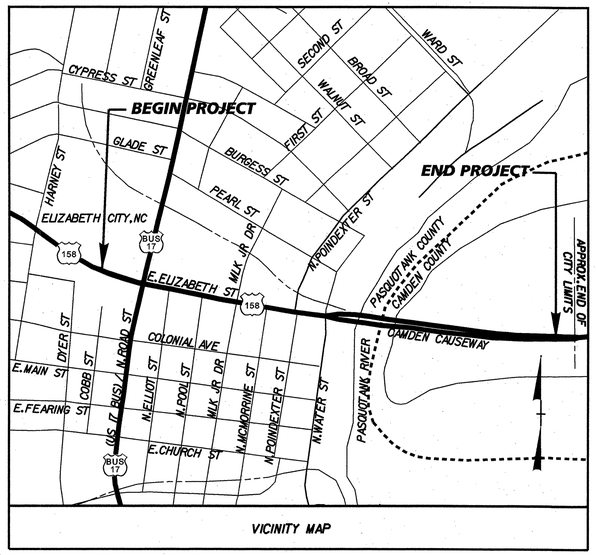
TIP PROJECT: U-4438

CONTRACT: C202599

K:\RAL_Roadway\01036\H2\Roadway\Proj\u4438_rdy_tshdgn

1/24/2011

SEE SHEET 1-A FOR INDEX OF SHEETS
SEE SHEET 1-B FOR CONVENTIONAL PLAN SHEET SYMBOLS



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

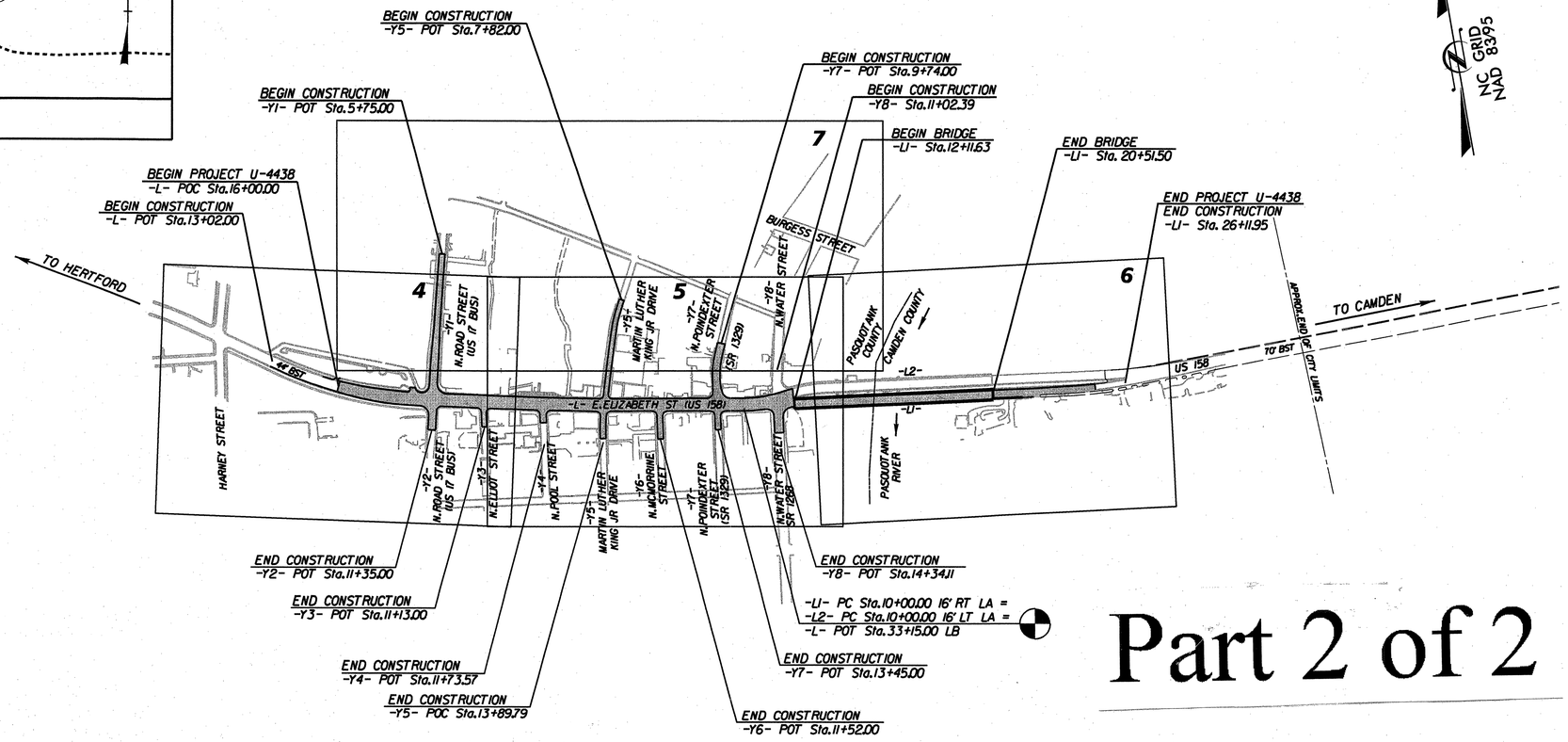
PASQUOTANK & CAMDEN COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4438	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35742.1.1	STP-0158(31)	P.E.
35742.2.1	STP-0158(50)	R/W & UTILITIES
35742.3.1	STP-0158(51)	CONSTRUCTION

LOCATION: *US 158 (EAST ELIZABETH STREET) FROM US 17 BUSINESS (NORTH ROAD STREET) TO EAST OF PASQUOTANK RIVER IN ELIZABETH CITY*

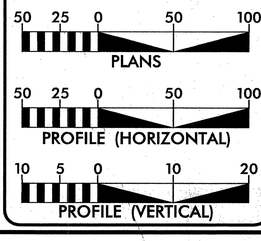
TYPE OF WORK: *GRADING, DRAINAGE, PAVING, SIGNALS, AND STRUCTURES*



Part 2 of 2

NCDOT CONTACT:
DOUG TAYLOR, P.E.
ASSISTANT STATE ROADWAY DESIGN ENGINEER
ROADWAY DESIGN UNIT

GRAPHIC SCALES



DESIGN DATA

ADT 2011 = 12,900 VPD
ADT 2030 = 18,800 VPD
DHV = 10%
D = 55%
T = 20% *
V = 40 MPH
* (TTST 11% + DUAL 9%)

CLASS = URBAN ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4438 = 0.471 MILES
LENGTH STRUCTURE TIP PROJECT U-4438 = 0.159 MILES
TOTAL LENGTH TIP PROJECT U-4438 = 0.630 MILES

PLANS PREPARED FOR THE NCDOT BY:

Kimley-Horn and Associates, Inc.
© , 2010
Post Office Box 33068
Raleigh, North Carolina 27636
PE NO. F-0102

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: *JULY 16, 2010*

LETTING DATE: *APRIL 19, 2011*

JEFFREY W. MOORE, P.E.
PROJECT ENGINEER

J. JASON PACE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 026480 ENGINEER LARRY D. ROBINSON, JR. 1-24-11 P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024436 1-24-11 ENGINEER JEFFREY W. MOORE P.E.

SIGNATURE:

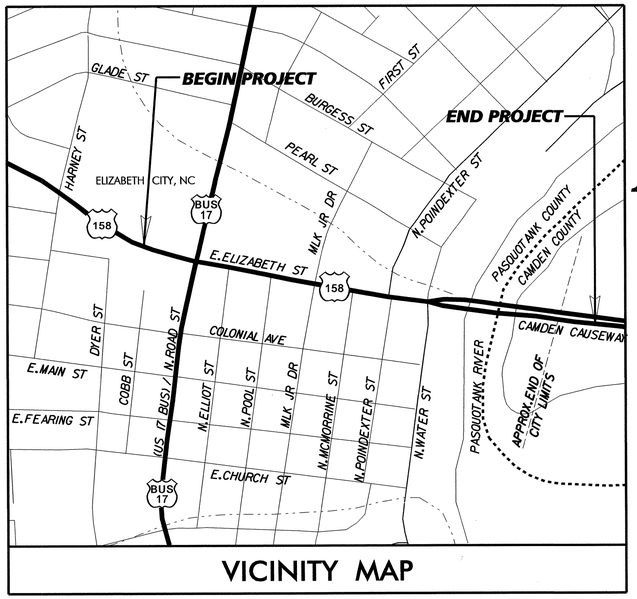
DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

art mcmillan P.E.
STATE HIGHWAY DESIGN ENGINEER

Project No.	Sheet No.
U-4438	Sig. 1

TIP PROJECT: U-4438



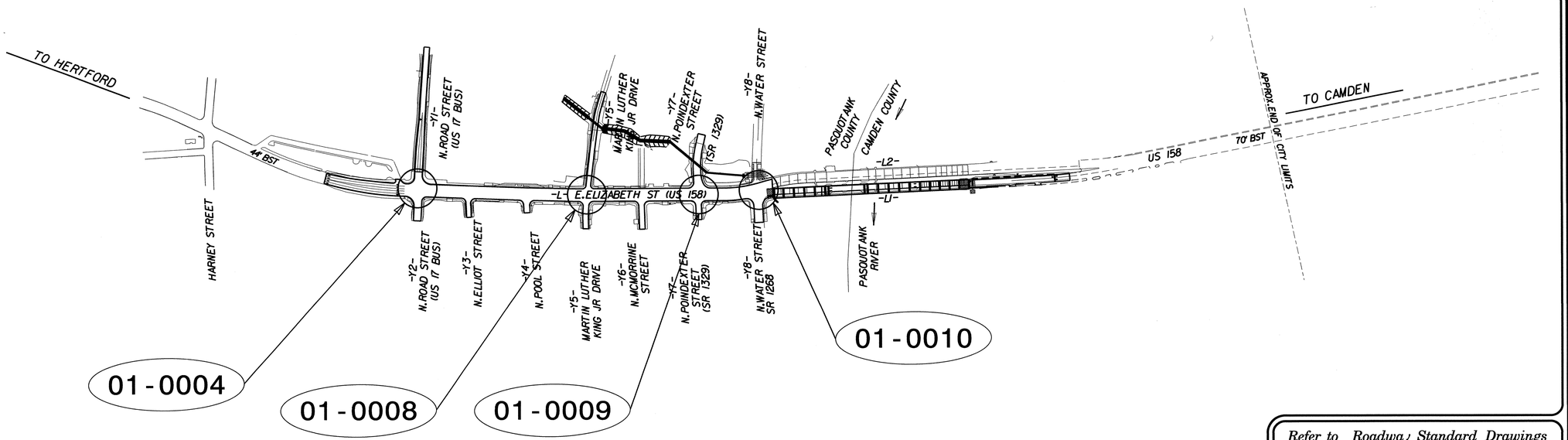
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PASQUOTANK & CAMDEN COUNTIES

LOCATION: *US 158 (EAST ELIZABETH STREET) FROM US 17 BUSINESS (NORTH ROAD STREET) TO EAST OF PASQUOTANK RIVER*

TYPE OF WORK: SIGNALS

NC GRID NAD 83 95



Refer to Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1	---------	Title Sheet
Sig. 2–17	01–0004 T1,T2,T3,T4&Final	US 158 (Elizabeth Street) at US 17 Bus. (North Road Street)
Sig. 18–28	01–0008 T1,T2&Final	US 158 (Elizabeth Street) at Martin Street
Sig. 29–40	01–0009 T1,T2&Final.	US 158 (Elizabeth Street) at Poindexter street
Sig. 41–53	01–0010 T1,T2&Final	US 158 (Elizabeth Street) at Water Street
Sig. 54–60	N/A	Communication and Conduit Routing Plans
Sig. 61–63	N/A	Signal Pile Cap Foundation
Sig. 64–68	N/A	Metal Poles Mast Arm Typicals
Sig. 69–71	N/A	Inductive Detection Loops Details

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

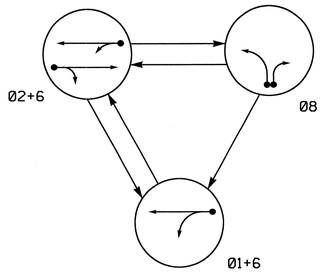
Contacts:

Pamela L. Alexander, PE – Eastern Region Signals Engineer
John T Rowe Jr., PE – Signal Equipment Design Engineer
Greg Fuller, PE – State ITS and Signals Engineer

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

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.2

PHASING DIAGRAM



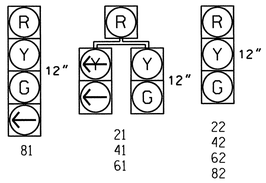
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION				
SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22	R	G	R	Y
61	G	G	R	Y
62	G	G	R	Y
81, 82	R	R	G	R

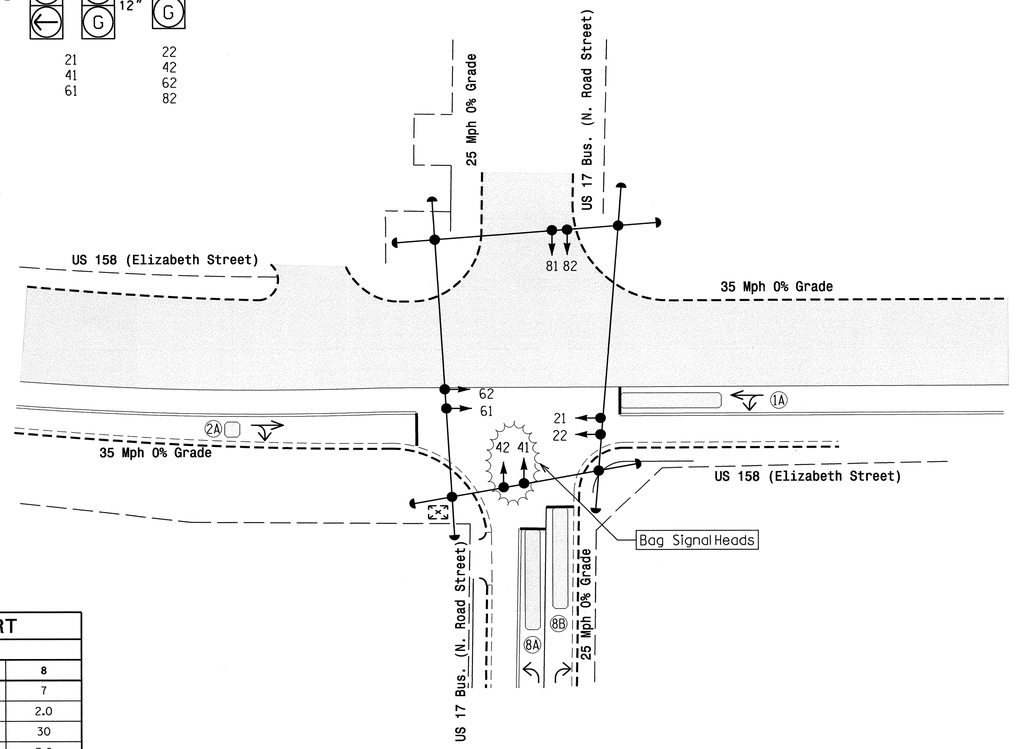
SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	Y	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	-
8A	6X40	0	N/A	Y	8	Y	Y	-	-	5	-	-
8B	6X40	0	N/A	Y	8	Y	Y	-	-	15	-	-

Use wireless detection.



OASIS 2070L TIMING CHART				
FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Min Green 1 *	4	10	10	7
Extension 1 *	2.0	3.0	3.0	2.0
Max Green 1 *	10	30	30	30
Yellow Clearance	3.0	3.8	3.8	3.0
Red Clearance	1.8	1.3	1.3	2.1
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

3 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
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 21, 22, 61 and 62.
5. Set all detector units to presence mode.
6. Bag pedestrian signal heads.

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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade (Phase II - TMP 7)

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

US 158 (Elizabeth Street)
at
US 17 Bus. (N. Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER IKENNA O. UMOZURIKE
12/22/10
SIGNATURE DATE

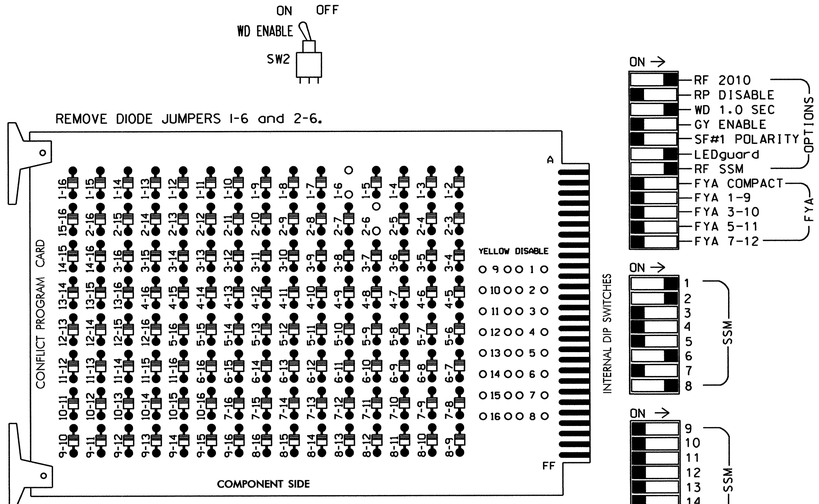
SIG. INVENTORY NO. 01-0004T1

22-DEC-2010 09:53
R:\Traffic\Signals\Design\Signals\01-0004\01000401_sig_dsn_2010mod.dgn
I.Umozurike

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.3

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,4, 5,7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET 332
SOFTWARE .....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS..12
LOAD SWITCHES USED.....S1,S2,S6,S8
PHASES USED.....1,2,6,8
OVERLAPS.....NONE

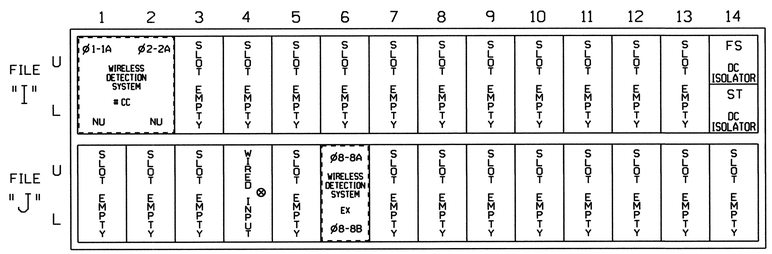
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU
RED	*	128						134			107	
YELLOW		129						135			108	
GREEN		130						136			109	
RED ARROW												
YELLOW ARROW	126											
GREEN ARROW	127											
✋												
🚶												

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.
NOTE: The arrows for signal heads 21 and 81 are not used during construction Phase II - Temp 7.

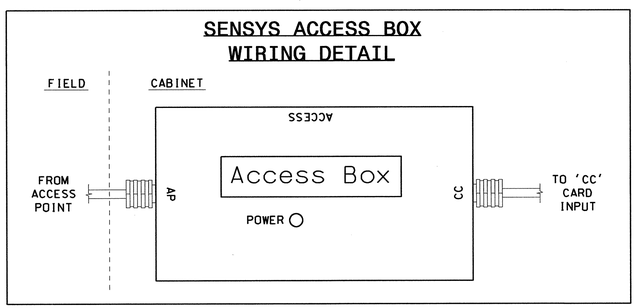
INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
FS = FLASH SENSE
ST = STOP TIME
⊗ Wired Input - Do not populate slot with detector card
See Sensys Access Box Wiring Detail below.

SENSYS ACCESS BOX WIRING DETAIL



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'	-	I1U	56	18	1	1	Y	Y	Y		15
	-	J4U	48	10	26	6	Y	Y			
* 2A	-	I2U	39	1	2	2	Y	Y			
* 8A	-	J6U	42	4	8	8	Y	Y			5
* 8B	-	J6L	46	8	18	8	Y	Y			15

'Add jumper from I1-W to J4-W, on rear of input file.

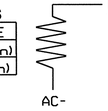
* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004T1
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase II - Tmp 7)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street) at US 17 Bus (N Road Street)

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: T. Vann

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

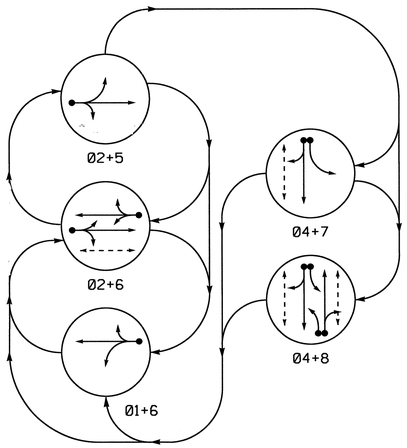
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE
12/28/10
DATE

SIG. INVENTORY NO. 01-0004T1

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

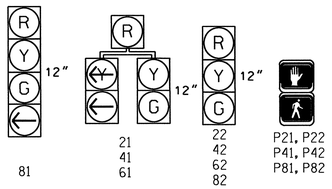
TABLE OF OPERATION

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

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

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

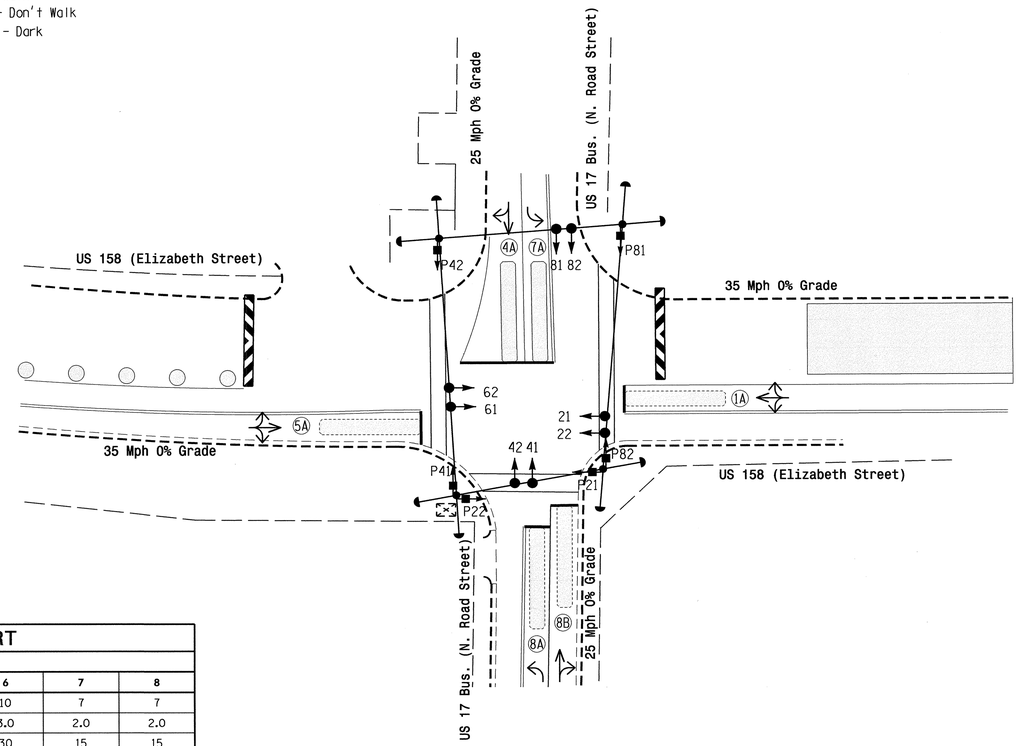
INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	-	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
4A	6X40	0	N/A	Y	4	Y	Y	-	-	3	-	Y
5A	6X40	0	N/A	-	5	Y	Y	Y	-	15	-	-
					2	Y	Y	-	-	-	-	-
7A	6X40	0	N/A	Y	7	Y	Y	-	-	15	-	Y
					4	Y	Y	-	-	-	-	Y
8A	6X40	0	N/A	-	8	Y	Y	-	-	3	-	-
8B	6X40	0	N/A	-	8	Y	Y	-	-	15	-	-

Use wireless detection.

5 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 7 during phase 8 on.
4. Program controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
5. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
6. Set all detector units to presence mode.
7. Bag pedestrian signal heads



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	4	10	7	4	10	7	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0	2.0
Max Green 1 *	10	30	15	10	30	15	15
Yellow Clearance	3.0	3.8	3.2	3.8	3.8	3.0	3.2
Red Clearance	1.9	2.0	1.3	2.3	2.0	1.4	2.1
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	-	9	15	-	-	-	6
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	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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade (Phase II - TMP 8)

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

US 158 (Elizabeth Street) at US 17 Bus. (N. Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER
SIGNATURE 12/22/10 DATE

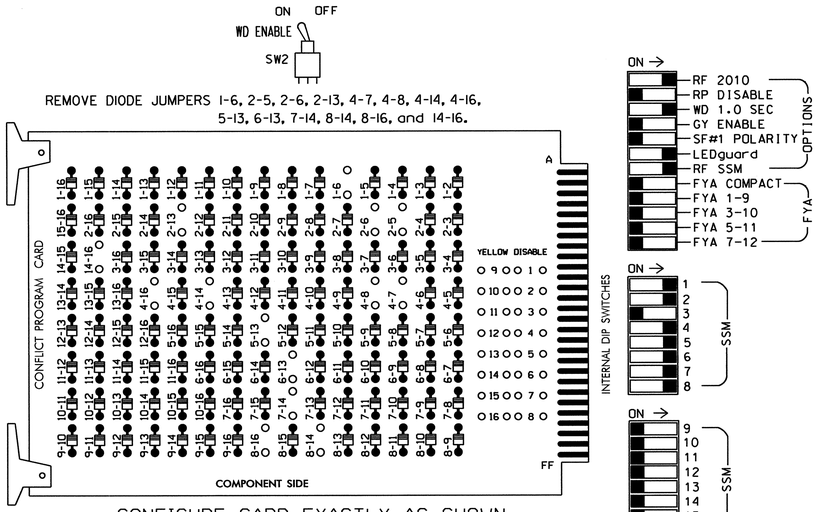
SIG. INVENTORY NO. 01-0004T2

22-DEC-2010 09:57
R:\Traffic Projects\Signals\Designs\Signals\01-0004\01000412_sig_dsn_2010mmsd.dgn
Iumozurike

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.5

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

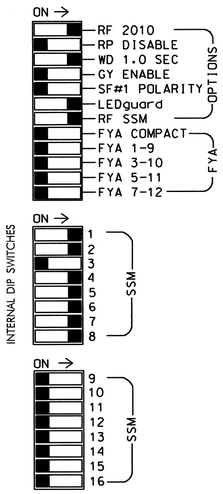
(remove jumpers and set switches as shown)



CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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



■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2, 4, and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET 332
SOFTWARE .....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS..12
LOAD SWITCHES USED.....S1,S2,S2P,S4,S4P,S5,S6,S7,S8,S8P
PHASES USED.....1,2*,2 PED,4,4 PED,5,6,7,8,8 PED
OVERLAP E.....2+5

* USED FOR TIMING PURPOSES ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	OLE	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	P21, P22	NU	41,42	P41, P42	21	61,62	NU	41	81,82	P81, P82
RED	*	128			101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132			123		
GREEN ARROW	127						133			124		
✋			113			104						110
🚶			115			106						112

NU = Not Used
* Denotes install load resistor. See load resistor installation detail this sheet.

NOTES: The arrow for signal head 81 is not used during construction Phase II - Temp 8.
~~Loadswitch S2 requires output remapping. See sheet 2 for programming details.~~

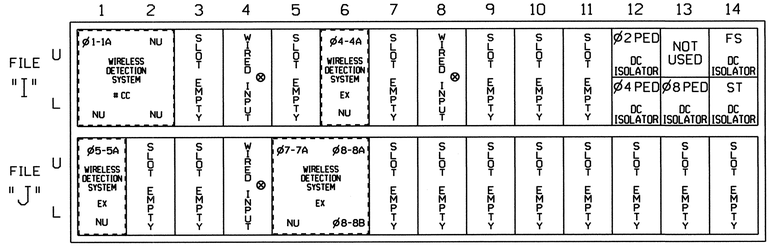
BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
FS = FLASH SENSE
ST = STOP TIME
⊗ Wired Input - Do not populate slot with detector card
See Sensys Access Box Wiring Detail below.

INPUT FILE CONNECTION & PROGRAMMING CHART

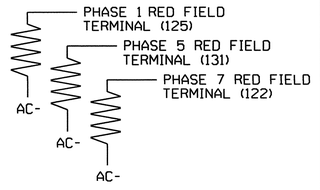
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
* 1A[1]	-	I1U	56	18	1	1	Y	Y	Y		15
* 4A	-	I6U	41	3	4	4	Y	Y			3
* 5A[2]	-	J1U	55	17	5	5	Y	Y	Y		15
	-	I4U	47	9	22	2	Y	Y			
* 7A[3]	-	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			
* 8A	-	J6U	42	4	8	8	Y	Y			3
* 8B	-	J6L	46	8	18	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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

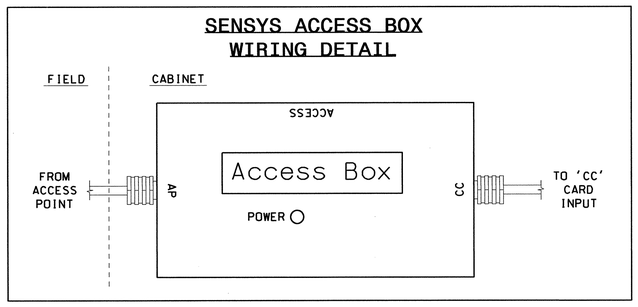
[1] Make sure jumper is installed from I1-W to J4-W, on rear of input file.
[2] Add jumper from J1-W to I4-W, on rear of input file.
[3] Add jumper from J5-W to I8-W, on rear of input file.

LOAD RESISTOR INSTALLATION DETAIL

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



SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004T2
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase II - Tmp 8) - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at US 17 Bus (N Road Street)

Division 1	Pasquotank County	Elizabeth City
PLAN DATE: December 2010	REVIEWED BY: T.Jpp	
PREPARED BY: S. Armstrong	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE 12/29/10 DATE

SIG. INVENTORY NO. 01-0004T2

22-DEC-2010 12:16
S:\#ITSSIG\#ITS Signals\Working\groups\Sig Man\Armstrong\M01000412_smuele_xxx.dgn
armstrong

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.6

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' FOUR TIMES

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          |1234567891011121314 1516
VEH OVL PARENTS: | X  X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  _ RED   _ YELLOW   _ GREEN
FLASH COLORS:   _ RED   _ YELLOW   _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:    (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...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)....2
```

OVERLAP PROGRAMMING COMPLETE

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)

RNG	LEAD	BARRIER 1		X-LAG	LEAD	BARRIER 2		X-LAG	LEAD	BARRIER 3		X-LAG
1	1	2	0	0	0	0	0	0	4	0	0	0
2	0	6	0	0	5	0	0	0	7	8	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

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:|1234567891011121314 1516
IF PHASES ARE ON|       X
OMIT PHASES     |      X
CALL PHASES     |
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004T2
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase II - Tmp 8) - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street)
at
US 17 Bus (N Road Street)

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

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: T.J.

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

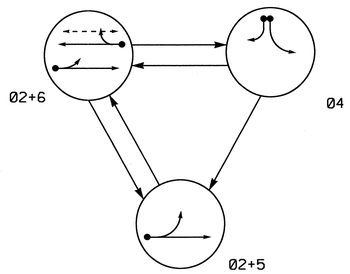
SIGNATURE | DATE 12/29/10

SIG. INVENTORY NO. 01-0004T2

28-DEC-2010 10:39
S:#ITS&SU#ITS Signals#Workgroups#Sig Mgmt#Armstrong#01000472_smuele_xxx.dgn
11.7.08

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.7

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

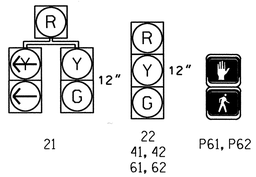
TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21	G	G	R	Y
22	G	G	R	Y
41, 42	R	R	G	R
61, 62	R	G	R	Y
P61, P62	DW	W	DW	DRK

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

SIGNAL FACE I.D.

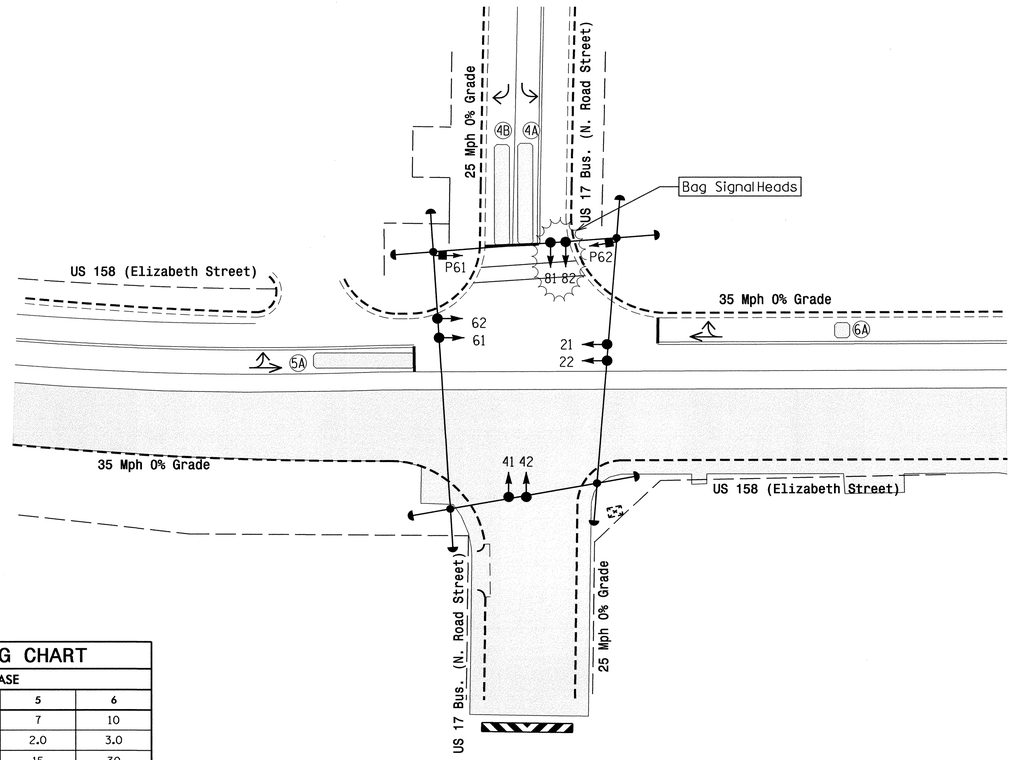
All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

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

Use wireless detection.



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	10	7	7	10
Extension 1 *	3.0	2.0	2.0	3.0
Max Green 1 *	30	15	15	30
Yellow Clearance	3.8	3.0	3.0	3.8
Red Clearance	1.3	1.6	2.1	1.4
Walk 1 *	-	-	-	7
Don't Walk 1	-	-	-	9
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

3 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Disable Backup Protect.
4. Reposition existing signal heads numbered 21, 22, 61 and 62.
5. Set all detector units to presence mode.
6. Bag pedestrian signal heads.

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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade (Phase III - TMP 12)

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

US 158 (Elizabeth Street)
at
US 17 Bus. (N. Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010
PREPARED BY: I. O. Umozurike
REVIEWED BY:
REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23408 ENGINEER IKECHUKWU OMOZURIKE
12/22/10
SIGNATURE DATE

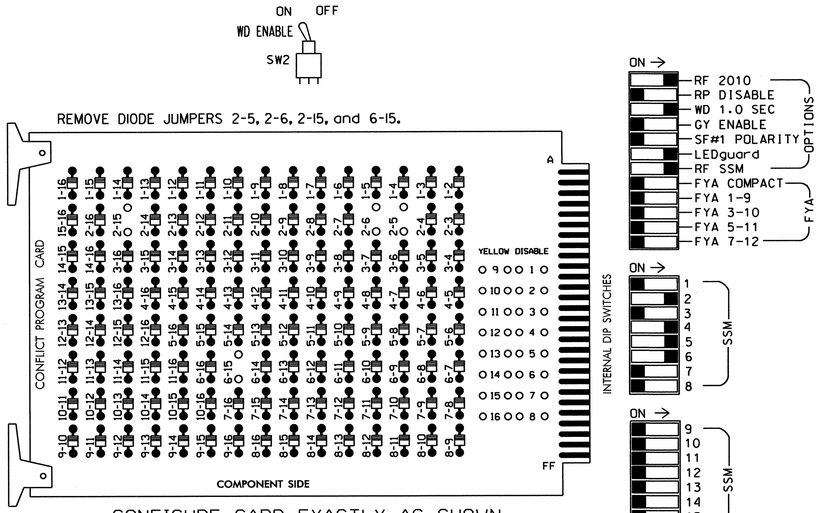
SIG. INVENTORY NO. 01-0004T3

22-DEC-2010 10:21
R:\Workfiles\Signals\Design\Signals\01-0004T\01000413_sig_dsn_2010mmdd.dgn
Ikozurike

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.8

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

! IMPORTANT! Default the controller before doing any progamming shown on this plan!

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET 332
SOFTWARE .....ECONOLITE OASIS
CABINET MOUNT .....BASE
OUTPUT FILE POSITIONS..12
LOAD SWITCHES USED.....S2,S4,S5,S6,S6P
PHASES USED.....2,4,5,6,6 PED
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

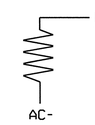
LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	21	61,62	P61, P62	NU	NU	NU
RED		128			101		✱	134				
YELLOW		129			102			135				
GREEN		130			103			136				
RED ARROW												
YELLOW ARROW							132					
GREEN ARROW							133					
✋									119			
🚶									121			

NU = Not Used

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

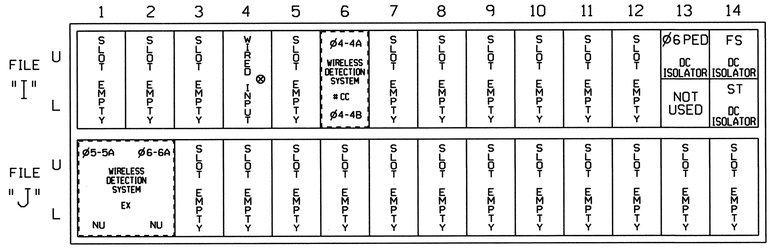
LOAD RESISTOR INSTALLATION DETAIL

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



INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
⊗ Wired Input - Do not populate slot with detector card
See Sensys Access Box Wiring Detail below.

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
✱ 4A	-	I6U	41	3	4	4	Y	Y			3
✱ 4B	-	I6L	45	7	14	4	Y	Y			15
✱ 5A[1]	-	J1U	55	17	5	5	Y	Y	Y		15
✱ 6A	-	I4U	47	9	22	2	Y	Y			
PED PUSH BUTTONS	-	J2U	40	2	6	6	Y	Y			
P61,P62	-	I13U	68	30	PED 6	6 PED					

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

[1]Make sure jumper is installed from J1-W to I4-W, on rear of input file.

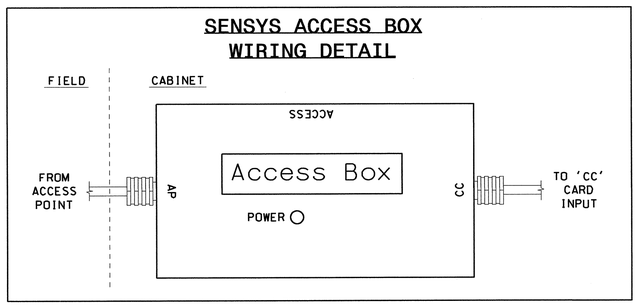
! Remove jumper from I1-W to J4-W on rear of input file if one is installed.
Remove jumper from J5-W to I8-W on rear of input file if one is installed.

✱ WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SENSYS ACCESS BOX WIRING DETAIL



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004T3
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase III - Tmp 12)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street) at US 17 Bus (N Road Street)

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

Division 1 | Pasquotank County | Elizabeth City
PLAN DATE: December 2010 | REVIEWED BY: T. Joyce
PREPARED BY: S. Armstrong | REVIEWED BY:

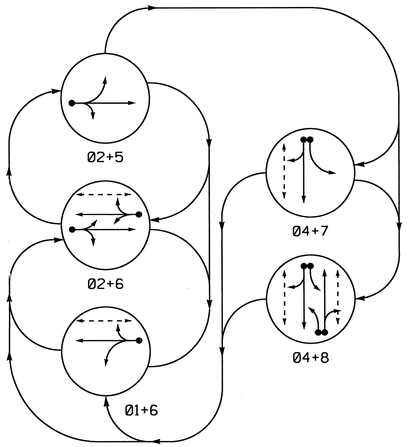
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 12/28/10 DATE
SIG. INVENTORY NO. 01-0004T3

28-DEC-2010 10:41
S:\#TSA$LW!TS Signals\Workgroups\Sig Man\Armstrong\#01000#T3_sml_e1e_xxx.dgn
floyce

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.9

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

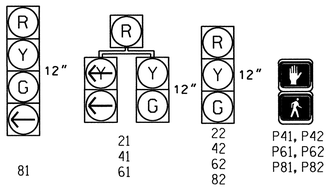
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	02+5	02+6	04+7	04+8	FLASH
21	R	G	G	R	R	Y
22	R	G	G	R	R	Y
41	R	R	R	G	G	R
42	R	R	R	G	G	R
61	G	R	G	R	R	Y
62	G	R	G	R	R	Y
81	R	R	R	R	G	R
82	R	R	R	R	G	R
P41, P42	DW	DW	DW	W	W	DRK
P61, P62	W	DW	W	DW	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

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

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

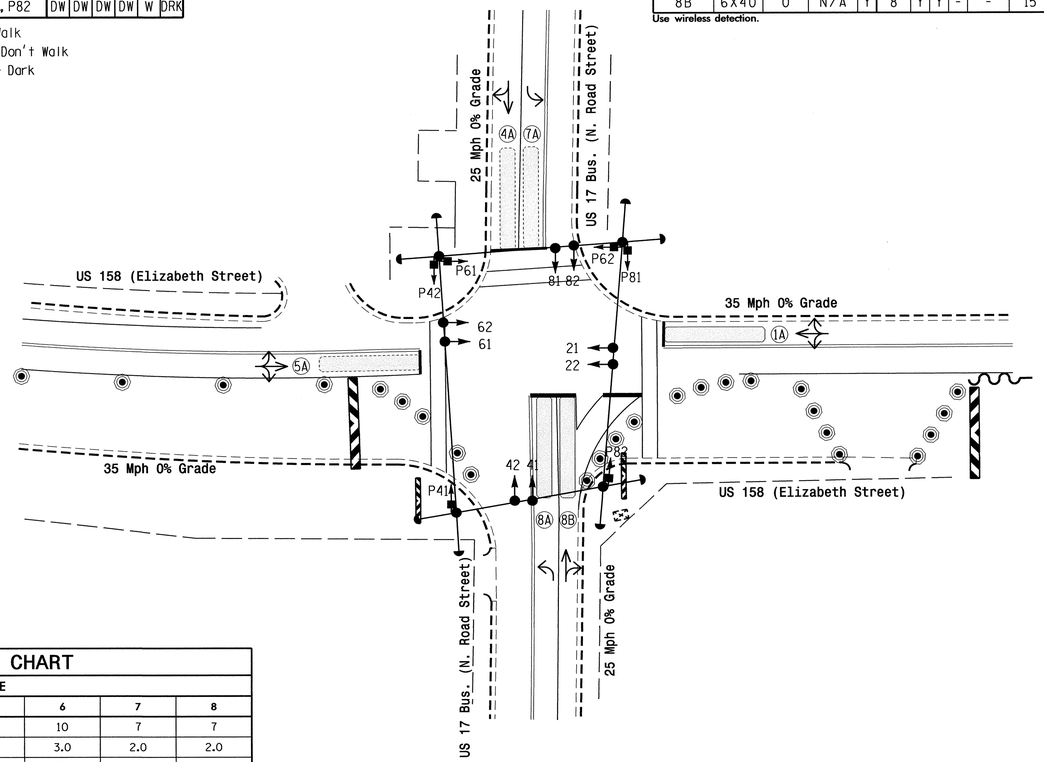
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	Y	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
4A	6X40	0	N/A	-	4	Y	Y	-	-	10	-	-
5A	6X40	0	N/A	-	5	Y	Y	Y	-	15	-	-
					2	Y	Y	-	-	-	-	-
7A	6X40	0	N/A	-	7	Y	Y	Y	-	15	-	-
					4	Y	Y	-	-	3	-	-
8A	6X40	0	N/A	Y	8	Y	Y	-	-	3	-	-
8B	6X40	0	N/A	Y	8	Y	Y	-	-	15	-	-

Use wireless detection.

5 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 7 during phase 8 on.
4. Program controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
5. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
6. Set all detector units to presence mode.
7. Bag pedestrian signal heads



OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	7	8
Min Green 1 *	7	10	7	7	10	7	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0	2.0
Max Green 1 *	15	30	15	15	30	15	15
Yellow Clearance	3.0	3.8	3.2	3.8	3.8	3.0	3.2
Red Clearance	2.3	2.0	2.1	2.3	2.0	2.3	1.6
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	-	-	15	-	9	-	14
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	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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	

Signal Upgrade (Phase III - TMP 17)

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

US 158 (Elizabeth Street)
at
US 17 Bus. (N. Road Street)

Division 01 Pasquotank County Elizabeth City
PLAN DATE: November 2010 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER
SIGNATURE 12/22/10 DATE
SIG. INVENTORY NO. 01-0004T4

22-DEC-2010 10:47
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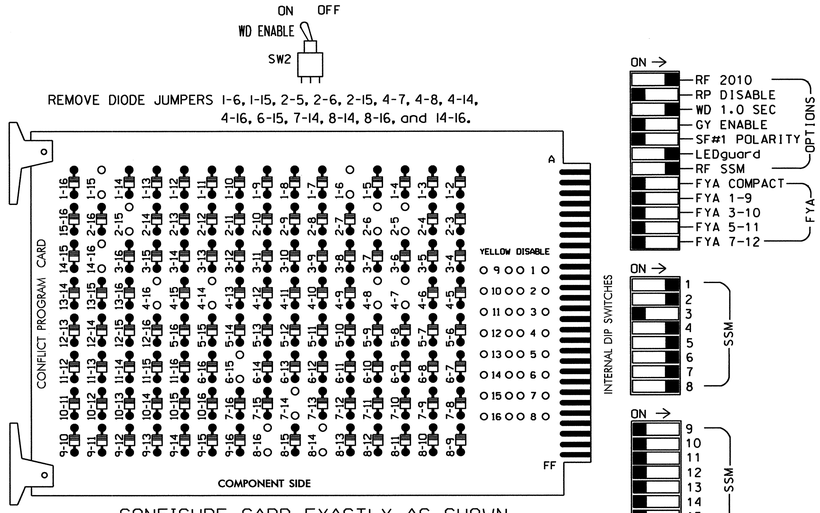
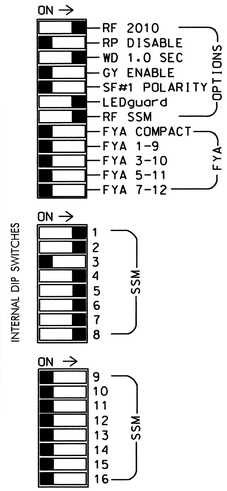
Computer File

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.10

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,9,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 4, 6, and 8 for 'STARTUP PED CALL'.
7. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET 332
SOFTWARE .....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS..12
LOAD SWITCHES USED.....S1,S2*,S4,S4P,S5,S6,S6P,S7,S8,S8P
PHASES USED.....1,2,4,4 PED,5,6,6 PED,7,8,8 PED
OVERLAP E.....2+5

*USED FOR TIMING PURPOSES ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	OLE	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42	P41, P42	21	61,62	P61, P62	41	81,82	P81, P82
RED	*	128			101		*	134		*	107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132			123		
GREEN ARROW	127						133			124		
✋						104			119			110
🚶						106			121			112

NU = Not Used

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

NOTES: The arrow for signal head 81 is not used during construction Phase III - Temp 17.
~~Loadswitch S2 requires output remapping. See sheet 2 for programming details.~~

BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

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 WIRELESS DETECTION SYSTEM # CC NU	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	Ø4-4A WIRELESS DETECTION SYSTEM EX NU	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L												Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	Ø5-5A WIRELESS DETECTION SYSTEM EX NU	SLOT EMPTY	SLOT EMPTY	WIRED INPUT ⊗	Ø7-7A Ø8-8A WIRELESS DETECTION SYSTEM EX NU Ø8-8B		SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
⊗ Wired Input - Do not populate slot with detector card
See Sensys Access Box Wiring Detail below.

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

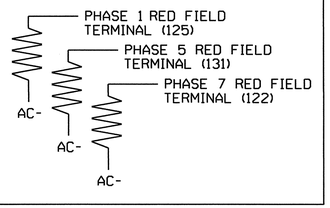
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
* 1A[1]	-	I1U	56	18	1	1	Y	Y	Y		15
* 4A	-	I6U	41	3	4	4	Y	Y			10
* 5A[2]	-	J1U	55	17	5	5	Y	Y	Y		15
	-	I4U	47	9	22	2	Y	Y			
* 7A[3]	-	J5U	57	19	7	7	Y	Y	Y		15
	-	I8U	49	11	24	4	Y	Y			3
* 8A	-	J6U	42	4	8	8	Y	Y			3
* 8B	-	J6L	46	8	18	8	Y	Y			15
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					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

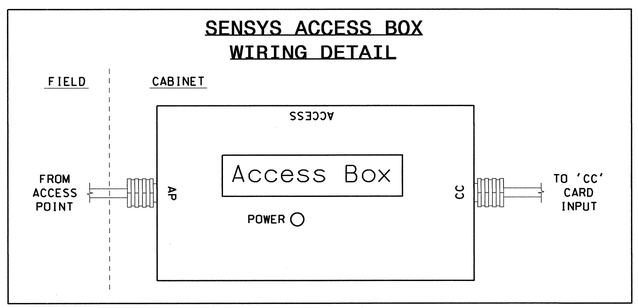
[1] Add jumper from I1-W to J4-W, on rear of input file.
[2] Make sure jumper is installed from J1-W to I4-W, on rear of input file.
[3] Add jumper from J5-W to I8-W, on rear of input file.

LOAD RESISTOR INSTALLATION DETAIL

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



SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004T4
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase III - Tmp 17) - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Transportation Mobility and Safety
DIVISION OF HIGHWAYS
Signal Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 158 (Elizabeth Street)
at
US 17 Bus (N Road Street)

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: T. V.
PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 12/29/10 DATE

SIG. INVENTORY NO. 01-0004T4

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PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.11

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' FOUR TIMES

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          ¦12345678910111213141516
VEH OVL PARENTS:¦ X  X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...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)....2
```

OVERLAP PROGRAMMING COMPLETE

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)

RNG	LEAD	BARRIER 1		X-LAG	LEAD	BARRIER 2		X-LAG	LEAD	BARRIER 3		X-LAG
1	1	2	0	0	0	0	0	0	4	0	0	0
2	0	6	0	0	5	0	0	0	7	8	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

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:¦12345678910111213141516
IF PHASES ARE ON¦       X
OMIT PHASES     ¦      X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0004T4
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade (Phase III - Tmp 17) - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street)
at
US 17 Bus (N Road Street)

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: T. Jyb

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

George C. Brown 12/29/10
SIGNATURE DATE

SIG. INVENTORY NO. 01-0004T4

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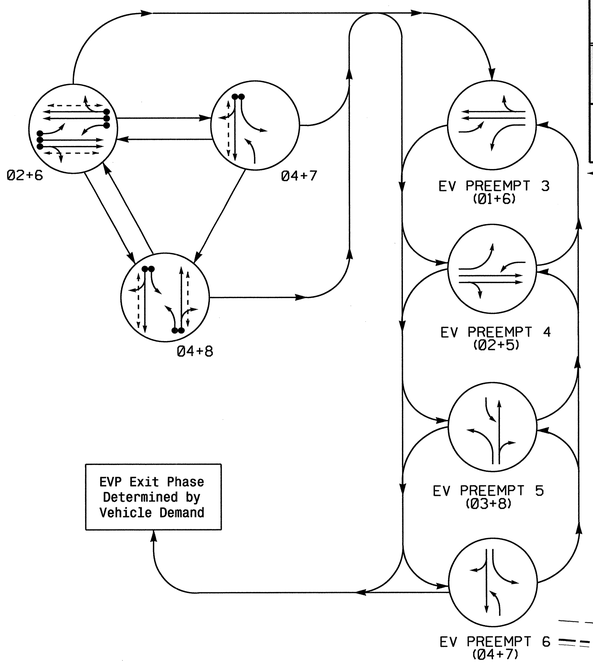
PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.12

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

FROM \ TO	←	F.Y.	→	←	F.Y.	→
	1	2	1	2	1	2
←	←	←	✶	→	→	→
F.Y.	F.Y.	F.Y.	F.Y.	F.Y.	✶	→
→	→	→	→	→	→	→

F.Y. = Flashing Yellow Arrow

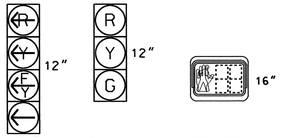
TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	04+7	04+8	EVP 3	EVP 4	EVP 5	EVP 6	FLASH
21	F.Y.	→	→	F.Y.	←	→	→	✶
22, 23	G	R	R	R	G	R	R	Y
41, 42	R	G	G	R	R	R	G	R
61	F.Y.	→	→	←	F.Y.	→	→	✶
62, 63	G	R	R	G	R	R	R	Y
71	→	←	F.Y.	→	→	F.Y.	←	→
81	→	F.Y.	F.Y.	→	→	←	F.Y.	→
82, 83	R	R	G	R	R	G	R	R
P21, P22	W	DW	DW	DW	DW	DW	DW	DRK
P41, P42	DW	W	W	DW	DW	DW	DW	DRK
P61, P62	W	DW	DW	DW	DW	DW	DW	DRK
P81, P82	DW	DW	W	DW	DW	DW	DW	DRK

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

SIGNAL FACE I.D.

All Heads L.E.D.



21	22, 23	P21, P22
61	41, 42	P41, P42
71	62, 63	P61, P62
81	82, 83	P81, P82

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

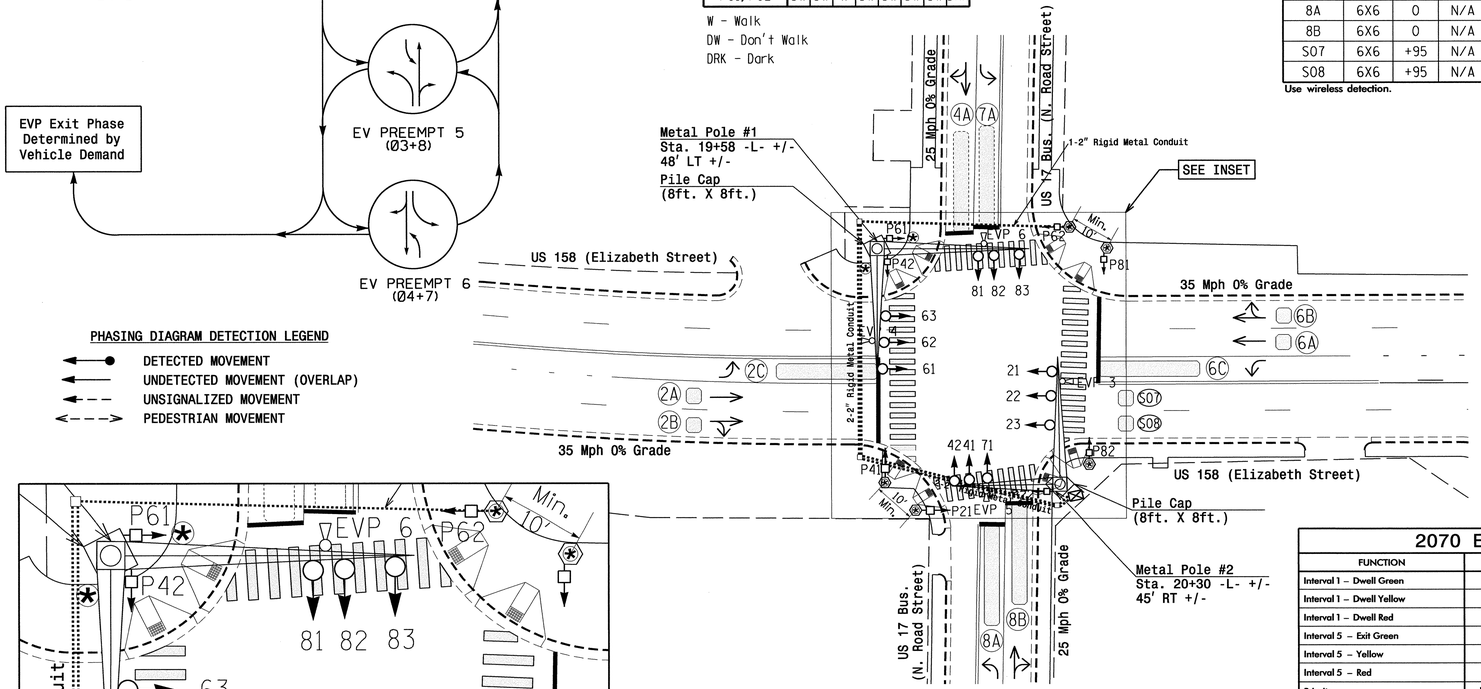
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	Y
2C	6X40	0	N/A	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	N/A	-	4	Y	Y	-	-	-	-	Y
6A	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	Y
6C	6X40	0	N/A	Y	6	Y	Y	-	-	-	-	Y
7A	6X40	0	N/A	Y	7	Y	Y	-	-	15	-	Y
					4	Y	Y	-	-	5	-	Y
8A	6X6	0	N/A	Y	8	Y	Y	-	-	5	-	Y
8B	6X6	0	N/A	Y	8	Y	Y	-	-	15	-	Y
S07	6X6	+95	N/A	Y	-	-	-	-	-	-	Y	Y
S08	6X6	+95	N/A	Y	-	-	-	-	-	-	Y	Y

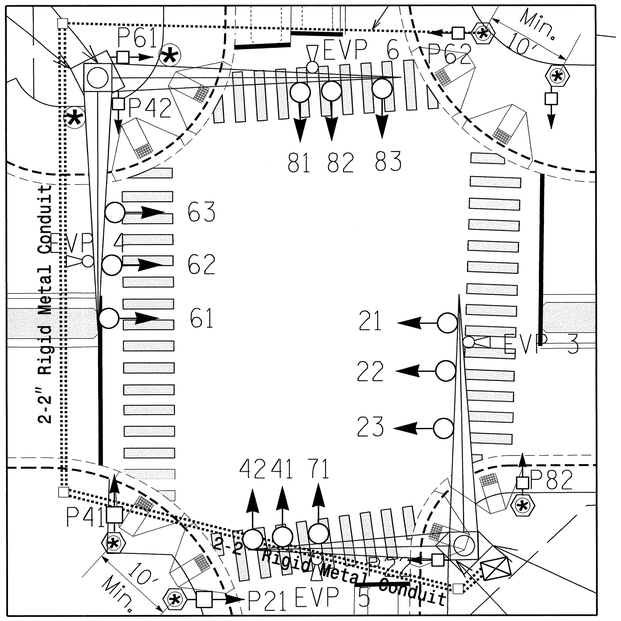
Use wireless detection.

3 Phase
Fully Actuated With EVP
US 158 (Elizabeth Street) CLS

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 7 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. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
8. Closed loop system data: Controller Asset #0004.





INSET

2070 EV PREEMPTION

FUNCTION	PRE 3	PRE 4	PRE 5	PRE 6
Interval 1 – Dwell Green	255	255	255	255
Interval 1 – Dwell Yellow	3.8	3.5	3.2	0.0*
Interval 1 – Dwell Red	1.5	1.6	2.6	0.0*
Interval 5 – Exit Green	0	0	0	0
Interval 5 – Yellow	0.0*	0.0*	0.0*	0.0*
Interval 5 – Red	0.0*	0.0*	0.0*	0.0*
Priority	Medium	Medium	Medium	Medium
Delay Time	0.0	0.0	0.0	0.0
Min Green Before Pre	1	1	1	1
Ped Clear Before Pre	8	8	8	8
Yellow Clear Before Pre	0.0*	0.0*	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*	0.0*	0.0*
Dwell Min Time	10	10	7	7
Enable Backup Protection	N	N	N	N
Ped Clear Through Yellow	Y	Y	Y	Y
Preempt Extend**	2	2	2	2
Omit Overlaps	-	-	-	-

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6	7	8
Min Green 1 *	10	7	10	7	7
Extension 1 *	3.0	2.0	3.0	2.0	2.0
Max Green 1 *	30	30	30	15	30
Yellow Clearance	3.8	3.2	3.8	3.0	3.2
Red Clearance	1.6	2.6	1.5	2.6	2.6
Walk 1 *	7	7	7	-	7
Don't Walk 1	8	16	9	-	15
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

* 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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Out of Pavement Detector	
	Signal Pedestal	
N/A	Wheelchair Ramp	
	2" Rigid Metal Conduit	N/A
	Push Button Post	N/A

Signal Upgrade

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

US 158 (Elizabeth Street) at US 17 Bus. (N. Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER IGNATIUS OLAKUNLE UMOZURIKE
SIGNATURE 12/22/10 DATE
SIG. INVENTORY NO. 01-0004

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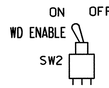
Camcurfke

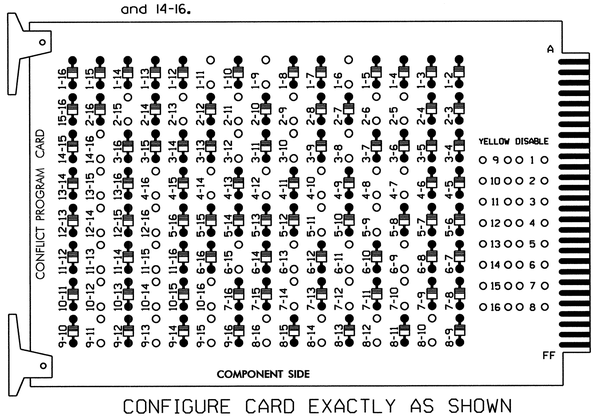
PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.13

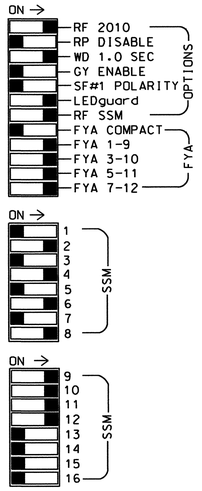
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-8, 3-10, 3-12, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 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.





CONFIGURE CARD EXACTLY AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3, 5,7,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 and 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2, 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 US 158 (Elizabeth Street) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 W/ AUX FILE
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P, S7,S8,S8P,S9,S10,S12,S13
PHASES USED.....1*,2,2 PED,3*,4,4 PED,5*,6,6 PED, 7,8,8 PED
OVERLAP "A".....1+2
OVERLAP "B".....3+4
OVERLAP "C".....5+6
OVERLAP "D".....7+8

* USED DURING PREEMPT ONLY.

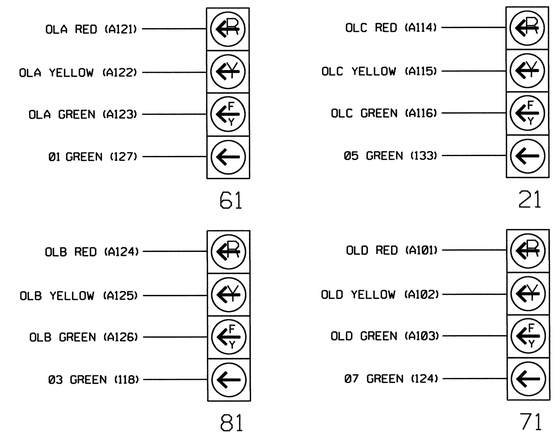
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	★ 61	22,23	P21, P22	★ 81	41,42	P41, P42	★ 21	62,63	P61, P62	★ 71	82,83	P81, P82	★ 61	★ 81	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													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
* Denotes install load resistor. See load resistor installation detail on sheet 3.
★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

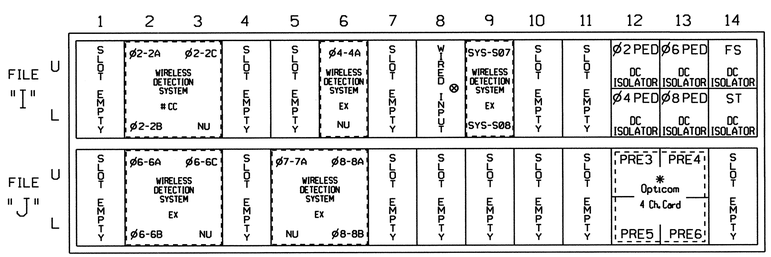


NOTE

The sequence display for signal heads 61, 81, 21, and 71 requires special logic programming. See sheet 2 of 3 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
⊗ Wired Input - Do not populate slot with detector card
* See Opticom Field Wire Detail on sheet 3.
# See Sensys Access Box Wiring Detail below.

FS = FLASH SENSE
ST = STOP TIME
PRE3,4,5,6 = EV PREEMPTS

INPUT FILE CONNECTION & PROGRAMMING CHART

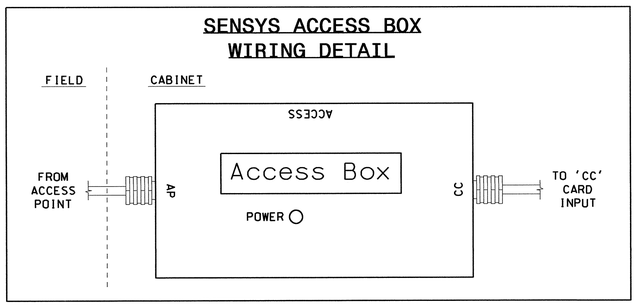
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
* 2A	-	I2U	39	1	2	2	Y	Y			
* 2B	-	I2L	43	5	12	2	Y	Y			
* 2C	-	I3U	63	25	32	2	Y	Y			
* 4A	-	I6U	41	3	4	4	Y	Y			
* 6A	-	J2U	40	2	6	6	Y	Y			
* 6B	-	J2L	44	6	16	6	Y	Y			
* 6C	-	J3U	64	26	36	6	Y	Y			
* 7A[1]	-	J5U	57	19	7	7	Y	Y			15
	-	I8U	49	11	24	4	Y	Y			5
* 8A	-	J6U	42	4	8	8	Y	Y			5
* 8B	-	J6L	46	8	18	8	Y	Y			15
# S07	-	I9U	60	22	11	SYS					
# S08	-	I9L	62	24	13	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.

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

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

SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment manufactured in accordance with the specifications for the type 2070 controller.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 158 (Elizabeth Street) at US 17 Bus (N Road Street)	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Signal Management Section	Division 1 Pasquotank County Elizabeth City	NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: December 2010 REVIEWED BY: T. Vick	
	PREPARED BY: S. Armstrong REVIEWED BY:	
	REVISIONS / INIT. / DATE	SIGNATURE DATE: 12/29/10
		SIG. INVENTORY NO. 01-0004

28-DEC-2010 11:57
S:\#ITSSIG\#ITS Signals\#Workgroups\#Sig Mgt\Armstrong\#10004_sm_ele_xxx.dgn
ittyoe

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.14

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, 6, 7, 8, 9, 10, 11, AND 12.

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 61).

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 61).

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 61).

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 21).

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 21).

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 21).

PRESS '+'

```
LOGICAL I/O COMMAND #7  (+/-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 81).

PRESS '+'

```
LOGICAL I/O COMMAND #8  (+/-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 81).

PRESS '+'

```
LOGICAL I/O COMMAND #9  (+/-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 81).

PRESS '+'

```
LOGICAL I/O COMMAND #10 (+/-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 #11 (+/-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 #12 (+/-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).

PRESS '+'

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

NOTICE GREEN FLASH

PRESS '+'

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

NOTICE GREEN FLASH

PRESS '+'

```
PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE:          :12345678910111213141516
VEH OVL PARENTS: :      XX
VEH OVL NOT VEH: :
VEH OVL NOT PED: :
VEH OVL GRN EXT: :
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...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.

OUTPUT REFERENCE SCHEDULE

USE TO INTERPRET LOGIC PROCESSOR

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C 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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0004
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street)
at
US 17 Bus (N Road Street)

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: T. Igo

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE | DATE 12/29/10

SIG. INVENTORY NO. 01-0004

28-DEC-2010 12:00
S:#TS&S#TS Signals#workgroups#Sig Mgmt#Armstrong#010004_smele_xxx.dgn
troyce

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.15

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press '4' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' to advance to Preemption #3.

```
   PREEMPTION  #3  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  3.8  1.5  |X     X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

PRESS '+'

```
   PREEMPTION  #4  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  3.5  1.6  |X  X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

PRESS '+'

```
   PREEMPTION  #5  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  3.2  2.6  |X     X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........7
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

PRESS '+'

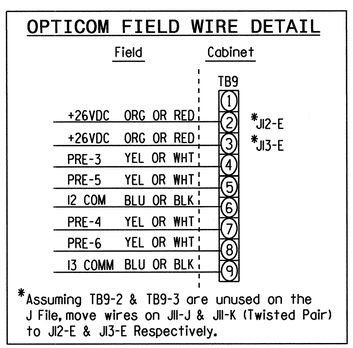
```
   PREEMPTION  #6  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  0.0  0.0  |   X  X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....8
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........7
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ..........................N
LINK TO NEXT PREEMPT? ................N
ENABLE BACKUP PROTECTION? ............N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ................N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? ..............N
OVERLAPS:            | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW |
OMIT OVERLAPS:       |
```

OVERLAP PROGRAMMING COMPLETE

Program extend time on optical detector unit for 2.0 sec for all preempts.

OPTICOM FIELD WIRE DETAIL



*Assuming TB9-2 & TB9-3 are unused on the J File, move wires on JII-J & JII-K (Twisted Pair) to JI2-E & JI3-E Respectively.

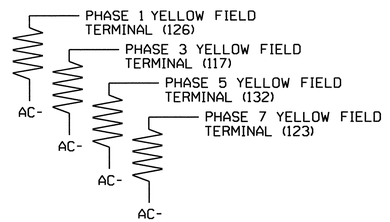
PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 1, 3, and 5 for 'Omit Phase' and Phases 2, 4, 6, 7 and 8 for 'Startup Calls'. This is to prevent Phases 1, 3, and 5 from being served when not in Preempt.

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: 01-0004
DESIGNED: November 2010
SEALED: 12/22/10
REVISED: N/A

Signal Upgrade - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth Street) at US 17 Bus (N Road Street)

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: S. Armstrong | REVIEWED BY:

REVISIONS	INIT.	DATE

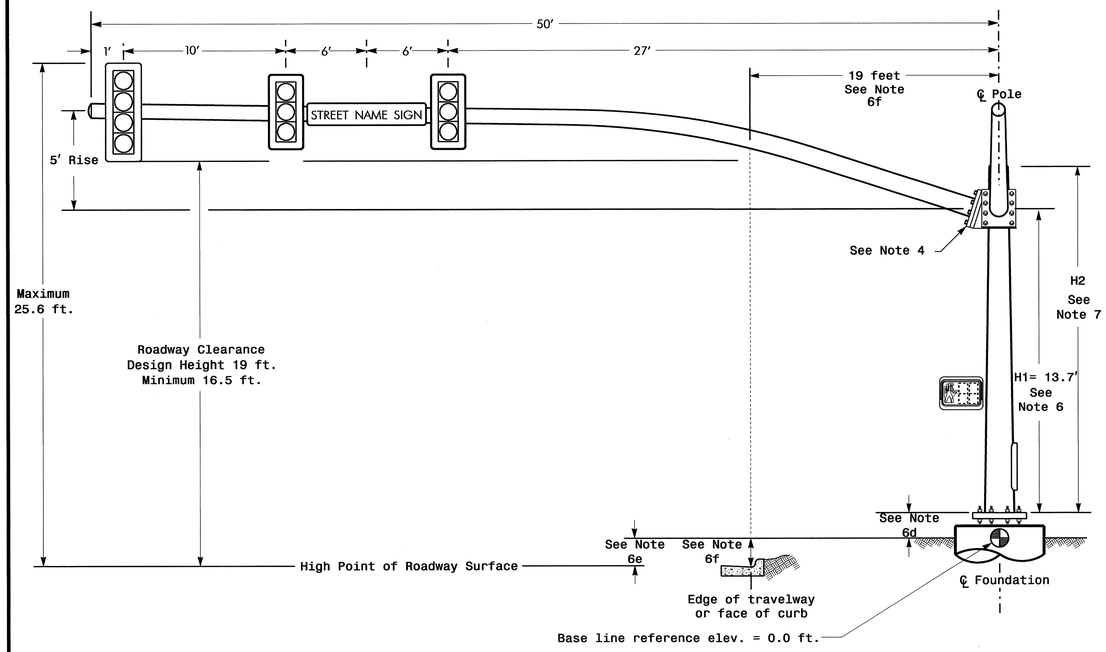
Prepared in the Offices of:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE 12/29/10 DATE

SIG. INVENTORY NO. 01-0004

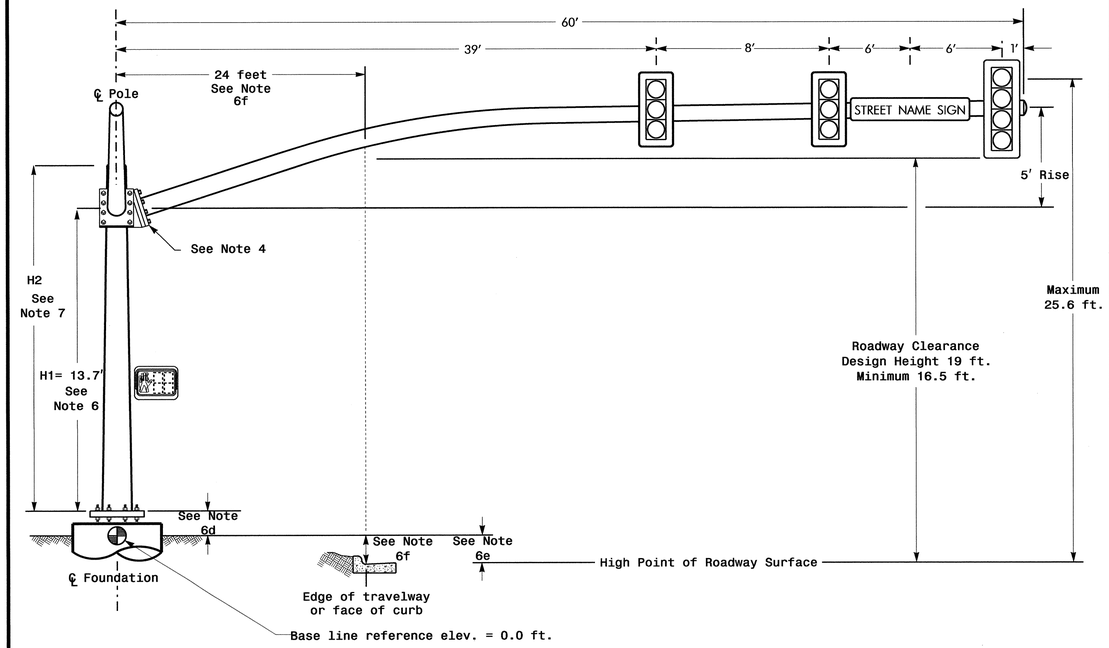
28-DEC-2010 12:01
S:\#ITSASU#ITS Signals\#Workgroups\#Sig Mgmt\Armstrong\#010004_sm_ele_xxx.dgn
ityoung

Design Loading for METAL POLE NO. 1, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 1, MAST ARM B



Elevation View @ 0°

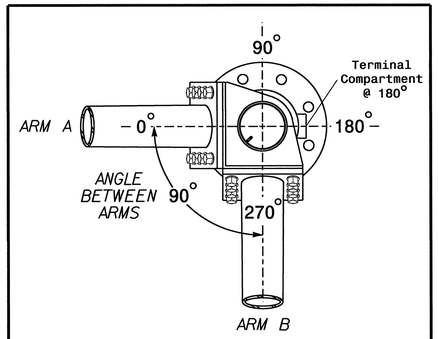
28-DEC-2010 14:15
R:\Traffic\Signals\Design\Signals\01-0004\#Part_archdouble.dgn
dumzurike

SPECIAL NOTE

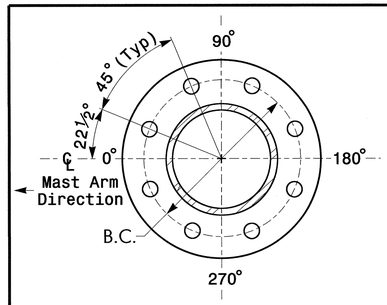
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	-2.3 ft.	-1.2 ft.
Elevation difference at Edge of travelway or face of curb	-2.9 ft.	-1.7 ft.

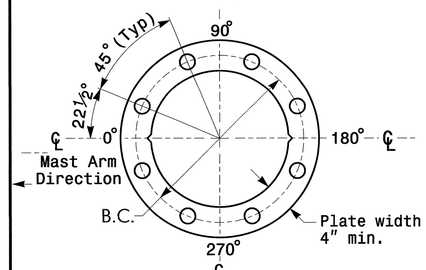


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"–5 SECTION–WITH BACKPLATE AND ASTRO–BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGNAL HEAD 12"–4 SECTION–WITH BACKPLATE AND ASTRO–BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"–3 SECTION–WITH BACKPLATE AND ASTRO–BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO–SIGN–BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2006 NCDOT Roadway Standard Drawings.

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. 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 connection points.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
7. The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. 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 Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. 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 1 (140 mph)

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

US 158 (Elizabeth Street)
at
US 17 Bus. (Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

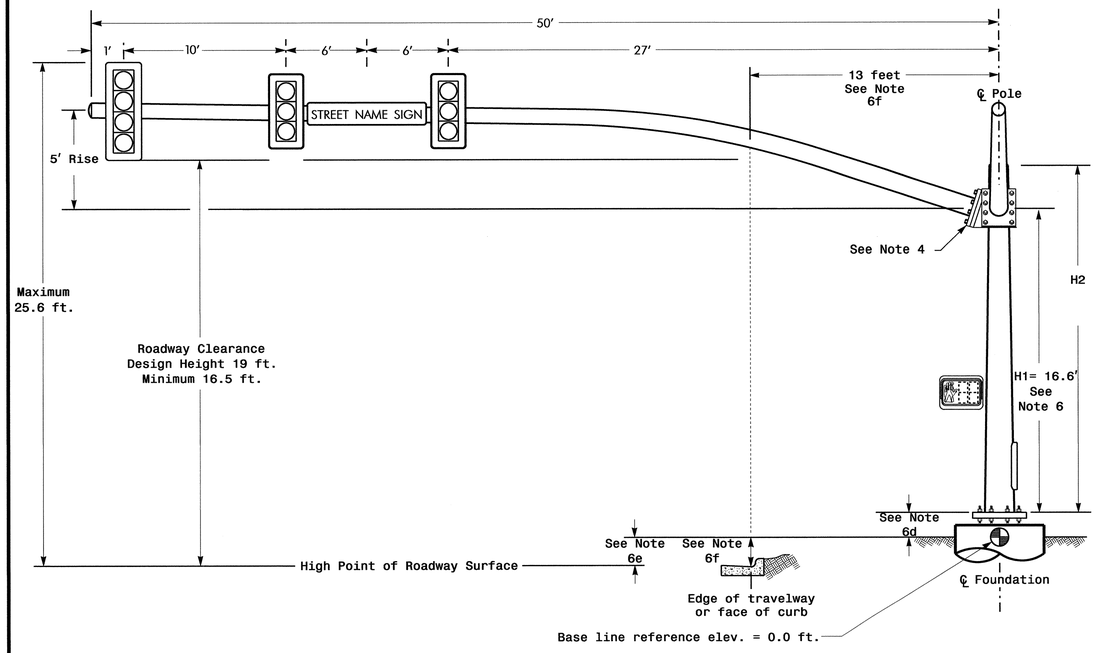
SCALE
0 N/A
N/A

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489 PAMELA PAIGE ALDRIDGE

SIGNATURE 12/28/10 DATE

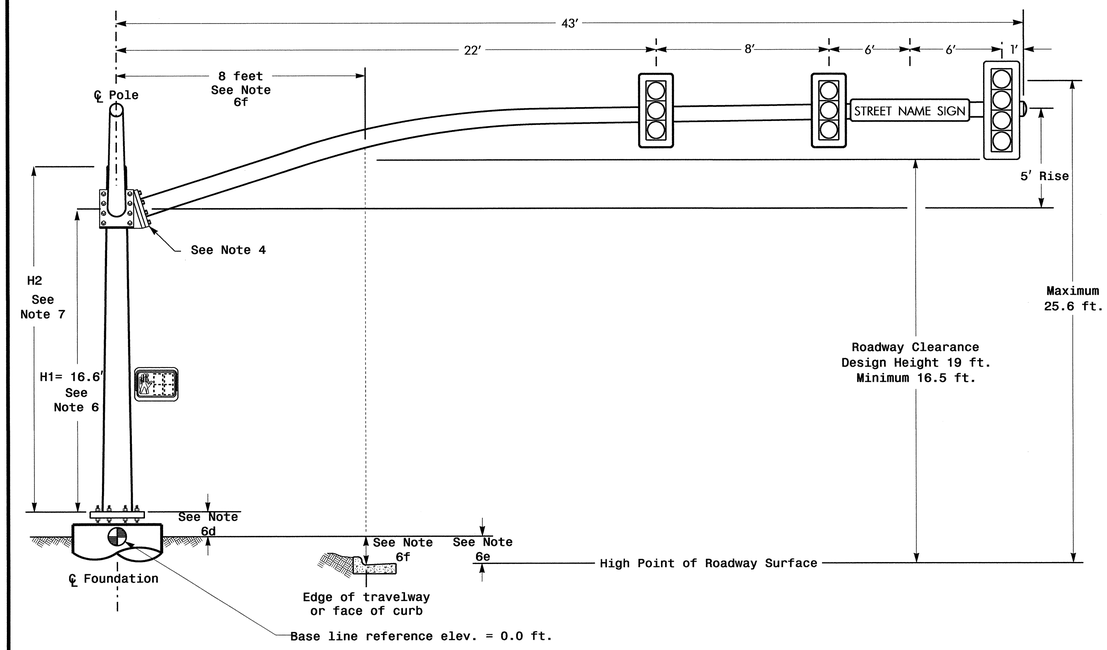
SIG. INVENTORY NO. 01-0004

Design Loading for METAL POLE NO. 2, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 2, MAST ARM B



Elevation View @ 0°

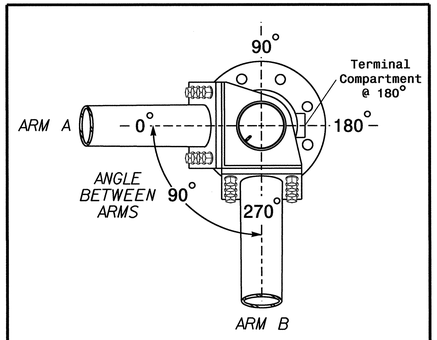
28-DEC-2010 14:18
R:\traffic\Signals\Design\Signals\01-0004\MPM2_archdouble.dgn
dsmith

SPECIAL NOTE

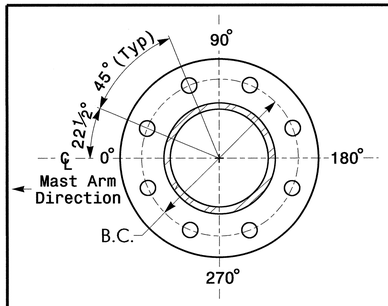
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	+0.6 ft.	0.0 ft.
Elevation difference at Edge of travelway or face of curb	-0.2 ft.	-0.4 ft.

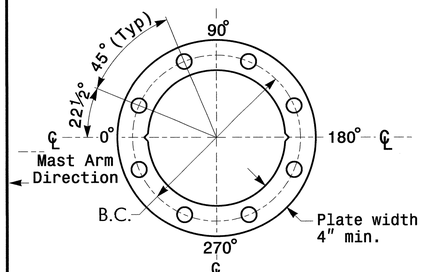


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
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STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

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1. Design the traffic signal structure and foundation in accordance with:
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   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
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   d. The top of the pole base plate is .75 feet above the ground elevation.
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   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
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10. 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 1 (140 mph)

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

US 158 (Elizabeth Street)
at
US 17 Bus. (Road Street)

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE
0 N/A
N/A

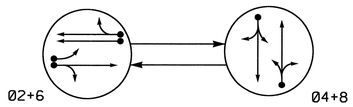
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAUL ALEXANDER

SIGNATURE DATE 12/28/10

SIG. INVENTORY NO. 01-0004

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.18

PHASING DIAGRAM



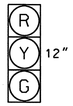
PHASING DIAGRAM DETECTION LEGEND

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

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

SIGNAL FACE I.D.

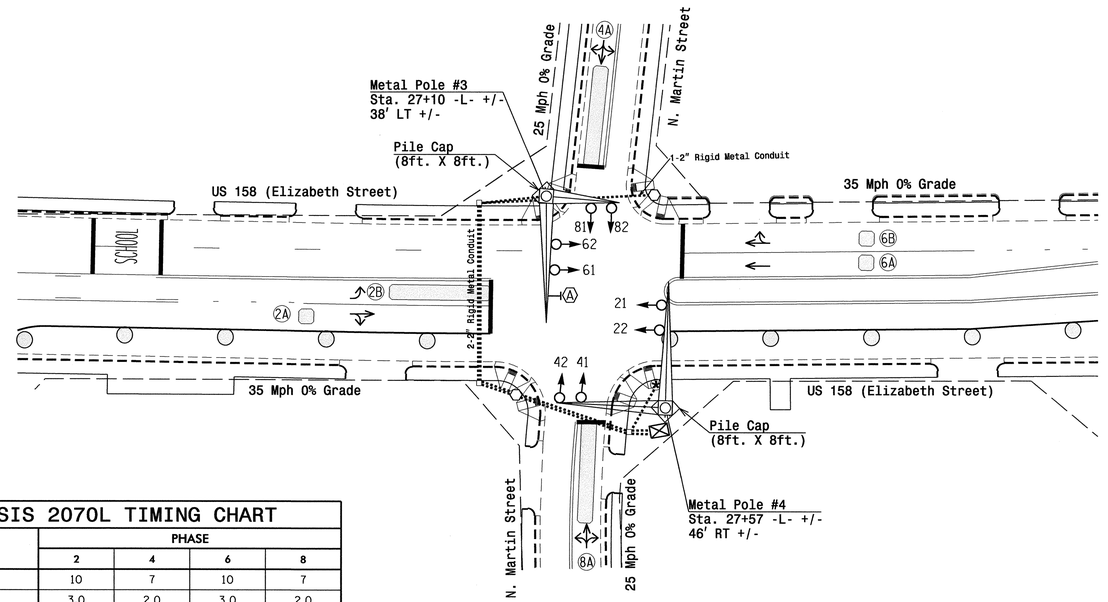
All Heads L.E.D.



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

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

Use wireless detection.



OASIS 2070L TIMING CHART				
FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	30	15	30	15
Yellow Clearance	3.8	3.2	3.8	3.2
Red Clearance	1.1	2.2	1.0	2.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
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.

2 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.

LEGEND

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

Signal Upgrade (Phase IV - TMP 21)

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

SCALE 1"=30'

US 158 (Elizabeth Street)
at
Martin Street

Division 1 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA K. ALEXANDER

SIGNATURE 12/29/10 DATE

SIG. INVENTORY NO. 01-0008T1

29-DEC-2010 11:03
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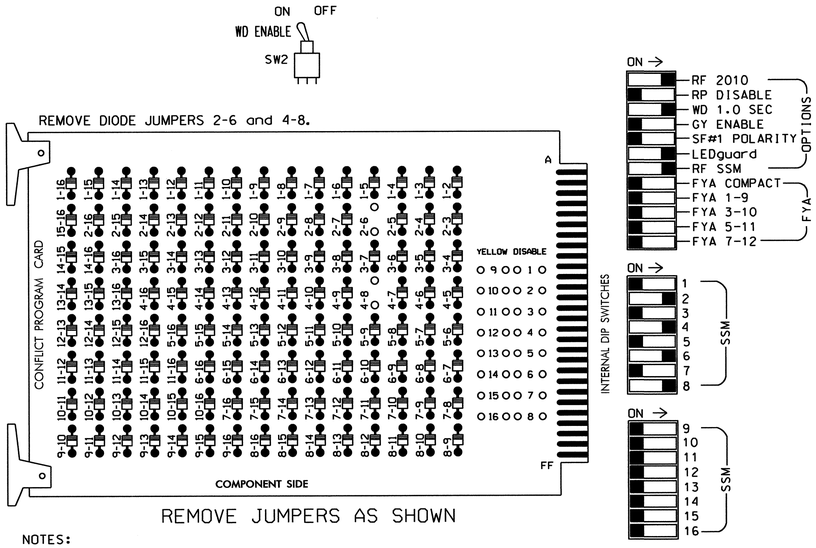
palexander

PROJECT REFERENCE NO.	SHEET NO.
	Sig.19

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5, 7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 an 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S4,S6,S8
PHASES USED.....2,4,6,8
OVERLAPS.....NOT USED

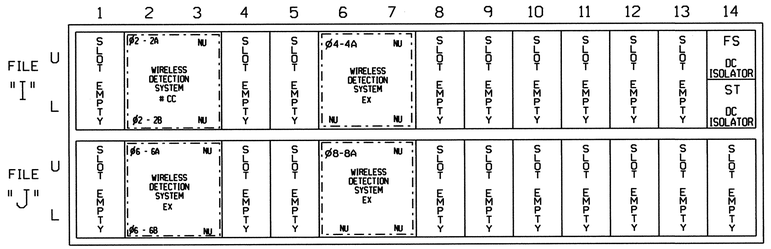
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
FS = FLASH SENSE
ST = STOP TIME

* See Sensys Access Box Wiring Detail this sheet.

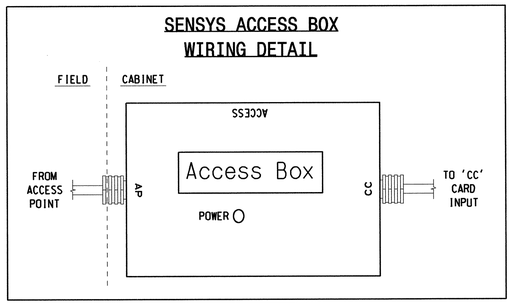
INPUT FILE CONNECTION & PROGRAMMING CHART

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	-	I2U	39	1	2	2	Y	Y			
2B	-	I2L	43	5	12	2	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			
6A	-	J2U	40	2	6	6	Y	Y			
6B	-	J2L	44	6	16	6	Y	Y			
8A	-	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0008T1
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Martin Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

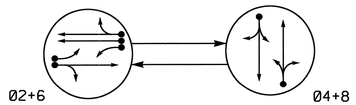
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-20-10 DATE
SIG. INVENTORY NO. 01-0008T1

29-DEC-2010 15:14
S:\Traffic\Signals\Workgroups\Sig Mgmt\Peterson\01008_sheets_xx.dgn
Timberlake

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.20

PHASING DIAGRAM



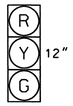
PHASING DIAGRAM DETECTION LEGEND

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

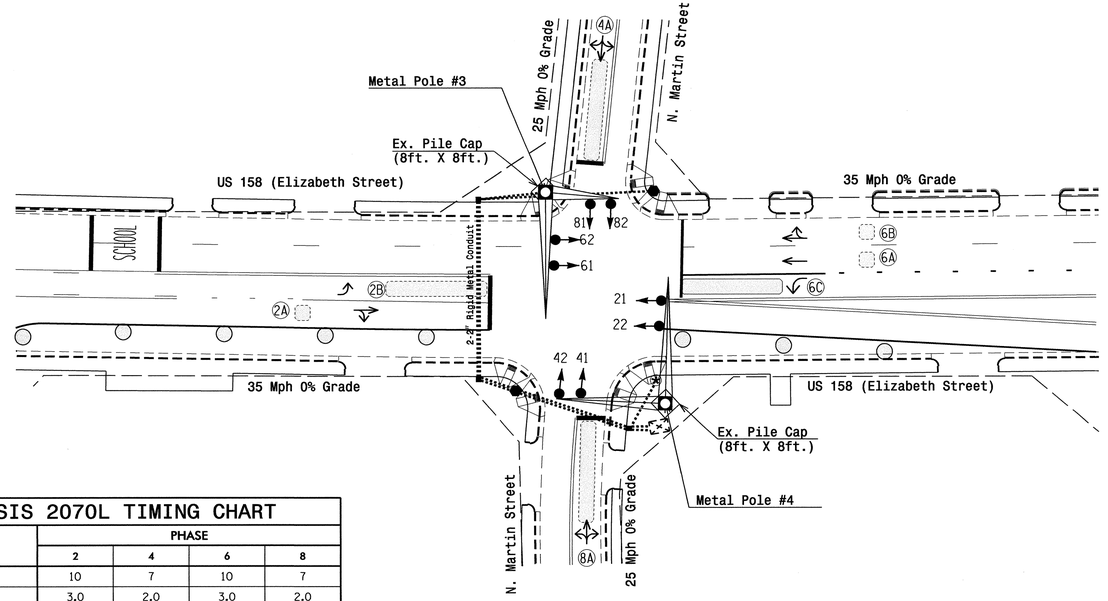
TABLE OF OPERATION			
SIGNAL FACE	PHASE Ø2+6	PHASE Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



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



OASIS 2070L TIMING CHART

FEATURE	PHASE 2	PHASE 4	PHASE 6	PHASE 8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	30	15	30	15
Yellow Clearance	3.8	3.2	3.8	3.2
Red Clearance	1.1	2.2	1.1	2.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
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.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP / NEW CARD
2A	6X6	70	N/A	-	2	Y	Y	-	-	-	- / -
2B	6X40	0	N/A	-	2	Y	Y	-	-	-	- / -
4A	6X40	0	N/A	-	4	Y	Y	-	-	-	- / -
6A	6X6	70	N/A	-	6	Y	Y	-	-	-	- / -
6B	6X6	70	N/A	-	6	Y	Y	-	-	-	- / -
6C	6X40	0	N/A	Y	6	Y	Y	-	-	-	- / Y
8A	6X40	0	N/A	-	8	Y	Y	-	-	-	- / -

Use wireless detection.

2 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.

LEGEND

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

Signal Upgrade (Phase V - TMP 25)

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

US 158 (Elizabeth Street)
at
Martin Street

Division 1 Pasquotank County Elizabeth City
PLAN DATE: November 2010 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA L. TAYLOR
SIGNATURE 12/29/10 DATE
SIG. INVENTORY NO. 01-0008T2

29-DEC-2010 10:31
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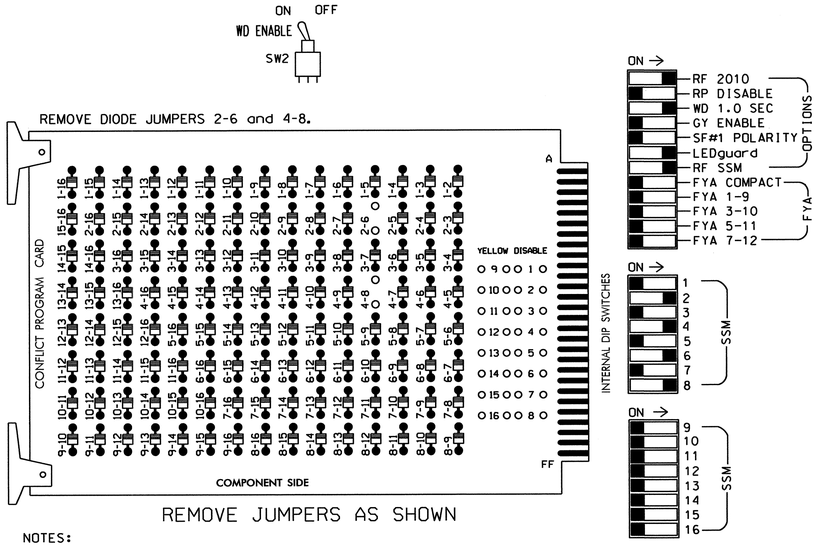
pdotwoodbe

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.21

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5, 7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 an 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S2,S4,S6,S8
PHASES USED.....2,4,6,8
OVERLAPS.....NOT USED

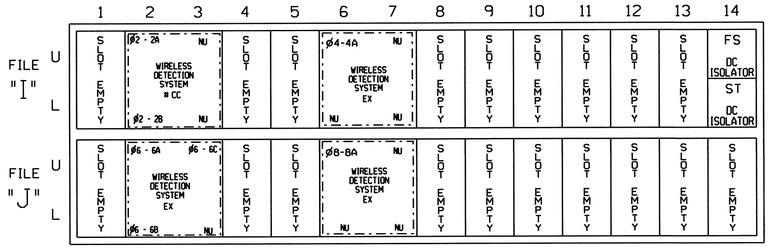
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
FLASHING YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
FS = FLASH SENSE
ST = STOP TIME
* See Sensys Access Box Wiring Detail this sheet.

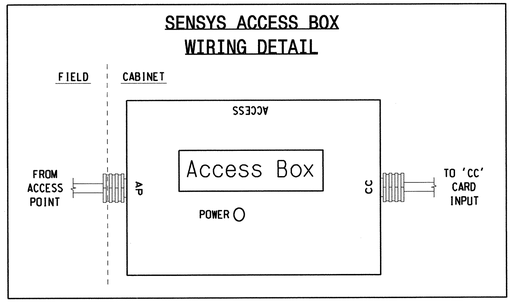
INPUT FILE CONNECTION & PROGRAMMING CHART

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	-	I2U	39	1	2	2	Y	Y			
2B	-	I2L	43	5	12	2	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			
6A	-	J2U	40	2	6	6	Y	Y			
6B	-	J2L	44	6	16	6	Y	Y			
6C	-	J3U	64	26	36	6	Y	Y			
8A	-	J6U	42	4	8	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0008T2
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Martin Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0008T2

29-DEC-2010 15:14
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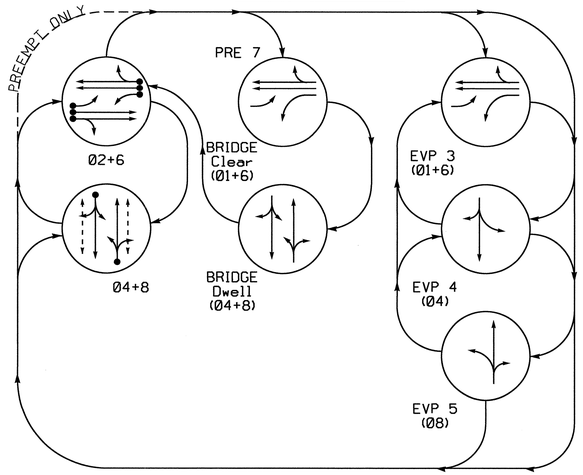
TIS 8.05.03

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.22

2 Phase
Fully Actuated
with EVP and Bridge Preemption
US 158 (Elizabeth Street) CLS

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 02+6	04+8	RIGHT OVLP	RIGHT OVLP	EVP 3	EVP 4	EVP 5	FLASH
21	~~Y~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
22, 23	G	R	R	R	R	R	R	Y
41, 42	R	G	R	G	R	G	R	R
61	~~Y~~	~~R~~	~~-~~	~~R~~	~~-~~	~~R~~	~~R~~	~~Y~~
62, 63	G	R	G	R	G	R	R	Y
81, 82	R	G	R	G	R	R	G	R
P41, P42	DW	W	DW	DW	DW	DW	DW	DRK
P81, P82	DW	W	DW	DW	DW	DW	DW	DRK

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

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

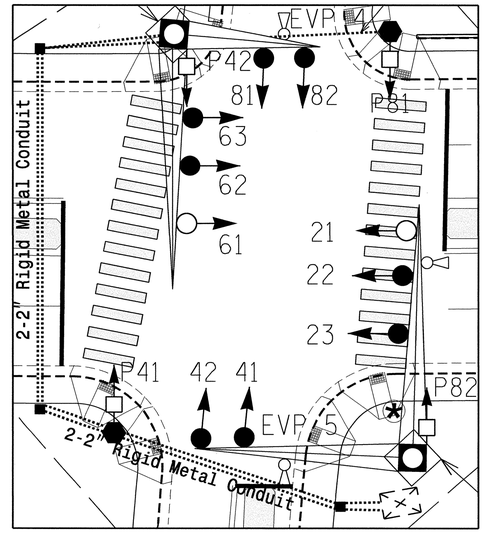
FROM	TO ← 1	TO ← 2	TO ~~Y~~ 1	TO ~~Y~~ 2	TO ~~R~~ 1	TO ~~R~~ 2
←	~~-~~	~~-~~	~~Y~~	~~Y~~	~~R~~	~~R~~
~~Y~~	~~Y~~	~~Y~~	~~Y~~	~~Y~~	~~R~~	~~R~~
~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~

~~Y~~ = Flashing Yellow Arrow

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	N/A	-	2	Y	Y	-	-	-	-	-
2B	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	-
2C	6X40	0	N/A	-	2	Y	Y	-	-	-	-	Y
4A	6X40	0	N/A	-	4	Y	Y	-	-	5	-	-
6A	6X6	70	N/A	-	6	Y	Y	-	-	-	-	-
6B	6X6	70	N/A	-	6	Y	Y	-	-	-	-	-
6C	6X40	0	N/A	-	6	Y	Y	-	-	-	-	-
8A	6X40	0	N/A	-	8	Y	Y	-	-	5	-	-
SO5	6X6	+80	N/A	Y	-	-	-	-	-	-	Y	-
SO6	6X6	+80	N/A	Y	-	-	-	-	-	-	Y	-

Use wireless detection.



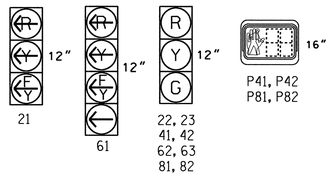
INSET

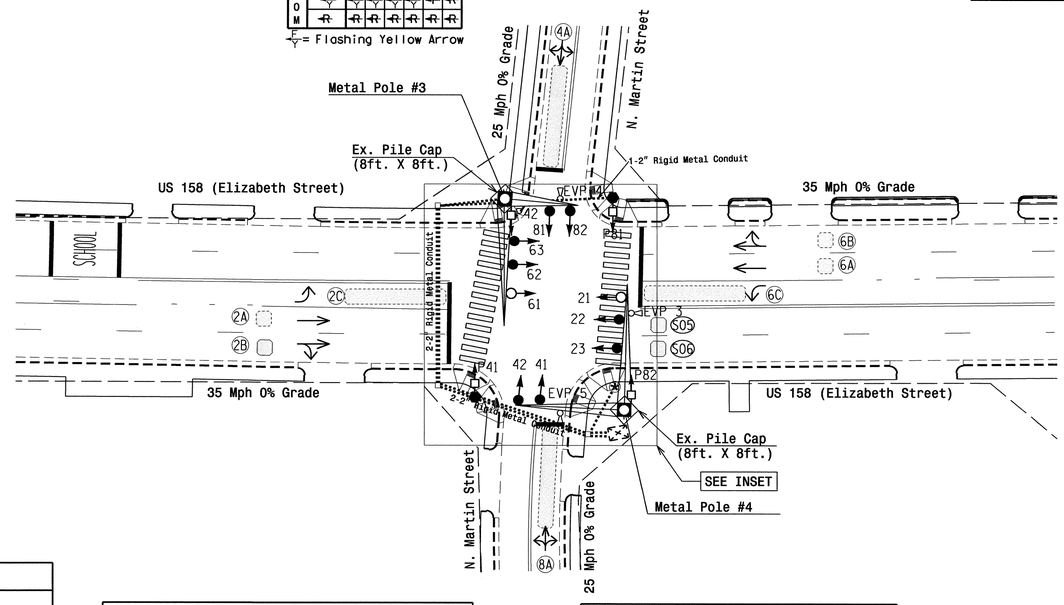
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
4. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
5. Closed loop system data: Controller Asset #0008.

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Out of Pavement Detector	
	Signal Pedestal	
N/A	Wheelchair Ramp	
N/A	2" Rigid Metal Conduit	
N/A	Push Button Post	

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	3.0	2.0	3.0	2.0
Max Green 1 *	30	15	30	15
Yellow Clearance	3.8	3.2	3.8	3.2
Red Clearance	1.2	2.2	1.2	2.2
Walk 1 *	-	7	-	7
Don't Walk 1	-	14	-	14
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

* 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.

2070 EV PREEMPTION

FUNCTION	PRE 3	PRE 4	PRE 5
Interval 1 – Dwell Green	255	255	255
Interval 1 – Dwell Yellow	3.8	0.0*	0.0*
Interval 1 – Dwell Red	1.2	0.0*	0.0*
Interval 5 – Exit Green	0	0	0
Interval 5 – Yellow	0.0*	0.0*	0.0*
Interval 5 – Red	0.0*	0.0*	0.0*
Priority	Medium	Medium	Medium
Delay Time	0.0	0.0	0.0
Min Green Before Pre	1	1	1
Ped Clear Before Pre	7	7	7
Yellow Clear Before Pre	0.0*	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*	0.0*
Dwell Min Time	10	7	7
Enable Backup Protection	N	Y	Y
Ped Clear Through Yellow	Y	Y	Y
Preempt Extend**	2	2	2
Omit Overlaps	-	-	-

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

2070 BRIDGE PREEMPTION 7

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	3.8
Interval 1 – Bridge Clearance Red	1.2
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	20
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	High
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	10
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	Y

* Time defaults to time used for phase during normal operation

Signal Upgrade

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

US 158 (Elizabeth Street) at Martin Street

Division 1 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA ALEXANDER
SIGNATURE DATE 12/29/10

SIG. INVENTORY NO. 01-0008

30-DEC-2010 09:49
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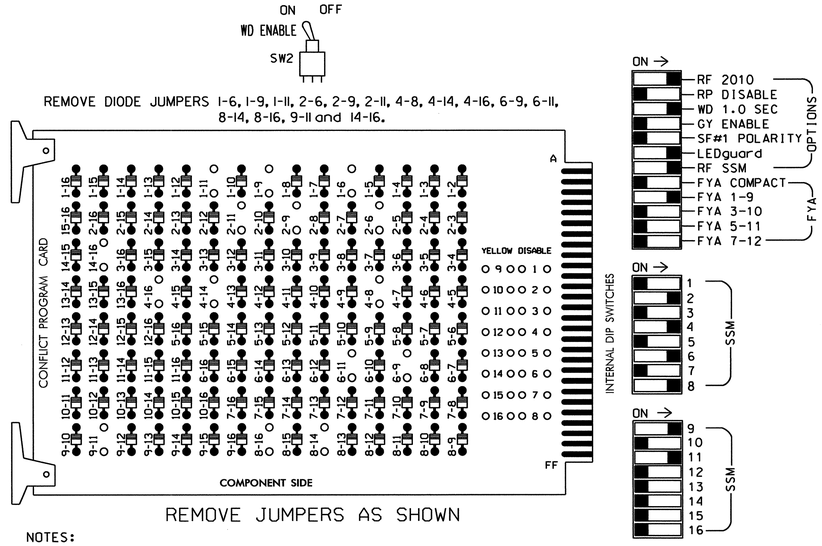
IOUmozurike

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 4 an 8 for Dual Entry.
4. Enable Simultaneous Gap-Out for all phases.
5. Program phases 2 and 6 for Start Up In Green.
6. Program phases 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 US 158 (Elizabeth Street) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S4P,S6,S8,S8P,S9,S12.
PHASES USED.....*1,2,4,6,8,4 PED,8 PED
OVERLAP "A".....1+2+6
OVERLAP "B".....NOT USED
OVERLAP "C".....6
OVERLAP "D".....NOT USED

*USED ONLY DURING PREEMPTION.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1★	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA★	OLB	SPARE	OLC★	OLD	SPARE
SIGNAL HEAD NO.	61	22,23	NU	NU	41,42	P41, P42	NU	62,63	NU	NU	81,82	P81, P82	61	NU	NU	21	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127																	
✋						104						110						
🚶						106						112						

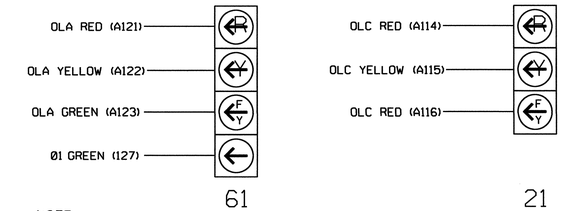
NU = Not Used

★See pictorial of head wiring in detail below.

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

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

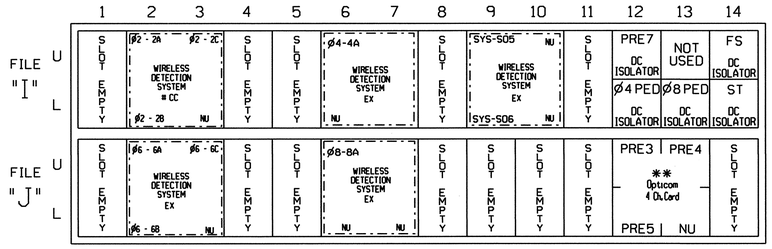


NOTE

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

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
* See Sensys Access Box Wiring Detail this sheet.

FS = FLASH SENSE
ST = STOP TIME
EV PREEMPT = PRE3, PRE4 & PRE5
BRIDGE PREEMPT = PRE7

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	-	I2U	39	1	2	2	Y	Y			
2B	-	I2L	43	5	12	2	Y	Y			
2C	-	I3U	63	25	32	2	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			5
*SØ5	-	I9U	60	22	11	SYS					
*SØ6	-	I9L	62	24	13	SYS					
6A	-	J2U	40	2	6	6	Y	Y			
6B	-	J2L	44	6	16	6	Y	Y			
6C	-	J3U	64	26	36	6	Y	Y			
8A	-	J6U	42	4	8	8	Y	Y			5
PED PUSH BUTTONS											
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.

* 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

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

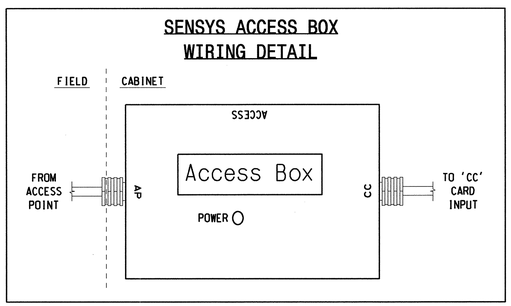
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 1 for 'Omit Phase' and Phases 2, 4, 6 and 8 for 'Startup Calls'. This is to prevent Phase 1 from being served when not in Preempt.

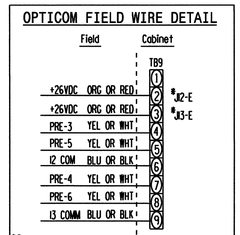
SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

OPTICOM FIELD WIRE DETAIL



**Assuming TB9-2 & TB9-3 are unused on the J File, move wires on J4-J & J4-K (Twisted Pair) to J2-E & J3-E Respectively.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0008
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

Signal Upgrade - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Martin Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0008

30-DEC-2010 10:48
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.24

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
                              PRESS '+'
```

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO NEXT PHASE AS EVP3 CLEARS. (HEAD 61)

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

                 SCROLL DOWN

 THEN:
 SET OUTPUT  ASSIGNMENT #52 OFF
                              PRESS '+'
```

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" WHEN PHASE 1 IS SERVED DURING EVP3. (HEAD 61)

```
  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 TO NEXT PHASE AS EVP3 CLEARS. (HEAD 61)

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

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)

PHASE 1 YELLOW FIELD TERMINAL (126)

AC-

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR SPECIAL SEQUENCE OPERATION

(program controller as shown below)

1. FROM MAIN MENU PRESS '5' (INPUTS).
2. WITH CURSOR IN "INPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE INPUT ASSIGNMENT NUMBER 29, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

STEP 1

```
PAGE:1  C1 PIN:67   PEDESTRIAN PHASE
INPUT ASSIGNMENT #.................29
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED........................Y
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).Y
```

SCROLL DOWN TO VIEW ALL DATA

EXISTING DEFAULT PROGRAMMING (IGNORE FOR NOW)

STEP 2

AFTER SELECTION IS MADE, THE PHASE CONTROL FUNCTIONS TABLE APPEARS. SCROLL DOWN ON THIS TABLE AND FIND "PREEMPT", THEN SELECT 7 FOR "PREEMPT".

AFTER SELECTION IS MADE PRESS "ENTER"

SELECT "Y" FOR "OVERRIDE PHASE CONTROL FUNCTION"

SCREEN NOW APPEARS AS SHOWN TO THE RIGHT.

(PROGRAMMING COMPLETE)

STEP 3

```
PAGE:1  C1 PIN:67   PREEMPT
INPUT ASSIGNMENT #.................29
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED.........................
VEHICLE DETECTOR (1-64).............
PEDESTRIAN DETECTOR (1-16)..........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10)......................7
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).Y
```

INPUT 29 = PED 2 DETECTOR

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0008
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

Signal Upgrade - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

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

750 N.Greenfield Pkwy.,Garner,NC 27529

US 158 (Elizabeth City) at Martin Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: Decmmber 2010 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

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

SIGNATURE 12-30-10 DATE

SIG. INVENTORY NO. 01-0008

29-DEC-2010 15:42
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.25

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:          |1234567891011213141516
VEH OVL PARENTS:  |XX    X
VEH OVL NOT VEH:  |
VEH OVL NOT PED:  |
VEH OVL GRN EXT:  |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC).........0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)..0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0
```

← NOTICE GREEN FLASH

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
  PHASE:          |1234567891011213141516
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

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press the 'Next" key 2-times to advance to Preempt #3.

EVP 3 :

```
   PREEMPTION  #3  SETTINGS (NEXT:1-10)
INTERVAL/TIMING |  CLEAR/DWELL PHASES
  GRN YEL  RED  |1234567891011213141516
1 255  3.8  1.2 |X    X
2   0  0.0  0.0 |
3   0  0.0  0.0 |
4   0  0.0  0.0 |
5   0  0.0  0.0 |
EXIT CALLS      |
          OPTIONS
PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ........................N
LINK TO NEXT PREEMPT? ..............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

PRESS 'NEXT'

EVP 4 :

```
   PREEMPTION  #4  SETTINGS (NEXT:1-10)
INTERVAL/TIMING |  CLEAR/DWELL PHASES
  GRN YEL  RED  |1234567891011213141516
1 255  0.0  0.0 |   X
2   0  0.0  0.0 |
3   0  0.0  0.0 |
4   0  0.0  0.0 |
5   0  0.0  0.0 |
EXIT CALLS      |
          OPTIONS
PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........7
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ........................N
LINK TO NEXT PREEMPT? ..............N
ENABLE BACKUP PROTECTION? ...........Y
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

PRESS 'NEXT'

EVP 5 :

```
   PREEMPTION  #5  SETTINGS (NEXT:1-10)
INTERVAL/TIMING |  CLEAR/DWELL PHASES
  GRN YEL  RED  |1234567891011213141516
1 255  0.0  0.0 |      X
2   0  0.0  0.0 |
3   0  0.0  0.0 |
4   0  0.0  0.0 |
5   0  0.0  0.0 |
EXIT CALLS      |
          OPTIONS
PRIORITY (Y/N TO SELECT) .............MED
DELAY TIMER (0-255 SEC) ..............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........7
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? ........................N
LINK TO NEXT PREEMPT? ..............N
ENABLE BACKUP PROTECTION? ...........Y
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

PROGRAMMING COMPLETE

* TIME DEFAULTS TO NORMAL PHASE TIMING.

* TIME DEFAULTS TO NORMAL PHASE TIMING.

Program extend time on optical detector units for 2.0 sec.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0008
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 158 (Elizabeth City)
at
Martin Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: Decmmber 2010 | REVIEWED BY: JTR

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

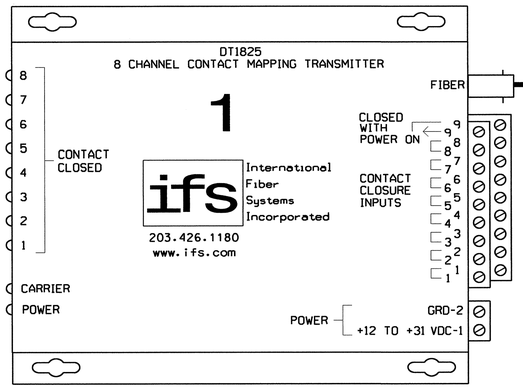
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.

SIGNATURE 12-30-10 DATE

SIG. INVENTORY NO. 01-0008

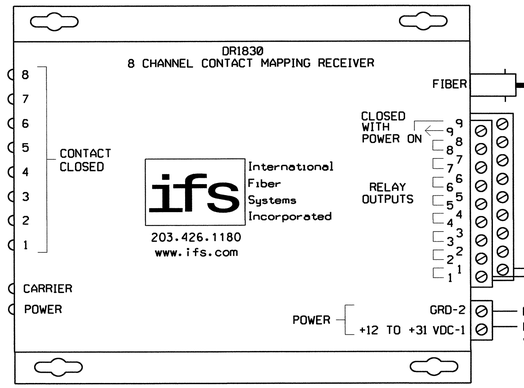
PROJECT REFERENCE NO.	SHEET NO.
	Sig.26

FIBER OPTIC CONTACT CLOSURE TRANSMITTER #1 WIRING FOR 01-0010



Simplex multimode fiber optic cable

FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0008



DC Isolator Common
(TB8-6)

(on input panel)
(TB8-4)
(PRE-7 CALL)

BRIDGE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' until you advance to Preemption #7.

```
   PREEMPTION  #7  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |123456789101112131415 16
1  25  3.8  1.2  |X    X
2 255  0.0  0.0  |   X   X
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   1  0.0  0.0  | X   X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ..........HIGH
DELAY TIMER (0-255 SEC) ............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....10
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                 | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW    |
OMIT OVERLAPS:            |
```

* Denotes time defaulting to normal phase timing.

NOTES

1. The International Fiber Systems DR1830 is an 8-channel contact mapping transmitter capable of transmitting up to eight contact closures over one optical fiber.

* 2. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0008
DESIGNED: November 2010
SEALED: 12-29-10
REVISED: N/A

Signal Upgrade - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street)
at
Martin Street

Division 01 | Pasquotank County | Elizabeth City

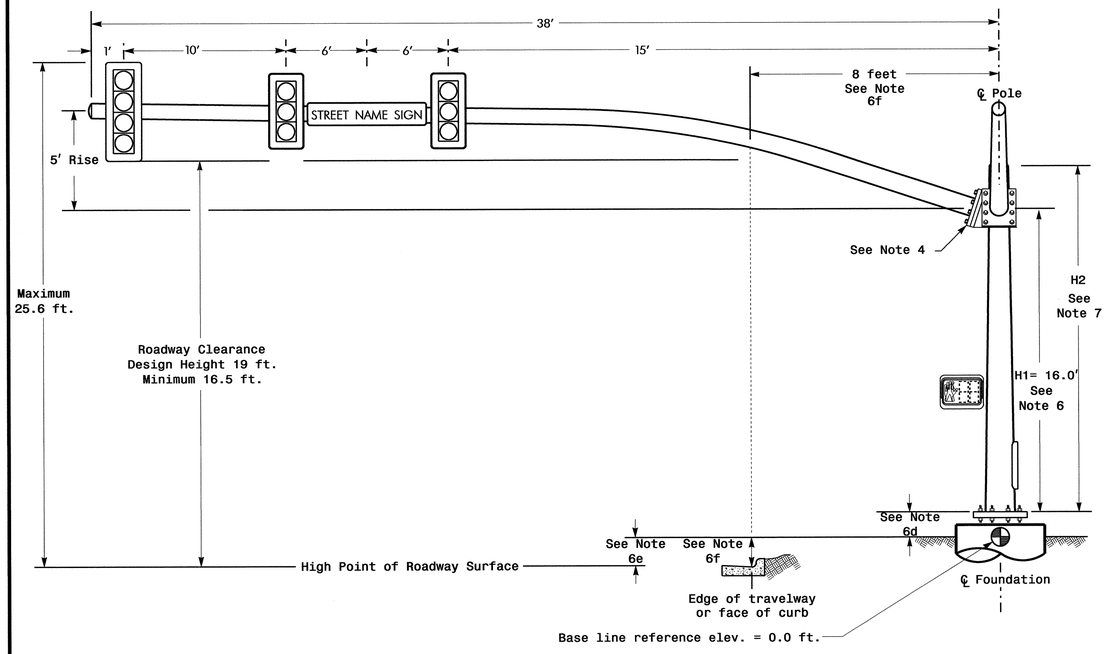
PLAN DATE: December 2010 | REVIEWED BY: JTR
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0008

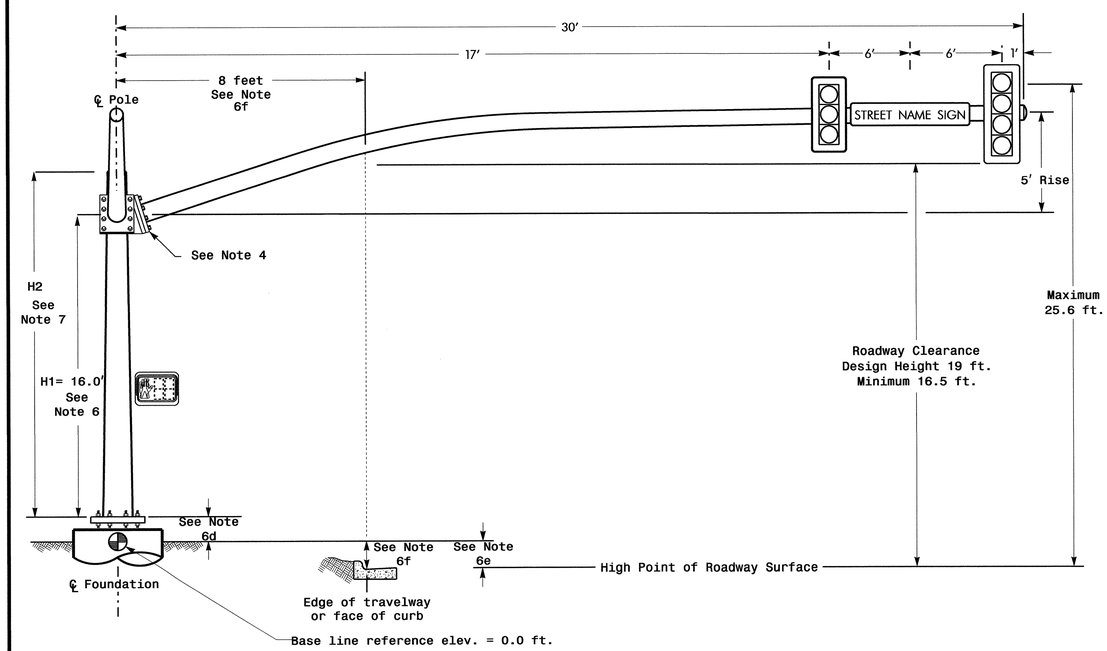
30-DEC-2010 10:45
S:\#TTSSUP#TS Signals\Workgroups\Sig Mon\Peterson\010008_sm_ele_xx.dgn
jtpeterson

Design Loading for METAL POLE NO. 3, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 3, MAST ARM B



Elevation View @ 0°

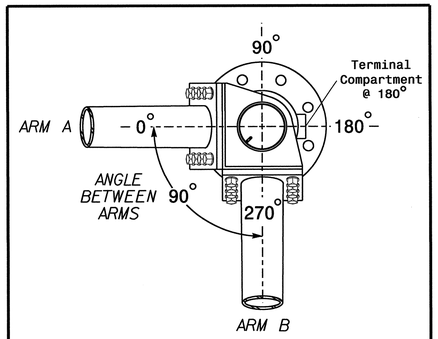
28-DEC-2010 14:33
R:\traffic\Designs\Signals\01-0008\Mast_arm3_arch2double.dgn
lounzurike

SPECIAL NOTE

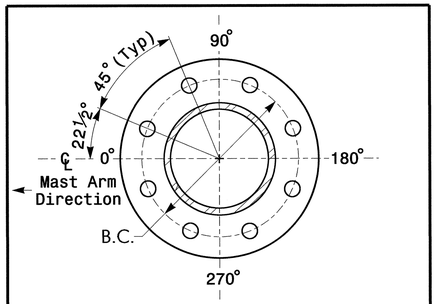
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	0.0 ft.	+0.1 ft.
Elevation difference at Edge of travelway or face of curb	-0.6 ft.	-0.2 ft.

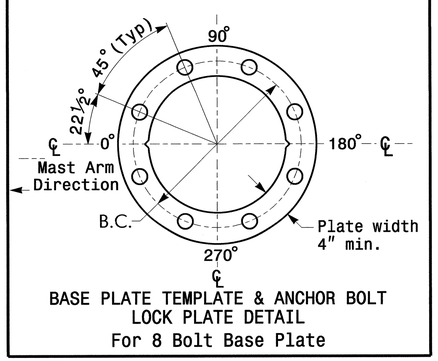


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2006 NCDOT Roadway Standard Drawings.

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. 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 connection points.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
7. The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. 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 Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. 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 1 (140 mph)

Prepared in the Offices of:
Traffic Engineering Branch, Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS and Signals Unit
750 N. Greenfield Pkwy, Garner, NC 27529

US 158 (Elizabeth Street) at Martin Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

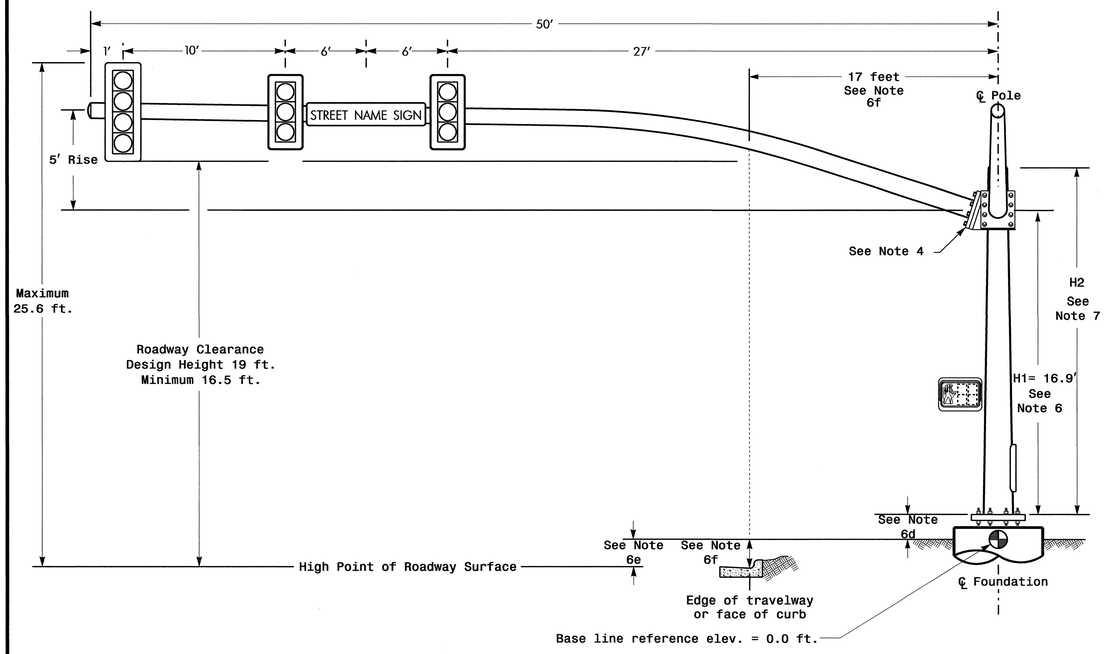
SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER IAN OMOZURIKE UMOZURIKE
12/28/10
SIGNATURE DATE

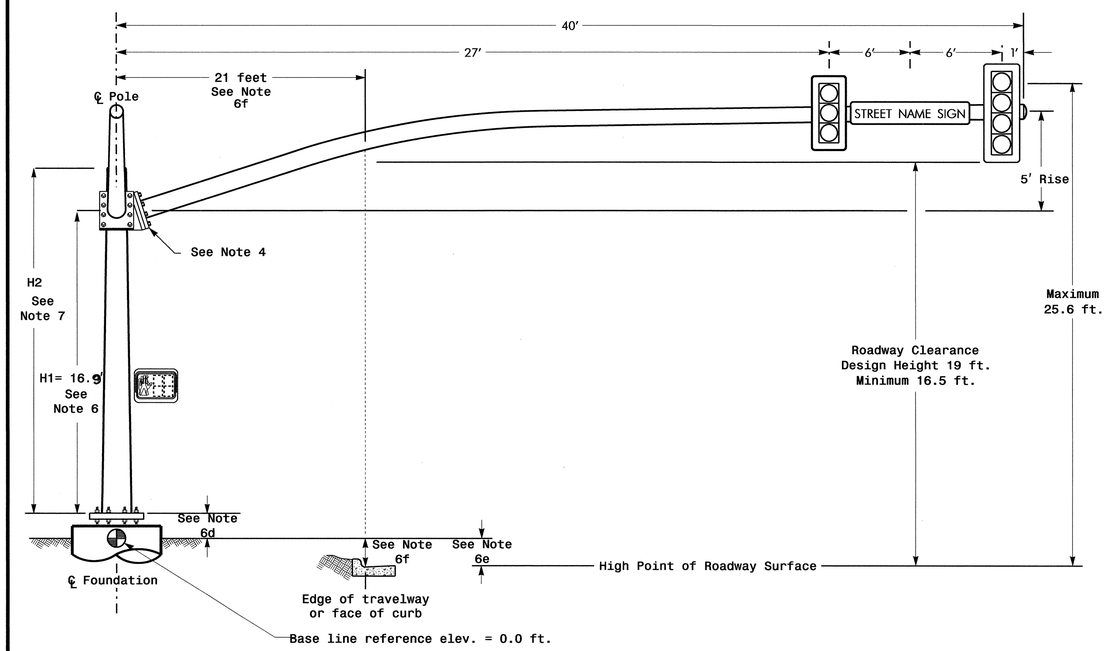
SIG. INVENTORY NO. 01-0008

Design Loading for METAL POLE NO. 4, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 4, MAST ARM B



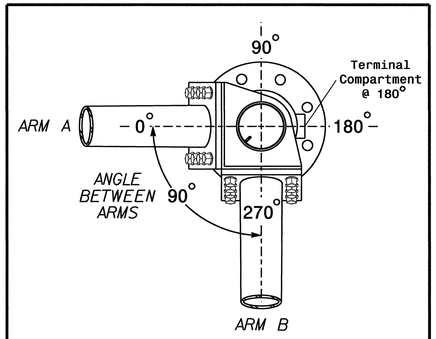
Elevation View @ 0°

SPECIAL NOTE

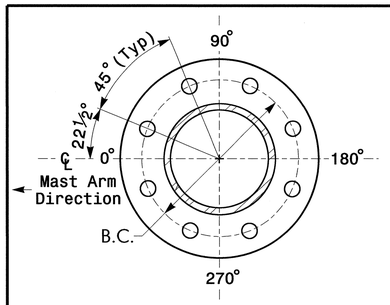
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	+0.9 ft.	+0.1 ft.
Elevation difference at Edge of travelway or face of curb	0.0 ft.	-0.3 ft.

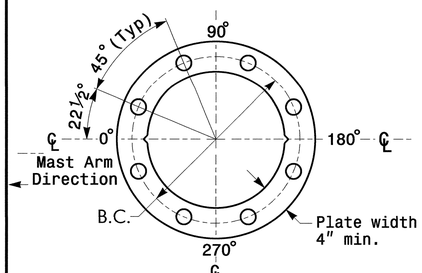


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

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LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
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   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
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NCDOT Wind Zone 1 (140 mph)

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

SCALE
0 N/A
N/A

US 158 (Elizabeth Street)
at
Martin Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER IFEANYI A. UMOZURIKE

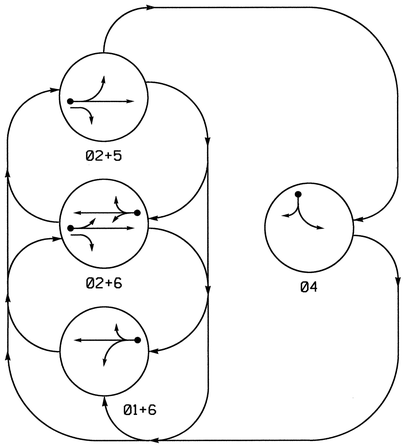
SIGNATURE 12/28/10 DATE

SIG. INVENTORY NO. 01-0008

28-DEC-2010 14:35
R:\#Traffic\Signals\Design\Signals\01-0008\#Lpm4_archdouble.dgn
lpmozur1ke

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.29

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

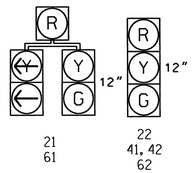
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

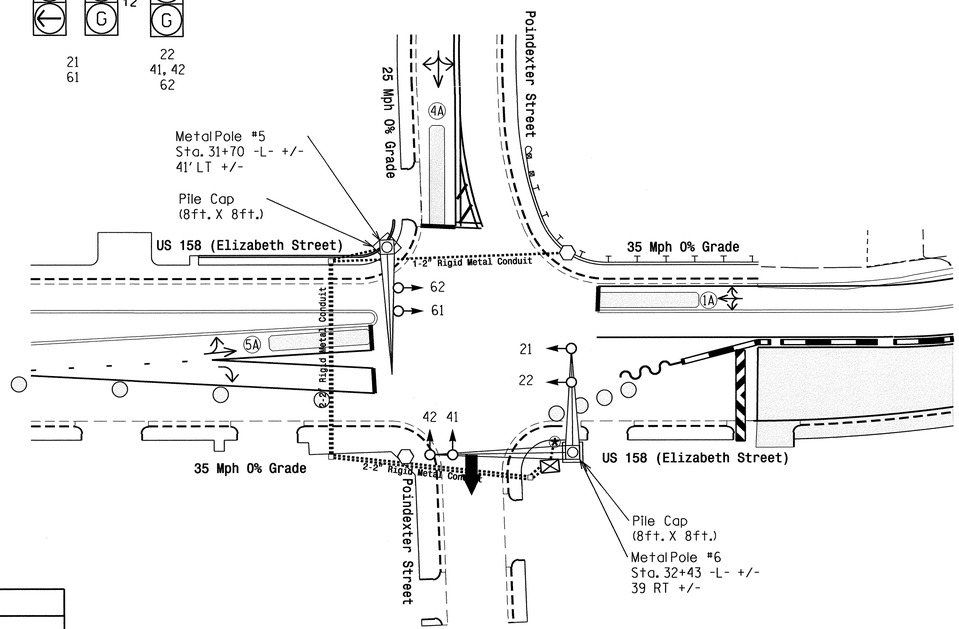
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+5	PHASE 02+6	PHASE 04	FLASH
21	R	G	G	R	Y
22	R	G	G	R	Y
41, 42	R	R	R	G	R
61	G	R	G	R	Y
62	G	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

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

* Use wireless detection.

4 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Program controller to clear from phase 2+6 to phase 2+5 by progressing through all red display.
4. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
5. Set all detector units to presence mode.

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 5	PHASE 6
Min Green 1 *	4	10	7	4	10
Extension 1 *	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	10	30	15	10	30
Yellow Clearance	3.0	3.8	3.2	3.0	3.8
Red Clearance	2.1	1.4	1.8	1.8	1.4
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Construction Zone	
	Barricade	
	Signal Pedestal	
	2" Rigid Metal Conduit	N/A
	Push Button Post	N/A

Signal Upgrade (Phase IV - TMP 21)

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

US 158 (Elizabeth Street)
at
Poindexter Street

Division 3 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA K. ALEXANDER
SIGNATURE 12/28/10 DATE

SIG. INVENTORY NO. 01-0009T1

28-DEC-2010 10:19
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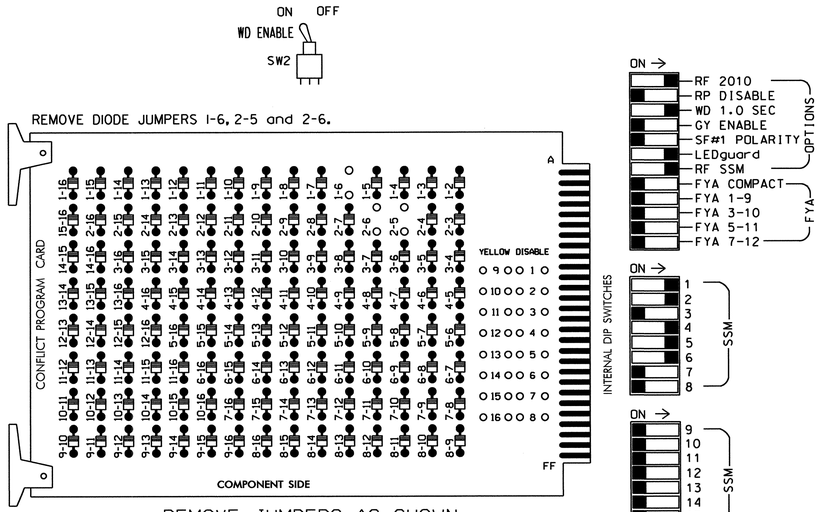
Computer File

PROJECT REFERENCE NO.	SHEET NO.
	Sig.30

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per thet cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2 / OLE	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101		*	134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW	126						132											
GREEN ARROW	127						133											

NU = Not Used

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

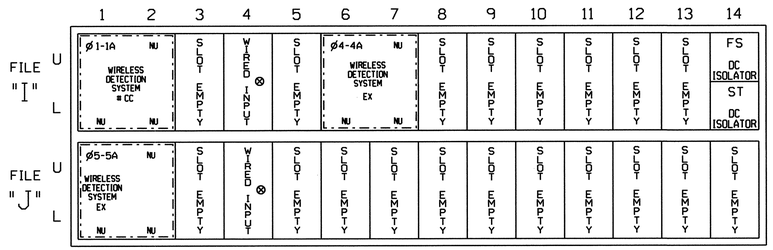
BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)



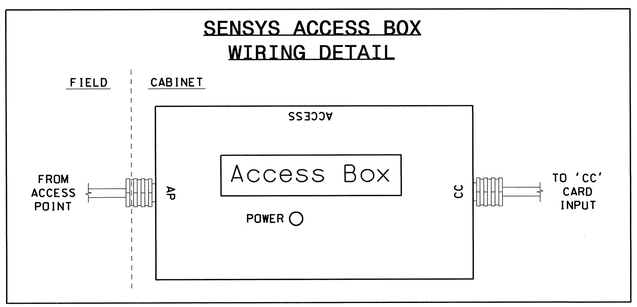
EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

* See Sensys Access Box Wiring Detail this sheet.

SENSYS ACCESS BOX WIRING DETAIL



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]	-	I1U	56	18	1	1	Y	Y	Y		15
	-	J4U	48	10	26	6	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			5
5A[2]	-	J1U	55	17	5	5	Y	Y	Y		15
	-	I4U	47	9	22	2	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.

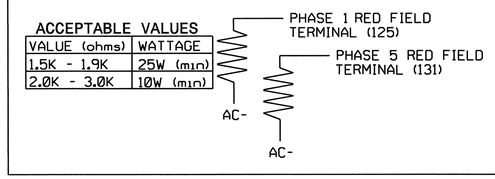
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

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: 01-0009T1
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Poindexter Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: December 2010 REVIEWED BY:

PREPARED BY: James Peterson REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR
SIGNATURE 12-29-10 DATE

SIG. INVENTORY NO. 01-0009T1

29-DEC-2010 16:31
S:\Traffic\Signals\Projects\Signals\Work\Groups\Sig Mgmt\Peterson\#010009_sm_ele_xxx.dgn
$$USER$$

PROJECT REFERENCE NO.	SHEET NO.
	Sig.31

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PRESS '+' FOUR TIMES

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          ¦12345678910111213141516
VEH OVL PARENTS:¦ X  X
VEH OVL NOT VEH:¦
VEH OVL NOT PED:¦
VEH OVL GRN EXT:¦
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ GREEN
-------------------------------------------
SELECT VEHICLE OVERLAP OPTIONS:   (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...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)....2
```

OVERLAP PROGRAMMING COMPLETE

PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1 NEXT: PAGES)

RNG	LEAD	BARRIER 1		X-LAG	LEAD	BARRIER 2		X-LAG	LEAD	BARRIER 3		X-LAG
1	1	2	0	0	0	0	0	0	4	0	0	0
2	0	6	0	0	5	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0009T1
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 158 (Elizabeth Street)
at
Poindexter Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

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

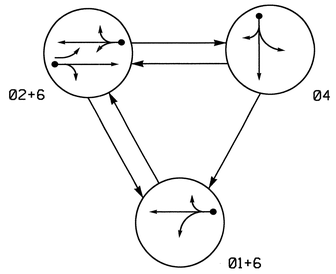
SIGNATURE 12-29-10 DATE

SIG. INVENTORY NO. 01-0009T1

29-DEC-2010 13:50
S:#ITSSSU#ITS Signals#Workgroups#Sig Mgmt#Peterson#010009_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.32

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

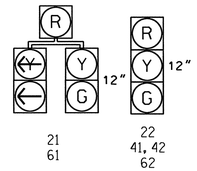
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

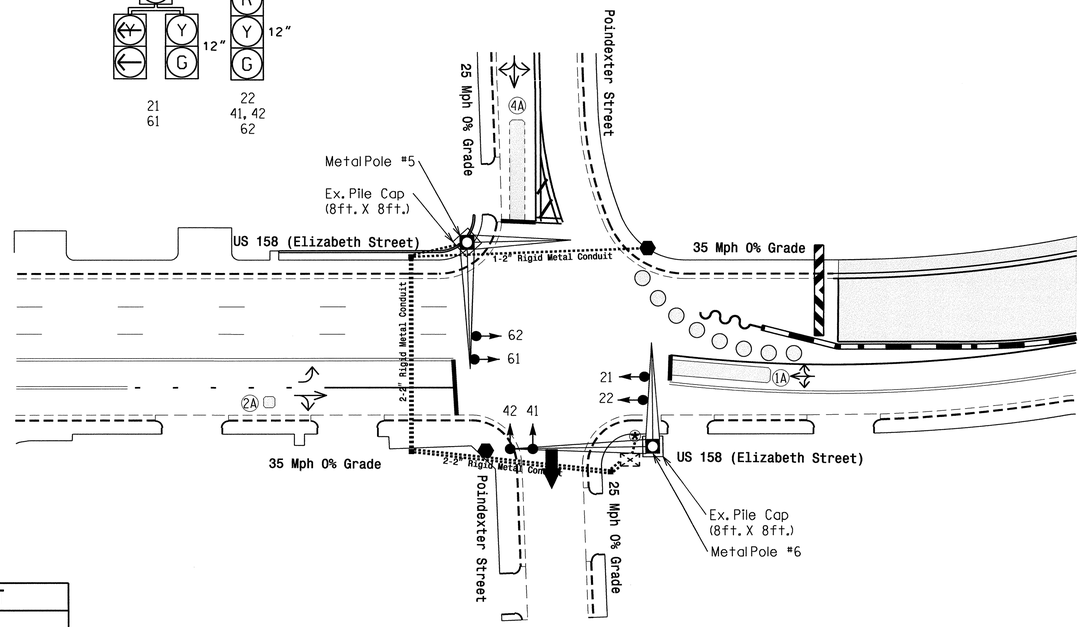
TABLE OF OPERATION

SIGNAL FACE	PHASE 01+6	PHASE 02+6	PHASE 04	PHASE FLASH
21	R	G	R	Y
22	R	G	R	Y
41, 42	R	R	G	R
61	G	G	R	Y
62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	Y	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	Y
2A	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	N/A	-	4	Y	Y	-	-	5	-	-

* Use wireless detection.

3 Phase
Fully Actuated
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
4. Reposition existing signal heads numbered 21, 22, 61 and 62.
5. Set all detector units to presence mode.

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green 1 *	4	10	7	10
Extension 1 *	2.0	3.0	2.0	3.0
Max Green 1 *	10	30	15	30
Yellow Clearance	3.0	3.8	3.2	3.8
Red Clearance	1.9	1.3	2.4	1.3
Red Revert	2.0	2.0	2.0	5.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Construction Zone	
	Barricade	
	Signal Pedestal	
N/A	2" Rigid Metal Conduit	
N/A	Push Button Post	

Signal Upgrade (Phase V - TMP 25)

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

US 158 (Elizabeth Street)
at
Poindexter Street

Division 3 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

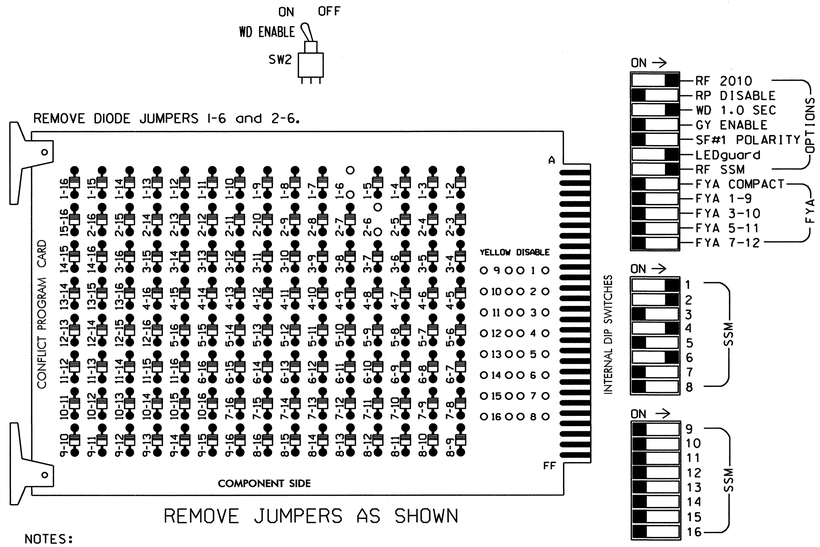
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA A. ALEXANDER
SIGNATURE 12/28/10 DATE

SIG. INVENTORY NO. 01-0009T2

28-DEC-2010 10:25
R:\#Traffic\Signals\Designs\signals\01-0009\01000912_sig_dsn_2010mmdd.dgn
rsmcnair\kb

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,5,7, 8,9,10,11,12,13,14,15 & 16 to load switch AC+ per thet cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	61	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	NU	NU	NU	NU	NU	NU
RED	*	128			101			134										
YELLOW		129			102			135										
GREEN		130			103			136										
RED ARROW																		
YELLOW ARROW	126																	
GREEN ARROW	127																	

NU = Not Used

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

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S6
PHASES USED.....1,2,4,6
OVERLAPS.....NONE

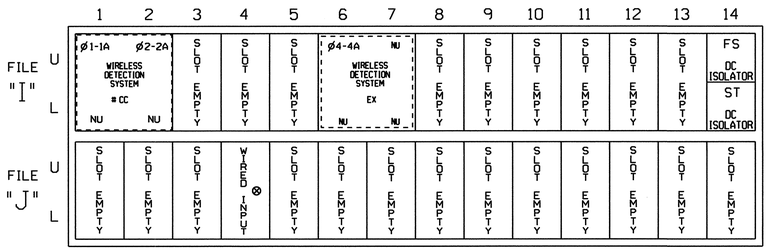
BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
⊗ Wired Input - Do not populate slot with detector card
* See Sensys Access Box Wiring Detail this sheet.

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

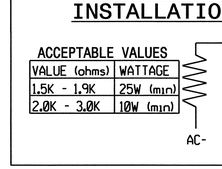
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	-	I1U	56	18	1	1	Y	Y	Y		15
	-	J4U	48	10	26	6	Y	Y			
2A	-	I2U	39	1	2	2	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			5

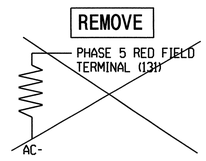
[1] Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

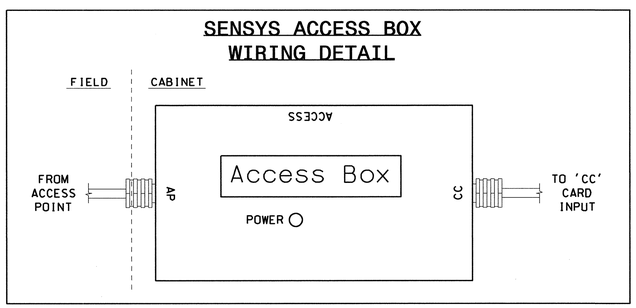
LOAD RESISTOR INSTALLATION DETAIL

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





SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0009T2
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Poindexter Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

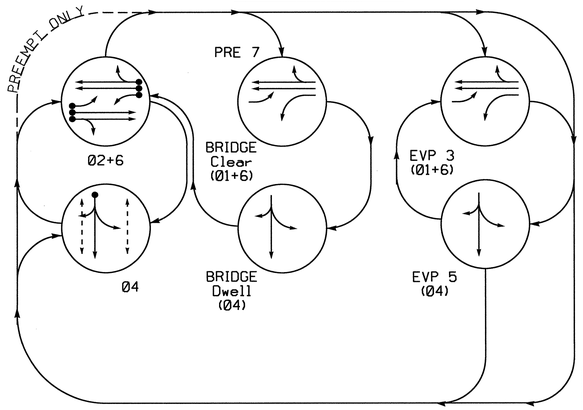
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-29-10 DATE
SIG. INVENTORY NO. 01-0009T2

29-DEC-2010 13:58
S:\#TSSALIMITS Signals\Workgroups\Sig Mgmt\Peterson\M10009_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.34

2 Phase
Fully Actuated
with EVP and Bridge Preemption
US 158 (Elizabeth Street) CLS

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

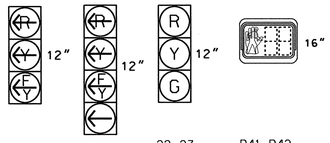
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4	Ø4 ADD-ON DWELL	Ø4 ADD-ON FIXED	EVP 3	EVP 5	FLASH
21	FYA	R	FYA	R	FYA	R	Y
22, 23	G	R	R	R	R	R	Y
41, 42	R	G	R	G	R	G	R
61	FYA	R	←	R	←	R	Y
62, 63	G	R	G	R	G	R	Y
P41, P42	DW	W	DW	DW	DW	DW	DRK
P43, P44	DW	W	DW	DW	DW	DW	DRK

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

SIGNAL FACE I.D.

All Heads L.E.D.



21 | 61 | 22, 23, 41, 42, 62, 63 | P41, P42, P43, P44

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	-
2B	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	-
2C	6X40	0	N/A	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	N/A	-	4	Y	Y	-	-	-	-	-
6A	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	-
6B	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	-
6C	6X40	0	N/A	Y	6	Y	Y	-	-	-	-	-
S03	6X6	+90	N/A	Y	-	-	-	-	-	-	Y	-
S04	6X6	+90	N/A	Y	-	-	-	-	-	-	Y	-

Use wireless detection.

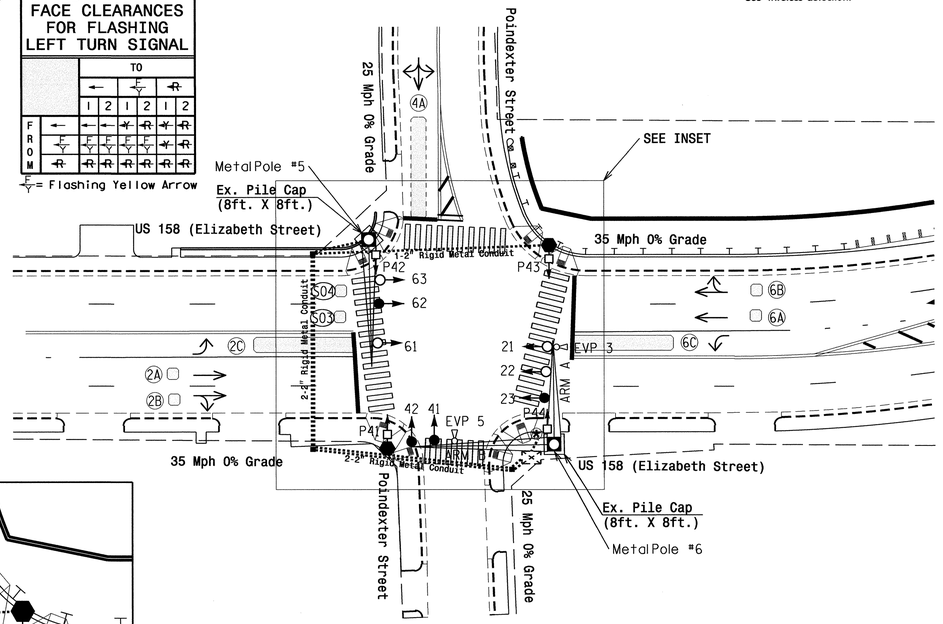
NOTES

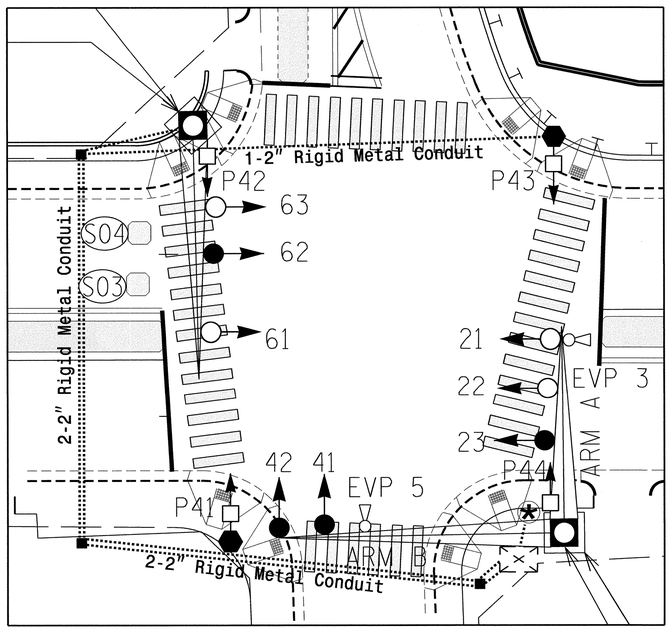
1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal head numbered 62.
4. Set all detector units to presence mode.
5. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #0009.

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

FROM \ TO	←	FYA	R	←	FYA	R
	1	2	1	2	1	2
←	←	←	R	R	R	R
FYA	FYA	FYA	FYA	FYA	R	R
R	R	R	R	R	R	R

FYA = Flashing Yellow Arrow





INSET

OASIS 2070L TIMING CHART

FEATURE	PHASE 2	4	6
Min Green 1 *	10	7	10
Extension 1 *	3.0	2.0	3.0
Max Green 1 *	30	15	30
Yellow Clearance	3.8	3.2	3.8
Red Clearance	1.6	2.4	1.6
Walk 1 *	-	7	-
Don't Walk 1	-	14	-
Seconds Per Actuation *	-	-	-
Max Variable Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* 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.

2070 BRIDGE PREEMPTION 7

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	3.8
Interval 1 – Bridge Clearance Red	1.6
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	20
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	High
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	7
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	Y

* Time defaults to time used for phase during normal operation

2070 EV PREEMPTION

FUNCTION	PRE 3	PRE 5
Interval 1 – Dwell Green	255	255
Interval 1 – Dwell Yellow	3.8	0.0*
Interval 1 – Dwell Red	1.6	0.0*
Interval 5 – Exit Green	0	0
Interval 5 – Yellow	0.0	0.0
Interval 5 – Red	0.0	0.0
Priority	Medium	Medium
Delay Time	0.0	0.0
Min Green Before Pre	1	1
Ped Clear Before Pre	7	7
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	10	7
Enable Backup Protection	N	N
Ped Clear Through Yellow	Y	Y
Preempt Extend**	2	2
Omit Overlaps	-	-

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

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	
	Wireless Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
	Out of Pavement Detector	
	Signal Pedestal	
N/A	Wheelchair Ramp	
N/A	2" Rigid Metal Conduit	
N/A	Push Button Post	

Signal Upgrade

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

US 158 (Elizabeth Street) at Poindexter Street

Division 3 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAUL ALEXANDER

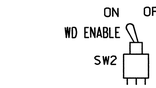
SIGNATURE 12/28/10 DATE

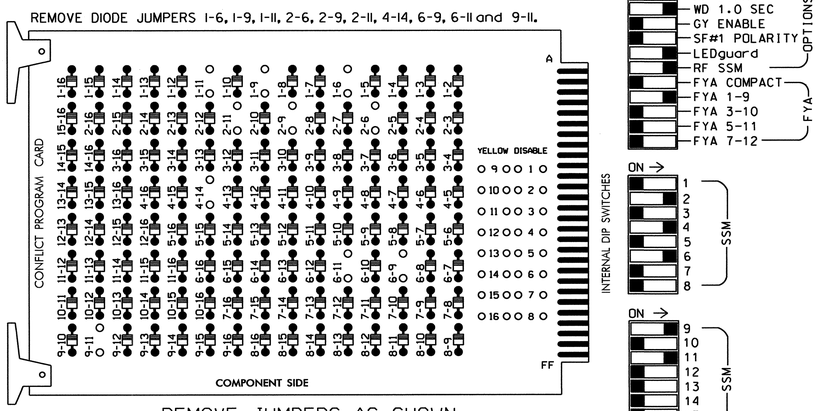
SIG. INVENTORY NO. 01-0009

30-DEC-2010 09:47
R:\Traffic\Signals\Designs\Signals\01-0009\010009_sig_dsn_2010mdd.dgn
tcumzurike

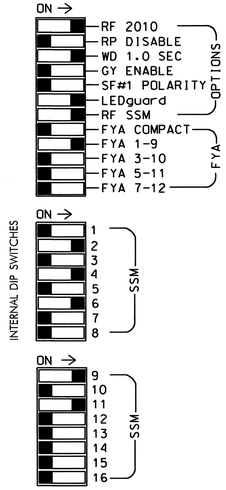
EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7,8, 10,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phase 4 for 'STARTUP PED CALL'.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
7. Disable phase 6 for Backup Protect.
8. The cabinet and controller are part of the US 158 (Elizabeth Street) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332 /W/ AUX
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S4,S4P,S6,S9,S12.
PHASES USED.....*1,2,4,6,4 PED
OVERLAP "A".....1+2+6
OVERLAP "B".....NOT USED
OVERLAP "C".....6
OVERLAP "D".....NOT USED

*USED ONLY DURING PREEMPTION.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1★	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA★	OLB	SPARE	OLC★	OLD	SPARE
SIGNAL HEAD NO.	61	22,23	NU	NU	41,42	P41,P42 P43,P44	NU	62,63	NU	NU	NU	NU	61	NU	NU	21	NU	NU
RED		128			101			134										
YELLOW	*	129			102			135										
GREEN		130			103			136										
RED ARROW													A121			A114		
YELLOW ARROW													A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127																	
✋						104												
🚶						106												

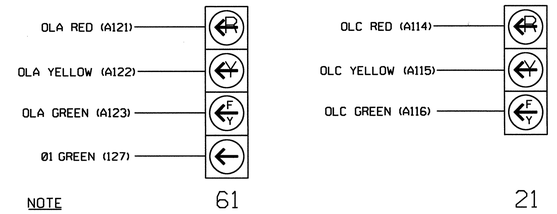
NU = Not Used

* Denotes install load resistor. See load resistor installation detail sheet 3.

★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.

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.

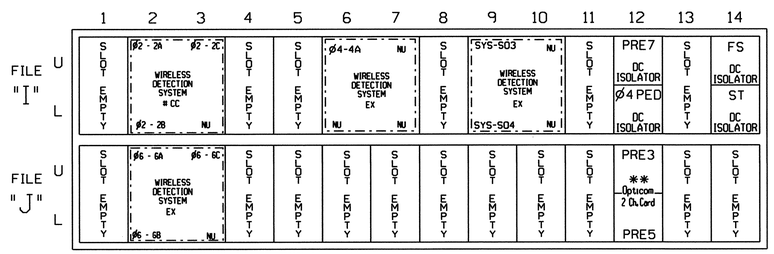
PREEMPT ONLY PHASE OMIT NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control). Then '1' (Phase Control Functions). Program Phase 1 for 'Omit Phase' and Phases 2, 4 and 6 for 'Startup Calls'. This is to prevent Phase 1 from being served when not in Preempt.

INPUT FILE POSITION LAYOUT

(from rear view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
* See Sensys Access Box Wiring Detail this sheet.

FS = FLASH SENSE
ST = STOP TIME
EV PREEMPT = PRE3 & PRE5
BRIDGE PREEMPT = PRE7

INPUT FILE CONNECTION & PROGRAMMING CHART

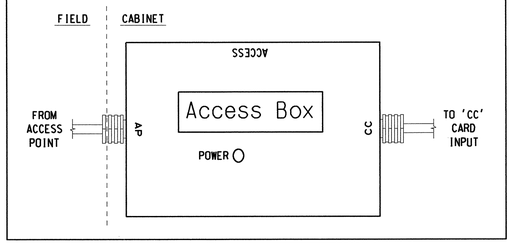
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	-	I2U	39	1	2	2	Y	Y			
2B	-	I2L	43	5	12	2	Y	Y			
2C	-	I3U	63	25	32	2	Y	Y			
4A	-	I6U	41	3	4	4	Y	Y			
*SØ3	-	I9U	60	22	11	SYS					
*SØ4	-	I9L	62	24	13	SYS					
6A	-	J2U	40	2	6	6	Y	Y			
6B	-	J2L	44	6	16	6	Y	Y			
6C	-	J3U	64	26	36	6	Y	Y			
PED PUSH BUTTONS											
P41,P42,P43,P44	TB8-5,6	I12L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

* 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

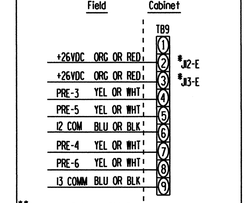
SENSYS ACCESS BOX WIRING DETAIL



* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

OPTICOM FIELD WIRE DETAIL



**Assuming TB9-2 & TB9-3 are unused on the J File, move wires on J1-J & J1-K (Twisted Pair) to J2-E & J3-E Respectively.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0009
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Poindexter Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:
PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0009

PROJECT REFERENCE NO.	SHEET NO.
	Sig.36

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 NEXT PHASE AS EVP3 CLEARS. (HEAD 61)

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" WHEN PHASE 1 IS SERVED DURING EVP3. (HEAD 61)

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 TO NEXT PHASE AS EVP3 CLEARS. (HEAD 61)

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

INPUT ASSIGNMENT PROGRAMMING DETAIL FOR SPECIAL SEQUENCE OPERATION

(program controller as shown below)

1. FROM MAIN MENU PRESS '5' (INPUTS).
2. WITH CURSOR IN "INPUT ASSIGNMENT #" FIELD, USE + KEY TO FIND THE INPUT ASSIGNMENT NUMBER 29, AS SHOWN BELOW.
3. PROGRAM CONTROLLER AS SHOWN:

STEP 1

```
PAGE:1  C1 PIN:67   PEDESTRIAN PHASE
INPUT ASSIGNMENT #.................29
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED........................Y  → EXISTING DEFAULT PROGRAMMING (IGNORE FOR NOW)
VEHICLE DETECTOR (1-64)............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).Y
```

SCROLL DOWN TO VIEW ALL DATA

STEP 2

AFTER SELECTION IS MADE, THE PHASE CONTROL FUNCTIONS TABLE APPEARS. SCROLL DOWN ON THIS TABLE AND FIND "PREEMPT", THEN SELECT 7 FOR "PREEMPT".

AFTER SELECTION IS MADE PRESS "ENTER"

SELECT "Y" FOR "OVERRIDE PHASE CONTROL FUNCTION"

SCREEN NOW APPEARS AS SHOWN TO THE RIGHT.

(PROGRAMMING COMPLETE)

STEP 3

```
PAGE:1  C1 PIN:67   PREEMPT
INPUT ASSIGNMENT #.................29
DEBOUNCE TIME (0-25.5 SEC).........0.5
DELAY TIME (0-25.5 SEC)............0.0
HOLD-OVER TIME (0-25.5 SEC).........0.0
ASSIGNMENT SELECTION:
NOT ENABLED........................
VEHICLE DETECTOR (1-64)............
PEDESTRIAN DETECTOR (1-16).........
ALTERNATE PED DETECTOR (1-16).......
PREEMPT (1-10).....................7
INVERTED PREEMPT (1-10).............
STOP TIME (Y/N).....................
FLASH SENSE (Y/N)...................
DOOR OPEN (Y/N).....................
MANUAL CONTROL ENABLE (Y/N).........
MANUAL CONTROL ADVANCE (Y/N)........
SPECIAL FUNCTION ALARM (1-8)........
TOD HOUR SYNCHRONIZATION (0-23).....
FORCE OFF RING (1-4)................
HOLD PHASES (1-16)..................
PLAN (65=FLSH,66=FREE)..._  OFFSET#..
CHANGE PHASE SEQUENCE PAGE (1-12)...
CHANGE PHASE TIMING PAGE (1-4)......
CHANGE PHASE CONTROL PAGE (1-4).....
CHANGE OVERLAP CONTROL PAGE (1-4)...
CHANGE INPUT PAGE (1-4).............
CHANGE OUTPUT PAGE (1-4)............
OVERRIDE PHASE CONTROL FUNCTION (Y).Y
```

INPUT 29 = PED 2 DETECTOR

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0009
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth City) at Poindexter Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: Decmmber 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0009

29-DEC-2010 13:52
S:\HITSASU\ITS Signals\Workgroups\Sig Mgmt\Peterson\#01009_sm_ele_xxx.dgn
jtpeterson

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```
 PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS: |XX    X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN   <-- NOTICE GREEN FLASH
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
```

PRESS '+' TWICE

```
 PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS: |     X
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN   <-- NOTICE GREEN FLASH
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
```

OVERLAP PROGRAMMING COMPLETE

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' twice to advance to Preemption #3.

```
   PREEMPTION  #3  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  3.8  1.6  |X     X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
```

PRESS 'NEXT TWICE

```
   PREEMPTION  #5  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN  YEL  RED  |12345678910111213141516
1 255  0.0  0.0  |   X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
EXIT CALLS       |

PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0
DWELL MIN TIMER (0-255 SEC) .........7
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

PREEMPT PROGRAMMING COMPLETE

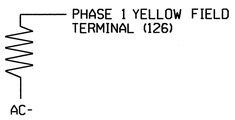
* TIME DEFAULTS TO NORMAL PHASE TIMING.

Program extend time on optical detector units for 2.0 sec for EVP3 and EVP5.

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: 01-0009
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 3 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street)
at
Poindexter Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: November 2010	REVIEWED BY:
PREPARED BY: James Peterson	REVIEWED BY:

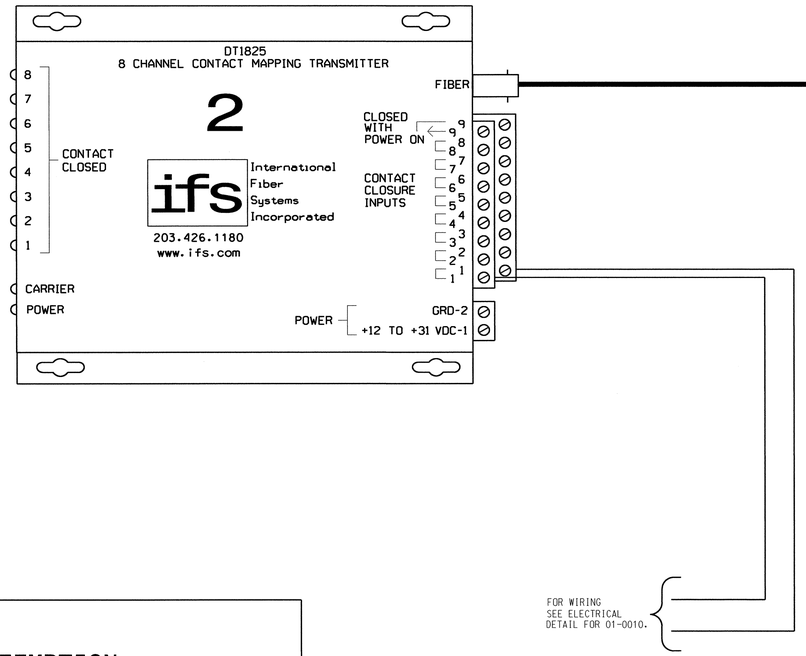
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
SIGNATURE 12-30-10 DATE
SIG. INVENTORY NO. 01-0009

30-DEC-2010 10:20
S:#ITSSIG1#ITS Signals#Workgroups#Sig Man#Peterson#010009_sm_ele_xxx.dgn
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.38

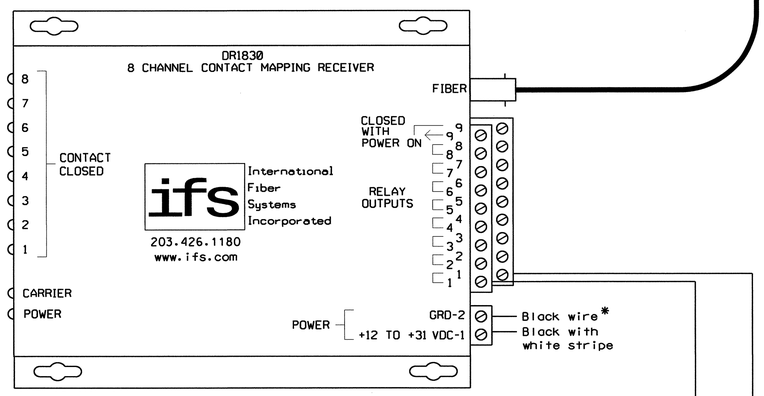
FIBER OPTIC CONTACT CLOSURE TRANSMITTER #1 WIRING FOR 01-0010



FOR WIRING SEE ELECTRICAL DETAIL FOR 01-0010.

FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0009

Simplex multimode fiber optic cable



DC Isolator Common
(TB8-6)

(on input panel)
(TB8-4)
(PRE-7 CALL)

BRIDGE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' until you advance to Preemption #7.

```
   PREEMPTION  #7  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1  25  3.8  1.6  |X    X
2 255  0.0  0.0  |   X
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5  20  0.0  0.0  | X   X
EXIT CALLS       |
          OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....7
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......Y
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............Y
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

* Denotes time defaults to normal phase timing.

NOTES

1. The International Fiber Systems DR1830 is an 8-channel contact mapping transmitter capable of transmitting up to eight contact closures over one optical fiber.

* 2. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0009
DESIGNED: November 2010
SEALED: 12-28-10
REVISED: N/A

Signal Upgrade - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared In the Offices of:

Transportation Mobility and Safety Division
Traffic Engineering Branch
Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

US 158 (Elizabeth Street) at Poindexter Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: November 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SIGNATURE 12-30-10 DATE

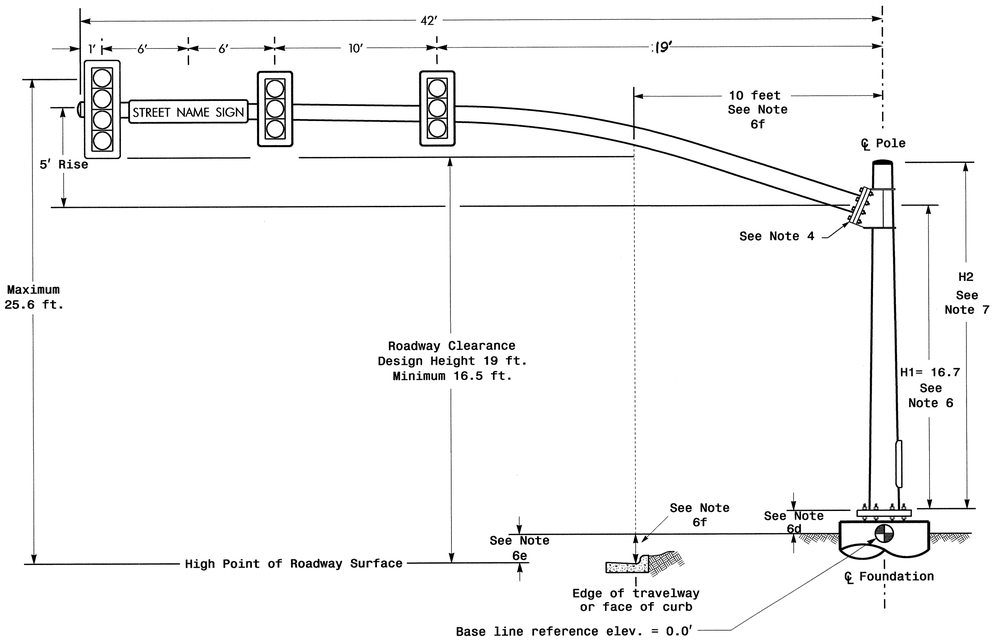
SIG. INVENTORY NO. 01-0009

30-DEC-2010 09:33
S:\#ITS&SU#ITS Signals#Workgroups#Sig Mgmt#Peterson#010009_sm_ele_xxx.dgn
jtpeterson

METAL POLE No. 5

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.3S

Design Loading for METAL POLE NO. 5



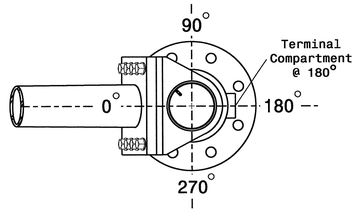
ELEVATION VIEW

SPECIAL NOTE

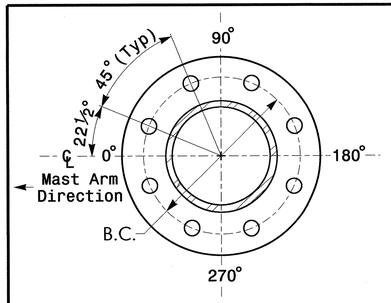
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 5
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	+0.7 ft.
Elevation difference at Edge of travelway or face of curb	-0.1 ft.

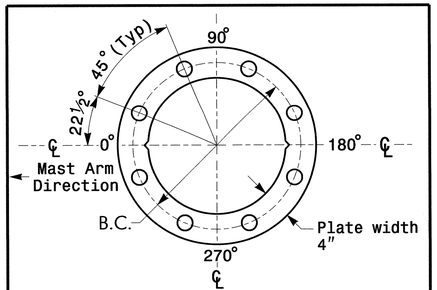


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2006 NCDOT Roadway Standard Drawings.

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. 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.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
7. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. 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 Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. 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 1 (140 mph)

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

US 158 (Elizabeth Street) at Poindexter Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489 PAMELA O. SAUNDER

SIGNATURE DATE 12/28/10

SIG. INVENTORY NO. 01-0009

28-DEC-2010 14:38
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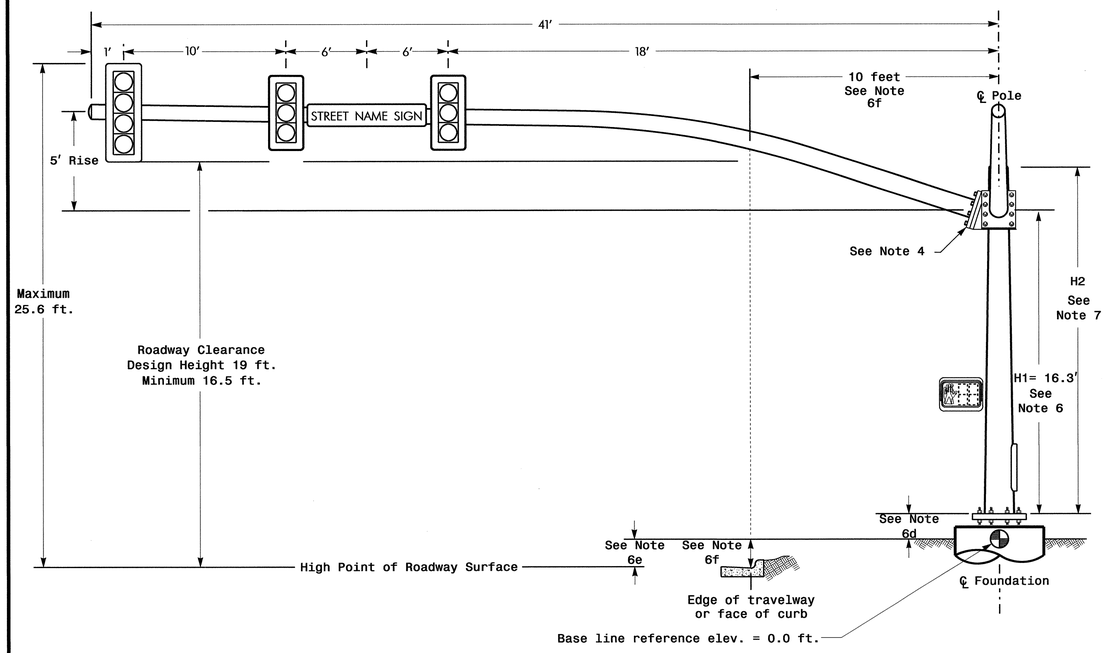
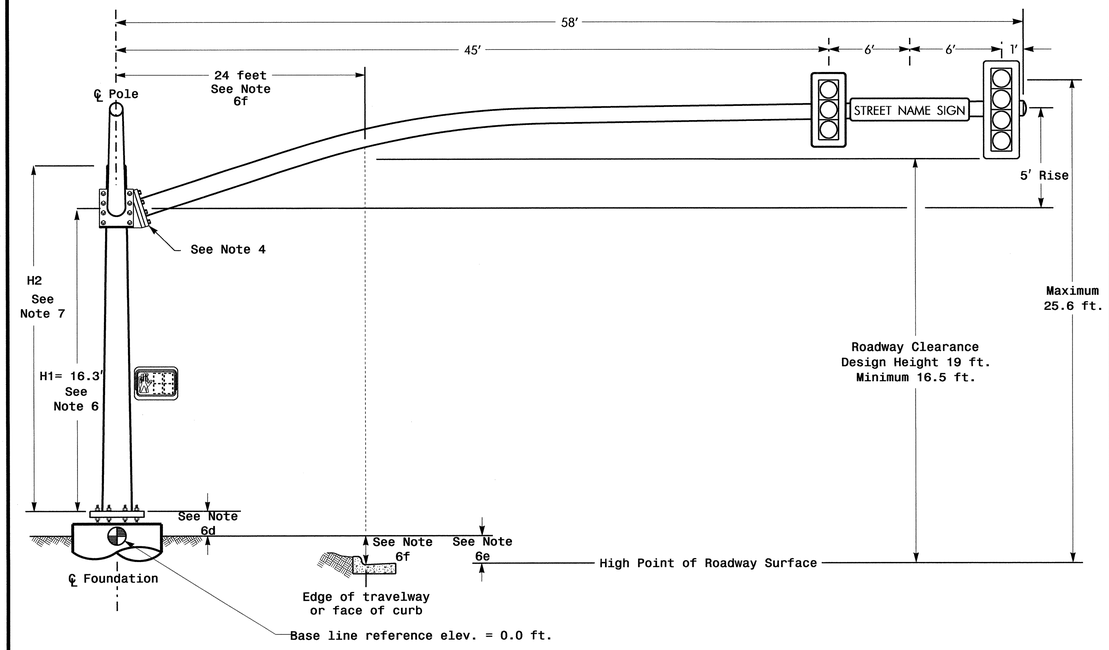
toumourike

Design Loading for METAL POLE NO. 6, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 6, MAST ARM B



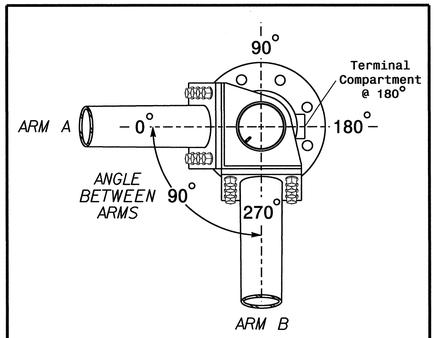
Elevation View @ 0°

SPECIAL NOTE

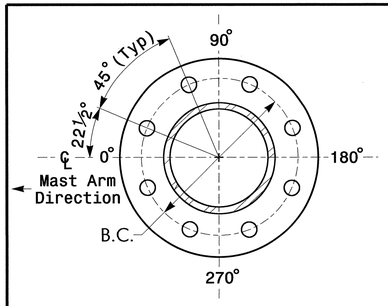
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	-0.5 ft.	-0.3 ft.

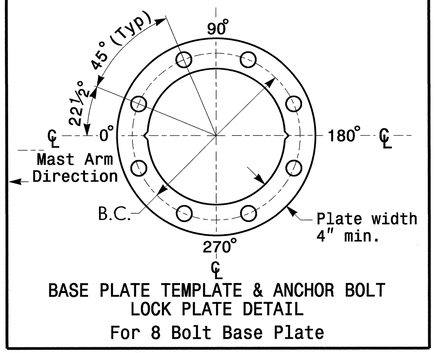


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2006 NCDOT Roadway Standard Drawings.

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. 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 connection points.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
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   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. 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 Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. 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 1 (140 mph)

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

SCALE: 0 N/A — N/A

US 158 (Elizabeth Street) at Poindexter Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489 IKENNA OLUWOLE UMOZURIKE

SIGNATURE 12/28/10 DATE

SIG. INVENTORY NO. 01-0009

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PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.41

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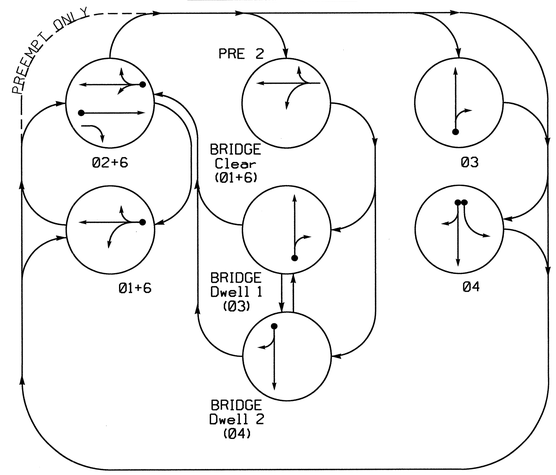


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

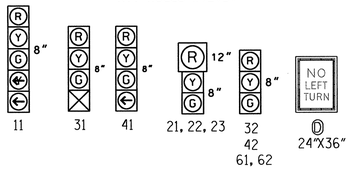


TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+6	Ø2+6	Ø3	Ø4	RECORD 1	RECORD 2	RECORD 3	FLASH
11	G	G	R	R	G	R	R	Y
21, 22, 23	R	G	R	R	R	R	R	Y
31	R	R	G	R	R	G	R	R
32	R	R	G	R	R	G	R	R
41	R	R	R	G	R	R	G	R
42	R	R	R	G	R	R	G	R
61, 62	G	G	R	R	G	R	R	Y
Sign D	OFF	OFF	OFF	OFF	ON	ON	ON	✳

✳See Note 6

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

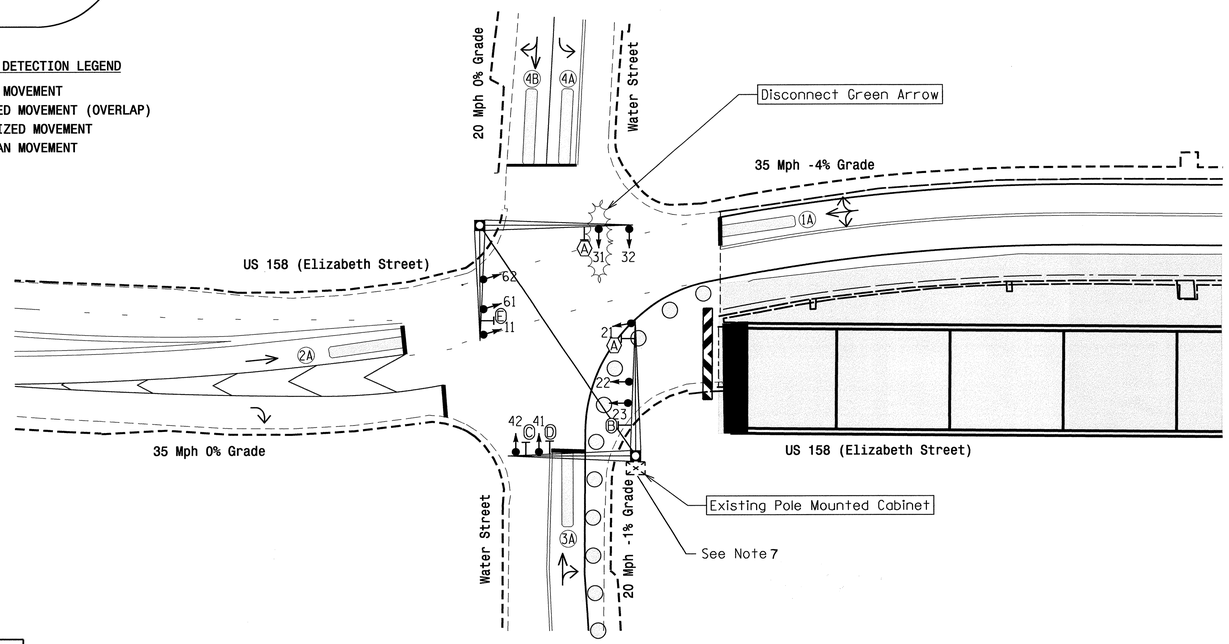
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	Y	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X40	0	N/A	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	N/A	Y	3	Y	Y	-	-	10	-	-
4A	6X40	0	N/A	Y	4	Y	Y	-	-	3	-	-
4B	6X40	0	N/A	Y	4	Y	Y	-	-	15	-	-

Use wireless detection.

4 Phase
Fully Actuated
With Bridge Preemption
Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Ensure flashing operation does not alter operation of blankout signs.
7. Maintain existing Bridge Preempt. Switch located in Bridge Tender's House.



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	
	Wireless Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
	Metal Pole with Mastarm	
A	No Left Turn Sign (R3-2)	A
B	Right Arrow "ONLY" Sign (R3-5R)	B
C	Left Arrow "ONLY" Sign (R3-5L) "NO LEFT TURN"	C
D	Fiber Optic Blankout Sign	D
E	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	E

OASIS 2070L TIMING CHART

FEATURE	PHASE				
	1	2	3	4	6
Min Green 1 *	10	10	10	10	10
Extension 1 *	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	17	30	20	20	30
Yellow Clearance	3.0	3.8	3.0	3.0	4.1
Red Clearance	3.3	1.6	2.9	3.3	2.2
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduction *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

2070 BRIDGE PREEMPTION 2

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	0.0*
Interval 1 – Bridge Clearance Red	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	High
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	N

Signal Upgrade (Phase I - TMP 4)

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

US 158 (Elizabeth Street) at Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER IKE OLUWAFEMI UMOZURIKE
SIGNATURE 12/22/10 DATE

SIG. INVENTORY NO. 01-0010T1

22-DEC-2010 14:55
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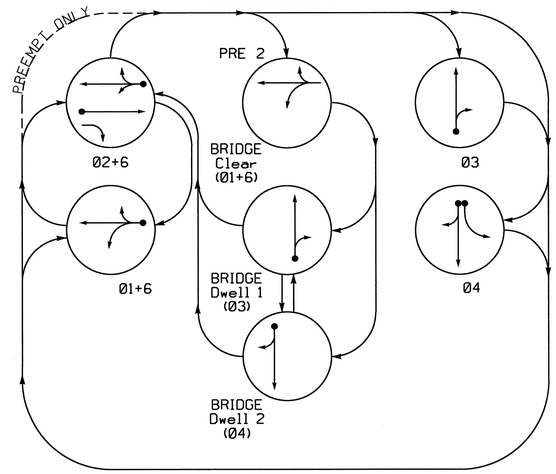
iumozurike

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.42

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE 1+6	PHASE 2+6	PHASE 3	PHASE 4	PHASE 3 RED REST	OVERLAP A	OVERLAP B	FLASH
11	G ←	G	R	R	G ←	R	R	Y
21, 22, 23	R	G	R	R	R	R	R	Y
31	R	R	G	R	R	G	R	R
32	R	R	G	R	R	G	R	R
41	R	R	R	G ←	R	R	G	R
42	R	R	R	G	R	R	G	R
61, 62	G	G	R	R	G	R	R	Y
Sign D	OFF	OFF	OFF	OFF	ON	ON	ON	*

*See Note 7

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	-	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X40	0	N/A	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	N/A	-	3	Y	Y	-	-	10	-	-
4A	6X40	0	N/A	-	4	Y	Y	-	-	3	-	-
4B	6X40	0	N/A	-	4	Y	Y	-	-	15	-	-

Use wireless detection.

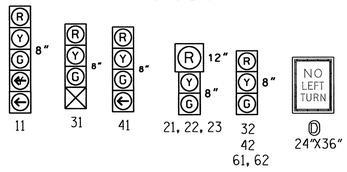
4 Phase
Fully Actuated
With Bridge Preemption
Isolated

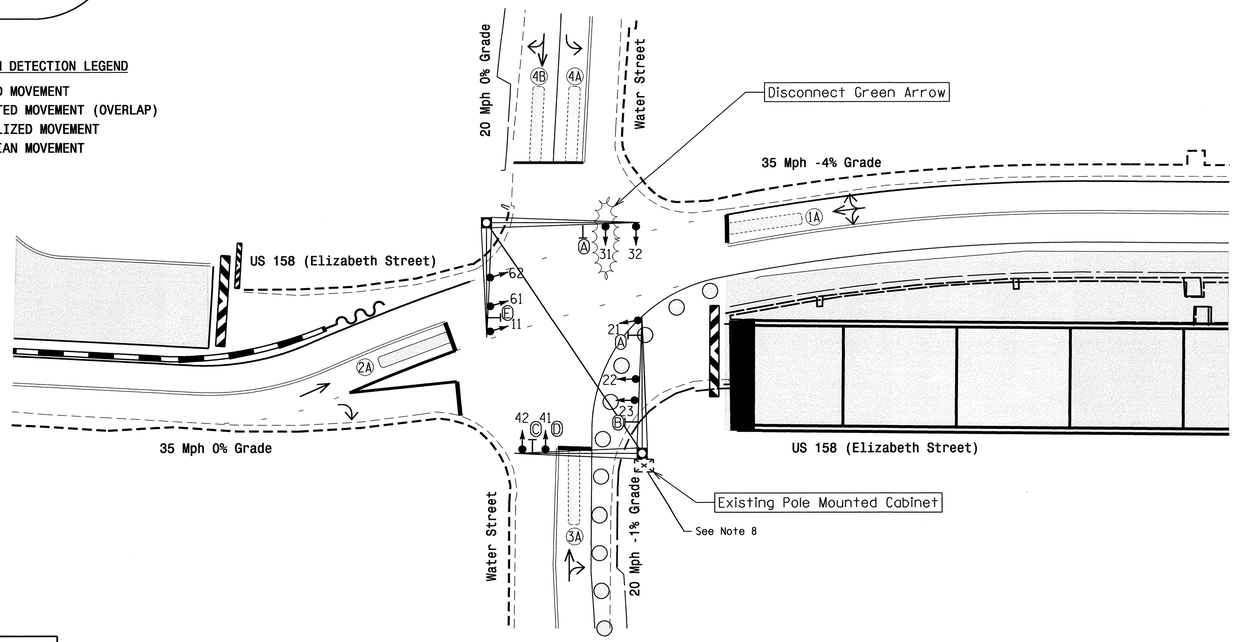
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Ensure flashing operation does not alter operation of blankout signs.
7. Maintain existing Bridge Preempt. Switch located in Bridge Tender's House.

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Wireless Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
	Metal Pole with Mastarm	
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L) "NO LEFT TURN"	Ⓒ
Ⓓ	Fiber Optic Blankout Sign	Ⓓ
Ⓔ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	6
Min Green 1 *	10	10	10	10	10
Extension 1 *	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	17	30	20	20	30
Yellow Clearance	3.0	3.8	3.0	3.0	4.1
Red Clearance	3.3	1.3	2.8	3.3	2.2
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduction *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

2070 BRIDGE PREEMPTION 2

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	0.0*
Interval 1 – Bridge Clearance Red	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	HIgh
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	N

Signal Upgrade (Phase II - TMP 11)

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

US 158 (Elizabeth Street) at Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489 IKECHUKWU O. UMOZURIKE

SIGNATURE 12/22/16 DATE

SIG. INVENTORY NO. 01-0010T2

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PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig 43

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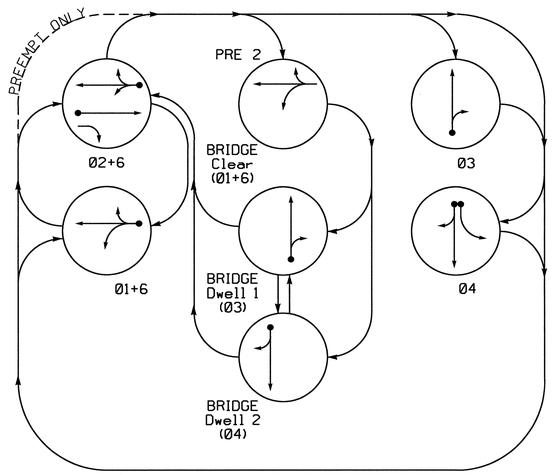


PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE								
	Ø1+6	Ø2+6	Ø3	Ø4	BRIDGE CLEAR	BRIDGE DWELL 1	BRIDGE DWELL 2	FLASH
11	G	G	R	R	G	R	R	Y
21, 22, 23	R	G	R	R	R	R	R	Y
31	R	R	G	R	R	G	R	R
32	R	R	G	R	R	G	R	R
41	R	R	R	G	R	R	G	R
42	R	R	R	G	R	R	G	R
61, 62	G	G	R	R	G	R	R	Y
Sign D	OFF	OFF	OFF	OFF	ON	ON	ON	*

* See Note 7

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	-	1	Y	Y	Y	-	15	-	-
					6	Y	Y	-	-	-	-	-
2A	6X40	0	N/A	Y	2	Y	Y	-	-	-	-	Y
3A	6X40	0	N/A	-	3	Y	Y	-	-	10	-	-
4A	6X40	0	N/A	-	4	Y	Y	-	-	3	-	-
4B	6X40	0	N/A	-	4	Y	Y	-	-	15	-	-

Use wireless detection.

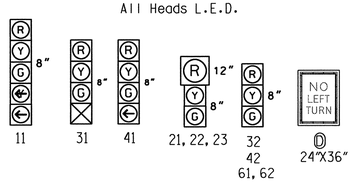
4 Phase
Fully Actuated
With Bridge Preemption
Isolated

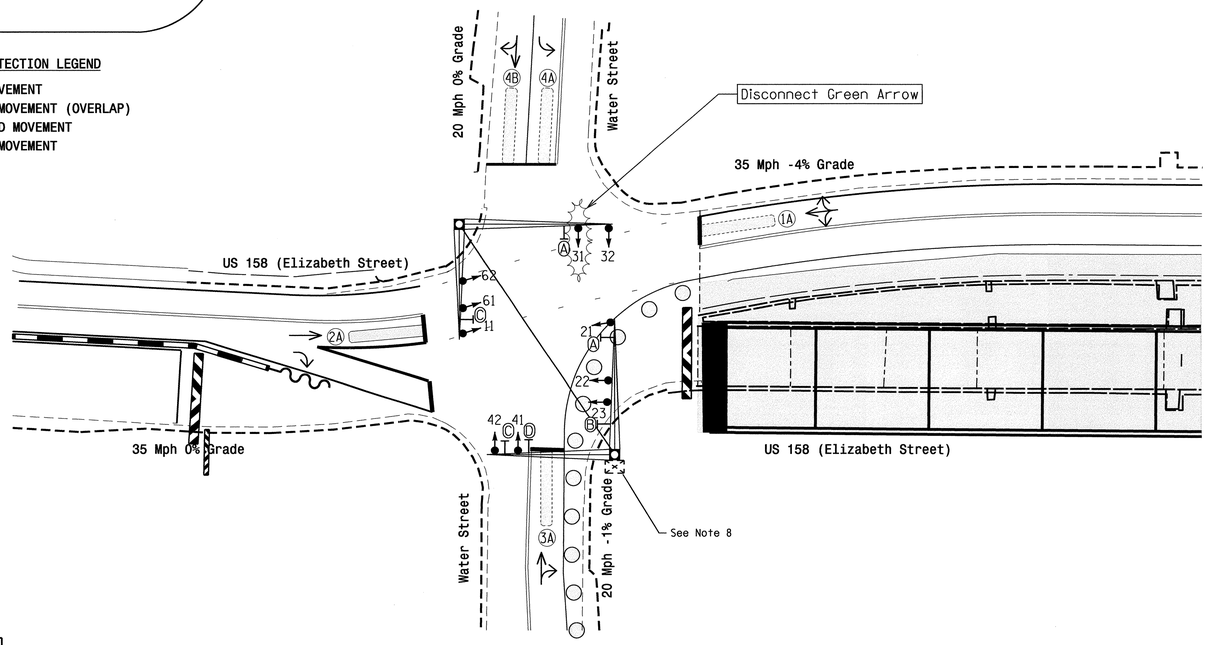
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Set all detector units to presence mode.
6. Ensure flashing operation does not alter operation of blankout signs.
7. Maintain existing Bridge Preempt. Switch located in Bridge Tender's House.

SIGNAL FACE I.D.

All Heads L.E.D.





LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Wireless Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
	Metal Pole with Mastarm	
Ⓐ	No Left Turn Sign (R3-2)	Ⓐ
Ⓑ	Right Arrow "ONLY" Sign (R3-5R)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L) "NO LEFT TURN"	Ⓒ
Ⓓ	Fiber Optic Blankout Sign	Ⓓ
Ⓔ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓔ

OASIS 2070L TIMING CHART

FEATURE	PHASE				
	1	2	3	4	6
Min Green 1 *	10	10	10	10	10
Extension 1 *	2.0	3.0	2.0	2.0	3.0
Max Green 1 *	17	30	20	20	30
Yellow Clearance	3.0	3.8	3.0	3.0	4.1
Red Clearance	3.3	1.2	2.8	3.2	2.2
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduction *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

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

2070 BRIDGE PREEMPTION 2

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	0.0*
Interval 1 – Bridge Clearance Red	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	High
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	N

Signal Upgrade (Phase - TMP 13)

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

US 158 (Elizabeth Street) at Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23489 IKENNA OLIVER UMOZURIKE

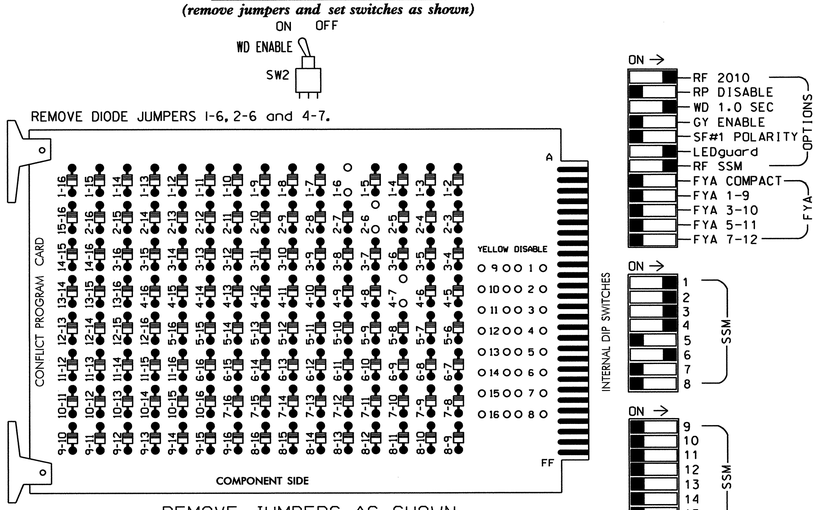
SIGNATURE 12/22/10 DATE

SIG. INVENTORY NO. 01-0010T3

22-DEC-2010 14:58
R:\Traffic\Signals\Designs\Signals\01-0010\01001013_sig_dsn_2010mmd.dgn
iumozurike

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 5,7,8,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out, for all phases.
4. Program phases 2 and 6, for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....EAGLE TYPE 2070L
CABINET.....McCAIN/CONTROL TECHNOLOGIES (DWG.NO.9500-336-NCDOT)
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....POLE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,*S2P,S3,S4,S6,S7
PHASES USED.....1,2,3,4,6
OVERLAP A:.....NOT USED
OVERLAP B:.....NOT USED
OVERLAP C:.....NOT USED
OVERLAP D:.....NOT USED
OVERLAP E:.....4

*USED FOR PREEMPT STATUS CONTROL

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
	1	2	2 PED	3	4	4 PED	5	6	6 PED	OVLE / 7	8	8 PED
SIGNAL HEAD NO.	11	21, 22,23	NU	31,32	41,42	NU	NU	11, 61,62	NU	41	NU	NU
RED	*	128		116	101			134				
YELLOW		129		117	102			135		*		
GREEN		130		118	103			136				
RED ARROW												
YELLOW ARROW	126											
GREEN ARROW	127									124		

NU = Not Used

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

REMOVE

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:|12345678910111213141516
IF PHASES ARE ON:| X
OMIT PHASES      |X
CALL PHASES      |
```

BACKUP PROTECTION PROGRAMMING COMPLETE

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).
PRESS "+" 4 TIMES TO REACH OLE.

```
 PAGE 1: VEHICLE OVERLAP 'E' SETTINGS
 PHASE:          |12345678910111213141516
VEH OVL PARENTS:|    X
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR: _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  _ 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)....7
```

OVERLAP PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø-1A	Ø-2A	Ø-3A	Ø-4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
L	* WIRELESS DETECTION SYSTEM ⊗ CC Wired Input	NU	NU	* WIRELESS DETECTION SYSTEM EX Ø-4B					PRE2 AC ISOLATOR					ST DC ISOLATOR

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

⊗ Wired Input - Disable channel 2.

*Wireless Detection System

FS = FLASH SENSE
ST = STOP TIME
PRE2 = BRIDGE PREEMPT

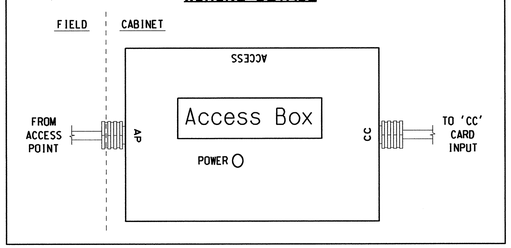
INPUT FILE CONNECTION & PROGRAMMING CHART

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]	-	I1U	56	18	1	1	Y	Y	Y		15
	-	I1L	47	9	22	6	Y	Y			
2A	-	I2U	39	1	2	2	Y	Y			
3A	-	I3U	58	20	3	3	Y	Y			10
4A	-	I4U	41	3	4	4	Y	Y			3
4B	-	I4L	45	7	14	4	Y	Y			15

[1] Add jumpers from I1-F to I1-W.

INPUT FILE POSITION LEGEND: I2L
FILE I
SLOT 2
LOWER

SENSYS ACCESS BOX WIRING DETAIL

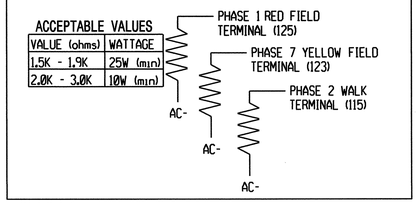


* WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

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: 01-0010T1, 01-0100T2 & 01-0010T3
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

Signal Upgrade - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

US 158 (Elizabeth St.) at Water Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SIGNATURE 12-29-10 DATE

SIG. INVENTORY NO. 01-0010T

29-DEC-2010 14:34
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.45

BRIDGE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

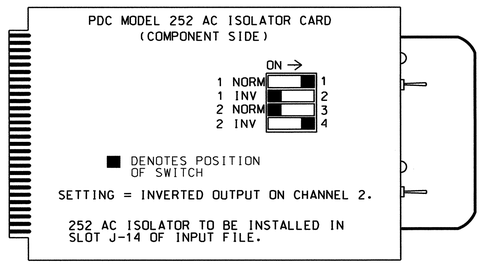
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' to advance to Preemption #2.

```
   PREEMPTION  #2   SETTINGS (NEXT:1-10)
INTERVAL/TIMING   |  CLEAR/DWELL PHASES
  GRN YEL  RED    |1234567891011121314151 6
1   25  0.0  0.0  |X     X
2  255  0.0  0.0  |  XX
3    0  0.0  0.0  |
4    0  0.0  0.0  |
5    1  0.0  0.0  | X   X
EXIT CALLS        |
                OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............Y
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |       X
```

* Denotes time defaults to normal phase timing.

PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

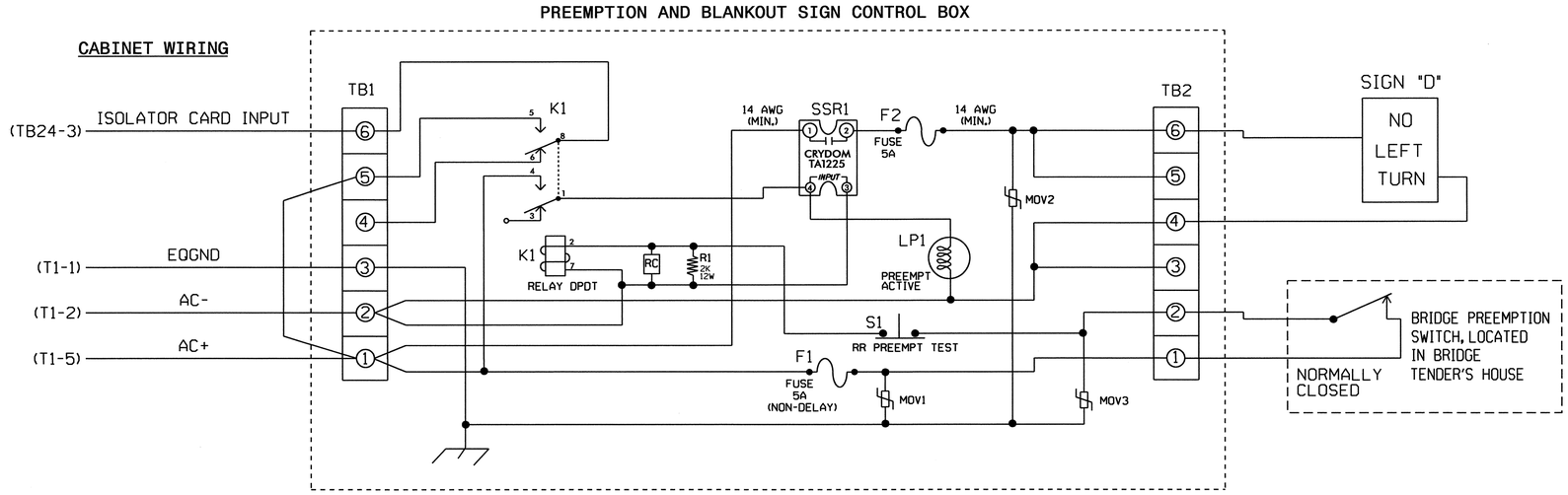
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

BRIDGE PREEMPTION WIRING DETAIL

(wire as shown below)

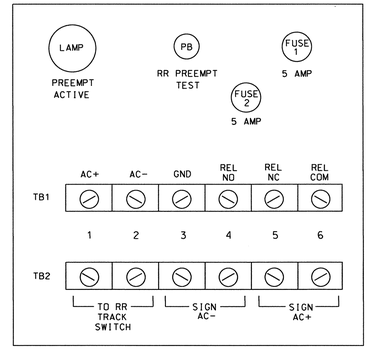


NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a Potter & Brumfield KRP11AG DPDT Relay with 120VAC coil and octal base.
3. Relay SSR1 Is A Crydom TA1225 SPST (normally open) Solid State Relay with AC input and AC (25 Amp) output. Dot Material# 625028740.
4. AC Isolator Card shall be set for normal output operation of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K; DOT Material# 625011550.
6. RC network is valued at .1 microfarad, 100 ohm.
7. If replacement movs are needed, GE part no. V150LA20A (Dot Material# 106023975) may be used.
8. Preemption and Blankout Sign Control Box is a Control Technologies Part No. 2299-101. DOT Material # 619033450.

9. IMPORTANT!! Terminal TB24-4 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 01-0010T1, 01-0100T2 & 01-0010T3
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

Signal Upgrade - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

US 158 (Elizabeth St.) at Water Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

John T. Rowe 12-29-10
SIGNATURE DATE

SIG. INVENTORY NO. 01-0010T

29-DEC-2010 14:35
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jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.46

NOTES

1. The International Fiber Systems DT1825 is an 8-channel contact mapping transmitter capable of transmitting up to eight contact closures over one optical fiber.

✳ 2. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

3. Relay 'K1' is a SPDT with a 120VAC coil. (DOT Material No. 625028600) (P&B# KRP5AG)

4. RCN is valued at .1 microFarad, 100 Ohm. (DOT Material No. 106018075)

PREEMPT STATUS OUTPUT PROGRAMMING NOTES FOR 01-0010

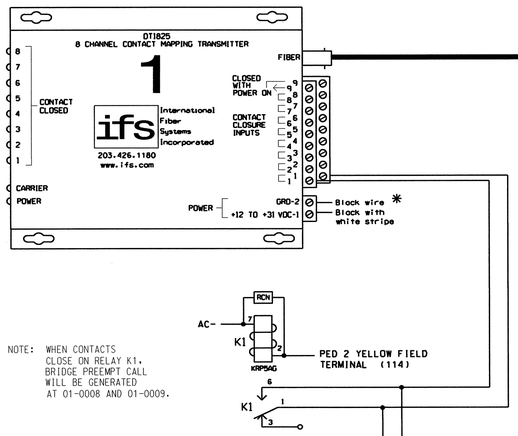
In order for the bridge preempt call to be relayed to 01-0008 and and 01-0009 make the following programming changes to Output No. 33 in the controller for 01-0010:

1. Change the function of C1 pin 35 to be an output for the bridge preempt. This is accomplished by the following:
   - A) From Main Menu select '6' (Outputs). Then select '1' (Output Assignments).
   - B) Scroll to C1 pin 35, Output No. 33. You will see that it is not enabled.
   - C) Scroll down to Preempt and input 'YES'. You will then be asked for a preempt number. Enter the number #2 for the bridge preempt here.
   - D) The output is now assigned for Bridge Peempt Active output.
2. If field terminal 114 has a conflict monitor wire attached, remove, tape, and label wire.
3. To prevent a 'phantom' (or false) conflict, install a load resistor on field terminal 115 (Ped 2 Walk) as shown on sheet 1.
4. Install a loadswitch in Output File Slot S2P.

PHASE 2 PED YELLOW = PREEMPT 2 STATUS OUTPUT.
(OUTPUT #33)

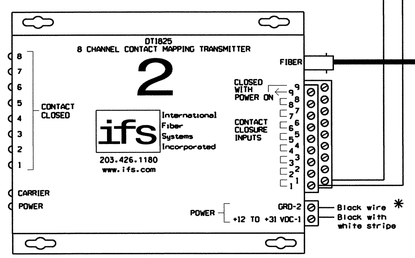
FIBER OPTIC CONTACT CLOSURE TRANSMITTER #1 WIRING FOR 01-0010

Wire As Shown



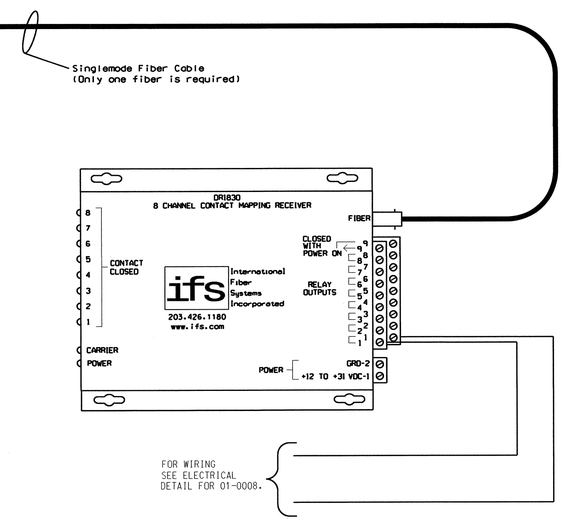
FIBER OPTIC CONTACT CLOSURE TRANSMITTER #2 WIRING FOR 01-0010

Wire As Shown



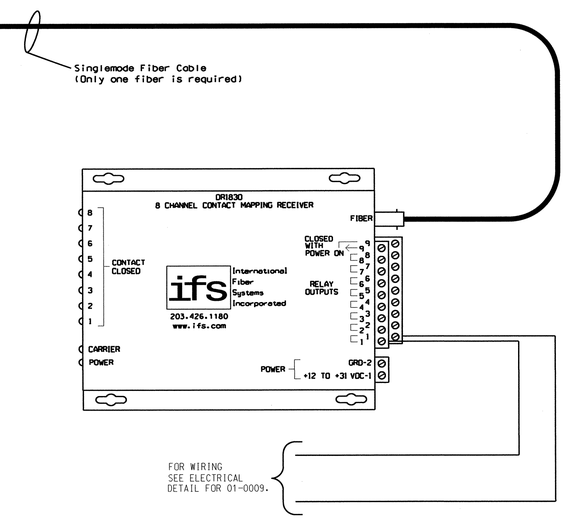
FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0008

Wire As Shown



FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0009

Wire As Shown



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0010T1,
01-0100T2 & 01-0010T3
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

Signal Upgrade - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Water Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SIGNATURE DATE 12-29-10

SIG. INVENTORY NO. 01-0010T

29-DEC-2010 14:45
$$\$$$$USER$$\$$$$
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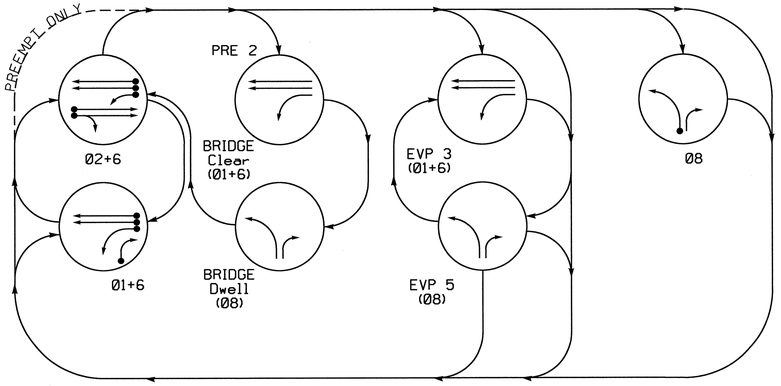
jtpeterson

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.47

3 Phase
Fully Actuated
with EVP and Bridge Preemption
US 158 (Elizabeth Street) CLS

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø1+6	Ø2+6	Ø8	NON-BRIDGE LOCKED	BRIDGE LOCKED	EVP 3	EVP 5	FLASH
11	←	F Y	R	←	R	←	R	Y
21, 22	R	G	R	R	R	R	R	Y
61, 62	G	G	R	G	R	G	R	Y
81	R	R	G	R	G	R	G	R
82	R/→	R	G	R	G	R	G	R

STANDARD SIGNAL FACE CLEARANCES FOR FLASHING LEFT TURN SIGNAL

FROM \ TO	←		F Y		R	
	1	2	1	2	1	2
F Y ←	←	←	R	R	R	R
F Y F Y	F Y	F Y	F Y	F Y	R	R
R	R	R	R	R	R	R

F Y = Flashing Yellow Arrow

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	N/A	Y	1	Y	Y	-	-	15	-	Y
					6	Y	Y	-	-	-	-	Y
1B	6X40	0	N/A	Y	1	Y	Y	-	-	15	-	Y
2A	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	70	N/A	Y	2	Y	Y	-	-	-	-	Y
6A	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	70	N/A	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	N/A	Y	8	Y	Y	-	-	3	-	Y
S01	6X6	+170	N/A	Y	-	-	-	-	-	-	Y	-
S02	6X6	+170	N/A	Y	-	-	-	-	-	-	Y	-

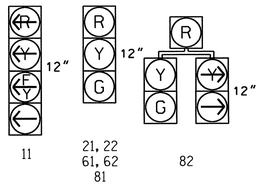
Use wireless detection.

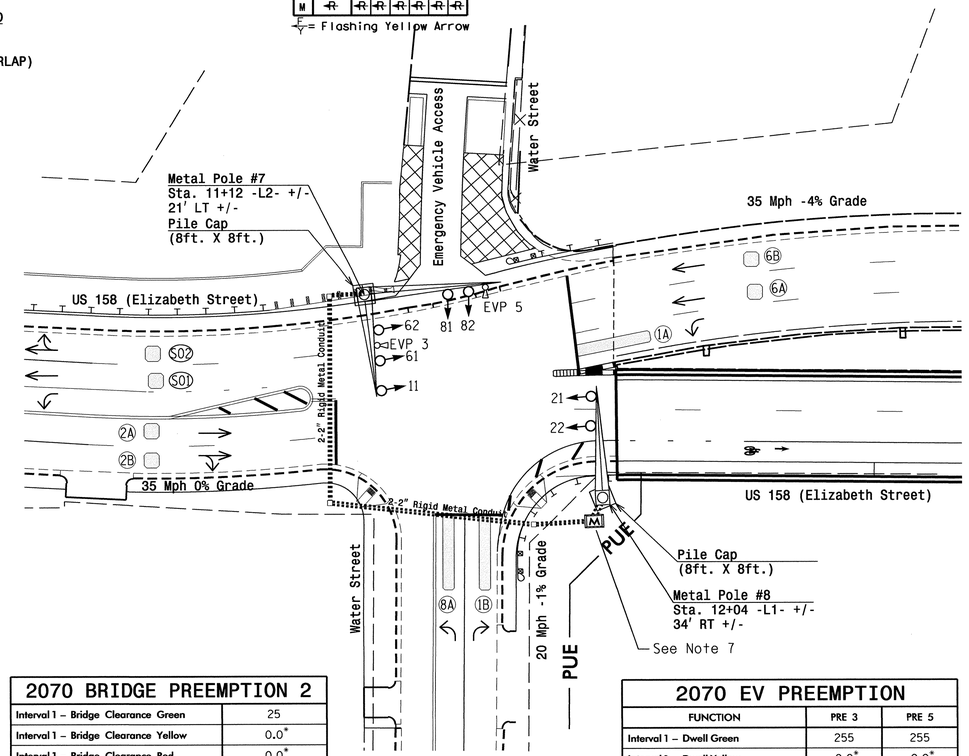
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Closed loop system data: Master Asset #10110, Controller Asset #0010.
7. Reconnect existing Bridge Preempt Switch located in the Bridge Tender's House.

SIGNAL FACE I.D.

All Heads L.E.D.





OASIS 2070L TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	10	10	10	10
Extension 1 *	2.0	3.0	3.0	2.0
Max Green 1 *	17	30	30	20
Yellow Clearance	3.0	3.8	4.1	3.0
Red Clearance	2.8	1.3	1.7	1.9
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduction *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

2070 BRIDGE PREEMPTION 2

Interval 1 – Bridge Clearance Green	25
Interval 1 – Bridge Clearance Yellow	0.0*
Interval 1 – Bridge Clearance Red	0.0*
Interval 2 – Dwell Green	255
Interval 2 – Dwell Yellow	0.0*
Interval 2 – Dwell Red	0.0*
Interval 5 – Exit Green	1
Interval 5 – Yellow	0.0
Interval 5 – Red	0.0
Priority	High
Delay Time	0
Min Green Before Pre	1
Ped Clear Before Pre	0
Yellow Clear Before Pre	0.0*
Red Clear Before Pre	0.0*
Dwell Min Time	10
Ped Clear Through Yellow	N

* Time defaults to time used for phase during normal operation

2070 EV PREEMPTION

FUNCTION	PRE 3	PRE 5
Interval 1 – Dwell Green	255	255
Interval 1 – Dwell Yellow	0.0*	0.0*
Interval 1 – Dwell Red	0.0*	0.0*
Interval 5 – Exit Green	0	0
Interval 5 – Yellow	0.0	0.0
Interval 5 – Red	0.0	0.0
Priority	Medium	Medium
Delay Time	0.0	0.0
Min Green Before Pre	1	1
Ped Clear Before Pre	0	0
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	10	10
Enable Backup Protection	N	N
Ped Clear Through Yellow	N	N
Preempt Extend**	2	2
Omit Overlaps	-	-

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

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	●
▭	Wireless Detector	▭
M	Master Controller & Cabinet	M
□	Junction Box	■
- - - - -	2-in Underground Conduit	- · - · -
N/A	Right of Way	- - - - -
→	Directional Arrow	→
▷	Metal Pole with Mastarm	▷
○	EVP Optical Detector	●
N/A	Wheelchair Ramp	♿
·····	2" Rigid Metal Conduit	N/A

Signal Upgrade

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

US 158 (Elizabeth Street)
at
Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:
PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 30 1"=30'

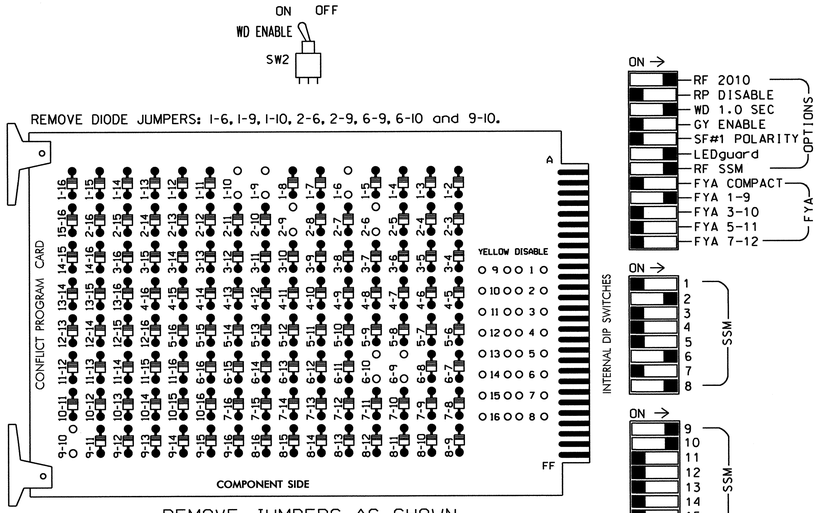
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23488 ENGINEER IKENNA OLUWAFEMI UMOZURIKE
SIGNATURE 12/22/10 DATE
SIG. INVENTORY NO. 01-0010

22-DEC-2010 14:54
R:\Traffic\Signals\Design\Signals\01-0010\01010_sig_dsn_2010mada.dgn
iumozurike

PROJECT REFERENCE NO.	SHEET NO.
	Sig.48

EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,4,5,7, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash and overlaps 1 and 2 as WAG Overlaps.
6. The cabinet and controller are part of the US 158 (Elizabeth Street) Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
CABINET.....332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,*S2P,S6,S8,S9,S10.
PHASES USED.....1,2,6,8.
OVERLAP "A".....1+2+6
OVERLAP "B".....1
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

*USED FOR PREEMPT STATUS CONTROL

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1★	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA★	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	11	82	NU	NU	NU	NU
RED		128						134			107			*				
YELLOW	*	129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW													A122	A125				
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127													A126				

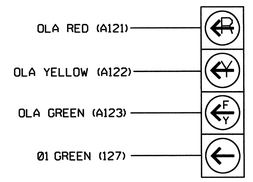
NU = Not Used

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

★ See pictorial of head wiring in detail below.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)

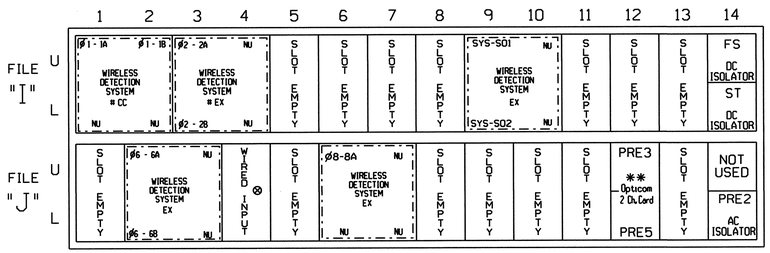


NOTE

1. The sequence display for this signal requires special logic. See sheet 3 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S
NU = CHANNEL NOT USED
⊗ Wired Input - Do not populate slot with detector card
* See Sensys Access Box Wiring Detail this sheet.

FS = FLASH SENSE
ST = STOP TIME
EV PREEMPT = PRE3 & PRE5
BRIDGE PREEMPT = PRE2

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]	-	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y			
1B	-	I2U	39	1	2	1	Y	Y			15
2A	-	I3U	63	25	32	2	Y	Y			
2B	-	I3L	76	38	42	2	Y	Y			
*SØ1	-	I9U	60	22	11	SYS					
*SØ2	-	I9L	62	24	13	SYS					
6A	-	J2U	40	2	6	6	Y	Y			
6B	-	J2L	44	6	16	6	Y	Y			
8A	-	J6U	42	4	8	8	Y	Y			3

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

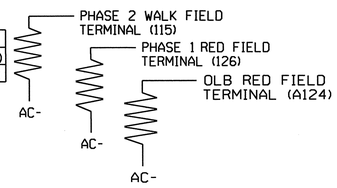
* SYSTEM DETECTOR ONLY. REMOVE THE VEHICLE PHASE ASSIGNED TO THIS DETECTOR IN THE DEFAULT PROGRAMMING.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

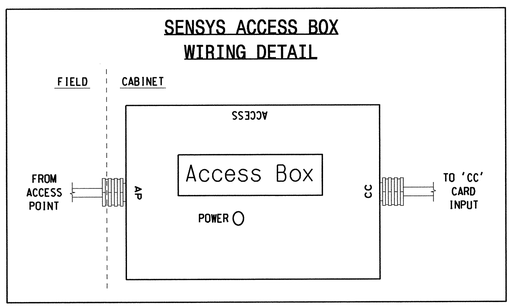
(install resistors as shown below)

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: 01-0010
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

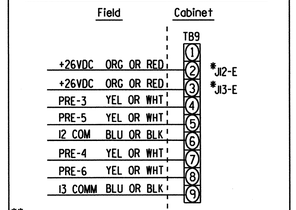
SENSYS ACCESS BOX WIRING DETAIL



WIRELESS DETECTION SYSTEM

1. Install a Wireless Vehicle Detection System for vehicle detection. Perform installation according to manufacturer's directions and NCDOT Engineer-approved mounting locations to accomplish the detection schemes shown on the signal design plans.
2. Ensure that the Wireless Vehicle Detection System is fully compatible with equipment and is manufactured in accordance with the specifications for the type 2070 controller.

OPTICOM FIELD WIRE DETAIL



**Assuming TB9-2 & TB9-3 are unused on the J File, move wires on J11-J & J-11-K (Twisted Pair) to J12-E & J13-E Respectively.

Signal Upgrade - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 158 (Elizabeth Street) at Water Street	SEAL
Prepared in the Offices of: Transportation Mobility and Safety Division, North Carolina Department of Transportation, Traffic Engineering Branch, Signals Management Section	Division 01 Pasquotank County Elizabeth City	NORTH CAROLINA PROFESSIONAL SEAL 008453 ENGINEER JOHN T. ROWE, JR.
750 N.Greenfield Pkwy.Garner,NC 27529	PLAN DATE: December 2010 REVIEWED BY:	
	PREPARED BY: James Peterson REVIEWED BY:	
	REVISIONS / INIT. / DATE	SIGNATURE 12-29-10 DATE
		SIG. INVENTORY NO. 01-0010

29-DEC-2010 16:32
S:\#TISSIGUNITS Signals\Workgroups\Sig Mgmt\Peterson\01001O_sht_ele_xxx.dgn
$$$$ICON

PROJECT REFERENCE NO.	SHEET NO.
	Sig.49

BRIDGE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

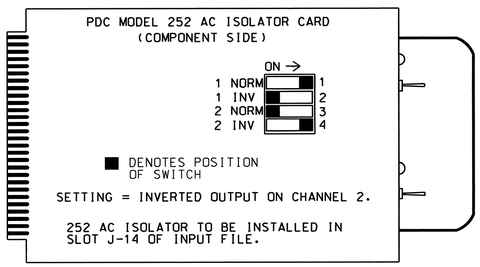
From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' to advance to Preemption #2.

```
   PREEMPTION  #2  SETTINGS (NEXT:1-10)
 INTERVAL/TIMING  |  CLEAR/DWELL PHASES
   GRN YEL  RED   |1234567891011121314151 6
 1  25  0.0  0.0  |X     X
 2 255  0.0  0.0  |       X
 3   0  0.0  0.0  |
 4   0  0.0  0.0  |
 5   1  0.0  0.0  | X   X
EXIT CALLS        |
            OPTIONS
PRIORITY (Y/N TO SELECT) ............HIGH
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............Y
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |  X
```

* Denotes time defaults to normal phase timing.

PREEMPT 2 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

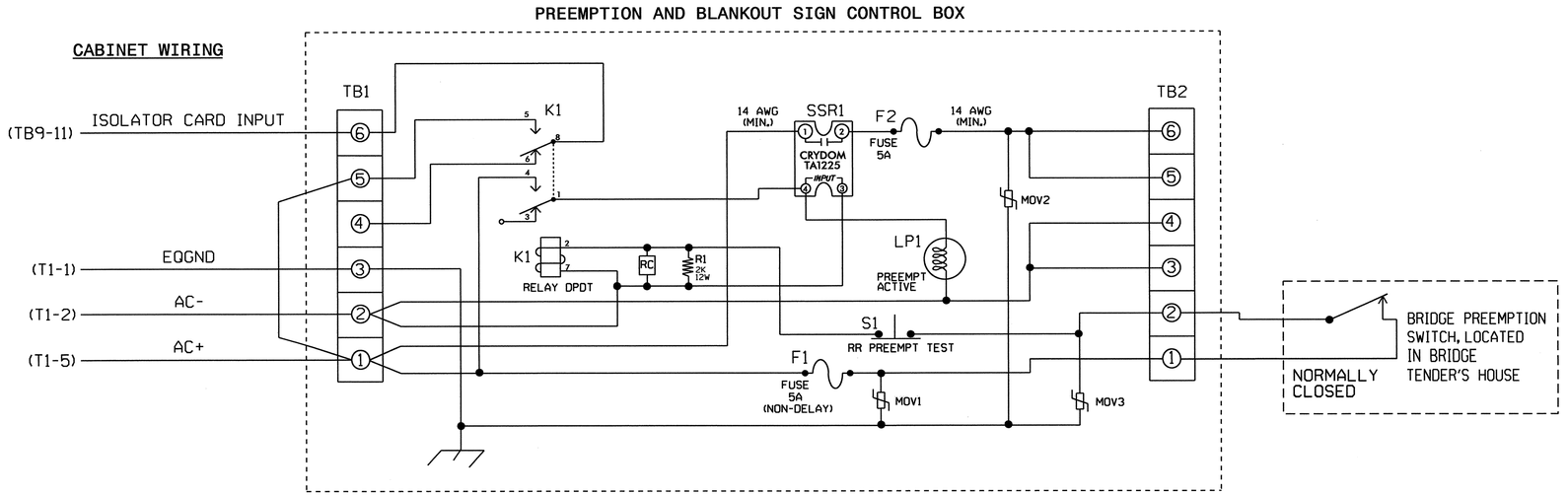
(set DIP switches as shown below)



NOTE: IF ANOTHER MANUFACTURER TYPE OF AC ISOLATOR IS USED, OUTPUT PROGRAMMING IS LIKELY NOT TO EQUATE TO THAT SHOWN ABOVE.

BRIDGE PREEMPTION WIRING DETAIL

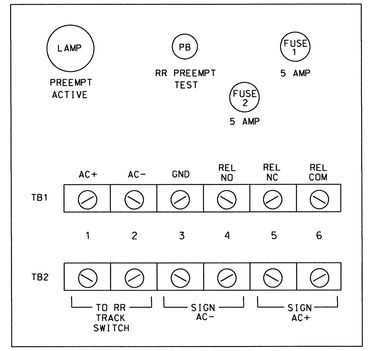
(wire as shown below)



NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a Potter & Brumfield KRP11AG DPDT Relay with 120VAC coil and octal base.
3. Relay SSR1 Is A Crydom TA1225 SPST (normally open) Solid State Relay with AC input and AC (25 Amp) output. Dot Material# 625028740.
4. AC Isolator Card shall be set for normal output operation of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.
5. Resistor is valued at 2K ohm, 12 watt. Clarostat part no. VPR10F-2K: DOT Material# 625011550.
6. RC network is valued at .1 microfarad, 100 ohm.
7. If replacement movs are needed, GE part no. V150LA20A (Dot Material# 106023975) may be used.
8. Preemption and Blankout Sign Control Box is a Control Technologies Part No. 2299-101. DOT Material # 619033450.
9. IMPORTANT!! Terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0010
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

Signal Upgrade - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation
Signals Management Section

122 N. McDowell St., Raleigh, NC 27603

US 158 (Elizabeth St.) at Water Street

Division 1 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

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

John T Rowe 12-29-10

SIGNATURE DATE

SIG. INVENTORY NO. 01-0010

29-DEC-2010 16:43
S:\Traffic\Signals\Workgroups\Sig Mon\Peterson\M010010_sm_ele_xxx.dgn
$$$$USER$$$$

PROJECT REFERENCE NO.	SHEET NO.
	Sig.50

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green
OUTPUT 33 = 2 PED YELLOW

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0010
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

EMERGENCY VEHICLE PREEMPTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press the "Next" key 2-times to advance to Preempt #3.

EVP 3 :

```
   PREEMPTION  #3  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1  255 0.0 0.0   |X     X
2    0 0.0 0.0   |
3    0 0.0 0.0   |
4    0 0.0 0.0   |
5    0 0.0 0.0   |
-------------------------------------------
EXIT CALLS
          OPTIONS
PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0.0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |  X
```

PRESS 'NEXT' TWICE

EVP 5 :

```
   PREEMPTION  #5  SETTINGS (NEXT:1-10)
INTERVAL/TIMING  |  CLEAR/DWELL PHASES
  GRN YEL  RED   |12345678910111213141516
1 255  0.0  0.0  |      X
2   0  0.0  0.0  |
3   0  0.0  0.0  |
4   0  0.0  0.0  |
5   0  0.0  0.0  |
-------------------------------------------
EXIT CALLS
          OPTIONS
PRIORITY (Y/N TO SELECT) ............MED
DELAY TIMER (0-255 SEC) .............0
MIN GREEN BEFORE PRE (0= DEFAULT)....1
PED CLEAR BEFORE PRE (0= DEFAULT)....0
YELLOW CLEAR BEFORE PRE (0= DEFAULT).0.0*
RED CLEAR BEFORE PRE (0= DEFAULT)....0.0*
DWELL MIN TIMER (0-255 SEC) .........10
DWELL MAX TIMER (0=OFF,1-255MIN) ....0
DWELL HOLD-OVER TIMER (0-255) .......0
LATCH CALL? .........................N
LINK TO NEXT PREEMPT? ...............N
ENABLE BACKUP PROTECTION? ...........N
HOLD CLEAR 1 PHASES DURING DELAY? ...N
FAST GREEN FLASH DWELL PHASES? ......N
PED CLEARANCE THROUGH YELLOW? .......N
INHIBIT OVERLAP GREEN EXTENSION? ....N
SERVICE DURING SOFTWARE FLASH? ......N
REST IN RED DURING DWELL INTERVAL? ..N
FLASH DWELL INTERVAL? ...............N
ALLOW PEDS IN DWELL INTERVAL? .......N
RE-TIME DWELL INTERVAL? .............N
OVERLAPS:                | ABCDEFGHIJKLMNOP
DWELL INT FLASH YELLOW   |
OMIT OVERLAPS:           |
```

* TIME DEFAULTS TO NORMAL PHASE TIMING.

Program extend time on opticom unit for 2.0 sec.

Signal Upgrade - Sheet 3 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

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

750 N.Greenfield Pkwy.Garner,NC 27529

US 158 (Elizabeth Street) at Water Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

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

SIGNATURE 12-29-10 DATE

SIG. INVENTORY NO. 01-0010

30-DEC-2010 07:25
S:\#TSGS\#ITS Signals\#workgroups\#Sig Mgmt\Peterson\#010010_smple_xxx.dgn
jpeterson

PROJECT REFERENCE NO.	SHEET NO.
	Sig.51

NOTES

1. The International Fiber Systems DT1825 is an 8-channel contact mapping transmitter capable of transmitting up to eight contact closures over one optical fiber.

✳ 2. Power connections are with the supplied 12 Volt DC Plug-in Power Supply.

3. Relay 'K1' is a SPDT with a 120VAC coil. (DOT Material No. 625028600) (P&B# KRP5AG)

4. RCN is valued at .1 microFarad, 100 Ohm. (DOT Material No. 106018075)

PREEMPT STATUS OUTPUT PROGRAMMING NOTES FOR 01-0010

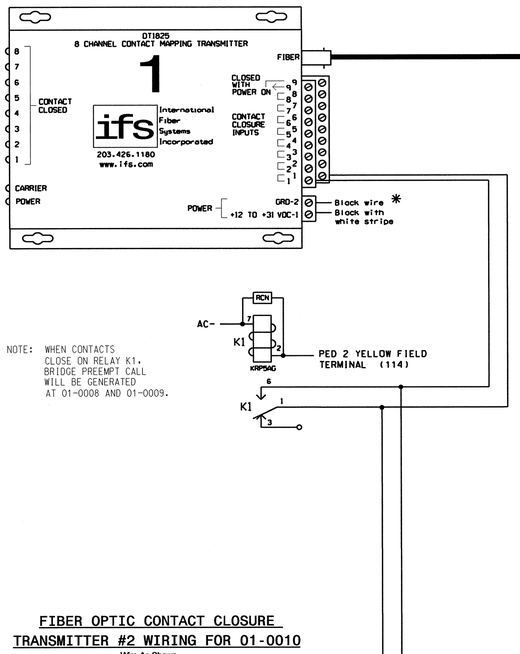
In order for the bridge preempt call to be relayed to 01-0008 and and 01-0009 make the following programming changes to Output No. 33 in the controller for 01-0010:

1. Change the function of C1 pin 35 to be an output for the bridge preempt. This is accomplished by the following:
   - A) From Main Menu select '6' (Outputs). Then select '1' (Output Assignments).
   - B) Scroll to C1 pin 35, Output No. 33. You will see that it is not enabled.
   - C) Scroll down to Preempt and input 'YES'. You will then be asked for a preempt number. Enter the number #2 for the bridge preempt here.
   - D) The output is now assigned for Bridge Peempt Active output.
2. If field terminal 114 has a conflict monitor wire attached, remove, tape, and label wire.
3. To prevent a 'phantom' (or false) conflict, install a load resistor on field terminal 115 (Ped 2 Walk) as shown on sheet 1.
4. Install a loadswitch in Output File Slot S2P.

PHASE 2 PED YELLOW = PREEMPT 2 STATUS OUTPUT
(OUTPUT 33)

FIBER OPTIC CONTACT CLOSURE TRANSMITTER #1 WIRING FOR 01-0010

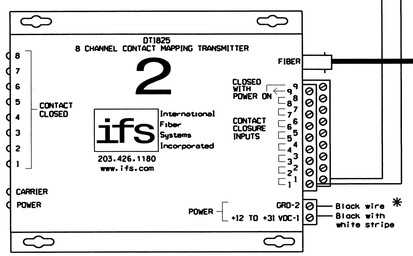
Wire As Shown



NOTE: WHEN CONTACTS CLOSE ON RELAY K1, BRIDGE PREEMPT CALL WILL BE GENERATED AT 01-0008 AND 01-0009.

FIBER OPTIC CONTACT CLOSURE TRANSMITTER #2 WIRING FOR 01-0010

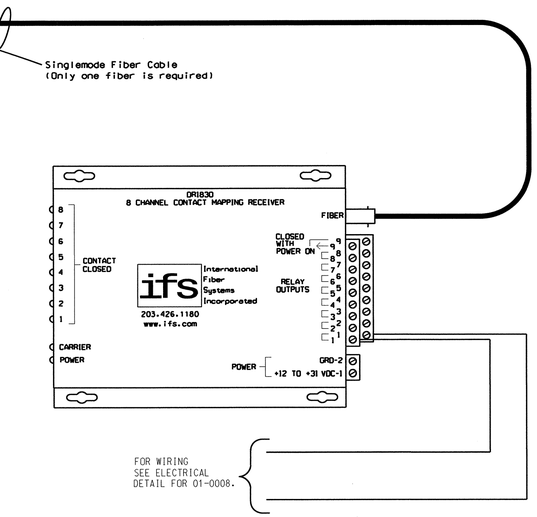
Wire As Shown



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 01-0010
DESIGNED: November 2010
SEALED: 12-22-10
REVISED: N/A

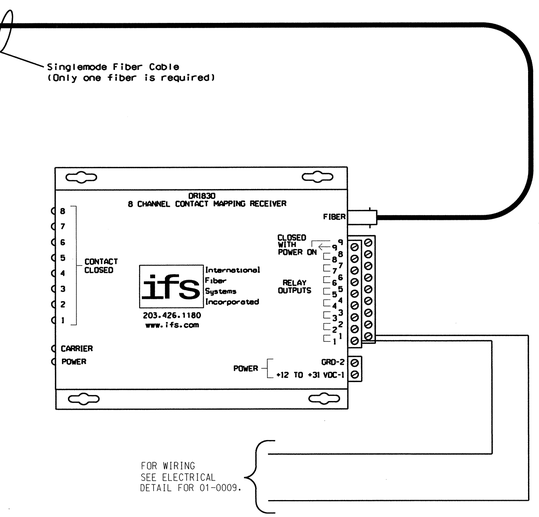
FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0008

Wire As Shown



FIBER OPTIC RECEIVER WIRING LOCATED AT 01-0009

Wire As Shown



Signal Upgrade - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 158 (Elizabeth Street) at Water Street

Division 01 | Pasquotank County | Elizabeth City

PLAN DATE: December 2010 | REVIEWED BY:

PREPARED BY: James Peterson | REVIEWED BY:

REVISIONS	INIT.	DATE

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

SIGNATURE 12-29-10 DATE

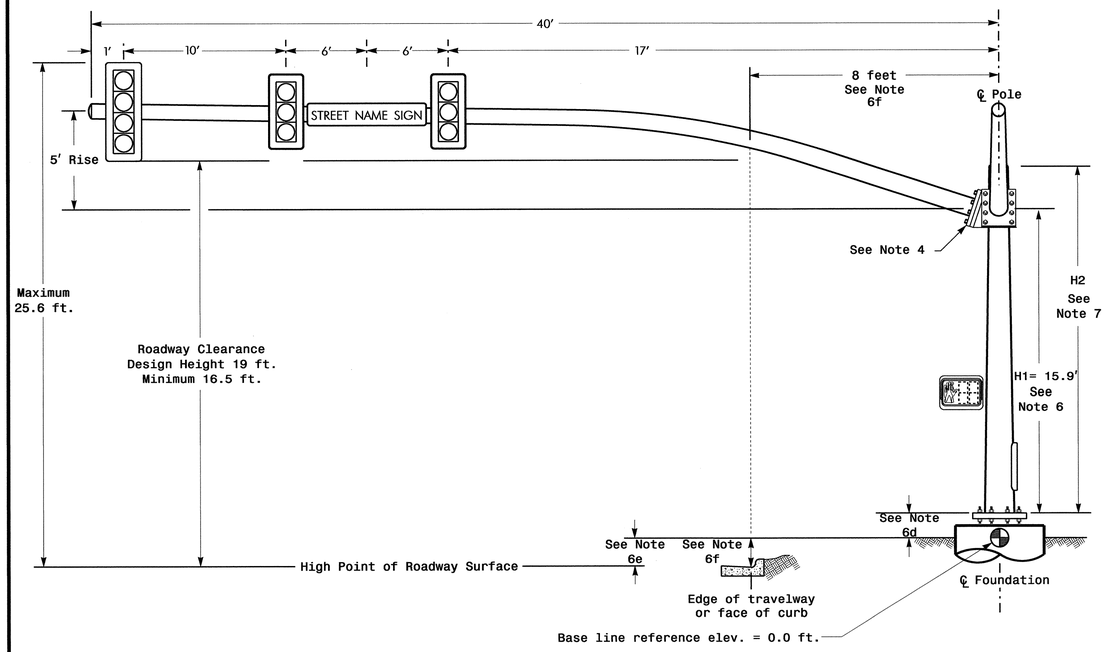
SIG. INVENTORY NO. 01-0010

29-DEC-2010 16:33
S:\TTSASD\ITS Signals\Workgroups\Sig Mgmt\Peterson\M01010_smLeIe_xxx.dgn
jtpeterson

METAL POLE No. 7

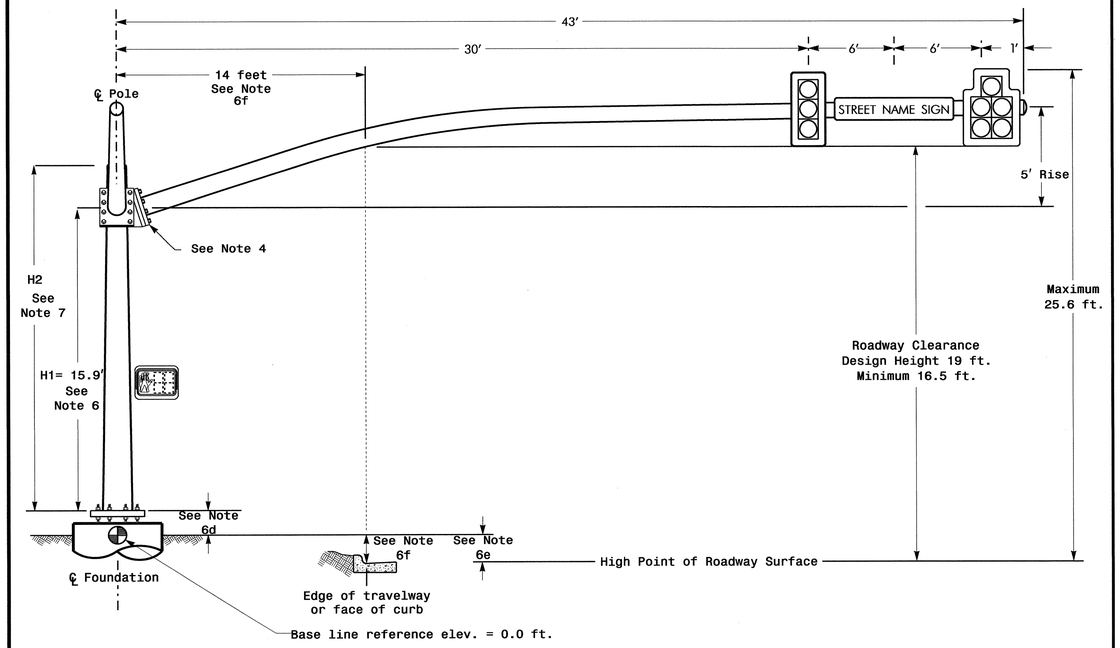
PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.52

Design Loading for METAL POLE NO. 7, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 7, MAST ARM B



Elevation View @ 0°

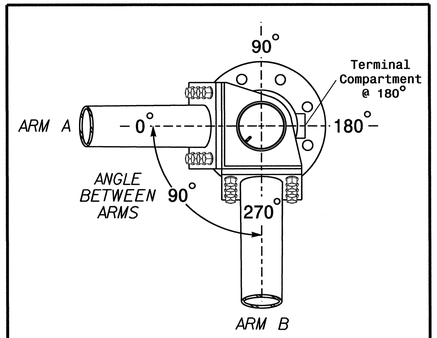
28-DEC-2010 14:54
R:\Traffic\Signals\Design\Signals\01-0010\MAPmt_archdouble.dgn
oumozurike

SPECIAL NOTE

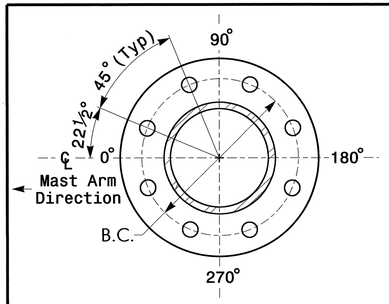
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

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	-0.1 ft.	+0.2 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	-0.2 ft.

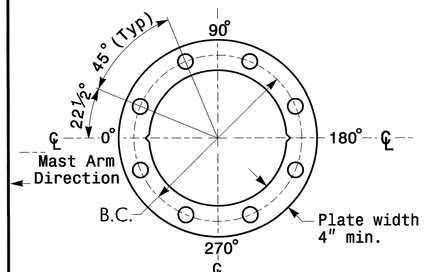


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"–5 SECTION–WITH BACKPLATE AND ASTRO–BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	SIGNAL HEAD 12"–4 SECTION–WITH BACKPLATE AND ASTRO–BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"–3 SECTION–WITH BACKPLATE AND ASTRO–BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO–SIGN–BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2006 NCDOT Roadway Standard Drawings.

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. 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 connection points.
5. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
7. The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
8. 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 Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
9. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
10. 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 1 (140 mph)

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

US 158 (Elizabeth Street) at Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

REVISIONS	INIT.	DATE

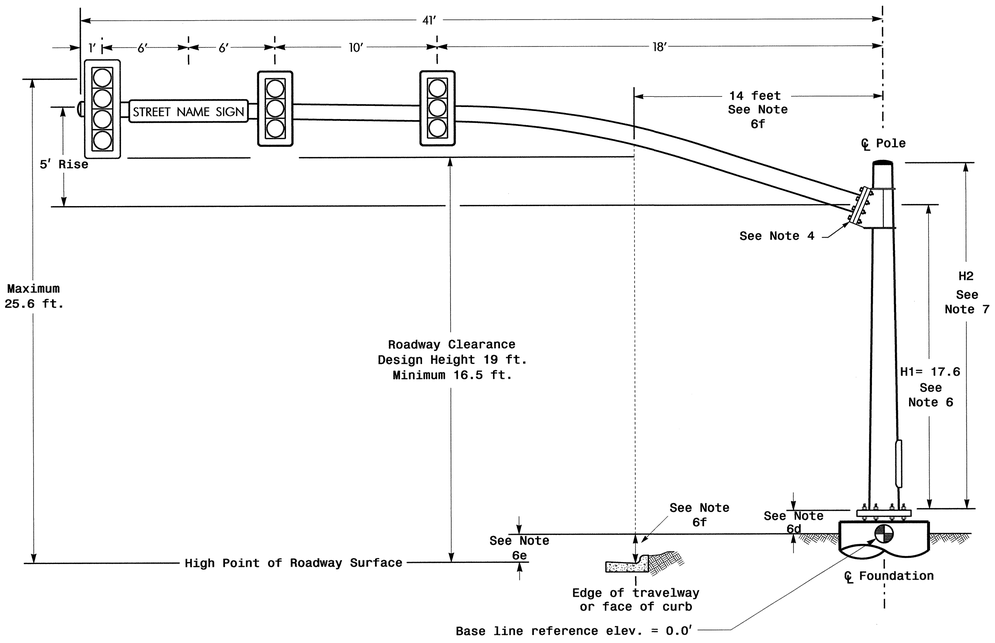
SCALE 0 N/A N/A

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA A. ALEXANDER

SIGNATURE 12/28/10 DATE

SIG. INVENTORY NO. 01-0010

Design Loading for METAL POLE NO. 8



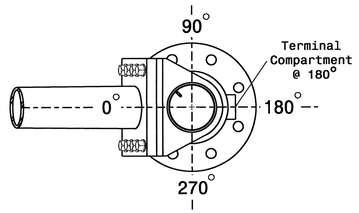
ELEVATION VIEW

SPECIAL NOTE

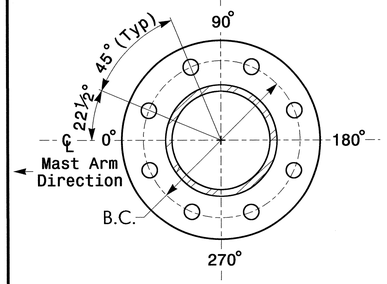
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 8
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	+1.6 ft.
Elevation difference at Edge of travelway or face of curb	+1.3 ft.

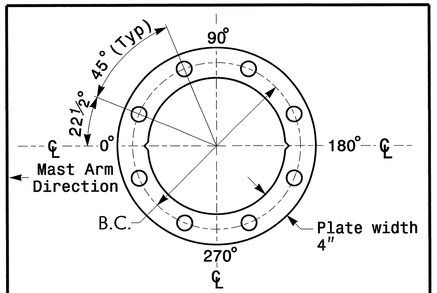


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
STREET NAME SIGN	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

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NCDOT Wind Zone 1 (140 mph)

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

US 158 (Elizabeth Street)
at
Water Street

Division 01 Pasquotank County Elizabeth City

PLAN DATE: November 2010 REVIEWED BY:

PREPARED BY: I. O. Umozurike REVIEWED BY:

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 23489 ENGINEER PAMELA G. GARNER

12/28/10

SIGNATURE DATE

SIG. INVENTORY NO. 01-0010

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.54

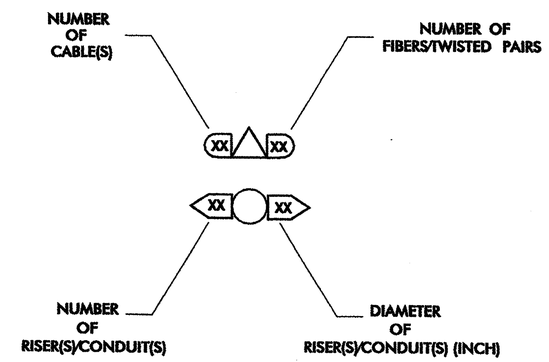
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
4. INSTALL SMFO CABLE
5. INSTALL MMFO CABLE
6. INSTALL FIBER OPTIC DROP 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 FIBER OPTIC CABLE SEAL
13. INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
14. INSTALL 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
21. INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
22. INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
26. TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
27. INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER 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 POLE MOUNTED SPLICE CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET
33. REMOVE EXISTING SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39. INSTALL 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 AND MESSENGER CABLE
49. REMOVE EXISTING MESSENGER CABLE
50. INSTALL TELEPHONE SERVICE
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 20 FEET OF COMMUNICATIONS 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
58. INSTALL NEW ELECTRICAL SERVICE

LEGEND

- FO — NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR — NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI — EXISTING COMMUNICATIONS CABLE
- REM — EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD — NEW DIRECTIONAL DRILLED CONDUIT
- B&J — NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- (S) AERIAL SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- S EXISTING SPLICE CABINET
- S 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)



Prepared in the Office of:
North Carolina Department of Transportation
Traffic Management Systems
122 N. McDowell St., Raleigh, NC 27603

CONSTRUCTION NOTES

PLAN DATE:
REVIEWED BY:
PREPARED BY: G. A. FULLER
REVIEWED BY:

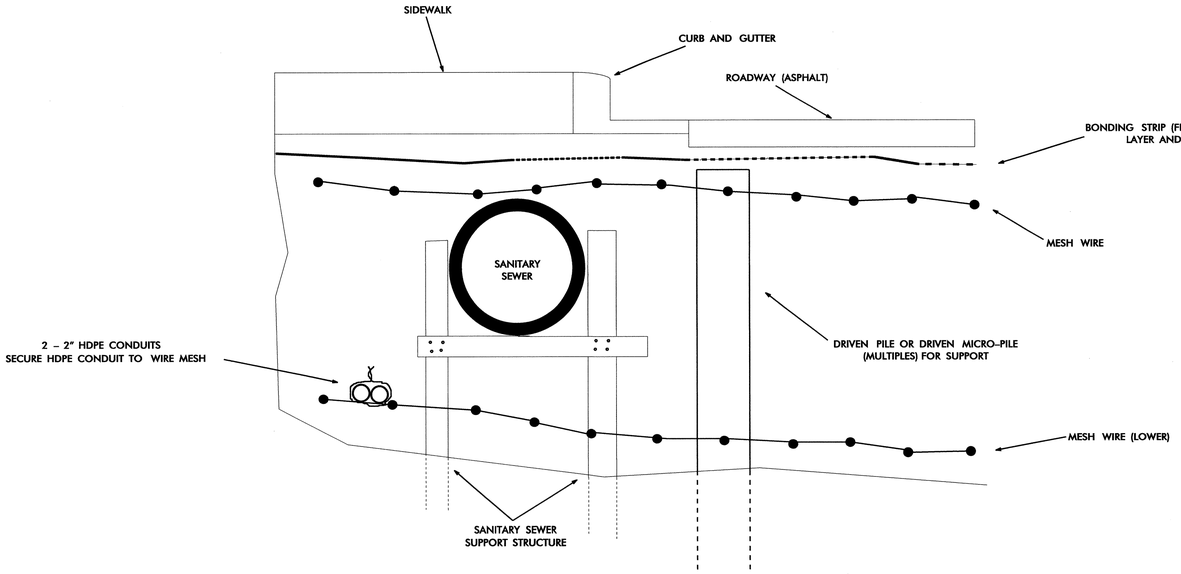
REVISIONS	INIT.	DATE

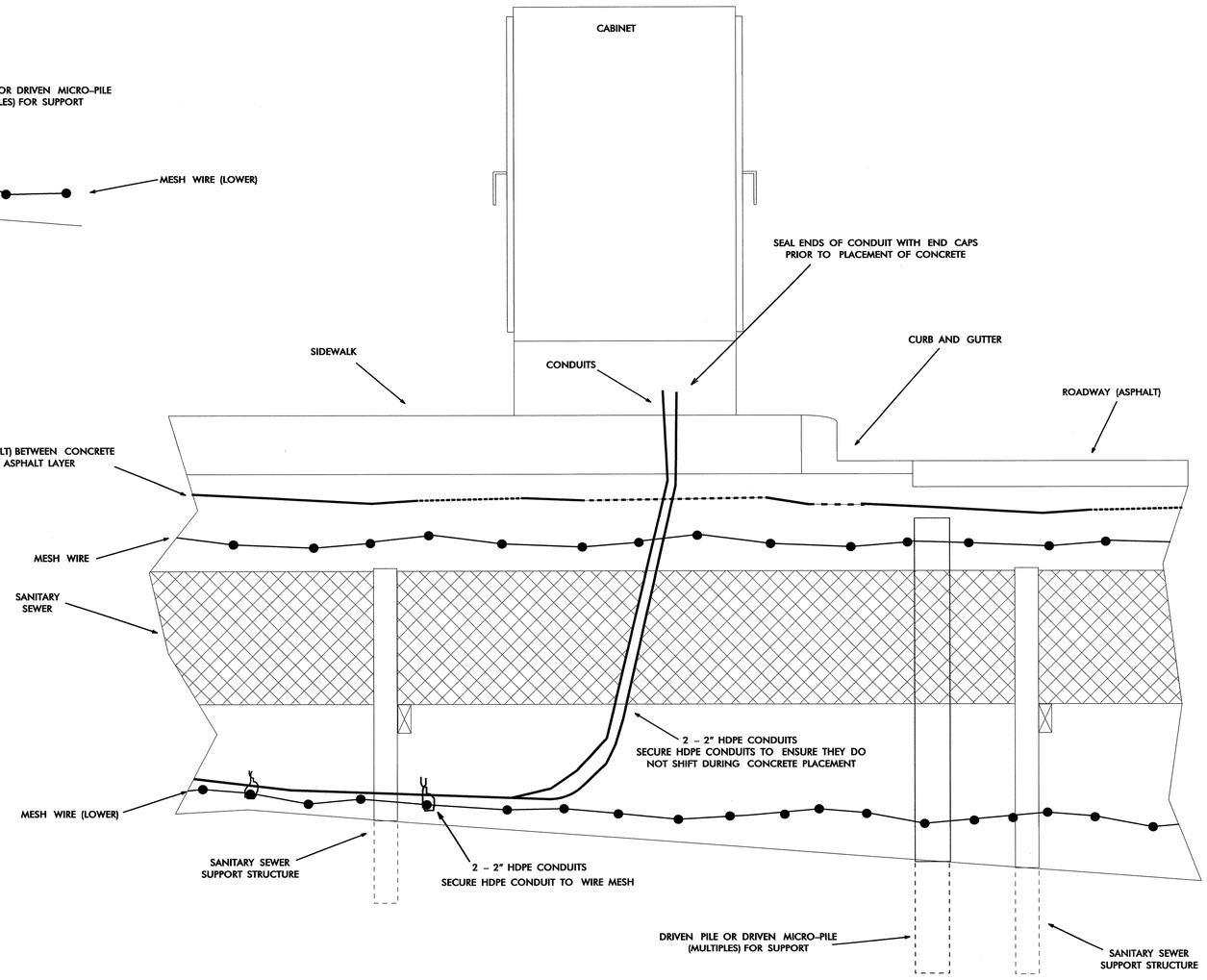
SCALE 0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
Gregory A. Fuller 10/31/02
SIGNATURE DATE

CADD Filenames:

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.55





NOTES FOR ITS CONDUIT:

1) SANITARY SEWER LINES TO BE INSTALLED UNDER THE SIDEWALK THROUGHOUT THE MAJORITY OF THIS PROJECT. COORDINATE INSTALLATION OF 2" HDPE CONDUITS WITH THE SANITARY SEWER CONTRACTOR AND OTHER CONTRACTORS INSTALLING UTILITIES IN THIS AREA.
2) INSTALL 2" HDPE CONDUIT IN CONTINUOUS LENGTHS FROM CABINET LOCATION TO CABINET LOCATION. NO SPLICING IS ALLOWED. THE ALLOWABLE RADII OF BENDS SHALL BE IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
3) 2" HDPE CONDUIT TO BE INSTALLED AFTER THE LOWER WIRE MESH IS INSTALLED.
4) SECURE THE 2" HDPE CONDUIT TO THE WIRE MESH USING REBAR TIES OR OTHER SUPPORT STRUCTURES WHERE ALLOWED. DO NOT SECURE CONDUIT TO SANITARY SEWER LINES.
5) INSTALL PULL TAPE IN BOTH CONDUITS PRIOR TO SEALING THE ENDS OF THE CONDUIT WITH DUCT PLUGS. ENSURE DUCT PLUGS ARE INSTALLED PRIOR TO CONCRETE PLACEMENT.

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

TYPICAL DETAILS FOR ITS HDPE CONDUIT INSTALLATION

DIVISION 01	PASQUOTANK COUNTY	ELIZABETH CITY
PLAN DATE: DECEMBER 2010	REVIEWED BY:	N. AVERY
PREPARED BY: S. WARDLE	REVIEWED BY:	G. FULLER

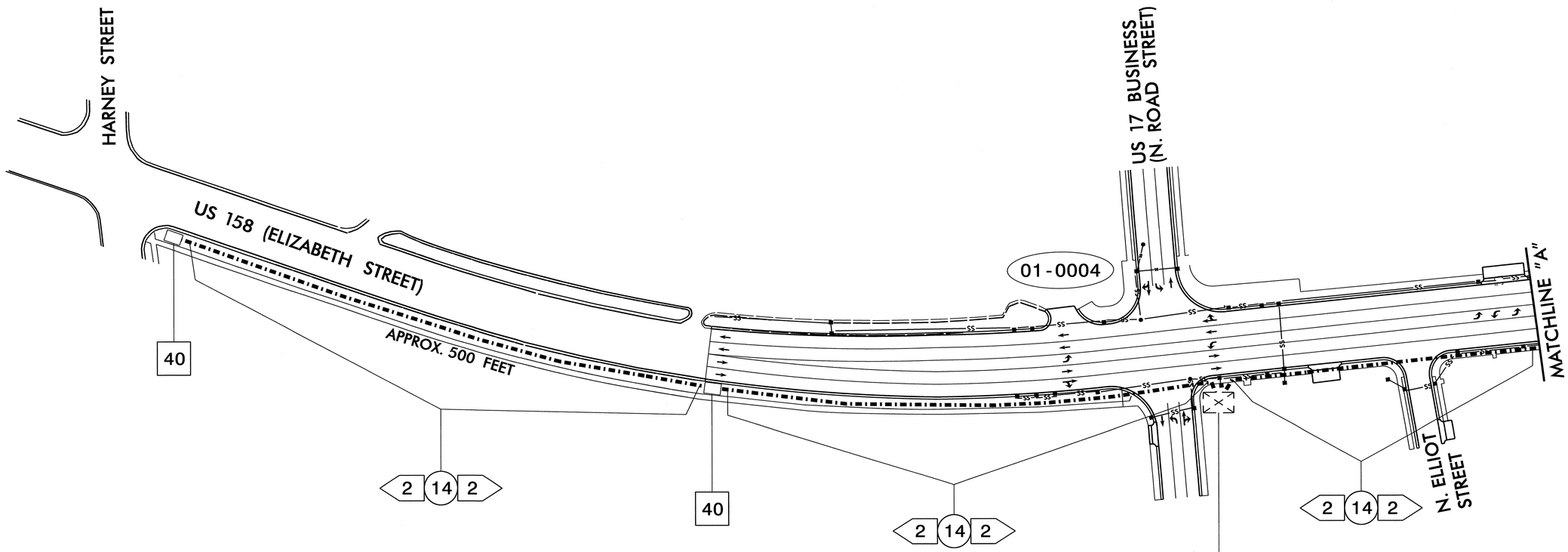
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/23/10
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.56



CABINET SHOWN FOR INFORMATIONAL PURPOSE ONLY. COORDINATE INSTALLATION OF "ITS CONDUITS" WITH THE "SIGNAL CONDUITS". ENSURE THESE CONDUITS ARE GROUPED TOGETHER.

TCP PHASE "III & IV"

REFERENCE "TYPICAL DETAIL FOR ITS HDPE CONDUIT INSTALLATION"

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

SCALE 0

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS ALONG US 158(ELIZABETH STREET)

DIVISION 01 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

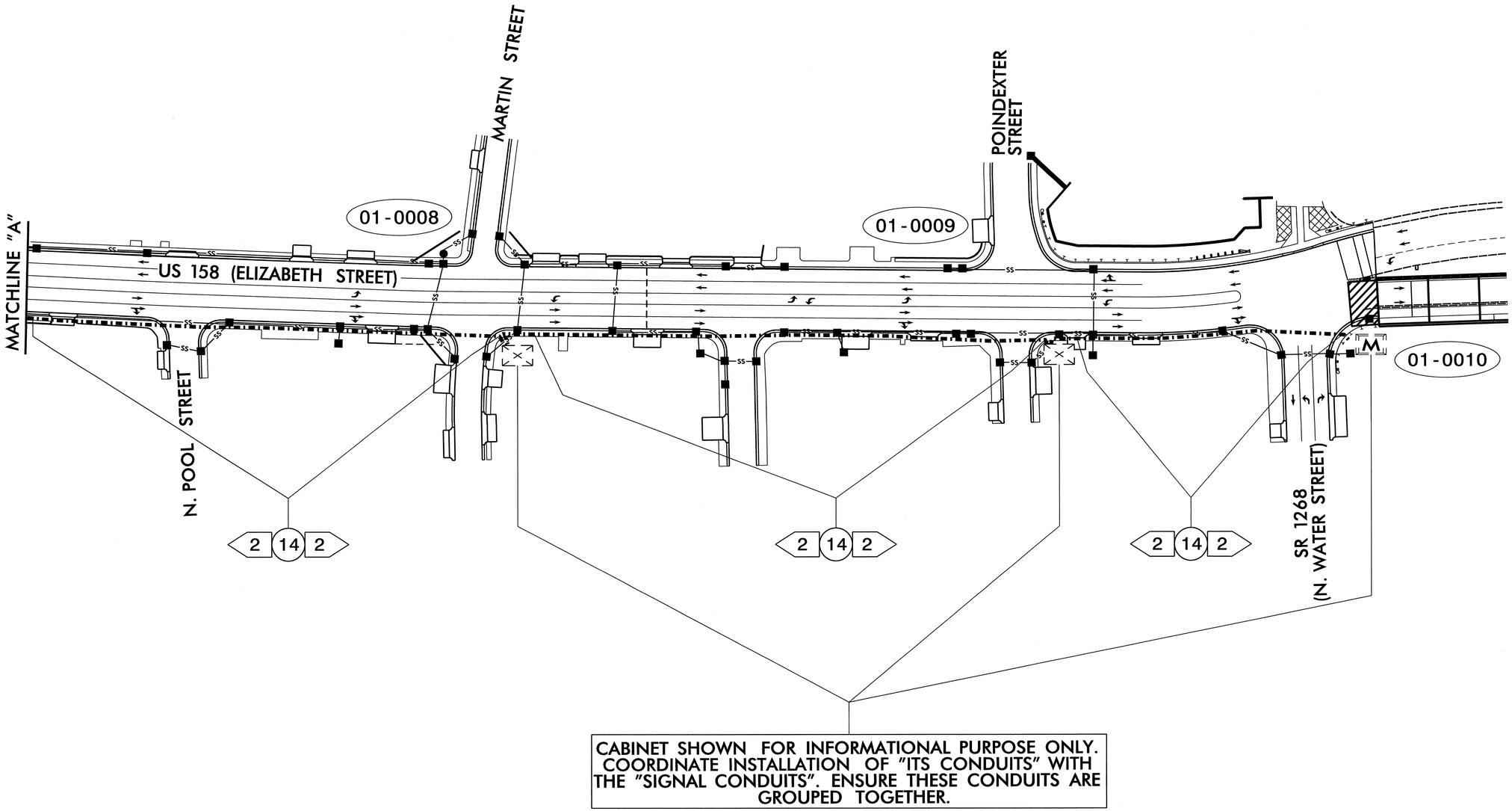
REVISIONS	INIT.	DATE

CADD Filename:

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL 023919
ENGINEER
GREGORY A. FULLER

Gregory A. Fuller 12/23/10
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.57



TCP PHASE "III & IV"

REFERENCE "TYPICAL DETAIL FOR ITS HDPE CONDUIT INSTALLATION"

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

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS ALONG US 158(ELIZABETH STREET)

DIVISION 01 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

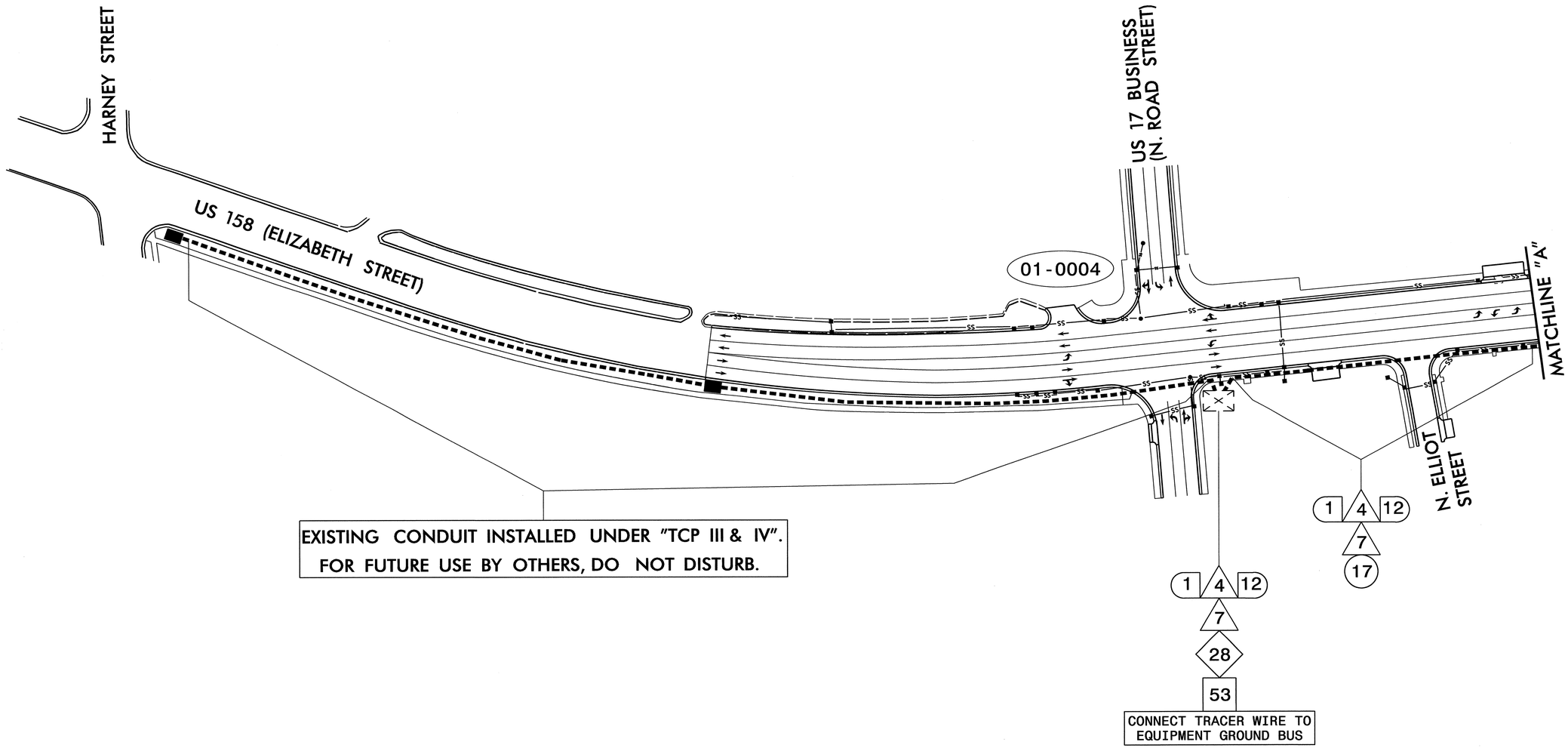
SCALE 0

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

SIGNATURE Gregory A Fuller 12/23/10 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.58



REFERENCE "TYPICAL DETAIL FOR ITS HDPE CONDUIT INSTALLATION"

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

SCALE 0

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS ALONG US 158(ELIZABETH STREET)

DIVISION 01 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

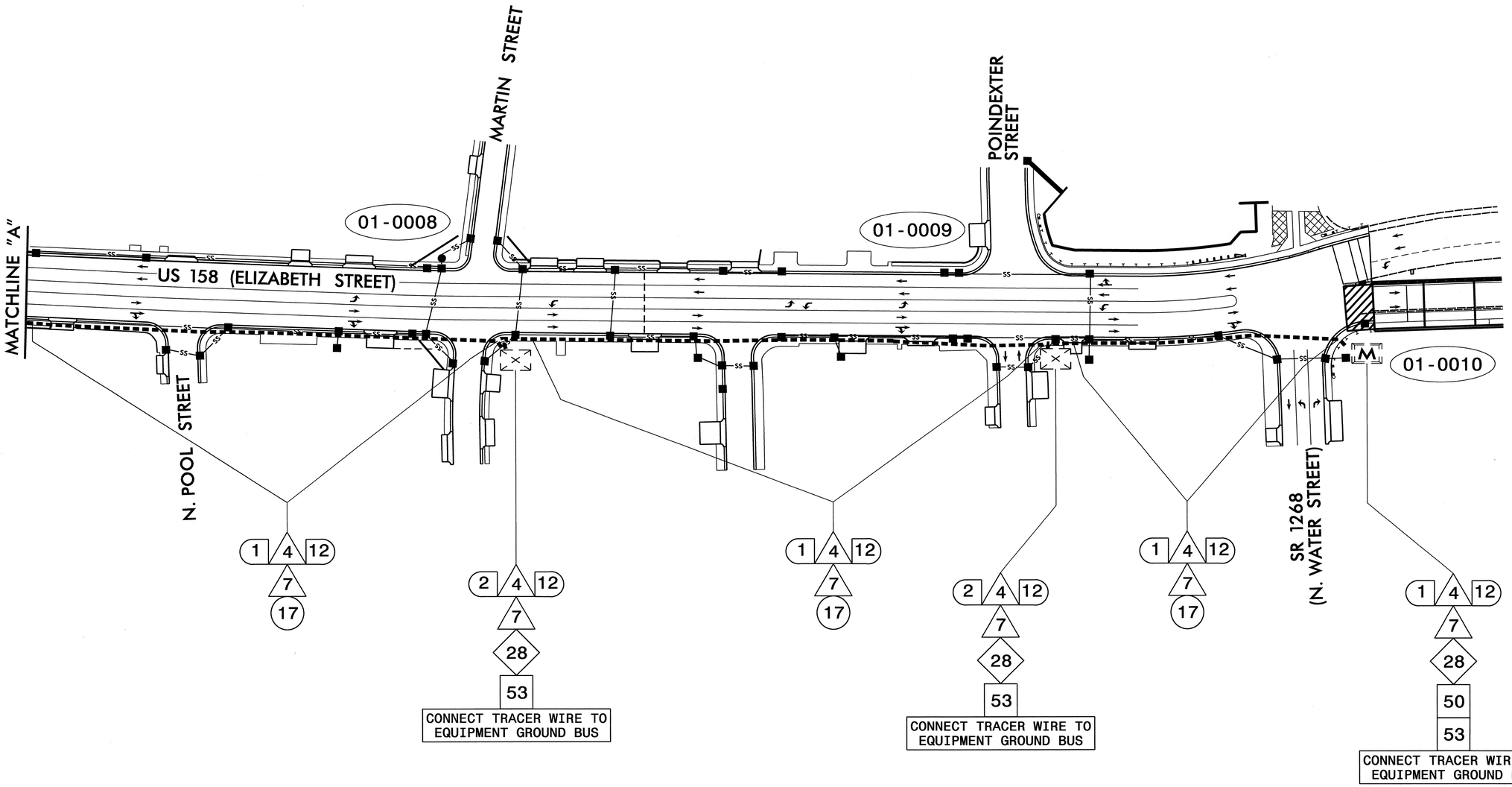
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/23/10
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.59



REFERENCE "TYPICAL DETAIL FOR ITS HDPE CONDUIT INSTALLATION"

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

SCALE
0

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS ALONG US 158(ELIZABETH STREET)

DIVISION 01 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

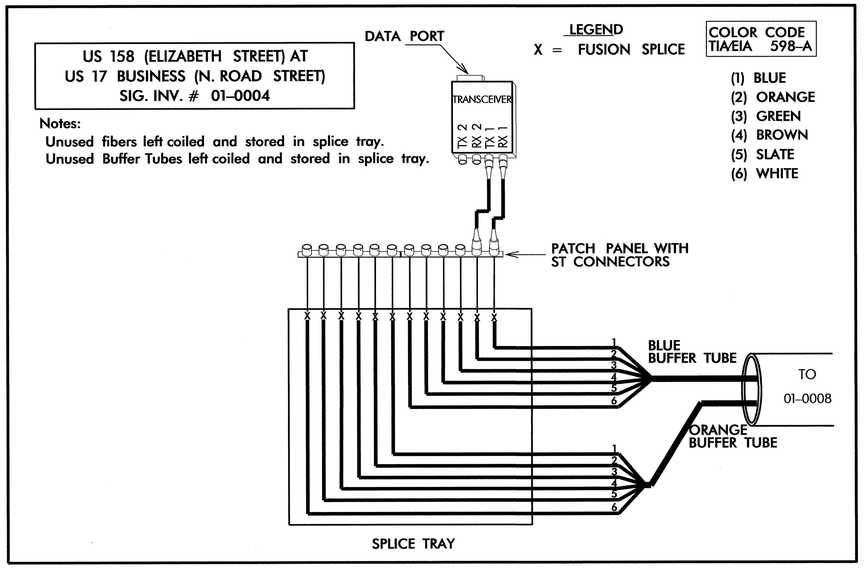
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

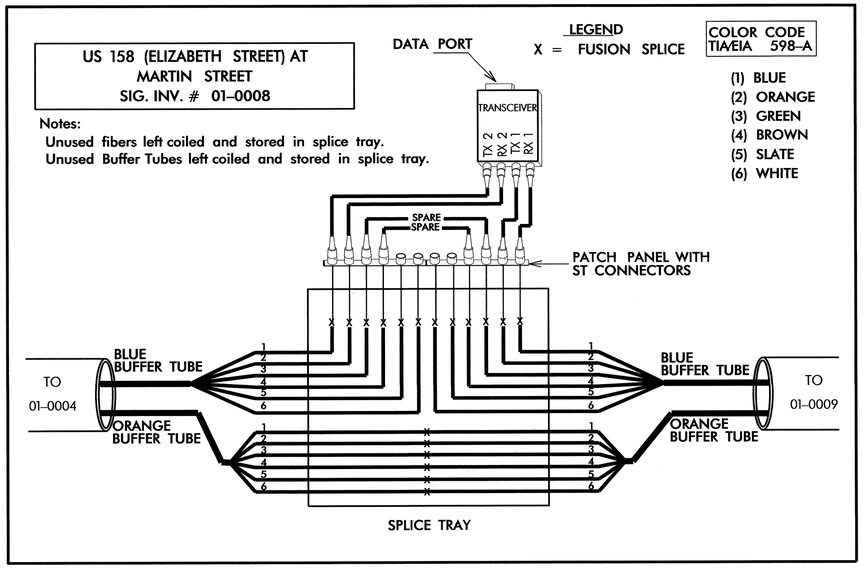
Gregory A. Fuller 12/23/10
SIGNATURE DATE

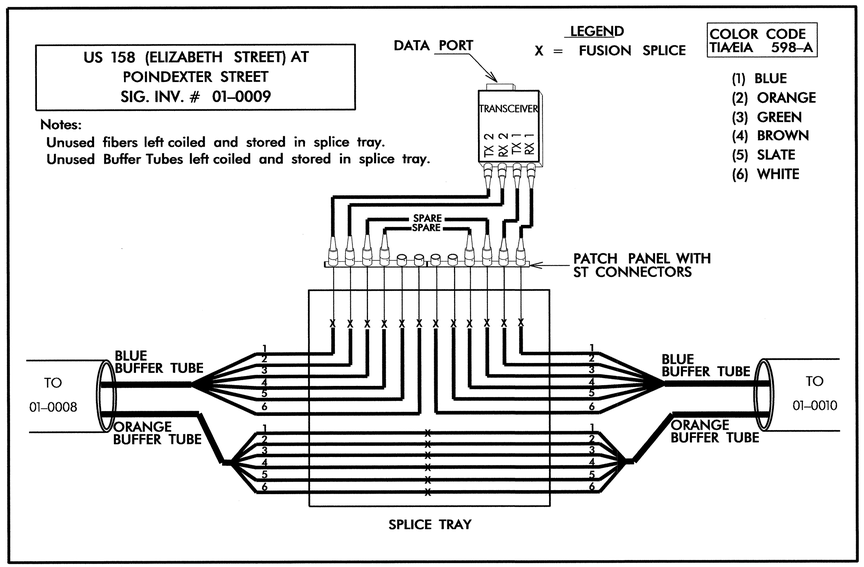
CADD Filename:

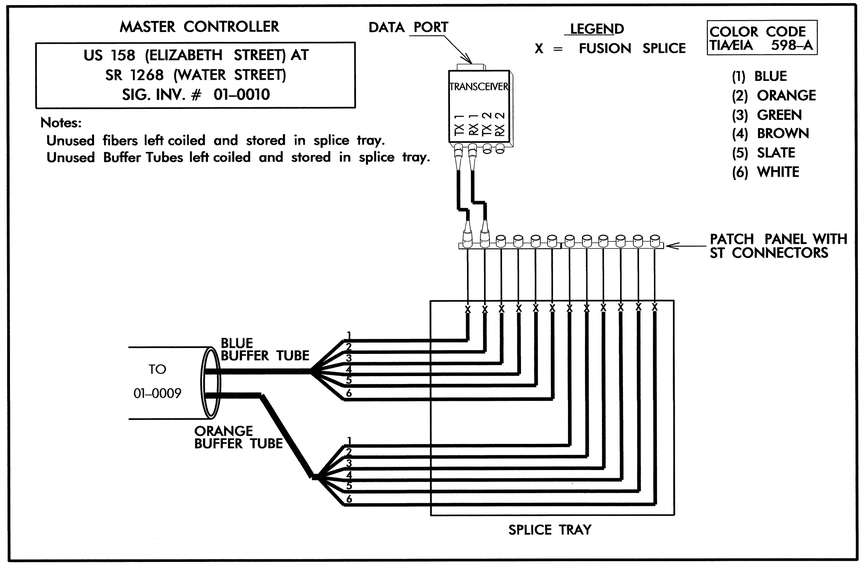
PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.60

FIBER OPTIC CABLE









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

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

SPLICE PLAN
ALONG US 158(ELIZABETH STREET)

DIVISION 01 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	I.N. AVERY
PREPARED BY:	S.C. WARDLE	REVIEWED BY:	G.A. FULLER

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER

Gregory A. Fuller 12/23/10
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.61

GENERAL NOTES:

1. FOLLOW AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS", 4TH EDITION 2001 INCLUDING THE LATEST INTERIM.
2. DESIGN SPECIFICATIONS: FOLLOW PROJECT SPECIAL PROVISIONS (VERSION 6.7) SIGNALS AND INTELLIGENT TRANSPORTATION SYSTEMS.
3. FOR DESIGN, UTILIZE GEOTECHNICAL DATA PROVIDED BY THE NCDOT GEOTECHICAL ENGINEERING UNIT: STRUCTURE SUBSURFACE INVESTIGATION FOR MSP-1 THROUGH MSP-8; PROJECT REFERENCE NO. 35742.1.1(U-4438), F.A. PROJECT STP-0158(31).
4. FOLLOW APPLICABLE SECTIONS OF THE 2006 NCDOT STANDARD SPECIFICATIONS
5. THE DESIGN WIND VELOCITY IS 130 MPH WITH 50 YEAR RECURRENCE INTERVAL.
6. THE DESIGN ICE LOAD IS 3 PSF. FOR FATIGUE DESIGN, SIGN SUPPORT STRUCTURAL DETAILS HAVE BEEN DESIGNED BASED ON FATIGUE CATEGORY II FOR NATURAL WIND GUSTS AND TRUCK INDUCED GUSTS.
7. FOR PEDESTAL AND PILE CAP, PROVIDE f'c=4500 PSI CONCRETE AT 28 DAYS WITH REQUIRED AIR ENTRAINMENT TO ACHIEVE FULL STRENGTH.
8. PROVIDE GRADE 60 REINFORCING STEEL BARS THAT MEET THE REQUIREMENTS OF ASTM A 615/A 615M-96A FOR CONCRETE REINFORCEMENT. DO NOT WELD REINFORCING STEEL BARS.
9. MAXIMUM DESIGN LATERAL DISPLACEMENT FOR PILE CAP CENTER IS 1 INCH AND ROTATION IS LESS THAN 1 DEGREE.
10. PROVIDE MIN 3 INCHES OF CONCRETE COVER ON REINFORCING BARS, EXCEPT AS NOTED.
11. CHAMFER EXPOSED CONCRETE EDGES 1 INCH BY 1 INCH.
12. ALL DIMENSIONS SHOWN ARE HORIZONTAL, EXCEPT AS NOTED.
13. DIMENSIONS ARE BASED ON A NORMAL TEMPERATURE OF 68°F.
14. DIVERT ALL SURFACE RUNOFF AWAY FROM EXCAVATIONS. PERFORM ALL EXCAVATIONS IN ACCORDANCE WITH OSHA REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT DEWATERING SO THAT EXCAVATIONS ARE DRY ENOUGH FOR INSPECTION AND CONSTRUCTION.
15. COORDINATE, LOCATE AND CONDUCT ALL WORK RELATED TO PUBLIC AND PRIVATE UTILITIES BEFORE CONSTRUCTION.
16. VERIFY AND LOCATE ALL EXISTING UTILITIES PRIOR TO STARTING WORK. CONDUCT OPERATIONS IN A MANNER WHICH ENSURES THAT THE UTILITIES WILL NOT BE DISTURBED OR ENDANGERED, AND ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE TO UTILITIES DURING CONSTRUCTION. THE DEPARTMENT DOES NOT ASSUME RESPONSIBILITY FOR REIMBURSEMENT, PARTICIPATION IN DESIGN AND/OR REVISIONS, OR LIABILITY FOR ACCURACY OF TYPE, SIZE AND LOCATION OF ANY UTILITY.
17. VERIFY ALL ELEVATIONS AND DIMENSIONS IN THE FIELD PRIOR TO PILE CAP CONSTRUCTION. NOTIFY THE ENGINEER FOR ANY DEVIATION.
18. SOIL NEEDS TO BE WELL PREPARED BEFORE PLACING THE CONCRETE FOR THE PILE CAP. SEE NCDOT 2006 STANDARD SPECIFICATION, SECTION 410.
19. FOR SIGNAL POLE MICROPILES, SEE MICROPILES SPECIAL PROVISIONS.
20. DESIGN SIGNAL POLE MICROPILES FOR A FACTORED COMPRESSION RESISTANCE OF 24 TONS PER PILE AND A FACTORED TENSILE RESISTANCE OF 14 TONS PER PILE. DESIGN THE BOND LENGTH TO PROVIDE THE REQUIRED FACTORED RESISTANCE.
21. PERMANENT CASINGS WITH A MINIMUM OUTSIDE DIAMETER OF 10.75 INCHES ARE REQUIRED FOR ALL SIGNAL POLE MICROPILES.
22. INSTALL CASINGS FOR SIGNAL POLE NO.1 THROUGH SIGNAL POLE NO.4 TO A TIP ELEVATION NO HIGHER THAN -40 FT.
23. INSTALL CASINGS FOR SIGNAL POLE NO.5 AND SIGNAL POLE NO.6 TO A TIP ELEVATION NO HIGHER THAN -50 FT.
24. INSTALL CASINGS FOR SIGNAL POLE NO.7 AND SIGNAL POLE NO.8 TO A TIP ELEVATION NO HIGHER THAN -58 FT.
25. USE A MINIMUM OF 0.5 INCH WALL THICKNESS PERMANENT CASINGS WITH A MINIMUM YIELD STRENGTH OF 50 KSI WITHOUT JOINTS ALONG THE PERMANENT CASING LENGTH FOR SIGNAL POLE MICROPILES OR MINIMUM 0.5 INCH WALL THICKNESS PERMANENT CASINGS WITH A MINIMUM YIELD STRENGTH OF 80 KSI WITH THREADED JOINTS. DO NOT LOCATE THREADED CASING JOINTS WITHIN THE TOP TEN (10) FEET FOR ALL SIGNAL POLE MICROPILES.
26. FULL LENGTH CENTRAL REINFORCING BAR IS REQUIRED FOR ALL SIGNAL POLE MICROPILES.
27. DEMONSTRATION SIGNAL POLE MICROPILES ARE NOT REQUIRED.
28. PROOF LOAD TESTS ARE REQUIRED FOR ONE SIGNAL POLE MICROPILE PER PILE CAP TO BE SELECTED BY THE ENGINEER. SIGNAL POLE MICROPILE PROOF LOAD TESTS MAY BE EITHER COMPRESSION OR TENSION TESTS AT THE CONTRACTOR'S DISCRETION. LOAD TEST EACH SELECTED PILE TO 24 TONS FOR PROOF TESTS.

INDEX OF DRAWINGS

STRUCTURAL DRAWING SHEET NO. 1 OF 3

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

MAST ARM POLE FOUNDATIONS
PILE CAP GENERAL NOTES

DIVISION 1 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED 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
D. Sarkar 12.30.10
SIGNATURE DATE

30-DEC-2010 11:34
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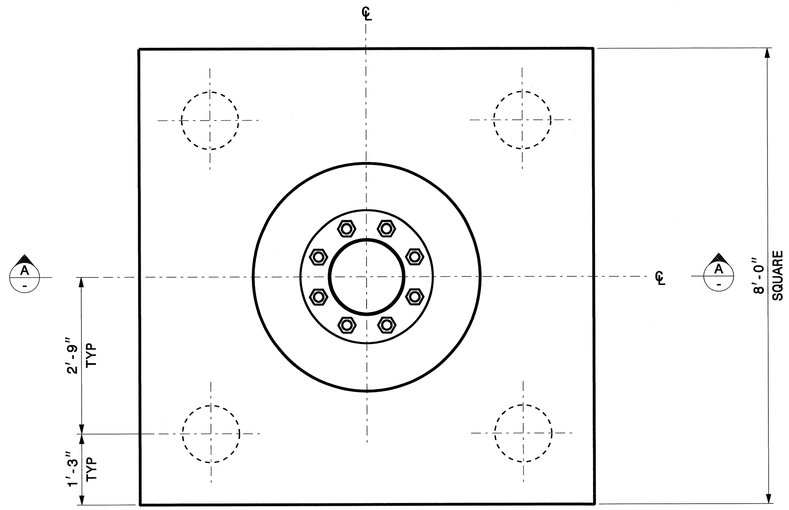
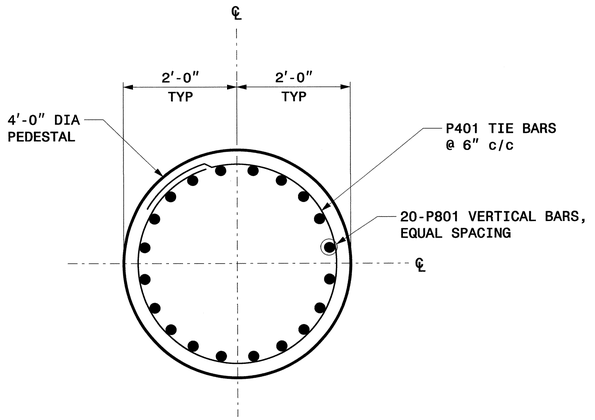
ioumzurike

PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.62



PLAN



SECTION B-B

(FOR CLARITY ANCHOR BOLTS ARE NOT SHOWN)

NOTES:

1. FOR GENERAL NOTES, SEE STRUCTURAL DRAWING SHEET 1 OF 3.
2. FOR DETAILS AND LOCATION OF SIGNAL HEADS AND SIGNS SEE SIGNAL PLAN DRAWING INV. NOS. 01-0004; 01-0008; 01-0009; 01-0010.
3. PROVIDE MATERIALS AND WORKMANSHIP PER SPECIFICATION.
4. IF ANY (NO.8 PC801) BAR INTERFERES WITH THE MICROPILE, RELOCATE THAT BAR NEXT TO THE MICROPILE AND ADD AN EXTRA BAR (PC802) BETWEEN THE MICROPILES.
5. ANY NECESSARY CONDUIT LAYOUT IS NOT SHOWN.
6. ANY REQUIRED GROUNDING ROD/PROVISIONS NOT SHOWN.
7. PLEASE SEE NCDOT STANDARD CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.
8. PLEASE SEE APPROVED POLE SHOP DRAWINGS FOR ANCHOR BOLT DATA INCLUDING BOLT CIRCLE, BOLT DIAMETER, NUMBER OF BOLTS AND BOLT LAYOUT PATTERN.
9. ALTERNATE PC601 BARS SO THAT THE 135° BAR BEND IS LOCATED AT THE TOP OF EVERY 24".

BAR SCHEDULE NOTES:

1. ALL DIMENSIONS ARE OUT TO OUT OF BAR.
2. FOR CONCRETE REINFORCEMENT BAR SEE "BAR SCHEDULE".

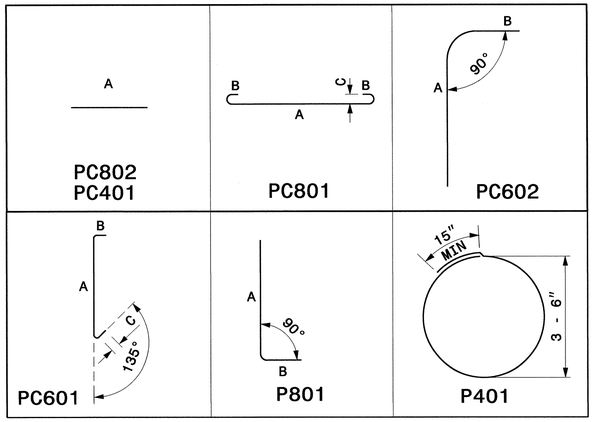
BAR SCHEDULE

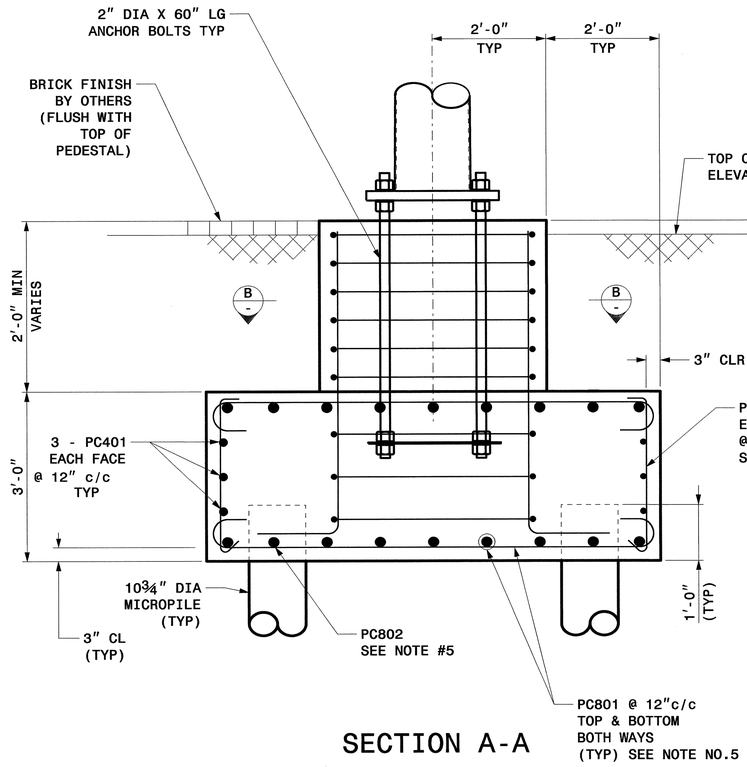
PILE CAP BARS

MARK	SIZE	QUANTITY	LENGTH	A	B	C	UNIT WEIGHT (LBS/FT)	WEIGHT (LBS)
PC802	8	4	4'-5¼"	4'-5¼"	-	-	2.67	48
PC801	8	36	9'-2"	7'-6"	0'-4"	0'-6"	2.67	882
PC602	6	16	4'-3"	3'-3"	1'-0"	-	1.50	102
PC601	6	36	3'-5¼"	2'-6"	0'-6¾"	0'-4½"	1.50	186
PC401	4	12	7'-6"	7'-6"	-	-	0.67	60

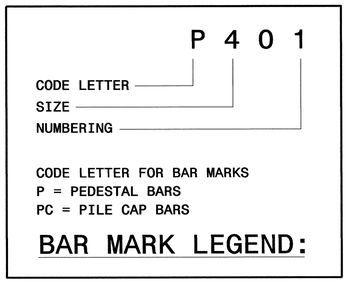
PEDESTAL BARS

MARK	SIZE	QUANTITY	LENGTH	A	B	C	UNIT WEIGHT (LBS/FT)	WEIGHT (LBS)
P801	8	20	6'-3 "	4'-3"	2'-0"	-	2.67	334
P401	4	9	12'-3 "	-	-	-	0.67	74





SECTION A-A



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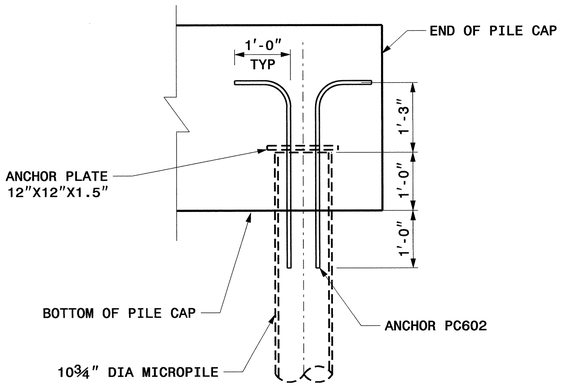

MICROPILE ANCHOR DETAIL

STRUCTURAL DRAWING SHEET NO. 2 OF 3

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

MAST ARM POLE FOUNDATIONS
PILE CAP DETAILS

DIVISION 1 | PASQUOTANK COUNTY | ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	K.C.DURIGON
PREPARED BY:	N.BITTING	REVIEWED BY:	M.B.BUTLER

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR
D. Sarkar 12.30.10
SIGNATURE DATE

SIG. INVENTORY NO.

30-DEC-2010 11:35
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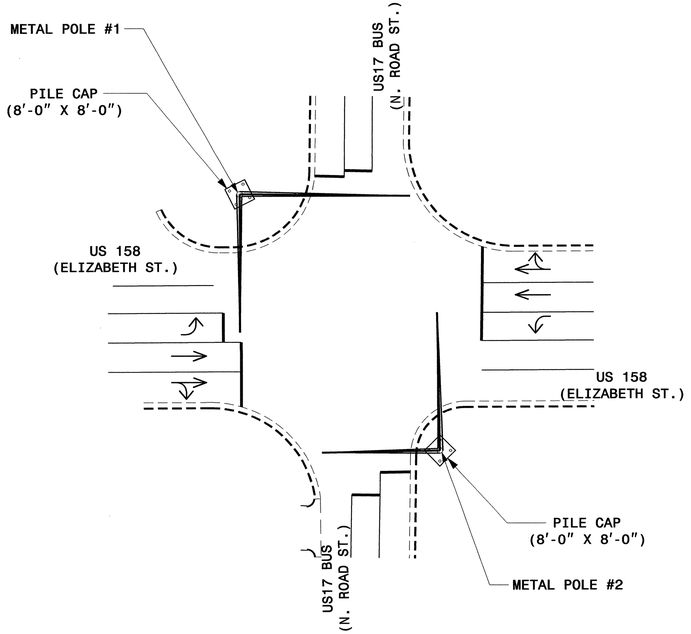
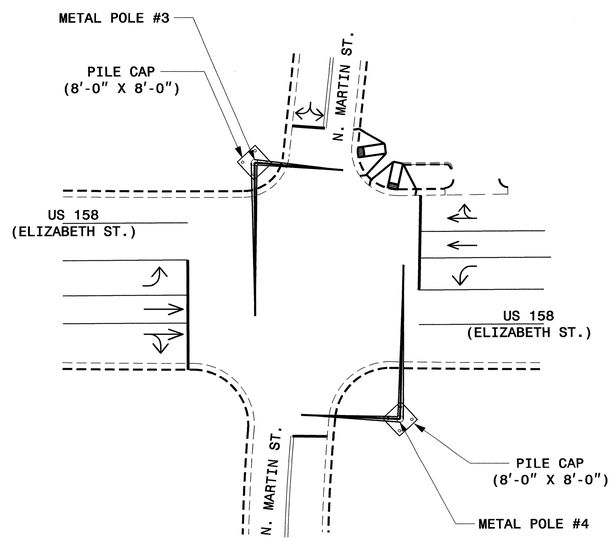
loumozurike

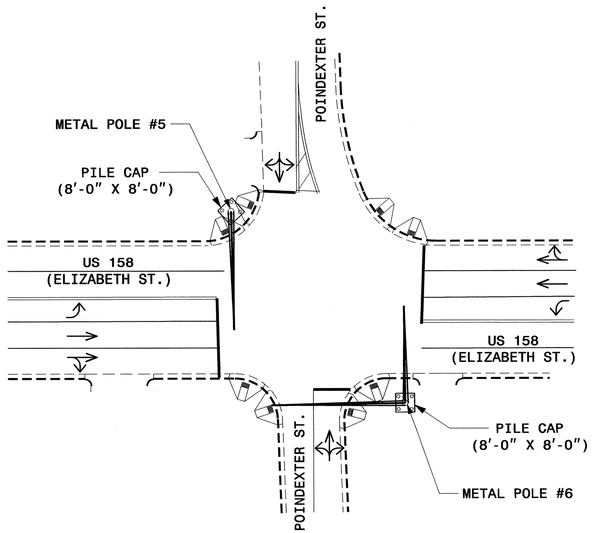
PROJECT REFERENCE NO.	SHEET NO.
U-4438	SIG.63



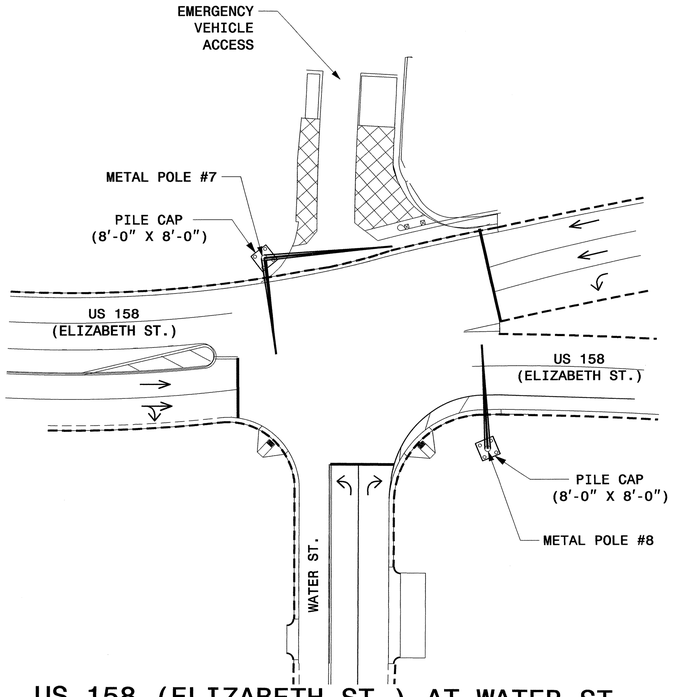
US 158 (ELIZABETH ST.) AT US 17
SIGNAL INVENTORY NO. 01-0004



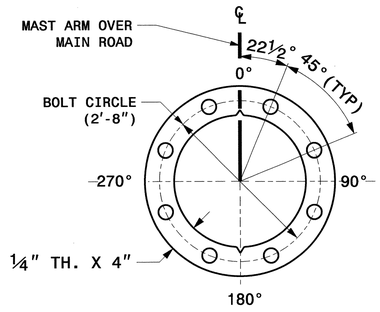
US 158 (ELIZABETH ST.) AT N. MAIN ST.
SIGNAL INVENTORY NO. 01-0008



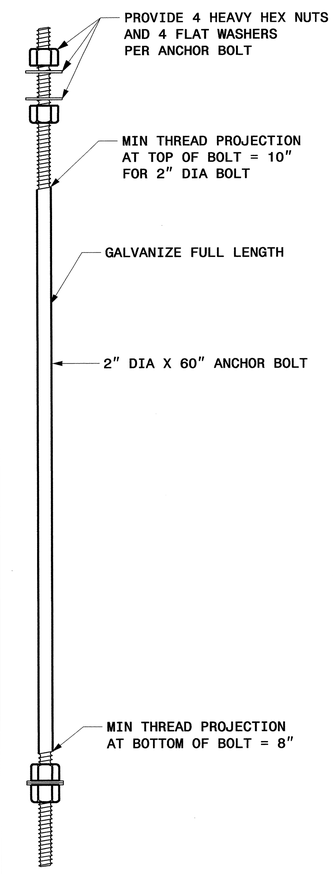
US 158 (ELIZABETH ST.) AT POINDEXTER ST.
SIGNAL INVENTORY NO. 01-0009



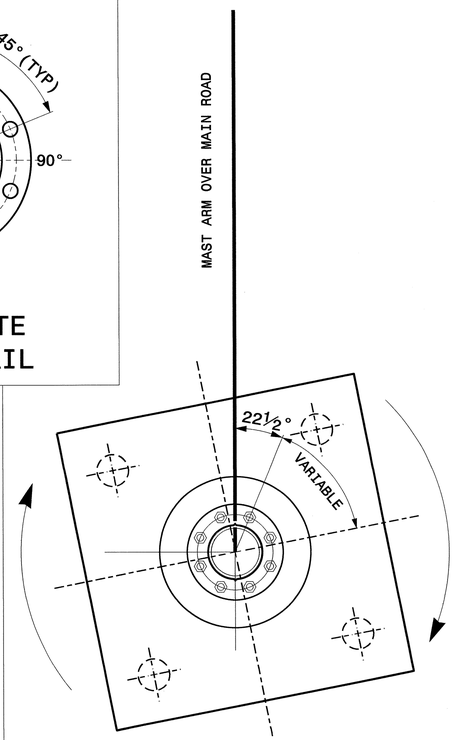
US 158 (ELIZABETH ST.) AT WATER ST.
SIGNAL INVENTORY NO. 01-0010



8 BOLT BASE PLATE AND TEMPLATE DETAIL



ANCHOR BOLT DETAIL



ARM ORIENTATION WITH RESPECT TO ANCHOR BOLTS

PILE CAP LOCATION

POLE	STATION -L-	OFFSET -L-
1	19+58 -L- +/-	48' LT.+/-
2	20+30 -L- +/-	45' RT.+/-
3	27+10 -L- +/-	38' LT.+/-
4	27+57 -L- +/-	48' RT.+/-
5	31+70 -L- +/-	41' LT.+/-
6	32+43 -L- +/-	39' RT.+/-
7	11+12 -L2- +/-	21' LT.+/-
8	12+04 -L1- +/-	34' RT.+/-

PILE CAP CHART

STRUCTURAL DRAWING SHEET NO. 3 OF 3

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

MAST ARM POLE FOUNDATIONS PILE CAP LOCATIONS, ORIENTATIONS AND DETAILS

DIVISION 1 PASQUOTANK COUNTY ELIZABETH CITY

PLAN DATE:	DECEMBER 2010	REVIEWED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	C.F.ANDREWS

REVISIONS	IN IT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBDESH C. SARKAR

D.SarKar 10.30.10
SIGNATURE DATE

30-DEC-2010 11:36
C:\Documents and Settings\oumzourlike\Local Settings\Temporary Internet Files\OLK14\U-4438_Pile Cap Drawing (3).dgn
oumzourlike

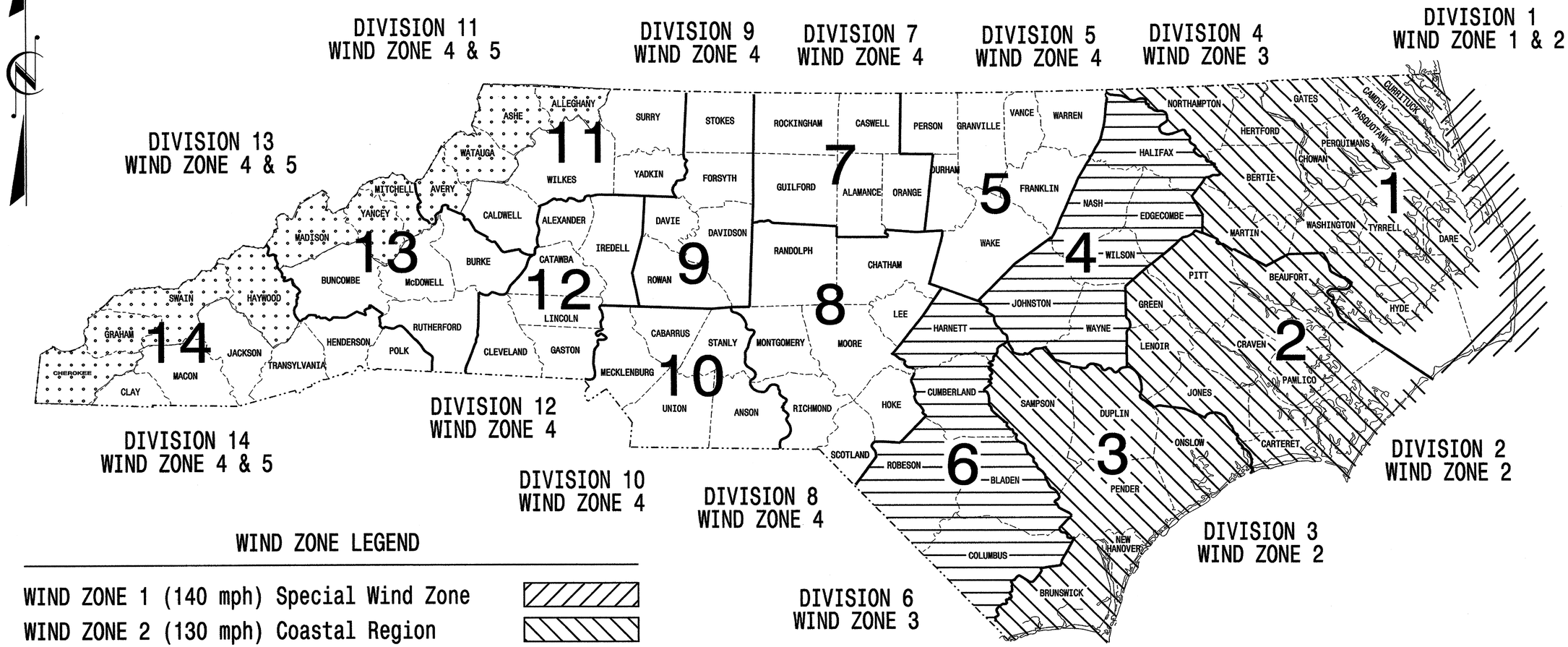
STATE	PROJECT NO.	SHEET NO.
N.C.	U-4438	Sig.64
F. A. PROJ. NO.		M 1
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES

POLE STANDARDS

NCDOT METAL P



WIND ZONE LEGEND

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

http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html

Prepared In the Offices of:

Transportation Mobility and Safety Division
Department of Transportation • State of North Carolina
Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

Designed in conformance with the 2002 Interim to the 4th Edition 2001

AASHTO

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

INDEX OF PLANS

NCDOT CONTACTS:

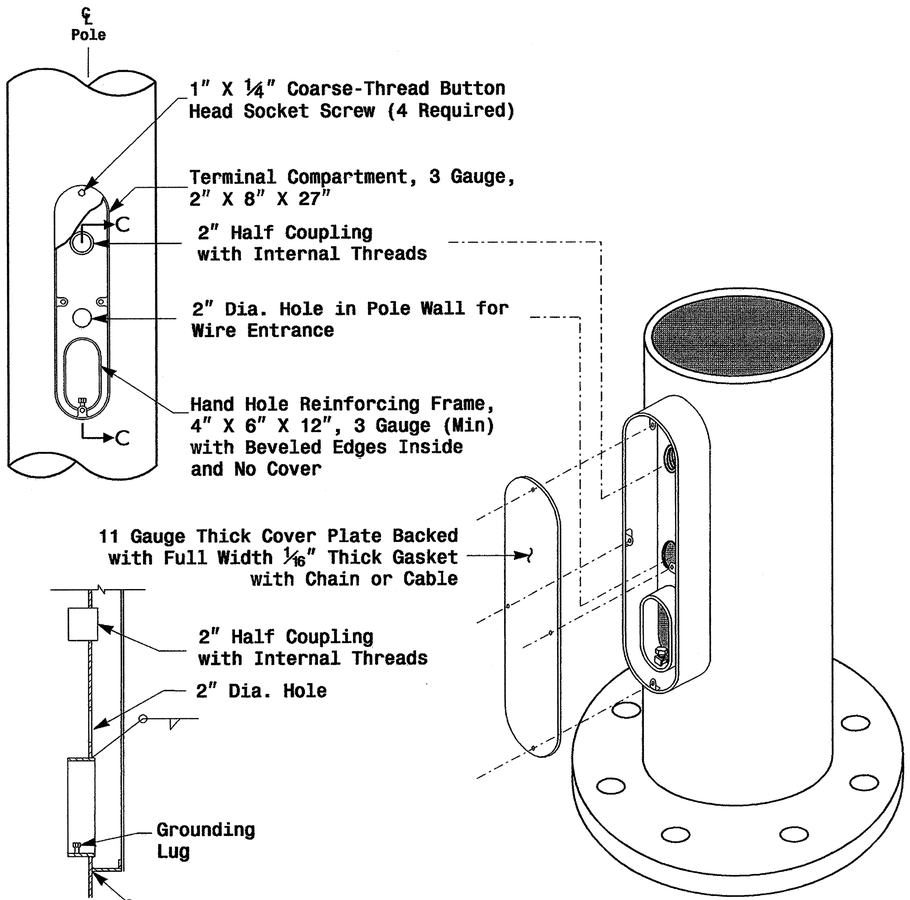
MOBILITY AND SAFETY DIVISION – ITS and SIGNALS UNIT

G. A. Fuller, P.E. – State ITS and Signals Engineer
G. G. Murr, Jr., P.E. – State Signals Engineer
D. C. Sarkar, P.E. – ITS and Signals Senior Structural Engineer
C. F. Andrews, Jr. – ITS and Signals Structural Project Engineer
M. Aslam – ITS and Signals Structural Project Engineer
N. Bitting, P.E. – ITS and Signals Structural Project Engineer

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 7.21.2009
SIGNATURE DATE



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

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	----------

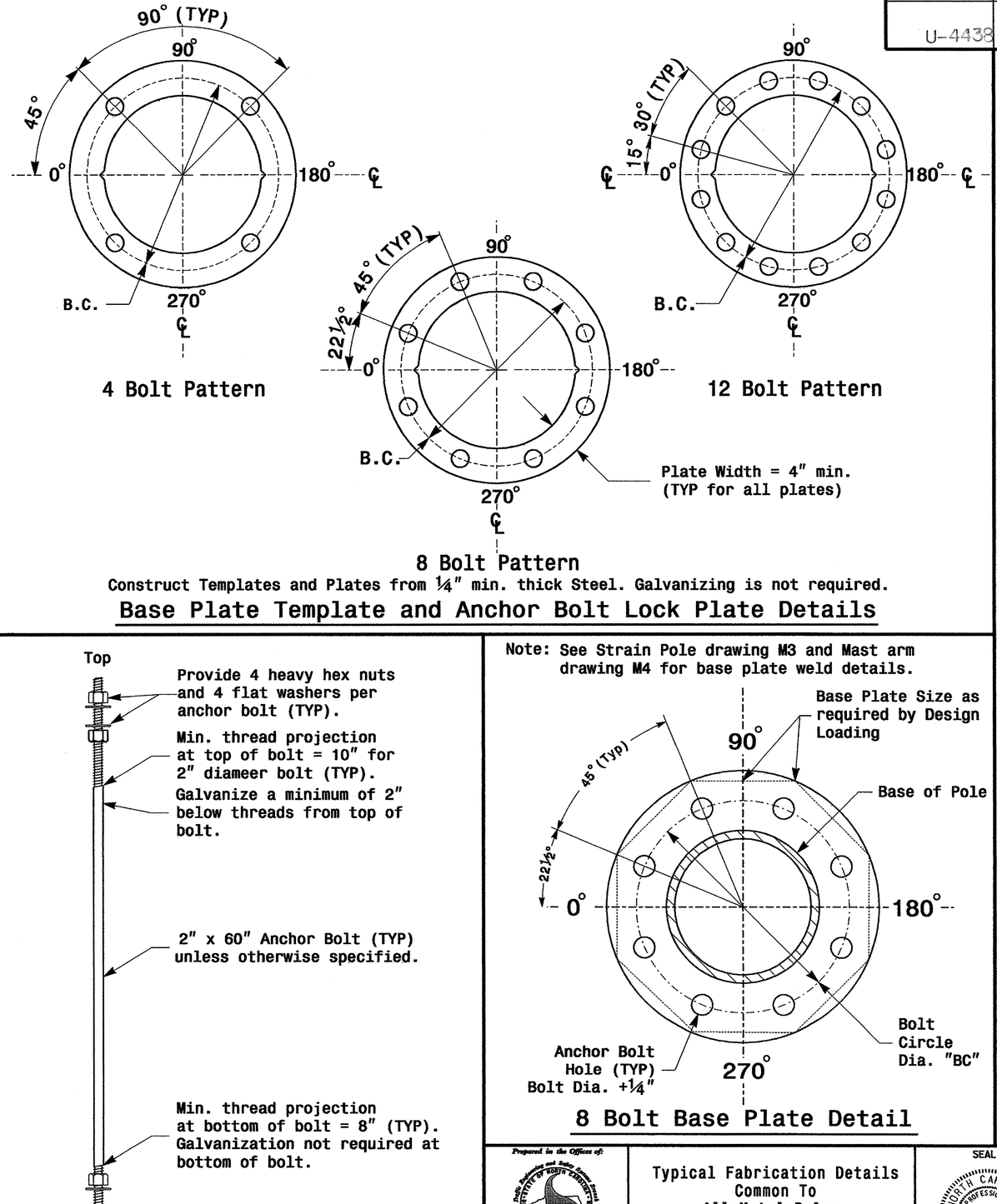
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

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 plan pole I.D.
5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details



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

Fabrication Details – All Poles

Prepared in the Offices of: North Carolina Department of Transportation, Traffic Engineering Branch, Signals and Geometrics Section
122 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details Common To All Metal Poles

PLAN DATE:	May 2005	REVIEWED BY:	C.F. Andrews
PREPARED BY:	P.L. Alexander	REVIEWED BY:	A.M. Esposito

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

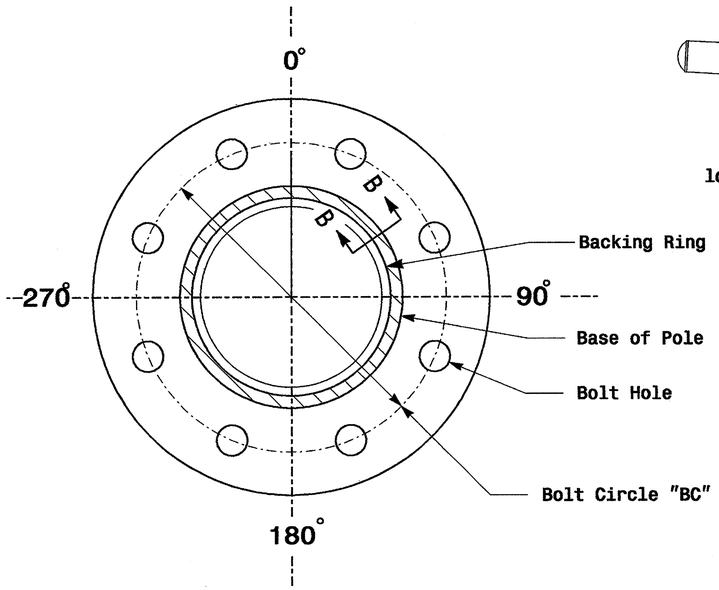
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DIBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

01-SEP-2005 18:22
D:\M2004 Metal Pole Standards\2004 m2 thru m5.dgn
candrews

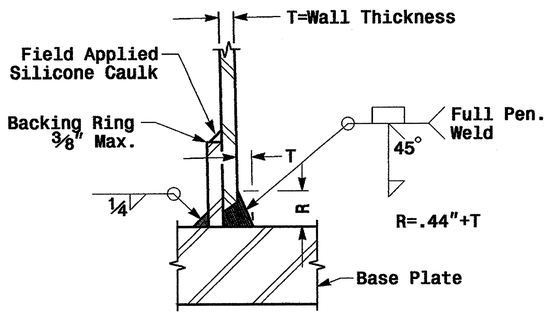
PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig. 66 M 4



Section A-A

(See drawing M 2)

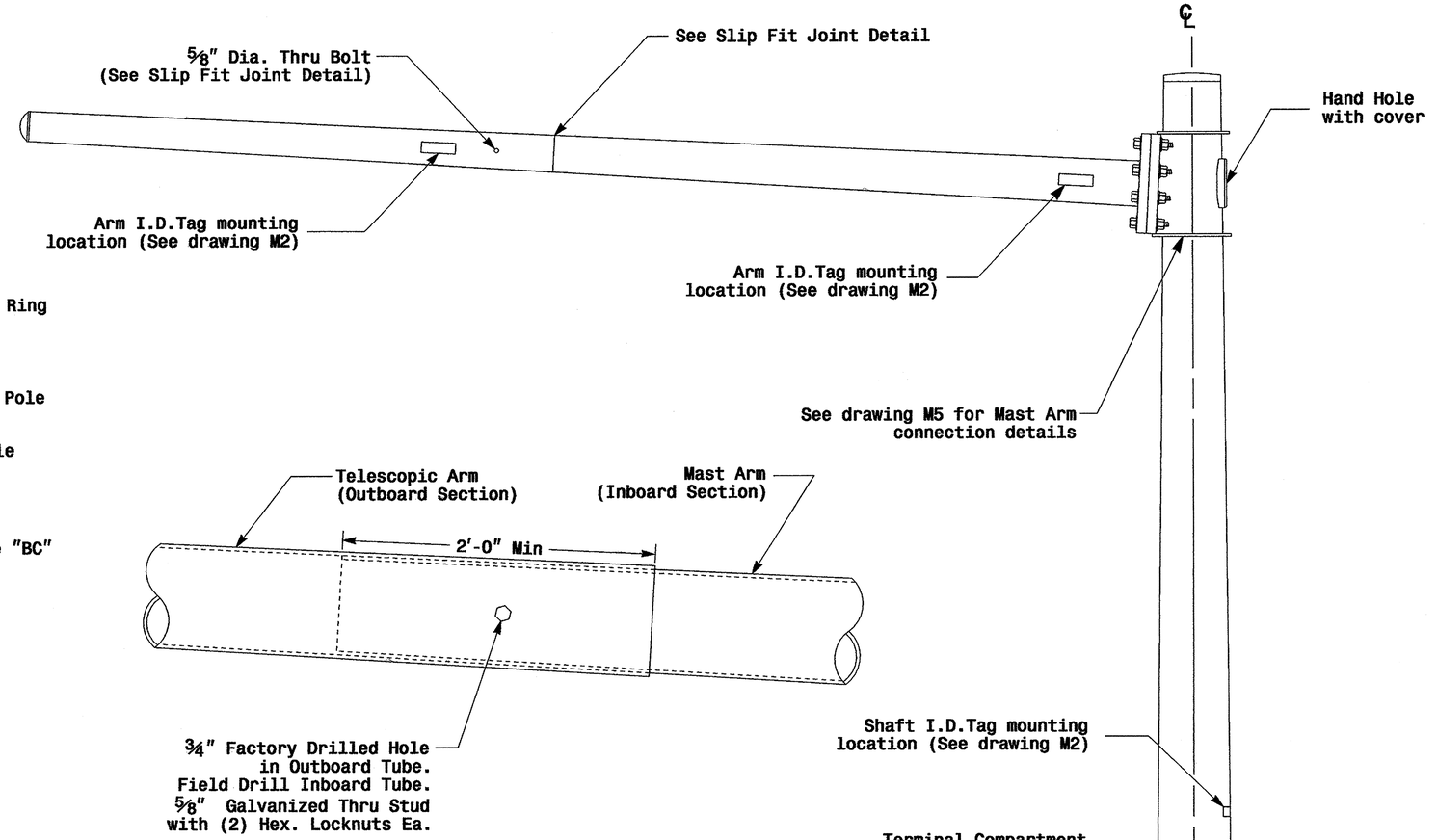
Pole Base Plate



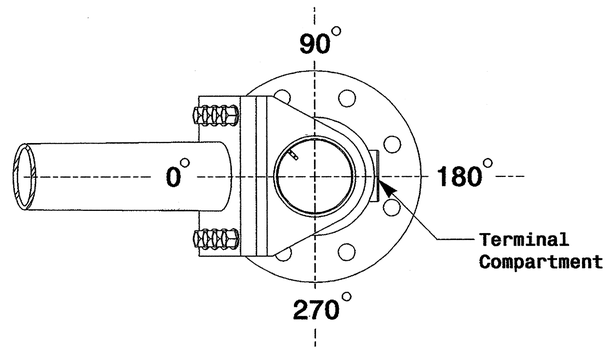
Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation

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

Fabrication Details – Mast Arm Poles

Prepared in the Offices of:
North Carolina Department of Transportation
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
322 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details for Mast Arm Poles

PLAN DATE:	May 2005	REVIEWED BY:	C.F. Andrews
PREPARED BY:	P.L. Alexander	REVIEWED BY:	A.W. Esposito

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

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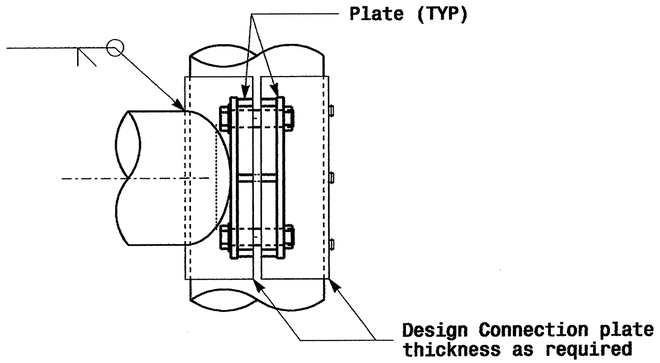
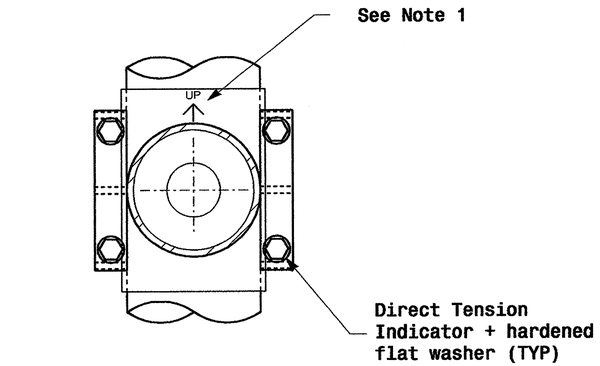
palexander

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.67 M 5

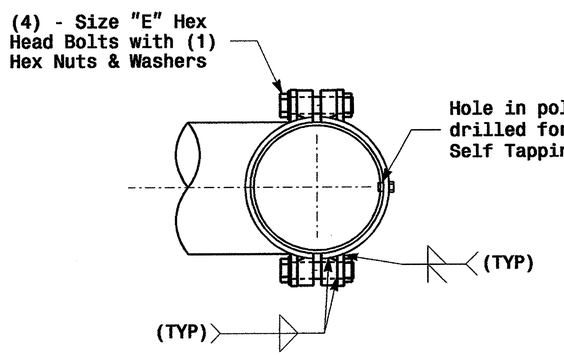
Adjustable Clamp Type Bolted Mast Arm Connection



Side Elevation View

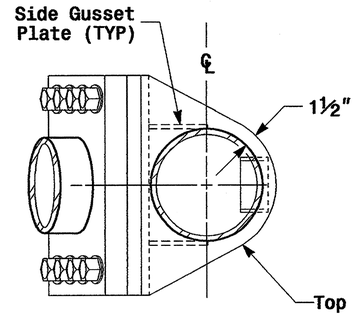


Front Elevation View

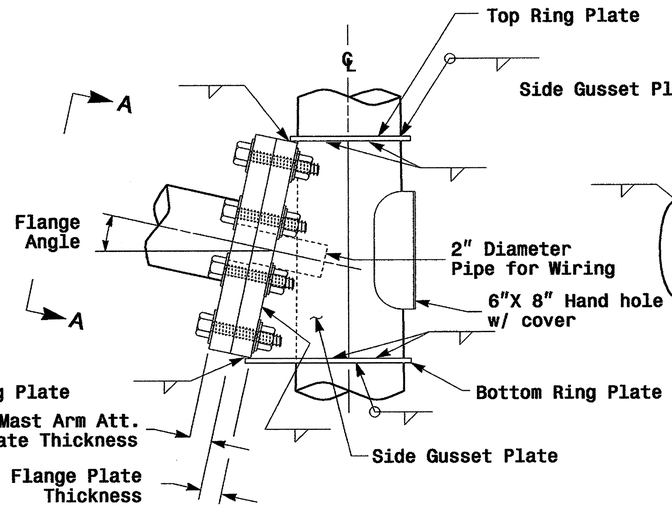


Plan View

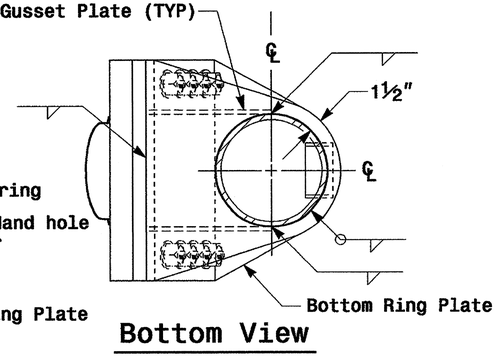
Welded Ring Stiffened Mast Arm Connection



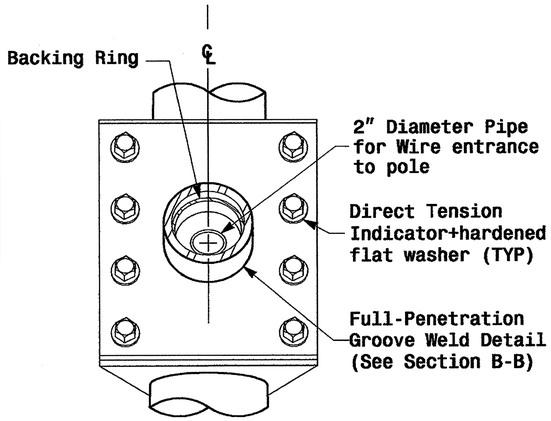
Plan View



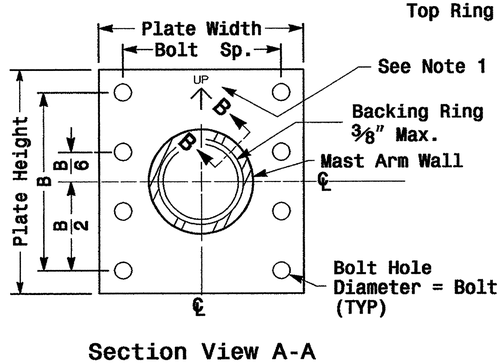
Side Elevation View



Bottom View

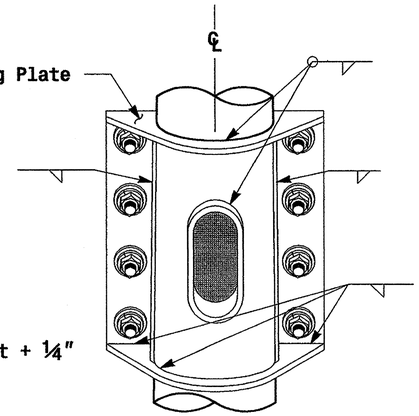


Front Elevation View

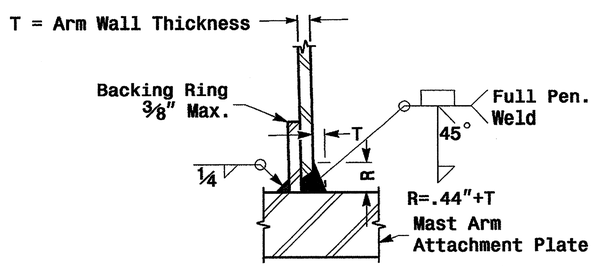


Section View A-A

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 Office of: North Carolina Department of Transportation, Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, 122 N. McDowell St., Raleigh, NC 27603

Fabrication Details For Mast Arm Connection To Pole

PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews
PREPARED BY: P.L. Alexander	REVIEWED BY: A.M. Esposito

SCALE: 0 NA NONE

REVISIONS	INIT.	DATE

SEAL: North Carolina Professional Seal 028094 Engineer Hemesh C. Sarkar

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

Fabrication Details – Mast Arm Poles

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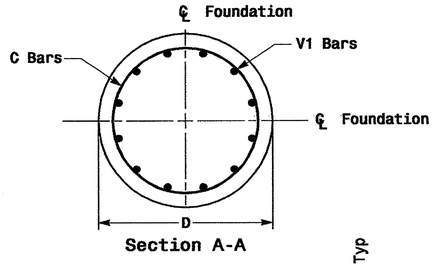
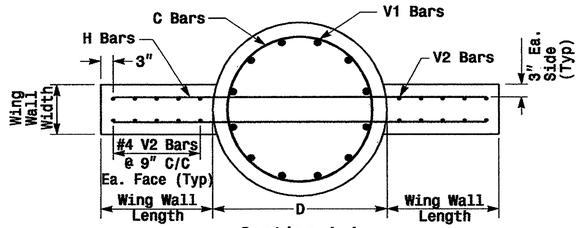
dsilvander

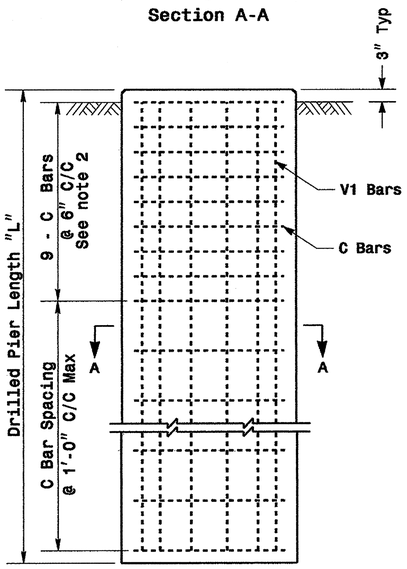
Reinforcing Steel Bars

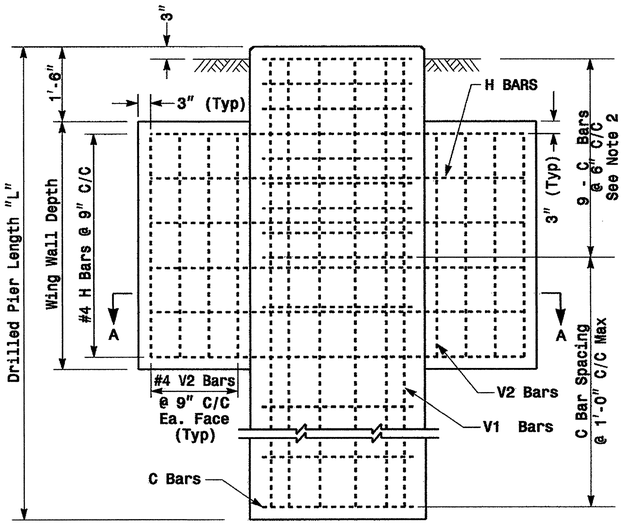


Section A-A



Section A-A

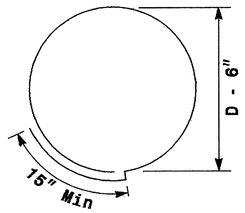




REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (42" & 48" DIAMETER)

Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	**
		C	*	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	**
		C	*	#4	CIR.	12'-6"

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



Typical "C" Bars

REINFORCING STEEL TABLE FOR STANDARD 42" and 48" DRILL PIER SHAFT WITH TYPE 1 AND TYPE 2 WING WALLS

Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel				
		Bar Name	No.	Size	Type	Length
TYPE 1	42"	V1	9	#8	STR.	**
		V2	12	#4	STR.	2'-6"
		H	8	#4	STR.	6'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	42"	V1	9	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	48"	V1	12	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-6"
		C	*	#4	CIR.	12'-6"

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

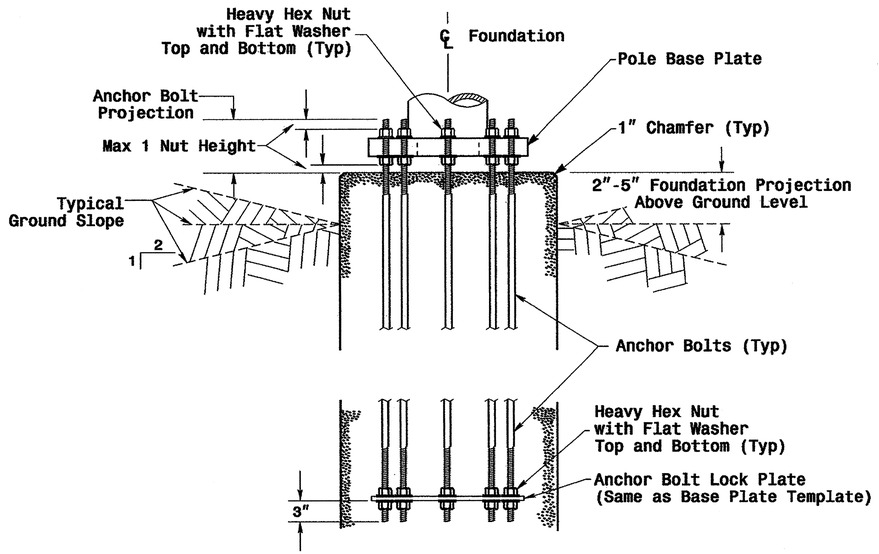
WING WALL DETAILS

Wing Wall Type	Wing Wall Length (Ft.)	Wing Wall Width (Ft.)	Wing Wall Depth (Ft.)	Concrete Volume (Cu. Yds.)
TYPE 1	1'-6"	1'-0"	3'-0"	.4
TYPE 2	3'-0"	1'-0"	5'-0"	1.2

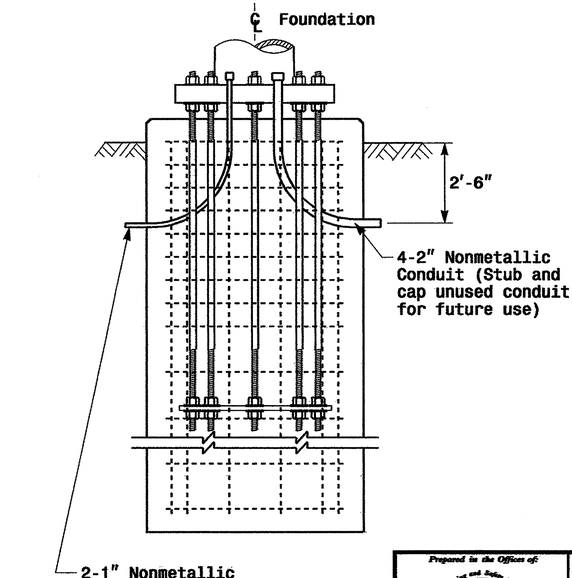
See Note No. 4

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. For standard foundations, see sheet M 8.
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 sheet M 8.
4. The quantities for steel and concrete shown in the Wing Wall Details Chart reflect the amount of material for 1 pair of wing walls (2 wing walls per drilled pier shaft.)

Construction Details – Foundations

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Department of Transportation, Division of Highways, Structure and Geometrics Section, 1722 N. McDowell St., Raleigh, NC 27603

Construction Details Foundations

PLAN DATE: May 2005 | REVIEWED BY: P.L. ALEXANDER
PREPARED BY: C.F. ANDREWS | REVIEWED BY: A.W. ESPOSITO

SCALE: 0 NA — NONE

REVISIONS	INIT.	DATE

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

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

01-SEP-2005 11:48
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dgnusr

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.69

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

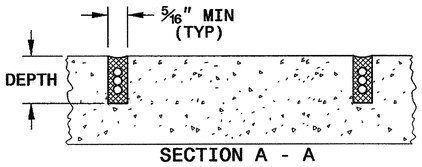
ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

CONVENTIONAL 4-SIDED LOOP

SAW SLOT DEPTH CHART

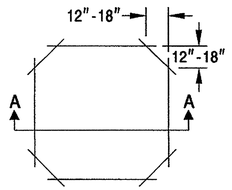
DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0



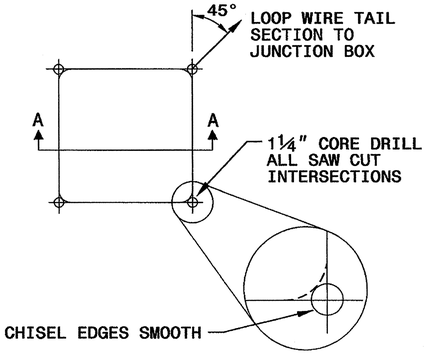
SECTION A - A

SAW CUT OPTIONS

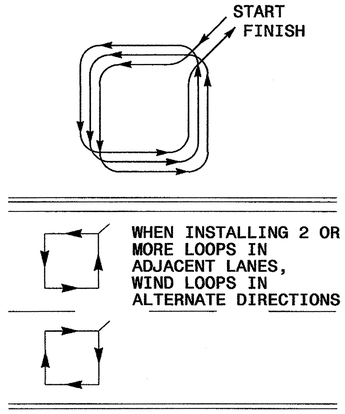
OPTION 1



OPTION 2
(POOR PAVEMENT)



LOOP WINDING METHOD



LOOP WIRE TWISTING METHOD

INCORRECT WAY TO TWIST WIRE

CORRECT WAY TO TWIST WIRE

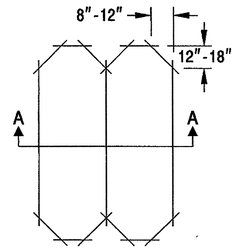
NOTES

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

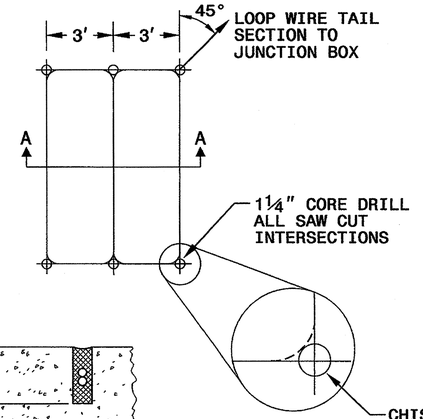
QUADRUPOLE LOOP

SAW CUT OPTIONS

OPTION 1



OPTION 2
(POOR PAVEMENT)



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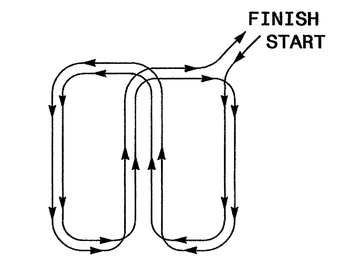

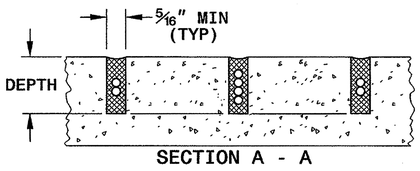

SECTION A - A

DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

SHEET 1 OF 3

1725D01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3

1725D01

See Plate for Title

Prepared in the Offices of:
Intelligent Transportation Systems & Signals Unit
750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON L. DEAN

SIGNATURE

11/24/08
DATE

24-NOV-2008 09:28
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2milittle

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.70

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

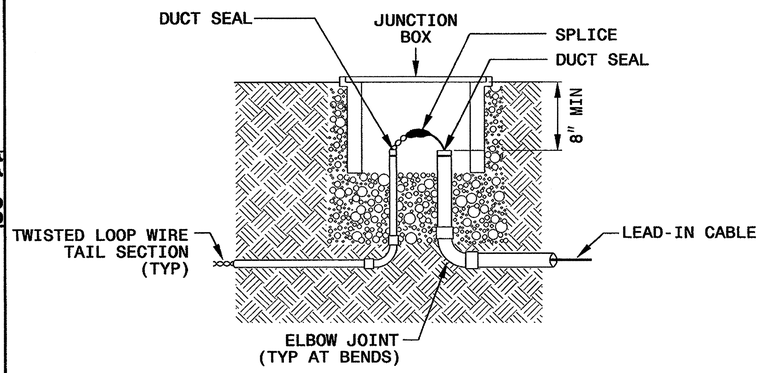
ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

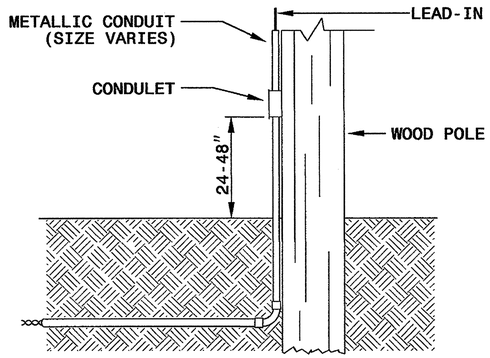
LOOP WIRE DETAILS

LOOP WIRE SPLICE POINT DETAILS

LOOP WIRE AT JUNCTION BOX



LOOP WIRE AT POLE

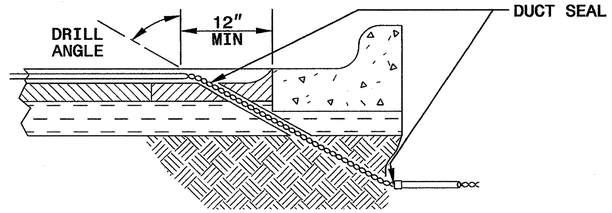


NOTE

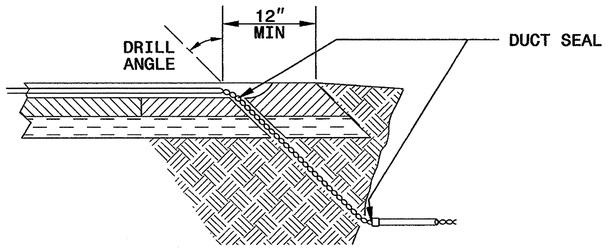
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

LOOP WIRE PAVEMENT EDGE DETAILS

LOOP WIRE AT CURB & GUTTER SECTION



LOOP WIRE AT PAVEMENT SECTION



NOTES

1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

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ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

LOOP WIRE DETAILS

SHEET 2 OF 3

1725D01

SHEET 2 OF 3

1725D01

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See Plate for Title

Prepared in the Offices of:

Intelligent Transportation Systems & Signals Unit
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON I DEAN

Milton I. Dean 11/24/08
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4438	Sig.71

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DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

11-08

ENGLISH DETAIL DRAWING FOR

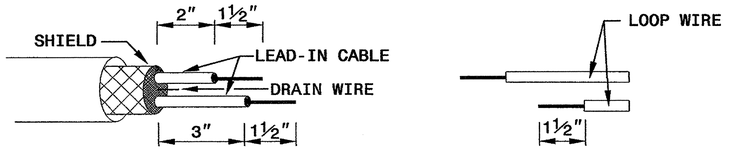
INDUCTIVE DETECTION LOOPS

SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

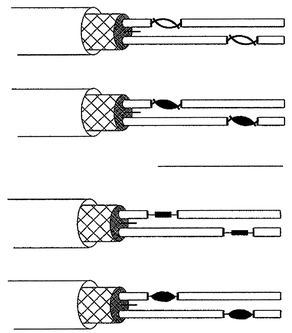
SHEET 3 OF 3

1725D01

STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE



STEP 2. CONNECT AND SOLDER



TWIST BARE CONDUCTORS TOGETHER AND SOLDER WITH RESIN CORE SOLDER

OR

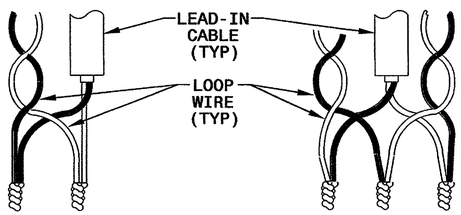
CRIMP BARE CONDUCTORS TOGETHER WITH AN UNINSULATED BUTT CONNECTOR AND SOLDER WITH RESIN CORE SOLDER

BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

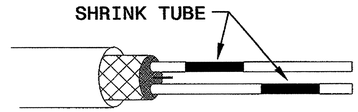
LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS

SINGLE CONNECTION

SERIES CONNECTION



STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY



STEP 4. ENVIRONMENTALLY PROTECT SPLICE

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ENGLISH DETAIL DRAWING FOR

INDUCTIVE DETECTION LOOPS

SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3

1725D01

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