

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

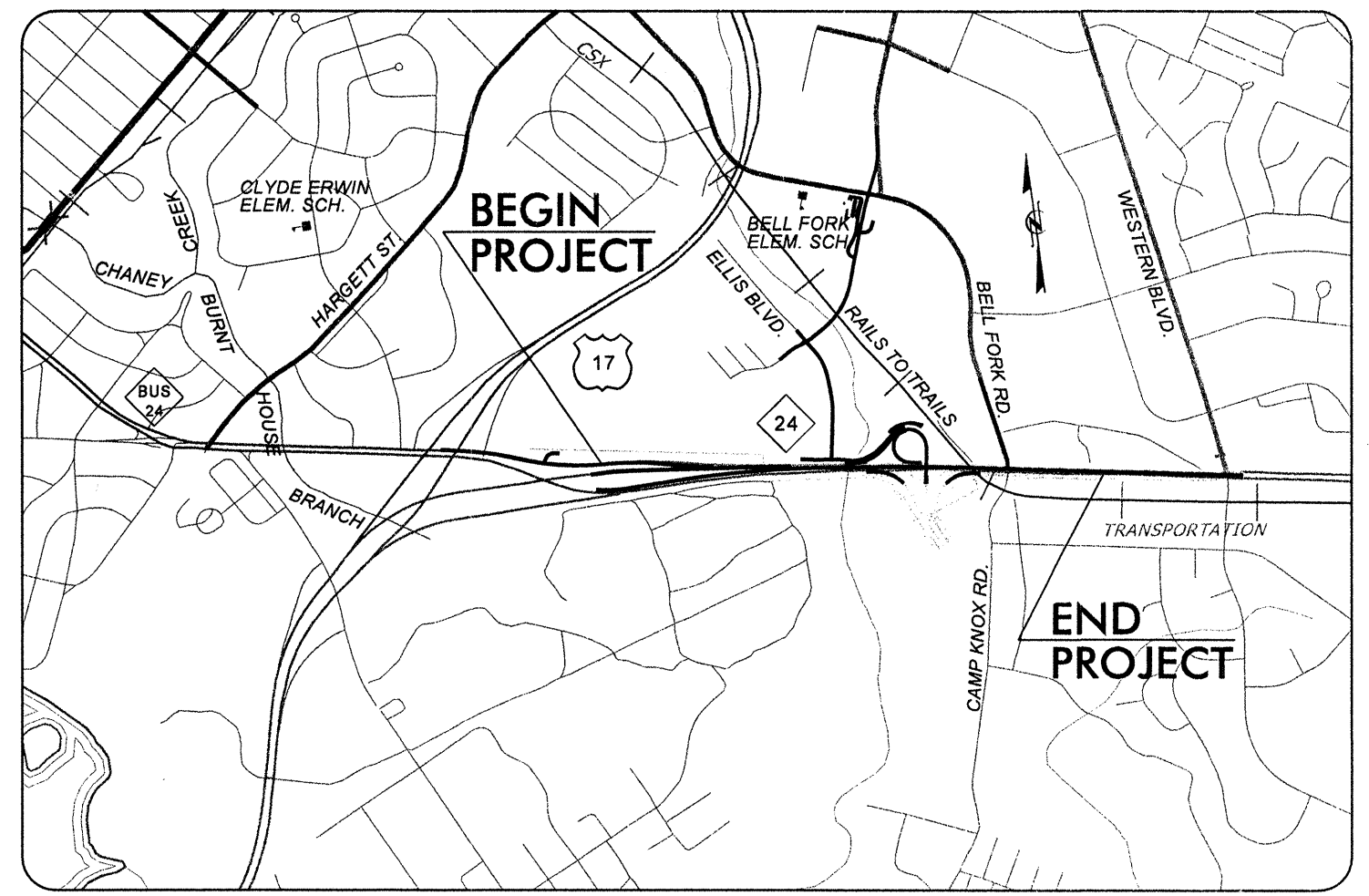
ONslow COUNTY

**LOCATION: NEW NC 24 ACCESS AND NEW BASE ENTRY ROAD
FOR CAMP LEJEUNE MARINE CORPS BASE**

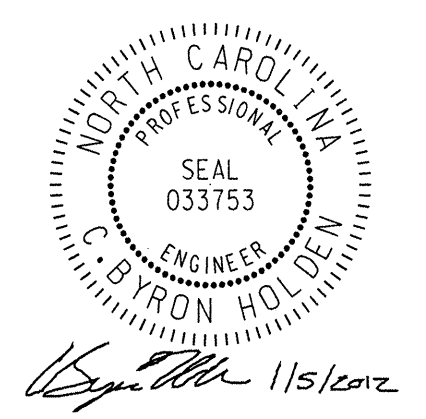
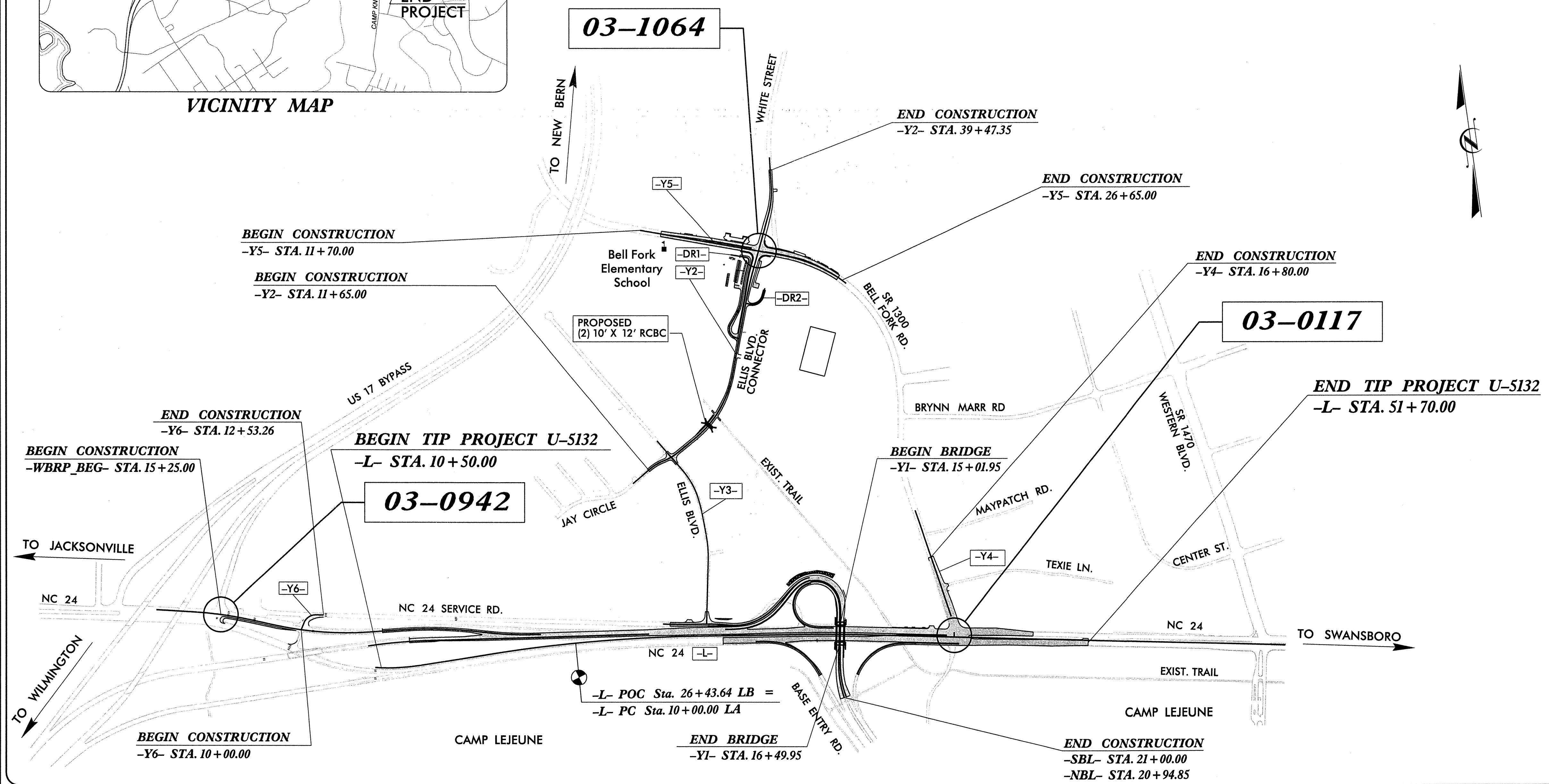
TYPE OF WORK: TRAFFIC SIGNALS

TIP PROJECT: U-5132

CONTRACT: C202816



VICINITY MAP



Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1		Title Sheet
Sig. 2-4	03-0942	NC 24 AT US 17 BYPASS NORTHBOUND RAMP
Sig. 5-6	03-0117T1	NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)
Sig. 7	03-0117T2	NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)
Sig. 8-9	03-0117T3	NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)
Sig. 10-11	03-0117	NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)
Sig. 12-16	03-1064	SR 1308 (BELL FORK RD.) AT ELLIS BLVD. CONNECTOR/WHITE ST.
Sig. 17-24	N/A	METAL STRAIN POLE AND MAST ARM TYPICALS

PLANS PREPARED BY :

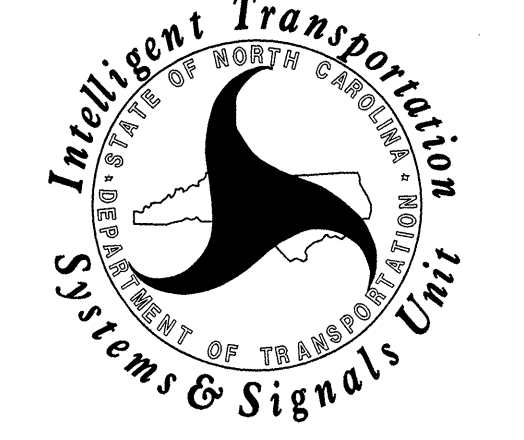


RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE, SUITE 350
RALEIGH, NORTH CAROLINA 27609
NC LICENSE NO. F-0112

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

Contacts:
Pamela L. Alexander, PE - Eastern Region Signals Engineer
George C. Brown, PE - Signal Equipment Design Engineer
Greg Fuller, PE - Intelligent Transportation Systems Engineer

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION



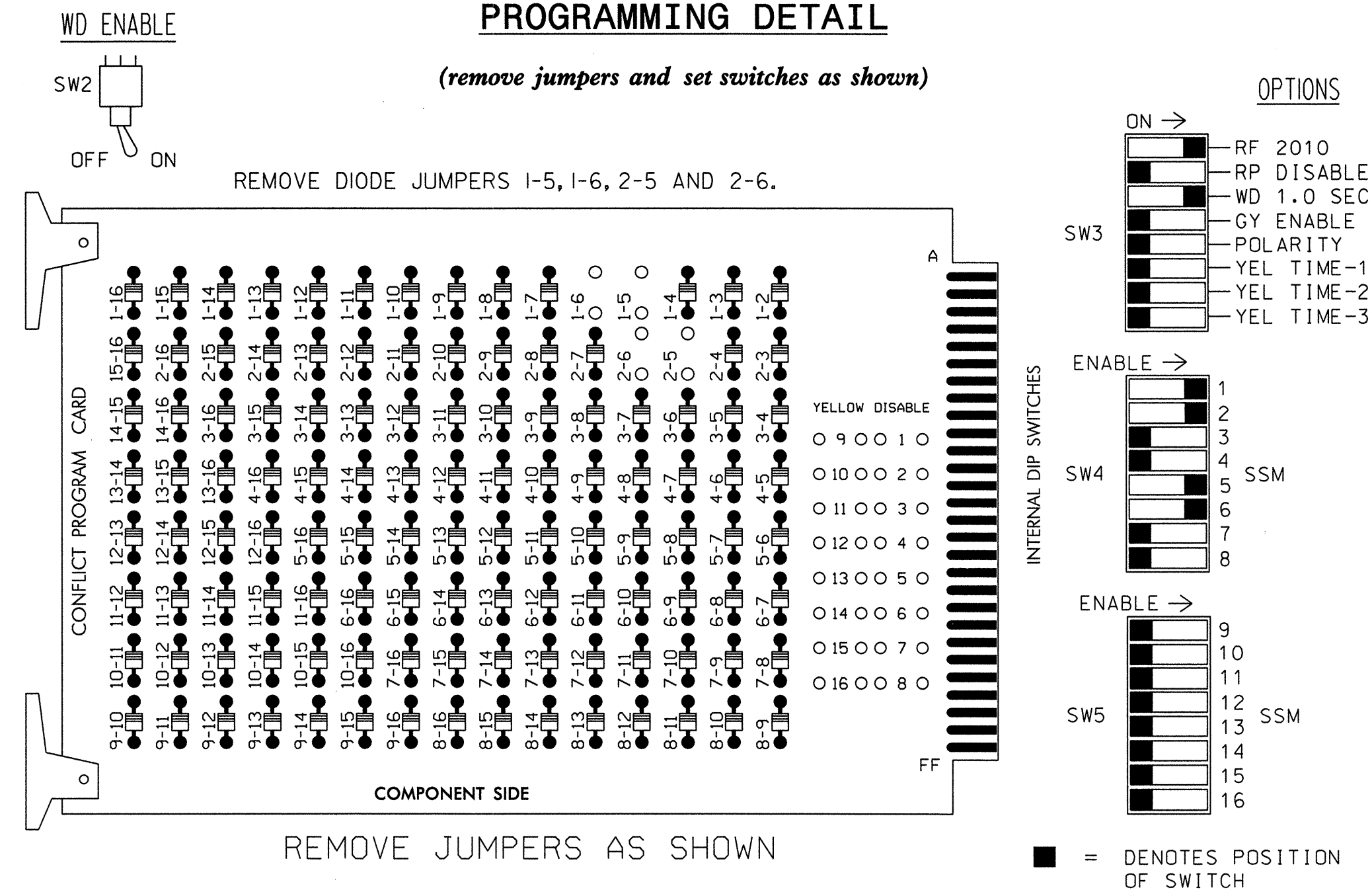
750 N. Greenfield Parkway, Garner, NC 27529

1/5/2012 R:\TrafficSignals\SIGNALS\U5132-sig_1-sh.dgn bholde

EDI MODEL 2010ECL CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

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

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.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 3,4,7,8, 9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Jacksonville City Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	NU	NU	NU	NU	51,52	61,62,63	NU	NU	NU	NU
RED		128						134				
YELLOW		129						135				
GREEN		130						136				
RED ARROW	125						131					
YELLOW ARROW	126						132					
GREEN ARROW	127						133					

NU = Not Used

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
 CABINET.....EXISTING 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...12
 LOAD SWITCHES USED.....S1,S2,S5,S6
 PHASES USED.....1,2,5,6
 OVERLAPS.....NONE

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2	∅ 2
L	1A	2A	2C	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B	2B
U	NOT USED	∅ 2	NOT USED	∅ 5	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
L	5A	6A	6C	5B	6B	6B	6B	6B	6B	6B	6B	6B	6B	6B

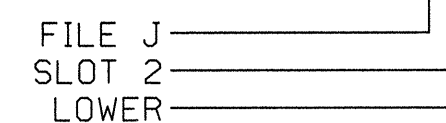
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



PHASE SEQUENCE PROGRAMMING DETAIL

(program controller as shown below)

FROM OASIS LOCAL CONTROLLER MAIN MENU
 SELECT: 4 PHASE SEQUENCE

PHASE SEQUENCE: PAGE 1	NEXT: PAGES)						
RNG:LEAD	BARRIER 1	X-LAG	LEAD	BARRIER 2	X-LAG		
1 1	2	0	0	9	0	0	0
2 5	6	0	0	0	0	0	0
3 0	0	0	0	0	0	0	0
4 0	0	0	0	0	0	0	0

Phase 9 utilized to enable sequence page change during coordination, if necessary.

1/12/2012 R:\Mtr\off\TrafficSignal\ME\lectr\Loc\Detail\5132_elec_03-0942.dgn N.Bisby

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0942
 DESIGNED: January 2012
 SEALED: JANUARY 5, 2012
 REVISED:

PLANS PREPARED BY :

RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560

SIGNAL UPGRADE - FINAL DESIGN

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared For the Offices of:

NC 24 AT US 17 BYPASS NORTHBOUND RAMP

DIVISION 3 ONSLOW COUNTY JACKSONVILLE

PLAN DATE: January 2012 REVIEWED BY: K. Bisby

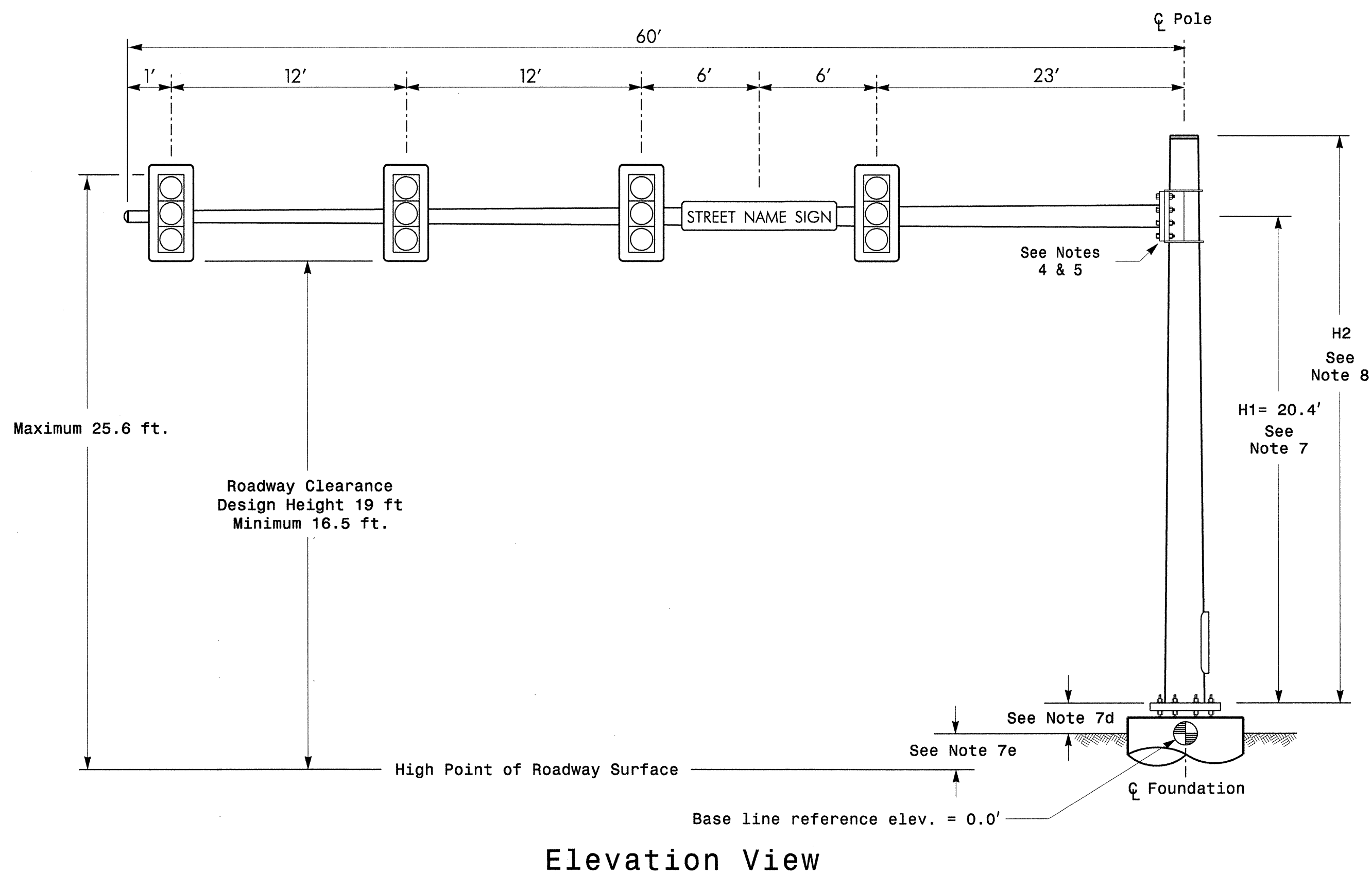
PREPARED BY: N. Harris REVIEWED BY:

REVISIONS: INIT. DATE

SIGNATURE: DATE

SIG. INVENTORY NO. 03-0942

Design Loading for METAL POLE NO. 1

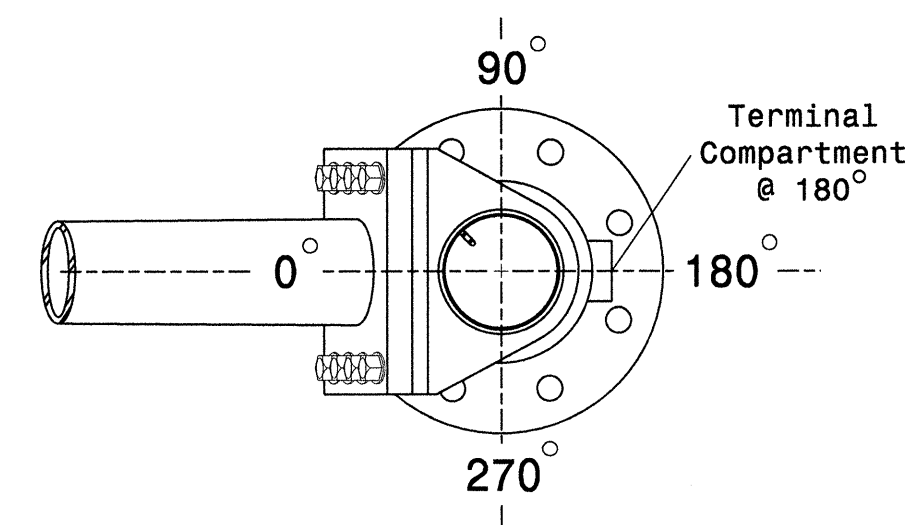


Elevation View

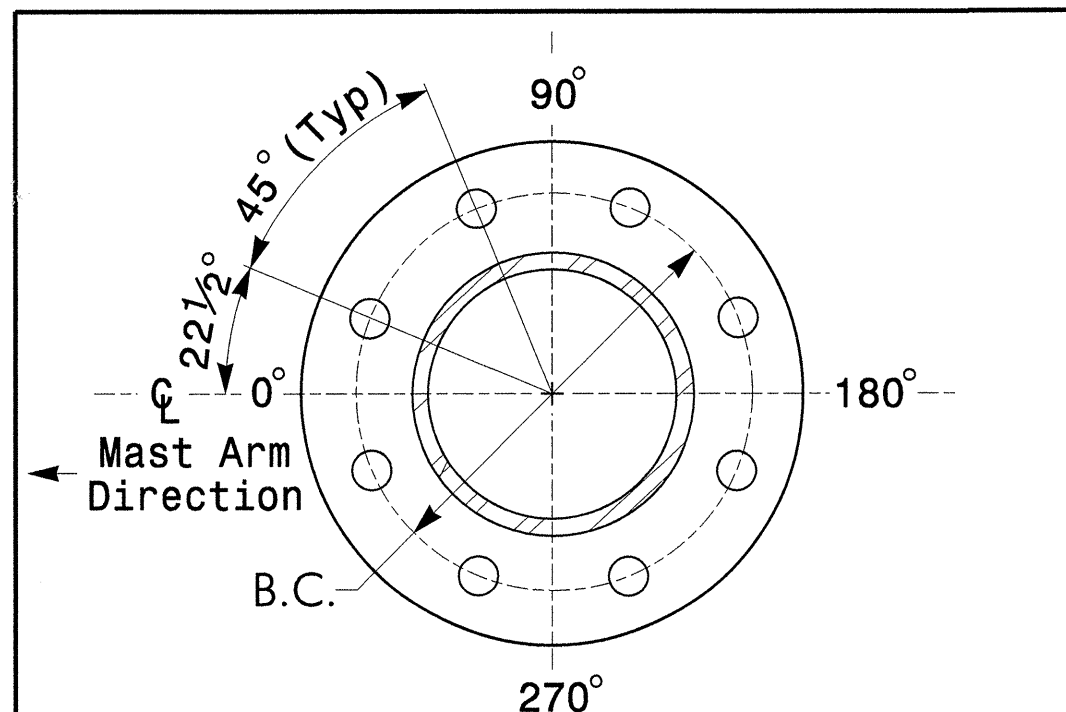
SPECIAL NOTE
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project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

Elevation Data for Mast Arm Attachment (H1)

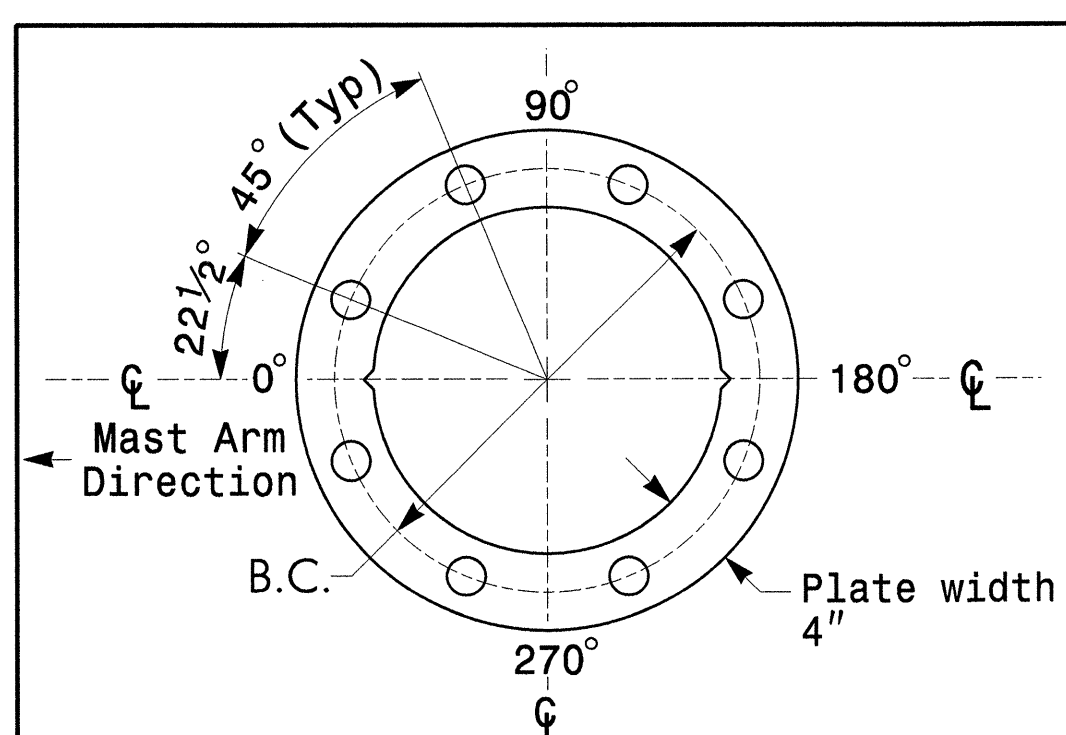
Elevation Differences for:	Pole 1
Baseline reference point at Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	-0.07 ft.
Elevation difference at Edge of travelway or face of curb	-0.04 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



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

METAL POLE No. 1

PROJECT REFERENCE NO. U-5132 SHEET NO. Sig. 04

MAST ARM LOADING SCHEDULE

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

NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is .75 feet above the ground elevation.
 - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

PLANS PREPARED BY :



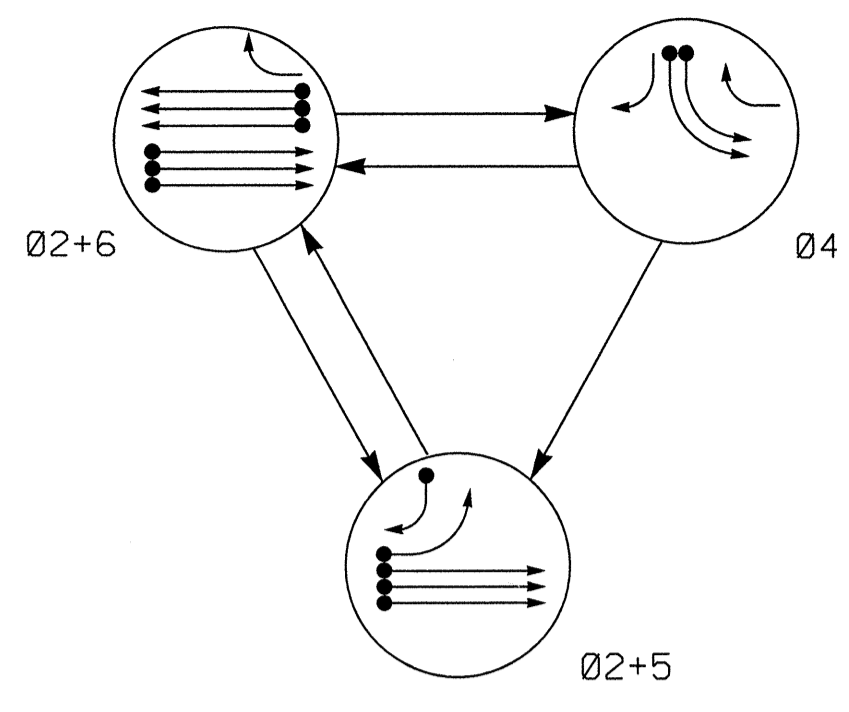
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

NCDOT Wind Zone 2 (130 mph)

 Prepared For the Offices of: TRANSPORTATION MOBILITY AND SAFETY DIVISION NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	NC 24 AT US 17 BYPASS NORTHBOUND RAMP		SEAL K. BISBY ENGINEER 033753 1/5/2012
	DIVISION 3 PLAN DATE: JANUARY 2012 PREPARED BY: C.B. HOLDEN	ONSLOW COUNTY REVIEWED BY: K. BISBY REVIEWED BY:	
SCALE 0 N/A N/A	SIGNATURE DATE SIG. INVENTORY NO. 03-0942		

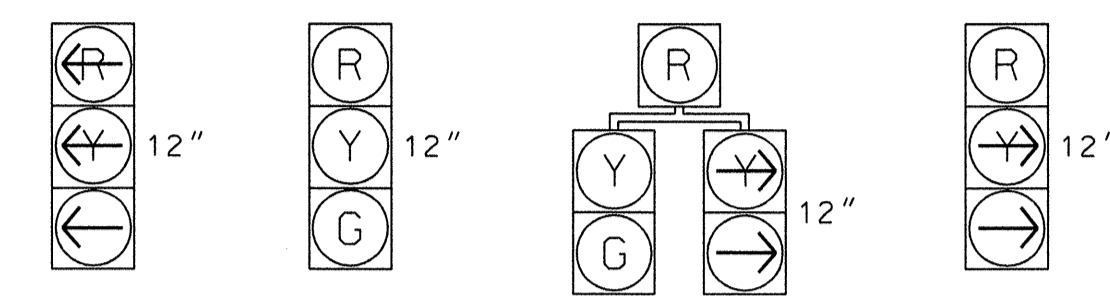
3 PHASE FULLY ACTUATED JACKSONVILLE CITY SIGNAL SYSTEM

PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



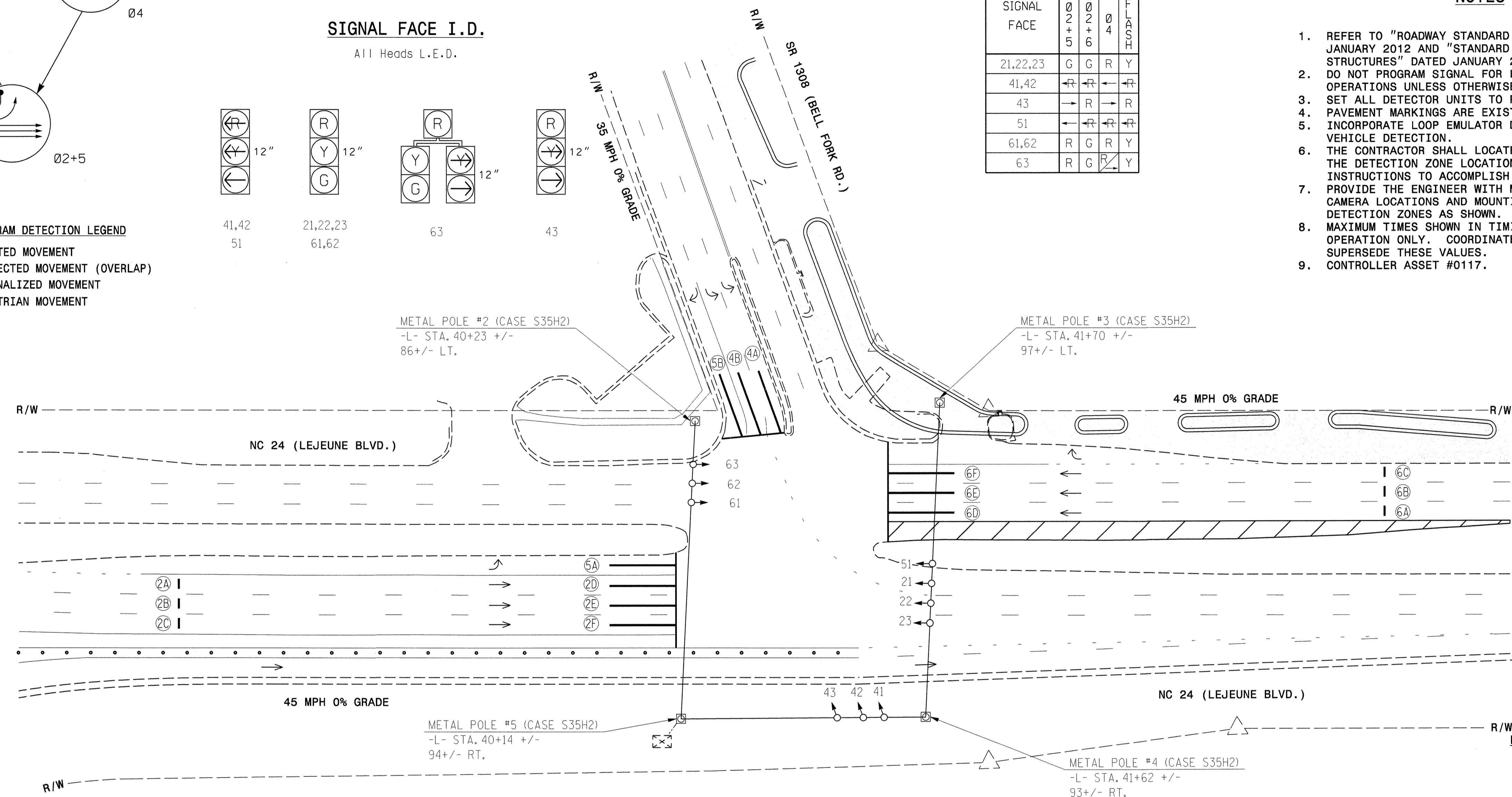
PHASING DIAGRAM DETECTION LEGEND
 ● DETECTED MOVEMENT
 ○ UNDETECTED MOVEMENT (OVERLAP)
 - - - UNSIGNALIZED MOVEMENT
 <- - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21,22,23	G	G	R	Y
41,42	←	←	←	←
43	→	R	→	R
51	←	←	←	←
61,62	R	G	R	Y
63	R	G	←	Y

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 OPERATIONS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- PAVEMENT MARKINGS ARE EXISTING.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.
- PROVIDE THE ENGINEER WITH MANUFACTURER'S APPROVED CAMERA LOCATIONS AND MOUNTING HEIGHTS TO OBTAIN DETECTION ZONES AS SHOWN.
- MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SUPERSEDE THESE VALUES.
- CONTROLLER ASSET #0117.



OASIS 2070L TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	4.5	3.0	3.0	4.5
Red Clearance	1.6	3.3	3.5	1.6
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.2	-	-	3.2
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY				
2A	6X6	300	*	*	2	Y	Y	-	-	-	-	*
2B	6X6	300	*	*	2	Y	Y	-	-	-	-	*
2C	6X6	300	*	*	2	Y	Y	-	-	-	-	*
2D	6X40	0	*	*	2	Y	Y	Y	2	5	-	*
2E	6X40	0	*	*	2	Y	Y	Y	2	5	-	*
2F	6X40	0	*	*	2	Y	Y	Y	2	5	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	-	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	-	-	*
5A	6X40	0	*	*	5	Y	Y	-	-	-	-	*
5B	6X40	0	*	*	5	Y	Y	-	-	15	-	*
6A	6X6	300	*	*	6	Y	Y	-	-	-	-	*
6B	6X6	300	*	*	6	Y	Y	-	-	-	-	*
6C	6X6	300	*	*	6	Y	Y	-	-	-	-	*
6D	6X40	0	*	*	6	Y	Y	Y	2	5	-	*
6E	6X40	0	*	*	6	Y	Y	Y	2	5	-	*
6F	6X40	0	*	*	6	Y	Y	Y	2	5	-	*

LEGEND

PROPOSED	EXISTING
	N/A

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

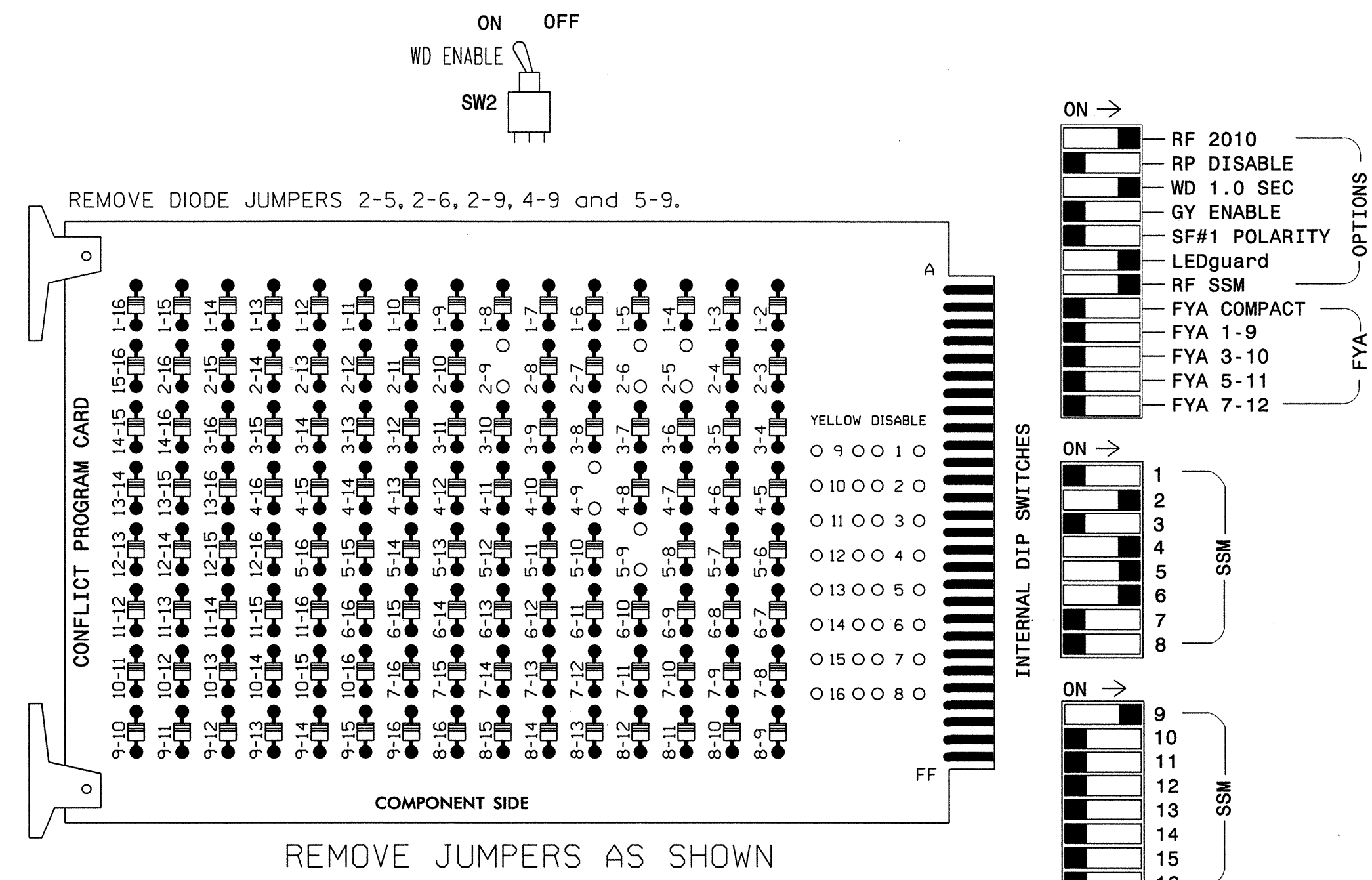
* VIDEO DETECTION ZONE

SIGNAL UPGRADE - TEMPORARY DESIGN - CONSTRUCTION PHASE 1

<p>PLANS PREPARED BY:</p> <p>RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p>Prepared for the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)</p>		<p>SEAL</p>					
		<p>DIVISION 3 ONSLOW COUNTY JACKSONVILLE</p> <p>PLAN DATE: JANUARY 2012 REVIEWED BY: K. BISBY</p> <p>PREPARED BY: C.B. HOLDEN REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr><th>INIT.</th><th>DATE</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>		INIT.	DATE			
INIT.	DATE								

EDI MODEL 2010ECL-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.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

■ = 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.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8,10, 11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Jacksonville City Signal System.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	41,42 63	NU	51	61,62 63	NU	NU	NU	NU	43	NU	NU	NU	NU	NU
RED		128						134					A121					
YELLOW		129						135										
GREEN		130						136										
RED ARROW					101		131											
YELLOW ARROW					102	102	132						A122					
GREEN ARROW					103	103	133						A123					
Hand icon																		
Person icon																		

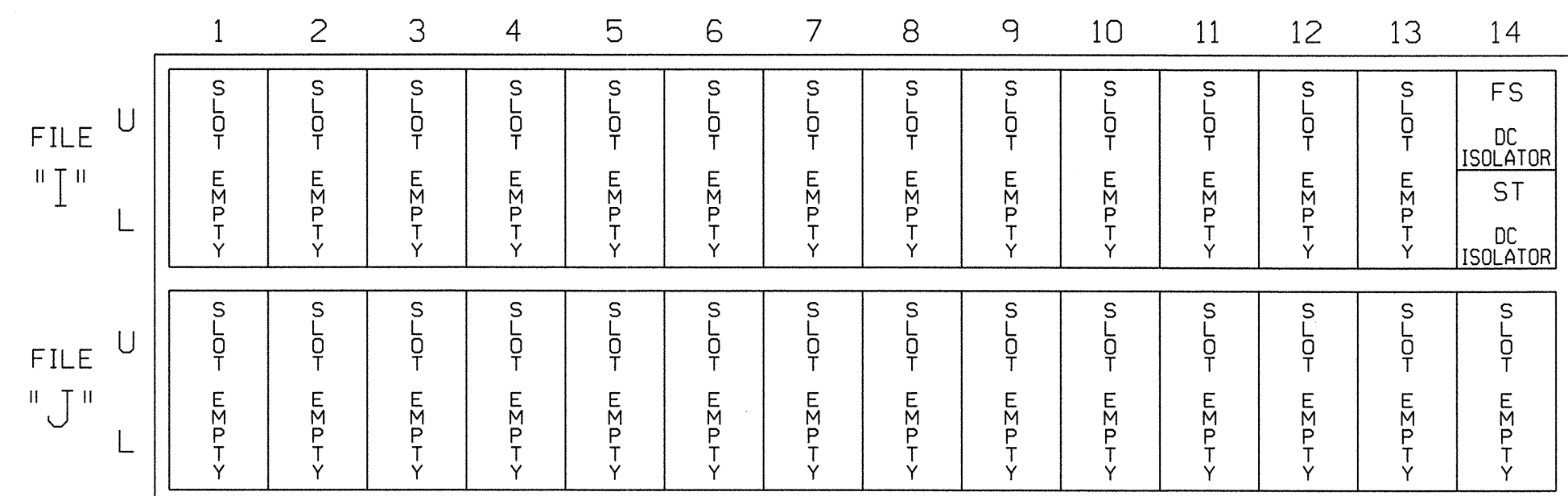
NU = Not Used
 **FLASH NOTE: WIRE OVERLAP "A" TO FLASH ON FLASHER UNIT #2, CIRCUIT #2.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
 CABINET.....EXISTING 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S2,S4,S5,S6,S9
 PHASES USED.....2,4,5,6
 OVERLAPS.....A: 4+5

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0117T1 & T2
 DESIGNED: JANUARY 2012
 SEALED: JANUARY 5, 2012
 REVISED:

SPECIAL DETECTOR NOTE

Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

SIGNAL UPGRADE - TEMPORARY DESIGN - CONSTRUCTION PHASES I & II

PLANS PREPARED BY:

RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

NC 24 (LEJEUNE BLVD.)
 AT
 SR 1308 (BELL FORK RD.)

DIVISION 3 ONSLOW COUNTY JACKSONVILLE

PLAN DATE: January 2012 REVIEWED BY: K. Bisby

PREPARED BY: N. Harris REVIEWED BY:

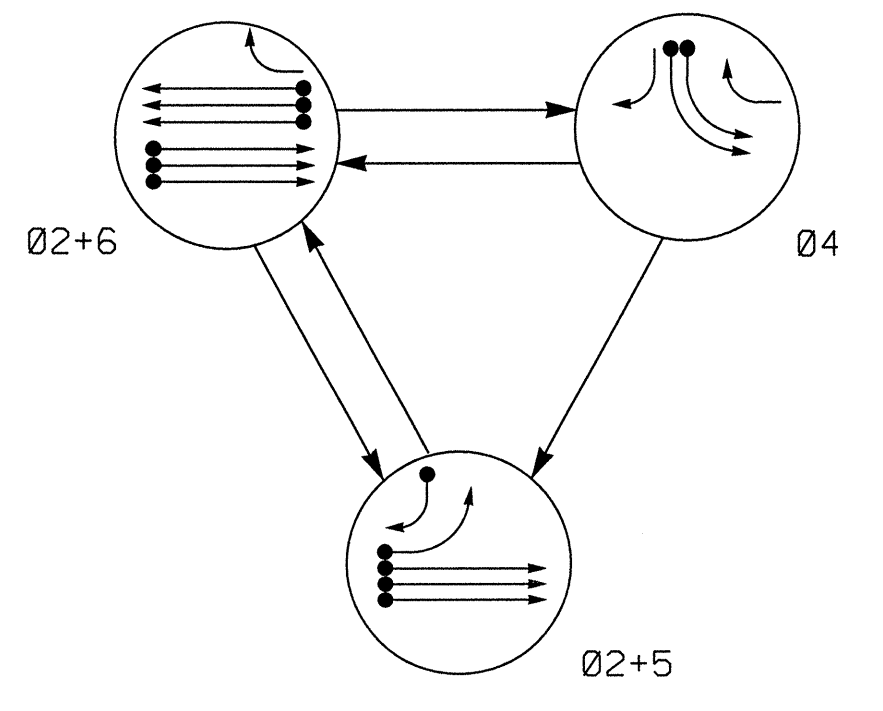
REVISIONS INIT. DATE

SIGNATURE DATE

Sig. INVENTORY NO. 03-0117T1

3 PHASE FULLY ACTUATED JACKSONVILLE CITY SIGNAL SYSTEM

PHASING DIAGRAM



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

SIGNAL FACE I.D.

All Heads L.E.D.

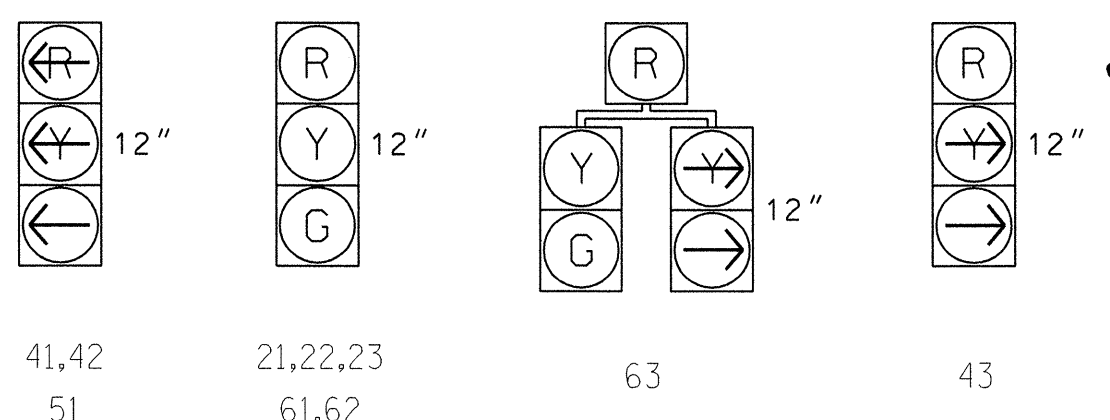
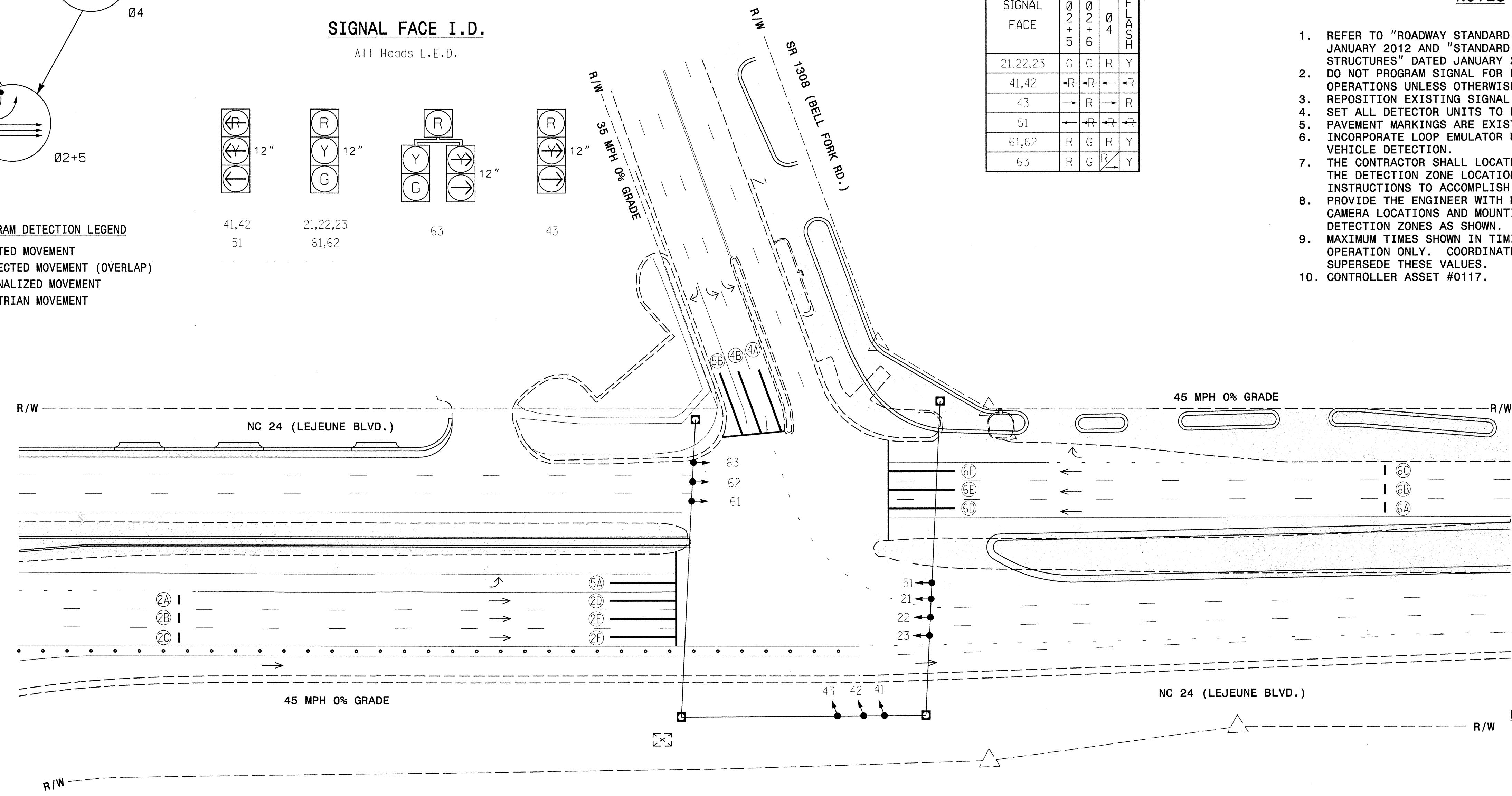


TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø 2+6	Ø 2+5	Ø 4	FLASHER
21,22,23	G	G	R	Y
41,42	←	←	←	←
43	→	R	→	R
51	←	←	←	←
61,62	R	G	R	Y
63	R	G	←	Y

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 OPERATIONS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 21, 22, 23, & 51.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- PAVEMENT MARKINGS ARE EXISTING.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.
- PROVIDE THE ENGINEER WITH MANUFACTURER'S APPROVED CAMERA LOCATIONS AND MOUNTING HEIGHTS TO OBTAIN DETECTION ZONES AS SHOWN.
- MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SUPERSEDE THESE VALUES.
- CONTROLLER ASSET #0117.



OASIS 2070L TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	4.5	3.0	3.0	4.5
Red Clearance	1.6	3.3	3.6	1.6
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.2	-	-	3.2
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

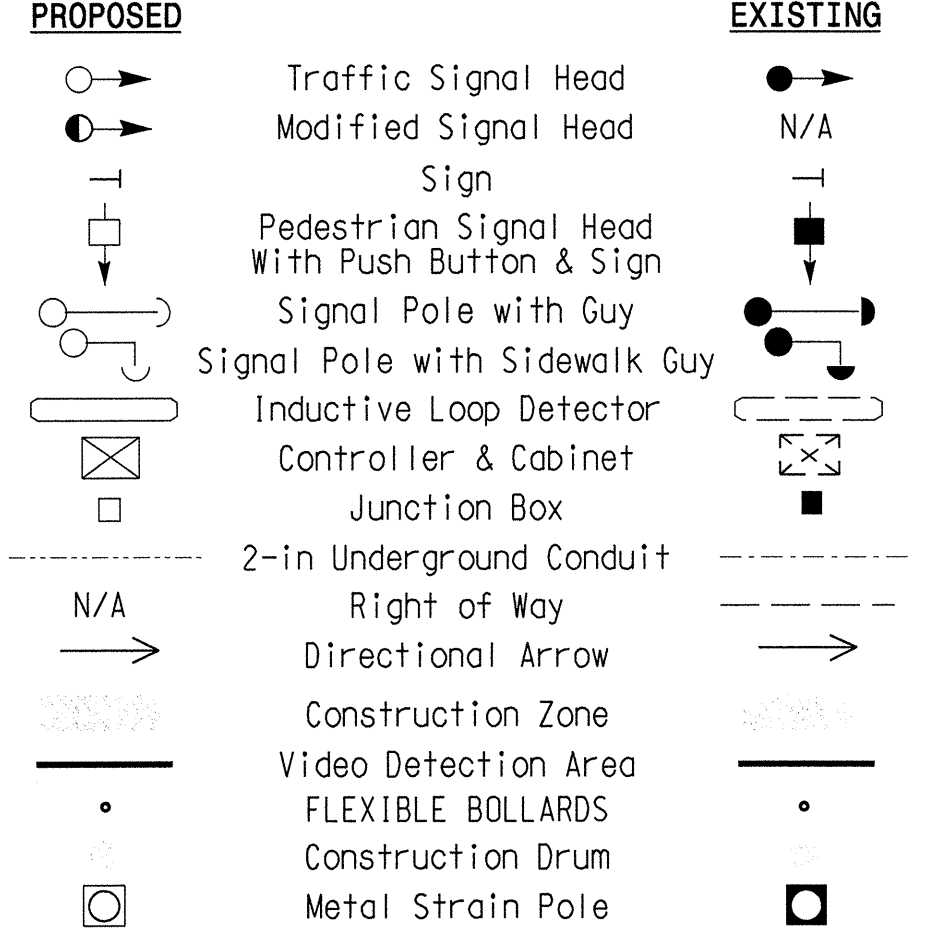
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART

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

* VIDEO DETECTION ZONE

LEGEND

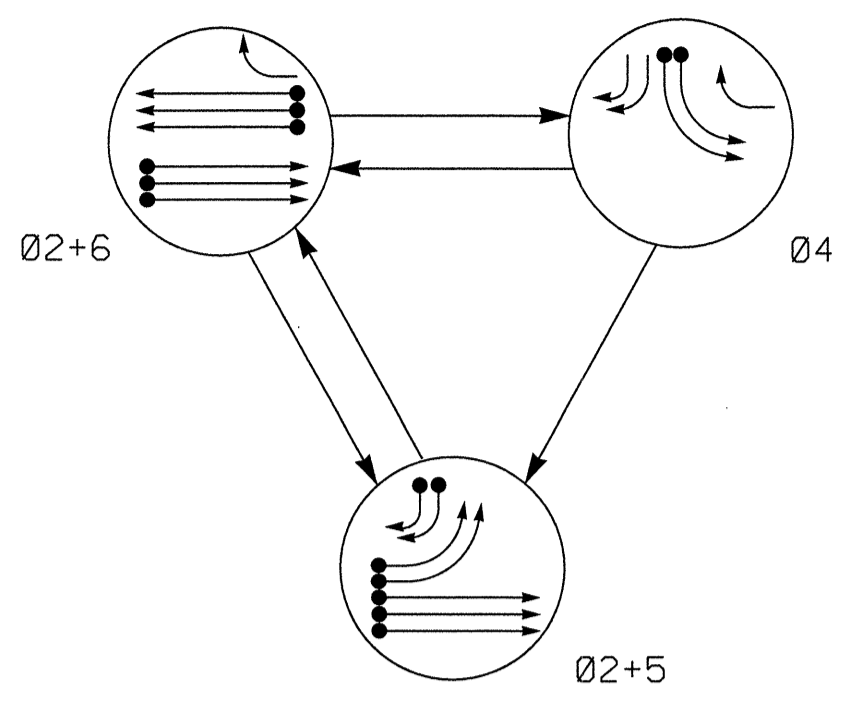


SIGNAL UPGRADE - TEMPORARY DESIGN - CONSTRUCTION PHASE 2

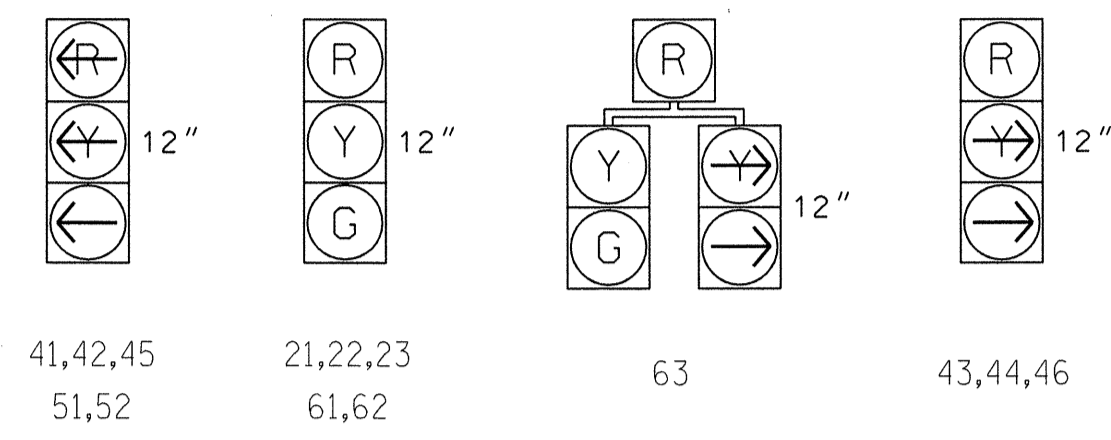
<p>PLANS PREPARED BY:</p> <p>RUMMEL, KLEPPER & KAHL, LLP 900 RIDGFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p>Prepared For the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)</p>		<p>SEAL</p>					
		<p>DIVISION 3 ONSLOW COUNTY JACKSONVILLE</p> <p>PLAN DATE: JANUARY 2012 REVIEWED BY: K. BISBY</p> <p>PREPARED BY: C.B. HOLDEN REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr><th>INIT.</th><th>DATE</th></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>		INIT.	DATE			
INIT.	DATE								

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PHASING DIAGRAM



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



SIGNAL FACE	PHASE			
	Ø 2+5	Ø 2+6	Ø 4	F
21,22,23	G	G	R	Y
41,42,45	R	R	R	R
43,44,46	R	R	R	R
51,52	R	R	R	R
61,62	R	G	R	Y
63	R	G	R	Y

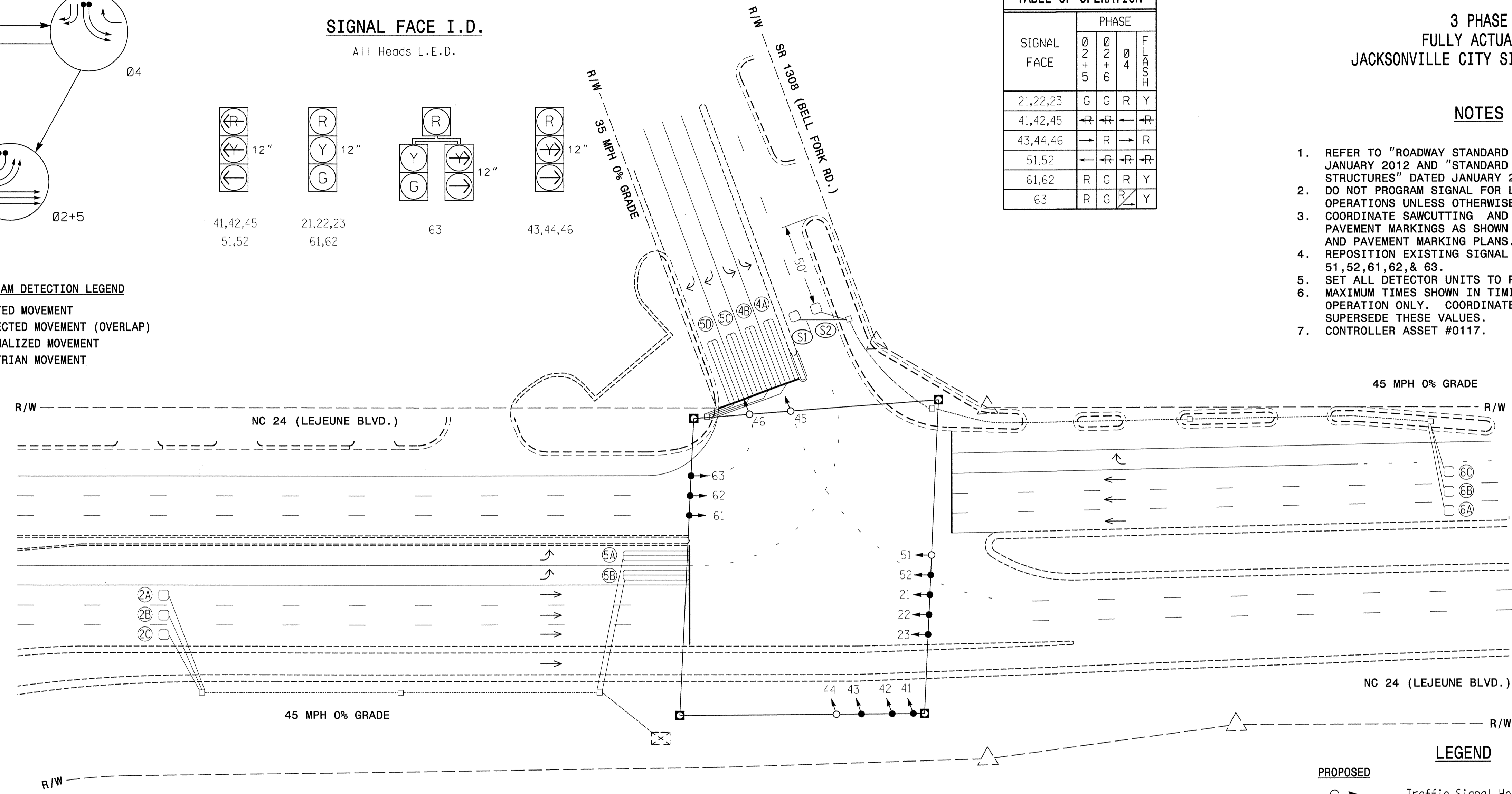
3 PHASE
FULLY ACTUATED
JACKSONVILLE CITY SIGNAL SYSTEM

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 OPERATIONS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- COORDINATE SAWCUTTING AND LOOP PLACEMENT WITH PAVEMENT MARKINGS AS SHOWN IN THE TRAFFIC CONTROL AND PAVEMENT MARKING PLANS.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 21, 22, 23, 41, 42, 43, 51, 52, 61, 62, & 63.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SUPERSEDE THESE VALUES.
- CONTROLLER ASSET #0117.

PHASING DIAGRAM DETECTION LEGEND

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



FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	4.5	3.0	3.0	4.5
Red Clearance	2.1	4.0	3.8	2.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.5
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.2	-	-	3.2
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD
					PHASE	CALLING EXTENSION	STRETCH FULL TIME DELAY	DELAY TIME		
2A	6X6	300	4	Y	2	Y	Y	-	-	-
2B	6X6	300	4	Y	2	Y	Y	-	-	-
2C	6X6	300	4	Y	2	Y	Y	-	-	-
4A	6X40	0	2-4-2	Y	4	Y	Y	-	3	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	Y
5B	6X40	0	2-4-2	Y	5	Y	Y	-	-	Y
5C	6X40	0	2-4-2	Y	5	Y	Y	-	15	-
5D	6X40	0	2-4-2	Y	5	Y	Y	-	15	-
6A	6X6	300	6	Y	6	Y	Y	-	-	-
6B	6X6	300	6	Y	6	Y	Y	-	-	-
6C	6X6	300	6	Y	6	Y	Y	-	-	-
S1	6X6	*	5	Y	-	-	-	-	-	Y
S2	6X6	*	5	Y	-	-	-	-	-	Y

* SEE DIMENSIONING ALONG SR 1308 (BELL FORK RD.)

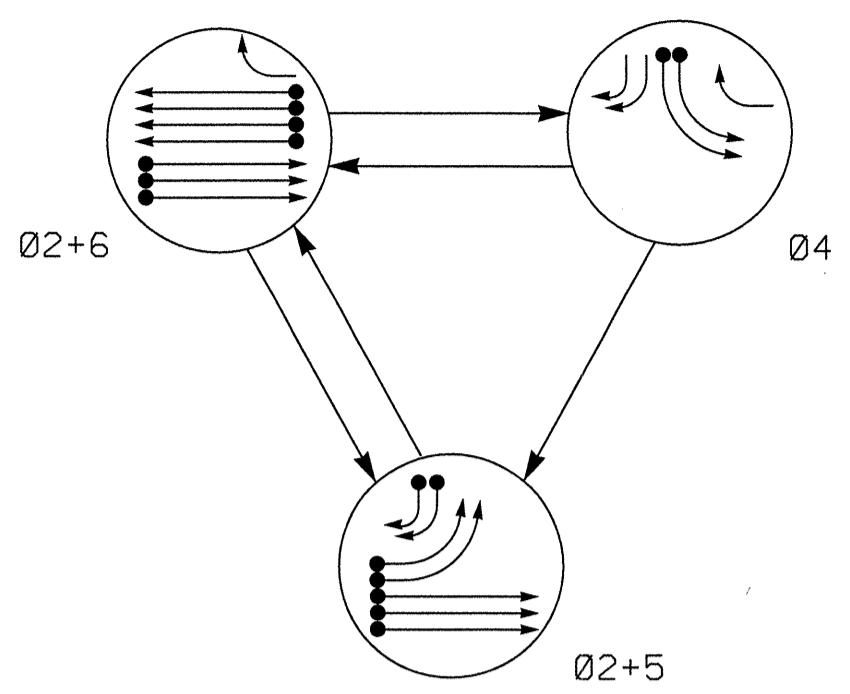
PROPOSED	EXISTING

SIGNAL UPGRADE - TEMPORARY DESIGN - CONSTRUCTION PHASE 3

<p>PLANS PREPARED BY:</p> <p>RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>		<p>NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)</p>			
		<p>DIVISION 3 ONSLOW COUNTY JACKSONVILLE</p> <p>PLAN DATE: JANUARY 2012 REVIEWED BY: K. BISBY</p> <p>PREPARED BY: C. B. HOLDEN REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>		INIT.
INIT.	DATE				

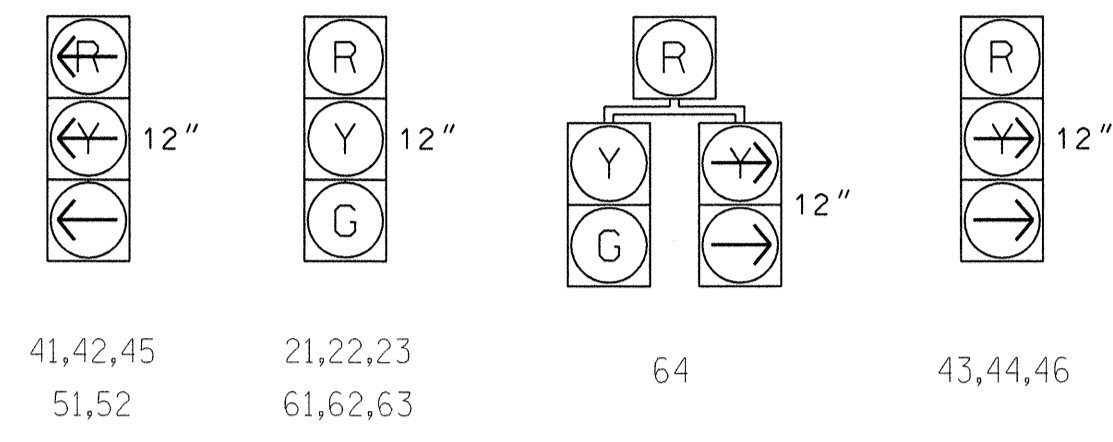
1/12/2012 R:\r\off\c\tr\off\c\signal\sig\03-5132-sig-03-0117T3.dgn dho

PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



SIGNAL FACE	PHASE			
	Ø2+5	Ø2+6	Ø4	FLASH
21,22,23	G	G	R	Y
41,42,45	R	R	Y	R
43,44,46	Y	R	Y	R
51,52	Y	R	R	R
61,62,63	R	G	R	Y
64	R	G	R	Y

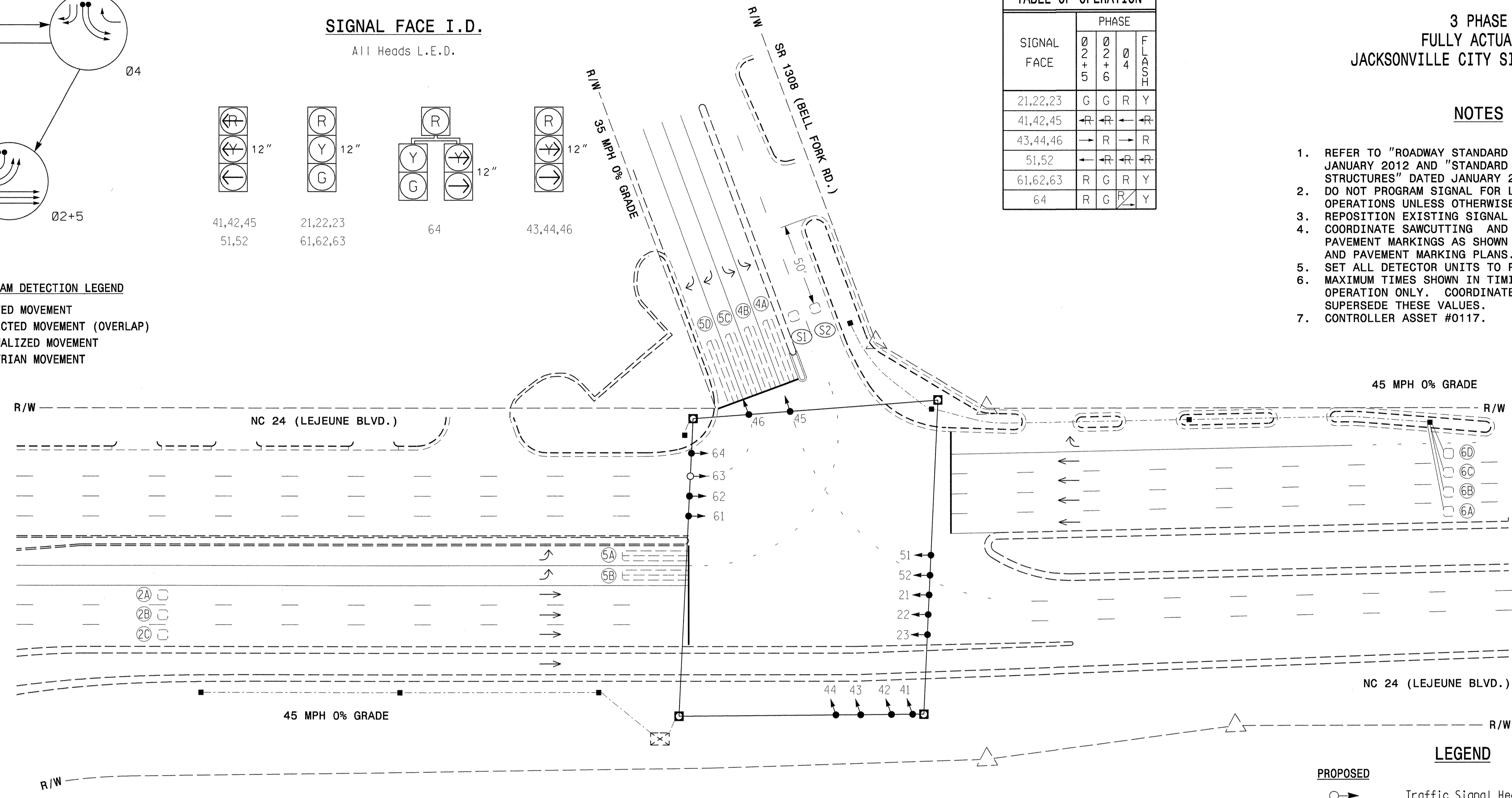
3 PHASE FULLY ACTUATED JACKSONVILLE CITY SIGNAL SYSTEM

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 OPERATIONS UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- REPOSITION EXISTING SIGNAL HEAD NUMBERED 64.
- COORDINATE SAWCUTTING AND LOOP PLACEMENT WITH PAVEMENT MARKINGS AS SHOWN IN THE TRAFFIC CONTROL AND PAVEMENT MARKING PLANS.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATION ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SUPERSEDE THESE VALUES.
- CONTROLLER ASSET #0117.

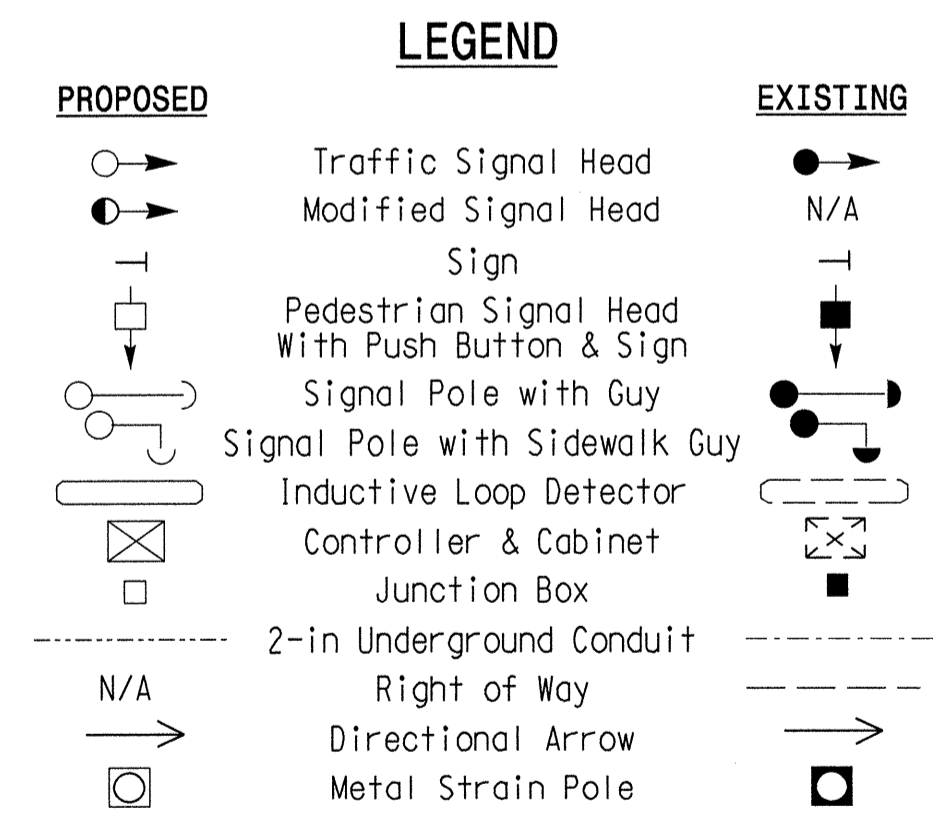
PHASING DIAGRAM DETECTION LEGEND

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



FEATURE	PHASE			
	2	4	5	6
Min Green 1 *	12	7	7	12
Extension 1	6.0	2.0	2.0	6.0
Max Green 1 *	90	25	25	90
Yellow Clearance	4.5	3.0	3.0	4.5
Red Clearance	2.1	4.0	3.9	2.2
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	1.5	-	-	1.0
Max Variable Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	30	-	-	30
Minimum Gap	3.2	-	-	3.2
Recall Mode	MIN RECALL	-	-	MIN RECALL
Vehicle Call Memory	YELLOW	-	-	YELLOW
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

OASIS 2070L LOOP & DETECTOR INSTALLATION CHART												
INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	-	2	Y	Y	-	-	-	-	-
2B	6X6	300	4	-	2	Y	Y	-	-	-	-	-
2C	6X6	300	4	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	3	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5B	6X40	0	2-4-2	-	5	Y	Y	-	-	-	-	-
5C	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
5D	6X40	0	2-4-2	-	5	Y	Y	-	-	15	-	-
6A	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6B	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6C	6X6	300	6	-	6	Y	Y	-	-	-	-	-
6D	6X6	300	6	Y	6	Y	Y	-	-	-	-	-
S1	6X6	*	5	-	-	-	-	-	-	-	Y	-
S2	6X6	*	5	-	-	-	-	-	-	-	Y	-



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

* SEE DIMENSIONING ALONG SR 1308 (BELL FORK RD.)

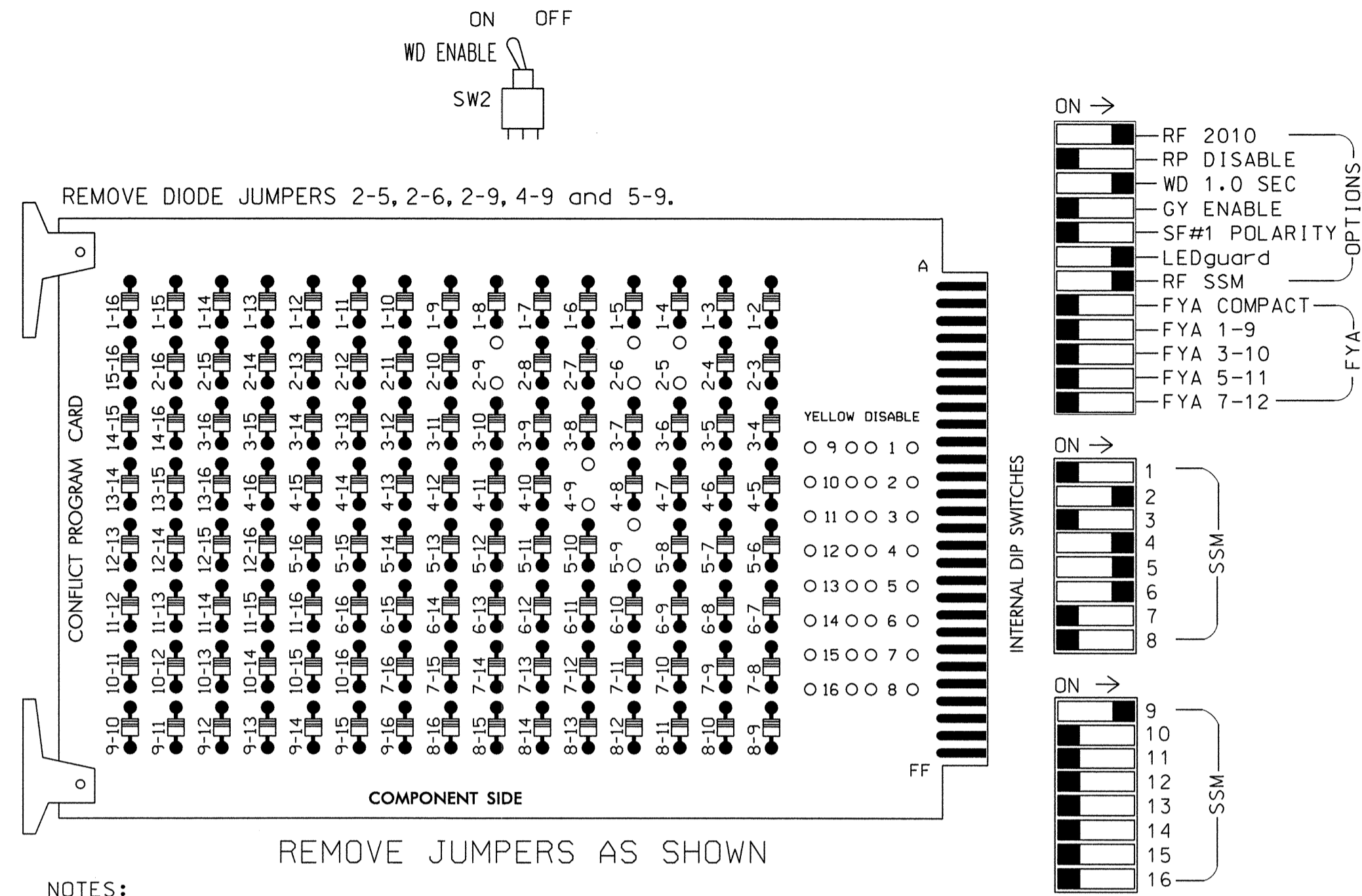
SIGNAL UPGRADE - FINAL DESIGN

<p>PLANS PREPARED BY:</p> <p>RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p>Prepared for the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>NC 24 (LEJEUNE BLVD.) AT SR 1308 (BELL FORK RD.)</p>		<p>SEAL</p>				
		<p>DIVISION 3 ONSLOW COUNTY JACKSONVILLE</p> <p>PLAN DATE: JANUARY 2012 REVIEWED BY: K. BISBY</p> <p>PREPARED BY: C.B. HOLDEN REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr><th>NO.</th><th>DATE</th><th>DESCRIPTION</th></tr> <tr><td> </td><td> </td><td> </td></tr> </table>		NO.	DATE	DESCRIPTION	
NO.	DATE	DESCRIPTION						

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EDI MODEL 2010ECL-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.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.

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.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,7,8,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Jacksonville City Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....EXISTING 2070L
 CABINET.....EXISTING 332
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S2,S4,S5,S6,S9
 PHASES USED.....2,4,5,6
 OVERLAPS.....A: 4+5

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P	S9	S10	S11	S12	S13	S14
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	**OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22 23	NU	NU	41,42 45	64	NU	51,52	61,62 63,64	NU	NU	NU	43,44 46	NU	NU	NU	NU	NU
RED		128							134				A121					
YELLOW		129							135									
GREEN		130							136									
RED ARROW					101			131										
YELLOW ARROW					102	102		132					A122					
GREEN ARROW					103	103		133					A123					

NU = Not Used
 **FLASH NOTE: WIRE OVERLAP "A" TO FLASH ON FLASHER UNIT #2, CIRCUIT #2.

INPUT FILE POSITION LAYOUT

(front view)

FILE	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	S	∅ 2	∅ 2	S	∅ 4	S	SYS. DET. S1	S	S	S	S	S	S	FS
L	∅ 2	NOT USED	∅ 4	∅ 4	∅ 4	∅ 4	SYS. DET. S2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	DC ISOLATOR
U	∅ 5	∅ 5	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	DC ISOLATOR
L	5A	5C	6A	6C	6D	6E	6F	6G	6H	6I	6J	6K	6L	6M
U	∅ 5	∅ 5	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
L	5B	5D	6B	6D	6E	6F	6G	6H	6I	6J	6K	6L	6M	6N

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

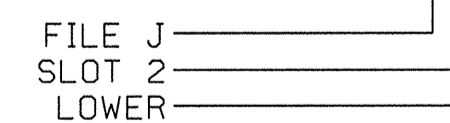
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y		3	
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
* S1	TB6-9,10	I9U	60	22	11	SYS					
* S2	TB6-11,12	I9L	62	24	13	SYS					
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y		15	
5D	TB3-7,8	J2L	44	6	16	5	Y	Y		15	
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
6C	TB5-1,2	J4U	48	10	26	6	Y	Y			
6D	TB5-3,4	J4L	48	10	26	6	Y	Y			

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

INPUT FILE POSITION LEGEND: J2L



OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

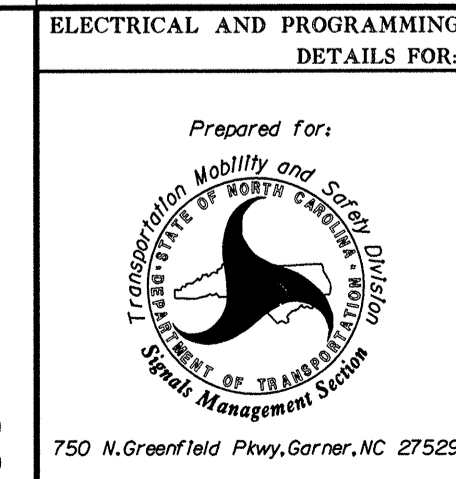
OVERLAP PROGRAMMING COMPLETE

SIGNAL UPGRADE - FINAL DESIGN

PLANS PREPARED BY :



RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560



Prepared for:
 NC 24 (LEJEUNE BLVD.)
 AT
 SR 1308 (BELL FORK RD.)
 DIVISION 3 ONSLOW COUNTY JACKSONVILLE
 PLAN DATE: January 2012 REVIEWED BY: K. Bisby
 PREPARED BY: N. Harris REVIEWED BY:
 REVISIONS: INIT. DATE

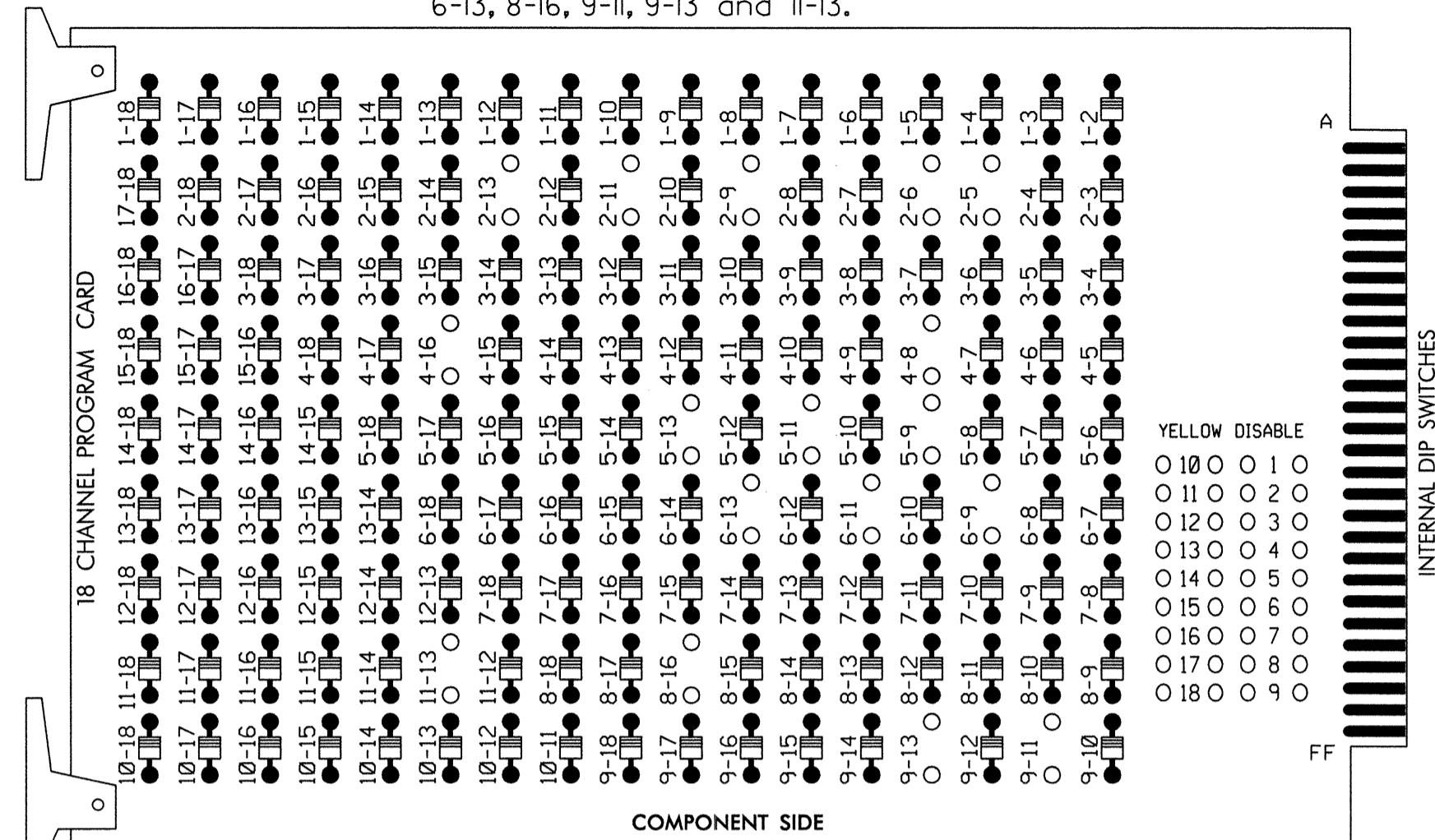
SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 021047
 N. HARRIS
 JAN 12, 2012
 SIGNATURE DATE
 STG. INVENTORY NO. 03-0117

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0117
 DESIGNED: JANUARY 2012
 SEALED: JANUARY 5, 2012
 REVISED:

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

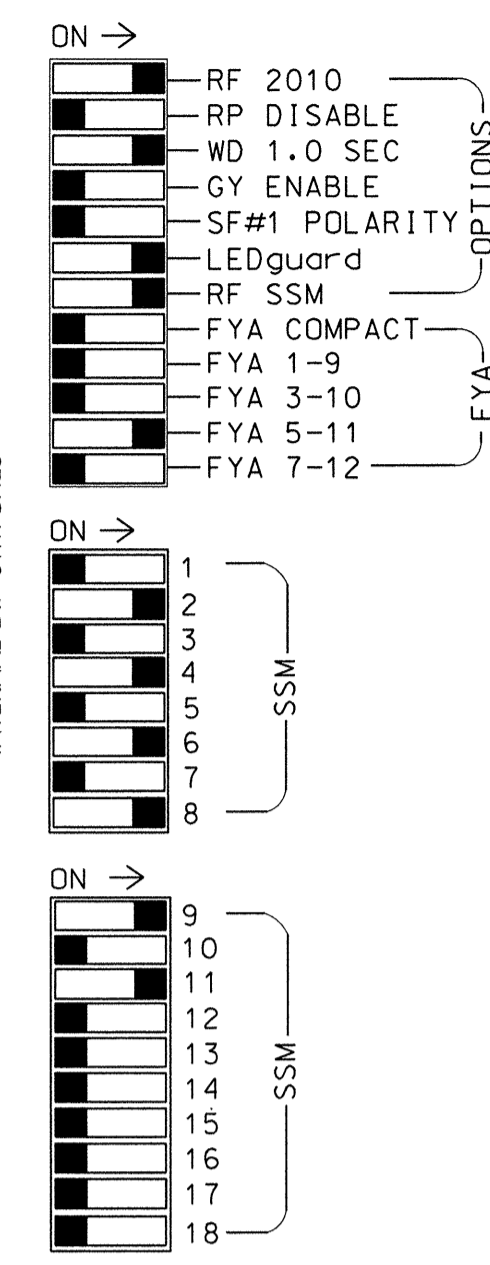
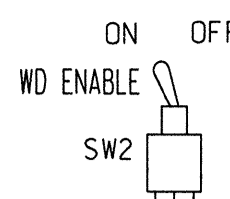
REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-13, 4-8, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 8-16, 9-11, 9-13 and 11-13.



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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Jacksonville City Signal System.

SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

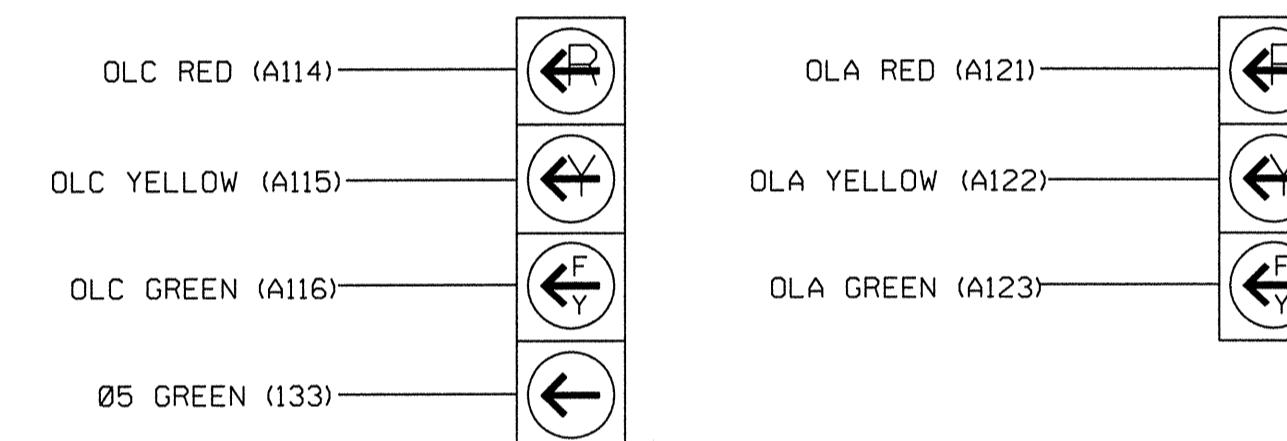
* Denotes install load resistor. See load resistor installation detail this sheet.

EQUIPMENT INFORMATION

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

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

61

NOTE

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

INPUT FILE POSITION LAYOUT

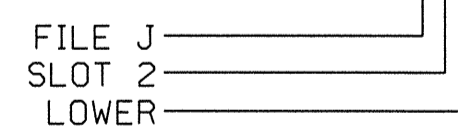
(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 2	∅ 2	∅ 3	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	NOT USED	2A/2B	NOT USED	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
U	∅ 5	∅ 6	∅ 7	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8
L	NOT USED	5A	6C	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8
U	∅ 6	6A/6B	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8
L	NOT USED	6A/6B	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8

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

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE POSITION LEGEND: J2L



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A,2B	TB2-5,6	I2U	39	1	2	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
6C	TB3-5,6	J2U	40	2	6	6	Y	Y			
6A,6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29					2 PED		
P81,P82	TB8-8,9	I13L	70	32					8 PED		

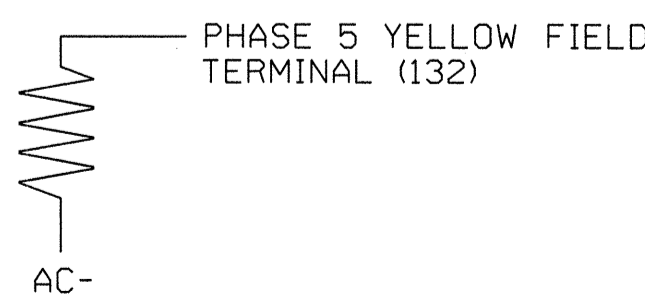
NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

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

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-1064
 DESIGNED: JANUARY 2012
 SEALED: JANUARY 5, 2012
 REVISED:

NEW INSTALLATION

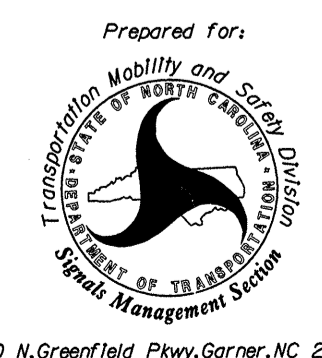
ELECTRICAL DETAIL SHEET 1 OF 2

PLANS PREPARED BY:



RUMMEL, KLEPPER & KAHL, LLP
 900 RIDGEFIELD DRIVE SUITE 350
 RALEIGH, NORTH CAROLINA 27609-3960
 NC LICENSE NO. F-0112 • (919) 878-9560

ELECTRICAL AND PROGRAMMING DETAILS FOR:



SR 1308 (BELL FORK RD)
 AT
 ELLIS BLVD CONNECTOR/
 SR 1702 (WHITE ST)

Division 3 Onslow County Jacksonville
 PLAN DATE: January 2012 REVIEWED BY: K. Bisby
 PREPARED BY: N. Harris REVIEWED BY:

REVISIONS INIT. DATE

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 021047
 N. Harris
 JAN 12, 2012
 SIGNATURE DATE
 SIG. INVENTORY NO. 03-1064

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

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

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

↓
SCROLL DOWN

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

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

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

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

↓
SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

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

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

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

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

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

← NOTICE GREEN FLASH

PRESS '+' TWICE

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

← NOTICE GREEN FLASH


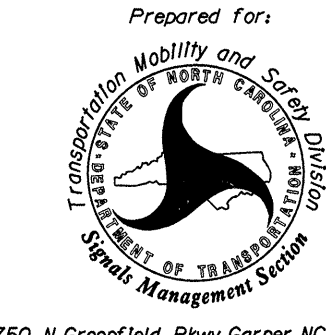
OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-1064
DESIGNED: JANUARY 2012
SEALED: JANUARY 5, 2012
REVISED:

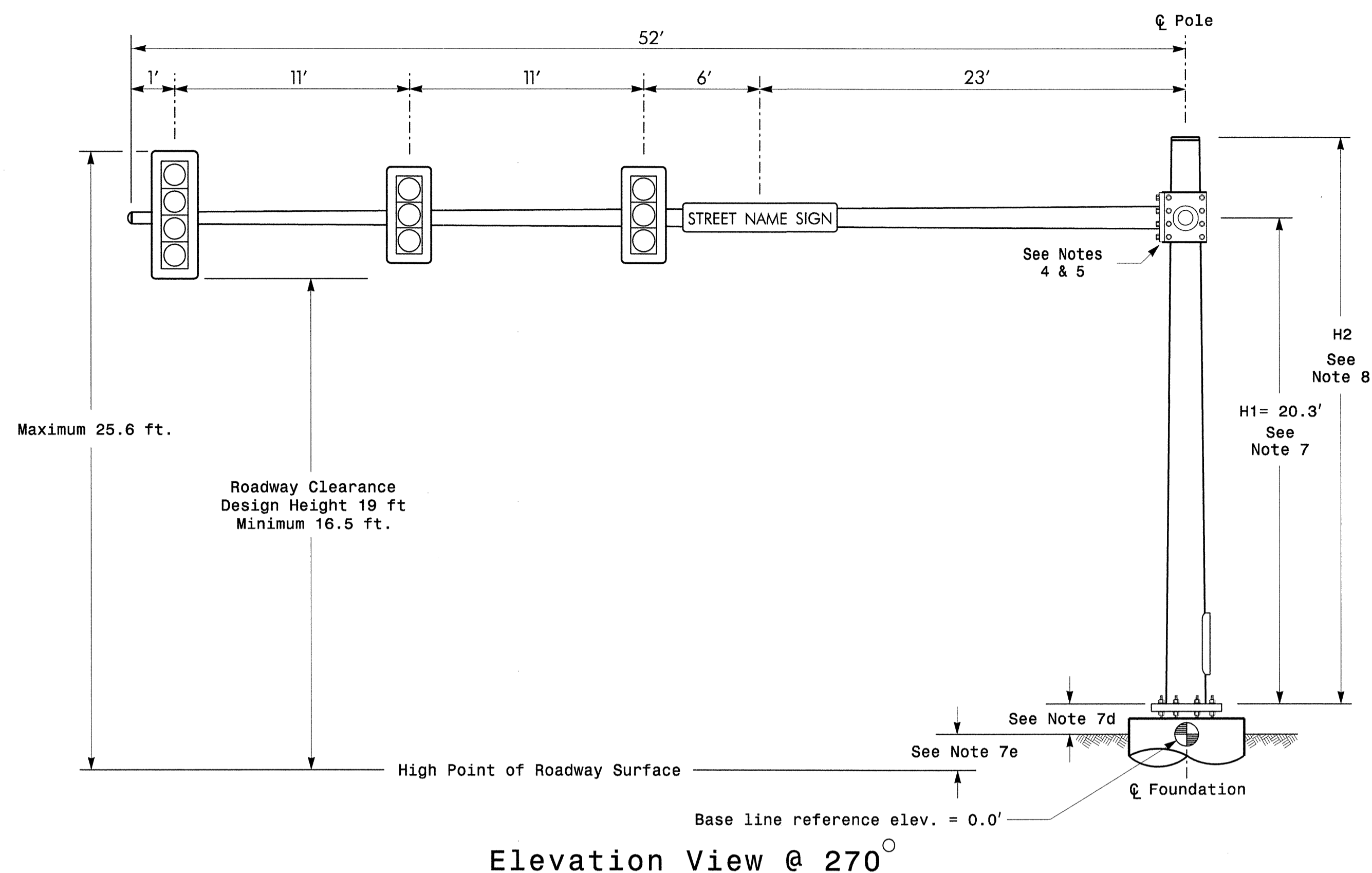
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NEW INSTALLATION

ELECTRICAL DETAIL SHEET 2 OF 2

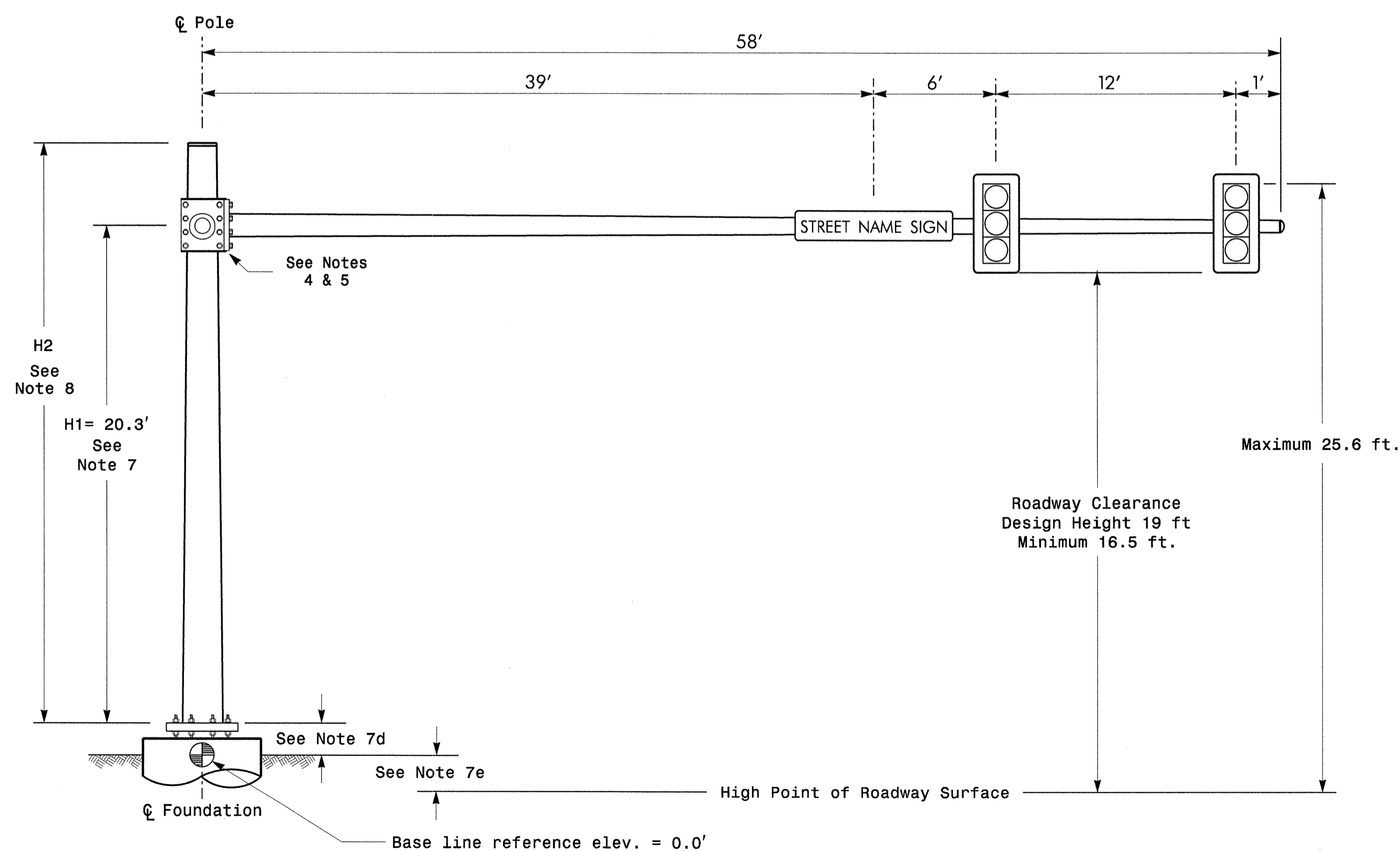
<p>PLANS PREPARED BY :</p>  <p>RUMMEL, KLEPPER & KAHL, LLP 900 RIDGEFIELD DRIVE SUITE 350 RALEIGH, NORTH CAROLINA 27609-3960 NC LICENSE NO. F-0112 • (919) 878-9560</p>	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p>  <p>Prepared for: T. Conner 750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 1308 (BELL FORK RD) AT ELLIS BLVD CONNECTOR/ SR 1702 (WHITE ST)</p>		<p>SEAL NORTH CAROLINA PROFESSIONAL SEAL 021047 K. Bisby JAN 5, 2012</p>			
		<p>Division 3 Onslow County Jacksonville</p> <p>PLAN DATE: January 2012 REVIEWED BY: K. Bisby</p> <p>PREPARED BY: N. Harris REVIEWED BY:</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		REVISIONS	INIT.	DATE
REVISIONS	INIT.	DATE					

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



Elevation View @ 270°

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

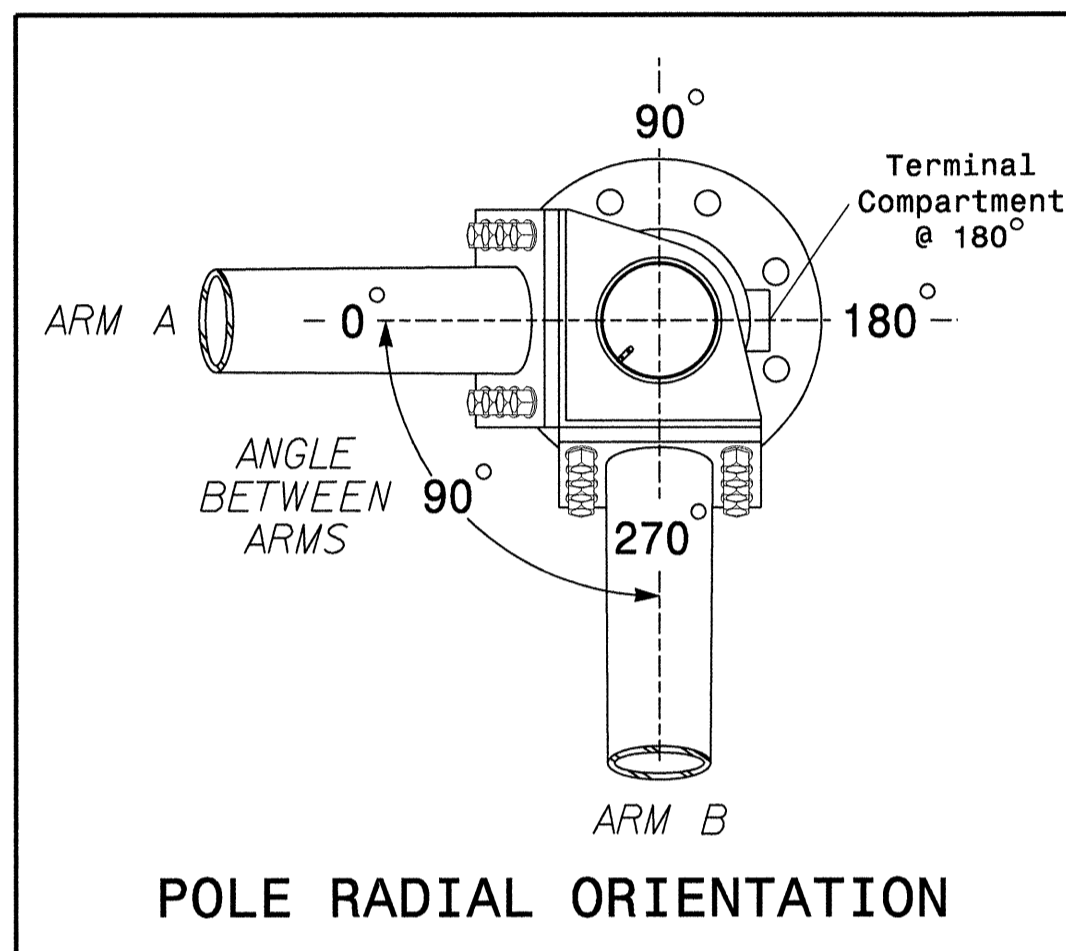


Elevation View @ 0°

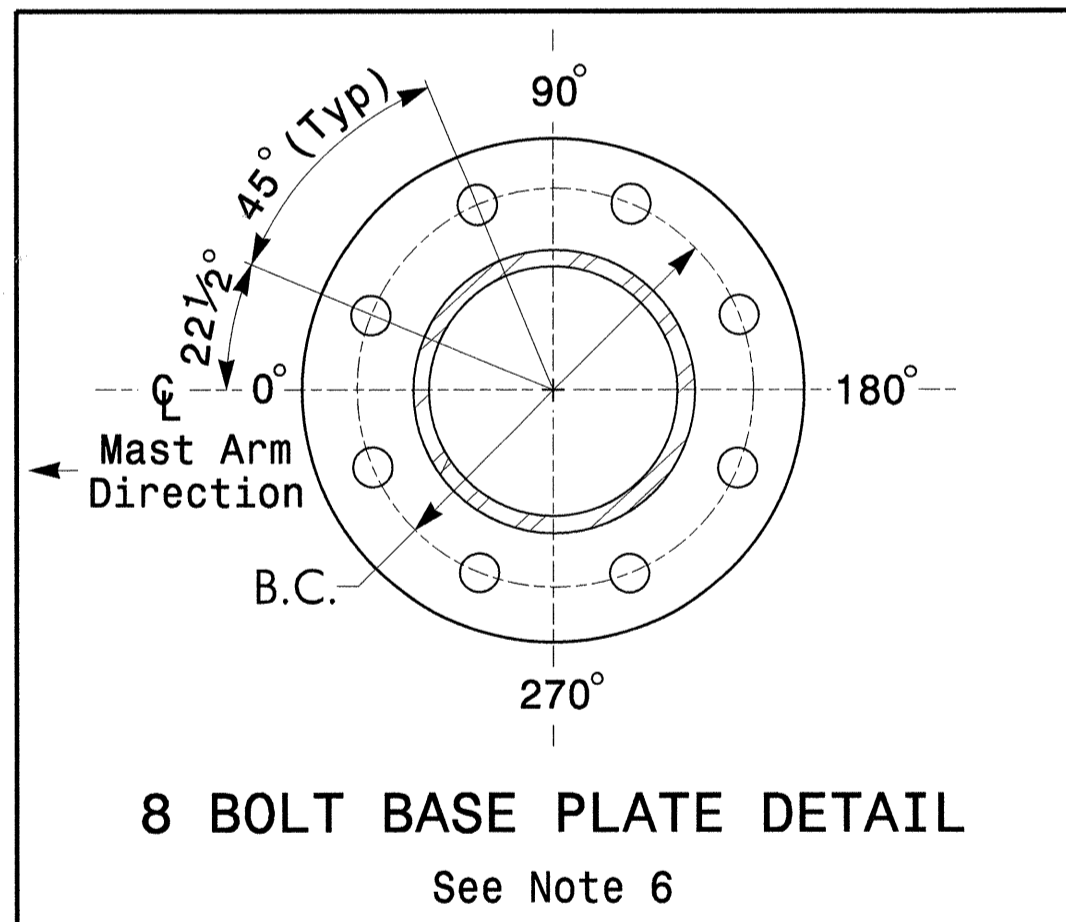
SPECIAL NOTE
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project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

Elevation Data for Mast Arm Attachment (H1)

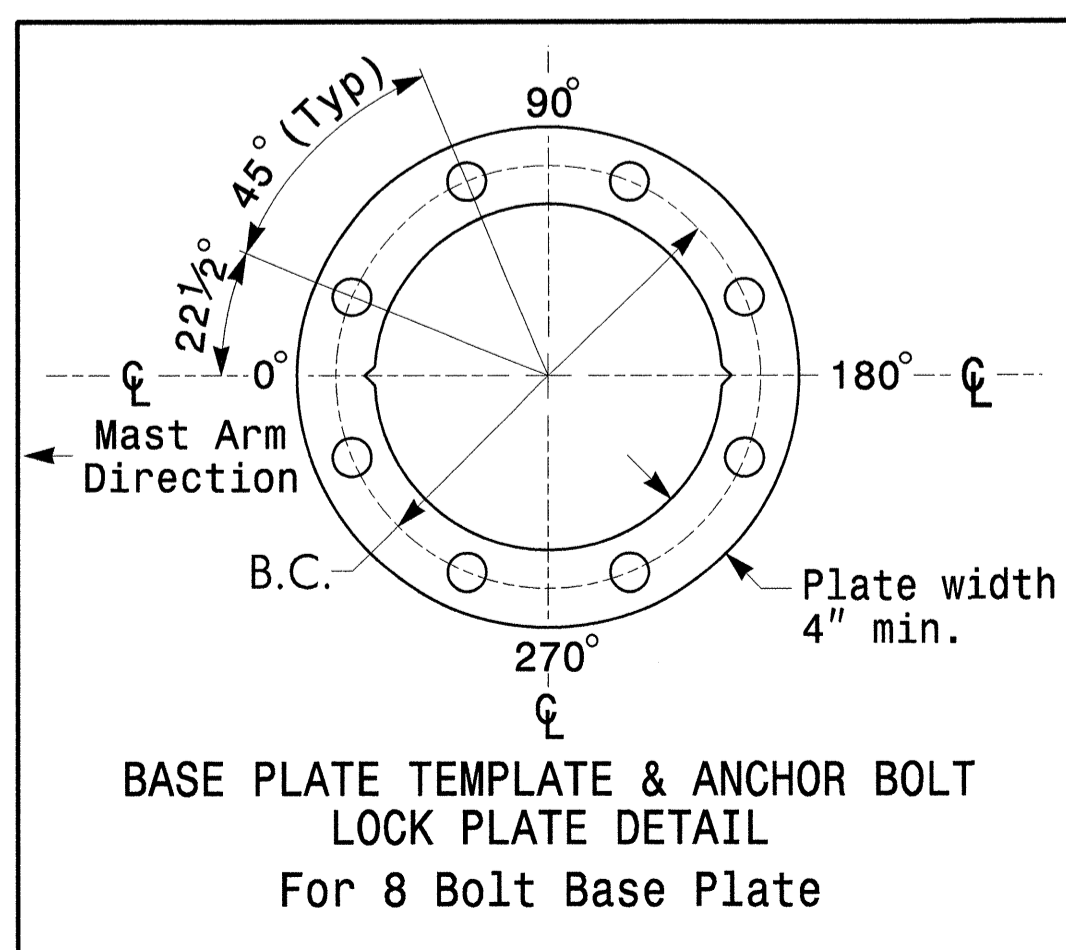
Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at ϕ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.75 ft.	-1.32 ft.
Elevation difference at Edge of travelway or face of curb	-0.35 ft.	-0.78 ft.



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL
See Note 6



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

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGNAL HEAD 8"-4 SECTION (VERTICAL)-WITH BACKPLATE AND ASTRO-BRAC	7.9 S.F.	22.0" W X 52.0" L	53.5 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
 - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
 - The 2012 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <http://www.ncdot.org/doh/preconstruct/traffic/ITSS/ws/mpoles/poles.html>

Design Requirements

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is .75 feet above the ground elevation.
 - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm lengths shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NOTES

1/4/2012 R:\Traffic\Traffic\Signal\Metal Pole Design\5132-81\03-1064mp.dgn

PLANS PREPARED BY :



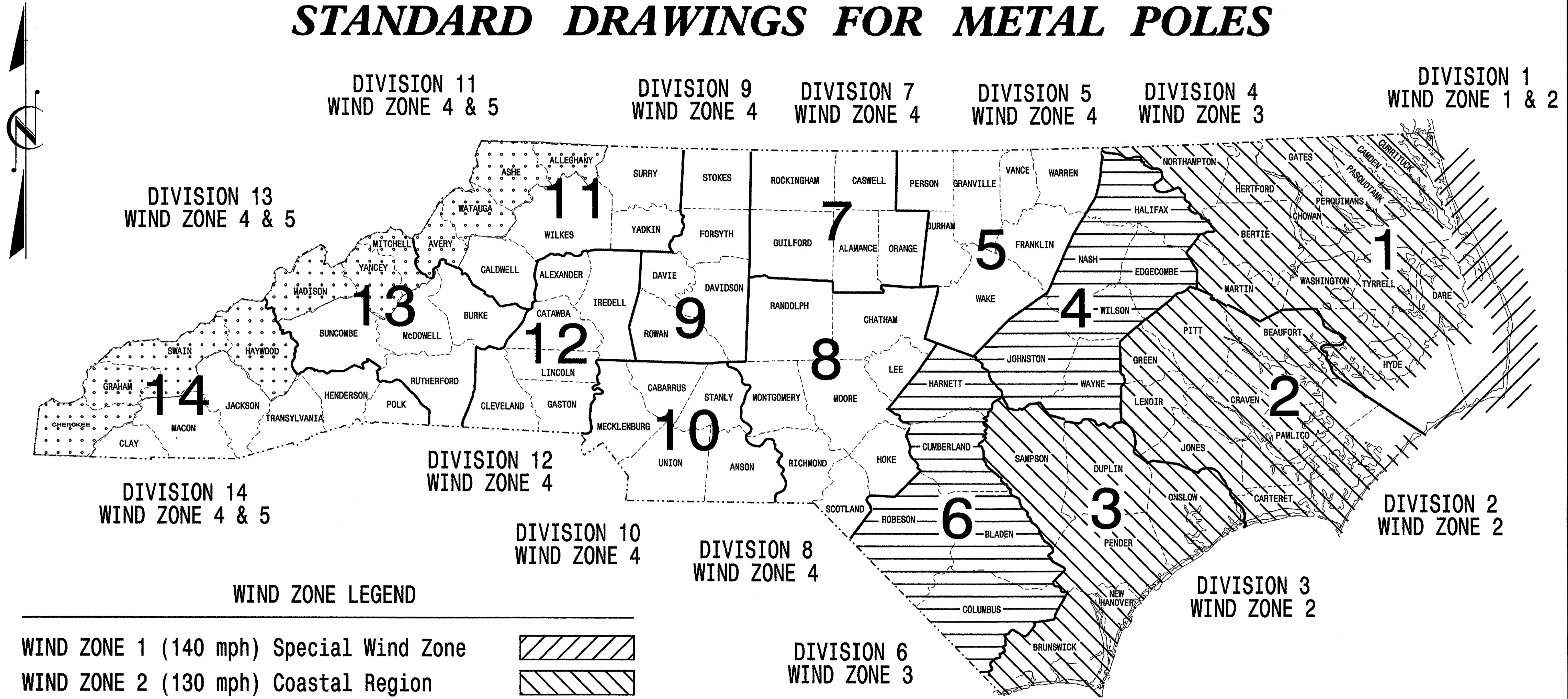
RUMMEL, KLEPPER & KAHL, LLP
900 RIDGEFIELD DRIVE SUITE 350
RALEIGH, NORTH CAROLINA 27609-3960
NC LICENSE NO. F-0112 • (919) 878-9560

	SR 1308 (BELL FORK RD.) AT ELLIS BLVD. CONNECTOR/ WHITE ST.		SEAL DATE 1/15/2012
	DIVISION 3 ONSLOW COUNTY JACKSONVILLE	PLAN DATE: JANUARY 2012 REVIEWED BY: K. BISBY	
SCALE: 0 N/A N/A		REVISIONS:	INIT. DATE
SIGNATURE:		DATE:	
SIG. INVENTORY NO. 03-1064		DATE:	

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	U-5132	Sig. 17
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

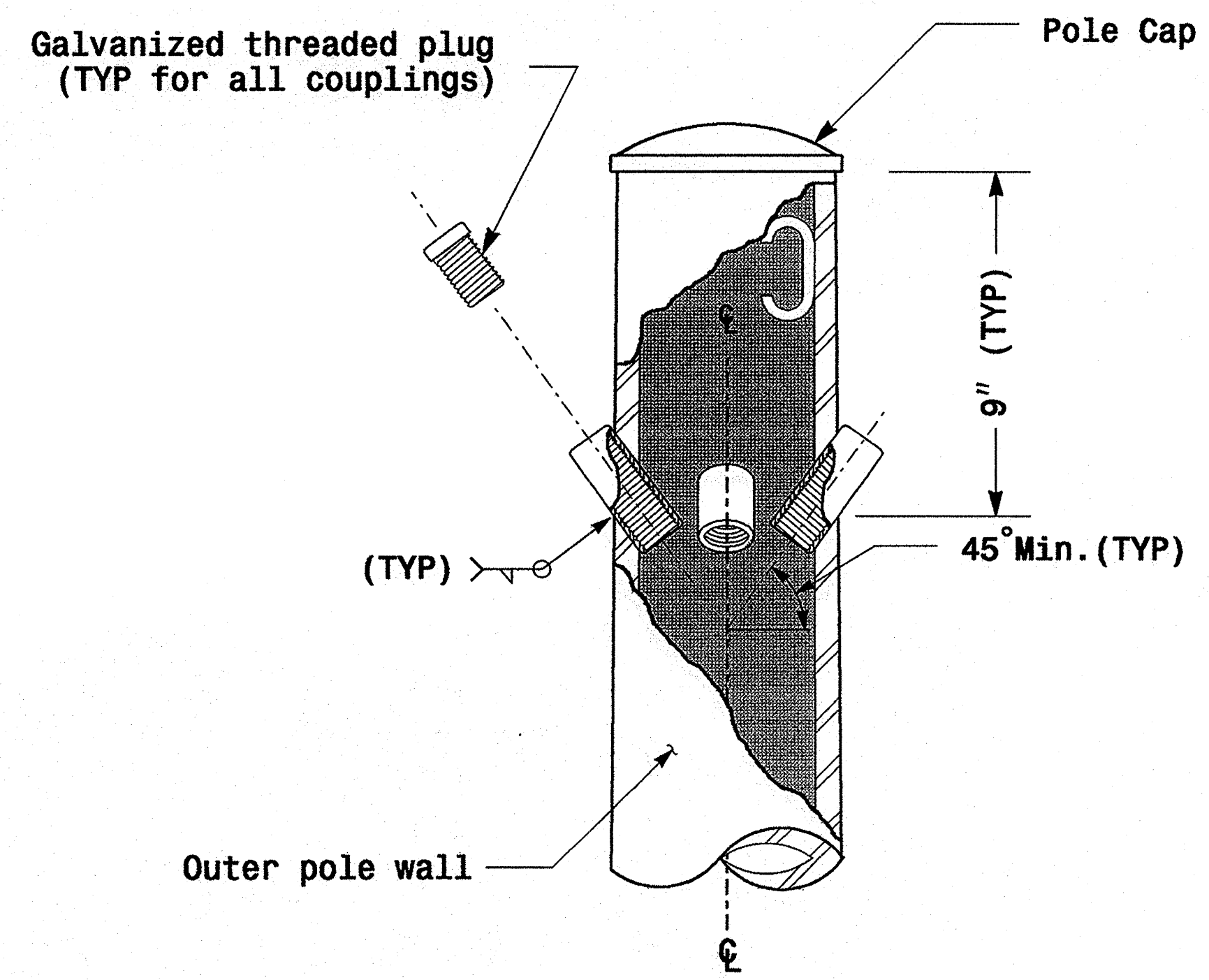
INDEX OF PLANS	
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

NCDOT CONTACTS:
MOBILITY AND SAFETY DIVISION - ITS and SIGNALS UNIT

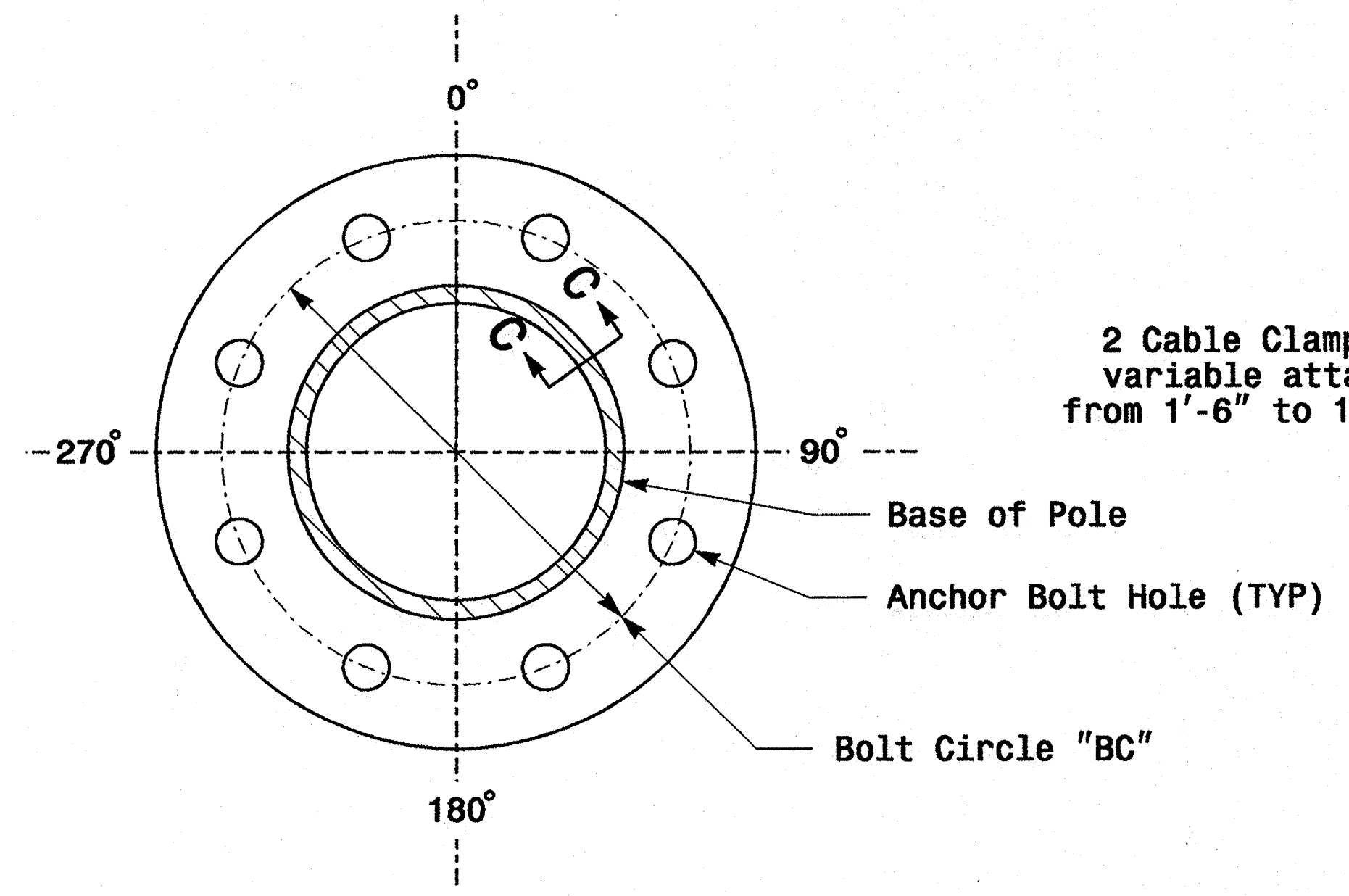
G. A. Fuller, P.E. - State ITS and Signals Engineer
 G. G. Murr, Jr., P.E. - State Signals Engineer
 D. C. Sarkar, P.E. - ITS and Signals Senior Structural Engineer
 C. F. Andrews, Jr. - ITS and Signals Structural Project Engineer
 M. Aslam - ITS and Signals Structural Project Engineer
 N. Bitting, P.E.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

SEAL

7.21.2009
DATE

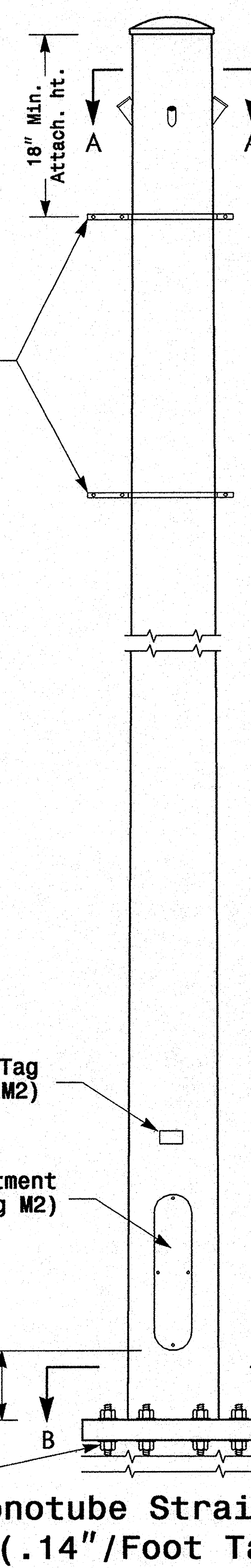


Cable Entrances at Top of Pole



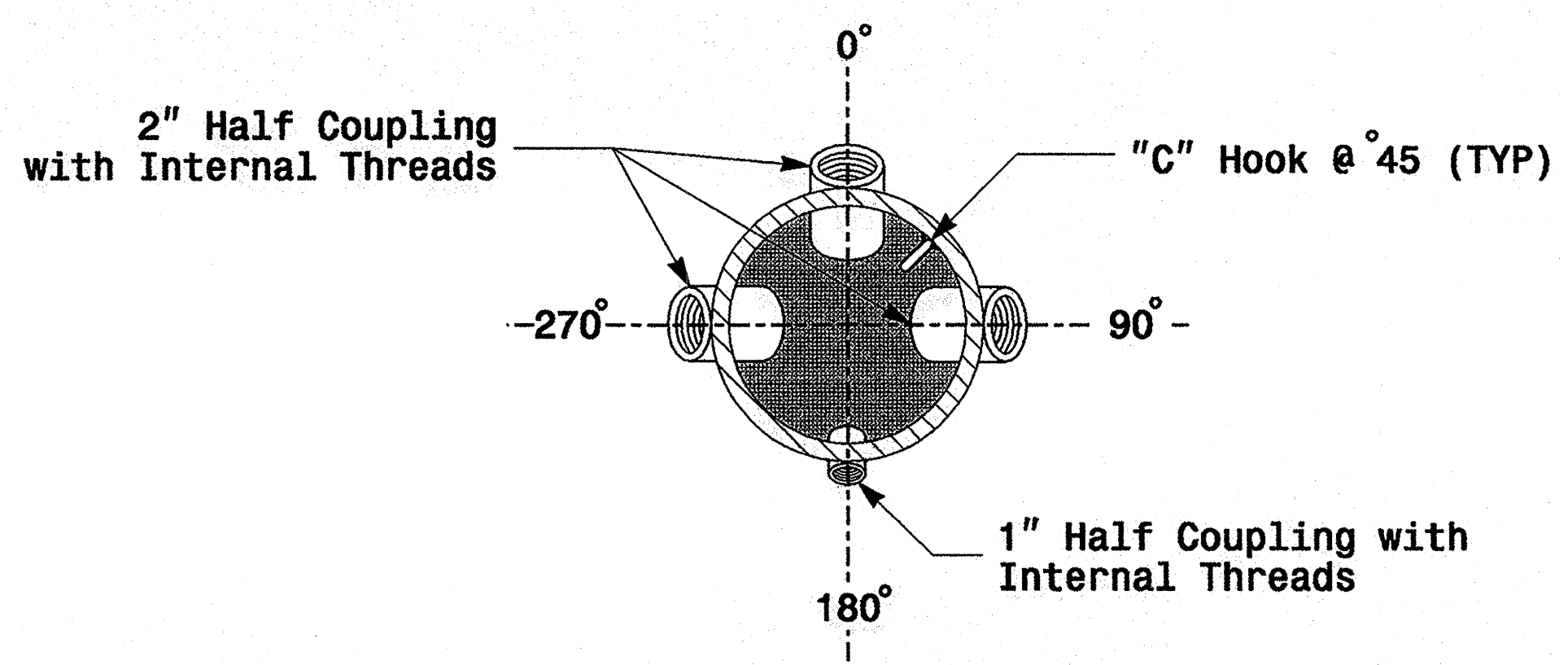
**Section B-B
(See drawing M2)
Pole Base Plate**

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

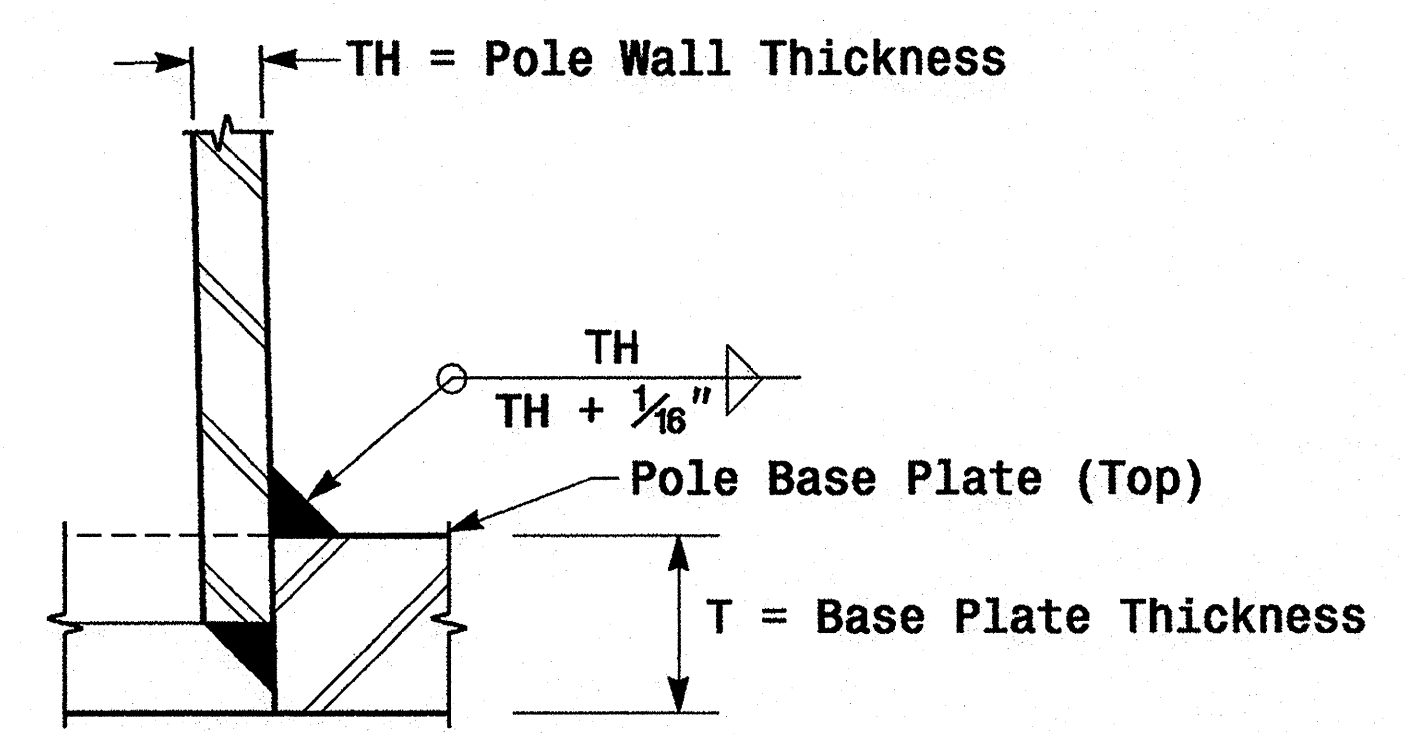


Shaft I.D. Tag (See drawing M2)
Terminal Compartment (See drawing M2)
12" (TYP)
Anchor Bolt (See drawing M2)

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



Radial Orientation for Factory Installed Accessories at Top of Pole

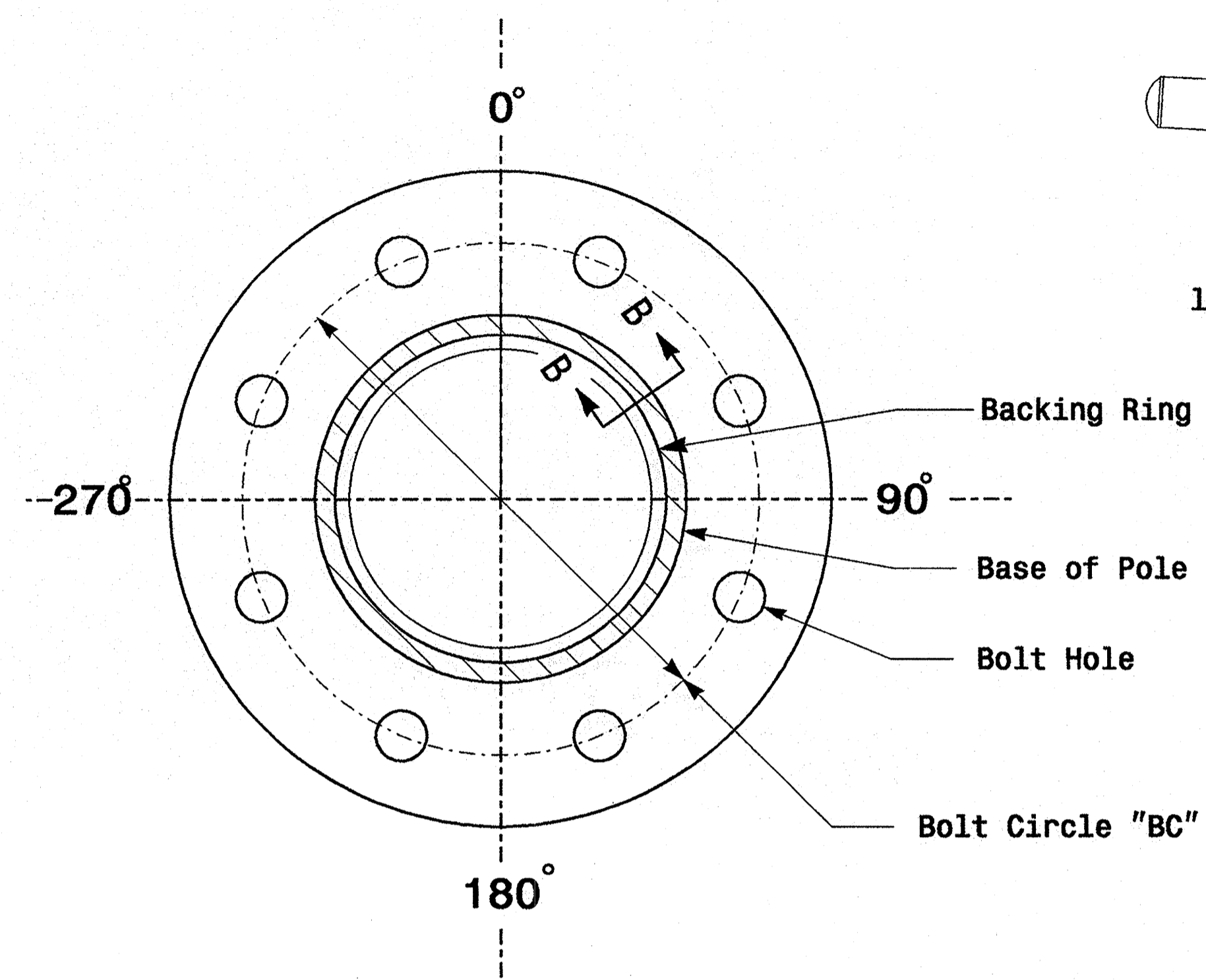


Socket Connection Weld Detail

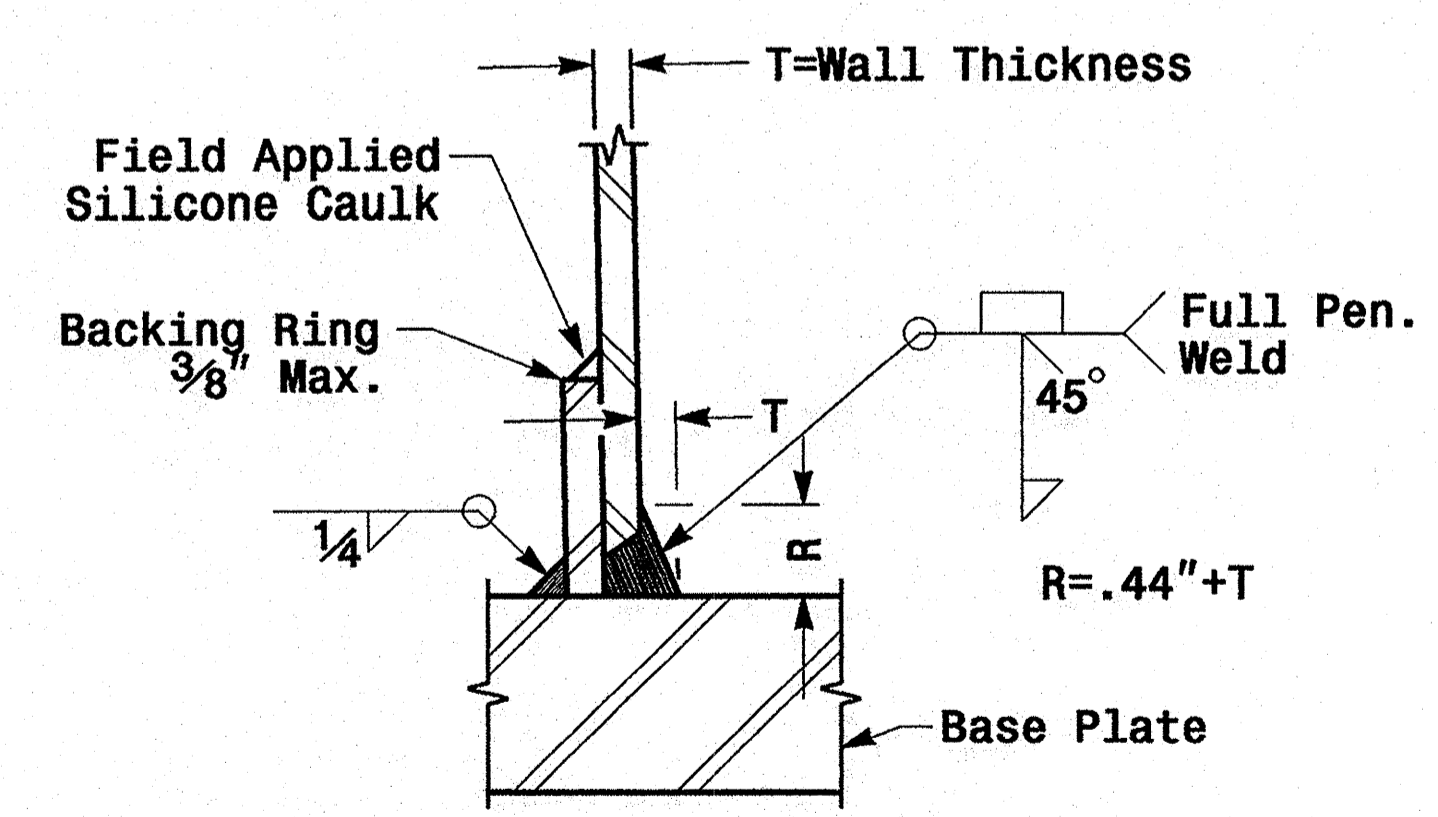
Fabrication Details - Strain Poles

01-SEP-2005 14:07 w:\peopl\lee-unit1\workgroups\2004 metal pole standard\2004 m3.dgn po levan@...

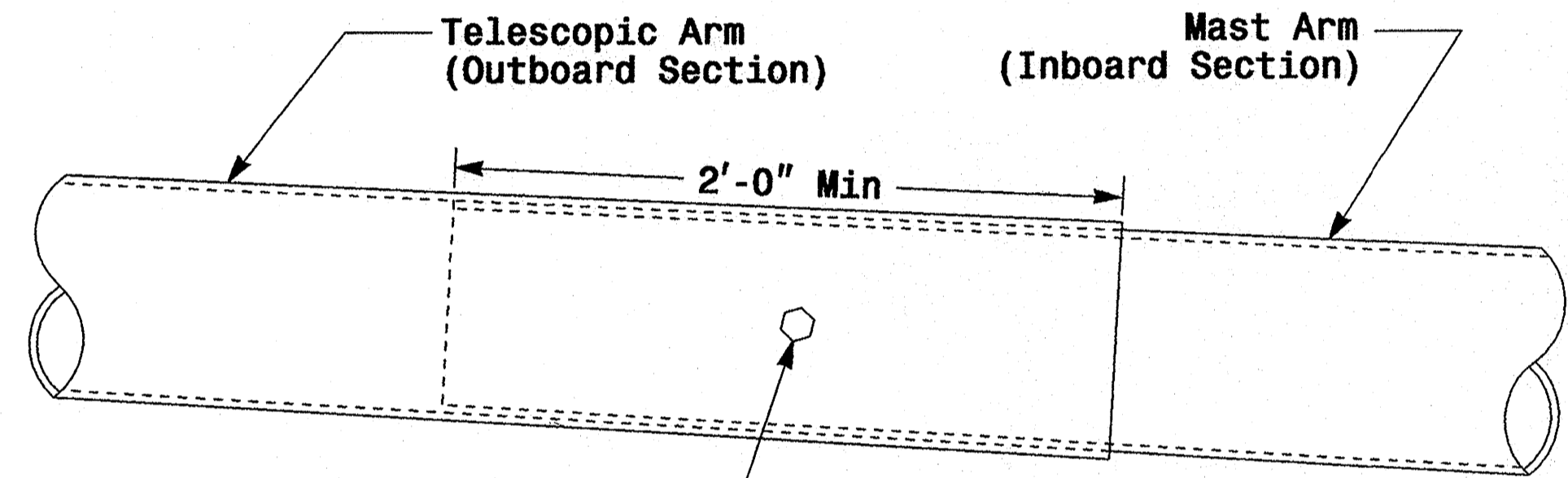
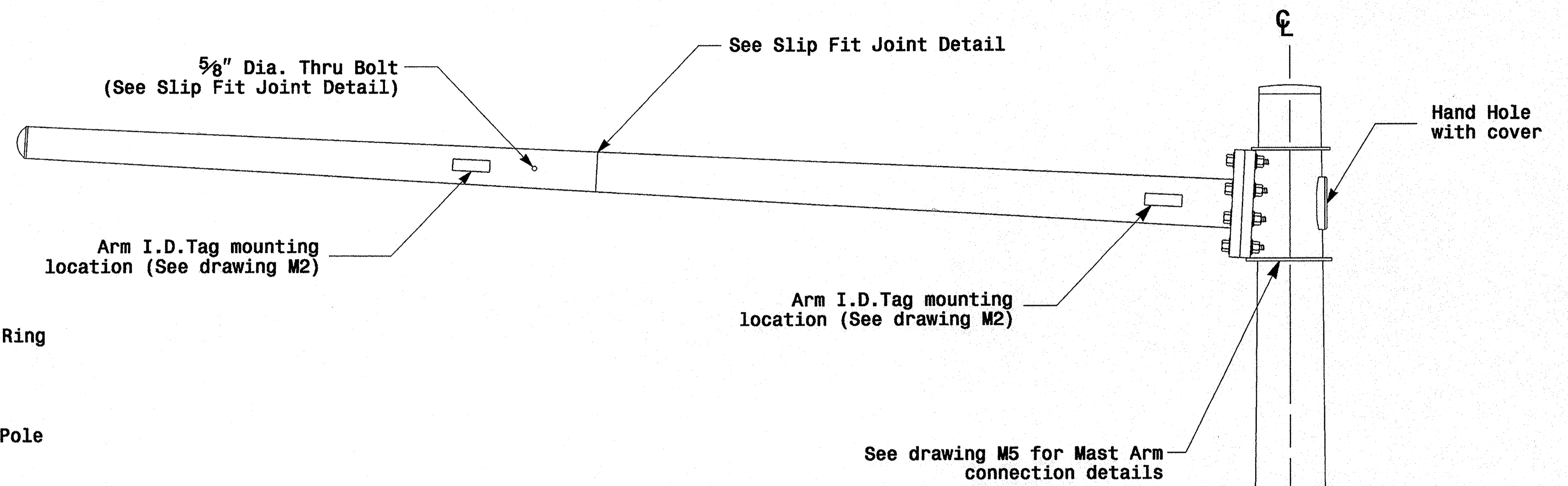
	Typical Fabrication Details For Strain Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
REVISIONS:		INIT. DATE	SIG. INVENTORY NO.



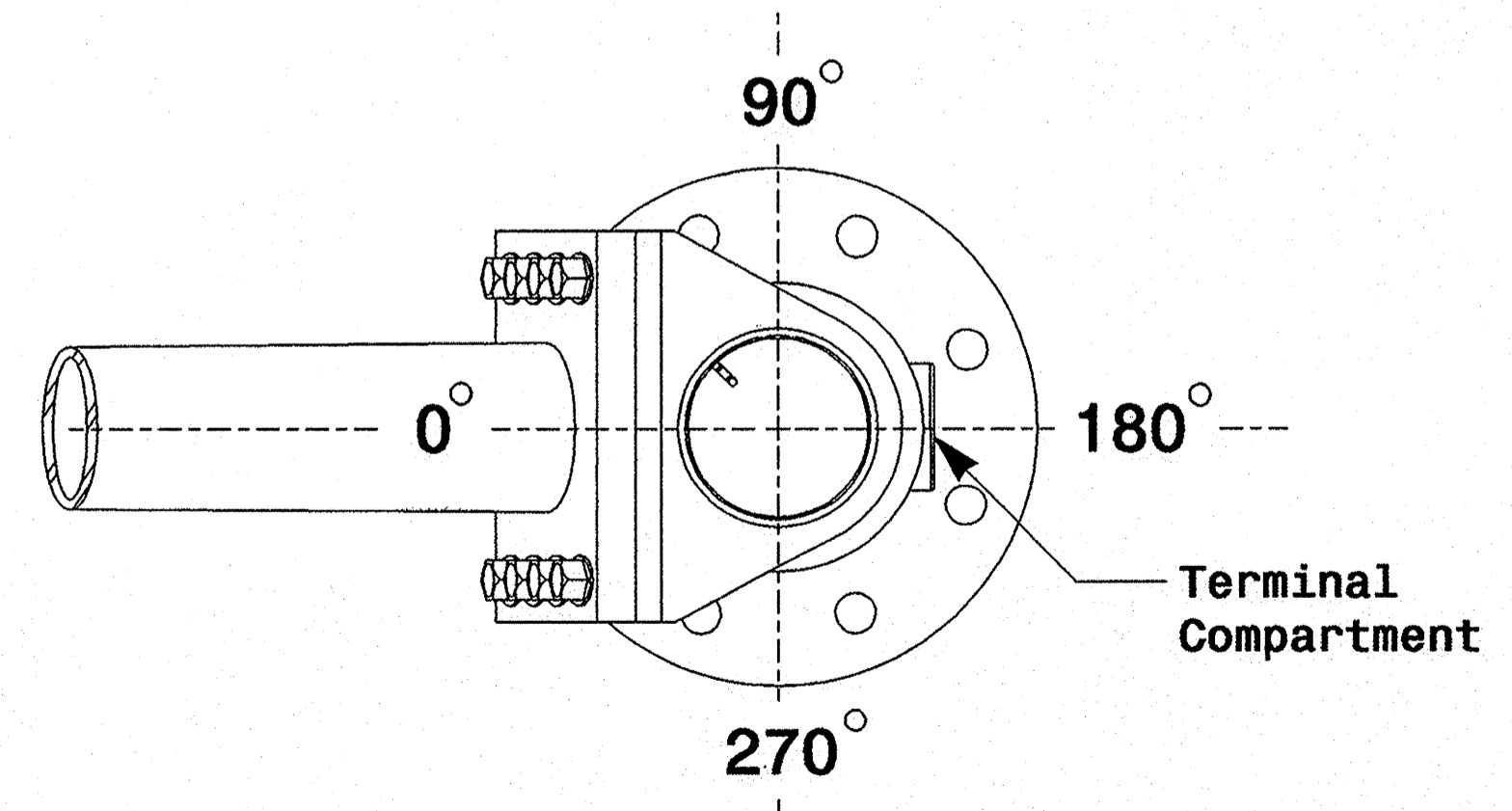
Section A-A
(See drawing M 2)
Pole Base Plate



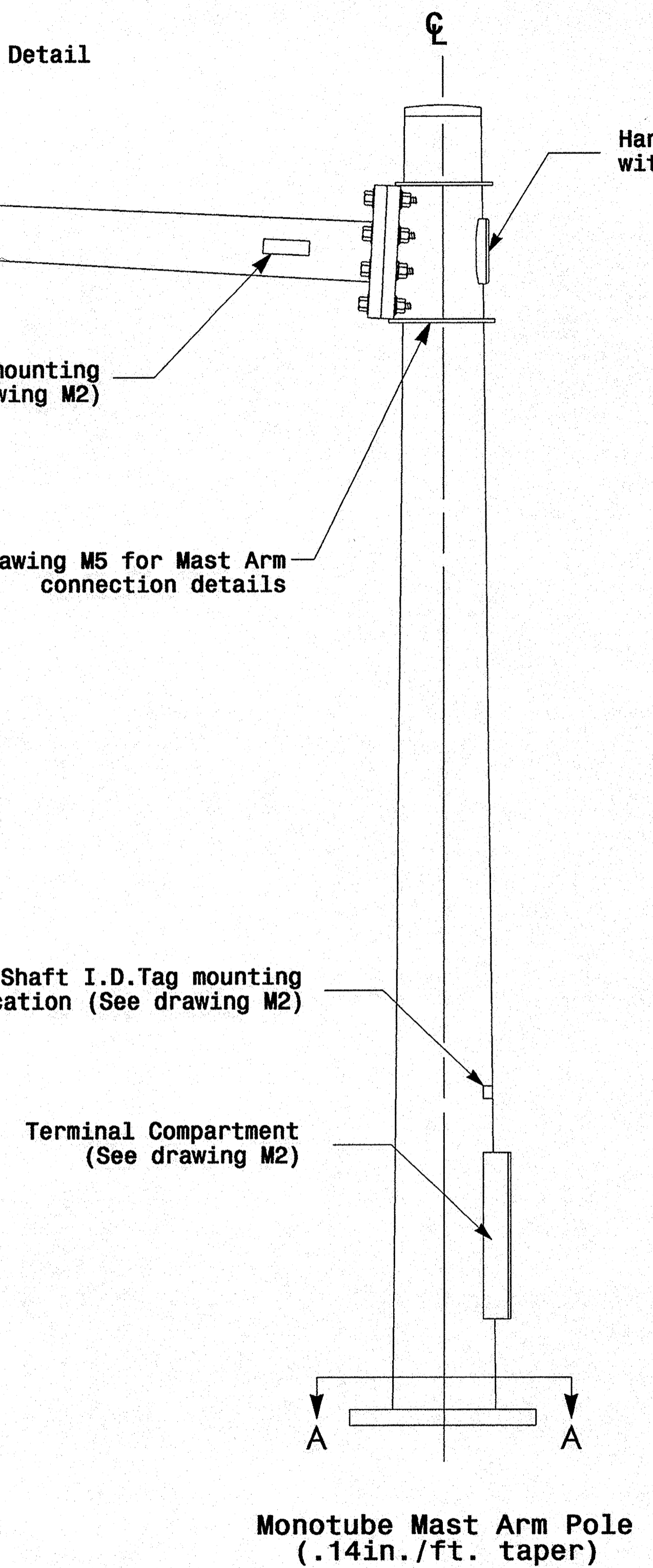
Section B-B
(Pole Attachment to Base Plate)
Full-Penetration Groove Weld Detail



3/4" Factory Drilled Hole in Outboard Tube. Field Drill Inboard Tube. 5/8" Galvanized Thru Stud with (2) Hex. Locknuts Ea.
Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation



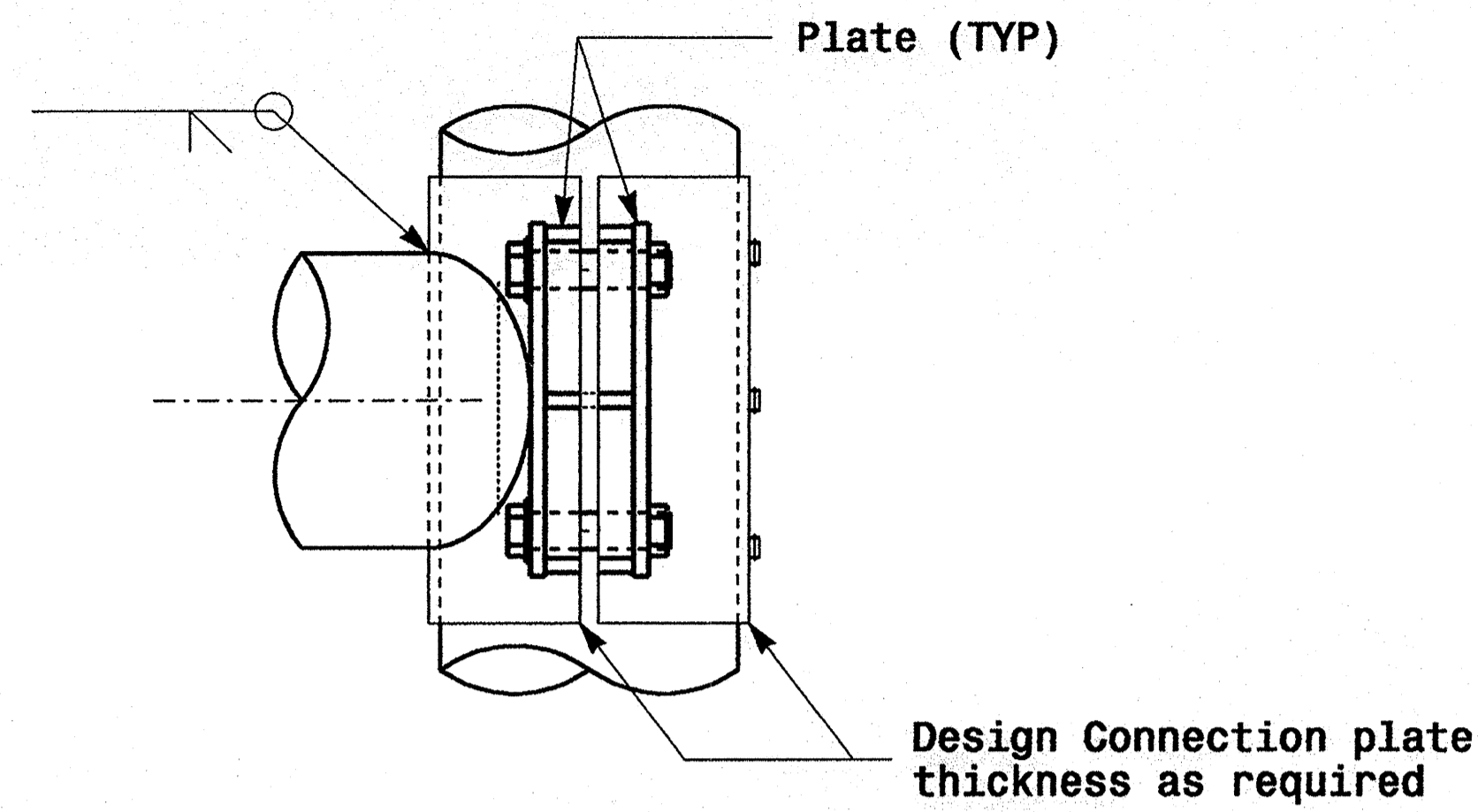
Monotube Mast Arm Pole (.14in./ft. taper)

Fabrication Details - Mast Arm Poles

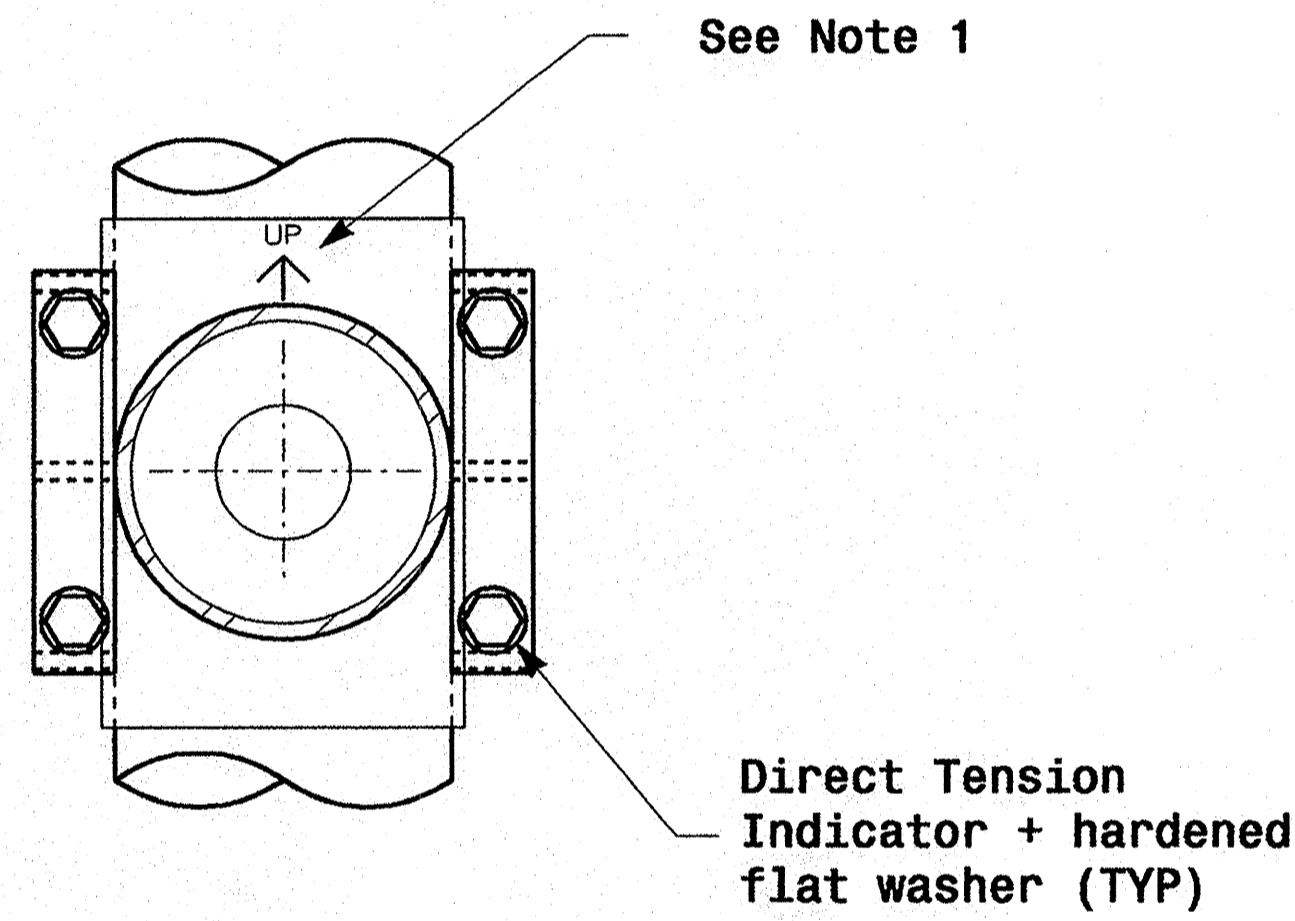
01-SEP-2005 14:08
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	Typical Fabrication Details for Mast Arm Poles		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
REVISIONS: _____ INIT. DATE _____		SIGNATURE: <i>D. Sacker</i> DATE: 9.2.2005	
STG. INVENTORY NO. _____			

Adjustable Clamp Type Bolted Mast Arm Connection

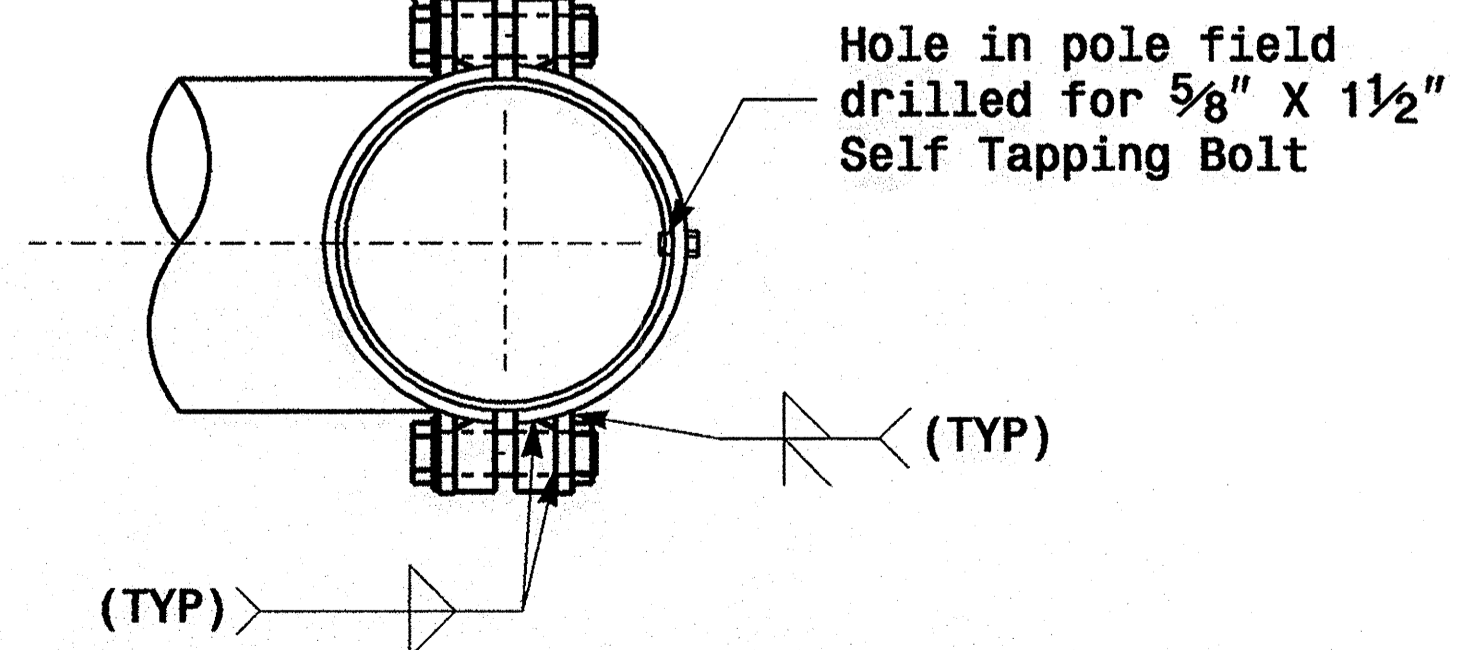


Side Elevation View



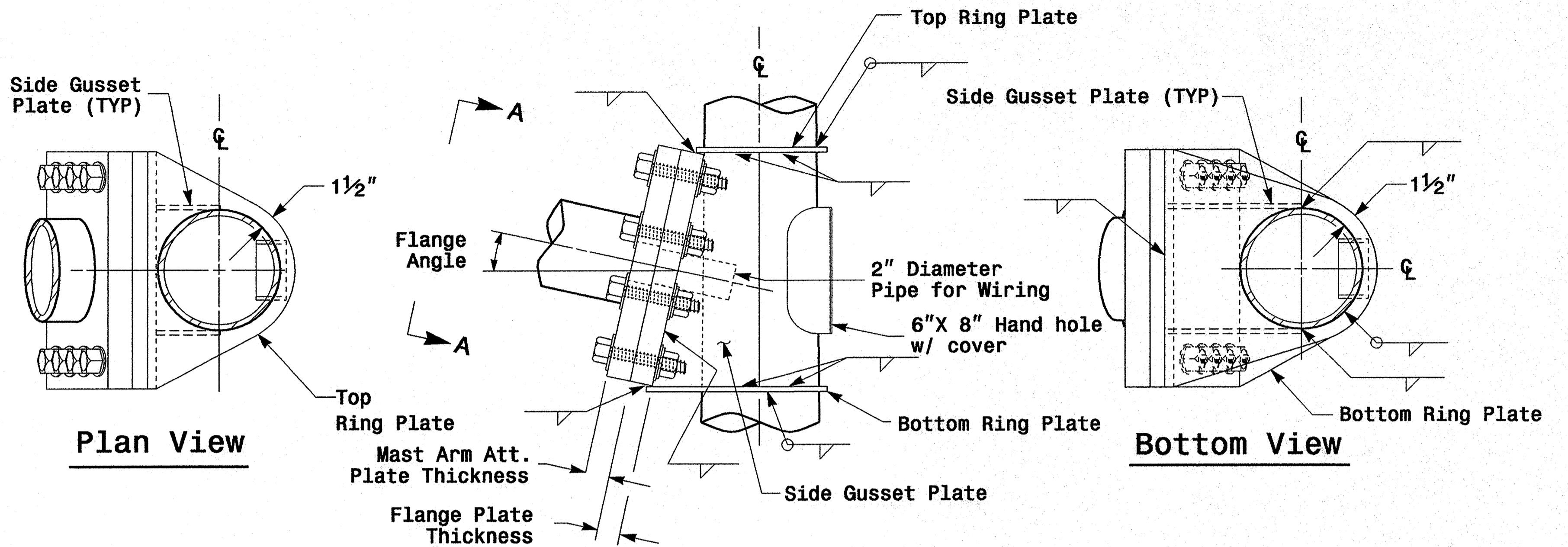
Front Elevation View

(4) - Size "E" Hex Head Bolts with (1) Hex Nuts & Washers



Plan View

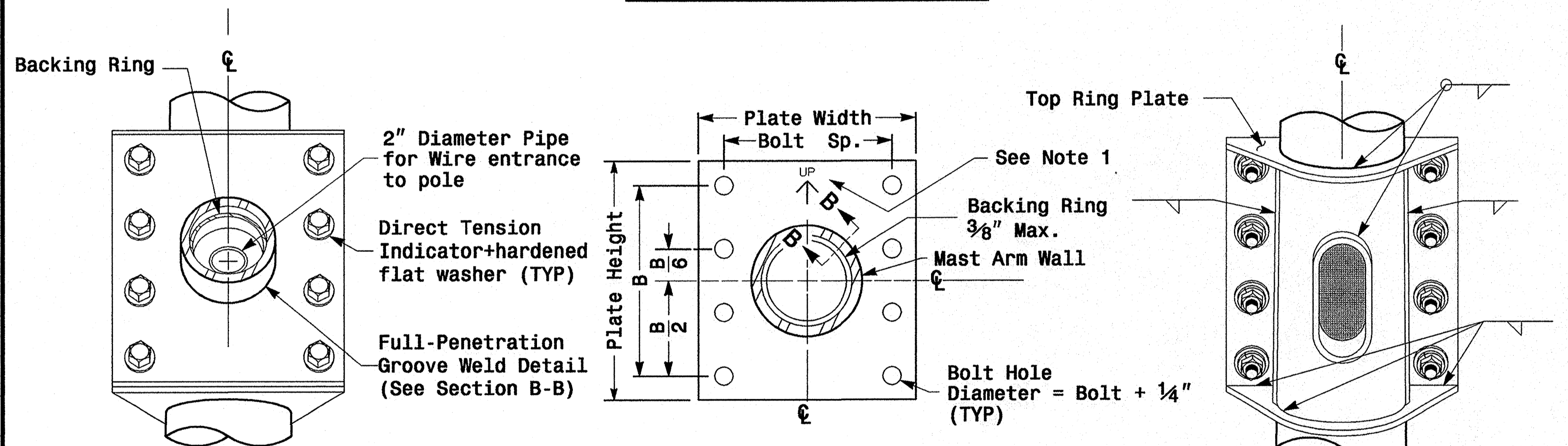
Welded Ring Stiffened Mast Arm Connection



Plan View

Side Elevation View

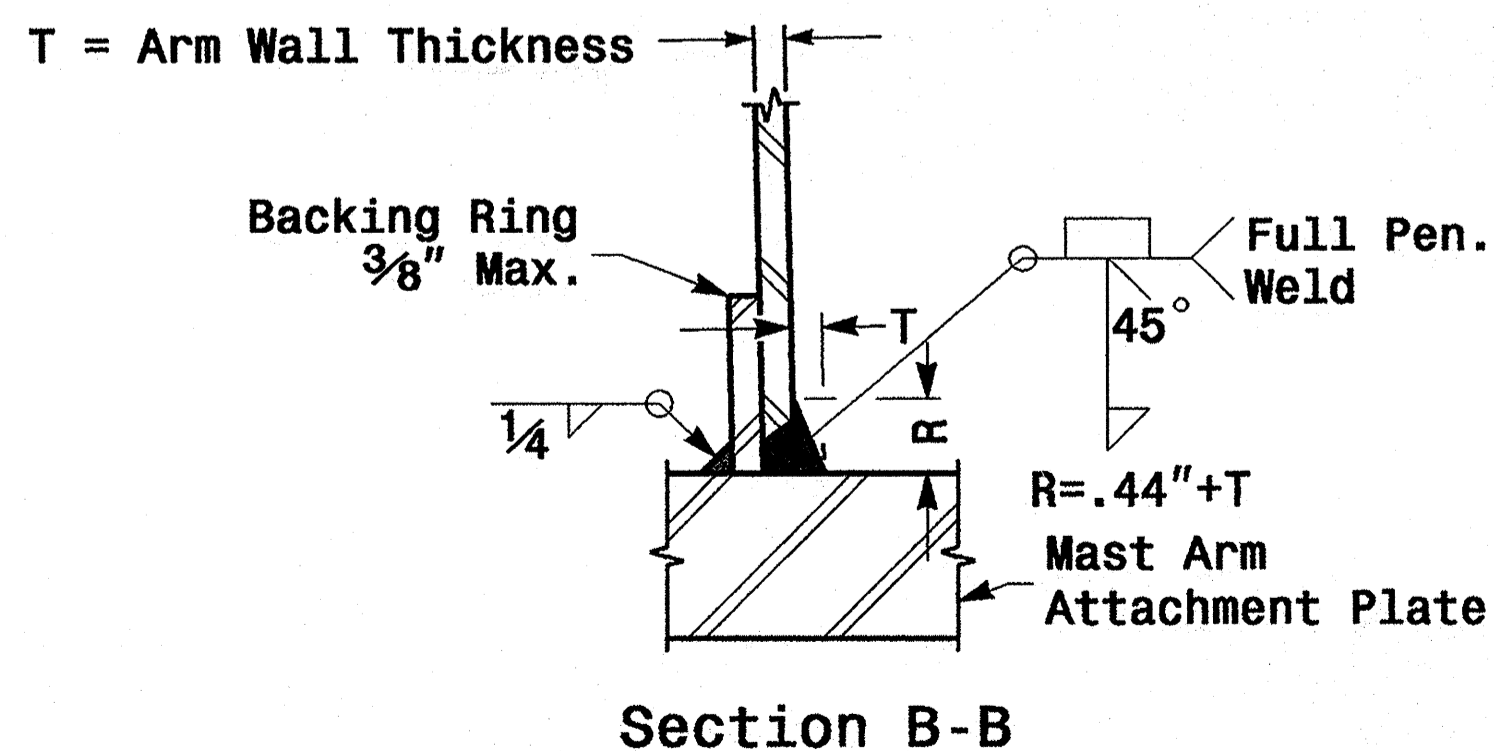
Bottom View



Front Elevation View

Mast Arm Attachment Plate

Back Elevation View



Section B-B Full-Penetration Groove Weld Detail

Notes:

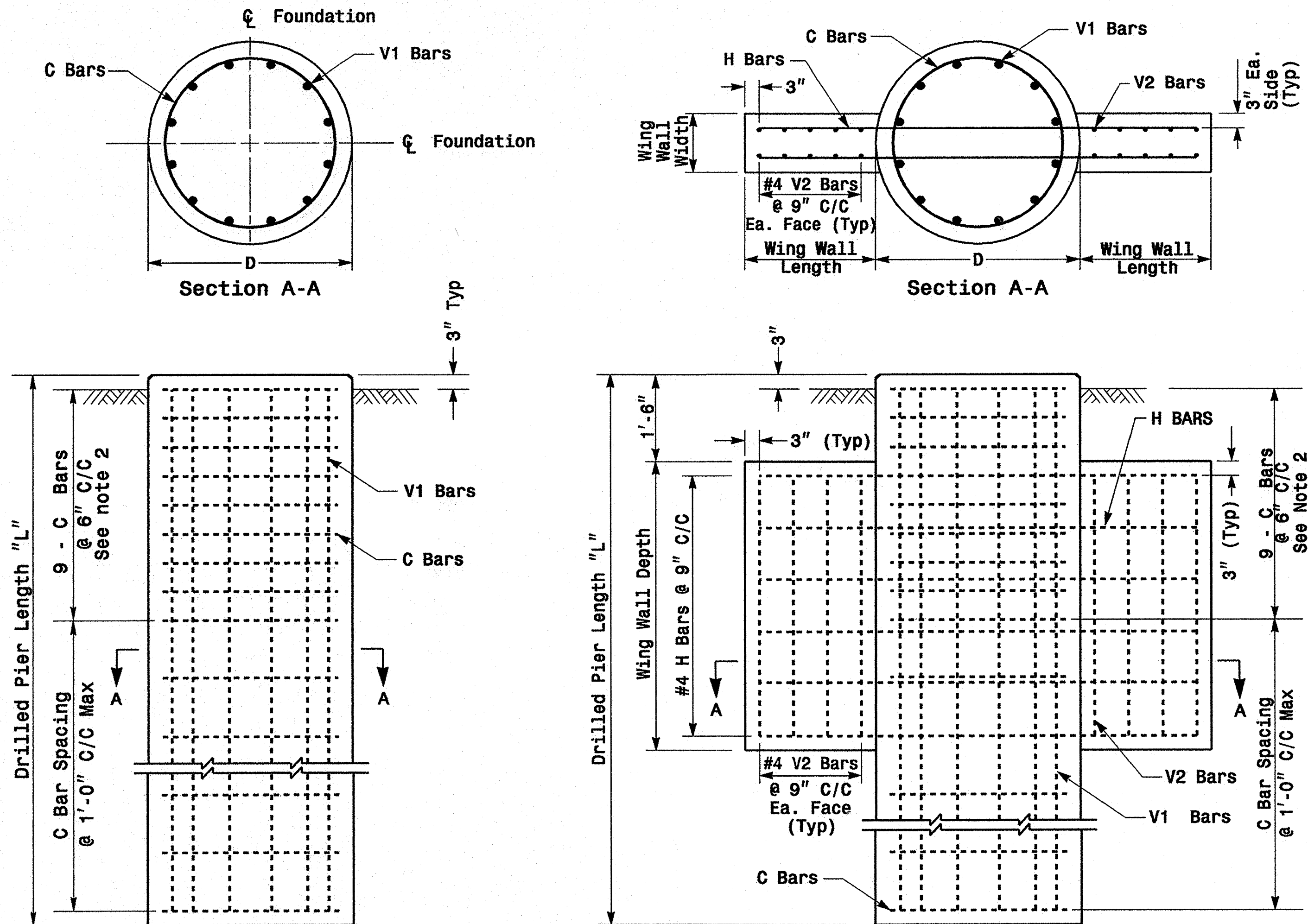
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing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

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Fabrication Details - Mast Arm Poles

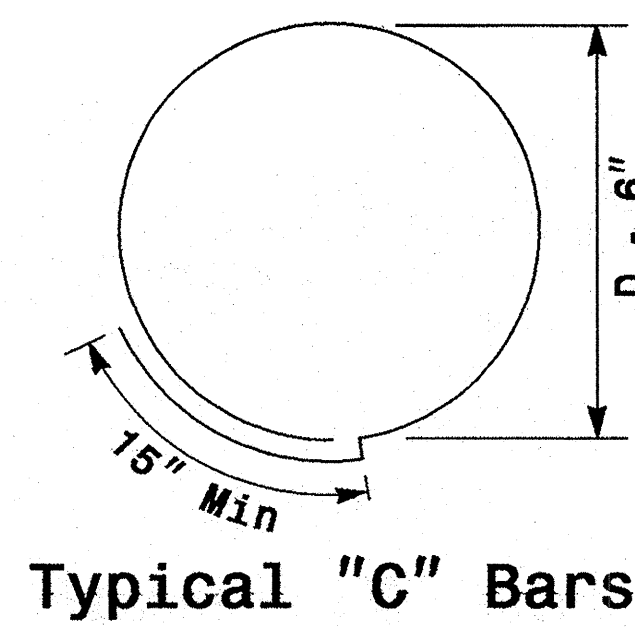
	Fabrication Details For Mast Arm Connection To Pole		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.W. Esposito	

Reinforcing Steel Bars



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

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



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

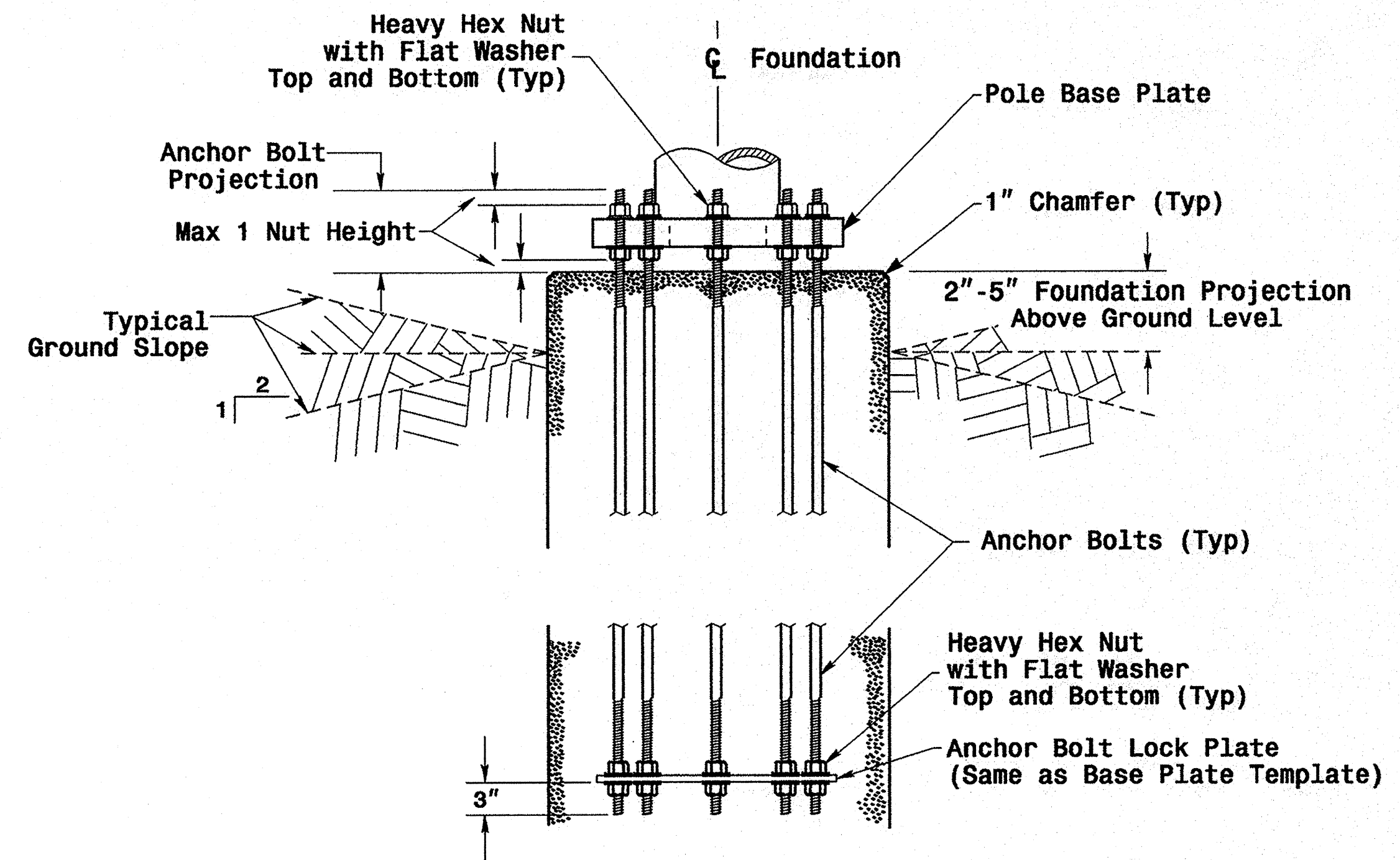
* See Note No. 1
** See Note No. 3

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

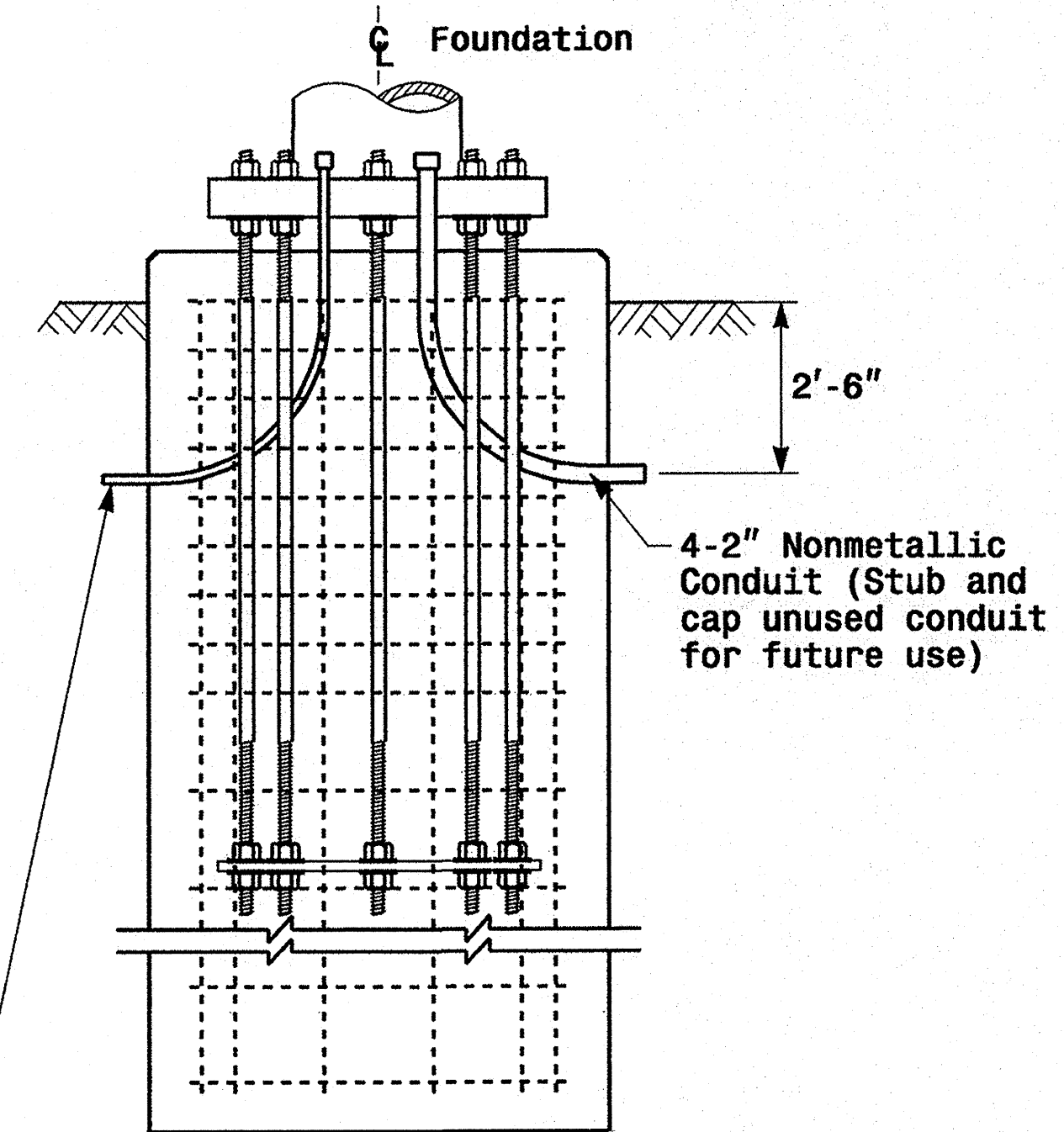
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



2-1" Nonmetallic Conduits for Electrical Service and Grounding Electrode Conductor

Notes

- The number of C-bars is based on foundation depth. For standard foundations, see sheet M 8.
- Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
- The length of V1-bars is based on foundation depth. For standard foundations, see sheet M 8.
- The quantities for steel and concrete shown in the Wing Wall Details Chart reflect the amount of material for 1 pair of wing walls (2 wing walls per drilled pier shaft.)

	Construction Details Foundations		
	PLAN DATE: May 2005 PREPARED BY: C.F. ANDREWS	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.M. ESPOSITO	

		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	14.0
		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	13.5
		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	13.0
		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	13.5
		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:

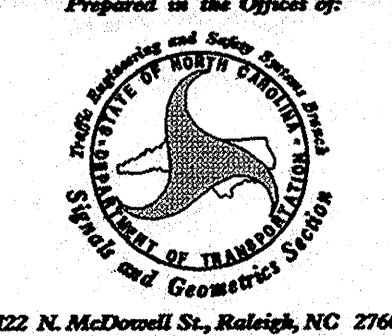
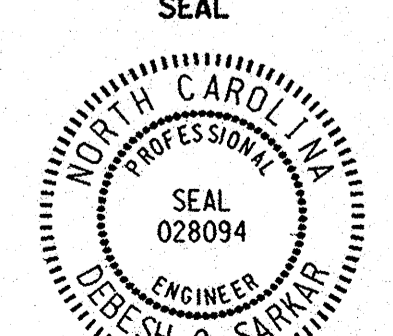
1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.
2. Base plate thickness (T) is 2.0 inches.

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

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	Standard Strain Poles and Standard Foundations		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.W. Esposito	
SCALE: 0 NA None		SIGNATURE: <i>D. Sarkar</i> DATE: 9.2.2005	