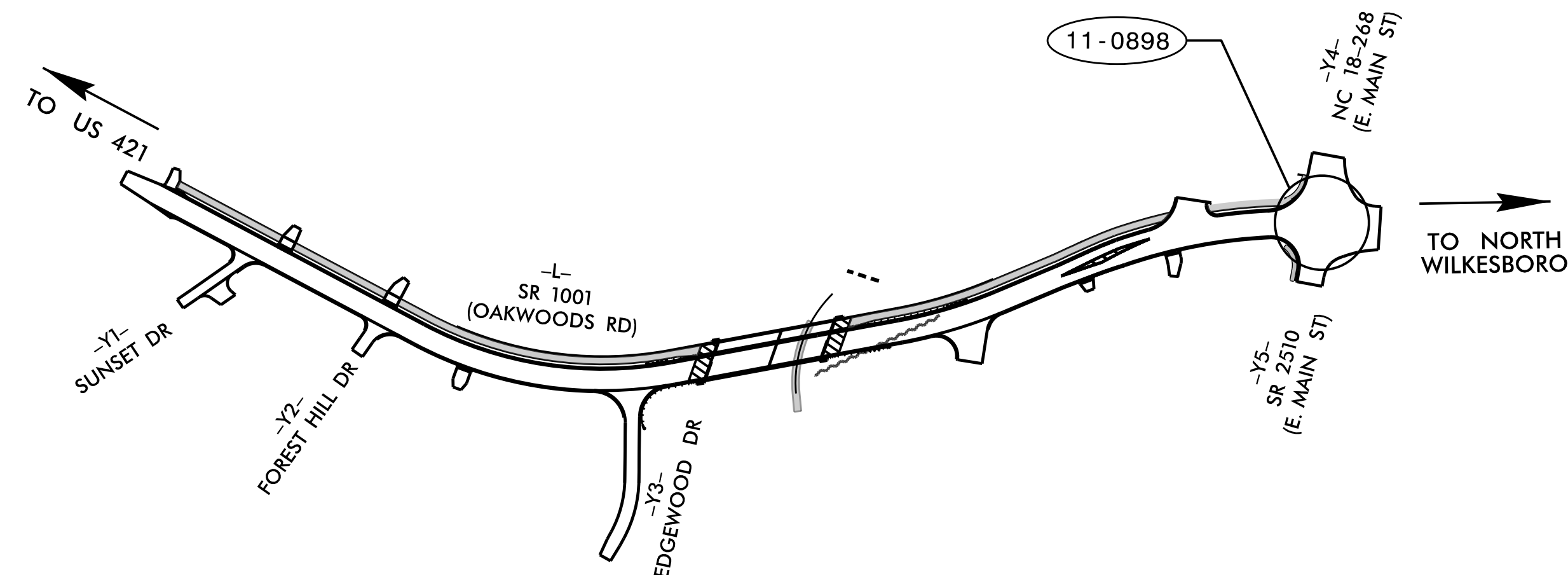


WILKES COUNTY

**LOCATION: BRIDGE #960029 OVER CUB CREEK ON
SR 1001 (OAKWOODS RD)**

TYPE OF WORK: SIGNALS



HNTB

Natasha R. Simmons, P.E., PTOE – Project Engineer
Nicole K. Vlanich, P.E. – Design Engineer
Emily E. Tiller, E.I. – Design Engineer

11-####

SIGNAL INVENTORY NUMBER

Contacts:

R. Nicholas Zinser, PE – Western Region Signals Engineer

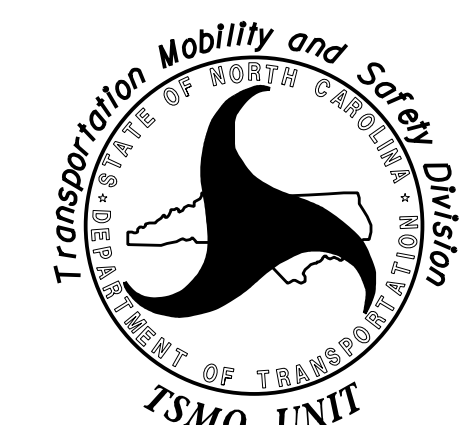
NCDOT – DIVISION 11

Contacts:

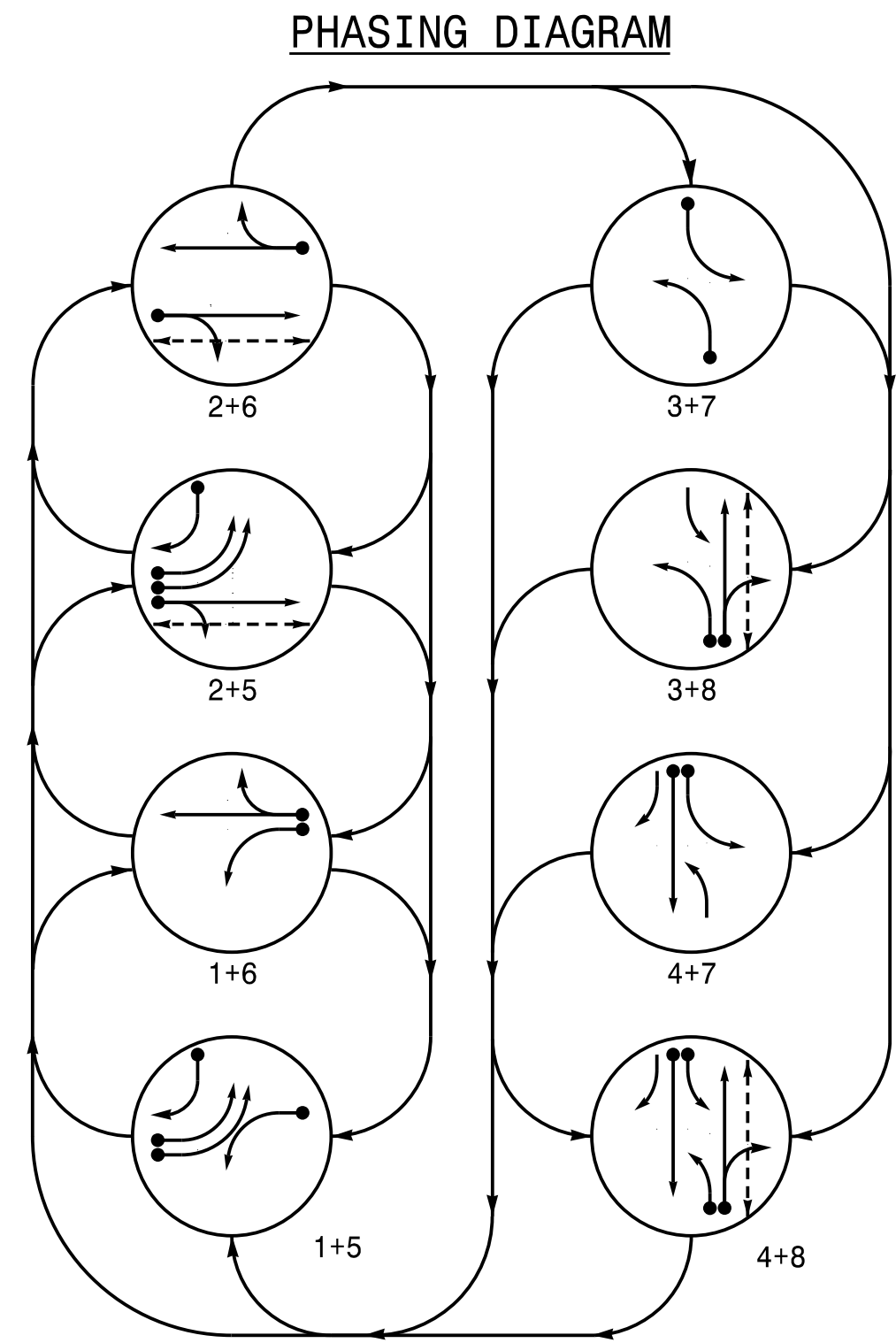
Chris Brown – Division Traffic Engineer

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

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION



750 N. Greenfield Parkway, Garner, NC 27529



PHASING DIAGRAM DETECTION LEGEND

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

RADAR DETECTION SYSTEM				
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	EB		WB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	< 750	-	< 750	-
Range (ft)	100-600	100-150	100-600	100-150
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-

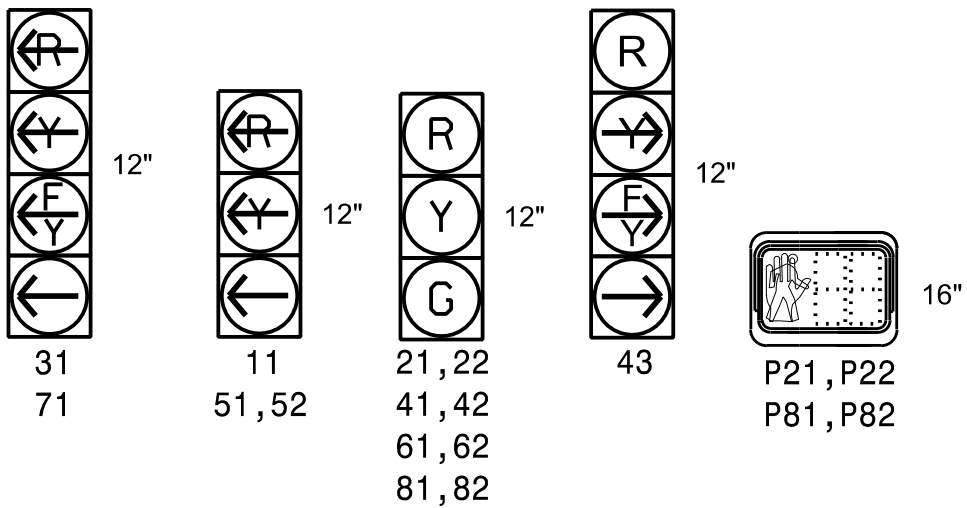
MAXTIME TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	-	14	-	-	-	-	-	13
Ped Clear	-	21	-	-	-	-	-	11
Min Green *	7	10	7	7	7	10	7	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	20	60	20	30	20	60	20	30
Yellow Change	3.3	4.6	3.0	3.9	3.0	4.6	3.0	3.9
Red Clear	2.8	2.2	3.2	2.6	3.9	2.2	3.5	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Added Initial *	-	-	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Advance Walk	-	7	-	-	-	-	-	6
Non Lock Detector	X	-	X	X	X	-	X	X
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X

* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
** See Note 10.

TABLE OF OPERATION										
SIGNAL FACE	PHASE								FLASH	H
	1 + 5	1 + 6	2 + 5	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8		
11	←	←	←	←	←	←	←	←		
21, 22	R	R	G	G	R	R	R	R		
31	←	←	←	←	←	←	←	←		
41, 42	R	R	R	R	R	R	G	G		
43	←	R	←	R	R	R	←	←		
51, 52	←	←	←	←	←	←	←	←		
61, 62	R	G	R	G	R	R	R	R		
71	←	←	←	←	←	←	←	←		
81, 82	R	R	R	R	R	G	R	G		
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK	
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK	

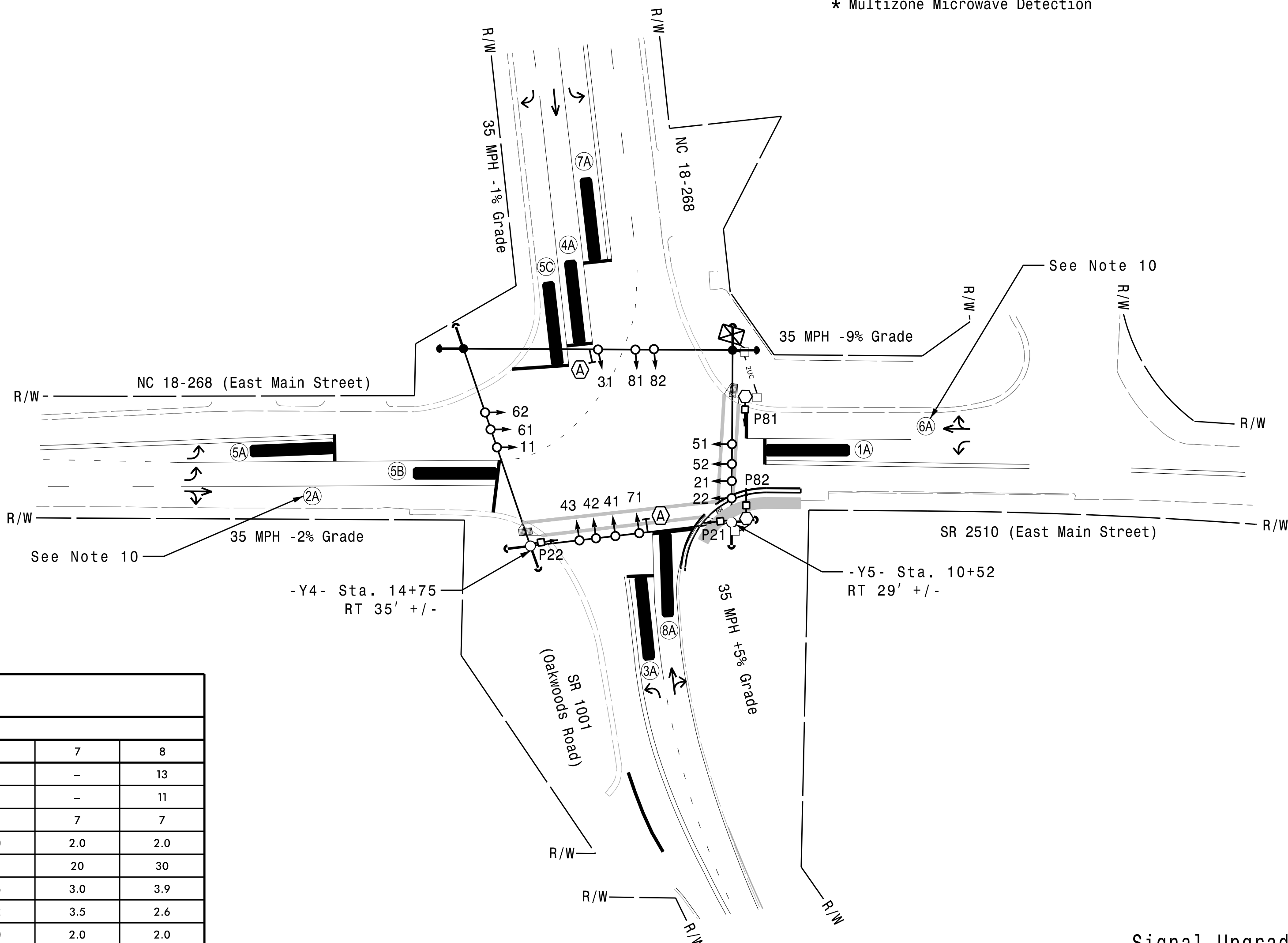
SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	NEW CARD
1A	*	0	*	-	1	3.0		X	-	X	*
2A	*	70	*	-	2	-		X	-	X	*
3A	*	0	*	-	3	15.0		X	-	X	*
4A	*	0	*	-	4	-		X	-	X	*
5A	*	0	*	-	5	3.0		X	-	X	*
5B	*	0	*	-	5	-		X	-	X	*
5C	*	0	*	-	5	15.0		X	-	X	*
6A	*	70	*	-	6	-		X	-	X	*
7A	*	0	*	-	7	15.0		X	-	X	*
8A	*	0	*	-	8	3.0		X	-	X	*
8A	*	0	*	-	8	10.0		X	-	X	*

* Multizone Microwave Detection



8 Phase
Fully Actuated
Isolated

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Disconnect and Abandon existing loops.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- See B-4676A TMP Phase 1 for pavement markings.

LEGEND

- | PROPOSED | EXISTING |
|--------------------------------|----------|
| Traffic Signal Head | N/A |
| Modified Signal Head | N/A |
| Sign | N/A |
| Pedestrian Signal Head | N/A |
| Signal Pole with Guy | N/A |
| Signal Pole with Sidewalk Guy | N/A |
| Non-Intrusive Detection Zone | N/A |
| Controller & Cabinet | N/A |
| Junction Box | N/A |
| 1-in Underground Conduit | N/A |
| 2-in Underground Conduit | N/A |
| Right of Way | N/A |
| Directional Arrow | N/A |
| Type II Signal Pedestal | N/A |
| Curb Ramp | N/A |
| Wedge/Widen | N/A |
| Left Arrow "ONLY" Sign (R3-5L) | N/A |

Signal Upgrade -
Temporary Design
(Construction Phase 1)

 HNTB 750 N. Greenfield Pkwy, Garner, NC 27526 Prepared for: North Carolina Department of Transportation Signal Design Section	NC 18-268 (E. Main St)/ SR 2510 (E. Main St) at NC 18-268/SR 1001 (Oakwoods Rd) Division 11 Wilkes County Wilkesboro		
	PLAN DATE: July 2025 REVIEWED BY: N.K. Vianich		
	PREPARED BY: E.E. Tiller REVIEWED BY: N.R. Simmons		
	REVISIONS		INIT. DATE
SIGNED: DATE: 4/30/2026 SIC. INVENTORY NO. 11-0898T			

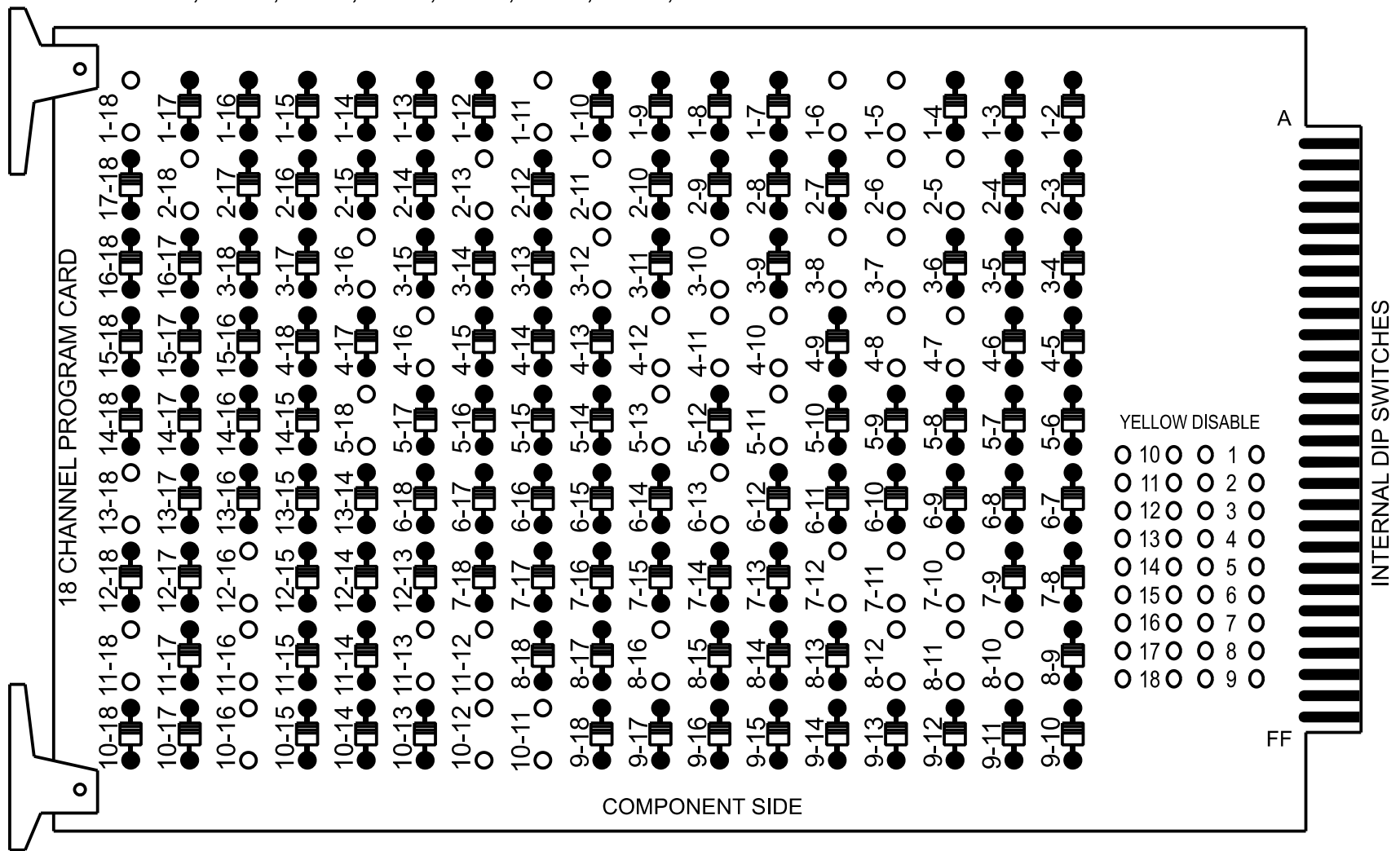
HNTB

HNTB NORTH CAROLINA, P.C.
4000 Center at North Hills St
Suite 500
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

18 CHANNEL CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-11, 1-18, 2-5, 2-6, 2-11, 2-13, 2-18, 3-7, 3-8, 3-10, 3-12, 3-16, 4-7, 4-8, 4-10, 4-11, 4-12, 4-16, 5-11, 5-13, 5-18, 6-13, 7-10, 7-11, 7-12, 8-10, 8-11, 8-12, 8-16, 10-11, 10-12, 10-16, 11-12, 11-13, 11-16, 11-18, 12-16, and 13-18.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S3, S4, S5, S7, S8, S10, S11, S12, AUX S2, AUX S4, AUX S5, AUX S6
Phases Used.....1, 2, 2PED, 3, 4, 5, 6, 7, 8, 8PED
Overlap "1".....Not Used
Overlap "2".....*
Overlap "3".....*
Overlap "4".....*
Overlap "5".....Not Used
Overlap "6".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

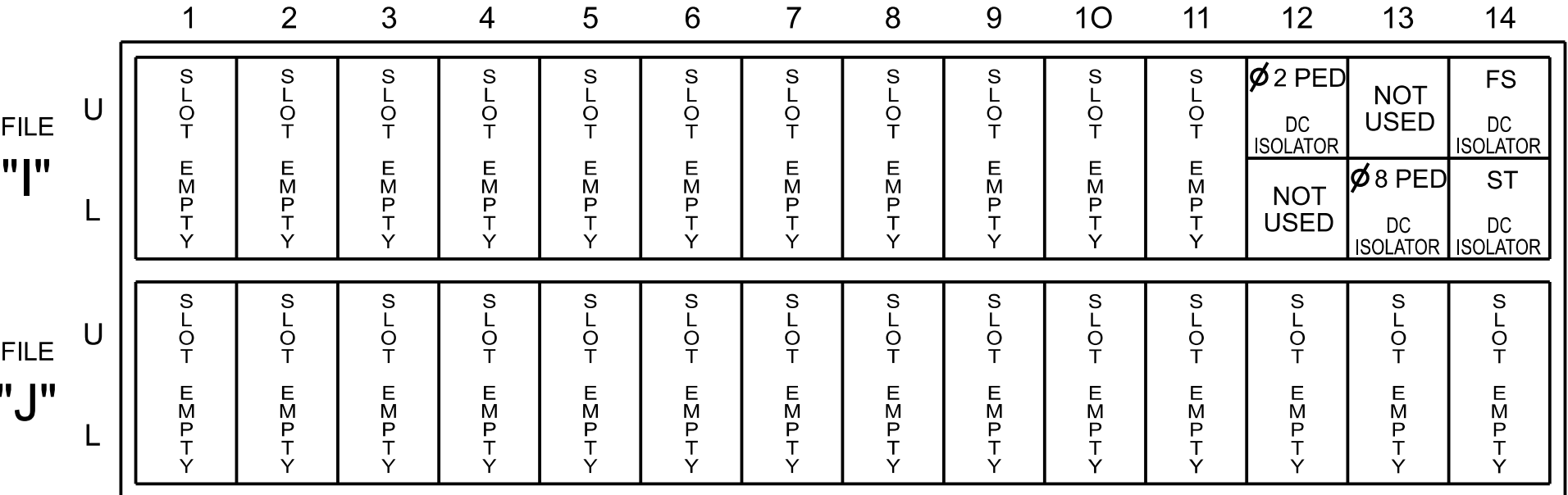
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	OL5	OL3	OL4	OL6
SIGNAL HEAD NO.	11	21,22	P21, P22	31	41,42	NU	43	61,62	NU	71	81,82	P81, P82	NU	31	NU	43	71	51,52
RED		128			101			134			107					A114		
YELLOW		129		*	102		*	135		*	108							
GREEN		130			103			136			109							
RED ARROW	125												A124			A101	A104	
YELLOW ARROW	126												A125		A115	A102	A105	
FLASHING YELLOW ARROW													A126		A116	A103		
GREEN ARROW	127			118			133			124								A106
Hand icon			113									110						
Walking person icon			115									112						

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	-	-	-	*	33	1	3.0		X		X	
2A	-	-	-	*	38	2			X		X	
3A	-	-	-	*	34	3	15.0		X		X	
4A	-	-	-	*	126	8	3.0		X		X	
5A	-	-	-	*	44	4			X		X	
5B	-	-	-	*	35	5	3.0		X		X	
5C	-	-	-	*	51	5			X		X	
6A	-	-	-	*	54	5	15.0		X		X	
7A	-	-	-	*	56	6			X		X	
8A	-	-	-	*	36	7	15.0		X		X	
				-	128	4	3.0		X		X	
				*	60	8	10.0		X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

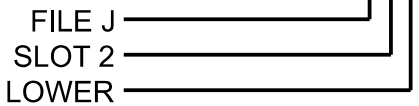
*For Input Point numbers, see SDLC NON-INTRUSIVE DETECTION CHART this sheet.

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
I12 AND I13.

SPECIAL DETECTOR NOTE

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

INPUT FILE POSITION LEGEND: J2L



SDLC NON-INTRUSIVE DETECTION CHART

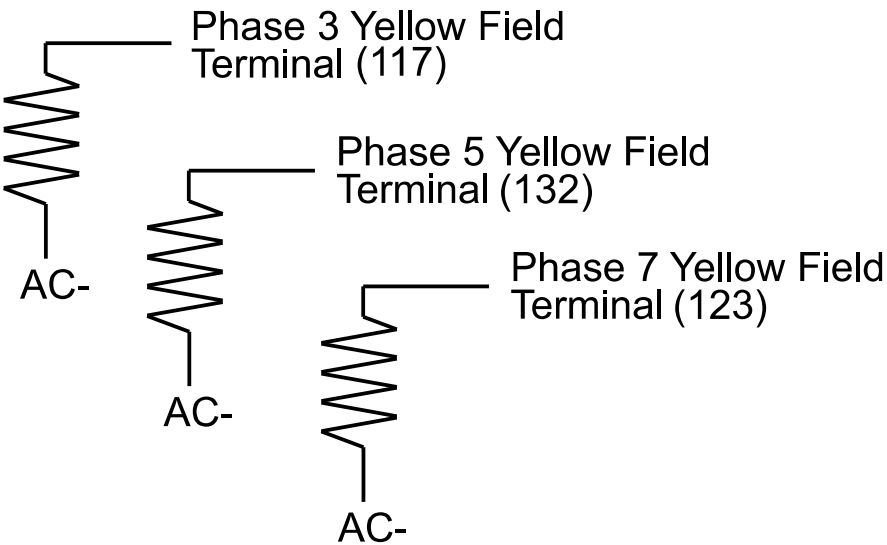
	Detector Rack #3		Detector Rack #4	
Input Point	Det # (Index)	Detector Zone	Det # (Index)	Detector Zone
1	33	1A	49	NU
2	34	3A	50	NU
3	35	5A	51	5B
4	36	7A	52	NU
5	37	NU	53	NU
6	38	2A	54	5C
7	39	NU	55	NU
8	40	NU	56	6A
9	41	NU	57	NU
10	42	NU	58	NU
11	43	NU	59	NU
12	44	4A	60	8A
13	45	NU	61	NU
14	46	NU	62	NU
15	47	NU	63	NU
16	48	NU	64	NU

NU = Not Used

LOAD RESISTOR INSTALLATION DETAIL

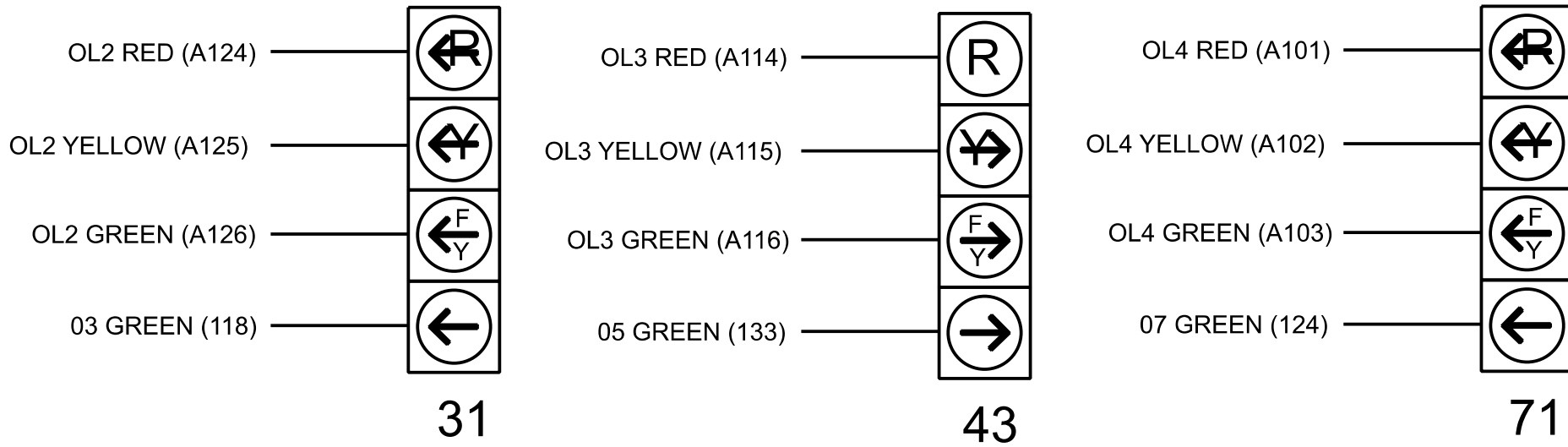
(install resistors as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

Signal Upgrade
Temporary Design
Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 18-268 (E. Main St)/ SR 2510 (E. Main St) at NC 18-268/SR 1001 (Oakwoods Rd)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER NATASHA R. SIMMONS SEAL 031464	
Prepared for the Offices of:		Division 11 Wilkes County Wilkesboro		DocuSigned by: Natasha R. Simmons 4/30/2026	
PLAN DATE: July 2025		REVIEWED BY: N. R. Simmons		DATE	
PREPARED BY: E.E. Tiller		REVIEWED BY: N. K. Vianich		DATE	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529		HNTB NORTH CAROLINA, P.C. 4000 Center at North Hills St Suite 500 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SIG. INVENTORY NO.		11-0898T			

	DETECTED MOVEMENT
	UNDETECTED MOVEMENT (OVERLAP)
	UNSIGNALIZED MOVEMENT
	PEDESTRIAN MOVEMENT

RADAR DETECTION SYSTEM				
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	EB		WB	
Type	Priority		Priority	
Level	2	QUEUE	2	QUEUE
Discovery Zone (ft)	< 750	–	< 750	–
Range (ft)	100–600	100–150	100–600	100–150
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35–100	1–35	35–100	1–35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5–6.5	–	2.5–6.5	–

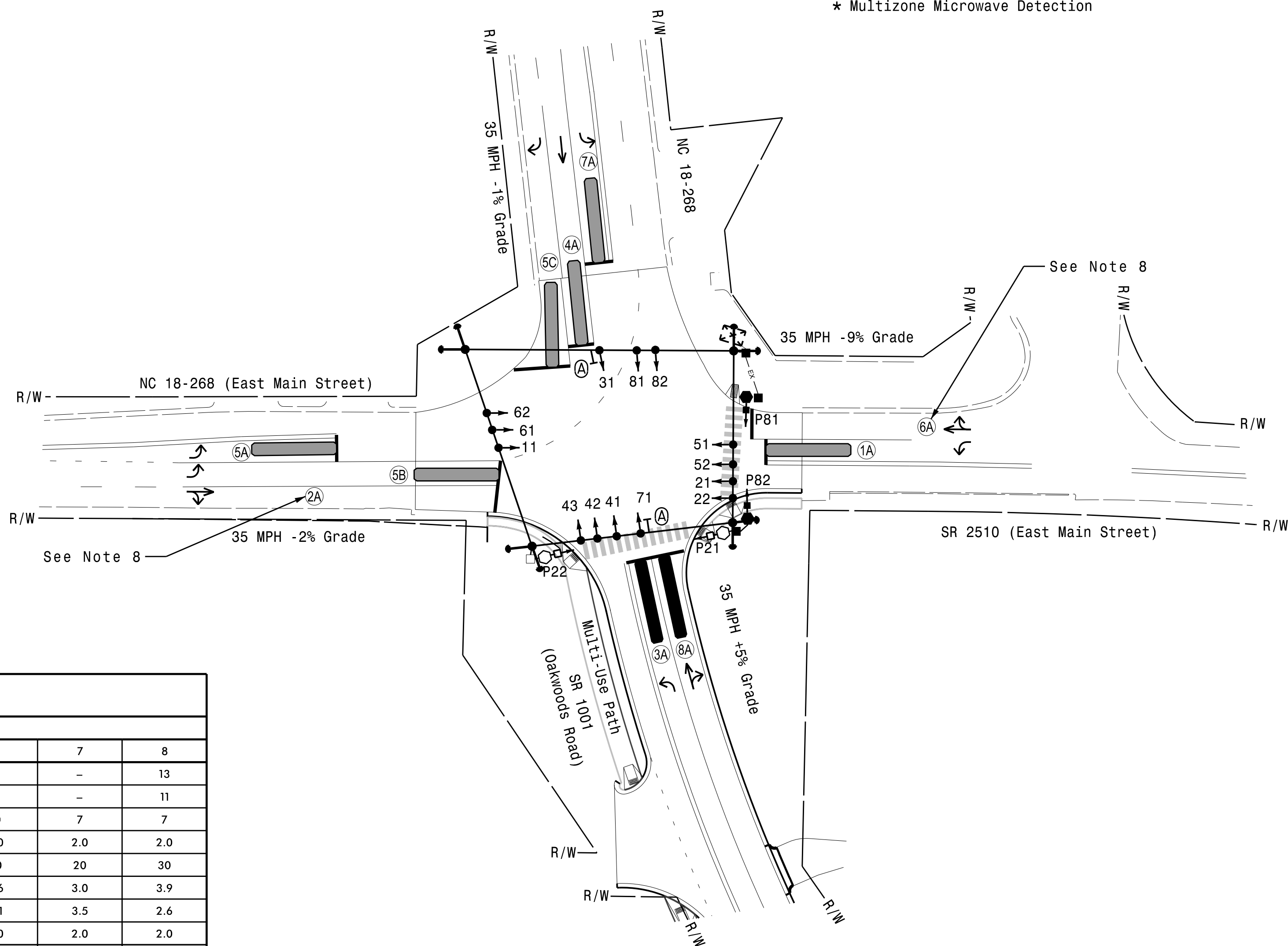
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	–	14	–	–	–	–	–	13
Ped Clear	–	14	–	–	–	–	–	11
Min Green *	7	10	7	7	7	10	7	7
Passage *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max I *	20	60	20	30	20	60	20	30
Yellow Change	3.3	4.6	3.0	3.9	3.0	4.6	3.0	3.9
Red Clear	2.9	2.1	2.9	2.6	3.9	2.1	3.5	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Added Initial *	–	–	–	–	–	–	–	–
Maximum Initial *	–	–	–	–	–	–	–	–
Time Before Reduction *	–	–	–	–	–	–	–	–
Time To Reduce *	–	–	–	–	–	–	–	–
Minimum Gap	–	–	–	–	–	–	–	–
Advance Walk	–	7	–	–	–	–	–	6
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	–	X

** See Note 9.

SIGNAL FACE	PHASE								
	1 + 5	1 + 6	2 + 5	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8	F L A S H
11	→	→	→	→	→	→	→	→	→
21,22	R	R	G	G	R	R	R	R	R
31	→	→	→	→	→	→	→	→	→
41,42	R	R	R	R	R	R	G	G	R
43	→	R	→		R	R	→	→	R
51,52	→	→	→	→	→	→	→	→	→
61,62	R	G	R	G	R	R	R	R	R
71	→	→	→	→	→	→	→	→	→
81,82	R	R	R	R	R	G	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	*	0	*	-	1	3.0	-	X	-	X	-	*
2A	*	70	*	-	2	-	-	X	-	X	-	*
3A	*	0	*	-	3	15.0	-	X	-	X	-	*
4A	*	0	*	-	8	3.0	-	X	-	X	-	*
5A	*	0	*	-	4	3.0	-	X	-	X	-	*
5B	*	0	*	-	5	-	-	X	-	X	-	*
5C	*	0	*	-	5	15.0	-	X	-	X	-	*
6A	*	70	*	-	6	-	-	X	-	X	-	*
7A	*	0	*	-	7	15.0	-	X	-	X	-	*
8A	*	0	*	-	8	3.0	-	X	-	X	-	*
8A	*	0	*	-	8	10.0	-	X	-	X	-	*

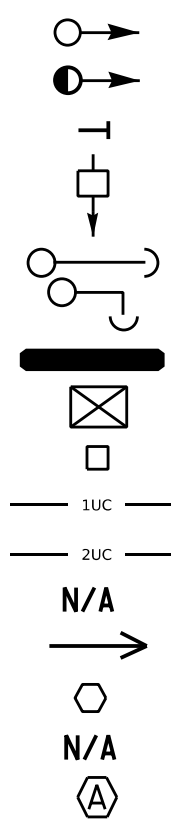
* Multizone Microwave Detection



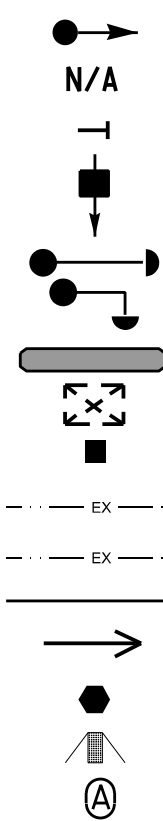
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
9. See B-4676A PMP for pavement markings.

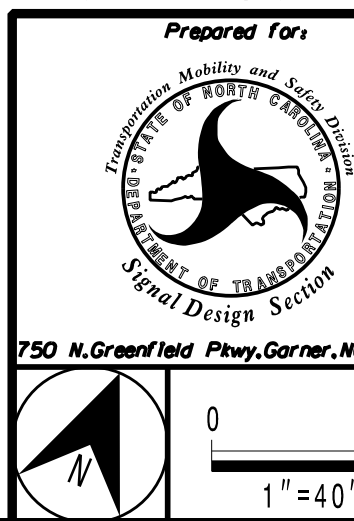
PROPOSED



EXISTING



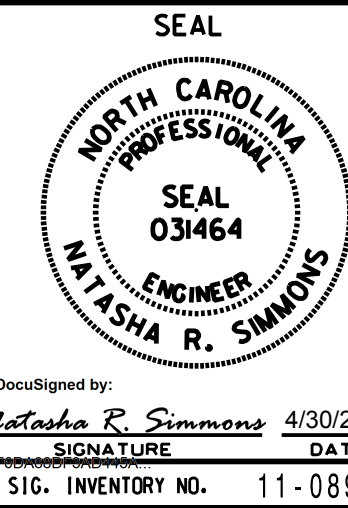
Signal Upgrade - Final Design



NC 18-268 (E. Main St)//
SR 2510 (E. Main St)
at
NC 18-268/SR 1001 (Oakwoods Rd)
Division 11 Wilkes County Wilkesboro
PLAN DATE: July 2025 REVIEWED BY: N.R. Vlanich
PREPARED BY: E.E. Tiller REVIEWED BY: N.R. Simmons

[illegible]

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



DocuSigned by:
Natasha R. Simmons 4/30/2025
SIGNATURE DATE
F06465B7-545-143K
SIG. INVENTORY NO. 11-0898

