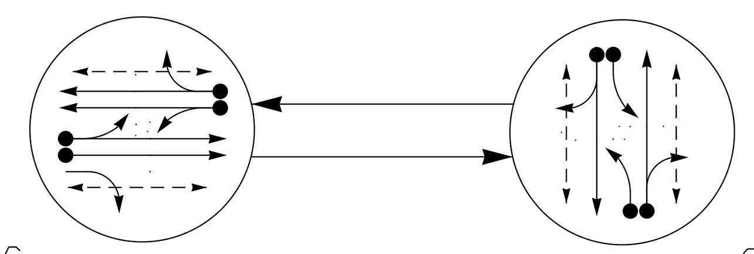
This electronic collection of documents is provided for the convenience of the user and is Not a Certified Document –

The documents contained herein were originally issued and sealed by the individuals whose names and license numbers appear on each page, on the dates appearing with their signature on that page.
This file or an individual page shall not be considered a certified document.

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.262.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

W - Walk
DW - Don't Walk
DRK - Dark

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	90	4	-	2	Yes	-	-	N	-	Y
2B	6X6	90	4	-	2	Yes	-	-	N	-	Y
4A	6X30	+5	2-4-2	-	4	Yes	-	-	N	-	Y
4B	6X60	0	4	-	4	Yes	-	-	N	-	Y
6A	6X6	90	4	-	6	Yes	-	-	N	-	Y
6B	6X6	90	4	-	6	Yes	-	-	N	-	Y
8A	6X60	0	2-4-2	-	8	Yes	-	-	N	-	Y
8B	6X60	0	2-4-2	-	8	Yes	-	-	N	-	Y

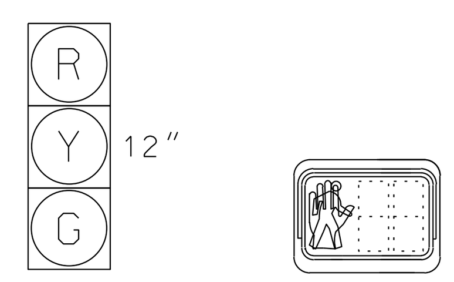
2 Phase
Fully Actuated
(Fayetteville Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
6. Locate new cabinet on existing foundation.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

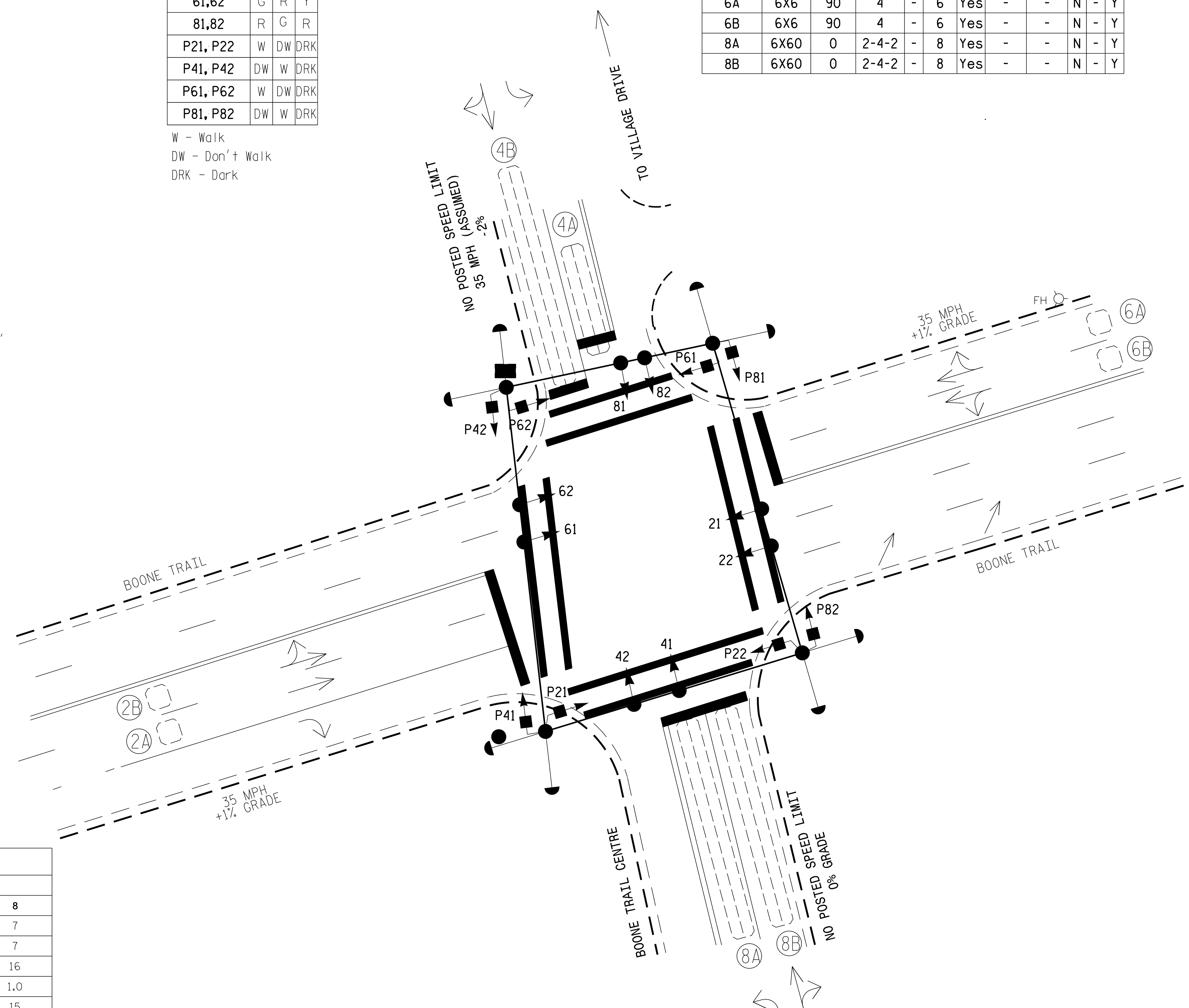
SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
61, 62
81, 82

P21, P22
P41, P42
P61, P62
P81, P82



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 with Marker	
	Directional Arrow	
	Pavement Marking Arrow	

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	12	16	12	16
Veh. Extension *	2.0	1.0	2.0	1.0
Max 1 *	30	15	30	15
Yellow	3.8	4.0	3.8	3.2
Red Clear	1.4	1.6	1.3	2.4
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Boone Trail at Boone Trail Centre

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE	
PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

SCALE 0 20

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate
F30C814C54B3430... SIGNATURE
11/21/2016 DATE

SIG. INVENTORY NO. C001

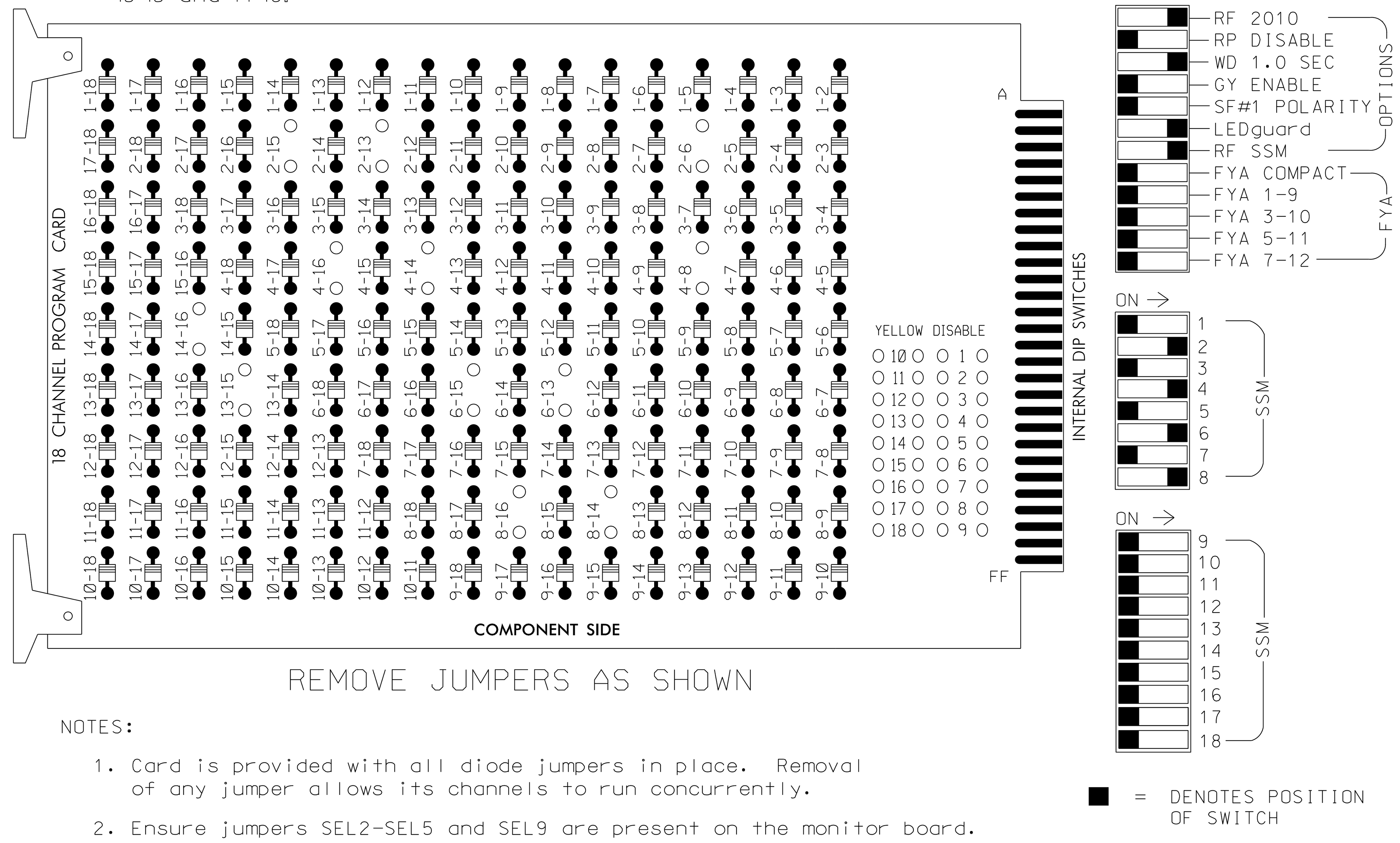
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\Boone Trail @ Boone Trail Centre.dgn
12:02:49 PM
11/17/2016

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2, 4, 6 and 8 for "STARTUP PED CALL".

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	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
(Don't Walk hand)			113			104			119			110
(Walk person)			115			106			121			112

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.............2070E
CABINET................332
SOFTWARE...............ECONOLITE ASC/3-2070
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED............2,4,6,8,2PED,4PED,6PED,8PED
OVERLAPS...............NONE

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	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø 2 2B				Ø 4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø 6 6B				Ø 8 8B								

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	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			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				
P41,P42	TB8-5,6	I12L	69	PED 4	4 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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C001
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

Boone Trail at Boone Trail Centre

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT	
PREPARED BY: RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036842 RICHARD T PATE

DocuSigned by: Richard T Pate F30C814C54B3430... 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C001

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Boone Trail @ Boone Trail Centre.dgn
11/17/2016 12:05:55 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.263.0

PHASING DIAGRAM

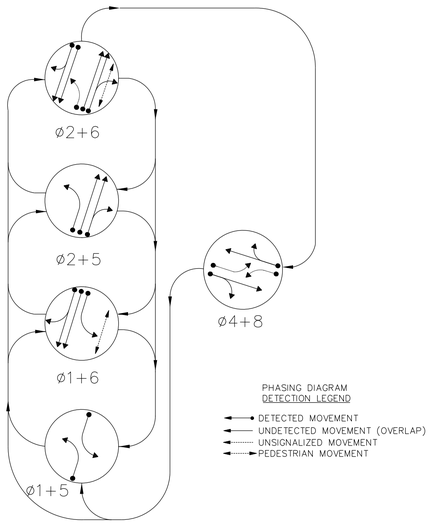
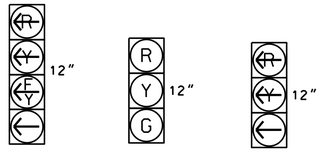


TABLE OF OPERATION						
SIGNAL FACE	PHASE					
	ø 1+5	ø 1+6	ø 2+5	ø 2+6	ø 4+8	FLASH
11	~~G~~	~~G~~	R	R	R	~~R~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	~~G~~	~~F Y~~	~~G~~	~~F Y~~	R	~~Y~~
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

SIGNAL FACE I.D.

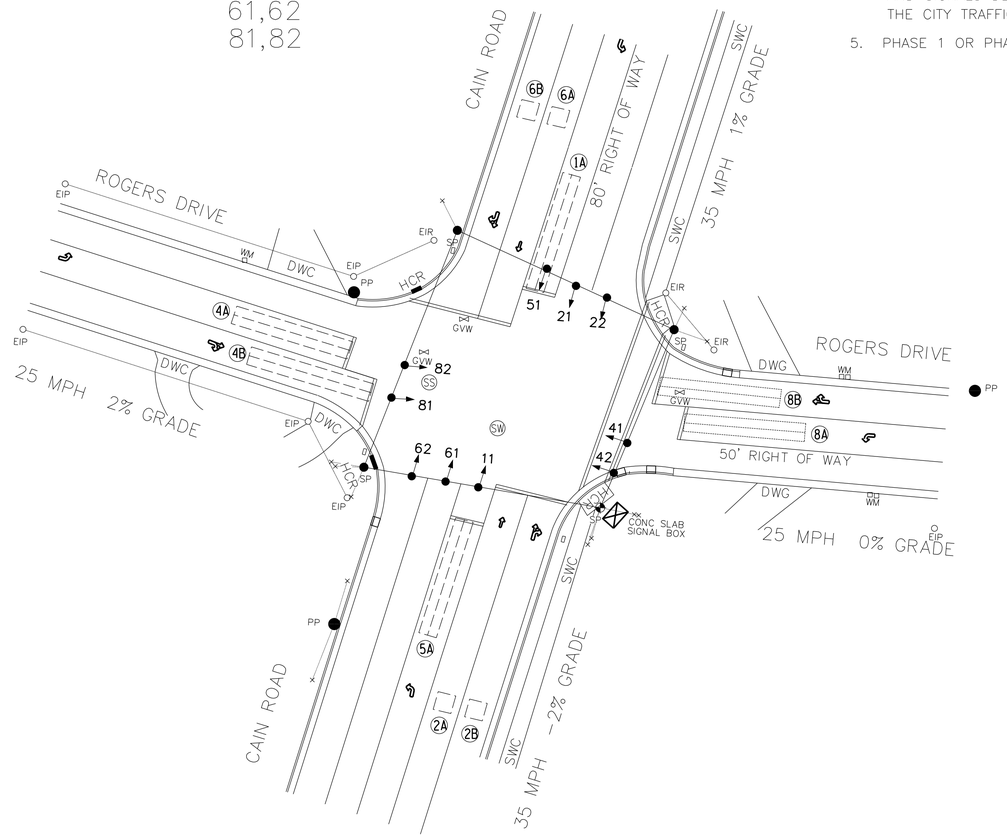
All Heads L.E.D.



5 PHASE
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. LOCATE NEW CABINET ON EXISTING FOUNDATION.
4. IN THE EVENT OF LOOP REPLACEMENT, REFER TO THE CURRENT ITS AND SIGNALS DESIGN MANUAL AND SUBMIT A PLAN OF RECORD TO THE CITY TRAFFIC ENGINEER.
5. PHASE 1 OR PHASE 5 MAY BE LAGGED.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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	

ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	1.0	1.0	6.0	1.0
Max 1 *	15	75	20	15	75	20
Yellow	3.1	4.0	3.1	3.3	3.8	3.2
Red Clear	1.5	1.0	2.1	1.7	1.0	2.2
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
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					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	-	-	S	-	Y
2A	6X6	70	4	-	2	-	-	S	-	Y
2B	6X6	70	4	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	3	S	-	Y
4B	6X40	0	2-4-2	-	4	-	-	S	-	Y
5A	6X40	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
6A	6X6	70	4	-	6	-	-	S	-	Y
6B	6X6	70	4	-	6	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	-	3	S	-	Y
8B	6X40	0	2-4-2	-	8	-	-	S	-	Y

Signal Upgrade

CAIN ROAD
AT
ROGERS DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 25

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C002

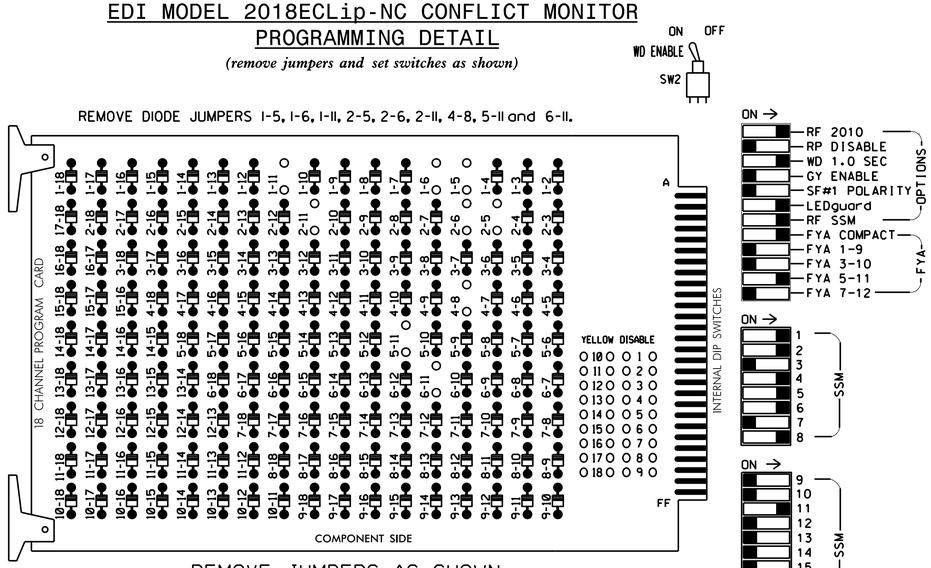
Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

default
\\NCF-DATA\Pro\360655.U-5742.Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201\Cain_at_Rogers.dgn
11/17/2016 12:19:33 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.263.1

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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Yellow Flash.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	NU	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW	125															A114		
YELLOW ARROW	126															A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW	127						133											

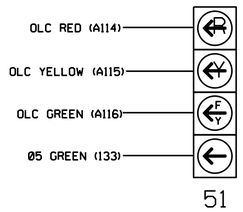
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE 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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	NOT USED	SLOT EMPTY	ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				ø4 4B	⊗ WIRED INPUT		ø5 5A						ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				ø8 8B									

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB6-9,10	19U	60	11	1			S
2A	TB2-5,6	12U	39	2	2			S
2B	TB2-7,8	12L	43	12	2			S
4A	TB4-9,10	16U	41	4	4		3	S
4B	TB4-11,12	16L	45	14	4			S
5A '	TB6-11,12	19L	62	13	5		15	S
	TB6-3,4	17L	78	44	2		3	G
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
8A	TB5-9,10	J6U	42	8	8		3	S
8B	TB5-11,12	J6L	46	18	8			S

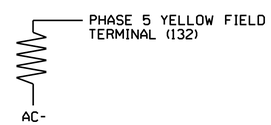
' Add jumper from 17-W to 19-W.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C002
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

CAIN ROAD
AT
ROGERS DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C002

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Cain_at_Rogers.dgn
11/17/2016
12:20:05 PM

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 C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C002
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

CAIN ROAD
AT
ROGERS DRIVE

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: BLR	REVIEWED BY:

REVISIONS	INIT.	DATE

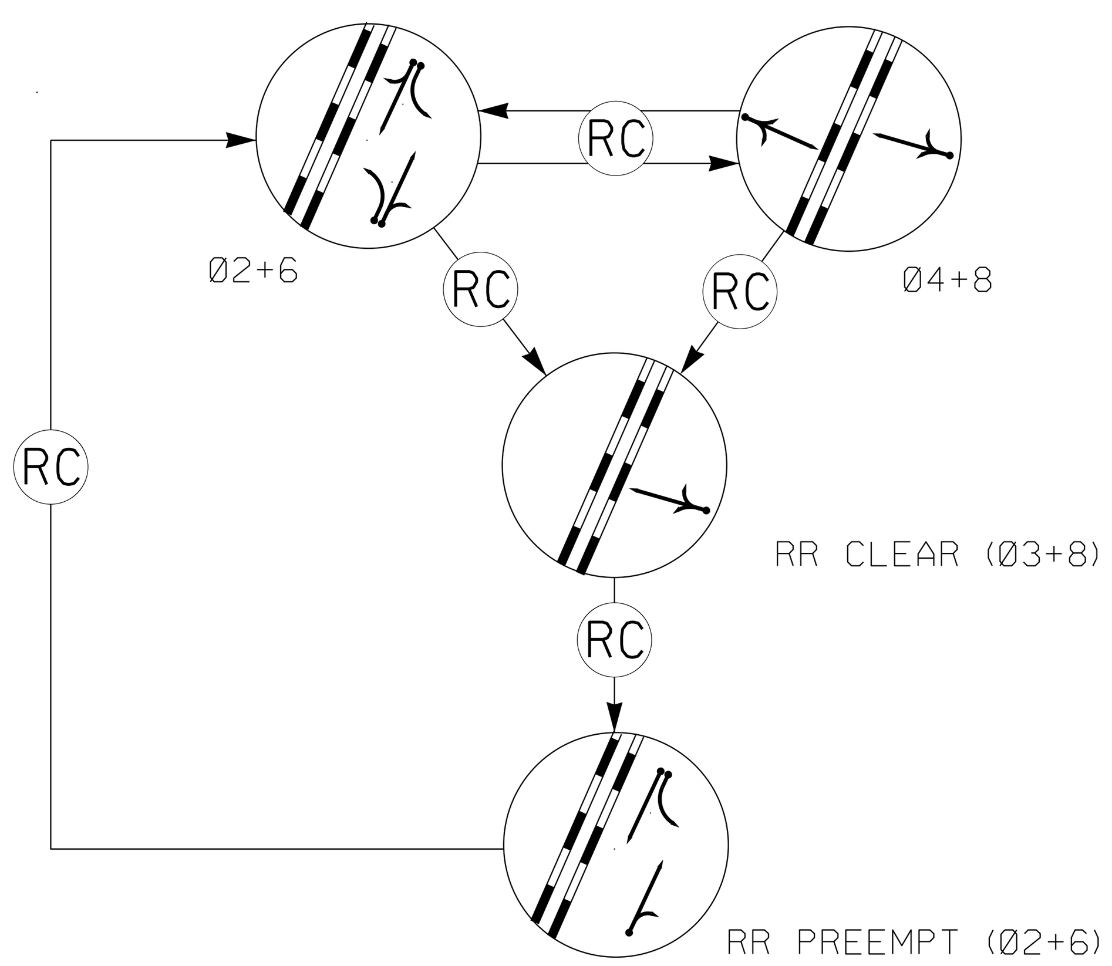
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C002

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\Cain_at_Rogers.dgn
11/17/2016 12:20:26 PM

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4+8	CLEAR RR	RR PRE	FLASH
21, 22	G	R	R	G	Y
41,42,43	R	G	R	R	R
61, 62	G	R	R	G	Y
81,83	R	G	G	R	R
82	R	G	G	R	R
A	OFF	OFF	OFF	ON	✳
B	OFF	OFF	OFF	ON	✳

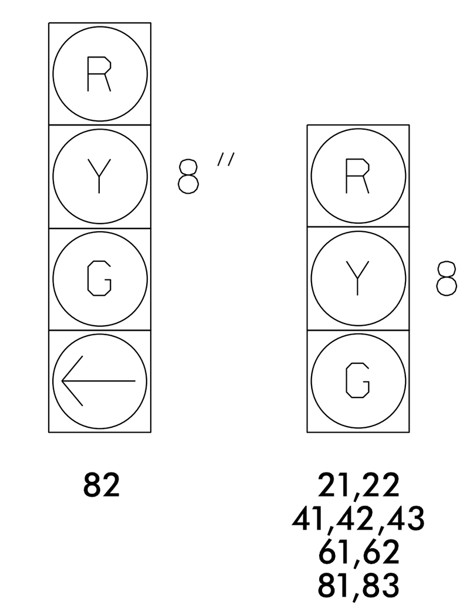
✳ SEE NOTE 8

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	-	2	Yes	-	-	N	-	Y
2B	6X60	0	2-4-2	-	2	Yes	-	-	N	-	Y
4A	6X60	0	2-4-2	-	4	Yes	-	-	N	-	Y
6A	6X6	70	4	-	6	Yes	-	-	N	-	Y
6B	6X60	0	2-4-2	-	6	Yes	-	-	N	-	Y
8A	6X60	0	2-4-2	-	8	Yes	-	-	N	-	Y

SIGNAL FACE I.D.

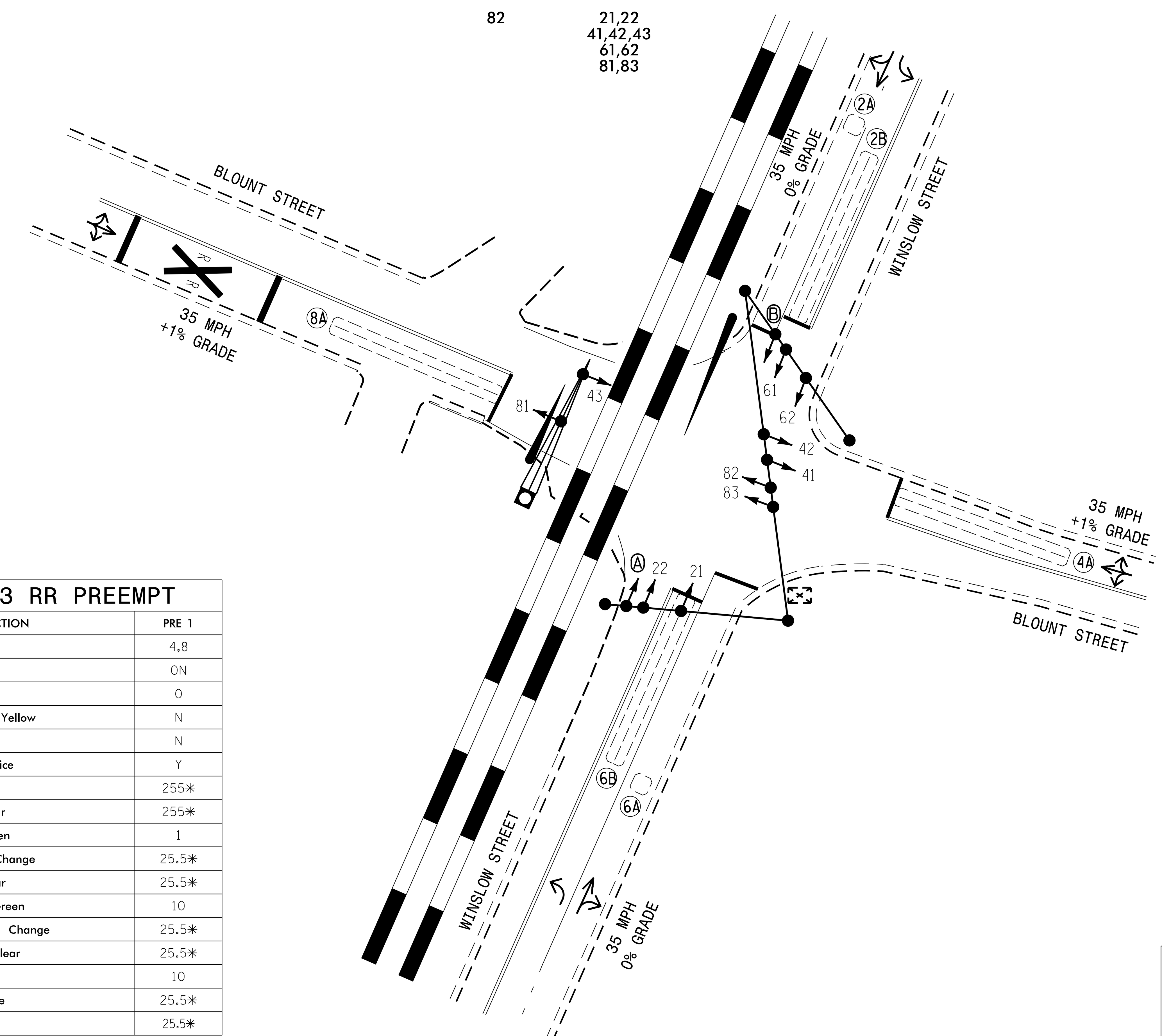
All Heads L.E.D.



2 Phase
Fully Actuated
(Fayetteville Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Located new cabinet on existing foundation.
3. Pavement markings are existing.
4. Maximum times shown in Timing Chart are for free-run operation only. Coordinated signal system timing values shall supercede these values.
5. This signal is part of the Fayetteville Signal System.
6. Begin preemption sequence immediately after track call.
7. Do not place this traffic signal in service until it has been properly interconnected with the railroad-highway crossing devices and the necessary railroad preemption.
8. Blankout signs shall operate normally during flashing operation.
11. Total railroad warning time shall be equal to or greater than maximum traffic signal preemption time.
12. Program Phase 4 and 8 for dual entry.



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 Gate and Flasher	
N/A	Railroad Tracks	
Ⓐ	"NO RIGHT TURN - TRAIN" Blankout Sign	Ⓐ
Ⓑ	"NO LEFT TURN - TRAIN" Blankout Sign	Ⓑ

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green *	12	20	12	20
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	1.0	3.0	1.0
Max 1 *	50	30	50	30
Yellow	3.8	3.8	3.8	3.8
Red Clear	1.2	1.3	1.0	1.9
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds/Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
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.

ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	4,8
Preempt Override	ON
Delay Time	0
Ped Clear Trough Yellow	N
Terminate Phases	N
Track Clear Reservice	Y
Entrance Walk	255✳
Entrance Ped Clear	255✳
Entrance Min Green	1
Entrance Yellow Change	25.5✳
Entrance Red Clear	25.5✳
Track Clear Min Green	10
Track Clear Yellow Change	25.5✳
Track Clear Red Clear	25.5✳
Min Dwell Time	10
Exit Yellow Change	25.5✳
Exit Red Clear	25.5✳

* Allows normal phase times to be used.

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

Winslow Street at Blount Street

DIV 06	CUMBERLAND COUNTY		FAYETTEVILLE
PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

N

SCALE 0 30 1" = 30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
F30C81C65AB3409E...
DATE

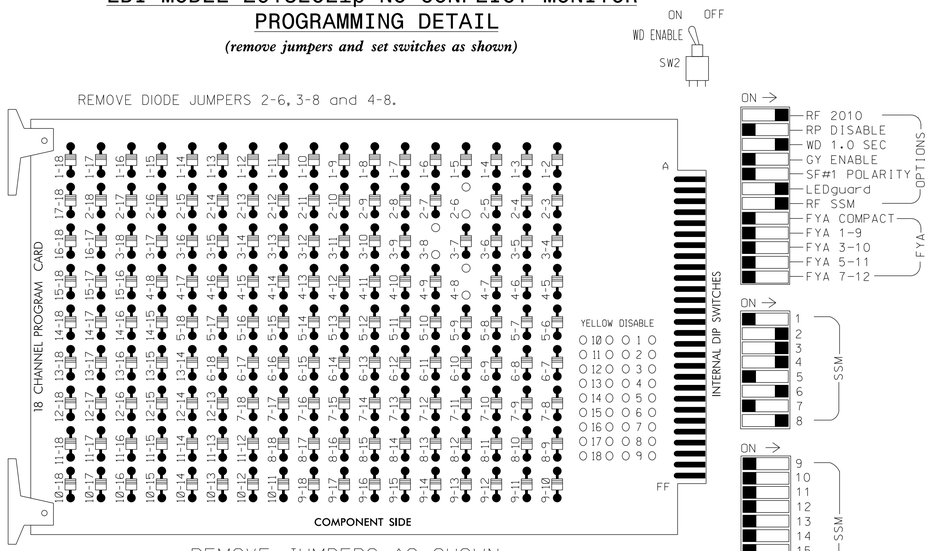
SIG. INVENTORY NO. C029

10:55:44 AM
**NCF-DATA*Proj*360655_U-5742_Fay-Sig*Project*Signals*Design*100%*FINAL SEALED PLANS*Revised 1172016*Winslow @ Blount.dgn
default

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.264.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

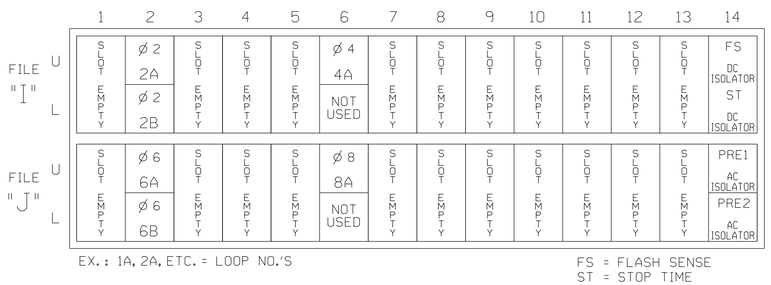
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	NU	21,22	NU	82	41,42 43	NU	NU	61,62	NU	NU	81,83	82	NU
RED		128		✳	101			134			107	107	
YELLOW		129		✳	102			135			108	108	
GREEN		130			103			136			109	109	
RED ARROW													
YELLOW ARROW													
GREEN ARROW				118									
✋													
🚶													

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES			S

✳ System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C029
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Fayetteville

Winslow Street
at
Blount Street

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: RTP	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C029

10:57:38 AM
\\HCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%FINAL SEALED PLANS\Revised 11?2016\Winslow @ Blount.dgn
default

ECONOLITE ASC/3-2070 RAILROAD PREEMPT PROGRAMMING DETAIL

(program controller as shown)

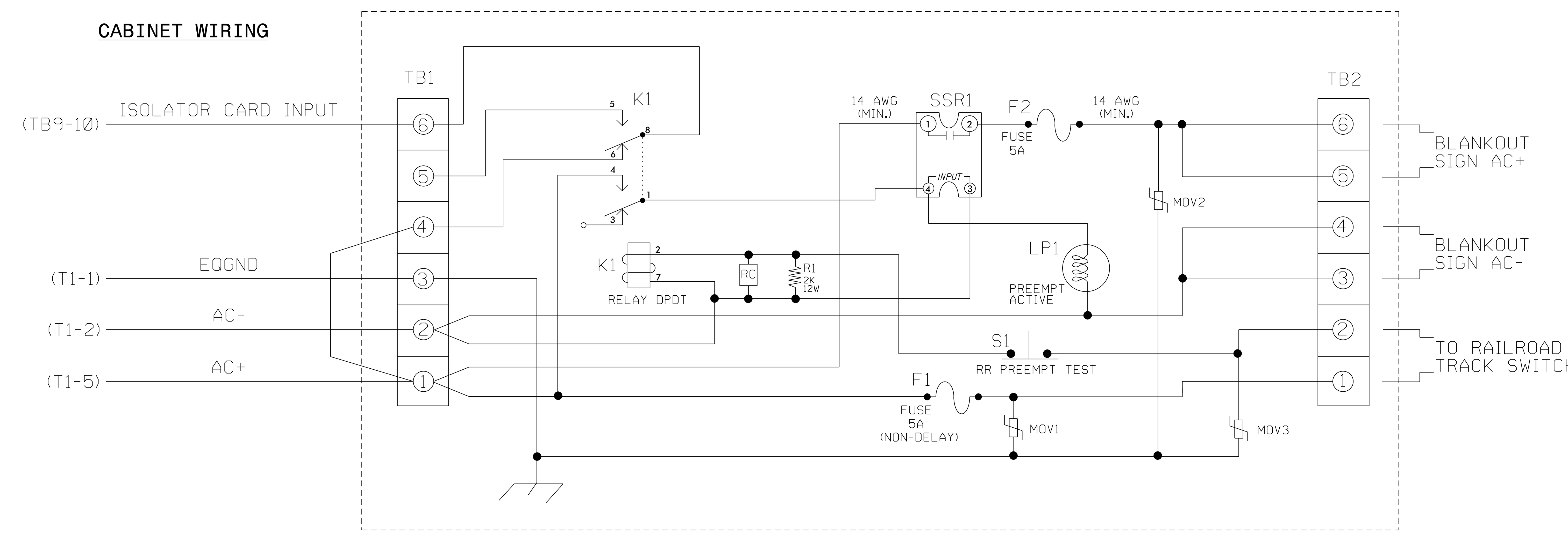
1. From Main Menu select [4. PREEMPTOR/TSP]
2. From PREEMPTOR/TSP/SCP Submenu select [1. PREEMPT PLAN 1-10]

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 . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . X . . . X . . . . . . . . . .
DWEL PED . . . . . . . . . . . . . . . .
DWEL OLP . . . . . . . . . . . . . . . .
CYC VEH  . . . . . . . . . . . . . . . .
CYC PED  . . . . . . . . . . . . . . . .
CYC OLP  . . . . . . . . . . . . . . . .
EXIT PH  . . . X . . . X . . . . . . . .
EXIT CAL . X . . . X . . . . . . . . . .
SP FUNC  . . . . . . . . . . . . . . . .

ENABLE... YES|PMT OVRIDE.X|INTERLOCK. NO
DET LOCK... X|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 CL|MN GR|YEL| RED
ENTRANCE TM.    0|     0|    1|25.5|25.5
-----------MIN GR|EXT GR|MX GR|YEL| RED
TRACK CLEAR    10|     0|    0|25.5|25.5
-----------MIN DL|PMTEXT|MX TM|YEL| RED
DWL/CYC-EXIT   10|   0.0|  120|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
```

RAILROAD PREEMPTION WIRING DETAIL

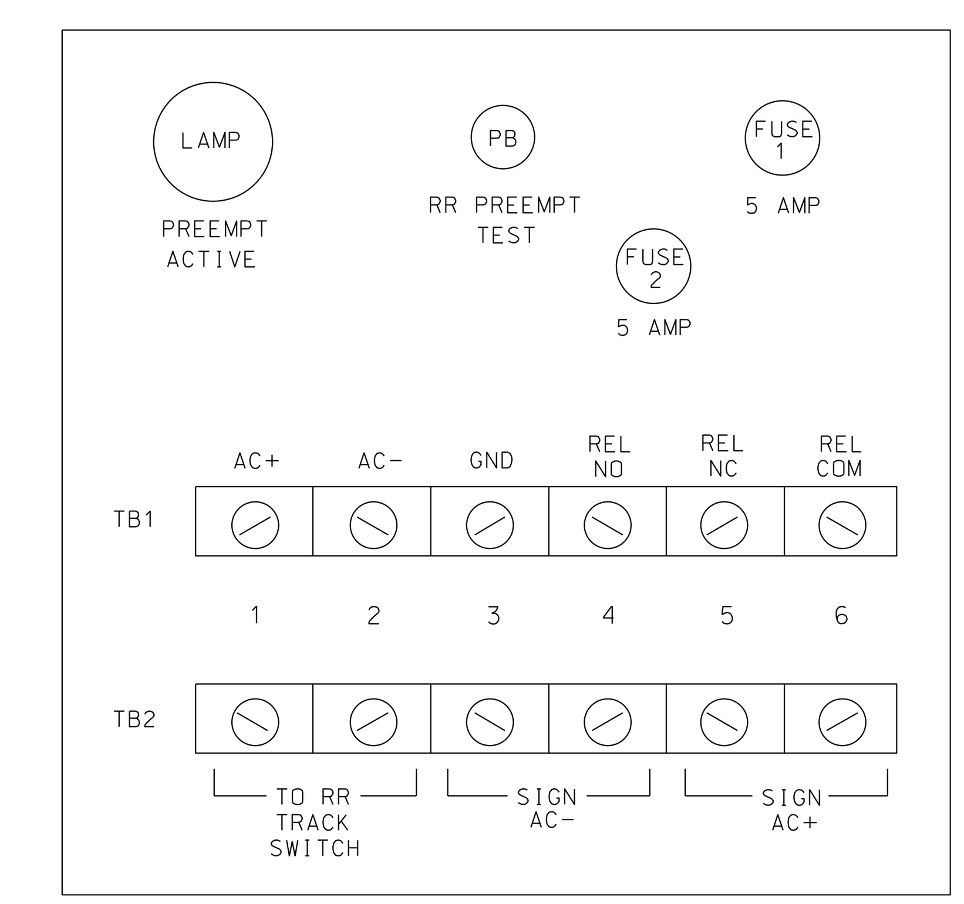
(wire as shown below)



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.
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: C029
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Fayetteville North Carolina

Winslow Street
at
Blount Street

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT	
PREPARED BY: RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

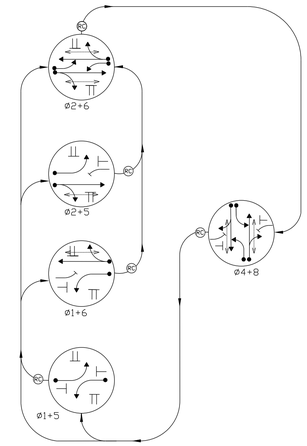
Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC LICENSE NO. F-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T. PATE
DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE
SIG. INVENTORY NO. C029

RTP

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.265.0

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

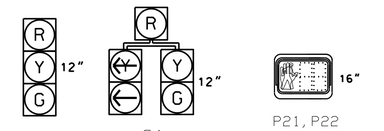
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
21	←	R	↓G	G	R	Y
22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	↓G	R
61	←	↓G	R	G	R	Y
62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P43,P44	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



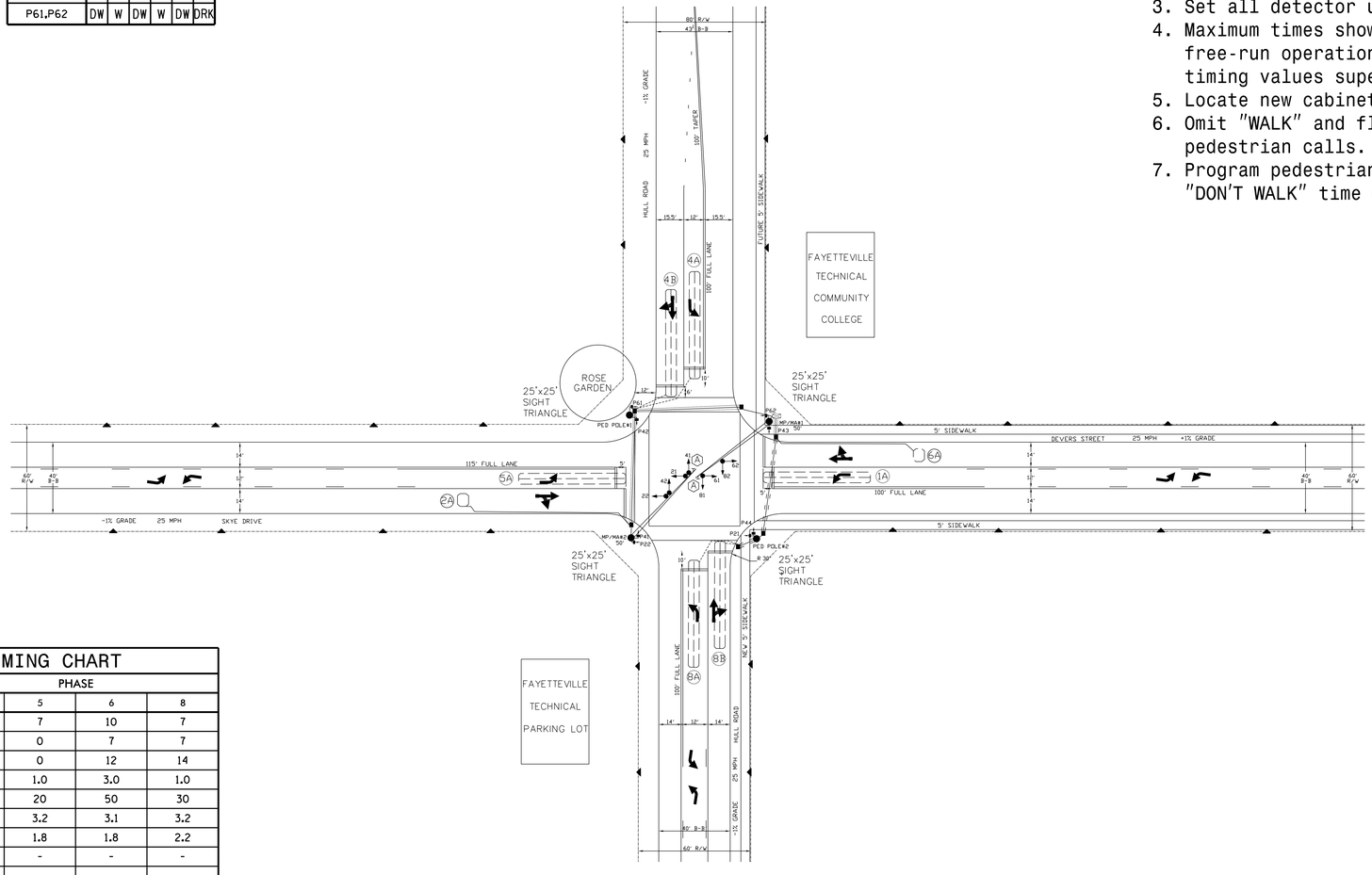
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	-	15	S	-	Y
				-	6	-	3	G	-	Y
2A	6X6	70	4	-	2	-	-	S	-	Y
4A	6X60	+5	2-4-2	-	4	-	3	S	-	Y
4B	6X60	+5	2-4-2	-	4	-	-	S	-	Y
5A	6X60	+5	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
6A	6X6	70	4	-	6	-	-	S	-	Y
8A	6X60	+5	2-4-2	-	8	-	3	S	-	Y
8B	6X60	+5	2-4-2	-	8	-	-	S	-	Y

5 PHASE PROTECTED-PERMITTED
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Do not program signal for late night flashing operation unless directed by the Engineer.
3. Set all detector units to presence mode.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Locate new cabinet on existing foundation.
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.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	0	7	7	0	7	7
Ped Clear	0	13	14	0	12	14
Veh. Extension *	1.0	3.0	1.0	1.0	3.0	1.0
Max 1 *	20	50	30	20	50	30
Yellow	3.1	3.2	3.2	3.2	3.1	3.2
Red Clear	1.8	1.8	2.2	1.8	1.8	2.2
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	X	-	-	X
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	
	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	

(A) LEFT ARROW "ONLY" SIGN (R3-5L) (A)

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville Work First

SCALE 0 40

HULL ROAD AT DEVERS STREET-SKYE DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

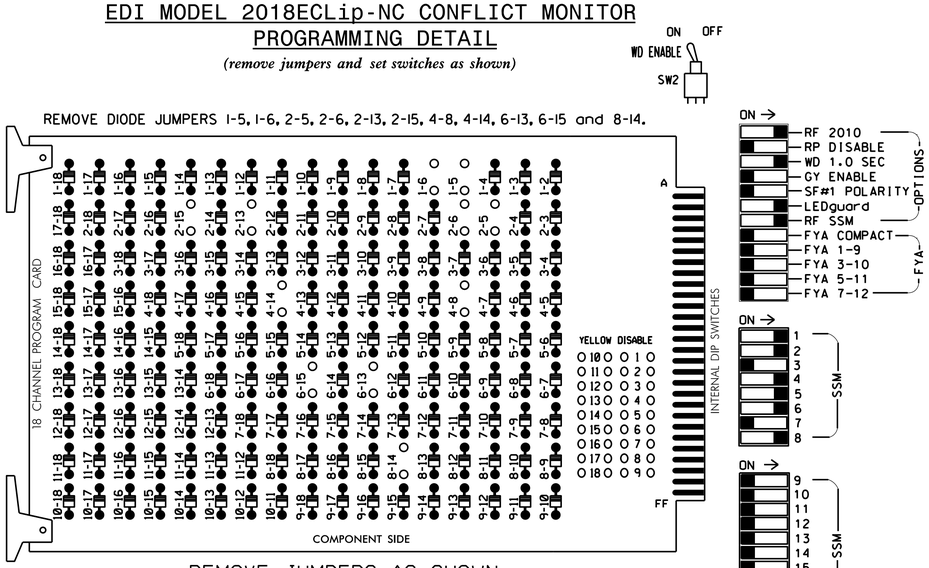
SIG. INVENTORY NO. C003

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11?2016\Devers_at_Hull.dgn
11/17/2016 12:27:14 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.265.1

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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program controller to start up in phase 2 Green and 6 Green.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown flashing "DON'T WALK" time only.
8. Program phases 2, 6 and 4 for 'STARTUP PED CALL'.
9. Program the audible pedestrian signal control board in pedestrian signal heads P21, P22, P61 and P62 for a CHIRP sound during the WALK interval.
10. Program the audible pedestrian signal control board in pedestrian signal heads P41, P42, P43 and P44 for a Cuckoo sound during the WALK interval.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11
PHASES USED.....1,2,4,5,6,8,2PED,4PED,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.	61	22	P21, P22	NU	41,42	P41,P42, P43,P44	21	61,62	P61, P62	NU	81,82	NU
RED	*	128			101		*	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132					
GREEN ARROW	127						133					
✋			113			104			119			
🚶			115			106			121			

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	SLOT EMPTY	Ø1 1A	SLOT EMPTY	⊛ WIRED INPUT	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
	L		Ø2 2A		NOT USED		Ø4 4B						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	SLOT EMPTY	⊛ WIRED INPUT	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6A		NOT USED		Ø8 8B								

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	DETECTOR TYPE
1A '	TB2-1,2	I2U	39	2	1	YES		15	S
	-	J4U	48	26	6	YES		3	G
2A	TB2-5,6	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES		3	S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A '	TB3-1,2	J2U	40	6	5	YES		15	S
	-	I4U	47	22	2	YES		3	G
6A	TB3-5,6	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		3	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				
P41,P42, P43,P44	TB8-5,6	I12L	69	PED 4	4 PED				
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED				

'Add jumper from I2-F to J4-F.

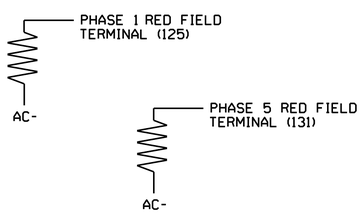
'Add jumper from J2-F to I4-F.

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)



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: C003
DESIGNED: NOVEMBER 2016
SEALED: 11/17/16
REVISED:

Electrical Detail

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

HULL ROAD
AT
DEVERS STREET-SKYE DRIVE

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

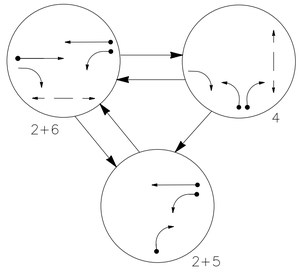
SIG. INVENTORY NO. C003

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Devers_at_Hull.dgn
11/17/2016
12:29:06 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.266.0

3-PHASE FULLY ACTUATED FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

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

SIGNAL FACE I.D.

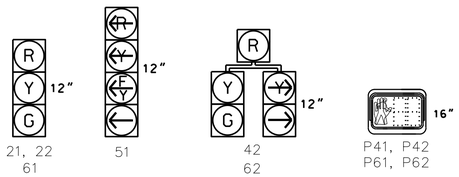
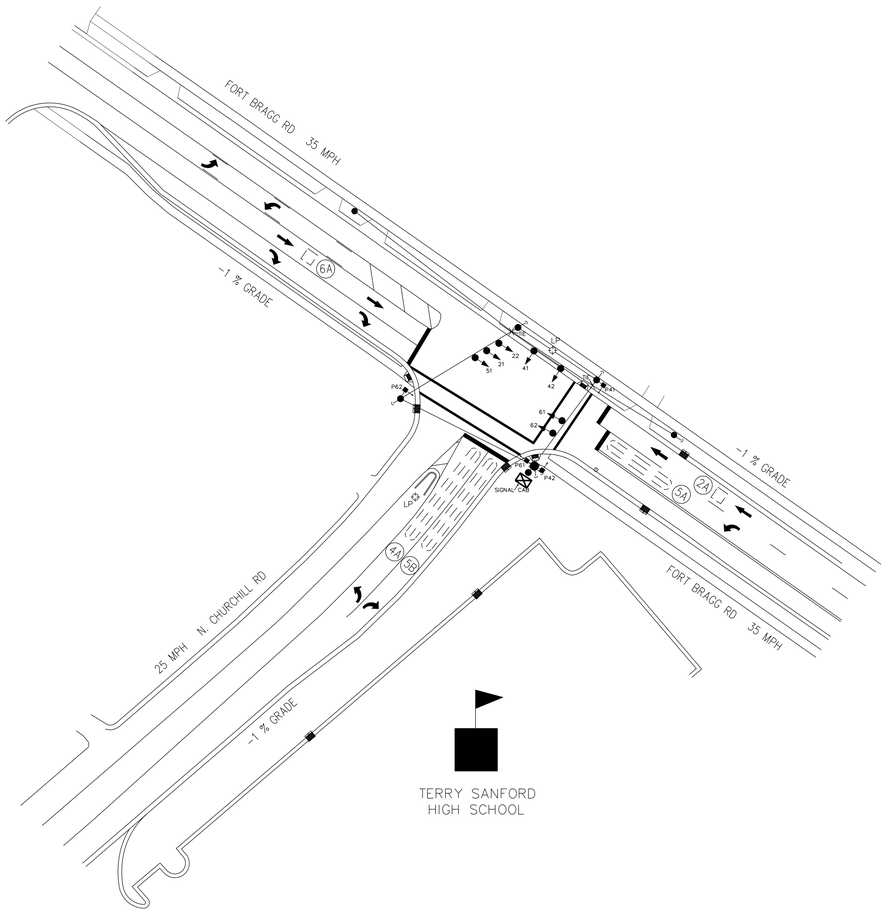


TABLE OF OPERATION				
SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 4	PHASE 1+3
21, 22	R	G	R	Y
41	R	R	G	R
42	R/→	R	G	R
51	←/F/Y	F/Y	R	Y
61	R	G	R	Y
62	R	G	R/→	Y
P41,P42	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	-	2	-	-	S	-	Y
4A	6X60	0	2-4-2	-	4	-	3	S	-	Y
5A	6X40	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	-	G	-	Y
5B	6X60	0	2-4-2	-	5	-	15	S	-	Y
6A	6X6	70	4	-	6	-	-	S	-	Y



NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JULY 2012 AND STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2012.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY ENGINEER.
3. THIS SIGNAL IS TO BE PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
4. SET ALL DETECTOR UNITS TO PRESENCE MODE.
5. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
6. LOCATE NEW CABINET ON EXISTING FOUNDATION.
7. OMIT "WALK" AND FLASHING "DON'T WALK" WITH NO PEDESTRIAN CALLS.
7. PROGRAM PEDESTRIAN HEADS TO COUNTDOWN THE FLASHING "DON'T WALK" TIME ONLY.

ASC/3 TIMING CHART				
	PHASE			
FEATURE	2	4	5	6
Min Green *	10	7	7	10
Walk *	-	5	-	5
Ped Clear	-	9	-	18
Veh. Extension *	3.0	1.0	1.0	3.0
Max 1 *	50	25	25	50
Yellow	3.9	3.2	3.2	3.9
Red Clear	1.5	1.7	2.0	1.6
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
⊣□↓	Pedestrian Signal Head	⊣■↓
○→	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	→

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

FORT BRAGG ROAD
AT
CHURCHILL AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

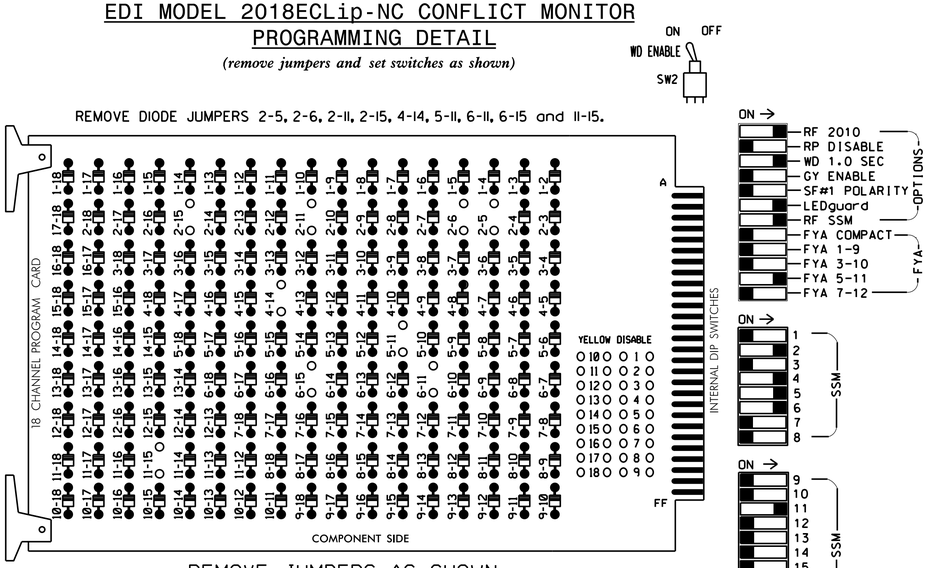
SIG. INVENTORY NO. C004

default
\\NCF-DATA\Proj\3606555_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\FtBragg_at_Churchill.dgn
11/17/2016 2:21:18 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.266.1

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 phases 2 and 6 for Yellow Flash.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 4 and 6 for 'STARTUP PED CALL'.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5
CMU CHANNEL NO.	1	2	13	3	4		14	5		6	15	7	8	16	9	10	17	11	12
PHASE	1	2	2 PED	3	4		4 PED	5		6	6 PED	7	5	8 PED	OLA	OLB	SPARE	OLC	OLD
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	P41, P42	42	51 ★	61,62	P61, P62	NU	NU	NU	NU	NU	NU	51 ★	NU
RED		128			101	*		*		134									
YELLOW		129			102					135									
GREEN		130			103					136									
RED ARROW																		A114	
YELLOW ARROW						102		132										A115	
FLASHING YELLOW ARROW																		A116	
GREEN ARROW						103		133	133										
✋							104				119								
🚶							106				121								

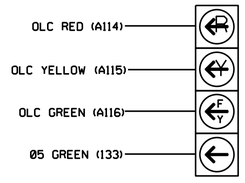
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE 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	SLOT EMPTY	WIRED INPUT •	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø6 6A				Ø5 5B						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	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	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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2			S
4A	TB4-9,10	I6U	41	4	4		3	S
5A '	TB3-1,2	J1U	55	5	5		15	S
	TB3-3,4	I4U	47	22	2			D
5B	TB4-11,12	I6L	45	14	5		15	S
6A	TB2-7,8	I2L	43	12	6			S
P41,P42	TB8-5,6	I12U	69	PED 4	4PED			S
P61,P62	TB8-7,9	I13U	68	PED 6	6PED			S

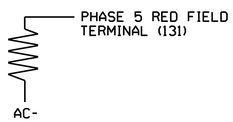
' Add jumper from J1-F to I4-F.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C004
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

FORT BRAGG ROAD
AT
CHURCHILL AVENUE

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C004

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201611FtBragg-at-Churchill.dgn
11/17/2016
2:21:37 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.266.2

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 C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C004
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:

Hatch Mott MacDonald

PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

FORT BRAGG ROAD
AT
CHURCHILL AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

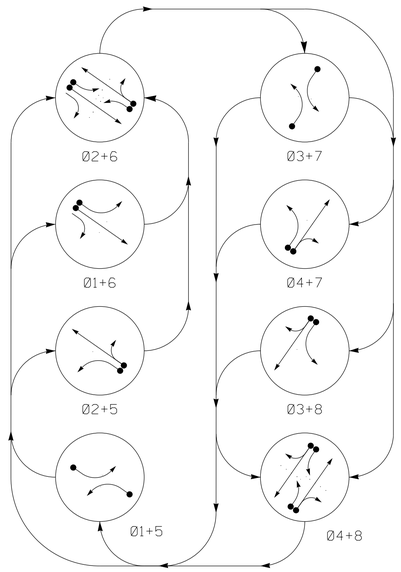
DocuSigned by:
Russell W Thompson 11/21/2016
F30C SIGNATURE DATE

SIG. INVENTORY NO. C004

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\FtBragg-at-Churchill.dgn
11/17/2016 2:24:36 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.267.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

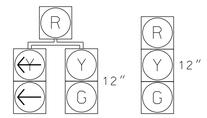
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	03+07	03+08	04+07	04+08	FLASH
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



21 22
41 42
61 62
81 82

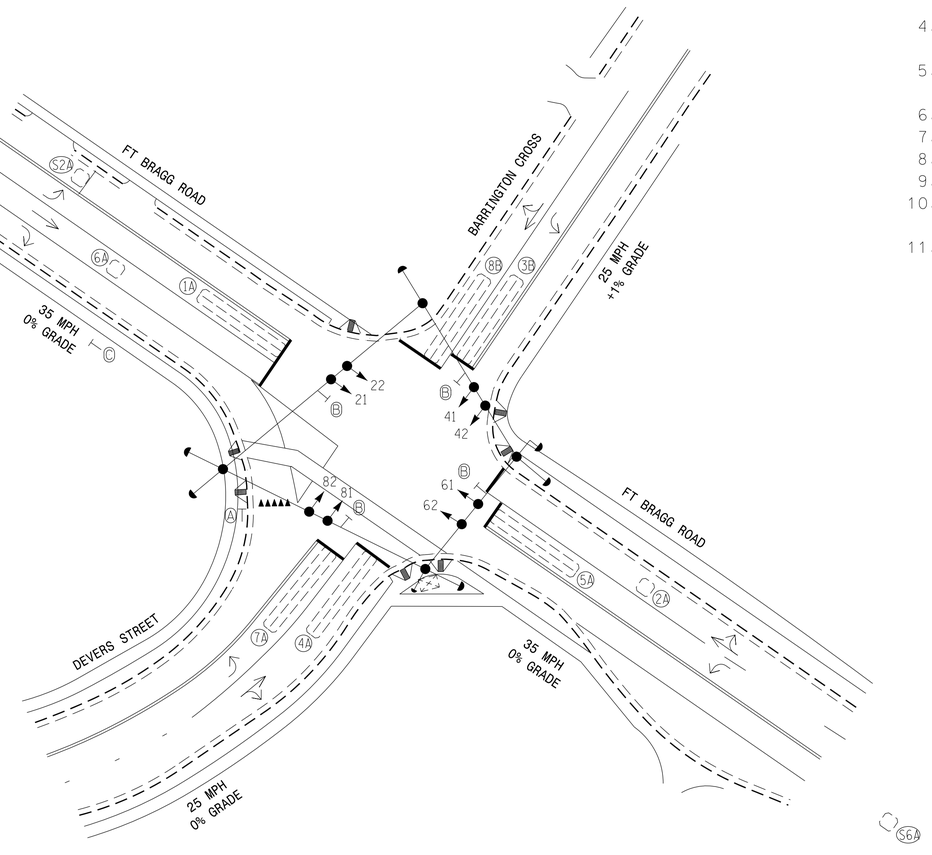
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	N	6	Yes	-	3	S	-	Y
					1	Yes	-	15	S	-	Y
2A	6X6	70	4	N	2	Yes	-	-	S	-	Y
3A	6X40	0	2-4-2	N	8	Yes	-	3	S	-	Y
					3	Yes	-	15	S	-	Y
4A	6X40	0	2-4-2	N	4	Yes	-	-	S	-	Y
5A	6X40	0	2-4-2	N	2	Yes	-	3	S	-	Y
					5	Yes	-	15	S	-	Y
6A	6X6	70	4	N	6	Yes	-	-	S	-	Y
7A	6X40	0	2-4-2	N	4	Yes	-	3	S	-	Y
					7	Yes	-	15	S	-	Y
8A	6X40	0	2-4-2	N	8	Yes	-	-	S	-	Y
S2A	6X6	+200	4	N	SYS	No	-	-	S	-	Y
S6A	6X6	+300	4	N	SYS	No	-	-	S	-	Y

8 PHASE FULLY ACTUATED (FAYETTEVILLE SIGNAL SYSTEM)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
5. INSTALL NEW CABINET ON EXISTING FOUNDATION.
6. OMIT PHASE 1 DURING PHASE 2 ON.
7. OMIT PHASE 5 DURING PHASE 6 ON.
8. OMIT PHASE 3 DURING PHASE 4 ON.
9. OMIT PHASE 7 DURING PHASE 8 ON.
10. ENABLE DYNAMIC/BACKUP CONTROL FUNCTIONS 1,2,3, AND 4.
11. IN THE EVENT OF LOOP REPLACEMENT, REFER TO THE CURRENT ITS AND SIGNALS DESIGN MANUAL AND SUBMIT A PLAN OF RECORD TO THE CITY TRAFFIC ENGINEER.



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	
A	"YIELD" SIGN (R1-2)	A
B	"LEFT TURN YIELD ON GREEN" SIGN (R10-12)	B
C	"RIGHT LANE MUST TURN RIGHT" SIGN (R3-7R)	C

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	4	10	4	10	4	10	4	10
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	1.0	3.0	1.0	1.0	1.0	3.0	1.0	1.0
Max 1 *	20	50	20	30	20	50	20	30
Yellow	3.2	3.8	3.1	3.8	3.2	3.8	3.2	3.8
Red Clear	2.0	1.1	1.7	1.2	1.7	1.7	1.8	1.2
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
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.

Signal Upgrade

Fayetteville North Carolina

FT BRAGG ROAD
AT
DEVERS STREET/
BARRINGTON CROSS

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: RTP | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 0 30 — 1" = 30'

N

Prepared In the Offices of:

Hatch Mott MacDonald

PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016

SIGNATURE | DATE

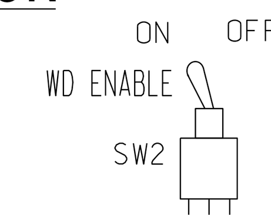
SIG. INVENTORY NO. C005

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Ft Bragg @ Barrington.dgn
11/17/2016 2:16:45 PM

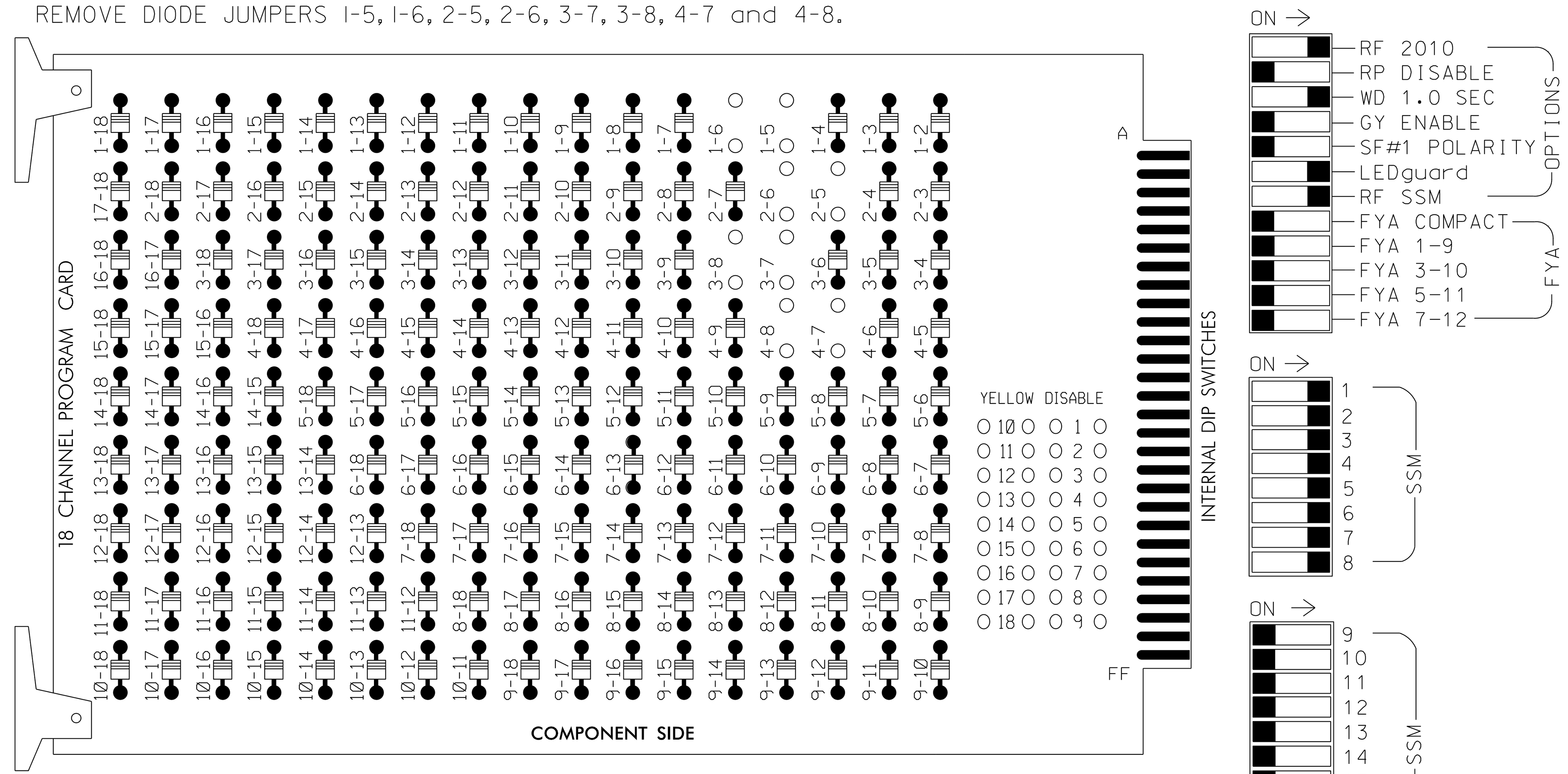
PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.267.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6, 3-7, 3-8, 4-7 and 4-8.



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 phases 2 and 6 for Start Up In Green.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 4 and 8 for Dual Entry.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.............2070E
CABINET.................332
SOFTWARE...............ECONOLITE ASC/3-2070
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S1,S2,S4,S5,S7,S8,S10,S11
PHASES USED............1,2,3,4,5,6,7,8
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.	61	21,22	NU	81	41,42	NU	21	61,62	NU	41	81,82	NU
RED	*	128		*	101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126			117			132			123		
GREEN ARROW	127			118			133			124		
(hand symbol)												
(pedestrian symbol)												

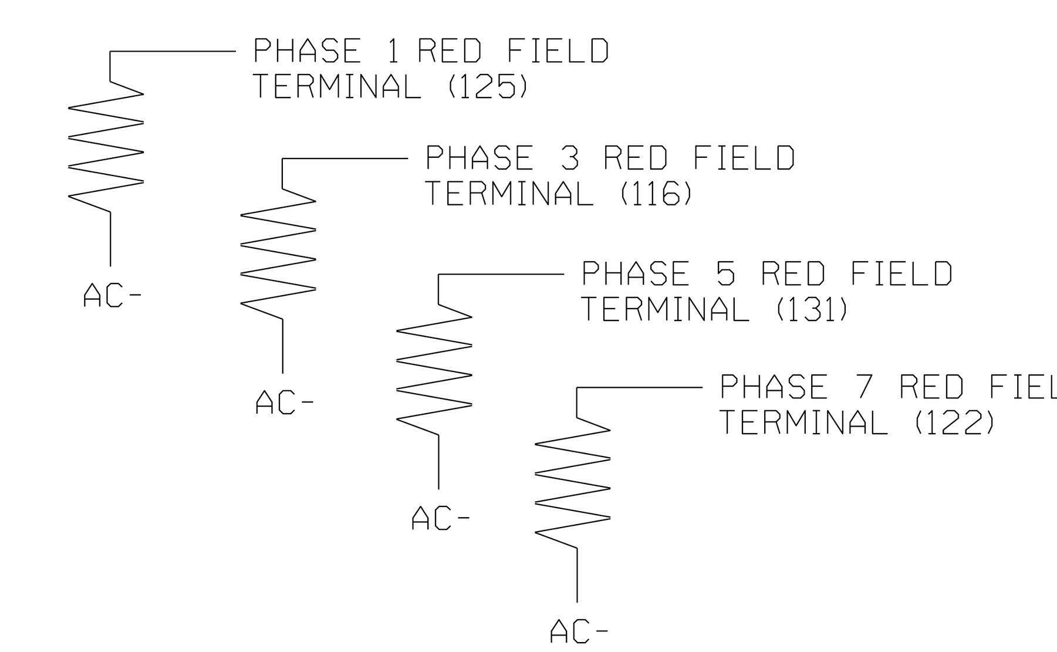
NU = Not Used

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

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)



NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø 1 1A	SYS. DET. S2A	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	⊗ WIRED INPUT	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø 2 2A	SYS. DET. S6A			Ø 4 4A				⊗ WIRED INPUT		Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	⊗ WIRED INPUT	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø 6 6A				Ø 8 8A				⊗ WIRED INPUT				

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	DETECTOR TYPE
1A [1]	TB2-5,6	I2U	39	2	1	YES		15	S
	TB6-9,10	I9U	60	11	6	YES		3	S
2A	TB2-7,8	I2L	43	12	2	YES			S
*S2A	TB2-9,10	I3U	63	32	SYS	NO			N
*S6A	TB2-11,12	I3L	76	42	SYS	NO			N
3A [2]	TB4-9,10	I6U	41	4	3	YES		15	S
	TB4-11,12	I9L	60	13	8	YES		3	S
4A	TB4-11,12	I6L	45	14	4	YES			S
5A [3]	TB3-5,6	J2U	40	6	5	YES			S
	TB7-9,10	J9U	59	15	2	YES			S
6A	TB3-7,8	J2L	44	16	6	YES			S
7A [4]	TB5-9,10	J6U	41	8	7	YES		15	S
	TB7-11,12	J9L	61	17	4	YES		3	S
8A	TB5-11,12	J6L	46	18	8	YES			S

* System detector only. Remove any assigned vehicle phase.

[1] Add jumper from I2-F to I9-F, on rear of input file.

[2] Add jumper from I6-F to I9-W, on rear of input file.

[3] Add jumper from J2-F to I9-F, on rear of input file.

[4] Add jumper from J6-F to I9-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C005
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

FT BRAGG ROAD
AT
DEVERS STREET/
BARRINGTON CROSS

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

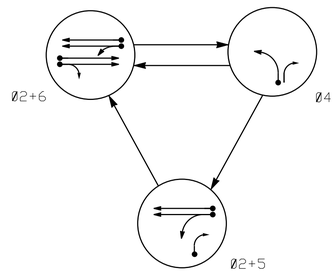
DocuSigned by: Richard T Pate 11/21/2016
DATE

SIG. INVENTORY NO. C005

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Ft Bragg @ Barrington.dgn
2:17:10 PM
11/17/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.268.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

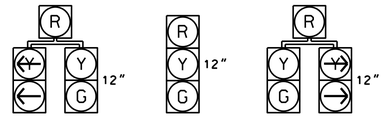
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+05	PHASE 02+06	PHASE 04	FLASH
21	G	G	R	Y
22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
61, 62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



21 | 22, 41, 61, 62 | 42

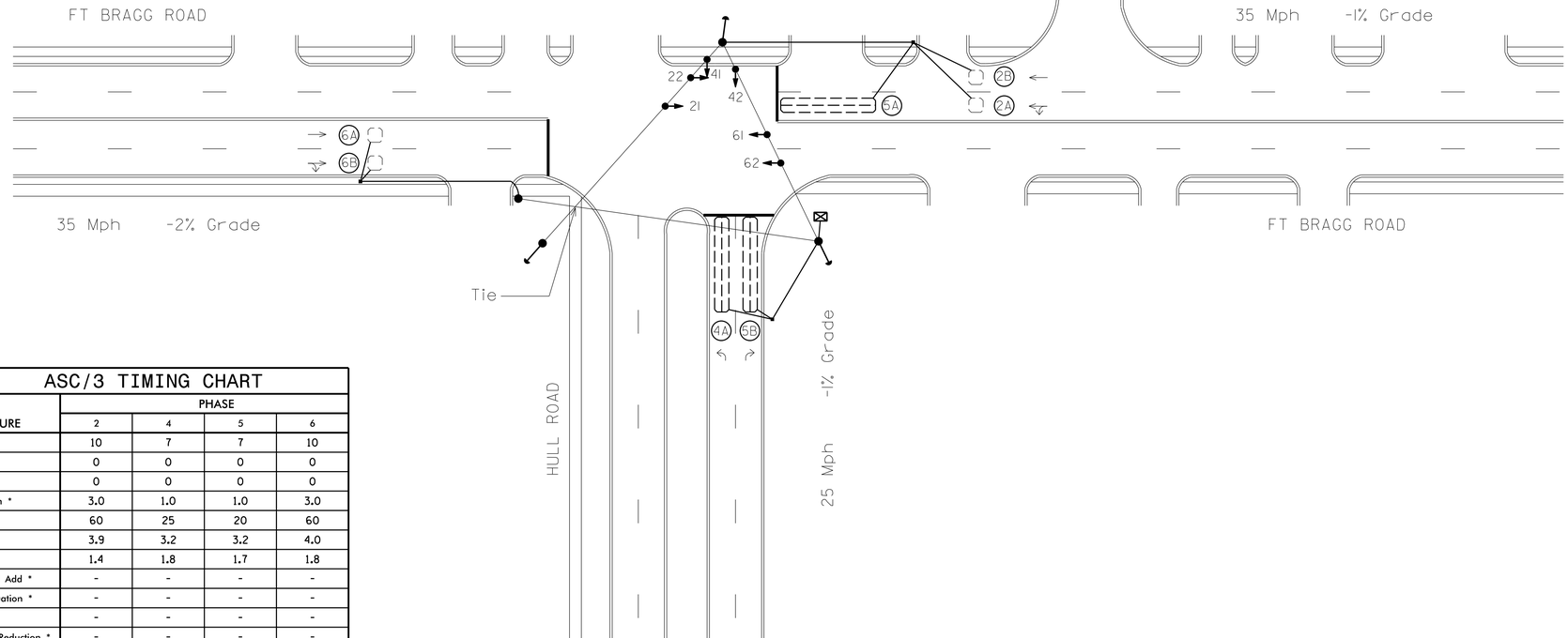
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A,2B	6X6	80	4	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	-	S	-	Y
5A	6X40	0	2-4-2	-	2	-	3	G	-	Y
				-	5	-	25	S	-	Y
5B	6X40	0	2-4-2	-	5	-	15	S	-	Y
6A,6B	6X6	70	4	-	6	-	-	S	-	Y

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Locate new cabinet on existing foundation.
3. Do not program signal for late night flashing operation unless otherwise directed by the engineer.
4. Program controller to clear from phase 2+6 to phase 2+5 by progressing through phase 4 (see Electrical Details).
5. Omit phase 5 during phase 6 on.
6. Set all detector units to presence mode.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. Locate new cabinet on existing foundation.



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	10	7	7	10
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	1.0	1.0	3.0
Max 1 *	60	25	20	60
Yellow	3.9	3.2	3.2	4.0
Red Clear	1.4	1.8	1.7	1.8
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MIN. RECALL	-	-	MIN. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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	

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

HULL ROAD AT FORT BRAGG ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 30

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

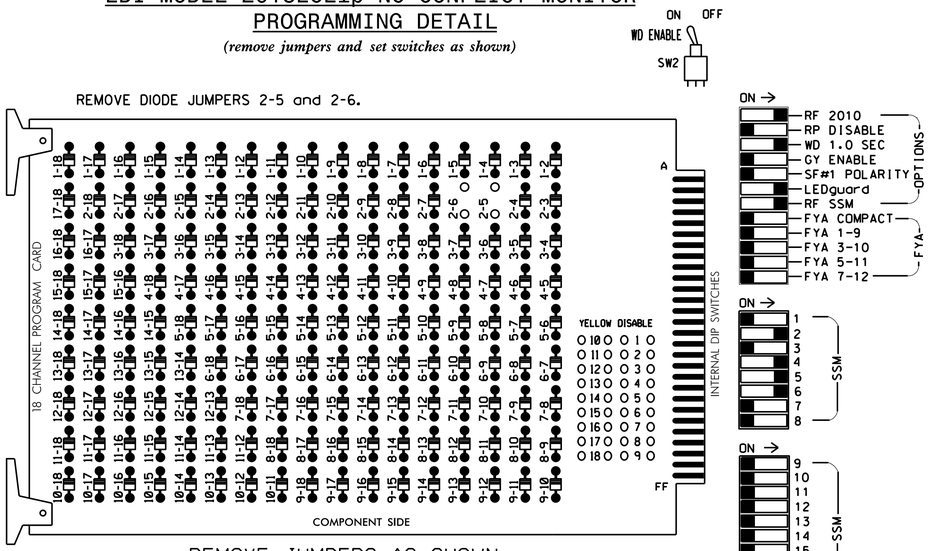
SIG. INVENTORY NO. C006

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\7\2016\FtBragg-at-Hull.dgn
11/17/2016 2:30:04 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.268.1

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. Enable Simultaneous Gap-Out for all phases.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
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

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	21,42	61,62	NU	NU	NU	NU
RED		128			101		*	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					
✋												
🚶												

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	SLOT EMPTY	Ø2 2A,2B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø6 6A,6B				Ø5 5B			⊗ WIRED INPUT					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

⊗ 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	DETECTOR TYPE
2A,2B	TB2-5,6	12U	39	2	2	YES			S
4A	TB4-9,10	16U	41	4	4	YES			S
'5A	TB6-9,10	19U	60	11	5	YES		25	S
	TB6-11,12	19L	62	13	2	YES		3	G
5B	TB4-11,12	16L	45	14	5	YES		15	S
6A,6B	TB2-7,8	12L	43	12	6	YES			S

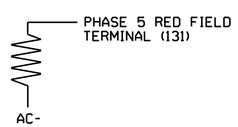
' Add jumper from I9-F to I9-W, on rear of input file.

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)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: C006
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville Nathaniel Greene

HULL ROAD
AT
FORT BRAGG ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

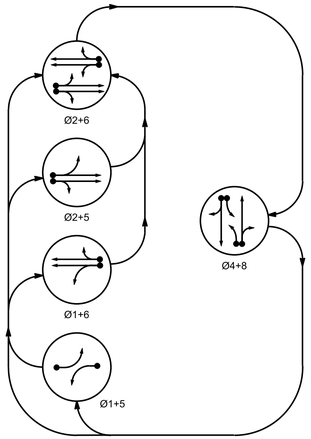
SIG. INVENTORY NO. C006

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1007\FINAL SEALED PLANS\Revised 117201G\F-tBragg-at-Hull.dgn
11/17/2016
2:31:03 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.269.0

5 PHASE
FULY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM

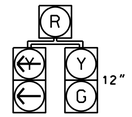


PHASING DIAGRAM DETECTION LEGEND

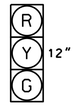
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



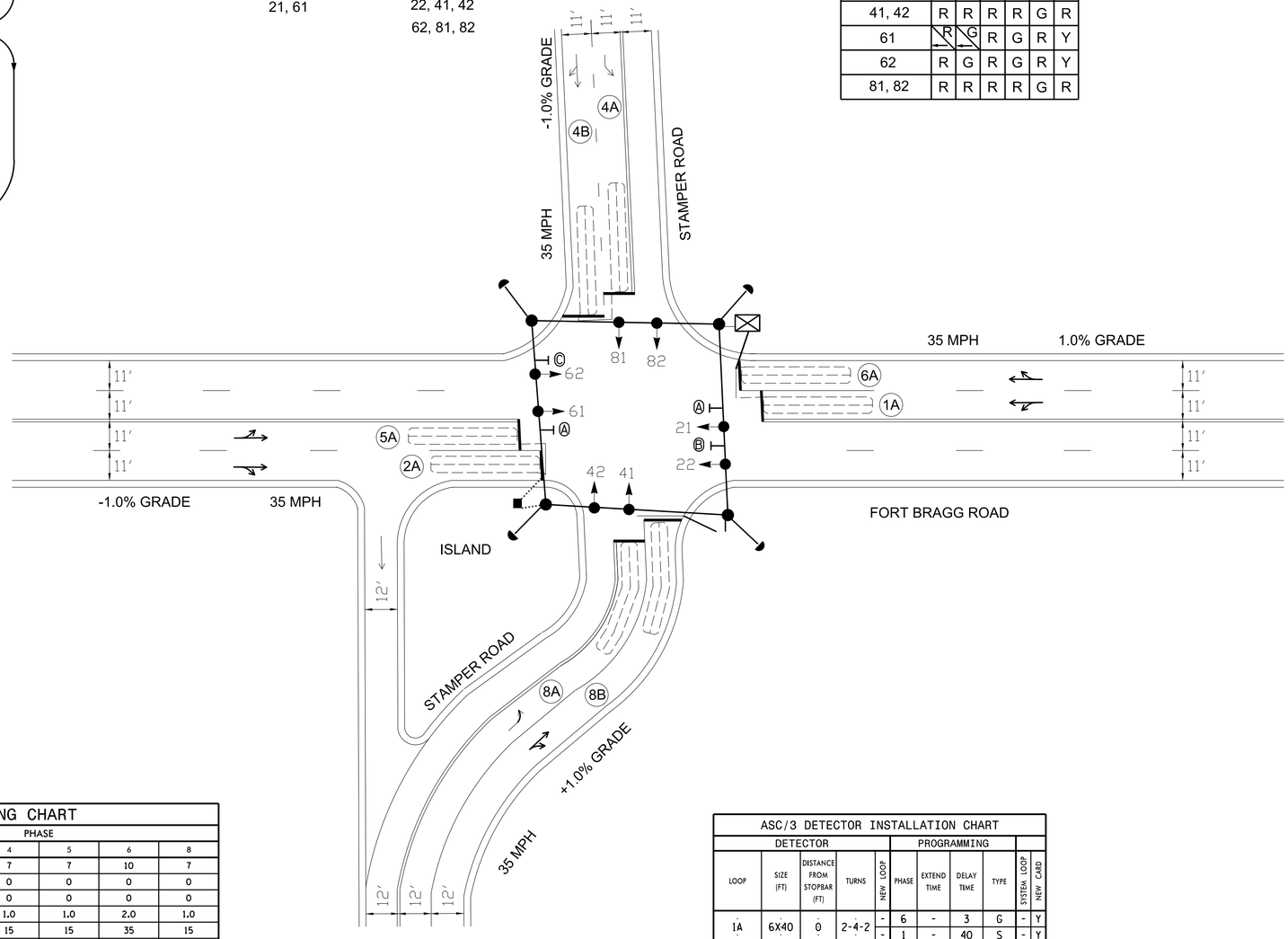
21, 61



22, 41, 42
62, 81, 82

TABLE OF OPERATION

SIGNAL FACE	PHASE ø1+5	ø1+6	ø2+5	ø2+6	ø4+8	FLASH
21	R/←	R	G/←	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R/←	G/←	R	G	R	Y
62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R



NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
3. Pavement markings are existing.
4. Program the controller to clear from phases 2+6 to phases 1+5 or phases 1+6 or phases 2+5 by progressing through phases 4+8.
5. Omit phase 1 during phase 2 on and omit phase 5 during phase 6 on.
6. Program phases 4 and 8 for dual entry.
7. Locate new cabinet on existing foundation.

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	0	0	0	0	0	0
Ped Clear	0	0	0	0	0	0
Veh. Extension *	1.0	2.0	1.0	1.0	2.0	1.0
Max 1 *	15	35	15	15	35	15
Yellow	3.1	3.9	3.9	3.2	3.8	3.8
Red Clear	1.8	1.2	1.2	1.5	1.4	1.2
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	MIN. RECALL	-	-	MIN. RECALL	-
Dual Entry	-	-	X	-	-	X
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	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	6	-	3	G	-	Y
				-	1	-	40	S	-	Y
2A	6X40	0	2-4-2	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	-	S	-	Y
4B	6X40	0	2-4-2	-	4	-	10	S	-	Y
5A	6X40	0	2-4-2	-	2	-	3	G	-	Y
				-	5	-	40	S	-	Y
6A	6X40	0	2-4-2	-	6	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	-	-	S	-	Y
8B	6X40	0	2-4-2	-	8	-	10	S	-	Y

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head	■↓
○→	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	→
Ⓐ	"Left Turn Yield on Green" Sign (R10-12)	Ⓐ
Ⓑ	No Left Turn When Emergency Vehicle is in Roadway	Ⓑ
Ⓒ	No Right Turn When Emergency Vehicle is in Roadway	Ⓒ

Signal Upgrade

Fayetteville

FORT BRAGG ROAD AT STAMPER ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 25

Prepared in the Offices of:

Hatch Mott MacDonald

PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C007

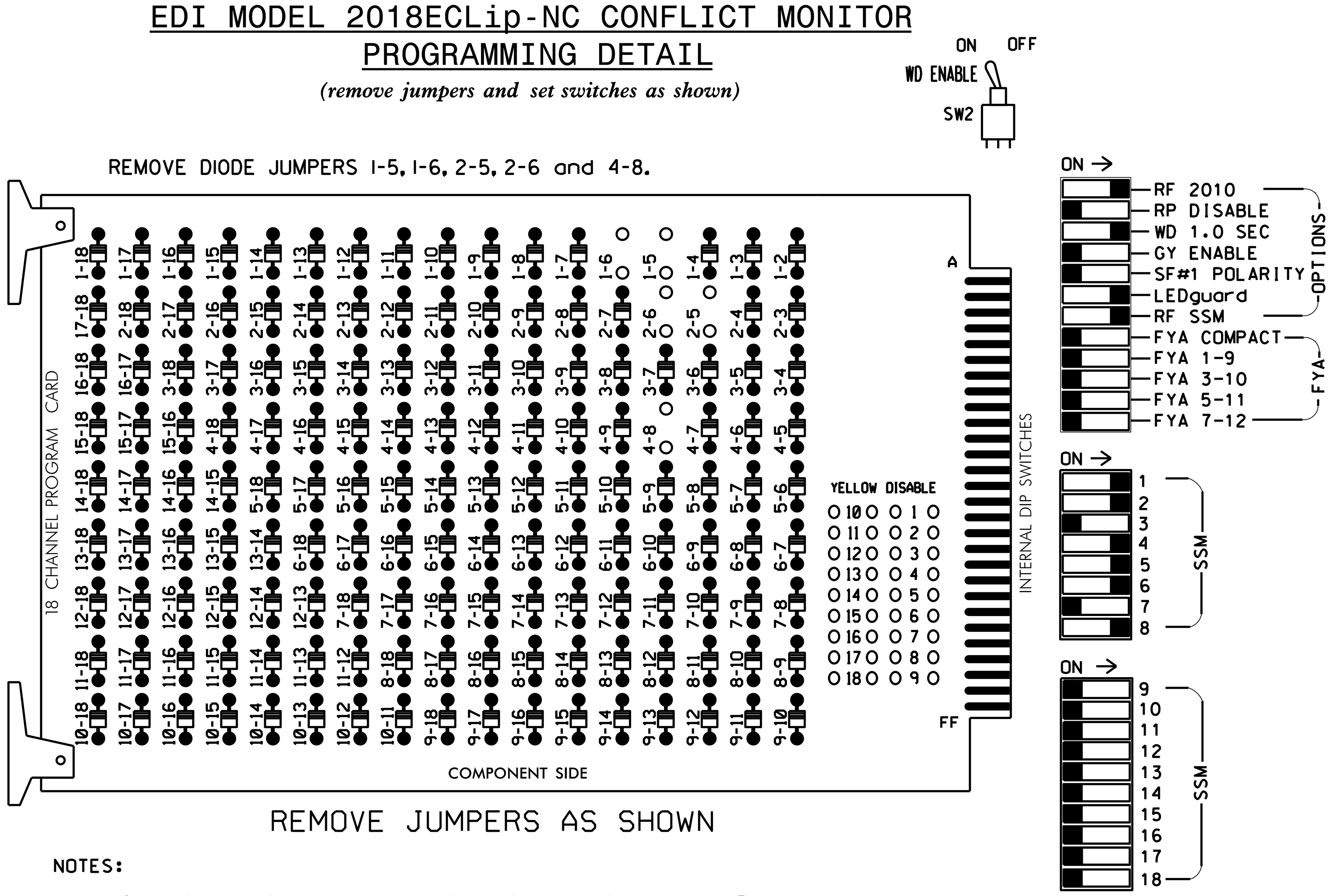
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201611FtBragg_at_Stamper.dgn
11/17/2016 2:37:35 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.269.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 2-5, 2-6 and 4-8.



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 phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER..............2070E
CABINET.................332
SOFTWARE................ECONOLITE ASC/3-2070
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S1,S2,S5,S7,S8,S11
PHASES USED.............1,2,4,5,6,8
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.	61	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU
RED	*	128			101		*	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132					
GREEN ARROW	127						133					
(DON'T WALK symbol)												
(WALK symbol)												

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø6 6A				ø4 4B			⊗ WIRED INPUT					ST DC ISOLATOR
"J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	ø5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L						ø8 8B			⊗ WIRED INPUT					

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	DETECTOR TYPE
[1] 1A	TB6-9,10	I9U	60	11	1	YES		40	S
	-	I9L	62	13	6	YES		3	G
2A	TB2-5,6	I2U	39	2	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES		10	S
[2] 5A	TB7-9,10	J9U	59	15	5	YES		40	S
	-	J9L	61	17	2	YES		3	G
6A	TB2-7,8	J2L	43	12	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S

[1] Add jumper from I9-F to I9-W.
[2] Add jumper from J9-F to J9-W.

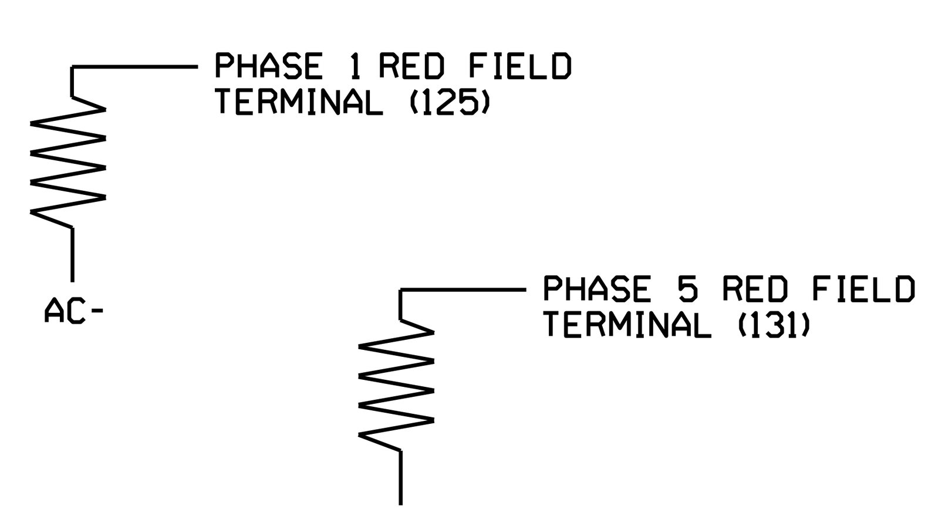
INPUT FILE POSITION LEGEND: J2L

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C007
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

FORT BRAGG ROAD
AT
STAMPER ROAD

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

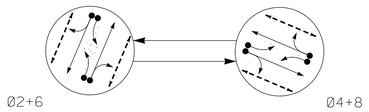
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE
SIG. INVENTORY NO. C007

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\FtBragg.et.Stamper.dgn
3:05:36 PM
11/17/2016

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.270.0

PHASING DIAGRAM



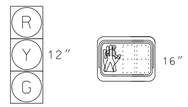
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

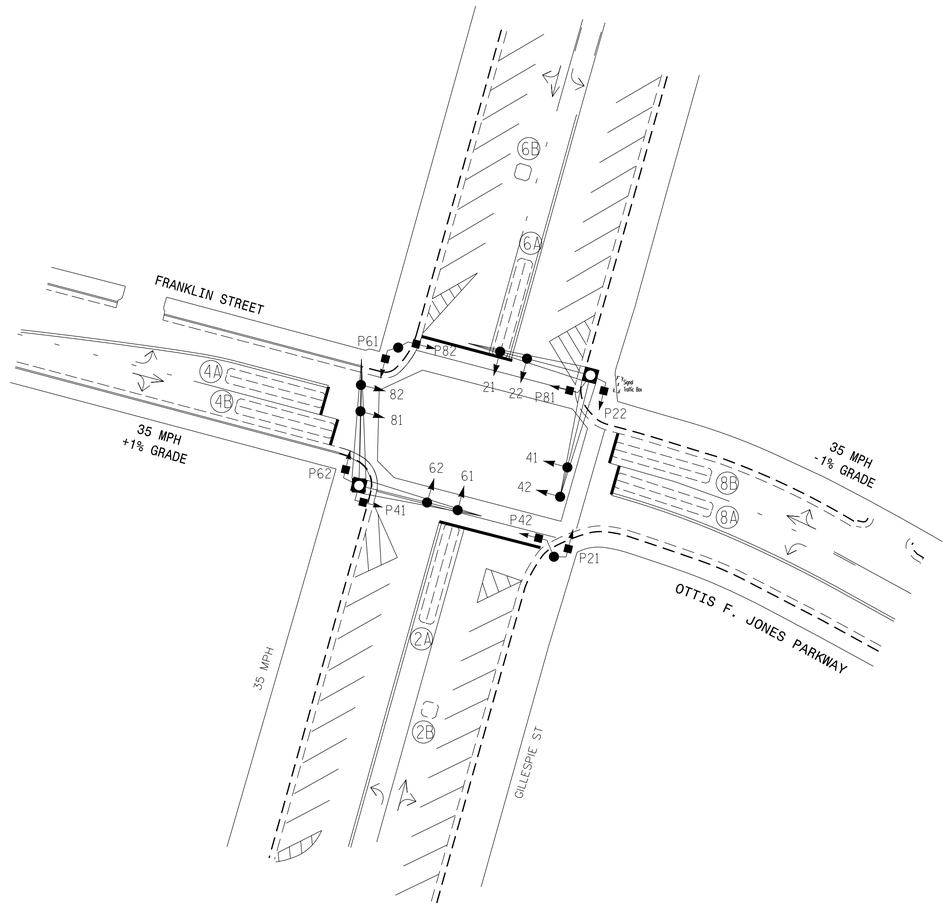
SIGNAL FACE I.D.

All Heads L.E.D.



21,22	P21,P22
41,42	P41,P42
61,62	P61,P62
81,82	P81,P82

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Yes	-	-	G	-	Y
2B	6X6	70	3	-	2	Yes	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	Y
4B	6X40	0	2-4-2	-	4	Yes	-	10	S	-	Y
6A	6X40	0	2-4-2	-	6	Yes	-	-	S	-	Y
6B	6X6	70	3	-	6	Yes	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	Yes	-	-	G	-	Y
8B	6X40	0	2-4-2	-	8	Yes	-	10	S	-	Y



2 PHASE FULLY ACTUATED (FAYETTEVILLE SIGNAL SYSTEM)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
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. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
8. SET ALL DETECTOR UNITS TO PRESENCE MODE.
8. INSTALL NEW CABINET ON EXISTING FOUNDATION.

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	

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	10	20	7	17
Veh. Extension *	2.0	2.0	2.0	2.0
Max 1 *	30	20	30	20
Yellow	3.2	3.1	3.2	3.2
Red Clear	1.7	2.8	1.7	2.8
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

Fayetteville North Carolina

GILLESPIE STREET AT FRANKLIN STREET/OTTIS F. JONES PARKWAY

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: RTP | REVIEWED BY:

SCALE 0 30 1" = 30'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016

SIGNATURE | DATE

SIG. INVENTORY NO. C008

Prepared In the Offices of:

Hatch Mott MacDonald

PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

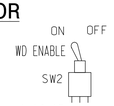
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Franklin @ Gillespie.dgn
11/17/2016
12:35:34 PM

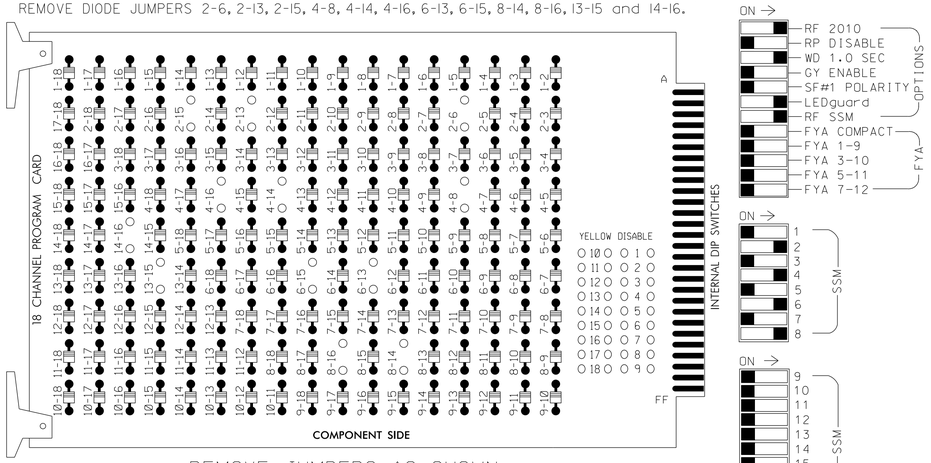
PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.270.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 6-13, 6-15, 8-14, 8-16, 13-15 and 14-16.



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 phases 2 and 6 for Yellow Flash.
3. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
4. Program phases 2 and 6 for Start Up In Green.
5. Enable Simultaneous Gap-Out for all phases.
6. Program phases 4 and 8 for Dual Entry.
7. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,4,6,8,2PED,4PED,6PED,8PED
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		41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104			119			110
🚶			115			106			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	SLOT EMPTY	Ø2 2A	SLOT EMPTY	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				Ø4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L		Ø6 6B				Ø8 8B								

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	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES		10	S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4 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.

✳ System detector only. Remove any assigned vehicle phase.

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: C008
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Fayetteville

GILLESPIE STREET AT FRANKLIN STREET/OTTIS F. JONES PARKWAY

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T. PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

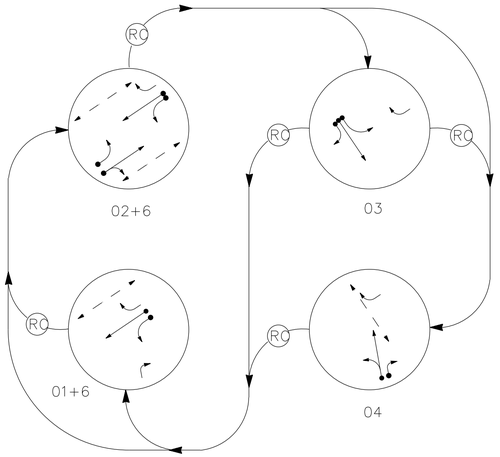
SIG. INVENTORY NO. C008

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.271.0

4 PHASE FULLY ACTUATED FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

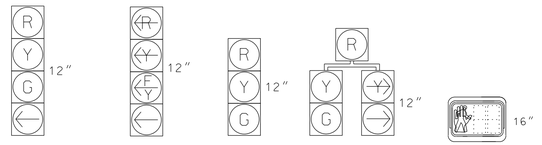
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	03	04	01+6	FLASH
11	FY	R	R	←	FY
21,22	G	R	R	R	Y
31	R	G	R	R	R
32,33	R	G	R	R	R
41	R	R	G	R	R
42	R	R	R	R	R
61,62	G	R	R	G	Y
P21,P22	W	DW	DW	DW	DRK
P41,P42	DW	DW	W	DW	DRK
P61,P62	W	DW	DW	DW	DRK

FY = Flashing Yellow Arrow
W - Walk
DW - Don't Walk
DRK - Dark

SIGNAL FACE I.D.



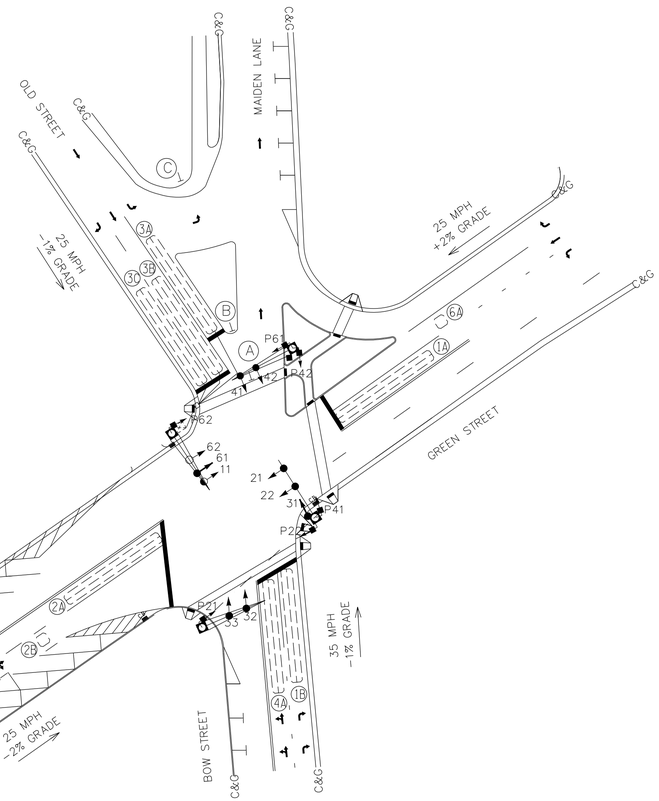
31
41

11

21, 22
32, 33
61, 62

42

P21, P22
P41, P42
P61, P62



NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
5. OMIT "WALK" AND "FLASHING DON'T WALK" WITH NO PEDESTRIAN CALLS.
6. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRETED BY THE ENGINEER.
7. SET ALL DETECTOR UNITS TO PRESENCE MODE.
8. INSTALL NEW CABINET ON EXISTING FOUNDATION.
9. PROGRAM PEDESTRIAN HEADS TO COUNTDOWN THE FLASHING "DON'T WALK" TIME ONLY.

LEGEND

PROPOSED		EXISTING
○→	TRAFFIC SIGNAL HEAD	●→
◐→	MODIFIED TRAFFIC SIGNAL HEAD	N/A
	PEDESTRIAN SIGNAL HEAD WITH PUSH BUTTON & SIGN	
	SIGNAL POLE WITH GUY	
	SIGNAL POLE WITH SIDEWALK GUY	
	INDUCTIVE LOOP DETECTOR	
	CONTROLLER & CABINET	
	LOOP DETECTOR PULL BOX	
	2" UNDERGROUND CONDUIT	
	INTERCONNECT CABLE (HARDWIRE)	
	RIGHT OF WAY WITH MARKER	
	DIRECTIONAL ARROW	
	PAVEMENT MARKING ARROW	
	METAL POLE WITH MASTARM	
N/A	COMBINED THOUGH AND LEFT ARROW SIGN (R4-7)	A
N/A	"KEEP RIGHT" SIGN (R4-7)	B
N/A	"DO NOT ENTER" SIGN (R5-1)	C

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	6
Min Green *	4	10	4	4	4
Walk *	-	7	-	7	7
Ped Clear	-	17	-	12	13
Veh. Extension *	1.0	2.0	1.0	1.0	2.0
Max 1 *	20	60	20	20	60
Yellow	3.1	3.3	3.2	3.2	3.1
Red Clear	2.8	3.0	3.2	3.0	2.8
Red Revert	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	-	X	-	-	X
Recall Position	-	MIN RECALL	-	-	MIN 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.

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	N	1	-	15	S	-	Y
					6	-	3	G		
1B	6X60	0	2-4-2	N	1	-	15	S	-	Y
2A	6X60	0	2-4-2	N	2	-	3	S	-	Y
2B	6X6	70	4	N	2	-	-	S	-	Y
3A	6X60	0	2-4-2	N	3	-	-	S	-	Y
3B	6X60	0	2-4-2	N	3	-	-	S	-	Y
3C	6X60	0	2-4-2	N	3	-	15	S	-	Y
4A	6X60	0	2-4-2	N	4	-	3	S	-	Y
6A	6X6	70	4	N	6	-	3	S	-	Y

Signal Upgrade

Green Street
at
Old Street/Bow Street

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: RTP | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

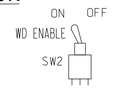
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE
DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE
SIG. INVENTORY NO. C009

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Green_at_Old.dgn
11/17/2016
3:11:13 PM

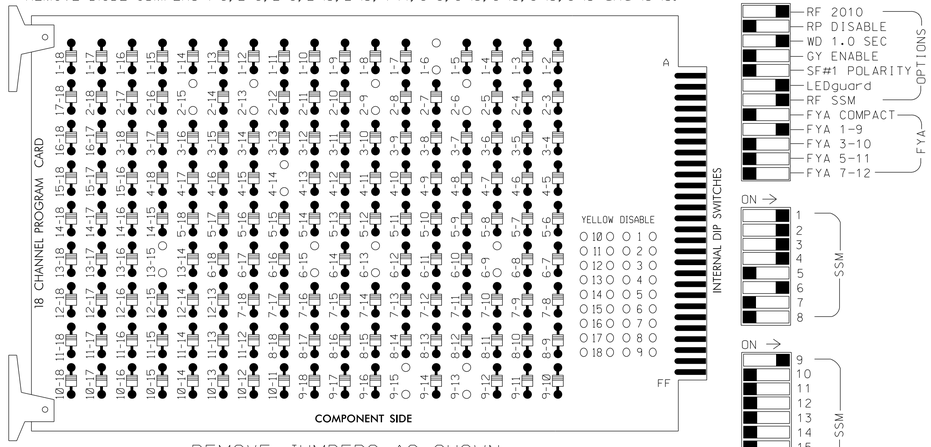
PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.271.1

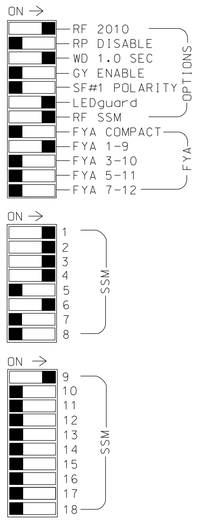
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-6, 2-6, 2-9, 2-13, 2-15, 4-14, 6-9, 6-13, 6-15, 9-13, 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. Enable Simultaneous Gap-Out for all phases.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.
5. Program phases 2 and 6 for Yellow Flash.
6. Program phases 2, 4, 6 for 'STARTUP PED CALL'.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4		S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4
CMU CHANNEL NO.	1		2	13	3		4		14	5	6	15	7	8	16	9	10	17	11
PHASE	1		2	2 PED	3		4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC
SIGNAL HEAD NO.	11 ★	42	21,22	P21, P22	31	32,33	41	42	P41, P42	NU	62	P61, P62	NU	NU	NU	11 ★	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																A121			
YELLOW ARROW		126														A122			
FLASHING YELLOW ARROW																A123			
GREEN ARROW	127	127			118		103												
✋				113					104			119							
🚶				115					106			121							

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1		15	S
2A	TB2-5,6	I2U	39	2	2		3	S
2B	TB2-7,8	I2L	43	12	2		3	S
3A	TB4-5,6	I5U	58	3	3			S
3B	TB4-7,8	I5L	58	3	3			S
3C	TB3-7,8	J2L	44	16	3		15	S
4A	TB4-9,10	I6U	41	4	4		3	S
1B	TB4-11,12	I6L	45	14	4		15	S
6A	TB3-5,6	J2U	40	6	6		3	S
PED PUSH BUTTONS								
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED			
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED			
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED			

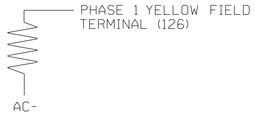
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

* System detector only. Remove any assigned vehicle phase.

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)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C009
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Fayetteville

Green Street
at
Old Street/Bow Street

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: RTP	REVIEWED BY:

REVISIONS	INIT.	DATE

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C009

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 112016\Green_at_Old.dgn
11/17/2016
3:11:28 PM

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

PROTECTED PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH13 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

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: C009
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

Green Street
at
Old Street/Bow Street

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: RTP	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

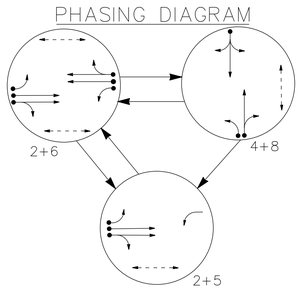
SIG. INVENTORY NO. C009

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Green_at_Old.dgn
11/17/2016 3:13:51 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.272.0

3-PHASE FULLY ACTUATED (FAYETTEVILLE SIGNAL SYSTEM)

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

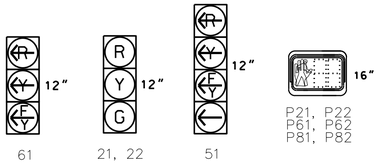
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+5	PHASE 2+6	PHASE 4+8	PHASE FLASH
21, 22	R	G	R	Y
41, 42	R	R	G	R
51	←	r/Y	R	~~→~~
61	r/Y	r/Y	~~R~~	~~→~~
62, 63	R	G	R	Y
81, 82	R	R	G	R
P21, P22	W	W	DW	DRK
P61, P62	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

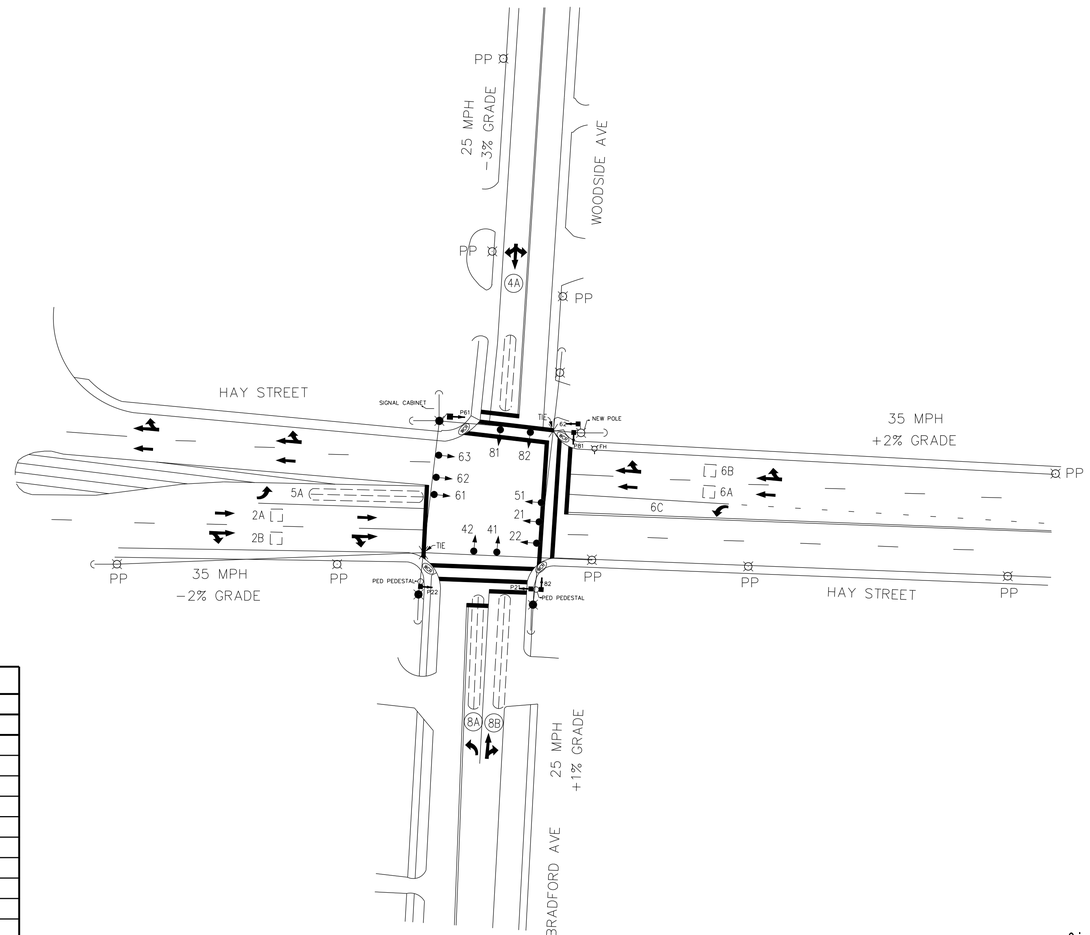


ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A,2B	6X6	70	4	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	3	S	-	Y
5A	6X60	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
6A,6B	6X6	70	4	-	6	-	-	S	-	Y
6C	6X40	0	2-4-2	-	6	-	-	S	-	Y
8A	6X60	0	2-4-2	-	8	-	3	S	-	Y
8B	6X60	0	2-4-2	-	8	-	15	15	-	Y

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JULY 2012 AND STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2012.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY ENGINEER.
3. SET ALL DETECTOR UNITS TO PRESENCE MODE.
4. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
5. LOCATE NEW CABINET ON EXISTING FOUNDATION.
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.



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6	PHASE 8
Min Green *	10	7	7	10	7
Walk *	5	0	0	5	5
Ped Clear	11	0	0	9	17
Veh. Extension *	3.0	1.0	1.0	3.0	1.0
Max 1 *	45	20	20	45	20
Yellow	3.7	3.1	3.1	3.7	3.1
Red Clear	1.2	2.4	1.7	1.2	2.2
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-
Max Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Locking Detector	X	-	-	X	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	X	-	X	-
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.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▼	Pedestrian Signal Head	■
○ ○	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	→

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

HAY STREET
AT
WOODSIDE AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 40

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

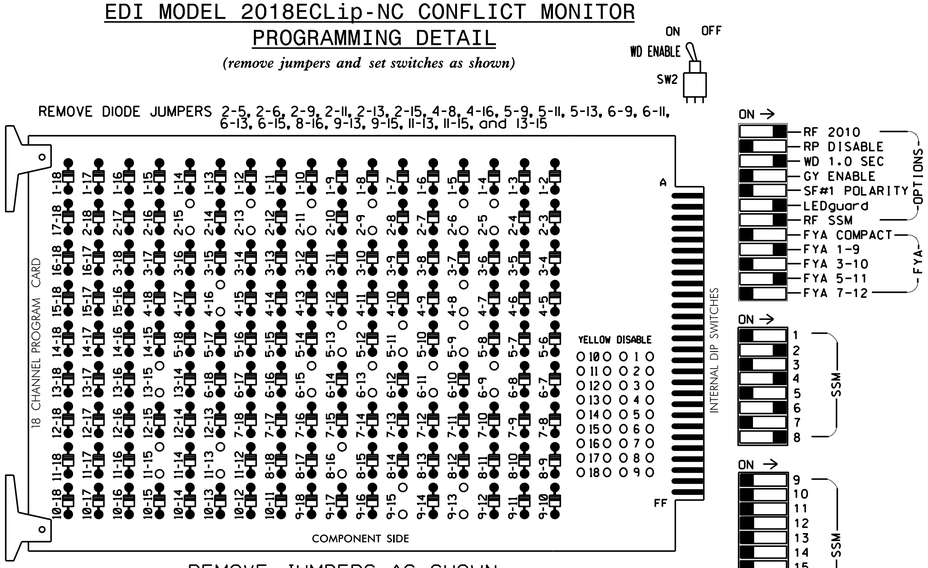
SIG. INVENTORY NO. C010

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Woodside_at_Hay.dgn
11/18/2016 11:16:53 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.272.1

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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 6, and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. Polara Engineering pushbutton integrated accessible pedestrian signal equipment (Navigator APS) to be installed and wired per manufacturer's instructions.
8. The cabinet and controller are part of the Fayetteville City System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	P21, P22	NU	41,42	NU	51 ★	62,63	P61, P62	NU	81,82	P81, P82	61	NU	NU	51 ★	NU	NU
RED		128			101			134			107							
YELLOW		129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW							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 this sheet.

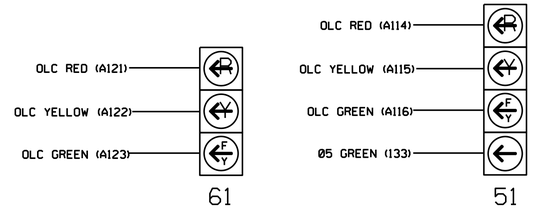
EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

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,2B	SLOT EMPTY	WIRED INPUT •	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		NOT USED				Ø6 6C						NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5 5A	Ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	NOT USED	NOT USED				Ø8 8B								

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A,2B	TB2-5,6	I2U	39	2	2			S
4A	TB4-9,10	I6U	41	4	4		3	S
5A '	TB3-1,2	J1U	55	5	5		15	S
	TB4-1,2	I4U	47	22	2			C
6A,6B	TB3-5,6	J2U	40	6	6			S
6C	TB4-11,12	I6L	45	14	6			S
8A	TB5-9,10	J6U	42	8	8		3	S
8B	TB5-11,12	J6L	46	18	8		15	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			

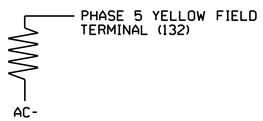
' Add jumper from J1-W to I4-W, on rear of input file.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C010
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD, L & E, LLC
LICENSE NO. P-0469

Fayetteville

HAY STREET
AT
WOODSIDE AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson
SIGNATURE
11/21/2016
DATE

SIG. INVENTORY NO. C010

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Woodside_at_Hay.dgn
11/18/2016
11:17:17 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.272.2

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 'PLT FYA'

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

PROTECTED PHASE (LEFT TURN)......... N/A
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH13 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH15 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

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: C010
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

HAY STREET
AT
WOODSIDE AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

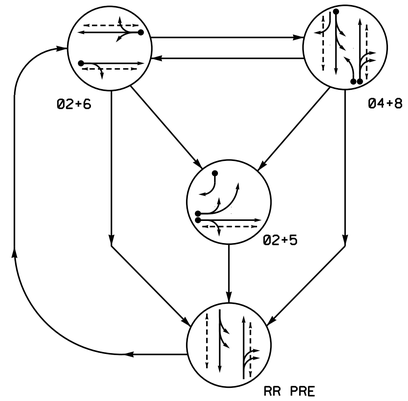
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C010

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11?2016\Woodside_at_Hay.dgn
11/18/2016 11:18:17 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.273.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

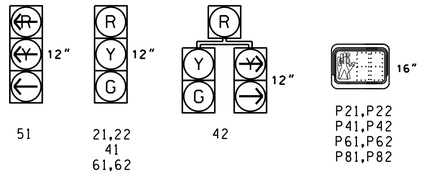
TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	02+6	04+8	RR PRE	FLASH
21, 22	G	G	R	R	Y
41	R	R	G	G	R
42	R/—	R	G	G	R
51	~~—~~	~~R~~	~~R~~	~~R~~	~~R~~
61, 62	R	G	R	R	Y
81, 82	R	R	G	G	R
P21, P22	W	W	DW	DW	DRK
P41, P42	DW	DW	W	W	DRK
P61, P62	DW	W	DW	DW	DRK
P81, P82	DW	DW	W	W	DRK
A	OFF	OFF	OFF	ON	*
B	OFF	OFF	OFF	ON	*

* SEE NOTE 12

SIGNAL FACE I.D.

All Heads L.E.D.



51 — 21,22 41 61,62 81,82 — 42 — P21,P22 P41,P42 P61,P62 P81,P82

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	*	-	2	Yes	-	-	S	-	N
4A	6X60	0	2-4-2	-	4	Yes	-	3	S	-	Y
5A	6X60	0	*	-	5	Yes	-	3	S	-	N
5B	6X60	0	2-4-2	-	5	Yes	-	15	S	-	Y
				-	4	Yes	-	-	G	-	Y
6A	6X6	70	*	-	6	Yes	-	-	S	-	N
8A	6X60	0	2-4-2	-	8	Yes	-	3	S	-	Y
8B	6X60	0	2-4-2	-	8	Yes	-	10	S	-	Y

* Video Detection Zone

ASC/3 RR PREEMPT

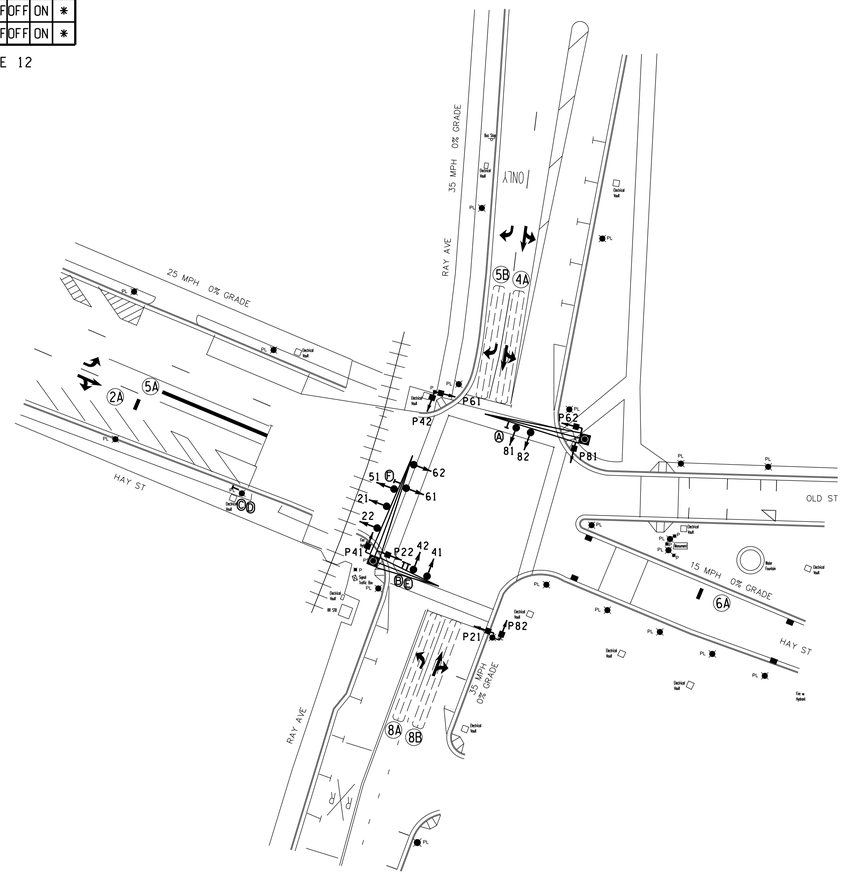
FUNCTION	PRE 1
Exit Phase(s)	2,6
Preempt Override	ON
Delay Time	0
Ped Clear Through Yellow	Y
Terminate Phases	N
Track Clear Reservice	Y
Entrance Walk	255*
Entrance Ped Clear	255*
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Track Clear Min Green	10
Track Clear Yellow Change	25.5*
Track Clear Red Clear	25.5*
Min Dwell Time	10
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

* Allows normal phase times to be used.

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green *	10	7	7	10	7
Walk *	7	7	-	7	7
Ped Clear	14	21	-	16	18
Veh. Extension *	3.0	1.0	1.0	3.0	1.0
Max 1 *	50	30	20	50	30
Yellow	3.8	3.8	3.2	3.0	3.8
Red Clear	3.0	2.1	3.5	3.4	2.1
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	-	X	-	-	X
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.



3 PHASE FULLY ACTUATED w/ RAILROAD PREEMPTION FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Pavement markings are existing.
3. Locate new cabinet on existing foundation.
4. Omit phase 5 during phase 6 on.
5. Wire cabinet to allow the controller to clear from phase 2+6 to phase 2+5 by progressing through phase 4+8 (see electrical details).
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program all signal heads for the same approach to flash concurrently during flashing operation.
9. Program phase 4 and phase 8 for dual entry.
10. Set all detector units to presence mode.
11. Begin preemption sequence immediately after track call.
12. Ensure flashing operation does not alter operation of blankout signs.

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	
(A)	"NO LEFT TURN - TRAIN" Fiber Optic Blankout Sign	(A)
(B)	"NO RIGHT TURN - TRAIN" Fiber Optic Blankout Sign	(B)
(C)	"DO NOT STOP ON TRACKS" Sign (R8-8)	(C)
(D)	"STOP HERE ON RED" Sign (R10-X)	(D)
(E)	Right Arrow "ONLY" Sign (R3-5R)	(E)
(F)	Left Arrow "ONLY" Sign (R3-5L)	(F)

Signal Upgrade

Fayetteville North Carolina

HAY STREET AT RAY AVENUE AND OLD STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
ESIGNATURE DATE

SIG. INVENTORY NO. C011

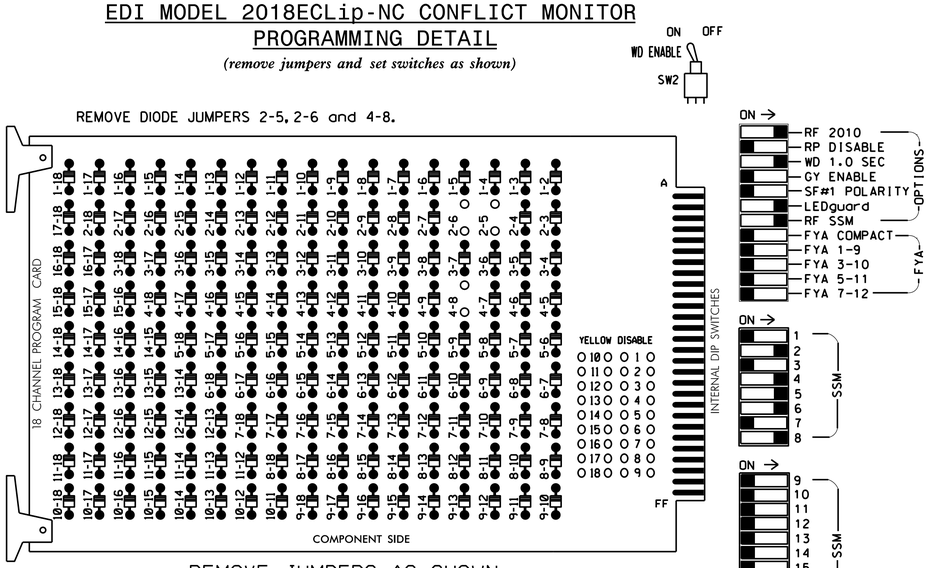
Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Hay_at_Ray.dgn
11/17/2016
3:34:02 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.273.1

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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program controller to start up in phase 2 Green and 6 Green.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S7,S8,S9,S11,S12
PHASES USED.....2,4,5,6,8,2PED,4PED,6PED,8PED
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	42	51	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101				134			107	
YELLOW		129			102				135			108	
GREEN		130			103				136			109	
RED ARROW								131					
YELLOW ARROW							132	132					
GREEN ARROW							133	133					
✋			113			104				119			110
🚶			115			106				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	Ø2 2A	Ø5 5A	SLOT EMPTY	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
	L	NOT USED	Ø6 6A				NOT USED						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED				Ø8 8B								

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	DETECTOR TYPE
2A	TB2-1,2	I1U	56	1	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES		3	S
5A	TB2-5,6	I2U	39	2	5	YES		3	S
5B	TB3-5,6	J2U	40	6	5	YES		15	S
6A	TB3-5,6	I2L	43	12	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		3	S
8B	TB5-11,12	J6L	46	18	8	YES		10	S

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: C011
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

HAY STREET
AT
RAY AVENUE AND OLD STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C011

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Hay_at_Ray.dgn
11/17/2016
3:34:23 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.273.2

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.

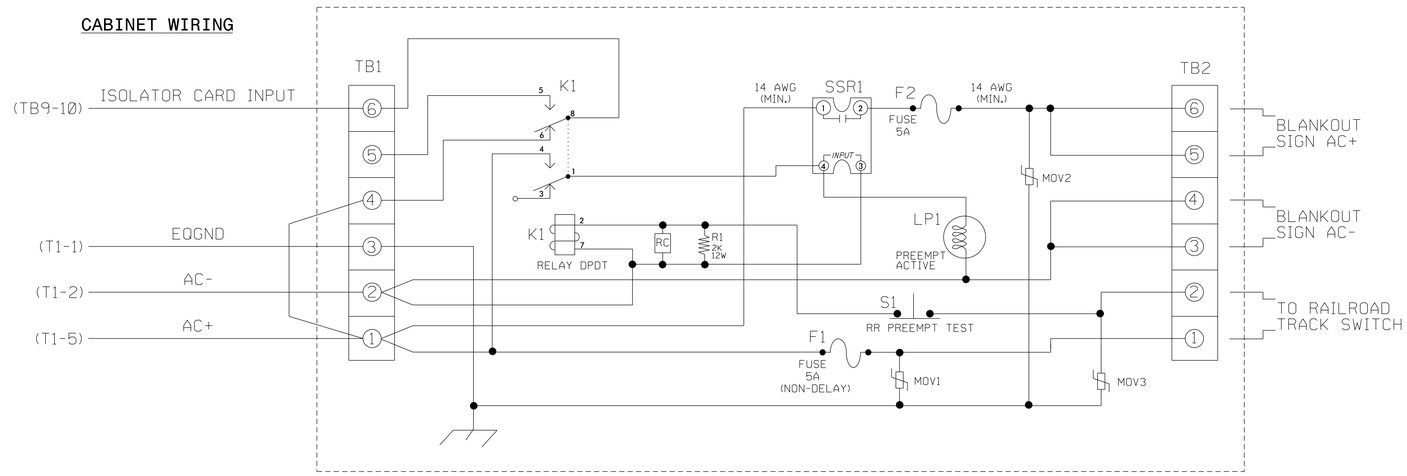
```
PREEMPT PLAN [  1]    ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . .
TRKCLR O . . . . . .
ENA TRL  . . . . . .
DWEL VEH . . . X . . . X . . . . . .
DWEL PED . . . X . . . X . . . . . .
DWEL OLP . . . . . .
CYC VEH  . X . . . X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

ENABLE... YESIPMT OVRIDE.XIINTERLOCK. NO
DET LOCK... XIDELAY..    0IINHIBIT... 0
OVERIDE FL. .IDURATION   0ICLR-GRN... NO
TERM OLP.  NOIPC>YEL   YESITERM PH    NO
PED DARK.. NOITC RESRV YESIDWELL FL   OFF
LINK PMT....OIX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV..  0IFLT TYPE.HARD
FREE DUR PMTIR1  NOIR2  NOIR3  NOIR4  NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM.  255I   255I    1I25.5I25.5
-----------MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR    10I     0I    0I25.5I25.5
-----------MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT   10I    0.0I  120I25.5I25.5
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
```

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

CABINET WIRING

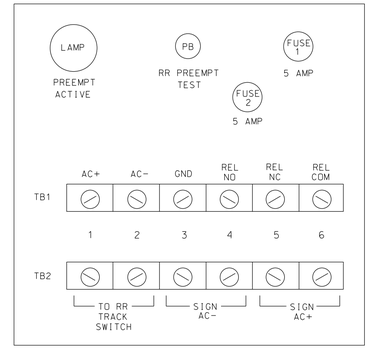
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



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.
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: C011
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville Northwestern

HAY STREET
AT
RAY AVENUE AND OLD STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

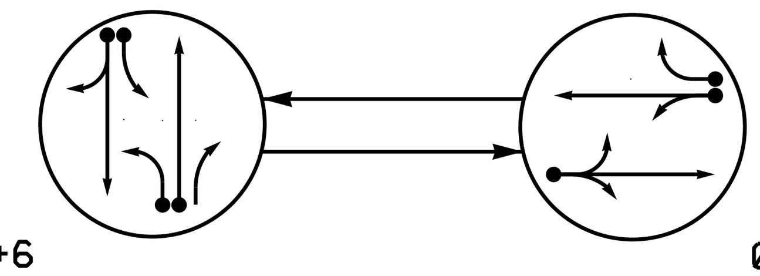
DocuSigned by:
Russell W Thompson 11/21/2016
ENGINEER'S SIGNATURE DATE

SIG. INVENTORY NO. C011

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Hay_at_Ray.dgn
11/17/2016 3:34:40 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.274.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

R
Y
G
12"

21,22
41,42
61,62
81,82

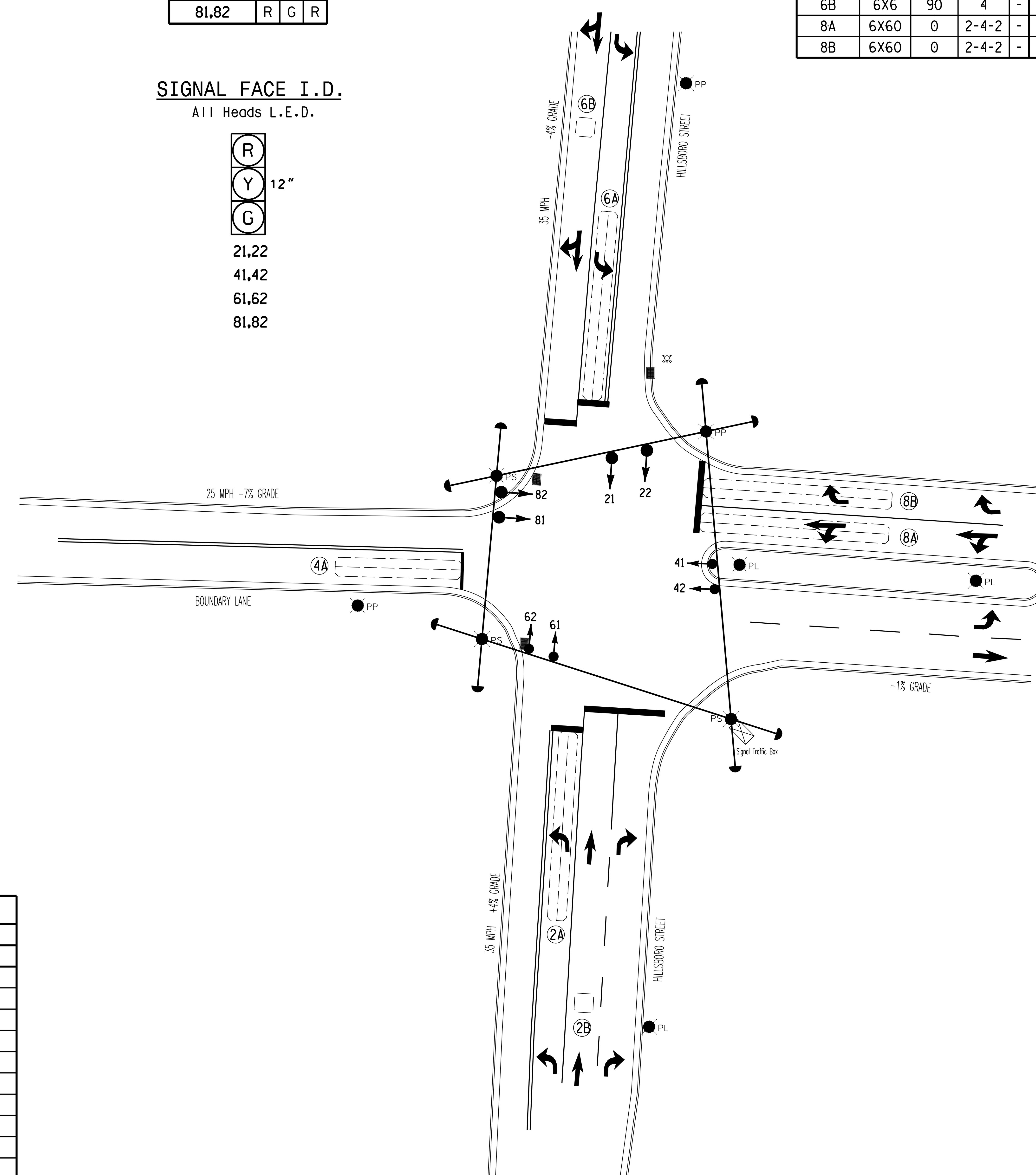
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X60	0	2-4-2	-	2	Yes	-	-	S	-	Y
2B	6X6	90	4	-	2	Yes	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	Y
6A	6X60	0	2-4-2	-	6	Yes	-	-	S	-	Y
6B	6X6	90	4	-	6	Yes	-	-	S	-	Y
8A	6X60	0	2-4-2	-	8	Yes	-	-	S	-	Y
8B	6X60	0	2-4-2	-	2	Yes	-	10	S	-	Y

2 PHASE
FULLY ACUTATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the engineer.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the City Traffic Engineer.
5. Maximum times shown in the timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Locate new cabinet on existing foundation.



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	

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green *	10	7	10	0
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	1.0	2.0	1.0
Max 1 *	35	20	35	20
Yellow	3.6	3.6	4.1	3.0
Red Clear	1.8	1.7	1.3	2.5
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	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

SCALE
0 25

Fayetteville North Carolina

HILLSBORO STREET
AT
BOUNDARY LANE

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

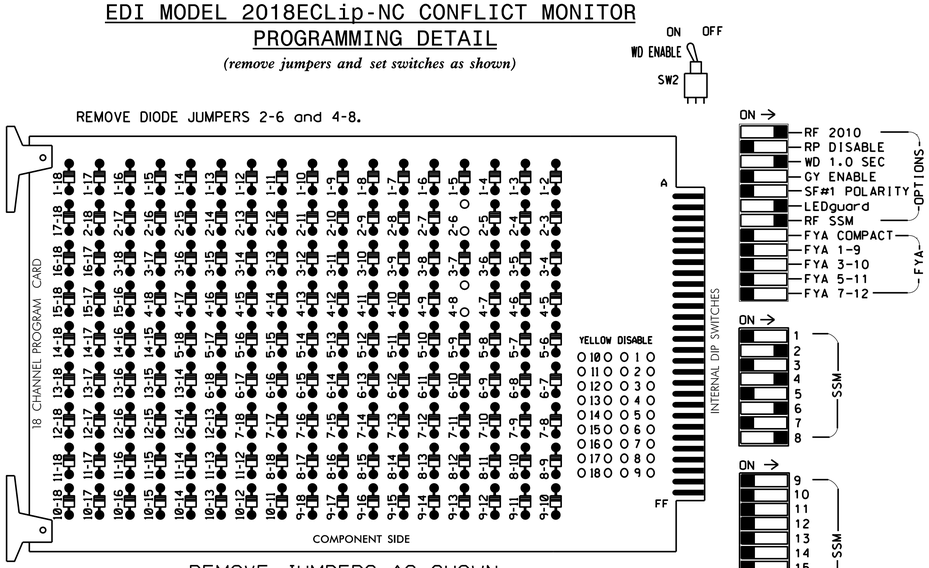
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C012

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Hillsboro.at.Boundary.dgn
11/17/2016 3:38:37 PM

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 phases 4 and 8 for Dual Entry.
3. Enable Simulataneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up in Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.274.1

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	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				NOT USED								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B				ø8 8B								

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	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C012
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

HILLSBORO STREET
AT
BOUNDARY LANE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

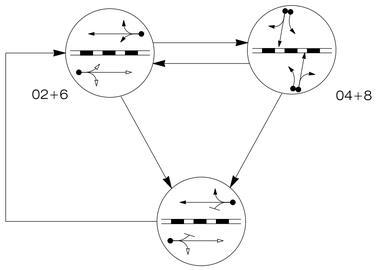
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C012

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117016\Hillsboro_at_Boundary.dgn
11/17/2016 3:38:54 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.275.0

PHASING DIAGRAM



RR PREEMPT

PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	PHASE 04+8	RR PREEMPT	FLASH*
21, 22	G	R	G	Y
41, 42	R	G	R	R
61, 62	G	R	G	Y
81, 82	R	G	R	R
SIGN A	OFF	OFF	ON	**

* FLASH IS ONLY FOR CONFLICT FLASH
** SEE NOTE #3.

SIGNAL FACE I.D.

All Heads L.E.D.

21, 22
41, 42
61, 62
81, 82

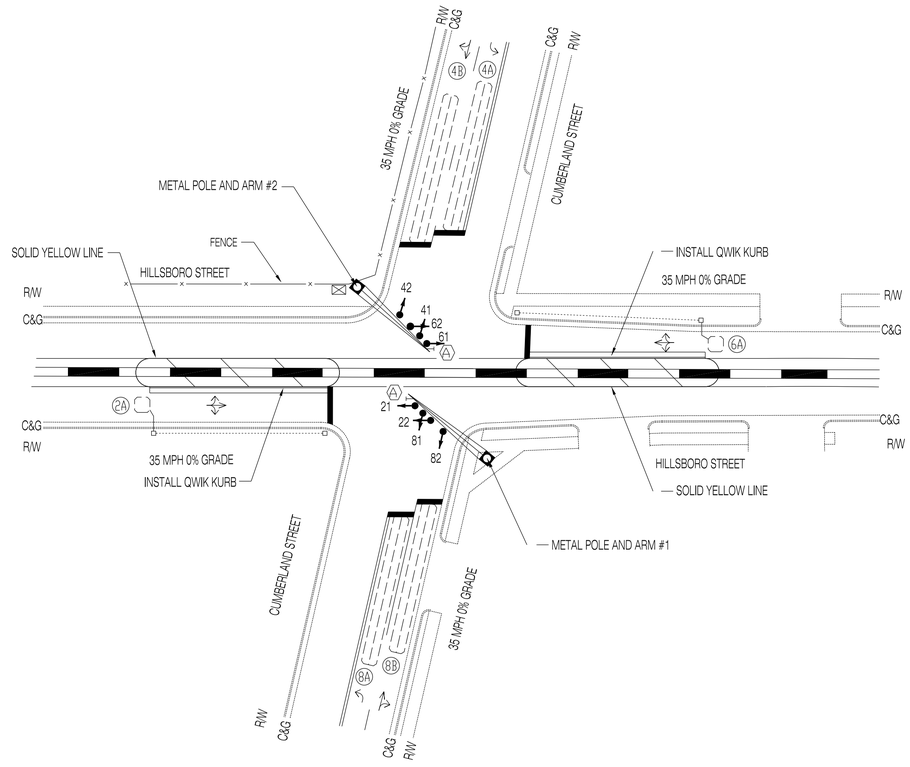
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	-	2	-	-	S	-	Y
4A	6X60	0	2-4-2	-	4	-	-	S	-	Y
4B	6X60	0	2-4-2	-	4	-	10	S	-	Y
6A	6X6	70	4	-	6	-	-	S	-	Y
8A	6X60	0	2-4-2	-	8	-	-	S	-	Y
8B	6X60	0	2-4-2	-	8	-	10	S	-	Y

3 PHASE
FULLY ACTUATED W/ RAILROAD PREEMPTION
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Ensure flashing operation does not alter operation of blankout signs.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
5. Set all detector units to presence mode.
6. Locate new cabinet on existing foundation.



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	1.0	3.0	1.0
Max 1 *	50	30	50	30
Yellow	3.8	3.8	3.8	3.8
Red Clear	1.1	1.5	1.2	1.5
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	-	X	-	X
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.

ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	2,6
Preempt Override	ON
Delay Time	0
Ped Clear Trough Yellow	N
Terminate Phases	N
Track Clear Reservice	Y
Entrance Walk	255*
Entrance Ped Clear	255*
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Track Clear Min Green	10
Track Clear Yellow Change	25.5*
Track Clear Red Clear	25.5*
Min Dwell Time	10
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

* Allows normal phase times to be used.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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	
A	"NO LEFT TURN - TRAIN" Fiber Optic Blankout Sign	A

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

HILLSBORO ROAD
AT
CUMBERLAND STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: BLR | REVIEWED BY:

SCALE 0 30

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

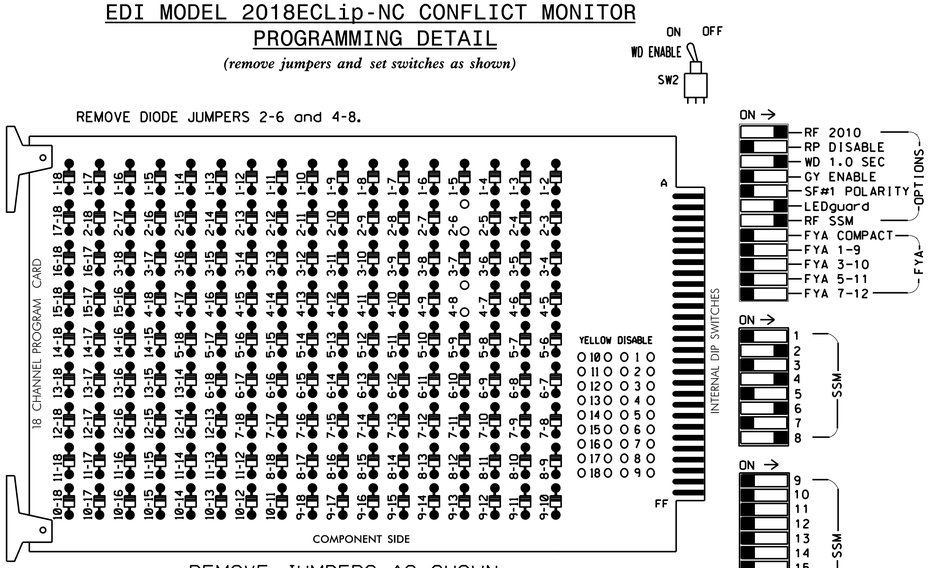
SIG. INVENTORY NO. C013

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Hillsboro_at_Cumberland.dgn
11/17/2016
3:41:57 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.275.1

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. Enable Simultaneous Gap-Out for all phases.
3. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....SAFETRAN 2070E
CABINET.....SAFETRAN 332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
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	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED				ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	PRE1 AC ISOLATOR
	L		NOT USED				ø8 8B								PRE2 AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
PRE = PREEMPT

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	12U	39	2	2	YES			S
4A	TB4-9,10	16U	41	4	4	YES			S
4B	TB4-11,12	16L	45	14	4	YES		10	S
6A	TB3-5,6	J2U	40	6	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C013
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

HILLSBORO ROAD
AT
CUMBERLAND STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C013

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Hillsboro_at_Cumberland.dgn
11/17/2016 3:42:10 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.275.2

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.

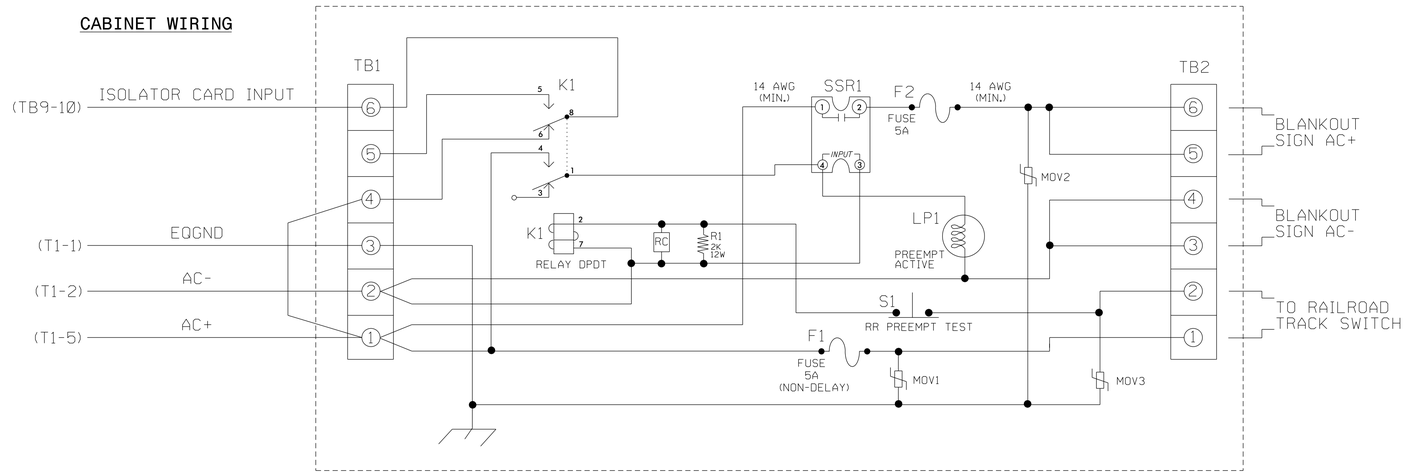
```
PREEMPT PLAN [  1]     ENABLE....YES
 VEH/PED 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 OVERLAP A B C D E F G H I J K L M N O P
TRKCLR V . . . . . . . . . . . . . . . .
TRKCLR O . . . . . . . . . . . . . . . .
ENA TRL  . . . . . . . . . . . . . . . .
DWEL VEH . X . . . X . . . . . . . . . .
DWEL PED . . .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

ENABLE... YESIPMT OVRIDE.XIINTERLOCK. NO
DET LOCK... XIDELAY..    OIINHIBIT...  0
OVERIDE FL. .IDURATION   OICLR-GRN... NO
TERM OLP.  NOIPC>YEL     NOITERM PH    NO
PED DARK.. NOITC RESRV YESIDWELL FL   OFF
LINK PMT....OIX FLCOLR REDIEXIT OPT. OFF
X TMG PLN...OIRE-SERV..  OIFLT TYPE.HARD
FREE DUR PMTIR1  NOIR2  NOIR3  NOIR4  NO
--TIMING-----WALKIPED CLIMN GRI YELI RED
ENTRANCE TM.  255I   255I    1I25.5I25.5
-----------MIN GRIEXT GRIMX GRI YELI RED
TRACK CLEAR   10I    OI    OI25.5I25.5
-----------MIN DLIPMTEXTIMX TMI YELI RED
DWL/CYC-EXIT  10I    0.0I  120I25.5I25.5
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
```

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

PREEMPTION AND BLANKOUT SIGN CONTROL BOX

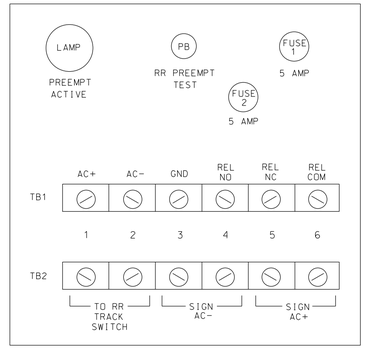
CABINET WIRING



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.
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: C013
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville Northwestern

HILLSBORO ROAD
AT
CUMBERLAND STREET

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

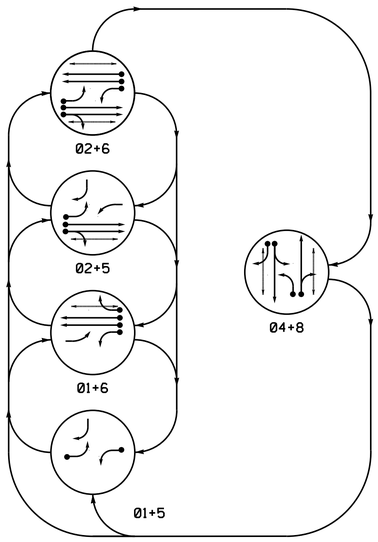
DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C013

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117016\Hillsboro_at_Cumberland.dgn
11/17/2016 3:42:26 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.276.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

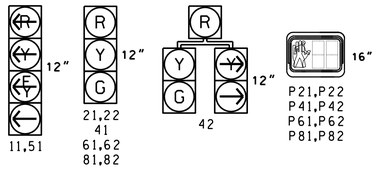
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	LEAD
11	←	←	~~R~~	F/Y	~~R~~	F/Y
21,22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R/←	R	R/←	R	G	R
51	←	~~R~~	←	F/Y	~~R~~	F/Y
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



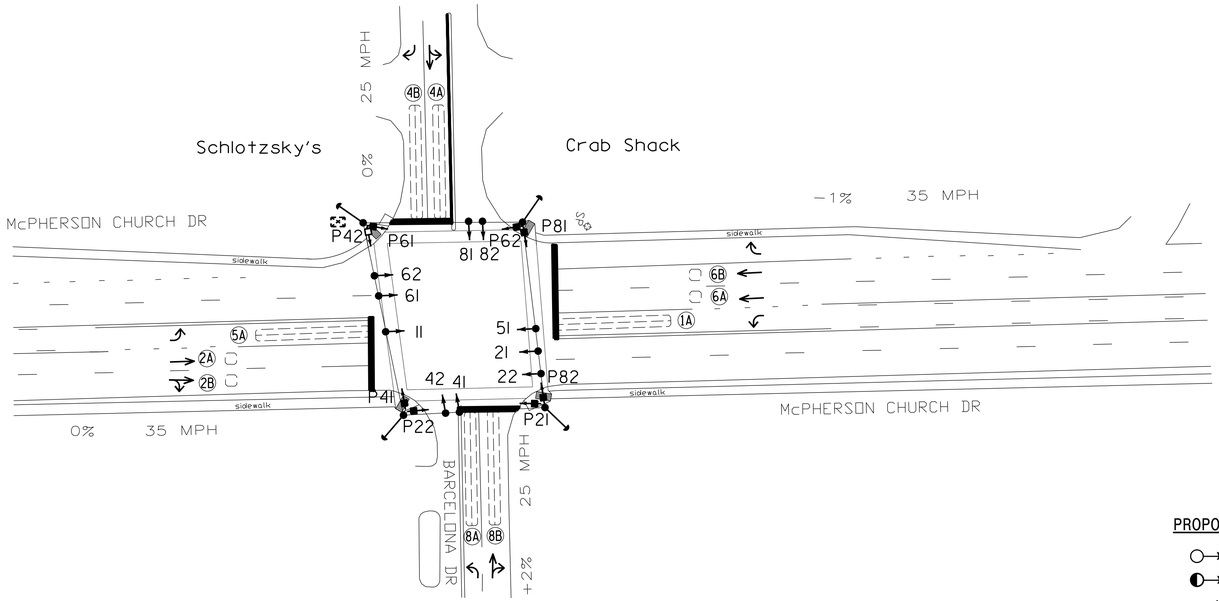
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	-	15	S	-	Y
				-	6	-	3	G	-	Y
2A	6X6	70	3	-	2	-	-	S	-	Y
2B	6X6	70	3	-	2	-	-	S	-	Y
4A	6X60	0	2-4-2	-	4	-	-	S	-	Y
4B	6X60	0	2-4-2	-	4	-	15	S	-	Y
5A	6X60	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
6A	6X6	70	3	-	6	-	-	S	-	Y
6B	6X6	70	3	-	6	-	-	S	-	Y
8A	6X60	0	2-4-2	-	8	-	-	S	-	Y
8B	6X60	0	2-4-2	-	8	-	15	S	-	Y

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
2. Phase 1 and/or phase 5 may be lagged.
3. Program phase 4 and phase 8 for Dual Entry.
4. Set all detector units to presence mode.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Locate new cabinet on existing 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.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	10	7	7	7	10
Walk *	-	7	7	-	7	7
Ped Clear	-	18	23	-	19	22
Veh. Extension *	1.0	3.0	1.0	1.0	3.0	1.0
Max 1 *	20	60	20	20	20	60
Yellow	3.0	3.8	3.2	3.0	3.9	3.1
Red Clear	2.4	1.8	2.7	2.4	1.8	2.5
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	-	-	X	-	-	X
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	■↓
○→	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	→

Signal Upgrade

Fayetteville North Carolina

McPHERSON CHURCH ROAD
AT
BARCELONA DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C014

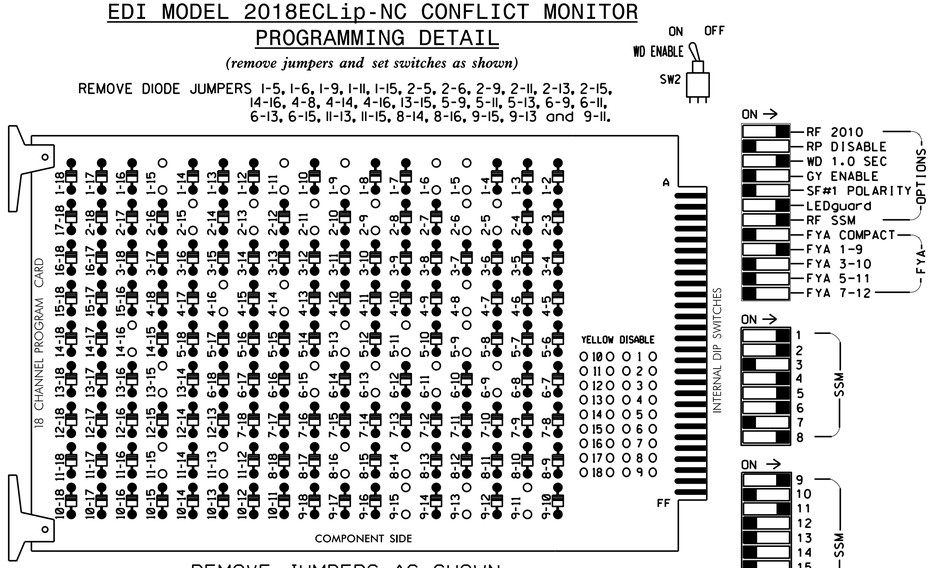
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\McPhersonChurch_at_Barcelona.dgn
11/17/2016
4:56:19 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.276.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 14-16, 4-8, 4-14, 4-16, 13-15, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 11-13, 11-15, 8-14, 8-16, 9-15, 9-13 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.

■ = 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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Yellow Flash.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S11,S12, AUX S1,AUX S4
PHASES USED.....1,2,4,5,6,8,2PED,4PED,6PED,8PED
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	NU	NU	51★	NU	NU
RED		128			101		*		134			107							
YELLOW	*	129			102				135			108							
GREEN		130			103				136			109							
RED ARROW														A121			A114		
YELLOW ARROW							132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127						133	133											
✋			113			104				119			110						
🚶			115			106				121			112						

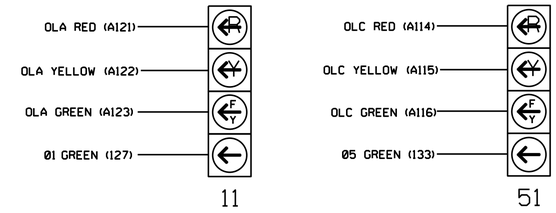
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B				Ø4 4B			Ø5 5A			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B								

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A'	TB6-9,10	I9U	60	11	1		15	S
	TB7-9,10	J9U	59	15	6		3	C
2A	TB2-5,6	I2U	39	2	2			S
2B	TB2-7,8	I2L	43	12	2			S
4A	TB4-9,10	I6U	41	4	4			S
4B	TB4-11,12	I6L	45	14	4			S
5A'	TB6-11,12	I9L	62	13	5		15	S
	TB7-11,12	J9L	61	7	2		3	C
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
8A	TB5-9,10	J6U	42	8	8		3	S
8B	TB5-11,12	J6L	46	18	8			S
PED PUSH BUTTONS								
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED			
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED			
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED			
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED			

' Add jumper from I9-F to J9-F.

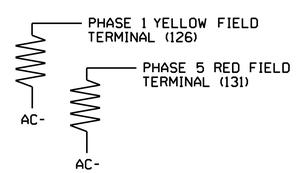
' Add jumper from I9-W to J9-W.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C014
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Prepared In the Offices of:
Fayetteville North Carolina

McPHERSON CHURCH ROAD
AT
BARCELONA DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE | DATE

SIG. INVENTORY NO. C014

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11/2016\McPhersonChurch_at_Barcelona.dgn
11/17/2016 4:56:35 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.276.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

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: C014
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Prepared In the Offices of:
Fayetteville North Carolina

MCPHERSON CHURCH ROAD
AT
BARCELONA DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

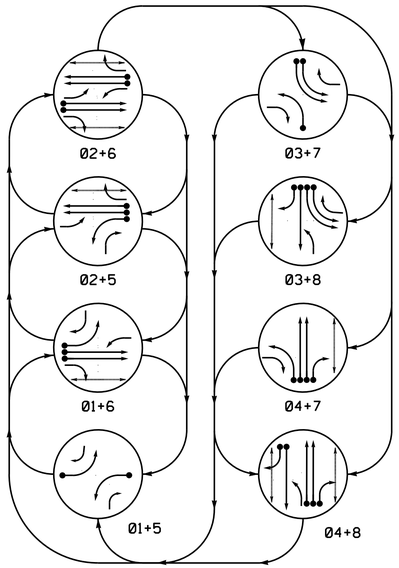
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C014

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\McPhersonChurch_at_Barcelona.dgn
11/17/2016 5:04:28 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.277.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

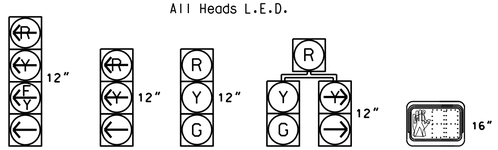
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	LEAD
11	—	—	Ⓕ	Ⓕ	R	R	R	R	Y
21	R	R	G	G	R	R	R	Y	
22	R	R	G	G	R/R	—	R	Y	
31, 32	R	R	R	R	—	—	R	R	R
41	R	R	R	R	R	G	G	R	
42	R/R	R	R/R	R	R	G	G	R	
51	—	Ⓕ	—	Ⓕ	R	R	R	Y	
61	R	G	R	G	R	R	R	Y	
62	R	G	R	G	R/R	R	R/R	Y	
71	R	R	R	R	—	Ⓕ	—	Ⓕ	R
81	R	R	R	R	R	G	R	G	R
82	R/R	R/R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

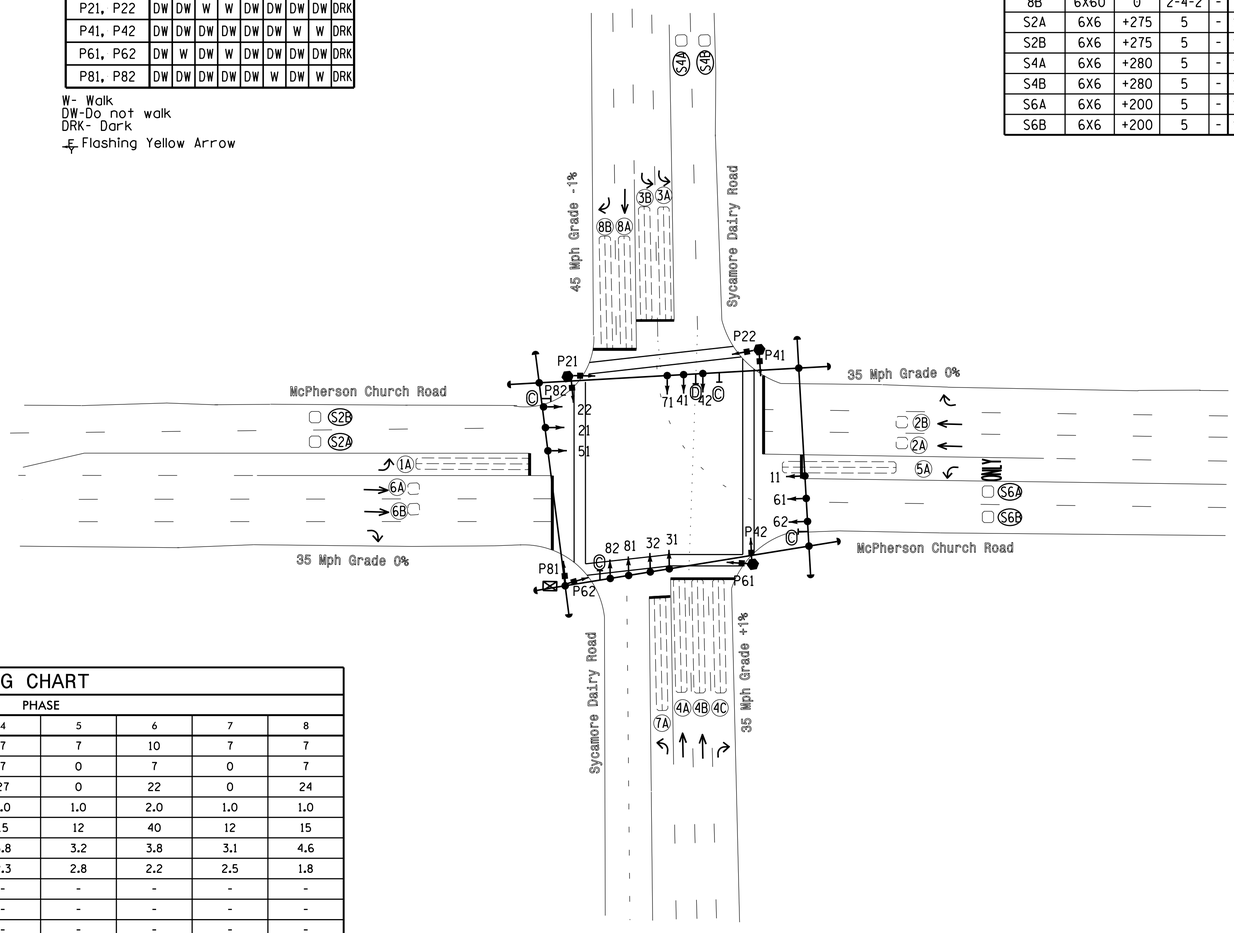
W- Walk
DW-Do not walk
DRK- Dark
Ⓕ Flashing Yellow Arrow

SIGNAL FACE I.D.

All Heads L.E.D.



11	31, 32	21	22	P21, P22
51		41	42	P41, P42
71		61	62	P61, P62
		81	82	P81, P82



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	-	15	S	-	Y
				-	6	-	-	G	-	Y
2A,2B	6X6	70	4	-	2	-	-	S	-	Y
3A	6X60	0	2-4-2	-	3	-	-	S	-	Y
3B	6X60	0	2-4-2	-	3	-	-	S	-	Y
4A	6X60	0	2-4-2	-	4	-	-	S	-	Y
4B	6X60	0	2-4-2	-	4	-	-	S	-	Y
4C	6X60	0	2-4-2	-	4	-	20	S	-	Y
5A	6X60	+10	2-4-2	-	5	-	15	S	-	Y
				-	2	-	-	G	-	Y
6A,6B	6X6	70	4	-	6	-	-	S	-	Y
7A	6X60	0	2-4-2	-	7	-	15	S	-	Y
				-	4	-	-	G	-	Y
8A	6X60	0	2-4-2	-	8	-	-	S	-	Y
8B	6X60	0	2-4-2	-	8	-	15	S	-	Y
S2A	6X6	+275	5	-	SYS	-	-	Y	-	Y
S2B	6X6	+275	5	-	SYS	-	-	Y	-	Y
S4A	6X6	+280	5	-	SYS	-	-	Y	-	Y
S4B	6X6	+280	5	-	SYS	-	-	Y	-	Y
S6A	6X6	+200	5	-	SYS	-	-	Y	-	Y
S6B	6X6	+200	5	-	SYS	-	-	Y	-	Y

8 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 or phase 5 may be lagged.
4. Phase 3 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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Locate new cabinet on existing foundation.

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 *	0	7	0	7	0	7	0	7
Ped Clear	0	20	0	27	0	22	0	24
Veh. Extension *	1.0	2.0	1.0	1.0	1.0	2.0	1.0	1.0
Max 1 *	12	40	12	15	12	40	12	15
Yellow	3.2	3.8	3.2	3.8	3.2	3.8	3.1	4.6
Red Clear	2.8	2.2	3.1	2.3	2.8	2.2	2.5	1.8
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN. RECALL	-	-	-	MIN. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	X
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	
	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	
	Pedestrian Signal Pedestal	
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ

Ⓓ

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

McPHERSON CHURCH ROAD
AT
SYCAMORE DAIRY ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: BLR | REVIEWED BY:

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C015

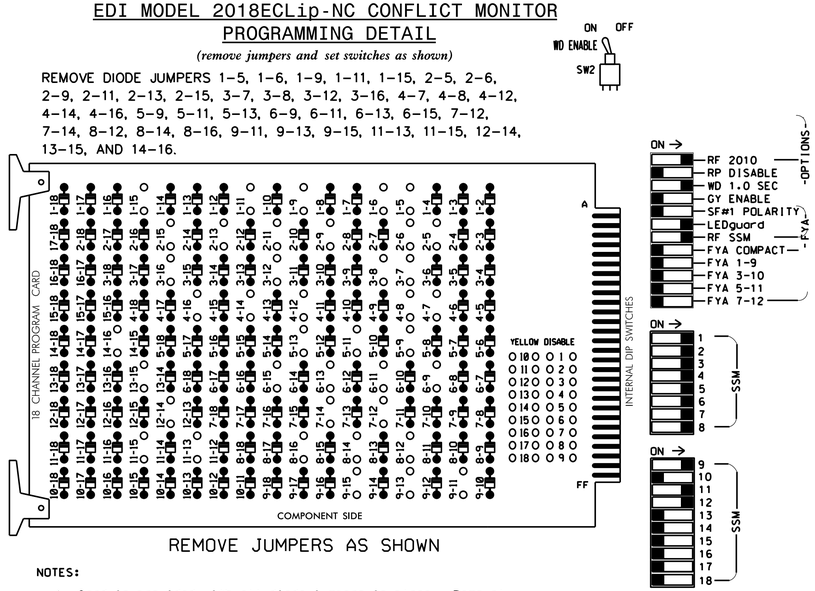
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\McPhersonChurch_at_SycamoreDairy.dgn
11/18/2016 8:48:36 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.277.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-12, 3-16, 4-7, 4-8, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-12, 7-14, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 12-14, 13-15, AND 14-16.



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 phases 2 and 6, on the controller unit, for Start Up In Green.
3. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
4. Program phase 8, on the controller unit, for Dual Entry.
5. Program phases 2, 4, 6 and 8, for 'Start Up Ped Call'.
6. The cabinet and controller are part of the City of Fayetteville Signal System.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....SAFETRAN 2070E
CABINET.....SAFETRAN 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 S10,S11,S12,AUX S1,AUX S4,AUX S5
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8,8PED
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....7+8

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☆	82	21,22	P21, P22	22	31,32	41,42	P41, P42	42	51☆	61,62	P61, P62	62	71☆	81,82	P81, P82	11☆	NU	NU	51☆	71☆	NU
RED		✱	128				101		✱		134		✱		107							
YELLOW			129				102				135				108							
GREEN			130				103				136				109							
RED ARROW						116											A121			A114	A101	
YELLOW ARROW		126			117	117			132				123				A122			A115	A102	
FLASHING YELLOW ARROW																	A123			A116	A103	
GREEN ARROW	127	127			118	118			133	133			124	124								
✋				113				104				119				110						
🚶				115				106				121				112						

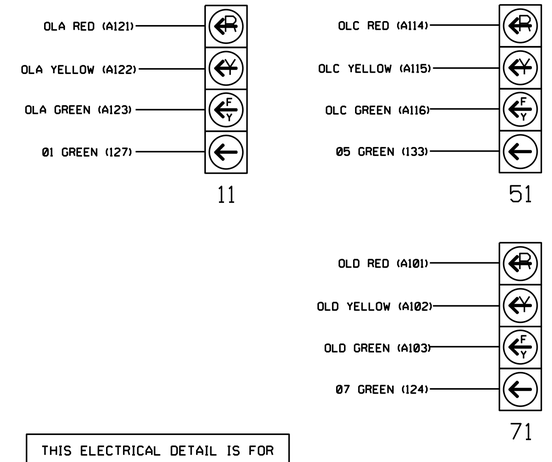
NU = Not Used

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

☆ See pictorial of head wiring in detail on page 2.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SPARE	Ø2 2A,2B	SYS. DET. SD2A	SPARE	Ø3 3A	Ø4 4A	SYS. DET. SD4A	Ø4 4C	Ø1 1A	SPARE	SPARE	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø6 6A,6B	SYS. DET. SD2B		Ø3 3B	Ø4 4B	SYS. DET. SD4B	NOT USED	Ø6 1A			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SPARE	SPARE	Ø7 7A	SPARE	SPARE	Ø8 8A	SYS. DET. SD8A	SPARE	Ø5 5A	SPARE	SPARE	SPARE	SPARE	SPARE
	L			Ø4 7A			Ø8 8B	SYS. DET. SD8B		Ø2 5A					

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	DETECTOR TYPE
2A,2B	TB2-5,6	I2U	39	2	2	Y	Y		S
6A,6B	TB2-7,8	I2L	43	12	6	Y	Y		S
✱ SD2A	TB2-9,10	I3U	63	32	SYS				S
✱ SD2B	TB2-11,12	I3L	76	42	SYS				S
3A	TB4-5,6	I5U	58	3	3	Y	Y		S
3B	TB4-7,8	I5L	58	3	3	Y	Y		S
4A	TB4-9,10	I6U	41	4	4	Y	Y		S
4B	TB4-11,12	I6L	45	14	4	Y	Y		S
✱ SD4A	TB6-1,2	I7U	65	34	SYS				S
✱ SD4B	TB6-3,4	I7L	78	44	SYS				S
4C	TB6-5,6	I8U	49	24	4	Y	Y	20	S
1A[1]	TB6-9,10	I9U	60	11	1	Y	Y	15	S
	TB6-11,12	I9L	62	13	6	Y	Y		S
7A[2]	TB3-9,10	J3U	64	36	7	Y	Y	15	S
	TB3-11,12	J3L	77	46	4	Y	Y		S
8A	TB5-9,10	J6U	42	8	8	Y	Y		S
8B	TB5-11,12	J6L	46	18	8	Y	Y	15	S
✱ SD8A	TB7-1,2	J7U	66	38	SYS				S
✱ SD8B	TB7-3,4	J7L	79	48	SYS				S
5A[3]	TB7-9,10	J9U	59	15	5	Y	Y	15	S
	TB7-11,12	J9L	61	17	2	Y	Y		S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4 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.

[1] Add jumpers from I9-F to I9-W.
[2] Add jumpers from J3-F to J3-W.
[3] Add jumpers from J9-F to J9-W.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

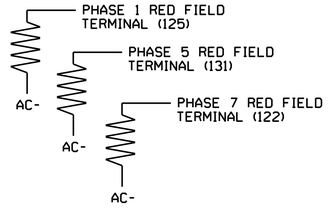
LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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

NOTE: The purpose of these resistors is to load the channel red monitor inputs in order for the Signal Sequence Monitor to use the full signal sequence monitoring capability on channels that do not use the red display in the field.



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C015
DESIGNED: NOVEMBER 2016
SEALED: 11/18/16
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

McPHERSON CHURCH ROAD
AT
SYCAMORE DAIRY ROAD

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C015

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117-2016\McPhersonChurch.at.SycamoreDairy.dgn
11/18/2016 8:49:40 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.277.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

↓

OVERLAP D

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

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

PROTECTED PHASE (LEFT TURN)......... 7
PERMISSIVE PHASE (OPPOSING THRU).... 8
FLASHING ARROW OUTPUT.....CH12 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL

In order to ensure that signals flash concurrently on the Same approach, make the following flasher circuit changes:

1. On rear of PDA - remove wire from Term. T2-4 and terminate on T2-2.
2. On rear of PDA - remove wire from Term. T2-5 and terminate on T2-3.
3. Remove flasher unit 2.

The changes listed above ties all phases and overlaps to flasher unit 1.

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: C015
DESIGNED: NOVEMBER 2016
SEALED: 11/18/16
REVISED:

Electrical Detail Sheet 2 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

McPHERSON CHURCH ROAD
AT
SYCAMORE DAIRY ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

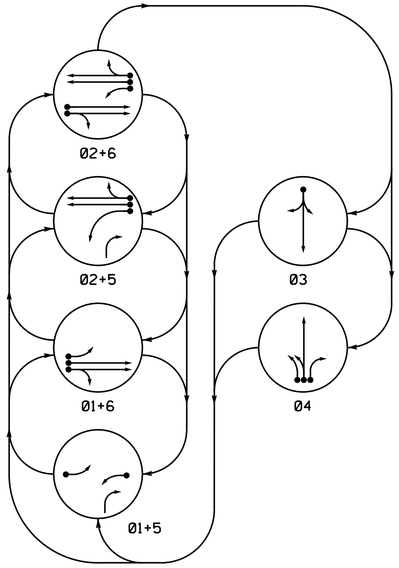
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C015

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\McPhersonChurch_at_SycamoreDairy.dgn
11/18/2016 8:50:50 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.278.0

PHASING DIAGRAM



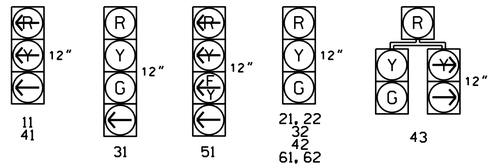
PHASING DIAGRAM DETECTION LEGEND

- 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~~	~~R~~
21,22	R	R	G	G	R	R	Y
31	R	R	R	R		R	R
32	R	R	R	R	G	R	R
41	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~←~~	R
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51	~~←~~	~~R~~	~~←~~	~~FY~~	~~R~~	~~R~~	~~Y~~
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.



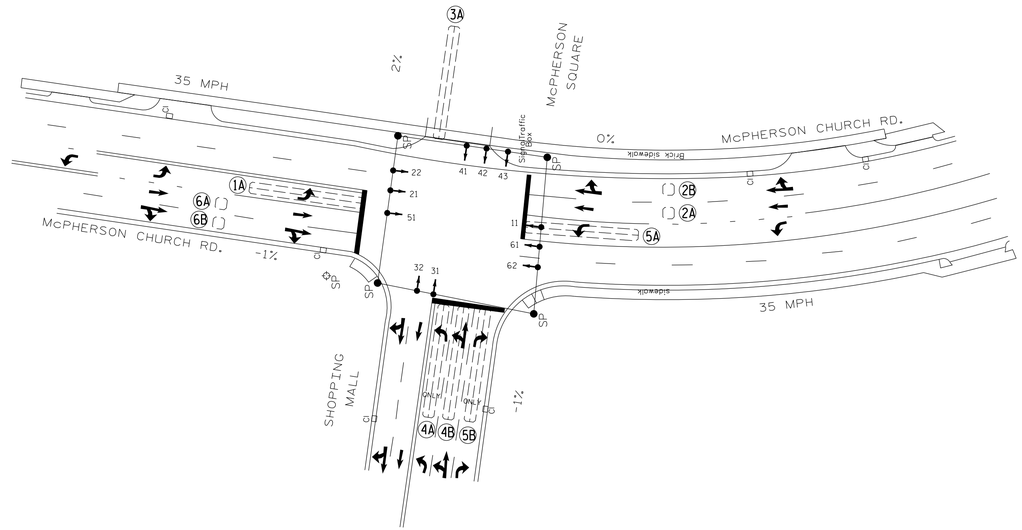
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	-	-	S	-	Y
2A,2B	6X6	70	4	-	2	-	-	S	-	Y
3A	6X60	0	2-4-2	-	3	-	3	S	-	Y
4A	6X60	0	2-4-2	-	4	-	-	S	-	Y
4B	6X60	0	2-4-2	-	4	-	-	S	-	Y
5A	6X60	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
5B	6X60	0	4	-	5	-	15	S	-	Y
6A,6B	6X6	70	4	-	6	-	-	S	-	Y

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Do not program signal for late night flashing operation unless 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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Locate new cabinet on existing foundation.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	20	60	20	20	20	60
Yellow	3.0	3.8	3.0	3.0	3.0	3.9
Red Clear	2.4	1.8	2.7	2.4	1.8	2.5
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	

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

McPHERSON CHURCH ROAD
AT
McPHERSON SQUARE

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

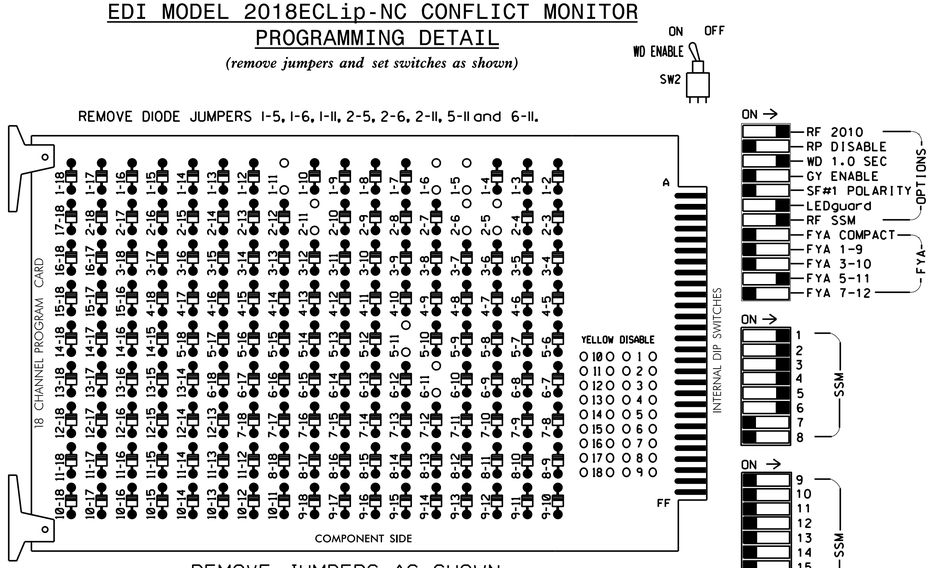
SIG. INVENTORY NO. C016

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\McPherson_at_McPhersonSquare.dgn
11/17/2016 3:49:44 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.278.1

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 phases 2 and 6 for Start Up In Green.
3. Enable Simulatneous Gap-Out for all phases.
4. The cabinet and controller are part of the Fayetteville City Signal System.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....SAFETRAN 2070E
CABINET.....SAFETRAN 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 S4
PHASES USED.....1,2,3,4,5,6
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....NOT USED

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4		14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4		4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	NU	43	51 ★	61,62	NU	NU	NU	NU	NU	NU	NU	51 ★	NU	NU
RED		128		115	115		101		*		134										
YELLOW		129		116	116		102				135										
GREEN		130		117	117		103				136										
RED ARROW	125					104													A114		
YELLOW ARROW	126					105			132										A115		
FLASHING YELLOW ARROW																			A116		
GREEN ARROW	127			118		106			133	133											

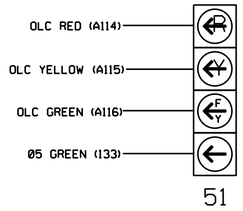
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

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,2B	Ø3 3A	SLOT EMPTY	SLOT EMPTY	Ø4 4A	⊗ WIRED INPUT	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø6 6A,6B	Ø5 5B			Ø4 4B	NOT USED		Ø5 5A					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

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A	TB6-9,10	19U	60	11	1			S
2A,2B	TB2-5,6	12U	39	2	2			S
3A	TB2-9,10	13U	63	32	3		3	S
4A	TB4-9,10	16U	41	4	4			S
4B	TB4-11,12	16L	45	14	4			S
5A'	TB6-1,2	17U	65	34	2		15	S
	TB6-11,12	19L	62	13	5		3	G
5B	TB2-11,12	13L	76	42	5		15	S
6A,6B	TB2-7,8	12L	43	12	6			S

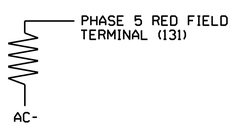
' Add jumper from J1-W to I4-W, on rear of input file.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C016
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD, L & E, LLC
LICENSE NO. P-0669

Fayetteville

McPHERSON CHURCH ROAD
AT
McPHERSON SQUARE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C016

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\McPherson_at_McPhersonSquare.dgn
11/17/2016
3:49:55 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.278.2

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 C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C016
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

McPHERSON CHURCH ROAD
AT
McPHERSON SQUARE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

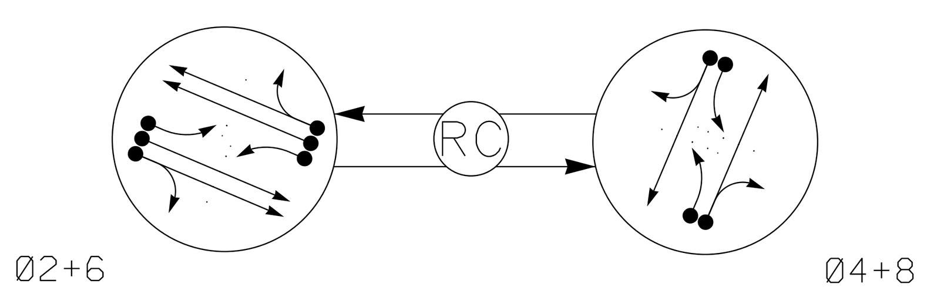
DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C016

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\McPherson_at_McPhersonSquare.dgn
11/17/2016 3:50:12 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.279.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

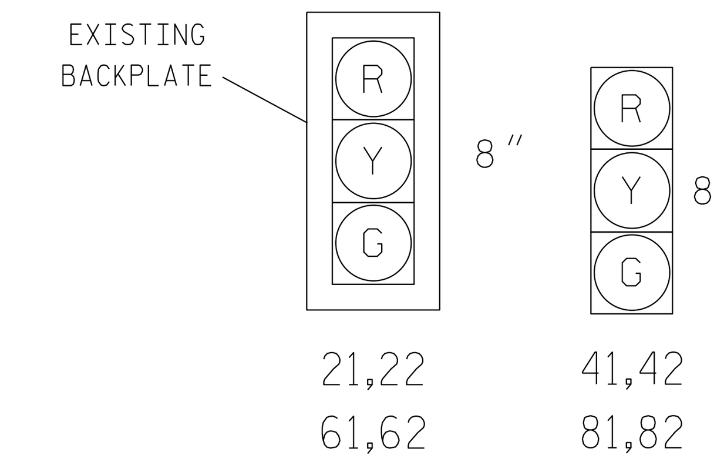
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



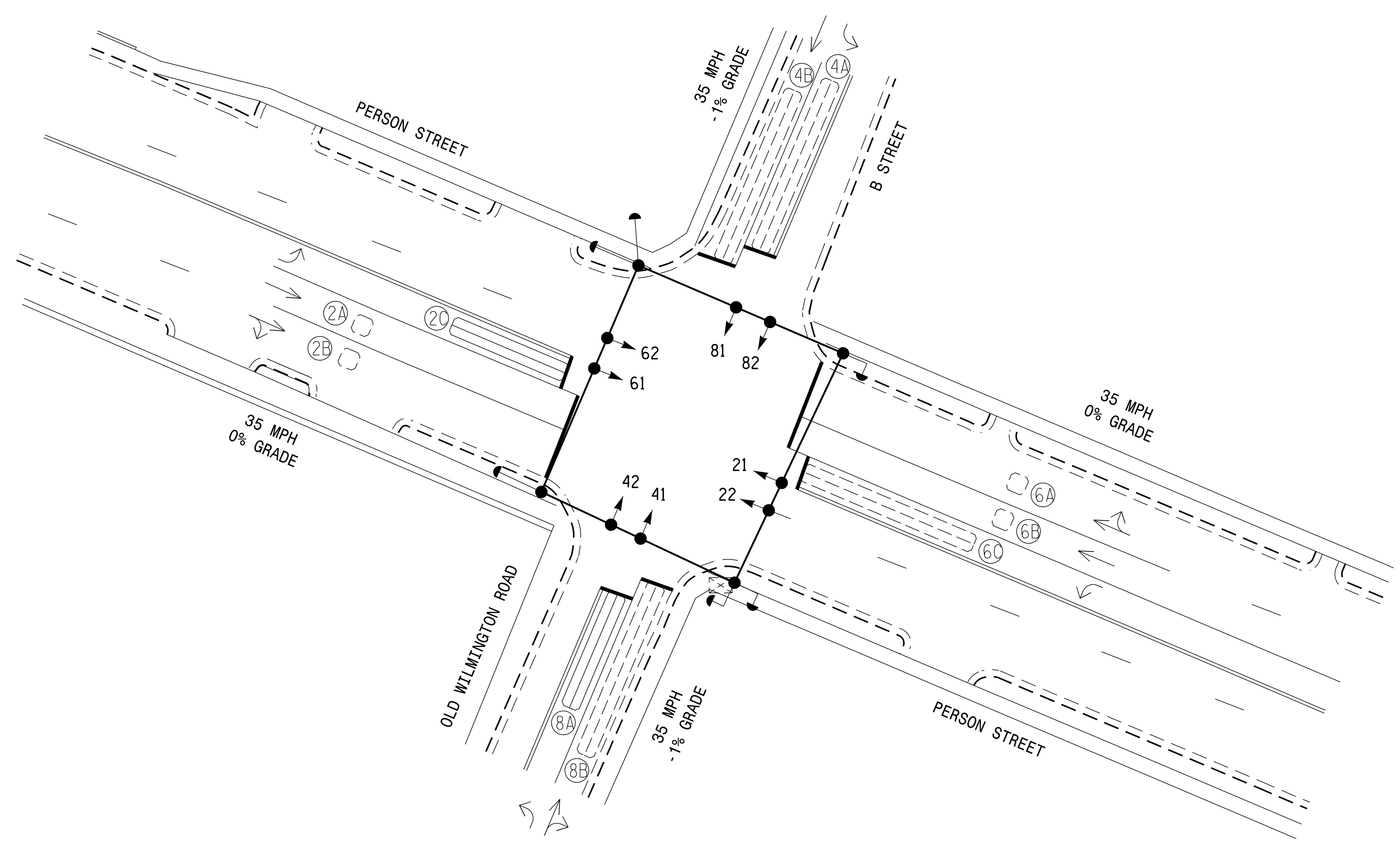
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	-	2	Yes	-	-	S	-	Y
2B	6X6	70	4	-	2	Yes	-	-	S	-	Y
2C	6X40	0	2-4-2	-	2	Yes	-	-	G	-	Y
4A	6X60	0	2-4-2	-	4	Yes	-	3	S	-	Y
4B	6X60	0	2-4-2	-	4	Yes	-	-	S	-	Y
6A	6X6	70	4	-	6	Yes	-	-	S	-	Y
6B	6X6	70	4	-	6	Yes	-	-	S	-	Y
6C	6X60	0	2-4-2	-	6	Yes	-	-	G	-	Y
8A	6X40	0	2-4-2	-	8	Yes	-	3	S	-	Y
8B	6X60	0	2-4-2	-	8	Yes	-	-	S	-	Y

2 PHASE
FULLY ACTUATED
(FAYETTEVILLE SIGNAL SYSTEM)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
5. PROGRAM PHASE 4 AND 8 FOR DUAL ENTRY.
6. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
7. SET ALL DETECTOR UNITS TO PRESENCE MODE.



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	

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	13	20	13	20
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	3.0	1.0	3.0	1.0
Max 1 *	50	30	50	30
Yellow	3.8	3.9	3.8	3.9
Red Clear	1.2	1.8	1.1	1.8
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds/Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

Prepared in the Offices of:

Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

SCALE 0 30
1" = 30'

PERSON STREET AT B STREET/OLD WILMINGTON ROAD

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE	
PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate
F30C814C54B3430...
SIGNATURE
11/21/2016
DATE

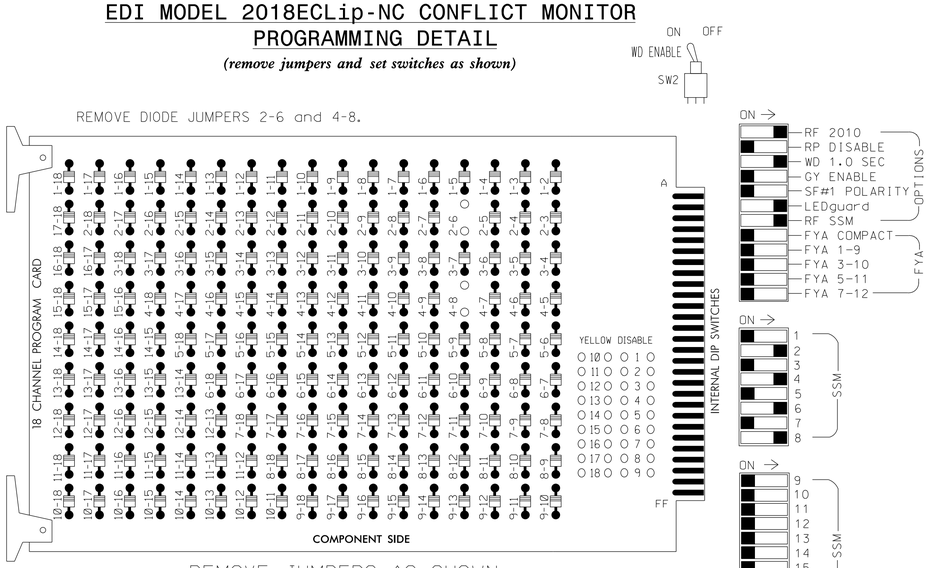
SIG. INVENTORY NO. C017

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\Person @ B.dgn
11/18/2016 8:58:24 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.279.1

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 phases 2 and 6 for Start Up In Green.
3. Program phases 2 and 6 for Yellow Flash.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 4 and 8 for Dual Entry.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....336
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8,S11
PHASES USED.....2,4,6,8
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	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

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	SLOT EMPTY	Ø2 2A	SLOT EMPTY	Ø4 4A	Ø2 2C	Ø6 6A	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø2 2B		Ø4 4B	Ø6 6C	Ø6 6B		Ø8 8B						ST DC ISOLATOR

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	DETECTOR TYPE
2A	TB21-3,4	I2U	39	2	2	YES			S
2B	TB23-3,4	I2L	43	12	2	YES			S
4A	TB21-7,8	I4U	41	4	4	YES		3	S
4B	TB23-7,8	I4L	45	14	4	YES			S
2C	TB21-9,10	I5U	55	5	2	YES			S
6C	TB23-9,10	I5L	48	26	6	YES			S
6A	TB21-11,12	I6U	40	6	6	YES			S
6B	TB23-11,12	I6L	44	16	6	YES			S
8A	TB22-1,2	I8U	42	8	8	YES		3	S
8B	TB24-1,2	I8L	46	18	8	YES			S

✳ System detector only. Remove any assigned vehicle phase.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C017
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

PERSON STREET
AT
B STREET/OLD WILMINGTON ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

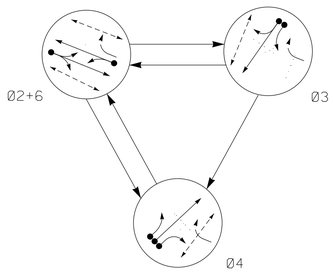
DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C017

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Person @ B.dgn
11/18/2016 8:58:52 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.280.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

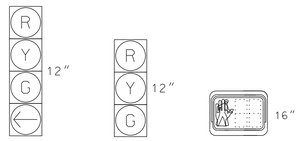
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø3	Ø4	FLASH
21,22	G	R	R	Y
31	R	G	R	R
32	R	G	R	R
41	R	R	G	R
42	R	R	G	R
61,62	R	R	R	Y
P21,P22	W	DW	DW	DRK
P23,P24	W	DW	DW	DRK
P31,P32	DW	W	DW	DRK
P41,P42	DW	DW	W	DRK

SIGNAL FACE I.D.

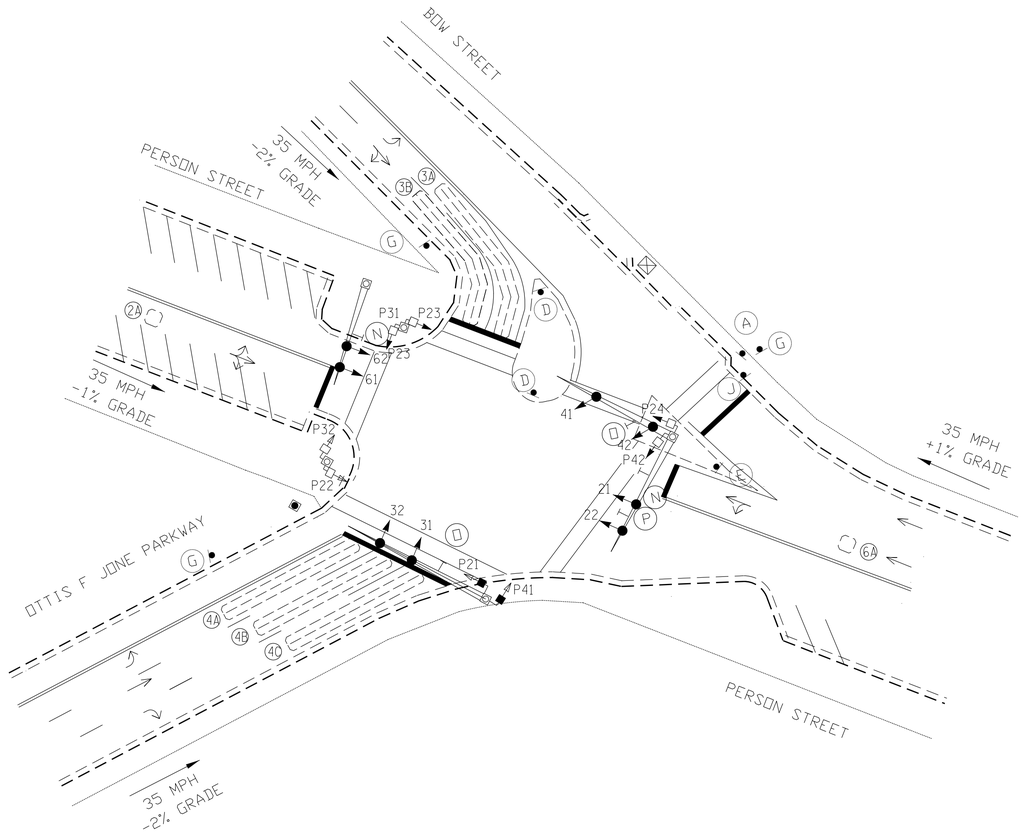
All Heads L.E.D.



31	21,22	P21,P22
41	32	P23,P24
	42	P31,P32
	61,62	P41,P42

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR						PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD	
2A	6X6	70	4	-	2	Yes	-	-	S	-	Y	
3A	6X60	0	2-4-2	-	3	Yes	-	-	S	-	Y	
3B	6X60	0	2-4-2	-	3	Yes	-	-	S	-	Y	
4A	6X60	0	2-4-2	-	4	Yes	-	-	S	-	Y	
4B	6X60	0	2-4-2	-	4	Yes	-	-	S	-	Y	
4C	6X60	0	2-4-2	-	4	Yes	-	15	S	-	Y	
6A	6X6	70	4	-	6	Yes	-	-	S	-	Y	



ASC/3 TIMING CHART

FEATURE	PHASE 2	3	4	6
Min Green *	10	7	7	10
Walk *	7	7	7	7
Ped Clear	17	6	14	12
Veh. Extension *	3.0	1.0	1.0	3.0
Max 1 *	30	20	30	20
Yellow	3.0	4.0	4.0	3.8
Red Clear	4.4	2.2	2.3	2.5
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	-	X
Recall Position	MIN RECALL	-	-	MIN 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.

2 PHASE FULLY ACTUATED (FAYETTEVILLE SIGNAL SYSTEM)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
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. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
8. SET ALL DETECTOR UNITS TO PRESENCE MODE.
8. INSTALL NEW CABINET ON EXISTING FOUNDATION.

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	

A	"STOP PEDESTRIAN LOOK BEFORE CROSSING" SIGN	A
D	KEEP RIGHT SIGN (R4-7)	D
E	DOUBLE ARROW SIGN (W12-1)	E
G	PEDESTRIAN CROSSING SIGN (W11A-2)	G
J	"YIELD" SIGN (R1-2)	J
N	STREET NAME SIGN "BOW ST"	N
O	STREET NAME SIGN "PERSON ST"	O
P	STREET NAME SIGN "FRANKLIN ST"	P

Signal Upgrade

Person Street
at
Bow Street/
Ottis F Jones Parkway

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 REVIEWED BY: RWT

PREPARED BY: RTP REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1" = 30'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036842 RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C018

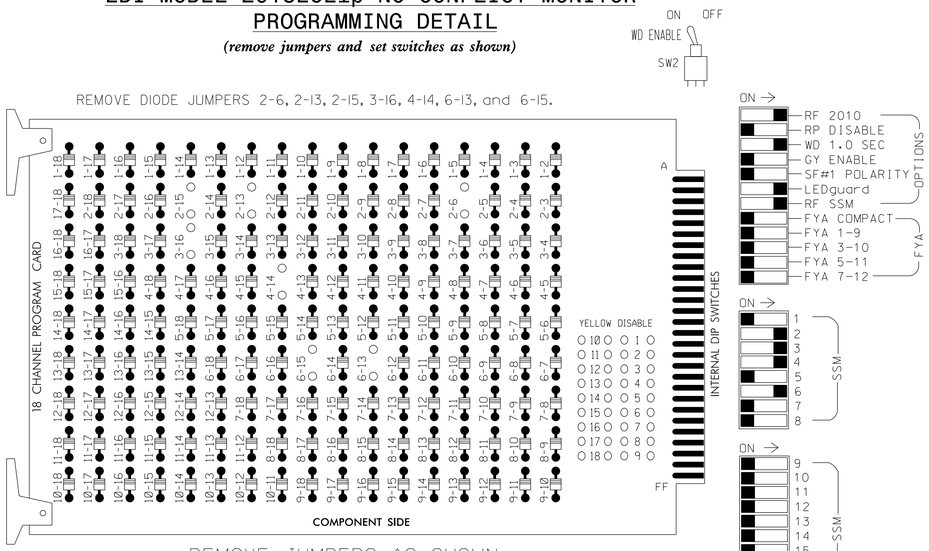
Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

default
\\NCF-DATA\Proj\360655_U-5742_Fay Sig Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11?2016\Person @ Bow-Ottis Jones.dgn
11/18/2016 9:35:38 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.280.1

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. Enable Simultaneous Gap-Out for all phases.
3. Program controller to start up in phase 2 Green and 6 Green.
4. Program phases 2, 3, and 4 for 'Startup Ped Call'.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S4,S5,S6,S8,S9,S12
PHASES USED.....2,3,4,6,2PED,3PED,4PED
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	3 PED
SIGNAL HEAD NO.	NU	21,22	P21,P22 P23,P24	31	32	41	42	P41, P42	NU	61,62	NU	NU	NU	P31, P32
RED		128		116	116	101	101			134				
YELLOW		129		117	117	102	102			135				
GREEN		130		118	118	103	103			136				
RED ARROW														
YELLOW ARROW														
GREEN ARROW				118		103								
✋			113					104			119			110
🚶			115					106			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" UPPER	SLOT EMPTY	Ø2 2A	Ø4 4C	SLOT EMPTY	SLOT EMPTY	Ø4 4A	Ø3 3A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" LOWER		Ø6 6A	NOT USED			Ø4 4B	Ø3 3B					Ø4 PED DC ISOLATOR	Ø3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" UPPER	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" LOWER														

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	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
6A	TB2-7,8	I2L	43	12	6	YES			S
4C	TB2-9,10	I3U	63	32	4	YES		15	S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
3A	TB6-1,2	I7U	65	34	3	YES			S
3B	TB6-3,4	I7L	78	44	3	YES			S
PED PUSH BUTTONS									
P21,P22 P23,P24	TB8-4,6	I12U	67	PED 2	2 PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED				
P31,P32	TB8-8,9	I13L	70	PED 3	3 PED				

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

✳ System detector only. Remove any assigned vehicle phase.

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: C018
DESIGNED: NOVEMBER 2016
SEALED: 11/18/16
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

Person Street
at
Bow Street/
Ottis F Jones Parkway

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

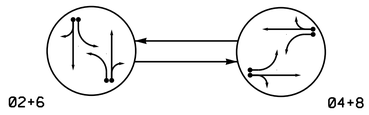
DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE | DATE

SIG. INVENTORY NO. C018

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 11720l6\Person @ Bow-Ottis Jones.dgn
11/18/2016 9:35:57 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.281.0

PHASING DIAGRAM



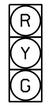
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



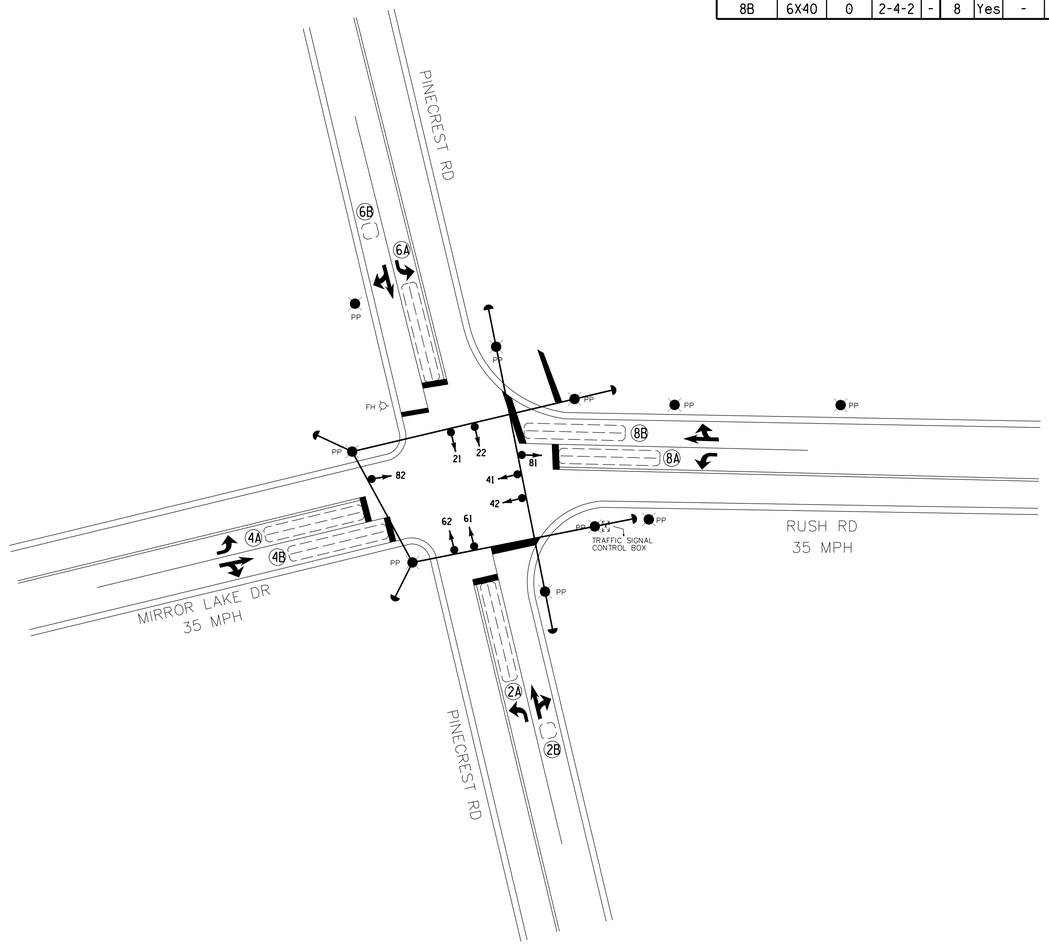
21, 22
41, 42
61, 62
81, 82

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Yes	-	3	S	-	Y
2B	6X6	70	4	-	2	Yes	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	3	S	-	Y
4B	6X40	0	2-4-2	-	4	Yes	-	-	S	-	Y
6A	6X40	0	2-4-2	-	6	Yes	-	3	S	-	Y
6B	6X6	70	4	-	6	Yes	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	Yes	-	3	S	-	Y
8B	6X40	0	2-4-2	-	8	Yes	-	-	S	-	Y

2 PHASE
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Locate new cabinet on existing foundation.



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	12	6	12	6
Walk *	0	0	0	0
Ped Clear	0	0	0	0
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	20	15	20	15
Yellow	3.2	3.5	3.2	3.2
Red Clear	1.5	1.5	1.4	1.5
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	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville Northcarolina

PINECREST DRIVE AT RUSH ROAD/MIRROR LAKE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

SCALE 0 30

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

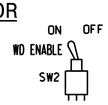
SIG. INVENTORY NO. C019

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Pinecrest_at_Rush.dgn
11/18/2016
9:44:18 AM

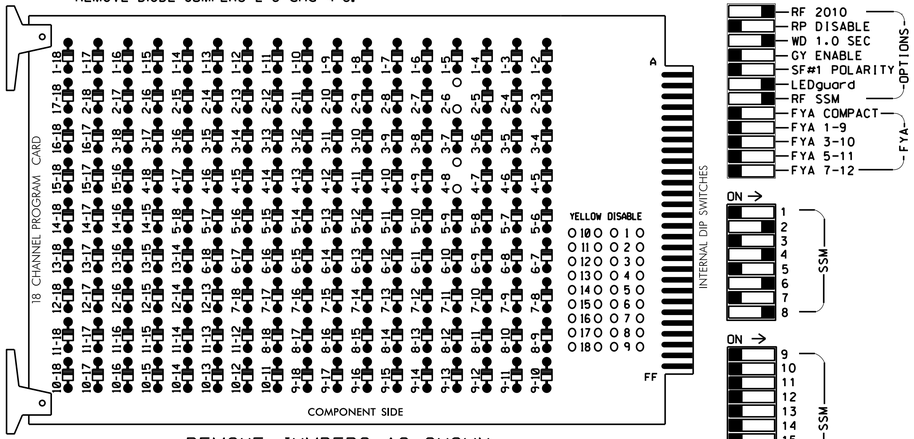
PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.281.1

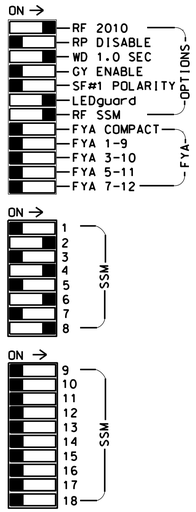
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-6 and 4-8.





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 phases 2 and 6 for Start Up In Green.
3. Program phases 2 and 6 for Yellow Flash.
4. Enable Simulataneous Gap-Put for all phases.
5. Program phases 4 and 8 for Dual Entry.
6. The cabinet and controller are part of the City of Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....SAFETRAN 2070E
CABINET.....SAFETRAN 336
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2.S5.S8.S11
PHASES USED.....2.4.6.8
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	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

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	SLOT EMPTY	Ø4 4A	SLOT EMPTY	Ø6 6A	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		Ø2 2B		Ø4 4B		Ø6 6B		Ø8 8B						ST DC ISOLATOR

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB21-3,4	12U	39	2	2		3	S
2B	TB23-3,4	12L	43	12	2			S
4A	TB21-7,8	14U	41	4	4		3	S
4B	TB23-7,8	14L	45	14	4			S
6A	TB21-11,12	16U	40	6	6		3	S
6B	TB23-11,12	16L	44	16	6			S
8A	TB22-1,2	18U	42	8	8		3	S
8B	TB24-1,2	18L	46	18	8			S

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C019
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville Worth Knowing

PINECREST DRIVE
AT
RUSH ROAD/MIRROR LAKE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

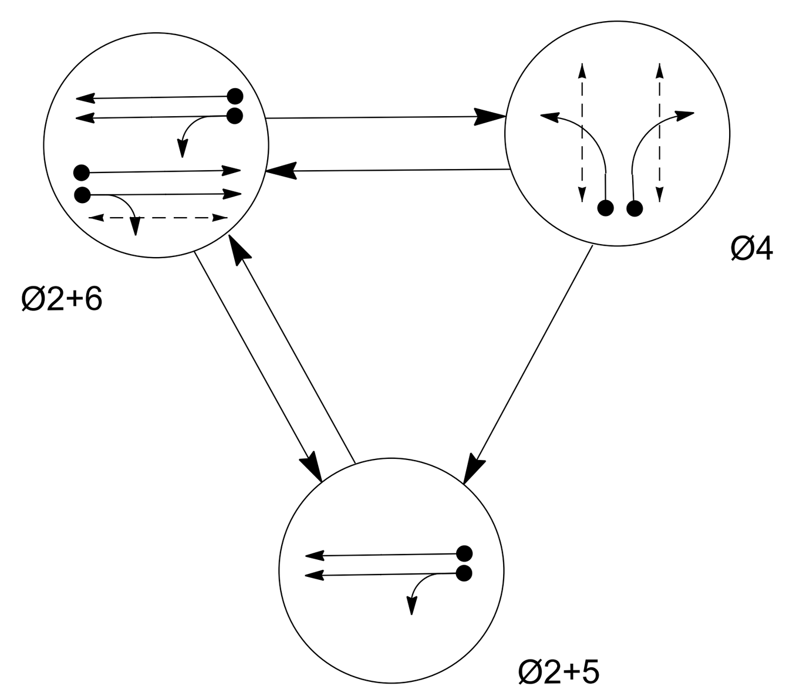
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
ENGINEER SIGNATURE DATE

SIG. INVENTORY NO. C019

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Pinecrest_at_Rush.dgn
11/18/2016 9:44:49 AM

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

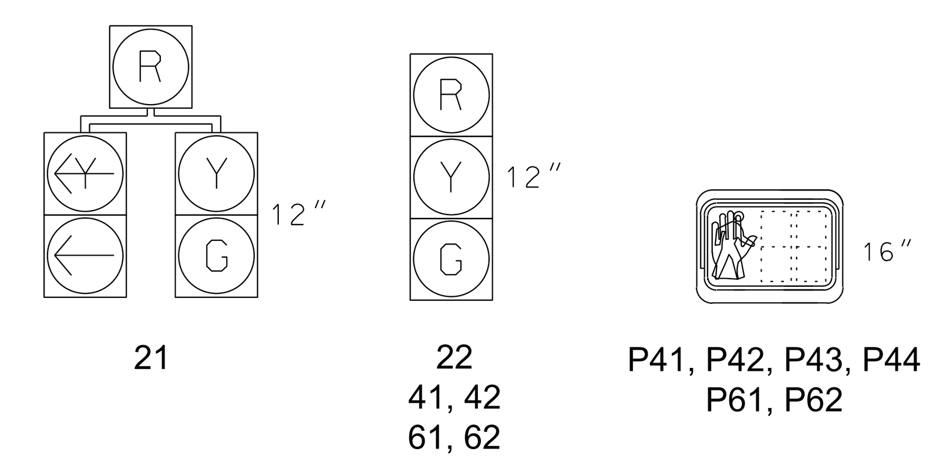
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø 2+5	Ø 2+6	Ø 4	FLASH
21	← / G	G	R	Y
22	G	G	R	Y
41, 42	R	R	G	R
61, 62	R	G	R	Y
P41,P42,P43,P44	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



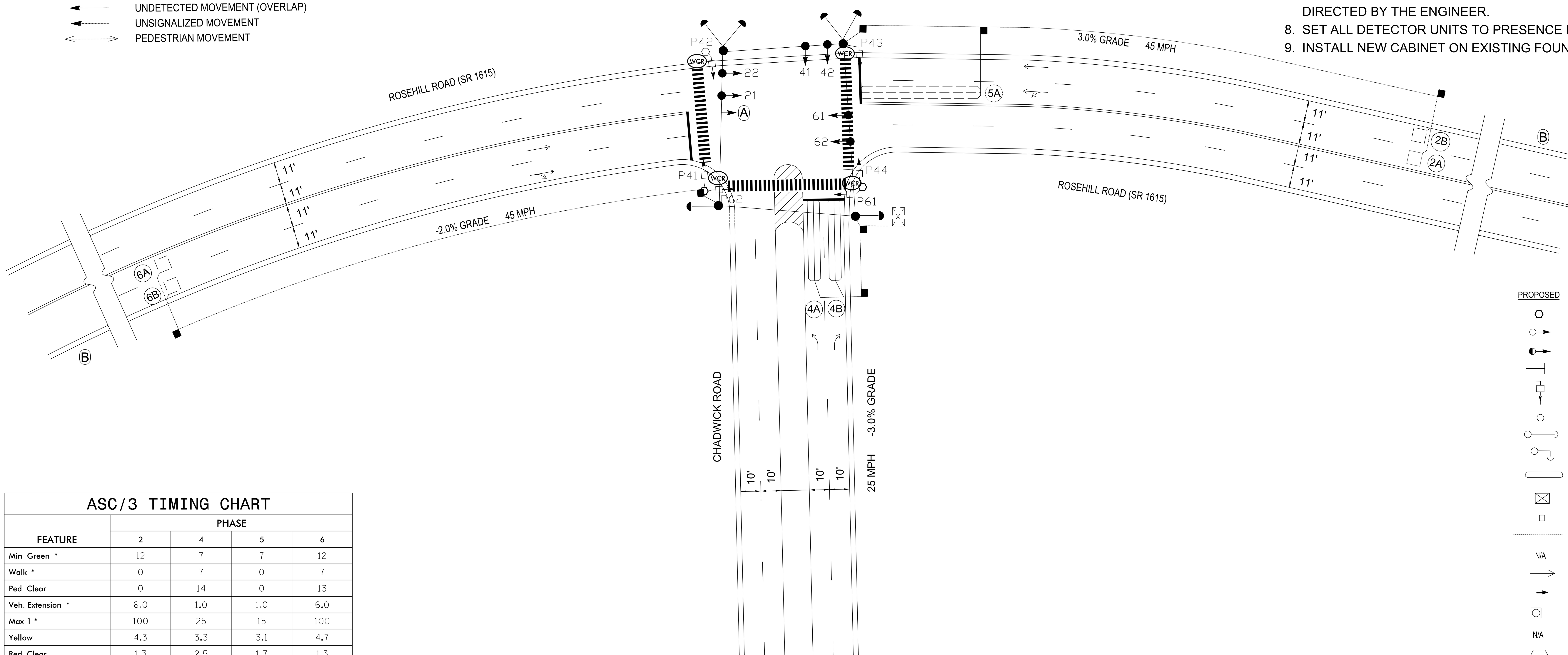
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	N	2	-	-	S	N	Y
2B	6X6	300	4	N	2	-	-	S	N	Y
4A	6X40	0	2-4-2	Y	4	-	-	S	N	Y
4B	6X40	0	2-4-2	Y	4	-	-	S	N	Y
5A	6X60	0	2-4-2	N	2	-	3	S	N	Y
				N	5	-	15	S	N	Y
6A	6X6	300	4	N	6	-	-	S	N	Y
6B	6X6	300	4	N	6	-	-	S	N	Y

3 PHASE
FULY ACTUATED
CITY OF FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMINGS VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
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. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING UNLESS DIRECTED BY THE ENGINEER.
8. SET ALL DETECTOR UNITS TO PRESENCE MODE.
9. INSTALL NEW CABINET ON EXISTING FOUNDATION.



LEGEND

PROPOSED		EXISTING
	Pedestrian Pedestal	
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Wood Pole	
	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 with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
	Metal Strain Pole	
N/A	Wheelchair Ramp	
A	"Left Turn Yield on Green" Sign (R10-12)	A
B	"Signal Ahead" Sign (W3-3)	B

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green *	12	7	7	12
Walk *	0	7	0	7
Ped Clear	0	14	0	13
Veh. Extension *	6.0	1.0	1.0	6.0
Max 1 *	100	25	15	100
Yellow	4.3	3.3	3.1	4.7
Red Clear	1.3	2.5	1.7	1.3
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	1.5	-	-	1.5
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	1.5	-	-	1.5
Locking Detector	X	-	-	X
Recall Position	MIN. RECALL	-	-	MIN. RECALL
Dual Entry	ON	-	-	ON
Simultaneous Gap	ON	-	-	ON

* 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

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

SCALE 0 30

ROSEHILL ROAD
AT
CHADWICK ROAD

DIV 06	CUMBERLAND COUNTY		FAYETTEVILLE
PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

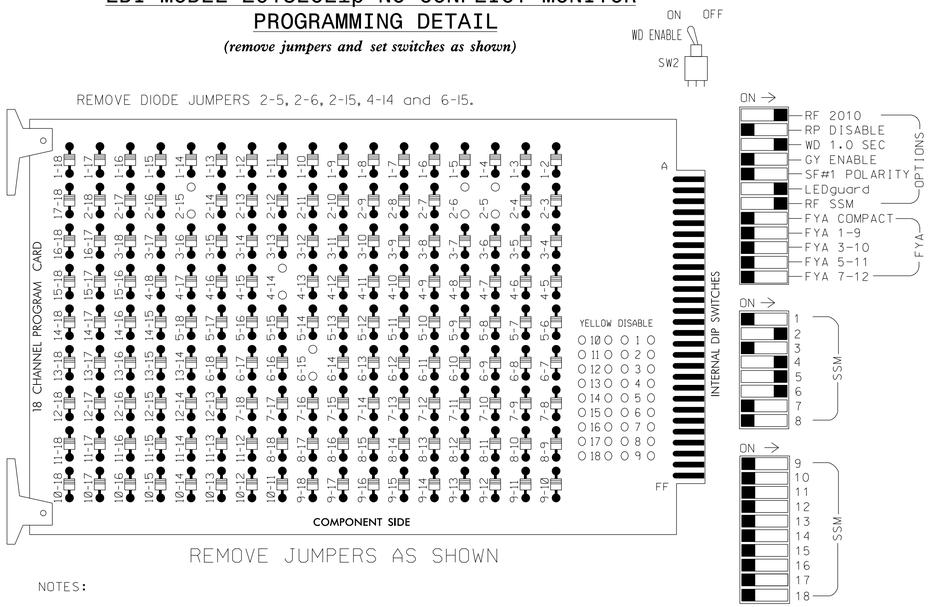
DocuSigned by:
Russell W Thompson 11/21/2016
F30C814C54B5430...
SIGNATURE DATE
SIG. INVENTORY NO. C020

default
\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Rosehill_at_Chadwick.dgn
11/18/2016 9:50:37 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.282.1

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. Enable Simulataneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Fayetteville City System.
6. Program phases 2 and 6 for 'STARTUP PED CALL'.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S7,S8
PHASES USED.....2,4,5,6,4PED,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	NU	NU	41,42	P41,P42 P43,P44	21	61,62	P61, P62	NU	NU	NU
RED		128			101		*	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					
✋						104			119			
🚶						106			121			

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	SLOT EMPTY	Ø2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B				Ø4 4B						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	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	NOT USED	Ø6 6B												

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	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			S
2B	TB2-7,8	I2L	43	12	2	YES			S
4A	TB4-9,10	I6U	41	4	4	YES			S
4B	TB4-11,12	I6L	45	14	4	YES			S
5A*	TB3-1,2	J1U	55	5	5	YES			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
PED PUSH BUTTONS									
P41,P42 P43,P44	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.

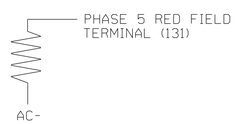
* Add jumper from J1-F to I4-F

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)



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: C020
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

ROSEHILL ROAD
AT
CHADWICK ROAD

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

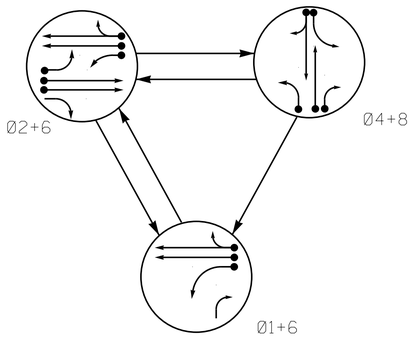
DocuSigned by: Russell W Thompson 11/21/2016
ENGINEER'S SIGNATURE DATE

SIG. INVENTORY NO. C020

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201G\Rosehill_at_Chadwick.dgn
11/18/2016
9:50:59 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.283.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

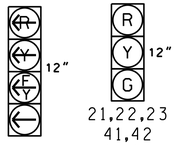
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01 + 06	PHASE 02 + 06	PHASE 04 + 08	FLASH
11	←	← F Y	← P	← F Y
21,22,23	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81,82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



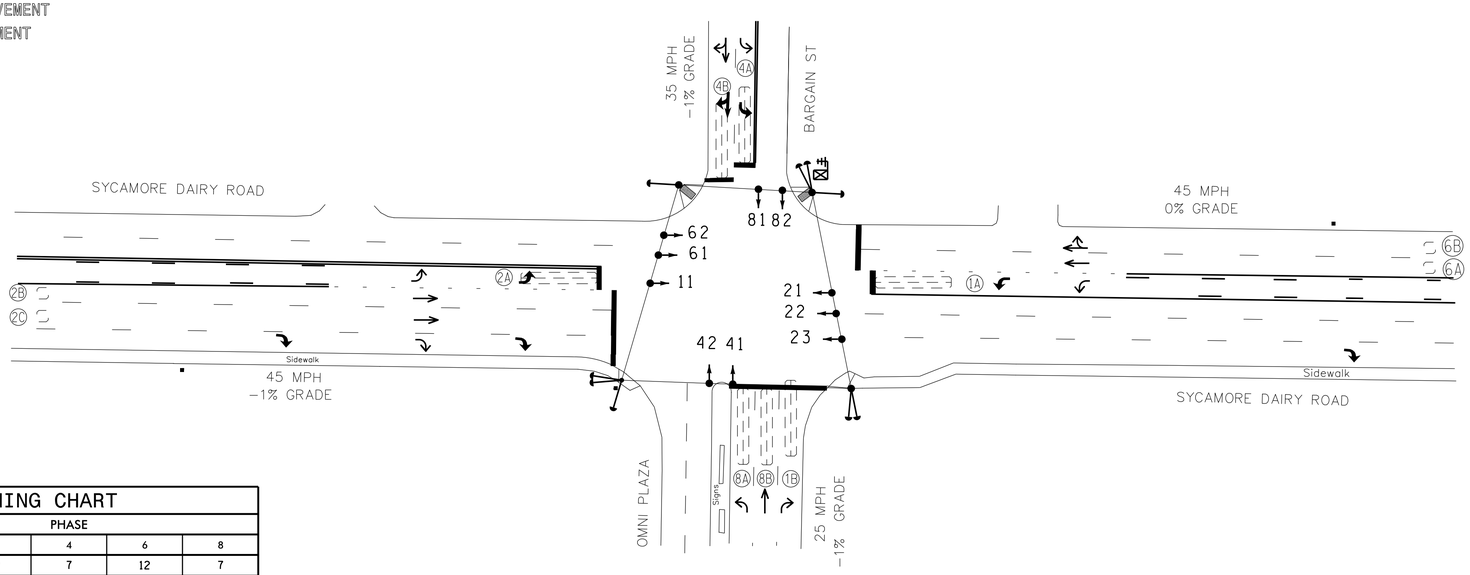
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	-	15	S	-	Y
				-	6	-	3	G	-	Y
2A	6X40	0	2-4-2	-	2	-	3	S	-	Y
2B,2C	6X6	300	3	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	-	S	-	Y
4B	6X40	0	2-4-2	-	4	-	-	S	-	Y
6A,6B	6X6	300	3	-	6	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	-	-	S	-	Y
8B	6X40	0	2-4-2	-	8	-	-	S	-	Y
1B	6X40	+5	2-4-2	-	1	-	25	S	-	Y

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the engineer.
3. Pavement markings are existing.
4. Locate new cabinet on existing foundation.
5. Phase 1 may be lagged.
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.
8. Locate new cabinet on existing foundation.



ASC/3 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	7	12	7	12	7
Walk *	0	0	0	0	0
Ped Clear	0	0	0	0	0
Veh. Extension *	1.0	6.0	1.0	6.0	1.0
Max 1 *	20	90	20	90	20
Yellow	3.2	4.6	3.9	4.6	3.2
Red Clear	2.8	1.6	1.9	1.5	2.4
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	1.5	-	1.5	-
Max Initial *	-	34	-	34	-
Time Before Reduction *	-	15	-	15	-
Time To Reduce *	-	30	-	30	-
Minimum Gap	-	3.0	-	3.0	-
Locking Detector	-	X	-	X	-
Recall Position	-	MIN. RECALL	-	MIN. RECALL	-
Dual Entry	-	-	X	-	X
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.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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	

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

SCALE 0 40

SYCAMORE DAIRY ROAD AT BARGAIN STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

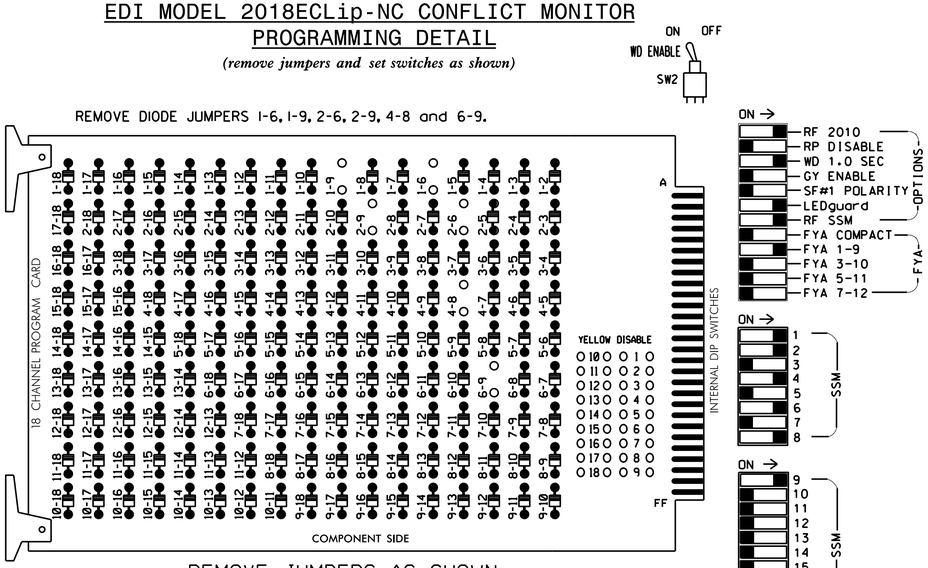
SIG. INVENTORY NO. C021

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Bargain_at_Sycamore_Dairy.dgn
11/17/2016 11:58:55 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.283.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22, 23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	11★	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	

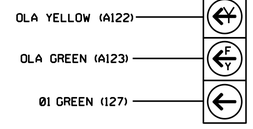
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



11

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø2 2B,2C				Ø4 4B								ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A,6B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø1 1B				Ø8 8B			⊗ WIRED INPUT					

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

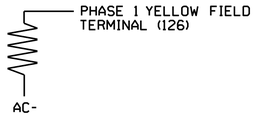
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A'	TB7-9,10	J9U	59	15	1		15	S
	-	J9L	61	17	6		3	G
2A	TB2-5,6	I2U	39	2	2		3	S
2B,2C	TB2-7,8	I2L	43	12	2			S
4A	TB4-9,10	I6U	41	4	4			S
4B	TB4-11,12	I6L	45	14	4			S
6A,6B	TB3-5,6	J2U	40	6	6			S
8A	TB5-9,10	J6U	42	8	8			S
8B	TB5-11,12	J6L	46	18	8			S
1B	TB3-7,8	J2L	44	16	1		25	S

'Add jumper from J9-F to J9-W. Turn off J9L detector channel.

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)

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C021
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

SYCAMORE DAIRY ROAD
AT
BARGAIN STREET

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C021

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\1002\FINAL SEALED PLANS\Revised 117201\6\Bargain_at_Sycamore_Dairy.dgn
11/17/2016 11:55:06 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.283.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C021
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

SYCAMORE DAIRY ROAD
AT
BARGAIN STREET

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

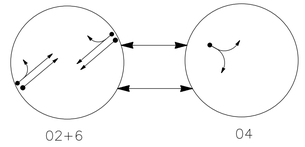
SIG. INVENTORY NO. C021

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201\6\Bargain_at_Sycamore_Dairy.dgn
11/17/2016 11:59:22 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.284.0

2 PHASE
FULY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM

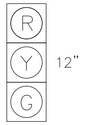


PHASING DIAGRAM
DETECTION LEGEND

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

SIGNAL FACE I.D.

ALL HEADS L.E.D.



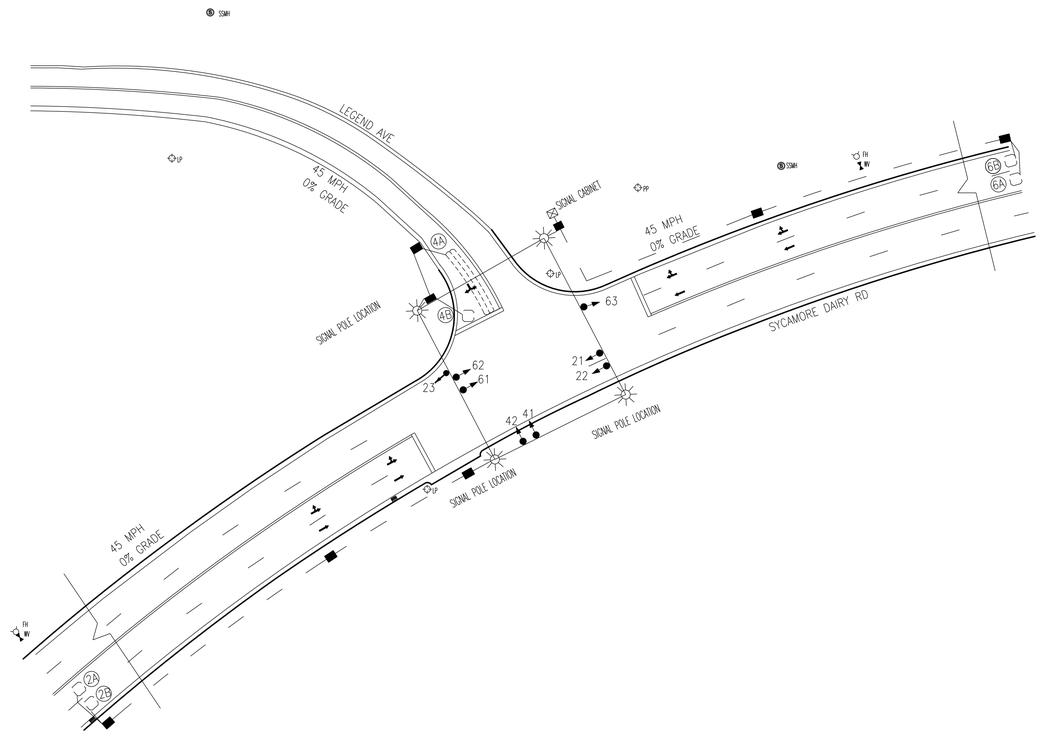
21, 22, 23
41, 42
61, 62, 63

TABLE OF OPERATION

SIGNAL FACE	PHASE 2+6	PHASE 4	PHASE FLASH
21,22,23	G	R	Y
41,42	R	G	R
61,62,63	G	R	Y

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	-	2	-	-	S	-	Y
2B	6X6	300	4	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	3	S	-	Y
4B	6X6	0	4	-	4	-	15	S	-	Y
6A	6X6	300	4	-	6	-	-	S	-	Y
6B	6X6	300	4	-	6	-	-	S	-	Y



NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JULY 2012 AND STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2012.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY ENGINEER.
3. SET ALL DETECTOR UNITS TO PRESENCE MODE.
4. LOCATE NEW CABINET ON EXISTING FOUNDATION.
5. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
6. PAVEMENT MARKINGS ARE EXISTING.

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green *	12	7	12
Walk *	0	0	0
Ped Clear	0	0	0
Veh. Extension *	6.0	2.0	6.0
Max 1 *	75	25	75
Yellow	4.6	3.0	4.6
Red Clear	1.3	1.9	1.2
Actuations B4 Add *	-	-	-
Seconds /Actuation *	1.5	-	1.5
Max Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	30	-	30
Minimum Gap	3.0	-	3.0
Locking Detector	X	-	X
Recall Position	MIN. RECALL	-	MIN. RECALL
Dual Entry	-	-	-
Simultaneous Gap	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	
	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	

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville
North Carolina

SYCAMORE DAIRY ROAD
AT
LEGEND AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
PROFESSIONAL SIGNATURE DATE

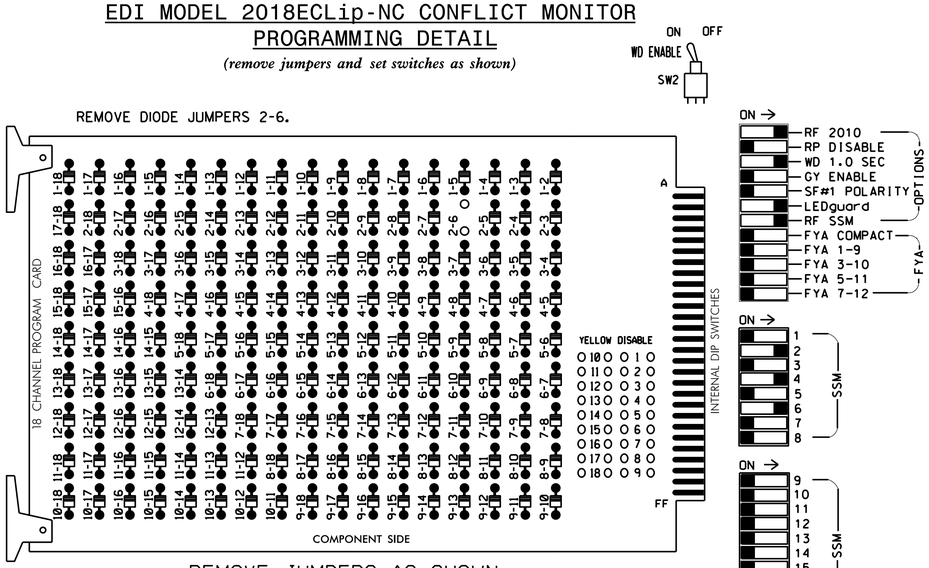
SIG. INVENTORY NO. C022

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11?2016\Legend_at_Sycamore.dgn
11/17/2016 3:45:19 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.284.1

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 phases 2 and 6 for Yellow Flash.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
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, 23	NU	NU	41,42	NU	NU	61,62, 63	NU	NU	NU	NU
RED		128			101			134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋												
🚶												

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	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
FILE "I" L		ø2 2B				ø4 4B								ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	ø6 6A	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		ø6 6B												

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	DETECTOR TYPE
2A	TB2-5,6	12U	39	2	2	YES			S
2B	TB2-7,8	12L	43	12	2	YES			S
4A	TB4-9,10	16U	41	4	4	YES		3	S
4B	TB4-11,12	16L	45	14	4	YES		15	S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B	TB3-7,8	J2L	44	16	6	YES			S

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C022
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

SYCAMORE DAIRY ROAD
AT
LEGEND AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

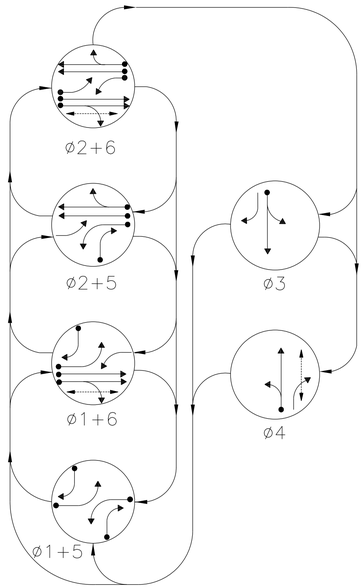
SIG. INVENTORY NO. C022

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Legend.dgn
11/17/2016 3:45:35 PM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.285.0

6 PHASE FULLY ACTUATED FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

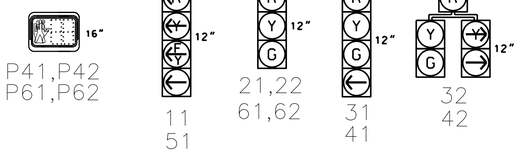
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE ø 1+5	ø 1+6	ø 2+5	ø 2+6	ø 3	ø 4	FLASH
11	—	—	F Y	F Y	R	R	✳
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	✳
61,62	R	G	R	G	R	R	Y
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

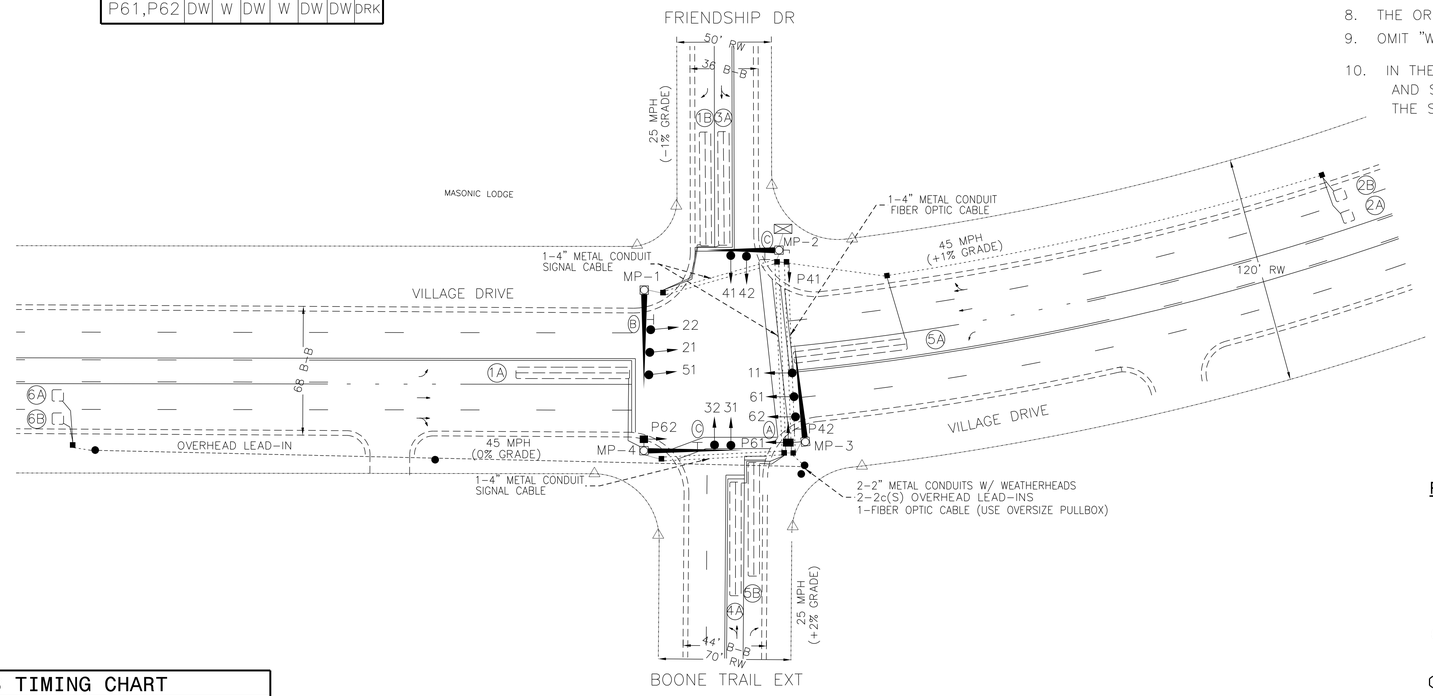
SIGNAL FACE I.D.

All Heads L.E.D.



NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERSEDE THESE VALUES.
4. SET ALL DETECTOR UNITS TO PRESENCE MODE.
5. PROGRAM PEDESTRIAN HEADS TO COUNTDOWN THE FLASHING "DON'T WALK" TIME ONLY. USE LIGHTED PEDESTRIAN PUSH BUTTON CALL INDICATORS.
6. LOCATE NEW CABINET ON EXISTING FOUNDATION.
7. PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
8. THE ORDER OF PHASE 3 AND PHASE 4 MAY BE REVERSED.
9. OMIT "WALK" AND FLASHING "DON'T WALK" WITH NO PEDESTRIAN CALLS.
10. IN THE EVENT OF LOOP REPLACEMENT, REFER TO THE CURRENT ITS AND SIGNALS DESIGN MANUAL AND SUBMIT A PLAN OF RECORD TO THE SIGNAL DESIGN SECTION.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	0	0	0	7	0	7
Ped Clear	0	0	0	22	0	11
Veh. Extension *	1.0	6.0	1.0	1.0	1.0	6.0
Max 1 *	15	75	20	20	15	75
Yellow	3.2	4.4	3.2	3.1	3.1	4.5
Red Clear	1.8	1.0	2.9	2.6	1.8	1.2
Actuations B4 Add *	-	0	-	-	-	0
Seconds /Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
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	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6x60	0	2-4-2	-	6	-	3	G	-	Y
				-	1	-	15	S	-	Y
1B	6x60	0	2-4-2	-	1	-	15	S	-	Y
2A	6x6	300	4	-	2	-	-	S	-	Y
2B	6x6	300	4	-	2	-	-	S	-	Y
3A	6x60	0	2-4-2	-	3	-	3	S	-	Y
4A	6x60	0	2-4-2	-	4	-	3	S	-	Y
5A	6x60	0	2-4-2	-	2	-	3	G	-	Y
				-	5	-	15	S	-	Y
5B	6x60	0	2-4-2	-	5	-	15	S	-	Y
6A	6x6	300	4	-	6	-	-	S	-	Y
6B	6x6	300	4	-	6	-	-	S	-	Y

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	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 Pole with Mastarm	
A	"BOONE TRL EXT" STREET NAME SIGN	A
B	"FRIENDSHIP DR" STREET NAME SIGN	B
C	"VILLAGE DR" STREET NAME SIGN	C

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

VILLAGE DRIVE
AT
BOONE TRAIL EXTENSION/
FRIENDSHIP DRIVE

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
F30C SIGNATURE DATE

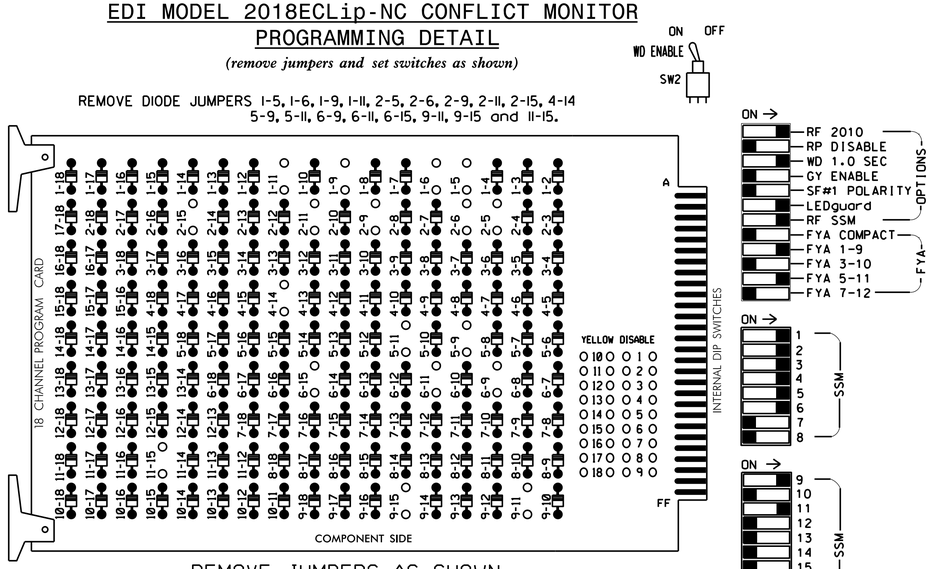
SIG. INVENTORY NO. C023

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Village_at_Boone.dgn
11/18/2016 10:03:45 AM

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, 2-5, 2-6, 2-9, 2-11, 2-15, 4-14
5-9, 5-11, 6-9, 6-11, 6-15, 9-11, 9-15 and 11-15.



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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Walk.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Program phases 4 and 6 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S7,S8,S9,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-5742	SIG.285.1

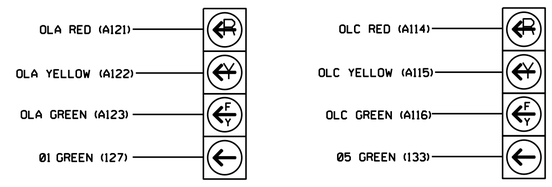
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4		S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3		4		14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3		4		4 PED	5		6	6 PED	7	8	8 PED	OLA	SPARE	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	32	21,22	NU	31	32	41	42	P41, P42	42	51★	61,62	P61, P62	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		126							132								A122			A115		
FLASHING YELLOW ARROW																	A123			A116		
GREEN ARROW	127	127		118		103			133	133												
✋									104				119									
🚶									105				121									

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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE 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	Ø3 3A	SLOT EMPTY	SLOT EMPTY	Ø4 4A	WIRED INPUT	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B	Ø1 1B			Ø5 5B			Ø5 5A			Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	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		Ø6 6B												

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A'	TB6-9,10	19U	60	11	1		15	S
	TB6-1,2	17U	65	34	6		3	G
1B	TB2-11,12	13L	76	42	1		15	S
2A	TB2-5,6	12U	39	2	2			S
2B	TB2-7,8	12L	43	12	2			S
3A	TB2-9,10	13U	63	32	3		3	S
4A	TB4-9,10	16U	41	4	4		3	S
5A"	TB6-11,12	19L	60	13	5		15	S
	TB6-3,4	17L	78	44	2		3	G
5B	TB4-11,12	16L	45	14	5		15	S
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
P41,P42	TB8-5,6	I12L	67	PED2	4 PED			S
P61,P62	TB8-7,9	I13U	68	PED4	6 PED			S

' Add jumper from I7-F to I9-F.
" Add jumper from I7-W to I9-W.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

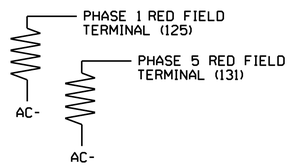
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

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: C023
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

VILLAGE DRIVE
AT
BOONE TRAIL EXTENSION/
FRIENDSHIP DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
ESIG. SIGNATURE DATE

SIG. INVENTORY NO. C023

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11/2016\Village_at_Boone.dgn
11/18/2016 10:04:07 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.285.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C023
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:

Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD, L & E, LLC
LICENSE NO. P-0669

Fayetteville

VILLAGE DRIVE
AT
BOONE TRAIL EXTENSION/
FRIENDSHIP DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: BLR	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

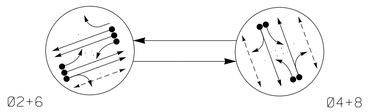
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C023

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Village_at_Boone.dgn
11/18/2016 10:04:26 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.286.0

PHASING DIAGRAM



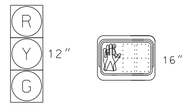
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P81,P82	DW	W	DRK

SIGNAL FACE I.D.

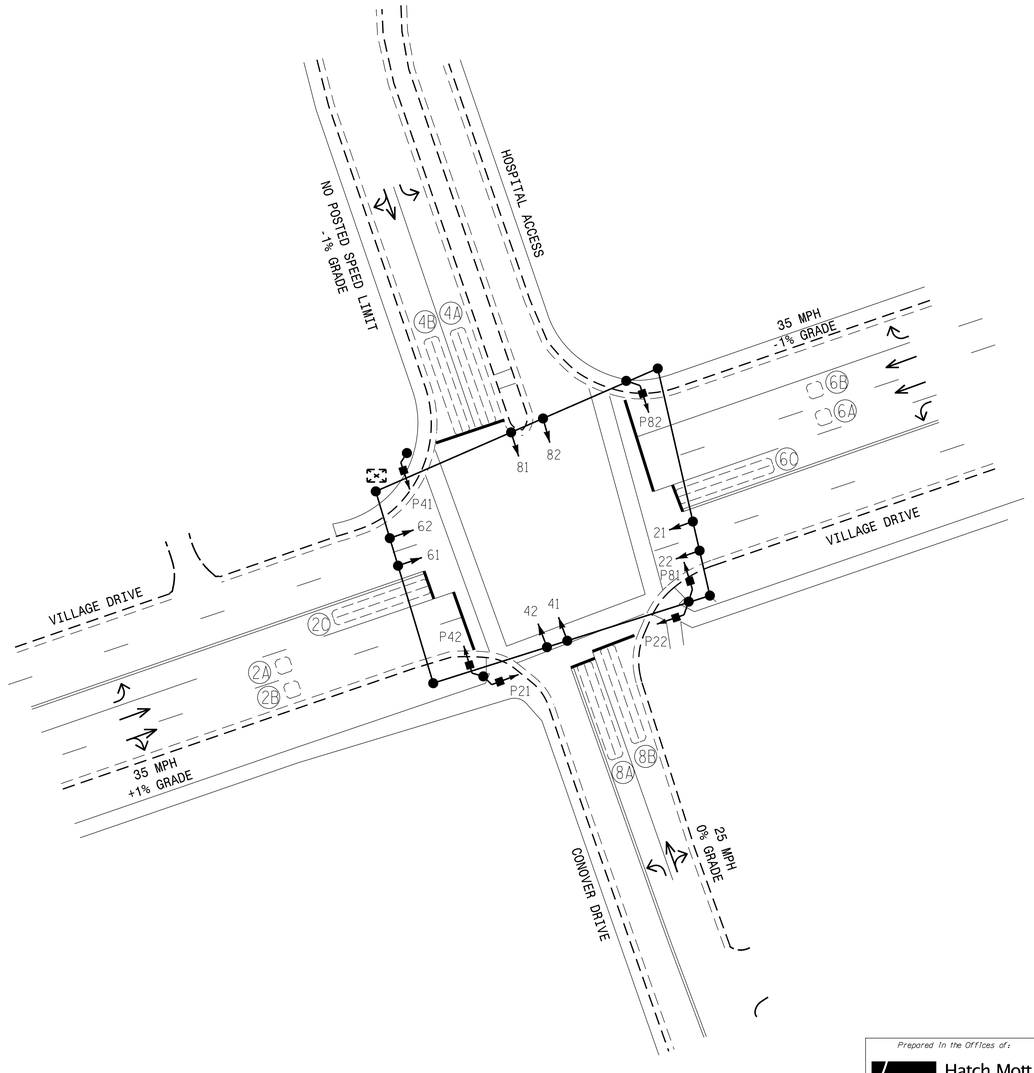
All Heads L.E.D.



21,22
41,42
61,62
81,82

P21,P22
P41,P42
P81,P82

ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	-	2	Yes	-	-	S	-	Y
2B	6X6	70	4	-	2	Yes	-	-	S	-	Y
2C	6X40	0	2-4-2	-	2	Yes	-	-	C	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	-	S	-	Y
4B	6X40	0	2-4-2	-	4	Yes	-	10	S	-	Y
6A	6X6	70	4	-	6	Yes	-	-	S	-	Y
6B	6X6	70	4	-	6	Yes	-	-	S	-	Y
6C	6X40	0	2-4-2	-	6	Yes	-	-	C	-	Y
8A	6X40	0	2-4-2	-	8	Yes	-	-	S	-	Y
8B	6X40	0	2-4-2	-	8	Yes	-	10	S	-	Y



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	22	22	17	17
Veh. Extension *	2.0	2.0	2.0	2.0
Max 1 *	30	20	30	20
Yellow	3.8	3.0	3.8	3.9
Red Clear	1.5	3.6	1.5	1.6
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
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.

2 PHASE
FULLY ACTUATED
(FAYETTEVILLE SIGNAL SYSTEM)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMINGS CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERCEDE THESE VALUES.
4. THIS SIGNAL IS PART OF THE FAYETTEVILLE SIGNAL SYSTEM.
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. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
8. SET ALL DETECTOR UNITS TO PRESENCE MODE.
8. INSTALL NEW CABINET ON EXISTING FOUNDATION.

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	

Signal Upgrade

Fayetteville

VILLAGE DRIVE AT CONOVER DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: RTP | REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1" = 30'

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

DocuSigned by: Richard T Pate 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C024

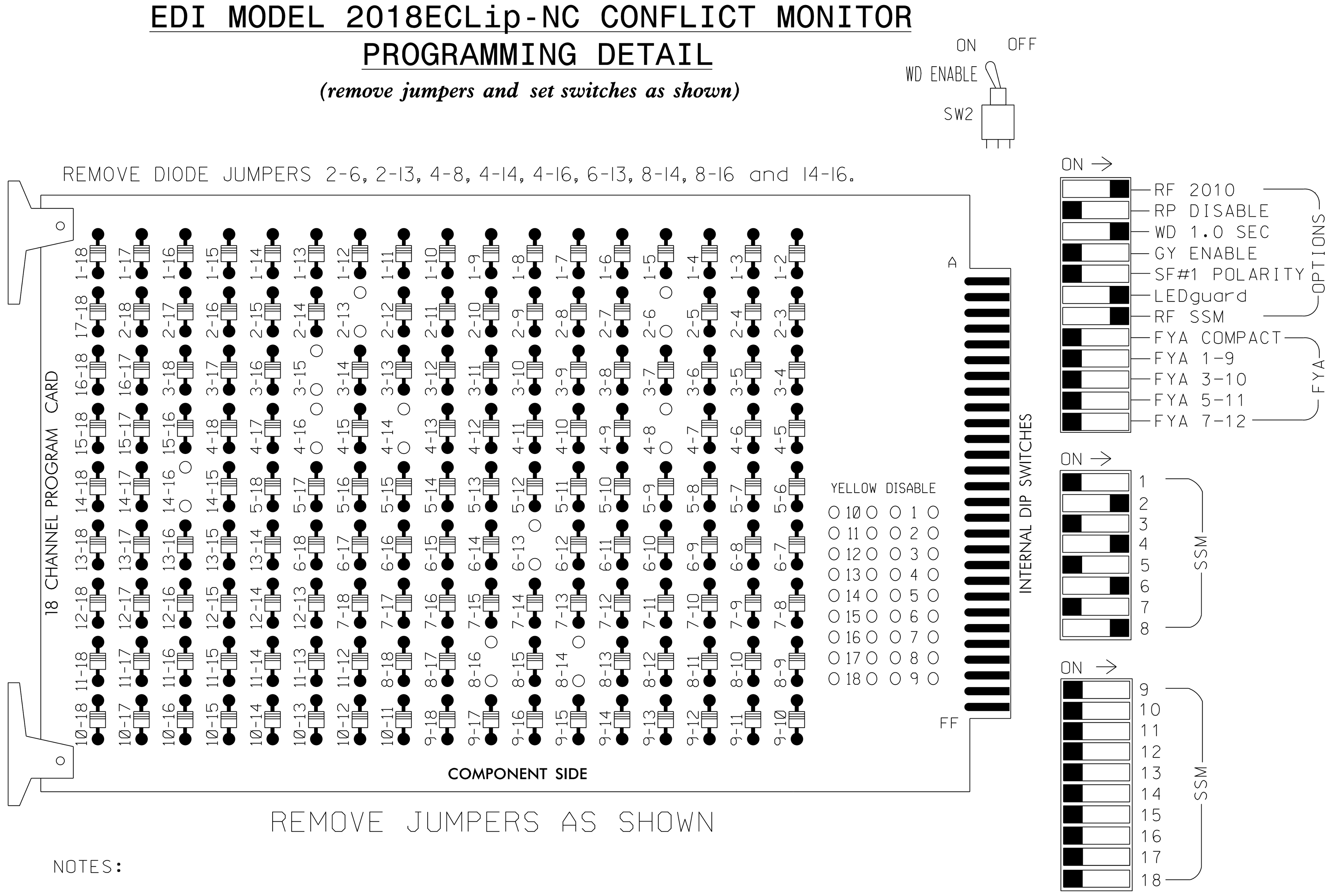
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Village @ Conover.dgn
11/18/2016 9:58:06 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.286.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-13, 4-8, 4-14, 4-16, 6-13, 8-14, 8-16 and 14-16.



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 Ped 2, 4, and 8 for 'STARTUP PED CALL'.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Fayetteville City System.

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	NU	61,62	NU	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
(hand)			113			104						110
(walk)			115			106						112

NU = Not Used

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

EQUIPMENT INFORMATION

CONTROLLER.............2070E
CABINET................332
SOFTWARE...............ECONOLITE ASC/3-2070
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S11,S12
PHASES USED............2,4,6,8,2PED,4PED,8PED
OVERLAPS...............NONE

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
"I"	U	SLOT EMPTY	Ø 2 2A	Ø 2 2C	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	NOT USED	FS DC ISOLATOR
"I"	L		Ø 2 2B	NOT USED			Ø 4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
"J"	U	SLOT EMPTY	Ø 6 6A	Ø 6 6C	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
"J"	L		Ø 6 6B	NOT USED			Ø 8 8B								

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	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
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
8A	TB5-9,10	J6U	42	8	8	YES			S
8B	TB5-11,12	J6L	46	18	8	YES		10	S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED				
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED				
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED				

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

✳ System detector only. Remove any assigned vehicle phase.

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: C024
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

VILLAGE DRIVE
AT
CONOVER DRIVE

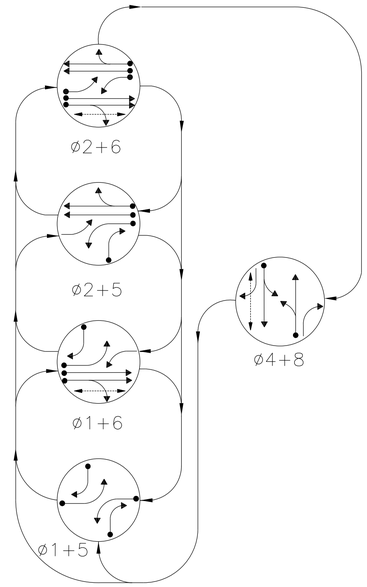
DIV 06 CUMBERLAND COUNTY FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 REVIEWED BY: RWT
PREPARED BY: RTP REVIEWED BY:
REVISIONS INIT. DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE
DocuSigned by: Richard T Pate 11/21/2016
SIG. INVENTORY NO. C024

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.287.0

5 PHASE
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

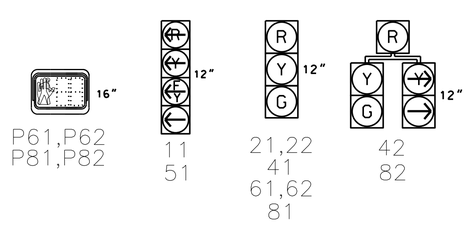
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE ø 1+5	ø 1+6	ø 2+5	ø 2+6	ø 4+8	FLASH
11	←	←	F Y	F Y	R	Y
21,22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R→	R	R→	R	G	R
51	←	F Y	←	F Y	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R→	R→	R	R	G	R
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



P61,P62
P81,P82

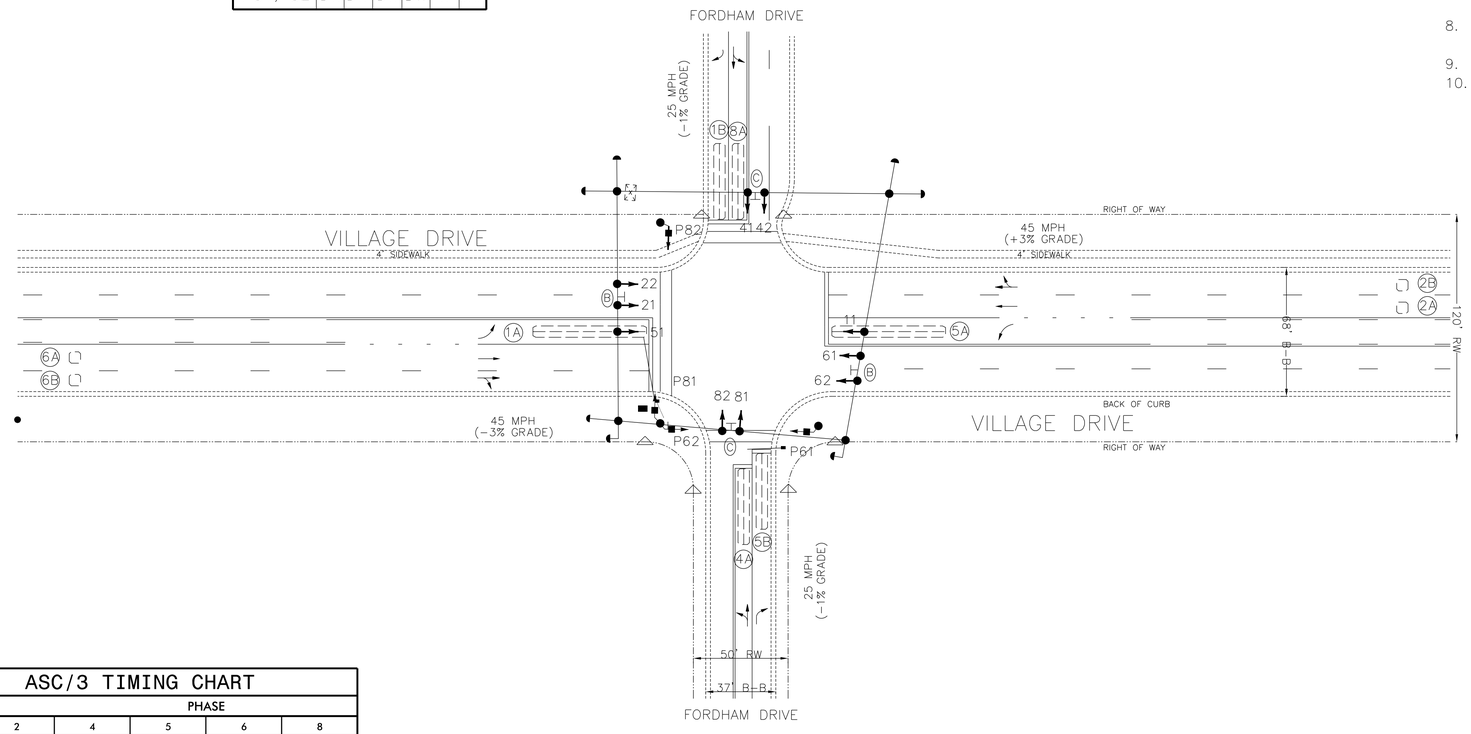
11
51

21,22
41
61,62
81

42
82

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. RUN ALL LEAD-IN CABLE OVERHEAD ON EXISTING UTILITY POLES WHERE POSSIBLE.
4. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERSEDE THESE VALUES.
5. PROGRAM PHASE 4 AND PHASE 8 FOR DUAL ENTRY.
6. SET ALL DETECTOR UNITS TO PRESENCE MODE.
7. PROGRAM PEDESTRIAN HEADS TO COUNTDOWN THE FLASHING "DON'T WALK" TIME ONLY.
8. OMIT "WALK" AND FLASHING "DON'T WALK" WITH NO PEDESTRIAN CALLS.
9. LOCATE NEW CABINET ON EXISTING FOUNDATION.
10. IN THE EVENT OF LOOP REPLACEMENT, REFER TO THE CURRENT ITS AND SIGNALS DESIGN MANUAL AND SUBMIT A PLAN OF RECORD TO THE SIGNAL DESIGN SECTION.



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	0	0	0	0	7	7
Ped Clear	0	0	0	0	5	16
Veh. Extension *	1.0	6.0	1.0	1.0	6.0	1.0
Max 1 *	15	75	20	15	75	20
Yellow	3.3	4.3	3.2	3.1	4.8	3.2
Red Clear	1.8	1.0	2.9	2.2	1.0	2.5
Actuations B4 Add *	-	0	-	-	0	-
Seconds /Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	MIN. RECALL	-	-	MIN. RECALL	-
Dual Entry	-	-	X	-	-	X
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	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	6	-	3	G	-	Y
					1	-	15	S	-	Y
1B	6X40	0	2-4-2	-	1	-	15	S	-	Y
2A	6X6	300	4	-	2	-	-	S	-	Y
2B	6X6	300	4	-	2	-	-	S	-	Y
4A	6X40	+10	2-4-2	-	4	-	3	S	-	Y
5A	6X60	0	2-4-2	-	2	-	3	G	-	Y
					5	-	15	S	-	Y
5B	6X40	0	2-4-2	-	5	-	15	S	-	Y
6A	6X6	300	4	-	6	-	-	S	-	Y
6B	6X6	300	4	-	6	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	-	3	S	-	Y

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▭↓	Pedestrian Signal Head	■↓
○→	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	→
Ⓑ	"FORDHAM DR" STREET NAME SIGN	Ⓑ
Ⓒ	"VILLAGE DR" STREET NAME SIGN	Ⓒ

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

SCALE 0 40

VILLAGE DRIVE
AT
FORDHAM DRIVE

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
ENGINEER SIGNATURE DATE

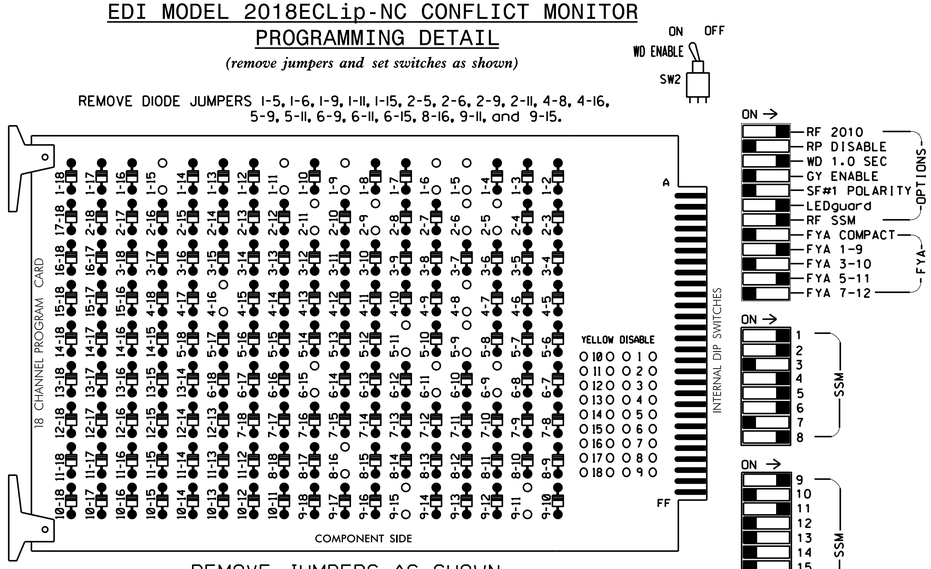
SIG. INVENTORY NO. C025

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Village_at_Fordham.dgn
11/18/2016 10:18:20 AM

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, 4-8, 4-16, 5-9, 5-11, 6-9, 6-11, 6-15, 8-16, 9-11, and 9-15.



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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2 and 6 for Yellow Flash.
8. Program phases 6 and 8 for 'STARTUP PED CALL'.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S9,S11,S12, AUX S1,AUX S4
PHASES USED.....1,2,4,5,6,8,6 PED,8 PED
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-5742	SIG.287.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	NU	41,42	NU	42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	NU	NU	51★	NU	NU
RED	*		128			101		*		134			107							
YELLOW			129			102				135			108							
GREEN			130			103				136			109							
RED ARROW															A121			A114		
YELLOW ARROW		126						132							A122			A115		
FLASHING YELLOW ARROW															A123			A116		
GREEN ARROW	127	127						133	133											
✋											119			110						
🚶											121			112						

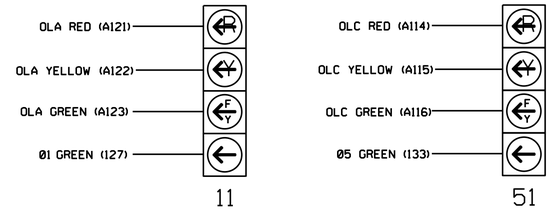
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE 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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	WIRED INPUT ⊗	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L		Ø2 2B				Ø5 5B	WIRED INPUT ⊗		Ø5 5A				Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L		Ø6 6B				Ø1 1B								

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A'	TB6-1,2	I7U	65	34	6		3	G
	TB6-9,10	I9U	60	11	1		15	S
1B	TB5-11,12	J6L	46	18	1		15	S
2A	TB2-5,6	I2U	39	2	2			S
2B	TB2-7,8	I2L	43	12	2			S
4A	TB4-9,10	I6U	41	4	4		3	S
5A'	TB6-3,4	I7L	78	44	2		3	G
	TB6-11,12	I9L	62	13	5		15	S
5B	TB4-11,12	I6L	45	14	5		15	S
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
8A	TB5-9,10	J6U	42	8	8		3	S
P61,P62	TB8-7,9	I13U	68	6 PED	PED 6			
P81,P82	TB8-8,9	I13L	70	8 PED	PED 8			

' Add jumper from I7-F to I9-F.

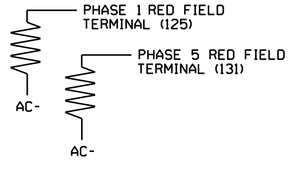
' Add jumper from I7-W to I9-W.

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C025
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville

VILLAGE DRIVE
AT
FORDHAM DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by:
Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C025

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Village_at_Fordham.dgn
11/18/2016 10:18:58 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.287.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

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: C025
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:

Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

VILLAGE DRIVE
AT
FORDHAM DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

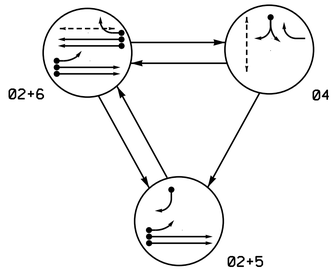
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C025

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Village_at_Fordham.dgn
11/18/2016 10:19:19 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.288.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

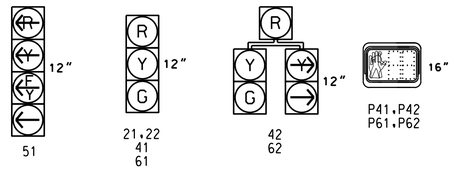
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R/	R	G	R
51	~~—~~	~~F Y~~	~~R~~	~~Y~~
61	R	G	R	Y
62	R	G	R/	Y
P41,P42	DW	DW	W	DRK
P61,P62	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



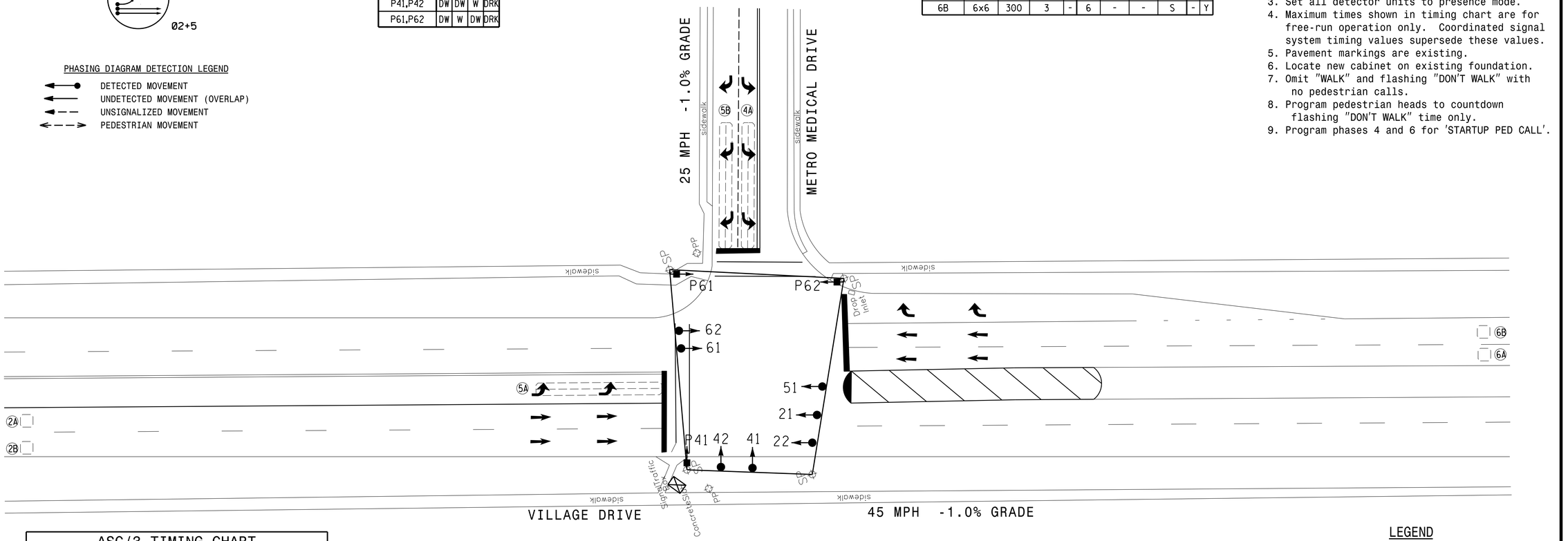
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6x6	300	3	-	2	-	-	S	-	Y
2B	6x6	300	3	-	2	-	-	S	-	Y
4A	6x60	0	2-4-2	-	4	-	-	S	-	Y
5A	6x60	0	2-4-2	-	5	-	15	S	-	Y
				-	2	-	3	G	-	Y
5B	6x60	0	2-4-2	-	5	-	15	S	-	Y
6A	6x6	300	3	-	6	-	-	S	-	Y
6B	6x6	300	3	-	6	-	-	S	-	Y

3 PHASE
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2012 and "Standard Specifications for Roads and Structures" dated July 2012.
2. Phase 5 may be lagged.
3. Set all detector units to presence mode.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Pavement markings are existing.
6. Locate new cabinet on existing foundation.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown flashing "DON'T WALK" time only.
9. Program phases 4 and 6 for 'STARTUP PED CALL'.



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	12	7	7	12
Walk *	0	7	0	7
Ped Clear	0	17	0	12
Veh. Extension *	6.0	1.0	1.0	6.0
Max 1 *	90	20	20	90
Yellow	4.6	3.2	3.2	4.6
Red Clear	1.1	2.5	2.4	1.3
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	1.5	-	-	1.5
Max Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Locking Detector	X	-	-	X
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade

Prepared in the Offices of:

Hatch Mott MacDonald

PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com

HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville Worth Knowing

SCALE 0 25

VILLAGE DRIVE AT METRO MEDICAL DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

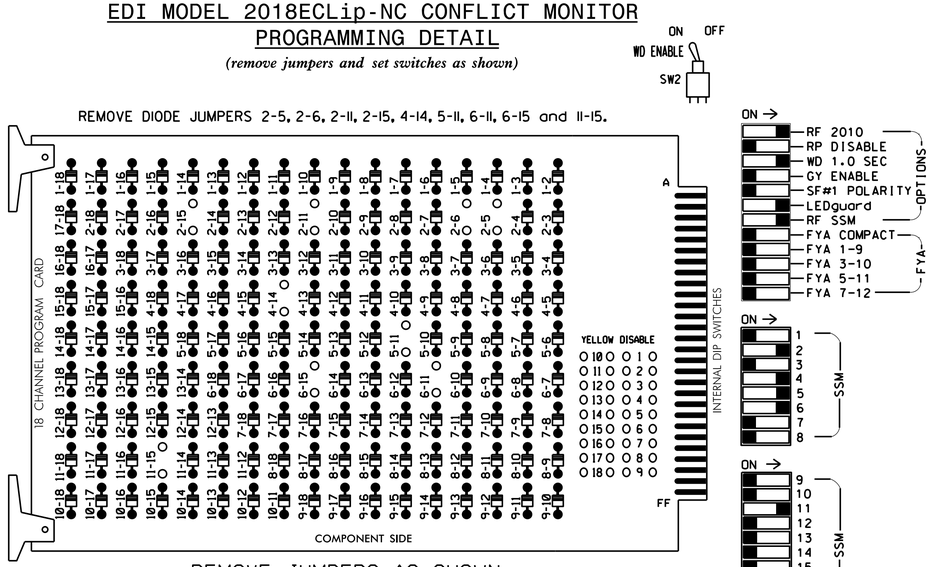
DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C026

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Village_at_Metromedical.dgn
11/18/2016 10:32:23 AM

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. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for volume density operation.
4. Program controller to start up in phase 2 Green and 6 Green.
5. The cabinet and controller are part of the Fayetteville Signal System.
6. Program phases 4 and 6 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.288.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4		14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4		4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	62	P41, P42	42	51 ★	61,62	P61, P62	NU	NU	NU	NU	NU	NU	51 ★	NU	NU
RED		128			101	*		*		134										
YELLOW		129			102					135										
GREEN		130			103					136										
RED ARROW																		A114		
YELLOW ARROW						102		132										A115		
FLASHING YELLOW ARROW																		A116		
GREEN ARROW						103		133	133											
✋							104			119										
🚶							106			121										

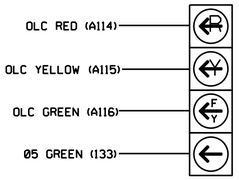
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	Ø5 5A * WIRED INPUT	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED OC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B				Ø5 5B						Ø4 PED OC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	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		Ø6 6B												

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2			S
2B	TB2-7,8	I2L	43	12	2			S
4A	TB4-9,10	I6U	41	4	4			S
5A'	TB6-9,10	I9U	60	11	5		15	S
	TB6-11,12	I9L	62	13	2		3	G
5B	TB4-11,12	I6L	45	14	5		15	S
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
PED PUSH BUTTONS								
P41, P42	TB8-5,6	I12L	69	PED 4	4 PED			
P61, P62	TB8-7,9	I13U	68	PED 6	6 PED			

' Add jumper from I9-F to I9-W, on rear of input file.

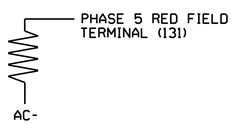
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C026
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

VILLAGE DRIVE
AT
METRO MEDICAL DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C026

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Village_at_Metromedical.dgn
11/18/2016 10:32:44 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.288.2

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 C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

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: C026
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:

Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville
North Carolina

VILLAGE DRIVE
AT
METRO MEDICAL DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032711 RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C026

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Village_at_Metromedical.dgn
11/18/2016 10:33:39 AM

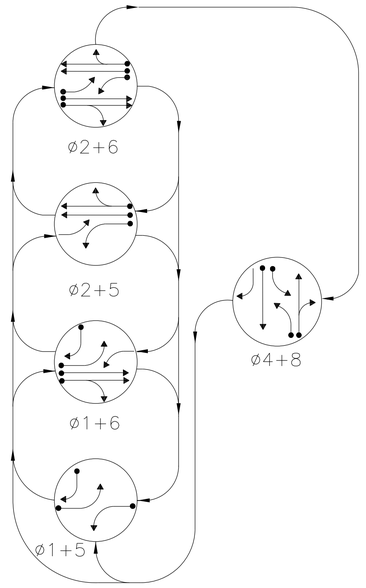
PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.289.0

5 PHASE FULLY ACTUATED FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2012 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2012.
2. PAVEMENT MARKINGS ARE EXISTING.
3. MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERSEDE THESE VALUES.
4. PROGRAM PHASE 4 AND PHASE 8 FOR DUAL ENTRY.
5. SET ALL DETECTOR UNITS TO PRESENCE MODE.
6. LOCATE NEW CABINET ON EXISTING FOUNDATION
7. IN THE EVENT OF LOOP REPLACEMENT, REFER TO THE CURRENT ITS AND SIGNALS DESIGN MANUAL.

PHASING DIAGRAM



PHASING DIAGRAM
DETECTION LEGEND

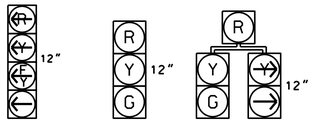
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE ø 1+5	PHASE ø 1+6	PHASE ø 2+5	PHASE ø 2+6	PHASE ø 4+8	FLASH
11	—	—	F Y	F Y	R	Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	—	F Y	—	F Y	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R →	R →	R	R	G	R

SIGNAL FACE I.D.

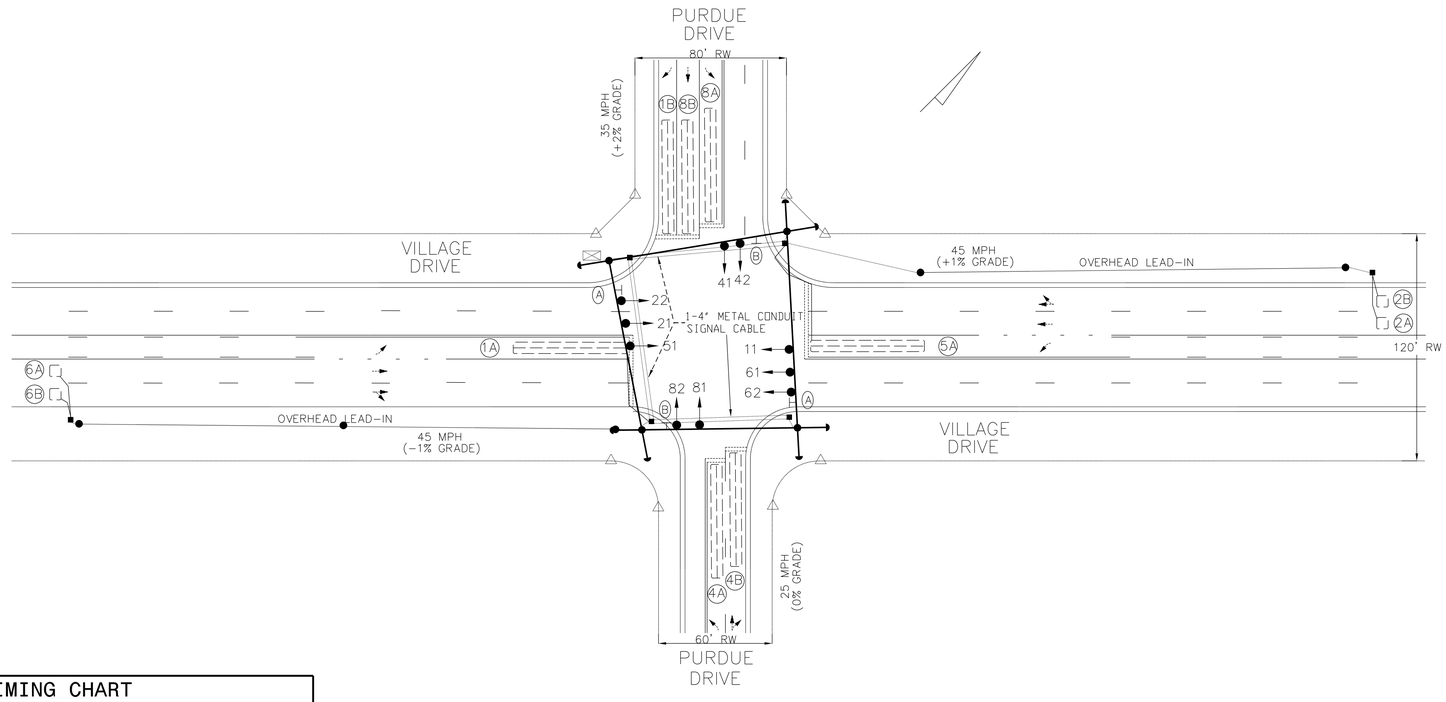
All Heads L.E.D.



11
51

21,22
41,42
61,62
81

82



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	1.0	1.0	6.0	1.0
Max 1 *	15	75	20	15	75	20
Yellow	3.2	4.4	3.2	3.1	4.6	3.1
Red Clear	2.1	1.2	2.4	2.1	1.0	2.5
Actuations B4 Add *	-	0	-	-	0	-
Seconds /Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	MIN. RECALL	-	-	MIN. RECALL	-
Dual Entry	-	-	X	-	-	X
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	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	6	-	3	G	-	Y
				-	1	-	15	S	-	Y
1B	6X60	0	2-4-2	-	1	-	15	S	-	Y
2A	6X6	300	4	-	2	-	-	S	-	Y
2B	6X6	300	4	-	2	-	-	S	-	Y
4A	6X60	0	2-4-2	-	4	-	3	S	-	Y
4B	6X60	0	2-4-2	-	4	-	10	S	-	Y
5A	6X60	0	2-4-2	-	2	-	3	G	-	Y
				-	5	-	15	S	-	Y
6A	6X6	300	4	-	6	-	-	S	-	Y
6B	6X6	300	4	-	6	-	-	S	-	Y
8A	6X60	0	2-4-2	-	8	-	3	S	-	Y
8B	6X60	0	2-4-2	-	8	-	-	S	-	Y

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head	■↓
○⌐	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	→
Ⓐ	"PURDUE DR" STREET NAME SIGN	Ⓐ
Ⓑ	"VILLAGE DR" STREET NAME SIGN	Ⓑ

Signal Upgrade

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

VILLAGE DRIVE AT PURDUE DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT

PREPARED BY: BLR | REVIEWED BY:

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C027

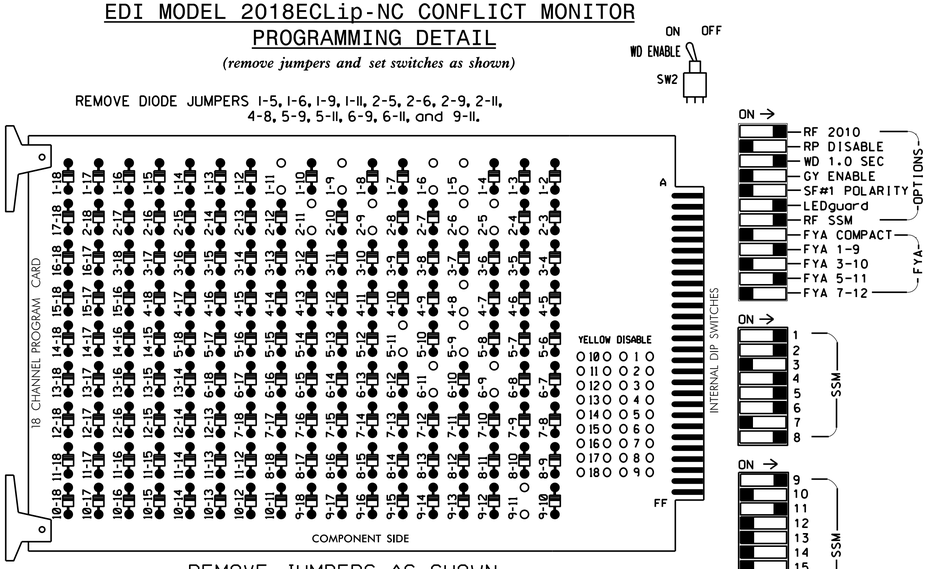
default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 117201G\Village_at_Purdue.dgn
11/18/2016 10:42:44 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.289.1

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, 2-5, 2-6, 2-9, 2-11, 4-8, 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.

■ = 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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2 and 6 for Yellow Flasn.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	NU	NU	51★	NU	NU
RED		*	128			101		*	134			107							
YELLOW			129			102		*	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		126												A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127						133											

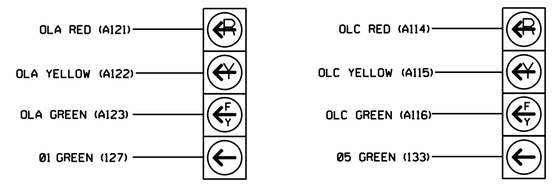
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE 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	Ø1 1B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		Ø2 2B	NOT USED			Ø4 4B			Ø5 5A					ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B								

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	EXTEND TIME	DELAY TIME	DETECTOR TYPE
1A'	TB6-1,2	I7U	65	34	6		3	C
	TB6-9,10	I9U	60	11	1		15	S
1B	TB2-9,10	I3U	63	32	1		15	S
2A	TB2-5,6	I2U	39	2	2			S
2B	TB2-7,8	I2L	43	12	2			S
4A	TB4-9,10	I6U	41	4	4		3	S
4B	TB4-11,12	I6L	45	14	4		10	S
5A'	TB6-3,4	I7L	78	44	2		3	S
	TB6-11,12	I9L	62	13	5		15	C
6A	TB3-5,6	J2U	40	6	6			S
6B	TB3-7,8	J2L	44	16	6			S
8A	TB5-9,10	J6U	42	8	8		3	S
8B	TB5-11,12	J6L	46	18	8			S

' Add jumper from I7-F to I9-F.
' Add jumper from I7-W to I9-W.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

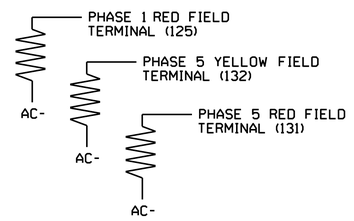
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

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: C027
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville North Carolina

VILLAGE DRIVE
AT
PURDUE DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
ENGINEER SIGNATURE DATE

SIG. INVENTORY NO. C027

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11/2016\Village_at_Purdue.dgn
11/18/2016 10:43:20 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.289.2

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 PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH9 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

Toggle Twice

↓

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C027
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:

Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

VILLAGE DRIVE
AT
PURDUE DRIVE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

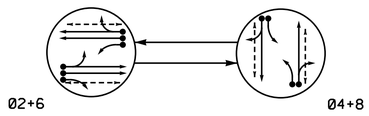
DocuSigned by: Russell W Thompson 11/21/2016
F30C SIGNATURE DATE

SIG. INVENTORY NO. C027

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Village_at_Purdue.dgn
11/18/2016 10:43:51 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.290.0

PHASING DIAGRAM



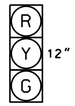
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE 02+6	PHASE 04+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



21,22
41,42
61,62
81,82

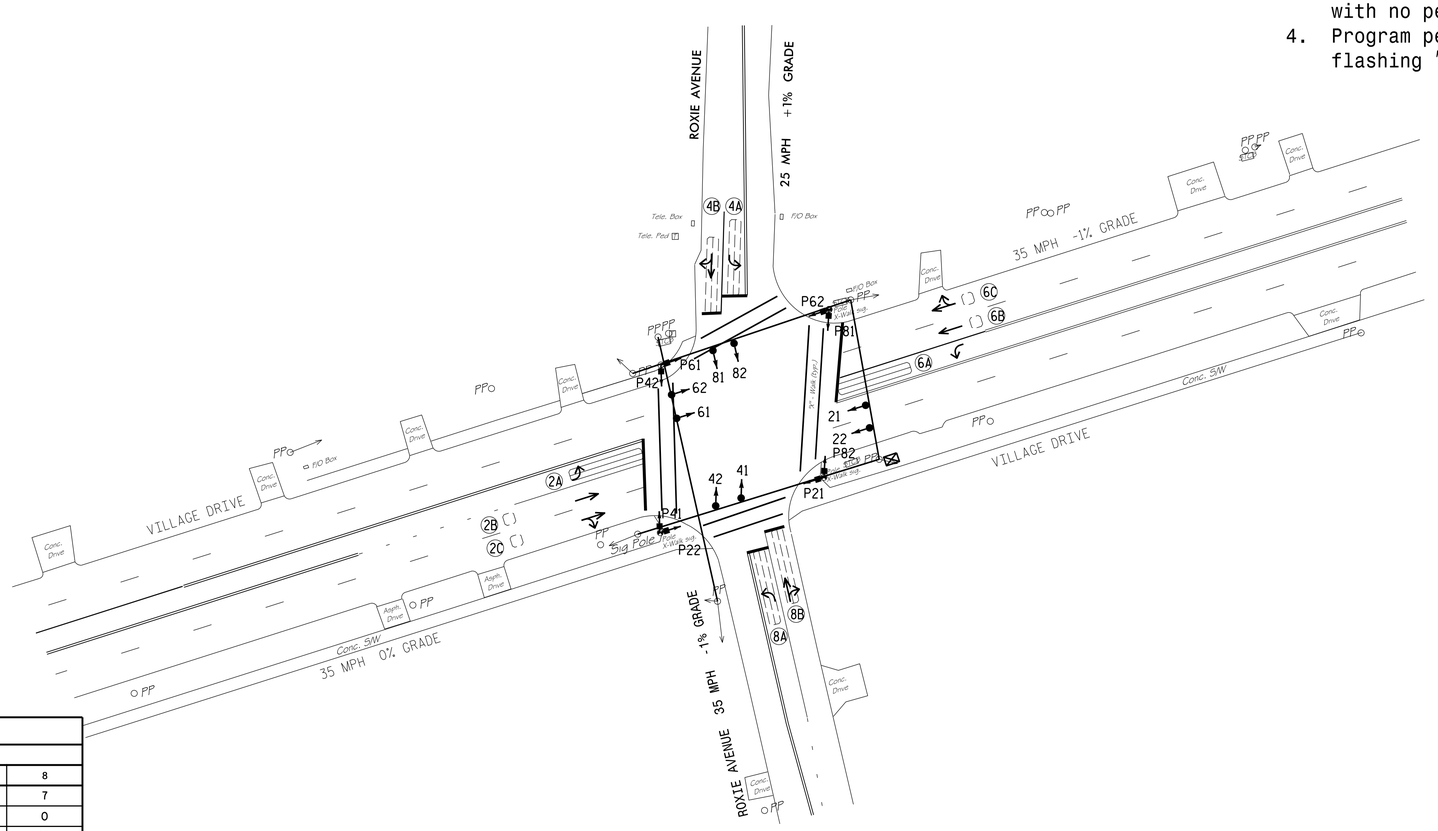
P21,P22
P41,P42
P61,P62
P81,P82

ASC/3 DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	-	-	S	-	Y
2B, 2C	6X6	70	4	-	2	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	-	3	S	-	Y
4B	6X40	0	2-4-2	-	4	-	-	S	-	Y
6A	6X40	0	2-4-2	-	6	-	-	S	-	Y
6B,6C	6X6	70	4	-	6	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	-	3	S	-	Y
8B	6X40	0	2-4-2	-	8	-	-	S	-	Y

2 PHASE
FULLY ACTUATED
FAYETTEVILLE SIGNAL SYSTEM

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Locate new cabinet on existing foundation.
3. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
4. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.



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	

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green *	10	7	10	7
Walk *	0	0	0	0
Ped Clear	8	17	11	15
Veh. Extension *	3.0	1.0	1.0	3.0
Max 1 *	50	20	50	20
Yellow	3.8	3.2	3.8	3.8
Red Clear	1.6	2.9	1.7	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville
North Carolina

VILLAGE DRIVE
AT
ROXIE AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	BLR	REVIEWED BY:	

SCALE 0 40

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
FOR SIGNATURE DATE

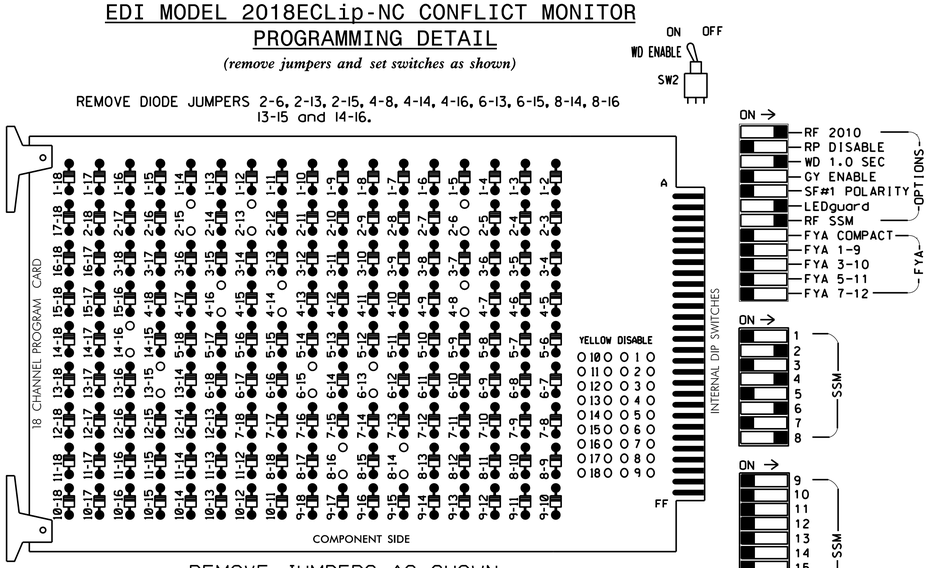
SIG. INVENTORY NO. C028

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Village_at_Roxie.dgn
11/18/2016 10:48:35 AM

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-13, 2-15, 4-8, 4-14, 4-16, 6-13, 6-15, 8-14, 8-16 13-15 and 14-16.



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 phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for volume density operation.
5. Program controller to start up in phase 2 Green and 6 Green.
6. The cabinet and controller are part of the Fayetteville Signal System.
7. Program phases 2 and 6 for Yellow Flash.
8. Program phases 2, 4, 6, and 8 for 'STARTUP PED CALL'.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,4,6,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.290.1

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	P21, P22	NU	41,42	P41, P41	NU	61,62	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104			119			110
🚶			115			106			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	SLOT EMPTY	Ø2 2A	SLOT EMPTY	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
	L		Ø2 2B,2C				Ø4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B,6C				Ø8 8B								

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	DETECTOR TYPE
2A	TB2-5,6	12U	39	2	2	YES			S
2B,2C	TB2-7,8	12L	43	12	2	YES			S
4A	TB4-9,10	16U	41	4	4	YES		3	S
4B	TB4-11,12	16L	45	14	4	YES			S
6A	TB3-5,6	J2U	40	6	6	YES			S
6B,6C	TB3-7,8	J2L	44	16	6	YES			S
8A	TB5-9,10	J6U	42	8	8	YES		3	S
8B	TB5-11,12	J6L	46	18	8	YES			S
PED PUSH BUTTONS									
P21,P22	TB8-4,6	112U	67	PED 2	2 PED				
P41,P42	TB8-5,6	112L	69	PED 4	4 PED				
P61,P62	TB8-7,9	113U	68	PED 6	6 PED				
P81,P82	TB8-8,9	113L	70	PED 8	8 PED				

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: C028
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

Fayetteville

VILLAGE DRIVE
AT
ROXIE AVENUE

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE

PLAN DATE: NOVEMBER 2016	REVIEWED BY: RWT
PREPARED BY: BLR	REVIEWED BY:

REVISIONS	INIT.	DATE

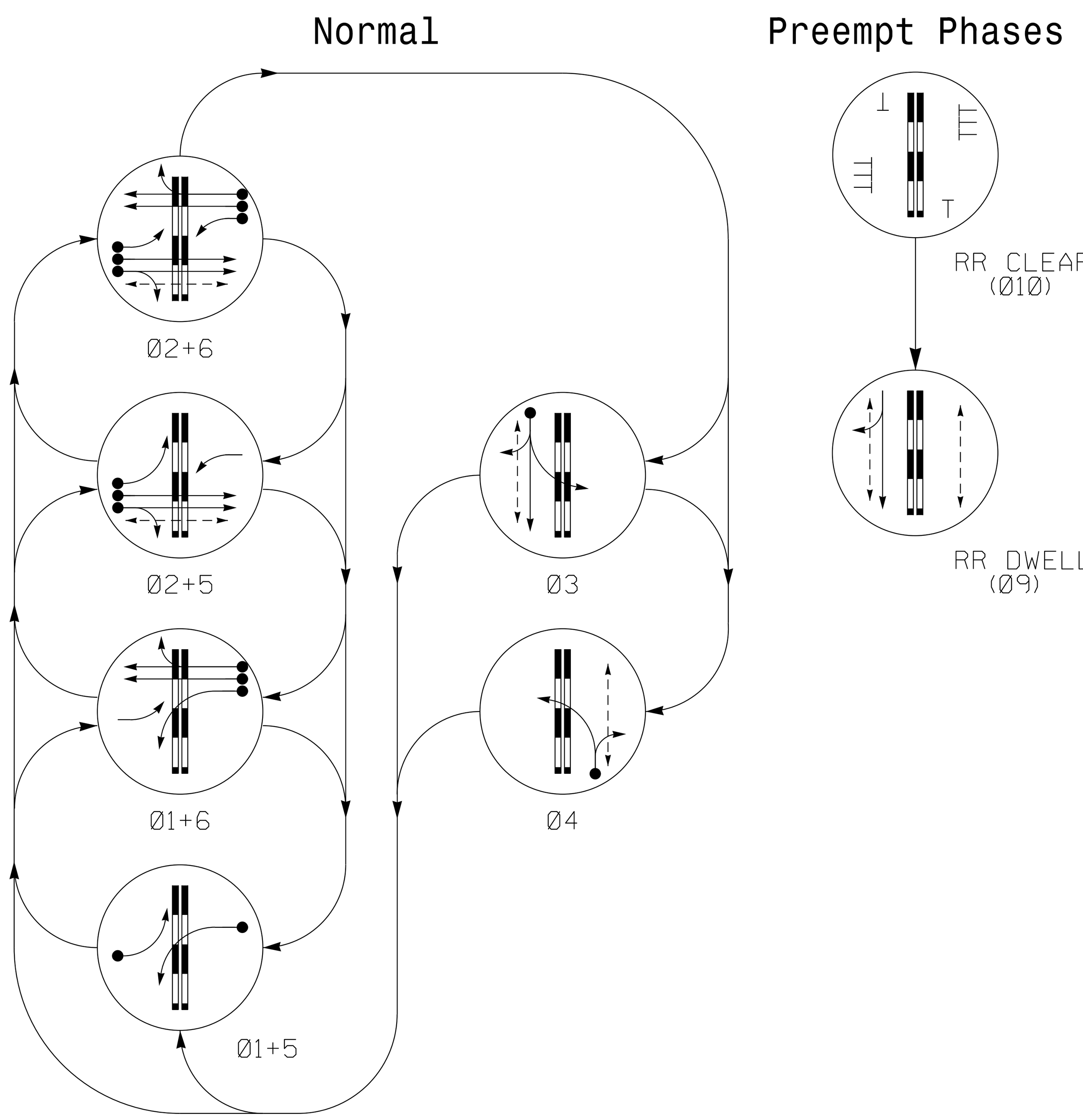
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032711 ENGINEER RUSSELL W. THOMPSON

DocuSigned by: Russell W Thompson 11/21/2016
SIGNATURE DATE

SIG. INVENTORY NO. C028

default
\\NCF-DATA\Proj\360655.U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 112016\Village_at_Roxie.dgn
11/18/2016 10:49:00 AM

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	RR CLEAR	RR DWELL	FLASH
11	←	←	F/Y ←	F/Y ←	←R	←R	←R	←R	←R
21, 22, 23	R	R	G	G	R	R	R	R	R
31	R	R	R	R	G ←	R	R	G	R
32	R	R	R	R	G	R	R	G	R
41	R	R	R	R	R	G ←	R	R	R
42	R	R	R	R	R	G	R	R	R
51	←	F/Y ←	←	F/Y ←	←R	←R	←R	←R	←R
61, 62, 63	R	G	R	G	R	R	R	R	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P31, P32	DW	DW	DW	DW	W	DW	DW	W	DRK
P41, P42	DW	DW	DW	DW	DW	W	DW	W	DRK
Sign C	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	✳

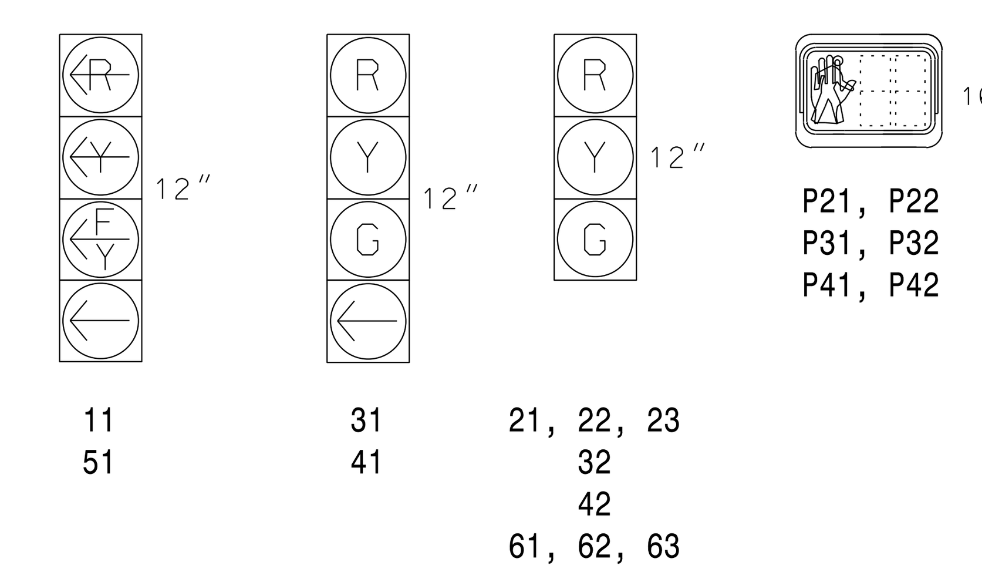
✳ See Note 9.

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	15	S	-	Y
				-	6	Yes	-	-	S	-	Y
2A	6X60	0	2-4-2	-	2	Yes	-	-	S	-	Y
2B	6X60	0	2-4-2	-	2	Yes	-	-	S	-	Y
3A	6X60	0	2-4-2	-	6	Yes	-	10	S	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	10	S	-	Y
5A	6X60	0	2-4-2	-	5	Yes	-	15	S	-	Y
				-	2	Yes	-	-	S	-	Y
6A	6X60	0	2-4-2	-	6	Yes	-	-	S	-	Y
6B	6X60	0	2-4-2	-	6	Yes	-	-	S	-	Y

SIGNAL FACE I.D.

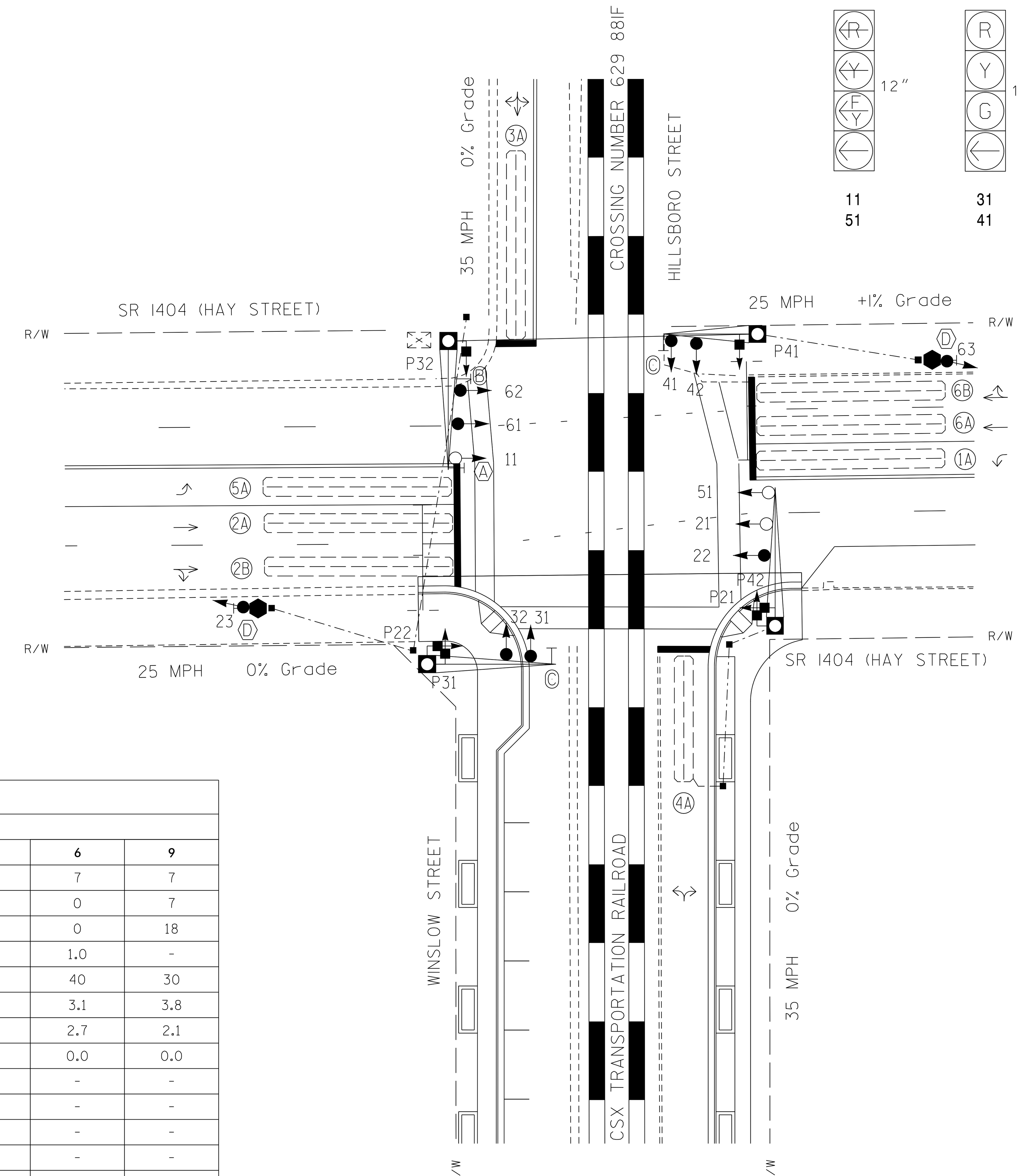
All Heads L.E.D.



6 Phase
Fully Actuated W/RR Preemption
(Fayetteville Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
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. 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. Ensure flashing operations 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 shall supercede these values.
10. Program phase 1 and 6 for Startup Red Clear.
11. Program phase 2 and 6 for First Phases.



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 Pole with Mastarm	
	Signal Pedestal	
N/A	Railroad Cantilever	
	Directional Drill	N/A
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)
(B)	"NO TURN ON RED" Sign (R10-11a)	(B)
(C)	"NO LEFT TURN - TRAIN" L.E.D. Blankout Sign	(C)
(D)	"DO NOT STOP ON TRACKS" Sign (R8-8)	(D)

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	9
Min Green *	7	7	7	7	7	7	7
Walk *	0	7	7	0	0	0	7
Ped Clear	0	17	18	718	0	0	18
Veh. Extension *	1.0	1.0	1.0	2.0	1.0	1.0	-
Max 1 *	15	40	30	30	15	40	30
Yellow	3.0	3.1	3.8	3.8	3.0	3.1	3.8
Red Clear	2.8	2.7	2.1	2.3	1.6	2.7	2.1
Red Revert	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Locking Detector	-	-	-	-	-	-	-
Recall Position	-	MIN RECALL	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-
Simultaneous Gap	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.

ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	2,6
Preempt Override	ON
Delay Time	0
Ped Clear Through Yellow	Y
Terminate Phases	N
Track Clear Reservice	Y
Entrance Walk	255✳
Entrance Ped Clear	255✳
Entrance Min Green	1
Entrance Yellow Change	25.5✳
Entrance Red Clear	25.5✳
Track Clear Min Green	10
Track Clear Yellow Change	25.5✳
Track Clear Red Clear	25.5✳
Min Dwell Time	10
Exit Yellow Change	25.5✳
Exit Red Clear	25.5✳

* Allows normal phase times to be used.

Signal Upgrade

SR 1404 (Hay Street) at Winslow Street and Hillsboro Street

Fayetteville North Carolina

DIV 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 30

N

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

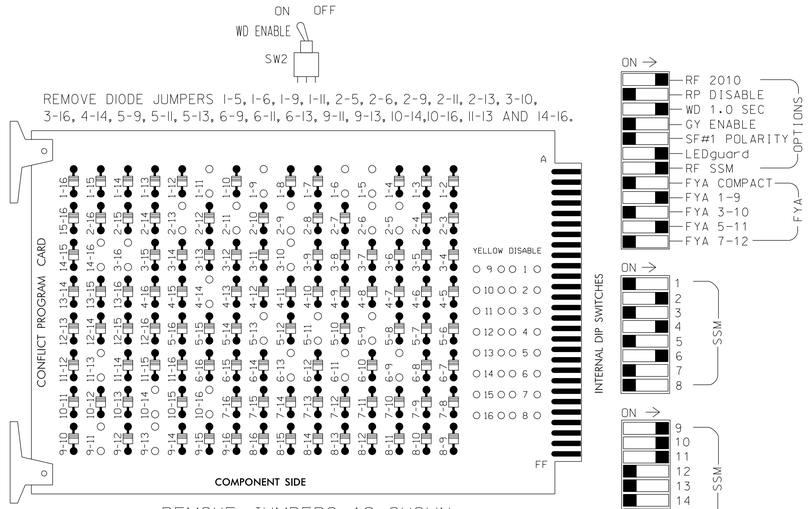
DocuSigned by: Richard T Pate
F30C81AC54B3E30...
11/22/2016
DATE

SIG. INVENTORY NO. C030

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.291.1

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From MAIN MENU press '2' (PHASE CONTROL), then '1' (PHASE CONTROL FUNCTIONS). Program phases 9, 10 for 'OMIT PHASE' and phases 1, 2, 3, 4, 5, 6 for 'STARTUP CALLS'. This is to prevent phases 9 and 10 from being served when not in preempt.

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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5, 7,8,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 1 and 6 for Start Up In Red Clr.
5. Program phases 2 and 6 for First Phases.
6. Program phases 2, 3 and 4 for 'STARTUP PED CALL'.
7. Program overlap OL1 as WAG Overlaps.
8. The cabinet and controller are part of the City of Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING SAFETRAN 2070L
CABINET.....EXISTING SAFETRAN 332 w/ AUX. FILE
SOFTWARE.....ECONOLITE OASIS 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, S12,AUX S1,AUX S2,AUX S4
PHASES USED.....1,2,3,4,5,6,9*,10*,2PED,3PED, 4PED, 9PED
OVERLAP "A".....1+2
OVERLAP "B".....3+9
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED
PED OVERLAP A.....3+9
PED OVERLAP B.....4+9

* PHASES USED ONLY IN PREEMPT

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	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22, 23	P21, P22	31	41	42	P41, P42	51 ★	61,62, 63	NU	NU	NU	P31, P32	11 ★	31,32	NU	51 ★	NU	NU
RED		128			101	101			134						A124				
YELLOW	*	129		*	102	102		*	135						A125				
GREEN		130			103	103			136						A126				
RED ARROW														A121			A114		
YELLOW ARROW														A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127			118	103			133											
✋			113				104						110						
🚶			115				106						112						

NU = Not Used

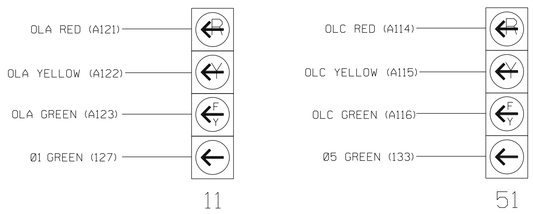
* Denotes install load resistor. See load resistor installation detail on this sheet.

** See Ped Overlap Programming Detail

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



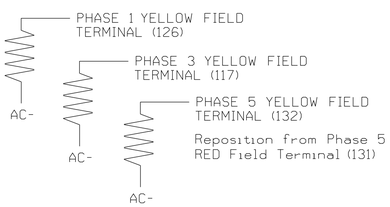
NOTE

1. The sequence display for this signal requires special logic programming. See sheet 3 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



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	SLOT EMPTY	WIRED INPUT ⊗	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	NOT USED	FS DC ISOLATOR
	L	NOT USED	Ø2 2B			NOT USED	NOT USED						Ø4 PED Ø9 PED DC ISOLATOR	Ø3 PED Ø9 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED
	L	NOT USED	Ø6 6B												RR2* AC ISOLATOR

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

FS = FLASH SENSE
ST = STOP TIME
RR = RAILROAD PREEMPT

⊗ Wired Input - Do not populate slot with detector card

* See AC Isolator Programming Detail sheet 2

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			10
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED 9 PED					
P31,P32	TB8-8,9	I13L	70	32	PED 8	3 PED 9 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.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: C030
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville Next Exit

SR 1404 (Hay Street) at Winslow Street and Hillsboro Street

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036842 RICHARD T PATE
DocuSigned by: Richard T Pate 11/22/2016
SIGNATURE DATE
SIG. INVENTORY NO. C030

Electrical Detail Sheet 1 of 3

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Hay @ Winslow-Hillsboro.dgn
11/22/2016 9:57:22 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.291.2

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 . . . . . .
TRKCLR O . . . . . .
ENA TRL  . . . . . .
DWEL VEH . . . . . X . . . . . .
DWEL PED . . . . . X . . . . . .
DWEL OLP . . . . . .
CYC VEH  . . . . . .
CYC PED  . . . . . .
CYC OLP  . . . . . .
EXIT PH  . X . . . X . . . . . .
EXIT CAL . . . . . .
SP FUNC  . . . . . .

ENABLE... YES|PMT OVRIDE.X|INTERLOCK. NO
DET LOCK... X|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 CLR|MN GR| YEL| RED
ENTRANCE TM.  255|  255|   1|25.5|25.5
-----------MIN GR|EXT GR|MX GR| YEL| RED
TRACK CLEAR    10|    0|   0|25.5|25.5
-----------MIN DL|IPM|TEXT|MX T| YEL| RED
DWL/CYC-EXIT   10|  0.0|  120|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
```

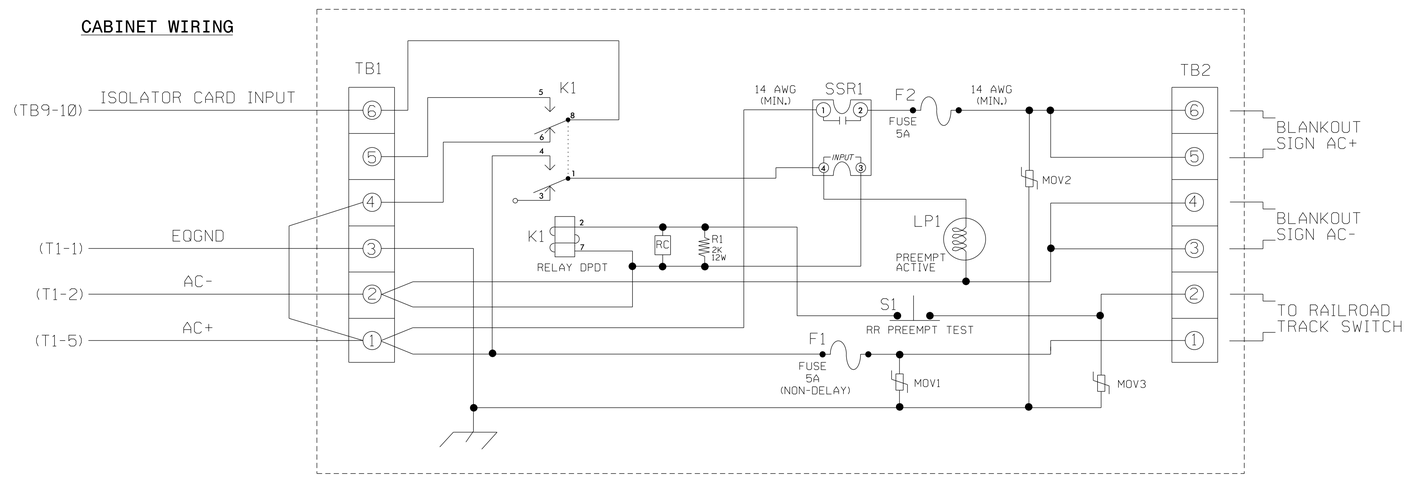
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

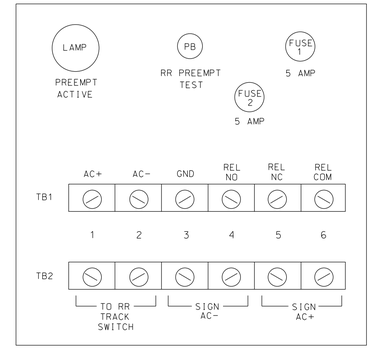
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



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.
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: C030
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 2 of 3

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:
Fayetteville

SR 1404 (Hay Street)
at
Winslow Street and
Hillsboro Street

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE
DocuSigned by: Richard T Pate 11/22/2016
SIGNATURE DATE
SIG. INVENTORY NO. C030

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.291.3

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

PROTECTED PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... 2
FLASHING ARROW OUTPUT.....CH13 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Twice

OVERLAP C

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

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

PROTECTED PHASE (LEFT TURN)......... 5
PERMISSIVE PHASE (OPPOSING THRU).... 6
FLASHING ARROW OUTPUT.....CH15 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: C030
DESIGNED: NOVEMBER 2016
SEALED: 11/17/2016
REVISED:

Electrical Detail Sheet 3 of 3

Prepared in the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Fayetteville North Carolina

SR 1404 (Hay Street)
at
Winslow Street and
Hillsboro Street

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE	
PLAN DATE:	NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY:	RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE

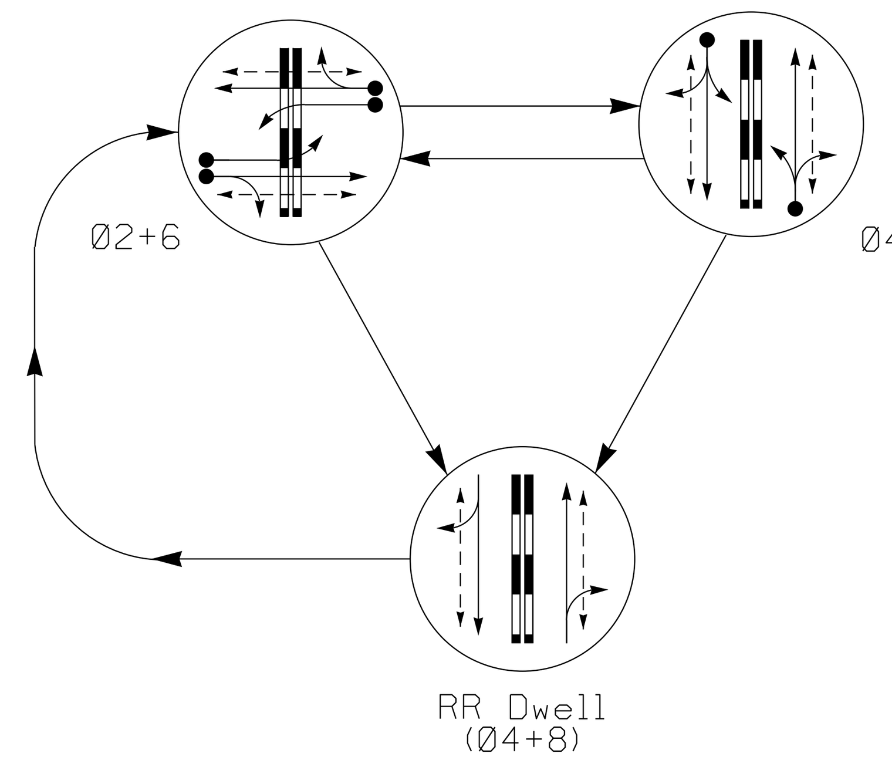
DocuSigned by: Richard T Pate
F30C814C5485430...
SIGNATURE 11/22/2016 DATE

SIG. INVENTORY NO. C030

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 1172016\Hay @ Winslow-Hillsboro.dgn
11/22/2016 9:57:52 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.292.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4+8	RR Dwell	FLASH
21, 22, 23	G	R	R	R
41, 42	R	G	G	R
61, 62, 63	G	R	R	R
81, 82	R	G	G	R
P21, P22	W	DW	DW	DRK
P41, P42	DW	W	W	DRK
P61, P62	W	DW	DW	DRK
P81, P82	DW	W	W	DRK
Sign C	OFF	OFF	ON	*

* See Note 6.

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING: PHASE	CALLING	EXTEND TIME	DELAY TIME	TYPE	SYSTEM LOOP	NEW CARD
2A	6X40	0	2-4-2	-	2	Yes	-	-	S	-	Y
2B	6X40	0	2-4-2	-	2	Yes	-	-	S	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	10	S	-	Y
6A	6X40	0	2-4-2	-	6	Yes	-	-	S	-	Y
6B	6X40	0	2-4-2	-	6	Yes	-	-	S	-	Y
8A	6X40	0	2-4-2	-	8	Yes	-	10	S	-	Y

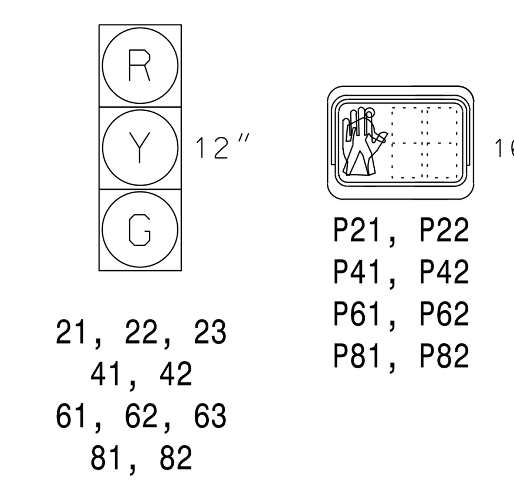
2 Phase
Fully Actuated W/RR Preemption
(Fayetteville Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 "Standard Specifications for Roads and Structures" dated January 2012.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Set all detector units to presence mode.
4. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Ensure flashing operation does not alter operation of blankout signs.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Activate loop 4A installed during TCP Phase II.
9. Program phases 2 and 6 for Startup Red Clr.
10. Program phases 2 and 6 for First Phases.

SIGNAL FACE I.D.

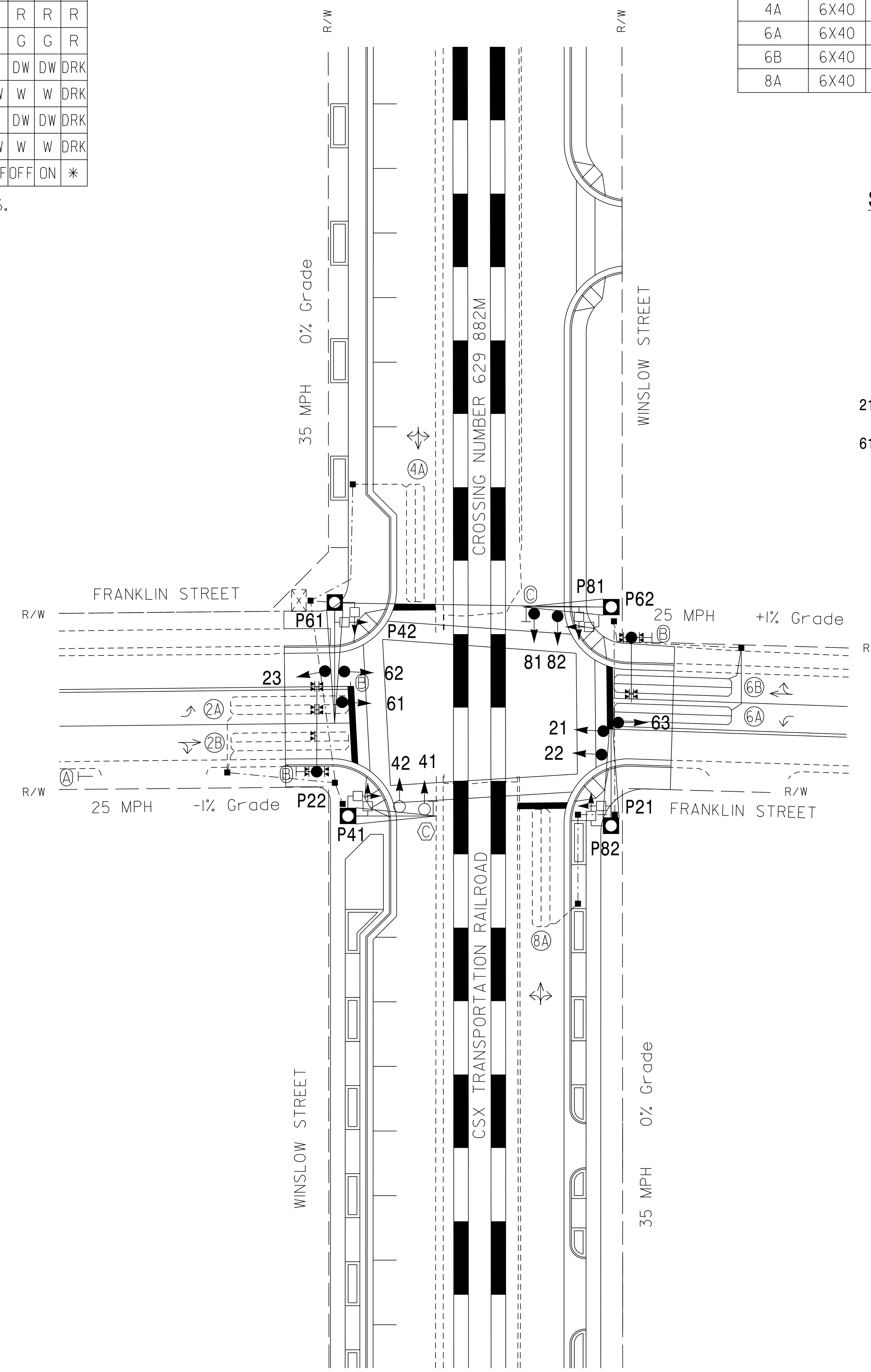
All Heads L.E.D.



ASC/3 RR PREEMPT

FUNCTION	PRE 1
Exit Phase(s)	2,6
Preempt Override	ON
Delay Time	0
Ped Clear Through Yellow	Y
Terminate Phases	N
Track Clear Reservice	Y
Entrance Walk	255*
Entrance Ped Clear	255*
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Track Clear Min Green	10
Track Clear Yellow Change	25.5*
Track Clear Red Clear	25.5*
Min Dwell Time	10
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

* Allows normal phase times to be used.



ASC/3 TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green *	7	7	7	7
Walk *	7	7	7	7
Ped Clear	16	11	17	10
Veh. Extension *	2.0	2.0	2.0	2.0
Max 1 *	50	30	50	30
Yellow	3.2	3.8	3.1	3.8
Red Clear	2.1	1.8	2.2	1.6
Red Revert	0.0	0.0	0.0	0.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
N/A	Railroad Cantilever	
	Directional Drill	N/A
Ⓐ	"LEFT LANE MUST TURN LEFT" Sign (R3-7L)	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"NO LEFT TURN - TRAIN" L.E.D. Blankout Sign	Ⓒ

Signal Upgrade

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. F-0669

SCALE 0 30

Fayetteville North Carolina

Winslow Street at Franklin Street

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: RTP | REVIEWED BY:

REVISIONS	INIT.	DATE

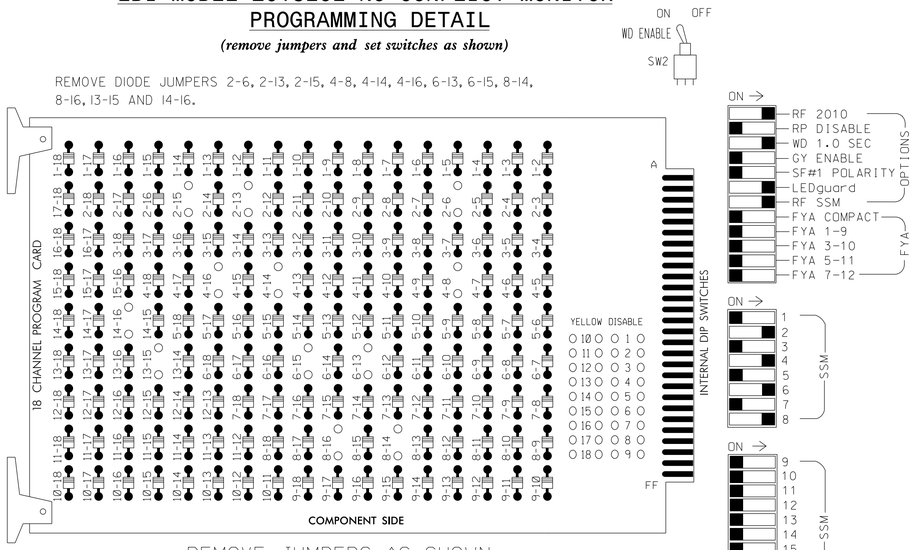
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE
Richard T Pate 11/22/2016
SIGNATURE DATE
SIG. INVENTORY NO. C031

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11172016\Winslow @ Franklin.dgn
11/22/2016 9:54:16 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.292.1

EDI MODEL 2018ECL-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. Connect serial cable from conflict monitor to comm. port 2 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Red Clr.
5. Program phases 2 and 6 for First Phases.
6. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
7. The cabinet and controller are part of the City of Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12
PHASES USED.....2,4,6,8,2PED,4PED,6PED,8PED
OVERLAPS.....NONE

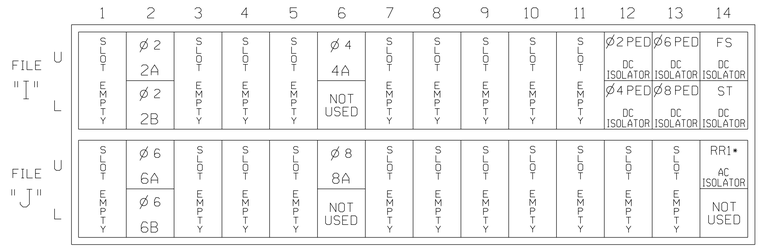
SIGNAL HEAD HOOK-UP CHART

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, 23	P21, P22	NU	41,42	P41, P42	NU	61,62, 63	P61, P62	NU	81,82	P81, P82
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												
✋			113			104			119			110
🚶			115			106			121			112

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME
RR = RAILROAD PREEMPT

* See AC Isolator Programming Detail on Page 2

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	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

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: C031
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 1 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD I & E, LLC
LICENSE NO. P-0669

Fayetteville North Carolina

Winslow Street at Franklin Street

DIV 06 | CUMBERLAND COUNTY | FAYETTEVILLE
PLAN DATE: NOVEMBER 2016 | REVIEWED BY: RWT
PREPARED BY: RTP | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036842 ENGINEER RICHARD T PATE
DocuSigned by: Richard T Pate 11/22/2016
SIGNATURE DATE
SIG. INVENTORY NO. C031

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11\2016\Winslow @ Franklin.dgn
11/22/2016 9:54:36 AM

PROJECT REFERENCE NO.	SHEET NO.
U-5742	SIG.292.2

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]

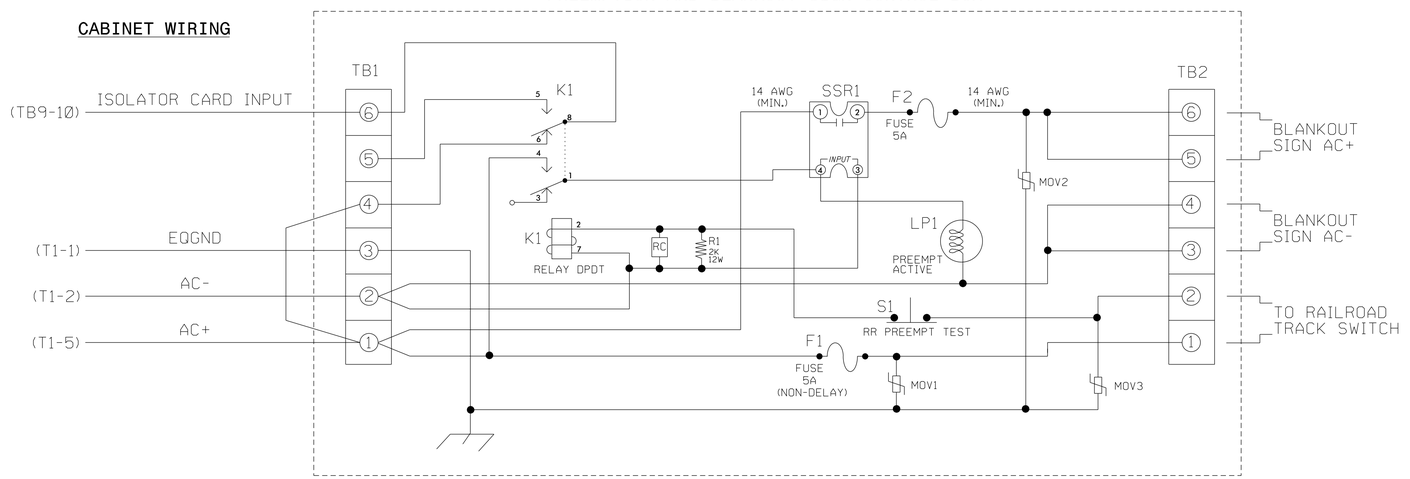
Place cursor in [ ] next to Preempt Plan and press 1. Then press the right cursor arrow and toggle the controller to YES. Next cursor down. This will select Railroad Preempt #1.

```
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 . . . . . .
TRKCLR O . . . . . .
ENA TRL  . . . . . .
DWEL VEH . . . X . . . X . . . . . .
DWEL PED . . . X . . . X . . . . . .
DWEL OLP . . . . . .
CYC VEH  . X . . . X . . . . . .
CYC PED  . X . . . X . . . . . .
CYC OLP  . . . . . .
EXIT PH  . X . . . X . . . . . .
EXIT CAL . . . . . .
SP FUNC  . . . . . .

ENABLE... YES!PMT OVRIDE.X!INTERLOCK. NO
DET LOCK... X!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 CL!MN GRI YEL! RED
ENTRANCE TM.  255!  255!   1!25.5!25.5
-----------MIN GRI!EXT GRI!MX GRI YEL! RED
TRACK CLEAR    10!    0!   0!25.5!25.5
-----------MIN DLI!PMT!EXT!MX TM! YEL! RED
DWL/CYC-EXIT   10!  0.0!  120!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
```

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

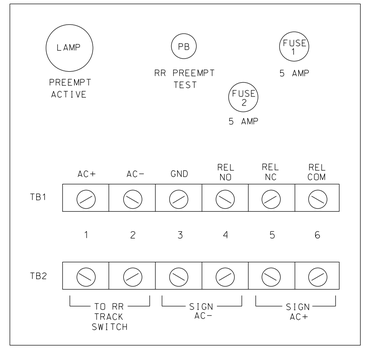
PREEMPTION AND BLANKOUT SIGN CONTROL BOX



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.
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: C030
DESIGNED: NOVEMBER 2016
SEALED: 11/18/2016
REVISED:

Electrical Detail Sheet 2 of 2

Prepared In the Offices of:
Hatch Mott MacDonald
PO Box 700
Fuquay-Varina, NC 27526
www.hatchmott.com
HATCH MOTT MACDONALD 1 & E, LLC
LICENSE NO. P-0669

Fayetteville

Winslow Street at Franklin Street

DIV 06	CUMBERLAND COUNTY	FAYETTEVILLE
PLAN DATE: NOVEMBER 2016	REVIEWED BY:	RWT
PREPARED BY: RTP	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036842 RICHARD T. PATE
DocuSigned by: Richard T Pate 11/22/2016
SIG. INVENTORY NO. C031

default
\\NCF-DATA\Proj\360655_U-5742_Fay-Sig\Project\Signals\Design\100%\FINAL SEALED PLANS\Revised 11?2016\Winslow @ Franklin.dgn
11/22/2016 9:54:52 AM