09/08/99

TIP PROJECT: U-2519CB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

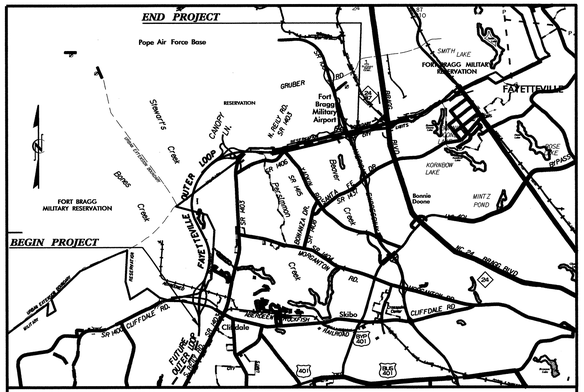
Project No.	Sheet No.
U-2519CB	Sig. 1

CUMBERLAND COUNTY

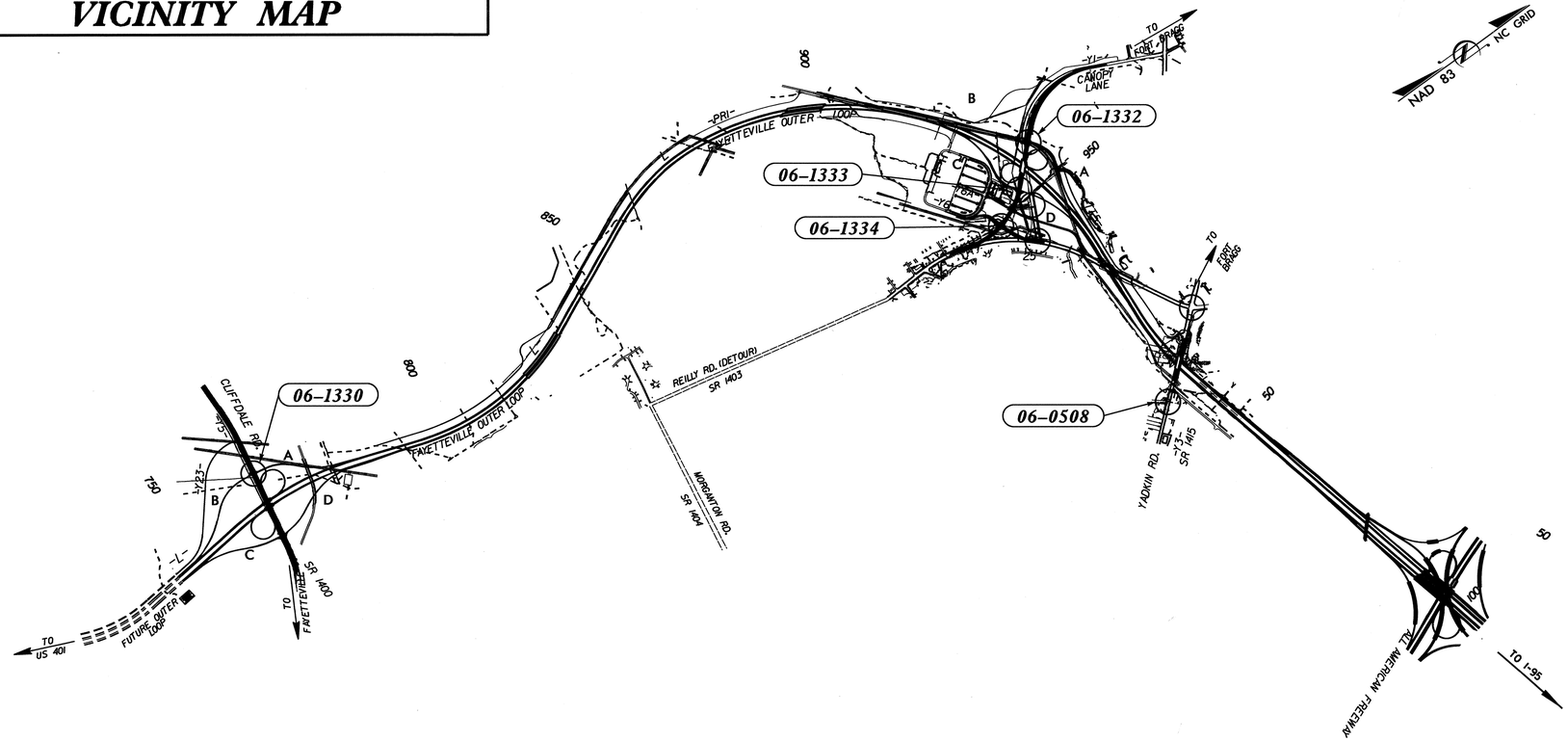
Part 2 of 3

LOCATION: FAYETTEVILLE OUTER LOOP
FROM SOUTH OF SR 1400 (CLIFFDALE ROAD)
TO EAST OF ALL AMERICAN FREEWAY

TYPE OF WORK: ITS and SIGNALS



VICINITY MAP



Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1	--------	Title Sheet
Sig. 2–3	06–1330	SR 1400 (Cliffdale Rd) at I–295 SB
Sig. 4–5	06–1332	Canopy Lane at I–295 SB
Sig. 6–7	06–1333	Canopy Lane at I–295 NB
Sig. 8–13	06–1334	Canopy Lane/Reilly Road at Reilly Road
Sig. 14–19	06–0508	SR 1415 (Yadkin Rd) at SR 1406 (Fillyaw Rd)
Sig. 20–25	N/A	Reilly Road at Canopy Lane
Sig. 26–28	N/A	Reilly Road at Yadkin Road
Sig. 29–31	N/A	Canopy Lane at Heffner Blvd
Sig. 32–36	N/A	Reilly Road at PX Road
Sig. 37–38	06–1301	Bragg Boulevard at I–295 Eastbound
Sig. 39–47	N/A	Metal Pole Details
Sig. 48–63	N/A	Communications Cable Routing Plans

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:

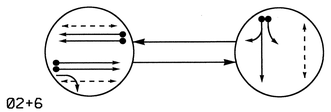
Jason Galloway, PE – East Region Signals Project Engineer
John Rowe, PE – Signal Equipment Design Engineer
Greg Fuller, PE – Intelligent Transportation Systems Engineer

Prepared In the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION
Intelligent Transportation Systems & Signals Unit
750 N. Greefield Parkway, Garner, NC 27529

29-APR-2014 15:19
R:\Traffic\Signals\Design\Titlesheet\u2519cb_sig_tsh.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 2

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

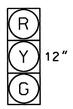
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	PHASE 04	PHASE FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



21,22
41,42
61,62

P21,P22
P41,P42
P61,P62

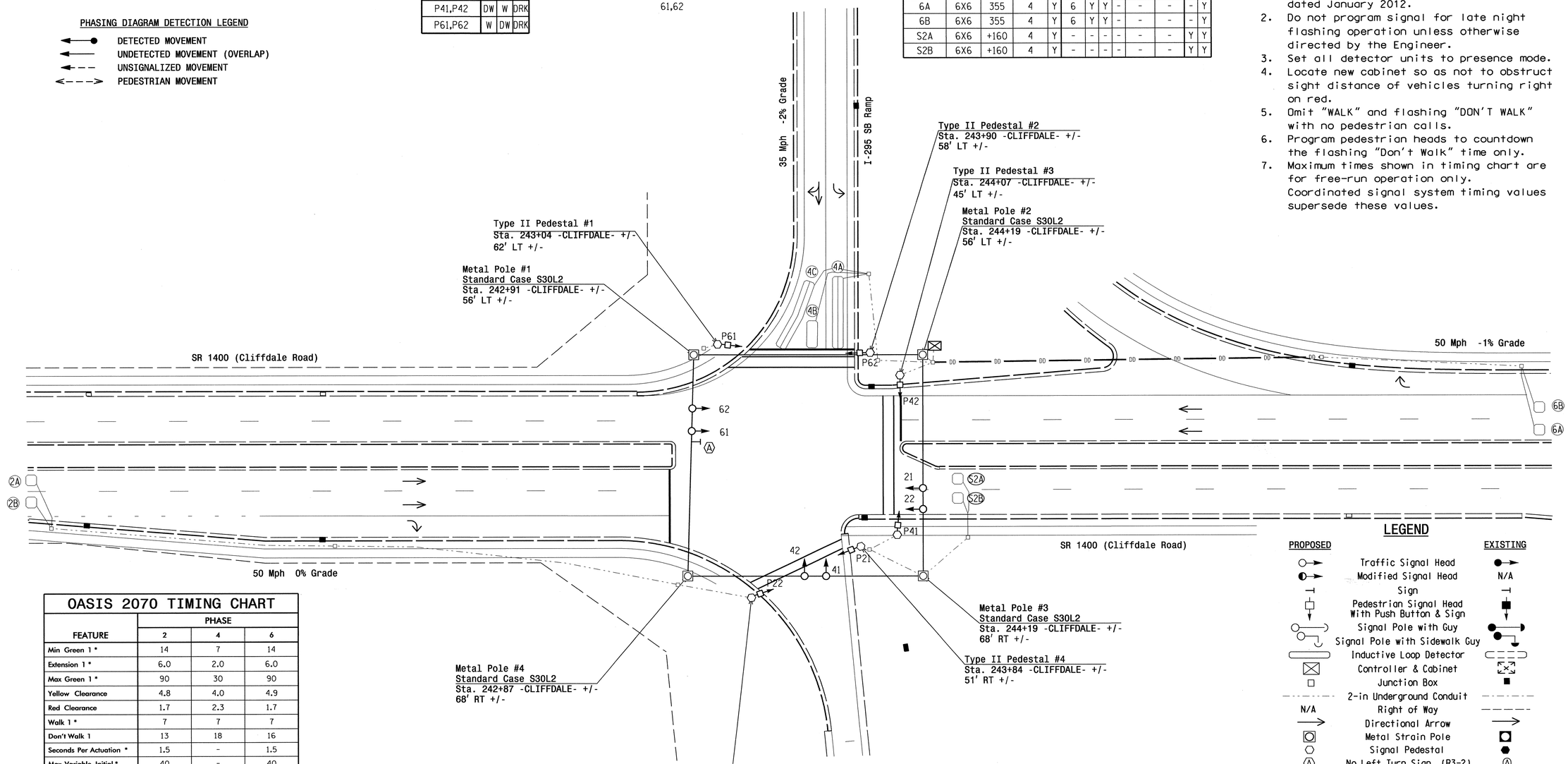
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	355	6	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	355	6	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X15	0	3	Y	4	Y	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	6X6	355	4	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	355	4	Y	6	Y	Y	-	-	-	-	Y
S2A	6X6	+160	4	Y	-	-	-	-	-	-	Y	Y
S2B	6X6	+160	4	Y	-	-	-	-	-	-	Y	Y

2 Phase
Fully Actuated
Fayetteville City System

NOTES

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



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	14	7	14
Extension 1 *	6.0	2.0	6.0
Max Green 1 *	90	30	90
Yellow Clearance	4.8	4.0	4.9
Red Clearance	1.7	2.3	1.7
Walk 1 *	7	7	7
Don't Walk 1	13	18	16
Seconds Per Actuation *	1.5	-	1.5
Max Variable Initial *	40	-	40
Time Before Reduction *	15	-	15
Time To Reduce *	45	-	45
Minimum Gap	3.0	-	3.0
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Signal Pedestal	
A	No Left Turn Sign (R3-2)	A

New Installation

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

SR 1400 (Cliffdale Road)
At
I-295 SB Ramps

Division 6 Cumberland County Fayetteville

PLAN DATE:	October 2013	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

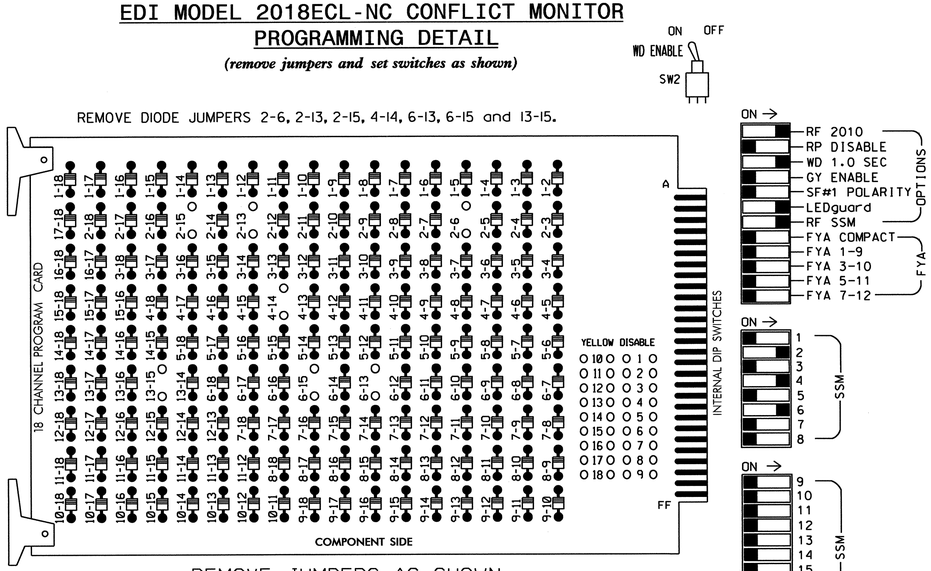
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON R. GALLOWAY
SIGNATURE 12/18/13 DATE
SIG. INVENTORY NO. 06-1330

17-DEC-2013 12:21
R:\Traffic\Signals\Design\Signals\06-1330\061330_sig_dsn_20131016.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 3

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4 and 6 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9
PHASES USED.....2,2 PED,4,4 PED,6,6 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	Ø4 4C	SLOT EMPTY	SYS. DET. S2A	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø2 2B				Ø4 4B	NOT USED		SYS. DET. S2B			Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B												

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
*S2A	TB6-9,10	I9U	60	22	11	SYS					
*S2B	TB6-11,12	I9L	62	24	13	SYS					
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					

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

* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1330
DESIGNED: October 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1400 (Cliffdale Road)
at
I-295 SB Ramps

Division 6 | Cumberland County | Fayetteville

PLAN DATE: December 2013 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE John T Rowe Jr DATE 12-18-13

SIG. INVENTORY NO. 06-1330

18-DEC-2013 10:23
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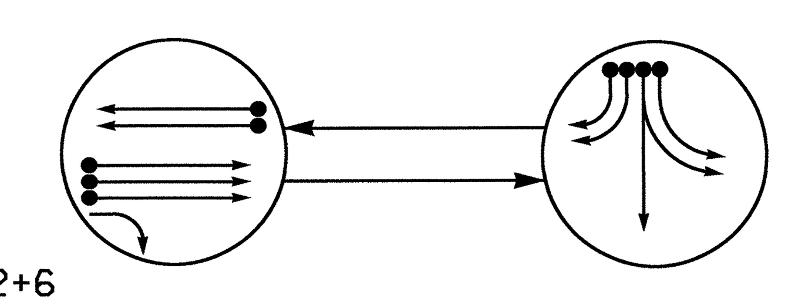
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

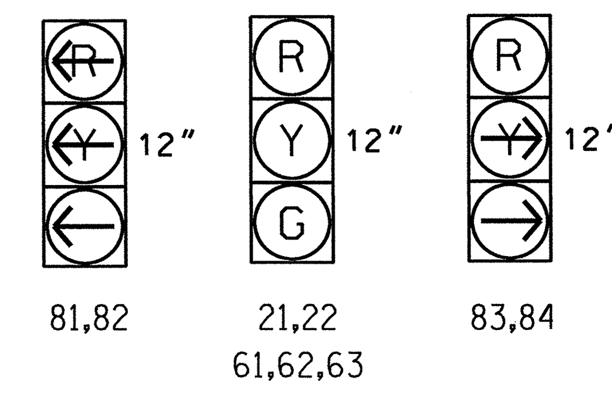
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21,22	G	R	Y
61,62,63	G	R	Y
81,82	←R	←	←R
83,84	R	→	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

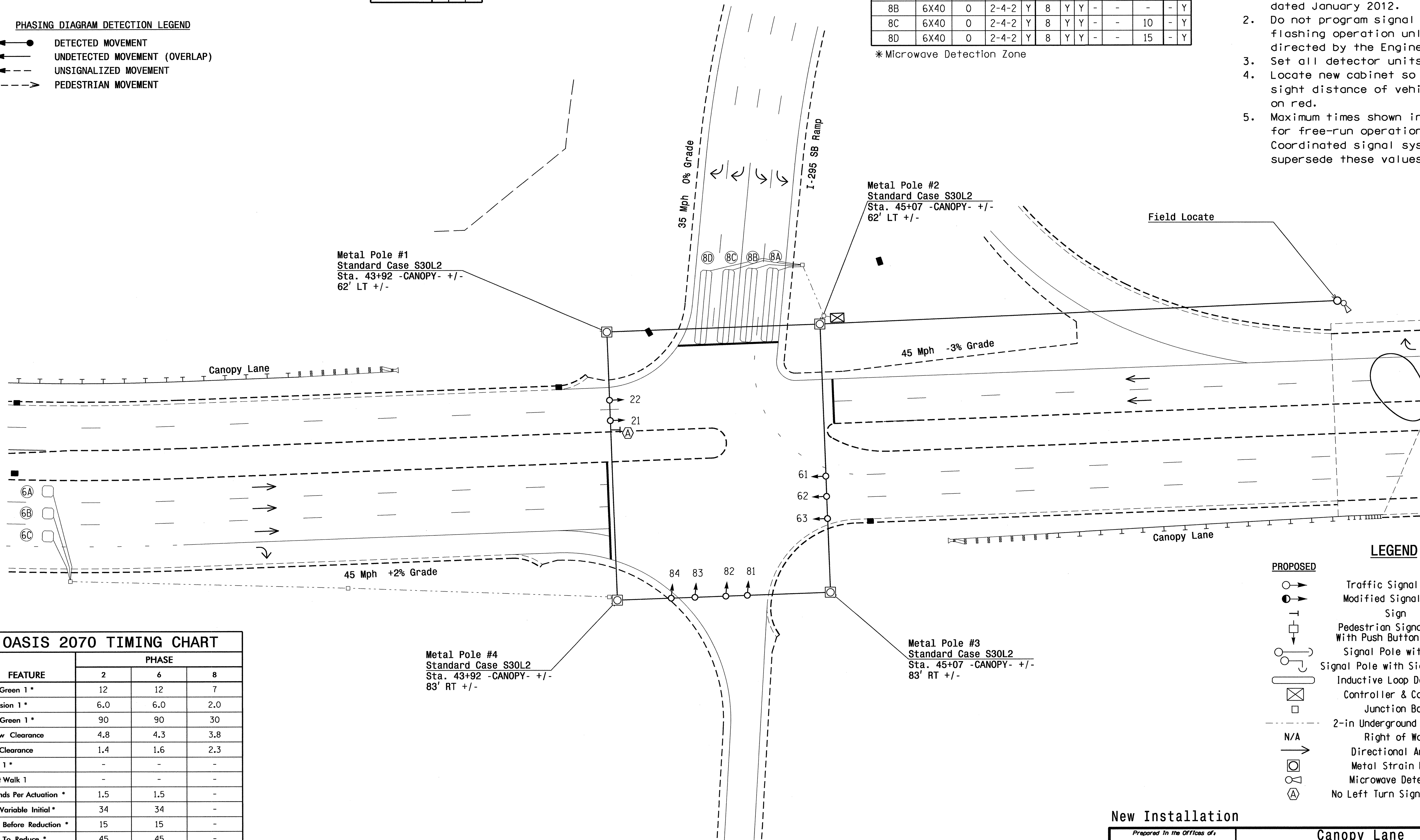
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	✳	300	✳	Y	2	Y	Y	-	-	-	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
6C	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8C	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	Y
8D	6X40	0	2-4-2	Y	8	Y	Y	-	-	15	-	Y

✳ Microwave Detection Zone

2 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	12	12	7
Extension 1 *	6.0	6.0	2.0
Max Green 1 *	90	90	30
Yellow Clearance	4.8	4.3	3.8
Red Clearance	1.4	1.6	2.3
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	1.5	1.5	-
Max Variable Initial *	34	34	-
Time Before Reduction *	15	15	-
Time To Reduce *	45	45	-
Minimum Gap	3.0	3.0	-
Recall Mode	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	YELLOW	YELLOW	-
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Strain Pole	
	Microwave Detector	
	No Left Turn Sign (R3-2)	

New Installation

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

Canopy Lane
At
I-295 SB Ramps

Division 6 Cumberland County Fayetteville

PLAN DATE:	October 2013	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29904 JASON P. GALLOWAY

SIGNATURE 12/18/13 DATE

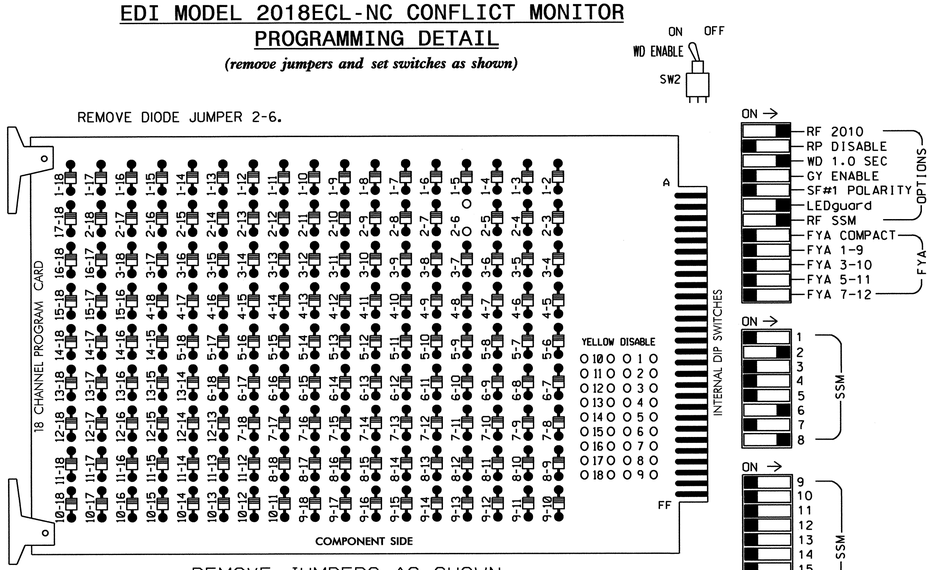
SIG. INVENTORY NO. 06-1332

17-DEC-2013 13:53
R:*Traffic*Signals*Design*Signals*06-1332*061332_sig_dsn_20131016.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 5

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S8,S11
PHASES USED.....2,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	61,62 63	NU	NU	81,82	83,84	NU
RED		128						134				107	
YELLOW		129						135					
GREEN		130						136					
RED ARROW											107		
YELLOW ARROW											108	108	
GREEN ARROW											109	109	

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 ZONE 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		NOT USED												ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 6A	ø6 6C	SLOT EMPTY	SLOT EMPTY	ø8 8A	ø8 8C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		ø6 6B	NOT USED			ø8 8B	ø8 8D							

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.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
*ZONE 2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			10
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			15

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

*SPECIAL DETECTOR NOTE

For Zone 2A install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plan.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1332
DESIGNED: October 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.,Garner,NC 27529

Canopy Lane
at
I-295 SB Ramps

Division 6 | Cumberland County | Fayetteville

PLAN DATE: December 2013 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

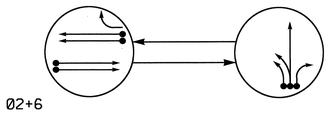
John T Rowe Jr. 12-18-13
SIGNATURE DATE

SIG. INVENTORY NO. 06-1332

20-DEC-2013 08:38
S:\#TSASIs#ITS Signals#Workgroups#Sig Mgmt#Peterson#061332_sm_ele_20131218.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.6

PHASING DIAGRAM



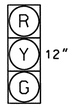
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



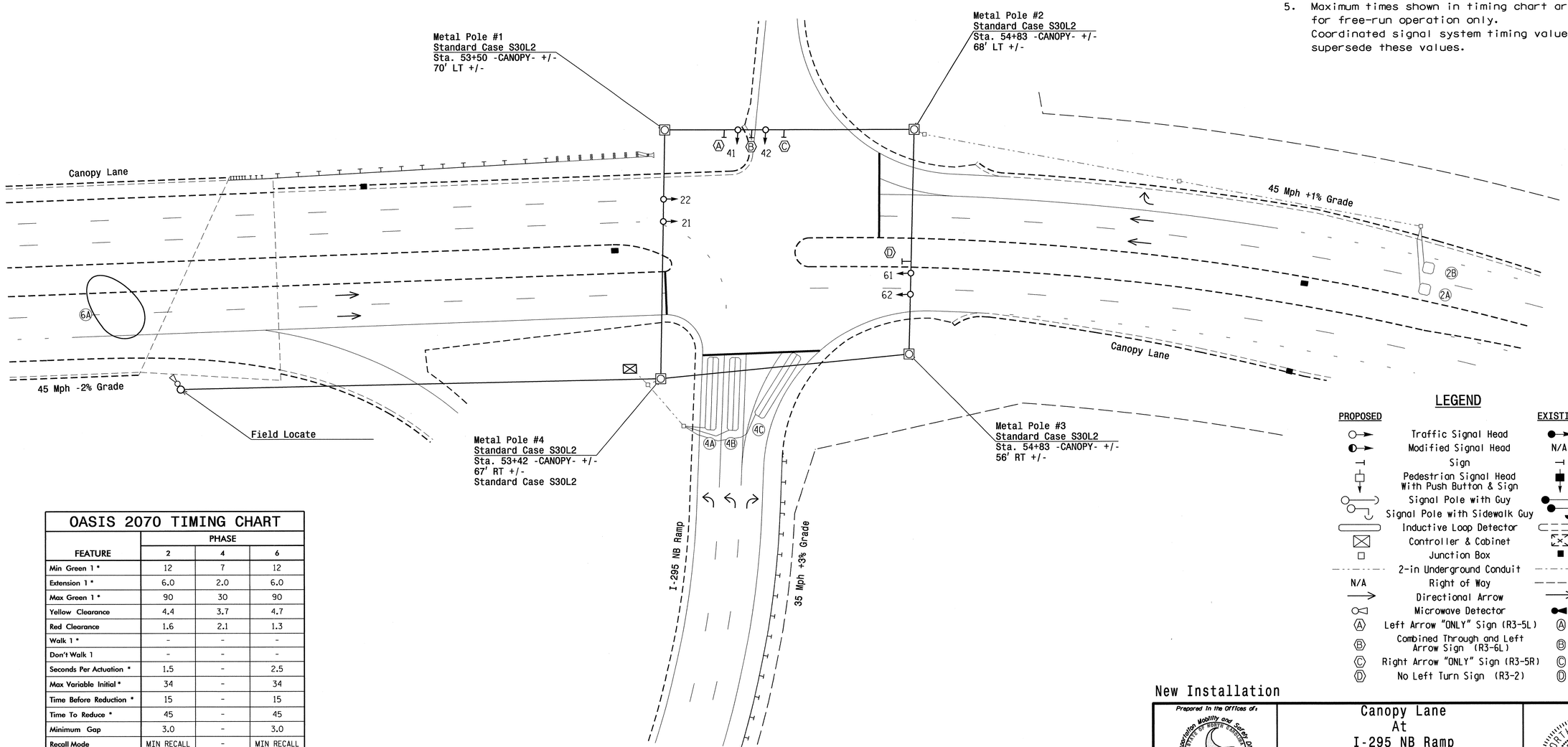
21,22
61,62
41,42

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	*	300	*	Y	6	Y	Y	-	-	-	-	Y

*Microwave Detection Zone

2 Phase
Fully Actuated
Fayetteville Signal System

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Microwave Detector	
A	Left Arrow "ONLY" Sign (R3-5L)	A
B	Combined Through and Left Arrow Sign (R3-6L)	B
C	Right Arrow "ONLY" Sign (R3-5R)	C
D	No Left Turn Sign (R3-2)	D

OASIS 2070 TIMING CHART			
FEATURE	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	12	7	12
Extension 1 *	6.0	2.0	6.0
Max Green 1 *	90	30	90
Yellow Clearance	4.4	3.7	4.7
Red Clearance	1.6	2.1	1.3
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	1.5	-	2.5
Max Variable Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	45	-	45
Minimum Gap	3.0	-	3.0
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

New Installation

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

Canopy Lane
At
I-295 NB Ramp

Division 6 Cumberland County Fayetteville

PLAN DATE:	October 2013	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 29904
ENGINEER
JASON P. GALLOWAY

SIGNATURE
12/18/13
DATE

SIG. INVENTORY NO. 06-1333

17-DEC-2013 14:40
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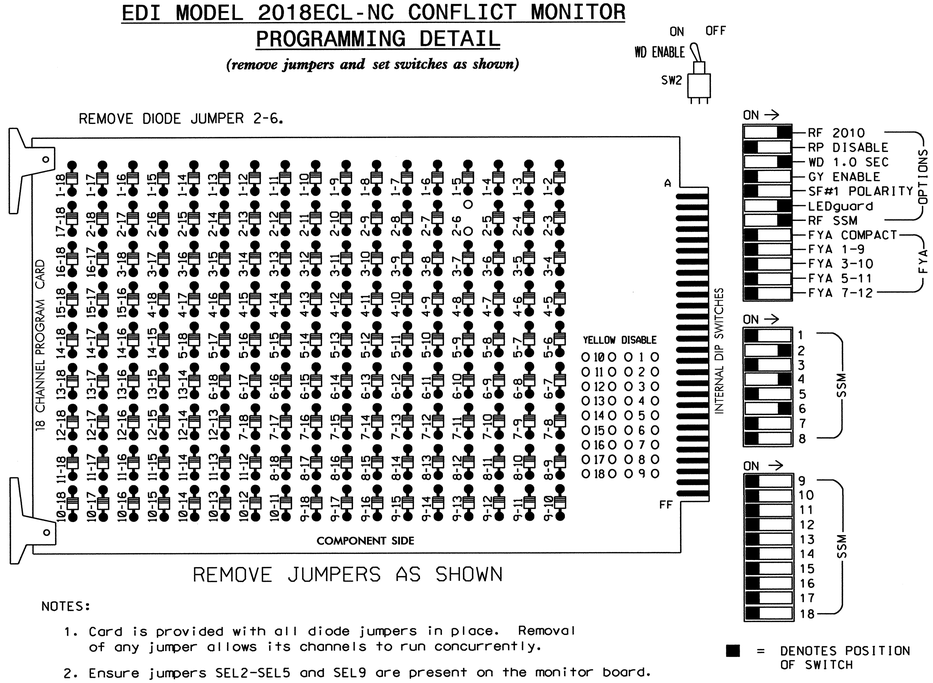
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 7

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S2,S5,S8
PHASES USED.....2,4,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ø4 4A	ø4 4C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L		ø2 2B				ø4 4B	NOT USED							ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	ø6 ZONE 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

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.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
*ZONE 6A	TB3-5,6	J2U	40	2	6	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

*SPECIAL DETECTOR NOTE

For Zone 6A install a microwave detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plan.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1333
DESIGNED: October 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Canopy Lane
at
I-295 NB Ramp

Division 6 | Cumberland County | Fayetteville

PLAN DATE: December 2013 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 12-18-13

SIG. INVENTORY NO. 06-1333

20-DEC-2013 08:40
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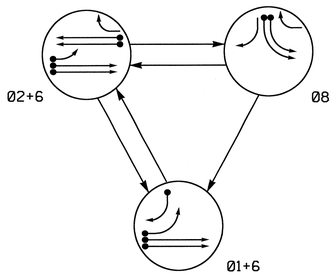
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.8

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

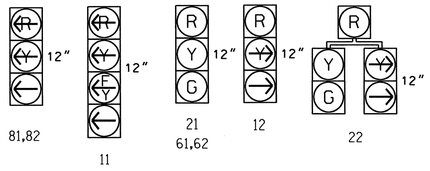
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
11	~~←~~	~~Y~~	~~R~~	~~Y~~
12	→	R	→	R
21	R	G	R	Y
22	R	G	R/→	Y
61,62	G	G	R	Y
81,82	~~R~~	~~R~~	~~←~~	~~R~~

SIGNAL FACE I.D.

All Heads L.E.D.



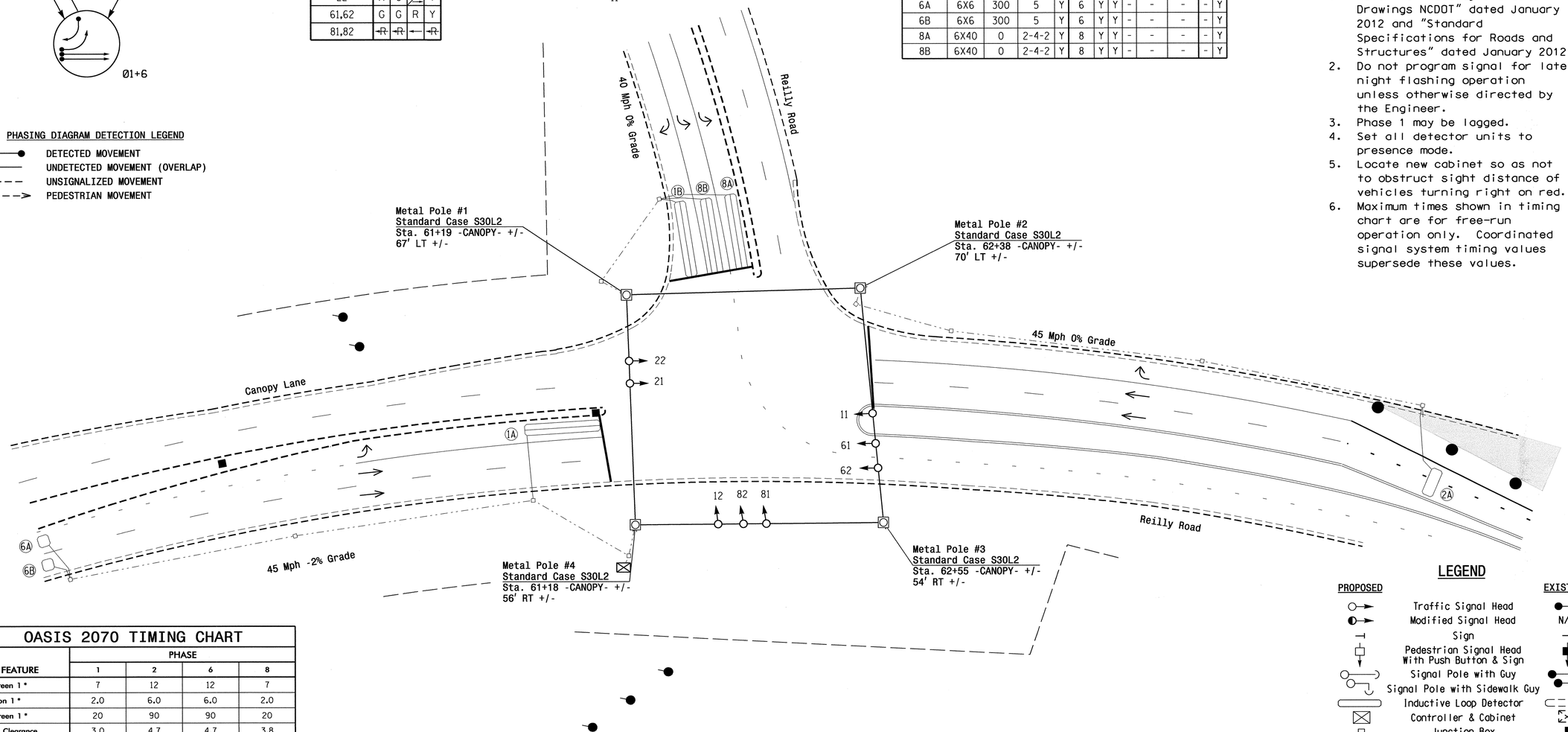
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
					6	Y	Y	Y	-	3	-	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6X15	300	5	Y	2	Y	Y	-	-	-	-	Y
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
Fayetteville City System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

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

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	6.0	6.0	2.0
Max Green 1 *	20	90	90	20
Yellow Clearance	3.0	4.7	4.7	3.8
Red Clearance	3.3	1.9	1.9	2.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

New Installation (Area 2 Phase IIB)

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

Canopy Lane/Reilly Road At Reilly Road

Division 6 Cumberland County Fayetteville

PLAN DATE: April 2014 REVIEWED BY: PLA
PREPARED BY: JPG REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON R GALLOWAY
4/28/14
DATE
SIG. INVENTORY NO. 06-1334T

29-APR-2014 08:41
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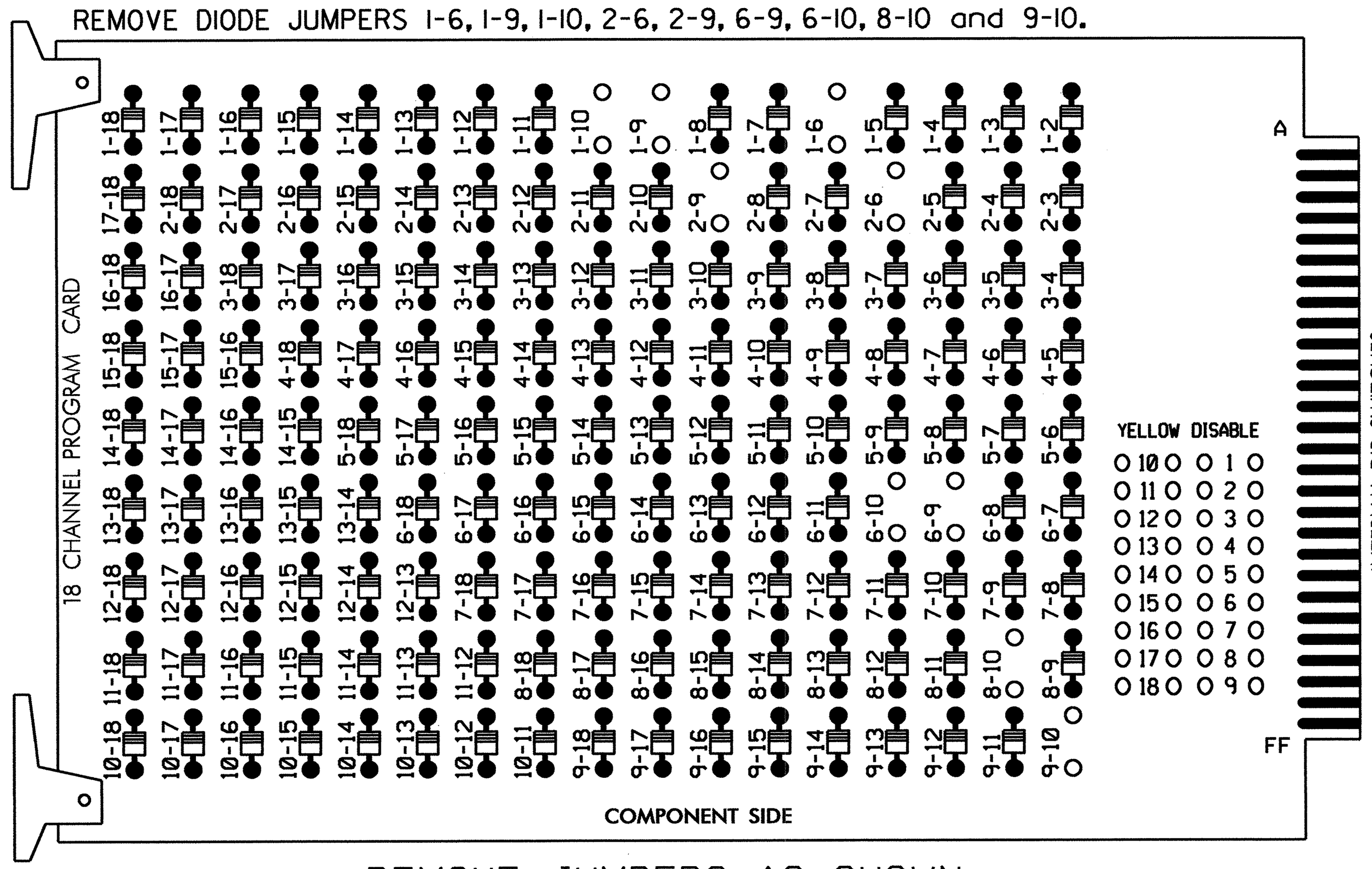
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.9

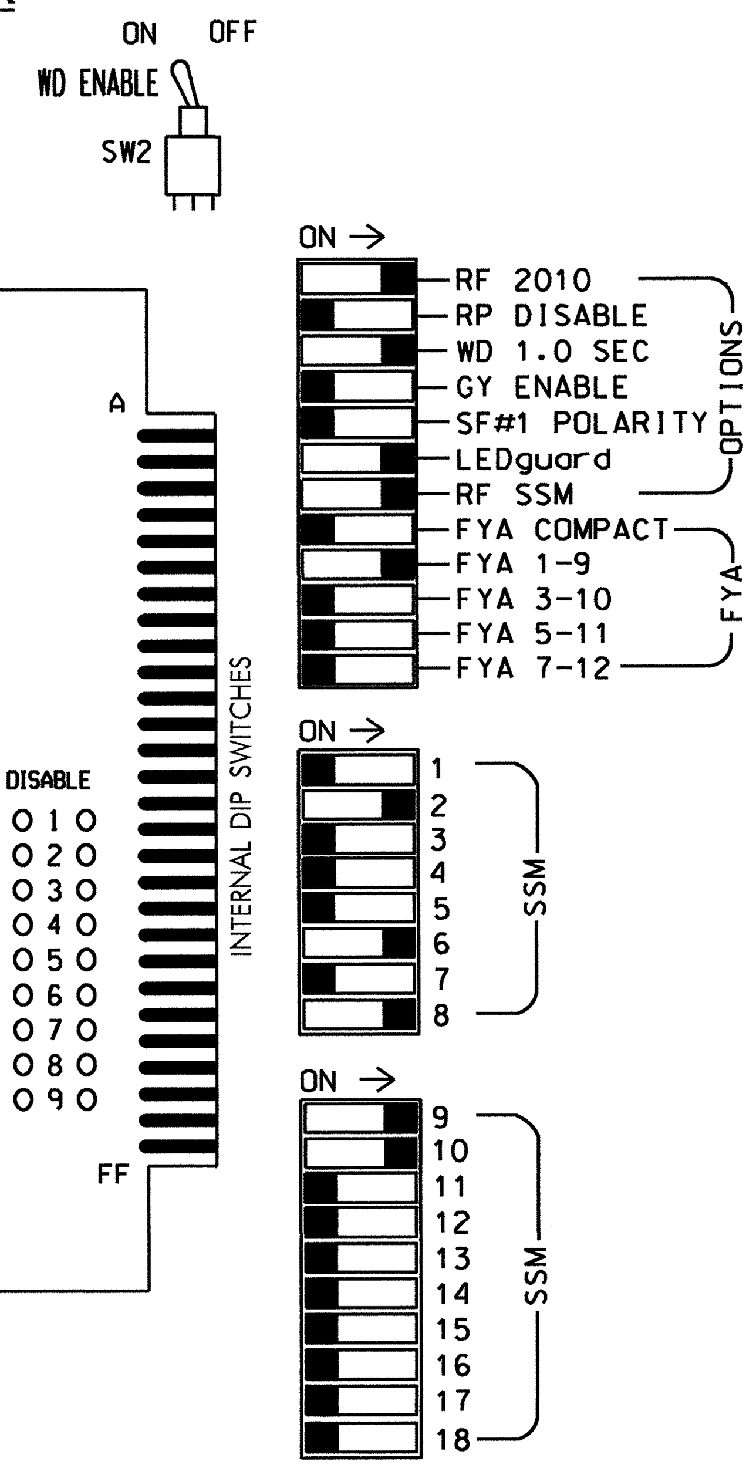
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 2-6, 2-9, 6-9, 6-10, 8-10 and 9-10.



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
6. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.............2070L
CABINET................332 /W/ AUX
SOFTWARE...............ECONOLITE OASIS
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S1,S2,S8,S11,AUX S1,AUX S2
PHASES USED............1,2,6,8.
OVERLAP "A"............1+2
OVERLAP "B"............1+8
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	4 PED	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	22	81,82	NU	11★	12	NU	NU	NU	NU
RED		128						134							A124				
YELLOW	✻	129						135											
GREEN		130						136											
RED ARROW												107		A121					
YELLOW ARROW											108	108		A122	A125				
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127										109	109			A126				

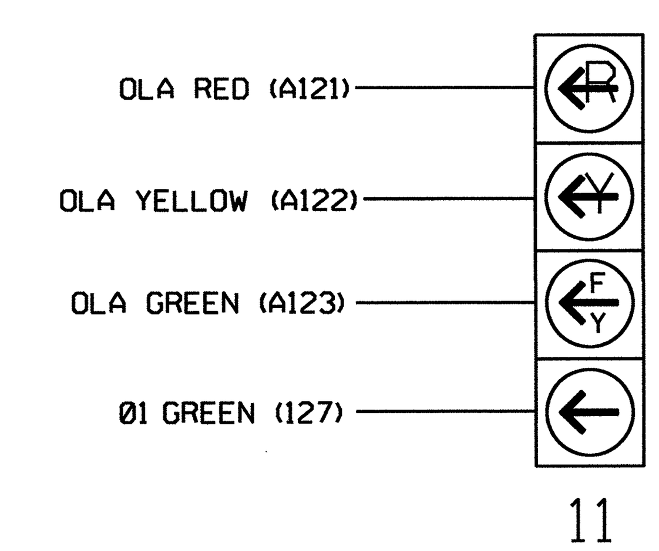
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø1 1B	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED	NOT USED											ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			

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

INPUT FILE POSITION LEGEND: J2L

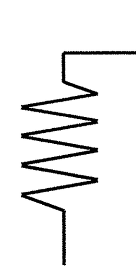
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1334T
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

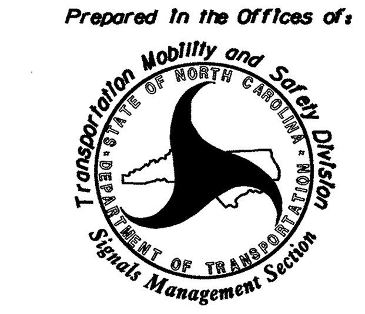
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:



750 N.Greenfield Pkwy,Garner,NC 27529

Canopy Lane/Reilly Road
at
Reilly Road

Division 6 Cumberland County Fayetteville

PLAN DATE: April 2014 REVIEWED BY: JTR

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

4-29-14

SIGNATURE DATE

SIG. INVENTORY NO. 06-1334T

29-APR-2014 09:21
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jpeterson

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
 LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE        #1  IS ON
AND RED CLEAR ON PHASE #1  IS ON

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
 LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE        #1  IS ON

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
 LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #1  IS ON

            SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:           ¦12345678910111213141516
VEH OVL PARENTS: ¦XX
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:           ¦12345678910111213141516
VEH OVL PARENTS: ¦X       X
VEH OVL NOT VEH: ¦
VEH OVL NOT PED: ¦
VEH OVL GRN EXT: ¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1334T
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Canopy Lane/Reilly Road
at
Reilly Road

Division 6 | Cumberland County | Fayetteville

PLAN DATE: April 2014	REVIEWED BY: JTR
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

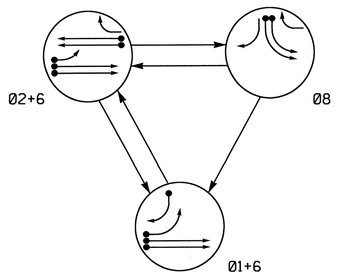
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR
John T. Rowe Jr (signature) 4-29-14
SIGNATURE DATE

SIG. INVENTORY NO. 06-1334T

29-APR-2014 09:22
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Peterson*061334_sm_ele_20131218.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.11

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

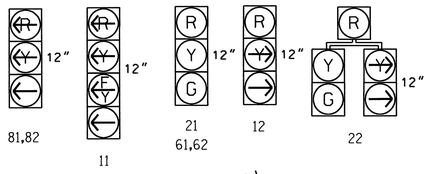
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 08	FLASH
11	←	~~F Y~~	~~R~~	~~Y~~
12	→	R	→	R
21	R	G	R	Y
22	R	G	R/→	Y
61,62	G	G	R	Y
81,82	~~R~~	~~R~~	←	~~R~~

SIGNAL FACE I.D.

All Heads L.E.D.



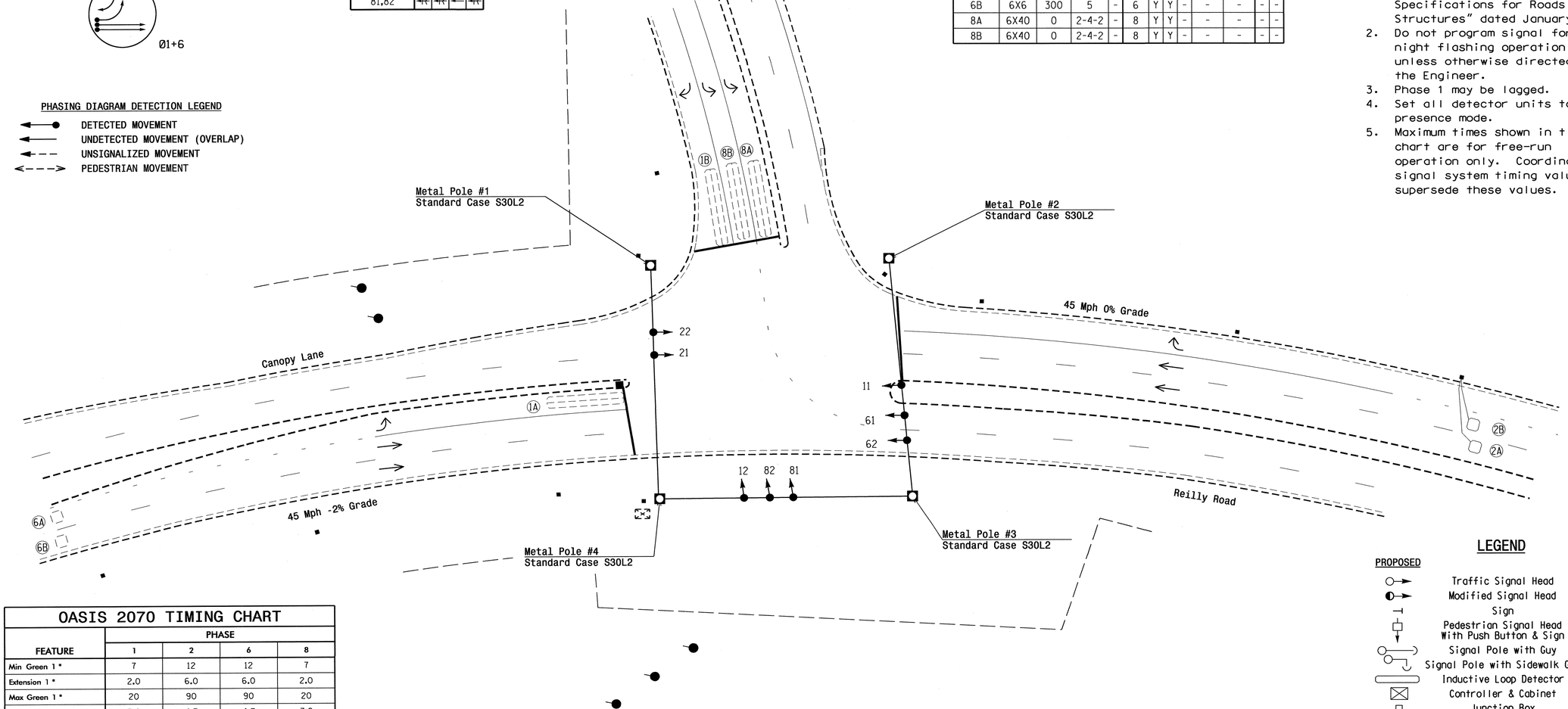
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

3 Phase
Fully Actuated
Fayetteville City System

NOTES

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



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	2.0	6.0	6.0	2.0
Max Green 1 *	20	90	90	20
Yellow Clearance	3.0	4.7	4.7	3.8
Red Clearance	3.3	1.9	1.9	2.3
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	45	45	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

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

New Installation - Final

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

Canopy Lane/Reilly Road
At
Reilly Road

Division 6 Cumberland County Fayetteville

PLAN DATE: April 2014 REVIEWED BY: PLA
PREPARED BY: JPG REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

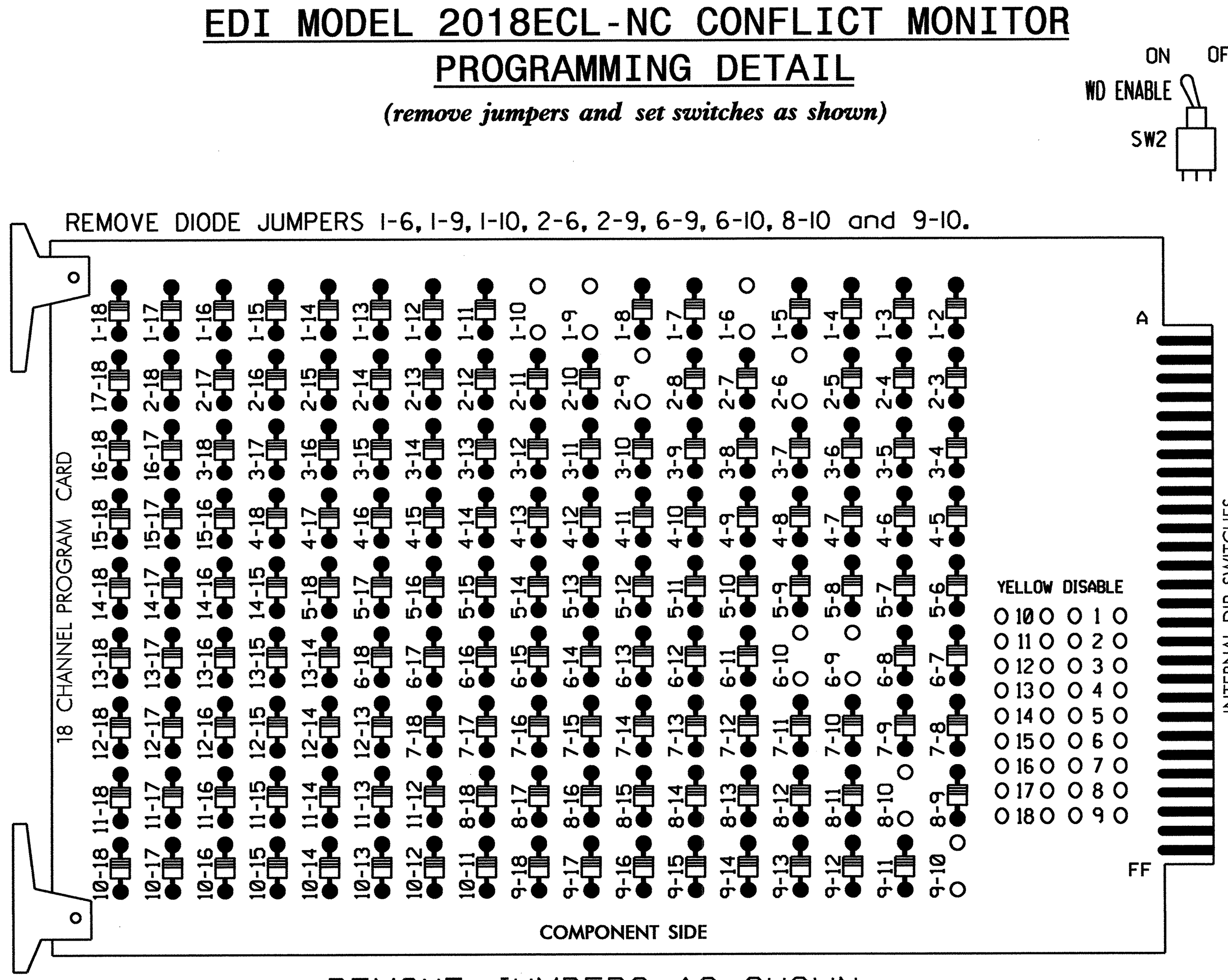
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON R. GALLOWAY
SIGNATURE
4/28/14
DATE
SIG. INVENTORY NO. 06-1334

28-APR-2014 08:36
R:\Traffic\Signals\Design\Signals\06-1334\061334_sig_dsn_20140428.dgn
jgalloway

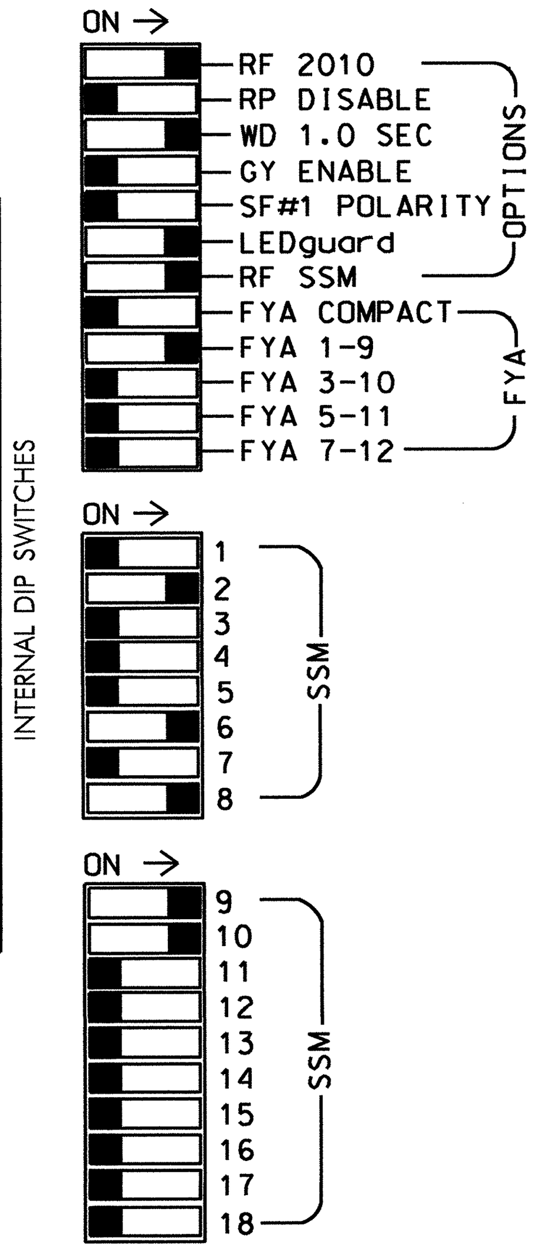
EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-10, 2-6, 2-9, 6-9, 6-10, 8-10 and 9-10.



REMOVE JUMPERS AS SHOWN



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
6. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER..............2070L
CABINET.................332 /W/ AUX
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S1, S2, S8, S11, AUX S1, AUX S2
PHASES USED.............1, 2, 6, 8.
OVERLAP "A".............1+2
OVERLAP "B".............1+8
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	4 PED	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	22	81,82	NU	11★	12	NU	NU	NU	NU
RED		128						134							A124				
YELLOW	✱	129						135											
GREEN		130						136											
RED ARROW												107		A121					
YELLOW ARROW											108	108		A122	A125				
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127										109	109			A126				

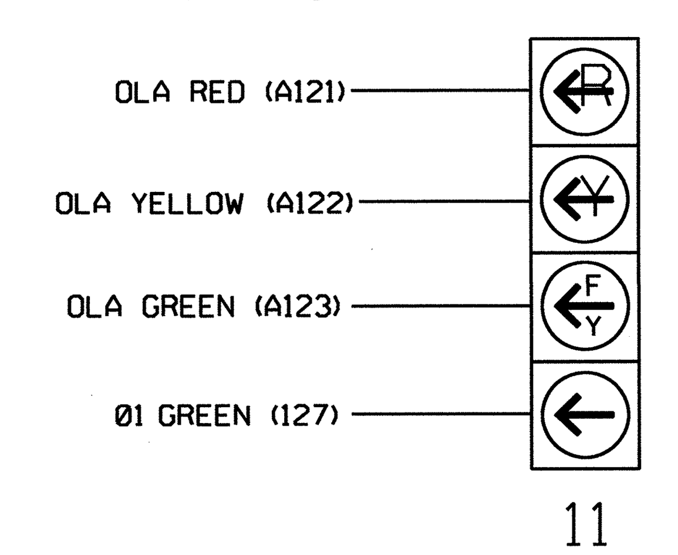
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø1 1B	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED	Ø2 2B											ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			

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

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

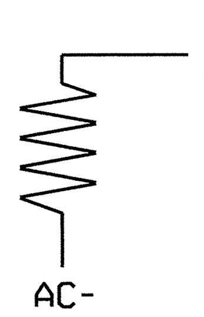
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1334
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of: Transportation Mobility and Safety Division, Signals Management Section

750 N.Greenfield Pkwy, Garner, NC 27529

Canopy Lane/Reilly Road
at
Reilly Road

Division 6 | Cumberland County | Fayetteville

PLAN DATE: April 2014	REVIEWED BY: JTR
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR

SIGNATURE: John T. Rowe, Jr. DATE: 4-29-14

SIG. INVENTORY NO. 06-1334

29-APR-2014 09:22
S:\ITS&SU\ITS Signals\Workgroups\Sig Man\Peterson\06-1334_sm_ele_20131218.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 13

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
 LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE          #1  IS ON
AND RED CLEAR ON PHASE #1  IS ON

              SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #50 ON
SET OUTPUT  ASSIGNMENT #51 OFF
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

PRESS '+'

```
 LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE          #1  IS ON

              SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #52 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

PRESS '+'

```
 LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #1  IS ON

              SCROLL DOWN
THEN:
SET OUTPUT  ASSIGNMENT #51 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

NOTICE GREEN FLASH

PRESS '+'

```
 PAGE 1: VEHICLE OVERLAP 'B' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|X      X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-1334
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of: Transportation Mobility and Safety Division, Signals Management Section — State of North Carolina Department of Transportation

750 N.Greenfield Pkwy,Garner,NC 27529

Canopy Lane/Reilly Road at Reilly Road

Division 6 — Cumberland County — Fayetteville

PLAN DATE: April 2014	REVIEWED BY: JTR
PREPARED BY: James Peterson	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

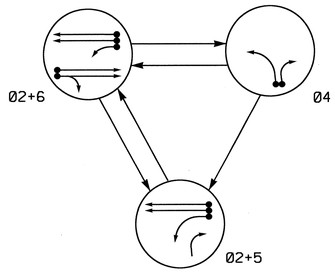
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

SIGNATURE — DATE 4-29-14

SIG. INVENTORY NO. 06-1334

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.14

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

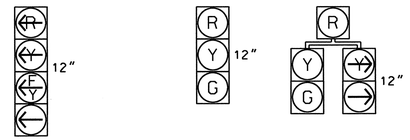
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R/←	R	G	R
51	←	F/↓	~~R~~	~~Y~~
61,62	R	G	R	Y

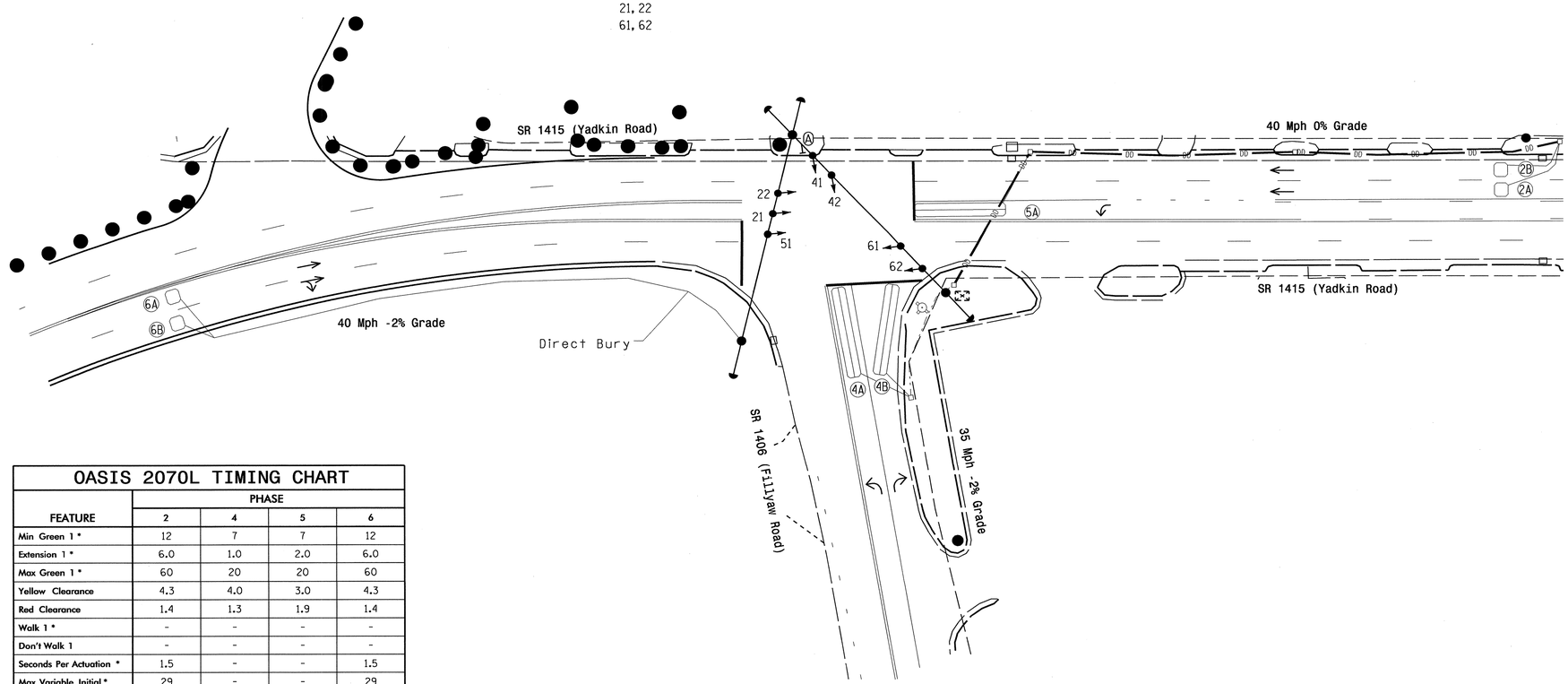
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	250	4	Y	2	Y	Y	-	-	-	-	-
2B	6X6	250	4	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	250	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	250	4	Y	6	Y	Y	-	-	-	-	-



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	1.0	2.0	6.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.3	4.0	3.0	4.3
Red Clearance	1.4	1.3	1.9	1.4
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	29	-	-	29
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

3 Phase
Fully Actuated
Fayetteville City System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 21,22,51,61, and 62.
5. Set all detector units to presence mode.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○—	Signal Pole with Guy	●—
○↓	Signal Pole with Sidewalk Guy	●↓
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
—DD—	Directional Drill	N/A
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ

Signal Upgrade - Area 2 Phase IA

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

SR 1415 (Yadkin Road)
at
SR 1406 (Fillyaw Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: November 2013 REVIEWED BY: PLA
PREPARED BY: JPG REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

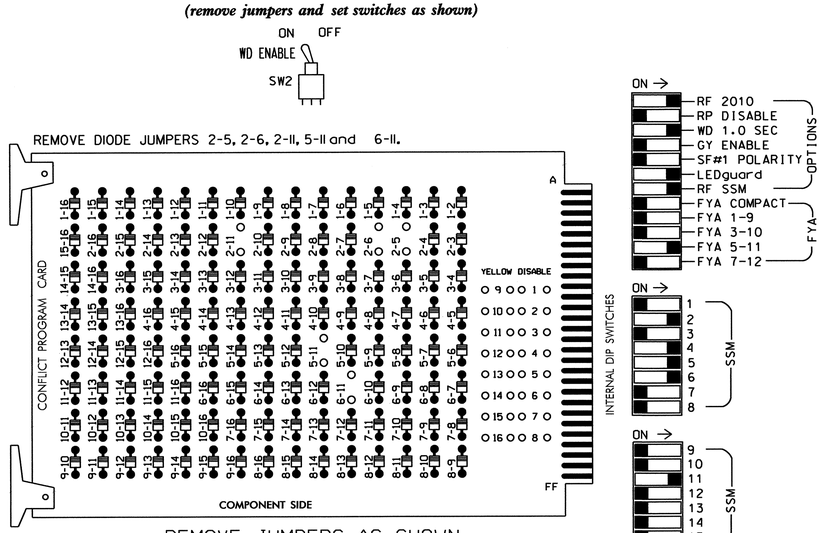
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON G. GALLOWAY
SIGNATURE 12/18/13 DATE
SIG. INVENTORY NO. 06-0508TI

14-MAR-2014 14:58
R:\Traffic\Signals\Oasis\gm\Signals\06-0508\06050811_sig_dsn_20131104.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.15

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

IMPORTANT! 2010ECL-NC conflict monitor required for FYA operation.

INPUT FILE POSITION LAYOUT

(front view)

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

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

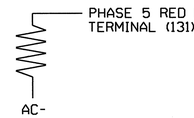
FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3, 7,8,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.
7. The cabinet and controller are part of the Fayetteville City System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
* CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S4,S5,S6,S12
PHASES USED.....2,4,5,6
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

* AUXILIARY OUTPUT FILE REQUIRED FOR FYA OPERATION

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

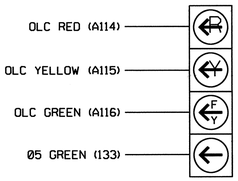
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5		S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51★	61,62	NU	NU	NU	NU	NU	NU	NU	51★	NU	NU
RED		128			101		✱		134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW																	A114		
YELLOW ARROW							132										A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW							133	133											

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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0508T1
DESIGNED: November 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail - Sheet 1 of 2 - Temp 1

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

SR 1415 (Yadkin Road)
at
SR 1406 (Fillyaw Road)

Division 6 | Cumberland County | Fayetteville
PLAN DATE: December 2013 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 12-19-13

SIG. INVENTORY NO. 06-0508T1

18-DEC-2013 10:18
S:\TTSS&S\TS Signals\Workgroups\Sig Mgn\Peterson\060508_sm_ele.20130304.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 16

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #42 ON
 SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |1234567891011121314151 6
VEH OVL PARENTS: |    XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  _ RED  _ YELLOW  _ GREEN
FLASH COLORS:   _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0508T1
DESIGNED: November 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail - Sheet 2 of 2 - Temp.1

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1415 (Yadkin Road) at SR 1406 (Fillyaw Road)	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signals Management Section	Division 6 · Cumberland County · Fayetteville	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.,Garner,NC 27529	PLAN DATE: December 2013 · REVIEWED BY: JTR	SIGNATURE · 12-19-13 DATE
	PREPARED BY: James Peterson · REVIEWED BY:	SIG. INVENTORY NO. 06-0508T1
	REVISIONS · INIT. · DATE	

19-DEC-2013 11:26
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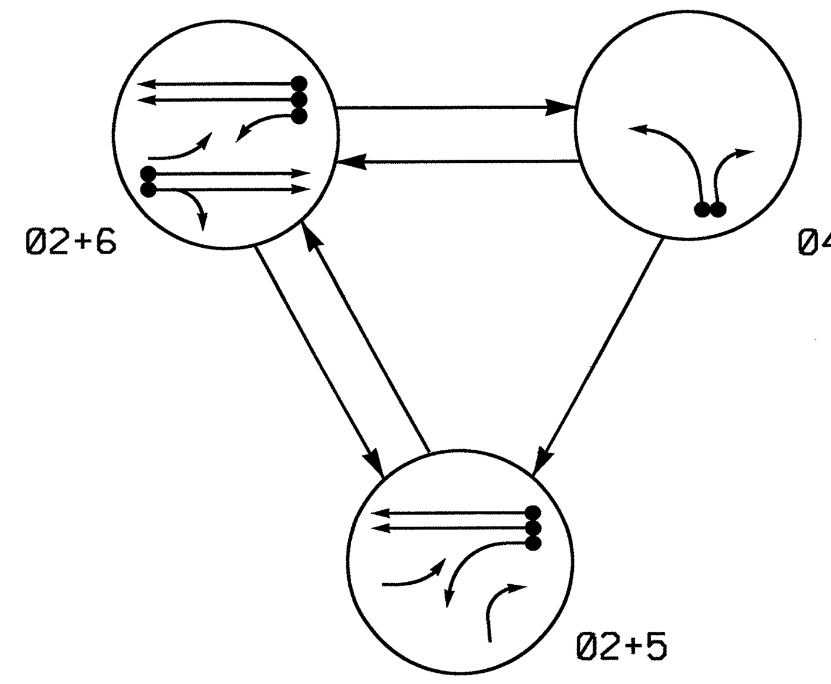
jtpeterson

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

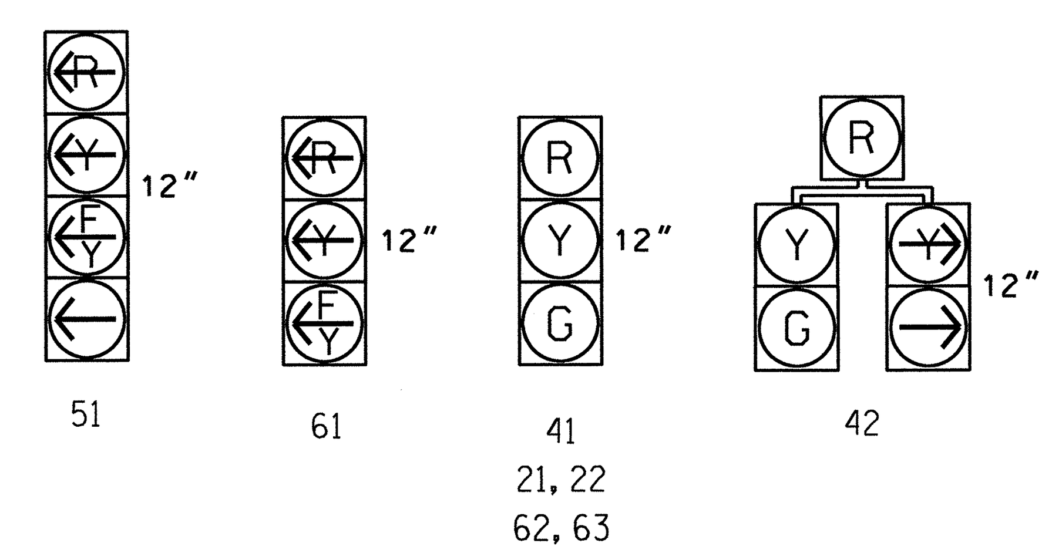
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R/→	R	G	R
51	←	←F/Y	←R	←Y
61	←F/Y	←F/Y	←R	←Y
62,63	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



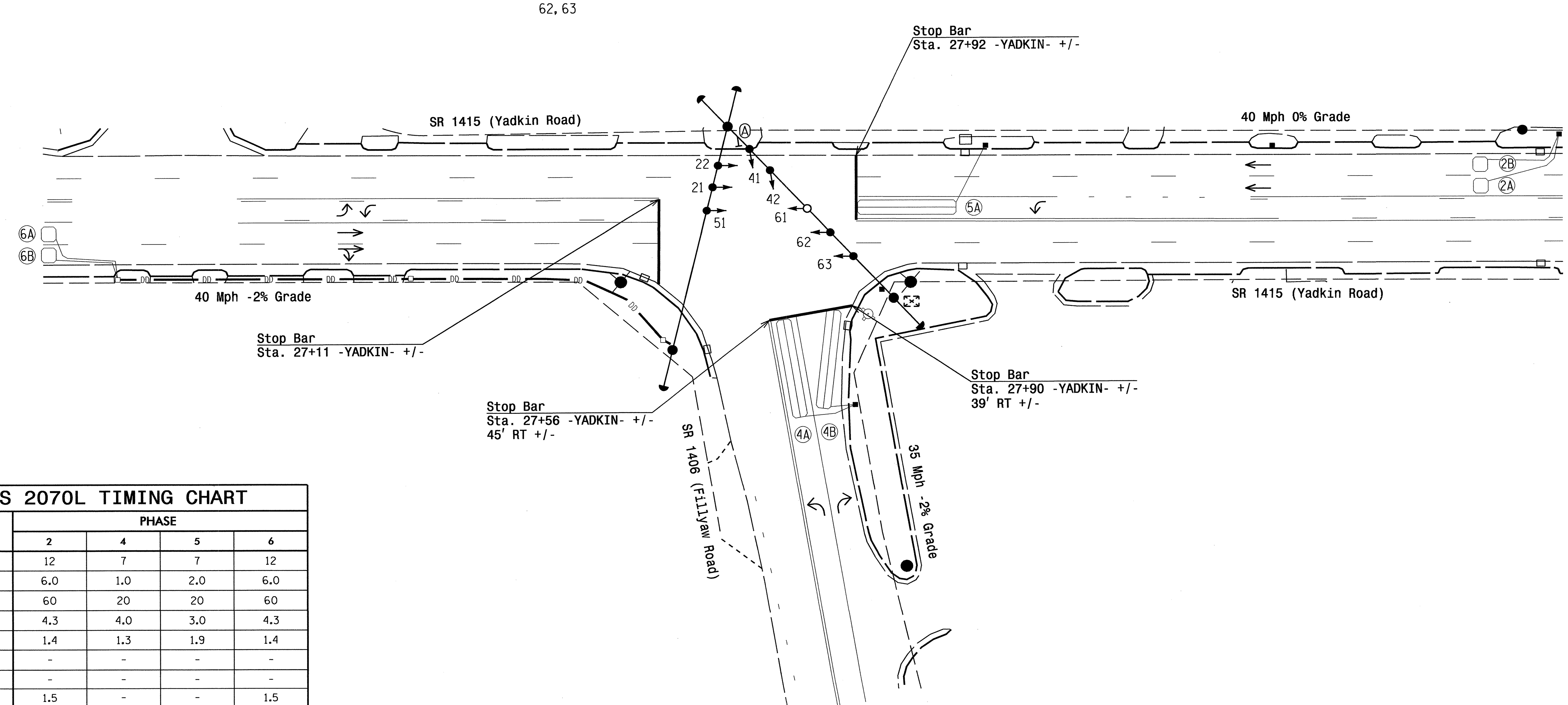
OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	250	4	Y	2	Y	Y	-	-	-	-	-
2B	6X6	250	4	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	250	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	250	4	Y	6	Y	Y	-	-	-	-	-

3 Phase
Fully Actuated
Fayetteville City System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads.
5. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1 *	6.0	1.0	2.0	6.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.3	4.0	3.0	4.3
Red Clearance	1.4	1.3	1.9	1.4
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	29	-	-	29
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
DD	Directional Drill	N/A
(A)	Left Arrow "ONLY" Sign (R3-5L)	(A)

Signal Upgrade - Final

SR 1415 (Yadkin Road)
at
SR 1406 (Fillyaw Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: November 2013	REVIEWED BY: PLA
PREPARED BY: JPG	REVIEWED BY:

REVISIONS	INIT.	DATE

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

SCALE 0 30 1"=30'

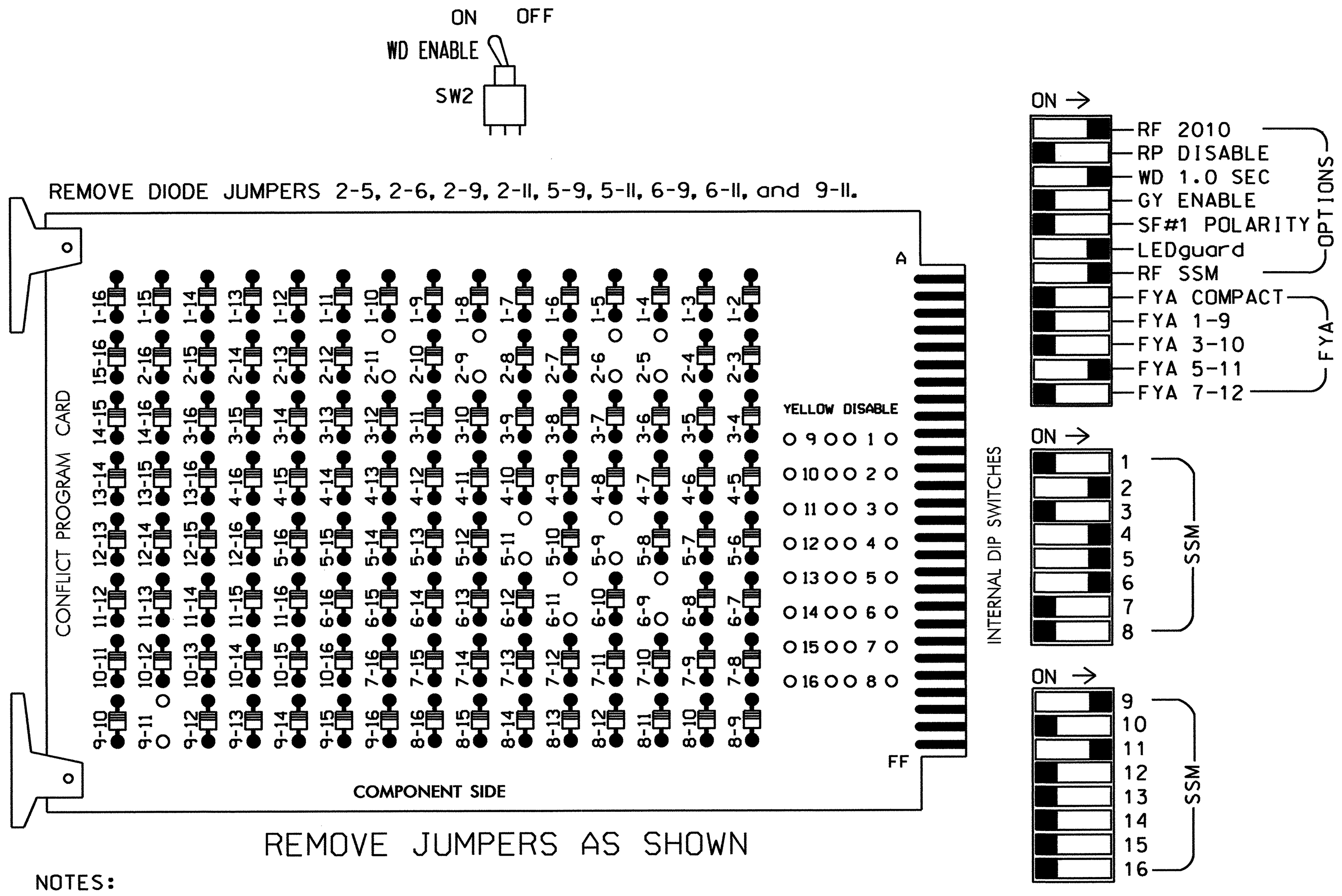
SEAL: North Carolina Professional Engineer Seal 29904 Jason P. Galloway

SIGNATURE DATE 12/18/13

SIG. INVENTORY NO. 06-0508

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

IMPORTANT! 2010ECL-NC conflict monitor required for FYA operation.

▽1 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. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3, 7,8,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
7. The cabinet and controller are part of the Fayetteville City System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5		S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51★	62,63	NU	NU	NU	NU	61★	NU	NU	51★	NU	NU
RED		128			101		✱		134										
YELLOW		129			102				135										
GREEN		130			103				136										
RED ARROW														A121			A114		
YELLOW ARROW							132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW							133	133											

NU = Not Used

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

★ See pictorial of head wiring in detail below.

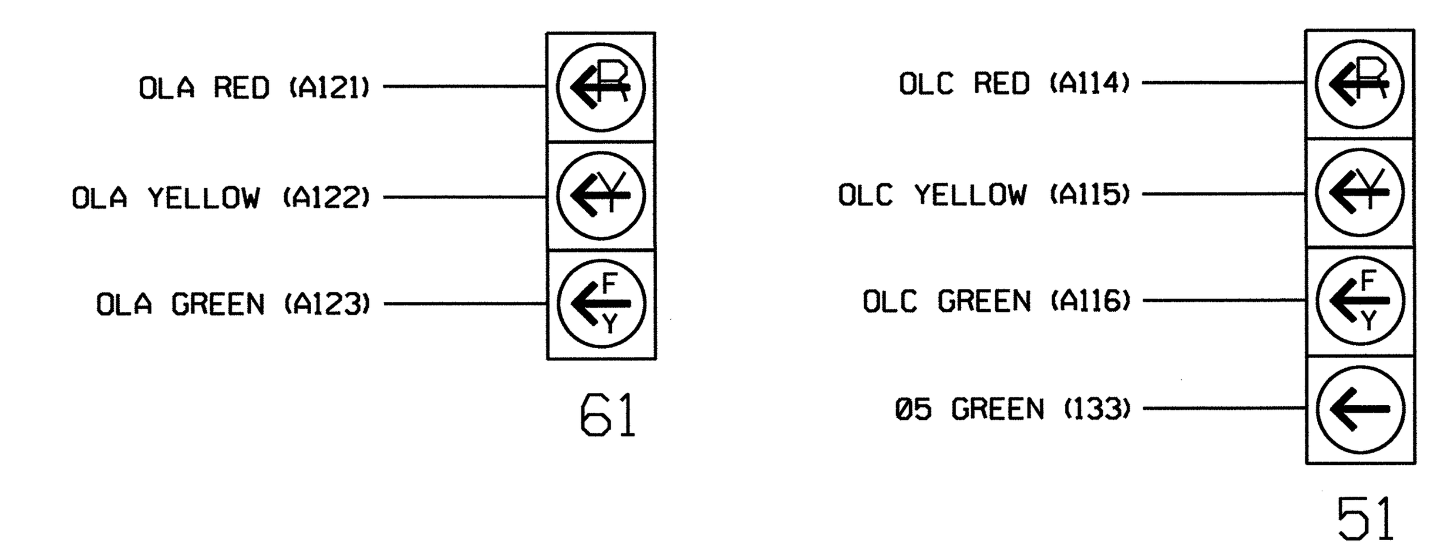
EQUIPMENT INFORMATION

CONTROLLER..............2070L
✱ CABINET.................332 W/ AUX
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S2,S4,S5,S6,S9,S12
PHASES USED.............2,4,5,6
OVERLAP "A".............2
OVERLAP "B".............NOT USED
OVERLAP "C".............5+6
OVERLAP "D".............NOT USED

✱ AUXILIARY OUTPUT FILE REQUIRED FOR FYA OPERATION

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

▽1 INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

▽1 INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A[1]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

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

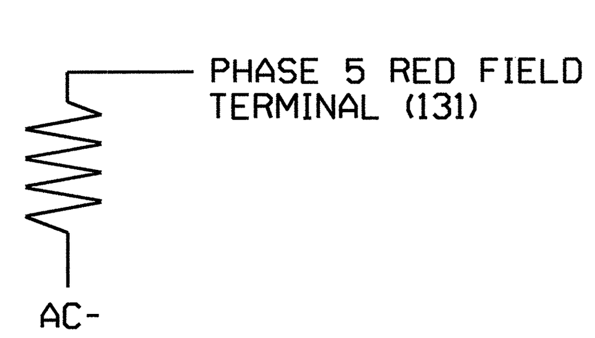
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0508
DESIGNED: November 2013
SEALED: 12-18-13
▽1 REVISED: N/A

Electrical Detail - Sheet 1 of 2 - Final

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1415 (Yadkin Road)
at
SR 1406 (Fillyaw Road)

Division 6 Cumberland County Fayetteville

PLAN DATE: February 2013 REVIEWED BY: JTR
PREPARED BY: S. Armstrong REVIEWED BY:

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

REVISIONS	INIT.	DATE
▽1 Revised loops and added Volume Density. (JP)	JTR	12-19-13

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE John T. Rowe, Jr. DATE 3-4-13

SIG. INVENTORY NO. 06-0508

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL

TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE         #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE         #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE     #5  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```
PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:           |12345678910111213141516
VEH OVL PARENTS:| X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:           |12345678910111213141516
VEH OVL PARENTS:|    XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

1 THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0508
DESIGNED: November 2013
SEALED: 12-18-13
REVISED: N/A

Electrical Detail - Sheet 2 of 2 - Final

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1415 (Yadkin Road)
at
SR 1406 (Fillyaw Road)

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

Division 6	Cumberland County	Fayetteville
PLAN DATE: February 2013	REVIEWED BY: JTR	
PREPARED BY: S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE
1 Revised loops and added Volume Density. (JP)	JTR	12-19-13

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE, JR
SIGNATURE: John T. Rowe Jr. DATE: 3-4-13

SIG. INVENTORY NO. 06-0508

18-DEC-2013 10:21
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Peterson*060508_sm_ele_20130304.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.2D

PHASING DIAGRAM

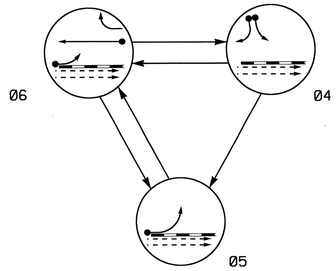
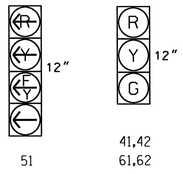


TABLE OF OPERATION				
SIGNAL FACE	PHASE 05	PHASE 06	PHASE 04	FLASH
41,42	R	R	G	R
51	←	F Y	~~R~~	~~Y~~
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	- / Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	- / Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	- / Y
6A,6B	6X6	250	4	Y	6	Y	Y	-	1.3	-	- / Y
6C,6D	6X6	80	4	Y	6	Y	Y	-	-	-	- / Y

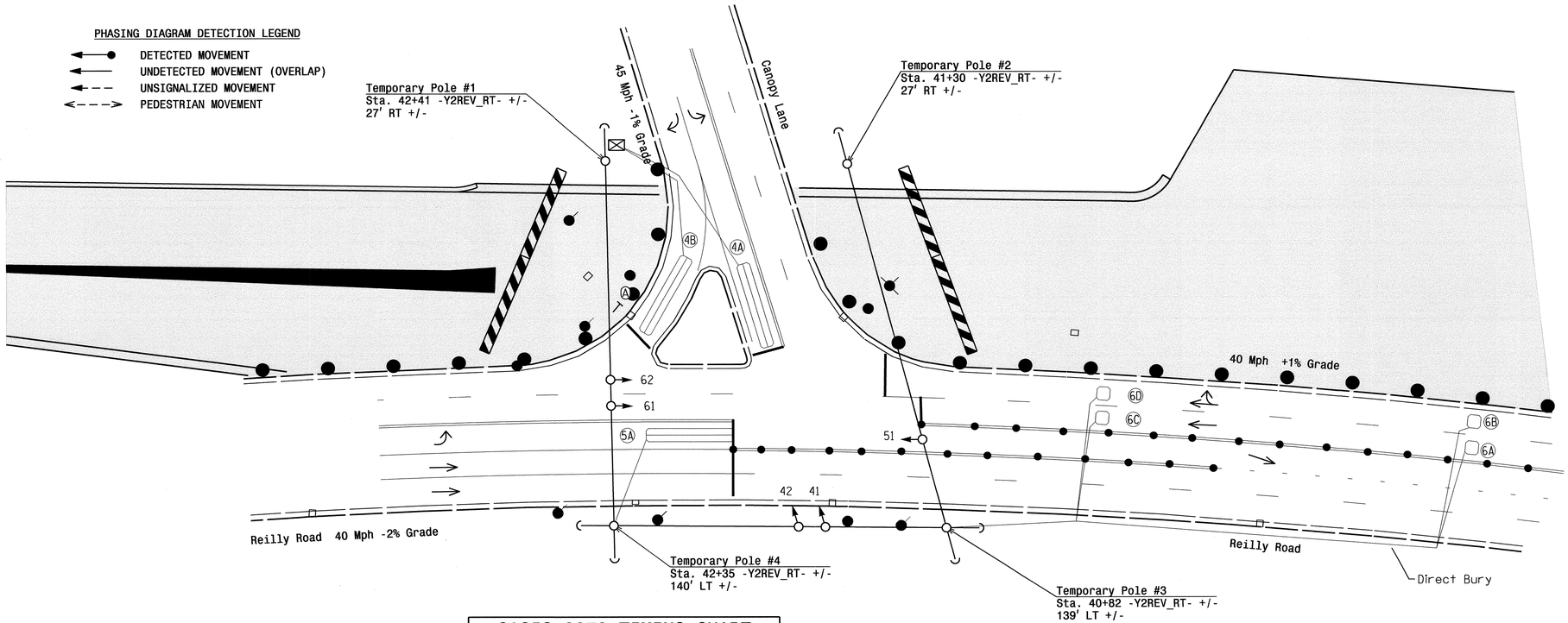
3 Phase
Fully Actuated
Fort Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Phase 5 may lag.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.

PHASING DIAGRAM DETECTION LEGEND

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



OASIS 2070 TIMING CHART			
FEATURE	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	7	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	25	25	60
Yellow Clearance	3.0	3.0	4.3
Red Clearance	2.3	1.4	1.4
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	-	-	MIN RECALL
Vehicle Call Memory	-	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○—	Signal Pole with Guy	●—
○‿	Signal Pole with Sidewalk Guy	●‿
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
▷	Metal Pole with Mastarm	▷
Ⓐ	"YIELD" Sign (R1-2)	Ⓐ

Signal Upgrade (Area 2 - Phase I)

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

Reilly Road
At
Canopy Lane

Cumberland County — Fort Bragg

PLAN DATE: April 2014 — REVIEWED BY: PLA
PREPARED BY: JPG — REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 0 30 — 1"=30'

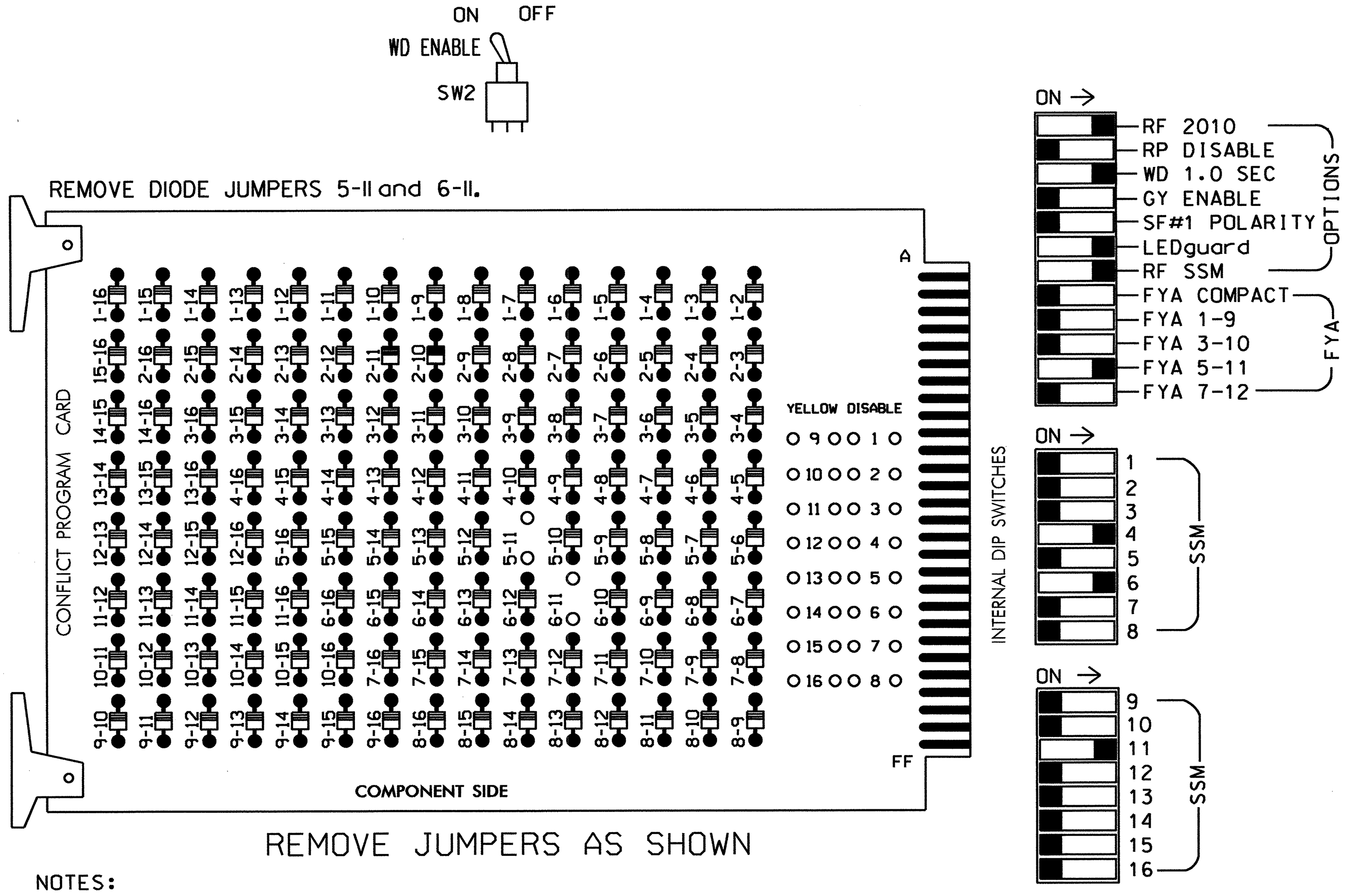
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON R GALLOWAY
SIGNATURE 4/28/14 DATE

SIG. INVENTORY NO. Temp 1

28-APR-2014 08:40
R:\Traffic\Signals\Designs\Signals\06BASEC Canopy sig_dsn_temp1_2013.dgn
jgalloway

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,2,3,5, 7,8,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phase 6 for Start Up In Green.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the Fort Bragg Signal System.
7. Ensure Auxiliary Output File is compatible with existing cabinet. Auxiliary Output File required to conform to Caltrans *Traffic Signal Control Equipment Specifications* (TSCES).

EQUIPMENT INFORMATION

CONTROLLER..............2070L
*CABINET.................332 /W/ AUX
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S4,S5,S6,S12.
PHASES USED.............4,5,6.
OVERLAP "A".............NOT USED
OVERLAP "B".............NOT USED
OVERLAP "C".............5+6
OVERLAP "D".............NOT USED

*In NOTES section refer to note 7.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5★	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC★	OLD	SPARE
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	51	NU	NU
RED					101			134										
YELLOW					102		✳	135										
GREEN					103			136										
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133											

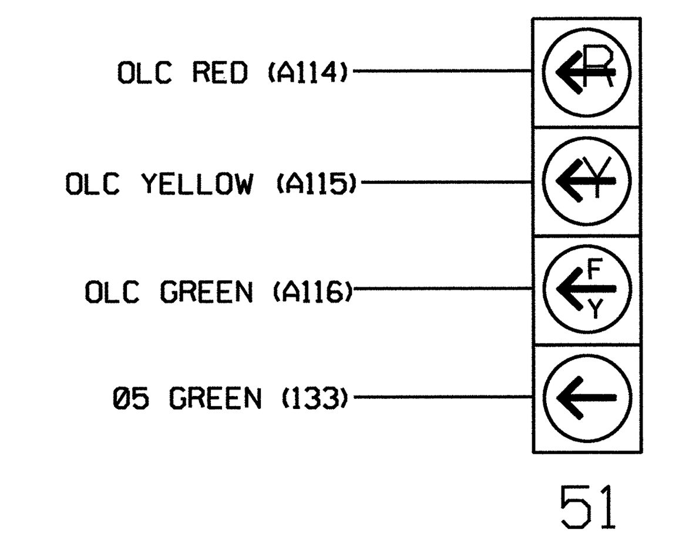
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y		1.3	
6C,6D	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L

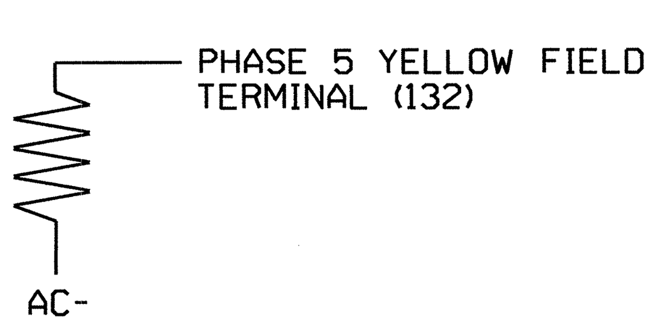
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-Canopy Templ
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Reilly Road
at
Canopy Lane

Division 6 | Cumberland County | Fort Bragg
PLAN DATE: April 2014 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:
REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 4-29-14 DATE
SIG. INVENTORY NO. Temp 1

29-APR-2014 11:24
S:*ITS Signals\Workgroups\Sig Man\Peterson\FortBragg_sm_ele_xxx.dgn
jtpeterson

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

```
LOGICAL I/O COMMAND #1   (+/-COMMAND#)
IF  ACTIVE PHASE         #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #42 ON
SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #2   (+/-COMMAND#)
IF  ACTIVE PHASE         #5  IS ON

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
LOGICAL I/O COMMAND #3   (+/-COMMAND#)
IF  YELLOW ON PHASE      #5  IS ON

                SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:           |12345678910111213141516
VEH OVL PARENTS: |    XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED   _ YELLOW  _ GREEN
FLASH COLORS:  _ RED   _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-Canopy Templ
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:	Reilly Road at Canopy Lane		SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, Signals Management Section, State of North Carolina Department of Transportation	Division 6 — Cumberland County — Fort Bragg		NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy,Garner,NC 27529	PLAN DATE: April 2014	REVIEWED BY: JTR	SIGNATURE: John T. Rowe Jr. — DATE: 4-29-14
	PREPARED BY: James Peterson	REVIEWED BY:	SIG. INVENTORY NO. Temp 1
	REVISIONS	INIT. / DATE	

29-APR-2014 11:27
S:\ITS\ITS Signals\Workgroups\Sig Man\Peterson\FortBragg_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.23

PHASING DIAGRAM

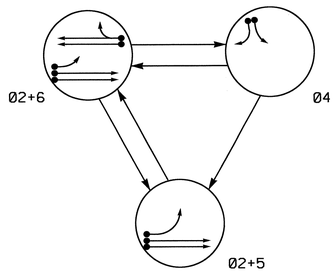
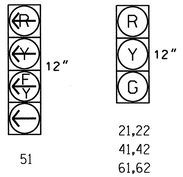


TABLE OF OPERATION				
SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21,22	G	G	R	Y
41,42	R	R	G	R
51	←	←	R	Y
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A,2B	6X6	70	4	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A,6B	6X6	250	4	Y	6	Y	Y	-	1.3	-	-	Y
6C,6D	6X6	80	4	Y	6	Y	Y	-	-	-	-	Y

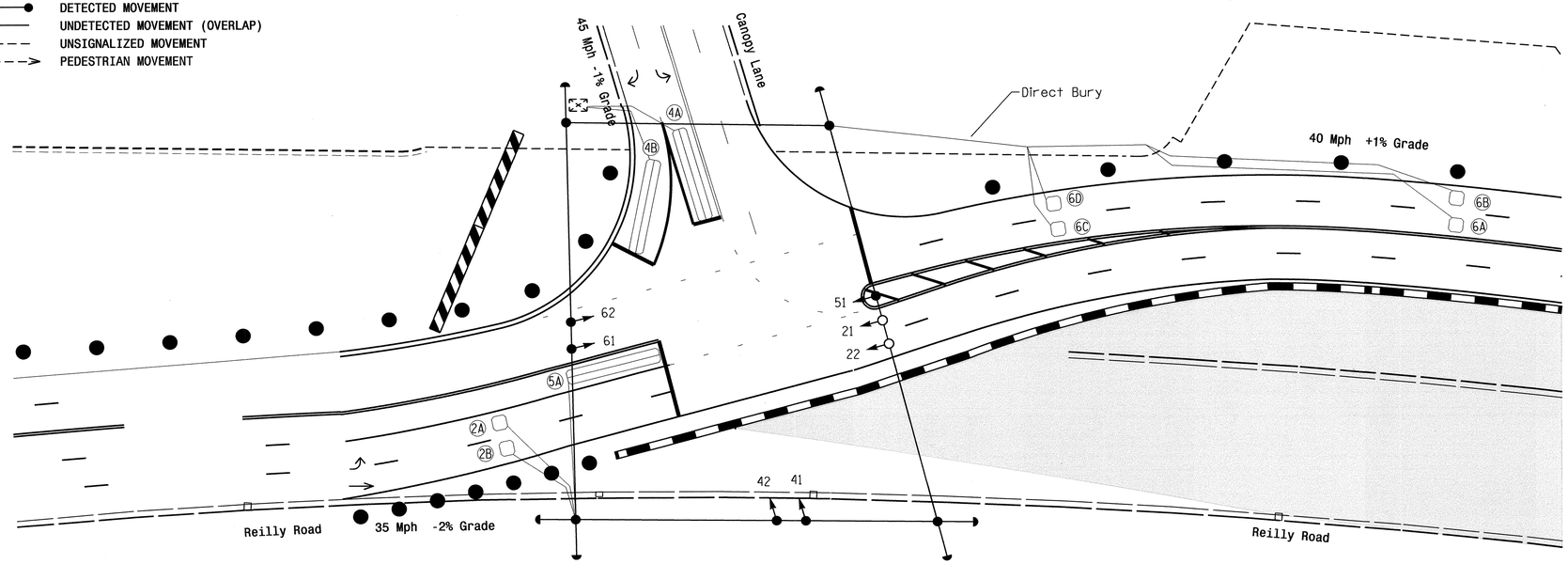
3 Phase
Fully Actuated
Fort Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered 51,61,& 62.
4. Set all detector units to presence mode.
5. Phase 5 may lag.

PHASING DIAGRAM DETECTION LEGEND

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



OASIS 2070 TIMING CHART				
FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	3.0	2.0	2.0	2.0
Max Green 1 *	60	25	25	60
Yellow Clearance	4.0	3.0	3.0	4.3
Red Clearance	1.6	2.6	1.9	1.8
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

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

Signal Upgrade (Area 2 - Phase IA & II)

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

Reilly Road
At
Canopy Lane

Division 6 Cumberland County Fort Bragg

PLAN DATE:	April 2014	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 30 1"=30'

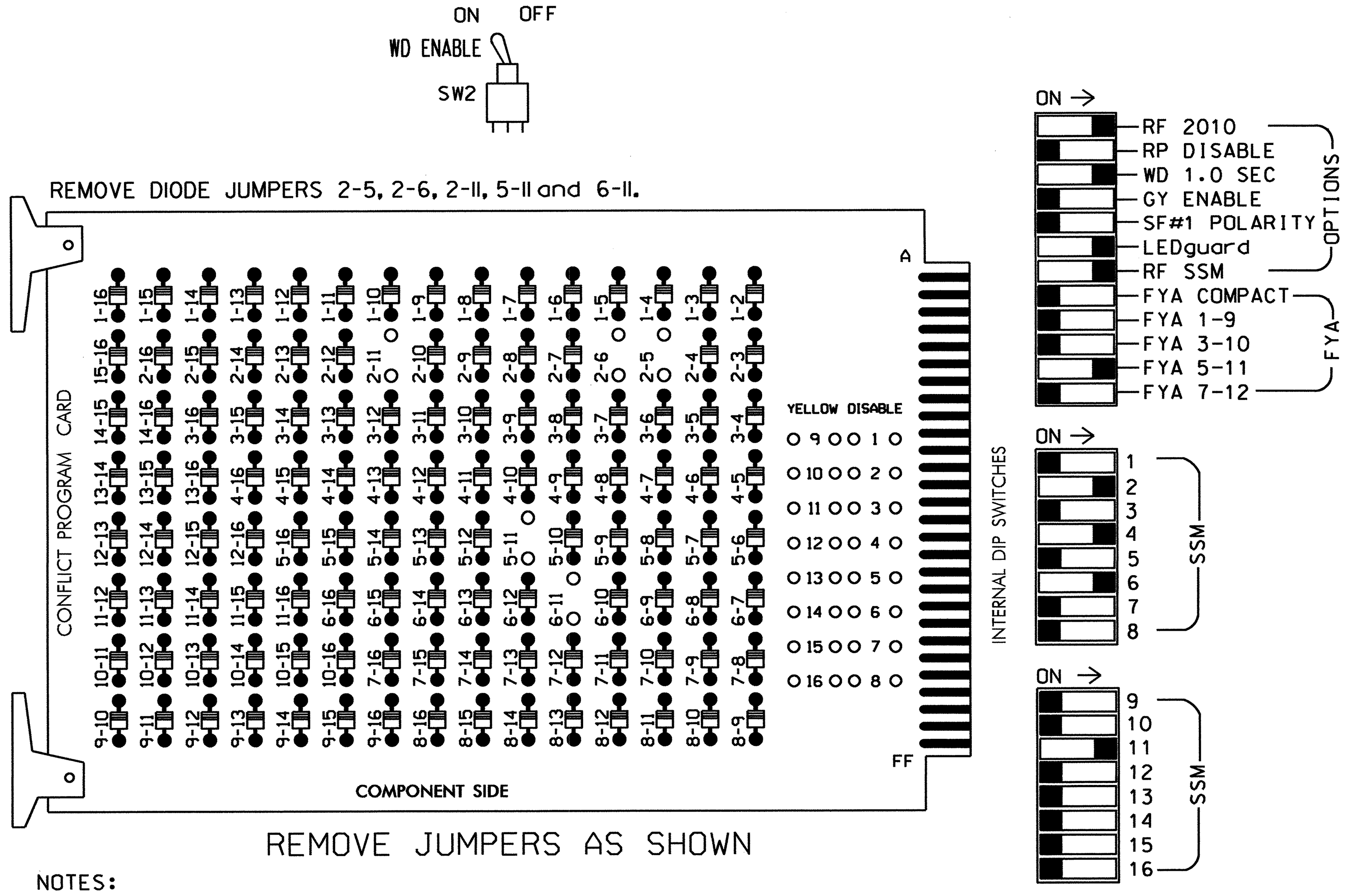
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON B. GALLOWAY
SIGNATURE 4/28/14 DATE
SIG. INVENTORY NO. Temp 2

28-APR-2014 08:43
R:\Traffic\Signals\Designs\Signals\06BASEC Canopy sig_dsn_temp2_2013.dgn
jgalloway

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5, 7,8,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fort Bragg Signal System.
7. Ensure Auxiliary Output File is compatible with existing cabinet. Auxiliary Output File required to conform to Caltrans *Traffic Signal Control Equipment Specifications* (TSCES).

EQUIPMENT INFORMATION

CONTROLLER..............2070L
*CABINET.................332 /W/ AUX
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S2,S4,S5,S6,S12.
PHASES USED.............2,4,5,6.
OVERLAP "A".............NOT USED
OVERLAP "B".............NOT USED
OVERLAP "C".............5+6
OVERLAP "D".............NOT USED

*In NOTES section refer to note 7.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5★	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC★	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	NU	NU	NU	NU	NU	51	NU	NU
RED		128			101			134										
YELLOW		129			102		*	135										
GREEN		130			103			136										
RED ARROW																A114		
YELLOW ARROW																A115		
FLASHING YELLOW ARROW																A116		
GREEN ARROW							133											

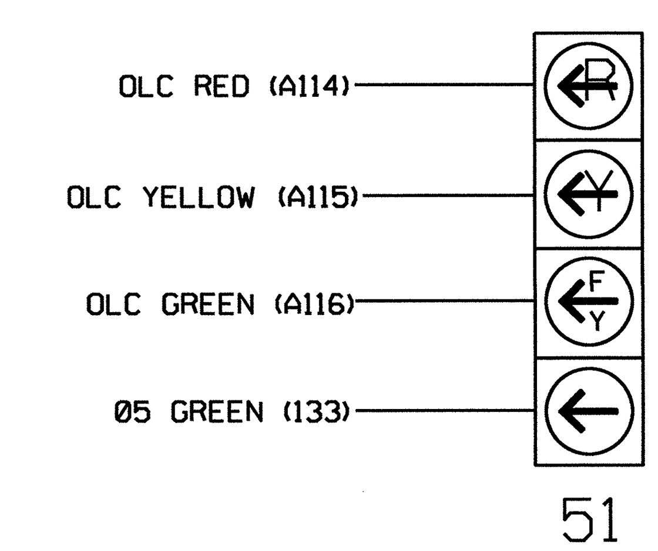
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6A,6B	TB3-5,6	J2U	40	2	6	6	Y	Y		1.3	
6C,6D	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

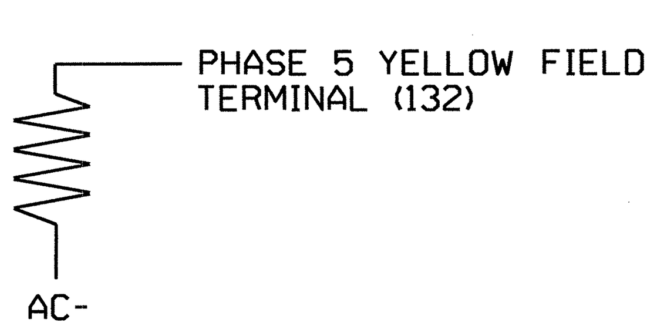
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-Canopy Temp2
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Reilly Road
at
Canopy Lane

Division 6 | Cumberland County | Fort Bragg

PLAN DATE: April 2014 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE 4-29-14 DATE

SIG. INVENTORY NO. Temp 2

28-APR-2014 14:18
S:\ITS\ITS Signals\Workgroups\Sig Man\Peterson\FortBragg_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.25

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL). THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.

2. FROM MAIN MENU PRESS '6' (OUTPUTS). THEN '3' (LOGICAL I/O PROCESSOR).

```
  LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON
AND RED CLEAR ON PHASE #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #42 ON
 SET OUTPUT  ASSIGNMENT #43 OFF
```

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE       #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #44 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

PRESS '+'

```
  LOGICAL I/O COMMAND #3  (+/-COMMAND#)
IF  YELLOW ON PHASE    #5  IS ON

          SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #43 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS). THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:              |12345678910111213141516
VEH OVL PARENTS:     |    XX
VEH OVL NOT VEH:     |
VEH OVL NOT PED:     |
VEH OVL GRN EXT:     |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-Canopy Temp2
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Reilly Road
at
Canopy Lane

Division 6 | Cumberland County | Fort Bragg

PLAN DATE: April 2014 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

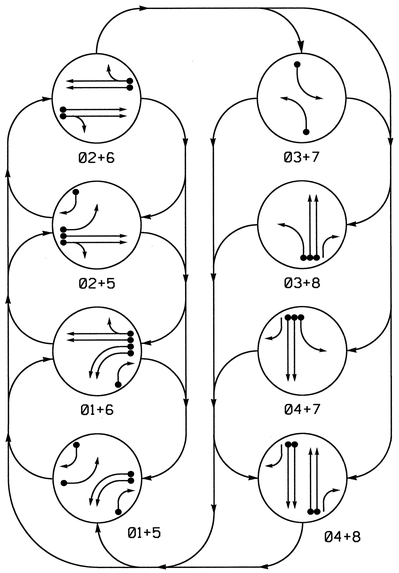
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 4-29-14 DATE
SIG. INVENTORY NO. Temp 2

28-APR-2014 13:20
S:\Traffic\ITS Signals\Workgroups\Sig Mgmt\Peterson\Fortbragg_sheets_xxx.dgn
$$USERNAME

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.26

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

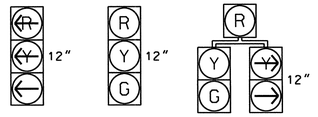
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11,12	←	←	R	R	R	R	R	R	R
21,22	R	R	G	G	R	R	R	R	Y
31	R	R	R	R	←	←	R	R	R
41	R	R	R	R	R	R	G	G	R
42	R/→	R	R/→	R	R	R	G	G	R
51	←	R	←	R	R	R	R	R	R
61,62	R	G	R	G	R	R	R	R	Y
71	R	R	R	R	←	R	←	R	R
81	R	R	R	R	R	G	R	G	R
82	R/→	R/→	R	R	R	G	R	G	R

SIGNAL FACE I.D.

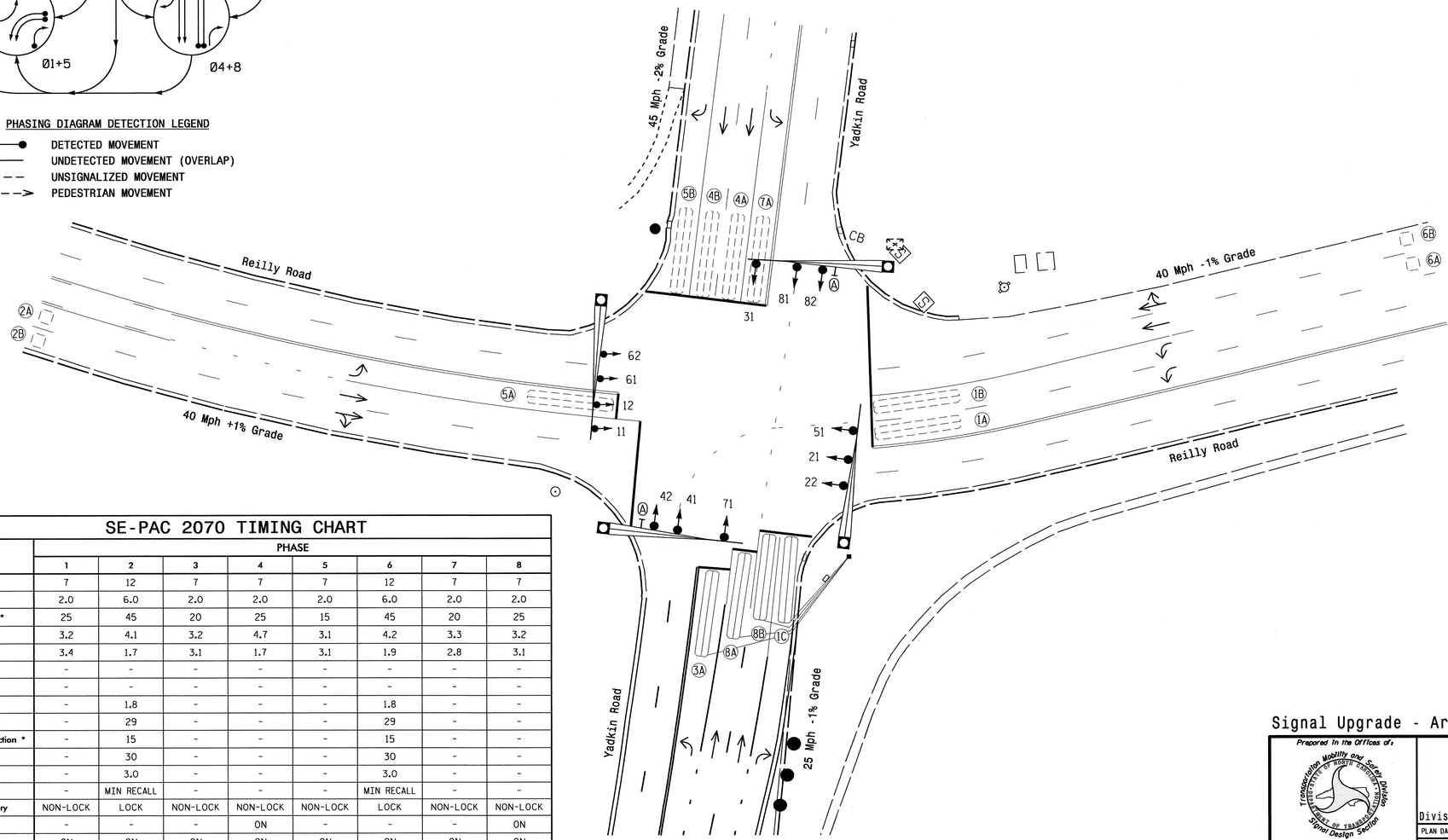
All Heads L.E.D.



11,12 21,22 42
31 41 82
51 61,62
71 81

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING																	
							TIMING		OPERATION MODE											STATUS	
									0	-	2	3	4	5	6	7					
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1. CALL	STOP A	STOP B	PROTPTED LEFT PROTPTED THROUGH	AND		SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	-	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
1B	6X40	2-4-2	0	-	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
1C	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2A	6X6	5	250	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2B	6X6	5	250	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
3A	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4A	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4B	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	0	-	X	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5B	6X40	2-4-2	0	-	X	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6A	6X6	3	250	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6B	6X6	3	250	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
7A	6X40	2-4-2	0	-	X	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8B	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X



SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Maximum Green *	25	45	20	25	15	45	20	25
Yellow Change	3.2	4.1	3.2	4.7	3.1	4.2	3.3	3.2
Red Clear	3.4	1.7	3.1	1.7	3.1	1.9	2.8	3.1
Walk *	-	-	-	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-	-	-	-
Added Initial *	-	1.8	-	-	-	1.8	-	-
Maximum Initial *	-	29	-	-	-	29	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

8 Phase
Fully Actuated
Fort Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
○	Metal Pole with Mastarm	○
(A)	Right Arrow "ONLY" Sign (R3-5R)	(A)

Signal Upgrade - Area 2- Phase IA

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

Reilly Road At Yadkin Road

Division 6 Cumberland County Fort Bragg

PLAN DATE: November 2012 REVIEWED BY: PLA

PREPARED BY: JPG REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON P. GALLOWAY

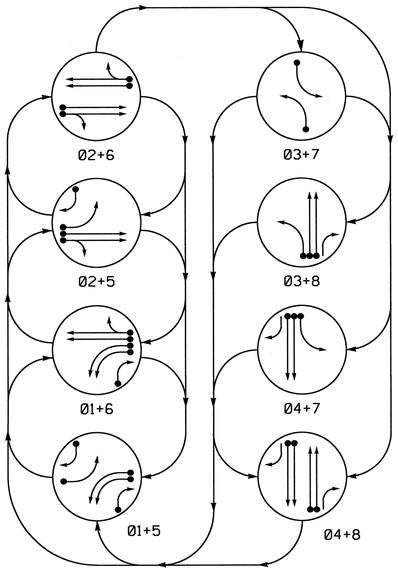
SIGNATURE 12/18/13 DATE

SIG. INVENTORY NO. Temp

17-DEC-2013 15:07
R:\Traffic\Signals\Designs\Signals\MOBASED_sig_dsn_temp1_2013.dgn
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.27

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

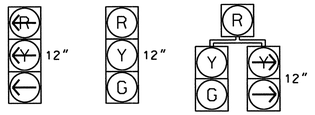
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	03+07	03+08	04+07	04+08	FLASH
11,12	←	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21,22	R	R	G	G	R	R	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←	←	~~R~~	~~R~~	~~R~~
41	R	R	R	R	R	R	G	G	R
42	R/←	R	R/←	R	R	R	G	G	R
51	←	~~R~~	←	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
61,62	R	G	R	G	R	R	R	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←	~~R~~	←	~~R~~	~~R~~
81	R	R	R	R	R	G	R	G	R
82	R/←	R/←	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



11,12
31
51
71

21,22
41
61,62
81

42
82

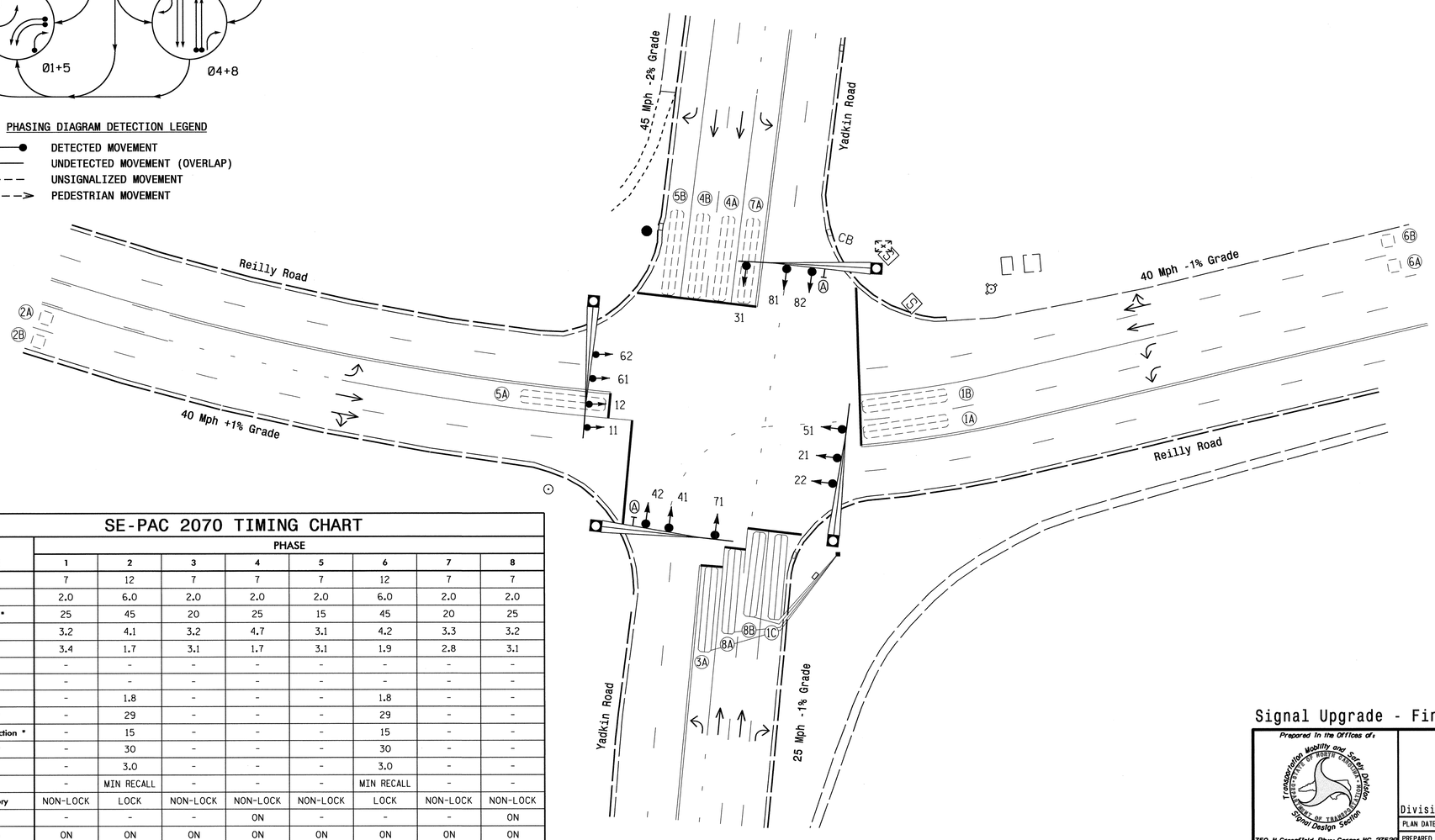
SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING																
							TIMING		OPERATION MODE											STATUS	
									0	1	2	3	4	5	6	7					
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PHOTOPIER LEFT	PHOTOPIER THROUGH	AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
1A	6X40	2-4-2	0	-	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
1B	6X40	2-4-2	0	-	X	1	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
1C	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2A	6X6	5	250	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
2B	6X6	5	250	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
3A	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4A	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4B	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	0	-	X	5	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5B	6X40	2-4-2	0	-	X	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6A	6X6	3	250	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6B	6X6	3	250	-	X	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
7A	6X40	2-4-2	0	-	X	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
8B	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X

8 Phase
Fully Actuated
Fort Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
○→	Signal Pole with Guy	●→
○⌐	Signal Pole with Sidewalk Guy	●⌐
▭	Inductive Loop Detector	- - -
⊠	Controller & Cabinet	E
□	Junction Box	■
·-·-·-·	2-in Underground Conduit	·-·-·-·
N/A	Right of Way	-----
→	Directional Arrow	→
○→	Metal Pole with Mastarm	○→
(A)	Right Arrow "ONLY" Sign (R3-5R)	(A)

SE-PAC 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Passage Gap *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Maximum Green *	25	45	20	25	15	45	20	25
Yellow Change	3.2	4.1	3.2	4.7	3.1	4.2	3.3	3.2
Red Clear	3.4	1.7	3.1	1.7	3.1	1.9	2.8	3.1
Walk *	-	-	-	-	-	-	-	-
Pedestrian Clear	-	-	-	-	-	-	-	-
Added Initial *	-	1.8	-	-	-	1.8	-	-
Maximum Initial *	-	29	-	-	-	29	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK	NON-LOCK
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

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

Signal Upgrade - Final

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

Reilly Road
At
Yadkin Road

Division 6 Cumberland County Fort Bragg
PLAN DATE: November 2012 REVIEWED BY: PLA
PREPARED BY: JPG REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON S. GALLOWAY
SIGNATURE 12/6/13 DATE
SIG. INVENTORY NO. Final

17-DEC-2013 15:09
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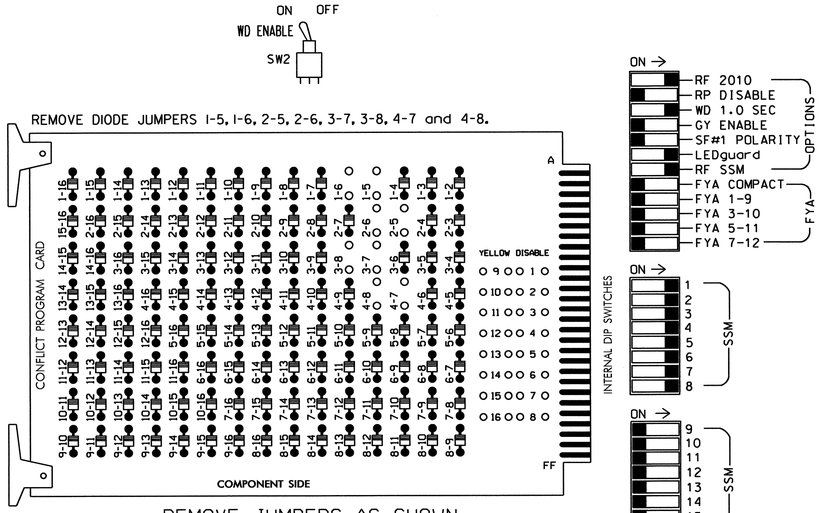
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 28

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program controller to start up in phases 2 and 6 green.
4. Enable simultaneous gap-out feature, on controller unit, for all phases.
5. Program phases 4 and 8, on controller unit, for dual entry.
6. Program phases 2 and 6, on controller unit, for volume density operation.
7. The cabinet and controller are part of the Fort Bragg Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....SE-PAC2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5		S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	82	21,22	NU	31	41,42	NU	42	51	61,62	NU	71	81,82	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			132	132			123		
GREEN ARROW	127	127			118			133	133			124		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	ø2 2A	SLOT EMPTY	ø3 3A	ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø1 1C	ø2 2B		NOT USED	ø4 4B								ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø5 5B	ø6 6A	SLOT EMPTY	ø7 7A	ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED	ø6 6B		NOT USED	ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A	TB2-1,2	I1U	56	1	1		
1B	TB2-5,6	I2U	39	3	1		
1C	TB2-7,8	I2L	43	4	1	15	
2A	TB2-9,10	I3U	63	5	2		
2B	TB2-11,12	I3L	76	6	2		
3A	TB4-5,6	I5U	58	9	3		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4		
5A	TB3-1,2	J1U	55	19	5		
5B	TB3-5,6	J2U	40	21	5	15	
6A	TB3-9,10	J3U	64	23	6		
6B	TB3-11,12	J3L	77	24	6		
7A	TB5-5,6	J5U	57	29	7		
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8		

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Yadkin-Reilly
DESIGNED: November 2012
SEALED: 12-18-13
REVISED: N/A

REVISION ▽ SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE 12-19-13 DATE

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

Reilly Road at Yadkin Road

Division 6 | Cumberland County | Fort Bragg

PLAN DATE:	March 2010	REVIEWED BY:	D. Darity
PREPARED BY:	D. Darity	REVIEWED BY:	

REVISIONS	INIT.	DATE
▽ No change to electrical detail (JP)	STR	12-19-13

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by Donald D. Darity, PE#19713, on 3-30-2010. This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. Temp & Final

18-DEC-2013 11:51
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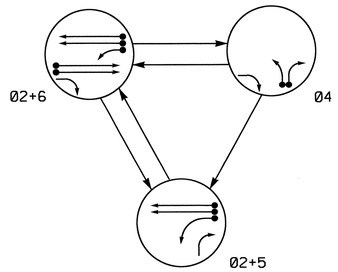
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 29

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R/←	R	G	R
51	←	F Y	~~R~~	~~Y~~
61,62	R	G	R	Y
63	R	G	R/←	Y

SIGNAL FACE I.D.

All Heads L.E.D.

SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING															
									OPERATION MODE										STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	TIMING DELAY	TIMING EXTEND (STRETCH)	0 VEHICLE	1 PEDESTRIAN	2 1 CALL	3 STOP A	4 STOP B	5 PROTPER LEF	6 PROTPER THROUGH	7 AND	SWITCH	SYSTEM LOOPS	NEW	EXISTING
2A,2B	6X6	4	330	-	X	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
4A,4B	6X40	2-4-2	0	-	X	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
5A	6X40	2-4-2	0	-	X	5	10 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
						2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6A	6X6	5	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X
6B	6X6	5	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X

3 Phase
Fully Actuated
Fort Bragg Signal System

NOTES

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

LEGEND

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

SE-PAC 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green *	12	7	7	12
Passage Gap *	6.0	2.0	2.0	6.0
Maximum Green *	100	25	25	100
Yellow Change	4.5	3.2	3.1	4.5
Red Clear	1.4	2.9	2.8	1.4
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	1.8	-	-	1.8
Maximum Initial *	37	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	45	-	-	45
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	LOCK	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

Signal Upgrade Area 2 - Phase IA

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

Canopy Lane At Heffner Drive

Division 6 Cumberland County Fort Bragg

PLAN DATE: November 2013 REVIEWED BY: PLA

PREPARED BY: JPG REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON P. CALLOWAY

SIGNATURE 12/9/13 DATE

SIG. INVENTORY NO. Temp

04-APR-2014 15:41
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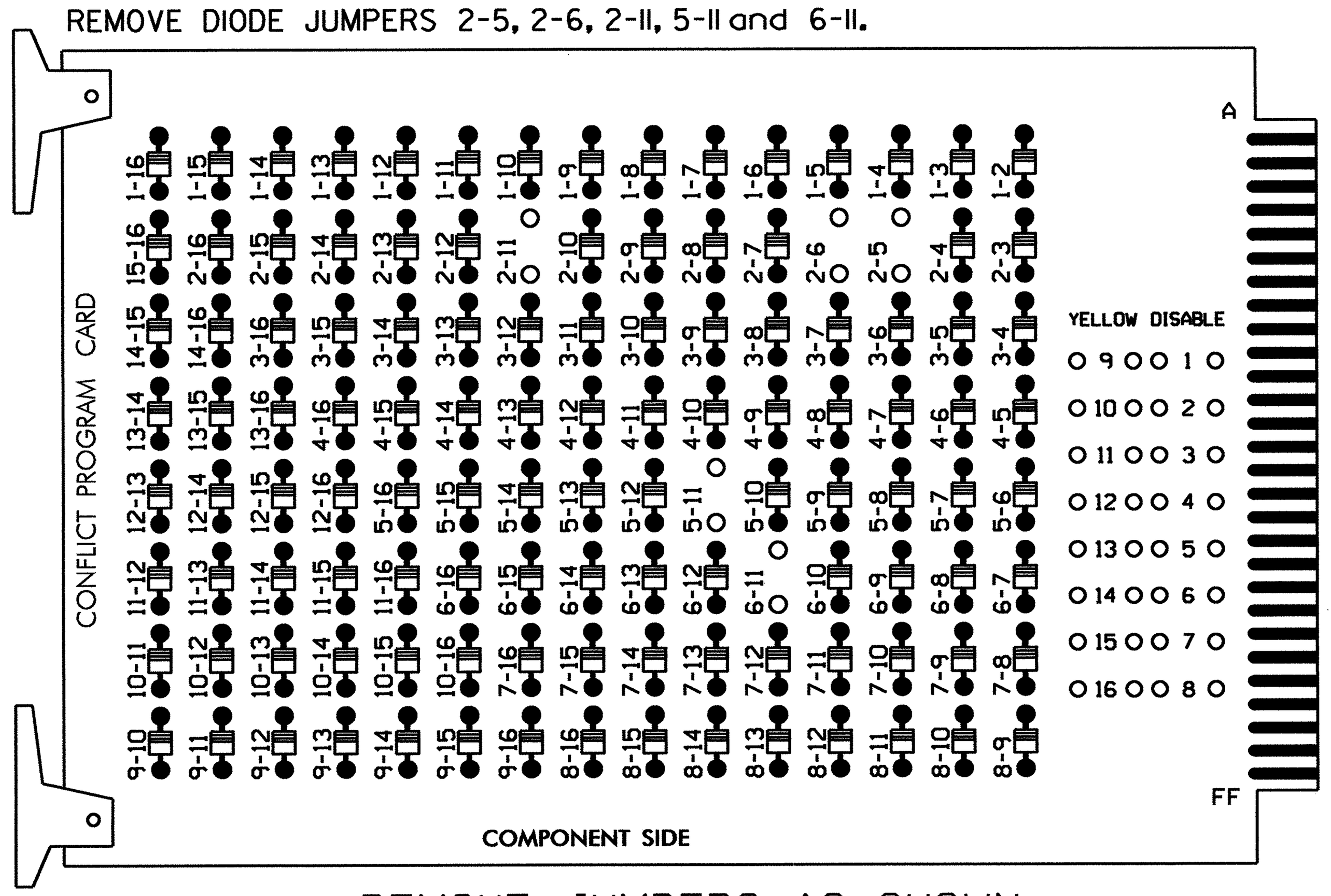
jgalloway

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

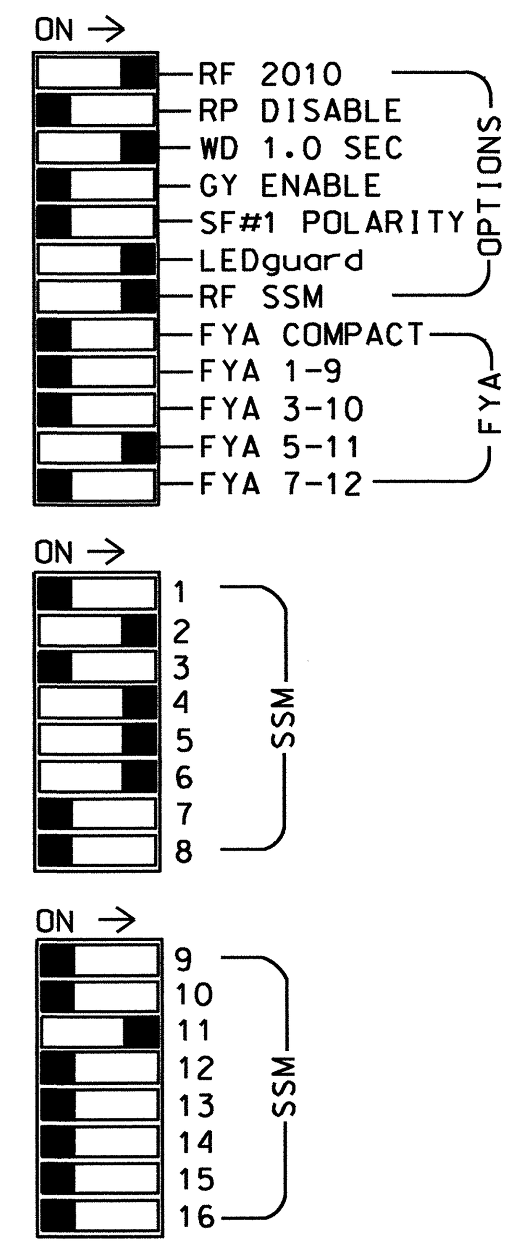
(remove jumpers and set switches as shown)

ON OFF
WD ENABLE
SW2

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



REMOVE JUMPERS AS SHOWN



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3, 7,8,9,10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6, on controller unit, for volume density operation.
5. Program phases 2 and 6 for Start Up In Green.
6. Ensure Auxiliary Output File is compatible with existing cabinet. Auxiliary Output File required to conform to Caltrans *Traffic Signal Control Equipment Specifications* (TSCES).
7. The cabinet and controller are part of the Fort Bragg Signal System.

EQUIPMENT INFORMATION

CONTROLLER.............2070L
** CABINET................332 /W/ AUX
SOFTWARE...............SE-PAC2070
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S2,S4,S5,S6,S12
PHASES USED............2,4,5,6
OVERLAP "A"............NOT USED
OVERLAP "B"............NOT USED
OVERLAP "C"............*
OVERLAP "D"............NOT USED

* See sheet 2 for Overlap and Protected & Permissive Phases programming.

** In NOTES section refer to note 6.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4		S4P	S5		S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1★	2	2 PED	3	4		4 PED	5		6	6 PED	7	8	8 PED	OLA★	OLB	SPARE	OLC★	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	63	NU	42	51★	61,62 63	NU	NU	NU	NU	NU	NU	NU	51	NU	NU
RED		128			101				✻	134										
YELLOW		129			102					135										
GREEN		130			103					136										
RED ARROW																		A114		
YELLOW ARROW						102		132										A115		
FLASHING YELLOW ARROW																		A116		
GREEN ARROW						103		133	133											

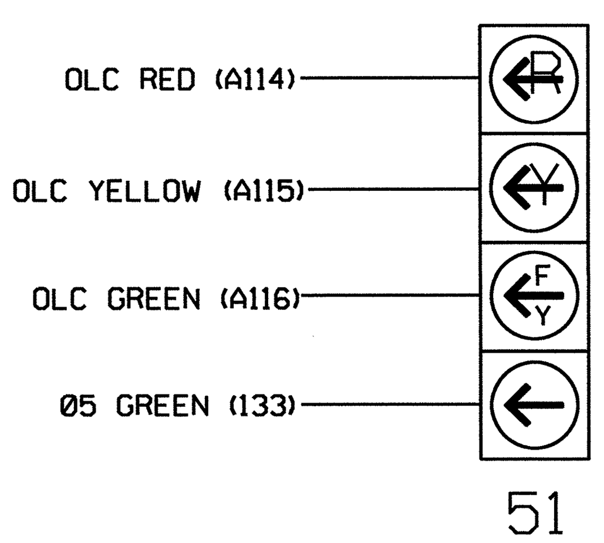
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

NOTE

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

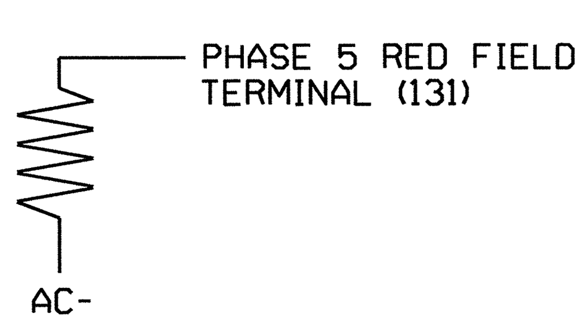
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A,2B	TB2-5,6	I2U	39	3	2		
4A,4B	TB4-9,10	I6U	41	11	4		
5A[1]	TB3-1,2	J1U	55	19	5	10	
	-	I4U	47	7	2		
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Canopy-Heffner
DESIGNED: November 2013
SEALED: 12-19-13
REVISED: N/A

ELECTRICAL DETAIL SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Canopy Lane at Heffner Drive

Division 6 Cumberland County Fort Bragg

PLAN DATE: December 2013 REVIEWED BY: JTR
PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR
SIGNATURE: John T. Rowe, Jr. DATE: 12-19-13

SIG. INVENTORY NO. Temp

19-DEC-2013 14:08
S:*ITS&SU*ITS Signals*Workgroups*Sig Man*Peterson*FortBragg3_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.31

FLASHING YELLOW ARROW
PROTECTED/PERMISSIVE SEQUENCE
for
OVERLAP "C"

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA          PRESS # DESIRED

 1-STARTUP & MISC      6-ALT SEQUENCES
 2-REMOTE FLASH        7-PORT 1 DATA
 3-OVERLAP STANDARD    8-I/O MISC
 4-OVERLAP SPECIAL     9-SIG DRV OUT
 5-RING STRUCTURE

                           F-PRIOR MENU
```

HIT "B" TWICE

DO NOT enter any OVL PHASES! ➡

```
SE-PAC OVERLAP - C                (0-NO/1-YES)

 OVL PHASES:   000000000 0000000
    PHS/CHN:   123456789 0123456789 01234
 OVL CHN(S):   000000000 0000010000 00000


A-UP B-DN D-DspChn   E-EDIT  F-PRIOR MENU
```

OVERLAP PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

PROTECTED & PERMISSIVE PHASES
for
FLASHING YELLOW ARROW

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

```
SE-PAC UNIT DATA          PRESS # DESIRED

 1-STARTUP & MISC      6-ALT SEQUENCES
 2-REMOTE FLASH        7-PORT 1 DATA
 3-OVERLAP STANDARD    8-I/O MISC
 4-OVERLAP SPECIAL     9-SIG DRV OUT
 5-RING STRUCTURE

                           F-PRIOR MENU
```

```
SE-PAC OVLP.A...B...C...D...E...F...G...H.
   TR GRN   0   0   0   0   0   0   0   0
   YEL/10  40  40  40  40  40  40  40  40
   RED/10  20  20  20  20  20  20  20  20
   -G/Y     0   0   5   0   0   0   0   0   ⬅ PROTECTED PHASES
   +GRN     0   0   6   0   0   0   0   0   ⬅ PERMISSIVE PHASES

(-) #-PH G/Y KILLS OVLP= (+) #-PH G STRT
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU
```

NOTE: THIS PROGRAMMING IS REQUIRED FOR SIGNAL HEAD 51 SO THAT THE SOLID GREEN ARROW TURNS ON EXCLUSIVELY DURING PROTECTED GREEN PHASE 5, AND THE FLASHING YELLOW ARROW ONLY TURNS ON EXCLUSIVELY DURING PERMITTED GREEN PHASE 6.

PPLT DEFINITION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Canopy-Heffner
DESIGNED: November 2013
SEALED: 12-19-13
REVISED: N/A

ELECTRICAL DETAIL SHEET 2 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Canopy Lane at Heffner Drive

Division 6 | Cumberland County | Fort Bragg

PLAN DATE: December 2013 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE | DATE 12-19-13

SIG. INVENTORY NO. Temp

19-DEC-2013 14:10
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jpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.32

PHASING DIAGRAM

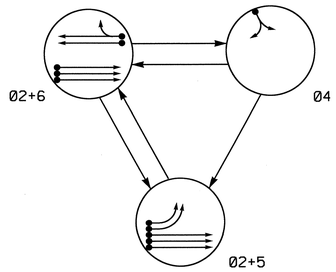
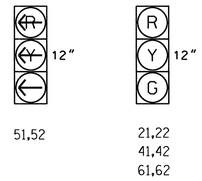


TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø4	FLASH
21,22	G	G	R	Y
41,42	R	R	G	R
51,52	←R	←R	←R	←R
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A,2B,2C	6X6	70	4	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	+25	2-4-2	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
6A,6B	6X6	300	4	Y	6	Y	Y	-	1.6	-	-	Y
6C,6D	6X6	90	4	Y	6	Y	Y	-	-	-	-	Y

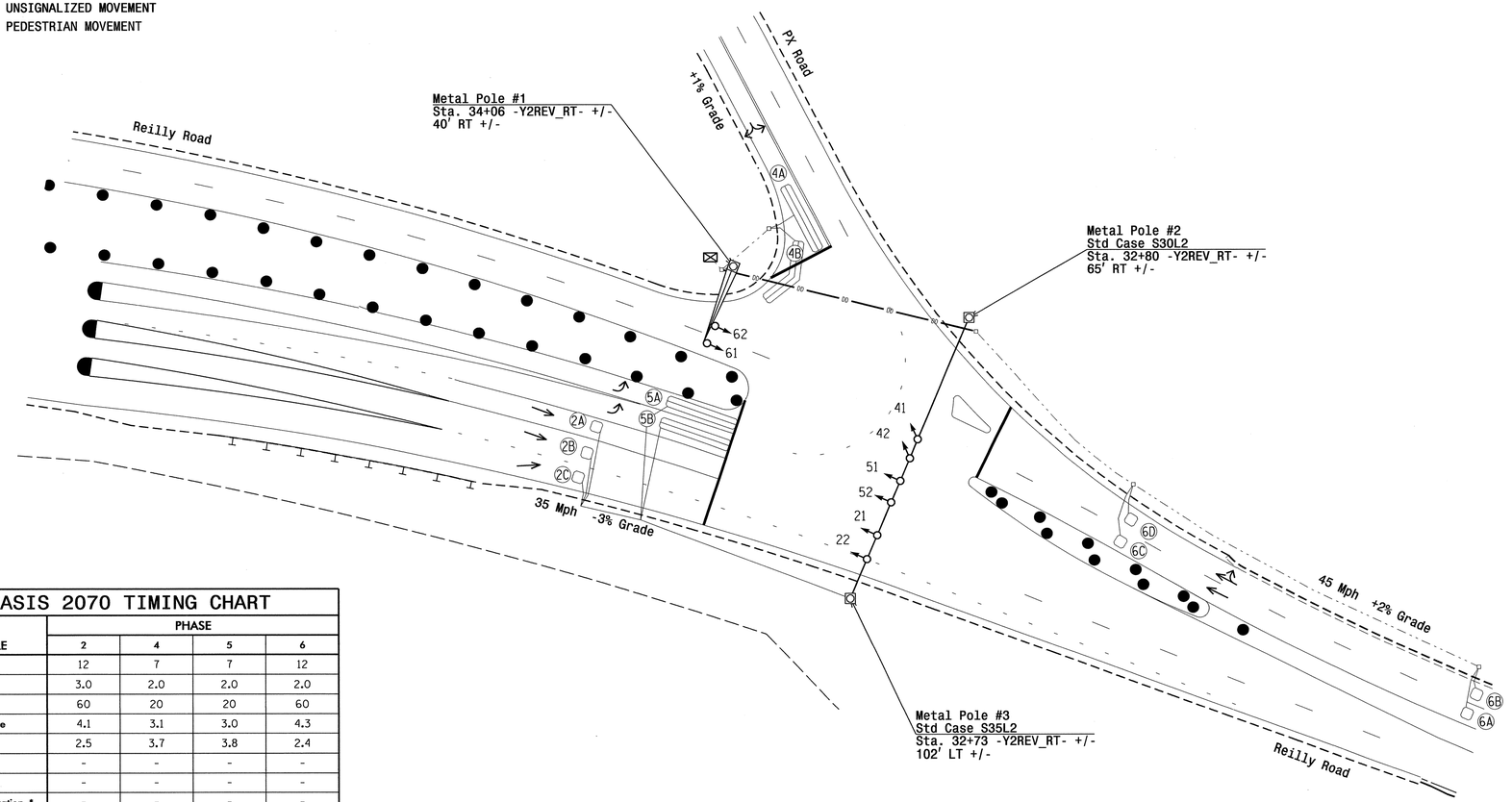
3 Phase
Fully Actuated
Ft. Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	12	7	7	12
Extension 1 *	3.0	2.0	2.0	2.0
Max Green 1 *	60	20	20	60
Yellow Clearance	4.1	3.1	3.0	4.3
Red Clearance	2.5	3.7	3.8	2.4
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

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

New Installation (Phase IIB & IIC)

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

Reilly Road
At
PX Road

Cumberland County Ft. Bragg

PLAN DATE:	April 2014	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON P. GALLOWAY
SIGNATURE 4/28/14 DATE
SIG. INVENTORY NO. Temp 1

29-APR-2014 15:28
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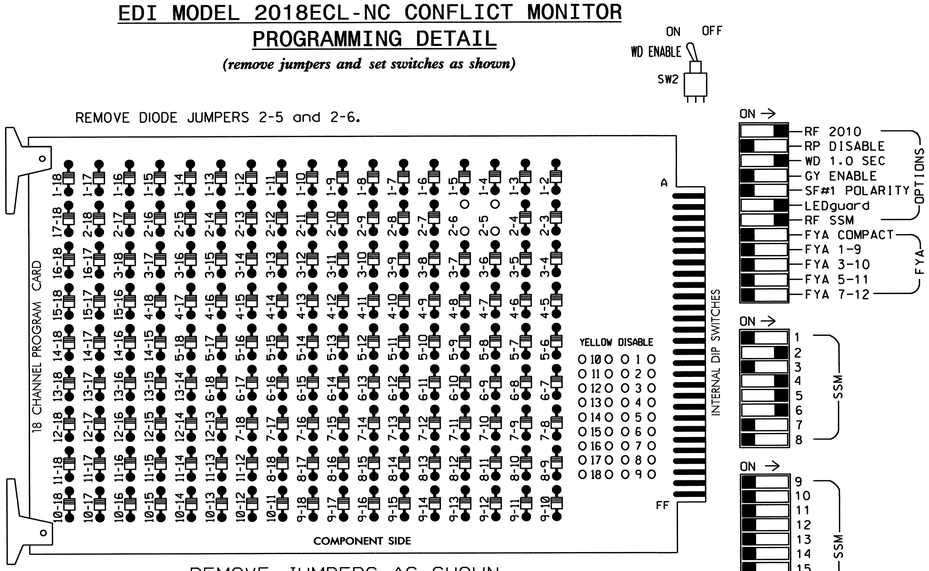
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.33

EDI MODEL 2018ECL-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. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Start Up In Green.
4. Program phases 2 and 6 for Yellow Flash.
5. The cabinet and controller are part of the Fort Bragg Signal System.

EQUIPMENT INFORMATION

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

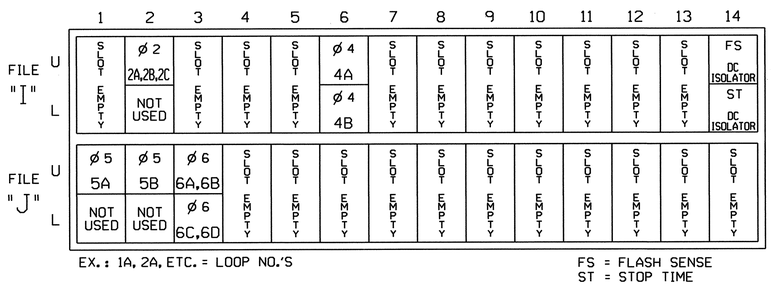
SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B,2C	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
6A,6B	TB3-9,10	J3U	64	26	36	6	Y	Y		1.6	
6C,6D	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-PX Templ
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

Reilly Road at PX Road

Division 6 | Cumberland County | Ft. Bragg

PLAN DATE: April 2014 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR

SIGNATURE | DATE 4-29-14

SIG. INVENTORY NO. Templ

28-APR-2014 14:19
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.3

PHASING DIAGRAM

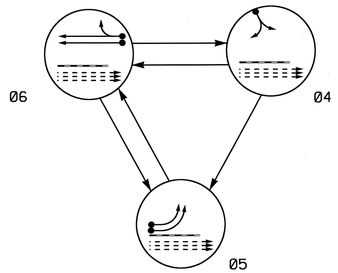
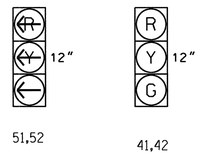


TABLE OF OPERATION				
SIGNAL FACE	PHASE 05	PHASE 02	PHASE 04	FLASH
41,42	R	R	G	R
51,52	~~←~~	~~R~~	~~R~~	~~R~~
61,62	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	-
4B	6X40	+25	2-4-2	Y	4	Y	Y	-	-	10	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
6A,6B	6X6	300	4	Y	6	Y	Y	-	1.6	-	-	-
6C,6D	6X6	90	4	Y	6	Y	Y	-	-	-	-	-

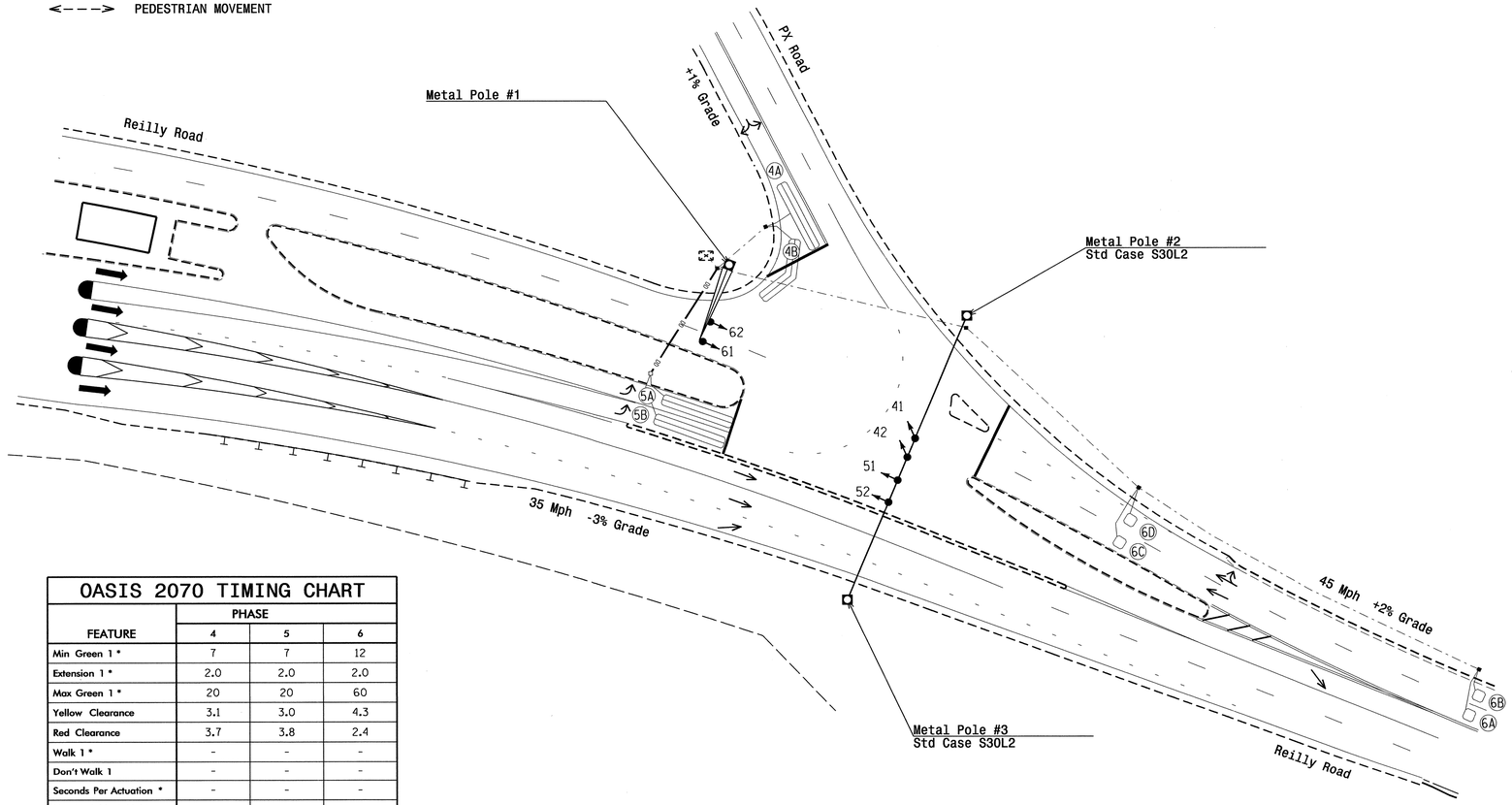
3 Phase
Fully Actuated
Ft. Bragg Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND

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



OASIS 2070 TIMING CHART			
FEATURE	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	7	7	12
Extension 1 *	2.0	2.0	2.0
Max Green 1 *	20	20	60
Yellow Clearance	3.1	3.0	4.3
Red Clearance	3.7	3.8	2.4
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	-	-	MIN RECALL
Vehicle Call Memory	-	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

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

LEGEND

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

New Installation (Final)

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

Reilly Road
At
PX Road

Cumberland County — Ft. Bragg

PLAN DATE:	April 2014	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON P. GALLOWAY
SIGNATURE 4/28/14 DATE
SIG. INVENTORY NO. Final

29-APR-2014 15:31
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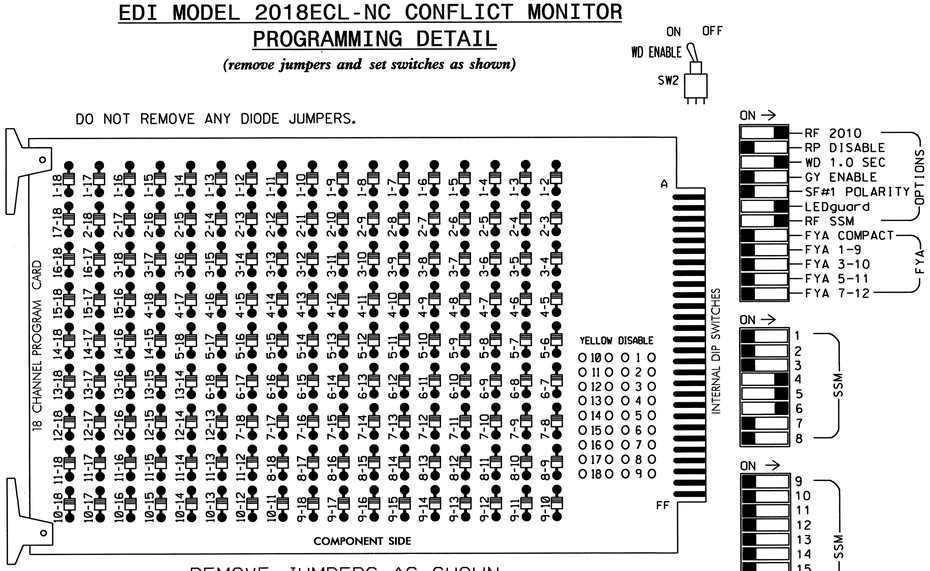
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 35

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Start Up In Green.
4. Program phase 6 for Yellow Flash.
5. The cabinet and controller are part of the Fort Bragg Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S5,S7,S8
PHASES USED.....4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NU	NU	NU	41,42	NU	51,52	61,62	NU	NU	NU	NU
RED					101			134				
YELLOW					102			135				
GREEN					103			136				
RED ARROW							131					
YELLOW ARROW							132					
GREEN ARROW							133					

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

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

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.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
6A,6B	TB3-9,10	J3U	64	26	36	6	Y	Y		1.6	
6C,6D	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Reilly-PX
DESIGNED: April 2014
SEALED: 4-28-14
REVISED: N/A

Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

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

750 N.Greenfield Pkwy,Garner,NC 27529

Reilly Road at PX Road

Division 6 | Cumberland County | Ft. Bragg

PLAN DATE: April 2014 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE John T. Rowe Jr. DATE 4-28-14

SIG. INVENTORY NO. Final

28-APR-2014 12:02
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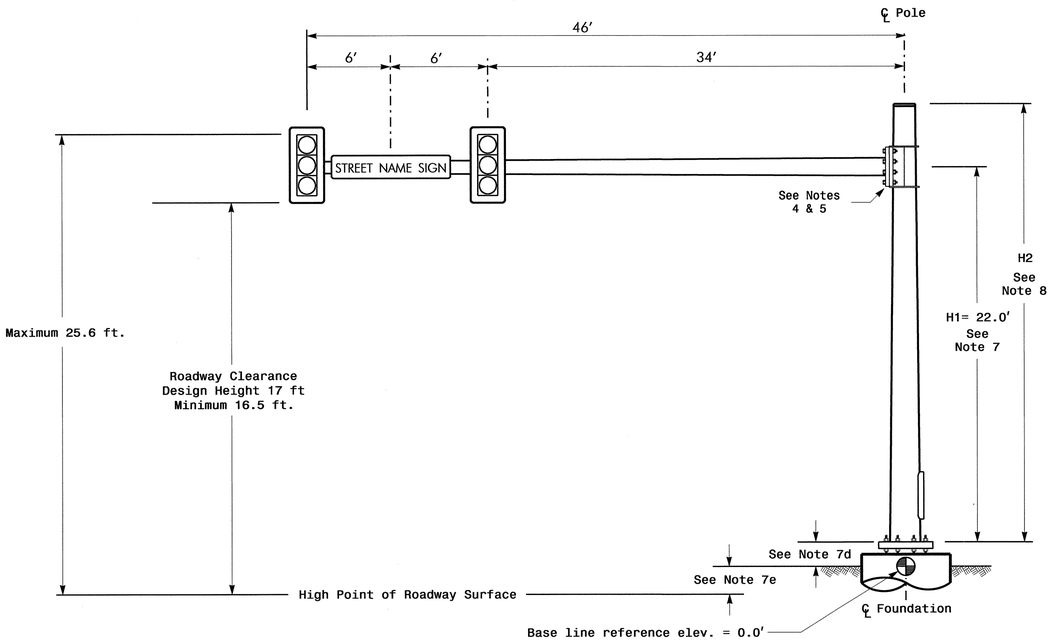
$USERNAME

Design Loading for METAL POLE NO. 1



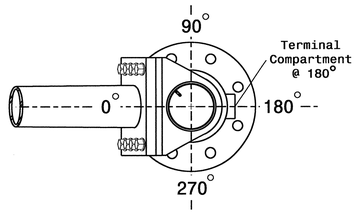
Elevation View

SPECIAL NOTE

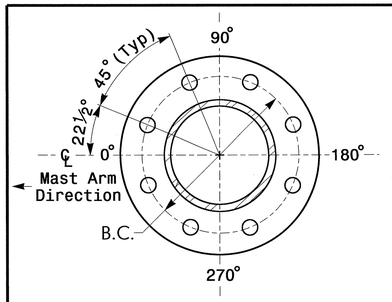
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	N/A
Elevation difference at High point of roadway surface	+3.5 ft.	N/A
Elevation difference at Edge of travelway or face of curb	N/A	N/A

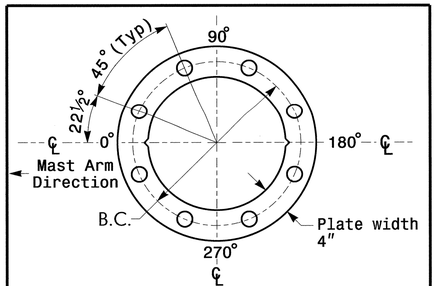


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.36

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12″–5 SECTION–WITH BACKPLATE AND ASTRO–BRAC	16.3 S.F.	42.0″ W X 56.0″ L	103 LBS
	SIGNAL HEAD 12″–4 SECTION–WITH BACKPLATE AND ASTRO–BRAC	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	SIGNAL HEAD 12″–3 SECTION–WITH BACKPLATE AND ASTRO–BRAC	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	SIGN RIGID MOUNTED WITH ASTRO–SIGN–BRAC	5.0 S.F.	24.0″ W X 30.0″ L	11 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO–SIGN–BRAC	16.0 S.F.	24.0″ W X 96.0″ L	36 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 5th Edition 2009 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2012 NCDOT Roadway Standard Drawings.
   - The traffic signal project plans and special provisions.
   - The NCDOT "Metal Pole Standards" located at the following NCDOT website: https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the ITS and Signals Structural Engineer for assistance at (919) 661-4830.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 3 (110 mph)

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

Metal Pole Loading for
Reilly Road
At
PX Road
Onslow County Ft. Bragg

PLAN DATE:	April 2014	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 29904 ENGINEER JASON P. GALLOWAY

SIGNATURE 4/24/14 DATE

SIG. INVENTORY NO. N/A

24-APR-2014 10:55
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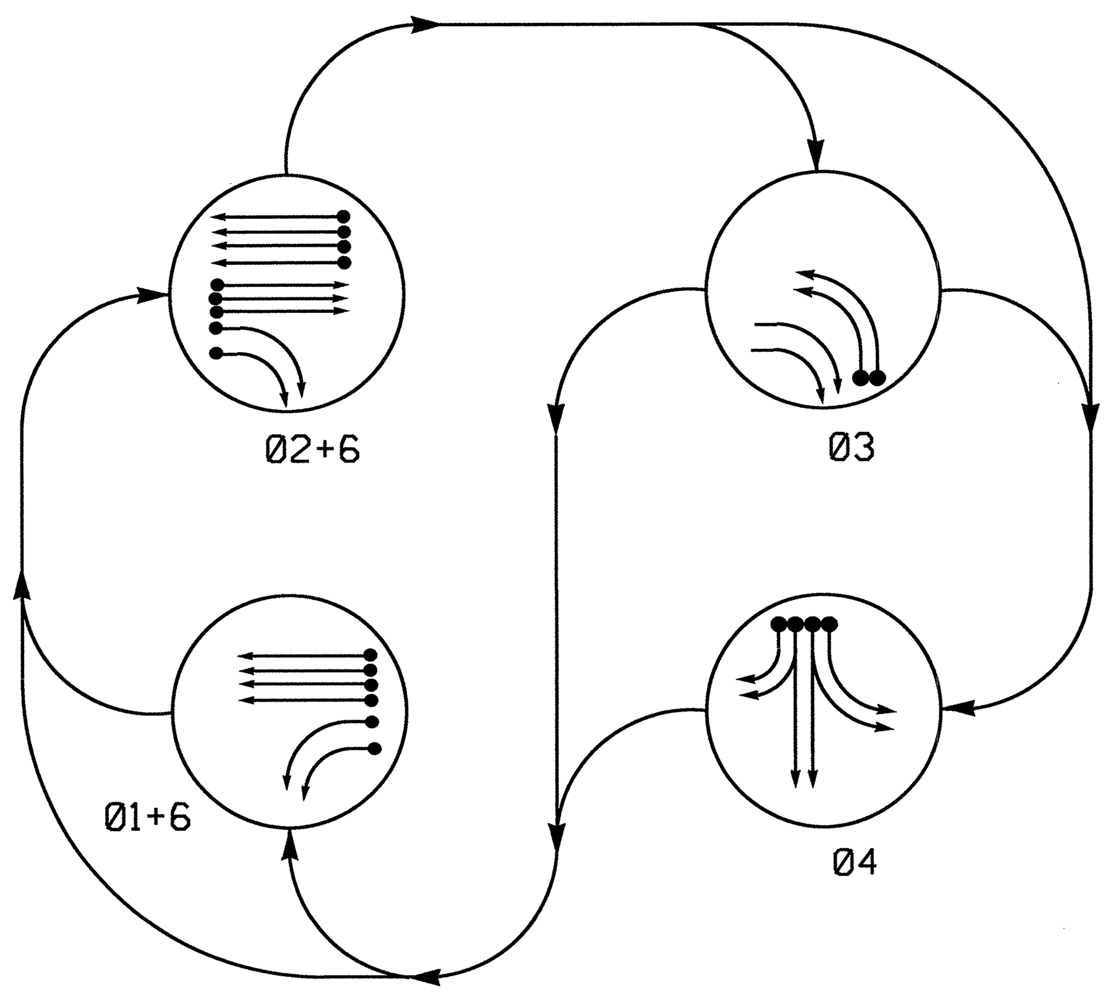
jgalloway

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

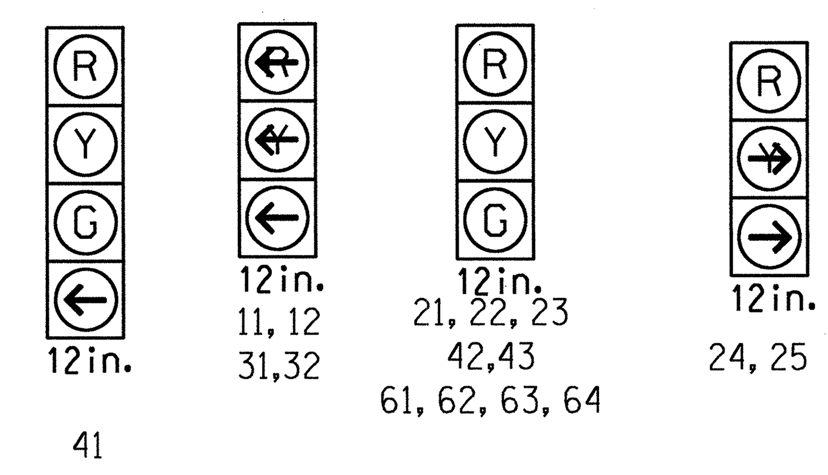
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø3	Ø4	FLASH
11,12	←	←R	←R	←R	←R
21,22,23	R	G	R	R	Y
24,25	R	→	→	R	→Y
31,32	←R	←R	←	←R	←R
41	R	R	R	G←	R
42,43	R	R	R	G	R
61,62,63,64	G	G	R	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

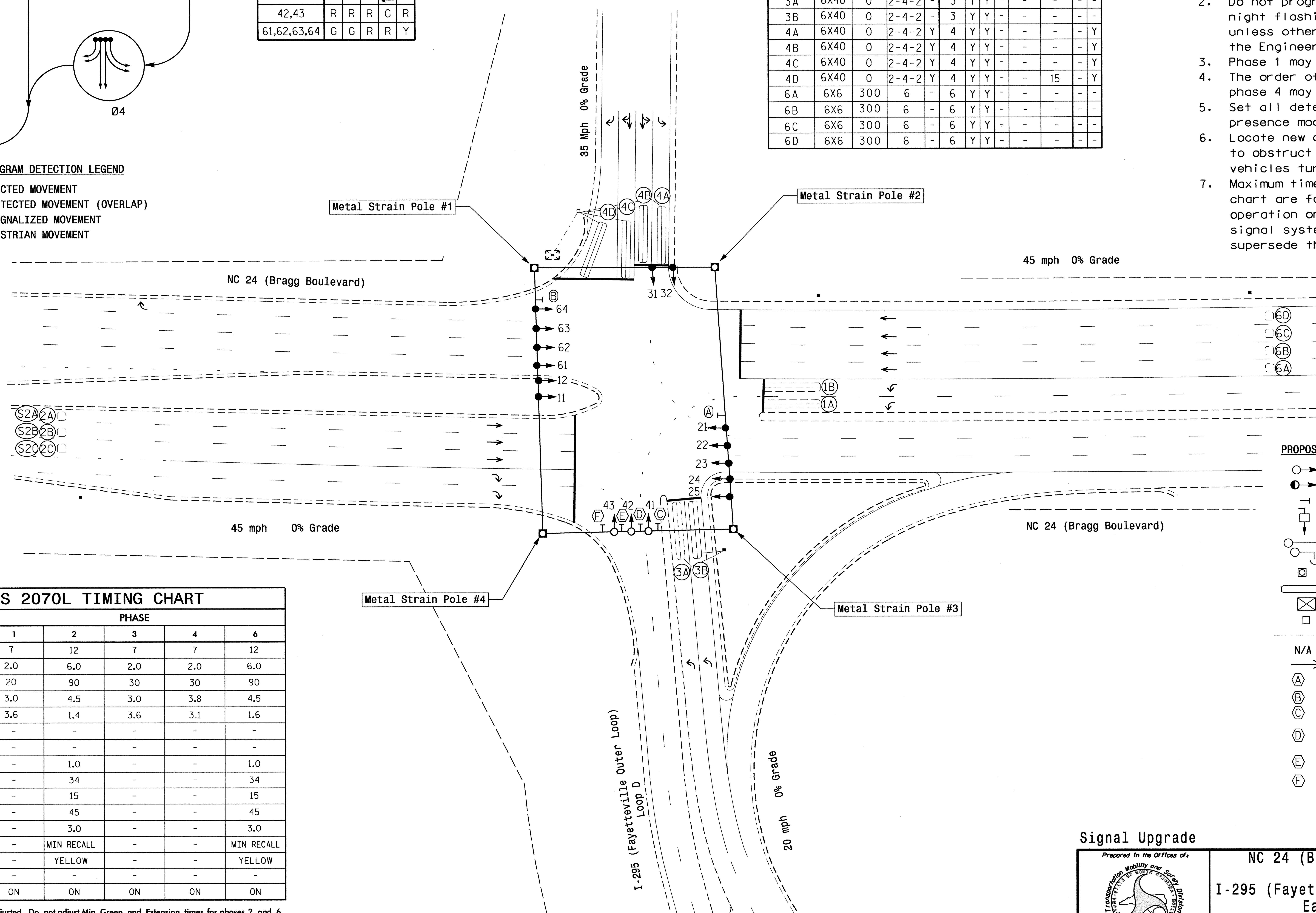
INDUCTIVE LOOPS: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	-
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	-
2A/S2A	6X6	300	6	-	2	Y	Y	-	-	-	Y	-
2B/S2B	6X6	300	6	-	2	Y	Y	-	-	-	Y	-
2C/S2C	6X6	300	6	-	2	Y	Y	-	-	-	Y	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
3B	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4D	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6C	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6D	6X6	300	6	-	6	Y	Y	-	-	-	-	-

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.37

4 Phase
Fully Actuated
Fayetteville Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated Janaury 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. 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 so as not to obstruct sight distance of vehicles turning right on red.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2in. Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	No Left Turn Sign (R3-2)	A
B	No Right Turn Sign (R3-1)	B
C	Left Arrow "ONLY" Sign (R3-5L)	C
D	Combined Through and Left Arrow Sign (R3-6L)	D
E	Combined Through and Right Arrow Sign (R3-6R)	E
F	Right Arrow "ONLY" Sign (R3-5R)	F

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	6
Min Green 1 *	7	12	7	7	12
Extension 1 *	2.0	6.0	2.0	2.0	6.0
Max Green 1 *	20	90	30	30	90
Yellow Clearance	3.0	4.5	3.0	3.8	4.5
Red Clearance	3.6	1.4	3.6	3.1	1.6
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	1.0	-	-	1.0
Max Variable Initial *	-	34	-	-	34
Time Before Reduction *	-	15	-	-	15
Time To Reduce *	-	45	-	-	45
Minimum Gap	-	3.0	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

19-DEC-2013 14:50
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jgalloway

Signal Upgrade

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

SCALE 0 40
1"=40'

NC 24 (Bragg Boulevard) At I-295 (Fayetteville Outer Loop) Eastbound

Division 6 Cumberland County Fayetteville

PLAN DATE:	December 2013	REVIEWED BY:	PLA
PREPARED BY:	JPG	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 29904 JASON R. GALLOWAY

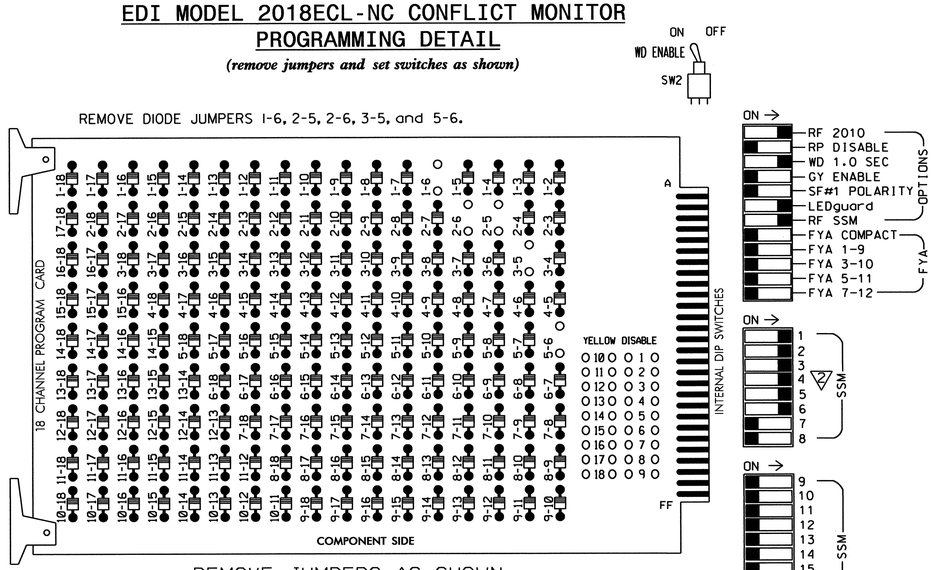
SIGNATURE 12/19/13 DATE

SIG. INVENTORY NO. 06-1301

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 36

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phases 2 and 6 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Fayetteville Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8
PHASES USED.....1,2,3,4,6
OVERLAP C.....2+3

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	OLC	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12	21, 22,23	NU	31,32	41	42,43	NU	24,25	61,62, 63,64	NU	NU	NU	NU
RED		128			101	101		131	134				
YELLOW		129			102	102			135				
GREEN		130			103	103			136				
RED ARROW	125			116									
YELLOW ARROW	126			117				132					
GREEN ARROW	127			118	103			133					

NU = Not Used

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:                 |123456789101112131415 16
 VEH OVL PARENTS:       | XX
 VEH OVL NOT VEH:       |
 VEH OVL NOT PED:       |
 VEH OVL GRN EXT:       |
 STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
 FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
 SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC).........0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)....5
```

OVERLAP PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø2/SYS 2A/S2A	Ø2/SYS 2C/S2C	SLOT EMPTY	Ø3 3A	Ø4 4A	Ø4 4C	SLOT EMPTY	Ø1 1A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	SLOT EMPTY	Ø2/SYS 2B/S2B	NOT USED	SLOT EMPTY	Ø3 3B	Ø4 4B	Ø4 4D	SLOT EMPTY	Ø1 1B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	Ø6 6C	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	SLOT EMPTY	Ø6 6B	Ø6 6D	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB6-9,10	I9U	60	22	11	1	Y	Y			
1B	TB6-11,12	I9L	62	24	13	1	Y	Y			
2A/S2A	TB2-5,6	I2U	39	1	2	2/SYS	Y	Y			
2B/S2B	TB2-7,8	I2L	43	5	12	2/SYS	Y	Y			
2C/S2C	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
3B	TB4-7,8	I5L	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			
4D	TB6-3,4	I7L	78	40	44	4	Y	Y			15
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
6D	TB3-11,12	J3L	77	39	46	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1301
DESIGNED: December 2013
SEALED: 12-19-13
REVISED: N/A

REVISION SEAL

NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

John T Rowe 12-20-13
SIGNATURE DATE

Electrical Design

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

NC 24 (Bragg Boulevard) at I-295 (Fayetteville Outer Loop) Eastbound

Division 6 | Cumberland County | Fayetteville

PLAN DATE:	May 2012	REVIEWED BY:	T. Joyce
PREPARED BY:	C. Strickland	REVIEWED BY:	

REVISIONS	INIT.	DATE
Added signal heads and loops: revised monitor. (WSA)	JTR	11/1/13
Added phase 4. (JP)	JTR	12-20-13

SEAL

Not a certified document as to the Original Document but Only as to the Revisions - This document originally issued and sealed by George C. Brown, #022013, on 5/18/12. This document is only certified as to the revisions.

SIGNATURE DATE

SIG. INVENTORY NO. 06-1301

20-DEC-2013 09:05
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JPpeterson

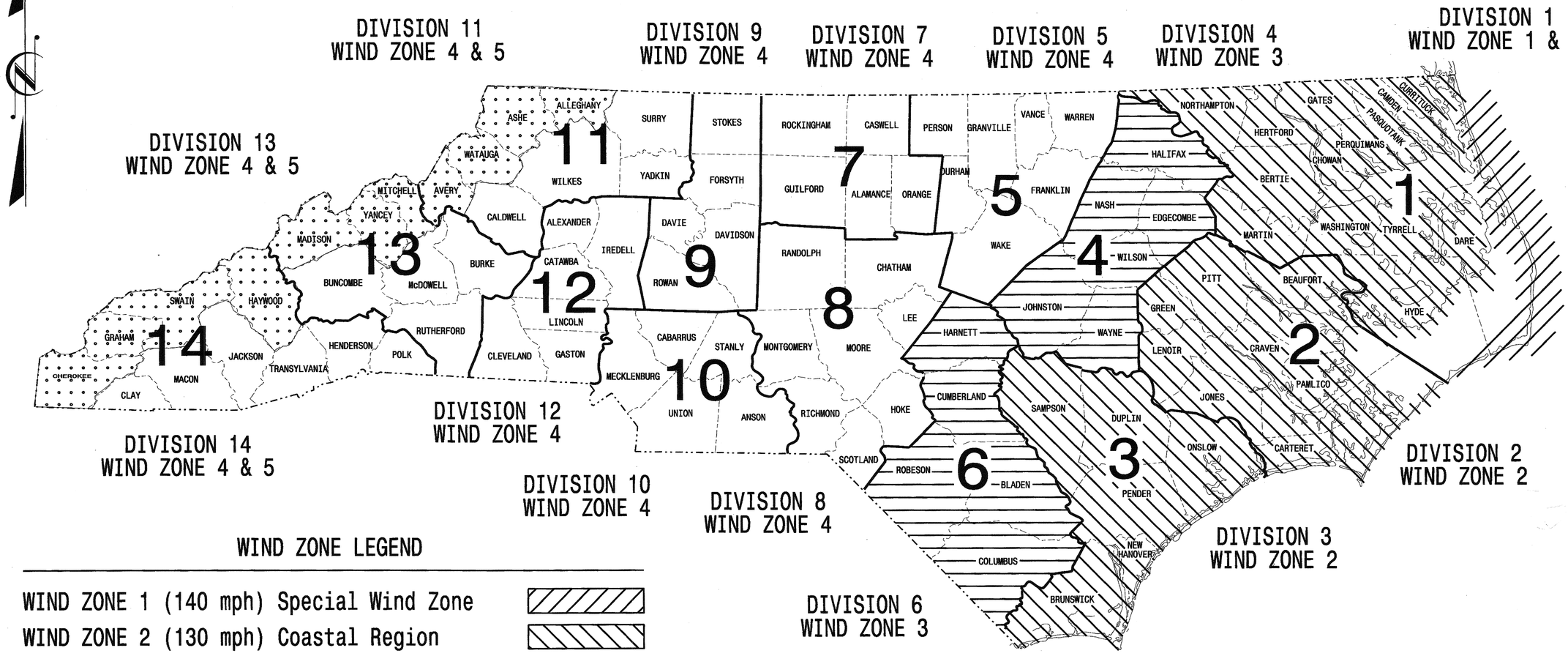
STATE	PROJECT NO.	SHEET NO.
N.C.	U-2519CB	Sig. 39
F. A. PROJ. NO.		M 1
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES

POLE STANDARDS

NCDOT METAL P



WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone	
WIND ZONE 2 (130 mph) Coastal Region	
WIND ZONE 3 (110 mph) Eastern Region	
WIND ZONE 4 (90 mph) Central & Mtn. Region	
WIND ZONE 5 (120 mph) Special Wind Zone	

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

Prepared In the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·
Signal Design Section

750 N.Greenfield Pkwy.Garner,NC 27529

Designed in conformance with the latest 2012 Interim to the 5th Edition 2009

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminares, and Traffic Signals

INDEX OF PLANS

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

G. A. FULLER, P.E. – STATE ITS AND SIGNALS ENGNEER

G. G. MURR, JR., P.E. – STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

C.F. ANDREWS – ITS AND SIGNALS JOURNEY STRUCTUIRAL ENGINEER

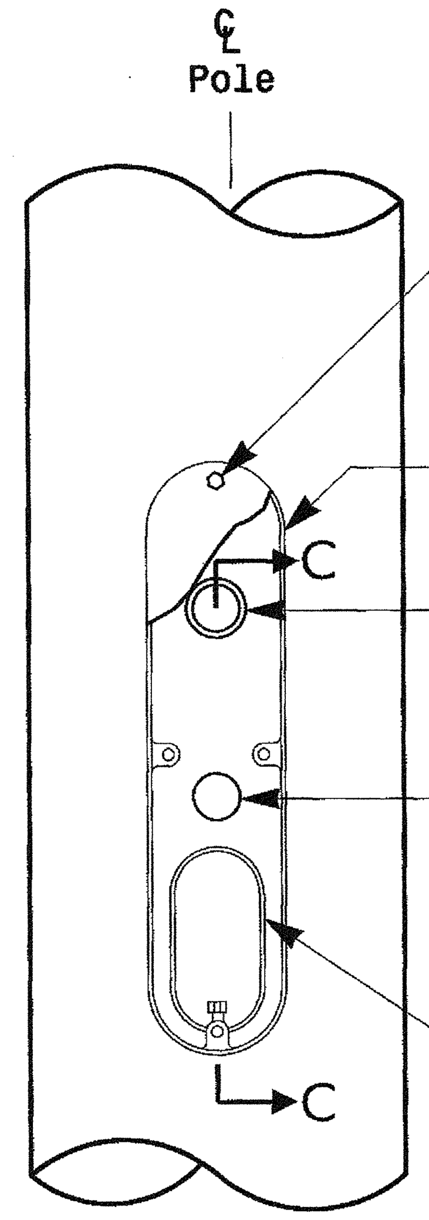
SEAL

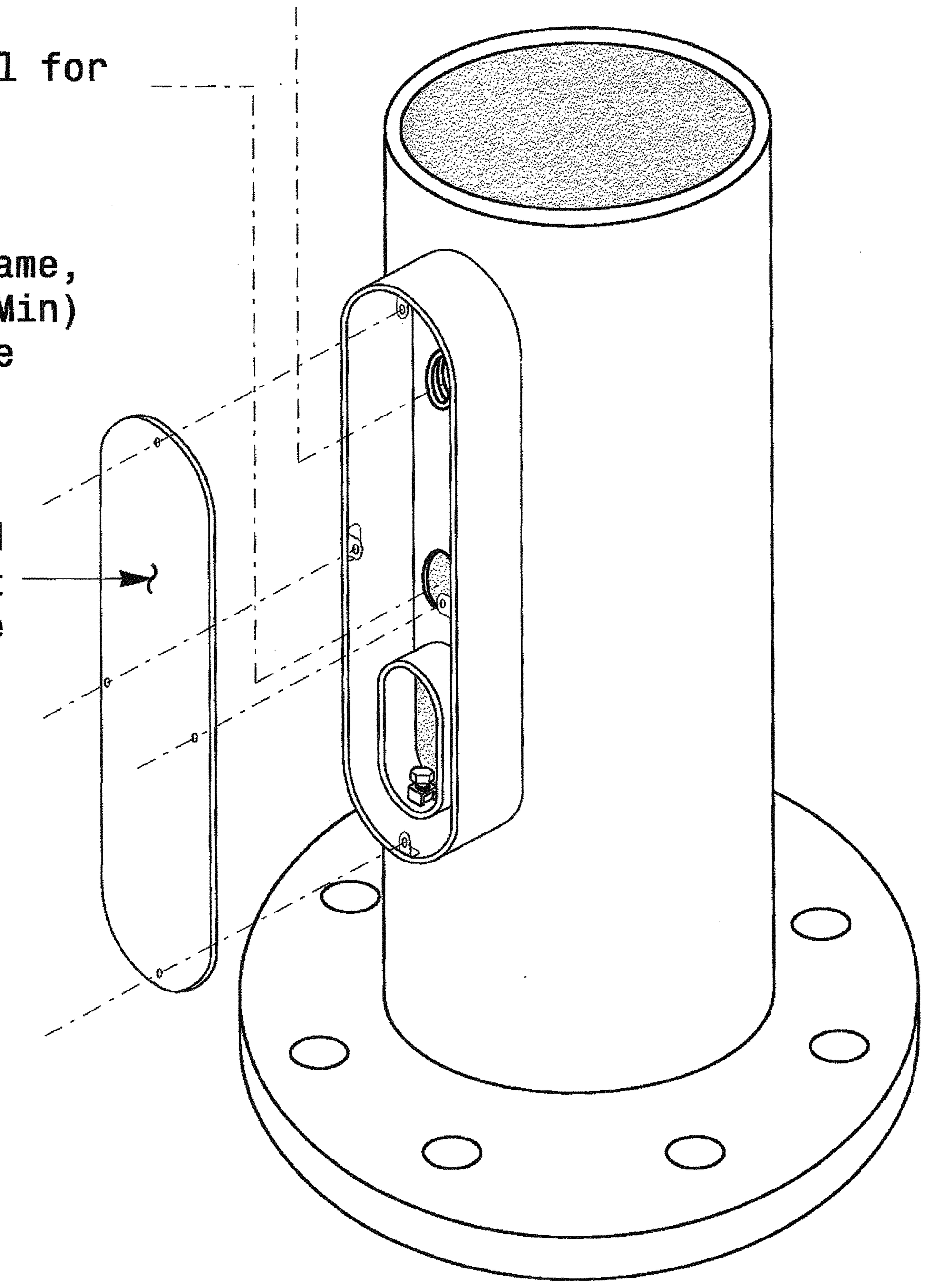
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

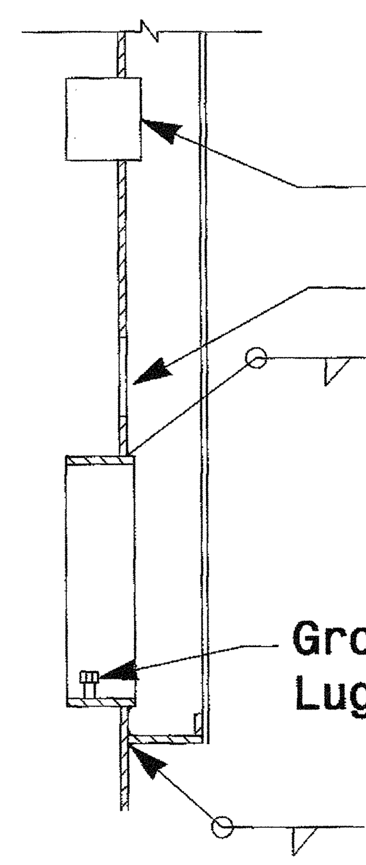
D. Sarkar 8.7.2013
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.40 M 2

Fabrication Details - All Poles



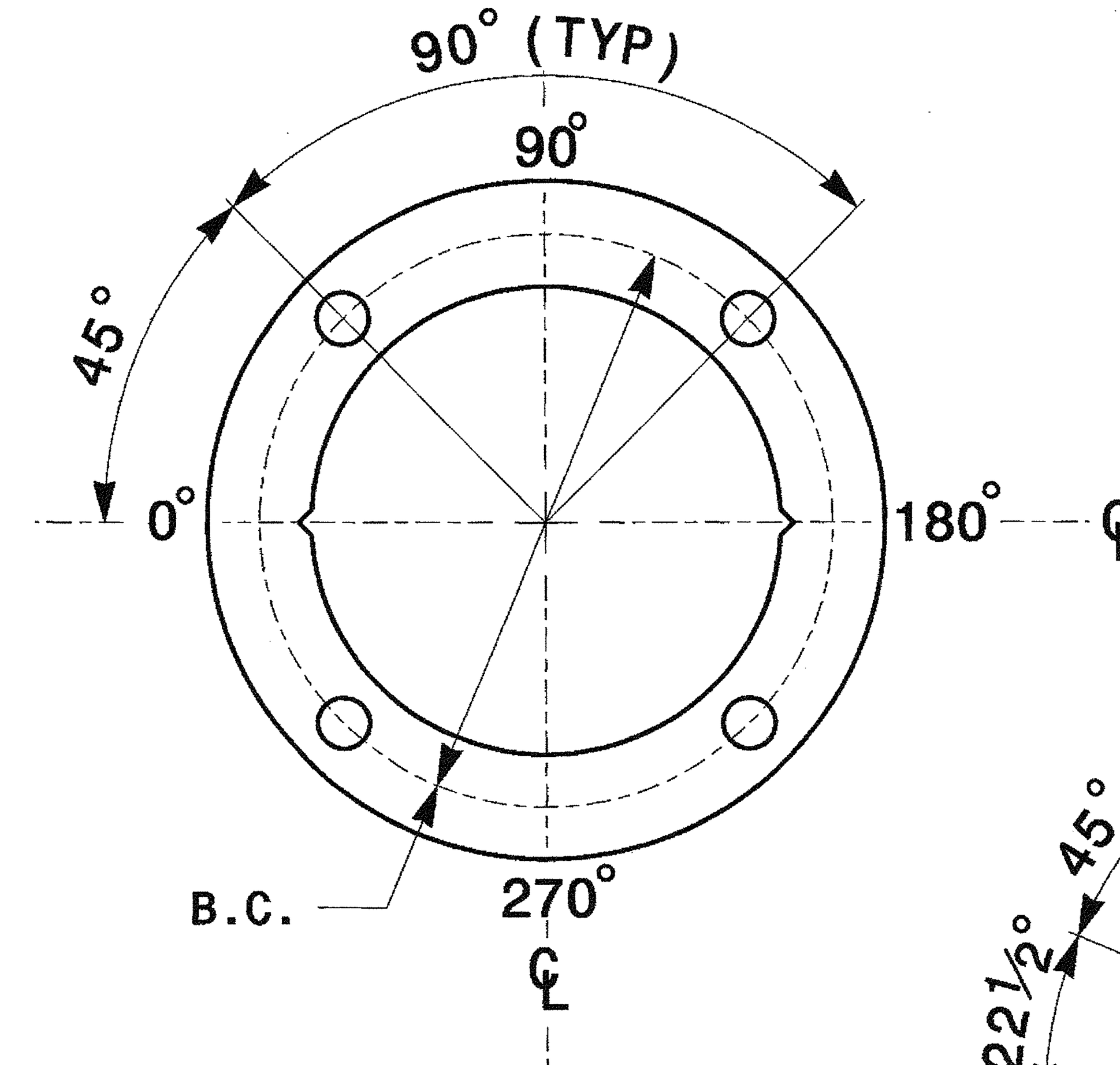




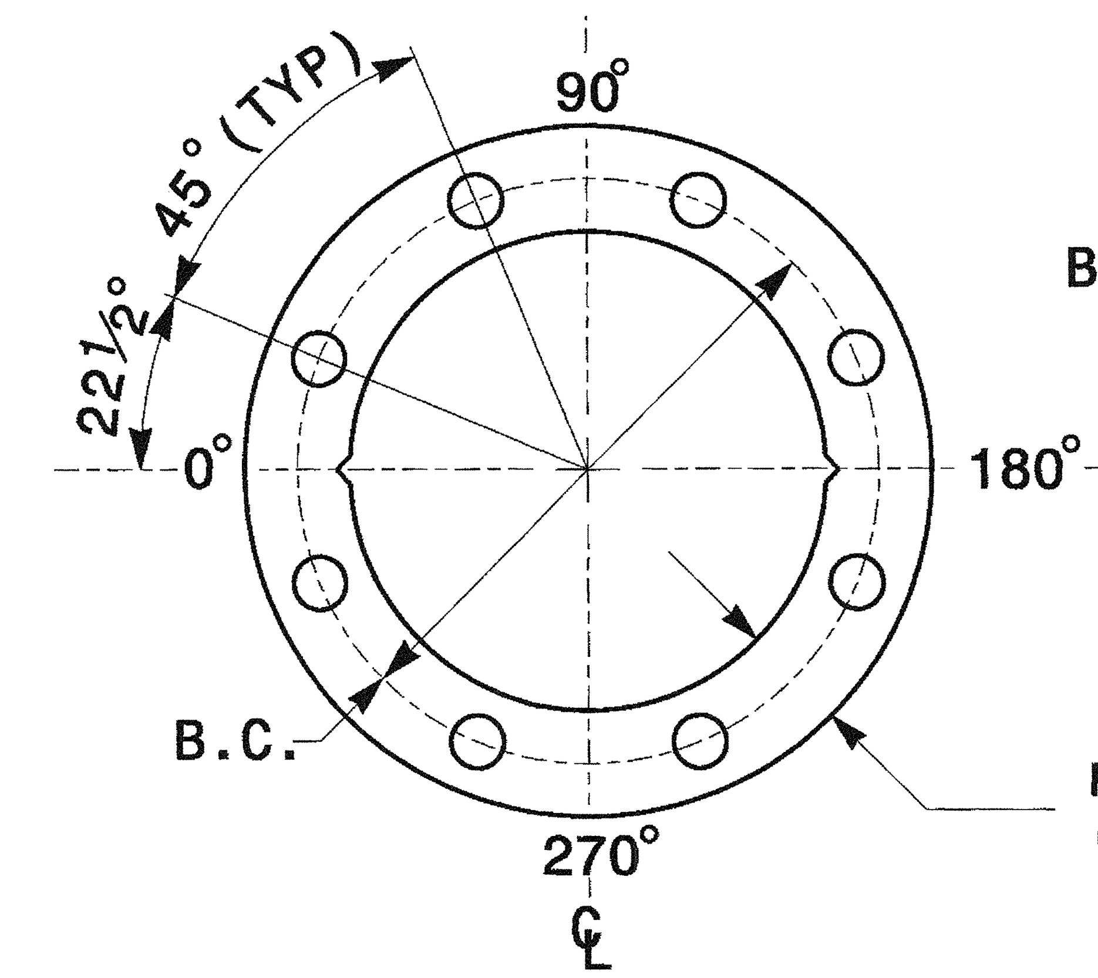
Section C-C

Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

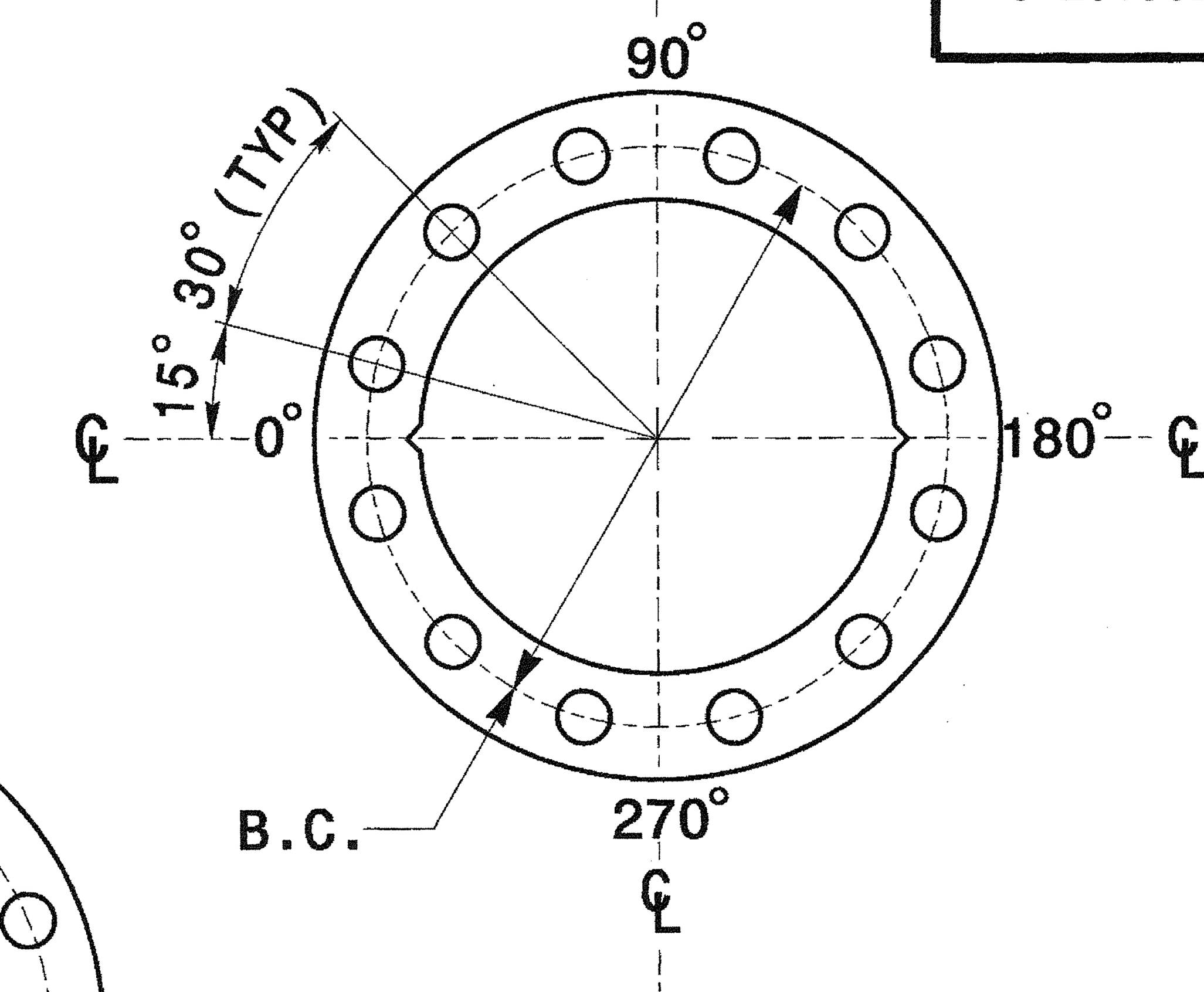
Terminal Compartment Detail



4 Bolt Pattern



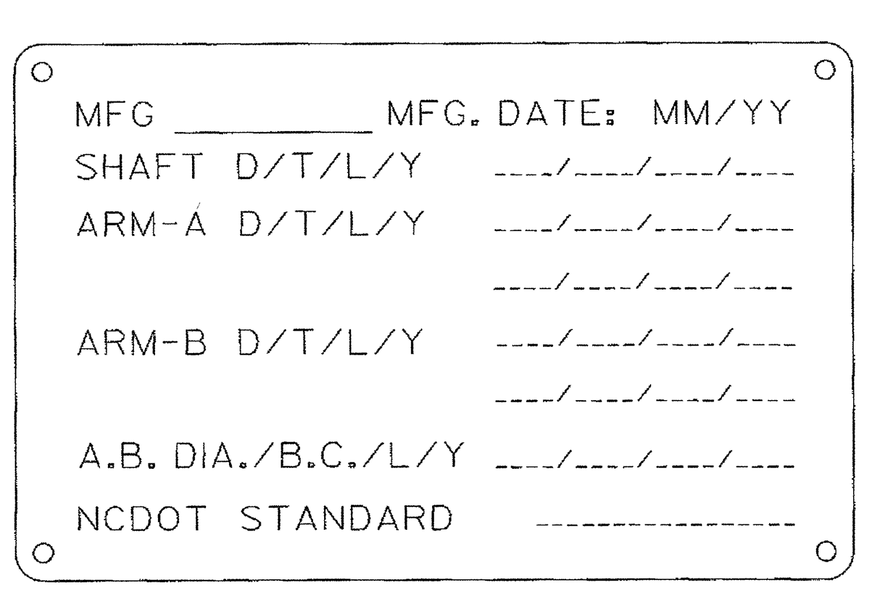
8 Bolt Pattern



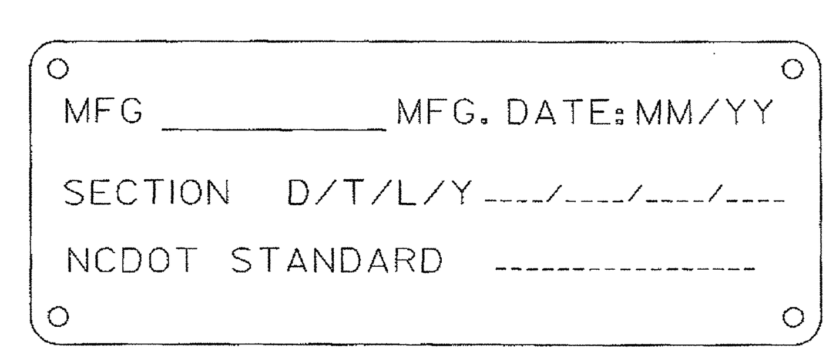
12 Bolt Pattern

Construct Templates and Plates from ¼" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

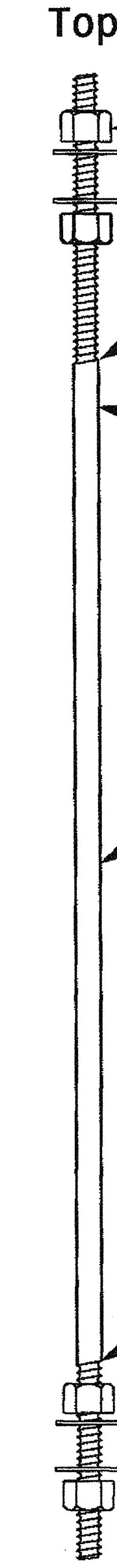


Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for pole I.D. number and Signal Inv. Number.
5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details

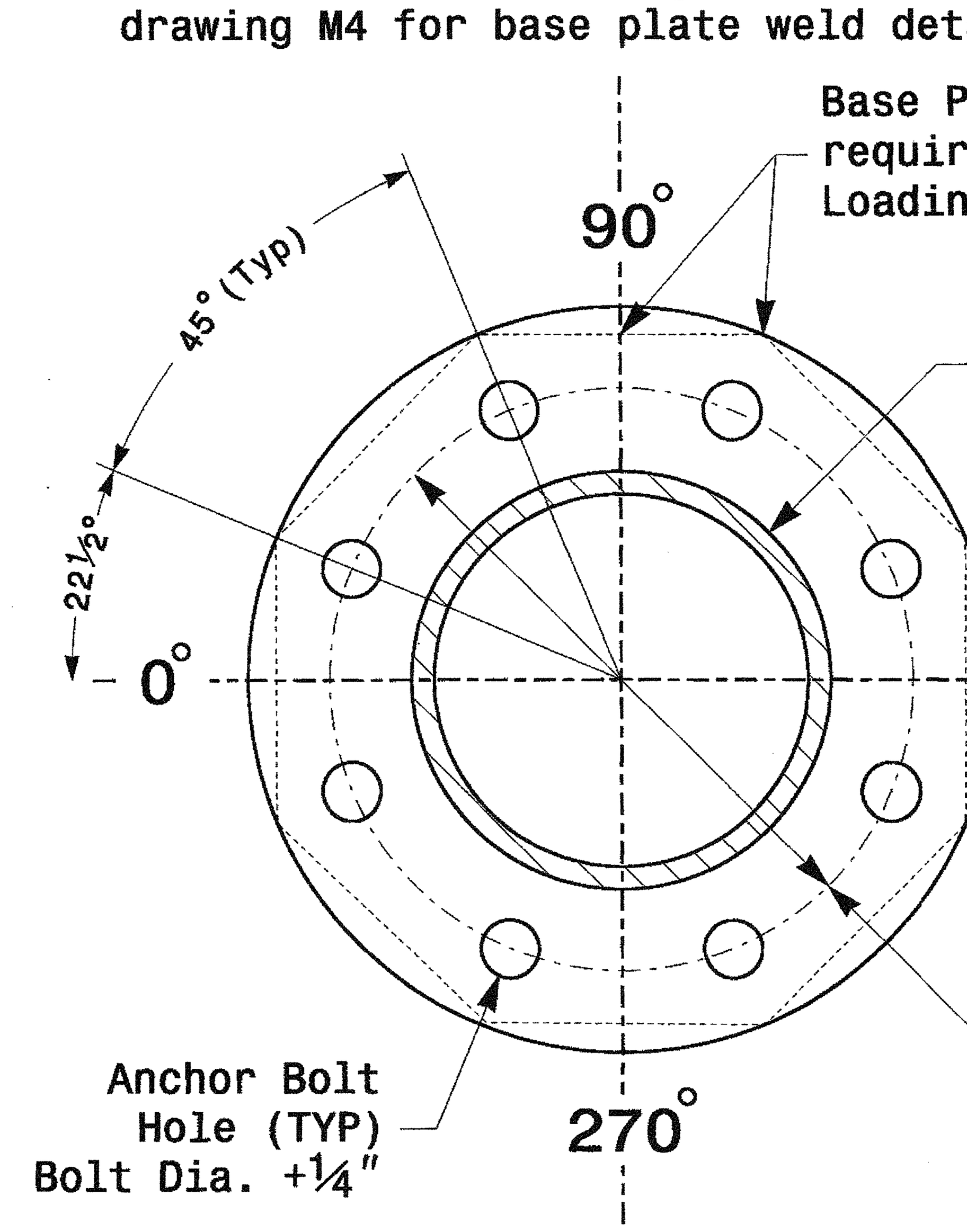
Top



Bottom

Anchor Bolt Detail

Note: See Strain Pole drawing M3 and Mast arm drawing M4 for base plate weld details.



8 Bolt Base Plate Detail

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

Typical Fabrication Details
Common To
All Metal Poles

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE
0 NA
NONE

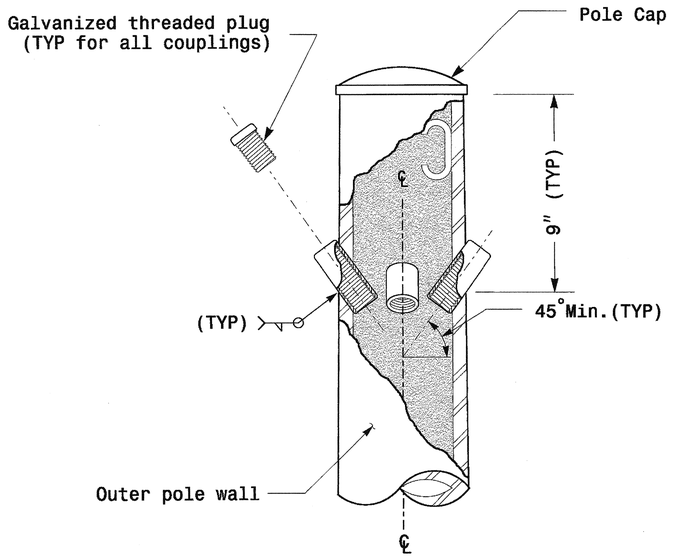
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

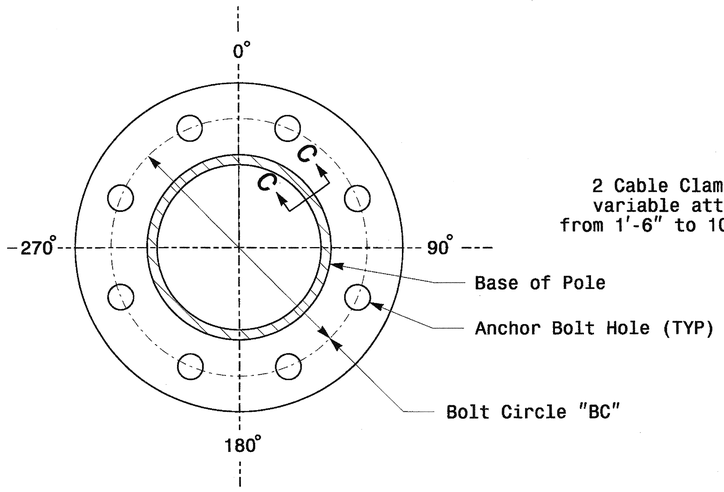
D. Sarkar 8-7-2013
SIGNATURE DATE
SIG. INVENTORY NO.

07-AUG-2013 13:15
S:*ITS&SU*ITS Signals*Workgroups*Structures*Drawings*2012 Standard Strain Pole Dwgs*2012 m2.dgn
nbitting

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.41 M 3



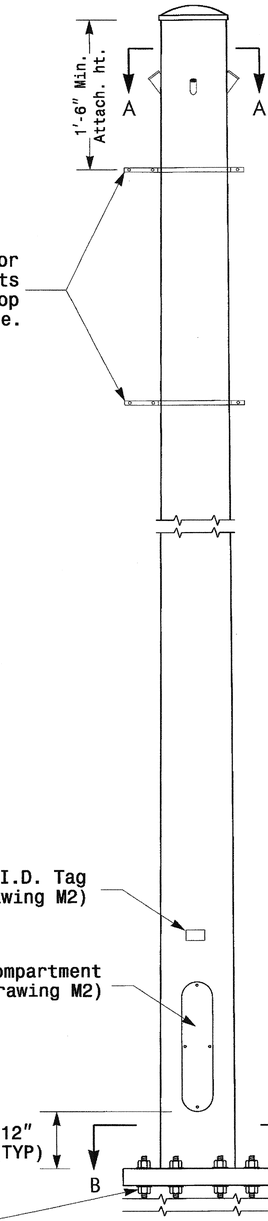
Cable Entrances at Top of Pole



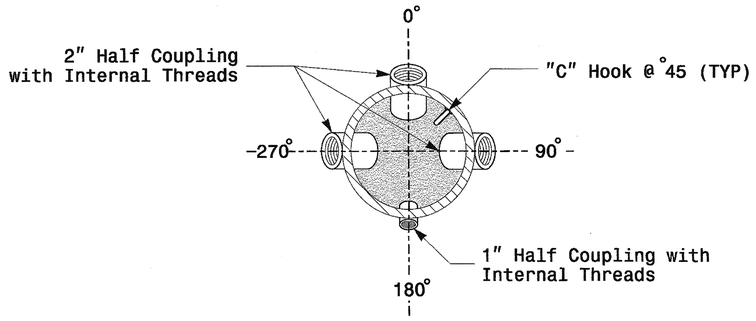
Section B-B

(See drawing M2)

Pole Base Plate

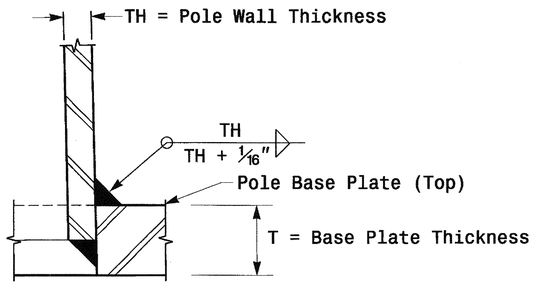


Monotube Strain Pole
(.14"/Foot Taper)



Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C

Socket Connection Weld Detail

Fabrication Details – Strain Poles

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

Typical Fabrication Details For Strain Poles

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DIBESH C. SARKAR

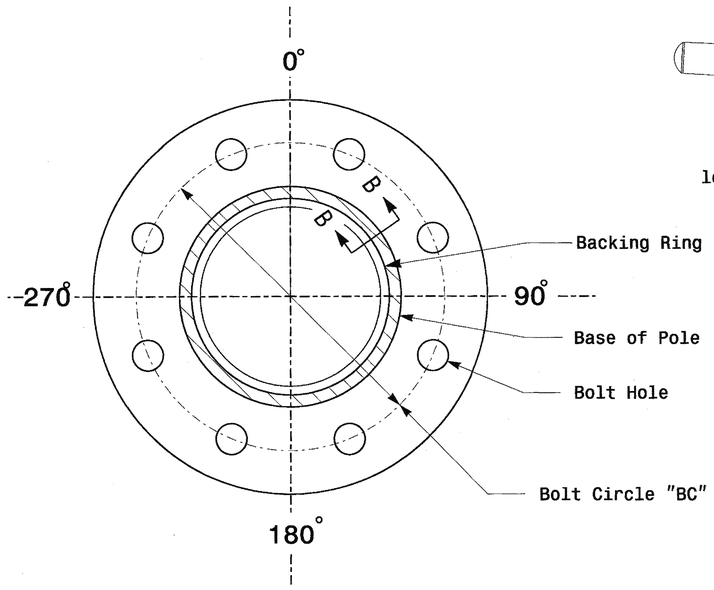
D.Sarkar 8.7.2013
SIGNATURE DATE

SIG. INVENTORY NO.

07-AUG-2013 13:11
S:\eITSSGU#ITS Signals#Workgroups#Structures#Drawings#2012 Standard Strain Pole Dwgs#2012 m3.dgn
dbaltrop

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.42 M 4

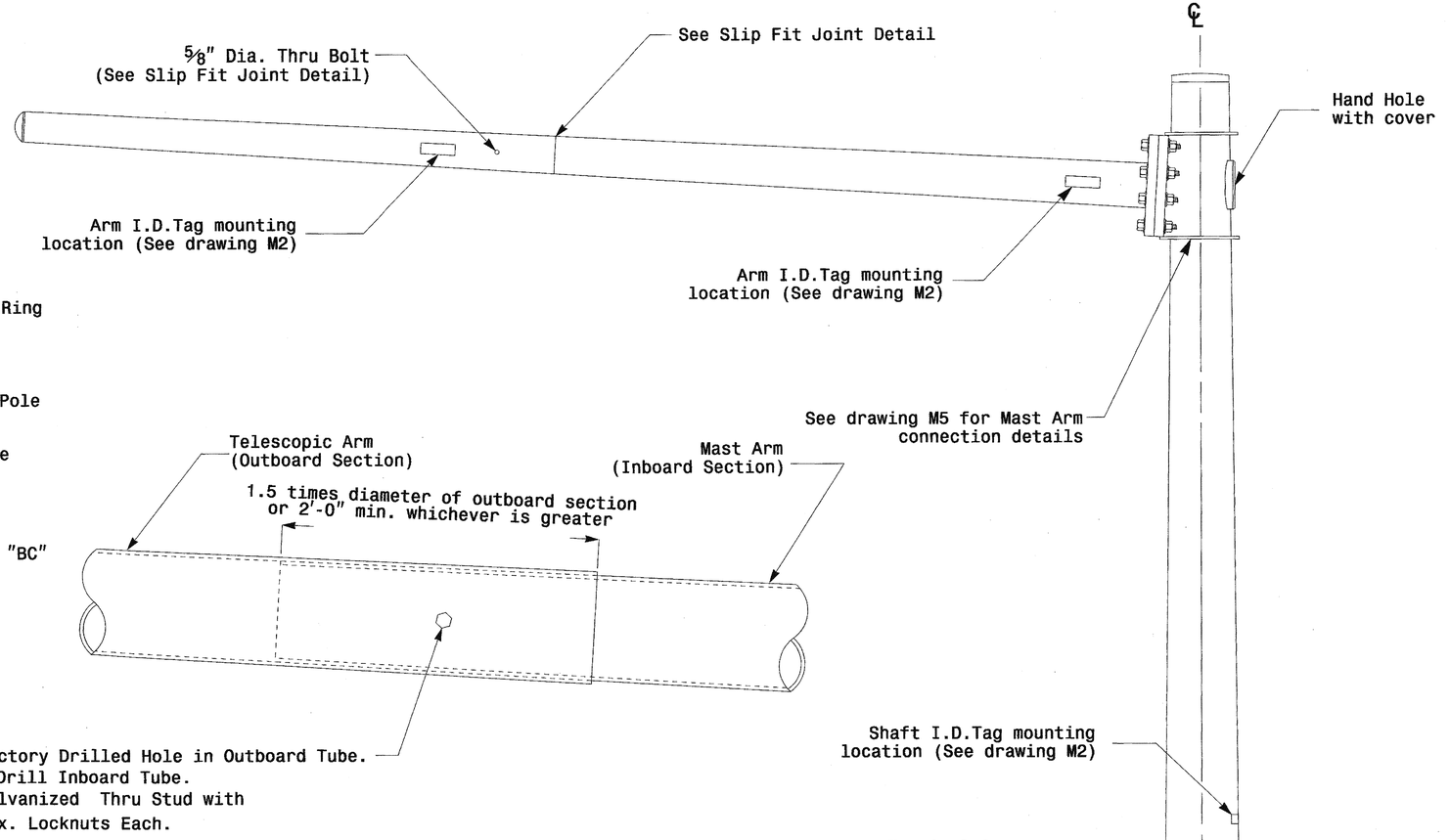
Fabrication Details – Mast Arm Poles



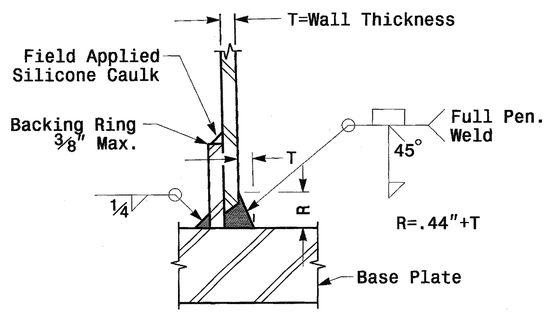
Section A-A

(See drawing M 2)

Pole Base Plate



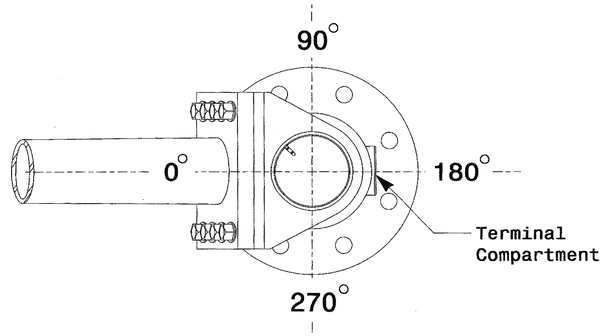
Slip Fit Joint Detail for Mast Arm



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

Monotube Mast Arm Pole
(.14in./ft. taper)

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

Typical Fabrication Details for Mast Arm Poles

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS | INIT. | DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBASISH C. SARKAR

D. Sarkar 8.7.2013
SIGNATURE DATE

SIG. INVENTORY NO.

07-AUG-2013 13:35
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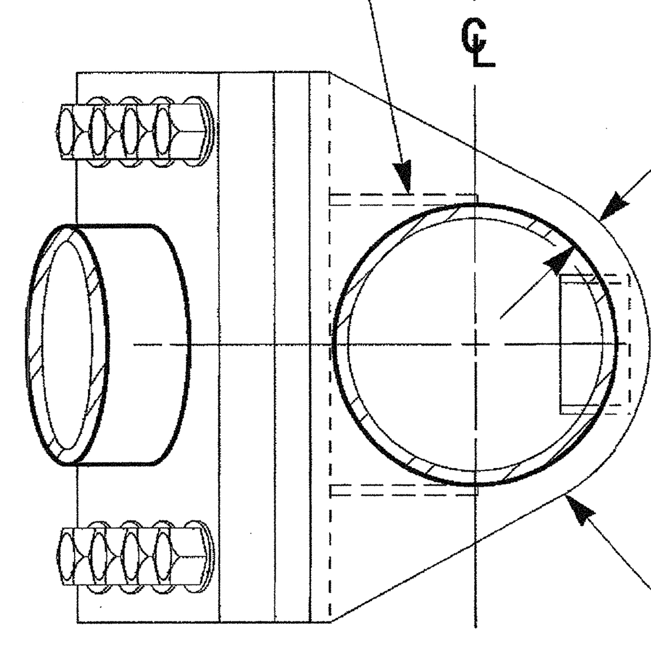
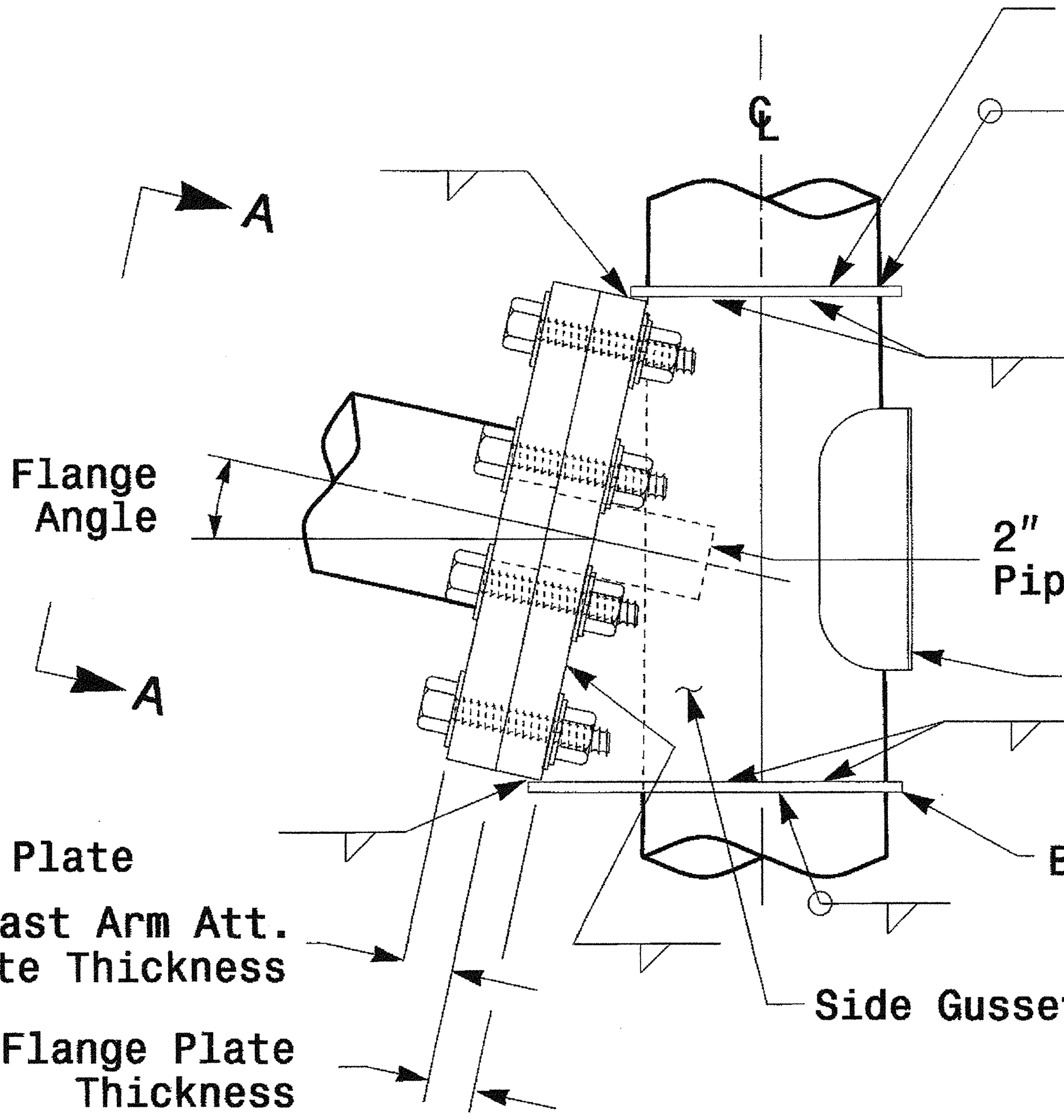
nbitting

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig. 43 M 5

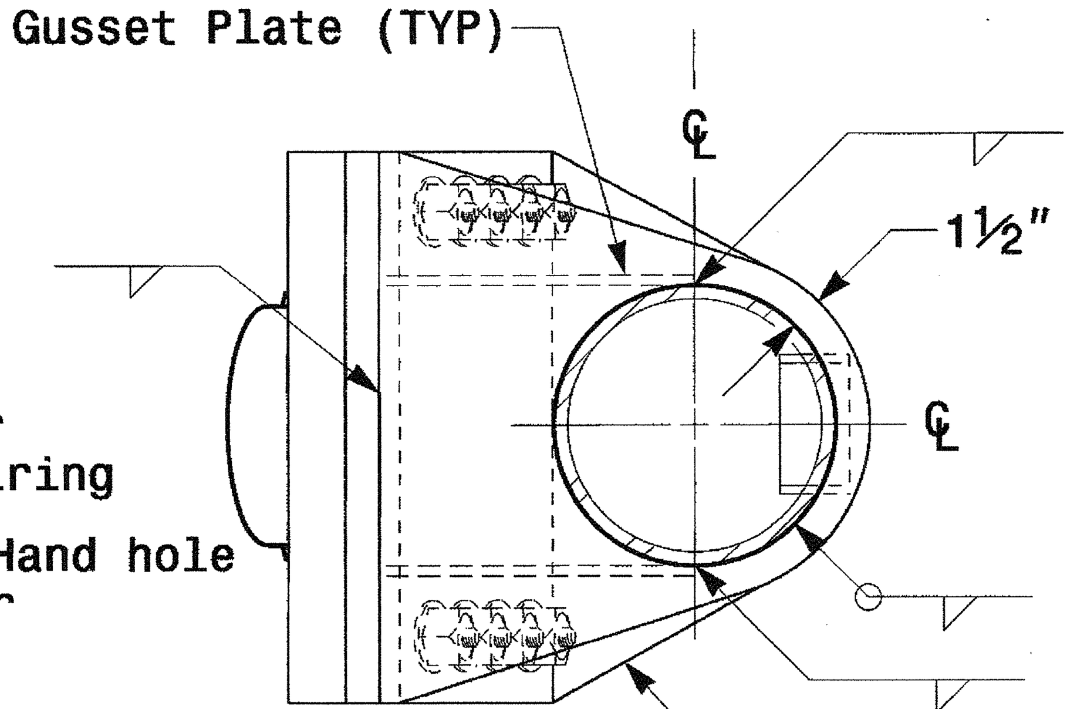
Welded Ring Stiffened Mast Arm Connection



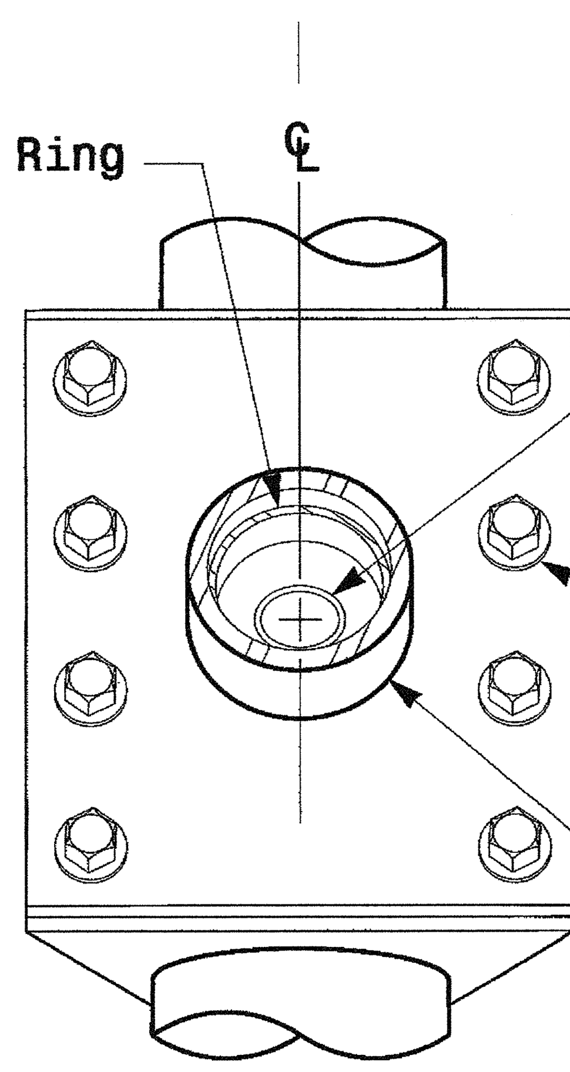
Plan View



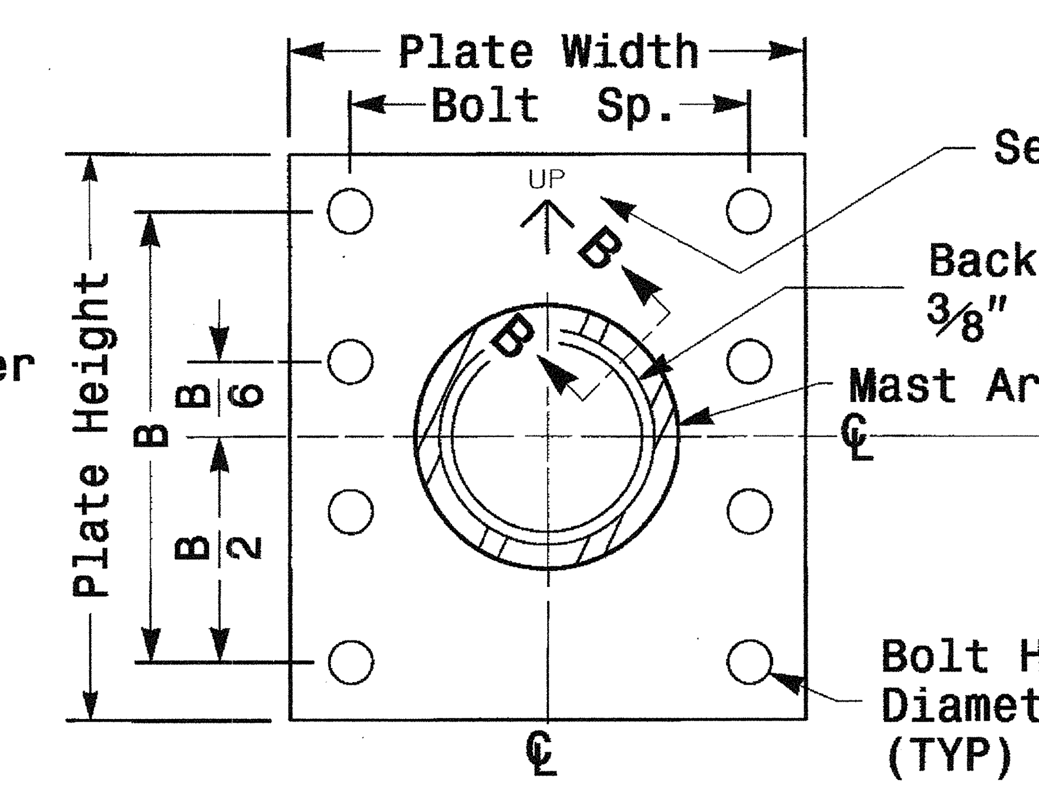
Side Elevation View



Bottom View

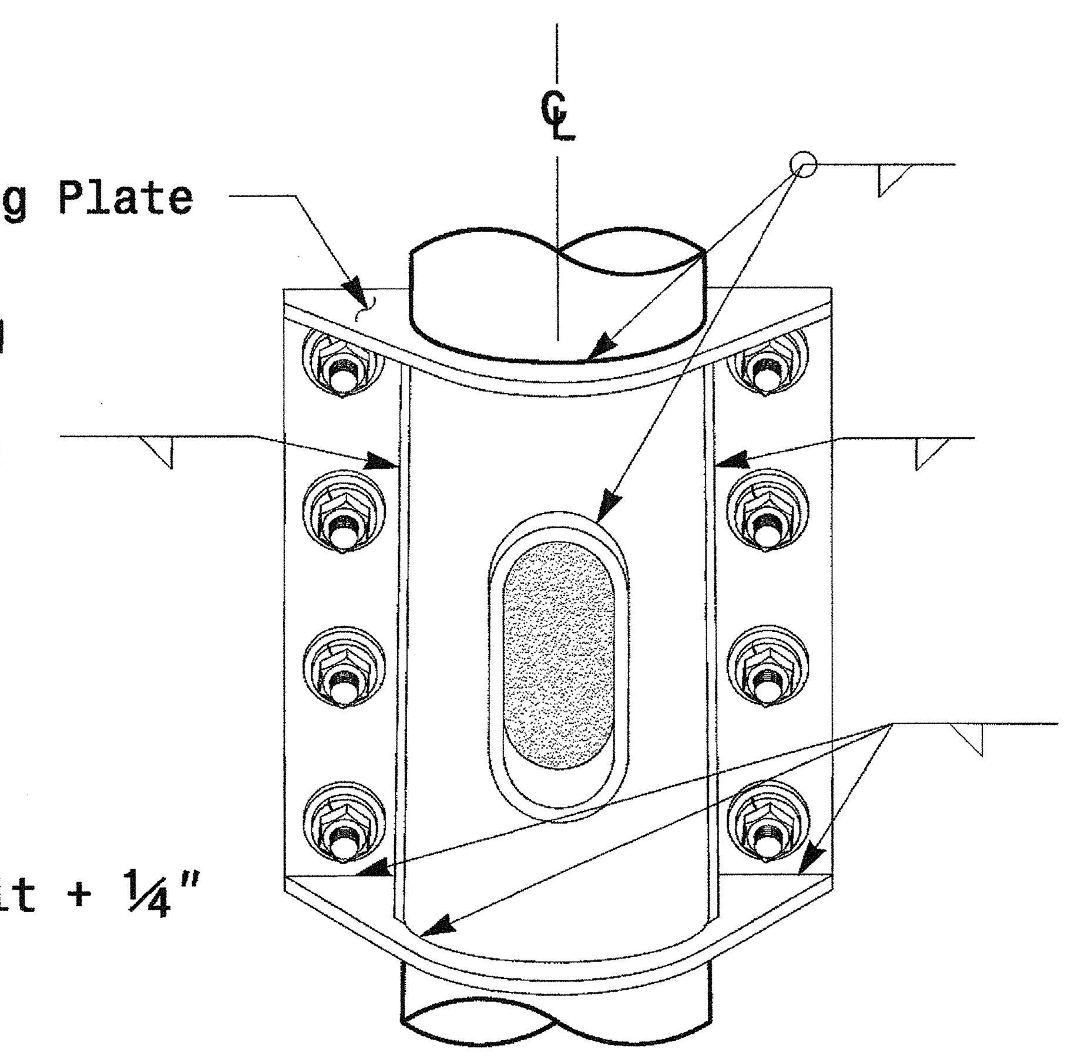


Front Elevation View

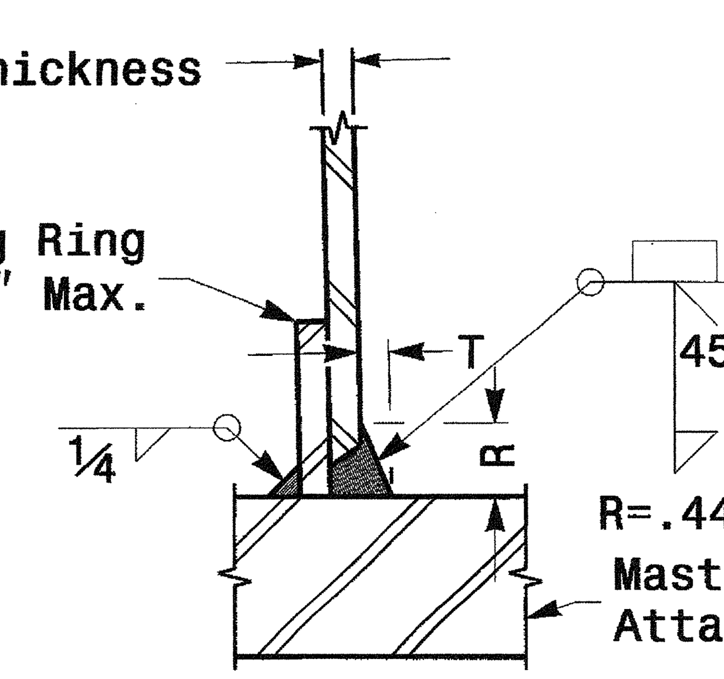


Section View A-A

Mast Arm Attachment Plate



Back Elevation View



Section B-B

Full-Penetration Groove Weld Detail

Notes:

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing appropriate drainage points.

Fabrication Details – Mast Arm Poles

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

Fabrication Details For
Mast Arm Connection To Pole

PLAN DATE:	AUGUST 2013	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

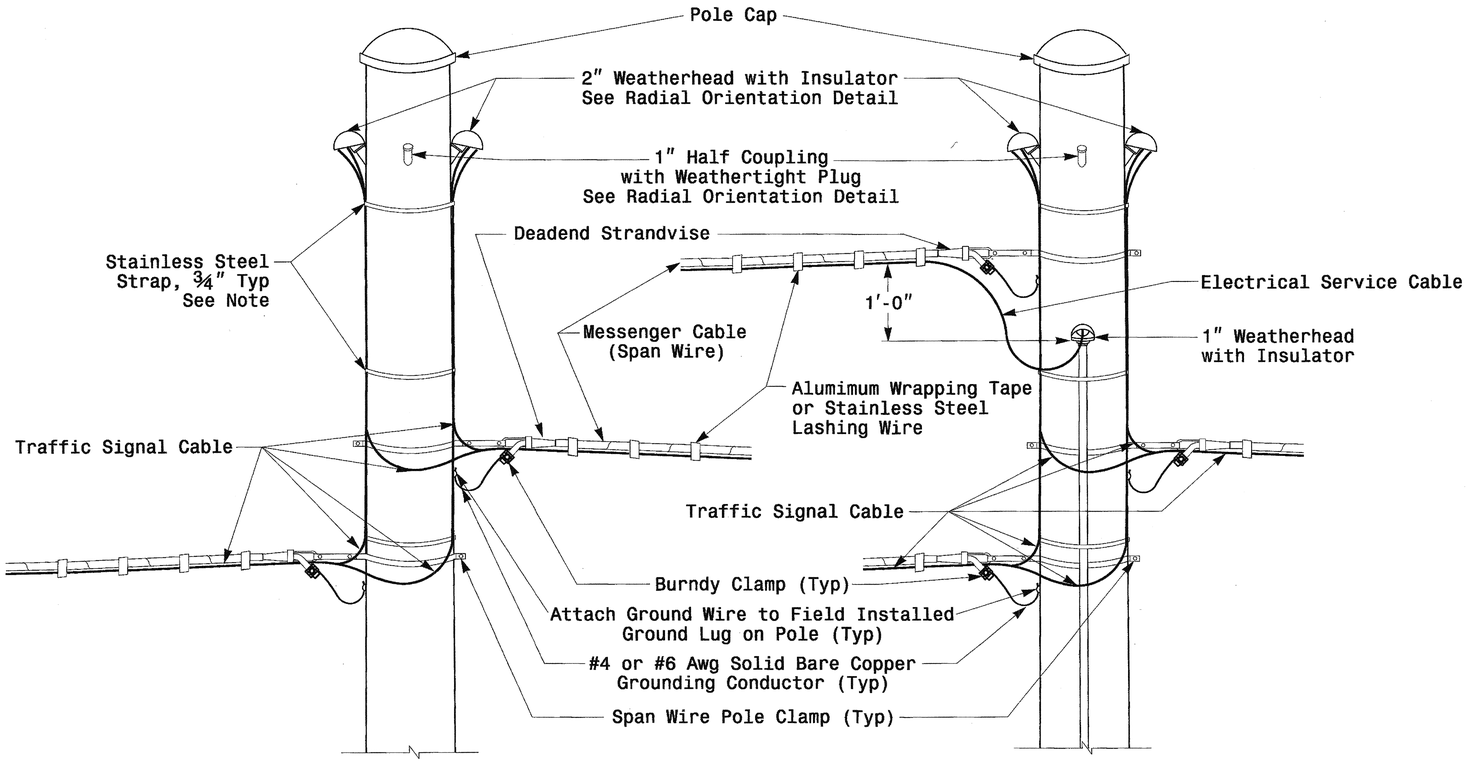
REVISIONS	INIT.	DATE

SCALE
0 NA
NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

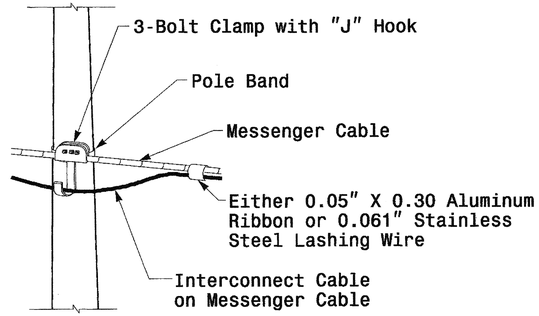
D. Sarkar 8.7.2013
SIGNATURE DATE

SIG. INVENTORY NO.

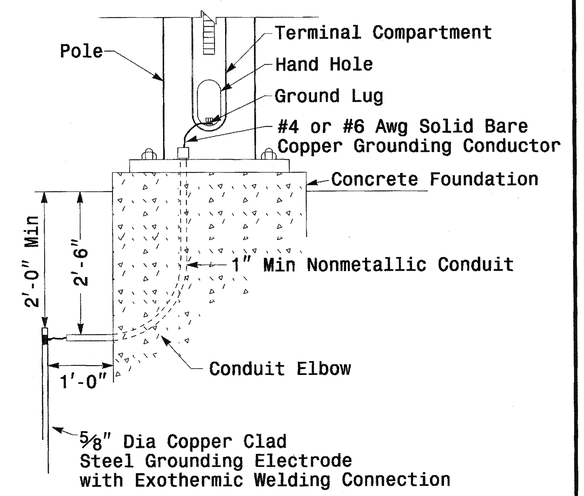


Strain Pole Attachments

Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail

Construction Details — Strain Poles

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

Construction Details
Strain Poles

PLAN DATE:	AUGUST 2013	REVIEWED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DIBESH C. SARKAR

D. Sarkar 8.7.2013
SIGNATURE DATE

SIG. INVENTORY NO.

07-AUG-2013 13:39
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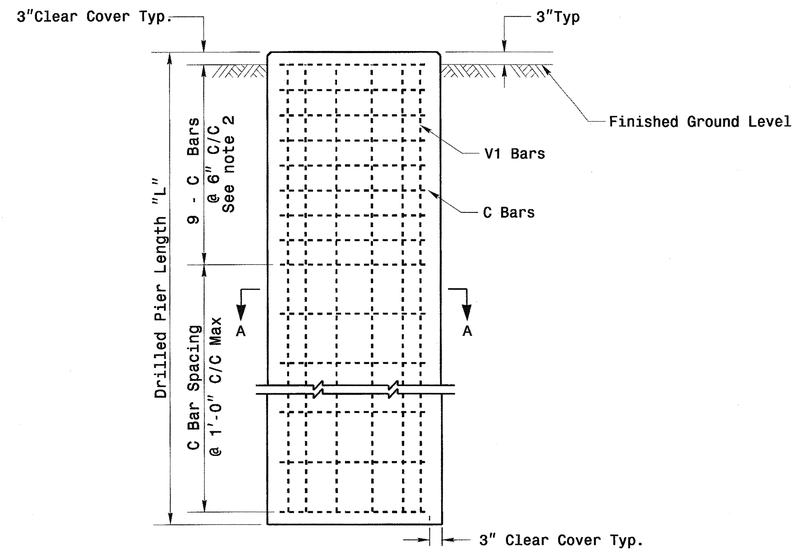
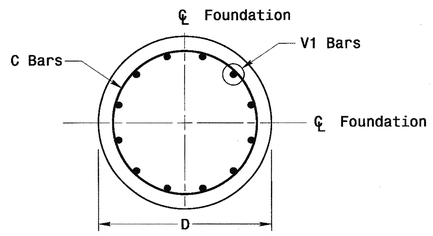
nbitting

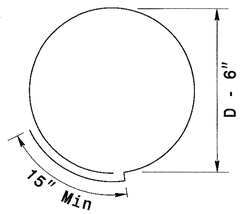
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.45 M 7

Reinforcing Steel Bars





Section A-A



Typical "C" Bars

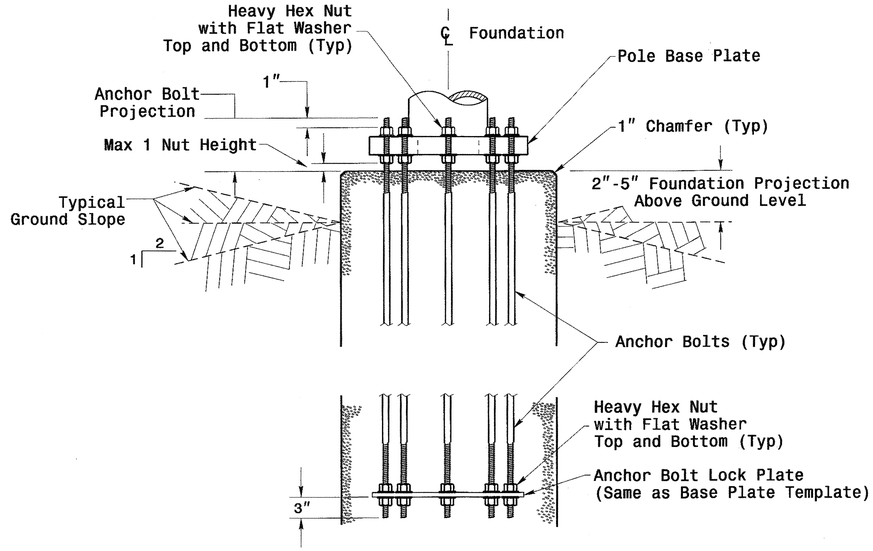
REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'–0" DIAMETER)

Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
48"	.465 x L	V1	***	#8	STR.	**
		C	*	#4	CIR.	12'-6"

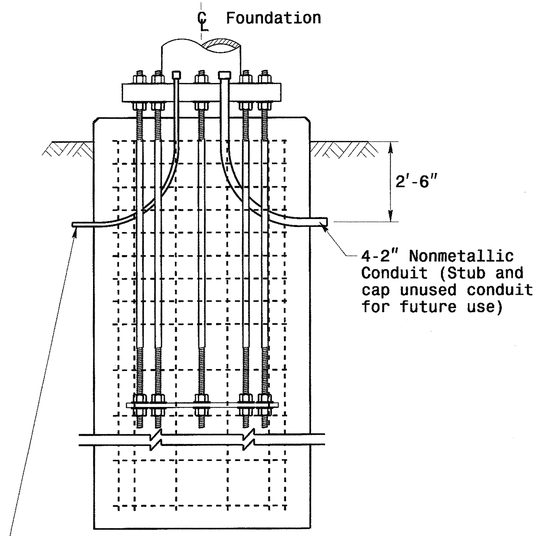
* See Note No. 1
** See Note No. 3
*** See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

1. The number of C-bars is based on foundation depth and/or as required. For standard foundations, see sheets M 8 and M 9 for details.
2. Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
3. The length of V1-bars is based on foundation depth. For standard foundations, see sheets M 8 and M 9 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3"to facilitate the installation of electrical conduit entering into the cage.
4. Provide vertical reinforcement as required per design. See sheets M 8 and M9 for details.

Construction Details – Foundations

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

Construction Details
Foundations

PLAN DATE:	AUGUST 2013	DESIGNED BY:	K.C. DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

SIGNATURE 2.7.2014 DATE

SIG. INVENTORY NO.

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dcsarkar

SATURATED SOIL CONDITION

		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Axial (kip)	Shear (kip)	Moment (ft–kip)	Medium N–Value 4–8	Stiff N–Value 9–15	Very Stiff N–Value 16–30	Hard N–Value >30	Loose N–Value 4–10	Medium N–Value 11–30	Dense N–Value >30	Bar Size (#)	Quantity	Bar Size (#)	Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	9	8	17	14.5	12.5	8	13	4	12
		S30L3	30	25	2	11	300	20	13.5	9	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	9.5	8	17.5	15	13	8	15	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	17	13	11	21	17.5	15	8	18	4	12
		S35H3	35	29	4	16	515	26	17.5	12	8.5	22	18.5	16	8	20	4	12
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11	8	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	8	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	8	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	14	9.5	8	18	15	13.5	8	15	4	12
		S35H1	35	25	4	12	350	21	14.5	10	8	18.5	15.5	13.5	8	16	4	12
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	8.5	8	16.5	14	12	8	13	4	12
		S30L2	30	23	2	10	270	19	12.5	9	8	16.5	14	12.5	8	13	4	12
		S35L2	35	23	3	10	300	19.5	13	9	8	17	14.5	13	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	25.5	15.5	11	8	20	17	14.5	8	17	4	12
		S35H2	35	29	4	15	475	25	16.5	11.5	8	21	17.5	15.5	8	19	4	12

48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Foundation Depth

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.46 M 8

Fabrication Design Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Min. base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case.
   The foundation depth is the value where the column and the row intersect.
6. Reference Drilled Shafts: Construction Procedures and Design Methods, FHWA -IF-99-025

S30H1 - Hard Clay-Stirrup Spacing: 6 in. c/c
S30H2 - Hard Clay-Stirrup Spacing: 6 in. c/c
S30H3 - Hard Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c
S35H1 - Hard Clay - Stirrup Spacing: 6 in. c/c
S35H2 - Very Stiff Clay-Stirrup Spacing: 6 in. c/c
- Hard Clay- Stirrup Spacing: 6 in. c/c
- Dense Sand- Stirrup Spacing: 6 in. c/c
S35H3 - Very Stiff Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c

Standard Strain Pole Foundation–Saturated Soil Condition

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

Standard Strain Pole Foundation for Saturated Soil Condition

PLAN DATE: SEPTEMBER 2013 | DESIGNED BY: C.B COGDELL
PREPARED BY: N. BITTING | REVIEWED BY: D. SARKAR

SCALE 0 NA None

REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

D. Sarkar 1.16.2014
SIGNATURE DATE

DRY SOIL CONDITION

Wind Zone	Load	STANDARD STRAIN POLES: Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base: Axial (kip)	Shear (kip)	Moment (ft-kip)	STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) – Feet — Clay: Medium N-Value 4-8	Clay: Stiff N-Value 9-15	Clay: Very Stiff N-Value 16-30	Clay: Hard N-Value >30	Sand: Loose N-Value 4-10	Sand: Medium N-Value 11-30	Sand: Dense N-Value >30	Reinforcement — Longitudinal: Bar Size (#)	Longitudinal: Quantity	Stirrups: Bar Size (#)	Stirrups: Spacing (in.)
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	18	12.5	9	8	14.5	11	10	8	13	4	12
		S30L3	30	25	2	11	300	18.5	13	9	8	15	11.5	10	8	14	4	12
		S35L3	35	25	3	11	320	19	13.5	9.5	8	15	11.5	10.5	8	15	4	12
	HEAVY	S30H3	30	29	3	16	450	23	16	11	8	17.5	13.5	11.5	8	18	4	12
		S35H3	35	29	4	16	515	24.5	16.5	12	8.5	18.5	14	12	8	20	4	12
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	15.5	10.5	8	8	13	10	9	8	12	4	12
		S30L1	30	22	2	8	205	15.5	11	8	8	13	10	9	8	12	4	12
		S35L1	35	22	3	8	230	16.5	11.5	8	8	13.5	10.5	9	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	19.5	13.5	9.5	8	15	12	10.5	8	15	4	12
		S35H1	35	25	4	12	350	20	14	10	8	15.5	12	10.5	8	15	4	12
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	17	12	8.5	8	14	11	9.5	8	13	4	12
		S30L2	30	23	2	10	270	18	12.5	8.5	8	14.5	11	10	8	13	4	12
		S35L2	35	23	3	10	300	18.5	13	9	8	14.5	11.5	10	8	14	4	12
	HEAVY	S30H2	30	29	3	15	415	22	15	10.5	8	17	13	11.5	8	17	4	12
		S35H2	35	29	4	15	475	23.5	16	11.5	8	18	13.5	12	8	19	4	12

48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Foundation Depth

Fabrication Design Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Min. base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case.
   The foundation depth is the value where the column and the row intersect.
6. Reference Drilled Shafts: Construction Procedures and Design Methods, FHWA -IF-99-025

S30H1 - Hard Clay-Stirrup Spacing: 6 in. c/c
- Dense Sand-Stirrup Spacing: 6 in. c/c

S30H2 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S30H3 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H1 - Hard Clay: tirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H2 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

S35H3 - Very Stiff Clay: Stirrup Spacing: 6 in. c/c
- Hard Clay: Stirrup Spacing: 6 in. c/c
- Medium Clay: Stirrup Spacing: 6 in. c/c
- Dense Sand: Stirrup Spacing: 6 in. c/c

Standard Strain Pole Foundation–Dry Soil Condition

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

SCALE 0 NA None

Standard Strain Pole Foundation for Dry Soil Condition

PLAN DATE: SEPTEMBER 2013 | DESIGNED BY: C.B COGDELL
PREPARED BY: N. BITTING | REVIEWED BY: D. SARKAR

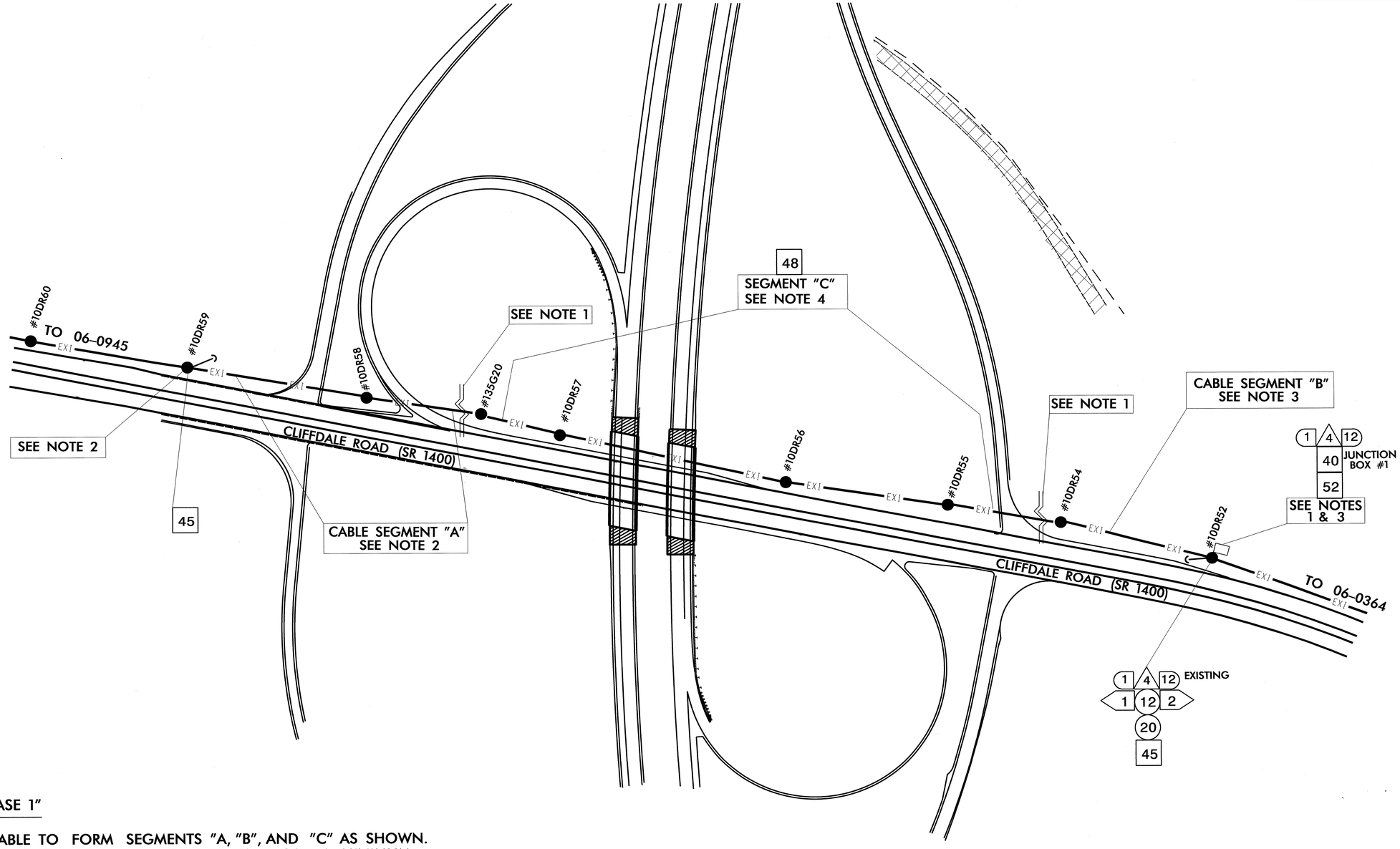
REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

D. Sarkar SIGNATURE 1.16.2014 DATE

15-JAN-2014 08:32
S:*ITS&SU*ITS Signals*Workgroups*Structures*Drawings*2012 Standard Strain Pole Dwgs*2012 M8 Saturated1. M9 Dry1.dgn
dcsarkar

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.48



NOTES FOR "TMP PHASE 1"

1) CUT FIBER OPTIC CABLE TO FORM SEGMENTS "A, "B", AND "C" AS SHOWN.
2) BACKPULL CABLE SEGMENT "A" TO POLE #10DR59 AND COIL A MINIMUM OF 400 FEET OF CABLE AT THE TOP OF THE POLE. CAP AND SEAL THE END OF THE FIBER. REMOVE THE REMAINING MESSENGER CABLE AND POLE MOUNTING HARDWARE.
3) BACKPULL CABLE SEGMENT "B" TO NEW JUNCTION BOX #1 AND STORE 60 FEET OF CABLE FOR FUTURE USE. CAP AND SEAL THE END OF THE FIBER. REMOVE THE REMAINING MESSENGER CABLE AND POLE MOUNTING HARDWARE.
4) REMOVE CABLE SEGMENT "C" INCLUDING ANY MESSENGER CABLE AND POLE MOUNTING HARDWARE.

CONTACT THE CITY OF FAYETTEVILLE TRAFFIC ENGINEER, LEE JERNIGAN, PE, (910-433-1153) A MINIMUM OF FIVE (5) DAYS PRIOR TO DISCONNECTING FIBER OPTIC CABLE AT THIS LOCATION.

TMP PHASE I

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

SCALE 0

FAYETTEVILLE OUTER LOOP
CLIFFDALE ROAD
COMMUNICATIONS CABLE
ROUTING PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	DECEMBER 2013	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

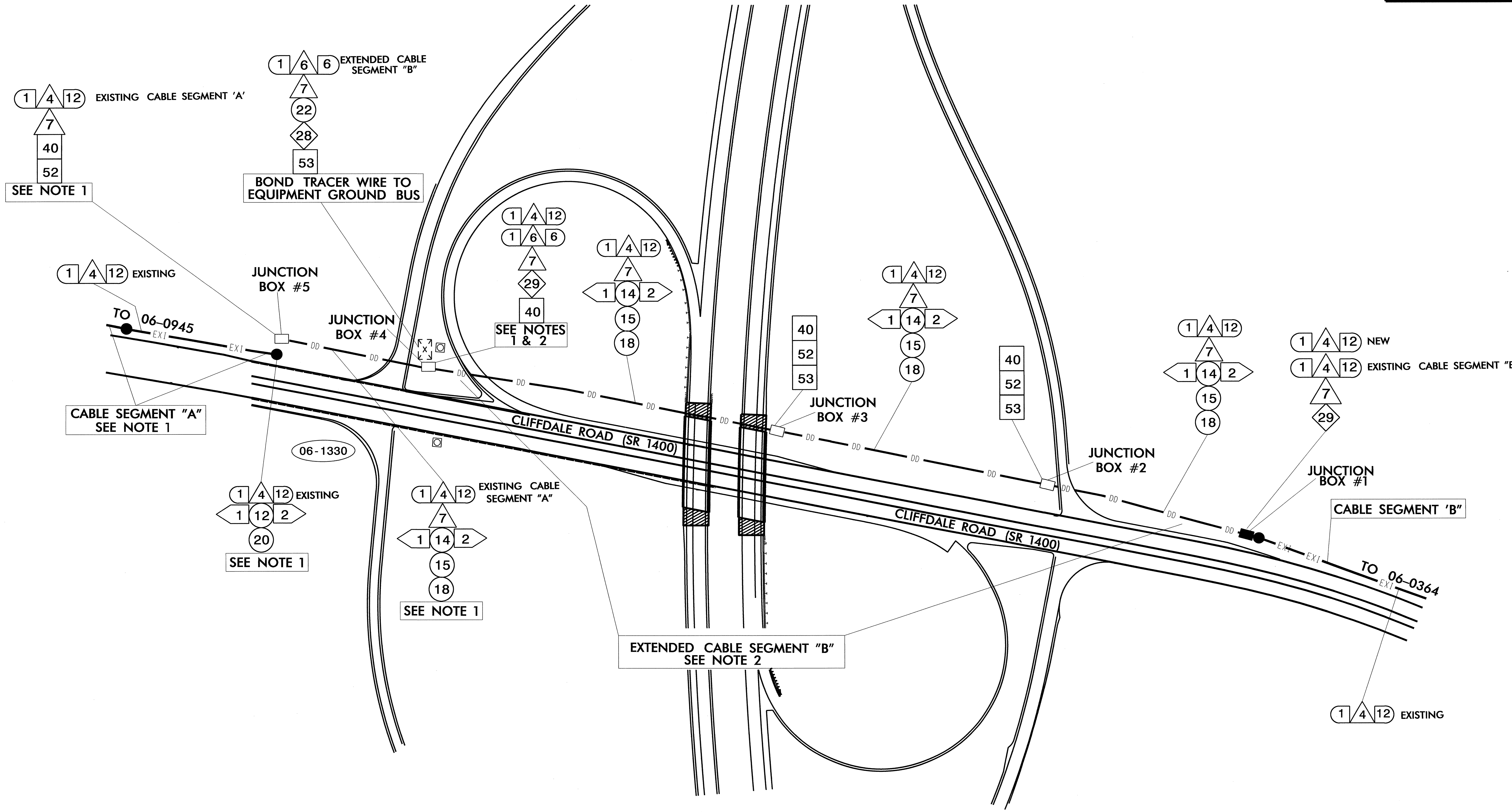
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 12/31/13 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.49



NOTES FOR "TMP FINAL"

1) EXTEND CABLE SEGMENT "A" TO NEW JUNCTION BOX #4. COIL UP 40 FEET INSIDE JUNCTION BOX. CAP AND SEAL THE END OF THE FIBER.
2) EXTEND CABLE SEGMENT "B" TO NEW JUNCTION BOX #4. COIL UP 40 FEET INSIDE JUNCTION BOX. SPLICE CABLE SEGMENT "B" TO NEW 6 FIBER DROP CABLE AND EXTEND TO CONTROLLER CABINET FOR TERMINATION.

TMP FINAL

Prepared in the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

FAYETTEVILLE OUTER LOOP
CLIFFDALE ROAD
COMMUNICATIONS CABLE
ROUTING PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: DECEMBER 2013	REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023919 GREGORY A. FULLER

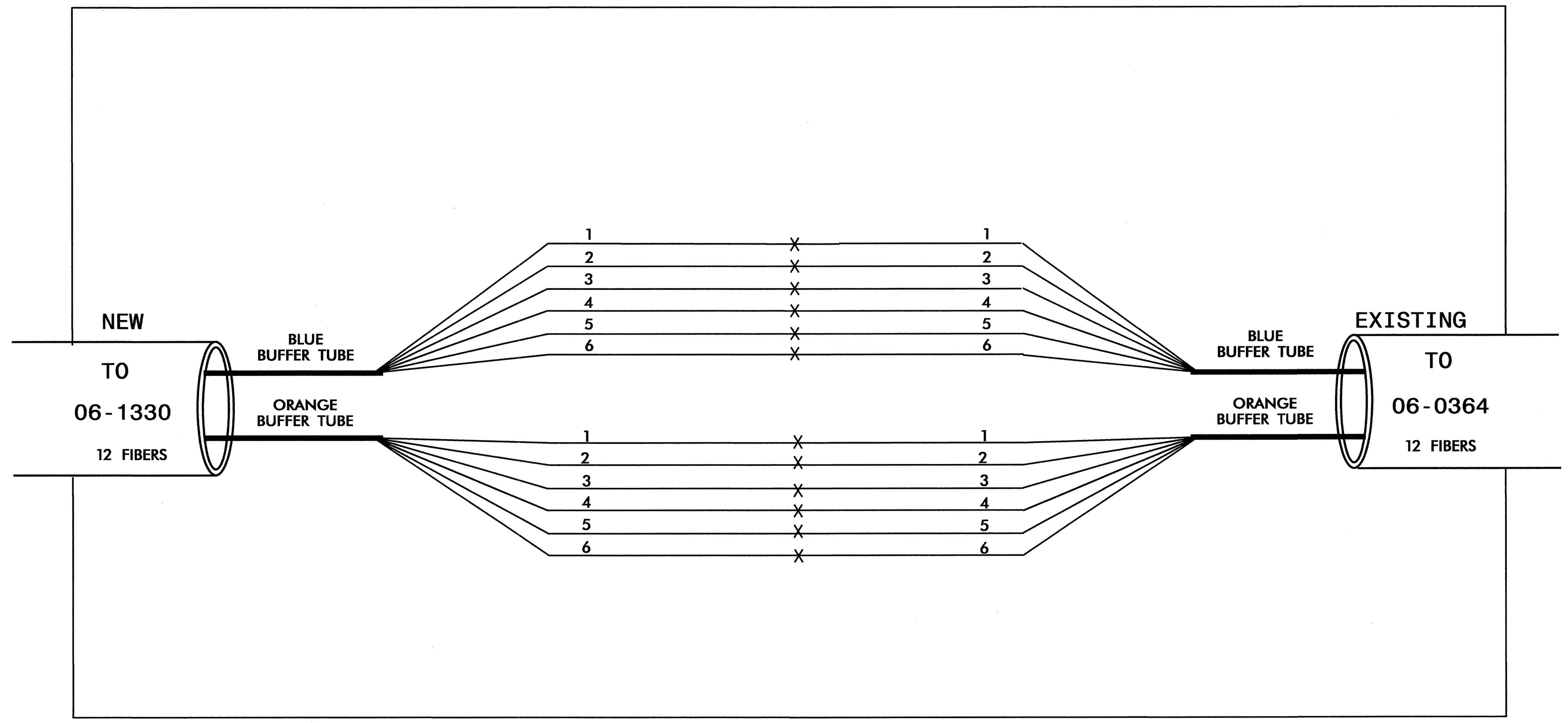
SIGNATURE 12/31/13 DATE

CADD Filename:

EXISTING CABLE SEGMENT "B"
TO THE NEW 12 FIBER CABLE
AT JUNCTION BOX #1

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



LEGEND

X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–FINAL

Prepared in the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Section, State of North Carolina Department of Transportation, 750 N. Greenfield Pkwy., Garner, NC 27529	CLIFFDALE ROAD SPLICE PLAN		SEAL
	DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE		NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
	PLAN DATE: DECEMBER 2013	REVIEWED BY: I. N. AVERY	
	PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE	
SCALE 0	REVISIONS	INIT. DATE	Gregory A. Fuller 12/31/13 SIGNATURE DATE
			CADD Filename:

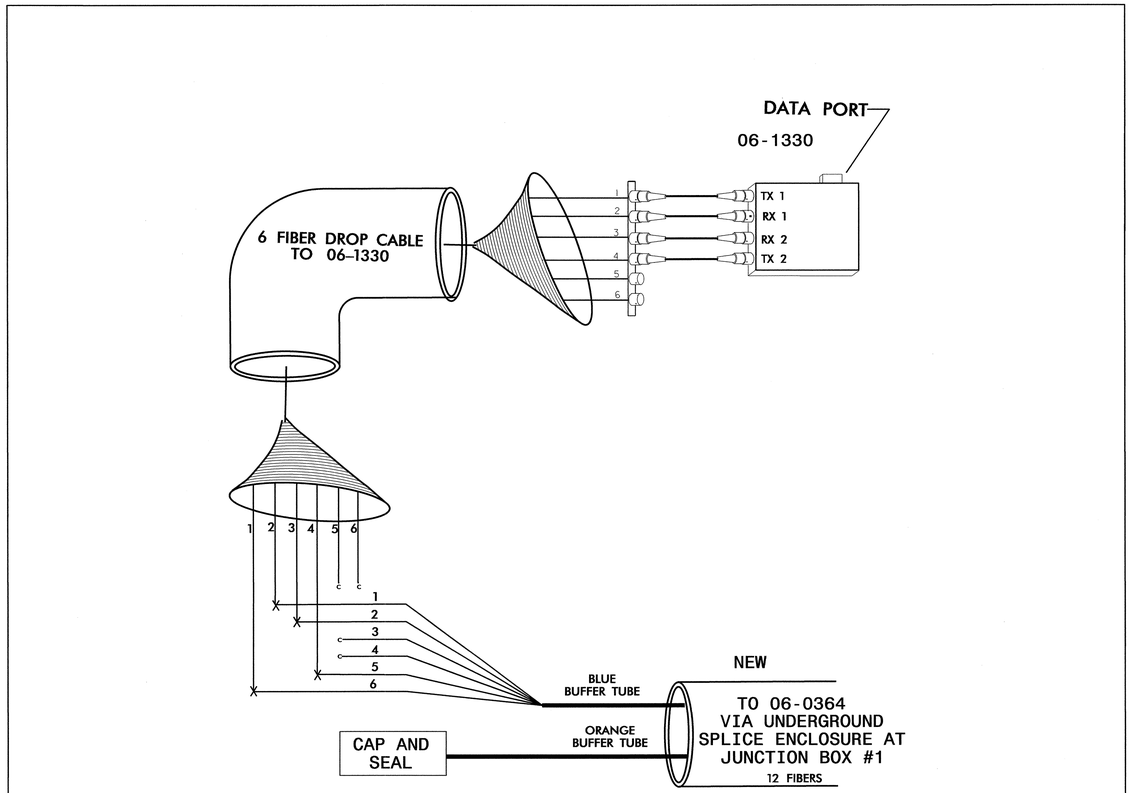
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig 51

SIG. 06–1330
CLIFFDALE RD. AT RAMP 1

Notes:

Unused fibers left coiled and stored in splice tray.

Unused Buffer Tubes left coiled and stored in splice tray.



NOTE
CABLE SEGMENT "A" TO SIN 06-0945
DOES NOT GET SPLICED AT THIS LOCATION.
COIL, CAP AND SEAL IN JUNCTION BOX #4.

LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598-A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–FINAL

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

CLIFFDALE ROAD
SPLICE PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	DECEMBER 2013	REVIEWED BY:	I. N .AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

SCALE 0

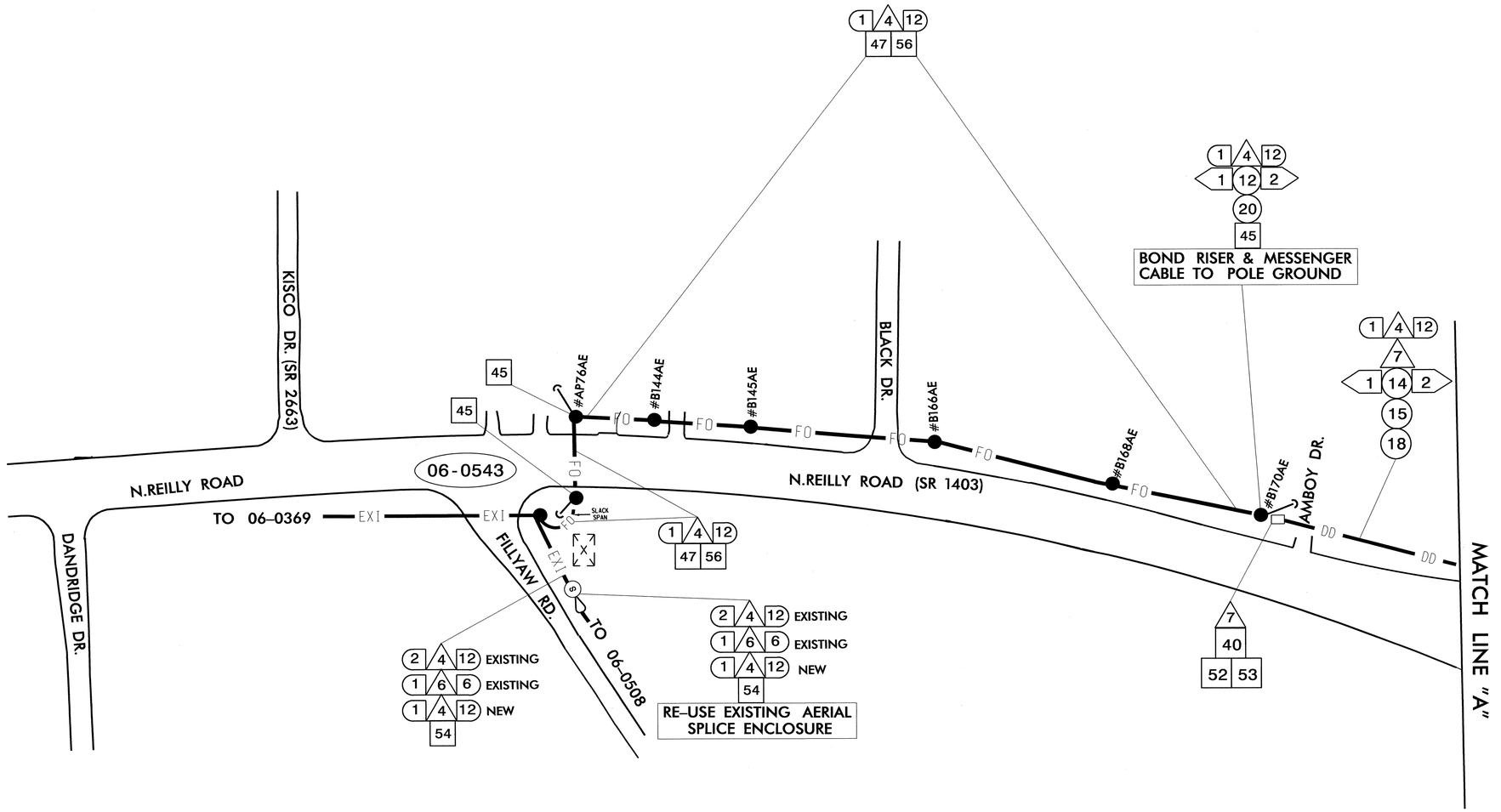
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
023919
ENGINEER
GREGORY A. FULLER

Gregory A Fuller 12/31/13
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig 52



CONTACT THE CITY OF FAYETTEVILLE TRAFFIC ENGINEER, LEE JERNIGAN, PE, (910–433–1153) A MINIMUM OF FIVE (5) DAYS PRIOR TO DISCONNECTING FIBER OPTIC CABLE AT THIS LOCATION.

ALL NCDOT ATTACHMENT POINTS ARE 12 INCHES ABOVE CATV, FRONT SIDE OF POLE UNLESS OTHERWISE SPECIFIED.

TMP PHASE II

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
1549 Mail Service Center, Raleigh, NC 27699-1549
750 N. Greenfield Pkwy., Garner, NC 27529

FAYETTEVILLE OUTER LOOP
N. REILLY ROAD (SR 1403)
COMMUNICATIONS CABLE
ROUTING PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	DECEMBER 2013	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
023919
ENGINEER
GREGORY A. FULLER

SIGNATURE 12/31/13 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.53

TMP–PHASE II

Prepared in the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

FAYETTEVILLE OUTER LOOP
N. REILLY ROAD (SR-1403)
COMMUNICATIONS CABLE
ROUTING PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: DECEMBER 2013	REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/31/13
SIGNATURE DATE

CADD Filename:

SIG. 06–0543
N. REILY RD. AT FILLYAW RD.
REVISED SPLICE ARRANGEMENT

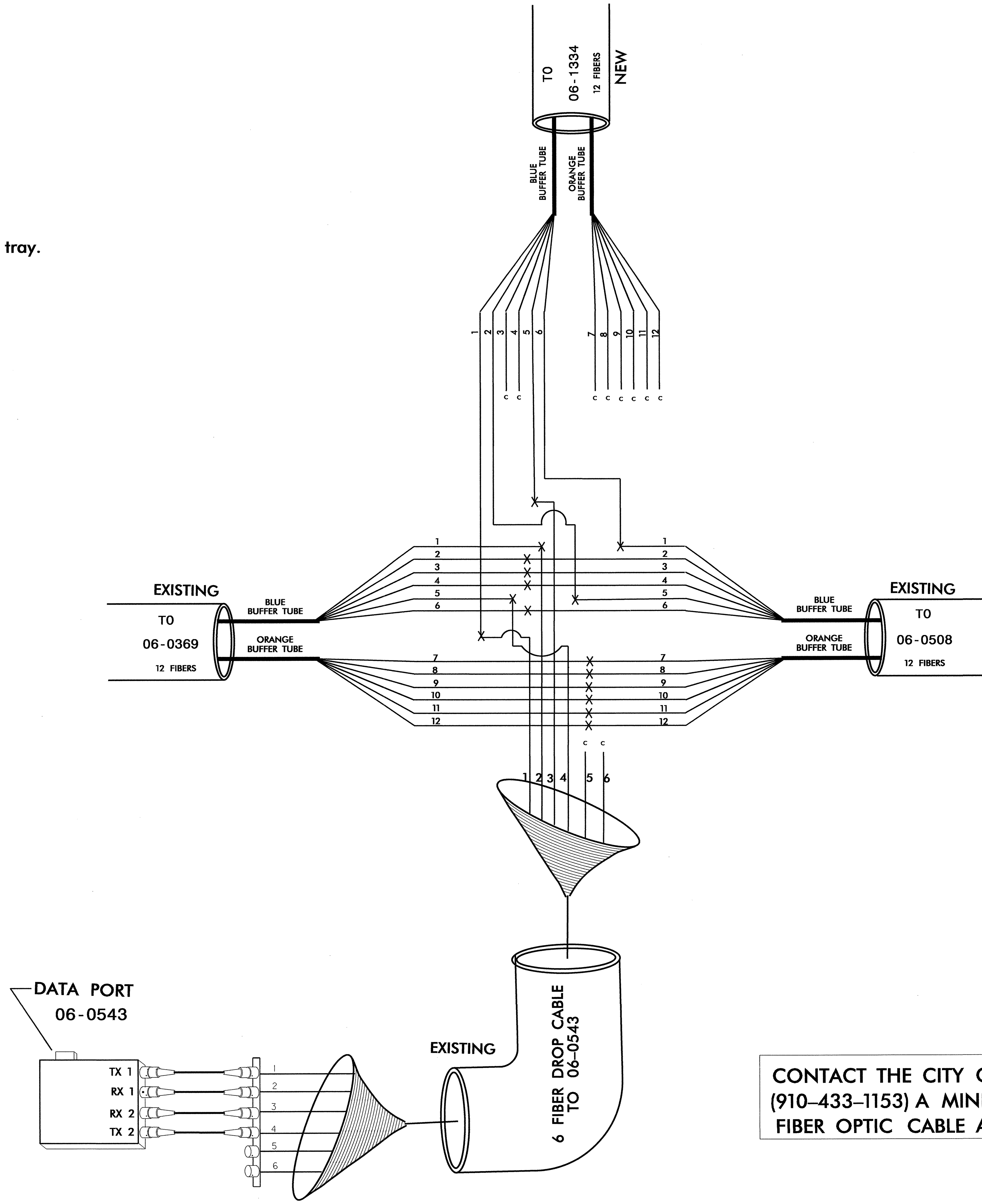
Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE



CONTACT THE CITY OF FAYETTEVILLE TRAFFIC ENGINEER, LEE JERNIGAN, PE, (910–433–1153) A MINIMUM OF FIVE (5) DAYS PRIOR TO DISCONNECTING FIBER OPTIC CABLE AT THIS LOCATION.

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–PHASE II

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
State of North Carolina Department of Transportation
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

SPLICE PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: DECEMBER 2013	REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/31/13
SIGNATURE DATE

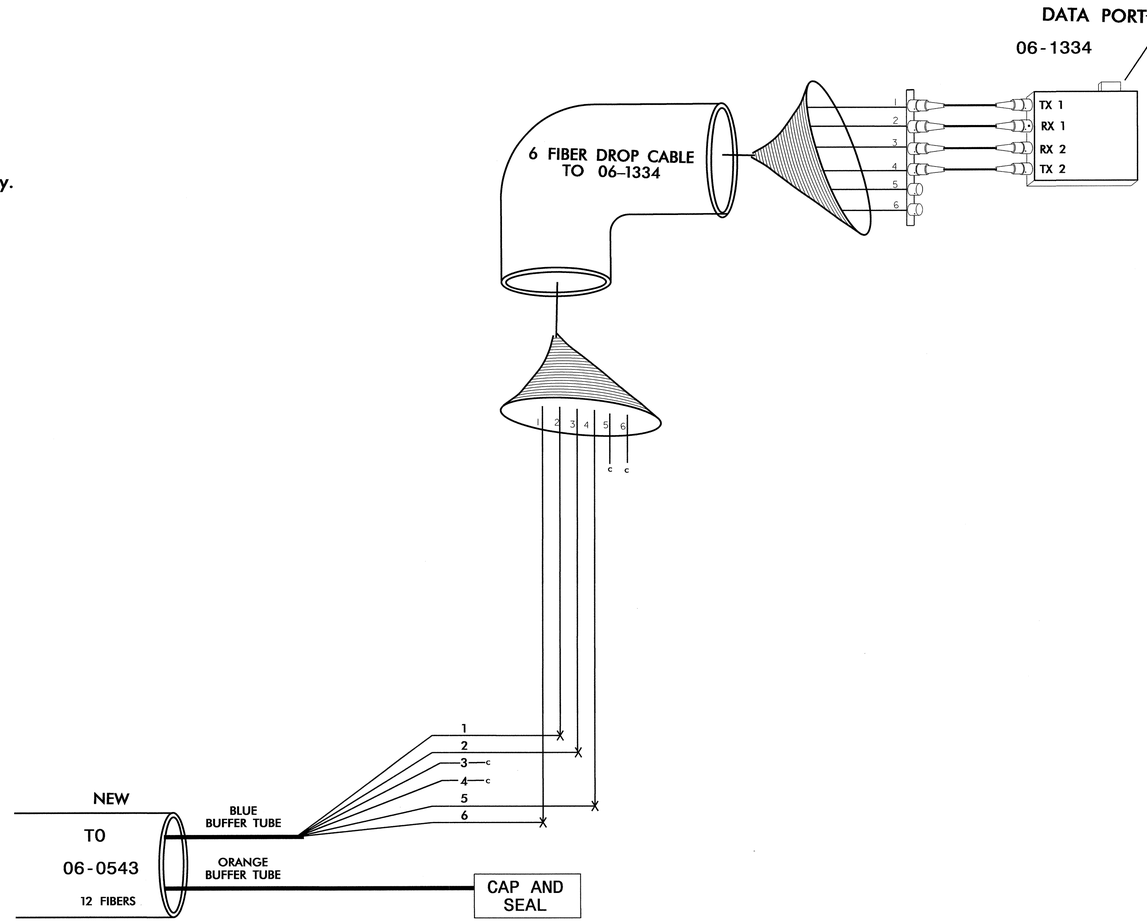
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.55

SIG. 06–1334
CANOPY LANE AT N. REILLY ROAD

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS
1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–PHASE II

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

SPLICE PLAN

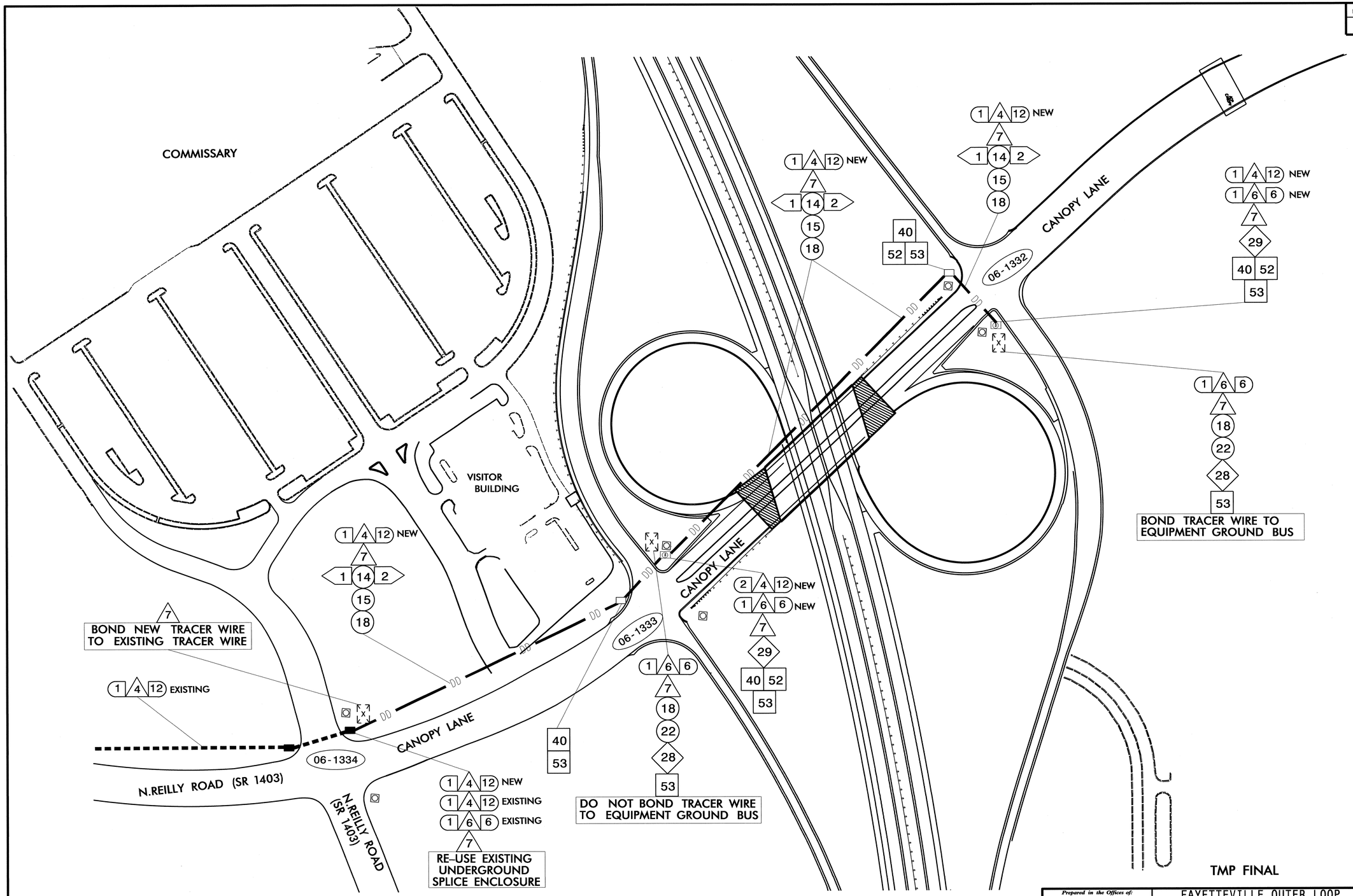
DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE
PLAN DATE: DECEMBER 2013 REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER REVIEWED BY: G.A.FULLER,PE

REVISIONS	INIT.	DATE

SCALE 0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE
12/31/13
DATE
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.56



TMP FINAL

Prepared in the Offices of:
Transportation Mobility and Safety Division
North Carolina Department of Transportation
Integrity Teamwork Service
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE 0

FAYETTEVILLE OUTER LOOP
N. REILLY ROAD (SR-1403)
COMMUNICATIONS CABLE
ROUTING PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	DECEMBER 2013	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 12/31/13 DATE

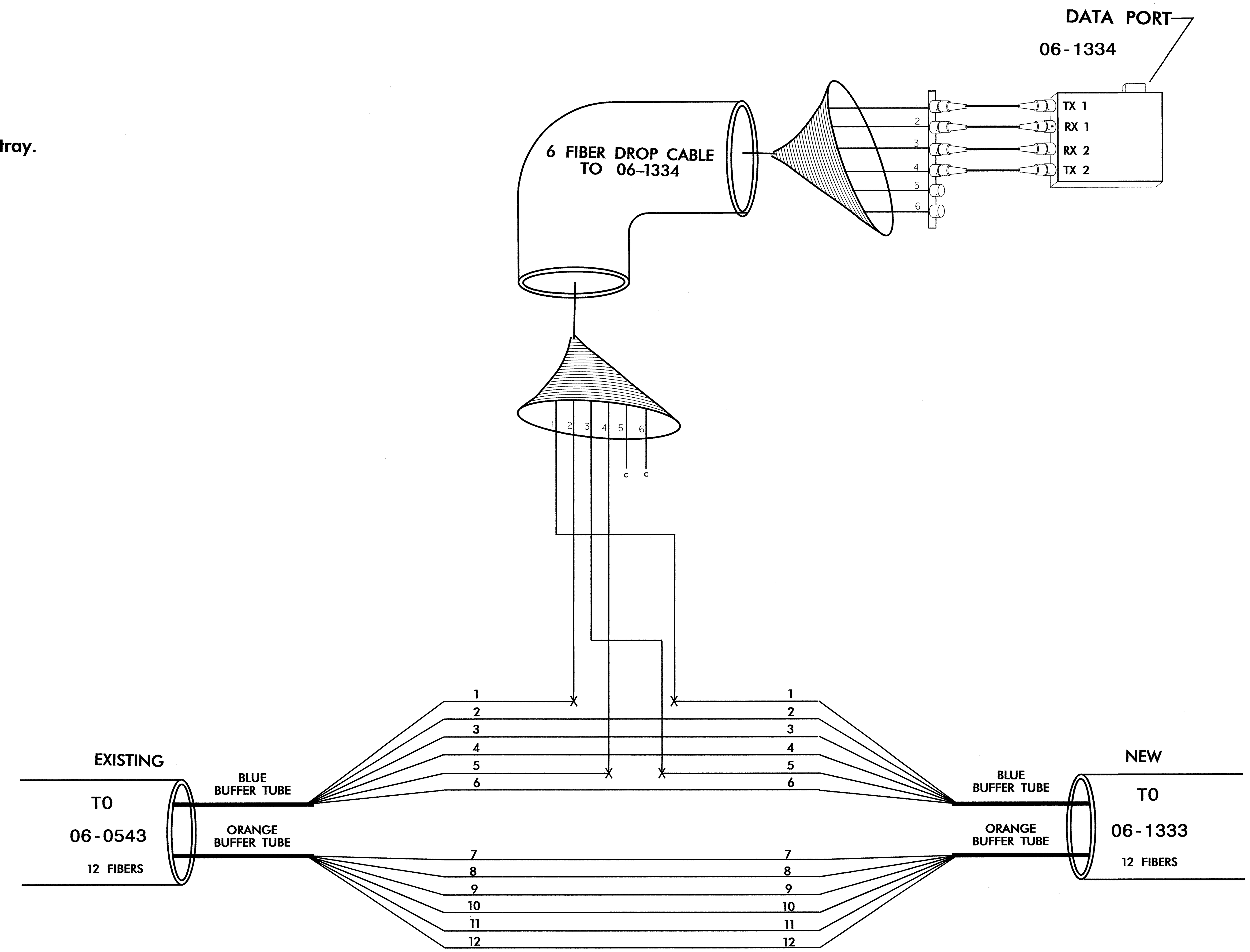
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig 57

SIG. 06–1334
CANOPY LANE AT N. REILLY ROAD

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

CONTACT THE CITY OF FAYETTEVILLE TRAFFIC ENGINEER, LEE JERNIGAN, PE, (910–433–1153) A MINIMUM OF FIVE (5) DAYS PRIOR TO DISCONNECTING FIBER OPTIC CABLE AT THIS LOCATION.

TMP–FINAL

Prepared in the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems Section, State of North Carolina Department of Transportation
750 N. Greenfield Pkwy., Garner, NC 27529

SPLICE PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE:	DECEMBER 2013	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/31/13
SIGNATURE DATE

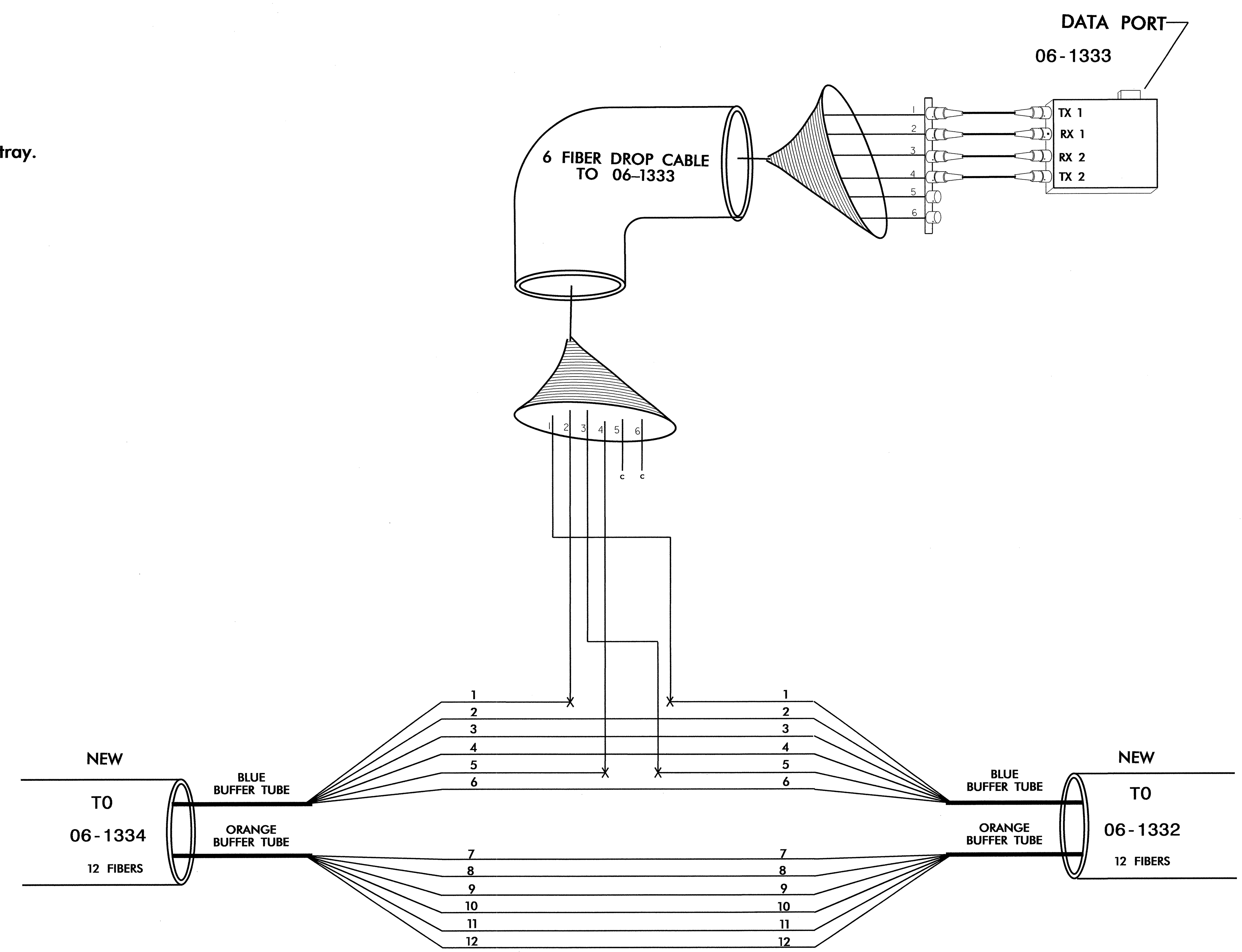
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.58

SIG. 06–1333
CANOPY LANE AT RAMP 1

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS
1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–FINAL

Prepared in the Offices of:
Transportation Mobility and Safety Division
Intelligent Transportation Systems Section
State of North Carolina Department of Transportation
750 N. Greenfield Pkwy., Garner, NC 27529

SPLICE PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE

PLAN DATE: DECEMBER 2013	REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

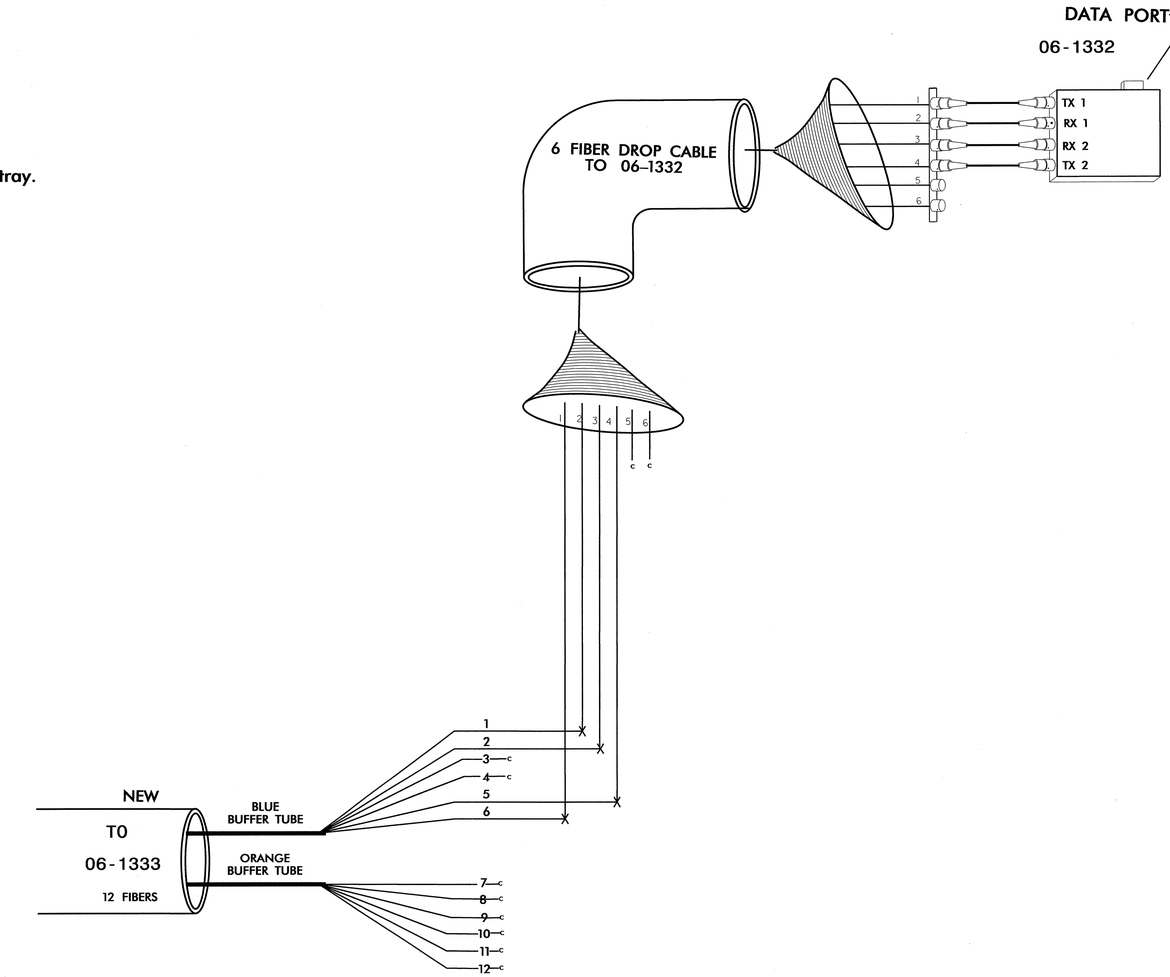
Gregory A. Fuller 12/31/13
SIGNATURE DATE
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	Sig.59

SIG. 06–1332
CANOPY AT RAMP 2

Notes:

Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



LEGEND
X = FUSION SPLICE
C = CAP

COLOR CODE
TIA/EIA 598–A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE" OF THE 2012 STANDARD SPECIFICATIONS FOR ROADS AND STRUCTUERS

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1–4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TMP–FINAL

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

SPLICE PLAN

DIVISION 06 CUMBERLAND COUNTY FAYETTEVILLE
PLAN DATE: DECEMBER 2013 REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER REVIEWED BY: G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 12/31/13 DATE

CADD Filename:

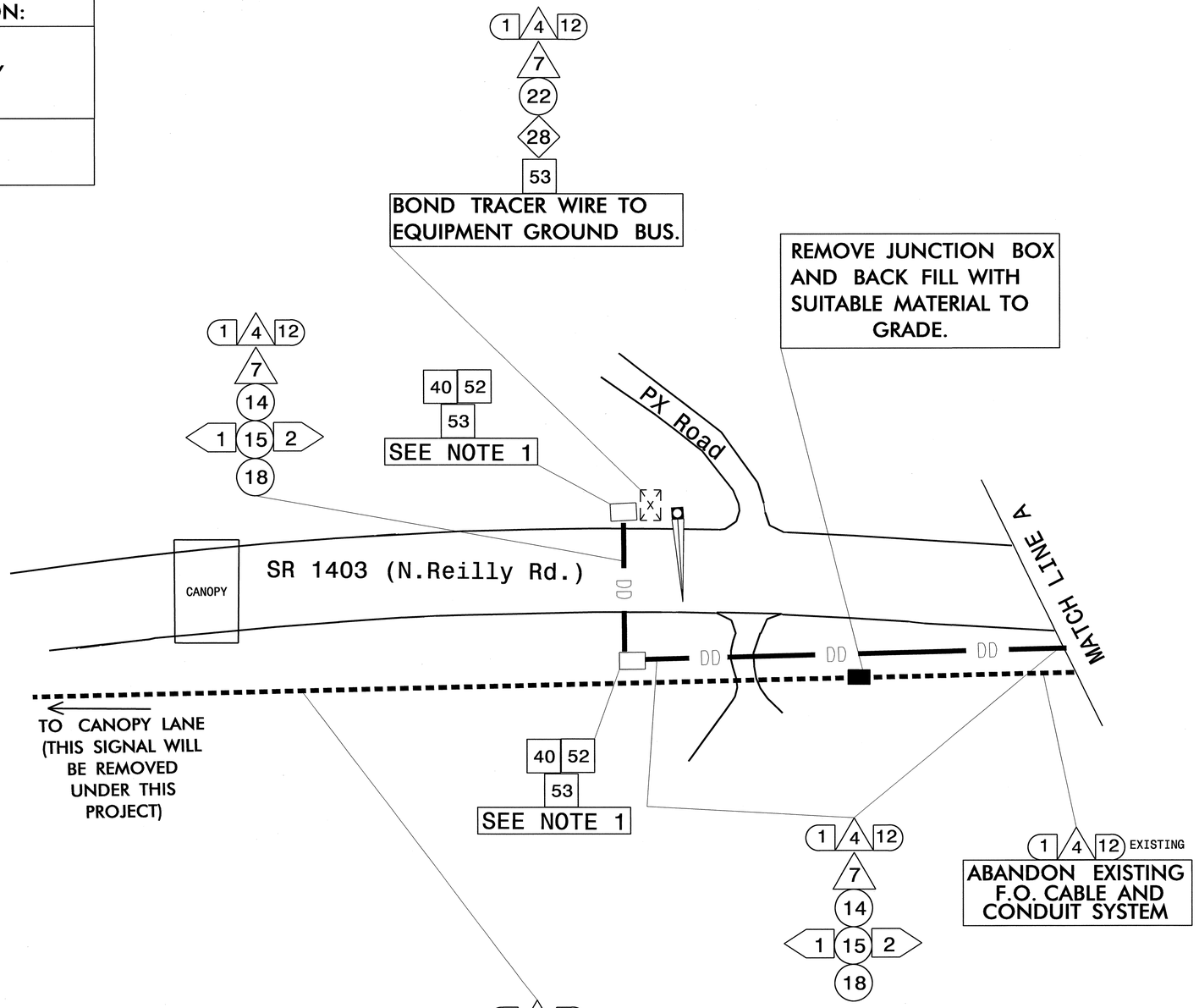
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	SIG.60

NOTE 1

DELINEATOR MARKER SHALL INCLUDE THE FOLLOWING INFORMATION:

BEFORE EXCAVATING
OR IN AN EMERGENCY
CALL (910) 396–0325

DIRECTORATE OF
PUBLIC WORKS



NOTE:

SEAL ALL CONDUITS ENTERING JUNCTION BOXES AND CABINETS WITH MOLDABLE DUCT SEAL.

TMP FINAL

Prepared in the Offices of:

Transportation Mobility and Safety Division
North Carolina Department of Transportation
Intelligent Transportation Systems Section

750 N. Greenfield Pkwy., Garner, NC 27529

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND COUNTY FORT BRAGG

PLAN DATE:	APRIL 2014	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

REVISIONS	INIT.	DATE

SCALE 0

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
023919
ENGINEER
GREGORY A. FULLER

SIGNATURE 4/29/14 DATE

CADD Filename:

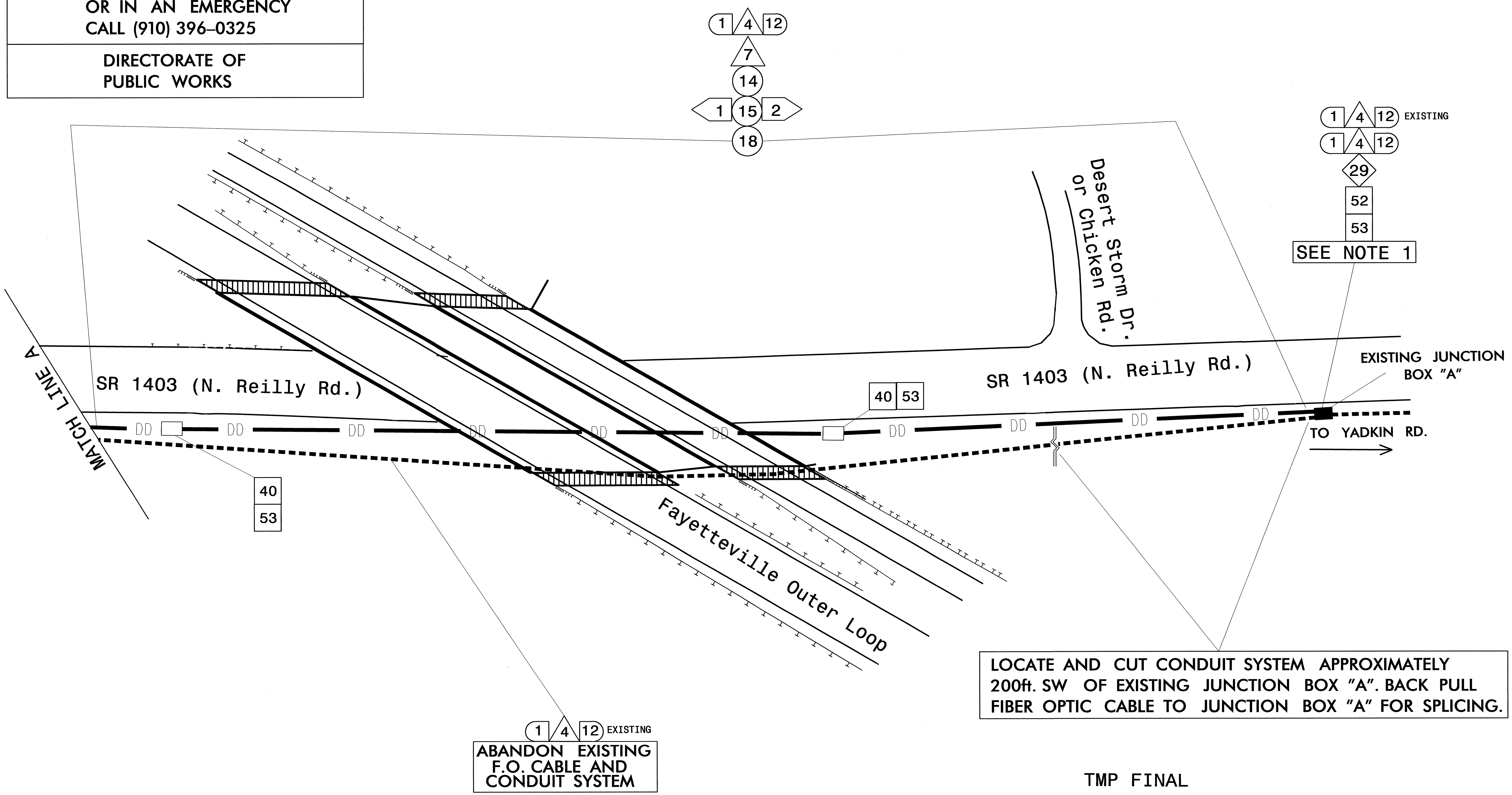
PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	SIG.61

NOTE 1

DELINEATOR MARKER SHALL INCLUDE THE FOLLOWING INFORMATION:

BEFORE EXCAVATING
OR IN AN EMERGENCY
CALL (910) 396-0325

DIRECTORATE OF
PUBLIC WORKS



NOTE:
SEAL ALL CONDUITS ENTERING JUNCTION BOXES AND CABINETS WITH MOLDABLE DUCT SEAL.

TMP FINAL

Prepared in the Offices of:
Transportation Mobility and Safety Division, Intelligent Transportation Systems Section
State of North Carolina Department of Transportation
750 N. Greenfield Pkwy., Garner, NC 27529

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 06 CUMBERLAND COUNTY FORT BRAGG

PLAN DATE: APRIL 2014	REVIEWED BY: I. N. AVERY
PREPARED BY: P. C. LOUDER	REVIEWED BY: G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

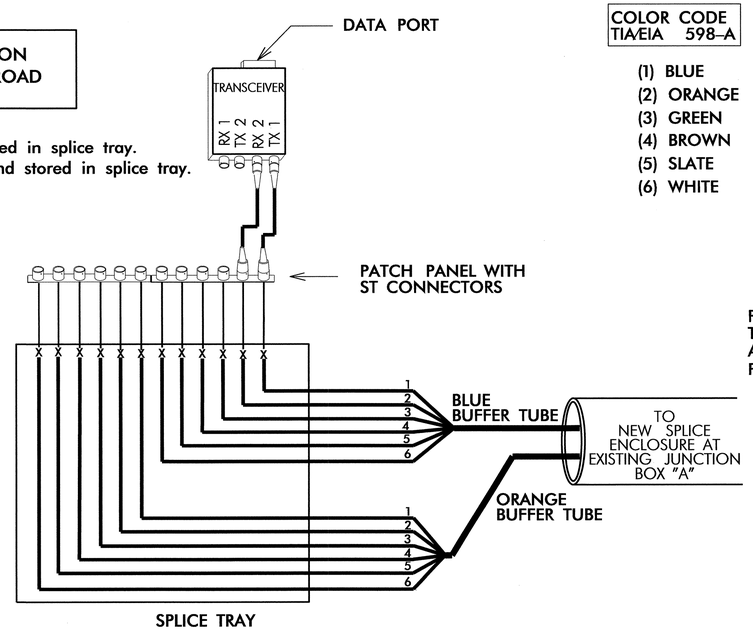
Gregory A. Fuller 4/29/14
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	SIG.G2

INTERSECTION LOCATION
N. REILLY ROAD AT PX ROAD

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



COLOR CODE TIA/EIA 598-A

(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

LEGEND
X = FUSION SPLICE

INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1931 "FIBER OPTIC SPLICE ENCLOSURE"

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICE

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.

TMP FINAL

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

SPLICE DETAILS

DIVISION 06 CUMBERLAND COUNTY FORT BRAGG

PLAN DATE:	APRIL 2014	REVIEWED BY:	I. N. AVERY
PREPARED BY:	P. C. LOUDER	REVIEWED BY:	G.A.FULLER,PE

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL
SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE 4/23/14 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-2519CB	SIG.63

NEW SPLICE ENCLOSURE AT EXISTING JUNCTION BOX "A"

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE

COLOR CODE TIA/EIA 598-A

(1) BLUE
(2) ORANGE
(3) GREEN
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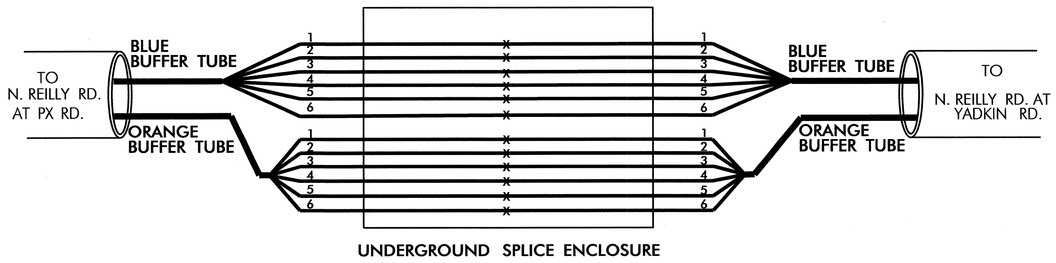

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TMP FINAL

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SCALE
0

SPLICE DETAILS

DIVISION 06 CUMBERLAND COUNTY FORT BRAGG

PLAN DATE:	APRIL 2014	REVIEWED BY:	I. N. AVERY
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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE
4/29/14
DATE
CADD Filename: