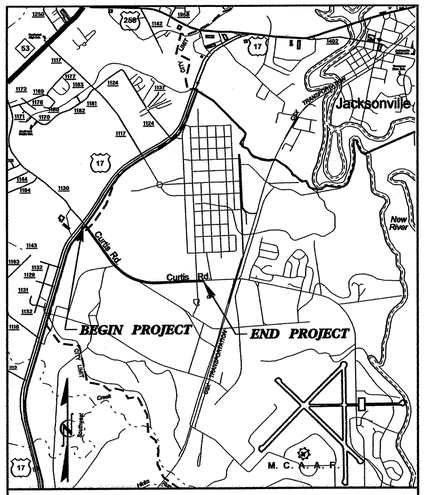
STATE	PROJECT NO.	SHEET NO.
N.C.	U-4439A&B	Sig. 1
F. A. PROJ. NO.		
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

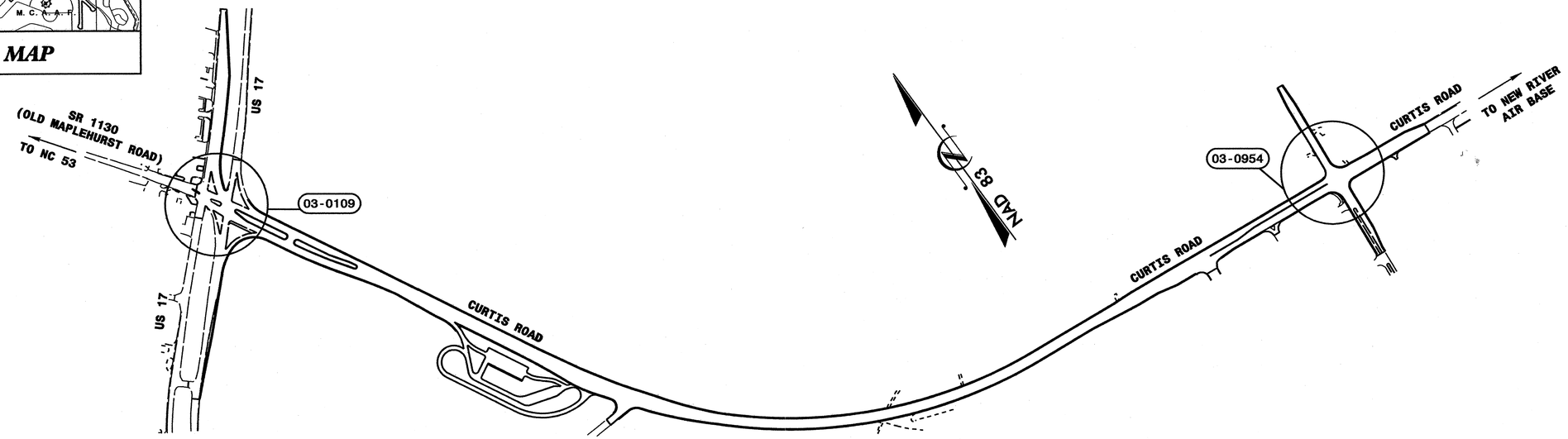
ONSLOW COUNTY

LOCATION: CURTIS ROAD FROM US 17 TO "A" STREET ON BOARD THE USMC BASE– NEW RIVER AIR STATION

TYPE OF WORK: TRAFFIC SIGNALS



VICINITY MAP



TIP NO. U-4439A&B

INDEX OF PLANS

SHEET NUMBER	SIGNAL INVENTORY NUMBER	LOCATION /DESCRIPTION
SIG. 1	——	Title Sheet
SIG. 2–3	03–0109	US 17 at SR 1130 (Old Maplehurst Road) and Curtis Road/Air Facility Entrance
SIG. 4	——	Metal Pole Loading Diagrams
SIG. 5–10	03–0954	Curtis Road at "A" Street and Schmidt Street
SIG. 11–12	——	Metal Pole Loading Diagrams
SIG. 13–17	——	Metal Pole Typicals
SIG. 18	——	Cabinet Component Layout– 170 Cabinet Model 332A with 2070L Controller
SIG. 19–21	——	Communications Cable and Conduit Routing Plans

LEGEND

(##-####) *SIGNAL INVENTORY NUMBER*

NCDOT CONTACTS:

TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

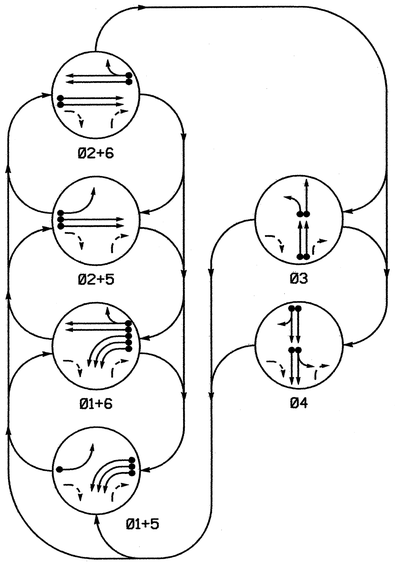
TIMOTHY J. WILLIAMS, PE – S & G CONTRACTS & PEF SUPPORT ENGINEER

GEORGE C. BROWN, PE – SIGNAL EQUIPMENT DESIGN ENGINEER

G. G. MURR, JR, PE – INTELLIGENT TRANSPORTATION SYSTEMS ENGINEER

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	SIG. 2

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

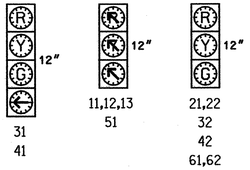
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
11,12,13	↖	↖	R	R	R	R	R
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G (←)	R	R
32	R	R	R	R	G	R	R
41	R	R	R	R	R	G (←)	R
42	R	R	R	R	R	G	R
51	↖	R	↖	R	R	R	R
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.

Denotes L.E.D.



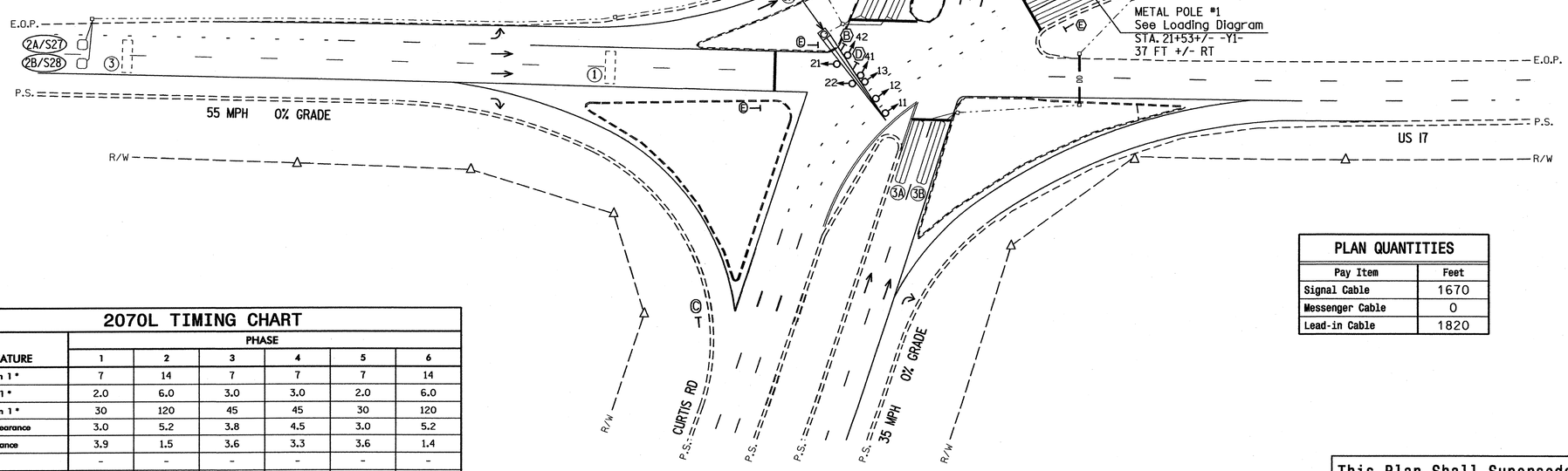
2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	Y
1B	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	Y
1C	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	-	Y
2A,S27	6X6	420	6	Y	2	Y	Y	-	Y	-	-	Y
2B,S28	6X6	420	6	Y	2	Y	Y	-	Y	-	-	Y
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	Y
3B	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	-	Y
3C	6X30	0	2-4-2	Y	3	Y	Y	-	-	-	5	Y
3D	6X30	0	2-4-2	Y	3	Y	Y	-	-	-	5	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	10	Y
4C	6X30	0	2-4-2	Y	4	Y	Y	-	-	-	5	Y
4D	6X30	0	2-4-2	Y	4	Y	Y	-	-	-	5	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	-	Y
6A,S29	6X6	420	4	Y	6	Y	Y	-	Y	-	-	Y
6B,S30	6X6	420	4	Y	6	Y	Y	-	Y	-	-	Y

6-Phase Fully Actuated (US 17 Closed Loop Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specifications for Roads and Structures" dated January 2002.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Abandon existing loops 1, 2, 3 and 4.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
9. Controller Asset #0109.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
	Metal Pole with Mastarm	
Ⓐ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓑ	Through Arrow "ONLY" Sign (R3-5A)	Ⓑ
Ⓒ	"YIELD" Sign (R1-2)	Ⓒ
Ⓓ	Combined Through and Left Arrow Sign (R3-6L)	Ⓓ
Ⓔ	"DO NOT ENTER" Sign (R5-1)	Ⓔ
DD	Directional Drill	N/A

PLAN QUANTITIES

Pay Item	Feet
Signal Cable	1670
Messenger Cable	0
Lead-in Cable	1820

2070L TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green 1 *	7	14	7	7	7	14
Extension 1 *	2.0	6.0	3.0	3.0	2.0	6.0
Max Green 1 *	30	120	45	45	30	120
Yellow Clearance	3.0	5.2	3.8	4.5	3.0	5.2
Red Clearance	3.9	1.5	3.6	3.3	3.6	1.4
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5
Max Variable Initial *	-	46	-	-	-	46
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	45	-	-	-	45
Minimum Gap	-	3.0	-	-	-	3.0
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	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.

This Plan Shall Supersede the Plan Sealed on 01-22-2004

Signal Upgrade

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

SCALE 0 40 1"=40'

US17
At
SR 1130 (Old Maplehurst Rd) and Curtis Rd/Air Facility Entrance
Division 03 Onslow County Jacksonville

PLAN DATE:	January 2006	REVIEWED BY:	I.O.Umozurike
PREPARED BY:	Luhr/BEW	REVIEWED BY:	

REVISIONS	INIT.	DATE

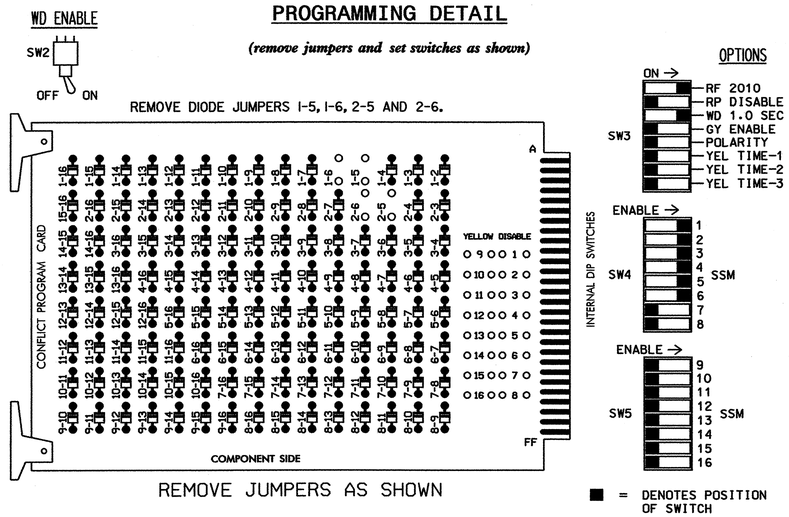
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY J. WILLIAMS
SIGNATURE 1/31/06 DATE
SIG. INVENTORY NO. 03-0109

31-JAN-2006 08:38
s:*ts signals\workgroups*tip projects*u-4439\2005updatedsignals\03-0109\03109_sig_dsn_2006xxxx.dgn
"luhr"

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	Sig.3

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL1-SEL5 are present on the monitor board.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 7,8,9, 10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
3. Program phases 2 and 6, on the controller unit, for Start Up In Green.
4. Enable Simultaneous Gap-Out, on the controller unit, for all phases.
5. Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.
6. The Cabinet And Controller Are Part Of US 17 Closed Loop System.

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S3,S4,S5,S6
PHASES USED.....1,2,3,4,5,6
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3		S4		S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3		4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11,12, 13	21,22	NU	31	32	41	42	NU	51	61,62	NU	NU	NU	NU
RED		128		116	116	101	101			134				
YELLOW		129		117	117	102	102			135				
GREEN		130		118	118	103	103			136				
RED ARROW	125								131					
YELLOW ARROW	126								132					
GREEN ARROW	127			118		103			133					
✋														
🚶														

NU = NOT USED

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	ø1 1A	ø1 1B	ø2/SYS 2A,S27	ø3 3A	ø3 3B	ø3 3C	ø4 4A	ø4 4C	ø4 4D	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	ø1 1C	ø2/SYS 2B,S28	NOT USED	NOT USED	ø3 3D	ø4 4B	NOT USED	NOT USED					ST DC ISOLATOR
FILE "J"	U	ø5 5A	ø6/SYS 6A,S29	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	ø6/SYS 6B,S30												

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			
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			
1C	TB2-7,8	I2L	43	5	12	1	Y	Y			
2A,S27	TB2-9,10	I3U	63	25	32	2/SYS	Y	Y			
2B,S28	TB2-11,12	I3L	76	38	42	2/SYS	Y	Y			
3A	TB4-1,2	I4U	47	9	22	3	Y	Y			
3B	TB4-5,6	I5U	58	20	3	3	Y	Y			
3C	TB4-9,10	I6U	41	3	4	3	Y	Y			5
3D	TB4-11,12	I6L	45	7	14	3	Y	Y			5
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			10
4C	TB6-5,6	I8U	49	11	24	4	Y	Y			5
4D	TB6-9,10	I9U	60	22	11	4	Y	Y			5
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A/29	TB3-5,6	J2U	40	2	6	6/SYS	Y	Y			
6B/30	TB3-7,8	J2L	44	6	16	6/SYS	Y	Y			

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0109
DESIGNED: January 2006
SEALED: January 31, 2006
REVISED: N/A

This Detail Shall Supersede The Detail Sealed On 1-22-04

Signal Upgrade

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 17
at
SR 1130 (Old Maplehurst Rd) and Curtis Rd/Air Facility Entrance

Division 3 Onslow County Jacksonville

PLAN DATE: DECEMBER 2003 REVIEWED BY: D.T. Joyce

PREPARED BY: D.H. Spaulding REVIEWED BY:

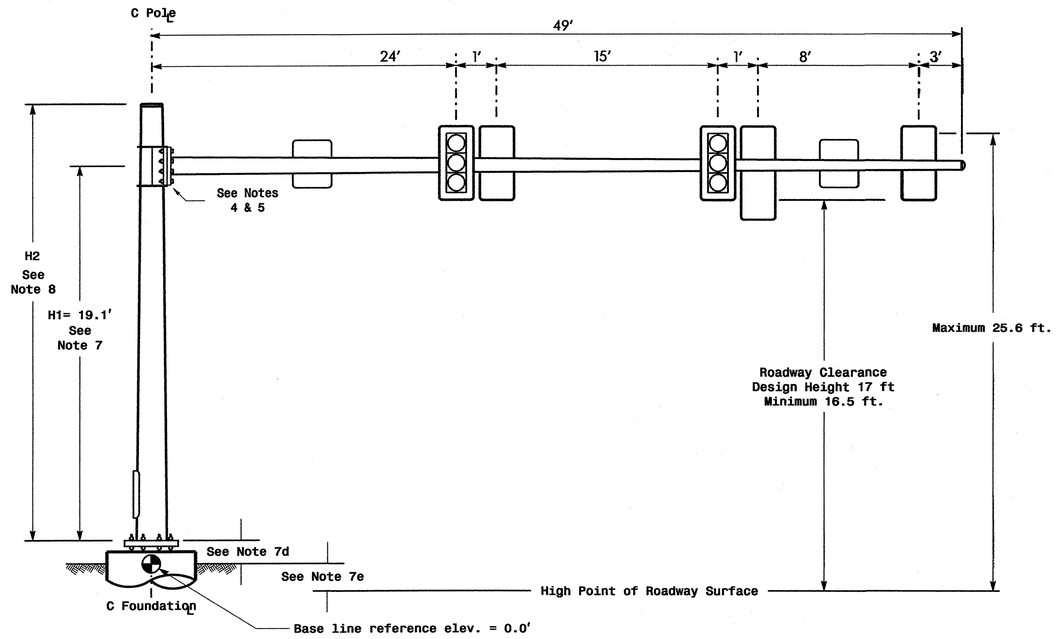
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE DATE 2/1/06

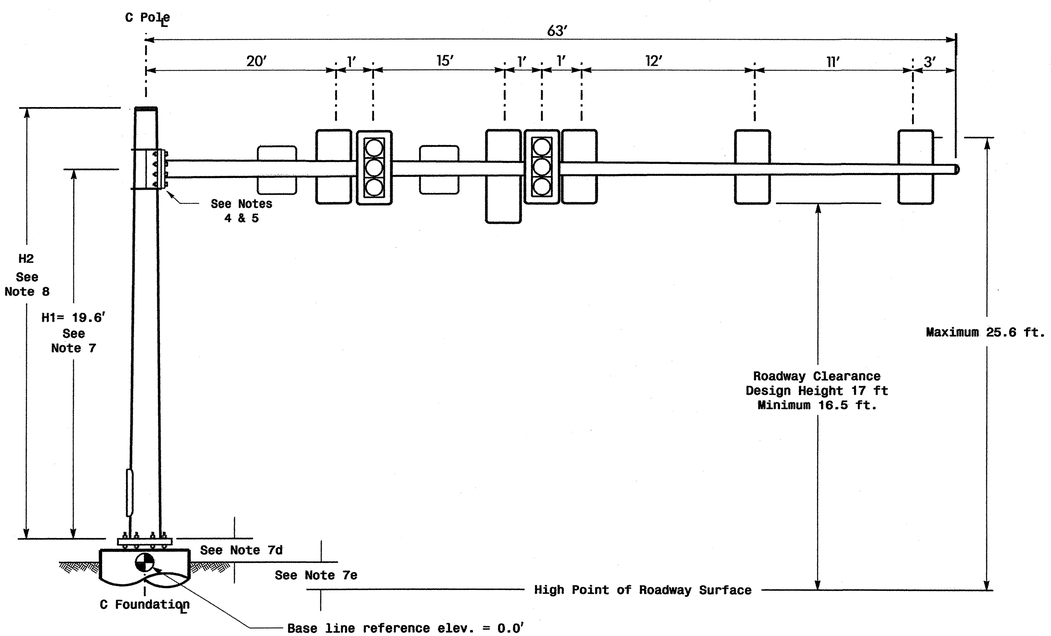
SIG. INVENTORY NO. 03-0109

Design Loading for METAL POLE NO. 1



Elevation View

Design Loading for METAL POLE NO. 2



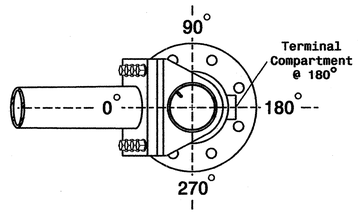
Elevation View

SPECIAL NOTE

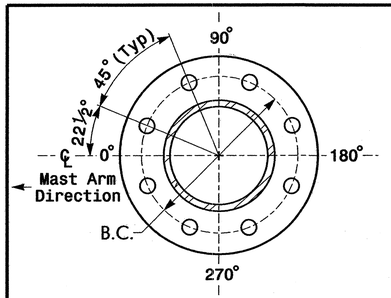
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 1	Pole 2
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.3 ft.	-0.5 ft.
Elevation difference at Edge of travelway or face of curb	-0.3 ft.	-0.5 ft.

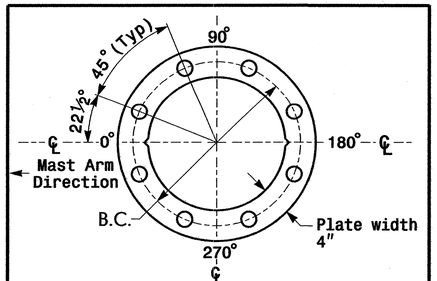


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



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

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	5.0 S.F.	24.0" W X 30.0" L	11 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2002 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2002 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.doh.dot.state.nc.us/preconstruct/traffic/tmssu/ws/mpoles/poles.htm

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Maximum allowable CSR for all signal supports is 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This is a high strength connection. Use Direct Tension Indicators (ASTM F959) for each bolt.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 66 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 733-3915.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2(130 mph)

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

Curtis Road
At
"A" Street / Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: January 2006 | REVIEWED BY: I.O.Umozurike
PREPARED BY: Luhr | REVIEWED BY:

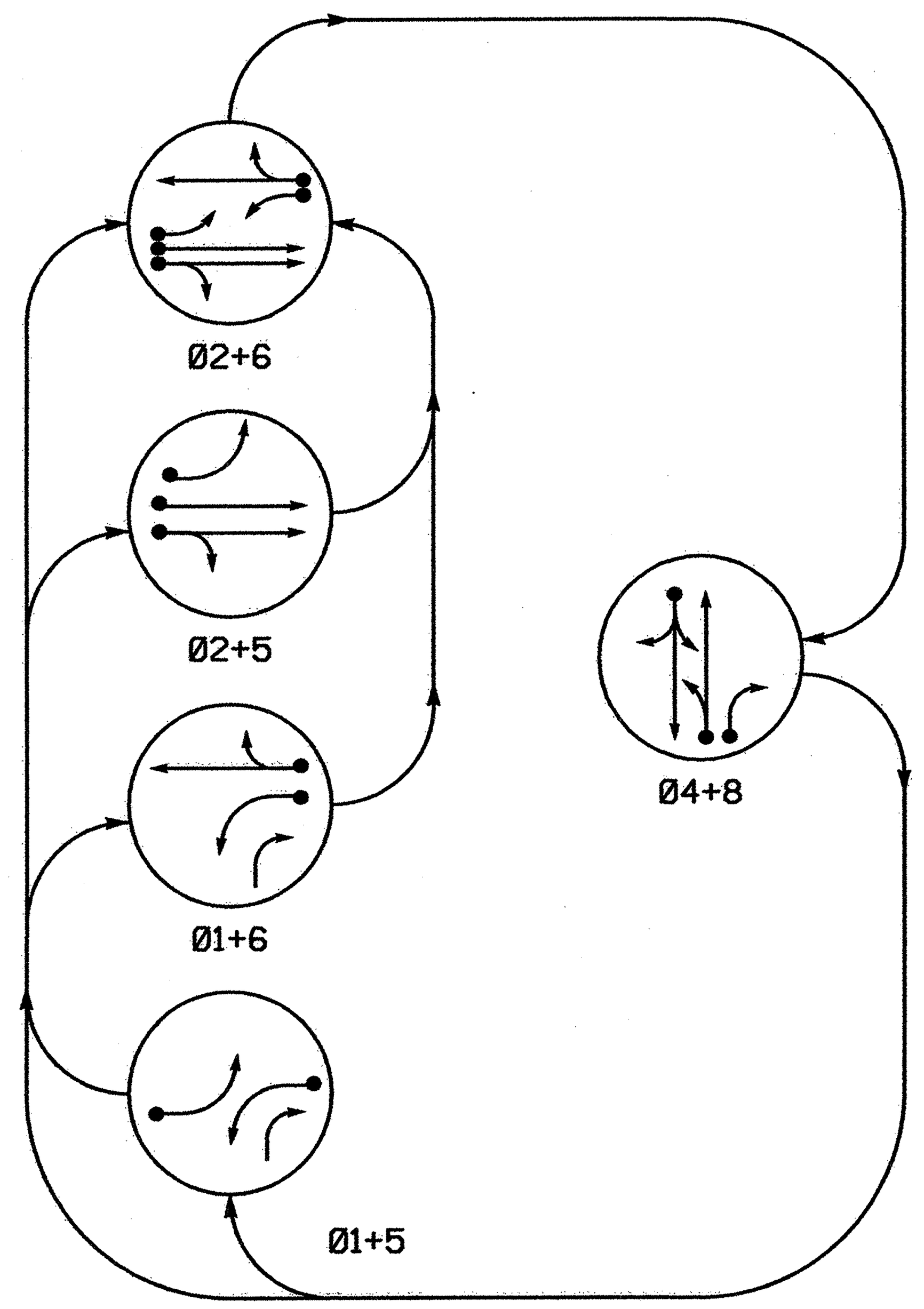
SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY J. WILLIAMS
SIGNATURE 1/31/06 DATE
SIG. INVENTORY NO. 03-0109

PROJECT REFERENCE NO.	SHEET NO.
U-4439 A&B	SIG. 5

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

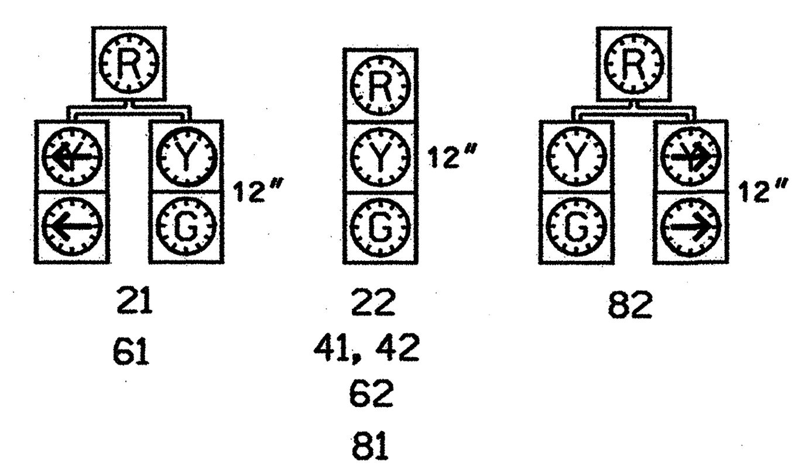
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	FLASH
21	R/←	R	G/←	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R/←	G/←	R	G	R	Y
62	R	G	R	G	R	Y
81	R	R	R	R	G	R
82	R/→	R/→	R	R	G	R

SIGNAL FACE I.D.

Denotes L.E.D.



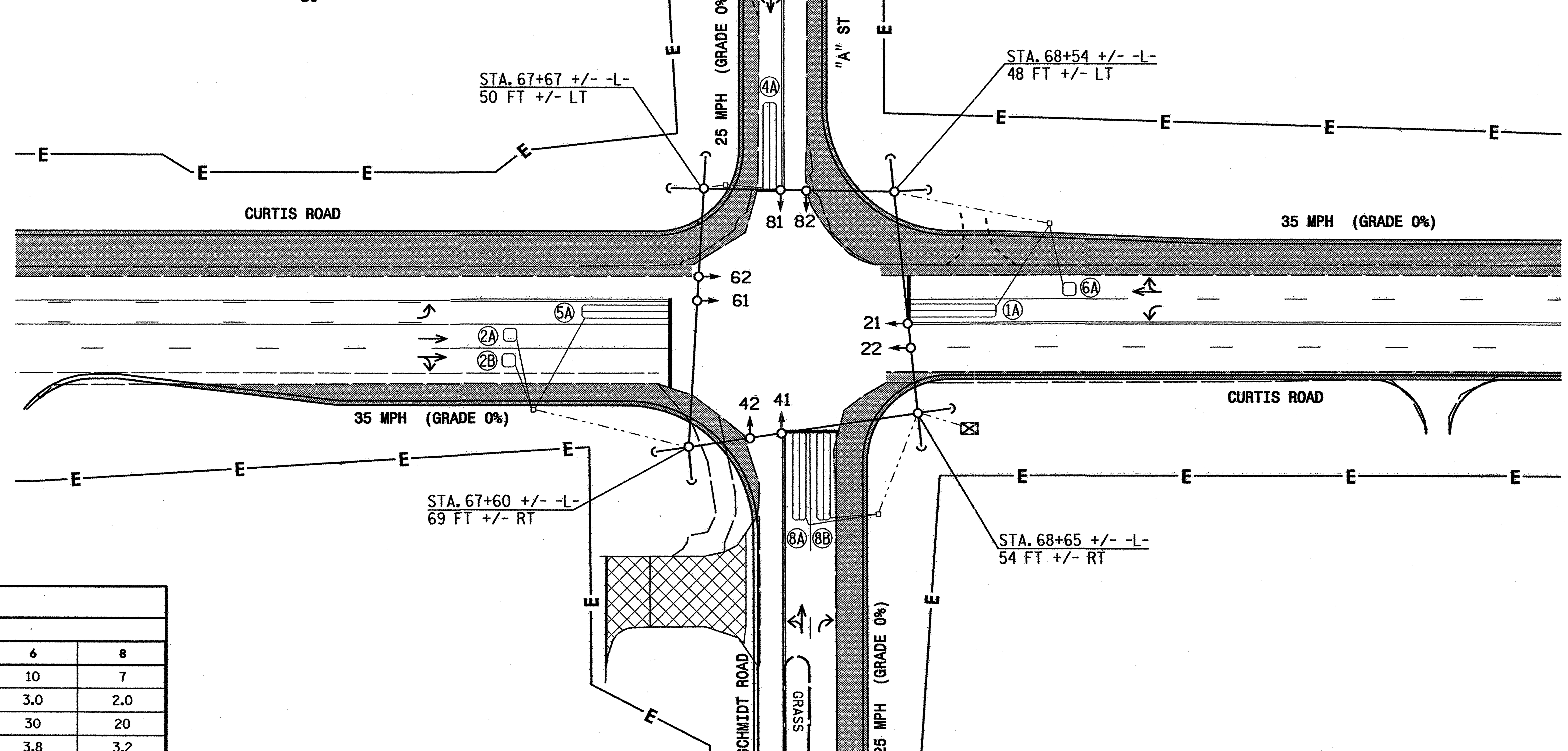
2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING: PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	-	15	Y
					6	Y	Y	-	-	-	-	Y
2A	6X6	70	4	Y	2	Y	Y	-	-	-	-	Y
2B	6X6	70	4	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	5	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	15	Y
					2	Y	Y	-	-	-	-	Y
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	3	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	15	Y

5-PHASE
FULLY ACTUATED
(ISOLATED)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specificatins for Roads and Structures" dated January 2002.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 1 during phase 2 on.
4. Omit phase 5 during phase 6 on.
5. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8.
6. Set all detector units to presence mode.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.



PLAN QUANTITIES

Pay Item	Feet
Signal Cable	750
Messenger Cable	430
Lead-in Cable	860

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
E	Roadway Easement	E
	Directional Arrow	
	Pavement Marking Arrow	
	Construction Zone	N/A

2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	3.0	2.0
Max Green 1 *	15	30	20	15	30	20
Yellow Clearance	3.0	3.8	3.2	3.0	3.8	3.2
Red Clearance	2.4	1.6	2.4	2.1	1.6	2.2
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	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.

30-JAN-2006 14:56
S:*ITS Signals*Workgroups*TIP Projects*U-4439*2005UpdatedSignals*03-0954*030954_2006mmdd.sig
iluhr

THIS PLAN SUPERSEDES THE PLAN SEALED ON 01-22-04

Signal Upgrade - Temporary 1

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

Curtis Rd.
at
"A" Street/ Schmidt Rd.

Division 3 — Onslow County — Camp Lejeune

PLAN DATE: December 2005 — REVIEWED BY: I.O.Umozurike
PREPARED BY: Luhr — REVIEWED BY:

REVISIONS	INIT.	DATE

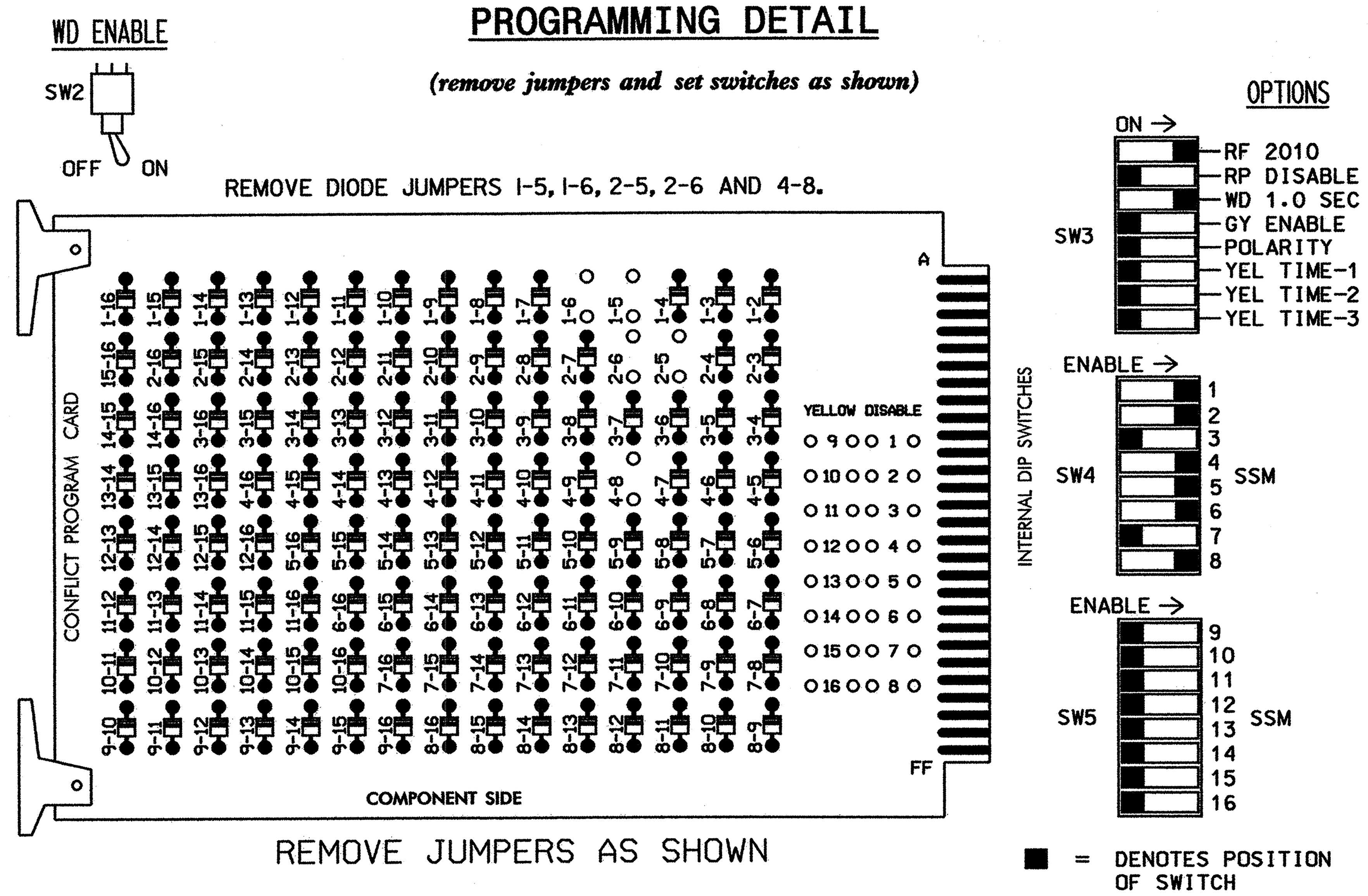
SCALE 0 40 — 1" = 40'

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24393 TIMOTHY J. WILLIAMS
T.J. Williams (SIGNATURE) 1/30/06 (DATE)

SIG. INVENTORY NO. 03-0954 T1

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL1-SEL5 are present on the monitor board.

NOTES

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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61,82	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU
RED	*	128			101		*	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126						132					
GREEN ARROW	127						133					

NU = Not Used

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

EQUIPMENT INFORMATION

CONTROLLER..............CONTRACTOR SUPPLIED 2070L
CABINET.................CONTRACTOR SUPPLIED 332
SOFTWARE................ECONOLITE OASIS
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S1,S2,S4,S5,S6,S8
PHASES USED.............1,2,4,5,6,8
OVERLAPS................NONE

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Functions 1 and 2.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
              OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR            PHASES:|12345678910111213141516
IF PHASES ARE ON|  X
OMIT PHASES     | X
CALL PHASES     |    X
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
              OVERLAPS:|ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE |
OR            PHASES:|12345678910111213141516
IF PHASES ARE ON|     X
OMIT PHASES     |     X
CALL PHASES     |    X
```

BACKUP PROTECTION PROGRAMMING COMPLETE

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15
	TB2-7,8	I2L	43	5	12	6	Y	Y			
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			5
5A[2]	TB3-5,6	J2U	40	2	6	5	Y	Y			15
	TB3-7,8	J2L	44	6	16	2	Y	Y			
6A	TB3-9,10	J3U	64	26	36	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			15

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

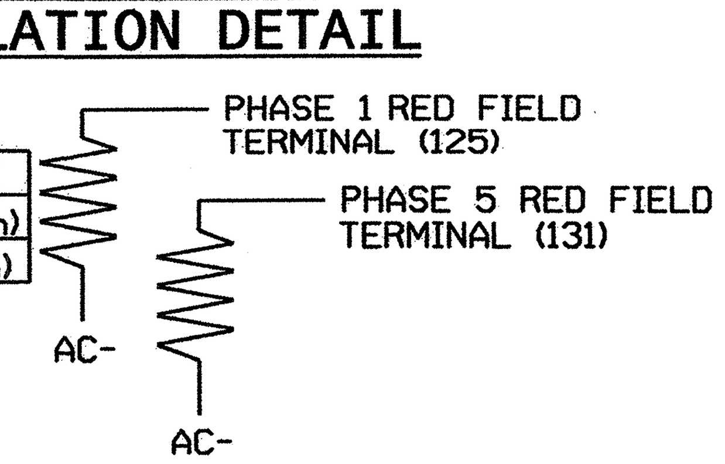
[1] Add jumpers from TB2-5 to TB2-7, and from TB2-6 to TB2-8.

[2] Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0954T1
DESIGNED: DECEMBER 2005
SEALED: 1/30/06
REVISED:

This plan supersedes the plan sealed on 1/22/04.

Signal Upgrade - Temporary 1

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Signal Management Section, N.C. Department of Transportation

122 N. McDowell St., Raleigh, NC 27603

Curtis Road
at
"A" Street/ Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: JANUARY 2006 | REVIEWED BY: TODD JOYCE

PREPARED BY: JAMES M. PESZKO | REVIEWED BY:

REVISIONS | INIT. | DATE

SEAL: NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN

SIGNATURE 1/31/06 DATE

SIG. INVENTORY NO. 03-0954T1

31-JAN-2006 10:36
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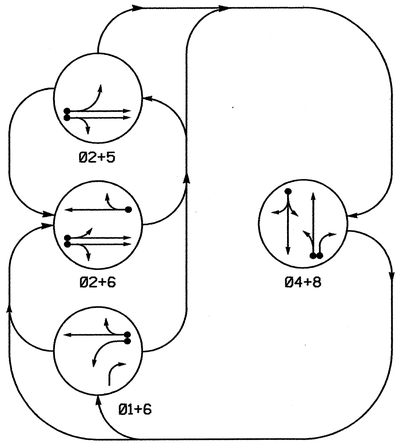
jpeszko

PROJECT REFERENCE NO.	SHEET NO.
U-4439 A&B	SIG. 7

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

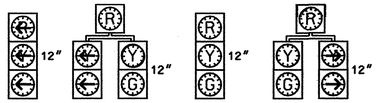
SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø2+5	Ø4+8	FLASH
11	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
21	R	G	G	R	Y
22	R	G	G	R	Y
41, 42	R	R	R	G	R
61,62	G	G	R	R	Y
81	R	R	R	G	R
82	R	R	R	G	R

2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	3	-
2A	6X6	70	4	-	2	Y	Y	-	-	-	-	-
2B	6X6	70	4	-	2	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	5	-
5A	6X15	50	4	Y	5	Y	Y	-	-	-	5	-
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	-	3	-
8B	6X40	0	2-4-2	-	8	Y	Y	-	-	-	15	-

SIGNAL FACE I.D.

Denotes L.E.D.



4-PHASE
FULLY ACTUATED
(ISOLATED)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specificatins for Roads and Structures" dated January 2002.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 1 during phase 2 on.
4. Program controller to clear from phase 2+6 to phase 1+6 by progressing through phase 4+8.
5. Reposition existing signal heads numbered 21, 22, 61 and 62.
6. Set all detector units to presence mode.

PLAN QUANTITIES

Pay Item	Feet
Signal Cable	0
Messenger Cable	0
Lead-in Cable	0

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
E	Roadway Easement	E
	Directional Arrow	
	Pavement Marking Arrow	
	Construction Zone	N/A

2070L TIMING CHART

FEATURE	PHASE 1	2	4	5	6	8
Min Green 1 *	7	10	7	7	10	7
Extension 1 *	2.0	3.0	2.0	3.0	3.0	2.0
Max Green 1 *	20	30	20	15	30	20
Yellow Clearance	3.0	3.8	3.2	3.0	3.8	3.2
Red Clearance	2.6	2.0	2.6	2.8	1.4	2.9
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduction *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

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

THIS PLAN SUPERSEDES THE PLAN SEALED ON 01-22-04

Signal Upgrade - Temporary 2

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

SCALE 0 40 1" = 40'

Curtis Rd.
at
"A" Street/ Schmidt Rd.

Division 3 Onslow County Camp Lejeune

PLAN DATE: December 2005 REVIEWED BY: I.O. Umozurike

PREPARED BY: Luhr REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY J. WILLIAMS
SIGNATURE 1/30/06 DATE

SIG. INVENTORY NO. 03-0954 T2

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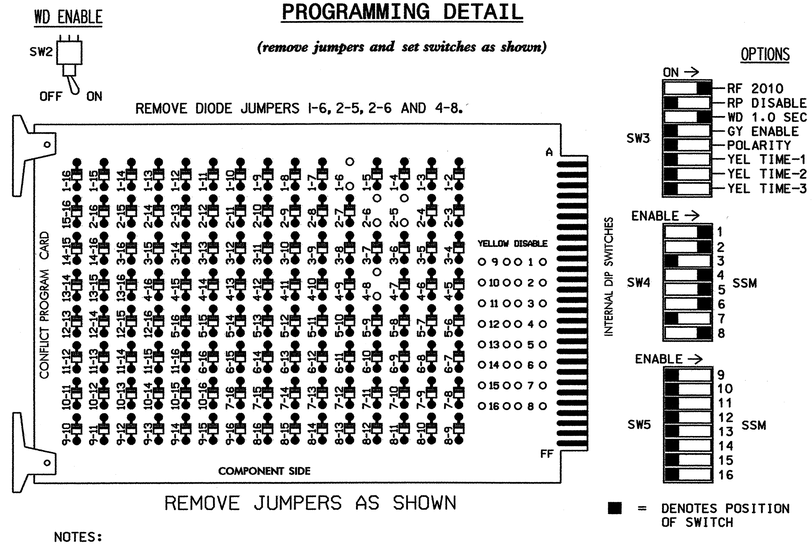
luhr

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	Sig.8

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL1-SEL5 are present on the monitor board.

NOTES

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

EQUIPMENT INFORMATION

CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S4,S5,S6,S8
PHASES USED.....1,2,4,5,6,8
OVERLAPS.....NONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1		2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	82	21,22	NU	NU	41,42	NU	21	61,62	NU	NU	81,82	NU
RED			128			101		*	134			107	
YELLOW			129			102			135			108	
GREEN			130			103			136			109	
RED ARROW	125												
YELLOW ARROW	126	126						132					
GREEN ARROW	127	127						133					

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

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	0	4	0	0
2	0	6	0	5	0	8	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Function 1.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

DYNAMIC/BACKUP CONTROL FUNCTION #01

	OVERLAPS:	ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE		
OR PHASES:		12345678910111213141516
IF PHASES ARE ON		X
OMIT PHASES		X
CALL PHASES		X

BACKUP PROTECTION PROGRAMMING COMPLETE

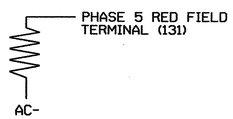
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-5,6	I2U	39	1	2	1	Y	Y			3
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			5
5A	TB3-5,6	J2U	40	2	6	5	Y	Y			5
6A	TB3-9,10	J3U	64	26	36	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			15

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

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



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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0954T2
DESIGNED: DECEMBER 2005
SEALED: 1/30/06
REVISED:

This plan supersedes the plan sealed on 1/22/04.

Signal Upgrade - Temporary 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Curtis Road
at
"A" Street/Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: JANUARY 2006 | REVIEWED BY: TODD JOYCE

PREPARED BY: JAMES M. PESZKO | REVIEWED BY:

REVISIONS	INIT.	DATE

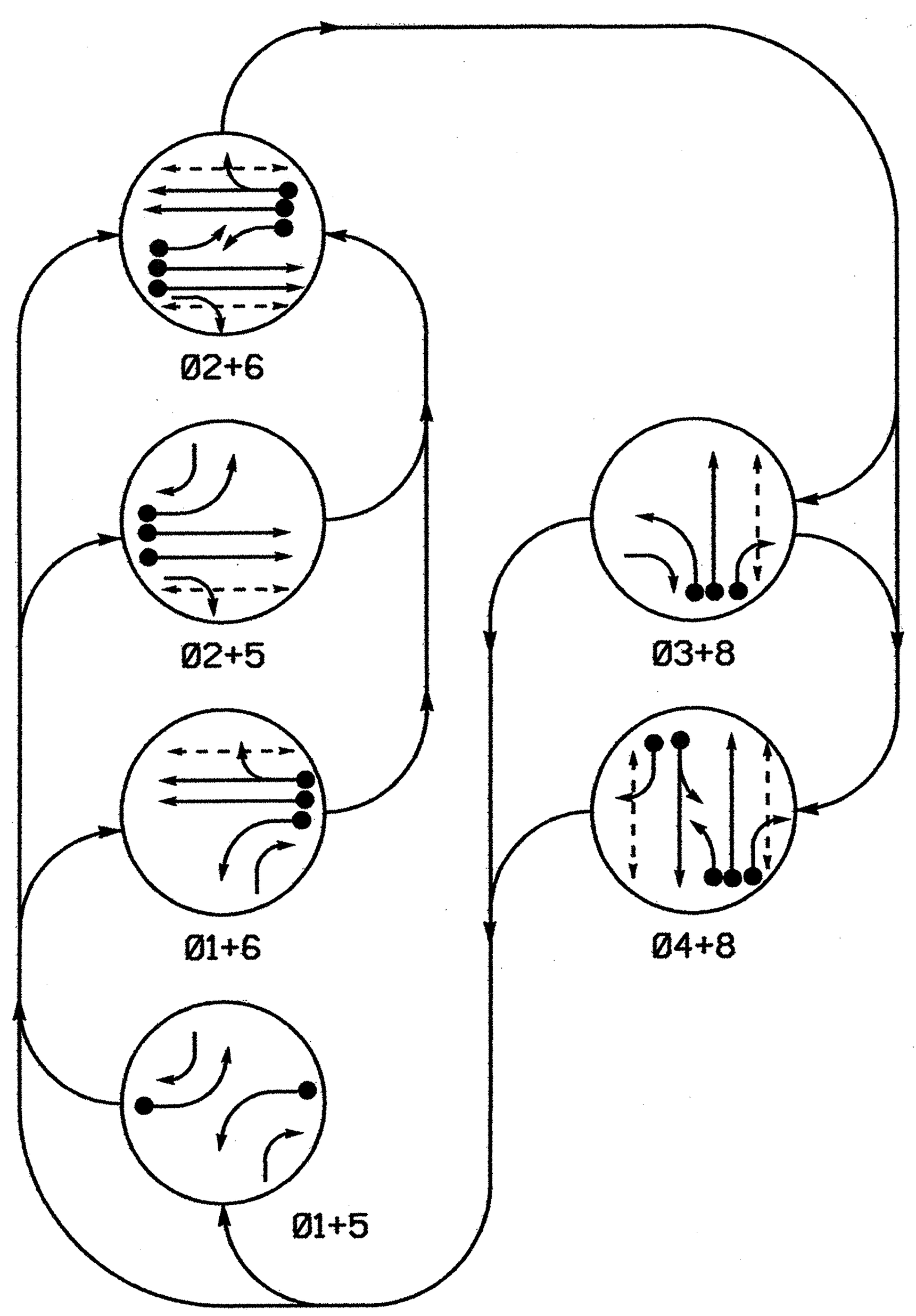
Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signals Management Section
122 N. McDowell St., Raleigh, NC 27603

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
George C. Brown 1/31/06
SIGNATURE DATE

SIG. INVENTORY NO. 03-0954T2

31-JAN-2006 10:42
U:\sig0954_sm\q16_xxx.dgn
jpeszko

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

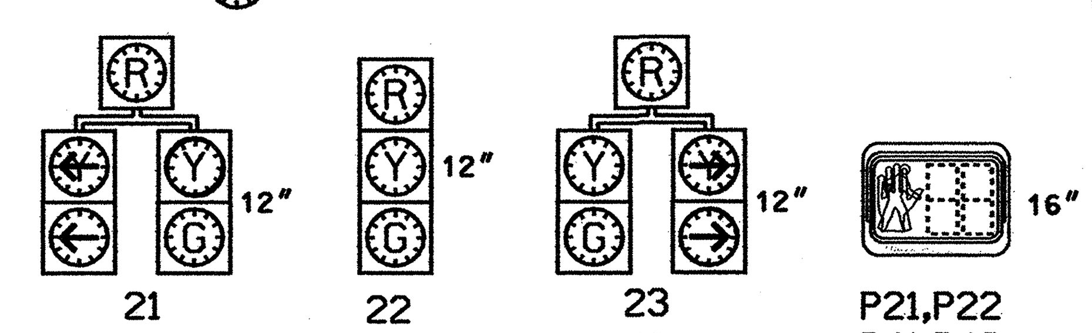
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+8	Ø4+8	FLASH
21	←/R	R	←/G	G	R	R	Y
22	R	R	G	G	R	R	Y
23	R	R	G	G	R/→	R	Y
41	R	R	R	R	R	G	R
42	R/→	R	R/→	R	R	G	R
61	←/R	←/G	R	G	R	R	Y
62	R	G	R	G	R	R	Y
81	R	R	R	R	←/G	G	R
82	R/→	R/→	R	R	G	G	R
P21, P22	DW	DW	W	W	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DRK
P81, P82	DW	DW	DW	DW	W	W	DRK

SIGNAL FACE I.D.

Denotes L.E.D.



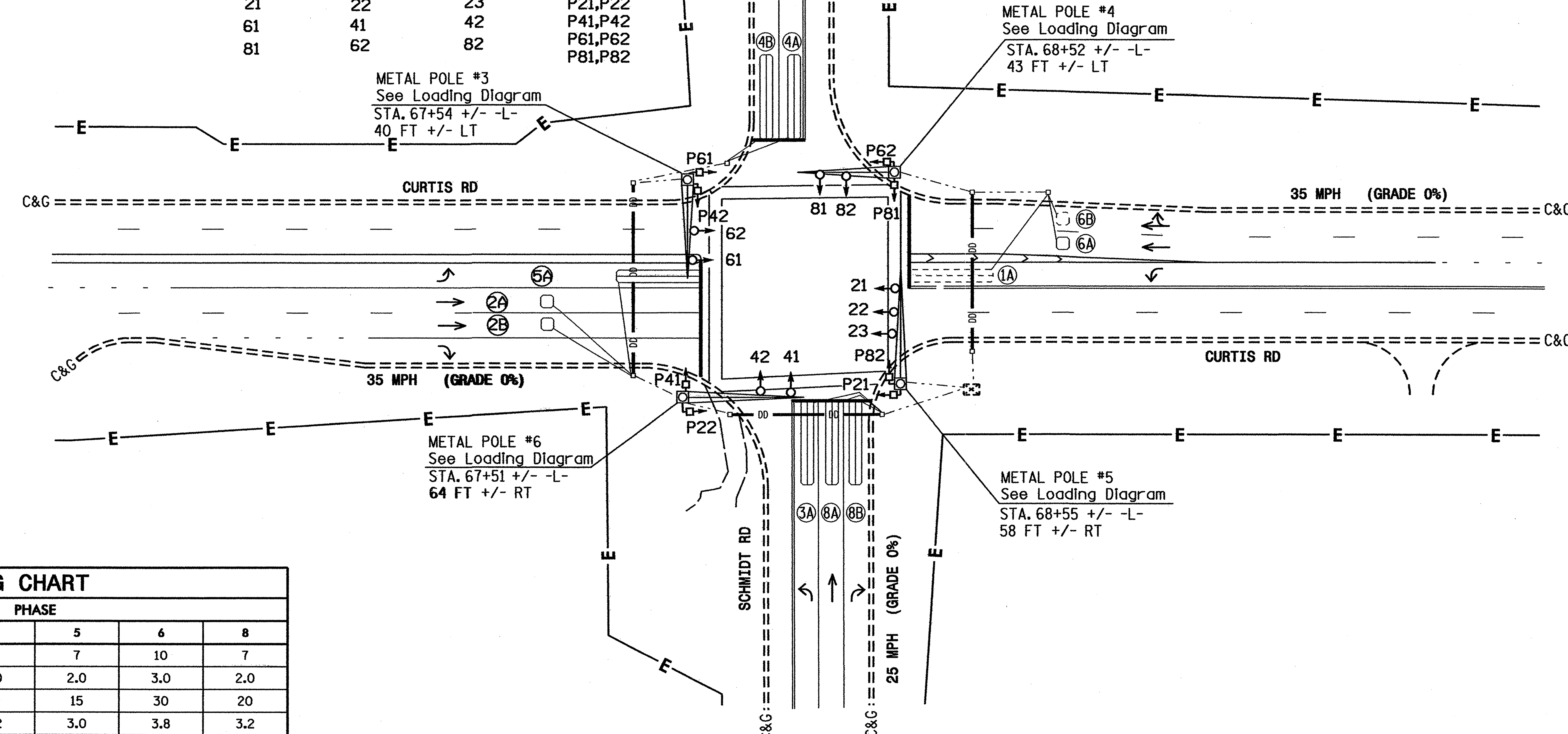
2070L LOOP & DETECTOR INSTALLATION

INDUCTIVE LOOPS					DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
1A	6X40	0	2-4-2	-	1	Y	Y	-	-	-	15	-
					6	Y	Y	-	-	-	-	-
2A	6X6	70	4	Y	2	Y	Y	-	-	-	-	-
2B	6X6	70	4	Y	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	Y	3	Y	Y	-	-	-	15	Y
					8	Y	Y	-	-	-	3	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	3	-
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	-	15	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	-	15	-
					2	Y	Y	-	-	-	-	-
6A	6X6	70	4	Y	6	Y	Y	-	-	-	-	-
6B	6X6	70	4	-	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	-	-
8B	6X40	0	2-4-2	Y	8	Y	Y	-	-	-	15	-

6-PHASE
FULLY ACTUATED
(ISOLATED)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specificatins for Roads and Structures" dated January 2002.
2. Do not program signal for late night flashing operation unless otherwise directed by the engineer.
3. Omit phase 1 during phase 2 on.
4. Omit phase 5 during phase 6 on.
5. Omit phase 3 during phase 4 on.
6. Program controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through phase 4+8.
7. Set all detector units to presence mode.
8. Omit "WALK" and "FLASHING DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.



PLAN QUANTITIES

Pay Item	Feet
Signal Cable	2160
Messenger Cable	0
Lead-in Cable	1210

LEGEND

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

2070L TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	8
Min Green 1 *	7	10	7	7	7	10	7
Extension 1 *	2.0	3.0	2.0	2.0	2.0	3.0	2.0
Max Green 1 *	15	30	15	20	15	30	20
Yellow Clearance	3.0	3.8	3.0	3.2	3.0	3.8	3.2
Red Clearance	2.8	1.8	2.9	3.0	2.3	2.0	2.7
Walk 1 *	-	7	-	7	-	7	7
Don't Walk 1	-	17	-	21	-	19	19
Seconds Per Actuation *	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-
Dual Entry	-	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON

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

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S:*ITS Signals*Workgroups*TIP Projects*U-4439*2005UpdatedSignals*03-0954*030954_2006mmdd.sig
i luhr

THIS PLAN SUPERSEDES THE PLAN SEALED ON 01-22-04

SIGNAL UPGRADE - FINAL

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, State of North Carolina Department of Transportation, Signals and Geometrics Section

122 N. McDowell St., Raleigh, NC 27603

SCALE 0 40 1"= 40'

Curtis Rd. at "A" Street/ Schmidt Rd.

DIVISION 3 ONSLOW COUNTY CAMP LEJEUNE

PLAN DATE: December 2005	REVIEWED BY: I.O.Umozurike
PREPARED BY: Luhr	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 24393 TIMOTHY J. WILLIAMS

SIGNATURE: T. J. Williams DATE: 1/30/06

SIG. INVENTORY NO. 03-0954

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	Sig.10

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

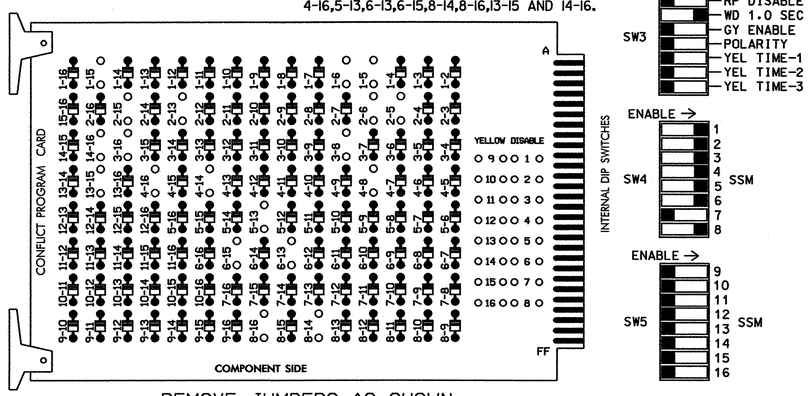
(remove jumpers and set switches as shown)

WD ENABLE

SW2

OFF ON

REMOVE DIODE JUMPERS 1-5,1-6,1-15,2-5,2-6,2-13,2-15,3-8,3-16,4-8,4-14, 4-16,5-13,6-13,6-15,8-14,8-16,13-15 AND 14-16.



OPTIONS

REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Make sure jumpers SEL1-SEL5 are present on the monitor board.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	Ø3 3A	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L		Ø6 1A	Ø2 2B			Ø8 3A	Ø4 4B					Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø5 5A	Ø6 6A	SLOT EMPTY	SLOT EMPTY	Ø8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		Ø2 5A	Ø6 6B			Ø8 8B								

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A[1]	TB2-5,6	I2U	39	1	2	1	Y	Y			15
	TB2-7,8	I2L	43	5	12	6	Y	Y			
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A[2]	TB4-9,10	I6U	41	3	4	3	Y	Y			15
	TB4-11,12	I6L	45	7	14	8	Y	Y			3
4A	TB6-1,2	I7U	65	27	34	4	Y	Y			3
4B	TB6-3,4	I7L	78	40	44	4	Y	Y			15
5A[3]	TB3-5,6	J2U	40	2	6	5	Y	Y			15
	TB3-7,8	J2L	44	6	16	2	Y	Y			
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			15
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

[1]Add jumpers from TB2-5 to TB2-7, and from TB2-6 to TB2-8.
[2]Add jumpers from TB4-9 to TB4-11, and from TB4-10 to TB4-12.
[3]Add jumpers from TB3-5 to TB3-7, and from TB3-6 to TB3-8.

NOTES

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

EQUIPMENT INFORMATION

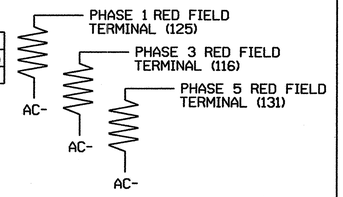
CONTROLLER.....CONTRACTOR SUPPLIED 2070L
CABINET.....CONTRACTOR SUPPLIED 332
SOFTWARE.....ECONOLITE OASIS
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED.....S1,S2,S2P,S3,S4,S4P,S5,S6,S6P,S8,S8P
PHASES USED.....1,2,2PED,3,4,4PED,5,6,6PED,8.8PED
OVERLAPS.....NONE

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

LOAD RESISTOR INSTALLATION DETAIL

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



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

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61,62	21,22, 23	P21, P22	23,81	41,42	P41, P42	21,42	61,62	P61, P62	NU	81,82	P81, P82
RED	*	128		*	101		*	134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW	126			117			132					
GREEN ARROW	127			118			133					
✋			113			104			119			110
🚶			115			106			121			112

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

DYNAMIC BACK-UP CONTROL PROGRAMMING

(program controller as shown below)

1. From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Scroll to the bottom of the menu and enable Dynamic/Backup Control Functions 1, 2 and 3.
2. From Phase Control Functions Menu press '2' (Dynamic/Backup Control Functions).

```
DYNAMIC/BACKUP CONTROL FUNCTION #01
                    OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR       PHASES:¦12345678910111213141516
IF PHASES ARE ON¦ X
OMIT PHASES     ¦X
CALL PHASES     ¦  X
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #02
                    OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR       PHASES:¦12345678910111213141516
IF PHASES ARE ON¦    X
OMIT PHASES     ¦  X
CALL PHASES     ¦  X
```

PRESS 'NEXT'

```
DYNAMIC/BACKUP CONTROL FUNCTION #03
                    OVERLAPS:¦ABCDEFGHIJKLMNOP
IF OVERLAPS ARE ACTIVE ¦
OR       PHASES:¦12345678910111213141516
IF PHASES ARE ON¦  X
OMIT PHASES     ¦X
CALL PHASES     ¦
```

BACKUP PROTECTION PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 03-0954
DESIGNED: DECEMBER 2005
SEALED: 1/30/06
REVISED:

This plan supersedes the plan sealed on 1/22/04.

Signal Upgrade - Final

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
North Carolina Department of Transportation
Division of Highways
Signal Management Section
122 N. McDowell St., Raleigh, NC 27603

Curtis Road at "A" Street/Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: JANUARY 2006 | REVIEWED BY: TODD JOYCE

PREPARED BY: JAMES W. PESZKO | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 022013 ENGINEER GEORGE C. BROWN
SIGNATURE DATE 2/1/06
SIG. INVENTORY NO. 03-0954

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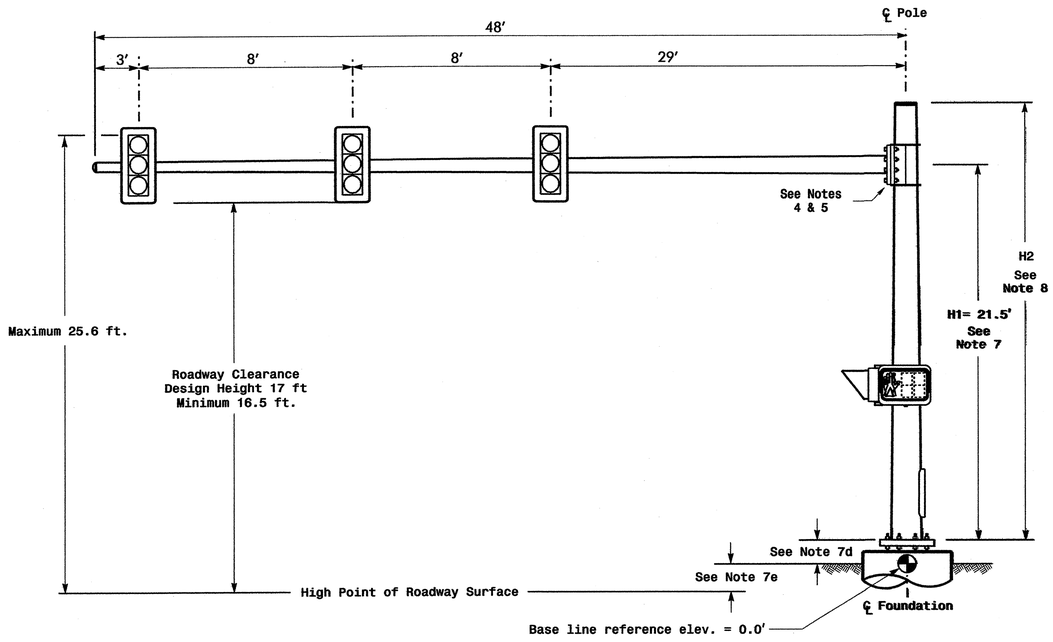
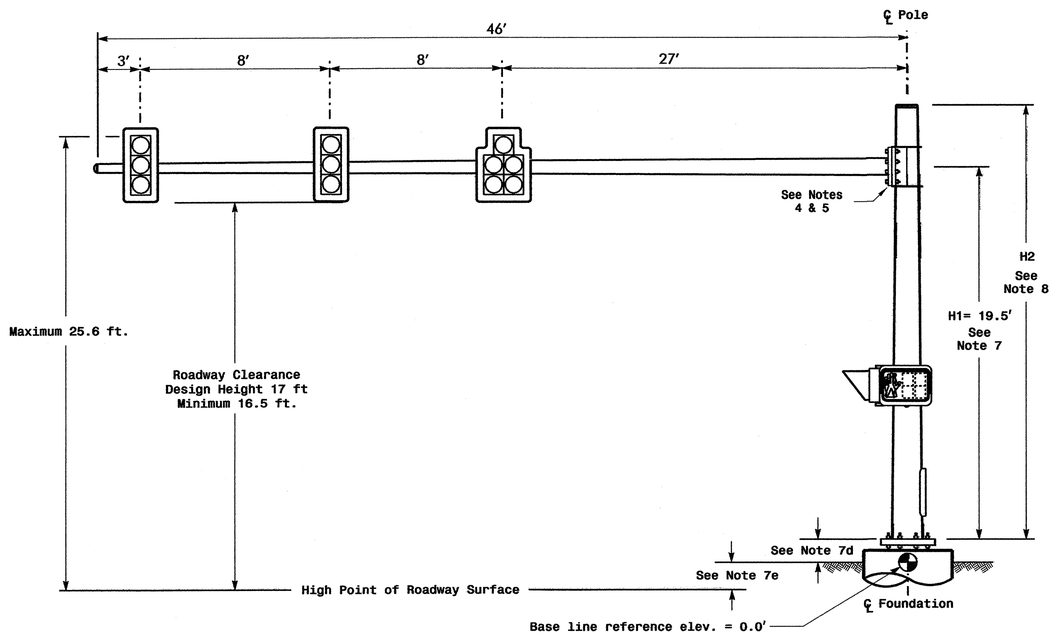
jpeszko

Design Loading for METAL POLE NO. 3



Elevation View

Design Loading for METAL POLE NO. 4



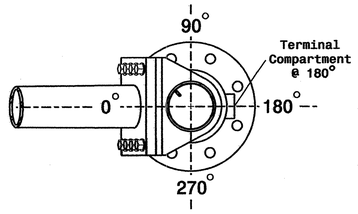
Elevation View

SPECIAL NOTE

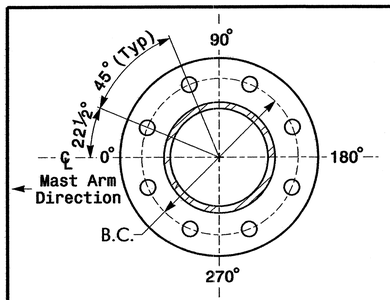
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3	Pole 4
Baseline reference point at ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+2.3 ft.	+0.5 ft.
Elevation difference at Edge of travelway or face of curb	+1.0 ft.	+0.1 ft.

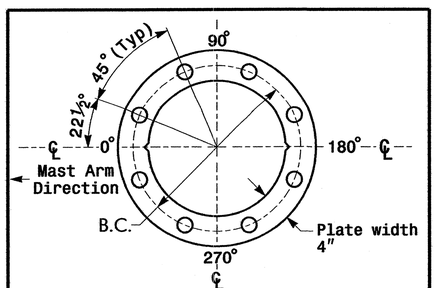


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	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 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2002 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2002 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.doh.dot.state.nc.us/preconstruct/traffic/tmssu/ws/mpoles/poles.htm

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Maximum allowable CSR for all signal supports is 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This is a high strength connection. Use Direct Tension Indicators (ASTM F959) for each bolt.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 66 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 733-3915.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2(130 mph)

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

Curtis Road
At
"A" Street / Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: January 2006 | REVIEWED BY: I.O.Umozurike
PREPARED BY: Luhr | REVIEWED BY:

SCALE 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY J. WILLIAMS

T.J. Williams 1/31/06
SIGNATURE DATE

SIG. INVENTORY NO. 03-0954

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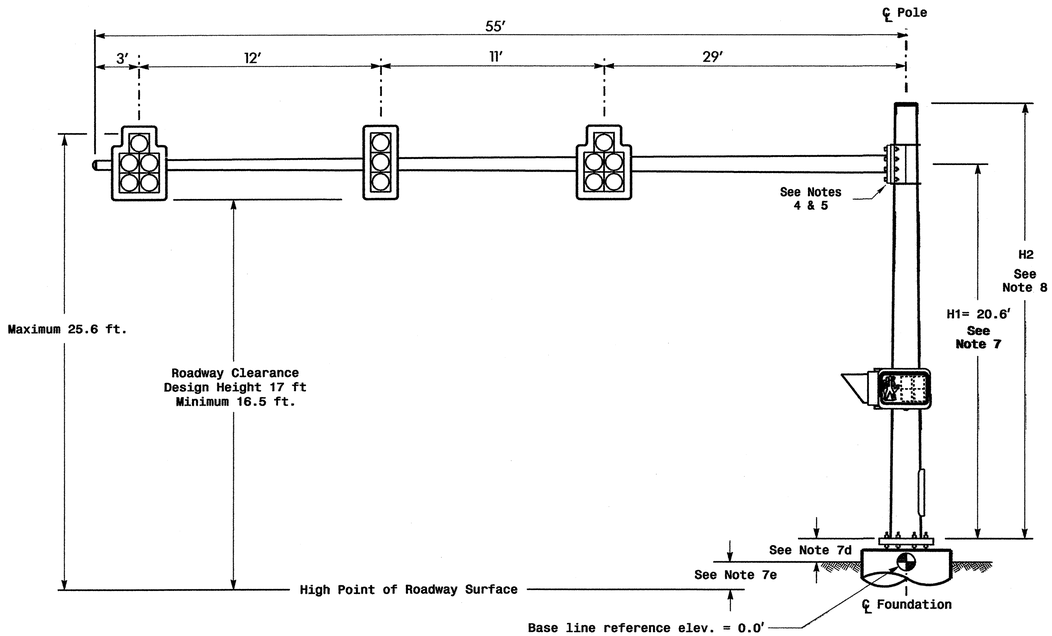
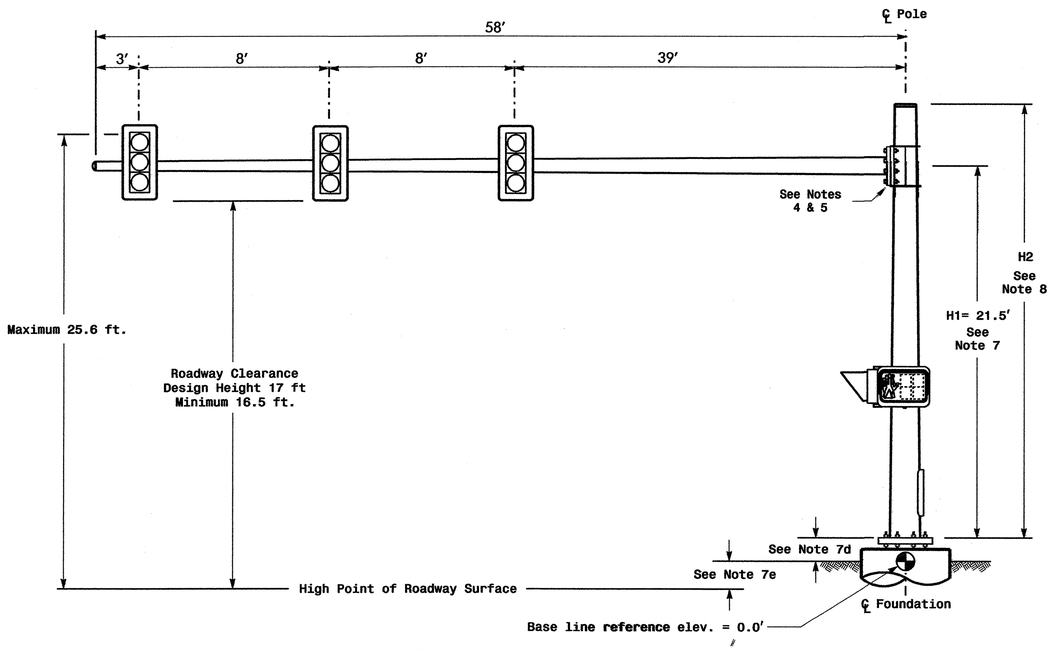
Design Loading for METAL POLE NO. 5



Elevation View

Design Loading for METAL POLE NO. 6



Elevation View

SPECIAL NOTE

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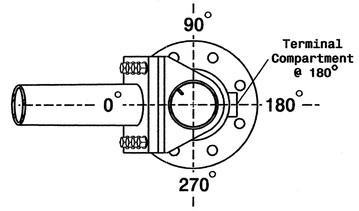
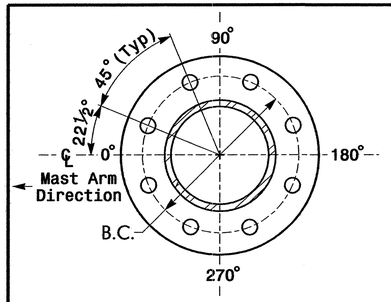
Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 5	Pole 6
Baseline reference point at ⊕ ℄ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.5 ft.	+2.5 ft.
Elevation difference at Edge of travelway or face of curb	+0.5 ft.	+2.0 ft.

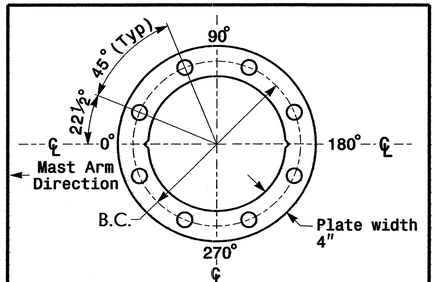


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL

For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	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 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 LBS

NOTES

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   - The 2002 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
   - The 2002 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.doh.dot.state.nc.us/preconstruct/traffic/tmssu/ws/mpoles/poles.htm

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Maximum allowable CSR for all signal supports is 0.9.
4. The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This is a high strength connection. Use Direct Tension Indicators (ASTM F959) for each bolt.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 66 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
   b. Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
   c. The roadway clearance height for design is as shown in the elevation views.
   d. The top of the pole base plate is .75 feet above the ground elevation.
   e. Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
   - Mast arm attachment height (H1) plus 2 feet, or
   - H1 plus ½ of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 733-3915.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 2(130 mph)

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

Curtis Road
At
"A" Street / Schmidt Road

Division 3 | Onslow County | Camp Lejeune

PLAN DATE: January 2006 | REVIEWED BY: I.O.Umozurike
PREPARED BY: Luhr | REVIEWED BY:

SCALE: 0 N/A N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 24393 ENGINEER TIMOTHY J. WILLIAMS
SIGNATURE: T.J. Williams | DATE: 1/31/06
SIG. INVENTORY NO. 03-0954

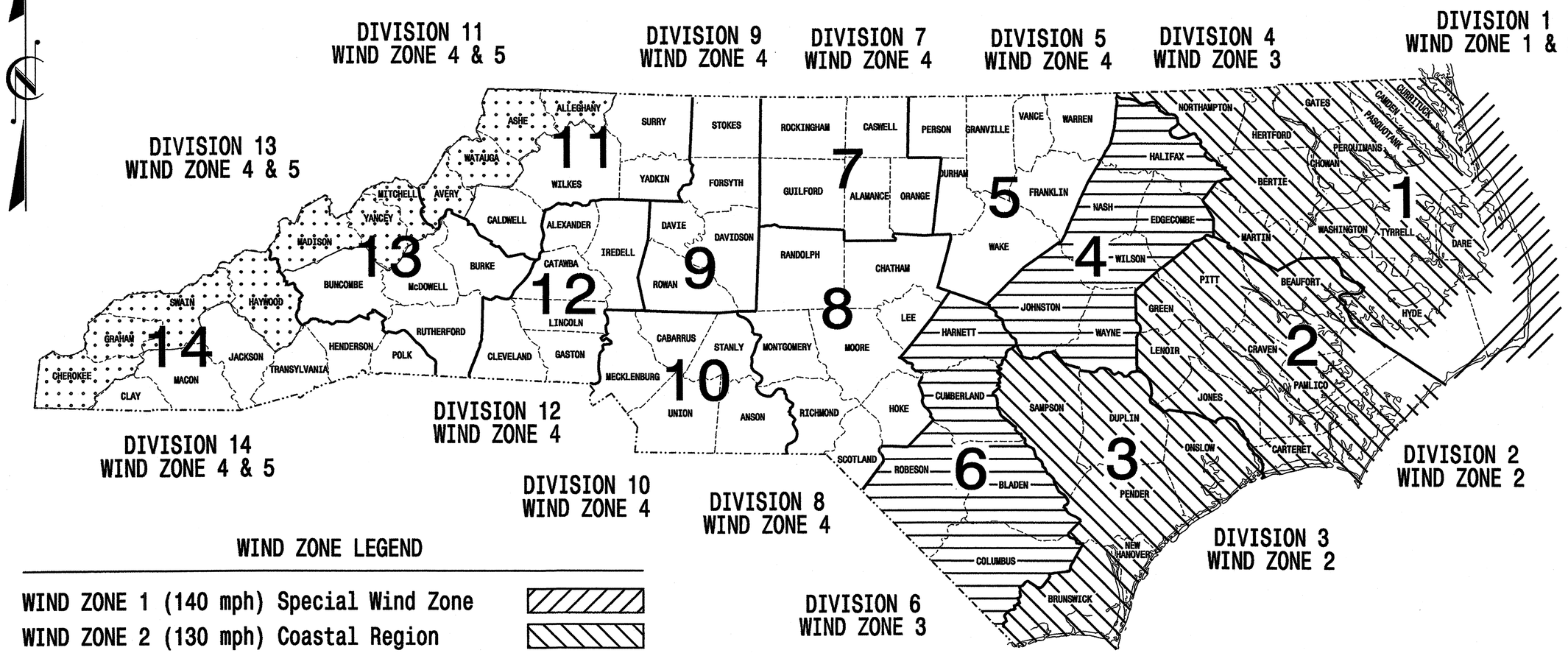
STATE	PROJECT NO.	SHEET NO.
N.C.	U-4439AB	Sig.13
F. A. PROJ. NO.		M 1
PROJECT ID. NO.		

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR METAL POLES

POLE STANDARDS

NCDOT METAL P



WIND ZONE LEGEND

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

http://www.ncdot.org/doh/preconstruct/traffic/tmssu/ws/default.htm

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch
STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION
Signals and Geometrics Section

122 N. McDowell St., Raleigh, NC 27603

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

AASHTO

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

INDEX OF PLANS

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:

TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

G. A. Fuller, P.E. – State ITS and Signals Engineer
R. E. Mullinax, P.E. – Signals and Geometrics Engineer
P. L. Alexander, P.E. – Signals and Geometrics Special Projects Engineer
D. C. Sarkar, P.E. – Signals and Geometrics Structural Engineer
A. M. Esposito, P.E. – Signals and Geometrics Project Engineer
C. F. Andrews, Jr. – Signals and Geometrics Project Engineer

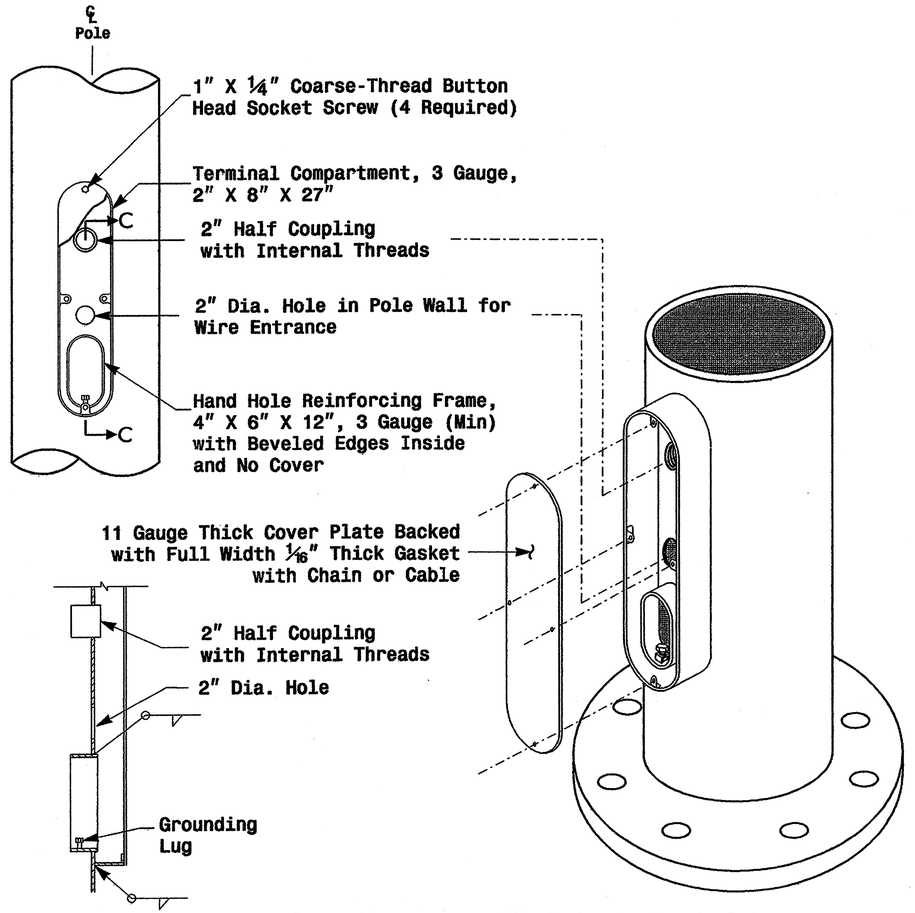
SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar — SIGNATURE

9.2.2005 — DATE

Fabrication Details – All Poles



Section C-C

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

Terminal Compartment Detail

MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y ----/----/----/----
ARM-A D/T/L/Y ----/----/----/----
----/----/----/----
ARM-B D/T/L/Y ----/----/----/----
----/----/----/----
A.B. DIA./B.C./L/Y ----/----/----/----
NCDOT STANDARD ----------

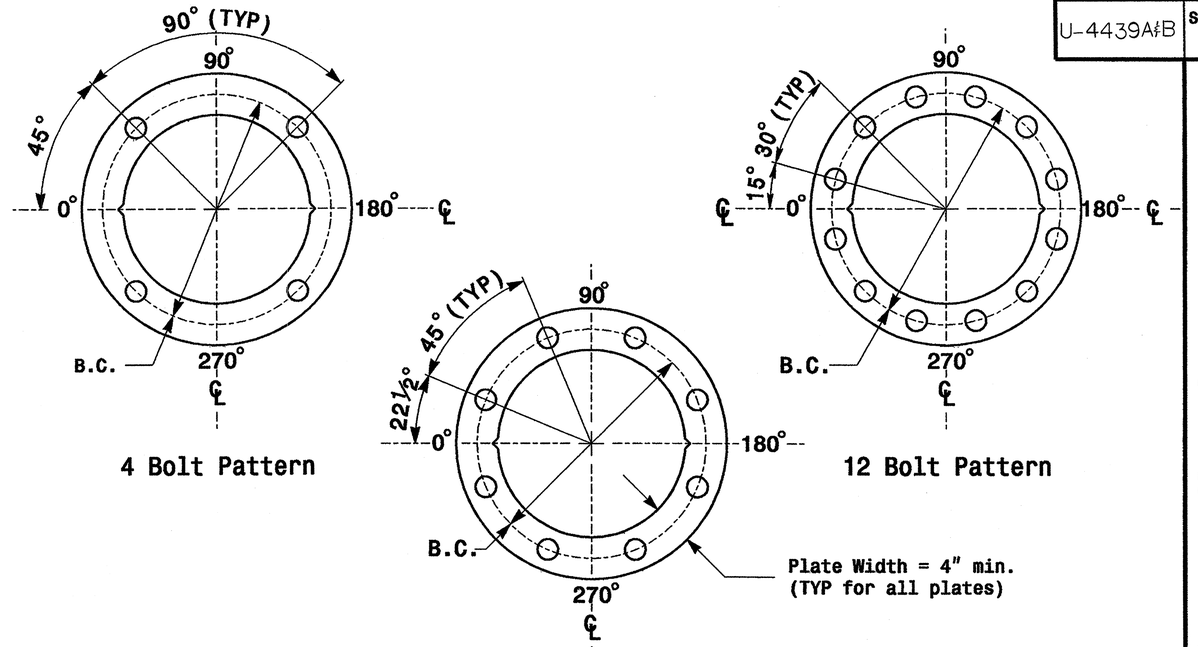
Shaft I.D. Tag
(Provide on Strain Poles and Mast Arm Poles)

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

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

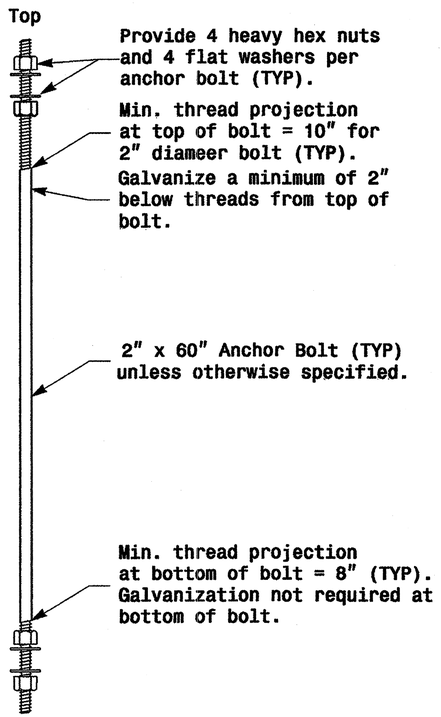
Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for plan pole I.D.
5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details



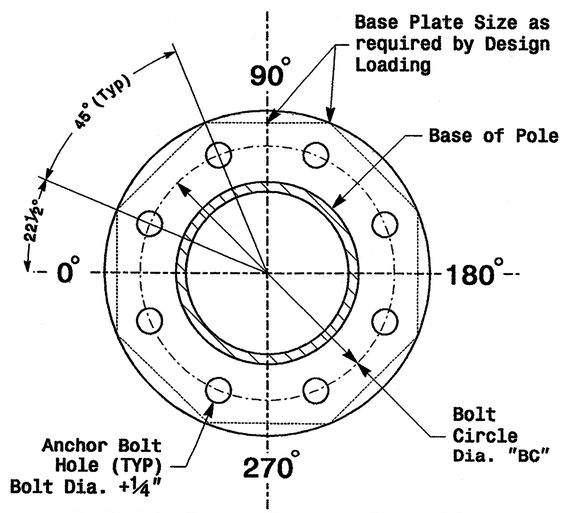
Construct Templates and Plates from ¼" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail

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



8 Bolt Base Plate Detail

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

Typical Fabrication Details Common To All Metal Poles

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

REVISIONS	INIT.	DATE

SCALE
0 NA
NONE

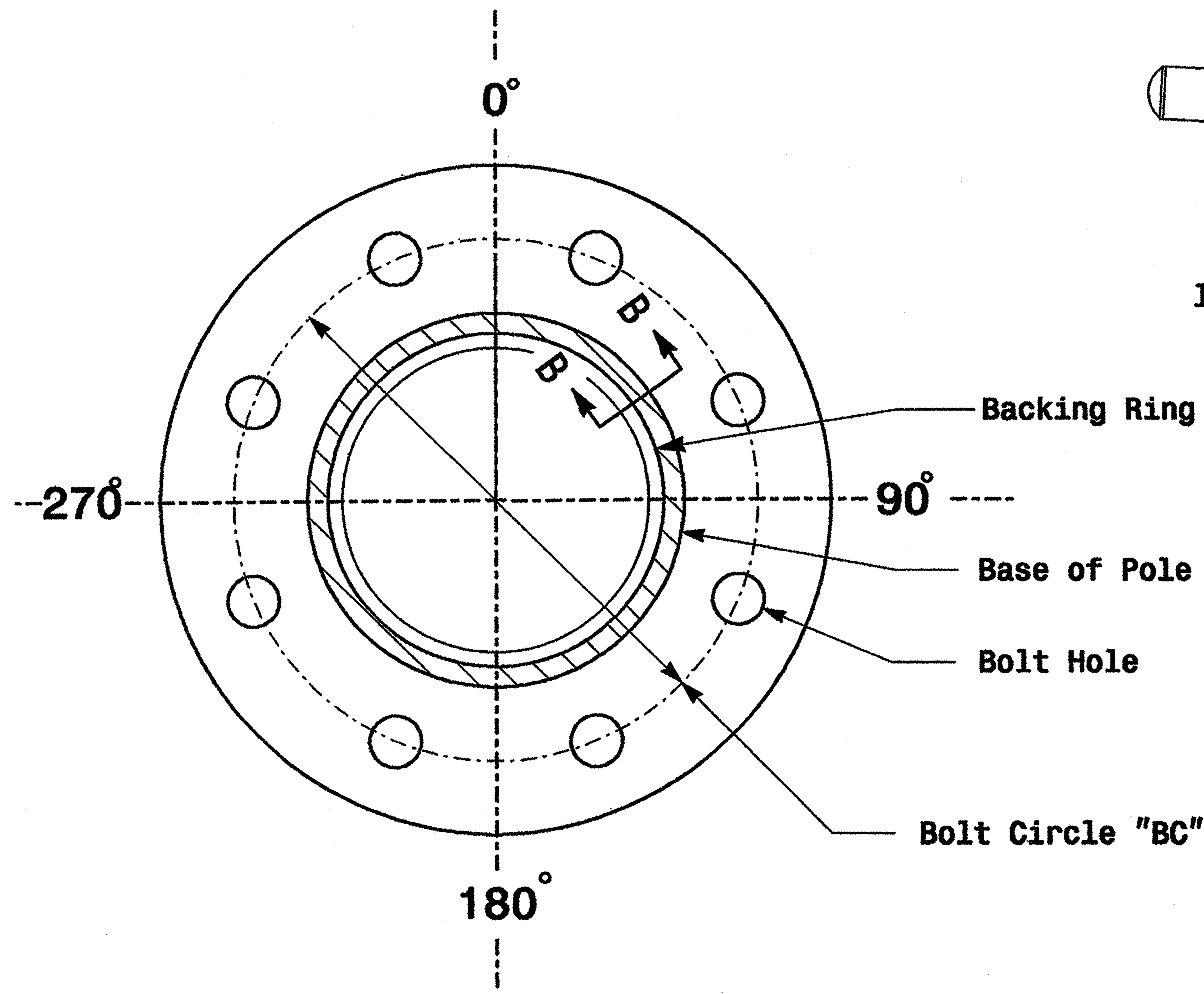
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

01-SEP-2005 18:22
D:\Projects\Metrol Pole Standards\6004 m2 thru m5.dgn
cdmcrews

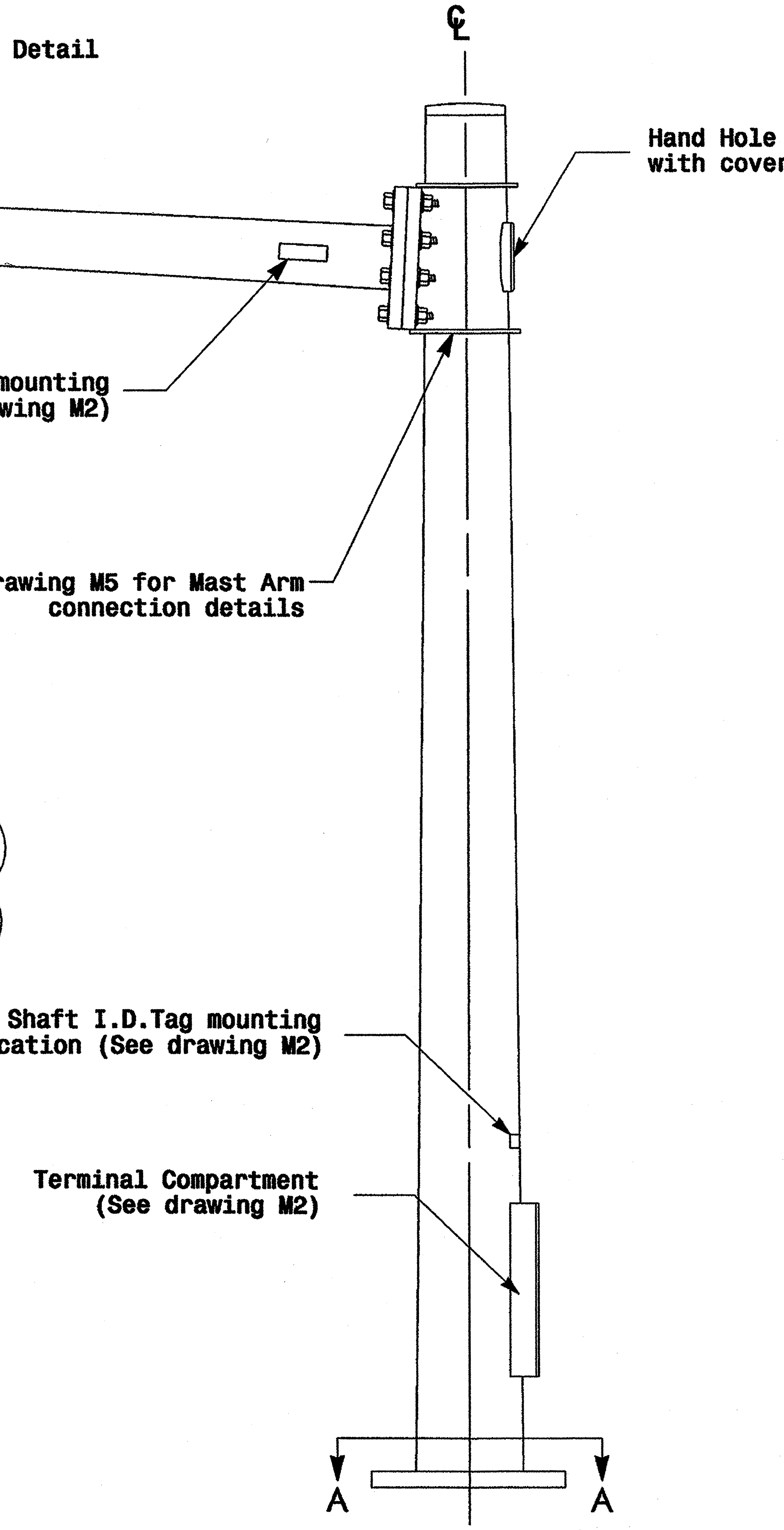
Fabrication Details – Mast Arm Poles



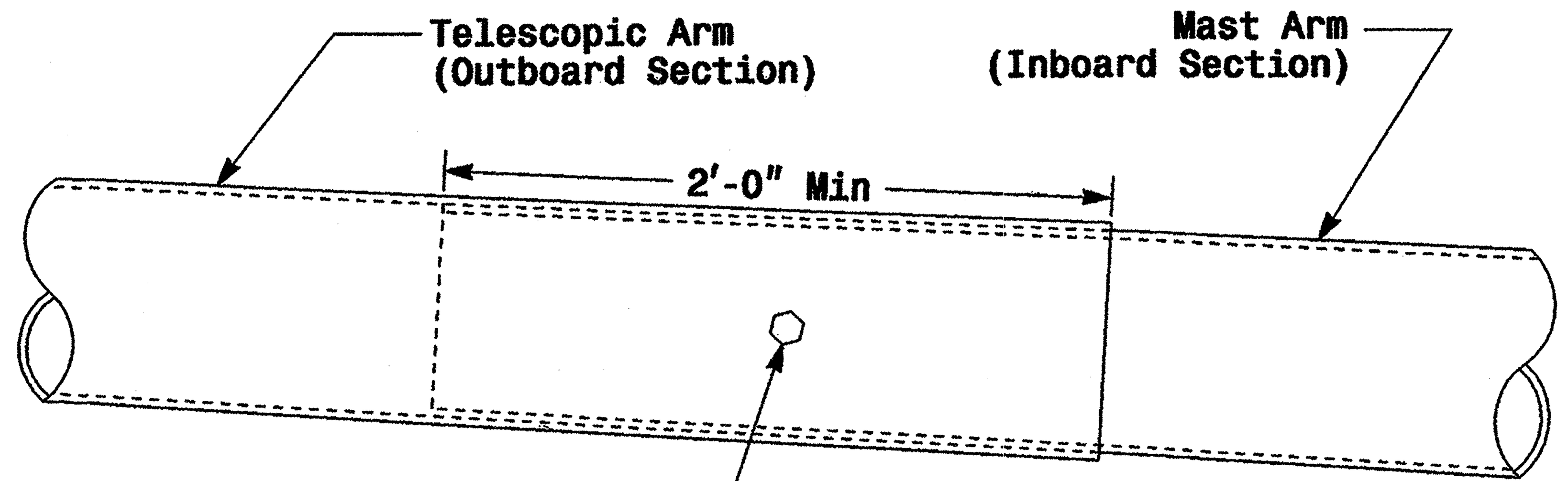
Section A-A

(See drawing M 2)

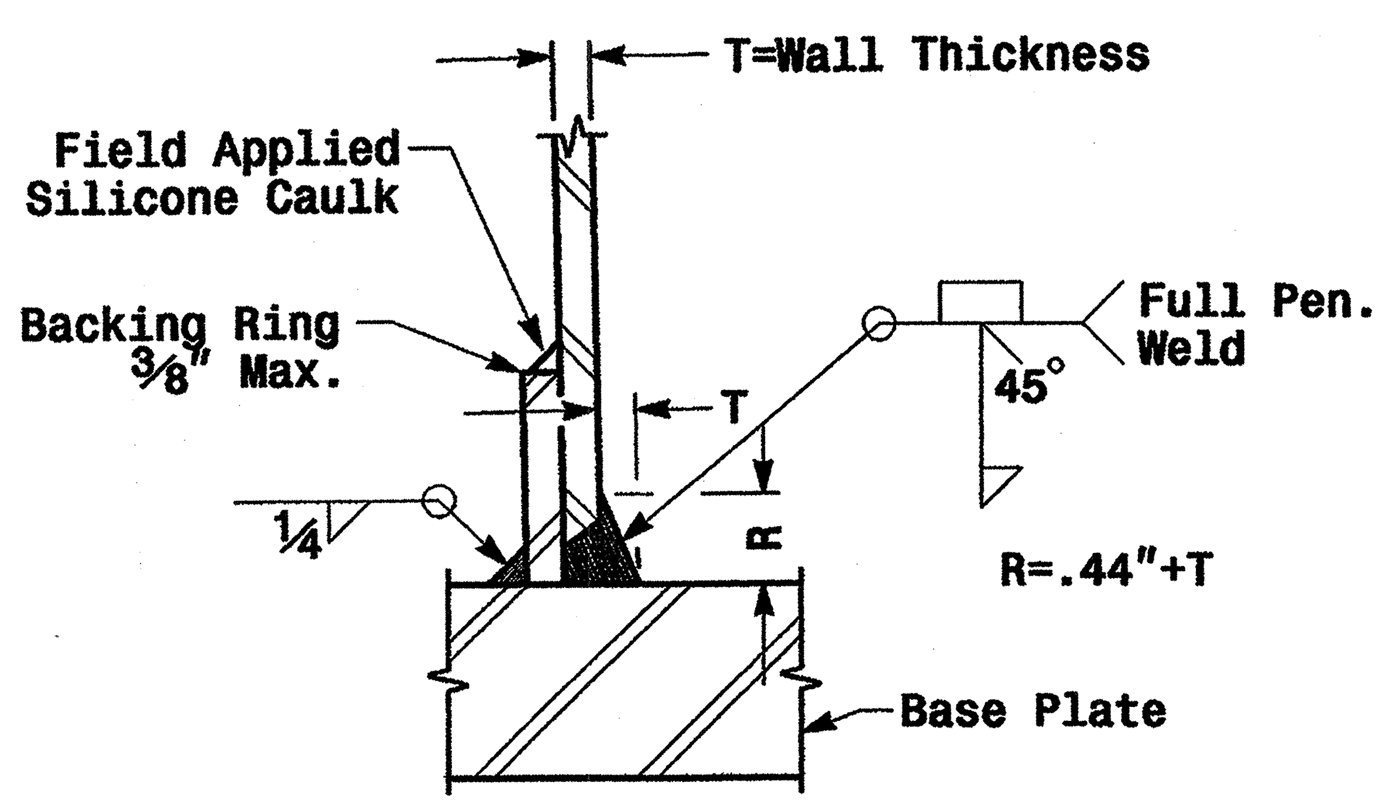
Pole Base Plate



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



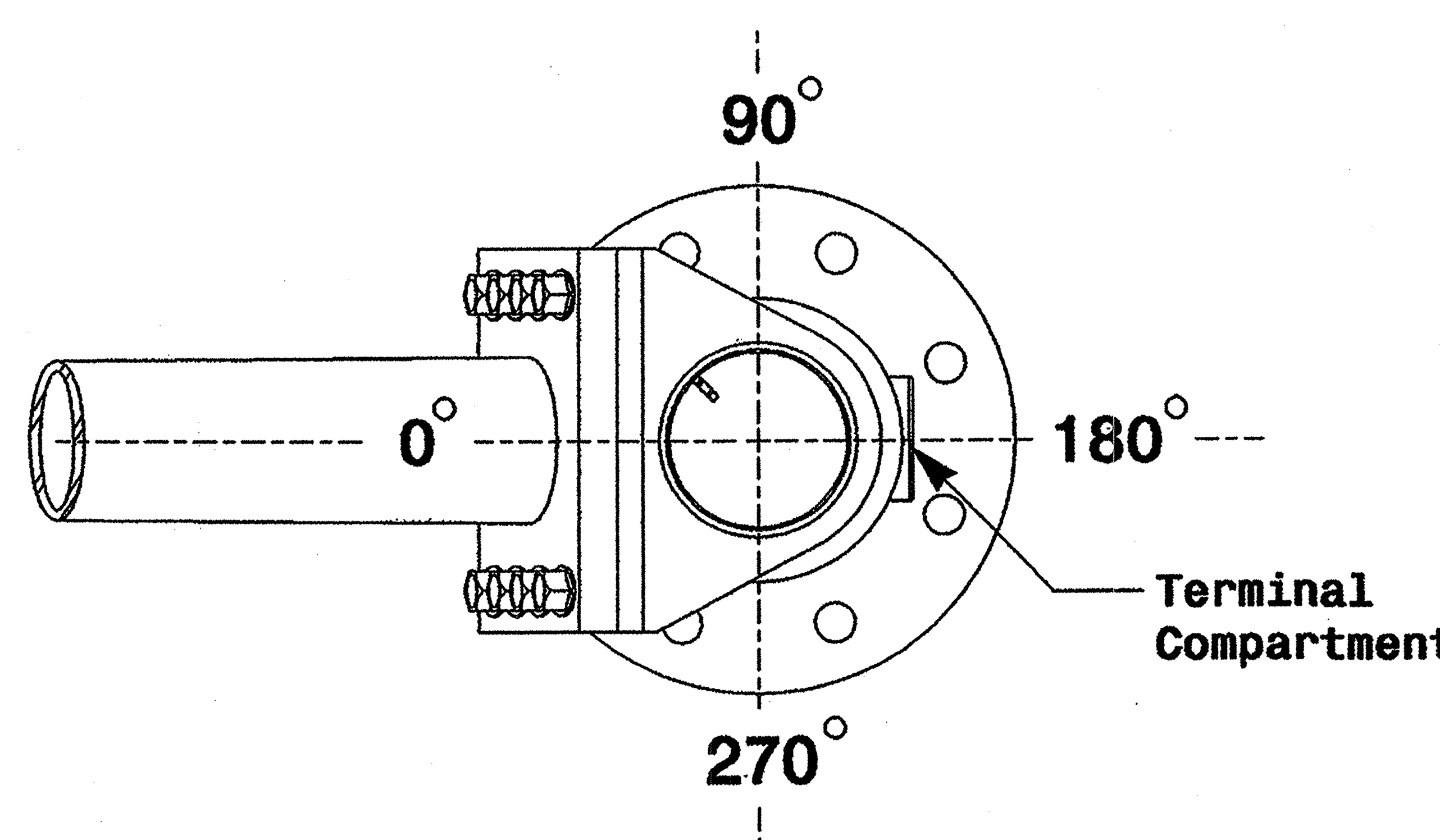
Slip Fit Joint Detail for Mast Arm



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

Prepared in the Offices of: Traffic Engineering and Safety Systems Branch, Signals and Geometrics Section, 122 N. McDowell St., Raleigh, NC 27603

Typical Fabrication Details for Mast Arm Poles

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

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL: North Carolina Professional Engineer, Seal 028094, Debesh C. Sarkar

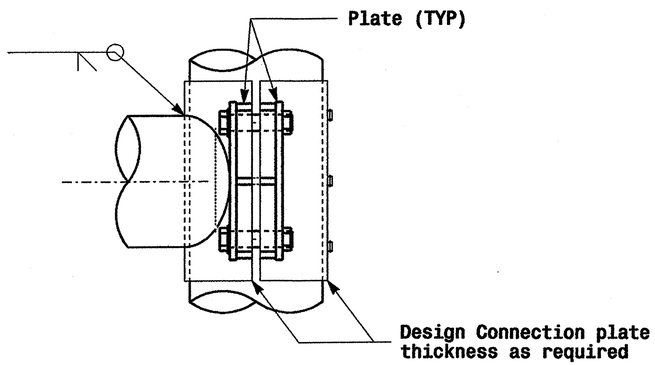
D. Sarkar — SIGNATURE — 9.2.2005 — DATE

SIG. INVENTORY NO.

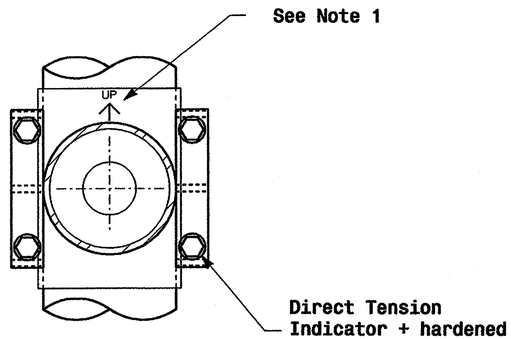
01-SEP-2005 14:08
w:*peoples-unit*workgroups*2004 metal pole standards*2004 m4.dgn
palexander

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	Sig.16 M 5

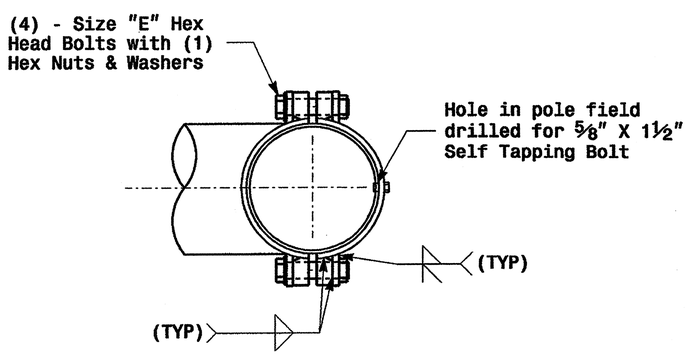
Adjustable Clamp Type Bolted Mast Arm Connection



Side Elevation View

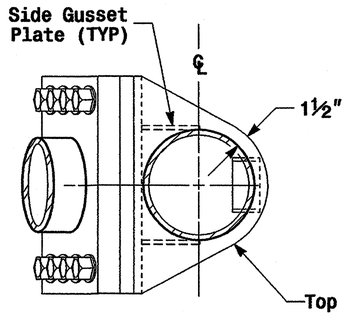


Front Elevation View

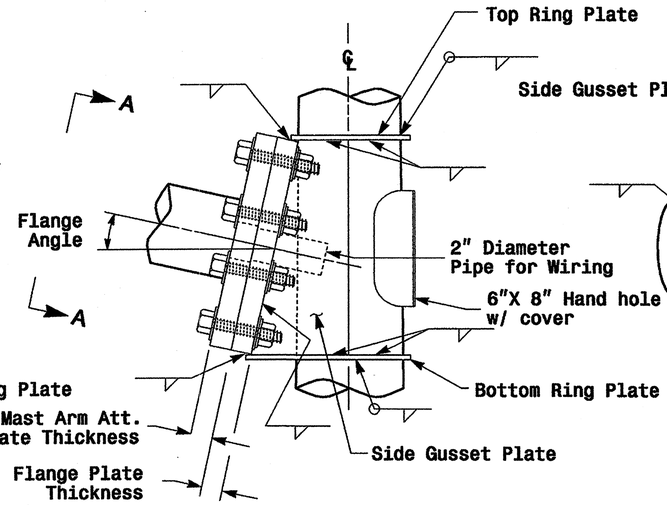


Plan View

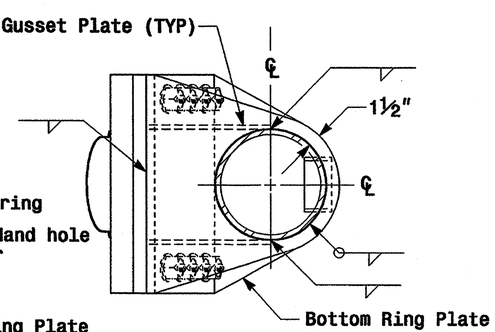
Welded Ring Stiffened Mast Arm Connection



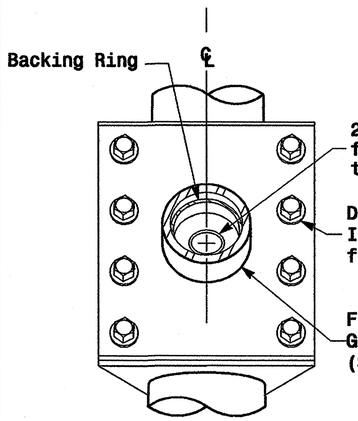
Plan View



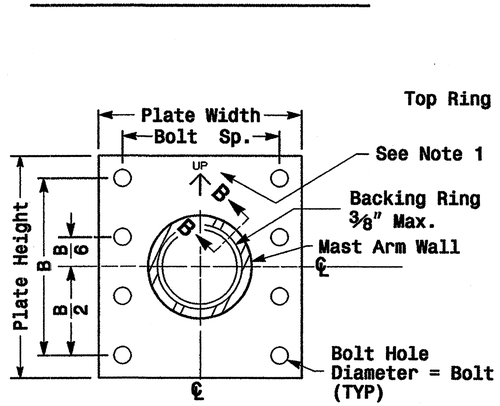
Side Elevation View



Bottom View

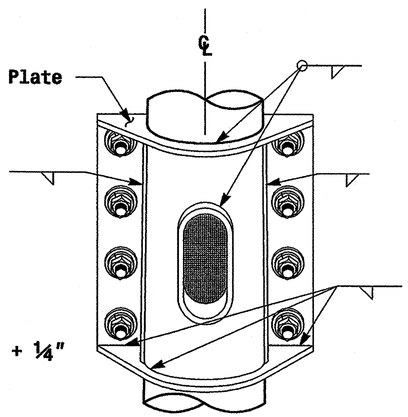


Front Elevation View

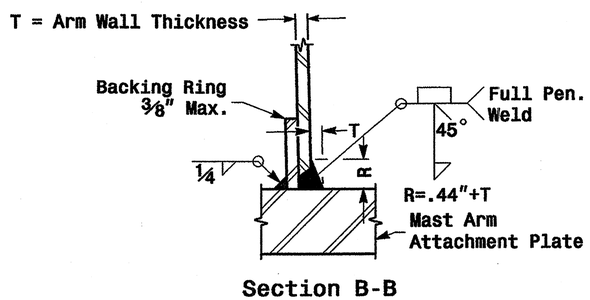


Section View A-A

Mast Arm Attachment Plate



Back Elevation View



Section B-B

Full-Penetration Groove Weld Detail

Notes:

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

Prepared in the Offices of
North Carolina Department of Transportation
Highway Design Branch
Signals and Geometrics Section
1122 N. McDowell St., Raleigh, NC 27603

SCALE
0 NA
NONE

Fabrication Details For Mast Arm Connection To Pole

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DIBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

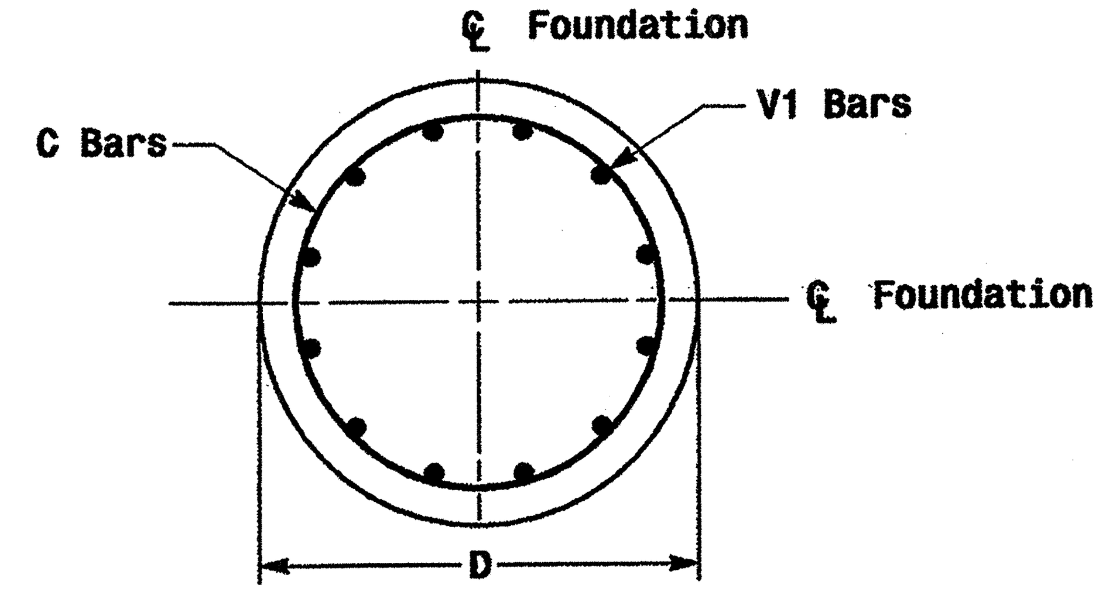
SIG. INVENTORY NO.

Fabrication Details – Mast Arm Poles

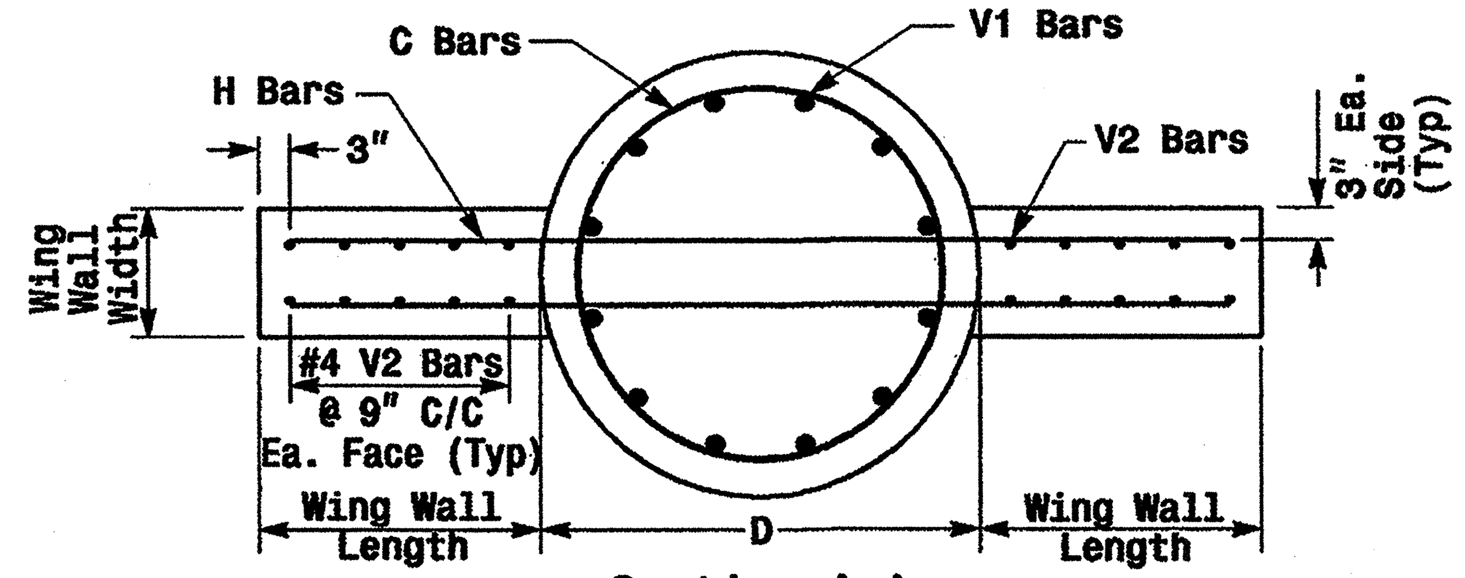
01-SEP-2005 14:11
w:\standards\roadway\workgroups\2004 metal pole standards\2004 m5.dgn
pallexander

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	Sig.17 M 7

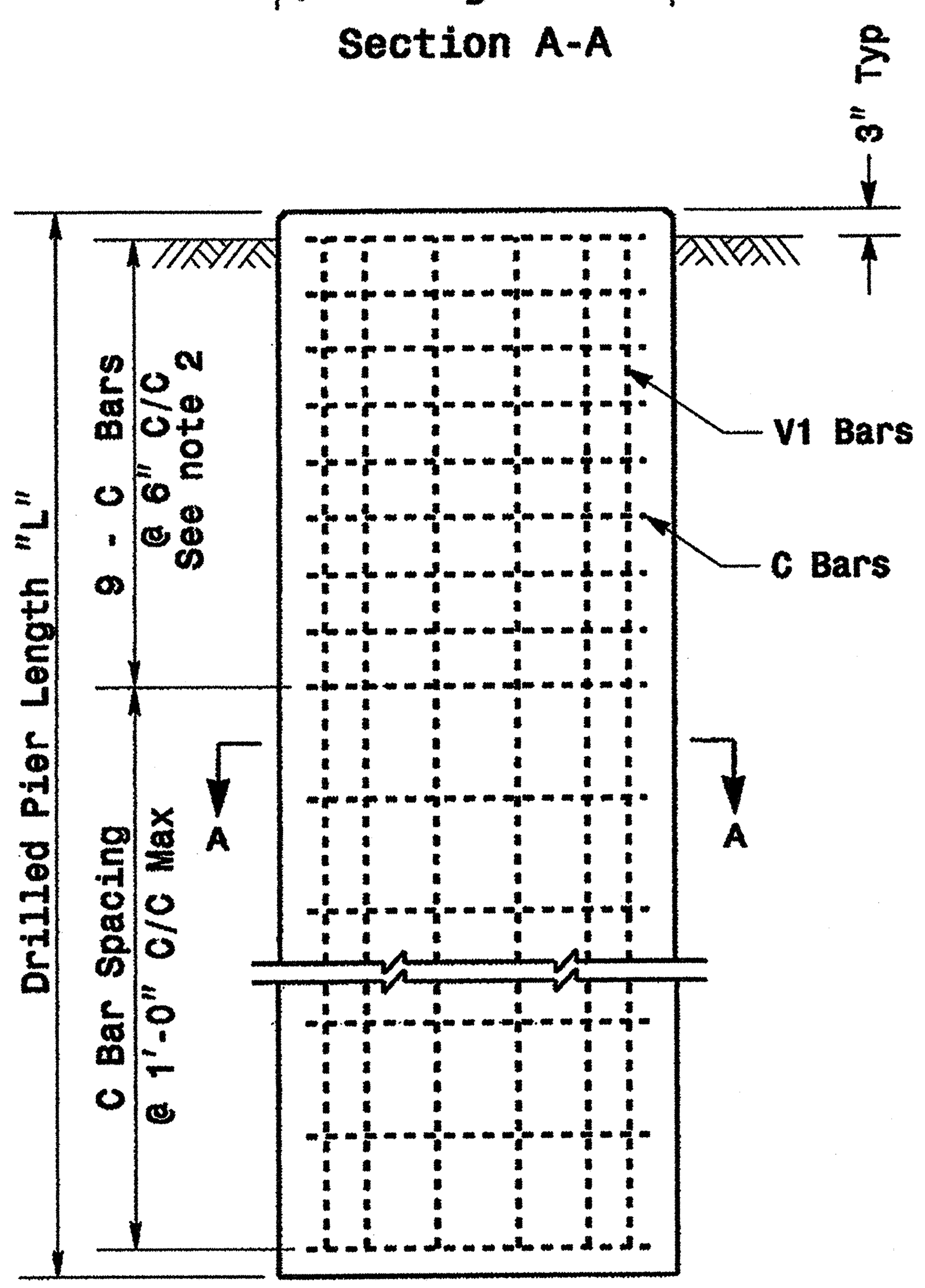
Reinforcing Steel Bars

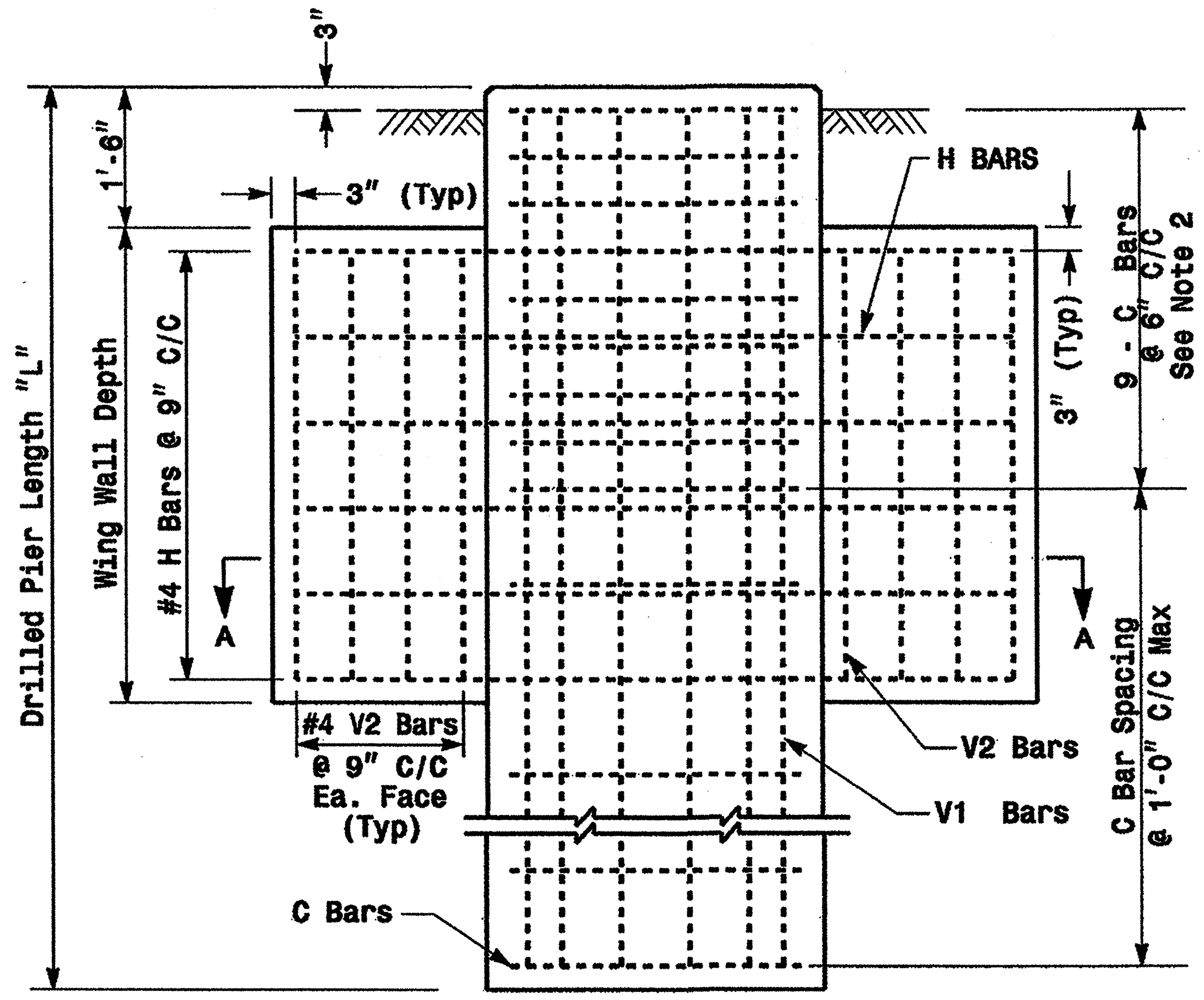


Section A-A



Section A-A





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

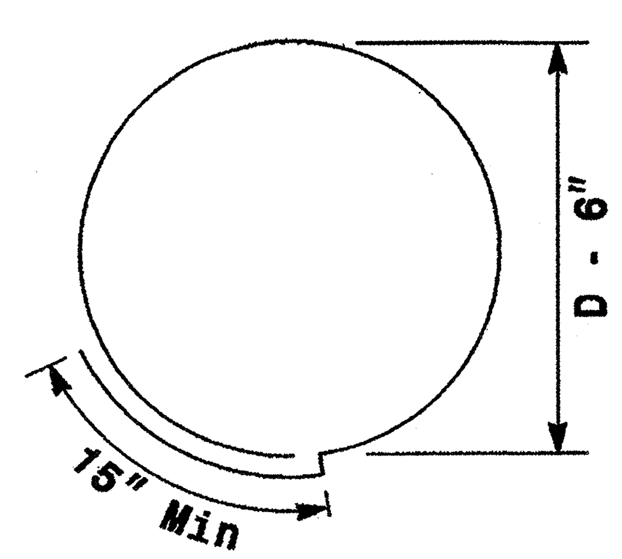
Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	✱✱
		C	✱	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	✱✱
		C	✱	#4	CIR.	12'-6"

✱ See Note No. 1
✱✱ See Note No. 3

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

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

✱ See Note No. 1
✱✱ See Note No. 3



Typical "C" Bars

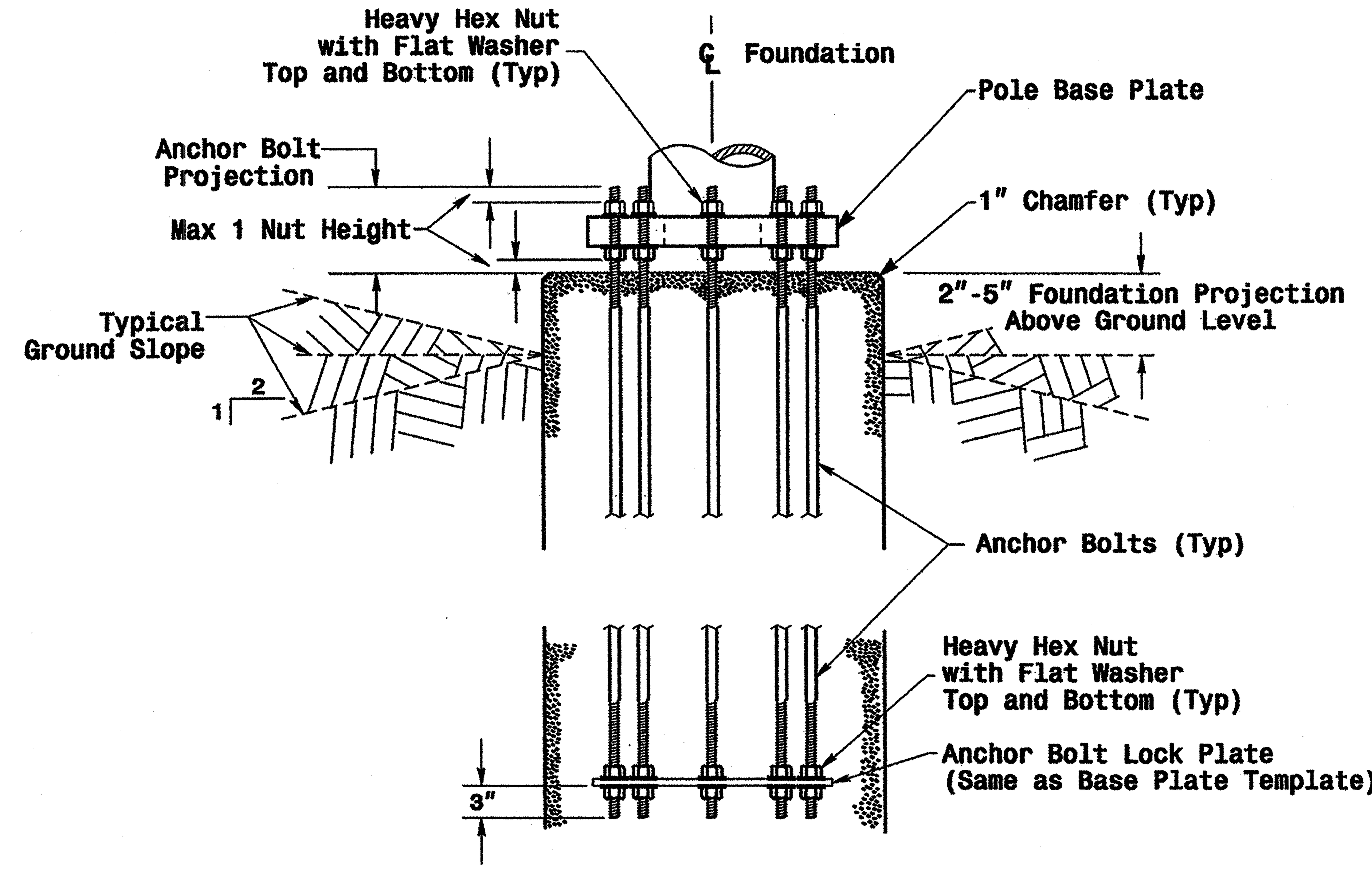
WING WALL DETAILS

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

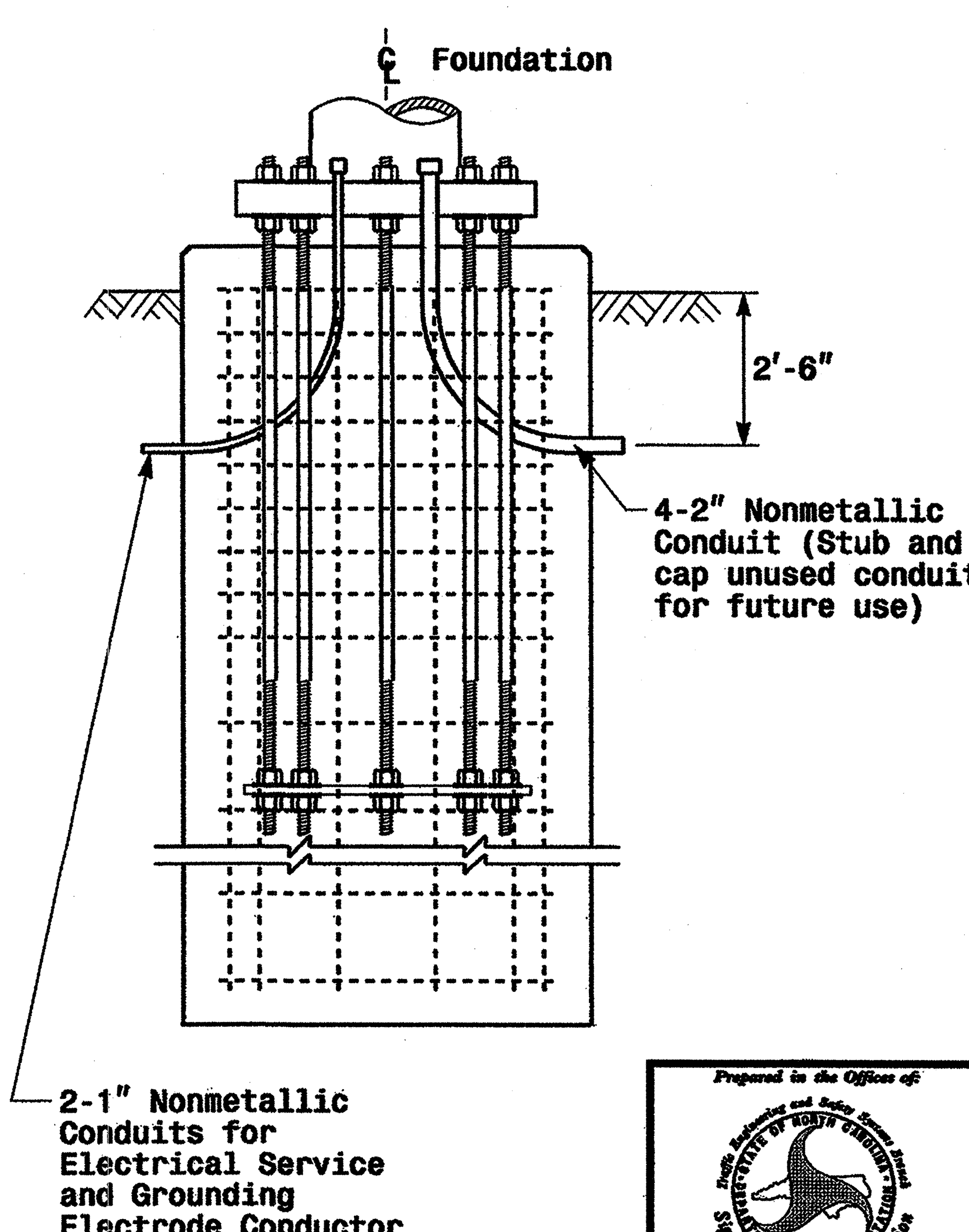
See Note No. 4

Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



Notes

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

Construction Details - Foundations

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

Construction Details
Foundations

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

REVISIONS | INIT. | DATE

SCALE: 0 NA — NONE

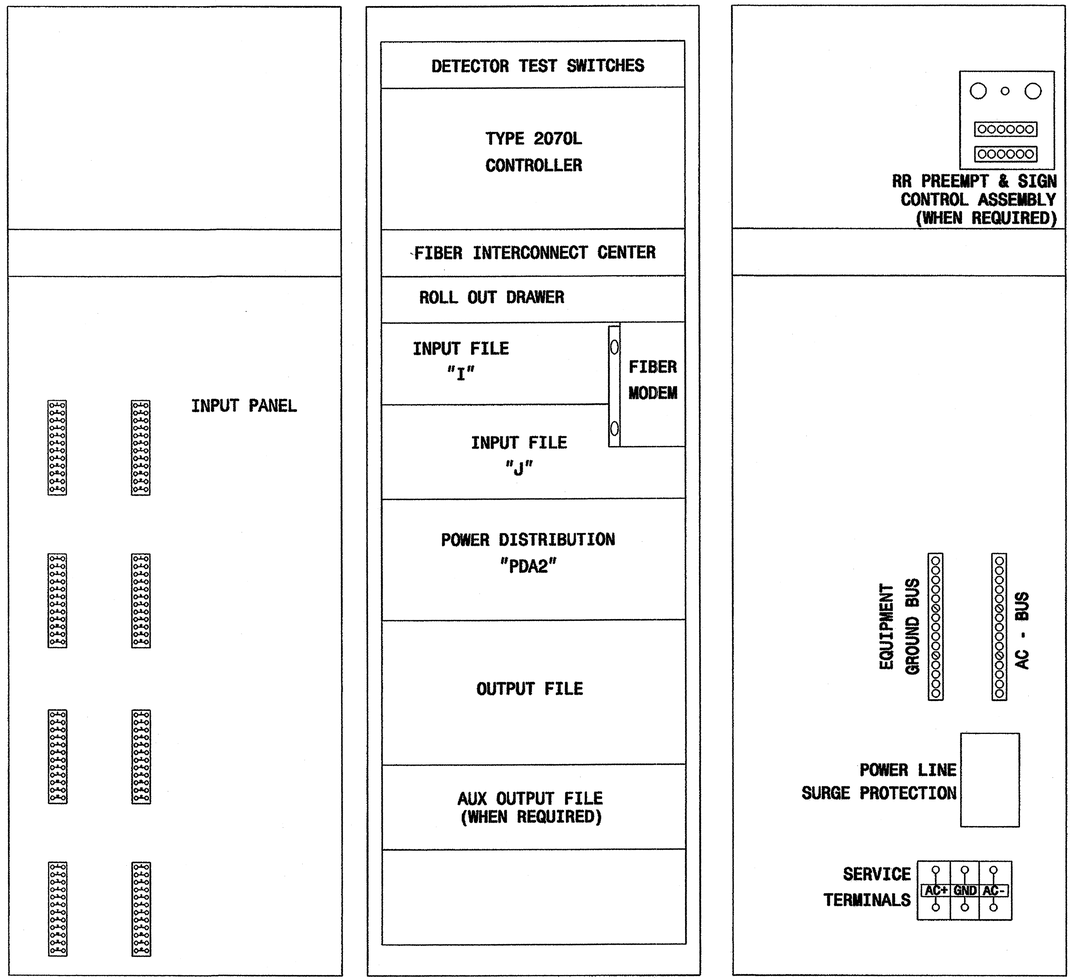
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

D. Sarkar 9.2.2005
SIGNATURE DATE

SIG. INVENTORY NO.

01-SEP-2005 17:48
w:\sspiles-unit\workgroups\2004 metal pole standards\2004 m7.dgn
polexander

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	SIG.18



NOTE

-PROVIDE A 2 " SPACE BETWEEN THE CONTROLLER AND THE ROLL OUT DRAWER TO ACCOMMODATE A FIBER INTERCONNECT CENTER.

REAR VIEW

Typical Drawing

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch
Traffic Control Systems Section
Signals and Geometrics Section
DEPARTMENT OF TRANSPORTATION

1122 N. MacDonell St., Raleigh, NC 27603

Cabinet Component Layout
170 Cabinet Model 332A
with 2070L Controller

PLAN DATE: October 2002 REVIEWED BY:
PREPARED BY: P L Alexander REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 16286 ENGINEER MILTON I. DEAN

SIGNATURE Milton I. Dean 11/13/02 DATE

SIG. INVENTORY NO. NA

13-NOV-2002 10:48
U:\Rodchet170 cabinet.dgn
palexander

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	SIG.19

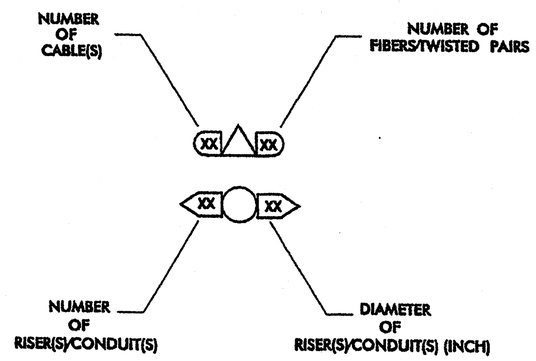
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL REA, PE – 38, (FIGURE 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
3. INSTALL REA, PE – 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
4. INSTALL SMFO CABLE
5. INSTALL MMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
12. INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
13. INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
14. INSTALL POLYETHYLENE CONDUIT
15. DIRECTIONAL DRILL CONDUIT
16. BORE AND JACK CONDUIT
17. INSTALL CABLE(S) IN EXISTING CONDUIT
18. INSTALL CABLE(S) IN NEW CONDUIT
19. INSTALL CABLE(S) IN EXISTING RISER
20. INSTALL CABLE(S) IN NEW RISER
21. INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
22. INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
23. INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
24. INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
25. INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
26. TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
27. INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL SPLICE ENCLOSURE
31. INSTALL POLE MOUNTED SPLICE CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET
33. REMOVE EXISTING SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. REMOVE EXISTING CABINET FOUNDATION
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39. INSTALL JUNCTION BOX
40. INSTALL OVERSIZED JUNCTION BOX
41. REMOVE EXISTING JUNCTION BOX
42. INSTALL WOOD POLE
43. REMOVE EXISTING WOOD POLE
44. INSTALL AERIAL GUY ASSEMBLY
45. INSTALL STANDARD GUY ASSEMBLY
46. INSTALL SIDEWALK GUY ASSEMBLY
47. INSTALL MESSENGER CABLE
48. REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
49. REMOVE EXISTING MESSENGER CABLE
50. INSTALL TELEPHONE SERVICE
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52. INSTALL DELINEATOR MARKER
53. STORE 20 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE
58. INSTALL NEW ELECTRICAL SERVICE

LEGEND

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

CONSTRUCTION NOTE SYMBOLOGY KEY

- (XX) INDICATES NUMBER OF CABLES, LOOPS, ETC.
- (XX) INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- <XX INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX> INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



Prepared in the Offices of
Traffic Management Systems
122 N. MacDonald St., Raleigh, NC 27603

CONSTRUCTION NOTES

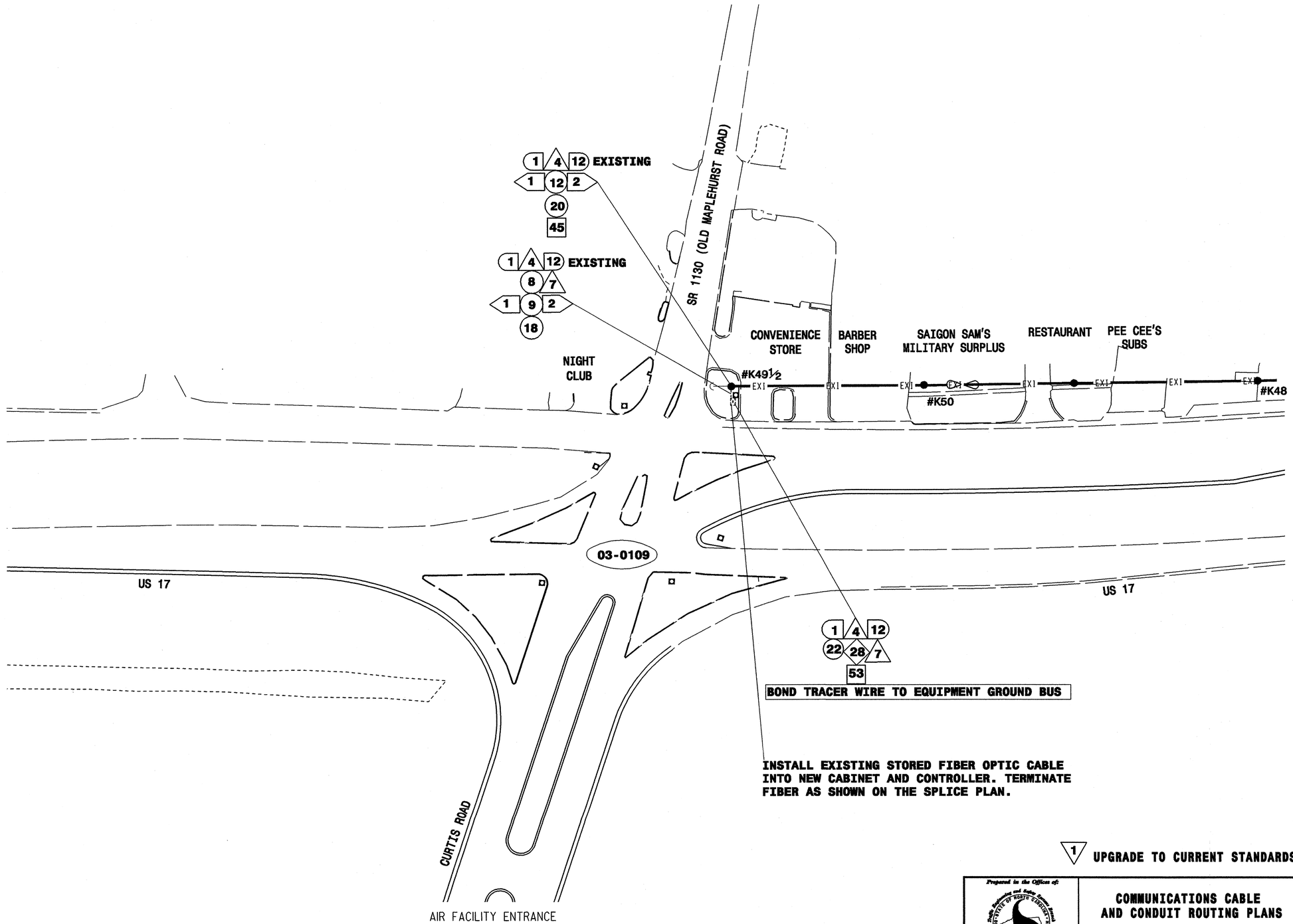
PLAN DATE:
PREPARED BY:
REVIEWED BY:
REVIEWED BY: G. A. FULLER

SCALE 0

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 023919 ENGINEER GREGORY A. FULLER
SIGNATURE
10/31/02
DATE
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-4439A&B	SIG. 20



INSTALL EXISTING STORED FIBER OPTIC CABLE INTO NEW CABINET AND CONTROLLER. TERMINATE FIBER AS SHOWN ON THE SPLICE PLAN.

1 SEAL

NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.

SIGNATURE 2-1-06 DATE

1 **UPGRADE TO CURRENT STANDARDS**

SEAL

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SIGNATURE DATE

SIG. INVENTORY NO.

ARCADIS
G & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

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

SCALE 0 40 1" = 40'

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 3 ONSLOW COUNTY JACKSONVILLE

PLAN DATE: SEPT 2003 REVIEWED BY: K. MILAM

PREPARED BY: K. MILAM REVIEWED BY:

REVISIONS	INIT.	DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4439 A&B	SIG. 21

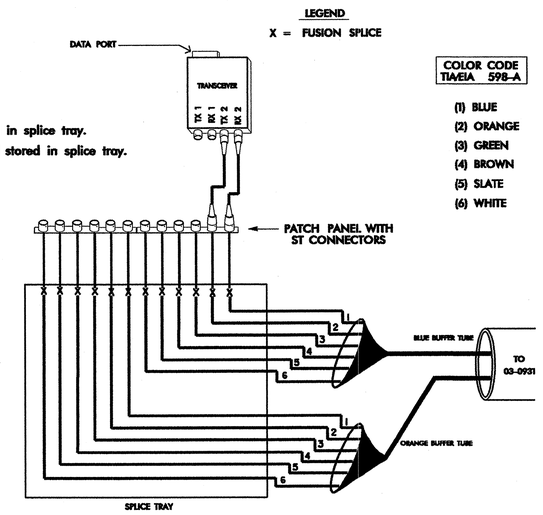
FIBER OPTIC CABLE

US 17 AT SR 1130
(OLD MAPLEHURST ROAD &
AIR FACILITY)
SIG. INV. # 03-0109

Notes:

Unused fibers left coiled and stored in splice tray.

Unused Buffer Tubes left coiled and stored in splice tray.



COLOR CODE
TIA/EIA 598-A

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

FIGURE 1

1 UPGRADE TO CURRENT STANDARDS

SEAL

1

NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER EUGENE C. MURR, JR.

SIGNATURE 2-1-06 DATE

ARCADIS
G & M of North Carolina, Inc.
WWW.ARCADIS-US.COM
801 Corporate Center Drive, Suite 300
Raleigh, NC 27607-5073
Tel: 919/854-1282 Fax: 919/854-5448

Prepared in the Offices of:

Traffic Engineering and Safety Systems Branch
Traffic Management Systems
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

122 N. MacDonell St., Raleigh, NC 27603

SPLICE PLAN

DIVISION 3 ONSLOW COUNTY JACKSONVILLE

PLAN DATE:	SEPT 2003	REVIEWED BY:	T. GRAVES
PREPARED BY:	K. MILAN	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE

0

NONE

SEAL

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SIGNATURE DATE

CADD FILE NAME