

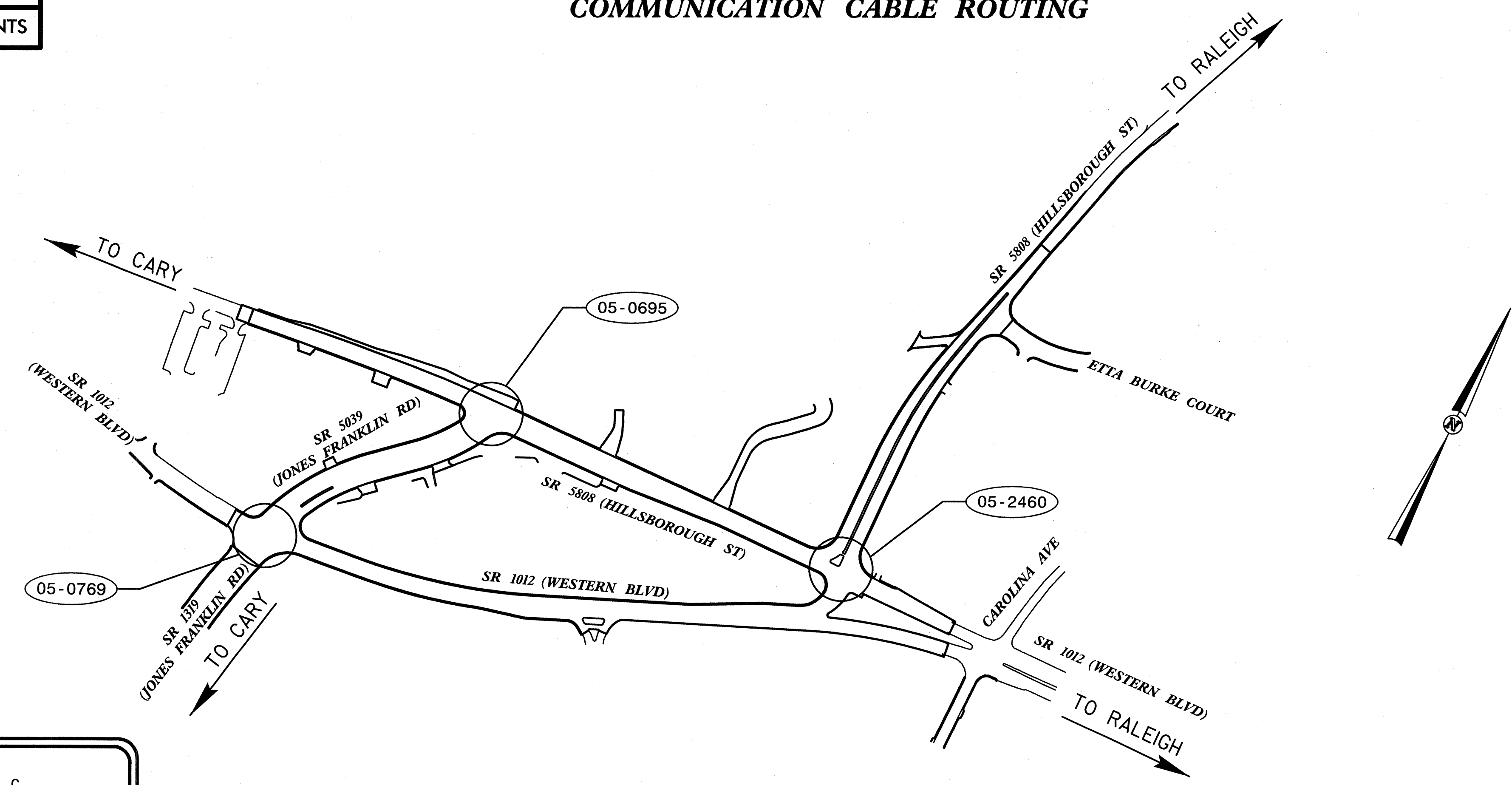
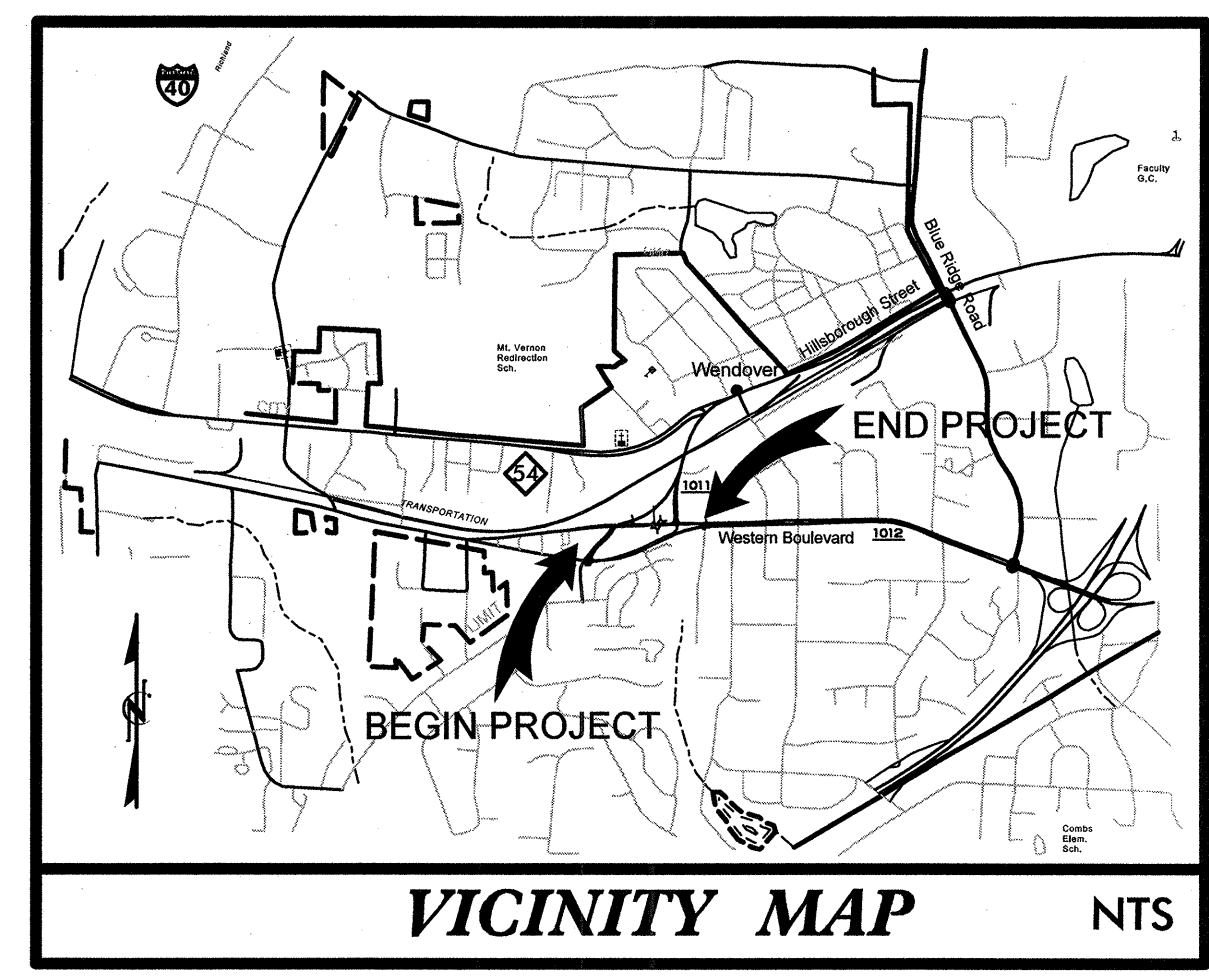
TIP Project: B-4656

CONTRACT: C202235

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

**LOCATION: REPLACE BRIDGE No. 492 OVER SR 1012 (WESTERN BLVD)
ON SR 1011 (HILLSBOROUGH ST) WITH AT-GRADE INTERSECTION**
**TYPE OF WORK: TRAFFIC SIGNALS AND FIBER OPTIC
COMMUNICATION CABLE ROUTING**



PLANS PREPARED BY:
HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

Charles Johnson, III, P.E. - Project Manager
Natasha M. Rodevick, P.E., PTOE - Project Engineer
Harvey L. Winstead, P.E. - Project Engineer
Andrew D. Klinskiak, E.I. - Design Engineer
Tracey R. Terrell - Design Technician

Sheet #	Reference #	Location/Description
Sig. 1	-----	Title Sheet
Sig. 2-8	05-0769	SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)
Sig. 9-15	05-0695	SR 5808 (Hillsborough St) at SR 5039 (Jones Franklin Rd)
Sig. 16-19	05-2460	SR 1012 (Western Blvd) at SR 5808 (Hillsborough St)
Sig. 20-25	-----	Metal Pole Standard Details
Sig. 26-30	-----	Communications Cable Routing
Sig. 31-33	-----	Fiber Optic Splice Details
Sig. 34	-----	Fiber Optic Jumper Connections

LEGEND
##-#### SIGNAL INVENTORY NUMBER

**INTELLIGENT TRANSPORTATION
AND SIGNALS UNIT**
Contacts:

Robert J. Ziembra, P.E. - Central Region Signals Project Engineer
George C. Brown, P.E. - Signal Equipment Design Engineer
I. Neil Avery - Signal Communications Project Engineer

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

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION

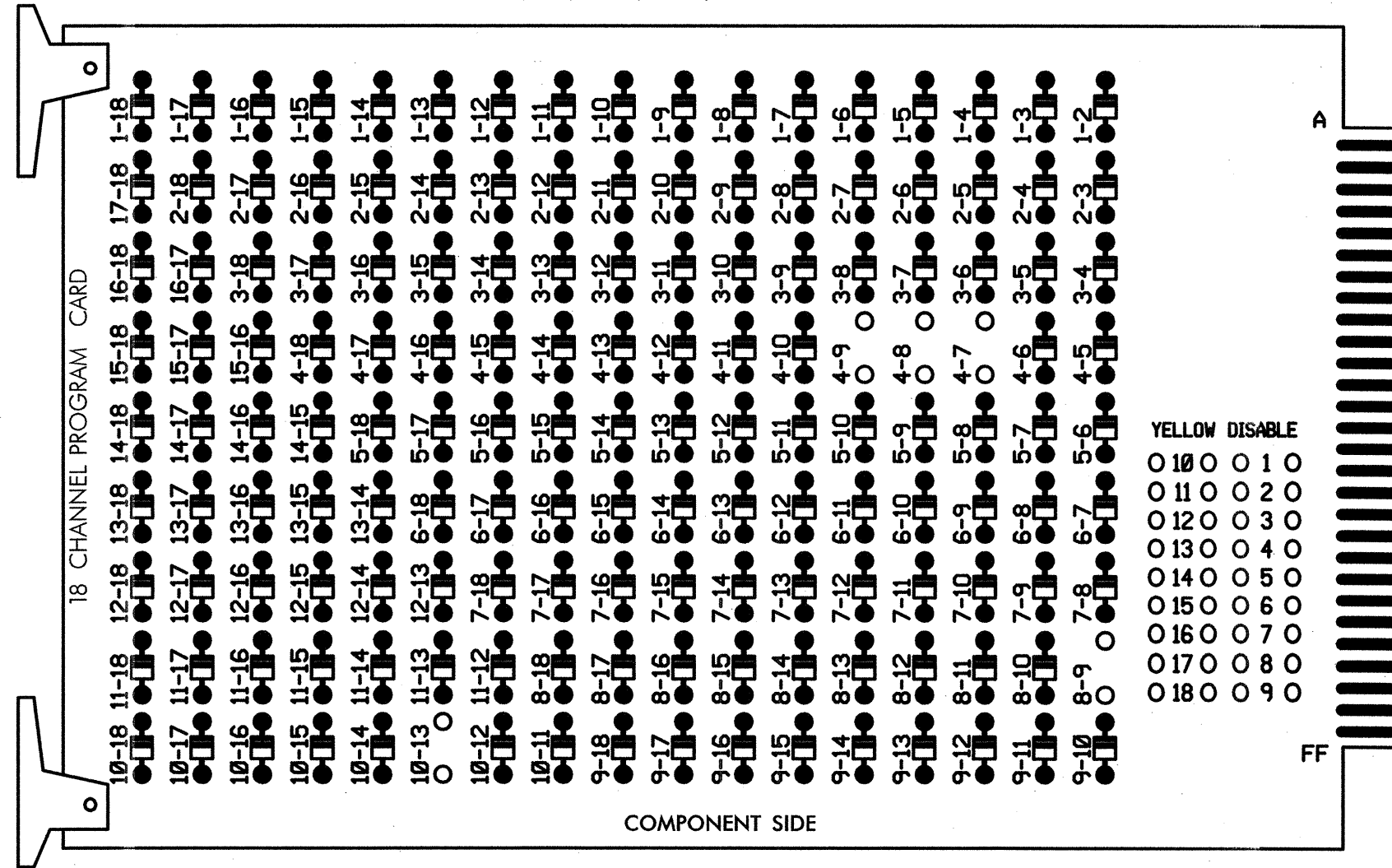
750 N. Greenfield Parkway, Garner, NC 27529

EDI MODEL 2018ECL-NC CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

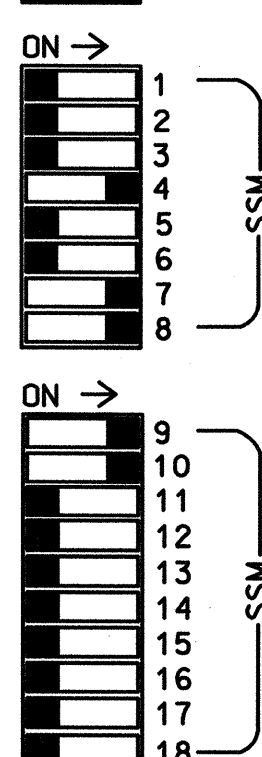
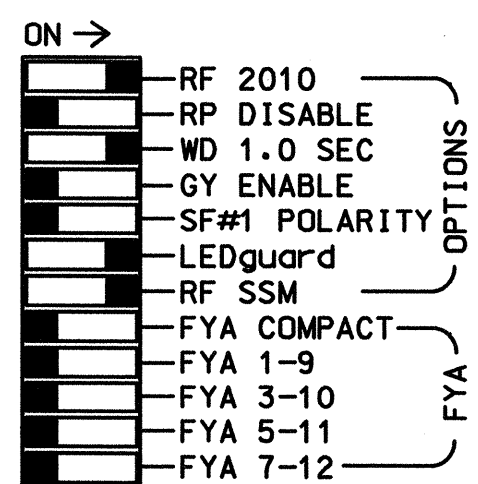
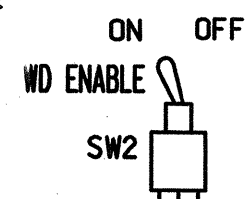
REMOVE DIODE JUMPERS 4-7, 4-8, 4-9, 8-9 AND 10-13.



REMOVE JUMPERS AS SHOWN

NOTES:

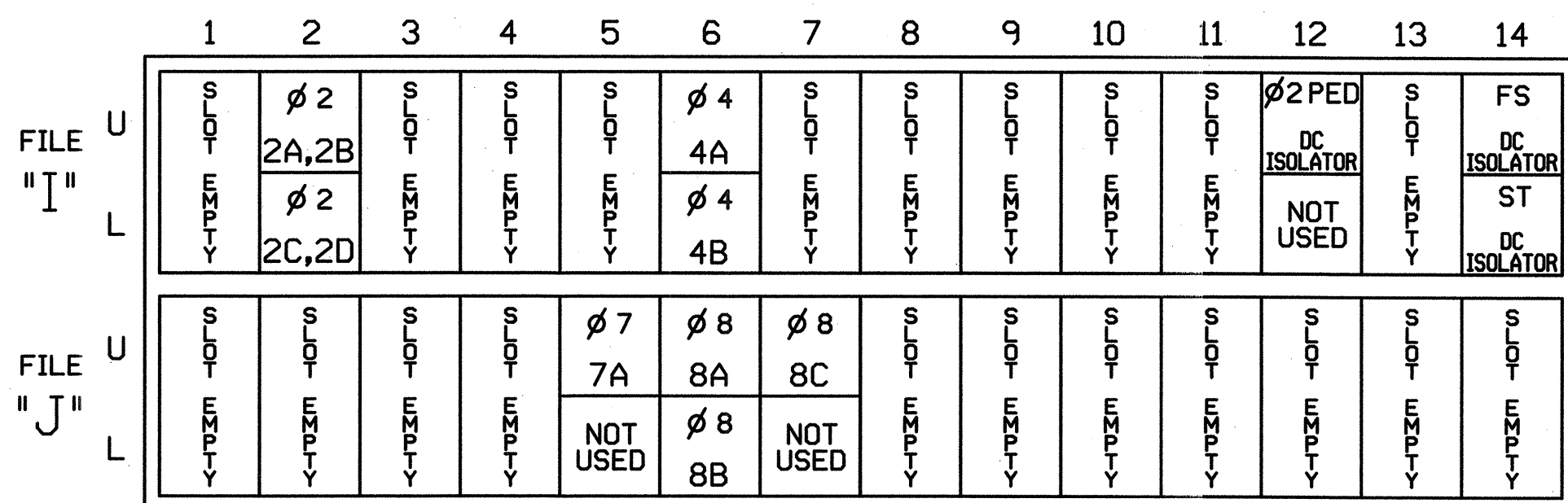
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor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



■ = DENOTES POSITION OF SWITCH

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 9 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phase 4, on controller unit, for dual entry.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

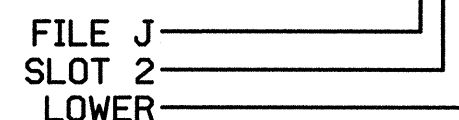
CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6 AUX)
 LOAD SWITCHES USED.....S3,S5,S10,S11,AUX S1,AUX S2
 PHASES USED.....2,2PED,4,7,8,9*
 OVERLAP A.....8
 OVERLAP B.....2+9
 *USED FOR TIMING PURPOSES ONLY

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A,2B	TB2-5,6	I2U	39	3	2		1.6
2C,2D	TB2-7,8	I2L	43	4	2		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4		
7A	TB5-5,6	J5U	57	29	7	3	
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8	15	
8C	TB7-1,2	J7U	66	33	8	15	
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NC	P21, P22	NU	41,42,43	NU	NU	NU	NU	71	83,84	NU	81,82	21,22	NU	NU	NU	NU
RED					101							107	A121	A124				
YELLOW					102								A122	A125				
GREEN					103								A123	A126				
RED ARROW											122							
YELLOW ARROW												123	108					
GREEN ARROW													124	109				
Hand icon																		
Person icon																		

NU = Not Used
 NC = Not connected (used for timing purposes only)

SE-PAC2070 CONTROLLER OVERLAP PROGRAMMING

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

SE-PAC UNIT DATA	PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES
2- REMOTE FLASH	7- PORT 1 DATA
3- OVERLAP STANDARD	8- I/O MISC
4- OVERLAP SPECIAL	9- SIG DRV OUT
5- RING STRUCTURE	F- PRIOR MENU

SE-PAC OVERLAP - A	(0-NO / 1-YES)
OVL PHASES:	00000010 0000000
PHS/CHN:	123456789 0123456789 01234
OVL CHN(S):	000000000 0001000000 00000
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU	

SE-PAC OVERLAP - B	(0-NO / 1-YES)
OVL PHASES:	010000001 0000000
PHS/CHN:	123456789 0123456789 01234
OVL CHN(S):	000000000 0000100000 00000
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU	

PRESS "F" TO RETURN TO UNIT DATA

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS

ENTER A 3 DIGIT ADDRESS & PRESS "E"
 ADDRESS: 001 - KEYPAD
 ADDRESS: 000 - T&F INPUTS
 WARNING...AN ADDRESS OTHER THAN "000"
 TRANSFERS I/O TO ITS SYSTEM DEFINITION
 F-PRIOR MENU

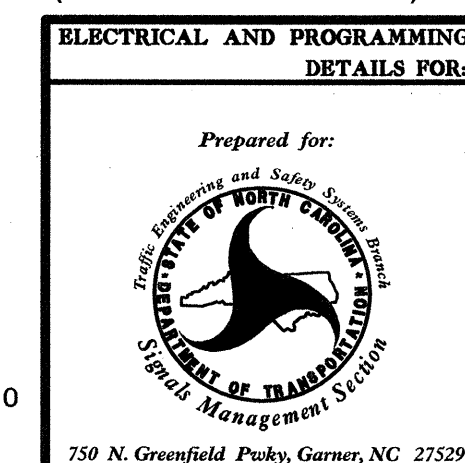
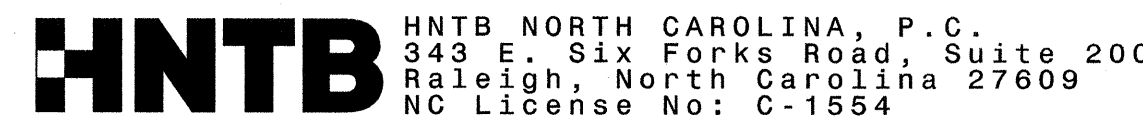
Modified Value

end of programming

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

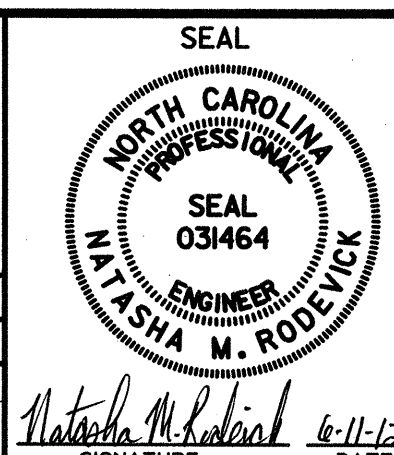
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0769T1
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:



SR 1012 (Western Blvd)
 at
 SR 1319 / SR 5039
 (Jones Franklin Rd)

PLANNING	DESIGN	CONSTRUCTION
PLANNING	DESIGN	CONSTRUCTION
PLANNING	DESIGN	CONSTRUCTION



Signal Upgrade - Temporary Design 1 (TMP Phase I, Step 3)
 (Sheet 1 of 2)

SE-PAC2070 CONTROLLER RING CONFIGURATION DETAIL

(program controller as shown below)

NOTE:
BEFORE PROGRAMMING CONTROLLER, BE SURE TO LOAD DEFAULT PARAMETERS.

SELECT (4) FROM MAIN MENU

SE-PAC UNIT DATA PRESS # DESIRED
 1- STARTUP & MISC 6- ALT SEQUENCES
 2- REMOTE FLASH 7- PORT 1 DATA
 3- OVERLAP STANDARD 8- I/O MISC
 4- OVERLAP SPECIAL 9- SIG DRV OUT
 5- RING STRUCTURE
 F- PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 3 RING: 1 NXT PHS: 4
 CONCUR PHS: 001000110 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 001000000 0000000000 00000
 PED CHN(S): 000000000 0000000010 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 6 RING: 2 NXT PHS: 7
 CONCUR PHS: 110001000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000001000 0000000000 00000
 PED CHN(S): 000000000 0100000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 1 RING: 1 NXT PHS: 2
 CONCUR PHS: 100011000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 100000000 0000000000 00000
 PED CHN(S): 000000000 0000000100 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 4 RING: 1 NXT PHS: 1
 CONCUR PHS: 000100110 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000100000 0000000000 00000
 PED CHN(S): 000000000 1000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 7 RING: 2 NXT PHS: 8
 CONCUR PHS: 001100100 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000100 0000000000 00000
 PED CHN(S): 000000000 0000000000 10000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 2 RING: 1 NXT PHS: 9
 CONCUR PHS: 010011000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 010000000 0000000000 00000
 PED CHN(S): 000000001 0000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

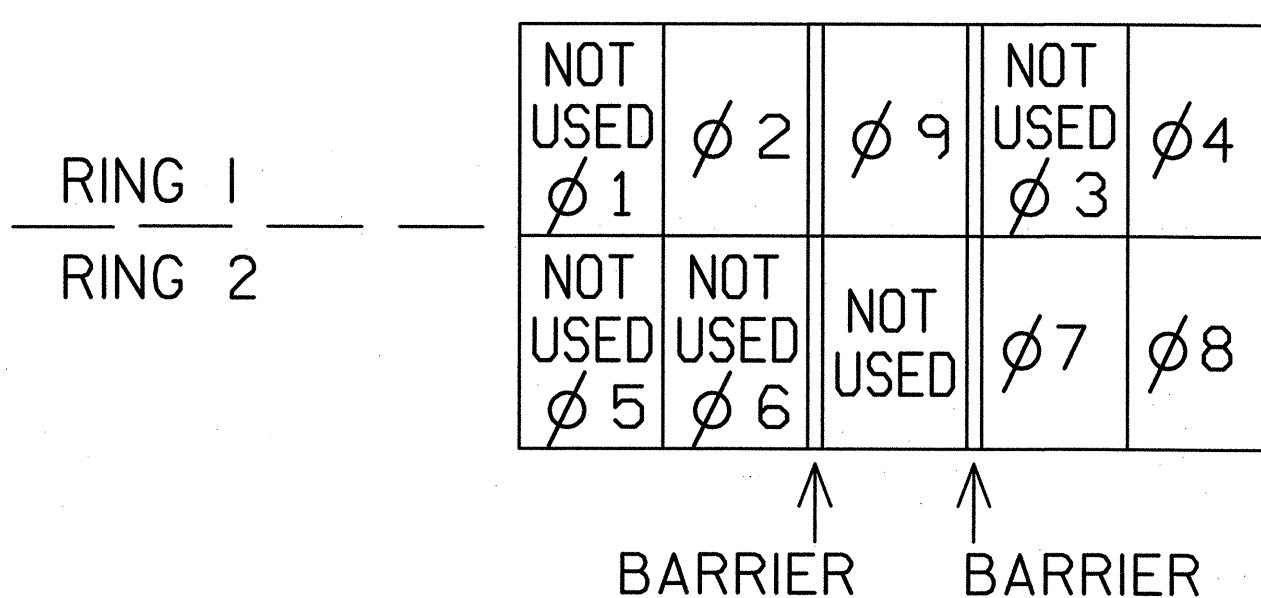
SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 5 RING: 2 NXT PHS: 6
 CONCUR PHS: 110010000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000010000 0000000000 00000
 PED CHN(S): 000000000 0000000001 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 8 RING: 2 NXT PHS: 5
 CONCUR PHS: 001100010 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000010 0000000000 00000
 PED CHN(S): 000000000 0010000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 9 RING: 1 NXT PHS: 3
 CONCUR PHS: 000000001 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000000 0000000000 00000
 PED CHN(S): 000000000 0000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

end of programming

RING CONFIGURATION
ADD PHASE 9



ADVANCED WALK PED PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

SE-PAC PHASE DATA PRESS # DESIRED
 1-VEHICLE TIMES 7-SPEC. SEQUENCE
 2-DENSITY TIMES 8-SPEC. DETECTOR
 3-PEDEST. TIMES 9-PHSE+BANK COPY
 4-INIT & N.A. RESP 0-MISC PED+VEH OPT
 5-V & P Recall Is A-SEL PHSE BANK
 6-N.LOCK & MISC
 F-PRIOR (1)

PHASE.....	1	2	3	4	5	6	7	8
WOFF/10	0	50	0	0	0	0	0	0
MODE	0	0	0	0	0	0	0	0
WOFF MODE:	0-ADVANCE WALK		1-DELAY WALK					
GDLY/10	0	0	0	0	0	0	0	0
YDLY/10	0	0	0	0	0	0	0	0
BGRN/10	0	0	0	0	0	0	0	0

A-UP B-DN C-LT D-RT E-ENTER F-PRIOR (1)

Advance Walk PED programming complete.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0769T1
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

Signal Upgrade - Temporary Design 1 (TMP Phase I, Step 3)
(Sheet 2 of 2)

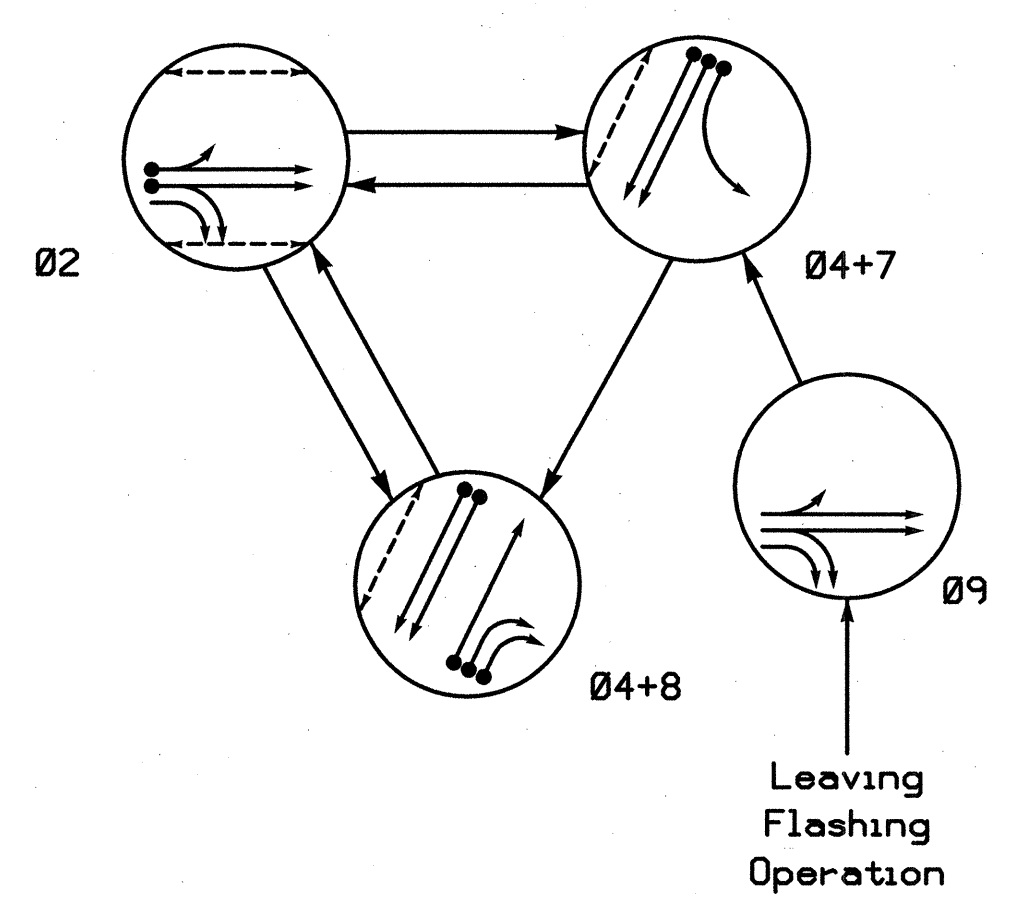
	Prepared for: 	SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)	SEAL
	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead PREPARED BY: A.D. Klinksiek REVIEWED BY: N.M. Rodevick	REVISIONS INIT. DATE

3 Phase Fully Actuated (Raleigh Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 7 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Program controller to allow an Advance Walk movement before serving the vehicle phase.
- Program controller to start up in Phase 9 green.
- Phase 9 shall only be used immediately after transitioning from flashing operation.

PHASING DIAGRAM

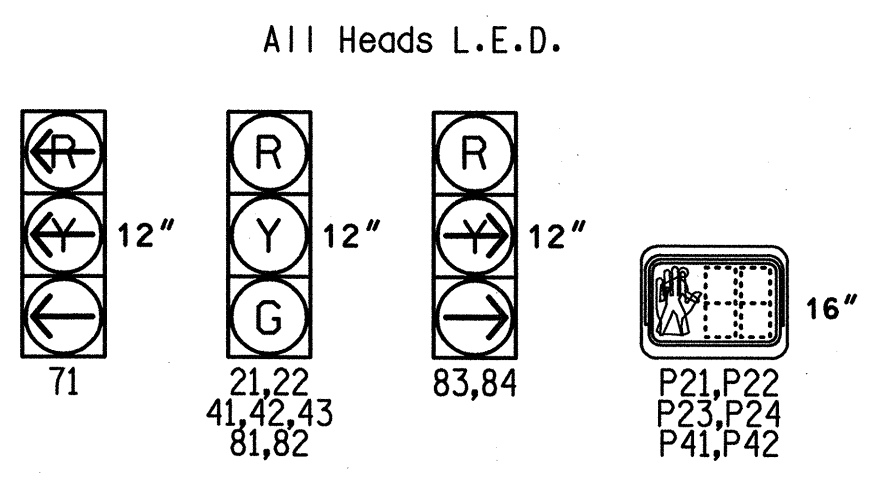


PHASING DIAGRAM DETECTION LEGEND
 ←●→ DETECTED MOVEMENT
 ←○→ UNDETECTED MOVEMENT (OVERLAP)
 - - - - - UNSIGNALIZED MOVEMENT
 ←- - - - - PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE				
	02	09	04+7	04+8	LEGEND
21,22	G	G	R	R	Y
41,42,43	R	R	G	G	R
71	R	R	R	R	R
81,82	R	R	R	G	R
83,84	R	R	R	-	R
P21,P22	W	DRK	DW	DW	DRK
P23,P24	W	DRK	DW	DW	DRK
P41,P42	DW	DRK	W	W	DRK

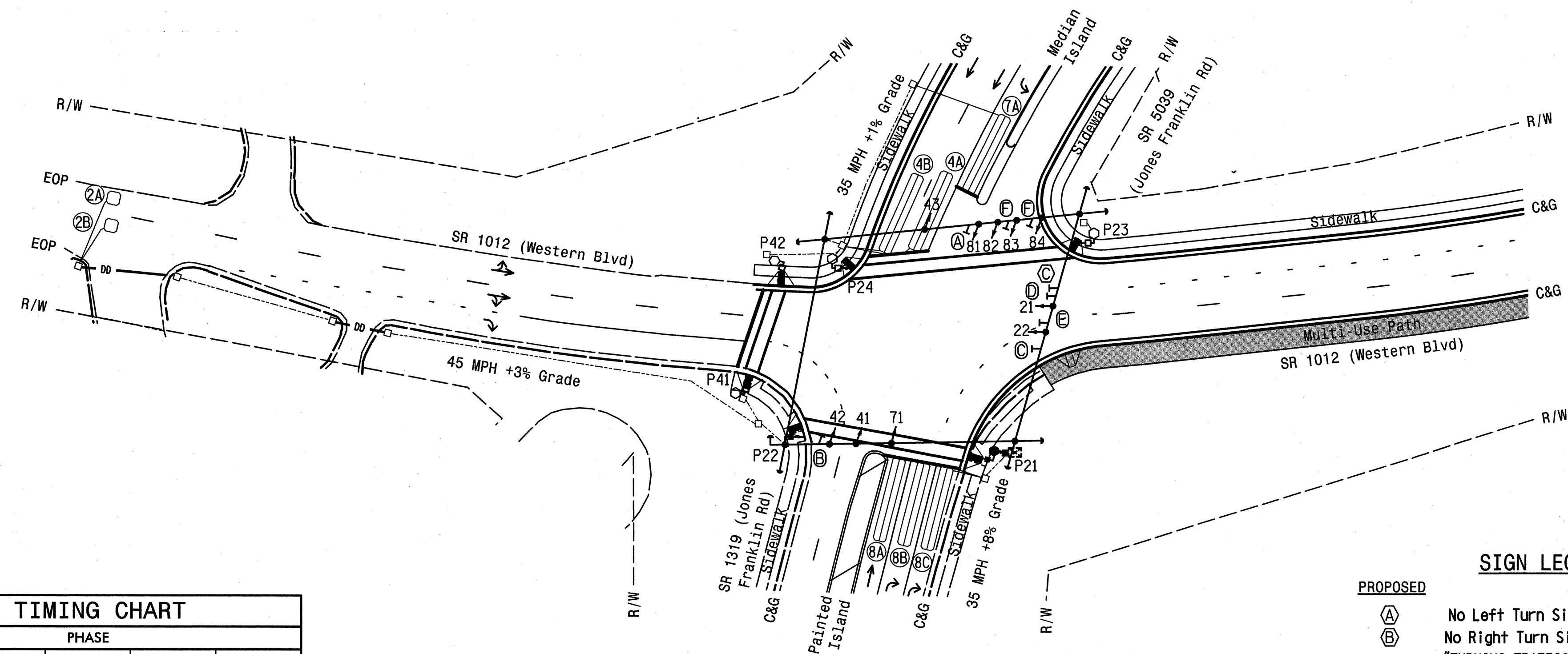
W - Walk
 DW - Don't Walk
 DRK - Dark

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW EXISTING	ASSIGNED PHASE	TIMING		DETECTOR PROGRAMMING							STATUS			
						DELAY	EXTEND (STRETCH)	OPERATION MODE							SYSTEM SWITCH	NEW EXISTING		
								VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROXIMITY	UPPER THROUGH			LOWER THROUGH	AND
2A	6X6	5	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
2B	6X6	5	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
4A	6X40	2-4-2	0	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
4B	6X40	2-4-2	0	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
7A	6X40	2-4-2	0	X	-	7	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
8A	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
8B	6X40	2-4-2	0	X	-	8	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X
8C	6X40	2-4-2	0	X	-	8	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X



SE-PAC 2070 TIMING CHART

FEATURE	PHASE				
	2	4	7	8	9
Min Green *	12	7	7	7	10
Passage Gap *	6.0	2.0	2.0	2.0	-
Maximum Green *	60	30	20	30	-
Yellow Change	4.3	3.8	3.0	3.4	4.3
Red Clear	1.9	1.7	1.8	1.9	1.9
Walk *	4	4	-	-	-
Pedestrian Clear	26	9	-	-	-
Advance Walk **	5.0	-	-	-	-
Added Initial *	1.5	-	-	-	-
Maximum Initial *	34	-	-	-	-
Time Before Reduction *	15	-	-	-	-
Time To Reduce *	30	-	-	-	-
Minimum Gap	3.0	-	-	-	-
Recall Mode	MIN RECALL	-	-	-	-
Vehicle Call Memory	LOCK	NON-LOCK	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	ON	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
 ** See Note 8.

SIGN LEGEND

PROPOSED	DESCRIPTION	EXISTING
(A)	No Left Turn Sign (R3-2)	(A)
(B)	No Right Turn Sign (R3-1)	(B)
(C)	"TURNING TRAFFIC MUST YIELD TO PEDESTRIANS" Sign (R10-15)	(C)
(D)	Combined Through and Left Arrow Sign (R3-6L)	(D)
(E)	Combined Through and Right Arrow Sign (R3-6R)	(E)
(F)	"RIGHT TURN SIGNAL" Sign (R10-10R)	(F)

LEGEND

PROPOSED	DESCRIPTION	EXISTING
○→	Traffic Signal Head	●→
○→	Modified Signal Head	N/A
⊥	Sign	⊥
⊥	Pedestrian Signal Head With Push Button & Sign	⊥
⊥	Signal Pole with Guy	⊥
⊥	Signal Pole with Sidewalk Guy	⊥
⊥	Inductive Loop Detector	⊥
⊥	Controller & Cabinet	⊥
⊥	Junction Box	⊥
⊥	2-in Underground Conduit	⊥
—	Directional Drill	—
N/A	Right of Way	---
→	Directional Arrow	→
○	Signal Pedestal	●
△	Wheelchair Ramp	△
●	Construction Zone Drums	N/A
■	Construction Zone Away from Traffic	N/A

Signal Upgrade - Temporary Design 2 (TMP Phase I, Step 5)

HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

SR 1012 (Western Blvd)
 at
 SR 1319 / SR 5039
 (Jones Franklin Rd)

Division 05 Wake County Raleigh
 PLAN DATE: April 2012 REVIEWED BY: A.D. Klinksiek
 PREPARED BY: T.R. Terrell REVIEWED BY: N.M. Rodevick

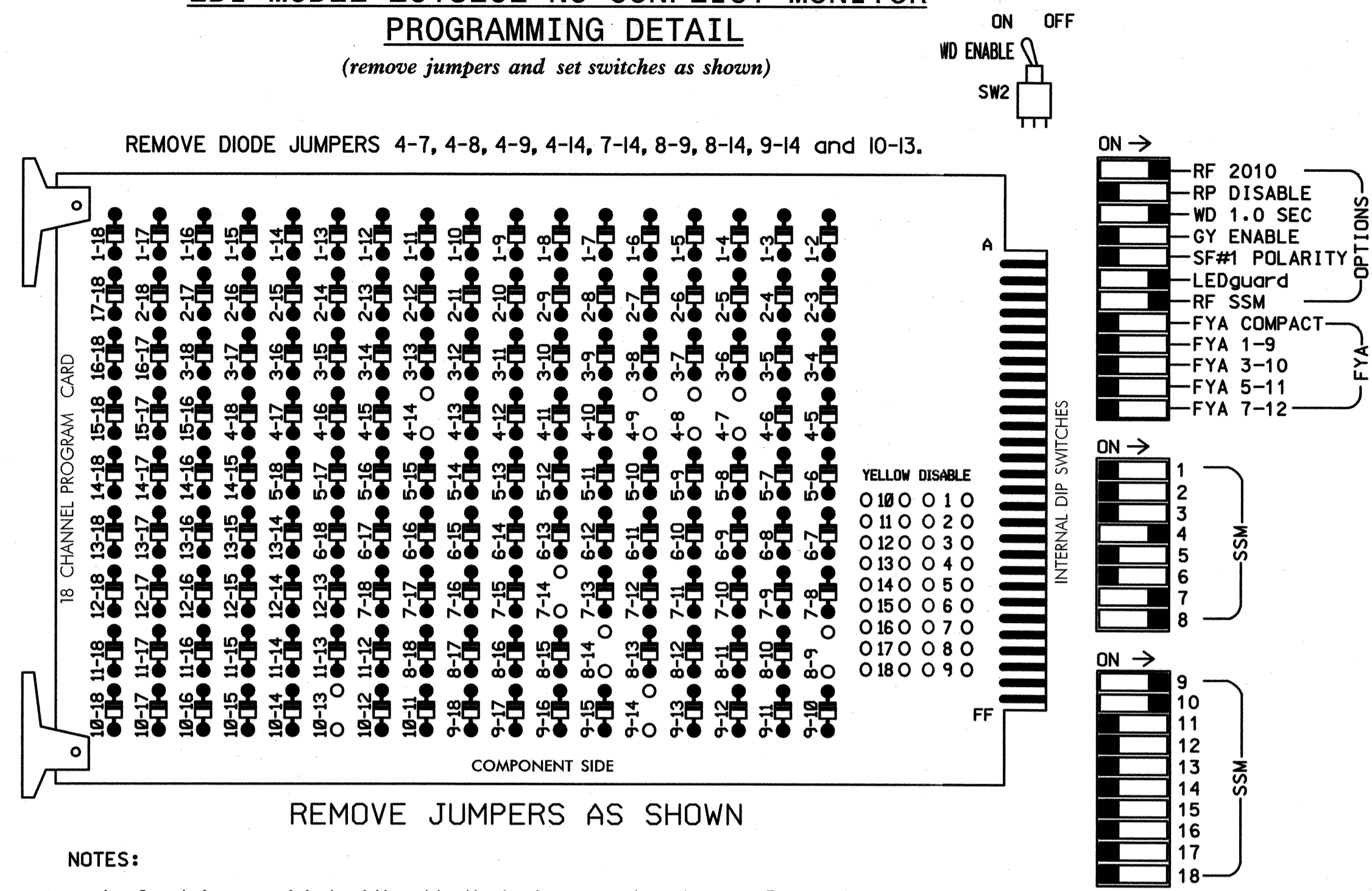
SEAL

 N. M. Rodevick
 ENGINEER
 DATE: 11/12
 SIGNATURE: [Signature]
 DATE: [Date]

SCALE 1"=40'
 REVISIONS: [Table with columns for REVISIONS, INIT., DATE]

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 4-7, 4-8, 4-9, 4-14, 7-14, 8-9, 8-14, 9-14 and 10-13.

REMOVE JUMPERS AS SHOWN

NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 9 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phase 4, on controller unit, for dual entry.
- Program phase 2, on controller unit, for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

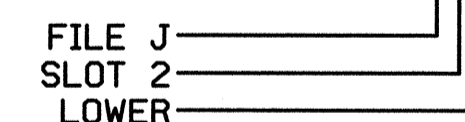
CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6 AUX)
 LOAD SWITCHES USED.....S3,S5,S6,S10,S11,AUX S1,AUX S2
 PHASES USED.....2,2PED,4,4PED,7,8,9*
 OVERLAP A.....8
 OVERLAP B.....2+9
 *USED FOR TIMING PURPOSES ONLY

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4		
7A	TB5-5,6	J5U	57	29	7		
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8	15	
8C	TB7-1,2	J7U	66	33	8	15	
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P23,P24	TB8-5,6	I12L	69	PED 4	4 PED		

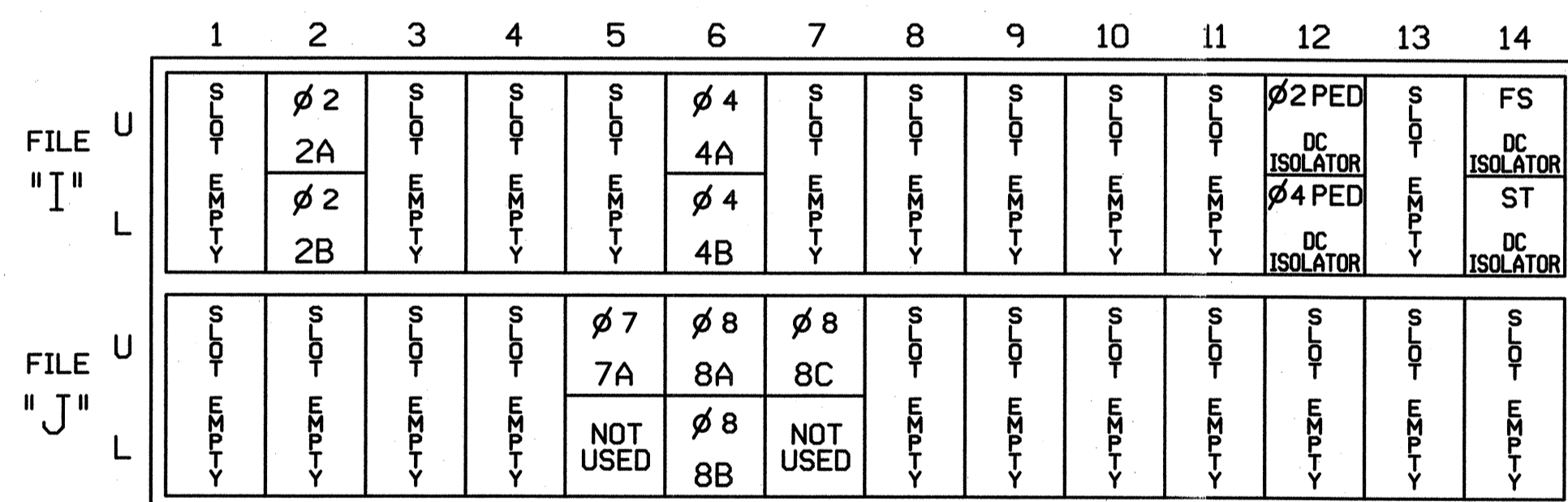
NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I12.

INPUT FILE POSITION LEGEND: J2L



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS

ENTER A 3 DIGIT ADDRESS & PRESS "E"
 ADDRESS: 001 - KEYPAD
 ADDRESS: 000 - T&F INPUTS
 WARNING...AN ADDRESS OTHER THAN "000"
 TRANSFERS I/O TO ITS SYSTEM DEFINITION
 F-PRIOR MENU

end of programming

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NC	P21,P22 P23,P24	NU	41,42, 43	P41, P42	NU	NU	NU	71	83,84	NU	81,82	21,22	NU	NU	NU	NU
RED					101						107		A121	A124				
YELLOW					102								A122	A125				
GREEN					103								A123	A126				
RED ARROW											122							
YELLOW ARROW												123	108					
GREEN ARROW													124	109				
Hand icon																		
Person icon																		

NU = Not Used
NC = Not connected (used for timing purposes only)

SE-PAC2070 CONTROLLER OVERLAP PROGRAMMING

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

SE-PAC UNIT DATA	PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES
2- REMOTE FLASH	7- PORT 1 DATA
3- OVERLAP STANDARD	8- I/O MISC
4- OVERLAP SPECIAL	9- SIG DRV OUT
5- RING STRUCTURE	F- PRIOR MENU

SE-PAC OVERLAP - A (0-NO / 1-YES)

OVL PHASES: 00000010 0000000
 PHS/CHN: 123456789 0123456789 01234
 OVL CHN(S): 000000000 0001000000 00000

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

SE-PAC OVERLAP - B (0-NO / 1-YES)

OVL PHASES: 010000001 0000000
 PHS/CHN: 123456789 0123456789 01234
 OVL CHN(S): 000000000 000010000 00000

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

PRESS "F" TO RETURN TO UNIT DATA

Signal Upgrade - Temporary Design 2 (TMP Phase I, Step 5)
(Sheet 1 of 2)

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0769T2
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

ELECTRICAL AND PROGRAMMING DETAILS FOR: SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)

Division 05 Wake County Raleigh

PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead

PREPARED BY: A.D. Klinksieck REVIEWED BY: N.M. Rodevick

REVISIONS: INIT. DATE

Signature: *N.M. Rodevick* DATE: 4/11/12

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 03464 M. W. RODEVICK

sig. INVENTORY NO. 05-0769T2

SE-PAC2070 CONTROLLER RING CONFIGURATION DETAIL

(program controller as shown below)

NOTE:
BEFORE PROGRAMMING CONTROLLER, BE SURE TO LOAD DEFAULT PARAMETERS.

SELECT 4 FROM MAIN MENU

SE-PAC UNIT DATA PRESS # DESIRED

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

F- PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 3 RING: 1 NXT PHS: 4

CONCUR PHS: 001000110 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 001000000 0000000000 00000

PED CHN(S): 000000000 0000000010 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 6 RING: 2 NXT PHS: 7

CONCUR PHS: 110001000 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 000001000 0000000000 00000

PED CHN(S): 000000000 0100000000 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 1 RING: 1 NXT PHS: 2

CONCUR PHS: 100011000 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 100000000 0000000000 00000

PED CHN(S): 000000000 0000000100 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 4 RING: 1 NXT PHS: 1

CONCUR PHS: 000100110 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 000100000 0000000000 00000

PED CHN(S): 000000000 1000000000 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 7 RING: 2 NXT PHS: 8

CONCUR PHS: 001100100 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 000000100 0000000000 00000

PED CHN(S): 000000000 0000000000 10000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 2 RING: 1 NXT PHS: 9

CONCUR PHS: 010011000 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 010000000 0000000000 00000

PED CHN(S): 000000001 0000000000 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 5 RING: 2 NXT PHS: 6

CONCUR PHS: 110010000 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 000010000 0000000000 00000

PED CHN(S): 000000000 0000000001 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 8 RING: 2 NXT PHS: 5

CONCUR PHS: 001100010 0000000

PHS/CHN: 123456789 0123456789 01234

VEH CHN(S): 000000010 0000000000 00000

PED CHN(S): 000000000 0010000000 00000

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

SE-PAC RING STRUCTURE (0-NO / 1-YES)

PHASE: 9 RING: 1 NXT PHS: 3

CONCUR PHS: 000000001 0000000

PHS/CHN: 123456789 0123456789 01234

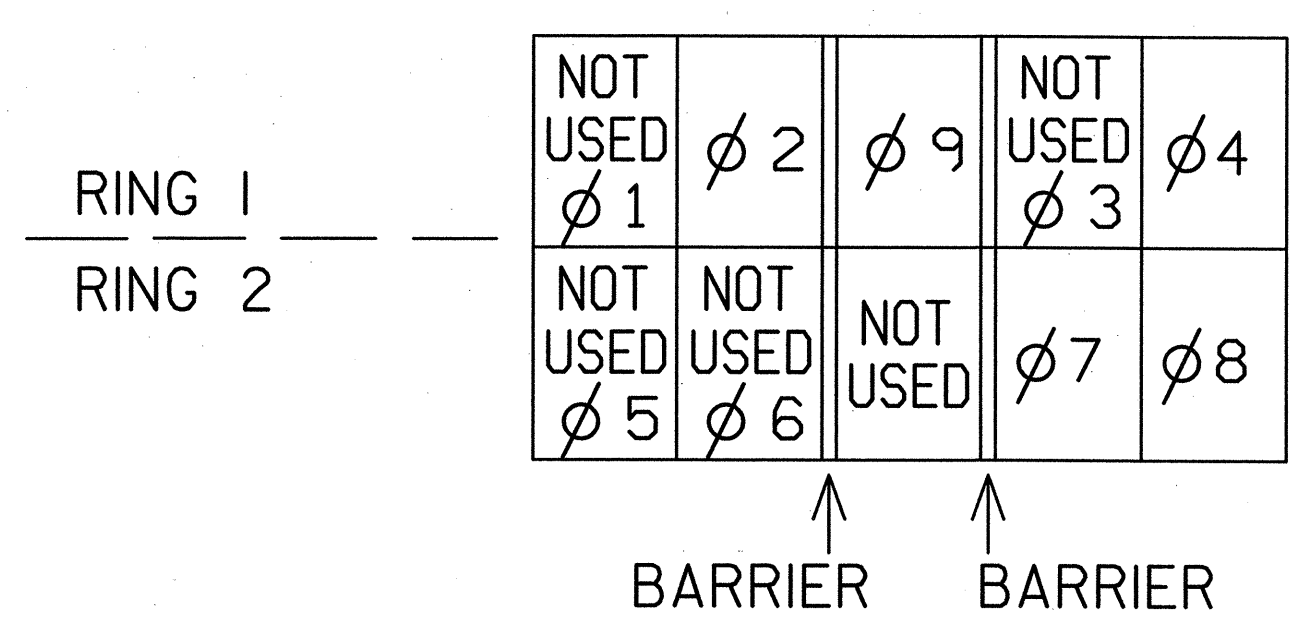
VEH CHN(S): 000000000 0000000000 00000

PED CHN(S): 000000000 0000000000 00000

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

end of programming

RING CONFIGURATION ADD PHASE 9



ADVANCED WALK PED PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

SE-PAC PHASE DATA PRESS # DESIRED

1-VEHICLE TIMES	7-SPEC. SEQUENCE
2-DENSITY TIMES	8-SPEC. DETECTOR
3-PEDEST. TIMES	9-PHSE+BANK COPY
4-INIT & N.A. RESP	0-MISC PED+VEH OPT
5-V & P Recalls	A-SEL PHSE BANK
6-N.LOCK & MISC	

F-PRIOR (1)

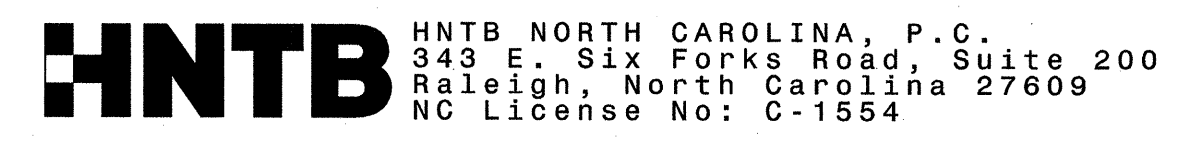
PHASE.....1...2...3...4...5...6...7...8							
WOFF/10	0	50	0	0	0	0	0
MODE	0	0	0	0	0	0	0
WOFF MODE: 0-ADVANCE WALK 1-DELAY WALK							
GDLY/10	0	0	0	0	0	0	0
YDLY/10	0	0	0	0	0	0	0
BGRN/10	0	0	0	0	0	0	0

A-UP B-DN C-LT D-RT E-ENTER F-PRIOR (1)

Advance Walk PED programming complete.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-0769T2
DESIGNED: April 2012
SEALED: 06-11-12
REVISED:

Signal Upgrade - Temporary Design 2 (TMP Phase I, Step 5)
(Sheet 2 of 2)



	Prepared for: 	SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)	SEAL
	Electrical and Programming Details For:	Wake County Division 05 PLAN DATE: April 2012 PREPARED BY: A.D. Klinksiek REVISIONS:	Raleigh REVIEWED BY: H.L. Winstead REVIEWED BY: N.M. Rodvick INIT. DATE:

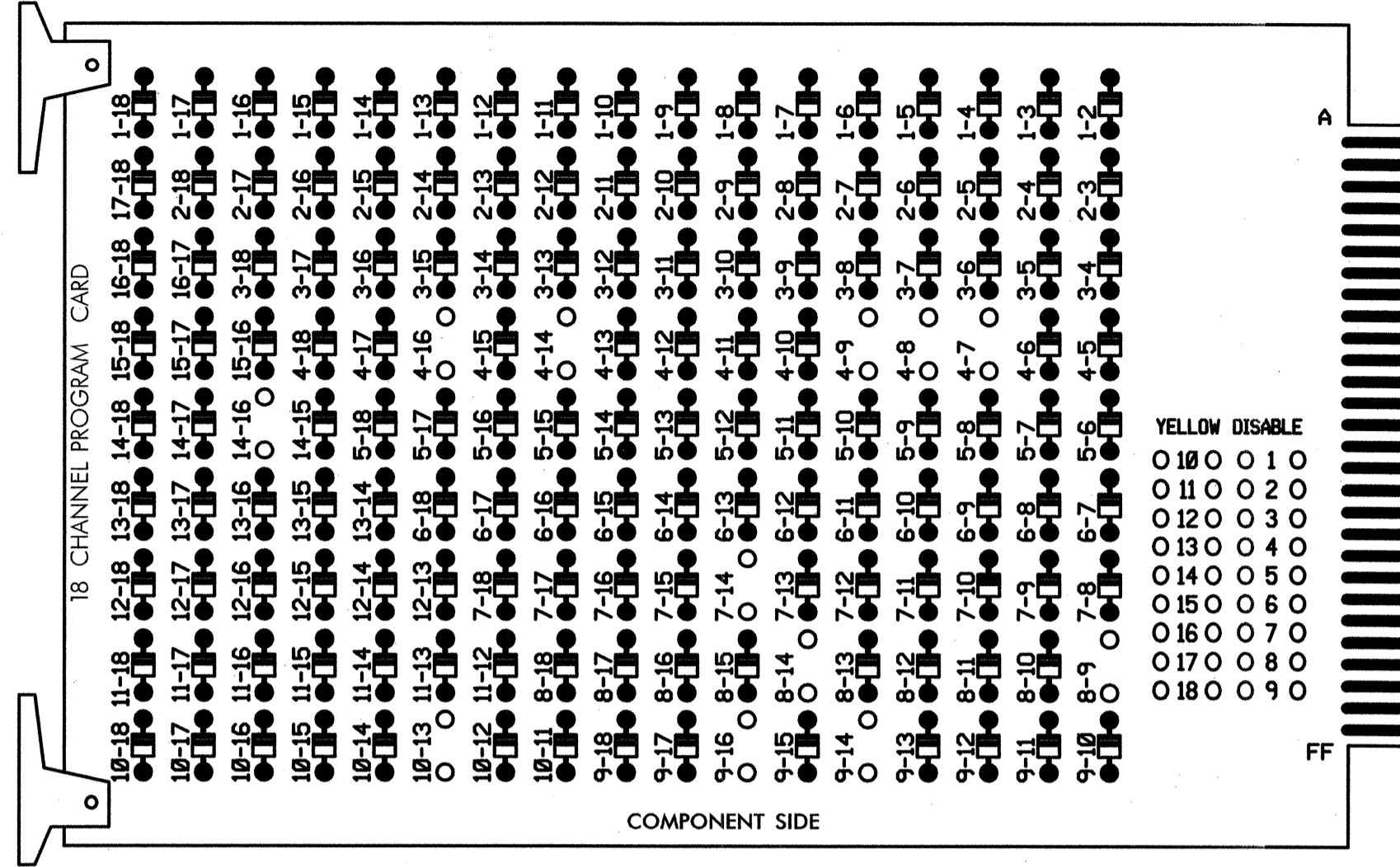
750 N. Greenfield Parkway, Garner, NC 27529

Signature: *Natasha M. Rodvick* 6-11-12
DATE: 6-11-12
SIG. INVENTORY NO. 05-0769T2

EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 4-7, 4-8, 4-9, 4-14, 4-16, 7-14, 8-9, 8-14, 9-14, 9-16, 10-13, and 14-16.



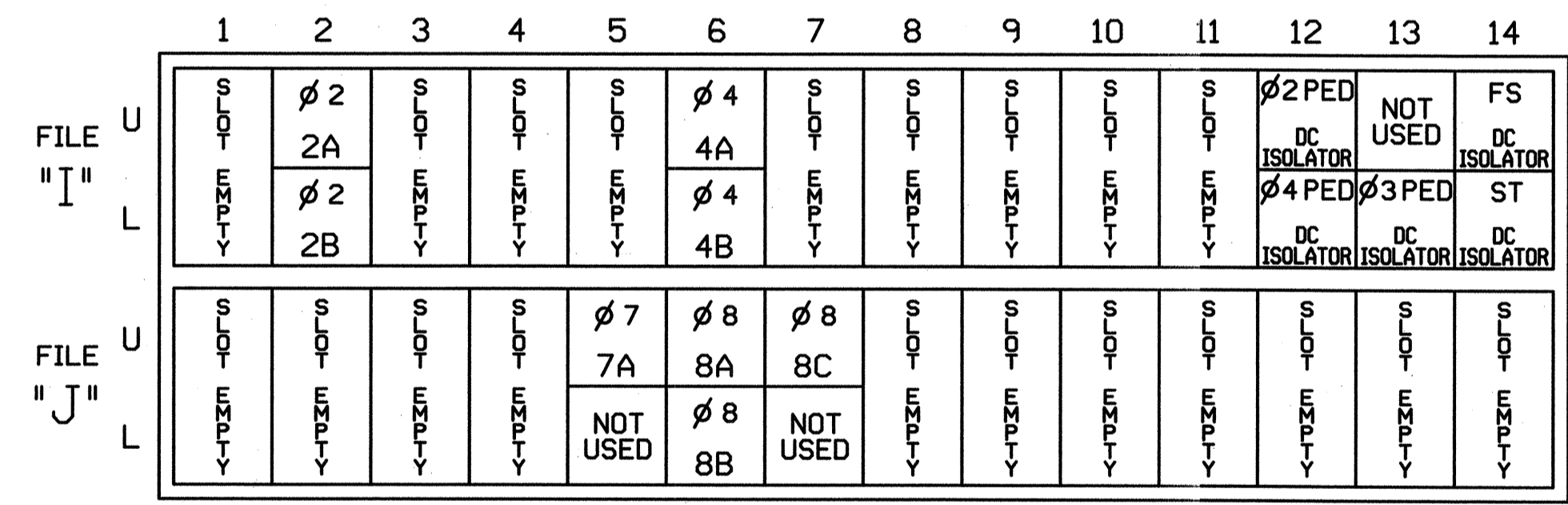
REMOVE JUMPERS AS SHOWN

NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 9 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phase 4, on controller unit, for dual entry.
- Program phase 2, on controller unit, for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

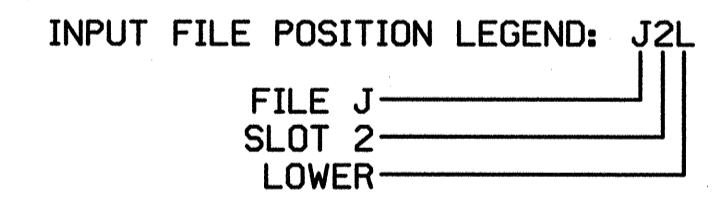
EQUIPMENT INFORMATION

CONTROLLER.....SIEMENS 2070L
CABINET.....332
SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6 AUX)
LOAD SWITCHES USED.....S3,S5,S6,S10,S11,S12,AUX S1,AUX S2
PHASES USED.....2,2PED,3*,3PED,4,4PED,7,8,9*
OVERLAP A.....3+8
OVERLAP B.....2+9
* USED FOR TIMING PURPOSES ONLY

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
4A	TB4-9,10	I6U	41	11	4		
4B	TB4-11,12	I6L	45	12	4		
7A	TB5-5,6	J6U	57	29	7		
8A	TB5-9,10	J6U	42	31	8		
8B	TB5-11,12	J6L	46	32	8	15	
8C	TB7-1,2	J7U	66	33	8	15	
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P23,P24	TB8-5,6	I12L	69	PED 4	4 PED		
P31,P32	TB8-8,9	I13L	70	PED 8	3 PED		

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



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	3 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	NC	P21,P22 P23,P24	NC	41,42, 43	P41, P42	NU	NU	NU	71	83,84	P31, P32	81,82	21,22	NU	NU	NU	NU
RED					101						107		A121	A124				
YELLOW					102								A122	A125				
GREEN					103								A123	A126				
RED ARROW											122							
YELLOW ARROW												123	108					
GREEN ARROW													124	109				
Hand icon															110			
Foot icon																		112

NU = Not Used
NC = Not connected (used for timing purposes only)

SE-PAC2070 CONTROLLER OVERLAP PROGRAMMING

(program controller as shown below)

FROM MAIN MENU PRESS 4 (UNIT DATA)

SE-PAC UNIT DATA	PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES
2- REMOTE FLASH	7- PORT 1 DATA
3- OVERLAP STANDARD	8- I/O MISC
4- OVERLAP SPECIAL	9- SIG DRV OUT
5- RING STRUCTURE	F- PRIOR MENU

SE-PAC OVERLAP - A (0-NO / 1-YES)

OVL PHASES: 001000010 0000000
PHS/CHN: 123456789 0123456789 01234
OVL CHN(S): 000000000 0001000000 00000

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

SE-PAC OVERLAP - B (0-NO / 1-YES)

OVL PHASES: 010000001 0000000
PHS/CHN: 123456789 0123456789 01234
OVL CHN(S): 000000000 0000100000 00000

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

PRESS "F" TO RETURN TO UNIT DATA

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS

ENTER A 3 DIGIT ADDRESS & PRESS "E"
ADDRESS: 001 - KEYPAD
ADDRESS: 000 - T&F INPUTS
WARNING...AN ADDRESS OTHER THAN "000"
TRANSFERS I/O TO ITS SYSTEM DEFINITION
F-PRIOR MENU

end of programming

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0769
DESIGNED: April 2012
SEALED: 06-11-12
REVISED:

Signal Upgrade - Final Design (Sheet 1 of 2)

	SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)	
	Division 05 PLAN DATE: April 2012 PREPARED BY: A.D. Klinksiek	Wake County REVIEWED BY: H.L. Winstead REVIEWED BY: N.M. Rodevick
REVISIONS INIT. DATE	REVISIONS INIT. DATE	SIGNATURE: <i>Natasha M. Rodevick</i> DATE: 12-11-12 SIG. INVENTORY NO. 05-0769

SE-PAC2070 CONTROLLER RING CONFIGURATION DETAIL

(program controller as shown below)

NOTE:
BEFORE PROGRAMMING CONTROLLER, BE SURE TO LOAD DEFAULT PARAMETERS.

SELECT (4) FROM MAIN MENU

SE-PAC UNIT DATA PRESS # DESIRED
 1- STARTUP & MISC 6- ALT SEQUENCES
 2- REMOTE FLASH 7- PORT 1 DATA
 3- OVERLAP STANDARD 8- I/O MISC
 4- OVERLAP SPECIAL 9- SIG DRV OUT
 5- RING STRUCTURE F- PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 3 RING: 2 NXT PHS: 8
 CONCUR PHS: 001100000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 001000000 0000000000 00000
 PED CHN(S): 000000000 0000000010 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 6 RING: 2 NXT PHS: 7
 CONCUR PHS: 110001000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000001000 0000000000 00000
 PED CHN(S): 000000000 0100000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 1 RING: 1 NXT PHS: 2
 CONCUR PHS: 100011000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 100000000 0000000000 00000
 PED CHN(S): 000000000 0000000100 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 4 RING: 1 NXT PHS: 1
 CONCUR PHS: 001100110 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000100000 0000000000 00000
 PED CHN(S): 000000000 1000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 7 RING: 2 NXT PHS: 3
 CONCUR PHS: 000100100 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000100 0000000000 00000
 PED CHN(S): 000000000 0000000000 10000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 2 RING: 1 NXT PHS: 9
 CONCUR PHS: 010011000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 010000000 0000000000 00000
 PED CHN(S): 000000001 0000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 5 RING: 2 NXT PHS: 6
 CONCUR PHS: 110010000 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000010000 0000000000 00000
 PED CHN(S): 000000000 0000000001 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

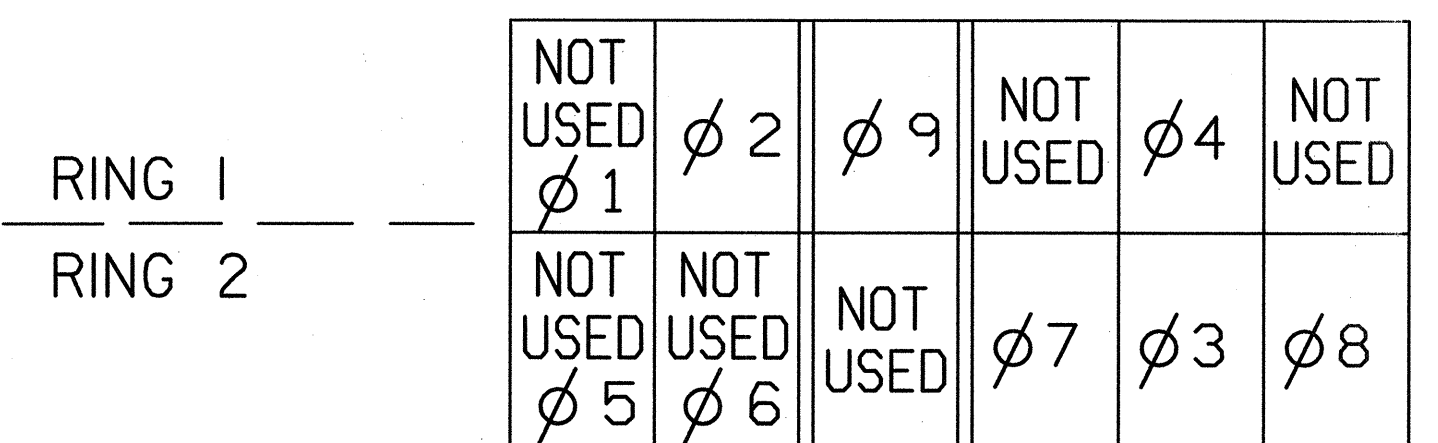
SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 8 RING: 2 NXT PHS: 5
 CONCUR PHS: 000100010 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000010 0000000000 00000
 PED CHN(S): 000000000 0010000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

SE-PAC RING STRUCTURE (0-NO / 1-YES)
 PHASE: 9 RING: 1 NXT PHS: 4
 CONCUR PHS: 000000001 0000000
 PHS/CHN: 123456789 0123456789 01234
 VEH CHN(S): 000000000 0000000000 00000
 PED CHN(S): 000000000 0000000000 00000
 A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU

end of programming

RING CONFIGURATION PHASE 3 MOVED & ADD PHASE 9

(PHASES 3 AND 7 & 8 INCOMPATIBLE)



BARRIER BARRIER

CONTROLLER PED DETECTOR ASSIGNMENT PROGRAMMING

(program controller as shown below)

From the Main Menu press '3' (Phase Data), then from Phase Menu press '8' (Spec.Detector), then from Detector Control Data Menu press '9' (Ped 1-8):

PED DET CONTROL .1..2..3..4..5..6..7..8
 ASSIGNED PHASE 1 2 0 4 0 6 0 3
 OPERATION MODE 1 1 1 0 1 0 1 0
 SWITCHED PHASE 0 0 0 0 0 0 0 0
 MODE: 0-VEH 1-PED 2-ONE 3-SBA
 4-SBB 5-PPL 6-PPT 7-AND
 SWITCHED: TO PH # (AP=Y/R & SP=GRN)
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

Press "F" to return to Detector Control Data

ADVANCED WALK PED PROTECTION PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu, press '3' (Phase Data)

SE-PAC PHASE DATA PRESS # DESIRED
 1-VEHICLE TIMES 7-SPEC. SEQUENCE
 2-DENSITY TIMES 8-SPEC. DETECTOR
 3-PEDEST. TIMES 9-PHSE+BANK COPY
 4-INIT & N.A. RESP 0-MISC PED+VEH OPT
 5-V & P Recalls A-SEL PHSE BANK
 6-N.LOCK & MISC F-PRIOR (1)

PHASE.....1...2...3...4...5...6...7...8
 WOFF/10 0 50 0 0 0 0 0 0
 MODE 0 0 0 0 0 0 0 0
 WOFF MODE: 0-ADVANCE WALK 1-DELAY WALK
 GDLY/10 0 0 0 0 0 0 0 0
 YDLY/10 0 0 0 0 0 0 0 0
 BGRN/10 0 0 0 0 0 0 0 0
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR (1)

Advance Walk PED programming complete.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0769
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

SIGNAL DRIVER OUTPUT PROGRAMMING DRIVER FOR PHASE 3 PED

(program controller as shown below)

From Main Menu press 4 (Unit Data)

SE-PAC UNIT DATA PRESS # DESIRED
 1- STARTUP & MISC 6- ALT SEQUENCES
 2- REMOTE FLASH 7- PORT 1/ITS DATA
 3- OVERLAP STANDARD 8- I/O MISC
 4- OVERLAP SPECIAL 9- SIG DRV OUT
 5- RING STRUCTURE A- 224E STATUS
 F- PRIOR MENU

SE-PAC SIGNAL DRIVER OUTPUTS
 SIG DRV GRP CHN HDWE OUTPUT PIN.. SET
 Ph 1 Vehicle..1 Ph 1 Red/Yel/Grn... 1
 Ph 2 Vehicle..2 Ph 2 Red/Yel/Grn... 2
 Scroll Down to Ph 8 Pedest
 Ph 8 Pedest..12 Ph 8 DW/PC/WK..... 16
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

← Default Value

SE-PAC SIGNAL DRIVER OUTPUTS
 SIG DRV GRP CHN HDWE OUTPUT PIN.. SET
 Ph 1 Vehicle..1 Ph 1 Red/Yel/Grn... 1
 Ph 2 Vehicle..2 Ph 2 Red/Yel/Grn... 2
 Scroll Down to Ph 3 Pedest
 Ph 3 Pedest..18 Ph 3 DW/PC/WK..... 11
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

← Default Value

For "Ph 3 Pedest" change "HDWE OUTPUT PIN SET"
 FROM: 11
 TO: 16

This will reassign loadswitch 12 to Ph 3 Pedest
 Display will now echo
 HDWE OUTPUT PIN SET "Ph 8"

Ph 3 Pedest..18 Ph 8 DW/PC/WK..... 16
 A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

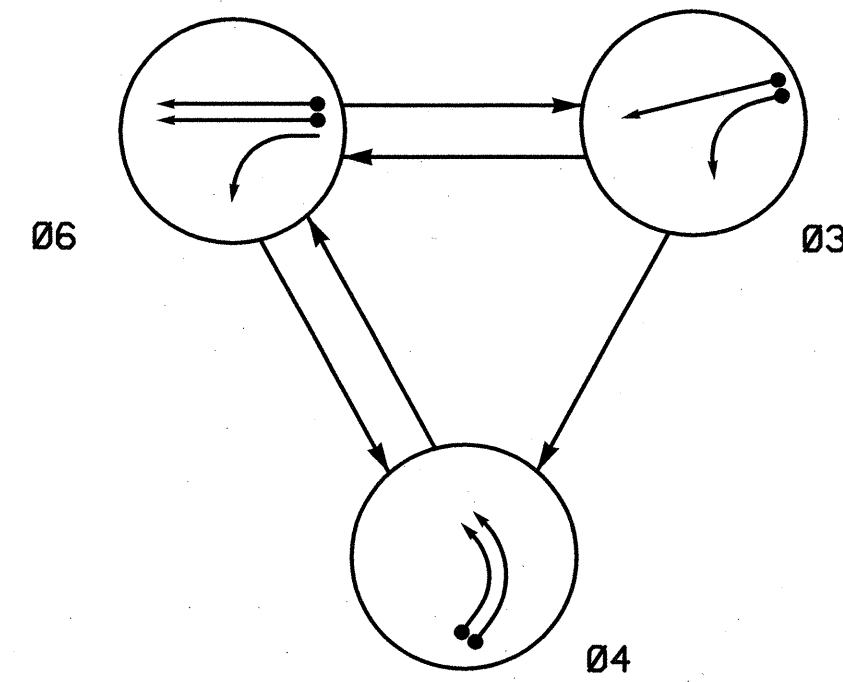
← Modified Value

Press "F" to return to Unit Data

Signal Upgrade - Final Design (Sheet 2 of 2)

	SR 1012 (Western Blvd) at SR 1319 / SR 5039 (Jones Franklin Rd)
	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead PREPARED BY: A.D. Klinksiek REVIEWED BY: N.M. Rodewick
REVISIONS INIT. DATE	SIGNATURE: <i>N. M. Rodewick</i> DATE: 6/11/12 SIG. INVENTORY NO. 05-0769

PHASING DIAGRAM

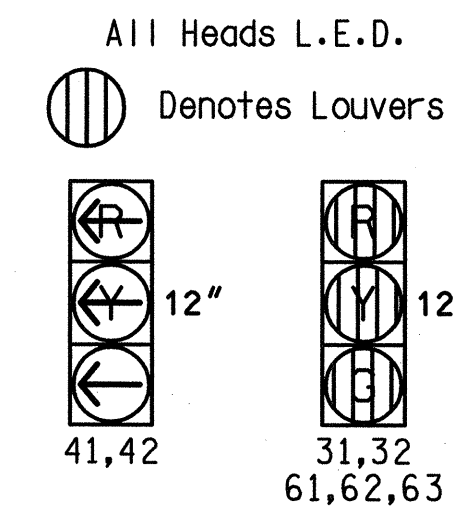


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE			
	06	03	04	FL/CE
31,32	R	G	R	R
41,42	-R	-R	-	-R
61,62,63	G	R	R	Y

SIGNAL FACE I.D.



SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

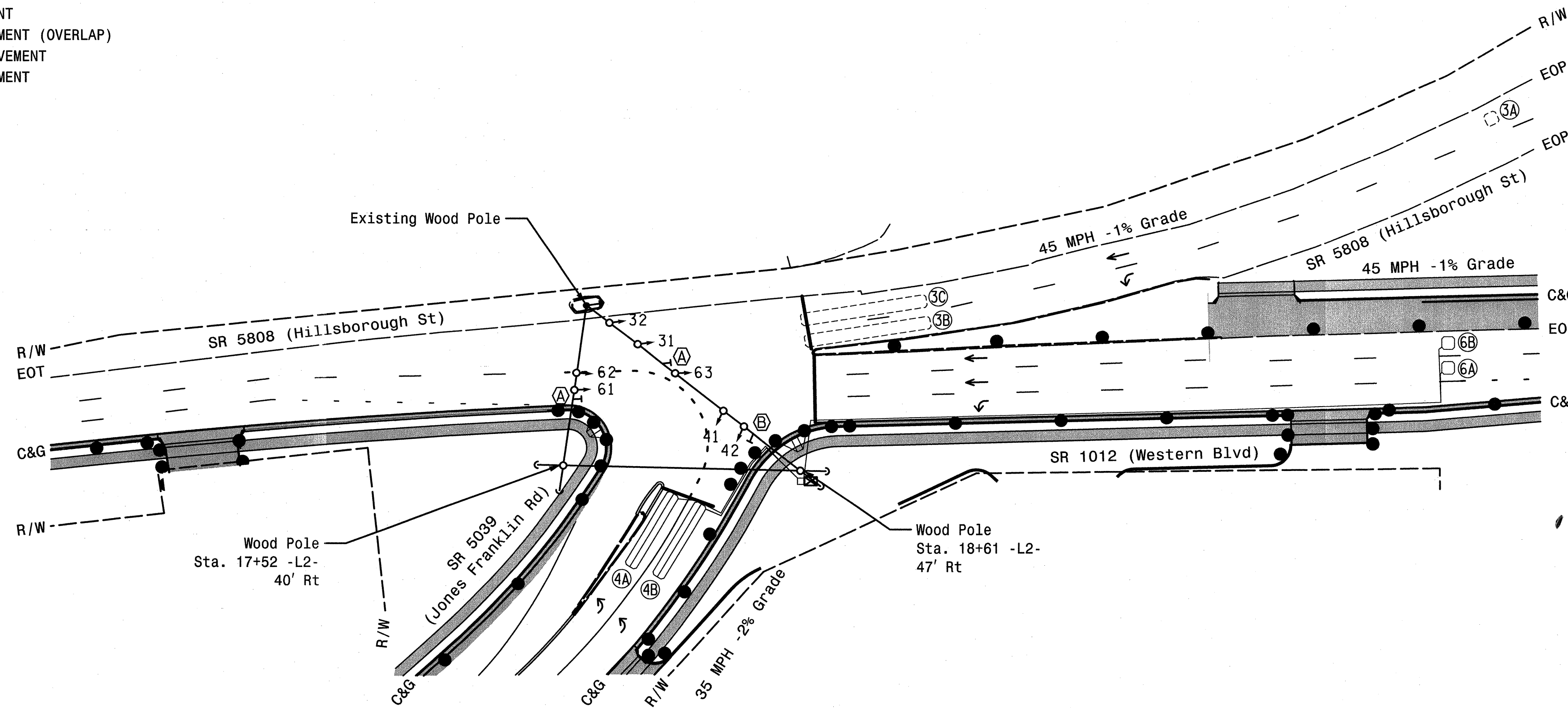
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	TIMING		DETECTOR PROGRAMMING							STATUS			
							DELAY	EXTEND (STRETCH)	OPERATION MODE								SWITCH	SYSTEM LOOPS	
									VEHICLE	PEDESTRIAN	1 CALL	STOP A	STOP B	PROT/FREE LEFT	PROT/FREE THROUGH				AND
3A	6X60	EXIST	*	-	X	3	100 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
3B,3C	6X60	EXIST	*	-	X	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	0	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
4B	6X40	2-4-2	0	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
6A	6X6	4	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
6B	6X6	4	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-

*Unable to field verify.

3 Phase Fully Actuated (Raleigh Signal System)

NOTES

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



LEGEND

- | PROPOSED | EXISTING |
|---------------------------------------------------------|--------------|
| (Symbol) Traffic Signal Head | (Symbol) N/A |
| (Symbol) Modified Signal Head | (Symbol) N/A |
| (Symbol) Sign | (Symbol) N/A |
| (Symbol) Pedestrian Signal Head With Push Button & Sign | (Symbol) N/A |
| (Symbol) Signal Pole with Guy | (Symbol) N/A |
| (Symbol) Signal Pole with Sidewalk Guy | (Symbol) N/A |
| (Symbol) Inductive Loop Detector | (Symbol) N/A |
| (Symbol) Controller & Cabinet | (Symbol) N/A |
| (Symbol) Junction Box | (Symbol) N/A |
| (Symbol) 2-in Underground Conduit | (Symbol) N/A |
| (Symbol) Right of Way | (Symbol) N/A |
| (Symbol) Directional Arrow | (Symbol) N/A |
| (Symbol) Wheelchair Ramp | (Symbol) N/A |
| (Symbol) Left Arrow "ONLY" Sign (R3-5L) | (Symbol) N/A |
| (Symbol) No Right Turn Sign (R3-1) | (Symbol) N/A |
| (Symbol) Construction Zone Drums | (Symbol) N/A |
| (Symbol) Construction Zone | (Symbol) N/A |
| (Symbol) Construction Zone Away from Traffic | (Symbol) N/A |
| (Symbol) Pavement Removal | (Symbol) N/A |

FEATURE	PHASE			
	2	3	4	6
Min Green *	12	7	7	12
Passage Gap *	6.0	1.0	2.0	6.0
Maximum Green *	60	30	30	60
Yellow Change	4.6	4.6	3.0	4.6
Red Clear	1.6	1.5	2.8	1.6
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	-	-	-	1.5
Maximum Initial *	-	-	-	34
Time Before Reduction *	-	-	-	15
Time To Reduce *	-	-	-	30
Minimum Gap	-	-	-	3.0
Recall Mode	-	-	-	MIN RECALL
Vehicle Call Memory	-	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

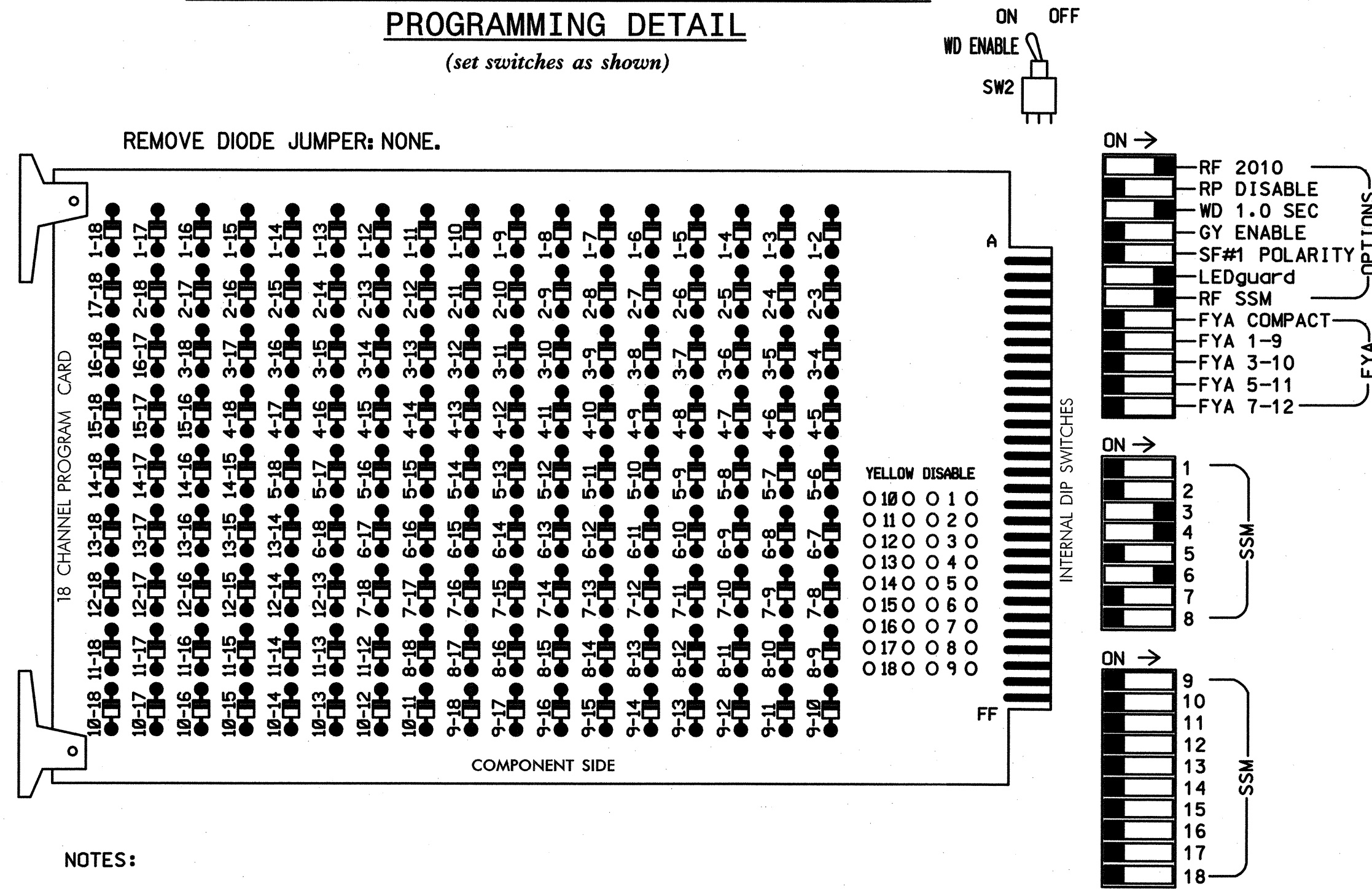
* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

Signal Upgrade - Temporary Design 1 (TMP Phase I, Step 3)

<p>HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554</p>	SR 1012 (Western Blvd) at SR 5808 (Hillsborough St)/ SR 5039 (Jones Franklin Rd)		
	Division 05 Wake County Raleigh		
	PLAN DATE: April 2012	REVIEWED BY: A.D. Klinsky	
	PREPARED BY: T.R. Terrell	REVIEWED BY: N.M. Rodevick	
SCALE: 1"=40'		REVISIONS:	SIGNATURE: <i>M. T. Asha</i> DATE: 6-11-12
SIG. INVENTORY NO. 05-0695T1			

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 6 green.
3. Enable simultaneous gap-out feature, on controller unit, for all phases.
4. Program phase 6, on controller unit, for volume density operation.
5. The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S4,S5,S8
 PHASES USED.....2*,3,4,6
 OVERLAPS.....NONE
 * USED FOR TIMING PURPOSES ONLY

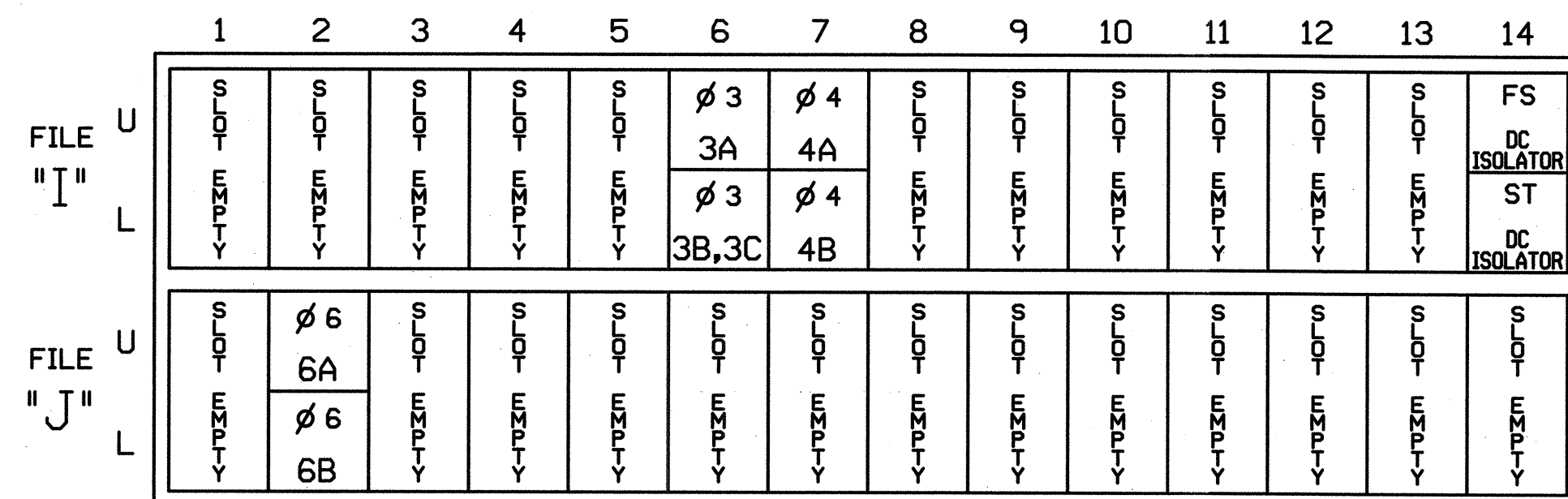
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NC	NU	31,32	41,42	NU	NU	61,62,63	NU	NU	NU	NU
RED				116				134				
YELLOW				117				135				
GREEN				118				136				
RED ARROW						101						
YELLOW ARROW						102						
GREEN ARROW						103						
Hand icon												
Person icon												

NU = Not Used
 NC = Not connected (used for timing purposes only)

INPUT FILE POSITION LAYOUT

(front view)



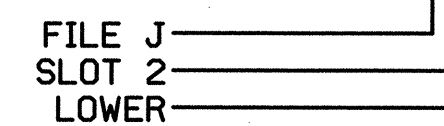
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
3A	TB4-9,10	I6U	41	11	3	100	
3B,3C	TB4-11,12	I6L	45	12	3		
4A	TB6-1,2	I7U	65	13	4		
4B	TB6-3,4	I7L	78	14	4		
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0695T1
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS
 ENTER A 3 DIGIT ADDRESS & PRESS "E"
 ADDRESS: 001 - KEYPAD
 ADDRESS: 000 - T&F INPUTS
 WARNING...AN ADDRESS OTHER THAN "000" TRANSFERS I/O TO ITS SYSTEM DEFINITION
 F-PRIOR MENU

← Modified Value

end of programming

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

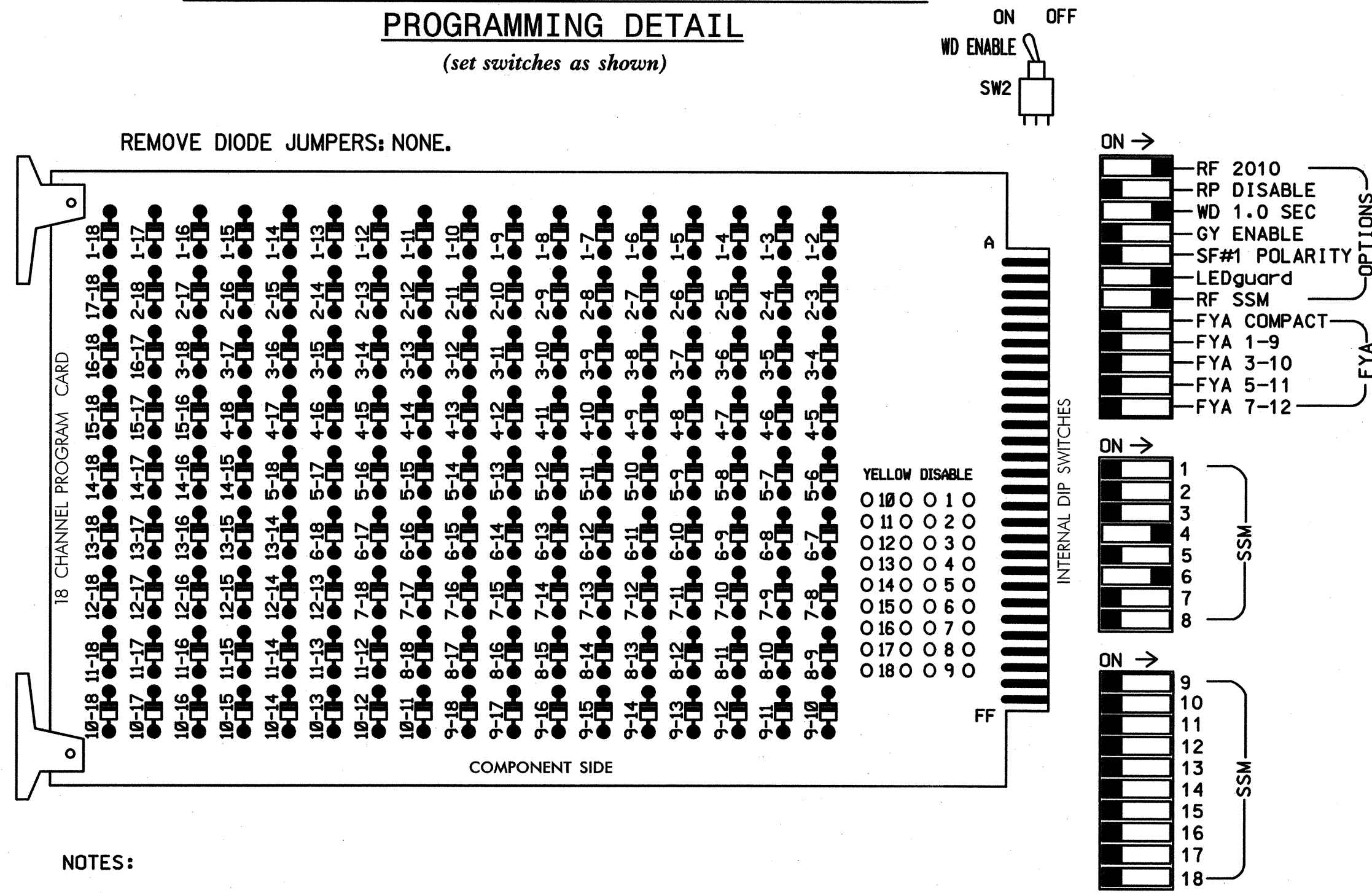
Signal Upgrade - Temporary Design 1 (TMP Phase I, Step 3)

ELECTRICAL AND PROGRAMMING DETAILS FOR:	SR 1012 (Western Blvd)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER MAYASHA M. RODEVICK SEAL 031464
	at SR 5808 (Hillsborough St)/ SR 5039 (Jones Franklin Rd)		
Prepared for:	Division 05	Wake County	Raleigh
	PLAN DATE: April 2012	REVIEWED BY: H.L. Winstead	
	PREPARED BY: A.D. Klinksiek	REVIEWED BY: N.M. Rodevick	
	REVISIONS	INIT.	DATE

750 N. Greenfield Pkwy, Garner, NC 27529

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(set switches as shown)



NOTES:

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

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 6 green.
3. Enable simultaneous gap-out feature, on controller unit, for all phases.
4. Program phase 6, on controller unit, for volume density operation.
5. The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S5,S8
 PHASES USED.....2*,4,6
 OVERLAPS.....NONE
 * USED FOR TIMING PURPOSES

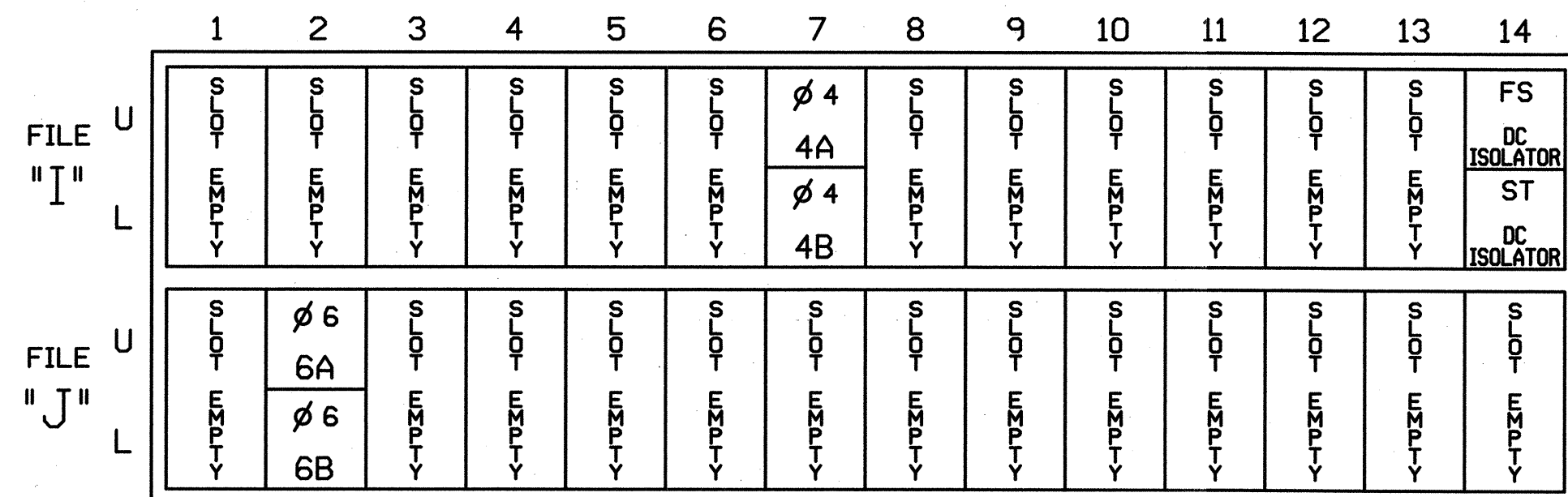
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NC	NU	NU	41,42	NU	NU	61,62,63	NU	NU	NU	NU
RED								134				
YELLOW								135				
GREEN								136				
RED ARROW					101							
YELLOW ARROW					102							
GREEN ARROW					103							
Hand icon												
Person icon												

NU = Not Used
 NC = Not connected (used for timing purposes only)

INPUT FILE POSITION LAYOUT

(front view)



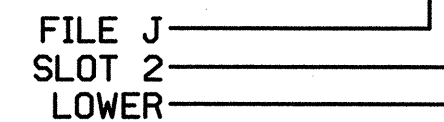
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
4A	TB6-1,2	I7U	65	13	4		
4B	TB6-3,4	I7L	78	14	4		
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0695T2
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS

ENTER A 3 DIGIT ADDRESS & PRESS "E"
 ADDRESS: 001 - KEYPAD
 ADDRESS: 000 - T&F INPUTS
 WARNING...AN ADDRESS OTHER THAN "000" TRANSFERS I/O TO ITS SYSTEM DEFINITION
 F-PRIOR MENU

← Modified Value

end of programming

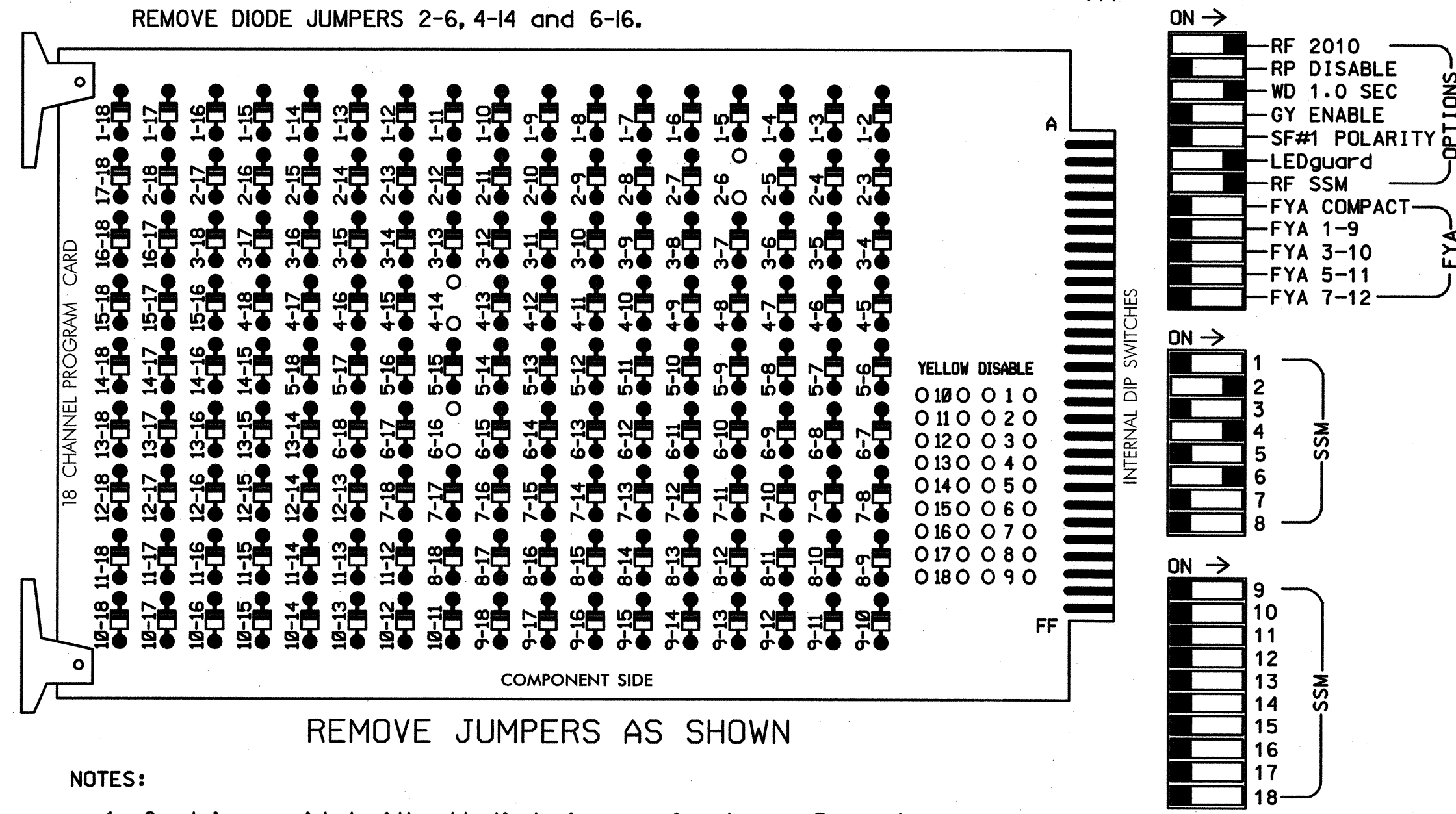
HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

Signal Upgrade - Temporary Design 2 (TMP Phase I, Step 5)

ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 5808 (Hillsborough St) at SR 5039 (Jones Franklin Rd)		
Prepared for:	Division 05	Wake County	Raleigh	
PLAN DATE: April 2012	REVIEWED BY: H.L. Winstead	PREPARED BY: A.D. Klinksiek	REVIEWED BY: N.M. Rodevick	
REVISIONS	INIT.	DATE		
				SIG. INVENTORY NO. 05-0695T2

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phase 6, on controller unit, for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S2,S5,S6,S8,S12
 PHASES USED.....1*,1PED,2,4,4PED,6
 OVERLAPS.....NONE
 * USED FOR TIMING PURPOSES ONLY

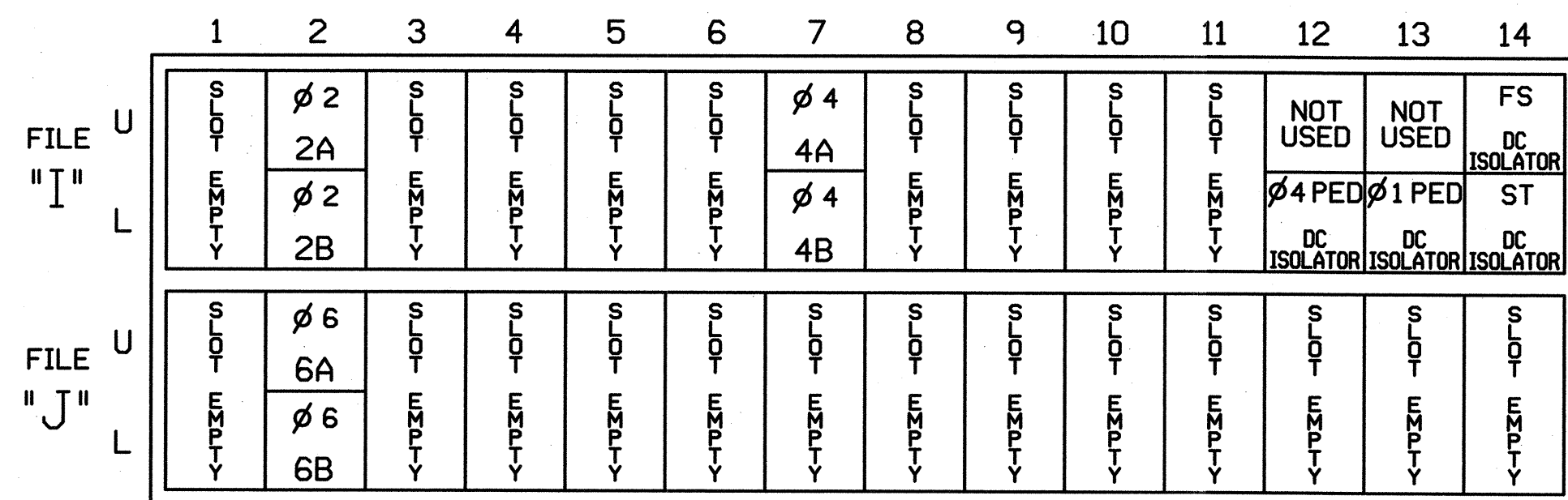
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	1 PED
SIGNAL HEAD NO.	NC	21,22	NU	NU	41,42	P41, P42	NU	61,62	NU	NU	NU	P11, P12
RED								134				
YELLOW								135				
GREEN								136				
RED ARROW		128			101							
YELLOW ARROW		129			102							
GREEN ARROW		130			103							
Hand icon							104					110
Person icon							106					112

NU = Not Used
 NC = Used for timing purposes only

INPUT FILE POSITION LAYOUT

(front view)



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

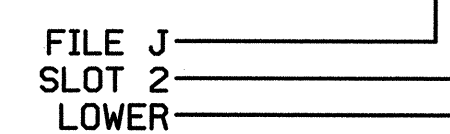
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
2A	TB2-5,6	I2U	39	3	2		
2B	TB2-7,8	I2L	43	4	2		
4A	TB6-1,2	I7U	65	13	4		
4B	TB6-3,4	I7L	78	14	4		
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
PED PUSH BUTTONS							
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P11,P12	TB8-8,9	I13L	70	PED 8	1 PED		

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

INPUT FILE POSITION LEGEND: J2L



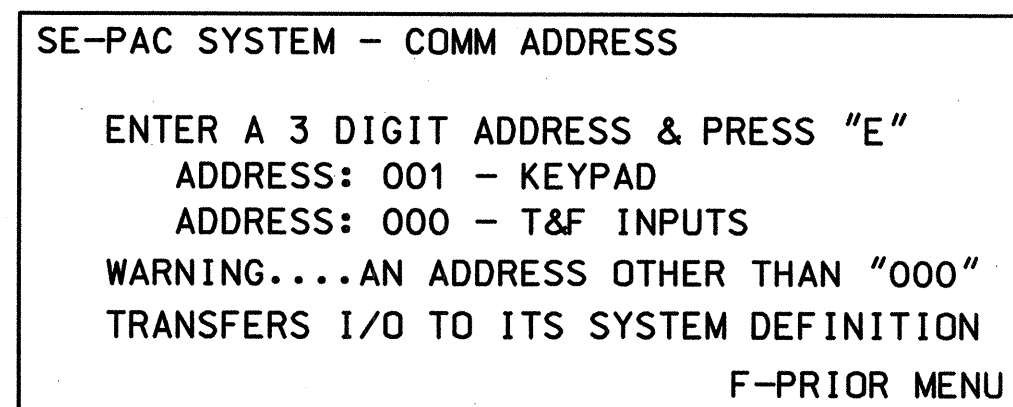
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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.

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):



end of programming

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-0695
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

Signal Upgrade - Final Design (Sheet 1 of 2)

	Prepared for: 	SR 5808 (Hillsborough St) at SR 5039 (Jones Franklin Rd)	SEAL
	Division 05 Wake County Raleigh	PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead PREPARED BY: A.D. Klinksiek REVIEWED BY: N.M. Rodevick	
750 N. Greenfield Pkwy, Garner, NC 27529		HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	SIGNATURE: <i>N. M. Rodevick</i> DATE: 10-11-12 SIG. INVENTORY NO. 05-0695

**SIGNAL DRIVER OUTPUT PROGRAMMING
DRIVER FOR PHASE 1 PED**

(program controller as shown below)

From Main Menu press 4 (Unit Data)

SE-PAC UNIT DATA	PRESS # DESIRED
1- STARTUP & MISC	6- ALT SEQUENCES
2- REMOTE FLASH	7- PORT 1/ITS DATA
3- OVERLAP STANDARD	8- I/O MISC
4- OVERLAP SPECIAL	9- SIG DRV OUT
5- RING STRUCTURE	A- 224E STATUS
	F- PRIOR MENU

SE-PAC SIGNAL DRIVER OUTPUTS	
SIG DRV GRP CHN	HDWE OUTPUT PIN.. SET
Ph 1 Vehicle..1	Ph 1 Red/Yel/Grn... 1
Ph 2 Vehicle..2	Ph 2 Red/Yel/Grn... 2
Scroll Down to Ph 1 Pedest	
Ph 1 Pedest..17	Ph 1 DW/PC/WK..... 09
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU	

← Default Value

For "Ph 1 Pedest" change "HDWE OUTPUT PIN SET"
FROM: 09
TO: 16

This will reassign loadswitch 12 to Ph 1 Pedest

Display will now echo
HDWE OUTPUT PIN SET "Ph 8"

Ph 1 Pedest..17	Ph 8 DW/PC/WK..... 16
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU	

← Modified Value

Press "F" to return to Unit Data

**CONTROLLER PED DETECTOR
ASSIGNMENT PROGRAMMING**

(program controller as shown below)



From the Main Menu press '3' (Phase Data), then from Phase Menu press '8' (Spec.Detector), then from Detector Control Data Menu press '9' (Ped 1-8):

PED DET CONTROL	.1..2..3..4..5..6..7..8
ASSIGNED PHASE	1 2 3 4 0 6 0 1
OPERATION MODE	1 1 1 1 0 1 0 1
SWITCHED PHASE	0 0 0 0 0 0 0 0
MODE:	0-VEH 1-PED 2-ONE 3-SBA
	4-SBB 5-PPL 6-PPT 7-AND
SWTICED:	TO PH # (AP=Y/R & SP=GRN)
	A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU

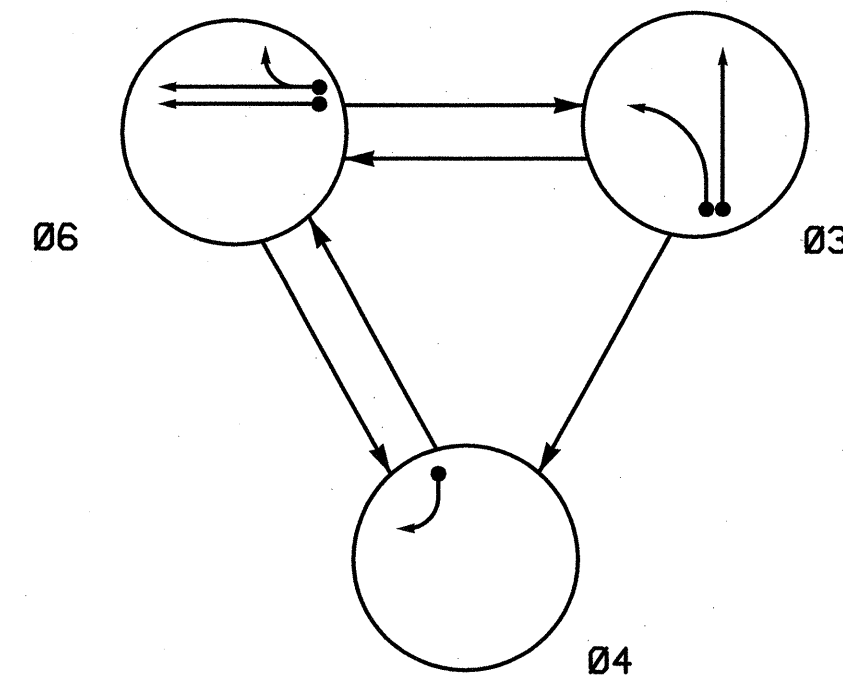
Press "F" to return to Detector Control Data

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-0695
DESIGNED: April 2012
SEALED: 06-11-12
REVISED:

Signal Upgrade - Final Design (Sheet 2 of 2)

 Prepared for: Public Engineering and Safety Systems Division NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Management Section 750 N. Greenfield Pkwy, Garner, NC 27529	SR 5808 (Hillsborough St) at SR 5039 (Jones Franklin Rd)									
	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead PREPARED BY: A.D. Klinskiesk REVIEWED BY: N.M. Rodevick		<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE				
REVISIONS	INIT.	DATE								

PHASING DIAGRAM



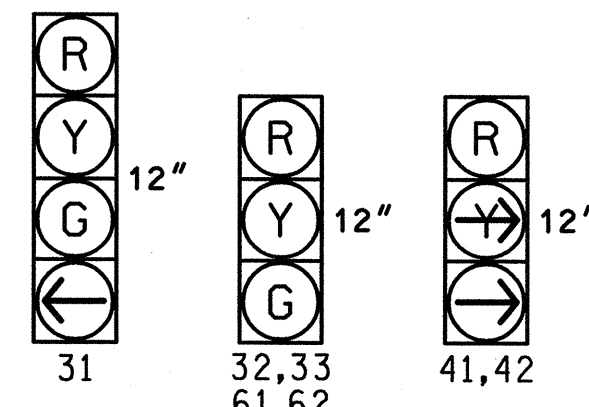
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE			
	Ø6	Ø3	Ø4	F
31	R	G	R	R
32,33	R	G	R	R
41,42	R	R	-	R
61,62	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



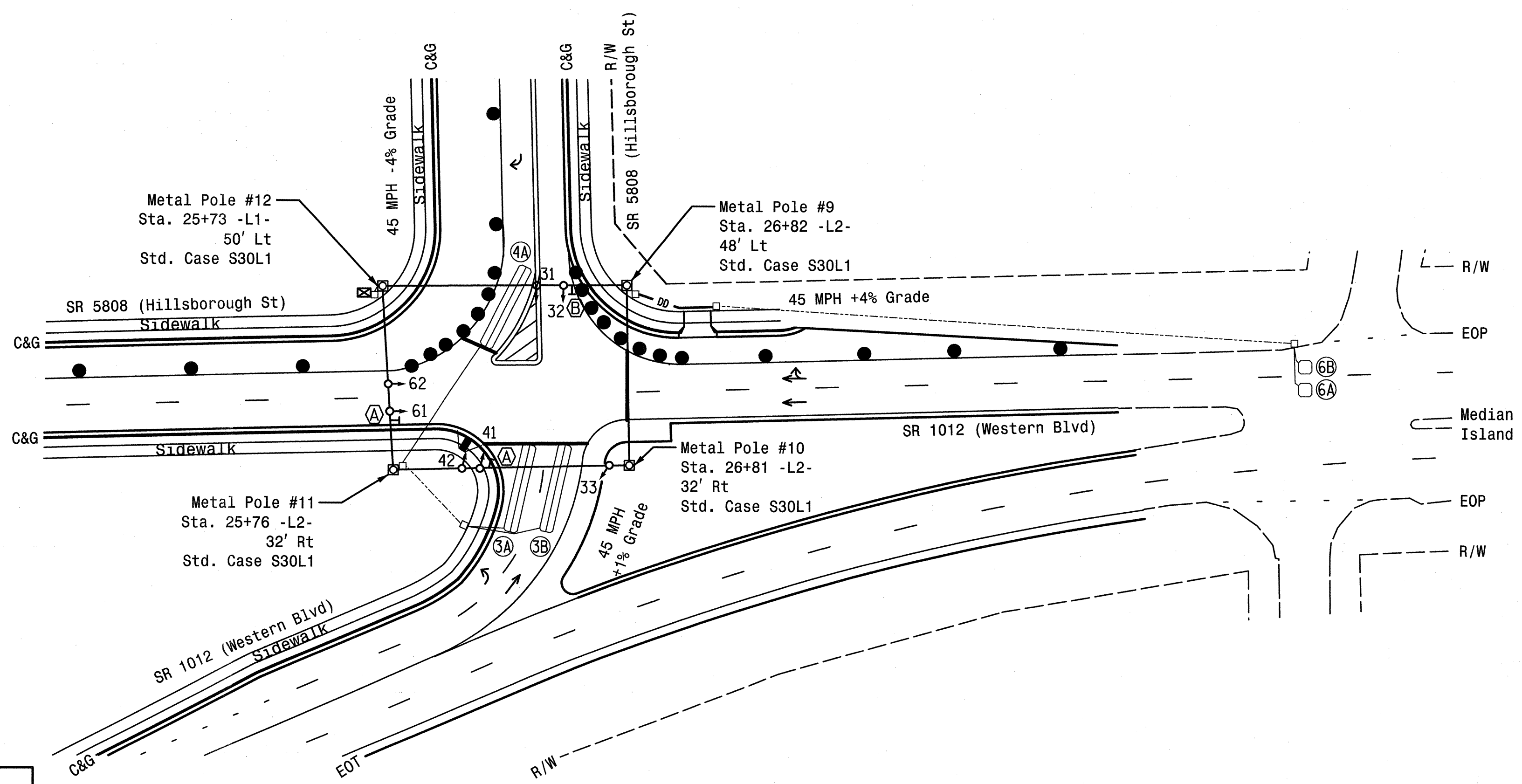
SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	ASSIGNED PHASE	TIMING		DETECTOR PROGRAMMING							STATUS			
							DELAY	EXTEND (STRETCH)	VEHICLE	OPERATION MODE							NEW	EXISTING	
										1 CALL	2 STOP A	3 STOP B	4 PROTECTOR LEFT	5 PROTECTOR THROUGH	6 AND	7 SWITCH			
3A	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
3B	6X40	2-4-2	0	X	-	3	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	0	X	-	4	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
6A	6X6	5	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-
6B	6X6	5	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	X	-

3 Phase Fully Actuated (Raleigh Signal System)

NOTES

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



LEGEND

- | PROPOSED | EXISTING |
|--------------------------------------------------|---------------------------------|
| ○ → Traffic Signal Head | ● → Traffic Signal Head |
| ○ → Modified Signal Head | N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head |
| ○ Signal Pole with Guy | ⊥ Signal Pole with Guy |
| ○ Signal Pole with Sidewalk Guy | ⊥ Signal Pole with Sidewalk Guy |
| ⊠ Inductive Loop Detector | ⊠ Inductive Loop Detector |
| ⊠ Controller & Cabinet | ⊠ Controller & Cabinet |
| ⊠ Junction Box | ⊠ Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| --- Directional Drill | --- Directional Drill |
| N/A Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| ⊠ Metal Strain Pole | ⊠ Metal Strain Pole |
| ⊠ Wheelchair Ramp | ⊠ Wheelchair Ramp |
| ⊠ No Left Turn Sign (R3-2) | ⊠ No Left Turn Sign (R3-2) |
| ⊠ No Right Turn Sign (R3-1) | ⊠ No Right Turn Sign (R3-1) |
| ● ● Construction Zone Drums | N/A |

SE-PAC 2070 TIMING CHART

FEATURE	PHASE			
	2	3	4	6
Min Green *	12	7	7	12
Passage Gap *	6.0	2.0	2.0	6.0
Maximum Green *	60	30	20	60
Yellow Change	4.2	4.4	4.0	4.2
Red Clear	1.2	1.0	1.0	1.2
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	-	-	-	1.5
Maximum Initial *	-	-	-	34
Time Before Reduction *	-	-	-	15
Time To Reduce *	-	-	-	30
Minimum Gap	-	-	-	3.0
Recall Mode	-	-	-	MIN RECALL
Vehicle Call Memory	-	NON-LOCK	NON-LOCK	LOCK
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

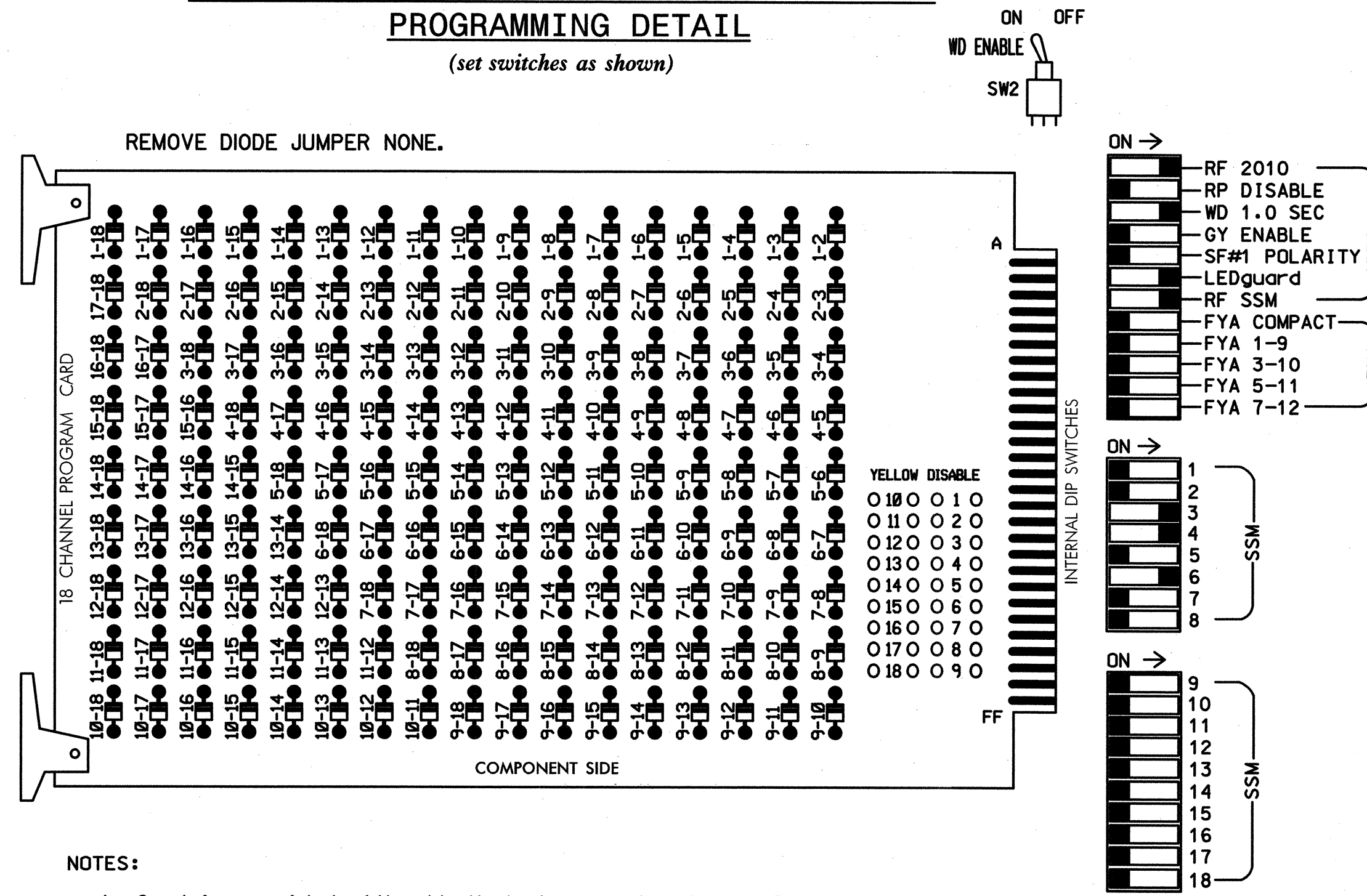
* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

New Installation - Temporary Design (TMP Phase II, Step 3)

	SR 1012 (Western Blvd) at SR 5808 (Hillsborough St)		SEAL
	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: A.D. Klinksiek	PREPARED BY: T.R. Terrell REVIEWED BY: N.M. Rodevick	
SCALE: 0 40 1"=40'	REVISIONS:	INIT. DATE:	SIG. INVENTORY NO. 05-24607

HNTB HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL
(set switches as shown)



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

■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program controller to start up in phase 6 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phase 6, on controller unit, for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

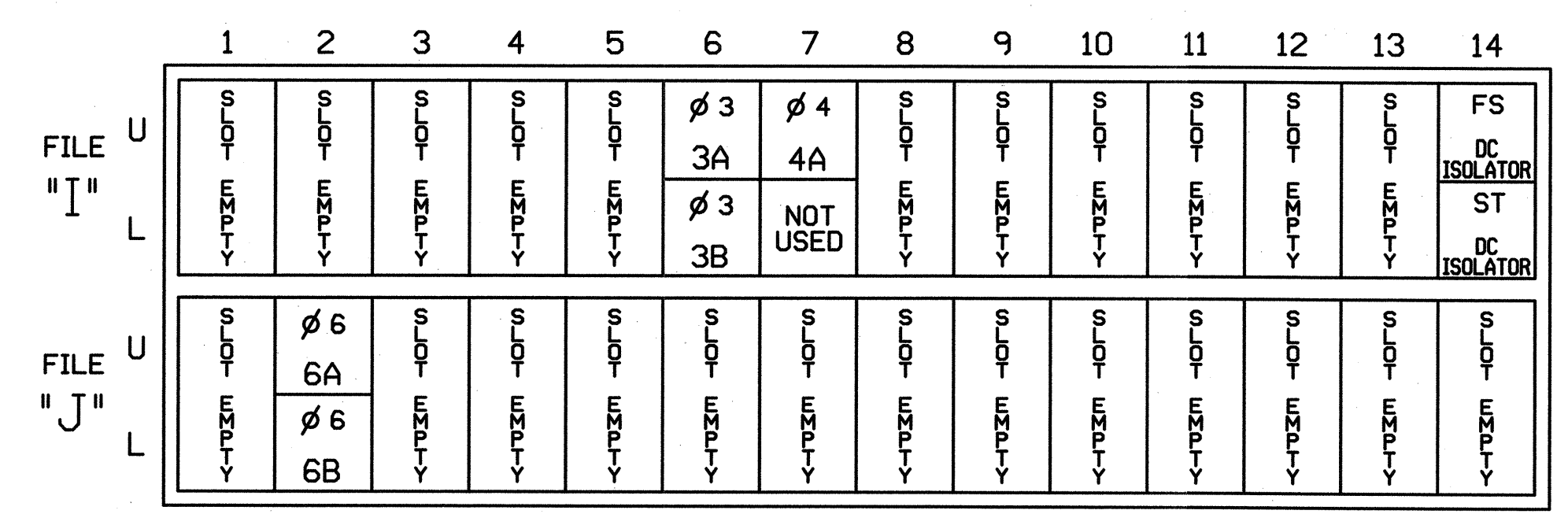
CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S4,S5,S8
 PHASES USED.....2*,3,4,6
 OVERLAPS.....NONE
 * USED FOR TIMING PURPOSES ONLY

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NC	NU	31	32,33	41,42	NU	NU	61,62	NU	NU	NU
RED				116	116	101			134			
YELLOW				117	117				135			
GREEN				118	118				136			
RED ARROW												
YELLOW ARROW						102						
GREEN ARROW				118	103							
Hand icon												
Person icon												

NU = Not Used
 NC = Not connected (used for timing purposes only)

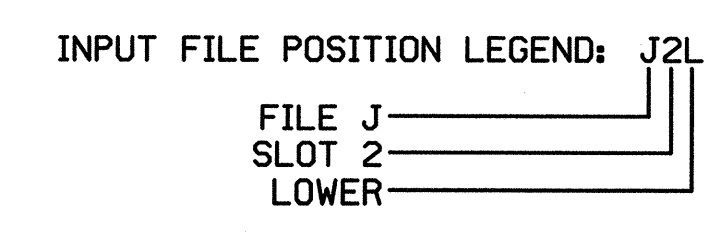
INPUT FILE POSITION LAYOUT
(front view)



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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
3A	TB4-9,10	I6U	41	11	3		
3B	TB4-11,12	I6L	45	12	3		
4A	TB6-1,2	I7U	65	13	4	15	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		



COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):

SE-PAC SYSTEM - COMM ADDRESS

ENTER A 3 DIGIT ADDRESS & PRESS "E"
 ADDRESS: 001 - KEYPAD
 ADDRESS: 000 - T&F INPUTS
 WARNING...AN ADDRESS OTHER THAN "000"
 TRANSFERS I/O TO ITS SYSTEM DEFINITION
 F-PRIOR MENU

← Modified Value

end of programming

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2460T
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

New Installation - Temporary Design (TMP Phase II, Step 3)

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:		SR 1012 (Western Blvd) at SR 5808 (Hillsbrough St)	
Division 05	Wake County	Raleigh	
PLAN DATE: April 2012	REVIEWED BY: H.L. Winstead		
PREPARED BY: A.D. Klinksiek	REVIEWED BY: N.M. Rodevick		
REVISIONS	INIT.	DATE	

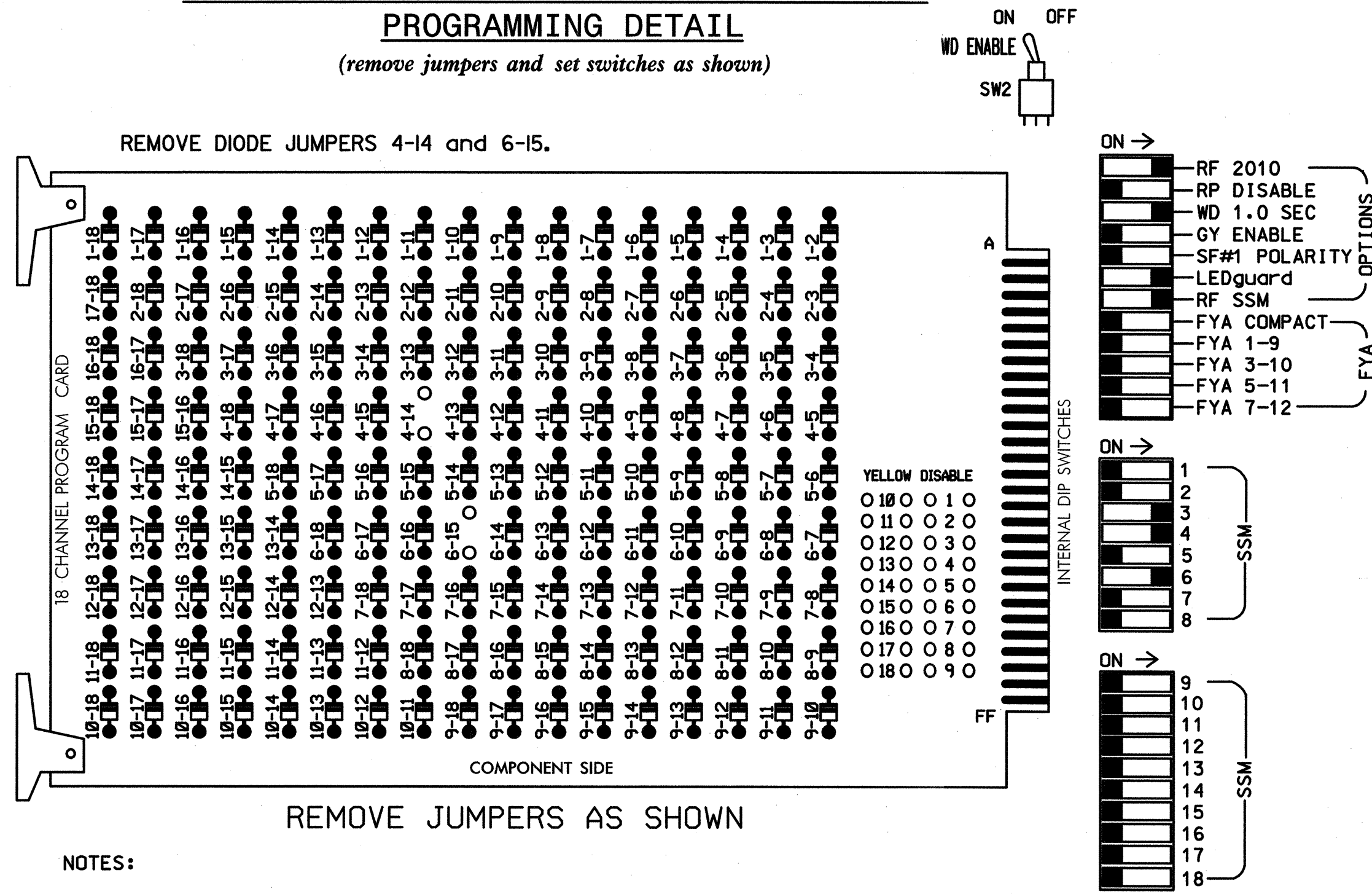
SEAL

Signature: N. M. Rodevick
 Date: 6-11-12

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 6 green.
3. Enable simultaneous gap-out feature, on controller unit, for all phases.
4. Program phase 6, on controller unit, for volume density operation.
5. The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....SIEMENS 2070L
 CABINET.....332
 SOFTWARE.....SE-PAC2070 SOFTWARE VERSION 3.34e OR HIGHER
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S4,S5,S6,S8,S9
 PHASES USED.....2*,3,4,4PED,6,6PED
 OVERLAPS.....NONE
 * USED FOR TIMING PURPOSES ONLY

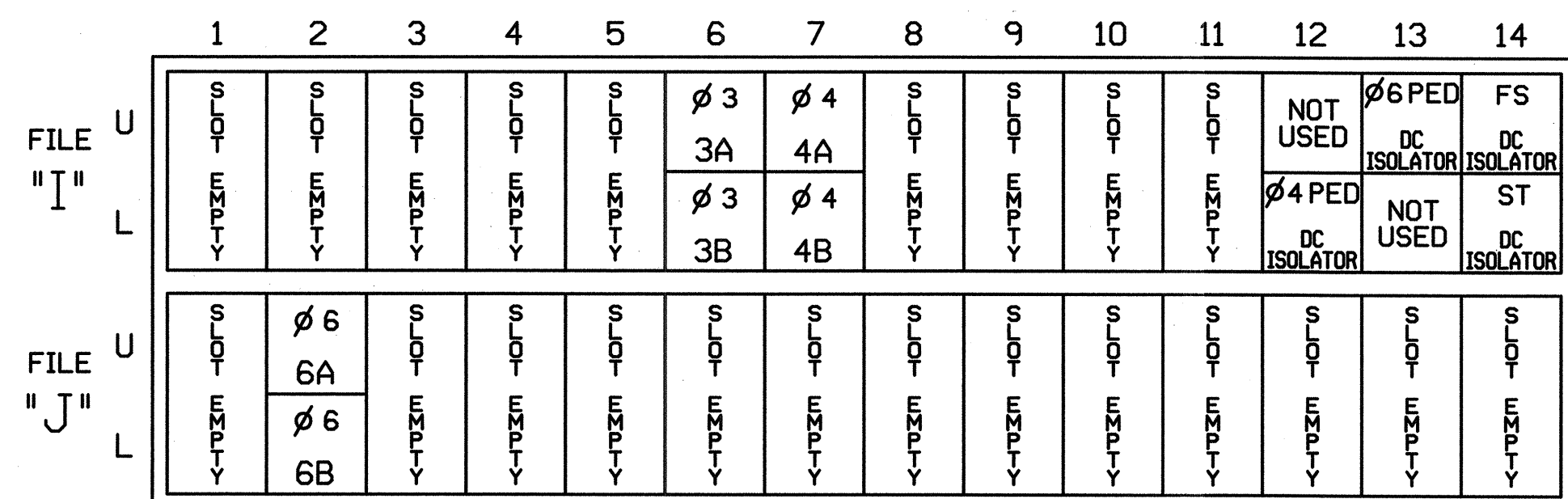
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	NC	NU	31	32,33	41,42	P41, P42	NU	61,62	P61,P62 P63,P64	NU	NU
RED				116	116	101			134			
YELLOW				117	117				135			
GREEN				118	118				136			
RED ARROW												
YELLOW ARROW						102						
GREEN ARROW				118		103						
Hand icon							104			119		
Walking person icon							106			121		

NU = Not Used
 NC = Not connected (used for timing purposes only)

INPUT FILE POSITION LAYOUT

(front view)

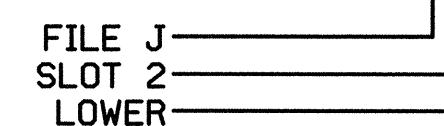


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
3A	TB4-9,10	I6U	41	11	3		
3B	TB4-11,12	I6L	45	12	3		
4A	TB6-1,2	I7U	65	13	4	15	
4B	TB6-3,4	I7L	78	14	4	15	
6A	TB3-5,6	J2U	40	21	6		
6B	TB3-7,8	J2L	44	22	6		
PED PUSH BUTTONS							
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62 P63,P64	TB8-7,9	I13U	68	PED 6	6 PED		

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

INPUT FILE POSITION LEGEND: J2L



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

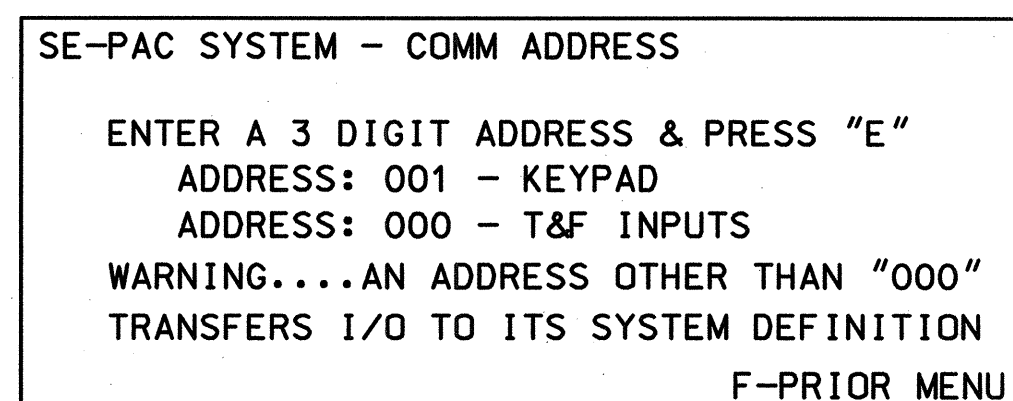
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-2460
 DESIGNED: April 2012
 SEALED: 06-11-12
 REVISED:

COMMUNICATIONS ADDRESS PROGRAMMING

(program controller as shown below)

From the Main Menu press '8' (System Data), then from SE-PAC System Data Menu press '1' (Communications), then from SE-PAC System Communications Menu press '1' (Address):



end of programming

New Installation - Final Design

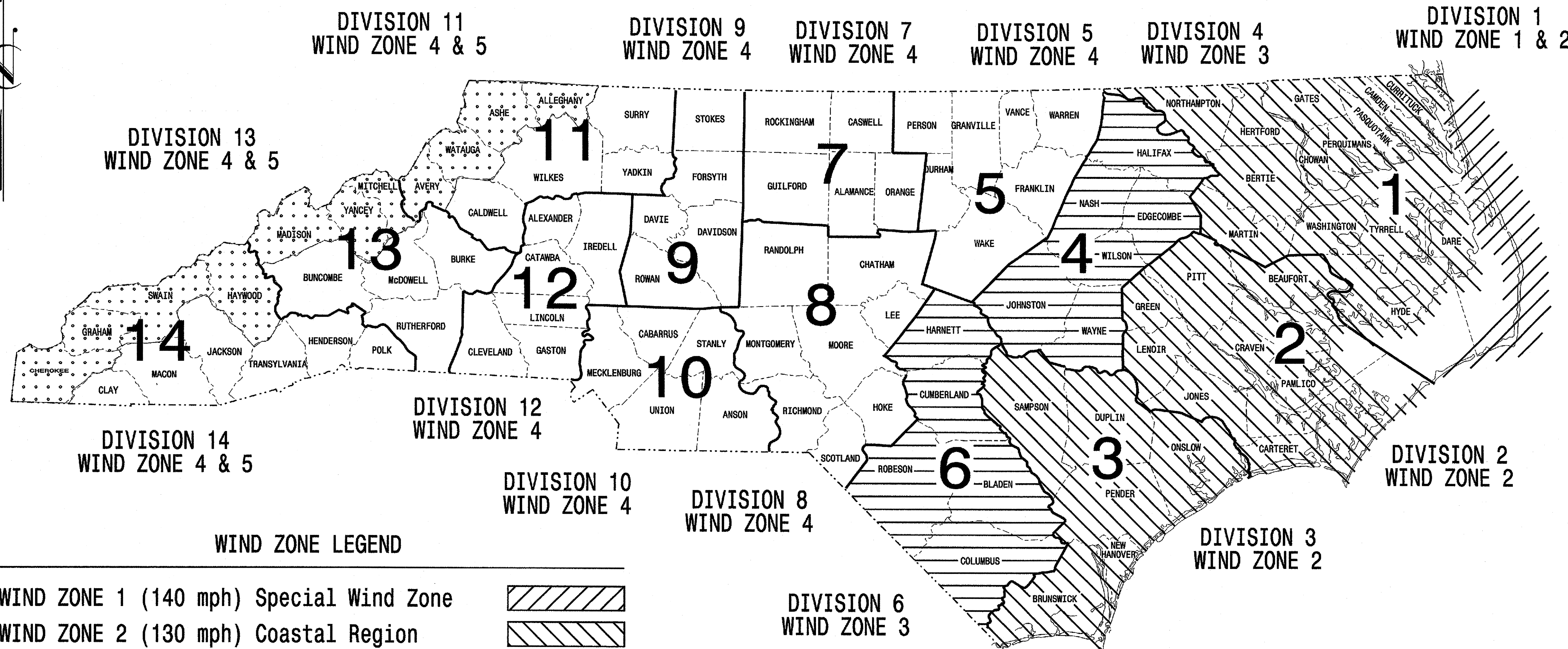
	SR 1012 (Western Blvd) at SR 5808 (Hillsbrough St)	
	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: H.L. Winstead PREPARED BY: A.D. Klinksiek REVIEWED BY: N.M. Rodevick	
Prepared for: 	REVISIONS INIT. DATE _____ _____ _____	SIGNATURE DATE _____ _____

HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	B-4656	Sig. 20
F. A. PROJ. NO.	M 1	
PROJECT ID. NO.		

STANDARD DRAWINGS FOR METAL POLES

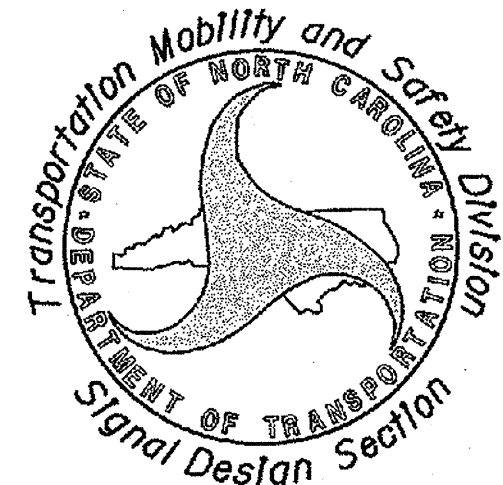


WIND ZONE LEGEND

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:



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, Luminaires,
and Traffic Signals

INDEX OF PLANS

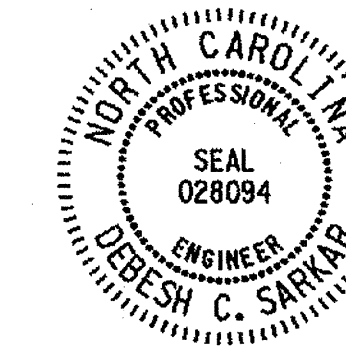
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:

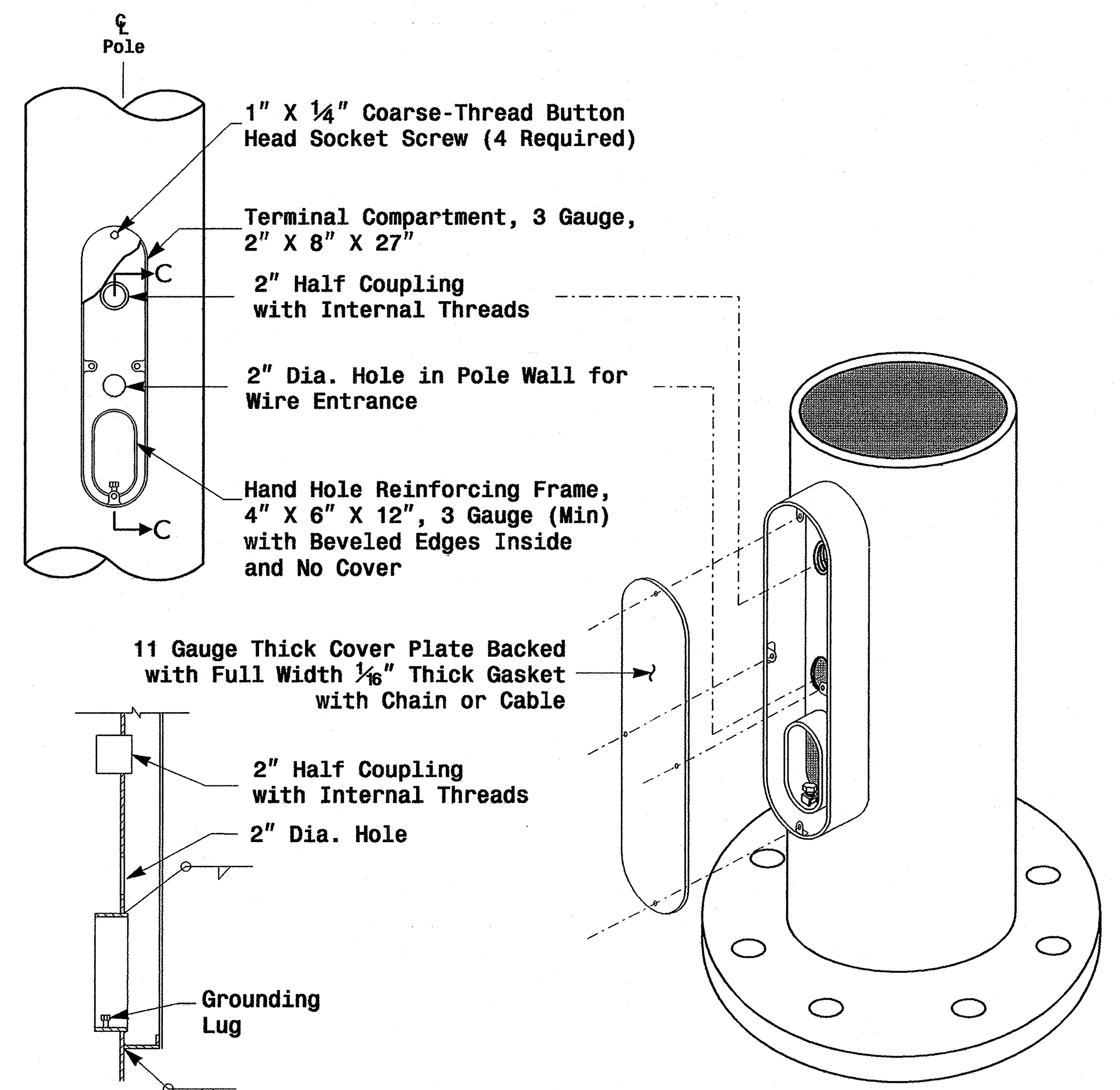
MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT

- 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



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 _____	

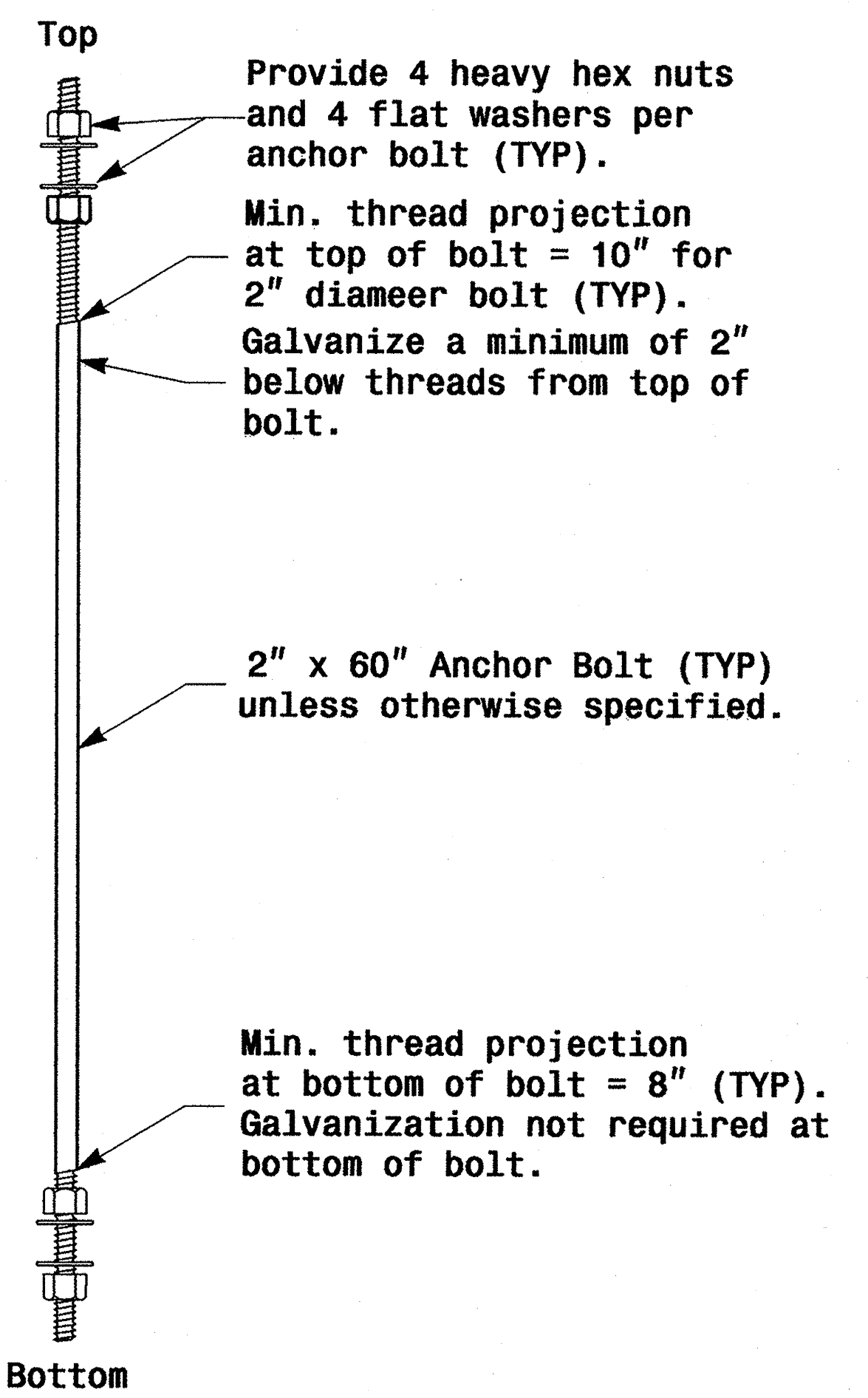
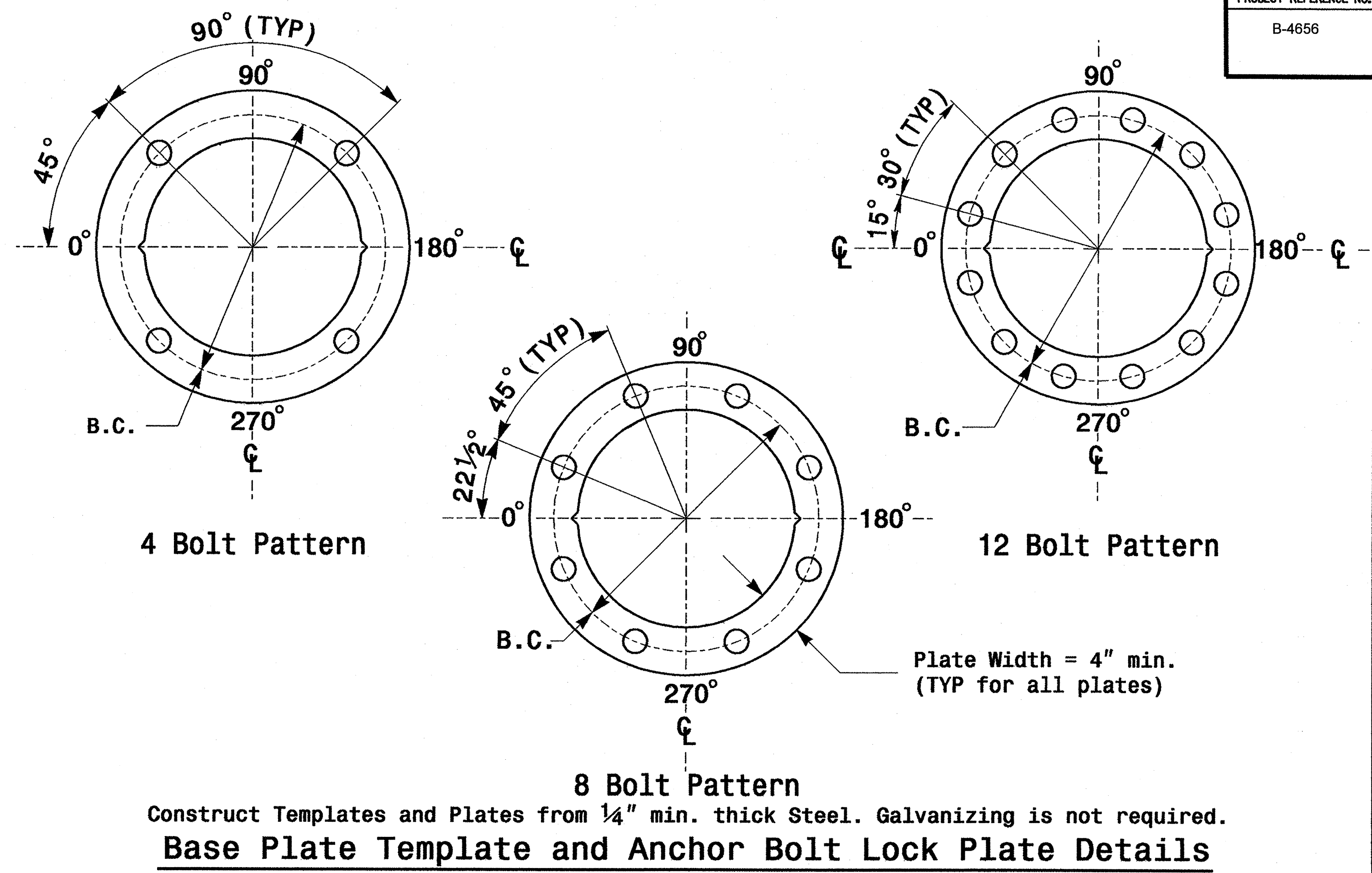
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

MFG _____	MFG. DATE: MM/YY _____
SECTION D/T/L/Y _____	
NCDOT STANDARD _____	

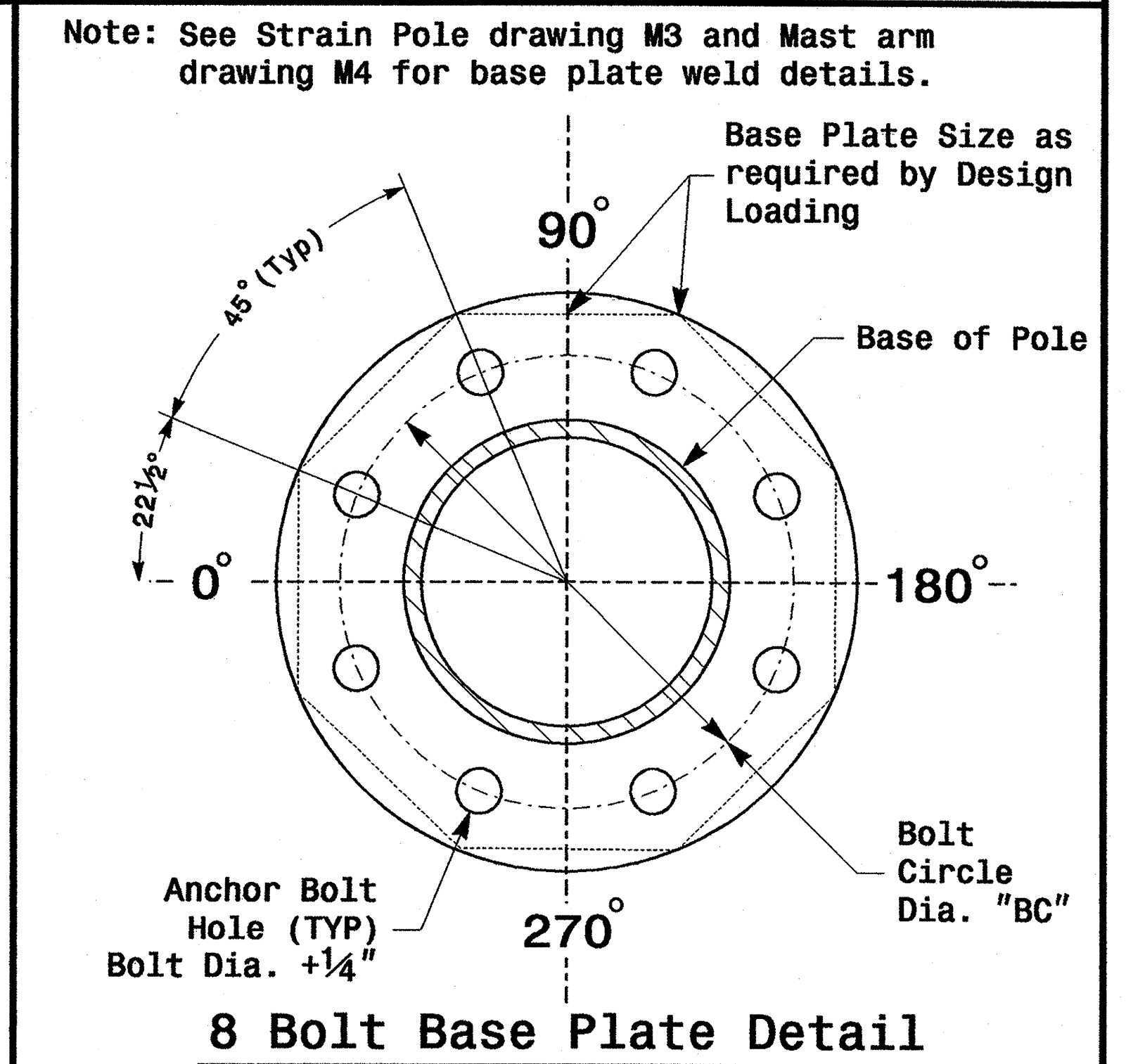
Arm I.D. Tag
(Provide on each section of a multi-section mast arm)

- 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



Anchor Bolt Detail



Prepared in the Offices of:

Typical Fabrication Details Common To All Metal Poles

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

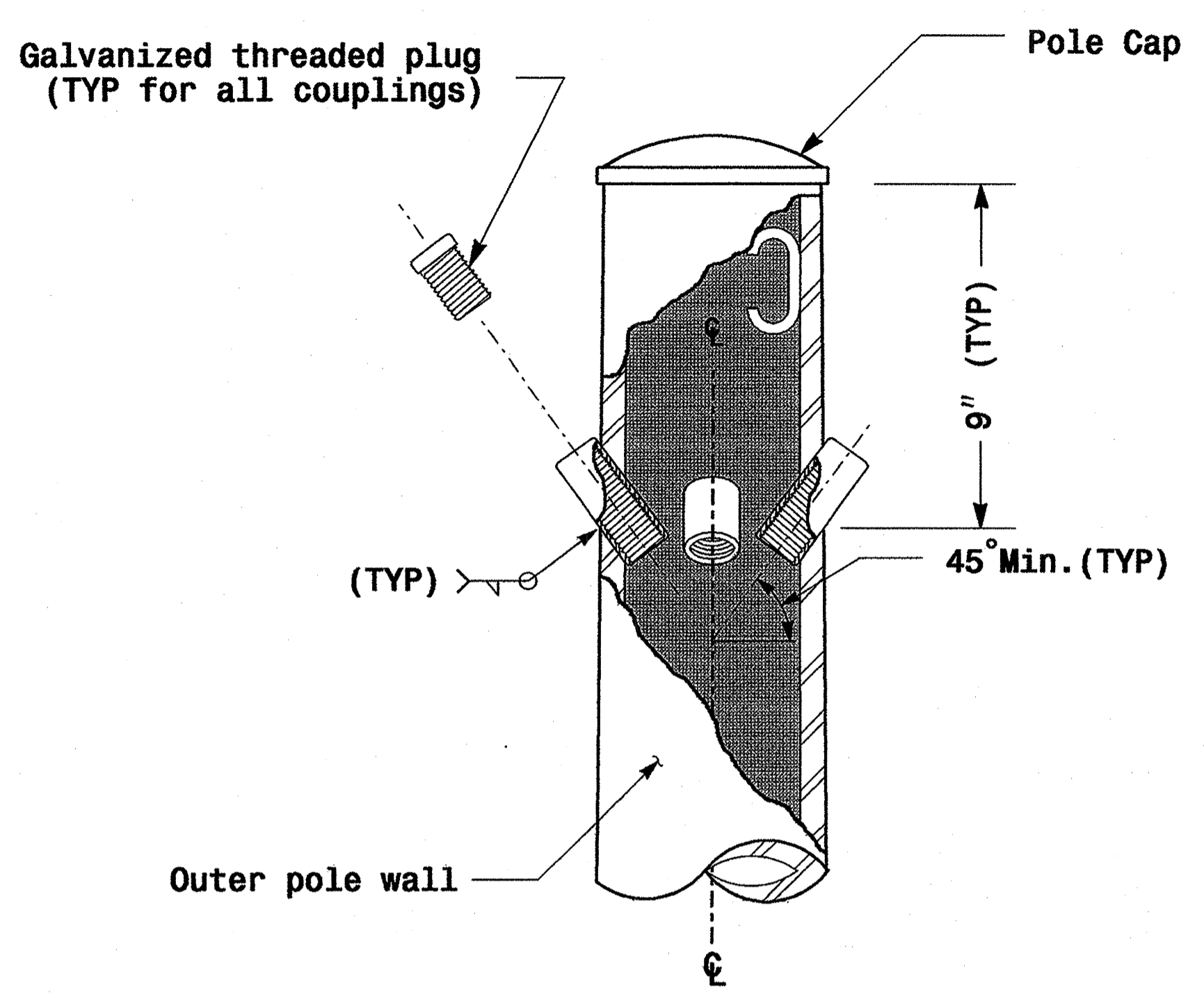
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SIGNATURE: D. Sankar 9.2.2005

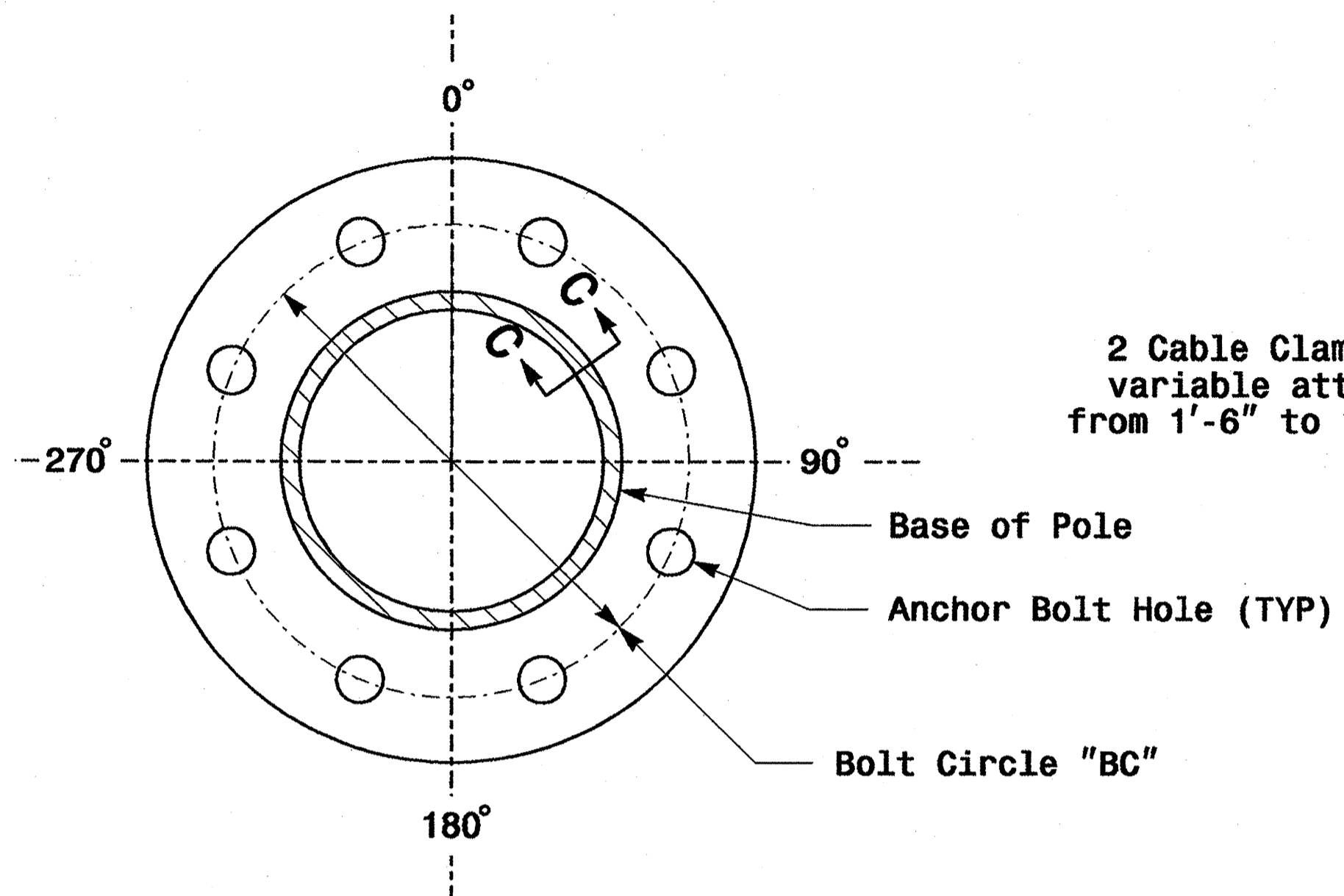
SIG. INVENTORY NO.

Fabrication Details - All Poles

01-SEP-2005 18:22 D:\2004 Metal Pole Standard.dwg2004.mg thru mg.dgn

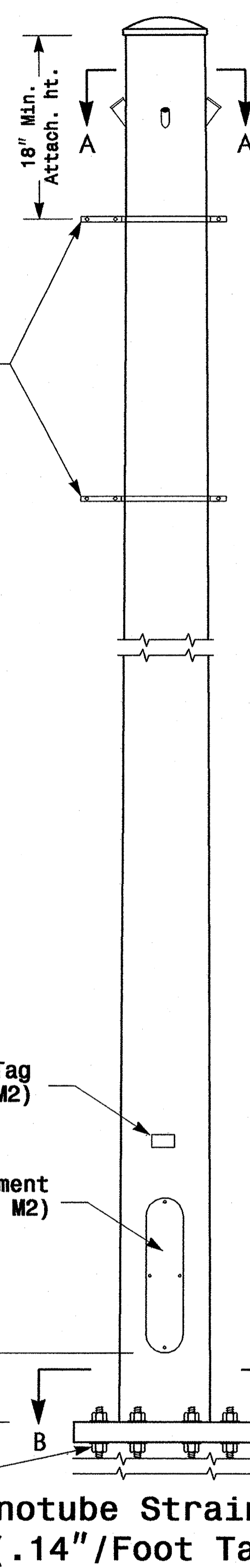


Cable Entrances at Top of Pole



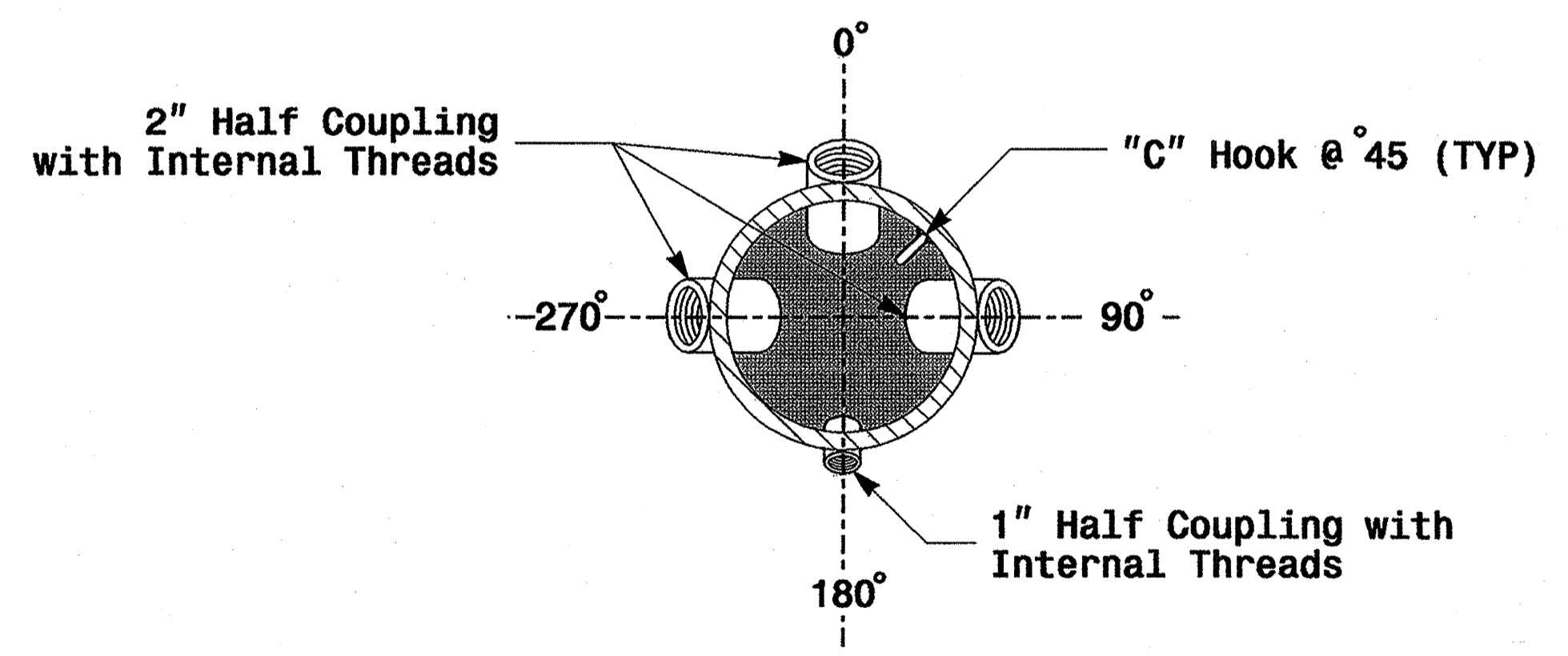
**Section B-B
Pole Base Plate**
(See drawing M2)

2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.

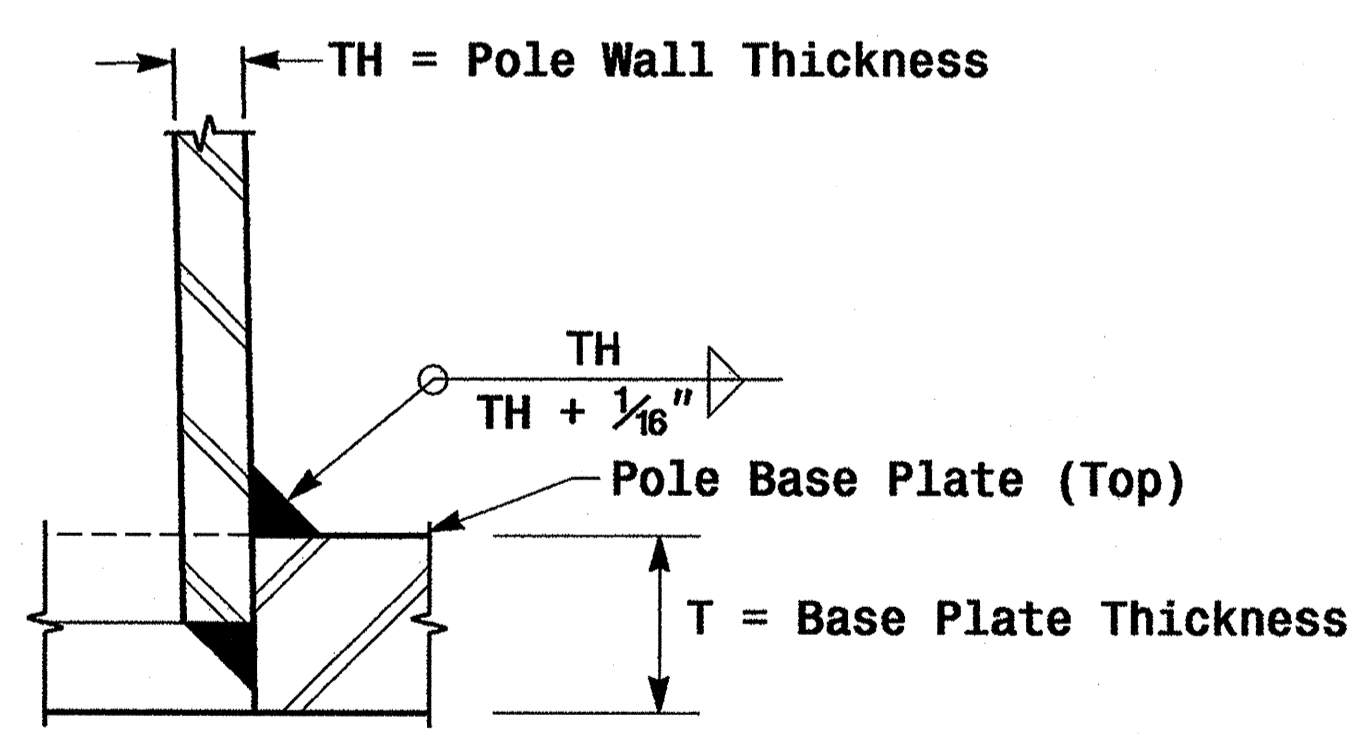


**Monotube Strain Pole
(.14"/Foot Taper)**

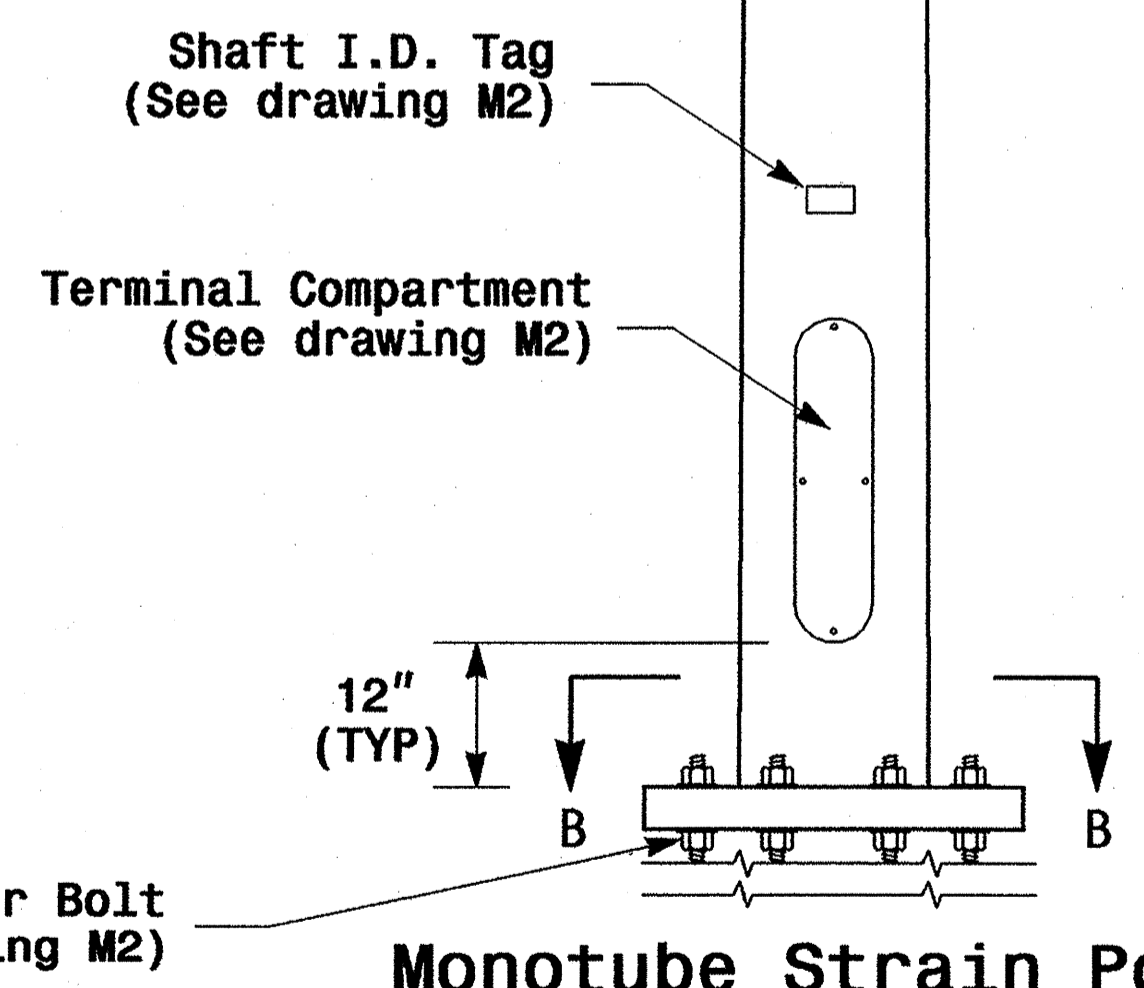
Fabrication Details - Strain Poles



Radial Orientation for Factory Installed Accessories at Top of Pole



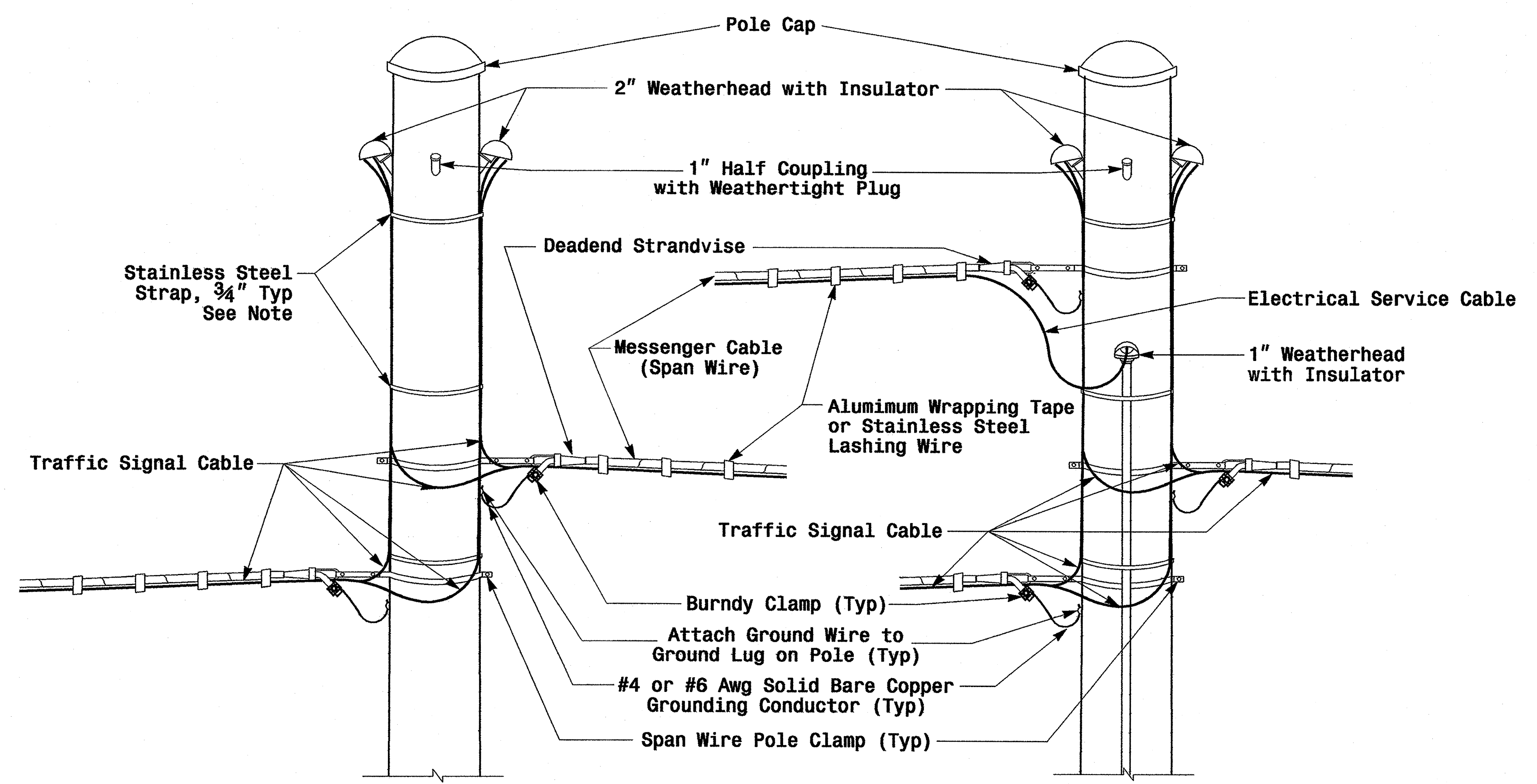
Socket Connection Weld Detail



**Anchor Bolt
(See drawing M2)**

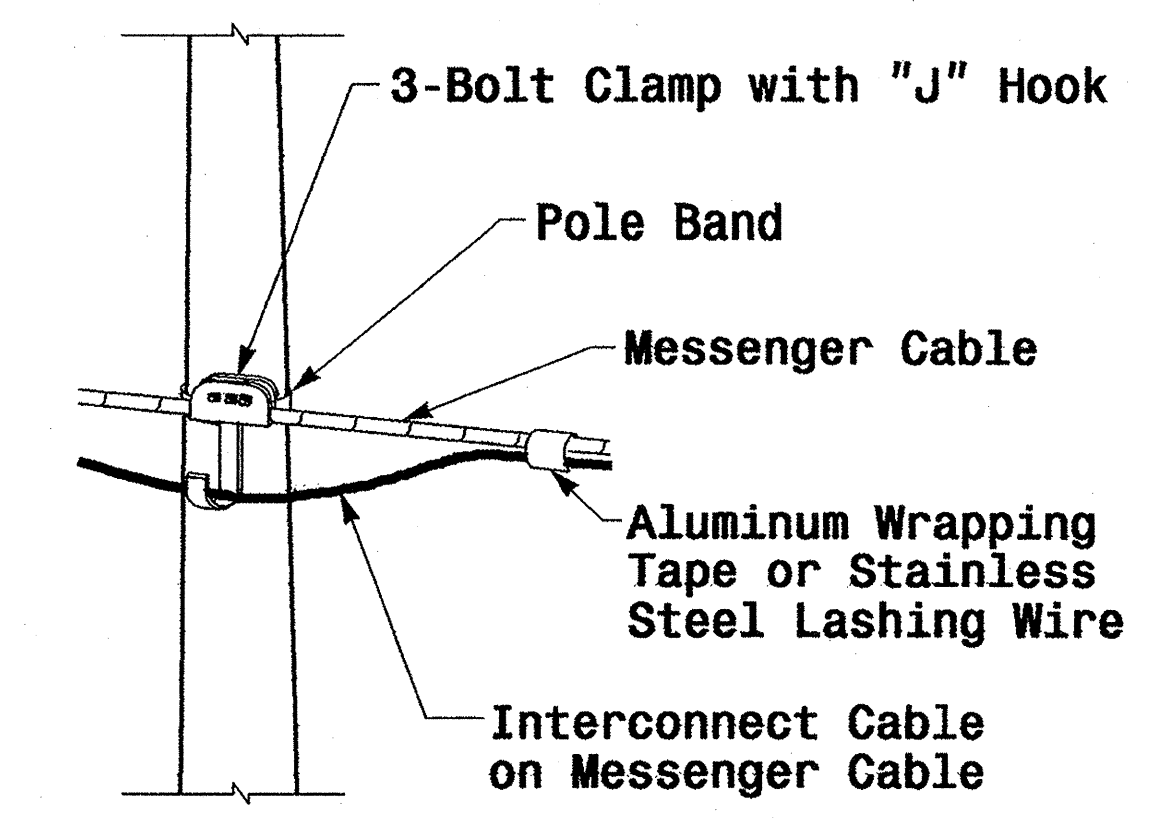
01-SEP-2005 14:07 v:\p\alexander\work\groups\2004 metal pole standard\2004 m3.dgn polexander

	Typical Fabrication Details For Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
SCALE: 0 NA NONE		REVISIONS: _____ INIT.: _____ DATE: _____	SIGNATURE: <i>D. Sarker</i> 9.2.2005 DATE: _____ SIG. INVENTORY NO. _____

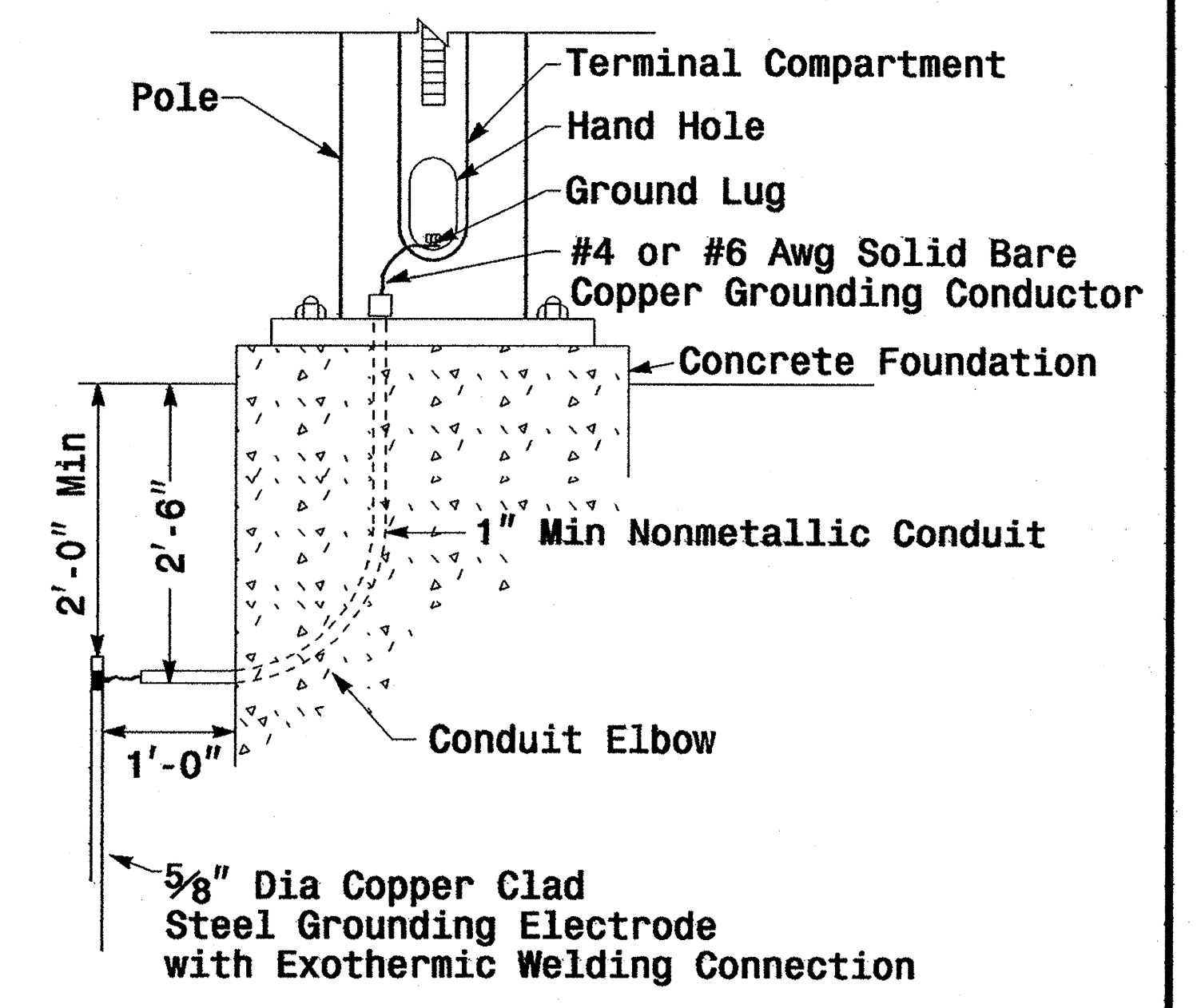


Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"

Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail

Construction Details - Strain Poles

01-SEP-2005 16:33 w:\p000\165-un1\mwr\grcpsa2004_metro\pole_standard\2004_m6.dgn

	Construction Details Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: D.C. SARKAR	
SCALE: 0 NA NONE		SIGNATURE: <i>P.L. Alexander</i> 9-1-05 DATE:	
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016286 P.L. ALEXANDER		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 016286 D.C. SARKAR	

		STANDARD STRAIN POLES				STANDARD FOUNDATIONS 42" Diameter Drilled Pier Length (L) - Feet						
Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Moment at the Pole Base (ft-kp)	Clay				Sand				
				Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30		
WIND ZONE 1	LIGHT	S26L3	26	25	280	20.5	14.0	11.5	9.5	18.0	16.0	14.0
		S30L3	30	25	310	21.0	14.5	11.5	9.5	18.5	16.5	14.5
		S35L3	35	25	350	22.5	15.0	12.0	10.0	19.5	17.5	15.5
	HEAVY	S30H3	30	29	450	25.5	16.5	13.0	11.0	21.0	18.5	16.5
		S35H3	35	29	540	26.0	17.0	13.5	11.5	22.0	19.5	17.0
	WIND ZONE 2	LIGHT	S26L2	26	23	250	19.5	13.5	11.0	9.0	18.0	15.5
S30L2			30	23	290	20.0	14.0	11.5	9.5	18.5	16.0	14.0
S35L2			35	23	315	21.0	14.5	11.5	9.5	19.0	16.5	14.5
HEAVY		S30H2	30	29	415	24.5	16.0	13.0	10.5	21.0	18.5	16.0
		S35H2	35	29	485	25.5	16.5	13.5	11.0	21.5	19.0	16.5
WIND ZONE 3		LIGHT	S26L2	26	23	250	18.5	13.0	10.5	9.0	17.5	15.0
	S30L2		30	23	290	19.5	13.5	11.0	9.0	18.0	15.5	14.0
	S35L2		35	23	315	20.0	14.0	11.5	9.5	18.5	16.0	14.5
	HEAVY	S30H2	30	29	415	23.0	15.5	12.5	10.0	20.5	17.5	16.0
		S35H2	35	29	485	24.0	16.0	13.0	10.5	21.0	18.0	16.5
	WIND ZONE 4	LIGHT	S26L1	26	22	195	18.0	13.0	10.5	9.0	16.5	14.5
S30L1			30	22	225	18.5	13.0	10.5	9.0	17.0	15.0	13.5
S35L1			35	22	255	19.0	13.5	11.0	9.0	17.5	15.5	14.0
HEAVY		S30H1	30	25	330	22.0	15.0	12.0	9.5	19.5	17.0	15.0
		S35H1	35	25	385	23.0	15.5	12.5	10.0	20.0	17.5	15.5
WIND ZONE 5		LIGHT	S26L2	26	23	250	19.0	13.5	10.5	9.0	17.5	15.5
	S30L2		30	23	290	20.0	14.0	11.0	9.5	18.0	16.0	14.0
	S35L2		35	23	315	21.0	14.5	11.5	10.0	19.0	16.5	14.5
	HEAVY	S30H2	30	29	415	23.5	15.5	12.5	10.5	21.0	18.0	16.0
		S35H2	35	29	485	25.0	16.5	13.0	11.0	21.5	18.5	16.5

Concrete Volume (cubic yards) = .356 X L

Fabrication Design Notes:

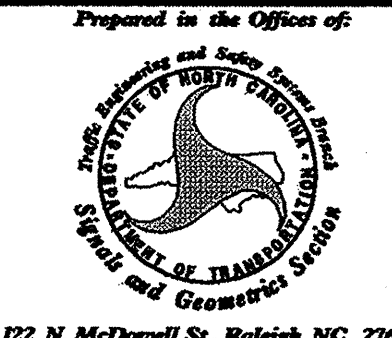
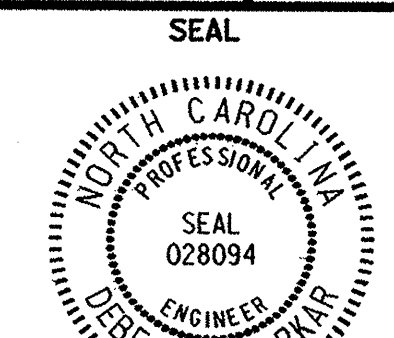
1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from sheet M 1.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate pole case load number from the plans or from the Engineer.
5. Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case. The foundation depth is the value where the column and the row intersect.

Standard Strain Poles

02-SEP-2005 12:42 p:\p001\p001\work\groups\2004\m01\pole_standards\2004 mg std strain pole.dgn

	Standard Strain Poles and Standard Foundations		
	PLAN DATE: May 2005	REVIEWED BY: C.F. Andrews	
PREPARED BY: P.L. Alexander		REVIEWED BY: A.W. Esposito	SEAL
SCALE: None	REVISIONS	INT.	DATE
SIGNATURE: <i>D. Sarker</i>		DATE: 9/2, 2005	SEAL

- 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 ASSEMBLY
- 7 INSTALL TRACER WIRE
- 8 TRENCH
- 9 INSTALL PVC CONDUIT
- 10 INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12 INSTALL RIGID, GALVANIZED STEEL RISER WITH HEAT SHRINK TUBING
- 13 INSTALL 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 ETHERNET EDGE SWITCH 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

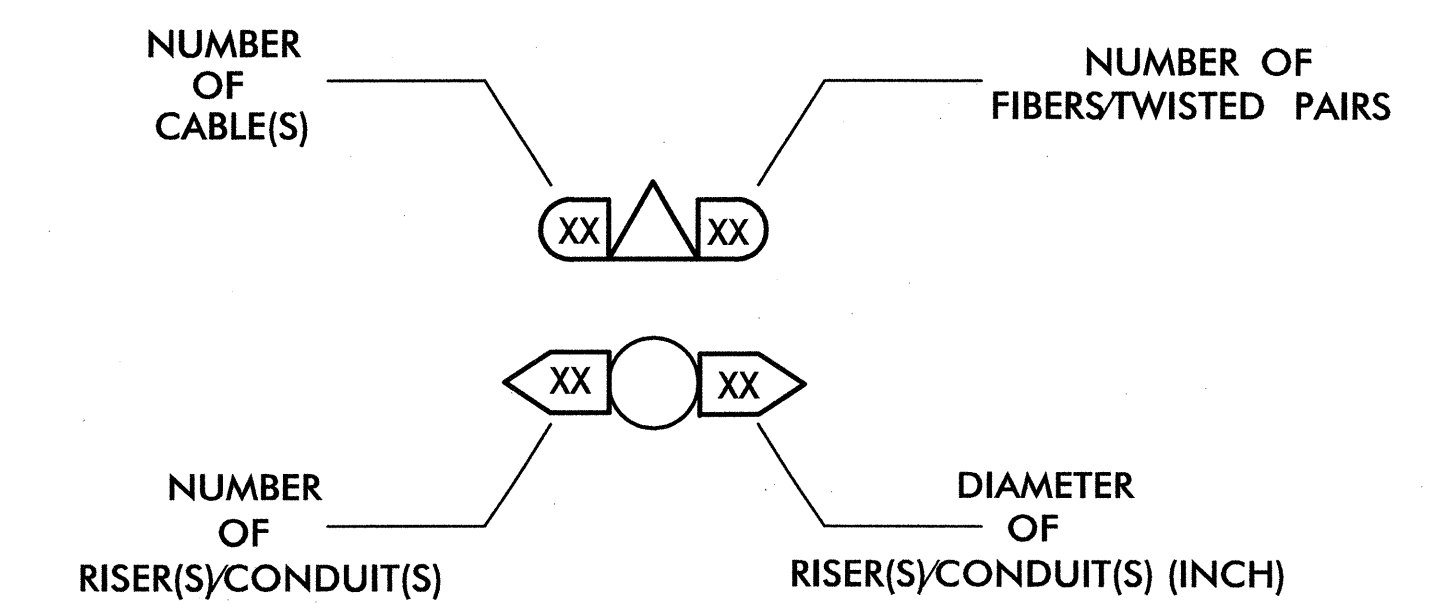
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL 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 COMMUNICATIONS CABLE
- 50 INSTALL TELEPHONE SERVICE
- 51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52 INSTALL DELINEATOR MARKER
- 53 STORE 60 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
- EX1 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
- NEW AERIAL SPLICE ENCLOSURE
- EXISTING AERIAL SPLICE ENCLOSURE
- NEW UNDERGROUND SPLICE ENCLOSURE
- NEW UNDERGROUND SPLICE ENCLOSURE IN EXISTING JUNCTION BOX
- EXISTING UNDERGROUND SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW MAST ARM
- NEW STANDARD GUY ASSEMBLY
- EXISTING STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- SP SIGNAL POLE
- XX-XXXX SIGNAL INVENTORY NUMBER

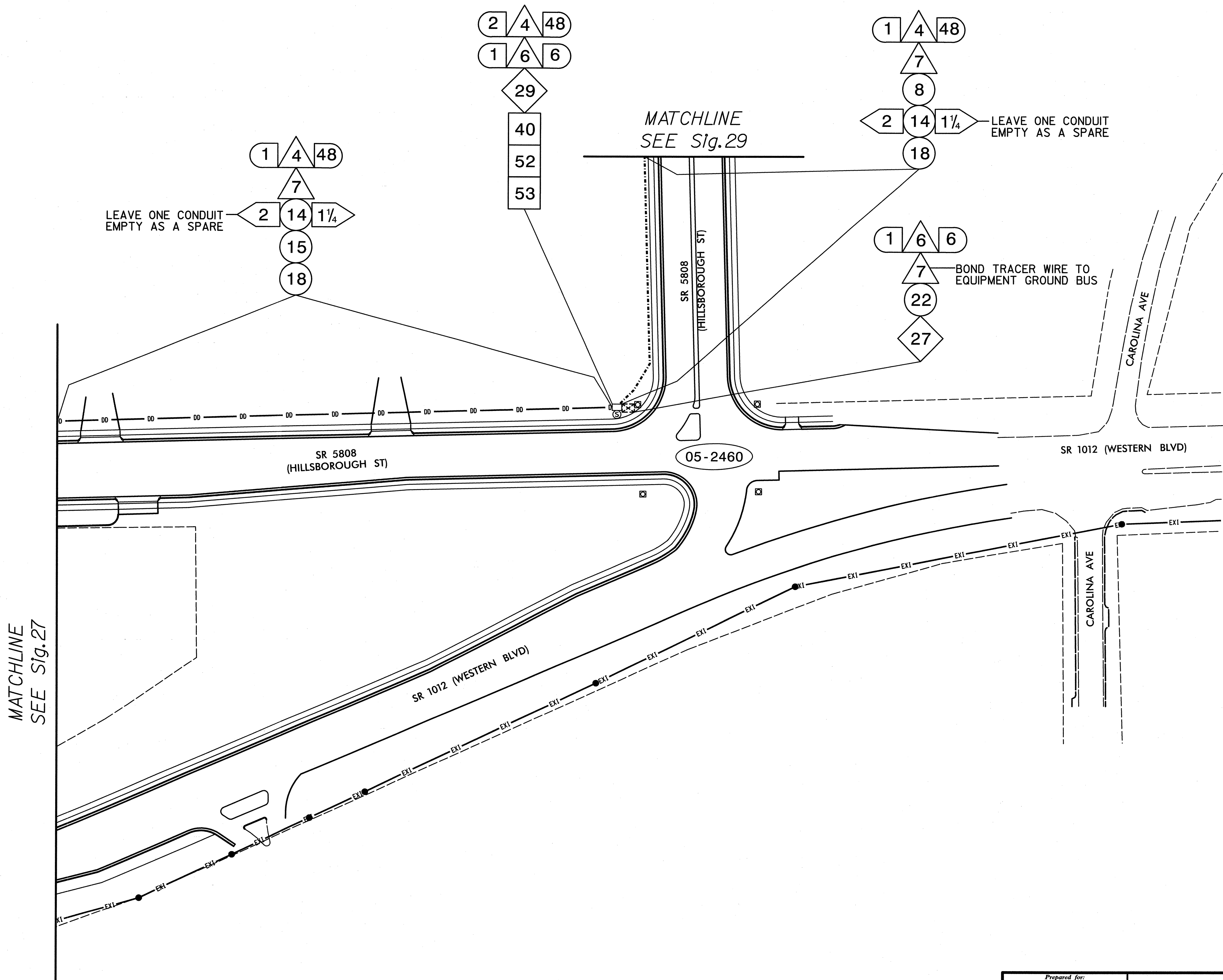
CONSTRUCTION NOTE SYMBOLOGY KEY

- 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)



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	B-4656 Construction Notes		SEAL 								
	Division 05 Wake County Raleigh PLAN DATE: April 2012 REVIEWED BY: N.M. Rodevick PREPARED BY: T.R. Terrell REVIEWED BY: H.L. Winstead	<table border="1"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REVISIONS	INIT.	DATE					
REVISIONS	INIT.	DATE									
SCALE: 0 NONE N/A		SIGNATURE: <i>H. Winstead</i> DATE: 4/11/12 CADD FILE NAME: Sig26.dgn									



- NOTES:
- DISTANCES SHOWN BETWEEN JUNCTION BOXES ARE APPROXIMATE.
 - INSTALL HEAVY DUTY JUNCTION BOXES.

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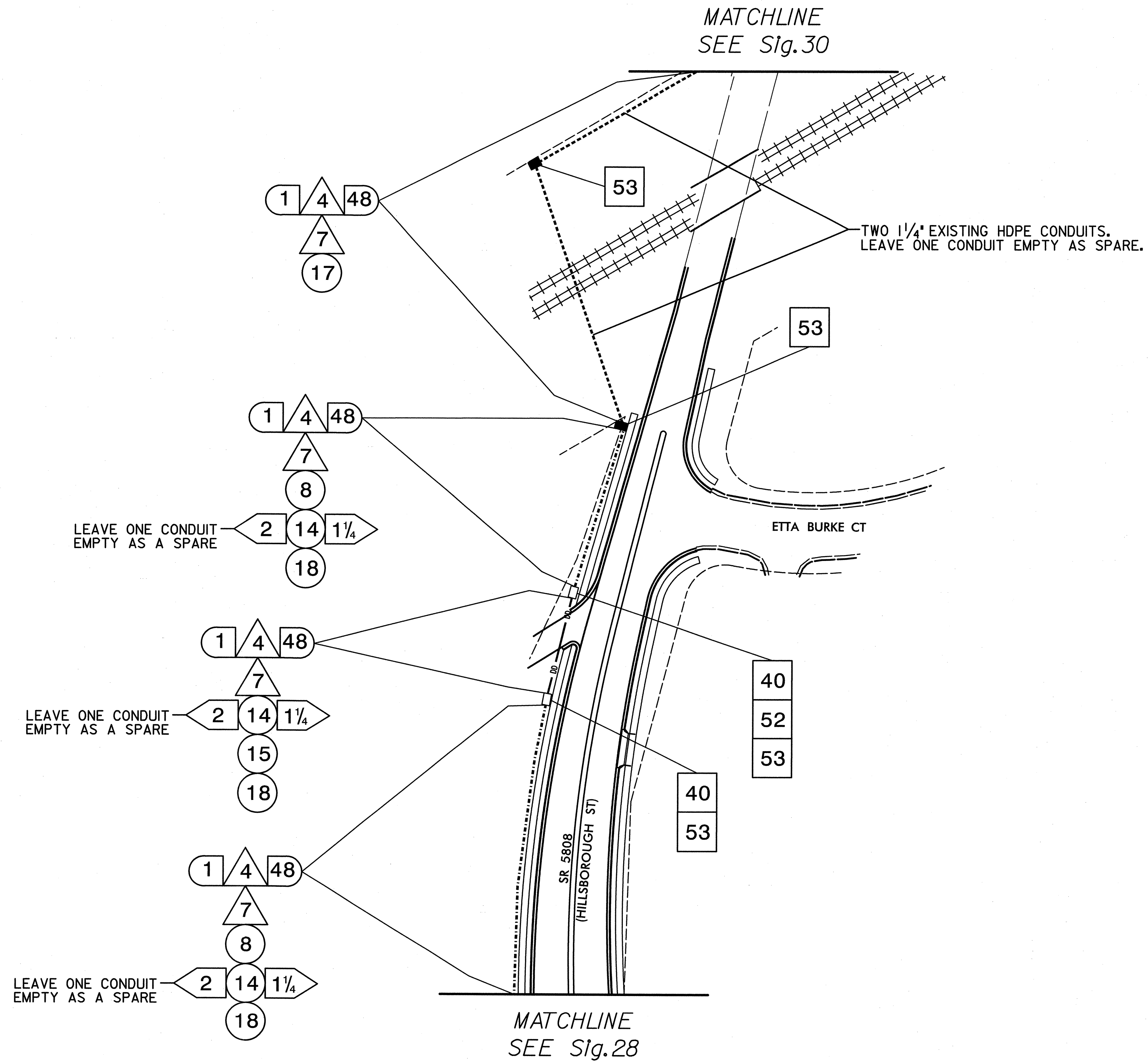
Prepared for:

 750 N. Greenfield Pkwy., Garner, NC 27529
 SCALE
 10 0 50
 1"=50'

B-4656 Communications Cable and Conduit Routing Plans	
Division 05	Wake County Raleigh
PLAN DATE: April 2012	REVIEWED BY: N.M. Rodevick
PREPARED BY: T.R. Terrell	REVIEWED BY: H.L. Winstead
REVISIONS	INIT. DATE

SEAL

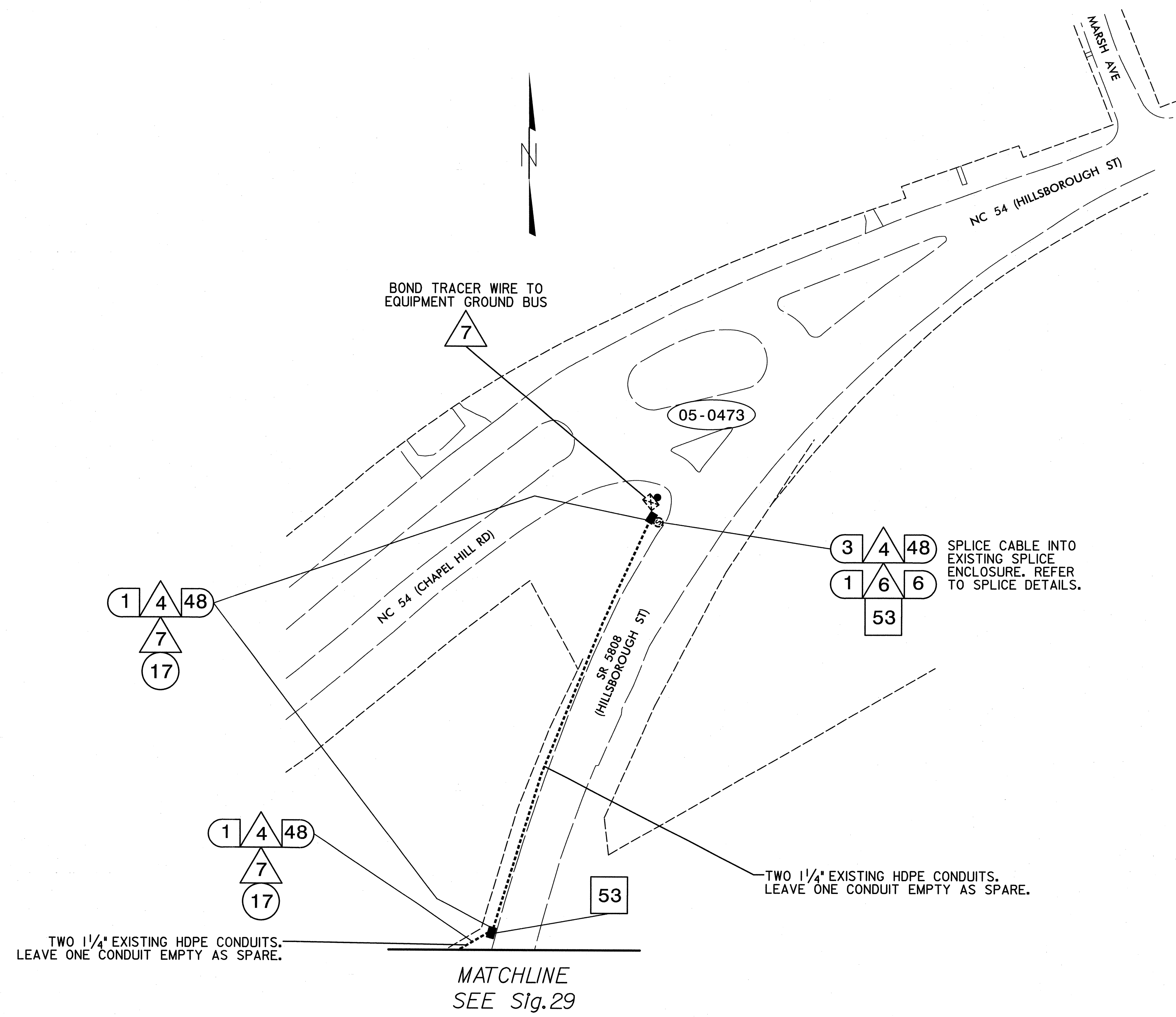
 H. L. WINSTEAD, P.E.
 SIGNATURE DATE 6/11/12
 CADD FILE NAME Sig28.dgn



- NOTES:
- DISTANCES SHOWN BETWEEN JUNCTION BOXES ARE APPROXIMATE.
 - INSTALL HEAVY DUTY JUNCTION BOXES.

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 NC License No: C-1554

	B-4656 Communications Cable and Conduit Routing Plans		SEAL
	Division 05 Wake County Raleigh PLAN DATE: April 2012 PREPARED BY: T.R. Terrell REVISIONS SCALE: 1"=50' 10 0 50	REVIEWED BY: N.M. Rodevick REVIEWED BY: H.L. Winstead INIT. DATE H.L. Winstead 4/11/12	



- NOTES:
1. DISTANCES SHOWN BETWEEN JUNCTION BOXES ARE APPROXIMATE.
 2. INSTALL HEAVY DUTY JUNCTION BOXES.

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Prepared for:

 750 N. Greenfield Pkwy., Garner, NC 27529
 SCALE
 10 0 50
 1"=50'

B-4656		Raleigh	
Communications Cable and Conduit Routing Plans			
Division 05	Wake County	Raleigh	
PLAN DATE: April 2012	REVIEWED BY: N.M. Rodevick		
PREPARED BY: T.R. Terrell	REVIEWED BY: H.L. Winstead		
REVISIONS	INIT.	DATE	

SEAL

 H. L. WINSTEAD, P.E.
 SIGNATURE DATE 6/11/12
 CADD FILE NAME Sig30.dgn

SR 1012 (WESTERN BLVD)
AT
SR 1319 /SR 5039 (JONES FRANKLIN RD)
SIG. INV. # 05-0769

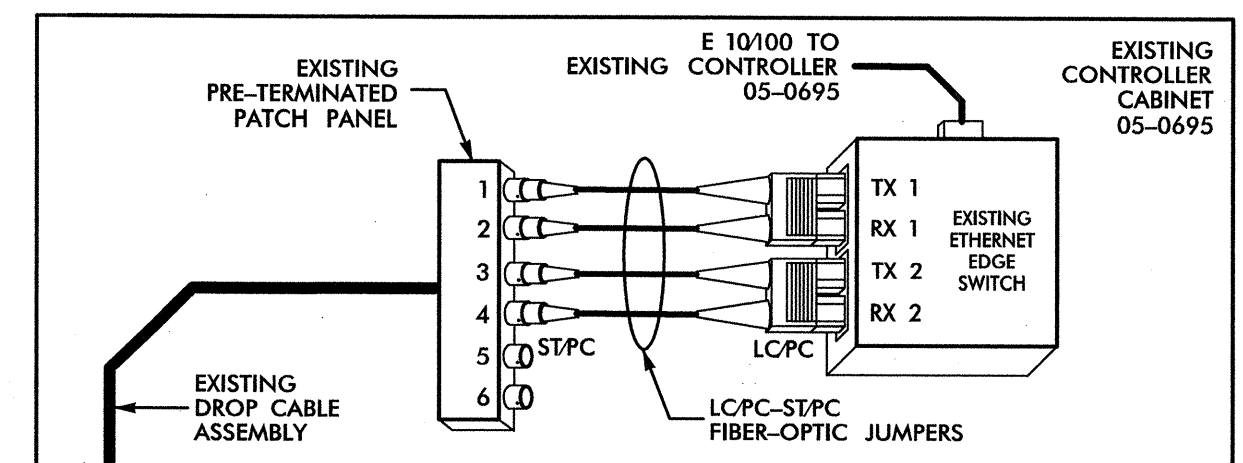
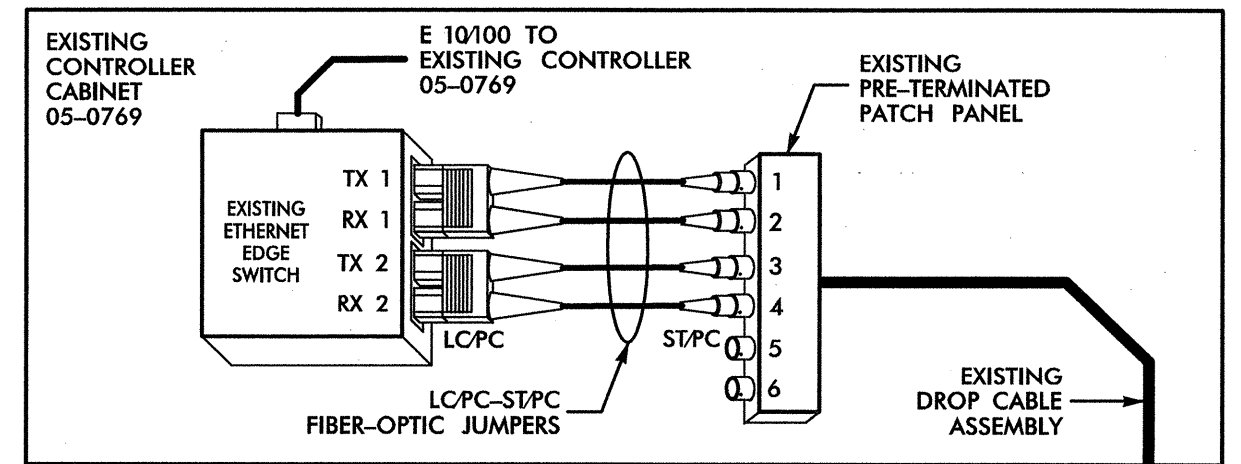
EXISTING SPLICE CONFIGURATION

PROPOSED SPLICE CONFIGURATION

EXISTING SPLICE ENCLOSURE NO.

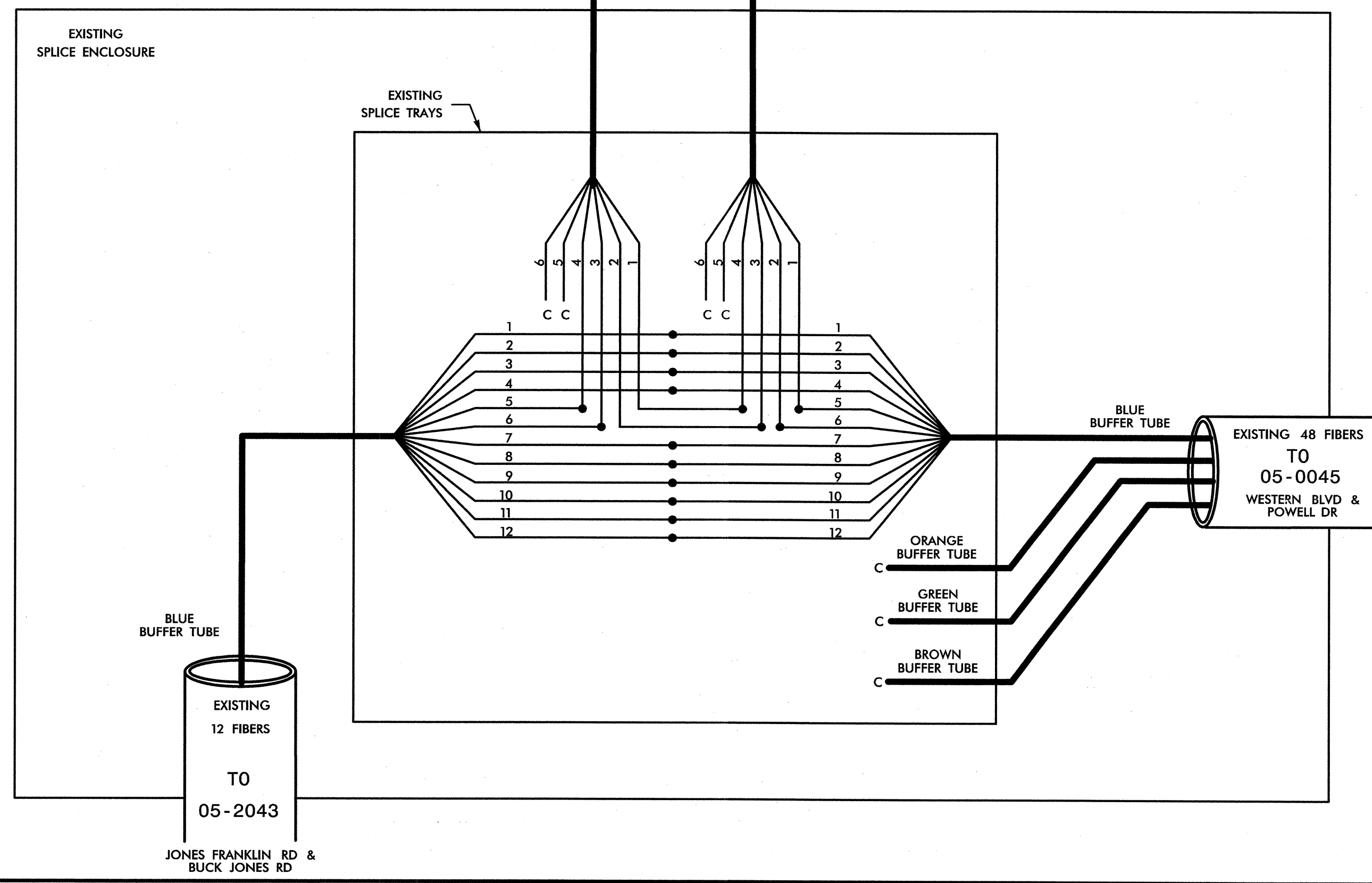
301

JONES FRANKLIN RD - WESTERN BLVD
HUB 2 - CIRCUIT 3



NOTES

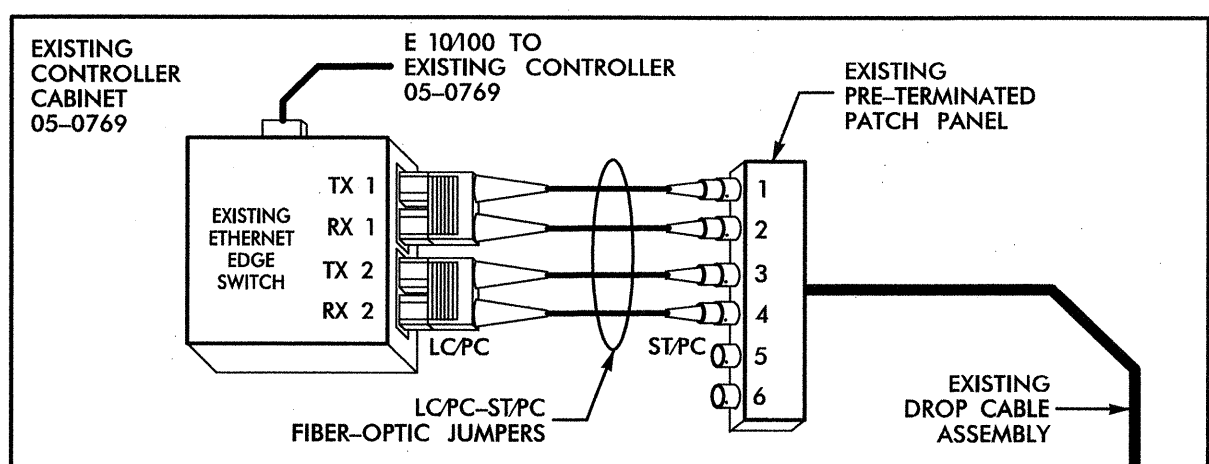
1. REMOVE THIS EXISTING DROP CABLE ASSEMBLY, WITHOUT DAMAGE, FROM THE EXISTING OVERHEAD SPLICE ENCLOSURE #301 AT 05-0769 (WESTERN BLVD AT JONES FRANKLIN RD). FULLY REMOVE DROP CABLE ASSEMBLY FROM RISER, JUNCTION BOXES, UNDERGROUND CONDUIT AND OUT THROUGH EXISTING TRAFFIC SIGNAL CABINET AT 05-0695.
2. REINSTALL THIS EXISTING DROP CABLE ASSEMBLY INTO THE NEW CABINET AT 05-0695 AND SPLICE INTO ENCLOSURE #340.



EXISTING SPLICE ENCLOSURE NO.

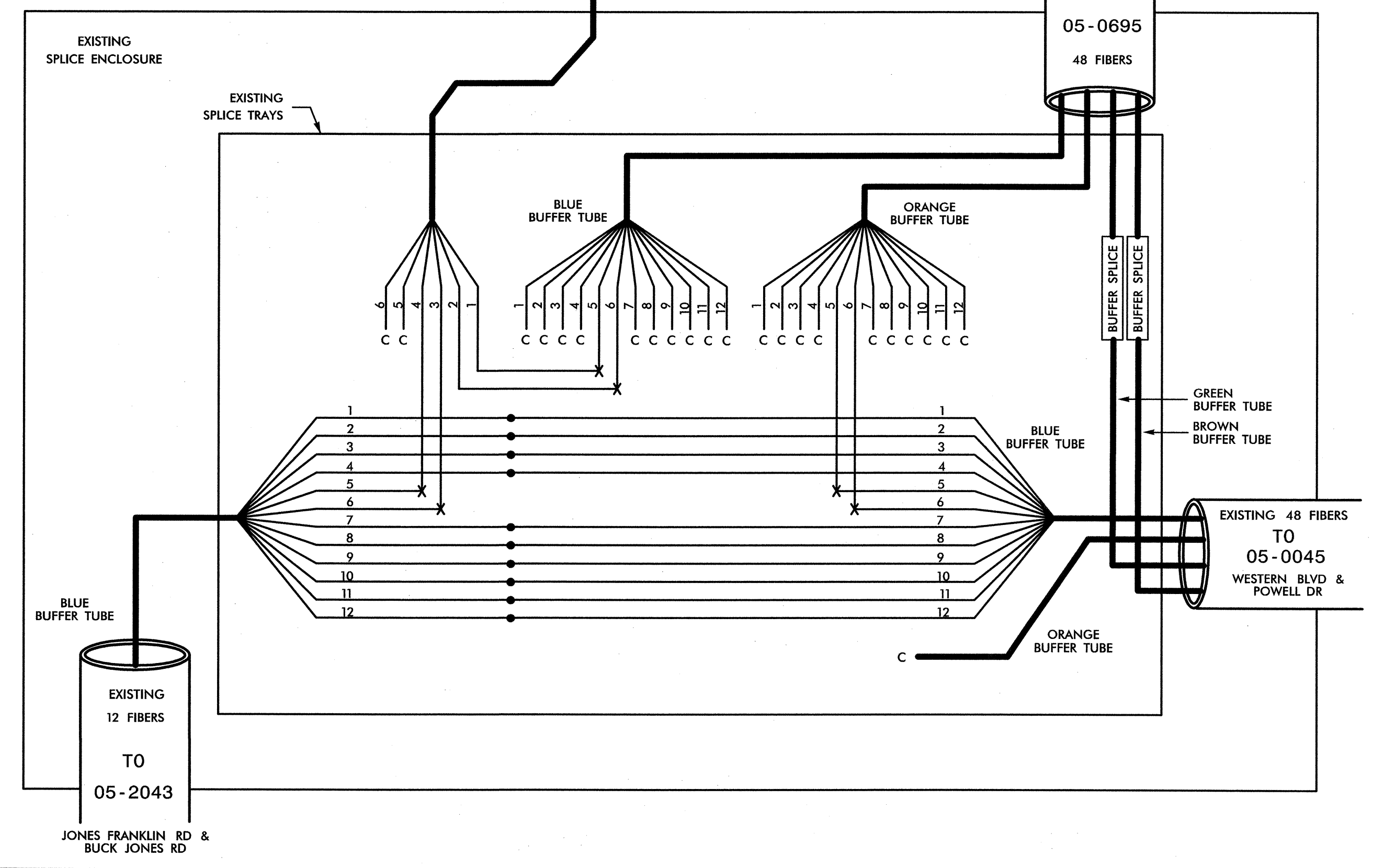
301

JONES FRANKLIN RD - WESTERN BLVD
HUB 2 - CIRCUIT 3



NOTES

1. FULLY REMOVE THIS EXISTING DROP CABLE ASSEMBLY, WITHOUT DAMAGE, FROM THE EXISTING OVERHEAD SPLICE ENCLOSURE #301 AT 05-0769 (WESTERN BLVD AT JONES FRANKLIN RD), AS WELL AS FROM RISER, UNDERGROUND CONDUIT AND EXISTING TRAFFIC SIGNAL CABINET.
2. REINSTALL THIS EXISTING DROP CABLE ASSEMBLY INTO THE NEW TRAFFIC SIGNAL CABINET EXTEND THROUGH UNDERGROUND CONDUIT INTO ADJACENT JUNCTION BOX, UP RISER AND OVER TO EXISTING OVERHEAD SPLICE ENCLOSURE.
3. SPLICE DROP CABLE ASSEMBLY BACK INTO EXISTING SPLICE ENCLOSURE #301 AS SHOWN HERE.
4. LEAVE 15' OF SLACK CABLE COILED IN THE CABINET. AFTER SPLICING AND REATTACHING SPLICE ENCLOSURE TO MESSENGER CABLE, STORE ANY REMAINING SPARE CABLE IN THE JUNCTION BOX.
5. REMOVE EXISTING ETHERNET EDGE SWITCH, POWER CORD, FIBER OPTIC JUMPERS AND ETHERNET CABLE FROM OLD CABINET AND REINSTALL INTO NEW CABINET.



LEGEND

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

X = NEW FUSION SPLICE INDIVIDUAL FIBER
 ● = EXISTING FUSION SPLICE
 C = CAP AND SEAL
 EXPRESS = EXPRESS ENTIRE BUFFER TUBE THROUGH WITHOUT CUTTING
 BUFFER SPLICE = SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

- NOTES**
1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
 2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

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	B-4656 Fiber Optic Splice Plans			
	Division 05	Wake County		Raleigh
	PLAN DATE: April 2012	REVIEWED BY: N.M. Rodevick		
	PREPARED BY: A.D. Klinknsiek	REVIEWED BY: H.L. Winstead		
SCALE: NONE		REVISIONS:	INIT. DATE	
		SIGNATURE: <i>H. L. Winstead</i> DATE: 6/1/12		
		CADD FILE NAME: Sig31.dgn		

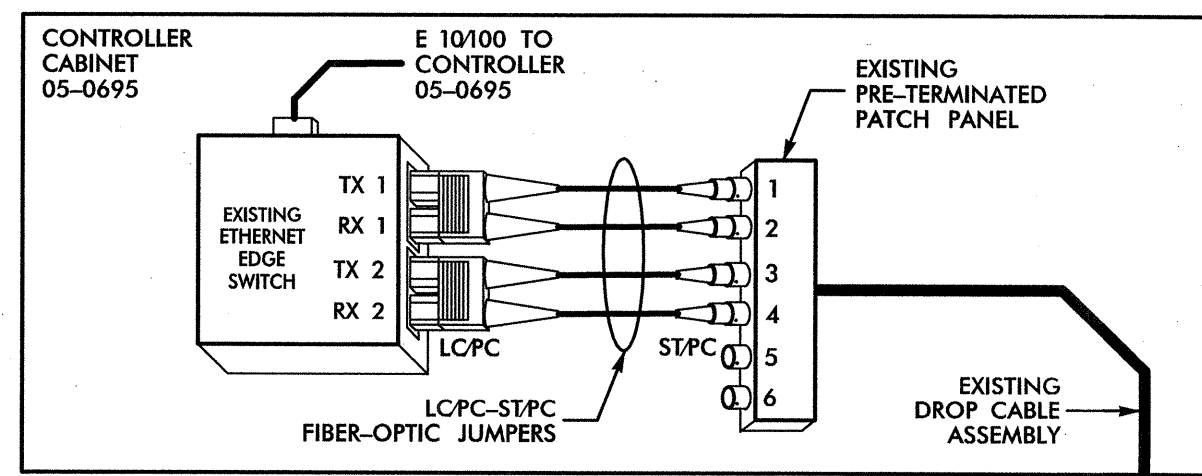
SR 5808 (HILLSBOROUGH ST)
AT
SR 5039 (JONES FRANKLIN RD)
SIG. INV. # 05-0695

SR 1012 (WESTERN BLVD)
AT
SR 5808 (HILLSBOROUGH ST)
SIG. INV. # 05-2460

NEW
SPLICE ENCLOSURE NO.

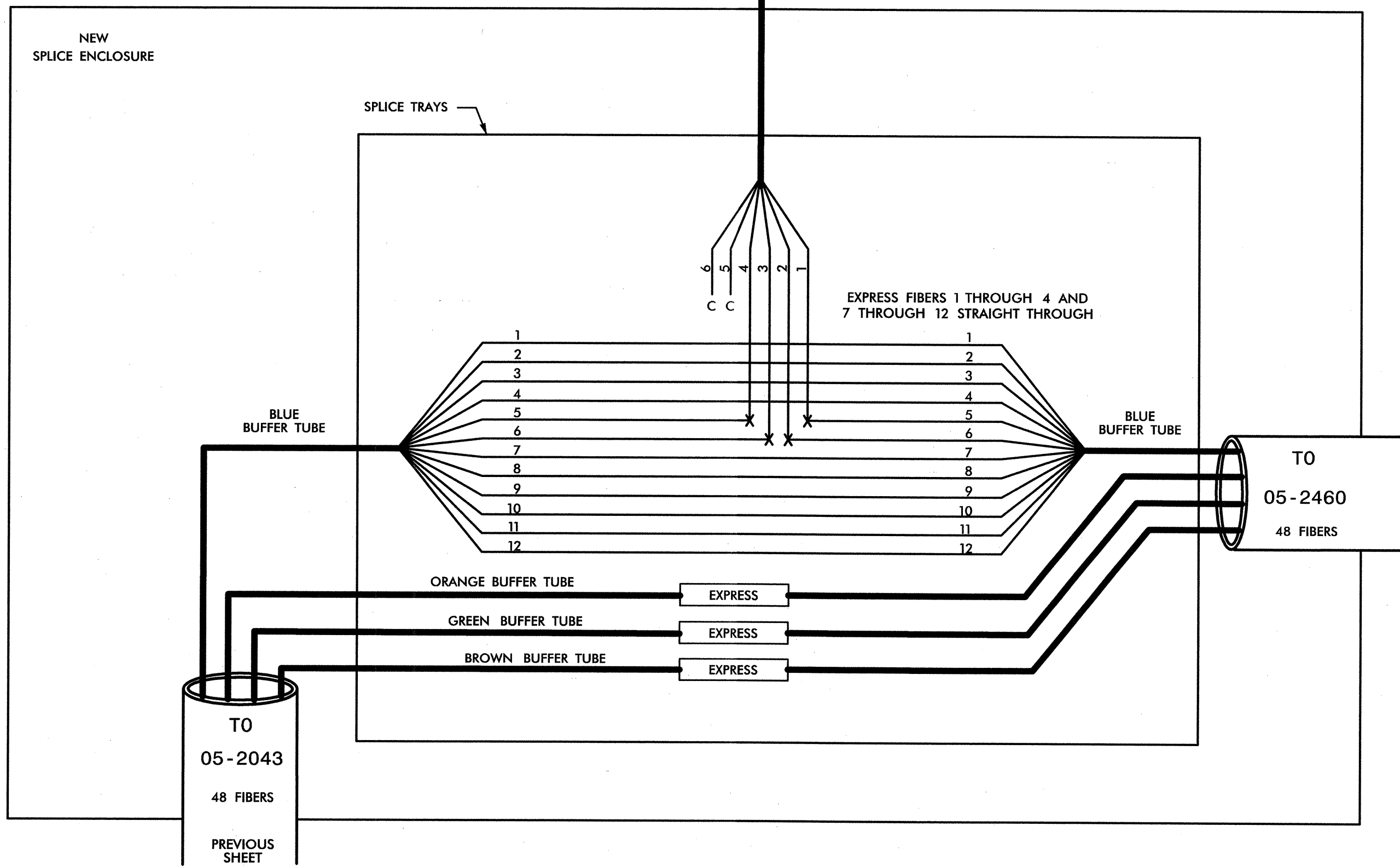
340

HILLSBOROUGH ST - JONES FRANKLIN RD
HUB 2 - CIRCUIT 3



NOTES

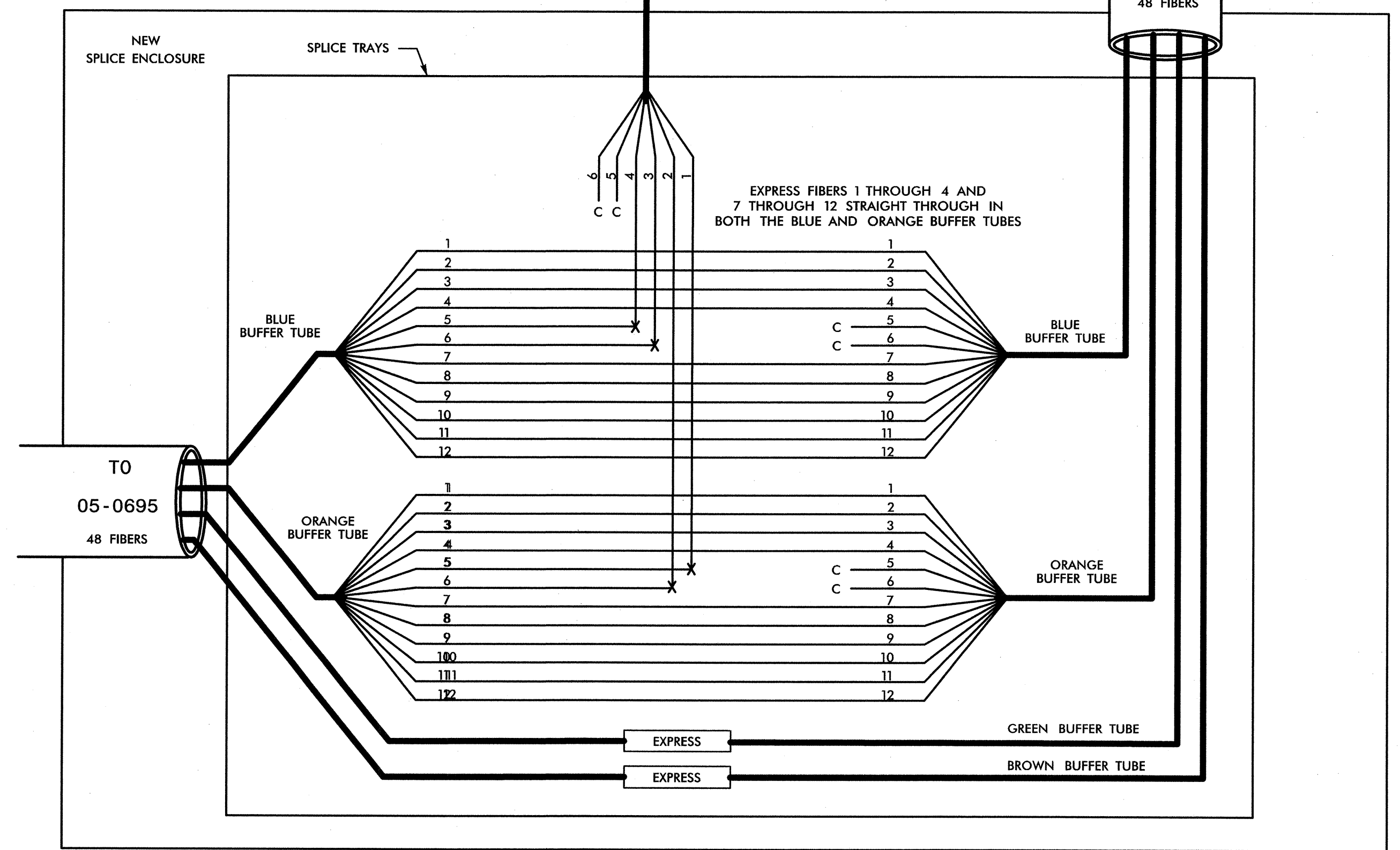
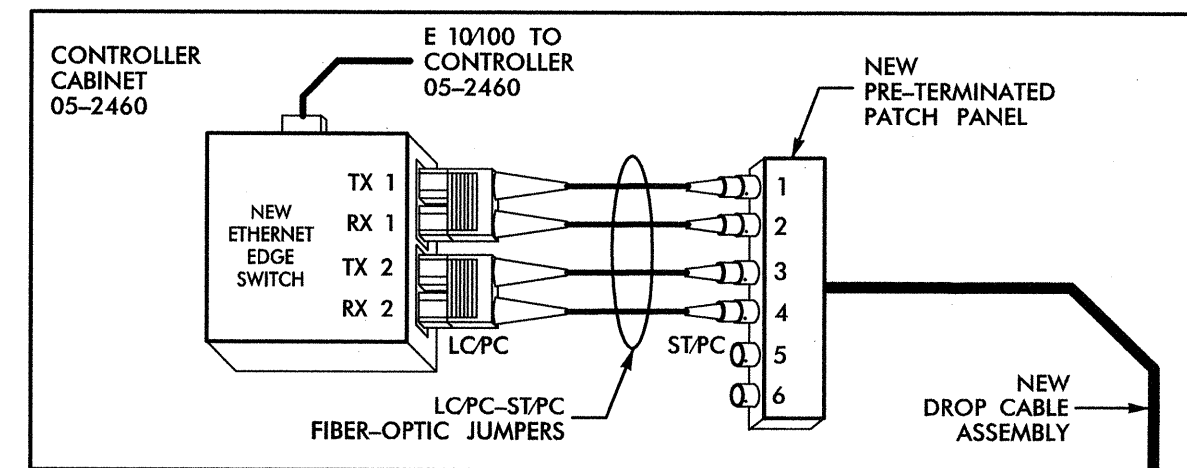
1. REINSTALL THIS EXISTING DROP CABLE ASSEMBLY (PREVIOUSLY REMOVED) INTO THE NEW TRAFFIC SIGNAL CABINET AT 05-0695 (HILLSBOROUGH ST AT JONES FRANKLIN RD), AND EXTEND INTO ADJACENT JUNCTION BOX. LEAVE 15' OF SLACK CABLE COILED IN THE CABINET AND 30' OF SPARE CABLE IN THE JUNCTION BOX.
2. TRIM OFF EXCESS CABLE AND SPLICE DROP CABLE ASSEMBLY INTO NEW 48-FIBER CABLE AS SHOWN HERE.
3. REMOVE EXISTING ETHERNET EDGE SWITCH, POWER CORD, FIBER OPTIC JUMPERS AND ETHERNET CABLE FROM OLD CABINET AND REINSTALL INTO NEW CABINET.



NEW
SPLICE ENCLOSURE NO.

644

WESTERN BLVD - HILLSBOROUGH ST
HUB 2 - CIRCUIT 3



COLOR CODE
TIA/EIA 598-A

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

LEGEND

X = NEW FUSION SPLICE INDIVIDUAL FIBER
● = EXISTING FUSION SPLICE
C = CAP AND SEAL

EXPRESS = EXPRESS ENTIRE BUFFER TUBE THROUGH WITHOUT CUTTING
BUFFER SPLICE = SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

NOTES

1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

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NC License No: C-1554

	Prepared for: Mobility and Safety Division DEPARTMENT OF TRANSPORTATION		B-4656 Fiber Optic Splice Plans		SEAL NORTH CAROLINA PROFESSIONAL SEAL 07983 HANLEY L. WINSTEAD, P.E.
	Division 05 Wake County Raleigh	PLAN DATE: April 2012	REVIEWED BY: N.M. Rodevick	PREPARED BY: A.D. Klinksiek	
SCALE NONE	REVISIONS	INIT.	DATE	SIGNATURE DATE 6/11/12	SEAL

CADD FILE NAME Sig32.dgn

NC 54 (CHAPEL HILL RD /HILLSBOROUGH ST)
 AT
 SR 5808 (HILLSBOROUGH ST)
 SIG. INV. # 05-0473

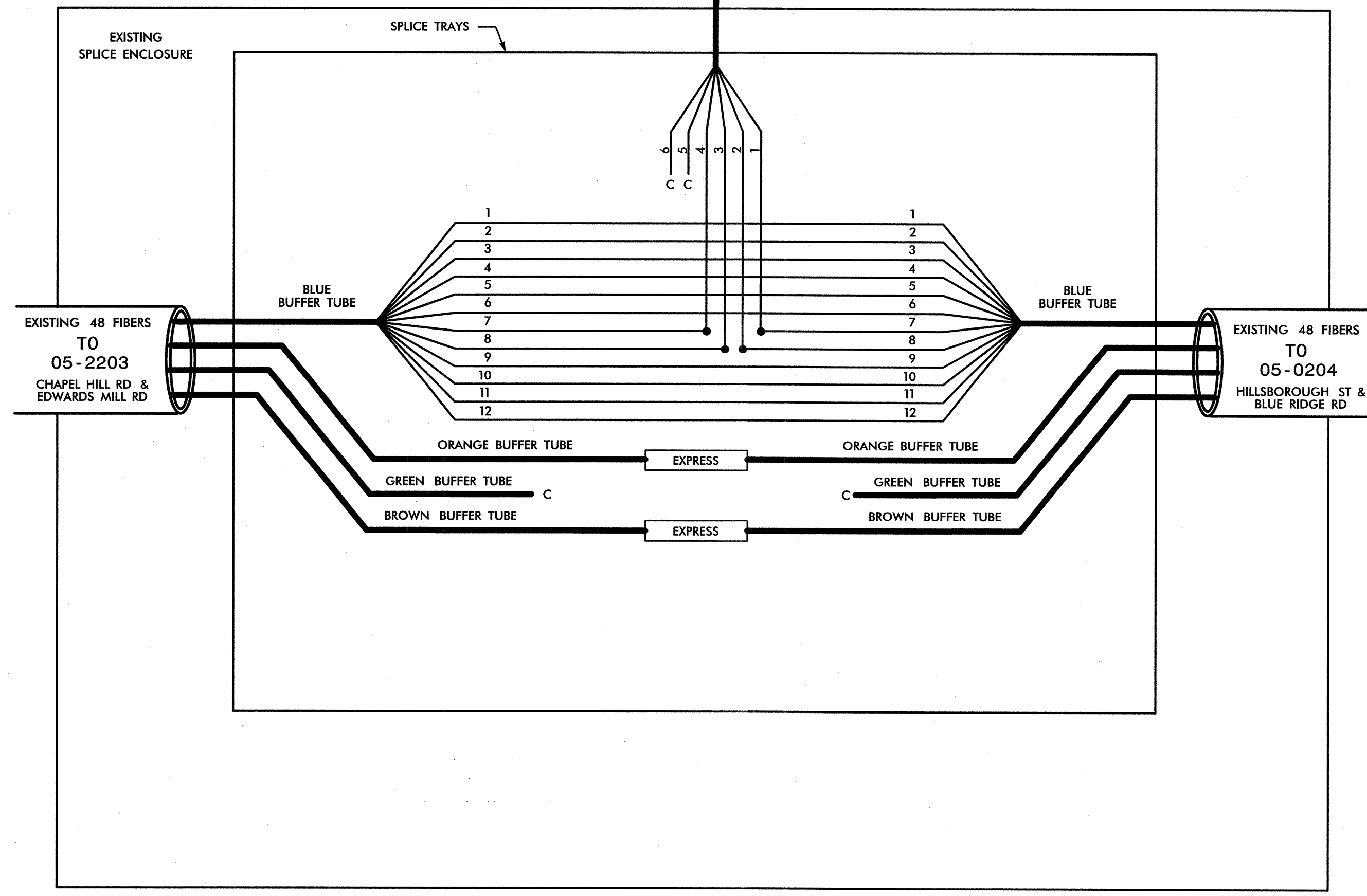
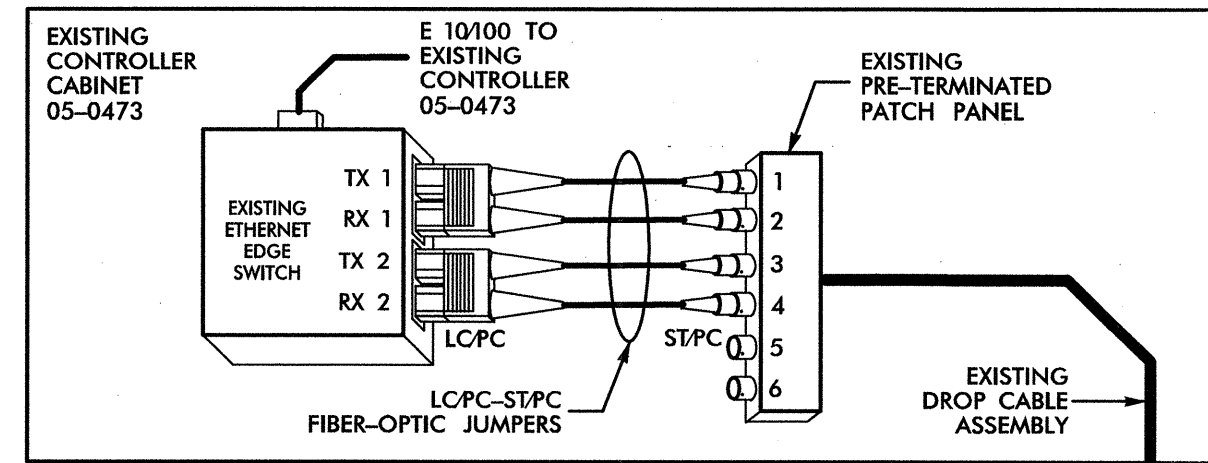
EXISTING SPLICE CONFIGURATION

PROPOSED SPLICE CONFIGURATION

EXISTING SPLICE ENCLOSURE NO.

526

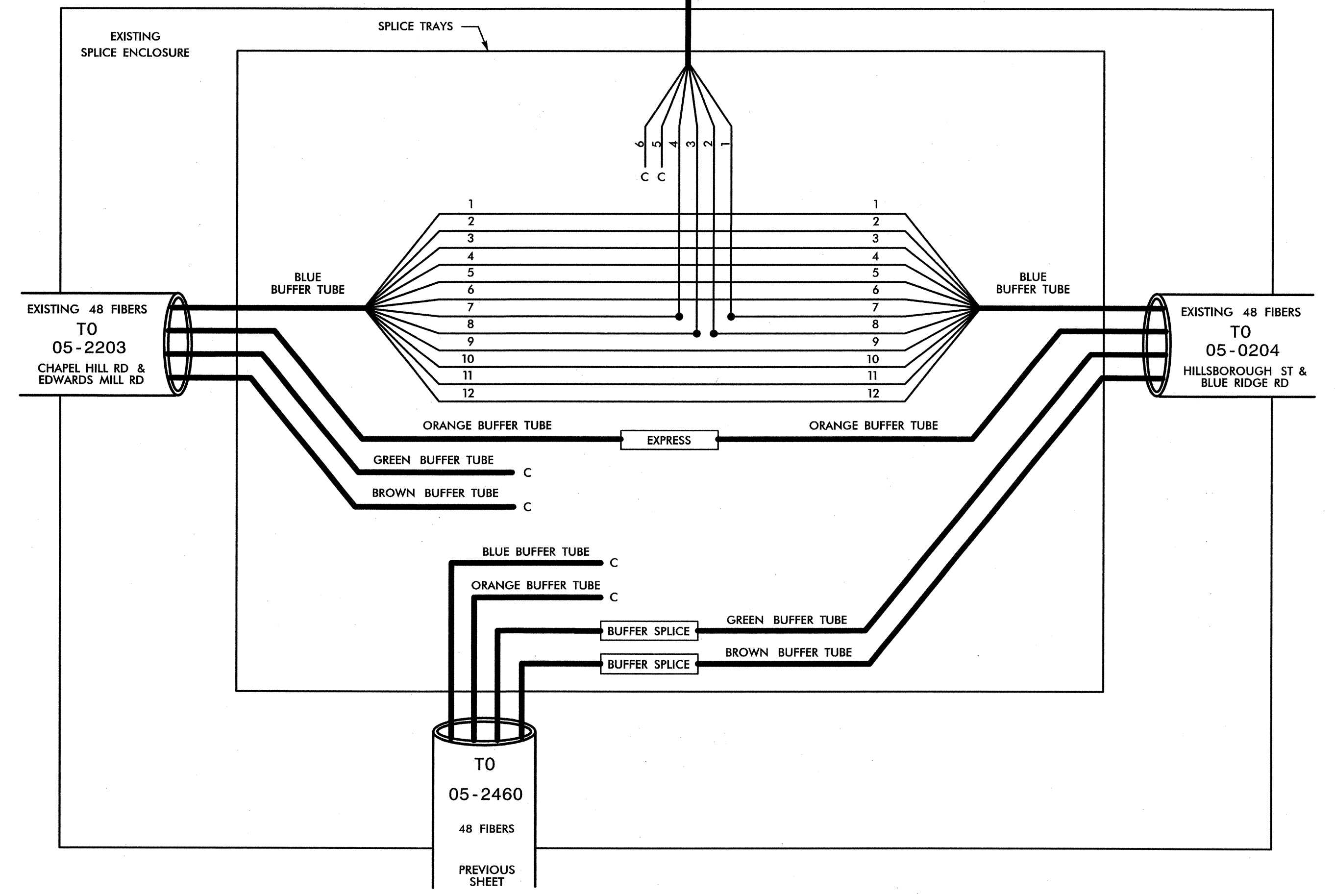
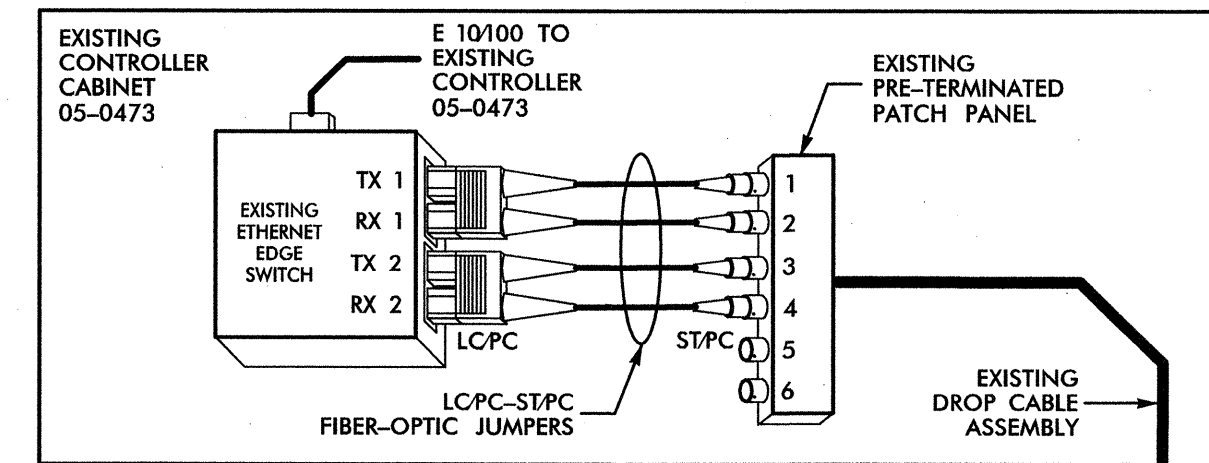
CHAPEL HILL RD - HILLSBOROUGH ST
 HUB 3A - CIRCUIT 4



EXISTING SPLICE ENCLOSURE NO.

526

CHAPEL HILL RD - HILLSBOROUGH ST
 HUB 3A - CIRCUIT 4

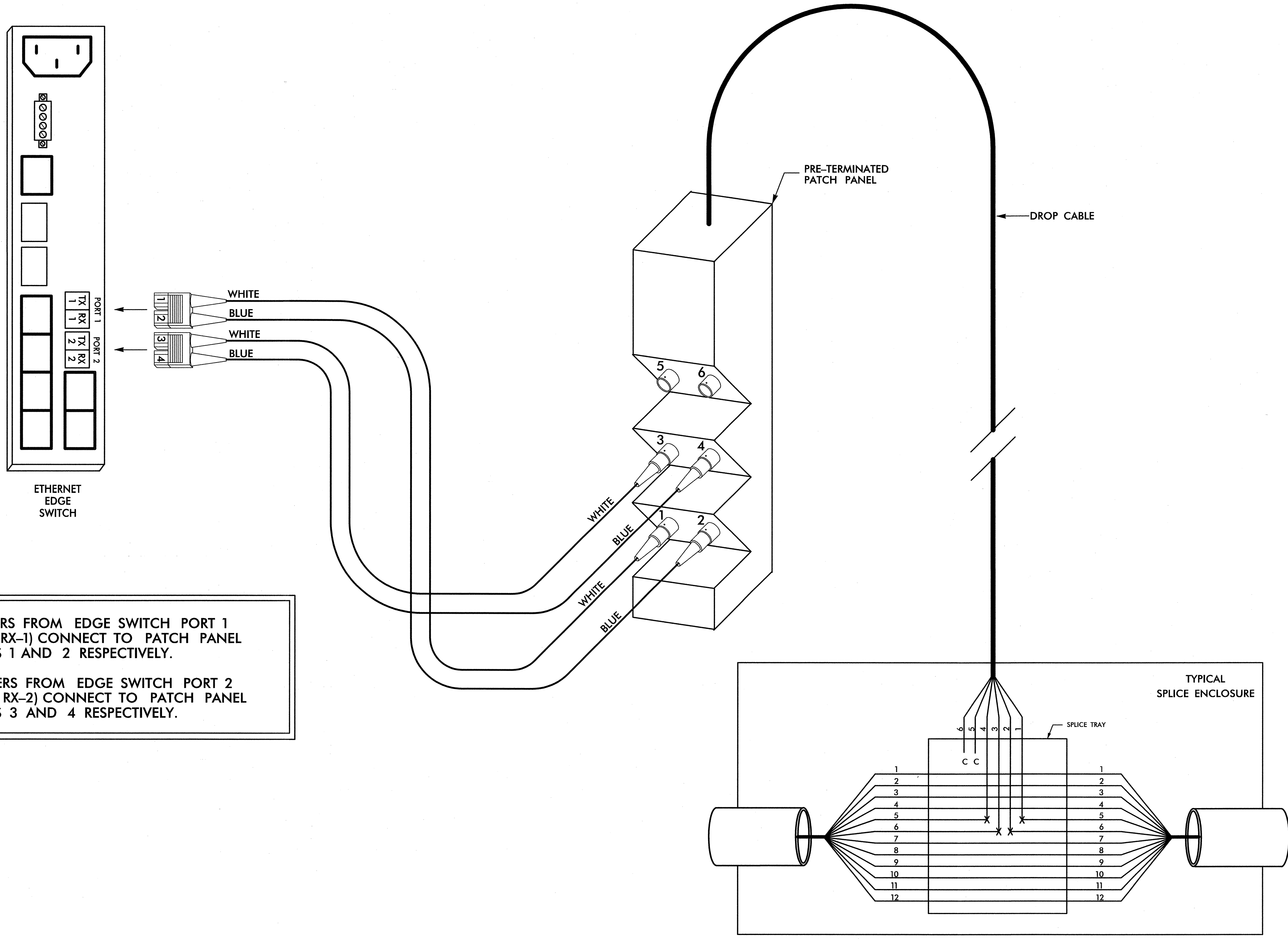


COLOR CODE		LEGEND	
TIA/EIA 598-A			
(1) BLUE	(7) RED	X = NEW FUSION SPLICE INDIVIDUAL FIBER	
(2) ORANGE	(8) BLACK	• = EXISTING FUSION SPLICE	
(3) GREEN	(9) YELLOW	C = CAP AND SEAL	
(4) BROWN	(10) VIOLET	EXPRESS = EXPRESS ENTIRE BUFFER TUBE THROUGH WITHOUT CUTTING	
(5) SLATE	(11) ROSE	BUFFER SPLICE = SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR	
(6) WHITE	(12) AQUA		

NOTES	
1.	UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
2.	UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

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 Raleigh, North Carolina 27609
 NC License No: C-1554

	Prepared for: B-4656 Fiber Optic Splice Plans		SEAL NORTH CAROLINA PROFESSIONAL SEAL 07983 HAYLEY L. WINSTEAD, ENGR.	
	Division 05 Wake County Raleigh			
	PLAN DATE: April 2012 REVIEWED BY: N.M. Rodevick			
	PREPARED BY: A.D. Klinksiek REVIEWED BY: H.L. Winstead			
SCALE NONE	REVISIONS INIT. DATE			
TO 05-2460 48 FIBERS PREVIOUS SHEET			SIGNATURE DATE H.L. Winstead 6/11/12	
			CADD FILE NAME Sig33.dgn	



1. JUMPERS FROM EDGE SWITCH PORT 1 (TX-1, RX-1) CONNECT TO PATCH PANEL PORTS 1 AND 2 RESPECTIVELY.
2. JUMPERS FROM EDGE SWITCH PORT 2 (TX-2, RX-2) CONNECT TO PATCH PANEL PORTS 3 AND 4 RESPECTIVELY.

HNTB HNTB NORTH CAROLINA, P.C.
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 Raleigh, North Carolina 27609
 NC License No: C-1554

	B-4656 Fiber Optic Jumper Connections		
	Division 05 Wake County Raleigh		
	PLAN DATE: April 2012	REVIEWED BY: N.M. Rodevick	
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SCALE NONE	REVISIONS	INIT. DATE	SIGNATURE DATE <i>H. Winstead</i> 6/11/12
CADD FILE NAME: Sig34.dgn			