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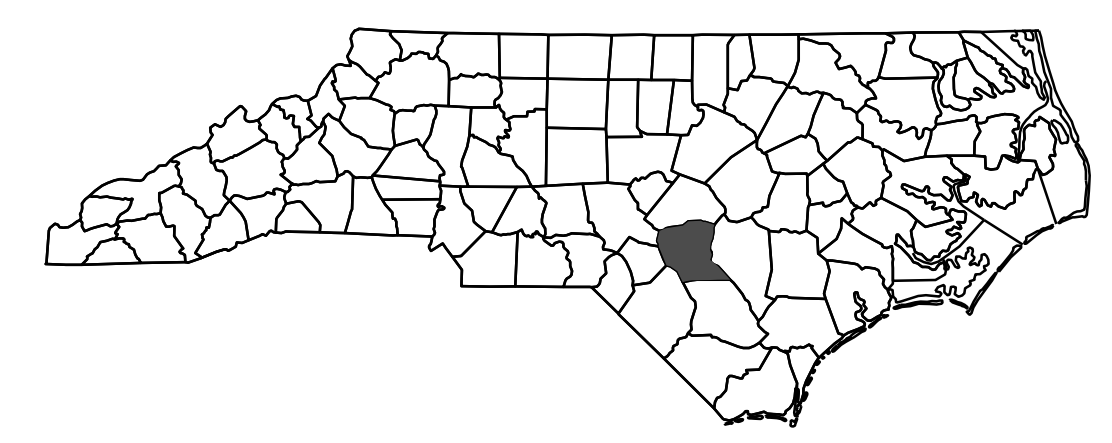
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CUMBERLAND COUNTY

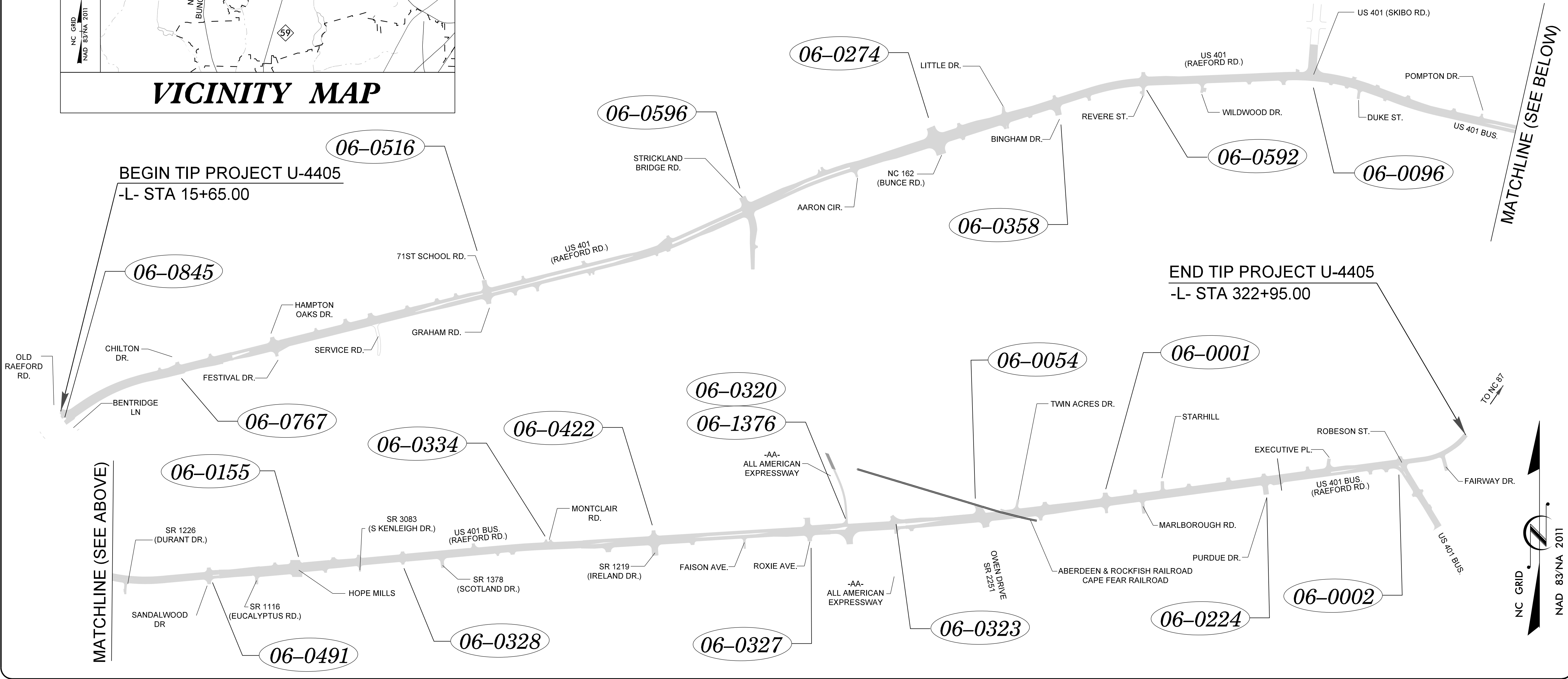
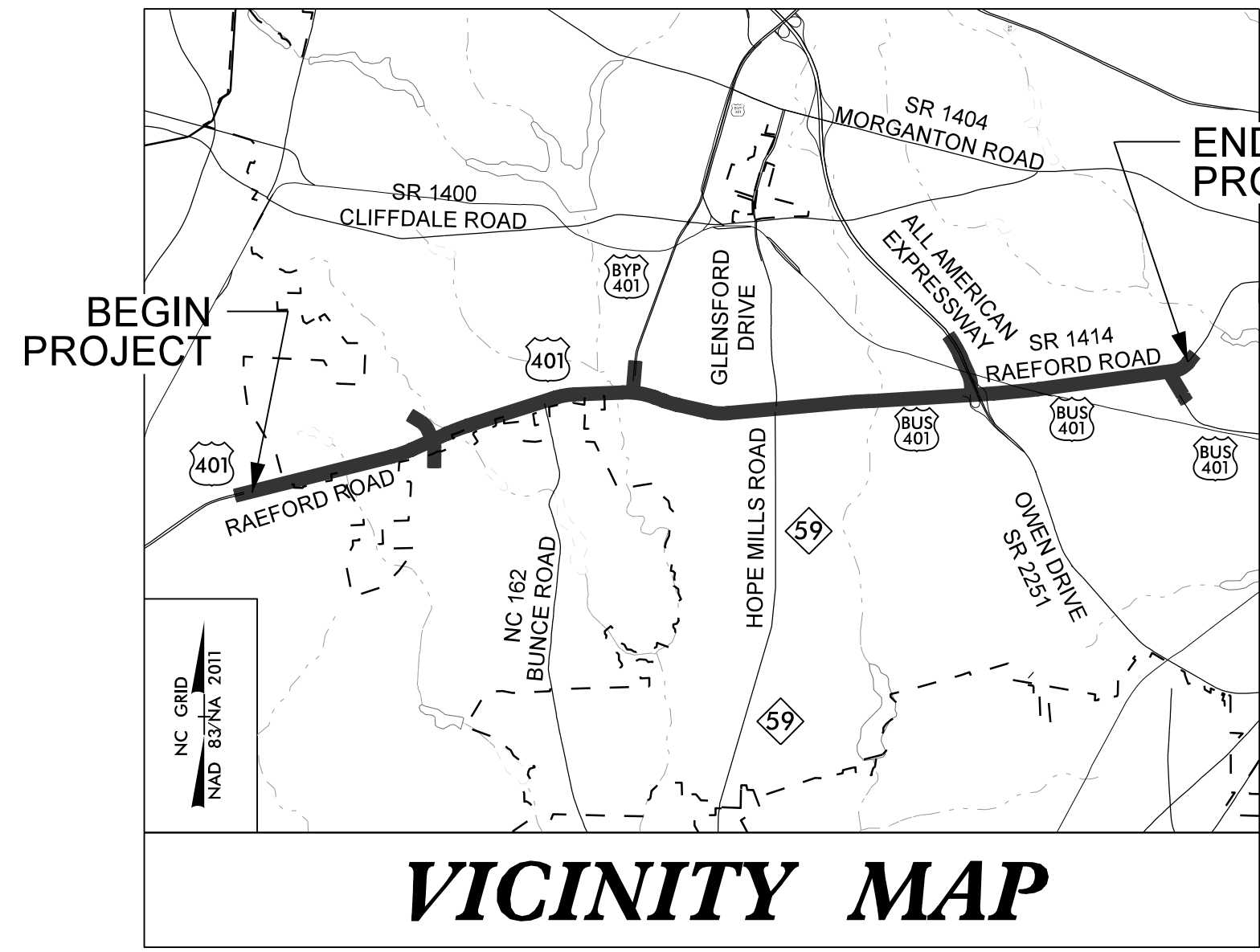
LOCATION: FAYETTEVILLE - US 401 (RAEFORD ROAD) FROM
OLD RAEFORD ROAD TO ROBESON STREET (US 401 BUSINESS)

TYPE OF WORK: TRAFFIC SIGNALS



TIP PROJECT: U-4405

CONTRACT: C204107



INDEX OF PLANS	
SHEET NUMBER	DESCRIPTION
SIG 1.0	TITLE SHEET
SIG 1.1	SHEET INDEX
SIG 2.0 - SIG 81.3	SIGNAL AND ELECTRICAL DESIGNS
SIG 82.0 - SIG 83.0	REVISED STANDARD PLATE SHEETS
MI - M8	METAL POLE STANDARD DRAWINGS

LEGEND

XX-XXXX - SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:

Zachary Little, PE
Signals Engineer, Eastern Region

Todd Joyce, PE
Signal Equipment Design Review Engineer

Plans Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

750 N. Greenfield Parkway, Garner, NC 27529

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Betsy L. Watson, PE
Senior Principal

Dean Harris
Senior Transportation Designer

APPROVED: *Betsy L. Watson*
DATE: 3/29/2018

INDEX OF SHEETS

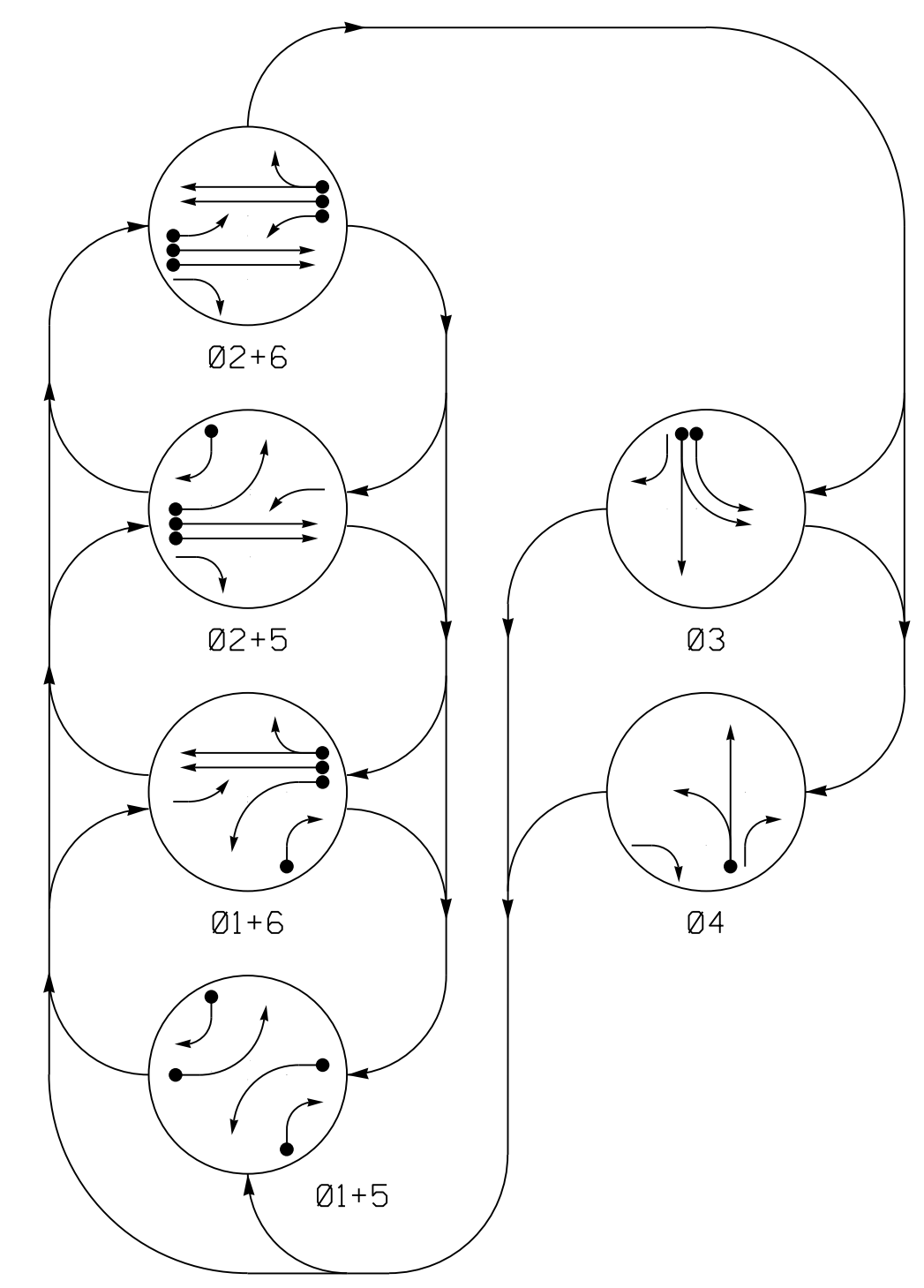
SIG-1.0		TITLE SHEET (PROJECT OVERVIEW)
SIG-1.1		INDEX OF SHEETS
SIG-2.0 – SIG-3.3	[06-0845]	US 401 (RAEFORD ROAD) AT OLD RAEFORD ROAD/BENTRIDGE LANE
SIG-4.0 – SIG-6.2	[06-0767]	US 401 (RAEFORD ROAD) AT CHILTON ROAD/RAYCONDA PLACE
SIG-7.0 – SIG-10.1	[06-0516]	US 401 (RAEFORD ROAD) AT 71ST SCHOOL ROAD/GRAHAM ROAD
SIG-11.0 – SIG-14.1	[06-0596]	US 401 (RAEFORD ROAD) AT SR 1104 (STRICKLAND BRIDGE ROAD)
SIG-15.0 – SIG-18.2	[06-0274]	US 401 (RAEFORD ROAD) AT SR 1411/NC 162 (BUNCE ROAD)
SIG-19.0 – SIG-22.2	[06-0358]	US 401 (RAEFORD ROAD) AT SR 1141 (BINGHAM DRIVE)
SIG-23.0 – SIG-26.2	[06-0592]	US 401 (RAEFORD ROAD) AT REVERE STREET
SIG-27.0 – SIG-31.1	[06-0096]	US 401/US 401 BUSINESS (RAEFORD ROAD) AT US 401 (SKIBO ROAD)
SIG-32.0 – SIG-35.3	[06-0491]	US 401 BUSINESS (RAEFORD ROAD) AT SANDALWOOD DRIVE
SIG-36.0 – SIG-39.3	[06-0155]	US 401 BUSINESS (RAEFORD ROAD) AT SR 1592 (GLENSFORD ROAD/ NC 59 (HOPE MILLS ROAD)
SIG-40.0 – SIG-43.3	[06-0328]	US 401 BUSINESS (RAEFORD ROAD) AT BRIGHTON ROAD
SIG-44.0 – SIG-47.3	[06-0334]	US 401 BUSINESS (RAEFORD ROAD) AT MONTCLAIR ROAD
SIG-48.0 – SIG-51.1	[06-0422]	US 401 BUSINESS (RAEFORD ROAD) AT SR 1219 (IRELAND DRIVE/ SHOPPING CENTER DRIVE
SIG-52.0 – SIG-55.2	[06-0327]	US 401 BUSINESS (RAEFORD ROAD) AT FERNCREEK DRIVE/ROXIE AVENUE
SIG-56.0 – SIG-59.1	[06-0320]	US 401 BUSINESS (RAEFORD ROAD) AT SR 1007 (ALL AMERICAN FREEWAY) SOUTHBOUND RAMPS
SIG-60.0 – SIG-61.1	[06-1376]	US 401 BUSINESS (RAEFORD ROAD) AT SR 1007 (ALL AMERICAN FREEWAY) SOUTHBOUND RAMP
SIG-62.0 – SIG-65.1	[06-0323]	US 401 BUSINESS (RAEFORD ROAD) AT SR 1007 (ALL AMERICAN FREEWAY) NORTHBOUND RAMPS
SIG-66.0 – SIG-69.6	[06-0054]	US 401 BUSINESS (RAEFORD ROAD) AT SOUTH MCPHERSON CHURCH ROAD/ OWEN DRIVE
SIG-70.0 – SIG-73.3	[06-0001]	US 401 BUSINESS (RAEFORD ROAD) AT FAIRFIELD ROAD
SIG-74.0 – SIG-77.3	[06-0224]	US 401 BUSINESS (RAEFORD ROAD) AT PURDUE DRIVE/ SHOPPING CENTER ENTRANCE
SIG-78.0 – SIG-81.3	[06-0002]	MCPHEE DRIVE/US 401 BUSINESS (ROBESON STREET)
SIG-82.0 – SIG-83.0		REVISED STANDARD PLATE SHEETS
M1 – M8		METAL POLE STANDARD DRAWINGS

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Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27526	Index of Sheets Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: E D Harris PREPARED BY: G B Spell REVIEWED BY: B L Watson									
	NOT TO SCALE	<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE						
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PHASING DIAGRAM



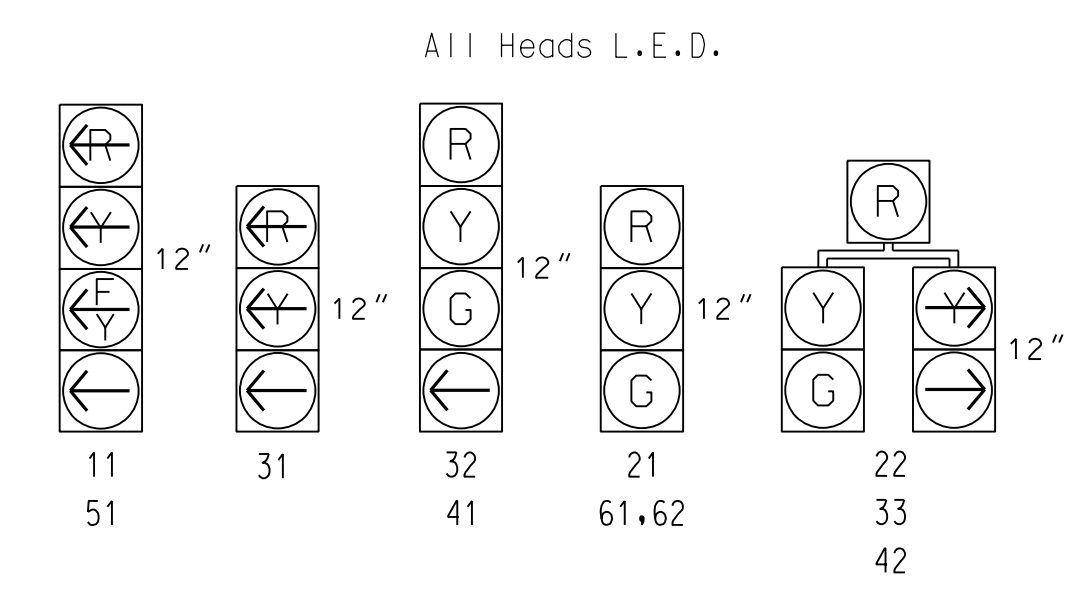
PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← - - UNSIGNALIZED MOVEMENT
- ← - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE						FL HEADS
	01+5	01+6	02+5	02+6	03	04	
11	←	←	←	←	←	←	Y
21	R	R	G	G	R	R	Y
22	R	R	G	G	R	R	Y
31	←	←	←	←	←	←	Y
32	R	R	R	R	G	R	R
33	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
51	←	←	←	←	←	←	Y
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

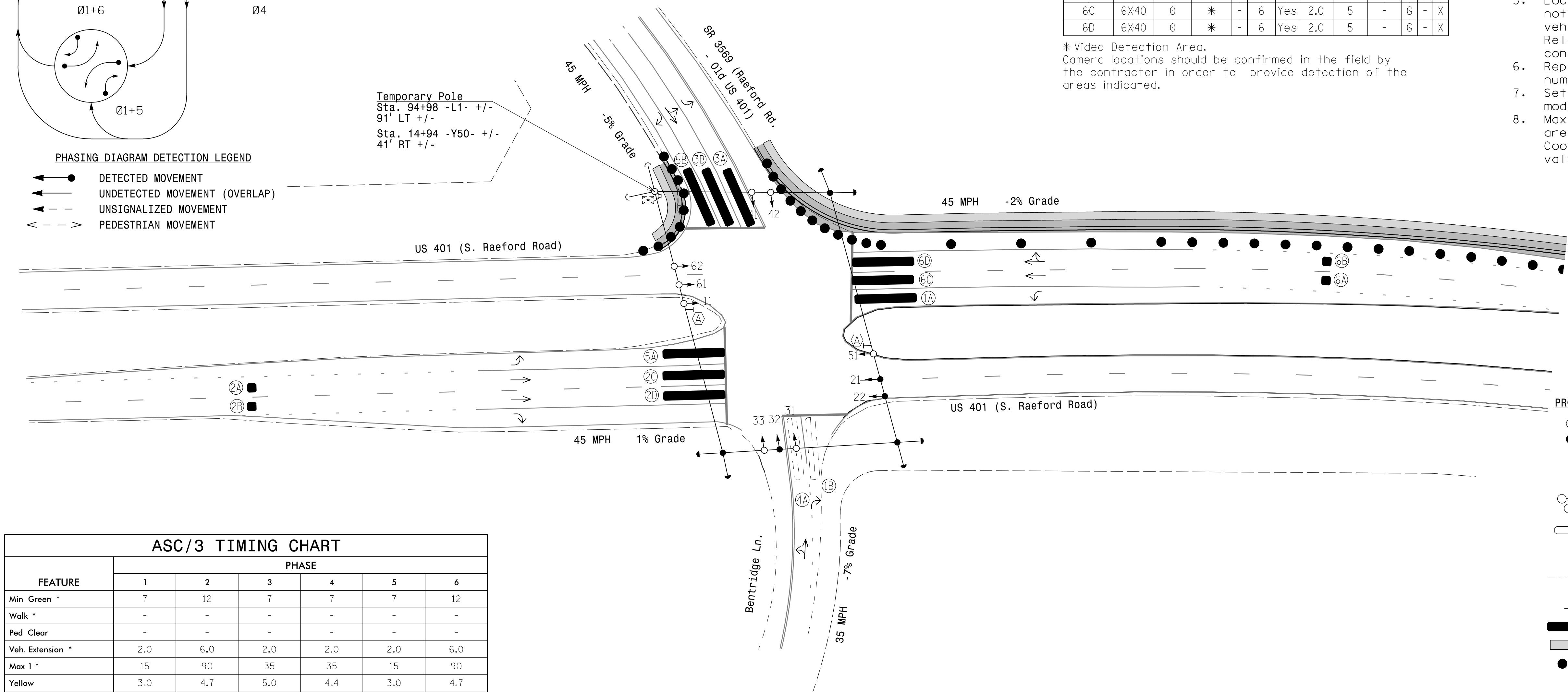
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	15	-	S	-	X
1B	6X40	0	EXIST	-	6	Yes	-	3	-	G	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	*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

6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- 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.
- Reposition existing signal head numbered 32.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	15	90	35	35	15	90
Yellow	3.0	4.7	5.0	4.4	3.0	4.7
Red Clear	3.3	1.6	2.0	2.1	2.8	1.6
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	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
○ → Modified Signal Head	○ → N/A
○ → Pedestrian Signal Head With Push Button & Sign	○ → N/A
○ → Signal Pole with Guy	○ → N/A
○ → Signal Pole with Sidewalk Guy	○ → N/A
□ → Inductive Loop Detector	□ → N/A
□ → Controller & Cabinet	□ → N/A
□ → Junction Box	□ → N/A
- - - 2-in Underground Conduit	- - - N/A
- - - Right of Way	- - - N/A
→ Directional Arrow	→ N/A
▬ Video Detection Area	▬ N/A
▬ Construction Zone	▬ N/A
● Drums	● N/A
Ⓐ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ N/A

**Signal Upgrade
Temporary Design 1 - 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 27526
SCALE: 0 40
1"=40'

**US 401 (South Raeford Rd.)
at
SR 3569 (Raeford Rd-Old US 401)
Bentrbridge Ln.**
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: B L Watson

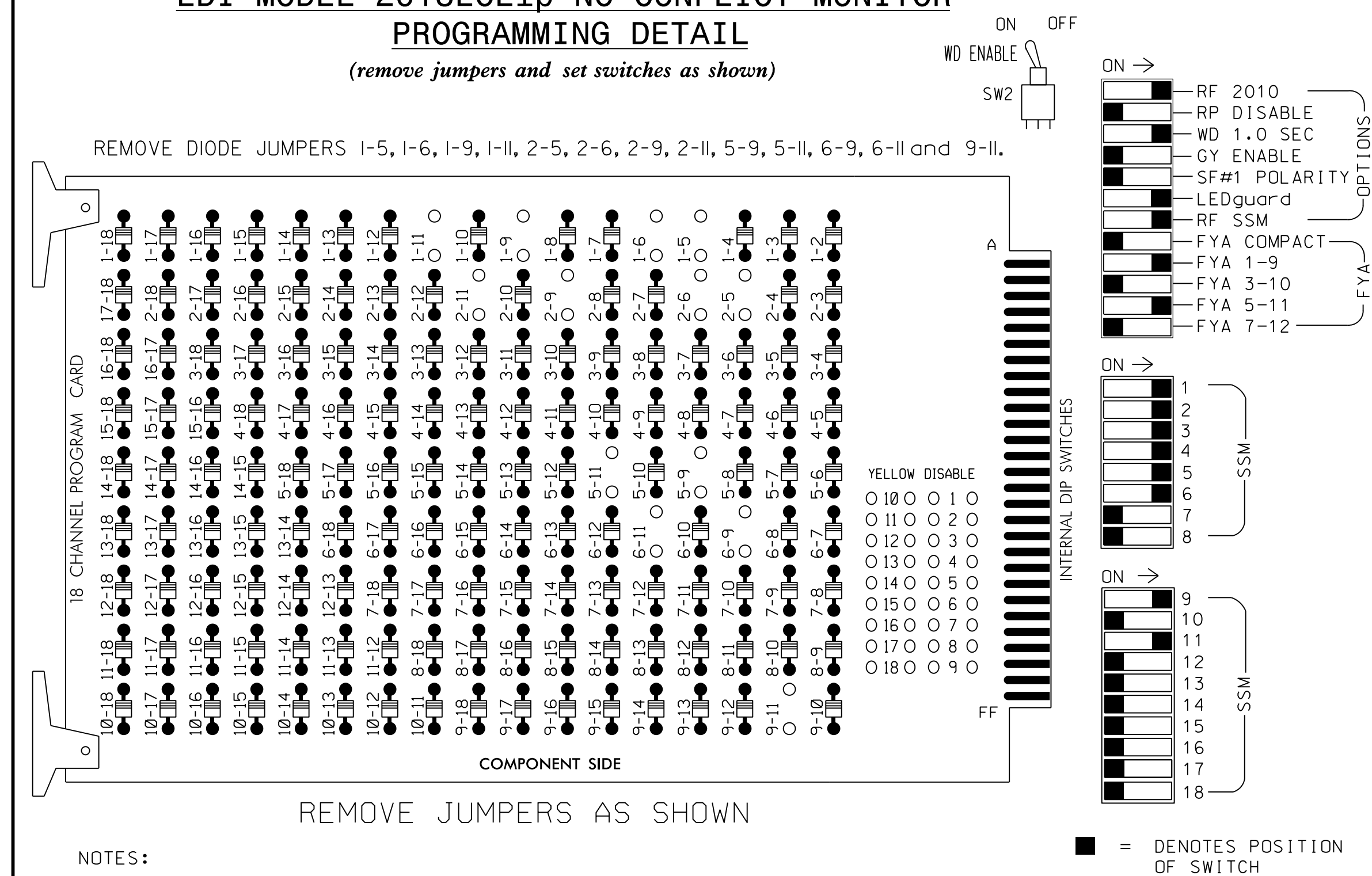
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Professional Engineer Seal: SEAL 29449
Professional Engineer: Betsy L. Watson
DATE: 3/29/2018
SIG. INVENTORY NO. 06-084511

3/29/2018 11:41:00 AM C:\Users\jgms\Documents\Signal Design\Phase 2\U-4405_Sig.dwg User: jgms

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

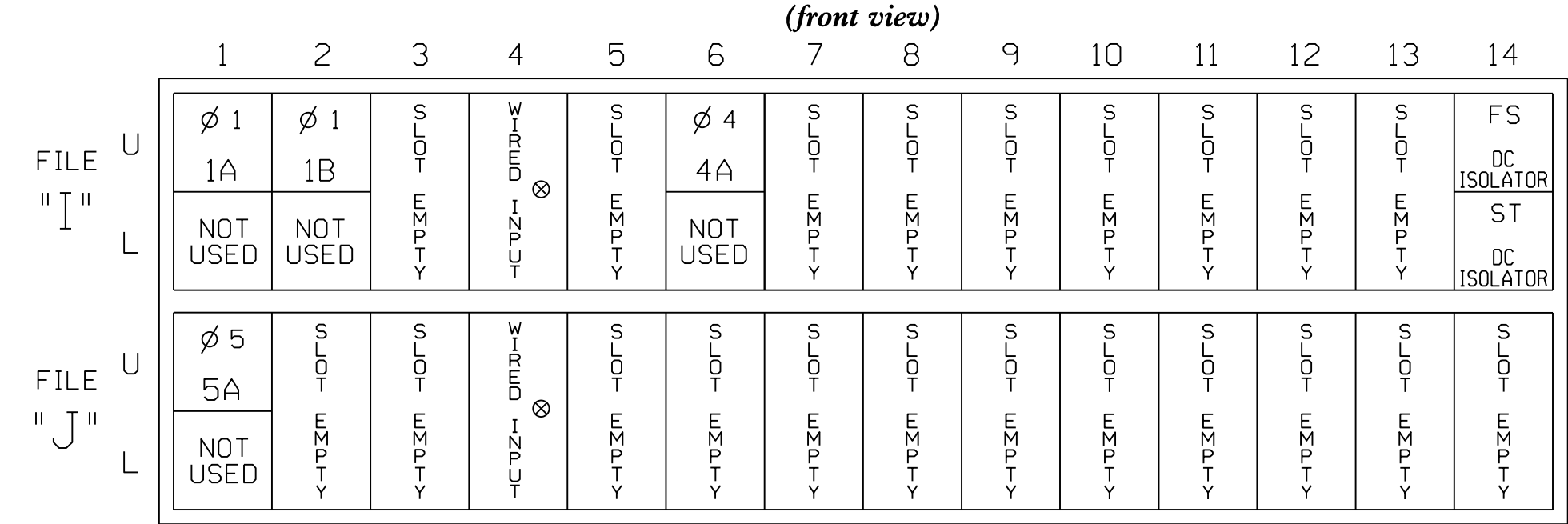
(remove jumpers and set switches as shown)



NOTES:

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

INPUT FILE POSITION LAYOUT (front view)

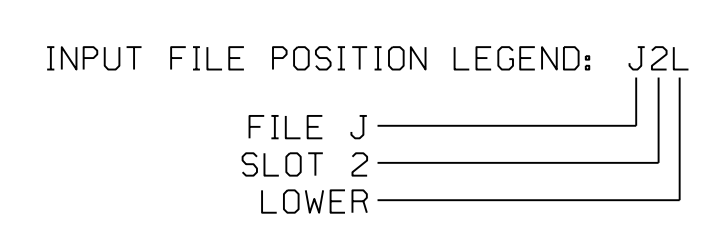


EX.: 1A, 2A, ETC. = LOOP NO.'S FS = FLASH SENSE ST = STOP TIME
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A ¹	-	I1U	56	1	1	YES		15		S
1B	TB2-5,6	J4U	48	26	6	YES		3		G
4A	TB4-9,10	I6U	41	4	4	YES				S
5A ²	-	J1U	55	5	5	YES		15		S
	-	I4U	47	22	2	YES		3		G

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



NOTES

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

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	42	21,22	NU	31	32	33	41	42	22	NU	51★	33	61,62	NU	NU	51★	NU
RED	*	128		116	116	101	101				*	134						
YELLOW		129		117	117	102	102					135						
GREEN		130		118	118	103	103					136						
RED ARROW				116												A121		A114
YELLOW ARROW	126			117				102			132					A122		A115
FLASHING YELLOW ARROW																A123		A116
GREEN ARROW	127	127		118	118	103	103	133	133									

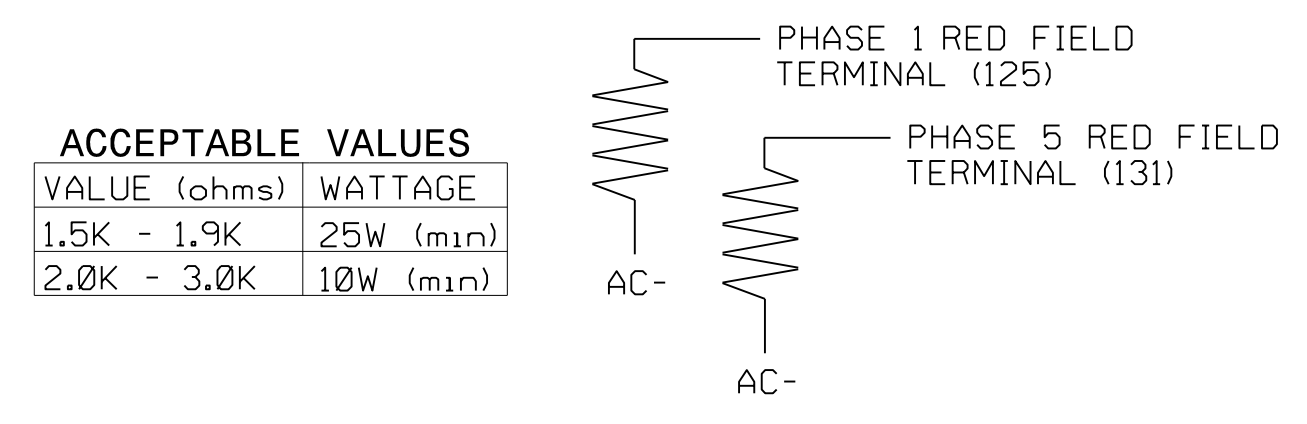
NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

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

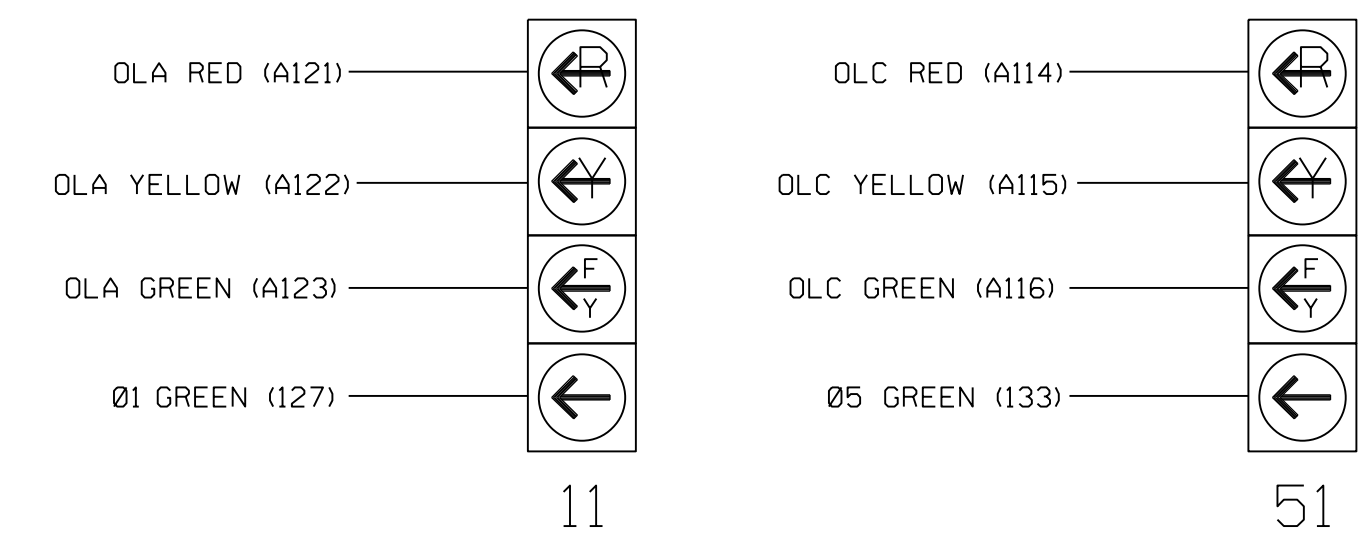
LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



DETECTOR NOTES

- 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.
- For loops 1A and 5A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation.

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

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Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (South Raeford Road)
at
SR 3569 (Raeford Rd-
Old US 401)/Bentridge Ln.
Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

3/29/2018

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SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
LAURENCE E. OVERN
045933
DATE
SIG. INVENTORY NO. 06-0845T1

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: 06-0845T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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<p>Stantec</p> <p style="font-size: x-small;">Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 401 (South Raeford Road) at SR 3569 (Raeford Rd- Old US 401)/Bentridge Ln. Division 6 Cumberland County Fayetteville	SEAL 									
	Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	PLAN DATE: March 2018 REVIEWED BY: L Overn PREPARED BY: R M Muncey REVIEWED BY:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 10%;">INIT.</th> <th style="width: 30%;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE						
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PHASING DIAGRAM

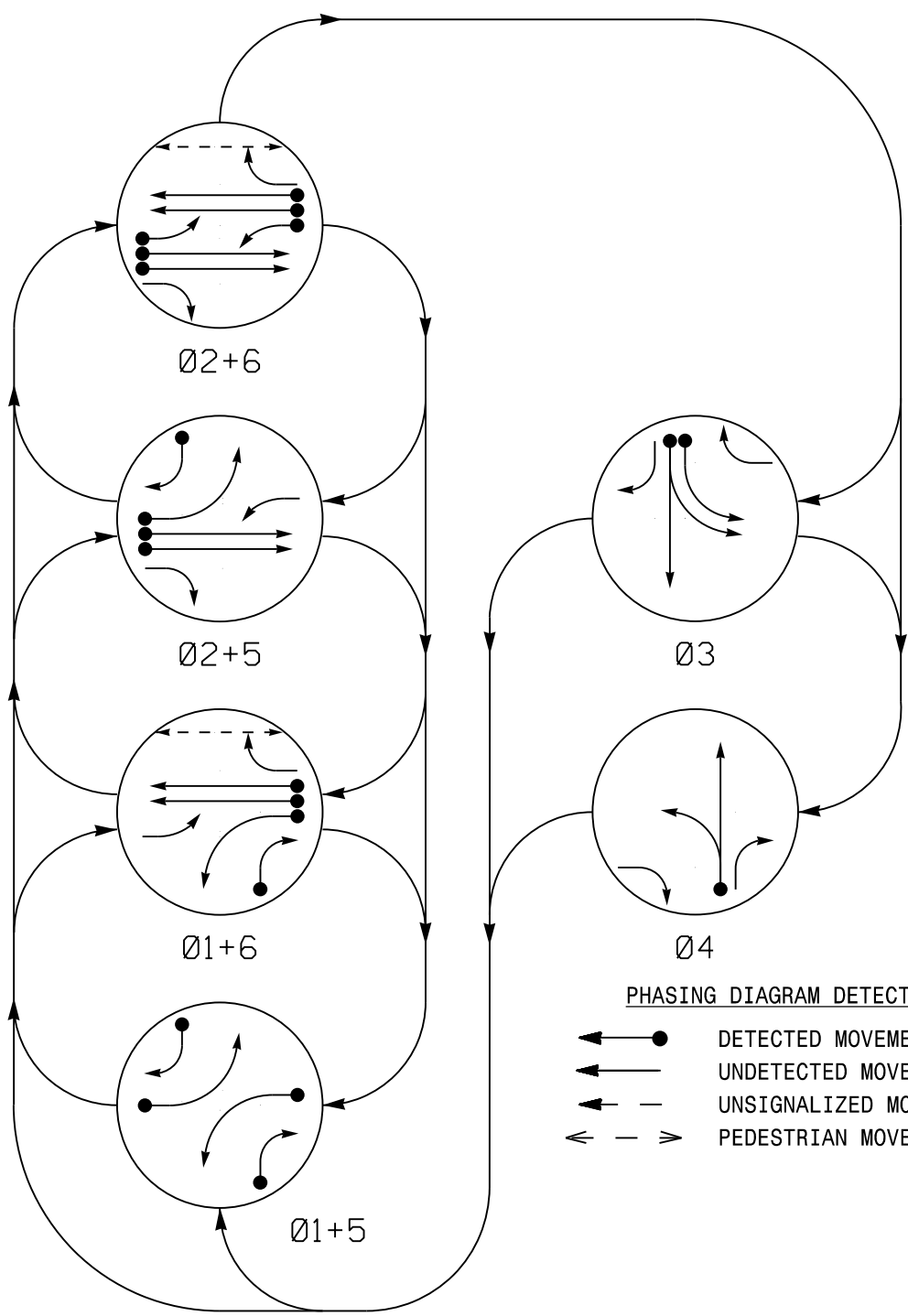
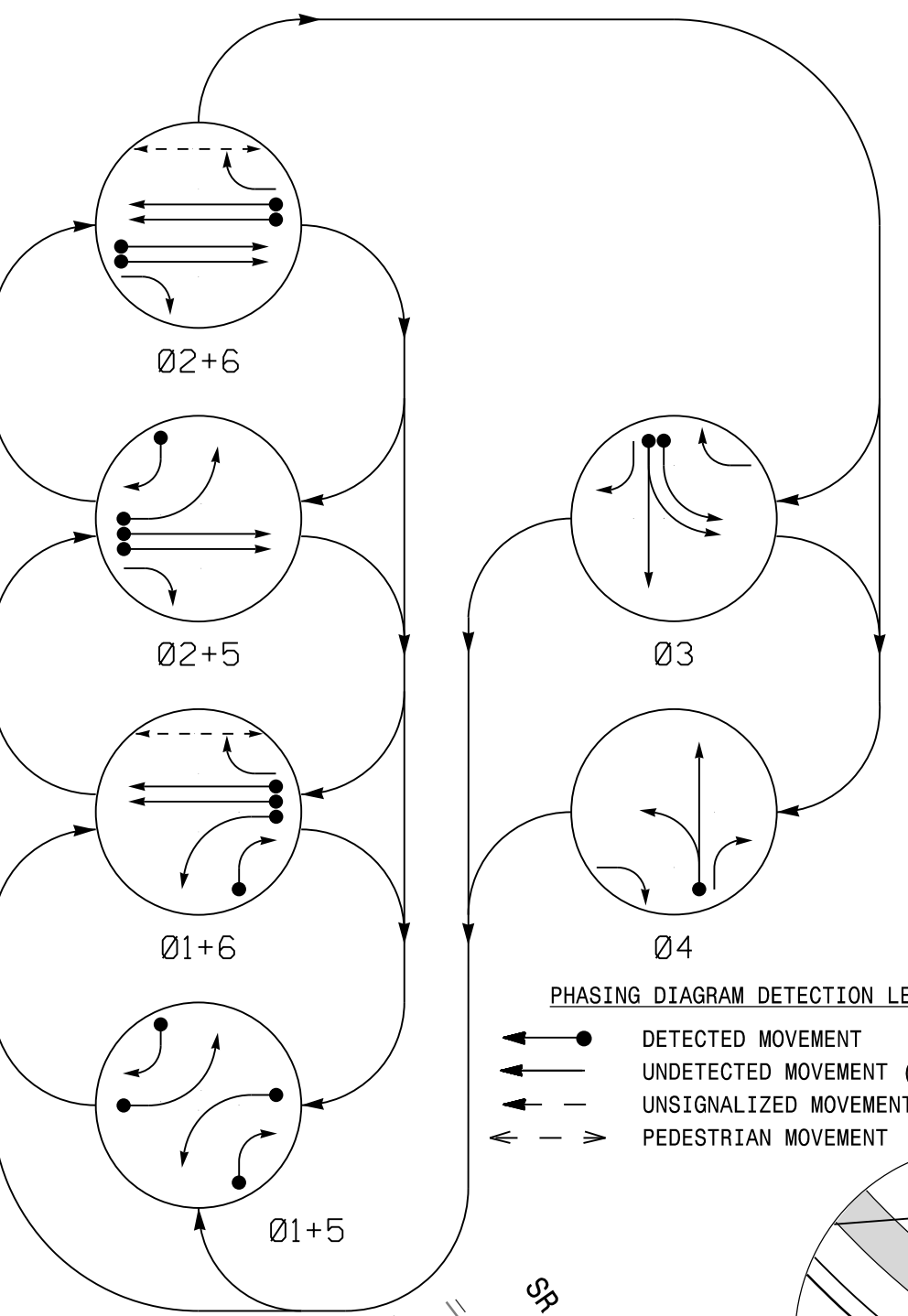


TABLE OF OPERATION table with columns for SIGNAL FACE and PHASE (Ø 1+5, Ø 2+5, Ø 3, Ø 4, FLASH).

PHASING DIAGRAM DETECTION LEGEND: DETECTED MOVEMENT, UNDETECTED MOVEMENT (OVERLAP), UNSIGNALIZED MOVEMENT, PEDESTRIAN MOVEMENT.

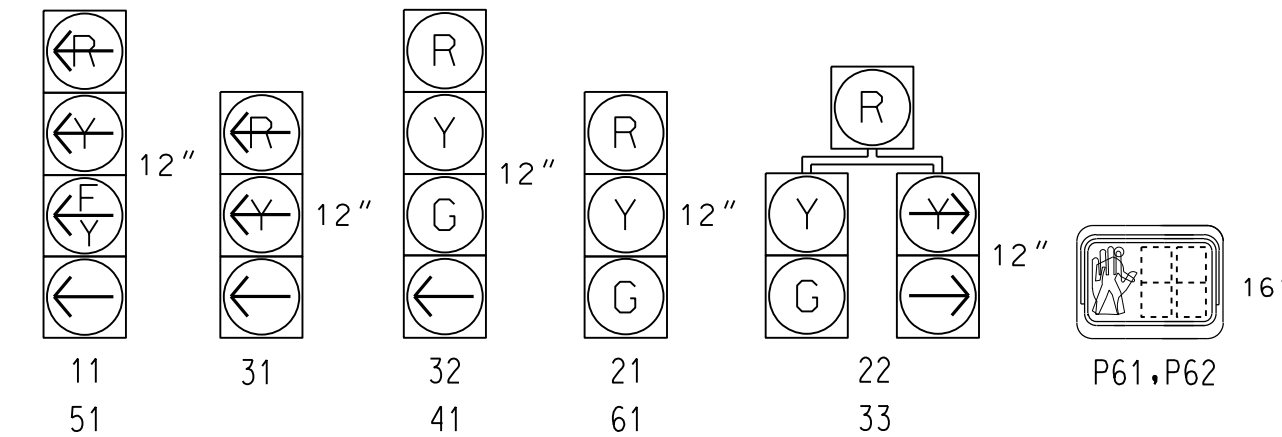
ALTERNATE PHASING DIAGRAM



ALTERNATE TABLE OF OPERATION table with columns for SIGNAL FACE and PHASE (Ø 1+5, Ø 2+5, Ø 3, Ø 4, FLASH).

PHASING DIAGRAM DETECTION LEGEND: DETECTED MOVEMENT, UNDETECTED MOVEMENT (OVERLAP), UNSIGNALIZED MOVEMENT, PEDESTRIAN MOVEMENT.

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



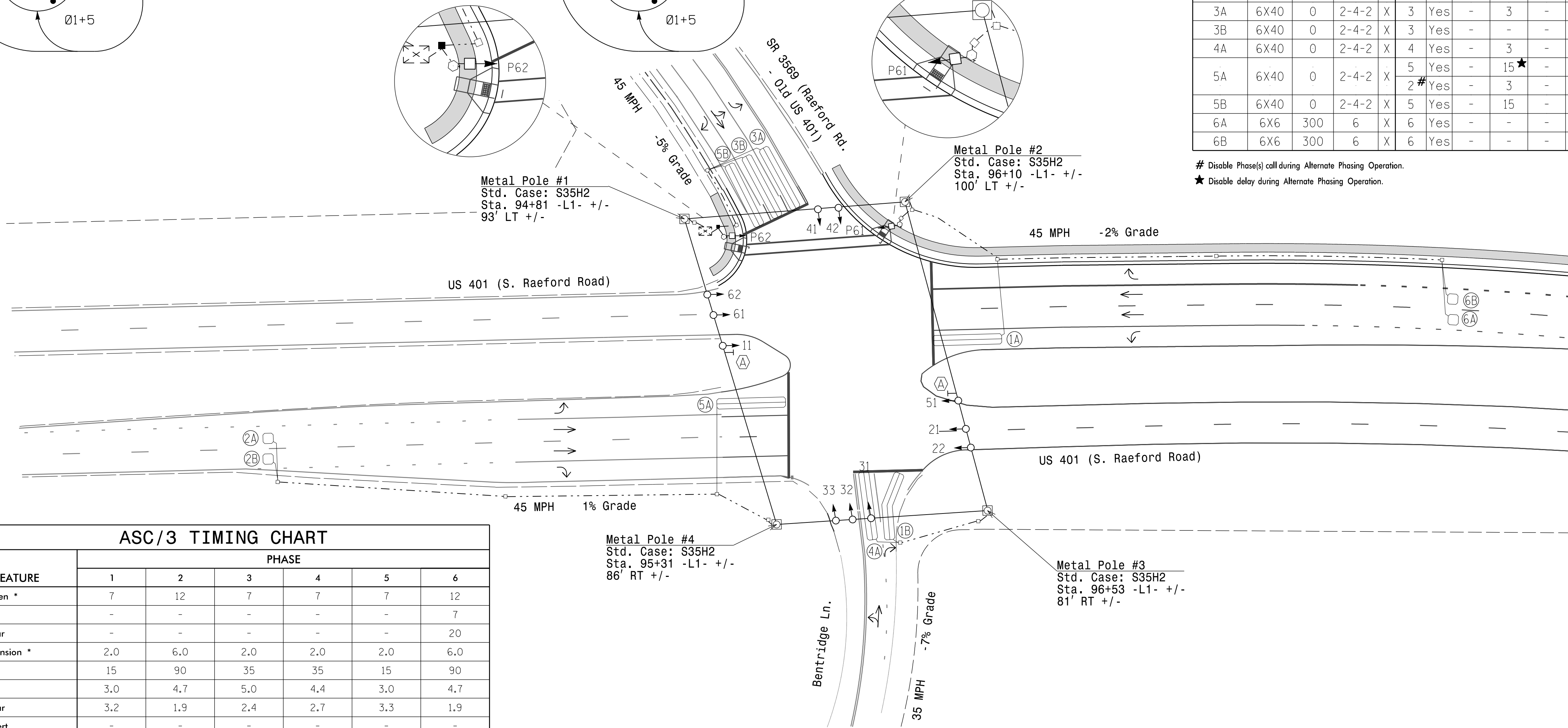
6 Phase Fully Actuated Fayetteville Signal System

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018... 2. Do not program signal for late night flashing operation... 3. Phase 1 may be lagged... 4. The order of phase 3 and phase 4 may be reversed... 5. Set all detector units to presence mode... 6. Locate new cabinet foundation so as not to obstruct sight distance... 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... 10. The Division (City) Traffic Engineer will determine the hours of use for each phasing plan... 11. Pedestrian pedestals are conceptual and shown for reference only.

ASC/3 DETECTOR INSTALLATION CHART table with columns for LOOP, SIZE, DISTANCE FROM STOPBAR, TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, SYSTEM LOOP, NEW CARD.

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

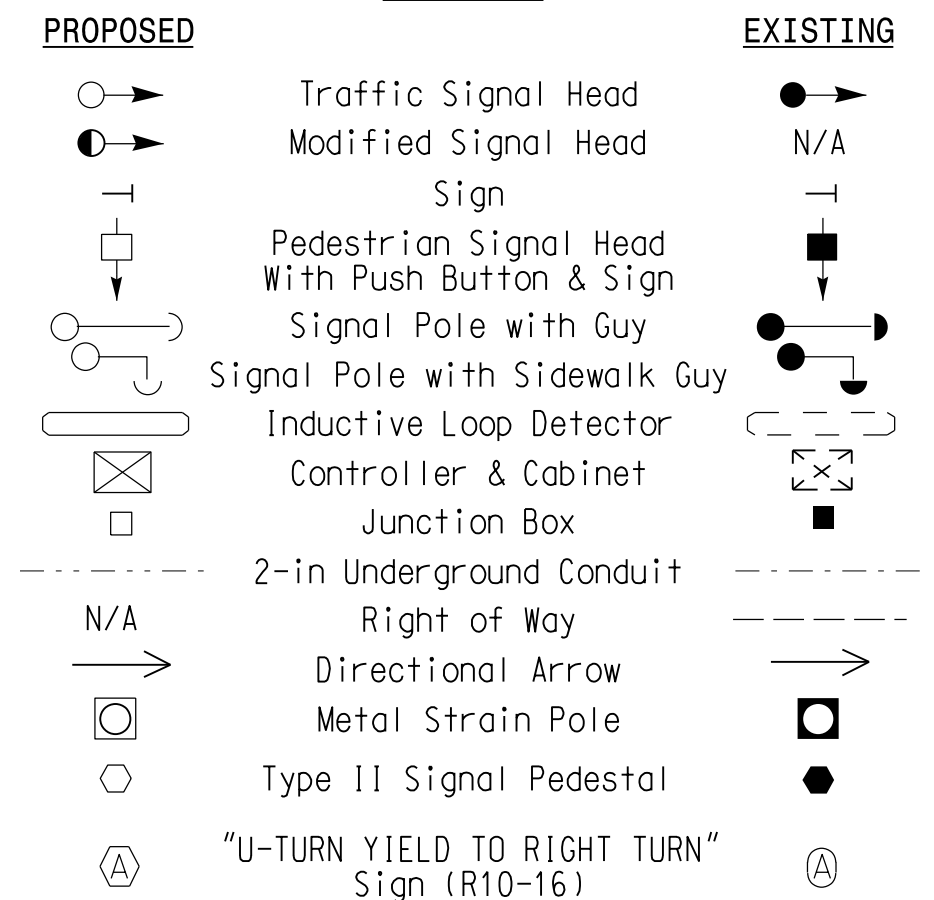


ASC/3 TIMING CHART

ASC/3 TIMING CHART table with columns for FEATURE and PHASE (1-6).

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

LEGEND



Signal Upgrade - Final Design

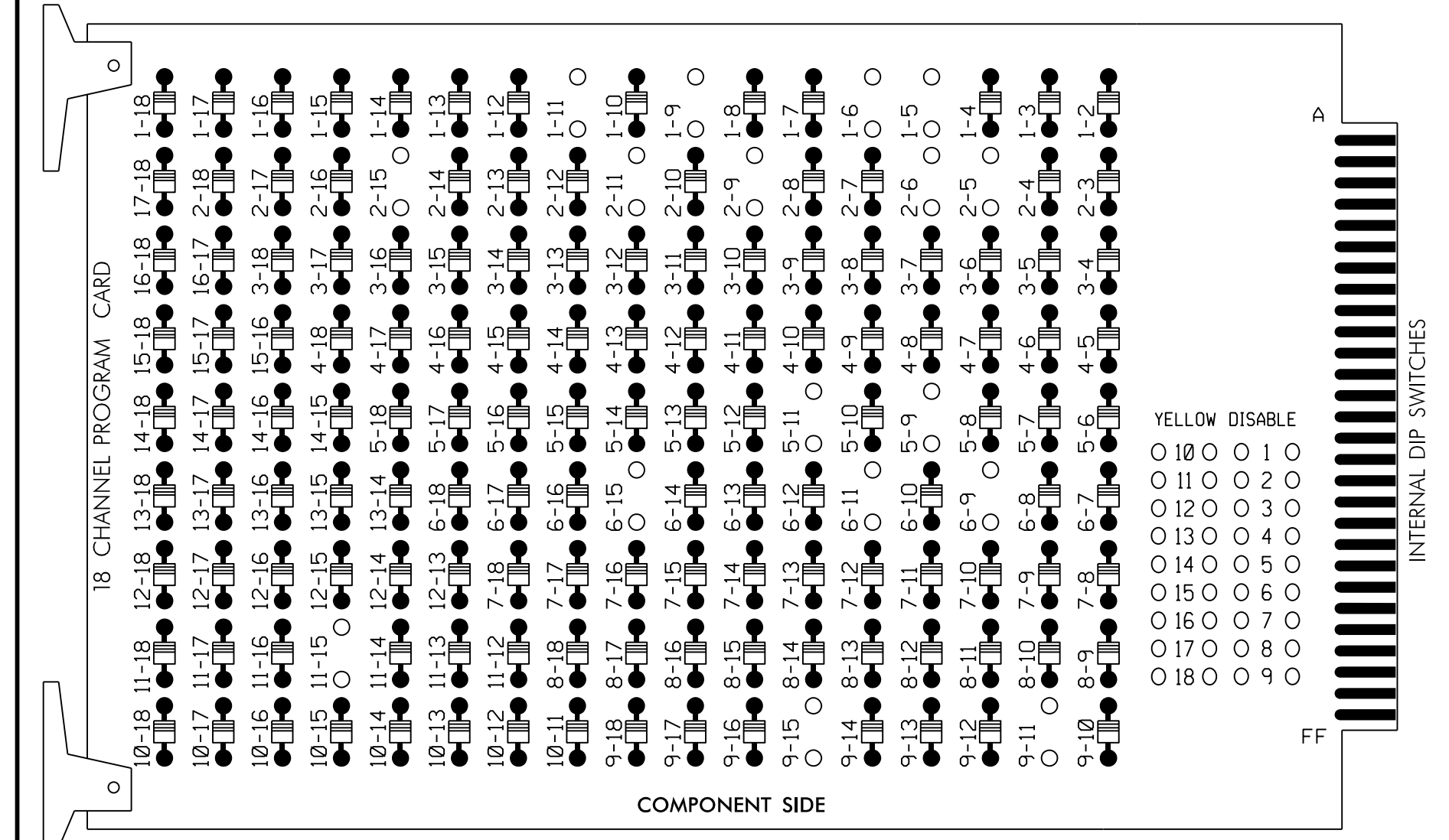
Project information block including Stantec logo, project name (US 401 at SR 3569), dates (March 2018), and signatures of R M Muncey and B L Watson.

3/29/2018 11:41:00 AM User: rmmuncey

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

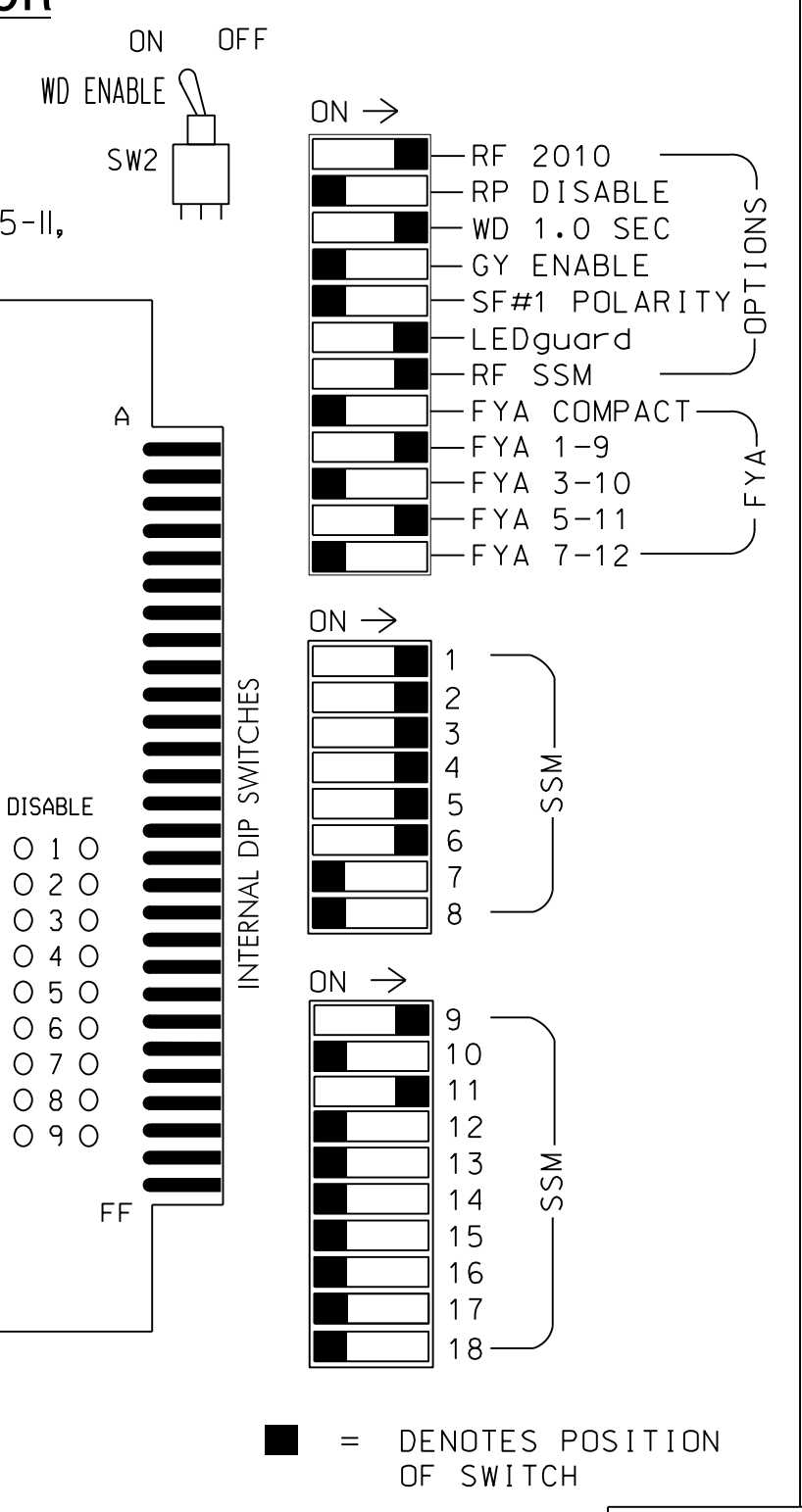
REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-15, 5-9, 5-11, 6-9, 6-11, 6-15, 9-11, 9-15, and 11-15.



REMOVE JUMPERS AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

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

SIGNAL HEAD HOOK-UP CHART

	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6						
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18						
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE						
SIGNAL HEAD NO.	11★	42	21,22	NU	31	32	33	62	41	42	22	NU	51★	33	61,62	P61, P62	NU	NU	NU	11★	51★	NU	NU	
RED	*	128		116	116	101	101			*	134													
YELLOW		129		117	117	102	102				135													
GREEN		130		118	118	103	103				136													
RED ARROW				116																		A121		A114
YELLOW ARROW		126		117		117		102			132											A122		A115
FLASHING YELLOW ARROW																						A123		A116
GREEN ARROW	127	127		118	118	118	103	103		133	133													
Hand																								
Person																								

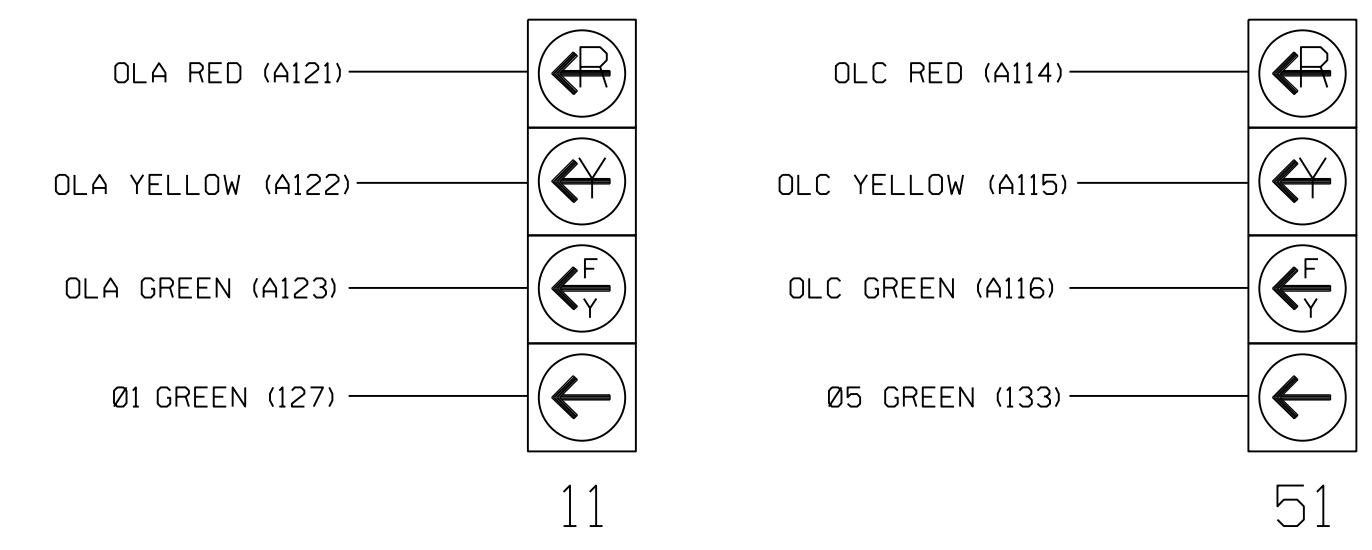
NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

EQUIPMENT INFORMATION

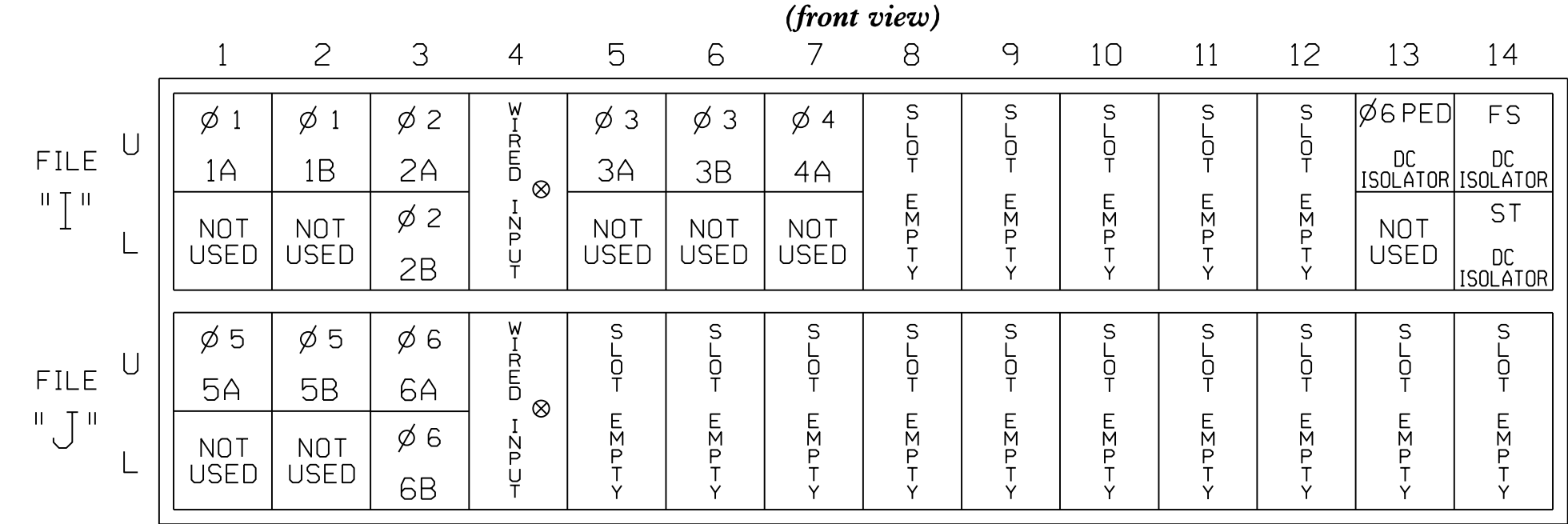
CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX.
 OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S9
 AUX S1,AUX S4
 PHASES USED.....1,2,3,4,5,6,6PED
 OVERLAP "A".....*
 OVERLAP "B".....NOT USED
 OVERLAP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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT



EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ⊗ Wired Input - Do not populate slot with detector card
 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
1B	TB2-5,6	I2U	39	2	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
3A	TB4-5,6	I5U	58	3	3	YES		3		S
3B	TB4-9,10	I6U	41	4	3	YES				S
4A	TB6-1,2	I7U	65	34	4	YES		3		S
5A ²	TB3-1,2	J1U	55	5★	5	YES		15		S
	-	I4U	47	22★	2	YES		3		G
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-7,8	J3U	64	6	6	YES			X	N
6B	TB3-9,10	J3L	77	16	6	YES			X	N
PED PUSH BUTTONS										
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

INPUT FILE POSITION LEGEND: J2L

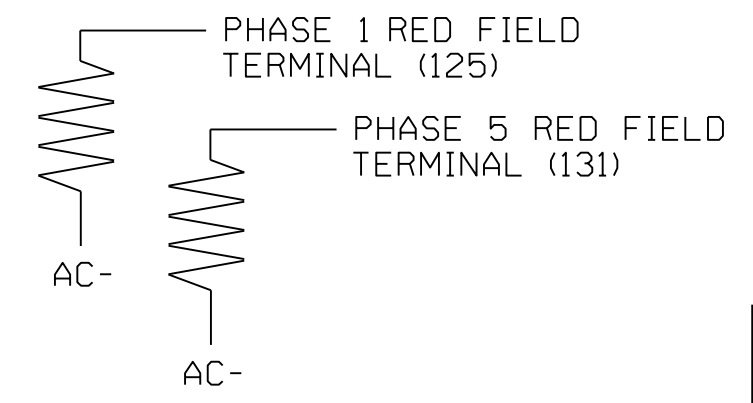
FILE J
 SLOT 2
 LOWER

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



Final Design
 Electrical Detail - Sheet 1 of 3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0845
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Stantec Consulting Services Inc.
 801 Jones Franklin Road-Suite 300
 Raleigh, NC 27606
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 www.stantec.com
 License No. F-0672

Prepared in the Offices of:

Lawrence E. Overn
 PROFESSIONAL ENGINEER
 No. 045933
 State of North Carolina

US 401 (South Raeford Road)
 at
 SR 3569 (Raeford Rd-
 Old US 401)/Bentridge Ln.
 Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

3/29/2018
 DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

- From Main Menu select **5. TIME BASE**
- From TIME BASE Submenu select **2. ACTION PLAN**

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

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

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

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

← NOTICE ACTION PLAN SF BIT "1"

Toggle Twice

OVERLAP C

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

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

← NOTICE ACTION PLAN SF BIT "5"

END PROGRAMMING

ALTERNATE PHASING ACTIVATION DETAIL

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

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

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN <u>DEFAULT PHASING</u>	1	NONE
ACTIONS REQUIRED TO RUN <u>ALTERNATE PHASING</u>	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.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0845
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 3

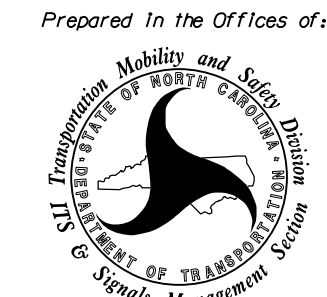
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:



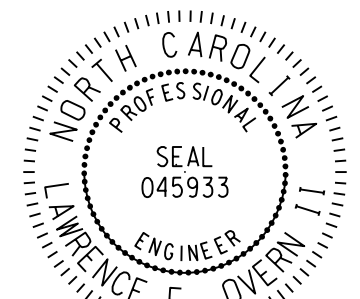
750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (South Raeford Road)
at
SR 3569 (Raeford Rd-
Old US 401)/Bentridge Ln.
Division 6 Cumberland County Fayetteville

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

REVISIONS	INIT.	DATE

SEAL



3/29/2018

SIG. INVENTORY NO. 06-0845

DATE: 03/29/2018 11:45:11 AM FILE: C:\Users\rmuncey\Documents\Electrical\06-0845.dgn USER: rmuncey

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.

- From Main Menu select **8. UTILITIES**
- From UTILITIES Submenu select **1. COPY/CLEAR**
- 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
  
```

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

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

```

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-0845
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Final Design
 Electrical Detail - Sheet 3 of 3

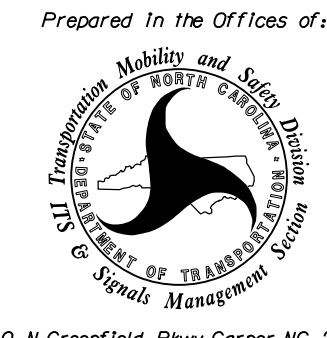
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ELECTRICAL AND PROGRAMMING
 DETAILS FOR:

Prepared in the Offices of:



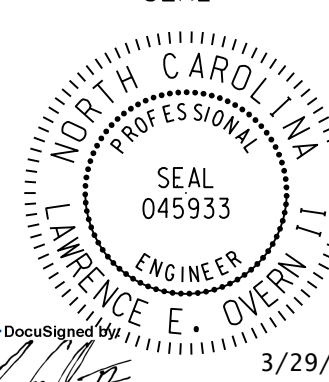
750 N. Greenfield Pkwy, Garner, NC 27529

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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



3/29/2018
 DATE

SIG. INVENTORY NO. 06-0845

DATE: 03/29/2018 10:45:11 AM
 USER: rfmuncey

PHASING DIAGRAM

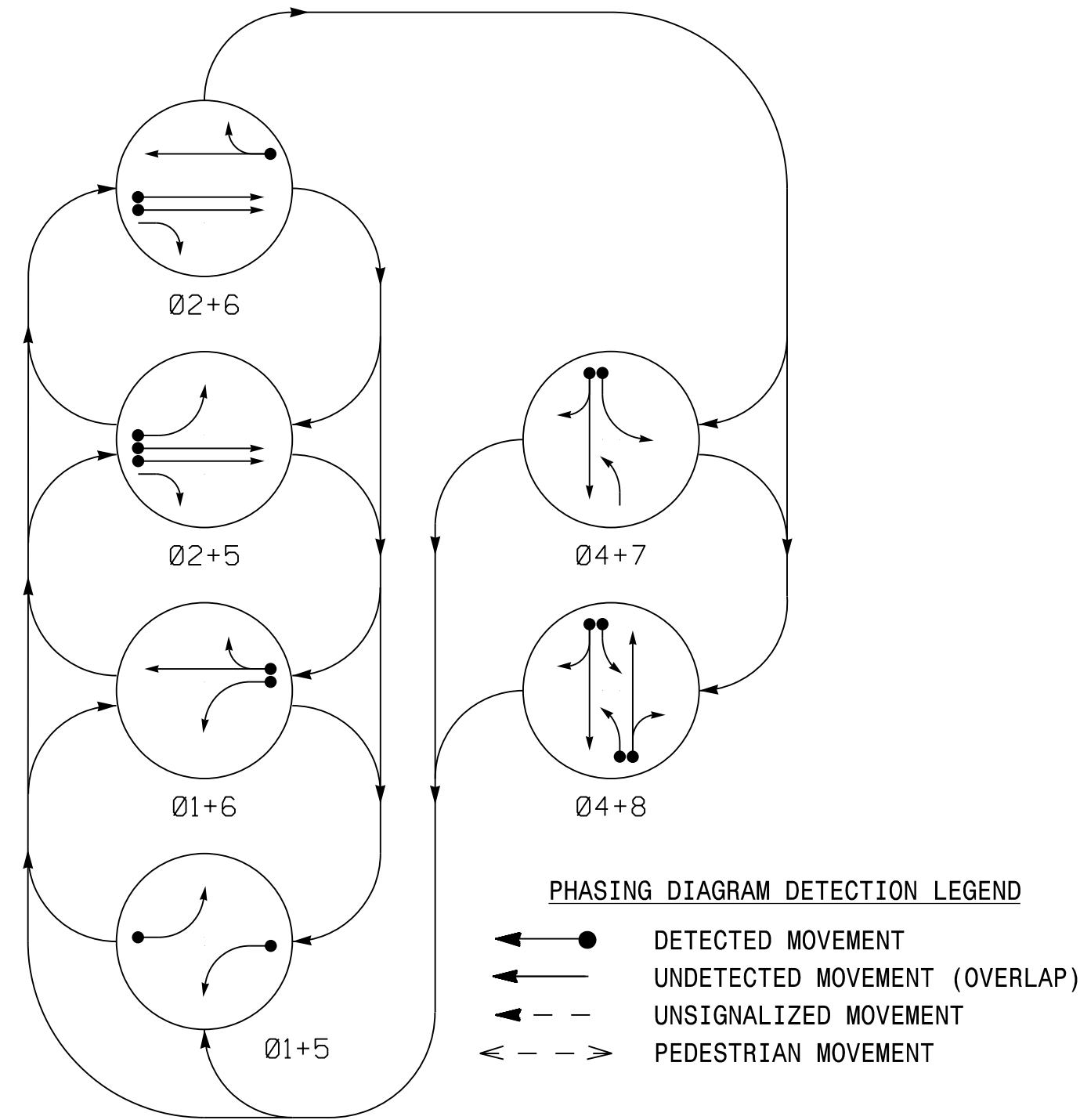
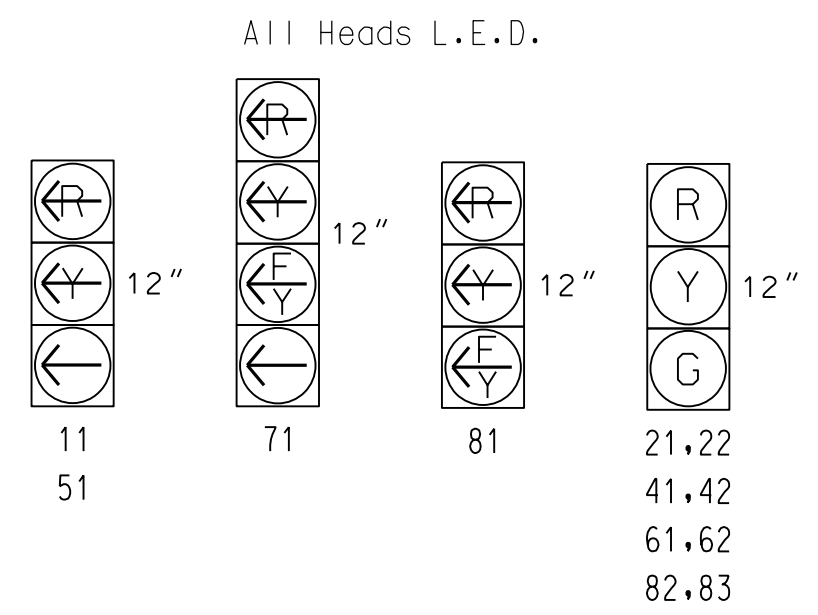


TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	04+7	04+8	F	H
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	Y	Y
41, 42	R	R	R	R	G	G	R	R
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	G	R	R	Y	Y
71	←	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←	←
82,83	R	R	R	R	R	G	R	R

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

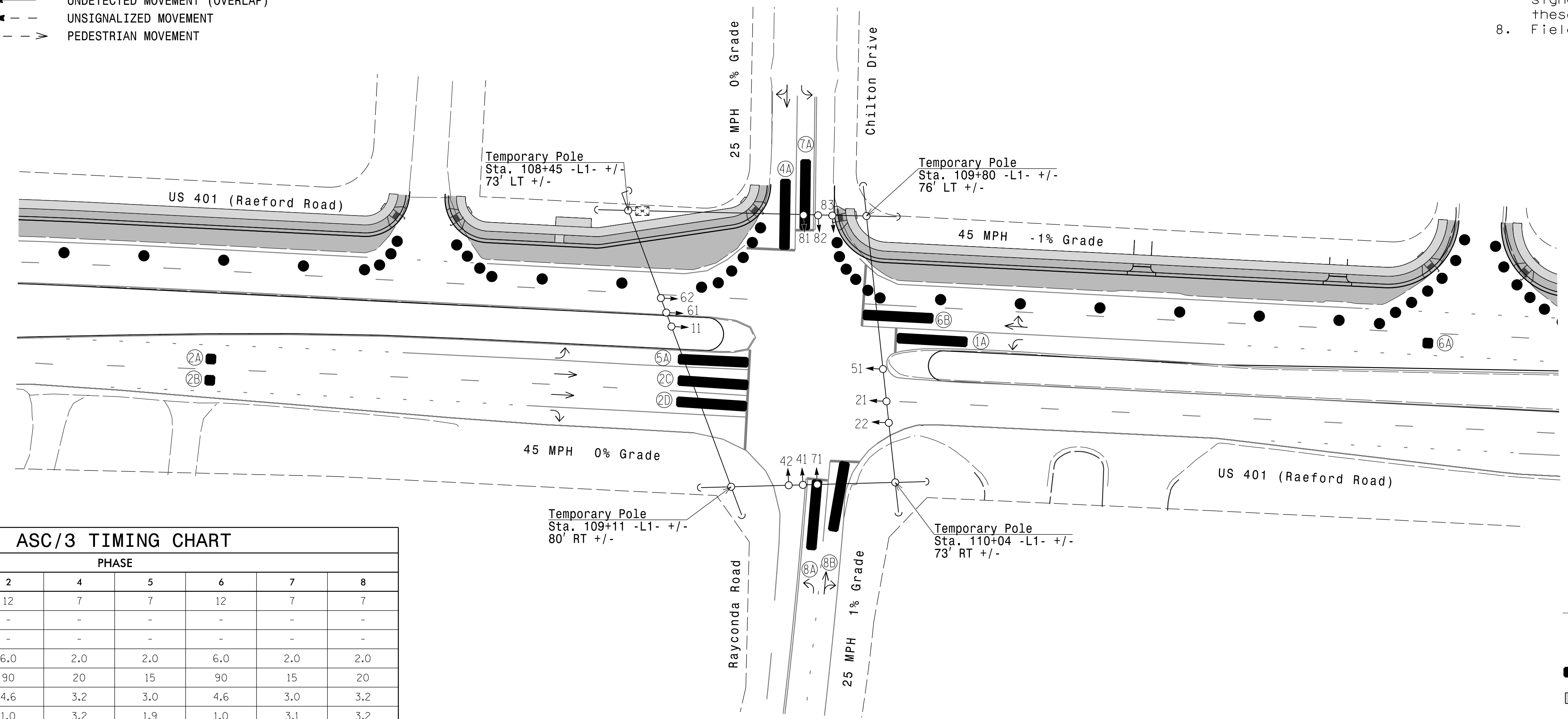
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
4A	6X40	0	*	-	4	Yes	-	10	-	S	-	X
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	15	-	S	-	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.

6 Phase Fully Actuated Fayetteville Signal System

NOTES

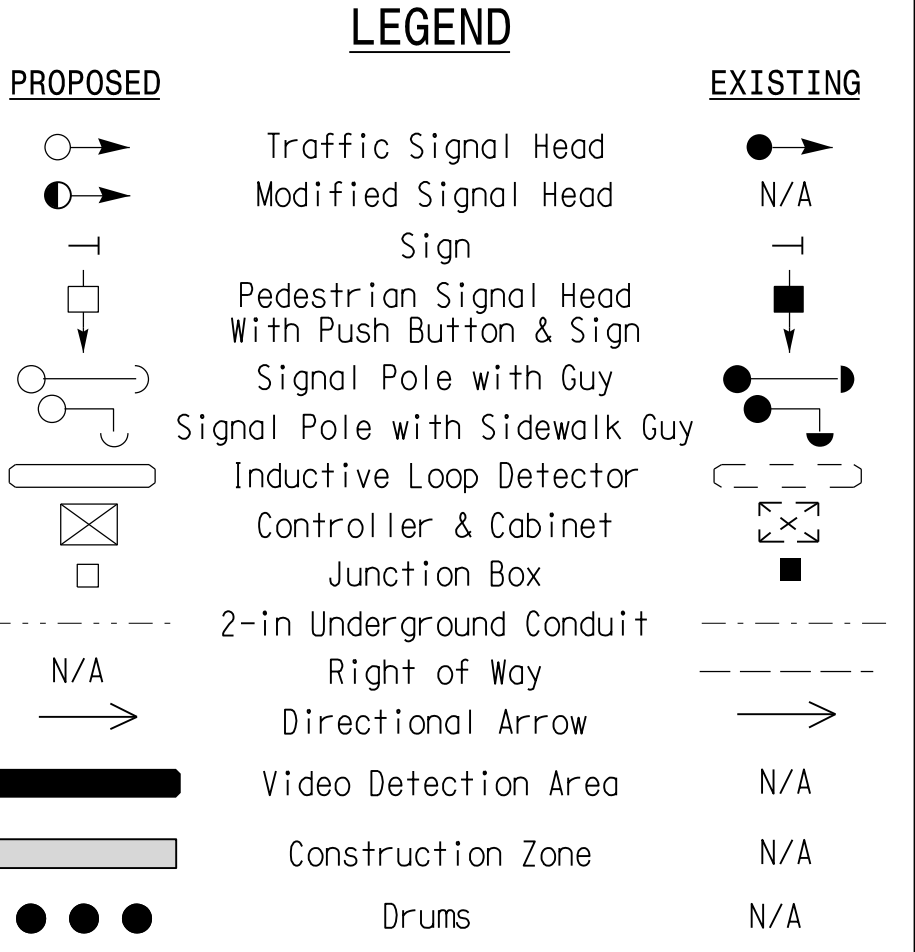
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red. Relocate existing cabinet and controller onto new foundation.
7. 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	7	8	
Min Green *	7	12	7	7	12	7	7	
Walk *	-	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0	2.0	
Max I *	15	90	20	15	90	15	20	
Yellow	3.0	4.6	3.2	3.0	4.6	3.0	3.2	
Red Clear	2.8	1.0	3.2	1.9	1.0	3.1	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	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 II

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**US 401 (Raeford Rd.)
at
Chilton Dr / Rayconda Rd**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: B L Watson

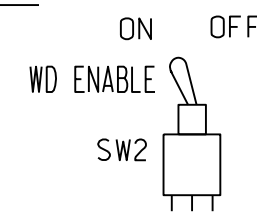
SEAL 29449
JEFFREY L. WATSON
ENGINEER
3/29/2018

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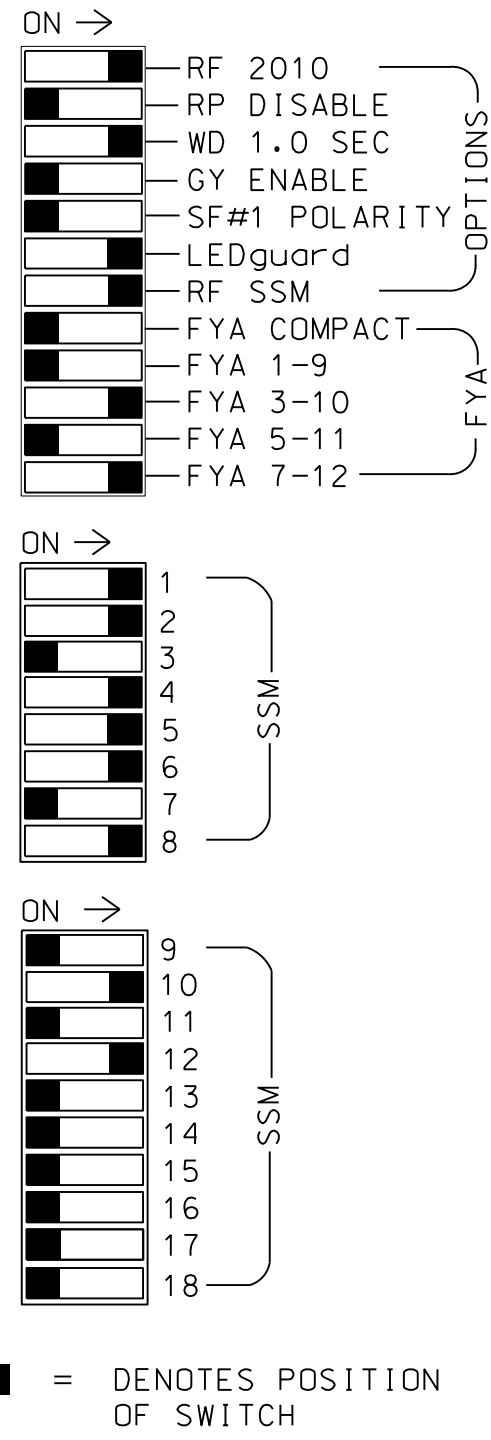
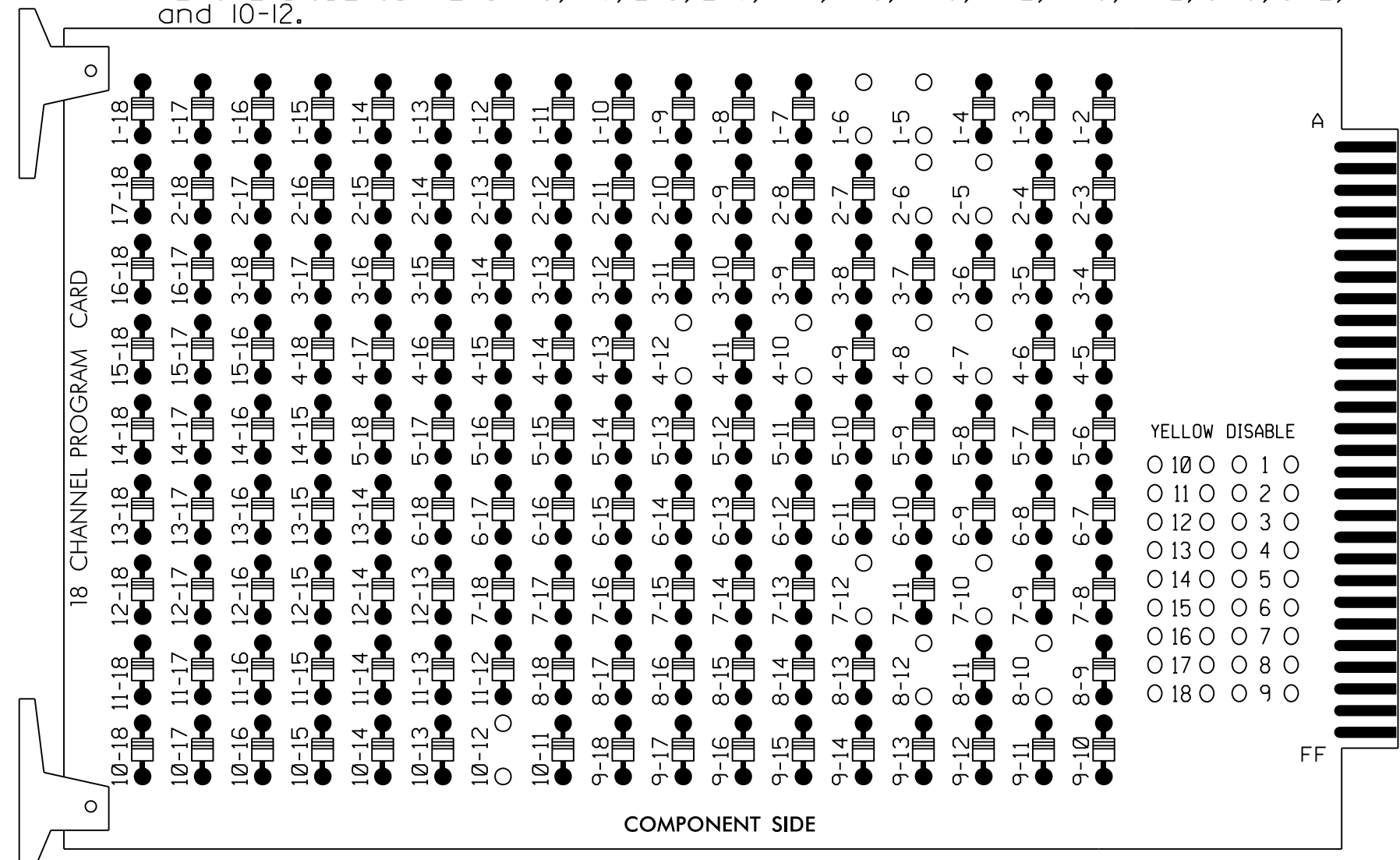
3/29/2018
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 User: rlmuncey

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, 4-7, 4-8, 4-10, 4-12, 7-10, 7-12, 8-10, 8-12, and 10-12.



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green and 6 Green.
- 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,S10,
 S11,AUX S2,AUX S5
 PHASES USED.....1,2,4,5,6,7,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....*
 OVERLAP "C".....NOT USED
 OVERLAP "D".....*
 * See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

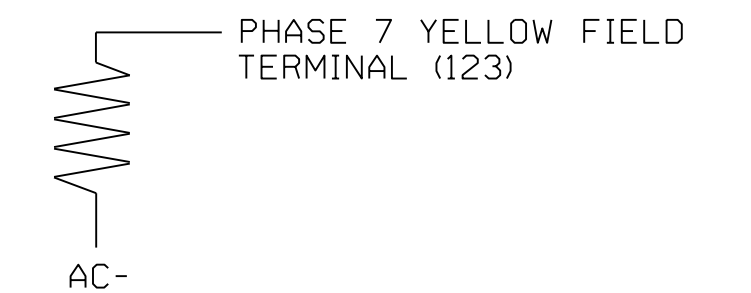
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	71	82,83	NU	NU	81	NU	NU	71	NU
RED		128			101			134			107							
YELLOW		129			102			135		*	108							
GREEN		130			103			136			109							
RED ARROW	125							131							A124			A101
YELLOW ARROW	126							132							A125			A102
FLASHING YELLOW ARROW															A126			A103
GREEN ARROW	127							133			124							

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

LOAD RESISTOR INSTALLATION DETAIL

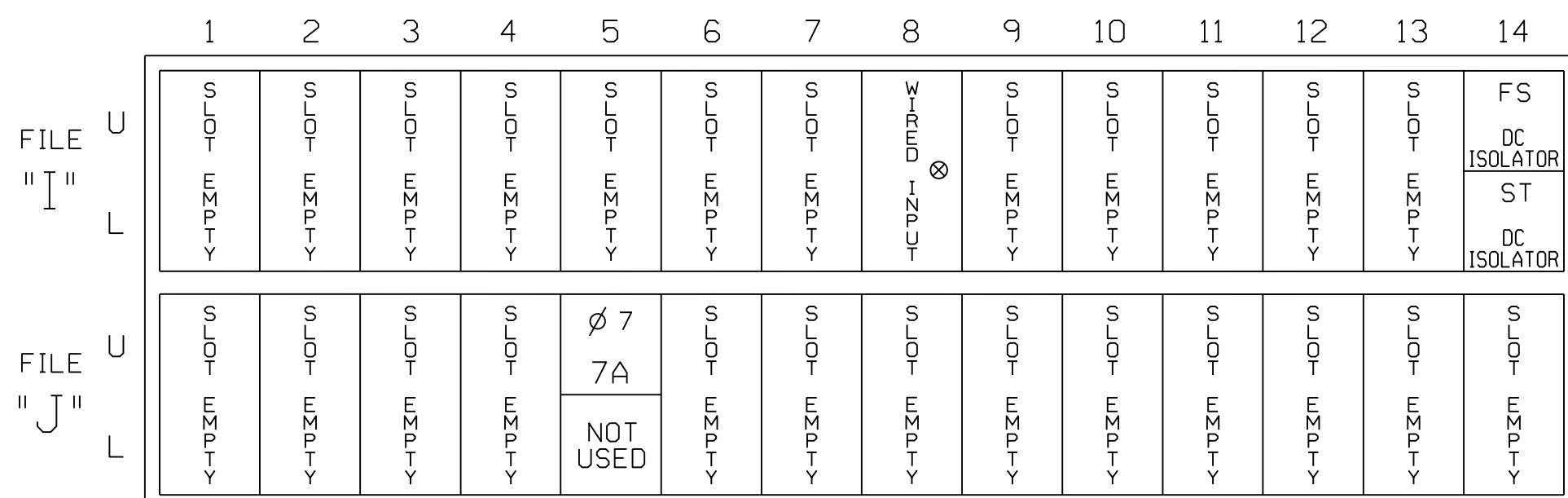
(install resistor as shown)

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



INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

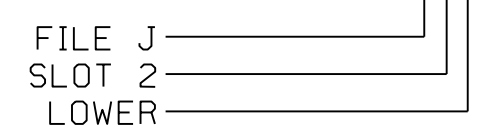
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
7A ¹	-	J5U	57	7	7	YES		15		S
	-	I8U	49	24	4	YES		3		S

¹Add jumper from J5-W to I8-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L

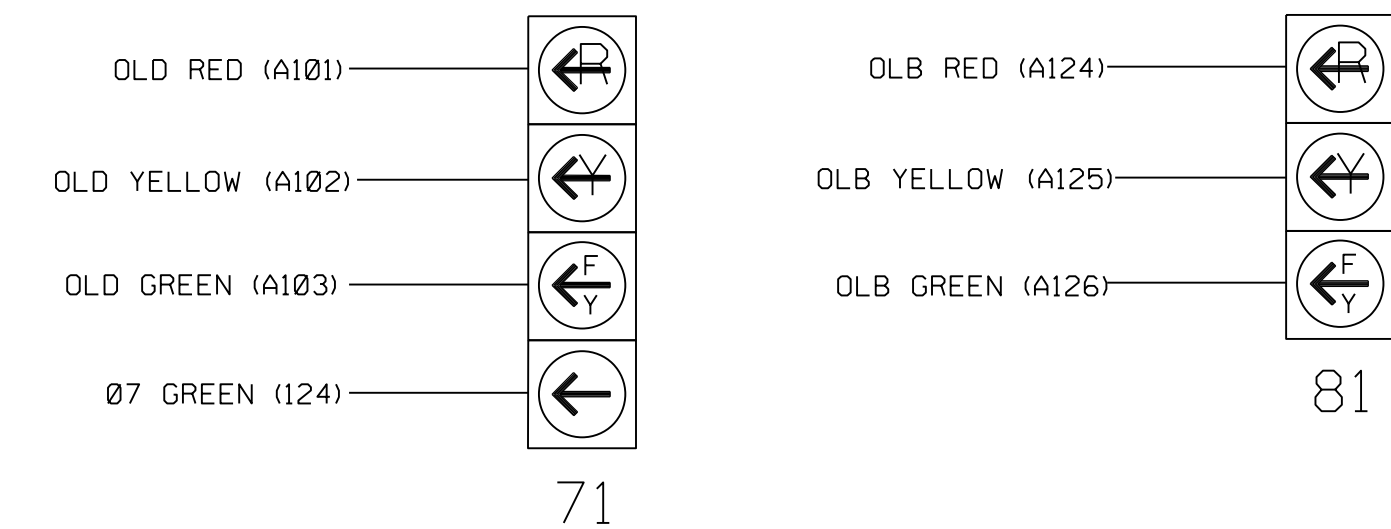


DETECTOR NOTES

- 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.
- For loop 7A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0767T1
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 1 - TMP Phase II
 Electrical Detail - Sheet 1 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: R M Muncey REVIEWED BY:		
REVISIONS _____ INIT. DATE		DATE 3/29/2018		SEAL DATE 3/29/2018

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**
- 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 . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

Toggle Twice

OVERLAP D

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

```

TMG VEH OVLP...[D] TYPE: . . . . .PPLT FYA
PROTECTED LEFT TURN.... PHASE 7
OPPOSING THROUGH..... PHASE 8

FLASHING ARROW OUTPUT.....CH12 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0



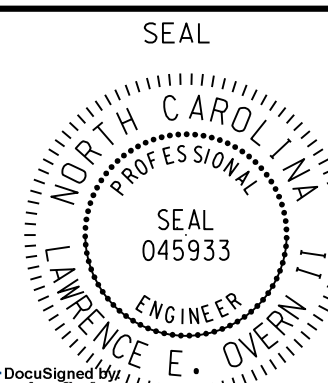
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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-0767T1
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

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

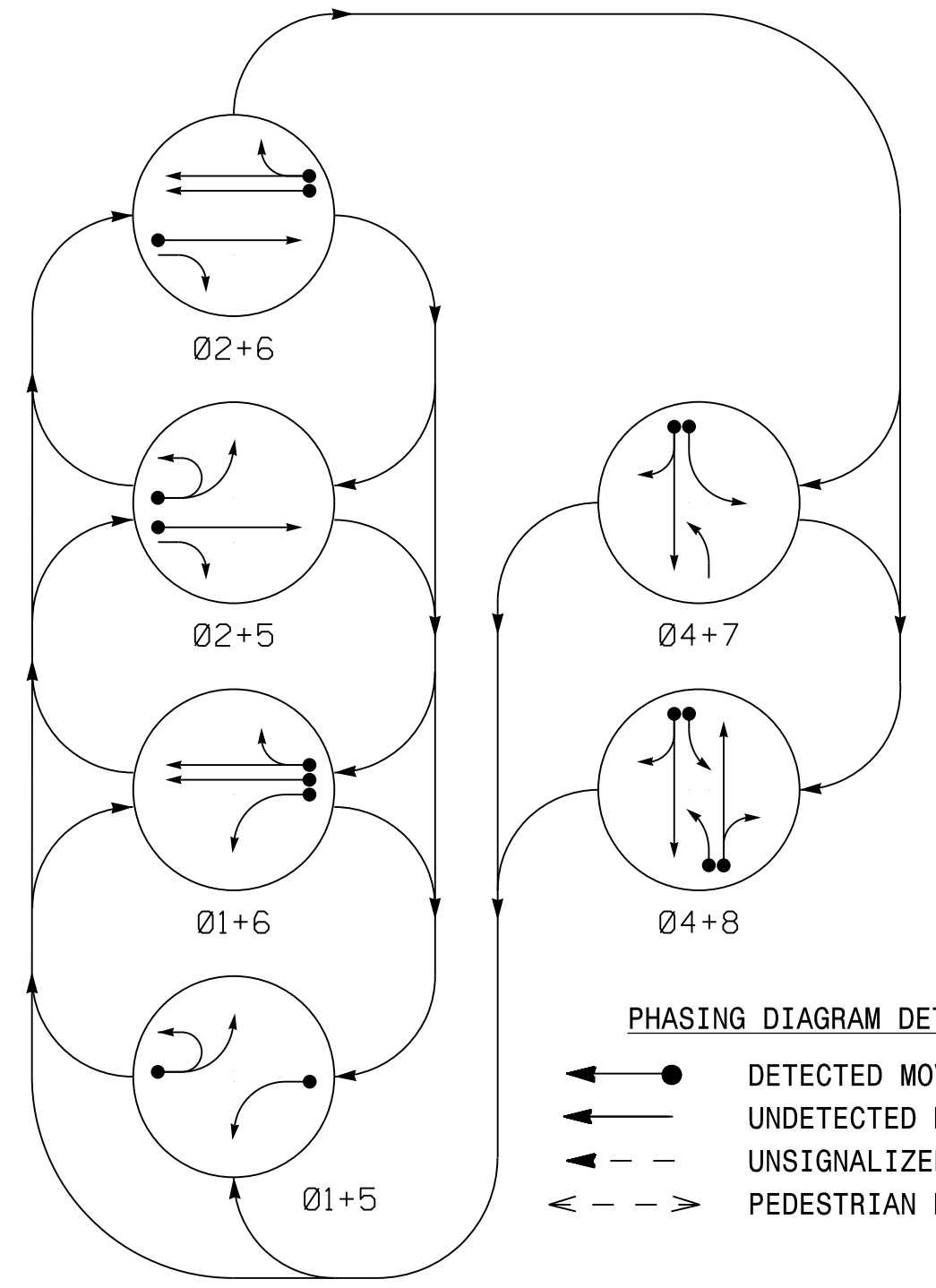
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		Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: L Overn PREPARED BY: R M Muncey REVIEWED BY:		

DATE: 03/29/2018
User: rfmuncy

3/29/2018
DATE
SIG. INVENTORY NO. 06-0767T1

PHASING DIAGRAM



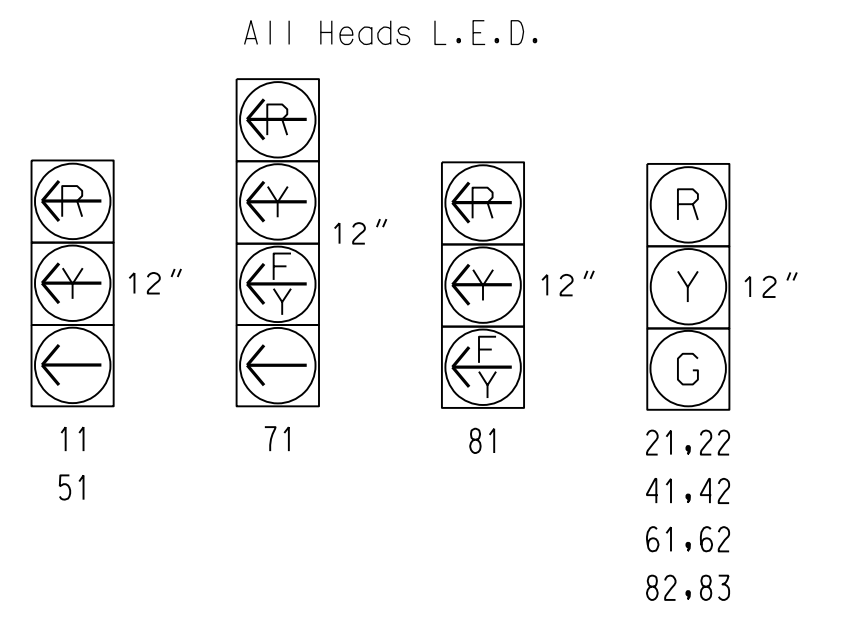
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	04+7	04+8	F	H
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	Y	
41, 42	R	R	R	R	G	G	R	
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	G	R	R	Y	
71	←	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←	←
82,83	R	R	R	R	R	G	R	

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

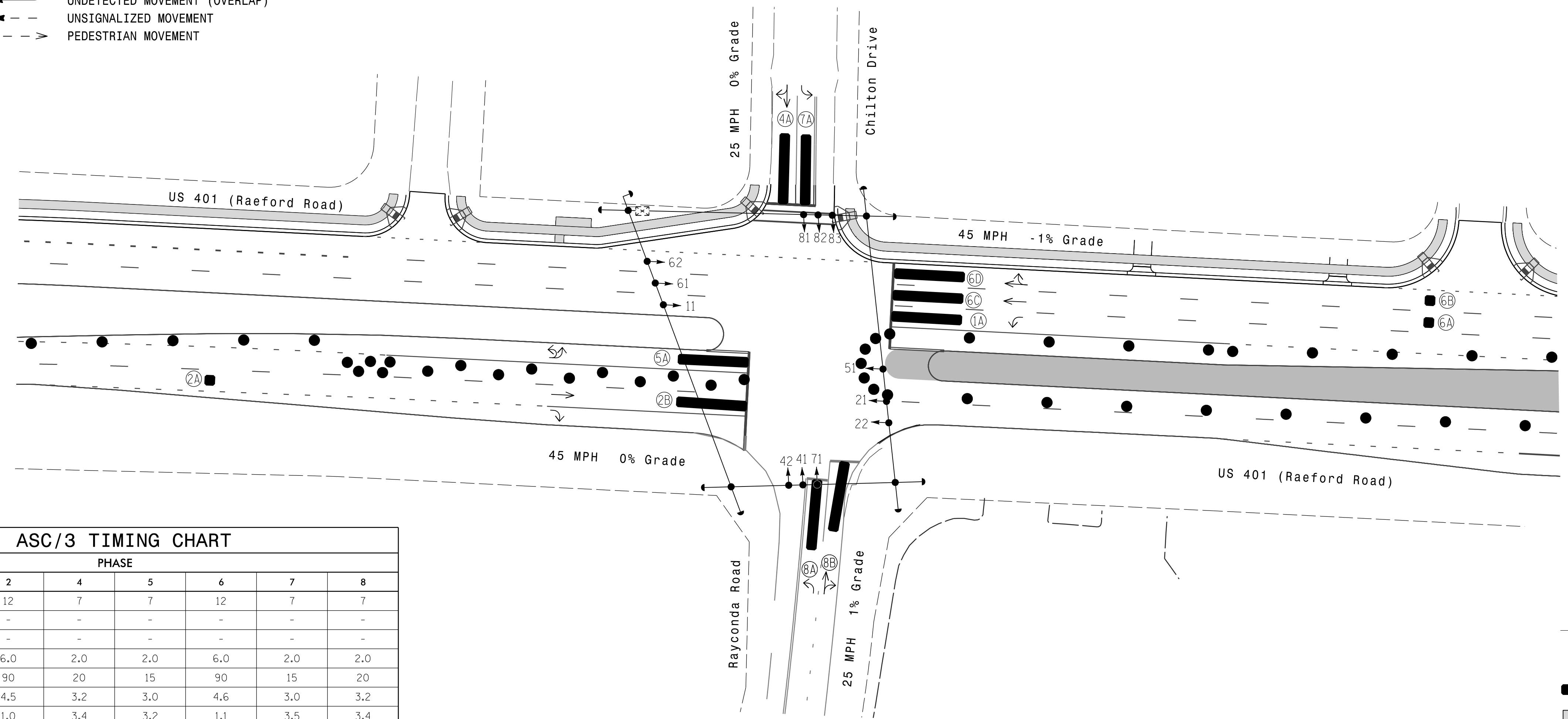
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
4A	6X40	0	*	-	4	Yes	-	10	-	S	-	-
5A	6X40	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	-	-
7A	6X40	0	*	-	7	Yes	-	15	-	S	-	-
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.

6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 7 may be lagged.
- Reposition existing signal heads numbered 11, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Min Green *	7	12	7	7	12	7	7	
Walk *	-	-	-	-	-	-	-	
Ped Clear	-	-	-	-	-	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0	2.0	
Max I *	15	90	20	15	90	15	20	
Yellow	3.0	4.5	3.2	3.0	4.6	3.0	3.2	
Red Clear	3.1	1.0	3.4	3.2	1.1	3.5	3.4	
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	-	-	X	-	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	X	

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

LEGEND

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

Signal Upgrade Temporary Design 2 - TMP Phase III

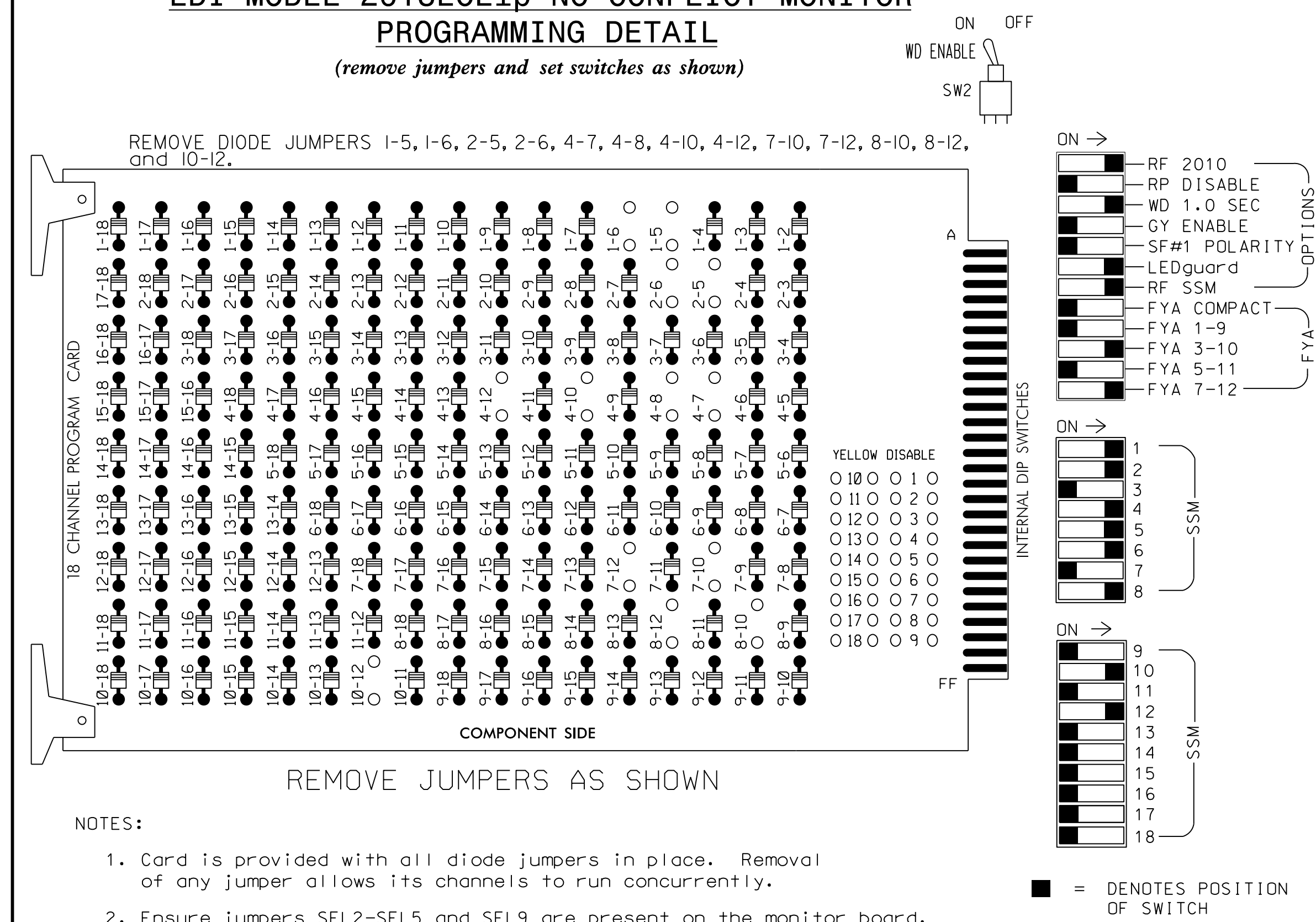
<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>		<p>US 401 (Raeford Rd.) at Chilton Dr / Rayconda Rd</p>		
		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: E D Harris</p> <p>PREPARED BY: R M Muncey REVIEWED BY: B L Watson</p>	<p>3/29/2018</p>	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/29/2018
 User: rlmuncey
 C:\Users\rlmuncey\Documents\Signal Design\Phase 3\U-4405_Sig_Design_06-076172.dgn

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Program controller to start up in phase 2 Green and 6 Green.
- 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,S10,
 S11,AUX S2,AUX S5

PHASES USED.....1,2,4,5,6,7,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....*
 OVERLAP "C".....NOT USED
 OVERLAP "D".....*

* See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

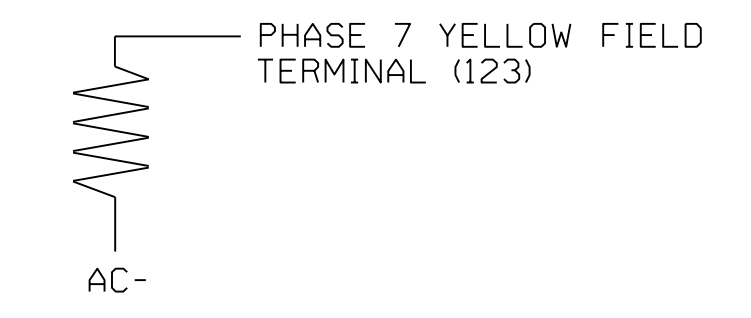
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18		
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE		
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	71	82,83	NU	NU	81	NU	NU	71	NU		
RED		128			101			134			107									
YELLOW		129			102			135		*	108									
GREEN		130			103			136			109									
RED ARROW	125							131										A124	A101	
YELLOW ARROW	126							132											A125	A102
FLASHING YELLOW ARROW																			A126	A103
GREEN ARROW	127							133			124									

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

LOAD RESISTOR INSTALLATION DETAIL

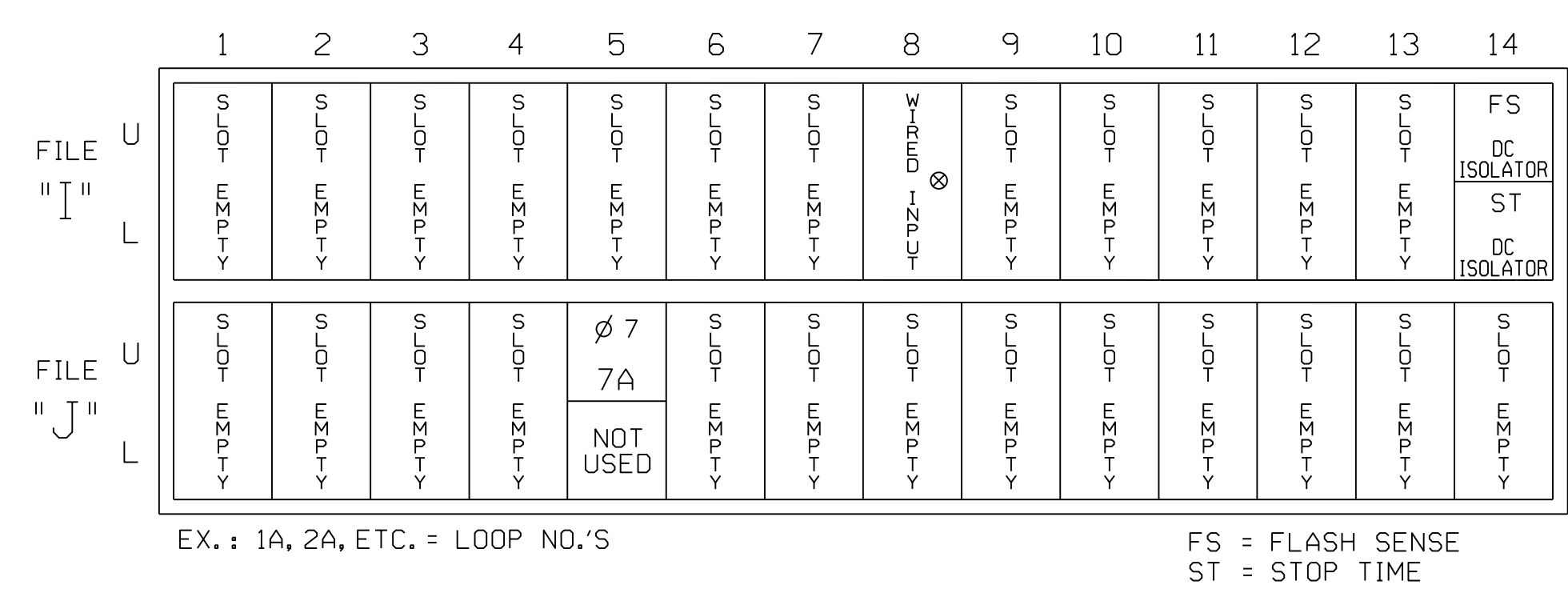
(install resistor as shown)

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



INPUT FILE POSITION LAYOUT

(front view)

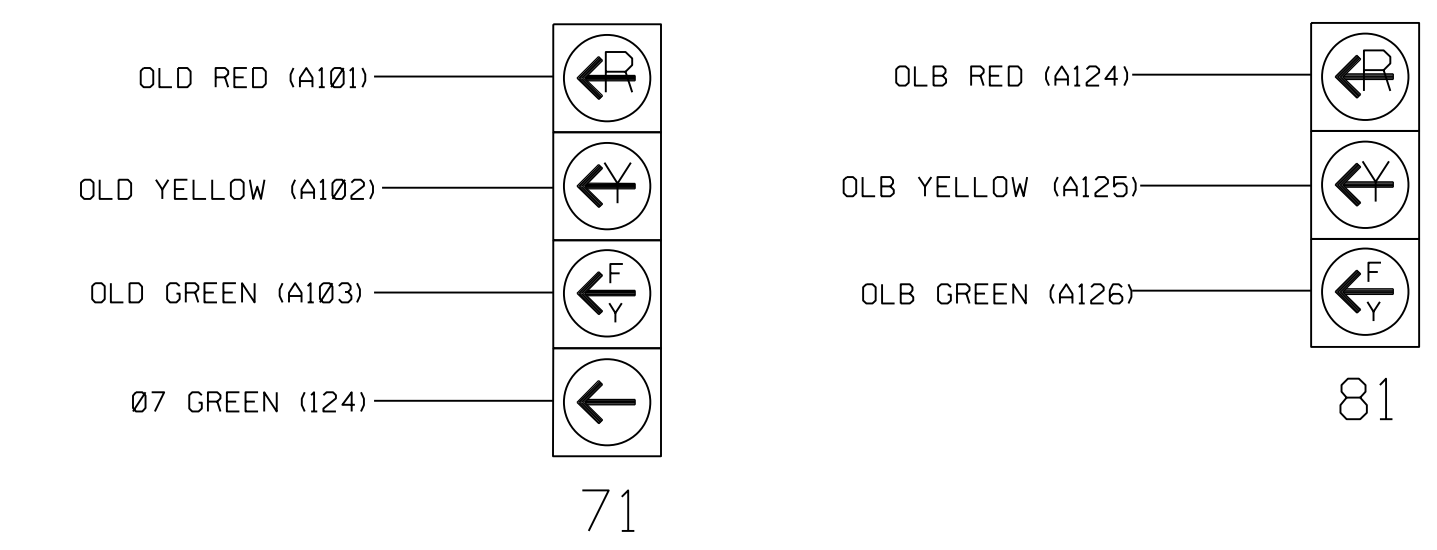


DETECTOR NOTES

- 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.
- For loop 7A detector card placements and slots reserved for wired inputs are typical for a NCDOT installation.

SIGNAL WIRING DETAIL

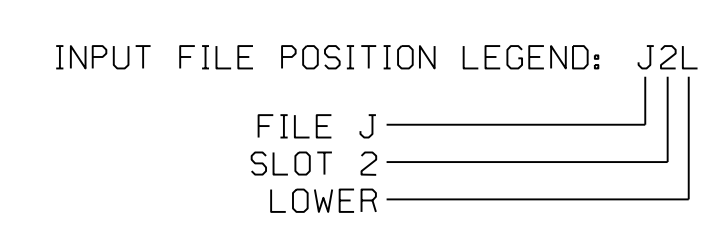
(wire signal heads as shown)



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
7A ¹	-	J5U	57	7	7	YES		15		S
	-	I8U	49	24	4	YES		3		S

¹Add jumper from J5-W to I8-W, on rear of input file.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-076712
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

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

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	REVISIONS INIT. DATE	REVISIONS INIT. DATE	REVISIONS INIT. DATE

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**
- 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 . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

Toggle Twice

OVERLAP D

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

```

TMG VEH OVLP...[D] TYPE: . . . . .PPLT FYA
PROTECTED LEFT TURN.... PHASE 7
OPPOSING THROUGH..... PHASE 8

FLASHING ARROW OUTPUT.....CH12 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE..... 0



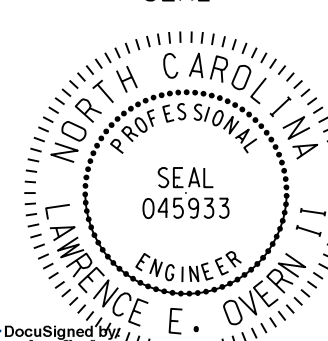
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END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
 THE SIGNAL DESIGN: 06-0767T2
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

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

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	REVISIONS <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		NO.	DESCRIPTION	INIT.	DATE				
NO.	DESCRIPTION	INIT.	DATE							

DATE: 03/29/2018 10:45:12 AM
User: rfmuncy

PHASING DIAGRAM

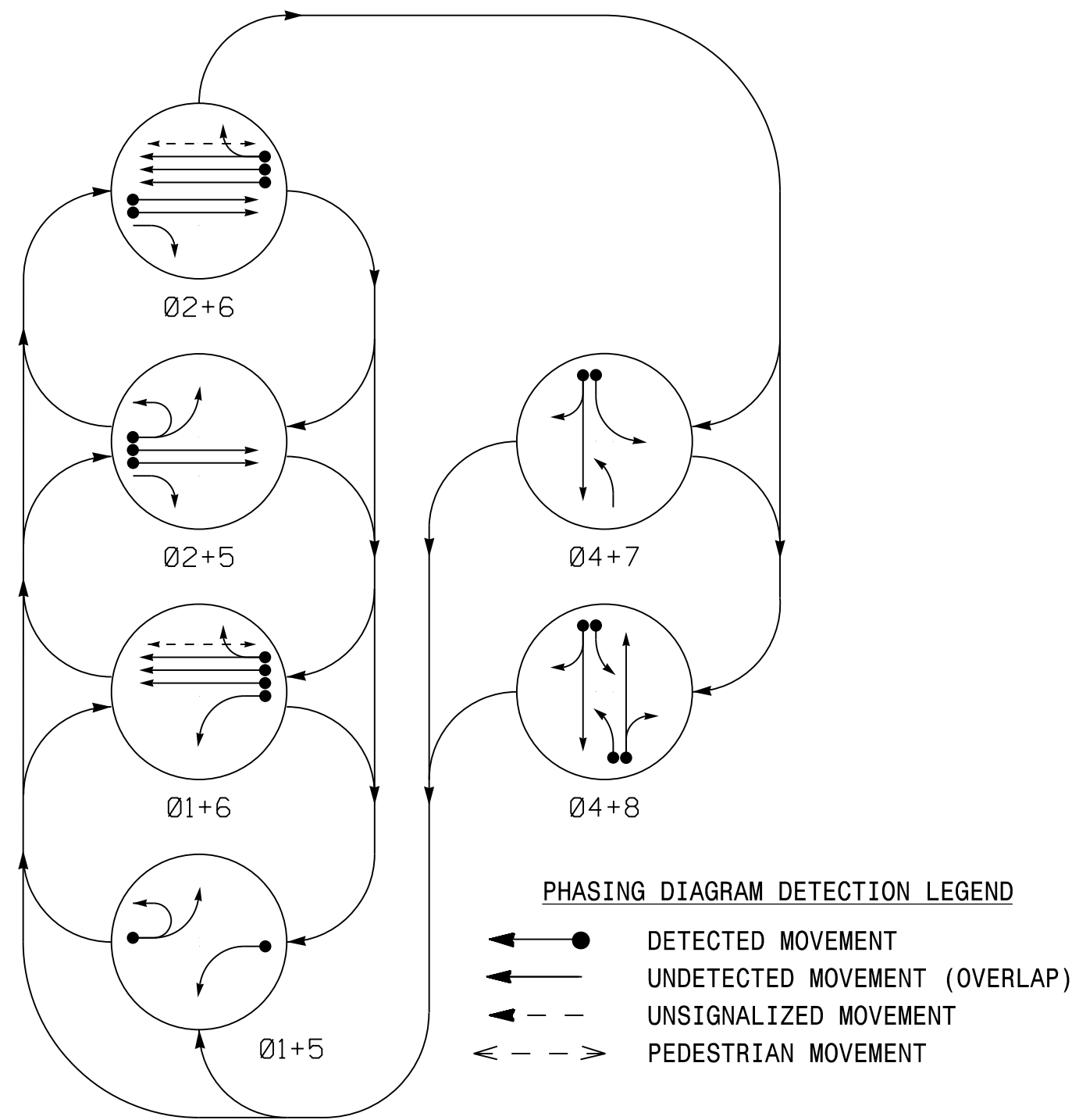
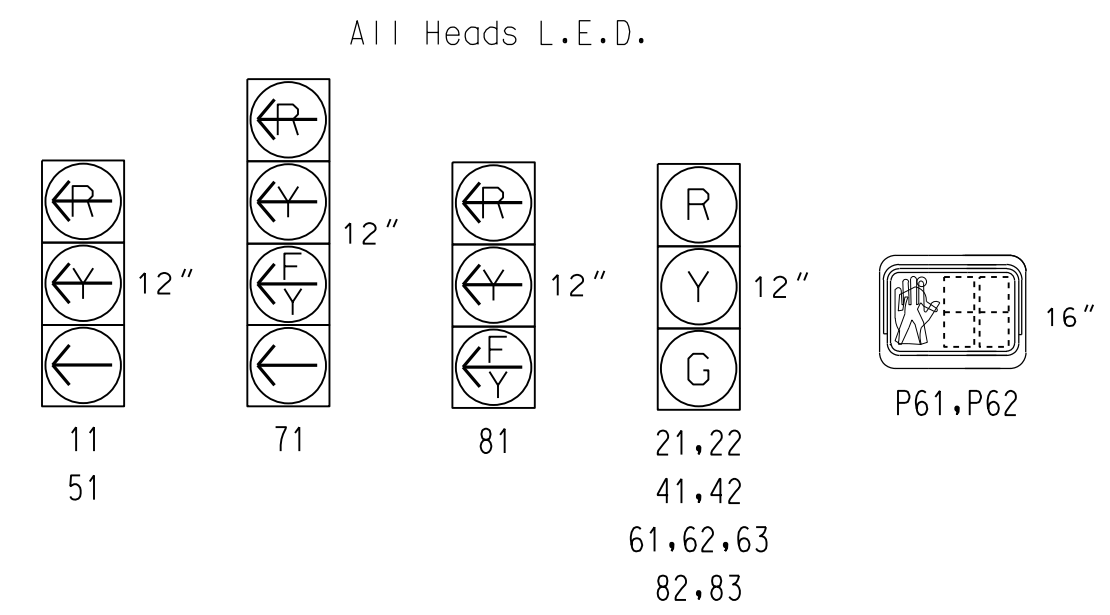


TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 7	Ø 4 + 8	F	H
11	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	Y	
41, 42	R	R	R	R	G	G	R	
51	←	←	←	←	←	←	←	←
61, 62, 63	R	G	R	G	R	R	Y	
71	←	←	←	←	←	←	←	←
81	←	←	←	←	←	←	←	←
82, 83	R	R	R	R	R	G	R	
P61, P62	DW	W	DW	W	DW	DW	DRK	

SIGNAL FACE I.D.



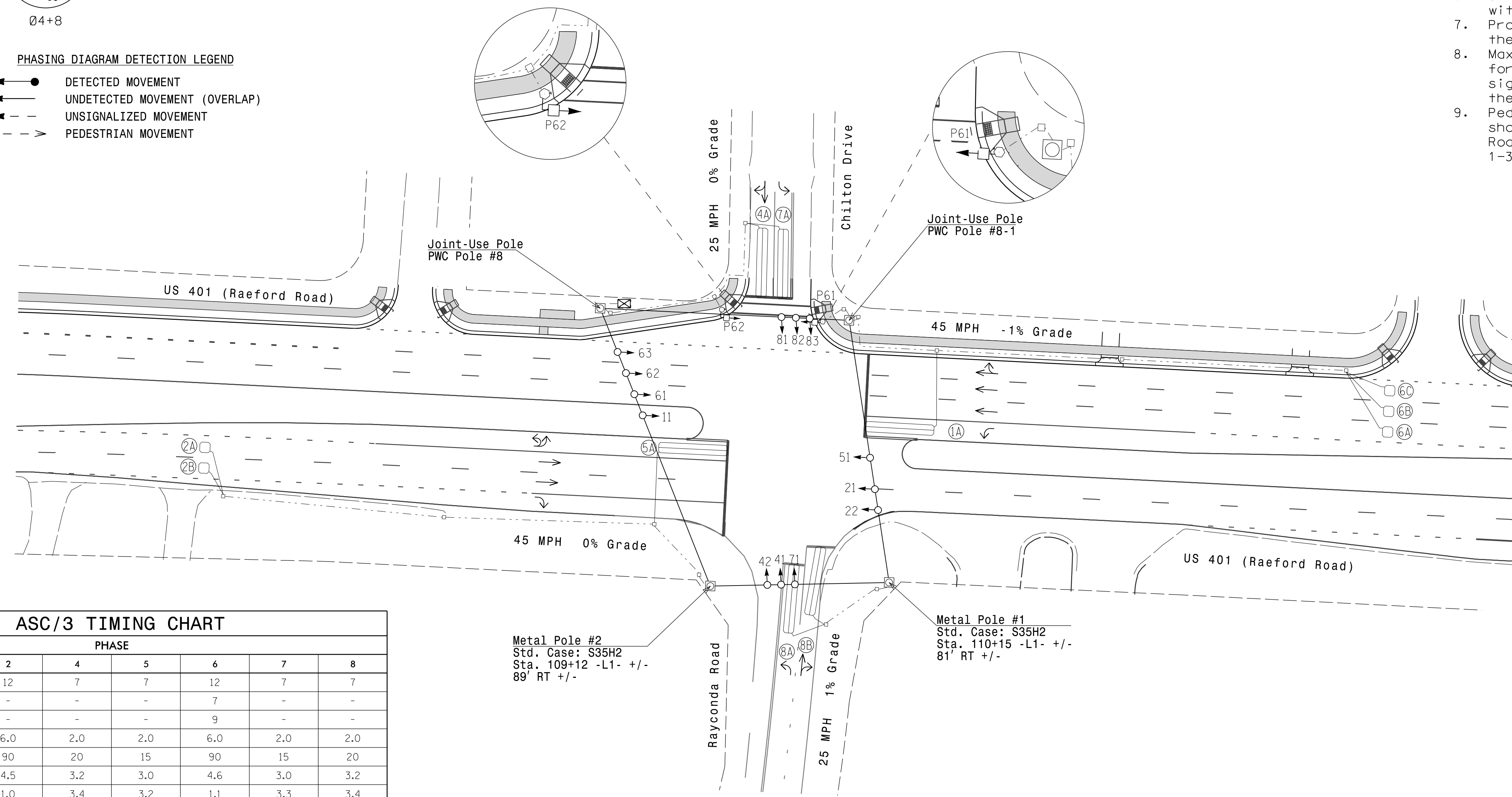
ASC/3 DETECTOR INSTALLATION CHART

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
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	10	-	S	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	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	-	15	-	S	-	X
8A	6X6	0	2-4-2	X	8	Yes	-	3	-	S	-	X
8B	6X6	0	2-4-2	X	8	Yes	-	10	-	S	-	X

6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 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.

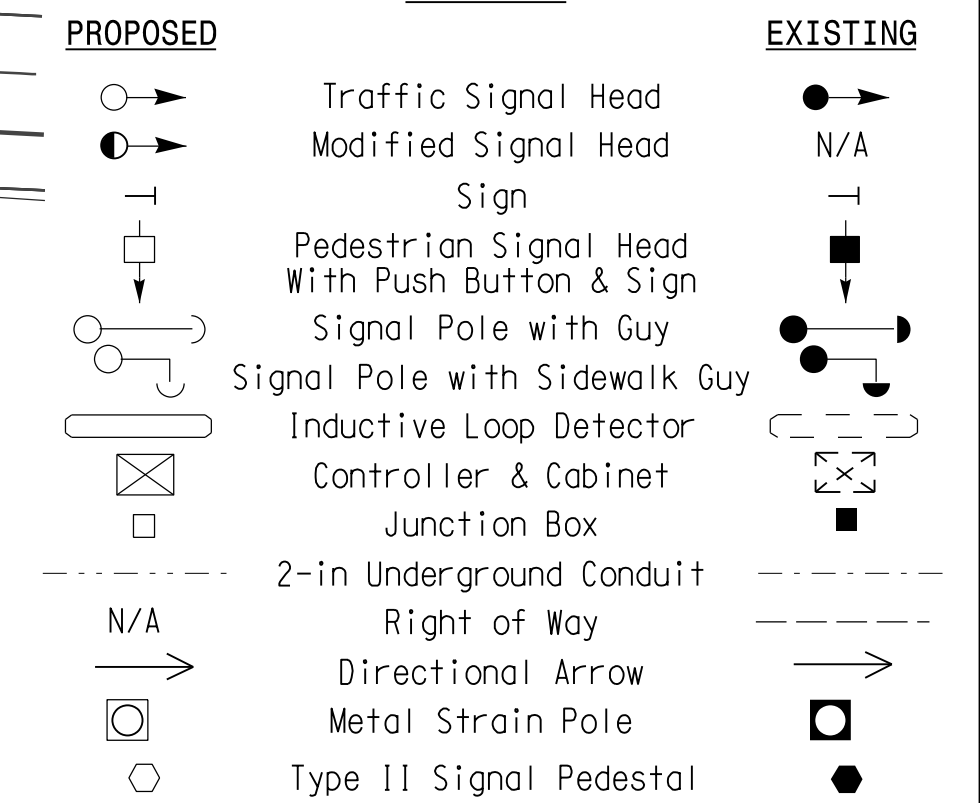


ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Min Green *	7	12	7	7	12	7	7	
Walk *	-	-	-	-	7	-	-	
Ped Clear	-	-	-	-	9	-	-	
Veh. Extension *	2.0	6.0	2.0	2.0	6.0	2.0	2.0	
Max I *	15	90	20	15	90	15	20	
Yellow	3.0	4.5	3.2	3.0	4.6	3.0	3.2	
Red Clear	2.8	1.0	3.4	3.2	1.1	3.3	3.4	
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	-	-	X	-	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	X	

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

LEGEND



Signal Upgrade - Final Design

Stantec Consulting Services Inc.
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Raleigh, NC 27606
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www.stantec.com
License No. F-0672

US 401 (Raeford Rd.)
at
Chilton Dr / Rayconda Rd

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: B L Watson

3/29/2018

SIG. INVENTORY NO. 06-0767

3/29/2018
 U:\Projects\4405\Signal\Drawings\Signal\Drawings\4405_Sig.dwg
 User: rfmuncy

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

- From Main Menu select
- From CONTROLLER Submenu select
- 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 . . . . .
PROTECT . . . . .
PED PRTC . . . . .
NOT OVLP . . . . .
FLSH GRN . . . 1 . . . . .
LAG X PH . . . . .
LAG 2 PH . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0

```

Toggle Twice

OVERLAP D

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

```

TMG VEH OVLP... [D] TYPE: . . . . PPLT FYA
PROTECTED LEFT TURN... PHASE 7
OPPOSING THROUGH..... PHASE 8

FLASHING ARROW OUTPUT.....CH12 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: 06-0767
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Final Design
Electrical Detail - Sheet 2 of 2

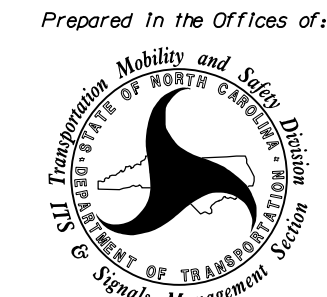
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ELECTRICAL AND PROGRAMMING
 DETAILS FOR:

Prepared in the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Raeford Rd.)
 at
 Chilton Dr / Rayconda Rd

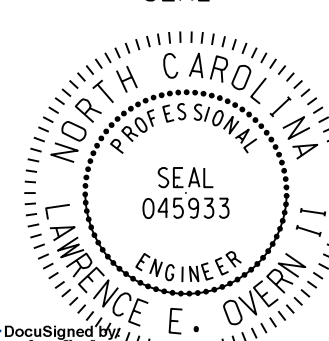
Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: R M Muncey REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

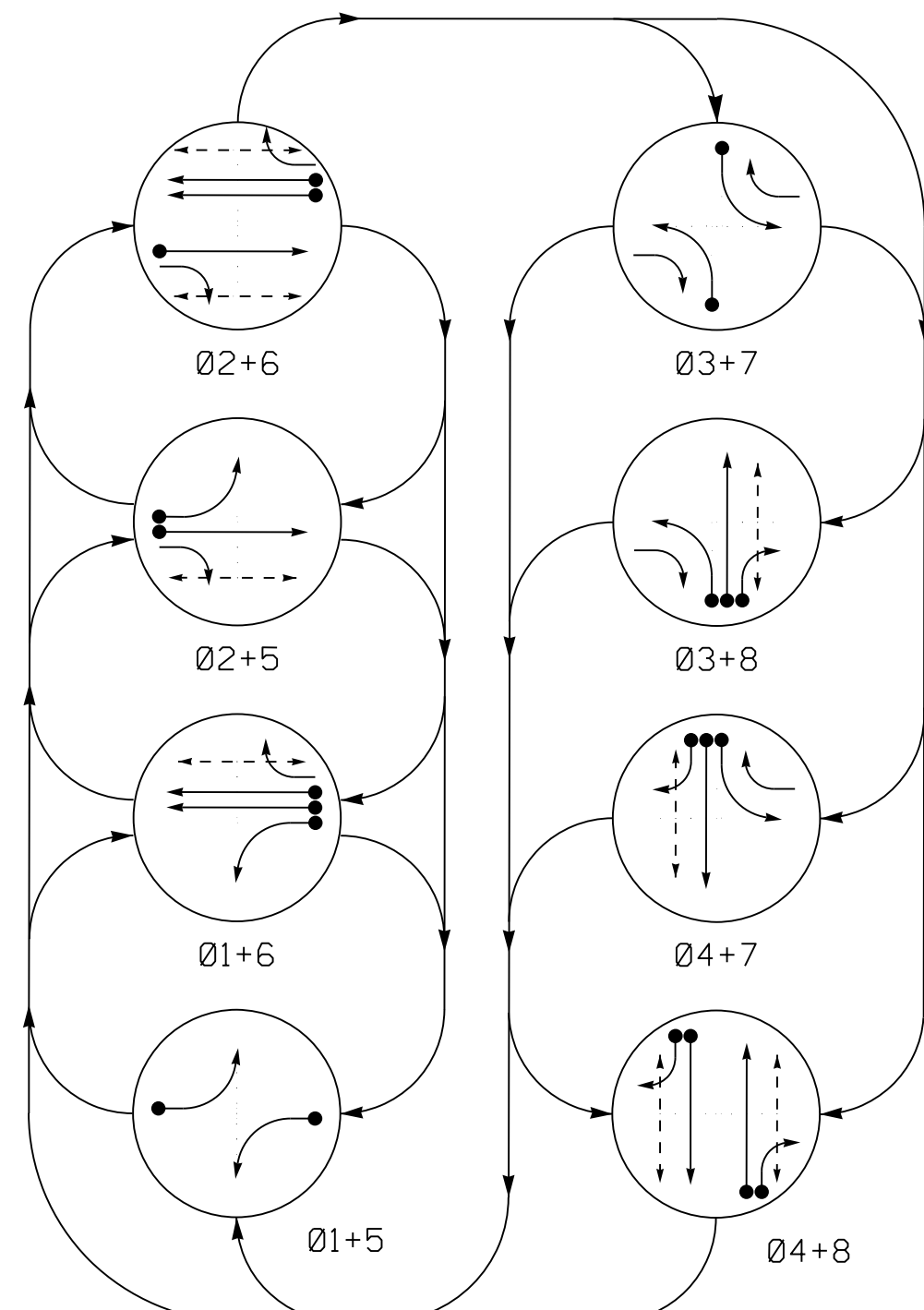


Lawrence E. Overn
 ENGINEER
 045933
 3/29/2018

SIG. INVENTORY NO. 06-0767

DATE: 03/29/2018 11:00:00 AM
 User: rfmuncy

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

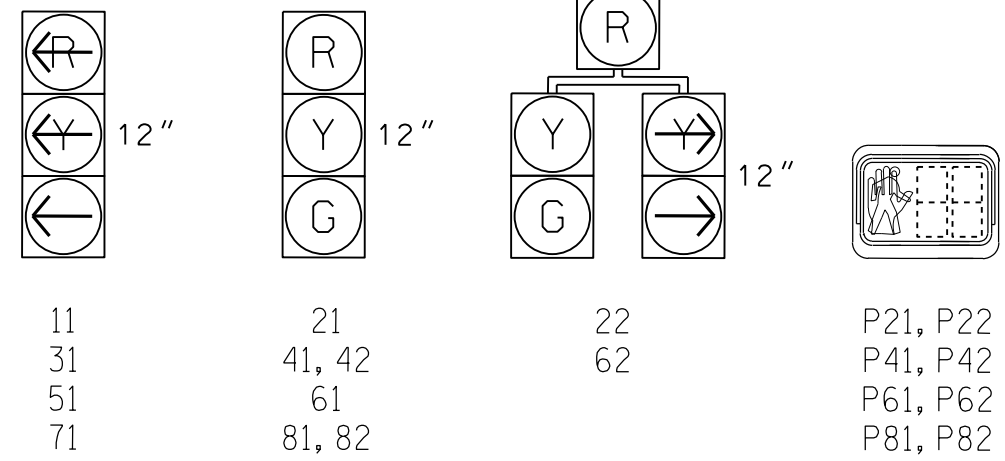
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ◀ — ▶ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

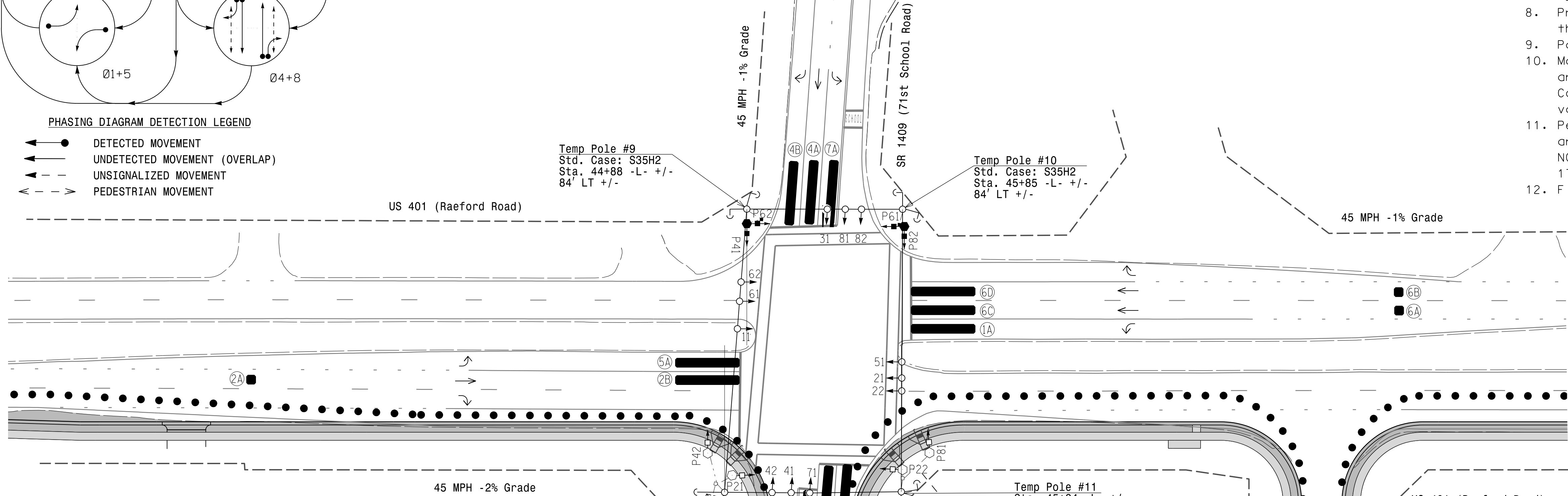
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
3A	6X40	0	*	-	3	Yes	-	3	-	S	-	X
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	X
4B	6X40	0	*	-	4	Yes	-	15	-	S	-	X
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	3	-	S	-	X
8A	6X40	0	*	-	8	Yes	-	-	-	S	-	X
8B	6X40	0	*	-	8	Yes	-	15	-	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.

8 Phase Fully Actuated Fayetteville Signal System

NOTES

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



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	-	20	-	36	-	17	-	30
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	20	90	25	35	20	90	25	35
Yellow	3.0	4.7	3.0	4.6	3.0	4.6	3.0	4.3
Red Clear	3.6	1.5	3.5	2.2	3.4	1.4	3.3	2.2
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	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

- | | | | |
|-----|---|-----|---|
| ○ | Proposed Traffic Signal Head | ● | Existing Traffic Signal Head |
| ○ | Proposed Modified Signal Head | ○ | Existing Modified Signal Head |
| ○ | Proposed Pedestrian Signal Head With Push Button & Sign | ○ | Existing Pedestrian Signal Head With Push Button & Sign |
| ○ | Proposed Signal Pole with Guy | ○ | Existing Signal Pole with Guy |
| ○ | Proposed Signal Pole with Sidewalk Guy | ○ | Existing Signal Pole with Sidewalk Guy |
| □ | Proposed Inductive Loop Detector | □ | Existing Inductive Loop Detector |
| □ | Proposed Controller & Cabinet | □ | Existing Controller & Cabinet |
| □ | Proposed Junction Box | □ | Existing Junction Box |
| --- | Proposed 2-in Underground Conduit | --- | Existing 2-in Underground Conduit |
| N/A | Proposed Right of Way | N/A | Existing Right of Way |
| → | Proposed Directional Arrow | → | Existing Directional Arrow |
| ■ | Proposed Video Detection Area | N/A | Existing Video Detection Area |
| ■ | Proposed Construction Zone | N/A | Existing Construction Zone |
| ● | Proposed Drums | N/A | Existing Drums |
| ○ | Proposed Type II Signal Pedestal | ○ | Existing Type II Signal Pedestal |

Signal Upgrade Temporary Signal Design 1 - TMP Phase I

Stantec
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801 Jones Franklin Road-Suite 300
Raleigh, NC 27606
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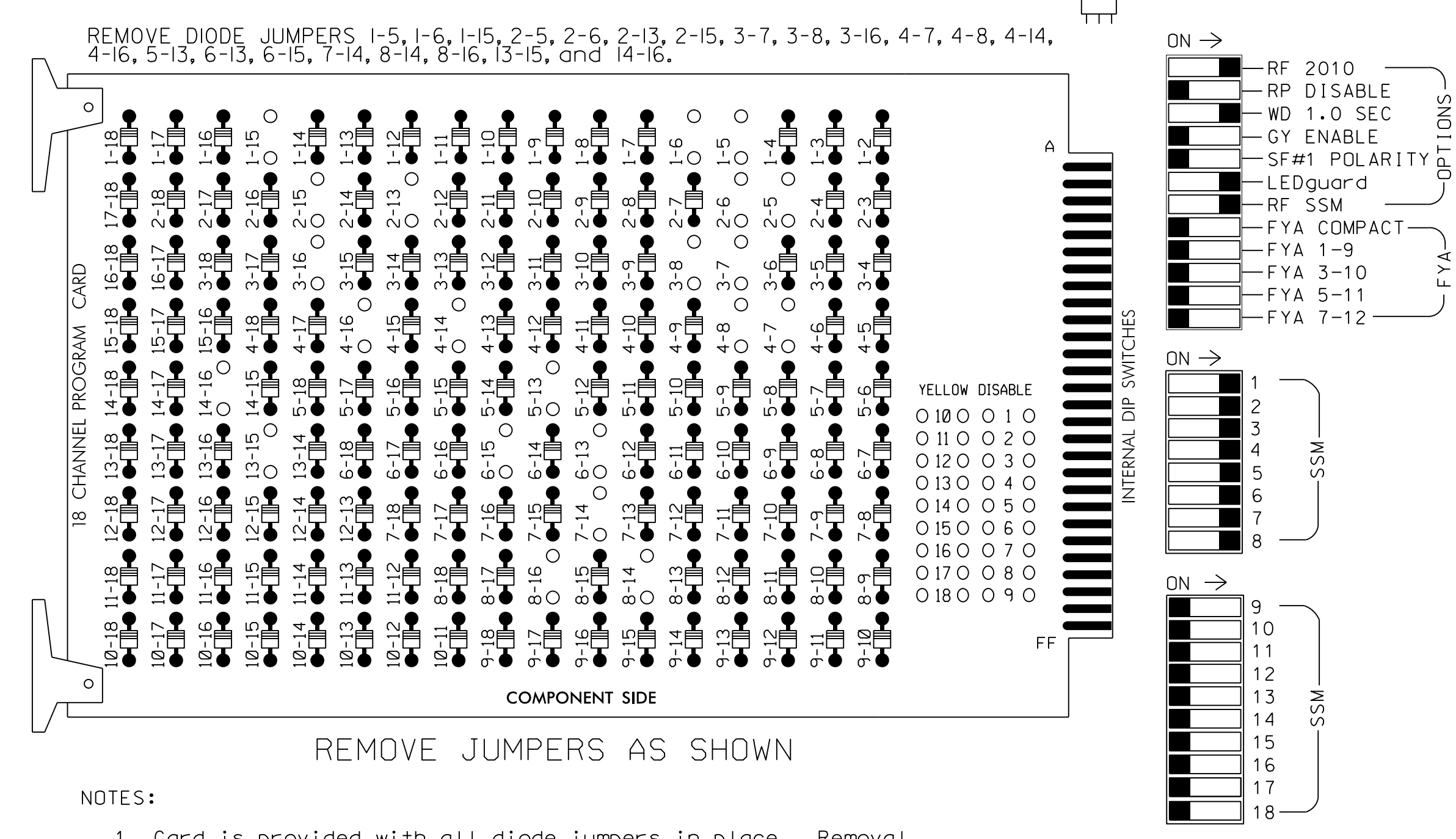
Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27526
SCALE
0 40
1"=40'

US 401 (Raeford Road) at
SR 1409 (71st School Road) /
SR 1105 (Graham Road)
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: M Wilson REVIEWED BY: B L Watson
REVISIONS
INIT. DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED
NORTH CAROLINA
PROFESSIONAL
SEAL
29449
ENGINEER
Betsy L. Watson
3/29/2018
DATE
SIG. INVENTORY NO. 06-051611

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,
 S9,S10,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED
 OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16		
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED		
SIGNAL HEAD NO.	11	21,22	P21, P22	31	22	41,42	P41, P42	51	61,62	P61, P62	71	62	81,82	P81, P82
RED		128			101			134				107		
YELLOW		129			102			135				108		
GREEN		130			103			136				109		
RED ARROW	125			116				131			122			
YELLOW ARROW	126			117	117			132			123	123		
GREEN ARROW	127			118	118			133			124	124		
Hand			113				104			119			110	
Walking			115				106			121			112	

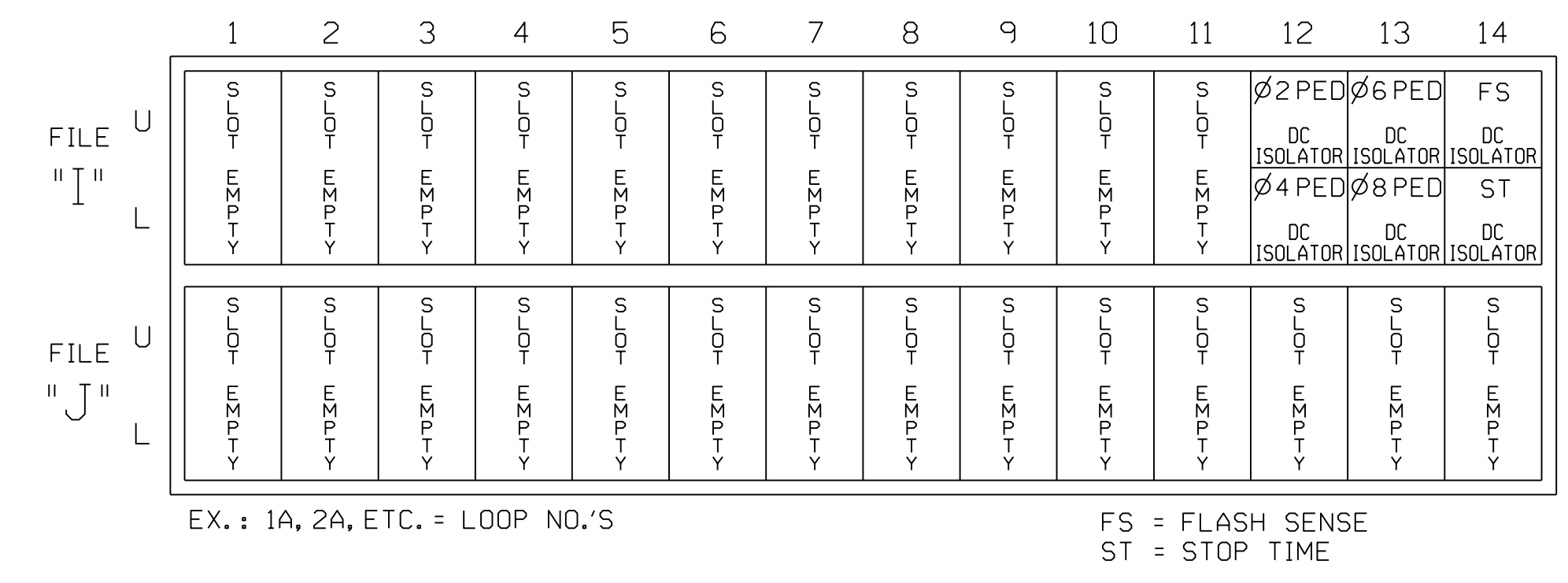
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

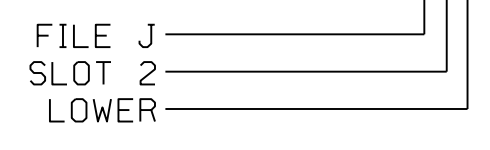
(front view)



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

INPUT FILE POSITION LEGEND: J2L



NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

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.

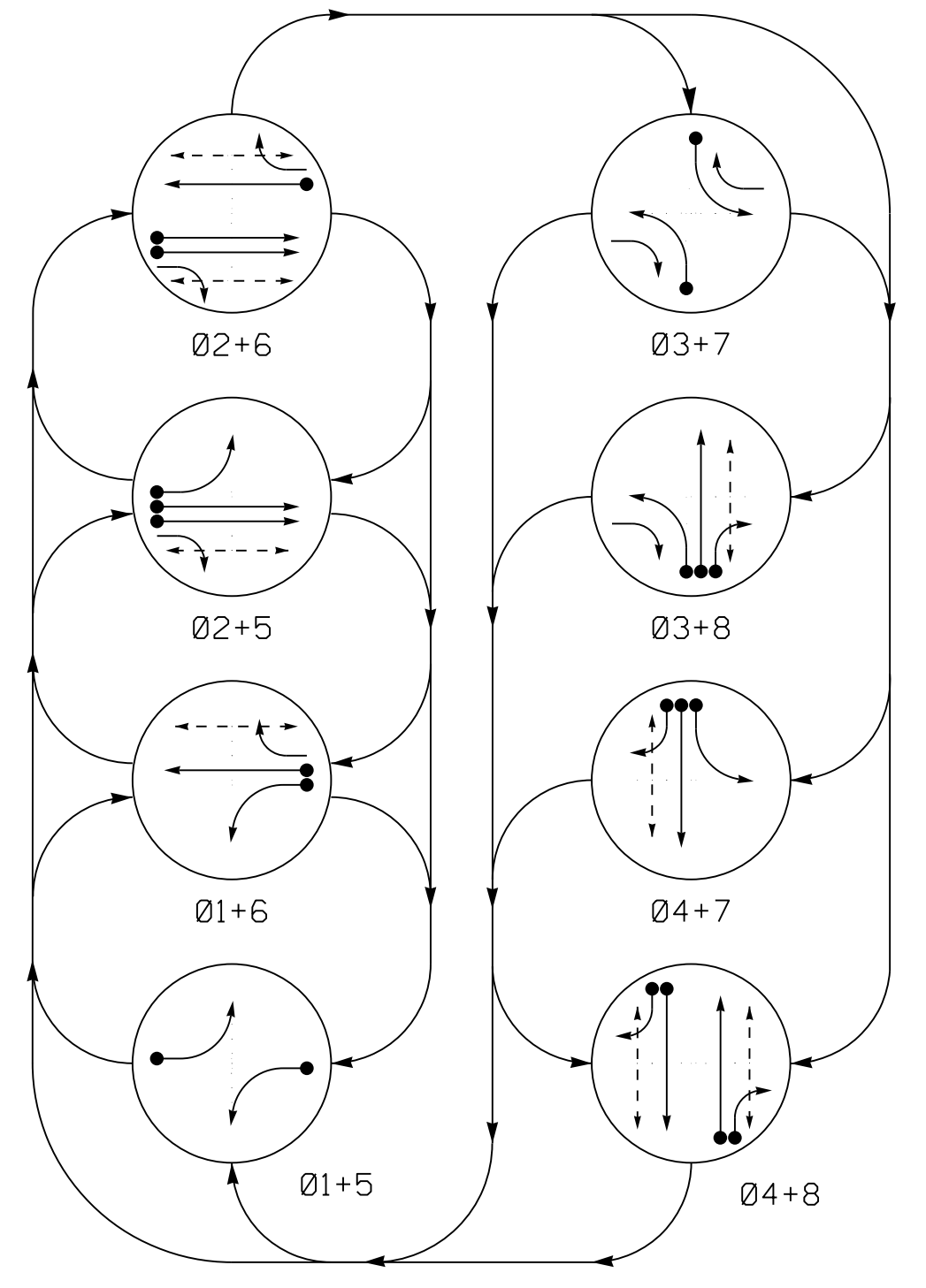
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0516T1
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 1 - TMP Phase I
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL
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<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>US 401 (Raeford Road) at SR 1409 (71st School Rd) / SR 1105 (Graham Rd)</p>		<p>SEAL</p> <p>NORTH CAROLINA PROFESSIONAL ENGINEER</p> <p>LAURENCE E. OVERN</p> <p>3/29/2018</p>			
		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: L Overn</p> <p>PREPARED BY: M RG WILSON REVIEWED BY:</p>	<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		REVISIONS	INIT.	DATE
REVISIONS	INIT.	DATE					

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

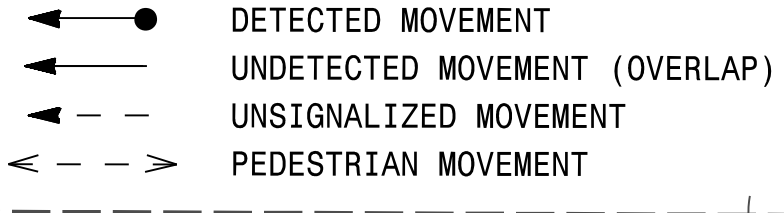
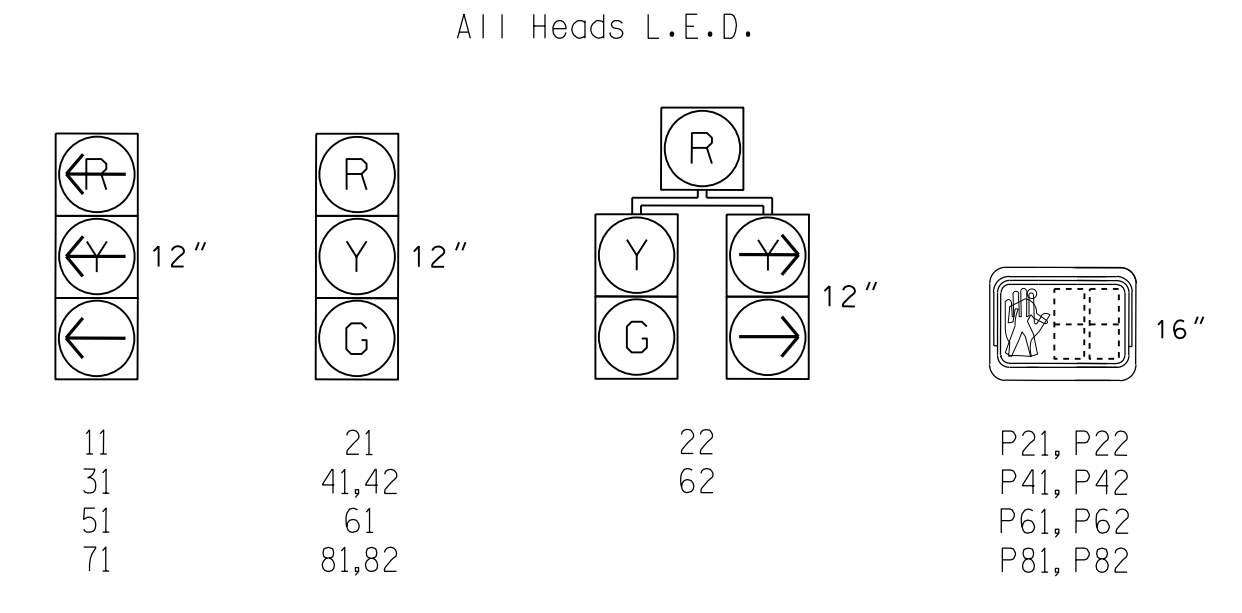


TABLE OF OPERATION

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

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

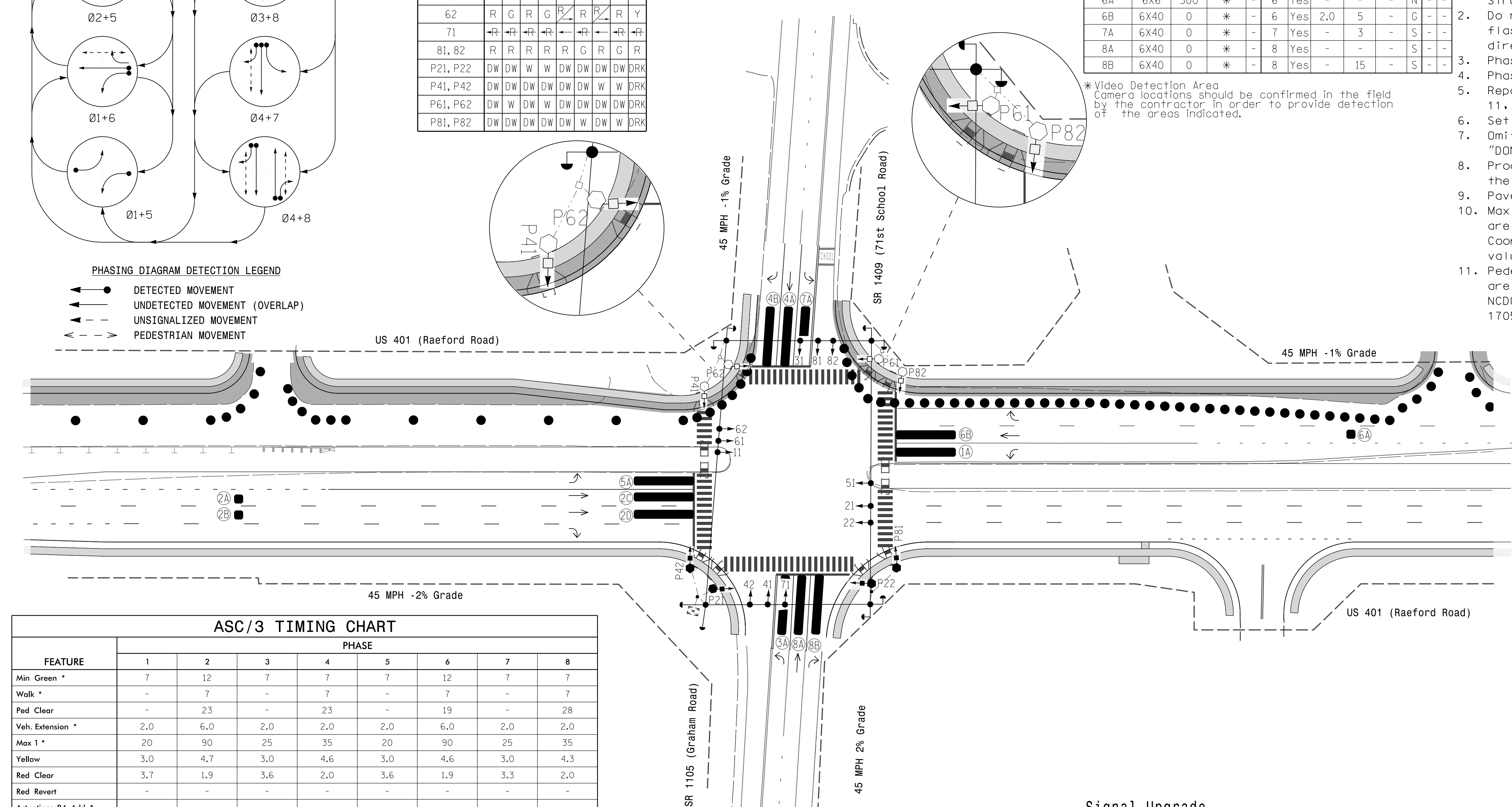
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
3A	6X40	0	*	-	3	Yes	-	3	-	S	-	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	*	-	4	Yes	-	15	-	S	-	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6B	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
7A	6X40	0	*	-	7	Yes	-	3	-	S	-	-
8A	6X40	0	*	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	*	-	8	Yes	-	15	-	S	-	-

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 numbered 11, 21, 22, 51, 61, & 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. Pavement markings are existing.
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 are shown for reference only. See 2018 NCDOT Roadway Standard Drawings 1705.04 sheets 1-3 for push button details.

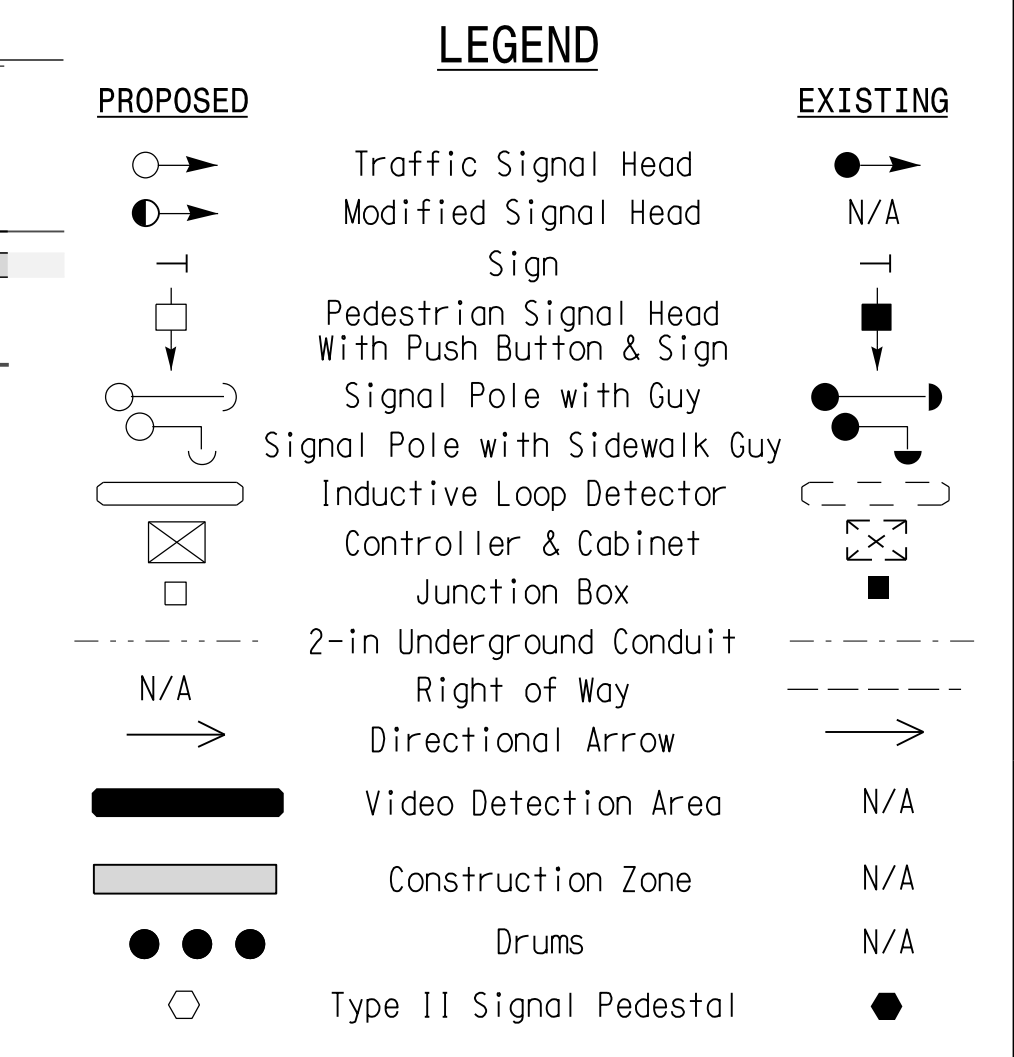
* Video Detection Area Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.



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	-	23	-	23	-	19	-	28
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	20	90	25	35	20	90	25	35
Yellow	3.0	4.7	3.0	4.6	3.0	4.6	3.0	4.3
Red Clear	3.7	1.9	3.6	2.0	3.6	1.9	3.3	2.0
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 Signal Design 2 - TMP Phase II

Stantec Consulting Services Inc.
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Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27526

**US 401 (Raeford Road) at
SR 1409 (71st School Road) /
SR 1105 (Graham Road)**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: A D Smith REVIEWED BY: B L Watson

REVISIONS: _____

INIT. DATE

3/29/2018

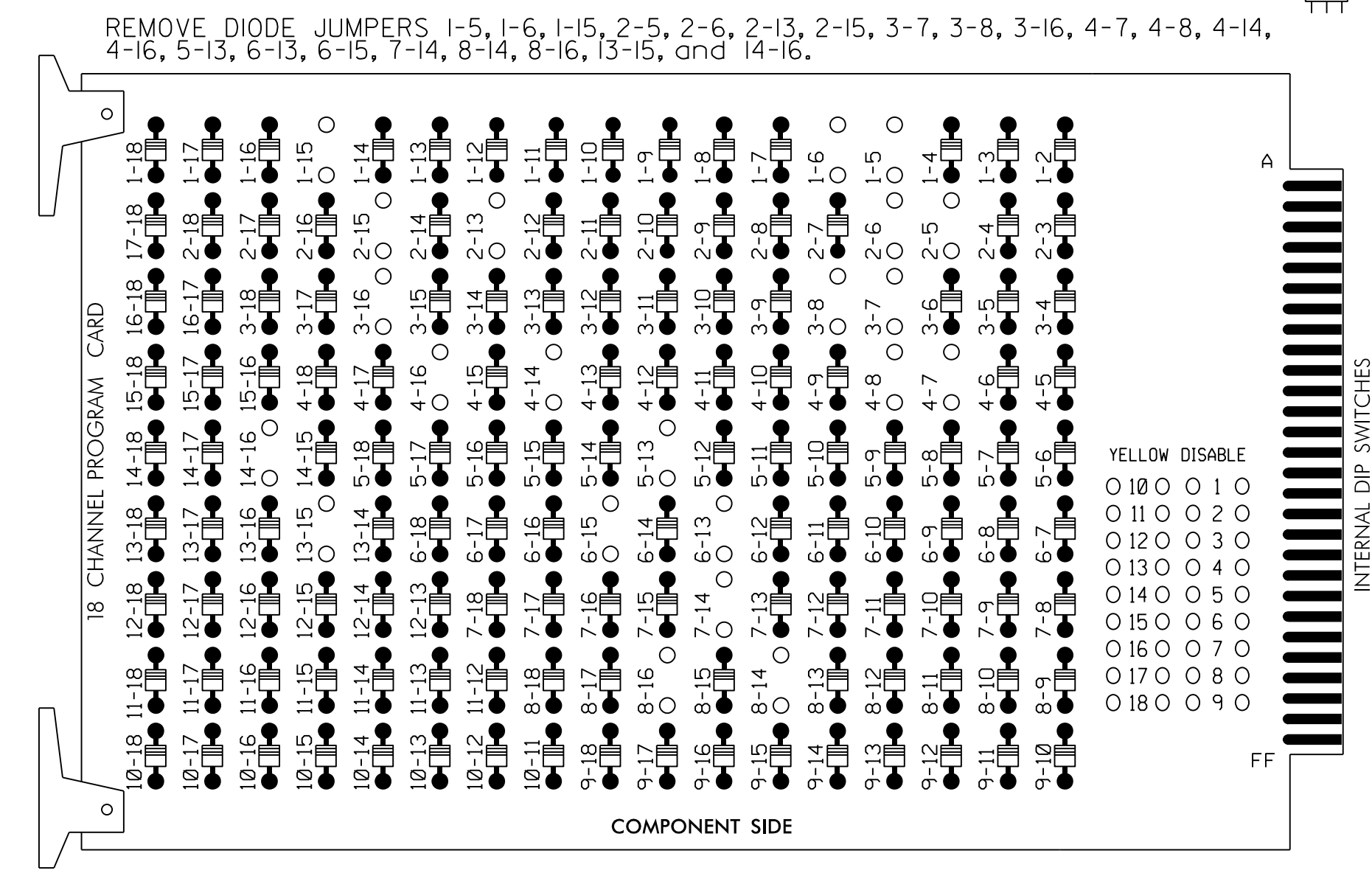
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SIG. INVENTORY NO. 06-0516T2

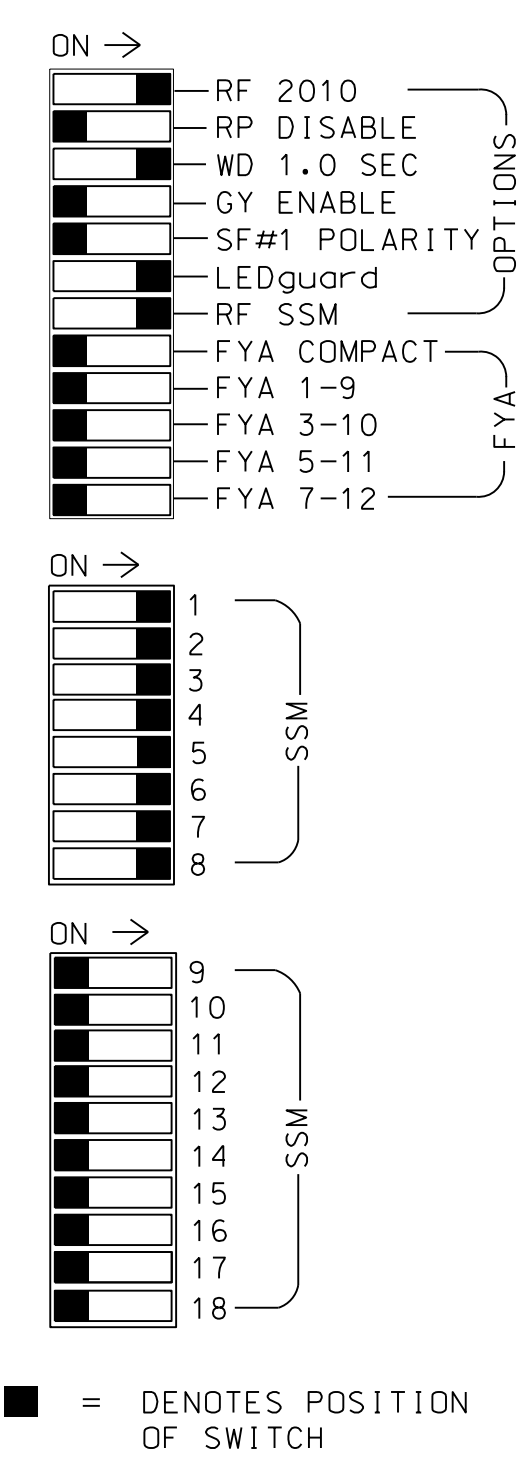
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EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-5, 1-6, 1-15, 2-5, 2-6, 2-13, 2-15, 3-7, 3-8, 3-16, 4-7, 4-8, 4-14, 4-16, 5-13, 6-13, 6-15, 7-14, 8-14, 8-16, 13-15, and 14-16.



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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,
 S9,S10,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED
 OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12		
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16		
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED		
SIGNAL HEAD NO.	11	21,22	P21, P22	31	22	41,42	P41, P42	51	61,62	P61, P62	71	62	81,82	P81, P82
RED		128			101			134				107		
YELLOW		129			102			135				108		
GREEN		130			103			136				109		
RED ARROW	125			116				131			122			
YELLOW ARROW	126			117	117			132			123	123		
GREEN ARROW	127			118	118			133			124	124		
Hand icon			113				104			119			110	
Walking person icon			115				106			121			112	

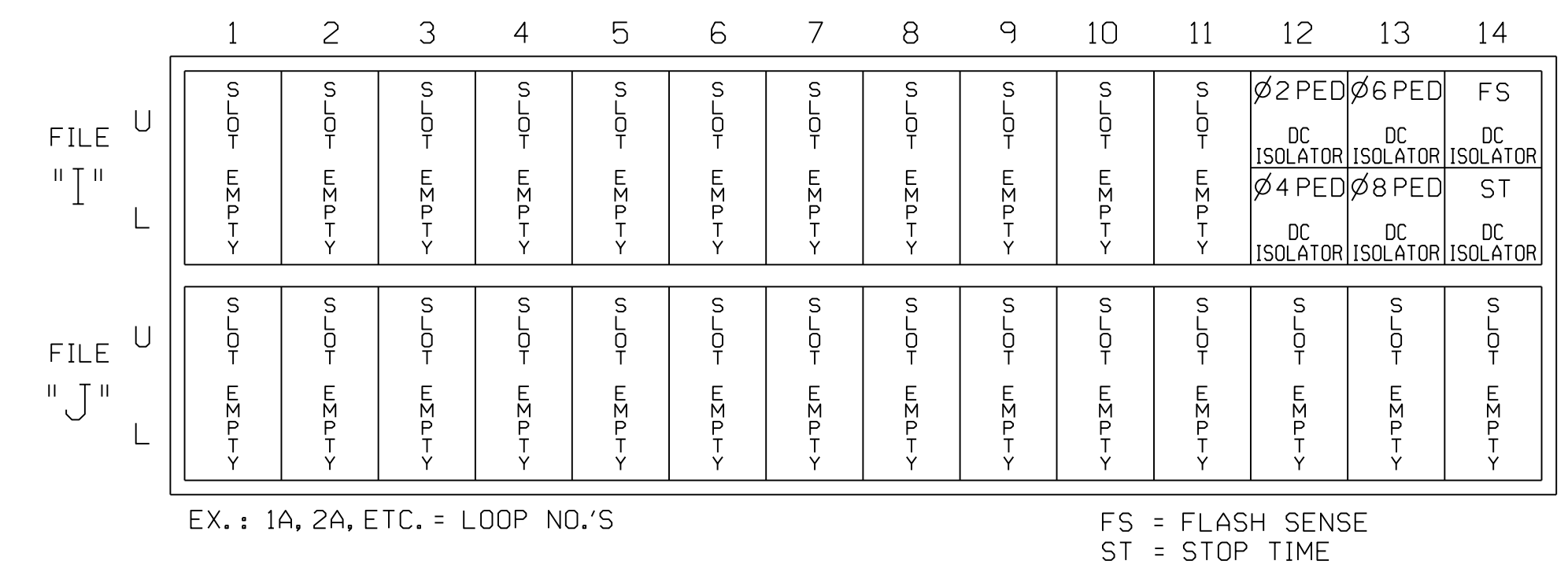
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

(front view)



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

INPUT FILE POSITION LEGEND: J2L
 FILE J
 SLOT 2
 LOWER

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

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: 06-0516T2
 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:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Raeford Road)
 at SR 1409 (71st School Rd) /
 SR 1105 (Graham Rd)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: M RG WILSON REVIEWED BY:

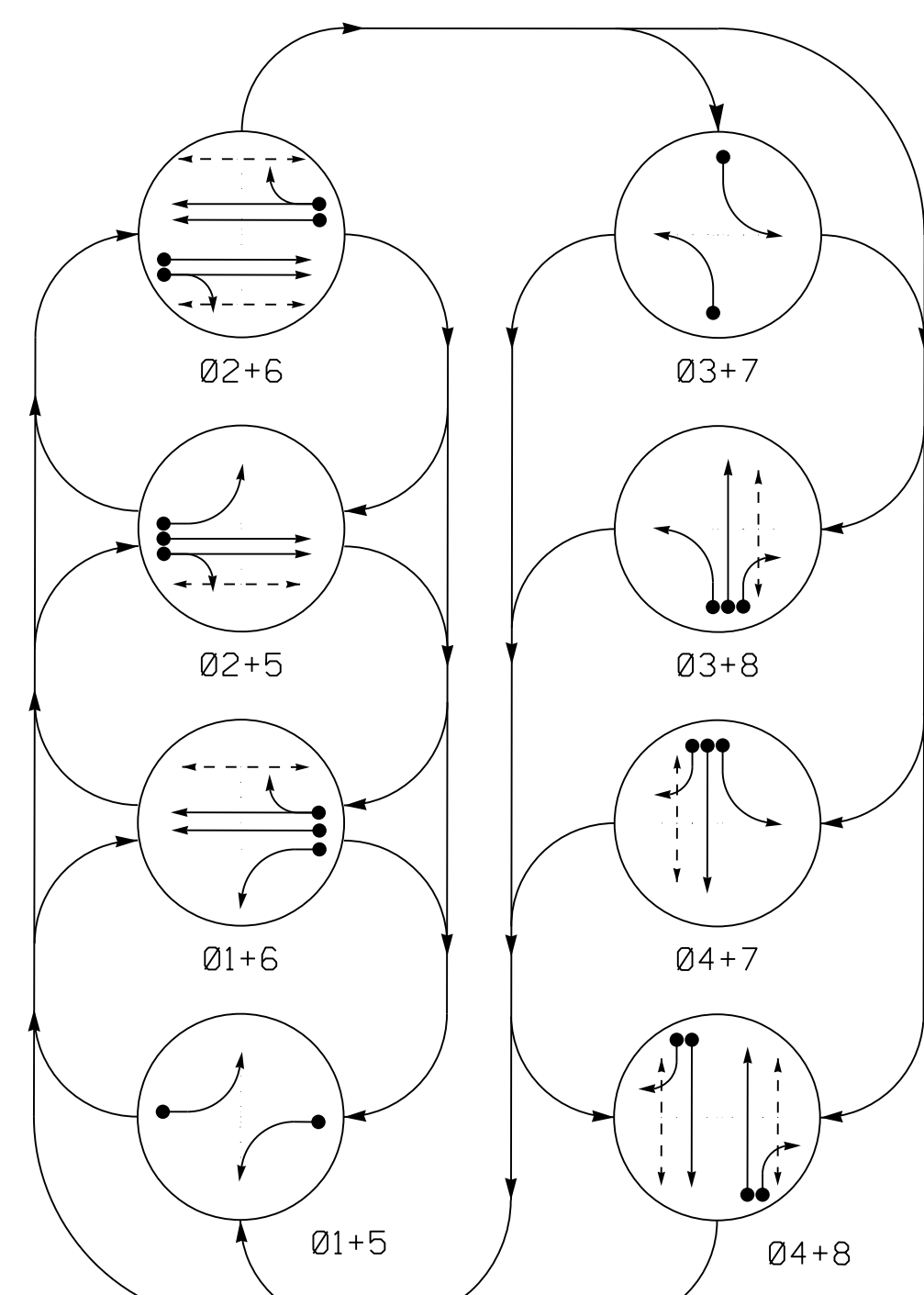
REVISIONS	INIT.	DATE

3/29/2018

SIG. INVENTORY NO. 06-0516T2

8 Phase Fully Actuated Fayetteville Signal System

PHASING DIAGRAM



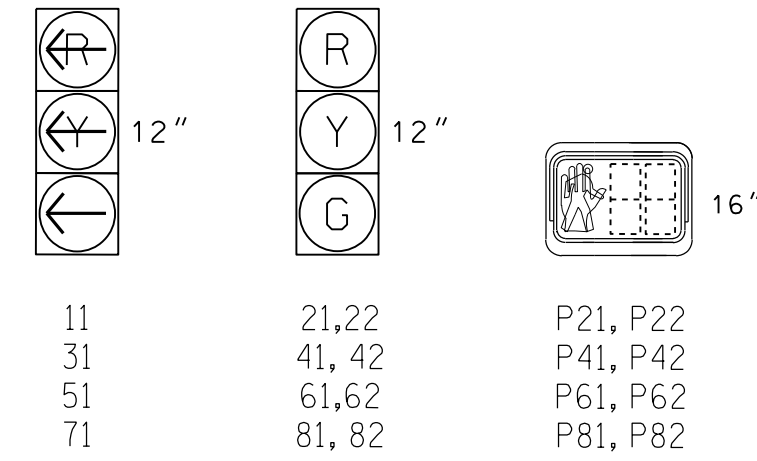
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE							
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 3+7	Ø 3+8	Ø 4+7	Ø 4+8
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41, 42	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81, 82	R	R	R	R	R	G	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

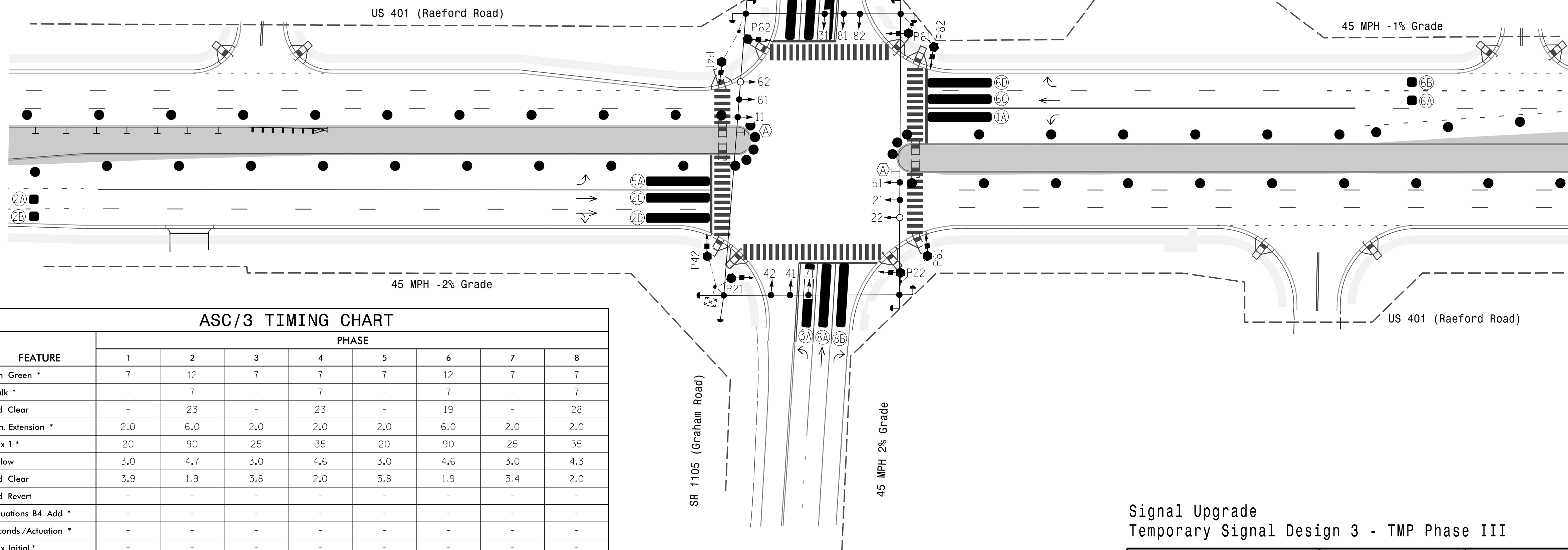


ASC/3 DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	-
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	-
3A	6X40	0	*	-	3	Yes	-	3	-	S	-	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	-
4B	6X40	0	*	-	4	Yes	-	15	-	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	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	3	-	S	-	-
8A	6X40	0	*	-	8	Yes	-	-	-	S	-	-
8B	6X40	0	*	-	8	Yes	-	15	-	S	-	-

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

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 11, 21, 51 & 61.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	23	-	23	-	19	-	28
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	20	90	25	35	20	90	25	35
Yellow	3.0	4.7	3.0	4.6	3.0	4.6	3.0	4.3
Red Clear	3.9	1.9	3.8	2.0	3.8	1.9	3.4	2.0
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.

LEGEND

- | | | | |
|--|---|--|---|
| | PROPOSED Traffic Signal Head | | EXISTING Traffic Signal Head |
| | PROPOSED Modified Signal Head | | EXISTING Modified Signal Head |
| | PROPOSED Pedestrian Signal Head With Push Button & Sign | | EXISTING Pedestrian Signal Head |
| | PROPOSED Signal Pole with Guy | | EXISTING Signal Pole with Guy |
| | PROPOSED Signal Pole with Sidewalk Guy | | EXISTING Signal Pole with Sidewalk Guy |
| | PROPOSED Inductive Loop Detector | | EXISTING Inductive Loop Detector |
| | PROPOSED Controller & Cabinet | | EXISTING Controller & Cabinet |
| | PROPOSED Junction Box | | EXISTING Junction Box |
| | PROPOSED 2-in Underground Conduit | | EXISTING 2-in Underground Conduit |
| | PROPOSED Right of Way | | EXISTING Right of Way |
| | PROPOSED Directional Arrow | | EXISTING Directional Arrow |
| | PROPOSED Video Detection Area | | EXISTING Video Detection Area |
| | PROPOSED Construction Zone | | EXISTING Construction Zone |
| | PROPOSED Drums | | EXISTING Drums |
| | PROPOSED Type II Signal Pedestal | | EXISTING Type II Signal Pedestal |
| | PROPOSED "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | | EXISTING "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) |

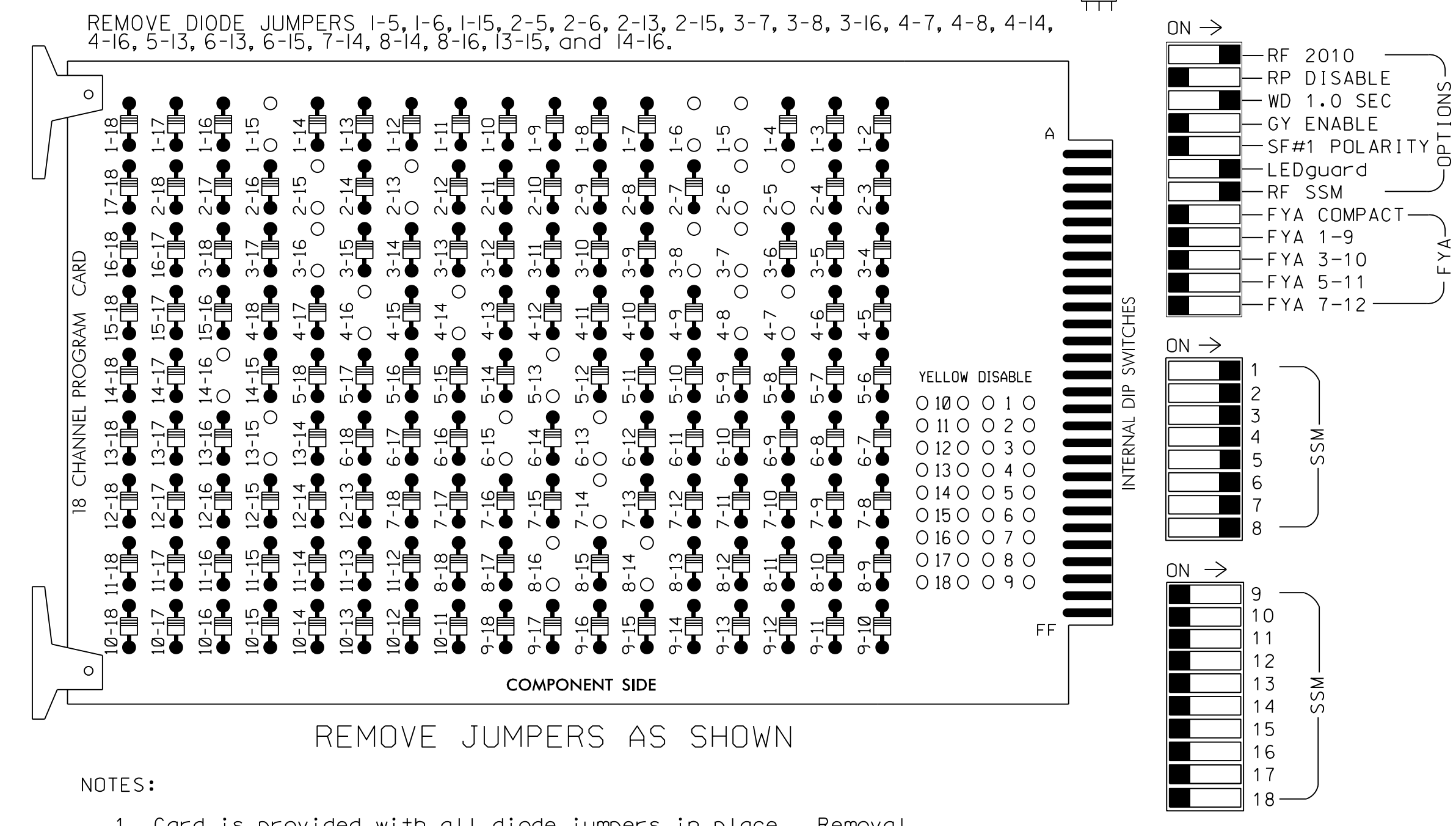
Signal Upgrade Temporary Signal Design 3 - TMP Phase III

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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		Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: E D Harris PREPARED BY: A D Smith REVIEWED BY: B L Watson	REVISIONS INIT. DATE	DATE: 3/29/2018 DATE:

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	P21, P22	31	41,42	P41, P42	51	61,62	P61, P62	71	81,82	P81, P82
RED		128			101			134				107
YELLOW		129			102			135				108
GREEN		130			103			136				109
RED ARROW	125			116			131				122	
YELLOW ARROW	126			117			132				123	
GREEN ARROW	127			118			133				124	
Hand			113			104			119			110
Walking			115			106			121			112

NU = Not Used

EQUIPMENT INFORMATION

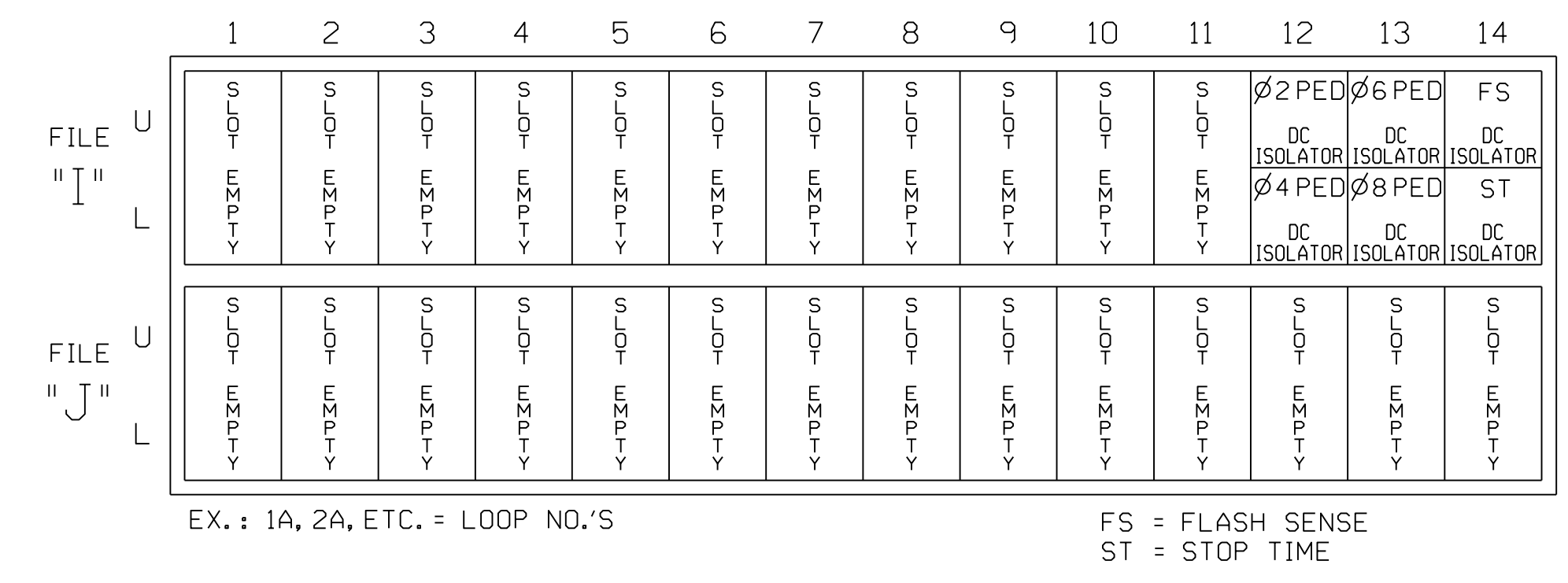
CONTROLLER.....2070
 CABINET.....332
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,
 S9,S10,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED
 OVERLAPS.....NONE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

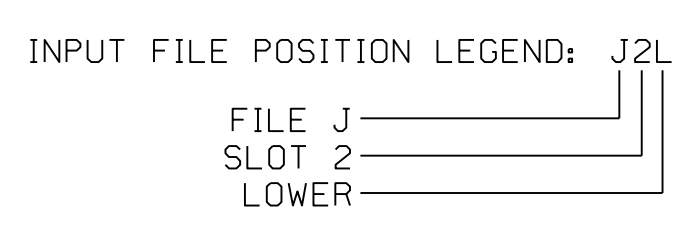
INPUT FILE POSITION LAYOUT

(front view)



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 112 AND 113.

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.

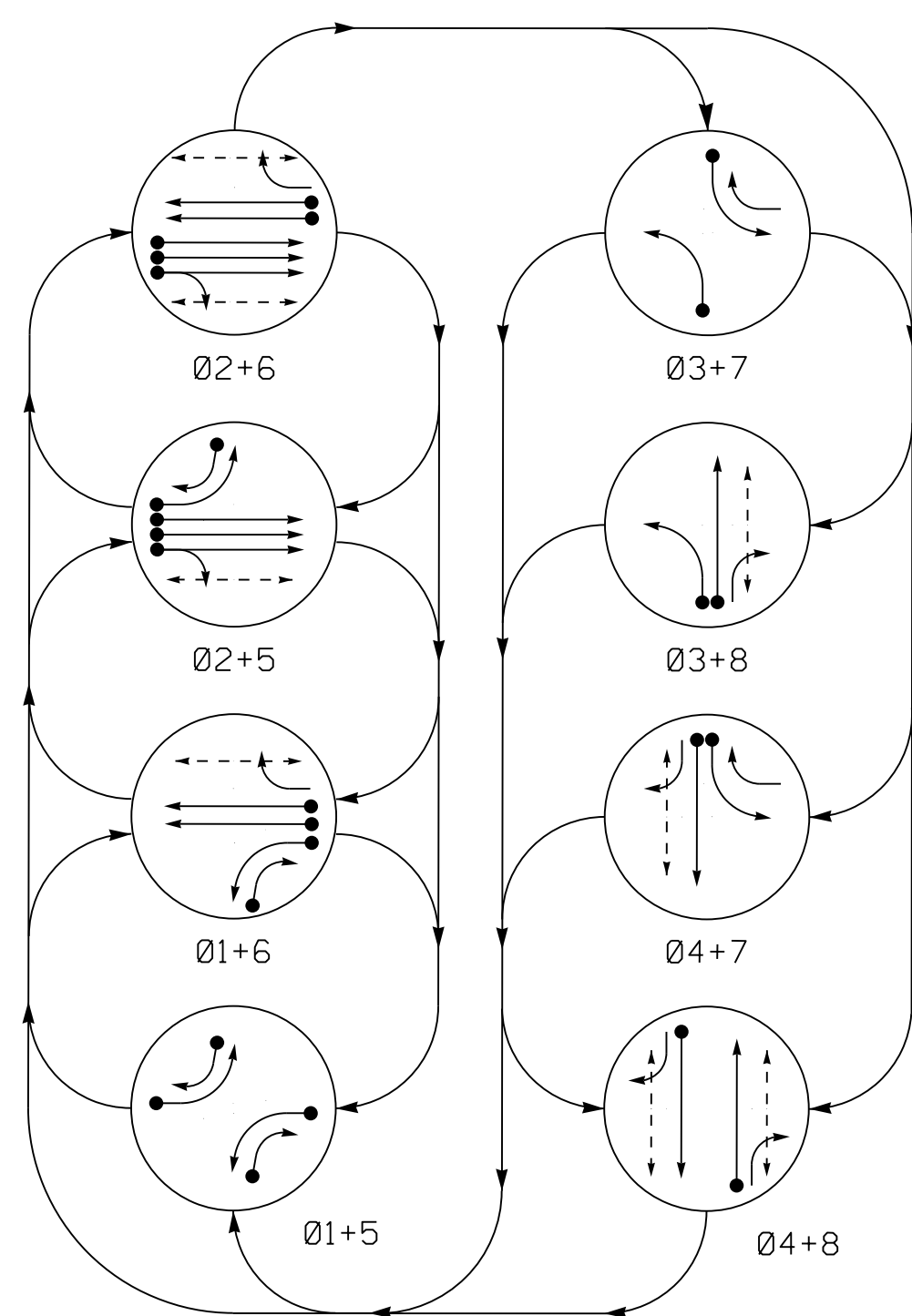
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0516T3
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 3-TMP Phase III
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: L Overn</p> <p>PREPARED BY: M RG WILSON REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>		NO.	DESCRIPTION	INIT.	DATE	
NO.	DESCRIPTION	INIT.	DATE						

PHASING DIAGRAM



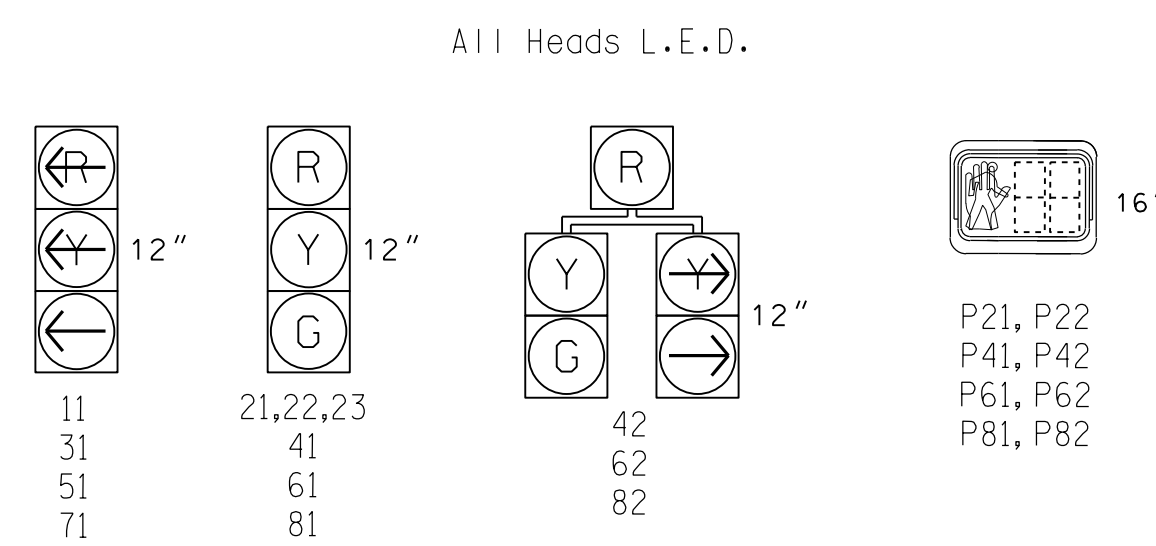
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
11	←	←	←	←	←	←	←	←	Y
21,22,23	R	R	G	G	R	R	R	R	Y
31	←	←	←	←	←	←	←	←	Y
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	Y
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
71	←	←	←	←	←	←	←	←	Y
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DRK	
P41, P42	DW	DW	DW	DW	DW	DW	W	DRK	
P61, P62	DW	W	DW	W	DW	DW	DW	DRK	
P81, P82	DW	DW	DW	DW	DW	W	DW	DRK	

SIGNAL FACE I.D.



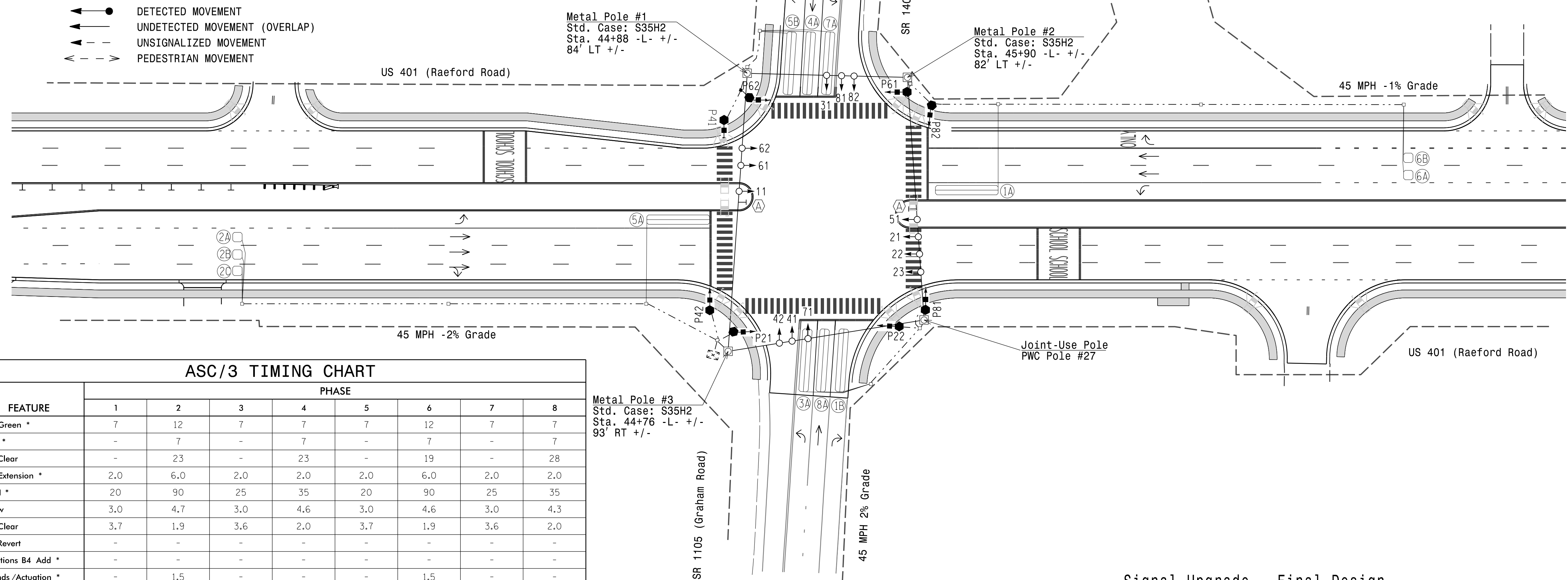
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	S	-	-
1B	6X40	0	2-4-2	X	1	Yes	-	15	-	S	-	-
2A	6X6	300	5	X	2	Yes	-	-	X	N	-	-
2B	6X6	300	5	X	2	Yes	-	-	X	N	-	-
2C	6X6	300	5	X	2	Yes	-	-	X	N	-	-
3A	6X40	0	2-4-2	X	3	Yes	-	3	-	S	-	-
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	S	-	-
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	S	-	-
5B	6X40	0	2-4-2	X	5	Yes	-	15	-	S	-	-
6A	6X6	300	5	X	6	Yes	-	-	X	N	-	-
6B	6X6	300	5	X	6	Yes	-	-	X	N	-	-
7A	6X40	0	2-4-2	X	7	Yes	-	3	-	S	-	-
8A	6X40	0	2-4-2	X	8	Yes	-	-	-	S	-	-

8 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	23	-	23	-	19	-	28
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	25	35	20	90	25	35
Yellow	3.0	4.7	3.0	4.6	3.0	4.6	3.0	4.3
Red Clear	3.7	1.9	3.6	2.0	3.7	1.9	3.6	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	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

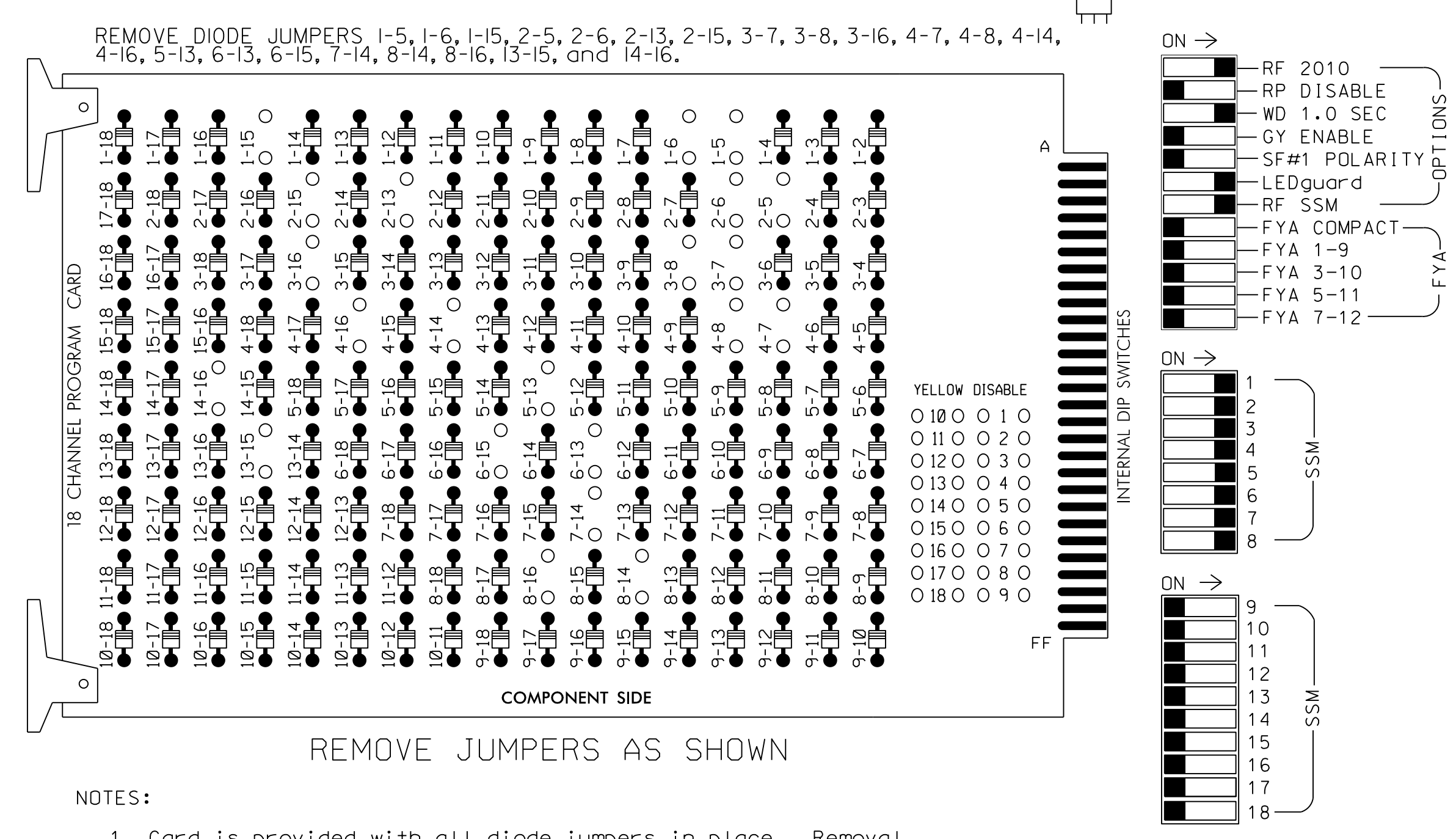
- | | | | |
|---|---|---|---|
| ○ | Proposed Traffic Signal Head | ● | Existing Traffic Signal Head |
| ○ | Proposed Modified Signal Head | ● | Existing Modified Signal Head |
| ⊥ | Proposed Sign | ⊥ | Existing Sign |
| ⊥ | Proposed Pedestrian Signal Head With Push Button & Sign | ⊥ | Existing Pedestrian Signal Head With Push Button & Sign |
| ⊥ | Proposed Signal Pole with Guy | ⊥ | Existing Signal Pole with Guy |
| ⊥ | Proposed Signal Pole with Sidewalk Guy | ⊥ | Existing Signal Pole with Sidewalk Guy |
| ⊥ | Proposed Inductive Loop Detector | ⊥ | Existing Inductive Loop Detector |
| ⊥ | Proposed Controller & Cabinet | ⊥ | Existing Controller & Cabinet |
| ⊥ | Proposed Junction Box | ⊥ | Existing Junction Box |
| ⊥ | Proposed 2-in Underground Conduit | ⊥ | Existing 2-in Underground Conduit |
| → | Proposed Right of Way | → | Existing Right of Way |
| → | Proposed Directional Arrow | → | Existing Directional Arrow |
| ○ | Proposed Metal Strain Pole | ○ | Existing Metal Strain Pole |
| ○ | Proposed Type II Signal Pedestal | ○ | Existing Type II Signal Pedestal |
| ⊥ | Proposed "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | ⊥ | Existing "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) |

Signal Upgrade - Final Design

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>		<p>US 401 (Raeford Road) at SR 1409 (71st School Road) / SR 1105 (Graham Road)</p>	
		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: E D Harris</p> <p>PREPARED BY: A D Smith REVIEWED BY: B L Watson</p>	<p>3/29/2018</p> <p>DATE</p> <p>3/29/2018</p> <p>DATE</p> <p>SIG. INVENTORY NO. 06-0516</p>

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12			
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16			
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED			
SIGNAL HEAD NO.	11	82	21, 22, 23	P21, P22	31	41, 42	P41, P42	51	42	61, 62	P61, P62	71	62	81, 82	P81, P82
RED		128			101				134			107			
YELLOW		129			102				135			108			
GREEN		130			103				136			109			
RED ARROW	125				116			131			122				
YELLOW ARROW	126	126			117			132	132		123	123			
GREEN ARROW	127	127			118			133	133		124	124			
Hand					113			104			119				110
Walker					115			106			121				112

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332
 SOFTWARE.....ECONOLITE ASC/3-2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7,8,8PED
 OVERLAPS.....NONE

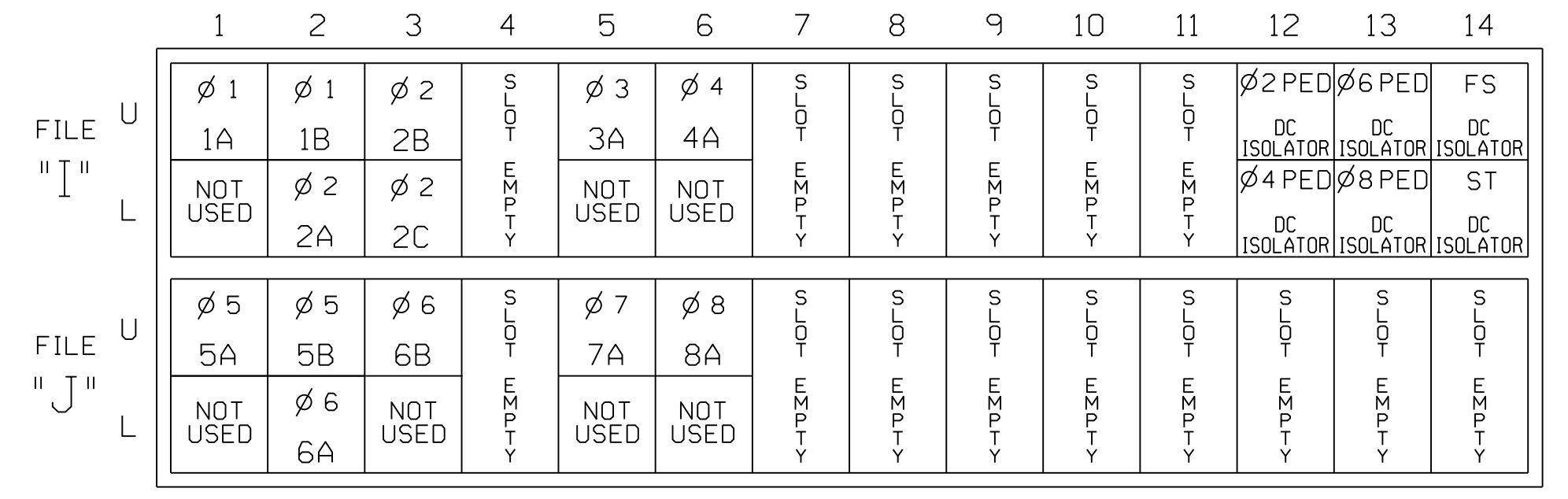
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

INPUT FILE POSITION LAYOUT

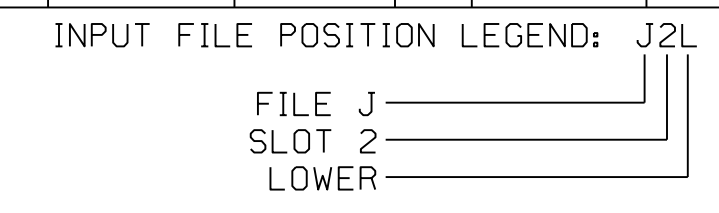
(front view)



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	TB2-5,6	I2U	39	2	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		3		S
4A	TB4-9,10	I6U	41	4	4	YES				S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-7,8	J2L	44	16	6	YES			X	N
6B	TB3-9,10	J3U	64	36	6	YES			X	N
7A	TB5-5,6	J5U	57	7	7	YES		3		S
8A	TB5-9,10	J6U	42	8	8	YES				S

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 112 AND 113.



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0516
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Final Design
 Electrical Detail

Stantec Consulting Services Inc.
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 www.stantec.com
 License No. F-0672

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Raeford Road) at SR 1409 (71st School Road) / SR 1105 (Graham Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: M RG WILSON REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

Lawrence E. Overn
 PROFESSIONAL ENGINEER
 STATE OF NORTH CAROLINA
 045933

3/29/2018

SIG. INVENTORY NO. 06-0516

PHASING DIAGRAM

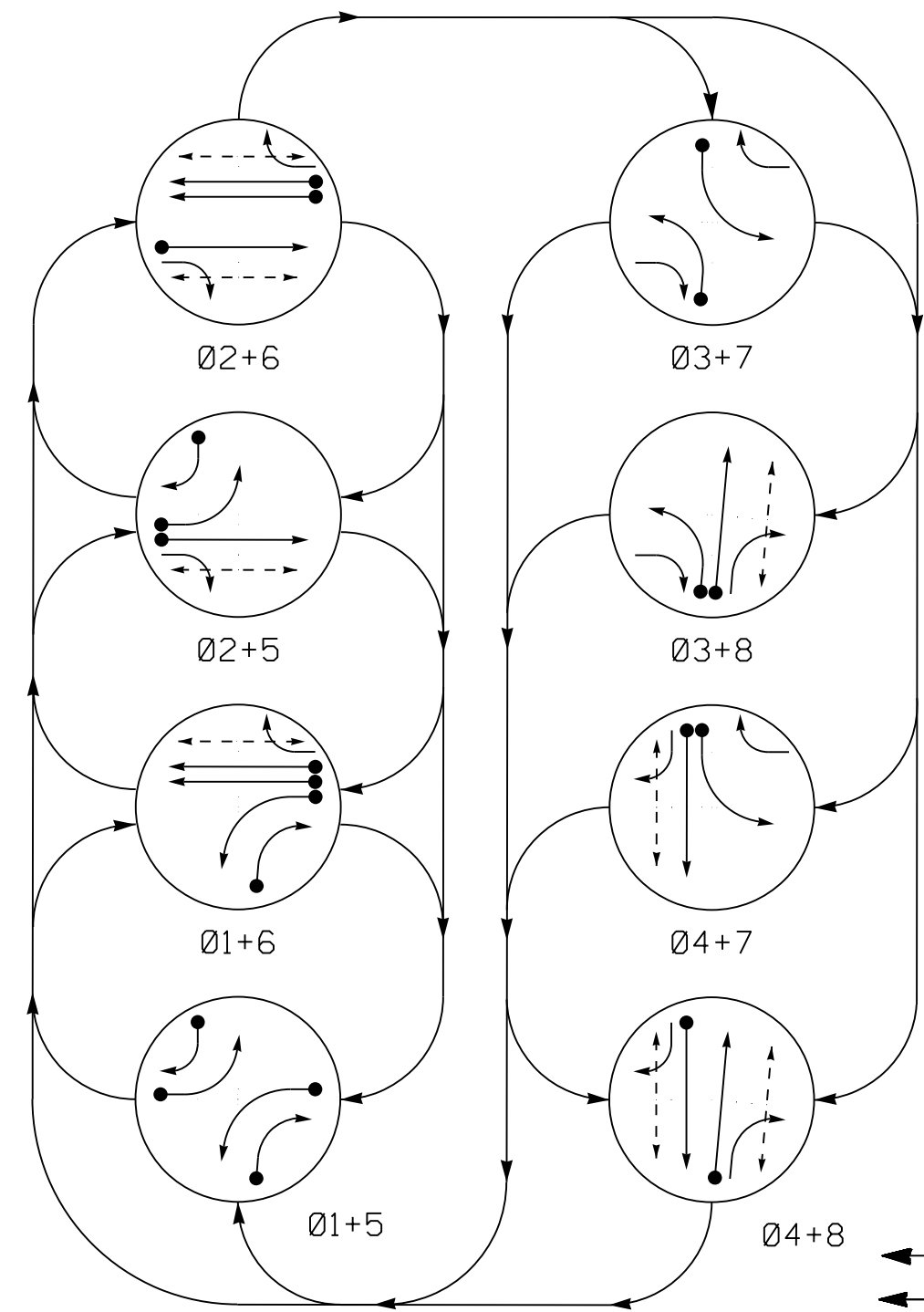


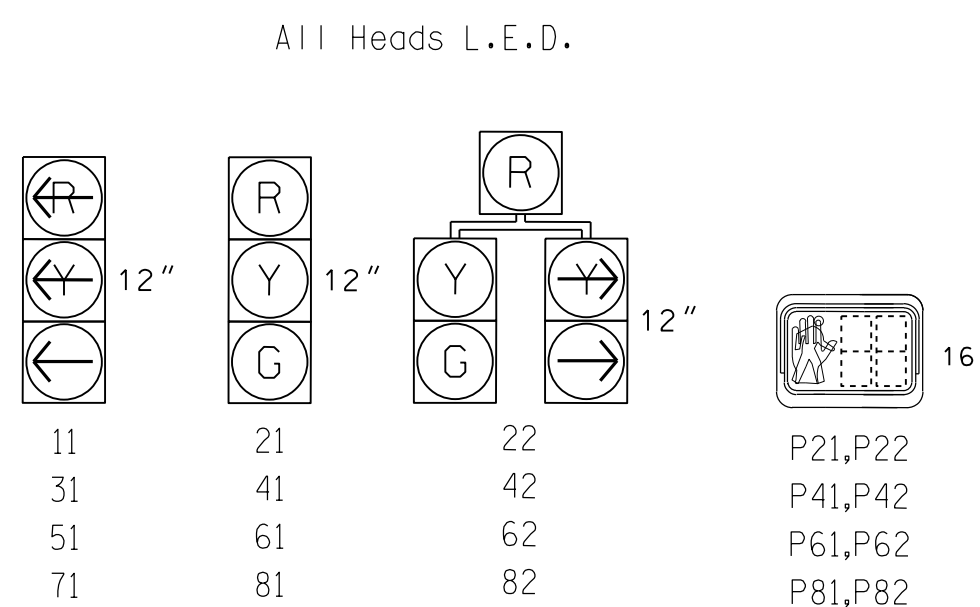
TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH	
	Ø1+5	Ø2+6	Ø3+7	Ø4+8	Ø1+6	Ø2+5	Ø3+8	Ø4+7		
11	←	←	←	←	←	←	←	←	←	
21	R	R	G	G	R	R	R	R	Y	
22	R	R	G	G	R	R	R	R	Y	
31	←	←	←	←	←	←	←	←	←	
41	R	R	R	R	R	R	G	G	R	
42	R	R	R	R	R	R	G	G	R	
51	←	←	←	←	←	←	←	←	←	
61	R	G	R	G	R	R	R	R	Y	
62	R	G	R	G	R	R	R	R	Y	
71	←	←	←	←	←	←	←	←	←	
81	R	R	R	R	R	G	G	R		
82	R	R	R	R	R	G	G	R		
P21,P22	DW	DW	W	W	DW	DW	DW	DRK		
P41,P42	DW	DW	DW	DW	DW	W	W	DRK		
P61,P62	DW	W	DW	W	DW	DW	DW	DRK		
P81,P82	DW	DW	DW	DW	W	W	W	DRK		

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.



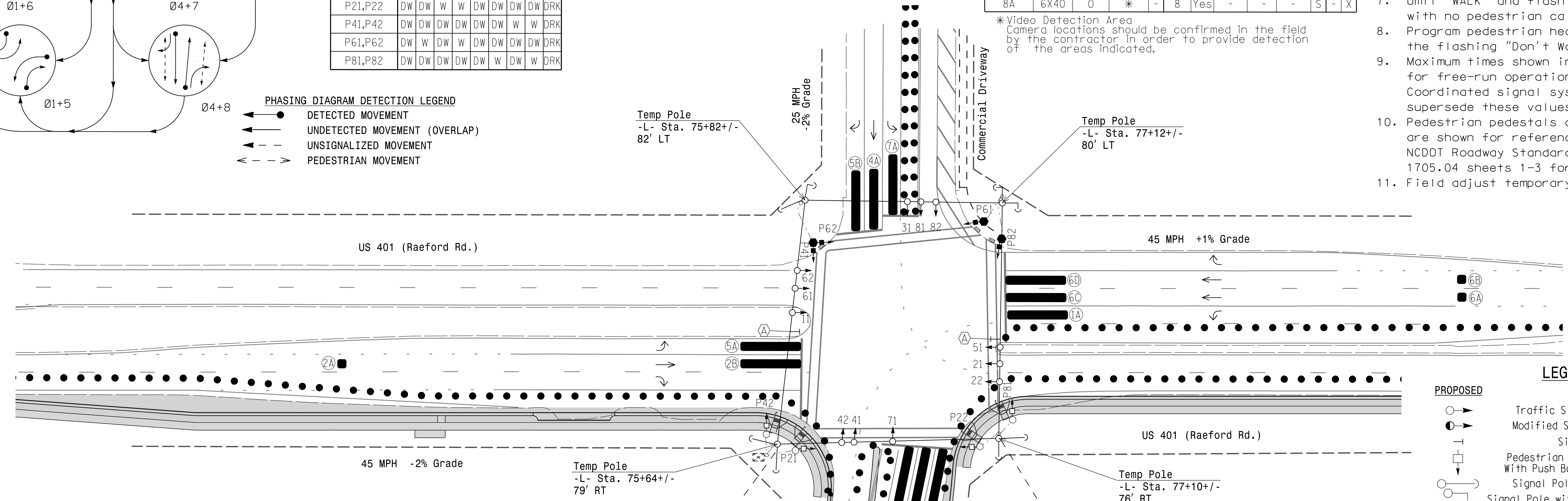
ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	X
1B	6X40	0	*	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
3A	6X40	0	*	-	3	Yes	-	-	-	S	-	X
4A	6X40	0	*	-	4	Yes	-	-	-	S	-	X
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	X
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	-	-	S	-	X
8A	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.

8 Phase Fully Actuated Fayetteville Signal System NOTES

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



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	-	23	-	31	-	25	-	28
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	30	90	25	25	30	90	25	25
Yellow	3.0	4.7	3.0	3.3	3.0	4.4	3.0	3.9
Red Clear	3.7	1.9	3.5	3.4	3.4	1.9	3.6	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	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

- | | | | |
|-----|---|-----|---|
| ○ | Proposed Traffic Signal Head | ● | Existing Traffic Signal Head |
| ○ | Proposed Modified Signal Head | N/A | Existing Modified Signal Head |
| ○ | Proposed Sign | - | Existing Sign |
| ○ | Proposed Pedestrian Signal Head With Push Button & Sign | ○ | Existing Pedestrian Signal Head With Push Button & Sign |
| ○ | Proposed Signal Pole with Guy | ○ | Existing Signal Pole with Guy |
| ○ | Proposed Signal Pole with Sidewalk Guy | ○ | Existing Signal Pole with Sidewalk Guy |
| ○ | Proposed Inductive Loop Detector | ○ | Existing Inductive Loop Detector |
| ○ | Proposed Controller & Cabinet | ○ | Existing Controller & Cabinet |
| ○ | Proposed Junction Box | ○ | Existing Junction Box |
| ○ | Proposed 2-in Underground Conduit | ○ | Existing 2-in Underground Conduit |
| N/A | Proposed Right of Way | --- | Existing Right of Way |
| → | Proposed Directional Arrow | → | Existing Directional Arrow |
| ○ | Proposed Video Detection Area | N/A | Existing Video Detection Area |
| ○ | Proposed Type II Signal Pedestal | ○ | Existing Type II Signal Pedestal |
| ○ | Proposed Construction Zone | N/A | Existing Construction Zone |
| ○ | Proposed Drums | ○ | Existing Drums |
| ○ | Proposed "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | ○ | Existing "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) |

Signal Upgrade Temporary Signal Design 1 - TMP Phase I

Stantec
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Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27526

US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road)
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: A D Smith REVIEWED BY: B L Watson

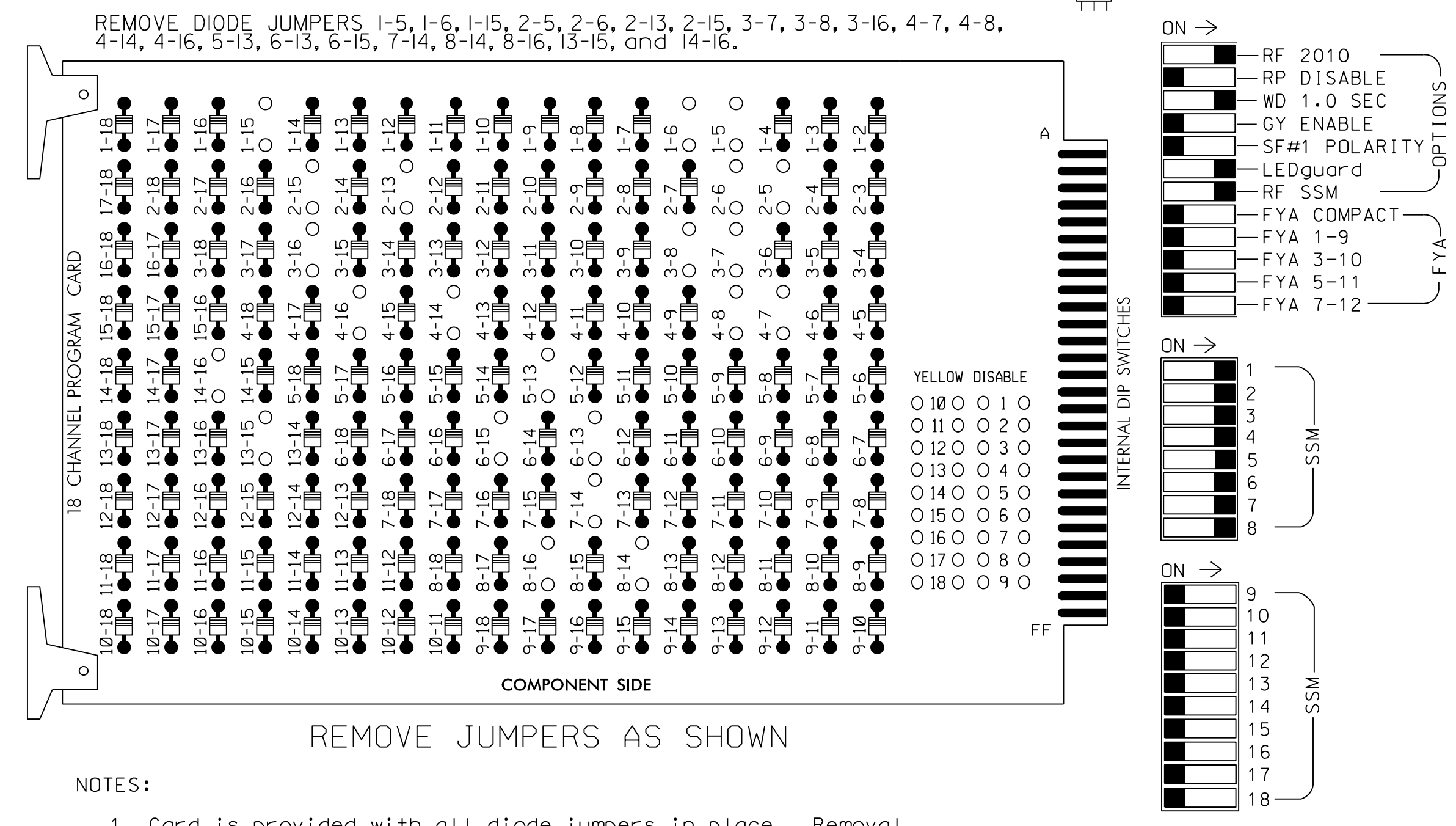
Professional Engineer Seal
SEAL 29449
Betsy L. Watson
3/29/2018
SIG. INVENTORY NO. 06-059611

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to Start Up in phase 2 WALK and phase 6 WALK.
- 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,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,
 6,6PED,7,8,8PED
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....NOT USED
 OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	21,22	P21, P22	31	22	41,42	P41, P42	51	42	61,62	P61, P62	71	62	81,82	P81, P82	NU	NU	NU
RED			128			101				134					107				
YELLOW			129			102				135					108				
GREEN			130			103				136					109				
RED ARROW	125				116					131					122				
YELLOW ARROW	126	126			117	117				132	132				123	123			
GREEN ARROW	127	127			118	118				133	133				124	124			
Hand icon					113					104					119				110
Walking person icon					115					106					121				112

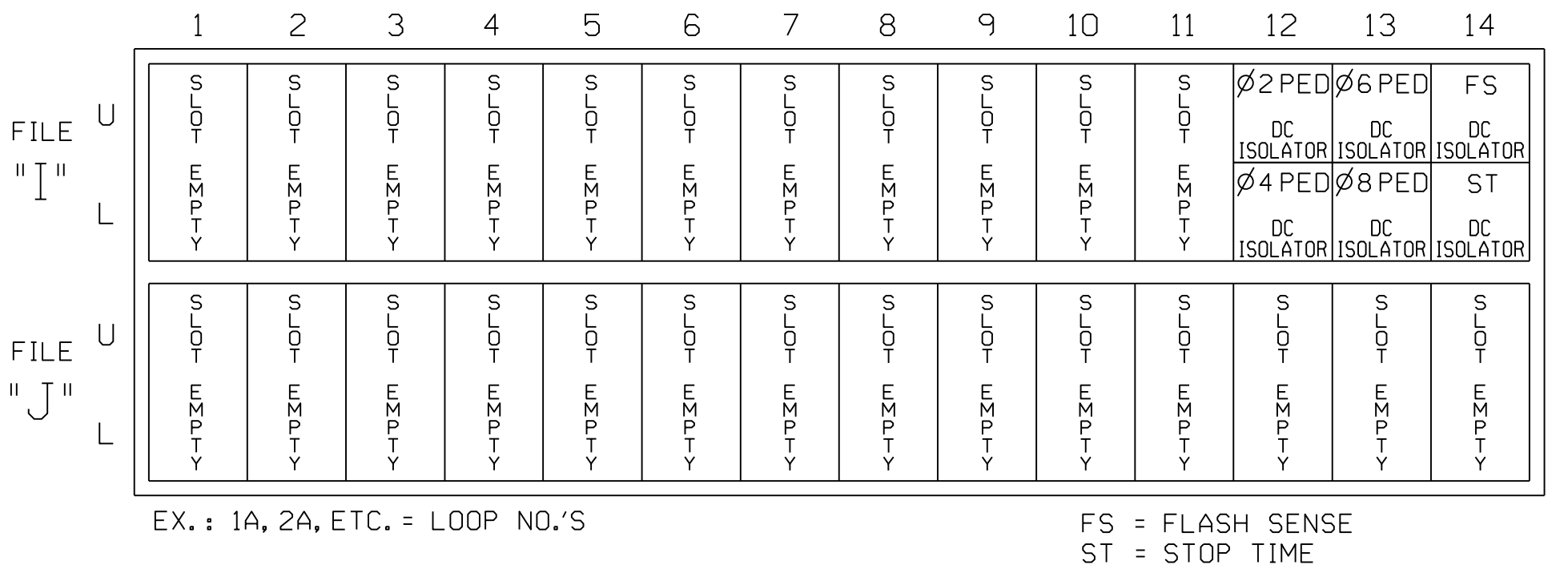
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

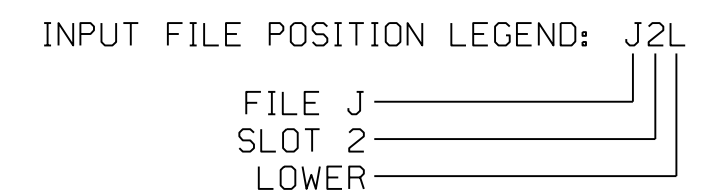
(front view)



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 112 AND 113.



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: 06-0596T1
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 1 - TMP Phase I
 Electrical Detail

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road)</p>		<p>SEAL</p> <p>3/29/2018</p>
		<p>Division 6 Cumberland County Fayetteville</p>		
		<p>PLAN DATE: March 2018</p>	<p>REVIEWED BY: L Overn</p>	
<p>PREPARED BY: M RG WILSON</p>	<p>REVIEWED BY:</p>	<p>REVISIONS</p>	<p>INIT.</p>	<p>DATE</p>

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 03/29/2018 11:04:11 AM
 User: rfmuncy

PHASING DIAGRAM

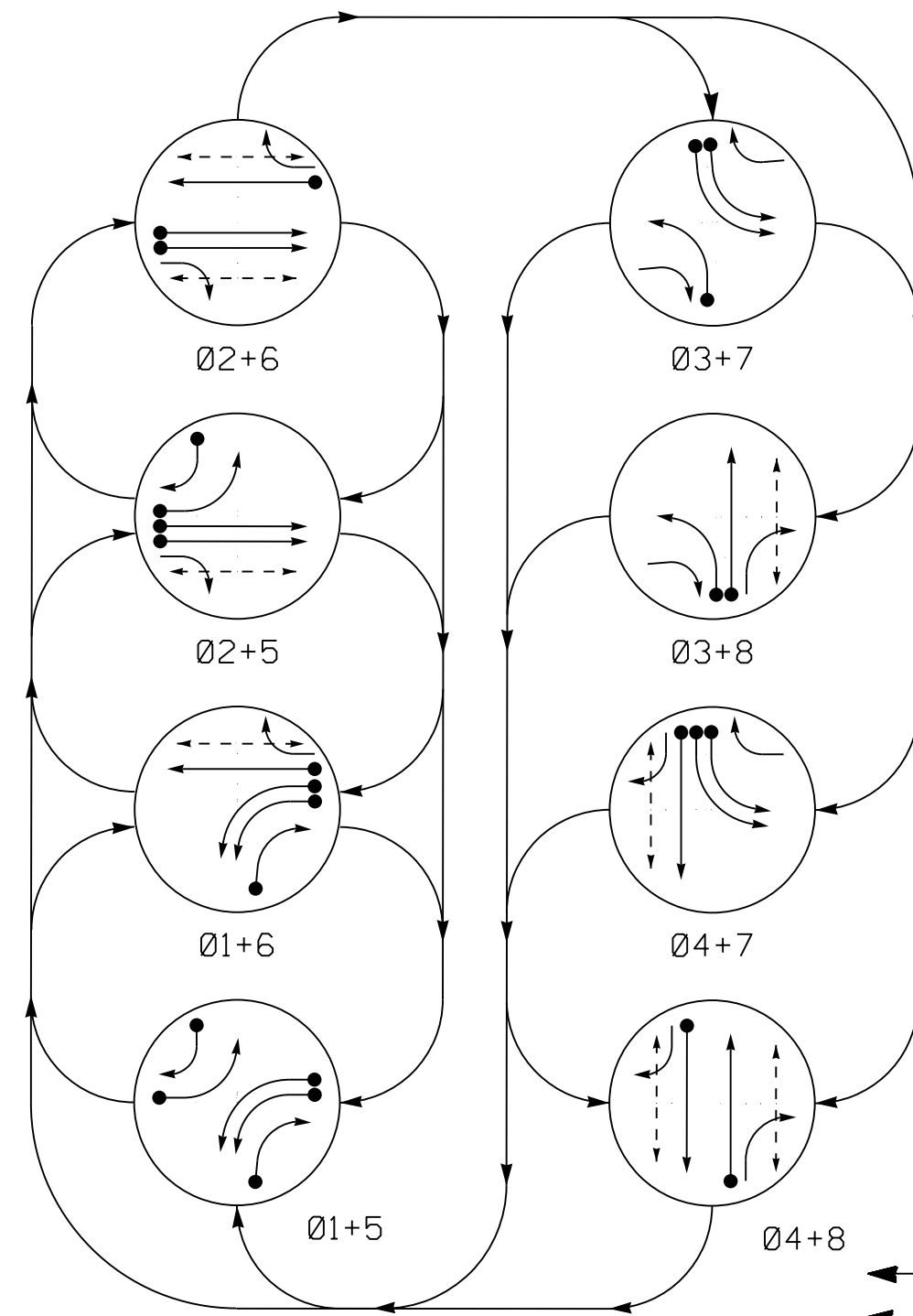
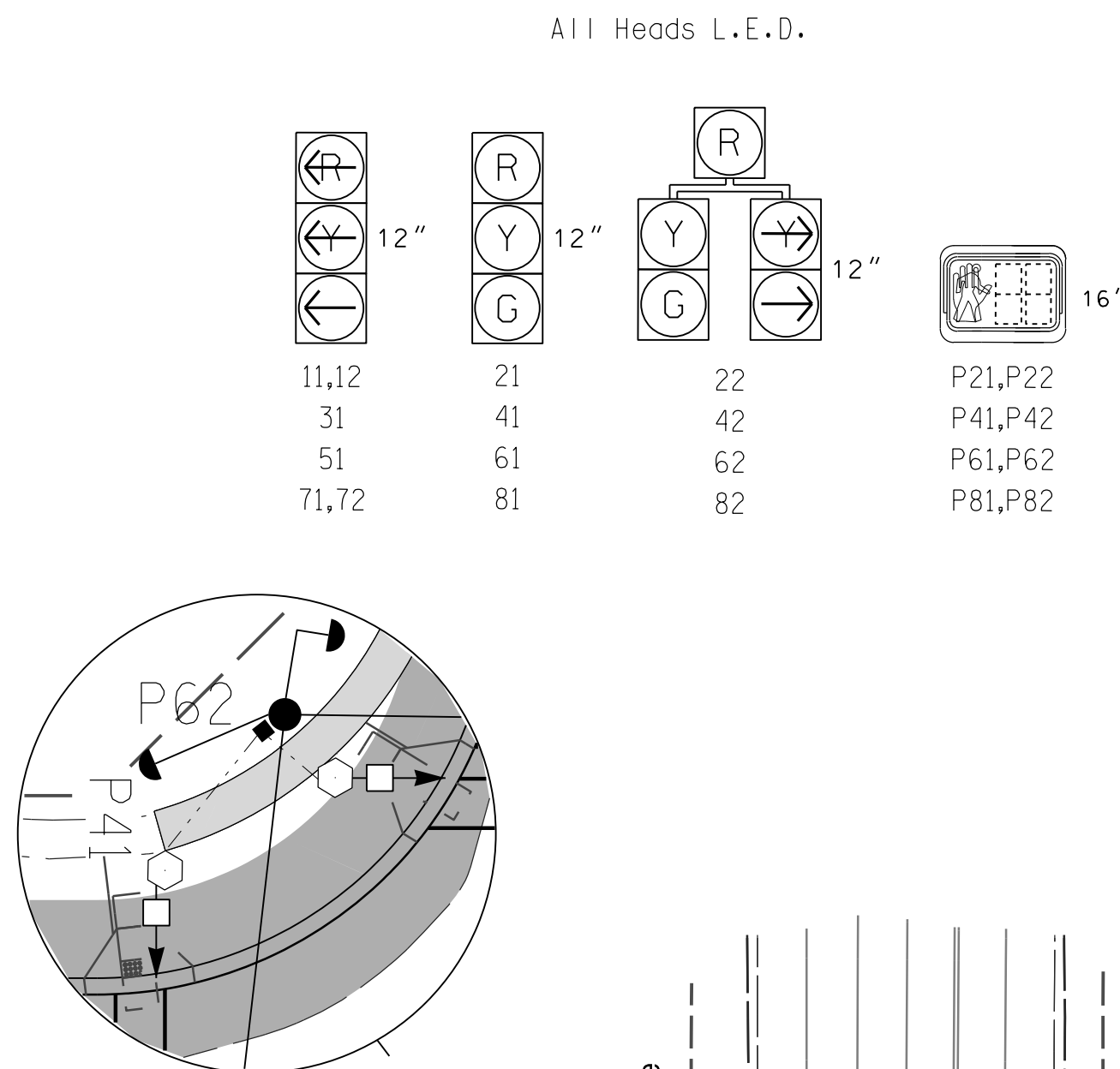


TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	
11,12	←	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
31	←	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
71,72	←	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	R	G	R
82	R	R	R	R	R	G	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DRK	
P41,P42	DW	DW	DW	DW	DW	DW	W	DRK	
P61,P62	DW	W	DW	DW	DW	DW	DW	DRK	
P81,P82	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.



ASC/3 DETECTOR INSTALLATION CHART

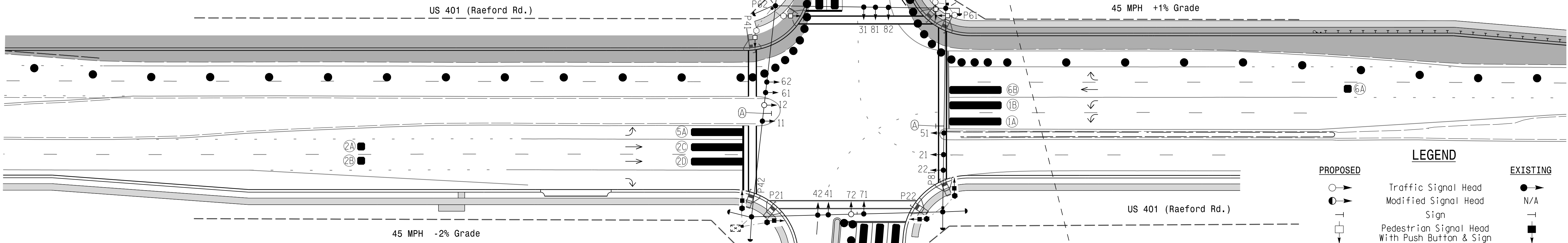
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP
1A	6X40	0	*	-	1	Yes	-	-	-	S	-
1B	6X40	0	*	-	1	Yes	-	-	-	S	-
1C	6X40	0	*	-	1	Yes	-	15	-	S	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	x
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	x
3A	6X40	0	*	-	3	Yes	-	-	-	S	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-
5B	6X40	0	*	-	5	Yes	-	15	-	S	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-
6B	6X40	0	*	-	6	Yes	2.0	5	-	G	-
7A	6X40	0	*	-	7	Yes	-	3	-	S	-
7B	6X40	0	*	-	7	Yes	-	-	-	S	-
8A	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.

8 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 11,21,22,41,42,61,62.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- 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	● → Traffic Signal Head
○ → Modified Signal Head	N/A
○ → Sign	N/A
○ → Pedestrian Signal Head With Push Button & Sign	○ → Pedestrian Signal Head
○ → Signal Pole with Guy	○ → Signal Pole with Guy
○ → Signal Pole with Sidewalk Guy	○ → Signal Pole with Sidewalk Guy
○ → Inductive Loop Detector	○ → Inductive Loop Detector
○ → Controller & Cabinet	○ → Controller & Cabinet
○ → Junction Box	○ → Junction Box
○ → 2-in Underground Conduit	○ → 2-in Underground Conduit
N/A → Right of Way	N/A
→ Directional Arrow	→ Directional Arrow
▬ Video Detection Area	N/A
○ Type II Signal Pedestal	○ Type II Signal Pedestal
▬ Construction Zone	N/A
● Drums	N/A
○ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	○ "U-TURN YIELD TO RIGHT TURN" Sign (R10-16)

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	-	27	-	29	-	22	-	31
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	30	90	25	25	30	90	25	25
Yellow	3.0	4.7	3.0	3.3	3.0	4.4	3.0	3.9
Red Clear	3.8	2.3	4.1	3.6	4.2	2.3	4.0	3.1
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 Signal Design 2 - TMP Phase II

Stantec Consulting Services Inc.
 801 Jones Franklin Road-Suite 300
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 License No. F-0672

Prepared for the Offices of:
 Transportation Mobility and Safety Division
 STATE OF NORTH CAROLINA
 Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27526

US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: A D Smith REVIEWED BY: B L Watson

3/29/2018

REVISIONS

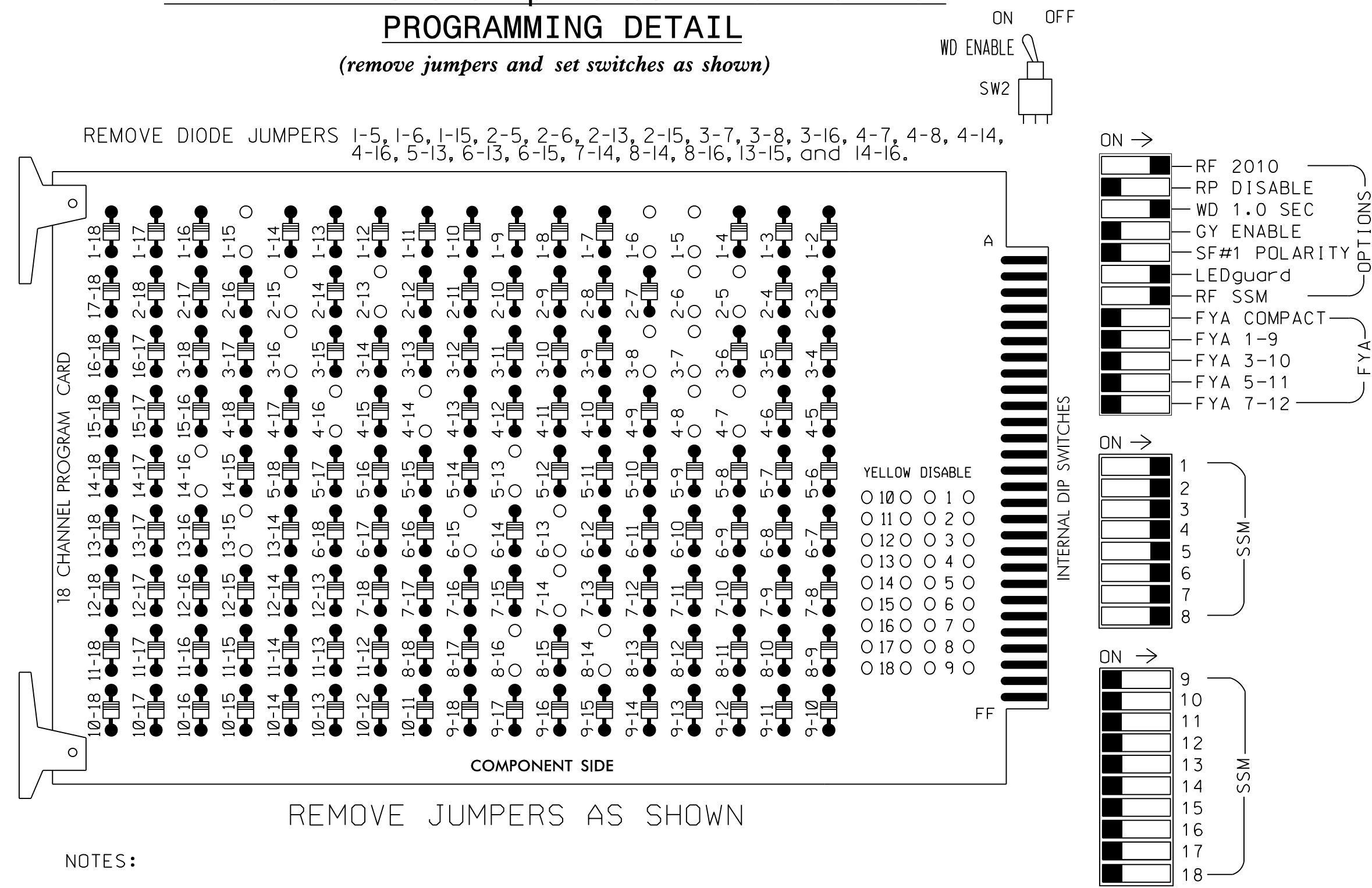
NO.	DATE	INIT.	DATE

DATE: 3/29/2018
 SIG. INVENTORY NO. 06-059612

3/29/2018
 User: rfmuncy
 Path: \\server\projects\signal\Design\Phase 2\U-4405.sig.dwg
 User: rfmuncy

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 WALK and phase 6 WALK.
- 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,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....NOT USED
 OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1 8	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11, 12	82	21,22	P21, P22	31	22	41,42	P41, P42	51	42	61,62	P61, P62	71,72	62	81,82	P81, P82	NU	NU	NU
RED			128			101				134					107				
YELLOW			129			102				135					108				
GREEN			130			103				136					109				
RED ARROW	125				116			131				122							
YELLOW ARROW	126	126			117	117		132	132			123	123						
GREEN ARROW	127	127			118	118		133	133			124	124						
Hand icon					113			104			119				110				
Walking person icon					115			106			121				112				

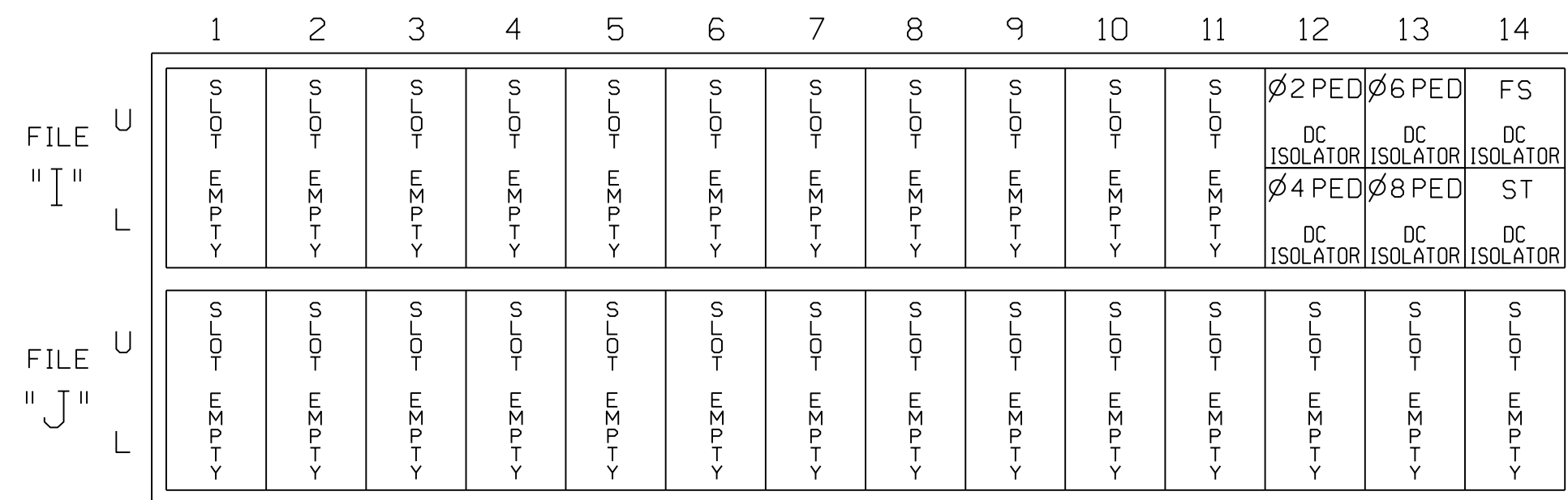
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

(front view)



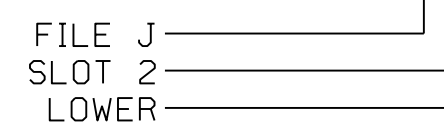
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE
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



NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

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: 06-0596T2
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 2 - TMP Phase II Electrical Detail

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 	US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road) Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: L Overn PREPARED BY: M RG WILSON REVIEWED BY:	SEAL
	750 N. Greenfield Pkwy, Garner, NC 27529	REVISIONS: _____ INIT. DATE _____ _____ INIT. DATE _____ _____ INIT. DATE _____	DATE: 3/29/2018 SIG. INVENTORY NO. 06-0596T2

PHASING DIAGRAM

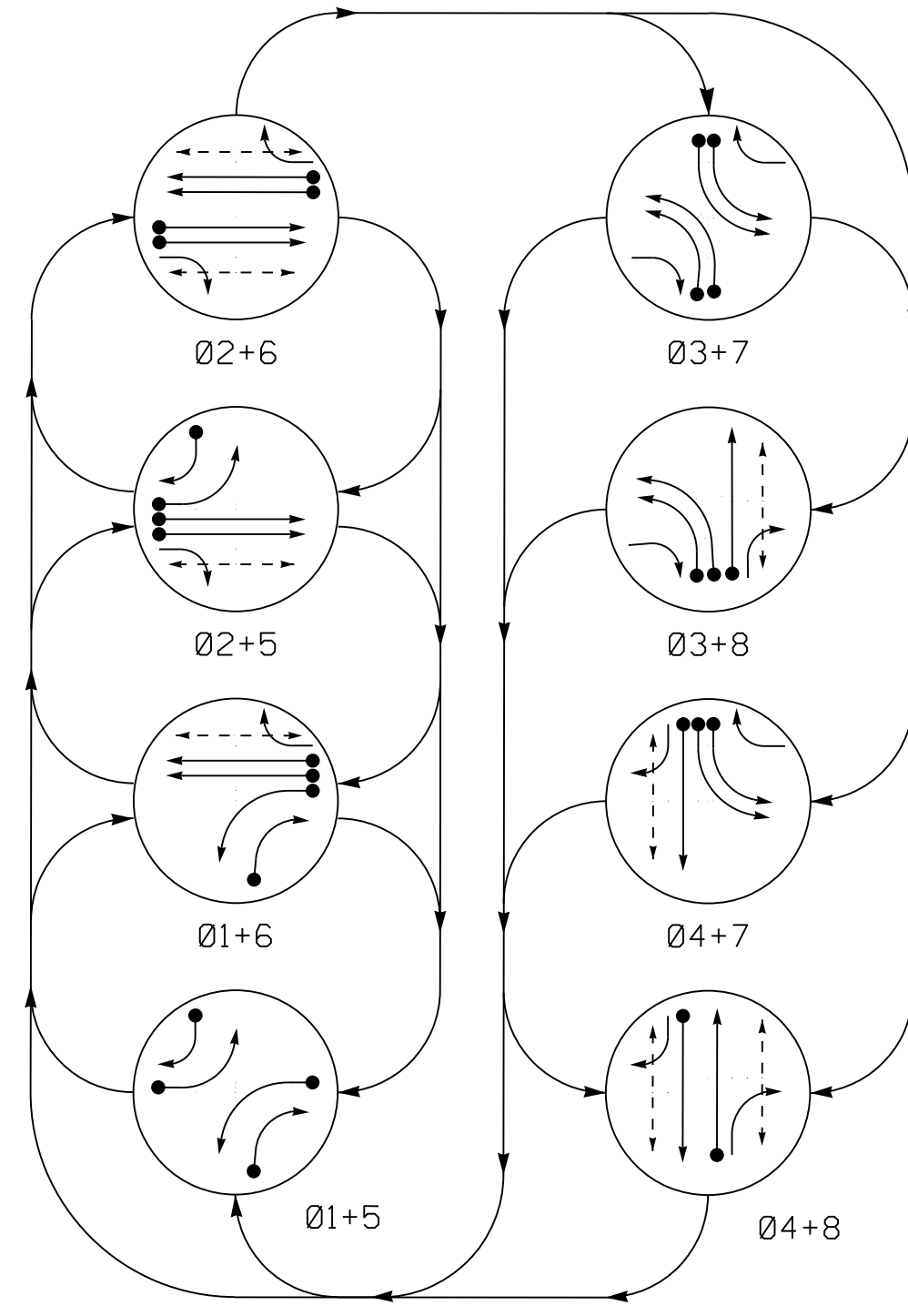


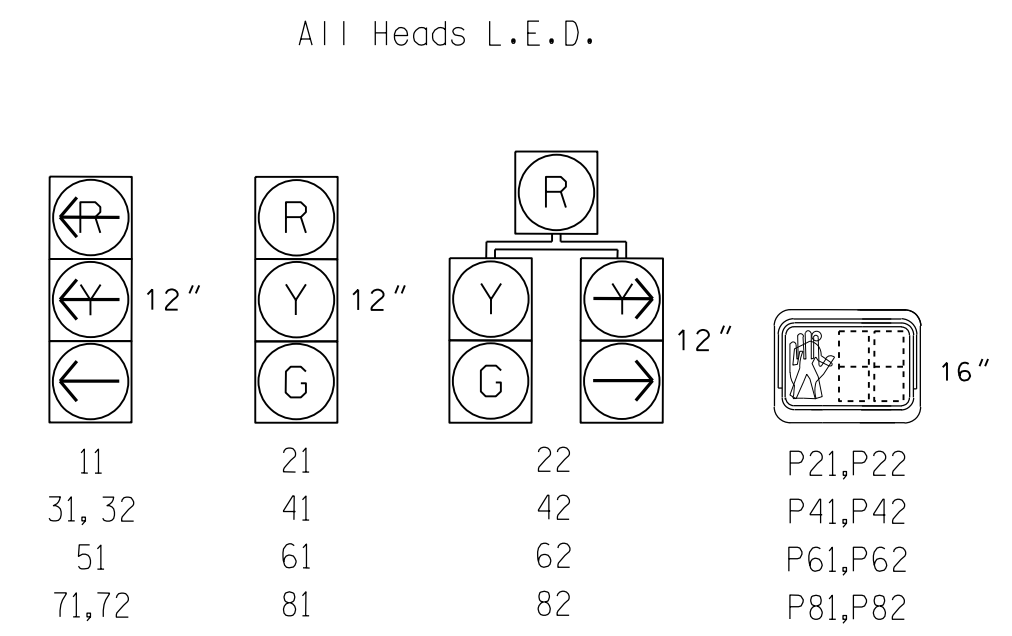
TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	01+5	02+6	03+7	04+8	01+6	02+5	03+8	04+7	
11	←	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R	R	R	R	Y
31, 32	←	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	Y
71, 72	←	←	←	←	←	←	←	←	←
81	R	R	R	R	G	R	G	R	R
82	R	R	R	R	G	R	G	R	R
P21,P22	DW	DW	W	W	DW	DW	W	W	DRK
P41,P42	DW	DW	W	W	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	W	W	DRK
P81,P82	DW	DW	DW	DW	W	DW	W	W	DRK

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

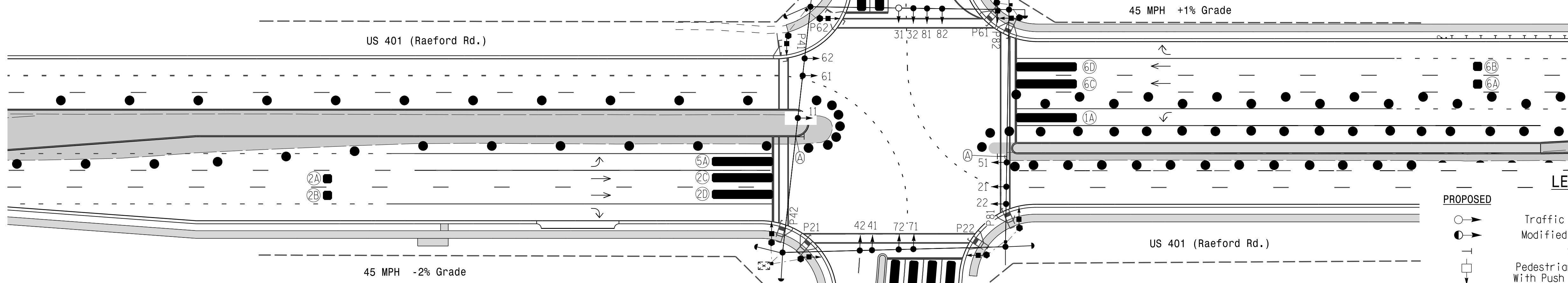
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP TYPE	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-
1B	6X40	0	*	-	1	Yes	-	15	-	S	-
2A	6X6	300	*	-	2	Yes	-	-	-	N	-
2B	6X6	300	*	-	2	Yes	-	-	-	N	-
2C	6X40	0	*	-	2	Yes	2.0	5	-	G	-
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-
3A	6X40	0	*	-	3	Yes	-	-	-	S	-
3B	6X40	0	*	-	3	Yes	-	-	-	S	-
4A	6X40	0	*	-	4	Yes	-	-	-	S	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-
5B	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	-
7A	6X40	0	*	-	7	Yes	-	3	-	S	-
7B	6X40	0	*	-	7	Yes	-	-	-	S	-
8A	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.

8 Phase Fully Actuated Fayetteville Signal System

NOTES

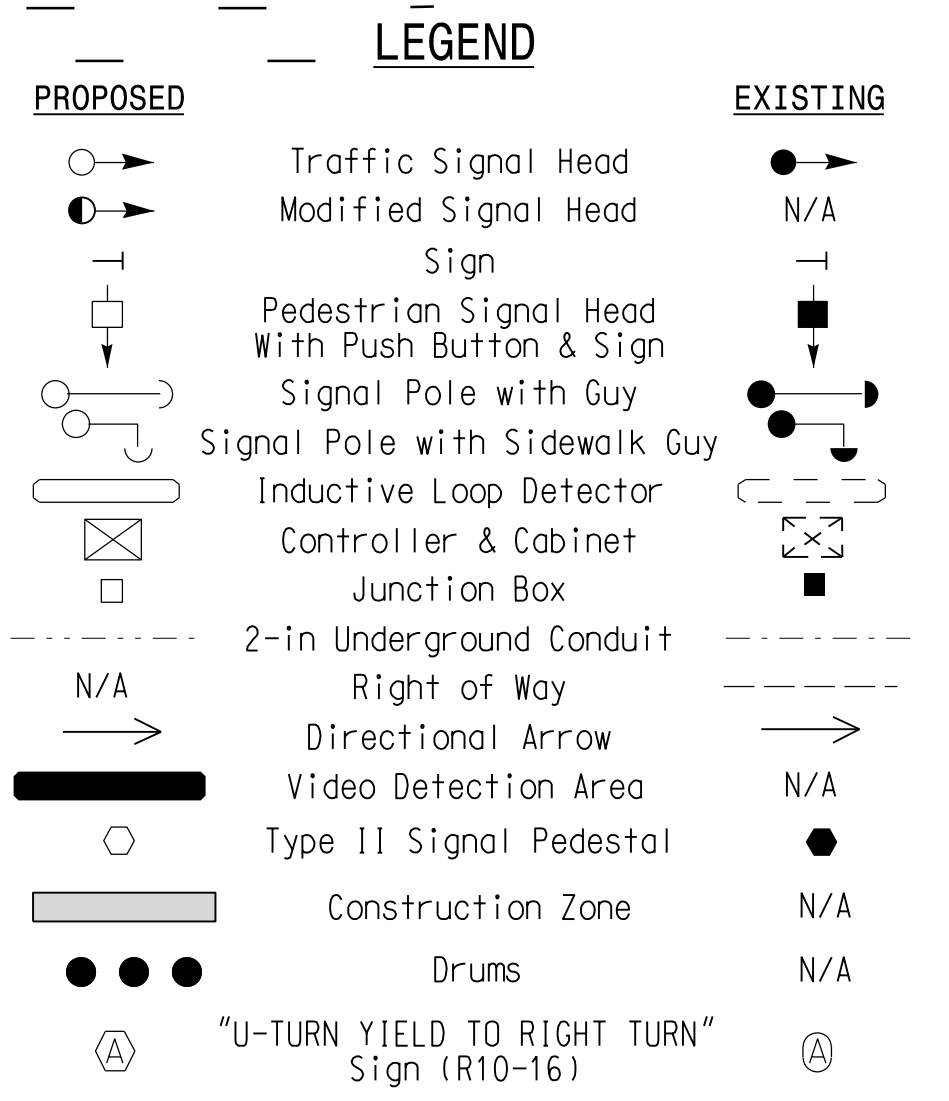
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 11, 21, 22, 51, 61, 62, & sign A.
- Set all detector units to presence mode. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



ASC/3 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	27	-	29	-	25	-	29
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	30	90	25	25	30	90	25	25
Yellow	3.0	4.7	3.0	3.3	3.0	4.4	3.0	3.9
Red Clear	3.7	2.3	4.4	3.6	4.3	2.3	4.0	3.1
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 Signal Design 3 - TMP Phase III

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License No. F-0672

Prepared for the Offices of:

US 401 (Raeford Road)
at
SR 1104 (Strickland Bridge Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: E D Harris

PREPARED BY: A D Smith REVIEWED BY: B L Watson

SCALE: 1"=40'

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

3/29/2018

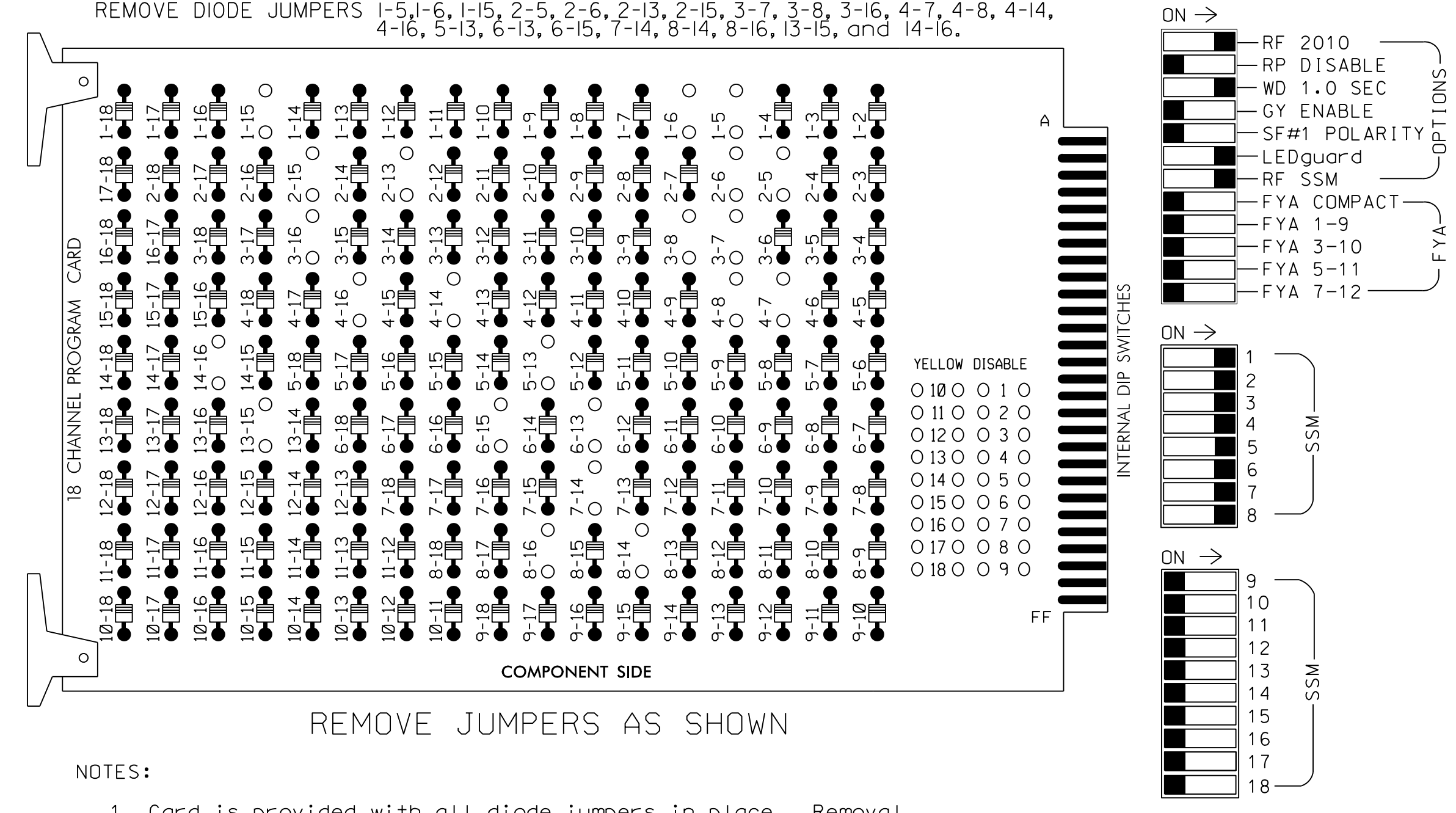
3/29/2018

SIG. INVENTORY NO. 06-059613

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 WALK and phase 6 WALK.
- 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,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED

OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....NOT USED
 OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	21,22	P21, P22	31, 32	22	41,42	P41, P42	51	42	61,62	P61, P62	71,72	62	81,82	P81, P82	NU	NU	NU
RED			128			101				134					107				
YELLOW			129			102				135					108				
GREEN			130			103				136					109				
RED ARROW	125				116				131				122						
YELLOW ARROW	126	126			117	117			132	132			123	123					
GREEN ARROW	127	127			118	118			133	133			124	124					
Hand					113				104			119			110				
Walking					115				106			121			112				

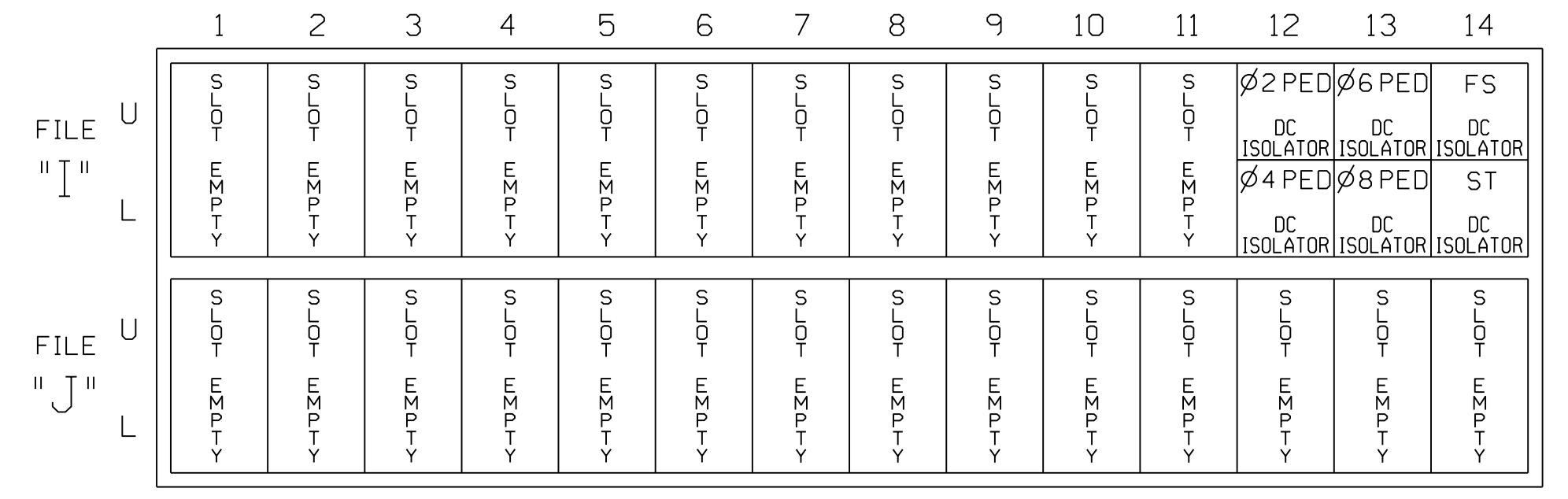
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

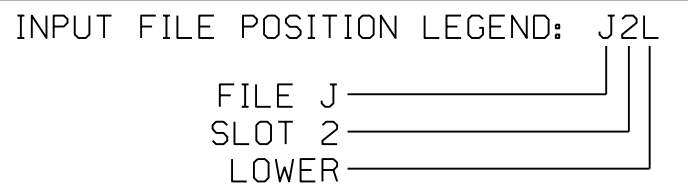
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE
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 112 AND 113.



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: 06-0596T3
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 3 - TMP Phase III Electrical Detail

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	ELECTRIC AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 	US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road) Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: L Overn PREPARED BY: M RG WILSON REVIEWED BY: REVISIONS: INIT. DATE 3/29/2018	SEAL LAWRENCE E. OVERN ENGINEER 045933 DATE: 3/29/2018 SIG. INVENTORY NO. 06-0596T3
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PHASING DIAGRAM

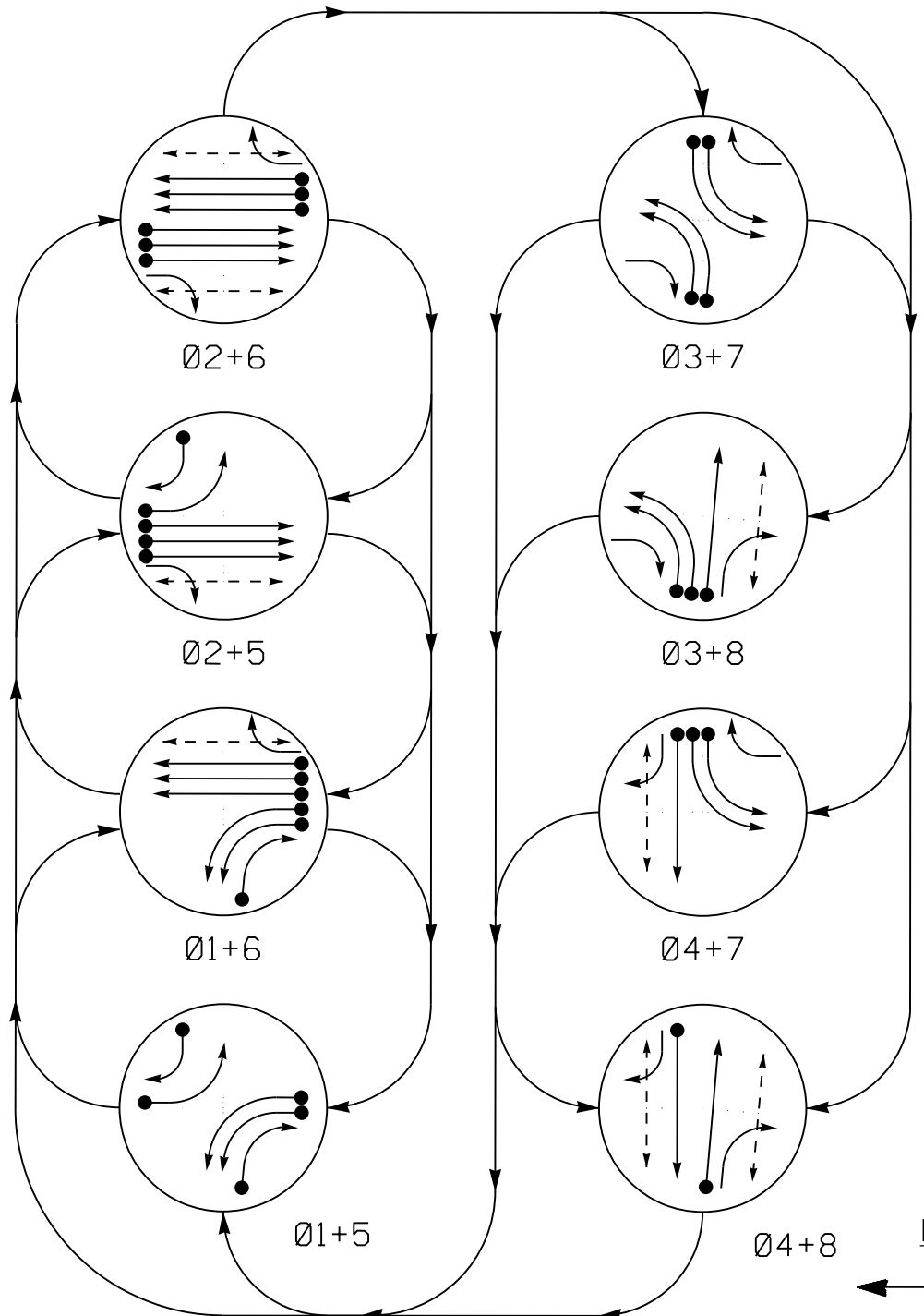
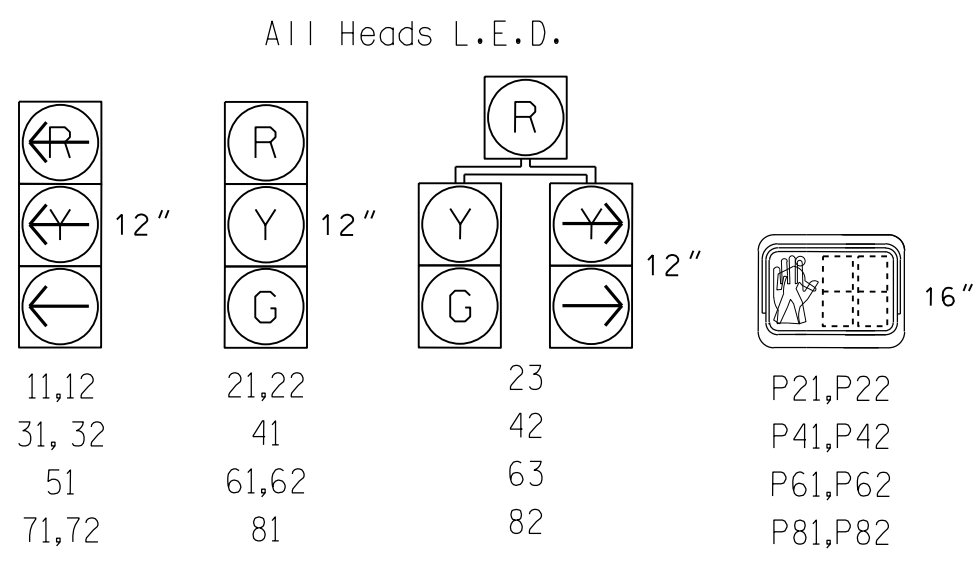


TABLE OF OPERATION

Table with columns for Signal Face, Phase (01-08), and Flash. Rows include signal faces 11,12 through 82 and program types P21,P22 through P81,P82.

SIGNAL FACE I.D.



ASC/3 DETECTOR INSTALLATION CHART

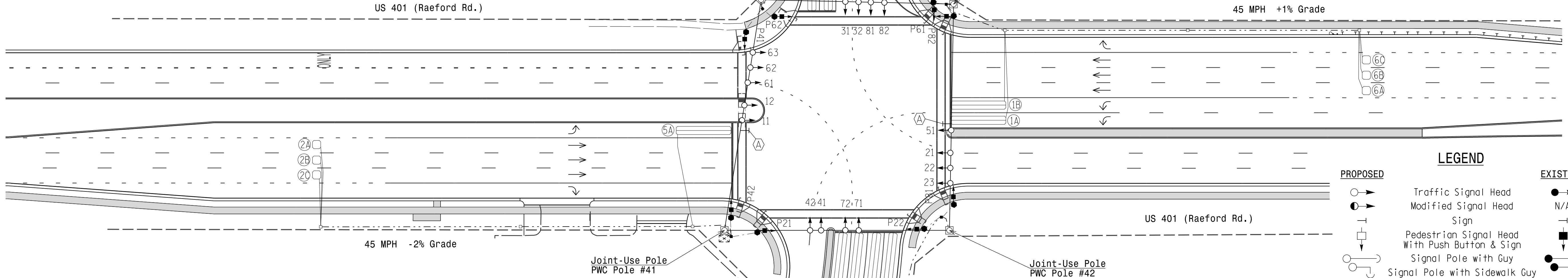
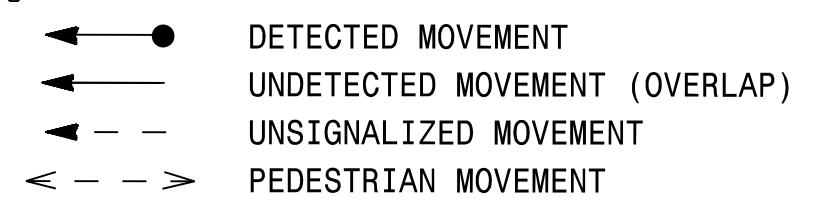
Table with columns for Loop, Size, Distance, Turns, New Loop, Phase, Calling, Extend Time, Delay Time, Uuse Added Initial, Type, Loop, New Card. Rows include loops 1A through 8A.

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. 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.

PHASING DIAGRAM DETECTION LEGEND

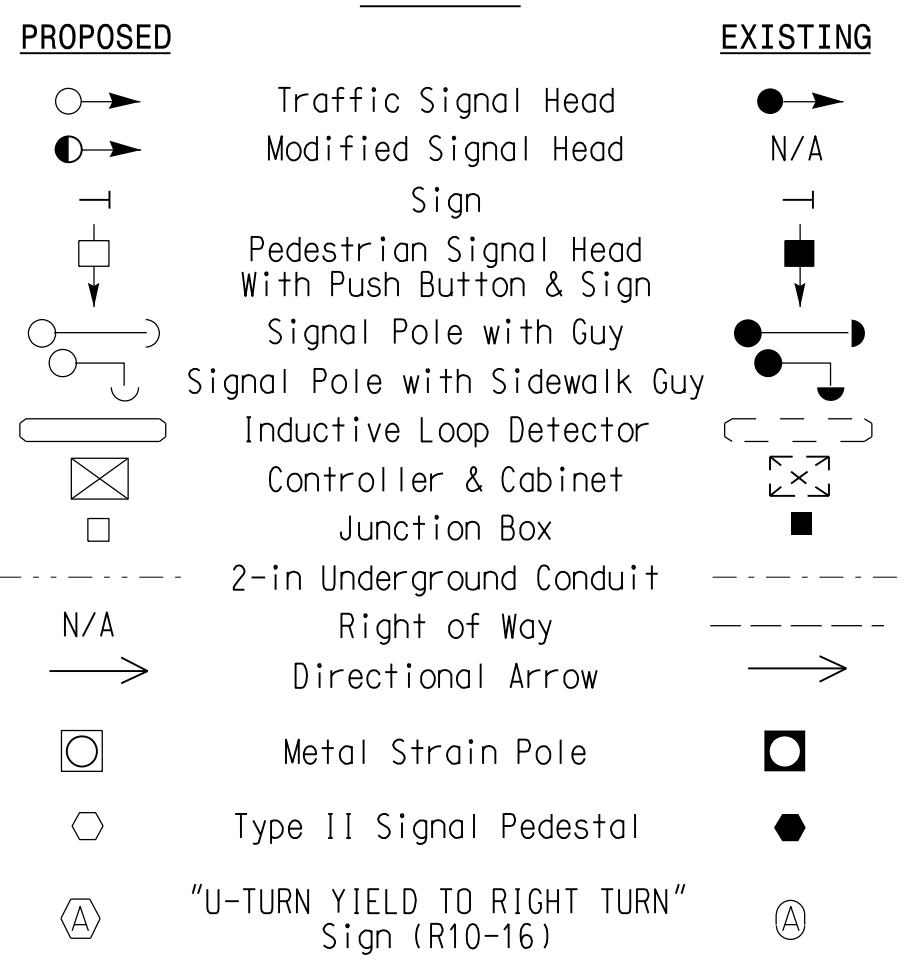


ASC/3 TIMING CHART

Timing chart table with columns for Feature and Phase (1-8). Rows include Min Green, Walk, Ped Clear, Veh. Extension, Max 1, Yellow, Red Clear, Red Revert, Actuations B4 Add, Seconds/Actuation, Max Initial, Time Before Reduction, Time To Reduce, Minimum Gap, Locking Detector, Recall Position, Dual Entry, Simultaneous Gap.

* 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



Signal Upgrade - Final Design

Stantec logo and contact information: Stantec Consulting Services Inc., 801 Jones Franklin Road-Suite 300, Raleigh, NC 27606.

Professional Engineer Seal for Eddy L. Watson, No. 29449, State of North Carolina.

Project information: US 401 (Raeford Road) at SR 1104 (Strickland Bridge Road), Division 6, Cumberland County, Fayetteville. Plan Date: March 2018. Prepared by: A D Smith. Reviewed by: E D Harris, B L Watson.

Professional Engineer Seal for Eddy L. Watson, No. 29449, State of North Carolina.

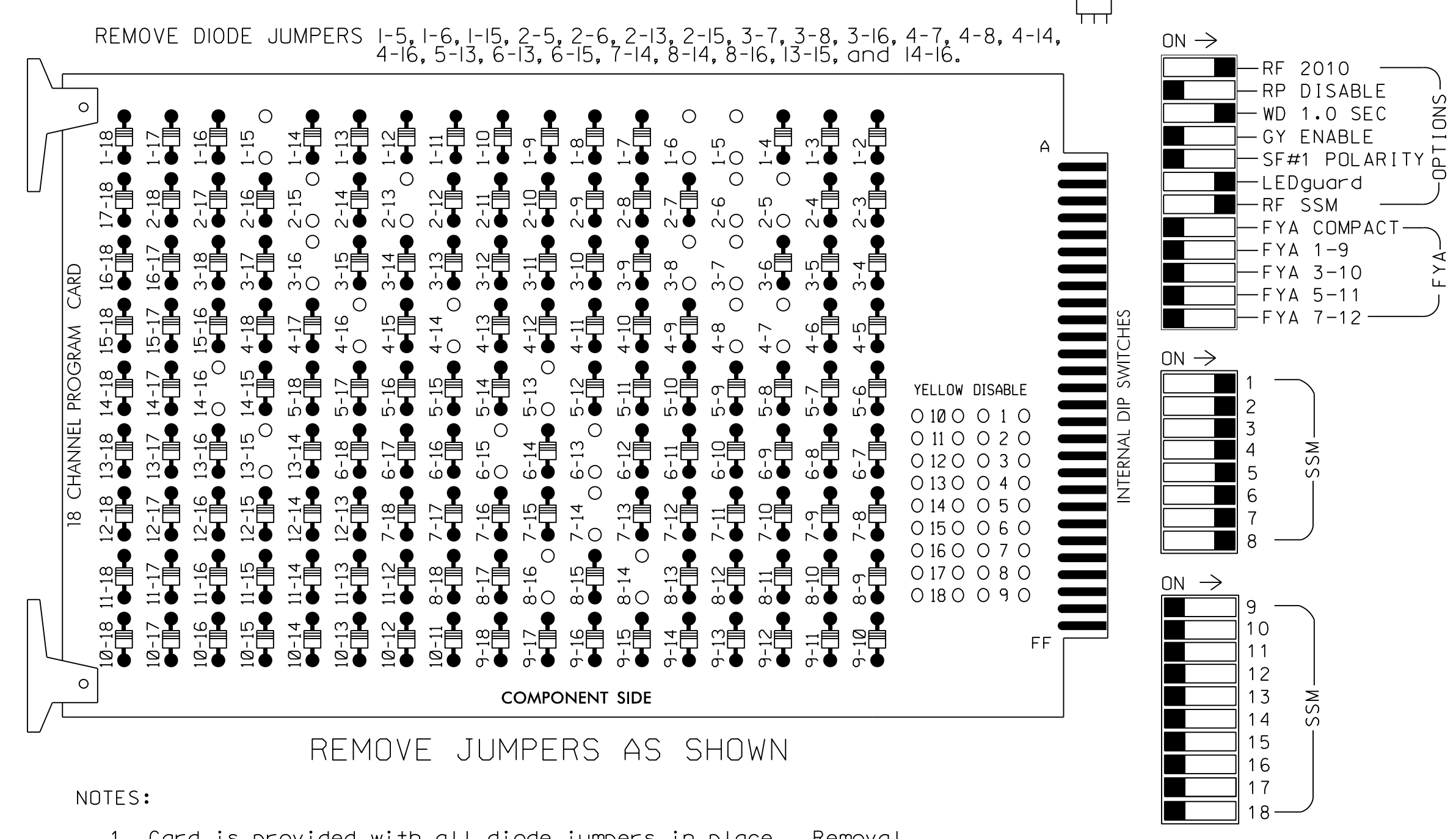
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DATE 3/29/2018 SIG. INVENTORY NO. 06-0596

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 2 WALK and phase 6 WALK.
- 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,S11,S12
 PHASES USED.....1,2,2PED,3,4,4PED,5,6,
 6PED,7,8,8PED
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....NOT USED
 OVERLAP D.....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO. / CMU CHANNEL 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	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11,12	82	21,22, 23	P21, P22	31,32	23	41,42	P41, P42	51	42	61,62, 63	P61, P62	71,72	63	81,82	P81, P82	NU	NU	NU
RED		128			101			134			107								
YELLOW		129			102			135			108								
GREEN		130			103			136			109								
RED ARROW	125			116			131			122									
YELLOW ARROW	126	126		117	117		132	132		123	123								
GREEN ARROW	127	127		118	118		133	133		124	124								
Hand icon				113			104			119			110						
Walking person icon				115			106			121			112						

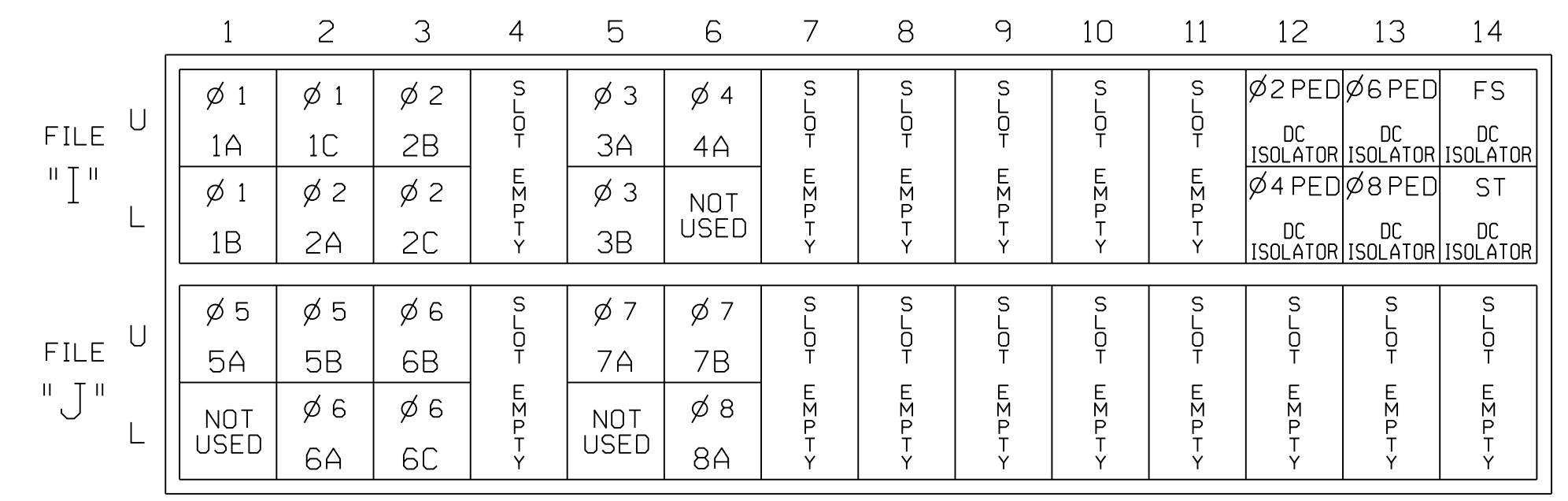
NU = Not Used

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.

INPUT FILE POSITION LAYOUT

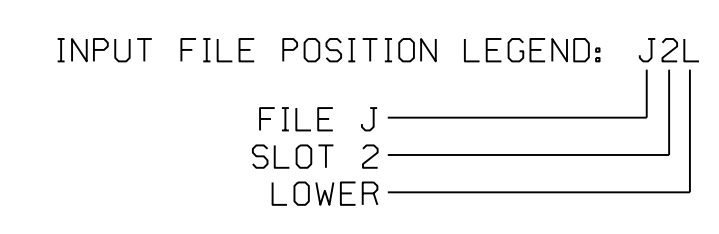
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				S
1B	TB2-3,4	I1L	56	1	1	YES				S
1C	TB2-5,6	I2U	39	2	1	YES		15		S
2A	TB2-7,8	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				S
3B	TB4-7,8	I5L	58	3	3	YES				S
4A	TB4-9,10	I6U	41	4	4	YES				S
5A	TB3-1,2	J1U	55	5	5	YES				S
5B	TB3-5,6	J2U	40	6	5	YES		15		S
6A	TB3-7,8	J2L	44	16	6	YES			X	N
6B	TB3-9,10	J3U	64	36	6	YES			X	N
6C	TB3-11,12	J3L	77	46	6	YES			X	N
7A	TB5-5,6	J5U	57	7	7	YES		3		S
7B	TB5-9,10	J6U	42	8	7	YES				S
8A	TB5-11,12	J6L	46	18	8	YES				S

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0596
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Final Design
Electrical Detail

Stantec
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 801 Jones Franklin Road-Suite 300
 Raleigh, NC 27606
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 Fax. (919) 851-7024
 www.stantec.com
 License No. F-0672

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

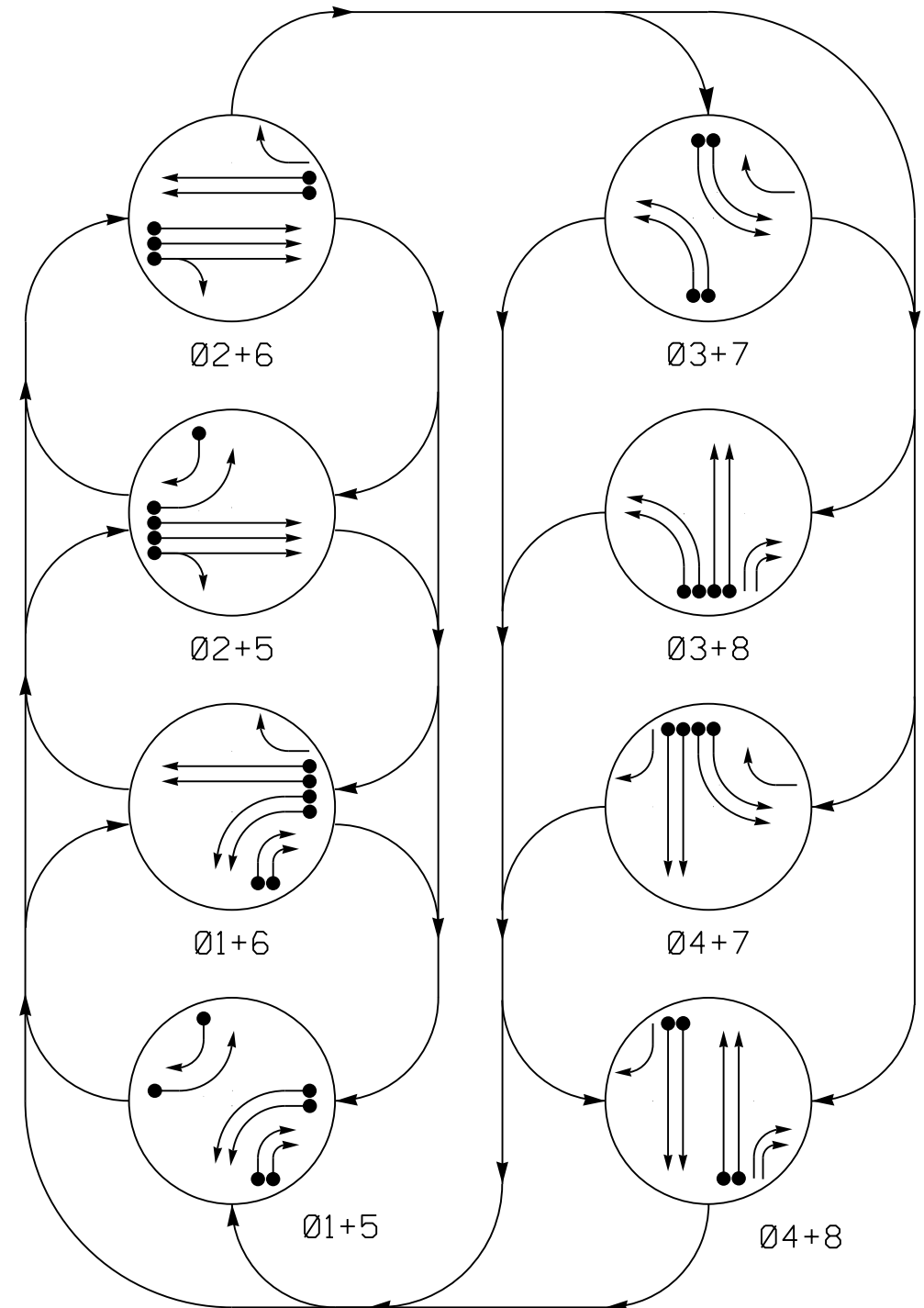
 750 N. Greenfield Pkwy, Garner, NC 27529

US 401 (Raeford Road)
 at
 SR 1104 (Strickland Bridge Road)
 Division 6 Cumberland County Fayetteville
 PLAN DATE: March 2018 REVIEWED BY: L Overn
 PREPARED BY: M RG WILSON REVIEWED BY:
 REVISIONS: INIT. DATE

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 LAWRENCE E. OVERN
 License No. 045933
 3/29/2018
 SIG. INVENTORY NO. 06-0596

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

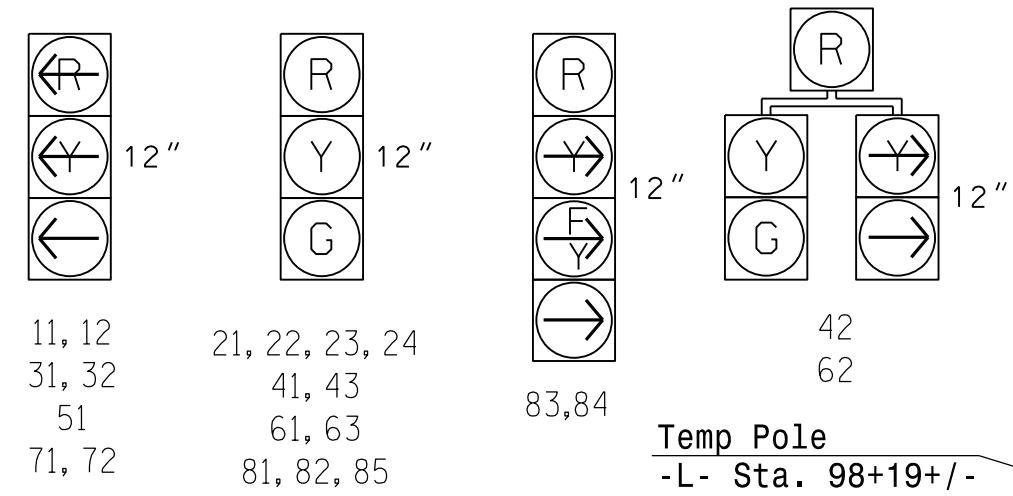
- ◀ ● DETECTED MOVEMENT
- ◀ ○ UNDETECTED MOVEMENT (OVERLAP)
- ◀ - - UNSIGNALIZED MOVEMENT
- ◀ - - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11, 12	←	←	←	←	←	←	←	←
21, 22, 23, 24	←	←	←	←	←	←	←	←
31, 32	←	←	←	←	←	←	←	←
41, 43	←	←	←	←	←	←	←	←
42	←	←	←	←	←	←	←	←
51	←	←	←	←	←	←	←	←
61, 63	←	←	←	←	←	←	←	←
62	←	←	←	←	←	←	←	←
71, 72	←	←	←	←	←	←	←	←
81, 82, 85	←	←	←	←	←	←	←	←
83, 84	←	←	←	←	←	←	←	←

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

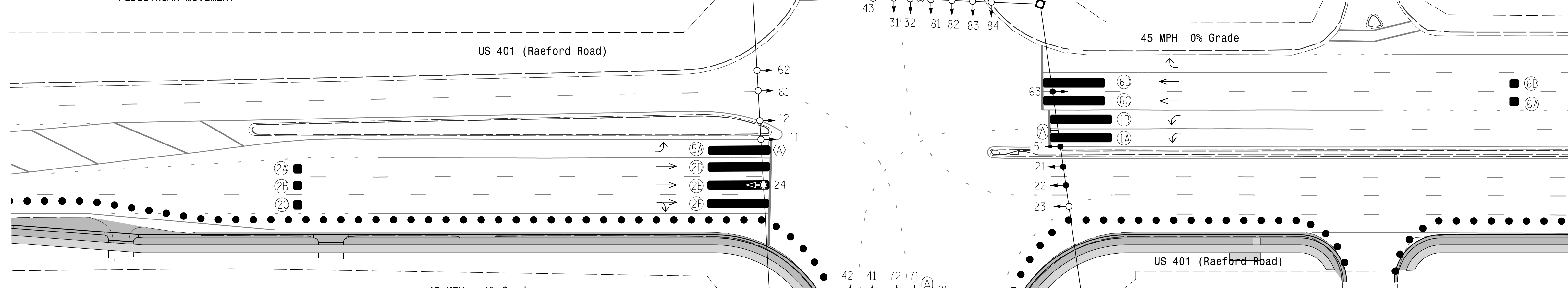
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	X
1B	6X40	0	*	-	1	Yes	-	-	-	S	-	X
1C	6X40	0	*	-	1	Yes	-	15	-	S	-	X
1D	6X40	0	*	-	1	Yes	-	15	-	S	-	X
2A	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2B	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2C	6X6	300	*	-	2	Yes	-	-	-	N	-	X
2D	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
2E	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
2F	6X40	0	*	-	2	Yes	2.0	5	-	G	-	X
3A	6X40	0	*	-	3	Yes	-	-	-	S	-	X
3B	6X40	0	*	-	3	Yes	-	-	-	S	-	X
4A	6X6	250	*	-	4	No	-	-	-	N	-	X
4B	6X6	250	*	-	4	No	-	-	-	N	-	X
4C	6X40	0	*	-	4	Yes	2.0	5	-	G	-	X
4D	6X40	0	*	-	4	Yes	2.0	5	-	G	-	X
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	X
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	X
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6B	6X6	300	*	-	6	Yes	-	-	-	N	-	X
6C	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
6D	6X40	0	*	-	6	Yes	2.0	5	-	G	-	X
7A	6X40	0	*	-	7	Yes	-	-	-	S	-	X
7B	6X40	0	*	-	7	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.

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 numbered 21 & 22.
6. Set all detector units to presence mode.
7. Locate new cabinet foundation so as not to obstruct sight distance of vehicles turning right on red.
8. The cabinet should be designed to include an Auxiliary Output File for future use.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Field adjust temporary poles as needed.



ASC/3 TIMING CHART

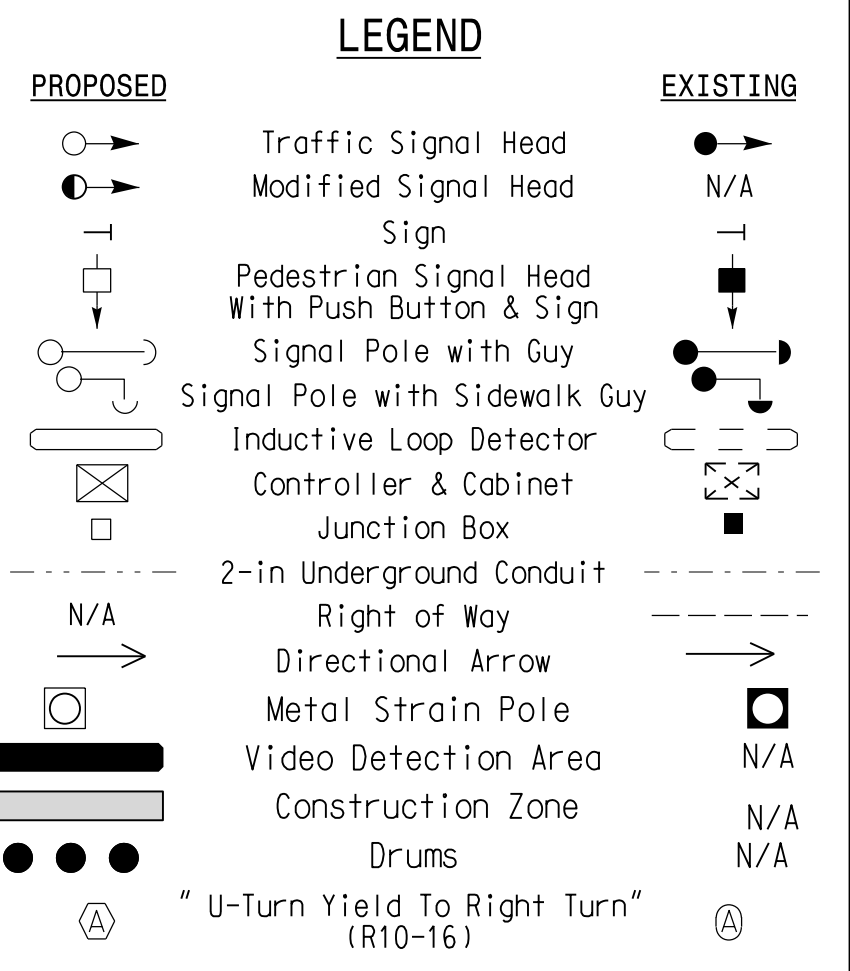
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	6.0	2.0	6.0	2.0	6.0
Max 1 *	20	60	30	40	20	60	30	40
Yellow	3.0	4.4	3.0	4.2	3.0	4.5	3.0	4.4
Red Clear	4.1	2.4	4.2	2.4	3.7	2.2	4.2	2.5
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	5	-	15	-	5
Time To Reduce *	-	30	-	20	-	30	-	20
Minimum Gap	-	3.0	-	3.0	-	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.

ASC/3 DETECTOR INSTALLATION CHART

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
8A	6X6	300	*	-	8	No	-	-	-	N	-	X
8B	6X6	300	*	-	8	No	-	-	-	N	-	X
8C	6X40	0	*	-	8	Yes	2.0	5	-	G	-	X
8D	6X40	0	*	-	8	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.



Signal Upgrade Temporary Signal Design 1 - TMP Phase I

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Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27526

US 401 (Raeford Road)
at
NC 162 (Bunce Road) /
SR 1411 (Bunce Road)
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: K Williams REVIEWED BY: B L Watson

PROFESSIONAL SEAL
29449
ENGINEER
Betsy L. Watson
3/29/2018
SIG. INVENTORY NO. 06-027411

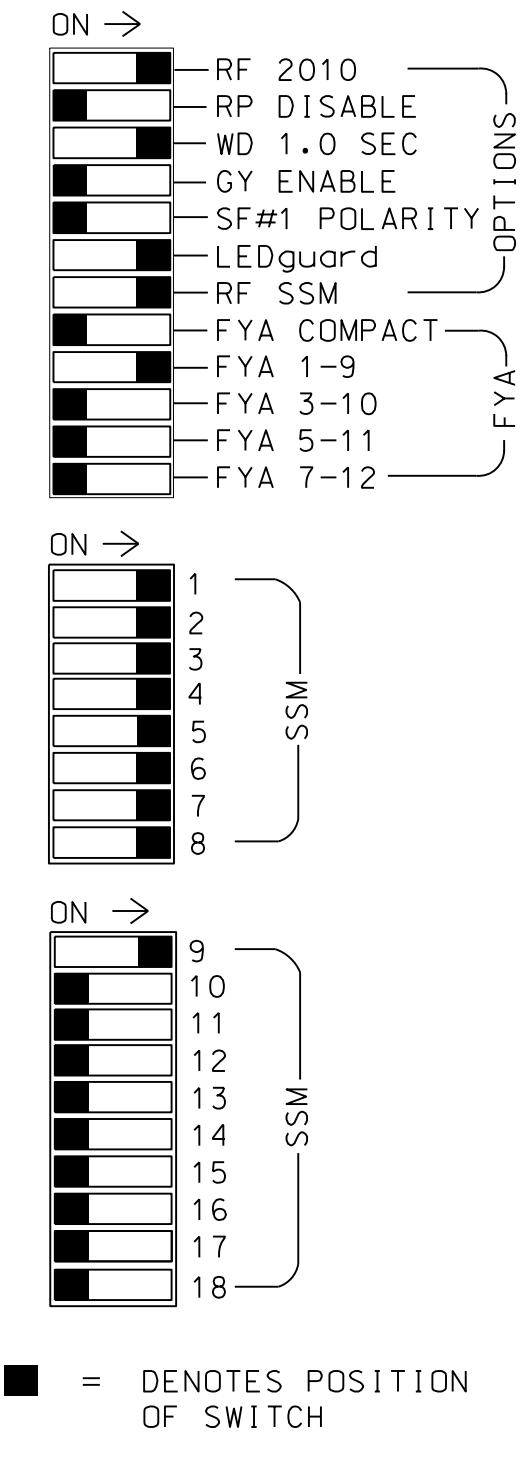
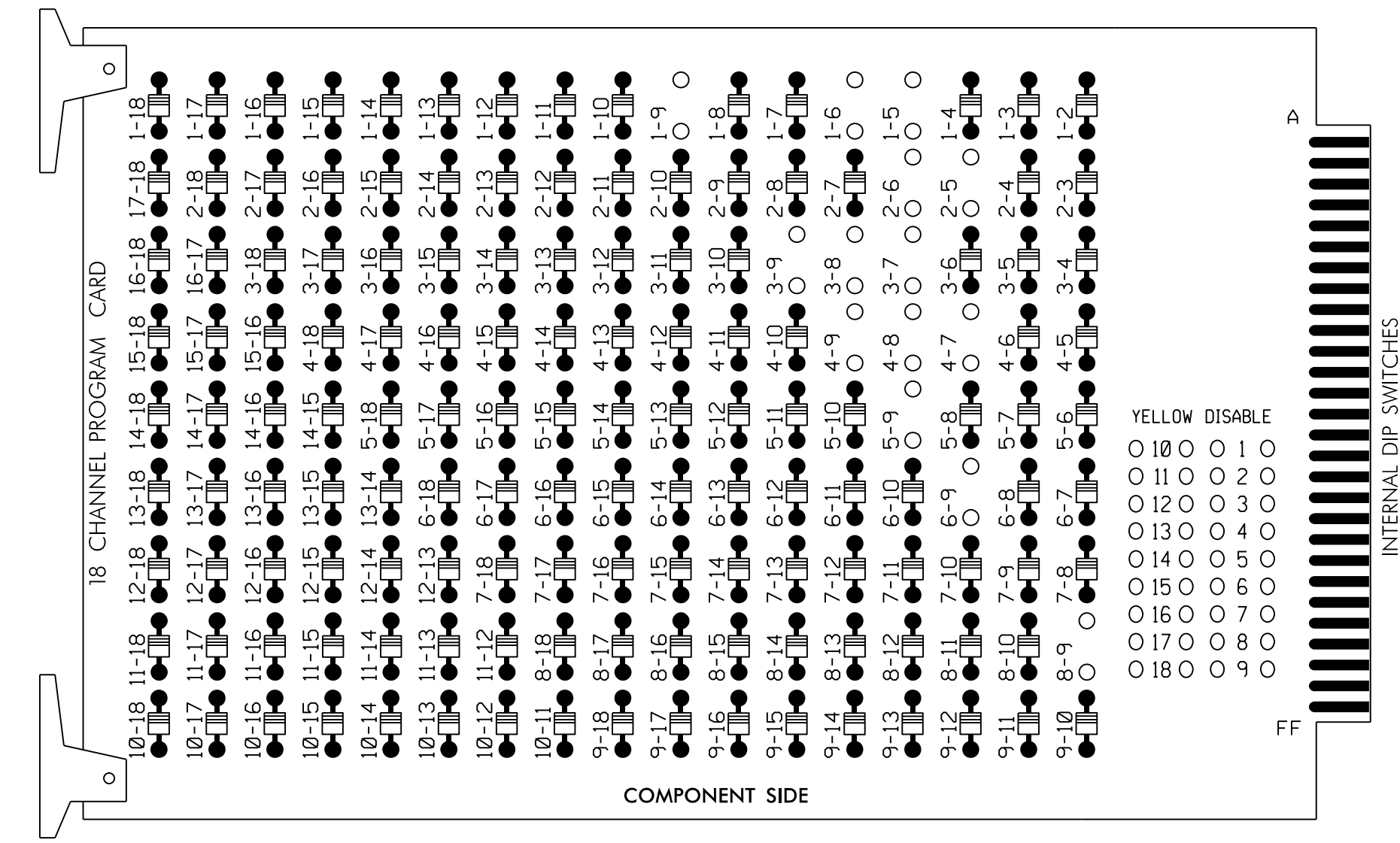
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



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.

REMOVE JUMPERS AS SHOWN

NOTES

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

EQUIPMENT INFORMATION

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

* 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.	11,12	83,84	21,22, 23,24	NU	31,32	41,42, 43	NU	51	42	61,62, 63	NU	71,72	62	81,82, 85	NU	83,84	NU	NU
RED			128			101				134						107		A121
YELLOW			129			102				135						108		
GREEN			130			103				136						109		
RED ARROW	125					116			131				122					
YELLOW ARROW	126					117			132	132			123	123				A122
FLASHING YELLOW ARROW																		A123
GREEN ARROW	127	127				118			133	133			124	124				

NU = Not Used
 * See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
FILE U	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
FILE L	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST
FILE U	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS	FS
FILE L	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST	ST

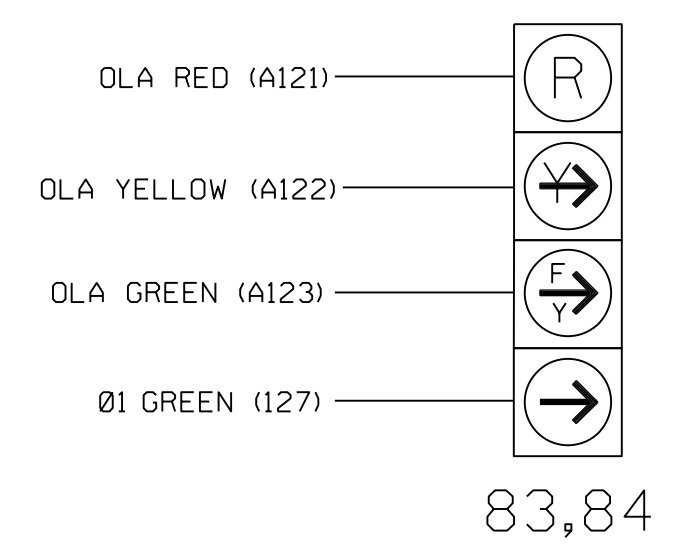
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0274T1
 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

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 401 (Raeford Road) at NC 162 (Bunce Road)/ SR 1411 (Bunce Road)</p>		<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 045933 LAWRENCE E. OVERN</p>
		<p>Division 6 Cumberland County Fayetteville</p>	<p>SEAL</p>	
<p>PLAN DATE: March 2018</p>		<p>REVIEWED BY: L Overn</p>		<p>DATE: 3/29/2018</p>
<p>PREPARED BY: G B Spell</p>		<p>REVIEWED BY:</p>		
<p>REVISIONS</p>		<p>INIT. DATE</p>		<p>DATE</p>
<p>INVENTORY NO. 06-0274T1</p>		<p>DATE</p>		

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

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 A

OVERLAP A

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

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

PROTECTED LEFT TURN.... PHASE 1

OPPOSING THROUGH..... OVERLAP G

FLASHING ARROW OUTPUT.....CH9 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.

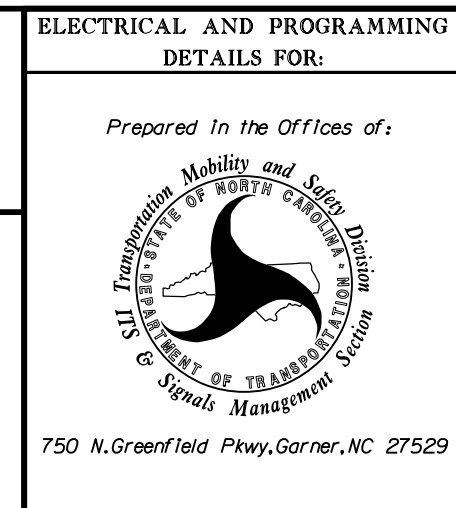
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0274T1
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

**DOCUMENT NOT CONSIDERED FINAL
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**ELECTRICAL AND PROGRAMMING
DETAILS FOR:**

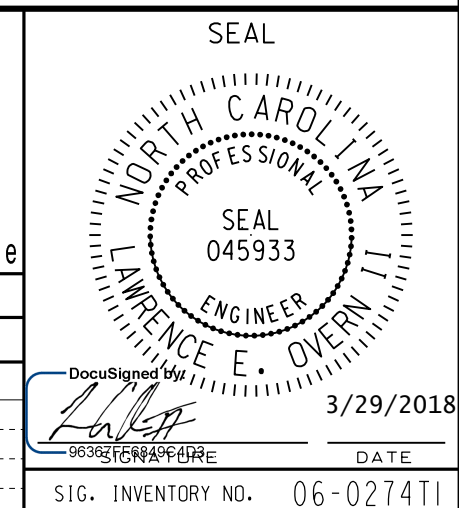
**US 401 (Raeford Road)
at
NC 162 (Bunce Road) /
SR 1411 (Bunce Road)**

Division 6 Cumberland County Fayetteville

PLAN DATE: March 2018 REVIEWED BY: L Overn

PREPARED BY: G B Spell REVIEWED BY:

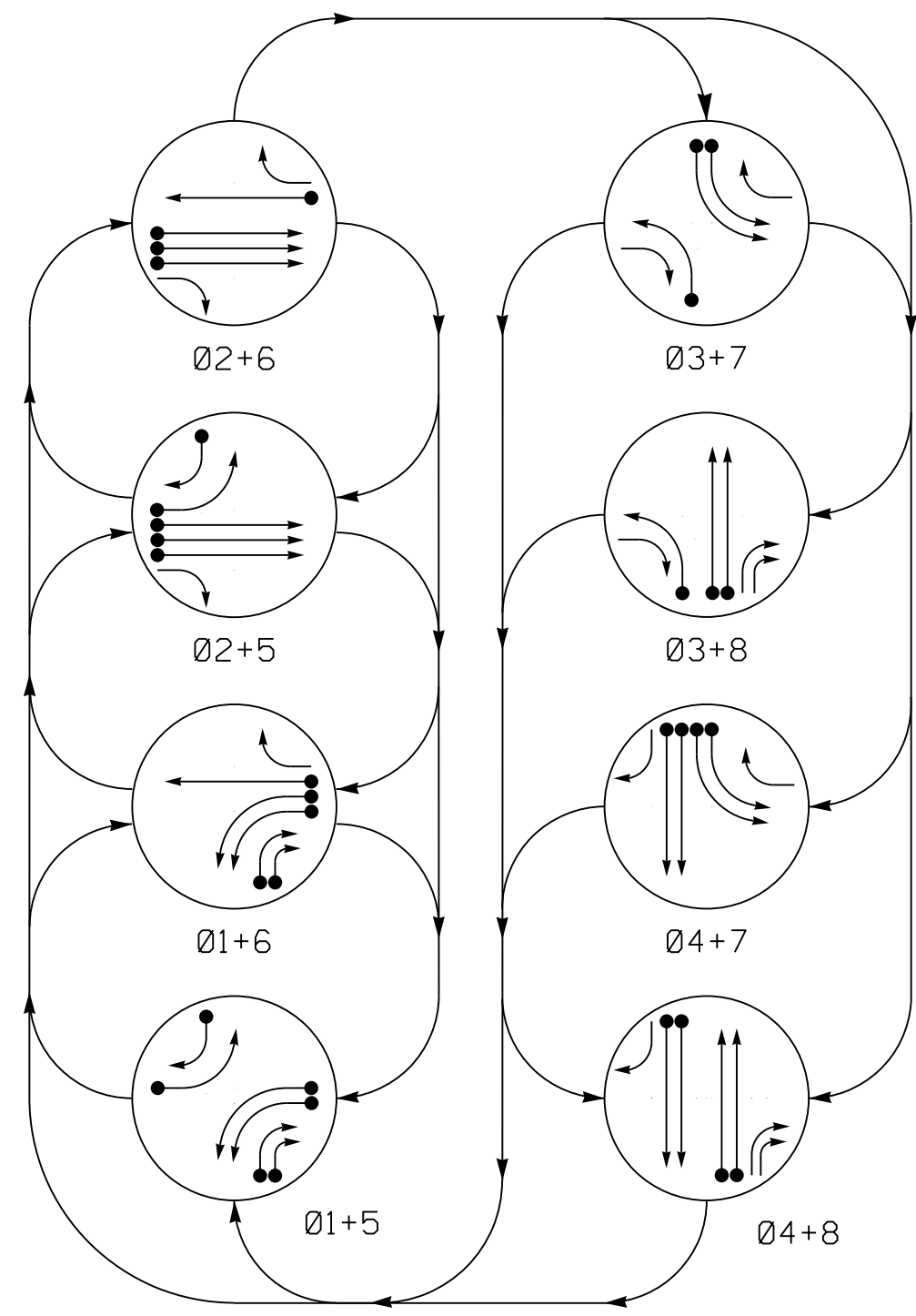
REVISIONS	INIT.	DATE



DATE: 03/29/2018 11:00:00 AM
USER: rfmancey
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PROJECT: U-4405-Phase I

DocuSign
3/29/2018
DATE
SIG. INVENTORY NO. 06-0274T1

PHASING DIAGRAM



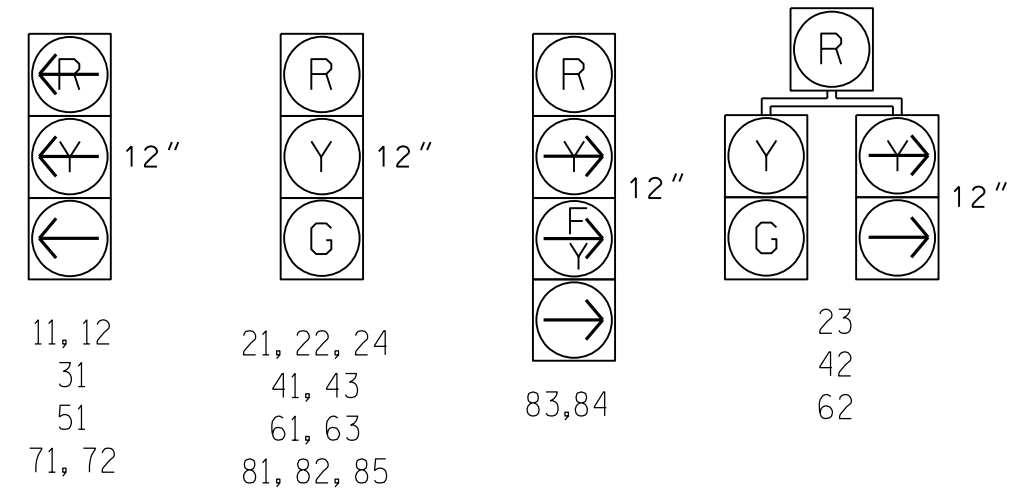
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8
11, 12	←	←	←	←	←	←	←	←
21, 22, 24	R	R	G	G	R	R	R	Y
23	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41, 43	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61, 63	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71, 72	←	←	←	←	←	←	←	←
81, 82, 85	R	R	R	R	R	G	R	G
83, 84	←	←	R	R	R	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

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	-	-	-	S	-	-
4A	6X6	250	*	-	4	No	-	-	-	N	-	-
4B	6X6	250	*	-	4	No	-	-	-	N	-	-
4C	6X40	0	*	-	4	Yes	2.0	5	-	G	-	-
4D	6X40	0	*	-	4	Yes	2.0	5	-	G	-	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	-
5B	6X40	0	*	-	5	Yes	-	15	-	S	-	-
6A	6X6	300	*	-	6	Yes	-	-	-	N	-	-
6B	6X40	0	*	-	6	Yes	2.0	5	-	G	-	-
7A	6X40	0	*	-	7	Yes	-	-	-	S	-	-
7B	6X40	0	*	-	7	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.

DETECTOR INSTALLATION CHART CONTINUED BELOW

8 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered #21, 22, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

US 401 (Raeford Road)

45 MPH +1% Grade

US 401 (Raeford Road)

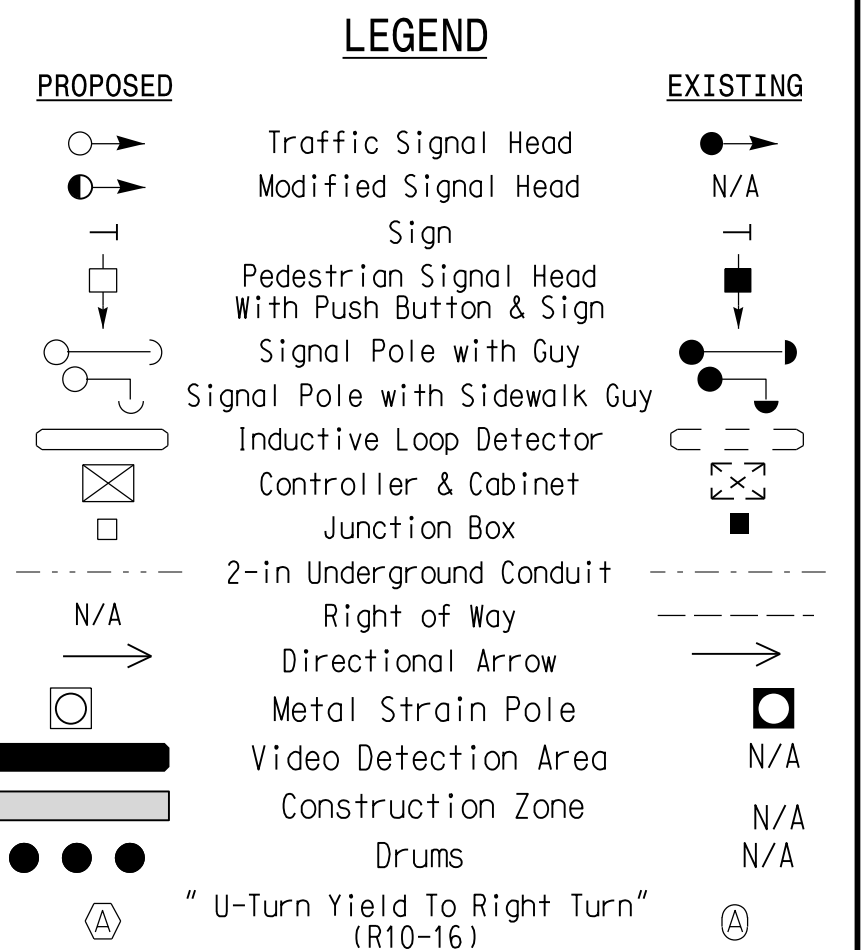
ASC/3 DETECTOR INSTALLATION CHART

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
8A	6X6	300	*	-	8	No	-	-	-	N	-	X
8B	6X6	300	*	-	8	No	-	-	-	N	-	X
8C	6X40	0	*	-	8	Yes	2.0	5	-	G	-	X
8D	6X40	0	*	-	8	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.

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	6.0	2.0	6.0	2.0	6.0
Max 1 *	20	60	30	40	20	60	30	40
Yellow	3.0	4.4	3.0	4.2	3.0	4.5	3.0	4.4
Red Clear	4.2	2.4	3.9	2.7	3.6	2.2	4.0	2.3
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	5	-	15	-	5
Time To Reduce *	-	30	-	20	-	30	-	20
Minimum Gap	-	3.0	-	3.0	-	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 Signal Design 2 - TMP Phase II

Stantec
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Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27526
 SCALE: 0 40
 1"=40'

US 401 (Raeford Road) at NC 162 (Bunce Road) / SR 1411 (Bunce 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

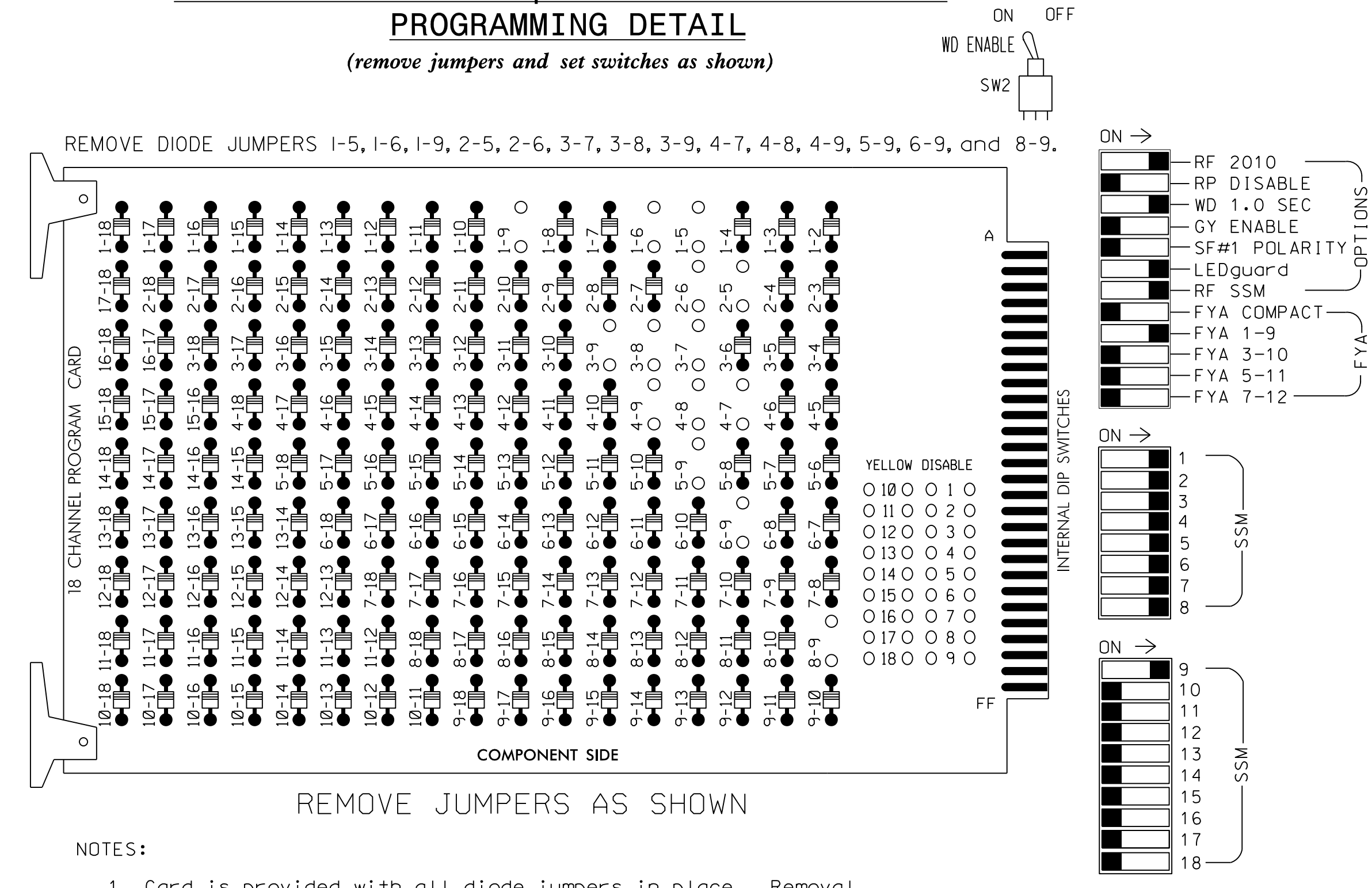
Professional Engineer Seal for B. L. Watson, State of North Carolina, License No. 29449.
 3/29/2018
 DATE: 3/29/2018
 SIG. INVENTORY NO. 06-027412

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/29/2018 10:58:11 AM
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 User: rfmccoy

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....Contractor Supplied
ECONOLITE 2070LX
CABINET.....332 W/AUX
SOFTWARE.....ECONOLITE ASC/3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,
S11,AUX S1

PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED
OVERLAP G.....*

* See Overlap Programming Detail on Sheet 2

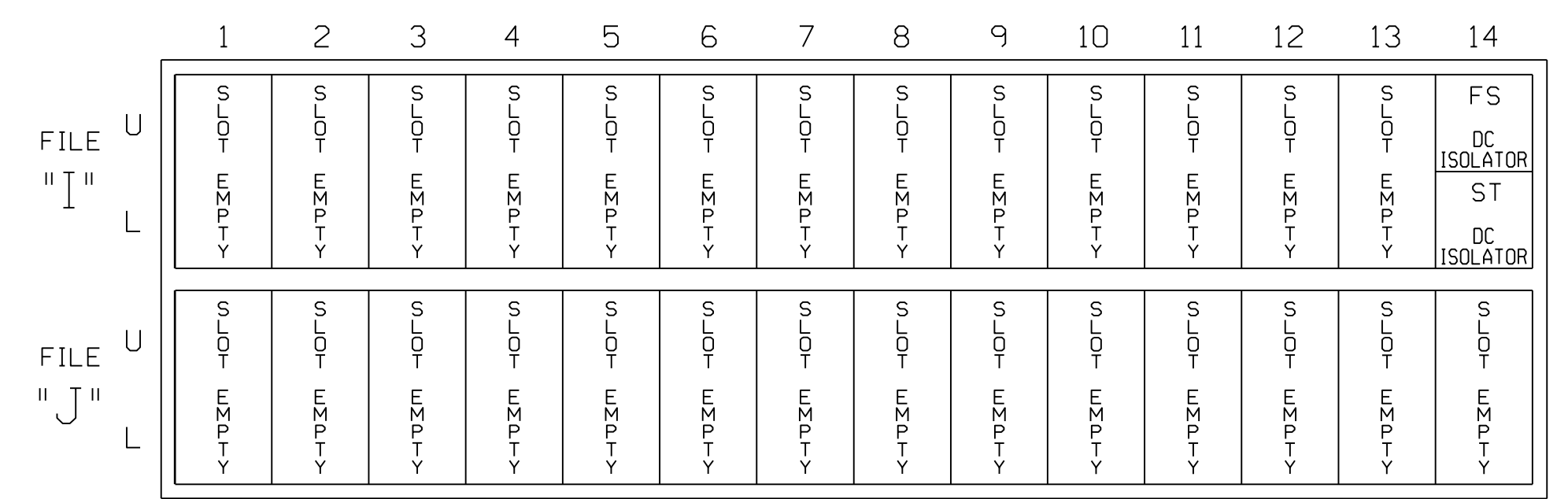
SIGNAL HEAD HOOK-UP CHART

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.	11,12	83,84	21,22, 23,24	31	23	41,42, 43	NU	51	42	61,62, 63	NU	71,72	62	81,82, 85	NU	83,84	NU	NU	NU
RED			128			101				134									A121
YELLOW			129			102				135									
GREEN			130			103				136									
RED ARROW	125			116				131					122						
YELLOW ARROW	126			117	117			132	132				123	123					A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127	127		118	118			133	133				124	124					

NU = Not Used
★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

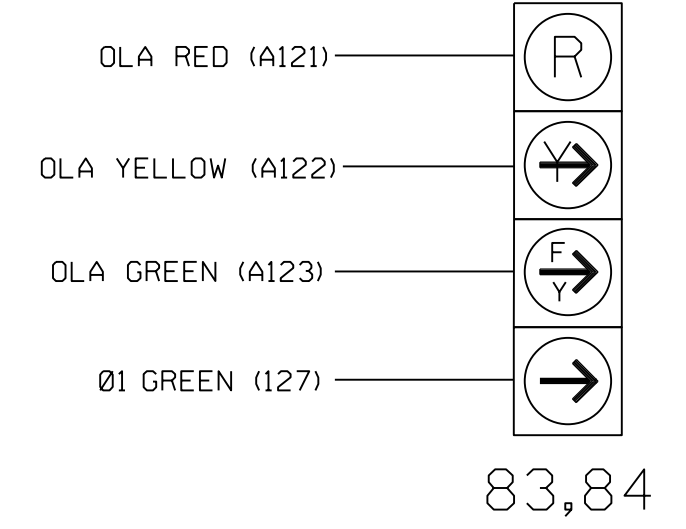


SPECIAL DETECTOR NOTE

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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0274T2
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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		<p>PLAN DATE: March 2018</p> <p>PREPARED BY: G B Spell</p>	<p>REVIEWED BY: L Overn</p> <p>REVIEWED BY:</p>		<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	INIT.	DATE		
NO.	DATE	INIT.	DATE								

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

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 A

OVERLAP A

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

```

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

FLASHING ARROW OUTPUT.....CH9 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: 06-0274T2
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

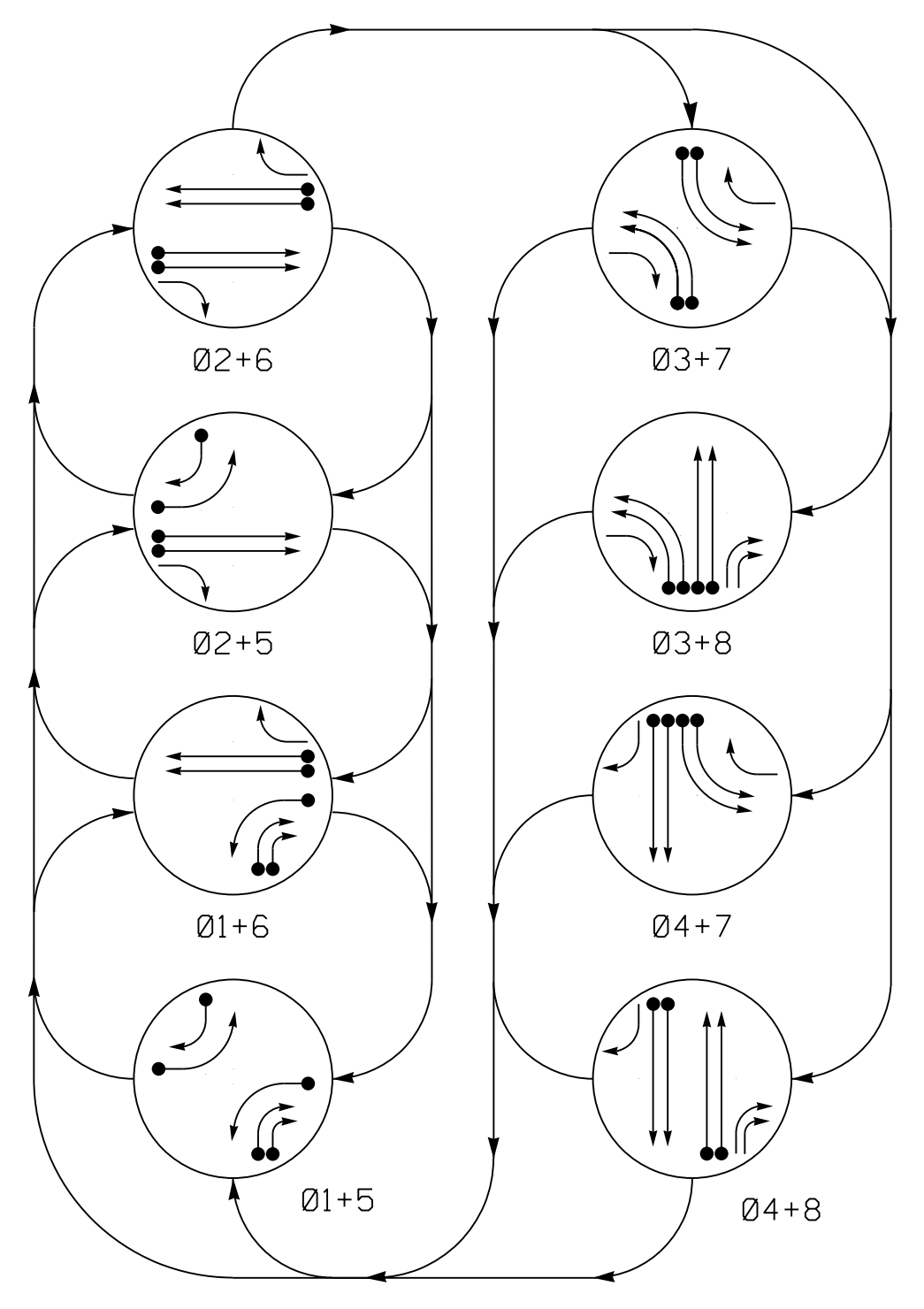
Temporary Design 2 - TMP Phase II
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL
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	<small>PLAN DATE: March 2018 REVIEWED BY: L Overn</small> <small>PREPARED BY: G B Spell REVIEWED BY:</small>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE						
REVISIONS	INIT.	DATE									

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User: rfmancey
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PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

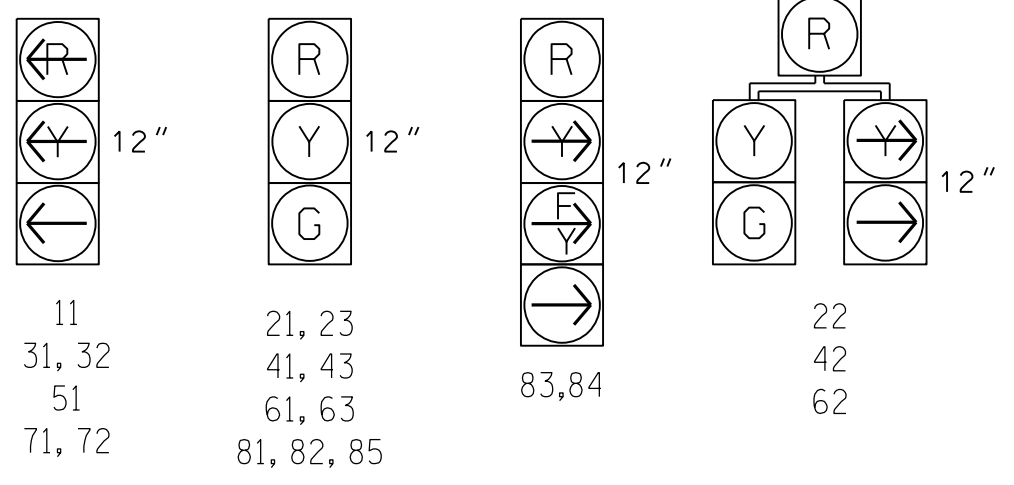
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- ▲ UNSIGNALIZED MOVEMENT
- ⬆ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	←	←	←	←	←	←	←	←
22, 23	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31, 32	←	←	←	←	←	←	←	←
41, 43	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61, 63	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71, 72	←	←	←	←	←	←	←	←
81, 82, 85	R	R	R	R	R	G	R	G
83, 84	←	←	←	←	←	←	←	←

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	-	1	Yes	-	-	-	S	-	-
1B	6X40	0	*	-	1	Yes	-	15	-	S	-	-
1C	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	-	-	-	S	-	-
3B	6X40	0	*	-	3	Yes	-	-	-	S	-	-
4A	6X6	250	*	-	4	No	-	-	-	N	-	-
4B	6X6	250	*	-	4	No	-	-	-	N	-	-
4C	6X40	0	*	-	4	Yes	2.0	5	-	G	-	-
4D	6X40	0	*	-	4	Yes	2.0	5	-	G	-	-
5A	6X40	0	*	-	5	Yes	-	-	-	S	-	-
5B	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	-	-
7A	6X40	0	*	-	7	Yes	-	-	-	S	-	-
7B	6X40	0	*	-	7	Yes	-	-	-	S	-	-

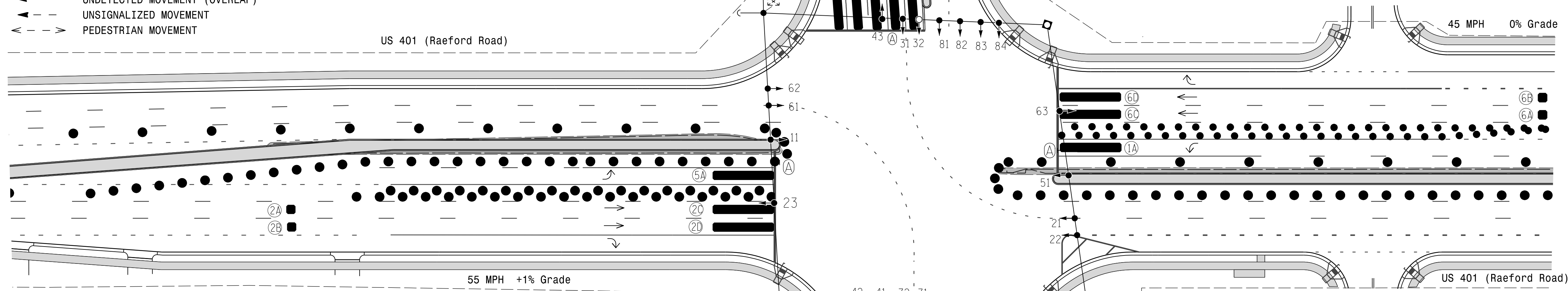
*Video Detection Area. Camera locations should be confirmed in the field by the contractor in order to provide detection of the areas indicated.

8 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered #11, 21, 22, 51, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

DETECTOR INSTALLATION CHART CONTINUED BELOW



ASC/3 TIMING CHART

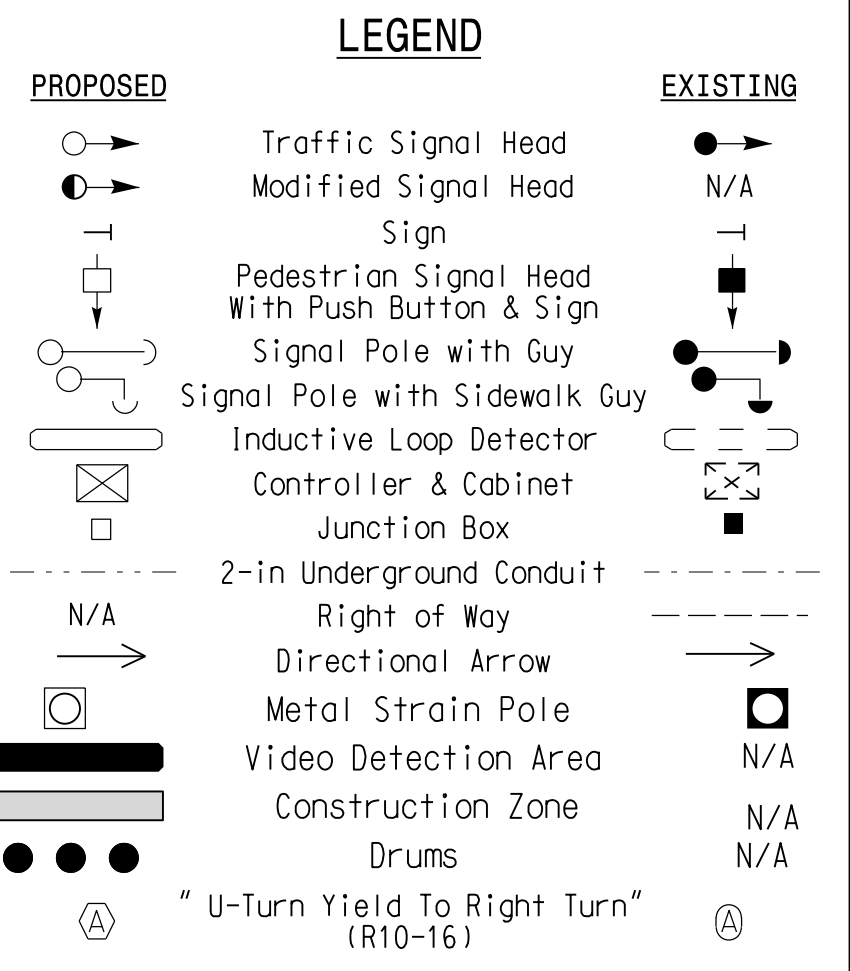
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	6.0	2.0	6.0	2.0	6.0
Max 1 *	20	60	30	40	20	60	30	40
Yellow	3.0	4.4	3.0	4.2	3.0	4.5	3.0	4.4
Red Clear	4.0	2.4	4.2	2.5	3.8	2.2	4.1	2.5
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	15	-	5	-	15	-	5
Time To Reduce *	-	30	-	20	-	30	-	20
Minimum Gap	-	3.0	-	3.0	-	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.

ASC/3 DETECTOR INSTALLATION CHART

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
8A	6X6	300	*	-	8	No	-	-	-	N	-	-
8B	6X6	300	*	-	8	No	-	-	-	N	-	-
8C	6X40	0	*	-	8	Yes	2.0	5	-	G	-	-
8D	6X40	0	*	-	8	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.



Signal Upgrade Temporary Signal Design 3 - TMP Phase III

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Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA
SIGNAL DESIGN SECTION
750 N. Greenfield Pkwy, Garner, NC 27526
SCALE
0 40
1"=40'

US 401 (Raeford Road) at NC 162 (Bunce Road) / SR 1411 (Bunce Road)
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: E D Harris
PREPARED BY: K Williams REVIEWED BY: B L Watson

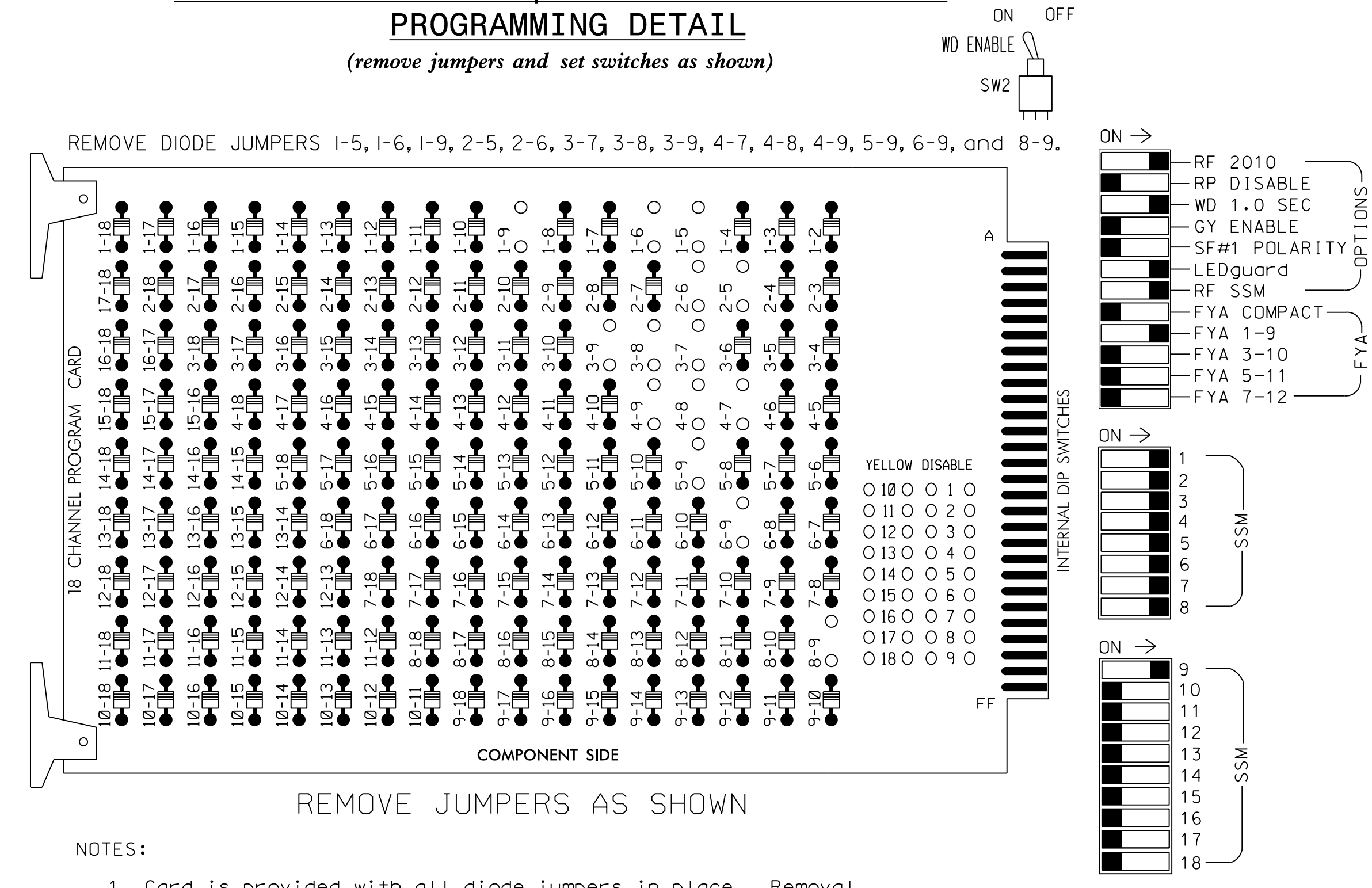
SEAL 29449
NORTH CAROLINA PROFESSIONAL ENGINEER
JENNY L. WATSON
3/29/2018
SIG. INVENTORY NO. 06-027413

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/29/2018 10:51:11 AM User: rfmccoy

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

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

* See Overlap Programming Detail on Sheet 2

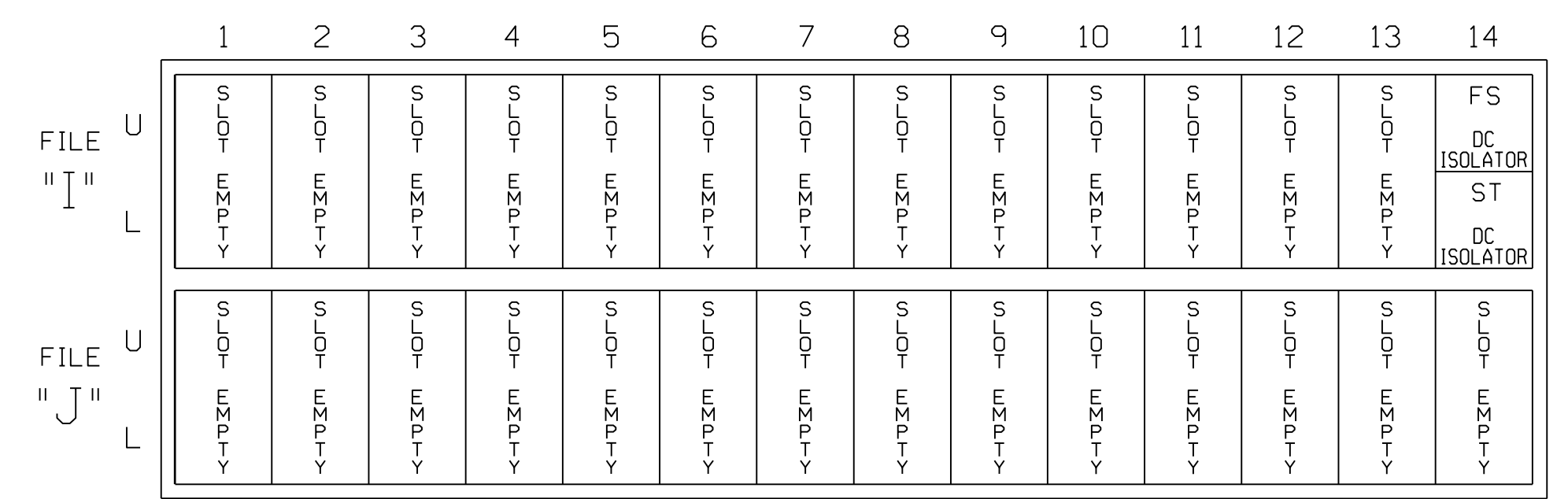
SIGNAL HEAD HOOK-UP CHART

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	83,84	21,22,23	NU	31,32	22	41,42,43	NU	51	42	61,62,63	NU	71,72	62	81,82,85	NU	83,84	NU
RED			128			101			134			107			A121			
YELLOW			129			102			135			108						
GREEN			130			103			136			109						
RED ARROW	125			116				131			122							
YELLOW ARROW	126			117	117			132	132		123	123			A122			
FLASHING YELLOW ARROW															A123			
GREEN ARROW	127	127		118	118			133	133		124	124						

NU = Not Used
★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



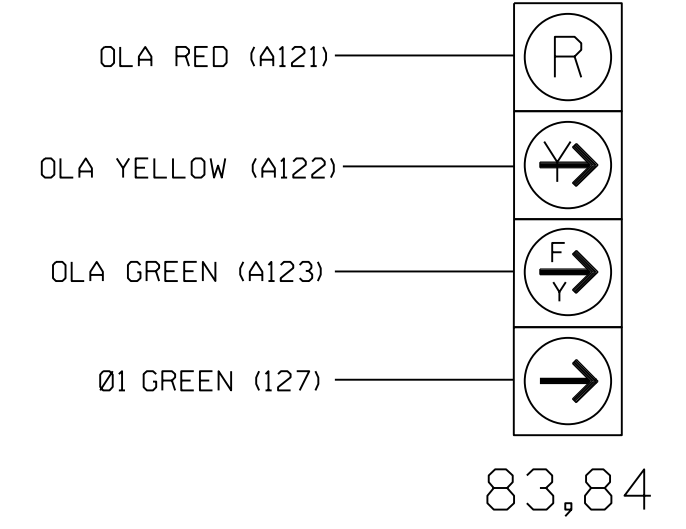
EX.: 1A, 2A, ETC. = LOOP NO.'S
FS = FLASH SENSE
ST = STOP TIME

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.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0274T3
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

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

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		<p>PLAN DATE: March 2018</p> <p>PREPARED BY: G B Spell</p>	<p>REVIEWED BY: L Overn</p> <p>REVIEWED BY:</p>		<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	INIT.	DATE		
NO.	DATE	INIT.	DATE								

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

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 A

OVERLAP A

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

```

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

FLASHING ARROW OUTPUT.....CH9 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: 06-0274T3
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

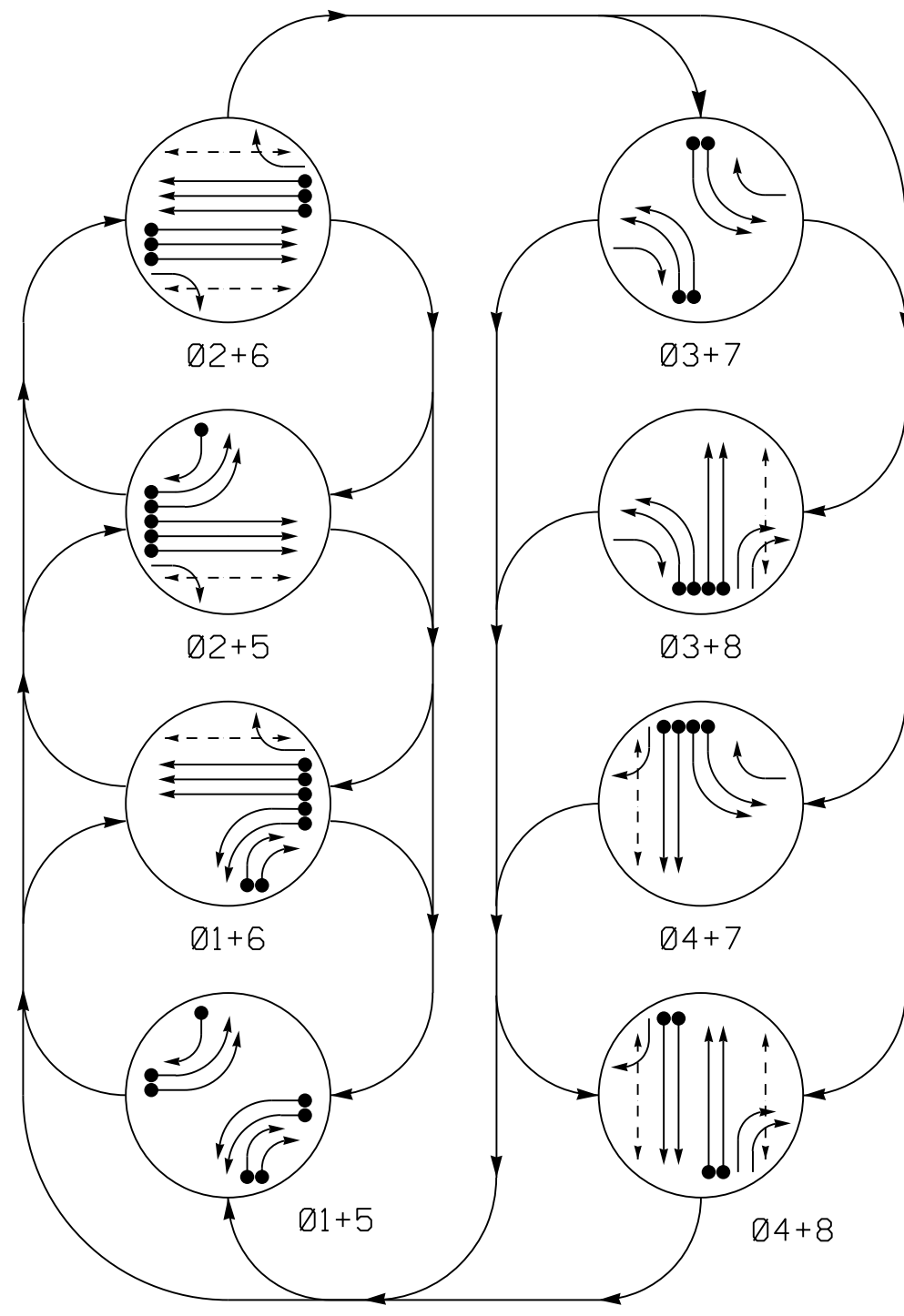
Temporary Design 3 - TMP Phase III
 Electrical Detail - Sheet 2 of 2

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 Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672	ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	US 401 (Raeford Road) at NC 162 (Bunce Road) / SR 1411 (Bunce Road) Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: L Overn PREPARED BY: G B Spell REVIEWED BY:	SEAL LAWRENCE E. OVERN ENGINEER 045933 3/29/2018
	REVISIONS INIT. DATE		DATE 3/29/2018

DATE: 03/29/2018 10:45:12 AM
 User: rfmuncey
 C:\Users\rfmuncey\Documents\Electrical\Detail\Signal\Phase 3\U-4405\SigEle_06-0274T3.dgn

PHASING DIAGRAM



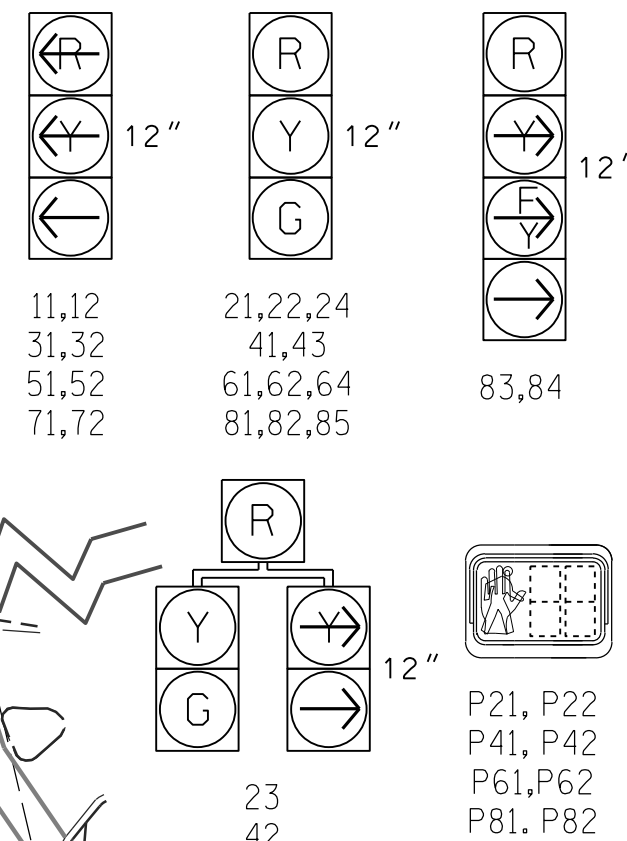
PHASING DIAGRAM DETECTION LEGEND

- ◀ ● ▶ DETECTED MOVEMENT
- ◀ ○ ▶ UNDETECTED MOVEMENT (OVERLAP)
- ◀ ○ ○ ▶ UNSIGNALIZED MOVEMENT
- ◀ ○ ○ ○ ▶ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE							
	01+5	02+6	03+7	04+8	01+6	02+5	03+8	04+7
11,12	←	←	←	←	←	←	←	←
21,22,24	R	R	G	G	R	R	R	Y
23	R	R	G	G	R	R	R	Y
31,32	←	←	←	←	←	←	←	←
41,43	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61,62,64	R	G	R	G	R	R	R	Y
63	R	G	R	G	R	R	R	Y
71,72	←	←	←	←	←	←	←	←
81,82,85	R	R	R	R	G	R	G	R
83,84	←	←	←	←	←	←	←	←
P21,22	DW	DW	W	W	DW	DW	DW	DRK
P41,42	DW	DW	DW	DW	DW	DW	W	DRK
P61,62	DW	W	DW	W	DW	DW	DW	DRK
P81,82	DW	DW	DW	DW	DW	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



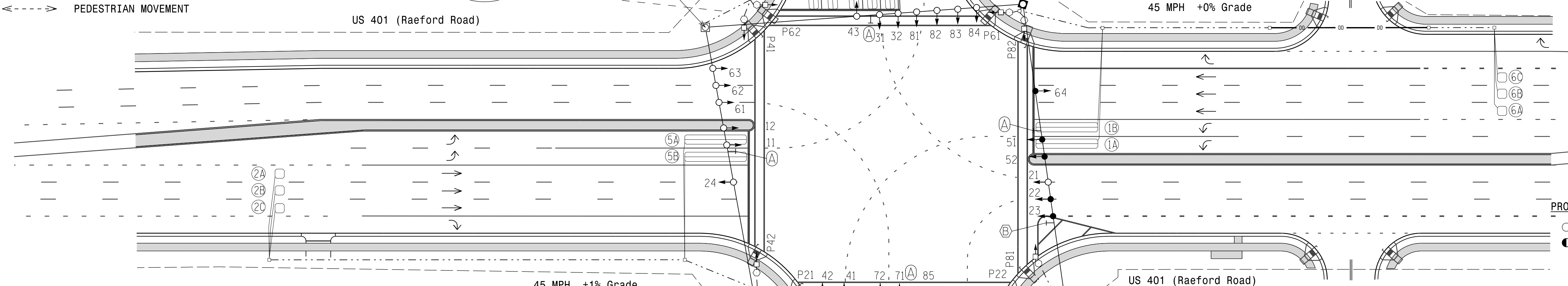
ASC/3 DETECTOR INSTALLATION CHART

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	5	X	2	Yes	-	-	-	X	N	-
2B	6X6	300	5	X	2	Yes	-	-	-	X	N	-
2C	6X6	300	5	X	2	Yes	-	-	-	X	N	-
3A	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	S	-	X
4A	6X6	250	4	X	4	No	-	-	-	N	-	X
4B	6X6	250	4	X	4	No	-	-	-	N	-	X
4C	6X40	0	2-4-2	X	4	Yes	2.0	5	-	G	-	X
4D	6X40	0	2-4-2	X	4	Yes	2.0	5	-	G	-	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
6A	6X6	300	5	X	6	Yes	-	-	-	X	N	-
6B	6X6	300	5	X	6	Yes	-	-	-	X	N	-
6C	6X6	300	5	X	6	Yes	-	-	-	X	N	-
7A	6X40	0	2-4-2	X	7	Yes	-	-	-	S	-	X
7B	6X40	0	2-4-2	X	7	Yes	-	-	-	S	-	Y
8A	6X6	300	5	X	8	No	-	-	-	N	-	X
8B	6X6	300	5	X	8	No	-	-	-	N	-	X
8C	6X40	0	2-4-2	Y	8	Yes	2.0	5	-	G	-	X
8D	6X40	0	2-4-2	X	8	Yes	2.0	5	-	G	-	X

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. Phase 1 and/or phase 5 may be lagged.
3. Phase 3 and/or phase 7 may be lagged.
4. Reposition existing signal head numbered #51.
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.



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	-	35	-	36	-	36	-	38
Veh. Extension *	2.0	6.0	2.0	6.0	2.0	6.0	2.0	6.0
Max 1 *	20	60	30	40	20	60	30	40
Yellow	3.0	4.4	3.0	4.2	3.0	4.5	3.0	4.4
Red Clear	4.4	2.7	4.3	3.1	4.0	2.7	4.1	2.8
Red Revert	-	-	-	-	-	-	-	-
Actuations B4 Add *	-	0	-	-	-	0	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	5	-	15	-	5
Time To Reduce *	-	30	-	20	-	30	-	20
Minimum Gap	-	3.0	-	3.0	-	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.

LEGEND

- | | | | |
|---|--|-----|----------|
| ○ | Traffic Signal Head | ● | EXISTING |
| ○ | 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 | ○ | |
| ○ | Right of Way | ○ | |
| ○ | Directional Arrow | ○ | |
| ○ | Directional Drill | N/A | |
| ○ | Metal Strain Pole | ○ | |
| ○ | Type II Signal Pedestal | ○ | |
| ○ | "U-Turn Yield to Right Turn" (R10-16) | ○ | |
| ○ | Right Arrow "ONLY" Sign (R3-5R) | ○ | |

Signal Upgrade - Final Design

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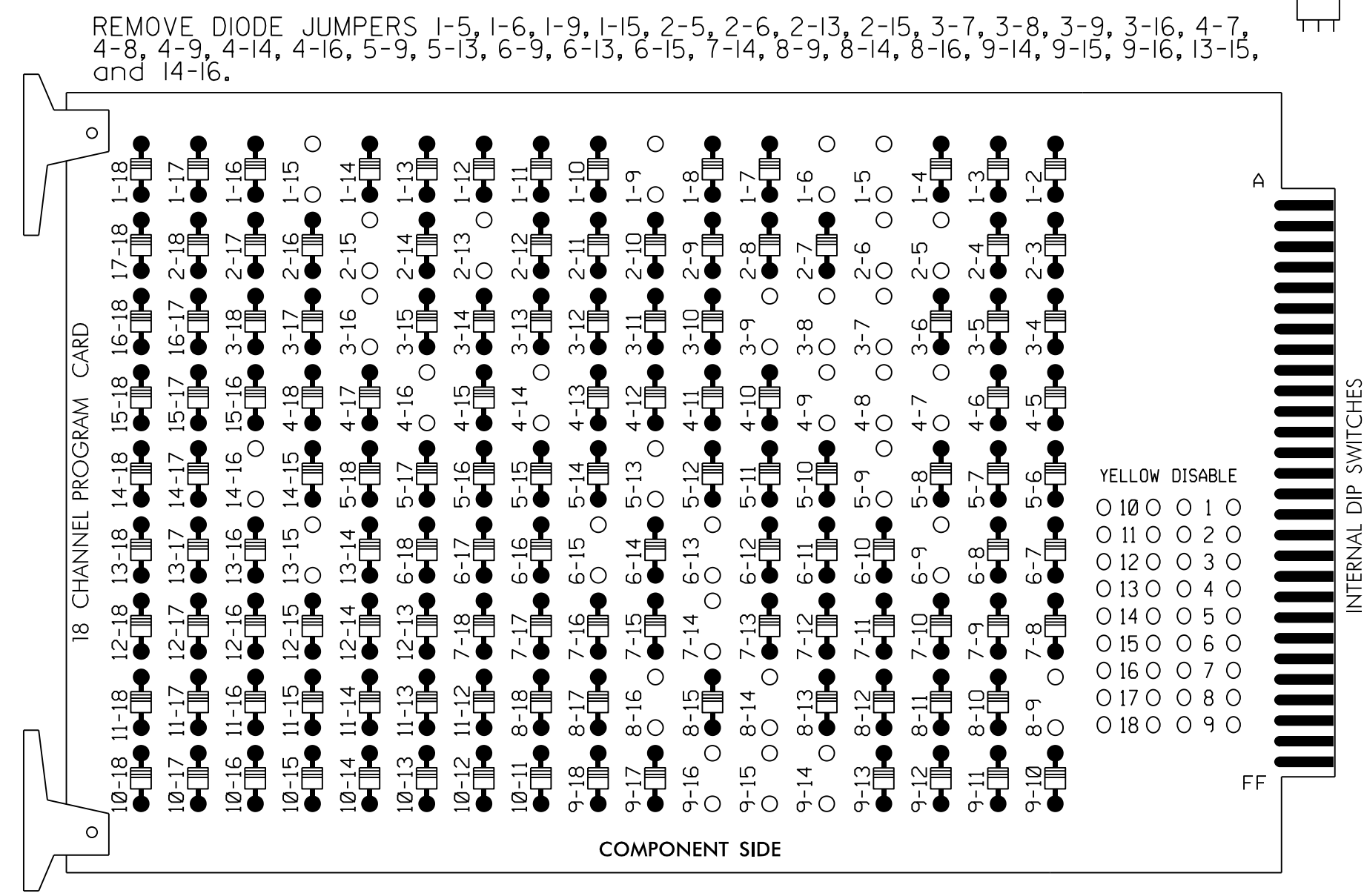
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL 29449
 PROFESSIONAL ENGINEER
 JEFFREY L. WATSON
 DATE 3/29/2018
 SIG. INVENTORY NO. 06-0274

3/29/2018 10:41:11 AM C:\Users\jgarnar\Documents\Signal Design\4405\Sig-18.0.dwg User: jgarnar

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....Contractor Supplied
ECONOLITE 2070LX
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,AUX S1
PHASES USED.....1,2,2PED,3,4,4PED,5,6,
6PED,7,8,8PED
OVERLAP A.....*
OVERLAP B.....NOT USED
OVERLAP C.....NOT USED
OVERLAP D.....NOT USED
OVERLAP G.....*

* 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	OLE	OLC	OLD	OLF	
SIGNAL HEAD NO.	11,12	83,84	21,22, 23,24	P21, P22	31,32	23	41,42, 43	P41, P42	51,52	42	61,62, 63,64	P61, P62	71,72	63	81,82, 83	P81, P82	83,84	NU	NU
RED			128			101					134				107		A121		
YELLOW			129			102					135				108				
GREEN			130			103					136				109				
RED ARROW	125				116					131					122				
YELLOW ARROW	126				117	117				132	132				123	123			A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127	127			118	118				133	133				124	124			
Hand icon					113					104					119				110
Person icon					115					106					121				112

NU = Not Used

* See pictorial of head wiring in detail this sheet.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

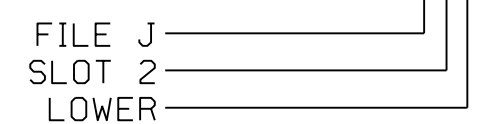
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

INPUT FILE 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				S
3B	TB4-7,8	I5L	58	3	3	YES				S
4A	TB4-9,10	I6U	41	4	4	NO				N
4B	TB4-11,12	I6L	45	14	4	NO				N
4C	TB6-1,2	I7U	65	34	4	YES	2.0	5		G
4D	TB6-3,4	I7L	78	44	4	YES	2.0	5		G
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
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	TB5-5,6	J5U	57	7	7	YES				S
7B	TB5-7,8	J5L	57	7	7	YES				S
8A	TB5-9,10	J6U	42	8	8	NO				N
8B	TB5-11,12	J6L	46	18	8	NO				N
8C	TB7-1,2	J7U	66	38	8	YES	2.0	5		G
8D	TB7-3,4	J7L	79	48	8	YES	2.0	5		G
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				

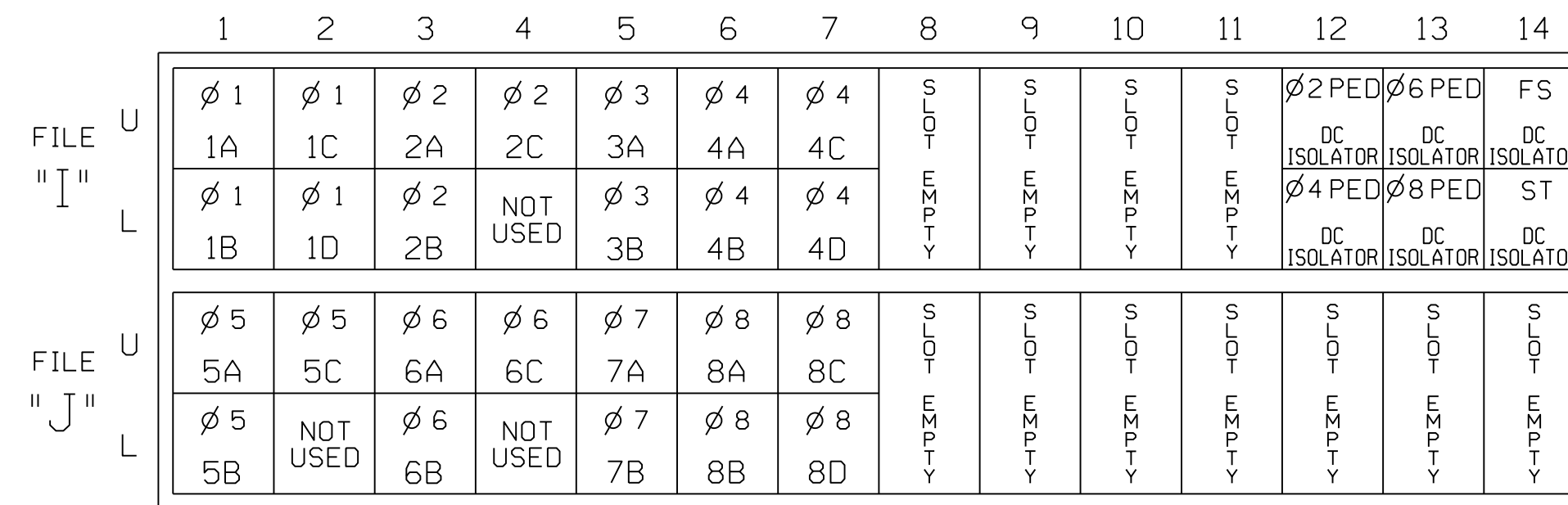
NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOTS
112 AND 113.

INPUT FILE POSITION LEGEND: J2L



INPUT FILE POSITION LAYOUT

(front view)

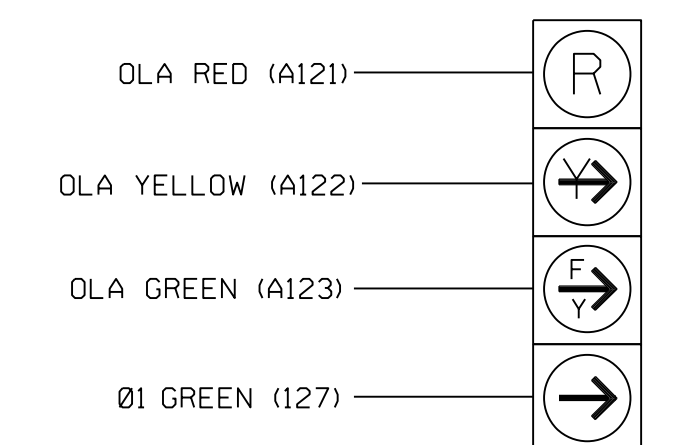


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
ST = STOP TIME

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



83,84

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0274
DESIGNED: March 2018
SEALED: 03-29-2018
REVISED: N/A

Final Design
Electrical Detail - Sheet 1 of 2

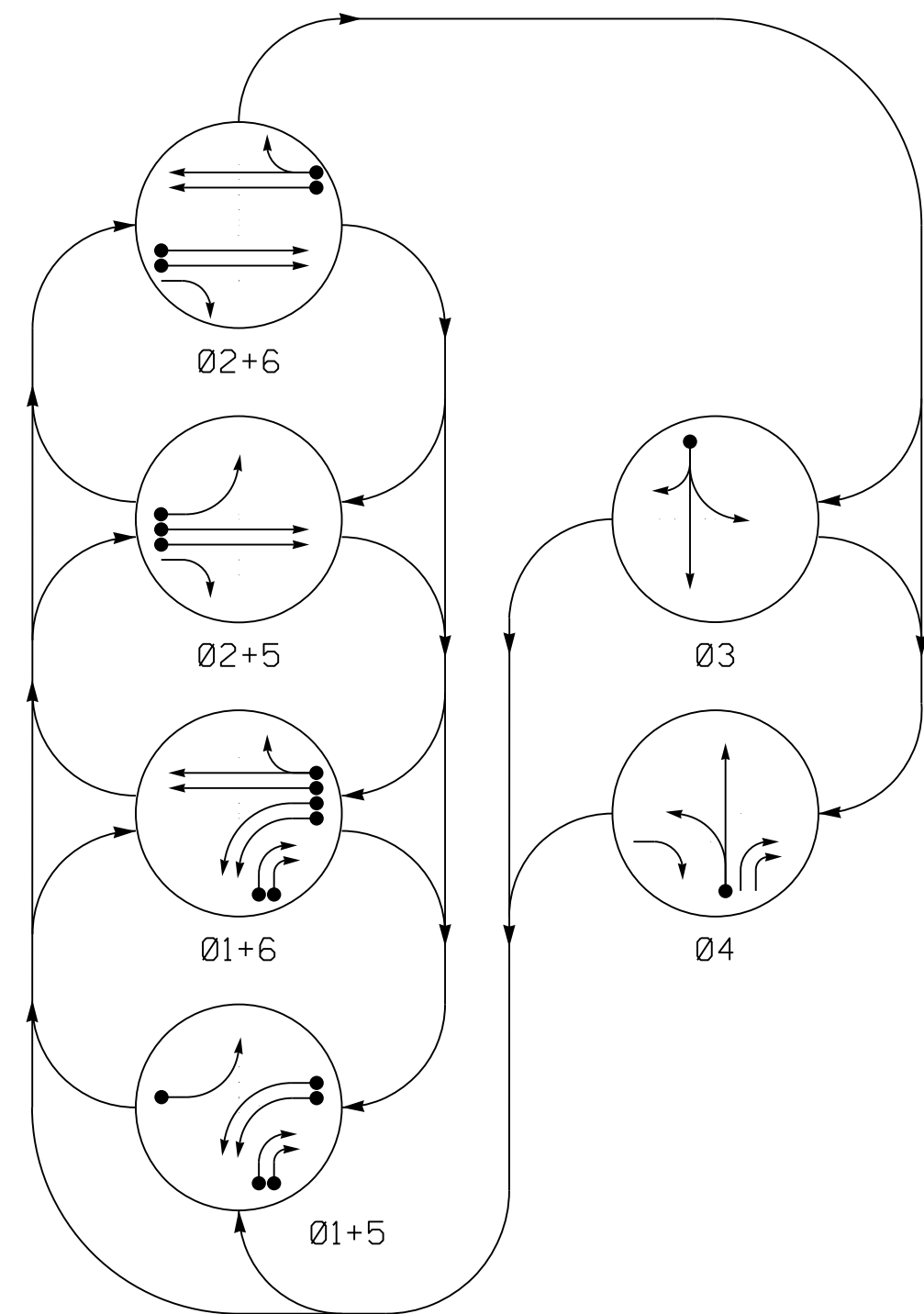
Stantec
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License No. F-0672

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

**US 401 (Raeford Road)
at
NC 162 (Bunce Road)/
SR 1411 (Bunce Road)**
Division 6 Cumberland County Fayetteville
PLAN DATE: March 2018 REVIEWED BY: L Overn
PREPARED BY: G B Spell REVIEWED BY:
REVISIONS: INIT. DATE
DATE: 3/29/2018
SIG. INVENTORY NO. 06-0274

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
LAWRENCE E. OVERN
3/29/2018
DATE: 3/29/2018
SIG. INVENTORY NO. 06-0274

PHASING DIAGRAM



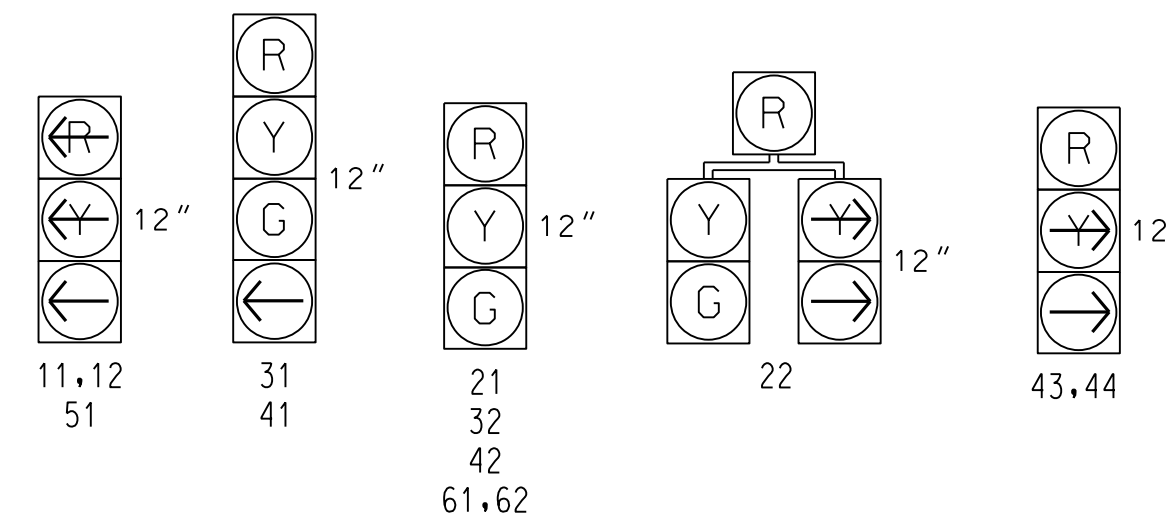
PHASING DIAGRAM DETECTION LEGEND

- ← ● → DETECTED MOVEMENT
- ← ○ → UNDETECTED MOVEMENT (OVERLAP)
- ← - - - → UNSIGNALIZED MOVEMENT
- ← - - - → PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE						FLSH
	Ø 1+5	Ø 2+5	Ø 2+6	Ø 3	Ø 4	FLSH	
11, 12	←	←	←	←	←	←	
21	R	R	G	G	R	R	Y
22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	Y
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	→	R
51	←	←	←	←	←	←	
61, 62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



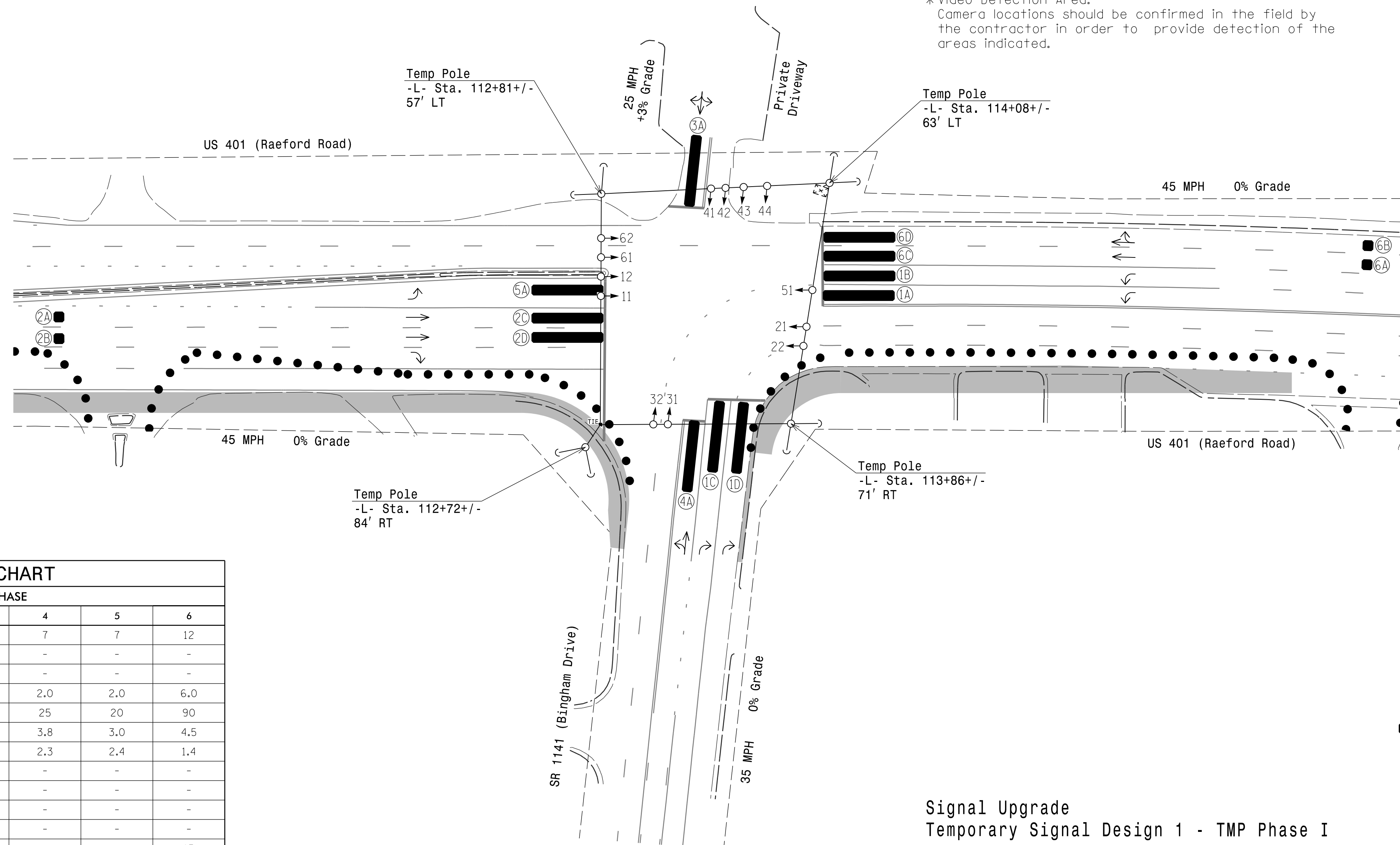
ASC/3 DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP NEW CARD
1A	6X40	0	*	-	1	Yes	-	3	-	S	X
1B	6X40	0	*	-	1	Yes	-	-	-	S	X
1C	6X40	0	*	-	1	Yes	-	15	-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

6 Phase Fully Actuated Fayetteville Signal System

NOTES

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



FEATURE	ASC/3 TIMING CHART					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	50	90	20	25	20	90
Yellow	3.0	4.5	3.1	3.8	3.0	4.5
Red Clear	3.3	1.4	2.6	2.3	2.4	1.4
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

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

Signal Upgrade Temporary Signal Design 1 - TMP Phase I

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 License No. F-0672

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27526
 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

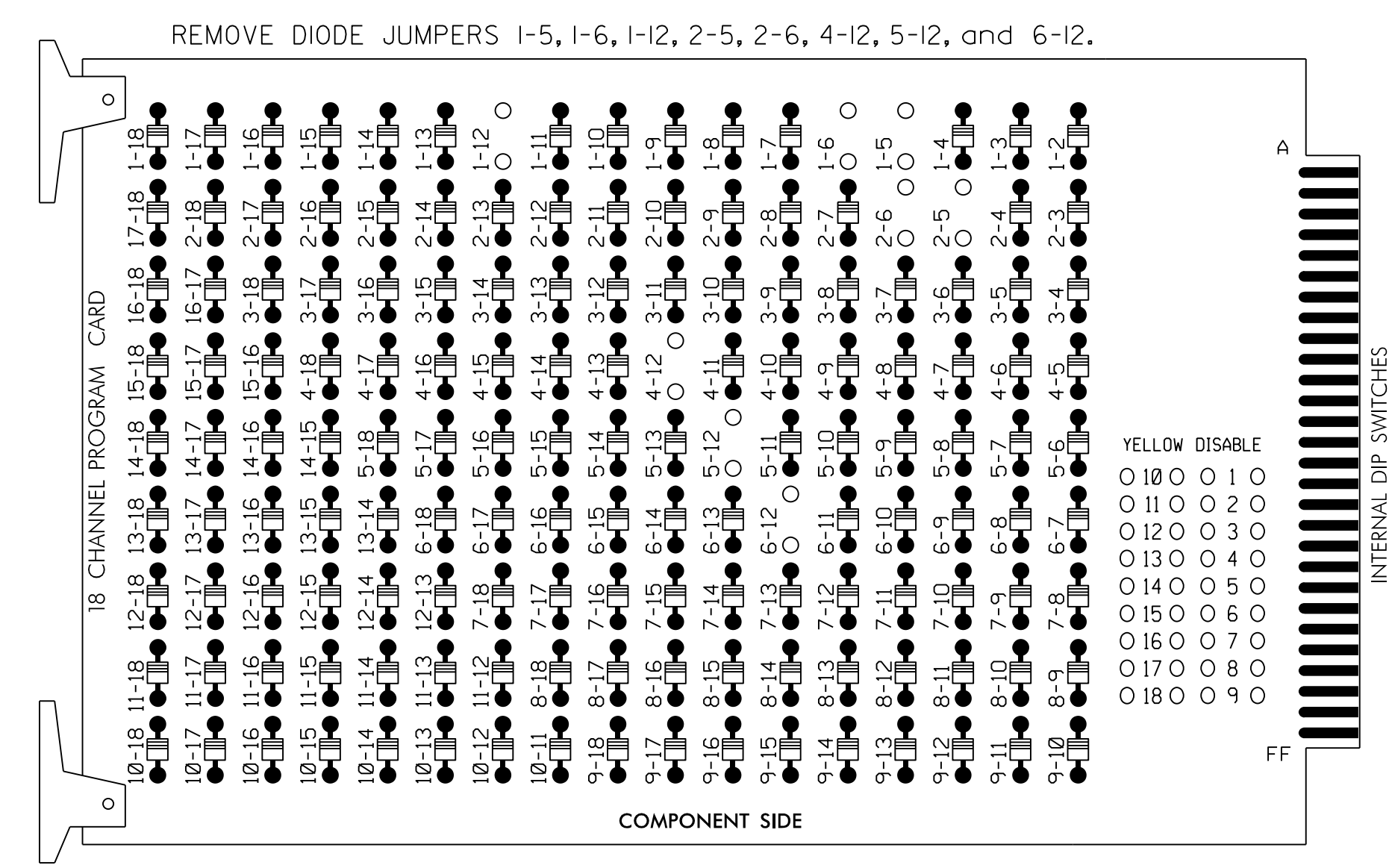
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Professional Engineer Seal 29449
 Betsy L. Watson
 DATE: 3/29/2018
 SIG. INVENTORY NO. 06-035811

3/29/2018 10:11:11 AM
 User: rfmccoy
 C:\Users\rfmccoy\Documents\Signal Design\Temporary_Signal_Design\Phase 1\U-4405.sig.dgn, 06-035811.dgn

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

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,S4,S5,S7,S8,AUX S5
 PHASES USED.....1,2,3,4,5,6
 OVERLAP A.....NOT USED
 OVERLAP B.....NOT USED
 OVERLAP C.....NOT USED
 OVERLAP D.....*

* See Overlap Programming Detail on this sheet

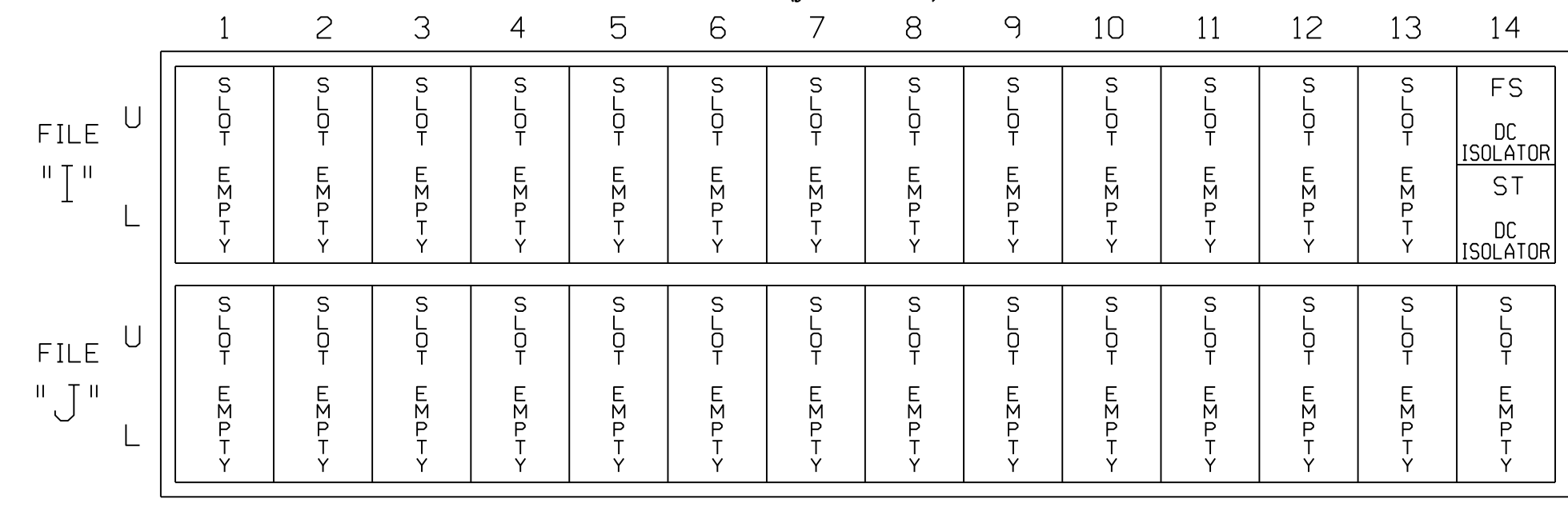
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11,12	21,22	NU	31	32	41	42	22	NU	51	61,62	NU	NU	NU	NU	NU	NU	43,44	NU
RED		128		116	116	101	101				134								A114
YELLOW		129		117	117	102	102				135								
GREEN		130		118	118	103	103				136								
RED ARROW	125										131								
YELLOW ARROW	126						102	132											A115
GREEN ARROW	127			118		103	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 D Toggle Three Times

Select TMG VEH OVLP [D] and 'NORMAL'

TMG VEH OVLP...[D] 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

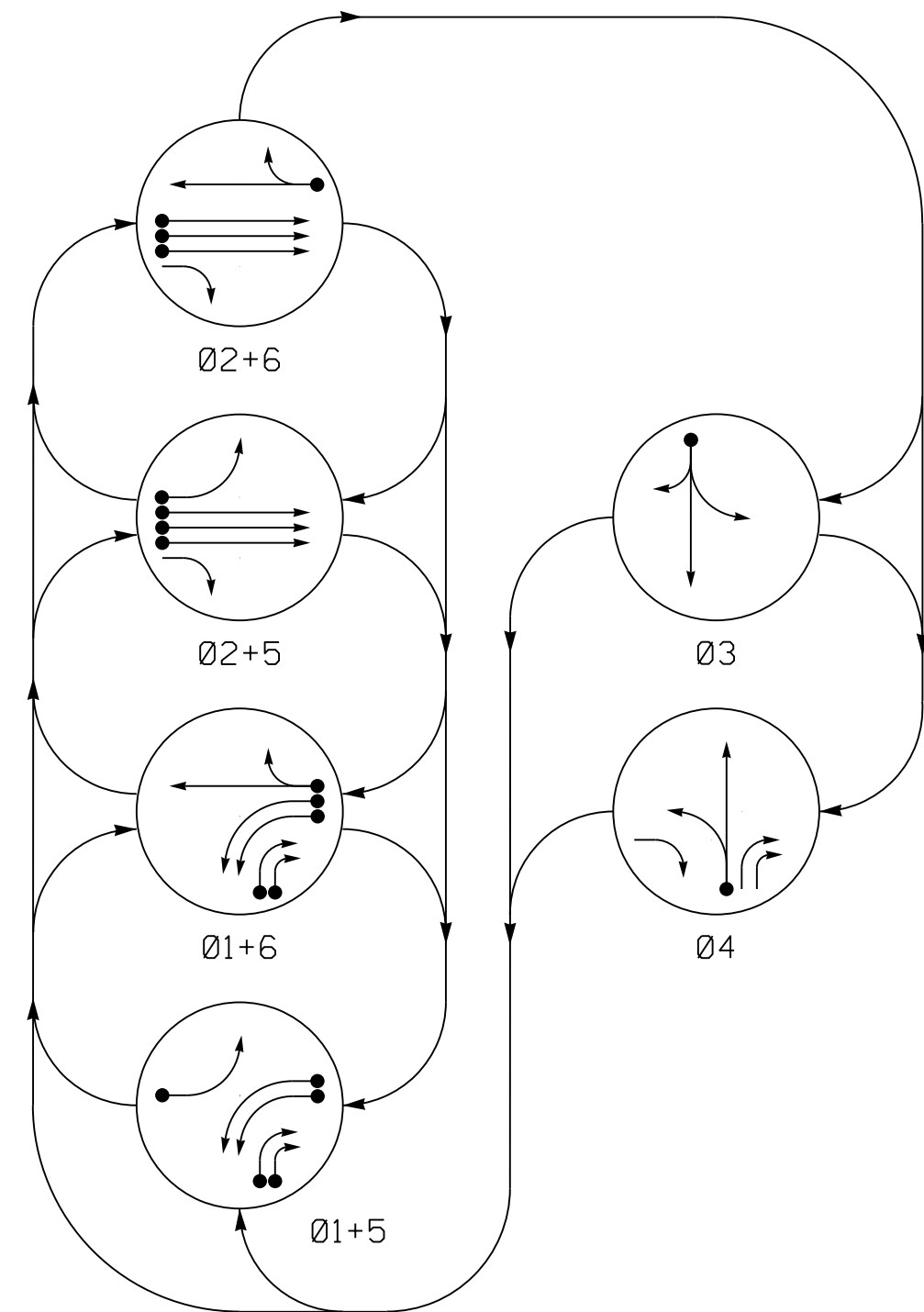
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0358T1
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 1 - TMP Phase I
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>Prepared in the Offices of:</p>	<p>US 401 (Raeford Road) at SR 1141 (Bingham Drive)</p> <p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: L Overn</p> <p>PREPARED BY: G B Spell REVIEWED BY:</p>	<p>SEAL</p> <p>3/29/2018</p>								
	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	INIT.	DATE					<p>DATE</p> <p>SIG. INVENTORY NO. 06-0358T1</p>	<p>DATE</p>
NO.	DATE	INIT.	DATE								

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

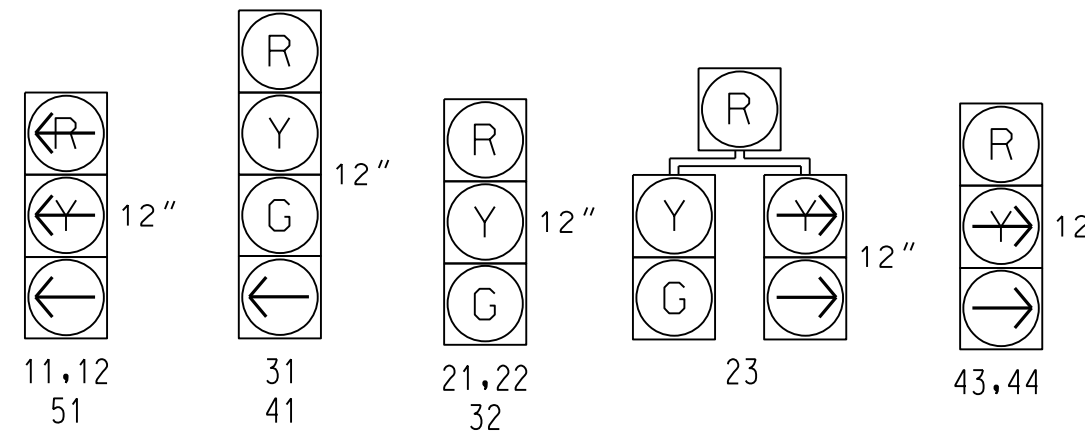
- DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ⚡ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE						FLIGHT
	01+5	01+6	02+5	02+6	03	04	
11,12	←	←	←	←	←	←	←
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	→	R
51	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

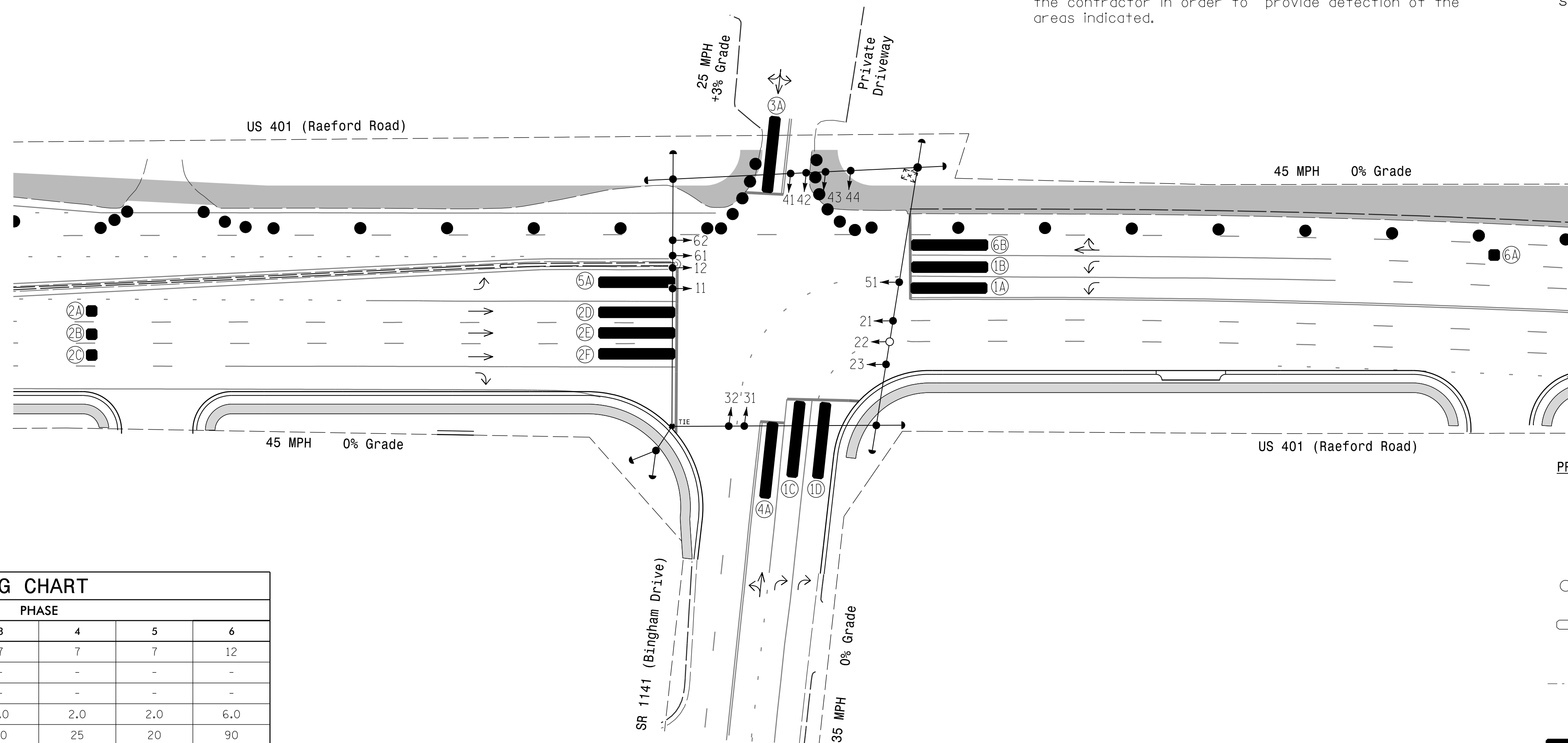
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING						
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP
1A	6X40	0	-	-	1	Yes	-	3	-	S	-
1B	6X40	0	-	-	1	Yes	-	-	-	S	-
1C	6X40	0	-	-	1	Yes	-	15	-	S	-
1D	6X40	0	-	-	1	Yes	-	15	-	S	-
2A	6X6	300	-	-	2	Yes	-	-	-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

6 Phase Fully Actuated Fayetteville Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or Phase 5 may be lagged.
- The order of Phase 3 and Phase 4 may be reversed.
- Set all detector units to presence mode.
- Reposition existing signal heads numbered 23,61 and 62. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	ASC/3 TIMING CHART					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0
Max I *	50	90	20	25	20	90
Yellow	3.0	4.5	3.1	3.8	3.0	4.5
Red Clear	3.5	1.4	2.9	2.3	2.3	1.4
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

* 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 | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ○ → Pedestrian Signal Head | ○ → N/A |
| ○ → Signal Pole with Push Button & Sign | ○ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| □ ⊗ Inductive Loop Detector | □ ⊗ N/A |
| □ ⊗ Controller & Cabinet | □ ⊗ N/A |
| □ ⊗ Junction Box | □ ⊗ N/A |
| --- 2-in Underground Conduit | --- N/A |
| → N/A Right of Way | → N/A |
| → Directional Arrow | → N/A |
| ▬ Video Detection Area | ▬ N/A |
| ▬ Construction Zone | ▬ N/A |
| ● ● ● Drums | ● ● ● N/A |

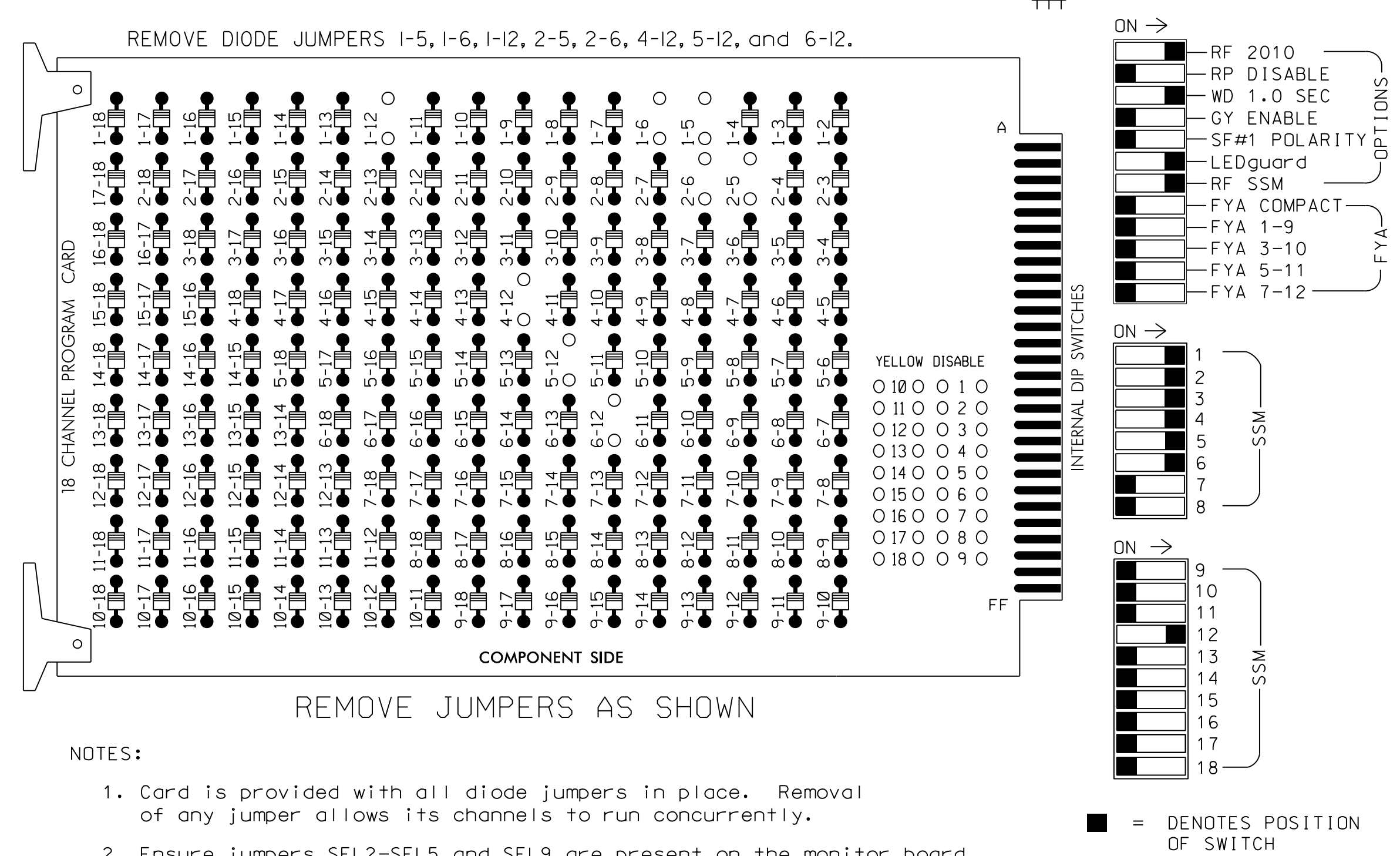
Signal Upgrade Temporary Signal Design 2 - TMP Phase II

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>Prepared For the Offices of: Transportation Mobility and Safety Division STATE OF NORTH CAROLINA Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27526</p>	<p>US 401 (Raeford Road) at SR 1141 (Bingham Drive)</p>		<p>Division 6 Cumberland County Fayetteville PLAN DATE: March 2018 REVIEWED BY: E D Harris PREPARED BY: G B Spell REVIEWED BY: B L Watson</p>					
		<p>SCALE 0 40 1" = 40'</p>	<p>REVISIONS</p> <table border="1"> <tr><th>NO.</th><th>INIT.</th><th>DATE</th></tr> <tr><td> </td><td> </td><td> </td></tr> </table>		NO.	INIT.	DATE		
NO.	INIT.	DATE							

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

EQUIPMENT INFORMATION

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

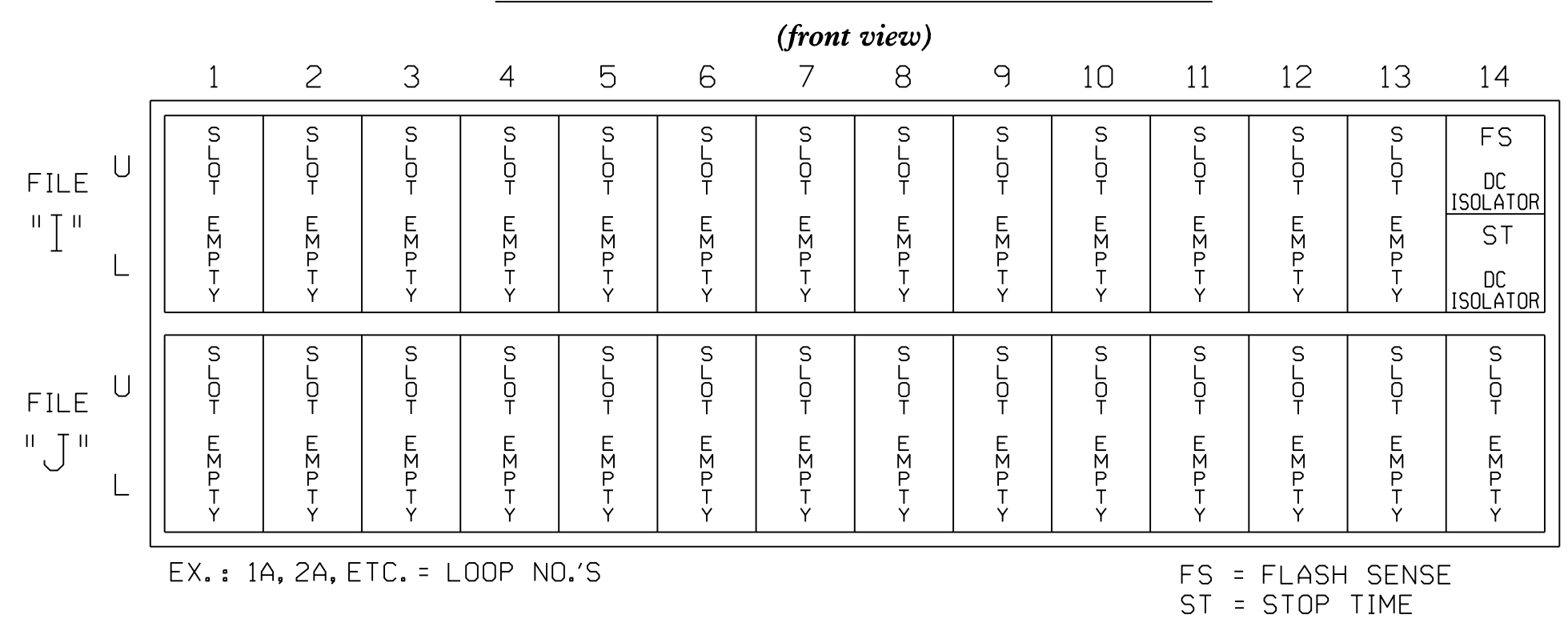
* See Overlap Programming Detail on this sheet

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11,12	21,22,23	NU	31	32	41	42	23	NU	51	61,62	NU	NU	NU	NU	NU	NU	43,44	NU
RED	128			116	116	101	101					134							A114
YELLOW	129			117	117	102	102					135							
GREEN	130			118	118	103	103					136							
RED ARROW	125											131							
YELLOW ARROW	126							102	132										A115
GREEN ARROW	127			118	103	103	133												A116

NU = Not Used

INPUT FILE POSITION LAYOUT



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:

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

- From Main Menu select **2. CONTROLLER**
- From CONTROLLER Submenu select **2. VEHICLE OVERLAPS**

OVERLAP D Toggle Three Times

Select TMG VEH OVLP [D] and 'NORMAL'

TMG VEH OVLP...[D] 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: 06-0358T2
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

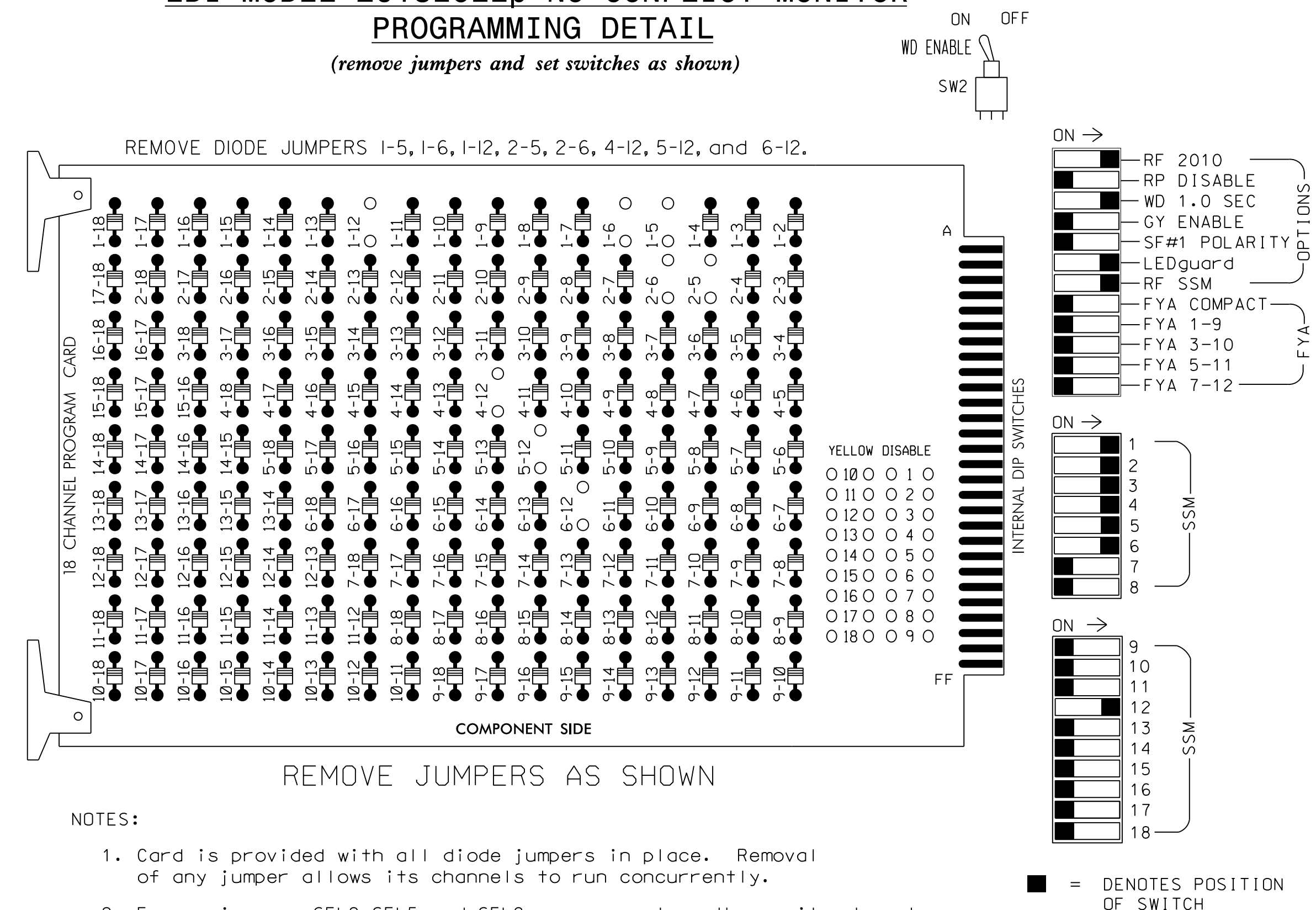
Temporary Design 2 - TMP Phase II
 Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>Stantec Consulting Services Inc. 801 Jones Franklin Road-Suite 300 Raleigh, NC 27606 Tel. (919) 851-6866 Fax. (919) 851-7024 www.stantec.com License No. F-0672</p>	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 401 (Raeford Road) at SR 1141 (Bingham Drive)</p>		<p>SEAL</p> <p>LAURENCE E. OVERN</p> <p>3/29/2018</p>					
		<p>Division 6 Cumberland County Fayetteville</p> <p>PLAN DATE: March 2018 REVIEWED BY: L Overn</p> <p>PREPARED BY: G B Spell REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>		NO.	DESCRIPTION	INIT.	DATE	
NO.	DESCRIPTION	INIT.	DATE						

EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

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

EQUIPMENT INFORMATION

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

* See Overlap Programming Detail on this sheet

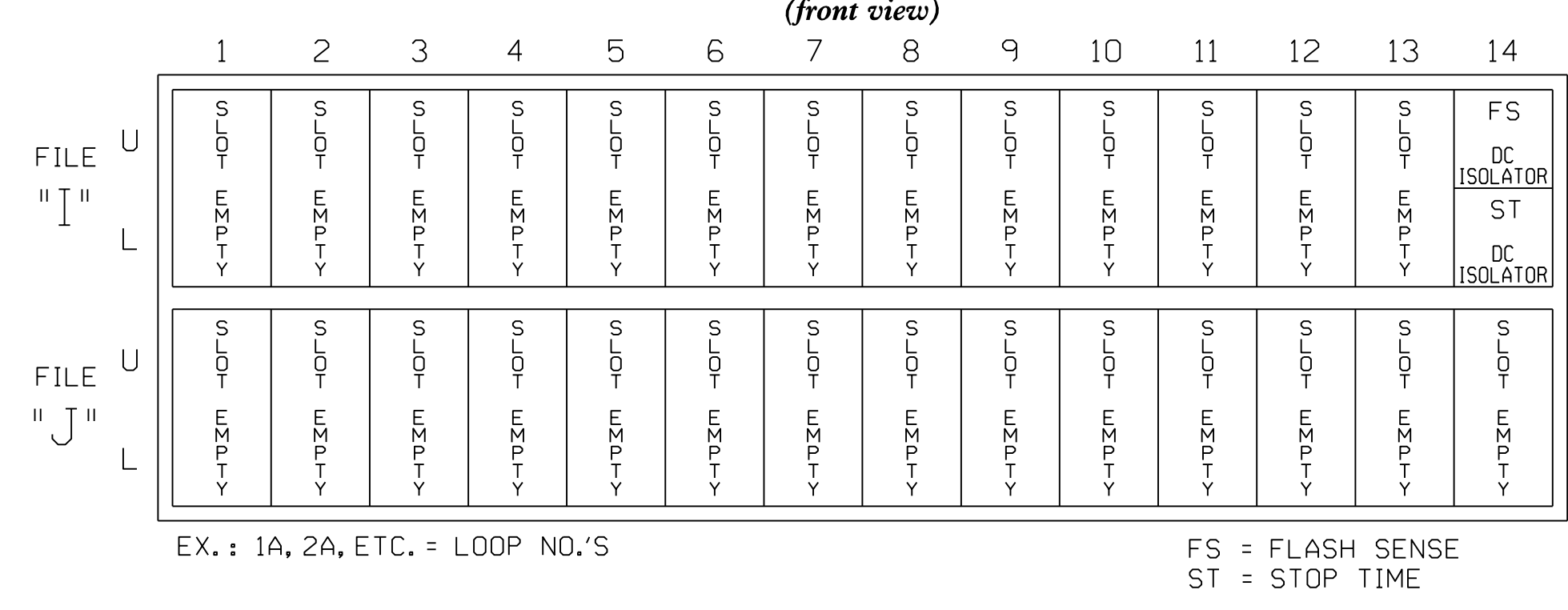
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	22	NU	51	61,62	NU	NU	NU	NU	NU	NU	43,44	NU
RED	128			116	116	101	101				134								A114
YELLOW	129			117	117	102	102				135								
GREEN	130			118	118	103	103				136								
RED ARROW	125									131									
YELLOW ARROW	126						102		132										A115
GREEN ARROW	127			118		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:

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

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

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(program controller as shown)

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Select TMG VEH OVLP [D] and 'NORMAL'

TMG VEH OVLP...[D] 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: 06-0358T3
 DESIGNED: March 2018
 SEALED: 03-29-2018
 REVISED: N/A

Temporary Design 3 - TMP Phase III
 Electrical Detail

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