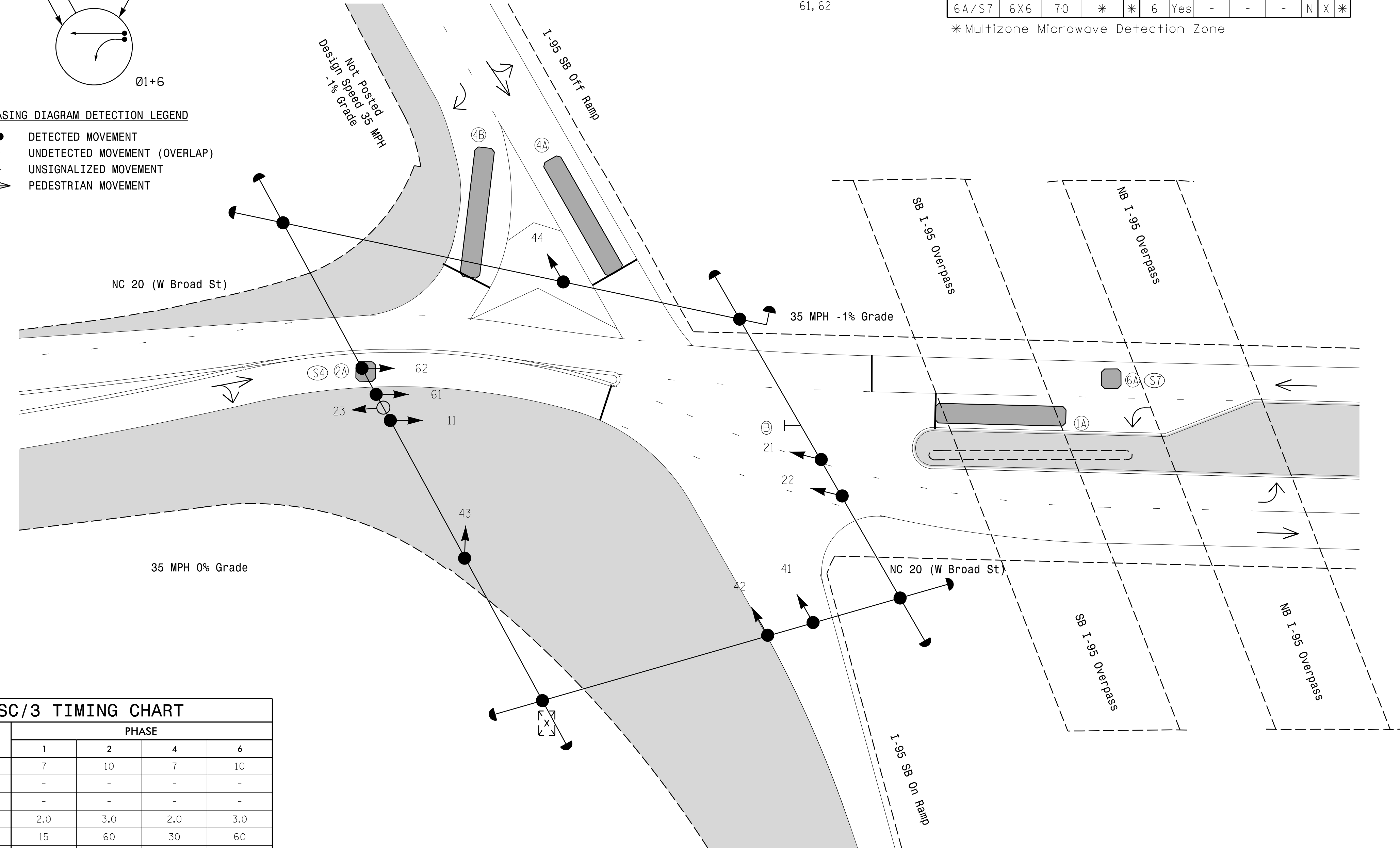
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Yes	-	15	-	N	-	*
2A/S4	6X6	70	*	*	2	Yes	-	-	-	N	X	*
4A	6X40	0	*	*	4	Yes	-	-	-	N	-	*
4B	6X40	0	*	*	4	Yes	-	15	-	N	-	*
6A/S7	6X6	70	*	*	6	Yes	-	-	-	N	X	*

* Multizone Microwave Detection Zone

**3 Phase Fully Actuated
06-21 St. Pauls**

NOTES

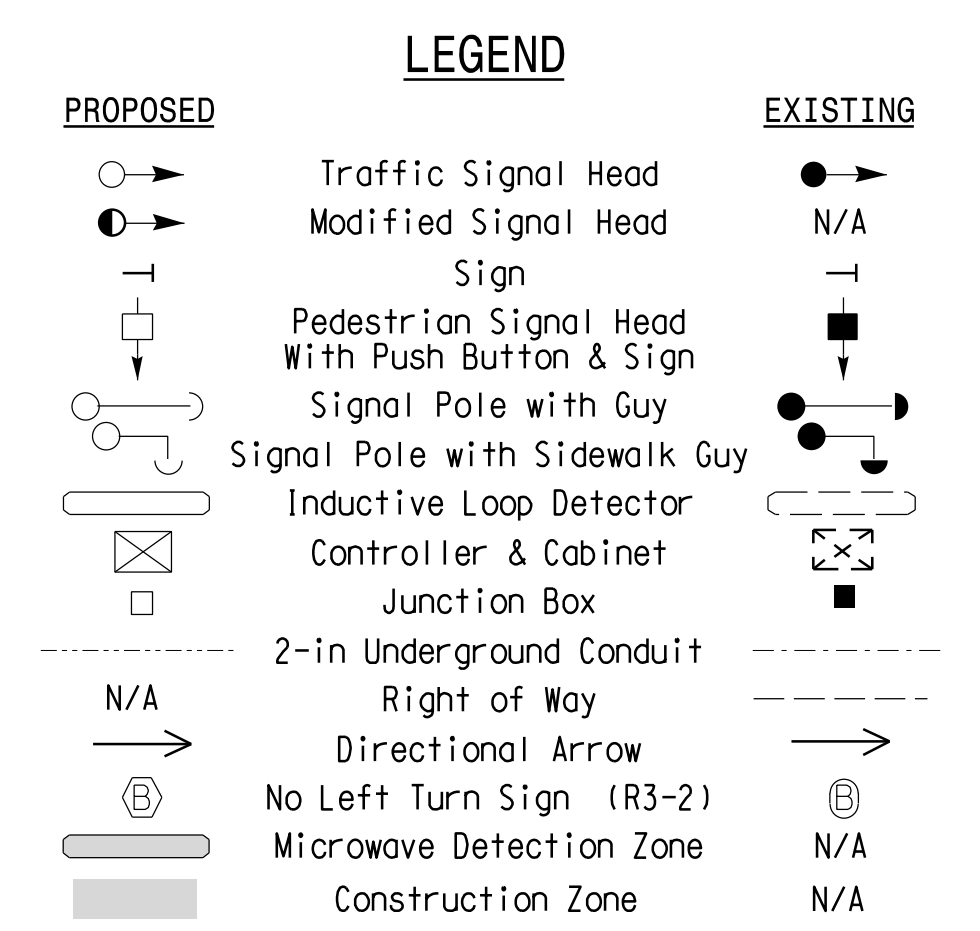
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signals heads numbered 21, 22 and 43.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1365.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.
- Reposition existing sign B.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	15	60	30	60
Yellow	3.0	3.9	3.9	3.9
Red Clear	2.3	2.8	1.9	2.8
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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.



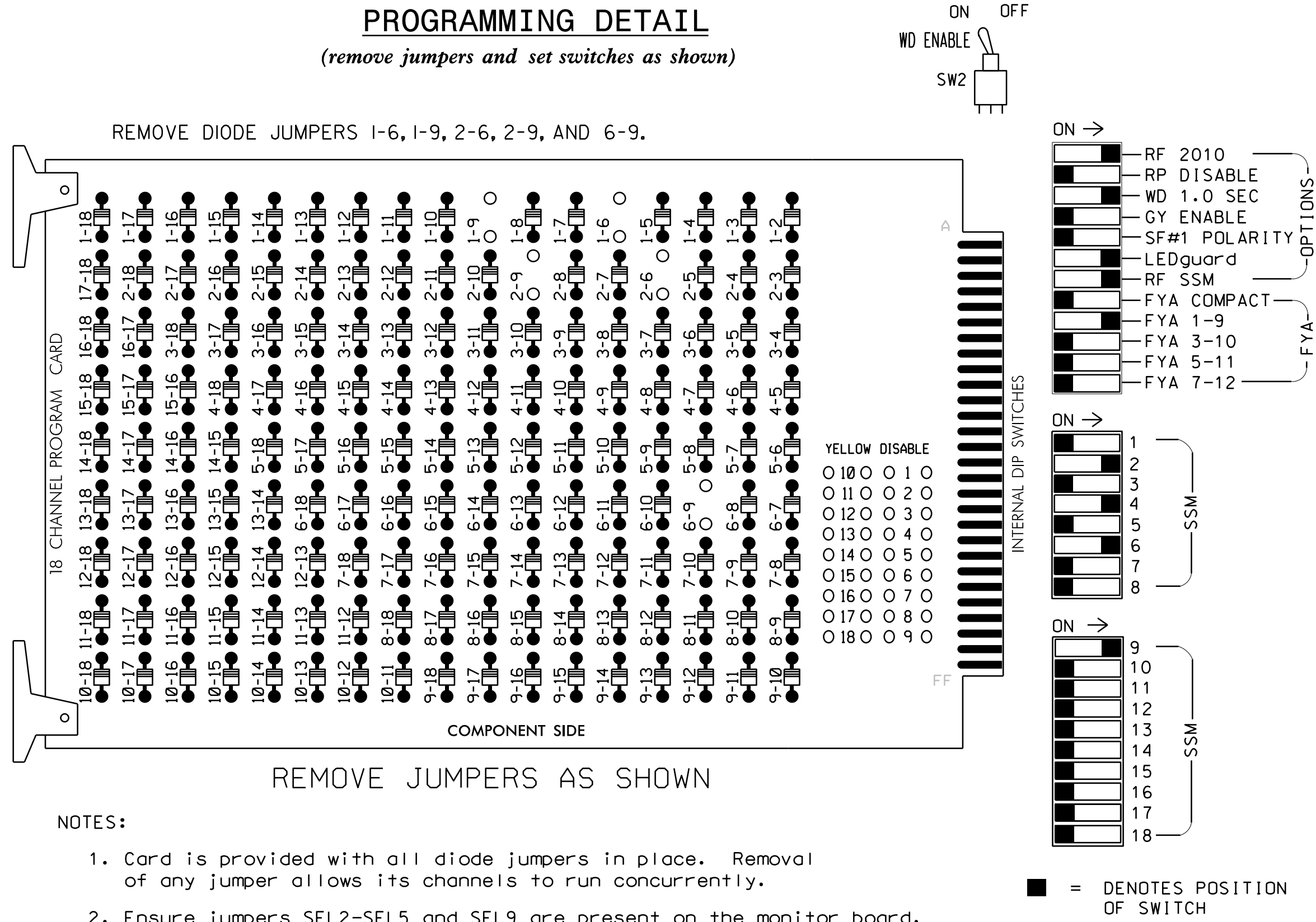
**Signal Upgrade
Temporary Design 3 - (TMP Phase 2.2)**

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UNLESS ALL SIGNATURES COMPLETED**

 RKA RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28262 Phone: 704-668-4202 www.rkainc.com NC License No. C-2019	Prepared For: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION	NC 20 (W. Broad St.) at I-95 SB Ramps	SEAL WILLIAM J. HAMILTON ENGINEER 32396
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE	DATE 02/25/2022

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

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, 23	NU	NU	41,42, 43,44	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU	
RED	128				101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

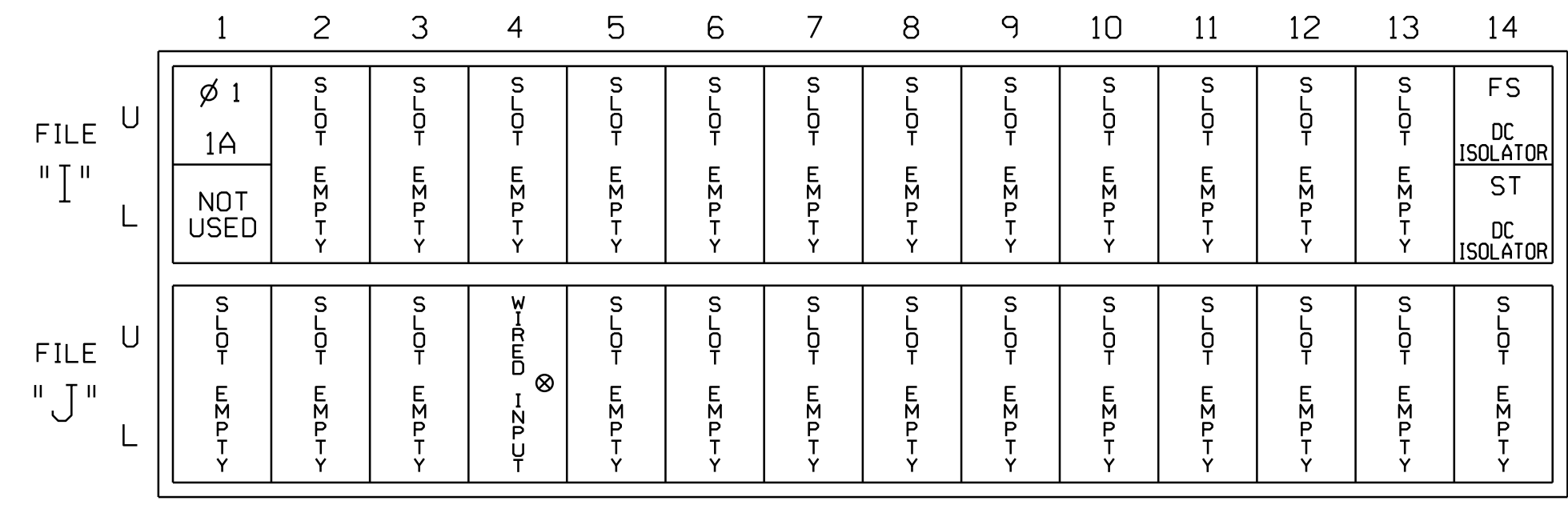
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

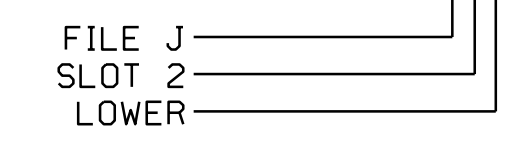
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

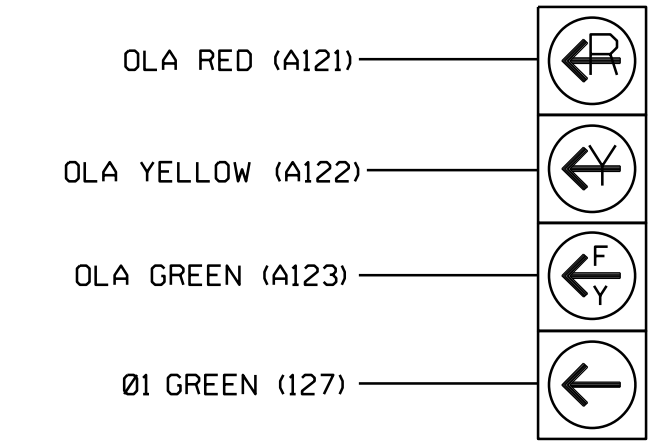
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

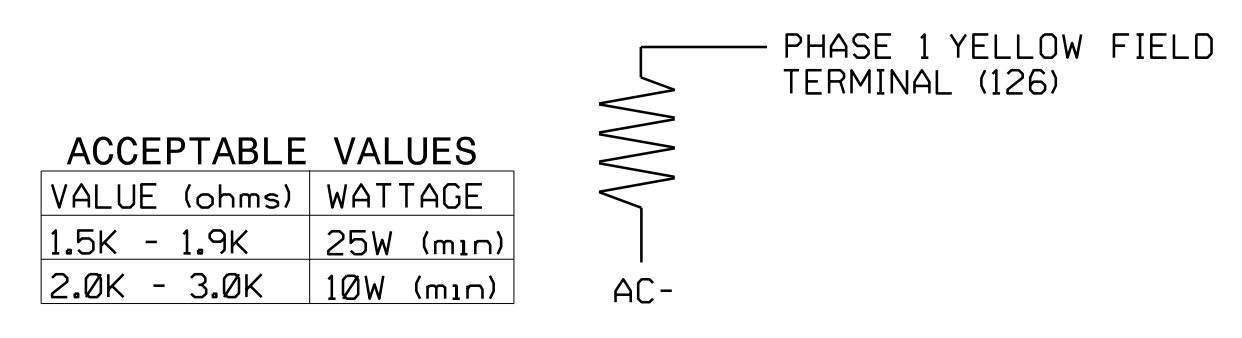
SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T3
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 1 of 2
 Temporary Design 3 - (TMP Phase 2.2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL William J. Hamilton ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'


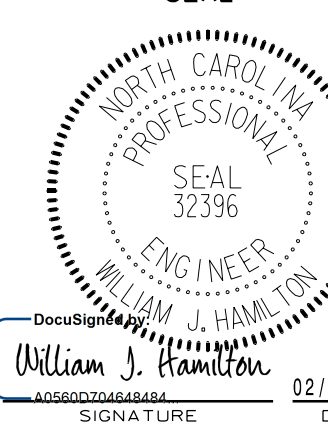
TMG VEH OVLP... [A] TYPE:	PPLT FYA
PROTECTED PHASE (LEFT TURN).....	1
PERMISSIVE PHASE (OPPOSING THRU)....	2
FLASHING ARROW OUTPUT.....CH9	ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE.....	0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T3 DESIGNED: Feb 2022 SEALED: 02/25/2022 REVISED: N/A

Electrical Detail Sheet 2 of 2
Temporary Design 3 - (TMP Phase 2.2)

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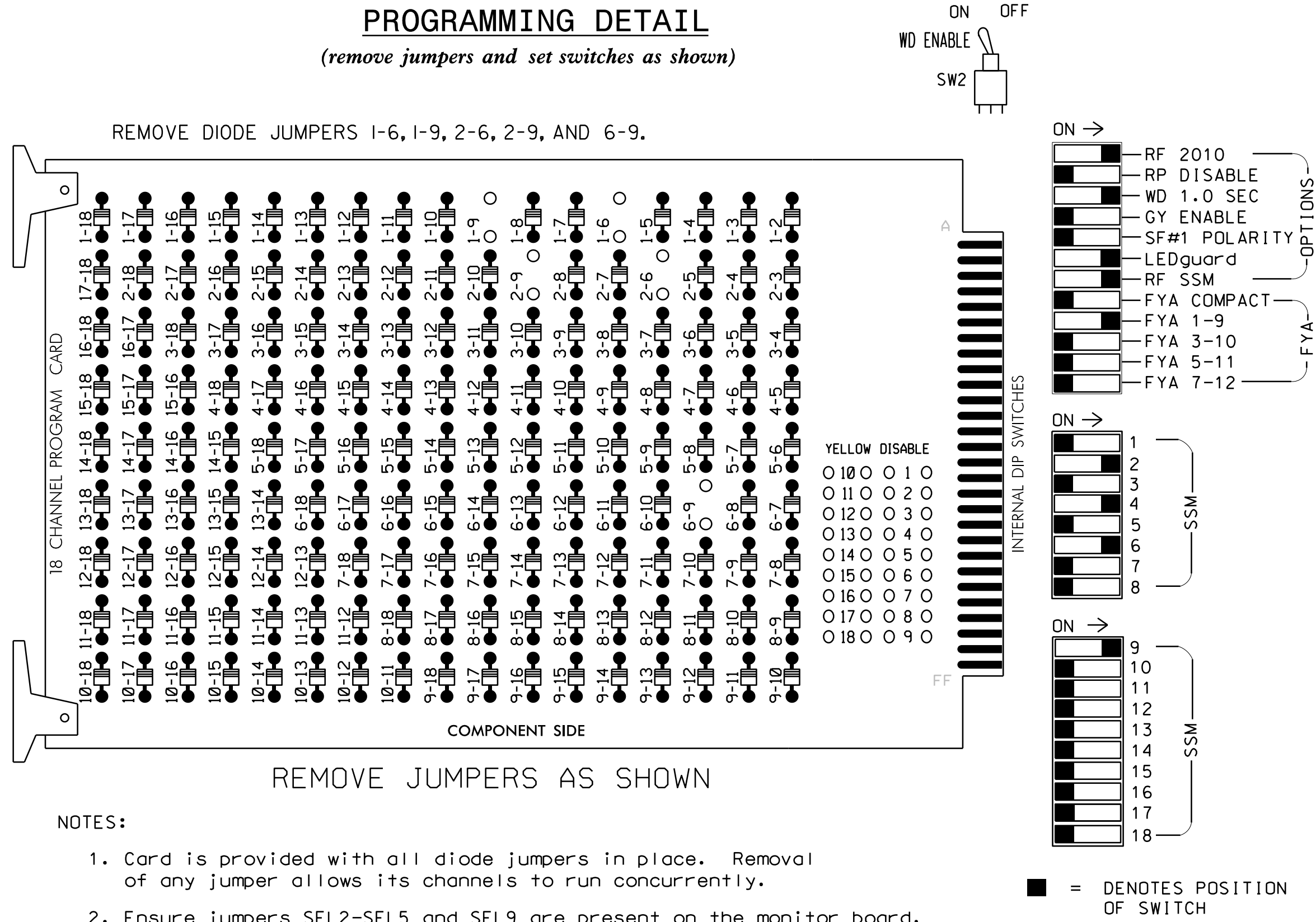
 RKA RAMEY KEMP ASSOCIATES <small>8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28222 Phone: 704-545-4260 www.rameykemp.com NC License No. C-9910</small>	ELECTRICAL AND PROGRAMMING DETAILS FOR: <div style="text-align: center; font-weight: bold;"> NC 20 (W. Broad St.) at I-95 SB Ramps </div>	SEAL  NORTH CAROLINA PROFESSIONAL SEAL 32396 ENGINEER WILLIAM J. HAMILTON
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE _____ _____ _____

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 06-1365T3

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

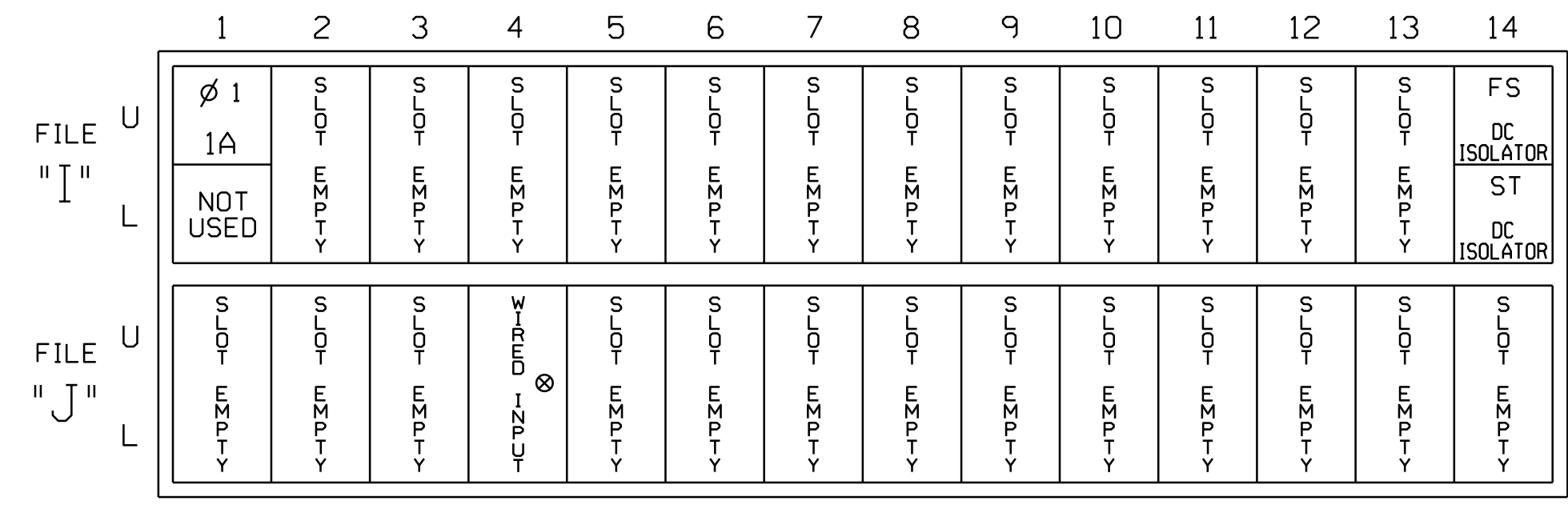
SIGNAL HEAD HOOK-UP CHART

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, 43,44	NU	NU	61,62	NU	NU	NU	NU	11*	NU	NU	NU	NU	NU	
RED	128				101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

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

INPUT FILE POSITION LAYOUT

(front view)



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

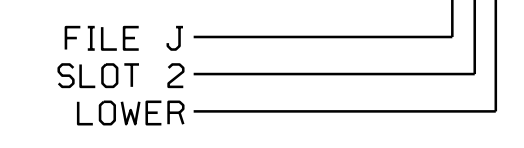
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

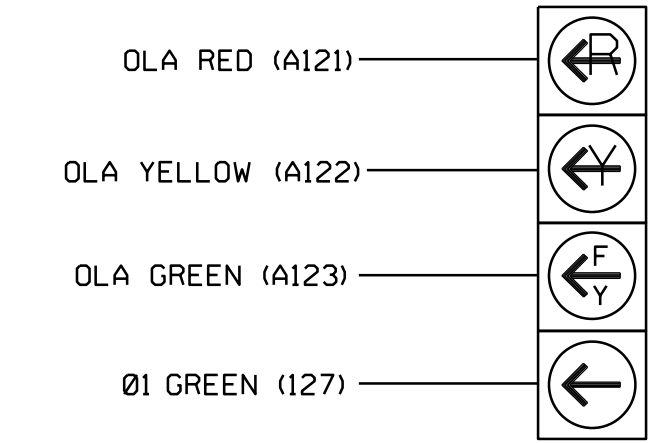
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



11

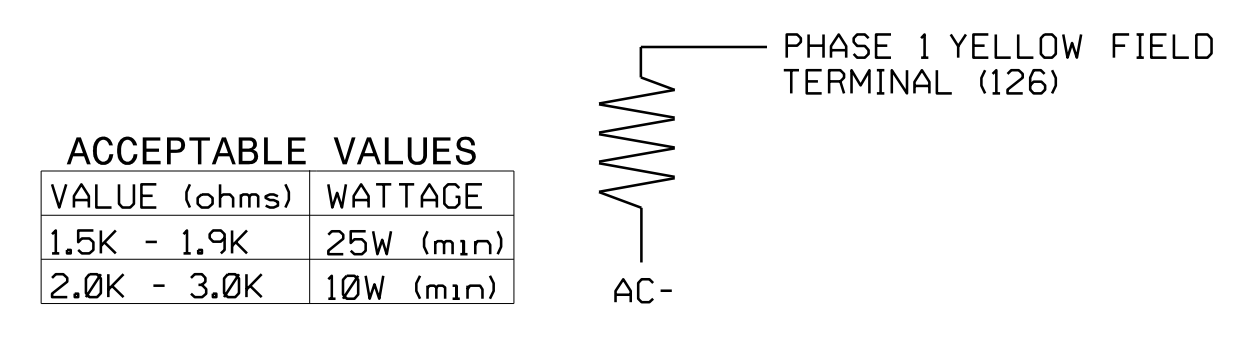
SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

Electrical Detail Sheet 1 of 2
 Temporary Design 4 - (TMP Phase 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```

TMG VEH OVLP...[A] TYPE: .....[PPLT FYA]
PROTECTED PHASE (LEFT TURN)..... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0

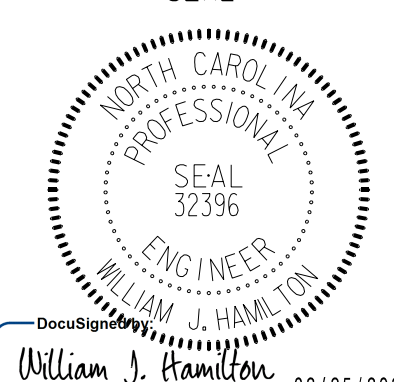


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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1365T4
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

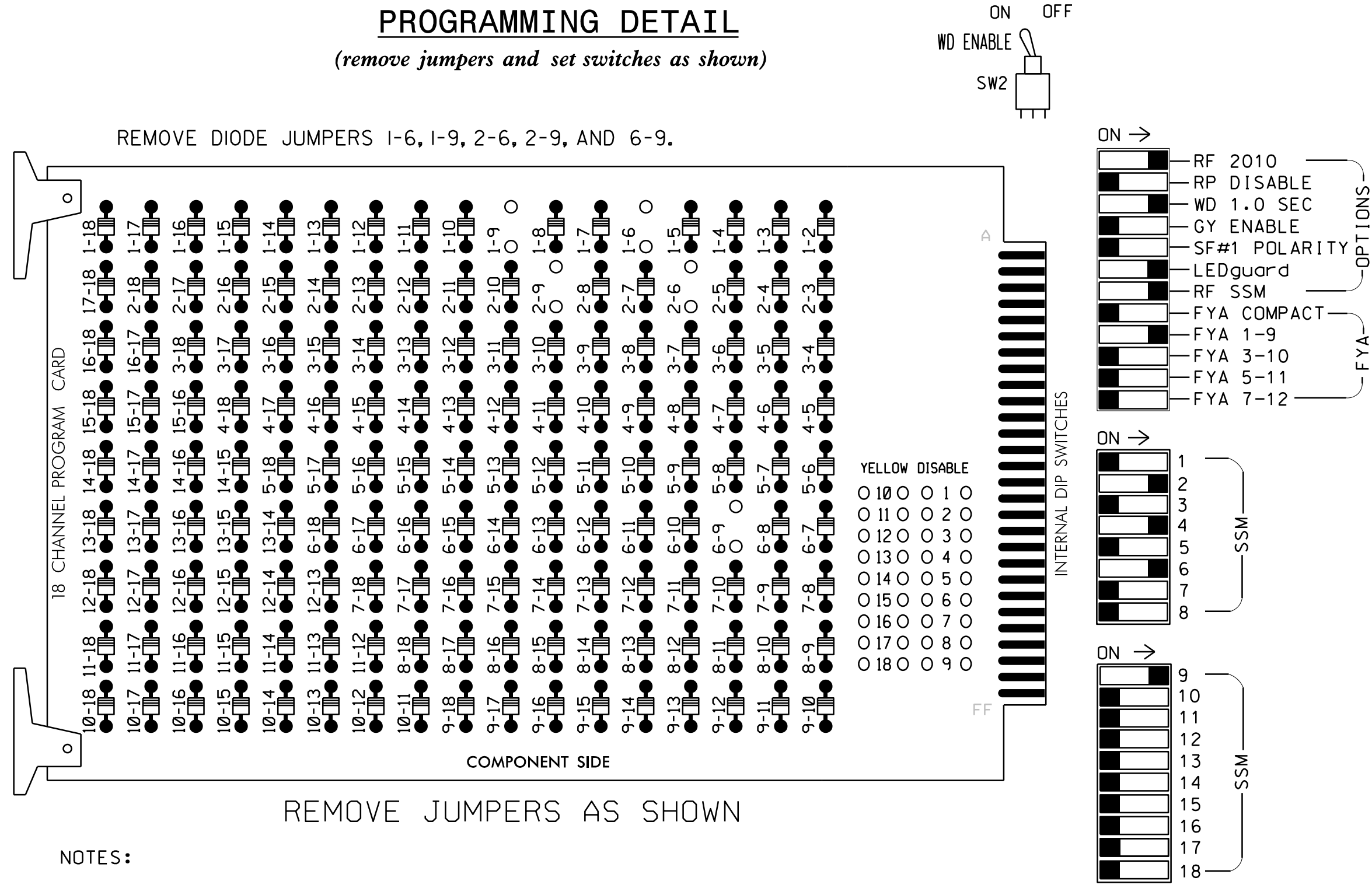
Electrical Detail Sheet 2 of 2
 Temporary Design 4 - (TMP Phase 3)

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

<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p>	<p>NC 20 (W. Broad St.) at I-95 SB Ramps</p> <p>Division 6 Robeson County St. Pauls</p> <p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p> <p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)</p>	<p style="text-align: center; font-size: x-small;">SEAL</p> <div style="text-align: center;">  <p style="font-size: x-small;">NORTH CAROLINA PROFESSIONAL ENGINEER WILLIAM J. HAMILTON 32396</p> </div> <p style="font-size: x-small;">DocuSign Envelope ID: [Signature]</p> <p style="font-size: x-small;">SIGNATURE DATE</p> <p style="font-size: x-small;">WJ Hamilton 02/25/2022</p>												
 <p style="font-size: x-small;">RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28202 Phone: 704-545-4260 www.rameykemp.com NC License No. C-0910</p>	 <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>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> <p style="font-size: x-small;">SIG. INVENTORY NO. 06-1365T4</p>	REVISIONS	INIT.	DATE									
REVISIONS	INIT.	DATE												

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicated 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 controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D06-21 St. Pauls System.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

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, 43,44	NU	NU	61,62	NU	NU	NU	NU	11*	NU	NU	NU	NU	NU	
RED		128			101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

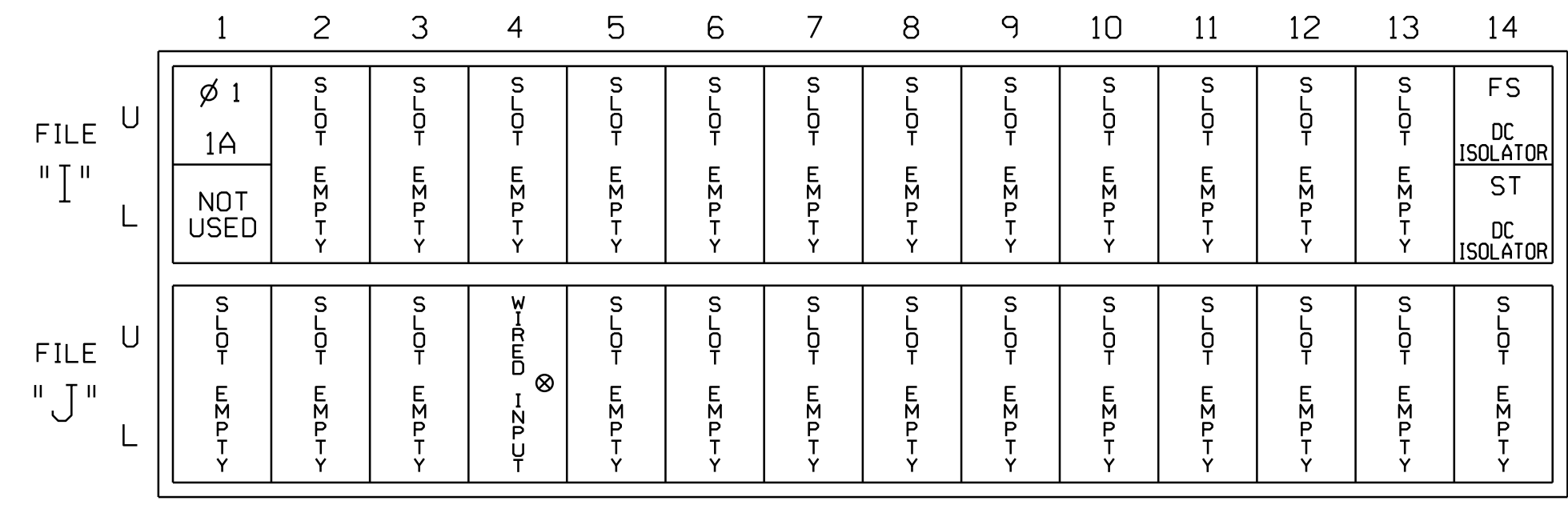
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

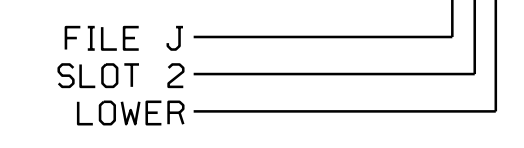


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

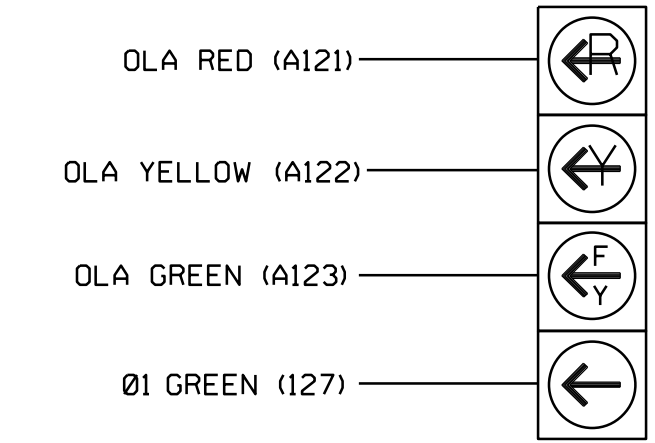
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

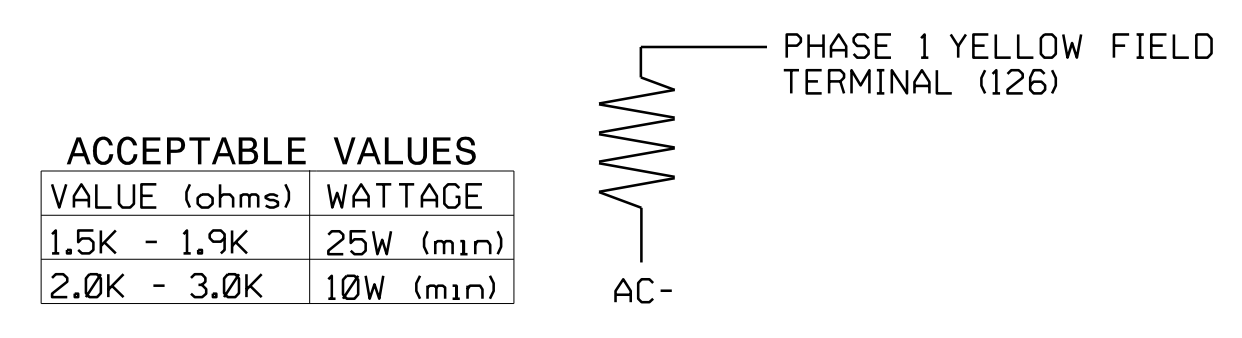
(wire signal head as shown)



11

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T5
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 1 of 2
 Temporary Design 5 - (TMP Phase 4.1)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	SIGNATURE: DATE: 02/25/2022 SIG. INVENTORY NO. 06-1365T5	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select
2. From CONTROLLER Submenu select

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

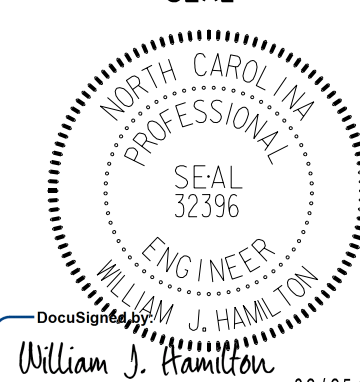
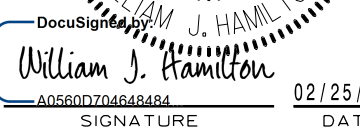
TMG VEH OVLP... [A] TYPE:	<input type="text" value="PPLT FYA"/>
PROTECTED PHASE (LEFT TURN).....	1
PERMISSIVE PHASE (OPPOSING THRU)....	2
FLASHING ARROW OUTPUT.....CH9	ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0	
ACTION PLAN SF BIT DISABLE.....	0

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1365T5
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 2 of 2
Temporary Design 5 - (TMP Phase 4.1)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL 
	Division 6 Robeson County St. Pauls		
PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton			DocuSign  SIGNATURE DATE
PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS	INIT. DATE	
750 N. Greenfield Pkwy, Garner, NC 27529			SIG. INVENTORY NO. 06-1365T5



2/24/2022
...061365T5.sm.ele_2021.mdd.dgn
User: J.Wend

PHASING DIAGRAM

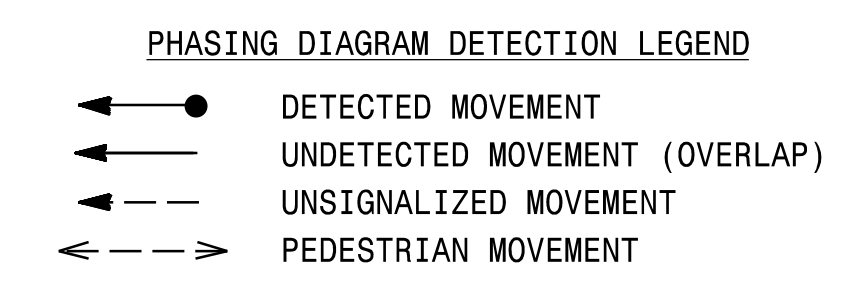
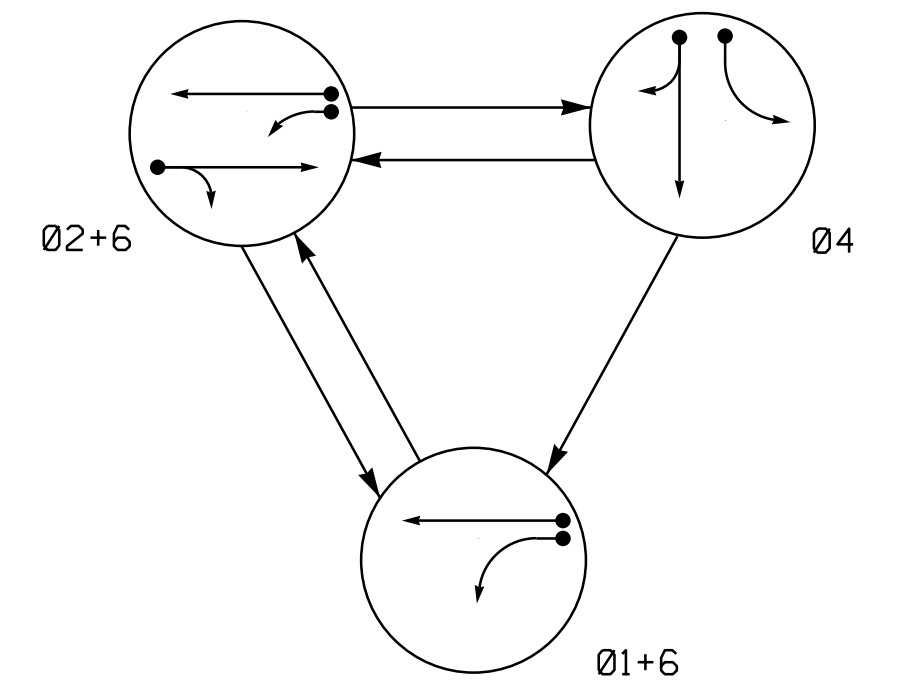
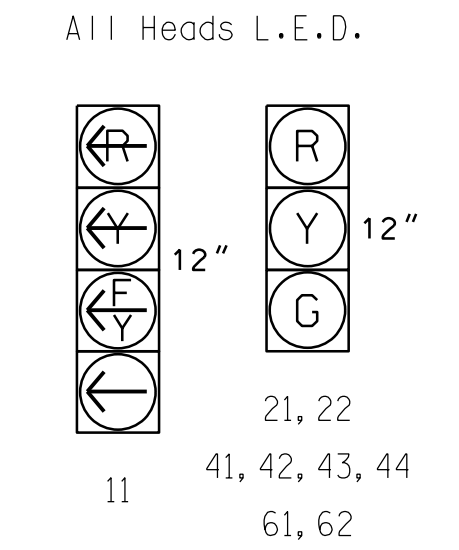


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	01+6	02+6	04	UNDETECTED
11	←	←	←	←
21, 22	R	G	R	Y
41, 42, 43, 44	R	R	G	R
61, 62	G	G	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

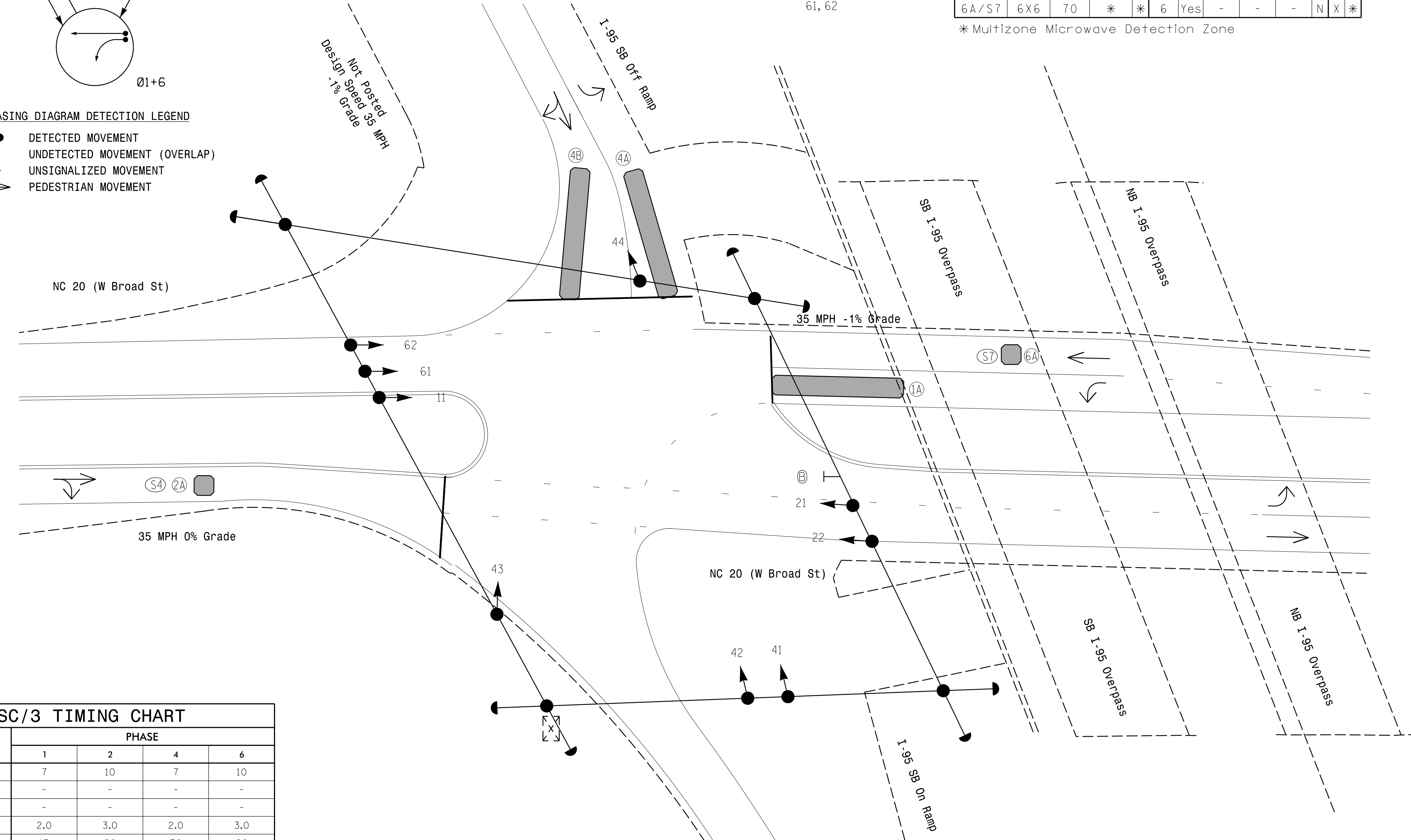
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Yes	-	15	-	N	-	*
2A/S4	6X6	70	*	*	2	Yes	-	-	-	N	X	*
4A	6X40	0	*	*	4	Yes	-	-	-	N	-	*
4B	6X40	0	*	*	4	Yes	-	10	-	N	-	*
6A/S7	6X6	70	*	*	6	Yes	-	-	-	N	X	*

* Multizone Microwave Detection Zone

**3 Phase Fully Actuated
06-21 St. Pauls**

NOTES

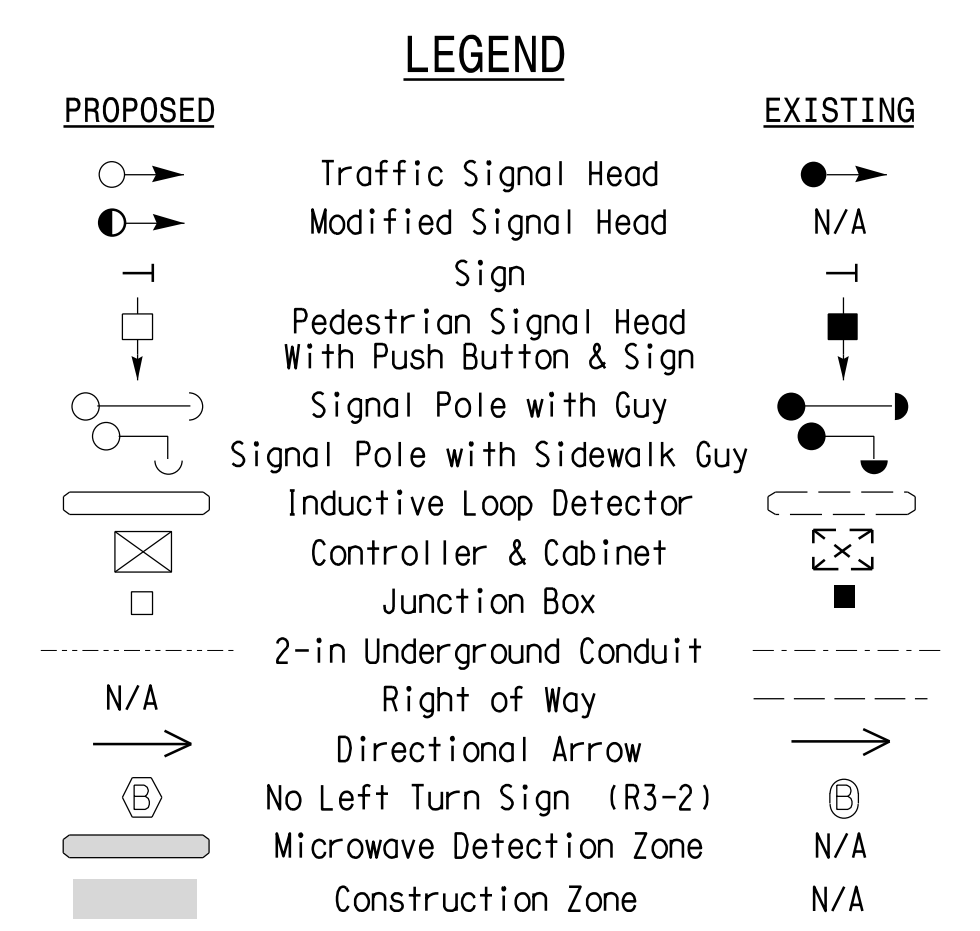
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signals heads numbered 11, 41, 42, 43, 44, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1365.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.



ASC/3 TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	15	60	30	60
Yellow	3.0	3.9	3.9	3.9
Red Clear	3.1	2.2	1.5	2.2
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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 6 - (TMP Phase 4.2)**

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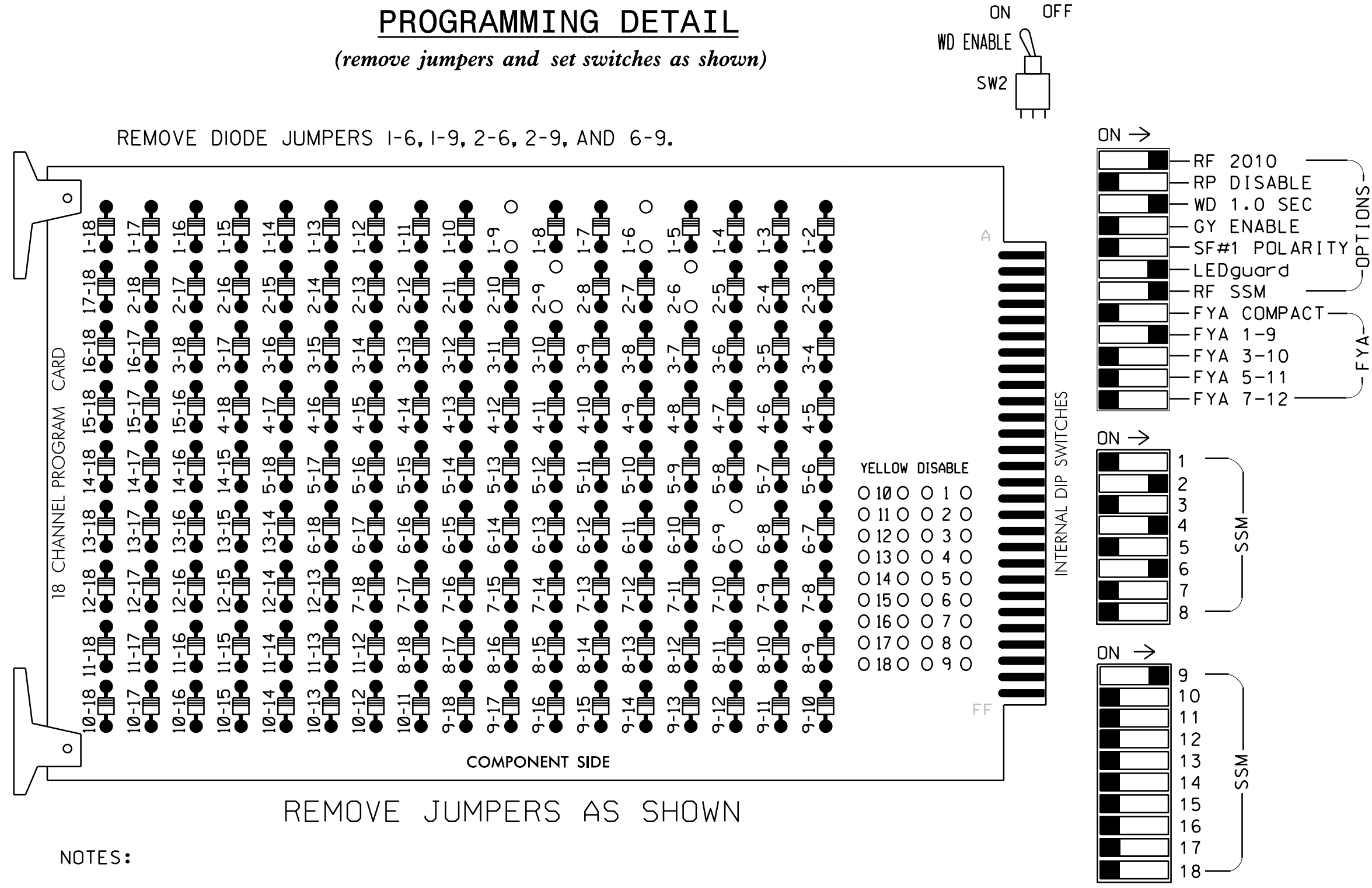
<p>RKA RAMEY KEMP ASSOCIATES</p>	<p>Prepared For: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION</p>	<p>NC 20 (W. Broad St.) at I-95 SB Ramps</p>	<p>SEAL WILLIAM J. HAMILTON PROFESSIONAL ENGINEER 32396</p>
	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Division 6 Robeson County St. Pauls</p>	<p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p>
<p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)</p>	<p>REVISIONS</p>	<p>INITIALS</p>	<p>DATE</p>

SCALE: 0 20 1"=20'

SIG. INVENTORY NO. 06-1365T6

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

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, 43,44	NU	NU	61,62	NU	NU	NU	NU	11	NU	NU	NU	NU	NU	
RED		128			101			134											
YELLOW	*	129			102			135											
GREEN		130			103			136											
RED ARROW																		A121	
YELLOW ARROW																			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127																		

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

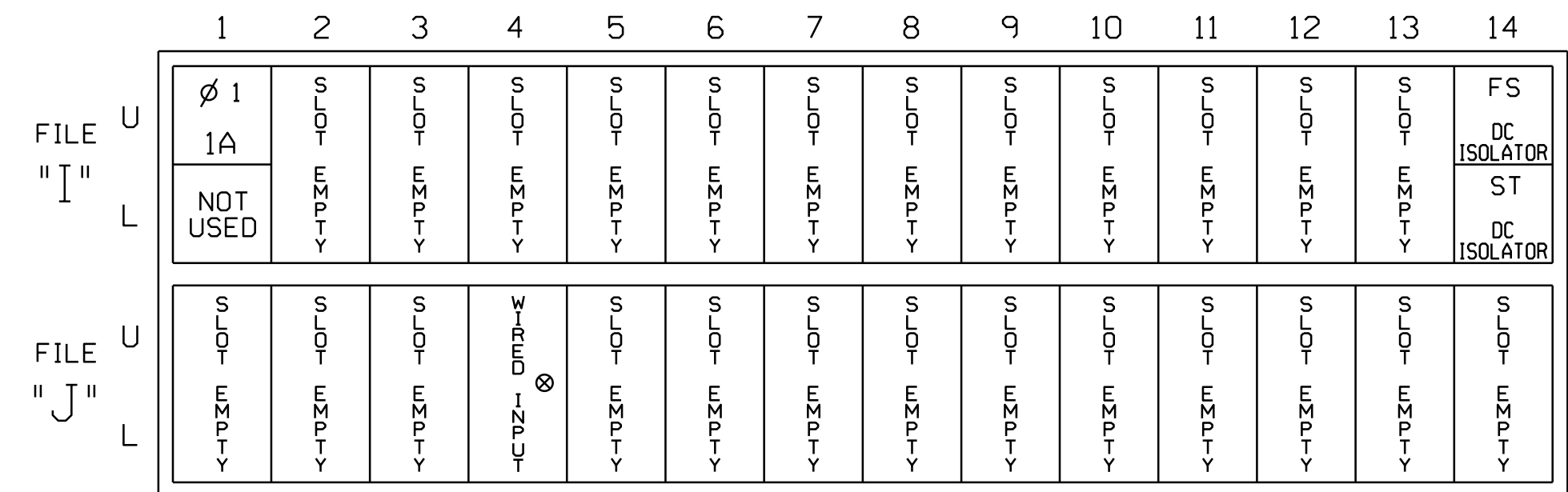
EQUIPMENT INFORMATION

CONTROLLER.....2070LX
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
 PHASES USED.....1,2,4,6
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

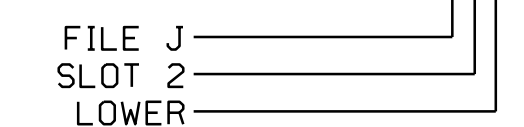
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N

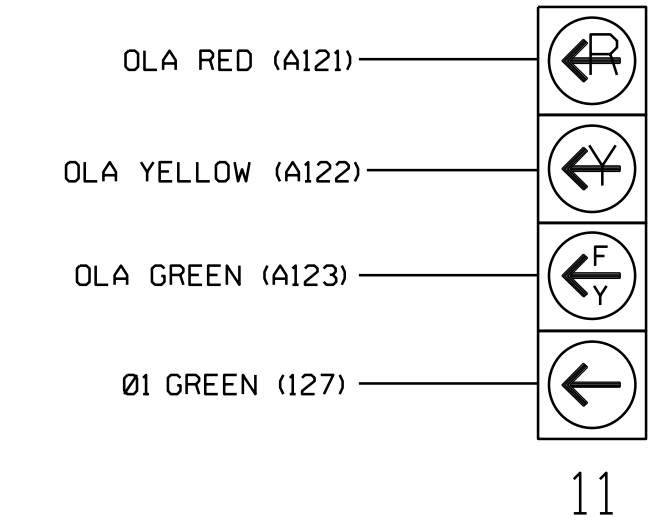
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



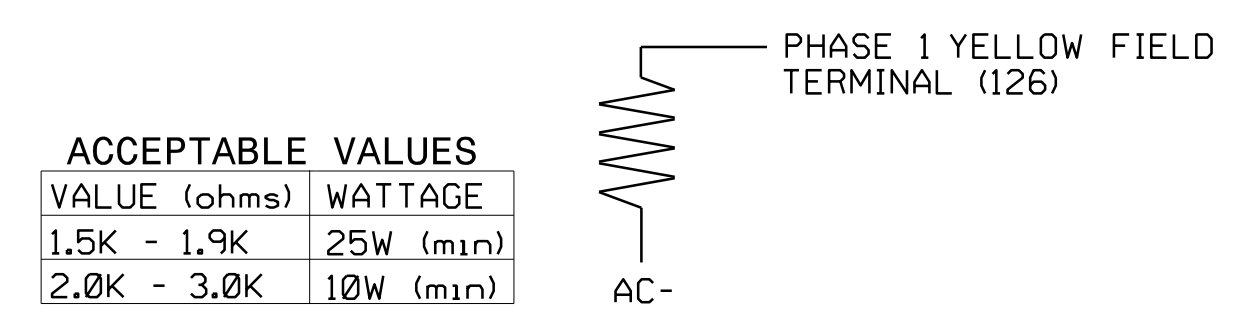
FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

SPECIAL DETECTOR NOTE

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

For Detection Zone 1A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1365T6
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 1 of 2
 Temporary Design 6 - (TMP Phase 4.2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 SB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE _____ _____	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select
- From CONTROLLER Submenu select

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'


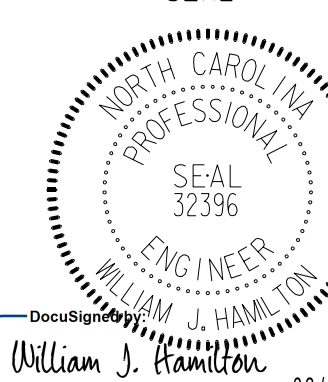
TMG VEH OVLP... [A] TYPE:	<input type="text" value="PPLT FYA"/>
PROTECTED PHASE (LEFT TURN).....	1
PERMISSIVE PHASE (OPPOSING THRU)....	2
FLASHING ARROW OUTPUT.....CH9	ISOLATE
DELAY START OF: FYA..0.0	CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.....	0

END PROGRAMMING

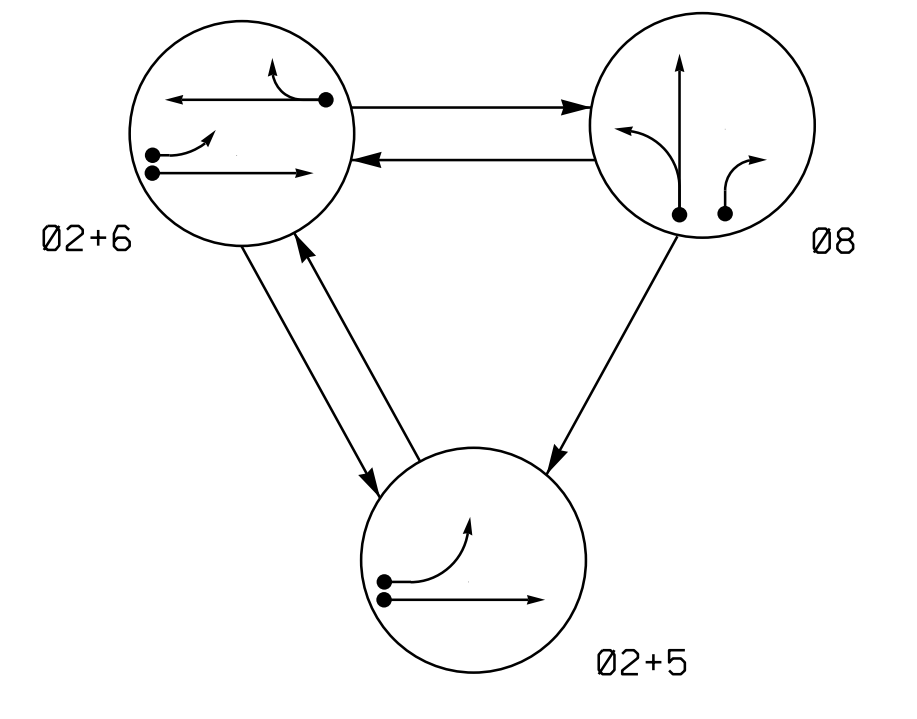
THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1365T6
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 2 of 2
Temporary Design 6 - (TMP Phase 4.2)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

 RKA RAMEY KEMP ASSOCIATES <small>8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28222 Phone: 704-545-4260 www.rameykemp.com NC License No. C-0910</small>	ELECTRICAL AND PROGRAMMING DETAILS FOR: <div style="text-align: center;"> NC 20 (W. Broad St.) at I-95 SB Ramps </div>	SEAL  NORTH CAROLINA PROFESSIONAL ENGINEER WILLIAM J. HAMILTON SEAL 32396									
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE						
REVISIONS	INIT.	DATE									

PHASING DIAGRAM

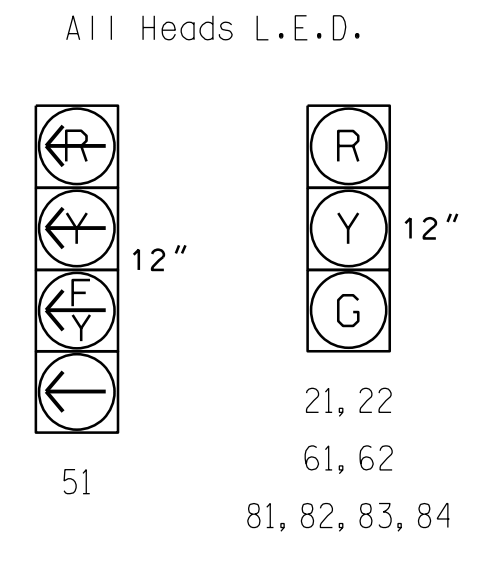


PHASING DIAGRAM DETECTION LEGEND
 ● ← DETECTED MOVEMENT
 — ← UNDETECTED MOVEMENT (OVERLAP)
 - - - ← UNSIGNALIZED MOVEMENT
 - - - ← PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	LOCAL
21, 22	G	G	R	Y
51	←	←	←	←
61, 62	R	G	R	Y
81, 82, 83, 84	R	R	G	R

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

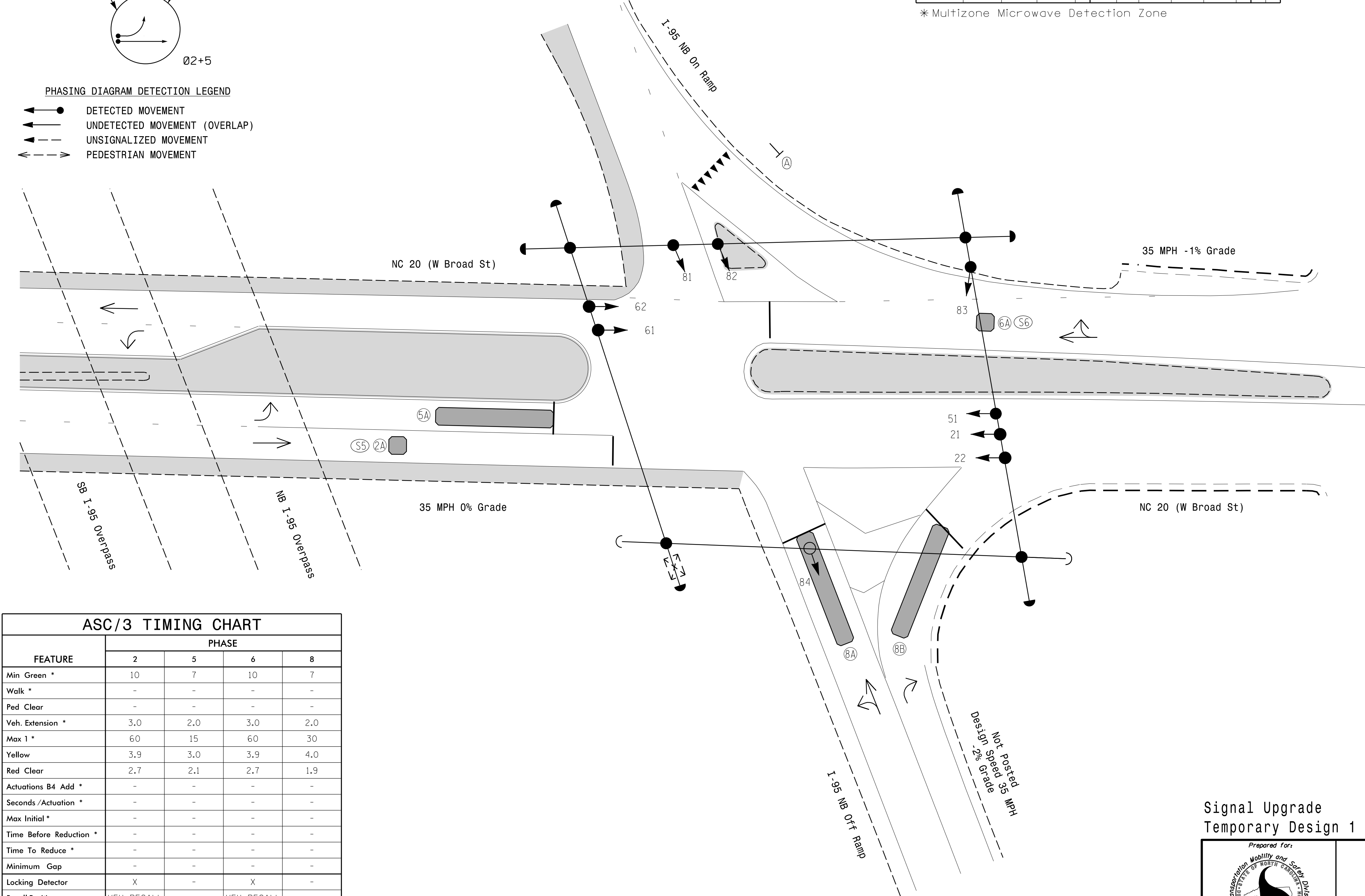
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S5	6X6	70	*	*	2	Yes	-	-	-	N	X	*
5A	6X40	0	*	*	5	Yes	-	15	-	N	-	*
6A/S6	6X6	70	*	*	6	Yes	-	-	-	N	X	*
8A	6X40	0	*	*	8	Yes	-	-	-	N	-	*
8B	6X40	0	*	*	8	Yes	-	15	-	N	-	*

* Multizone Microwave Detection Zone

3 Phase Fully Actuated
 D06-21 St. Pauls

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 5 may be lagged.
- Reposition existing signal heads numbered 21, 22, 51, 81, 82, and 83.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1366.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Min Green *	10	7	10	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	60	15	60	30
Yellow	3.9	3.0	3.9	4.0
Red Clear	2.7	2.1	2.7	1.9
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● →
● → Modified Signal Head	N/A
⊥ Sign	⊥
⊥ Pedestrian Signal Head	⊥
⊥ 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)	⊠
▭ Microwave Detection Zone	N/A
▭ Construction Zone	N/A
▼▼▼ Shark's Teeth Yield Line	N/A

Signal Upgrade
 Temporary Design 1 - (TMP Phase I)

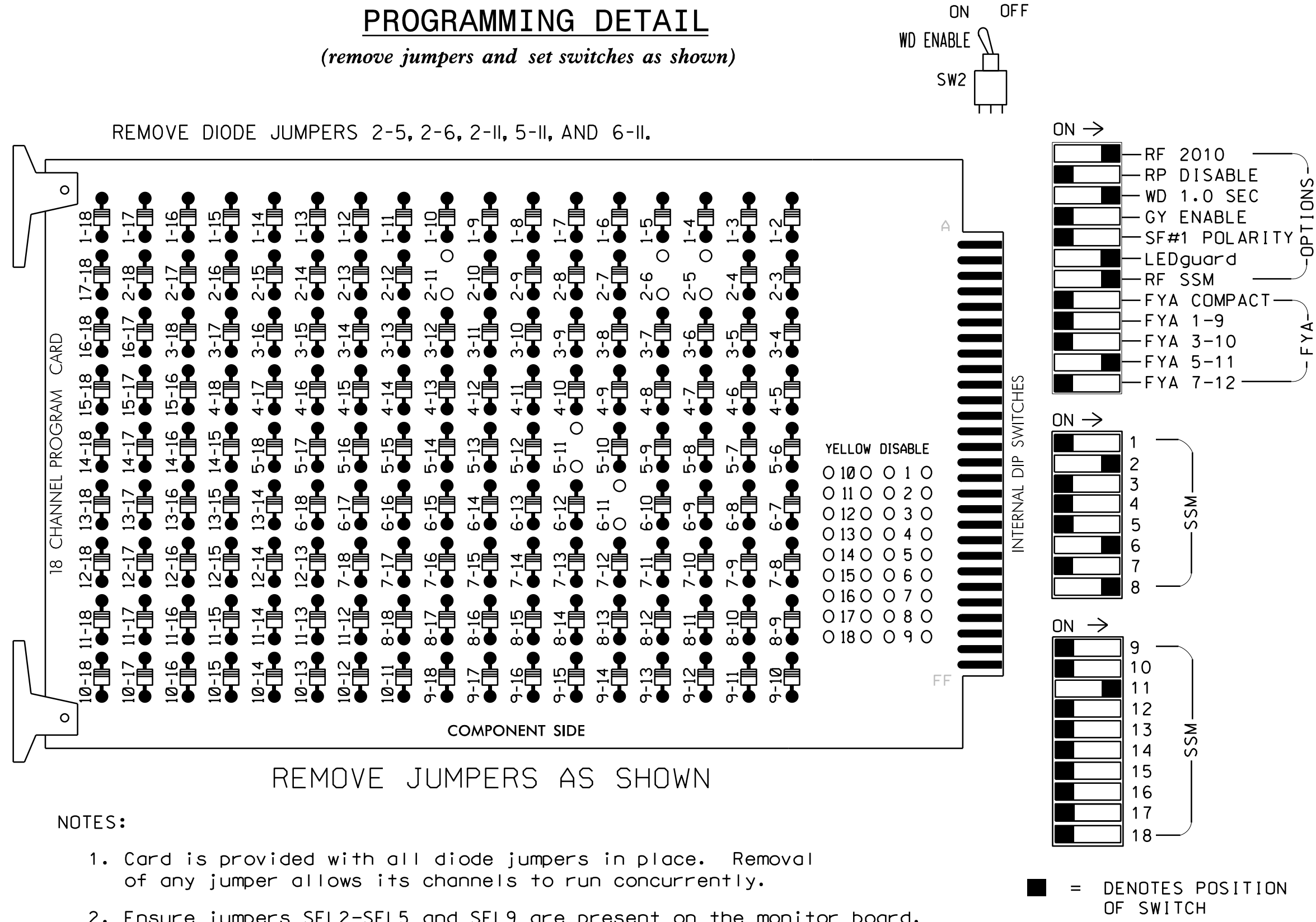
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>RKA RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28262 Phone: 704-688-4202 www.rameykemp.com NC License No. C-2019</p>	<p>NC 20 (W. Broad St.) at I-95 NB Ramps</p>		<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER WILLIAM J. HAMILTON 32396 02/25/2022</p>
	<p>Division 6 Robeson County St. Pauls</p> <p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p> <p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21273 (040)</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>SCALE: 0" = 20' 1" = 20'</p>	

2/24/2022
 4:46:13 PM
 User: jwincd

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51★	61,62	NU	NU	81,82, 83,84	NU	NU	NU	NU	51★	NU	NU	
RED		128						134			107								
YELLOW		129					*	135			108								
GREEN		130						136			109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW							133												

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

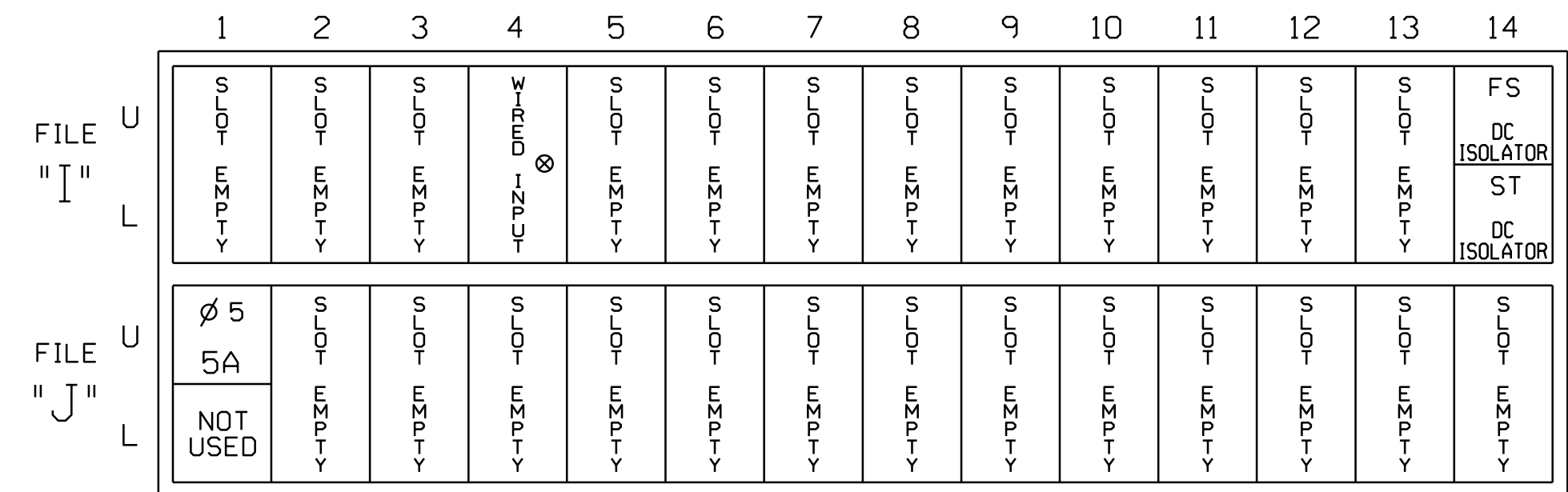
EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



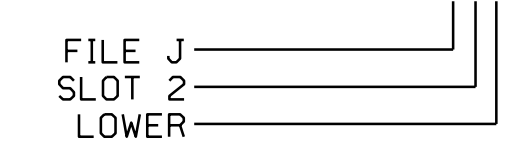
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		N
	-	14U	47	22	2	YES				N

¹Add jumper from J1-W to 14-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

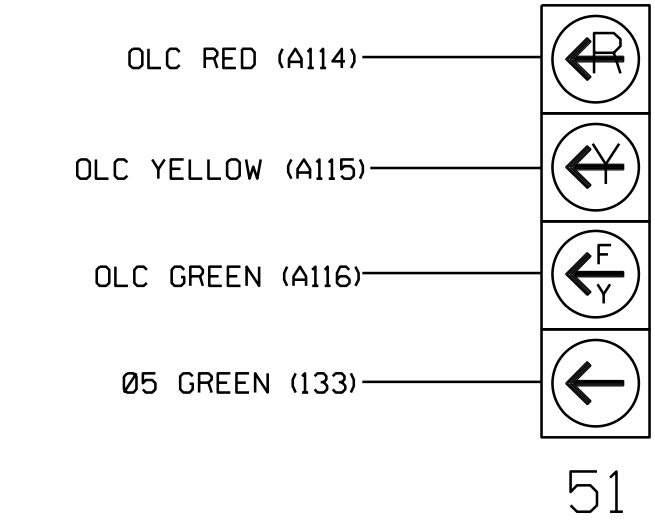


SPECIAL DETECTOR NOTE

Install a multi-zone microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans. For Detection Zone 5A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

FYA SIGNAL WIRING DETAIL

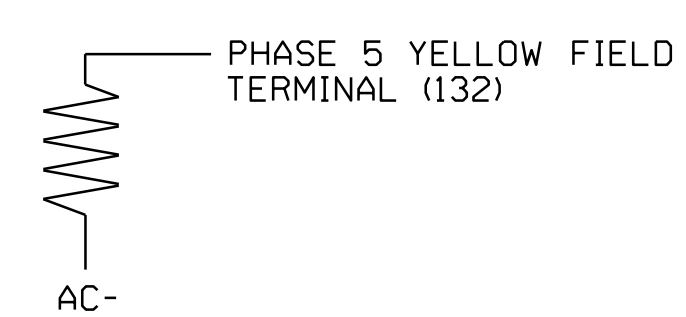
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



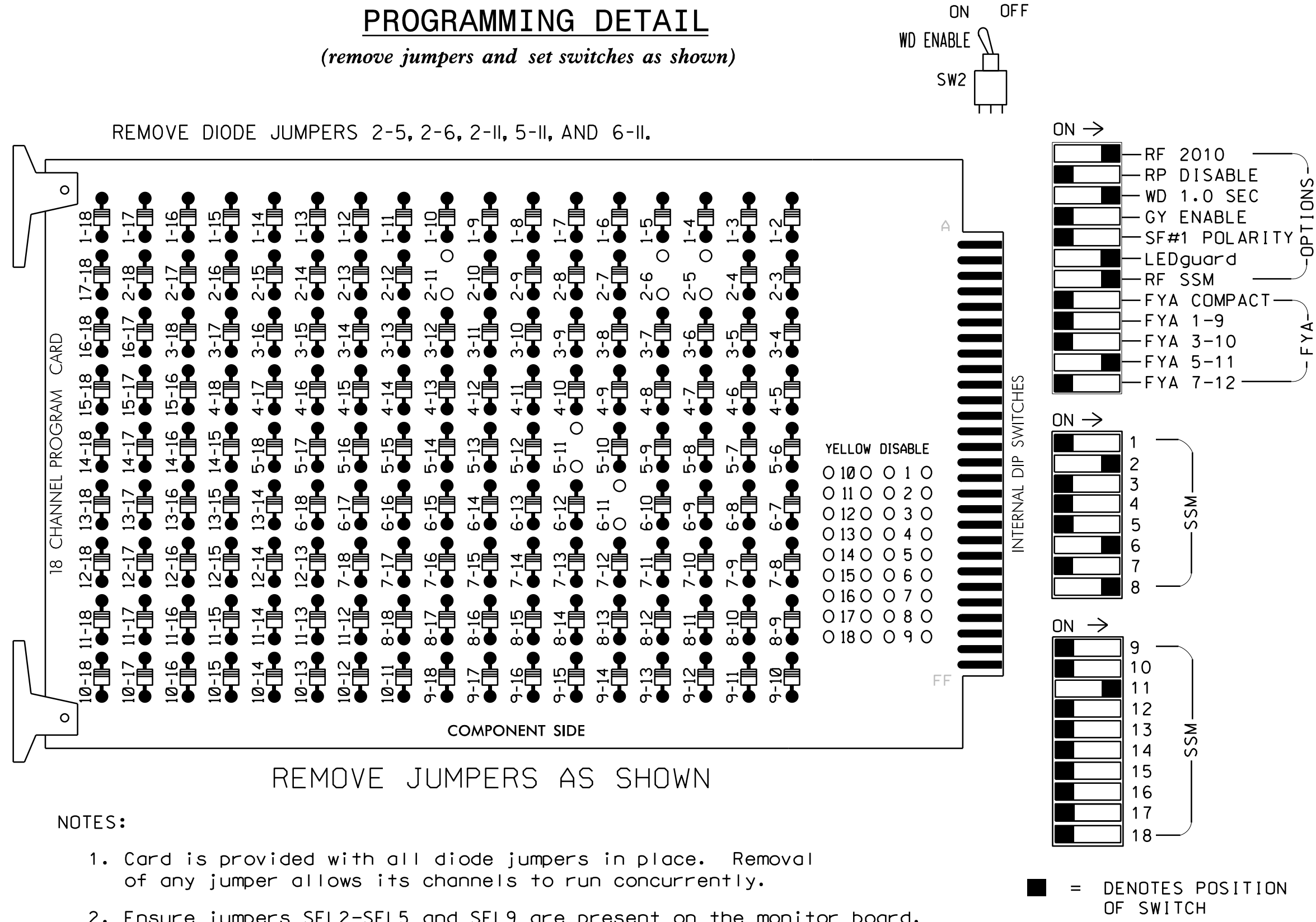
Electrical Detail Sheet 1 of 2
 Temporary Design 1 - (TMP Phase I)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28210 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 NB Ramps		
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	SEAL WILLIAM J. HAMILTON ENGINEER 02/25/2022 DATE	

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51★	61,62	NU	NU	81,82, 83,84	NU	NU	NU	NU	51★	NU	NU	
RED		128						134			107								
YELLOW		129					*	135			108								
GREEN		130						136			109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

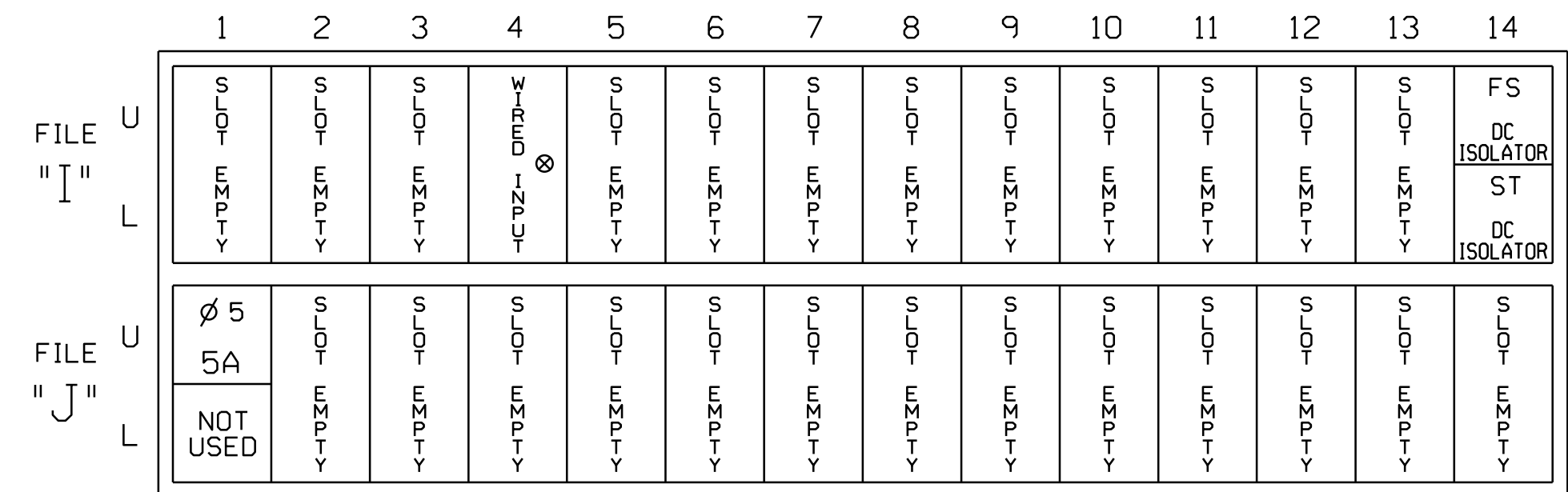
EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

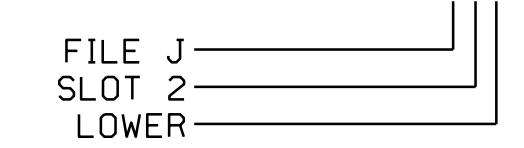
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		N
	-	14U	47	22	2	YES				N

¹Add jumper from J1-W to 14-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



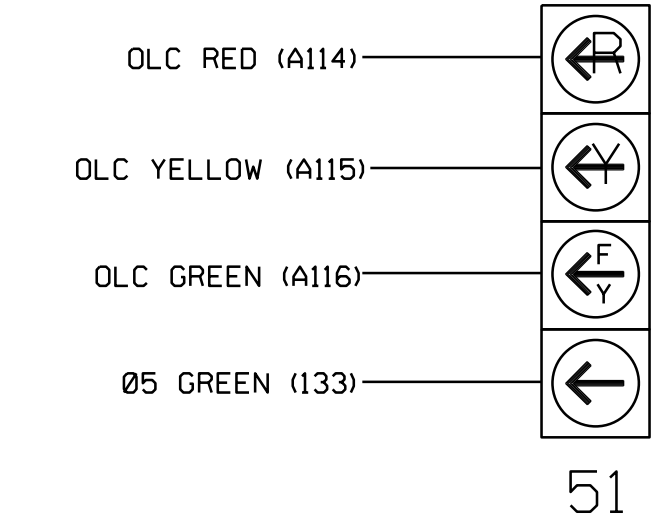
SPECIAL DETECTOR NOTE

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

For Detection Zone 5A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

FYA SIGNAL WIRING DETAIL

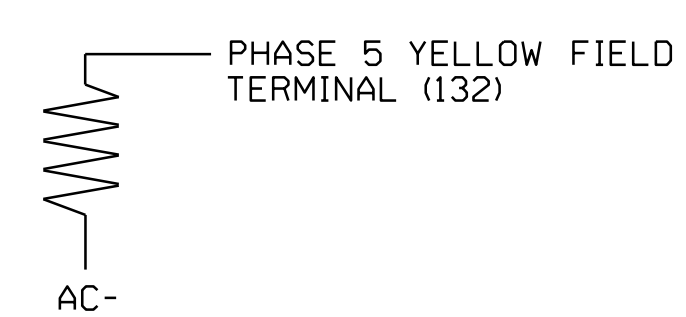
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail Sheet 1 of 2
 Temporary Design 2 - (TMP Phase 2.1)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 NB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	SIGNATURE: DATE: 02/25/2022 SIG. INVENTORY NO. 06-1366T2	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

PRESS '+' THREE TIMES

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```

TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED PHASE (LEFT TURN)..... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0

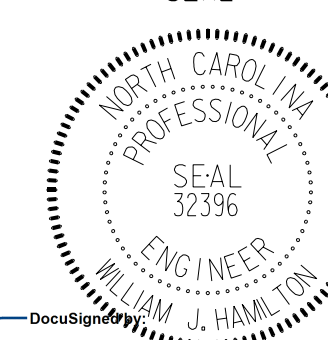
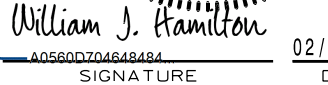
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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1366T2
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 2 of 2
 Temporary Design 2 - (TMP Phase 2.1)

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

ELECTRICAL AND PROGRAMMING DETAILS FOR:	NC 20 (W. Broad St.) at I-95 NB Ramps		SEAL 
	Division 6 Robeson County St. Pauls		
PLAN DATE: February 2022	REVIEWED BY: WJ Hamilton		DocuSign 
PREPARED BY: TS Popelka	RKA PROJ. NO.: 21031 (040)		
REVISIONS	INIT.	DATE	SIGNATURE DATE
_____	_____	_____	_____ 02/25/2022
_____			SIG. INVENTORY NO. 06-1366T2



PHASING DIAGRAM

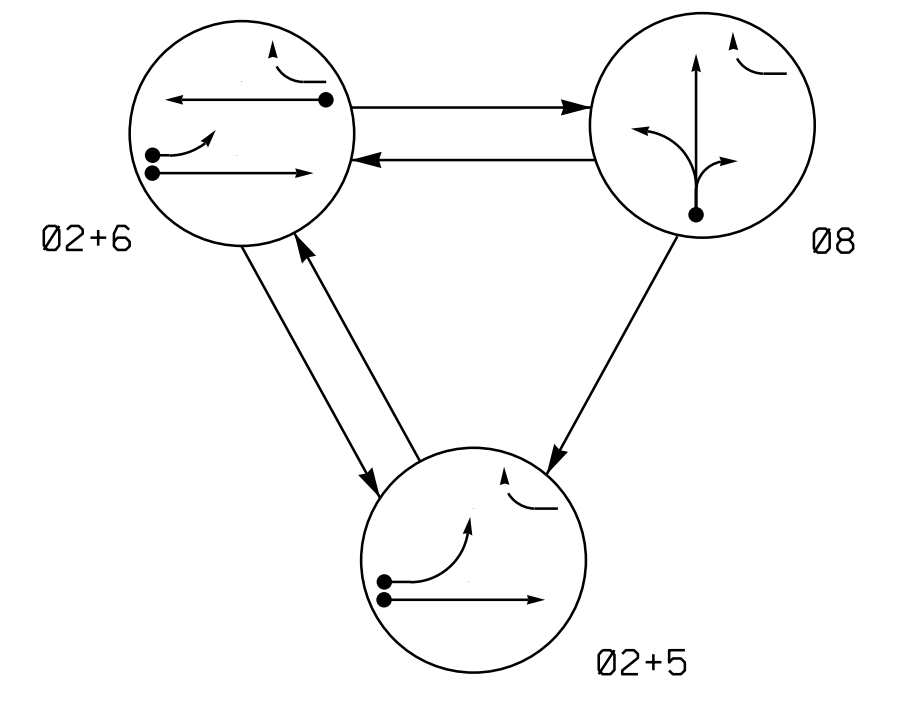
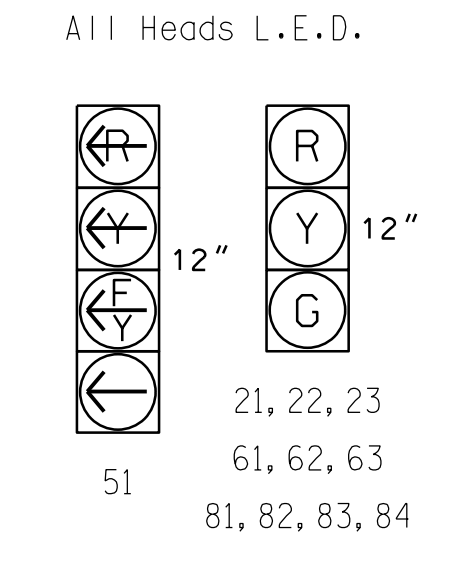


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	08	LOCAL
21, 22, 23	G	G	R	Y
51	←	←	←	←
61, 62, 63	R	G	R	Y
81, 82, 83, 84	R	R	G	R

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S5	6X6	70	*	*	2	Yes	-	-	-	N	X	*
5A	6X40	0	*	*	5	Yes	-	15	-	N	-	*
6A/S6	6X6	70	*	*	6	Yes	-	-	-	N	X	*
8A	6X40	0	*	*	8	Yes	-	-	-	N	-	*
8B	6X40	0	*	*	8	Yes	-	15	-	N	-	*

* Multizone Microwave Detection Zone

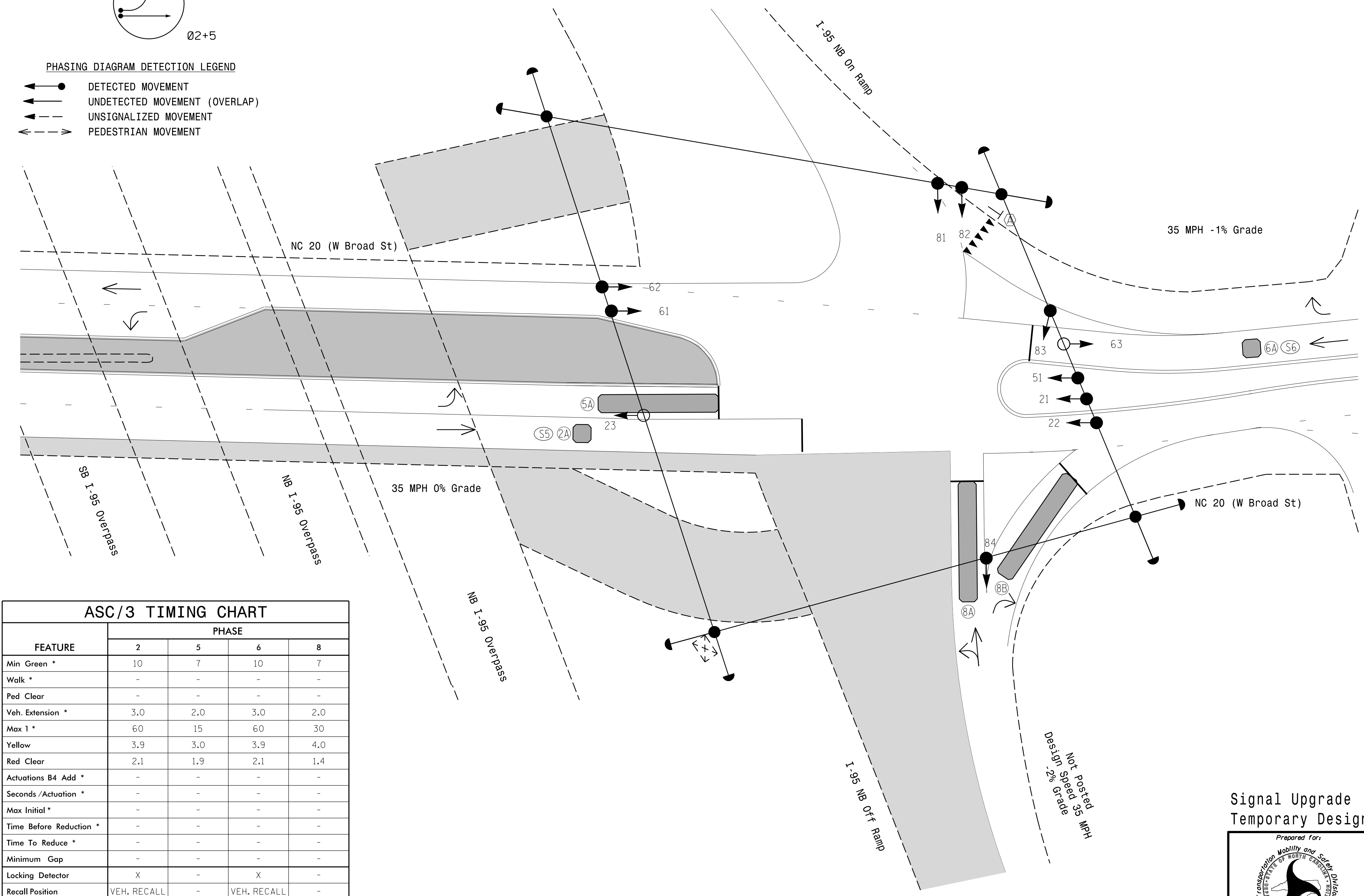
3 Phase Fully Actuated
D06-21 St. Pauls

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 5 may be lagged.
- Set all detector units to presence mode.
- Reposition existing signal heads numbered 81, 82, 83 and 84.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1366.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.

PHASING DIAGRAM DETECTION LEGEND

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



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Min Green *	10	7	10	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	60	15	60	30
Yellow	3.9	3.0	3.9	4.0
Red Clear	2.1	1.9	2.1	1.4
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
Traffic Signal Head	Modified Signal Head
Signal	Signal Pole with Guy
Pedestrian Signal Head With Push Button & Sign	Signal Pole with Sidewalk Guy
Inductive Loop Detector	Controller & Cabinet
Junction Box	2-in Underground Conduit
Right of Way	Directional Arrow
"YIELD" Sign (R1-2)	Microwave Detection Zone
Construction Zone	Shark's Teeth Yield Line

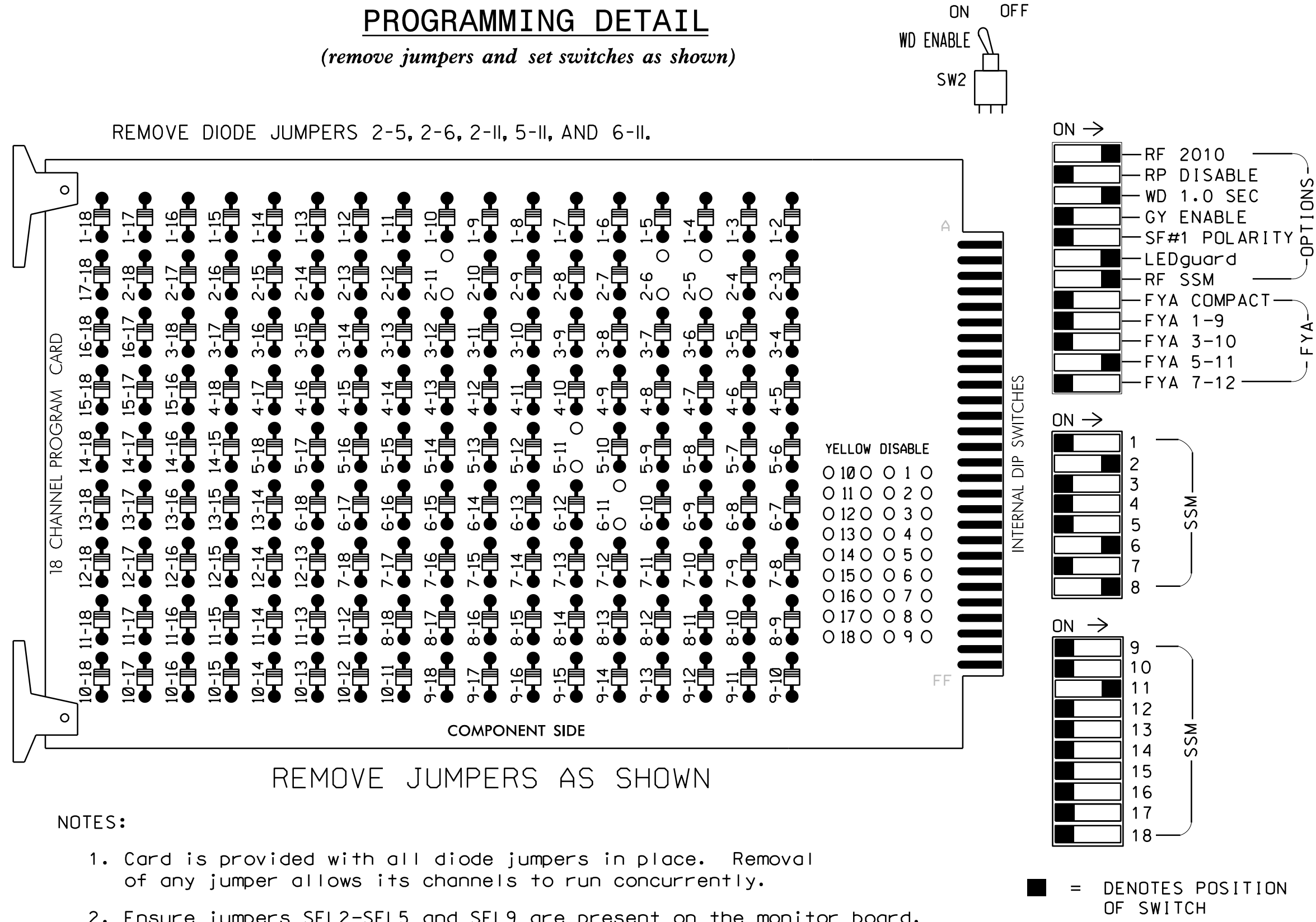
Signal Upgrade
Temporary Design 3 - (TMP Phase 2.2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>RKA RAMEY KEMP ASSOCIATES</p>	<p>NC 20 (W. Broad St.) at I-95 NB Ramps</p>		
	<p>Division 6 Robeson County St. Pauls</p> <p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p> <p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21273 (040)</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>SCALE: 0" = 20'</p> <p>1" = 20'</p>	

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicated 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 controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the D06-21 St. Pauls System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22,23	NU	NU	NU	NU	51	61,62,63	NU	NU	81,82,83,84	NU	NU	NU	NU	51	NU	NU
RED		128							134		107							
YELLOW		129					*		135		108							
GREEN		130							136		109							
RED ARROW																		A114
YELLOW ARROW																		A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW								133										

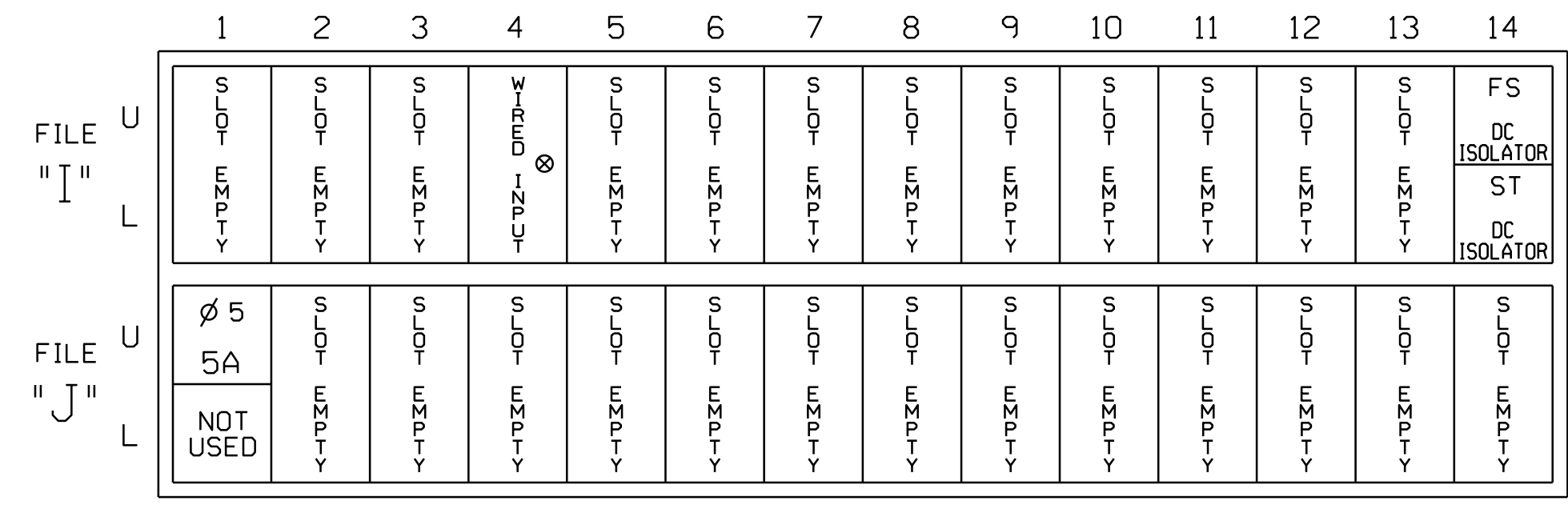
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED
 * See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)

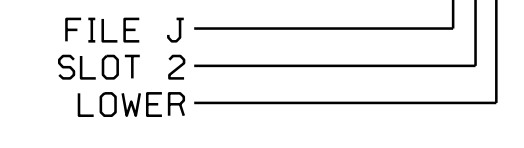


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A ¹	TB3-1,2	J1U	55	5	5	YES		15		N
	-	14U	47	22	2	YES				N

¹Add jumper from J1-W to 14-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

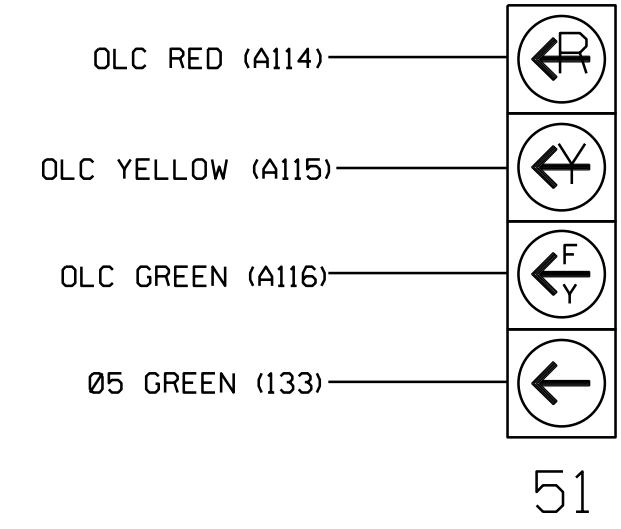


SPECIAL DETECTOR NOTE

Install a multi-zone microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
 For Detection Zone 5A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

FYA SIGNAL WIRING DETAIL

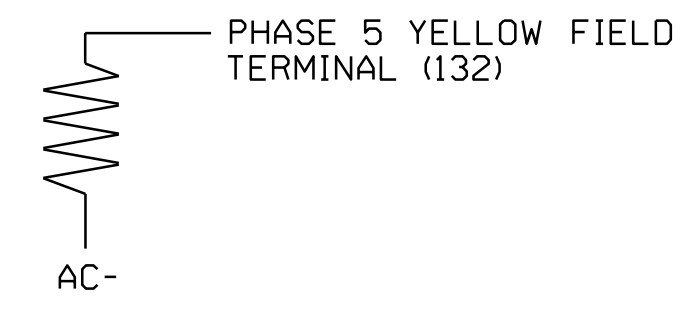
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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

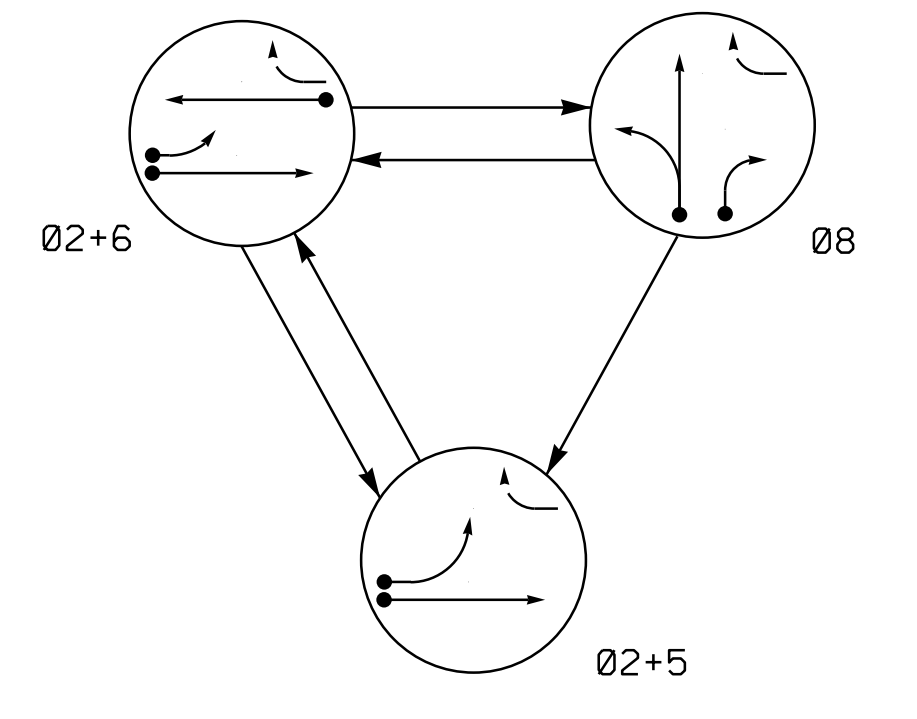


Electrical Detail Sheet 1 of 2
 Temporary Design 3 - (TMP Phase 2.2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

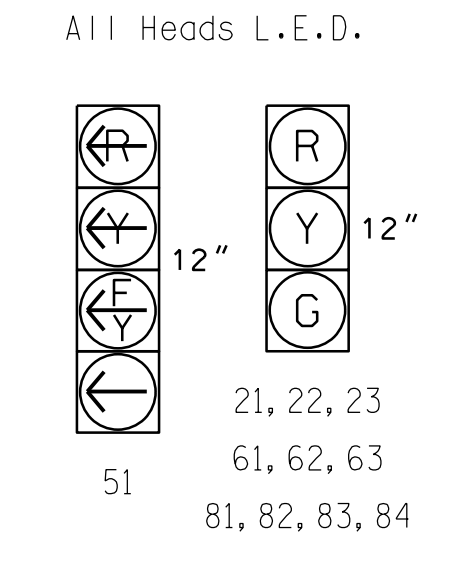
 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28212 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 NB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	SIGNATURE: DATE: 02/25/2022 SIG. INVENTORY NO. 06-1366T3	

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	08	LOCAL
21, 22, 23	G	G	R	Y
51	←	←	←	←
61, 62, 63	R	G	R	Y
81, 82, 83, 84	R	R	G	R

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S5	6X6	70	*	*	2	Yes	-	-	-	N	X	*
5A	6X40	0	*	*	5	Yes	-	15	-	N	-	*
6A/S6	6X6	70	*	*	6	Yes	-	-	-	N	X	*
8A	6X40	0	*	*	8	Yes	-	-	-	N	-	*
8B	6X40	0	*	*	8	Yes	-	15	-	N	-	*

* Multizone Microwave Detection Zone

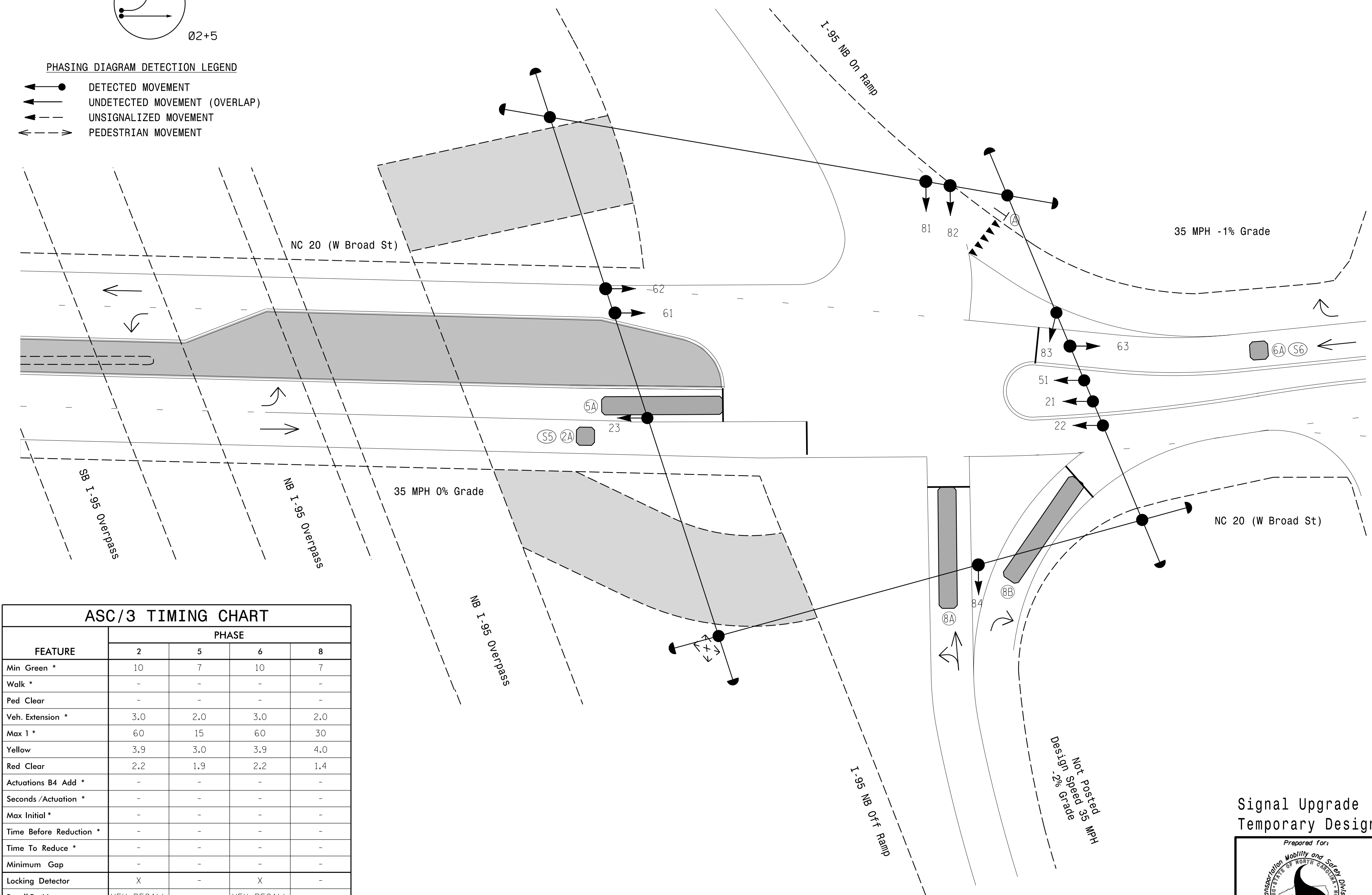
3 Phase Fully Actuated
D06-21 St. Pauls

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 5 may be lagged.
- Reposition existing signal heads numbered 81, 82, and 84.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Closed loop system data: Controller Asset #1366.
- Contractor shall remove and relocate wireless radio/antenna, as required, in order to maintain CLS communication during construction.

PHASING DIAGRAM DETECTION LEGEND

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



FEATURE	PHASE			
	2	5	6	8
Min Green *	10	7	10	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	60	15	60	30
Yellow	3.9	3.0	3.9	4.0
Red Clear	2.2	1.9	2.2	1.4
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

* 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.

PROPOSED	EXISTING
Traffic Signal Head	●→
Modified Signal Head	N/A
Sign	—
Pedestrian Signal Head 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)	Ⓐ
Microwave Detection Zone	N/A
Construction Zone	N/A
Shark's Teeth Yield Line	N/A

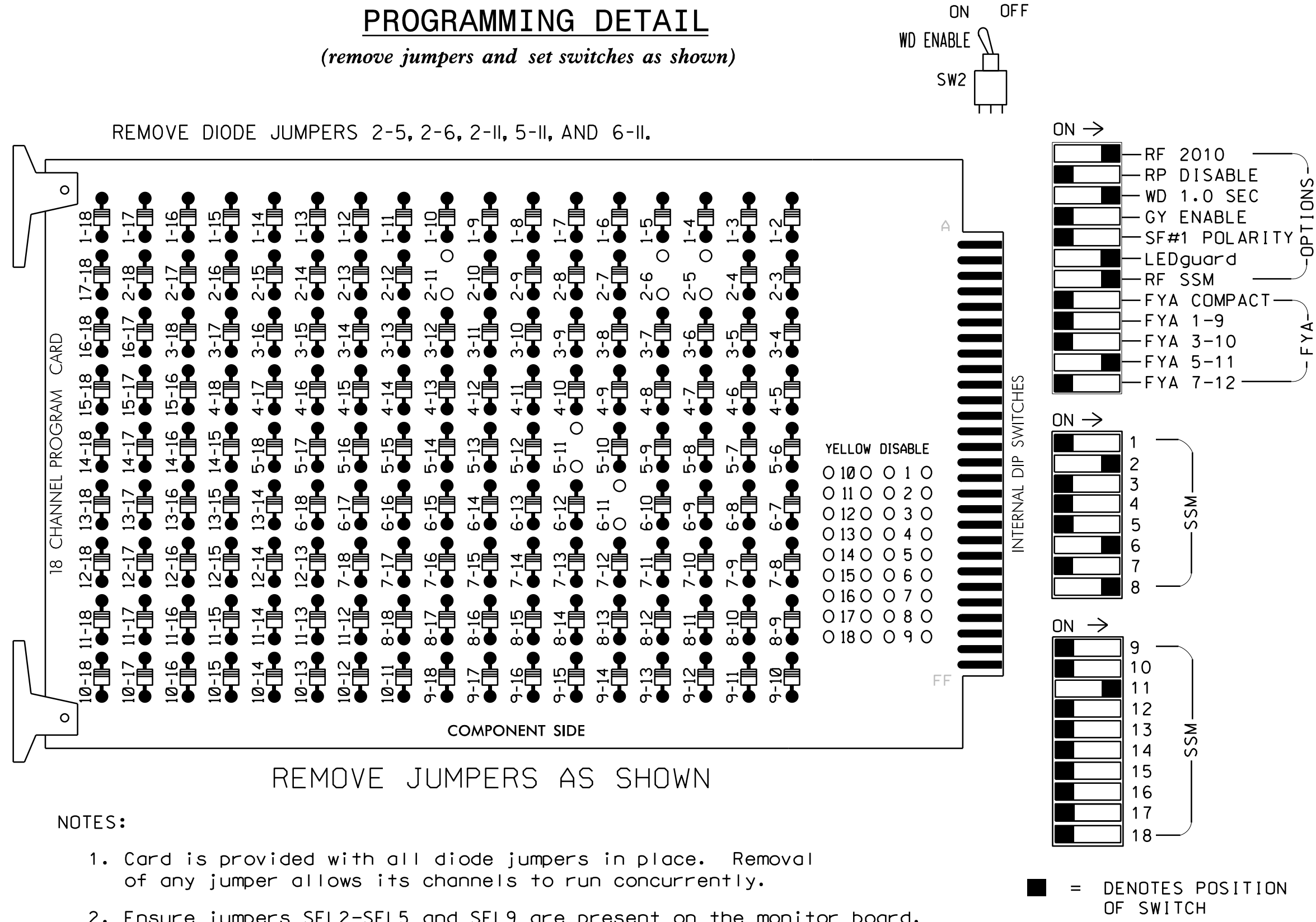
Signal Upgrade
Temporary Design 4 - (TMP Phase 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>RKA RAMEY KEMP ASSOCIATES</p>	<p>NC 20 (W. Broad St.) at I-95 NB Ramps</p>		
	<p>Division 6 Robeson County St. Pauls</p> <p>PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton</p> <p>PREPARED BY: TS Popelka RKA PROJ. NO.: 21273 (040)</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>SCALE: 0 20 1" = 20'</p>	

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 communicated 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 controller to start up in phase 2 Green and 6 Green.
- 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 D06-21 St. Pauls System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22,23	NU	NU	NU	NU	51	61,62,63	NU	NU	81,82,83,84	NU	NU	NU	NU	51	NU	NU	
RED		128							134		107								
YELLOW		129					*	135			108								
GREEN		130							136		109								
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

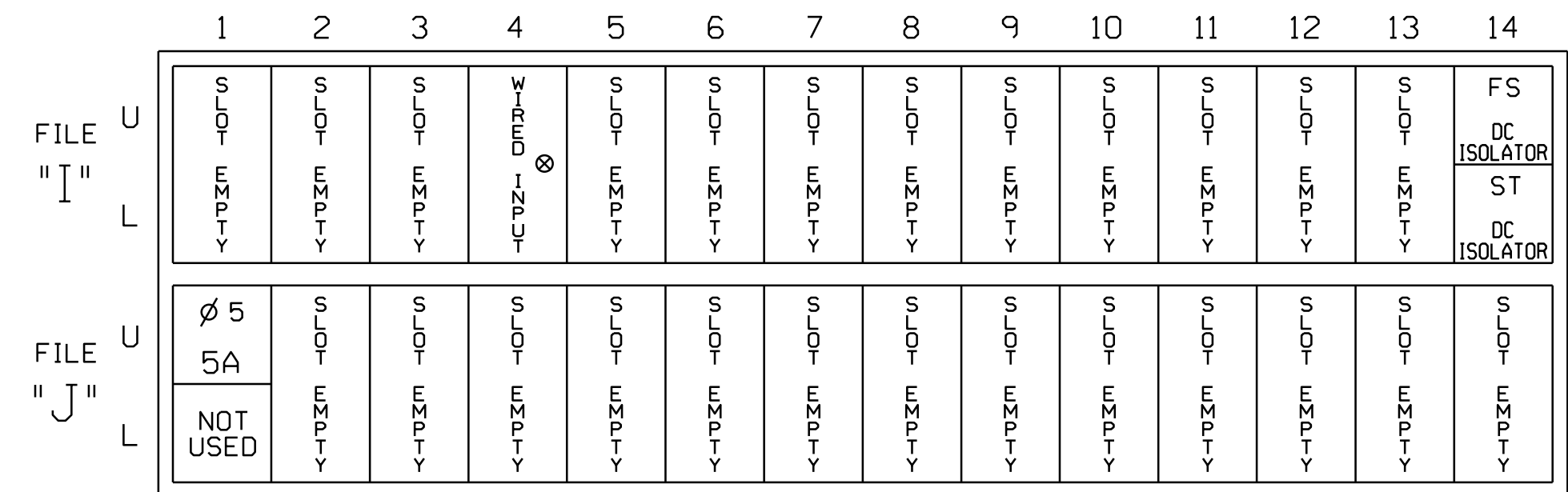
EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
 PHASES USED.....2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....*
 OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)

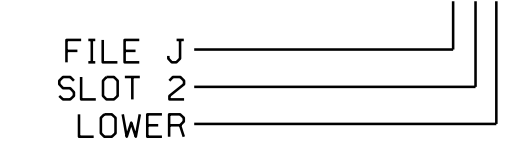


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
5A ¹	T83-1,2	J1U	55	5	5	YES		15		N
	-	14U	47	22	2	YES				N

¹Add jumper from J1-W to 14-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

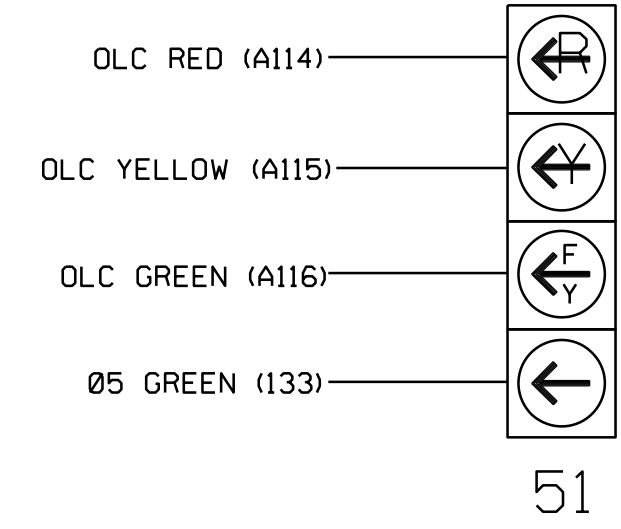


SPECIAL DETECTOR NOTE

Install a multi-zone microwave detection system for vehicle detection. Perform installation according to the manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans. For Detection Zone 5A the equipment and slots reserved for wired inputs are typical for a NCDOT installation.

FYA SIGNAL WIRING DETAIL

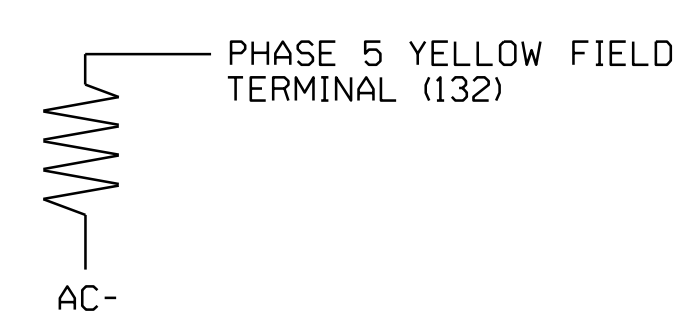
(wire signal head as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



Electrical Detail Sheet 1 of 2
 Temporary Design 4 - (TMP Phase 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 RAMEY KEMP ASSOCIATES 8210 University Executive Park Drive Suite 220 Charlotte, North Carolina 28216 Phone: 704-548-4260 www.rameykemp.com NC License No. C-0910	NC 20 (W. Broad St.) at I-95 NB Ramps		SEAL WILLIAM J. HAMILTON ENGINEER
	Division 6 Robeson County St. Pauls PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)	REVISIONS INIT. DATE _____ _____ _____	

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select 2. CONTROLLER
2. From CONTROLLER Submenu select 2. VEHICLE OVERLAPS

PRESS '+' THREE TIMES

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

TMG VEH OVLP...[C] TYPE:PPLT FYA

PROTECTED PHASE (LEFT TURN)..... 5

PERMISSIVE PHASE (OPPOSING THRU).... 6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0


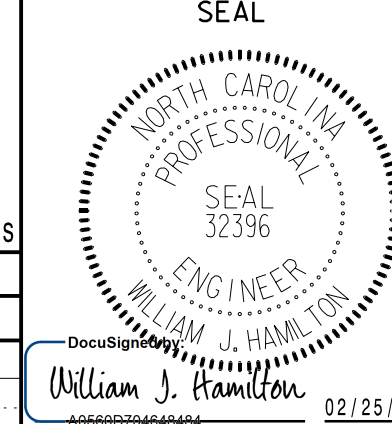
ACTION PLAN SF BIT DISABLE..... 0

END PROGRAMMING

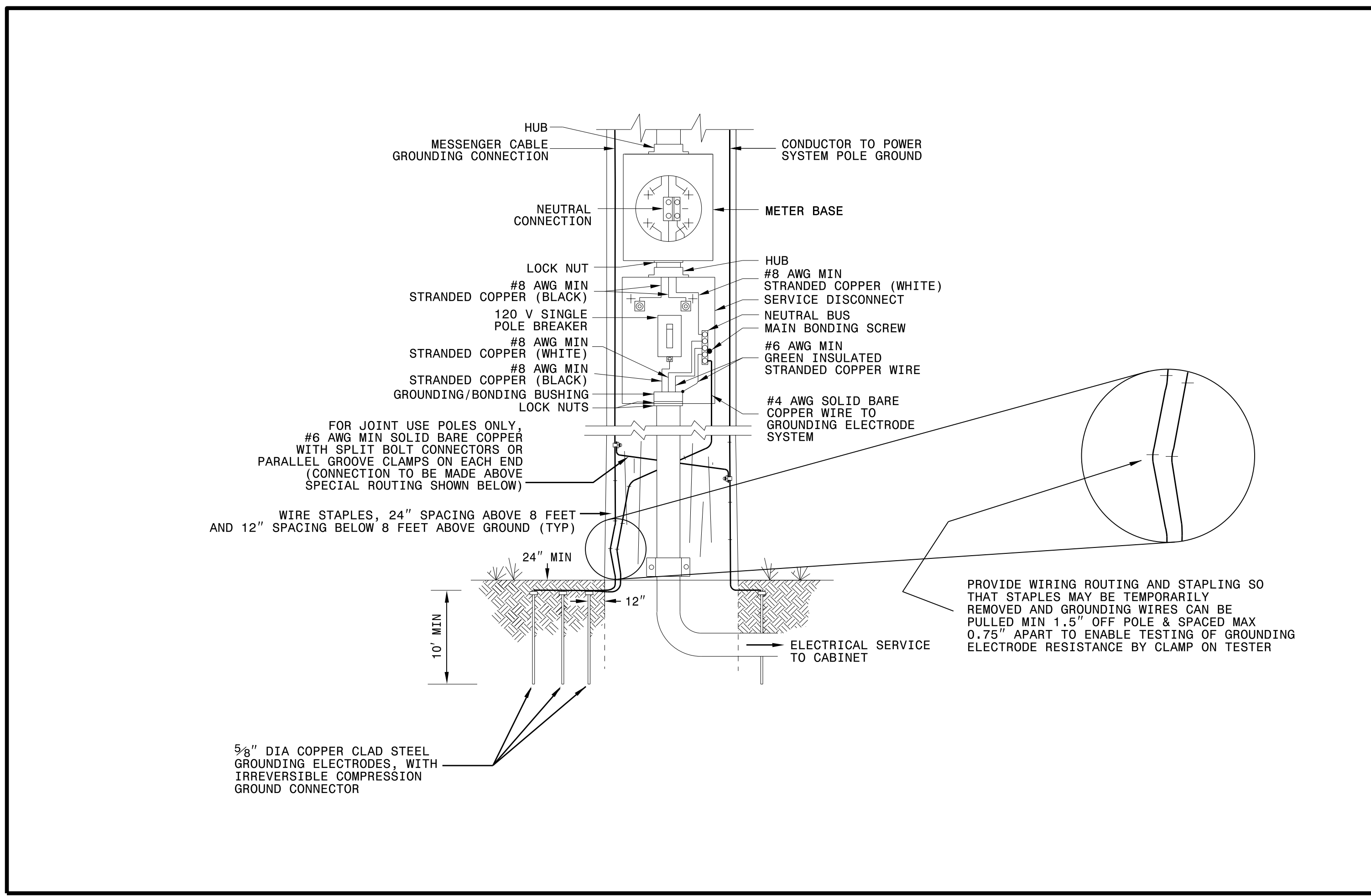
THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-1366T4
 DESIGNED: Feb 2022
 SEALED: 02/25/2022
 REVISED: N/A

Electrical Detail Sheet 2 of 2
 Temporary Design 4 - (TMP Phase 3)

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

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <div style="text-align: center;">  </div> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>NC 20 (W. Broad St.) at I-95 NB Ramps</p> <p>Division 6 Robeson County St. Pauls</p> <p style="font-size: x-small;">PLAN DATE: February 2022 REVIEWED BY: WJ Hamilton PREPARED BY: TS Popelka RKA PROJ. NO.: 21031 (040)</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>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; font-size: x-small;">SEAL</p> <div style="text-align: center;">  </div> <p style="font-size: x-small;">DocuSign Envelope ID: 40669204-6444-4444-4444-444444444444</p> <p style="font-size: x-small;">SIGNATURE: <i>William J. Hamilton</i> DATE: 02/25/2022</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 06-1366T4</p>
REVISIONS	INIT.	DATE												





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

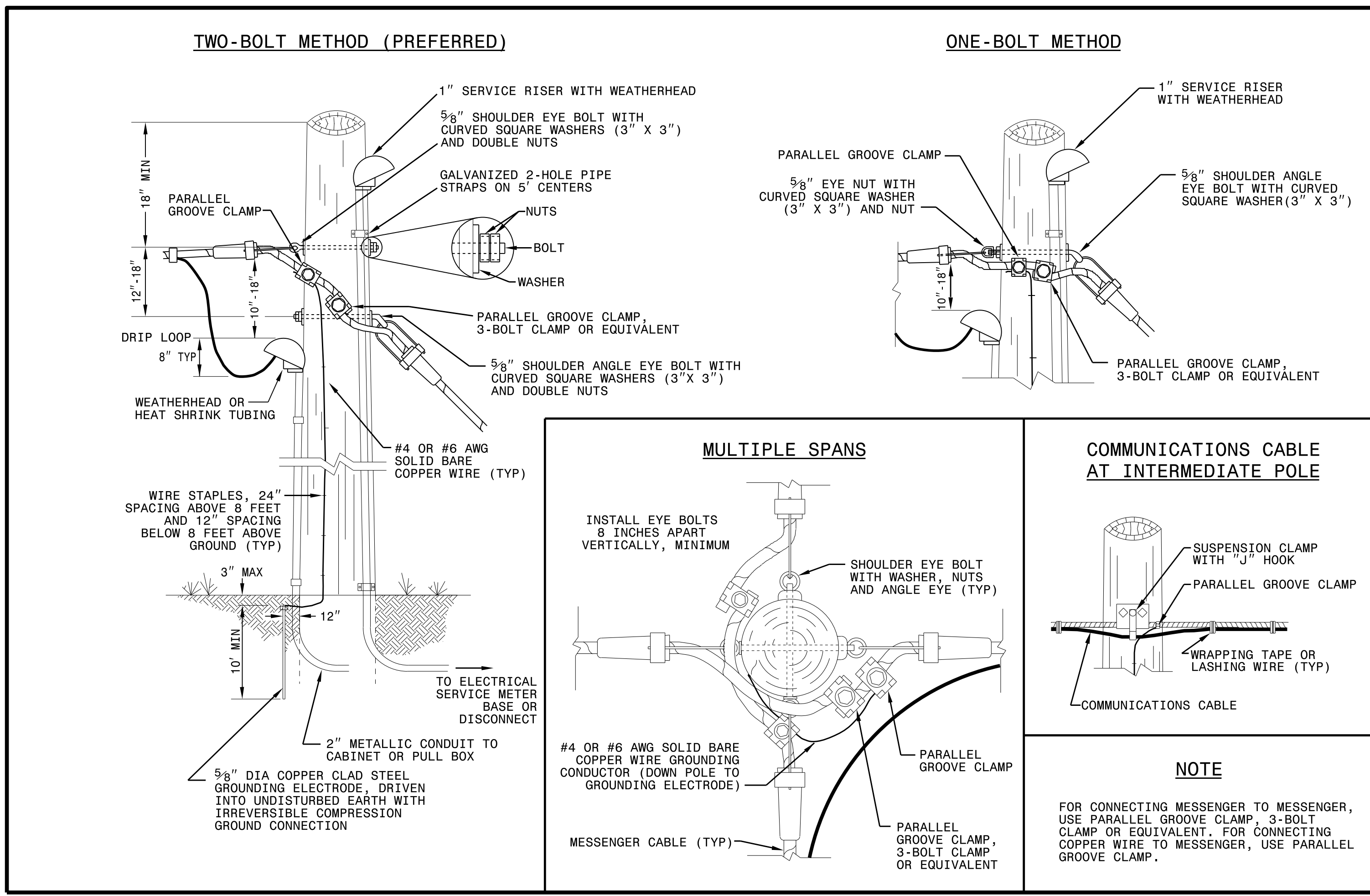
ENGLISH STANDARD DRAWING FOR

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>
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