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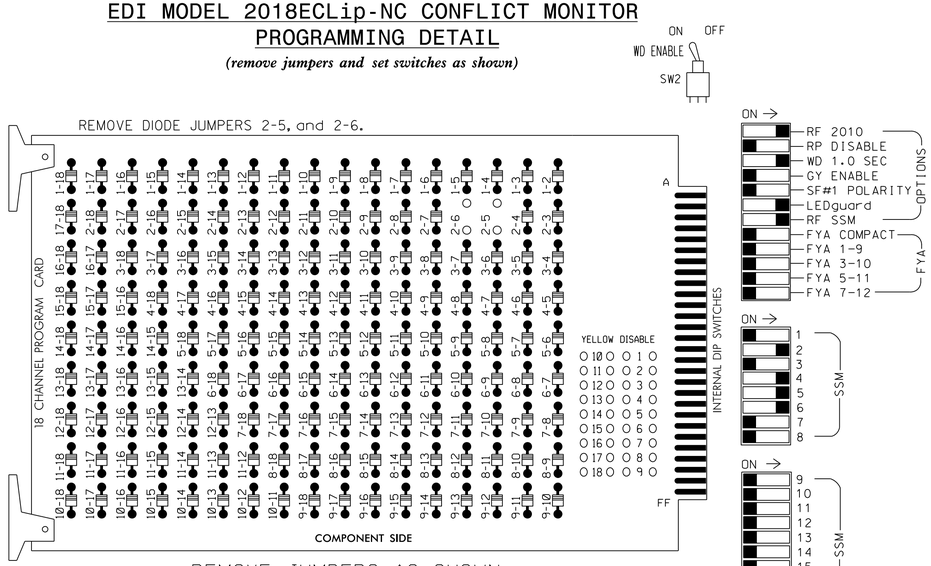
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

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 and 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S7,S8
PHASES USED.....2,4,5,6
OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-64.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW							131					
YELLOW ARROW							132					
GREEN ARROW							133					

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a video 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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0323T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering Branch, Mobility and Safety Division, NCDOT, Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at SR 1007 (All American Freeway) Northbound Ramps
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

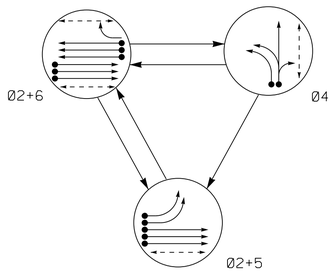
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0323T3

DATE:
User:
I:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0323T3.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-65.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

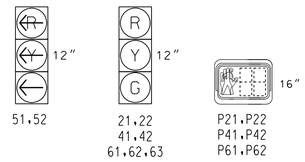
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
21,22	G	G	R	Y
41,42	R	R	G	R
51,52	←	~~R~~	~~R~~	~~R~~
61,62,63	R	G	R	Y
P21,P22	W	W	DW	DRK
P41,P42	DW	DW	W	DRK
P43,P44	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK

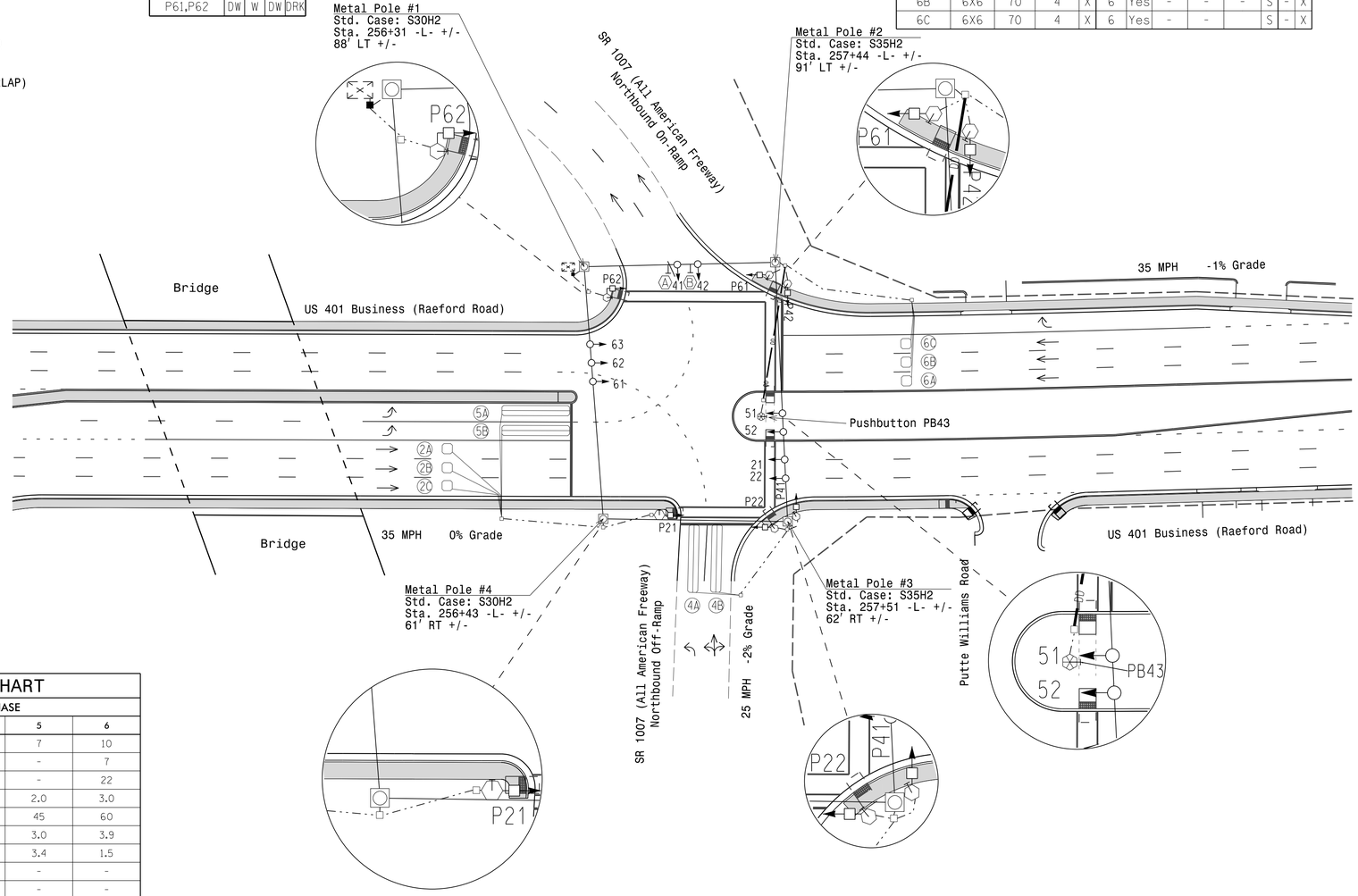
SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	X	2	Yes	-	-	-	S	-	X
2B	6X6	70	4	X	2	Yes	-	-	-	S	-	X
2C	6X6	70	4	X	2	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
6A	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6B	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6C	6X6	70	4	X	6	Yes	-	-		S	-	X



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	10	7	7	10
Walk *	7	7	-	7
Ped Clear	12	34	-	22
Veh. Extension *	3.0	2.0	2.0	3.0
Max 1 *	60	30	45	60
Yellow	3.8	3.3	3.0	3.9
Red Clear	2.3	3.4	3.4	1.5
Red Revert	-	-	-	-
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
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 supersede these values.
8. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	———
→	Directional Arrow	→
DD	Directional Drill	N/A
◎	Metal Strain Pole	◘
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Dual Turn and Through Arrows Sign	Ⓑ

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Business (Raeford Road)
at
SR 1007 (All American Freeway) Northbound Ramps
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	J HAMBRIGHT	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

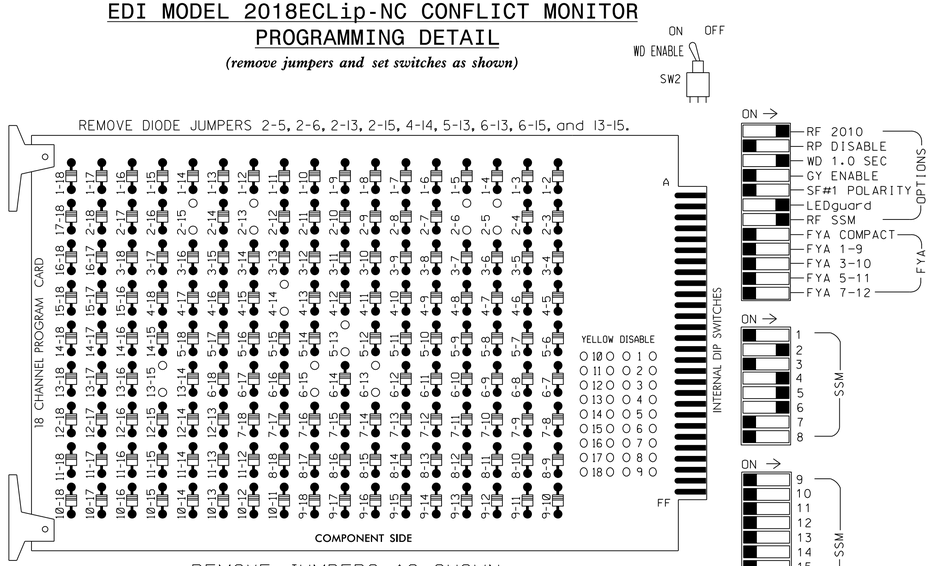
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0323

3/29/2018
10:18:59 AM
User:rmurcey
K:\Traf_Projects\Signals\Design\Signal Designs\Final Signal Designs\U-4405_sig_dsn_06-0323 Final.dgn
User:rmurcey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-65.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

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 and 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S7,S8,S9
PHASES USED.....2,2PED,4,4PED,5,6,6PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	P41, P42	51,52	61,62, 63	P61, P62	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW							131					
YELLOW ARROW							132					
GREEN ARROW							133					
✋			113			104			119			
🚶			115			106			121			

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	Ø2 2A	Ø2 2C	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L		Ø2 2B	NOT USED			Ø4 4B						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	Ø5 5B	Ø6 6B	NOT USED											

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				S
2B	TB2-7,8	I2L	43	12	2	YES				S
2C	TB2-9,10	I3U	63	32	2	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-3,4	J1L	55	5	5	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P41,P42, PB43	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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: 06-0323
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
NC Department of Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at SR 1007 (All American Freeway) Northbound Ramps
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

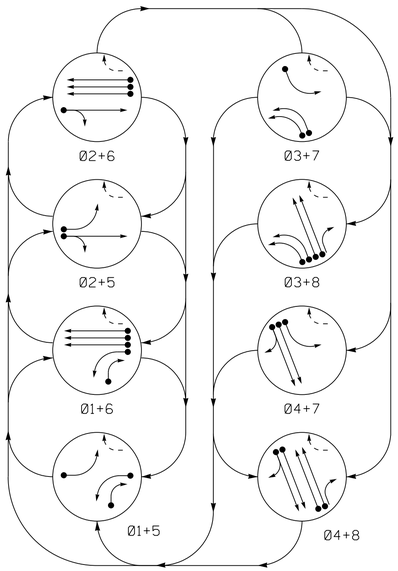
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0323

DATE:
User:rtraffic
I:\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0323.dgn
User:rtrafficuser

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.0

8 Phase Fully Actuated w/ Railroad Preemption Fayetteville Signal System

PHASING DIAGRAM



RAIL PREEMPT PHASES

(High Priority)

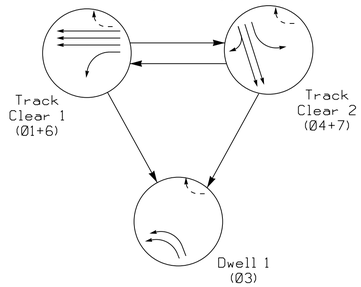


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	TRACK CLEAR 1	TRACK CLEAR 2	DWELL 1	FLASH
11	←R	←R	R	R	R	R	R	R	←R	R	R	R
21,22	R	R	G	G	R	R	R	R	R	R	R	Y
31,32	R	R	R	R	←R	←R	R	R	R	R	←R	R
41,42	R	R	R	R	R	R	G	G	R	G	R	R
51	←R	R	←R	R	R	R	R	R	R	R	R	R
61,62	R	G	R	G	R	R	R	R	G	R	R	Y
71	R	R	R	R	←R	R	←R	R	←R	R	←R	R
81	R	R	R	R	R	G	R	G	R	R	R	R
82	R/→R	R/→R	R	R	R	G	R	G	R	R	R	R
Sign Ⓐ	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	✳

✳ See Note 8

PHASING DIAGRAM DETECTION LEGEND

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

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	3	-	S	-	X
1B	6X40	0	✳	-	1	Yes	-	15	-	S	-	X
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	X
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	X
4C	6X15	0	✳	-	4	Yes	-	15	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	3	-	S	-	X
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
7A	6X40	0	✳	-	7	Yes	-	3	-	S	-	X
8A	6X40	0	✳	-	8	Yes	-	-	-	S	-	X
8B	6X40	0	✳	-	8	Yes	-	-	-	S	-	X

✳ Video Detection Area.
Camera locations should be confirmed in the filed by the contractor in order to provide detection of the areas indicated.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or Phase 5 may be lagged.
4. Phase 3 and/or Phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
7. Ensure flashing operation does not alter operation of blankout signs.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Directional clearance shall be provided during preemption to allow crossing closest to approaching train to clear first. Sequence 1 shall clear crossing 847 201H (Raeford Road) first. Sequence 2 shall clear crossing 847 200B (McPherson Church Road) first.
10. Field adjust temporary poles as needed.

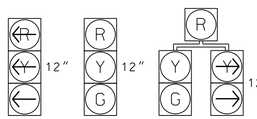
ASC/3 RR PREEMPT

FUNCTION	SEQUENCE 1	SEQUENCE 2
Exit Phase(s)	4,8	4,8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Trough Yellow	N	N
Terminate Phases	N	N
Track Clear Reservice	Y	Y
Entrance Walk	255✳	255✳
Entrance Ped Clear	255✳	255✳
Entrance Min Green	1	1
Entrance Yellow Change	25.5✳	25.5✳
Entrance Red Clear	25.5✳	25.5✳
Track Clear Min Green 1	35	21
Track Clear Yellow Change 1	3.8	4.6
Track Clear Red Clear 1	2.1	1.7
Track Clear Min Green 2	21	35
Track Clear Yellow Change 2	4.6	3.8
Track Clear Red Clear 2	1.7	2.1
Min Dwell Time	7	7
Exit Yellow Change	25.5✳	25.5✳
Exit Red Clear	25.5✳	25.5✳

✳ Time defaults to time used for phase during normal operation.

SIGNAL FACE I.D.

All Heads L.E.D.



11
31,32
51
71

21,22
41,42
61,62
81

82

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	15	45	15	25	15	45	15	25
Yellow	3.0	3.9	3.0	4.6	3.0	3.8	3.0	4.3
Red Clear	2.9	2.1	3.3	1.4	2.8	1.9	3.3	1.6
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
□	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Railroad Cantilever	
N/A	Railroad Tracks	
	Video Detection Area	N/A
	Construction Zone	N/A
	Construction Zone Drums	N/A
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"Stop Here on Red" Sign (R10-6)	Ⓒ

This signal is designed for simultaneous preemption

Signal Upgrade
Temporary Design 1 - TMP Phase I

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NCDOT NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 50 1"=50'

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

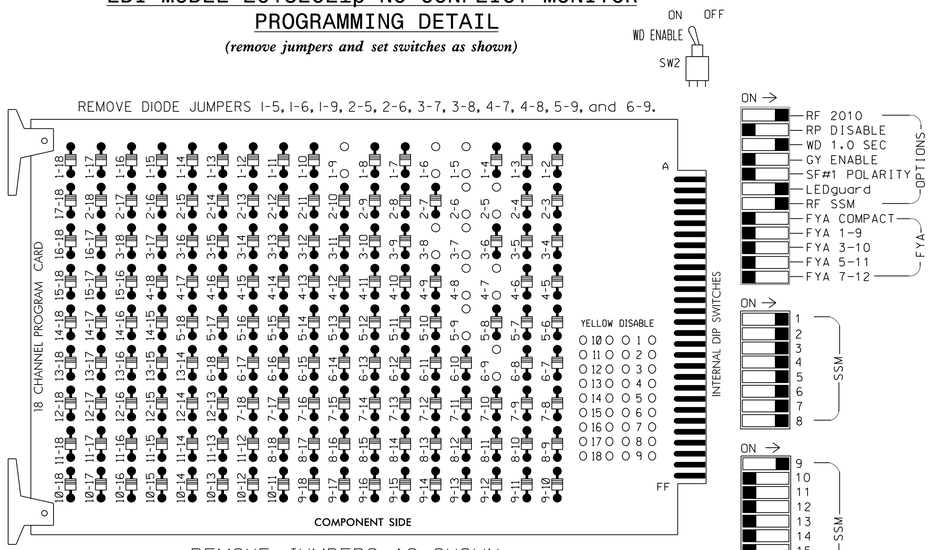
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0054TI

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in Phase 2 Green and Phase 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8, S10,S11,AUX S1
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP A.....1
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31,32	41,42	NU	51	61,62	NU	71	81,82	NU	82					
RED		128			101			134			107		✳					
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123			A122					
GREEN ARROW	127			118			133			124			A123					

NU = Not Used

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

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

Select TMG VEH OVLP [A] and 'NORMAL'

```
TMG VEH OVLP...[A] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L														ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	RR1 AC ISOLATOR
FILE "J" L														RR2 AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
RR1,RR2 = RAILROAD PREEMPTS

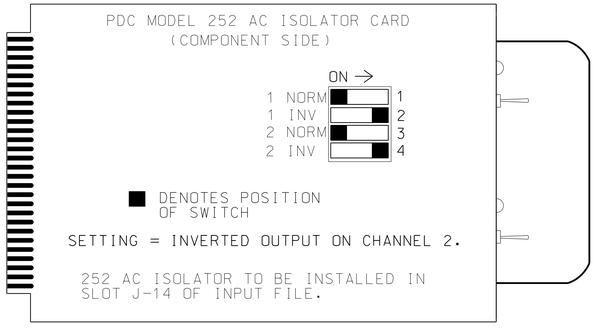
NOTE: The RR1 and RR2 preempt inputs have been remapped as detector inputs for use by the Logic Processor. See sheet 5 for details.

SPECIAL DETECTOR NOTE

Install a video 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.

AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



■ DENOTES POSITION OF SWITCH

SETTING = INVERTED OUTPUT ON CHANNEL 2.

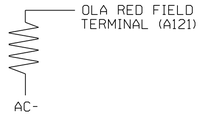
252 AC ISOLATOR TO BE INSTALLED IN SLOT J-14 OF INPUT FILE.

NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

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)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 1 of 5

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750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

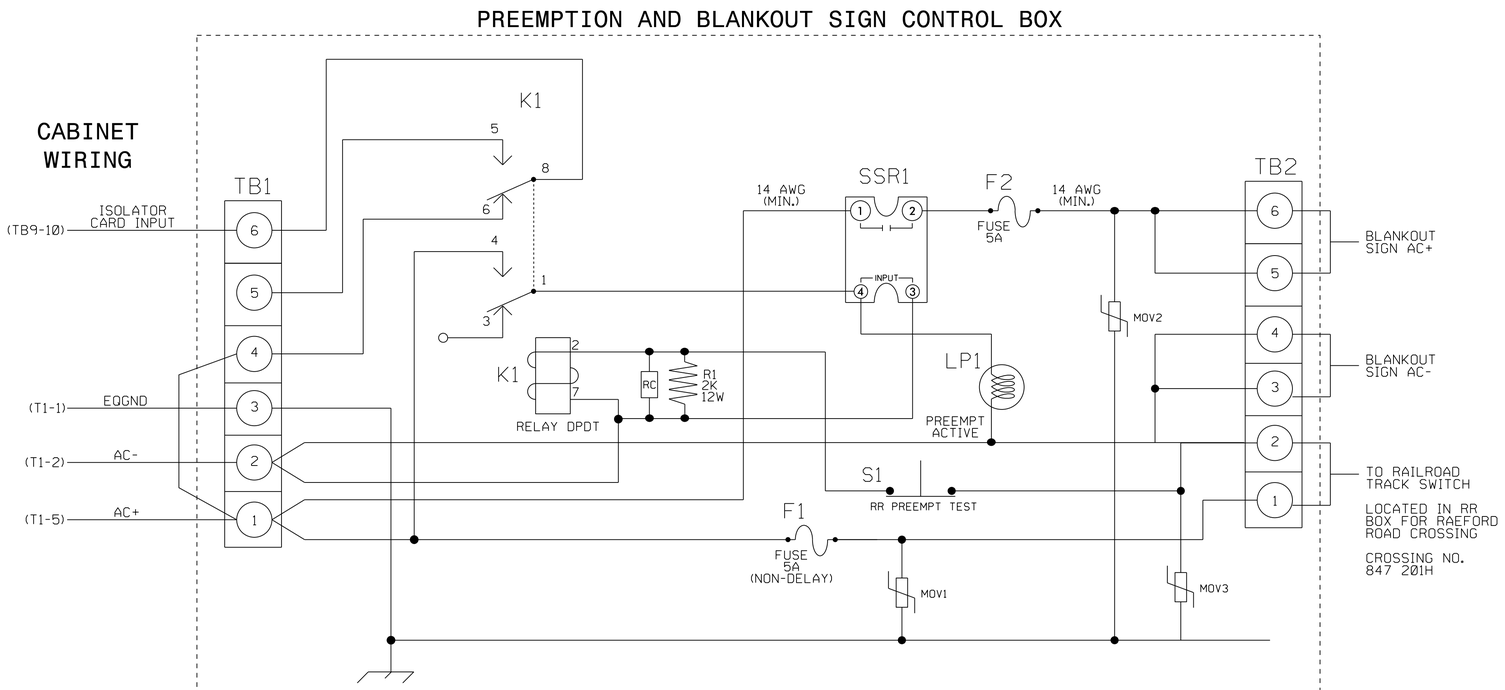
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054TI

DATE:
K:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0054T1.dgn
User:rmurcay

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.2

RAILROAD PREEMPTION WIRING DETAIL FOR RR1 (LINKED RR PREEMPTS 1 & 2)

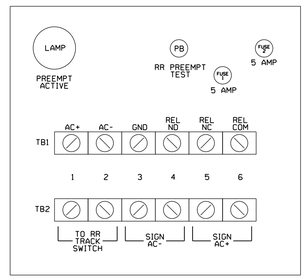
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 2 of 5

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Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

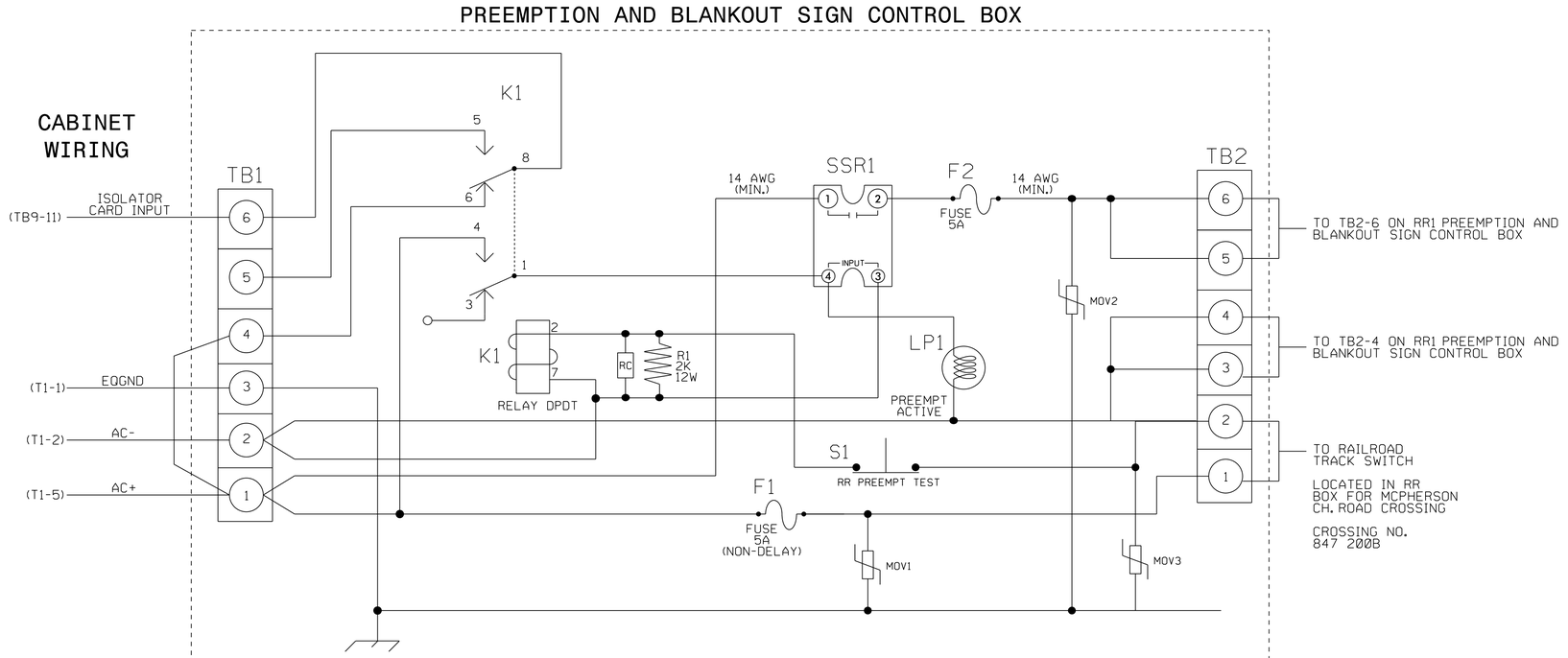
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0054T1

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.3

RAILROAD PREEMPTION WIRING DETAIL FOR RR2 (LINKED RR PREEMPTS 3 & 4)

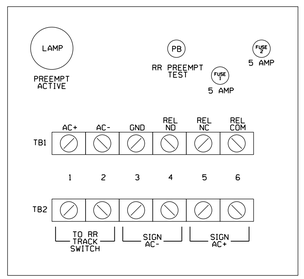
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 3 of 5

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PLAN DATE:	March 2018	REVIEWED BY:	L Overn
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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE F. OVERN, II

DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0054T1

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.4

ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]

2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

```
PREEMPT PLAN [  1]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....0!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  255!  255!   1!25.5!25.5
-----------MIN GRI!EXT GRIMX GRI YEL! RED
TRACK CLEAR    21!    0!    0! 4.6! 1.7
-----------MIN DLI!PMTEXTIMX TMI YEL! RED
DWL/CYC-EXIT    7!  0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE
LINK PMT 1 →

Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #2.

```
PREEMPT PLAN [  2]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....1!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  255!  255!   1!25.5!25.5
-----------MIN GRI!EXT GRIMX GRI YEL! RED
TRACK CLEAR    35!    0!    0! 3.8! 2.1
-----------MIN DLI!PMTEXTIMX TMI YEL! RED
DWL/CYC-EXIT    0!  0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 1 and 2 make up preempt RR1

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #3.

```
PREEMPT PLAN [  3]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....0!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  255!  255!   1!25.5!25.5
-----------MIN GRI!EXT GRIMX GRI YEL! RED
TRACK CLEAR    35!    0!    0! 3.8! 2.1
-----------MIN DLI!PMTEXTIMX TMI YEL! RED
DWL/CYC-EXIT    7!  0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE
LINK PMT 3 →

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #4.

```
PREEMPT PLAN [  4]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....3!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  255!  255!   1!25.5!25.5
-----------MIN GRI!EXT GRIMX GRI YEL! RED
TRACK CLEAR    21!    0!    0! 4.6! 1.7
-----------MIN DLI!PMTEXTIMX TMI YEL! RED
DWL/CYC-EXIT    0!  0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 3 and 4 make up preempt RR2

ECONOLITE ASC/3-2070 PREEMPT FILTERING

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [2. ENABLE PREEMPT FILTERING & TSP/SCP]
3. Ensure all preempt entries are set to BYPASSED for both SOLID and PULSING.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Mobility and Safety Division
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054TI

DATE:
FILE: U:\traffic\signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0054T1.dgn
User:rmurphy

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-66.5

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    1  COPY FROM:    1  ACTIVE:  M
IF     DET                  52   IS  ON

THEN  LP SET LOGIC FLAG     1       ON

ELSE
```

IF RR1 PREEMPT (REMAPPED AS DET 52) INPUT IS ACTIVE, SET LOGIC FLAG 1 ON.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    2  COPY FROM:    2  ACTIVE:  M
IF     LP FLAG              1    IS  ON

THEN   PMT CALL PMT SEQ     2       ON

ELSE
```

IF LOGIC FLAG 1 IS ON, THEN INITIATE PREEMPT 2 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    3  COPY FROM:    3  ACTIVE:  M
IF     DET                  54    IS  ON

THEN   LP SET LOGIC FLAG    2       ON

ELSE
```

IF RR2 PREEMPT (REMAPPED AS DET 54) INPUT IS ACTIVE, SET LOGIC FLAG 2 ON.

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    4  COPY FROM:    4  ACTIVE:  M
IF     LP FLAG              2    IS  ON

THEN   PMT CALL PMT SEQ     4       ON

ELSE
```

IF LOGIC FLAG 2 IS ON, THEN INITIATE PREEMPT 4 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "5" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    5  COPY FROM:    5  ACTIVE:  M
IF     DET                  52   IS   OFF
AND    DET                  54   IS   OFF

THEN   LP SET LOGIC FLAG    1       OFF
THEN   LP SET LOGIC FLAG    2       OFF

ELSE
```

WHEN BOTH PREEMPT INPUTS GO INACTIVE, THIS LOGIC RESETS THE LOGIC FLAG THAT IS HOLDING THE ACTIVE PREEMPT ACTIVE, AND RESETS THE OTHER LOGIC FLAG TO PREVENT IT FROM CALLING THE OTHER PREEMPT.

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-5 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  E  E  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

ECONOLITE ASC/3-2070 I/O PIN REMAPPING FOR RR1 AND RR2 PREEMPT INPUTS

The ASC/3 Configurator utility program must be used to remap the I/O pins as shown below. Consult the ASC/3 Configurator User Guide for specific instructions on software use.

1. Run the Configurator utility. Load a file as the Current DB.
2. Choose the C1-in tab to change the I/O mapping as needed. Use the drop down list within the program to select the assigned function for the pins shown below.
3. Save the database file and download it to the controller.

C1 PIN #	DEFAULT FUNCTION	ASSIGNED FUNCTION
PIN 51	PREEMPT 1 CALL	DETECTOR 52
PIN 52	PREEMPT 2 CALL	DETECTOR 54

NOTE: PREEMPT INPUTS REMAPPED AS DETECTORS

NOTE: The steps below can be used to view changes to I/O pins within the controller. Any I/O pins that have been remapped will display and show their default function in addition to the current assigned function.

1. From Main Menu select [7. STATUS DISPLAY]
2. From STATUS DISPLAY Submenu select [8. INPUTS/OUTPUTS]
3. From INPUT/OUTPUT Submenu select [9. I/O DIFFERENCES]

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR REMAPPED DETECTORS

(program controller as shown)

The preempt inputs remapped as detectors that are to be used by the logic processor are assigned to a dummy phase 9 as shown in the detector setup programming below.

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]

- Place cursor in VEH DETECTOR [ ] position and enter "52".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [52]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
52  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "54".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [54]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
54  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering, Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6	Cumberland County	Fayetteville
PLAN DATE: March 2018	REVIEWED BY:	L Overn
PREPARED BY: G B Spell	REVIEWED BY:	

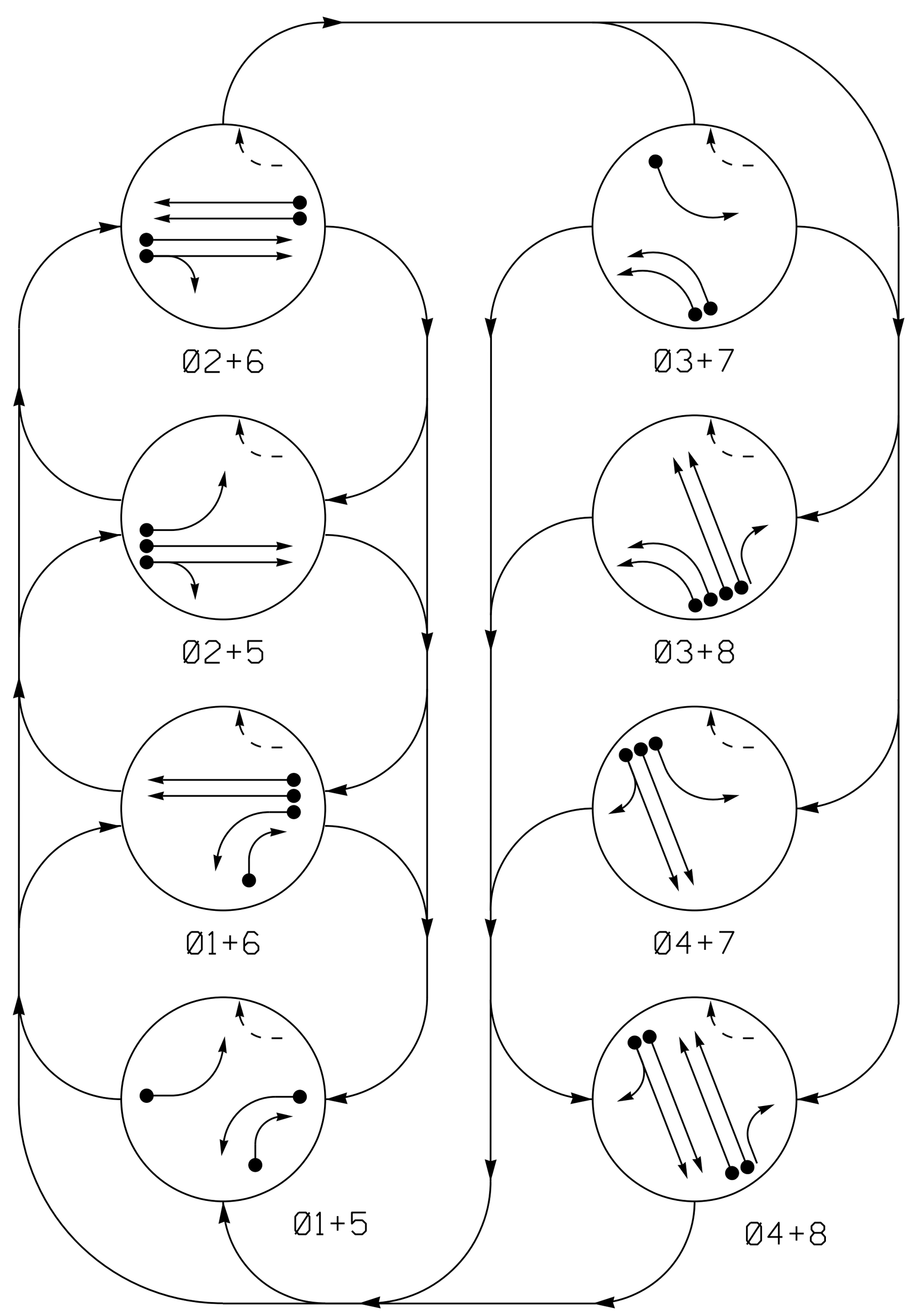
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054TI

DATE: 3/29/2018
User:rmuncey
File:C:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0054T1.dgn

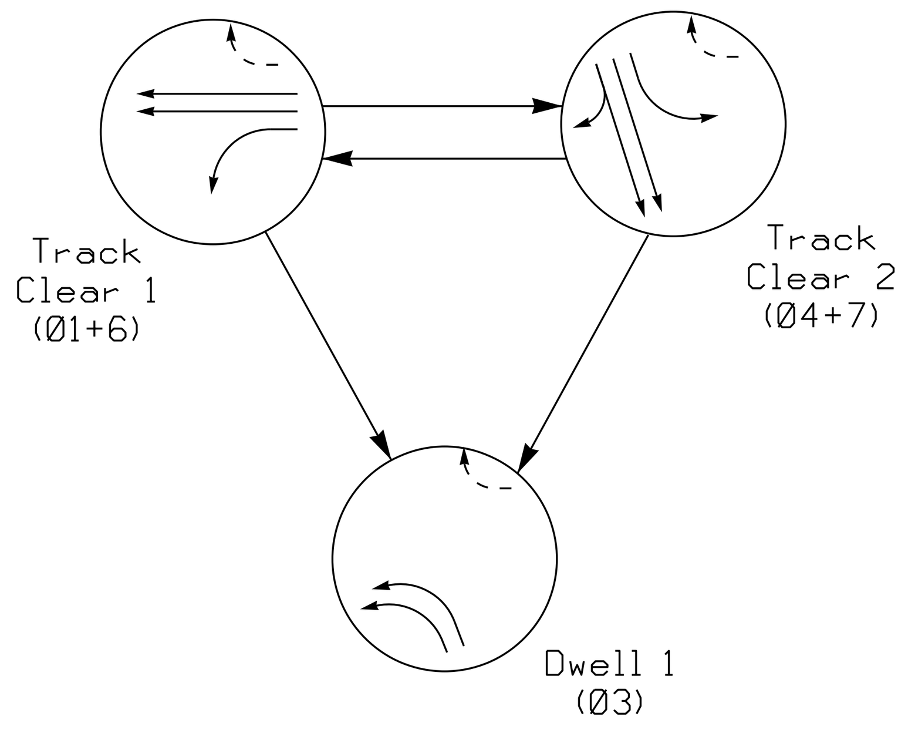
PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.0

PHASING DIAGRAM



RAIL PREEMPT PHASES

(High Priority)



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

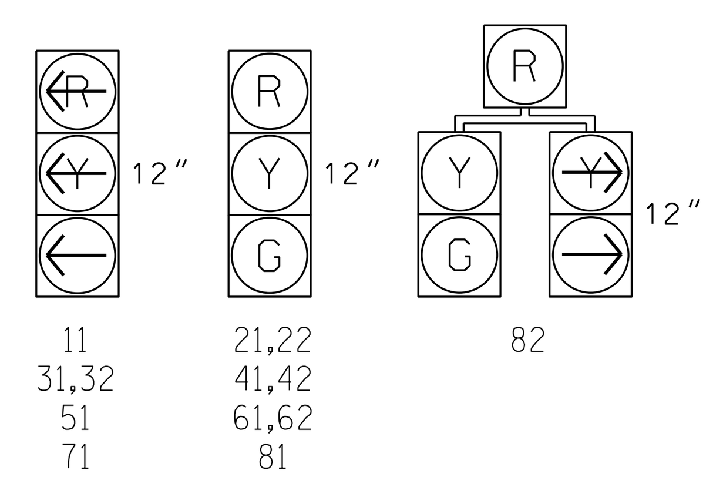


TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	TRACK CLEAR 1	TRACK CLEAR 2	DWELL 1	FLASH
11	←	←	←R	←R	←R	←R	←R	←R	←	←R	←R	←R
21,22	R	R	G	G	R	R	R	R	R	R	R	Y
31,32	←R	←R	←R	←R	←	←	←R	←R	←R	←R	←	←R
41,42	R	R	R	R	R	R	G	G	R	G	R	R
51	←	←R	←	←R	←R	←R	←R	←R	←R	←R	←R	←R
61,62	R	G	R	G	R	R	R	R	G	R	R	Y
71	←R	←R	←R	←R	←	←R	←	←R	←R	←	←R	←R
81	R	R	R	R	R	G	R	G	R	R	R	R
82	R/→	R/→	R	R	R	G	R	G	R	R	R	R
Sign Ⓐ	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	*

* See Note 7

ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
DETECTOR					PROGRAMMING							
1A	6X40	0	*	-	1	Yes	-	3	-	S	-	-
1B	6X40	0	*	-	1	Yes	-	15	-	S	-	-
2A	6X6	70	*	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	*	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	*	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	*	-	3	Yes	-	-	-	S	-	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	*	-	4	Yes	-	10	-	S	-	-
4C	6X15	0	*	-	4	Yes	-	15	-	S	-	-
5A	6X40	0	*	-	5	Yes	-	3	-	S	-	-
6A	6X6	70	*	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	*	-	6	Yes	-	-	-	S	-	-
7A	6X40	0	*	-	7	Yes	-	3	-	S	-	-
8A	6X40	0	*	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	*	-	8	Yes	-	-	-	S	-	-

* Video Detection Area.
Camera locations should be confirmed in the filed by the contractor in order to provide detection of the areas indicated.

8 Phase Fully Actuated w/ Railroad Preemption Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or Phase 5 may be lagged.
4. Phase 3 and/or Phase 7 may be lagged.
5. Reposition existing signal heads #22, 61,62, and Sign Ⓐ
6. Set all detector units to presence mode.
7. Ensure flashing operation does not alter operation of blankout signs.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Directional clearance shall be provided during preemption to allow crossing closest to approaching train to clear first. Sequence 1 shall clear crossing 847 201H (Raeford Road) first. Sequence 2 shall clear crossing 847 200B (McPherson Church Road) first.

ASC/3 RR PREEMPT

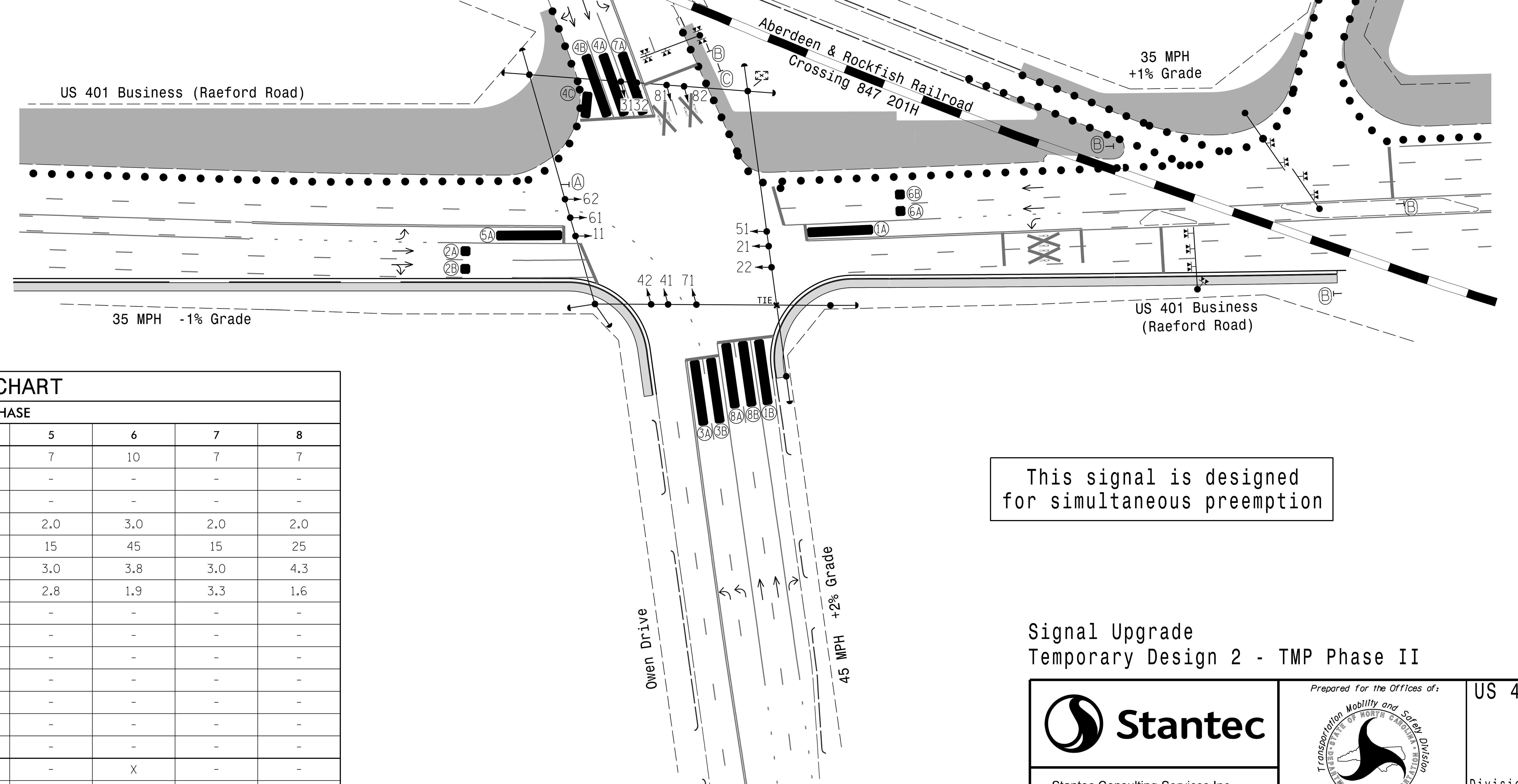
FUNCTION	SEQUENCE 1	SEQUENCE 2
Exit Phase(s)	4,8	4,8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Trough Yellow	N	N
Terminate Phases	N	N
Track Clear Reservice	Y	Y
Entrance Walk	255*	255*
Entrance Ped Clear	255*	255*
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Track Clear Min Green 1	35	21
Track Clear Yellow Change 1	3.8	4.6
Track Clear Red Clear 1	2.1	1.7
Track Clear Min Green 2	21	35
Track Clear Yellow Change 2	4.6	3.8
Track Clear Red Clear 2	1.7	2.1
Min Dwell Time	7	7
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

* Time defaults to time used for phase during normal operation.

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	15	45	15	25	15	45	15	25
Yellow	3.0	3.9	3.0	4.6	3.0	3.8	3.0	4.3
Red Clear	2.9	2.1	3.3	1.6	2.8	1.9	3.3	1.6
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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



This signal is designed for simultaneous preemption

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Railroad Cantilever	
N/A	Railroad Tracks	
	Video Detection Area	N/A
	Construction Zone	N/A
	Construction Zone Drums	N/A
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"Stop Here on Red" Sign (R10-6)	Ⓒ

Signal Upgrade
Temporary Design 2 - TMP Phase II

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Prepared for the Offices of:
Transportation Mobility and Safety Division
Signal Design Section
750 N.Greenfield Pkwy.Garner.NC 27529

SCALE 0 50 1"=50'

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

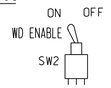
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

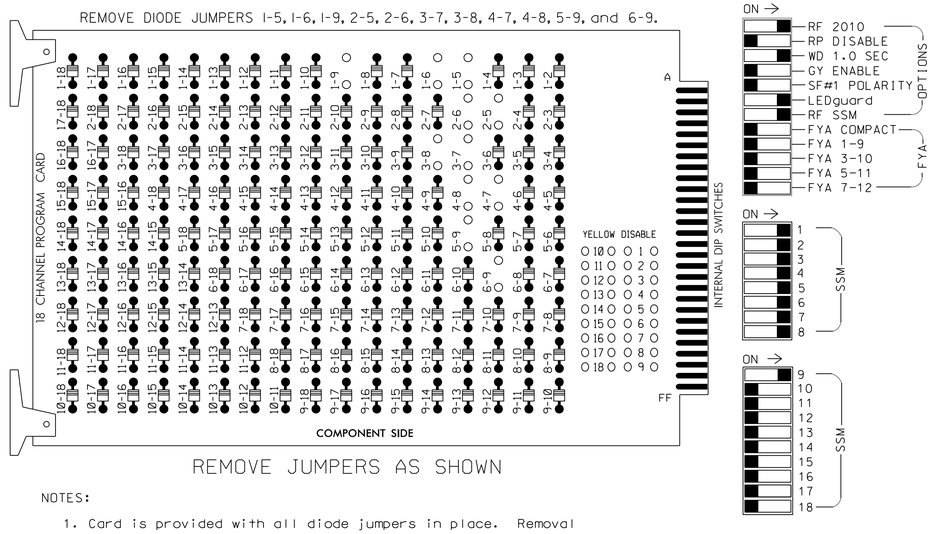
SIG. INVENTORY NO. 06-0054T2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 and Phase 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8, S10,S11,AUX S1
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP A.....1
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31,32	41,42	NU	51	61,62	NU	71	81,82	NU	82					
RED		128			101			134			107		✳					
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123			A122					
GREEN ARROW	127			118			133			124			A123					

NU = Not Used

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

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

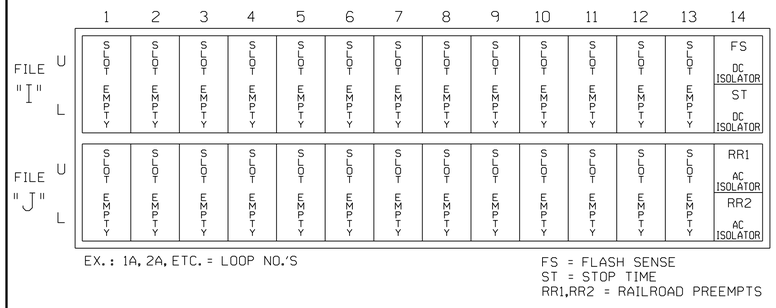
Select TMG VEH OVLP [A] and 'NORMAL'

```
TMG VEH OVLP...[A] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME
RR1,RR2 = RAILROAD PREEMPTS

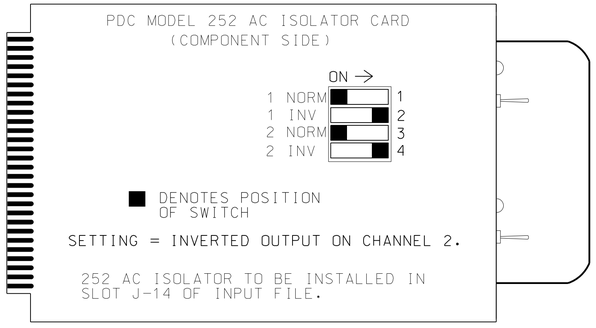
NOTE: The RR1 and RR2 preempt inputs have been remapped as detector inputs for use by the Logic Processor. See sheet 5 for details.

SPECIAL DETECTOR NOTE

Install a video 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.

AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



■ DENOTES POSITION OF SWITCH

SETTING = INVERTED OUTPUT ON CHANNEL 2.

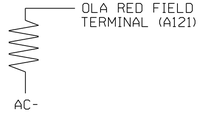
252 AC ISOLATOR TO BE INSTALLED IN SLOT J-14 OF INPUT FILE.

NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

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)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 1 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Systems Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

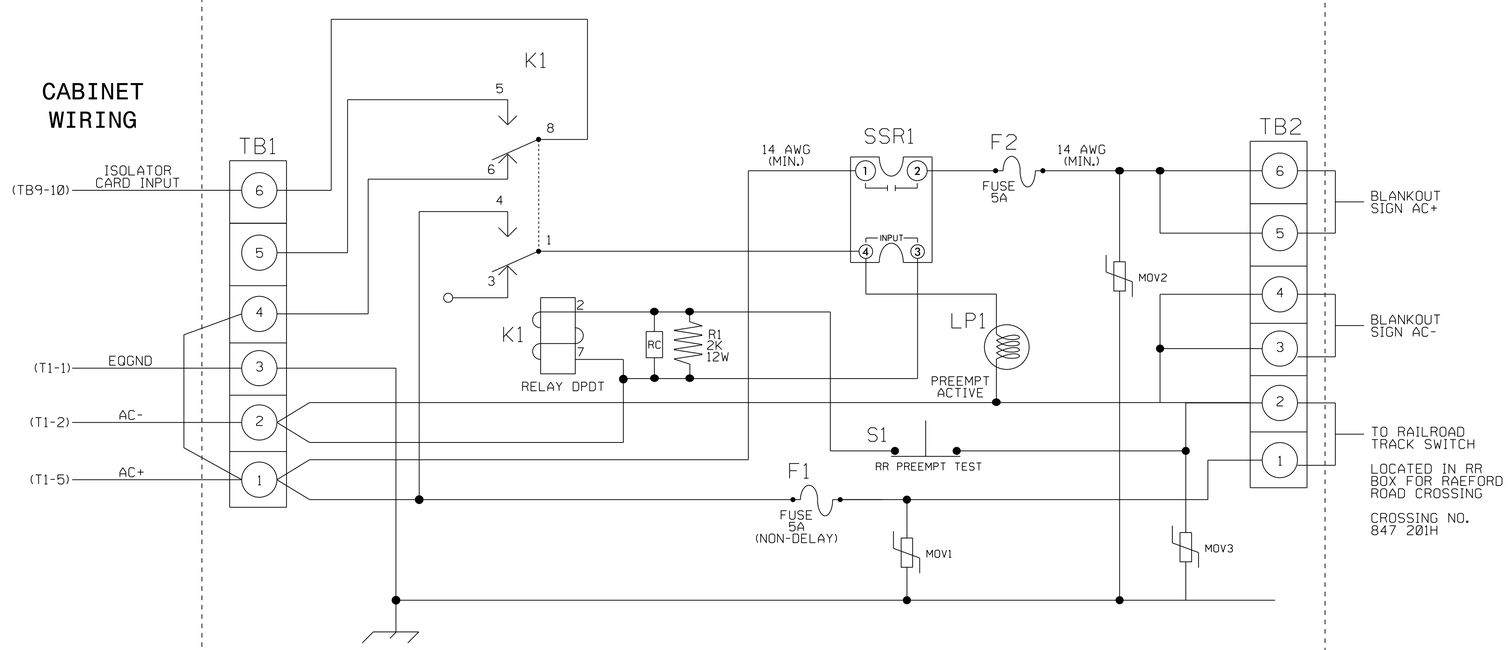
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.2

RAILROAD PREEMPTION WIRING DETAIL FOR RR1 (LINKED RR PREEMPTS 1 & 2)

(wire as shown below)

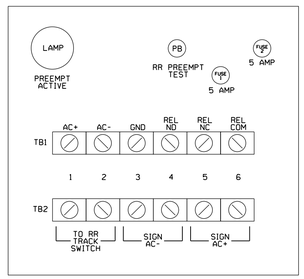
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 5

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750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by:
3/29/2018
SIGNATURE DATE

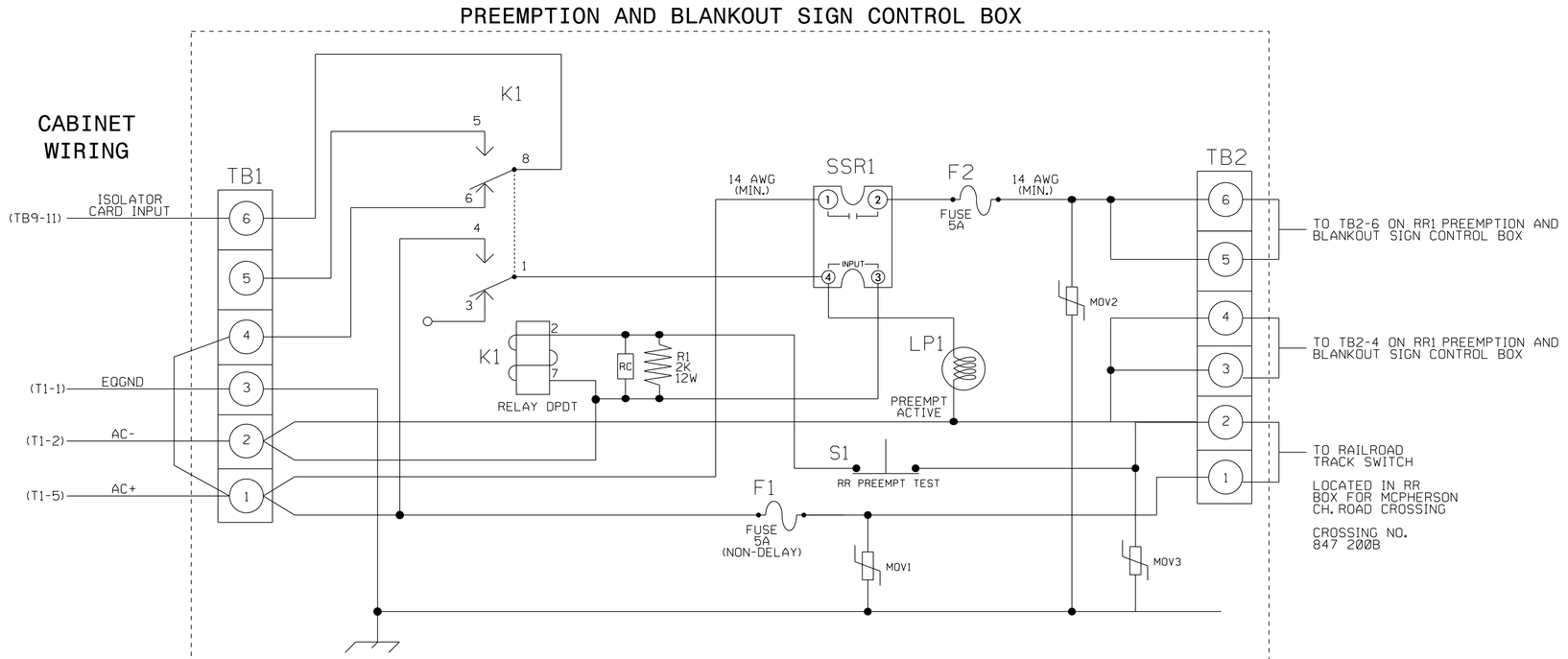
SIG. INVENTORY NO. 06-0054T2

DATE:
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_eld_06-0054T2.dgn
User:rmuckey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.3

RAILROAD PREEMPTION WIRING DETAIL FOR RR2 (LINKED RR PREEMPTS 3 & 4)

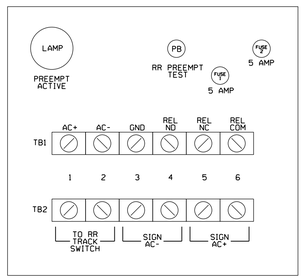
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 3 of 5

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PLAN DATE:	March 2018	REVIEWED BY:	L Overn
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REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE F. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.4

ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]

2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

```
PREEMPT PLAN [  1]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....0!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  25.5!  25.5!   1!25.5!25.5
-----------MIN GRI!EXT GRI!MX GRI YEL! RED
TRACK CLEAR    21!     0!    0! 4.6! 1.7
-----------MIN DLI!PMTEXT!MX TMI YEL! RED
DWL/CYC-EXIT    7!   0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE
LINK PMT 1 →

Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #2.

```
PREEMPT PLAN [  2]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....1!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  25.5!  25.5!   1!25.5!25.5
-----------MIN GRI!EXT GRI!MX GRI YEL! RED
TRACK CLEAR    35!     0!    0! 3.8! 2.1
-----------MIN DLI!PMTEXT!MX TMI YEL! RED
DWL/CYC-EXIT    0!   0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 1 and 2 make up preempt RR1

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #3.

```
PREEMPT PLAN [  3]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....0!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  25.5!  25.5!   1!25.5!25.5
-----------MIN GRI!EXT GRI!MX GRI YEL! RED
TRACK CLEAR    35!     0!    0! 3.8! 2.1
-----------MIN DLI!PMTEXT!MX TMI YEL! RED
DWL/CYC-EXIT    7!   0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE
LINK PMT 3 →

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #4.

```
PREEMPT PLAN [  4]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES!PMT OVRIDE..!INTERLOCK. NO
DET LOCK... .!DELAY..    0!INHIBIT...  0
OVERIDE FL. .!DURATION   0!CLR-GRN... NO
TERM OLP.  NO!PC>YEL    NO!TERM PH    NO
PED DARK.. NO!TC RESRV YES!DWELL FL  OFF
LINK PMT....3!X FLCOLR RED!EXIT OPT. OFF
X TMG PLN...0!RE-SERV..  0!FLT TYPE.HARD
FREE DUR PMT!R1  NO!R2  NO!R3  NO!R4  NO
--TIMING-----WALK!PED CLMN GRI YEL! RED
ENTRANCE TM.  25.5!  25.5!   1!25.5!25.5
-----------MIN GRI!EXT GRI!MX GRI YEL! RED
TRACK CLEAR    21!     0!    0! 4.6! 1.7
-----------MIN DLI!PMTEXT!MX TMI YEL! RED
DWL/CYC-EXIT    0!   0.0!    0!25.5!25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 3 and 4 make up preempt RR2

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 4 of 5

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ECONOLITE ASC/3-2070 PREEMPT FILTERING

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [2. ENABLE PREEMPT FILTERING & TSP/SCP]
3. Ensure all preempt entries are set to BYPASSED for both SOLID and PULSING.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T2

DATE:
User:rmurcay
M:\Traffic\Signals\Design\Electrical Details*Temporary Signals*Phase 2\U-4405_sig_ele_06-0054T2.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-67.5

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    1  COPY FROM:    1  ACTIVE:  M
IF     DET                  52   IS  ON

THEN  LP SET LOGIC FLAG     1       ON

ELSE
```

IF RR1 PREEMPT (REMAPPED AS DET 52) INPUT IS ACTIVE, SET LOGIC FLAG 1 ON.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    2  COPY FROM:    2  ACTIVE:  M
IF     LP FLAG              1    IS  ON

THEN   PMT CALL PMT SEQ     2       ON

ELSE
```

IF LOGIC FLAG 1 IS ON, THEN INITIATE PREEMPT 2 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    3  COPY FROM:    3  ACTIVE:  M
IF     DET                  54    IS  ON

THEN   LP SET LOGIC FLAG    2       ON

ELSE
```

IF RR2 PREEMPT (REMAPPED AS DET 54) INPUT IS ACTIVE, SET LOGIC FLAG 2 ON.

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    4  COPY FROM:    4  ACTIVE:  M
IF     LP FLAG              2    IS  ON

THEN   PMT CALL PMT SEQ     4       ON

ELSE
```

IF LOGIC FLAG 2 IS ON, THEN INITIATE PREEMPT 4 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "5" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    5  COPY FROM:    5  ACTIVE:  M
IF     DET                  52   IS   OFF
AND    DET                  54   IS   OFF

THEN   LP SET LOGIC FLAG    1        OFF
THEN   LP SET LOGIC FLAG    2        OFF

ELSE
```

WHEN BOTH PREEMPT INPUTS GO INACTIVE, THIS LOGIC RESETS THE LOGIC FLAG THAT IS HOLDING THE ACTIVE PREEMPT ACTIVE, AND RESETS THE OTHER LOGIC FLAG TO PREVENT IT FROM CALLING THE OTHER PREEMPT.

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-5 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  E  E  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

ECONOLITE ASC/3-2070 I/O PIN REMAPPING FOR RR1 AND RR2 PREEMPT INPUTS

The ASC/3 Configurator utility program must be used to remap the I/O pins as shown below. Consult the ASC/3 Configurator User Guide for specific instructions on software use.

1. Run the Configurator utility. Load a file as the Current DB.
2. Choose the C1-in tab to change the I/O mapping as needed. Use the drop down list within the program to select the assigned function for the pins shown below.
3. Save the database file and download it to the controller.

C1 PIN #	DEFAULT FUNCTION	ASSIGNED FUNCTION
PIN 51-PREEMPT 1 CALL		DETECTOR 52
PIN 52-PREEMPT 2 CALL		DETECTOR 54

NOTE: PREEMPT INPUTS REMAPPED AS DETECTORS

NOTE: The steps below can be used to view changes to I/O pins within the controller. Any I/O pins that have been remapped will display and show their default function in addition to the current assigned function.

1. From Main Menu select [7. STATUS DISPLAY]
2. From STATUS DISPLAY Submenu select [8. INPUTS/OUTPUTS]
3. From INPUT/OUTPUT Submenu select [9. I/O DIFFERENCES]

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR REMAPPED DETECTORS

(program controller as shown)

The preempt inputs remapped as detectors that are to be used by the logic processor are assigned to a dummy phase 9 as shown in the detector setup programming below.

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]

- Place cursor in VEH DETECTOR [ ] position and enter "52".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [52]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
52  9    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "54".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [54]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
54  9    . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 5 of 5

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6	Cumberland County	Fayetteville
PLAN DATE: March 2018	REVIEWED BY:	L Overn
PREPARED BY: G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

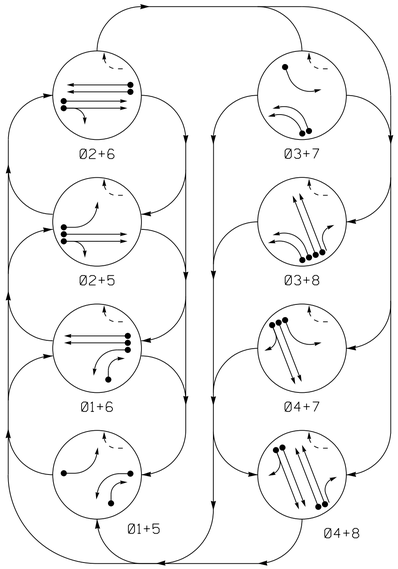
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T2

DATE:
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-68.0

8 Phase Fully Actuated w/ Railroad Preemption Fayetteville Signal System

PHASING DIAGRAM



RAIL PREEMPT PHASES

(High Priority)

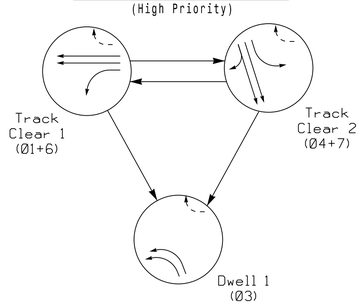


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	TRACK	TRACK CLEAR 1	TRACK CLEAR 2	DWELL 1	FLASH
11	↚	↚	R̸	R̸	R̸	R̸	R̸	R̸	↚	R̸	R̸	R̸	R̸
21,22	R	R	G	G	R	R	R	R	R	R	R	Y	
31,32	R̸	R̸	R̸	R̸	↚	↚	R̸	R̸	R̸	R̸	↚	R̸	
41,42	R	R	R	R	R	R	G	G	R	G	R	R	
51	↚	R̸	↚	R̸	R̸	R̸	R̸	R̸	R̸	R̸	R̸	R̸	
61,62	R	G	R	G	R	R	R	G	R	R	R	Y	
71	R̸	R̸	R̸	R̸	↚	R̸	↚	R̸	R̸	↚	R̸	R̸	
81	R	R	R	R	R	G	R	G	R	R	R	R	
82	R/↛	R/↛	R	R	R	G	R	G	R	R	R	R	
Sign Ⓐ	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	✳

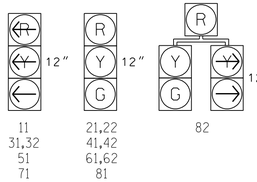
✳ See Note 7

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1B	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	-
4C	6X15	0	✳	-	4	Yes	-	15	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
7A	6X40	0	✳	-	7	Yes	-	3	-	S	-	-
8A	6X40	0	✳	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	✳	-	8	Yes	-	-	-	S	-	-

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or Phase 5 may be lagged.
4. Phase 3 and/or Phase 7 may be lagged.
5. Reposition all existing signal heads.
6. Set all detector units to presence mode.
7. Ensure flashing operation does not alter operation of blankout signs.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Directional clearance shall be provided during preemption to allow crossing closest to approaching train to clear first. Sequence 1 shall clear crossing 847 201H (Raeford Road) first. Sequence 2 shall clear crossing 847 200B (McPherson Church Road) first.

ASC/3 RR PREEMPT

FUNCTION	SEQUENCE 1	SEQUENCE 2
Exit Phase(s)	4,8	4,8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Trough Yellow	N	N
Terminate Phases	N	N
Track Clear Reservice	Y	Y
Entrance Walk	255✳	255✳
Entrance Ped Clear	255✳	255✳
Entrance Min Green	1	1
Entrance Yellow Change	25.5✳	25.5✳
Entrance Red Clear	25.5✳	25.5✳
Track Clear Min Green 1	35	19
Track Clear Yellow Change 1	3.8	4.6
Track Clear Red Clear 1	2.5	2.3
Track Clear Min Green 2	19	35
Track Clear Yellow Change 2	4.6	3.8
Track Clear Red Clear 2	2.3	2.5
Min Dwell Time	7	7
Exit Yellow Change	25.5✳	25.5✳
Exit Red Clear	25.5✳	25.5✳

✳ Time defaults to time used for phase during normal operation.

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	15	45	15	25	15	45	15	25
Yellow	3.0	3.9	3.0	4.6	3.0	3.8	3.0	4.3
Red Clear	3.3	2.4	4.0	2.1	3.2	2.2	3.9	1.9
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
□	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
N/A	Railroad Cantilever	
N/A	Railroad Tracks	
	Video Detection Area	N/A
	Construction Zone	N/A
	Construction Zone Drums	N/A
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"Stop Here on Red" Sign (R10-6)	Ⓒ
Ⓓ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓓ

This signal is designed for simultaneous preemption

Signal Upgrade
Temporary Design 3 - TMP Phase III

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Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

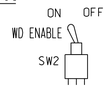
SCALE 0 50 1"=50'

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

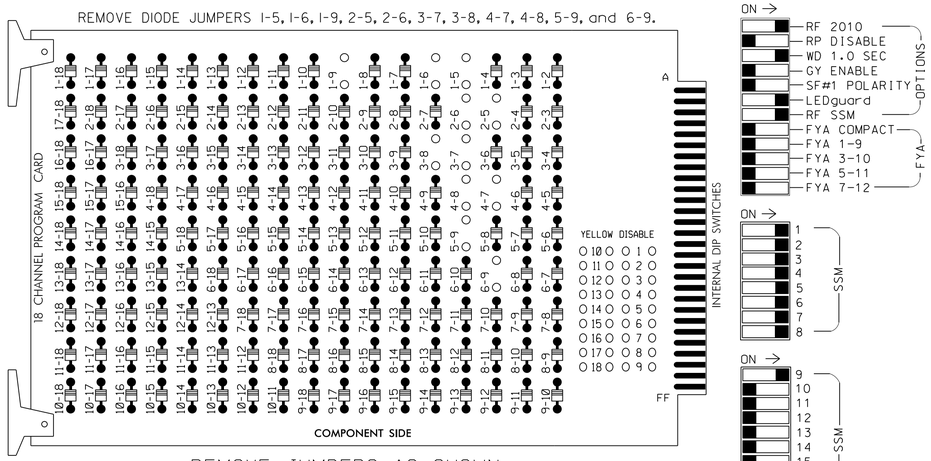
SIG. INVENTORY NO. 06-0054T3

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, 2-5, 2-6, 3-7, 3-8, 4-7, 4-8, 5-9, and 6-9.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in Phase 2 Green and Phase 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8, S10,S11,AUX S1
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP A.....1
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG168.1

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31,32	41,42	NU	51	61,62	NU	71	81,82	NU	82					
RED		128			101			134			107		✳					
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123			A122					
GREEN ARROW	127			118			133			124			A123					

NU = Not Used

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

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

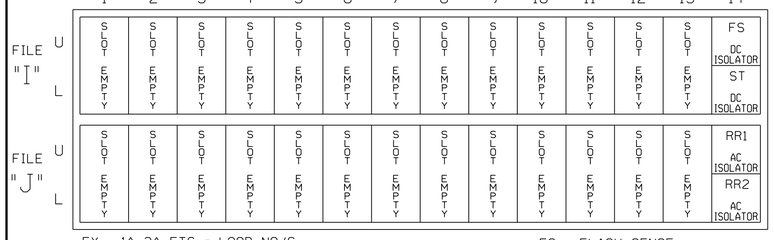
Select TMG VEH OVLP [A] and 'NORMAL'

```
TMG VEH OVLP...[A] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME
RR1,RR2 = RAILROAD PREEMPTS

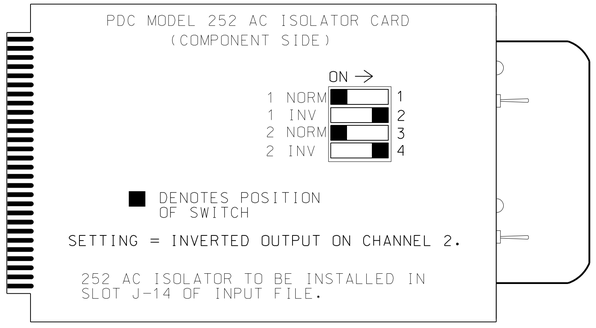
NOTE: The RR1 and RR2 preempt inputs have been remapped as detector inputs for use by the Logic Processor. See sheet 5 for details.

SPECIAL DETECTOR NOTE

Install a video 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.

AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



■ DENOTES POSITION OF SWITCH

SETTING = INVERTED OUTPUT ON CHANNEL 2.

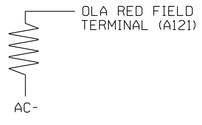
252 AC ISOLATOR TO BE INSTALLED IN SLOT J-14 OF INPUT FILE.

NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

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)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 1 of 5

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Traffic Engineering Branch
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

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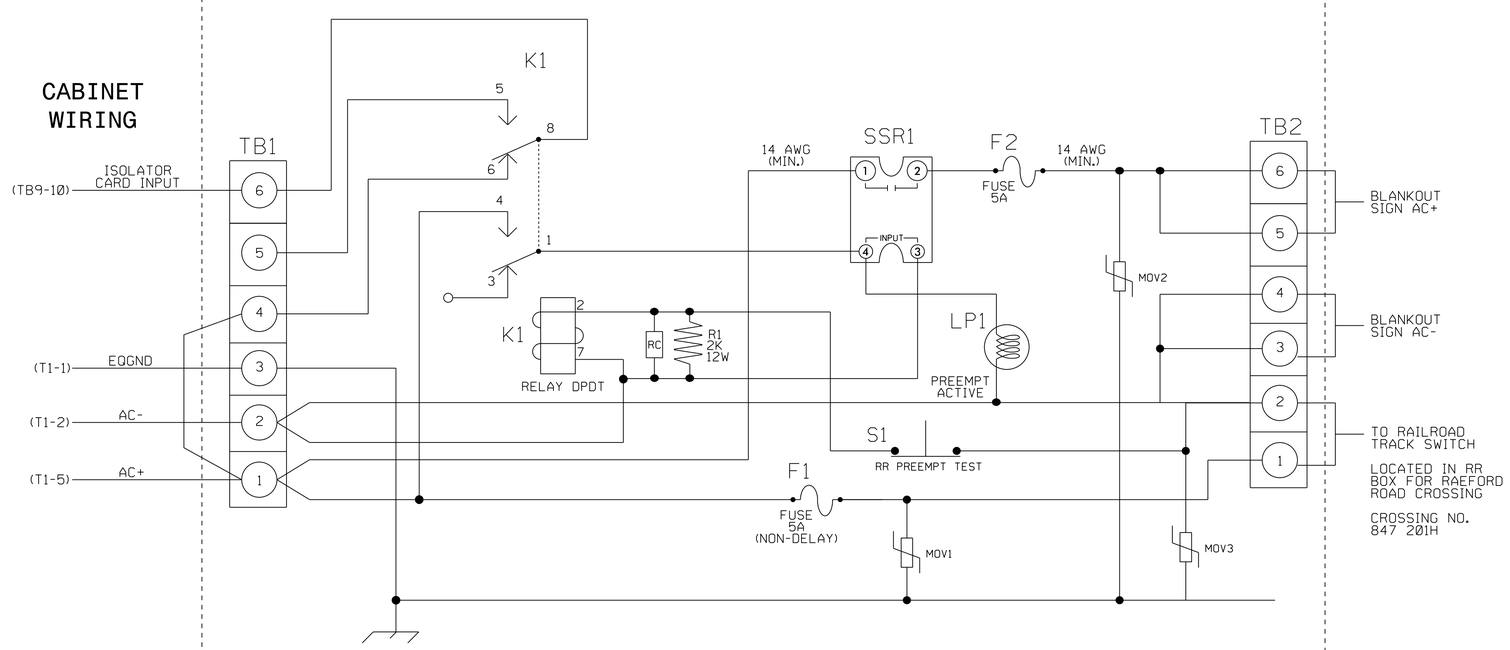
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T3

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-68.2

RAILROAD PREEMPTION WIRING DETAIL FOR RR1 (LINKED RR PREEMPTS 1 & 2)

(wire as shown below)

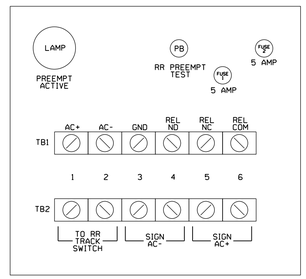
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



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DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 2 of 5

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US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

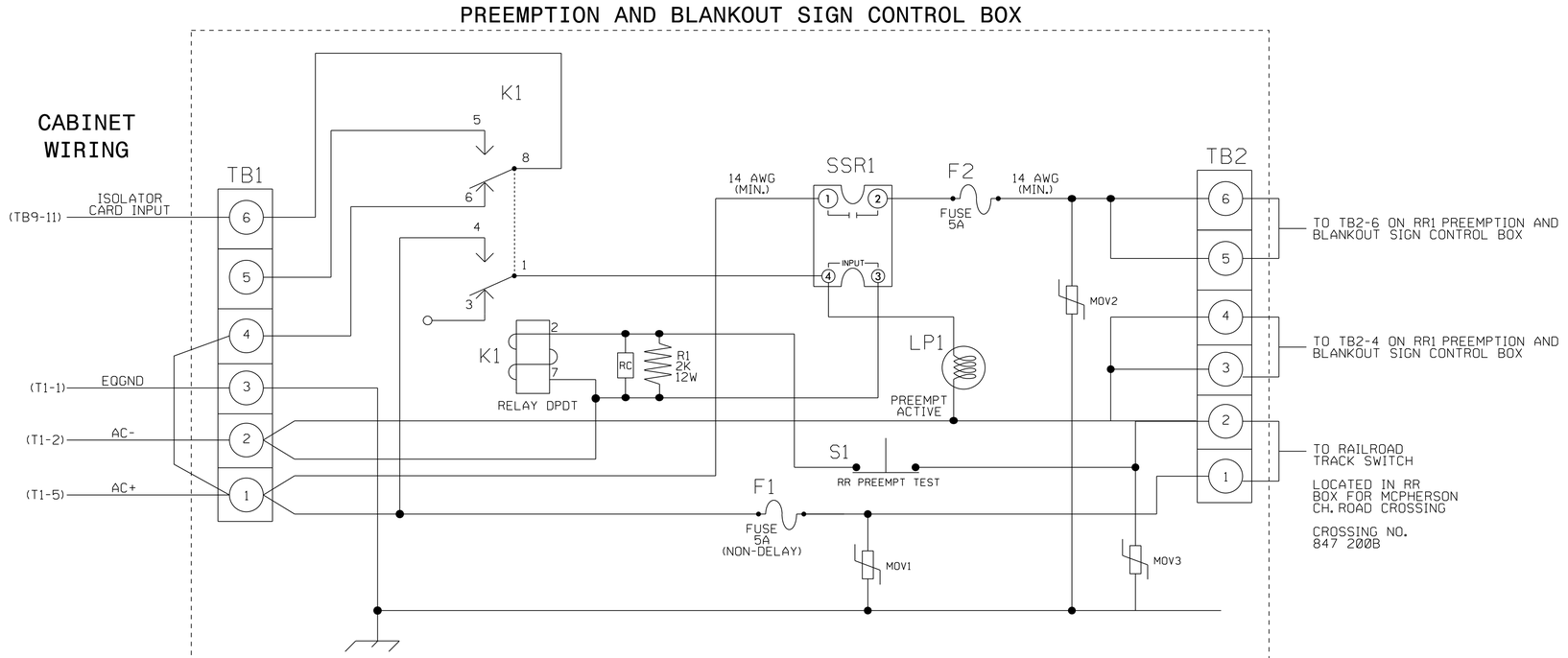
DocuSigned by:
SIGNATURE 3/29/2018
DATE

SIG. INVENTORY NO. 06-0054T3

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-68.3

RAILROAD PREEMPTION WIRING DETAIL FOR RR2 (LINKED RR PREEMPTS 3 & 4)

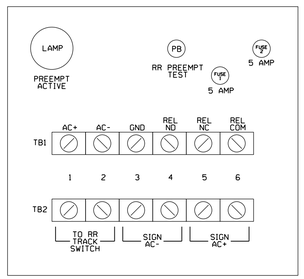
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 1.

FRONT VIEW



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DESIGNED: March 2018
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Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 3 of 5

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Branch, Traffic Engineering & Signals Management Section, N.C. DEPARTMENT OF TRANSPORTATION
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T3

DATE:
U:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0054T3.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-68.4

ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]

2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

```
PREEMPT PLAN [  1]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YELI RED
ENTRANCE TM.  255|  255|   1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YELI RED
TRACK CLEAR    19|    0|   0| 4.6| 2.3
-----------MIN DLI|PMTEXT|IMX TMI YELI RED
DWL/CYC-EXIT    7|  0.0|   0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE LINK PMT 1 →

Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #2.

```
PREEMPT PLAN [  2]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....1|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YELI RED
ENTRANCE TM.  255|  255|   1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YELI RED
TRACK CLEAR    35|    0|   0| 3.8| 2.5
-----------MIN DLI|PMTEXT|IMX TMI YELI RED
DWL/CYC-EXIT    0|  0.0|   0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 1 and 2 make up preempt RR1

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #3.

```
PREEMPT PLAN [  3]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YELI RED
ENTRANCE TM.  255|  255|   1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YELI RED
TRACK CLEAR    35|    0|   0| 3.8| 2.5
-----------MIN DLI|PMTEXT|IMX TMI YELI RED
DWL/CYC-EXIT    7|  0.0|   0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

NOTICE LINK PMT 3 →

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #4.

```
PREEMPT PLAN [  4]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....3|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YELI RED
ENTRANCE TM.  255|  255|   1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YELI RED
TRACK CLEAR    19|    0|   0| 4.6| 2.3
-----------MIN DLI|PMTEXT|IMX TMI YELI RED
DWL/CYC-EXIT    0|  0.0|   0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1   2   3   4   5   6   7   8
PR RTN%    0   0   0   0   0   0   0   0
PHASES     9  10  11  12  13  14  15  16
PR RTN%    0   0   0   0   0   0   0   0
```

Linked preempts 3 and 4 make up preempt RR2

ECONOLITE ASC/3-2070 PREEMPT FILTERING

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [2. ENABLE PREEMPT FILTERING & TSP/SCP]
3. Ensure all preempt entries are set to BYPASSED for both SOLID and PULSING.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 4 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T3

DATE:
M:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0054T3.dgn
User:rmurcay

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-68.5

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    1  COPY FROM:    1  ACTIVE:  M
IF     DET                  52   IS  ON

THEN  LP SET LOGIC FLAG     1       ON

ELSE
```

IF RR1 PREEMPT (REMAPPED AS DET 52) INPUT IS ACTIVE, SET LOGIC FLAG 1 ON.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    2  COPY FROM:    2  ACTIVE:  M
IF     LP FLAG              1    IS  ON

THEN   PMT CALL PMT SEQ     2       ON

ELSE
```

IF LOGIC FLAG 1 IS ON, THEN INITIATE PREEMPT 2 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    3  COPY FROM:    3  ACTIVE:  M
IF     DET                  54    IS  ON

THEN   LP SET LOGIC FLAG    2       ON

ELSE
```

IF RR2 PREEMPT (REMAPPED AS DET 54) INPUT IS ACTIVE, SET LOGIC FLAG 2 ON.

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    4  COPY FROM:    4  ACTIVE:  M
IF     LP FLAG              2    IS  ON

THEN   PMT CALL PMT SEQ     4       ON

ELSE
```

IF LOGIC FLAG 2 IS ON, THEN INITIATE PREEMPT 4 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "5" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    5  COPY FROM:    5  ACTIVE:  M
IF     DET                  52   IS  OFF
AND    DET                  54   IS  OFF

THEN   LP SET LOGIC FLAG    1       OFF
THEN   LP SET LOGIC FLAG    2       OFF

ELSE
```

WHEN BOTH PREEMPT INPUTS GO INACTIVE, THIS LOGIC RESETS THE LOGIC FLAG THAT IS HOLDING THE ACTIVE PREEMPT ACTIVE, AND RESETS THE OTHER LOGIC FLAG TO PREVENT IT FROM CALLING THE OTHER PREEMPT.

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-5 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  E  E  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

ECONOLITE ASC/3-2070 I/O PIN REMAPPING FOR RR1 AND RR2 PREEMPT INPUTS

The ASC/3 Configurator utility program must be used to remap the I/O pins as shown below. Consult the ASC/3 Configurator User Guide for specific instructions on software use.

1. Run the Configurator utility. Load a file as the Current DB.
2. Choose the C1-in tab to change the I/O mapping as needed. Use the drop down list within the program to select the assigned function for the pins shown below.
3. Save the database file and download it to the controller.

C1 PIN #	DEFAULT FUNCTION	ASSIGNED FUNCTION
PIN 51-PREEMPT 1 CALL		DETECTOR 52
PIN 52-PREEMPT 2 CALL		DETECTOR 54

NOTE: PREEMPT INPUTS REMAPPED AS DETECTORS

NOTE: The steps below can be used to view changes to I/O pins within the controller. Any I/O pins that have been remapped will display and show their default function in addition to the current assigned function.

1. From Main Menu select [7. STATUS DISPLAY]
2. From STATUS DISPLAY Submenu select [8. INPUTS/OUTPUTS]
3. From INPUT/OUTPUT Submenu select [9. I/O DIFFERENCES]

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR REMAPPED DETECTORS

(program controller as shown)

The preempt inputs remapped as detectors that are to be used by the logic processor are assigned to a dummy phase 9 as shown in the detector setup programming below.

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]

- Place cursor in VEH DETECTOR [ ] position and enter "52".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [52]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
52  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "54".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [54]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
54  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 5 of 5

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6	Cumberland County	Fayetteville
PLAN DATE: March 2018	REVIEWED BY:	L Overn
PREPARED BY: G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

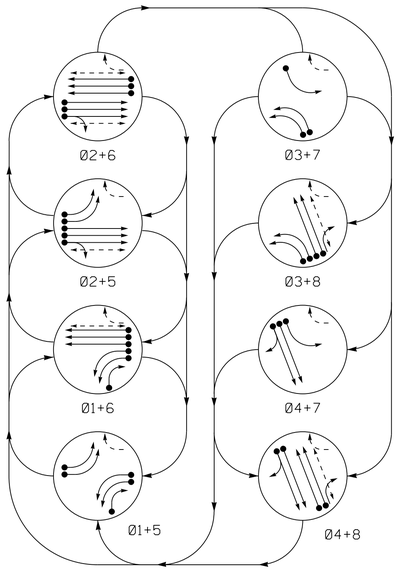
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054T3

DATE: 3/29/2018
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.0

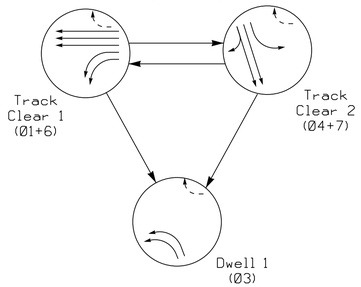
8 Phase Fully Actuated w/ Railroad Preemption Fayetteville Signal System

PHASING DIAGRAM



RAIL PREEMPT PHASES

(High Priority)



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

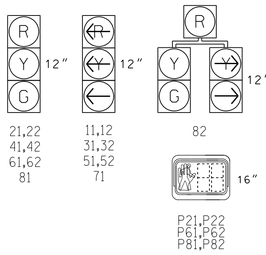


TABLE OF OPERATION

SIGNAL FACE	PHASE															
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	TRACK 1	TRACK 2	DWELL 1	FLASH
11,12	←R	←R	←R	←R	←R	←R	←R	←R	←	←R	←R	←R
21,22	R	R	G	G	R	R	R	R	R	R	R	Y
31,32	←R	←R	←R	←R	←	←	←R	←R	←R	←R	←	←R
41,42	R	R	R	R	R	R	G	G	R	G	R	R
51,52	←	←R	←	←R	←R	←R	←R	←R	←R	←R	←R	←R
61,62	R	G	R	G	R	R	R	R	G	R	R	Y
71	←R	←R	←R	←R	←	←R	←	←R	←R	←	←R	←R
81	R	R	R	R	R	G	R	G	R	R	R	R
82	R/→	R/→	R	R	R	G	R	G	R	R	R	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DW	DW	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DW	DW	DW	DRK
Sign Ⓐ	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	✳

✳See Note 8

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1C	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	70	5	X	2	Yes	-	-	-	S	-	X
2B	6X6	70	5	X	2	Yes	-	-	-	S	-	X
2C	6X6	70	5	X	2	Yes	-	-	-	S	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
4A	6X6	0	4	X	4	Yes	-	-	-	S	-	X
4B	6X6	0	4	X	4	Yes	-	10	-	S	-	X
4C	6X15	0	2-4-2	X	4	Yes	-	15	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
6A	6X6	70	3	X	6	Yes	-	-	-	S	-	X
6B	6X6	70	3	X	6	Yes	-	-	-	S	-	X
6C	6X6	70	3	X	6	Yes	-	-	-	S	-	X
7A	6X40	0	2-4-2	X	7	Yes	-	3	-	S	-	X
8A	6X6	0	4	X	8	Yes	-	-	-	S	-	X
8B	6X6	0	4	X	8	Yes	-	-	-	S	-	X

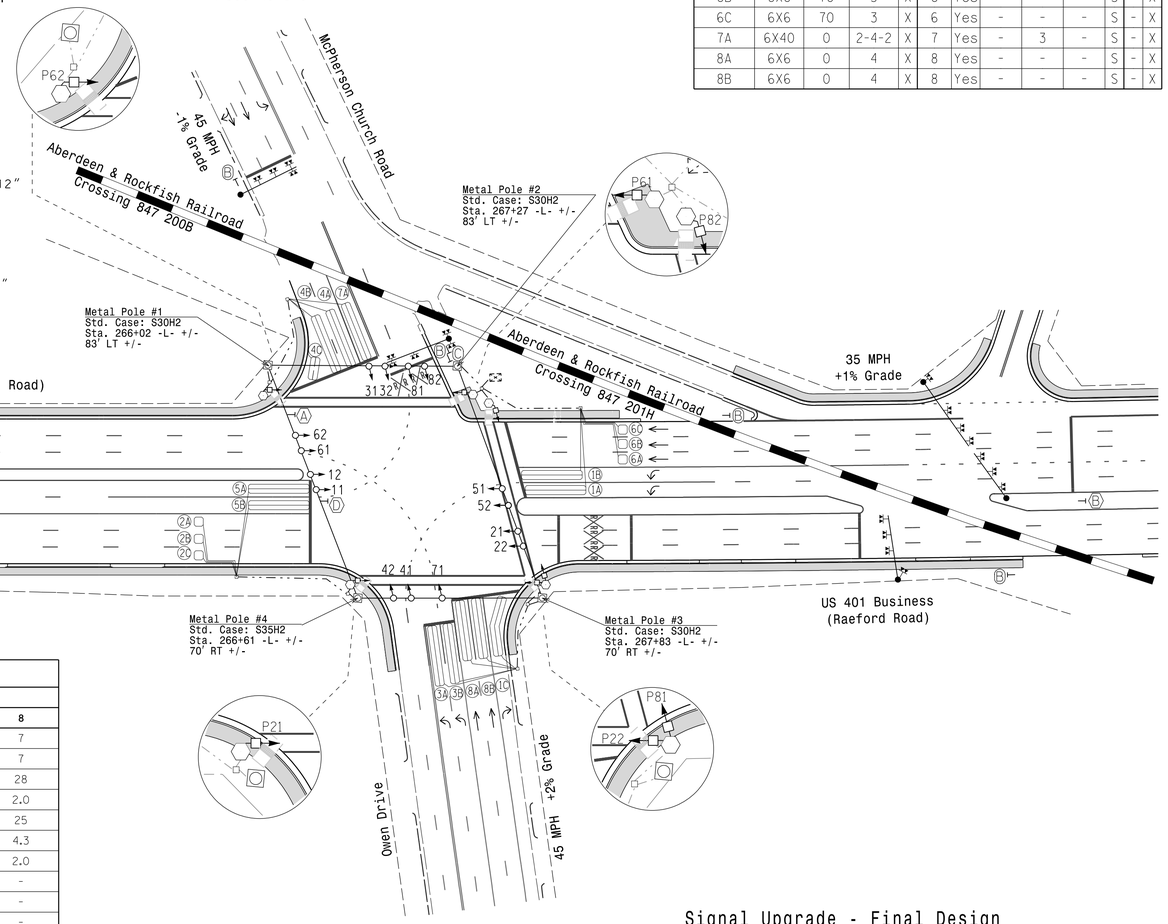
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or Phase 5 may be lagged.
4. Phase 3 and/or Phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
8. Ensure flashing operation does not alter operation of blankout signs.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.
11. Directional clearance shall be provided during preemption to allow crossing closest to approaching train to clear first. Sequence 1 shall clear crossing 847 201H (Raeford Road) first. Sequence 2 shall clear crossing 847 200B (McPherson Church Road) first.

ASC/3 RR PREEMPT

FUNCTION	SEQUENCE 1	SEQUENCE 2
Exit Phase(s)	4,8	4,8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Trough Yellow	Y	Y
Terminate Phases	N	N
Track Clear Reservice	Y	Y
Entrance Walk	1	1
Entrance Ped Clear	3.0	3.0
Entrance Min Green	1	1
Entrance Yellow Change	25.5✳	25.5✳
Entrance Red Clear	25.5✳	25.5✳
Track Clear Min Green 1	35	19
Track Clear Yellow Change 1	3.8	4.6
Track Clear Red Clear 1	2.5	2.3
Track Clear Min Green 2	19	35
Track Clear Yellow Change 2	4.6	3.8
Track Clear Red Clear 2	2.3	2.5
Min Dwell Time	7	7
Exit Yellow Change	25.5✳	25.5✳
Exit Red Clear	25.5✳	25.5✳

✳ Time defaults to time used for phase during normal operation.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	-	10	-	-	-	10	-	7
Ped Clear	-	28	-	-	-	30	-	28
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max 1 *	15	45	15	25	15	45	15	25
Yellow	3.0	3.9	3.0	4.6	3.0	3.8	3.0	4.3
Red Clear	3.3	2.8	3.9	2.2	3.3	2.2	3.9	2.0
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	- - -
⊠	Controller & Cabinet	⛶
□	Junction Box	■
·-·-·-·	2-in Underground Conduit	·-·-·-·
N/A	Right of Way	- - - -
→	Directional Arrow	→
◯	Metal Strain Pole	◘
N/A	Railroad Cantilever	✕
N/A	Railroad Tracks	▬
⬡	Type II Signal Pedestal	⬢
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"Stop Here on Red" Sign (R10-6)	Ⓒ
Ⓓ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓓ

This signal is designed for simultaneous preemption

Signal Upgrade - Final Design

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 50 1"=50'

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETTY L. WATSON

DocuSigned by: Betsy L. Watson 3/29/2018

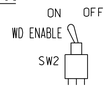
SIGNATURE DATE

SIG. INVENTORY NO. 06-0054

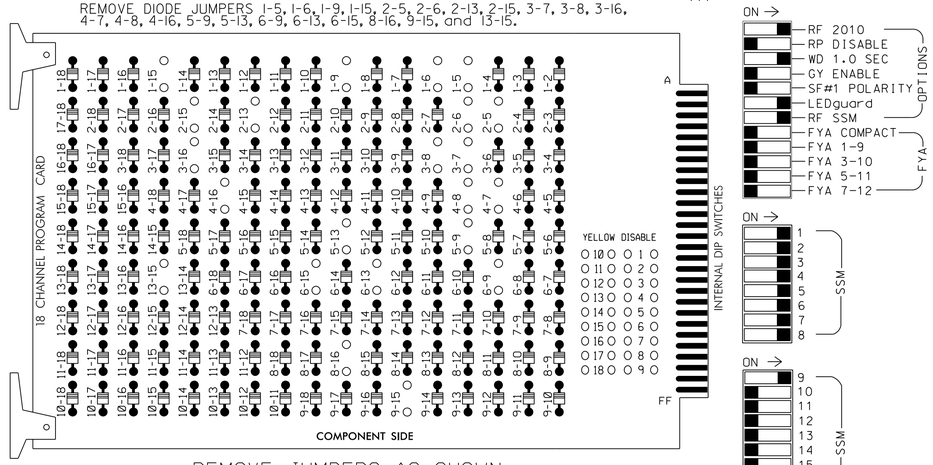
PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-16, 5-9, 5-13, 6-9, 6-13, 6-15, 8-16, 9-15, and 13-15.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 Walk and Phase 6 Walk.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8,S9, S10,S11,S12,AUX S1
PHASES USED.....1,2,2PED,3,4,5,6,6PED,7, 8,8PED
OVERLAP A.....5
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	P21, P22	31,32	41,42	NU	51,52	61,62	P61, P62	71	81,82	P81, P82	82	NU	NU	NU	NU	NU
RED		128			101			134			107		✳					
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123			A122					
GREEN ARROW	127			118			133			124			A123					
✋			113					119			110							
🚶			115					121			112							

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø1 1A	Ø1 1C	Ø2 2A	Ø2 2C	Ø3 3A	Ø3 3B	Ø4 4A	Ø4 4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	Ø1 1B	NOT USED	Ø2 2B	NOT USED	NOT USED	NOT USED	Ø4 4B	NOT USED				NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	Ø6 6C	SLOT EMPTY	Ø7 7A	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	RR1 AC ISOLATOR
FILE "J" L	Ø5 5B	Ø6 6B	NOT USED		NOT USED	Ø8 8B								RR2 AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
RR1,RR2 = RAILROAD PREEMPTS

NOTE: The RR1 and RR2 preempt inputs have been remapped as detector inputs for use by the Logic Processor. See sheet 5 for details.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-3,4	I1L	56	1	1	YES				S
1C	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES				S
2B	TB2-11,12	I3L	76	42	2	YES				S
2C	TB4-1,2	I4U	47	22	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES				S
4B	TB6-3,4	I7L	78	44	4	YES		10		S
4C	TB6-5,6	I8U	49	24	4	YES		15		S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-3,4	J1L	55	5	5	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
7A	TB5-5,6	J5U	57	7	7	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES				S
8B	TB5-11,12	J6L	46	18	8	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

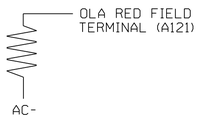
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



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: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 6

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Branch, Transportation Mobility and Safety Division, NC DEPARTMENT OF TRANSPORTATION, Traffic Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054

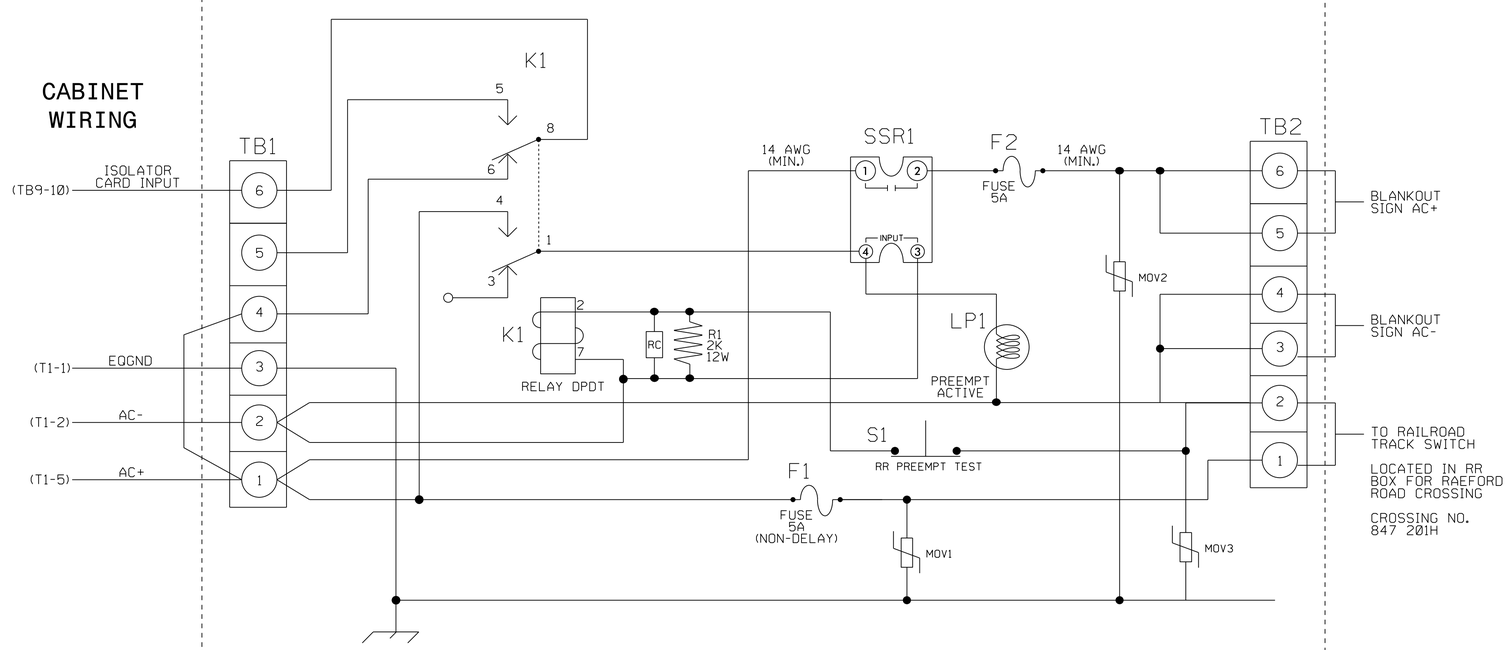
DATE:
I:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_e1e_06-0054.dgn
User:lrmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.2

RAILROAD PREEMPTION WIRING DETAIL FOR RR1 (LINKED RR PREEMPTS 1 & 2)

(wire as shown below)

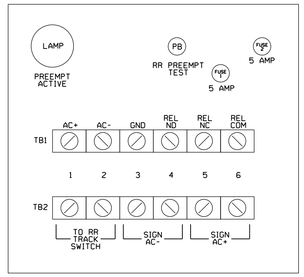
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 6.
5. IMPORTANT!! A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 6

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Traffic Engineering Branch, Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: 3/29/2018
SIGNATURE DATE

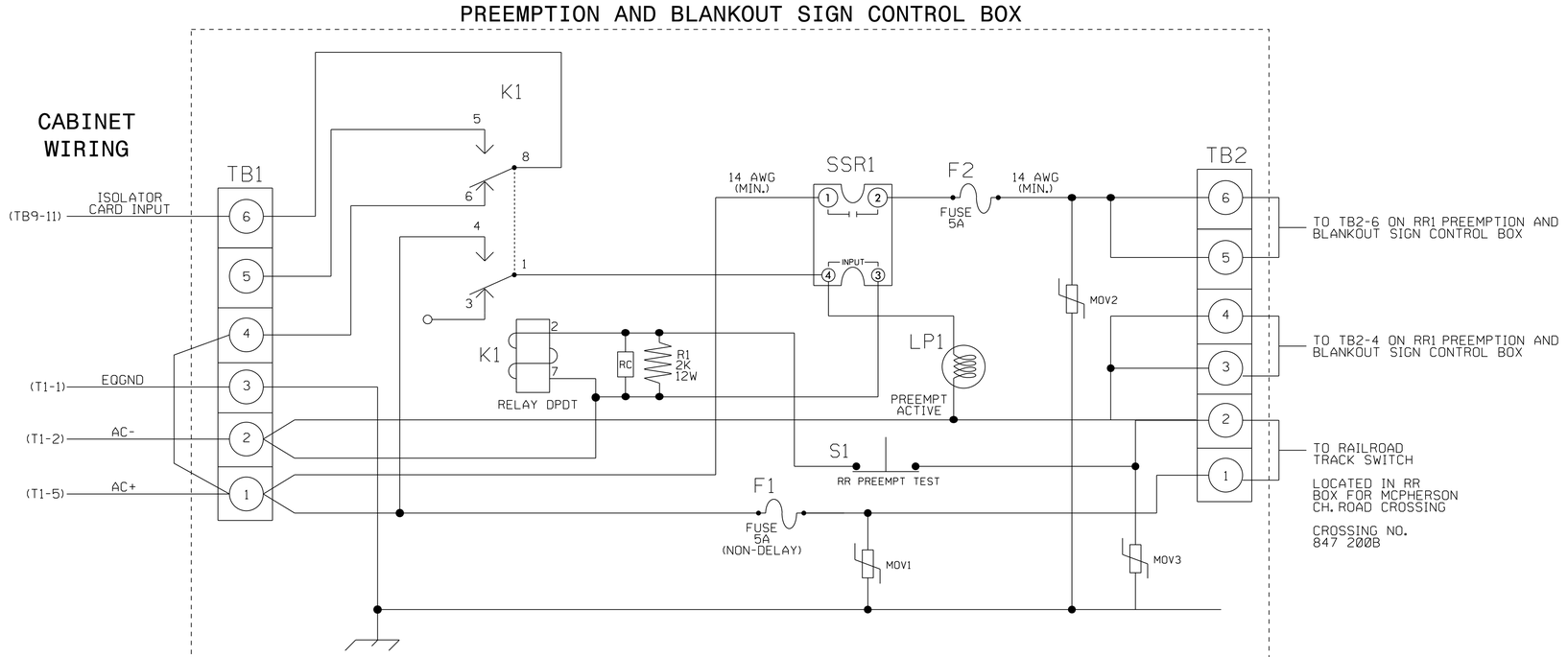
SIG. INVENTORY NO. 06-0054

DATE:
I:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0054.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.3

RAILROAD PREEMPTION WIRING DETAIL FOR RR2 (LINKED RR PREEMPTS 3 & 4)

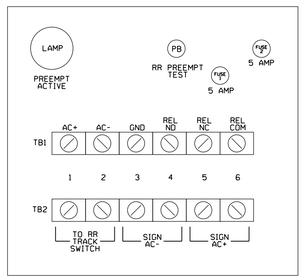
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card. See AC Isolator Output Programming Detail on Sheet 6.

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 6

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Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054

DATE:
U:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0054.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.4

ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [4. PREEMPTOR/TSP]

2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

```
PREEMPT PLAN [  1]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    YES|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YEL| RED
ENTRANCE TM.   1|  3.0|  1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YEL| RED
TRACK CLEAR   19|    0|  0| 4.6| 2.3
-----------MIN DLI|PMTEXTI|MX TMI YEL| RED
DWL/CYC-EXIT   7|  0.0|  0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1  2  3  4  5  6  7  8
PR RTN%    0  0  0  0  0  0  0  0
PHASES     9 10 11 12 13 14 15 16
PR RTN%    0  0  0  0  0  0  0  0
```

NOTICE
LINK PMT 1 →

Place cursor in [ ] next to Preempt Plan and press 2. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #2.

```
PREEMPT PLAN [  2]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....1|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YEL| RED
ENTRANCE TM. 255|  255|  1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YEL| RED
TRACK CLEAR   35|    0|  0| 3.8| 2.5
-----------MIN DLI|PMTEXTI|MX TMI YEL| RED
DWL/CYC-EXIT   0|  0.0|  0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1  2  3  4  5  6  7  8
PR RTN%    0  0  0  0  0  0  0  0
PHASES     9 10 11 12 13 14 15 16
PR RTN%    0  0  0  0  0  0  0  0
```

Linked preempts 1 and 2 make up preempt RR1

Place cursor in [ ] next to Preempt Plan and press 3. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #3.

```
PREEMPT PLAN [  3]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V X . . . . X . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    YES|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....0|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YEL| RED
ENTRANCE TM.   1|  3.0|  1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YEL| RED
TRACK CLEAR   35|    0|  0| 3.8| 2.5
-----------MIN DLI|PMTEXTI|MX TMI YEL| RED
DWL/CYC-EXIT   7|  0.0|  0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1  2  3  4  5  6  7  8
PR RTN%    0  0  0  0  0  0  0  0
PHASES     9 10 11 12 13 14 15 16
PR RTN%    0  0  0  0  0  0  0  0
```

NOTICE
LINK PMT 3 →

Place cursor in [ ] next to Preempt Plan and press 4. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #4.

```
PREEMPT PLAN [  4]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . X . . X . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . . X . . . . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . . . . . . . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE..|INTERLOCK. NO
DET LOCK... .|DELAY..    0|INHIBIT...  0
OVERIDE FL. .|DURATION   0|CLR-GRN... NO
TERM OLP.  NO|PC>YEL    NO|TERM PH    NO
PED DARK.. NO|TC RESRV YES|DWELL FL  OFF
LINK PMT....3|X FLCOLR RED|EXIT OPT. OFF
X TMG PLN...0|RE-SERV..  0|FLT TYPE.HARD
FREE DUR PMT|R1 NO|R2 NO|R3 NO|R4 NO
--TIMING-----WALK|PED CLMN GRI YEL| RED
ENTRANCE TM. 255|  255|  1|25.5|25.5
-----------MIN GRI|EXT GRI|MX GRI YEL| RED
TRACK CLEAR   19|    0|  0| 4.6| 2.3
-----------MIN DLI|PMTEXTI|MX TMI YEL| RED
DWL/CYC-EXIT   0|  0.0|  0|25.5|25.5
PMT ACTIVE OUT..ON   PMT ACT DWELL...NO
OTHER - PRI PMT.OFF  NON-PRI PMT.....OFF
INH EXT TIME... 0.0  PED PR RETURN...OFF
PRIORITY RETURN.OFF  QUEUE DELAY.... OFF
COND DELAY......OFF
PHASES     1  2  3  4  5  6  7  8
PR RTN%    0  0  0  0  0  0  0  0
PHASES     9 10 11 12 13 14 15 16
PR RTN%    0  0  0  0  0  0  0  0
```

Linked preempts 3 and 4 make up preempt RR2

ECONOLITE ASC/3-2070 PREEMPT FILTERING

1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [2. ENABLE PREEMPT FILTERING & TSP/SCP]
3. Ensure all preempt entries are set to BYPASSED for both SOLID and PULSING.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 4 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering Branch, Mobility and Safety Division, North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road)
at
McPherson Church Road/
Owen Drive

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054

DATE:
Mar
C:\traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0054.dgn
User:rmurcay

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.5

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    1  COPY FROM:    1  ACTIVE:  M
IF     DET                 52   IS  ON

THEN  LP SET LOGIC FLAG     1       ON

ELSE
```

IF RR1 PREEMPT (REMAPPED AS DET 52) INPUT IS ACTIVE, SET LOGIC FLAG 1 ON.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    2  COPY FROM:    2  ACTIVE:  M
IF     LP FLAG             1    IS  ON

THEN   PMT CALL PMT SEQ    2       ON

ELSE
```

IF LOGIC FLAG 1 IS ON, THEN INITIATE PREEMPT 2 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    3  COPY FROM:    3  ACTIVE:  M
IF     DET                 54    IS  ON

THEN   LP SET LOGIC FLAG   2       ON

ELSE
```

IF RR2 PREEMPT (REMAPPED AS DET 54) INPUT IS ACTIVE, SET LOGIC FLAG 2 ON.

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    4  COPY FROM:    4  ACTIVE:  M
IF     LP FLAG             2    IS  ON

THEN   PMT CALL PMT SEQ    4       ON

ELSE
```

IF LOGIC FLAG 2 IS ON, THEN INITIATE PREEMPT 4 SEQUENCE. THE PREEMPT MAY OR MAY NOT ACTUALLY BE SERVED DEPENDING ON THE STATE OF THE OTHER RR PREEMPT INPUT.

ENTER A "5" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    5  COPY FROM:    5  ACTIVE:  M
IF     DET                 52   IS  OFF
AND    DET                 54   IS  OFF

THEN   LP SET LOGIC FLAG   1       OFF
THEN   LP SET LOGIC FLAG   2       OFF

ELSE
```

WHEN BOTH PREEMPT INPUTS GO INACTIVE, THIS LOGIC RESETS THE LOGIC FLAG THAT IS HOLDING THE ACTIVE PREEMPT ACTIVE, AND RESETS THE OTHER LOGIC FLAG TO PREVENT IT FROM CALLING THE OTHER PREEMPT.

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-5 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  E  E  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

ECONOLITE ASC/3-2070 I/O PIN REMAPPING FOR RR1 AND RR2 PREEMPT INPUTS

The ASC/3 Configurator utility program must be used to remap the I/O pins as shown below. Consult the ASC/3 Configurator User Guide for specific instructions on software use.

1. Run the Configurator utility. Load a file as the Current DB.
2. Choose the C1-in tab to change the I/O mapping as needed. Use the drop down list within the program to select the assigned function for the pins shown below.
3. Save the database file and download it to the controller.

C1 PIN #	DEFAULT FUNCTION	ASSIGNED FUNCTION
PIN 51-PREEMPT 1 CALL		DETECTOR 52
PIN 52-PREEMPT 2 CALL		DETECTOR 54

NOTE: PREEMPT INPUTS REMAPPED AS DETECTORS

NOTE: The steps below can be used to view changes to I/O pins within the controller. Any I/O pins that have been remapped will display and show their default function in addition to the current assigned function.

1. From Main Menu select [7. STATUS DISPLAY]
2. From STATUS DISPLAY Submenu select [8. INPUTS/OUTPUTS]
3. From INPUT/OUTPUT Submenu select [9. I/O DIFFERENCES]

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR REMAPPED DETECTORS

(program controller as shown)

The preempt inputs remapped as detectors that are to be used by the logic processor are assigned to a dummy phase 9 as shown in the detector setup programming below.

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]

- Place cursor in VEH DETECTOR [ ] position and enter "52".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [52]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
52  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "54".

DISABLE TS2 DETECTOR →
ASSIGN PHASE 9 →

```
VEH DETECTOR [54]    VEH DET PLAN [ 1]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
54  9    . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 5 of 6

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Traffic Engineering, Mobility and Safety Division
NCDEPARTMENT OF TRANSPORTATION
Traffic Engineering & Safety Systems Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at McPherson Church Road/ Owen Drive

Division 6	Cumberland County	Fayetteville
PLAN DATE: March 2018	REVIEWED BY:	L Overn
PREPARED BY: G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

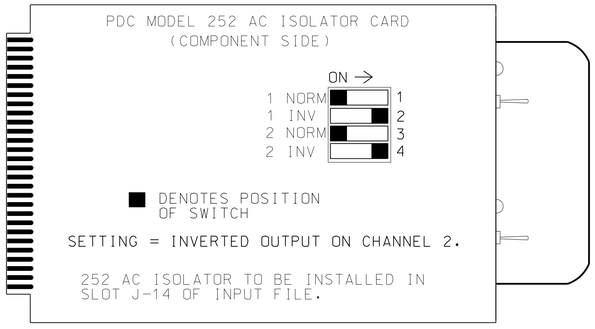
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054

DATE:
User:rmuncey
File:C:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0054.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-69.6

AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

Select TMG VEH OVLP [A] and 'NORMAL'

```
TMG VEH OVLP...[A] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . .
LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0054
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 6 of 6

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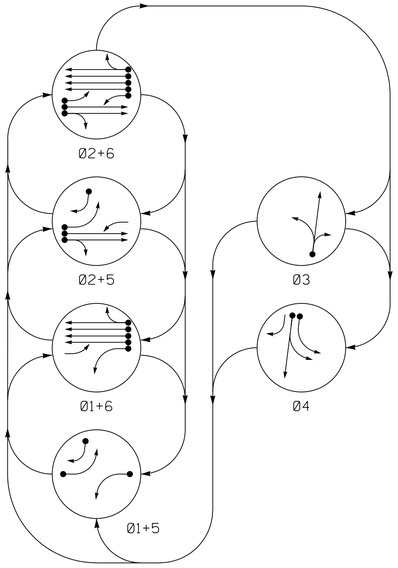
PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

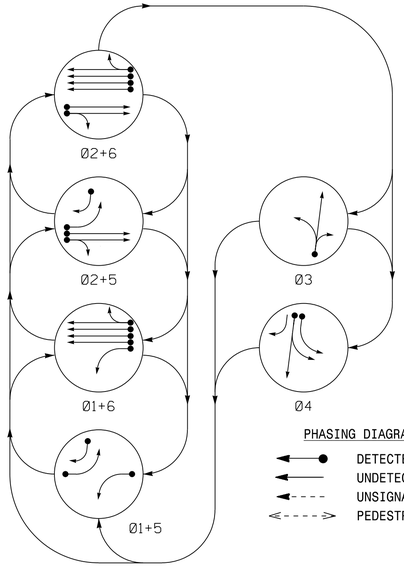
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0054

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-70.0

DEFAULT PHASING DIAGRAM

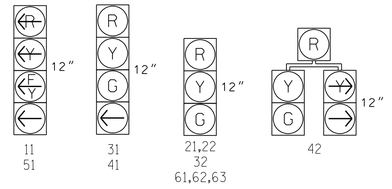


ALTERNATE PHASING DIAGRAM



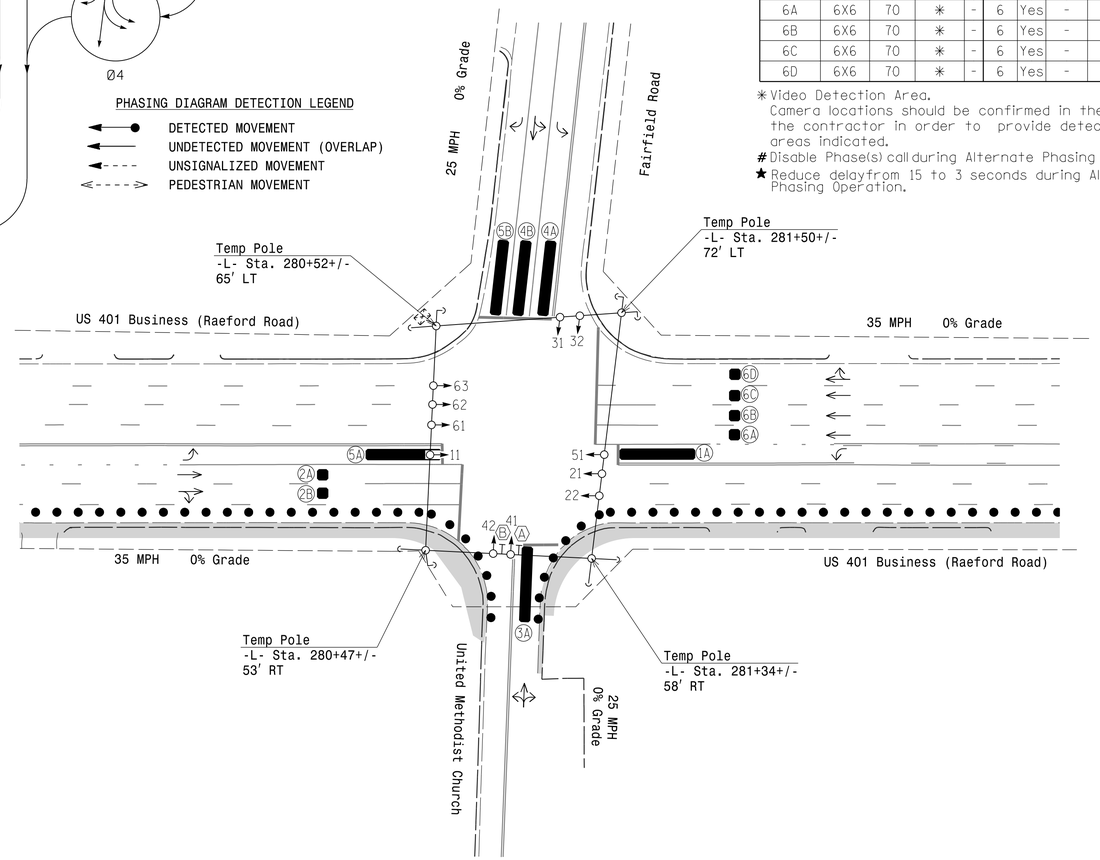
SIGNAL FACE I.D.

All Heads L.E.D.



PHASING DIAGRAM DETECTION LEGEND

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



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	FLASH
11	←	←	←F/Y	←F/Y	←R	←R	←Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G←	R
42	R/→	R	R/→	R	R	G	R
51	←	←F/Y	←	←F/Y	←R	←R	←Y
61,62,63	R	G	R	G	R	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03	04	FLASH
11	←	←	←R	←R	←R	←R	←Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G←	R
42	R/→	R	R/→	R	R	G	R
51	←	←R	←	←R	←R	←R	←Y
61,62,63	R	G	R	G	R	R	Y

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	15	45	20	15	15	45
Yellow	3.0	3.8	3.2	3.2	3.0	3.8
Red Clear	2.3	2.0	2.8	3.0	2.8	2.0
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	UUSE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	-	-	S	-	X
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	5	-	S	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	S	-	X
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	X
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6D	6X6	70	✳	-	6	Yes	-	-	-	S	-	X

✳ Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delayfrom 15 to 3 seconds during Alternate Phasing Operation.

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
7. The Division (City) 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 supersede these values.
9. Field adjust temporary poles as needed.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	- - - - -
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ●	Construction Zone Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ

Signal Upgrade
Temporary Signal Design 1 - TMP Phase I

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Prepared for the Offices of:
Transportation Mobility and Safety Division
DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Business (Raeford Road)
at
Fairfield Road/
United Methodist Church
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

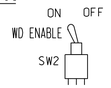
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

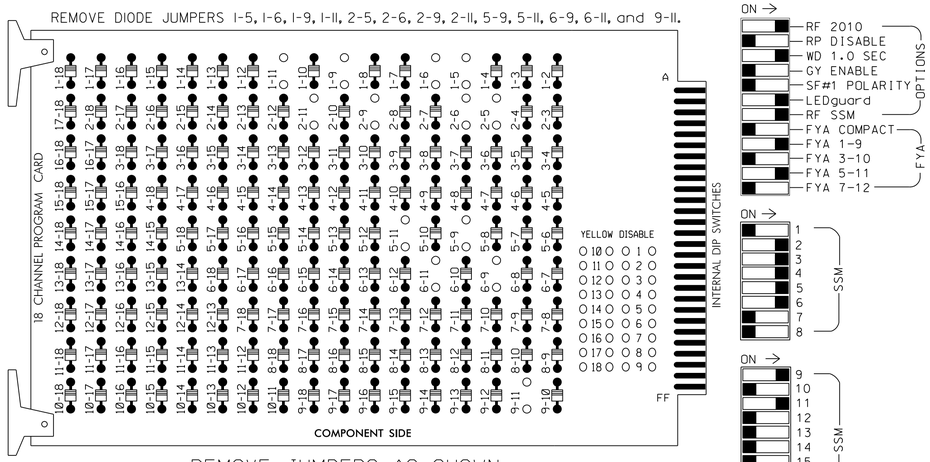
Designed by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0001TI

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 and Phase 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8, AUX S1,AUX S4
PHASES USED.....1,2,3,4,5,6
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-70.1

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	3	4	4	4 PED	5	4	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	NU	31	32	41	42	NU	51 ★	42	61,62, 63	NU	NU	NU	NU	11 ★	NU	NU	51 ★	NU	NU
RED		128		116	116	101	101		*		134										
YELLOW	*	129		117	117	102	102				135										
GREEN		130		118	118	103	103				136										
RED ARROW																A121			A114		
YELLOW ARROW										132						A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW	127			118		103			133	133											

NU = Not Used

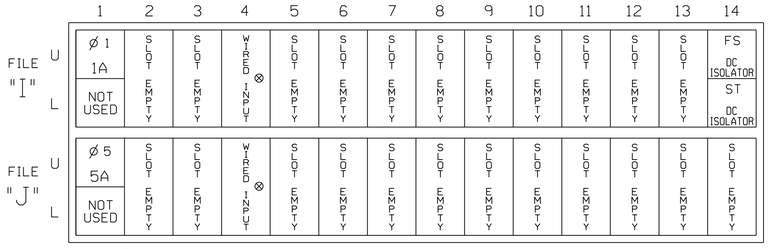
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail below.

DETECTOR NOTES

1. For all loops install a video 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.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
5A [2]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				S

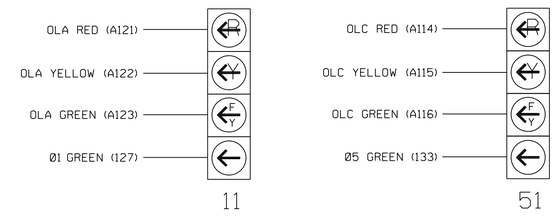
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

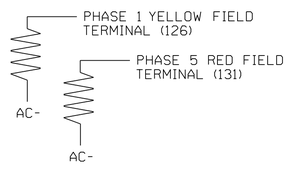
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0001T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Traffic Engineering Branch Traffic Mobility and Safety Division Traffic Signals Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Fairfield Road/ United Methodist Church
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001T1

DATE:
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0001T1.dgn
User:lrmuncey

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM                TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
        THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "1".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "26".
   - Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "22".
   - Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

END PROGRAMMING

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....    PHASE    1
OPPOSING THROUGH.......    PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1
```

← NOTICE SF BIT DISABLE 1

Toggle Twice

OVERLAP C

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

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

PROTECTED LEFT TURN....    PHASE    5
OPPOSING THROUGH.......    PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5
```

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........  --   RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..  NO   PRIORITY RETURN. NO
PED PR RETURN..   NO   QUEUE DELAY..... NO
PMT COND DELAY    NO
  PHASE  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL  . . . . . . . . . . . . . . . .
WALK 2   . . . . . . . . . . . . . . . .
VEX 2    . . . . . . . . . . . . . . . .
VEH RCL  . . . . . . . . . . . . . . . .
MAX RCL  . . . . . . . . . . . . . . . .
MAX 2    . . . . . . . . . . . . . . . .
  PHASE  1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3    . . . . . . . . . . . . . . . .
CS INH   . . . . . . . . . . . . . . . .
OMIT     . . . . . . . . . . . . . . . .
SPC FCT  X . . . X . . . (1-8)
AUX FCT  . . . (1-3)
         1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15  . . . . . . . . . . . . . . . .
LP 16-30 . . . . . . . . . . . . . . . .
LP 31-45 . . . . . . . . . . . . . . . .
LP 46-60 . . . . . . . . . . . . . . . .
LP 61-75 . . . . . . . . . . . . . . . .
LP 76-90 . . . . . . . . . . . . . . . .
LP 91-100. . . . . . . . . . . . . . . .
```

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-70.2

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0001T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN

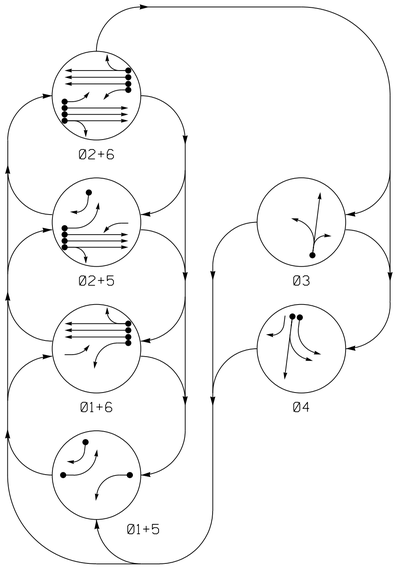
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0001T1

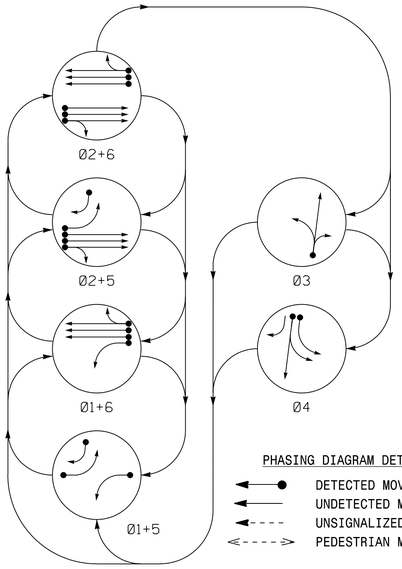
DATE:
User:lrmurcey
File:C:\Traffic Signals\Designs\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0001T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-71.0

DEFAULT PHASING DIAGRAM

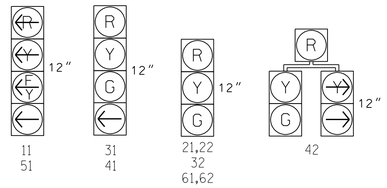


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



PHASING DIAGRAM DETECTION LEGEND

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

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	UUSE ADDED INTIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	-
					6#	Yes	-	-	-	S	-	-
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2C	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	5	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	-
					2#	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delay from 15 to 3 seconds during Alternate Phasing Operation.

6 Phase Fully Actuated Fayetteville Signal System

NOTES

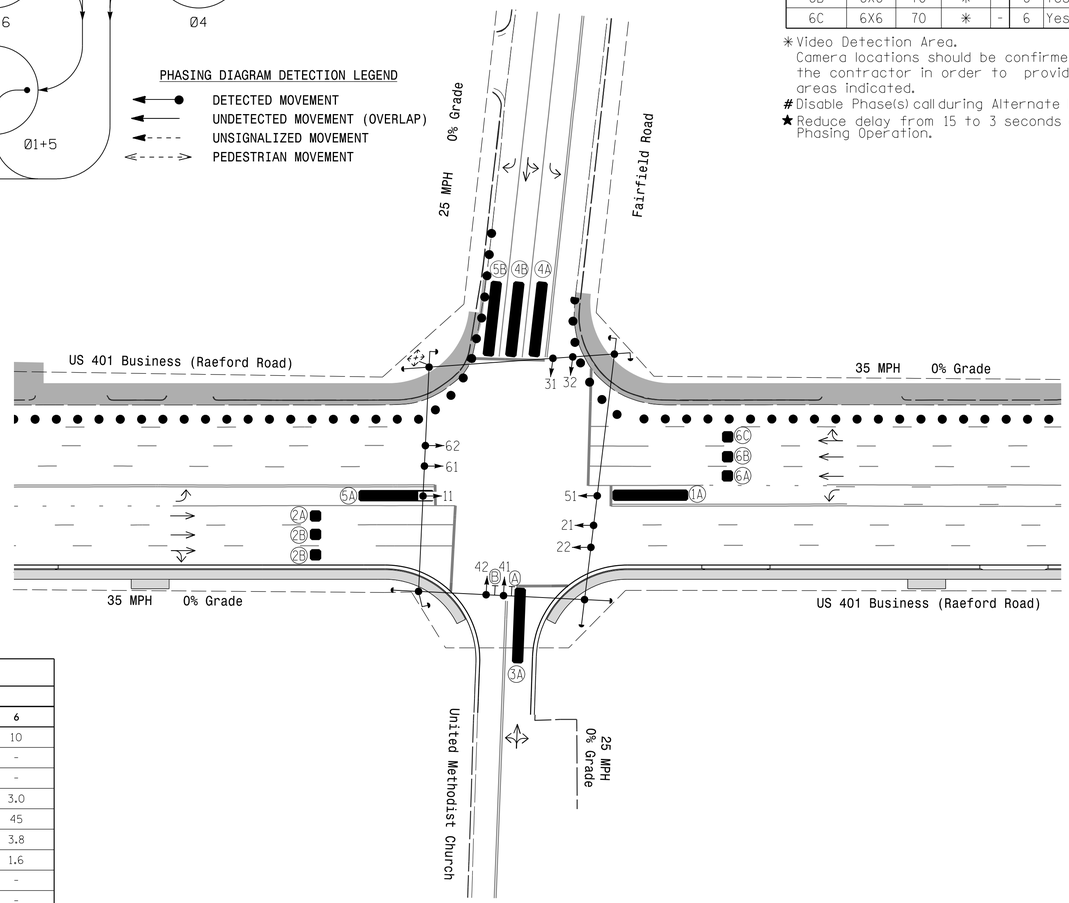
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Reposition existing signal heads numbered 21,22,61 and 62.
6. The Division (City) Traffic Engineer will determine hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	F Y	F Y	R	R	Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	G ←	R	R
42	R/	R	R/	R	R	G	R
51	←	F Y	←	F Y	R	R	Y
61,62	R	G	R	G	R	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	R	R	R	R	Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G ←	R
42	R/	R	R/	R	R	G	R
51	←	R	←	R	R	R	Y
61,62	R	G	R	G	R	R	Y



ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	15	45	20	15	15	45
Yellow	3.0	3.8	3.2	3.2	3.0	3.8
Red Clear	2.4	1.6	2.4	3.0	2.4	1.6
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
	Video Detection Area	N/A
	Construction Zone	N/A
	Construction Zone Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ

Signal Upgrade
Temporary Signal Design 2 - TMP Phase II

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Business (Raeford Road)
at
Fairfield Road/
United Methodist Church
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

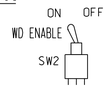
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0001T2

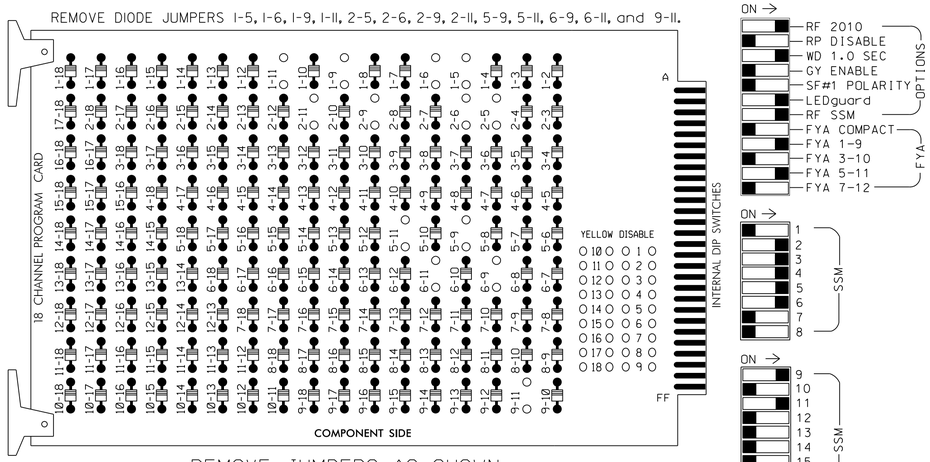
3/29/2018
10:24:12 AM
L:\Projects\Design\Signal Designs\Temporary Signal Designs\Phase 2\U-4405_sig_dsn_06-000112.dgn
User:rmuncey

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 5-9, 5-11, 6-9, 6-11, and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 and Phase 6 Green.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8, AUX S1,AUX S4
PHASES USED.....1,2,3,4,5,6
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-71.1

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	3	4	4	4 PED	5	4	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	NU	31	32	41	42	NU	51 ★	42	61,62	NU	NU	NU	NU	11 ★	NU	NU	51 ★	NU	NU
RED		128		116	116	101	101		*		134										
YELLOW	*	129		117	117	102	102				135										
GREEN		130		118	118	103	103				136										
RED ARROW																A121			A114		
YELLOW ARROW										132						A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW	127			118		103			133	133											

NU = Not Used

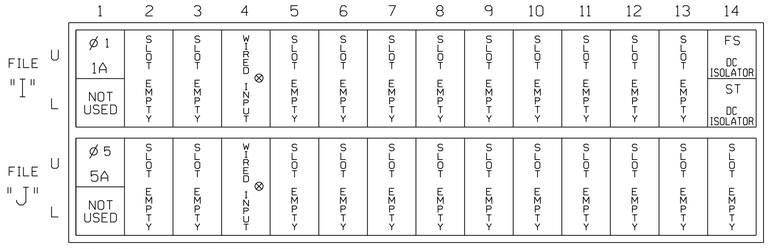
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail below.

DETECTOR NOTES

1. For all loops install a video 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.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
5A [2]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				S

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

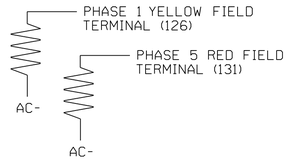
★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

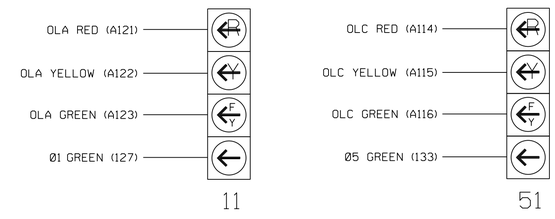
(install resistors as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0001T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Fairfield Road/
United Methodist Church
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001T2

DATE:
File: C:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0001T2.dgn
User:lrmurcey

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM                TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
        THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "1".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "26".
   - Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE DELAY IS SET TO '3.0'

   - Place cursor in VEH DETECTOR [ ] position and enter "22".
   - Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

← NOTICE VEH DET PLAN 2

← ENSURE PHASE IS SET TO "0"

END PROGRAMMING

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

← NOTICE SF BIT DISABLE 1

Toggle Twice

OVERLAP C

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

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

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........  --   RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..  NO   PRIORITY RETURN. NO
PED PR RETURN..   NO   QUEUE DELAY..... NO
PMT COND DELAY    NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   X . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-71.2

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1.5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0001T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 2

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN

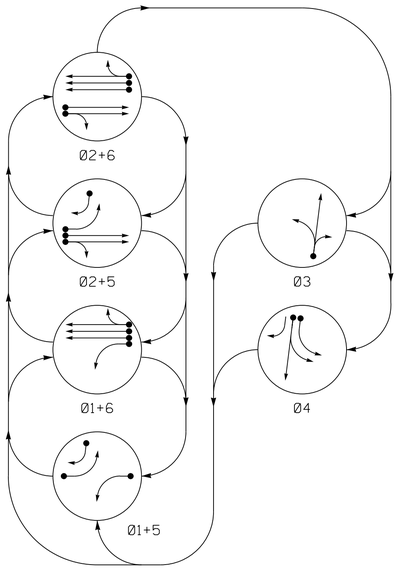
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0001T2

DATE:
User:rmurkey
File:C:\Traffic Signals\Designs\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0001T2.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-72.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

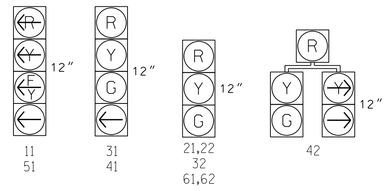
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	03	04	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R/→	R	R/→	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

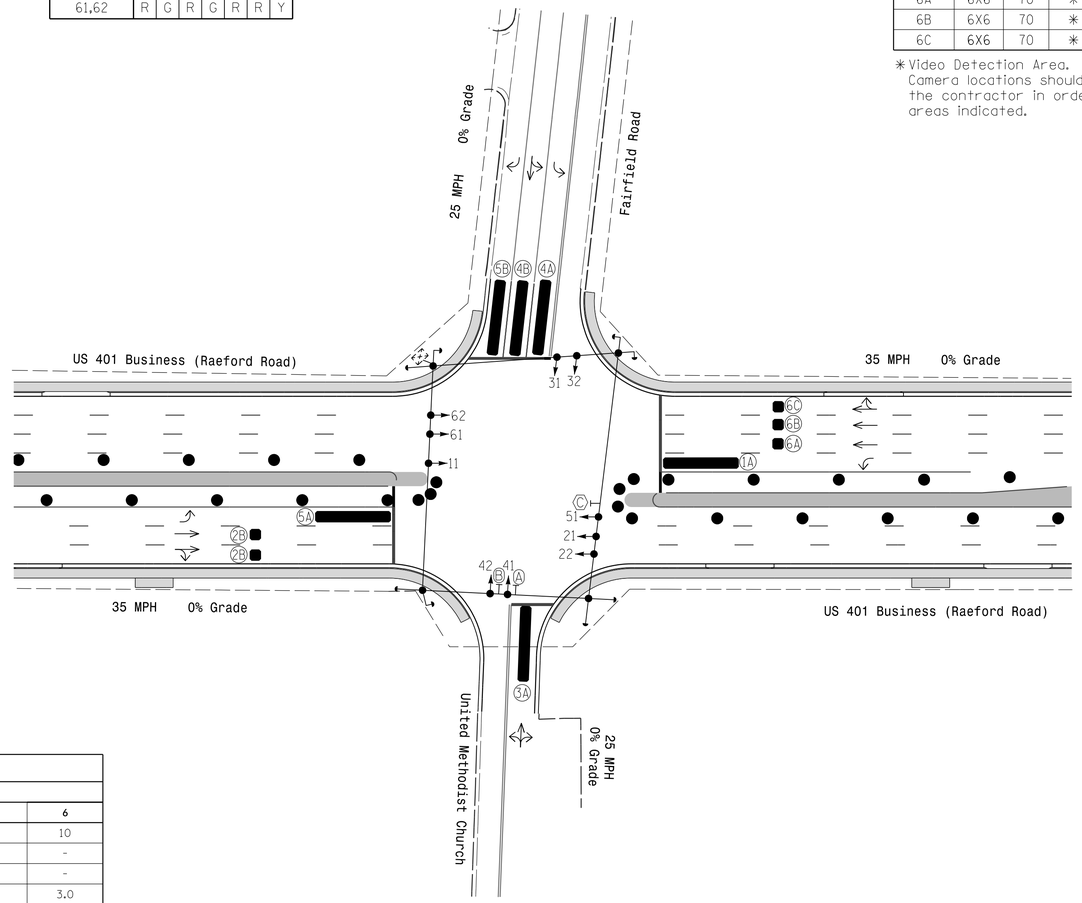
All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	UUSE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	✳	-	3	Yes	-	5	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	15	45	20	15	15	45
Yellow	3.0	3.8	3.2	3.2	3.0	3.8
Red Clear	3.3	2.0	3.1	3.1	3.5	2.0
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Reposition existing signal heads numbered 21.22.61 and 62.
6. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ●	Construction Zone Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

Signal Upgrade
Temporary Signal Design 3 - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Prepared for the Offices of:
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Fairfield Road/
United Methodist Church

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

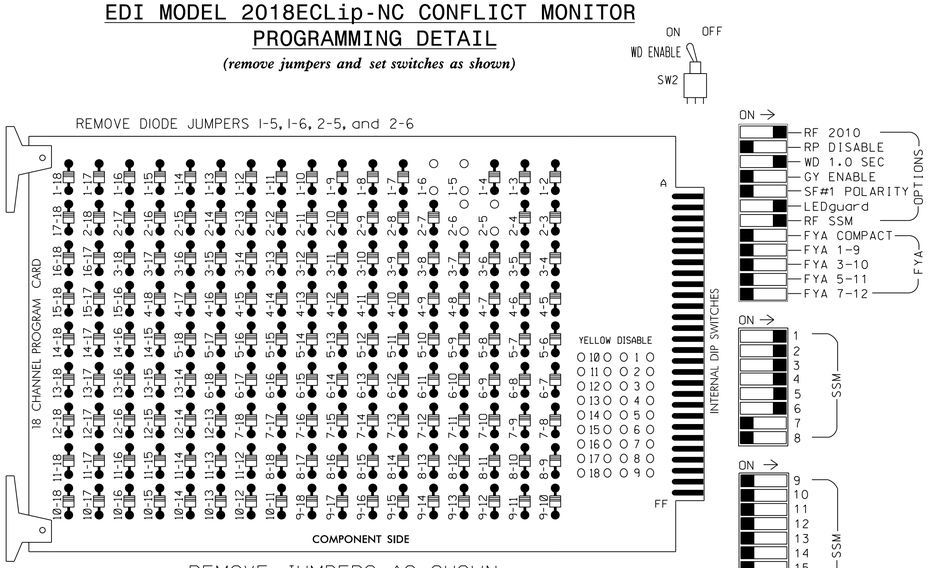
REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001T3

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 and Phase 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
PHASES USED.....1,2,3,4,5,6
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-72.1

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	3	4	4	4 PED	5	4	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	NU	51	42	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED		128		116	116	101	101				134										
YELLOW		129		117	117	102	102				135										
GREEN		130		118	118	103	103				136										
RED ARROW	125								131												
YELLOW ARROW	126								132	132											
GREEN ARROW	127			118		103			133	133											

NU = Not Used

DETECTOR NOTES

1. For all loops, install a video 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.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phases 2 and 6.

INPUT FILE POSITION LAYOUT

(front view)

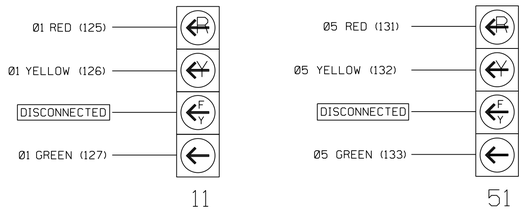
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY

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

FS = FLASH SENSE
ST = STOP TIME

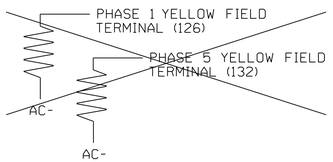
SIGNAL WIRING DETAIL

(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

IMPORTANT! Remove resistors from field terminals as shown above, if present.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0001T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NCDOT Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Fairfield Road/
United Methodist Church

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

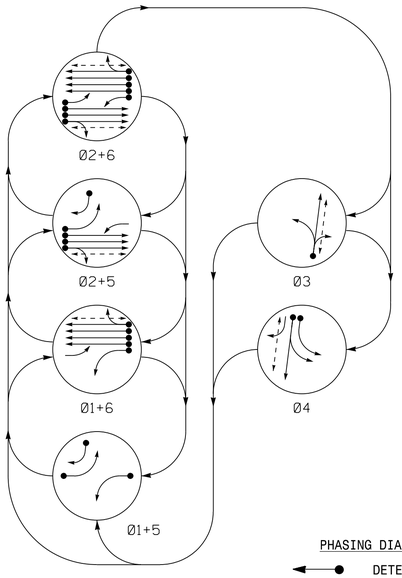
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001T3

DATE:
I:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0001T3.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-73.0

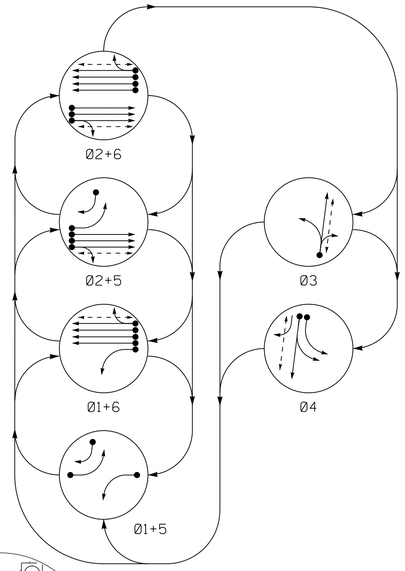
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	Ø3	Ø4	FLASH
11	←	←	F Y	F Y	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R G ←	R	R
42	R ↗	R ↗	R ↗	R	R	G	R
51	←	F Y	←	F Y	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	Ø3	Ø4	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R G ←	R	R
42	R ↗	R ↗	R ↗	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR						PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	UUSE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	-	-	G	-	X
2A	6X6	70	3	X	2	Yes	-	-	-	S	-	X
2B	6X6	70	3	X	2	Yes	-	-	-	S	-	X
2C	6X6	70	3	X	2	Yes	-	-	-	S	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	5	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	G	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	S	-	X
6A	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6B	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6C	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6D	6X6	70	4	X	6	Yes	-	-	-	S	-	X

Disable Phase(s) call during Alternate Phasing Operation.
★ Disable delay during Alternate Phasing Operation.

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

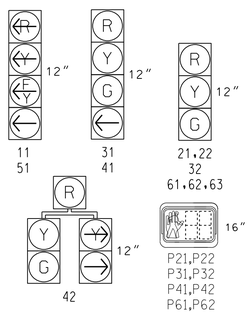
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
8. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

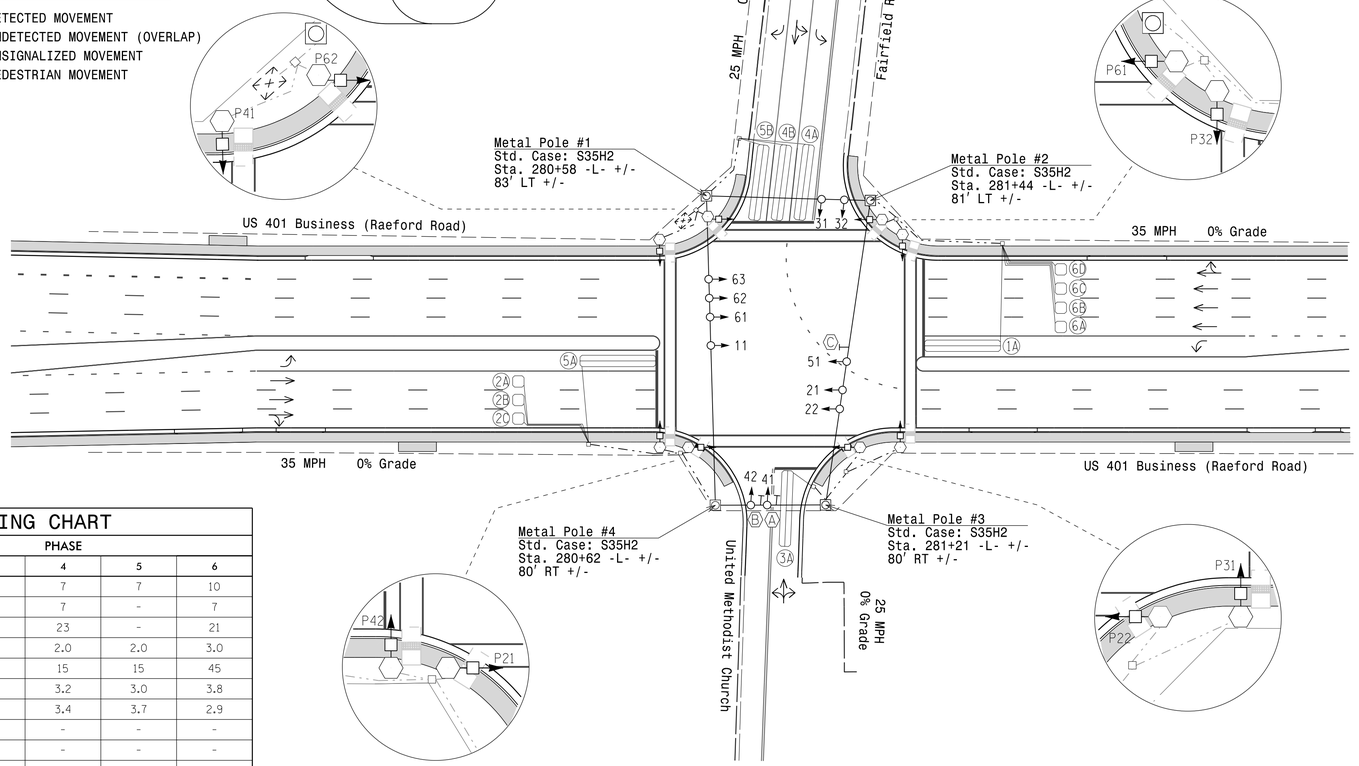
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	7	-	7
Ped Clear	-	18	24	23	-	21
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	15	45	20	15	15	45
Yellow	3.0	3.8	3.2	3.2	3.0	3.8
Red Clear	3.5	2.9	3.3	3.4	3.7	2.9
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	- - -
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	— — — —
→	Directional Arrow	→
◎	Metal Strain Pole	◘
⬡	Type II Signal Pedestal	⬢
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SCALE 0 40 1"=40'

US 401 Business (Raeford Road)
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Fairfield Road/
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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

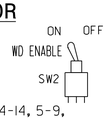
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSEY L. WATSON

DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

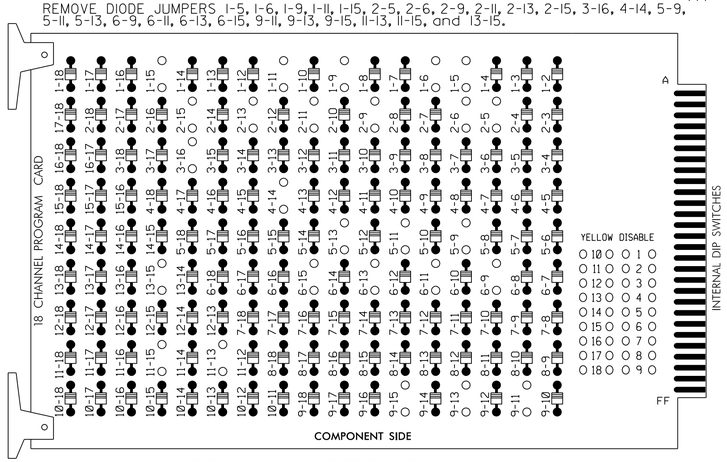
SIG. INVENTORY NO. 06-0001

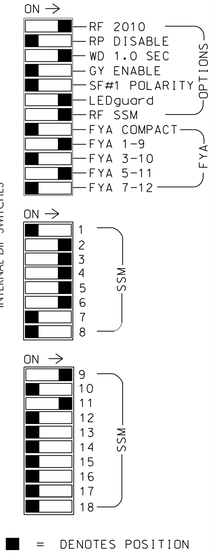
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, I-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-16, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15.





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 WALK and Phase 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8, S9,S12,AUX S1,AUX S4
PHASES USED.....1,2,2PED,3,4,4PED,5,6, 6PED,3PED
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-73.1

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	3	4	4	4 PED	5	4	6	6 PED	7	8	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	31	32	41	42	P41, P42	51★	42	61,62, 63	P61, P62	NU	NU	P31, P32	11★	NU	NU	51★	NU	NU
RED		128		116	116	101	101		*		134										
YELLOW	*	129		117	117	102	102				135										
GREEN		130		118	118	103	103				136										
RED ARROW																A121			A114		
YELLOW ARROW										132						A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW	127			118		103			133	133											
✋			113					104				119			110						
🚶			115					106				121			112						

NU = Not Used

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

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.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	ø2 2C	WIRED INPUT ⊗	ø3 3A	ø4 4A	ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø2 PED DC ISOLATOR	ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	ø2 2B	NOT USED		NOT USED	ø4 4B	NOT USED					ø4 PED DC ISOLATOR	ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	ø6 6C	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	ø6 6D											

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A[1]	TB2-1,2	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				G
2A	TB2-5,6	I2U	39	2	2	YES				S
2B	TB2-7,8	I2L	43	12	2	YES				S
2C	TB2-9,10	I3U	63	32	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		5		S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES				S
5A[2]	TB3-1,2	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				G
5B	TB6-1,2	I7U	65	34	5	YES		15		S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
6D	TB3-11,12	J3L	77	46	6	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

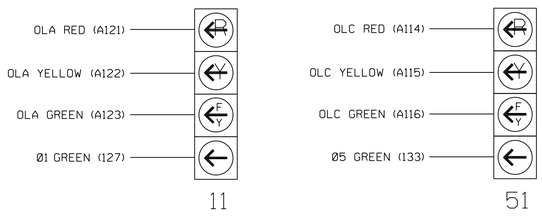
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See Vehicle Detector Setup Programming Detail for alternate phasing on Sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

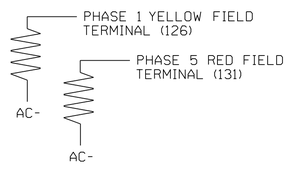
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0001
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Fairfield Road/ United Methodist Church

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001

DATE: 3/29/2018
File: C:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_e1e_06-0001.dgn
User: rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-73.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1
```

← NOTICE SF BIT DISABLE 1

Toggle Twice

OVERLAP C

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

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5
```

← NOTICE SF BIT DISABLE 5

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........   --  RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   X . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1   2   3   4   5   6   7   8
DETECTOR  0   2   8   4   0   6   0   0

   PHASE  9  10  11  12  13  14  15  16
DETECTOR  0   0   0   0   0   0   0   0
```

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
    PHASE      DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1     1    V   . . . + A   R   X
2     2    V   . . . + A   Y   .
3     3    V   . . . + A   R   X
4     4    V   . . . + A   R   .
5     5    V   . . . - A   R   .
6     6    V   . . . - A   Y   X
7     7    V   . . . - A   R   .
8     8    V   . . . - A   R   X
9     1    O   . . . + A   Y   X
10    2    O   . . . + A   R   X
11    3    O   . . . - A   Y   .
12    4    O   . . . - A   R   .
13    2    P   . . . + A   .   .
14    4    P   . . . - A   .   .
15    6    P   . . . + A   .   .
16    3    P   . . . - A   .   .
```

NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16 →

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0001
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

Traffic Engineering Branch, Mobility and Safety Division, NCDOT, State of North Carolina, Department of Transportation

750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at Fairfield Road/ United Methodist Church

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II

DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0001

DATE:
User:
File: Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0001.dgn
User:rmurcay

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-73.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".
- Set delay time to "0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE DELAY IS SET TO '0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "26".
- Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE DELAY IS SET TO '0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0001
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

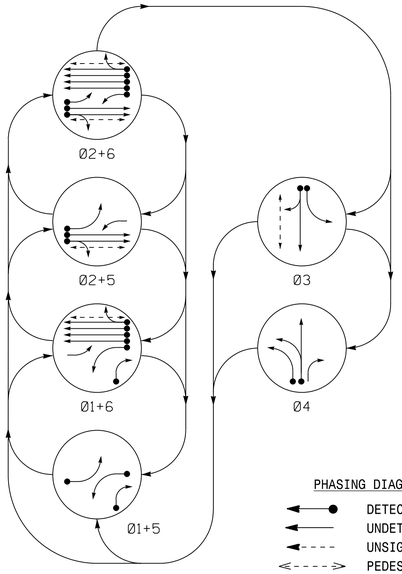
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0001

DATE:
User:rtraffic
I:\Traffic\Signals\Designs\Electrical Details\Final Signals\U-4405_sig_eld_06-0001.dgn
User:rtrumcky

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-74.0

6 Phase Fully Actuated Fayetteville Signal System

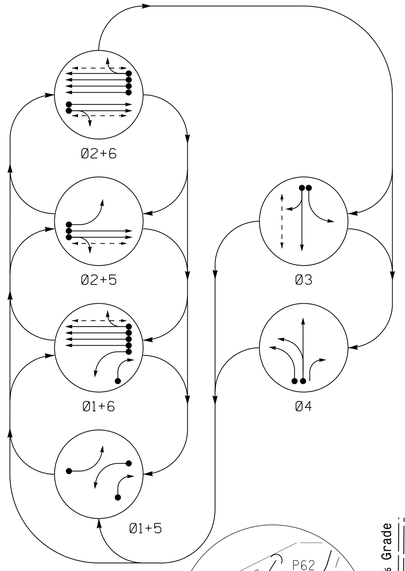
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←●	←	F Y	F Y	R	R	Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G ←	R
42	R / R	R / ←	R	R	R	G	R
51	←●	F Y ←	←	F Y	R	R	Y
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

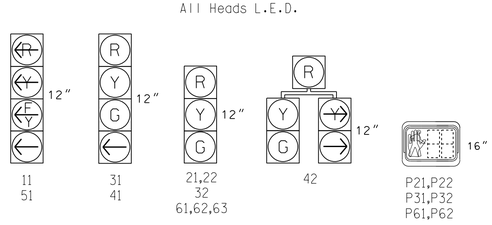
SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←●	←	R	R	R	R	Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G ←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G ←	R
42	R / R	R / ←	R	R	R	G	R
51	←●	R ←	←	R	R	R	Y
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

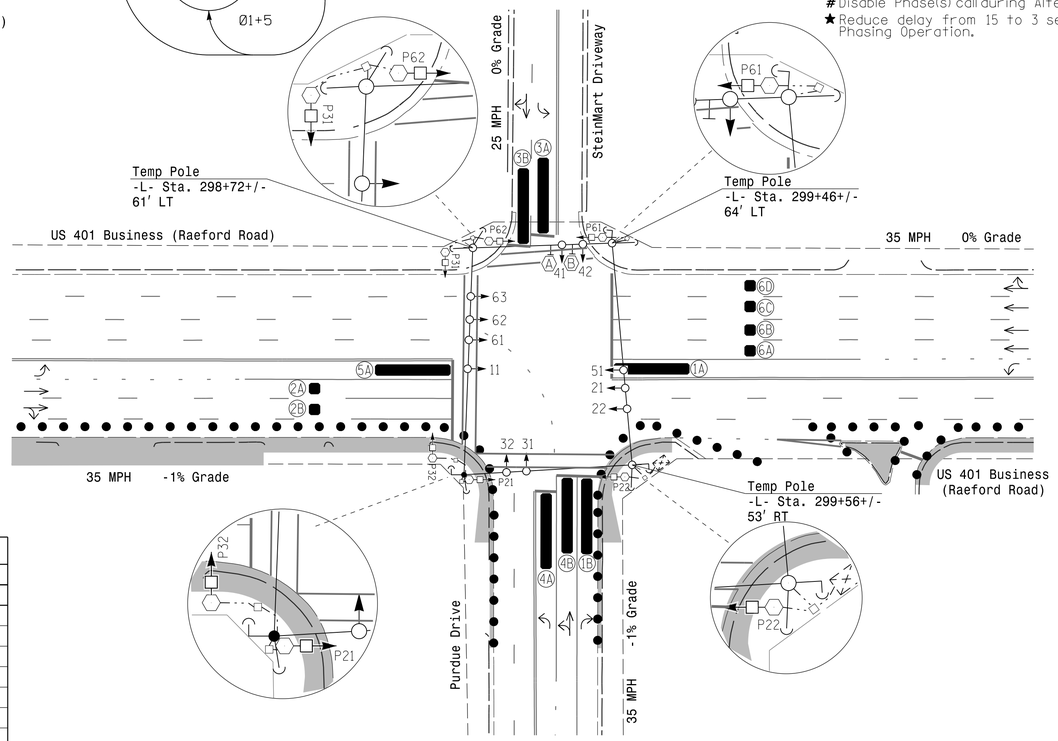
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	-	-	S	-	X
1B	6X40	0	✳	-	1	Yes	-	15	-	S	-	X
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	✳	-	3	Yes	-	10	-	S	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	S	-	X
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6D	6X6	70	✳	-	6	Yes	-	-	-	S	-	X

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delay from 15 to 3 seconds during Alternate Phasing Operation.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
9. The Division (City) Traffic Engineer will determine hours of use for each phasing plan.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestrian pedestals are conceptual and shown for reference only. See NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for pushbutton location details.
12. Field adjust temporary poles as needed.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-·-·-	2-in Underground Conduit	-·-·-
N/A	Right of Way	———
→	Directional Arrow	→
▬	Video Detection Area	N/A
⬡	Type II Signal Pedestal	⬢
▭	Construction Zone	N/A
●●●	Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	-	-	7
Ped Clear	-	17	24	-	-	12
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	20	90	25	25	20	90
Yellow	3.0	3.9	3.2	3.9	3.0	3.9
Red Clear	2.3	2.0	3.1	2.3	2.9	2.0
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 1 - TMP Phase I

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

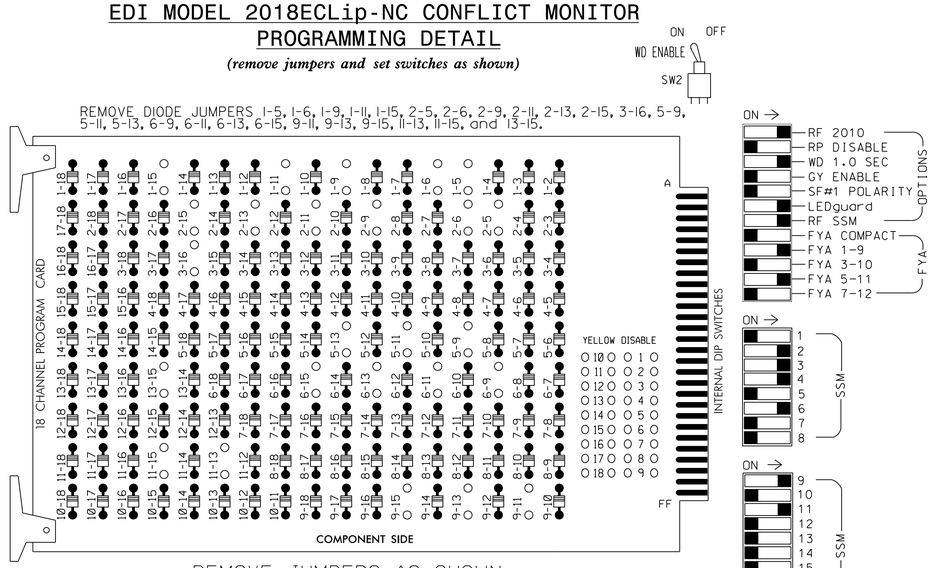
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSEY L. WATSON

DocuSigned by: Betsey L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224TI

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

■ = DENOTES POSITION OF SWITCH

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 for start up in Phase 2 WALK and Phase 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8, S9,S12,AUX S1,AUX S4
PHASES USED.....1,2,2PED,3,4,5,6, 6PED,3PED
OVERLAP A.....✳
OVERLAP B.....NOT USED
OVERLAP C.....✳
OVERLAP D.....NOT USED

✳ See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-74.1

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	3 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11★	42	21,22	P21, P22 / 31	32 / 41	42 / NU	51★	61,62, 63	P61, P62	NU	NU	P31, P32	11★	NU	NU	51★	NU	NU
RED	✳		128	116	116	101	101		134									
YELLOW			129	117	117	102	102	✳	135									
GREEN			130	118	118	103	103		136									
RED ARROW													A121			A114		
YELLOW ARROW		126											A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127	127		118	103		133											
✋			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 below.

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.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED											NOT USED	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED														

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A[1]	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
5A[2]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

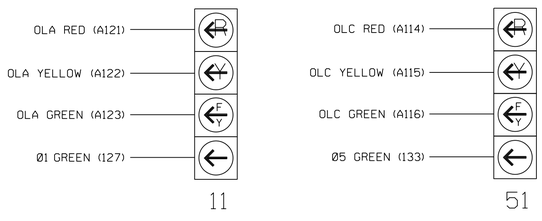
NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See Vehicle Detector Setup Programming Detail for alternate phasing on Sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

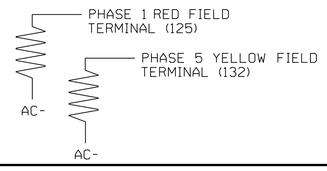
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



DETECTOR NOTES

1. For all loops install a video 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.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 2 and 3 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 1 of 3

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Prepared In the Offices of:
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750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
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SteinMart Driveway
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224T1

DATE: 3/29/2018
User:trmurcey
File:C:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0224T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-74.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1   <- NOTICE SF BIT DISABLE 1
```

Toggle Twice

OVERLAP C

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

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

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <- NOTICE SF BIT DISABLE 5
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........   --  RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   X . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1  2  3  4  5  6  7  8
DETECTOR  0  2  8  0  0  6  0  0   <- NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

   PHASE  9 10 11 12 13 14 15 16
DETECTOR  0  0  0  0  0  0  0  0
```

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
    PHASE      DIMMING ---FLASH---
   /OVLP TYPE  R Y G D PWR AUT TGR
1     1    V    . . . + A   R   X
2     2    V    . . . + A   Y   .
3     3    V    . . . + A   R   X
4     4    V    . . . + A   R   .
5     5    V    . . . - A   R   .
6     6    V    . . . - A   Y   X
7     7    V    . . . - A   R   .
8     8    V    . . . - A   R   X
9     1    O    . . . + A   R   X
10    2    O    . . . + A   R   X
11    3    O    . . . - A   R   .
12    4    O    . . . - A   R   .
13    2    P    . . . + A   .   .
14    4    P    . . . - A   .   .
15    6    P    . . . + A   .   .   <- NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16
16    3    P    . . . - A   .   .
```

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0224T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 2 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224TI

DATE:
User:rmurcay
File:C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0224T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-74.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".
- Set delay time to "3.0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE DELAY IS SET TO '3.0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "26".
- Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE DELAY IS SET TO '3.0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail - Sheet 3 of 3

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

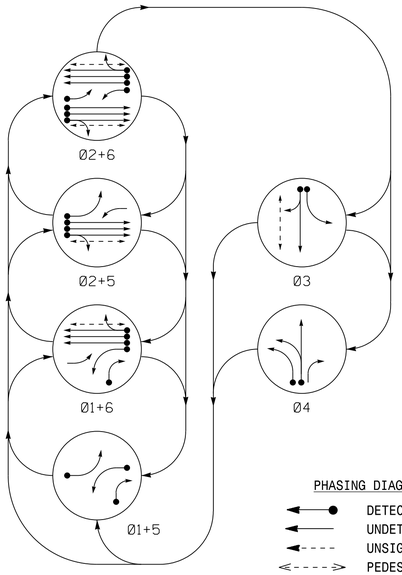
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224TI

DATE:
User:Traffic\Designs\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0224T1.dgn
User:rmurphy

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-75.0

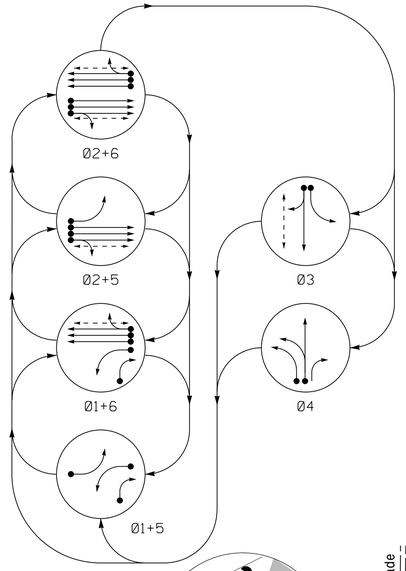
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	~~F Y~~	~~F Y~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R/←	R/←	R	R	R	G	R
51	←	~~F Y~~	←	~~F Y~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

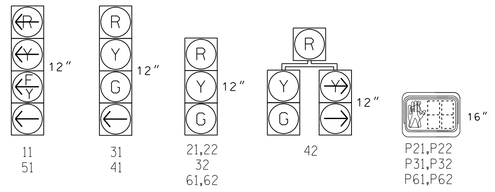
SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R/←	R/←	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

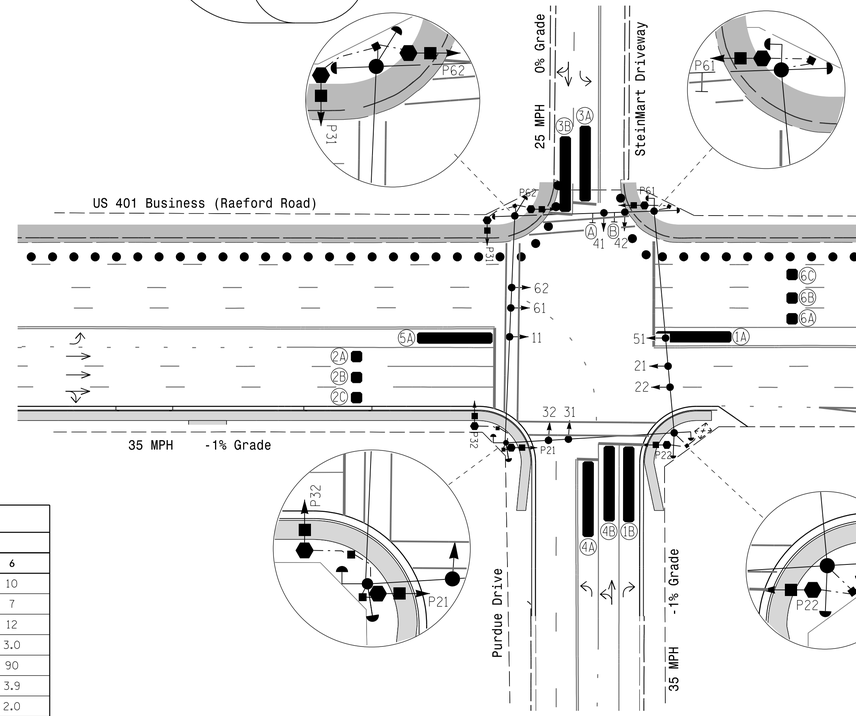
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	-
					6#	Yes	-	-	-	S	-	-
1B	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2C	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	10	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	-
					2#	Yes	-	-	-	S	-	-
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delay from 15 to 3 seconds during Alternate Phasing Operation.

6 Phase Fully Actuated Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
7. Reposition existing signal heads numbered 21 and 22.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
10. The Division (City) Traffic Engineer will determine hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	-	-	7
Ped Clear	-	17	24	-	-	12
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	20	90	25	25	20	90
Yellow	3.0	3.9	3.2	3.9	3.0	3.9
Red Clear	2.3	2.0	3.1	2.3	2.9	2.0
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○⤵	Signal Pole with Sidewalk Guy	●⤵
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	
→	Directional Arrow	→
▬	Video Detection Area	N/A
⬡	Type II Signal Pedestal	⬢
▭	Construction Zone	N/A
● ● ●	Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ

Signal Upgrade
Temporary Design 2 - TMP Phase II

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Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

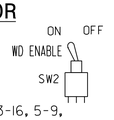
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L Watson 3/29/2018
3567B7B2A2AF4FE... SIGNATURE DATE

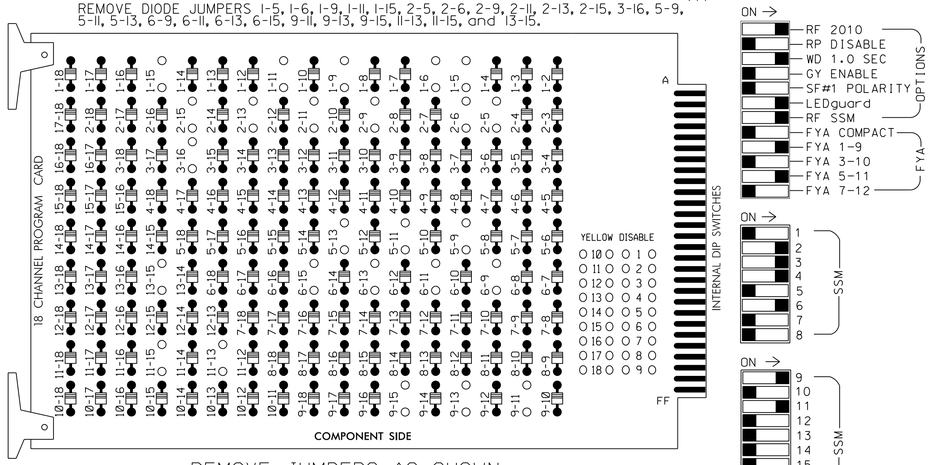
SIG. INVENTORY NO. 06-0224T2

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, I-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 for start up in Phase 2 WALK and Phase 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8, S9,S12,AUX S1,AUX S4
PHASES USED.....1,2,2PED,3,4,5,6, 6PED,3PED
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-75.1

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	3 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11★	42	21,22	P21, P22	31	32	41	42	NU	51★	61,62	P61, P62	NU	NU	P31, P32	11★	NU	NU	51★	NU	NU
RED	*		128		116	116	101	101			134									
YELLOW			129		117	117	102	102		*	135									
GREEN			130		118	118	103	103			136									
RED ARROW															A121			A114		
YELLOW ARROW		126													A122			A115		
FLASHING YELLOW ARROW															A123			A116		
GREEN ARROW	127	127		118		103			133											
✋			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 below.

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.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED											NOT USED	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A[1]	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
5A[2]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

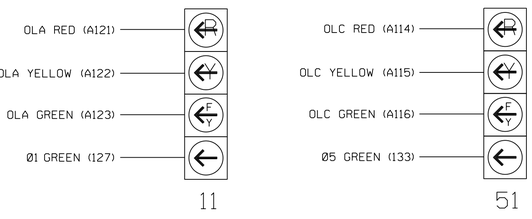
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See Vehicle Detector Setup Programming Detail for alternate phasing on Sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

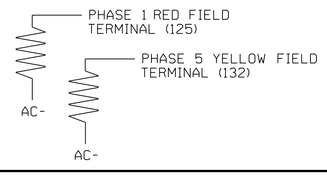
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



DETECTOR NOTES

1. For all loops install a video 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.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 2 and 3 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0224T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 1 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224T2

DATE: 3/29/2018
File: C:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0224T2.dgn
User: lrmurcey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-75.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1   <-- NOTICE SF BIT DISABLE 1
```

Toggle Twice

OVERLAP C

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

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

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <-- NOTICE SF BIT DISABLE 5
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........  --   RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   X . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1   2   3   4   5   6   7   8
DETECTOR  0   2   8   0   0   6   0   0   <-- NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

   PHASE  9  10  11  12  13  14  15  16
DETECTOR  0   0   0   0   0   0   0   0
```

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
     PHASE       DIMMING ---FLASH---
    /OVLP TYPE  R Y G D PWR AUT TGR
1     1    V    . . . + A   R   X
2     2    V    . . . + A   Y   .
3     3    V    . . . + A   R   X
4     4    V    . . . + A   R   .
5     5    V    . . . - A   R   .
6     6    V    . . . - A   Y   X
7     7    V    . . . - A   R   .
8     8    V    . . . - A   R   X
9     1    O    . . . + A   R   X
10    2    O    . . . + A   R   X
11    3    O    . . . - A   R   .
12    4    O    . . . - A   R   .
13    2    P    . . . + A   .   .
14    4    P    . . . - A   .   .
15    6    P    . . . + A   .   .   <-- NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16
16    3    P    . . . - A   .   .
```

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0224T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 3

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PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224T2

DATE:
User:mruncky
File: C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-022412.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-75.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".
- Set delay time to "3.0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE DELAY IS SET TO '3.0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "26".
- Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "3.0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE DELAY IS SET TO '3.0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 3 of 3

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road)
at
Purdue Drive/
SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: 3/29/2018
SIGNATURE DATE

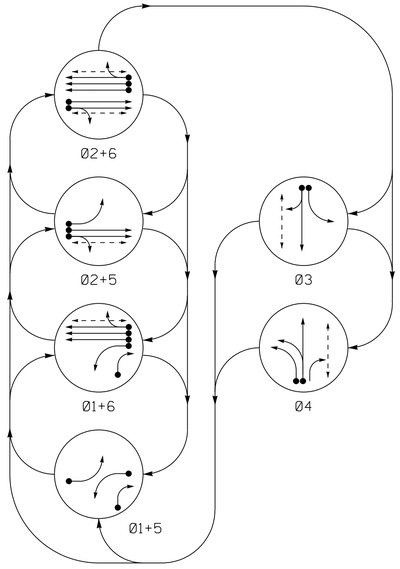
SIG. INVENTORY NO. 06-0224T2

DATE:
User:trafficsignals
K:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0224T2.dgn
User:rmurphy

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-76.0

6 Phase
Fully Actuated
Fayetteville Signal System

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

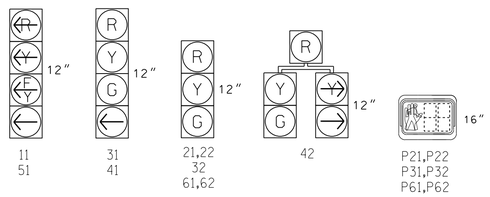
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11	←̶	←̶	R̶	R̶	R̶	R̶	Y̶
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G̲	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G̲	R
42	R̸	R̸	R	R	R	G	R
51	←̶	R̶	←̶	R̶	R̶	R̶	Y̶
61,62	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



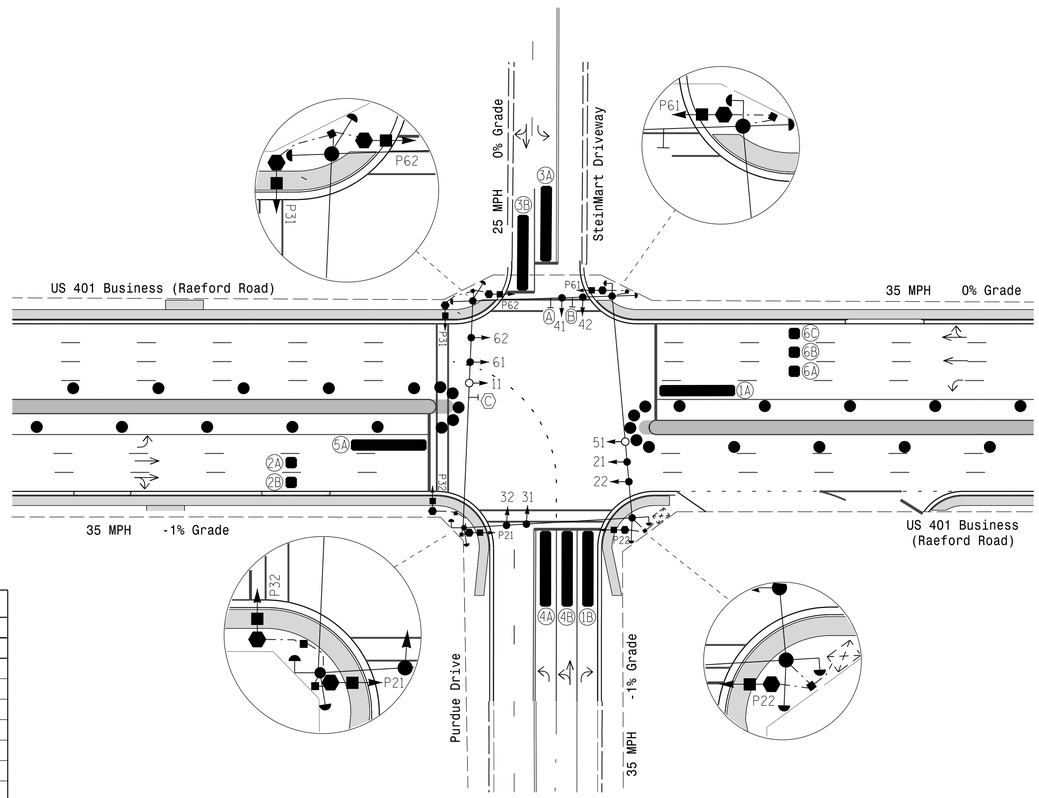
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1B	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
2B	6X6	70	✳	-	2	Yes	-	-	-	S	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	10	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
6A	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	-
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	-

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Reposition existing signal heads numbered 21,22,61, and 62.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	———
→	Directional Arrow	→
▬	Video Detection Area	N/A
⬡	Type II Signal Pedestal	⬢
▭	Construction Zone	N/A
● ● ●	Drums	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Combined Through and Left Arrow Sign (R3-6L)	Ⓑ
Ⓒ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓒ

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	-	-	7
Ped Clear	-	17	23	-	-	12
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	20	90	25	25	20	90
Yellow	3.0	3.9	3.2	3.9	3.0	3.9
Red Clear	2.3	2.2	3.2	2.7	3.2	2.2
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 3 - TMP Phase III

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

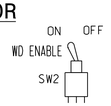
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224T3

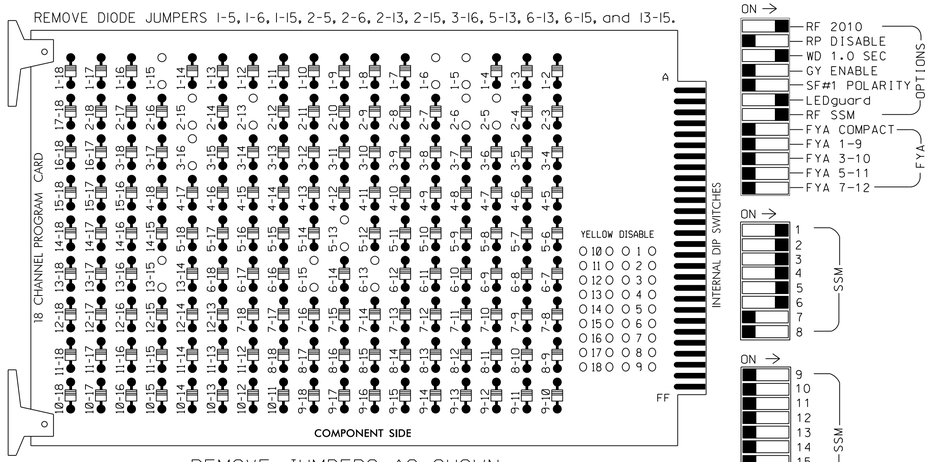
3/29/2018
10:27:54 AM
User:rmurcey
L:\Signals\Design\Signal Designs\Temporary Signal Designs\Phase 3\U-4405_sig_dsn_06-0224-T3.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 3-16, 5-13, 6-13, 6-15, and 13-15.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 for start up in Phase 2 WALK and Phase 6 WALK.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S7,S8, S9,S12
PHASES USED.....1,2,2PED,3,4,5,6, 6PED,3PED
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-76.1

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	4	2	2 PED	3	3	4	4	4 PED	5	6	6 PED	7	8	3 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11★	42	21,22	P21, P22	31	32	41	42	NU	51★	61,62	P61, P62	NU	NU	P31, P32	NU	NU	NU	NU	NU	NU
RED			128		116	116	101	101			134										
YELLOW			129		117	117	102	102			135										
GREEN			130		118	118	103	103			136										
RED ARROW	125									131											
YELLOW ARROW	126	126								132											
FLASHING YELLOW ARROW																					
GREEN ARROW	127	127			118		103			133											
✋				113								119			110						
🚶				115								121			112						

NU = Not Used
★ See pictorial of head wiring in detail below.

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.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L												NOT USED	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

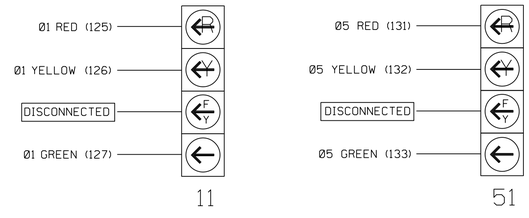
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE
PED PUSH BUTTONS					
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SIGNAL WIRING DETAIL

(wire signal heads as shown)



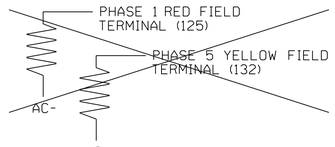
DETECTOR NOTES

1. For all loops, install a video 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.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phases 2 and 6.

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)



IMPORTANT! Remove resistors from field terminals as shown above, if present.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0224T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 1 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224T3

DATE:
User:rmuncey
File:C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0224t3.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-76.2

ECONOLITE ASC/3-2070
PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1   2   3   4   5   6   7   8
DETECTOR  0   2   8   0   0   6   0   0

   PHASE  9  10  11  12  13  14  15  16
DETECTOR  0   0   0   0   0   0   0   0
```

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
     PHASE       DIMMING ---FLASH---
     /OVLP TYPE  R Y G D PWR AUT TGR
 1     1    V     . . . +  A   R   X
 2     2    V     . . . +  A   Y   .
 3     3    V     . . . +  A   R   X
 4     4    V     . . . +  A   R   .
 5     5    V     . . . -  A   R   .
 6     6    V     . . . -  A   Y   X
 7     7    V     . . . -  A   R   .
 8     8    V     . . . -  A   R   X
 9     1    O     . . . +  A   R   X
10     2    O     . . . +  A   R   X
11     3    O     . . . -  A   R   .
12     4    O     . . . -  A   R   .
13     2    P     . . . +  A   .   .
14     4    P     . . . -  A   .   .
15     6    P     . . . +  A   .   .
16     3    P     . . . -  A   .   .
```

NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16 →

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail - Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Traffic & Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Purdue Drive/
SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

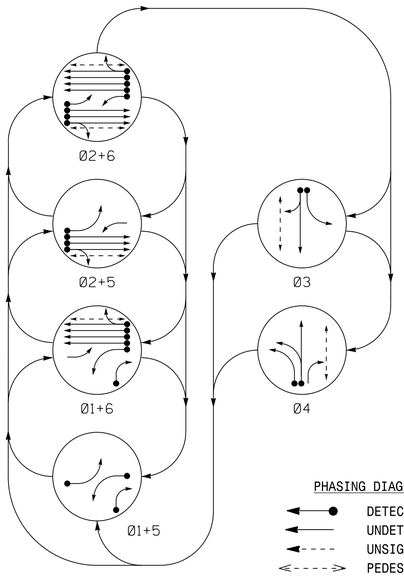
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by:
3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224T3

DATE:
User:rmuncey
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0224t3.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-77.0

6 Phase Fully Actuated Fayetteville Signal System

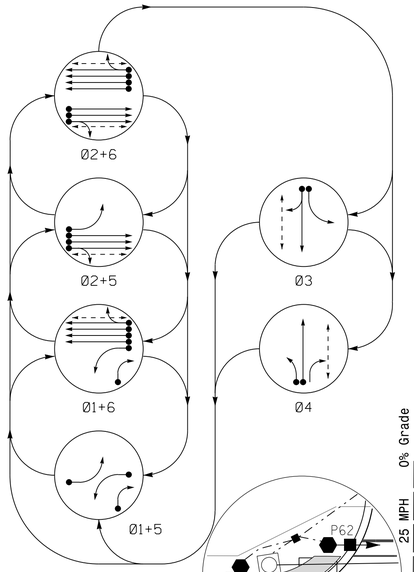
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	Ø3	Ø4	FLASH
11	←●	←●	FY	FY	←R	←R	←Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G←	R
42	R/R→		R	R	R	G	R
51	←●	FY	←●	FY	←R	←R	←Y
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	Ø3	Ø4	FLASH
11	←●	←●	←R	←R	←R	←R	←Y
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G←	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	G←	R	R
42	R/R→		R	R	R	G	R
51	←●	←R	←●	←R	←R	←R	←Y
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	70	4	X	2	Yes	-	-	-	S	-	X
2B	6X6	70	4	X	2	Yes	-	-	-	S	-	X
2C	6X6	70	4	X	2	Yes	-	-	-	S	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	10	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	S	-	X
6A	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6B	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6C	6X6	70	4	X	6	Yes	-	-	-	S	-	X
6D	6X6	70	4	X	6	Yes	-	-	-	S	-	X

#Disable Phase(s) call during Alternate Phasing Operation.
★Disable delay during Alternate Phasing Operation.

NOTES

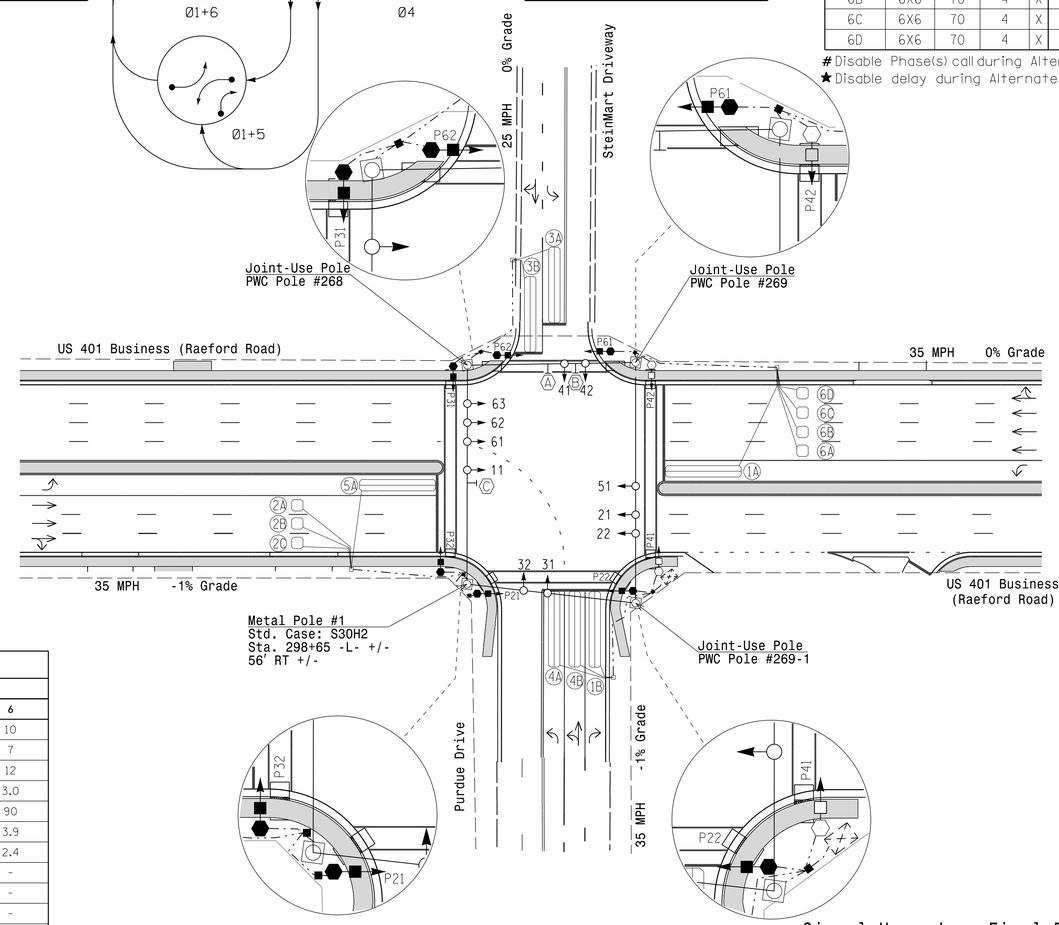
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. The order of Phase 3 and Phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
8. The Division (City) Traffic Engineer will determine hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NDCOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Pushbutton & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Type II Signal Pedestal	
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	Combined Through and Left Arrow Sign (R3-6L)	(B)
(C)	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	(C)

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	7	-	7
Ped Clear	-	17	23	22	-	12
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	20	90	25	25	20	90
Yellow	3.0	3.9	3.2	3.9	3.0	3.9
Red Clear	3.1	2.4	3.2	2.7	3.3	2.4
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Prepared for the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Purdue Drive/
SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

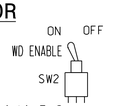
SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

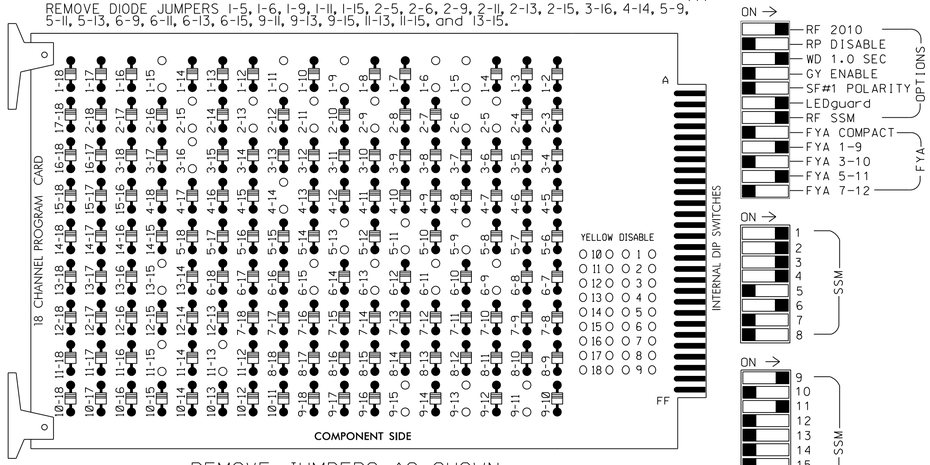
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSEY L. WATSON
Betsey L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS I-5, I-6, I-9, I-11, I-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-16, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 9-11, 9-13, 9-15, 11-13, 11-15, and 13-15.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 for start up in Phase 2 WALK and Phase 6 WALK.
3. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8, S9,S12,AUX S1,AUX S4
PHASES USED.....1,2,2PED,3,4,4PED,5,6, 6PED,3PED
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-77.1

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	4	2	2 PED	3	3	4	4	4 PED	5	6	6 PED	7	8	3 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11★	42	21,22	P21, P22	31	32	41	42	P41, P42	51★	61,62, 63	P61, P62	NU	NU	P31, P32	11★	NU	NU	51★	NU	NU
RED	*		128		116	116	101	101			134										
YELLOW			129		117	117	102	102		*	135										
GREEN			130		118	118	103	103			136										
RED ARROW																A121			A114		
YELLOW ARROW		126														A122			A115		
FLASHING YELLOW ARROW																A123			A116		
GREEN ARROW	127	127			118		103			133											
✋				113					104			119			110						
🚶				115					106			121			112						

NU = Not Used

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

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.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø1 1A	Ø1 1B	Ø2 2B	WIRED INPUT ⊗	Ø3 3A	Ø3 3B	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED	Ø2 2A	Ø2 2C		NOT USED	NOT USED	Ø4 4B					Ø4 PED DC ISOLATOR	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A	Ø6 6C	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	Ø6 6B	Ø6 6D											

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A[1]	TB2-1,2	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES				S
1B	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-7,8	I2L	43	12	2	YES				S
2B	TB2-9,10	I3U	63	32	2	YES				S
2C	TB2-11,12	I3L	76	42	2	YES				S
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES		10		S
4A	TB6-1,2	I7U	65	34	4	YES		3		S
4B	TB6-3,4	I7L	78	44	4	YES				S
5A[2]	TB3-1,2	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES				S
6A	TB3-5,6	J2U	40	6	6	YES				S
6B	TB3-7,8	J2L	44	16	6	YES				S
6C	TB3-9,10	J3U	64	36	6	YES				S
6D	TB3-11,12	J3L	77	46	6	YES				S
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

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

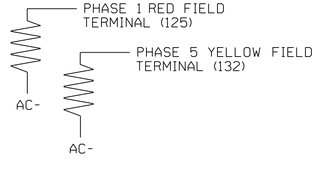
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See Vehicle Detector Setup Programming Detail for alternate phasing on Sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

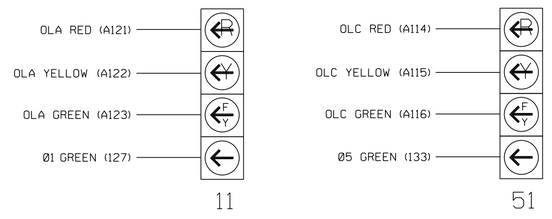
(install resistors as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0224
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road) at Purdue Drive/ SteinMart Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224

DATE: 3/29/2018
File: C:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0224.dgn
User: rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-77.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 1   <- NOTICE ACTION PLAN SF BIT "1"
```

Toggle Twice

OVERLAP C

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

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <- NOTICE ACTION PLAN SF BIT "5"
```

END PROGRAMMING

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BITS 1 and 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	1, 5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BITS 1 AND 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 1,5: Modifies overlap parent phases for heads 11 and 51 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.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select [5. TIME BASE]
2. From TIME BASE Submenu select [2. ACTION PLAN]

```
ACTION PLAN...[  1]
PATTERN.........AUTO   SYS OVERRIDE.... NO
TIMING PLAN..... 0    SEQUENCE........  0
VEH DETECTOR PLAN.. 2  DET LOG........NONE
FLASH...........  --   RED REST........ NO
VEH DET DIAG PLN... 0  PED DET DIAG PLN..0
DIMMING ENABLE..   NO  PRIORITY RETURN. NO
PED PR RETURN..    NO  QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
PED RCL   . . . . . . . . . . . . . . . .
WALK 2    . . . . . . . . . . . . . . . .
VEX 2     . . . . . . . . . . . . . . . .
VEH RCL   . . . . . . . . . . . . . . . .
MAX RCL   . . . . . . . . . . . . . . . .
MAX 2     . . . . . . . . . . . . . . . .
  PHASE   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
MAX 3     . . . . . . . . . . . . . . . .
CS INH    . . . . . . . . . . . . . . . .
OMIT      . . . . . . . . . . . . . . . .
SPC FCT   X . . . X . . . (1-8)
AUX FCT   . . . (1-3)
          1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
LP 1-15   . . . . . . . . . . . . . . .
LP 16-30  . . . . . . . . . . . . . . .
LP 31-45  . . . . . . . . . . . . . . .
LP 46-60  . . . . . . . . . . . . . . .
LP 61-75  . . . . . . . . . . . . . . .
LP 76-90  . . . . . . . . . . . . . . .
LP 91-100 . . . . . . . . . . . . . . .
```

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

1. From Main Menu select [6. DETECTORS]
2. From DETECTOR Submenu select [3. PED DETECTOR INPUT ASSIGNMENT]

```
PED DET PHASE ASSIGNMENT MODE:  NTCIP

   PHASE  1  2  3  4  5  6  7  8
DETECTOR  0  2  8  4  0  6  0  0   <- NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

   PHASE  9 10 11 12 13 14 15 16
DETECTOR  0  0  0  0  0  0  0  0
```

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

```
LD SWITCH ASSIGN
    PHASE      DIMMING ---FLASH---
    /OVLP TYPE R Y G D PWR AUT TGR
1     1    V   . . . + A   R   X
2     2    V   . . . + A   Y   .
3     3    V   . . . + A   R   X
4     4    V   . . . + A   R   .
5     5    V   . . . - A   R   .
6     6    V   . . . - A   Y   X
7     7    V   . . . - A   R   .
8     8    V   . . . - A   R   X
9     1    O   . . . + A   R   X
10    2    O   . . . + A   R   X
11    3    O   . . . - A   R   .
12    4    O   . . . - A   R   .
13    2    P   . . . + A   .   .
14    4    P   . . . - A   .   .
15    6    P   . . . + A   .   .   <- NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16
16    3    P   . . . - A   .   .
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0224

DATE:
User:
File: C:\Traffic\Designs\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0224.dgn
User:rmurphy

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-77.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL

FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select [8. UTILITIES]
2. From UTILITIES Submenu select [1. COPY/CLEAR]
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
        FROM              TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
          THEN PRESS ENTER
```

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "1".
- Set delay time to "0".

```
VEH DETECTOR [ 1]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 1  1   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE DELAY IS SET TO '0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "26".
- Set assigned phase to "0".

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE DELAY IS SET TO '0'
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: S-STANDARD
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    0.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0224
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road)
at
Purdue Drive/
SteinMart Driveway

Division 6 Cumberland County Fayetteville

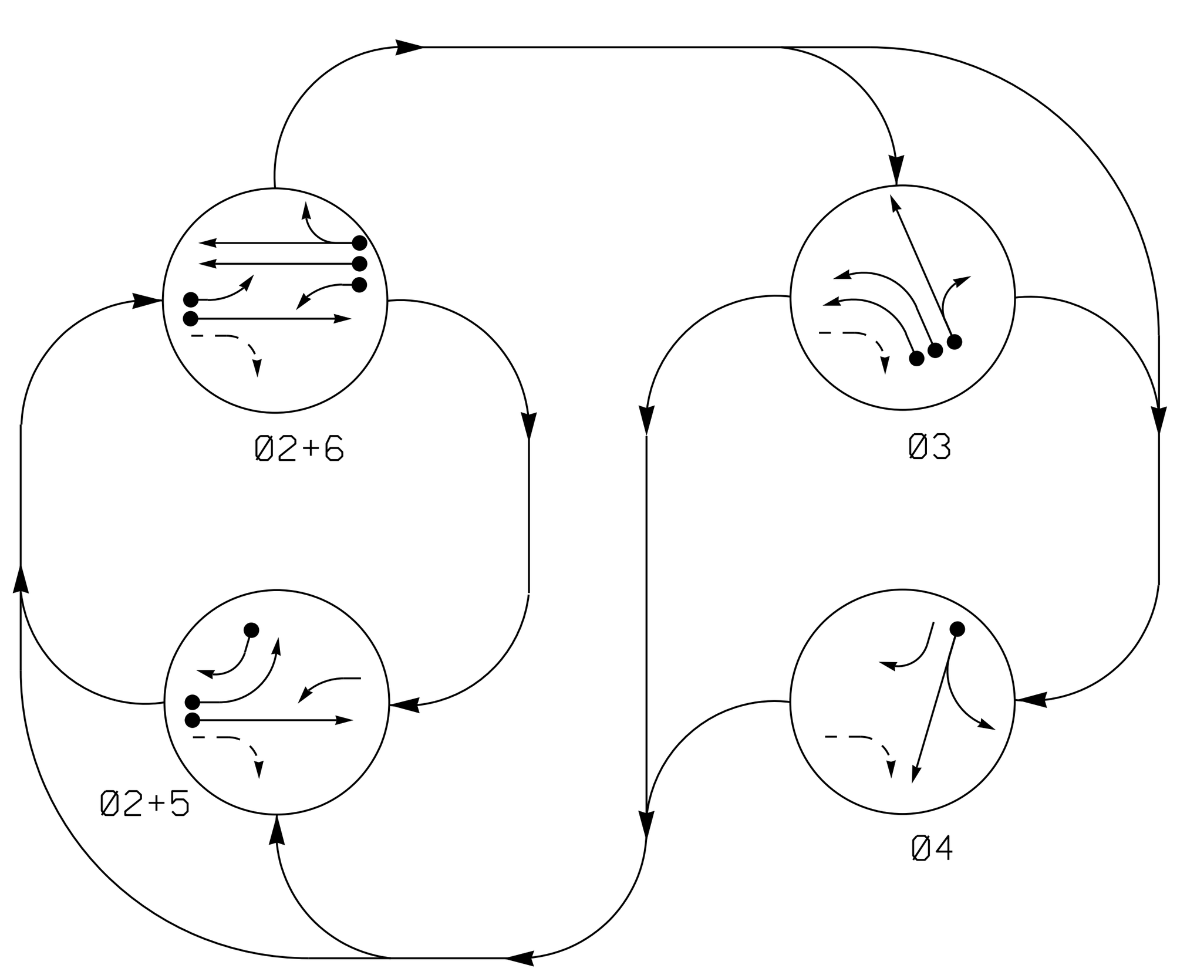
PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	G B Spell	REVIEWED BY:	

REVISIONS	INIT.	DATE

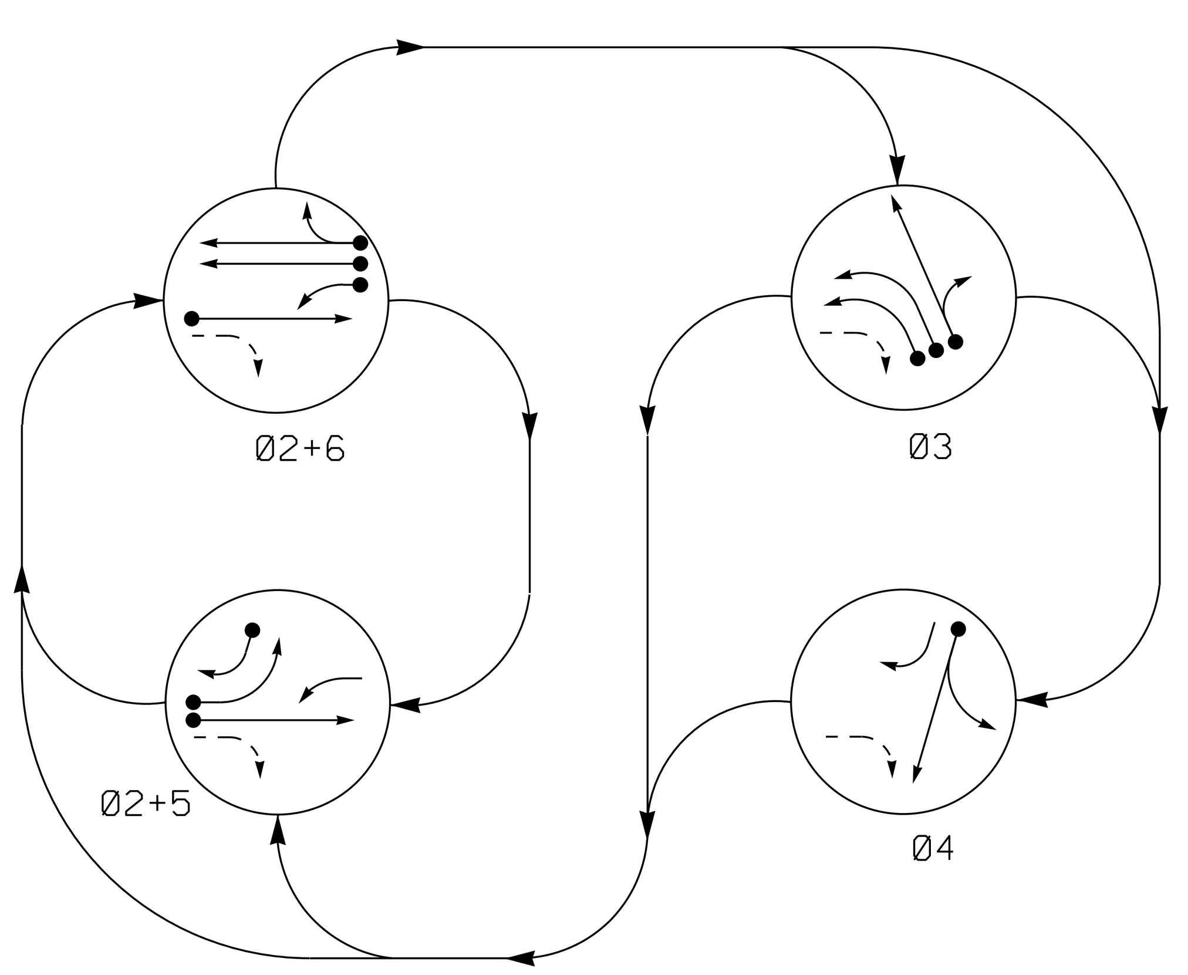
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0224

DATE
User:rtraffic
File:C:\Signals\Designs\Electrical Details\Final Signals\U-4405_sig_ele_06-0224.dgn
User:rmurphy

DEFAULT PHASING DIAGRAM

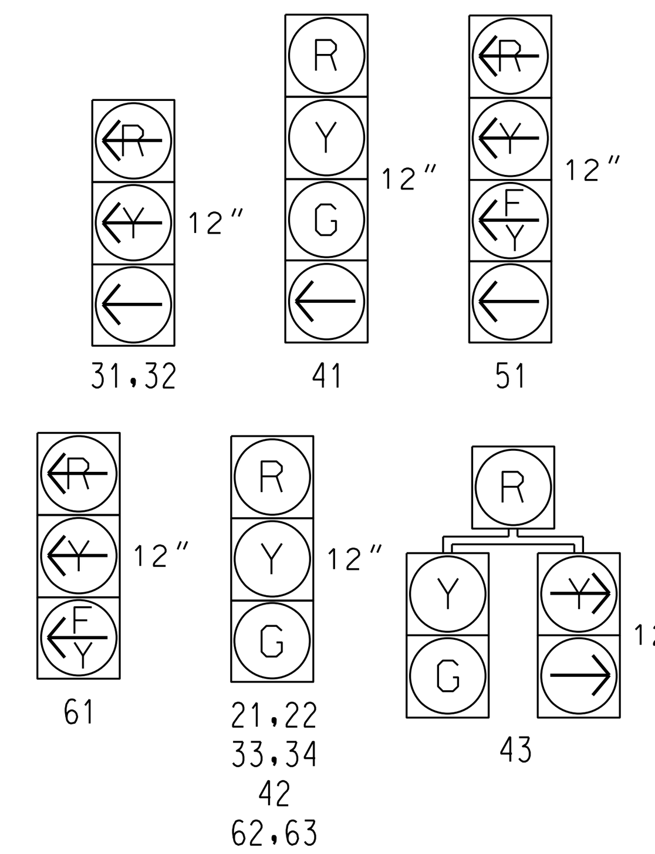


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	✳	-	2	Yes	-	-	-	S	-	X
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	X
3C	6X40	0	✳	-	3	Yes	-	10	-	S	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	-	-	S	-	X
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	X
6A	6X40	0	✳	-	6	Yes	-	-	-	S	-	X
6B	6X6	70	✳	-	6	Yes	-	-	-	S	-	X
6C	6X6	70	✳	-	6	Yes	-	-	-	S	-	X

✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.
Disable Phase(s) call during Alternate Phasing Operation.
★ Reduce delay from 15 to 3 seconds during Alternate Phasing Operation.

4 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
7. The Division (City) 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 supersede these values.
9. Field adjust temporary poles as needed.

DEFAULT PHASING TABLE OF OPERATION

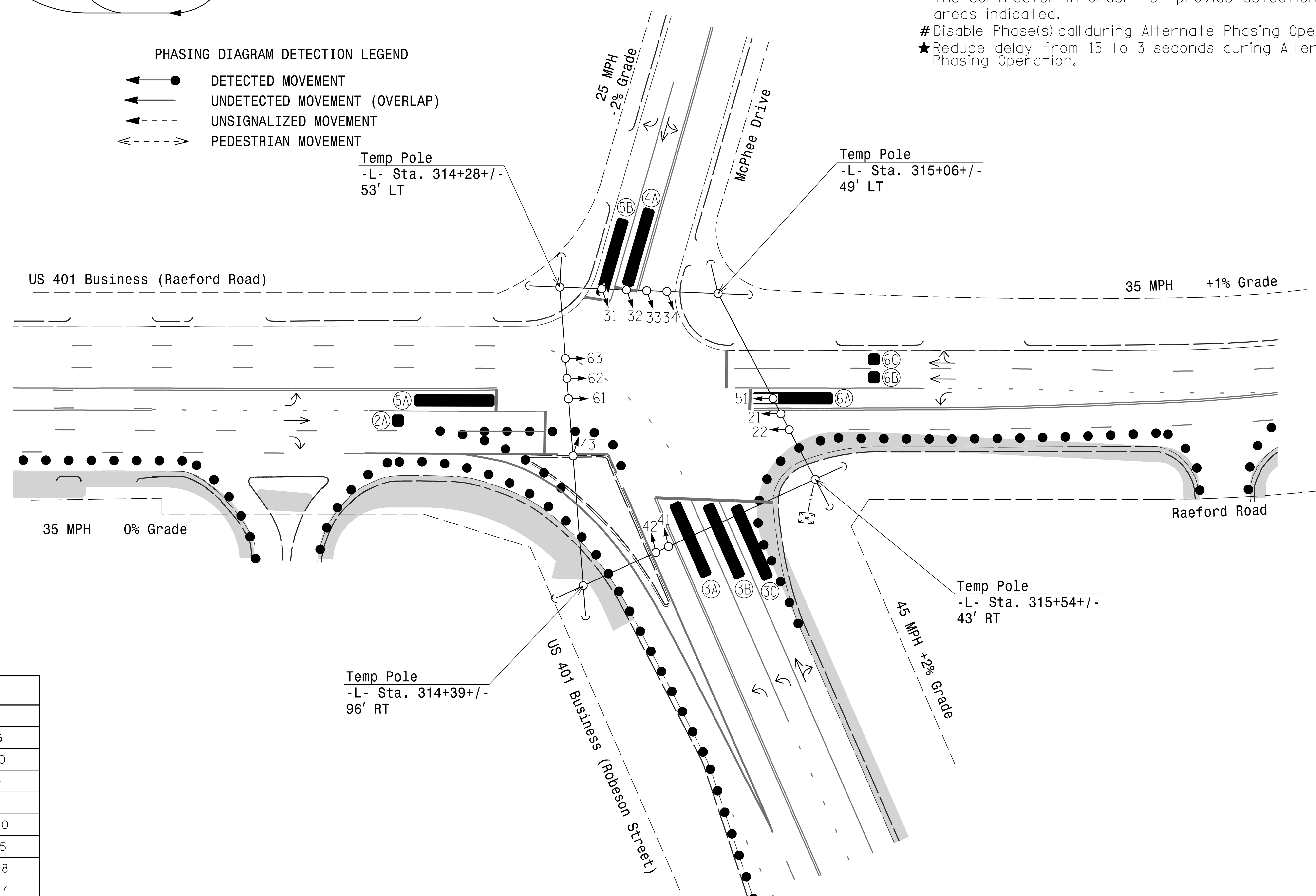
SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G/←	R
42	R	R	R	G	R
43	R/→	R	R	G	R
51	←	←F/Y	←R	←R	←Y
61	←F/Y	←F/Y	←R	←R	←Y
62,63	R	G	R	R	Y

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21,22	G	G	R	R	Y
31,32	←R	←R	←	←R	←R
33,34	R	R	G	R	R
41	R	R	R	G/←	R
42	R	R	R	G	R
43	R/→	R	R	G	R
51	←	←R	←R	←R	←Y
61	←F/Y	←F/Y	←R	←R	←Y
62,63	R	G	R	R	Y

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Video Detection Area	N/A
	Construction Zone	N/A
	Drums	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 2	3	4	5	6
Min Green *	10	7	7	7	10
Walk *	-	-	-	-	-
Ped Clear	-	-	-	-	-
Veh. Extension *	3.0	2.0	2.0	2.0	3.0
Max 1 *	45	25	20	15	45
Yellow	3.8	4.3	3.3	3.0	3.8
Red Clear	1.7	2.0	2.3	2.4	1.7
Red Revert	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	-	X
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X

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

Signal Upgrade
Temporary Design 1 - TMP Phase I

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Prepared for the Offices of:
Transportation Mobility and Safety Division
State of North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE 0 40 1"=40'

US 401 Bus./SR 1414 (Raeford Road)
at
US 401 Bus. (Robeson Street)
/McPhee Drive

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	G B Spell	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DocuSigned by: Betsy L. Watson 35E67BB34F87435 SIGNATURE 3/29/2018 DATE

SIG. INVENTORY NO. 06-0002TI