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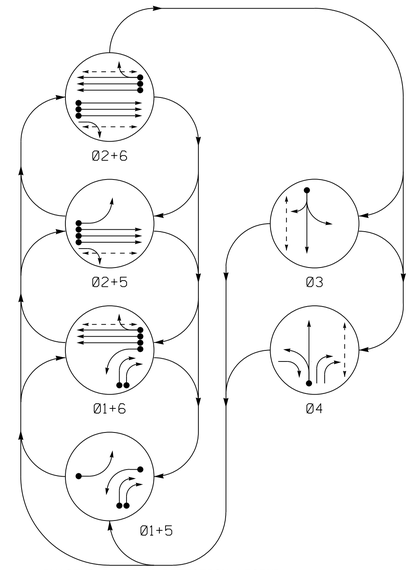
PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-22.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

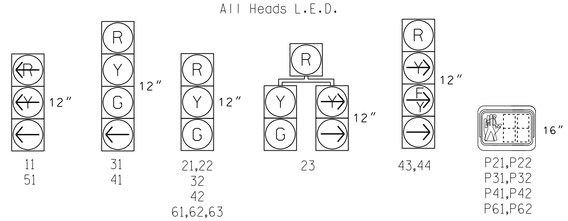
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3	0 4	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	R	Y
23	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
43,44	→	→	R	R	R	F	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	R	Y
P21,P22	DW	DW	W	W	DW	DW	DRK
P31,P32	DW	DW	DW	DW	W	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



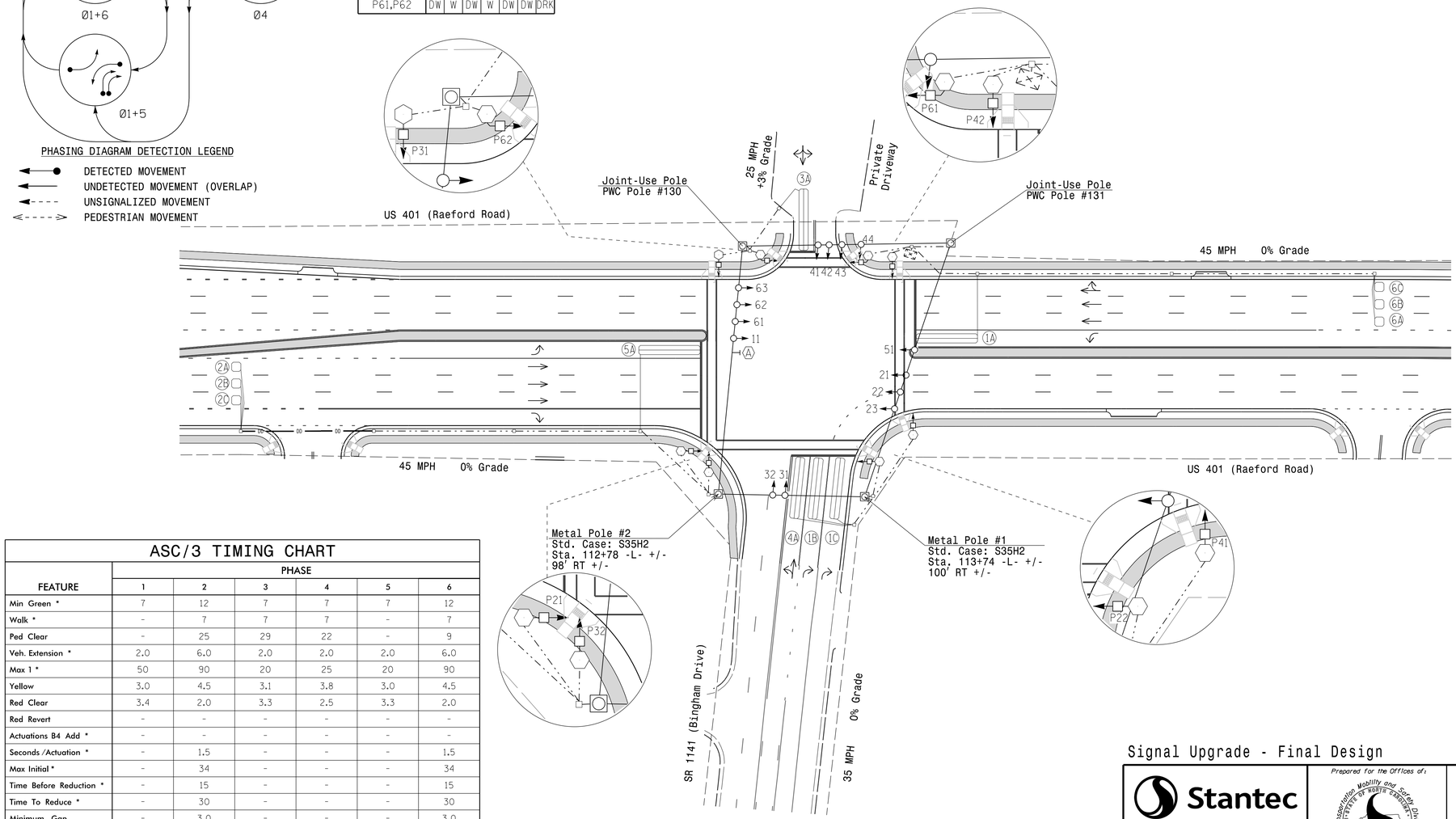
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
1C	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	5	X	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
6A	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	4	X	6	Yes	-	-	X	N	-	X

6 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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



LEGEND

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

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	7	7	7	-	7
Ped Clear	-	25	29	22	-	9
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max 1 *	50	90	20	25	20	90
Yellow	3.0	4.5	3.1	3.8	3.0	4.5
Red Clear	3.4	2.0	3.3	2.5	3.3	2.0
Red Revert	-	-	-	-	-	-
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	X	X

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

Signal Upgrade - Final Design

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

SCALE 0 40 1"=40'

US 401 (Raeford Road)
at
SR 1141 (Bingham Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L WATSON

DocuSigned by: Betsy L Watson 3/29/2018
356E7B0A2A4F4FE... SIGNATURE DATE

SIG. INVENTORY NO. 06-0358

3/29/2018
10:03:34 AM
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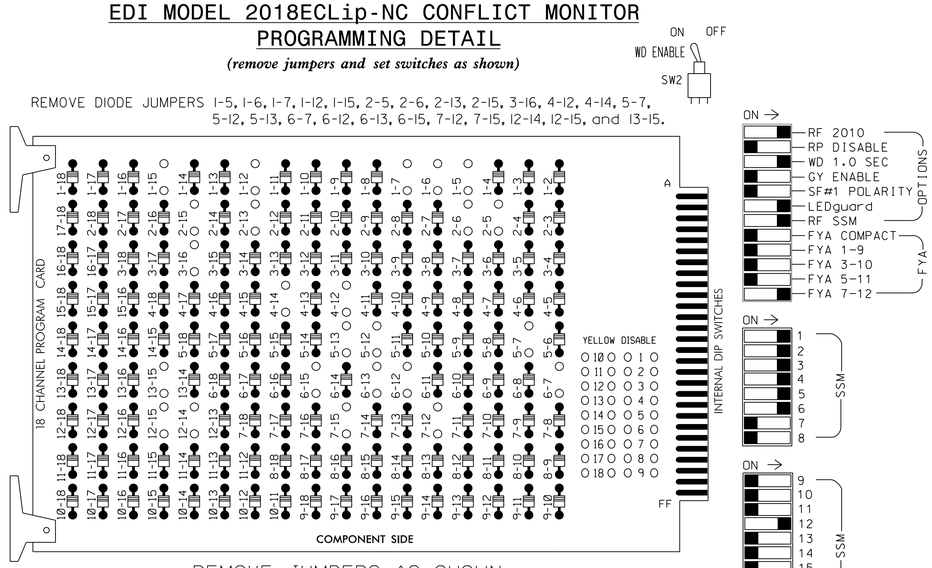
User:rmuncey

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-5, I-6, I-7, I-12, I-15, 2-5, 2-6, 2-13, 2-15, 3-16, 4-12, 4-14, 5-7, 5-12, 5-13, 6-7, 6-12, 6-13, 6-15, 7-12, 7-15, I2-I4, I2-I5, and I3-I5.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4, S5,S6,S7,S8, S9,S10,S12,AUX S5
PHASES USED.....1,2,2PED,3,3PED, 4,4PED,5,6,6PED
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....*
OVERLAP G.....*

* See Overlap Programming Detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-22.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5			S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4			14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4			4 PED	5	6	6 PED	OLG	8	3 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11	21,22, 23	P21, P22	31	32	41	42	23	P41, P42	51	61,62, 63	P61, P62	43,44 ★	NU	P31, P32	NU	NU	NU	NU	43,44 ★	NU
RED		128		116	116	101	101				134									A121	
YELLOW		129		117	117	102	102				135										
GREEN		130		118	118	103	103				136										
RED ARROW	125									131											
YELLOW ARROW	126							102		132										A122	
FLASHING YELLOW ARROW																				A123	
GREEN ARROW	127			118		103		103		133			124								
✋			113						104			119			110						
🚶			115						106			121			112						

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-5,6	I2U	39	2	1	YES				S
1B	TB2-1,2	I1U	56	1	1	YES		15		S
1C	TB2-3,4	I1L	56	1	1	YES		15		S
2A	TB2-7,8	I2L	43	12	2	YES			X	N
2B	TB2-9,10	I3U	63	32	2	YES			X	N
2C	TB2-11,12	I3L	76	42	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES		5		S
4A	TB4-9,10	I6U	41	4	4	YES		3		S
5A	TB3-1,2	J1U	55	5	5	YES				S
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

ECONOLITE ASC/3-2070 PED 3 PROGRAMMING ASSIGNMENT DETAIL

(program controller as shown)

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

PED DET PHASE ASSIGNMENT MODE: NTCIP

PHASE	1	2	3	4	5	6	7	8
DETECTOR	0	2	8	4	0	6	0	0
PHASE	9	10	11	12	13	14	15	16
DETECTOR	0	0	0	0	0	0	0	0

← NOTICE PED DETECTOR 8 ASSIGNED TO PHASE 3

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

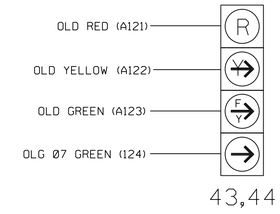
LD SWITCH ASSIGN

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

NOTICE PHASE 3 PED ASSIGNED TO LD SWITCH 16 →

FYA SIGNAL WIRING DETAIL

(wire signal head as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0358
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 (Raeford Road) at SR 1141 (Bingham Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0358

DATE: 3/29/2018
File: Traffic\Signals\Designs\Electrical Details\Final Signals\U-4405_sig_e1e_06-0358.dgn
User: lmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-22.2

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]
3. Toggle Until Positioned on Overlap G

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```
TMG VEH OVLP...[G] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Until Positioned on Overlap D

OVERLAP D

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

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

PROTECTED PHASE (LEFT TURN)......... 1
PERMISSIVE PHASE (OPPOSING THRU).... G
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 INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0358
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 2

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

REVISIONS	INIT.	DATE

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

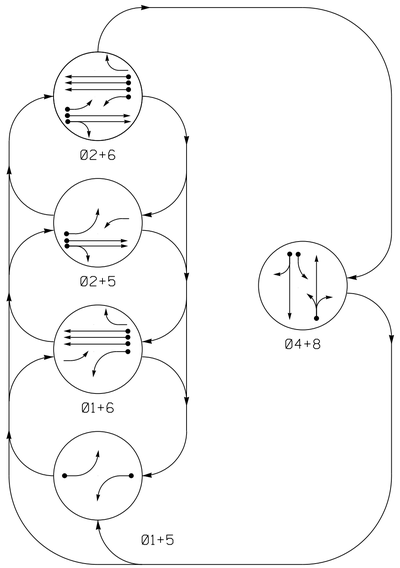
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0358

DATE
User:rmuncey
File:c:\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0358.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-23.0

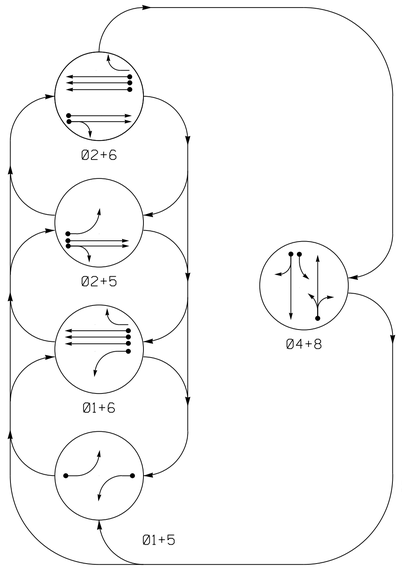
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+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~~
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

ALTERNATE PHASING DIAGRAM

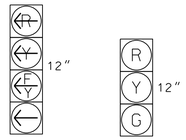


ALTERNATE TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~Y~~
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



11
51

21,22
41,42
61,62,63
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	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	3	-	G	-	X
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
8A	6X40	0	✳	-	8	Yes	-	5	-	S	-	X

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

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Field adjust temporary poles as needed.

PHASING DIAGRAM DETECTION LEGEND

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

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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.8	3.1	3.0	4.8	3.1
Red Clear	2.3	1.2	2.8	2.8	1.2	2.6
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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	
	Construction Zone	N/A
	Video Detection Area	N/A
	Drums	N/A

Signal Upgrade
Temporary Design 1 - TMP Phase I

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

SCALE 0 40 1"=40'

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway
Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: B L Watson

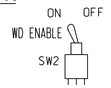
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
3560788CBBA4AFE... SIGNATURE DATE
SIG. INVENTORY NO. 06-0592TI

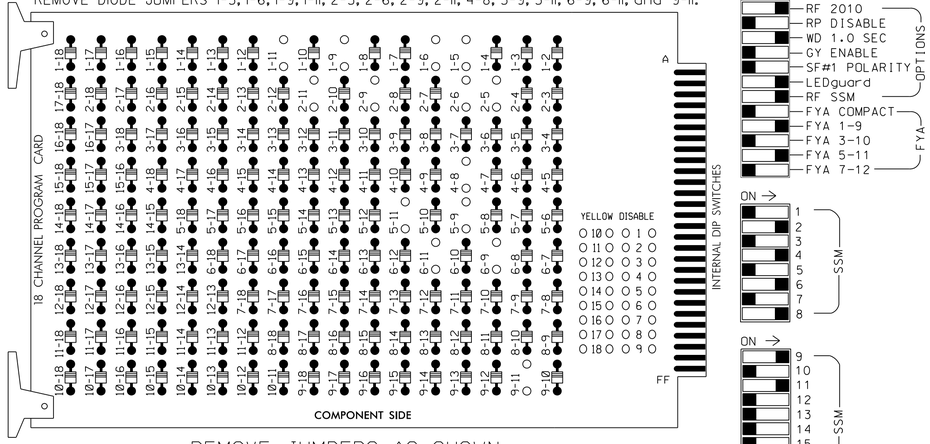
3/29/2018
10:03:58 AM
User:rmuncey
Pw:signals
N:\Signals\Designs\Signal Designs\Temporary Signal Designs\Phase 1\U-4405_sig_dsn_06-0592T1.dgn

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

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-23.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	61,62, 63	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													A122			A115		
FLASHING YELLOW ARROW													A123			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 below.

DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1★	1	YES		15		S
	-	J4U	48	26★	6	YES		3		C
5A [2]	-	J1U	55	5★	5	YES		15		S
	-	I4U	47	22★	2	YES		3		C

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

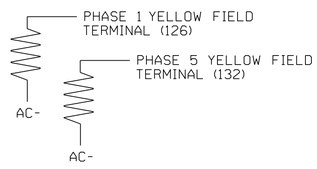
★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

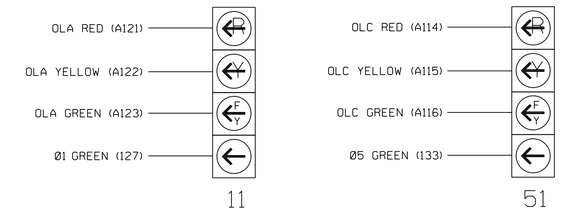
(install resistors as shown)

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0592T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway
Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592TI

DATE:
User:trmuncey
I:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0592T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-23.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <- NOTICE SF BIT DISABLE 1
```

END PROGRAMMING

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

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

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

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

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

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

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

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

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

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

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

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

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

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

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

SF BITS 1,5:	Modifies overlap parent phases for heads 11 and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.
	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0592T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Division 6 Cumberland County Fayetteville

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

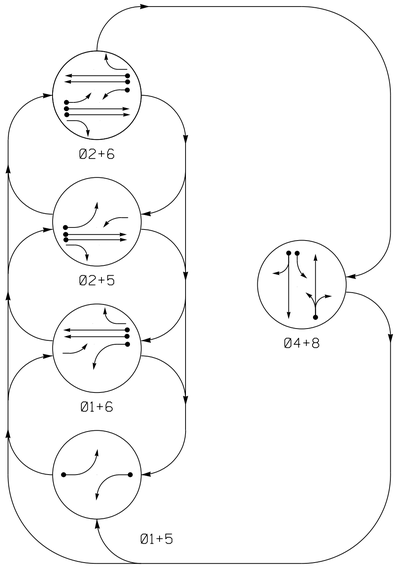
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T1

DATE:
User:rmuncey
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0592T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-24.0

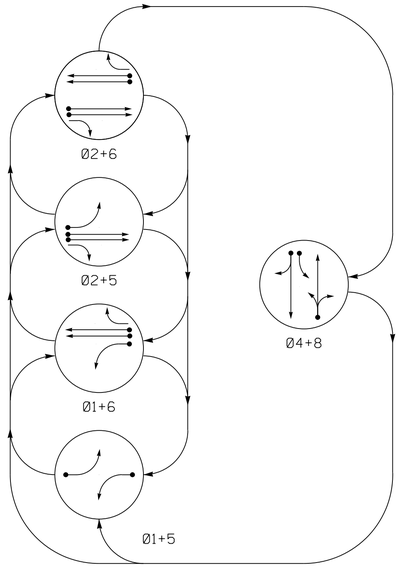
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+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
81,82	R	R	R	R	G	R

ALTERNATE PHASING DIAGRAM

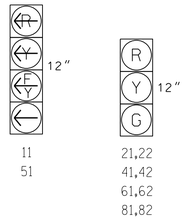


ALTERNATE TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~Y~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~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.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	-
					6#	Yes	-	3	-	G	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	-
					2#	Yes	-	3	-	G	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
8A	6X40	0	✳	-	8	Yes	-	5	-	S	-	-

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

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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

PHASING DIAGRAM DETECTION LEGEND

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▭	Construction Zone	N/A
▬	Video Detection Area	N/A
● ● ●	Drums	N/A

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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.8	3.1	3.0	4.8	3.1
Red Clear	2.4	1.3	2.9	2.6	1.3	2.4
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 2 - TMP Phase II

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

SCALE 0 40 1"=40'

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway

Division 6 Cumberland County Fayetteville

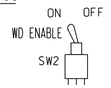
PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

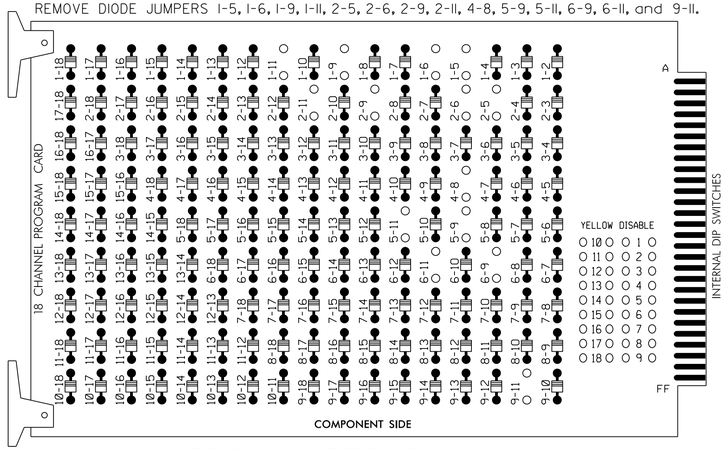
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T2

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

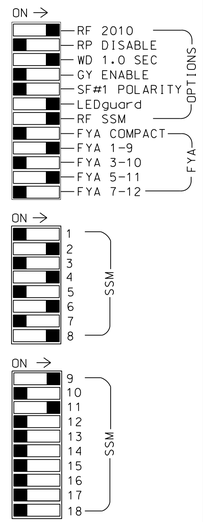
(remove jumpers and set switches as shown)



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



■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-24.1

SIGNAL HEAD HOOK-UP CHART

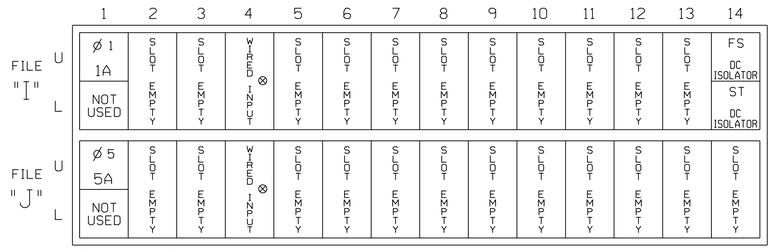
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	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													A122			A115		
FLASHING YELLOW ARROW													A123			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 below.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheet 2 of this electrical detail.

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1★	1	YES		15		S
	-	J4U	48	26★	6	YES		3		G
5A [2]	-	J1U	55	5★	5	YES		15		S
	-	I4U	47	22★	2	YES		3		G

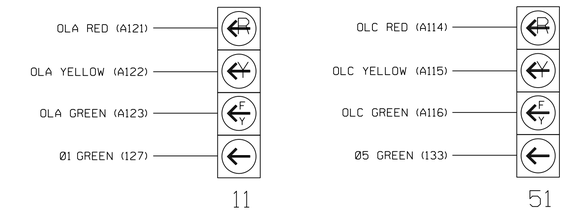
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

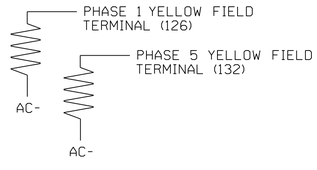
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0592T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway
Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T2

DATE:
User:rmuncey
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0592T2.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-24.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <- NOTICE SF BIT DISABLE 1
```

END PROGRAMMING

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

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

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

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

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

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

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

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

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

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

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

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0   <- ENSURE PHASE IS SET TO "0"
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

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

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

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

SF BITS 1,5:	Modifies overlap parent phases for heads 11 and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.
	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0592T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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at
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Division 6 Cumberland County Fayetteville

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

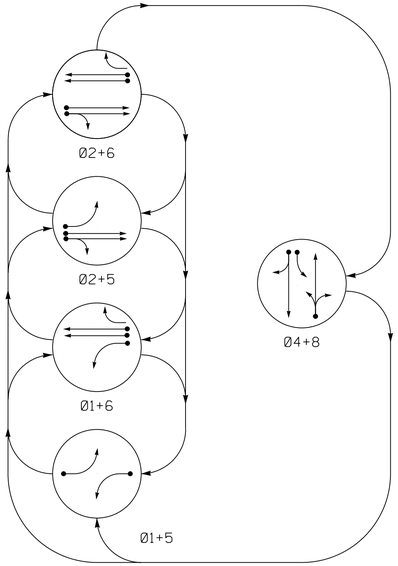
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T2

DATE:
User:rmuncey
I:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0592T2.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-25.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

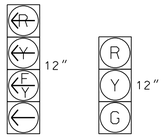
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	~~R~~	~~R~~	~~R~~	~~R~~
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~
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.



11
51

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

ASC/3 DETECTOR INSTALLATION CHART

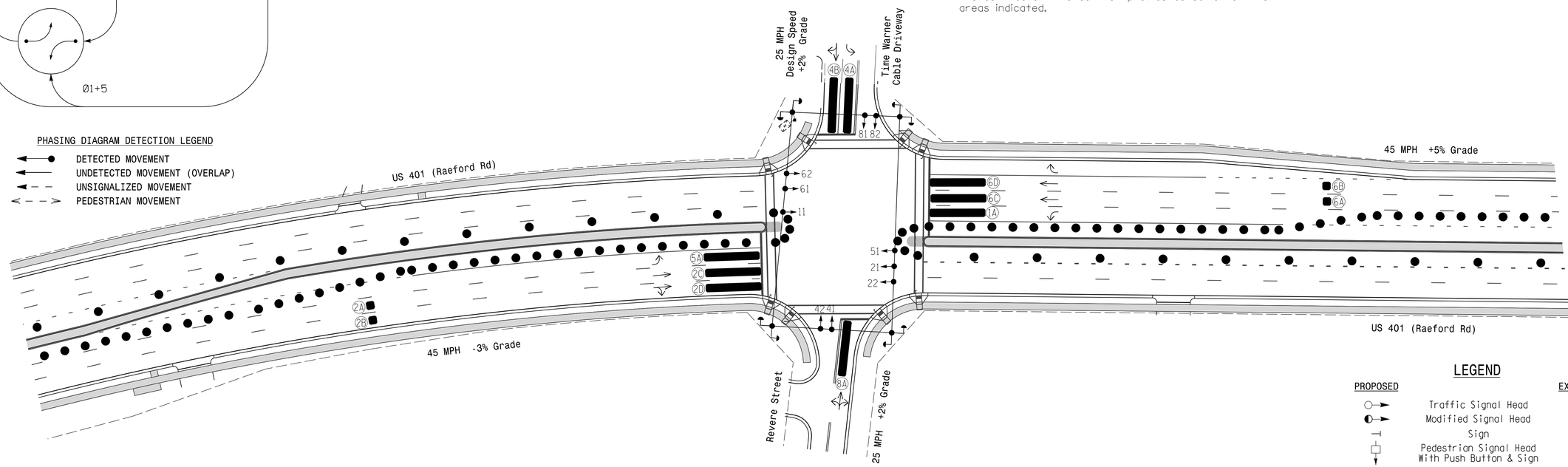
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
8A	6X40	0	✳	-	8	Yes	-	5	-	S	-	-

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

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition existing signal heads numbered 11,21,22,51,61, and 62.
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.



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	●⤵
▬	Video Detection Area	N/A
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	-----
→	Directional Arrow	→
▭	Construction Zone	N/A
▬	Video Detection Area	N/A
● ● ●	Drums	N/A

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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.8	3.1	3.0	4.8	3.1
Red Clear	3.1	1.3	3.1	3.3	1.3	3.2
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 3 - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

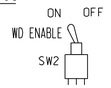
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
3567E7B9A2AF4FE... SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T3

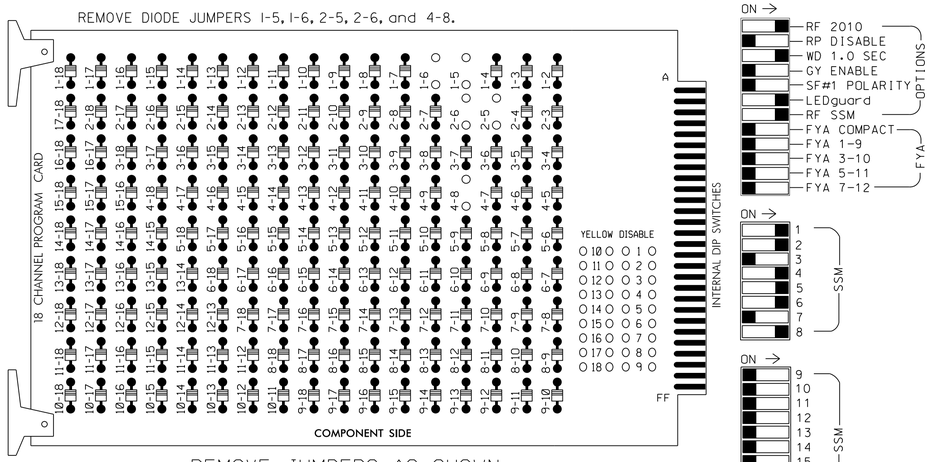
3/29/2018
10:04:43 AM
U:\Projects\Signals\Designs\Signal Designs\Temporary Signal Designs\Phase 3\U-4405_sig_dsn_06-0592T3.dgn
User:rmuncey

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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



■ = DENOTES POSITION OF SWITCH

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

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-25.1

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★	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

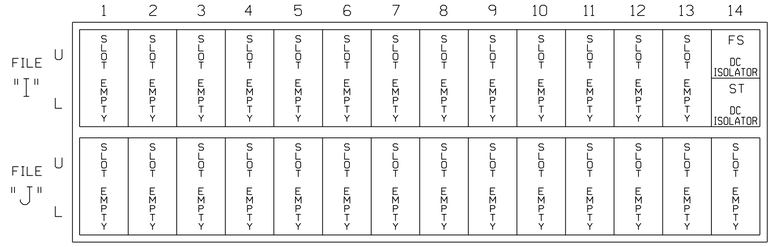
★ See pictorial of head wiring in detail below.

DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phases 2 and 6.

INPUT FILE POSITION LAYOUT

(front view)

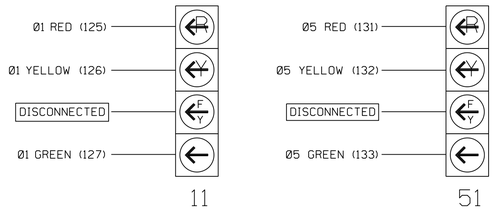


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

SIGNAL WIRING DETAIL

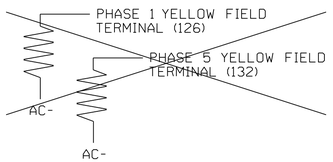
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0592T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

Traffic Engineering Branch, Traffic Signal Design Section, NCDEPARTMENT OF TRANSPORTATION, Mobility and Safety Division, Traffic Engineering & Safety Systems Branch, Traffic Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway

Division 6 Cumberland County Fayetteville

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

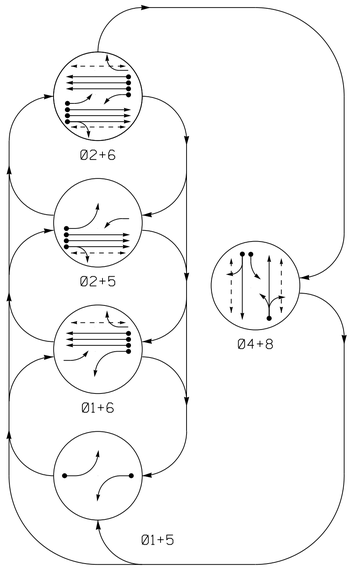
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592T3

DATE: 3/29/2018
File: C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0592t3.dgn
User: rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-26.0

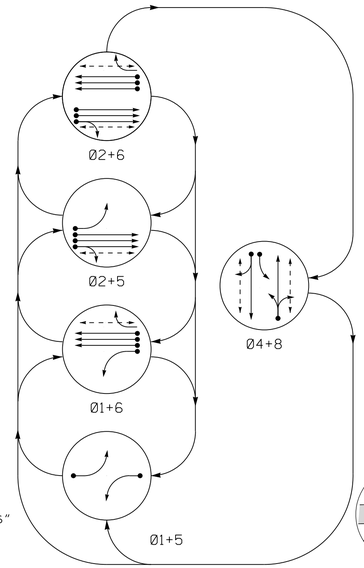
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F/Y	F/Y	R	Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	G	R	Y
51	←	F/Y	←	F/Y	R	Y
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	G	R	Y
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

ALTERNATE PHASING DIAGRAM

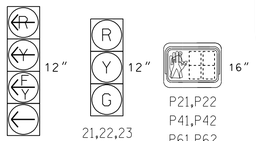


ALTERNATE TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	R	R	R	Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	R	←	R	R	Y
61,62,63	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.



PHASING DIAGRAM DETECTION LEGEND

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

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	3	-	G	-	X
2A	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	6	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	300	5	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	5	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	5	X	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	10	-	S	-	X

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

5 Phase Fully Actuated Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and Flahsing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1704.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	— — —
→	Directional Arrow	→
◙	Metal Strain Pole	◙
⬡	Type II Signal Pedestal	⬢

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	7	7	-	7	7
Ped Clear	-	13	23	-	15	26
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	20	90	30	20	90	30
Yellow	3.0	4.8	3.1	3.0	4.8	3.1
Red Clear	2.9	1.8	3.3	3.3	1.8	3.3
Actuations B4 Add *	-	0	-	-	0	-
Seconds /Actuation *	-	1.2	-	-	1.2	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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US 401 (Raeford Road) at Revere Street/ Time Warner Cable Driveway

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSEY L. WATSON

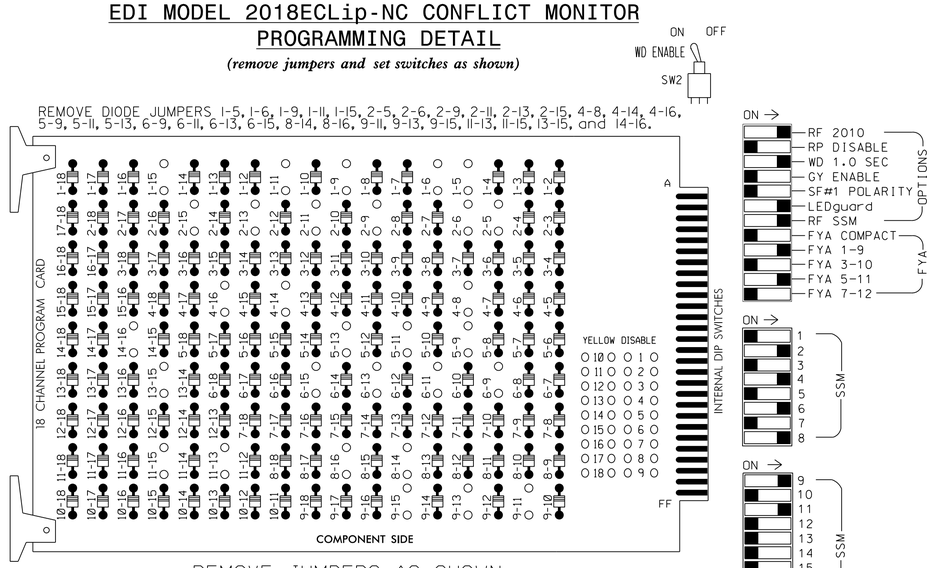
DocuSigned by: Betsey L. Watson 3/29/2018
3560788CBA0A4FE... SIGNATURE DATE

SIG. INVENTORY NO. 06-0592

3/29/2018
10:05:05 AM
U:\Raleigh\Projects\Signals\Designs\Signal Designs\Final Signal Designs\U-4405_sig_dsn_06-0592 Final.dgn
User:rmuncey

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

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

* See Overlap Programming Detail on Sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-26.1

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 ★	21,22, 23	P21, P22	NU	41,42	P41, P42	51 ★	61,62, 63	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

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

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø2 2A	ø2 2C	WIRED JUMPER ⊗	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	ø2 2B	NOT USED			ø4 4B						ø4 PED DC ISOLATOR	ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6 6A	ø6 6C	WIRED JUMPER ⊗	SLOT EMPTY	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6 6B	NOT USED			NOT USED								

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A[1]	TB2-1,2	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26 ★	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES				S
4B	TB4-11,12	I6L	45	14	4	YES				S
5A[2]	TB3-1,2	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22 ★	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
8A	TB5-9,10	J6U	42	8	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.

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

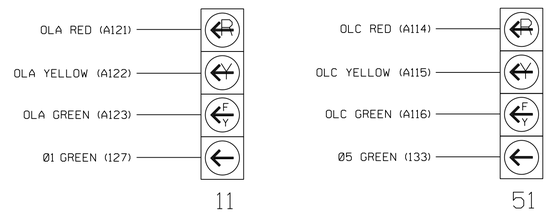
[2] Add jumper from J1-W to I4-W, on rear of input file.

★ See Vehicle Detector Setup Programming Detail for alternate phasing on Sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FYA SIGNAL WIRING DETAIL

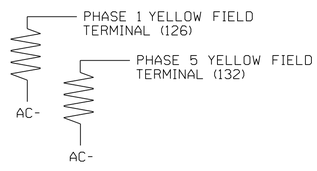
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0592
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592

DATE: 3/29/2018
File: Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0592.dgn
User: rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-26.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5   <- NOTICE SF BIT DISABLE 1
```

END PROGRAMMING

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

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

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

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

4. From Main Menu select [6. DETECTORS]
5. From DETECTOR Submenu select [2. VEHICLE DETECTOR SETUP]
6. Place cursor in VEH DET PLAN [ ] position and enter "2".
   - Place cursor in VEH DETECTOR [ ] position and enter "1".
   - Set delay time to "0.0".

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

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

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .   <- ENSURE PHASE IS SET TO "0"
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

   - Place cursor in VEH DETECTOR [ ] position and enter "5".
   - Set delay time to "0.0".

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

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

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .   <- ENSURE PHASE IS SET TO "0"
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

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

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

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

SF BITS 1,5:	Modifies overlap parent phases for heads 11 and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.
	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0592
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 2

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

US 401 (Raeford Road)
at
Revere Street/
Time Warner Cable Driveway

Division 6 Cumberland County Fayetteville

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

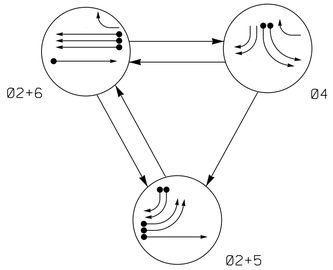
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0592

DATE:
User:rmuncey
I:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0592.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-27.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

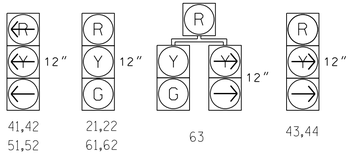
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	G	G	R	Y
41,42	~~R~~	~~R~~	~~R~~	~~R~~
43,44	→	R	→	R
51,52	~~R~~	~~R~~	~~R~~	~~R~~
61,62	R	G	R	Y
63	R	G	R/→	Y

SIGNAL FACE I.D.

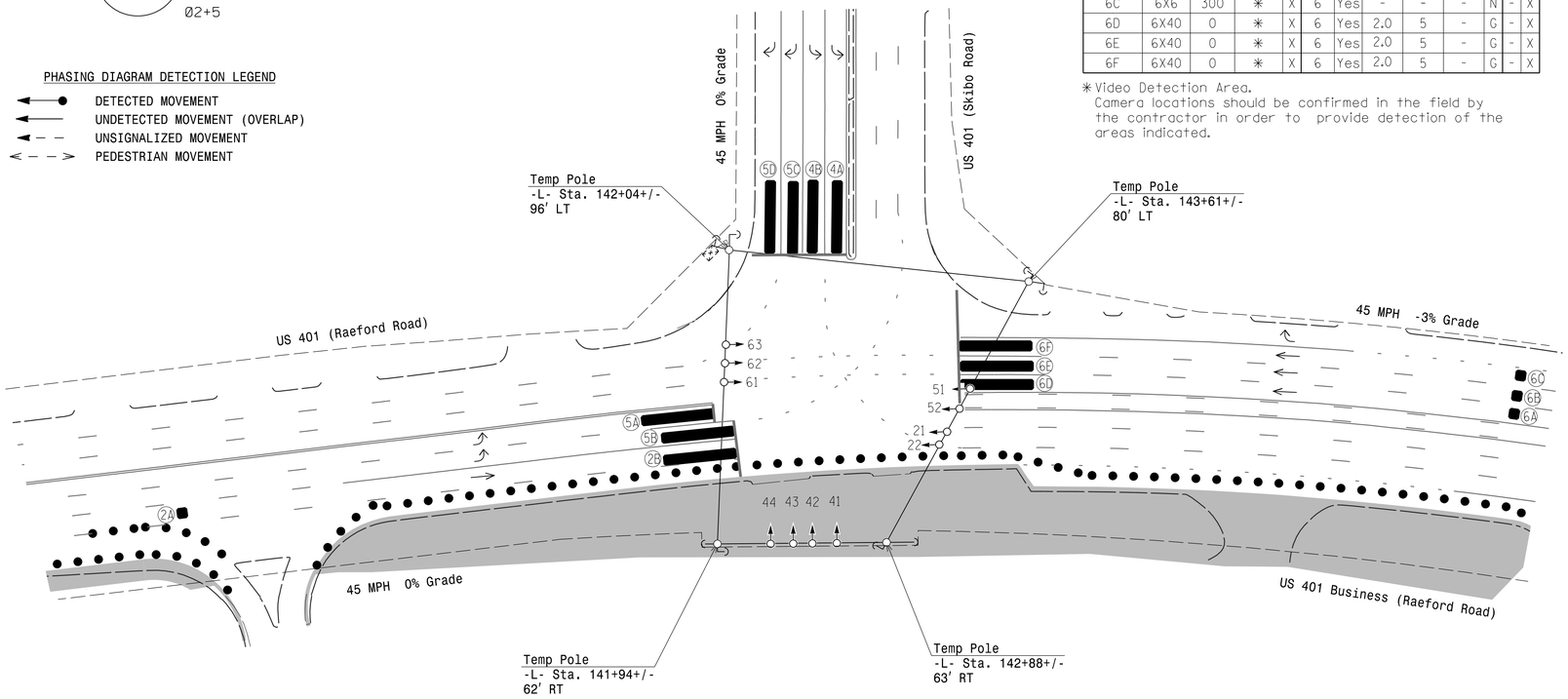
All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	✳	X	2	Yes	-	-	-	N	-	X
2B	6X40	0	✳	X	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	✳	X	4	Yes	-	-	-	S	-	X
4B	6X40	0	✳	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	✳	X	5	Yes	-	-	-	S	-	X
5B	6X40	0	✳	X	5	Yes	-	-	-	S	-	X
5C	6X40	0	✳	X	5	Yes	-	15	-	S	-	X
5D	6X40	0	✳	X	5	Yes	-	15	-	S	-	X
6A	6X6	300	✳	X	6	Yes	-	-	-	N	-	X
6B	6X6	300	✳	X	6	Yes	-	-	-	N	-	X
6C	6X6	300	✳	X	6	Yes	-	-	-	N	-	X
6D	6X40	0	✳	X	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	✳	X	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	✳	X	6	Yes	2.0	5	-	G	-	X

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



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	12	7	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	30	35	90
Yellow	4.5	3.0	3.0	4.8
Red Clear	1.6	3.6	3.3	1.8
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Locking Detector	-	-	-	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation..
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Field adjust temporary poles as needed.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	— — — —
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ● ●	Drums	N/A

Signal Upgrade
Temporary Design 1- TMP Phase I

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

N
SCALE 0 40 1"=40'

US 401/US 401 Business
(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	K Williams	REVIEWED BY:	B L Watson

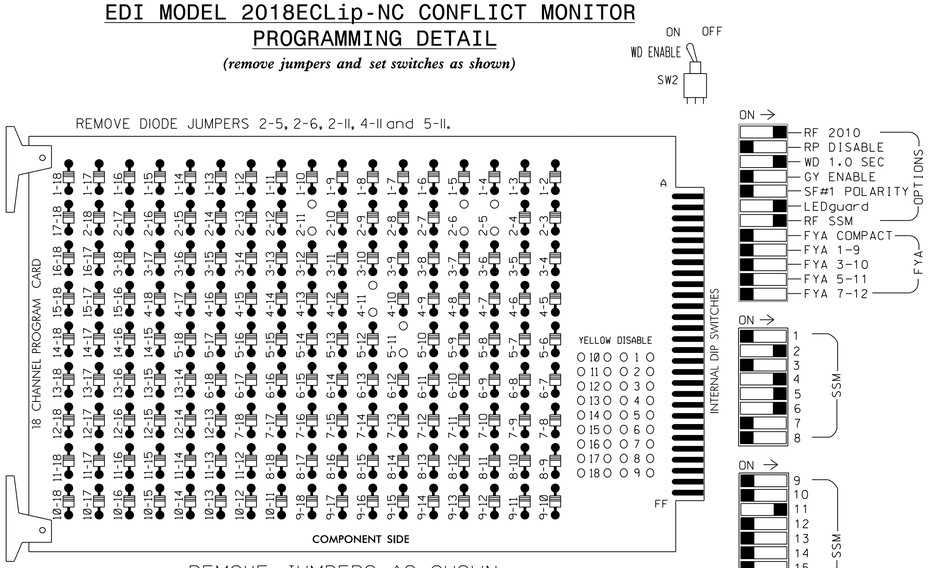
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096T1

3/29/2018
10:05:27 AM
User:rmuncey
U:\Projects\Signals\Designs\Signal Designs\Temporary Signal Designs\Phase 1\U-4405_sig_dsn_06-0096T1.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-27.1

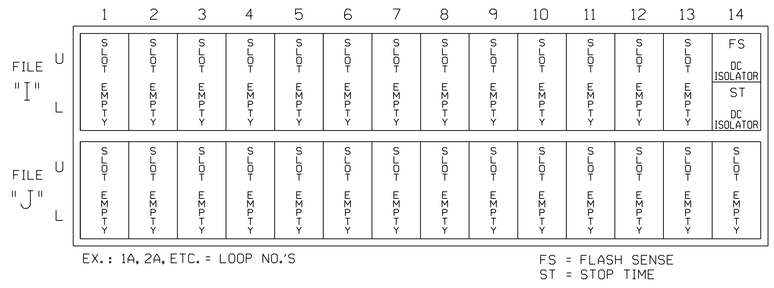
SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4		14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	63	NU	51,52	61,62, 63	NU	NU	NU	NU	NU	NU	NU	43,44	NU	NU
RED		128							134								A114		
YELLOW		129							135										
GREEN		130							136										
RED ARROW					101			131											
YELLOW ARROW					102	102		132									A115		
GREEN ARROW					103	103		133									A116		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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 Toggle Twice

Select TMG VEH OVLP [C] and 'NORMAL'

```
TMG VEH OVLP...[C] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0096T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 1 - TMP Phase I
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

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

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

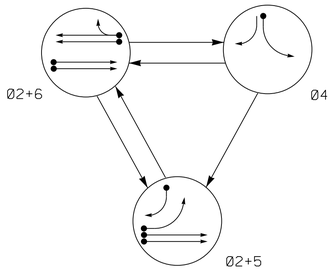
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096TI

DATE:
User:lrmurcey
L:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0096T1.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-28.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

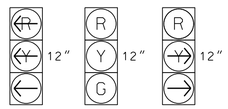
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	G	G	R	Y
41	~~R~~	~~R~~	~~R~~	~~R~~
42	→	R	→	R
51	~~R~~	~~R~~	~~R~~	~~R~~
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

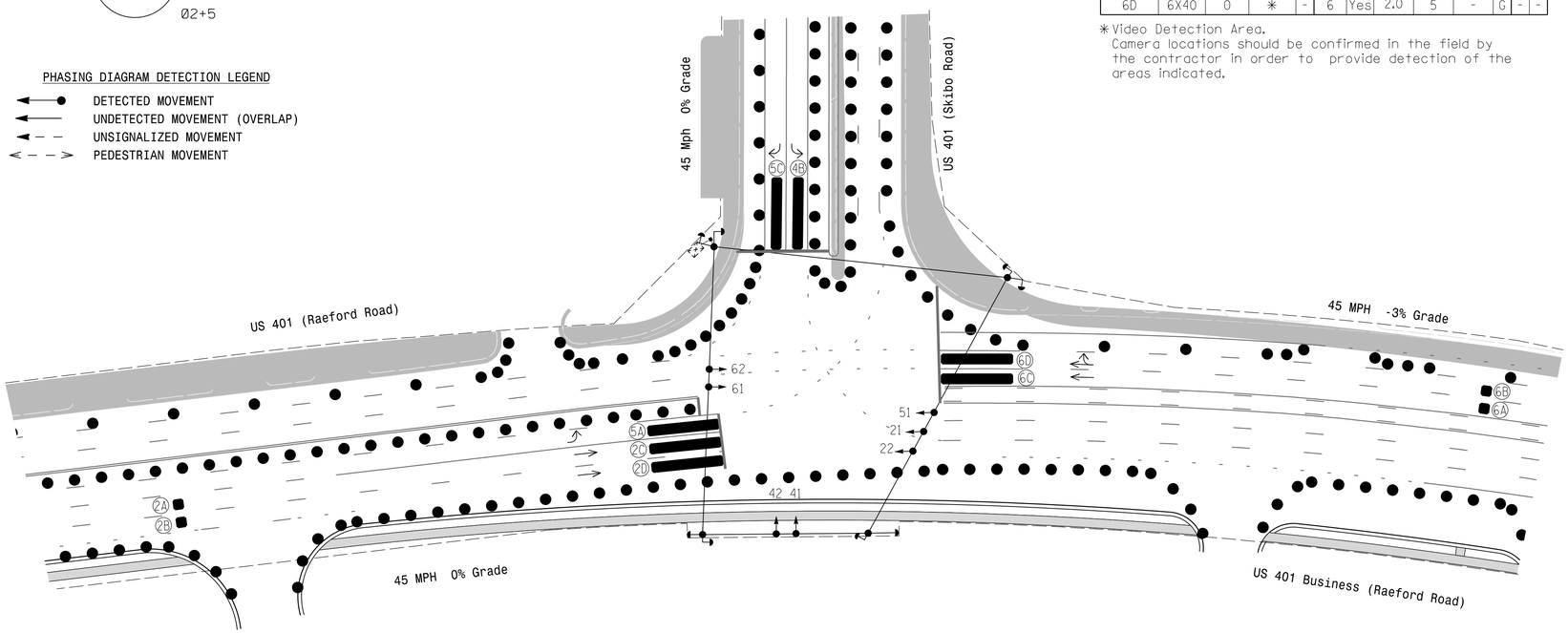
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-

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

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	12	7	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	30	35	90
Yellow	4.5	3.0	3.0	4.8
Red Clear	1.6	3.4	3.2	1.6
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Locking Detector	-	-	-	-
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	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ● ●	Drums	N/A

Signal Upgrade
Temporary Design 2- TMP Phase II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

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(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	K Williams	REVIEWED BY:	B L Watson

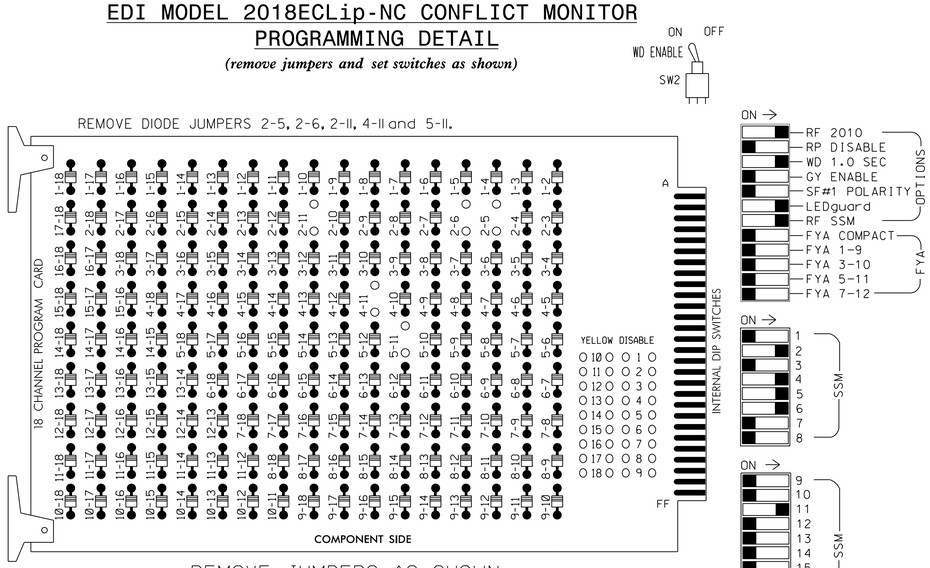
SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-00961Z

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-28.1

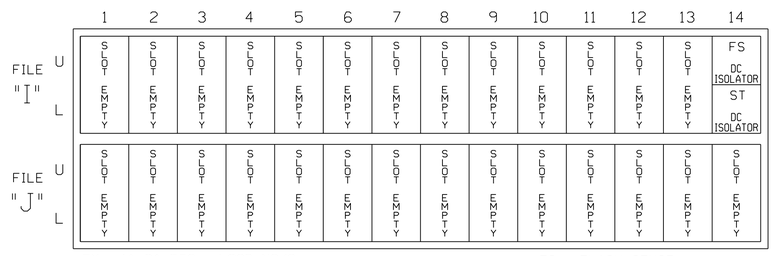
SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	42	NU	NU
RED		128						134								A114		
YELLOW		129						135										
GREEN		130						136										
RED ARROW					101		131											
YELLOW ARROW					102		132									A115		
GREEN ARROW					103		133									A116		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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 Toggle Twice

Select TMG VEH OVLP [C] and 'NORMAL'

```
TMG VEH OVLP...[C] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0096T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 2 - TMP Phase II
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
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NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
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at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

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

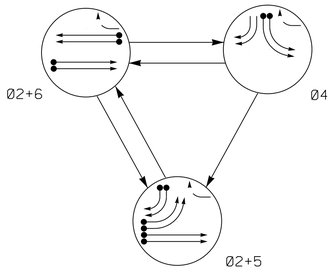
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096T2

DATE:
User:lrmurcey
L:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0096T2.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-29.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

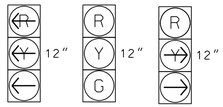
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	G	G	R	Y
41,42	~~R~~	~~R~~	←	~~R~~
43,44	→	R	→	R
51,52	←	~~R~~	~~R~~	~~R~~
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



41,42 51,52 — 21,22 61,62 — 43,44

ASC/3 DETECTOR INSTALLATION CHART

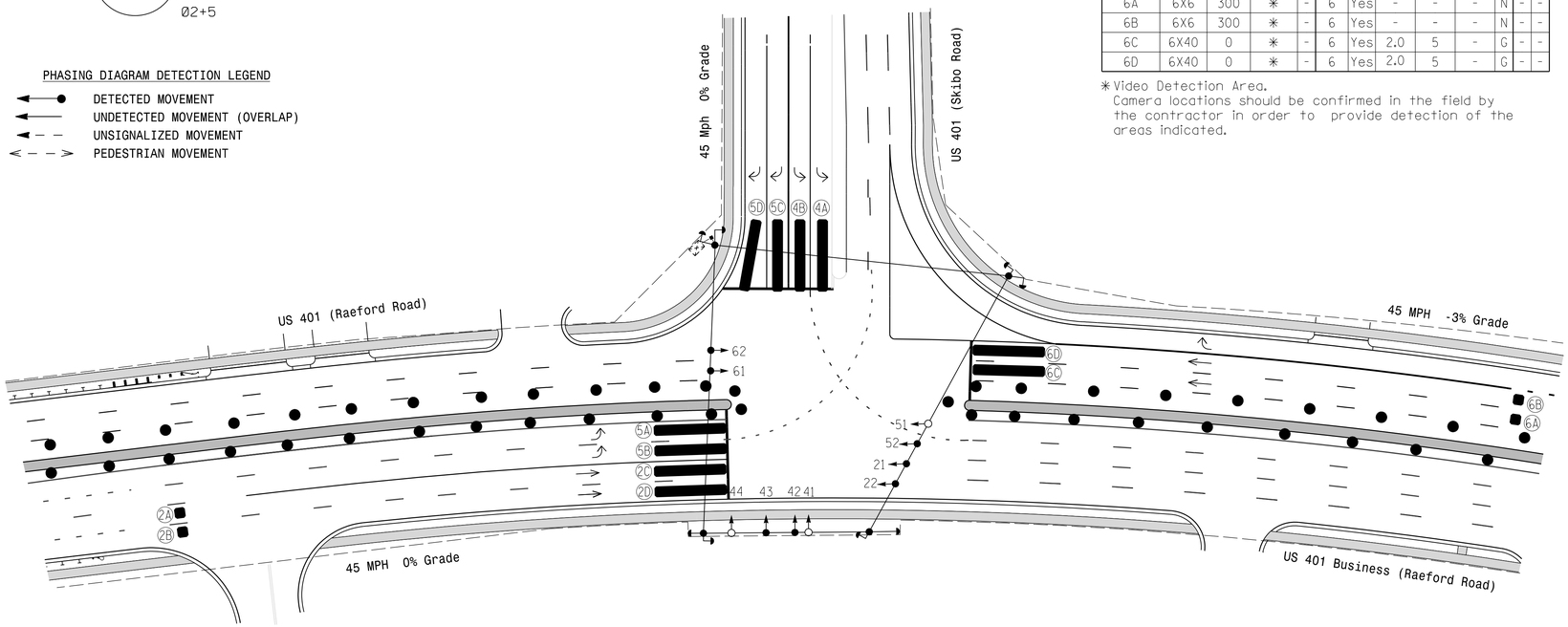
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
5D	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-

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

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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



ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	12	7	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	6.0	2.0	2.0	6.0
Max 1 *	90	30	35	90
Yellow	4.5	3.0	3.0	4.8
Red Clear	1.4	3.2	3.3	1.9
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Locking Detector	-	-	-	-
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	
	Video Detection Area	N/A
	Construction Zone	N/A
	Drums	N/A

Signal Upgrade
Temporary Design 3 - TMP Phase III - Step 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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SCALE 0 40 1"=40'

US 401/US 401 Business
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at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: K Williams REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

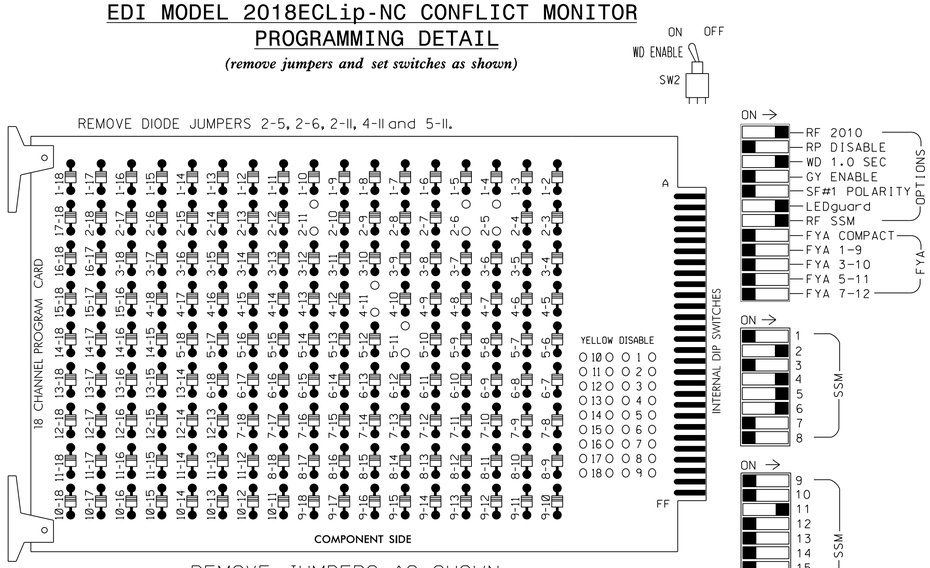
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0096T3

3/29/2018
10:05:19 AM
User:rmurcey
I:\Signals\Design\Signal Designs\Temporary Signal Designs\Phase 3\U-4405_sig_dsn_06-0096T3.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-29.1

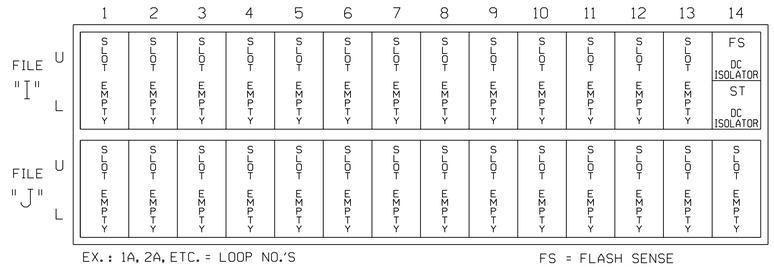
SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51,52	61,62	NU	NU	NU	NU	NU	NU	NU	43,44	NU	NU
RED		128						134								A114		
YELLOW		129						135										
GREEN		130						136										
RED ARROW					101		131											
YELLOW ARROW					102		132									A115		
GREEN ARROW					103		133									A116		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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 Toggle Twice

Select TMG VEH OVLP [C] and 'NORMAL'

```
TMG VEH OVLP...[C] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0096T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III - Step 2
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Division 6 Cumberland County Fayetteville

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

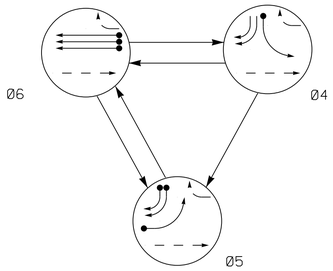
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096T3

DATE:
U:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0096t3.dgn
User:lmurcey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-30.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

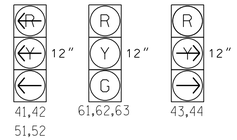
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø5	PHASE Ø6	PHASE Ø4	FLASH
41,42	~~R~~	~~R~~	~~R~~	~~R~~
43,44	→	R	→	R
51,52	←	~~R~~	~~R~~	~~R~~
61,62,63	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

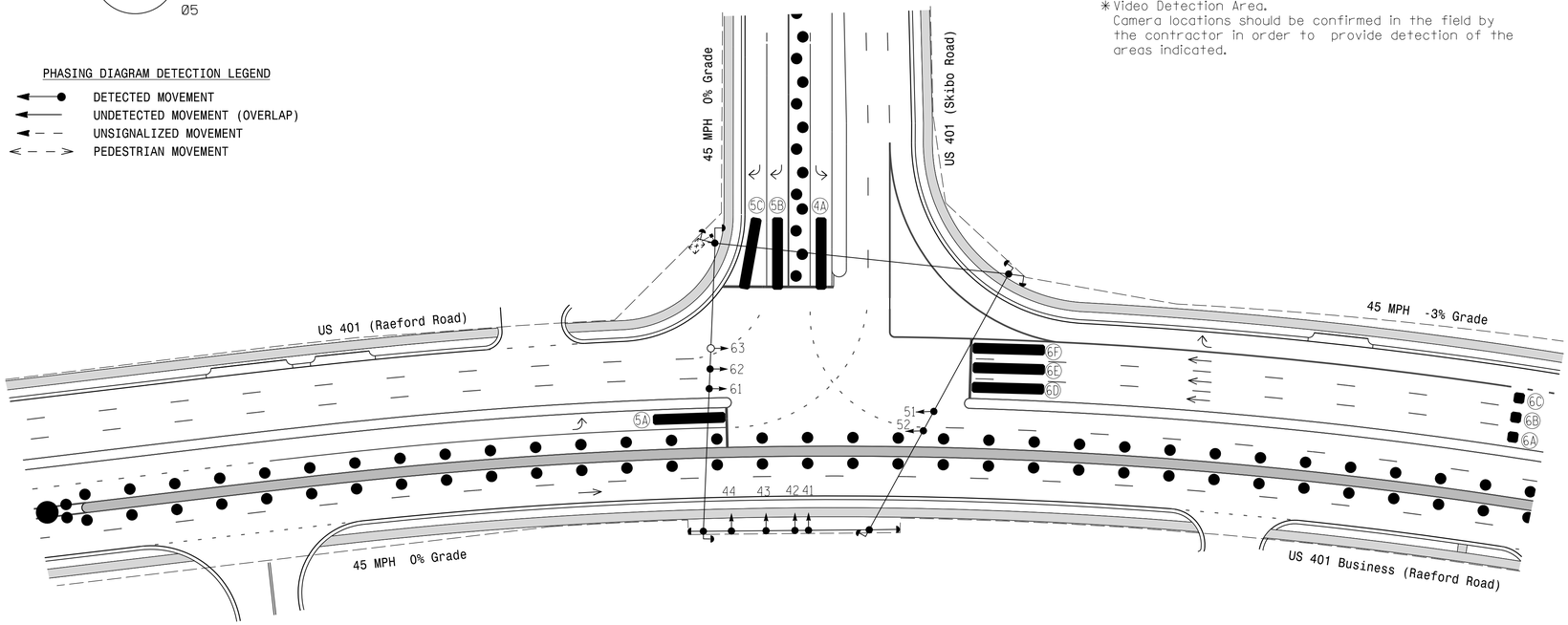
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6E	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6F	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-

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

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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



ASC/3 TIMING CHART

FEATURE	PHASE 4	PHASE 5	PHASE 6
Min Green *	7	7	12
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	2.0	2.0	6.0
Max 1 *	30	35	90
Yellow	3.0	3.0	4.8
Red Clear	3.1	2.9	2.0
Actuations B4 Add *	-	-	-
Seconds /Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	15
Time To Reduce *	-	-	45
Minimum Gap	-	-	3.0
Locking Detector	-	-	-
Recall Position	-	-	VEH. 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 With Push Button & Sign	■↓
○—	Signal Pole with Guy	●—
○⌒	Signal Pole with Sidewalk Guy	●⌒
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⛶
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
●●●	Drums	N/A

Signal Upgrade
Temporary Design 4 - TMP Phase III - Step 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 401/US 401 Business
(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

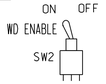
SCALE 0 40 1"=40'

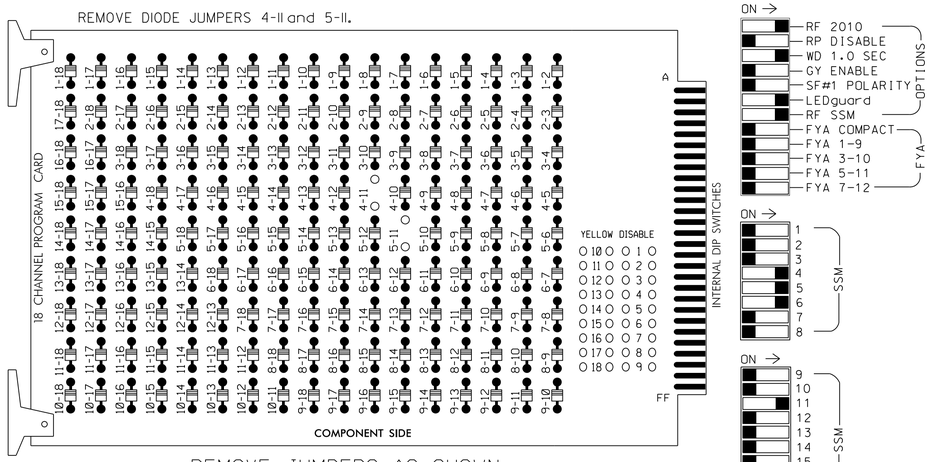
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096T4

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-30.1

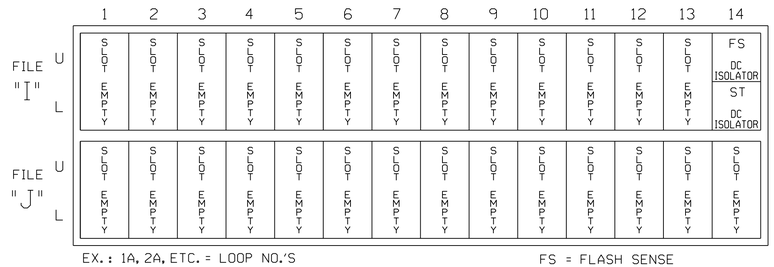
SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	NU	51,52	61,62, 63	NU	NU	NU	NU	NU	NU	NU	43,44	NU	NU
RED								134								A114		
YELLOW								135										
GREEN								136										
RED ARROW					101		131											
YELLOW ARROW					102		132									A115		
GREEN ARROW					103		133									A116		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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 Toggle Twice

Select TMG VEH OVLP [C] and 'NORMAL'

```
TMG VEH OVLP...[C] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0096T4
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 4 - TMP Phase III - Step 3
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401/US 401 Business
(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

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

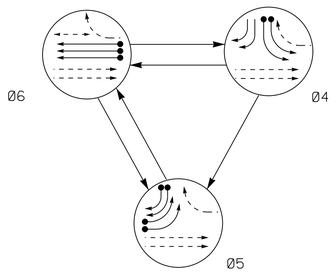
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096T4

DATE:
U:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0096T4.dgn
User:lrmurcey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-31.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

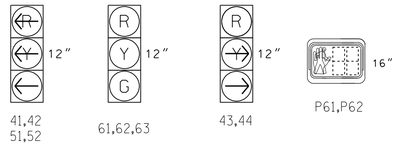
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø5	PHASE Ø6	PHASE Ø4	PHASE FLASH
41,42	~~R~~	~~R~~	←	~~R~~
43,44	R	R	→	R
51,52	←	~~R~~	~~R~~	~~R~~
61,62,63	R	G	R	Y
P61,P62	DW	W	DW	DRK

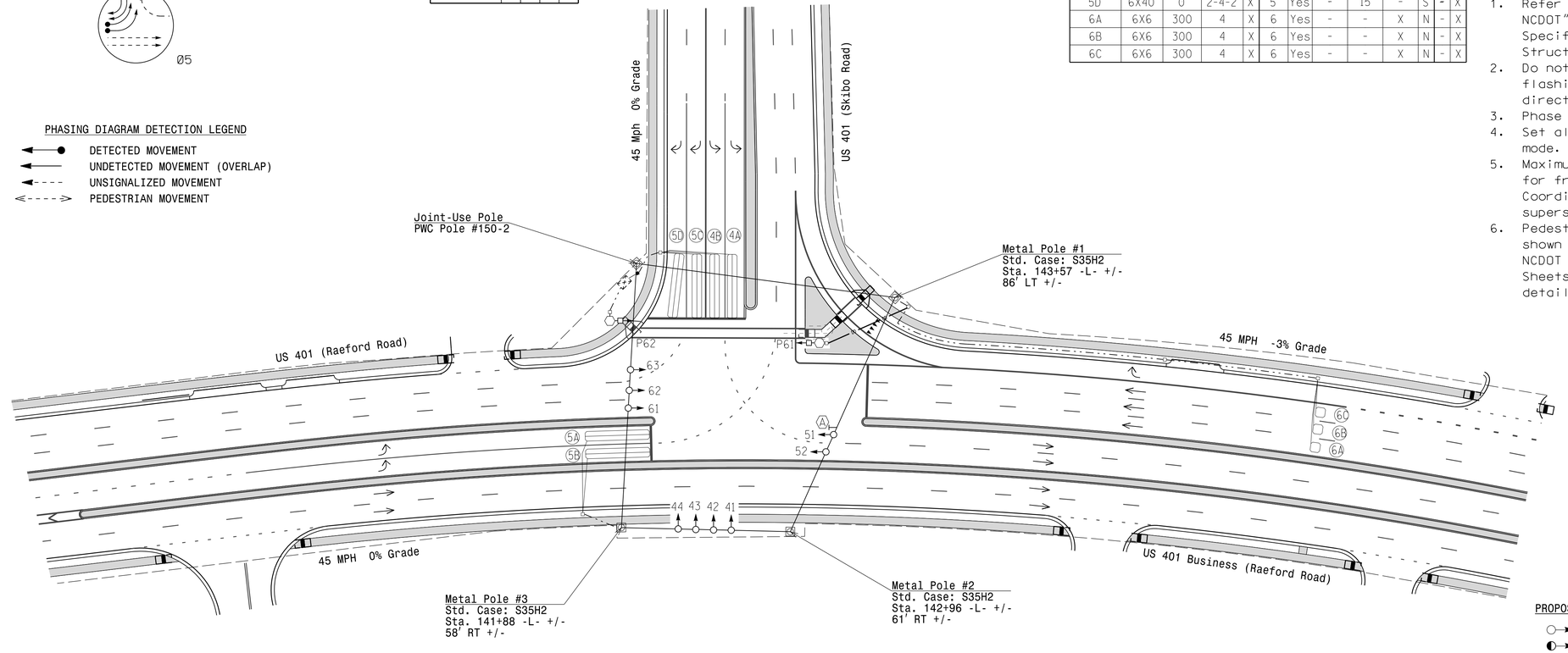
SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR						PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5C	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
5D	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
6A	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	4	X	6	Yes	-	-	X	N	-	X



ASC/3 TIMING CHART

FEATURE	PHASE 4	PHASE 5	PHASE 6
Min Green *	7	7	12
Walk *	-	-	7
Ped Clear	-	-	24
Veh. Extension *	2.0	2.0	6.0
Max 1 *	30	35	90
Yellow	3.0	3.0	4.8
Red Clear	3.3	3.5	2.0
Actuations B4 Add *	-	-	-
Seconds /Actuation *	-	-	1.5
Max Initial *	-	-	34
Time Before Reduction *		-	15
Time To Reduce *		-	45
Minimum Gap		-	3.0
Locking Detector		-	X
Recall Position		-	VEH. 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.

3 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - -	2-in Underground Conduit	- - - -
N/A	Right of Way	———
→	Directional Arrow	→
◎	Metal Strain Pole	■
DD	Directional Drill	N/A
⬡	Type II Signal Pedestal	●
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SCALE 0 40 1"=40'

US 401/US 401 Business
(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: K Williams REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

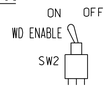
NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

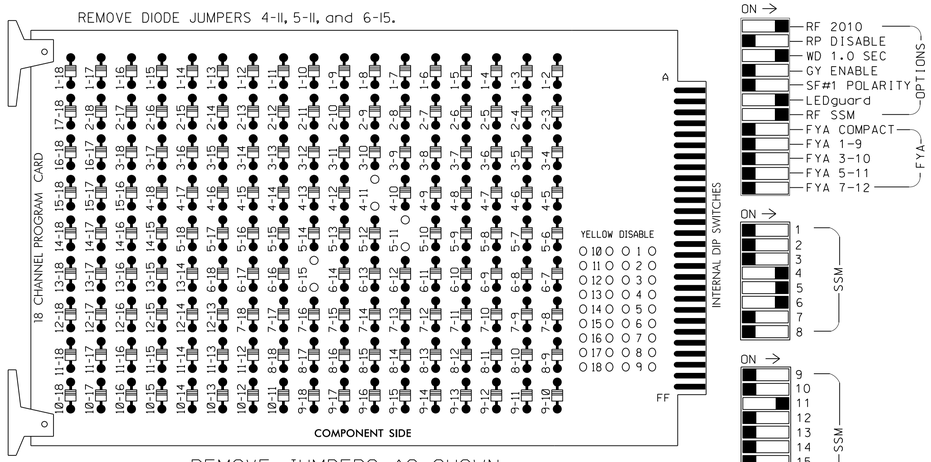
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0096

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

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.

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-31.1

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	NU	51,52	61,62, 63	P61, P62	NU	NU	NU	NU	NU	NU	43,44	NU	NU
RED								134								A114		
YELLOW								135										
GREEN								136										
RED ARROW					101		131											
YELLOW ARROW					102		132									A115		
GREEN ARROW					103		133									A116		
✋									119									
🚶									121									

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
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
5B	TB3-3,4	J1L	55	5	5	YES				S
5C	TB3-5,6	J2U	40	6	5	YES		15		S
5D	TB3-7,8	J2L	44	16	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES			X	N
6B	TB3-11,12	J3L	77	46	6	YES			X	N
6C	TB5-1,2	J4U	48	26	6	YES			X	N
PED PUSH BUTTONS										
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

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 Toggle Twice

Select TMG VEH OVLP [C] and 'NORMAL'

```
TMG VEH OVLP...[C] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0096
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401/US 401 Business
(Raeford Road)
at
US 401 (Skibo Road)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0096

DATE:
I:\Traffic\Signals\Designs\Electrical Details\Final Signals\U-4405_sig_e1e_06-0096.dgn
User:lrmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-32.0

PHASING DIAGRAM

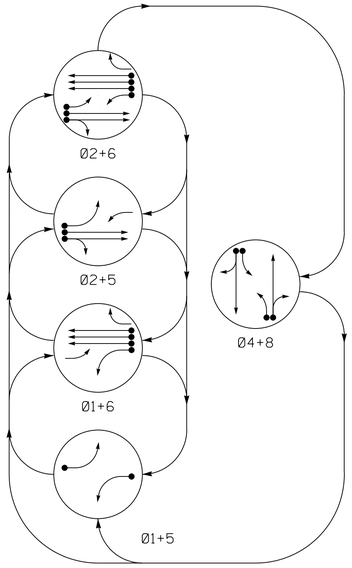
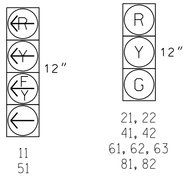


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+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, 63	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



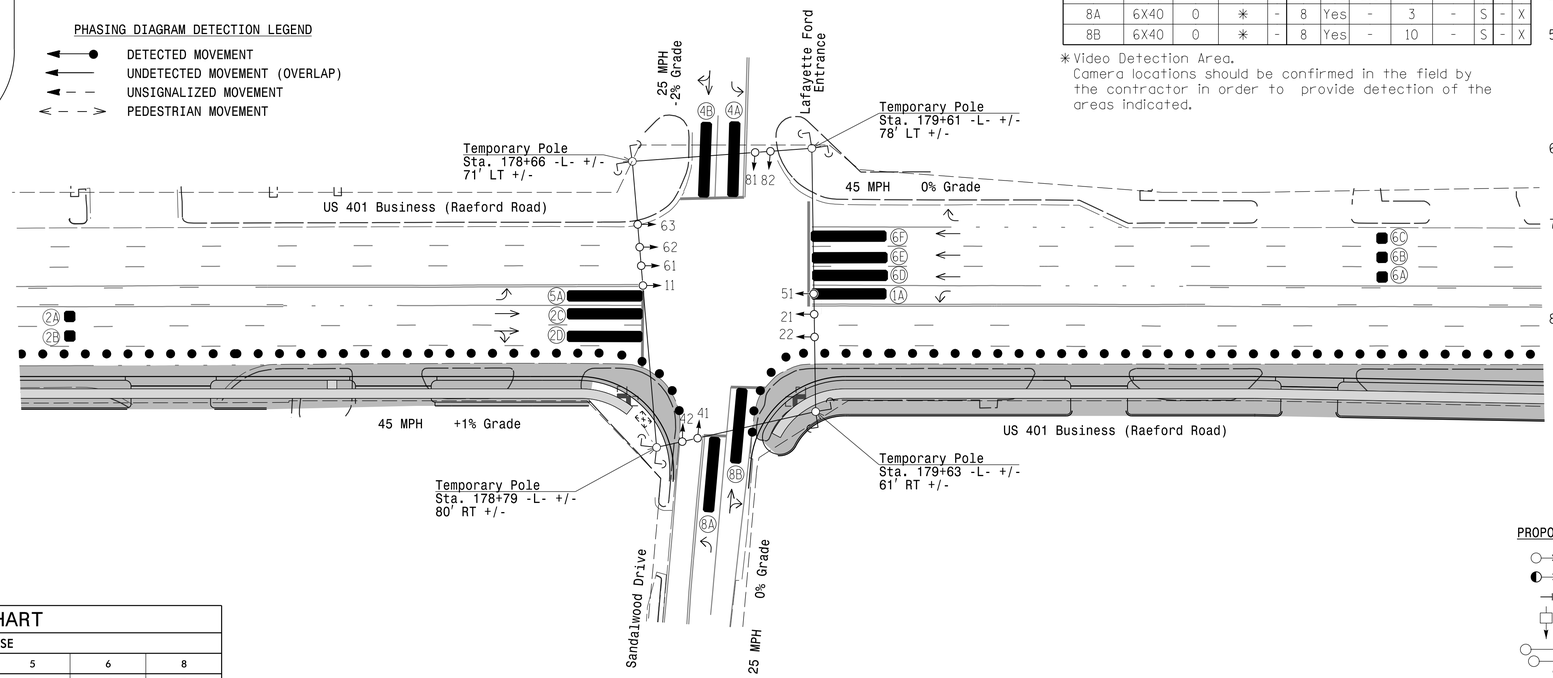
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15	-	S	-	X
					6	Yes	-	3	-	G	-	X
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15	-	S	-	X
					2	Yes	-	3	-	G	-	X
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
8A	6X40	0	✳	-	8	Yes	-	3	-	S	-	X
8B	6X40	0	✳	-	8	Yes	-	10	-	S	-	X

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

PHASING DIAGRAM DETECTION LEGEND

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



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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	15	15	90	15
Yellow	3.0	4.5	3.3	3.0	4.5	3.2
Red Clear	2.3	1.4	2.2	2.8	1.4	2.8
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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.

5 Phase Fully Actuated Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Field adjust temporary poles as needed.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - -	2-in Underground Conduit	- - - - -
N/A	Right of Way	- - - - -
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ● ●	Drums	N/A

Signal Upgrade
Temporary Design 1 - TMP Phase I

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

SCALE 0 40

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Lafayette Ford Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

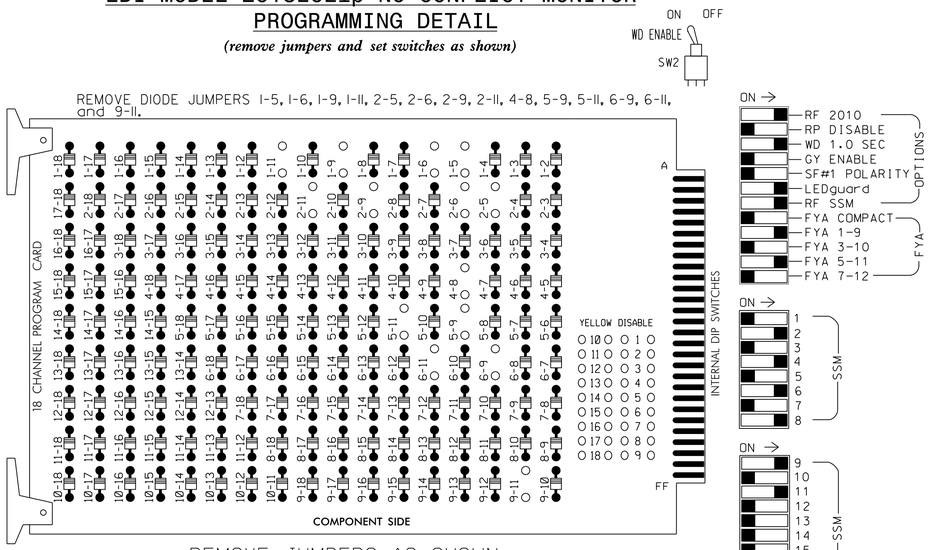
REVISIONS	INIT.	DATE

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

SIG. INVENTORY NO. 06-0491TI

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. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-32.1

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★	21,22	NU	NU	41,42	NU	51★	61,62, 63	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											

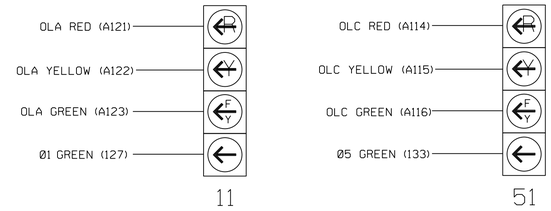
NU = Not Used

* 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)



DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation.

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 1A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED														ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED														

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
5A [2]	-	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G

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

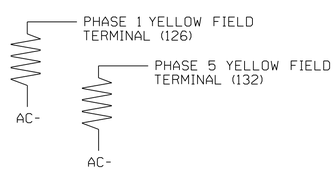
[2] Add jumper from J1-W to I4-W, on rear of input file.

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: 06-0491T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Layfayette Ford Entrance
Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0491T1

DATE: 3/29/2018
File: C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0491T1.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-32.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

↓

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0491T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0491T1

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-33.0

PHASING DIAGRAM

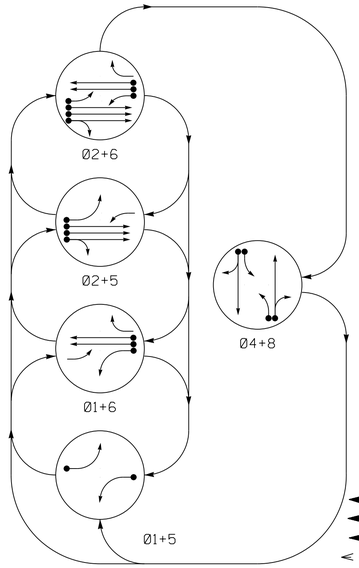
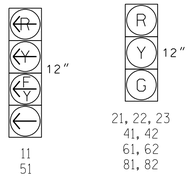


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	↓	↓	R	←
21, 22, 23	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	↓	←	↓	R	←
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.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
					6	Yes	-	3	-	G	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2E	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2F	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
					2	Yes	-	3	-	G	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
8A	6X40	0	✳	-	8	Yes	-	3	-	S	-	-
8B	6X40	0	✳	-	8	Yes	-	10	-	S	-	-

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

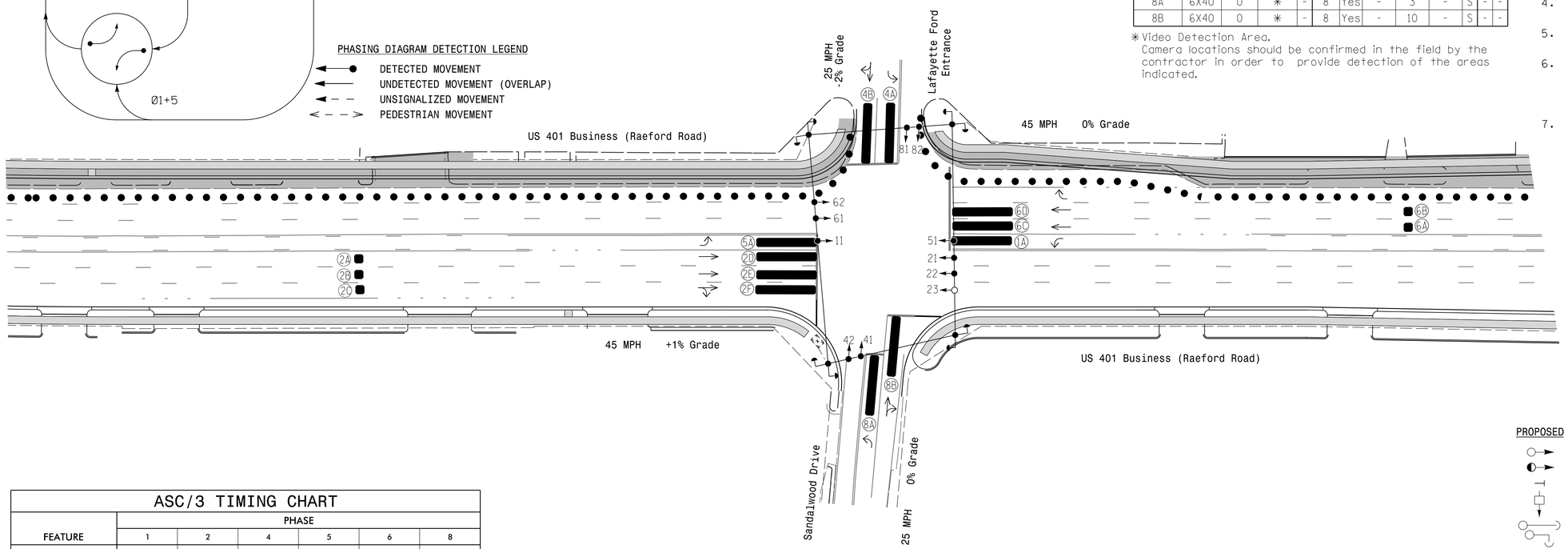
5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition signal heads numbered 11, 21, 22, 51, 61, and 62.
5. Set all detector units to presence mode.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - - -	2-in Underground Conduit	- · - · - ·
N/A	Right of Way	— — — —
→	Directional Arrow	→
▬	Video Detection Area	N/A
▬	Construction Zone	N/A
● ● ●	Drums	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	15	15	90	15
Yellow	3.0	4.5	3.3	3.0	4.5	3.2
Red Clear	2.6	1.1	2.6	2.4	1.1	2.7
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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.

Signal Upgrade
Temporary Design 2 - TMP Phase II

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

SCALE 0 40

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Lafayette Ford Entrance
Division 6 Cumberland County Fayetteville

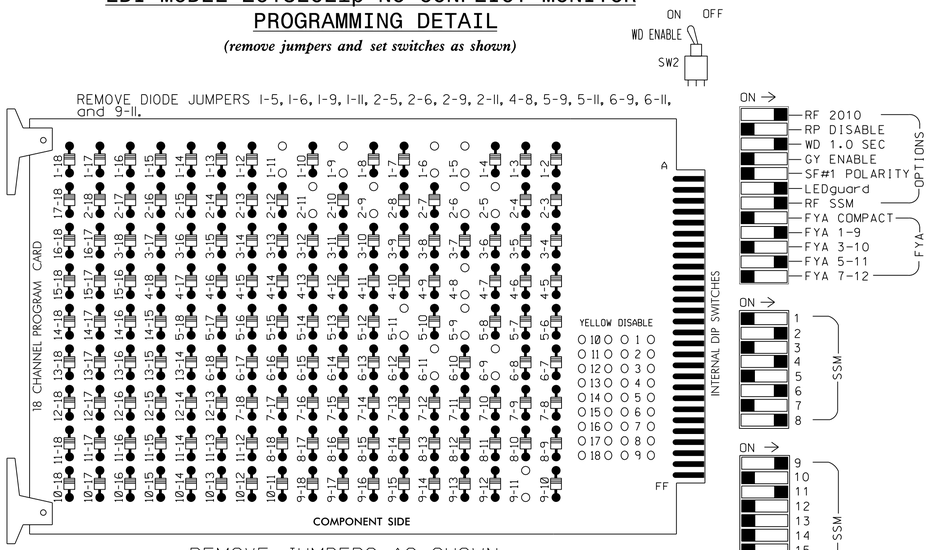
PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29449 BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0491T2

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. Program controller to start up in phase 2 Green and 6 Green.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-33.1

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 ★	21,22, 23	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											

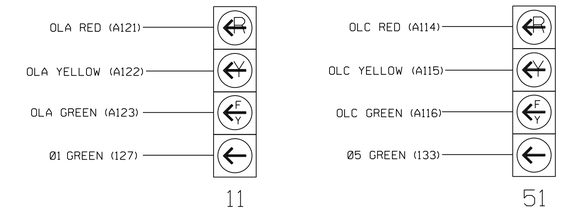
NU = Not Used

* 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)



DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation.

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 1A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED														ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED														

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1	1	YES		15		S
	-	J4U	48	26	6	YES		3		G
5A [2]	-	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G

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

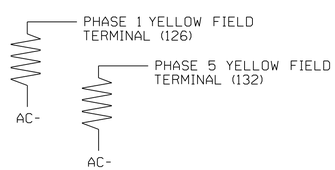
[2] Add jumper from J1-W to I4-W, on rear of input file.

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: 06-0491T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Layfayette Ford Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
045933
NORTH CAROLINA PROFESSIONAL ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
DESIGNATURE DATE
SIG. INVENTORY NO. 06-0491T2

DATE: 3/29/2018
File: c:\office\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0491T2.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-33.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

↓

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0491T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: 3/29/2018
SIGNATURE — DATE

SIG. INVENTORY NO. 06-0491T2

DATE:
User:cstaffiex
L:\projects\signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0491T2.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-34.0

PHASING DIAGRAM

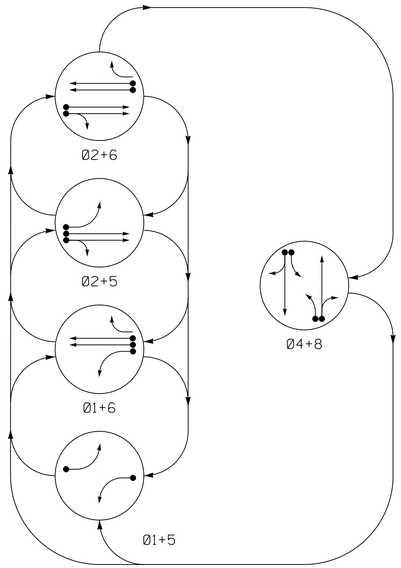
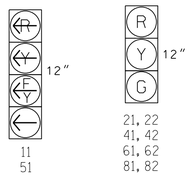


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←-	←-	←R	←R	←R	←R
21, 22	R	R	G	G	R	←Y
41, 42	R	R	R	R	G	R
51	←-	←R	←-	←R	←R	←R
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.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP / NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	- -
2A	6X6	300	✳	-	2	Yes	-	-	-	N	- -
2B	6X6	300	✳	-	2	Yes	-	-	-	N	- -
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	- -
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	- -
4A	6X40	0	✳	-	4	Yes	-	3	-	S	- -
4B	6X40	0	✳	-	4	Yes	-	10	-	S	- -
5A	6X40	0	✳	-	5	Yes	-	-	-	S	- -
6A	6X6	300	✳	-	6	Yes	-	-	-	N	- -
6B	6X6	300	✳	-	6	Yes	-	-	-	N	- -
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	- -
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	- -
8A	6X40	0	✳	-	8	Yes	-	3	-	S	- -
8B	6X40	0	✳	-	8	Yes	-	10	-	S	- -

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

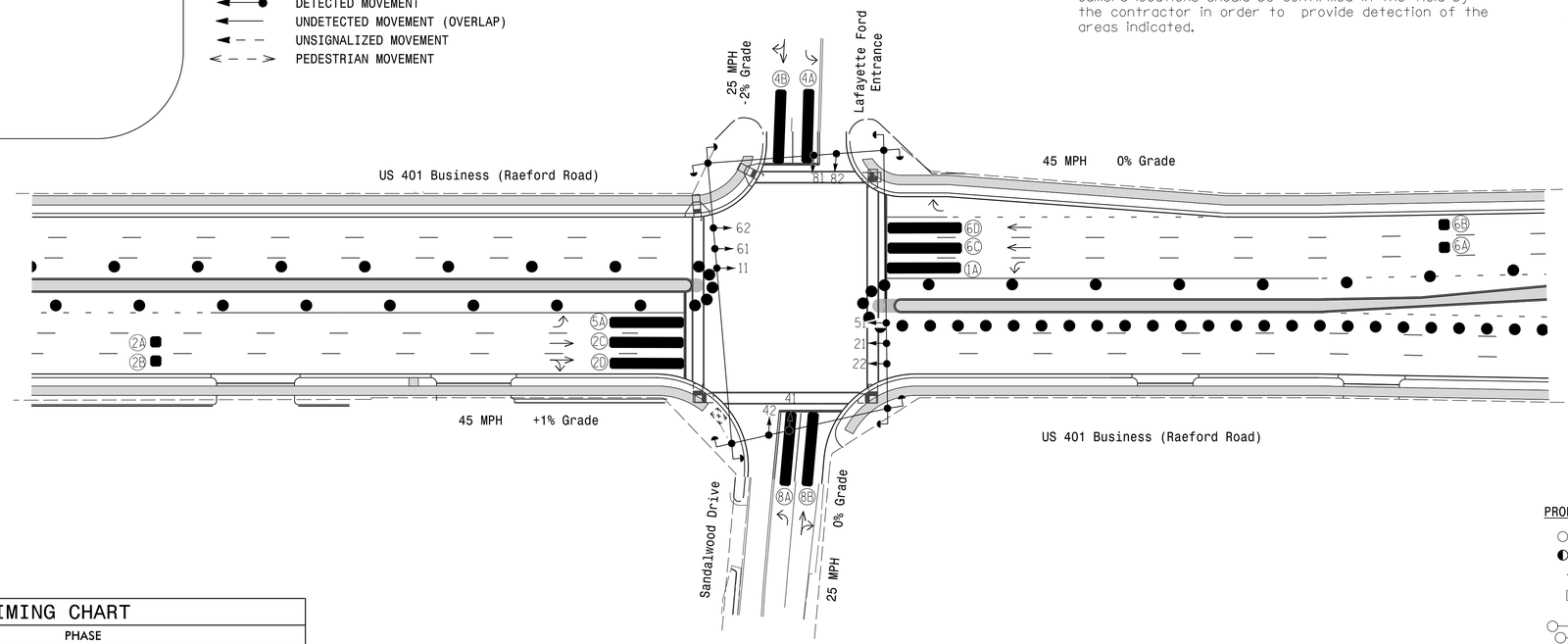
5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Reposition signal heads numbered 11, 21, 22, 51, 61, and 62.
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.

PHASING DIAGRAM DETECTION LEGEND

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



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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	15	15	90	15
Yellow	3.0	4.4	3.3	3.0	4.5	3.2
Red Clear	2.9	1.3	1.3	3.3	1.0	3.2
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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 With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▬	Video Detection Area	N/A
▬	Construction Zone	N/A
● ● ●	Drums	N/A

Signal Upgrade
Temporary Design 3 - TMP Phase III

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PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
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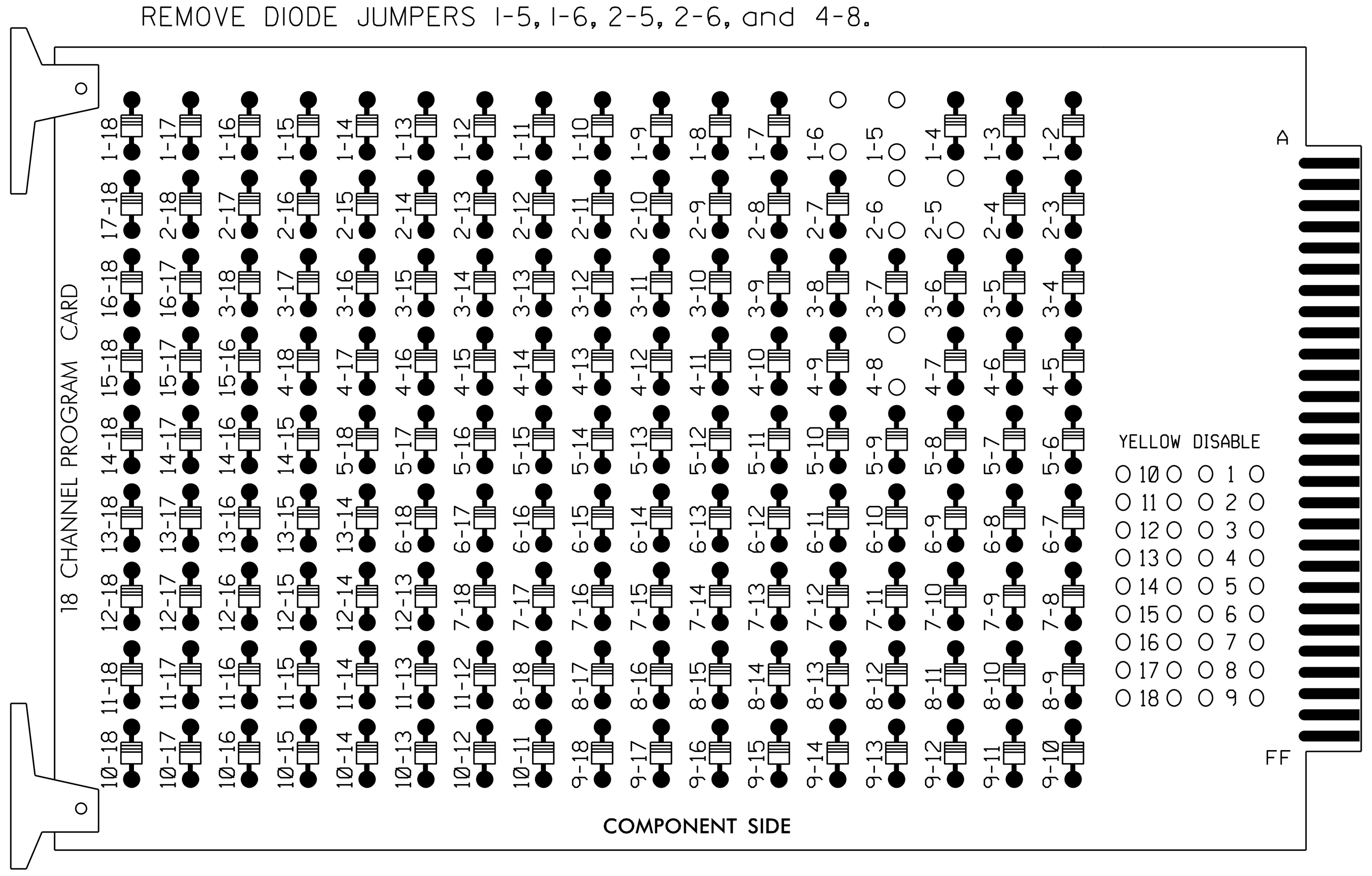
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-049IT3

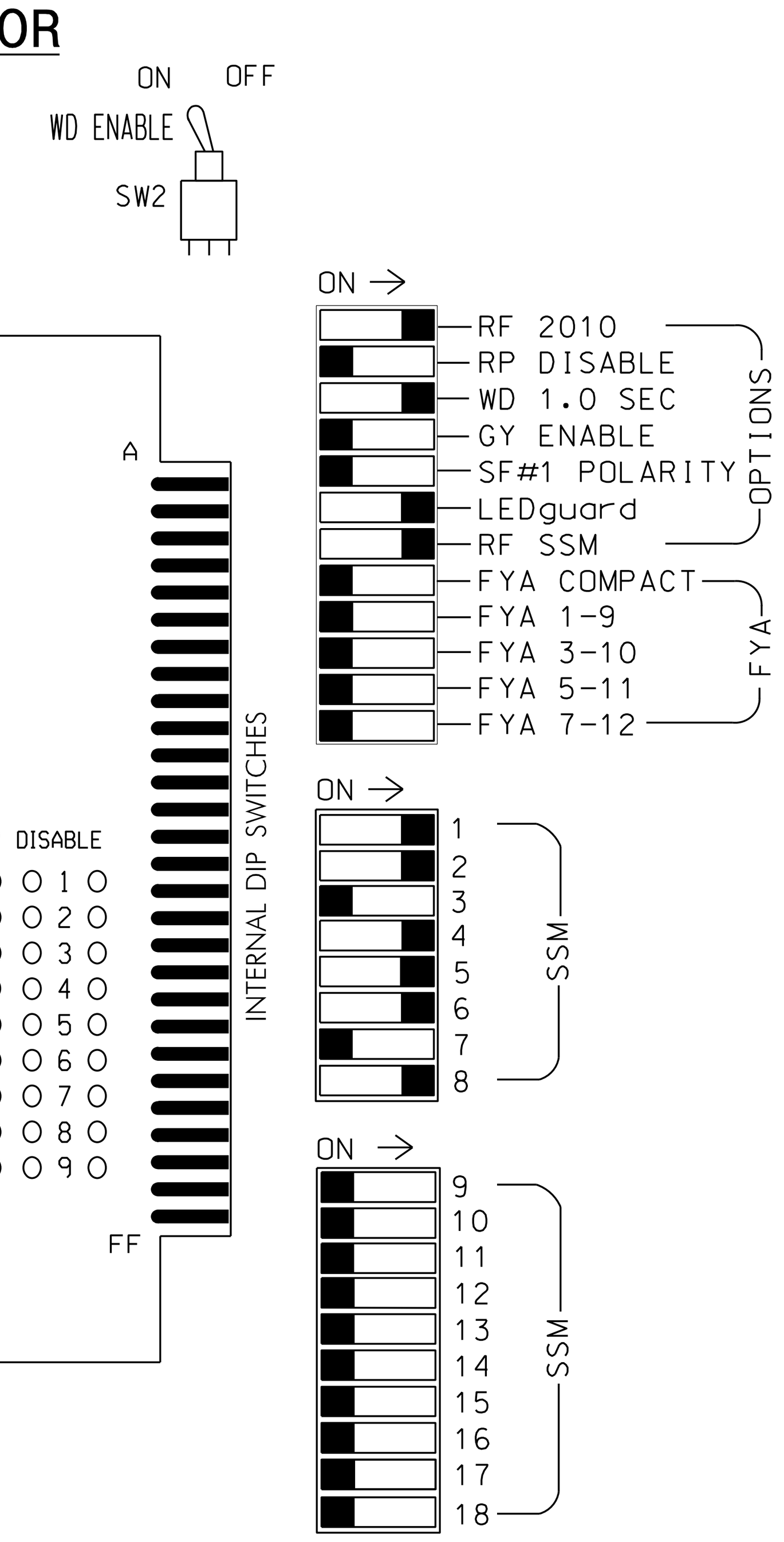
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(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



■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Return controller to Factory Defaults before programming per this electrical detail.
3. Program phases 4 and 8 for Dual Entry.
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..............2070
CABINET.................332 W/AUX
SOFTWARE................ECONOLITE ASC/3-2070
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S1,S2,S5,S7,S8,S11
PHASES USED.............1,2,4,5,6,8
OVERLAP "A".............NOT USED
OVERLAP "B".............NOT USED
OVERLAP "C".............NOT USED
OVERLAP "D".............NOT USED

✳ See overlap programming detail on sheet 2

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	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

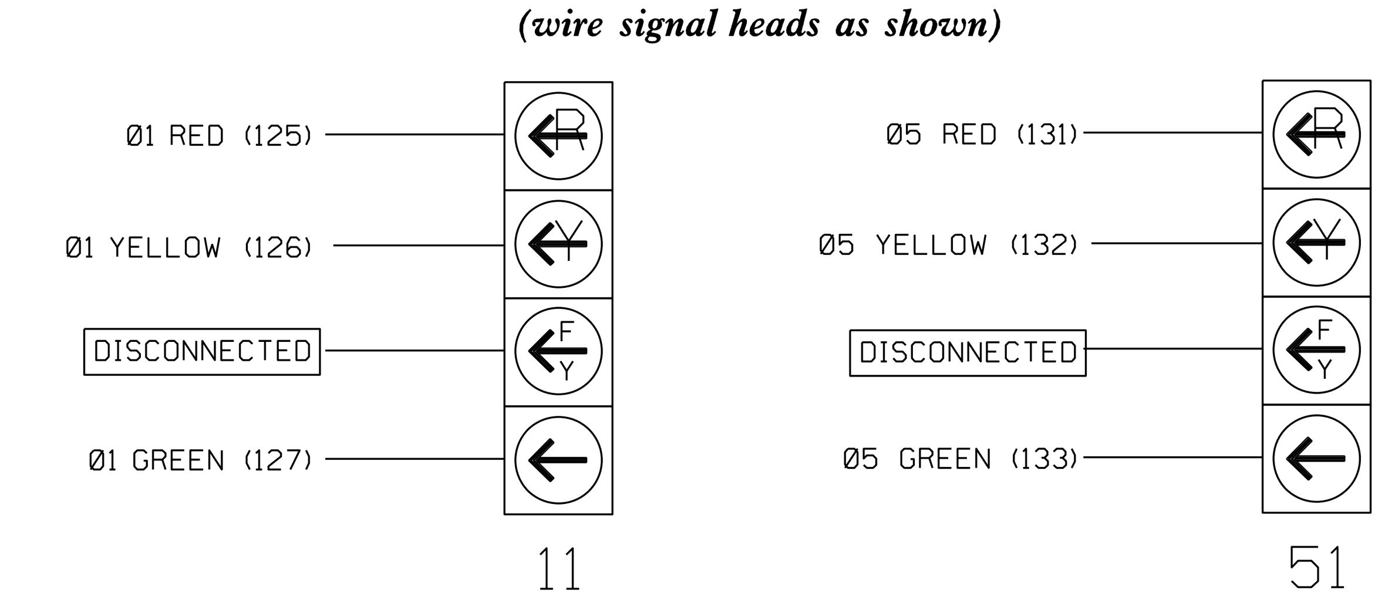
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

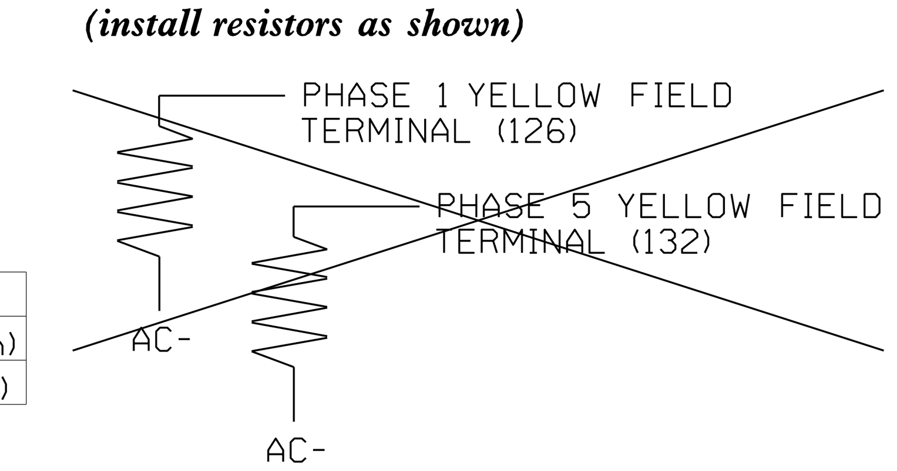
FS = FLASH SENSE
ST = STOP TIME

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)



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

DETECTOR NOTES

1. For all loops install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. Remove "Wired Inputs" from rear of input file to prevent unwanted calls to Phases 2 and 6.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0491T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Temporary Design 3 - TMP Phase III
Electrical Detail

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn
PREPARED BY: R M Muncey REVIEWED BY:

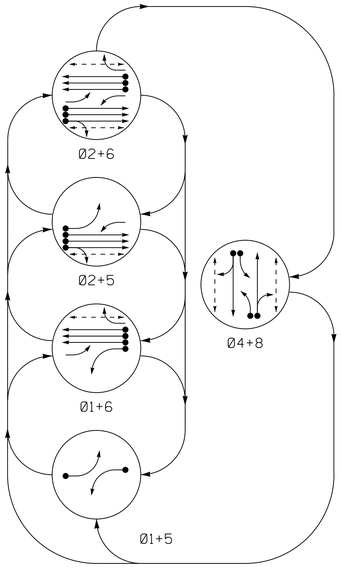
REVISIONS INIT. DATE

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

SIG. INVENTORY NO. 06-0491T3

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-35.0

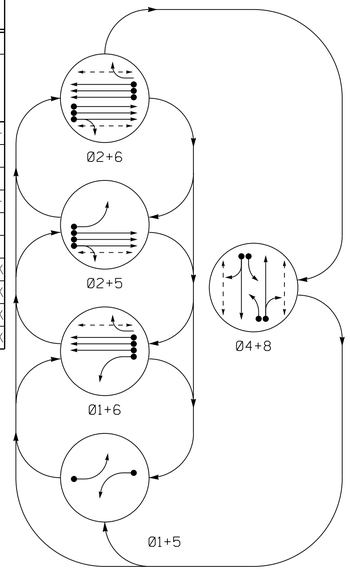
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←●	←	←F/Y	←F/Y	←R	←Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←F/Y	←	←F/Y	←R	←Y
61,62,63	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

ALTERNATE PHASING DIAGRAM

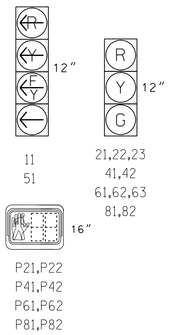


ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←●	←	←R	←R	←R	←Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←R	←	←R	←R	←Y
61,62,63	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	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	3	-	G	-	X
2A	6X6	300	4	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	4	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	4	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	6	X	6	Yes	-	-	X	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	3	-	S	-	X
8B	6X40	0	2-4-2	X	8	Yes	-	10	-	S	-	X

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

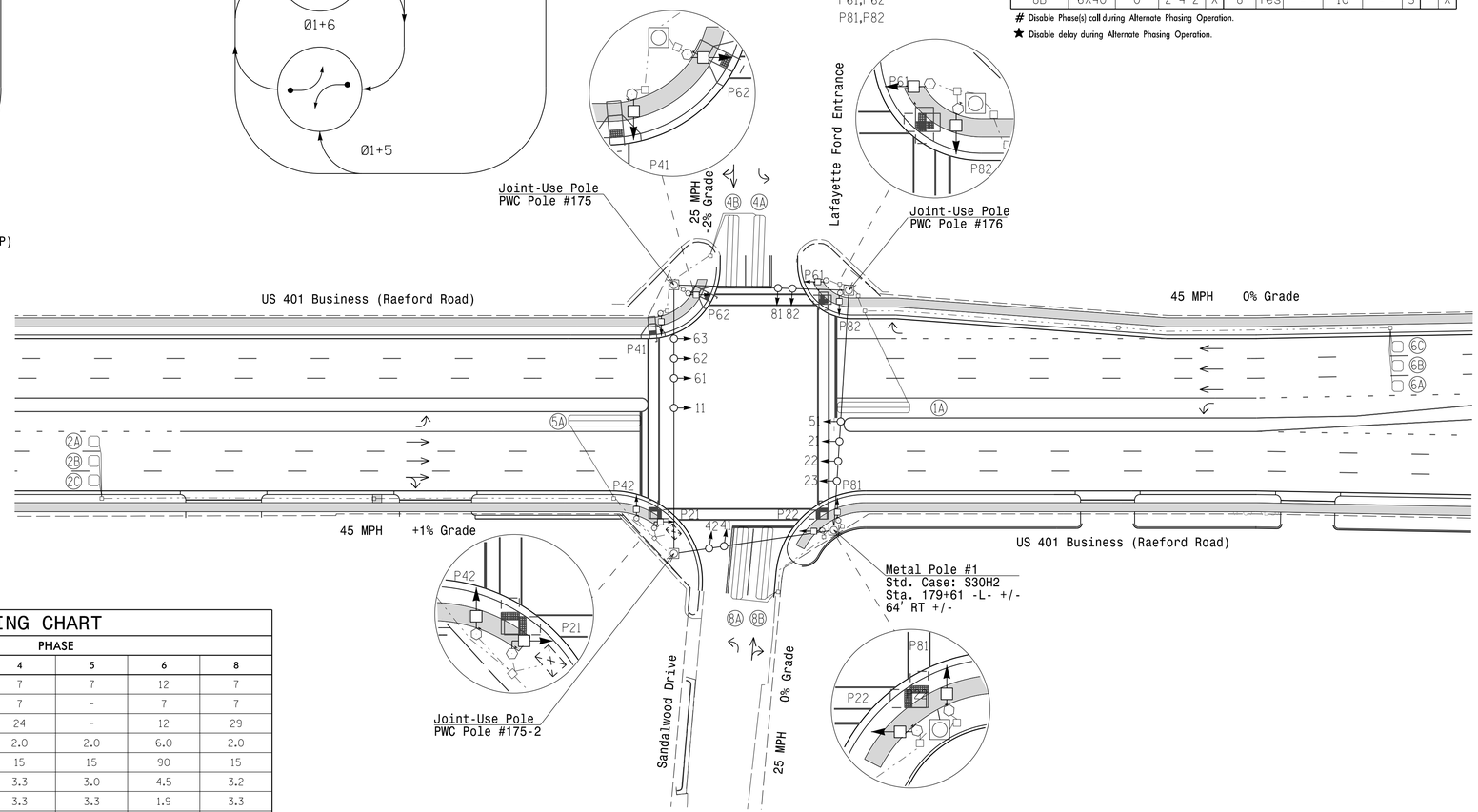
5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

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

PHASING DIAGRAM DETECTION LEGEND

- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←– – UNSIGNALIZED MOVEMENT
- <– – – > PEDESTRIAN MOVEMENT



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	7	7	-	7	7
Ped Clear	-	18	24	-	12	29
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	15	15	90	15
Yellow	3.0	4.5	3.3	3.0	4.5	3.2
Red Clear	2.9	1.9	3.3	3.3	1.9	3.3
Red Revert	-	-	-	-	-	-
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	-	-	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 With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	- - -
⊠	Controller & Cabinet	⊠
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
◯	Metal Strain Pole	■
⬡	Type II Signal Pedestal	⬢

Signal Upgrade - Final Design

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

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Lafayette Ford Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

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

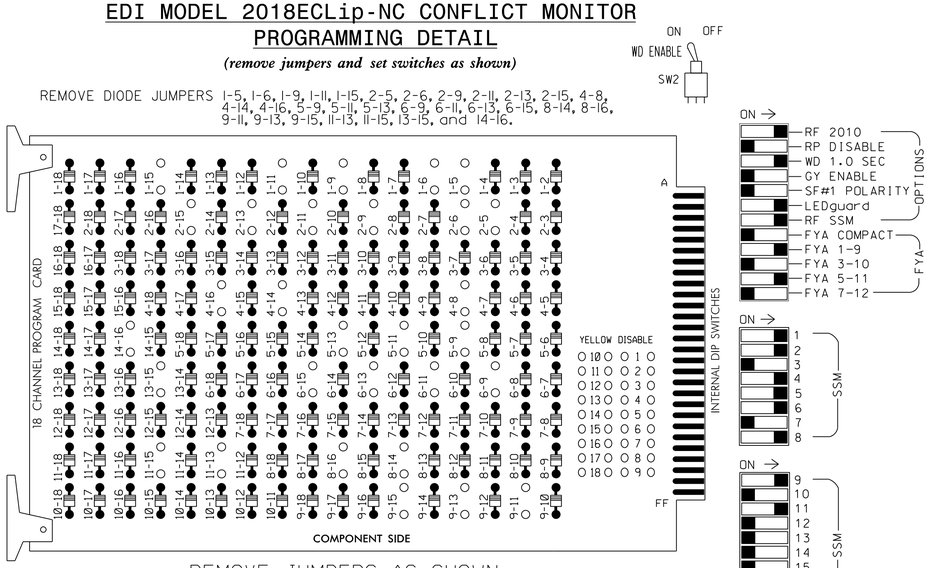
SIG. INVENTORY NO. 06-0491

3/29/2018
10:07:51 AM
U:\Traffic\Projects\Signals\Designs\Signal Designs\Final Signal Designs\U-4405_sig_dsn_06-0491 Final.dgn
User:rmuncey

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 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. Program controller to start up in phase 2 Walk and 6 Walk.
4. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-35.1

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★	21,22, 23	P21, P22	NU	41,42	P41, P42	51★	61,62, 63	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

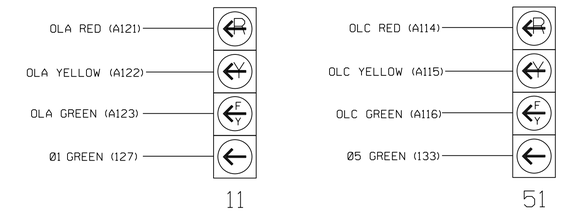
NU = Not Used

* 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	Ø1 1A	Ø2 2A	Ø2 2C	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	NOT USED	Ø2 2B	NOT USED			Ø4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	Ø6 6C	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B	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	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1★	1	YES		15		S
	-	J4U	48	26★	6	YES		3		G
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
2C	TB2-9,10	I3U	63	32	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		S
4B	TB4-11,12	I6L	45	14	4	YES		10		S
5A [2]	TB3-1,2	J1U	55	5★	5	YES		15		S
	-	I4U	47	22★	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
6C	TB3-9,10	J3U	64	36	6	YES			X	N
8A	TB5-9,10	J6U	42	8	8	YES		3		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.

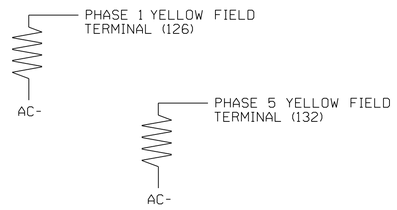
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
★ See vehicle detector setup programming detail for alternate phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0491
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:
NC Department of Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Layfayette Ford Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0491

DATE:
U:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0491.dgn
User:rmuncey

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

Toggle Twice

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

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.

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-35.2

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

SF BITS 1.5:	Modifies overlap parent phases for heads 11, and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds. Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0491
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

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PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II

DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0491

DATE:
User:rcoffie\&Signals\&Design\&Electrical Details\&Final Signals\&U-4405_sig_ele_06-0491.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-35.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP

PROGRAMMING DETAIL FOR ALTERNATE PHASING

LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

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

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

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

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

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

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

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

ENSURE PHASE IS SET TO "0" →

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

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

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

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

ENSURE PHASE IS SET TO "0" →

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

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN

PROGRAMMING DETAIL

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0491
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

NC DEPARTMENT OF TRANSPORTATION Mobility and Safety Division Traffic Engineering Branch Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Sandalwood Drive/
Layfayette Ford Entrance

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

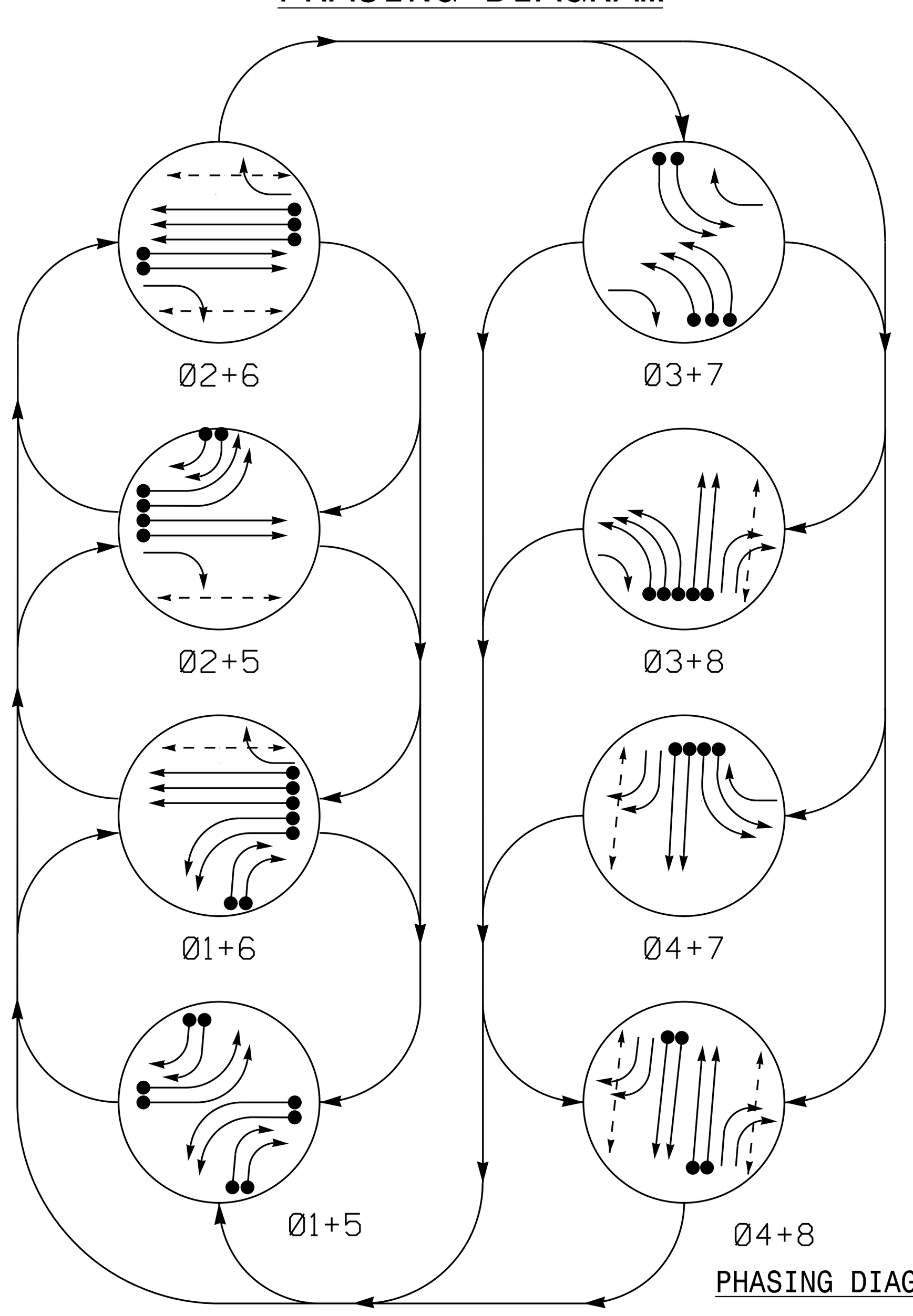
DocuSigned by:
SIGNATURE 3/29/2018
DATE

SIG. INVENTORY NO. 06-0491

DATE
11:47:07
C:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0491.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-36.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

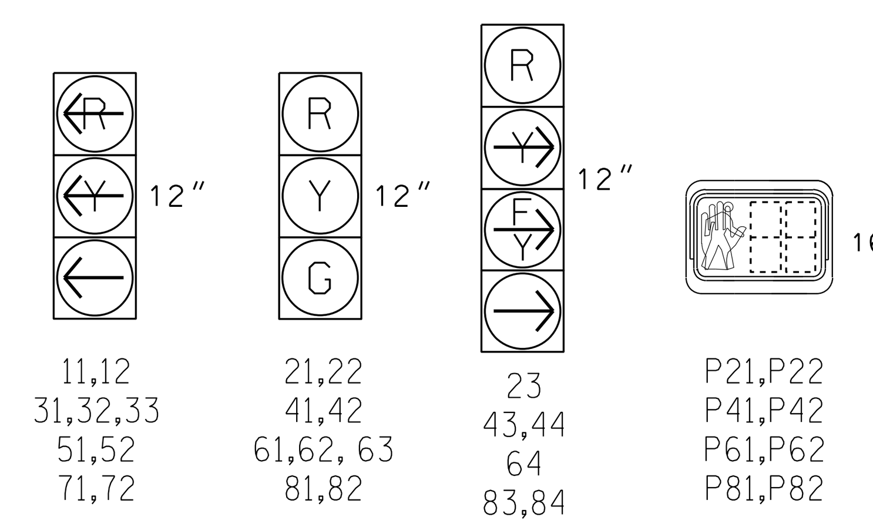
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11,12	←	←	←R	←R	←R	←R	←R	←R	←R
21,22	R	R	G	G	R	R	R	R	Y
23	R	R	F/Y→	F/Y→	→	→	R	R	Y→
31,32,33	←R	←R	←R	←R	←	←	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
43,44	→	R	→	R	R	R	F/Y→	F/Y→	R
51,52	←	←R	←	←R	←R	←R	←R	←R	←R
61,62,63	R	G	R	G	R	R	R	R	Y
64	R	F/Y→	R	F/Y→	→	R	→	R	Y→
71,72	←R	←R	←R	←R	←	←R	←	←R	←R
81,82	R	R	R	R	R	G	R	G	R
83,84	→	→	R	R	R	F/Y→	R	F/Y→	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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	X
1B	6X40	0	✳	-	1	Yes	-	-	-	S	-	X
1C	6X40	0	✳	-	1	Yes	-	15	-	S	-	X
1D	6X40	0	✳	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	X
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	X
3C	6X40	0	✳	-	3	Yes	-	-	-	S	-	X
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	X
5B	6X40	0	✳	-	5	Yes	-	-	-	S	-	X
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	X
5D	6X40	0	✳	-	5	Yes	-	15	-	S	-	X
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	✳	-	6	Yes	-	-	-	N	-	X

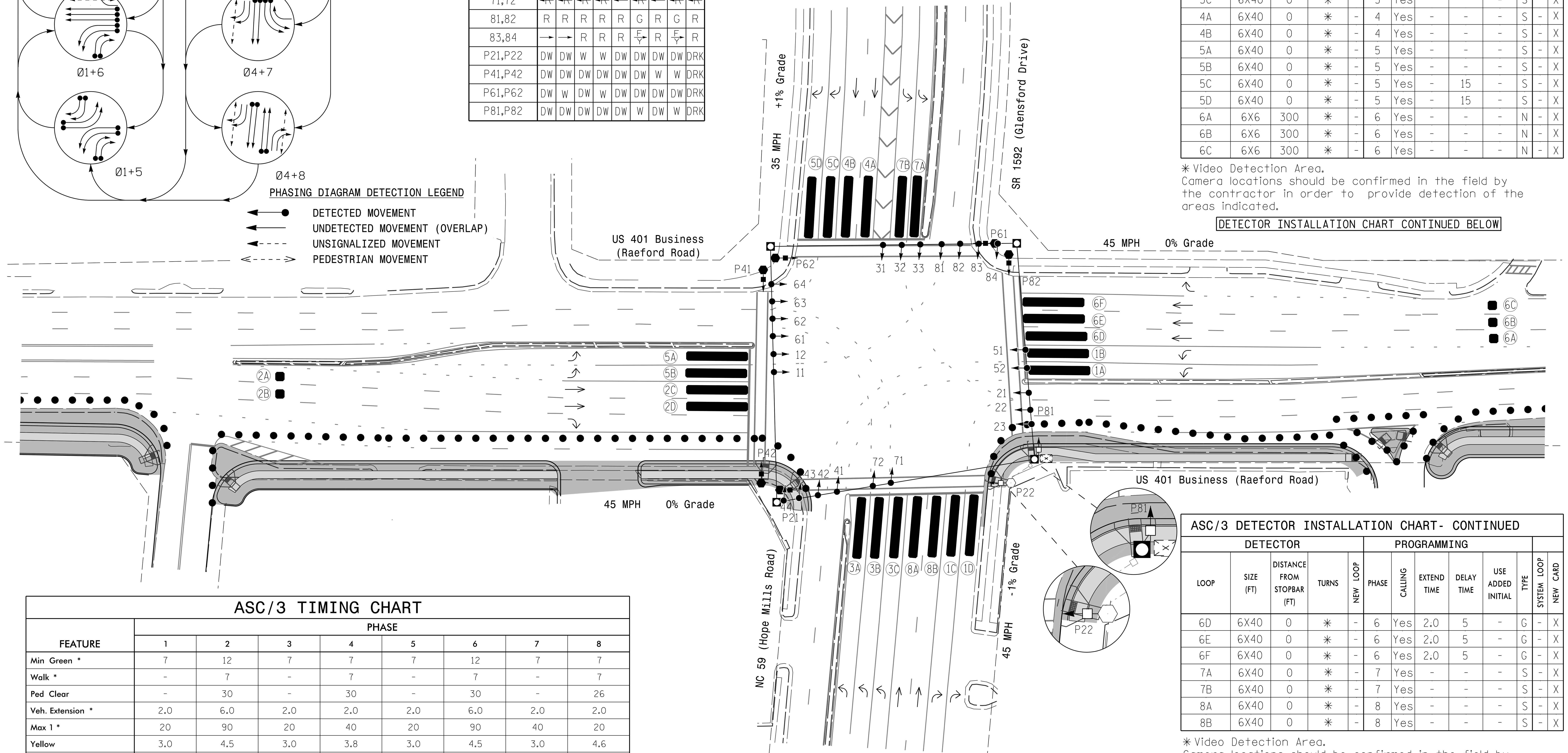
✳ Video Detection Area.
Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

DETECTOR INSTALLATION CHART CONTINUED BELOW

8 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads 23 and 24.
6. Set all detector units to presence mode.
7. Locate new fabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.



ASC/3 DETECTOR INSTALLATION CHART- CONTINUED

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	✳	-	7	Yes	-	-	-	S	-	X
7B	6X40	0	✳	-	7	Yes	-	-	-	S	-	X
8A	6X40	0	✳	-	8	Yes	-	-	-	S	-	X
8B	6X40	0	✳	-	8	Yes	-	-	-	S	-	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Type II Signal Pedestal	
	Video Detection Area	N/A
	Construction Zone	N/A
	Drums	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	30	-	30	-	30	-	26
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	40	20	90	40	20
Yellow	3.0	4.5	3.0	3.8	3.0	4.5	3.0	4.6
Red Clear	4.2	2.6	4.1	3.1	4.2	2.5	3.8	2.4
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	-	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 1 - TMP Phase I

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SCALE 0 40 1"=40'

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 | Cumberland County | Fayetteville

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

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L. WATSON

DocuSigned by: Betsy L. Watson 35E67BB34F8743F... SIGNATURE 3/29/2018 DATE

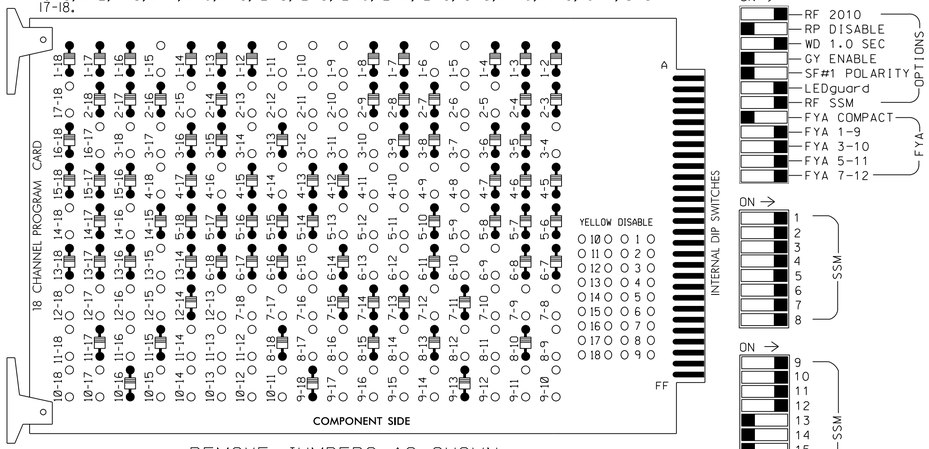
SIG. INVENTORY NO. 06-0155TI

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-36.1

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-10, I-11, I-15, 2-5, 2-6, 2-10, 2-11, 2-12, 2-13, 2-15, 3-4, 3-7, 3-10, 3-11, 3-12, 3-14, 3-17, 3-18, 4-8, 4-9, 4-10, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-10, 6-12, 6-13, 6-15, 7-8, 7-9, 7-10, 7-12, 7-16, 7-17, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 8-17, 9-10, 9-11, 9-12, 9-14, 9-15, 9-16, 9-17, 10-11, 10-12, 10-13, 10-14, 10-15, 10-17, 10-18, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 12-17, 12-18, 13-15, 14-16, 14-18, 16-17, and 17-18.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

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.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 S11,S12,AUXS1,AUXS2,AUXS3,AUXS4 AUXS5,AUXS6
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8, 8PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*
OVERLAP "E".....3
OVERLAP "F".....7
OVERLAP "G".....7
OVERLAP "H".....3

* 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	OLG	4	4 PED	5		6	6 PED	OLH	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	83,84★	21,22	P21, P22	64★	41,42	P41, P42	43,44★	51,52	61,62, 63	P61, P62	23★	81,82	P81, P82	83,84★	64★	31,32, 33	43,44★	23★	71,72
RED			128			101				134			107		A121	A124		A114	A101	
YELLOW			129		*	102				135		*	108							
GREEN			130			103				136			109							
RED ARROW	125								131								A111			A104
YELLOW ARROW	126								132						A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124					A113			A106
✋				113			104				119			110						
🚶				115			106				121			112						

NU = Not Used

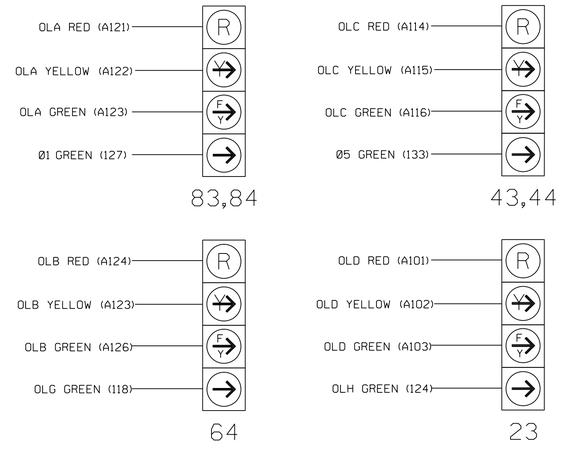
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

NOTE: Output functions for load switches S4 and S10 have been reassigned. See sheet 2 for details.

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE
PED PUSH BUTTONS					
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED
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

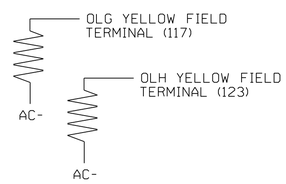
NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

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

SIG. INVENTORY NO. 06-0155T1

DATE: 3/29/2018
User:rmuncey
File: C:\Traffic\Signals\Designs\Electrical Details\Temporary Signals\Phase I\MU-4405_sig_ele_06-0155T1.dgn

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 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN 1 . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP B

Select TMG VEH OVLP [B] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[B] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[C] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP E

Select TMG VEH OVLP [E] and 'NORMAL'

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

Toggle Once

OVERLAP F

Select TMG VEH OVLP [F] and 'NORMAL'

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

Toggle Once

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

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

Toggle Once

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

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

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-36.2

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 and S10 as OLG and OLH, program LD SWITCH 3 as OVLP '7' TYPE 'O' and LD SWITCH 7 as OVLP '8' TYPE 'O' as shown below.

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

LD SWITCH ASSIGN

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

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155T1

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-36.3

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

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

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

```
LP#:  1  COPY FROM:  1  ACTIVE:  M  FALSE
IF    CTR PHASE TMING      1     IS ON
THEN  SIG SET OLP GREEN    1        OFF
ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEADS 83,84)

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

```
LP#:  2  COPY FROM:  2  ACTIVE:  M  FALSE
IF    VEH YELLOW ON PH     1     IS ON
THEN  SIG SET OLP YELLOW   1        ON
ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:  3  COPY FROM:  3  ACTIVE:  M  FALSE
IF    CTR PHASE TIMING     1     IS ON
AND   VEH RED ON PHASE     1     IS ON
THEN  SIG SET OLP RED      1        ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:  4  COPY FROM:  4  ACTIVE:  M  FALSE
IF    VEH OVERLAP          7     IS ON
THEN  SIG SET OVLP GREEN   2        OFF
ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLG, WHICH HAS PARENT PHASE 7 (HEAD 64)

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

```
LP#:  5  COPY FROM:  5  ACTIVE:  M  FALSE
IF    VEH OVERLAP YLW      7     IS ON
THEN  SIG SET OLP YELLOW   2        ON
ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLG, WHICH HAS PARENT PHASE 7 (HEAD 64)

ENTER A "6" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  6  COPY FROM:  6  ACTIVE:  M  FALSE
IF    VEH OVERLAP          7     IS ON
AND   VEH OVERLAP RED      7     IS ON
THEN  SIG SET OLP RED      2        ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLG, WHICH HAS PARENT PHASE 7 (HEAD 64)

ENTER A "7" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  7  COPY FROM:  7  ACTIVE:  M  FALSE
IF    CTR PHASE TMING      5     IS ON
THEN  SIG SET OLP GREEN    3        OFF
ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEADS 43,44)

ENTER A "8" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  8  COPY FROM:  8  ACTIVE:  M  FALSE
IF    VEH YELLOW ON PH     5     IS ON
THEN  SIG SET OLP YELLOW   3        ON
ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "9" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  9  COPY FROM:  9  ACTIVE:  M  FALSE
IF    CTR PHASE TIMING     5     IS ON
AND   VEH RED ON PHASE     5     IS ON
THEN  SIG SET OLP RED      3        ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "10" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  10  COPY FROM:  10  ACTIVE:  M  FALSE
IF    VEH OVERLAP          8     IS ON
THEN  SIG SET OVLP GREEN   4        OFF
ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLH, WHICH HAS PARENT PHASE 3 (HEAD 23)

ENTER A "11" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  11  COPY FROM:  11  ACTIVE:  M  FALSE
IF    VEH OVERLAP YLW      8     IS ON
THEN  SIG SET OLP YELLOW   4        ON
ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEAD 23)

ENTER A "12" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  12  COPY FROM:  12  ACTIVE:  M  FALSE
IF    VEH OVERLAP          8     IS ON
AND   VEH OVERLAP RED      8     IS ON
THEN  SIG SET OLP RED      4        ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEAD 23)

END PROGRAMMING

4. From LOGIC PROCESSOR Submenu select **1. LOGIC STATEMENT CONTROL**

ENABLE LOGIC PROCESSOR STATEMENTS 1-12 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:
Prepared in the Offices of:
Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation
750 N.Greenfield Pkwy,Garner,NC 27529

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045933 LAWRENCE E. OVERN II
DocuSigned by: 96367FF6849C4D3
SIGNATURE 3/29/2018 DATE
SIG. INVENTORY NO. 06-0155T1

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-37.0

PHASING DIAGRAM

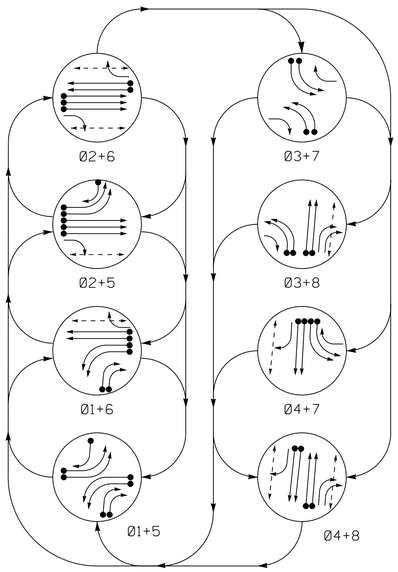
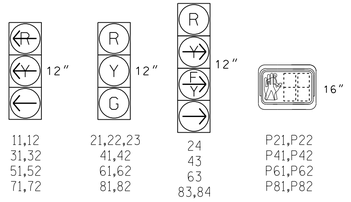


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11,12	←●	←●	←R	←R	←R	←R	←R	←R	←R
21,22,23	R	R	G	G	R	R	R	R	Y
24	R	R	F Y	F Y	→●	→●	R	R	←Y
31,32	←R	←R	←R	←R	←●	←●	←R	←R	←R
41,42	R	R	R	R	R	R	G	G	R
43	→●	R	→●	R	R	R	F Y	F Y	R
51,52	←●	←R	←●	←R	←R	←R	←R	←R	←R
61,62	R	G	R	G	R	R	R	R	Y
63	R	F Y	R	F Y	→●	→●	R	R	←Y
71,72	←R	←R	←R	←R	←●	←●	←R	←R	←R
81,82	R	R	R	R	R	G	R	G	R
83,84	→●	→●	R	R	R	F Y	R	F Y	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

SIGNAL FACE I.D.

All Heads L.E.D.



11,12
31,32
51,52
71,72

21,22,23
41,42
61,62
81,82

24
43
63
83,84

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

ASC/3 DETECTOR INSTALLATION CHART

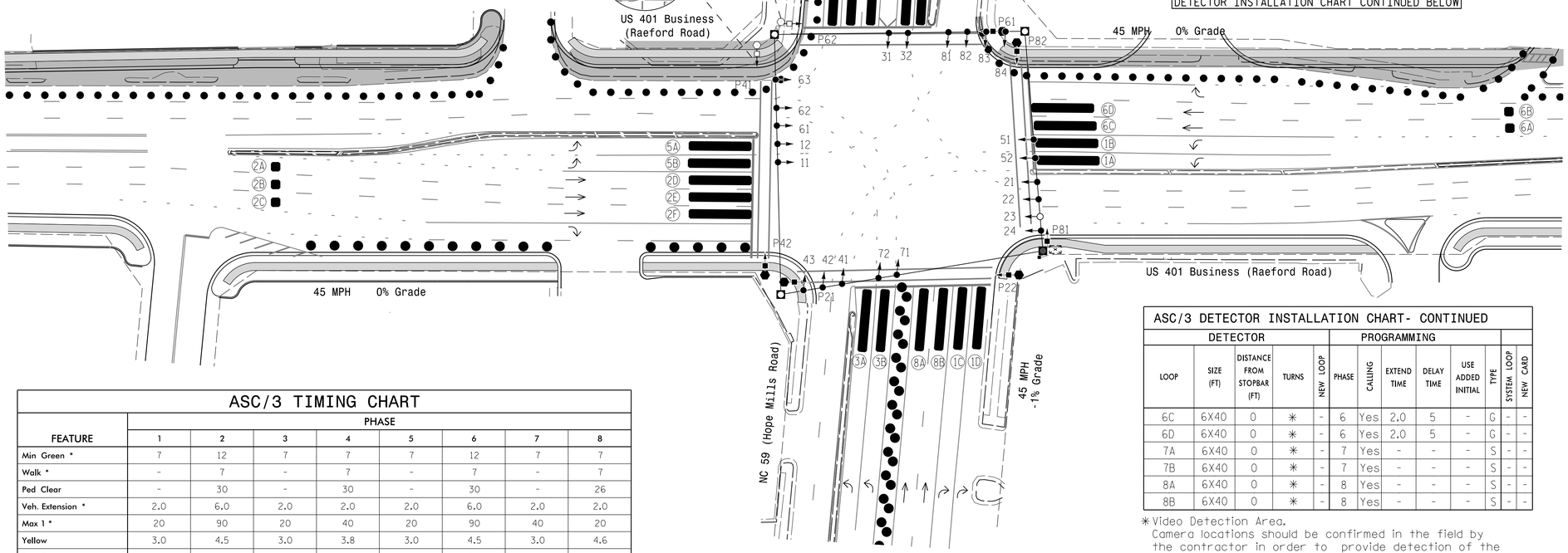
DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1B	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1C	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
1D	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2E	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2F	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-

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

DETECTOR INSTALLATION CHART CONTINUED BELOW

PHASING DIAGRAM DETECTION LEGEND

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



ASC/3 DETECTOR INSTALLATION CHART- CONTINUED

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
7A	6X40	0	✳	-	7	Yes	-	-	-	S	-	-
7B	6X40	0	✳	-	7	Yes	-	-	-	S	-	-
8A	6X40	0	✳	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	✳	-	8	Yes	-	-	-	S	-	-

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

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	30	-	30	-	30	-	26
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	40	20	90	40	20
Yellow	3.0	4.5	3.0	3.8	3.0	4.5	3.0	4.6
Red Clear	4.2	2.6	3.9	3.1	4.2	2.6	3.8	2.4
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	-	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

8 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal head 24 and 63.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	———
→	Directional Arrow	→
◎	Metal Strain Pole	■
⬡	Type II Signal Pedestal	⬢
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
●●●	Drums	N/A

Signal Upgrade
Temporary Design 2 - TMP Phase II

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SCALE 0 40 1"=40'

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155T2

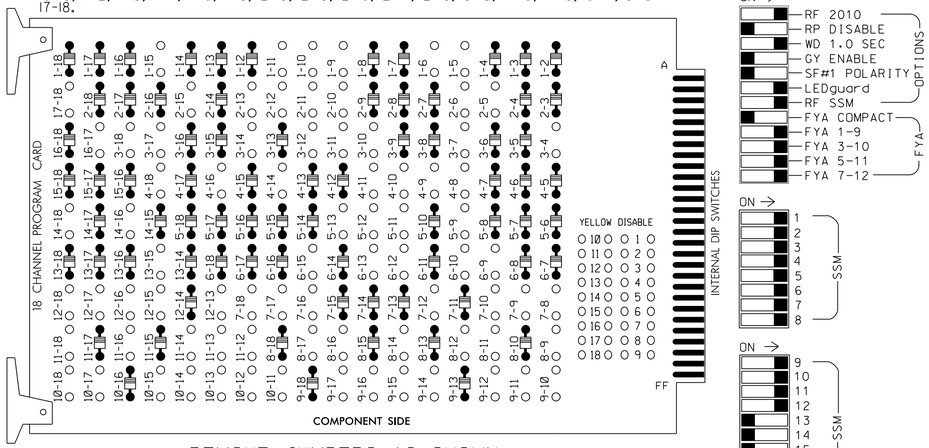
3/29/2018
10:09:12 AM
User:rmuncey
U:\Projects\Signals\Designs\Signal Designs\Temporary Signal Designs\Phase 2\U-4405_sig_dsn_06-0155T2.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

REMOVE DIODE JUMPERS I-5, I-6, I-9, I-10, I-11, I-15, 2-5, 2-6, 2-10, 2-11, 2-12, 2-13, 2-15, 3-4, 3-7, 3-10, 3-11, 3-12, 3-14, 3-17, 3-18, 4-8, 4-9, 4-10, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-10, 6-12, 6-13, 6-15, 7-8, 7-9, 7-10, 7-12, 7-16, 7-17, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 8-17, 9-10, 9-11, 9-12, 9-14, 9-15, 9-16, 9-17, 10-11, 10-12, 10-13, 10-14, 10-15, 10-17, 10-18, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 12-17, 12-18, 13-15, 14-16, 14-18, 16-17, and 17-18.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

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.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 S11,S12,AUXS1,AUXS2,AUXS3,AUXS4 AUXS5,AUXS6
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8, 8PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*
OVERLAP "E".....3
OVERLAP "F".....7
OVERLAP "G".....7
OVERLAP "H".....3

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-37.1

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	OLG	4	4 PED	5		6	6 PED	OLH	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	83,84★	21,22, 23	P21, P22	63★	41,42	P41, P42	43★	51,52	61,62	P61, P62	24★	81,82	P81, P82	83,84★	63★	31,32	43★	24★	71,72
RED			128			101				134			107		A121	A124		A114	A101	
YELLOW			129		*	102				135		*	108							
GREEN			130			103				136			109							
RED ARROW	125								131								A111			A104
YELLOW ARROW	126								132						A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127	127			118			133	133			124					A113			A106
✋				113			104				119			110						
🚶				115			106				121			112						

NU = Not Used

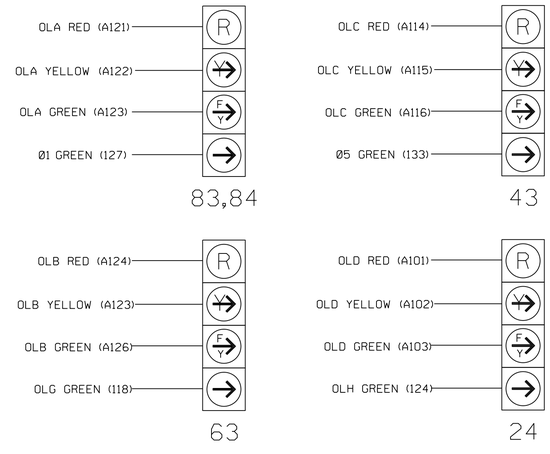
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

NOTE: Output functions for load switches S4 and S10 have been reassigned. See sheet 2 for details.

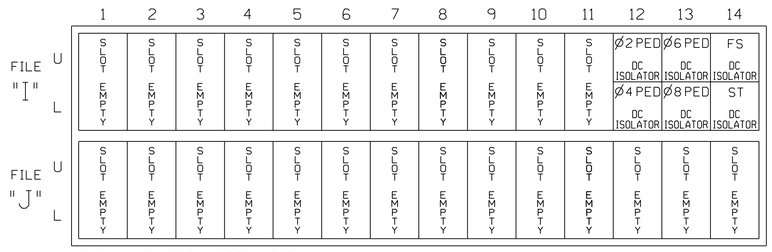
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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
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

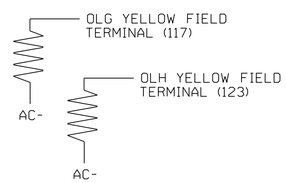
NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)



SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155T2

DATE: 3/29/2018
User:Office\Signals\Designs\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0155T2.dgn
User:rmuncey

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 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN 1 . . . . . 1 . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP B

Select TMG VEH OVLP [B] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[B] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X X . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . . . . . 1 1 . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[C] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . . . 1 1 . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X X . . . . . . . . . . . . .
PROTECT  . . . . . . . . . . . . . . . .
PED PRTC . . . . . . . . . . . . . . . .
NOT OVLP . . . . . . . . . . . . . . . .
FLSH GRN . 1 1 . . . . . . . . . . . . .
LAG X PH . . . . . . . . . . . . . . . .
LAG 2 PH . . . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP E

Select TMG VEH OVLP [E] and 'NORMAL'

```
TMG VEH OVLP...[E] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP F

Select TMG VEH OVLP [F] and 'NORMAL'

```
TMG VEH OVLP...[F] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```
TMG VEH OVLP...[G] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

```
TMG VEH OVLP...[H] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-37.2

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S4 and S10 as OLG and OLH, program LD SWITCH 3 as OVLP '7' TYPE 'O' and LD SWITCH 7 as OVLP '8' TYPE 'O' as shown below.

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

LD SWITCH ASSIGN

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

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Division 6 | Cumberland County | Fayetteville

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

REVISIONS	INIT.	DATE

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

SIG. INVENTORY NO. 06-0155T2

DATE:
File:
User:rmurcay

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-37.3

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

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

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

```
LP#:   1  COPY FROM:   1  ACTIVE:  M   FALSE
IF     CTR PHASE TMING       1     IS ON
THEN   SIG SET OLP GREEN     1       OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEADS 83,84)

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

```
LP#:   2  COPY FROM:   2  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH      1     IS ON
THEN   SIG SET OLP YELLOW    1       ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:   3  COPY FROM:   3  ACTIVE:  M   FALSE
IF     VEH RED ON PHASE      1     IS ON
AND    CTR PHASE TIMING      1     IS ON
THEN   SIG SET OLP RED       1       ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:   4  COPY FROM:   4  ACTIVE:  M   FALSE
IF     VEH OVERLAP           7     IS ON
THEN   SIG SET OVLP GREEN    2       OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLG. WHICH HAS PARENT PHASE 7 (HEAD 63)

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

```
LP#:   5  COPY FROM:   5  ACTIVE:  M   FALSE
IF     VEH OVERLAP YLW       7     IS ON
THEN   SIG SET OLP YELLOW    2       ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLG. WHICH HAS PARENT PHASE 7 (HEAD 63)

ENTER A "6" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   6  COPY FROM:   6  ACTIVE:  M   FALSE
IF     VEH OVERLAP           7     IS ON
AND    VEH OVERLAP RED       7     IS ON
THEN   SIG SET OLP RED       2       ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLG. WHICH HAS PARENT PHASE 7 (HEAD 63)

ENTER A "7" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   7  COPY FROM:   7  ACTIVE:  M   FALSE
IF     CTR PHASE TMING       5     IS ON
THEN   SIG SET OLP GREEN     3       OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEAD 43)

ENTER A "8" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   8  COPY FROM:   8  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH      5     IS ON
THEN   SIG SET OLP YELLOW    3       ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 5 (HEAD 43)

ENTER A "9" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:   9  COPY FROM:   9  ACTIVE:  M   FALSE
IF     VEH RED ON PHASE      5     IS ON
AND    CTR PHASE TIMING      5     IS ON
THEN   SIG SET OLP RED       3       ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 5 (HEAD 43)

ENTER A "10" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  10  COPY FROM:  10  ACTIVE:  M   FALSE
IF     VEH OVERLAP           8     IS ON
THEN   SIG SET OVLP GREEN    4       OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLH. WHICH HAS PARENT PHASE 3 (HEAD 24)

ENTER A "11" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  11  COPY FROM:  11  ACTIVE:  M   FALSE
IF     VEH OVERLAP YLW       8     IS ON
THEN   SIG SET OLP YELLOW    4       ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLH. WHICH HAS PARENT PHASE 3 (HEAD 24)

ENTER A "12" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:  12  COPY FROM:  12  ACTIVE:  M   FALSE
IF     VEH OVERLAP           8     IS ON
AND    VEH OVERLAP RED       8     IS ON
THEN   SIG SET OLP RED       4       ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLH. WHICH HAS PARENT PHASE 3 (HEAD 24)

END PROGRAMMING

4. From LOGIC PROCESSOR Submenu select **1. LOGIC STATEMENT CONTROL**

ENABLE LOGIC PROCESSOR STATEMENTS 1-12 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

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

DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0155T2

DATE:
USER:traffic
C:\Signals\Design\Electrical Details\Temporary Signals\Phase 2\U-4405_sig_ele_06-0155T2.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-38.0

8 Phase Fully Actuated Fayetteville Signal System

PHASING DIAGRAM

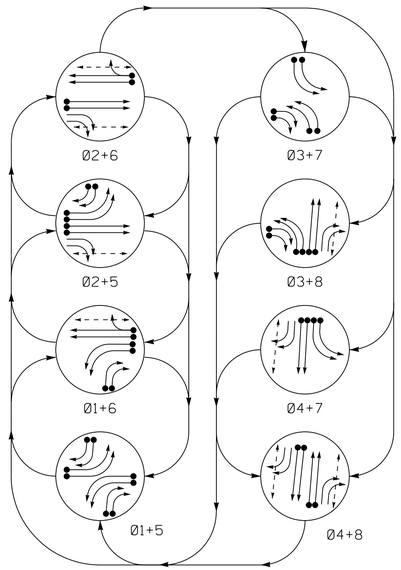


TABLE OF OPERATION

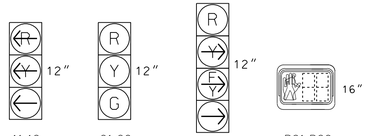
SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11,12	←	←	↛R	↛R	↛R	↛R	↛R	↛R	↛R
21,22	R	R	G	G	R	R	R	R	Y
23,24	R	R	F/Y	F/Y	→	→	R	R	↛R
31,32	↛R	↛R	↛R	↛R	←	←	↛R	↛R	↛R
41,42	R	R	R	R	R	R	G	G	R
43,44	→	R	→	R	R	R	F/Y	F/Y	R
51,52	←	↛R	←	↛R	↛R	↛R	↛R	↛R	↛R
61,62	R	G	R	G	R	R	R	R	Y
71,72	↛R	↛R	↛R	↛R	←	↛R	←	↛R	↛R
81,82	R	R	R	R	R	G	R	G	R
83,84	→	→	R	R	R	F/Y	R	F/Y	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	W	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

PHASING DIAGRAM DETECTION LEGEND

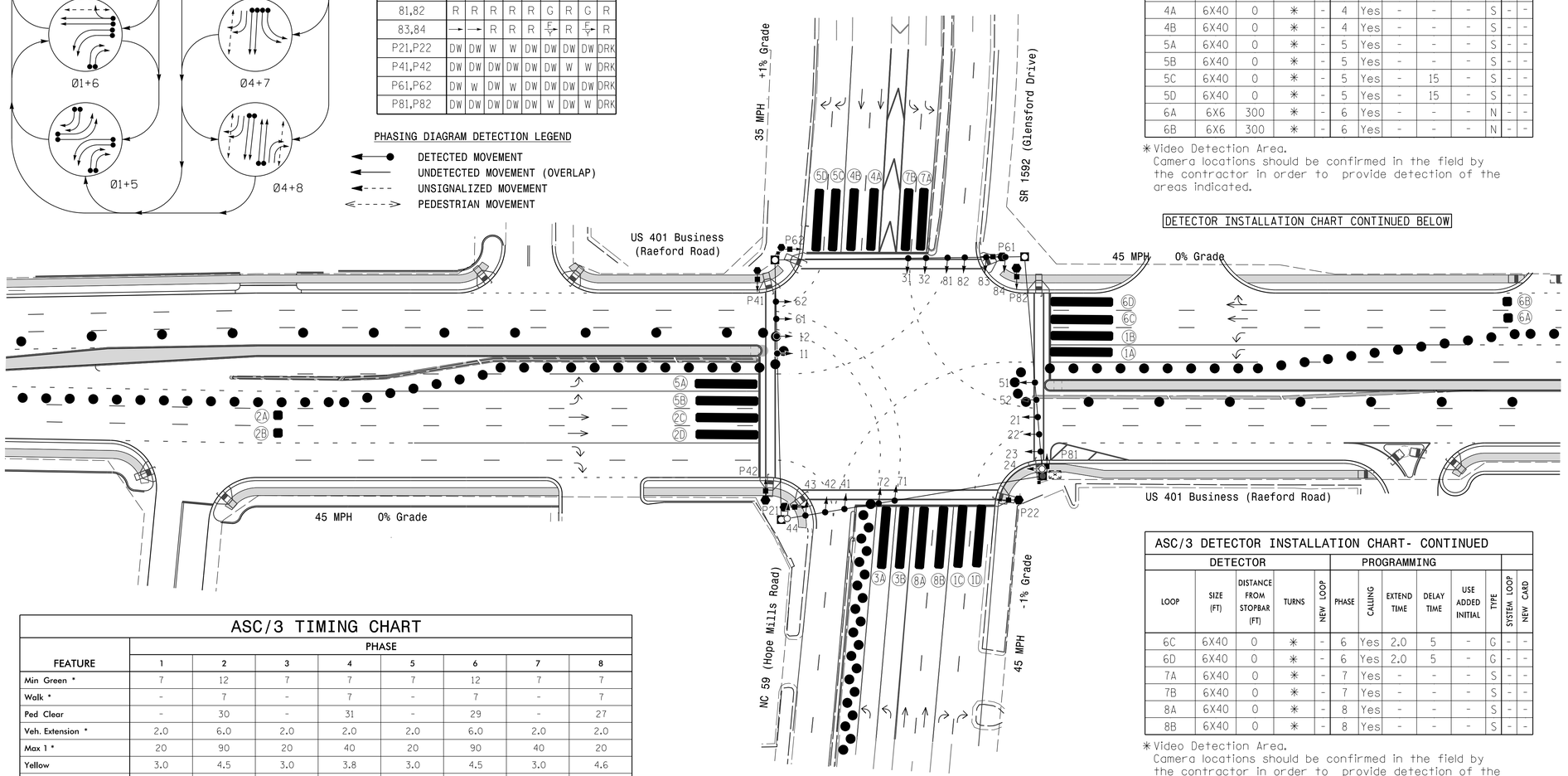
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



11,12 31,32 51,52 71,72 — 21,22 41,42 61,62 81,82 — 23,24 43,44 83,84 — P21,P22 P41,P42 P61,P62 P81,P82



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING: PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1B	6X40	0	✳	-	1	Yes	-	-	-	S	-	-
1C	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
1D	6X40	0	✳	-	1	Yes	-	15	-	S	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
3A	6X40	0	✳	-	3	Yes	-	3	-	S	-	-
3B	6X40	0	✳	-	3	Yes	-	-	-	S	-	-
4A	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	-	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	✳	-	5	Yes	-	-	-	S	-	-
5C	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
5D	6X40	0	✳	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-

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

DETECTOR INSTALLATION CHART CONTINUED BELOW

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads 11, 12, 22, 23, 31, 32, 51, 52, 61, and 62.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

ASC/3 DETECTOR INSTALLATION CHART- CONTINUED

DETECTOR: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING: PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
7A	6X40	0	✳	-	7	Yes	-	-	-	S	-	-
7B	6X40	0	✳	-	7	Yes	-	-	-	S	-	-
8A	6X40	0	✳	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	✳	-	8	Yes	-	-	-	S	-	-

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
◎	Metal Strain Pole	□
○	Type II Signal Pedestal	⬢
▬	Video Detection Area	N/A
▬	Construction Zone	N/A
●●●	Drums	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	30	-	31	-	29	-	27
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	40	20	90	40	20
Yellow	3.0	4.5	3.0	3.8	3.0	4.5	3.0	4.6
Red Clear	4.3	2.8	4.2	3.1	3.9	2.8	4.0	2.4
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	-	-	-	-	-	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

Signal Upgrade
Temporary Design 3 - TMP Phase III

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

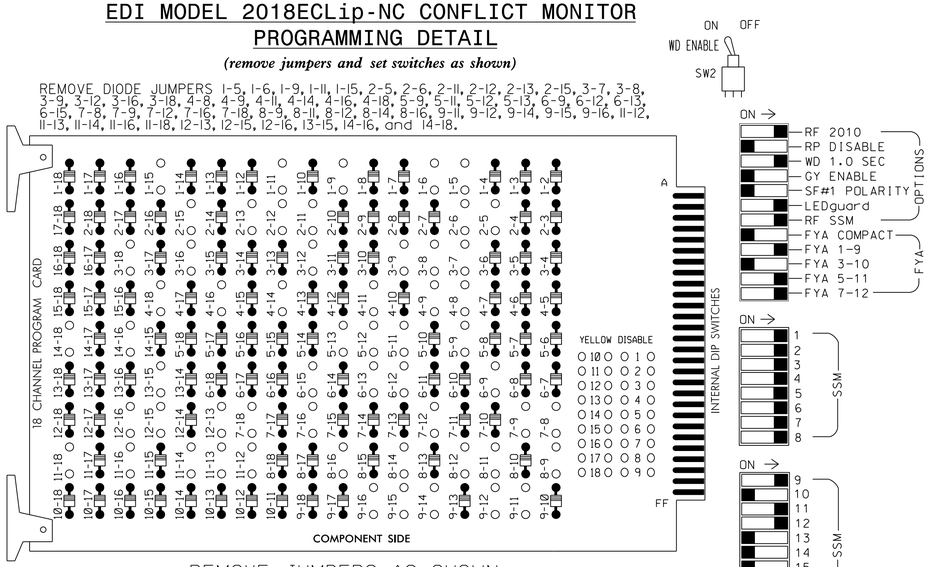
REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155T3

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, 2-11, 2-12, 2-13, 2-15, 3-7, 3-8, 3-9, 3-12, 3-16, 3-18, 4-8, 4-9, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-12, 6-13, 6-15, 7-8, 7-9, 7-12, 7-16, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 9-11, 9-12, 9-14, 9-15, 9-16, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 13-15, 14-16, and 14-18.



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

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

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.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 S11,S12,AUXS1,AUXS4,AUXS5,AUXS6
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8, 8PED
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....*
OVERLAP "F".....7
OVERLAP "H".....3
* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-38.1

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	OLH	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	83,84★	21,22	P21, P22	31,32	41,42	P41, P42	43,44★	51,52	61,62	P61, P62	23,24★	81,82	P81, P82	83,84★	NU	NU	43,44★	23,24★	71,72
RED			128			101				134			107		A121			A114	A101	
YELLOW			129			102				135		*	108							
GREEN			130			103				136			109							
RED ARROW	125				116				131											A104
YELLOW ARROW	126				117				132						A122			A115	A102	A105
FLASHING YELLOW ARROW															A123			A116	A103	
GREEN ARROW	127	127			118			133	133			124								A106
✋				113			104				119			110						
🚶				115			106				121			112						

NU = Not Used

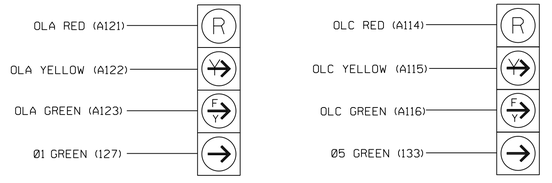
* Denotes install load resistor. See load resistor installation detail this sheet.

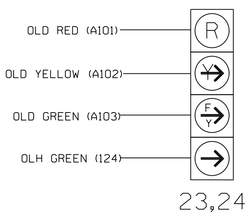
★ See pictorial of head wiring in detail this sheet.

NOTE: Output functions for load switch S10 have been reassigned. See sheet 2 for details.

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	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE
PED PUSH BUTTONS					
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED
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

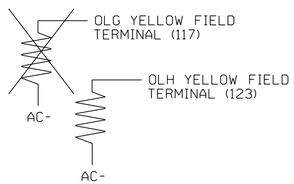
SPECIAL DETECTOR NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)

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



IMPORTANT! Remove resistor from field terminal as shown above, if present.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE-DATE
DATE
SIG. INVENTORY NO. 06-0155T3

DATE
User:rmuckey
U:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0155T3.dgn

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 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN 1 . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[C] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:[OTHER/ECONOLITE]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP F

Select TMG VEH OVLP [F] and 'NORMAL'

```
TMG VEH OVLP...[F] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Twice

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

```
TMG VEH OVLP...[H] TYPE: ......[NORMAL]
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-38.2

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S10 as OLH, program LD SWITCH 7 as OVLP '8' TYPE 'O' as shown below.

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

LD SWITCH ASSIGN

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

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155T3

DATE
U:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 3\U-4405_sig_ele_06-0155T3.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-38.3

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

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

3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

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

```
LP#:    1  COPY FROM:    1  ACTIVE:  M   FALSE
IF     CTR PHASE TMING        1      IS ON
THEN   SIG SET OLP GREEN      1         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEADS 83,84)

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

```
LP#:    2  COPY FROM:    2  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH       1      IS ON
THEN   SIG SET OLP YELLOW     1         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:    3  COPY FROM:    3  ACTIVE:  M   FALSE
IF     CTR PHASE TIMING       1      IS ON
AND    VEH RED ON PHASE       1      IS ON
THEN   SIG SET OLP RED        1         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:    4  COPY FROM:    4  ACTIVE:  M   FALSE
IF     CTR PHASE TMING        5      IS ON
THEN   SIG SET OLP GREEN      3         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEADS 43,44)

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

```
LP#:    5  COPY FROM:    5  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH       5      IS ON
THEN   SIG SET OLP YELLOW     3         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "6" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    6  COPY FROM:    6  ACTIVE:  M   FALSE
IF     CTR PHASE TIMING       5      IS ON
AND    VEH RED ON PHASE       5      IS ON
THEN   SIG SET OLP RED        3         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "7" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    7  COPY FROM:    7  ACTIVE:  M   FALSE
IF     VEH OVERLAP            8      IS ON
THEN   SIG SET OVLP GREEN     4         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLH, WHICH HAS PARENT PHASE 3 (HEADS 23,24)

ENTER A "8" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    8  COPY FROM:    8  ACTIVE:  M   FALSE
IF     VEH OVERLAP YLW        8      IS ON
THEN   SIG SET OLP YELLOW     4         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEADS 23,24)

ENTER A "9" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    9  COPY FROM:    9  ACTIVE:  M   FALSE
IF     VEH OVERLAP            8      IS ON
AND    VEH OVERLAP RED        8      IS ON
THEN   SIG SET OLP RED        4         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEADS 23,24)

END PROGRAMMING

4. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-9 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

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

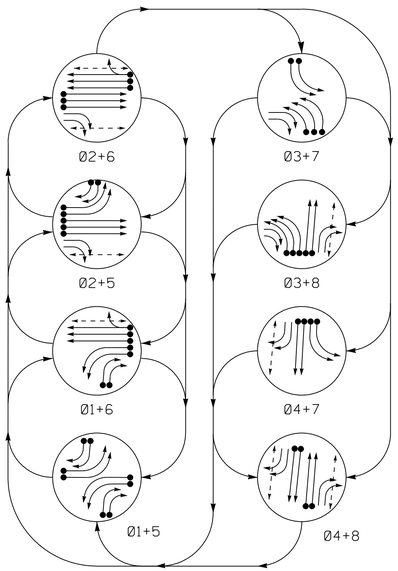
DocuSigned by:
3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0155T3

DATE
11:44 P:\Office\Signals\Design\Electrical Details*Temporary Signals*Phase 3\U-4405_sig_ele_06-0155t3.dgn
User:rmuckey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-39.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

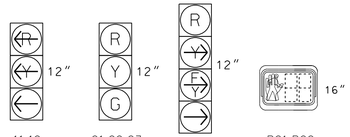
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3 + 7	0 3 + 8	0 4 + 7	0 4 + 8	FLASH
11,12	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	
21,22,23	R	R	G	G	R	R	R	R	Y
24,25	R	R	F Y	F Y	→	→	R	R	~~Y~~
31,32,33	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
41,42	R	R	R	R	R	R	G	G	R
43,44	→	R	→	R	R	R	F Y	F Y	R
51,52	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61,62,63	R	G	R	G	R	R	R	R	Y
71,72	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
81,82	R	R	R	R	R	G	R	G	R
83,84	→	→	R	R	R	F Y	R	F Y	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

SIGNAL FACE I.D.

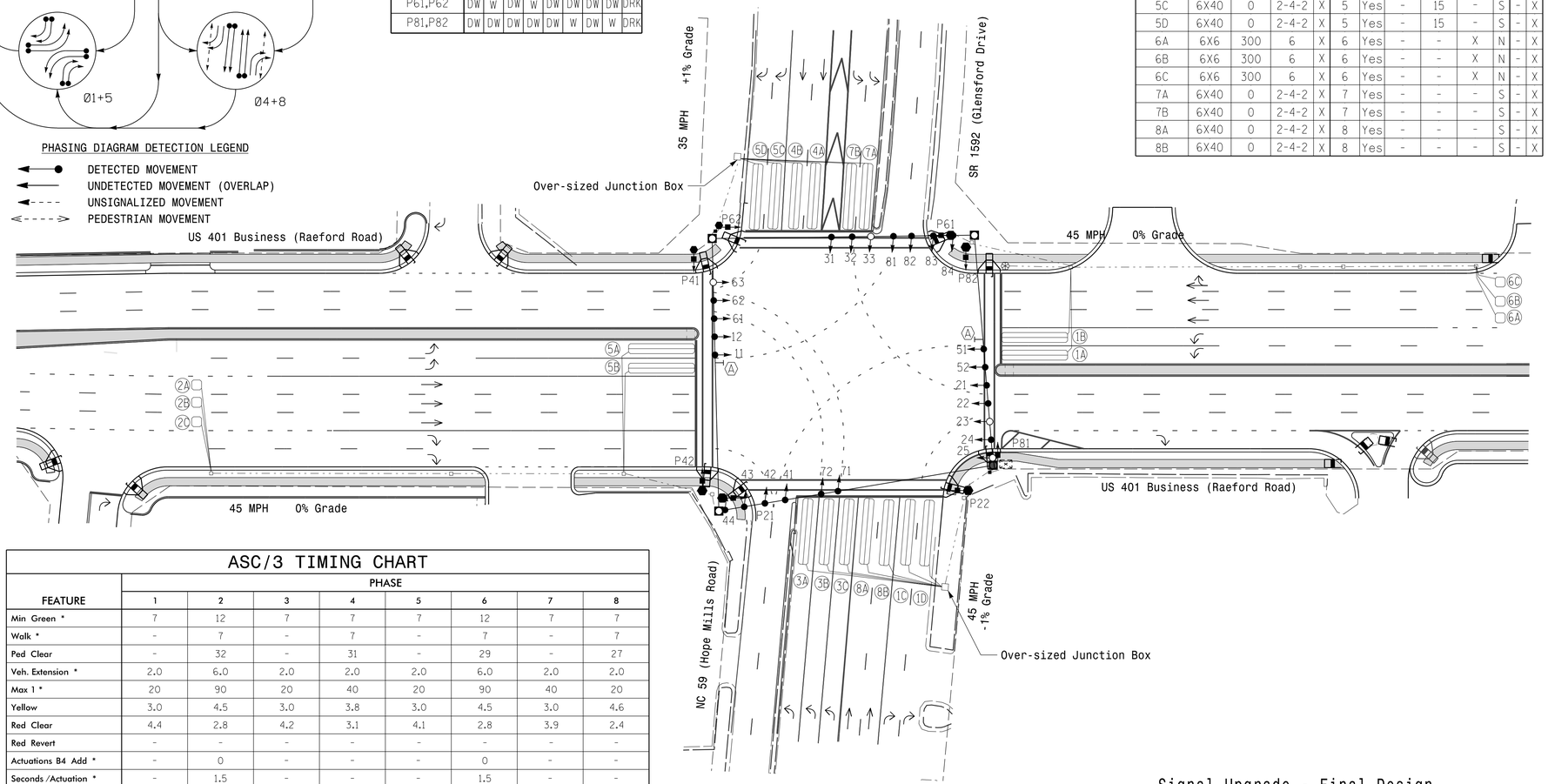
All Heads L.E.D.



11,12 31,32,33 51,52 71,72 — 21,22,23 41,42 61,62,63 81,82 — 24,25 43,44 83,84 — P21,P22 P41,P42 P61,P62 P81,P82

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	X
1C	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
1D	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	X
2A	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	6	X	2	Yes	-	-	X	N	-	X
2C	6X6	300	6	X	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
3C	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	X
5C	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
5D	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	X
6A	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	300	6	X	6	Yes	-	-	X	N	-	X
7A	6X40	0	2-4-2	X	7	Yes	-	-	-	S	-	X
7B	6X40	0	2-4-2	X	7	Yes	-	-	-	S	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	-	-	S	-	X
8B	6X40	0	2-4-2	X	8	Yes	-	-	-	S	-	X



ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	32	-	31	-	29	-	27
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	40	20	90	40	20
Yellow	3.0	4.5	3.0	3.8	3.0	4.5	3.0	4.6
Red Clear	4.4	2.8	4.2	3.1	4.1	2.8	3.9	2.4
Red Revert	-	-	-	-	-	-	-	-
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	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.

8 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2018 and "Standard Specifications for Roads and Structures" dated July 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or Phase 5 may be lagged.
4. Phase 3 and/or Phase 7 may be lagged.
5. Reposition existing signal heads 11, 12, 21, 22, 24, 25, 51, 52, 61, and 62.
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.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Pedestrian pedestals are conceptual and shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 Sheets 1-3 for push button location details.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
------	2-in Underground Conduit	------
N/A	Right of Way	------
→	Directional Arrow	→
◎	Metal Strain Pole	◘
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ

Signal Upgrade - Final Design

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US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

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

SCALE: 0 40 1"=40'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSY L WATSON

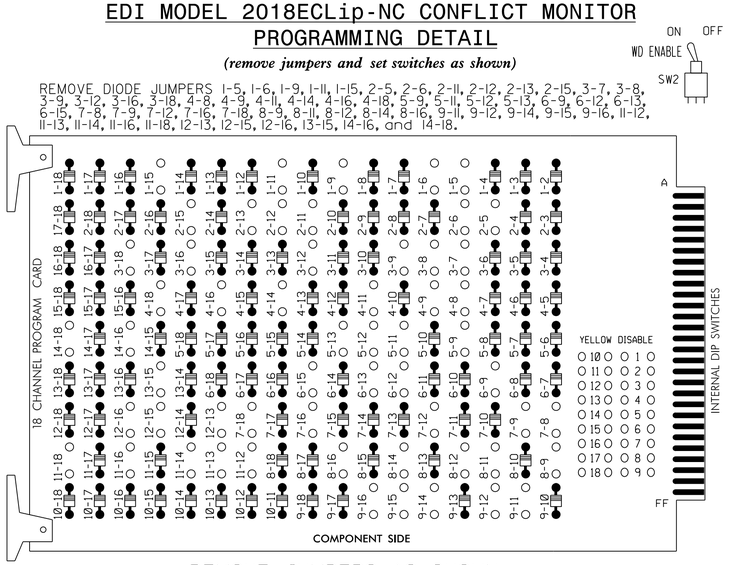
DocuSigned by: Betsy L. Watson 3/29/2018
SIGNATURE DATE

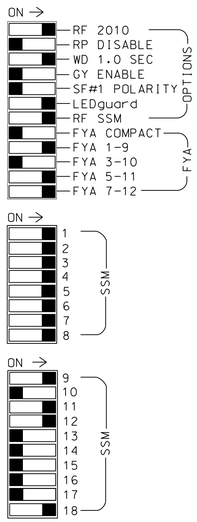
SIG. INVENTORY NO. 06-0155

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, 2-11, 2-12, 2-13, 2-15, 3-7, 3-8, 3-9, 3-12, 3-16, 3-18, 4-8, 4-9, 4-11, 4-14, 4-16, 4-18, 5-9, 5-11, 5-12, 5-13, 6-9, 6-12, 6-13, 6-15, 7-8, 7-9, 7-12, 7-16, 7-18, 8-9, 8-11, 8-12, 8-14, 8-16, 9-11, 9-12, 9-14, 9-15, 9-16, 11-12, 11-13, 11-14, 11-16, 11-18, 12-13, 12-15, 12-16, 13-15, 14-16, and 14-18.





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

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

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.

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10 S11,S12,AUXS1,AUXS4,AUXS5,AUXS6
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8, 8PED
OVERLAP "A".....*
OVERLAP "B".....NOT USED
OVERLAP "C".....*
OVERLAP "D".....*
OVERLAP "F".....7
OVERLAP "H".....3
* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-39.1

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	OLH	8	8 PED	OLA	OLB	SPARE	OLC	OLD	OLF
SIGNAL HEAD NO.	11,12	★ 83,84	21,22, 23	P21, P22	31,32, 33	41,42	P41, P42	43,44 ★	51,52	61,62, 63	P61, P62	★ 24,25	81,82	P81, P82	83,84 ★	NU	NU	43,44 ★	24,25 ★	71,72
RED			128			101				134			107		A121			A114	A101	
YELLOW			129			102				135		*	108							
GREEN			130			103				136			109							
RED ARROW	125				116				131											A104
YELLOW ARROW	126				117				132						A122			A115	A102	A105
FLASHING YELLOW ARROW															A123			A116	A103	
GREEN ARROW	127	127			118			133	133			124								A106
✋				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.

NOTE: Output functions for load switch S10 have been reassigned. See sheet 2 for details.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0155
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

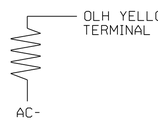
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-3,4	I1L	56	1	1	YES				S
1C	TB2-5,6	I2U	39	2	1	YES		15		S
1D	TB2-7,8	I2L	43	12	1	YES		15		S
2A	TB2-9,10	I3U	63	32	2	YES			X	N
2B	TB2-11,12	I3L	76	42	2	YES			X	N
2C	TB4-1,2	I4U	47	22	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
3C	TB4-11,12	I6L	45	14	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES				S
4B	TB6-3,4	I7L	78	44	4	YES				S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-3,4	J1L	55	5	5	YES				S
5C	TB3-5,6	J2U	40	6	5	YES		15		S
5D	TB3-7,8	J2L	44	16	5	YES		15		S
6A	TB3-9,10	J3U	64	36	6	YES			X	N
6B	TB3-11,12	J3L	77	46	6	YES			X	N
6C	TB5-1,2	J4U	48	26	6	YES			X	N
7A	TB5-9,10	J6U	42	8	7	YES				S
7B	TB5-11,12	J6L	46	18	7	YES				S
8A	TB7-1,2	J7U	66	38	8	YES				S
8B	TB7-3,4	J7L	79	48	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					

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown)



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

Final Design
Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155

DATE: 3/29/2018
File: C:\Users\rmuncey\Documents\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0155.dgn
User:rmuncey

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 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED X . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN 1 . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[C] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X X . . . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X X . . . . . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . 1 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Twice

OVERLAP F

Select TMG VEH OVLP [F] and 'NORMAL'

```
TMG VEH OVLP...[F] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Twice

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

```
TMG VEH OVLP...[H] TYPE: ......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . X . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-39.2

ECONOLITE ASC/3-2070 LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S10 as OLH, program LD SWITCH 7 as OVLP '8' TYPE 'O' as shown below.

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

LD SWITCH ASSIGN

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

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.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road) at NC 59 (Hope Mills Road)/ SR 1592 (Glensford Drive)

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0155

DATE
U:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0155.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-39.3

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]

2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]

3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

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

```
LP#:    1  COPY FROM:    1  ACTIVE:  M   FALSE
IF     CTR PHASE TMING        1      IS ON
THEN   SIG SET OLP GREEN      1         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 1 (HEADS 83,84)

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

```
LP#:    2  COPY FROM:    2  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH       1      IS ON
THEN   SIG SET OLP YELLOW     1         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:    3  COPY FROM:    3  ACTIVE:  M   FALSE
IF     CTR PHASE TIMING       1      IS ON
AND    VEH RED ON PHASE       1      IS ON
THEN   SIG SET OLP RED        1         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 1 (HEADS 83,84)

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

```
LP#:    4  COPY FROM:    4  ACTIVE:  M   FALSE
IF     CTR PHASE TMING        5      IS ON
THEN   SIG SET OLP GREEN      3         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING PHASE 5 (HEADS 43,44)

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

```
LP#:    5  COPY FROM:    5  ACTIVE:  M   FALSE
IF     VEH YELLOW ON PH       5      IS ON
THEN   SIG SET OLP YELLOW     3         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "6" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    6  COPY FROM:    6  ACTIVE:  M   FALSE
IF     CTR PHASE TIMING       5      IS ON
AND    VEH RED ON PHASE       5      IS ON
THEN   SIG SET OLP RED        3         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING PHASE 5 (HEADS 43,44)

ENTER A "7" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    7  COPY FROM:    7  ACTIVE:  M   FALSE
IF     VEH OVERLAP            8      IS ON
THEN   SIG SET OVLP GREEN     4         OFF

ELSE
```

LOGIC FOR TURNING FLASHING YELLOW ARROW OFF DURING OLH, WHICH HAS PARENT PHASE 3 (HEADS 24,25)

ENTER A "8" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    8  COPY FROM:    8  ACTIVE:  M   FALSE
IF     VEH OVERLAP YLW        8      IS ON
THEN   SIG SET OLP YELLOW     4         ON

ELSE
```

LOGIC FOR YELLOW ARROW CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEADS 24,25)

ENTER A "9" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    9  COPY FROM:    9  ACTIVE:  M   FALSE
IF     VEH OVERLAP            8      IS ON
AND    VEH OVERLAP RED        8      IS ON
THEN   SIG SET OLP RED        4         ON
ELSE
```

LOGIC FOR RED SIGNAL CLEARANCE WHEN LEAVING OLH, WHICH HAS PARENT PHASE 3 (HEADS 24,25)

END PROGRAMMING

4. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-9 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0155
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 3 of 3

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

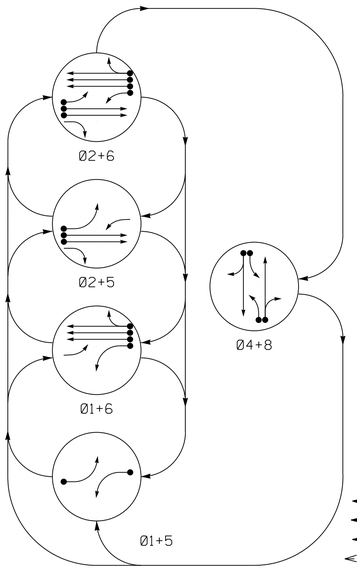
DocuSigned by: 3/29/2018
SIGNATURE DATE

SIG. INVENTORY NO. 06-0155

DATE
U:\Traffic\Signals\Design\Electrical Details\Final Signals\U-4405_sig_ele_06-0155.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-40.0

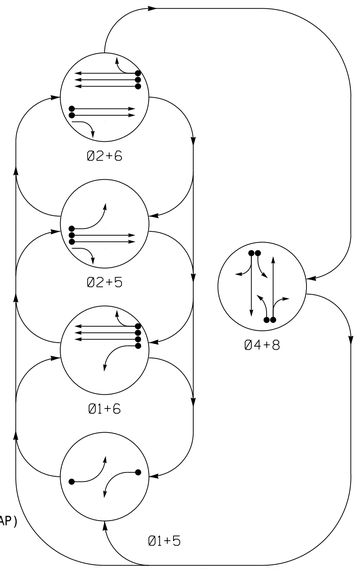
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	←F	←F	←R	←Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←F	←	←F	←R	←Y
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

ALTERNATE PHASING DIAGRAM



ALTERNATE TABLE OF OPERATION

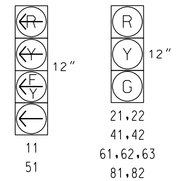
SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	←R	←R	←R	←Y
21,22	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←R	←	←R	←R	←Y
61,62,63	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	X
					6#	Yes	-	3	-	G	-	X
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	X
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6C	6X6	300	✳	-	6	Yes	-	-	-	N	-	X
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6E	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
6F	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	X
8A	6X40	0	✳	-	8	Yes	-	3	-	S	-	X
8B	6X40	0	✳	-	8	Yes	-	10	-	S	-	X

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

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
6. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Field adjust temporary poles as needed.

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 *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	25	15	90	25
Yellow	3.0	4.5	3.2	3.0	4.5	3.2
Red Clear	2.3	1.1	2.5	2.6	1.1	2.5
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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 With Push Button & Sign	■↓
○)	Signal Pole with Guy	●)
○))	Signal Pole with Sidewalk Guy	●))
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·-·	2-in Underground Conduit	·-·-·-·
N/A	Right of Way	— — — —
→	Directional Arrow	→
▬	Video Detection Area	N/A
▬	Construction Zone	N/A
● ● ●	Drums	N/A

Signal Upgrade
Temporary Design 1 - TMP Phase I

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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 401 Business (Raeford Road)
at
Brighton Road/
Fred Anderson Nissan

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	E D Harris
PREPARED BY:	R M Muncey	REVIEWED BY:	B L Watson

SCALE 0 40 1"=40'

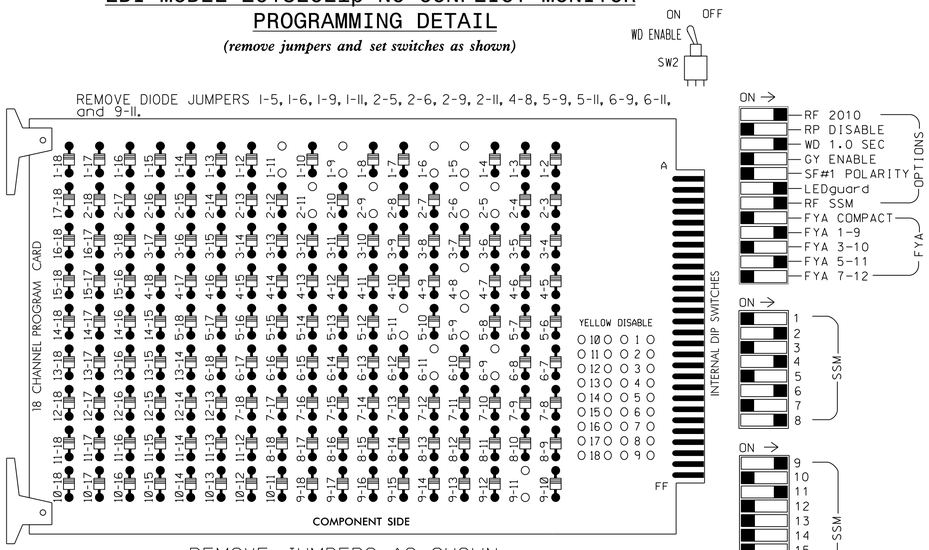
REVISIONS	INIT.	DATE

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

SIG. INVENTORY NO. 06-0328TI

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,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

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-40.1

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 ★	21,22	NU	NU	41,42	NU	51 ★	61,62, 63	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													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133											

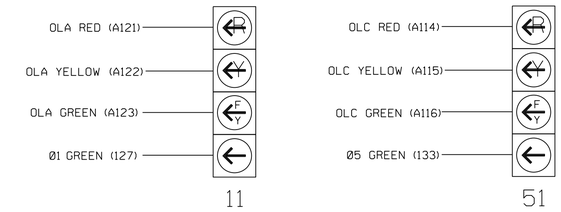
NU = Not Used

* 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	Ø 1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED															ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED															

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	-	I1U	56	1 ★	1	YES		15		S
	-	J4U	48	26★	6	YES		3		G
5A [2]	-	J1U	55	5 ★	5	YES		15		S
	-	I4U	47	22★	2	YES		3		G

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

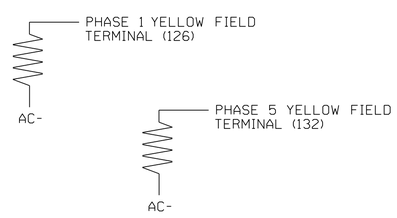
[2] Add jumper from J1-W to I4-W. on rear of input file.

★ See vehicle detector setup programming detail for alternate phasing on sheet 3.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



ACCEPTABLE VALUES

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

DETECTOR NOTES

1. For all loops, install a video detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.
2. For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation. Inputs associated with these slots are compatible with time of day instructions located on sheets 2 and 3 of this electrical detail.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0328T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 401 Business (Raeford Road)
at
Brighton Road/
Fred Anderson Nissan

Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0328T1

DATE: 3/29/2018
User:rmuncey
File:C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase I\U-4405_sig_ele_06-0328T1.dgn

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9  ISOLATE

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

← NOTICE ACTION PLAN SF BIT "1"

Toggle Twice

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

← NOTICE ACTION PLAN SF BIT "5"

END PROGRAMMING

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-40.2

ALTERNATE PHASING ACTIVATION DETAIL

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

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

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

SF BITS 1.5:	Modifies overlap parent phases for heads 11, and 51 to run protected turns only.
VEH DET PLAN 2:	Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.
	Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0328T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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Division 6 | Cumberland County | Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN, II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0328TI

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-40.3

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP

PROGRAMMING DETAIL FOR ALTERNATE PHASING

LOOPS 1A, 5A

(program controller as shown)

IMPORTANT!

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

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

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

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

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

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

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

ENSURE PHASE IS SET TO "0" →

```
VEH DETECTOR [26]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 26 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

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

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

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

ENSURE PHASE IS SET TO "0" →

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]      <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0   . . . . . . . . . . . . . . . .
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN..... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN

PROGRAMMING DETAIL

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0328T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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Division 6 Cumberland County Fayetteville

PLAN DATE:	March 2018	REVIEWED BY:	L Overn
PREPARED BY:	R M Muncey	REVIEWED BY:	

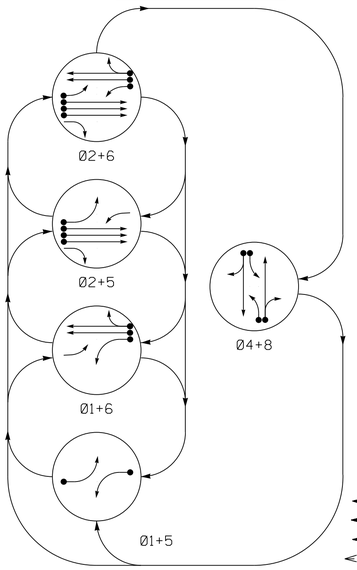
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 045933 ENGINEER LAWRENCE E. OVERN II
DocuSigned by: 3/29/2018
SIGNATURE DATE
SIG. INVENTORY NO. 06-0328T1

DATE
11:47:50
C:\Traffic\Signals\Design\Electrical Details\Temporary Signals\Phase 1\U-4405_sig_ele_06-0328T1.dgn
User:rmuncey

PROJECT REFERENCE NO.	SHEET NO.
U-4405	SIG-41.0

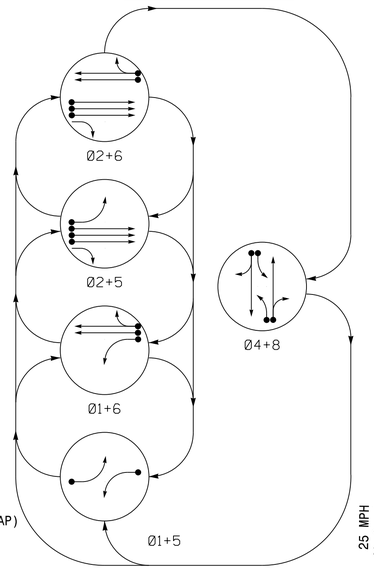
DEFAULT PHASING DIAGRAM



DEFAULT TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	←FY	←FY	←R	←Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←FY	←	←FY	←R	←Y
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

ALTERNATE PHASING DIAGRAM



ALTERNATE TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	←R	←R	←R	←Y
21,22,23	R	R	G	G	R	Y
41,42	R	R	R	R	G	R
51	←	←R	←	←R	←R	←Y
61,62	R	G	R	G	R	Y
81,82	R	R	R	R	G	R

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✳	-	1	Yes	-	15★	-	S	-	-
					6#	Yes	-	3	-	G	-	-
2A	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2C	6X6	300	✳	-	2	Yes	-	-	-	N	-	-
2D	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2E	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
2F	6X40	0	✳	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	✳	-	4	Yes	-	3	-	S	-	-
4B	6X40	0	✳	-	4	Yes	-	10	-	S	-	-
5A	6X40	0	✳	-	5	Yes	-	15★	-	S	-	-
					2#	Yes	-	3	-	G	-	-
6A	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6B	6X6	300	✳	-	6	Yes	-	-	-	N	-	-
6C	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
6D	6X40	0	✳	-	6	Yes	2.0	5	-	G	-	-
8A	6X40	0	✳	-	8	Yes	-	3	-	S	-	-
8B	6X40	0	✳	-	8	Yes	-	10	-	S	-	-

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

5 Phase
Fully Actuated
Fayetteville Signal System

NOTES

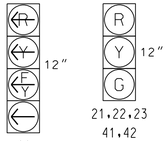
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector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

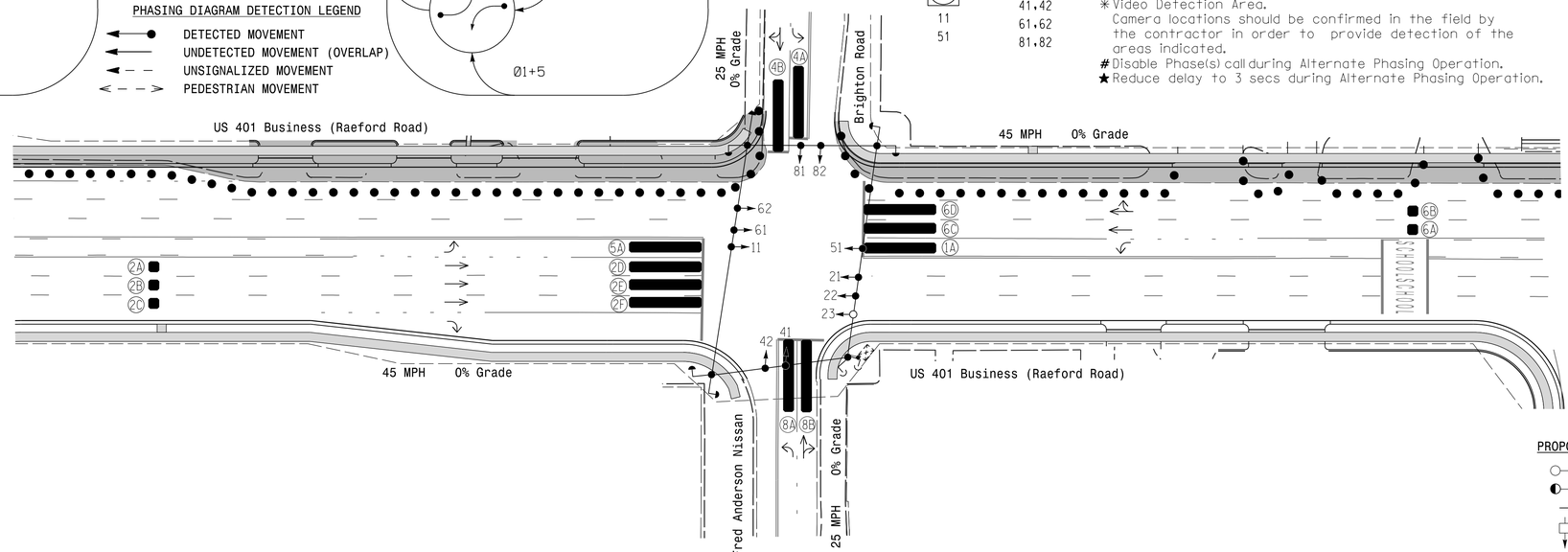
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▯↓	Pedestrian Signal Head With Push Button & Sign	■↓
○	Signal Pole with Guy	●
○⤵	Signal Pole with Sidewalk Guy	●⤵
▭	Inductive Loop Detector	⌒
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·-·-·	2-in Underground Conduit	·-·-·
N/A	Right of Way	- - -
→	Directional Arrow	→
▬	Video Detection Area	N/A
▭	Construction Zone	N/A
● ● ●	Drums	N/A

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0
Max 1 *	15	90	25	15	90	25
Yellow	3.0	4.5	3.2	3.0	4.5	3.2
Red Clear	2.6	1.1	2.9	2.4	1.1	2.2
Red Revert	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	45	-	-	45	-
Minimum Gap	-	3.0	-	-	3.0	-
Locking Detector	-	-	-	-	-	-
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.

Signal Upgrade
Temporary Design 2 - TMP Phase II

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SCALE: 0 40 1"=40'

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

PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: B L Watson

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 29449 ENGINEER BETSEY L. WATSON

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

SIG. INVENTORY NO. 06-0328T2