ECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 14.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
1	1	0
29	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	FYA 4 - Section	ı	FYA 4 - Section	1
Included Phases	2	-	2	-
Modifier Phases	1	ı	1	1
Modifier Overlaps	-	ı	ı	ı
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4	
Туре	FYA 4 - Section	-	FYA 4 - Section	-	
Included Phases	-	-	2	-	← NO
Modifier Phases	1	-	-	-	Ph
Modifier Overlaps	-	•	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

NOTICE REMOVED INCLUDED
PHASE FOR OL1

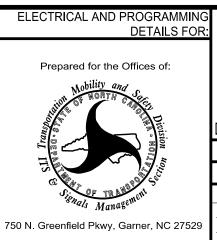
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0502T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade Temporary Design 2 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TH CAROL

031464



NC 49 (Albemarle Rd) at I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County

REVISIONS

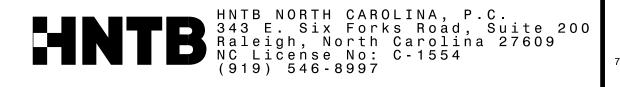
I-74 EB Ramps
on 8 Randolph County Ashebor
TE: August 2021 REVIEWED BY: A.D. Klinksiek
ED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

Simmons

T. DATE

DocuSigned by:

Natasha R S



OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 14.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2
	OVERLAP PLAN 1 2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 11 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A

and reduces delay time for phase 1 call on loop 1A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

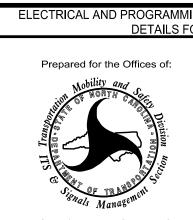
Pattern	Pattern Veh Det Plan					
*	2	2				

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0502T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 2 Electrical Detail - Sheet 3 of 3

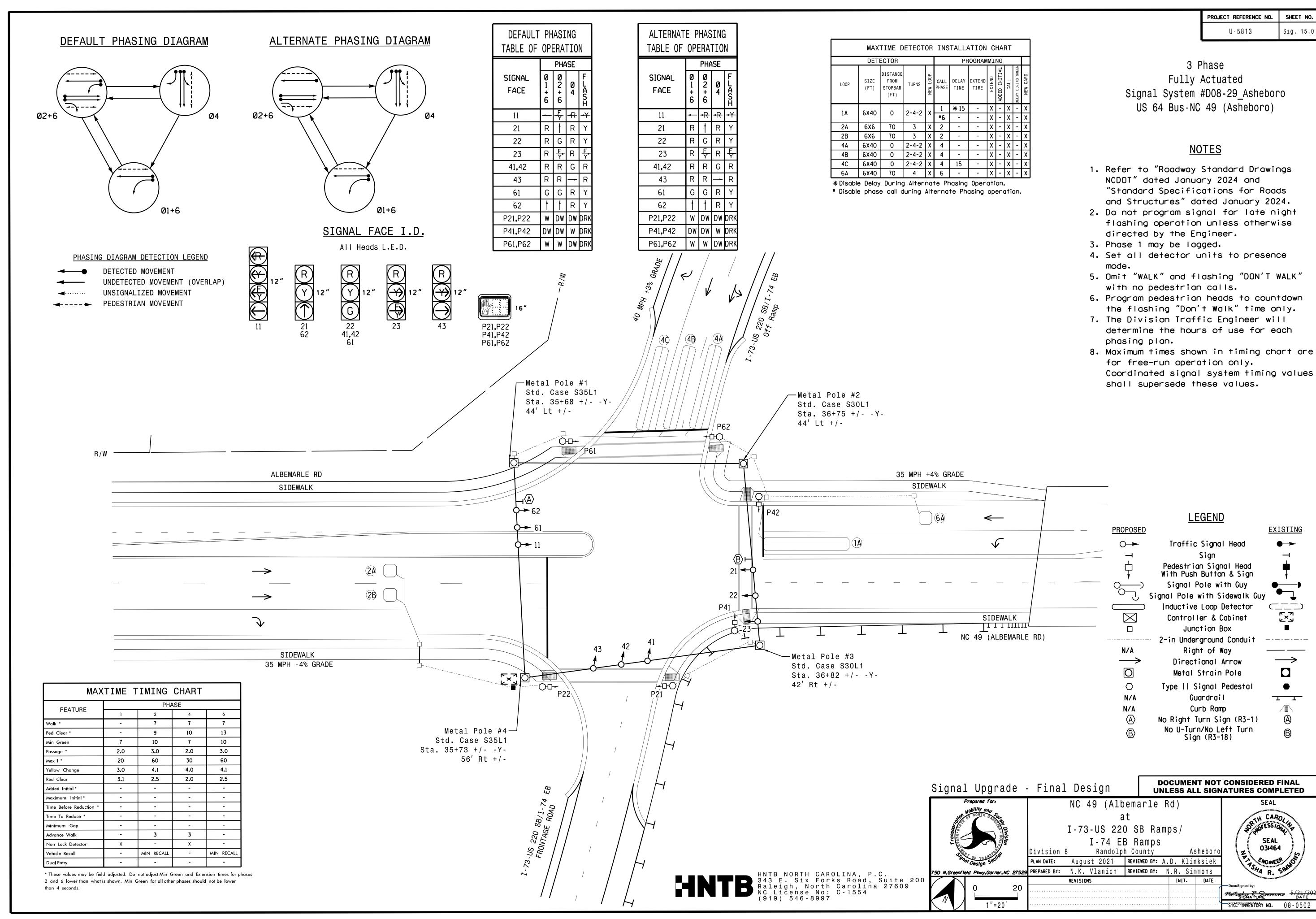
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49 (Albemarle Rd) I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County

Ashebor REVIEWED BY: A.D. Klinksiek August 2021 REVIEWED BY: N.R. Simmons N.K. Vlanich

031464



18 CHANNEL IP CONFLICT MONITOR ON PROGRAMMING DETAIL WD ENABLE Ω (remove jumpers and set switches as shown) REMOVE DIODE JUMPERS 1-6, 1-9, 1-15, 2-6, 2-9, 2-11, 2-13, 2-15, 4-14, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15. - RP DISABLE WD 1.0 SEC GY ENABLE SF#1 POLA LEDguard RF SSM SF#1 POLARITY FYA COMPACT— FYA 7-12

COMPONENT SIDE

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 the Red Enable is active at all times during normal operation.

REMOVE JUMPERS AS SHOWN

4. Integrate monitor with Ethernet network in cabinet.

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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
- 4. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

CMU CHANNEL NO. OL1 OL2 SPARE OL3 PHASE SIGNAL HEAD NO 128 128 101 134 RED 102 129 129 135 YELLOW 135 103 130 GREEN RED A121 ARROW YELLOW A122 ARROW FLASHING YELLOW A123 ARROW **GREEN** 103

SIGNAL HEAD HOOK-UP CHART

NU = Not Used

ARROW

LOAD SWITCH NO

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

OL1 RED (A121)

OL1 YELLOW (A122)

OL1 GREEN (A123)

01 GREEN (127) -

106

★ See pictorial of head wiring in detail this sheet.

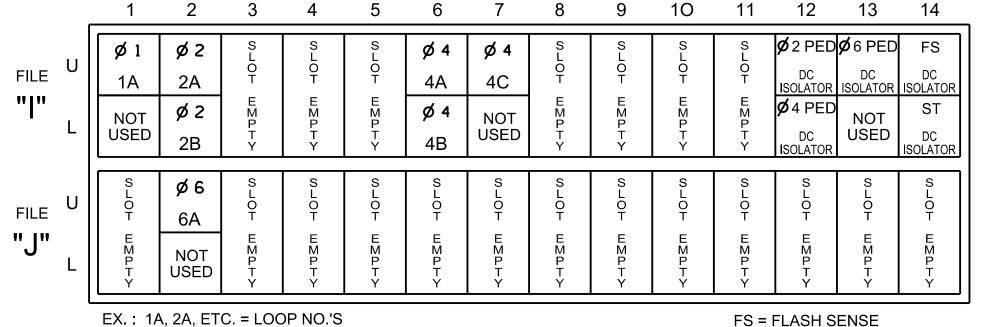
EQUIPMENT INFORMATION

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,S5,S6,S8,S9
	AUX S1, AUX S4
Phases Used	1,2,2 PED,4,4 PED,6,6 PED
Overlap "1"	*
Overlap "2"	Not Used

*See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)



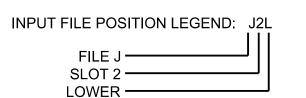
FS = FLASH SENSE ST = STOP TIME

= DENOTES POSITION OF SWITCH

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NC	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		Х		Χ	
	102-1,2	110	30	-	29 ★	6			Х		Х	
2A	TB2-5,6	I2U	39	1	2	2			Х		Χ	
2B	TB2-7,8	I2L	43	5	3	2			Х		Х	
4A	TB4-9,10	I6U	41	3	8	4			Χ		Χ	
4B	TB4-11,12	I6L	45	7	9	4			Х		Х	
4C	TB6-1,2	I7U	65	31	10	4	15		Х		Χ	
6A	TB3-5,6	J2U	40	2	16	6			Х		Х	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2	· · · · · · ·					
P41,P42	TB8-5,6	I12L	69	35	4	PED 4	INSTALL DC ISOLATORS IN INPUT FILE SLOTS					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6	I12 AND		10			

For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



⟨F Y OL3 GREEN (A116) -<u>(C)</u>

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

OL3 RED (A114)

OL3 YELLOW (A115)

(P)

(4)

121

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0502 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 1 of 3

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PROJECT REFERENCE NO.

ELECTRICAL AND PROGRAMM **DETAILS FOR** Prepared for the Offices of:

NC 49 (Albemarle Rd) August 2021

REVISIONS

N.K. Vlanich

I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County Ashebor REVIEWED BY: A.D. Klinksiek

REVIEWED BY:

INIT.

031464 FACINEER N.R. Simmons

R

(*)

F

SIG. INVENTORY NO.

TH CAROL

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)

Phase 1 Yellow Field Terminal (126) AC-

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.

ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 15.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
1	1	0
29	0	_

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	FYA 4 - Section	-	-	FYA 4 - Section
Included Phases	2	-	-	2
Modifier Phases	1	-		ı
Modifier Overlaps	-	-	-	ı
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

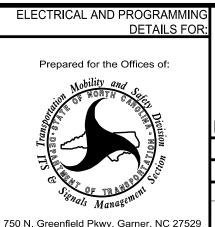
Overlap	1	2	3	4	
Type	FYA 4 - Section	-	-	FYA 4 - Section	
Included Phases	-	1	ı	2	•
Modifier Phases	1	-	-	-	
Modifier Overlaps	-		•	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

PHASE FOR OL1

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0502 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49 (Albemarle Rd) I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County REVIEWED BY: A.D. Klinksiek August 2021

REVIEWED BY:

N.K. Vlanich

REVISIONS

TH CAROL 031464 Ashebor

N.R. Simmons INIT. DATE

OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 15.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2
	OVERLAP PLAN 1 2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 11 to

run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A

and reduces delay time for phase 1 call on loop 1A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

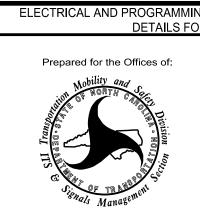
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0502 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49 (Albemarle Rd) I-73-US 220 SB Ramps/ I-74 EB Ramps Randolph County REVIEWED BY: August 2021

N.K. Vlanich

Ashebor A.D. Klinksiek N.R. Simmons

031464

02+6

PROJECT REFERENCE NO. U-5813

3 Phase Fully Actuated (Isolated)

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 6. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

LEGEND

Traffic Signal Head

Modified Signal Head

Sign Pedestrian Signal Head <u>EXISTING</u>

N/A

 \bigcirc

7. The Division Traffic Engineer will determine the hours of use for each phasing plan.

	DETECTOR PROGRAMMING											
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A *	6X6	70	*	*	2	-	-	Χ	-	Х	-	*
5A *	6X40	0	*	*	5	** 15	-	Х	-	Х	-	*
DA 不	6,40	U	不	不	* 2	-	-	Х	-	Х	-	*
6A *	6X6	70	*	*	6	-	-	X	-	Х	-	*
8A *	6X40	0	*	*	8	-	-	Х	-	Х	-	*
8B *	6X40	0	*	*	8	-	-	Χ	-	Х	-	*
8C*	6X40	0	*	*	8	10	-	Χ	-	Х	-	*
8D *	6X20	0	*	*	8	15	-	Х	-	Х	-	*

MAXTIME DETECTOR INSTALLATION CHART

- * Microwave Detection
- ** Disable Delay during Alternate Phasing Operation. * Disable phase call during Alternate Phasing operation.

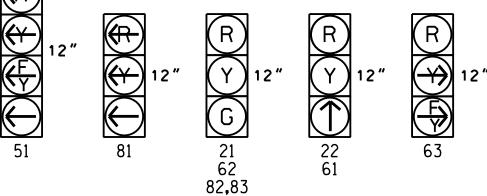
PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

DEFAULT PHASING DIAGRAM

UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

-	PEDESTRIAN	MOVEMENT	



SIGNAL FACE I.D.

All Heads L.E.D.

ALTERNATE PHASING DIAGRAM

02+6

12"	12"	(R) Y) 12"	12"	12"
51	81	21 62 82,83	22 61	63

; /	Sta. 41+37 +/Y- 63' Lt +/-	
	63 	51 ← 6
	35 MPH -4% GRADE Sta. 41+66 +/Y- 40' Rt +/-	21 — O 22 — O (A) — O

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

22

51

61

81

82,83

PHASE

 $R \mid \uparrow \mid R \mid \Upsilon$

R 👇 R 🗡

R R G R

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21

22

51

61

62

81

82,83

PHASE

R 🗗 R 🛧

R R G R

	63			
1	62 0→61	<u>.</u>	□ 6A ←	
]	_B	51 ← O		
	\			
		21 ~ 0 22 ~ 0 (A)		
			SR 1713 (ALBEMARLE RD)	
66 +/-		T	· /	R/W
40' Rt	+/-		Sta. 42+62 +/Y-	
			<pre></pre>	

∕—Sta. 42+41 +/- -Y-

35 MPH +4% GRADE

56′ Lt +/-

MAXTIME TIMING CHART											
FEATURE	PHASE										
FEATURE	2	5	6	8							
Walk *	-	-	-	-							
Ped Clear *	-	-	-	-							
Min Green	10	7	10	7							
Passage *	3.0	2.0	3.0	2.0							
Max 1 *	60	20	60	30							
Yellow Change	4.1	3.0	4.1	3.7							
Red Clear	3.1	3.3	3.1	3.0							
Added Initial *	-	-	-	-							
Maximum Initial *	-	-	-	-							
Time Before Reduction *	-	-	-	-							
Time To Reduce *	-	-	-	-							
Minimum Gap	-	-	-	-							
Advance Walk	-	-	-	-							
Non Lock Detector	-	Х	-	Х							

phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

MIN RECALL

MIN RECALL

Vehicle Recall

New Installation -Temporary Design (Construction Phase IIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SR 1713 (Albemarle Rd) I-73-US 220 NB/I-74 WB Ramps

PROPOSED

Division 8 Randolph County August 2021 REVIEWED BY: A D Klinksiek

INIT. DATE

750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997 HNTB

With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy ر____ لاخما الاحما Inductive Loop Detector \boxtimes Controller & Cabinet Junction Box 2-in Underground Conduit Right of Way \longrightarrow Directional Arrow Construction Zone Microwave Detection Zone Guardrail 1 1 \triangle

No Right Turn Sign (R3-1) No U-Turn/No Left Turn Sign (R3-18) Left Turn Sign (R3-1L)

> TH CAROL 031464

SIG. INVENTORY NO. 08-0503T

MOINEER

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

ON OFF

SF#1 POLARITY

- FYA COMPACT-

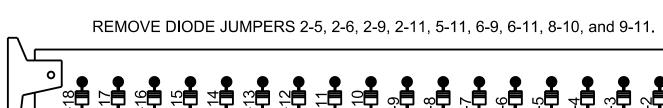
LEDguard

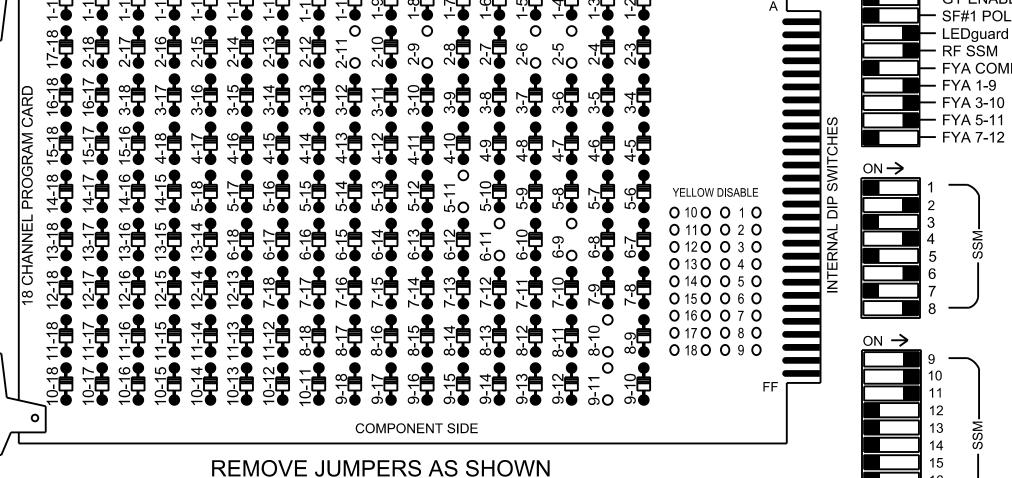
– FYA 7-12

= DENOTES POSITION OF SWITCH

RF SSM

(remove jumpers and set switches as shown)





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 the Red Enable is active at all times during normal operation.

4. Integrate monitor with Ethernet network in cabinet.

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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

SIGNAL HEAD HOOK-UP CHART

				OI.	31 47	` L'	· L / \	יי כ				/	1 \ 1							
LOAD SWITCH NO.	S1	S	52	S3	S4	S5	S6	S7	S	8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	2	13	3	4	14	5	(6	15	7	8	16	9	10	17	11	12	18
PHASE	1	:	2	2 PED	3	4	4 PED	5	(6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	NU	NU	NU	NU	★ 51	61	62	NU	NU	82,83	NU	★ 63	★ 81	NU	★ 51	NU	NU
RED		128	128						134	134			107		A121					
YELLOW		129	129					*	135	135			108							
GREEN		130								136			109							
RED ARROW																A124		A114		
YELLOW ARROW															A122	A125		A115		
FLASHING YELLOW ARROW															A123			A116		
GREEN ARROW			130					133	136							A126				
₩																				
Ķ																				

EQUIPMENT INFORMATION

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

^{*}See overlap programming detail on sheet 2

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)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE	U	S L O	SLOT	S L O	S L O	S L O T	S L O	S L O	S L O	S L O	S L O	S L O	S L O	S L O	FS DC
" "	L	- EMPT>	- EMPTY	- EMPT>	E M P T >	- EMPT>	- EMPT	E M P T V	- EMPT>	E M P T Y	- EMPT>	E M P T >	E M P T Y	- EMPT	ST DC
		S	S	S	S	S	S	S	S	S	S	S	Ş	Y S	ISOLATOR S
FILE	U	L O T	L O T	L O T	L O T	LOT	L O T	L O T	L O T	L O T	L O T	L O T	O T	L O T	L O T
"J"	L	E M P T Y	EMPTY	EMPTY	EMPTY	EMPTY	E M P T Y	E M P T Y	田MPTY	E M P T Y	EMPTY	E M P T Y	E M P T Y	E M P T Y	E M P T Y
	Į	EX.: 1/	A, 2A, ET	C. = LOC	P NO.'S							FS = I	FLASH S	ENSE	

SPECIAL DETECTOR NOTE

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

 \mathbb{A}

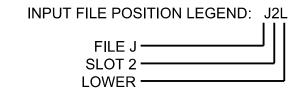
AC-

Install a multizone 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 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
5A	TD2 1 2	J1U	55	17	15 ★	5	15		Х		Х	
θA	TB3-1,2	310	აა	-	31★	2	3		X		Х	Х

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



OL2 RED (A124) -

OL2 YELLOW (A125) —

OL2 GREEN (A126) -

OL1 RED (A121) -

OL1 YELLOW (A122)

OL1 GREEN (A123) -

63

New Installation Temporary Design Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.

ELECTRICAL AND PROGRAMM **DETAILS FOR** Prepared for the Offices of:

NC 49/SR 1713 (Albemarle Rd) I-73-US 220 NB/I-74 WB Ramps

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

OL3 YELLOW (A115)

OL3 GREEN (A116) -

05 GREEN (133) —

Randolph County Ashebor REVIEWED BY: August 2021 A.D. Klinksiek N.K. Vlanich REVIEWED BY: N.R. Simmons REVISIONS

031464 FACINEER

SIG. INVENTORY NO.

TH CAROL

(R)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0503T **DESIGNED: AUGUST 2021** SEALED: 05/21/2024

ACCEPTABLE VALUES

Value (ohms) Wattage

1.5K - 1.9K | 25W (min)

2.0K - 3.0K | 10W (min)

Phase 5 Yellow Field Terminal (132) REVISED:

ST = STOP TIME

ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 16.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

5/

Detector	Call Phase	Delay
15	5	0
31	0	_

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	6	8	6	-
Modifier Phases	-	-	5	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

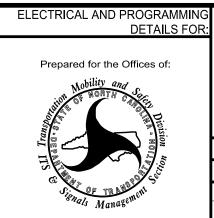
Overlap	1	2	3	4	
Туре	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-	
Included Phases	6	8	-	-	┫
Modifier Phases	-	-	5	-	
Modifier Overlaps	-	-	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

NOTICE REMOVED INCLUDED
PHASE FOR OL3

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0503T
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

New Installation Temporary Design Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49/SR 1713 (Albemarle Rd) at I-73-US 220 NB/I-74 WB Ramps

I-73-US 220 NB/I-74 WB Ramps

on 8 Randolph County Ashebor
TE: August 2021 REVIEWED BY: A.D. Klinksiek
ED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons
REVISIONS INIT. DATE

—DocuSigned by:

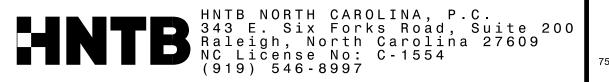
Natasha R Simmons 5/21/2024

SIGNATURE DATE

FOUASSDF3AD449A...
SIG. INVENTORY NO. 08-0503T

TH CAROL

031464



OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 16.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2
	OVERLAP PLAN 1 2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 51 to

run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5

call on loop 5A to 0 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.



Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

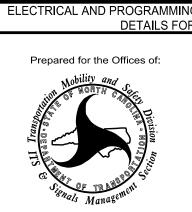
i allem i arameters									
Pattern	Veh Det Plan	Overlap Plan							
*	2	2							

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0503T
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

New Installation Temporary Design Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49/SR 1713 (Albemarle Rd) at I-73-US 220 NB/I-74 WB Ramps

sion 8 Randolph County Asheboro
DATE: August 2021 REVIEWED BY: A.D. Klinksiek
PARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

SEAL
031464

O31464

R. SIMMON

DocuSigned by:

Matasha R Simmons

SIGNATURE

DATE

TH CAROL

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

PREPARED BY:

RE

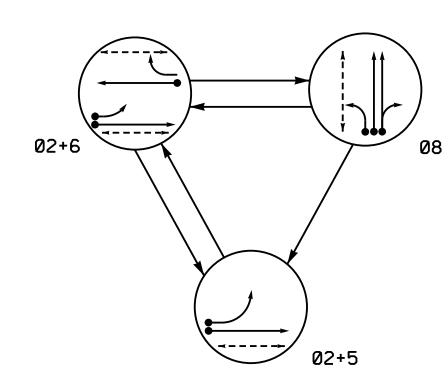
750 N. Greenfield Pkwy, Garner, NC 27529

REVISIONS INIT. DATE DocuSigned by:

Motasha R Simmons SIGNATURE

**FOUNDATION ON THE POUNDATION O

DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

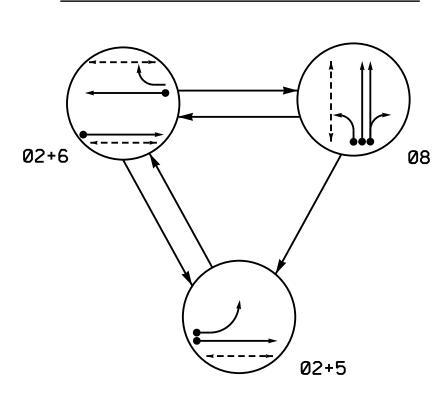
UNSIGNALIZED MOVEMENT

PEDESTRIAN MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

DETECTED MOVEMENT

ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

DEFAULT TABLE OF				N	ALTERNAT TABLE OF				
SIGNAL FACE	0 2+5	PH4 02+6	NSE Ø 8	FUGOI	SIGNAL FACE	0 2+5	PH4 0 2+6	Ø 8	F L A S H
21	G	G	R	Υ	21	G	G	R	Υ
22	1	1	R	Υ	22	1	1	R	Υ
51	1	┸	#	- +	51	—	#	₹	−¥
61	R	†	R	Υ	61	R	1	R	Υ
62	R	G	R	Υ	62	R	G	R	Υ
63	R	F∱	R	Υ	63	R	F∱	R	Υ
81	R	R	₹	R	81	R	R	누	R
82,83	R	R	G	R	82,83	R	R	G	R
P21 , P22	W	W	DW	DRK	P21 , P22	W	W	DW	DR
P61 , P62	DW	W	DW	DRK	P61 , P62	DW	W	DW	DR

P81**,**P82

P81**,**P82

	MAX.	TIME D	ETECT	OR	INS	TALL	ATION	С	HA	RT		
	DETI	ECTOR				PF	ROGRAM	ΜI	NG			
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
2A	6X6	70	3	Х	2	-	-	Χ	-	Х	-	Χ
E A	CV40		2 4 2	Ţ	5	* 15	-	Х	-	Х	•	Χ
5A	6X40	0	2-4-2	X	* 2	-	-	Х	-	Х	-	Χ
6A	6X6	70	5	Х	6	-	-	Х	-	Х	-	Χ
8.8	6X40	0	2-4-2	Х	8	-	-	Х	-	Х	-	Χ
8B	6X40	0	2-4-2	Х	8	-	-	Х	-	Х	-	Χ
8C	6X40	0	2-4-2	Х	8	10	-	Х	-	Х	-	Х
8D	6X20	0	3	Х	8	15	-	Х	-	Х	-	Х

* Disable Delay during Alternate Phasing Operation. * Disable phase call during Alternate Phasing operation.

NOTES

3 Phase

Fully Actuated

Signal System #D08-29_Asheboro

US 64 Bus-NC 49 (Asheboro)

PROJECT REFERENCE NO.

U-5813

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.
- 4. Set all detector units to presence mode.
- 5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- 6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- 7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- 8. The Division Traffic Engineer will determine the hours of use for each phasing plan.

All Heads L.E.D. 51 ### ### 81 R Y G 21 62 82,83 63 Y) 12" P21,P22 P61,P62 P81,P82 ∕—Metal Pole #2 Std. Case S30L1 Sta. 42+36 +/- -Y-56' Lt +/-Metal Pole #1— Std. Case S30L1 Sta. 41+33 +/- -Y-59' Lt +/-35 MPH +4% GRADE 81 82 83 SIDEWALK ALBEMARLE RD T T SIDEWALK □ 6A **← 少**(5A) SIDEWALK SIDEWALK 35 MPH -4% GRADE SR 1713 (ALBEMARLE RD) Metal Pole #4-Std. Case S30L1 Sta. 41+62 +/- -Y--Metal Pole #3 44' Rt +/-Std. Case S30L1 Sta. 42+66 +/- -Y-56' Rt +/-

MAXTIME TIMING CHART						
FEATURE	PHASE					
PEATURE	2	5	6	8		
Walk *	7	-	7	7		
Ped Clear *	18	-	11	17		
Min Green	10	7	10	7		
Passage *	3.0	2.0	3.0	2.0		
Max 1 *	60	20	60	30		
Yellow Change	4.1	3.0	4.1	3.7		
Red Clear	2.2	3.3	2.2	2.3		
Added Initial *	-	-	-	-		
Maximum Initial *	-	-	-	-		
Time Before Reduction *	-	-	-	=		
Time To Reduce *	-	-	-	-		
Minimum Gap	-	-	-	-		
Advance Walk	-	-	3	3		
Non Lock Detector	-	Х	-	Х		
Vehicle Recall	MIN RECALL	-	MIN RECALL	-		
Dual Entry	-	-	-	-		

* 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 - Final Design

UNLESS ALL SIGNATURES COMPLETED



I-73-US 220 NB/I-74 WB Ramps

NC 49/SR 1713 (Albemarle Rd)

PROPOSED

 \circ

 \boxtimes

Division 8 Randolph County PLAN DATE: August 2021 REVIEWED BY: A D Klinksiek

750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons INIT. DATE TH CAROL 031464 * CONEER

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

LEGEND

<u>EXISTING</u> Traffic Signal Head Modified Signal Head N/A Pedestrian Signal Head With Push Button & Sign

K×3

Signal Pole with Guy Signal Pole with Sidewalk Guy Inductive Loop Detector Controller & Cabinet

Junction Box 2-in Underground Conduit Right of Way

Directional Arrow Metal Strain Pole

Type II Signal Pedestal Curb Ramp Guardrail

No Right Turn Sign (R3-1) No U-Turn/No Left Turn Sign (R3-18) Left Arrow "ONLY" Sign (R3-5L)

DOCUMENT NOT CONSIDERED FINAL

<u>Natasha R Simmons</u> 5/21/202 SIGNATURE DATE SIG. INVENTORY NO. 08-0503

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL ON (remove jumpers and set switches as shown) REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-10, 8-16, 9-11, 9-13, 9-15, 10-16, 11-13, 11-15, and 13-15. RP DISABLE - WD 1.0 SEC GY ENABLE SF#1 POLARITY LEDguard RF SSM RF SSM - FYA COMPACT-**–** FYA 1-9 FYA 3-10 FYA 5-11 FYA 7-12 COMPONENT SIDE REMOVE JUMPERS AS SHOWN

NOTES

- 1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plans.
- 2. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
- 4. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	S2,S3,S7,S8,S9,S11,S12
	AUX S1,AUX S2,AUX S4
Phases Used	2,2 PED,5,6,6 PED,8,8 PED
Overlap "1"	*
Overlap "2"	*
Overlap "3"	*
Overlap "4"	Not Used

*See overlap programming detail on sheet 2

U-5813 Sig. 17.1

SIGNAL HEAD HOOK-UP CHART																				
LOAD SWITCH NO.	S1	S	2	S3	S4	S5	S6	S7	S	8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	2	13	3	4	14	5	(3	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2	2 PED	3	4	4 PED	5	6	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21	22	P21, P22	NU	NU	NU	★ 51	61	62	P61, P62	NU	82,83	P81, P82	★ 63	★ 81	NU	★ 51	NU	NU
RED		128	128						134	134			107		A121					
YELLOW		129	129					*	135	135			108							
GREEN		130								136			109							
RED ARROW																A124		A114		
YELLOW ARROW															A122	A125		A115		
FLASHING YELLOW ARROW															A123	A126		A116		
GREEN ARROW			130					133	136											
*				113							119			110						
Ķ				115							121			112						

NU = Not Use

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

OL1 RED (A121) -

OL1 YELLOW (A122)

OL1 GREEN (A123)

OL2 RED (A124) —

OL2 YELLOW (A125) -

OL2 GREEN (A126) —

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE U " " L	SLOT EMPTY	Ø 2 2A NOT USED	SLOT ESPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EXPTY	SLOT EMPTY	DC ISOLATOR	Ø 6 PED DC ISOLATOR Ø 8 PED DC ISOLATOR	DC ISOLATOR ST DC
FILE U "J" L	Ø 5 5A NOT USED	Ø 6 6A NOT USED	SLOT EMPT	SLOT EMPT	S L O T E M P T	Ø 8 8A Ø 8	Ø 8 8C Ø 8	S L O T E M P T	S L O T E M P T	SLOT EMPT	S L O T E M P T	S L O T E M P T	SLOT EMPT	SLOT EMPT
EX.: 1A, 2A, ETC. = LOOP NO.'S							Y	Y	Y	FS =	FLASH S	ENSE	Y	

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 the Red Enable is active at all times during normal operation.

4. Integrate monitor with Ethernet network in cabinet.

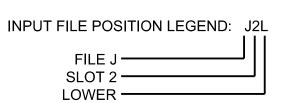
FS = FLASH SENSE ST = STOP TIME

= DENOTES POSITION OF SWITCH

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			Χ		Х	
5A	TB3-1,2	J1U	55	17	15 ★	5	15		Χ		Х	
ЭA	100-1,2	310	55	-	31 ★	2			Χ		Х	
6A	TB3-5,6	J2U	40	2	16	6			Х		Х	
8A	TB5-9,10	J6U	42	4	22	8			Х		Х	
8B	TB5-11,12	J6L	46	8	23	8			Х		Х	
8C	TB7-1,2	J7U	66	32	24	8	10		Х		Х	
8D	TB7-3,4	J7L	79	45	25	8	15		Х		Х	
PED PUSH BUTTONS	_						NOTE:					
P21,P22	TB8-4,6	I12U	67	33	2	PED 2	INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

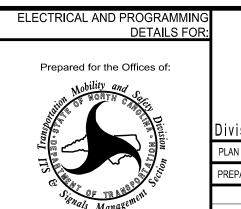
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0503
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49/SR 1713 (Albemarle Rd) at I-73-US 220 NB/I-74 WB Ramps

FYA SIGNAL WIRING DETAIL

63

81

(wire signal heads as shown)

OL3 RED (A114) -

OL3 YELLOW (A115)

OL3 GREEN (A116)

05 GREEN (133)

n 8 Randolph County Asheboro

August 2021 Reviewed By: A.D. Klinksiek

By: N.K. Vlanich Reviewed By: N.R. Simmons

REVISIONS INIT. DATE

SEAL
O31464

DocuSigned by:

(4)

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

Phas Term

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

Phase 5 Yellow Field Terminal (132)

ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 17.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

5A

Detector	Call Phase	Delay
15	5	0
31	0	-

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

		,	,	
Overlap	1	2	3	4
Туре	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	6	8	6	ı
Modifier Phases	1	1	5	•
Modifier Overlaps	1	-	-	ı
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

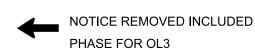
Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4
Туре	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	-
Included Phases	6	8	-	-
Modifier Phases	-	-	5	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0503
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

NC 49/SR 1713 (Albemarle Rd) at

I-73-US 220 NB/I-74 WB Ramps

Ashebor August 2021 REVIEWED BY: A.D. Klinksiek
RED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

TH CAROL

031464

ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 17.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2
	OVERLAP PLAN 1 2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 51 to

run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5

call on loop 5A to 0 seconds.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- 1. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- 2. ON REAR OF PDA REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- 3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.



Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

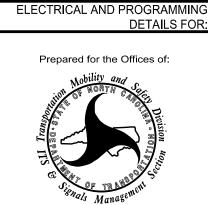
Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0503
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 3 of 3 DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



NC 49/SR 1713 (Albemarle Rd) at I-73-US 220 NB/I-74 WB Ramps

)ivision 8	Randolp	h County	ı	Ashebor
PLAN DATE:	August 2021	REVIEWED BY:	A.D. Klin	ksiek
PREPARED BY:	N.K. Vlanich	REVIEWED BY:	N.R. Sim	mons
	REVISIONS		INIT	DATE

DocuSigned by:

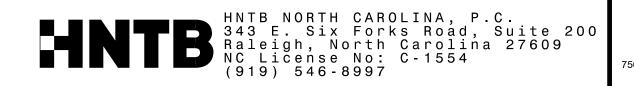
Malasha R Simmons 5/21/2024

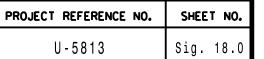
SIGNATURE DATE

FOUNDOOLF SALVANDA...
SIG. INVENTORY NO. 08-0503

TH CAROL

031464







NOTES

(Isolated)

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Set all detector units to presence mode. 4. Locate new cabinet so as not to
- obstruct sight distance of vehicles turning right on red.
- 5. Incorporate Microwave Detection system for vehicle detection.
- 6. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

LEGEND

<u>EXISTING</u>

	DETI	ECTOR			PF	ROGRAM	ΙMΙ	NG			L	
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE		EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	
3A *	6X40	0	*	*	3	** 15	-	Х	-	Х	ı	
6A*	6X6	300	*	*	6	-	-	Х	Х	Х	-	ŀ
6B *	6X6	300	*	*	6	-	-	Χ	Х	Х	-	

45 MPH +2% GRADE

US 64 Bus.

(Dixie Dr)

New Installation -

Temporary Design 1

SIGNAL FACE

ALTERNATE PHASING

TABLE OF OPERATION

61,62

PHASE

—— Sta. 109+94 +/- -L-

— Sta. 111+08 +/- -L-

80' Lt +/-

71' Lt +/-

PHASING DIAGRAM DETECTION LEGEND DETECTED MOVEMENT UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

→---- PEDESTRIAN MOVEMENT

DEFAULT PHASING DIAGRAM

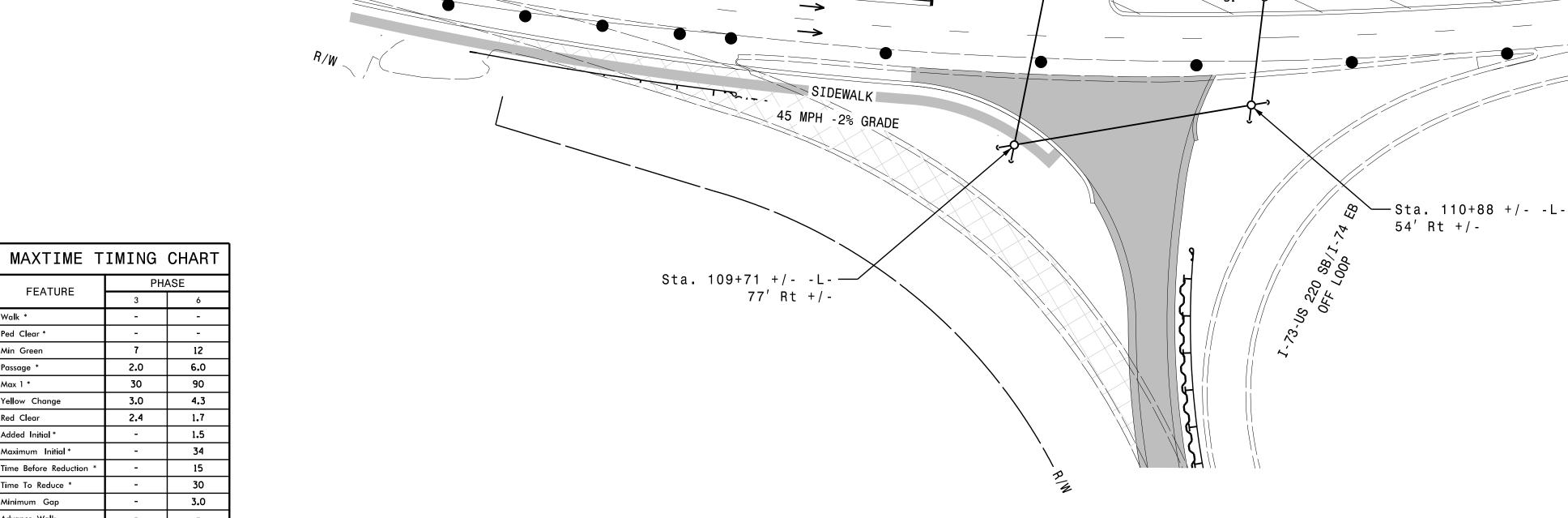
All Heads L.E.D. 12" 51 12" 61,62

SIGNAL FACE I.D.

ALTERNATE PHASING DIAGRAM

	ì
4RT	
6	
6	
-	
- - 12	
- - 12 6.0	
- - 12 6.0 90	
- - 12 6.0 90 4.3	
- 12 6.0 90 4.3	
- 12 6.0 90 4.3 1.7	
- 12 6.0 90 4.3	
- 12 6.0 90 4.3 1.7 1.5 34	
- 12 6.0 90 4.3 1.7 1.5 34 15 30	
- 12 6.0 90 4.3 1.7 1.5 34	
- 12 6.0 90 4.3 1.7 1.5 34 15 30 3.0	
- 12 6.0 90 4.3 1.7 1.5 34 15 30 RECALL	
- 12 6.0 90 4.3 1.7 1.5 34 15 30 3.0	

phases should not be lower than 4 seconds.



US 64 Bus./NC 49 (Dixie Dr)

DEFAULT PHASING

TABLE OF OPERATION

FACE

61,62

PHASE

| R | Y

Traffic Signal Head **—** 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 \longrightarrow Directional Arrow Construction Zone Microwave Detection Zone N/A Guardrail Construction Zone Drums Temporary Pavement **(A)** "YIELD" Sign (R1-2) No U-Turn/No Left Turn Sign (R3-18) $^{\otimes}$

(Construction Phase I)

US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

PROPOSED

Division 8 Randolph County August 2021 PLAN DATE: REVIEWED BY: A.D. Klinksiek

750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons INIT. DATE

TH CAROL 031464 * CONEER

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997 SIG. INVENTORY NO. 08-0500T

PHASE Ped Clear * Min Green 2.0 Passage * 30 Yellow Change 3.0 Red Clear 2.4 -Maximum Initial * Time Before Reduction *

Vehicle Recall **Dual Entry**

Χ

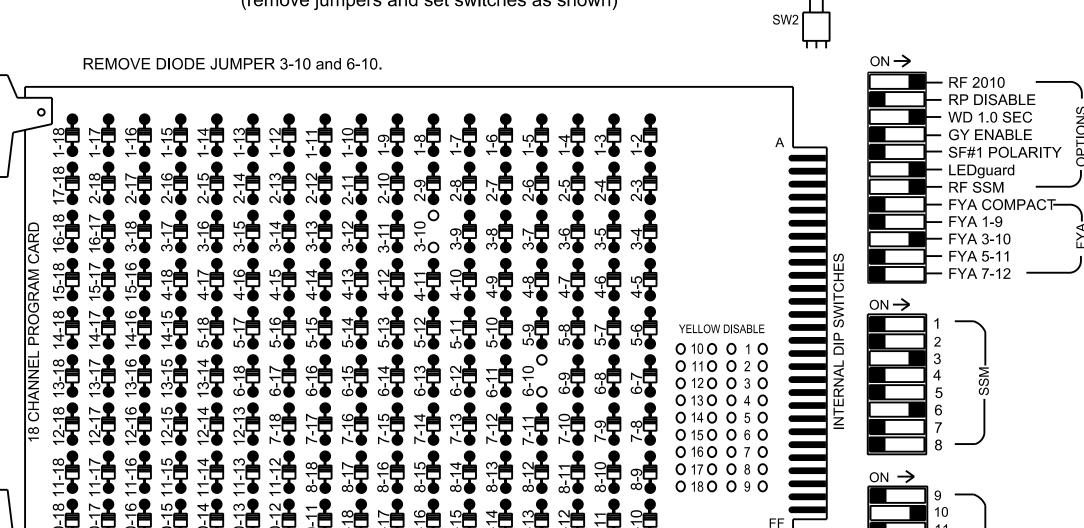
Time To Reduce *

Minimum Gap Advance Wa**l**k

Non Lock Detector

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



ON

= DENOTES POSITION OF SWITCH

PRE = PREEMPT

WD ENABLE 🕥

REMOVE JUMPERS AS SHOWN

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.

COMPONENT SIDE

- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

NOTES

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

EQUIPMENT INFORMATION

ControllerCabinet	
Software	
Cabinet Mount	Base
Output File Positions	•
Load Switches Used	S4,S8,AUX S2
Phases Used	3,6
Overlap "1"	NOT USED
Overlap "2"	*
Overlap "3"	NOT USED
Overlap "4"	NOT USED

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.

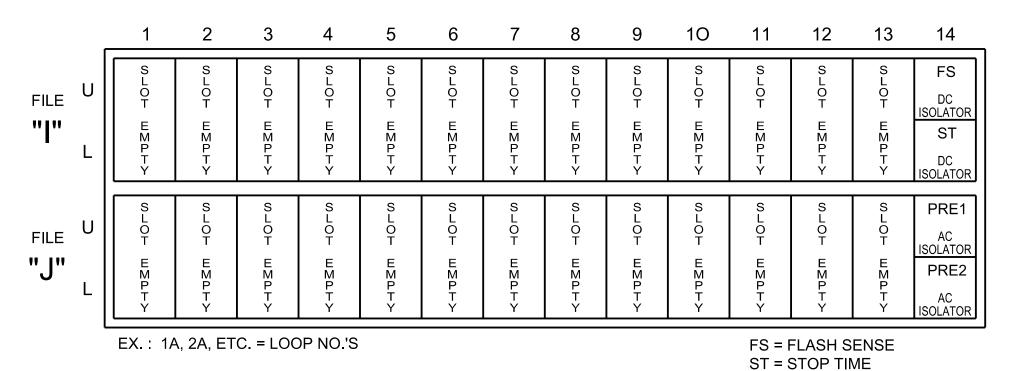
							SIGNA	AL HEA	D HOO	K-UP C	CHART							
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NU	NU	★ 51	NU	NU	NU	61,62	NU	NU	NU	NU	NU	★ 51	NU	NU	NU	NU
RED								134										
YELLOW				*				135										
GREEN																		
RED ARROW														A124				
YELLOW ARROW														A125				
FLASHING YELLOW ARROW														A126				
GREEN ARROW				118				136										
₩																		
Ķ																		

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)



SPECIAL DETECTOR NOTE

Install a multizone 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 CONNECTION & PROGRAMMING CHART

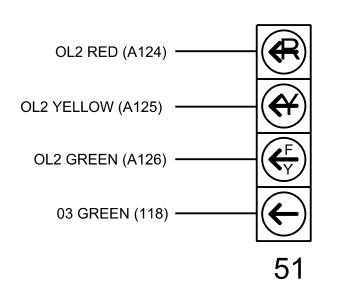
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.		DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I5U	58	20	7★	3	15		Х		Х	

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L SLOT 2 -LOWER -

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T1 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

New Installation Temporary Design 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMI **DETAILS FOR** Prepared for the Offices of:

Electrical Detail - Sheet 1 of 3

US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps

Randolph County Ashebor REVIEWED BY: A.D. Klinksiek August 2021 REVIEWED BY: N.K. Vlanich N.R. Simmons REVISIONS

TH CAROL 031464 CACINEER

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)

Phase 3 Yellow Field Terminal (118)

PROJECT REFERENCE NO. SHEET NO. U-5813 Sig. 18.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

3/

Detector	Call Phase	Delay
7	3	0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	-	FYA 4 - Section	1	-
Included Phases	-	6	•	-
Modifier Phases	-	3	ı	-
Modifier Overlaps	-	-	•	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

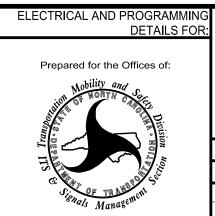
Overlap	1	2	3	4
Туре	-	FYA 4 - Section	-	-
Included Phases	-	-	-	-
Modifier Phases	-	3	-	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

NOTICE REMOVED INCLUDE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0500T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

New Installation Temporary Design 1 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



at I-73-US 220 SB/I-74 EB Ramps

US 64 Bus. (Dixie Dr)/NC 49

ision 8 Randolph County Ashebor

N DATE: August 2021 REVIEWED BY: A.D. Klinksiek

PARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

DocuSigned by:

Natasha R Simmons
SIGNATURE
DATE

PODAGGODE SAD449A...
SIGNIVIENTORY NO
08-0500T1

TH CAROL

031464

OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 18.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 51 to

run protected turns only.

VEH DET PLAN 2: Reduce delay time for phase 3

call on loop 3A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

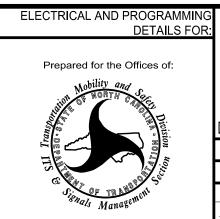
Pattern	Veh Det Plan	Overlap Plan					
*	2	2					

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0500T1
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

New Installation Temporary Design 1 Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus. (Dixie Dr)/NC 49
at
I-73-US 220 SB/I-74 EB Ramps

vision 8 Randolph County Ashebo
AN DATE: August 2021 REVIEWED BY: A.D. Klinksiek
EPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons
REVISIONS INIT. DATE

SEAL
03I464

Pocusigned by:

Matasha R Simmons
SIGNATURE
POUAGOUT SAD449A...

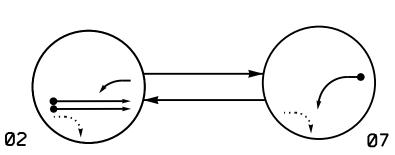
DATE
POUAGOUT SAD449A...

TH CAROL

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

50 N. Greenfield Pkwy, Garner, NC 27529

DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

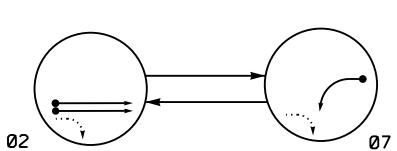
UNSIGNALIZED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP)

→ DETECTED MOVEMENT

→---- PEDESTRIAN MOVEMENT

<u>ALTERNATE PHASING DIAGRAM</u>

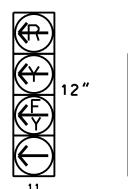


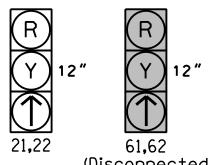
DEFAULT TABLE OF			
		PHAS	E
SIGNAL FACE	02	0 7	FLASH
11	щ≻	1	- ¥
21,22	1	R	Y

ALTERNATE TABLE OF			
		PHAS	E
SIGNAL			F
FACE	ו שַׁ	ן שַׁ ן	<u>ک</u> ا

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)	上し母のエ	
-	- ¥	[
7.	Υ	

SIGNAL FACE I.D. All Heads L.E.D.





61,62
(Disconnected
and bagged)

	MAXTIME DETECTOR INSTALLATION CHART											
	DETE	CTOR				PF	OGRAM	IMI	NG			
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	
2A *	6X6	300	*	*	2	ı	-	X	Х	Х	ı	:
2B *	6X6	300	*	*	2		-	X	X	Х	1	;
7 ∧ *	6X40	0	*	*	7	** 15	-	X	-	Х	1	:

* Microwave Detection
** Disable Delay During Alternate Phasing Operation.

2 Phase Fully Actuated (Isolated)

PROJECT REFERENCE NO.

U-5813

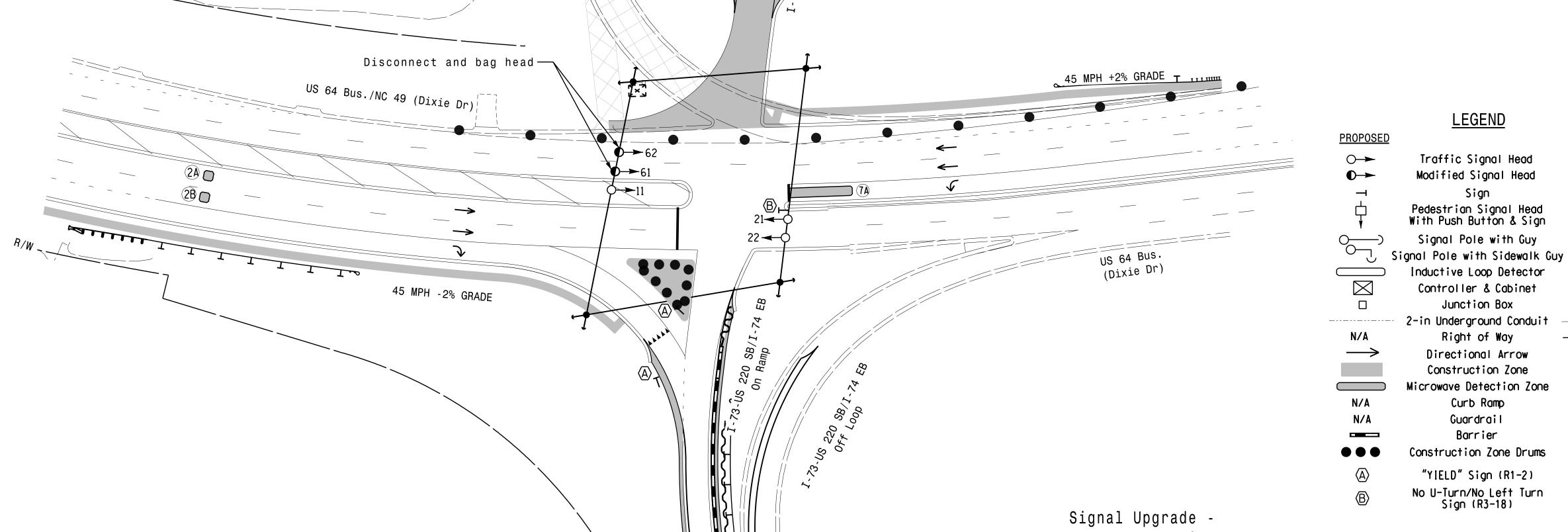
NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Disconnect and bag existing signal heads numbered 61 and 62.
- 4. Set all detector units to presence mode.
- 5. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.

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HART	
SE.	
7	
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-	
- - 7	
- 7 2.0	
- 7 2.0 20	
- 7 2.0 20 3.0	
- 7 2.0 20 3.0 1.8	
- 7 2.0 20 3.0 1.8	
- 7 2.0 20 3.0 1.8	
- 7 2.0 20 3.0 1.8	
- 7 2.0 20 3.0 1.8 - -	
- 7 2.0 20 3.0 1.8 - - -	
- 7 2.0 20 3.0 1.8 X	
- 7 2.0 20 3.0 1.8 - - -	
- 7 2.0 20 3.0 1.8 X	

MAXTIME TIMING CH PHAS Ped Clear * 12 Min Green 6.0 Passage * 90 Yellow Change 4.7 1.1 Red Clear 1.5 34 Maximum Initial * 15 Time Before Reduction * 30 Time To Reduce * 3.0 Minimum Gap Advance Wa**l**k Non Lock Detector MIN RECALL Vehicle Recall Dual Entry

Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be



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Temporary Design 2 (Construction Phase IA) US 64 Bus. (Dixie Dr)/NC 49

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



I-73-US 220 SB/I-74 EB Ramps

Division 8 Randolph County August 2021 REVIEWED BY: A.D. Klinksiek

750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons INIT. DATE SIG. INVENTORY NO. 08-0500T2

031464 * CONEER

TH CAROL

<u>EXISTING</u>

 \longrightarrow

1 1

N/A

 \triangle

 lack

18 CHANNEL IP CONFLICT MONITOR ON OFF **PROGRAMMING DETAIL**

= DENOTES POSITION OF SWITCH

(remove jumpers and set switches as shown) REMOVE DIODE JUMPER 2-12 and 7-12. RF 2010 -RP DISABLE — WD 1.0 SEC GY ENABLE A INTERNAL DIE SYNTENIAL DE SYN SF#1 POLARITY LEDguard - FYA COMPACT-— FYA 3-10 — FYA 5-11 — FYA 7-12

REMOVE JUMPERS AS SHOWN

- 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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

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. Return controller to Factory Defaults before programming per this electrical detail.
- 3. Program controller to start up in phase 2 Green No Walk.
- 4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

EQUIPMENT INFORMATION

Controller	332 w/ Aux Q-Free MAXTIME Base 18 With Aux. Output File S2,S10,AUX S5
Phases Used	2,7
Overlap "1" Overlap "2" Overlap "3"	NOT USED
Overlap "4"	*

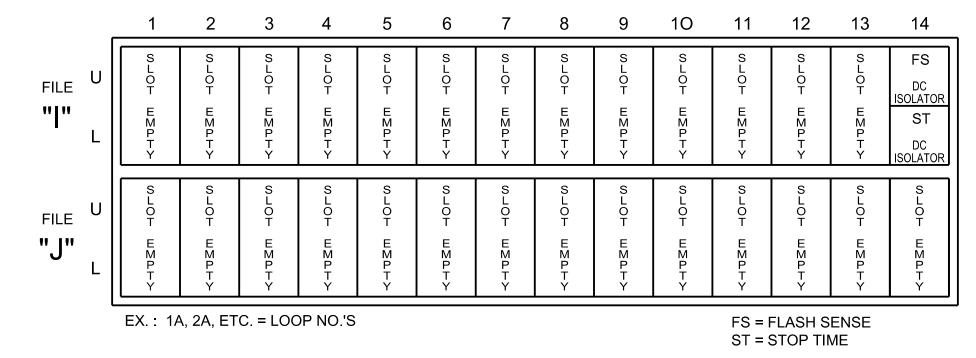
*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.

				SI	GN	AL H	HEA	DΗ	00	K-U	PC	HAF	RT					
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	★ 11	NU	NU	NU	NU	NU	NU	★ 11	NU
RED		128																
YELLOW		129								*								
GREEN																		
RED ARROW																	A101	
YELLOW ARROW																	A102	
FLASHING YELLOW ARROW																	A103	
GREEN ARROW		130								124								
•																		
Κ̈́																		

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

Install a multizone 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.

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)

Phase 7 Yellow Field Terminal (123) $\langle \rangle$

Remove Phase 3 Yellow Field Terminal (118) (if present)

INPUT FILE CONNECTION & PROGRAMMING CHART

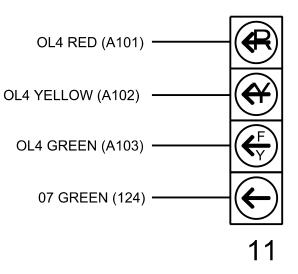
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
7A	TB5-5,6	J5U	57	19	21 ★	7			Χ		Χ	

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2I FILE J — SLOT 2 -LOWER -

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 2 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMIN **DETAILS FOR**

US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps Randolph County REVIEWED BY: A.D. Klinksiek August 2021

Ashebor REVIEWED BY: N.K. Vlanich N.R. Simmons REVISIONS

TH CAROL 031464 * CONEER

PROJECT REFERENCE NO. Sig. 19.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
21	7	0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	-	-	•	FYA 4 - Section
Included Phases	-	1	ī	2
Modifier Phases	-	-	-	7
Modifier Overlaps	-	-	•	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

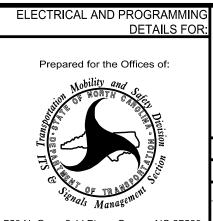
Overlap	1	2	3	4	
Туре	-	-	-	FYA 4 - Section	
Included Phases	•	•	-	-	┫
Modifier Phases	-	-	-	7	
Modifier Overlaps	-	-	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

PHASE FOR OL4

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 2 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

Randolph County Ashebor REVIEWED BY: August 2021 A.D. Klinksiek N.K. Vlanich REVIEWED BY: N.R. Simmons

031464

TH CAROL

OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 19.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

OVERLAP PLAN	VEH DET PLAN
1	1
2	2
	OVERLAP PLAN 1 2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 11 to

run protected turns only.

VEH DET PLAN 2: Reduce delay time for phase 7

call on loop 7A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

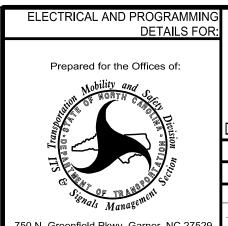
attorri ara	11101010	
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 2 Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

August 2021 REVIEWED BY: A.D. Klinksiek N.R. Simmons N.K. Vlanich

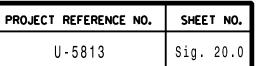
TH CAROL

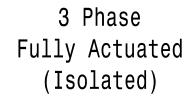
031464

DEFAULT PHASING DIAGRAM

ALTERNATE PHASING DIAGRAM

02+6





NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 1 may be lagged.
- 4. Reposition existing signal heads numbered 11, 61, and 62.
- 5. Renumber existing loop 7A as 1A.
- 6. Set all detector units to presence mode.
- 7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- 8. The Division Traffic Engineer will determine the hours of use for each phasing plan.

LEGEND

Traffic Signal Head

Modified Signal Head

<u>EXISTING</u>

—

N/A

N/A \longrightarrow

N/A

1 1

 \bigcirc

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031464

	DETECTOR PROGRAMMING													
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD		
114	6X40	0	Ψ.	J.	1	** 15	-	Х	-	Х	-	*		
1A *	6,40		* * -	本 本 	* 7	不	# 6	3	-	Х	-	Х	Х	*
2A *	6X6	300	*	*	2	-	-	Х	Х	Х	-	*		
2B *	6X6	300	*	*	2	-	-	Х	Х	Х	-	*		
4A *	6X40	0	*	*	4	-	-	Х	-	Х	-	*		
4B*	6X40	0	*	*	4	15	-	Х	-	Х	-	*		
6A *	6X6	300	*	*	6	-	-	Х	Х	Х	-	*		
6B*	6X6	300	*	*	6	-	-	Х	Х	Х	-	*		
6C*	6X6	300	*	*	6	-	-	Х	Х	Х	-	*		

- ** Reduce Delay to 3 seconds for loop during Alternate Phasing operation.
- * Disable phase call during Alternate Phasing operation.

PHASING DIAGRAM DETECTION LEGEND → DETECTED MOVEMENT	SIGNAL FACE I.D. All Heads L.E.D.	R/W		
UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT PEDESTRIAN MOVEMENT	12" R	&	GRADE	
	11 21,22 41,42 61,62,63		35 MPH +3%	
R/W_			I-73-US 23	
	US 64 Bus./No	3 49 (Dixie Dr)		45 MPH +2% GRADE T T T
		Olixie Dr	63	
	2A C	→	B B	
R/W		→ — — — — — — — — — — — — — — — — — — —	21 — — — — — — — — — — — — — — — — — — —	
		45 MPH -2% GRADE	A Z	US 64 Bus. (Dixie Dr)
			220 SB/I. On Ramp	8
MAXTIME TIMING CHART PHASE				4. 7. 80 7. 7. 80 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
FEATURE 1 2 4 6 Walk * Ped Clear * Min Green 7 12 7 12				
Passage * 2.0 6.0 2.0 6.0 Max 1 * 20 90 30 90 Vollage Change 3.0 4.7 3.7 4.7				Signal Upgra

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62,63

PHASE

R | R Y

R R G R

† † R Y

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62,63

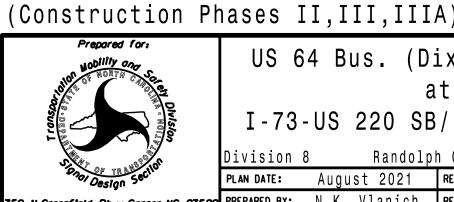
PHASE

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 Drill Directional Arrow Construction Zone Microwave Detection Zone

N/A Curb Ramp Guardrail Construction Zone Drums "YIELD" Sign (R1-2) No U-Turn/No Left Turn

Sign (R3-18) No Right Turn Sign (R3-1)

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



1"=40'

Signal Upgrade -

Temporary Design 3

US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

© 60

Division 8 Randolph County August 2021 REVIEWED BY: A D Klinksiek 750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

* CONEER INIT. DATE <u>Natasha R Simmons</u> 5/21/202 SIGNATURE DATE SIG. INVENTORY NO. 08-0500T3

HNTB

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554 (919) 546-8997

Dual Entry * 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.

3.0

1.9

Yellow Change

Maximum Initial * Time Before Reduction

Time To Reduce *

Minimum Gap Advance Wa**l**k

Non Lock Detector

Vehicle Recall

Red Clear

3.7

2.2

4.7

1.0

34

15

30

3.0

MIN RECALL

4.7

1.5

34

15

30

3.0

MIN RECALL

18 CHANNEL IP CONFLICT MONITOR ON OFF

= DENOTES POSITION OF SWITCH

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPER 1-6, 1-9, 2-6, 2-9, and 6-9. ─ RF 2010 ─ RP DISABLE ─ WD 1.0 SEC GY ENABLE SF#1 POLARITY LEDguard - FYA COMPACT-FYA 5-11
FYA 7-12

REMOVE JUMPERS AS SHOWN

- 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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

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. Return controller to Factory Defaults before programming per this electrical detail.

- 3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- 4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

EQUIPMENT INFORMATION

Controller	332 w/ Aux .Q-Free MAXTIME Base .18 With Aux. Output File S1,S2,S5,S8,AUX S1 1,2,4,6 *
•	NOT USED NOT USED

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.

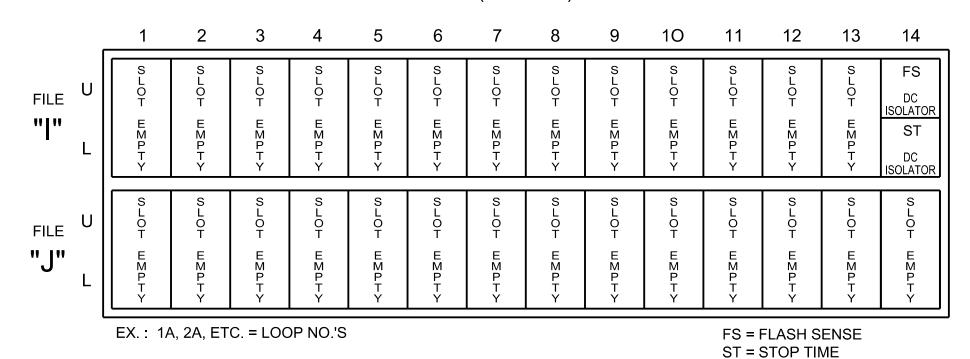
				SI	GNA	AL H	HEA	D H	00	K-U	P C	HAF	RT					
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	★ 11	21,22	NU	NU	41,42	NU	NU	61,62, 63	NU	NU	NU	NU	11	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN					103													
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	130						136										
•																		
Ķ																		

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)



SPECIAL DETECTOR NOTE

Install a multizone 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.

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)

Phase 1 Yellow Field Terminal (126)

.OOP 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
1 /	TD0 1 0	1411	56	18	1 ★	1	15		Х		Χ	
1A	TB2-1,2	I1U	90	-	29 ★	6	3		Х		Χ	Χ

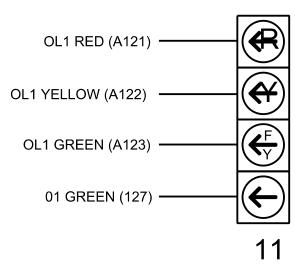
★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE CONNECTION & PROGRAMMING CHART

INPUT FILE POSITION LEGEND: J2L LOWER —

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade

Temporary Design 3 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:

US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps

Randolph County Ashebor REVIEWED BY: A.D. Klinksiek August 2021 REVIEWED BY: N.K. Vlanich N.R. Simmons REVISIONS

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MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

1	Δ
	,

Detector	Call Phase	Delay
1	1	3
29	0	3

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	-		-
Included Phases	2	-	1	-
Modifier Phases	1	-	1	-
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4	
Туре	FYA 4 - Section	-	-	-	
Included Phases	-	-	-	-	—
Modifier Phases	1	-	-	-	
Modifier Overlaps	-	1	-	1	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

NOTICE REMOVED INCLUDED PHASE FOR OL1

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 3 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:

US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps Randolph County

Ashebor REVIEWED BY: A.D. Klinksiek August 2021 N.K. Vlanich REVIEWED BY: N.R. Simmons

031464

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ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 20.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN	
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1	
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2	

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 11 to

run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN **PROGRAMMING DETAIL**

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

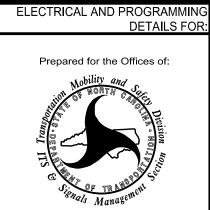
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 3 Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

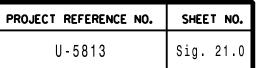


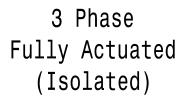
US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

August 2021 REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons N.K. Vlanich

031464

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NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 1 may be lagged.
- 4. Disconnect and bag existing signal head numbered 63.
- 5. Reposition existing sign \mathbb{C} .
- 6. Set all detector units to presence mode.
- 7. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

LEGEND

Traffic Signal Head

Modified Signal Head

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

Right of Way

Directional Drill Directional Arrow

Construction Zone Microwave Detection Zone

> Curb Ramp Guardrail

Construction Zone Drums

"YIELD" Sign (R1-2)

No U-Turn/No Left Turn Sign (R3-18)

No Right Turn Sign (R3-1)

DOCUMENT NOT CONSIDERED FINAL

EXISTING

-

N/A

N/A

N/A

1 1

 $^{\otimes}$

0

SIG. INVENTORY NO. 08-0500T4

8. The Division Traffic Engineer will determine the hours of use for each phasing plan.

DETECTOR PROGRAMMING												
ZONE	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 *	6X40	0	*	*	1	*** 15	-	Х	-	Χ	-	*
1A *	6840	'	木	*	#6	3	-	Х	-	Х	Χ	*
2A *	6X6	300	*	*	2	-	-	Х	Х	Χ	1	*
2B *	6X6	300	*	*	2	-	-	Х	Х	Х	-	*
4A *	6X40	0	*	*	4	-	-	Х	-	Χ	•	*
4B*	6X40	0	*	*	4	15	-	Х	-	Х	-	*
6A *	6X6	300	*	*	6	-	-	Х	Х	Χ	-	*
6B *	6X6	300	*	*	6	-	-	Х	Х	Х	-	*

* Microwave Detection ** Reduce Delay to 3 seconds for loop during Alternate

Phasing operation. * Disable phase call during Alternate Phasing operation.

SIGNAL FACE I.D. PHASING DIAGRAM DETECTION LEGEND DETECTED MOVEMENT All Heads L.E.D. UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT →---- PEDESTRIAN MOVEMENT R Y 12" 63 (Disconnected and bagged) Disconnect and — 45 MPH +2% GRADE T US 64 Bus./NC 49 (Dixie Dr) bag head 42 41 45 MPH -2% GRADE

DEFAULT PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62

PHASE

R | R Y

† † R Y

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

FACE

21,22

41,42

61,62

PHASE

MAX	TIME T	IMING	CHART					
FEATURE	PHASE							
FEATURE	1	2	4	6				
Walk *	-	-	-	-				
Ped Clear *	-	-	-	-				
Min Green	7	12	7	12				
Passage *	2.0	6.0	2.0	6.0				
Max 1 *	20	90	30	90				
Yellow Change	3.0	4.7	3.7	4.7				
Red Clear	1.9	1.1	2.2	1.1				
Added Initial *	-	1.5	-	1.5				
Maximum Initial *	-	34	-	34				
Time Before Reduction *	-	15	-	15				
Time To Reduce *	-	30	-	30				
Minimum Gap	-	3.0	-	3.0				
Advance Walk	-	-	-	-				
Non Lock Detector	Х	-	Х	-				
Vehicle Recall	-	MIN RECALL	-	MIN RECALL				
D 15 .								

DEFAULT PHASING DIAGRAM

ALTERNATE PHASING DIAGRAM

02+6

* 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 4 (Construction Phase IIA)

US 64 Bus.

(Dixie Dr)

UNLESS ALL SIGNATURES COMPLETED

August 2021 REVIEWED BY: A.D. Klinksiek INIT. DATE

N/A

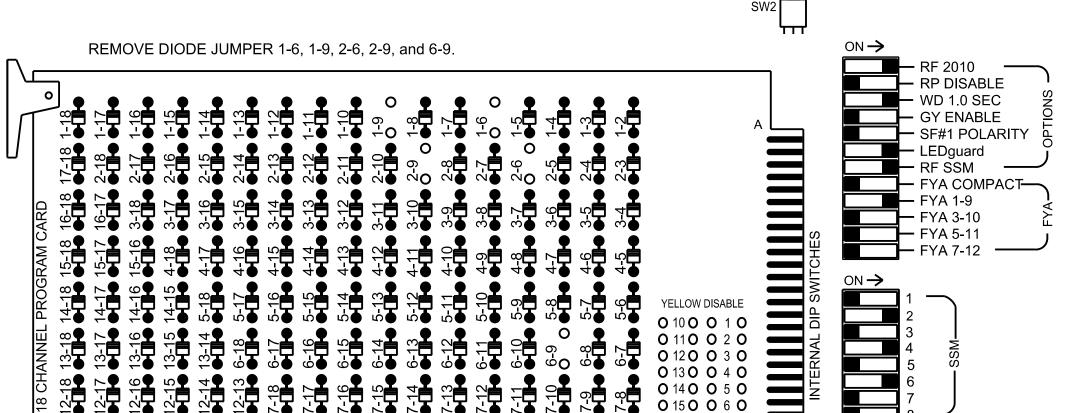
N/A

US 64 Bus. (Dixie Dr)/NC 49 TH CAROL I-73-US 220 SB/I-74 EB Ramps 031464 Division 8 Randolph County * CONEER 750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

18 CHANNEL IP CONFLICT MONITOR ON OFF PROGRAMMING DETAIL

= DENOTES POSITION OF SWITCH

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

- 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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled 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,S5,S8,AUX S1
Phases Used	1,2,4,6
Overlap "1"	*
Overlap "2"	NOT USED
Overlap "3"	NOT USED
Overlap "4"	NOT USED

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.

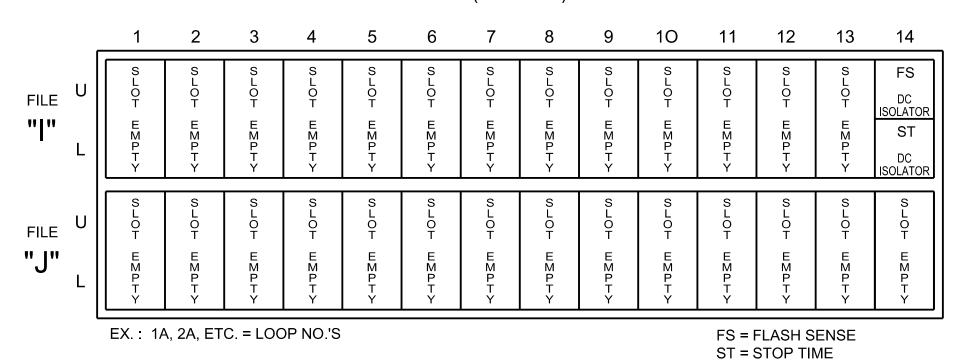
	SIGNAL HEAD HOOK-UP CHART																	
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	★ 11	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	★ 11	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN					103													
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	130						136										
•																		
×																		

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)



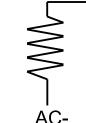
SPECIAL DETECTOR NOTE

Install a multizone 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.

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)



Phase 1 Yellow Field Terminal (126)

INPUT FILE CONNECTION & PROGRAMMING CHART

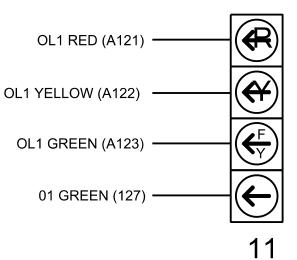
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.		DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 *	1	15		Χ		X	
IA	102-1,2	110	1 20 1		20 🛨	6	3		ν		V	V

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L SLOT 2 — LOWER —

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T4 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 4

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:

US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps

Randolph County Ashebor REVIEWED BY: A.D. Klinksiek August 2021 REVIEWED BY: N.K. Vlanich N.R. Simmons REVISIONS

MOINEER

TH CAROL

031464

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
1	1	3
29	0	3

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	FYA 4 - Section	-	-	-
Included Phases	2	-	1	-
Modifier Phases	1	-	1	-
Modifier Overlaps	-	-	1	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

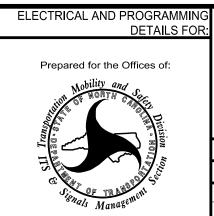
Overlap	1	2	3	4	
Туре	FYA 4 - Section	-	-	-	
Included Phases	-	-	-	-	—
Modifier Phases	1	1	-	-	
Modifier Overlaps	-	•	-	1	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

NOTICE REMOVED INCLUDED PHASE FOR OL1

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T4 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 4 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus. (Dixie Dr)/NC 49

I-73-US 220 SB/I-74 EB Ramps

Randolph County Ashebor REVIEWED BY: August 2021 A.D. Klinksiek N.K. Vlanich REVIEWED BY: N.R. Simmons

TH CAROL 031464

ROJECT REFERENCE NO.	SHEET NO.			
U-5813	Sig. 21.3			

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 11 to

run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1

call on loop 1A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

attorri ara	11101010	
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500T4 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Design 4 Electrical Detail - Sheet 3 of 3

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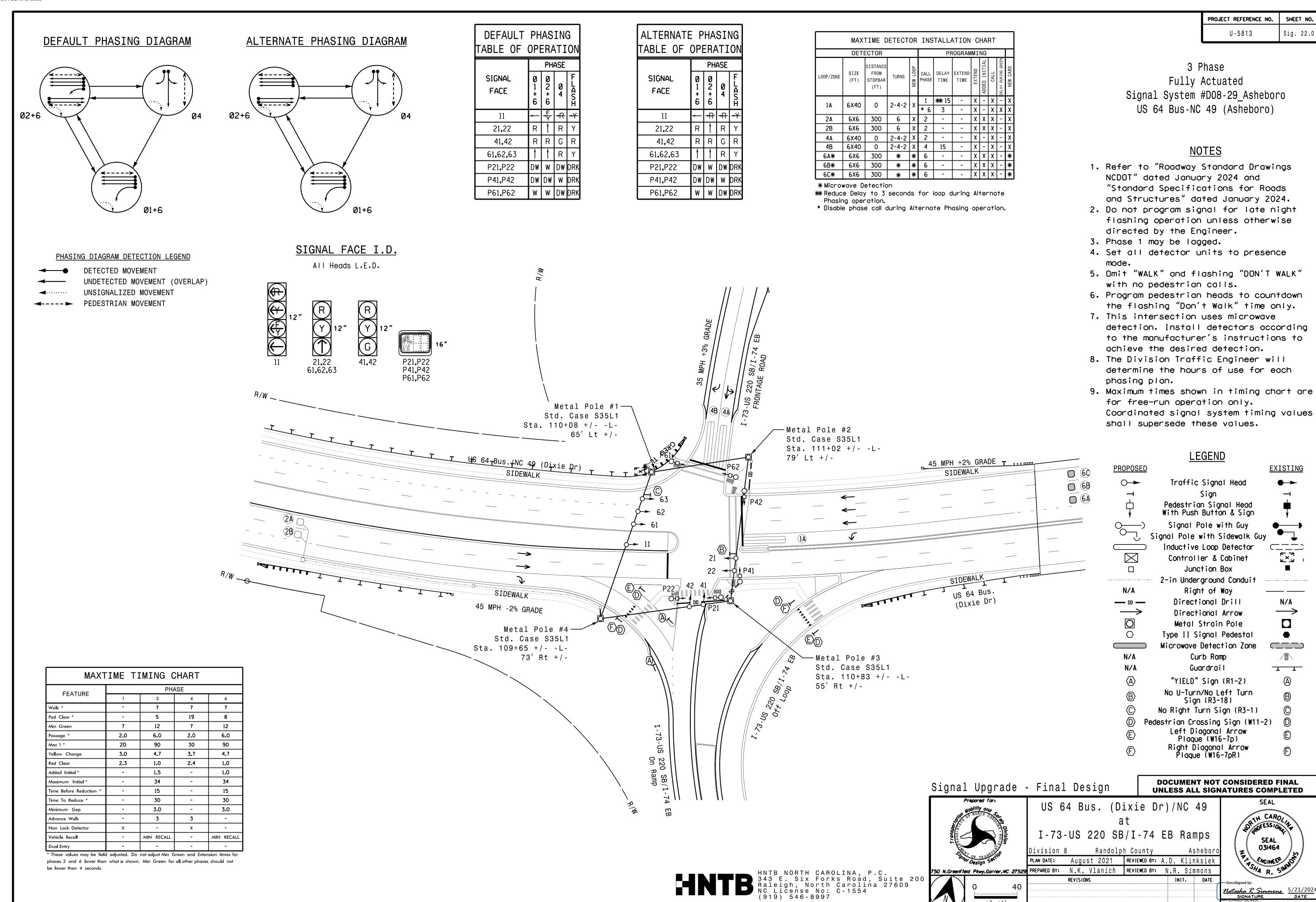
ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 64 Bus. (Dixie Dr)/NC 49 I-73-US 220 SB/I-74 EB Ramps

August 2021 REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons N.K. Vlanich

031464

TH CAROL



<u>Natasha R Simmons</u> 5/21/202 SIGNATURE DATE SIG. INVENTORY NO. 08-0500

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

SW2

= DENOTES POSITION OF SWITCH

DC DC DC ISOLATOR ISOLATOR

USED

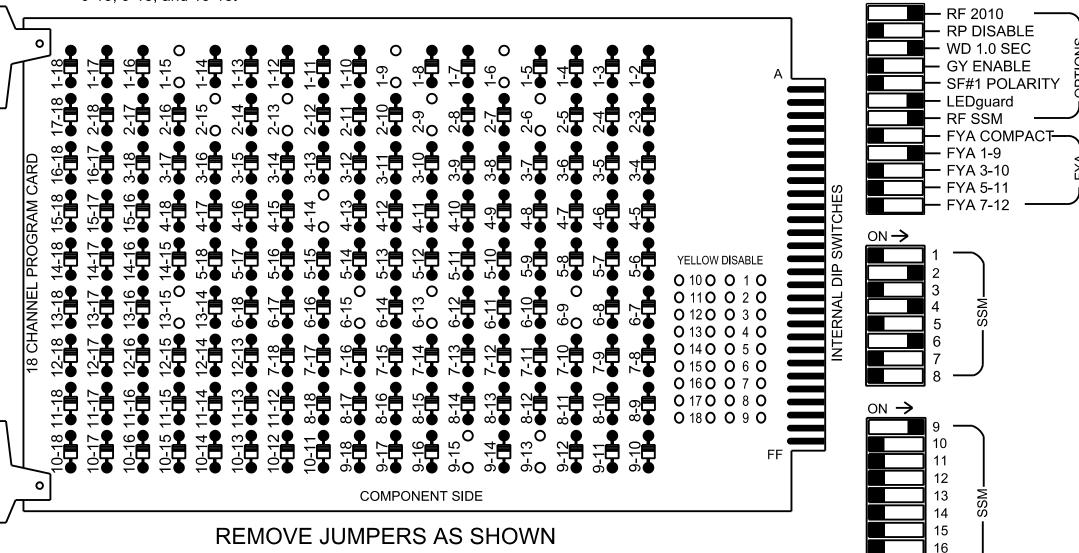
Ø4 PED

DC SOLATOR

FS = FLASH SENSE ST = STOP TIME

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPER 1-6, 1-9, 1-15, 2-6, 2-9, 2-13, 2-15, 4-14, 6-9, 6-13, 6-15, 9-13, 9-15, and 13-15.



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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
- 4. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	S1,S2,S3,S5,S6,S8,S9
	AUX S1
Phases Used	1,2,2 PED,4,4 PED,6,6 PED
Overlap "1"	*
Overlap "2"	NOT USED
Overlap "3"	NOT USED
Overlap "4"	NOT USED

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO. SHEET NO. U-5813 Sig. 22.1

SIGNAL HEAD HOOK-UP CHART																		
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	★ 11	21,22	P21, P22	NU	41,42	P41, P42	NU	61,62, 63	P61, P62	NU	NU	NU	★ 11	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN					103													
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	130						136										
₩			113			104			119									
×			115			106			121									

III = Not I lead

- ★ Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

NOTES:

FILE

FILE

NOT

USED

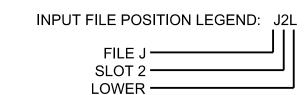
EX.: 1A, 2A, ETC. = LOOP NO.'S

- 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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

INPUT FILE CONNECTION & PROGRAMMING CHART

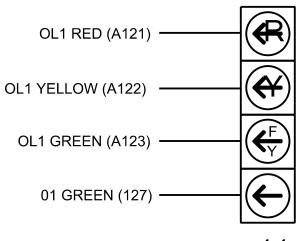
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15		Х		Х	
IA	102-1,2	110	50	-	29 ★	6	3		Х		Х	Х
2A	TB2-5,6	1 2U	39	1	2	2			Х	Χ	Х	
2B	TB2-7,8	I2L	43	5	3	2			Х	Χ	Х	
4A	TB4-9,10	I6U	41	3	8	4			Х		Х	
4B	TB4-11,12	I6L	45	7	9	4	15		Х		Х	
PED PUSH BUTTONS							NOTE:					_
P21,P22	TB8-4,6	I12U	67	33	2	PED 2	INSTALL DC ISOLATORS IN INPUT FILE SLOTS					
P41,P42	TB8-5,6	I12L	69	35	4	PED 4	IN INPUT FILE SLOTS I12 AND I13.					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



1

SPECIAL DETECTOR NOTE

Install a multizone 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 LAYOUT

(front view)

4A

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)

Phase 1 Yellow Field Terminal (126)

AC-

11

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.

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

Signal Upgrade - Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

Diagram And Programming DETAILS FOR:

US 64 Bus. (Dixie Dr)/NC 49 at

REVIEWED BY:

N.R. Simmons

I-73-US 220 SB/I-74 EB Ramps

Division 8 Randolph County Ashebor

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek

THIS ELECTRICAL DETAIL IS FOR

THE SIGNAL DESIGN: 08-0500

DESIGNED: AUGUST 2021

SEALED: 05/21/2024

N.K. Vlanich

REVISIONS

SEAL 031464

SCINEER SIMMONS

SCUSIGNED BY:

STASHA R SIMMONS

5/21/202

TH CAROL

 Matasha R Simmons
 5/21/2024

 SIGNATURE
 DATE

 FIGUARDITY SIGNATURE
 08-0500

\$ HNTB

OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 22.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
1	1	3
29	0	3

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Туре	FYA 4 - Section	-	1	ı
Included Phases	2	-	1	1
Modifier Phases	1	-	1	ı
Modifier Overlaps	=	-		-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4	
Type	FYA 4 - Section	-	-	1	
Included Phases	-	-	-	-	
Modifier Phases	1	-	-	-	Ρ
Modifier Overlaps	-	-	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

NOTICE REMOVED INCLUDED
PHASE FOR OL1

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0500
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

Nobility and State of the Offices of:

Management Manageme

US 64 Bus. (Dixie Dr)/NC 49
at

I-73-US 220 SB/I-74 EB Ramps

on 8 Randolph County Ashebor

August 2021 Reviewed By: A.D. Klinksiek

BD BY: N.K. Vlanich Reviewed By: N.R. Simmons

REVISIONS INIT. DATE

TH CAROL

031464

ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 22.3

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 11 to

run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A

and reduces delay time for phase 1 call on loop 1A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN **PROGRAMMING DETAIL**

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

attorr ara	11101010	
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0500 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMIN

Bus. US 64 (Dixie Dr)/NC 49

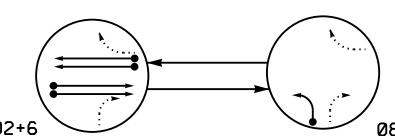
I-73-US 220 SB/I-74 EB Ramps

August 2021 REVIEWED BY: A.D. Klinksiek N.K. Vlanich N.R. Simmons

031464

TH CAROL

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT

UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

PEDESTRIAN MOVEMENT

MAXTIME TIMING CHART

12

6.0

90

4.5

1.0

1.5

15

30

3.0

6

12

6.0

90 4.5

1.4

1.5

34

15

30

3.0

-

MIN RECALL | MIN RECALL |

2.0

30

3.0

2.4

FEATURE

Ped Clear *

Min Green

Passage *

Red Clear

Yellow Change

Added Initial *

Maximum Initial

Time To Reduce *

Non Lock Detector

Vehicle Recall

Minimum Gap Advance Walk

Time Before Reduction

TABLE OF OPERATION PHASE SIGNAL FACE

21,22

81,82

+

12"	R Y
81,82	21 , 22 61 , 62

SIGNAL FACE I.D.

All Heads L.E.D.

(R)		
Y) 12"		
添		
21,22		

	MAX	TIME D	ETECT	OR	INS	TALLA	ATION	С	HA	RT		
	DETE	CTOR				PF	ROGRAN	ΜI	NG			
:	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
ŧ	6X6	300	*	*	2	-	-	χ	χ	χ	-	*

ZONE	SIZE (FT)	FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	GXTEND	ADDED INITI	CALL	DELAY DURING GF	NEW CARD
2A *	6X6	300	*	*	2	-	-	Χ	Х	Х	•	*
2B *	6X6	300	*	*	2	-	-	Х	Х	Х	1	*
6A *	6X6	300	*	*	6	-	-	Х	Х	Х	ı	*
6B *	6X6	300	*	*	6	1	-	X	Х	Х	ı	*
8A *	6X40	0	*	*	8	-	-	Х	-	Х		*

* Microwave Detection

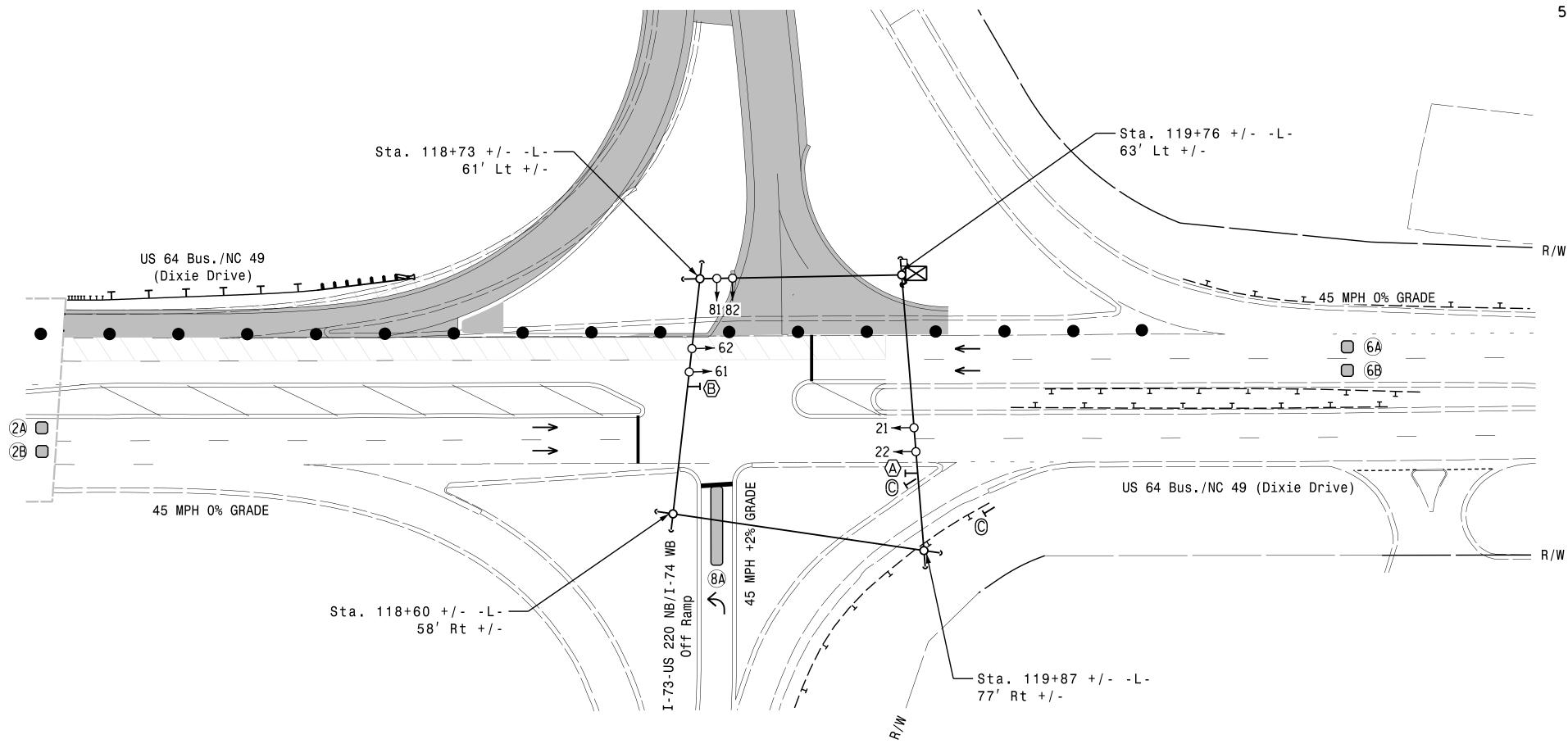
2 Phase Fully Actuated (Isolated)

PROJECT REFERENCE NO.

U-5813

<u>NOTES</u>

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Set all detector units to presence mode.
- 4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- 5. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.



LEGEND EXISTING PROPOSED Traffic Signal Head Modified Signal Head N/A 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 _______ Right of Way ____ \longrightarrow Directional Arrow Construction Zone N/A Guardrail 1 1 Microwave Detection Zone Curb Ramp Construction Zone Drums Wedge/Widen

New Installation -Temporary Design 1 (Construction Phase IIA)

DOCUMENT NOT CONSIDERED FINAL



US 64 Bus./NC 49 (Dixie Drive) I-73-US 220 NB/I-74 WB Ramps

Division 8 Randolph County August 2021 REVIEWED BY: A.D. Klinksiek PLAN DATE: 750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

INIT. DATE <u>Natasha R Simmons</u> 5/21/202 SIGNATURE DATE SIG. INVENTORY NO. 08-0501T

HNTB NORTH CAROLINA, P.C.
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Raleigh, North Carolina 27609
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(919) 546-8997

* 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.

No Right Turn Sign (R3-1)

B No U-Turn/No Left Turn Sign (R3-18) B"YIELD" SIGN (R1-2)

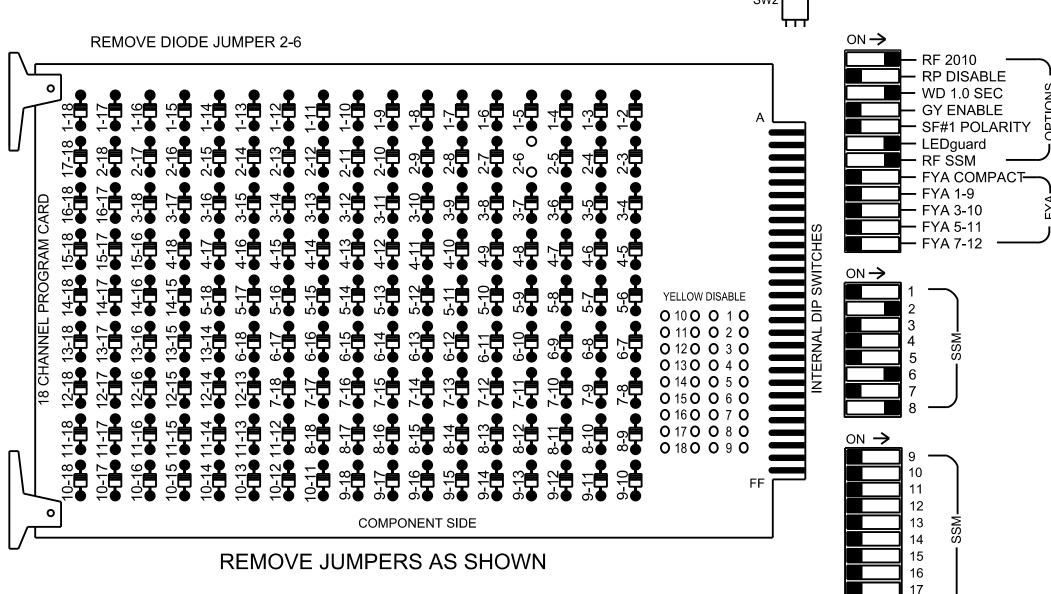
UNLESS ALL SIGNATURES COMPLETED

RATH CAROL 031464 MCINEER.

 \bigcirc

18 CHANNEL IP CONFLICT MONITOR ON OFF PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



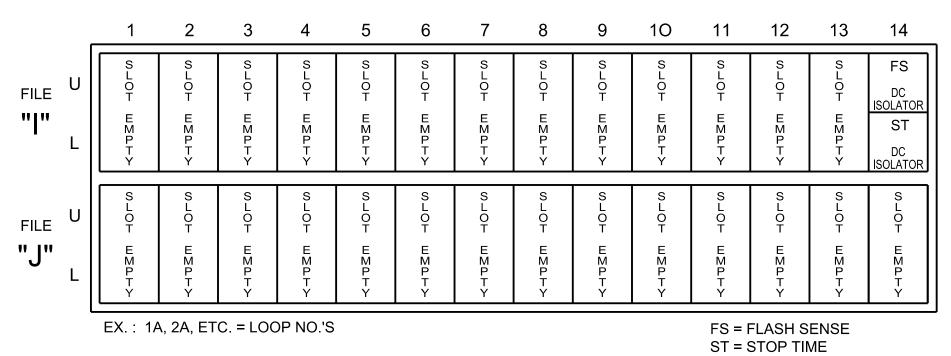
Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.

- 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- 3. Ensure that the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

INPUT FILE POSITION LAYOUT

= DENOTES POSITION OF SWITCH

(front view)



SPECIAL DETECTOR NOTE

Install a multizone 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.

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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	.Q-Free MAXTIME
Cabinet Mount	.Base
Output File Positions	.18 With Aux. Output File
Load Switches Used	S2,S8,S11
Phases Used	2,6,8
Overlap "1"	NOT USED
Overlap "2"	NOT USED
Overlap "3"	NOT USED
Overlap "4"	NOT USED

PROJECT REFERENCE NO. Sig. 23.1

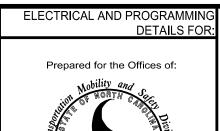
SIGNAL HEAD HOOK-UP CHART																		
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128						134										
YELLOW		129						135										
GREEN																		
RED ARROW											107							
YELLOW ARROW											108							
FLASHING YELLOW ARROW																		
GREEN ARROW		130						136			109							
•																		
ķ																		

NU = Not Used

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0501T1 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

New Installation Temporary Design 1 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB/ NC 49 SB Ramps

Randolph County REVIEWED BY: August 2021

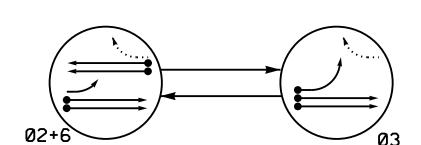
031464 Ashebor A.D. Klinksiek REVIEWED BY: N.R. Simmons N.K. Vlanich REVISIONS

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

TH CAROL

PROJECT REFERENCE NO. U-5813

DEFAULT PHASING DIAGRAM



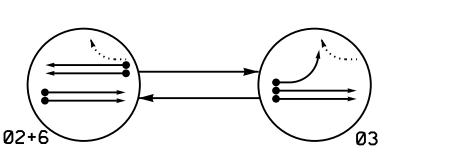
PHASING DIAGRAM DETECTION LEGEND

DETECTED MOVEMENT UNDETECTED MOVEMENT (OVERLAP)

UNSIGNALIZED MOVEMENT

PEDESTRIAN MOVEMENT

ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

DEFAULT I				ALTERNATI TABLE OF			
	Р	HAS	E		Р	HAS	E
SIGNAL FACE	Ø 2 + 6	Ø 3	エーロのエ	SIGNAL FACE	Ø 2 + 6	03	FLGOI
21,22	†	†	Υ	21,22	1	1	Υ
51	╙ॄ≻	<u> </u>	- Y	51	₹R	-	₹
61,62	1	R	Υ	61,62	†	R	Υ

	MAX.	TIME D	ETECT	OR	INS	TALL	NOITA	С	HAI	RT		
	DETI	ECTOR				PF	ROGRAN	ΙMΙ	NG			
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A*	6X6	300	*	*	2	-	-	Х	X	Х	-	*
2B *	6X6	300	*	*	2	ı	-	Х	X	Х	-	*
3A *	6X40	0	*	*	3	₩ 15	-	Х	-	Х	-	*
6A*	6X6	300	*	*	6	-	-	Х	Х	Х	-	*
6B*	6X6	300	*	*	6	-	-	Х	Х	Х	-	*
* Micro	vave D	etectio	n .									

* Microwave Detection

** Disable Delay During Alternate Phasing Operation.

2 Phase Fully Actuated (Isolated)

<u>NOTES</u>

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Remove existing signal heads numbered 81 and 82.
- 4. Set all detector units to presence mode.
- 5. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- 6. The Division Traffic Engineer will determine the hours of use for each phasing plan.

<u>LEGEND</u>

Traffic Signal Head

Modified Signal Head

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

Right of Way

Directional Arrow Directional Drill

Guardrail

Microwave Detection Zone

Construction Zone

Curb Ramp Wedge/Widen

(Lane Closure Required)

No Right Turn Sign (R3-1)

⊗ No U-Turn/No Left Turn Sign (R3-18)
⊗

<u>EXISTING</u>

 \longrightarrow

N/A

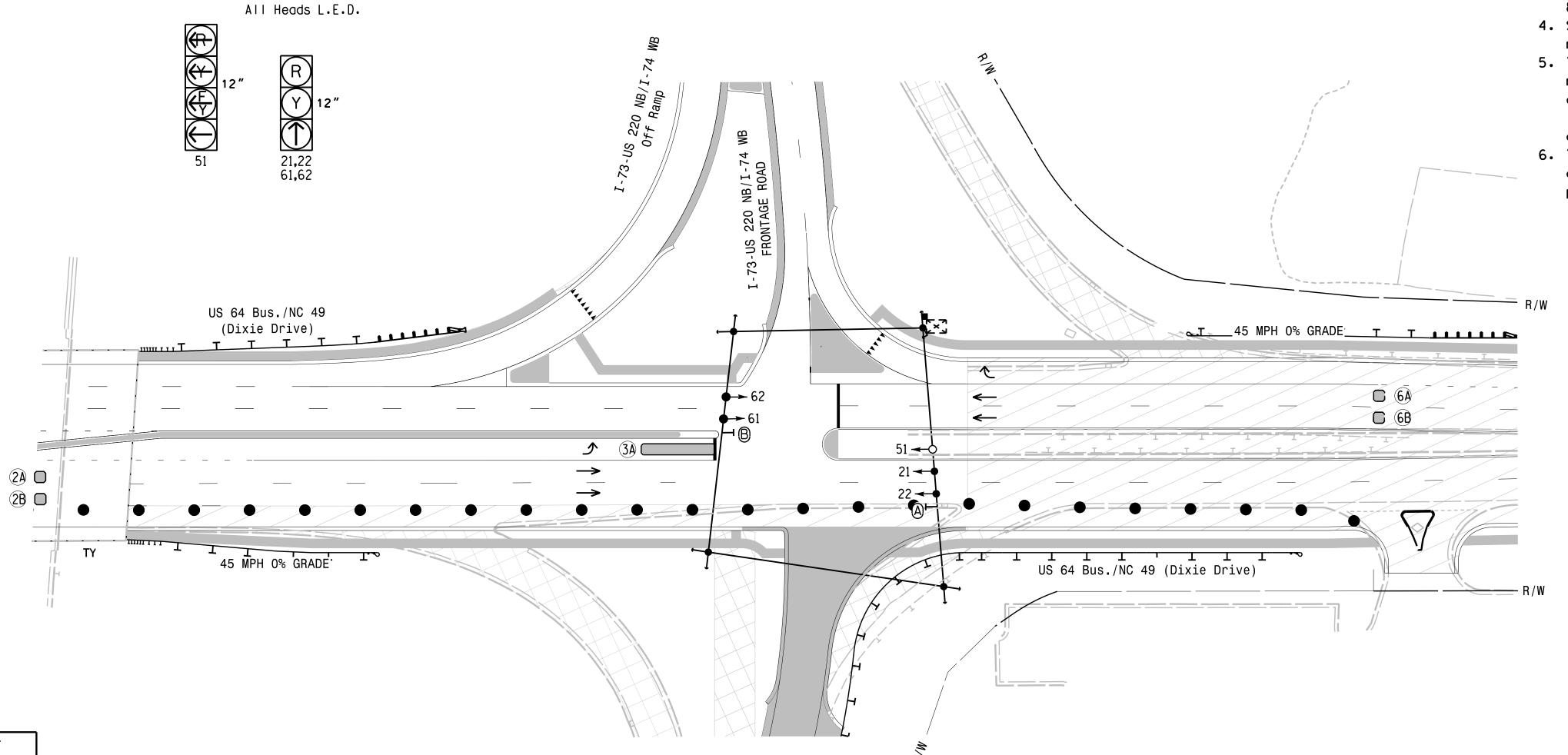
N/A

 \triangle

TH CAROL

031464

MCINEER.



MAXTIN	ME TIMI	NG CHA	ART
FEATURE		PHASE	
FEATURE	2	3	6
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	12	7	12
Passage *	6.0	2.0	6.0
Max 1 *	90	20	90
Yellow Change	4.5	3.0	4.5
Red Clear	1.0	1.8	1.0
Added Initial *	1.5	-	1.5
Maximum Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	30	-	30
Minimum Gap	3.0	-	3.0
Advance Wa l k	-	-	-
Non Lock Detector	-	Х	-
Vehicle Recall	MIN RECALL	-	MIN RECALL

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

Signal Upgrade -Temporary Design 2 (Construction Phase III)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



I-73-US 220 NB/I-74 WB Ramps

US 64 Bus./NC 49 (Dixie Drive)

PROPOSED

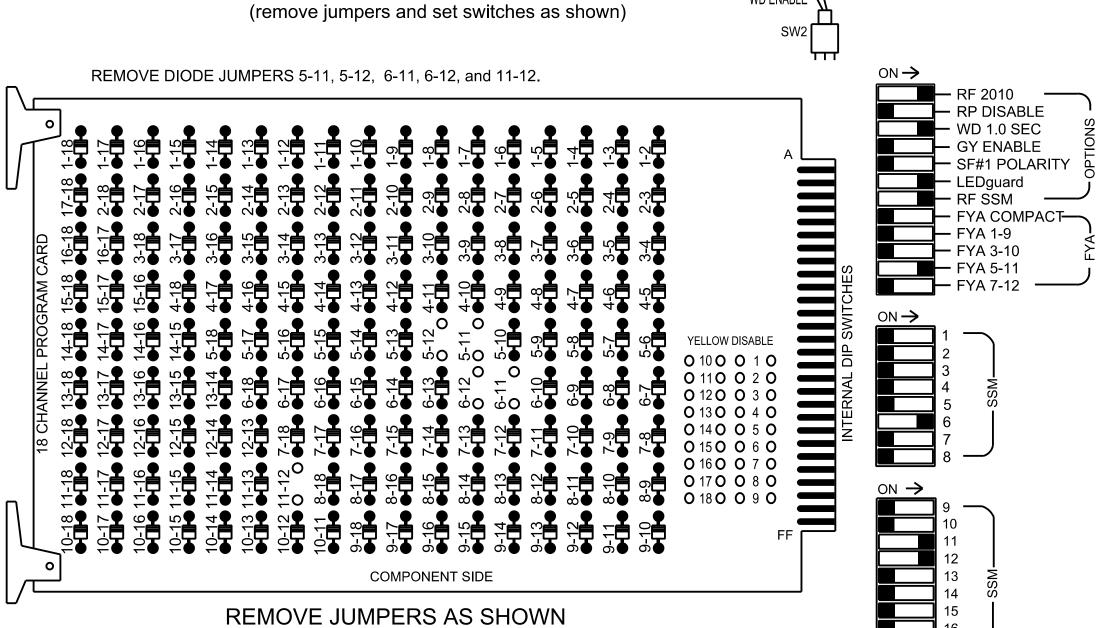
N/A

N/A

Division 8 Randolph County August 2021 REVIEWED BY: A.D. Klinksiek

750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons INIT. DATE SIG. INVENTORY NO. 08-0501T2

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL



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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

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

INPUT FILE POSITION LAYOUT

■ = DENOTES POSITION OF SWITCH

FS = FLASH SENSE ST = STOP TIME

(front view) 10 ST

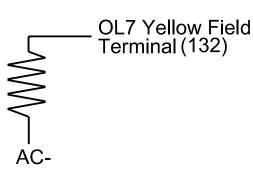
SPECIAL DETECTOR NOTE

Install a multizone 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.

(install resistor as shown)

LOAD RESISTOR INSTALLATION DETAIL

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



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 phases 2 Green No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

EQUIPMENT INFORMATION

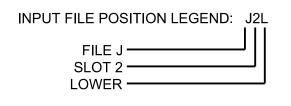
Controller	2070LX
Cabinet	332 w/ Aux
Software	Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	18 With Aux. Output File
Load Switches Used	S7,S8,AUX S4,AUX S5
Phases Used	2,3,6
Overlap "1"	Not Used
Overlap "2"	Not Used
Overlap "3"	*
Overlap "4"	*
Overlap "5"	Not Used
Overlap "6"	Not Used
Overlap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

*See overlap programming detail on sheet 2

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
3A	TB4-5,6	I5U	58	20	7★	3	15		Х		Х	

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



PROJECT REFERENCE NO.

				SIC	3N/	۲L ۲	ΙEΑ	DΗ	00	K-U	IP C	HA	RT					
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	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	NC	NU	NC	NU	NU	★ 51	61,62	NU	NU	NU	NU	NU	NU	NU	★ 51	21,22	NU
RED								134									A101	
YELLOW							*	135									A102	
GREEN																	A103	
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133	136										
*																		
×																		

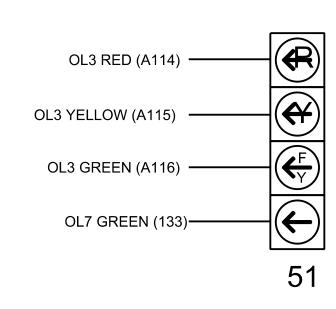
NC = Not Connected

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0501T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 **REVISED:**

Signal Upgrade Temporary Signal 2 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMM **DETAILS FOR** Prepared for the Offices of:

US 64 Bus./NC 49 (Dixie Drive) I-73-US 220 NB/I-74 WB Ramps

Randolph County REVIEWED BY: August 2021 A.D. Klinksiek

Ashebor N.K. Vlanich REVIEWED BY: N.R. Simmons REVISIONS

TH CAROL 031464

U-5813 Sig. 24.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4	7
Туре	-	-	FYA 4 - Section	NORMAL	NORMAL
Included Phases	-	1	-	2,3	3
Modifier Phases	-	•	-	•	-
Modifier Overlaps	ı	ı	7	ı	-
Trail Green	0	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0	0.0

NOTICE REMOVED INCLUDED

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 3A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

34

Detector	Call Phase	Delay
7	3	0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4	7
Type	1	ı	FYA 4 - Section	NORMAL	NORMAL
Included Phases	-	Ī	6	2,3	3
Modifier Phases	-	-	-	-	-
Modifier Overlaps	1	ı	7	1	-
Trail Green	0	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0	0.0

MAXTIME OUTPUT CHANNEL CONFIGURATION

Front Panel

Main Menu >Controller >More>Channels>Channels Config

Web Interface

Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

NOTICE OVERLAP 7
ASSIGNED TO
CHANNEL 5

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		Х	Χ	1
2	Phase Vehicle	2	Х			2
3	Phase Vehicle	3		Х	Х	3
4	Phase Vehicle	4		Х		4
5	Overlap	7		Х		5
6	Phase Vehicle	6	Х		Х	6
7	Phase Vehicle	7		Х		7
8	Phase Vehicle	8		Х	Χ	8
9	Overlap	1	Х		Х	9
10	Overlap	2		Х	Χ	10
11	Overlap	3	Х			11
12	Overlap	4		Х		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		Х	Х	17
18	Overlap	6		Х		18

Signal Upgrade Temporary Signal 2

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB Ramps

sion 8 Randolph County Ashebor

DATE: August 2021 REVIEWED BY: A.D. Klinksiek

ARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

REVISIONS INIT. DATE

DocuSigned by:

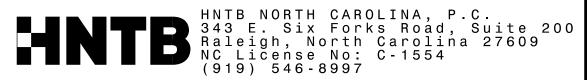
Matasha R Simmons
SIGNATURE
PODAGOUFSALU449A...
SIG. INVENTORY NO. 08-0501T2

TH CAROL

031464

ACINEER.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0501T2
DESIGNED: AUGUST 2021
SEALED: 05/21/2024
REVISED:



ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 24.3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 51 to run protected turns only.

VEH DET PLAN 2: Reduce delay time for phase 3 call on loop 3A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

attern arameters							
Pattern	Veh Det Plan	Overlap Plan					
*	2	2					

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

1. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.

2. ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.

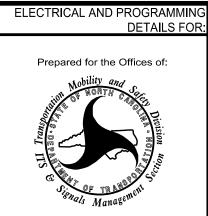
3. REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0503T2 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Signal 2 Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus./NC 49 (Dixie Drive) I-73-US 220 NB/I-74 WB Ramps

Randolph County August 2021 REVIEWED BY: A.D. Klinksiek N.R. Simmons

TH CAROL

031464

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

REVIEWED BY: N.K. Vlanich

DEFAULT PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

UNSIGNALIZED MOVEMENT

PEDESTRIAN MOVEMENT

DETECTED MOVEMENT

PROJECT REFERENCE NO. U-5813

3 Phase Fully Actuated

<u>NOTES</u>

(Isolated)

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.

PROPOSED

 \bigcirc

N/A

6A

□ 6B

- 4. Renumber existing loop 3A to 5A.
- 5. Renumber existing signal head 22 to 23.
- 6. Set all detector units to presence
- 7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 8. This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.

LEGEND

Traffic Signal Head

Modified Signal Head

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 Right of Way

> Directional Arrow Construction Zone

> Directional Drill

Guardrail Microwave Detection Zone Curb Ramp

No Right Turn Sign (R3-1)

<u>EXISTING</u>

 \longrightarrow

N/A

K×N K×N

N/A

(A)

MAXTIME DETECTOR INSTALLATION CHART													
	DET		PROGRAMMING										
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD	
2A*	6X6	300	*	*	2	ı	-	X	X	X	ı	*	
2B *	6X6	300	*	*	2	ı	ı	X	X	X	ı	*	
2C*	6X6	300	*	*	2	ı	-	X	X	X	ı	*	
5A *	6X40	0	*	*	5	*** 15	-	X	-	X	ı	*	
DA 本	6,40	U	不	本	* 2	3	-	X	-	Χ	X	*	
6A *	6X6	300	*	*	6	-	-	Χ	Χ	Х	-	*	
6B*	6X6	300	*	*	6	-	-	Χ	Χ	Χ	•	*	
8A *	6X40	0	*	*	8	-	-	X	-	Х	-	*	
8B*	6X40	0	*	*	8	-	-	Χ	-	Х	-	*	

* Microwave Detection

** Reduce Delay to 3 seconds for loop during Alternate Phasing operation.

* Disable phase call during Alternate Phasing operation.

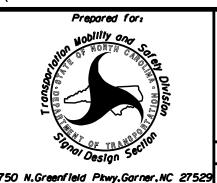
UNDETECTED MOVEMENT (OVERLAP)

51 R Y 12" R Y 12" G 21,22 81,82 US 64 Bus./NC 49 45 MPH 0% GRADE (Dixie Drive) **→** 5A ==== 51 → 45 MPH 0% GRADE US 64 Bus /NC 49 (Dixie Drive)

Signal Upgrade -	
Temporary Signal 3	
(Construction Phase	IIIA)

⊗ No U-Turn/No Left Turn Sign (R3-18) ⊗ Right Arrow "ONLY" Sign (R3-5R) No Left Turn Sign (R3-2) Combined Through and Right Arrow Sign (R3-6R) "NO TURN ON RED" Sign (R10-11a) (F)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



1"=40'

1 - /3	-US 220 NB	/1-/4	MR	катрѕ
Division	8 Randolp	n County		Asheboro
PLAN DATE:	August 2021	REVIEWED BY:	A.D.	Klinksiek
PREPARED BY:	N.K. Vlanich	REVIEWED BY:	N.R	Simmons

REVISIONS

COUNTER INIT. DATE SIG. INVENTORY NO. 08-0501T3

TH CAROL

031464

Dual Entry	-	-	-	-
* These values may be fiel	d adjusted. Do	not adjust Min C	Green and Exten	sion times for

MAXTIME TIMING CHART

12

6.0

90

4.5 1.3

1.0

34

15

3.0

FEATURE

Ped Clear * Min Green

Passage *

Red Clear

Yellow Change

Added Initial *

Maximum Initial *

Time To Reduce

Advance Wa**l**k

Time Before Reduction

PHASE

2.0

20

3.0

1.8

5 6

12

6.0

90

4.5

1.3

1.5

34

15

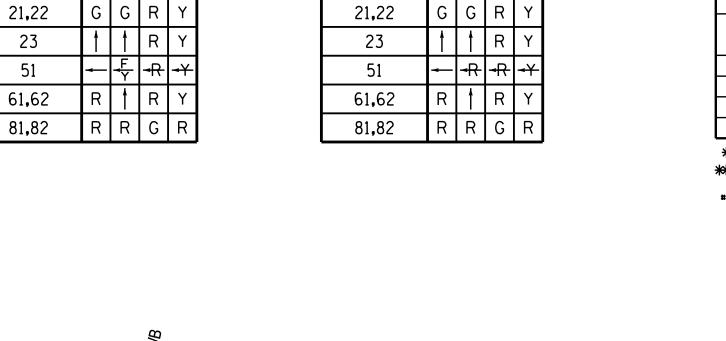
30

3.0

2.0

30

4.3



SIGNAL

ALTERNATE PHASING

TABLE OF OPERATION

PHASE

SIGNAL FACE I.D. All Heads L.E.D.

ALTERNATE PHASING DIAGRAM

DEFAULT PHASING

TABLE OF OPERATION

FACE

PHASE

US 64 Bus./NC 49 (Dixie Drive)

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. Return controller to Factory Defaults before programming per this electrical detail.

- 3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- 4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.

EQUIPMENT INFORMATION

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

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO.

	SIGNAL HEAD HOOK-UP CHART																		
LOAD SWITCH NO.	S1	S	2	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	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	23	NU	NU	NU	NU	★ 51	61,62	NU	NU	81,82	NU	NU	NU	NU	★ 51	NU	NU
RED		128	128						134			107							
YELLOW		129	129					*	135			108							
GREEN		130										109							
RED ARROW																	A114		
YELLOW ARROW																	A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW			130					133	136										
₩																			
×																			

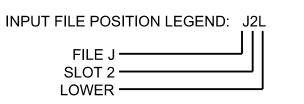
NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

INPUT FILE CONNECTION & PROGRAMMING CHART

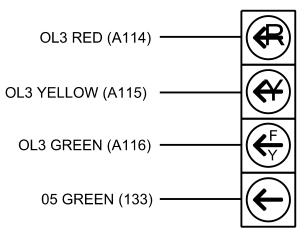
LOOP NO	LOOP TERMINAL	INPUT FILE POS.	PIN NO.		DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
5A	TB3-1,2	J1U	55	17	15 ★	5	15		Х		Х	
J JA	163-1,2	310	33	-	31★	2			Х		Х	

★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0501T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 **REVISED:**

Signal Upgrade Temporary Signal 3 Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMM **DETAILS FOR** Prepared for the Offices of:

August 2021

I-73-US 220 NB/I-74 WB Ramps

US 64 Bus./NC 49 (Dixie Drive)

Randolph County Ashebor REVIEWED BY: A.D. Klinksiek N.K. Vlanich REVIEWED BY: N.R. Simmons REVISIONS INIT.

TH CAROL 031464 FACINEER

SPECIAL DETECTOR NOTE

INPUT FILE POSITION LAYOUT

(front view)

Install a multizone 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.

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)

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

AC-

18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

COMPONENT SIDE

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 the Red Enable is active at all times during normal operation.

REMOVE JUMPERS AS SHOWN

4. Integrate monitor with Ethernet network in cabinet.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 5-11, and 6-11.

ON OFF

RF 2010 - RP DISABLE

- GY ENABLE

LEDguard

FYA 3-10

= DENOTES POSITION OF SWITCH

ISOLATOR

ST

RF SSM

FYA 5-11 FYA 7-12

SF#1 POLARITY

FYA COMPACT— **—** FYA 1-9

WD ENABLE 🕥

Phase 5 Yellow Field Terminal (132)

10

11 12 13

FS = FLASH SENSE ST = STOP TIME

PROJECT REFERENCE NO.

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

5A

Detector	Call Phase	Delay
15	5	3
31	0	3

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type			FYA 4 - Section	-
Included Phases	1	1	6	-
Modifier Phases	-	1	5	-
Modifier Overlaps			=	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

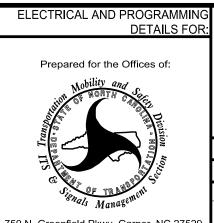
Overlap Plan 2

Overlap	1	2	3	4	
Туре	-	-	FYA 4 - Section	-	
Included Phases	-	-	-	-	+
Modifier Phases	1	-	5	-	
Modifier Overlaps	•	-	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0501T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Signal 3 Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



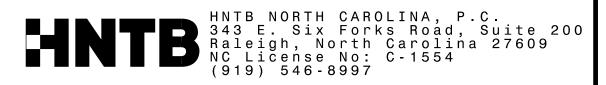
US 64 Bus./NC 49 (Dixie Drive) I-73-US 220 NB/I-74 WB Ramps

Randolph County REVIEWED BY: August 2021

Ashebor A.D. Klinksiek N.K. Vlanich REVIEWED BY: N.R. Simmons REVISIONS

TH CAROL

031464



ROJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 25.3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 51 to

run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 5A

and reduces delay time for phase 5 call on loop 5A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

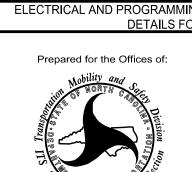
<u>ralleni raia</u>	11166619	
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0503T3 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade Temporary Signal 3 Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



US 64 Bus./NC 49 (Dixie Drive) I-73-US 220 NB/I-74 WB Ramps

August 2021 REVIEWED BY: A.D. Klinksiek REVIEWED BY: N.R. Simmons N.K. Vlanich

031464

H CAROL

PROJECT REFERENCE NO. U-5813

3 Phase Fully Actuated Signal System #D08-29_Asheboro US 64 Bus-NC 49 (Asheboro)

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 3. Phase 5 may be lagged.

PROPOSED

 \bigcirc

 \boxtimes

N/A

N/A

- 4. Set all detector units to presence mode.
- 5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- 6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- 7. The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.

LEGEND

Traffic Signal Head

Modified Signal Head

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

Right of Way

Directional Arrow

Directional Drill

Guardrail

Metal Strain Pole

Type || Signal Pedestal

Curb Ramp

No Right Turn Sign (R3-1)

⊗ No U-Turn/No Left Turn Sign (R3-18)
⊗

Right Arrow "ONLY" Sign (R3-5R)

No Left Turn Sign (R3-2)

Combined Through and Right Arrow Sign (R3-6R)

"NO TURN ON RED" Sign (R10-11a)

Pedestrian Crossing Sign (W11-2)

Left Diagonal Arrow Plaque (W16-7pL)

Right Diagonal Arrow Plaque (W16-7pR)

DOCUMENT NOT CONSIDERED FINAL

EXISTING

N/A

K×3

_ - - - - - - - - - - -

N/A

 \triangle

0

MAXTIME DETECTOR INSTALLATION CHART DETECTOR PROGRAMMING 2A 6X6 300 6 X 2 6X6 300 6 X 2 2C 6X6 300 6X40 0 6A 6X6 300 4 X 6 6x6 300 4 X 6 6X40 0 2-4-2 X 8 8B 6X40 0 2-4-2 X 8 -

*Reduce Delay to 3 seconds for loop during Alternate Phasing operation.

45 MPH 0% GRADE T

SIDEWALK

SIDEWALK

* Disable phase call during Alternate Phasing operation.

SIGNAL FACE I.D. All Heads L.E.D.

ALTERNATE PHASING DIAGRAM

51 P 12" 21,22 81,82

P21,P22 P61,P62 P81,P82

US 64 Bus./NC 49

SIDEWALK

(Dixie Drive)

T T T T

SIDEWALK

58' Lt +,

Sta. 118+67 +/- -L-

Metal Pole #1— Std. Case S30L1

DEFAULT PHASING

TABLE OF OPERATION

FACE

21,22

61,62

81,82

P21,P22

P61,P62

P81**,**P82

PHASE

→ (5A)

Metal Pole #4 —

65' Rt +/-

Std. Case S30L1

Sta. 118+83 +/- -L-

— Metal Pole #2 Std. Case S30L1

ALTERNATE PHASING

TABLE OF OPERATION

SIGNAL

61,62

P21**,**P22

P61**,**P62

P81**,**P82

PHASE

–|-R|-R|-Y

RRGR

DW W DW DRK

DW DW W DRK

Sta. 119+72 +/- -L-65' Lt +/-

US 64 Bus /NC 49 (Dixie Drive)

-Metal Pole #3 Std. Case S30L1

Sta. 119+85 +/- -L-

69' Rt +/-

UNLESS ALL SIGNATURES COMPLETED US 64 Bus /NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB/

Division 8 PLAN DATE:

NC 49 SB Ramps Randolph County August 2021 REVIEWED BY: A.D. Klinksiek 750 N.Greenfield Pkwy.Garner.NC 27529 PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

REVISIONS

Signal Upgrade - Final Design

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554
(919) 546-8997

INIT. DATE 1"=40'

031464 * CONEER <u>Natasha R Simmons</u> 5/21/202 SIGNATURE DATE SIG. INVENTORY NO. 08-0501

TH CAROL

DEFAULT PHASING DIAGRAM

DETECTED MOVEMENT UNDETECTED MOVEMENT (OVERLAP) UNSIGNALIZED MOVEMENT

PHASING DIAGRAM DETECTION LEGEND

PEDESTRIAN MOVEMENT

MAXTIME TIMING CHART PHASE FEATURE 5 6 Ped Clear * 11 7 Min Green 12 6.0 2.0 Passage *

> Non Lock Detector Х MIN RECALL MIN RECALL Vehicle Recall Dual Entry

90

4.5 1.3

1.0

34

15

3.0

20

3.0

2.1

4

12

6.0

90

4.5

1.3

1.5

34

15

30

3.0

18

2.0

30

4.3

1.8

than 4 seconds

* 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

Max 1 *

Red Clear Added Initial *

Yellow Change

Maximum Initial *

Time To Reduce

Minimum Gap

Advance Wa**l**k

Time Before Reduction

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 6-15, 8-16, 11-13, 11-15, and 13-15.

REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-13, 2-15, 5-11, 5-13, 6-15, 6-

WD ENABLE Ω

= DENOTES POSITION OF SWITCH

Ø2PEDØ6PED FS

NOT USED

FS = FLASH SENSE ST = STOP TIME

DC DC DC ISOLATOR ISOLATOR

REMOVE JUMPERS AS SHOWN

NOTES

FILE

FILE

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 the Red Enable is active at all times during normal operation.
- 4. Integrate monitor with Ethernet network in cabinet.

2C

NOT USED

2A

Ø 2

2B

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

NOT USED

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 No Walk and 6 Green No Walk.
- 3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors used at this location.
- 4. The cabinet and controller are part of Signal System #D08-29_Asheboro, US 64 Bus-NC 49 (Asheboro).

EQUIPMENT INFORMATION

Controller	2070LX
Cabinet	332 w/ Aux
Software	.Q-Free MAXTIME
Cabinet Mount	Base
Output File Positions	.18 With Aux. Output File
Load Switches Used	S2,S3,S7,S8,S9,S11,S12,AUX S4

Overlap "3".....*

Overlap "4"......Not Used

*See overlap programming detail on sheet 2

PROJECT REFERENCE NO. SHEET NO. II-5813 Sig 26.1

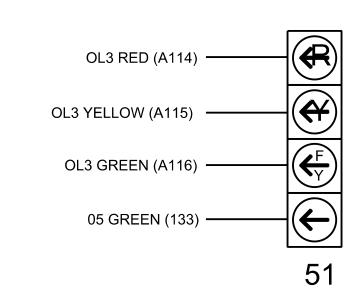
					SIC	GNA	\L F	łΕΑ	DΗ	00	K-U	IP C	HA	RT					
LOAD SWITCH NO.	S1	S	2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	<u>)</u>	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE		OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	23	P21, P22	NU	NU	NU	★ 51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	★ 51	NU	NU
RED		128	128						134			107							
YELLOW		129	129					*	135			108							
GREEN		130										109							
RED ARROW																	A114		
YELLOW ARROW																	A115		
FLASH I NG YELLOW ARROW																	A116		
GREEN ARROW			130					133	136										
₩				113						119			110						
*				115						121			112						

NU = Not Used

- ★ Denotes install load resistor. See load resistor installation detail this sheet.
- ★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

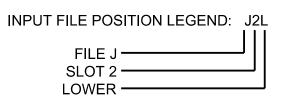
(wire signal heads as shown)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			Х	Х	Х	
2B	TB2-7,8	I2L	43	5	3	2			Х	Х	Х	
2C	TB2-9,10	I3U	63	29	4	2			Х	Х	Х	
ΕΛ	TD2 4 2	1411	55	17	15 ★	5	15		Х		Х	
5A	TB3-1,2	J1U	55	-	31 ★	2	3		Х		Х	Х
6A	TB3-5,6	J2U	40	2	16	6			Х	Χ	Х	
6B	TB3-7,8	J2L	44	6	17	6			Х	Х	Х	
8A	TB5-9,10	J6U	42	4	22	8			Х		Х	
8B	TB5-11,12	J6L	46	8	23	8			Х		Х	
PED PUSH BUTTONS							NOTE:					
P21,P22	TB8-4,6	I12U	67	33	2	PED 2	I INSTALL DC ISOLATORS					
P61,P62	TB8-7,9	I13U	68	34	6	PED 6	IN INPUT FILE SLOTS I12 AND I13.					
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

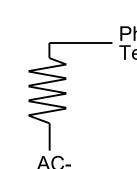
★ For the detectors to work as shown on the signal design plan, see the Detector Programming Detail for Alternate Phasing on Sheet 2.



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)



___ Phase 5 Yellow Field Terminal (132)

INPUT FILE POSITION LAYOUT

(front view)

1 2 3 4 5 6 7 8 9 10 11 12 13

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.

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
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(919) 546-8997

Signal Upgrade - Final Design

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

64 Bus /NC 49 (Divio Drivo)

SEAL

REVISED:

THIS ELECTRICAL DETAIL IS FOR

THE SIGNAL DESIGN: 08-0501

DESIGNED: AUGUST 2021

SEALED: 05/21/2024



US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB/ NC 49 SB Ramps

ion 8 Randolph County Asheboro
ATE: August 2021 REVIEWED BY: A.D. Klinksiek
RED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

SEAL
O31464

SEAL
O31464

DocuSigned by:

Matanha & Simmons 5/21/2024

 Docustified by:

 Matasha R Simmons
 5/21/2024

 SIGNATURE
 DATE

 FODARDUS ADUPATURE
 08-0501

U-5813 Sig. 26.2

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

Front Panel

Main Menu >Controller >Detector >Veh Det Plans

Web Interface

Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

5A

Detector	Call Phase	Delay
15	5	3
31	0	3

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	-	ı	FYA 4 - Section	ı
Included Phases	-	1	6	1
Modifier Phases	=		5	ı
Modifier Overlaps	-	1	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel

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

Web Interface

Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	3	4	
Туре	-	-	FYA 4 - Section	-	
Included Phases	1	ı	-	-	
Modifier Phases	1	-	5	-	
Modifier Overlaps	1	1	-	-	
Trail Green	0	0	0	0	
Trail Yellow	0.0	0.0	0.0	0.0	
Trail Red	0.0	0.0	0.0	0.0	
Trail Yellow			0 0.0 0.0		

NOTICE REMOVED INCLUDED
PHASE FOR OL3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0501 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for the Offices of:

US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB/ NC 49 SB Ramps

vision 8 Randolph County Ashebor
ANDATE: August 2021 REVIEWED BY: A.D. Klinksiek
EPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

REVISIONS

usigned by:

tasha R Simmons
SIGNATURE

ADDITIONAL DATE

TH CAROL

750 N. Greenfield Pkwy, Garner, NC 27529

OJECT REFERENCE NO.	SHEET NO.
U-5813	Sig. 26.3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN	
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1	
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2	

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases

for head 51 to

run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 5A

and reduces delay time for phase 5 call on loop 5A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel

Main Menu >Controller >Coordination >Patterns

Web Interface

Home >Controller >Coordination >Patterns

Pattern Parameters

allenn ara	HICICIS	
Pattern	Veh Det Plan	Overlap Plan
*	2	2

*The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

> THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 08-0503 DESIGNED: AUGUST 2021 SEALED: 05/21/2024 REVISED:

Signal Upgrade - Final Design Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 64 Bus./NC 49 (Dixie Drive) at I-73-US 220 NB/I-74 WB/ NC 49 SB Ramps

Randolph County Ashebor REVIEWED BY: A.D. Klinksiek August 2021 REVIEWED BY: N.R. Simmons N.K. Vlanich

TH CAROL

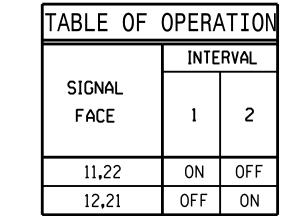
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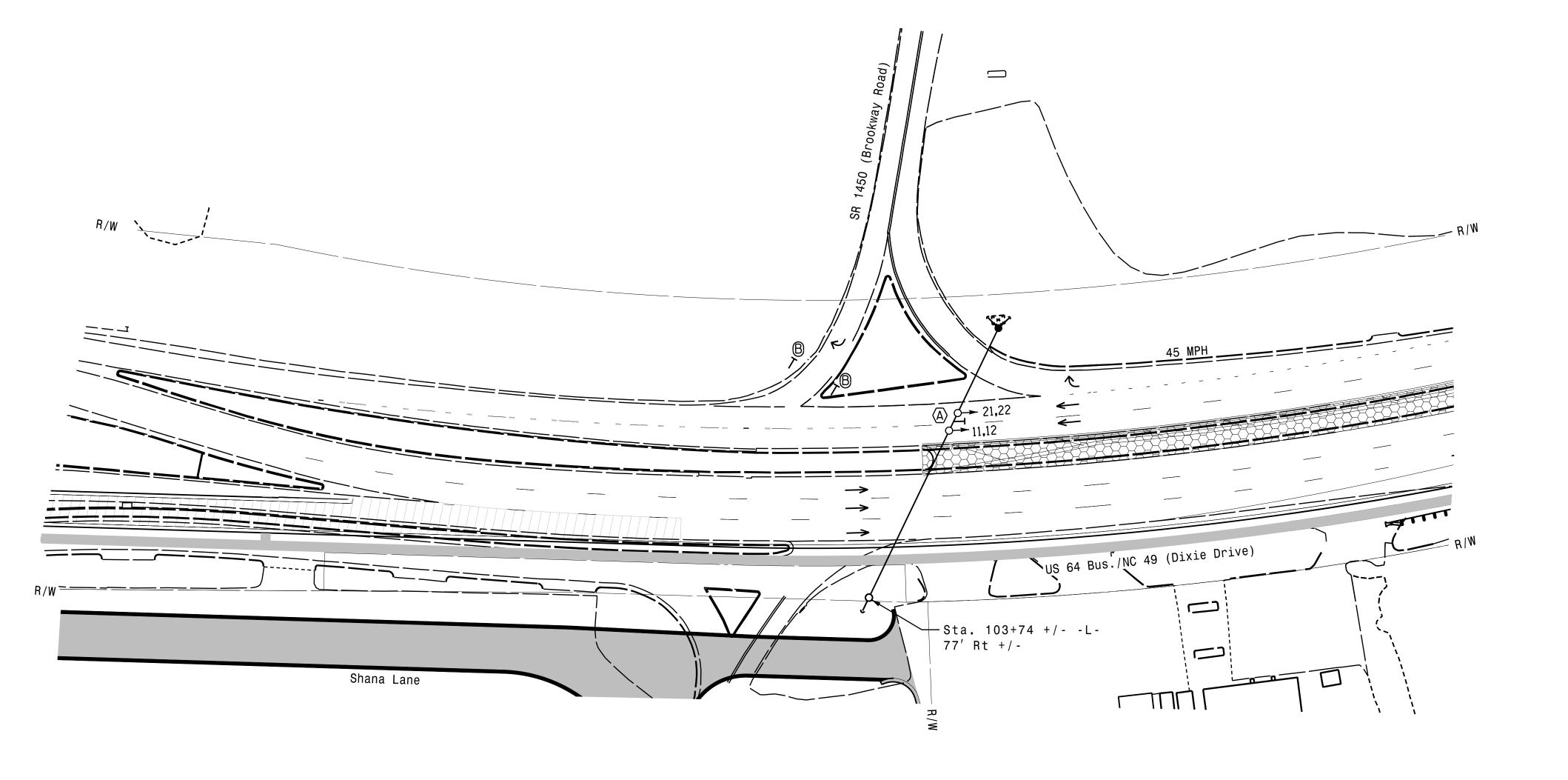
U-5813 Sig. 27.0

2 Circuit Flasher (Isolated)

<u>NOTES</u>

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- 2. All beacons shall flash continuously.





SIGNAL FACE I.D.

All Heads L.E.D.

13**-**10"

Sign 🛦

LEGEND PROPOSED <u>EXISTING</u> Traffic Signal Head Sign Pedestrian Signal Head With Push Button & Sign Signal Pole with Guy Signal Pole with Sidewalk Guy Inductive Loop Detector \boxtimes Controller & Cabinet Junction Box 2-in Underground Conduit N/A Right of Way \longrightarrow Directional Arrow Construction Zone N/A N/A Curb Ramp N/A Guardrail 1 1 Construction Zone Drums Temporary Pavement Wedge/Widen (Lane Closure Required) Low Clearance Sign (W12-2) with Warning Beacons

Signal Upgrade -Temporary Design (Construction Phase IIA)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Stop Sign (R1-1)



for SR 1713 Bridge

REVISIONS

Division 8 Randolph County Asheboro

PLAN DATE: August 2021 REVIEWED BY: A.D. Klinksiek

PREPARED BY: N.K. Vlanich REVIEWED BY: N.R. Simmons

Overheight Flasher on US 64 WB

INIT. DATE

Docusigned by:

Matasha R Simmons 5/21/2024

SIGNATURE DATE

FOLIAGODE SADAHAN...

SIG. INVENTORY NO. 08-0345T

ATH CAROL

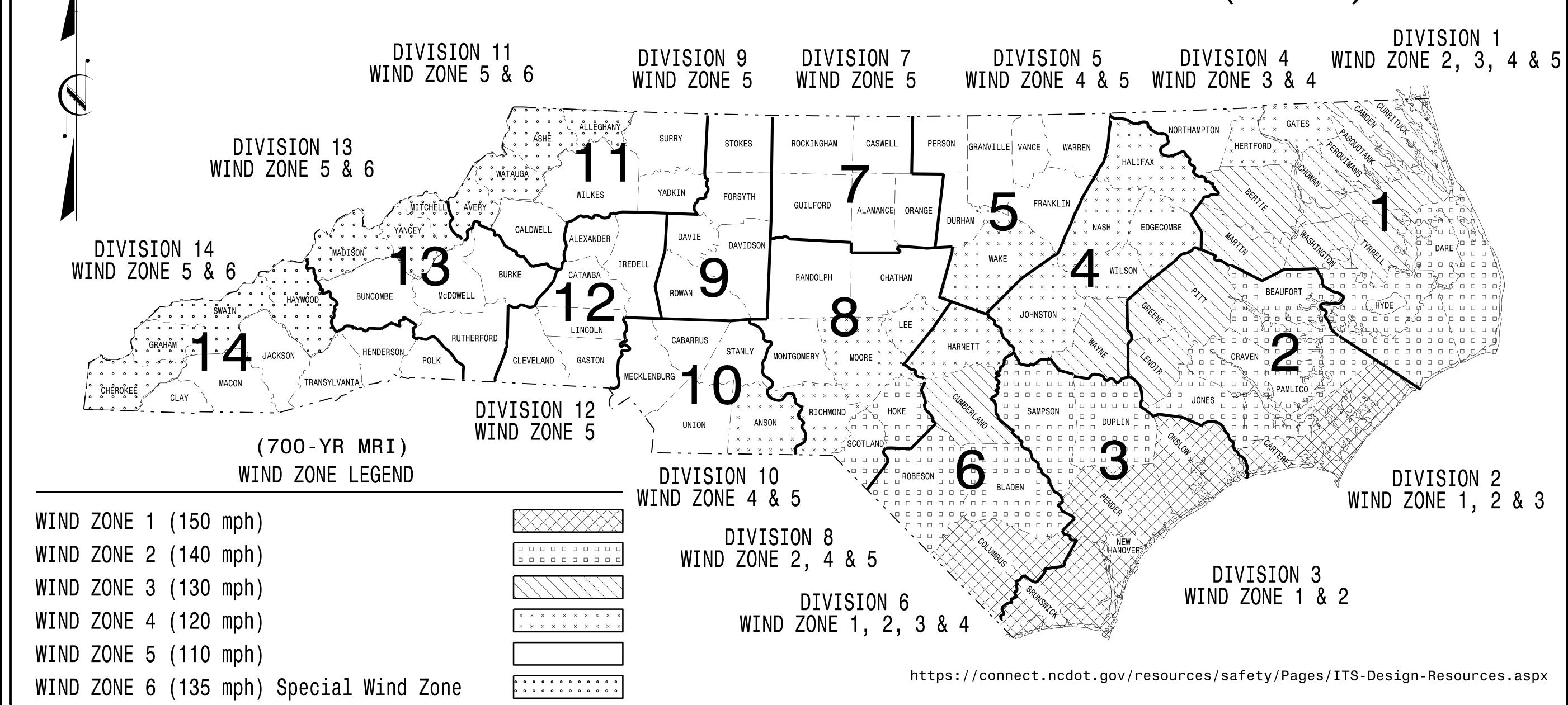
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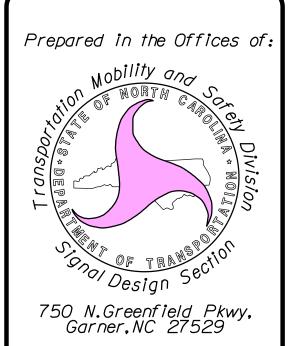
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STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS PROJECT I.D. NO. SHEET NO. SIG.M1A

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)





Designed in conformance
with the latest
2020 Interim to the
1st Edition 2015

AASHTO LRFD

Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

Sig. M 9

DRAWING INDEX OF PLANS NUMBER DESCRIPTION

Sig. M	<i>1A</i>	Statewide Wind Zone Map (700-yr MRI)
Sig. M	1 B	Statewide Wind Zone Map (10-yr MRI)
Sig. M	2	Typical Fabrication Details-All Metal Poles
Sig. M	3	Typical Fabrication Details-Strain Poles
Sig. M	4	Typical Fabrication Details-Mast Arm Poles
Sig. M	5	Typical Fabrication Details-Mast Arm Connection
Sig. M	6	Typical Fabrication Details-Strain Pole Attachments
Sig. M	7	Construction Details-Foundations
Sig. M	8	Standard Strain Pole Foundation-All Soil Conditions

Typical Fabrication Details-CCTV Camera Poles

MOBILITY AND SAFETY DIVISION –
TRANSPORTATION SYSTEMS MANAGEMENT
AND OPERATIONS UNIT

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B. WALKER, P.E. – ITS AND SIGNALS STRUCTURAL ENGINEER

