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TIP PROJECT: U-3338B

Project No.	Sheet No.
U-3338B	Sig. 1.0

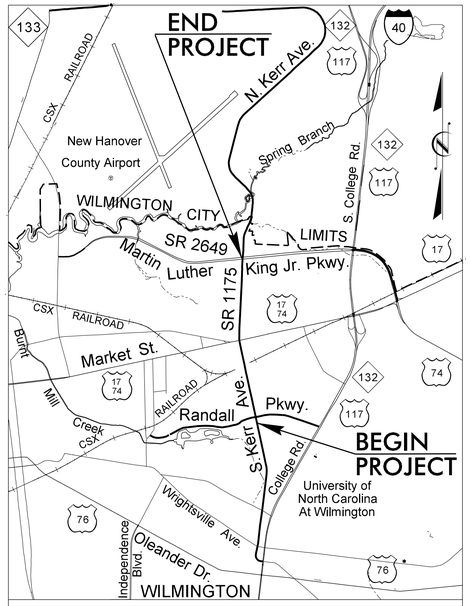
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

NEW HANOVER COUNTY

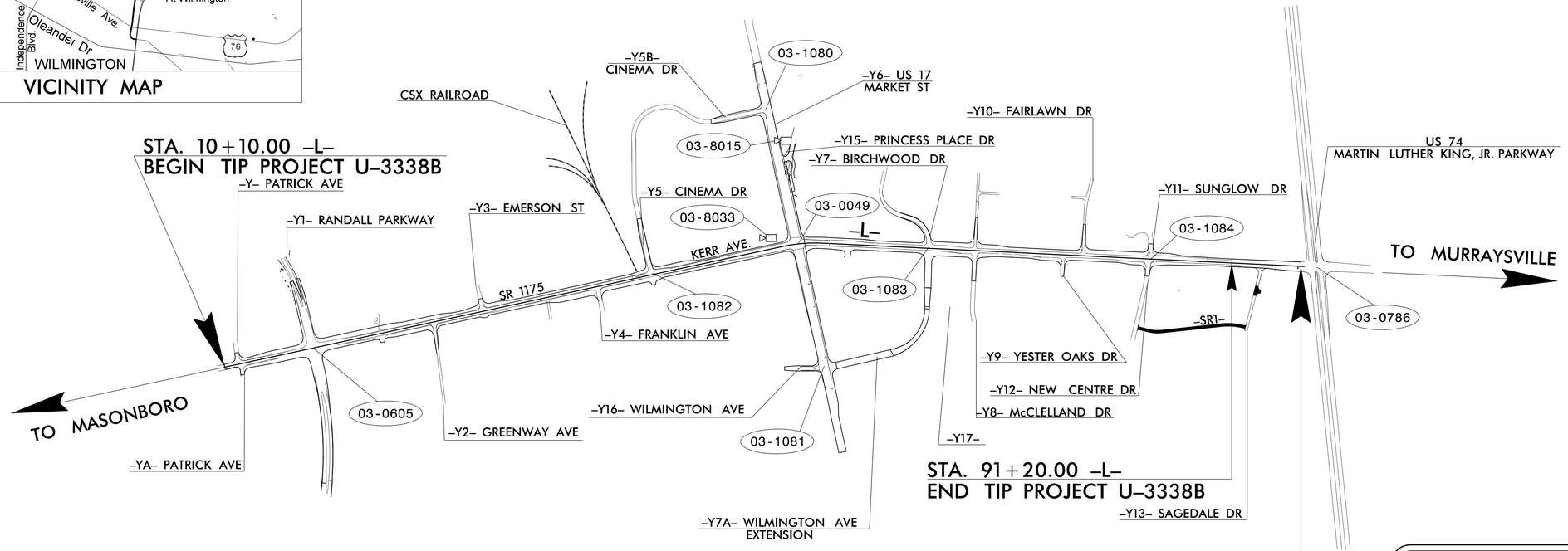
LOCATION: WILMINGTON – SR 1175 (KERR AVENUE) FROM RANDALL PARKWAY TO SR 2649 (MARTIN LUTHER KING, JR. PARKWAY)

TYPE OF WORK: TRAFFIC SIGNALS & ITS FIBER OPTIC CABLE ROUTING AND CCTV CAMERAS

NAD 83/95



VICINITY MAP



NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

DocuSigned by: Lisa M. Moon 3/13/2015
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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. 1.0	--------	Title Sheet
Sig. 2.0 – Sig. 5.4	03-0605 (T1, T2, T3 & Final)	SR 1175 (Kerr Avenue) at Randall Parkway
Sig. 6.0 – Sig. 9.4	03-1082 (T1, T2, T3 & Final)	SR 1175 (Kerr Avenue) at Cinema Drive/Shopping Center Driveway
Sig. 10.0 – Sig. 13.4	03-0049 (T1, T2, T3 & Final)	US 17 Business (Market Street) at SR 1175 (Kerr Avenue)
Sig. 14.0 – Sig. 17.4	03-1083 (T1, T2, T3 & Final)	SR 1175 (Kerr Avenue) at Birchwood Drive/Wilmington Avenue Extension
Sig. 18.0 – Sig. 19.4	03-1084 (T1 & Final)	SR 1175 (Kerr Avenue) at Sunglow Drive/New Centre Drive
Sig. 20.0 – Sig. 20.3	03-0786 (Final)	SR 1175 (Kerr Avenue) at US 74 (Martin Luther King, Jr. Parkway)
Sig. 21.0 – Sig. 23.4	03-1080 (T1, T2 & Final)	US 17 Business (Market Street) at Cinema Drive
Sig. 24.0 – Sig. 26.4	03-1081 (T1, T2 & Final)	US 17 Business (Market Street) at Wilmington Avenue/Wilmington Avenue Extension
Sig. 27.0	SD-01	Temporary Pedestrian Posts for Push Buttons
Sig. M1 – Sig. M9	--------	Metal Pole Details
SCP 1 – SCP 2	--------	Signal Communication Plans – Block Diagrams
SCP 3	--------	Signal Communication Plans – Cable Schematic
SCP 4	--------	Signal Communication Plans – Special Details
SCP 5	CL-A	Signal Communication Plans – Construction Notes
SCP 6 – SCP 19	CL-01 thru CL-14	Signal Communication Plans – Cable Layout Plans
SCP 20 – SCP 31	--------	Signal Communication Plans – Splice Details

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Lisa M. Moon, P.E. – Project Manager
Melissa B. Toth, P.E. – Senior Design Engineer
ITS & SIGNALS UNIT
Contacts:
Pam Alexander, PE – Eastern Region Signals Engineer
George Brown, P.E. – Signal Equipment Design Engineer
I. Neil Avery – Signal Communications Project Engineer

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION
Transportation Mobility and Safety Division · Department of Transportation · State of North Carolina · Signal Design Section
750 N. Greenfield Parkway, Garner, NC 27529

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 2.0

6 Phase
Fully Actuated
(Wilmington Signal System)

PHASING DIAGRAM

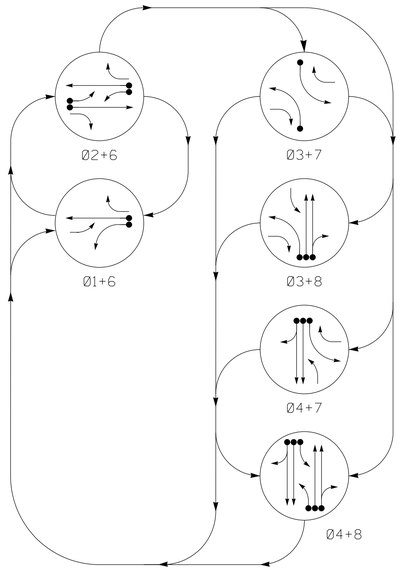


TABLE OF OPERATION

SIGNAL FACE	PHASE 01+06	02+06	03+07	03+08	04+07	04+08	FLASH
11	←F	←F	←R	←R	←R	←R	←Y
21	←F	←F	←R	←R	←R	←R	←Y
22	R	G	R	R	R	R	Y
23	R	G	R→	R→	R	R	Y
31	←R	←R	←	←	←F	←F	←R
41, 42	R	R	R	R	G	G	R
61	G	G	R	R	R	R	Y
62	G	G	R→	R	R→	R	Y
71	←R	←R	←	←F	←	←F	←R
81, 82	R	R	R	G	R	G	R

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
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
					8	Y	Y	-	-	3	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	Y
					4	Y	Y	-	-	3	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

NOTES

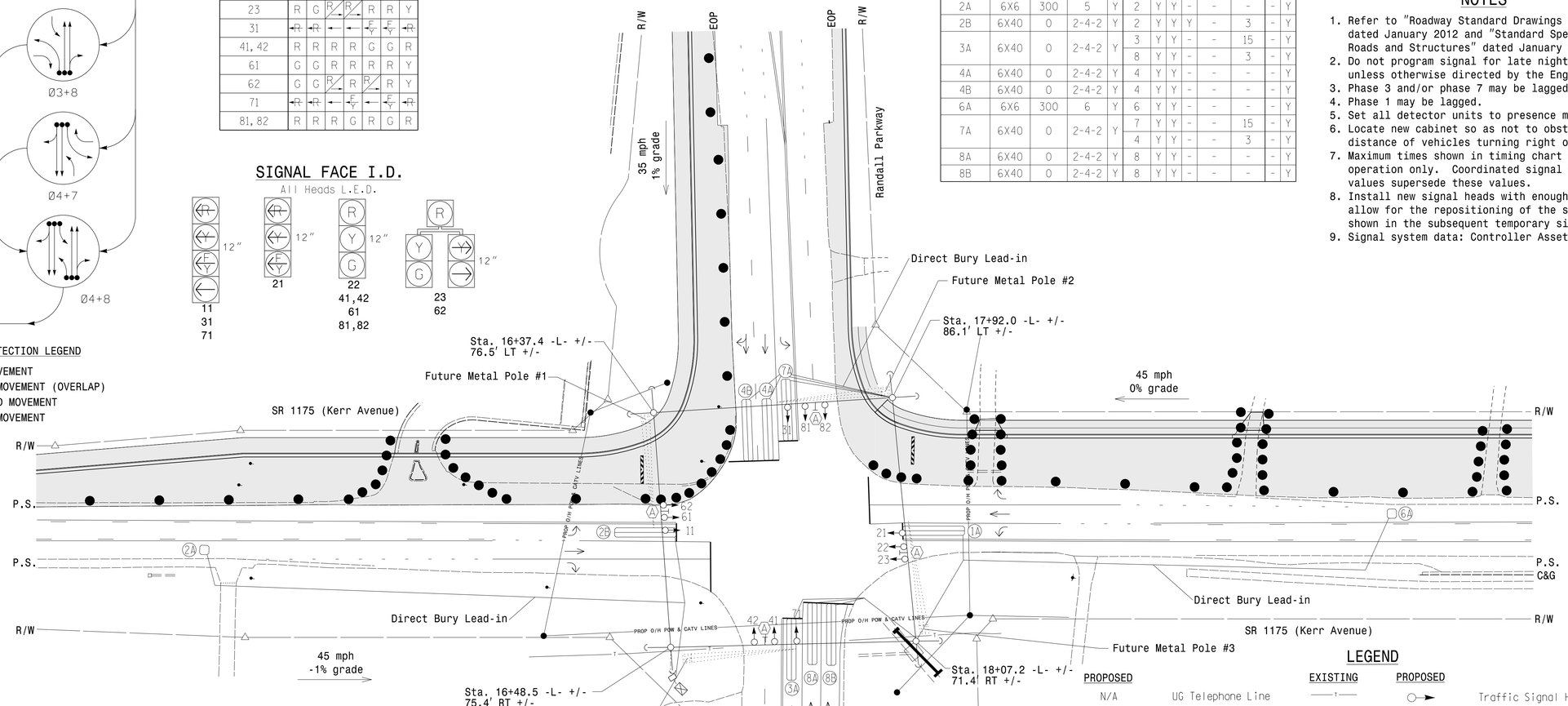
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 3 and/or phase 7 may be lagged.
4. Phase 1 may be lagged.
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.
8. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in the subsequent temporary signal designs.
9. Signal system data: Controller Asset #0605.

SIGNAL FACE I.D.

All Heads L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
N/A	UG Telephone Line	—T—		Traffic Signal Head	
N/A	UG Power Line	— —P— —		Sign	
N/A	Drainage Pipe	═══		Inductive Loop Detector	
N/A	Right of Way	— — — —		Signal Pole with Guy	
Ⓐ	Street Name Sign	Ⓐ		Signal Pole with Sidewalk Guy	
				Controller & Cabinet	
				Junction Box	
				Oversize Junction Box	
			— DD —	Directional Drill	N/A
				2-in Underground Conduit	
				Directional Arrow	
				Construction Zone	
				Construction Zone Drums	
				Construction Zone Cones	
				Construction Barricade	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	35	60	15	25	60	15	25
Yellow Clearance	3.0	4.6	3.0	3.8	4.6	3.0	3.8
Red Clearance	2.9	1.5	2.6	2.0	1.5	2.8	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	2.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	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 - Temporary Design 1 (TMP Phase I & II)

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Thigpen	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DIRECTOR SIGNATURE DATE

SIG. INVENTORY NO. 03-0605TI

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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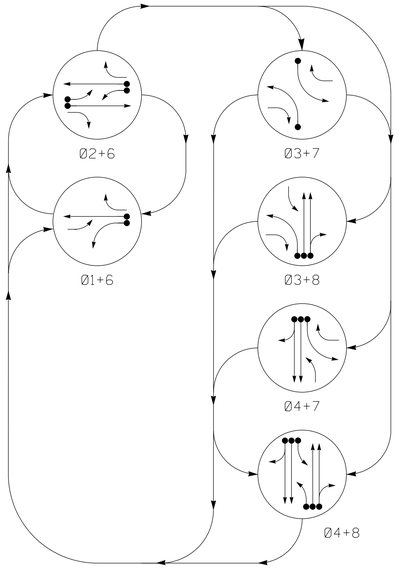
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+06	02+06	03+07	03+08	04+07	04+08	FLASH
11	←	F Y	R	R	R	R	Y
21	F Y	F Y	R	R	R	R	Y
22	R	G	R	R	R	R	Y
23	R	G	R →	R →	R	R	Y
31	R	R	←	←	F Y	F Y	R
41, 42	R	R	R	R	G	G	R
61	G	G	R	R	R	R	Y
62	G	G	R →	R	R →	R	Y
71	R	R	←	F Y	←	F Y	R
81, 82	R	R	R	G	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

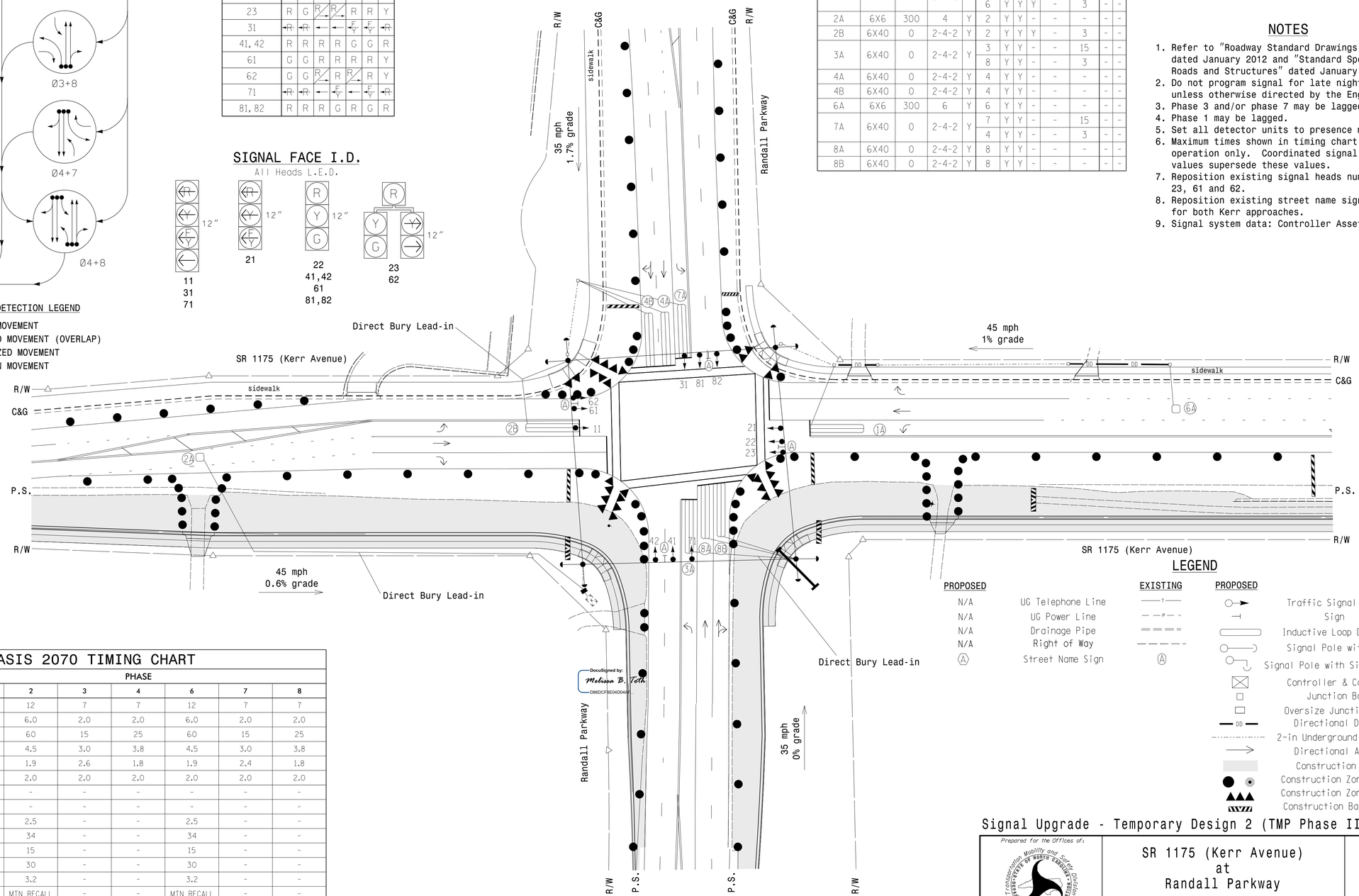
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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 C&D
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	-
2B	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	-
					8	Y	Y	-	-	3	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	-
					4	Y	Y	-	-	3	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

6 Phase
Fully Actuated
(Wilmington 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 3 and/or phase 7 may be lagged.
4. Phase 1 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.
7. Reposition existing signal heads numbered 11, 21, 22, 23, 61 and 62.
8. Reposition existing street name signs as shown on plan for both Kerr approaches.
9. Signal system data: Controller Asset #0605.



LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Power Line	P
N/A	Drainage Pipe	
N/A	Right of Way	
A	Street Name Sign	A

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
DD	Directional Drill	N/A
	2-in Underground Conduit	
	Directional Arrow	
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	35	60	15	25	60	15	25
Yellow Clearance	3.0	4.5	3.0	3.8	4.5	3.0	3.8
Red Clearance	3.3	1.9	2.6	1.8	1.9	2.4	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	2.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	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.

DocuSigned by: Melissa B. Toth
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Signal Upgrade - Temporary Design 2 (TMP Phase III)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SR 1175 (Kerr Avenue)
at
Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Thigpen	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth
D86DCF8E04D04AF... 12/19/2014
DATE

SIG. INVENTORY NO. 03-0605T2

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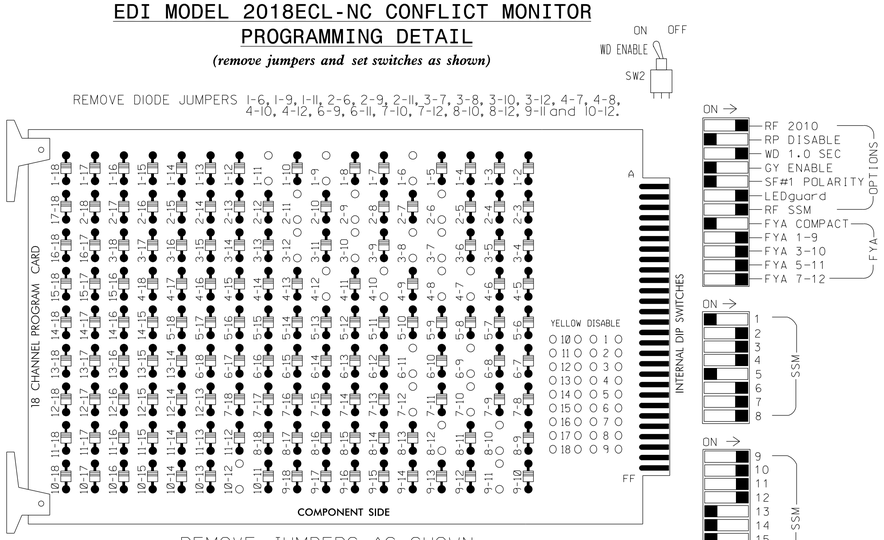
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 3.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Program phases 4 and 8 for Dual Entry.
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 overlaps 1 and 2 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S8,S10,S11,AUX S1, AUX S2,AUX S4,AUX S5.
PHASES USED.....1,2,3,4,6,7,8.
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....6
OVERLAP "D".....7+8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5	S6	S7	S8	S9	S10		S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4	14	5	6	15	7		8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4	4 PED	5	6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	22,23	NU	23	31★	41,42	NU	NU	61,62	NU	62	71★	81,82	NU	11★	31★	NU	21★	71★	NU
RED		128		✳		101			134		✳		107							
YELLOW	✳	129				102			135				108							
GREEN		130				103			136				109							
RED ARROW															A121	A124		A114	A101	
YELLOW ARROW				117							123				A122	A125		A115	A102	
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127			118	118						124	124								

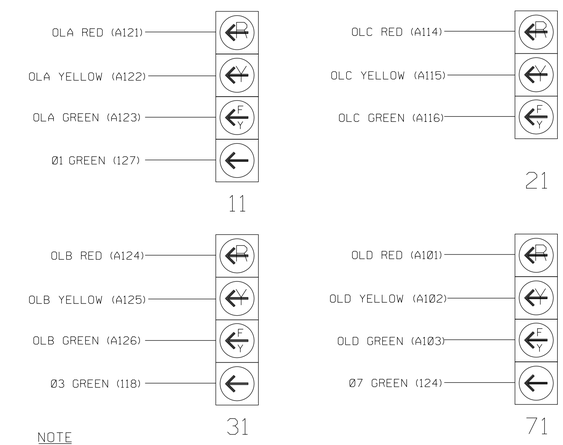
NU = Not Used

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

★ See pictorial of head wiring in detail below.

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 11, 31 and 71 require special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
3A[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A[3]	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
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.
[2] Add jumper from I5-W to J8-W, on rear of input file.
[3] Add jumper from J5-W to I8-W, on rear of input file.

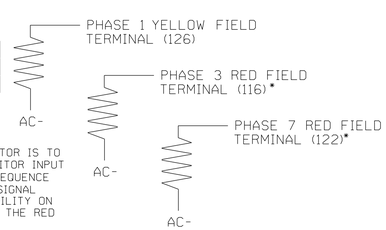
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Designs 1 and 2 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

Prepared for 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

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-0605T1&T2

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 3.2

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 THROUGH 9.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE       #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #39 ON
SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-COMMAND#)
IF  YELLOW ON PHASE    #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
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:          ¦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  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:          ¦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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          ¦123456789101112131415 16
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 '+'

```
PAGE 1: VEHICLE OVERLAP 'D' 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  X 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
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Temporary Designs 1 and 2 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 | New Hanover County | Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by:
Melissa B. Toth
D86CCE6DAD0A4F...
12/19/2014
DATE

SIG. INVENTORY NO. 03-0605T1&T2

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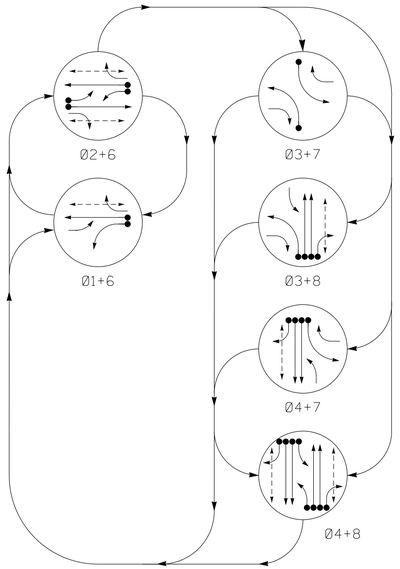
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 4.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

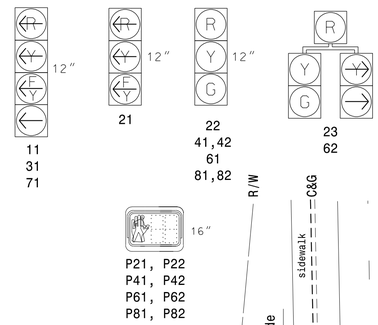
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+06	02+06	03+07	03+08	04+07	04+08	FLASH
11	←	F Y	R	R	R	R	Y
21	F Y	F Y	R	R	R	R	Y
22	R	G	R	R	R	R	Y
23	R	G	R/→	R/→	R	R	Y
31	R	R	←	←	F Y	F Y	R
41, 42	R	R	R	R	G	G	R
61	G	G	R	R	R	R	Y
62	G	G	R/→	R	R/→	R	Y
71	R	R	←	F Y	←	F Y	R
81, 82	R	R	R	G	R	G	R
P21,P22	DW	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	W	W	DRK
P61,P62	W	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



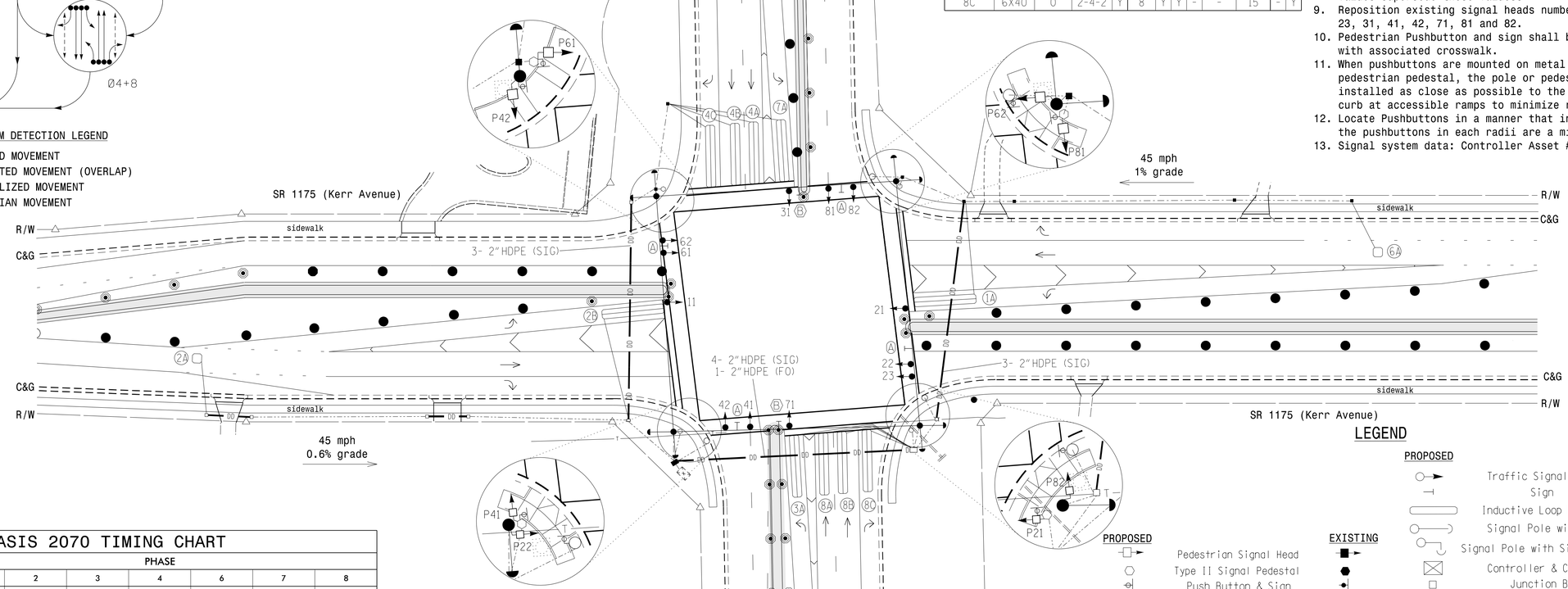
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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 C&D
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
					6	Y	Y	Y	-	3	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
2B	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	-
					8	Y	Y	-	-	3	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	-	-	15	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	15	-	-
					4	Y	Y	-	-	3	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8C	6X40	0	2-4-2	Y	8	Y	Y	-	-	15	-	Y

6 Phase
Fully Actuated
(Wilmington 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 3 and/or phase 7 may be lagged.
4. Phase 1 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Reposition existing signal heads numbered 11, 21, 22, 23, 31, 41, 42, 71, 81 and 82.
10. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
11. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
12. Locate Pushbuttons in a manner that in the final design the pushbuttons in each radii are a minimum of 10' apart.
13. Signal system data: Controller Asset #0605.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	Directional Drill	N/A
	2-in Underground Conduit	
	Directional Arrow	
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Pedestrian Signal Head	
	Type II Signal Pedestal	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
N/A	UG Telephone Line	
N/A	UG Power Line	
N/A	Drainage Pipe	
N/A	Right of Way	
	Street Name Sign	
	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	35	60	15	25	60	15	25
Yellow Clearance	3.0	4.5	3.0	3.8	4.5	3.0	3.8
Red Clearance	3.7	2.3	3.9	3.1	2.3	3.9	3.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7	7	-	7
Don't Walk 1	-	33	-	34	33	-	34
Seconds Per Actuation *	-	2.5	-	-	2.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	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 - Temporary Design 3 (TMP Phase IV)

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

SR 1175 (Kerr Avenue)
at
Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Thiggen	REVIEWED BY:	MB Toth

REVISIONS | INIT. | DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
D86DCF8E04D04AF DATE

SIG. INVENTORY NO. 03-0605T3

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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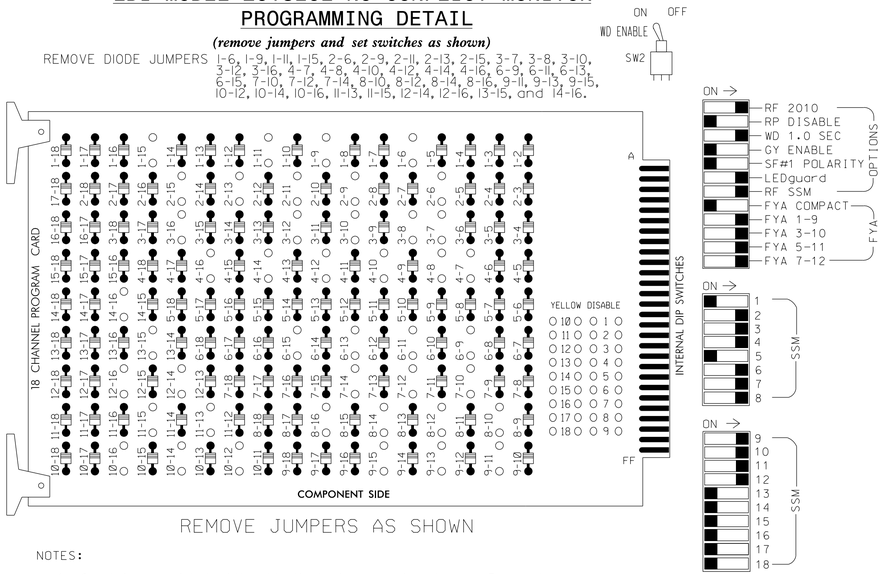
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 4.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 1-15, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-10, 3-12, 3-16, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 6-9, 6-11, 6-13, 6-15, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S8,S9,S10,S11 S12,AUX S1,AUX S2,AUX S4,AUX S5.
PHASES USED.....1,2,2PED,3,4,4PED,6,6PED,7,8, 8PED.
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....6
OVERLAP "D".....7+8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5	S6	S7	S8	S9	S10		S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4	14	5	6	15	7		8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4	4 PED	5	6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	22,23	P21, P22	23	31★	41,42	P41, P42	NU	61,62	P61, P62	62	71★	81,82	P81, P82	11★	31★	NU	21★	71★	NU
RED		128		*		101			134		*		107							
YELLOW	*	129				102			135				108							
GREEN		130				103			136				109							
RED ARROW															A121	A124		A114	A101	
YELLOW ARROW				117							123				A122	A125		A115	A102	
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127			118	118						124	124								
✋			113				104			119				110						
🚶			115				106			121				112						

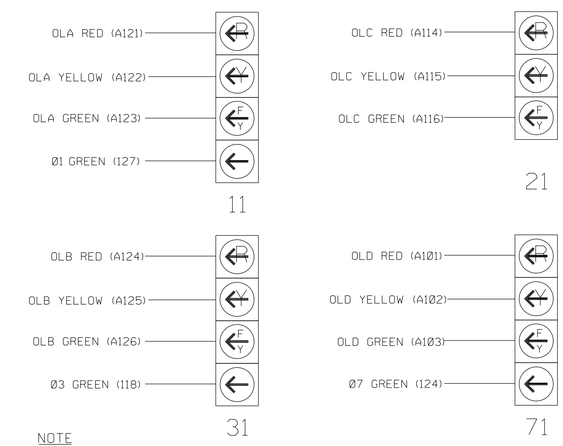
NU = Not Used

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

★ See pictorial of head wiring in detail below.

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 11, 31 and 71 require special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
3A[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			3
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
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
7A[3]	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
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			15
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Add jumper from I5-W to J8-W, on rear of input file.
[3] Add jumper from J5-W to I8-W, on rear of input file.

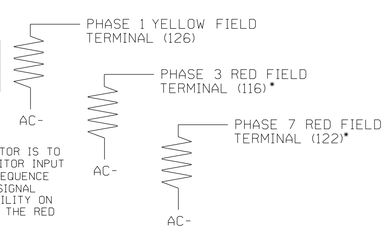
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
SIGNATURE DATE
PROFESSIONAL ENGINEER

SIG. INVENTORY NO. 03-0605T3

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 4.2

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 THROUGH 9.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE       #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE    #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #39 ON
SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-COMMAND#)
IF  ACTIVE PHASE       #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-COMMAND#)
IF  YELLOW ON PHASE    #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B Green
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:          |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  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:          |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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE:          |123456789101112131415 16
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 '+'

```
PAGE 1: VEHICLE OVERLAP 'D' 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  X 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
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 | New Hanover County | Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth
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12/19/2014
DATE

SIG. INVENTORY NO. 03-0605T3

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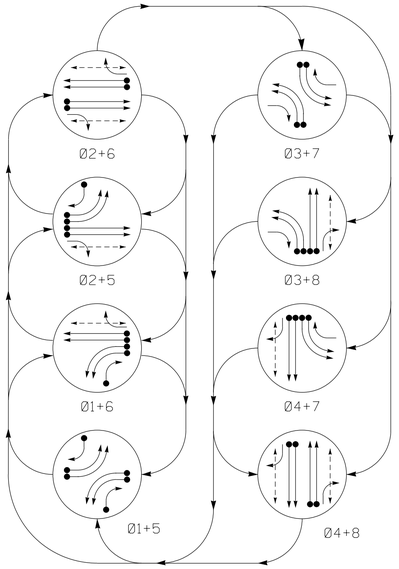
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 5.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

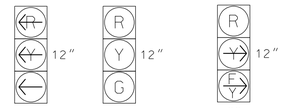
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8	FLASH
11, 12	←-	←-	←R	←R	←R	←R	←R	←R	←R
21, 22	R	R	G	G	R	R	R	R	Y
23	R	R	F Y	F Y	F Y	F Y	R	R	Y
31, 32	←R	←R	←R	←R	←-	←-	←R	←R	←R
41, 42	R	R	R	R	R	R	G	G	R
43	F Y	R	F Y	R	R	R	F Y	F Y	R
51, 52	←-	←R	←-	←R	←R	←R	←R	←R	←R
61, 62	R	G	R	G	R	R	R	R	Y
63	R	F Y	R	F Y	F Y	R	F Y	R	Y
71, 72	←R	←R	←R	←R	←-	←R	←-	←R	←R
81, 82	R	R	R	R	R	G	R	G	R
83	F Y	F Y	R	R	R	F Y	R	F Y	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



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

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

23
43
63
83

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

8 Phase Fully Actuated (Wilmington Signal System)

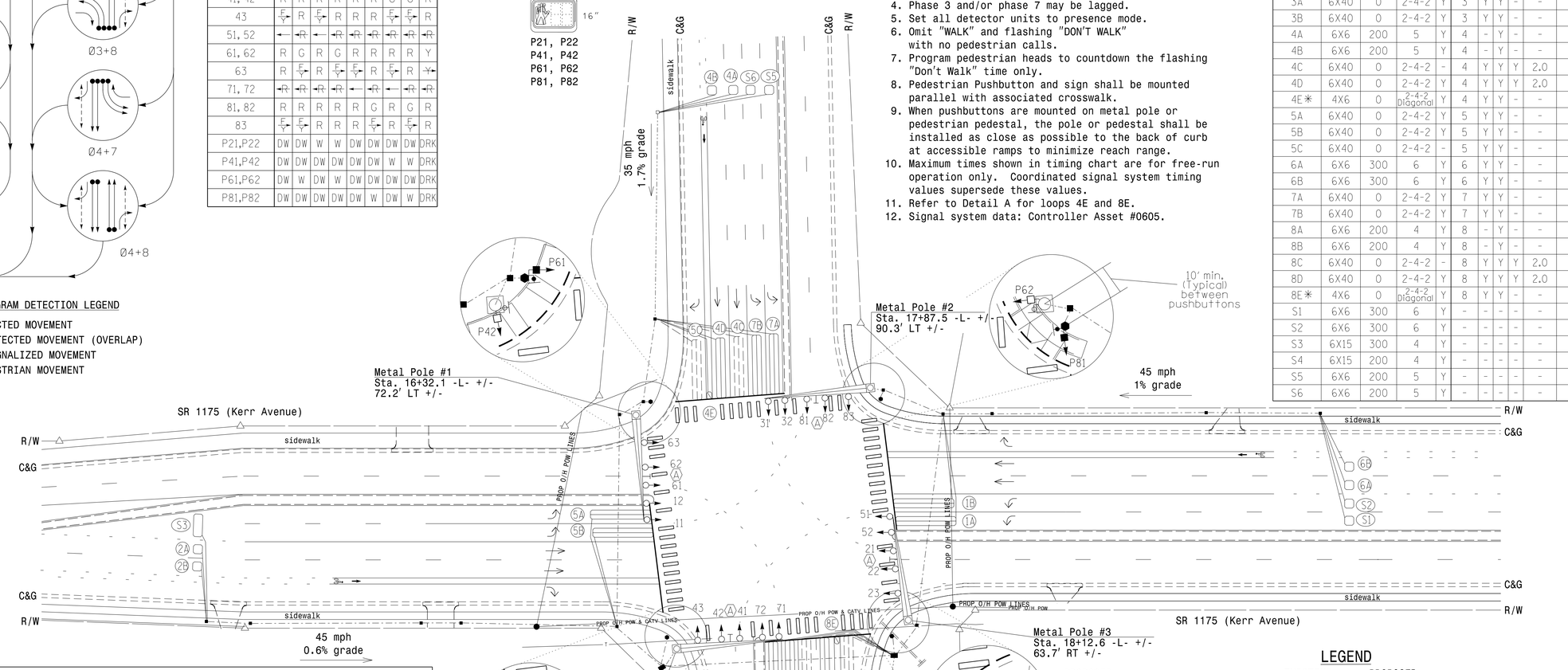
NOTES

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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Refer to Detail A for loops 4E and 8E.
12. Signal system data: Controller Asset #0605.

✳Set Sensitivity to appropriate level to detect a bicycle.

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	-	-	-	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	-
1C	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	4	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	-
4A	6X6	200	5	Y	4	-	Y	-	-	-	-	-
4B	6X6	200	5	Y	4	-	Y	-	-	-	-	-
4C	6X40	0	2-4-2	-	4	Y	Y	Y	2.0	5	-	-
4D	6X40	0	2-4-2	Y	4	Y	Y	Y	2.0	5	-	-
4E✳	4X6	0	2-4-2 diagonal	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	-
8A	6X6	200	4	Y	8	-	Y	-	-	-	-	-
8B	6X6	200	4	Y	8	-	Y	-	-	-	-	-
8C	6X40	0	2-4-2	-	8	Y	Y	Y	2.0	5	-	-
8D	6X40	0	2-4-2	Y	8	Y	Y	Y	2.0	5	-	-
8E✳	4X6	0	2-4-2 diagonal	Y	8	Y	Y	-	-	-	-	Y
S1	6X6	300	6	Y	-	-	-	-	-	-	Y	Y
S2	6X6	300	6	Y	-	-	-	-	-	-	Y	Y
S3	6X15	300	4	Y	-	-	-	-	-	-	Y	Y
S4	6X15	200	4	Y	-	-	-	-	-	-	Y	Y
S5	6X6	200	5	Y	-	-	-	-	-	-	Y	-
S6	6X6	200	5	Y	-	-	-	-	-	-	Y	-

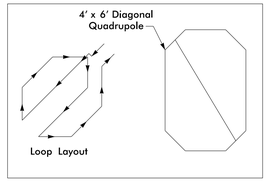


OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	5.0	2.0	6.0	2.0	5.0
Max Green 1 *	25	80	20	40	25	80	20	40
Yellow Clearance	3.0	4.5	3.0	3.8	3.0	4.4	3.0	3.8
Red Clearance	3.9	2.3	3.9	3.0	3.9	2.3	3.9	3.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7	-	7	-	7
Don't Walk 1	-	33	-	34	-	33	-	34
Seconds Per Actuation *	-	1.5	-	-	-	1.8	-	-
Max Variable Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	5	-	15	-	5
Time To Reduce *	-	30	-	15	-	30	-	15
Minimum Gap	-	3.2	-	3.0	-	3.2	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
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.

DETAIL A



LEGEND

PROPOSED		EXISTING
□	Junction Box	■
□	Oversize Junction Box	■
—DD—	Directional Drill	N/A
	2-in Underground Conduit	
→	Directional Arrow	→
N/A	UG Telephone Line	—T—
N/A	Drainage Pipe	
N/A	Right of Way	
Ⓐ	Street Name Sign	Ⓐ

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	

Signal Upgrade - Final Design

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Thigpen	REVIEWED BY:	MB Toth

REVISIONS | INIT. | DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 12/19/2014
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DATE

SIG. INVENTORY NO. 03-0605

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

DocuSigned by: Melissa B. Toth
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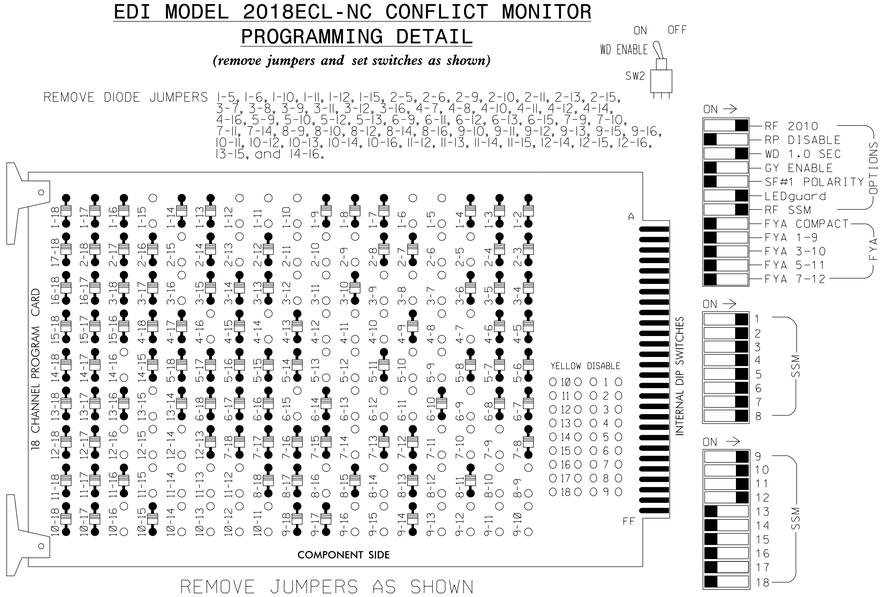
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 5.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 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.
4. Program phases 2, 4, 6 and 8 for Gap Reduction.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash and overlaps 3 and 4 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6,S7,S8,S9, S10,S11,S12,AUX S1,AUX S2, AUX S4,AUX S5.
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,7, 8,8PED.
OVERLAP "A".....2+3
OVERLAP "B".....4+5
OVERLAP "C".....6+7
OVERLAP "D".....1+8

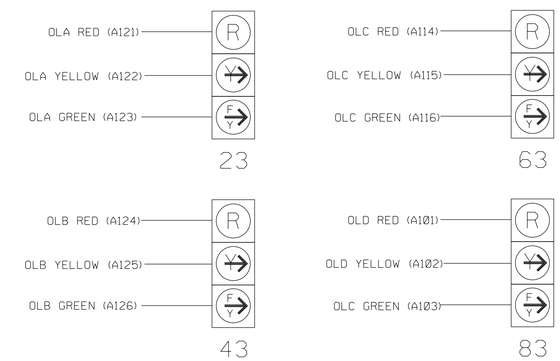
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	P21, P22	31,32	41,42	P41, P42	51,52	61,62	P61, P62	71,72	81,82	P81, P82	23 ★	43 ★	NU	63 ★	83 ★	NU
RED		128			101			134			107		A121	A124		A114	A101	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125		116			131			122									
YELLOW ARROW	126			117		132			123				A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124								
✋			113			104			119			110						
🚶			115			106			121			112						

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

3 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1C	Ø 2 2A	Ø 2 2B	Ø 3 3B	Ø 4 4A	Ø 4 4C	Ø 4 4E	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø 2 PED DC ISOLATOR	Ø 6 PED DC ISOLATOR	FS DC ISOLATOR
	L	Ø 1 1B	SYS. DET. S5	Ø 3 3A	NOT USED	NOT USED	Ø 4 4B	Ø 4 4D	NOT USED	SYS. DET. S2			Ø 4 PED DC ISOLATOR	Ø 8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5C	Ø 6 6A	Ø 6 6B	Ø 7 7B	Ø 8 8A	Ø 8 8C	Ø 8 8E	SYS. DET. S3	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	Ø 5 5B	SYS. DET. S6	Ø 7 7A	NOT USED	NOT USED	Ø 8 8B	Ø 8 8D	NOT USED	SYS. DET. S4					

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE CONNECTION & PROGRAMMING CHART

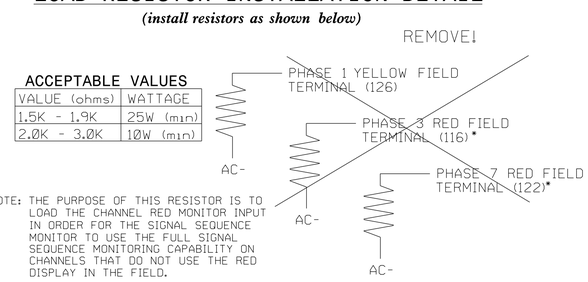
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-3,4	I1L	56	18	1	1	Y	Y			
1C	TB2-5,6	I2U	39	1	2	1	Y	Y			15
✳ S5	TB2-7,8	I2L	43	5	12	SYS					
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB2-11,12	I3L	76	38	42	3	Y	Y			
2B	TB4-1,2	I4U	47	9	22	2	Y	Y			
3B[2]	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	-	Y			
4B	TB4-11,12	I6L	45	7	14	4	-	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
4D	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2.0	5
4E	TB6-5,6	I8U	49	11	24	4	Y	Y			
✳ S1	TB6-9,10	I9U	60	22	11	SYS					
✳ S2	TB6-11,12	I9L	62	24	13	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
✳ S6	TB3-7,8	J2L	44	6	16	SYS					
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
7A	TB3-11,12	J3L	77	39	46	7	Y	Y			
6B	TB5-1,2	J4U	48	10	26	6	Y	Y			
7B[3]	TB5-5,6	J5U	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y			
8B	TB5-11,12	J6L	46	8	18	8	-	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5
8D	TB7-3,4	J7L	79	41	48	8	Y	Y	Y	2.0	5
8E	TB7-5,6	J8U	50	12	28	8	Y	Y			
✳ S3	TB7-9,10	J9U	59	21	15	SYS					
✳ S4	TB7-11,12	J9L	61	23	17	SYS					
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

✳ SYSTEM DETECTOR ONLY. REMOVE THE VEHICLE PHASE ASSIGNED TO THIS DETECTOR IN THE DEFAULT PROGRAMMING.
[1] Remove jumper from I1-W to J4-W, on rear of input file.
[2] Remove jumper from I5-W to J8-W, on rear of input file.
[3] Remove jumper from J5-W to I8-W, on rear of input file.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



ACCEPTABLE VALUES

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

*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

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

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
SIGNATURE DATE

SIG. INVENTORY NO. 03-0605

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 5.2

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:          |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  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:          |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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
 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  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 'D' SETTINGS
 PHASE:          |123456789101112131415 16
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  X 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
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O PROCESSOR PROGRAMMING TO DISABLE 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 DISABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, 6, 7, 8, and 9.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0605
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

Prepared for the Offices of: Transportation Mobility and Safety Division, State of North Carolina Department of Transportation, Signal Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCFBE04D04AF 12/19/2014 DATE

SIG. INVENTORY NO. 03-0605

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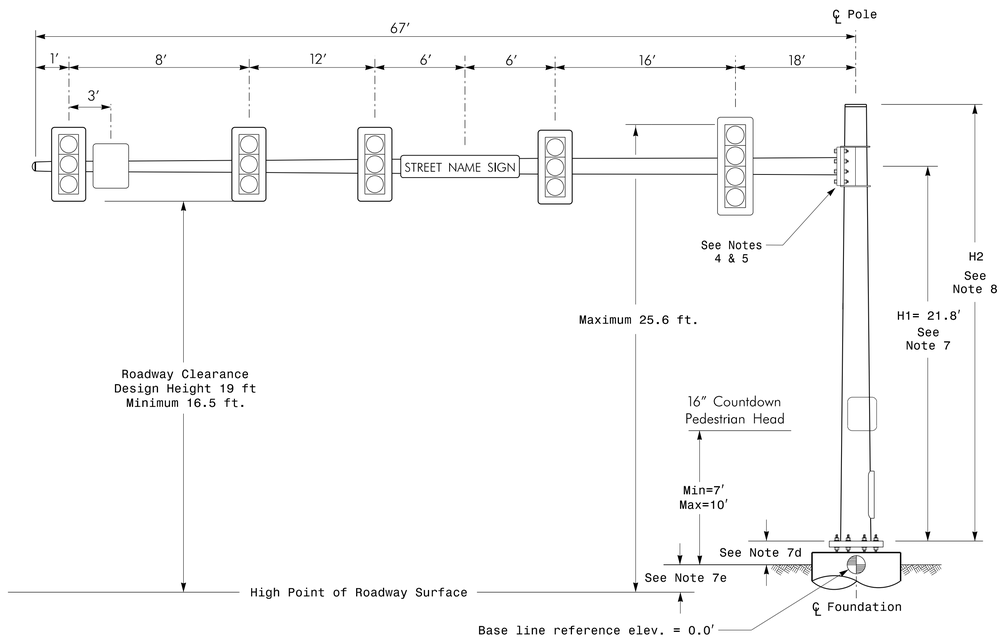
METAL POLE No. 1 and 2

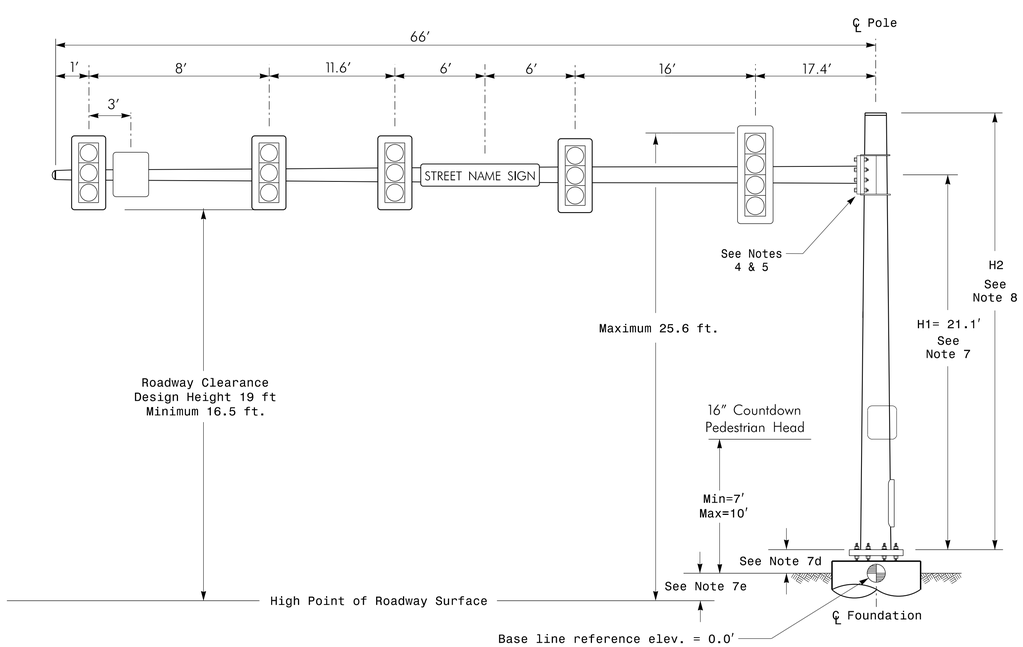
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 5.3

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2



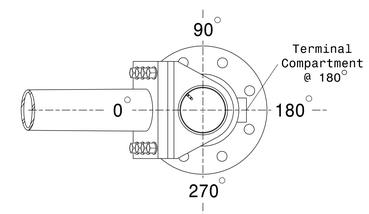
Elevation View

SPECIAL NOTE

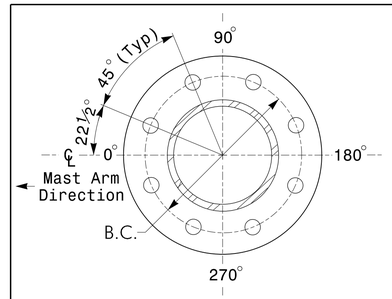
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.8 ft.	0.1 ft.
Elevation difference at Edge of travelway or face of curb	-0.8 ft.	-0.7 ft.

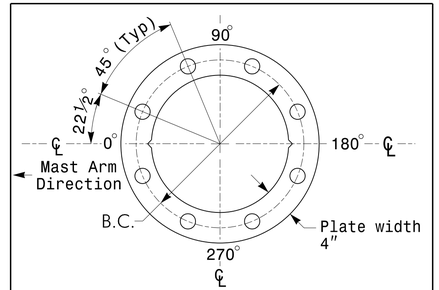


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SR 1175 (Kerr Avenue)
at
Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Thigpen	REVIEWED BY: MB Toth

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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SIG. INVENTORY NO. 03-0605

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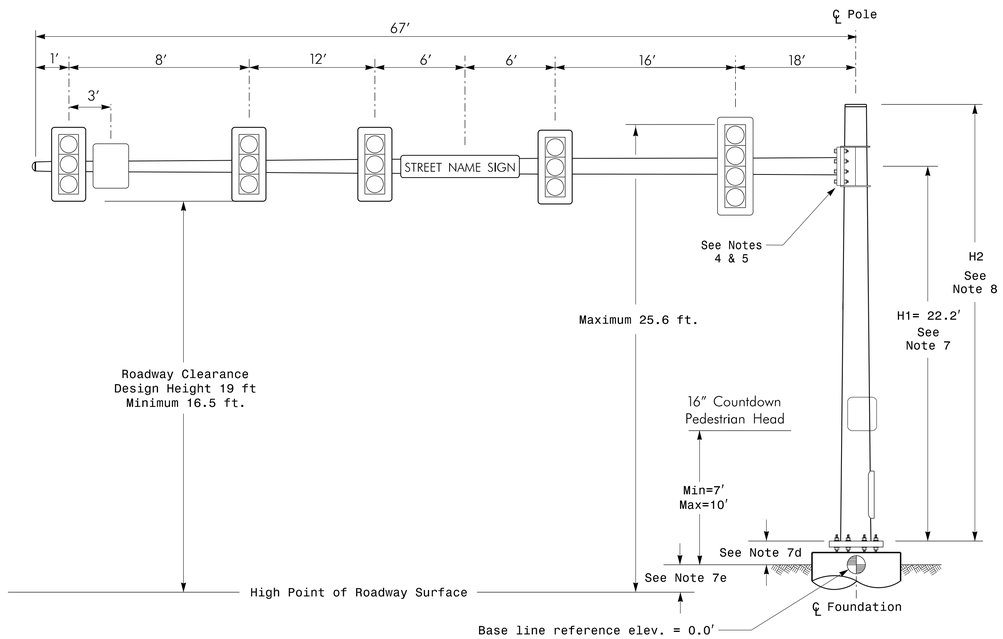
METAL POLE No. 3 and 4

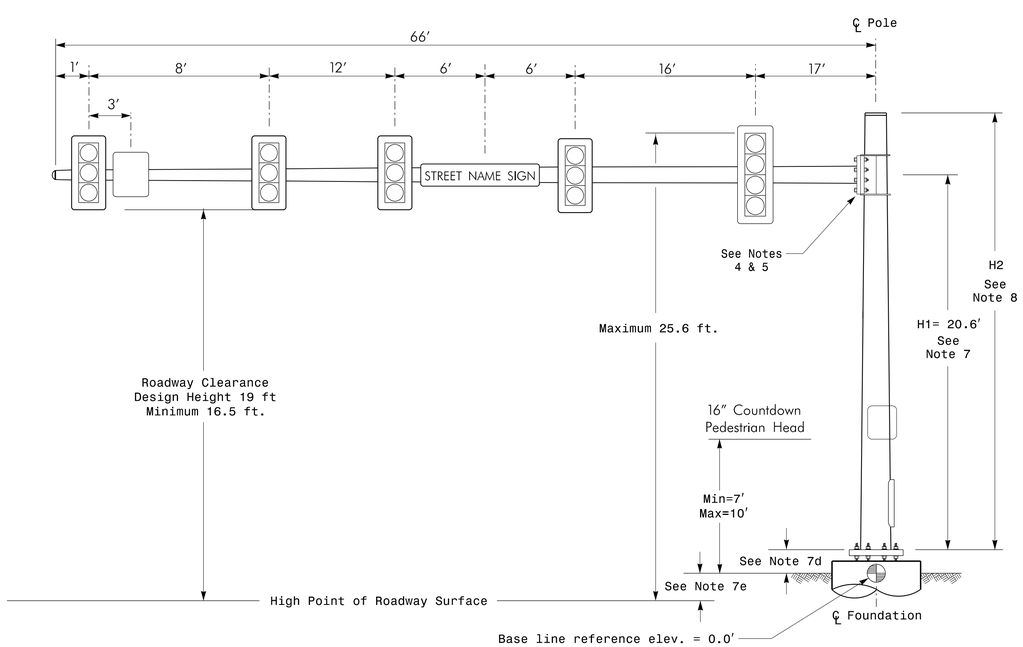
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 5.4

Design Loading for METAL POLE NO. 3



Elevation View

Design Loading for METAL POLE NO. 4



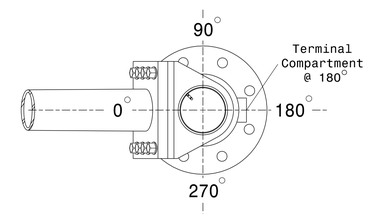
Elevation View

SPECIAL NOTE

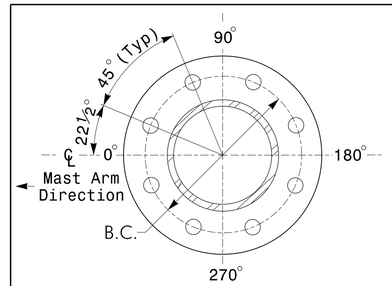
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.2 ft.	-0.4 ft.
Elevation difference at Edge of travelway or face of curb	-0.3 ft.	-0.4 ft.

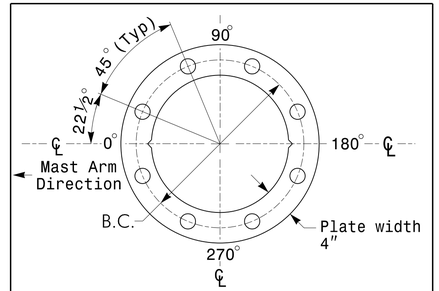


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SR 1175 (Kerr Avenue) at Randall Parkway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Thigpen	REVIEWED BY:	MB Toth	

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCFBE4D04AF... 12/19/2014 DATE

SIG. INVENTORY NO. 03-0605

13-JUL-2015 10:31
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WILE2054 AT DUS29140

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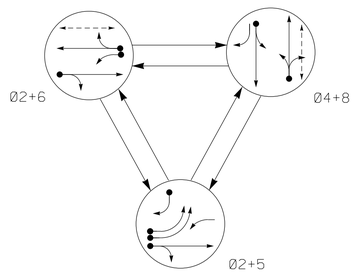
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 6.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

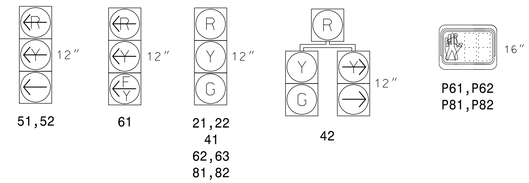
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04+8	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51,52	R	R	R	R
61	F Y	F Y	R	Y
62,63	R	G	R	Y
81,82	R	R	G	R
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



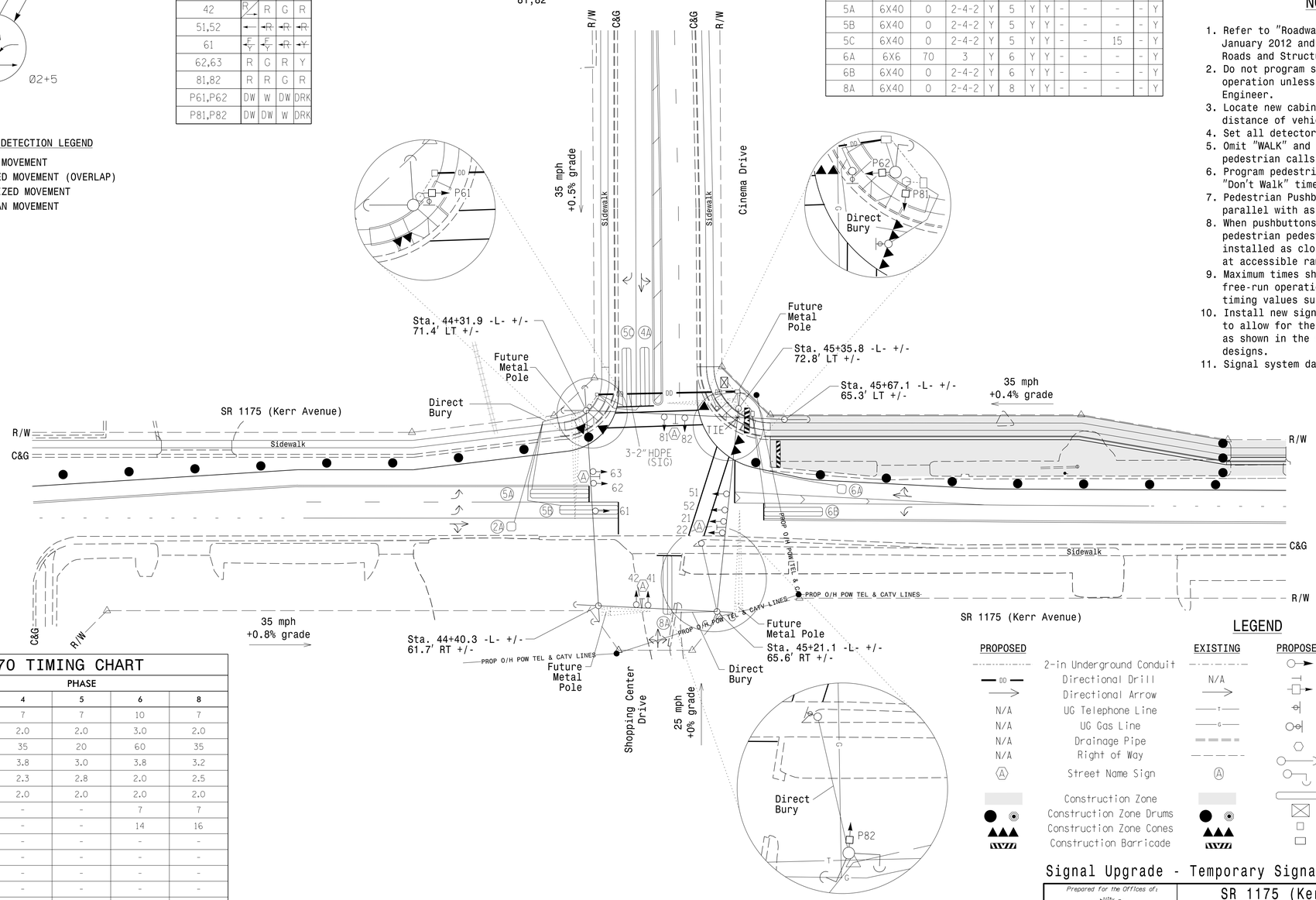
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	6X6	70	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
5C	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A	6X6	70	3	Y	6	Y	Y	-	-	-	-	Y
6B	6X40	0	2-4-2	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

3 Phase
Fully Actuated
(Wilmington Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
8. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in the subsequent temporary signal designs.
11. Signal system data: Controller Asset #1082.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	7	10	7
Extension 1 *	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	60	35	20	60	35
Yellow Clearance	3.8	3.8	3.0	3.8	3.2
Red Clearance	2.0	2.3	2.8	2.0	2.5
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	7	7
Don't Walk 1	-	-	-	14	16
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
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.

LEGEND

PROPOSED		EXISTING
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Drainage Pipe	
N/A	Right of Way	
A	Street Name Sign	A
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	

Signal Upgrade - Temporary Signal 1 (TMP Phase II)

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway
Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM MOON
PREPARED BY:	IW BERDEAU	REVIEWED BY:	MB TOTH

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
D80DCF8E04D04AF
DATE

SIG. INVENTORY NO. 03-1082T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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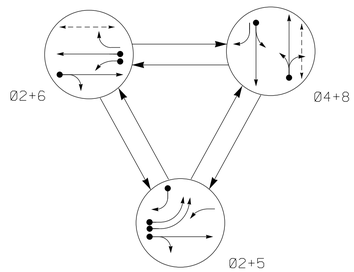
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 7.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

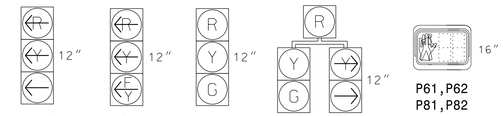
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04+8	FLASH
21,22	G	G	R	Y
41	R	R	G	R
42	R	R	G	R
51,52	R	R	R	R
61	F Y	F Y	R	Y
62,63	R	G	R	Y
81,82	R	R	G	R
P61,P62	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

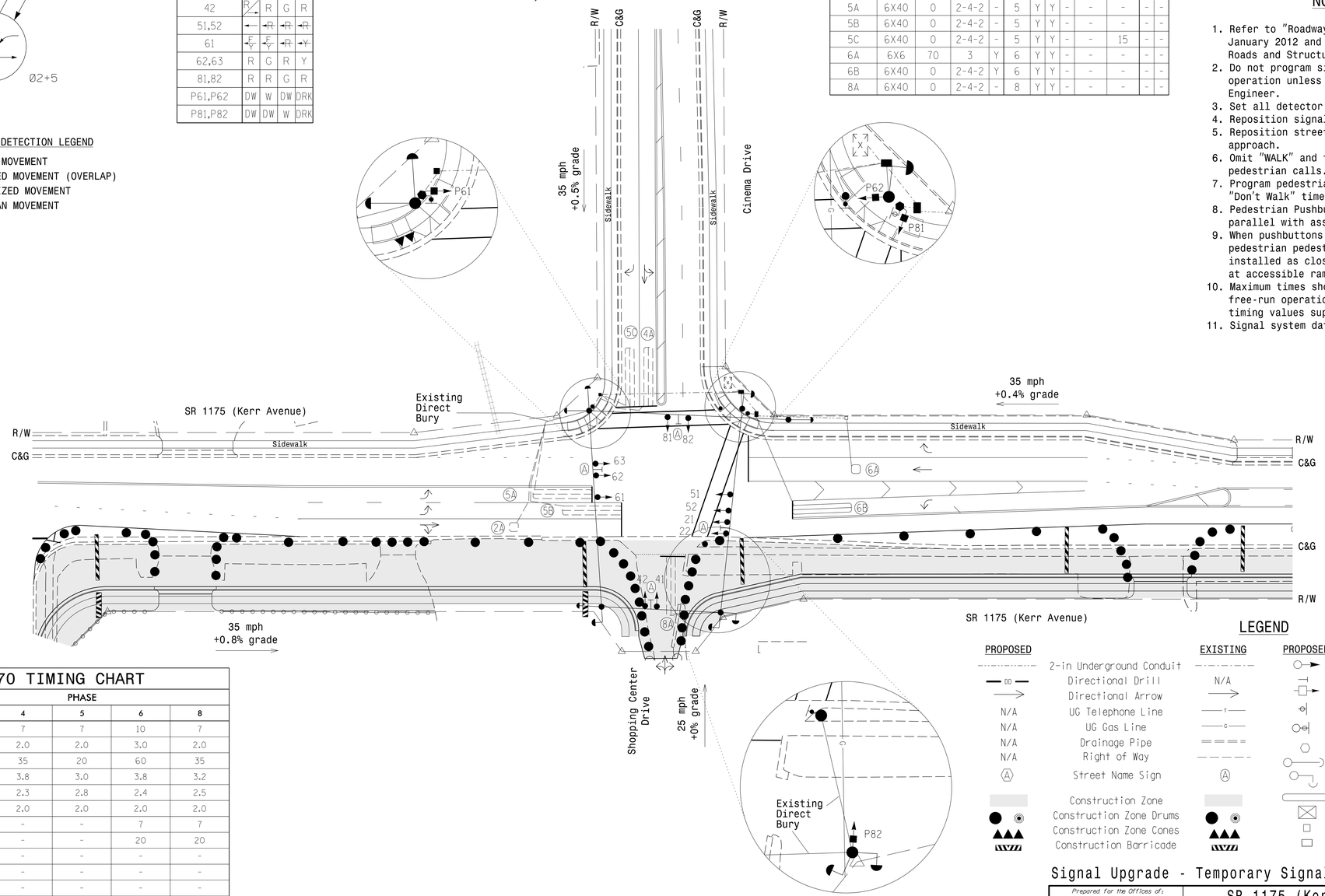


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	5	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	70	3	Y	6	Y	Y	-	-	-	-	-
6B	6X40	0	2-4-2	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

3 Phase
Fully Actuated
(Wilmington 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. Reposition signal heads numbered 61, 62, and 63.
5. Reposition street name sign for southbound approach.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data: Controller Asset #1082.



OASIS 2070 TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6	PHASE 8
Min Green 1 *	10	7	7	10	7
Extension 1 *	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	60	35	20	60	35
Yellow Clearance	3.8	3.8	3.0	3.8	3.2
Red Clearance	2.4	2.3	2.8	2.4	2.5
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	7	7
Don't Walk 1	-	-	-	20	20
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
	2-in Underground Conduit			Traffic Signal Head	
	Directional Drill	N/A		Sign	
	Directional Arrow			Pedestrian Signal Head	
N/A	UG Telephone Line			Push Button & Sign	
N/A	UG Gas Line			Temporary Pedestrian Post w/ Push Button & Sign	
N/A	Drainage Pipe			Type II Signal Pedestal	
N/A	Right of Way			Signal Pole with Guy	
A	Street Name Sign	A		Signal Pole with Sidewalk Guy	
	Construction Zone			Inductive Loop Detector	
	Construction Zone Drums			Controller & Cabinet	
	Construction Zone Cones			Junction Box	
	Construction Barricade			Oversize Junction Box	

Signal Upgrade - Temporary Signal 2 (TMP Phase III)

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM MOON
PREPARED BY:	IW BERDEAU	REVIEWED BY:	MB TOTH

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
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SIG. INVENTORY NO. 03-108212

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

13-JUL-2015 10:18
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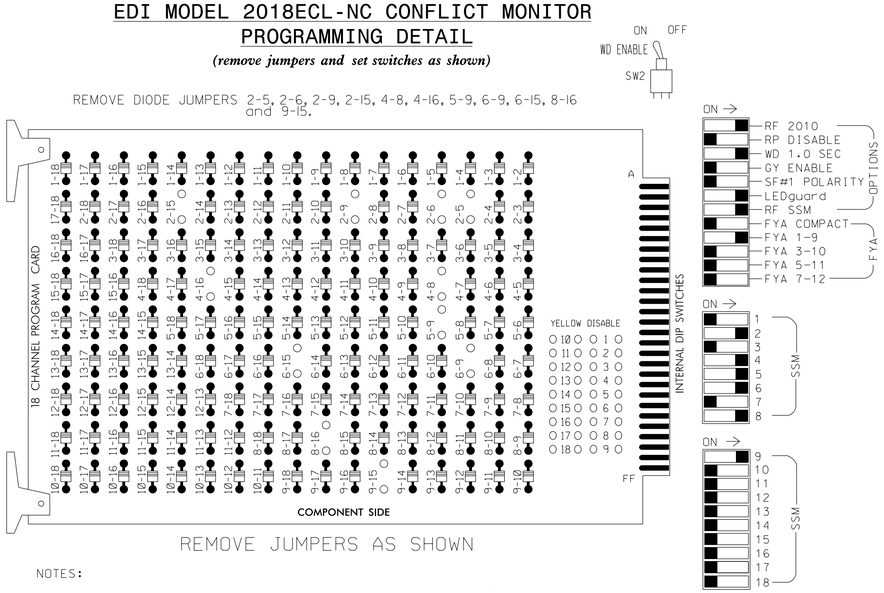
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 7.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-15, 4-8, 4-16, 5-9, 6-9, 6-15, 8-16 and 9-15.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51,52	62,63	P61, P62	NU	81,82	P81, P82	61 ★	NU	NU	NU	NU	NU
RED		128			101				134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW								131						A121					
YELLOW ARROW							132	132						A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW							133	133											
✋										119			110						
🚶										121			112						

NU = Not Used

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

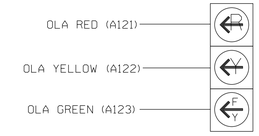
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

3 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



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COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

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:            |123456789101112131415 16
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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1082T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Designs 1 & 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
D86DCFBE04D04AF... DATE

SIG. INVENTORY NO. 03-1082T1&T2

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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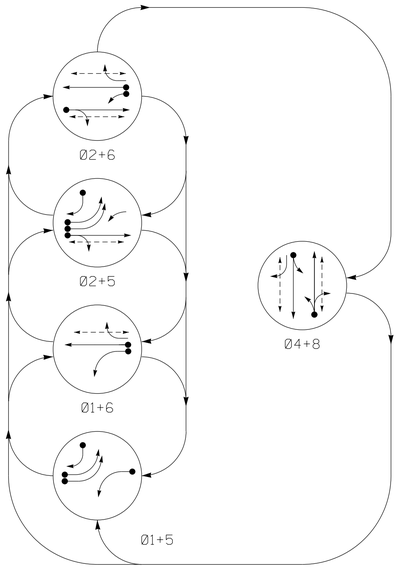
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 8.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

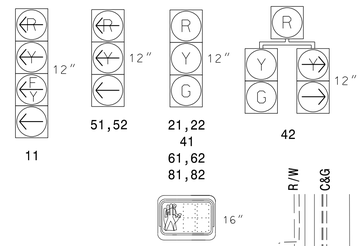
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	R	Y
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R/→	R	R/→	R	G	R
51,52	←	R	←	R	R	R
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



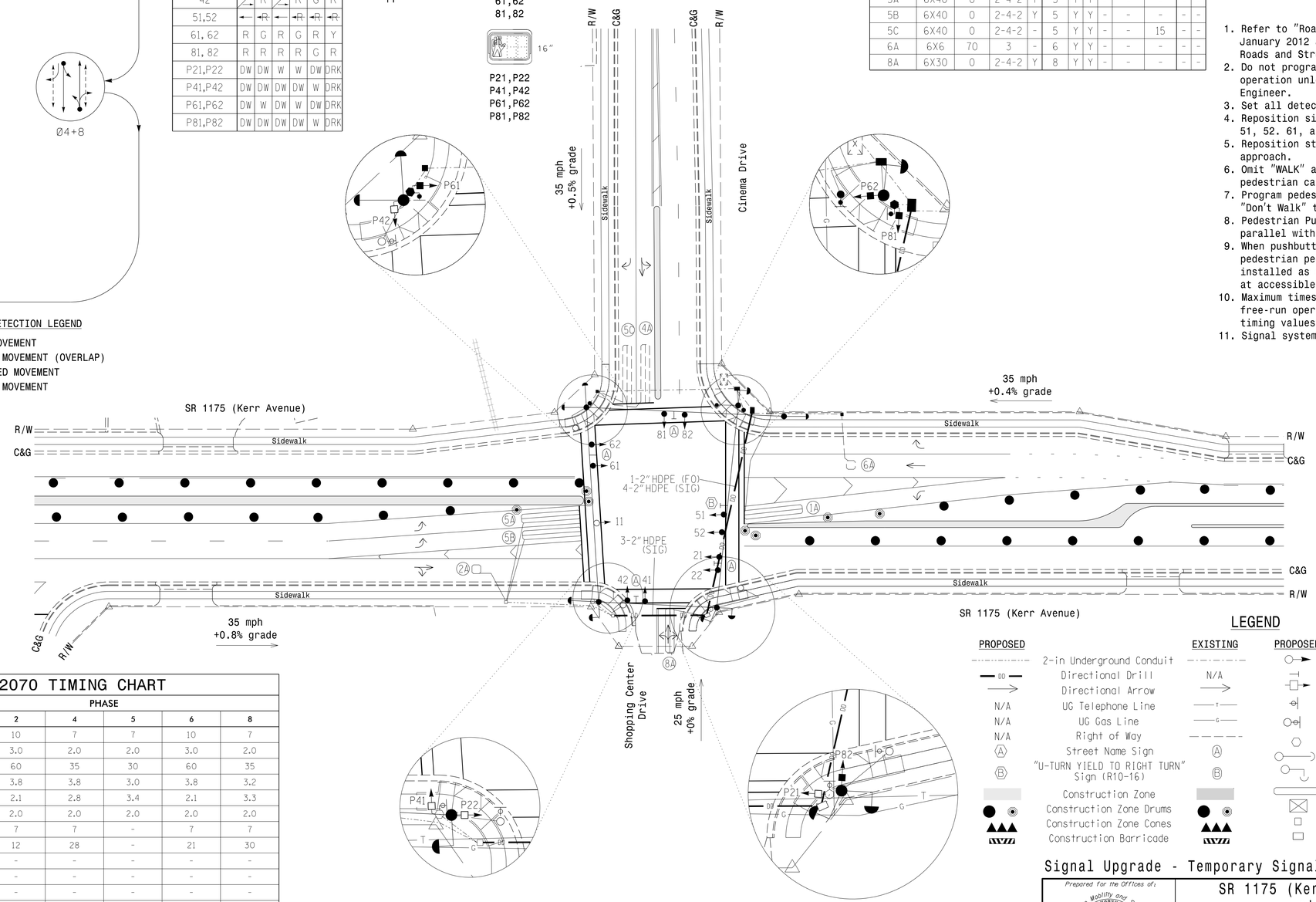
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-	-	-	-
2A	6X6	70	4	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	70	3	-	6	Y	Y	-	-	-	-	-
8A	6X30	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

5 Phase
Fully Actuated
(Wilmington 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. Reposition signal heads numbered 21, 22, 41, 42, 51, 52. 61, and 62.
5. Reposition street name sign for southbound approach.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data: Controller Asset #1082.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	20	60	35	30	60	35
Yellow Clearance	3.0	3.8	3.8	3.0	3.8	3.2
Red Clearance	2.9	2.1	2.8	3.4	2.1	3.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	12	28	-	21	30
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	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING
	2-in Underground Conduit	
	Directional Drill	N/A
	Directional Arrow	
N/A	UG Telephone Line	
N/A	UG Gas Line	
N/A	Right of Way	
Ⓐ	Street Name Sign	Ⓐ
Ⓑ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓑ
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	

Signal Upgrade - Temporary Signal 3 (TMP Phase IV)

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway
Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM MOON
PREPARED BY:	IW BERDEAU	REVIEWED BY:	MB TOTH

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
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DATE

SIG. INVENTORY NO. 03-108213

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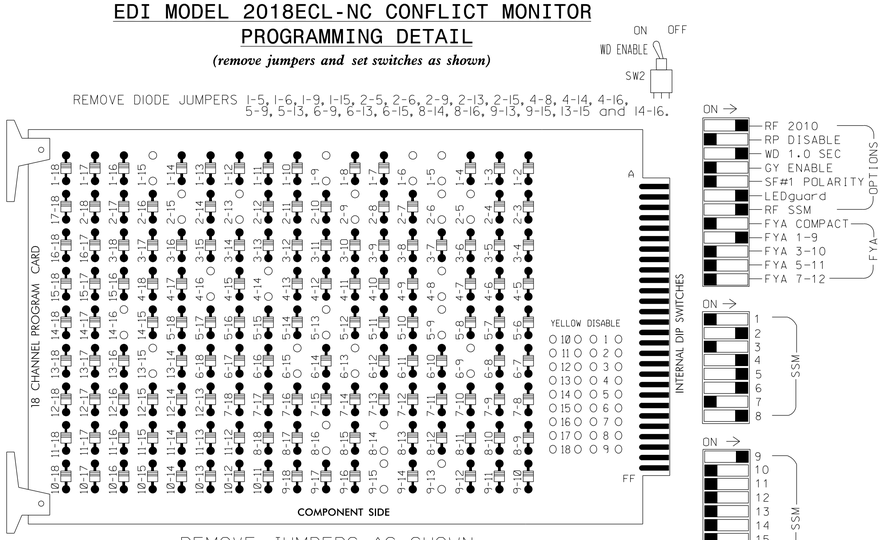
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 8.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	42	51,52	61,62	P61, P62	NU	81,82	P81, P82	11★	NU	NU	NU	NU	NU
RED		128			101				134			107							
YELLOW	✳	129			102				135			108							
GREEN		130			103				136			109							
RED ARROW								131						A121					
YELLOW ARROW							132	132						A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127						133	133											
✋			113			104				119			110						
🚶			115			106				121			112						

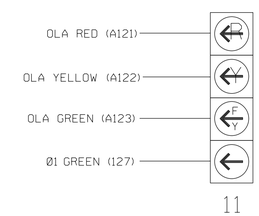
NU = Not Used

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

★ See pictorial of head wiring in detail 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	Ø 1 1A	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED				NOT USED						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	WIRED INPUT ⊗	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5C	NOT USED			NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown 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: 03-1082T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Cinema Drive/ Shopping Center Driveway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS | INIT. | DATE

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

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DocuSigned by: Melissa B. Toth 12/19/2014
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PROJECT REFERENCE NO.	SHEET NO.
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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:          ¦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  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: 03-1082T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014		REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion		REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1082T3

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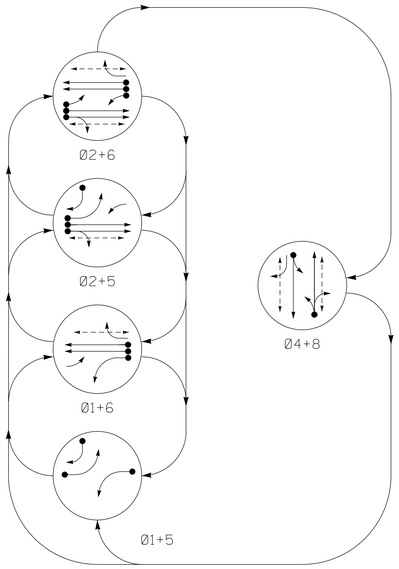
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 9.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

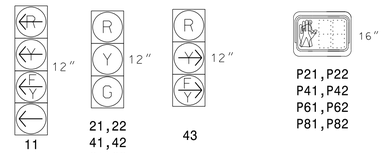
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



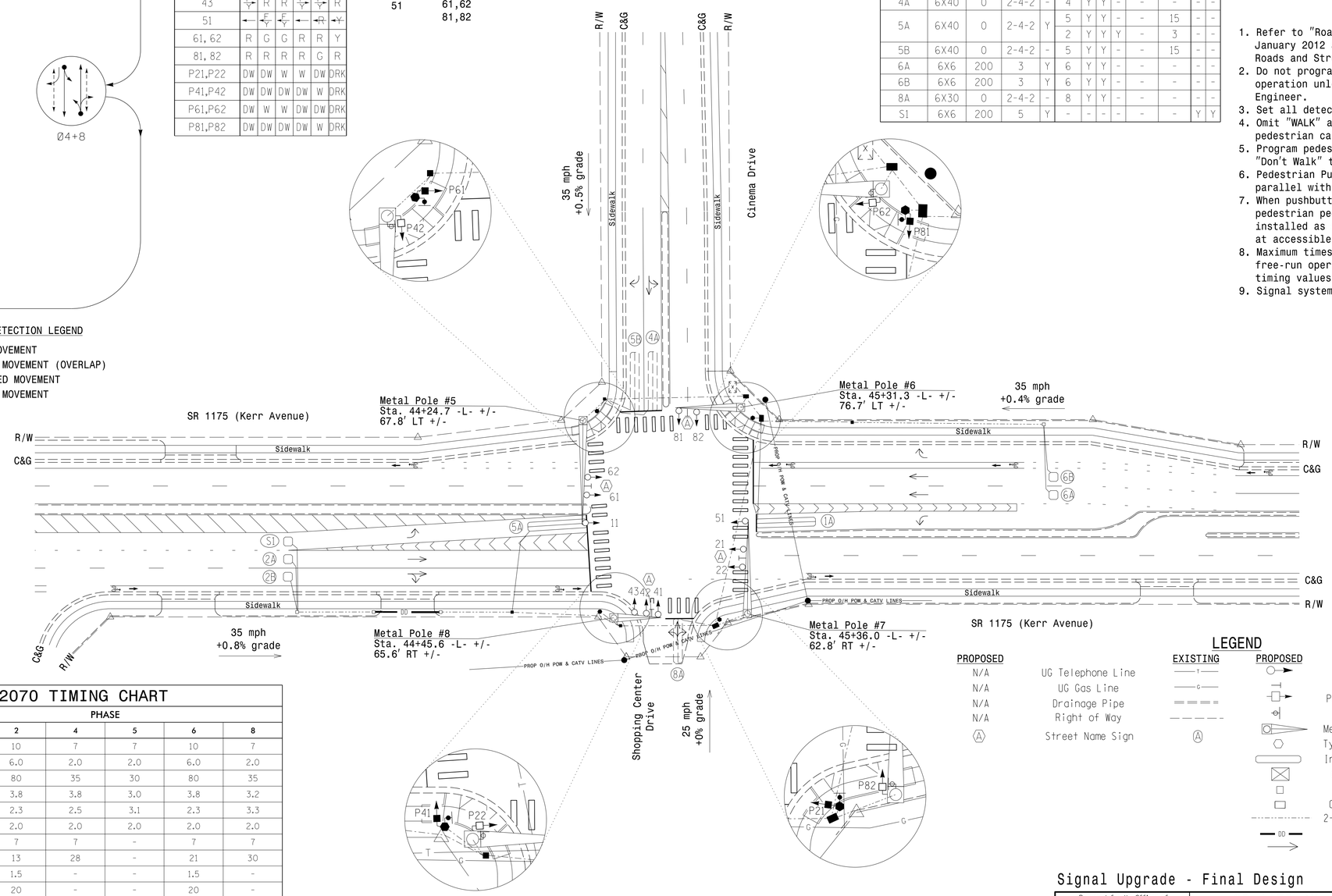
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-
					6	Y	Y	Y	-	3	-	-
2A	6X6	200	5	Y	2	Y	Y	-	-	-	-	-
2B	6X6	200	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	200	3	Y	6	Y	Y	-	-	-	-	-
6B	6X6	200	3	Y	6	Y	Y	-	-	-	-	-
8A	6X30	0	2-4-2	-	8	Y	Y	-	-	-	-	-
S1	6X6	200	5	Y	-	-	-	-	-	-	Y	Y

5 Phase
Fully Actuated
(Wilmington Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
7. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Signal system data: Controller Asset #1082.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	80	35	30	80	35
Yellow Clearance	3.0	3.8	3.8	3.0	3.8	3.2
Red Clearance	3.1	2.3	2.5	3.1	2.3	3.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	13	28	-	21	30
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	20	-	-	20	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	25	-	-	25	-
Minimum Gap	-	3.0	-	-	3.0	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
N/A	UG Telephone Line	T		Traffic Signal Head	
N/A	UG Gas Line	G		Sign	
N/A	Drainage Pipe			Pedestrian Signal Head	
N/A	Right of Way			Push Button & Sign	
Ⓐ	Street Name Sign	Ⓐ		Metal Pole with Mastarm	
				Type II Signal Pedestal	
				Inductive Loop Detector	
				Controller & Cabinet	
				Junction Box	
				Oversize Junction Box	
				2-in Underground Conduit	
			DD	Directional Drill	N/A
				Directional Arrow	

Signal Upgrade - Final Design

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM MOON
PREPARED BY:	IW BERDEAU	REVIEWED BY:	MB TOTH

SCALE 0 40 1"=40'

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1082

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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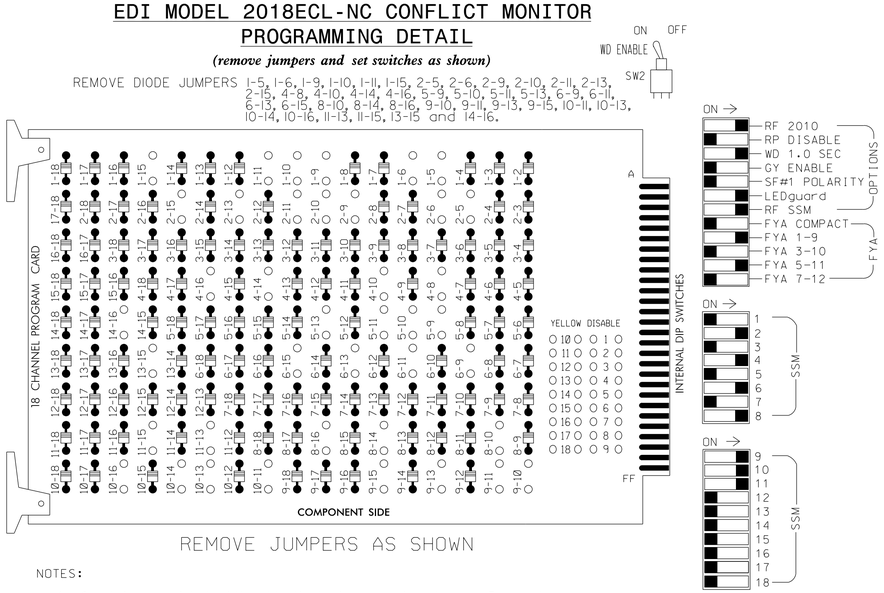
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 9.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-10, 1-11, 1-15, 2-5, 2-6, 2-9, 2-10, 2-11, 2-13, 2-15, 4-8, 4-10, 4-14, 4-16, 5-9, 5-10, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-10, 8-14, 8-16, 9-10, 9-11, 9-13, 9-15, 10-11, 10-13, 10-14, 10-16, 11-13, 11-15, 13-15 and 14-16.



■ = DENOTES POSITION OF SWITCH

REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	43★	NU	51★	NU	NU
RED		128			101			134			107			A124				
YELLOW	✳	129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 2 2A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø 2 2B				NOT USED			NOT USED			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	WIRED INPUT ⊗	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED	Ø 6 6B			NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
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			
✳ S1	TB6-9,10	I9U	60	22	11	SYS					
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 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.

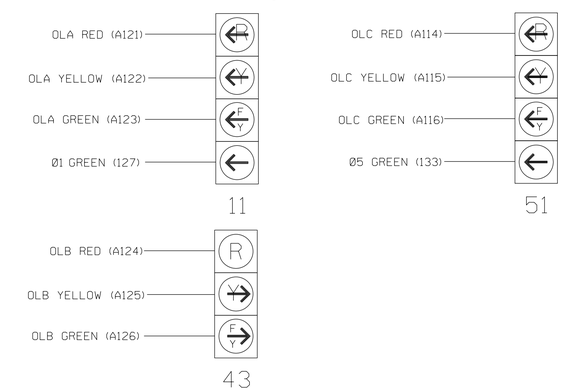
[1] Add jumper from I1-W TO J4-W, on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

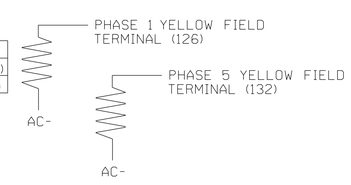
1. The sequence displays for signal heads 11 & 51 require special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: Ø3-1082
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Cinema Drive/ Shopping Center Driveway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

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

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1082

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 9.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  X 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
```

← NOTICE GREEN FLASH

PRESS '+'

```
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  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

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1082
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth — DBEDCFBE04D0AAF... 12/19/2014 DATE

SIG. INVENTORY NO. 03-1082

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(919) 876-6888 NCBEES #F-0326

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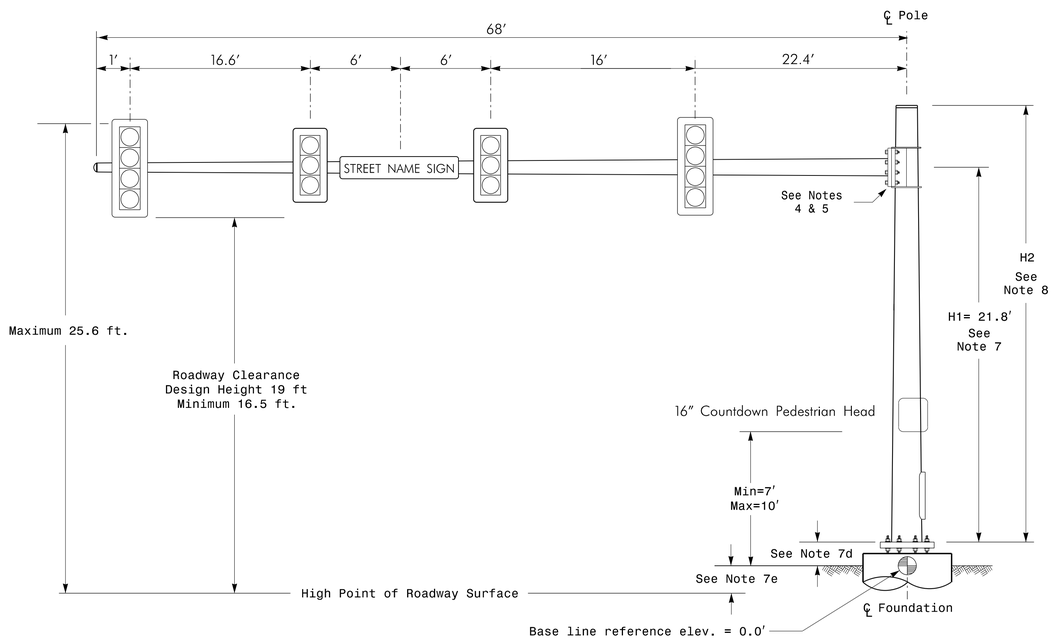
METAL POLE No. 5 and 6

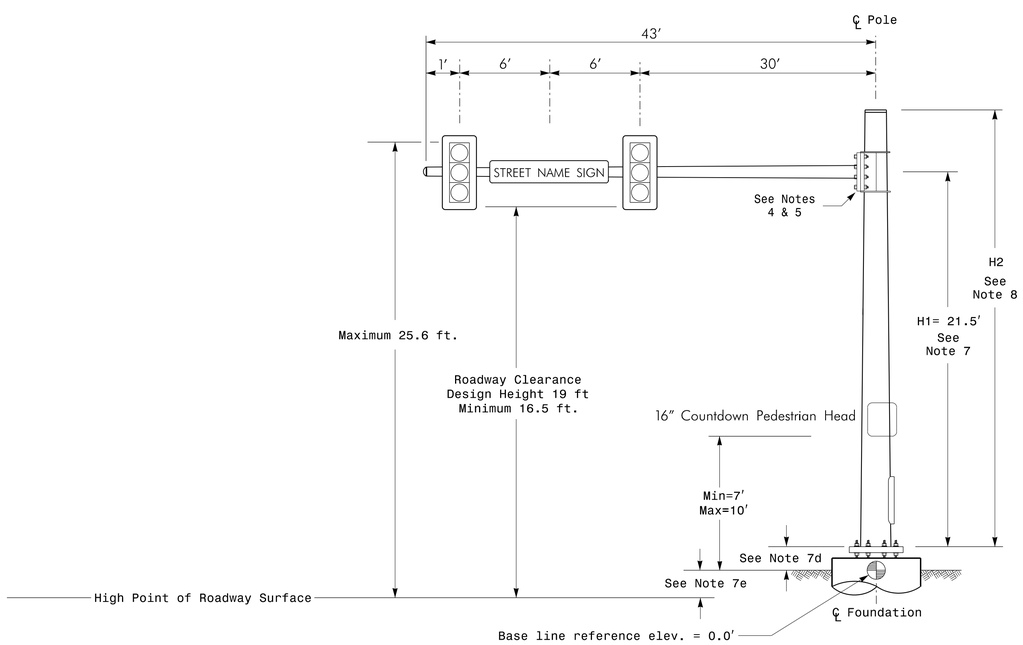
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 9.3

Design Loading for METAL POLE NO. 5



Elevation View

Design Loading for METAL POLE NO. 6



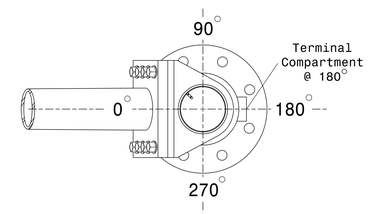
Elevation View

SPECIAL NOTE

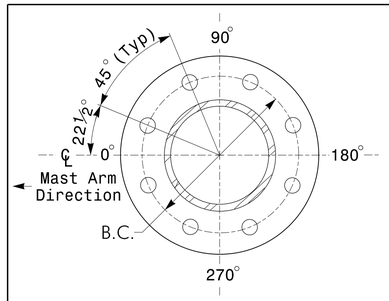
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 5	Pole 6
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.8 ft.	+0.4 ft.
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	-0.5 ft.

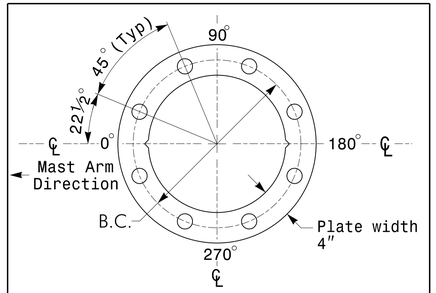


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCFBED4D0AAF 12/19/2014 DATE

SIG. INVENTORY NO. 03-1082

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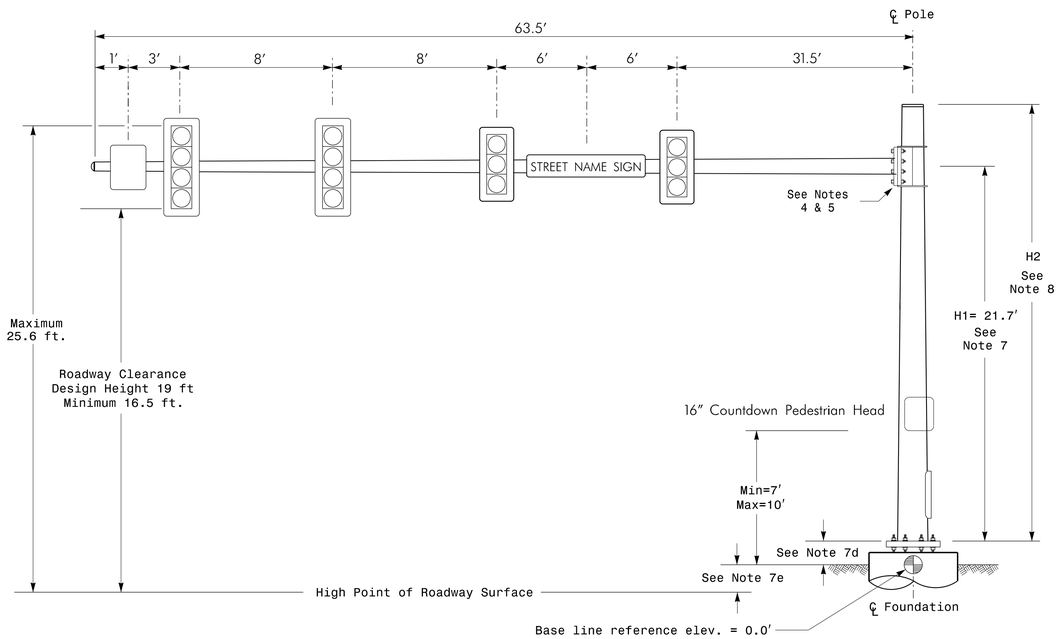
METAL POLE No. 7 and 8

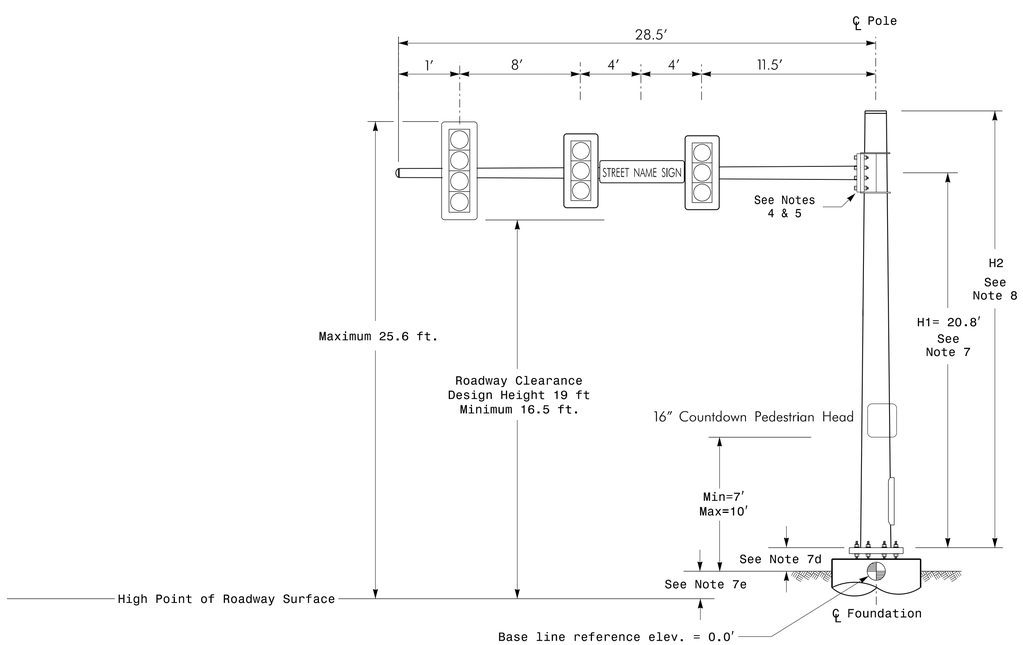
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 9.4

Design Loading for METAL POLE NO. 7



Elevation View

Design Loading for METAL POLE NO. 8



Elevation View

SPECIAL NOTE

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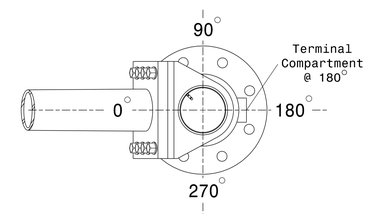
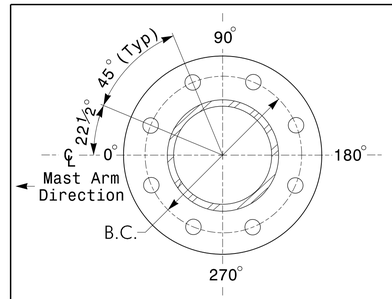
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 7	Pole 8
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.7 ft.	-0.3 ft.
Elevation difference at Edge of travelway or face of curb	-0.5 ft.	-0.5 ft.

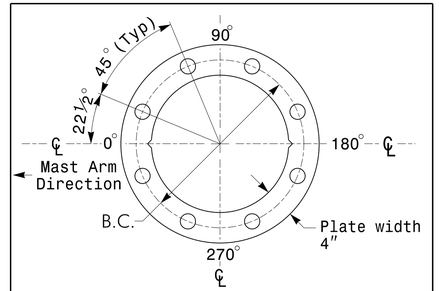


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



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NCDOT Wind Zone 2 (130 mph)

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SR 1175 (Kerr Avenue)
at
Cinema Drive/
Shopping Center Driveway

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: IW BERDEAU	REVIEWED BY:	MB Toth	

SCALE 0 N/A N/A

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1082

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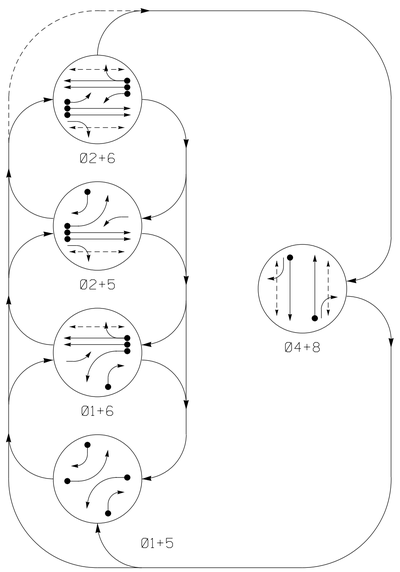
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 10.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.

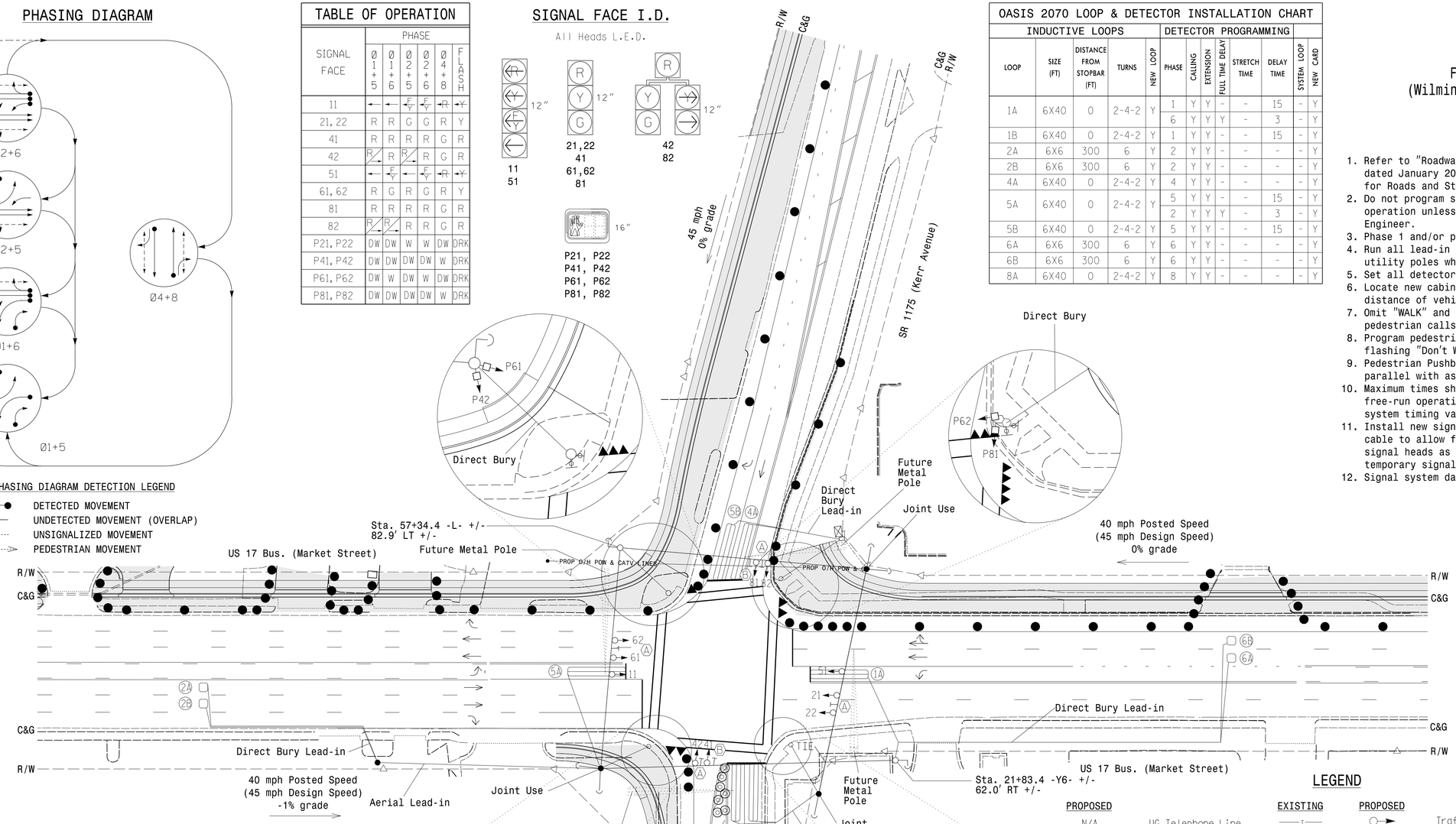
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	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
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

5 Phase
Fully Actuated
(Wilmington 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. Run all lead-in cable overhead on existing utility poles where possible.
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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in the subsequent temporary signal designs.
12. Signal system data: Controller Asset #0049.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	1.0	6.0	3.0	1.0	6.0	3.0
Max Green 1 *	30	90	60	30	90	60
Yellow Clearance	3.0	4.6	4.5	3.0	4.6	3.9
Red Clearance	3.1	1.7	1.8	3.3	1.7	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	13	19	-	10	23
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Right of Way	
A	Street Name Sign	A
B	No Left Turn Sign (R3-2)	B
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	

Signal Upgrade - Temporary Design 1 (TMP Phase II)

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

US 17 Business (Market Street)
at
SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	AJ Davis	REVIEWED BY:	LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DB0DCFBE04D04AF... DATE

SIG. INVENTORY NO. 03-0049TI

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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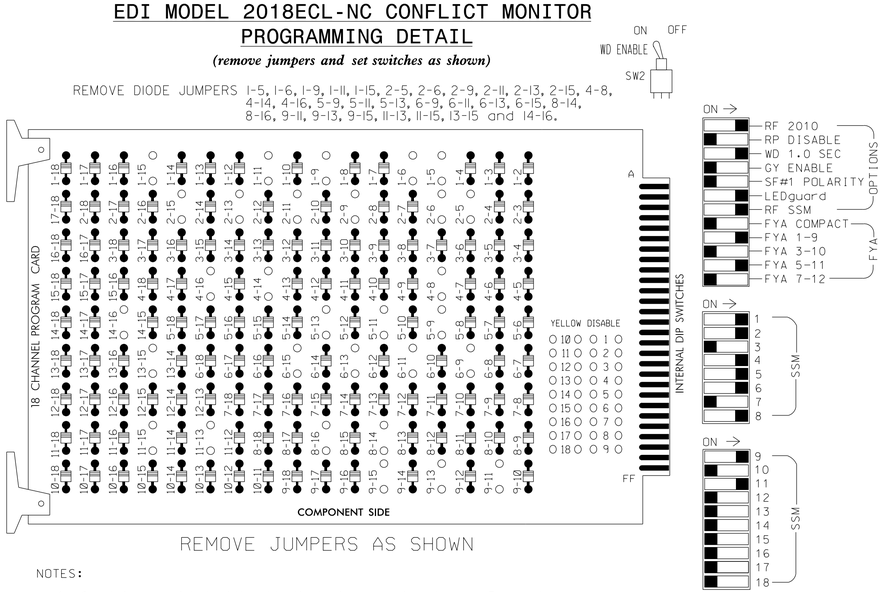
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 10.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phase 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	P21, P22	NU	41,42	P41, P42	42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	NU	NU	51★	NU	NU
RED		*	128			101		*		134			107						
YELLOW			129			102				135			108						
GREEN			130			103				136			109						
RED ARROW														A121			A114		
YELLOW ARROW		126					132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127					133	133											
✋			113			104				119			110						
🚶			115			106				121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail below.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
	-	J5U	57	19	7	6	Y	Y	Y		3
1B	TB2-7,8	I2L	43	5	12	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

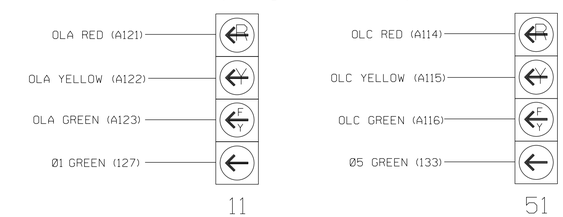
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J5-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



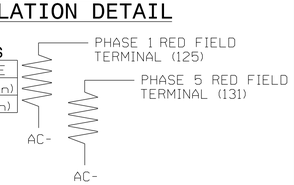
NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0049T1
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AJ Davis	REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

Prepared for 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

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014 DATE

SIG. INVENTORY NO. 03-0049T1

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 10.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-0049T1
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 Business (Market Street)
at
SR 1175 (Kerr Avenue)

Division 03 | New Hanover County | Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-0049T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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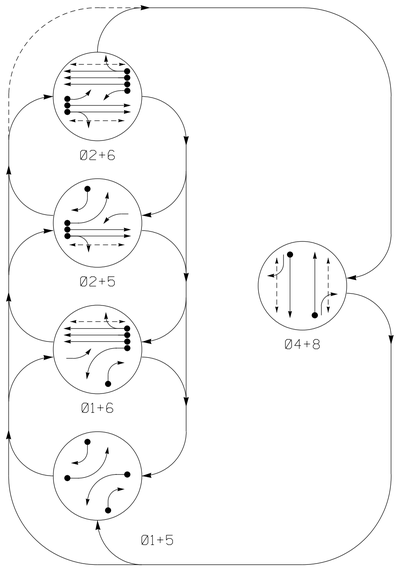
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 11.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	R	Y
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	←	F Y	←	F Y	R	Y
61, 62, 63	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

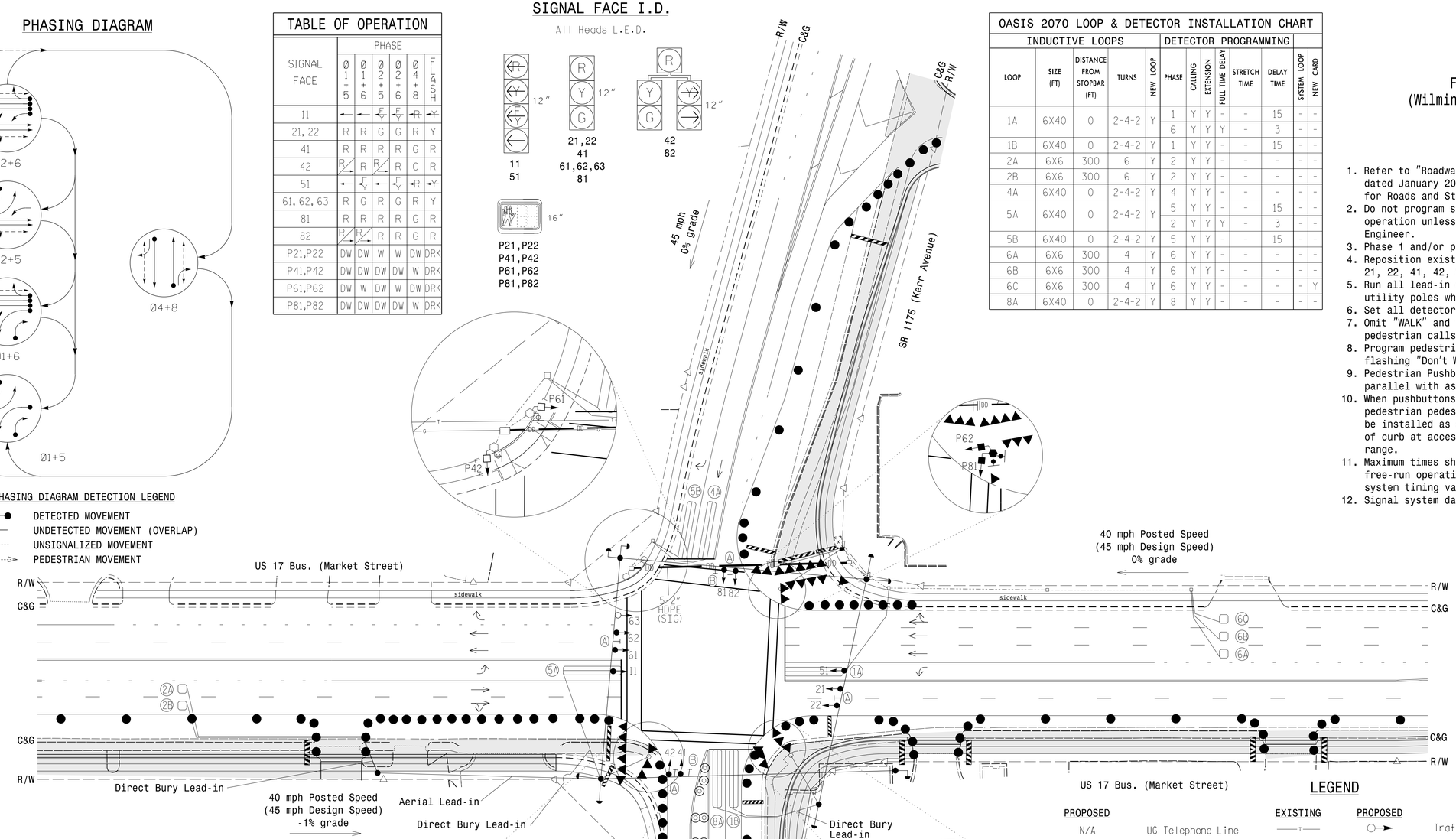
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6C	6X6	300	4	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

5 Phase
Fully Actuated
(Wilmington 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. Reposition existing signal heads numbered 11, 21, 22, 41, 42, 51, 61, 62, 81 & 82.
5. Run all lead-in cable overhead on existing utility poles where possible.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
10. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
12. Signal system data: Controller Asset #0049.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	1.0	6.0	3.0	1.0	6.0	3.0
Max Green 1 *	30	90	60	30	90	60
Yellow Clearance	3.0	4.6	4.5	3.0	4.6	3.9
Red Clearance	2.9	1.6	1.9	3.1	1.6	2.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	18	23	-	15	22
Seconds Per Actuation *	-	1.5	-	-	1.3	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Right of Way	
A	Street Name Sign	A
B	No Left Turn Sign (R3-2)	B
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	

Signal Upgrade - Temporary Design 2 (TMP Phase III)

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

US 17 Business (Market Street) at SR 1175 (Kerr Avenue)

Division 03	New Hanover County	Wilmington
PLAN DATE: June 2014	REVIEWED BY:	MB Toth
PREPARED BY: AJ Davis	REVIEWED BY:	LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-0049T2

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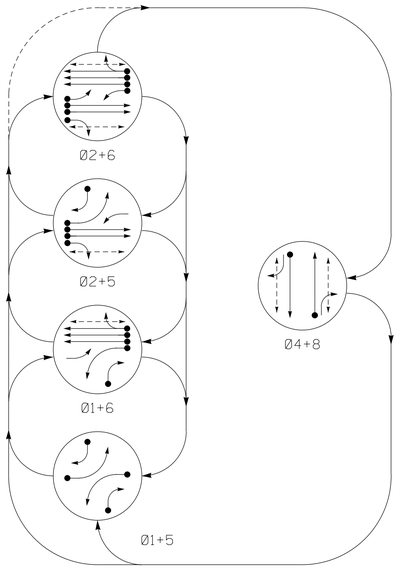
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 12.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

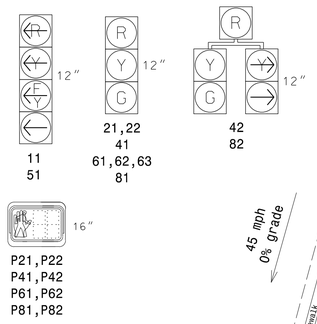
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11	←	←	←F Y	←F Y	←R	←Y
21, 22	R	R	G	G	R	Y
41	R	R	R	R	G	R
42	R↘	R	R↘	R	G	R
51	←	←F Y	←	←F Y	←R	←Y
61, 62, 63	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R↘	R↘	R	R	G	R
P21,P22	DW	DW	W	W	DW	DRK
P41,P42	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DRK
P81,P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



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	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6C	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

5 Phase
Fully Actuated
(Wilmington 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. Reposition existing signal heads numbered 11, 21, 22, 41, 42, 51, 81 & 82.
5. Reposition signs as shown on plans.
6. Run all lead-in cable overhead on existing utility poles where possible.
7. Set all detector units to presence mode.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
11. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
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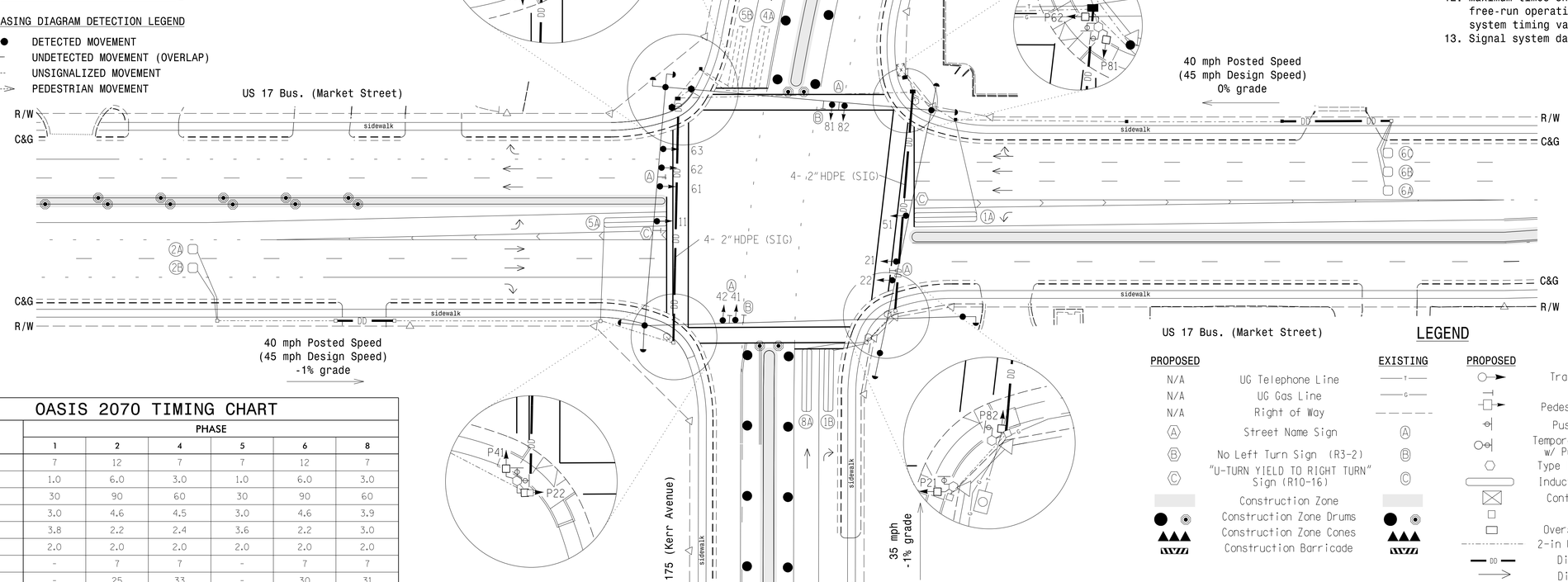

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	1.0	6.0	3.0	1.0	6.0	3.0
Max Green 1 *	30	90	60	30	90	60
Yellow Clearance	3.0	4.6	4.5	3.0	4.6	3.9
Red Clearance	3.8	2.2	2.4	3.6	2.2	3.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	25	33	-	30	31
Seconds Per Actuation *	-	1.5	-	-	1.3	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Right of Way	
A	Street Name Sign	A
B	No Left Turn Sign (R3-2)	B
C	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	C
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	

Signal Upgrade - Temporary Design 3 (TMP Phase IV)

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

US 17 Business (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	AJ Davis	REVIEWED BY:	LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-0049T3

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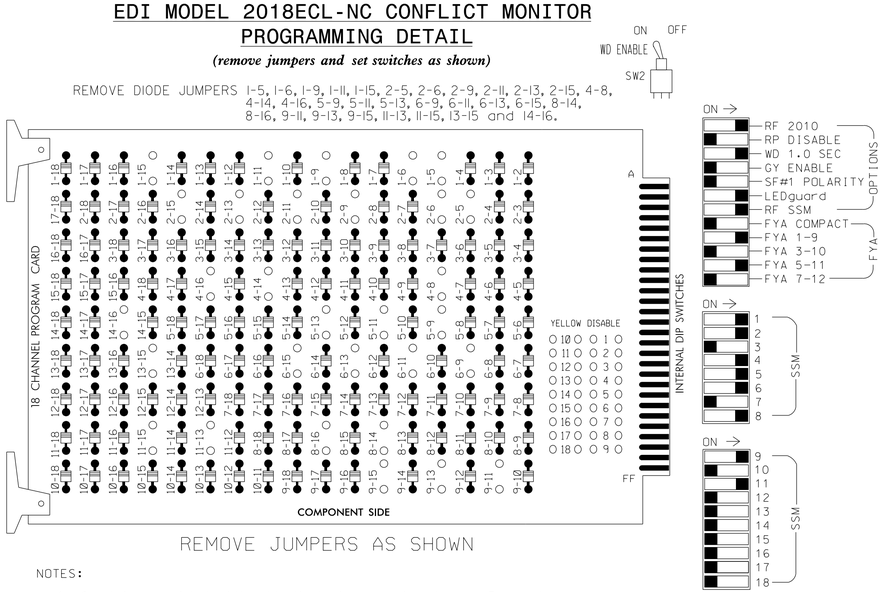
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 12.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

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. Program phase 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	★ 11	82	21,22	P21, P22	NU	41,42	P41, P42	42	★ 51	61,62, 63	P61, P62	NU	81,82	P81, P82	★ 11	NU	NU	★ 51	NU	NU
RED		*	128			101		*		134			107						
YELLOW			129			102				135			108						
GREEN			130			103				136			109						
RED ARROW														A121			A114		
YELLOW ARROW		126					132							A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127					133	133											
✋			113			104				119			110						
🚶			115			106				121			112						

NU = Not Used

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

★ See pictorial of head wiring in detail below.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	NOT USED	Ø 2 2A	WIRED INPUT ⊗	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø 1 1B	Ø 2 2B			NOT USED						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	NOT USED	Ø 6 6A	Ø 6 6C	WIRED INPUT ⊗	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5B	Ø 6 6B	NOT USED		NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
	-	J5U	57	19	7	6	Y	Y	Y		3
1B	TB2-7,8	I2L	43	5	12	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

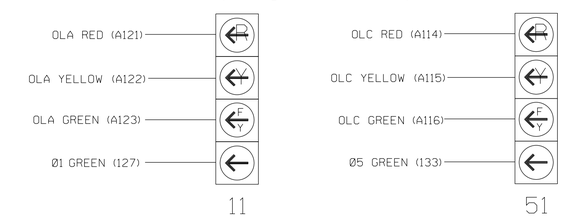
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I1-W to J5-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



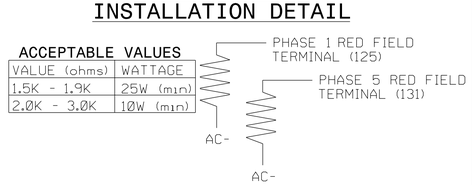
NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0049T2&T3
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 2 & 3 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

US 17 Business (Market Street)
at
SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AJ Davis	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
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DATE

SIG. INVENTORY NO. 03-0049T2&T3

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 12.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-0049T2&T3
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 2 & 3 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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

750 N.Greenfield Pkwy,Garner,NC 27529

US 17 Business (Market Street)
at
SR 1175 (Kerr Avenue)

Division 03 | New Hanover County | Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-0049T2&T3

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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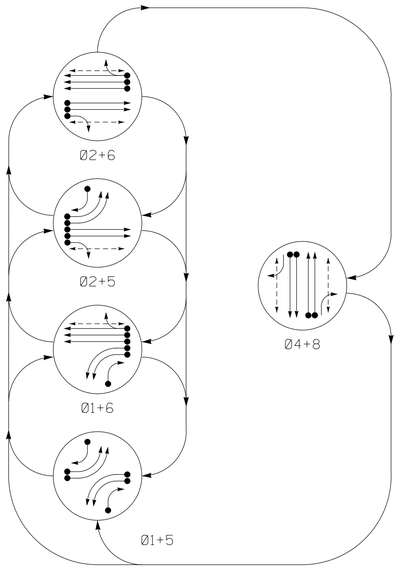
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 13.0

5 Phase Fully Actuated (Wilmington Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+8	FLASH
11, 12	←	←	←R	←R	←R	←R
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
43	F Y ←	R	F Y ←	R	F Y ←	R
51, 52	←	←R	←	←R	←R	←R
61, 62, 63	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
83	F Y ←	F Y ←	R	R	F Y ←	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

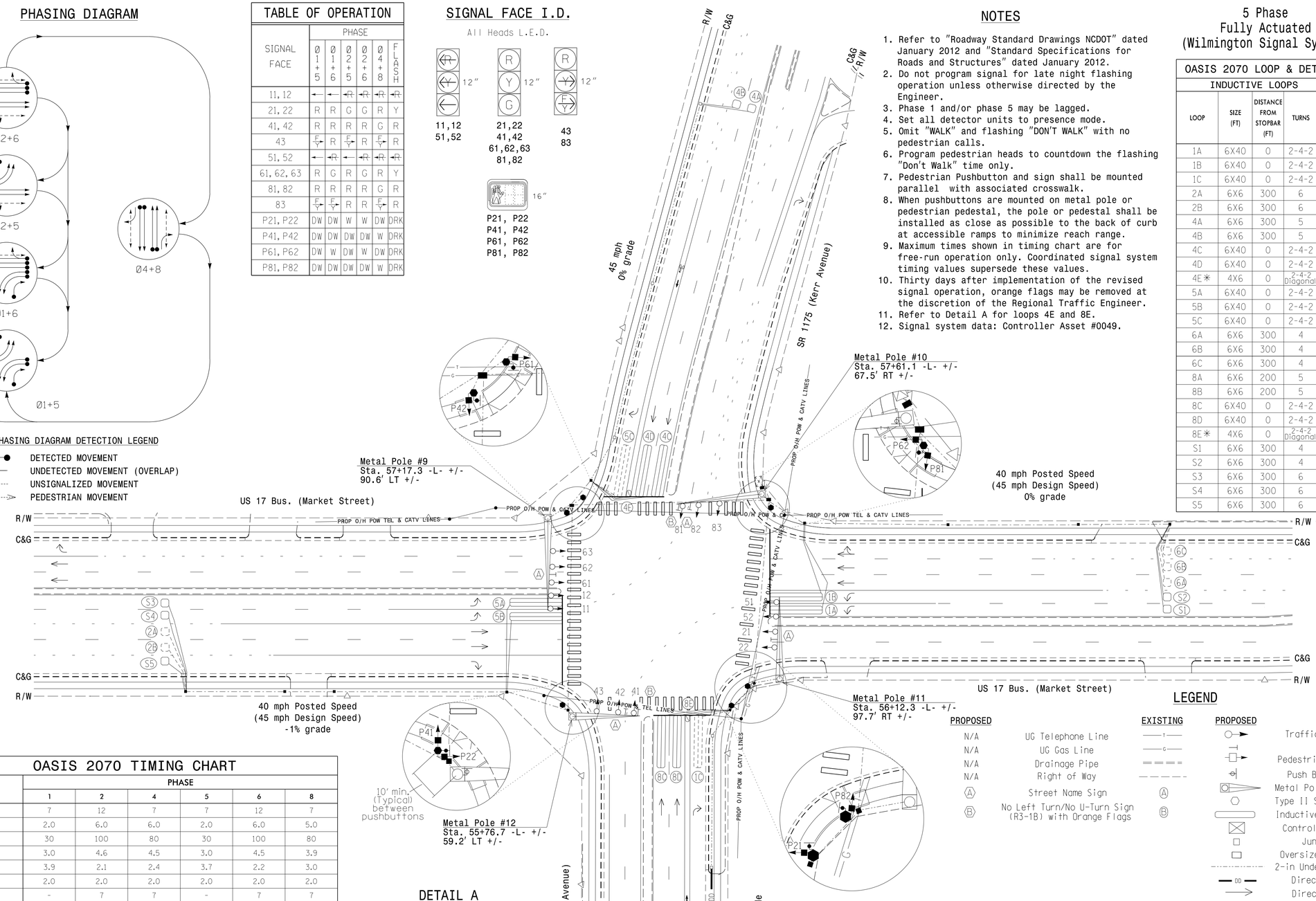
NOTES

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. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
8. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Thirty days after implementation of the revised signal operation, orange flags may be removed at the discretion of the Regional Traffic Engineer.
11. Refer to Detail A for loops 4E and 8E.
12. Signal system data: Controller Asset #0049.

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	-	-	-	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	-
1C	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	6	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	6	-	2	Y	Y	-	-	-	-	-
4A	6X6	300	5	Y	4	-	Y	-	-	-	-	-
4B	6X6	300	5	Y	4	-	Y	-	-	-	-	-
4C	6X40	0	2-4-2	Y	4	Y	Y	Y	2.0	5	-	Y
4D	6X40	0	2-4-2	Y	4	Y	Y	Y	2.0	5	-	Y
4E *	4X6	0	2-4-2 Diagonal	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	4	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	4	-	6	Y	Y	-	-	-	-	-
6C	6X6	300	4	-	6	Y	Y	-	-	-	-	-
8A	6X6	200	5	Y	8	-	Y	-	-	-	-	-
8B	6X6	200	5	Y	8	-	Y	-	-	-	-	-
8C	6X40	0	2-4-2	Y	8	Y	Y	Y	2.0	5	-	Y
8D	6X40	0	2-4-2	Y	8	Y	Y	Y	2.0	5	-	Y
8E *	4X6	0	2-4-2 Diagonal	Y	8	Y	Y	-	-	-	-	Y
S1	6X6	300	4	Y	-	-	-	-	-	-	Y	Y
S2	6X6	300	4	Y	-	-	-	-	-	-	Y	Y
S3	6X6	300	6	Y	-	-	-	-	-	-	Y	Y
S4	6X6	300	6	Y	-	-	-	-	-	-	Y	Y
S5	6X6	300	6	Y	-	-	-	-	-	-	Y	Y

* Set Sensitivity to appropriate level to detect a bicycle.

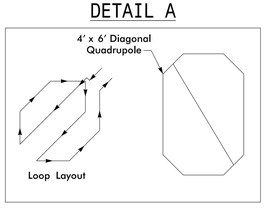


OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	6.0	2.0	6.0	5.0
Max Green 1 *	30	100	80	30	100	80
Yellow Clearance	3.0	4.6	4.5	3.0	4.5	3.9
Red Clearance	3.9	2.1	2.4	3.7	2.2	3.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	25	32	-	30	30
Seconds Per Actuation *	-	1.5	-	-	1.3	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	20	5	-	20	5
Time To Reduce *	-	30	15	-	30	15
Minimum Gap	-	3.2	3.2	-	3.2	3.0
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

DETAIL A



LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Drainage Pipe	
N/A	Right of Way	
A	Street Name Sign	A
B	No Left Turn/No U-Turn Sign (R3-1B) with Orange Flags	B

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	

Signal Upgrade - Final Design

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

US 17 Bus. (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DBBDCFBE5ED04AF... DATE

SIG. INVENTORY NO. 03-0049

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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$$ILE2054 AT DUS280140

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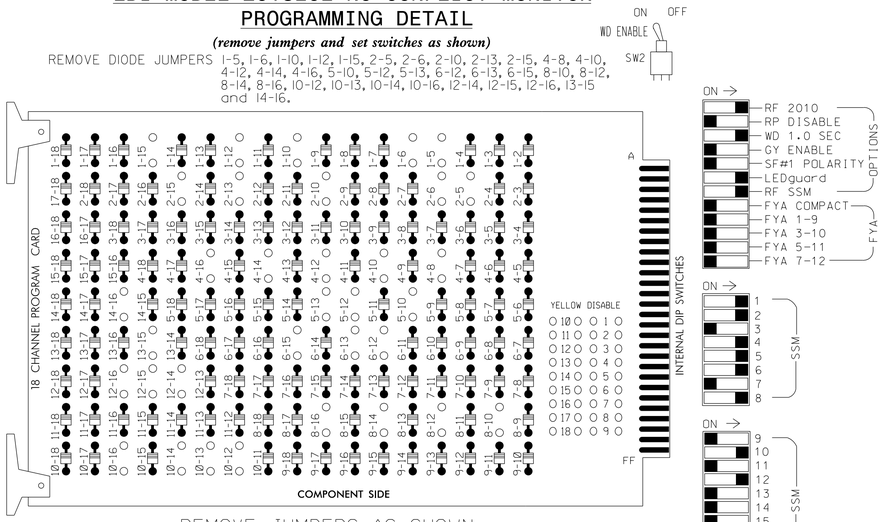
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 13.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-10, 1-12, 1-15, 2-5, 2-6, 2-10, 2-13, 2-15, 4-8, 4-10, 4-12, 4-14, 4-16, 5-10, 5-12, 5-13, 6-12, 6-13, 6-15, 8-10, 8-12, 8-14, 8-16, 10-12, 10-13, 10-14, 10-16, 12-14, 12-15, 12-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phase 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial.
5. Program phases 2, 4, 6 and 8 for Gap Reduction.
6. Program phases 2 and 6 for Start Up In Green.
7. Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
8. Program phases 2 and 6 for Yellow Flash and overlap 4 as Wag Overlaps.
9. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	21,22	P21, P22	NU	41,42	P41, P42	51,52	61,62, 63	P61, P62	NU	81,82	P81, P82	NU	43★	NU	NU	83★	NU
RED		128			101			134			107			A124			A101	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132							A125			A102	
FLASHING YELLOW ARROW														A126			A103	
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

★ See pictorial of head wiring in detail below.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1B	Ø 2 2A	SLOT EMPTY	SYS. DET. S5	Ø 4 4A	Ø 4 4C	Ø 4 4E	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø 1 1C	Ø 2 2B		NOT USED	Ø 4 4B	Ø 4 4D	NOT USED	SYS. DET. S2			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	Ø 6 6C	SLOT EMPTY	Ø 8 8A	Ø 8 8C	Ø 8 8E	SYS. DET. S3	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5C	Ø 6 6B	NOT USED		Ø 8 8B	Ø 8 8D	NOT USED	SYS. DET. S4					

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	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			
4A	TB4-9,10	I6U	41	3	4	4	-	Y			
4B	TB4-11,12	I6L	45	7	14	4	-	Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
4D	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2.0	5
4E	TB6-5,6	I8U	49	11	24	4	Y	Y			
✱ S5	TB4-5,6	I5U	58	20	3	SYS					
✱ S1	TB6-9,10	I9U	60	22	11	SYS					
✱ S2	TB6-11,12	I9L	62	24	13	SYS					
5A[2]	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-5,6	J2U	40	2	6	5	Y	Y			
5C	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y			
8B	TB5-11,12	J6L	46	8	18	8	-	Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5
8D	TB7-3,4	J7L	79	41	48	8	Y	Y	Y	2.0	5
8E	TB7-5,6	J8U	50	12	28	8	Y	Y			
✱ S3	TB7-9,10	J9U	59	21	15	SYS					
✱ S4	TB7-11,12	J9L	61	23	17	SYS					
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

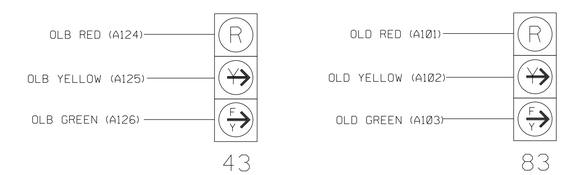
✱ SYSTEM DETECTOR ONLY. REMOVE THE VEHICLE PHASE ASSIGNED TO THIS DETECTOR IN THE DEFAULT PROGRAMMING.

[1] Remove jumper from I1-W to J5-W, on rear of input file.

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

3 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



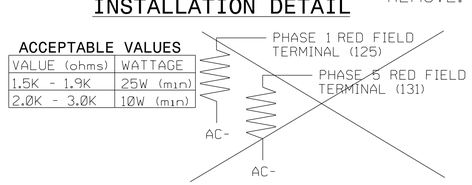
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0049
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

LOAD RESISTOR INSTALLATION DETAIL

REMOVE!

ACCEPTABLE VALUES

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



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

ATKINS
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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

US 17 Business (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AJ Davis	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth D80DCFBE0ED0AAF 12/19/2014
DATE
SIG. INVENTORY NO. 03-0049

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 13.2

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

CLEAR SETTINGS FOR OVERLAP 'A'
PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'B' 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  X 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
```

← NOTICE GREEN FLASH

PRESS '+'
CLEAR SETTINGS FOR OVERLAP 'C'
PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:            |123456789101112131415 16
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  X 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
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O PROCESSOR PROGRAMMING
TO DISABLE 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 DISABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 and 6.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0049
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street)
at
SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
C9B0CF8E8A0GAAF DATE

SIG. INVENTORY NO. 03-0049

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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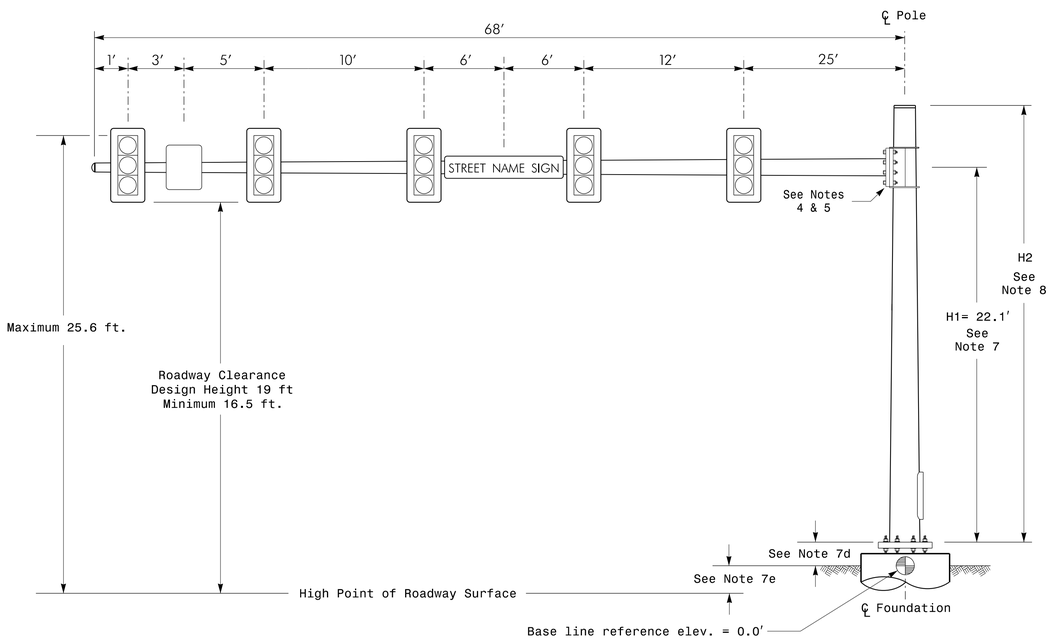
METAL POLE No. 9 and 10

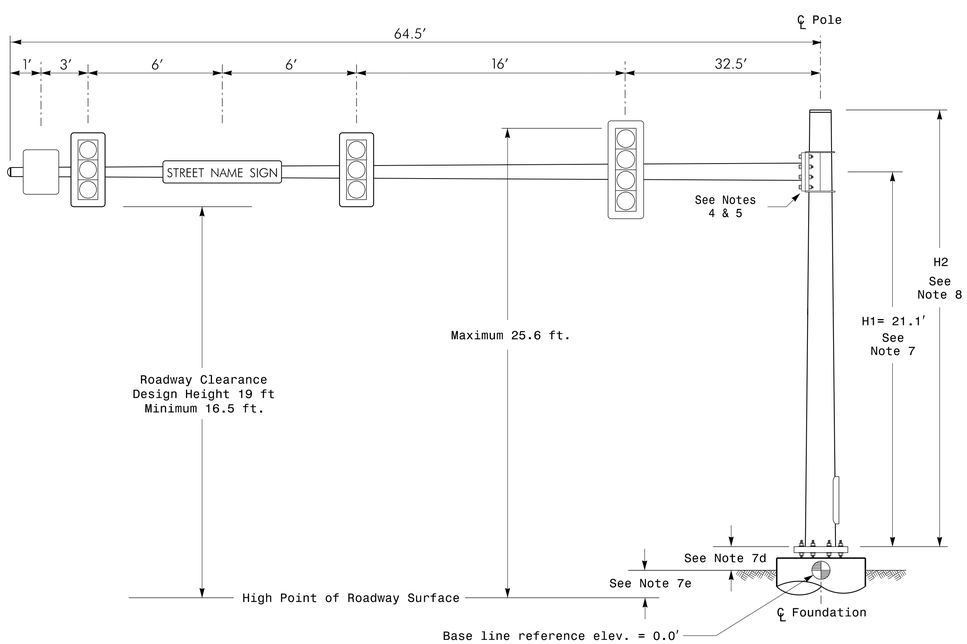
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 13.3

Design Loading for METAL POLE NO. 9



Elevation View

Design Loading for METAL POLE NO. 10



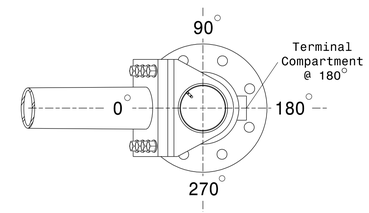
Elevation View

SPECIAL NOTE

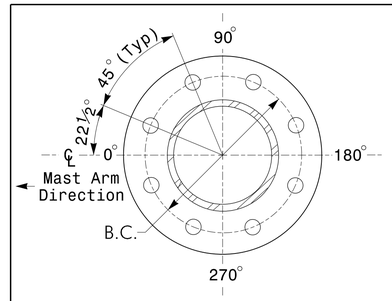
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 9	Pole 10
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.1 ft.	+0.1 ft.
Elevation difference at Edge of travelway or face of curb	+0.0 ft.	-0.6 ft.

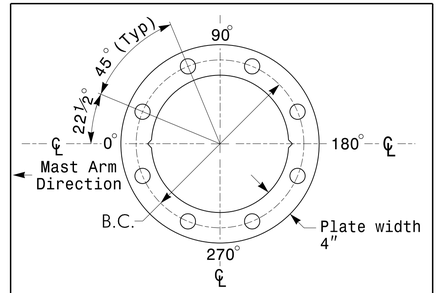


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Bus. (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

SCALE 0 N/A N/A

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth
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12/19/2014
DATE

SIG. INVENTORY NO. 03-0049

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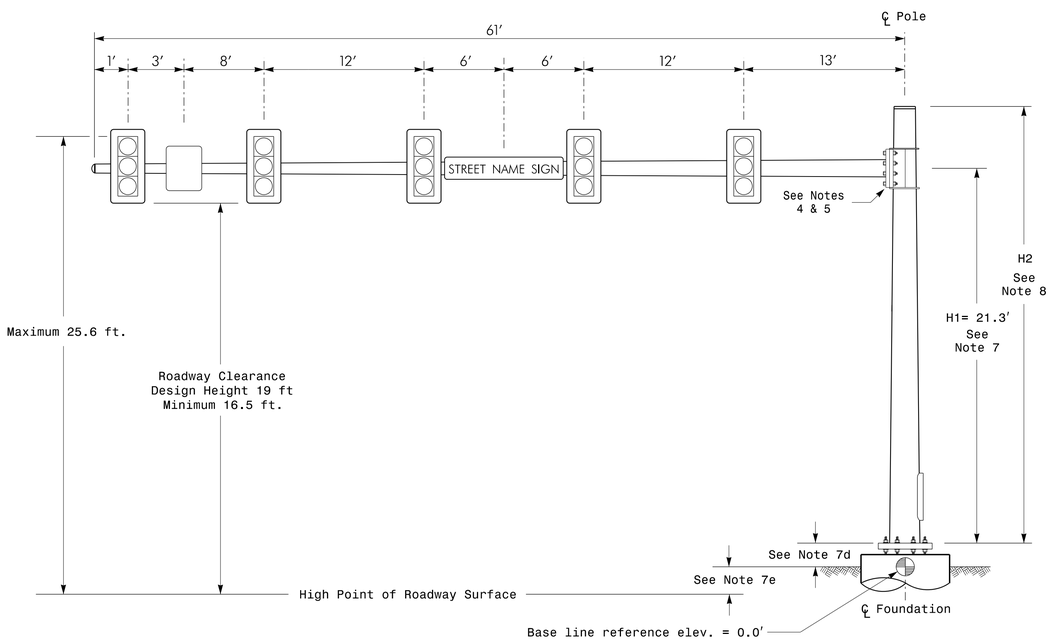
METAL POLE No. 11 and 12

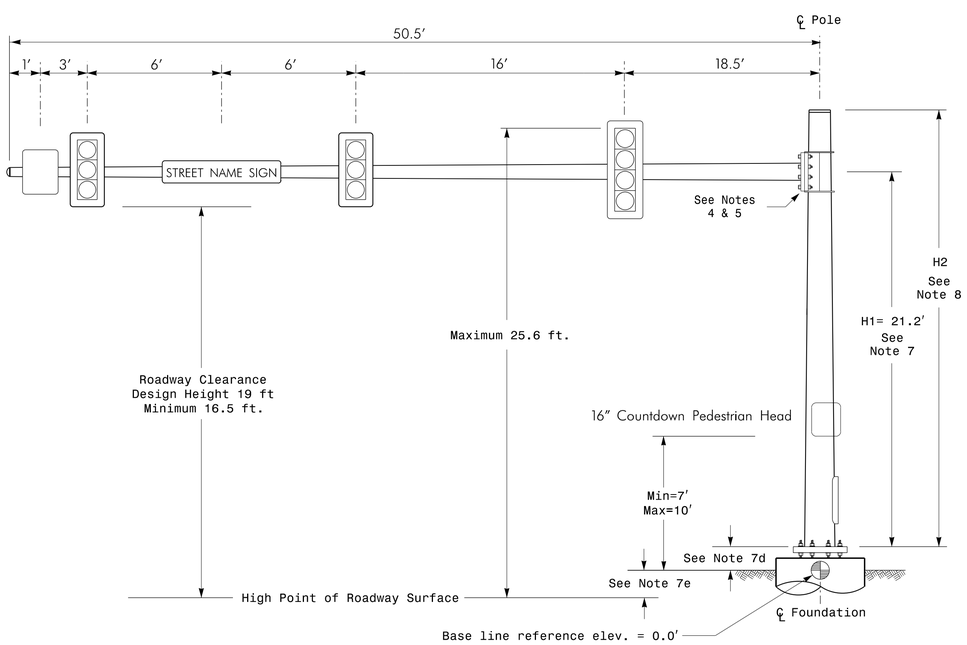
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 13.4

Design Loading for METAL POLE NO. 11



Elevation View

Design Loading for METAL POLE NO. 12



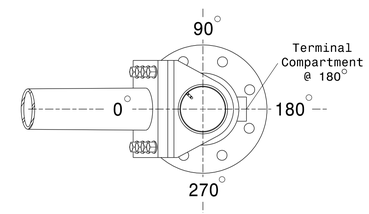
Elevation View

SPECIAL NOTE

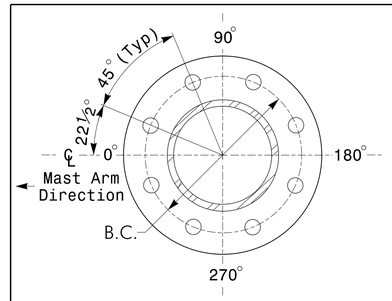
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 11	Pole 12
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.3 ft.	+0.2 ft.
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	+0.1 ft.

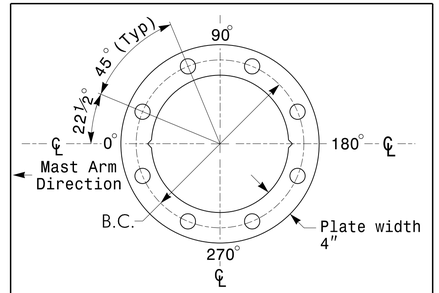


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Bus. (Market Street) at SR 1175 (Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

SCALE 0 N/A N/A

REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth
D8BDCFBE9D0AAF...
12/19/2014
DATE

SIG. INVENTORY NO. 03-0049

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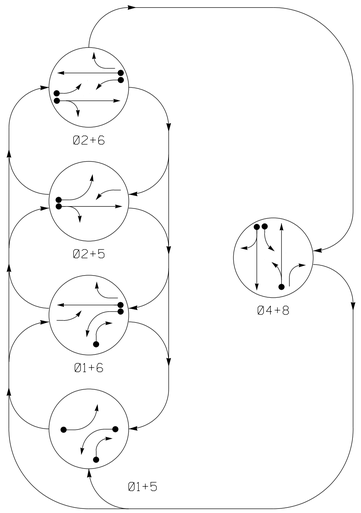
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 14.0

5 Phase
Fully Actuated
(Wilmington Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

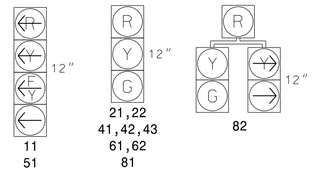
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+08	FLASH
11	←	←	←FY	←FY	←R	←Y
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	←	←FY	←	←FY	←R	←Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.

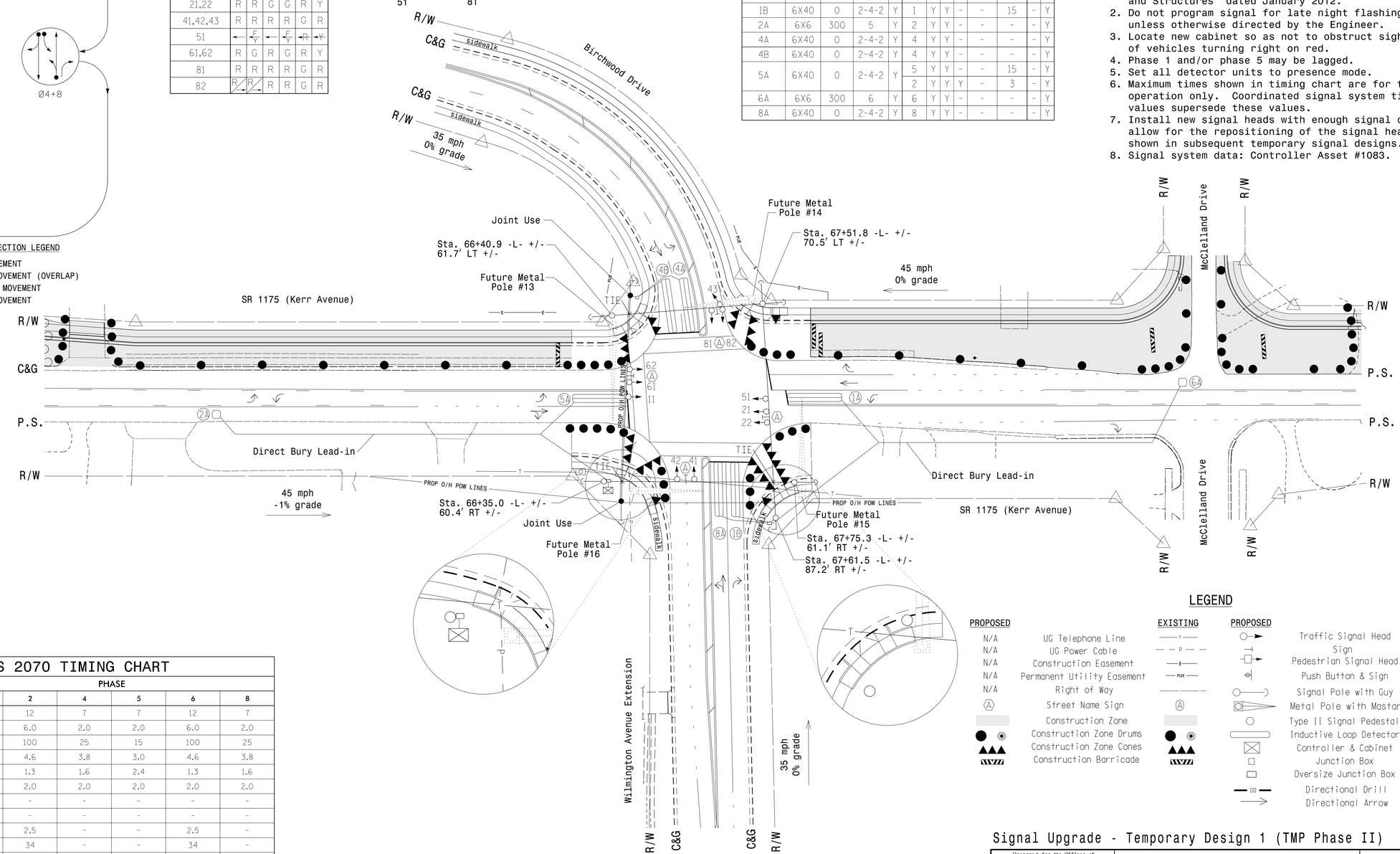


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	6X6	300	5	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
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Phase 1 and/or phase 5 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.
7. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in subsequent temporary signal designs.
8. Signal system data: Controller Asset #1083.



LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
N/A	UG Telephone Line	—T—		Traffic Signal Head	
N/A	UG Power Cable	—P—		Sign	
N/A	Construction Easement	—E—		Pedestrian Signal Head	
N/A	Permanent Utility Easement	—PUE—		Push Button & Sign	
N/A	Right of Way			Signal Pole with Guy	
Ⓐ	Street Name Sign	Ⓐ		Metal Pole with Mastarm	
	Construction Zone			Type II Signal Pedestal	
	Construction Zone Drums			Inductive Loop Detector	
	Construction Zone Cones			Controller & Cabinet	
	Construction Barricade			Junction Box	
				Oversize Junction Box	
			—DD—	Directional Drill	N/A
				Directional Arrow	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	30	100	25	15	100	25
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.8
Red Clearance	2.4	1.3	1.6	2.4	1.3	1.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	2.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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 - Temporary Design 1 (TMP Phase II)

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

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: JA Wiles	REVIEWED BY: MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL

DATE

SIG. INVENTORY NO. 03-1083TI

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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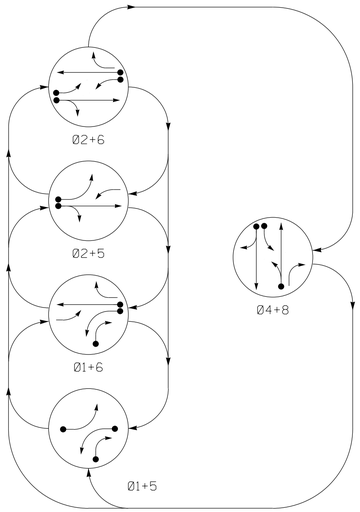
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 15.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

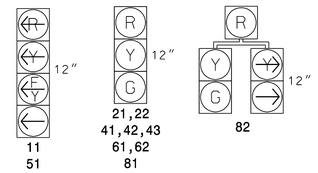
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+08	FLASH
11	←	←	←FY	←FY	←R	←Y
21,22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	←	←FY	←	←FY	←R	←Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



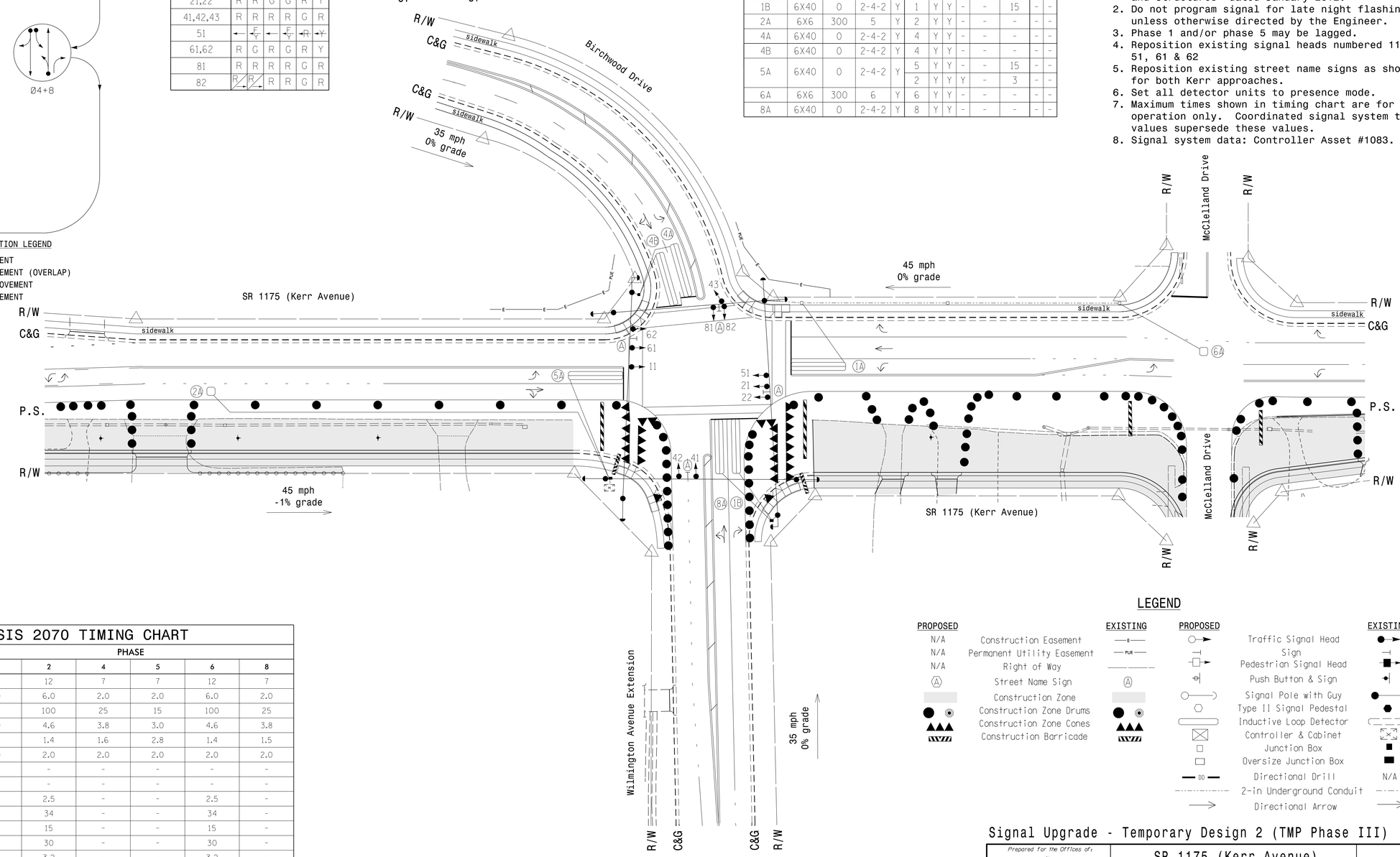
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

5 Phase
Fully Actuated
(Wilmington 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. Reposition existing signal heads numbered 11, 21, 22, 51, 61 & 62
5. Reposition existing street name signs as shown on plan for both Kerr approaches.
6. Set all detector units to presence mode.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Signal system data: Controller Asset #1083.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	30	100	25	15	100	25
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.8
Red Clearance	2.6	1.4	1.6	2.8	1.4	1.5
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	2.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
N/A	Construction Easement	E		Traffic Signal Head	
N/A	Permanent Utility Easement	PUE		Sign	
N/A	Right of Way			Pedestrian Signal Head	
A	Street Name Sign	A		Push Button & Sign	
	Construction Zone			Signal Pole with Guy	
	Construction Zone Drums			Type II Signal Pedestal	
	Construction Zone Cones			Inductive Loop Detector	
	Construction Barricade			Controller & Cabinet	
				Junction Box	
				Oversize Junction Box	
			DD	Directional Drill	N/A
				2-in Underground Conduit	
				Directional Arrow	

Signal Upgrade - Temporary Design 2 (TMP Phase III)

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

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	JA Wiles	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL

DATE

SIG. INVENTORY NO. 03-1083T2

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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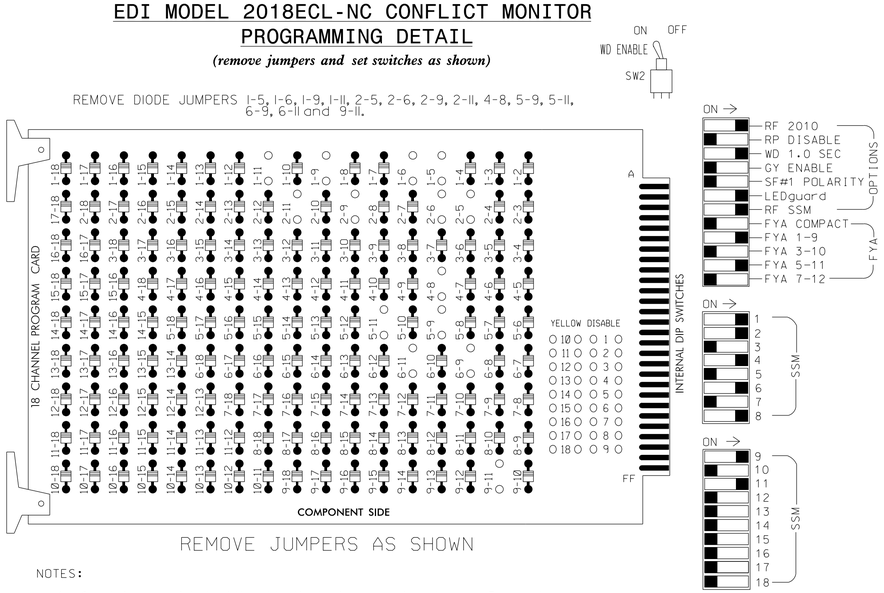
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 15.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 4-8, 5-9, 5-11, 6-9, 6-11 and 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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 Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	NU	41,42,43	NU	51★	61,62	NU	NU	81,82	NU	11★	NU	NU	51★	NU	NU
RED		✳	128			101			134			107							
YELLOW			129			102		✳	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		126												A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127						133											

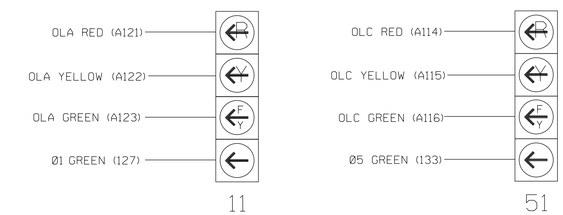
NU = Not Used

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

★ See pictorial of head wiring in detail 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 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A[2]	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			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			

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

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

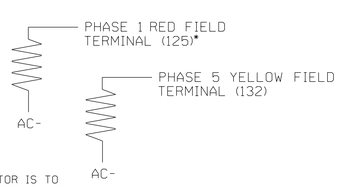
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1083T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 and 2 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014		REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion		REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1083T1&T2

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 15.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-1083T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 & 2 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue)
at
Birchwood Drive /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1083T1&T2

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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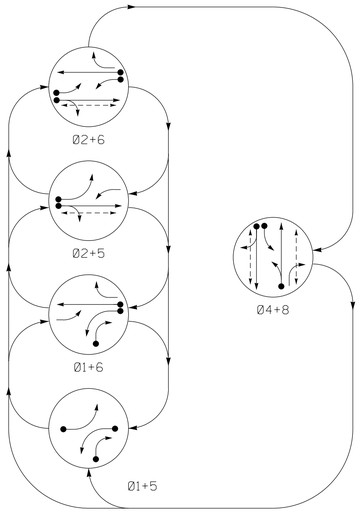
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 16.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

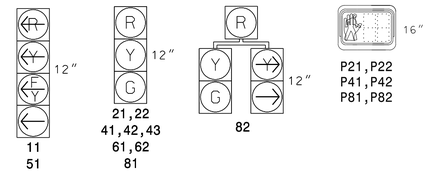
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
11	←	←	F Y	F Y	R	Y
21,22	R	R	G	R	Y	
41,42,43	R	R	R	R	G	R
51	←	F Y	←	F Y	R	Y
61,62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P81, P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



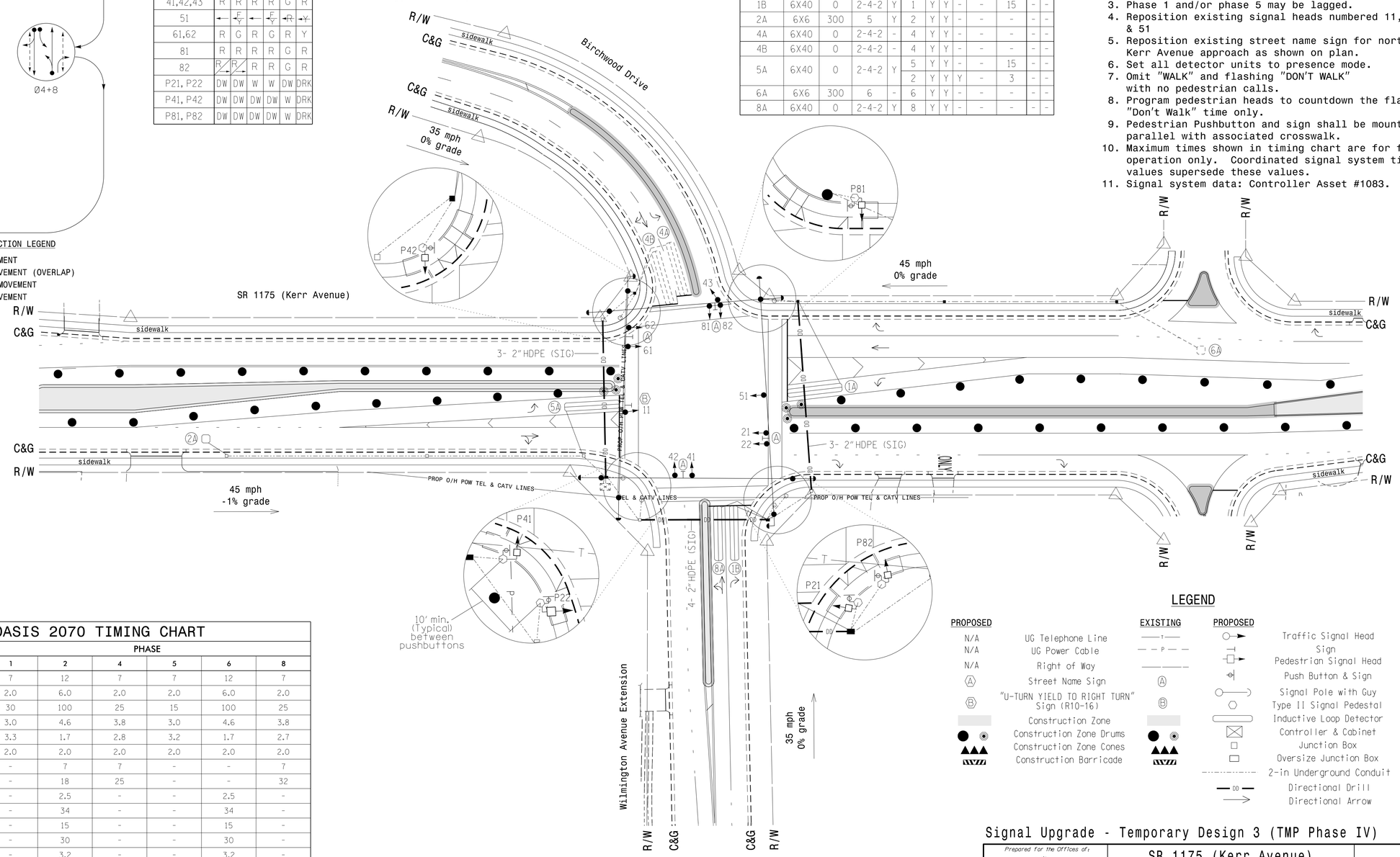
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	300	6	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

5 Phase Fully Actuated (Wilmington 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. Reposition existing signal heads numbered 11, 21, 22 & 51
5. Reposition existing street name sign for northbound Kerr Avenue approach as shown on plan.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data: Controller Asset #1083.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	30	100	25	15	100	25
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.8
Red Clearance	3.3	1.7	2.8	3.2	1.7	2.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	-	7
Don't Walk 1	-	18	25	-	-	32
Seconds Per Actuation *	-	2.5	-	-	2.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Power Cable	P
N/A	Right of Way	
A	Street Name Sign	A
B	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	B
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Signal Pole with Guy	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
	Directional Arrow	

Signal Upgrade - Temporary Design 3 (TMP Phase IV)

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

SCALE 0 40 1"=40'

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	JA Wiles	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL

DATE

SIG. INVENTORY NO. 03-1083T3

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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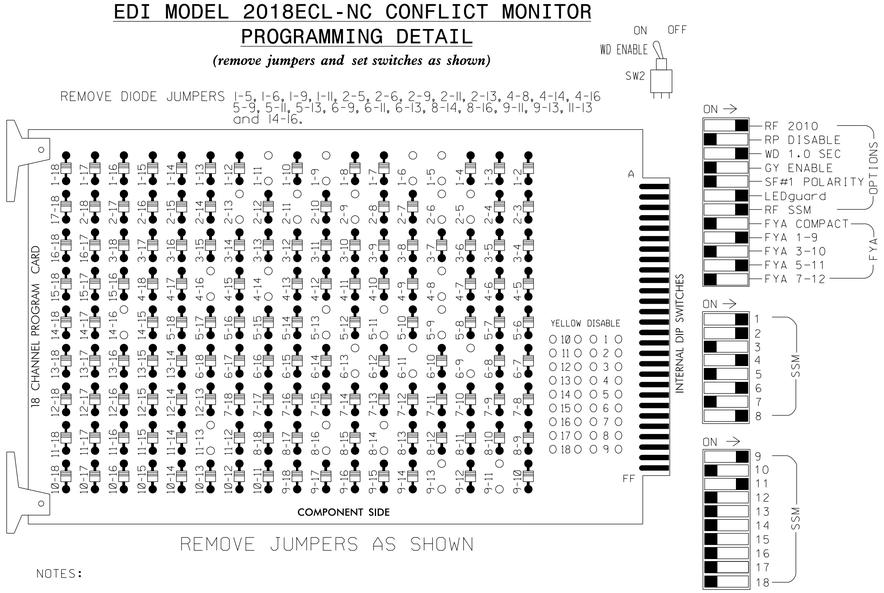
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 16.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	P21, P22	NU	41,42, 43	P41, P42	51★	61,62	NU	NU	81,82	P81, P82	11★	NU	NU	51★	NU	NU
RED		✳	128			101			134			107							
YELLOW			129			102		✳	135			108							
GREEN			130			103			136			109							
RED ARROW														A121			A114		
YELLOW ARROW		126												A122			A115		
FLASHING YELLOW ARROW														A123			A116		
GREEN ARROW	127	127						133											
✋				113			104						110						
🚶				115			106						112						

NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A[2]	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			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

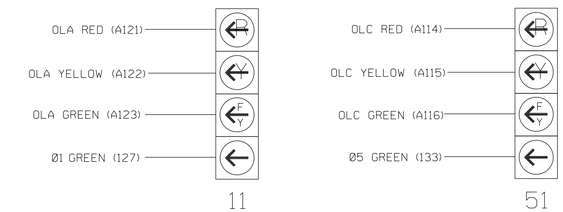
[1] Add jumper from I1-W to J4-W, on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

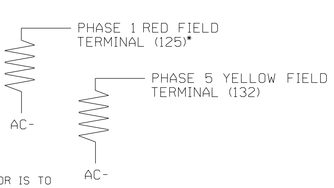
1. The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1083T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS | INIT. | DATE

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

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth — 0BE0CF8E5ADD4AF... 12/19/2014 DATE

SIG. INVENTORY NO. 03-1083T3

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

13-JUL-2015 10:33
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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 16.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-1083T3
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 3 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue)
at
Birchwood Drive /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1083T3

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

13-JUL-2015 10:33
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WILE2054 AT DUS2901A0

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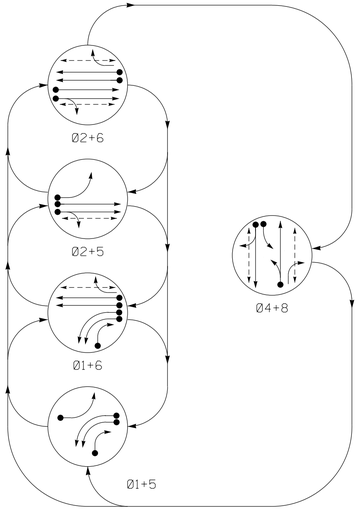
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 17.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+08	FLASH
11, 12	←	←	←R	←R	←R	←R
21, 22	R	R	G	G	R	Y
41,42,43	R	R	R	R	G	R
51	←	←R	←	←R	←R	←R
61, 62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
83	F Y	F Y	R	R	F Y	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

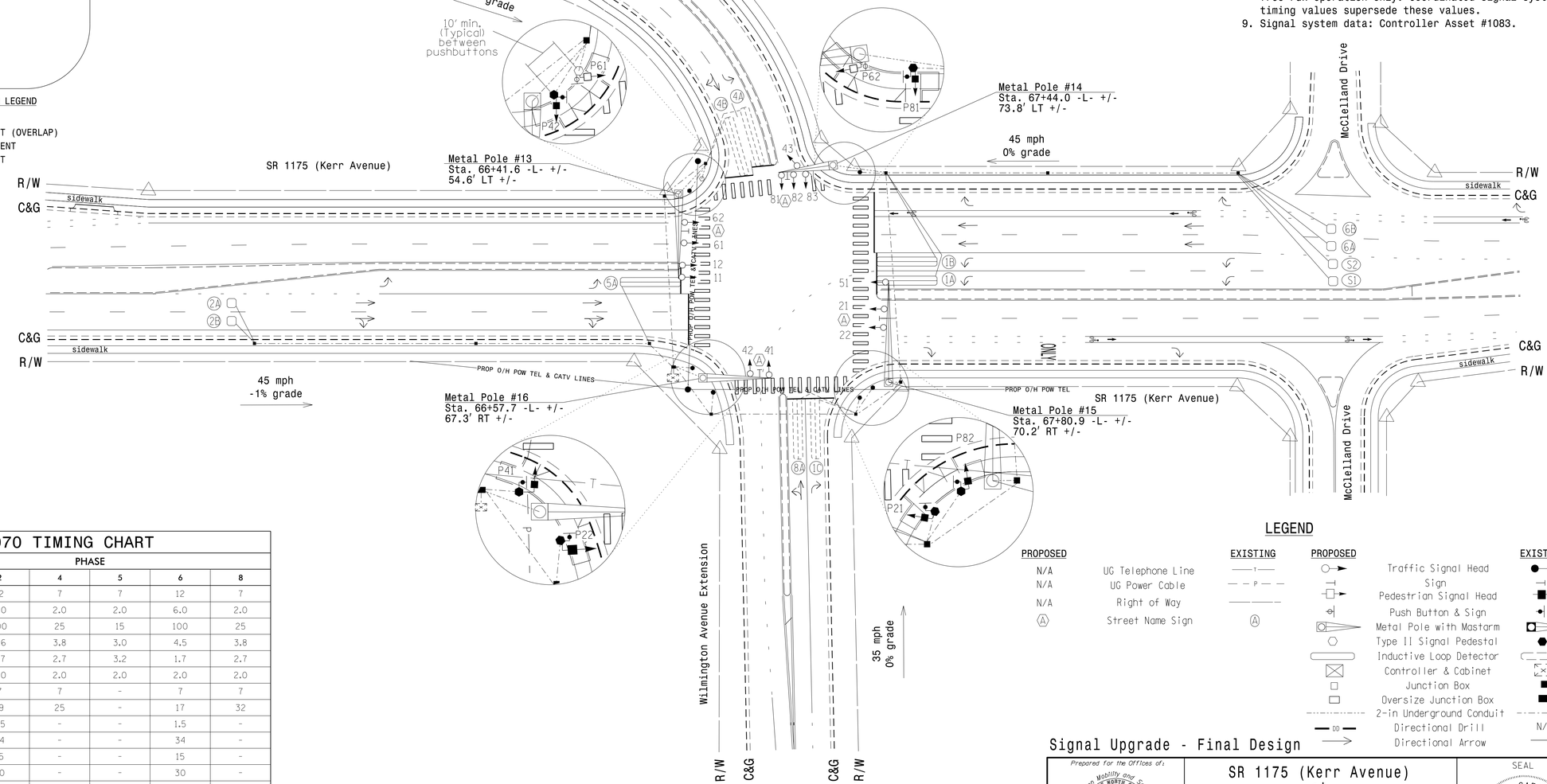
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-	-	-	-
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	-
1C	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
S1	6X6	300	6	Y	-	-	-	-	-	-	Y	Y
S2	6X6	300	6	Y	-	-	-	-	-	-	Y	Y

5 Phase
Fully Actuated
(Wilmington 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. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Signal system data: Controller Asset #1083.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	30	100	25	15	100	25
Yellow Clearance	3.0	4.6	3.8	3.0	4.5	3.8
Red Clearance	3.5	1.7	2.7	3.2	1.7	2.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	19	25	-	17	32
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
N/A	UG Telephone Line	—T—		Traffic Signal Head	
N/A	UG Power Cable	— P —		Sign	
N/A	Right of Way			Pedestrian Signal Head	
Ⓐ	Street Name Sign	Ⓐ		Push Button & Sign	
				Metal Pole with Mastarm	
				Type II Signal Pedestal	
				Inductive Loop Detector	
				Controller & Cabinet	
				Junction Box	
				Oversize Junction Box	
				2-in Underground Conduit	
			DD	Directional Drill	N/A
				Directional Arrow	

Signal Upgrade - Final Design

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

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	JA Wiles	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 12/19/2014
DATE
SIG. INVENTORY NO. 03-1083

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

13-JUL-2015 10:19
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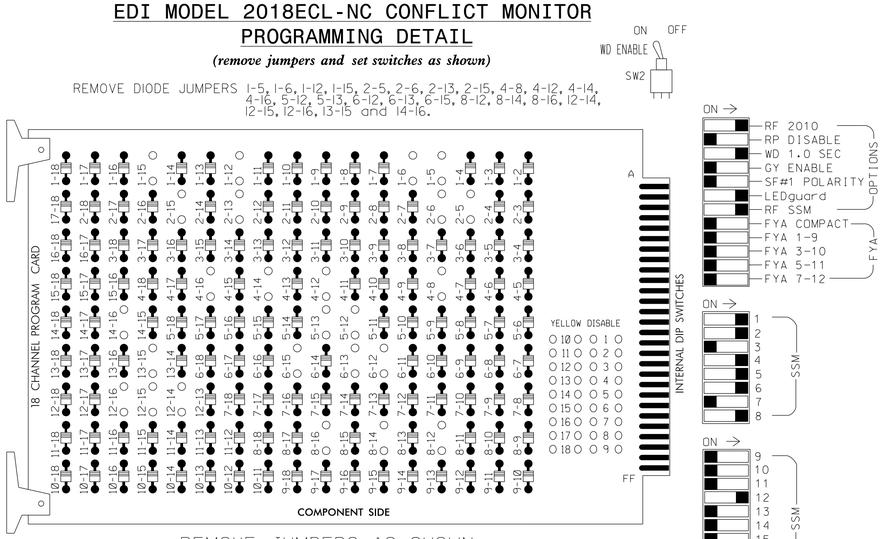
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 17.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-12, 1-15, 2-5, 2-6, 2-13, 2-15, 4-8, 4-12, 4-14, 4-16, 5-12, 5-13, 6-12, 6-13, 6-15, 8-12, 8-14, 8-16, 12-14, 12-15, 12-16, 13-15 and 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash and overlap 4 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD *	SPARE
SIGNAL HEAD NO.	11	21,22	P21, P22	NU	41,42, 43	P41, P42	51	61,62	P61, P62	NU	81,82	P81, P82	NU	NU	NU	NU	83 ★	NU
RED		128			101			134			107						A101	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132										A102	
FLASHING YELLOW ARROW																	A103	
GREEN ARROW	127						133											
✋			113			104			119			110						
🚶			115			106			121			112						

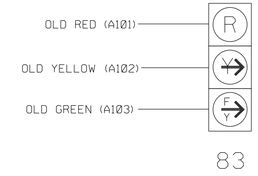
NU = Not Used

★ See pictorial of head wiring in detail below.

* Flash Note: Wire Overlap "D" to flash on Flasher unit #2, Circuit #1.

3 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1B	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø 1 1C	Ø 2 2B			Ø 4 4B			SYS. DET. S2			Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 6 6B				NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
* S1	TB6-9,10	I9U	60	22	11	SYS					
* S2	TB6-11,12	I9L	62	24	13	SYS					
5A[2]	TB3-1,2	J1U	55	17	5	5	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			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

* 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

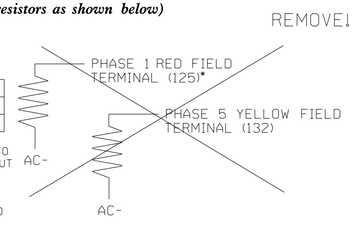
[1] Remove jumper from I1-W to J4-W, on rear of input file.
[2] Remove jumper from J1-W to I4-W, on rear of input file.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)



ACCEPTABLE VALUES

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

NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1083
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue)
at
Birchwood Drive /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

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

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DIRECTOR OF TRANSPORTATION SIGNATURE DATE

SIG. INVENTORY NO. 03-1083

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 17.2

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

CLEAR SETTINGS FOR OVERLAPS 'A' AND 'C' PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:                 |123456789101112131415 16
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  X 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
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

LOGICAL I/O PROCESSOR PROGRAMMING

TO DISABLE 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 DISABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 and 6.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1083
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue)
at
Birchwood Drive /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1083

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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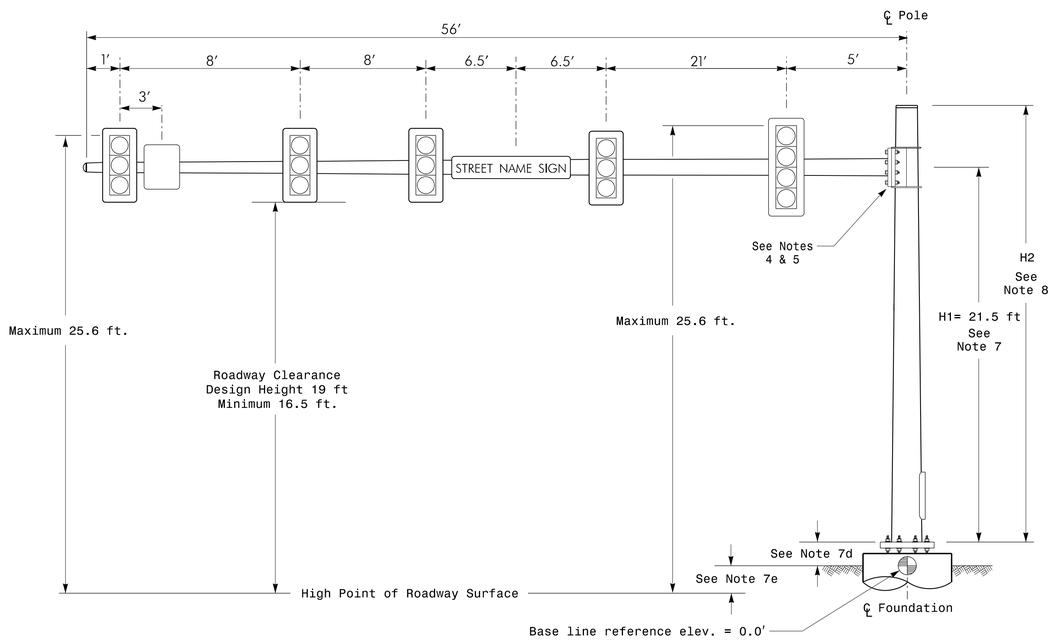
METAL POLE No. 13 and 14

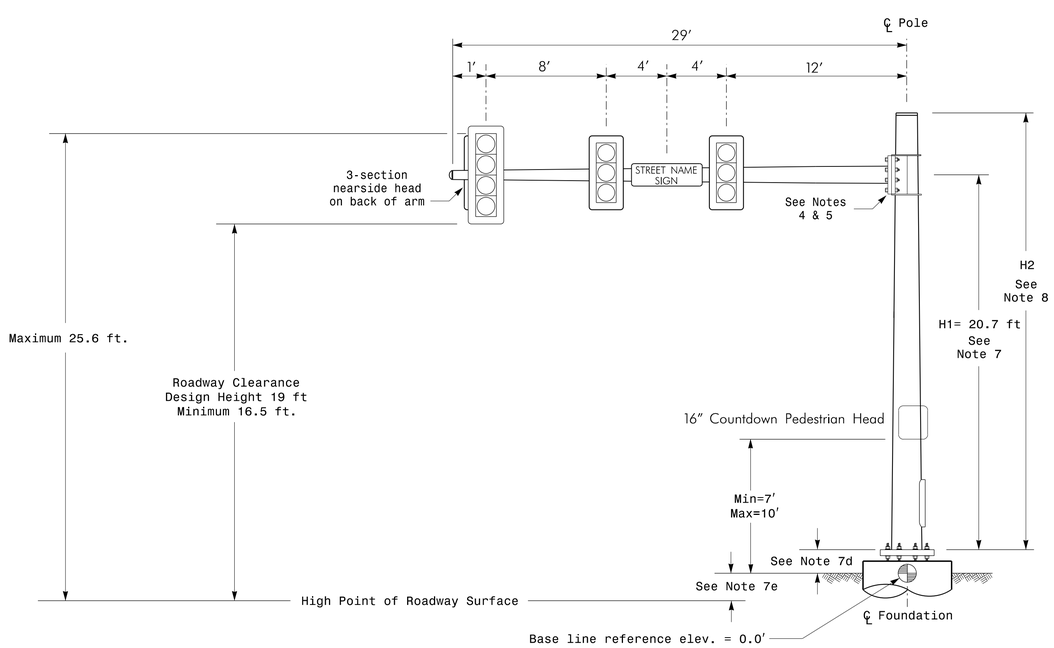
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 17.3

Design Loading for METAL POLE NO. 13



Elevation View

Design Loading for METAL POLE NO. 14



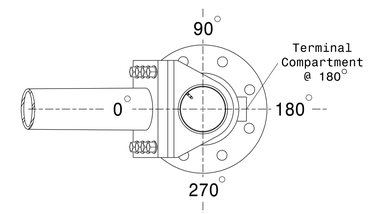
Elevation View

SPECIAL NOTE

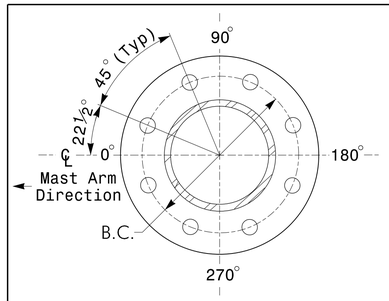
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 13	Pole 14
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.5 ft.	-0.3 ft.
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	-0.4 ft.

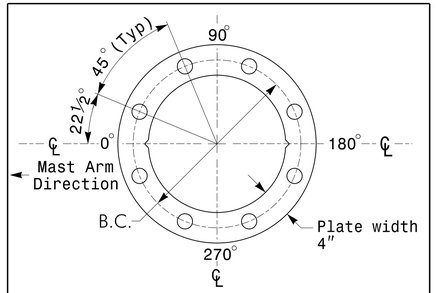


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Traffic Engineering and Safety Systems Branch, State of North Carolina Department of Transportation, Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	JA Wiles	REVIEWED BY:	MB Toth

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1083

13-JUL-2015 10:31
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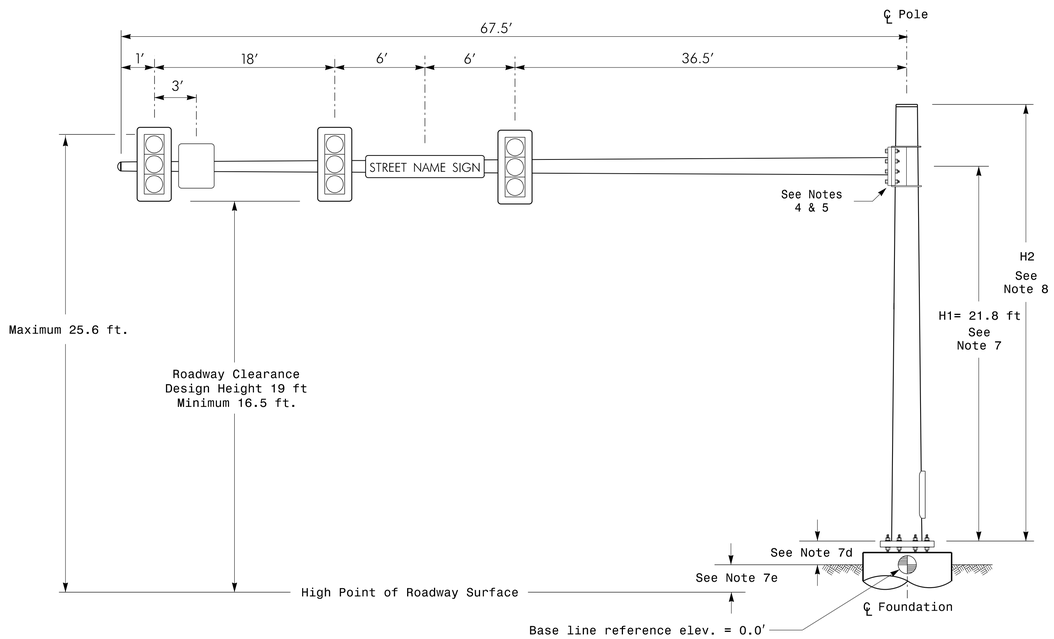
METAL POLE No. 15 and 16

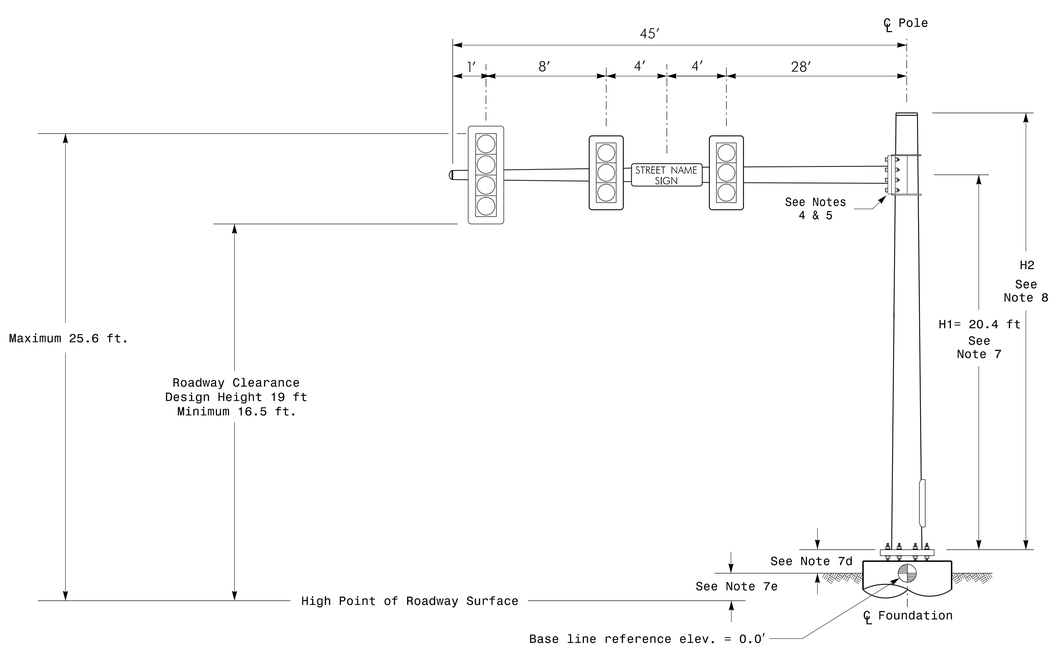
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 17.4

Design Loading for METAL POLE NO. 15



Elevation View

Design Loading for METAL POLE NO. 16



Elevation View

SPECIAL NOTE

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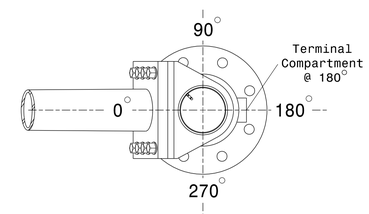
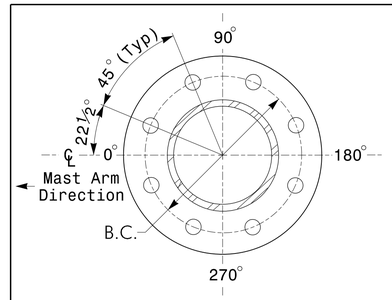
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 15	Pole 16
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.8 ft.	-0.6 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	-1.5 ft.

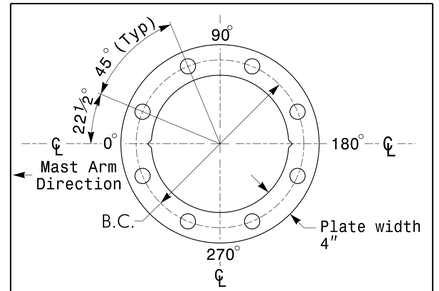


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

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NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SR 1175 (Kerr Avenue) at Birchwood Drive / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	JA Wiles	REVIEWED BY:	MB Toth

SCALE 0 N/A N/A

REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014 DATE

SIG. INVENTORY NO. 03-1083

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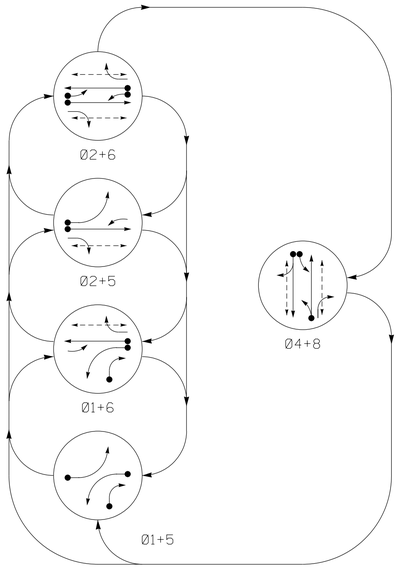
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 18.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

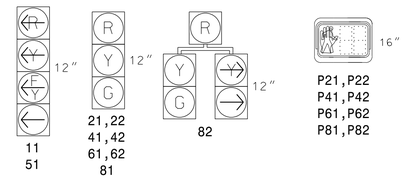
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



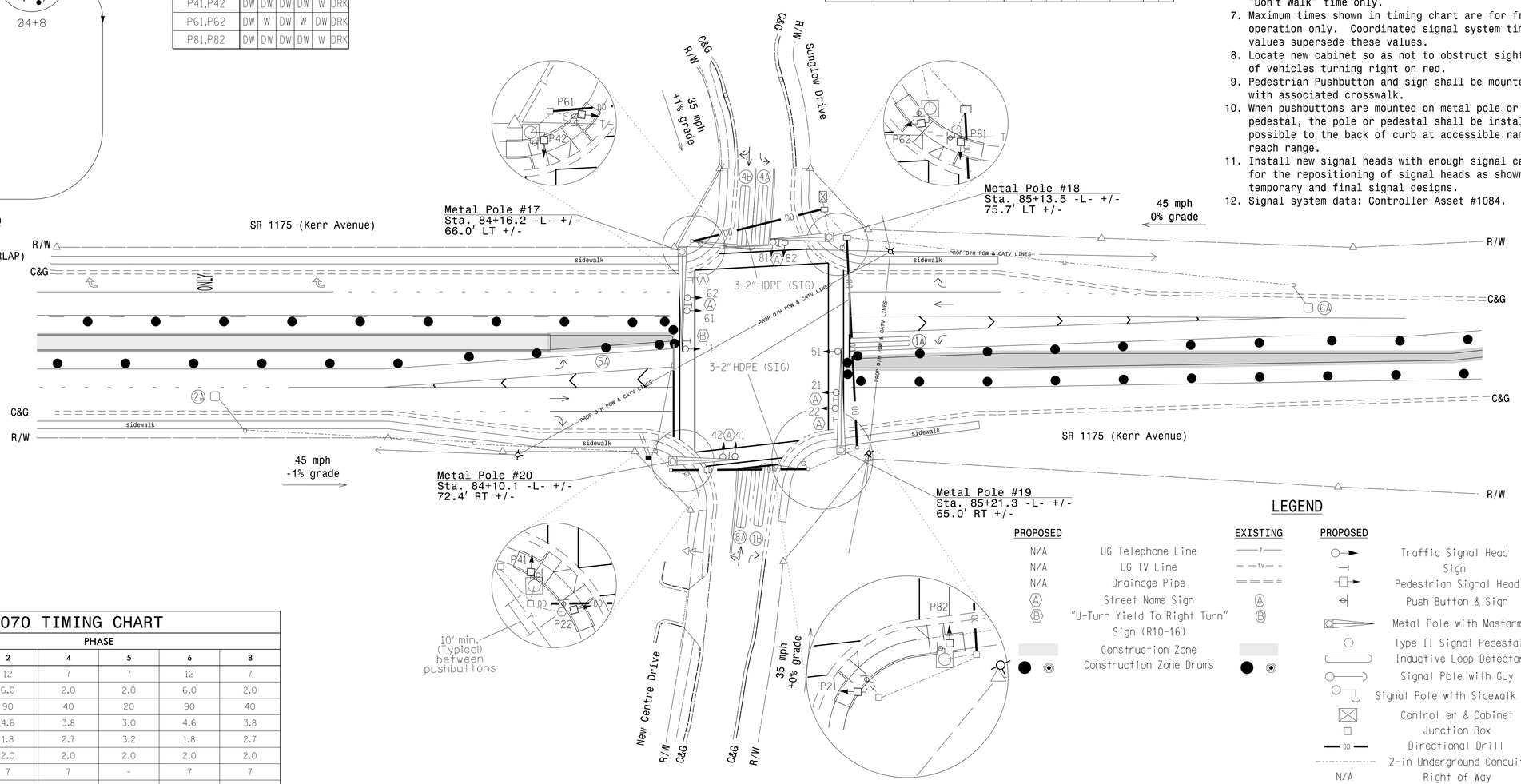
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	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
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

5 Phase Fully Actuated (Wilmington 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. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
10. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
11. Install new signal heads with enough signal cable to allow for the repositioning of signal heads as shown in the temporary and final signal designs.
12. Signal system data: Controller Asset #1084.



LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	
N/A	UG TV Line	
N/A	Drainage Pipe	
Ⓐ	Street Name Sign	Ⓐ
Ⓑ	"U-Turn Yield To Right Turn" Sign (R10-16)	Ⓑ
	Construction Zone	
	Construction Zone Drums	

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

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	40	20	90	40
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.8
Red Clearance	3.3	1.8	2.7	3.2	1.8	2.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	13	31	-	18	28
Seconds Per Actuation *	-	2.5	-	-	2.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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.

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WILE2054 AT DUS2301140

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Temporary Design 1 (TMP Phase IV)

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

SR 1175 (Kerr Avenue) at New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	AM Thigpen	REVIEWED BY:	LM Moon

SCALE 0 40 1" = 40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DBDCFBE9ED04DAAF... DATE

SIG. INVENTORY NO. 03-1084TI

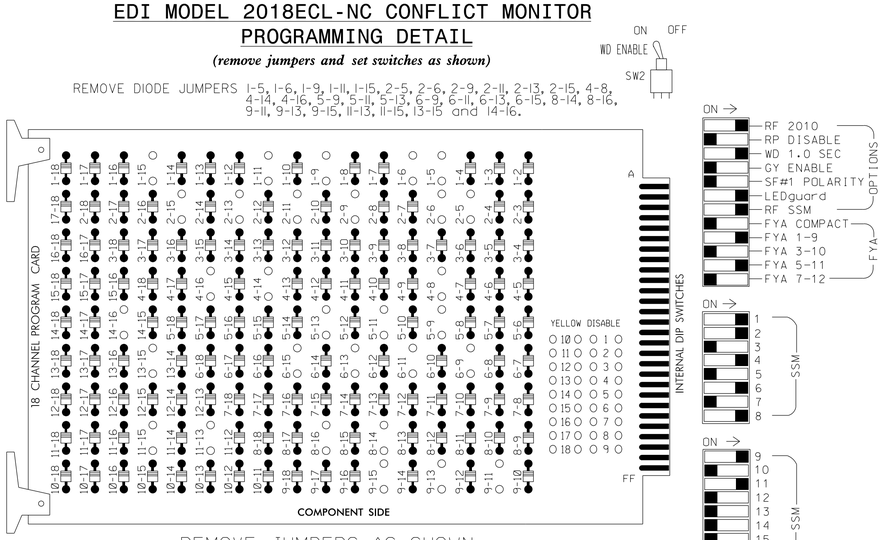
DocuSign Envelope ID: 0C2C82B9-01A1-4006-9BCC-6F5248024E16

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 18.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	P21, P22	NU	41,42	P41, P42	51★	61,62	P61, P62	NU	81,82	P81, P82	11★	NU	NU	51★	NU	NU
RED		✳	128			101			134			107							
YELLOW			129			102		✳	135			108							
GREEN			130			103			136			109							
RED ARROW													A121			A114			
YELLOW ARROW		126											A122			A115			
FLASHING YELLOW ARROW													A123			A116			
GREEN ARROW	127	127					133												
✋			113			104			119			110							
🚶			115			106			121			112							

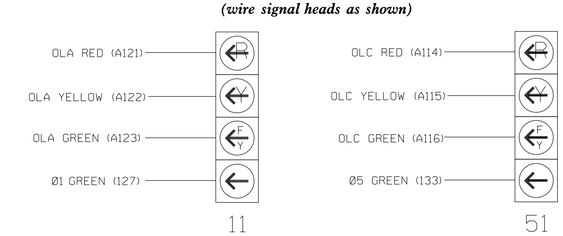
NU = Not Used

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

★ See pictorial of head wiring in detail below.

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 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A[2]	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			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

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

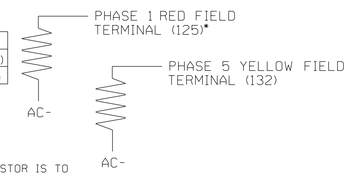
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1084T1
DESIGNED: June 2014
SEALED: DECEMBER 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 1175 (Kerr Avenue)
at
New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

Prepared for 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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1084T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 18.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-1084T1
DESIGNED: June 2014
SEALED: DECEMBER 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue)
at
New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1084T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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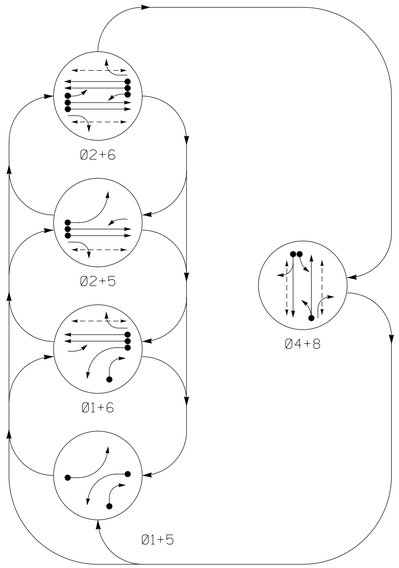
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 19.0

5 Phase
Fully Actuated
(Wilmington Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

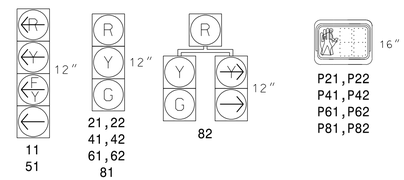
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.

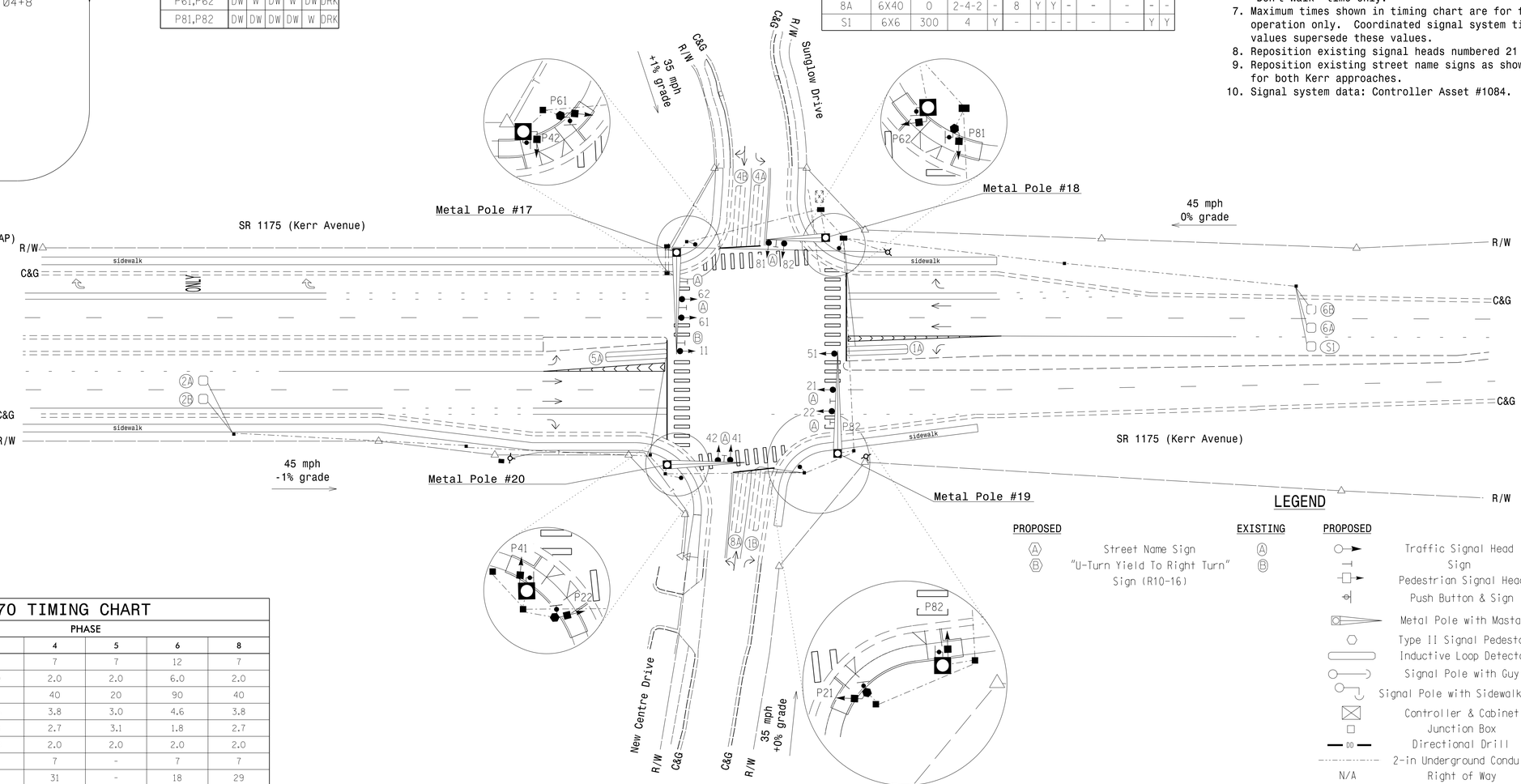


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-
					6	Y	Y	Y	-	3	-	-
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	6	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	300	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	4	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
S1	6X6	300	4	Y	-	-	-	-	-	-	Y	Y

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. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Reposition existing signal heads numbered 21 and 61.
9. Reposition existing street name signs as shown on plan for both Kerr approaches.
10. Signal system data: Controller Asset #1084.



LEGEND

PROPOSED		EXISTING
(A)	Street Name Sign	(A)
(B)	"U-Turn Yield To Right Turn" Sign (R10-16)	(B)
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
DD	Directional Drill	N/A
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	12	7	7	12	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	90	40	20	90	40
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.8
Red Clearance	3.3	1.8	2.7	3.1	1.8	2.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	7
Don't Walk 1	-	13	31	-	18	29
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.2	-	-	3.2	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	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 Design

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

SCALE 0 40 1"=40'

SR 1175 (Kerr Avenue) at New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Thigpen	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DRDCFBE9D0AAF DATE

SIG. INVENTORY NO. 03-1084

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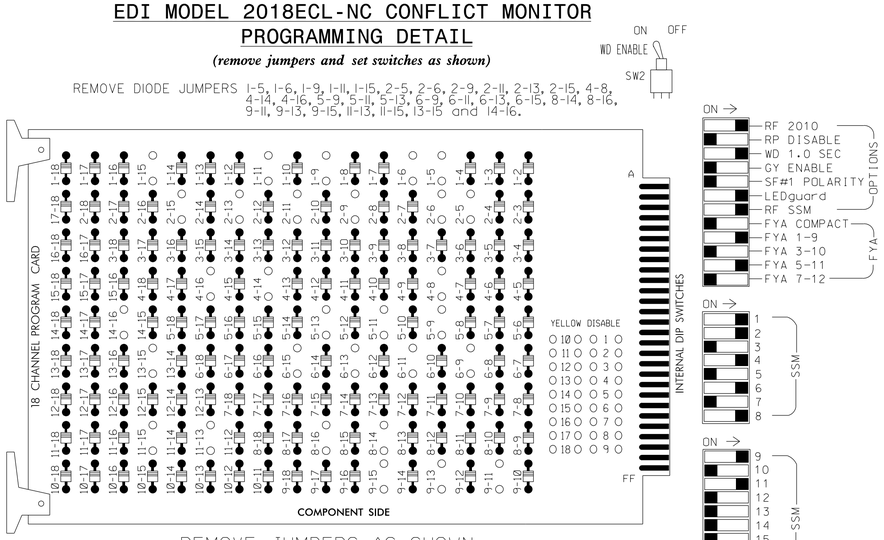
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 19.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phases 4 and 8 for Dual Entry.
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, 4, 6 and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	★ 11	82	21,22	P21, P22	NU	41,42	P41, P42	★ 51	61,62	P61, P62	NU	81,82	P81, P82	★ 11	NU	NU	★ 51	NU	NU
RED		✳	128			101			134			107						
YELLOW			129			102		✳	135			108						
GREEN			130			103			136			109						
RED ARROW													A121			A114		
YELLOW ARROW		126											A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127	127					133											
✋			113			104			119			110						
🚶			115			106			121			112						

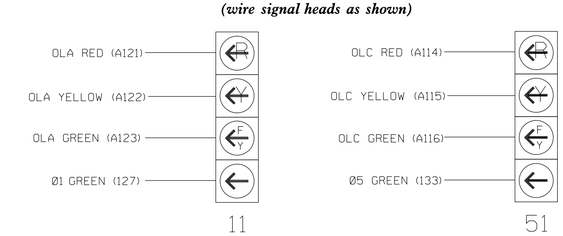
NU = Not Used

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

★ See pictorial of head wiring in detail below.

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 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø 1	Ø 1	Ø 2	WIRED INPUT ⊗	SLOT EMPTY	Ø 4	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	1A	1B	2A			4A						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
	NOT USED	NOT USED	Ø 2 2B			Ø 4 4B			NOT USED					
FILE "J" U	Ø 5	Ø 6	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø 8	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L	5A	6A				8A								
	NOT USED	Ø 6 6B				NOT USED								

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
✳ S1	TB6-9,10	I9U	60	22	11	SYS					
5A[2]	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			
8A	TB5-9,10	J6U	42	4	8	8	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 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.

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

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

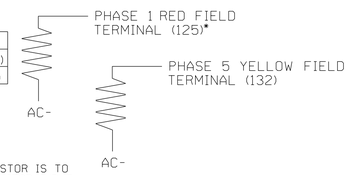
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



*NOTE: THE PURPOSE OF THIS RESISTOR IS TO LOAD THE CHANNEL RED MONITOR INPUT IN ORDER FOR THE SIGNAL SEQUENCE MONITOR TO USE THE FULL SIGNAL SEQUENCE MONITORING CAPABILITY ON CHANNELS THAT DO NOT USE THE RED DISPLAY IN THE FIELD.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1084
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

SR 1175 (Kerr Avenue)
at
New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DOCUSIGNED BY: SIGNATURE DATE

SIG. INVENTORY NO. 03-1084

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 19.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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: 03-1084
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1175 (Kerr Avenue)
at
New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
SIGNATURE DATE

SIG. INVENTORY NO. 03-1084

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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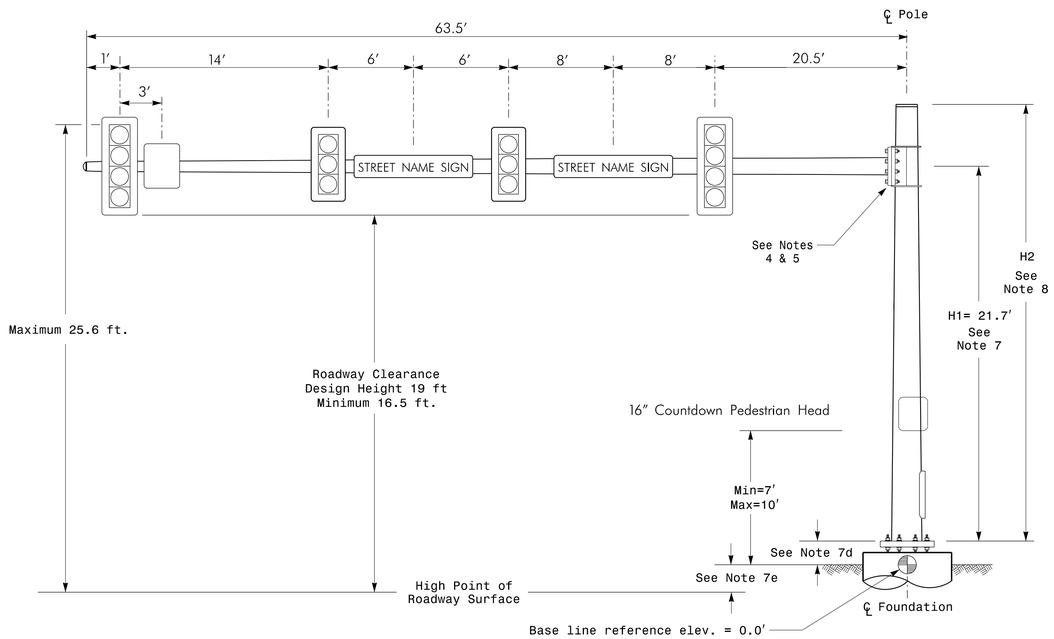
METAL POLE No. 17 and 18

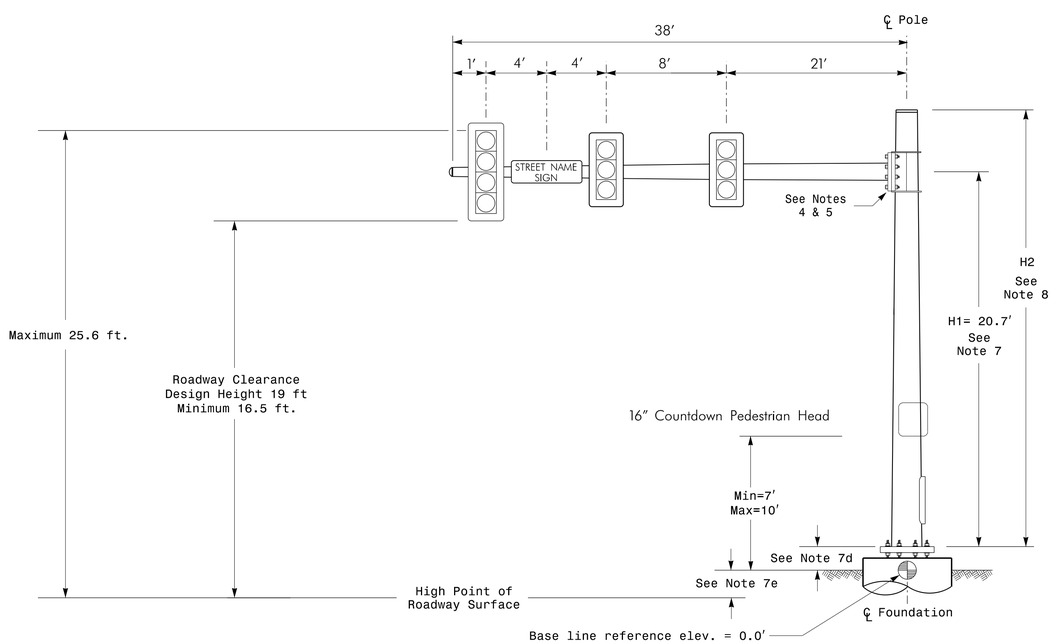
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 19.3

Design Loading for METAL POLE NO. 17



Elevation View

Design Loading for METAL POLE NO. 18



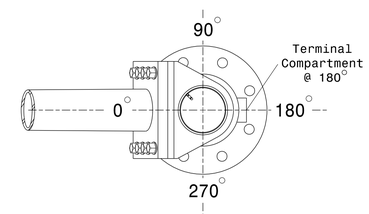
Elevation View

SPECIAL NOTE

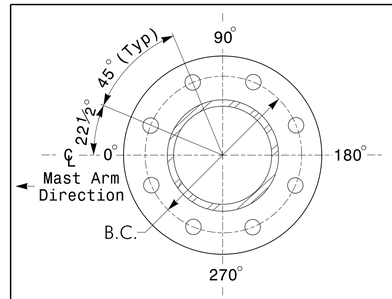
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 17	Pole 18
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.7 ft.	-0.3 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	-0.8 ft.

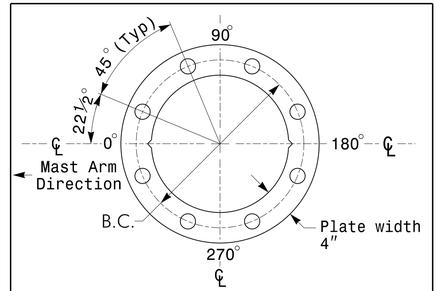


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1175 (Kerr Avenue) at New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Thigpen	REVIEWED BY:	MB Toth	

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014 DATE

SIG. INVENTORY NO. 03-1084

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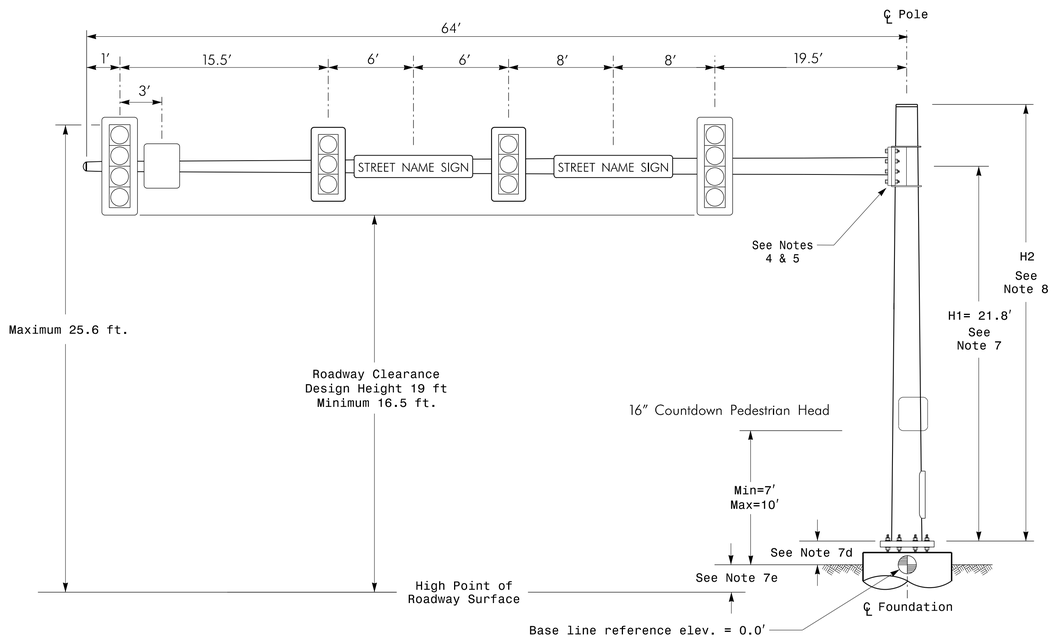
METAL POLE No. 19 and 20

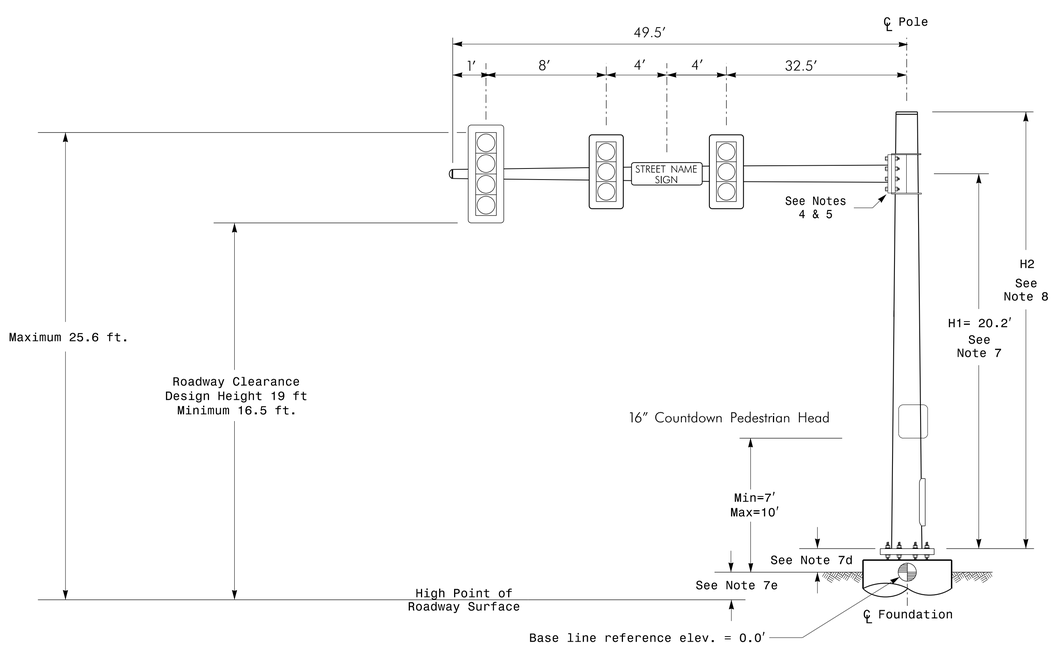
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 19.4

Design Loading for METAL POLE NO. 19



Elevation View

Design Loading for METAL POLE NO. 20



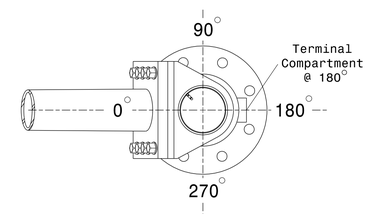
Elevation View

SPECIAL NOTE

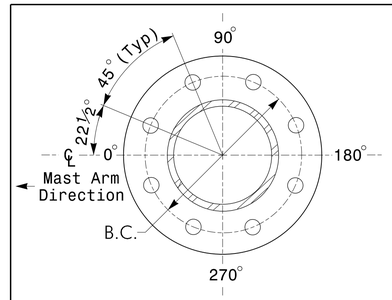
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 19	Pole 20
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.8 ft.	-0.8 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	-0.8 ft.

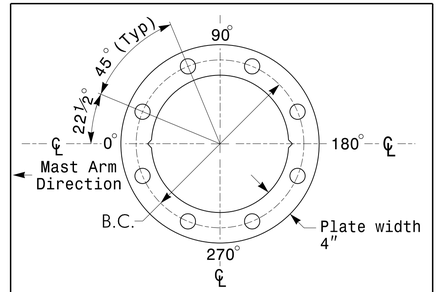


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
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	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
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2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0″ W X 96.0″ L	36 LBS

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   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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, Department of Transportation, State of North Carolina
750 N. Greenfield Pkwy, Garner, NC 27529

SR 1175 (Kerr Avenue) at New Centre Drive/Sunglow Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Thigpen	REVIEWED BY:	MB Toth	

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014 DATE

SIG. INVENTORY NO. 03-1084

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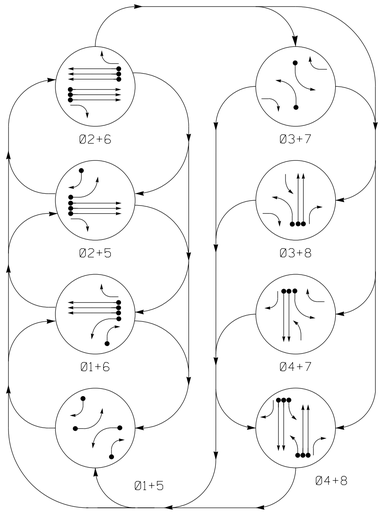
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 20.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

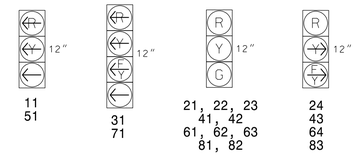
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



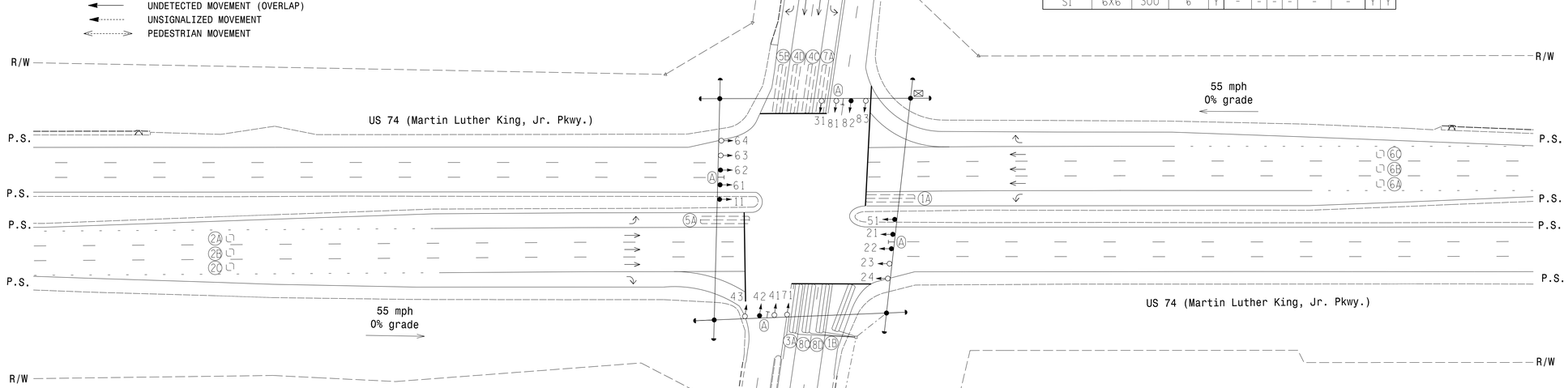
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	-	-	-	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6X6	420	Existing	-	2	Y	Y	-	-	-	-	Y
2B	6X6	420	Existing	-	2	Y	Y	-	-	-	-	Y
2C	6X6	420	Existing	-	2	Y	Y	-	-	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	15	-	Y
					8	Y	Y	-	-	3	-	Y
4A	6X6	300	Existing	-	4	-	Y	-	-	-	-	Y
4B	6X6	300	Existing	-	4	-	Y	-	-	-	-	Y
4C	6X40	0	2-4-2	-	4	Y	Y	Y	2.0	5	-	Y
4D	6X40	0	2-4-2	-	4	Y	Y	Y	2.0	5	-	Y
5A	6X40	+5	2-4-2	-	5	Y	Y	-	-	-	-	Y
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	Y
6A	6X6	420	Existing	-	6	Y	Y	-	-	-	-	Y
6B	6X6	420	Existing	-	6	Y	Y	-	-	-	-	Y
6C	6X6	420	Existing	-	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	15	-	Y
					4	Y	Y	-	-	3	-	Y
8A	6X6	300	6	Y	8	-	Y	-	-	-	-	Y
8B	6X6	300	6	Y	8	-	Y	-	-	-	-	Y
8C	6X40	0	2-4-2	Y	8	Y	Y	Y	2.0	5	-	Y
8D	6X40	0	2-4-2	Y	8	Y	Y	Y	2.0	5	-	Y
S1	6X6	300	6	Y	-	-	-	-	-	-	Y	Y

8 Phase
Fully Actuated
(Wilmington 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 or phase 5 may be lagged.
4. Phase 3 or phase 7 may be lagged.
5. Reposition all existing signal heads except for heads numbered 11 and 51
6. Set all detector units to presence mode.
7. Replace conflict monitor with new ethernet capable conflict monitor when convert to ethernet system.
8. Existing backplates on signal heads numbered 21, 22, and 51.
9. Install backplates on signal heads 11, 23, 24, 61, 62, 63, and 64.
10. Maximum times shown in timing charts are for free-run operation only. Coordinated signal timing values supercede these values.
11. Signal system data: Controller Asset #0786.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	12	7	14	7	12
Extension 1 *	1.0	6.0	1.0	6.0	1.0	6.0	1.0	6.0
Max Green 1 *	20	120	30	90	20	120	20	90
Yellow Clearance	3.0	5.2	3.0	4.6	3.0	5.2	3.0	4.6
Red Clearance	3.7	1.2	3.2	2.4	3.6	1.2	3.3	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	35	-	-	-	35	-	-
Time Before Reduction *	-	15	-	15	-	15	-	15
Time To Reduce *	-	50	-	30	-	50	-	30
Minimum Gap	-	3.5	-	3.5	-	3.5	-	3.5
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
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.

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	
	Street Sign	

Signal Upgrade - Final Design - Traffic Control Phase II

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

US 74
(Martin Luther King, Jr. Pkwy.)
at
SR 1175 (N. Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014 REVIEWED BY: MB Toth
PREPARED BY: AM Encarnacion REVIEWED BY: LM Moon

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
C9B0DCF8E5AD0AAF... DATE

SIG. INVENTORY NO. 03-0786

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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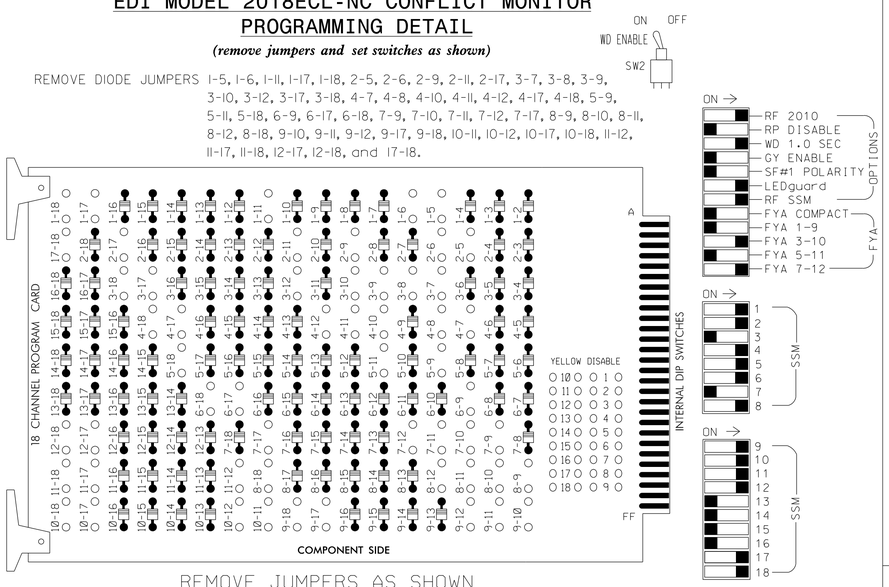
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 20.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-11, 1-17, 1-18, 2-5, 2-6, 2-9, 2-11, 2-17, 3-7, 3-8, 3-9, 3-10, 3-12, 3-17, 3-18, 4-7, 4-8, 4-10, 4-11, 4-12, 4-17, 4-18, 5-9, 5-11, 5-18, 6-9, 6-17, 6-18, 7-9, 7-10, 7-11, 7-12, 7-17, 8-9, 8-10, 8-11, 8-12, 8-18, 9-10, 9-11, 9-12, 9-17, 9-18, 10-11, 10-12, 10-17, 10-18, 11-12, 11-17, 11-18, 12-17, 12-18, and 17-18.



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. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Variable Initial.
5. Program phases 2, 4, 6 and 8 for Gap Reduction.
6. Program phases 2 and 6 for Start Up In Green.
7. Program phases 2 and 6 for Yellow Flash and overlaps 2, 5 and 6 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	OLF
SIGNAL HEAD NO.	11	21,22, 23	NU	31★	41,42	NU	51	61,62, 63	NU	71★	81,82	NU	24★	31★	64★	43★	71★	83★
RED		128			101			134			107		A121		A111	A114		A104
YELLOW		129		*	102			135		*	108							
GREEN		130			103			136			109							
RED ARROW	125						131							A124			A101	
YELLOW ARROW	126						132						A122	A125	A112	A115	A102	A105
FLASHING YELLOW ARROW													A123	A126	A113	A116	A103	A106
GREEN ARROW	127			118			133			124								

NU = Not Used

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

★ See pictorial of head wiring in detail below.

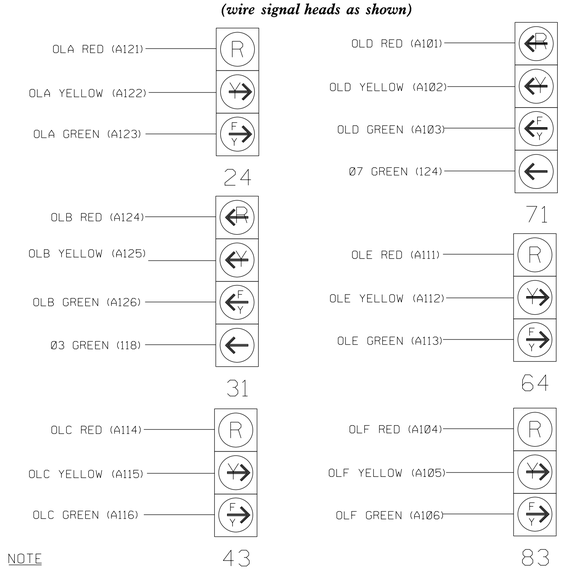
NOTE: Load Switches AUX S3 and AUX S6 require output remapping. See sheet 3 of this electrical detail for instructions.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX, OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1,AUX S2, AUX S3,AUX S4,AUX S5,AUX S6
PHASES USED.....1,2,3,4,5,6,7,8
OVERLAP "A".....2+3
OVERLAP "B".....3+4
OVERLAP "C".....4+5
OVERLAP "D".....7+8
OVERLAP "E".....6+7
OVERLAP "F".....1+8

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 31 and 71 requires special logic programming. See sheet 2 of 3 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	Ø 1 / 1A	Ø 2 / 2A	Ø 2 / 2C	Ø 3 / 3A	Ø 4 / 4A	Ø 4 / 4C	WIRED INPUT ⊗	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS / DC ISOLATOR
	L		Ø 1 / 1B	Ø 2 / 2B	NOT USED	NOT USED	Ø 4 / 4B	Ø 4 / 4D		NOT USED					ST / DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 5 / 5A	Ø 6 / 6A	Ø 6 / 6C	Ø 7 / 7A	Ø 8 / 8A	Ø 8 / 8C	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø 5 / 5B	Ø 6 / 6B	NOT USED	NOT USED	Ø 8 / 8B	Ø 8 / 8D							

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	TB2-5,6	I2U	39	1	2	1	Y	Y			
1B	TB2-7,8	I2L	43	5	12	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			
2C	TB4-1,2	I4U	47	9	22	2	Y	Y			
3A'	TB4-5,6	I5U	58	20	3	3	Y	Y			15
	-	J8U	50	12	28	8	Y	Y			3
4A	TB4-9,10	I6U	41	3	4	4		Y			
4B	TB4-11,12	I6L	45	7	14	4		Y			
4C	TB6-1,2	I7U	65	27	34	4	Y	Y	Y	2.0	5
4D	TB6-3,4	I7L	78	40	44	4	Y	Y	Y	2.0	5
* S1	TB6-9,10	I9U	60	22	11	SYS					
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			
5B	TB3-7,8	J2L	44	6	16	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
7A'	TB5-5,6	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			3
8A	TB5-9,10	J6U	42	4	8	8		Y			
8B	TB5-11,12	J6L	46	8	18	8		Y			
8C	TB7-1,2	J7U	66	28	38	8	Y	Y	Y	2.0	5
8D	TB7-3,4	J7L	79	41	48	8	Y	Y	Y	2.0	5

* SYSTEM DETECTOR ONLY. REMOVE THE VEHICLE PHASE ASSIGNED TO THIS DETECTOR IN THE DEFAULT PROGRAMMING.

[1] Add jumper from I5-W to J8-W, on rear of input file.

[2] Add jumper from J5-W to I8-W, on rear of input file.

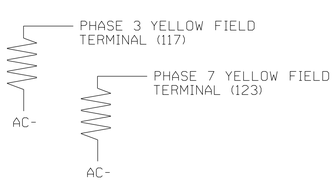
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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: 03-0786
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Electrical Detail Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74
(Martin Luther King, Jr. Pkwy.)
at
SR 1175 (N. Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE:	May 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Encarnacion	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

Prepared for 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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DIRECTOR/PROGRAM SIGNATURE DATE

SIG. INVENTORY NO. 03-0786

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig 20.2

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, 3, 4, 5 AND 6.

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

```
LOGICAL I/O COMMAND #1  (+/-COMMAND#)
IF  ACTIVE PHASE        #3  IS ON
AND RED CLEAR ON PHASE #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #47 ON
SET OUTPUT  ASSIGNMENT #48 OFF
```

NOTE: LOGIC FOR PHASE 3 RED CLEAR WHEN TRANSITIONING FROM PHASE 3 TO PHASE 4 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #2  (+/-COMMAND#)
IF  ACTIVE PHASE        #3  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #49 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 3 (HEAD 31).

PRESS '+'

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

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #48 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 3 (HEAD 31).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-COMMAND#)
IF  ACTIVE PHASE        #7  IS ON
AND RED CLEAR ON PHASE #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #39 ON
SET OUTPUT  ASSIGNMENT #40 OFF
```

NOTE: LOGIC FOR PHASE 7 RED CLEAR WHEN TRANSITIONING FROM PHASE 7 TO PHASE 8 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #5  (+/-COMMAND#)
IF  ACTIVE PHASE        #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #41 OFF
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 7 (HEAD 71).

PRESS '+'

```
LOGICAL I/O COMMAND #6  (+/-COMMAND#)
IF  YELLOW ON PHASE     #7  IS ON

SCROLL DOWN

THEN:
SET OUTPUT  ASSIGNMENT #40 ON
```

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 7 (HEAD 71).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 47 = Overlap B Red
OUTPUT 48 = Overlap B Yellow
OUTPUT 49 = Overlap B 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:          |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  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:          |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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' 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  X 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
```

NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'E' 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  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 'F' SETTINGS
PHASE:          |123456789101112131415 16
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  X 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
```

NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0786
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Electrical Detail Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 74
(Martin Luther King, Jr. Pkwy.)
at
SR 1175 (N. Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014		REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion		REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
PROFESSIONAL SIGNATURE DATE

SIG. INVENTORY NO. 03-0786

13-JUL-2015 10:33
03*Transportation*Traffic*Curr*100036295 U3338 Kerr Sig_ITS*Wiring*03-0786v.dgn
WILE2054 AT DUS290140

DocuSign Envelope ID: 0C2C82B9-01A1-4006-9BCC-6F5248024E16

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig 20.3

FYA SIGNAL OUTPUT REMAPPING ASSIGNMENT PROGRAMMING DETAIL

(program controller as shown below)

OUTPUT ASSIGNMENTS FOR OLE

STEP 1

FROM MAIN MENU PRESS '6' (OUTPUTS). THEN
'1' (OUTPUT ASSIGNMENTS).
WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "45"

```
PAGE:1  C1 PIN:91  NOT ENABLED
OUTPUT ASSIGNMENT #................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'E' RED

THE OUPUT IS SET AS NOT ENABLED BY DEFAULT. THIS 'Y' WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:91  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:91  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................45
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 46

STEP 2

```
PAGE:1  C1 PIN:93  NOT ENABLED
OUTPUT ASSIGNMENT #................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'E' GREEN

THE OUPUT IS SET AS NOT ENABLED BY DEFAULT. THIS 'Y' WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:93  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:93  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................46
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "54"

STEP 3

```
PAGE:1  C1 PIN:101  CONTROLLER FLASH
OUTPUT ASSIGNMENT #................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................Y
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'E' YELLOW

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:101 CONTROLLER FLASH
SELECT VEHICLE OVERLAP (A=1,P=16)...5
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:101  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................54
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

WITH CURSOR IN "OUTPUT ASSIGNMENT#"
POSITION ENTER "37"

OUTPUT ASSIGNMENTS FOR OLF

STEP 4

```
PAGE:1  C1 PIN:83  NOT ENABLED
OUTPUT ASSIGNMENT #................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'F' RED

THE OUPUT IS SET AS NOT ENABLED BY DEFAULT. THIS 'Y' WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:83  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....0
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:83  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................37
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

PRESS "+" KEY FOR OUTPUT 38

STEP 5

```
PAGE:1  C1 PIN:84  NOT ENABLED
OUTPUT ASSIGNMENT #................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'F' GREEN

THE OUPUT IS SET AS NOT ENABLED BY DEFAULT. THIS 'Y' WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:84  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....2
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:84  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................38
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

WITH CURSOR IN "OUTPUT ASSIGNMENT#" POSITION ENTER "53"

STEP 6

```
PAGE:1  C1 PIN:100  NOT ENABLED
OUTPUT ASSIGNMENT #................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................Y
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OVERLAP 'F' YELLOW

THE OUPUT IS SET AS NOT ENABLED BY DEFAULT. THIS 'Y' WILL REMAIN UNTIL THE OUTPUT IS CHANGED.

ENTER A "Y" FOR VEHICLE OVERLAP.

```
PAGE:1  C1 PIN:100  NOT ENABLED
SELECT VEHICLE OVERLAP (A=1,P=16)...6
SELECT COLOR(0=RED,1=YEL,2=GRN).....1
```

WHEN A 'Y' IS ENTERED FOR 'VEHICLE OVERLAP'
THE SCREEN SHOWN ABOVE WILL APPEAR.
ENTER DATA AS SHOWN.

PRESS THE 'ENT' KEY AFTER INPUTTING DATA.
THEN 'ESC'.

DISPLAY WILL NOW SHOW THE SPECIFIED OUTPUT
ASSIGNED AS 'VEHICLE OVERLAP' AS SHOWN BELOW.

```
PAGE:1  C1 PIN:100  VEHICLE OVERLAP
OUTPUT ASSIGNMENT #................53
FREQUENCY (0=DEFAULT) (0-25.5 HZ)...0.0
DUTY CYCLE (0=DEFAULT) (0 - 100%)...0
MODE (0=SOLID.1=FLASH).............0
SELECT ASSIGNMENT:
NOT ENABLED........................_
VEHICLE PHASE......................_
PEDESTRIAN PHASE...................._
VEHICLE OVERLAP....................Y
PEDESTRIAN OVERLAP.................._
WATCHDOG............................_
DETECTOR RESET......................_
ADVANCE BEACON......................_
OUT OF PHASE FLASHER................_
CONTROLLER FLASH...................._
RUN FREE............................_
RESERVED............................_
PREEMPT............................._
SOFT PREEMPT........................_
ANY PREEMPT........................._
COORDINATION PLAN..................._
OFFSET.............................._
PHASE CHECK........................._
PHASE ON............................_
PHASE NEXT.........................._
```

OUTPUT PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0786
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Electrical Detail Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 74
(Martin Luther King, Jr. Pkwy.)
at
SR 1175 (N. Kerr Avenue)

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

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

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
ORIGINAL SIGNATURE DATE

SIG. INVENTORY NO. 03-0786

13-JUL-2015 10:33
G:\Transportation\Traffic\Current\0003G295 U3338B Kerr Sig.ITS\Wiring\03-0786a.dgn
WILE2054 AT DGS290140

DocuSign Envelope ID: 0C2C82B9-01A1-4006-9BCC-6F5248024E16

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 21.0

PHASING DIAGRAM

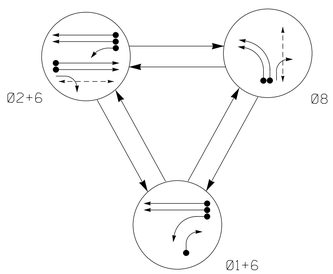
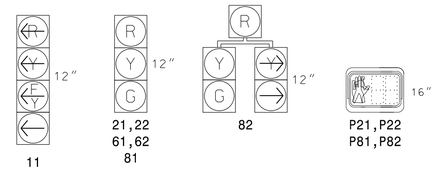


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11	←F	←F	←R	←Y
21, 22	R	G	R	Y
61, 62	G	G	R	Y
81	R	R	G	R
82	R/→	R	G	R
P21,P22	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

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	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	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

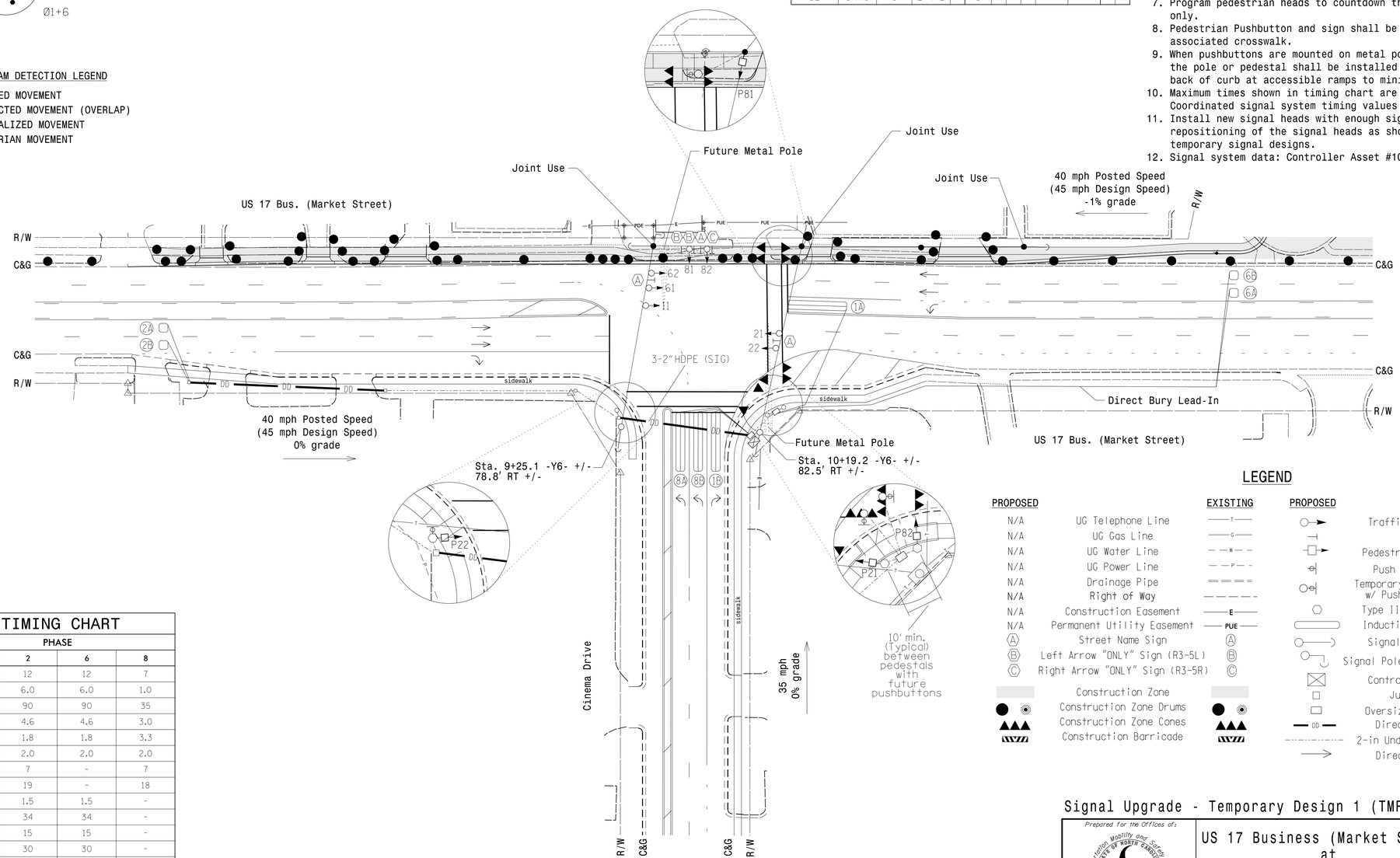
3 Phase
Fully Actuated
(Wilmington Signal System)

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 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. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in the subsequent temporary signal designs.
12. Signal system data: Controller Asset #1080.

PHASING DIAGRAM DETECTION LEGEND

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



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	1.0	6.0	6.0	1.0
Max Green 1 *	20	90	90	35
Yellow Clearance	3.0	4.6	4.6	3.0
Red Clearance	3.4	1.8	1.8	3.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7
Don't Walk 1	-	19	-	18
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.2	3.2	-
Recall Mode	-	SOFT RECALL	SOFT 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
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	UG Water Line	W
N/A	UG Power Line	P
N/A	Drainage Pipe	
N/A	Right of Way	
N/A	Construction Easement	E
N/A	Permanent Utility Easement	PUE
Ⓐ	Street Name Sign	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
DD	Directional Drill	N/A
	2-in Underground Conduit	
	Directional Arrow	

Signal Upgrade - Temporary Design 1 (TMP Phase II)

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

US 17 Business (Market Street) at Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	AJ Davis	REVIEWED BY:	LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DB6DCF8E94D0AAF DATE

SIG. INVENTORY NO. 03-1080TI

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 22.0

PHASING DIAGRAM

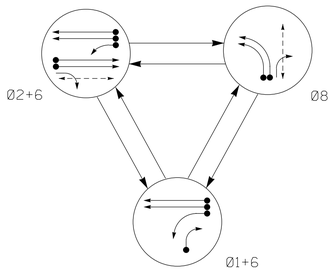
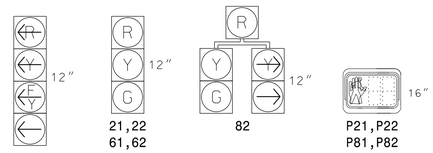


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11	←F	←F	←R	←Y
21, 22	R	G	R	Y
61, 62	G	G	R	Y
81	R	R	G	R
82	R/→	R	G	R
P21,P22	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

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	-	-
					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	6	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

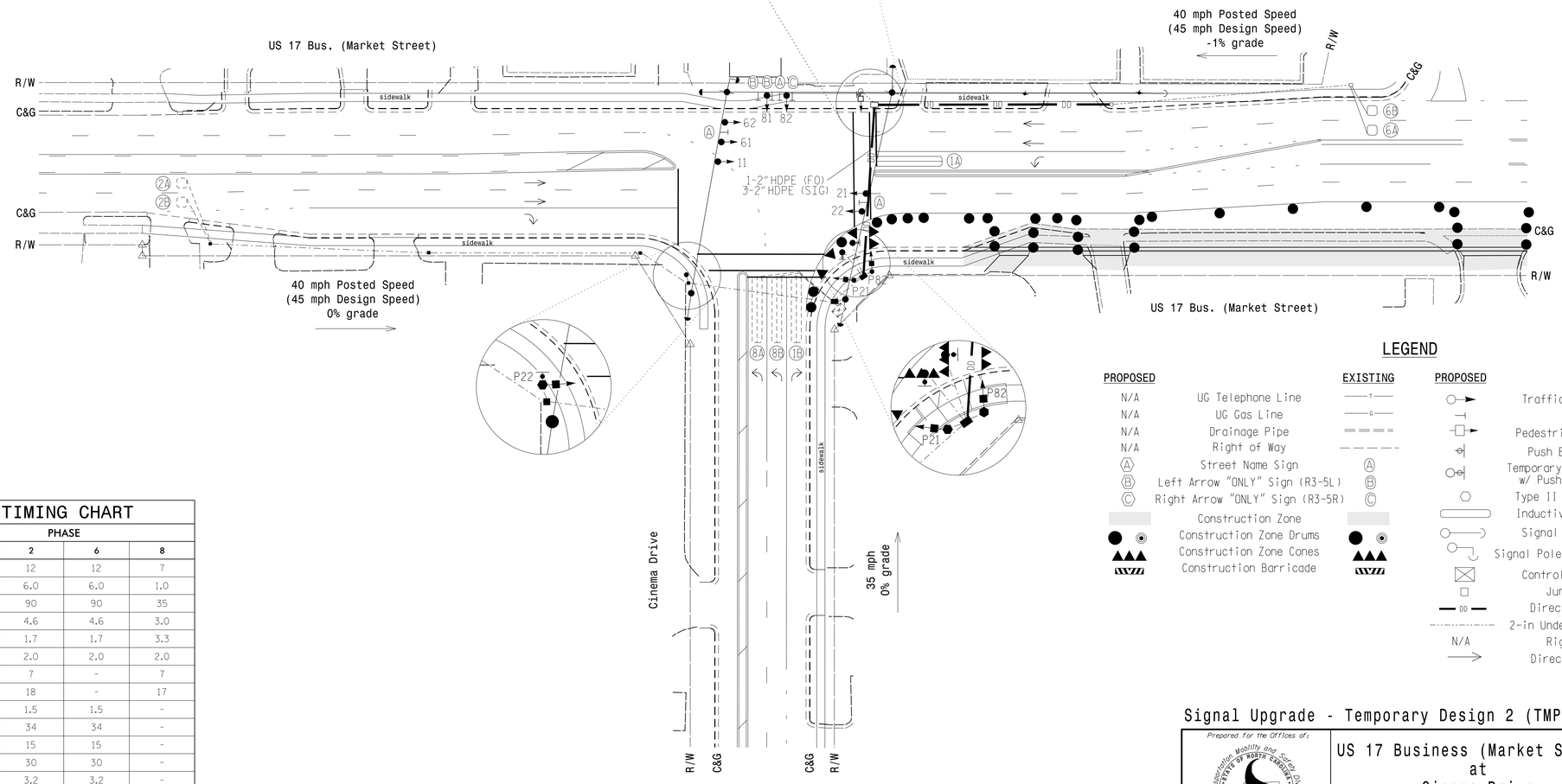
3 Phase
Fully Actuated
(Wilmington Signal System)

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 may be lagged.
4. Reposition existing signal heads numbered 11, 21, 22 & 61.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data: Controller Asset #1080.

PHASING DIAGRAM DETECTION LEGEND

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



LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	Drainage Pipe	
N/A	Right of Way	
Ⓐ	Street Name Sign	Ⓐ
Ⓑ	Left Arrow "ONLY" Sign (R3-5L)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
	Construction Zone	
	Construction Zone Drums	
	Construction Zone Cones	
	Construction Barricade	

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Temporary Pedestrian Post w/ Push Button & Sign	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
DD	Directional Drill	N/A
	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 *	1.0	6.0	6.0	1.0
Max Green 1 *	20	90	90	35
Yellow Clearance	3.0	4.6	4.6	3.0
Red Clearance	3.3	1.7	1.7	3.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7
Don't Walk 1	-	18	-	17
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.2	3.2	-
Recall Mode	-	SOFT RECALL	SOFT 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.

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WILE2054 AT DUS290140

Signal Upgrade - Temporary Design 2 (TMP Phase III)

Prepared for 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

US 17 Business (Market Street)
at
Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	AJ Davis	REVIEWED BY:	LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-108012

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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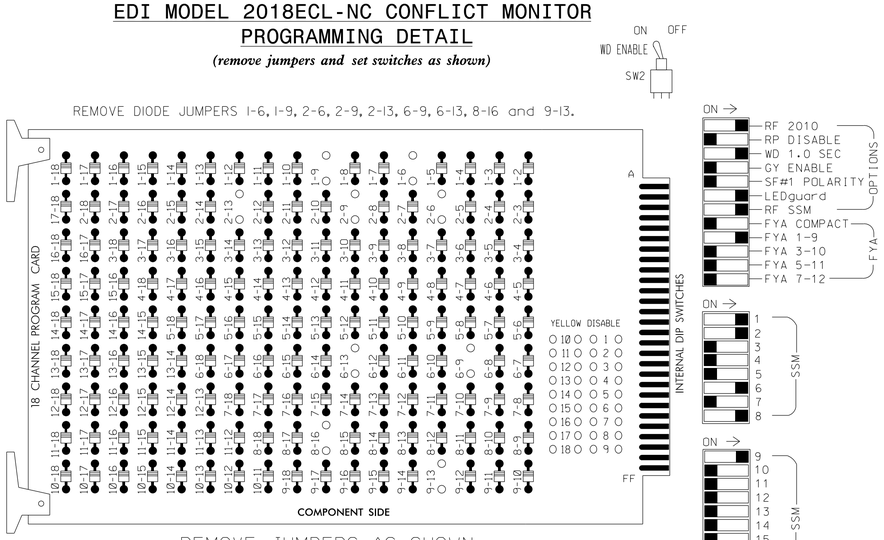
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 22.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S3,S8,S11,S12,AUX S1
PHASES USED.....1,2,2PED,6,8,8PED.
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	82	21,22	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	P81, P82	11 ★	NU	NU	NU	NU	NU
RED		✳	128						134			107							
YELLOW			129						135			108							
GREEN			130						136			109							
RED ARROW														A121					
YELLOW ARROW		126												A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127	127																	
✋				113									110						
🚶				115									112						

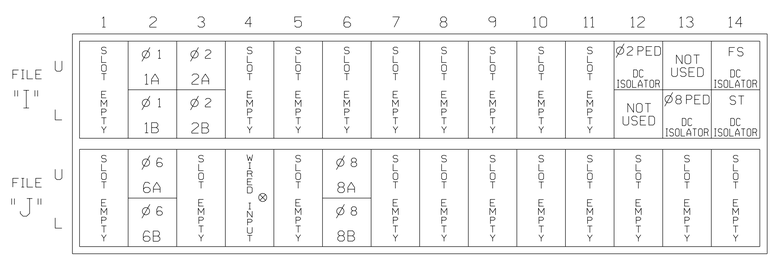
NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)



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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-7,8	I2L	43	5	12	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			
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

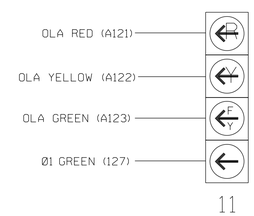
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

[1] Add jumper from I2-F to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



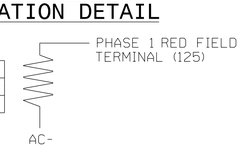
NOTE

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

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1080T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Designs 1 & 2 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

US 17 Business (Market Street) at Cinema Drive

Division 03	New Hanover County		Wilmington
PLAN DATE: June 2014		REVIEWED BY:	LM Moon
PREPARED BY: AJ Davis		REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
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DATE

SIG. INVENTORY NO. 03-1080T1&T2

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig 22.2

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:          |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  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: 03-1080T1&T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Designs 1 & 2 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

US 17 Business (Market Street)
at
Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1080T1&T2

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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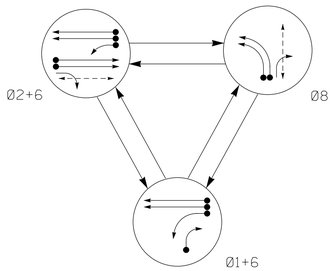
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 23.0

3 Phase
Fully Actuated
(Wilmington Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

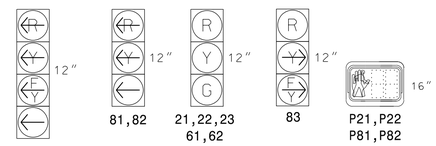
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11	←	F	R	Y
21, 22, 23	R	G	R	Y
61, 62	G	G	R	Y
81,82	R	R	←	R
83	F	R	F	R
P21,P22	DW	W	DW	DRK
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

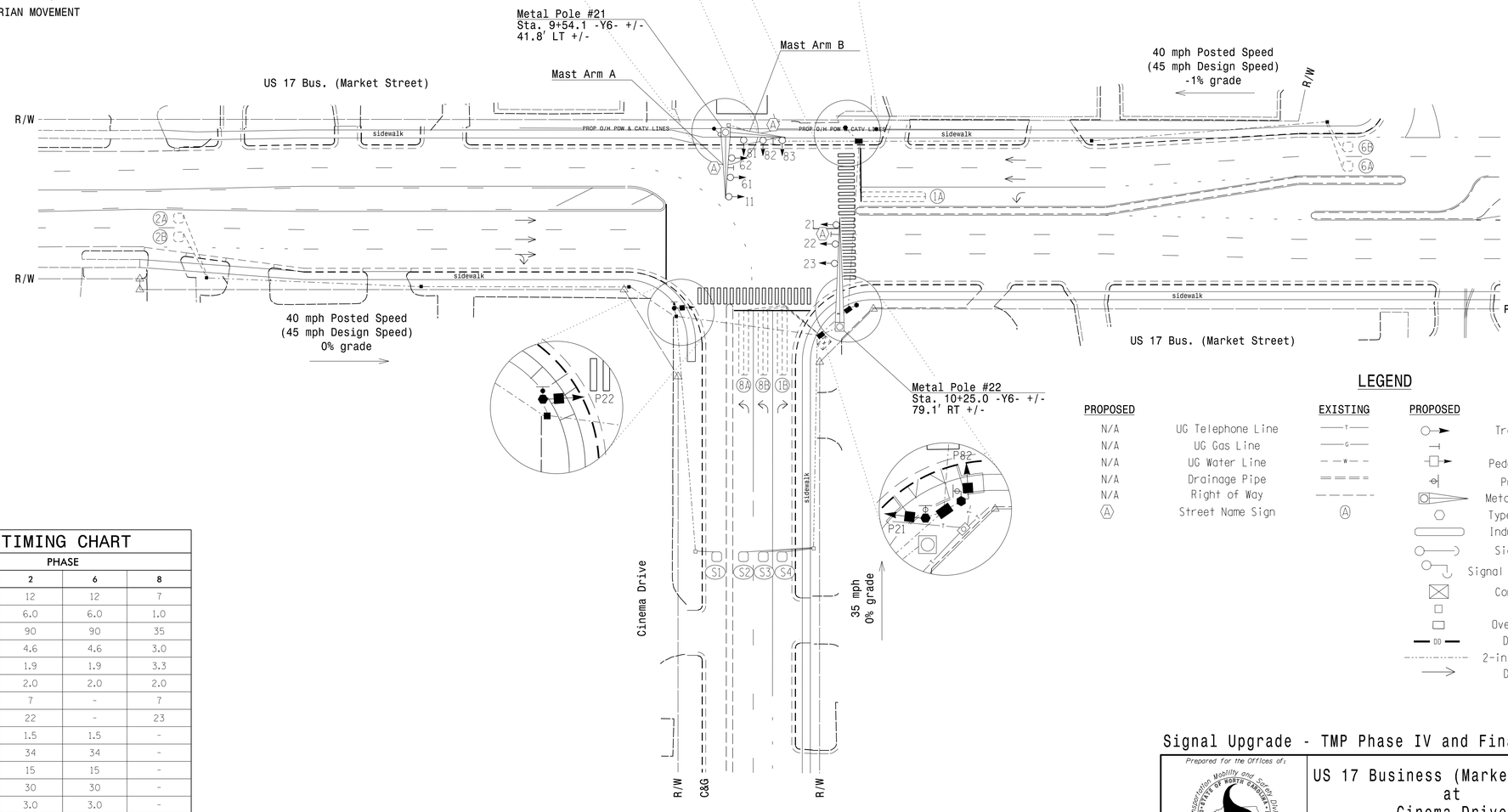


OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	5	-	2	Y	Y	-	-	-	-	-
6A	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	-	6	Y	Y	-	-	-	-	-
8A	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8B	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
S1	6X6	150	4	Y	-	-	-	-	-	-	Y	Y
S2	6X6	150	4	Y	-	-	-	-	-	-	Y	Y
S3	6X6	150	4	Y	-	-	-	-	-	-	Y	Y
S4	6X6	150	4	Y	-	-	-	-	-	-	Y	Y

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. 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. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Signal system data: Controller Asset #1080.



LEGEND

PROPOSED		EXISTING
N/A	UG Telephone Line	T
N/A	UG Gas Line	G
N/A	UG Water Line	W
N/A	Drainage Pipe	
N/A	Right of Way	
A	Street Name Sign	A

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
CO	Directional Drill	N/A
	2-in Underground Conduit	
	Directional Arrow	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	7	12	12	7
Extension 1 *	1.0	6.0	6.0	1.0
Max Green 1 *	20	90	90	35
Yellow Clearance	3.0	4.6	4.6	3.0
Red Clearance	3.5	1.9	1.9	3.3
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7
Don't Walk 1	-	22	-	23
Seconds Per Actuation *	-	1.5	1.5	-
Max Variable Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.0	3.0	-
Recall Mode	-	SOFT RECALL	SOFT 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.

Signal Upgrade - TMP Phase IV and Final Design

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

US 17 Business (Market Street) at Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: MB Toth
PREPARED BY: AJ Davis	REVIEWED BY: LM Moon

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth C8EDCF8E0ED0A4F...
12/19/2014
DATE

SIG. INVENTORY NO. 03-1080

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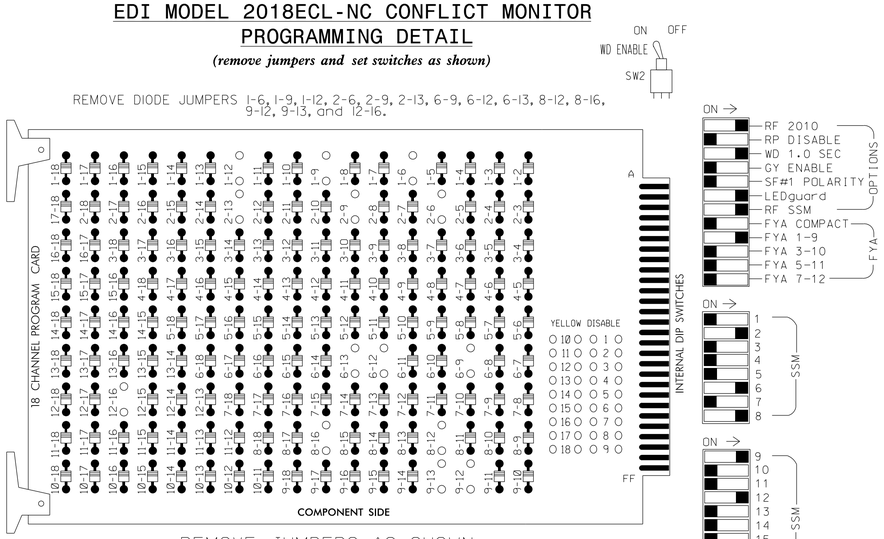
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 23.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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 8 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 and 4 as Wag Overlaps.
7. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S3,S8,S11,S12,AUX S1,AUX S5
PHASES USED.....1,2,2PED,6,8,8PED.
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....1+8

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	** OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22, 23	P21, P22	NU	NU	NU	NU	61,62	NU	NU	81,82	P81, P82	11 ★	NU	NU	NU	83 ★	NU
RED		128						134									A101	
YELLOW	*	129						135										
GREEN		130						136										
RED ARROW											107		A121					
YELLOW ARROW											108		A122				A102	
FLASHING YELLOW ARROW													A123				A103	
GREEN ARROW	127										109							
✋			113									110						
🚶			115									112						

NU = Not Used

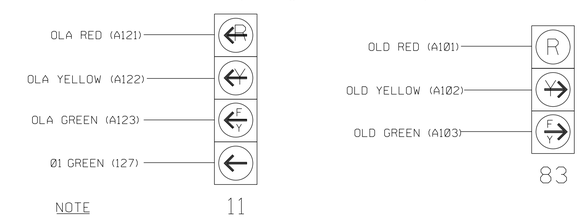
* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail below.

** Flash Note: Wire Overlap "D" to flash on Flasher unit #2, Circuit #1.

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal head 11 requires special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	NOT USED	FS DC ISOLATOR
	L		Ø1 1B	Ø2 2B						SYS. DET. S2			NOT USED	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S3	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø6 6B				Ø8 8B			SYS. DET. S4					

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-7,8	I2L	43	5	12	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			
* S1	TB6-9,10	I9U	60	22	11	SYS					
* S2	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			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			
* S3	TB7-9,10	J9U	59	21	15	SYS					
* S4	TB7-11,12	J9L	61	23	17	SYS					
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 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.

[1] Add jumper from I2-F to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

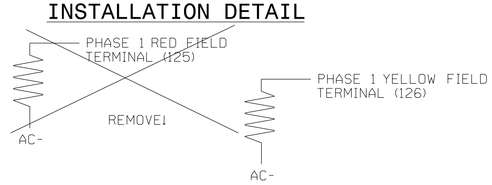
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

LOAD RESISTOR INSTALLATION DETAIL

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: 03-1080
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 Business (Market Street) at Cinema Drive

Division 03 | New Hanover County | Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 12/19/2014
DATE
SIG. INVENTORY NO. 03-1080

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 23.2

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:          ¦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  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 '+' THREE TIMES

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
PHASE:          ¦123456789101112131415 16
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  X 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
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1080
DESIGNED: JUNE 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17 Business (Market Street)
at
Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AJ Davis	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1080

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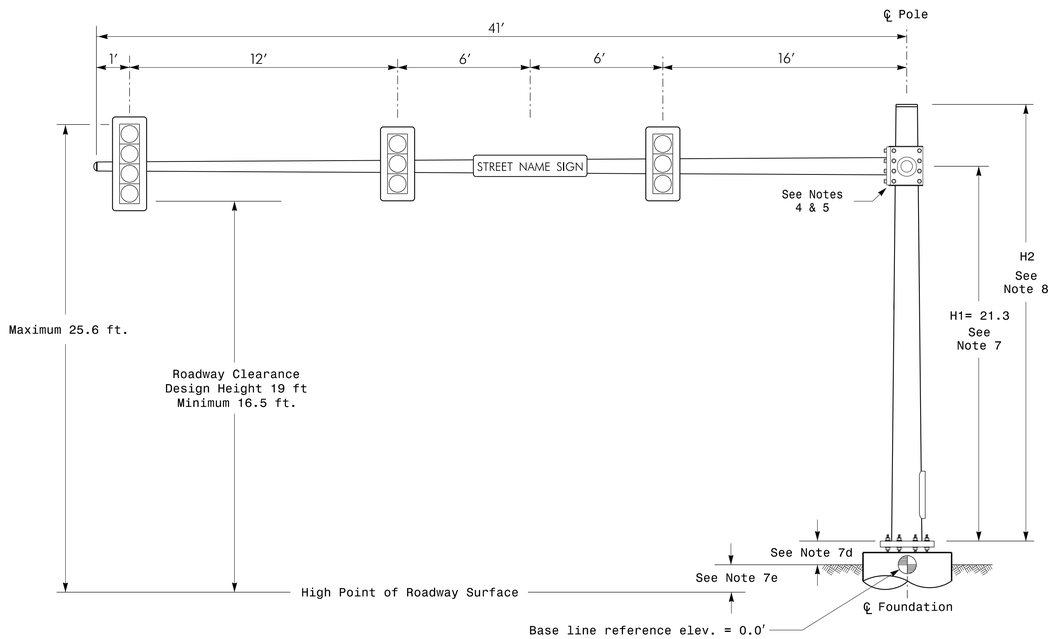
METAL POLE No. 21

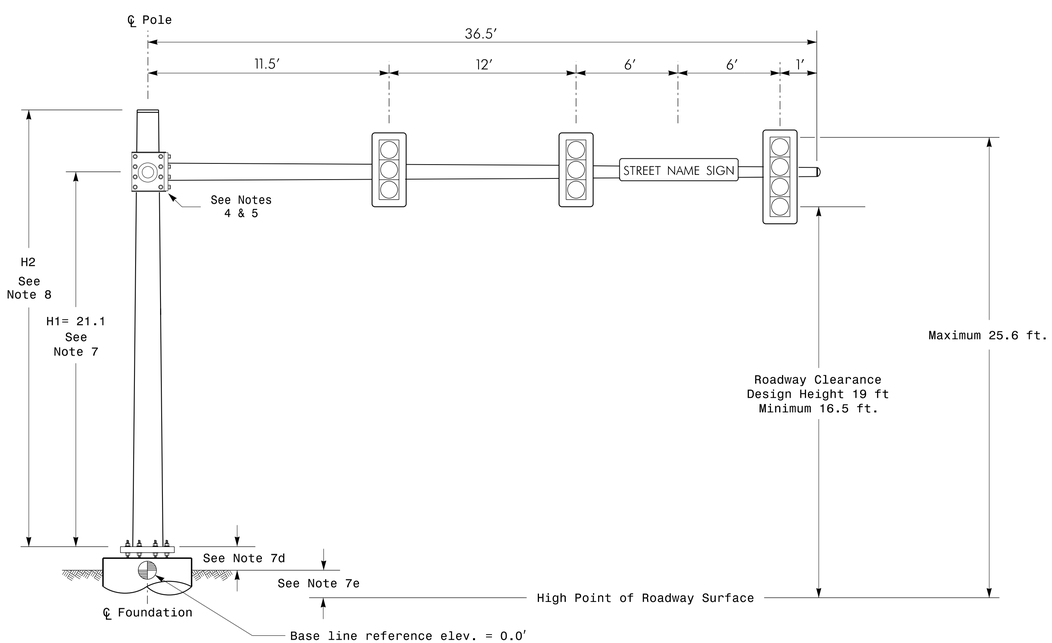
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 23.3

Design Loading for METAL POLE NO. 21, MAST ARM A



Elevation View @ 0°

Design Loading for METAL POLE NO. 21, MAST ARM B



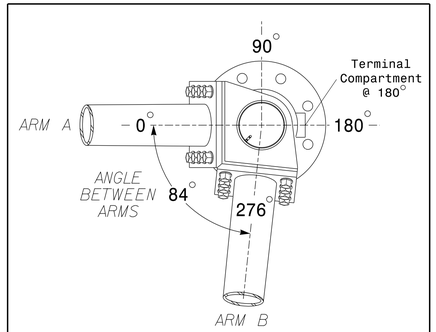
Elevation View @ 276°

SPECIAL NOTE

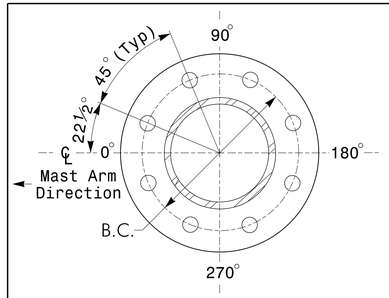
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.3 ft.	+0.1 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	N/A

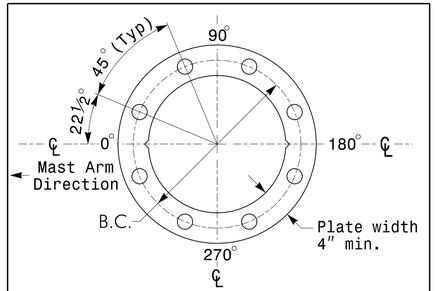


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, State of North Carolina Department of Transportation
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Business (Market Street) at Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE: April 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AJ Davis	REVIEWED BY:	MB Toth	

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
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DATE

SIG. INVENTORY NO. 03-1080

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WILE2054 AT DUS290140

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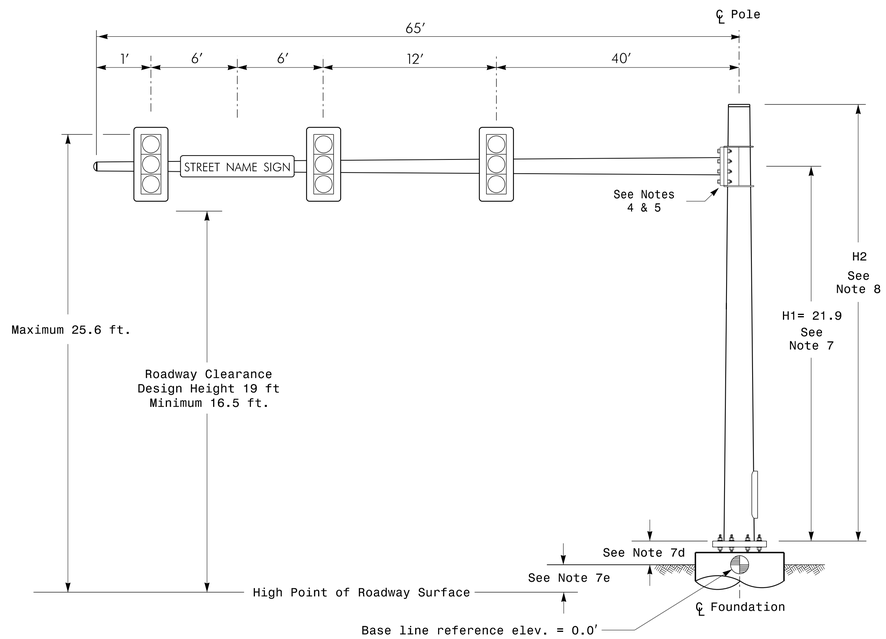
METAL POLE No. 22

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 23.4

Design Loading for METAL POLE NO. 22



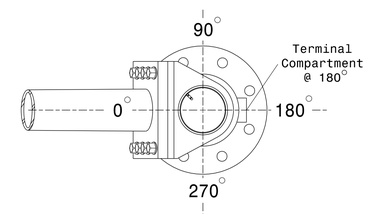
Elevation View

SPECIAL NOTE

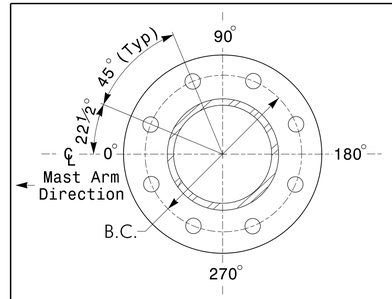
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 22	
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	
Elevation difference at High point of roadway surface	+0.8 ft.	
Elevation difference at Edge of travelway or face of curb	-0.5 ft.	

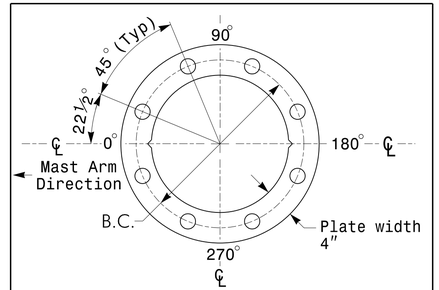


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
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NCDOT Wind Zone 2 (130 mph)

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Prepared for the Offices of:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Business (Market Street)
at
Cinema Drive

Division 03 New Hanover County Wilmington

PLAN DATE: April 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AJ Davis	REVIEWED BY:	MB Toth	

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1080

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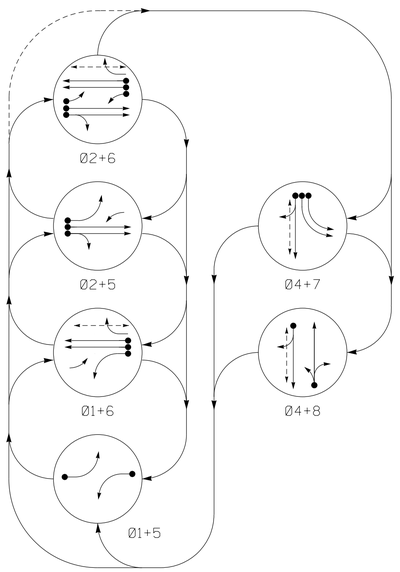
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 24.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

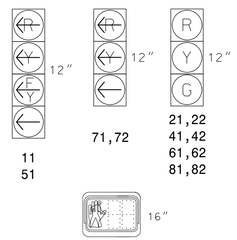
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

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

SIGNAL FACE I.D.

All Heads L.E.D.



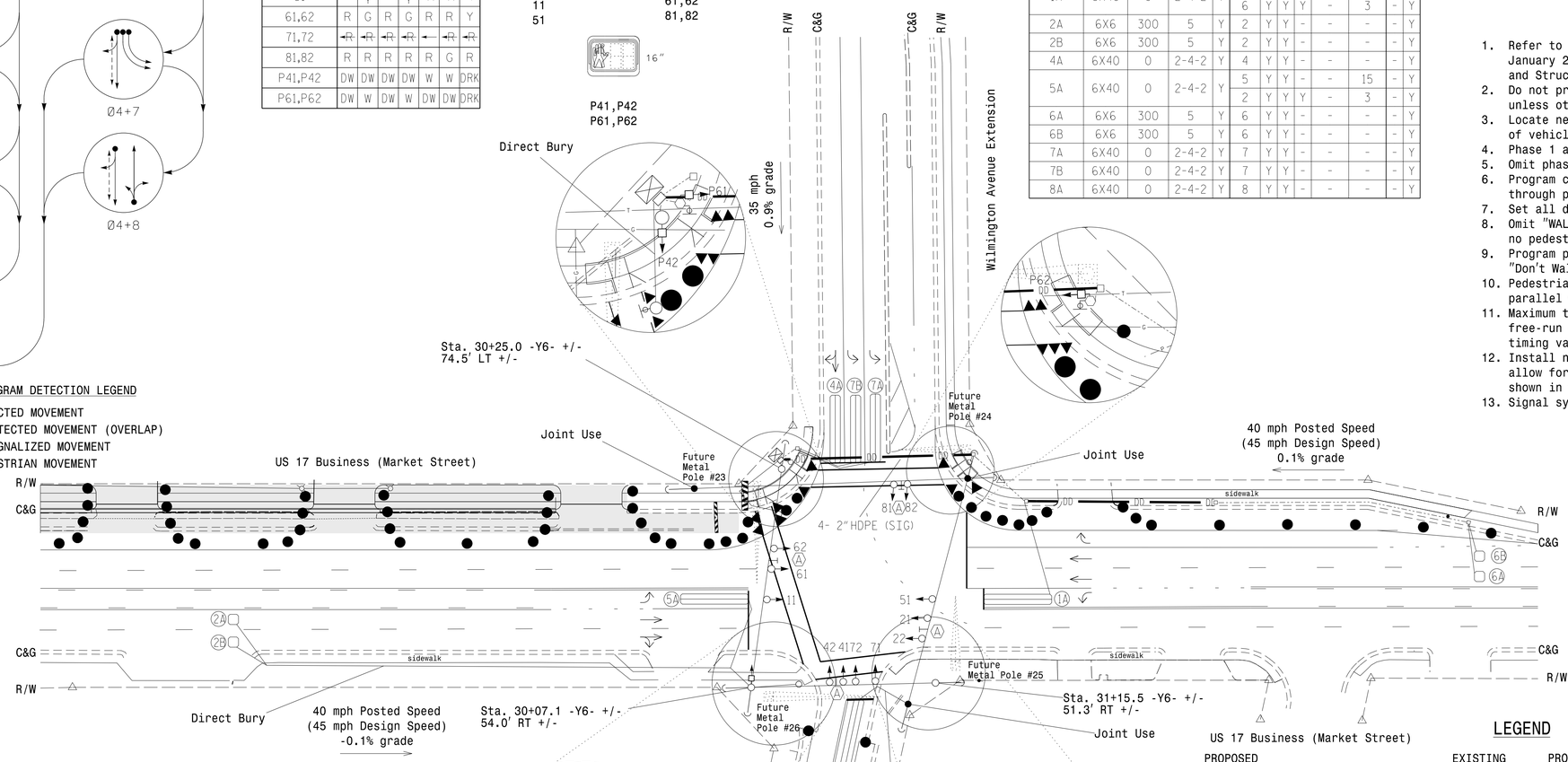
OASIS 2070 LOOP & DETECTOR INSTALLATION

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
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
					2	Y	Y	Y	-	3	-	Y
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
7B	6X40	0	2-4-2	Y	7	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	Y

6 Phase
Fully Actuated
(Wilmington Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Phase 1 and/or phase 5 may be lagged.
5. Omit phase 7 during phase 8 on.
6. Program controller to clear from phase 8 to phase 7 through phase 2 (see Electrical Details).
7. Set all detector units to presence mode.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
12. Install new signal heads with enough signal cable to allow for the repositioning of the signal heads as shown in the subsequent temporary signal design.
13. Signal system data: Controller Asset #1081.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	15	100	40	15	100	35	40
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.0	3.8
Red Clearance	2.9	2.0	2.2	3.6	2.0	3.3	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	-	7	-	-
Don't Walk 1	-	-	22	-	19	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	ON	-	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
	2-in Underground Conduit			Traffic Signal Head	
N/A	Sewer Line	SS		Sign	
N/A	UG Telephone Line	T		Pedestrian Signal Head	
N/A	UG Gas Line	G		Push Button & Sign	
N/A	Drainage Pipe			Temporary Pedestrian Post w/ Push Button & Sign	
N/A	UG Power Line	P		Signal Pole with Guy	
N/A	Right of Way			Type II Signal Pedestal	
A	Street Name Sign	A		Inductive Loop Detector	
	Construction Zone			Controller & Cabinet	
	Construction Zone Drums			Junction Box	
	Construction Zone Cones			Oversize Junction Box	
	Construction Barricade		DD	Directional Drill	N/A
				Directional Arrow	

Signal Upgrade - Temporary Design 1 (TMP Phase II)

Prepared for 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

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension
Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon		
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth		
REVISIONS		INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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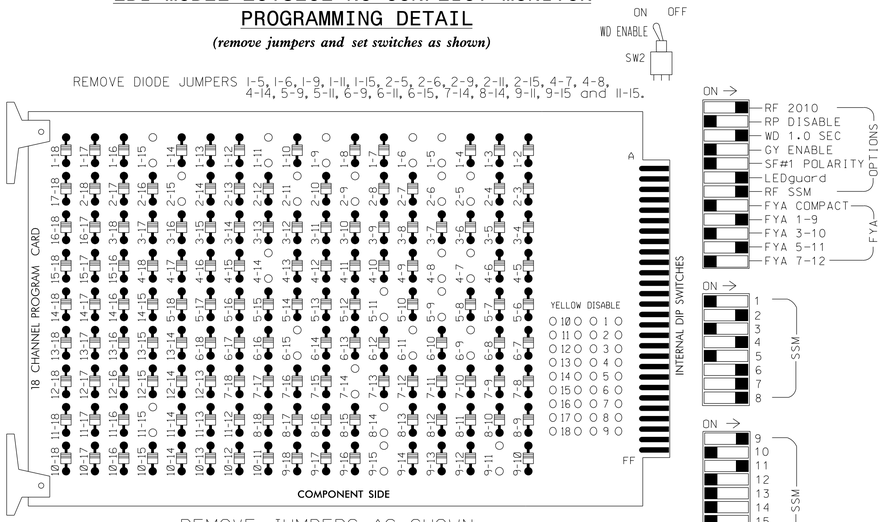
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 24.1

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. Program phases 4 and 8 for Dual Entry.
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 4 and 6 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8,
S9,S10,S11,AUX S1,AUX S4.
PHASES USED.....1,2,4,4PED,5,6,6PED,7,8.
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	★ 11	21,22	NU	NU	41,42	P41, P42	★ 51	61,62	P61, P62	71,72	81,82	NU	★ 11	NU	NU	★ 51	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW										122			A121			A114		
YELLOW ARROW										123			A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133			124								
✋						104			119									
🚶						106			121									

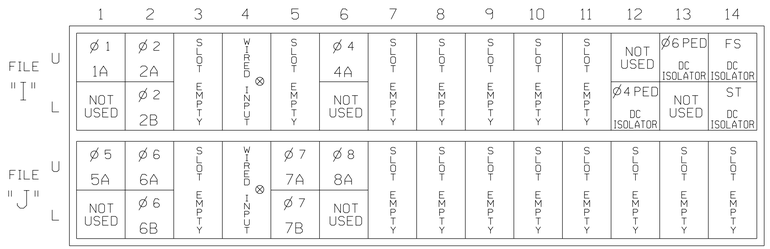
NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
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			
5A[2]	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			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
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.

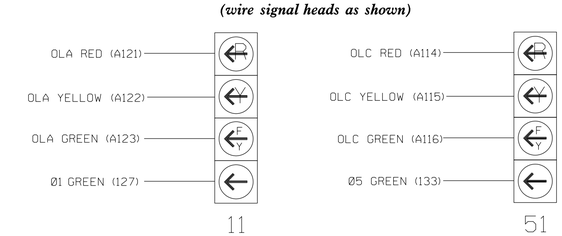
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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

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

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 of 2 for programming instructions.

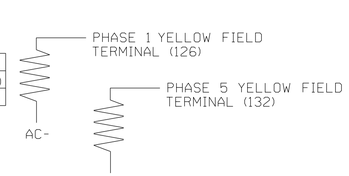
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1081T1
DESIGNED: June 2014
SEALED: DECEMBER 19, 2014
REVISED:

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)



ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	

REVISIONS INIT. DATE

Prepared for 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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCFBE9D0A4F... 12/19/2014 DATE

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 24.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 Dynamic/Backup Control Function 1.

2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                 OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR        PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦        X
OMIT PHASES     ¦       X
CALL PHASES     ¦ X
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1081T1
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 1 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for 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

US 17 Business (Market Street) at Wilmington Avenue / Wilmington Avenue Extension

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014		REVIEWED BY:	LM Moon
PREPARED BY: AM Encarnacion		REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth
DBEDCF8E04D0AAF...
12/19/2014
DATE

SIG. INVENTORY NO. 03-1081T1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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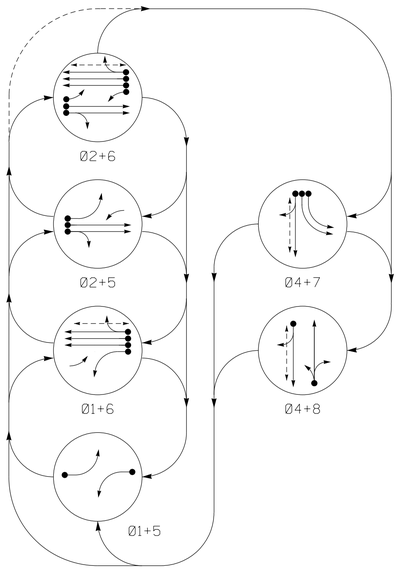
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 25.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

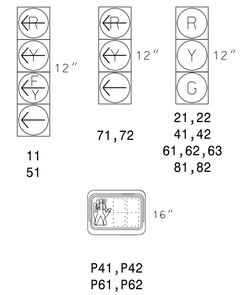
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+5	01+6	02+5	02+6	04+7	04+8	FLASH
11	←	←	F Y	F Y	←R	←R	←Y
21,22	R	R	G	G	R	R	Y
41,42	R	R	R	R	G	G	R
51	←	F Y	←	F Y	←R	←R	←Y
61,62,63	R	G	R	G	R	R	Y
71,72	←R	←R	←R	←R	←	←R	←R
81,82	R	R	R	R	R	G	R
P41,P42	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



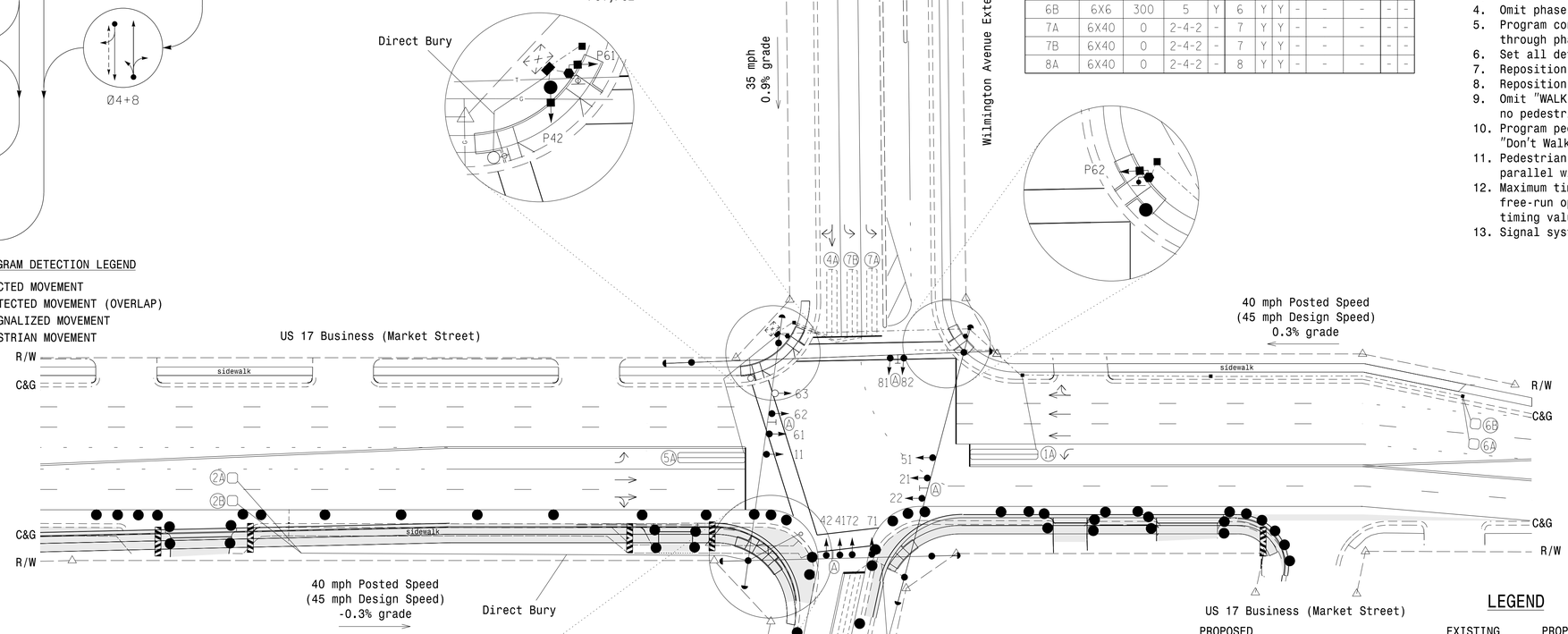
OASIS 2070 LOOP & DETECTOR INSTALLATION

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	-	-
					6	Y	Y	Y	-	3	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	300	5	Y	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	Y	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

6 Phase
Fully Actuated
(Wilmington 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. Omit phase 7 during phase 8 on.
5. Program controller to clear from phase 8 to phase 7 through phase 2 (see Electrical Details).
6. Set all detector units to presence mode.
7. Reposition signal heads numbered 11, 21, 22, 51, 61, 62.
8. Reposition signs for eastbound and westbound approaches.
9. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
10. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
11. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Signal system data: Controller Asset #1081.



OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	15	100	40	15	100	35	40
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.0	3.8
Red Clearance	2.8	2.0	2.1	3.6	2.0	3.2	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	7	-	7	-	-
Don't Walk 1	-	-	24	-	22	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	ON	-	-	-	ON
Simultaneous Gap	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.

LEGEND

PROPOSED		EXISTING	PROPOSED		EXISTING
	2-in Underground Conduit			Traffic Signal Head	
N/A	Sewer Line	SS		Sign	
N/A	UG Telephone Line	T		Pedestrian Signal Head	
N/A	UG Gas Line	G		Push Button & Sign	
N/A	Drainage Pipe			Temporary Pedestrian Post w/ Push Button & Sign	
N/A	Right of Way			Signal Pole with Guy	
	Street Name Sign			Type II Signal Pedestal	
	Construction Zone			Inductive Loop Detector	
	Construction Zone Drums			Controller & Cabinet	
	Construction Zone Cones			Junction Box	
	Construction Barricade			Oversize Junction Box	
			DD	Directional Drill	N/A
				Directional Arrow	

Signal Upgrade - Temporary Design 2 (TMP Phase III)

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

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCF8E04D0AAF... 12/19/2014
DATE

SIG. INVENTORY NO. 03-108IT2

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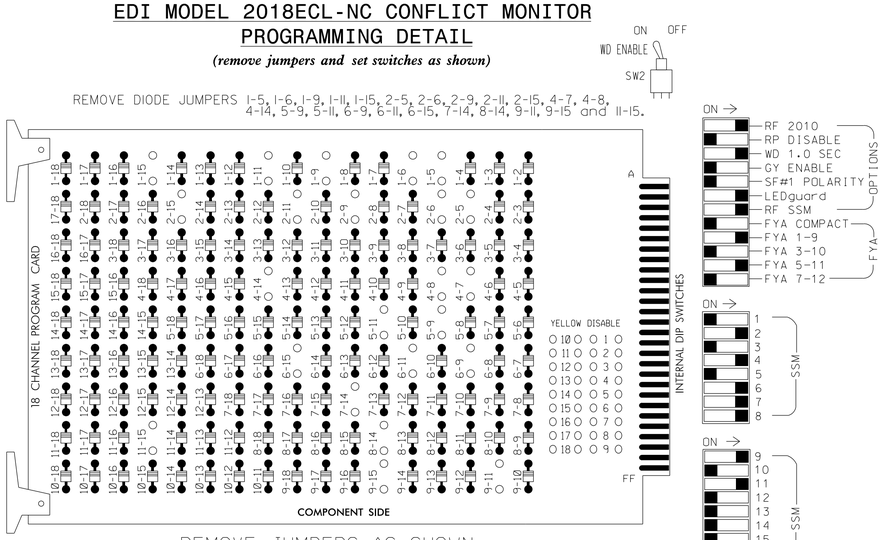
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 25.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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. Program phases 4 and 8 for Dual Entry.
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 4 and 6 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S6,S7,S8, S9,S10,S11,AUX S1,AUX S4.
PHASES USED.....1,2,4,4PED,5,6,6PED,7,8.
OVERLAP "A".....1+2
OVERLAP "B".....NOT USED
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	P41, P42	51★	61,62, 63	P61, P62	71,72	81,82	NU	11★	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW										122			A121			A114		
YELLOW ARROW										123			A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127						133			124								
✋						104			119									
🚶						106			121									

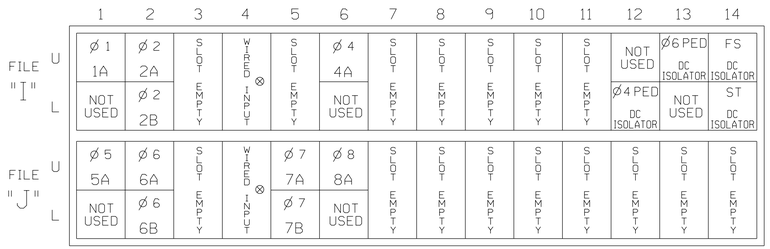
NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
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			
5A[2]	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			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
PED PUSH BUTTONS											
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.

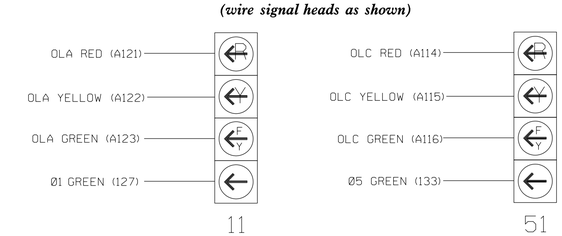
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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

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

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

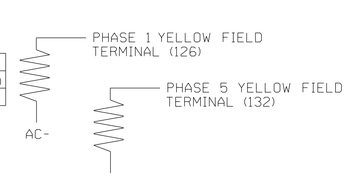
1. The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1081T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 2 (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street) at Wilmington Avenue / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

Prepared for 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

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth D86DCF8E0E0D4AF... 12/19/2014 DATE

SIG. INVENTORY NO. 03-1081T2

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 25.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦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  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

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 Dynamic/Backup Control Function 1.

2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
              OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR       PHASES:¦123456789101112131415 16
IF PHASES ARE ON¦        X
OMIT PHASES     ¦       X
CALL PHASES     ¦ X
```

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1081T2
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Temporary Design 2 (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension

Division 03 | New Hanover County | Wilmington

PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	
REVISIONS		INIT.	DATE

Prepared for 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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081T2

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

13-JUL-2015 10:33
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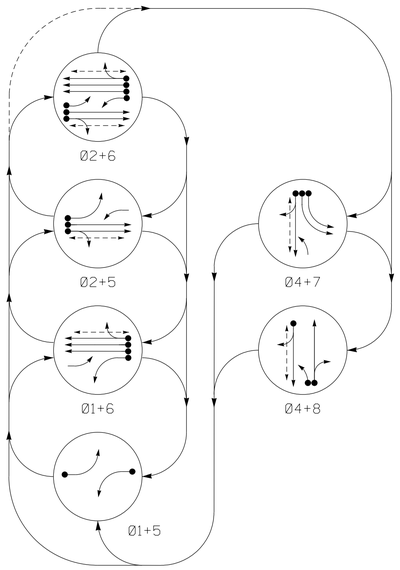
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 26.0

6 Phase
Fully Actuated
(Wilmington Signal System)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

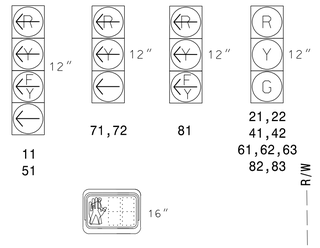
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE 01+05	01+06	02+05	02+06	04+07	04+08	FLASH
11	←	←	F Y	F Y	←R	←R	←R
21,22	R	R	G	G	R	R	Y
41,42	R	R	R	R	G	G	R
51	←	F Y	←	F Y	←R	←R	←R
61,62,63	R	G	R	G	R	R	Y
71,72	←R	←R	←R	←R	←	←R	←R
81	←R	←R	←R	←R	F Y	F Y	←R
82,83	R	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DRK
P41,P42	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

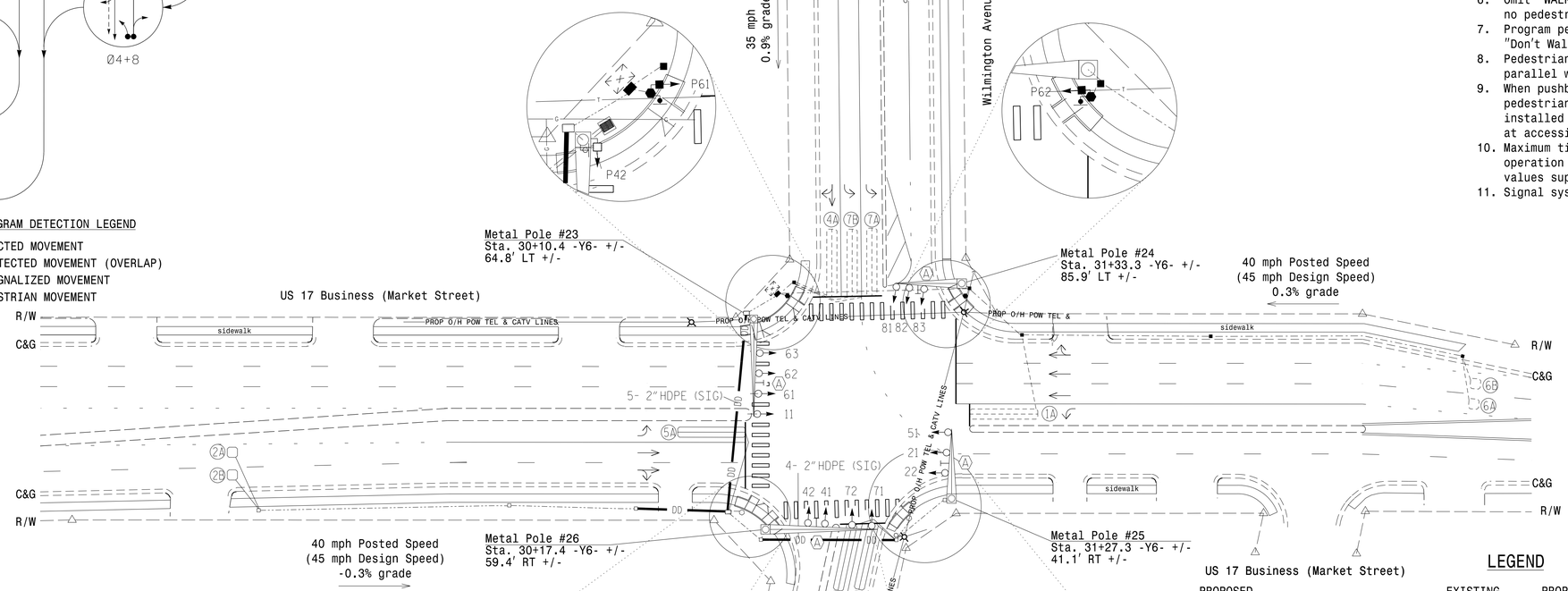


OASIS 2070 LOOP & DETECTOR INSTALLATION

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	-	-
2A	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
2B	6X6	300	5	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	-
					2	Y	Y	Y	-	3	-	-
6A	6X6	300	5	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	5	-	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-

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. Disable backup protect for phase 8.
4. Phase 1 and/or phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pedestrian Pushbutton and sign shall be mounted parallel with associated crosswalk.
9. When pushbuttons are mounted on metal pole or pedestrian pedestal, the pole or pedestal shall be installed as close as possible to the back of curb at accessible ramps to minimize reach range.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Signal system data: Controller Asset #1081.



LEGEND

PROPOSED		EXISTING
N/A	Sewer Line	—SS—
N/A	UG Gas Line	—G—
N/A	Drainage Pipe	
N/A	Telephone Line	—T—
N/A	Right of Way	
Ⓐ	Street Name Sign	Ⓐ

PROPOSED		EXISTING
	Traffic Signal Head	
	Sign	
	Pedestrian Signal Head	
	Push Button & Sign	
	Metal Pole with Mastarm	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	Oversize Junction Box	
	2-in Underground Conduit	
—DD—	Directional Drill	N/A
	Directional Arrow	

OASIS 2070 TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	7	12	7	7	12	7	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	15	100	40	15	100	35	40
Yellow Clearance	3.0	4.6	3.8	3.0	4.6	3.0	3.8
Red Clearance	3.3	2.0	2.4	3.6	2.0	3.3	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	-	7	-	-
Don't Walk 1	-	18	24	-	22	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-	-
Max Variable Initial *	-	34	-	-	34	-	-
Time Before Reduction *	-	15	-	-	15	-	-
Time To Reduce *	-	30	-	-	30	-	-
Minimum Gap	-	3.2	-	-	3.2	-	-
Recall Mode	-	SOFT RECALL	-	-	SOFT RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-	-
Dual Entry	-	-	ON	-	-	-	ON
Simultaneous Gap	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 Design - (TMP Phase IV & Final)

Prepared for 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

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM Encarnacion	REVIEWED BY:	MB Toth

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

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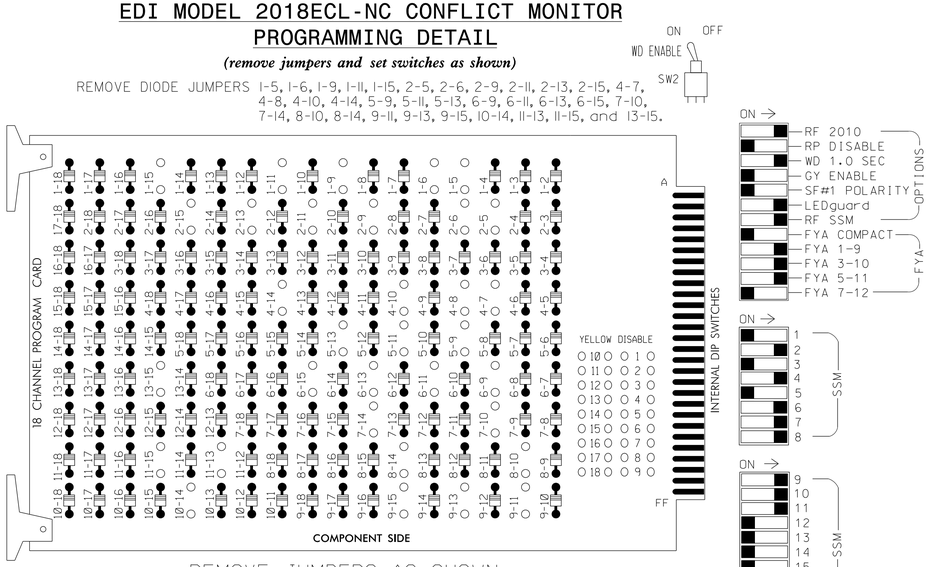
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 26.1

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-7, 4-8, 4-10, 4-14, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-10, 7-14, 8-10, 8-14, 9-11, 9-13, 9-15, 10-14, 11-13, 11-15, and 13-15.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. 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. Program phase 4 and 8 for Dual Entry.
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, 4 and 6 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash and overlaps 1 and 2 as Wag Overlaps.
8. The cabinet and controller are part of the Wilmington Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,S10, S11,AUX S1,AUX S2,AUX S4.
PHASES USED.....1,2,2PED,4,4PED,5,6,6PED, 7,8.
OVERLAP "A".....1+2
OVERLAP "B".....4
OVERLAP "C".....5+6
OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41, P42	51★	61,62, 63	P61, P62	71,72	82,83	NU	11★	81★	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	✳	129			102		✳	135			108							
GREEN		130			103			136			109							
RED ARROW										122			A121	A124		A114		
YELLOW ARROW										123			A122	A125		A115		
FLASHING YELLOW ARROW													A123	A126		A116		
GREEN ARROW	127						133			124								
✋			113			104			119									
🚶			115			106			121									

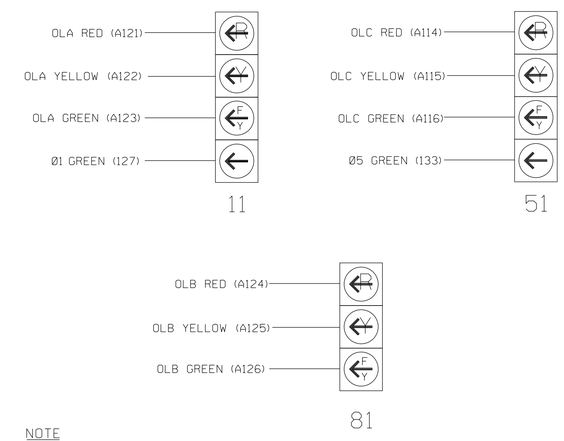
NU = Not Used

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

★ See pictorial of head wiring in detail below.

3 & 4 SECTION FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

1. The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 of 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED-OR J2U ⊗	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø2 2B				NOT USED						Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED-OR J2U ⊗	Ø7 7A	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø6 6B			Ø7 7B	Ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	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
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			
5A[2]	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			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	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.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

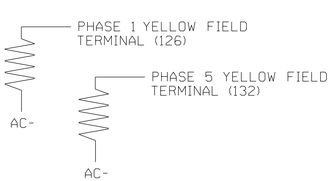
[1] Add jumper from I1-W to J4-W, on rear of input file.

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

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: 03-1081
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

Signal Upgrade - Final Design (Electrical Detail Sheet 1 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 17 Business (Market Street) at Wilmington Avenue / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014 REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion REVIEWED BY: MB Toth

REVISIONS | INIT. | DATE

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

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 12/19/2014
DATE
SIG. INVENTORY NO. 03-1081

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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MILE2054 AT DU5290140

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 26.2

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, 3, 4, 5 AND 6.

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).

PRESS '+'

```
LOGICAL I/O COMMAND #4  (+/-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 #5  (+/-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 #6  (+/-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
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:          ¦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  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:          ¦123456789101112131415 16
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?...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
```

← NOTICE GREEN FLASH

PRESS '+'

```
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  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

DYNAMIC BACK-UP CONTROL PROGRAMMING

(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 disable Dynamic/Backup Control Function 1.

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1081
DESIGNED: June 2014
SEALED: December 19, 2014
REVISED:

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Signal Upgrade - Final Design (Electrical Detail Sheet 2 of 2)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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

750 N.Greenfield Pkwy,Garner,NC 27529

US 17 Business (Market Street)
at
Wilmington Avenue /
Wilmington Avenue Extension

Division 03	New Hanover County		Wilmington
PLAN DATE: June 2014	REVIEWED BY:	LM Moon	
PREPARED BY: AM Encarnacion	REVIEWED BY:	MB Toth	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081

13-JUL-2015 10:34
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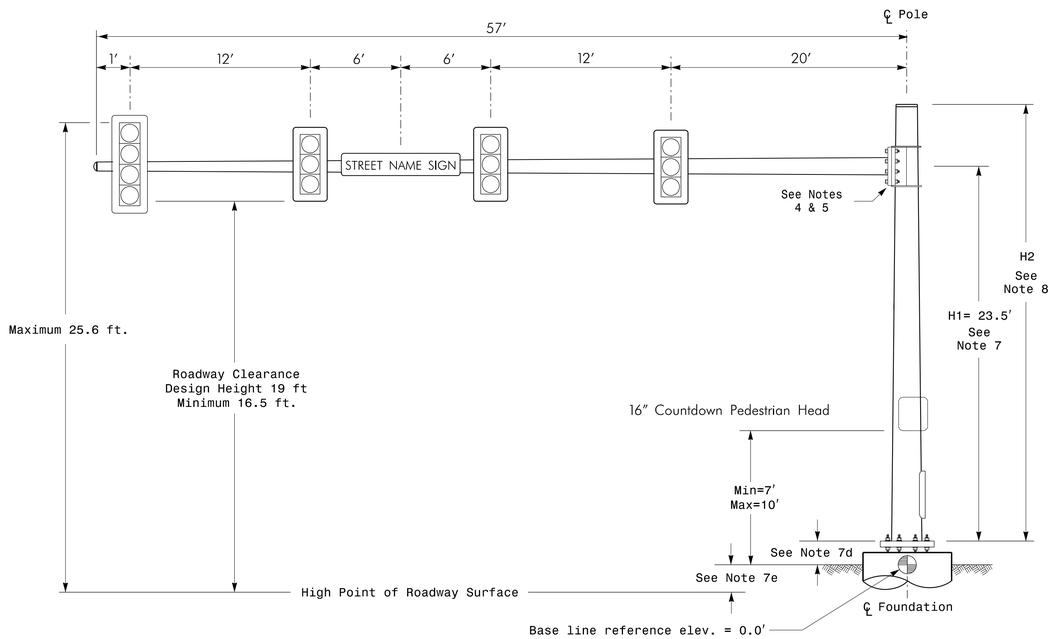
WILE2054 AT BUS290140

DocuSign Envelope ID: 0C2C82B9-01A1-4006-9BCC-6F5248024E16

METAL POLE No. 23 and 24

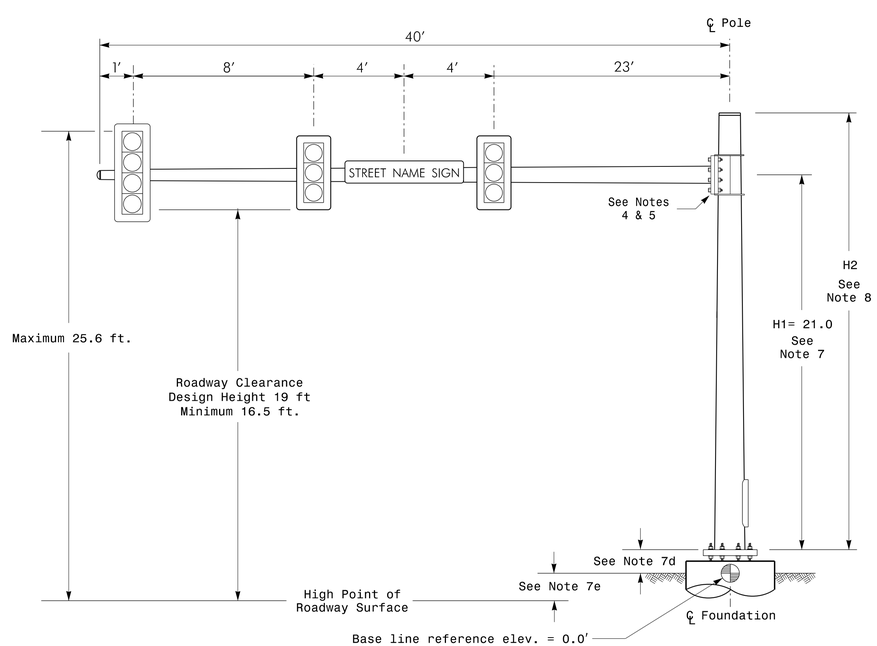
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 26.3

Design Loading for METAL POLE NO. 23



Elevation View

Design Loading for METAL POLE NO. 24



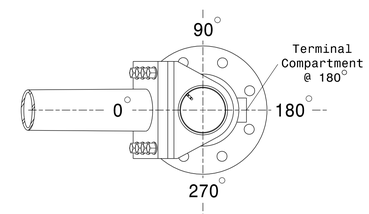
Elevation View

SPECIAL NOTE

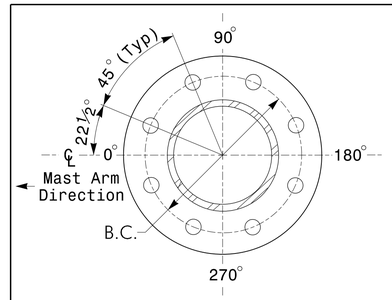
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 23	Pole 24
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	2.5 ft.	0.0 ft.
Elevation difference at Edge of travelway or face of curb	1.1 ft.	-1.0 ft.

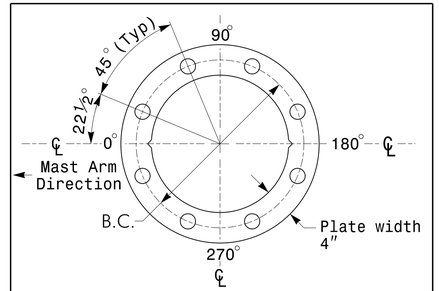


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Business (Market Street) at Wilmington Avenue / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

SCALE 0 N/A N/A

REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081

13-JUL-2015 10:31
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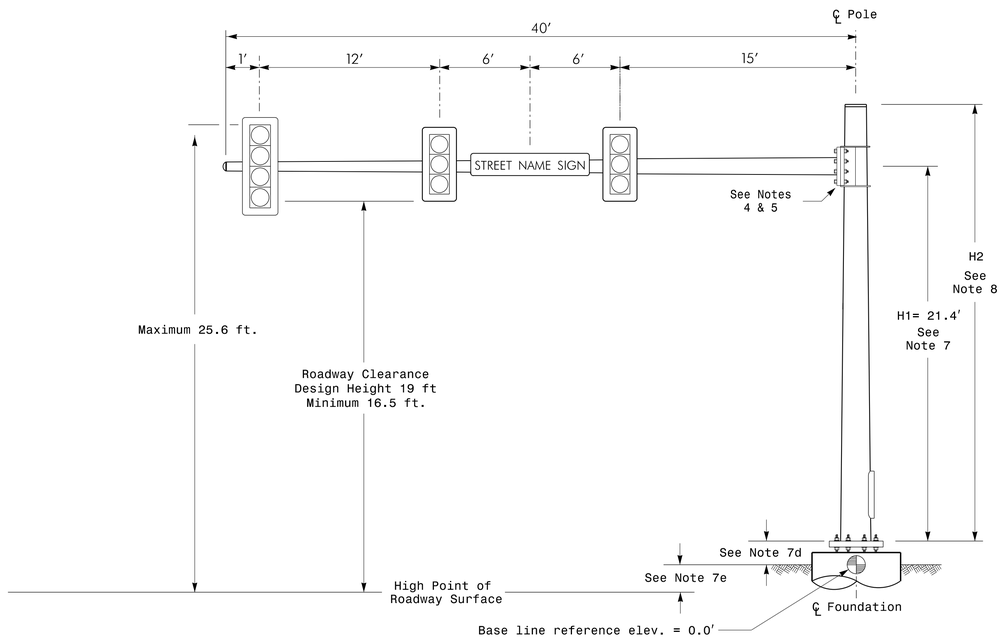
WILE2054 AT DUS29140

DocuSign Envelope ID: 0C2C82B9-01A1-4006-9BCC-6F5248024E16

METAL POLE No. 25 and 26

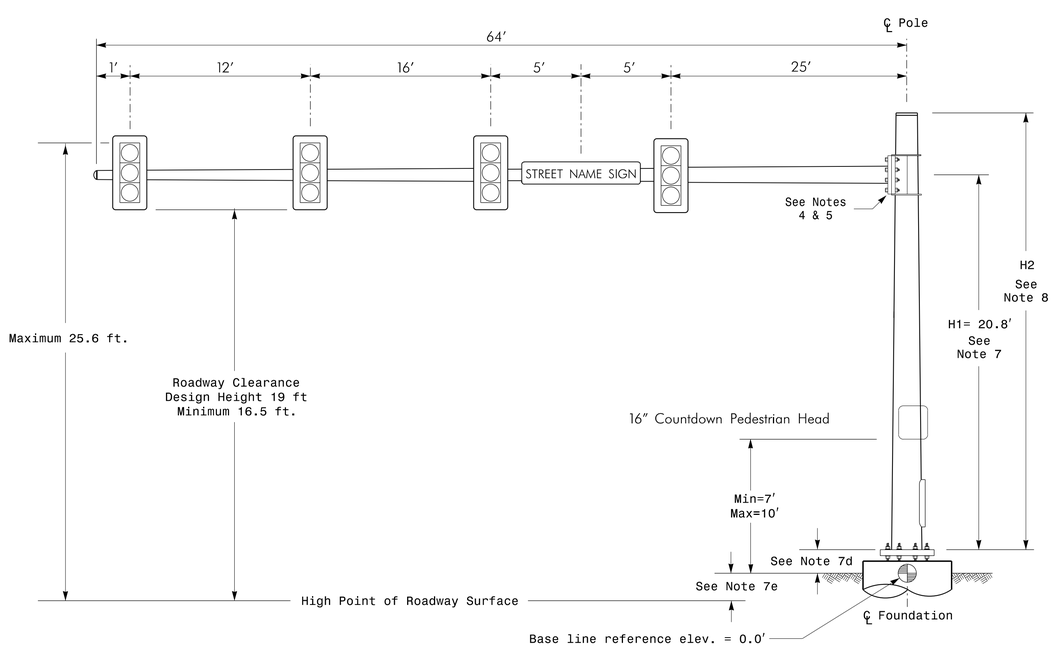
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 26.4

Design Loading for METAL POLE NO. 25



Elevation View

Design Loading for METAL POLE NO. 26



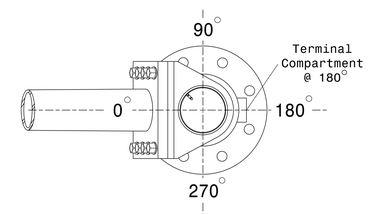
Elevation View

SPECIAL NOTE

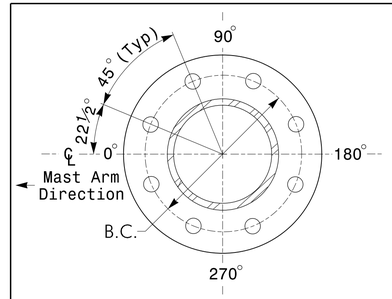
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 25	Pole 26
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	0.4 ft.	-0.2 ft.
Elevation difference at Edge of travelway or face of curb	0.1 ft.	-0.8 ft.

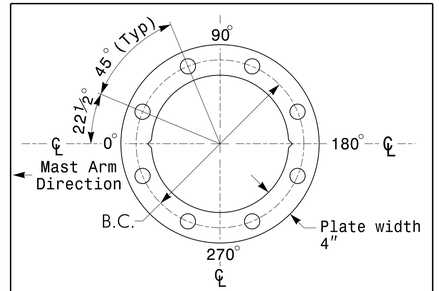


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12″-4 SECTION-WITH BACKPLATE	11.5 S.F.	25.5″ W X 66.0″ L	74 LBS
	RIGID MOUNTED SIGNAL HEAD 12″-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5″ W X 52.5″ L	60 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5″ W X 17.0″ L	21 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0″ W X 36.0″ L	14 LBS
Street Name	STREET NAME SIGN RIGID MOUNTED	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 the 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 the 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 are rigidly mounted and vertically centered on the mast arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is 0.75 feet above the ground elevation.
   e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of 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 1/2 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 Signal Design Section Senior Structural Engineer for assistance at (919) 773-2800.
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.

All metal poles and arms should be black in color as specified in the project special provisions.

NCDOT Wind Zone 2 (130 mph)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Traffic Engineering and Safety Systems Branch, Signals Section, Geometrics Section, Department of Transportation, State of North Carolina
750 N. Greenfield Pkwy, Garner, NC 27529

US 17 Business (Market Street) at Wilmington Avenue / Wilmington Avenue Extension

Division 03 New Hanover County Wilmington

PLAN DATE: June 2014	REVIEWED BY: LM Moon
PREPARED BY: AM Encarnacion	REVIEWED BY: MB Toth

REVISIONS	INIT.	DATE

SCALE 0 N/A N/A

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. 03-1081

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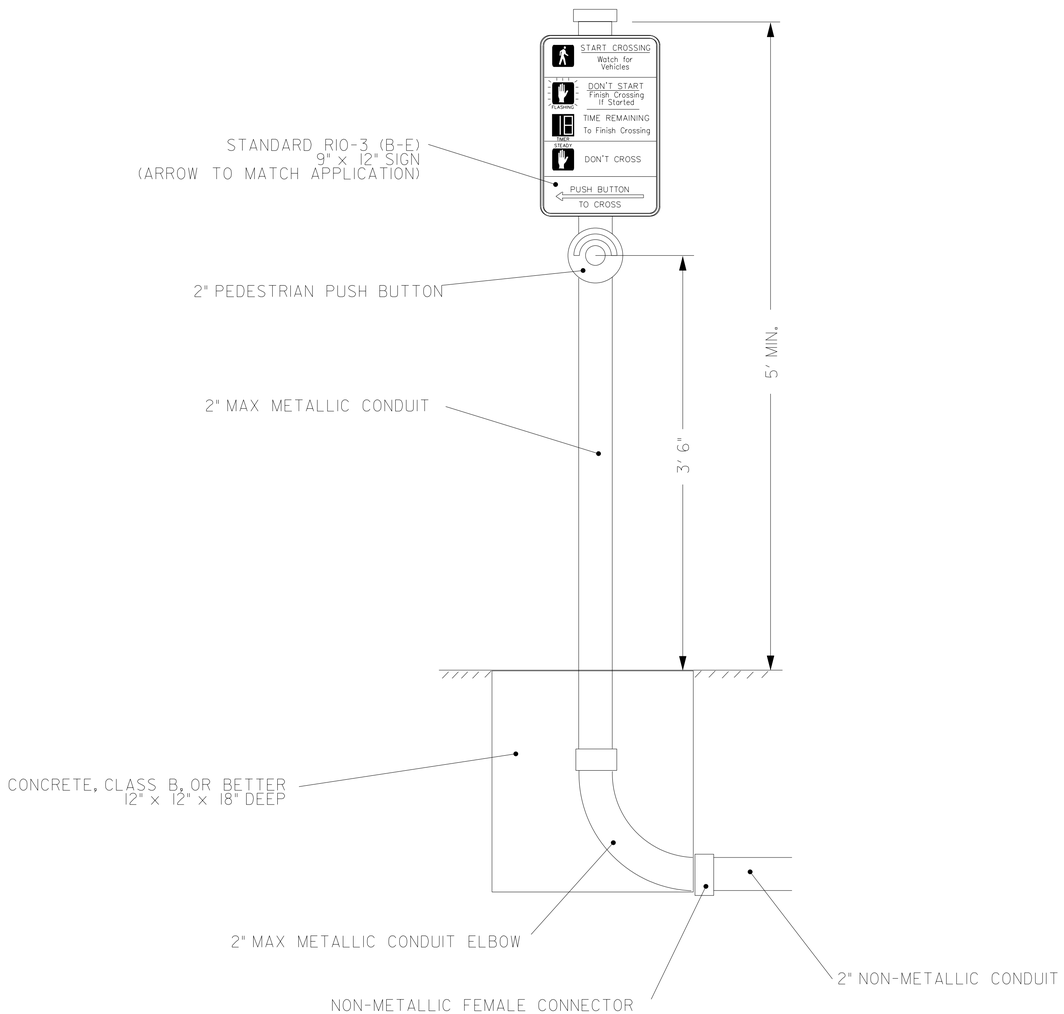
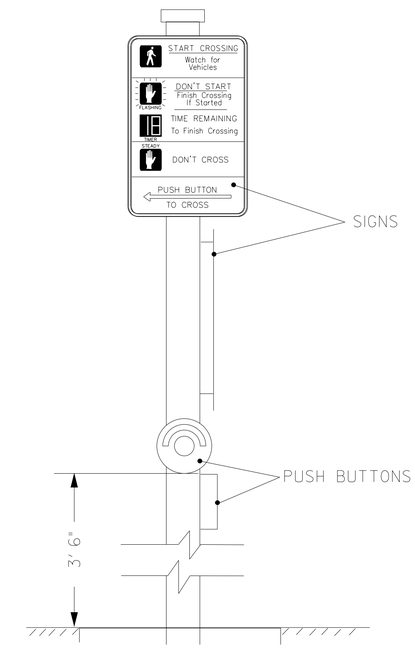
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. 27.0

SINGLE PUSH BUTTON



DUAL PUSH BUTTONS



NOTE

CONNECT PUSHBUTTON TO CONTROLLER CABINET USING LEAD-IN CABLE. BOND PUSH BUTTON HOUSING AND ALL METAL COMPONENTS TO CABINET GROUND USING CABLE GROUND.

Special Detail

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

SCALE: Not to Scale

Temporary Pedestrian Posts for Push Buttons

Division 03 New Hanover County Wilmington

PLAN DATE:	June 2014	REVIEWED BY:	MB Toth
PREPARED BY:	LM Moon	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 12/19/2014
DATE

SIG. INVENTORY NO. SD-01

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

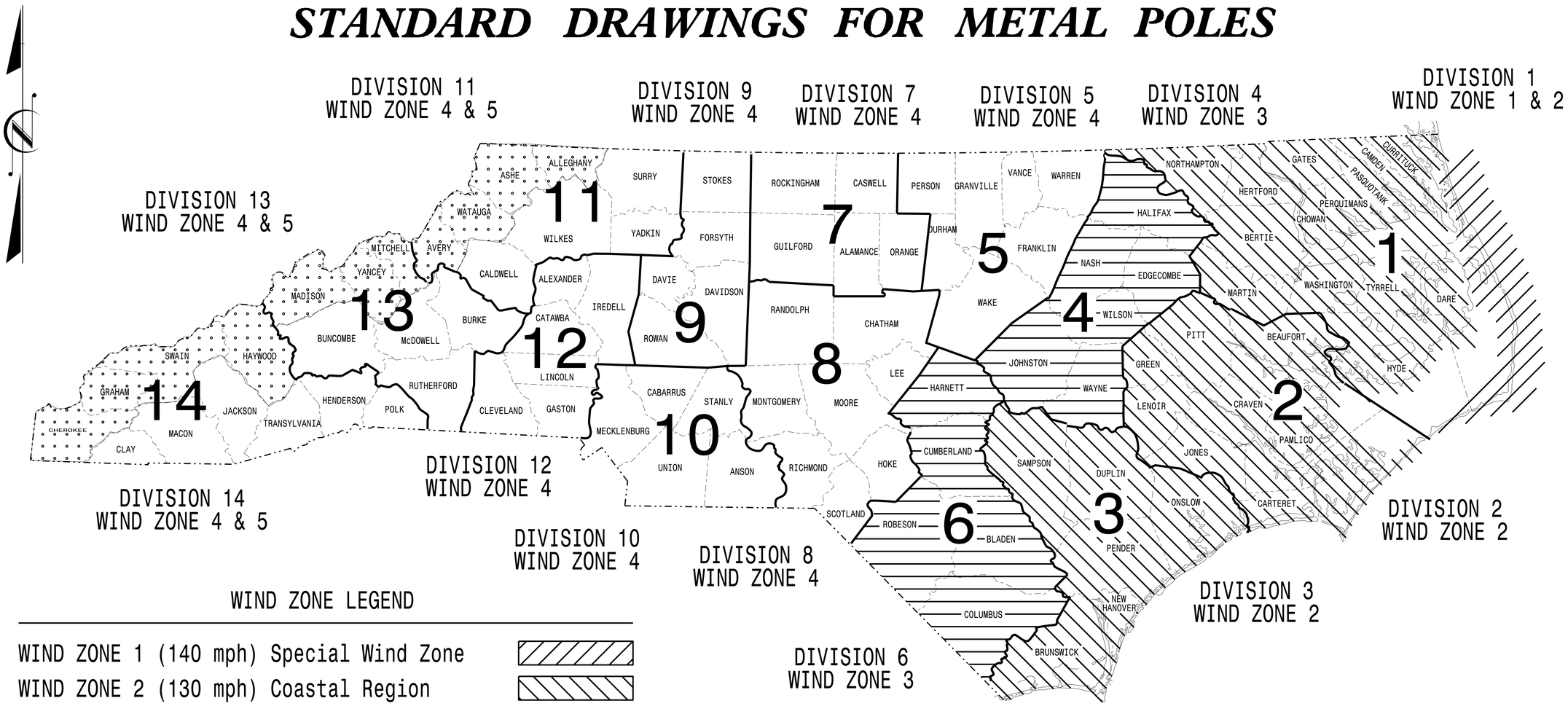
13-JUL-2015 10:37
O:\Transportation\Traffic\Curr\10003629S U3338B Kerr Sig_ITS\Signals\Stopbar&Crosswalk\PedPostSpecialDetail.dgn
MLE2054 AT DUS290140

PROJECT NO.	SHEET NO.
U-3338B	Sig. M1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES

NCDOT METAL POLE STANDARDS



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
Signal Design Section
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

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

DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details – All Poles
M 3	Fabrication Details – Strain Poles
M 4,5	Fabrication Details – Mast Arm Poles
M 6	Construction Details – Strain Poles
M 7	Construction Details – Foundations
M 8,9	Standard Strain Pole Foundations

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 STRUCTURAL ENGINEER

SEAL

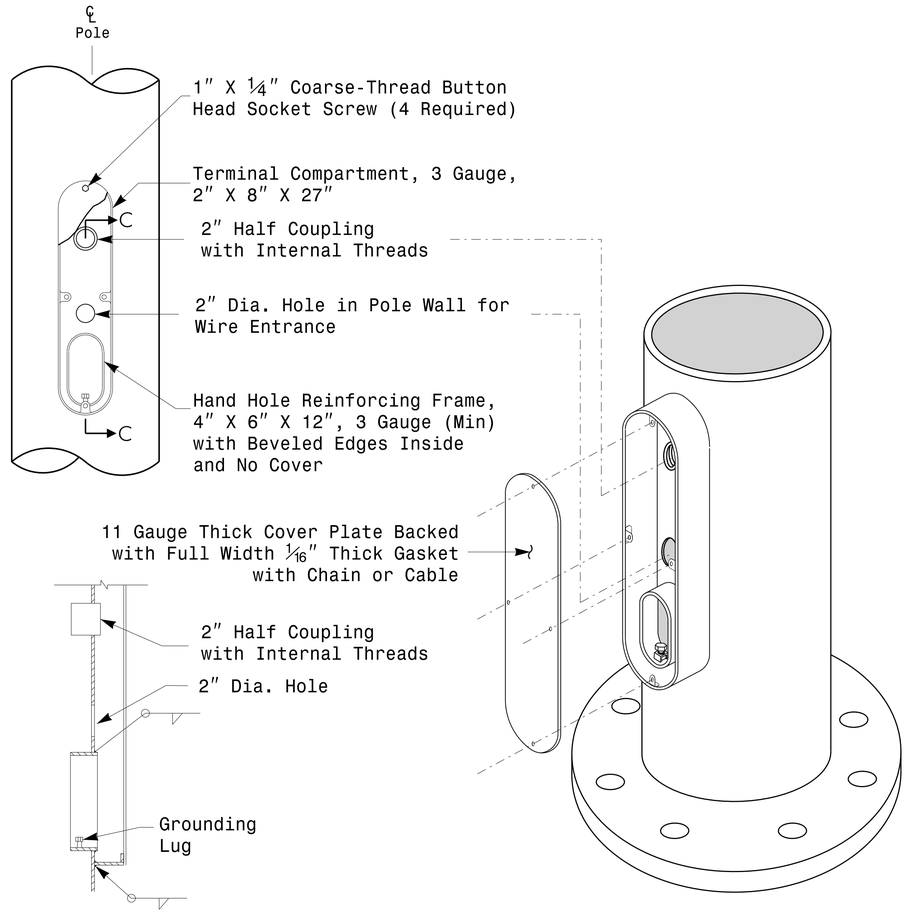
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8E32E147E4C4...

8/26/2014

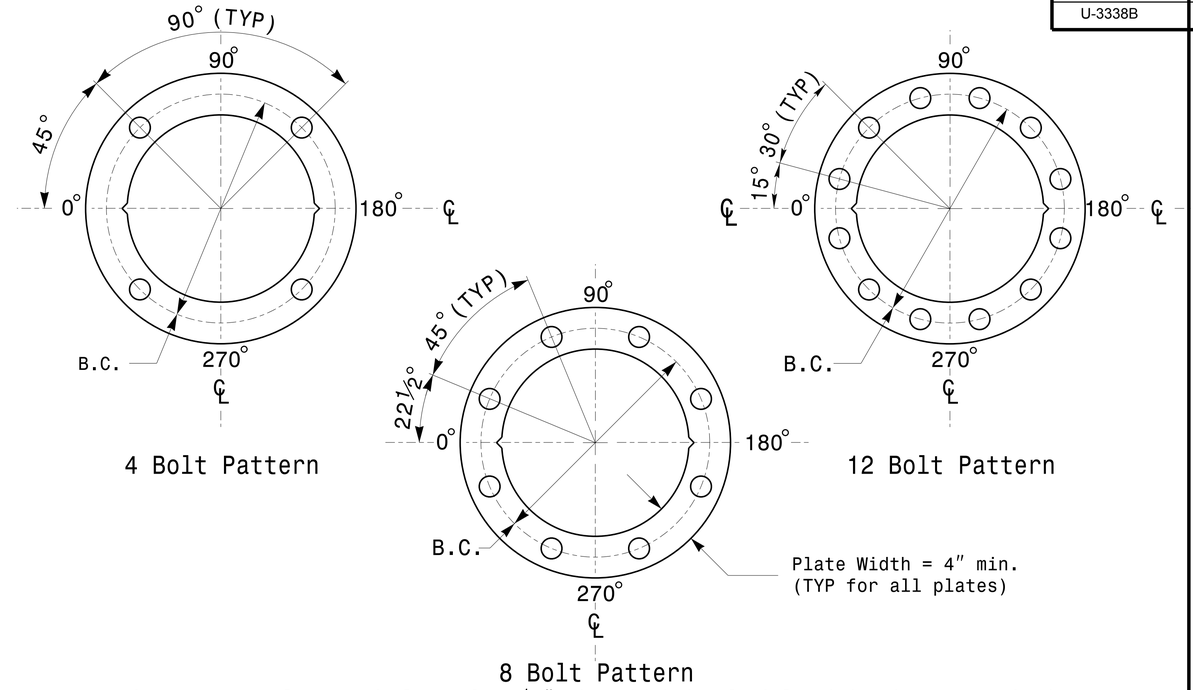
DATE

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M2



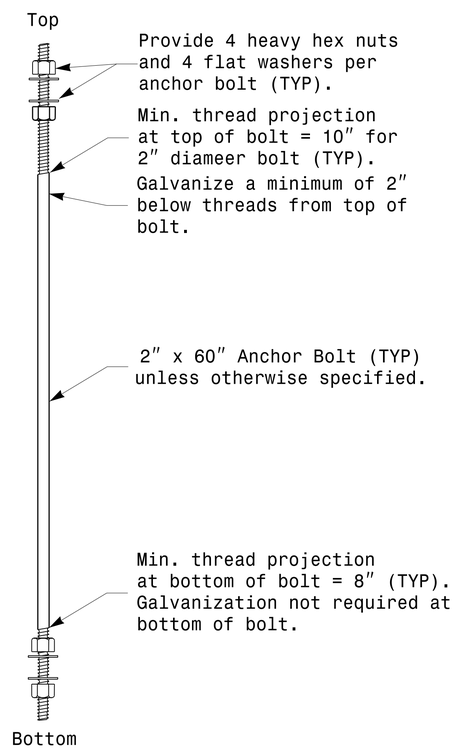
Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail



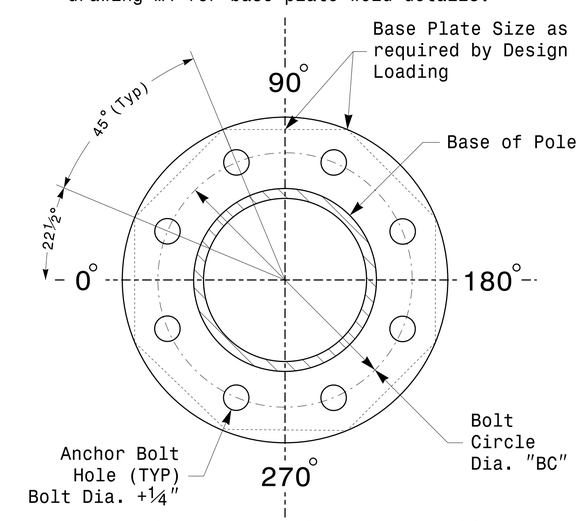
Construct Templates and Plates from ¼″ min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail

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



8 Bolt Base Plate Detail

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT STANDARD ----------

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

MFG _____ MFG. DATE: MM/YY
SECTION D/T/L/Y ----/----/----/----
NCDOT STANDARD ----------

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

Fabrication Details – All Poles

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

DocuSigned by: Debesh C. Sarkar 44EBE32E147E4C4... 8/26/2014
DATE
SIG. INVENTORY NO.

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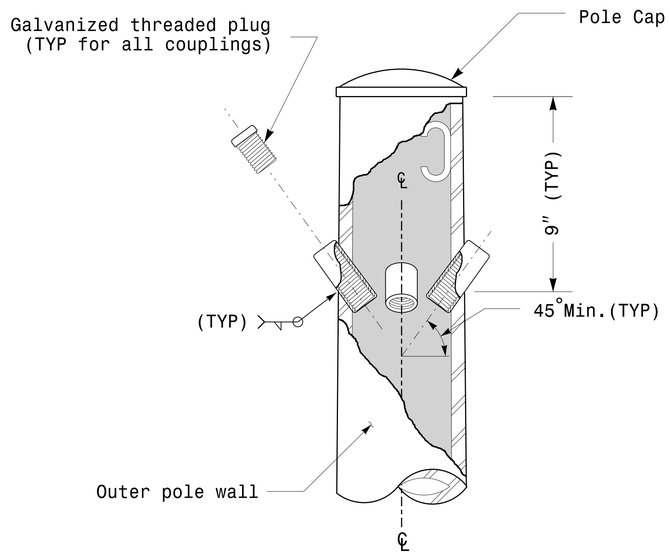
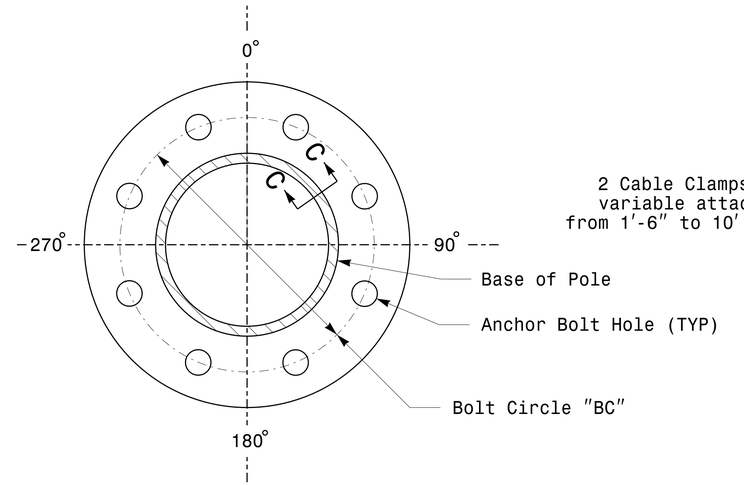
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M3

Fabrication Details – Strain Poles



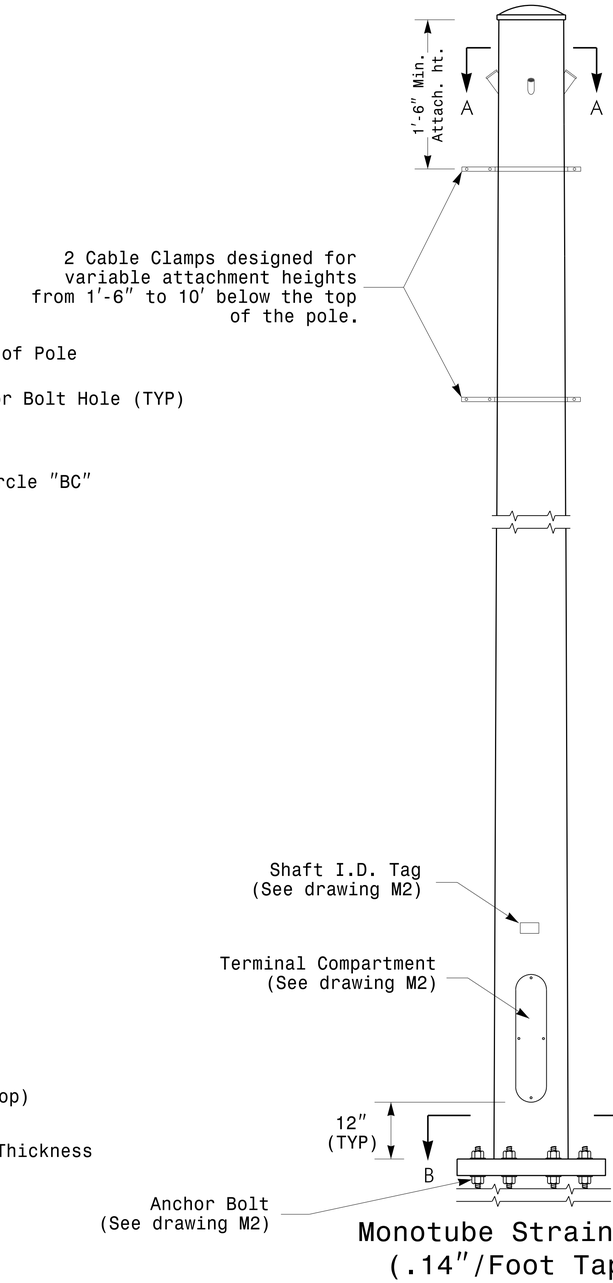
Cable Entrances at Top of Pole



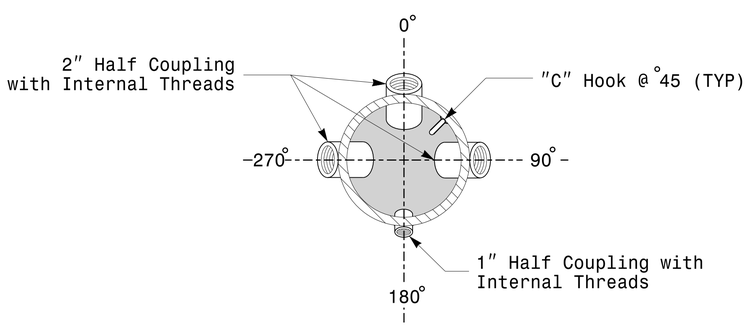
Section B-B

(See drawing M2)

Pole Base Plate

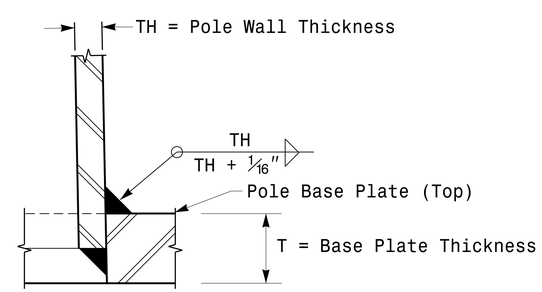


Monotube Strain Pole
(.14″/Foot Taper)



Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C

Socket Connection Weld Detail

Prepared in the Offices of:
Transportation Mobility and Safety Division
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

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

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DATE

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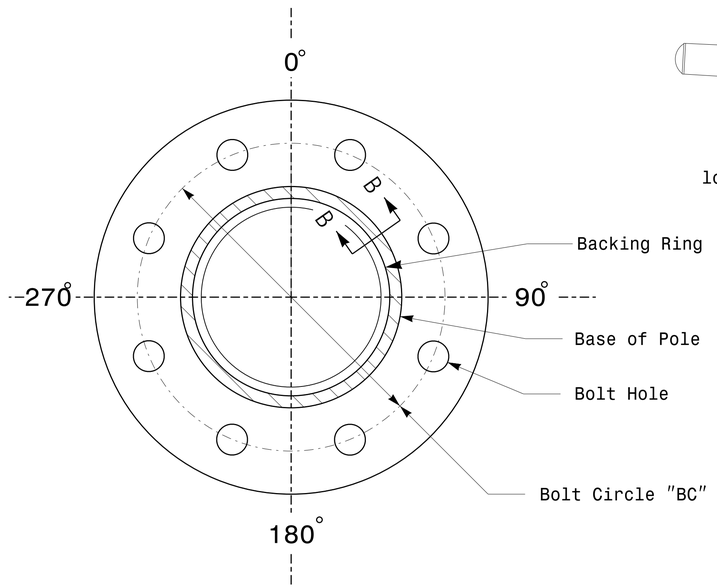
jgallaway

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M4

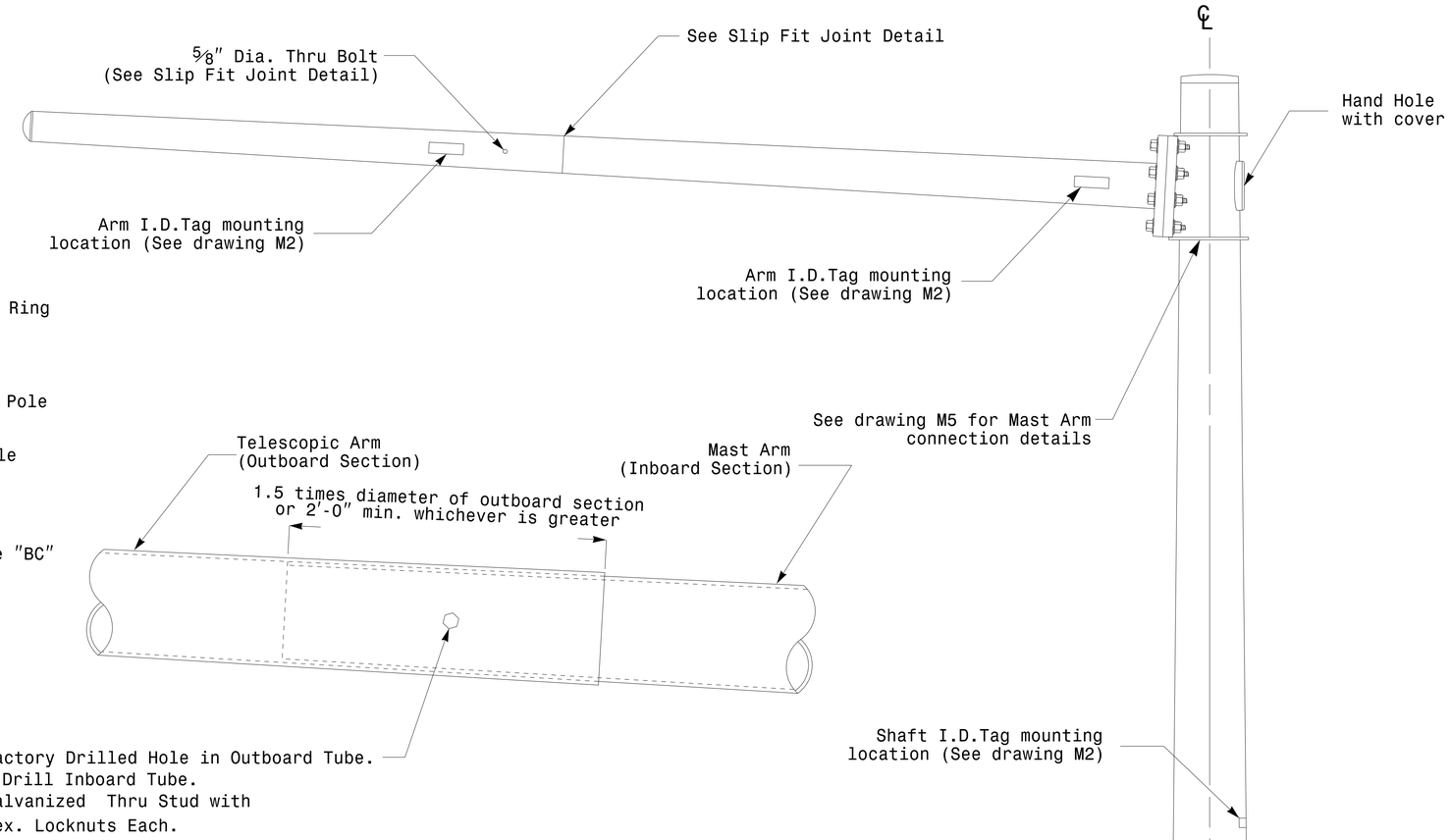
Fabrication Details – Mast Arm Poles



Section A-A

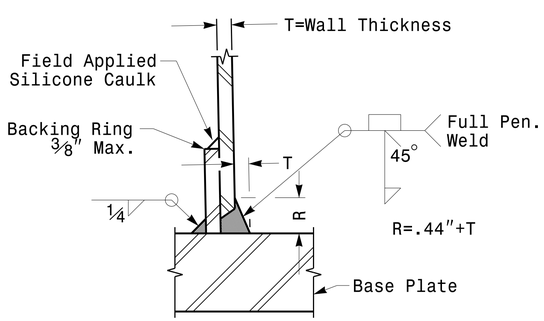
(See drawing M 2)

Pole Base Plate



Slip Fit Joint Detail for Mast Arm

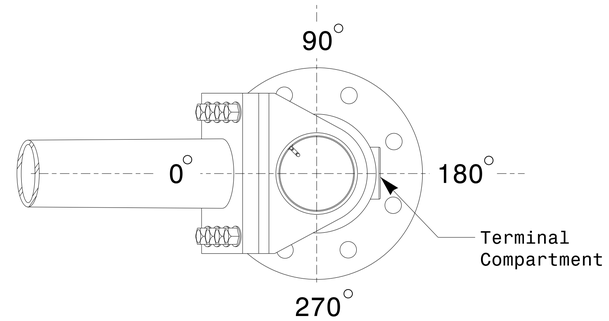
Monotube Mast Arm Pole
(.14in./ft. taper)



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

Prepared in the Offices of:
Transportation Mobility and Safety Division
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

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014
DATE

SIG. INVENTORY NO.

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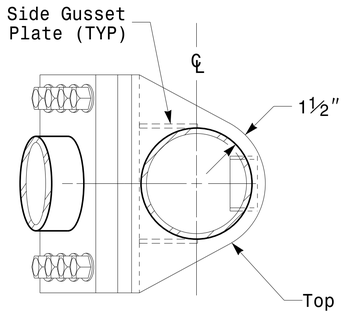
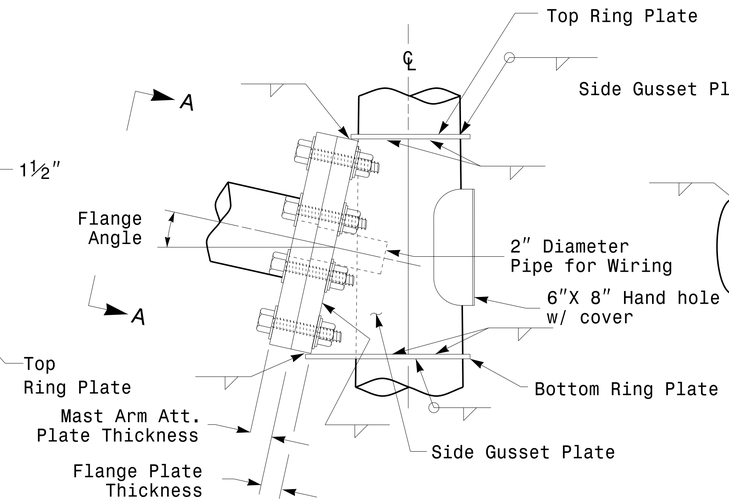
jgallaway

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M5

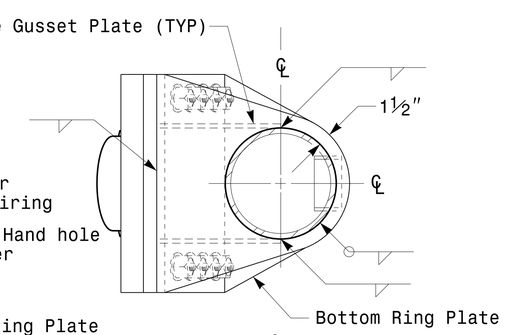
Welded Ring Stiffened Mast Arm Connection



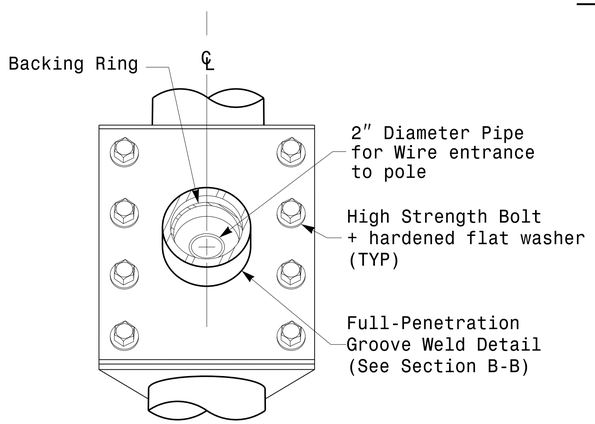
Plan View



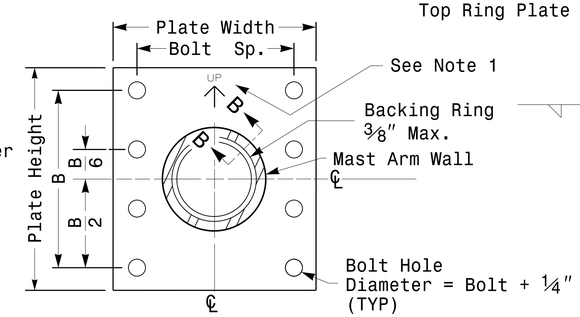
Side Elevation View



Bottom View

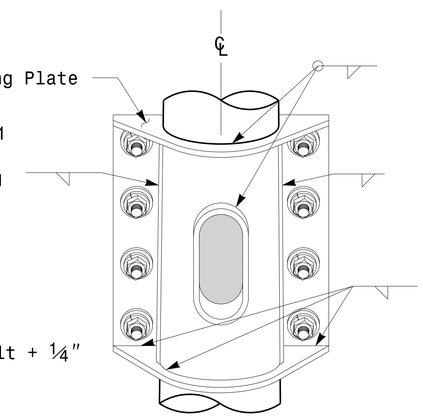


Front Elevation View

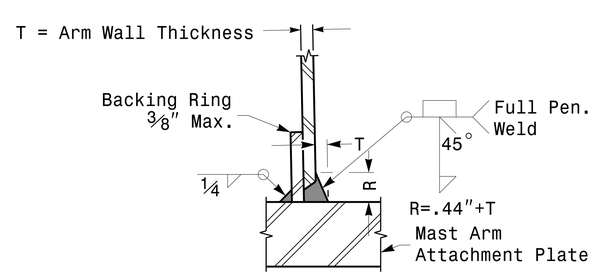


Section View A-A

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.

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

SCALE: 0 NA — NONE

REVISIONS | INIT. | DATE

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

DocuSigned by: Debesh C. Sarkar 44EBE3E147E4C4... 8/26/2014 DATE

SIG. INVENTORY NO.

Fabrication Details – Mast Arm Poles

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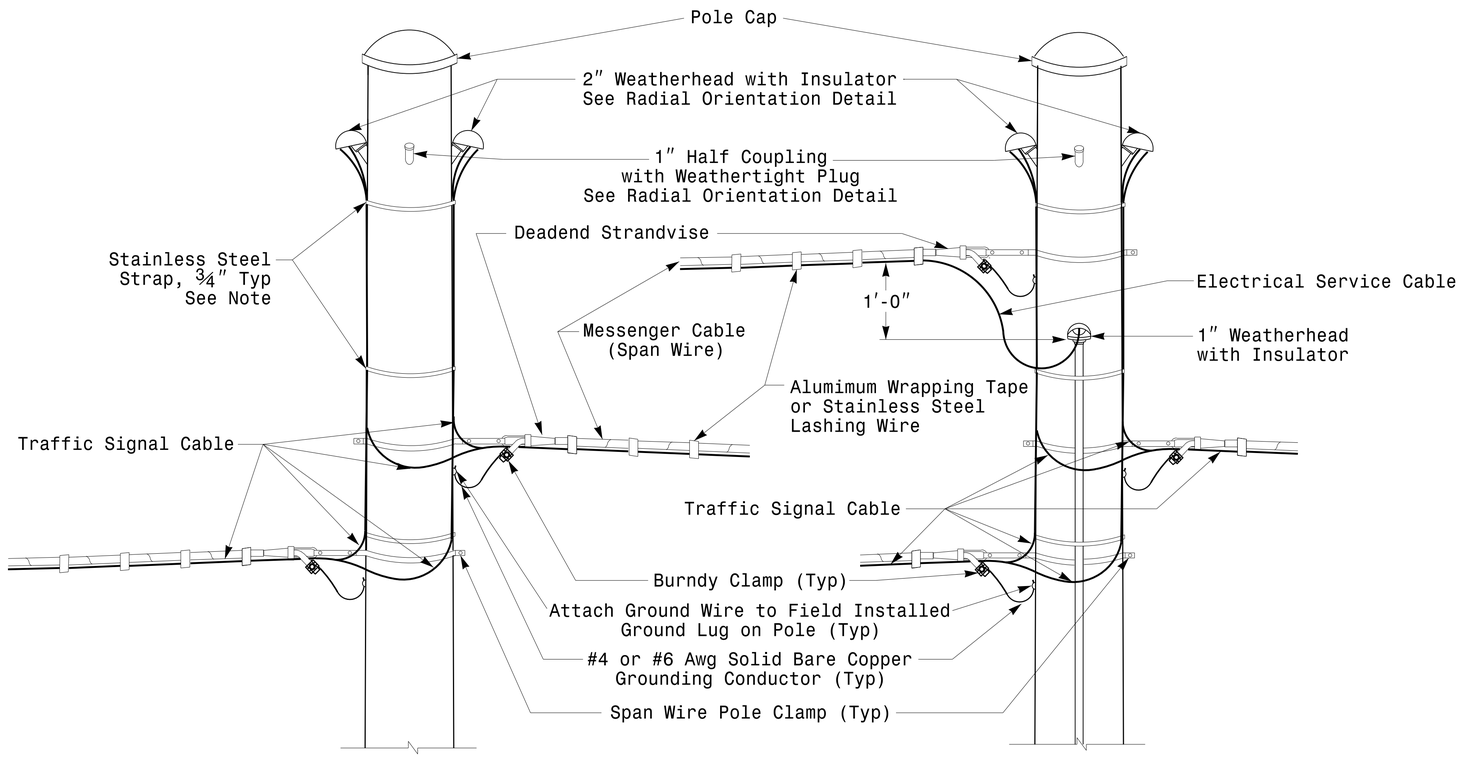
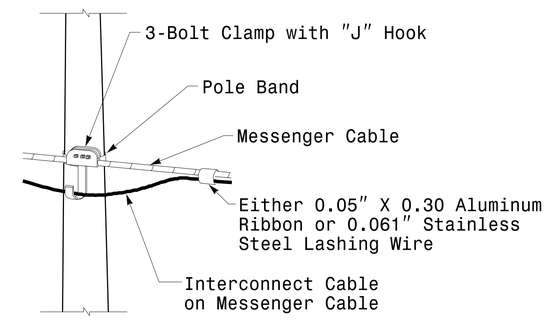
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M6

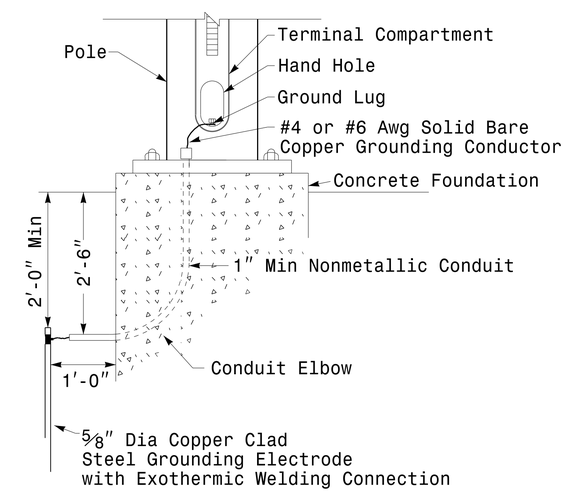


Strain Pole Attachments

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
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

SCALE 0 NA NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014
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DATE

SIG. INVENTORY NO.

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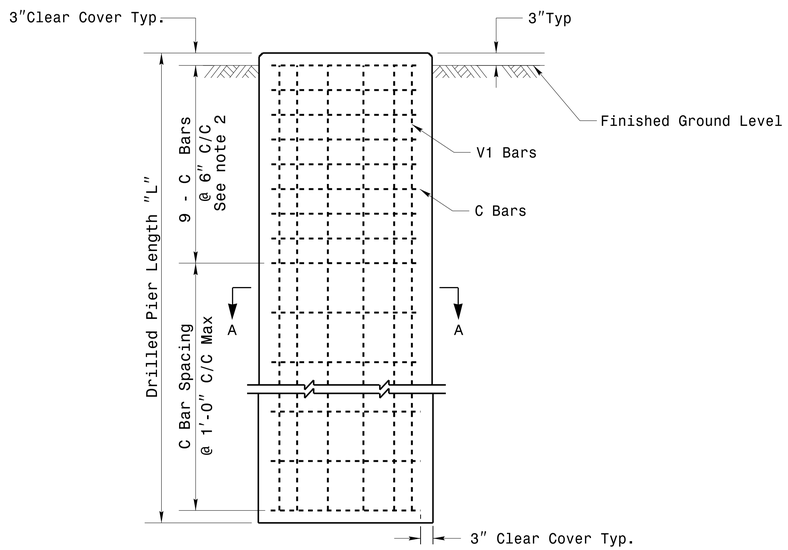
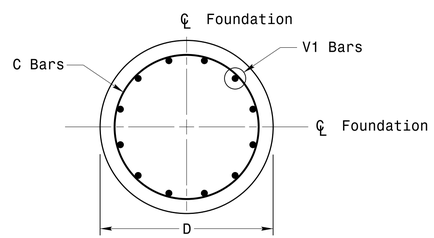
jgalloway

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M7

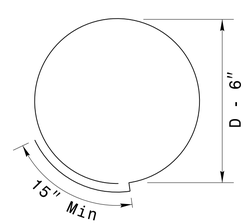
Construction Details – Foundations

Reinforcing Steel Bars





Section A-A



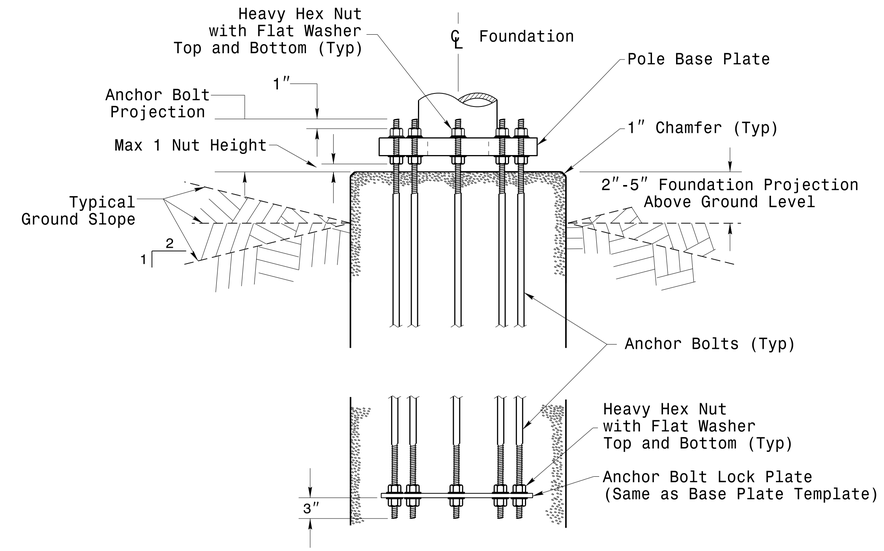
Typical "C" Bars

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"

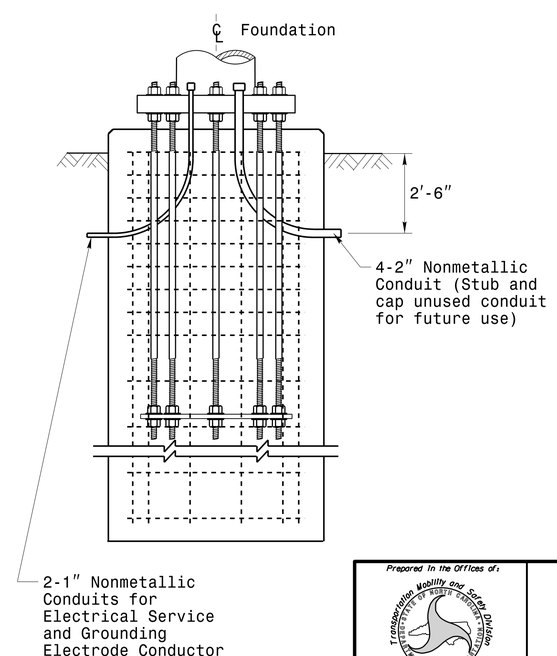
* See Note No. 1
** See Note No. 3
*** See Note No. 4

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.

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

SCALE
0 NA
NONE

Construction Details
Foundations

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

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DATE

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jgallaway

SATURATED SOIL CONDITION

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M8

		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

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
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 028094 NORTH CAROLINA PROFESSIONAL ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014
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DATE

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jgalloway

DRY SOIL CONDITION

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	Sig. M9

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

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

SCALE: 0 NA None

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 8/26/2014
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DATE

25-AUG-2014 08:38
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jgalloway

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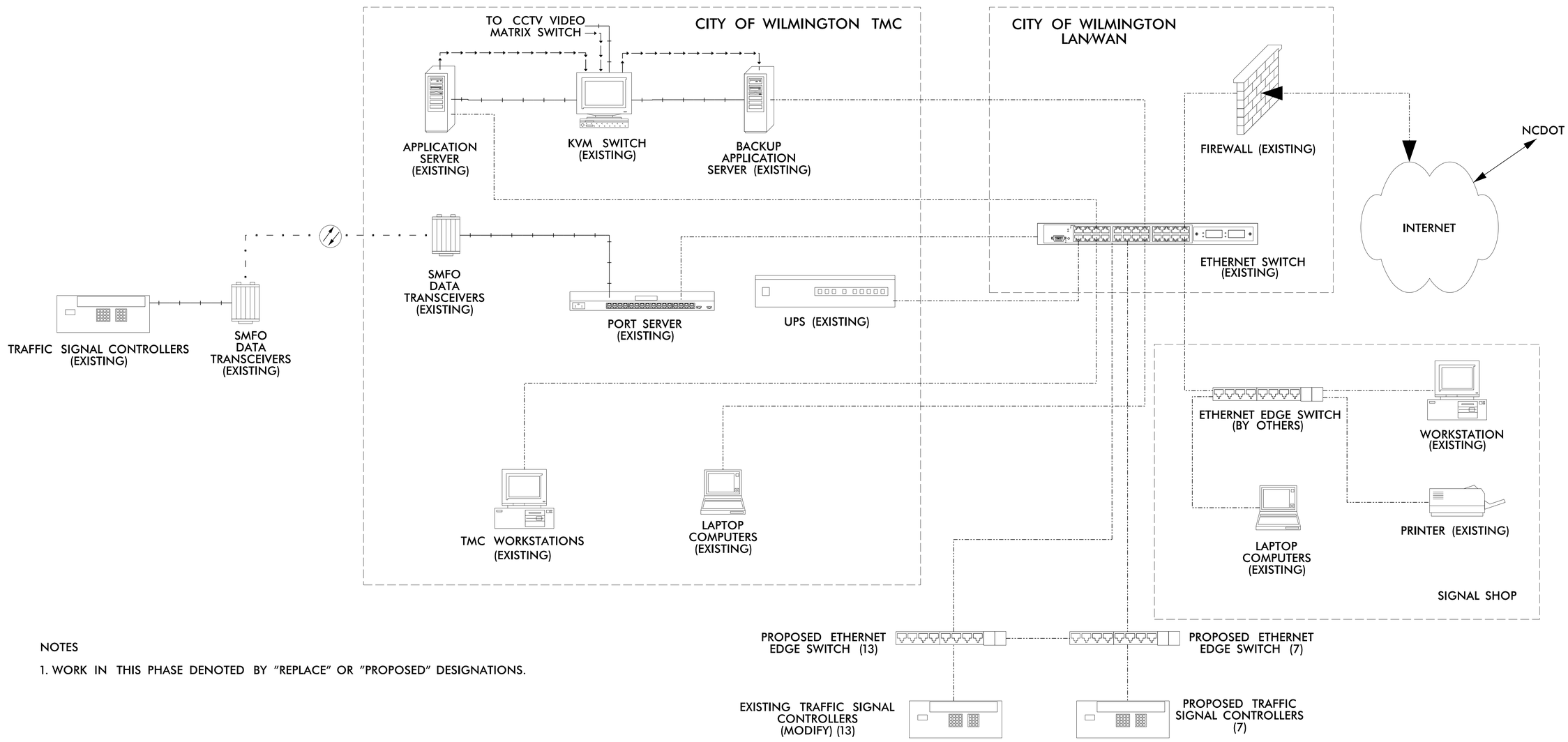
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 1



NOTES

1. WORK IN THIS PHASE DENOTED BY "REPLACE" OR "PROPOSED" DESIGNATIONS.

CONNECTION LEGEND

- 100 BASE TX ETHERNET
- FIBER-OPTIC CABLE
- ANALOG VIDEO
- RS-232/422/485

CITY OF WILMINGTON NORTH CAROLINA
305 Chestnut Street
4th Floor, Tower
Wilmington, NC 28402

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

Kerr Avenue Block Diagram

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

SCALE: NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 019962 HENRY ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015
SIGNATURE DATE

SIG. INVENTORY NO.

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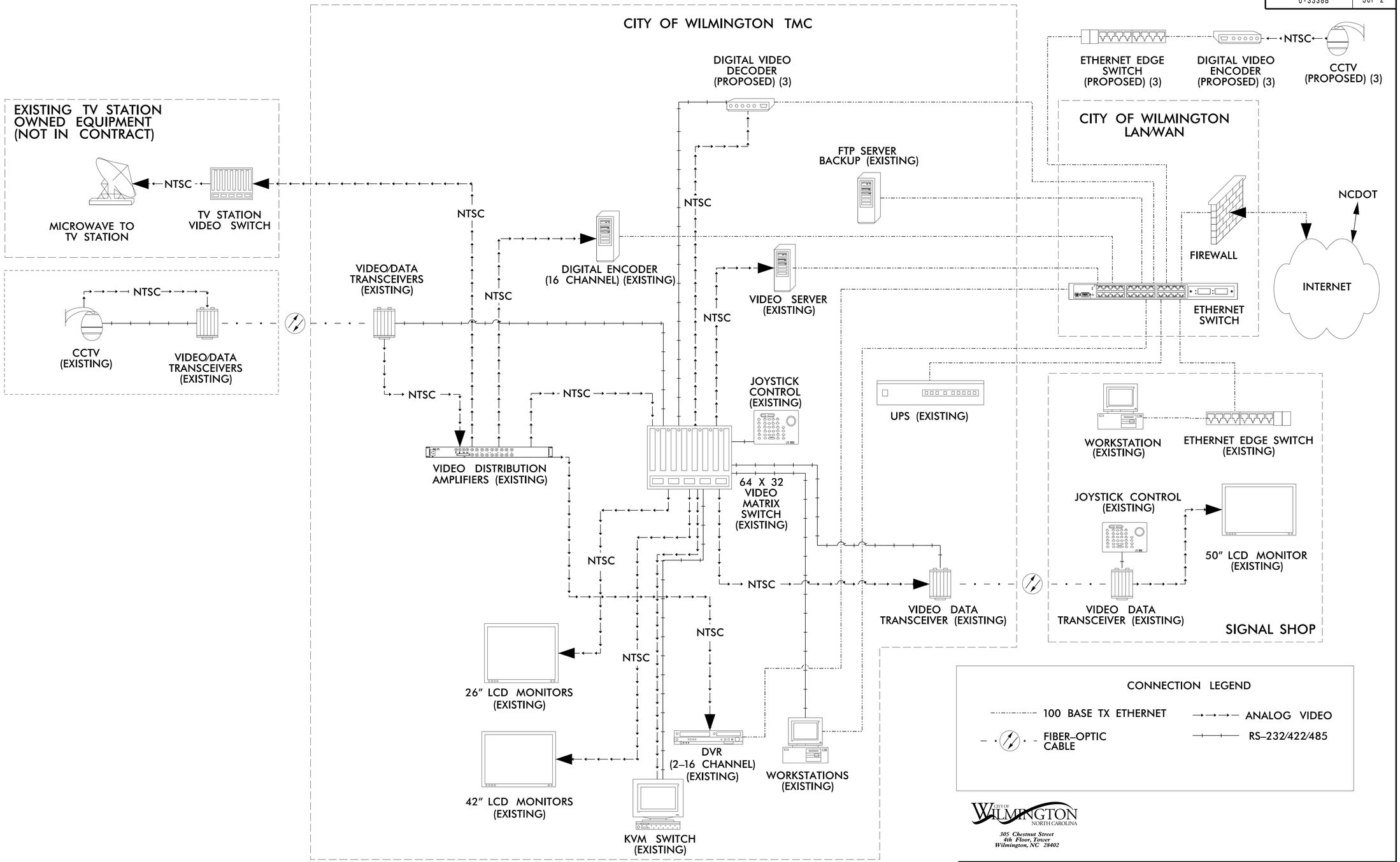
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 2



CITY OF WILMINGTON NORTH CAROLINA

305 Chestnut Street
4th Floor, Tower
Wilmington, NC 28402

NOTE:

1. WORK IN THIS PHASE DENOTED BY "REPLACE" OR "PROPOSED" DESIGNATIONS.

Prepared for the Offices of:
Transportation Mobility and Safety Division
Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

Kerr Avenue CCTV System Block Diagram

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: NONE

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

SEAL

KENT NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

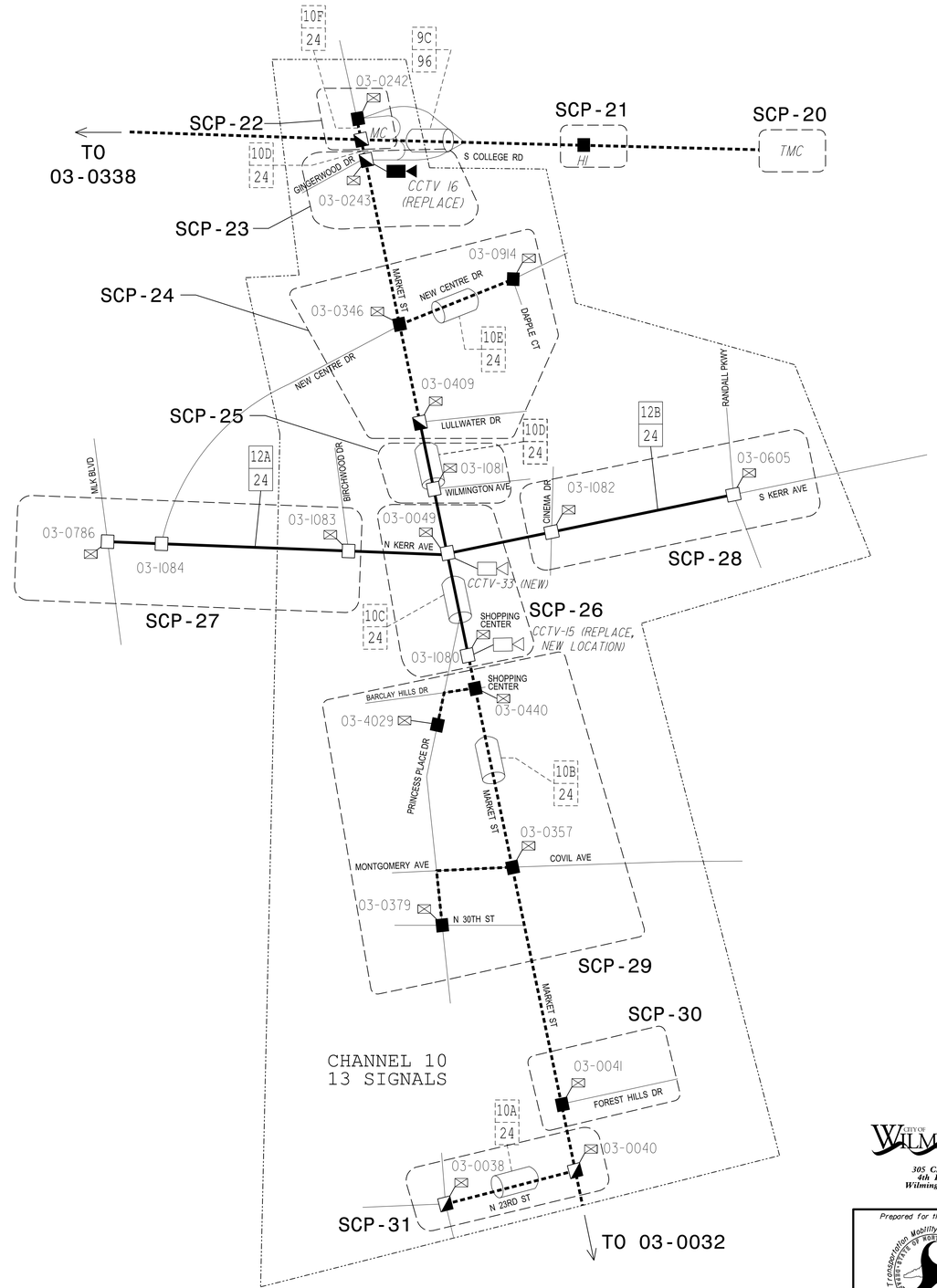
DocuSigned by: Alf Badgett 1/5/2015

SIGNATURE DATE

SIG. INVENTORY NO.

DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 3



LEGEND

- TRAFFIC SIGNAL CONTROLLER CABINET
- SIGNAL CHANNEL BOUNDARY
- SPLICE ENCLOSURE, MODIFY SPLICE
- SPLICE ENCLOSURE, NEW SPLICE
- SPLICE ENCLOSURE, NO SPLICING WORK
- NEW CCTV LOCATION
- EXISTING CCTV LOCATION
- CITY INTERSECTION NUMBER — C ### — 03-XXXX — NCDOT SIGNAL IDENTIFICATION NUMBER
- 6-FIBER DROP CABLE ASSEMBLY
- PROPOSED FIBER-OPTIC COMMS CABLE
- EXISTING FIBER-OPTIC COMMS CABLE
- M / 12 — CABLE SEGMENT I.D. / NUMBER OF FIBERS IN CABLE (DASHES INDICATE EXISTING FIBER)
- SCP-XX — SEE SHEET SCP-XX FOR SPLICING DETAIL

CITY OF WILMINGTON NORTH CAROLINA
305 Chestnut Street
4th Floor, Tower
Wilmington, NC 28402

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RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

Kerr Avenue Cable Schematic

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:
PREPARED BY: REVIEWED BY:

SCALE: NONE

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015
SIGNATURE/PRICE/CAP DATE
SIG. INVENTORY NO.

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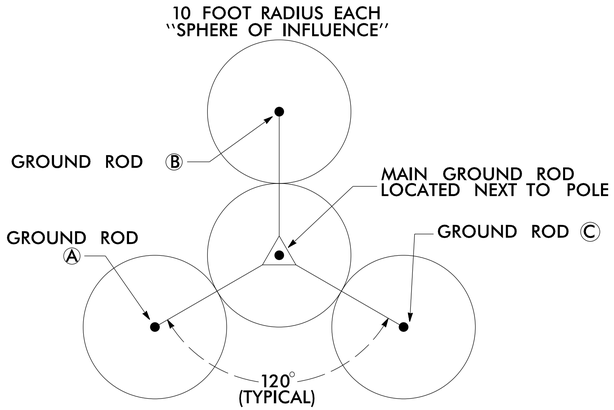
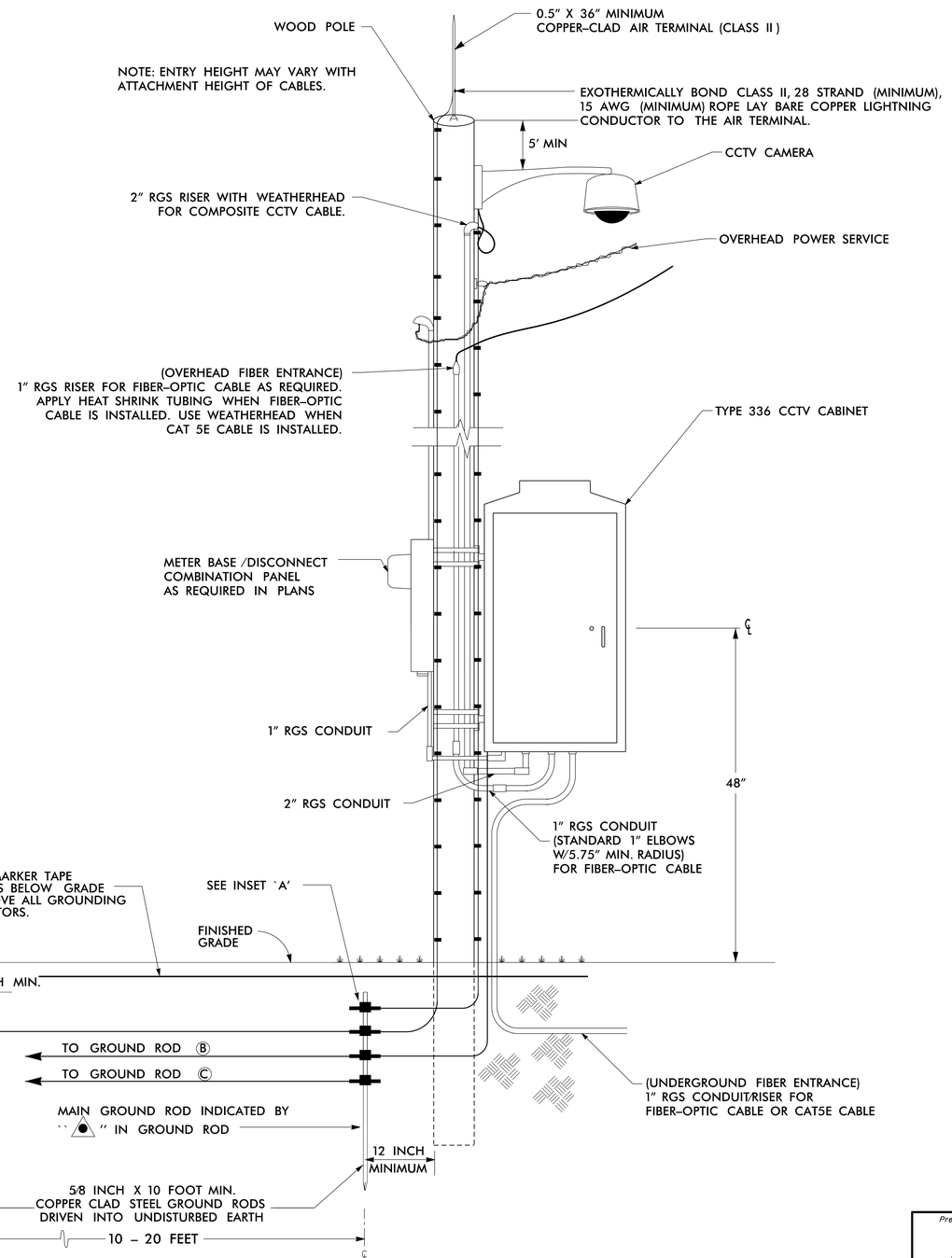
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 4

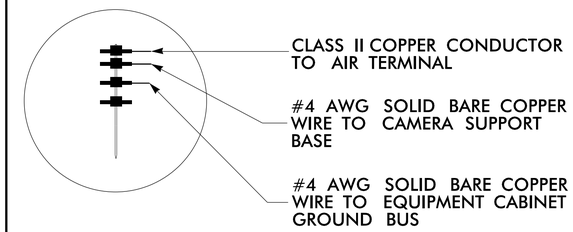


GROUND ROD PLACEMENT DETAIL

(TYPICAL EACH POLE)

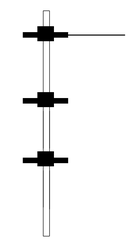


INSET `A'



ALTERNATE GROUNDING METHOD

IF SPACE IS NOT AVAILABLE TO DRIVE MULTIPLE RODS, DRIVE SECTIONAL GROUND RODS A MINIMUM OF 30 FEET.



JOIN SECTIONAL GROUND RODS BY
EXOTHERMIC WELDING CONNECTION

NOTES

1. BOND CLASS II, 28 STRAND (MINIMUM), 15 AWG (MINIMUM) ROPE-LAY BARE COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN EXOTHERMIC WELD METHOD. MAINTAIN MAXIMUM HORIZONTAL SEPARATION BETWEEN COPPER CONDUCTOR AND RISER.
2. EXOTHERMICALLY WELD ALL CONNECTIONS TO GROUND RODS.
3. THE CONTRACTOR MAY, UPON APPROVAL OF THE ENGINEER, INSTALL A 30' SECTIONAL GROUND ROD FOR INSTANCES WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE 3 – RADIAL GROUND RODS.
4. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12".
5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUS AND NEUTRAL BUS.

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

Kerr Avenue
CCTV Camera Installation, Wood Poles O/H Elec. Service, O/H Comms. / U/G Comms.

Division 03 New Hanover County Wilmington

PLAN DATE:	August 2013	REVIEWED BY:	
PREPARED BY:		REVIEWED BY:	

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015
6DF42EEF9BC4NF DATE

SIG. INVENTORY NO.

DocuSign Envelope ID: 6E3468AF-9C11-4B9E-A521-597588D38A4A

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 5

1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL CATEGORY 5E CABLE
4. INSTALL SMFO CABLE
5. INSTALL COAXIAL ANTENNA CABLE
6. INSTALL FIBER–OPTIC DROP CABLE
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12. INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING
13. INSTALL HEAT SHRINK TUBING RETROFIT KIT
14. INSTALL HIGH DENSITY POLYETHYLENE CONDUIT
15. DIRECTIONAL DRILL CONDUIT
16. BORE AND JACK CONDUIT
17. INSTALL CABLE(S) IN EXISTING CONDUIT
18. INSTALL CABLE(S) IN NEW CONDUIT
19. INSTALL CABLE(S) IN EXISTING RISER
20. INSTALL CABLE(S) IN NEW RISER(S)
21. INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS
22. INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUB–OUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUB–OUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO POLE MOUNTED CABINET
26. INSTALL DIGITAL VIDEO ENCODER
27. INSTALL NEW ETHERNET EDGE SWITCH IN CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL SPLICE ENCLOSURE
31. INSTALL SPLICE CABINET
32. MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER
33. REMOVE EXISTING SPLICE /HUB/CCTV CABINET
34. INSTALL CABINET FOUNDATION
35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV WOOD POLE
38. INSTALL STANDARD SIZE JUNCTION BOX
39. INSTALL SPECIAL–SIZED JUNCTION BOX
40. INSTALL OVERSIZED JUNCTION BOX
41. REMOVE EXISTING JUNCTION BOX
42. INSTALL WOOD POLE
43. REMOVE EXISTING WOOD POLE
44. INSTALL AERIAL GUY ASSEMBLY
45. INSTALL STANDARD GUY ASSEMBLY
46. INSTALL SIDEWALK GUY ASSEMBLY
47. INSTALL MESSENGER CABLE
48. REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE
49. REMOVE EXISTING COMMUNICATIONS CABLE
50. INSTALL WIRELESS DSL
51. INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)
54. LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV
58. INSTALL NEW ELECTRICAL SERVICE FOR CCTV
59. INSTALL NEW POLE MOUNTED CCTV CABINET
60. INSTALL NEW BASE MOUNTED CCTV CABINET
61. INSTALL UNI–DIRECTIONAL ANTENNA
62. NOT USED
63. INSTALL 900 MHZ ETHERNET RADIO
64. INTERCEPT AND REROUTE EXISTING CONDUITS
65. BOND MESSENGER TO POLE GROUND
66. BOND RISER TO POLE GROUND
67. BOND TRACER WIRE TO POLE GROUND
68. BOND TRACER WIRE TO EQUIPMENT GROUND BUS
69. REMOVE EXISTING CCTV CAMERA ASSEMBLY
70. INSTALL RELOCATED WIRELESS SYSTEM

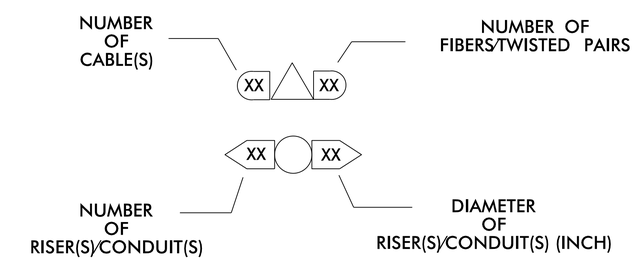
LEGEND

CL-A

- NEW FIBER OPTIC COMMUNICATIONS CABLE
- NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXISTING COMMUNICATIONS CABLE
- EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- NEW DIRECTIONAL DRILLED CONDUIT
- NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- NEW AERIAL SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV CAMERA ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW STANDARD GUY USING EXISTING ANCHOR
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- EXISTING SPLICE CABINET
- NEW SPLICE CABINET
- SP — SIGNAL POLE
- XX–XXXX — SIGNAL INVENTORY NUMBER

CONSTRUCTION NOTE SYMBOLOGY KEY

- XX — INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX — INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX — INDICATES NUMBER OF RISER(S) /CONDUIT(S)
- XX — INDICATES DIAMETER OF RISER(S) /CONDUIT(S) (INCH)



ATTACHMENT POINT:

- XXX / YYY — DISTANCE ABOVE (IN) / REFERENCE POINT
- YYY / XXX — REFERENCE POINT / DISTANCE BELOW (IN)

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of: Transportation Mobility and Safety Division, Intelligent Transportation Systems, Department of Transportation, State of North Carolina
750 Greenfield Parkway, Garner, NC 27529

NOT TO SCALE

ITS Construction Notes

Division 03	New Hanover County	Wilmington
PLAN DATE: June 2014	REVIEWED BY: LM Moon	
PREPARED BY: AM Thigpen	REVIEWED BY: MB Toth	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 7/15/2015
D86DCF8E04D04AF... DATE

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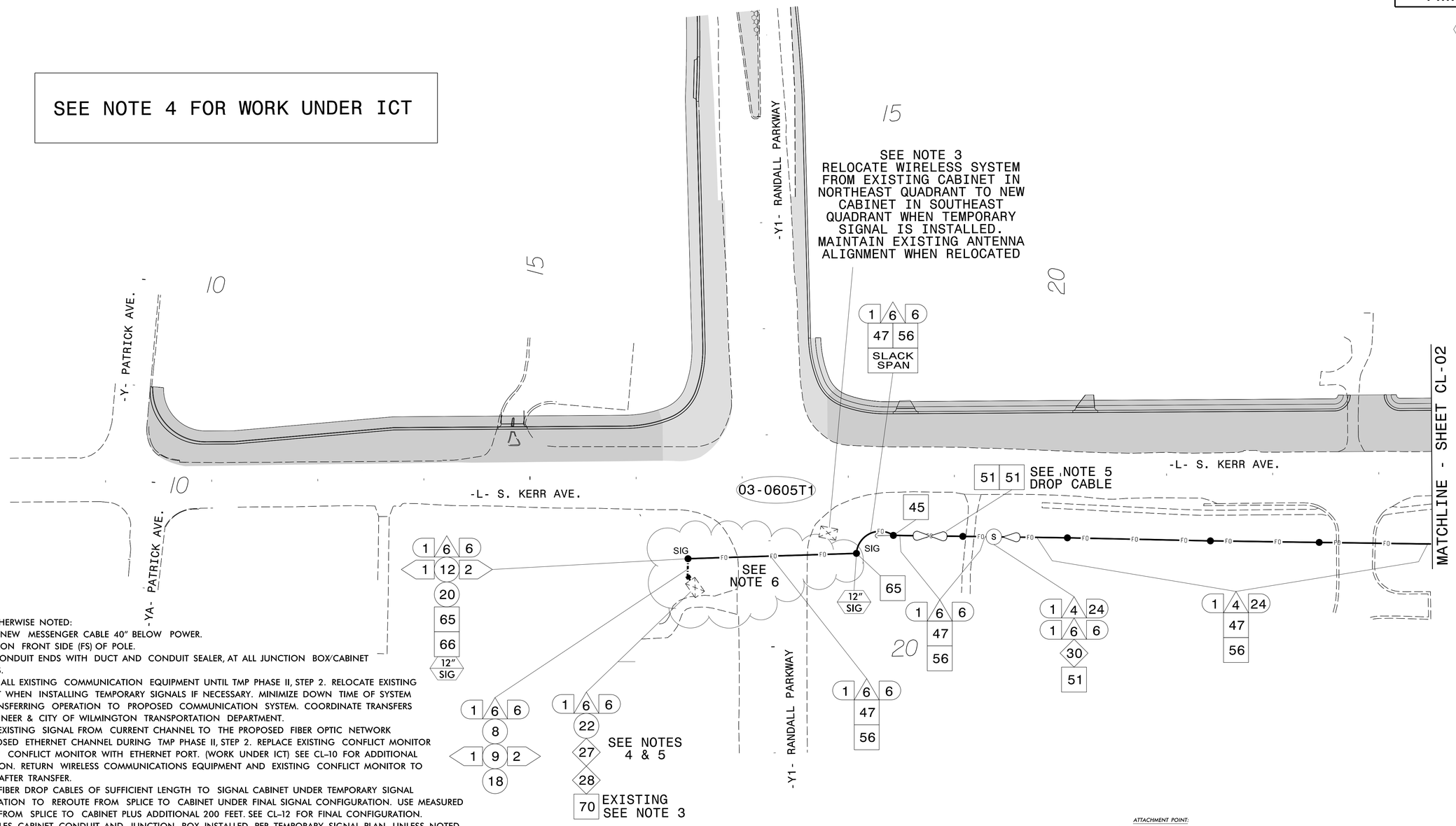
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 6

CL-01



NOTES:

1. UNLESS OTHERWISE NOTED:
   – ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   – ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. MAINTAIN ALL EXISTING COMMUNICATION EQUIPMENT UNTIL TMP PHASE II, STEP 2. RELOCATE EXISTING EQUIPMENT WHEN INSTALLING TEMPORARY SIGNALS IF NECESSARY. MINIMIZE DOWN TIME OF SYSTEM WHILE TRANSFERRING OPERATION TO PROPOSED COMMUNICATION SYSTEM. COORDINATE TRANSFERS WITH ENGINEER & CITY OF WILMINGTON TRANSPORTATION DEPARTMENT.
4. TRANSFER EXISTING SIGNAL FROM CURRENT CHANNEL TO THE PROPOSED FIBER OPTIC NETWORK FOR PROPOSED ETHERNET CHANNEL DURING TMP PHASE II, STEP 2. REPLACE EXISTING CONFLICT MONITOR WITH NEW CONFLICT MONITOR WITH ETHERNET PORT. (WORK UNDER ICT) SEE CL–10 FOR ADDITIONAL INFORMATION. RETURN WIRELESS COMMUNICATIONS EQUIPMENT AND EXISTING CONFLICT MONITOR TO ENGINEER AFTER TRANSFER.
5. INSTALL 6–FIBER DROP CABLES OF SUFFICIENT LENGTH TO SIGNAL CABINET UNDER TEMPORARY SIGNAL CONFIGURATION TO REROUTE FROM SPLICE TO CABINET UNDER FINAL SIGNAL CONFIGURATION. USE MEASURED DISTANCE FROM SPLICE TO CABINET PLUS ADDITIONAL 200 FEET. SEE CL–12 FOR FINAL CONFIGURATION.
6. SIGNAL POLES, CABINET, CONDUIT AND JUNCTION BOX INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

1 INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13 INSTALL HEAT SHRINK TUBING RETROFIT KIT	25 INSTALL NEW RISER INTO POLE MOUNTED CABINET	37 INSTALL CCTV WOOD POLE	49 REMOVE EXISTING COMMUNICATIONS CABLE	61 INSTALL UNI–DIRECTIONAL ANTENNA
2 INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14 INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26 INSTALL DIGITAL VIDEO ENCODER	38 INSTALL STANDARD SIZE JUNCTION BOX	50 INSTALL WIRELESS DSL	62 NOT USED
3 INSTALL CATEGORY 5E CABLE	15 DIRECTIONAL DRILL CONDUIT	27 INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39 INSTALL SPECIAL–SIZED JUNCTION BOX	51 INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63 INSTALL 900 MHZ ETHERNET RADIO
4 INSTALL SMFO CABLE	16 BORE AND JACK CONDUIT	28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40 INSTALL OVERSIZED JUNCTION BOX	52 INSTALL DELINEATOR MARKER	64 INTERCEPT AND REROUTE EXISTING CONDUITS
5 INSTALL COAXIAL ANTENNA CABLE	17 INSTALL CABLE(S) IN EXISTING CONDUIT	29 INSTALL UNDERGROUND SPLICE ENCLOSURE	41 REMOVE EXISTING JUNCTION BOX	53 STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65 BOND MESSENGER TO POLE GROUND
6 INSTALL FIBER–OPTIC DROP CABLE	18 INSTALL CABLE(S) IN NEW CONDUIT	30 INSTALL AERIAL SPLICE ENCLOSURE	42 INSTALL WOOD POLE	54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66 BOND RISER TO POLE GROUND
7 INSTALL TRACER WIRE	19 INSTALL CABLE(S) IN EXISTING RISER(S)	31 INSTALL SPLICE CABINET	43 REMOVE EXISTING WOOD POLE	55 LASH CABLE(S) TO EXISTING MESSENGER CABLE	67 BOND TRACER WIRE TO POLE GROUND
8 TRENCH	20 INSTALL CABLE(S) IN NEW RISER(S)	32 MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44 INSTALL AERIAL GUY ASSEMBLY	56 LASH CABLE(S) TO NEW MESSENGER CABLE	68 BOND TRACER WIRE TO EQUIPMENT GROUND BUS
9 INSTALL PVC CONDUIT	21 INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33 REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45 INSTALL STANDARD GUY ASSEMBLY	57 MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69 REMOVE EXISTING CCTV CAMERA ASSEMBLY
10 INSTALL RIGID, GALVANIZED STEEL CONDUIT	22 INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34 INSTALL CABINET FOUNDATION	46 INSTALL SIDEWALK GUY ASSEMBLY	58 INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70 INSTALL RELOCATED WIRELESS SYSTEM
11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23 INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35 REMOVE EXISTING CABINET FOUNDATION	47 INSTALL MESSENGER CABLE	59 INSTALL NEW POLE MOUNTED CCTV CABINET	
12 INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24 INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36 INSTALL CCTV CAMERA ASSEMBLY	48 REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE	60 INSTALL NEW BASE MOUNTED CCTV CABINET	

ATTACHMENT POINT:

XXX / YYY — DISTANCE ABOVE (IN) REFERENCE POINT

YYY / XXX — REFERENCE POINT DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY

NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS — NUMBER OF FIBERS/TWISTED PAIRS

NUMBER OF RISER(S)/ CONDUIT(S) — DIAMETER OF RISER(S)/ CONDUIT(S) (IN)

TMP PHASE I - PHASE II, Steps 1 & 2

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

DocuSigned by: Lisa M. Moon 12/19/14
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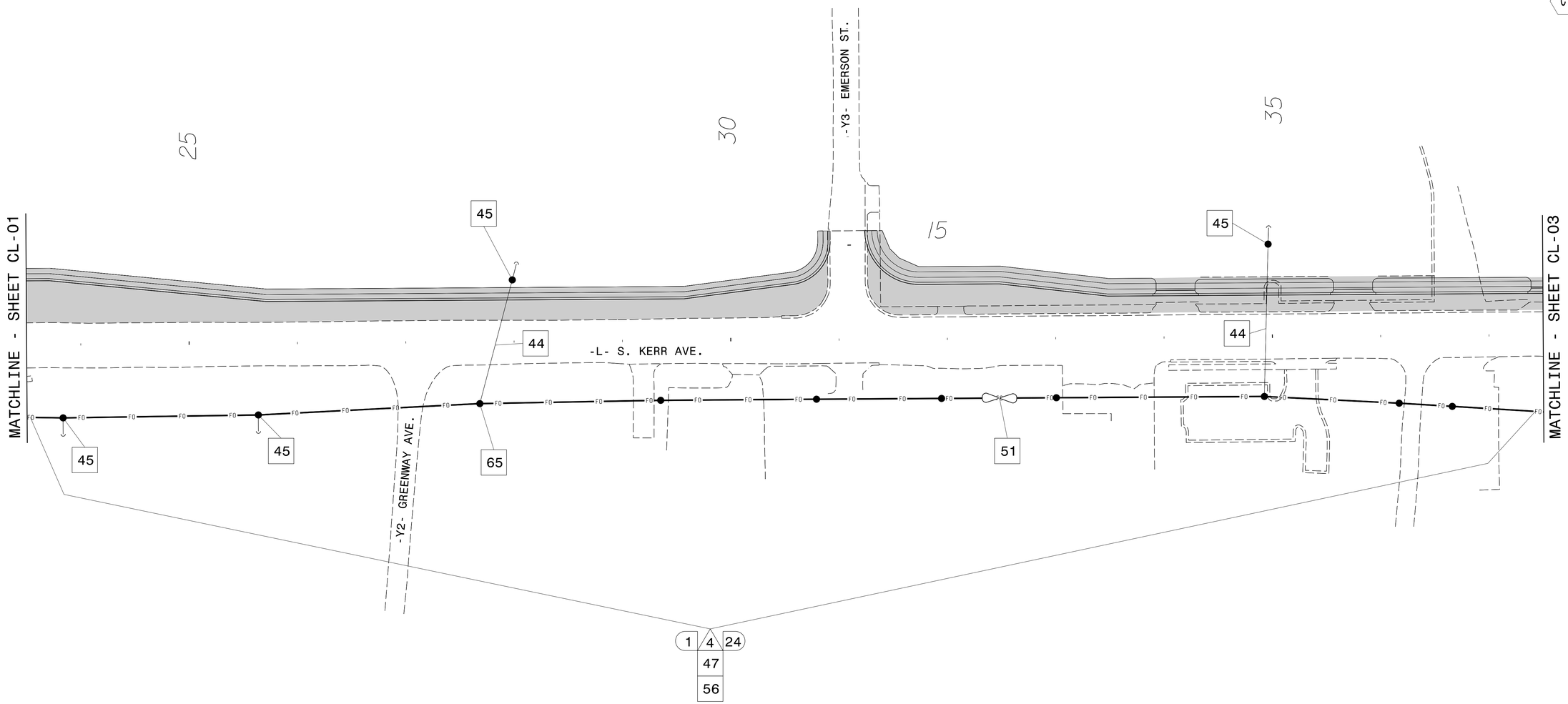
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 7

CL-02



NOTES:
1. UNLESS OTHERWISE NOTED:
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   – ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE	49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI-DIRECTIONAL ANTENNA
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3	INSTALL CATEGORY 5E CABLE	15	DIRECTIONAL DRILL CONDUIT	27	INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39	INSTALL SPECIAL-SIZED JUNCTION BOX	51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63	INSTALL 900 MHZ ETHERNET RADIO
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TMP PHASE I - PHASE II, Steps 1 & 2

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Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE 0 50 — 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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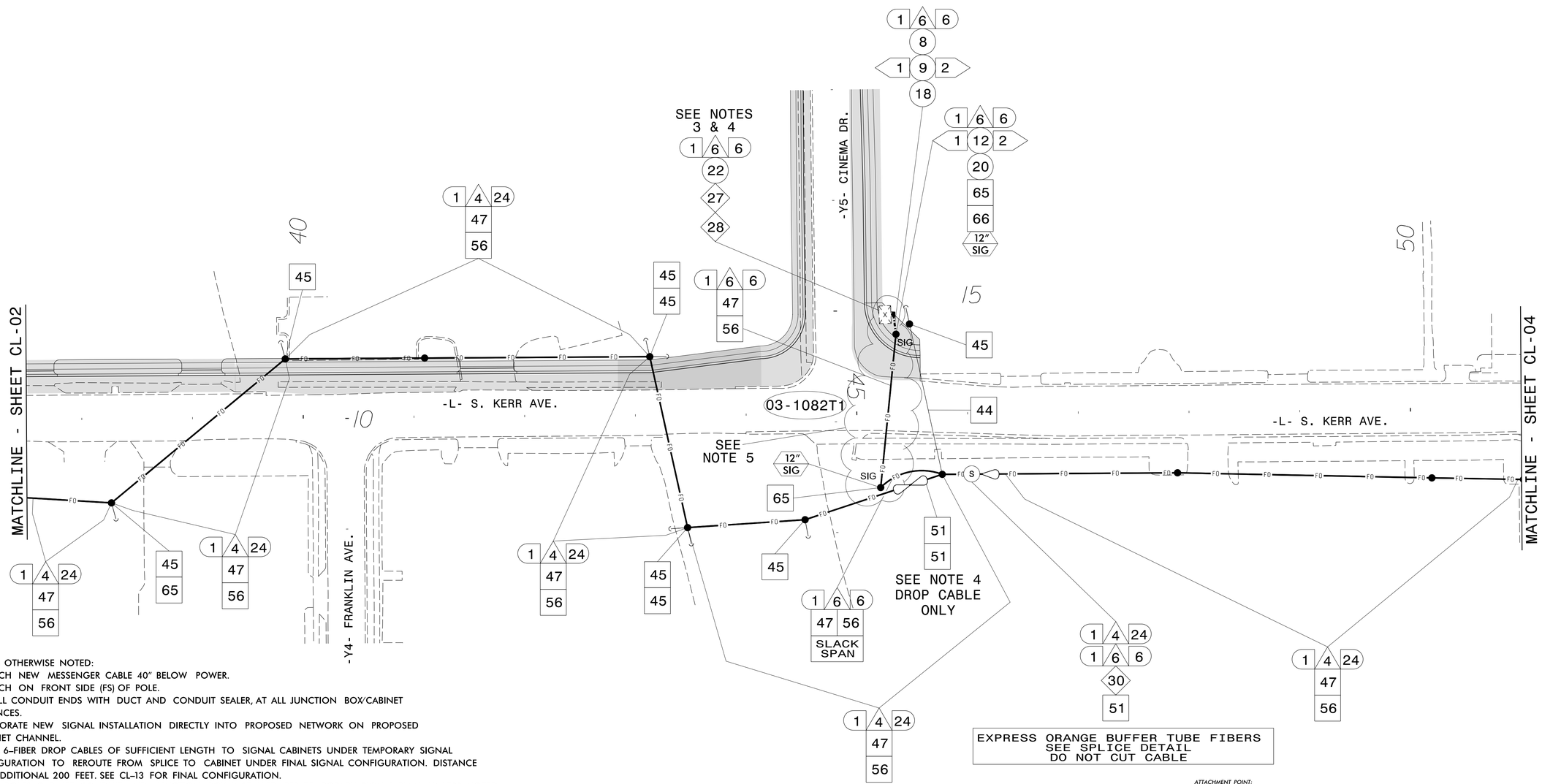
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 8

CL-03



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2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. INCORPORATE NEW SIGNAL INSTALLATION DIRECTLY INTO PROPOSED NETWORK ON PROPOSED ETHERNET CHANNEL.
4. INSTALL 6-FIBER DROP CABLES OF SUFFICIENT LENGTH TO SIGNAL CABINETS UNDER TEMPORARY SIGNAL CONFIGURATION TO REROUTE FROM SPLICE TO CABINET UNDER FINAL SIGNAL CONFIGURATION. DISTANCE PLUS ADDITIONAL 200 FEET. SEE CL-13 FOR FINAL CONFIGURATION.
5. SIGNAL POLES, CABINET, CONDUIT AND JUNCTION BOX INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

1 INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13 INSTALL HEAT SHRINK TUBING RETROFIT KIT	25 INSTALL NEW RISER INTO POLE MOUNTED CABINET	37 INSTALL CCTV WOOD POLE	49 REMOVE EXISTING COMMUNICATIONS CABLE	61 INSTALL UNI-DIRECTIONAL ANTENNA
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TMP PHASE I - PHASE II, Steps 1 & 2

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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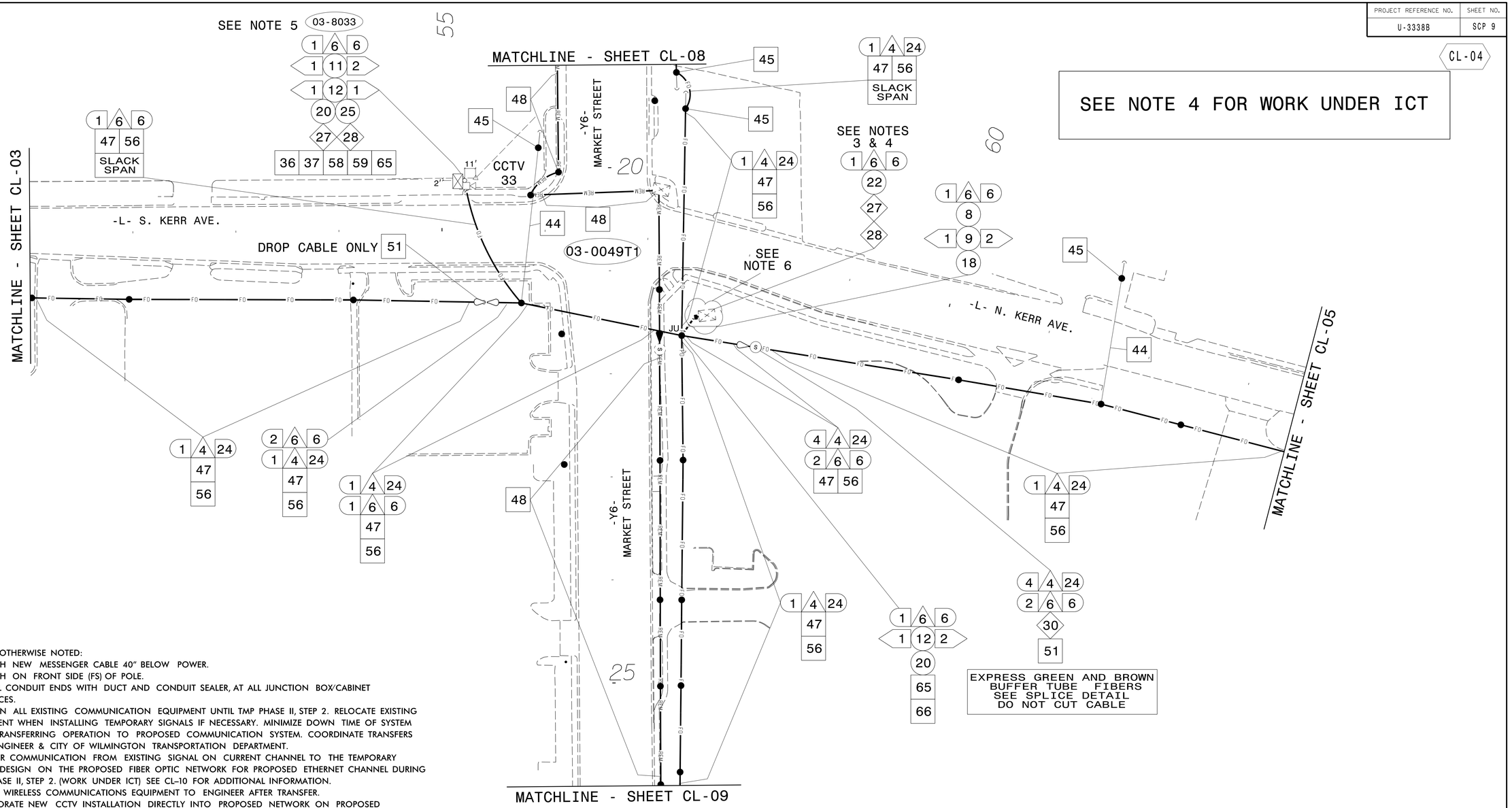
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 9



NOTES:

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2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. MAINTAIN ALL EXISTING COMMUNICATION EQUIPMENT UNTIL TMP PHASE II, STEP 2. RELOCATE EXISTING EQUIPMENT WHEN INSTALLING TEMPORARY SIGNALS IF NECESSARY. MINIMIZE DOWN TIME OF SYSTEM WHILE TRANSFERRING OPERATION TO PROPOSED COMMUNICATION SYSTEM. COORDINATE TRANSFERS WITH ENGINEER & CITY OF WILMINGTON TRANSPORTATION DEPARTMENT.
4. TRANSFER COMMUNICATION FROM EXISTING SIGNAL ON CURRENT CHANNEL TO THE TEMPORARY SIGNAL DESIGN ON THE PROPOSED FIBER OPTIC NETWORK FOR PROPOSED ETHERNET CHANNEL DURING TMP PHASE II, STEP 2. (WORK UNDER ICT) SEE CL-10 FOR ADDITIONAL INFORMATION. RETURN WIRELESS COMMUNICATIONS EQUIPMENT TO ENGINEER AFTER TRANSFER.
5. INCORPORATE NEW CCTV INSTALLATION DIRECTLY INTO PROPOSED NETWORK ON PROPOSED ETHERNET CHANNEL.
6. SIGNAL CABINET AND JUNCTION BOX INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

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U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 0 50 — 1"=50'

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 10

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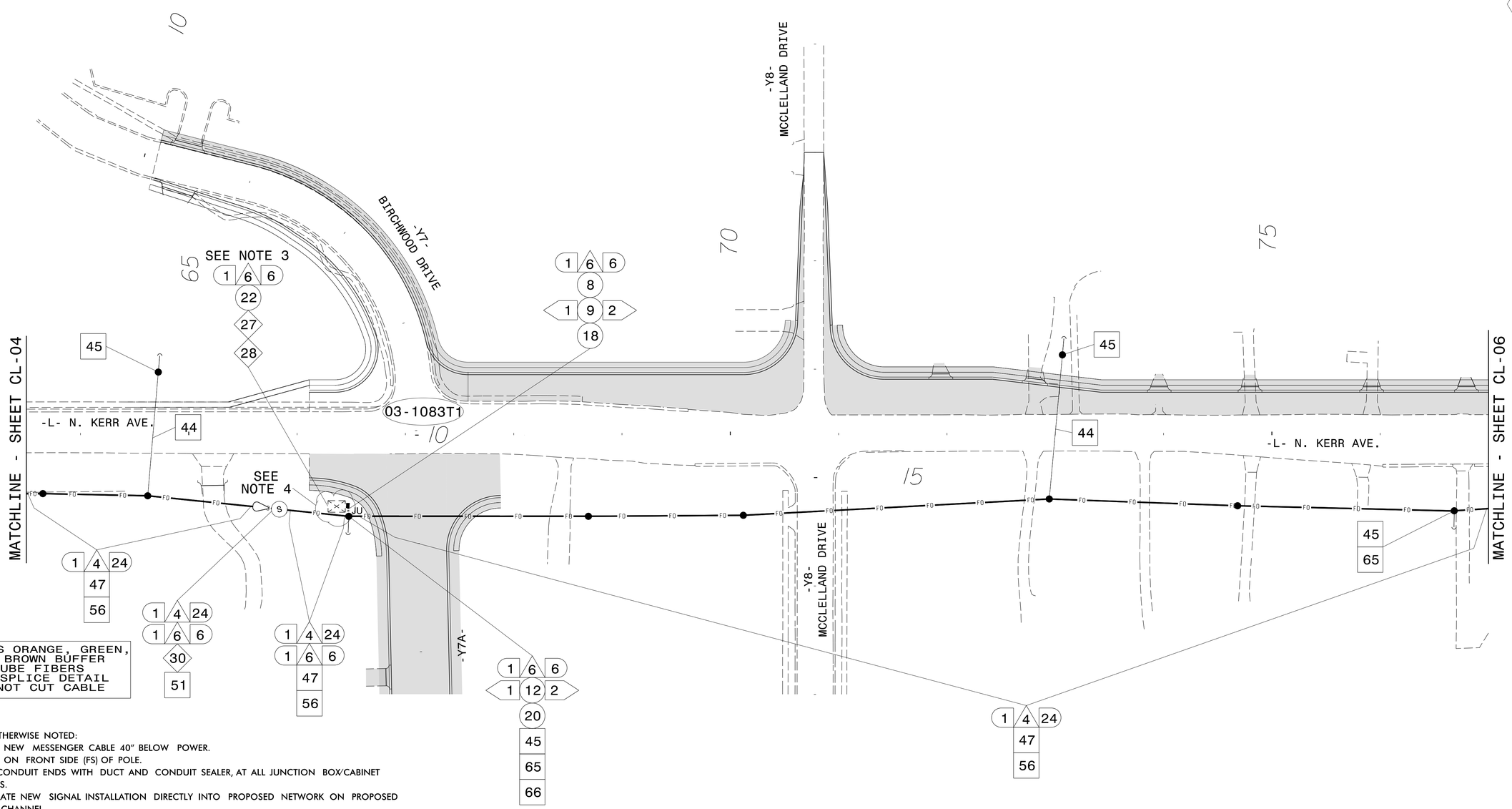

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4	INSTALL SMFO CABLE	16	BORE AND JACK CONDUIT	28	INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40	INSTALL OVERSIZED JUNCTION BOX
5	INSTALL COAXIAL ANTENNA CABLE	17	INSTALL CABLE(S) IN EXISTING CONDUIT	29	INSTALL UNDERGROUND SPLICE ENCLOSURE	41	REMOVE EXISTING JUNCTION BOX
6	INSTALL FIBER–OPTIC DROP CABLE	18	INSTALL CABLE(S) IN NEW CONDUIT	30	INSTALL AERIAL SPLICE ENCLOSURE	42	INSTALL WOOD POLE
7	INSTALL TRACER WIRE	19	INSTALL CABLE(S) IN EXISTING RISER(S)	31	INSTALL SPLICE CABINET	43	REMOVE EXISTING WOOD POLE
8	TRENCH	20	INSTALL CABLE(S) IN NEW RISER(S)	32	MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44	INSTALL AERIAL GUY ASSEMBLY
9	INSTALL PVC CONDUIT	21	INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33	REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45	INSTALL STANDARD GUY ASSEMBLY
10	INSTALL RIGID, GALVANIZED STEEL CONDUIT	22	INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34	INSTALL CABINET FOUNDATION	46	INSTALL SIDEWALK GUY ASSEMBLY
11	INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23	INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35	REMOVE EXISTING CABINET FOUNDATION	47	INSTALL MESSENGER CABLE
12	INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24	INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36	INSTALL CCTV CAMERA ASSEMBLY	48	REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE

49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI–DIRECTIONAL ANTENNA				
50	INSTALL WIRELESS DSL	62	NOT USED				
51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63	INSTALL 900 MHZ ETHERNET RADIO				
52	INSTALL DELINEATOR MARKER	64	INTERCEPT AND REROUTE EXISTING CONDUITS				
53	STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65	BOND MESSENGER TO POLE GROUND				
54	LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66	BOND RISER TO POLE GROUND				
55	LASH CABLE(S) TO EXISTING MESSENGER CABLE	67	BOND TRACER WIRE TO POLE GROUND				
56	LASH CABLE(S) TO NEW MESSENGER CABLE	68	BOND TRACER WIRE TO EQUIPMENT GROUND BUS				
57	MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69	REMOVE EXISTING CCTV CAMERA ASSEMBLY				
58	INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70	INSTALL RELOCATED WIRELESS SYSTEM				
59	INSTALL NEW POLE MOUNTED CCTV CABINET						
60	INSTALL NEW BASE MOUNTED CCTV CABINET						

ATTACHMENT POINT:

XXX / YYY — DISTANCE ABOVE (IN) / REFERENCE POINT

YYY / XXX — REFERENCE POINT / DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY

NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS — NUMBER OF FIBERS/TWISTED PAIRS — NUMBER OF RISER(S)/ CONDUIT(S) — DIAMETER OF RISER(S)/ CONDUIT(S) (IN)

TMP PHASE I - PHASE II, Steps 1 & 2

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE 0 50 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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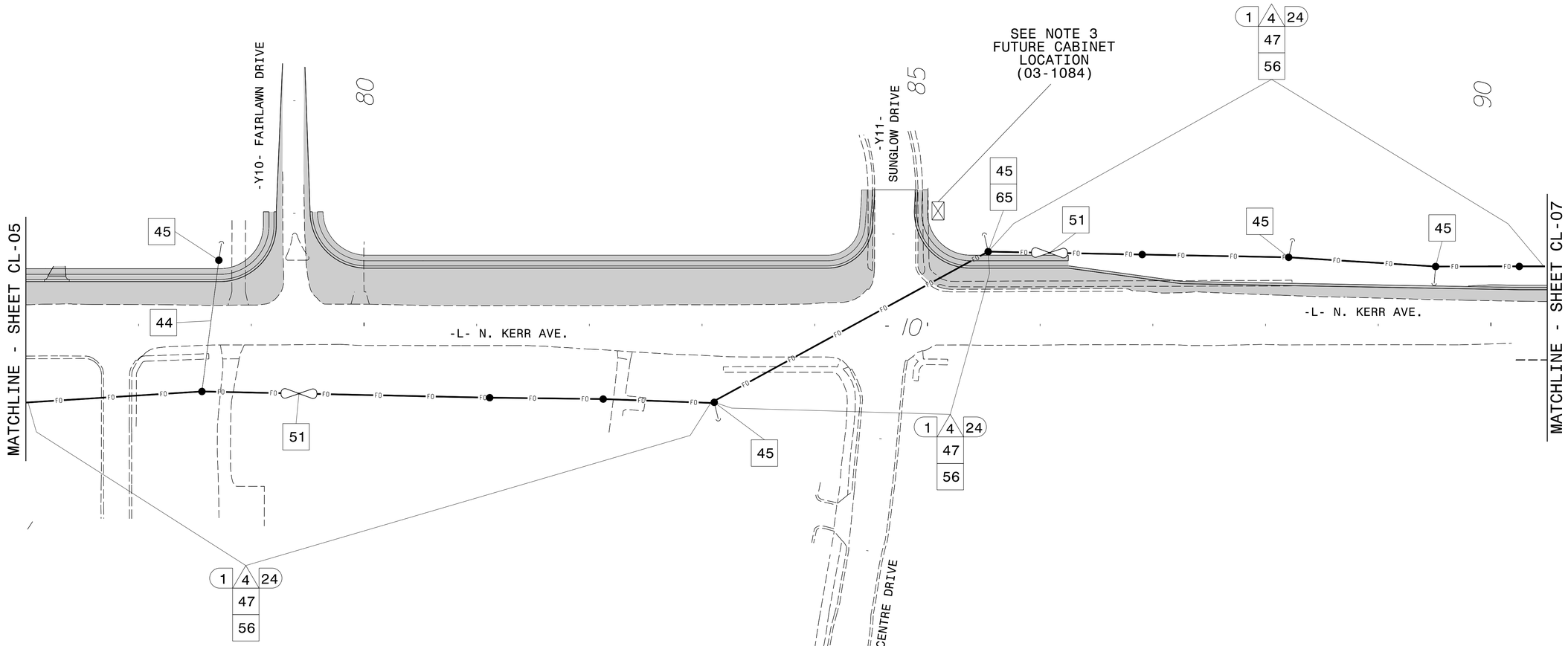
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 11

CL-06



NOTES:
1. UNLESS OTHERWISE NOTED:
   – ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   – ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. CONNECT TO SYSTEM IN TMP PHASE IV, STEP 1 WHEN 03–1084T1 SIGNAL IS INSTALLED. SEE CL–11 FOR FUTURE CONFIGURATION.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE	49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI–DIRECTIONAL ANTENNA
2	INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14	INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26	INSTALL DIGITAL VIDEO ENCODER	38	INSTALL STANDARD SIZE JUNCTION BOX	50	INSTALL WIRELESS DSL	62	NOT USED
3	INSTALL CATEGORY 5E CABLE	15	DIRECTIONAL DRILL CONDUIT	27	INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39	INSTALL SPECIAL–SIZED JUNCTION BOX	51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63	INSTALL 900 MHZ ETHERNET RADIO
4	INSTALL SMFO CABLE	16	BORE AND JACK CONDUIT	28	INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40	INSTALL OVERSIZED JUNCTION BOX	52	INSTALL DELINEATOR MARKER	64	INTERCEPT AND REROUTE EXISTING CONDUITS
5	INSTALL COAXIAL ANTENNA CABLE	17	INSTALL CABLE(S) IN EXISTING CONDUIT	29	INSTALL UNDERGROUND SPLICE ENCLOSURE	41	REMOVE EXISTING JUNCTION BOX	53	STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65	BOND MESSENGER TO POLE GROUND
6	INSTALL FIBER–OPTIC DROP CABLE	18	INSTALL CABLE(S) IN NEW CONDUIT	30	INSTALL AERIAL SPLICE ENCLOSURE	42	INSTALL WOOD POLE	54	LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66	BOND RISER TO POLE GROUND
7	INSTALL TRACER WIRE	19	INSTALL CABLE(S) IN EXISTING RISER(S)	31	INSTALL SPLICE CABINET	43	REMOVE EXISTING WOOD POLE	55	LASH CABLE(S) TO EXISTING MESSENGER CABLE	67	BOND TRACER WIRE TO POLE GROUND
8	TRENCH	20	INSTALL CABLE(S) IN NEW RISER(S)	32	MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44	INSTALL AERIAL GUY ASSEMBLY	56	LASH CABLE(S) TO NEW MESSENGER CABLE	68	BOND TRACER WIRE TO EQUIPMENT GROUND BUS
9	INSTALL PVC CONDUIT	21	INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33	REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45	INSTALL STANDARD GUY ASSEMBLY	57	MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69	REMOVE EXISTING CCTV CAMERA ASSEMBLY
10	INSTALL RIGID, GALVANIZED STEEL CONDUIT	22	INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34	INSTALL CABINET FOUNDATION	46	INSTALL SIDEWALK GUY ASSEMBLY	58	INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70	INSTALL RELOCATED WIRELESS SYSTEM
11	INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23	INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35	REMOVE EXISTING CABINET FOUNDATION	47	INSTALL MESSENGER CABLE	59	INSTALL NEW POLE MOUNTED CCTV CABINET		
12	INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24	INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36	INSTALL CCTV CAMERA ASSEMBLY	48	REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE	60	INSTALL NEW BASE MOUNTED CCTV CABINET		

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CONSTRUCTION NOTE SYMBOLOGY KEY

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TMP PHASE I - PHASE II, Steps 1 & 2

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Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA — DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 1"=50' (0 – 50)

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

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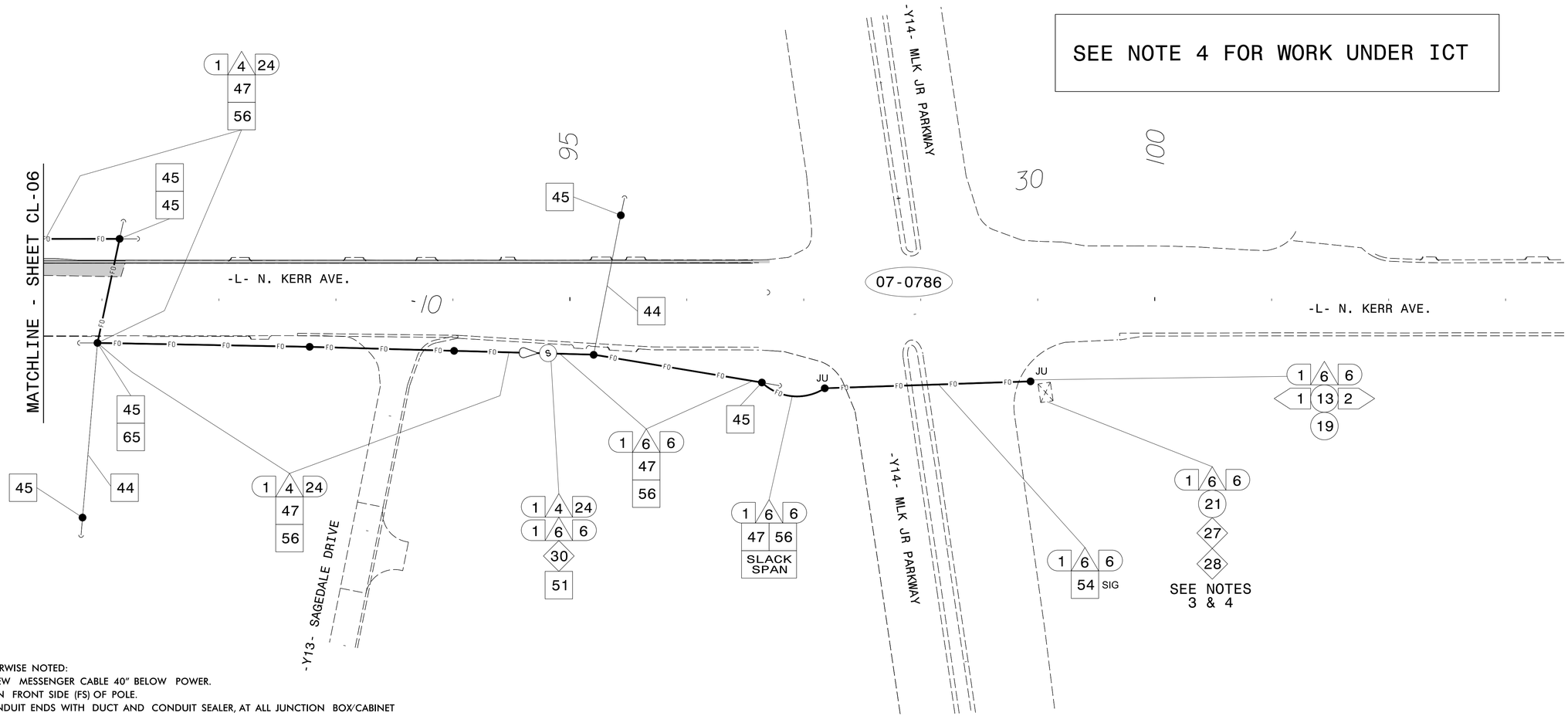
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 12

CL-07



NOTES:

1. UNLESS OTHERWISE NOTED:
   – ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   – ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. MAINTAIN ALL EXISTING COMMUNICATION EQUIPMENT UNTIL TMP PHASE II, STEP 2. RELOCATE EXISTING EQUIPMENT WHEN INSTALLING TEMPORARY SIGNALS IF NECESSARY. MINIMIZE DOWN TIME OF SYSTEM WHILE TRANSFERRING OPERATION TO PROPOSED COMMUNICATION SYSTEM. COORDINATE TRANSFERS WITH ENGINEER & CITY OF WILMINGTON TRANSPORTATION DEPARTMENT.
4. TRANSFER EXISTING SIGNAL FROM CURRENT CHANNEL TO THE PROPOSED FIBER OPTIC NETWORK FOR PROPOSED ETHERNET CHANNEL DURING TMP PHASE II, STEP 2. REPLACE EXISTING CONFLICT MONITOR WITH NEW CONFLICT MONITOR WITH ETHERNET PORT. (WORK UNDER ICT) SEE CL–10 FOR ADDITIONAL INFORMATION. RETURN WIRELESS COMMUNICATIONS EQUIPMENT AND EXISTING CONFLICT MONITOR TO ENGINEER AFTER TRANSFER.

1 INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13 INSTALL HEAT SHRINK TUBING RETROFIT KIT	25 INSTALL NEW RISER INTO POLE MOUNTED CABINET	37 INSTALL CCTV WOOD POLE	49 REMOVE EXISTING COMMUNICATIONS CABLE	61 INSTALL UNI–DIRECTIONAL ANTENNA
2 INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14 INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26 INSTALL DIGITAL VIDEO ENCODER	38 INSTALL STANDARD SIZE JUNCTION BOX	50 INSTALL WIRELESS DSL	62 NOT USED
3 INSTALL CATEGORY 5E CABLE	15 DIRECTIONAL DRILL CONDUIT	27 INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39 INSTALL SPECIAL–SIZED JUNCTION BOX	51 INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63 INSTALL 900 MHZ ETHERNET RADIO
4 INSTALL SMFO CABLE	16 BORE AND JACK CONDUIT	28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40 INSTALL OVERSIZED JUNCTION BOX	52 INSTALL DELINEATOR MARKER	64 INTERCEPT AND REROUTE EXISTING CONDUITS
5 INSTALL COAXIAL ANTENNA CABLE	17 INSTALL CABLE(S) IN EXISTING CONDUIT	29 INSTALL UNDERGROUND SPLICE ENCLOSURE	41 REMOVE EXISTING JUNCTION BOX	53 STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65 BOND MESSENGER TO POLE GROUND
6 INSTALL FIBER–OPTIC DROP CABLE	18 INSTALL CABLE(S) IN NEW CONDUIT	30 INSTALL AERIAL SPLICE ENCLOSURE	42 INSTALL WOOD POLE	54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66 BOND RISER TO POLE GROUND
7 INSTALL TRACER WIRE	19 INSTALL CABLE(S) IN EXISTING RISER(S)	31 INSTALL SPLICE CABINET	43 REMOVE EXISTING WOOD POLE	55 LASH CABLE(S) TO EXISTING MESSENGER CABLE	67 BOND TRACER WIRE TO POLE GROUND
8 TRENCH	20 INSTALL CABLE(S) IN NEW RISER(S)	32 MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44 INSTALL AERIAL GUY ASSEMBLY	56 LASH CABLE(S) TO NEW MESSENGER CABLE	68 BOND TRACER WIRE TO EQUIPMENT GROUND BUS
9 INSTALL PVC CONDUIT	21 INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33 REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45 INSTALL STANDARD GUY ASSEMBLY	57 MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69 REMOVE EXISTING CCTV CAMERA ASSEMBLY
10 INSTALL RIGID, GALVANIZED STEEL CONDUIT	22 INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34 INSTALL CABINET FOUNDATION	46 INSTALL SIDEWALK GUY ASSEMBLY	58 INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70 INSTALL RELOCATED WIRELESS SYSTEM
11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23 INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35 REMOVE EXISTING CABINET FOUNDATION	47 INSTALL MESSENGER CABLE	59 INSTALL NEW POLE MOUNTED CCTV CABINET	
12 INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24 INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36 INSTALL CCTV CAMERA ASSEMBLY	48 REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE	60 INSTALL NEW BASE MOUNTED CCTV CABINET	

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CONSTRUCTION NOTE SYMBOLOGY KEY

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NUMBER OF RISER(S)/CONDUIT(S) — DIAMETER OF RISER(S)/CONDUIT(S) (IN)

TMP PHASE I - PHASE II, Steps 1 & 2

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
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(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE 0 50 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

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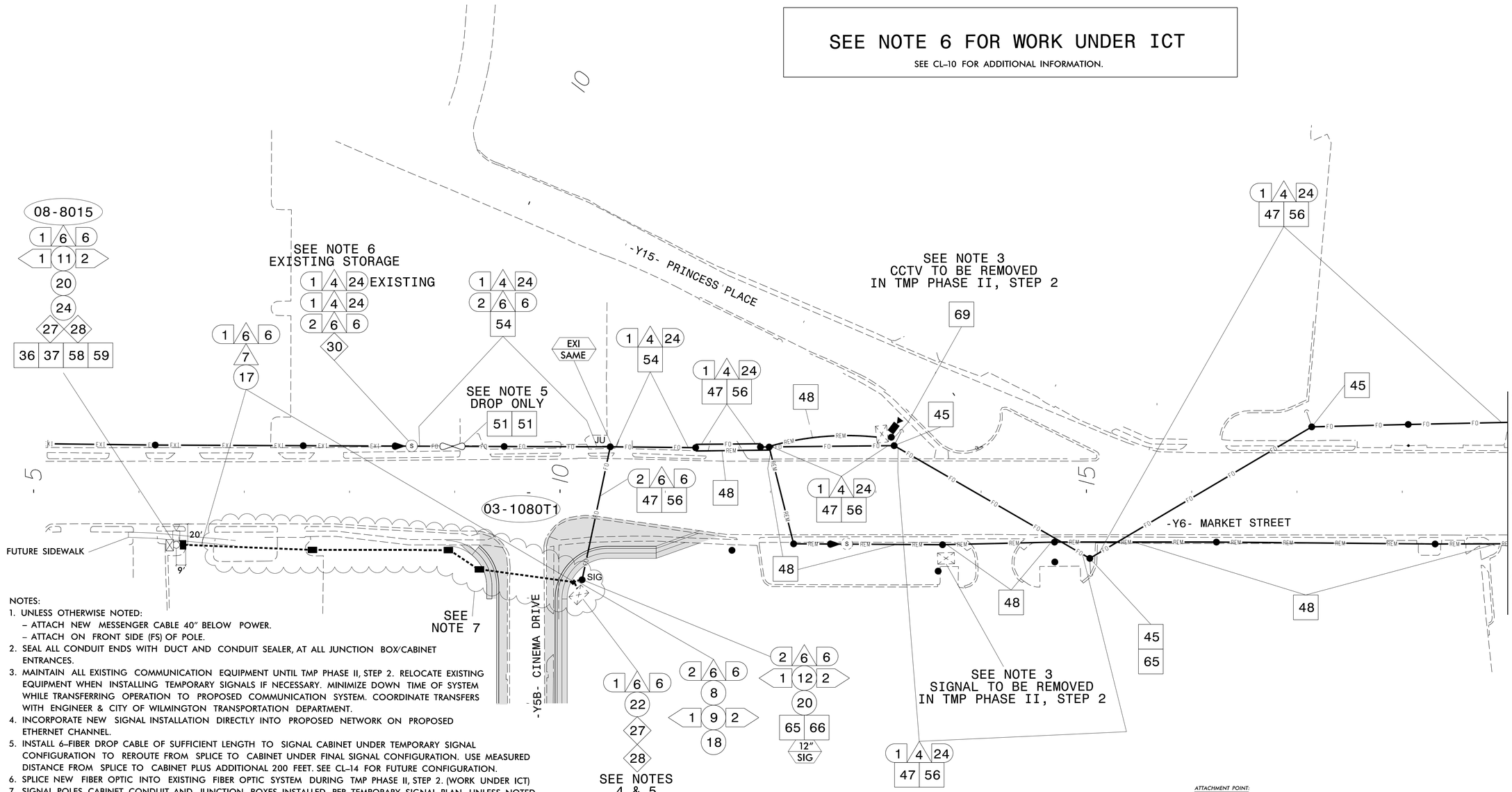
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 13

CL-08

SEE NOTE 6 FOR WORK UNDER ICT

SEE CL-10 FOR ADDITIONAL INFORMATION.



NOTES:

1. UNLESS OTHERWISE NOTED:
   - ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   - ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. MAINTAIN ALL EXISTING COMMUNICATION EQUIPMENT UNTIL TMP PHASE II, STEP 2. RELOCATE EXISTING EQUIPMENT WHEN INSTALLING TEMPORARY SIGNALS IF NECESSARY. MINIMIZE DOWN TIME OF SYSTEM WHILE TRANSFERRING OPERATION TO PROPOSED COMMUNICATION SYSTEM. COORDINATE TRANSFERS WITH ENGINEER & CITY OF WILMINGTON TRANSPORTATION DEPARTMENT.
4. INCORPORATE NEW SIGNAL INSTALLATION DIRECTLY INTO PROPOSED NETWORK ON PROPOSED ETHERNET CHANNEL.
5. INSTALL 6-FIBER DROP CABLE OF SUFFICIENT LENGTH TO SIGNAL CABINET UNDER TEMPORARY SIGNAL CONFIGURATION TO REROUTE FROM SPLICE TO CABINET UNDER FINAL SIGNAL CONFIGURATION. USE MEASURED DISTANCE FROM SPLICE TO CABINET PLUS ADDITIONAL 200 FEET. SEE CL-14 FOR FUTURE CONFIGURATION.
6. SPLICE NEW FIBER OPTIC INTO EXISTING FIBER OPTIC SYSTEM DURING TMP PHASE II, STEP 2. (WORK UNDER ICT)
7. SIGNAL POLES, CABINET, CONDUIT AND JUNCTION BOXES INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE	49	REMOVE EXISTING COMMUNICATIONS CABLE
2	INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14	INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26	INSTALL DIGITAL VIDEO ENCODER	38	INSTALL STANDARD SIZE JUNCTION BOX	50	INSTALL WIRELESS DSL
3	INSTALL CATEGORY 5E CABLE	15	DIRECTIONAL DRILL CONDUIT	27	INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39	INSTALL SPECIAL-SIZED JUNCTION BOX	51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE
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5	INSTALL COAXIAL ANTENNA CABLE	17	INSTALL CABLE(S) IN EXISTING CONDUIT	29	INSTALL UNDERGROUND SPLICE ENCLOSURE	41	REMOVE EXISTING JUNCTION BOX	53	STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)
6	INSTALL FIBER-OPTIC DROP CABLE	18	INSTALL CABLE(S) IN NEW CONDUIT	30	INSTALL AERIAL SPLICE ENCLOSURE	42	INSTALL WOOD POLE	54	LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
7	INSTALL TRACER WIRE	19	INSTALL CABLE(S) IN EXISTING RISER(S)	31	INSTALL SPLICE CABINET	43	REMOVE EXISTING WOOD POLE	55	LASH CABLE(S) TO EXISTING MESSENGER CABLE
8	TRENCH	20	INSTALL CABLE(S) IN NEW RISER(S)	32	MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44	INSTALL AERIAL GUY ASSEMBLY	56	LASH CABLE(S) TO NEW MESSENGER CABLE
9	INSTALL PVC CONDUIT	21	INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33	REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45	INSTALL STANDARD GUY ASSEMBLY	57	MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV
10	INSTALL RIGID, GALVANIZED STEEL CONDUIT	22	INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34	INSTALL CABINET FOUNDATION	46	INSTALL SIDEWALK GUY ASSEMBLY	58	INSTALL NEW ELECTRICAL SERVICE FOR CCTV
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61	INSTALL UNI-DIRECTIONAL ANTENNA	69	REMOVE EXISTING CCTV CAMERA ASSEMBLY
62	NOT USED	70	INSTALL RELOCATED WIRELESS SYSTEM
63	INSTALL 900 MHZ ETHERNET RADIO		
64	INTERCEPT AND REROUTE EXISTING CONDUITS		
65	BOND MESSENGER TO POLE GROUND		
66	BOND RISER TO POLE GROUND		
67	BOND TRACER WIRE TO POLE GROUND		
68	BOND TRACER WIRE TO EQUIPMENT GROUND BUS		

ATTACHMENT POINT:

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Prepared for the Offices of:
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Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

SCALE 0 50 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 7/15/2015
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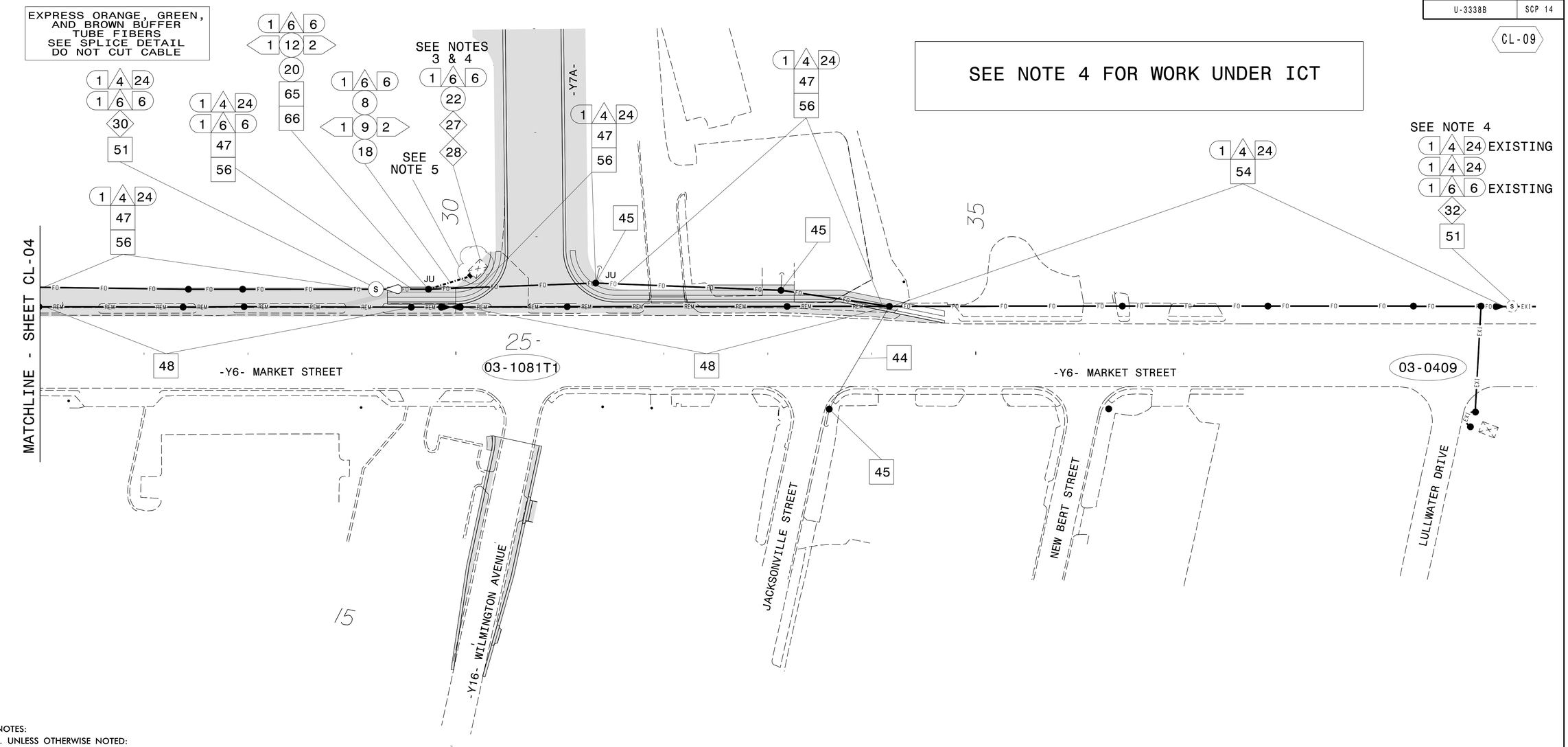
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 14

CL-09



NOTES:

1. UNLESS OTHERWISE NOTED:
   - ATTACH NEW MESSENGER CABLE 40" BELOW POWER.
   - ATTACH ON FRONT SIDE (FS) OF POLE.
2. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
3. INCORPORATE NEW SIGNAL INSTALLATION DIRECTLY INTO PROPOSED NETWORK ON PROPOSED ETHERNET CHANNEL.
4. SPLICE NEW FIBER OPTIC INTO EXISTING FIBER OPTIC SYSTEM AT THE END OF TMP PHASE II, STEP 2. (WORK UNDER ICT) SEE CL-10 FOR ADDITIONAL INFORMATION.
5. SIGNAL CABINET, CONDUIT, AND JUNCTION BOX INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

1 INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13 INSTALL HEAT SHRINK TUBING RETROFIT KIT	25 INSTALL NEW RISER INTO POLE MOUNTED CABINET	37 INSTALL CCTV WOOD POLE	49 REMOVE EXISTING COMMUNICATIONS CABLE	61 INSTALL UNI-DIRECTIONAL ANTENNA
2 INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14 INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26 INSTALL DIGITAL VIDEO ENCODER	38 INSTALL STANDARD SIZE JUNCTION BOX	50 INSTALL WIRELESS DSL	62 NOT USED
3 INSTALL CATEGORY 5E CABLE	15 DIRECTIONAL DRILL CONDUIT	27 INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39 INSTALL SPECIAL-SIZED JUNCTION BOX	51 INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63 INSTALL 900 MHZ ETHERNET RADIO
4 INSTALL SMFO CABLE	16 BORE AND JACK CONDUIT	28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40 INSTALL OVERSIZED JUNCTION BOX	52 INSTALL DELINEATOR MARKER	64 INTERCEPT AND REROUTE EXISTING CONDUITS
5 INSTALL COAXIAL ANTENNA CABLE	17 INSTALL CABLE(S) IN EXISTING CONDUIT	29 INSTALL UNDERGROUND SPLICE ENCLOSURE	41 REMOVE EXISTING JUNCTION BOX	53 STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65 BOND MESSENGER TO POLE GROUND
6 INSTALL FIBER-OPTIC DROP CABLE	18 INSTALL CABLE(S) IN NEW CONDUIT	30 INSTALL AERIAL SPLICE ENCLOSURE	42 INSTALL WOOD POLE	54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66 BOND RISER TO POLE GROUND
7 INSTALL TRACER WIRE	19 INSTALL CABLE(S) IN EXISTING RISER(S)	31 INSTALL SPLICE CABINET	43 REMOVE EXISTING WOOD POLE	55 LASH CABLE(S) TO EXISTING MESSENGER CABLE	67 BOND TRACER WIRE TO POLE GROUND
8 TRENCH	20 INSTALL CABLE(S) IN NEW RISER(S)	32 MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44 INSTALL AERIAL GUY ASSEMBLY	56 LASH CABLE(S) TO NEW MESSENGER CABLE	68 BOND TRACER WIRE TO EQUIPMENT GROUND BUS
9 INSTALL PVC CONDUIT	21 INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33 REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45 INSTALL STANDARD GUY ASSEMBLY	57 MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69 REMOVE EXISTING CCTV CAMERA ASSEMBLY
10 INSTALL RIGID, GALVANIZED STEEL CONDUIT	22 INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34 INSTALL CABINET FOUNDATION	46 INSTALL SIDEWALK GUY ASSEMBLY	58 INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70 INSTALL RELOCATED WIRELESS SYSTEM
11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23 INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35 REMOVE EXISTING CABINET FOUNDATION	47 INSTALL MESSENGER CABLE	59 INSTALL NEW POLE MOUNTED CCTV CABINET	
12 INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24 INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36 INSTALL CCTV CAMERA ASSEMBLY	48 REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE	60 INSTALL NEW BASE MOUNTED CCTV CABINET	

ATTACHMENT POINT:

XXX / YYY — DISTANCE ABOVE (IN) REFERENCE POINT

YYY / XXX — REFERENCE POINT DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY

NUMBER OF CABLE(S)/LOOPS, DETECTOR AMPLIFIERS, GUYS — NUMBER OF FIBERS/TWISTED PAIRS — NUMBER OF RISER(S)/ CONDUIT(S) — DIAMETER OF RISER(S)/ CONDUIT(S) (IN)

TMP PHASE I - PHASE II, Steps 1 & 2

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL — NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 7/15/2015

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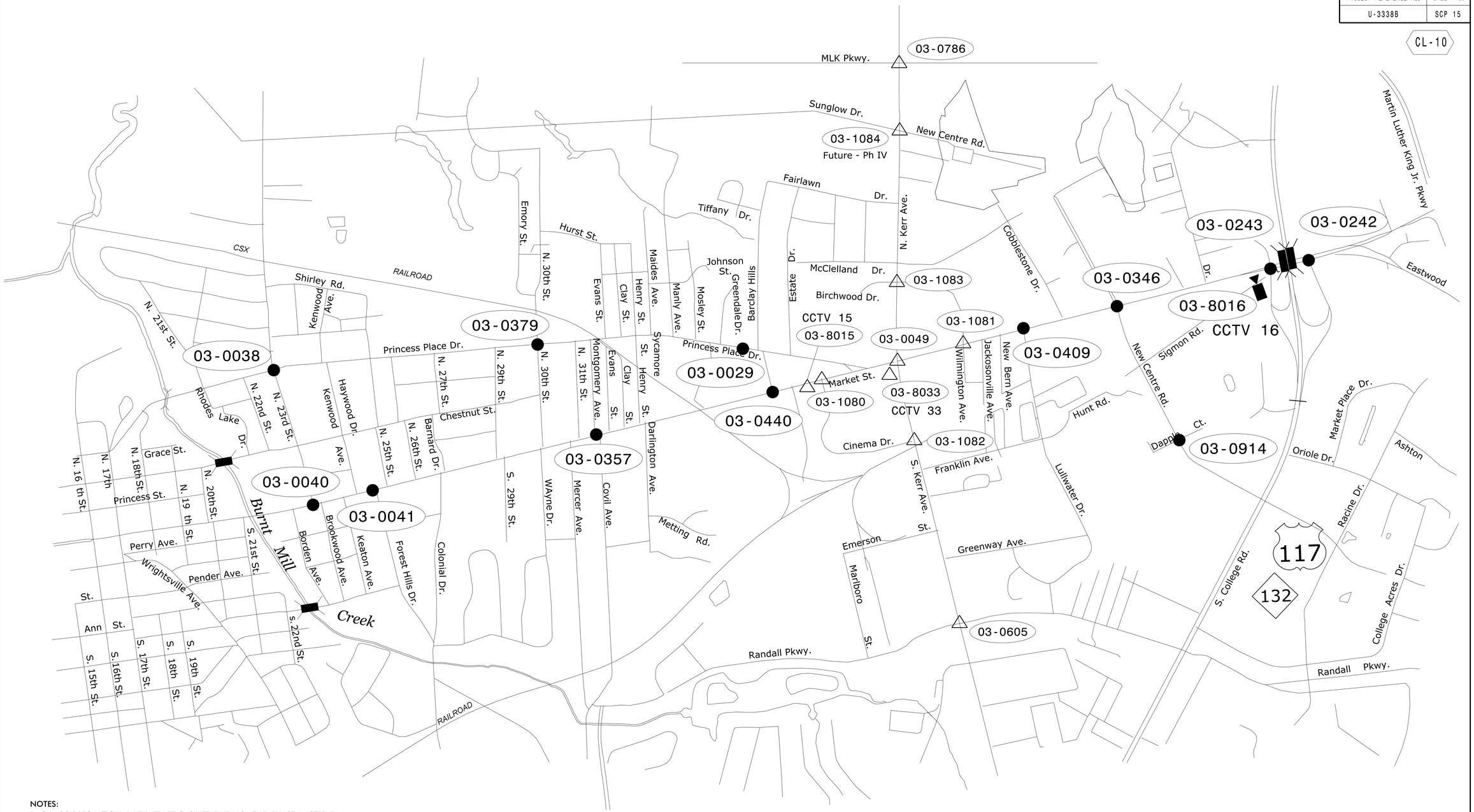
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 15

CL-10



NOTES:

1. IN COORDINATION WITH TRAFFIC SHIFT DURING TMP PHASE II, STEP 2, COMPLETE THE FOLLOWING WORK TO MIGRATE LOCATIONS SHOWN TO PROPOSED ETHERNET CHANNELS.
   - FOR SIGNALS AS SHOWN ABOVE WITH SOLID CIRCLE (●):
     - REPLACE TRANSCEIVER WITH FIELD ETHERNET SWITCH
     - REPLACE 2070-1B CPU MODULE WITH 2070-1E CPU MODULE
     - REPLACE EXISTING CONFLICT MONITORS
     - INSTALL SMFO JUMPERS
   - FOR CCTVS AS SHOWN ABOVE WITH SOLID CAMERA SYMBOL (■◄):
     - REPLACE TRANSCEIVER WITH FIELD ETHERNET SWITCH
     - REPLACE CCTV CAMERA WITH NEW CCTV CAMERA
     - MODIFY ADJACENT SPLICE AS SHOWN IN SPLICE PLANS
     - MODIFY INTERCONNECT CENTER AS SHOWN IN PLANS
     - INSTALL SMFO JUMPERS

2. SEE SHEETS CL-1 THRU CL-09 FOR DETAILS OF ITS WORK ON SIGNALS AND CCTV SHOWN WITH HOLLOW TRIANGLE (△)

WORK UNDER ICT

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

0 50
1"=50'

System Conversion To Ethernet TMP Phase II, Step 2

Division 03 New Hanover County Wilmington

PLAN DATE: November 2014	REVIEWED BY: JT Brooks		
PREPARED BY: LM Moon	REVIEWED BY: MB Toth		
REVISIONS		INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 7/15/2015
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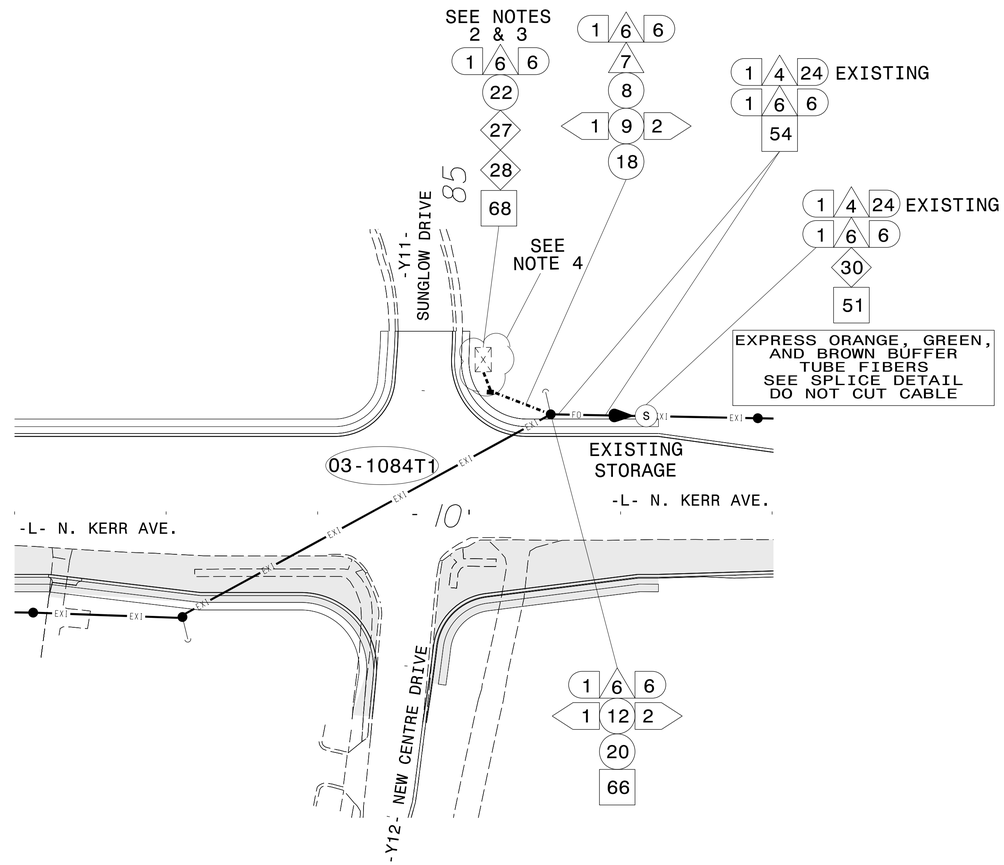
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 16

CL-11



NOTES:
1. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
2. INCORPORATE NEW SIGNAL INSTALLATION DIRECTLY INTO PROPOSED NETWORK ON PROPOSED ETHERNET CHANNEL.
3. CONNECT TO SYSTEM IN TMP PHASE IV, STEP 1 WHEN 03–1084T1 SIGNAL IS INSTALLED.
4. SIGNAL CABINET, CONDUIT AND JUNCTION BOX INSTALLED PER TEMPORARY SIGNAL PLAN UNLESS NOTED.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE	49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI–DIRECTIONAL ANTENNA
2	INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14	INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26	INSTALL DIGITAL VIDEO ENCODER	38	INSTALL STANDARD SIZE JUNCTION BOX	50	INSTALL WIRELESS DSL	62	NOT USED
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ATTACHMENT POINT:
XXX DISTANCE ABOVE (IN) / YYY REFERENCE POINT
YYY REFERENCE POINT / XXX DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY
NUMBER OF CABLE(S) /LOOPS, DETECTOR AMPLIFIERS, GUYS — NUMBER OF FIBERS/TWISTED PAIRS
NUMBER OF RISER(S)/ CONDUIT(S) — DIAMETER OF RISER(S)/ CONDUIT(S) (IN)

TMP PHASE IV, Step 1

ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310 RALEIGH, NORTH CAROLINA 27609 (919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems
750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH
DocuSigned by: Melissa B. Toth 7/15/2015
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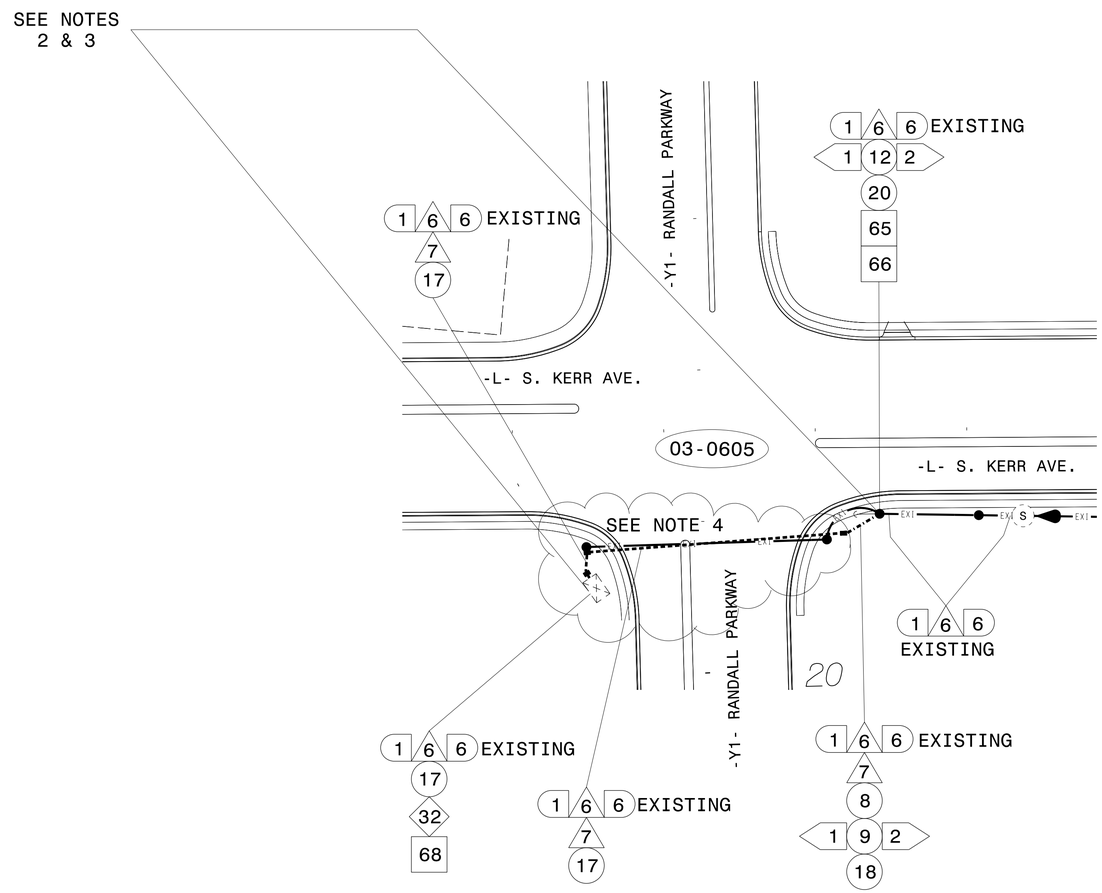
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 17

CL-12



NOTES:

1. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
2. DISCONNECT AND PULL BACK EXISTING 6-FIBER DROP CABLE FROM EXISTING CABINET TO POLE SHOWN. REROUTE DROP CABLE BACK TO CABINET AS SHOWN.
3. REMOVE MESSENGER SUPPORTING EXISTING DROP CABLE AFTER DROP CABLE IS REMOVED.
4. SIGNAL CABINET, CONDUIT AND JUNCTION BOXES INSTALLED PER SIGNAL PLANS UNLESS NOTED.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE	49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI-DIRECTIONAL ANTENNA
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CONSTRUCTION NOTE SYMBOLOGY KEY

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NUMBER OF FIBERS/TWISTED PAIRS — XX

NUMBER OF RISER(S)/ CONDUIT(S) — XX

DIAMETER OF RISER(S)/ CONDUIT(S) (IN) — XX

TMP FINAL

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE: 0 50 — 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 022516 ENGINEER LISA M. MOON

DocuSigned by: Lisa M. Moon 68E63C0DA8F4E3... 12/19/14 DATE

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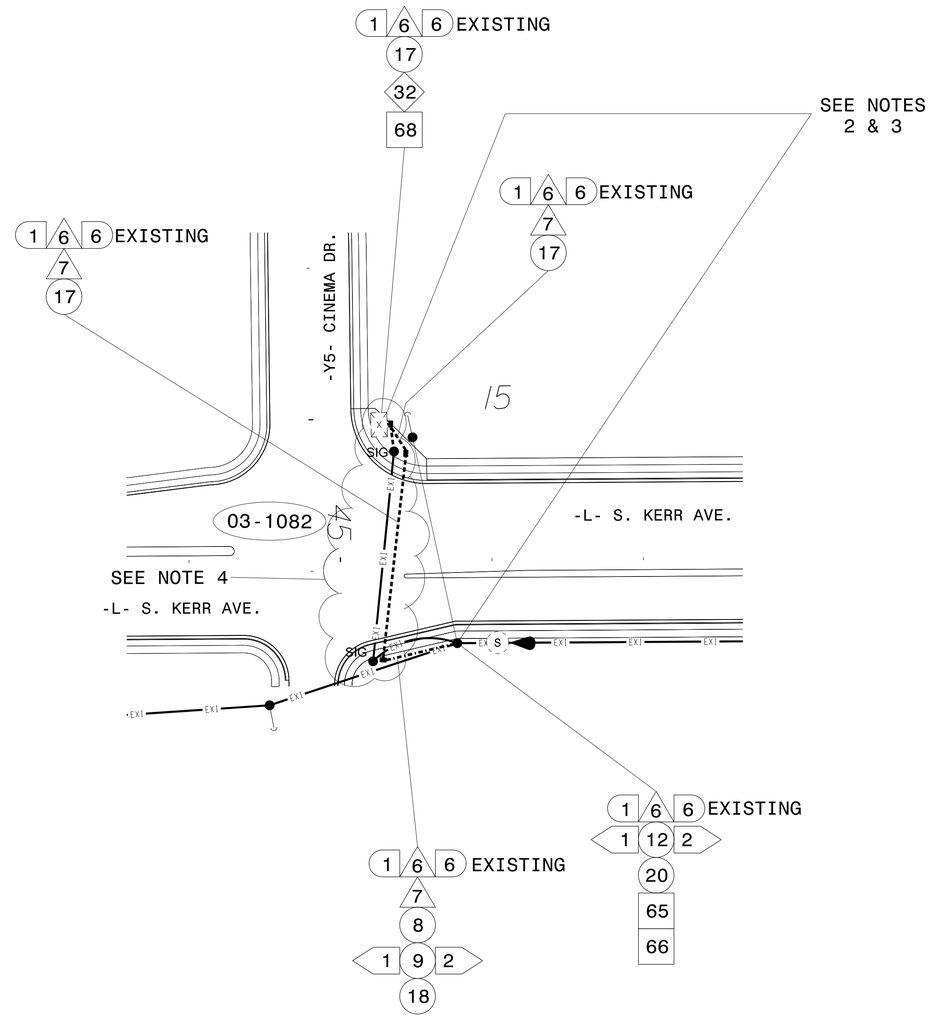
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 18

CL-13



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TMP FINAL

ATKINS
1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

Prepared for the Offices of:

Transportation Mobility and Safety Division — STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION — Intelligent Transportation Systems

750 Greenfield Parkway, Garner, NC 27529

SCALE 0 50 1"=50'

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 7/15/2015
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CADD Filename: U3338B_CL_03_FINAL.dgn

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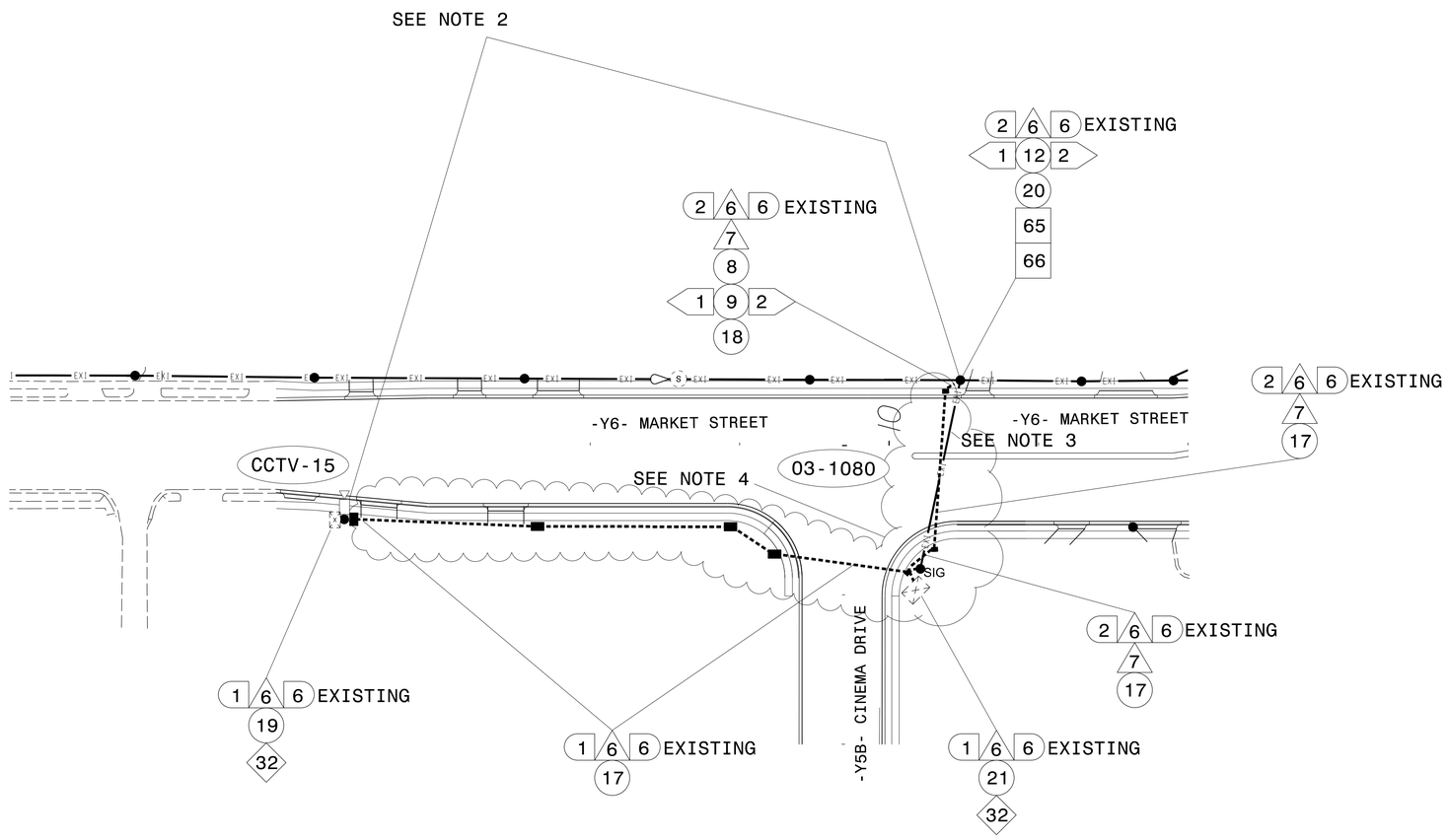
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 19

CL-14



NOTES:
1. SEAL ALL CONDUIT ENDS WITH DUCT AND CONDUIT SEALER, AT ALL JUNCTION BOX/CABINET ENTRANCES.
2. DISCONNECT AND PULL BACK EXISTING 6-FIBER DROP CABLES FROM EXISTING SIGNAL CABINET TO POLE SHOWN. REROUTE DROP CABLES BACK TO SIGNAL CABINET AS SHOWN.
3. REMOVE MESSENGER SUPPORTING EXISTING DROP CABLE AFTER DROP CABLE IS REMOVED.
4. SIGNAL CABINET, CONDUIT AND JUNCTION BOXES INSTALLED PER SIGNAL PLANS UNLESS NOTED.

1	INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	13	INSTALL HEAT SHRINK TUBING RETROFIT KIT	25	INSTALL NEW RISER INTO POLE MOUNTED CABINET	37	INSTALL CCTV WOOD POLE
2	INSTALL REA, PE – 38, (FIGURE – 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE	14	INSTALL HIGH DENSITY POLYETHYLENE CONDUIT	26	INSTALL DIGITAL VIDEO ENCODER	38	INSTALL STANDARD SIZE JUNCTION BOX
3	INSTALL CATEGORY 5E CABLE	15	DIRECTIONAL DRILL CONDUIT	27	INSTALL NEW ETHERNET EDGE SWITCH IN CABINET	39	INSTALL SPECIAL–SIZED JUNCTION BOX
4	INSTALL SMFO CABLE	16	BORE AND JACK CONDUIT	28	INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET	40	INSTALL OVERSIZED JUNCTION BOX
5	INSTALL COAXIAL ANTENNA CABLE	17	INSTALL CABLE(S) IN EXISTING CONDUIT	29	INSTALL UNDERGROUND SPLICE ENCLOSURE	41	REMOVE EXISTING JUNCTION BOX
6	INSTALL FIBER–OPTIC DROP CABLE	18	INSTALL CABLE(S) IN NEW CONDUIT	30	INSTALL AERIAL SPLICE ENCLOSURE	42	INSTALL WOOD POLE
7	INSTALL TRACER WIRE	19	INSTALL CABLE(S) IN EXISTING RISER(S)	31	INSTALL SPLICE CABINET	43	REMOVE EXISTING WOOD POLE
8	TRENCH	20	INSTALL CABLE(S) IN NEW RISER(S)	32	MODIFY EXISTING SPLICE ENCLOSURE OR INTERCONNECT CENTER	44	INSTALL AERIAL GUY ASSEMBLY
9	INSTALL PVC CONDUIT	21	INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS	33	REMOVE EXISTING SPLICE /HUB /CCTV CABINET	45	INSTALL STANDARD GUY ASSEMBLY
10	INSTALL RIGID, GALVANIZED STEEL CONDUIT	22	INSTALL NEW CONDUIT INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	34	INSTALL CABINET FOUNDATION	46	INSTALL SIDEWALK GUY ASSEMBLY
11	INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD	23	INSTALL NEW RISER INTO CABINET BASE (USE EX CONDUIT STUBOUTS WHEN AVAILABLE)	35	REMOVE EXISTING CABINET FOUNDATION	47	INSTALL MESSENGER CABLE
12	INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING	24	INSTALL NEW CONDUIT INTO POLE MOUNTED CABINET	36	INSTALL CCTV CAMERA ASSEMBLY	48	REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE

49	REMOVE EXISTING COMMUNICATIONS CABLE	61	INSTALL UNI–DIRECTIONAL ANTENNA				
50	INSTALL WIRELESS DSL	62	NOT USED				
51	INSTALL CABLE STORAGE GUIDE(S) [SNOW SHOE(S)] AND STORE 100 FEET OF EACH CABLE	63	INSTALL 900 MHZ ETHERNET RADIO				
52	INSTALL DELINEATOR MARKER	64	INTERCEPT AND REROUTE EXISTING CONDUITS				
53	STORE 50 FEET OF COMMUNICATIONS CABLE (EACH CABLE)	65	BOND MESSENGER TO POLE GROUND				
54	LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE	66	BOND RISER TO POLE GROUND				
55	LASH CABLE(S) TO EXISTING MESSENGER CABLE	67	BOND TRACER WIRE TO POLE GROUND				
56	LASH CABLE(S) TO NEW MESSENGER CABLE	68	BOND TRACER WIRE TO EQUIPMENT GROUND BUS				
57	MODIFY EXISTING ELECTRICAL SERVICE FOR CCTV	69	REMOVE EXISTING CCTV CAMERA ASSEMBLY				
58	INSTALL NEW ELECTRICAL SERVICE FOR CCTV	70	INSTALL RELOCATED WIRELESS SYSTEM				
59	INSTALL NEW POLE MOUNTED CCTV CABINET						
60	INSTALL NEW BASE MOUNTED CCTV CABINET						

ATTACHMENT POINT:

XXX / YYY — DISTANCE ABOVE (IN) / REFERENCE POINT

YYY / XXX — REFERENCE POINT / DISTANCE BELOW (IN)

CONSTRUCTION NOTE SYMBOLOGY KEY

NUMBER OF CABLE(S) /LOOPS, DETECTOR AMPLIFIERS, GUYS — NUMBER OF FIBERS/TWISTED PAIRS

NUMBER OF RISER(S)/ CONDUIT(S) — DIAMETER OF RISER(S)/ CONDUIT(S) (IN)

TMP FINAL

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DEPARTMENT OF TRANSPORTATION
Intelligent Transportation System

750 Greenfield Parkway, Garner, NC 27529

U-3338B - Kerr Avenue Cable Layout Plans

Division 03 New Hanover County Wilmington

PLAN DATE:	April 2014	REVIEWED BY:	LM Moon
PREPARED BY:	AM THIGPEN	REVIEWED BY:	MB Toth

REVISIONS	INIT.	DATE

SCALE 0 50 1"=50'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 025892 ENGINEER MELISSA B. TOTH

DocuSigned by: Melissa B. Toth 7/15/2015
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PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 20

SPLICE DETAIL

TMC

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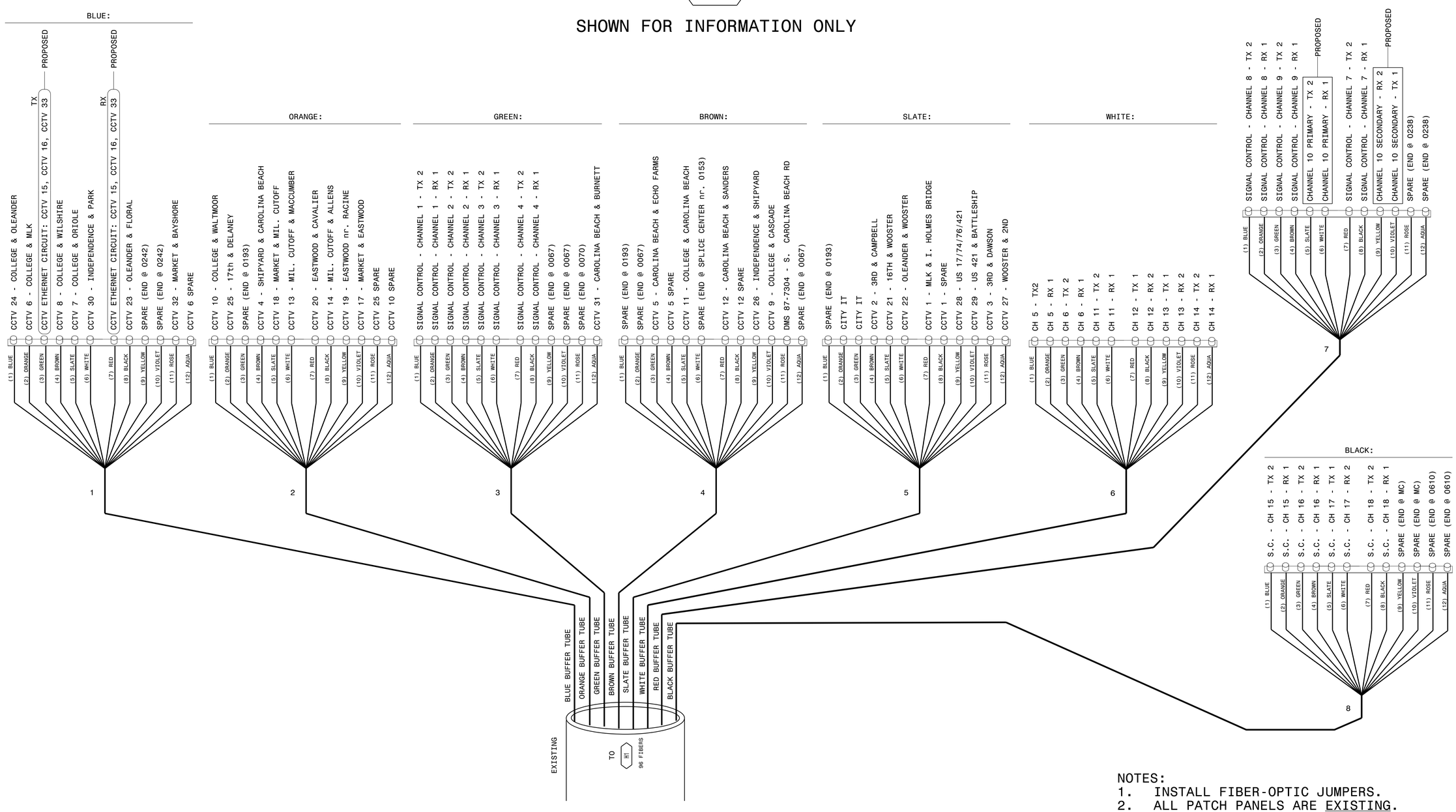

NOTES:
1. INSTALL FIBER-OPTIC JUMPERS.
2. ALL PATCH PANELS ARE EXISTING.
3. FIELD-VERIFY EXISTING TERMINATIONS.

LEGEND

COLOR CODE TIA/EIA 598-B	
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X = FUSION SPLICE INDIVIDUAL FIBER

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NOTES

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CITY OF WILMINGTON
ATKINS 1616 EAST MILLBROOK ROAD, SUITE 310
RALEIGH, NORTH CAROLINA 27609
(919) 876-6888 NCBEES #F-0326

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

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013	REVIEWED BY:
PREPARED BY:	REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED A. BADGETT
DocuSigned by: Alf Badgett 1/5/2015
DOCUMENT PROOF
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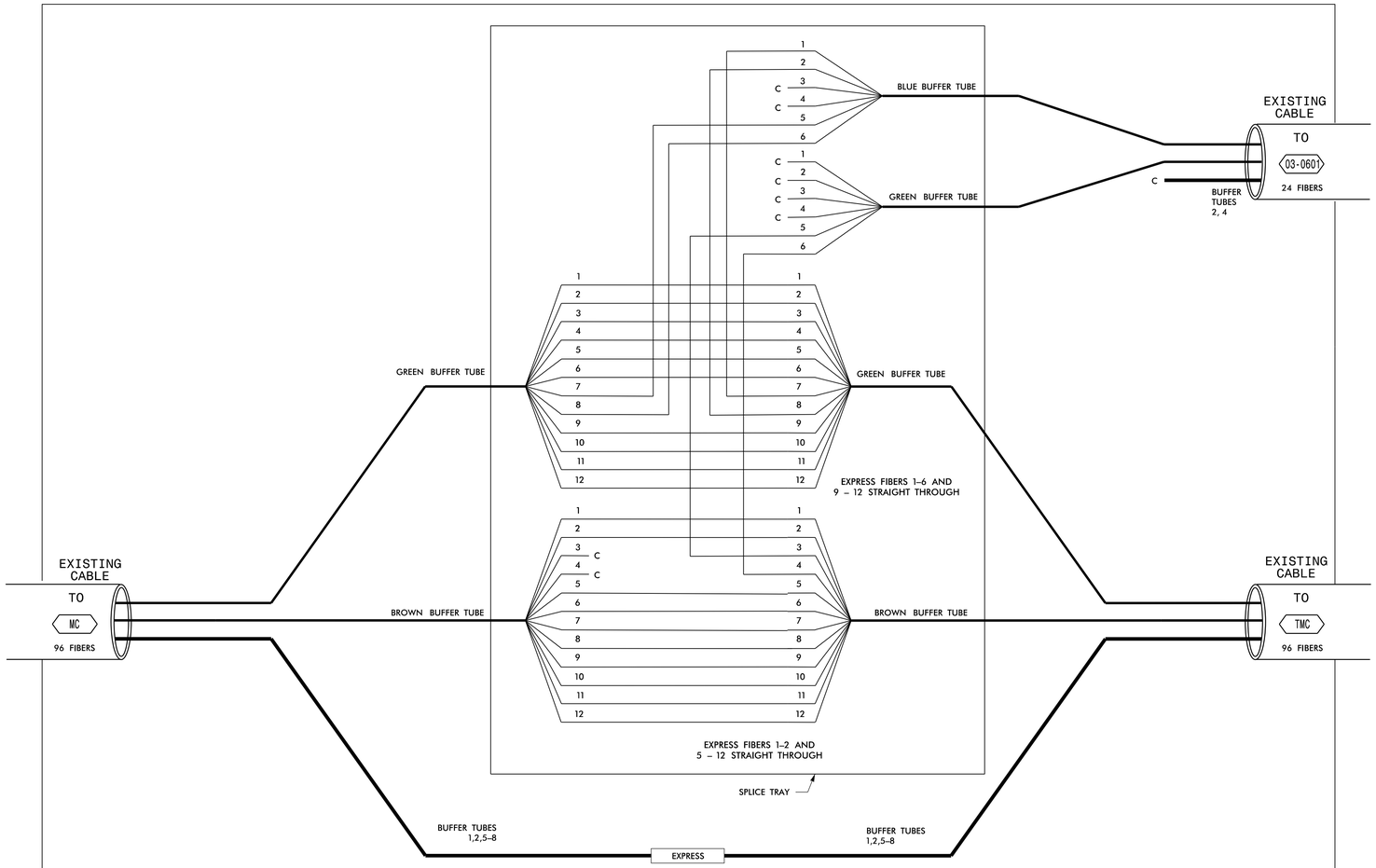
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 21

SPLICE ENCLOSURE NO.

H1

CAROLINA BEACH RD AT SUNNYVALE RD



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

SCALE: NONE

Kerr Avenue
Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER HENRY ALFRED BADGETT

DocuSigned by: Aly Badgett 1/5/2015
SIGNATURE DATE

SIG. INVENTORY NO.

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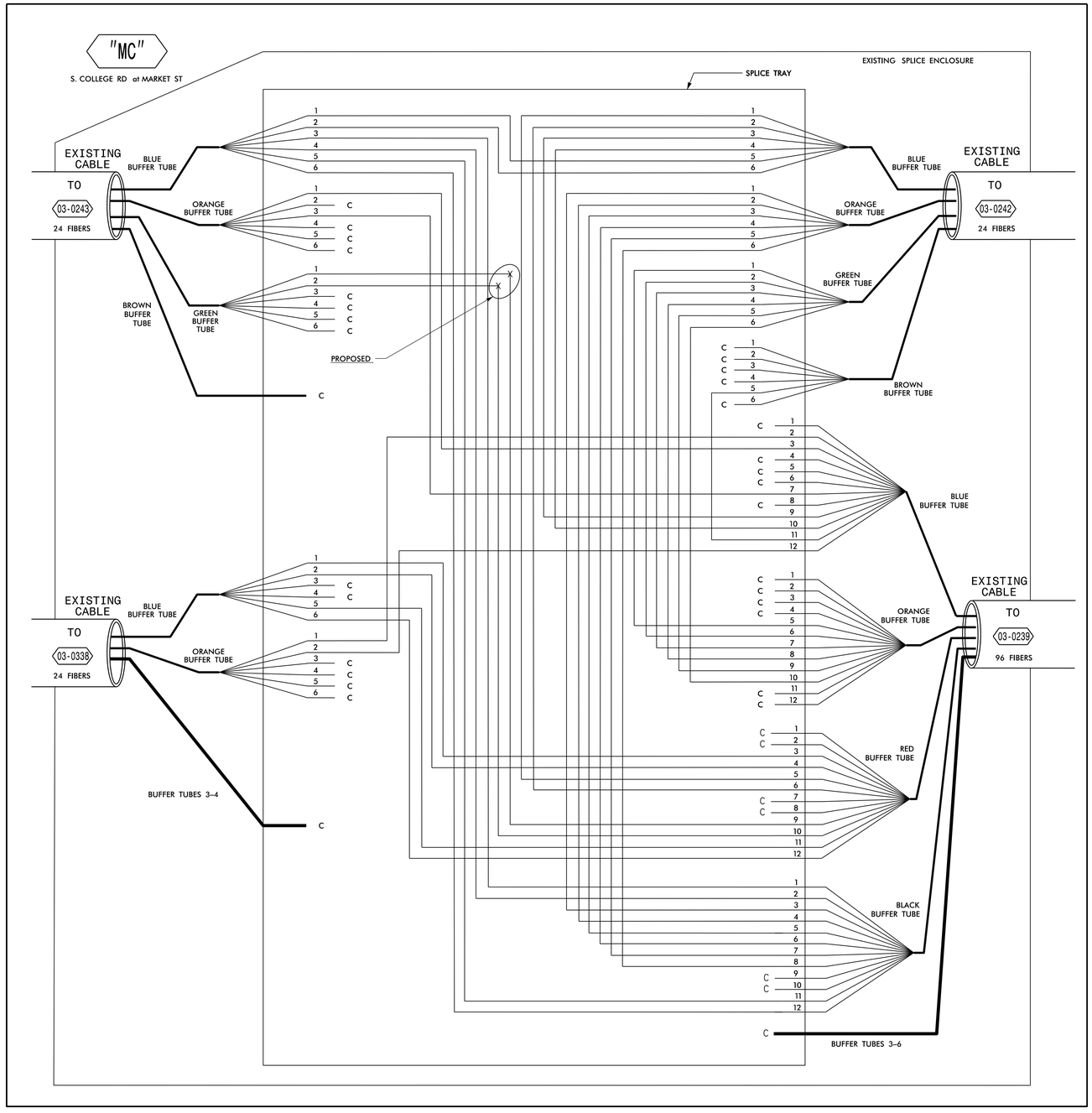
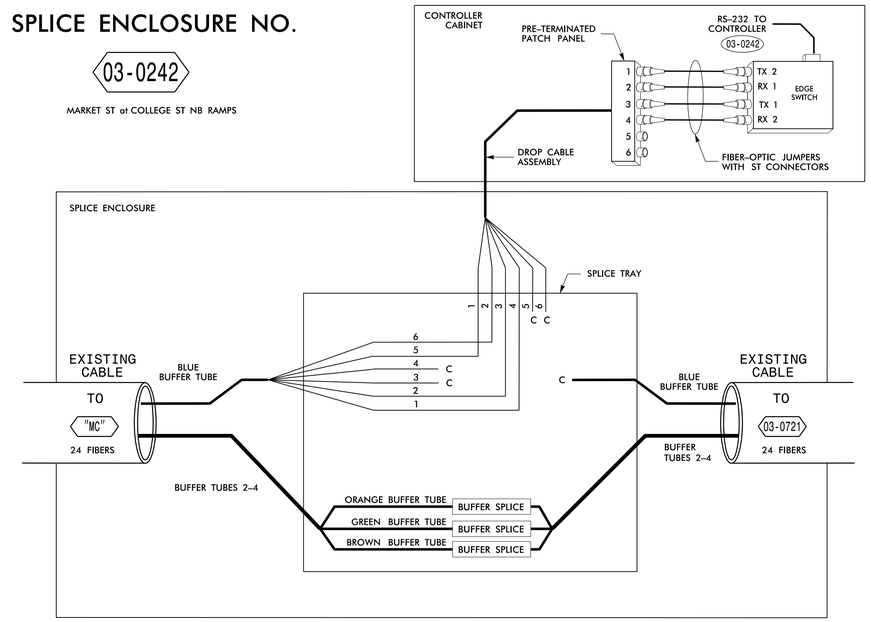
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 22



SPLICE ENCLOSURE NO. 03-0242

MARKET ST at COLLEGE ST NB RAMPS



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Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013	REVIEWED BY:
PREPARED BY:	REVIEWED BY:

SCALE: NONE

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015

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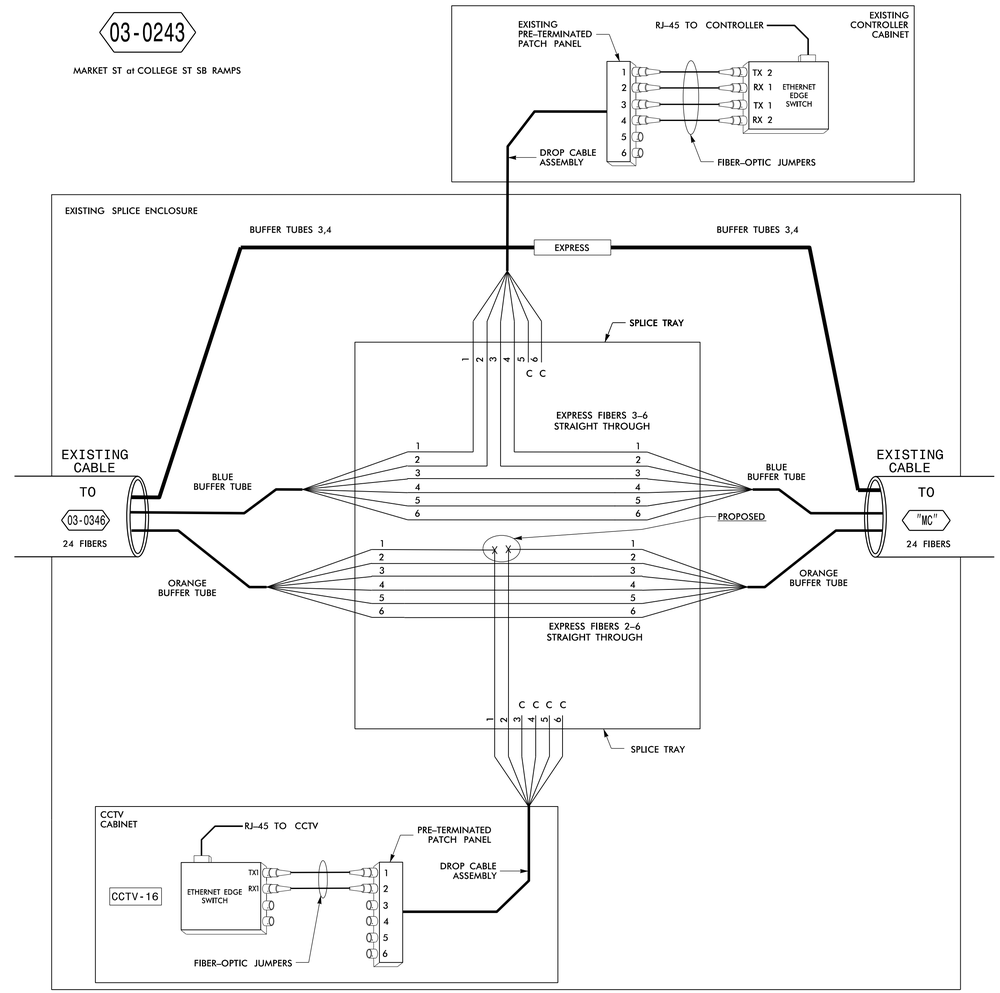
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 23

SPLICE ENCLOSURE NO.

03-0243

MARKET ST at COLLEGE ST SB RAMPS



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

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013	REVIEWED BY:
PREPARED BY:	REVIEWED BY:

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER FRANK ALFRED BADGETT

DocuSigned by:
Alf Badgett 1/5/2015
DATE

SIG. INVENTORY NO.

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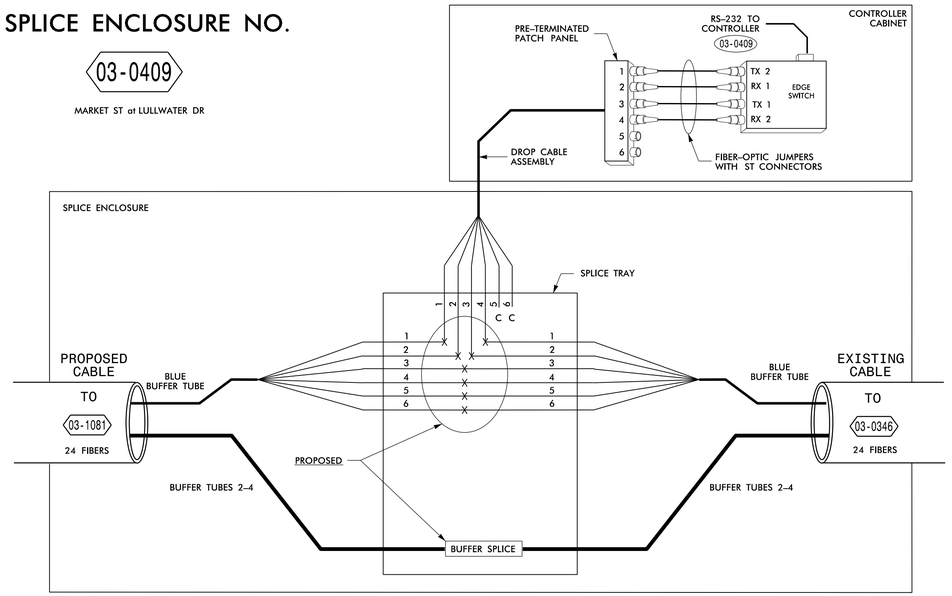
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 24

SPLICE ENCLOSURE NO.

03-0409

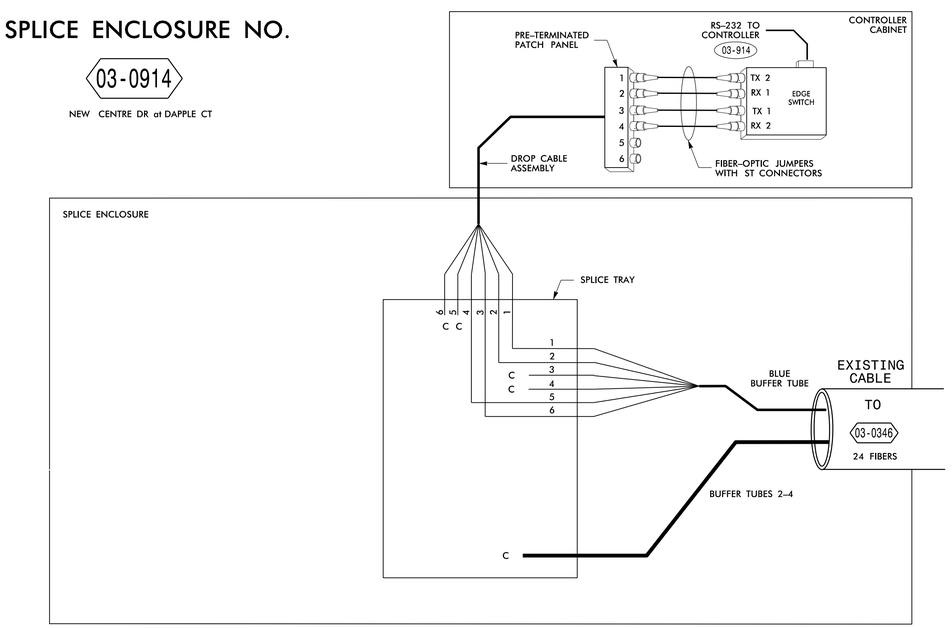
MARKET ST at LULLWATER DR



SPLICE ENCLOSURE NO.

03-0914

NEW CENTRE DR at DAPPLE CT



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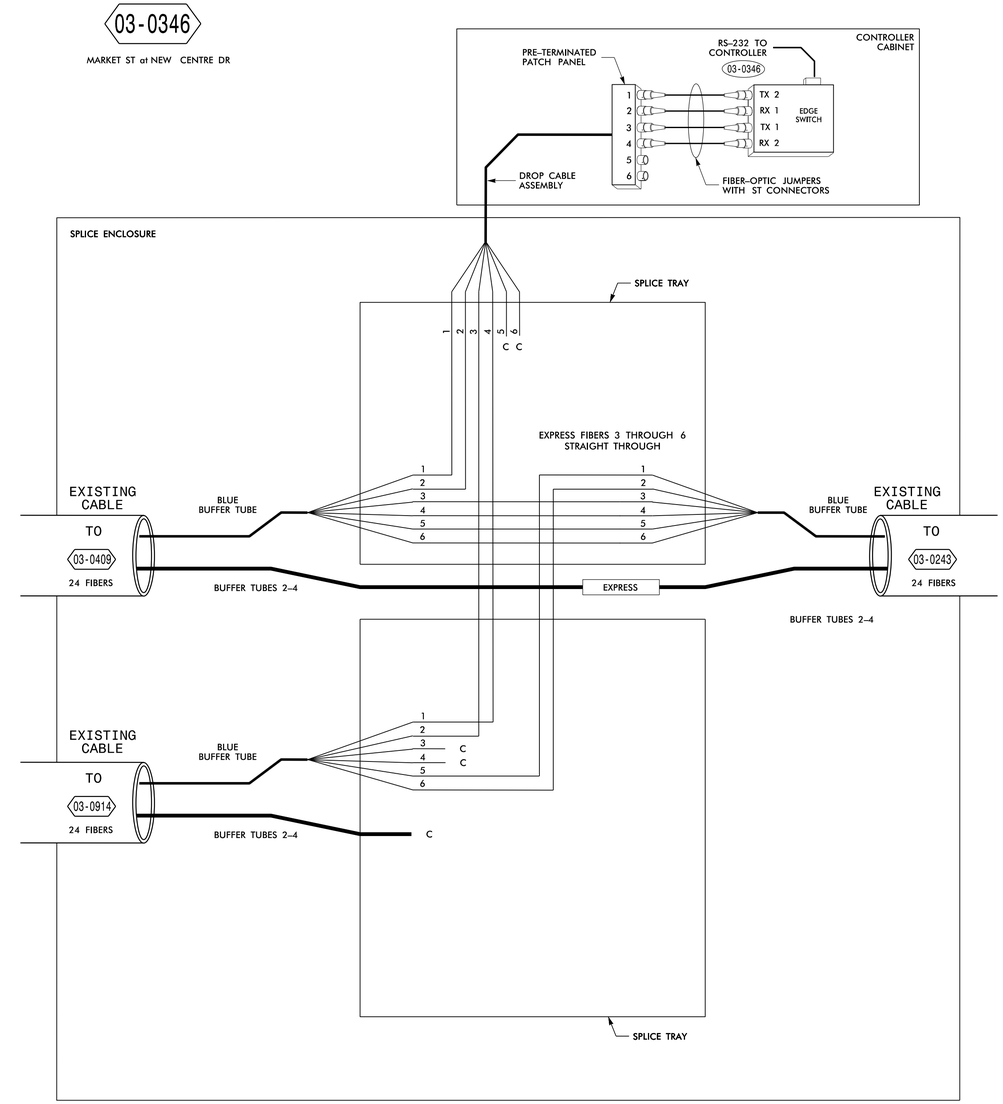
SPLICE ENCLOSURE NO.

03-0346

MARKET ST at NEW CENTRE DR



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

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015

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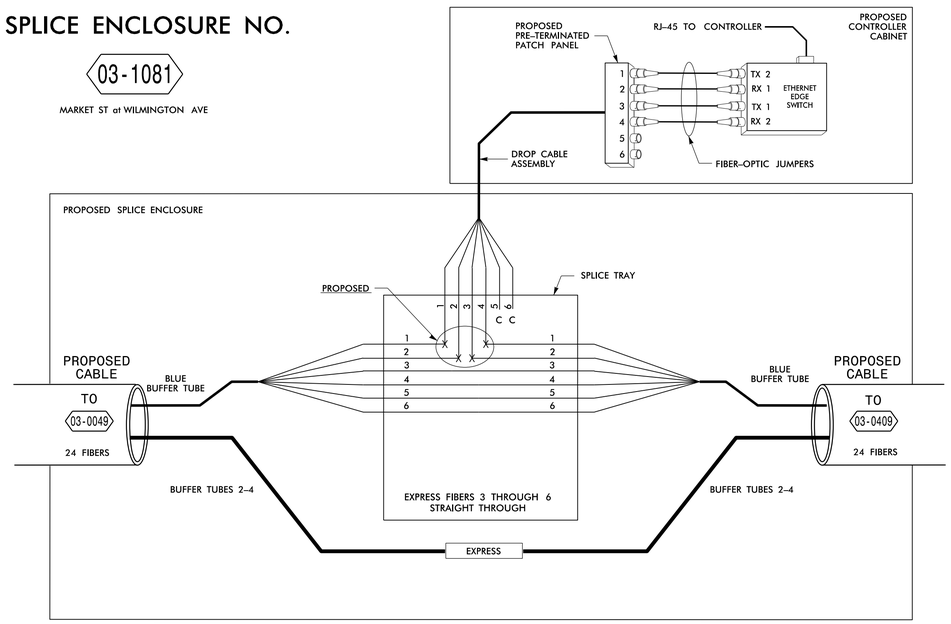
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 25

SPLICE ENCLOSURE NO.

03-1081

MARKET ST at WILMINGTON AVE



NOTES:
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2. FIELD-VERIFY EXISTING TERMINATIONS.

LEGEND

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

SCALE: NONE

Kerr Avenue
Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015

SIGNATURE AND DATE

SIG. INVENTORY NO.

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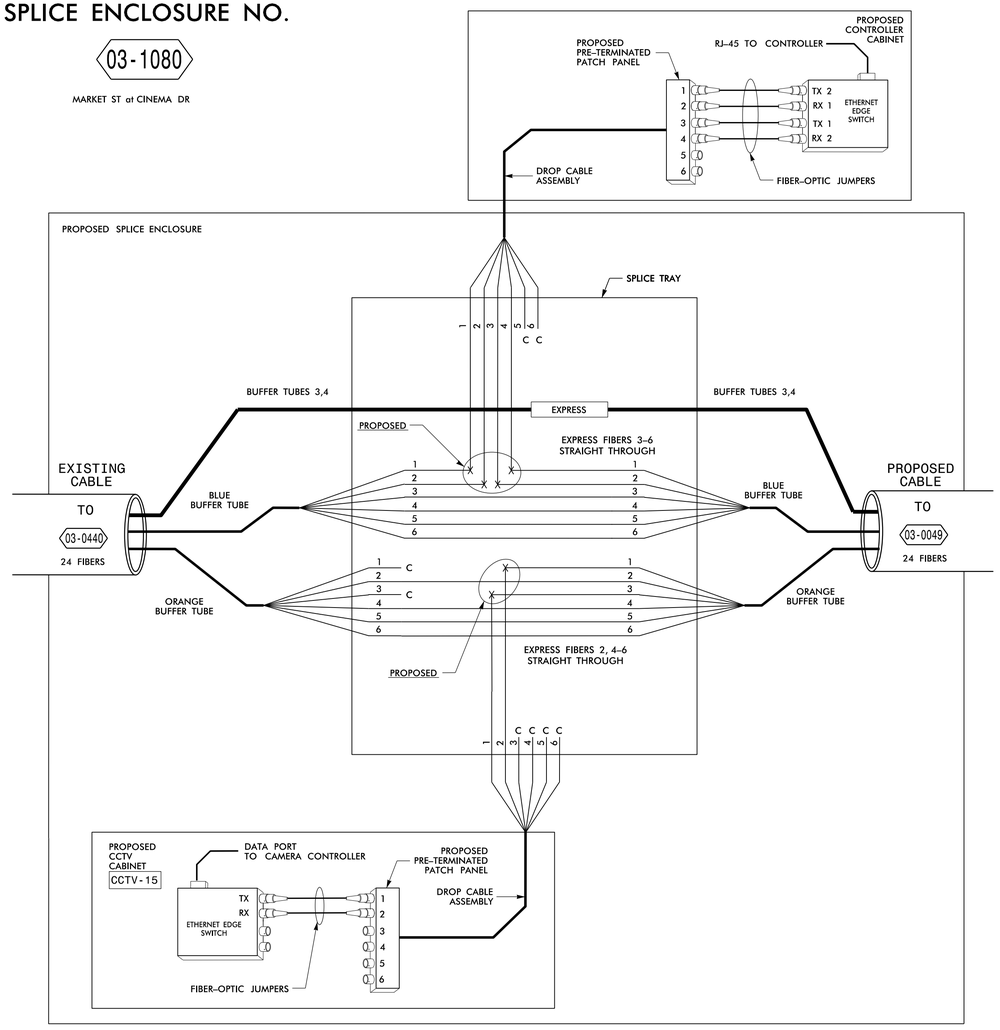
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 26

SPLICE ENCLOSURE NO.

03-1080

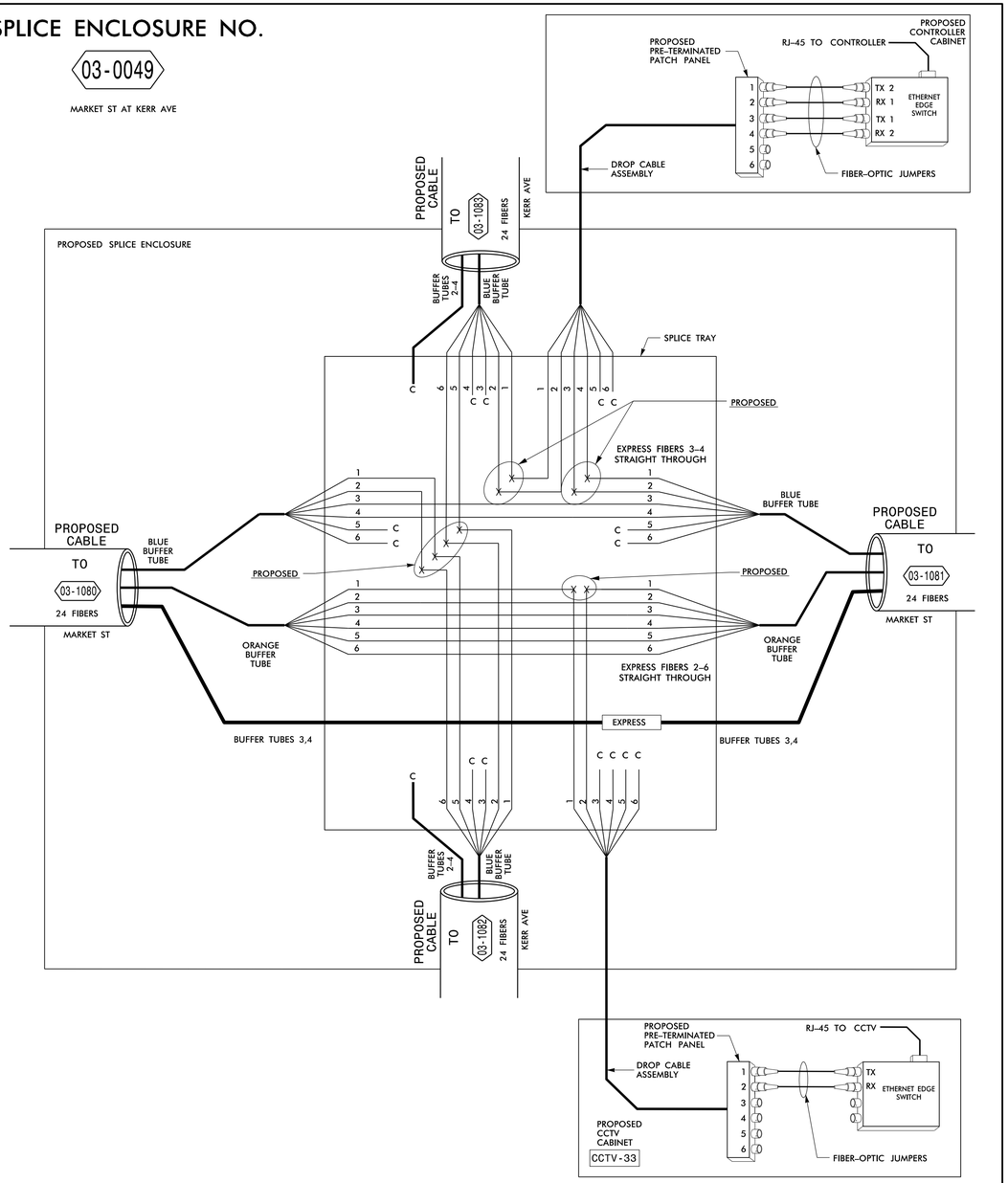
MARKET ST at CINEMA DR



SPLICE ENCLOSURE NO.

03-0049

MARKET ST AT KERR AVE



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1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
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4. ALL SPLICES EXISTING UNLESS NOTED AS PROPOSED.

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(919) 876-6888 NCBEES #F-0326

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

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013	REVIEWED BY:
PREPARED BY:	REVIEWED BY:

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER HENRY ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015 DATE

SIG. INVENTORY NO.

DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

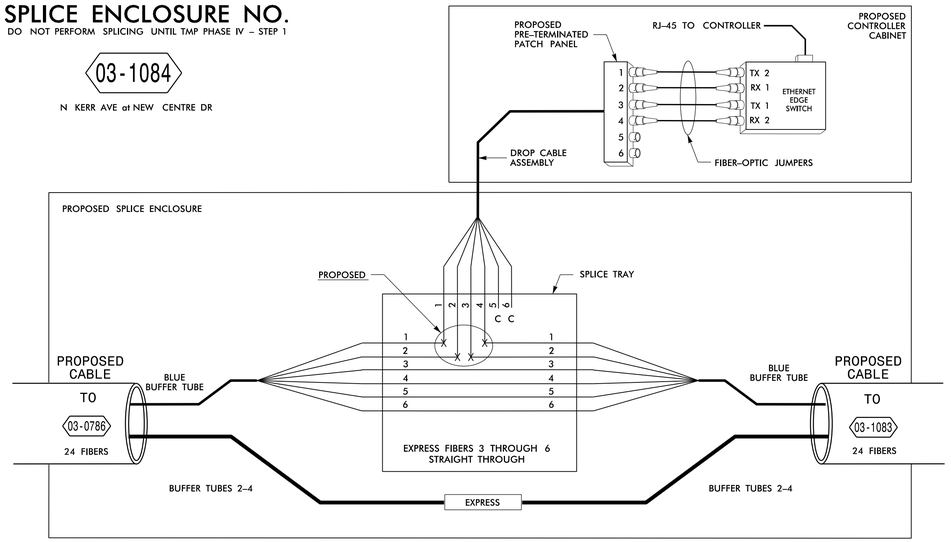
PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 27

SPLICE ENCLOSURE NO.

DO NOT PERFORM SPLICING UNTIL TMP PHASE IV – STEP 1

03-1084

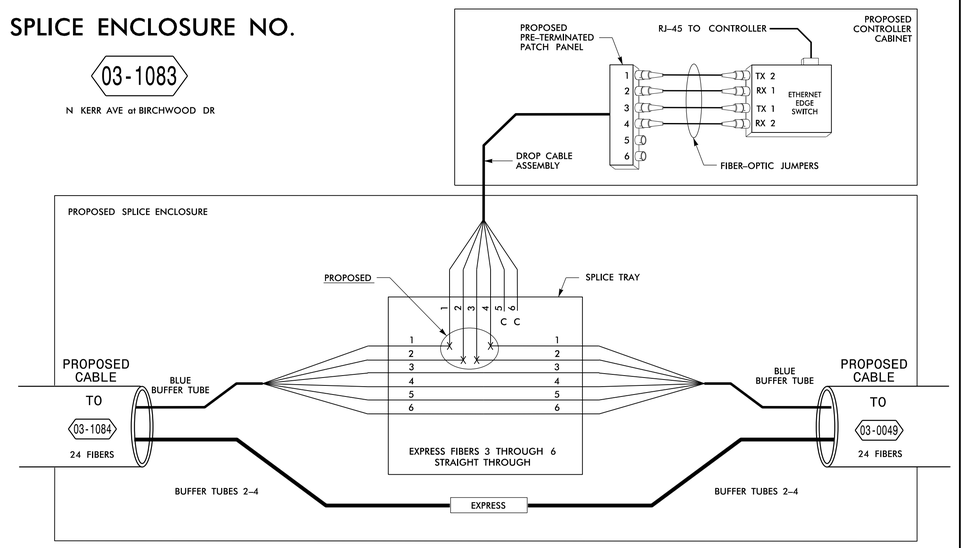
N KERR AVE at NEW CENTRE DR



SPLICE ENCLOSURE NO.

03-1083

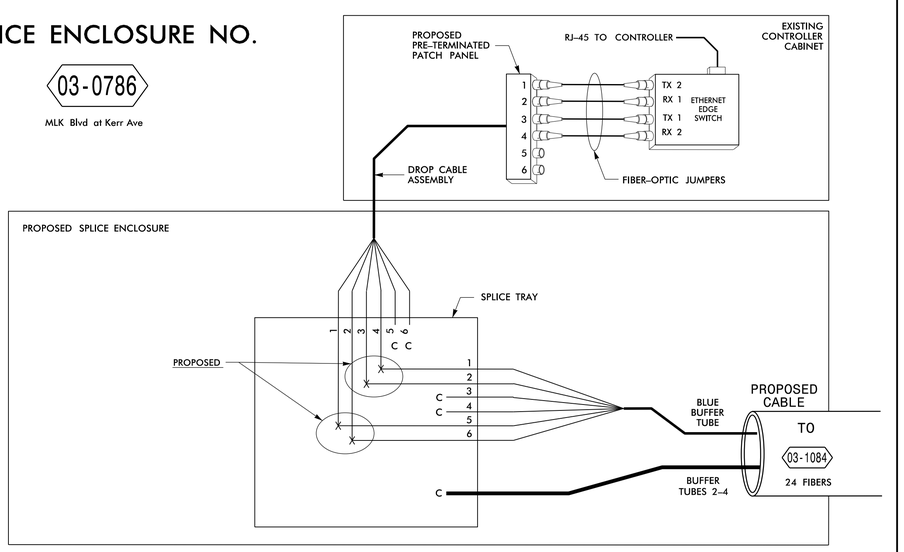
N KERR AVE at BIRCHWOOD DR



SPLICE ENCLOSURE NO.

03-0786

MLK Blvd at Kerr Ave



NOTE:
1. INSTALL FIBER-OPTIC JUMPERS.

LEGEND

COLOR CODE TIA/EIA 598-B	
(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

X = FUSION SPLICE INDIVIDUAL FIBER

C = CAP AND SEAL

EXPRESS = EXPRESS ENTIRE BUFFER TUBE THROUGH WITHOUT CUTTING

BUFFER SPLICE = SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

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SCALE: NONE

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 019962 HENRY ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015 DATE

SIG. INVENTORY NO.

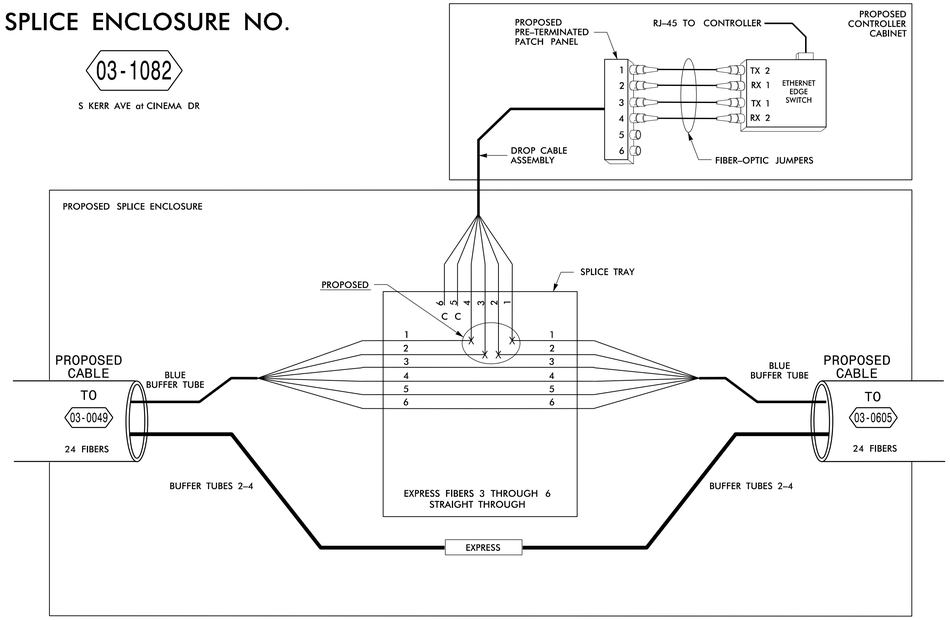
DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 28

SPLICE ENCLOSURE NO.

03-1082

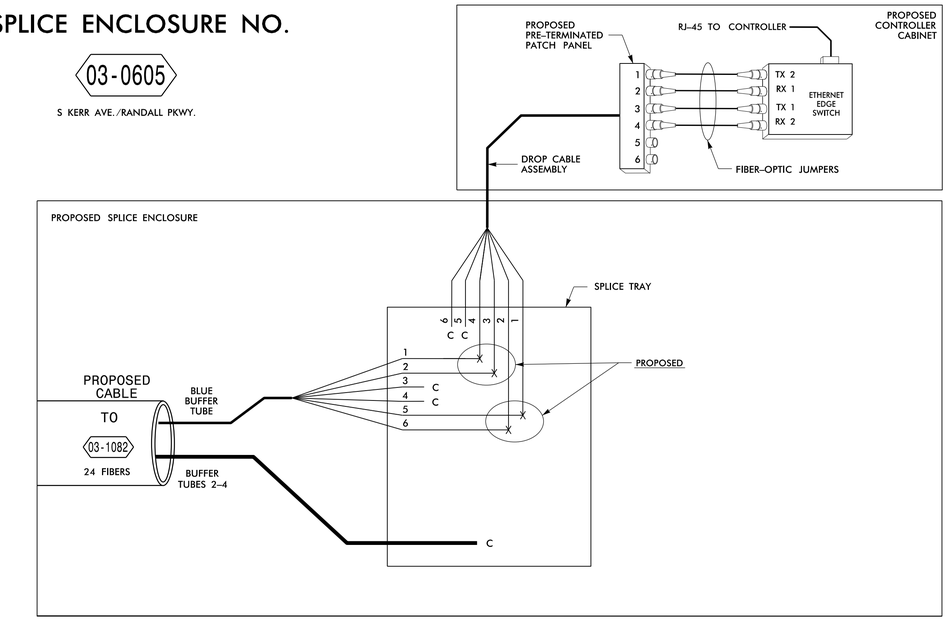
S KERR AVE at CINEMA DR



SPLICE ENCLOSURE NO.

03-0605

S KERR AVE./RANDALL PKWY.



NOTES:
1. INSTALL FIBER-OPTIC JUMPERS.

LEGEND

COLOR CODE TIA/EIA 598-B

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Signal Design Section
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SCALE: NONE

Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER HENRY FRED BADGETT

DocuSigned by: Hf Badgett 1/5/2015

SIGNATURE DATE

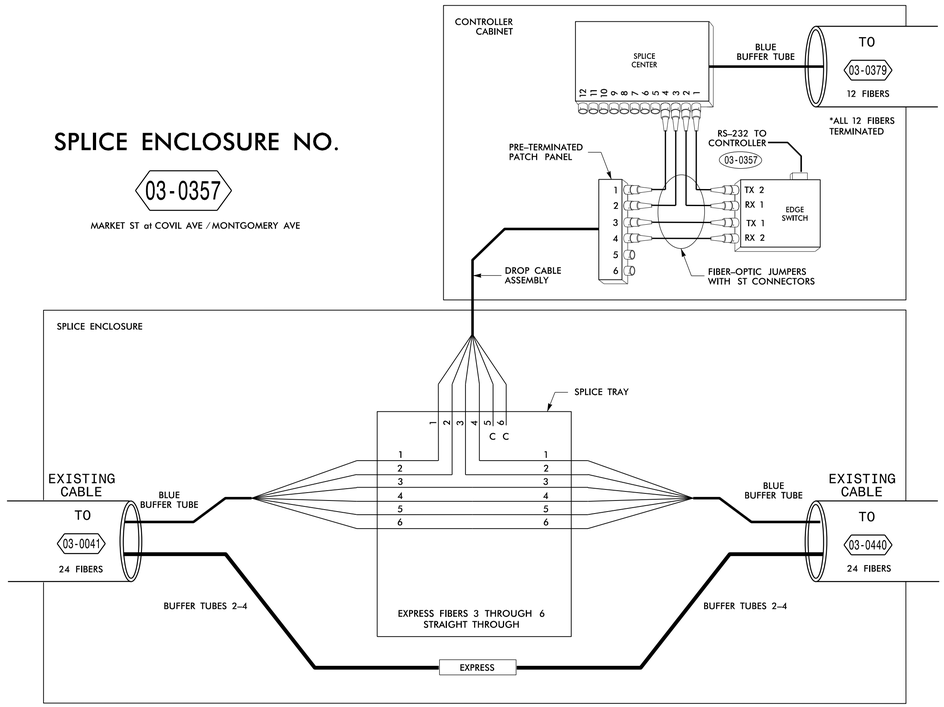
SIG. INVENTORY NO.

DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 29

SPLICE ENCLOSURE NO. 03-0357

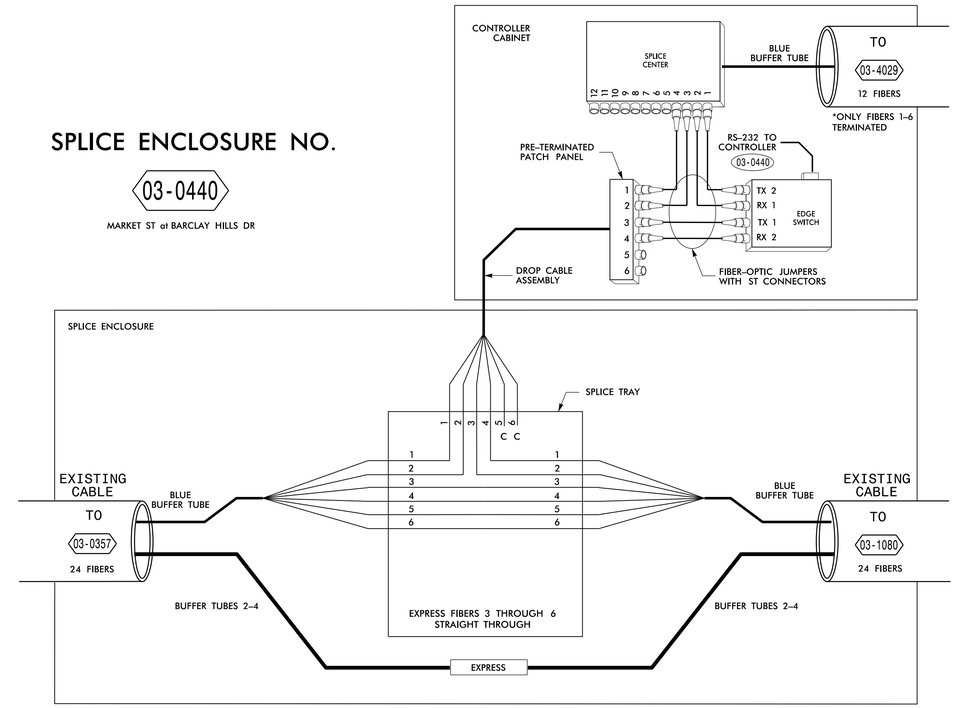
MARKET ST at COVIL AVE / MONTGOMERY AVE



SHOWN FOR INFORMATION ONLY

SPLICE ENCLOSURE NO. 03-0440

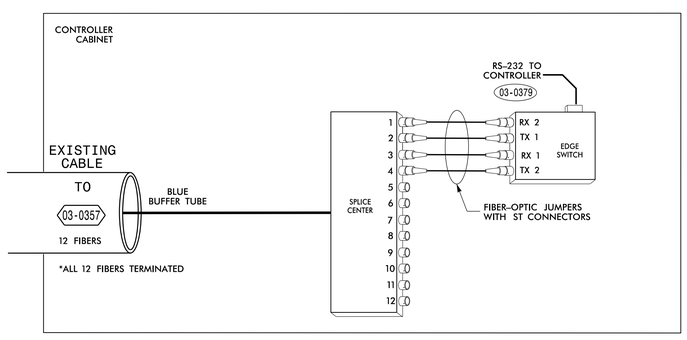
MARKET ST at BARCLAY HILLS DR



SHOWN FOR INFORMATION ONLY

SPLICE ENCLOSURE NO. 03-0379

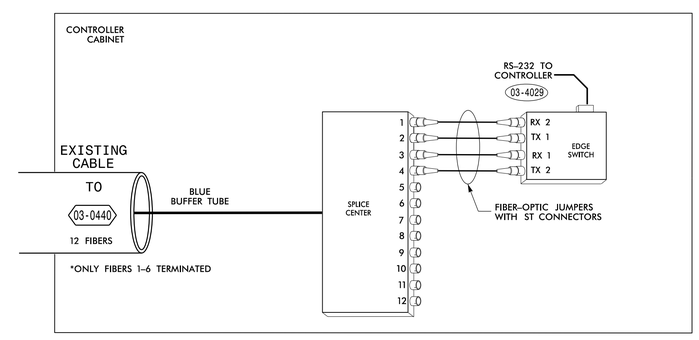
PRINCESS PLACE DR @ 30TH ST



SHOWN FOR INFORMATION ONLY

SPLICE ENCLOSURE NO. 03-4029

PRINCESS PLACE DR @ BARCLAY HILLS FIRE STATION



SHOWN FOR INFORMATION ONLY

LEGEND

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Kerr Avenue Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013	REVIEWED BY:
PREPARED BY:	REVIEWED BY:

SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015 DATE

SIG. INVENTORY NO.

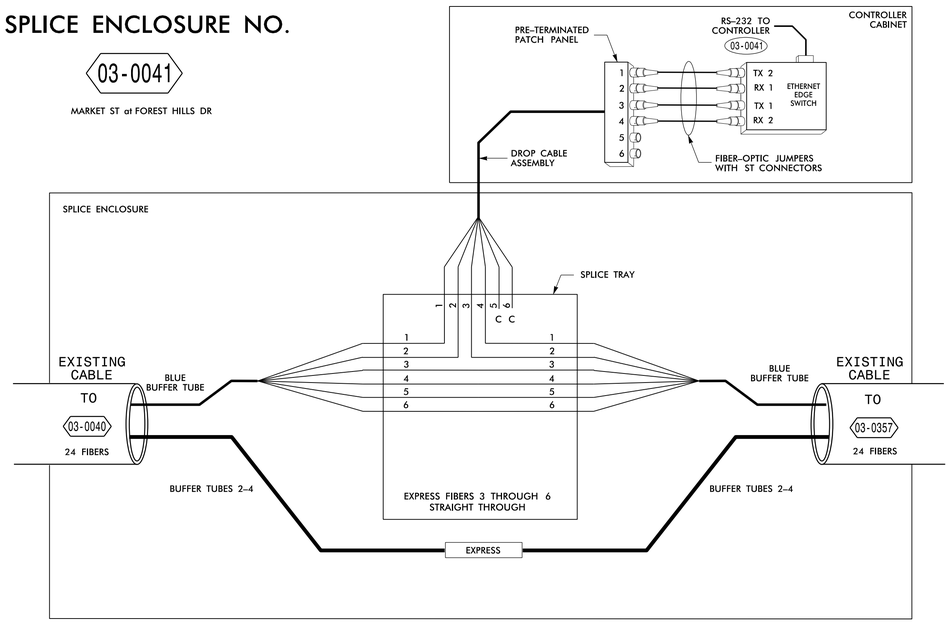
DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 30

SPLICE ENCLOSURE NO.

03-0041

MARKET ST at FOREST HILLS DR



SHOWN FOR INFORMATION ONLY

LEGEND

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SCALE: NONE

Kerr Avenue
Splicing Details

Division 03 New Hanover County Wilmington

PLAN DATE: August 2013 REVIEWED BY:

PREPARED BY: REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 019962 ALFRED BADGETT

DocuSigned by: Alf Badgett 1/5/2015

DOCUMENT NO. SIG. INVENTORY NO.

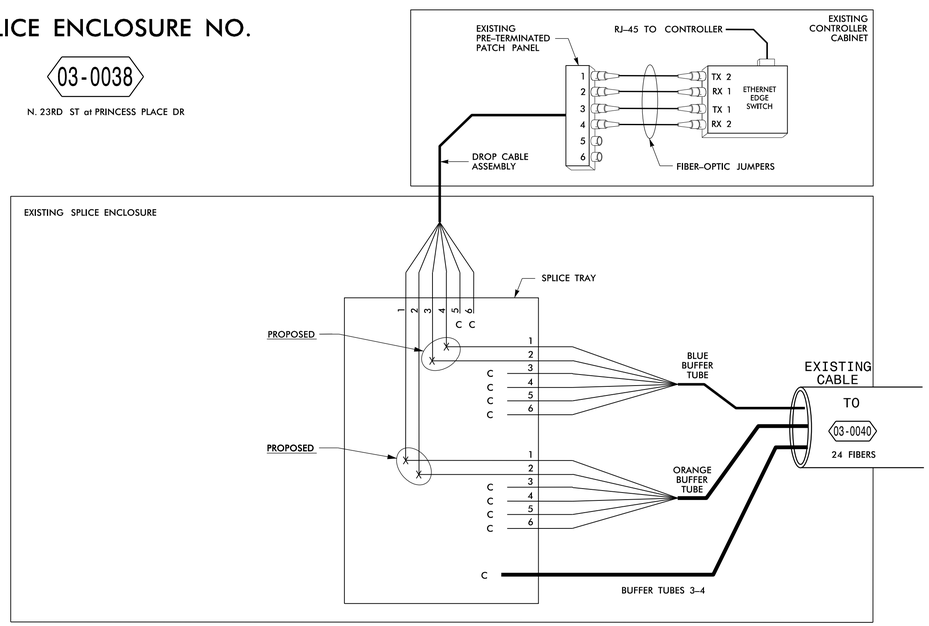
DocuSign Envelope ID: 14889495-FE2F-4DE3-9423-B0B68DBA0C66

PROJECT REFERENCE NO.	SHEET NO.
U-3338B	SCP 31

SPLICE ENCLOSURE NO.

03-0038

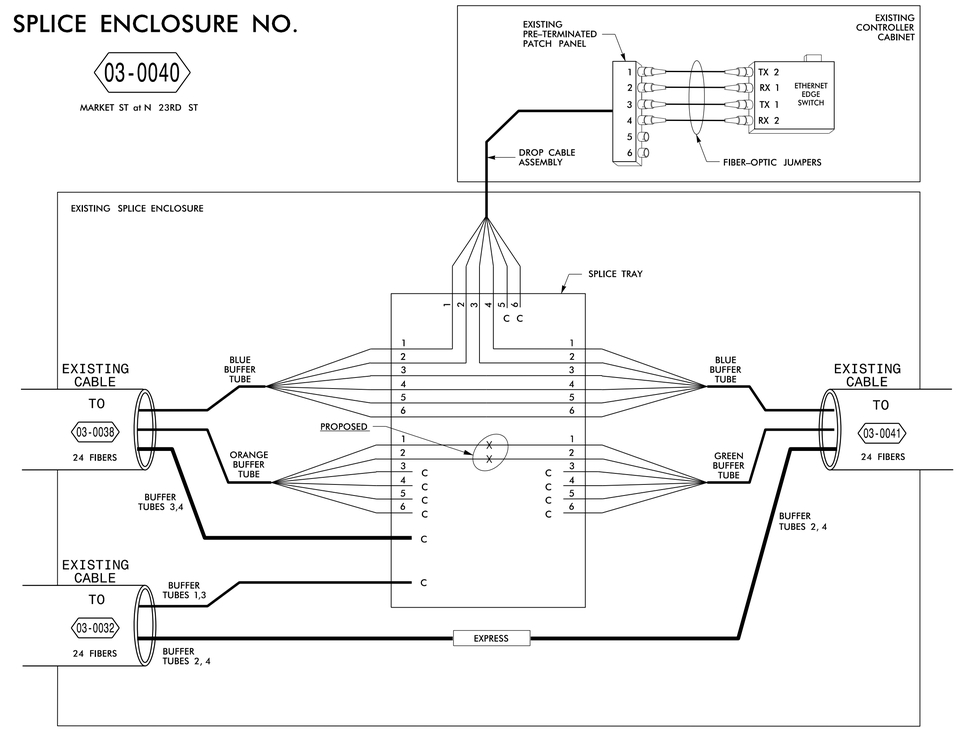
N. 23RD ST at PRINCESS PLACE DR



SPLICE ENCLOSURE NO.

03-0040

MARKET ST at N 23RD ST



NOTES:
1. INSTALL FIBER-OPTIC JUMPERS.
2. FIELD-VERIFY EXISTING TERMINATIONS.

LEGEND

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Splicing Details

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SCALE	REVISIONS	INIT.	DATE
NONE			

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 019962 ENGINEER FRED BARGETT

DocuSigned by: Alf Bargett 1/5/2015
DOCUMENT NOT TO SCALE
SIG. INVENTORY NO.