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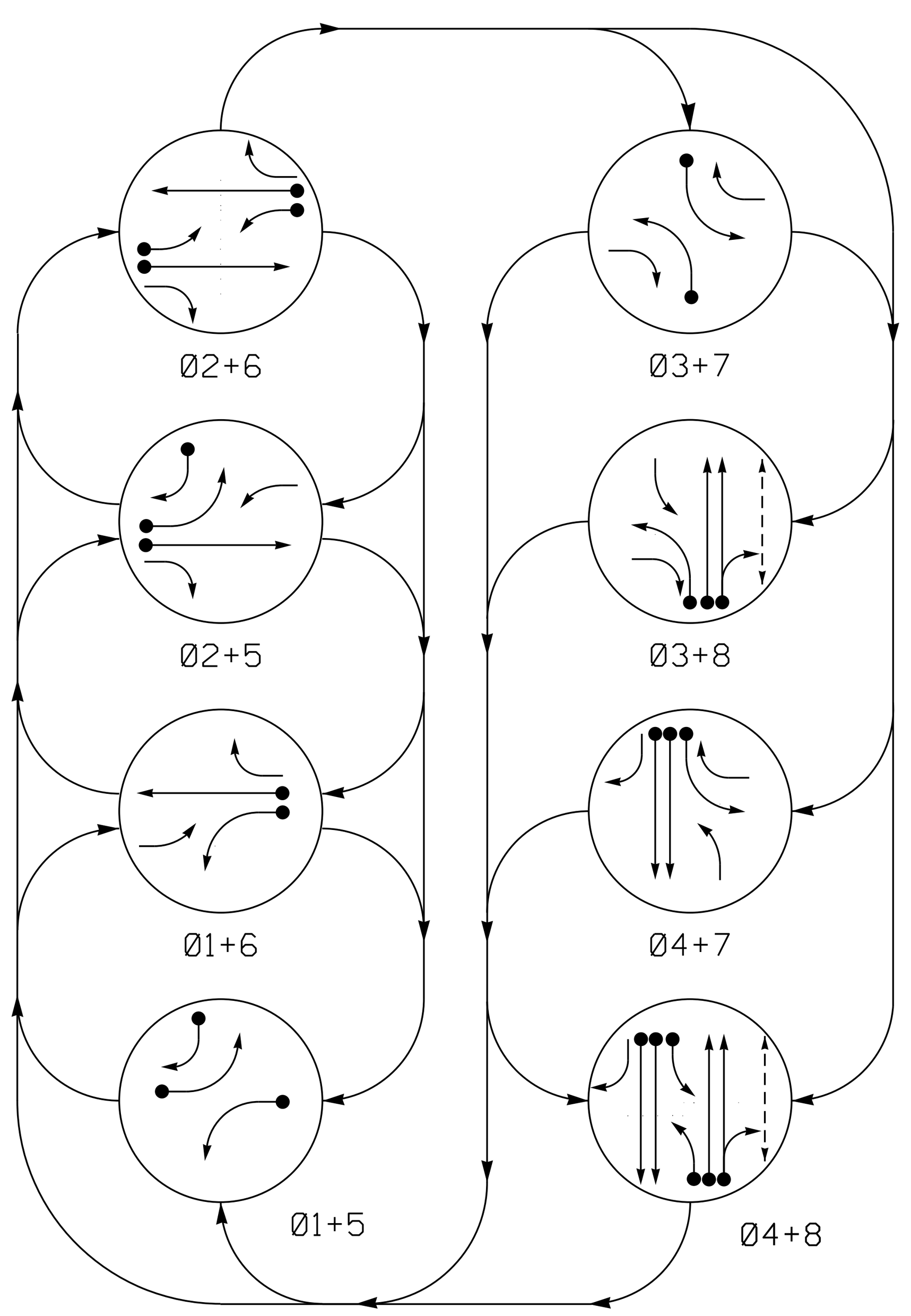
PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 1.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

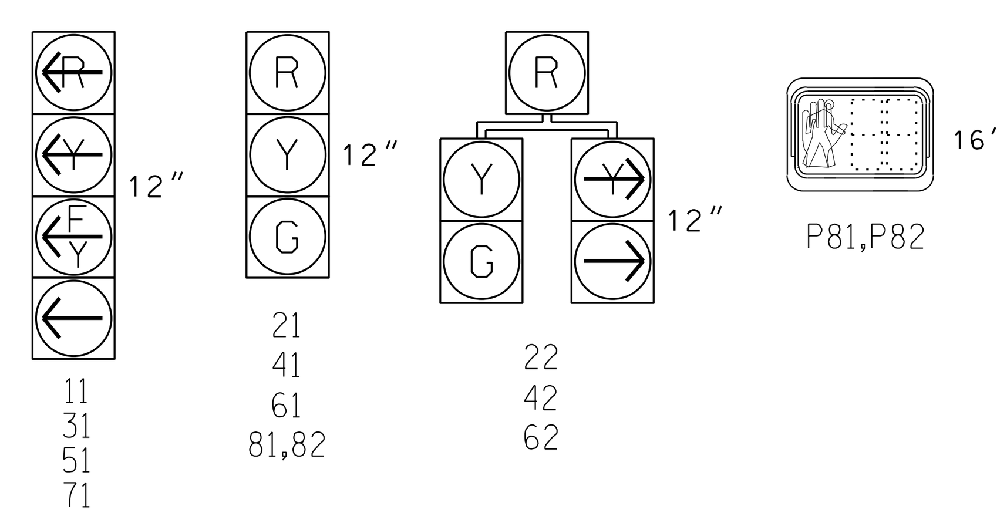
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11	←	←	←F/Y	←F/Y	←R	←R	←R	←R	←Y
21	R	R	G	G	R	R	R	R	Y
22	R	R	G	G	R/→	R/→	R	R	Y
31	←R	←R	←R	←R	←	←	←F/Y	←F/Y	←R
41	R	R	R	R	R	R	G	G	R
42	R/→	R	R/→	R	R	R	G	G	R
51	←	←F/Y	←	←F/Y	←R	←R	←R	←R	←Y
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R/→	R	R/→	R	Y
71	←R	←R	←R	←R	←	←F/Y	←	←F/Y	←R
81,82	R	R	R	R	R	G	R	G	R
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

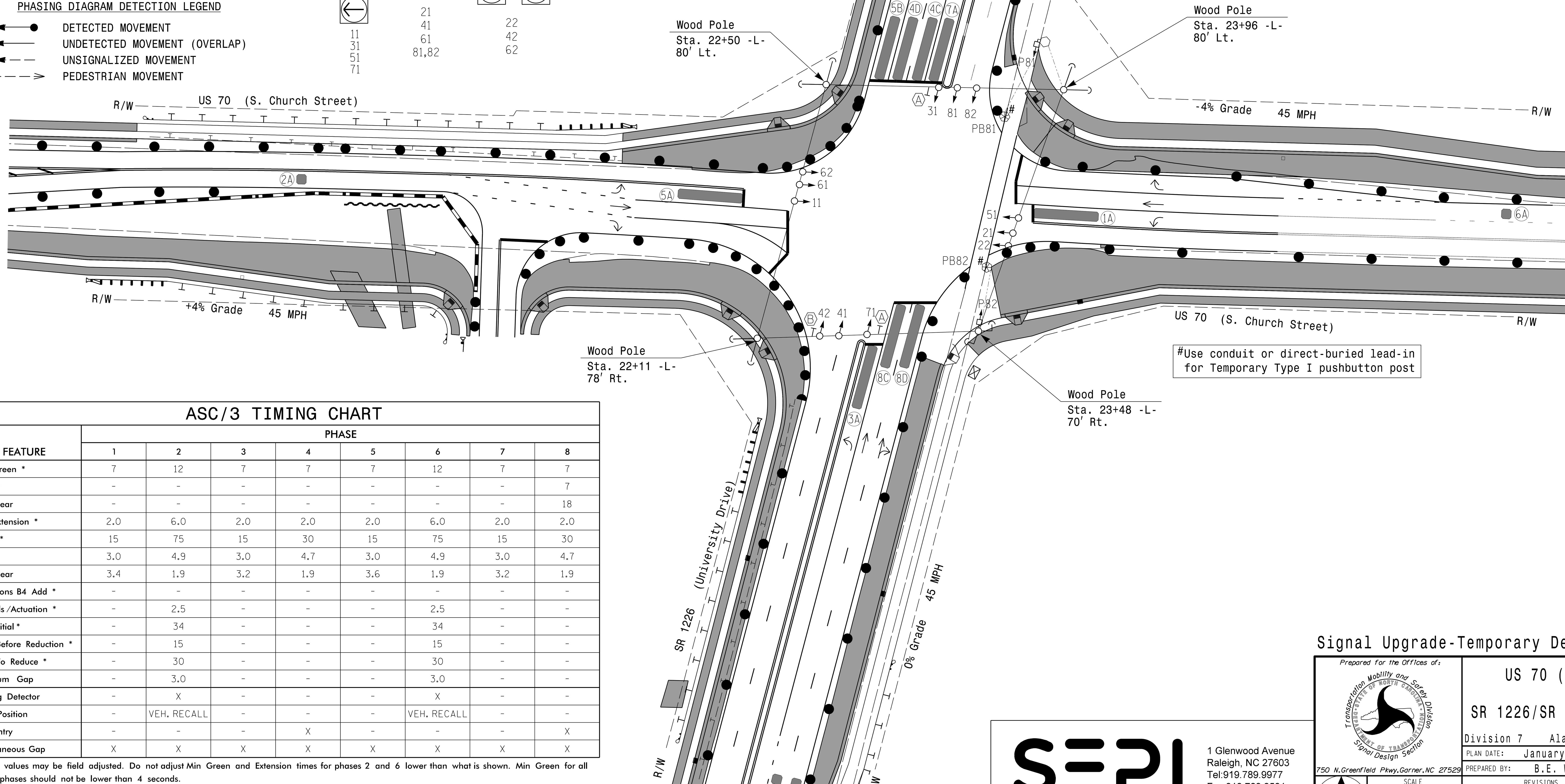
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	X	1	Yes	-	15	-	N	-	-
					6	Yes	-	3	-	G	-	-
2A	6X6	300	*	X	2	Yes	-	-	X	N	-	-
3A	6X40	0	*	X	3	Yes	-	15	-	N	-	-
					8	Yes	-	-	-	N	-	-
4A	6X6	300	*	X	4	No	2.4	-	-	N	-	-
4B	6X6	300	*	X	4	No	2.4	-	-	N	-	-
4C	6X40	0	*	X	4	Yes	-	-	-	N	-	-
4D	6X40	0	*	X	4	Yes	-	-	-	N	-	-
5A	6X40	0	*	X	5	Yes	-	15	-	N	-	-
					2	Yes	-	3	-	G	-	-
5B	6X40	0	*	X	5	Yes	-	-	-	N	-	-
6A	6X6	300	*	X	6	Yes	-	-	X	N	-	-
7A	6X40	0	*	X	7	Yes	-	15	-	N	-	-
					4	Yes	-	-	-	N	-	-
8A	6X6	300	*	X	8	No	2.4	-	-	N	-	-
8B	6X6	300	*	X	8	No	2.4	-	-	N	-	-
8C	6X40	0	*	X	8	Yes	-	-	-	N	-	-
8D	6X40	0	*	X	8	Yes	-	10	-	N	-	-

* Video Detection Zone

8 Phase
Fully Actuated
(Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to count down the flashing "Don't Walk" time only.
9. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



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	
	Video Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
N/A	Curb Ramp	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Construction Zone	N/A
	Drums	N/A
	Guardrail	
A	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	A
B	"NO TURN ON RED" Sign (R10-11)	B

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	-	-	7
Ped Clear	-	-	-	-	-	-	-	18
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	15	75	15	30	15	75	15	30
Yellow	3.0	4.9	3.0	4.7	3.0	4.9	3.0	4.7
Red Clear	3.4	1.9	3.2	1.9	3.6	1.9	3.2	1.9
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	2.5	-	-	-	2.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X	X	X

* 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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Signal Upgrade-Temporary Design 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 70 (S. Church Street) at SR 1226/SR 1311 (University Dr.)

Division 7 Alamance County Burlington

PLAN DATE: January 2022	REVIEWED BY: G.G.Murr, Jr.
PREPARED BY: B.E. Wynn	REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

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

DocuSigned by: Gene G Murr, Jr. 03/01/2022
144586BE1CDD45B
SIGNATURE DATE

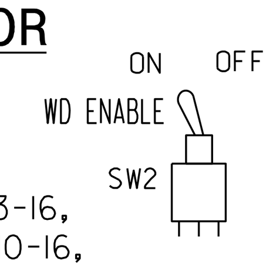
SIG. INVENTORY NO. 07-1996TI

3/1/2022
...W071996T1_sig_dsn_2022xxxx.dgn
USER:bwynn

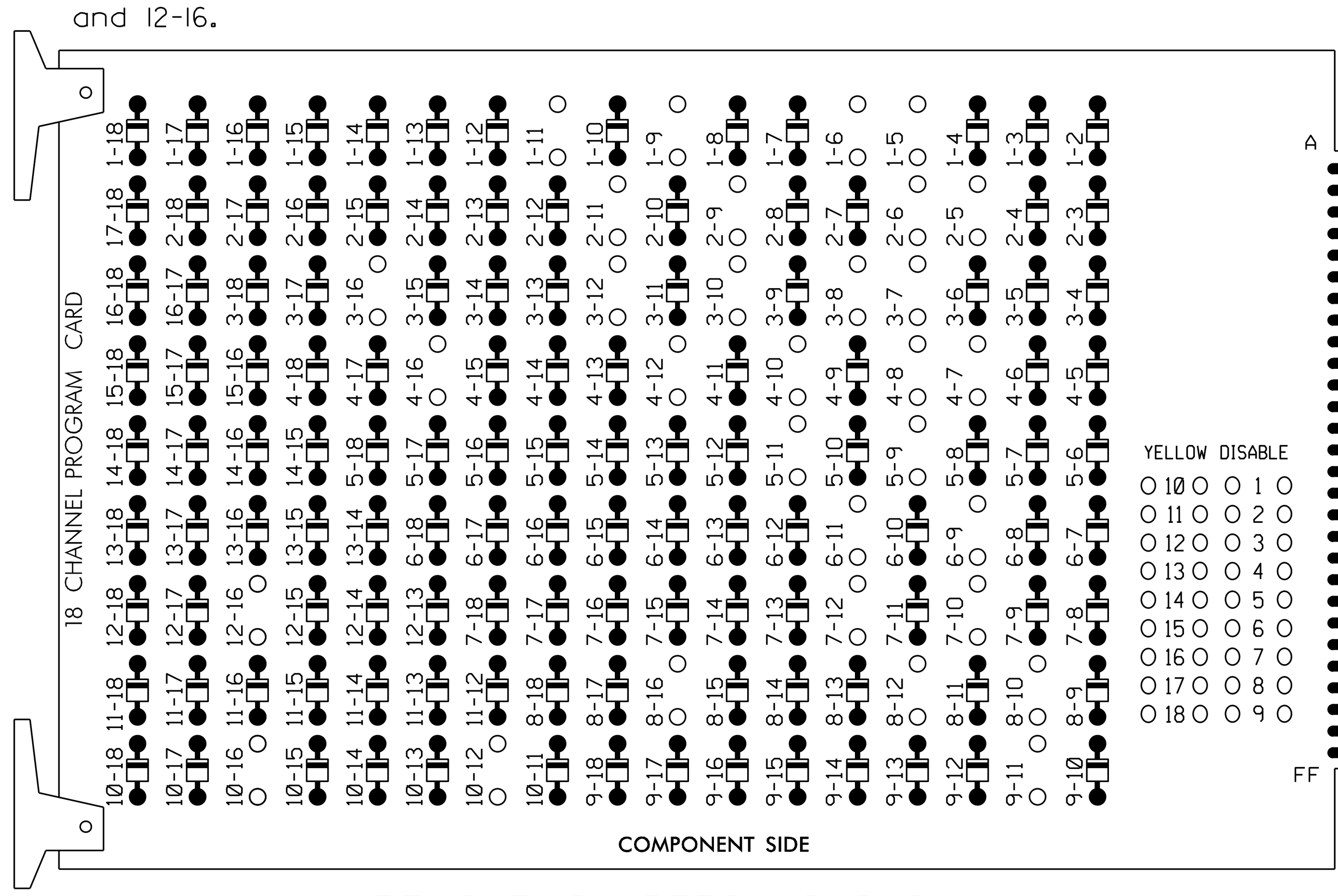
PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig.1.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

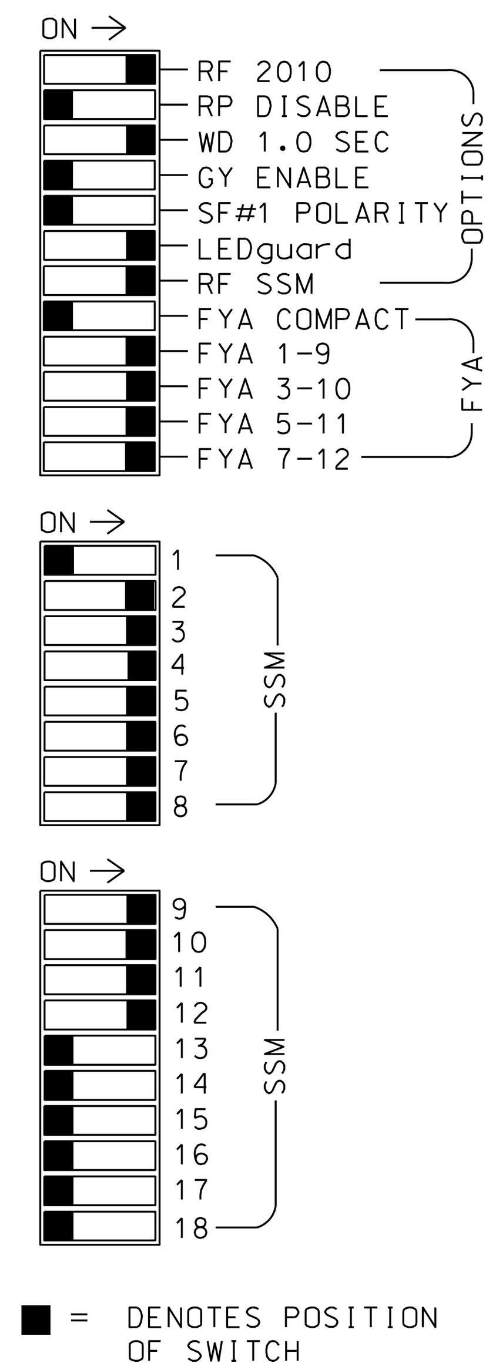
(remove jumpers and set switches as shown)



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



REMOVE JUMPERS AS SHOWN



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Green.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

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

✳ See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4		S5	S6	S7		S8	S9	S10		S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3		4	14	5		6	15	7		8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3		4	4 PED	5		6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	22	31★	41,42	NU	42	51★	61,62	NU	62	71★	81,82	P81, P82	11★	31★	NU	51★	71★	NU
RED		128			✳	101			✳	134			✳	107							
YELLOW	✳	129				102				135				108							
GREEN		130				103				136				109							
RED ARROW																A121	A124		A114	A101	
YELLOW ARROW				117				132				123				A122	A125		A115	A102	
FLASHING YELLOW ARROW																A123	A126		A116	A103	
GREEN ARROW	127			118	118			133	133			124	124								
(Don't Walk)															110						
(Walk)															112						

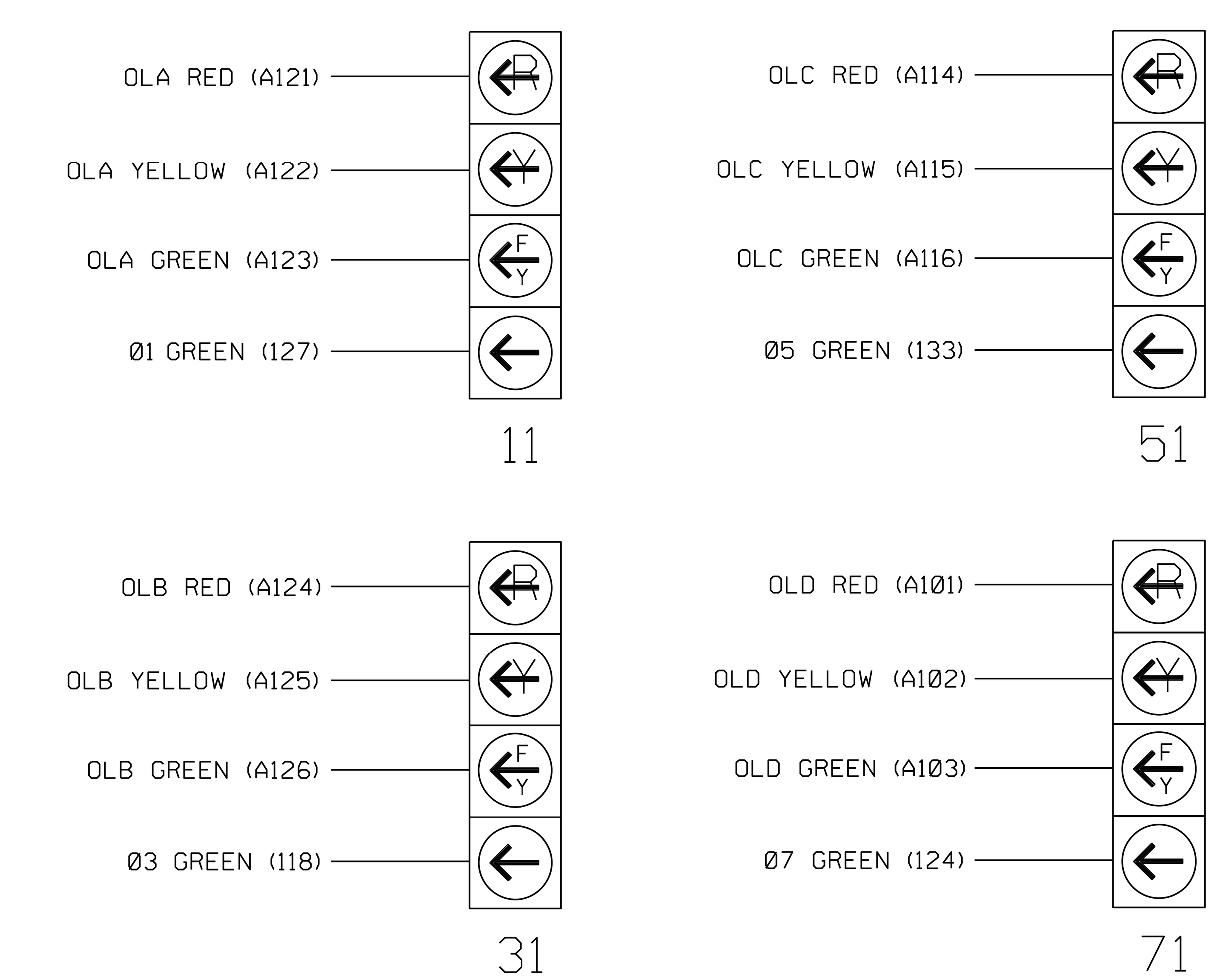
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

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

VIDEO DETECTION

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
PED PUSH BUTTONS										
PB81,PB82	TB8-8,9	I13L	70	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL VIDEO DETECTION NOTE

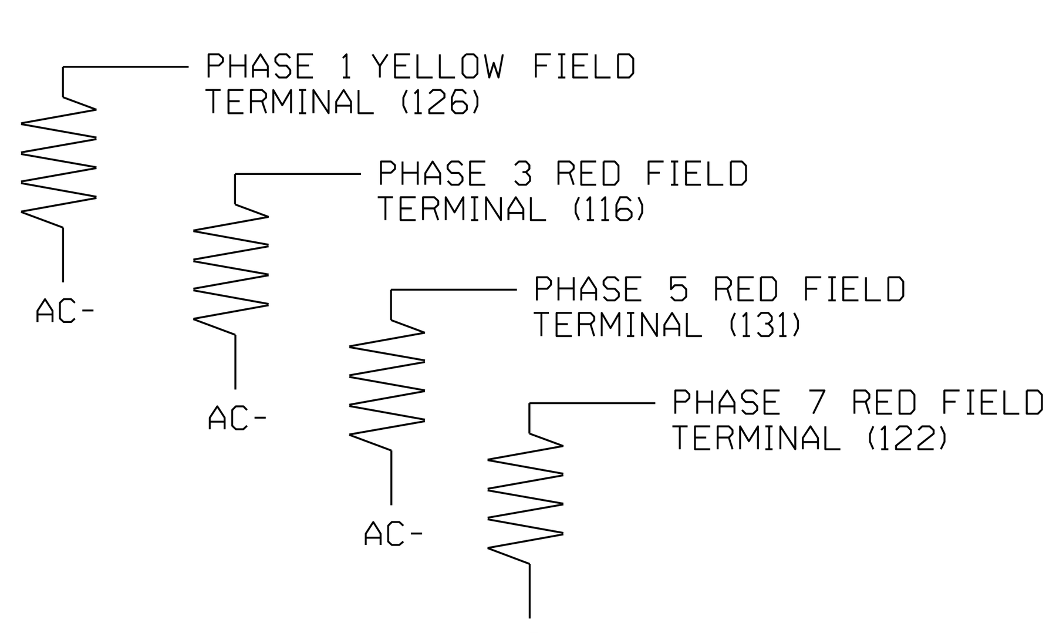
Install a video detection system for vehicle detection. Perform installation in accordance with manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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: 07-1996T1
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

Electrical Detail - Sheet 1 of 2

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
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Fax:919.789.9591
License: C-2197

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 70 (S. Church Street) at SR 1226/SR 1311 (University Dr.)

Division 7 | Alamance County | Burlington
PLAN DATE: February 2022 | REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J.T. Rowe | REVIEWED BY:

REVISIONS	INIT.	DATE

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

DocuSigned by: John T. Rowe, Jr. 03/01/2022 DATE
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SIG. INVENTORY NO. 07-1996T1

3/1/2022
...*07-1996T1e.dgn
USER:bwynn

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig.1.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2
FLASHING ARROW OUTPUT.....CH9  ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP B

Select TMG VEH OVLP [B] and 'PPLT FYA'

```
TMG VEH OVLP...[B] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    3
OPPOSING THROUGH.......   PHASE    4
FLASHING ARROW OUTPUT.....CH10 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6
FLASHING ARROW OUTPUT.....CH11 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'PPLT FYA'

```
TMG VEH OVLP...[D] TYPE: .....PPLT FYA
PROTECTED LEFT TURN....   PHASE    7
OPPOSING THROUGH.......   PHASE    8
FLASHING ARROW OUTPUT.....CH12 ISOLATE
DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THE TAPED WIRES WILL BE MOVED AGAIN IN THE FINAL ELECTRICAL DETAIL OF 07-1996.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1996T1
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

3/1/2022
...*07-1996T1e.dgn
USER:bwynn

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Electrical Detail - Sheet 2 of 2

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PLAN DATE: February 2022	REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J.T. Rowe	REVIEWED BY:

REVISIONS	INIT.	DATE

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

DocuSigned by: John T. Rowe, Jr.
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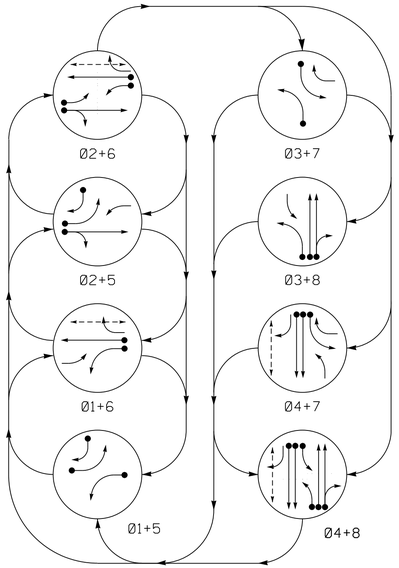
03/01/2022
DATE

SIG. INVENTORY NO. 07-1996T1

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

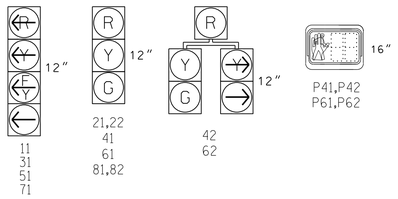
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

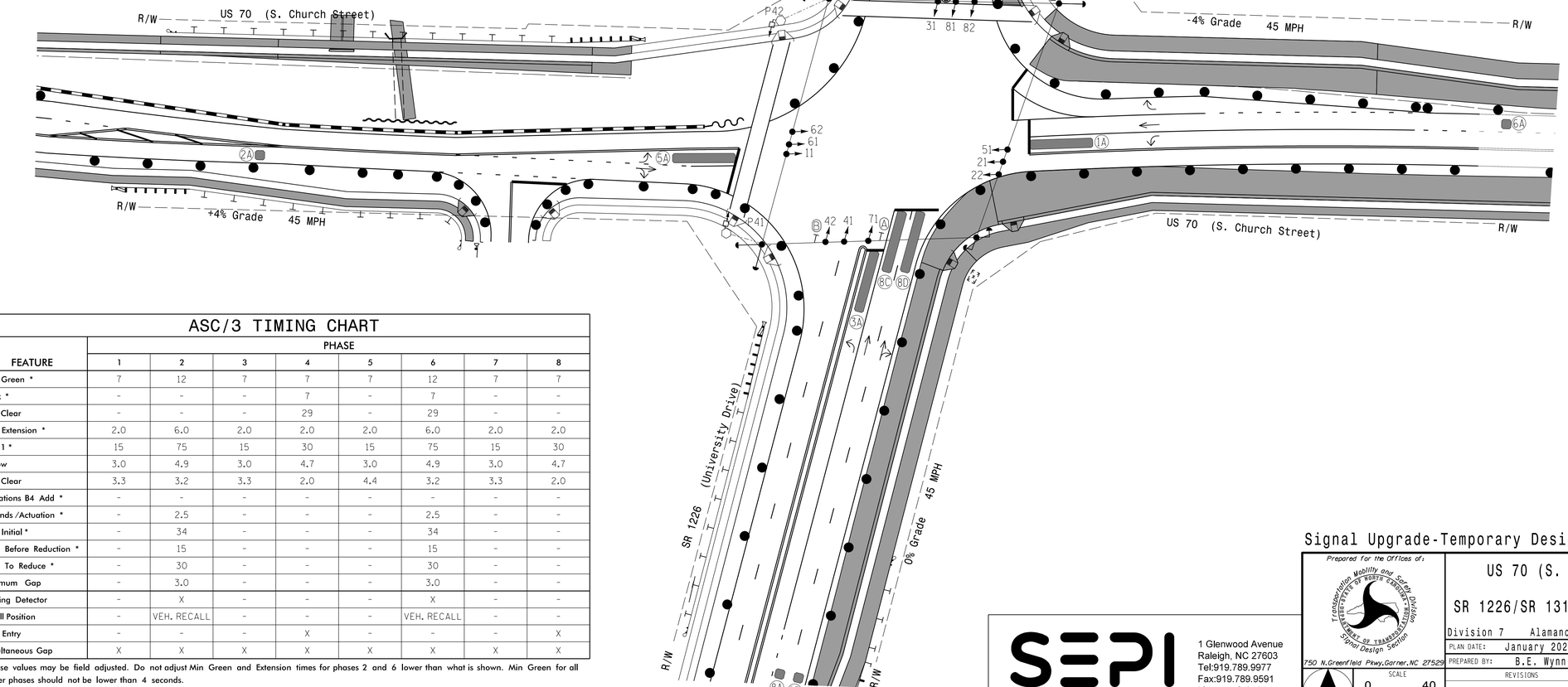
TABLE OF OPERATION

SIGNAL FACE	PHASE 0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3 + 7	0 3 + 8	0 4 + 7	0 4 + 8	FLASH
11	←R	←R	←FY	←FY	→R	→R	→R	→R	→Y
21,22	R	R	G	G	R	R	R	R	Y
31	→R	→R	→R	→R	←R	←R	←FY	←FY	→R
41	R	R	R	R	R	R	G	G	R
42	R→	R	R→	R	R	R	G	G	R
51	←R	←FY	←R	←FY	→R	→R	→R	→R	→Y
61	R	G	R	G	R	R	R	R	Y
62	R	G	R	G	R→	R	R→	R	Y
71	→R	→R	→R	→R	←R	←FY	←R	←FY	→R
81,82	R	R	R	R	R	G	R	G	R
P41,P42	DW	DW	DW	DW	DW	W	W	DRK	
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.





ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	✱	X	1	Yes	-	15	-	N	-	-
					6	Yes	-	3	-	C	-	-
2A	6X6	300	✱	X	2	Yes	-	-	X	N	-	-
3A	6X40	0	✱	X	3	Yes	-	15	-	N	-	-
					8	Yes	-	-	-	N	-	-
4A	6X6	300	✱	X	4	No	2.4	-	-	N	-	-
4B	6X6	300	✱	X	4	No	2.4	-	-	N	-	-
4C	6X40	0	✱	X	4	Yes	-	-	-	N	-	-
4D	6X40	0	✱	X	4	Yes	-	-	-	N	-	-
5A	6X40	0	✱	X	5	Yes	-	15	-	N	-	-
					2	Yes	-	3	-	C	-	-
5B	6X40	0	✱	X	5	Yes	-	-	-	N	-	-
6A	6X6	300	✱	X	6	Yes	-	-	X	N	-	-
7A	6X40	0	✱	X	7	Yes	-	15	-	N	-	-
					4	Yes	-	-	-	N	-	-
8A	6X6	300	✱	X	8	No	2.4	-	-	N	-	-
8B	6X6	300	✱	X	8	No	2.4	-	-	N	-	-
8C	6X40	0	✱	X	8	Yes	-	-	-	N	-	-
8D	6X40	0	✱	X	8	Yes	-	10	-	N	-	-

✱Video Detection Zone

8 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Reposition existing signal heads numbered 11, 21, 22, 51, 61 & 62.
6. Set all detector units to presence mode.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to count down the flashing "Don't Walk" time only.
9. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

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	
	Video Detection Zone	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Curb Ramp	
	Construction Zone	N/A
	Drums	N/A
	Guardrail	
Ⓐ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	7	-	7	-	-
Ped Clear	-	-	-	29	-	29	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	15	75	15	30	15	75	15	30
Yellow	3.0	4.9	3.0	4.7	3.0	4.9	3.0	4.7
Red Clear	3.3	3.2	3.3	2.0	4.4	3.2	3.3	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	2.5	-	-	-	2.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X	X	X

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

Signal Upgrade-Temporary Design 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

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

US 70 (S. Church Street)
at
SR 1226/SR 1311 (University Dr.)

Division 7 Alamance County Burlington

PLAN DATE:	January 2022	REVIEWED BY:	G.G.Murr, Jr.
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

REVISIONS	INIT.	DATE

SCALE 1"=40' (0 40)

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

DocuSigned by: Gene G. Murr Jr 03/01/2022 DATE

SIG. INVENTORY NO. 07-I99612

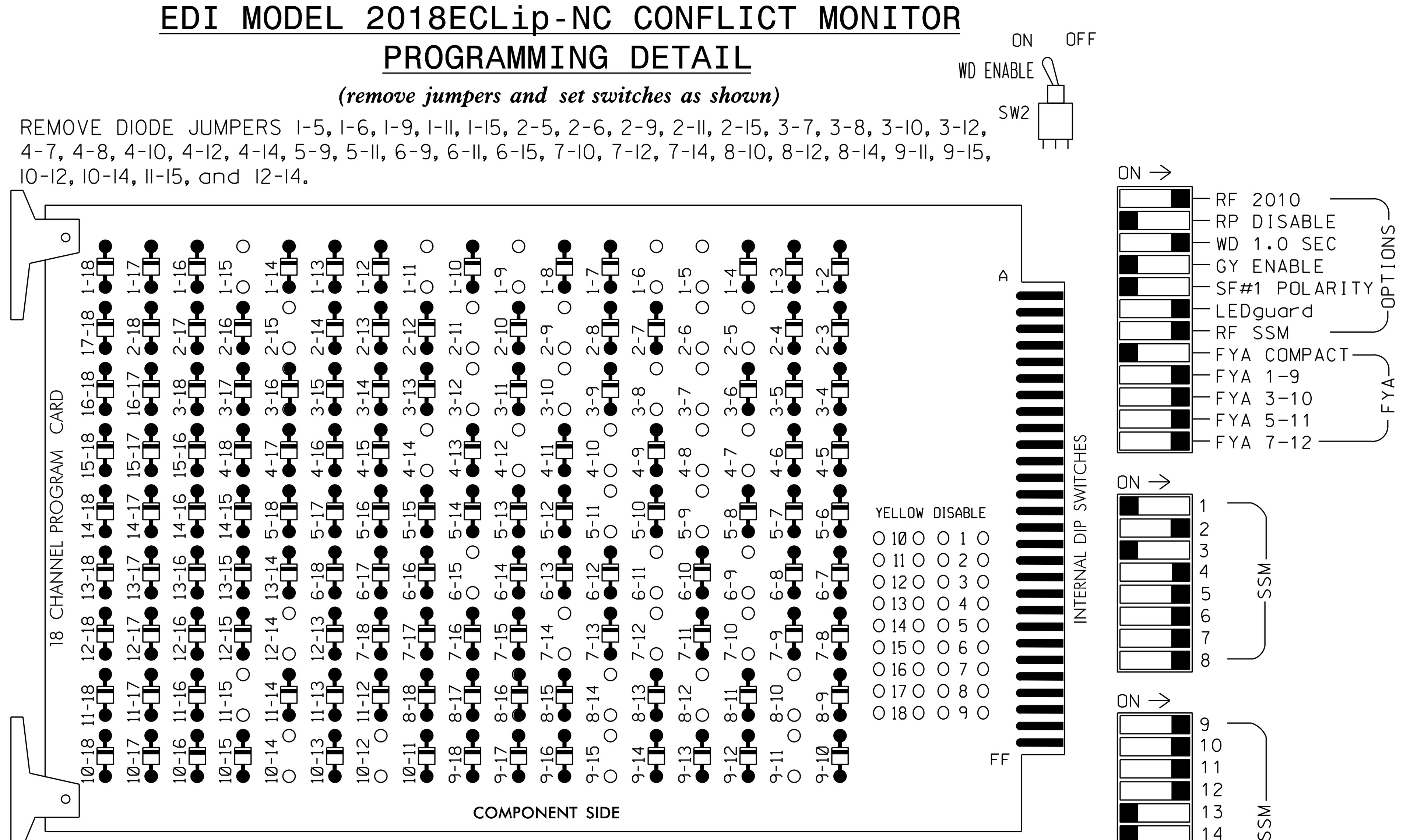
3/1/2022
...\07I99612_sig_dsn_2022xxxx.dgn
USER:bwynn

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig.2.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green and 6 Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
5. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

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

✳ See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7		S8	S9	S10		S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5		6	15	7		8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5		6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	31★	41,42	P41, P42	42	51★	61,62	P61, P62	62	71★	81,82	NU	11★	31★	NU	51★	71★	NU
RED		128			101			✳	134			✳	107							
YELLOW	✳	129		✳	102				135				108							
GREEN		130			103				136				109							
RED ARROW															A121	A124		A114	A101	
YELLOW ARROW							132				123				A122	A125		A115	A102	
FLASHING YELLOW ARROW															A123	A126		A116	A103	
GREEN ARROW	127			118			133	133			124	124								
(Don't Walk symbol)						104				119										
(Walk symbol)						106				121										

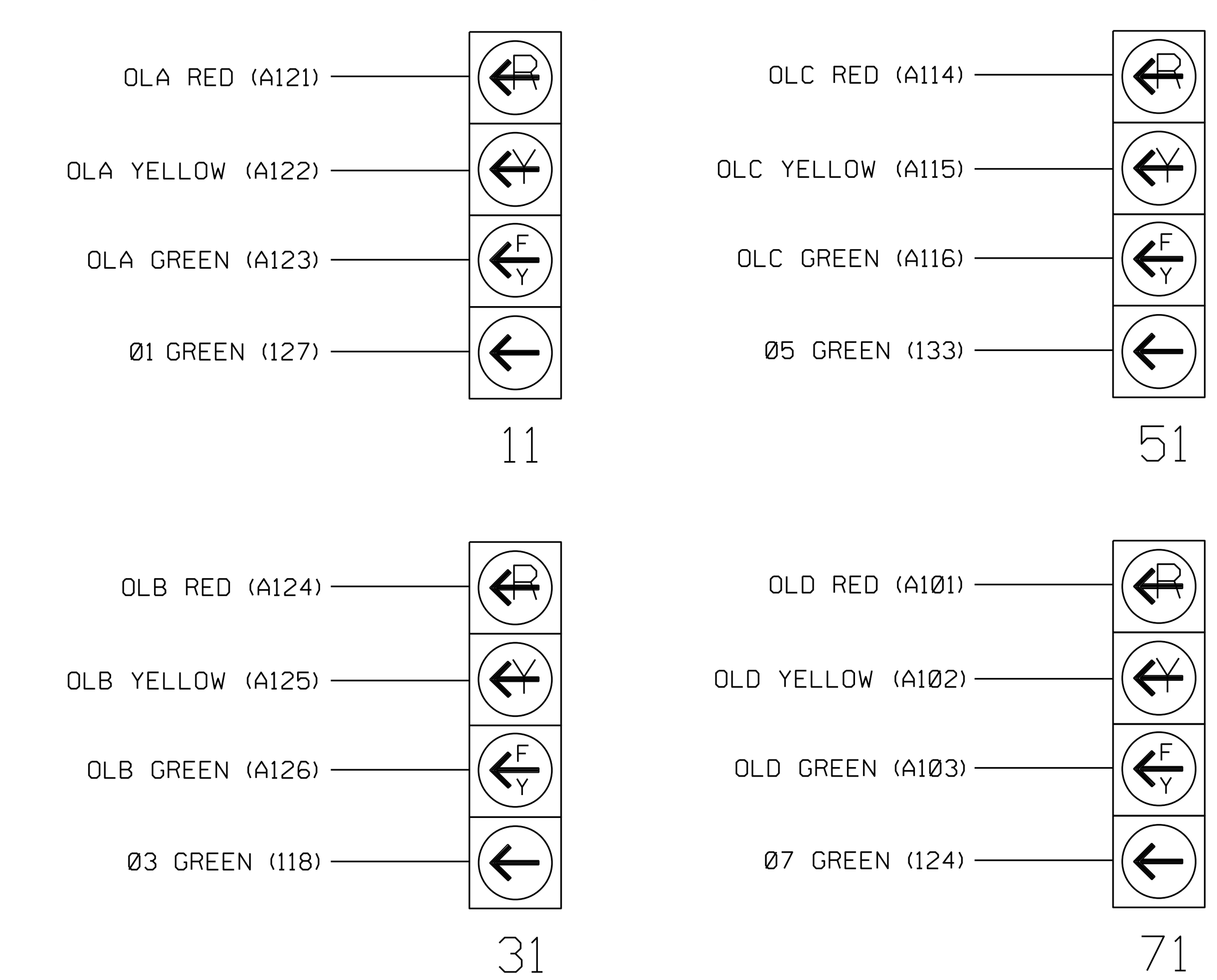
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

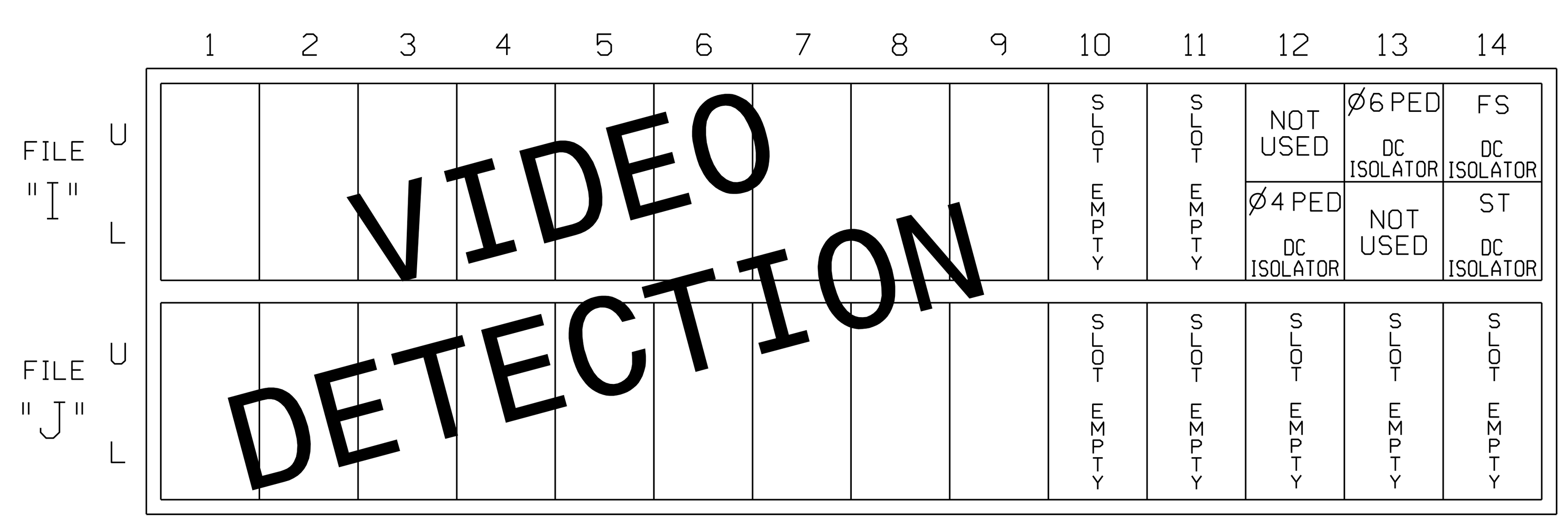
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
PED PUSH BUTTONS										
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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

SPECIAL VIDEO DETECTION NOTE

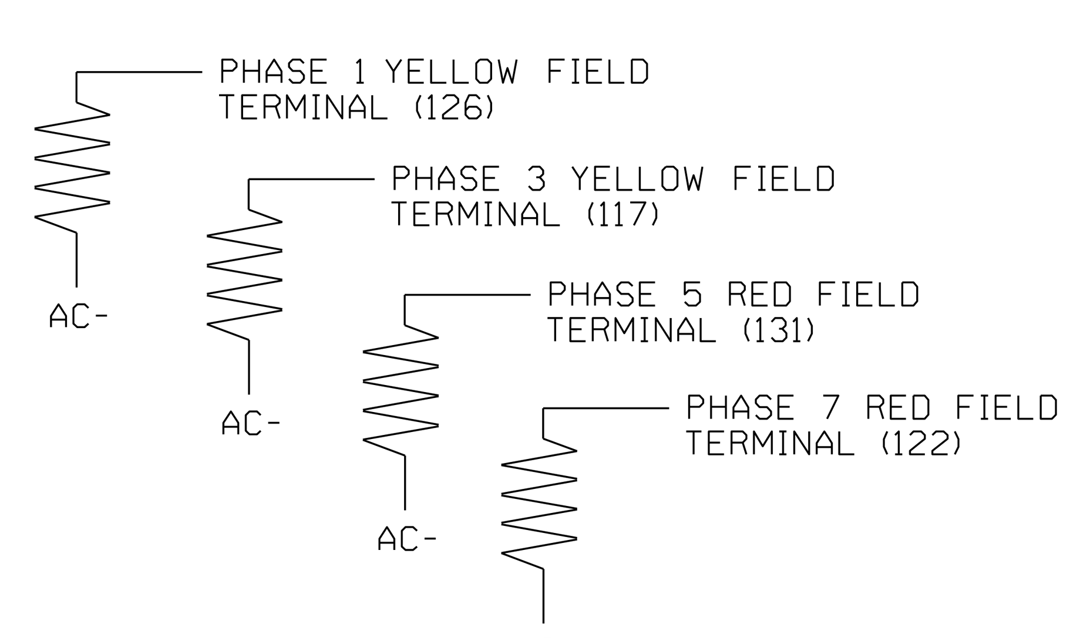
Install a video detection system for vehicle detection. Perform installation in accordance with manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Plans.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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: 07-1996T2
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
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License: C-2197

Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 70 (S. Church Street)
at
SR 1226/SR 1311 (University Dr.)

Division 7 | Alamance County | Burlington

PLAN DATE: February 2022	REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J.T. Rowe	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DocuSigned by:
John T. Rowe, Jr.
D0847BA0ACA9400...
03/01/2022
DATE

SIG. INVENTORY NO. 07-1996T2

3/1/2022
...*07-1996T2e.dgn
USER:bwynn

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```
TMG VEH OVLP...[A] TYPE: .....[PPLT FYA]

PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH.......   PHASE    2

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP B

Select TMG VEH OVLP [B] and 'PPLT FYA'

```
TMG VEH OVLP...[B] TYPE: .....[PPLT FYA]

PROTECTED LEFT TURN....   PHASE    3
OPPOSING THROUGH.......   PHASE    4

FLASHING ARROW OUTPUT.....CH10 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....[PPLT FYA]

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'PPLT FYA'

```
TMG VEH OVLP...[D] TYPE: .....[PPLT FYA]

PROTECTED LEFT TURN....   PHASE    7
OPPOSING THROUGH.......   PHASE    8

FLASHING ARROW OUTPUT.....CH12 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, ENSURE THE FOLLOWING FLASHER CIRCUIT CHANGES HAVE BEEN MADE:

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

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

THE TAPED WIRES WILL BE MOVED AGAIN IN THE FINAL ELECTRICAL DETAIL OF 07-1996.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1996T2
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

Electrical Detail - Sheet 2 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared in the Offices of:

Transportation Mobility and Safety Division
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State of North Carolina Department of Transportation

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US 70 (S. Church Street)
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Division 7 | Alamance County | Burlington

PLAN DATE: February 2022	REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: J.T. Rowe	REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

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

DocuSigned by:
John T. Rowe, Jr.
D0047BA0A0A0400...
03/01/2022
DATE

SIG. INVENTORY NO. 07-1996T2

3/1/2022
...*07-1996T2e.dgn
USER:bwynn

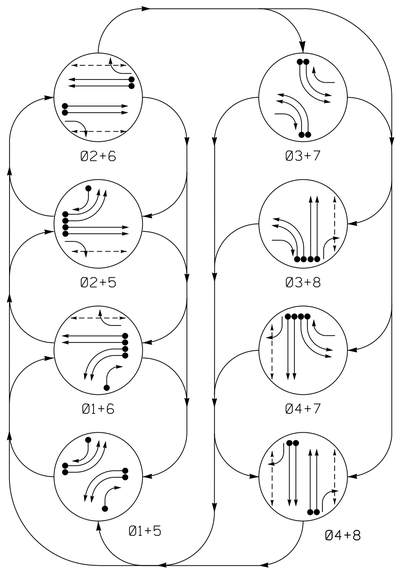
PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 3.0

8 Phase
Fully Actuated
(Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and " Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged. Phase 3 and/or phase 7 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

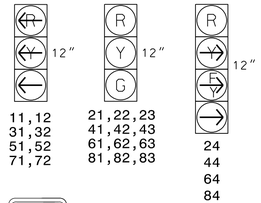
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11,12	←	←	↱R	↱R	↱R	↱R	↱R	↱R	↱R
21,22,23	R	R	G	G	R	R	R	R	Y
24	R	R	F Y	F Y	→	→	R	R	Y
31,32	↱R	↱R	↱R	↱R	←	←	↱R	↱R	↱R
41,42,43	R	R	R	R	R	R	G	G	R
44	→	R	→	R	R	R	F Y	F Y	R
51,52	←	↱R	←	↱R	↱R	↱R	↱R	↱R	↱R
61,62,63	R	G	R	G	R	R	R	R	Y
64	R	F Y	R	F Y	→	R	→	R	Y
71,72	↱R	↱R	↱R	↱R	←	↱R	←	↱R	↱R
81,82,83	R	R	R	R	R	G	R	G	R
84	→	→	R	R	R	F Y	R	F Y	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



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

21,22,23
41,42,43
61,62,63
81,82,83

24
44
64
84

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

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR: LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING: PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	-	-	N	-	X
1B	6X40	0	2-4-2	X	1	Yes	-	-	-	N	-	X
1C	6X40	0	2-4-2	X	1	Yes	-	15	-	N	-	X
2A	6X6	300	4	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	4	X	2	Yes	-	-	X	N	-	X
3A	6X40	0	2-4-2	X	3	Yes	-	-	-	N	-	X
3B	6X40	0	2-4-2	X	3	Yes	-	-	-	N	-	X
4A	6X6	300	4	X	4	No	2.4	-	-	N	-	X
4B	6X6	300	4	X	4	No	2.4	-	-	N	-	X
4C	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	X
4D	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	-	-	N	-	X
5B	6X40	0	2-4-2	X	5	Yes	-	-	-	N	-	X
5C	6X40	0	2-4-2	X	5	Yes	-	15	-	N	-	X
6A	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	4	X	6	Yes	-	-	X	N	-	X
7A	6X40	0	2-4-2	X	7	Yes	-	-	-	N	-	X
7B	6X40	0	2-4-2	X	7	Yes	-	-	-	N	-	X
8A	6X40	300	4	X	8	No	2.4	-	-	N	-	X
8B	6X40	300	4	X	8	No	2.4	-	-	N	-	X
8C	6X40	0	2-4-2	X	8	Yes	-	-	-	N	-	X
8D	6X40	0	2-4-2	X	8	Yes	-	-	-	N	-	X

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	27	-	28	-	28	-	29
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	25	75	15	30	25	75	15	35
Yellow	3.0	4.2	3.0	4.7	3.0	4.9	3.0	4.5
Red Clear	4.6	2.9	3.9	2.6	4.5	2.9	3.8	2.6
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds /Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	■
◯	Metal Strain Pole	■
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⛶
□	Junction Box	■
----	2-in Underground Conduit	----
—DD—	Directional Drill	N/A
N/A	Curb Ramp	◢
⊥⊥	Guardrail	⊥⊥
N/A	Right of Way	----
→	Directional Arrow	→
⊛	Type I Pushbutton Post	●
⬡	Type II Signal Pedestal	●
Ⓐ	Right "TURNING VEHICLES YIELD TO PEDESTRIANS" Sign (R10-15R)	Ⓐ
Ⓑ	"U-TURN YIELD TO RIGHT TURN" Sign (R10-16)	Ⓑ

Signal Upgrade-Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 70 (S. Church Street) at SR 1226/SR 1311 (University Dr.)

Division 7 Alamance County Burlington

PLAN DATE: January 2022 REVIEWED BY: G.G.Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G MURR JR

Docusigned by: Gene G Murr Jr. 03/01/2022
SIGNATURE DATE

SIG. INVENTORY NO. 07-1996

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1 Glenwood Avenue
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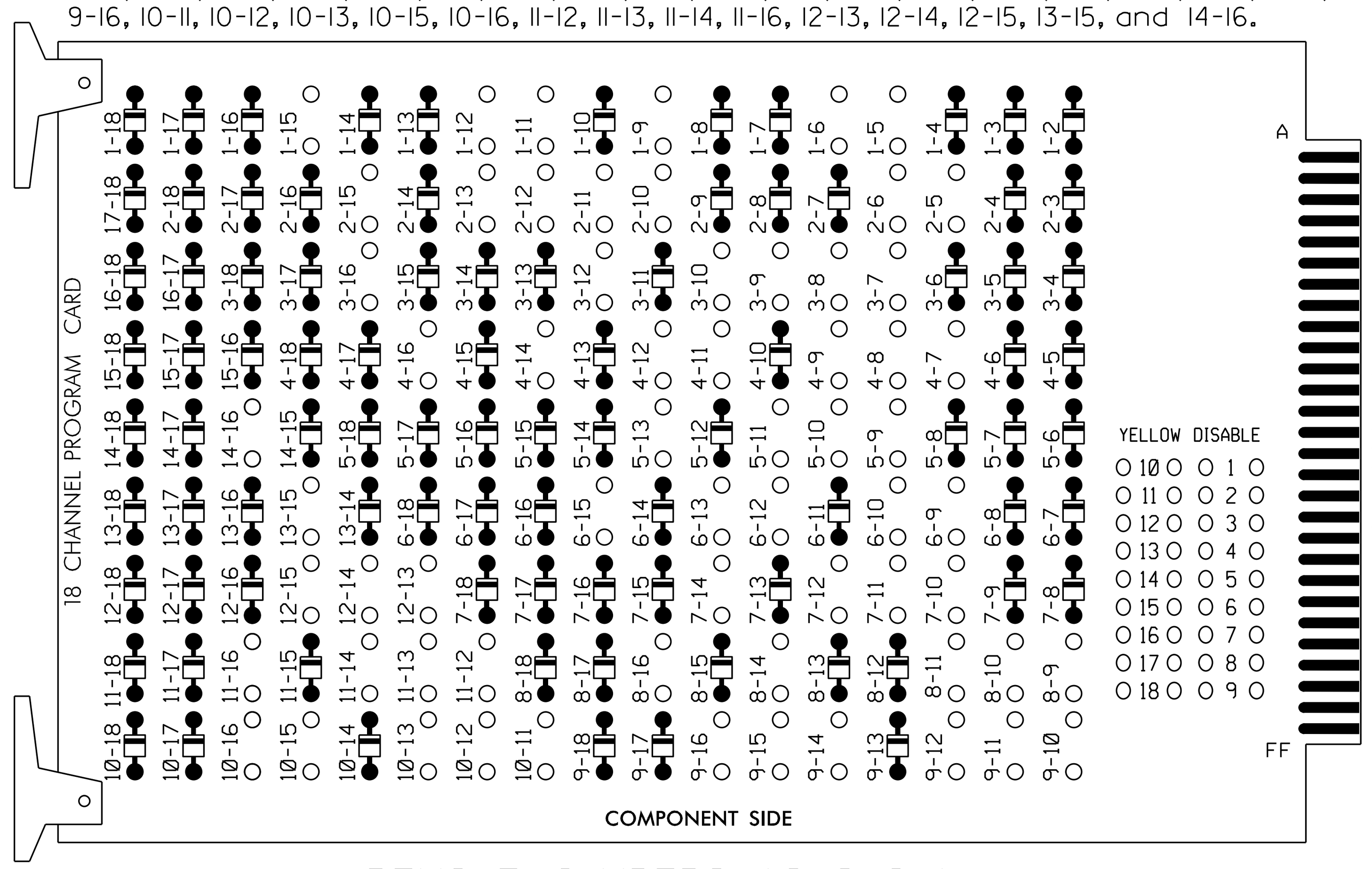
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

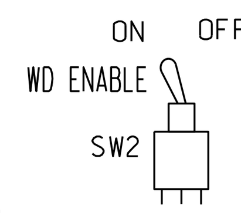
3/1/2022
07-1996_sig_dsn_2022xxxx.dgn
USER:bwynn

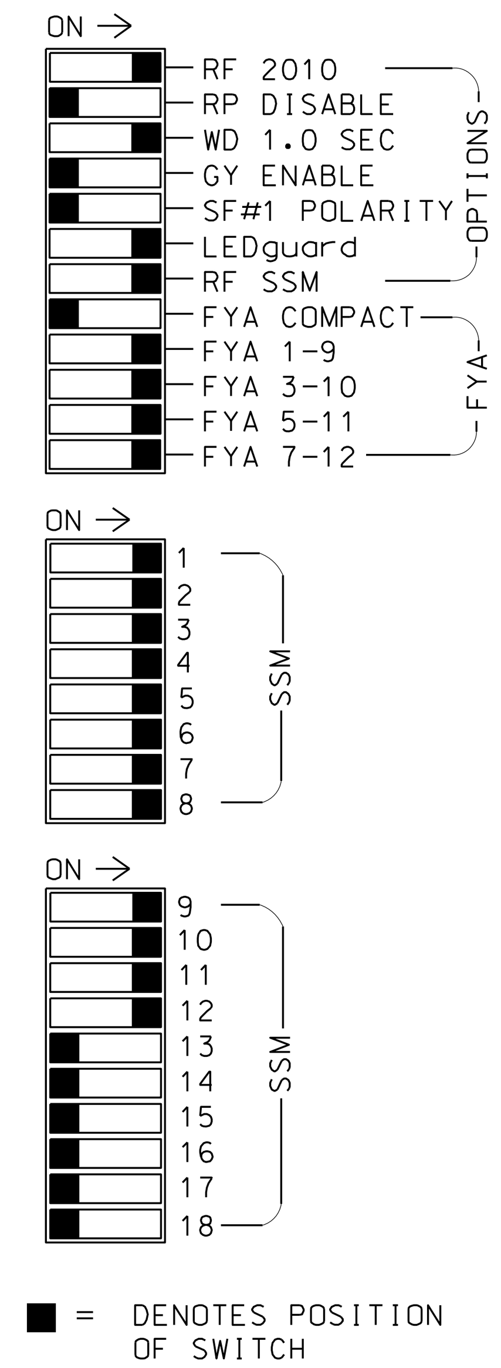
EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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







REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Walk and 6 Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

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

* See overlap programming detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 3.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1		S2	S3	S4		S5	S6	S7		S8	S9	S10		S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1		2	13	3#		4#	14	5		6	15	7#		8#	16	9#	10#	17	11#	12#	18
PHASE	1		2	2 PED	3		4	4 PED	5		6	6 PED	7		8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	84★	21,22, 23	P21, P22	24★	31,32	41,42, 43	P41, P42	44★	51,52	61,62, 63	P61, P62	64★	71,72	81,82, 83	P81, P82	84★	24★	NU	44★	64★	NU
RED			128				101				134				107		A121	A124		A114	A101	
YELLOW			129				102				135				108							
GREEN			130				103				136				109							
RED ARROW	125					116				131				122								
YELLOW ARROW	126					117				132				123			A122	A125		A115	A102	
FLASHING YELLOW ARROW																	A123	A126		A116	A103	
GREEN ARROW	127	127			118	118			133	133			124	124								
(Don't Walk hand)				113				104				119				110						
(Walk person)				115				106				121				112						

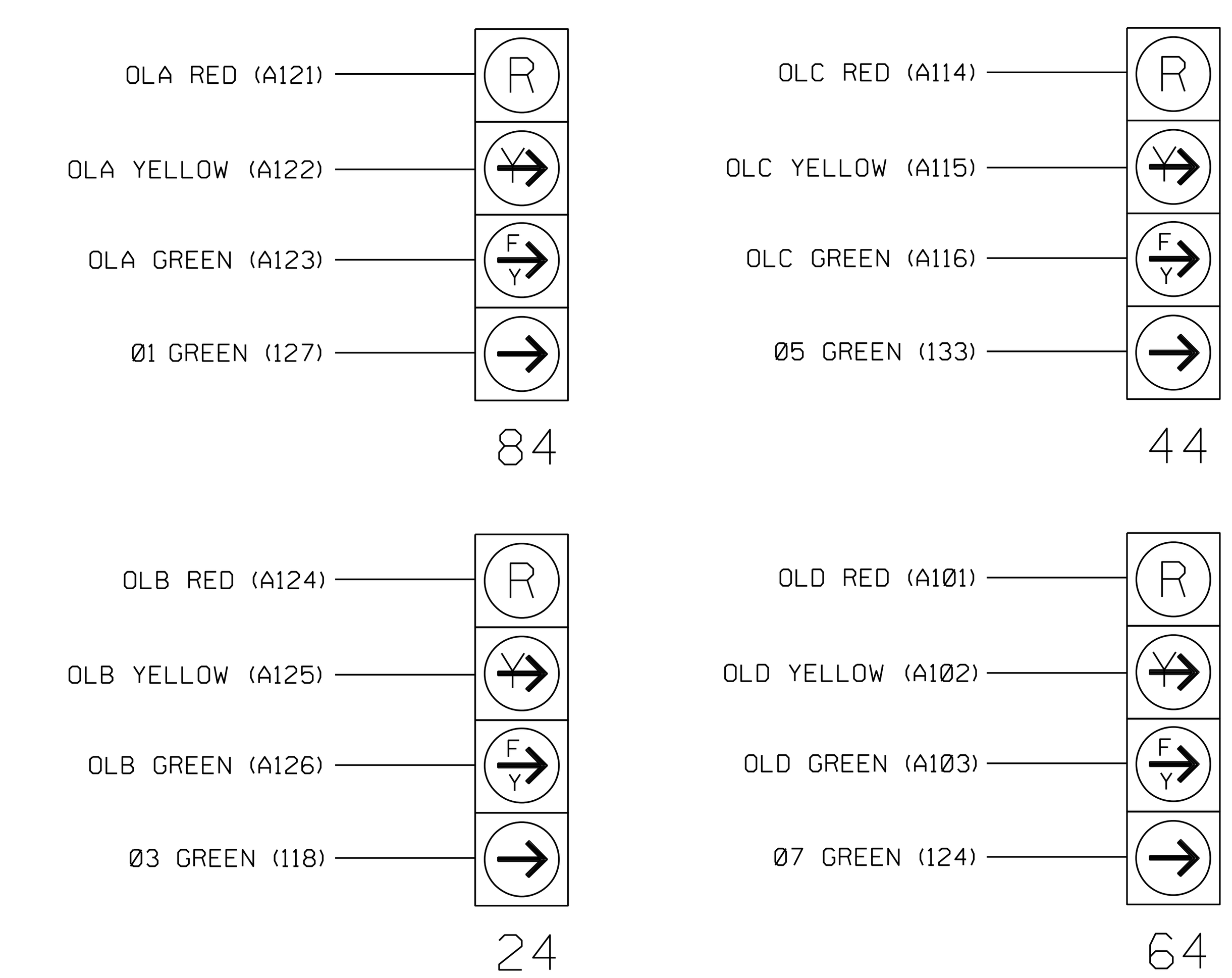
NU = Not Used

★ See pictorial of head wiring in detail this sheet.

See Flasher Circuit Modification Detail on Sheet 2.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 1 1B	Ø 2 2A	SLOT EMPTY	Ø 3 3A	Ø 4 4A	Ø 4 4C	SLOT EMPTY	Ø 3 3B	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	Ø 1 1C	Ø 2 2B	SLOT EMPTY	NOT USED	Ø 4 4B	Ø 4 4D	SLOT EMPTY	NOT USED	SLOT EMPTY	SLOT EMPTY	Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 5 5B	Ø 6 6A	SLOT EMPTY	Ø 7 7A	Ø 8 8A	Ø 8 8C	SLOT EMPTY	Ø 7 7B	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	Ø 5 5C	Ø 6 6B	SLOT EMPTY	NOT USED	Ø 8 8B	Ø 8 8D	SLOT EMPTY	NOT USED	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT 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.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A	TB2-1,2	I1U	56	1	1	YES				N
1B	TB2-5,6	I2U	39	2	1	YES				N
1C	TB2-7,8	I2L	43	12	1	YES		15		N
2A	TB2-9,10	I3U	63	32	2	YES			X	N
2B	TB2-11,12	I3L	76	42	2	YES			X	N
3A	TB4-5,6	I5U	58	3	3	YES				N
4A	TB4-9,10	I6U	41	4	4	NO	2.4			N
4B	TB4-11,12	I6L	45	14	4	NO	2.4			N
4C	TB6-1,2	I7U	65	34	4	YES				N
4D	TB6-3,4	I7L	78	44	4	YES				N
3B	TB6-9,10	I9U	60	11	3	YES				N
5A	TB3-1,2	J1U	55	5	5	YES				N
5B	TB3-5,6	J2U	40	6	5	YES				N
5C	TB3-7,8	J2L	44	16	5	YES		15		N
6A	TB3-9,10	J3U	64	36	6	YES			X	N
6B	TB3-11,12	J3L	77	46	6	YES			X	N
7A	TB5-5,6	J5U	57	7	7	YES				N
8A	TB5-9,10	J6U	42	8	8	NO	2.4			N
8B	TB5-11,12	J6L	46	18	8	NO	2.4			N
8C	TB7-1,2	J7U	66	38	8	YES				N
8D	TB7-3,4	J7L	79	48	8	YES				N
7B	TB7-9,10	J9U	59	15	7	YES				N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1996
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 70 (S. Church Street) at SR1226/SR1311 (University Dr.)

Division 7 | Alamance County | Burlington

PLAN DATE: February 2022	REVIEWED BY: J.T. Rowe, Jr.
PREPARED BY: M.B.Copple	REVIEWED BY:

REVISIONS	INIT.	DATE

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

DocuSigned by: John T. Rowe, Jr. D0847BA0ACA9400... 03/01/2022 DATE

SIG. INVENTORY NO. 07-1996

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 3.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]
3. Toggle until positioned on Overlap G.

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```
TMG VEH OVLP...[G] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . . . X . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP H

Select TMG VEH OVLP [H] and 'NORMAL'

```
TMG VEH OVLP...[H] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP I

Select TMG VEH OVLP [I] and 'NORMAL'

```
TMG VEH OVLP...[I] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X . . . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Once

OVERLAP J

Select TMG VEH OVLP [J] and 'NORMAL'

```
TMG VEH OVLP...[J] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

Toggle Until Positioned on Overlap A

OVERLAP A

Select TMG VEH OVLP [A] and 'PPLT FYA'

```
TMG VEH OVLP...[A] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    1
OPPOSING THROUGH....... OVERLAP    G

FLASHING ARROW OUTPUT.....CH9  ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP B

Select TMG VEH OVLP [B] and 'PPLT FYA'

```
TMG VEH OVLP...[B] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    3
OPPOSING THROUGH....... OVERLAP    H

FLASHING ARROW OUTPUT.....CH10 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    5
OPPOSING THROUGH....... OVERLAP    I

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

Toggle Once

OVERLAP D

Select TMG VEH OVLP [D] and 'PPLT FYA'

```
TMG VEH OVLP...[D] TYPE: .....PPLT FYA

PROTECTED LEFT TURN....   PHASE    7
OPPOSING THROUGH....... OVERLAP    J

FLASHING ARROW OUTPUT.....CH12 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE........... 0
```

END PROGRAMMING

FLASHER CIRCUIT MODIFICATION DETAIL

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

1. ON REAR OF PDA - REMOVE PREVIOUSLY TAPED WIRE ON TERM. T2-2 AND TERMINATE ON T2-3.
2. ON REAR OF PDA - REMOVE PREVIOUSLY TAPED WIRE ON TERM. T2-3 AND TERMINATE ON T2-2.
3. REMOVE FLASHER UNIT 2.
4. WIRE OVERLAPS A AND B TO FLASH ON FLASHER UNIT 1, CIRCUIT 2.
5. WIRE OVERLAPS C AND D TO FLASH ON FLASHER UNIT 1, CIRCUIT 1.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1. FLASHER UNIT 2'S NORMAL WIG AND WAG FLASHING WILL BE SWAPPED. OVERLAPS WILL ALSO HAVE NORMAL WIG AND WAG FLASHING SWAPPED.

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: 07-1996
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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

750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (S. Church Street)
at
SR1226/SR1311 (University Dr.)

Division 7 Alamance County Burlington

PLAN DATE: February 2022	REVIEWED BY: J.T. Rowe, Jr.
PREPARED BY: M.B.Copple	REVIEWED BY:

REVISIONS	INIT.	DATE

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

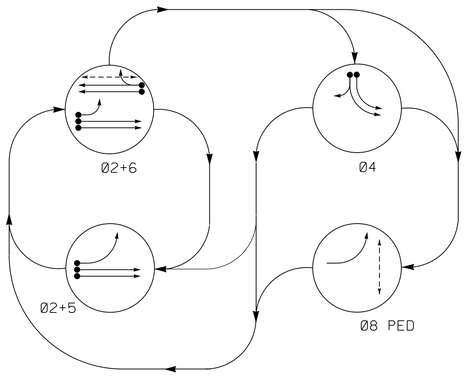
DocuSigned by: John T. Rowe, Jr.
D0847BA0ACA9400...
03/01/2022
DATE

SIG. INVENTORY NO. 07-1996

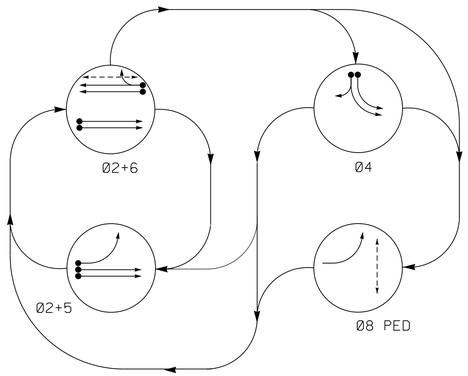
3/1/2022
...*07-1996e.dgn
USER:bwynn

PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 4.0

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	02+6	04	08 PED	FLASH
21,22	G	G	R	R	Y
41	R	R	←	R	R
42	R	R	↙	R	R
51	←	~~F Y~~	~~R~~	←	~~Y~~
61,62	R	G	R	R	Y
P61,P62	DW	W	DW	DW	DRK
P81,P82	DW	DW	DW	W	DRK

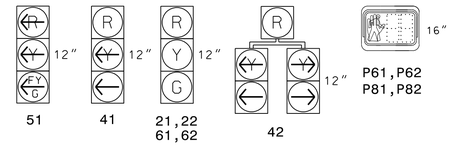
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 02+5	02+6	04	08 PED	FLASH
21,22	G	G	R	R	Y
41	R	R	←	R	R
42	R	R	↙	R	R
51	←	~~R~~	~~R~~	←	~~Y~~
61,62	R	G	R	R	Y
P61,P62	DW	W	DW	DW	DRK
P81,P82	DW	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

F Y G Bi-modal Section



3 Phase Fully Actuated (Burlington-Graham Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit Phase 5 during Phase 8 PED on.
4. Phase 5 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
10. The Division (or City) Traffic Engineer will determine the hours of use for each phasing plan.
11. If necessary, raise the span attachment at MP#1 to 1.3 foot below the top of the pole to achieve the required signal head clearance.

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	●↓
◎	Metal Strain Pole	◘
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊡
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	-----
→	Directional Arrow	→
	Curb Ramp	
⊛	Type I Pushbutton Post	⊛
⬡	Type II Signal Pedestal	⬢

ASC/3 TIMING CHART

FEATURE	PHASE 2	4	5	6	8
Min Green *	12	7	7	12	7
Walk *	-	-	-	7	7
Ped Clear	-	-	-	18	19
Veh. Extension *	6.0	2.0	2.0	6.0	-
Max 1 *	90	30	20	90	26
Yellow	4.6	3.0	3.0	4.6	3.0
Red Clear	1.8	3.1	3.1	1.8	3.1
Red Revert	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	1.5	-	-	1.5	-
Max Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	30	-	-	30	-
Minimum Gap	3.0	-	-	3.0	-
Locking Detector	X	-	-	X	-
Recall Position	VEH. RECALL	-	-	VEH. RECALL	-
Dual Entry	-	-	-	-	-
Simultaneous Gap	X	X	X	X	-

* 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.

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	300	4	X	2	Yes	-	-	X	N	-	X
2B	6X6	300	4	X	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	N	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	10	-	N	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15✳	-	N	-	X
					2#	Yes	-	3	-	G	-	X
6A	6X6	300	4	X	6	Yes	-	-	X	N	-	X
6B	6X6	300	4	X	6	Yes	-	-	X	N	-	X

✳ Disable delay during Alternate Phasing operation
\# Disable Phase call for Loop during Alternate Phasing Operation

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
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License: C-2197

Signal Upgrade-Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

US 70 (S. Church Street)
at
SR 1309 (Westbrook Avenue)
Division 7 Alamance County Burlington

PLAN DATE: January 2022 REVIEWED BY: G.G.Murr, Jr.
PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

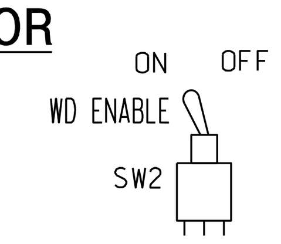
SEAL NORTH CAROLINA PROFESSIONAL SEAL 14543 ENGINEER GENE G. MURR, JR.
DocuSigned by: Gene G. Murr Jr. 03/01/2022
SIGNATURE DATE
SIG. INVENTORY NO. 07-1049

3/1/2022
...#07I049_sig_dsn_2022xxxx.dgn
USER:bwynn

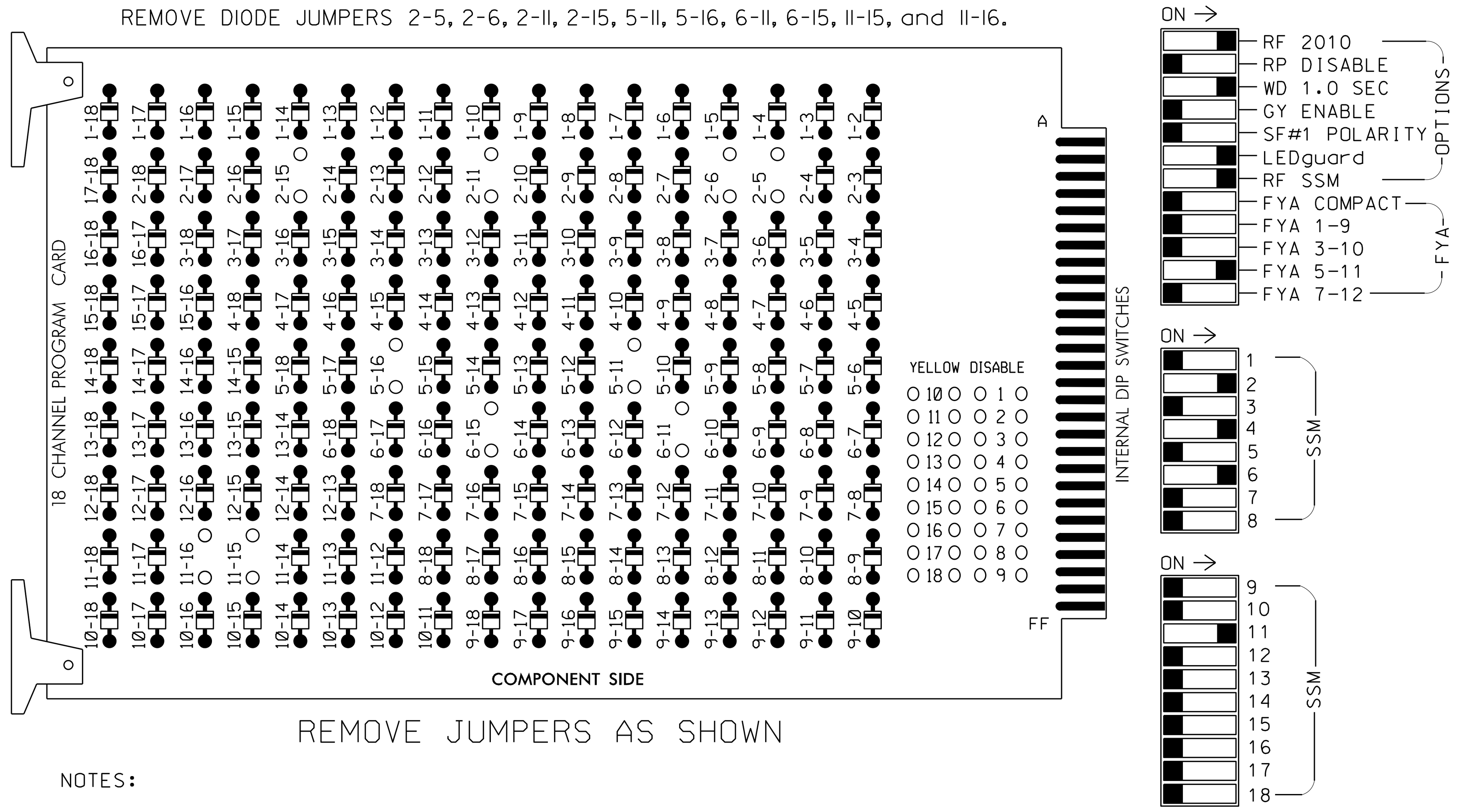
PROJECT REFERENCE NO.	SHEET NO.
U-6010	Sig. 4.1

EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 2-5, 2-6, 2-11, 2-15, 5-11, 5-16, 6-11, 6-15, 11-15, and 11-16.



REMOVE JUMPERS AS SHOWN

NOTES:

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2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Walk.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
4. The cabinet and controller are part of the Burlington-Graham Signal System.

EQUIPMENT INFORMATION

CONTROLLER..............2070LX
CABINET.................332 W/AUX
SOFTWARE................ECONOLITE ASC/3-2070
CABINET MOUNT...........BASE
OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
LOAD SWITCHES USED......S2,S5,S7,S8,S9,S12,AUX S4
PHASES USED.............2,4,5,6,8**,6PED,8PED
OVERLAP "A".............NOT USED
OVERLAP "B".............NOT USED
OVERLAP "C".............*
OVERLAP "D".............NOT USED
OVERLAP "E".............NOT USED
OVERLAP "G".............*

* See overlap programming detail on Sheet 2.
** Dummy Phase for timing only.

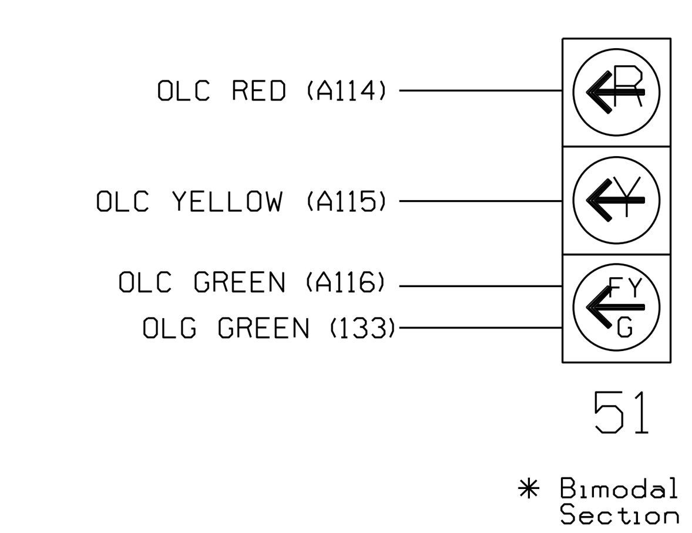
SIGNAL HEAD HOOK-UP CHART

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	OLG	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41	42	NU	51★	61,62	P61, P62	NU	NC	P81, P82	NU	NU	NU	51★	NU	NU
RED		128			101	101			134										
YELLOW		129						*	135										
GREEN		130							136										
RED ARROW																	A114		
YELLOW ARROW					102	102											A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW					103	103		133											
(Don't Walk hand symbol)										119			110						
(Walk pedestrian symbol)										121			112						

NU = Not Used NC = Not Connected
* Denotes install load resistor. See load resistor installation detail this sheet.
★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

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

EX.: 1A, 2A, ETC. = LOOP NO.'S
⊗ Wired Input - Do not populate slot with detector card.
FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES			X	N
2B	TB2-7,8	I2L	43	12	2	YES			X	N
4A	TB4-9,10	I6U	41	4	4	YES		3		N
4B	TB4-11,12	I6L	45	14	4	YES		10		N
5A [1]	TB3-1,2	J1U	55	5 ★	5	YES		15		N
	-	I4U	47	22 ★	2	YES		3		G
6A	TB3-5,6	J2U	40	6	6	YES			X	N
6B	TB3-7,8	J2L	44	16	6	YES			X	N
PED PUSH BUTTONS										
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on Sheet 4.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

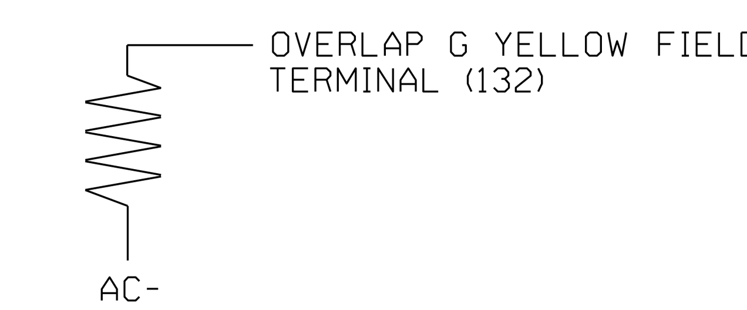
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1049
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

Electrical Detail - Sheet 1 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Transportation Mobility and Safety Division – ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (S. Church Street)
at
SR 1309 (Westbrook Avenue)

Division 7 Alamance County Burlington
PLAN DATE: February 2022 REVIEWED BY: J.T. Rowe, Jr.
PREPARED BY: M.B.Copple REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE JR.
DocuSigned by: John T. Rowe Jr. 750A017BDBE141C... 03/01/2022 DATE
SIG. INVENTORY NO. 07-1049

3/1/2022
...*07-1049e.dgn
USER:bwynn

ECONOLITE ASC/3-2070
LOAD SWITCH ASSIGNMENT DETAIL

(program controller as shown)

To assign load switch S5 AS OLG,
program LD SWITCH 5 as OVLP '7' TYPE 'O' as shown below.

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [3. LOAD SW ASSIGN]

LD SWITCH ASSIGN

	PHASE /OVLP	TYPE	DIMMING R	Y	G	D	---FLASH--- PWR	AUT	TGR
1	1	V	.	.	.	+	A	R	X
2	2	V	.	.	.	+	A	Y	.
3	3	V	.	.	.	+	A	R	X
4	4	V	.	.	.	+	A	R	.
→ 5	7	O	.	.	.	−	A	R	.
6	6	V	.	.	.	−	A	Y	X
7	7	V	.	.	.	−	A	R	.
8	8	V	.	.	.	−	A	R	X
9	1	O	.	.	.	+	A	R	X
10	2	O	.	.	.	+	A	R	X
11	3	O	.	.	.	−	A	Y	.
12	4	O	.	.	.	−	A	R	.
13	2	P	.	.	.	+	A	.	.
14	4	P	.	.	.	−	A	.	.
15	6	P	.	.	.	+	A	.	.
16	8	P	.	.	.	−	A	.	.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1049
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

ECONOLITE ASC/3-2070 OVERLAP
PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [2. CONTROLLER]
2. From CONTROLLER Submenu select [2. VEHICLE OVERLAPS]
3. Toggle until positioned on Overlap G.

OVERLAP G

Select TMG VEH OVLP [G] and 'NORMAL'

```
TMG VEH OVLP...[G] TYPE: .......NORMAL
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . X . . X . . . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0
```

↓ Toggle Until Positioned on Overlap C

OVERLAP C

Select TMG VEH OVLP [C] and 'PPLT FYA'

```
TMG VEH OVLP...[C] TYPE: .....PPLT FYA

PROTECTED LEFT TURN.... OVERLAP    G
OPPOSING THROUGH.......   PHASE    6

FLASHING ARROW OUTPUT.....CH11 ISOLATE

DELAY START OF: FYA..0.0 CLEARANCE..0.0
ACTION PLAN SF BIT DISABLE.......... 5
```

END PROGRAMMING

SEPI Engineering & Construction, Inc.
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License: C-2197

Electrical Detail - Sheet 2 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

US 70 (S. Church Street)
at
SR 1309 (Westbrook Avenue)

Division 7 | Alamance County | Burlington

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PREPARED BY: M.B.Copple | REVIEWED BY:

REVISIONS	INIT.	DATE

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 008453 JOHN T. ROWE JR.
DocuSigned by: John T. Rowe Jr. 750A017BDBE141C... 03/01/2022 DATE

SIG. INVENTORY NO. 07-1049

3/1/2022
...*07-1049e.dgn
USER:bwynn

ECONOLITE ASC/3-2070 CONTROLLER SEQUENCE PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [1. CONTROLLER SEQ]
3. From CONTROLLER SEQUENCE Submenu select [1. PHASE RING SEQUENCE AND ASSIGNMENT]

```
CONTROLLER SEQUENCE [ 1]
SEQUENCE COMMANDS  . HW ALT SEQ ENA.          NO.
   01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
BC-B  -  B  -  B  -  -  -  -  -  -  -  -  -  -  -
R1-¦.  02¦04 08¦.  .  .  .  .  .  .  .  .  .  .  .
R2-¦05 06¦.  . ¦.  .  .  .  .  .  .  .  .  .  .  .
R3-¦.  . ¦.  . ¦.  .  .  .  .  .  .  .  .  .  .  .
R4-¦.  . ¦.  . ¦.  .  .  .  .  .  .  .  .  .  .  .

R1-R4=RING 1-4, DATA ENTRY, PHASES 1-16
BC=BARRIER CONTROL, VALUES: B,C
B=BARRIER MODE
C=COMPATIBILITY MODE
```

END PROGRAMMING

ECONOLITE ASC/3-2070 BACKUP PROTECTION ENABLE PROGRAMMING

(program controller as shown)

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [1. CONTROLLER SEQ]
3. From CONTROLLER SEQUENCE Submenu select [3. BACKUP PREVENT PHASES]

Follow programming as shown below. On the 'ENABLE BACKUP PREVENT' screen move cursor to the appropriate field and press 'YES/NO' on the controller keypad to toggle field value between 'X' ,'B', 'C' and 'OFF'.

```
ENABLE BACKUP PREVENT
TMG/BKUP 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
       1   . . . . . . . . . . . . . . .
       2 .   . . . . . . . . . . . . . .
       3 . .   . . . . . . . . . . . . .
       4 . . .   . . . . . . . . . . . .
       5 . . . .   . . . . . . . . . . .
       6 . . . . .   . . . . . . . . . .
       7 . . . . . .   . . . . . . . . .
       8 . . . . X . .   . . . . . . . .
       9 . . . . . . . .   . . . . . . .
      10 . . . . . . . . .   . . . . . .
      11 . . . . . . . . . .   . . . . .
      12 . . . . . . . . . . .   . . . .
      13 . . . . . . . . . . . .   . . .
      14 . . . . . . . . . . . . .   . .
      15 . . . . . . . . . . . . . .   .
      16 . . . . . . . . . . . . . . .
```

END PROGRAMMING

NOTES

1. 'X' inhibits the controller from servicing the 'BACKUP' (column) phase when the 'TIMING' (row) phase is active or next.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1049
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

SEPI Engineering & Construction, Inc.
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License: C-2197

Electrical Detail - Sheet 3 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:
Transportation Mobility and Safety Division — ITS & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (S. Church Street) at SR 1309 (Westbrook Avenue)

Division 7 | Alamance County | Burlington

PLAN DATE: February 2022 | REVIEWED BY: J.T. Rowe, Jr.
PREPARED BY: M.B.Copple | REVIEWED BY:

REVISIONS	INIT.	DATE

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

DocuSigned by: John T. Rowe Jr.
750A017BDBE141C...
03/01/2022
DATE

SIG. INVENTORY NO. 07-1049

3/1/2022
...\07-1049e.dgn
USER:bwynn

ECONOLITE ASC/3-2070 VEHICLE DETECTOR SETUP PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 5A

(program controller as shown)

IMPORTANT!

Program detectors per the input file connection and programming chart shown on sheet 1 before proceeding.

1. From Main Menu select **8. UTILITIES**
2. From UTILITIES Submenu select **1. COPY/CLEAR**
3. Copy from DETECTOR PLAN "1" to DETECTOR PLAN "2".

```
COPY / CLEAR UTILITY
      FROM               TO
PHASE TIMING.... . > PHASE TIMING.... .
TIMING PLAN..... . > TIMING PLAN..... .
PH DET OPT PLAN. . > PH DET OPT PLAN. .
DETECTOR PLAN... 1 > DETECTOR PLAN... 2
  TOGGLE TO SELECT A "FROM" AND A "TO"
           THEN PRESS ENTER
```

4. From Main Menu select **6. DETECTORS**
5. From DETECTOR Submenu select **2. VEHICLE DETECTOR SETUP**
6. Place cursor in VEH DET PLAN [ ] position and enter "2".

- Place cursor in VEH DETECTOR [ ] position and enter "5".
- Set delay time to "0".

```
VEH DETECTOR [ 5]   VEH DET PLAN [ 2]        <- NOTICE VEH DET PLAN 2
TYPE: N-NTCIP
TS2 DETECTOR..... X ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 5  5    . . . . . . . . . . . . . . . .
CALL OPTION.... YES DELAY TIME...    0.0  <- ENSURE DELAY IS SET TO '0'
EXT OPTION. PASSAGE EXTENSION TIME.  0.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

- Place cursor in VEH DETECTOR [ ] position and enter "22".
- Set assigned phase to "0".

```
VEH DETECTOR [22]   VEH DET PLAN [ 2]        <- NOTICE VEH DET PLAN 2
TYPE: G-GREEN EXTENSION/DELAY
TS2 DETECTOR..... . ECPI LOG.......   NO
DET PH - 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
 22 0    . . . . . . . . . . . . . . . .   <- ENSURE PHASE IS SET TO "0"
EXTEND TIME...  0.0 DELAY TIME...    3.0
USE ADDED INITIAL . CROSS SWITCH PH..  0
LOCK IN....... NONE NTCIP VOL . OR OCC .
PMT QUEUE DELAY. NO
```

END PROGRAMMING

ECONOLITE ASC/3-2070 ACTION PLAN PROGRAMMING DETAIL

1. From Main Menu select **5. TIME BASE**
2. From TIME BASE Submenu select **2. ACTION PLAN**

```
ACTION PLAN...[  1]
PATTERN..........AUTO   SYS OVERRIDE.... NO
TIMING PLAN........ 0   SEQUENCE........  0
VEH DETECTOR PLAN.. 2   DET LOG........NONE
FLASH...........   --   RED REST........ NO
VEH DET DIAG PLN... 0   PED DET DIAG PLN..0
DIMMING ENABLE..   NO   PRIORITY RETURN. NO
PED PR RETURN..    NO   QUEUE DELAY..... NO
PMT COND DELAY     NO
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
PED RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
WALK 2    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
VEH RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX RCL   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
MAX 2     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
  PHASE   1  2  3  4  5  6  7  8  9  0  1  2  3  4  5  6
MAX 3     .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
CS INH    .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
OMIT      .  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
SPC FCT   .  .  .  .  X  .  .  .  (1-8)
AUX FCT   .  .  .  (1-3)
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 91-100 .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

ALTERNATE PHASING ACTIVATION DETAIL

TO RUN ALT. PHASING DURING FREE RUN - PROGRAM CHANGES (SHOWN BELOW) IN A TIME BASED ACTION PLAN. SCHEDULE A DAY PLAN THAT INCLUDES THE ACTION PLAN PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF BIT 5.

TO RUN ALT. PHASING DURING COORDINATION - SELECT THE TIME BASED ACTION PLAN THAT IS PROGRAMMED TO SELECT VEH DET PLAN 2 AND ENABLE SF 5.

PHASING	VEH DET PLAN	SF BITS ENABLED
ACTIONS REQUIRED TO RUN DEFAULT PHASING	1	NONE
ACTIONS REQUIRED TO RUN ALTERNATE PHASING	2	5

IMPORTANT: IF ALT. PHASING IS USED DURING FREE RUN AND COORDINATION, DO NOT OPERATE TIME OF DAY EVENTS CONCURRENTLY WITH COORDINATION PLAN EVENTS IN THE EVENT SCHEDULER. (EX. FREE RUN EVENT SHOULD END BEFORE COORDINATION PLAN EVENT STARTS AND VICE-VERSA).

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN SF BIT 5 AND VEH DET PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

SF BITS 5: Modifies overlap parent phases for head 51 to run protected turns only.

VEH DET PLAN 2: Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 0 seconds.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1049
DESIGNED: January 2022
SEALED: 03-01-2022
REVISED: N/A

SEPI Engineering & Construction, Inc.
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Raleigh, NC 27603
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License: C-2197

Electrical Detail - Sheet 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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750 N.Greenfield Pkwy,Garner,NC 27529

US 70 (S. Church Street) at SR 1309 (Westbrook Avenue)

Division 7 | Alamance County | Burlington

PLAN DATE: February 2022 | REVIEWED BY: J.T. Rowe, Jr.
PREPARED BY: M.B.Copple | REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

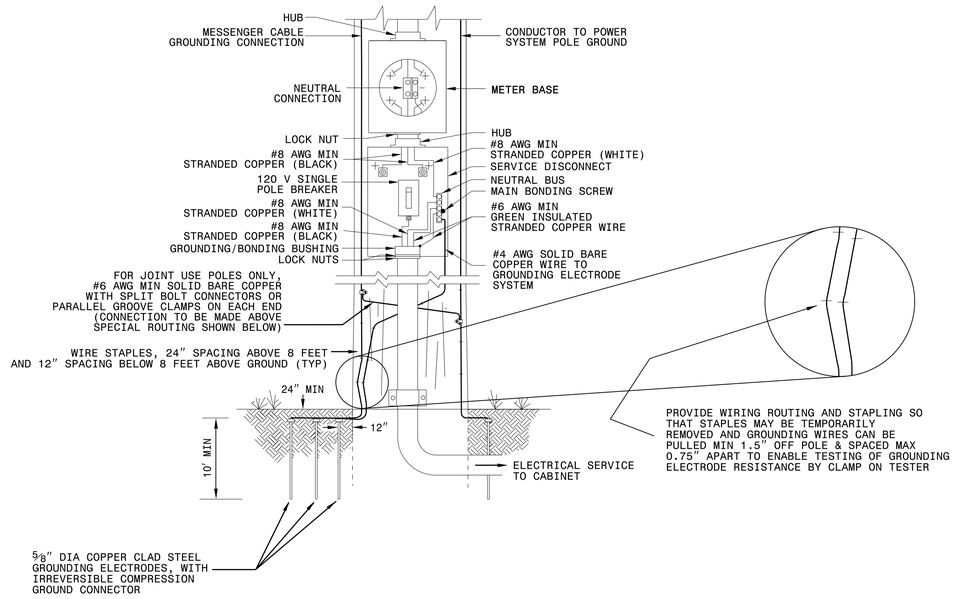
SEAL: North Carolina Professional Engineer, SEAL 008453, John T. Rowe Jr.

DocuSigned by: John T. Rowe Jr. 750A017BDBE141C... DATE 03/01/2022

SIG. INVENTORY NO. 07-1049

3/1/2022 ...*07-1049e.dgn USER:bwynn

PROJECT NO.	SHEET NO.
U-6010	Sig. 5.0



1-18

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

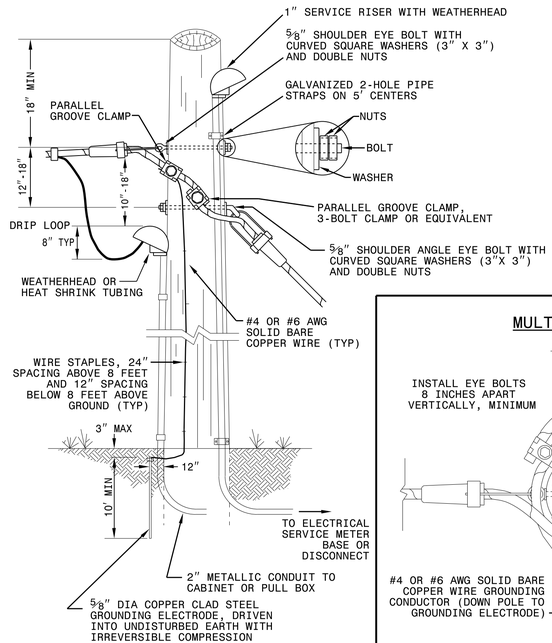
ENGLISH STANDARD DRAWING FOR

ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

SHEET 1 OF 1

1700D01



1-18

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

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ITS & Signals Unit

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

DocuSigned by: Mohd Aslami
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10/11/2017
DATE

11-OCT-2017 08:56
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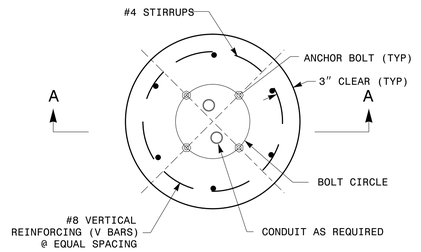
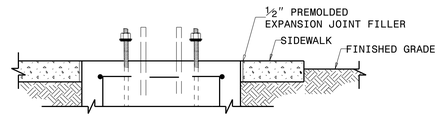
PROJECT NO.	SHEET NO.
U-6010	Sig. 5.1



PEDESTAL FOUNDATION - PLAN VIEW

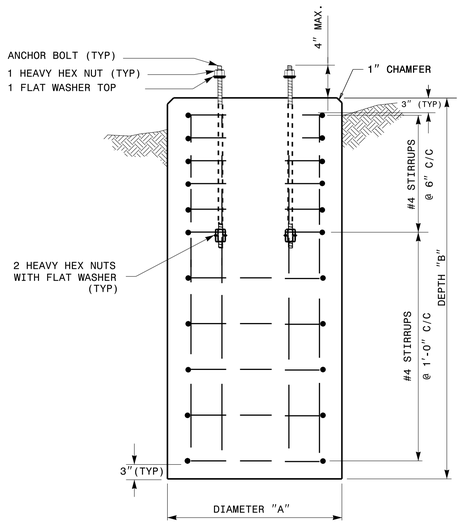


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

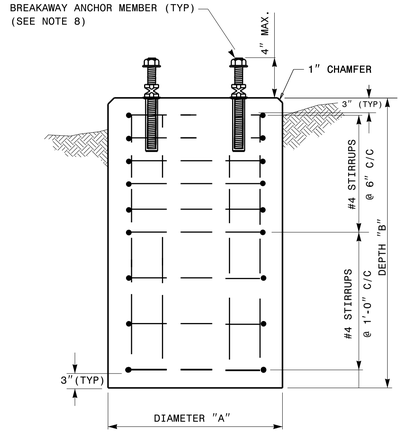
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF F'c= 3000 PSI (MIN.).
4. USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
5. GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
   A. SANDY TYPE SOIL
   B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
   C. WIND SPEED NOT TO EXCEED 140 MPH

   IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
6. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
7. ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
8. USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4½" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6⅝". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



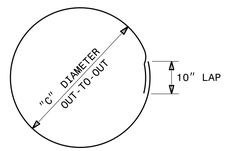
TYPES I, II & III

SECTION A-A

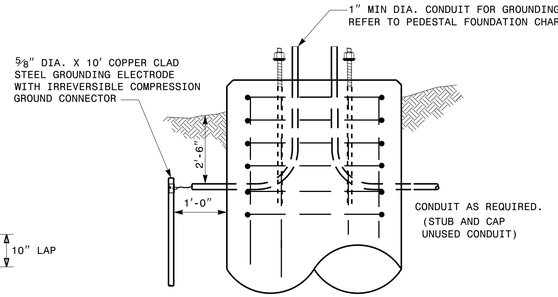


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	½	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	¾	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

REINFORCING STEEL SCHEDULE

TYPE	V-BAR				STIRRUP								TOTAL STEEL WEIGHT LBS
	SIZE #	QTY	LENGTH	WEIGHT LBS	SIZE #	QUANTITY VERTICAL SPACING ON 6" CENTERS	QUANTITY VERTICAL SPACING ON 12" CENTERS	QUANTITY TOTAL	LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

1-18

ENGLISH STANDARD DRAWING FOR

PEDESTALS

FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

Prepared in the Offices of:

Transportation Mobility and Safety Division
ITS & Signals Unit
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

DocuSigned by:
Debesh C. Sarkar
44E8E32E147E4C4...
10/11/2017
DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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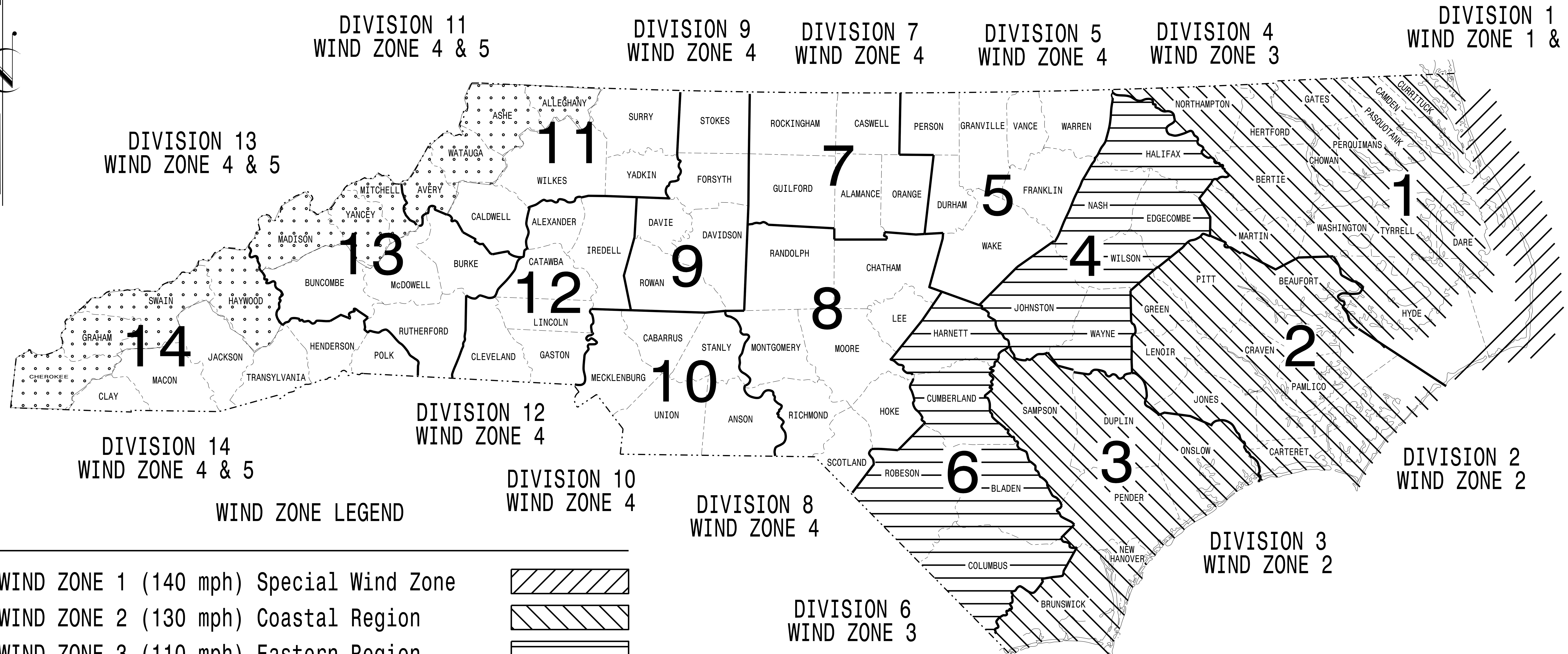
NCDOT METAL POLE STANDARDS

PROJECT I.D. NO.	SHEET NO.
U-6010	Sig.M1

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES



WIND ZONE LEGEND

Wind Zone	Pattern
WIND ZONE 1 (140 mph) Special Wind Zone	diagonal hatch (/)
WIND ZONE 2 (130 mph) Coastal Region	diagonal hatch (\)
WIND ZONE 3 (110 mph) Eastern Region	horizontal hatch
WIND ZONE 4 (90 mph) Central & Mtn. Region	blank
WIND ZONE 5 (120 mph) Special Wind Zone	dotted

https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

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

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013
AASHTO
Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

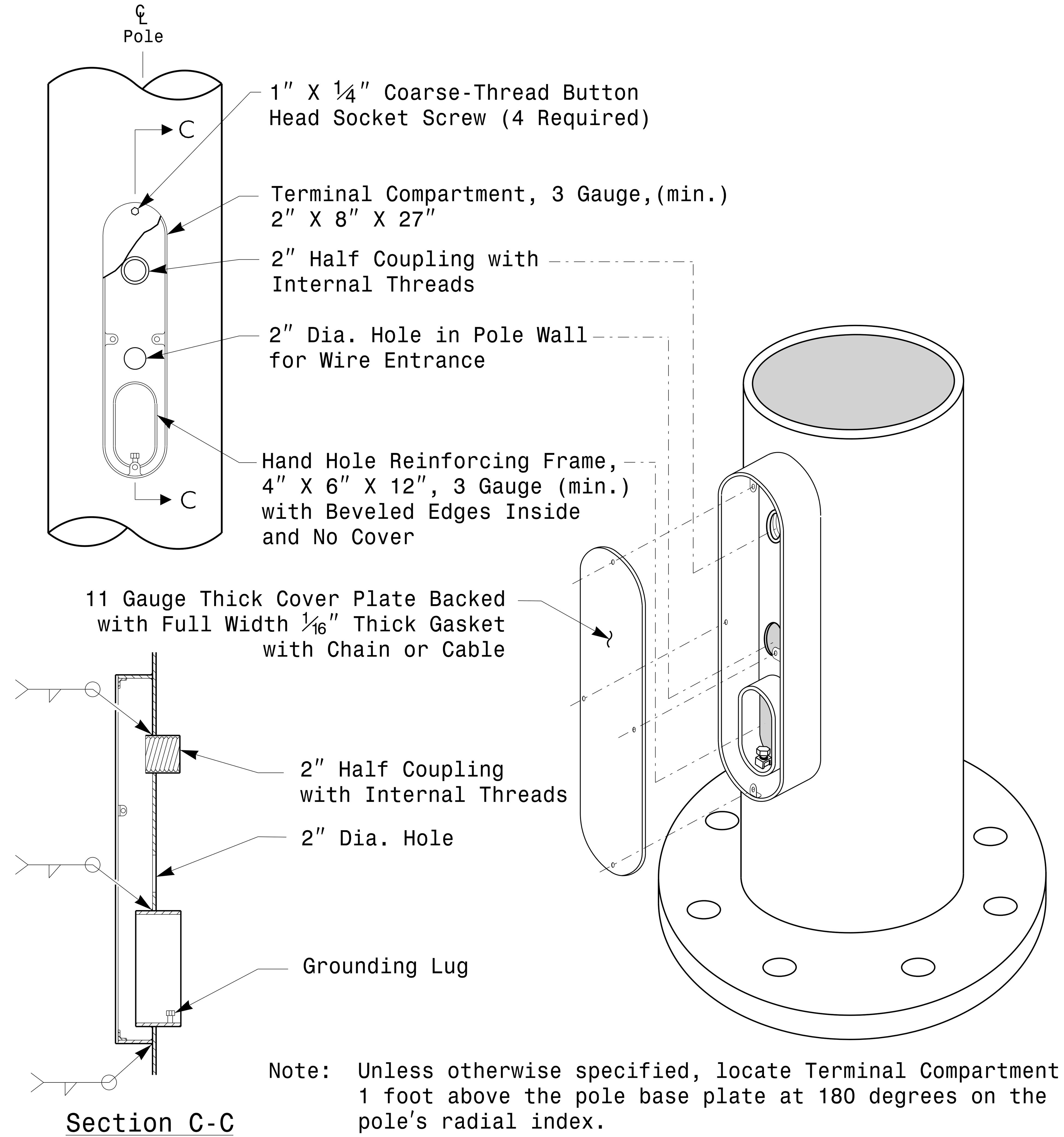
M.M. MCDIARMID, P.E. – STATE ITS AND SIGNALS ENGINEER
J. P. GALLOWAY, P.E. – STATE SIGNALS ENGINEER
D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

Debesh C. Sarkar 10/11/2017
SIGNATURE DATE

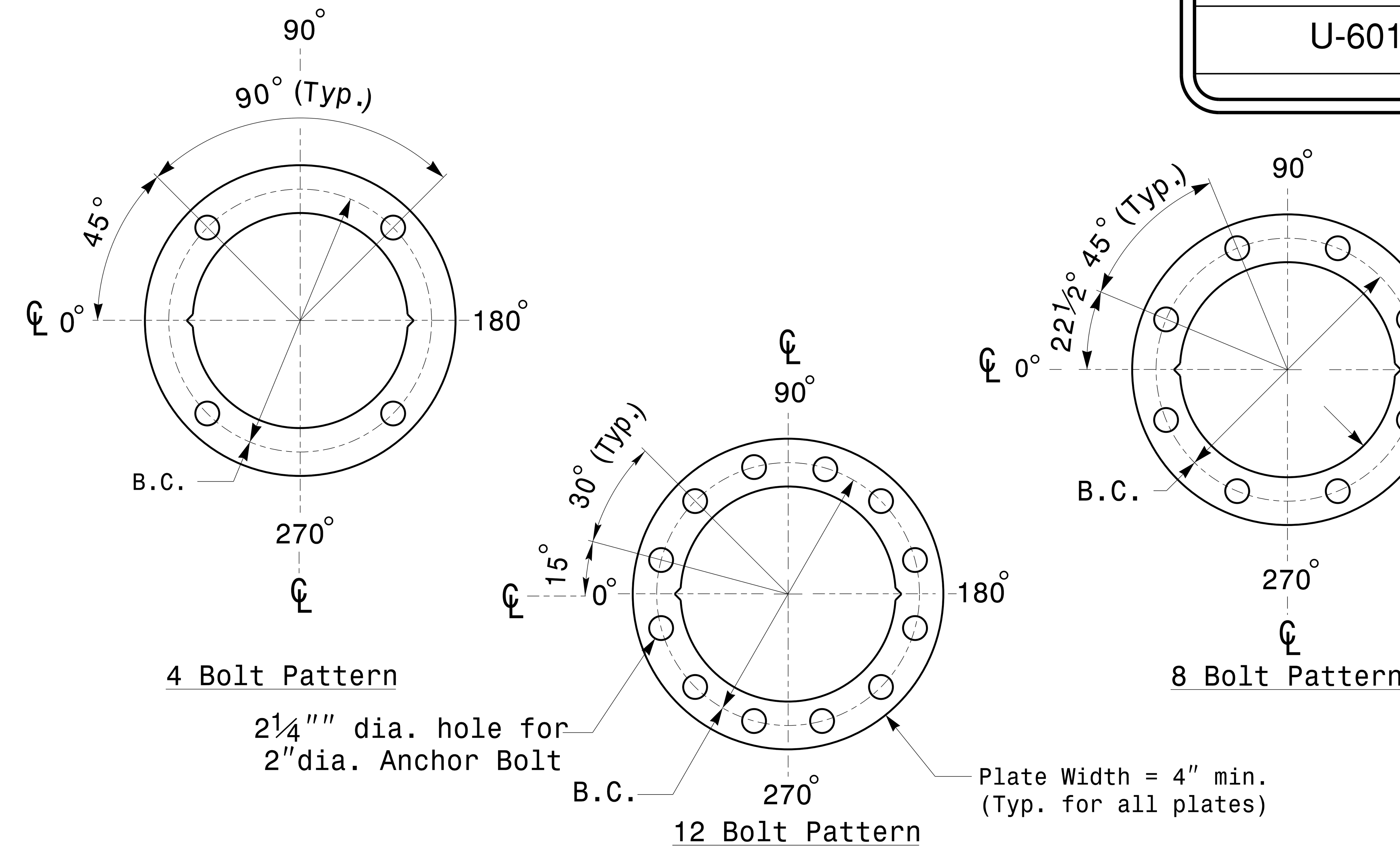
PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M2

Fabrication Details – All Metal Poles



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

Terminal Compartment Detail



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

Base Plate Template and Anchor Bolt Lock Plate Details

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 SIG. INV. NO.	_ _ _ _ _ _ _ _
NCDOT POLE NO.	_ _ _ _ _ _ _ _

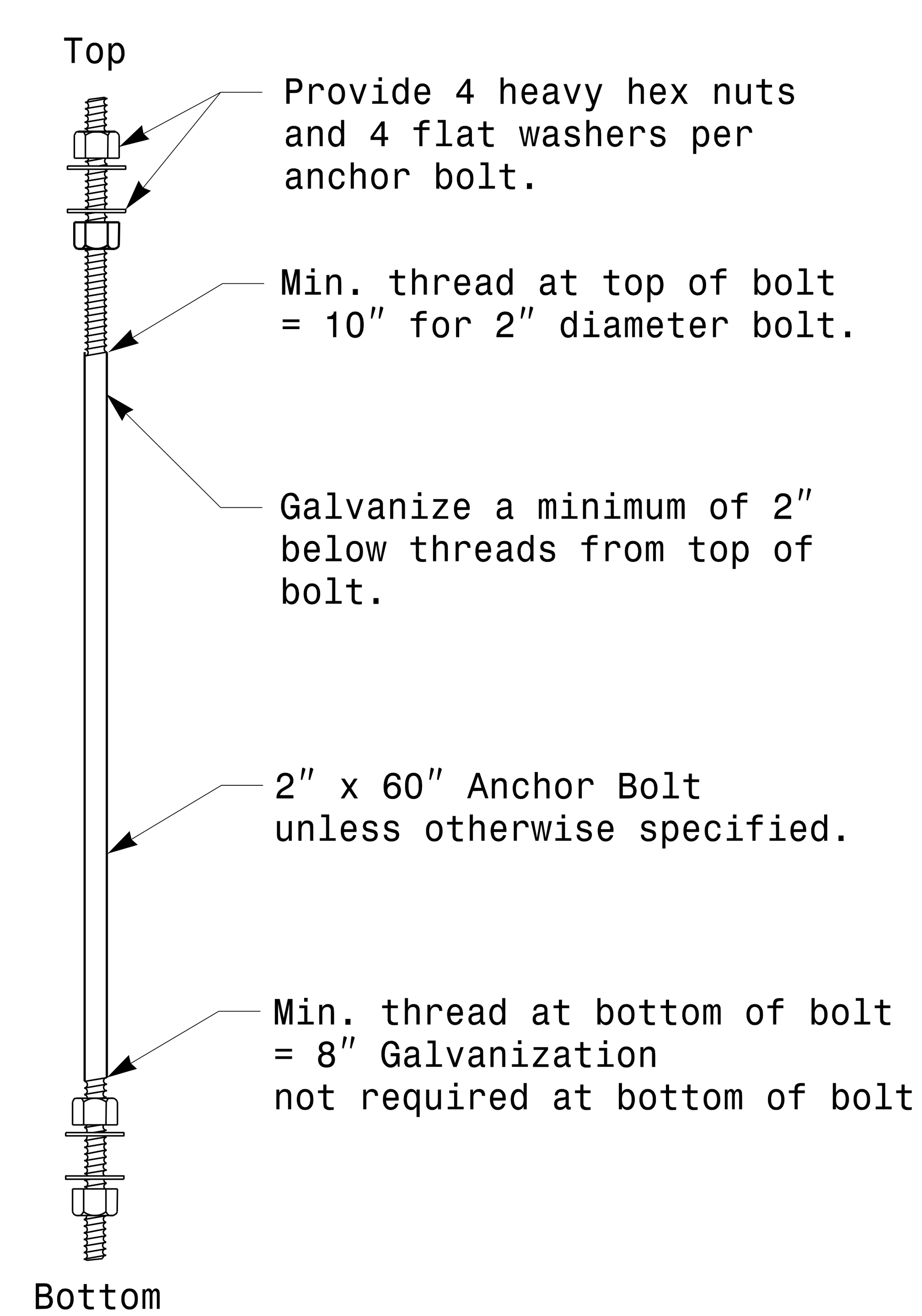
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

MFG ________ MFG. DATE:MM/YY	
SECTION D/T/L/Y	____/____/____/____
NCDOT SIG. INV. NO.	_ _ _ _ _ _ _ _
NCDOT POLE NO.	_ _ _ _ _ _ _ _

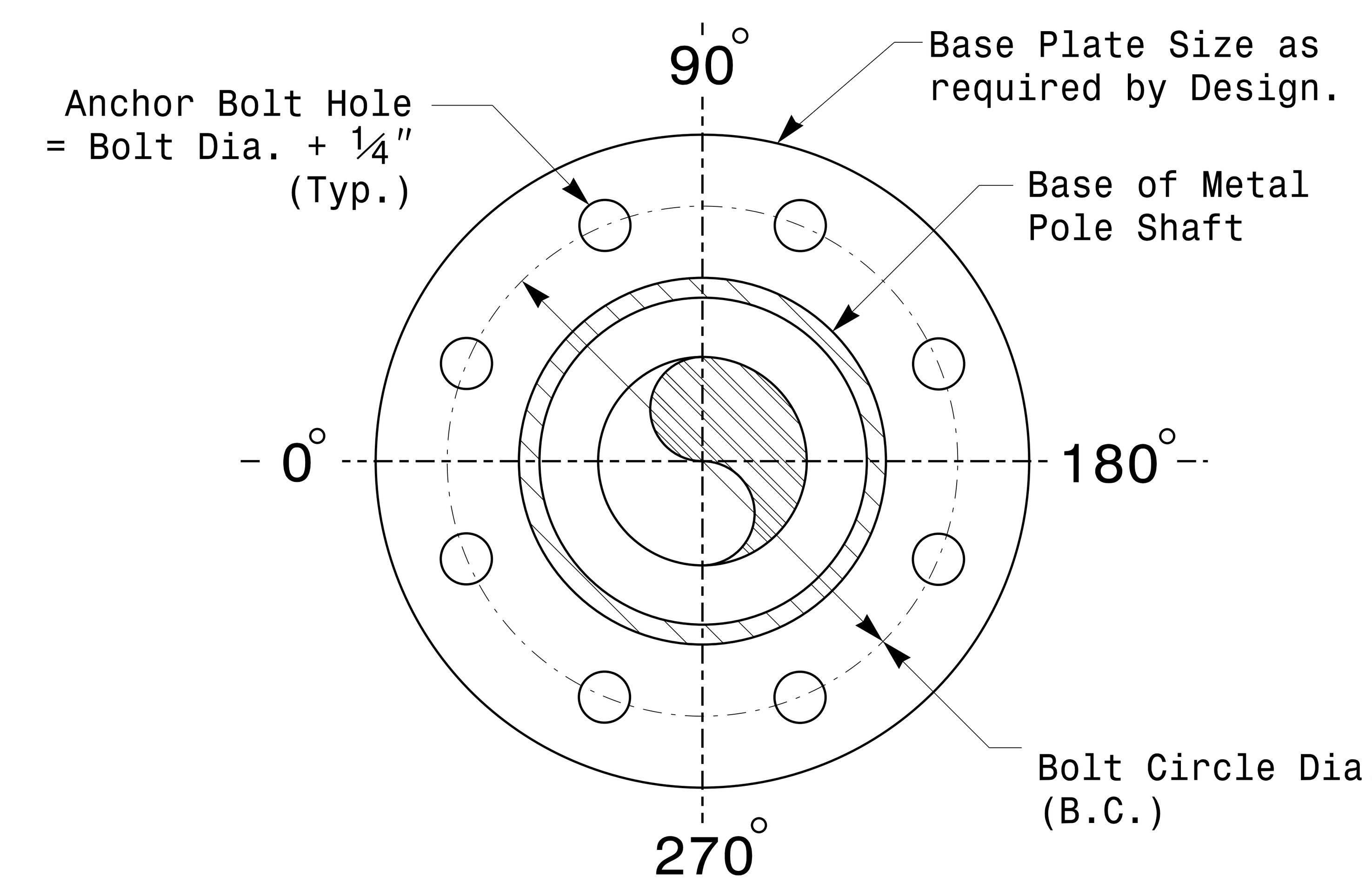
Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)

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 Signal Inv. Number and pole I.D. number
5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details



Anchor Bolt Detail



Note: Base plate may be circular,octagonal,square or rectangular in shape.

Typical Base Plate Detail

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

Typical Fabrication Details For All Metal Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA — NONE

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

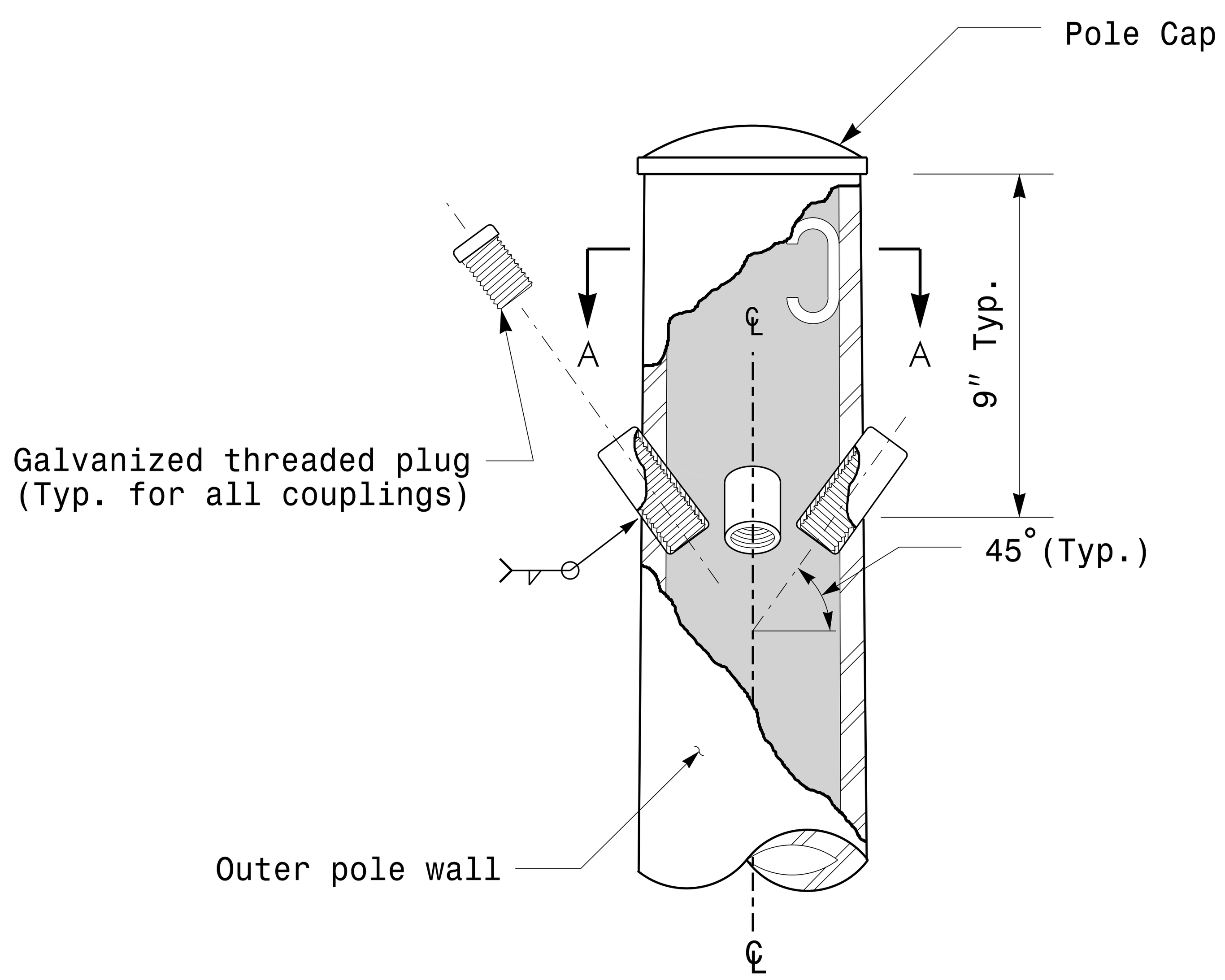
DocuSigned by: Debesh C. Sarkar
SIGNATURE 10/11/2017 DATE

11-OCT-2017 08:30
S:*ITS&SU*ITS Signals*Signal Design Section*Eastern Region*M Sheets*2016*2014 Sig.M2 Std. Fabrication Details-All Poles..dgn
r*zinser

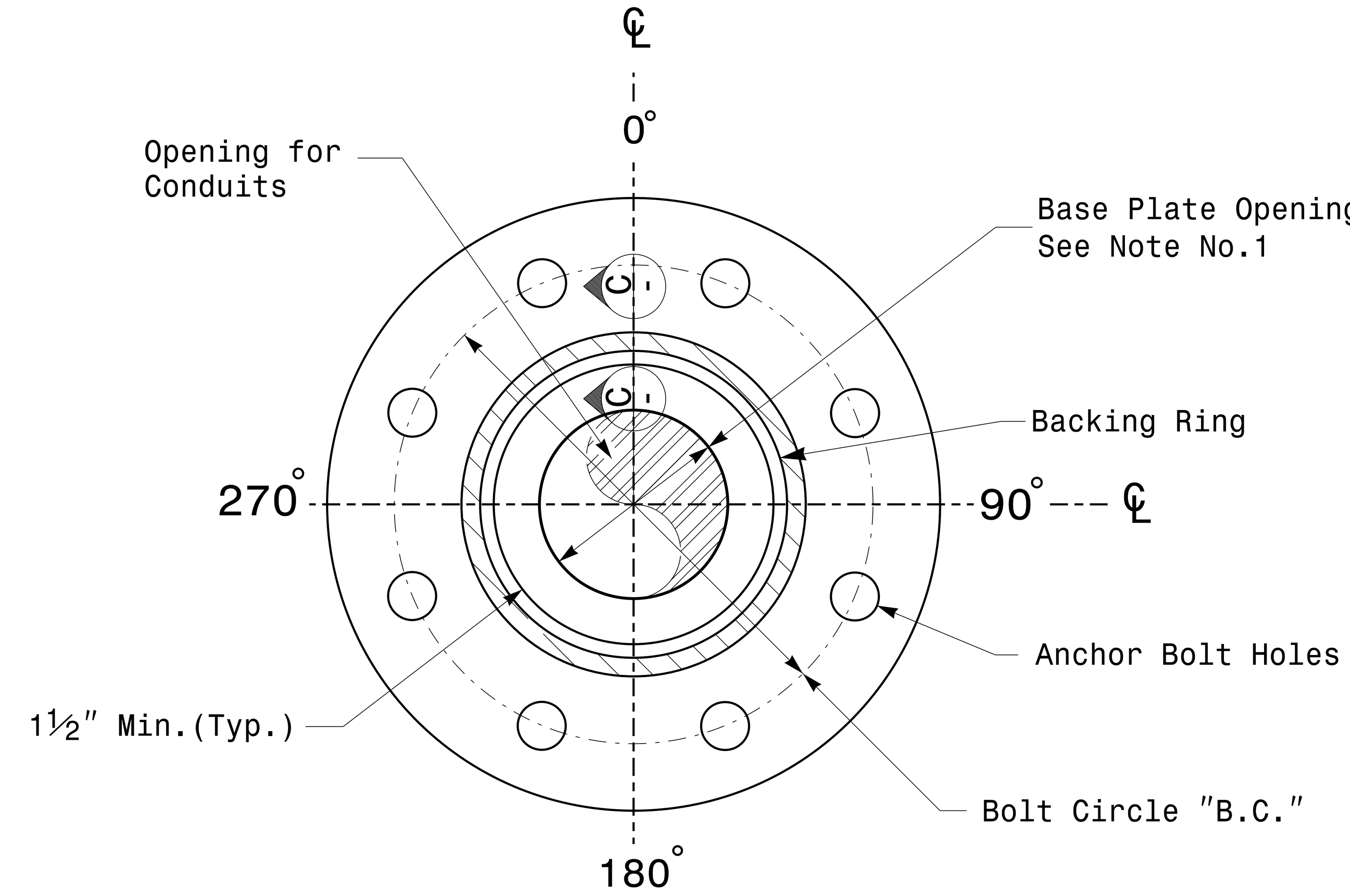
PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M3

Fabrication Details – Strain Poles

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½″ but shall not be less than 8½″.

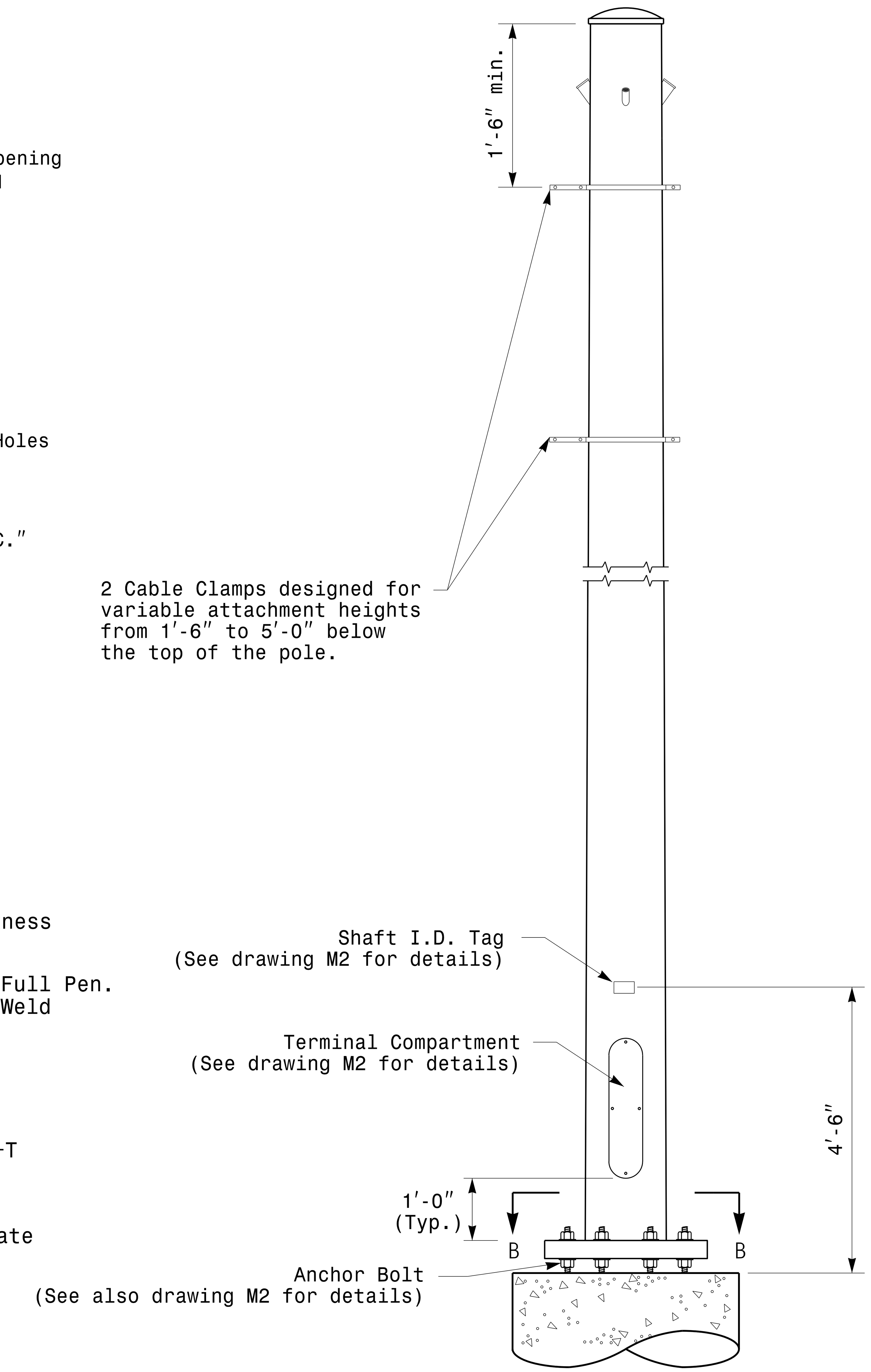


Cable Entrances at Top of Pole

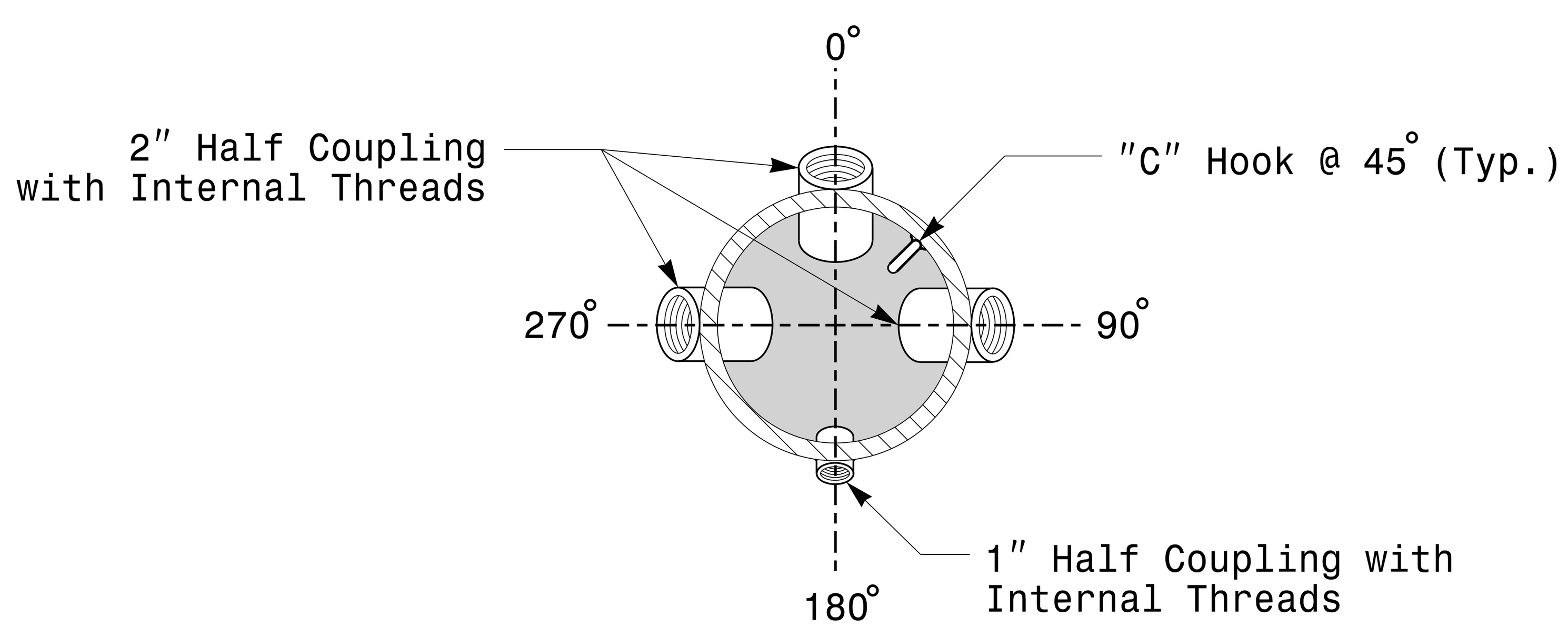


Section B-B

Pole Base Plate Details (8 and 12 Bolt Pattern)

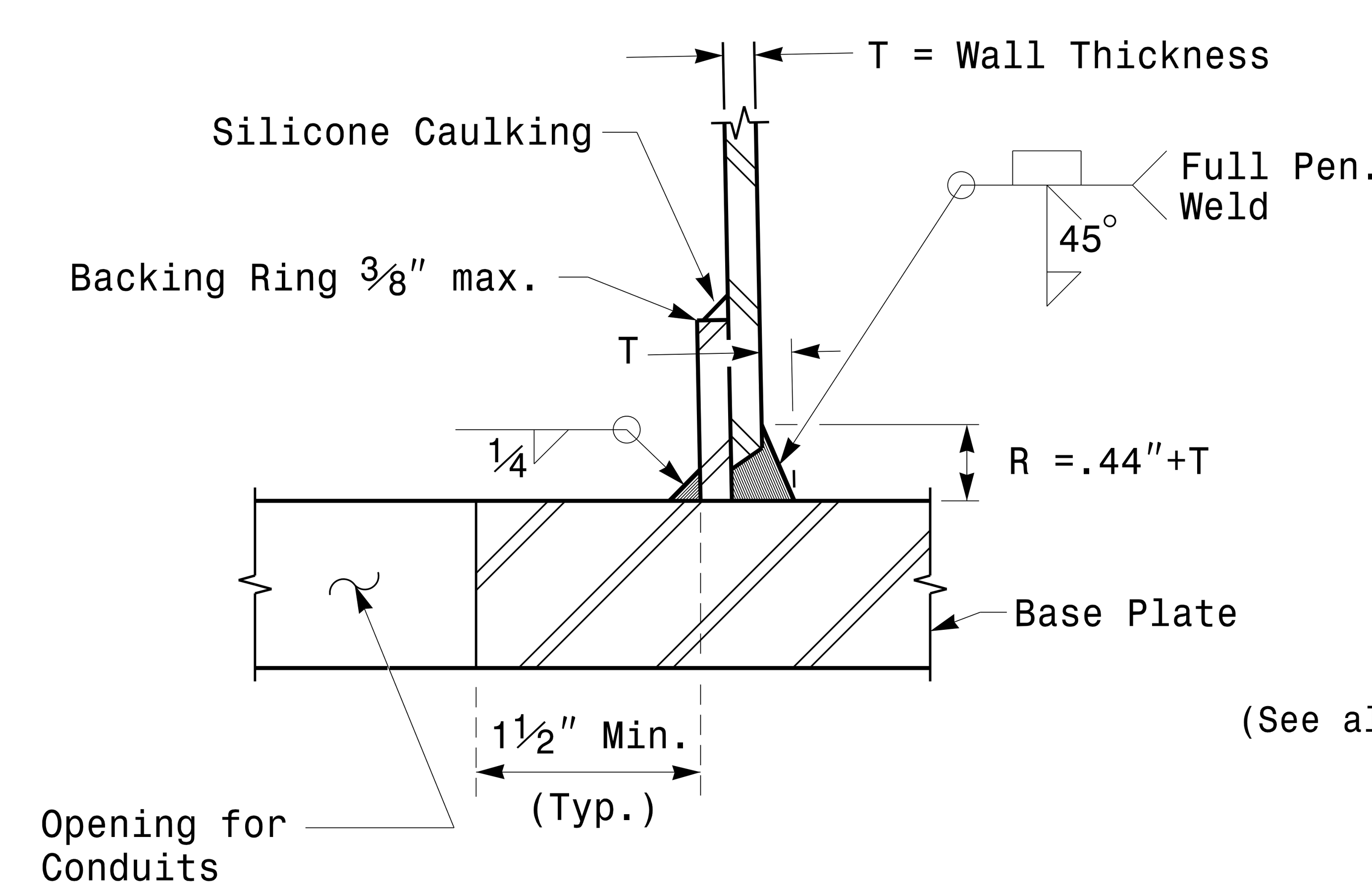


Monotube Strain Pole



Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail

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

Typical Fabrication Details For Strain Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA — NONE

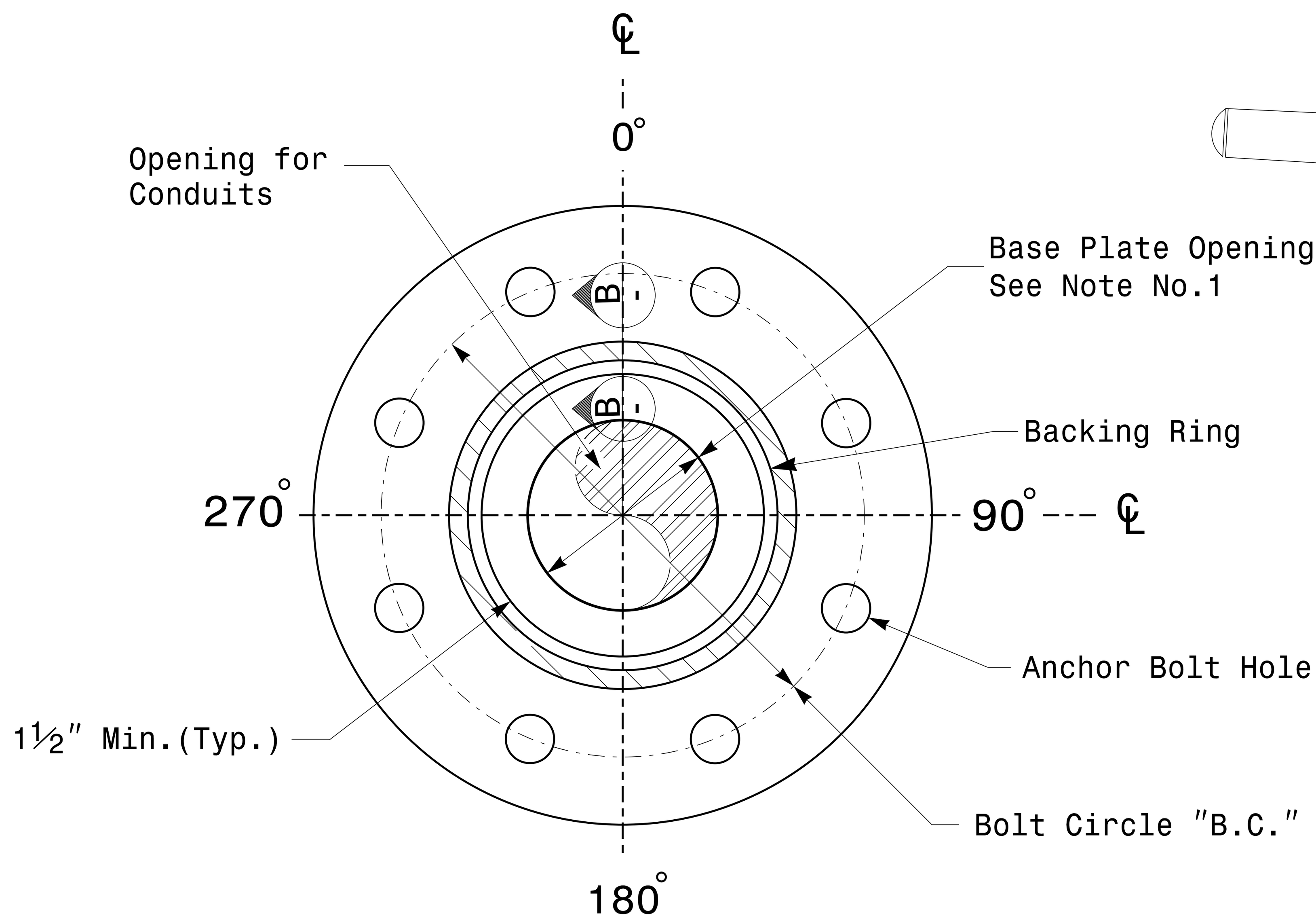
REVISIONS | INIT. | DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR
DocuSigned by: Debesh C. Sarkar
SIGNATURE 10/11/2017 DATE

PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M4

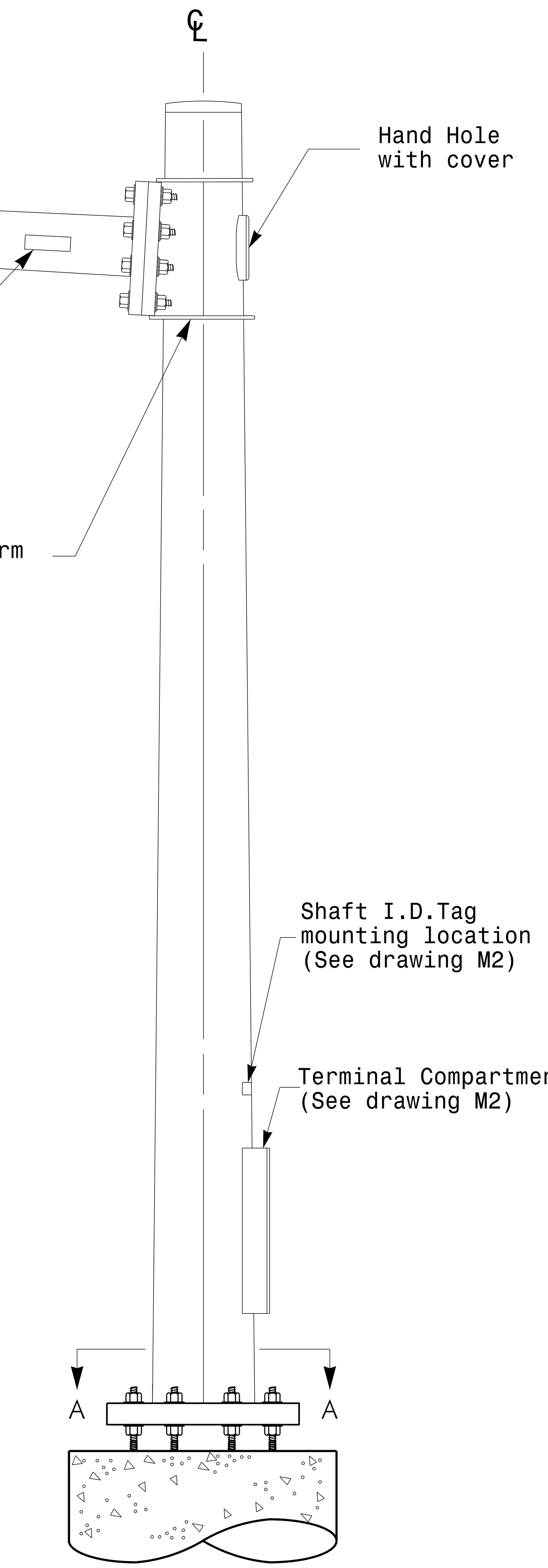
Fabrication Details – Mast Arm Poles

Note:
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3½″ but shall not be less than 8½″.

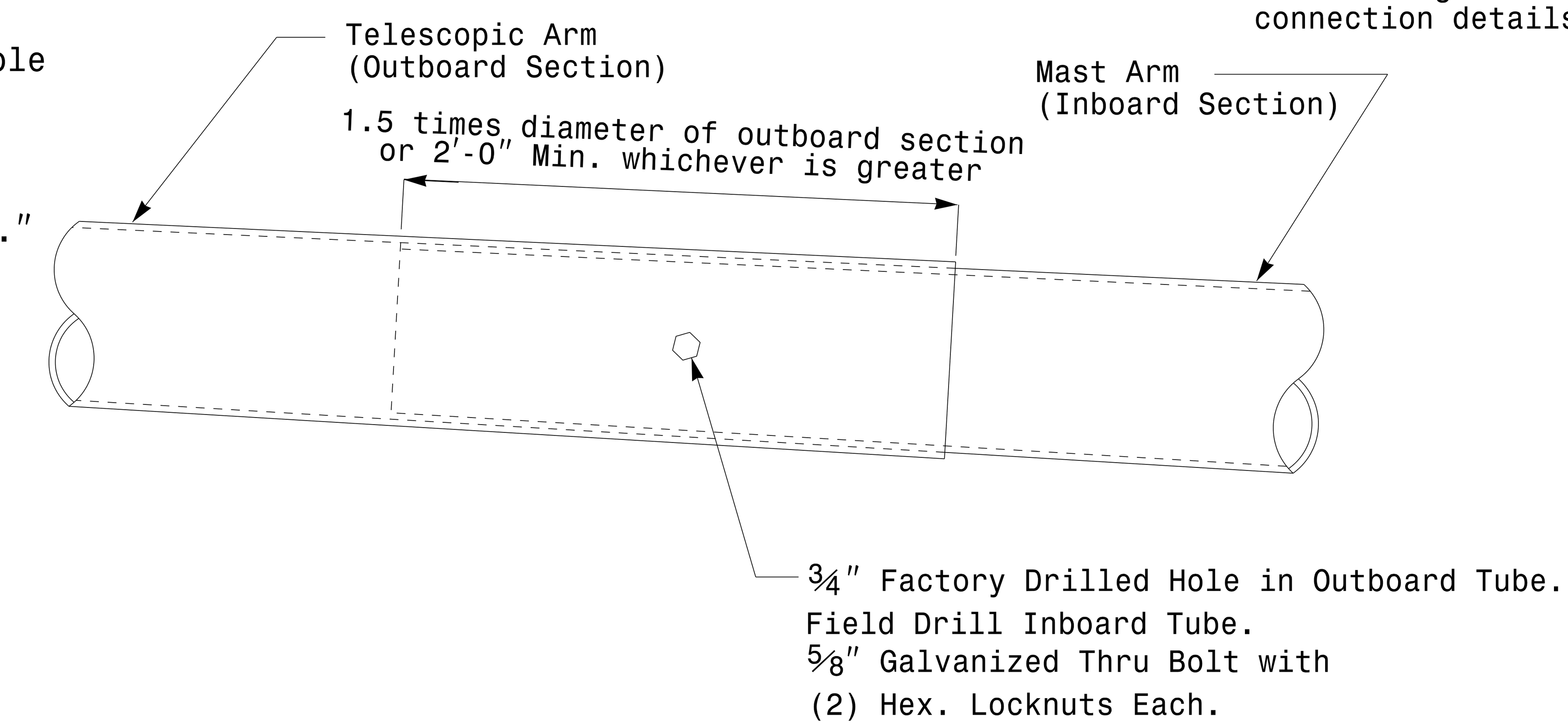


Section A-A

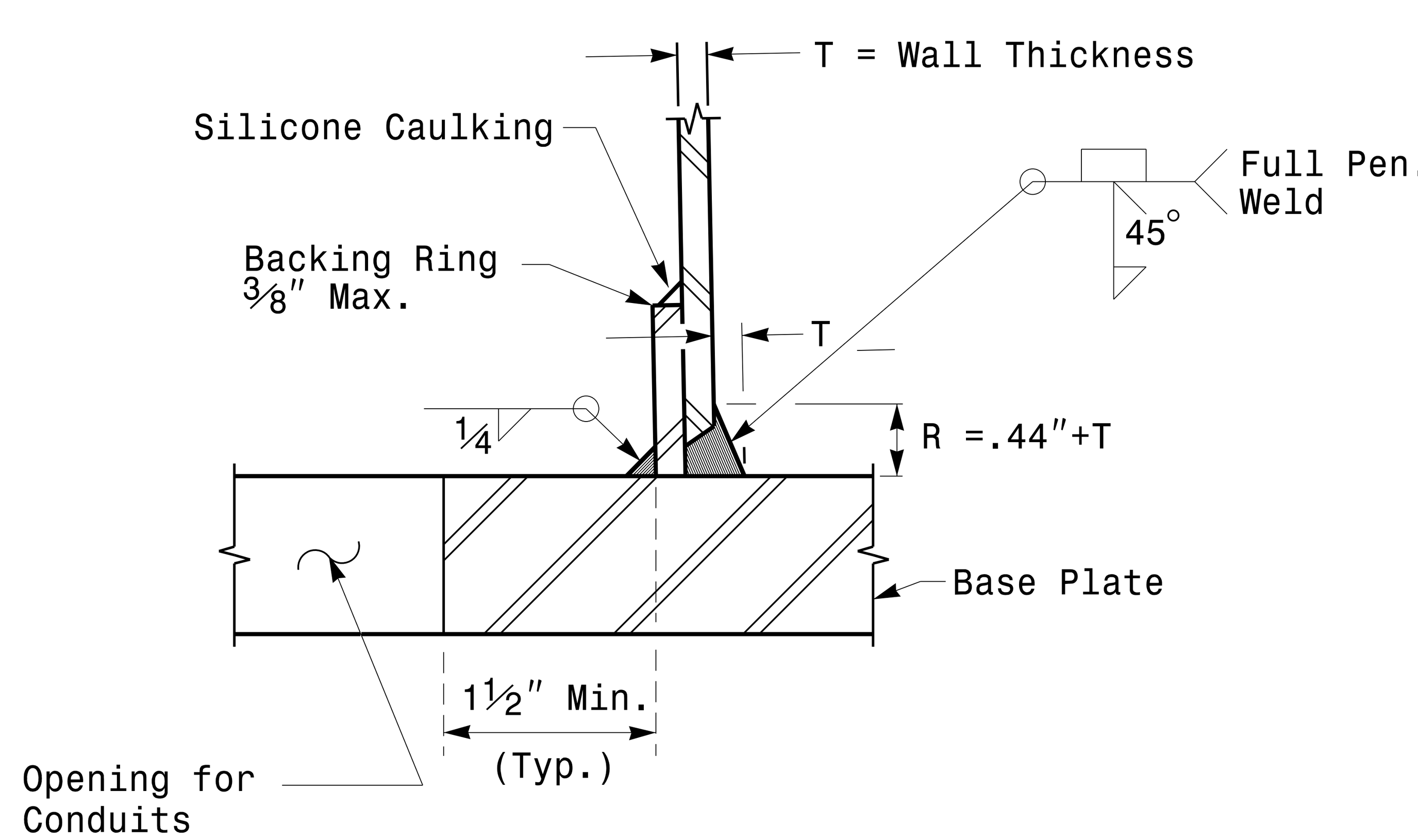
Pole Base Plate Details



Mast Arm Pole

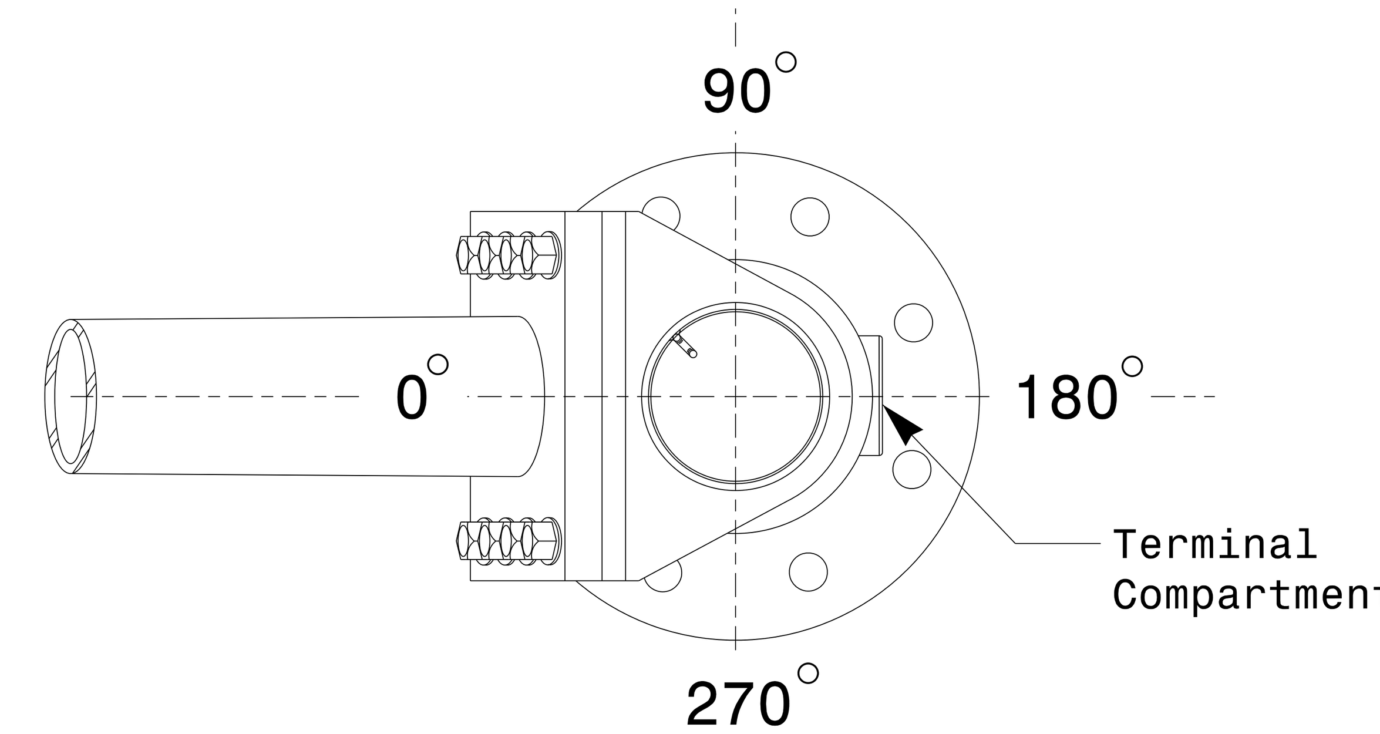


Slip Fit Joint Detail for Mast Arm



Section B-B
(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

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

Typical Fabrication Details
For
Mast Arm Poles

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	K.C.DURIGON
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE
0 NA
NONE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar
SIGNATURE
10/11/2017
DATE

11-OCT-2017 08:33
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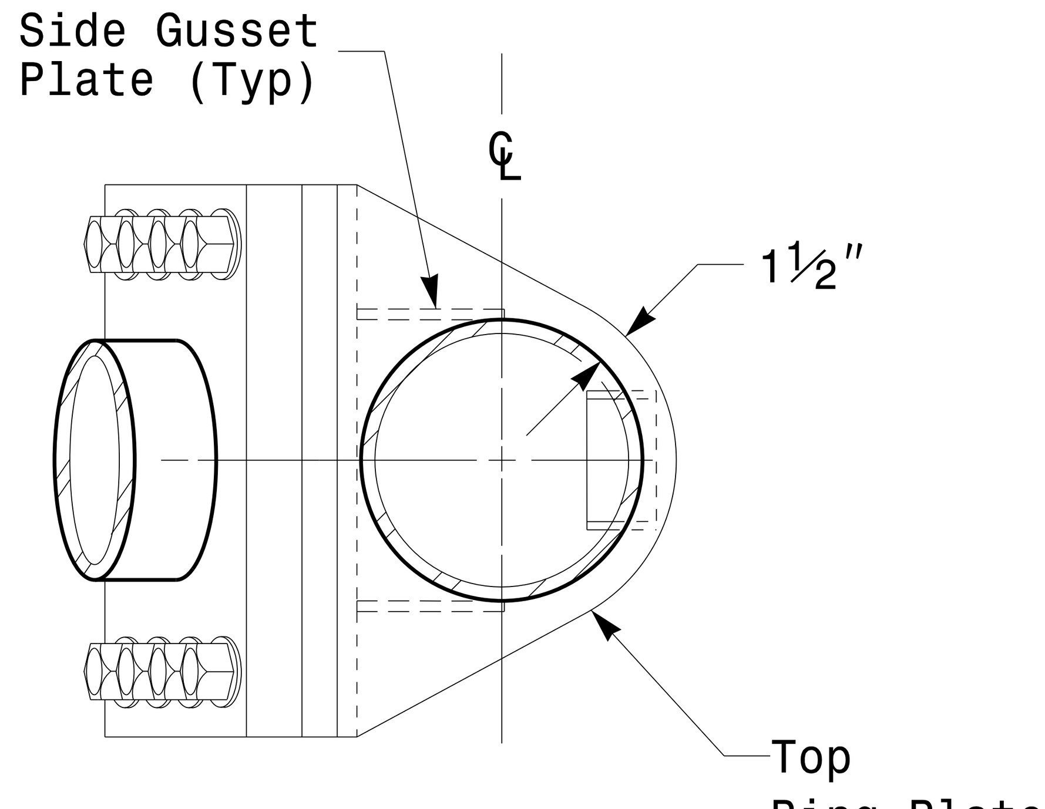
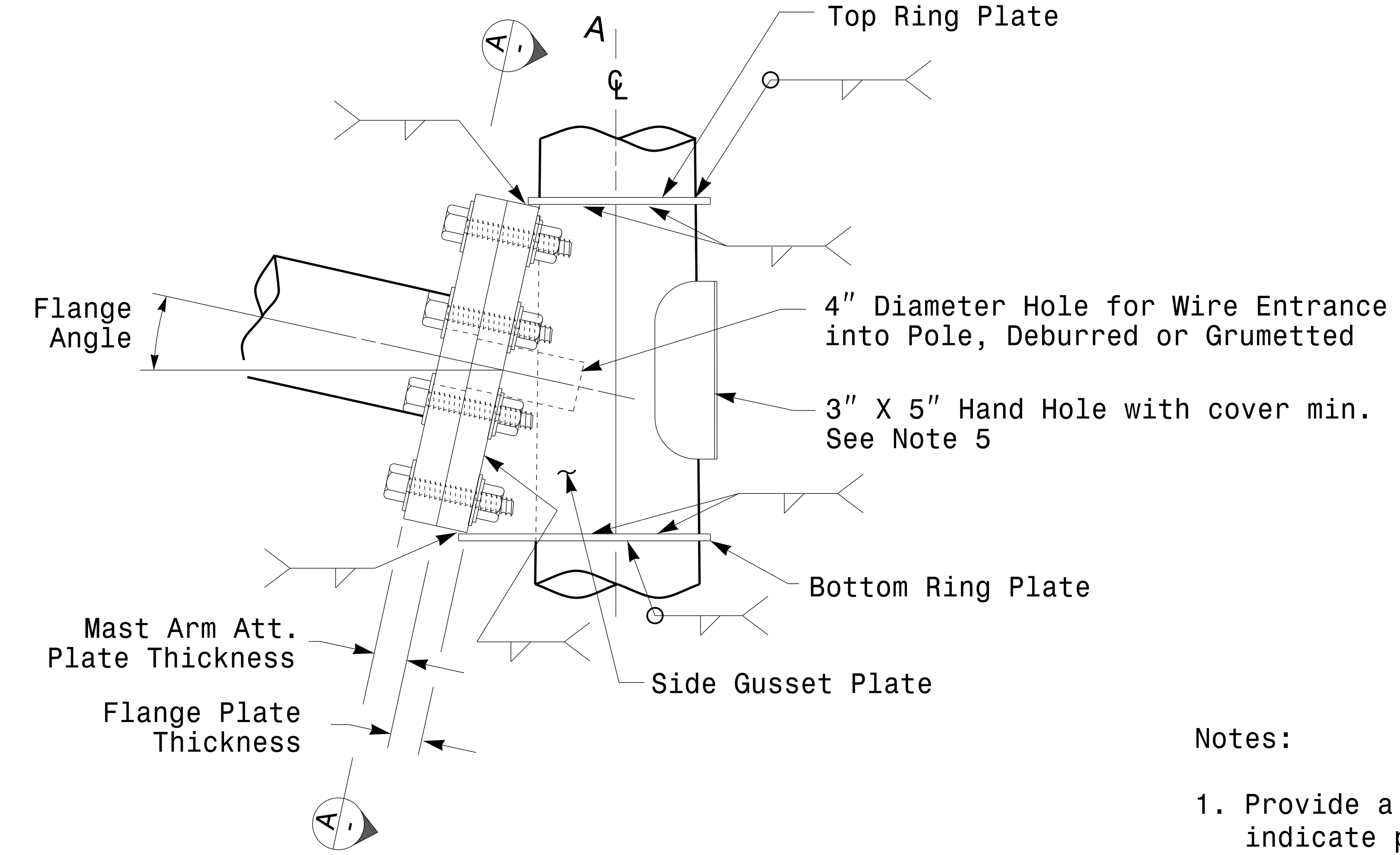
rnzinger

Welded Ring Stiffened Mast Arm Connection

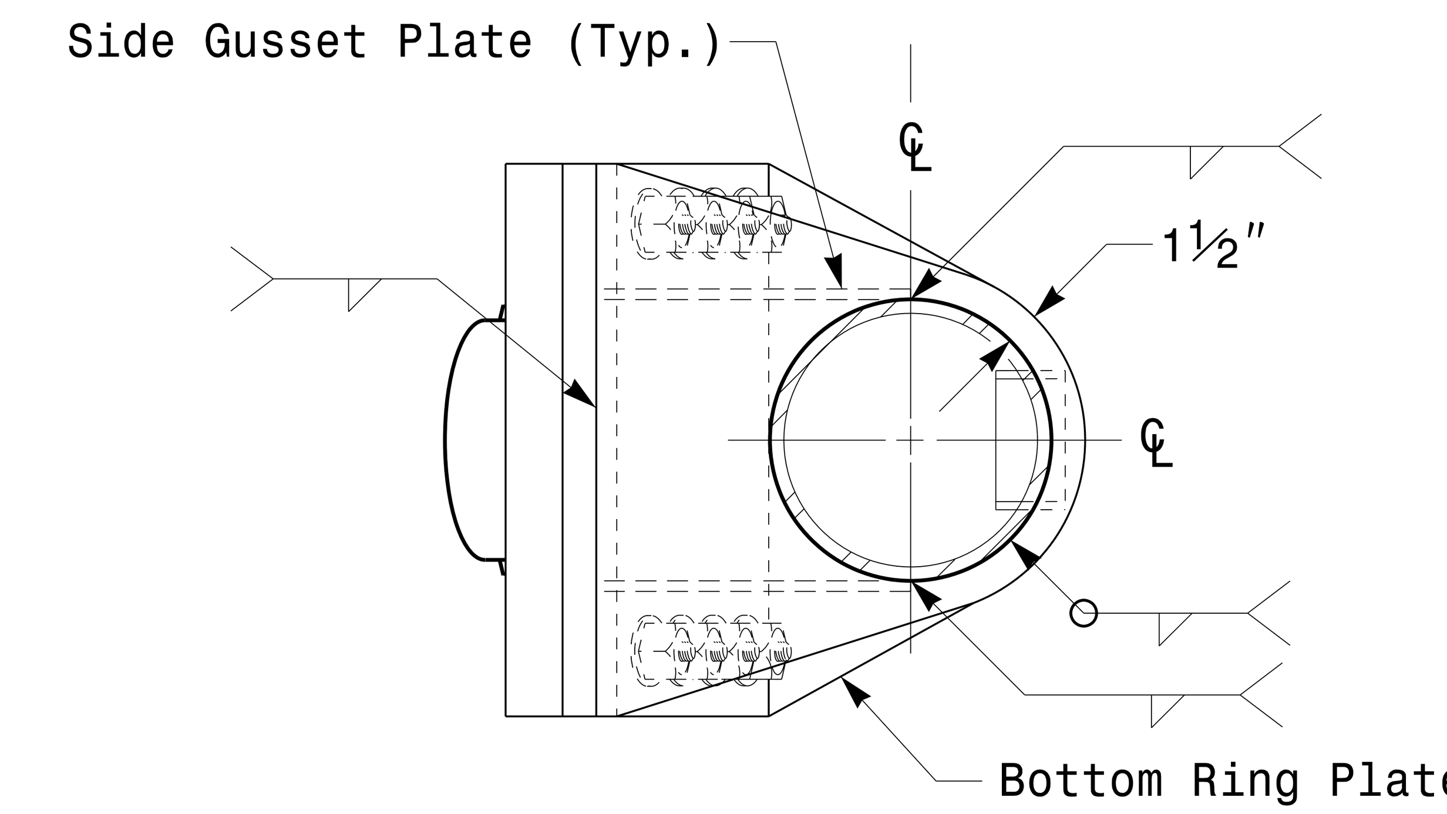
PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M5



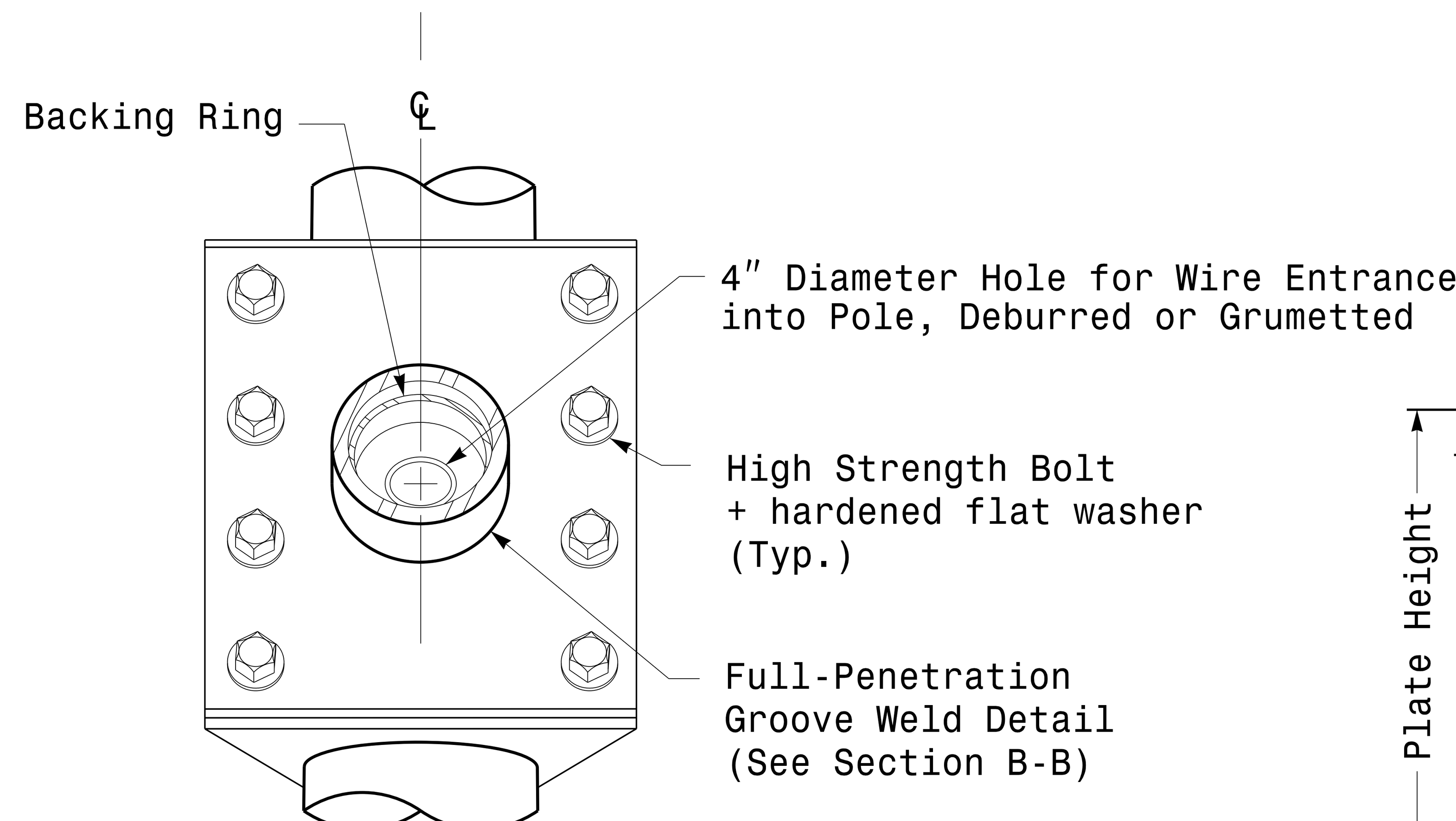
Plan View



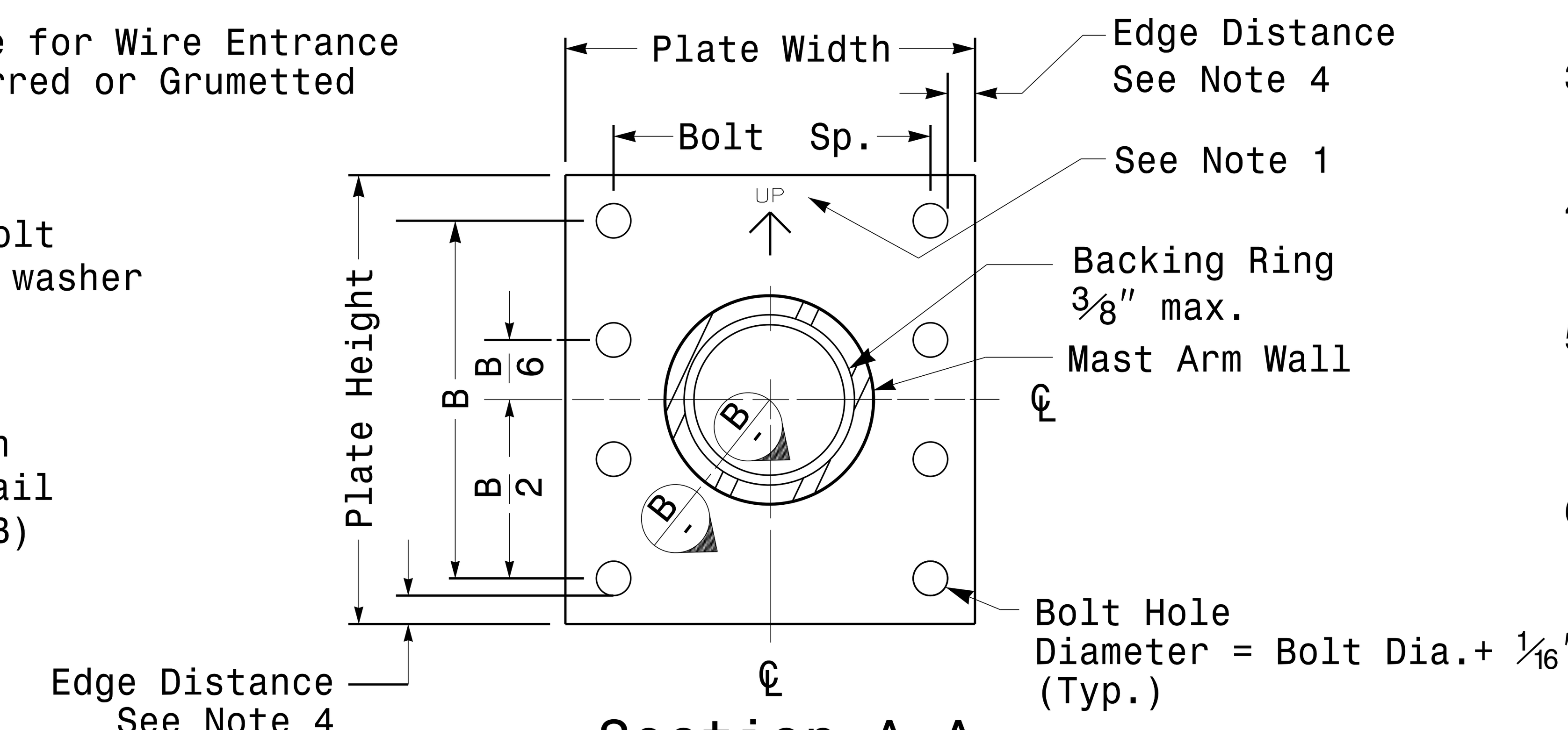
Side Elevation View



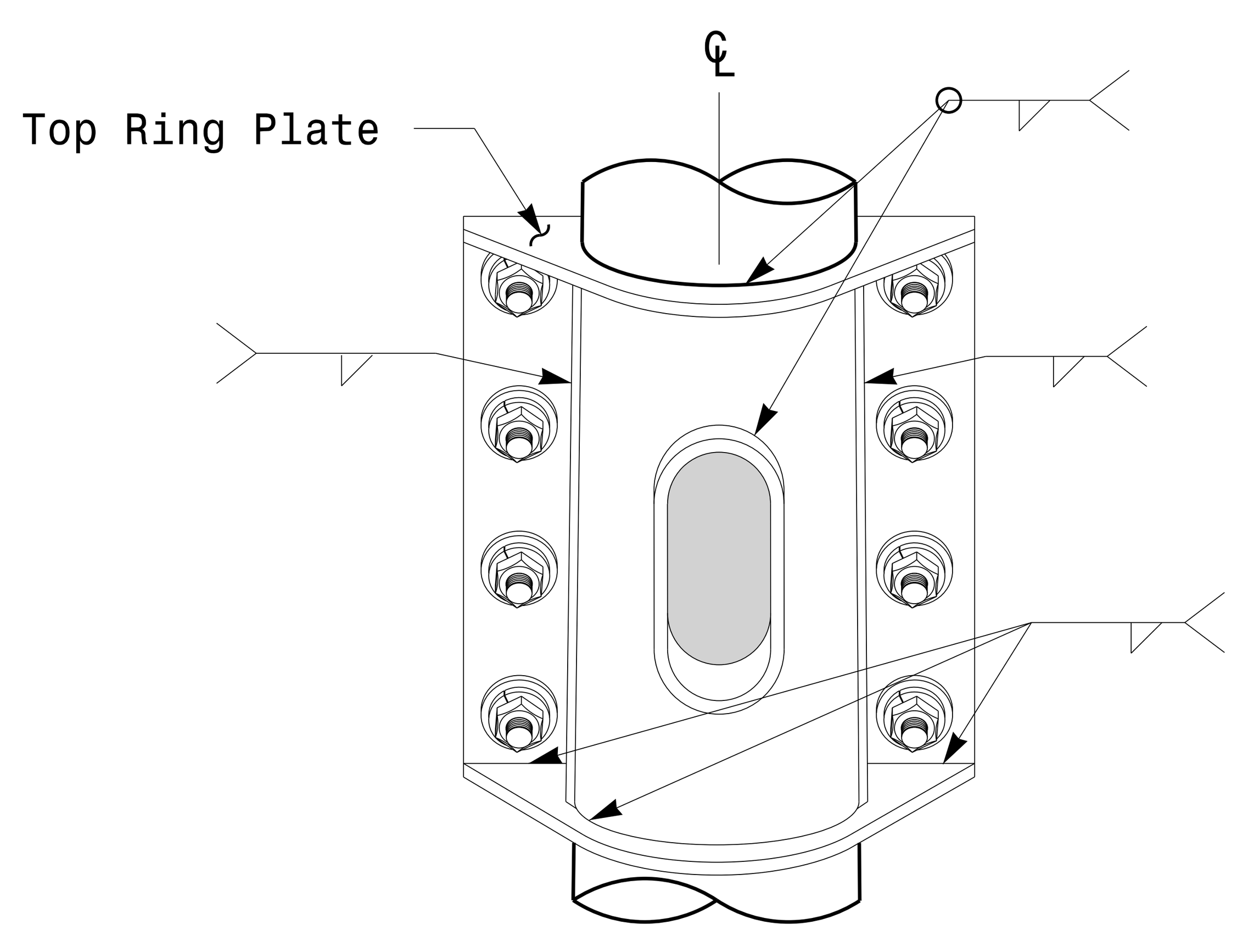
Bottom View



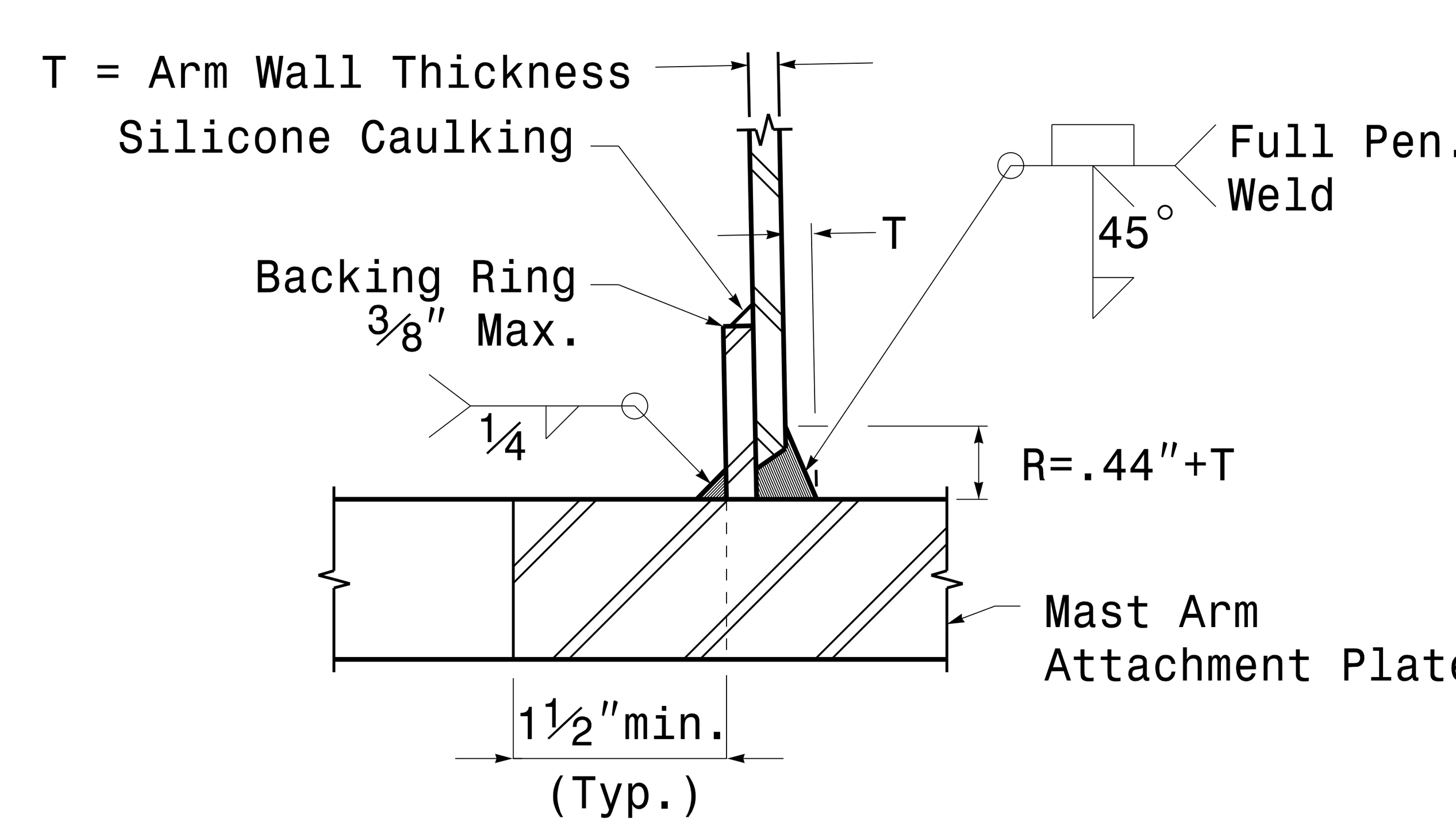
Front Elevation View



Section 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. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are reguired for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.

Fabrication Details – Mast Arm Connection

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

Typical Fabrication Details
For
Mast Arm Connection To Pole

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

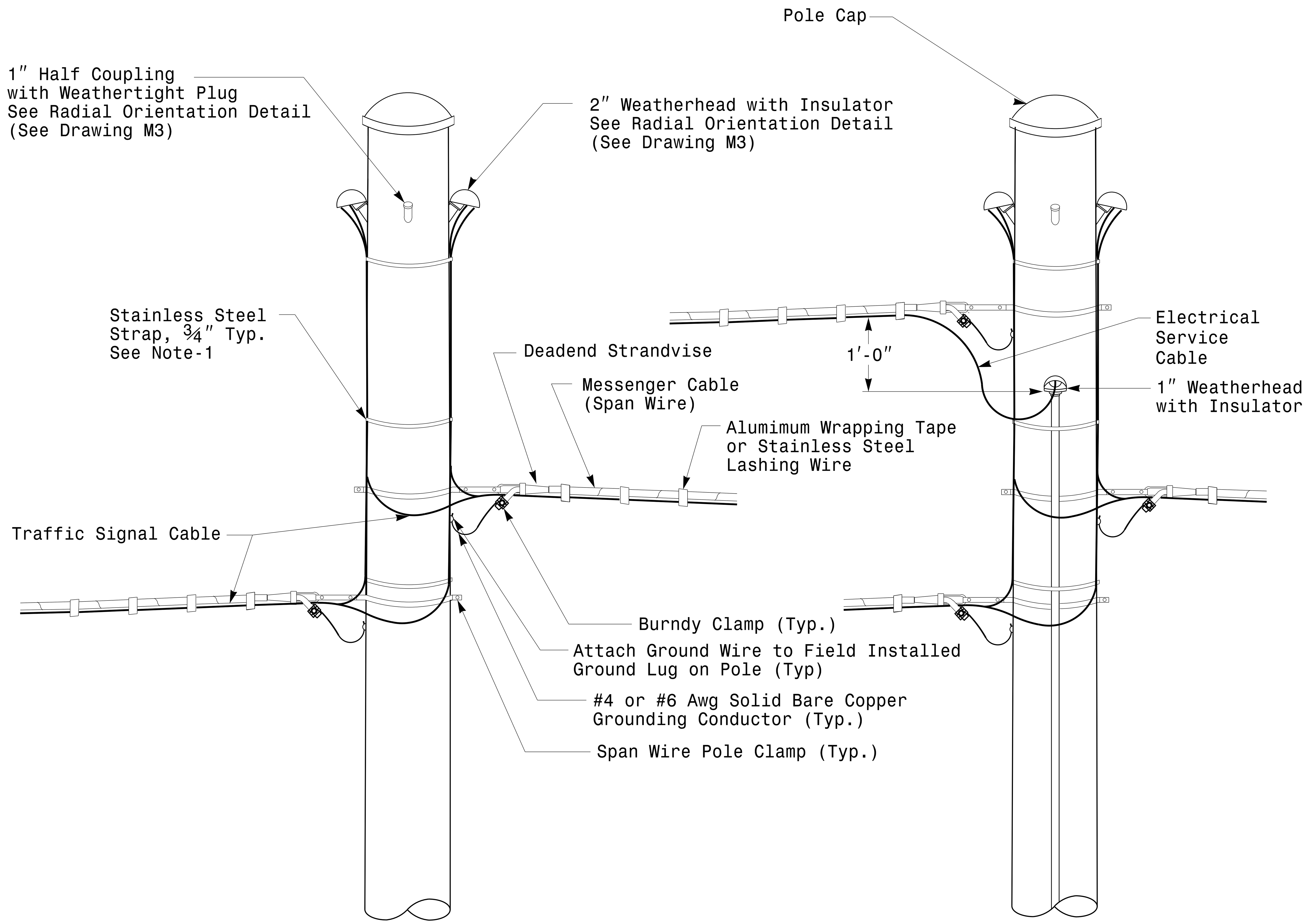
SCALE
0 NA
NONE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 028094
DEBESH C. SARKAR

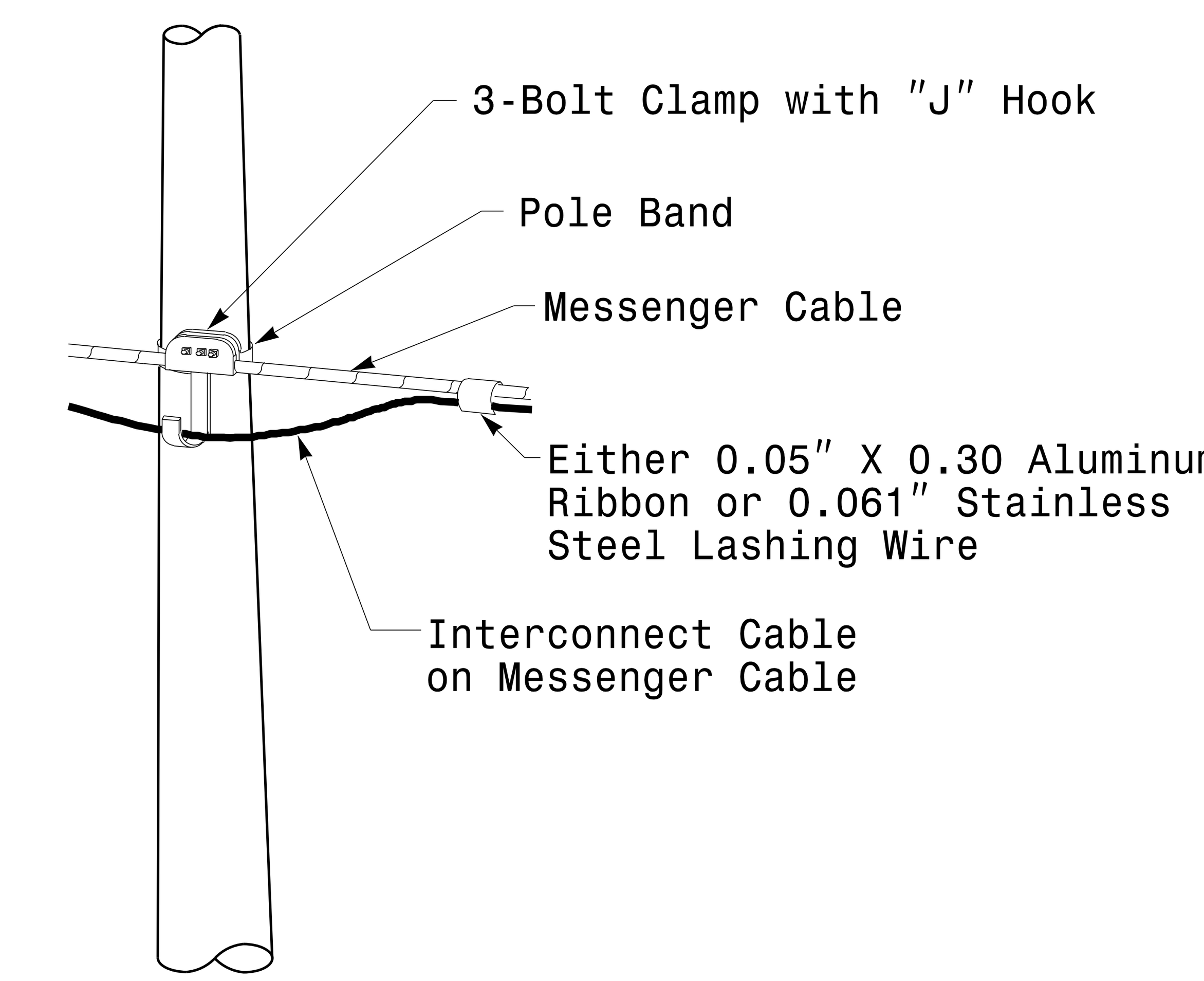
DocuSigned by: Debesh C. Sarkar
SIGNATURE 10/11/2017 DATE

PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M6

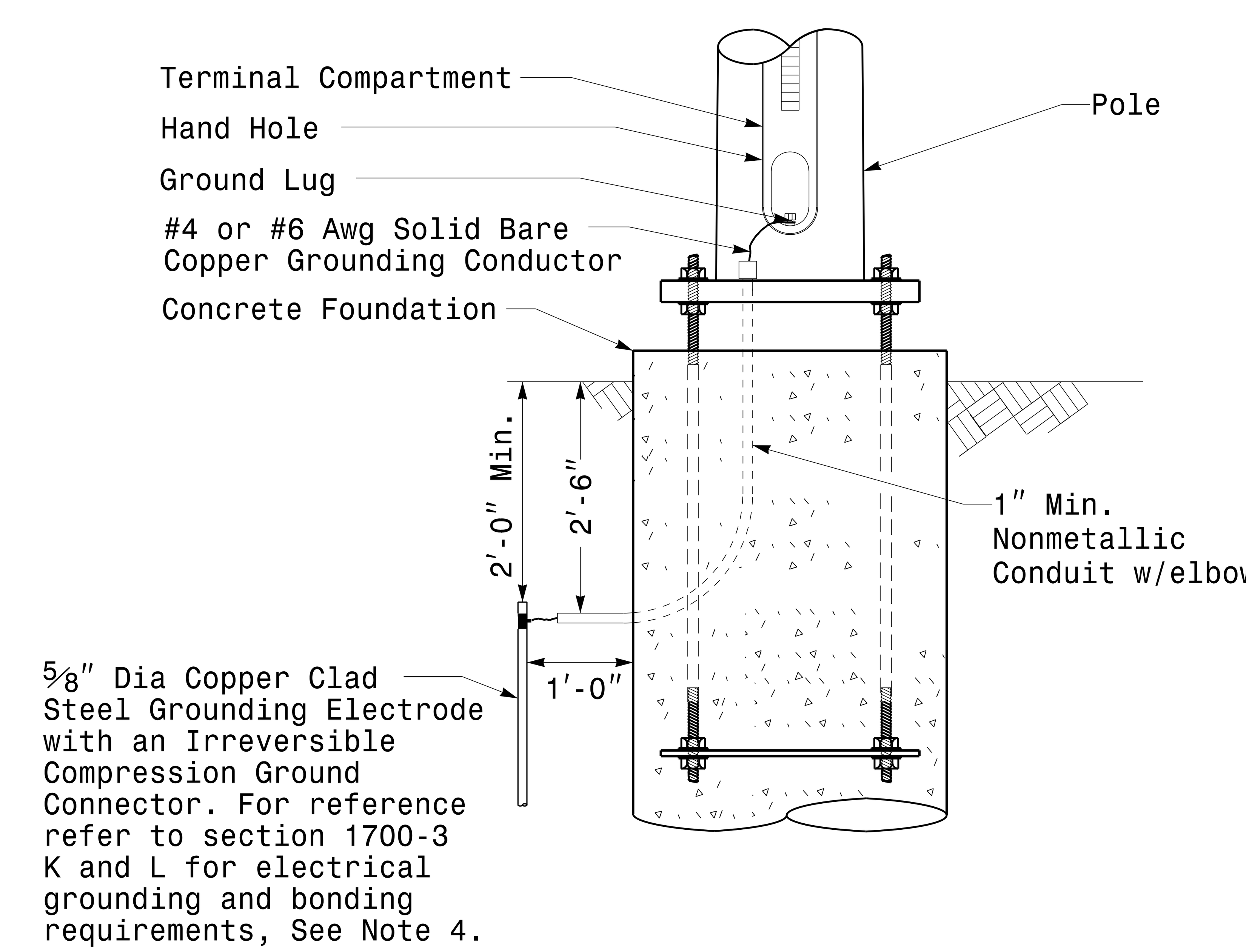
Fabrication Details – Strain Pole Attachments



Strain Pole Attachments



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail For Strain Pole and Mast Arm

NOTE:

1. Strap all signal cables to the side of the pole with 3/4″ stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3′-0″.
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2018.

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

Typical Fabrication Details
For
Strain Pole Attachments

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F.ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE

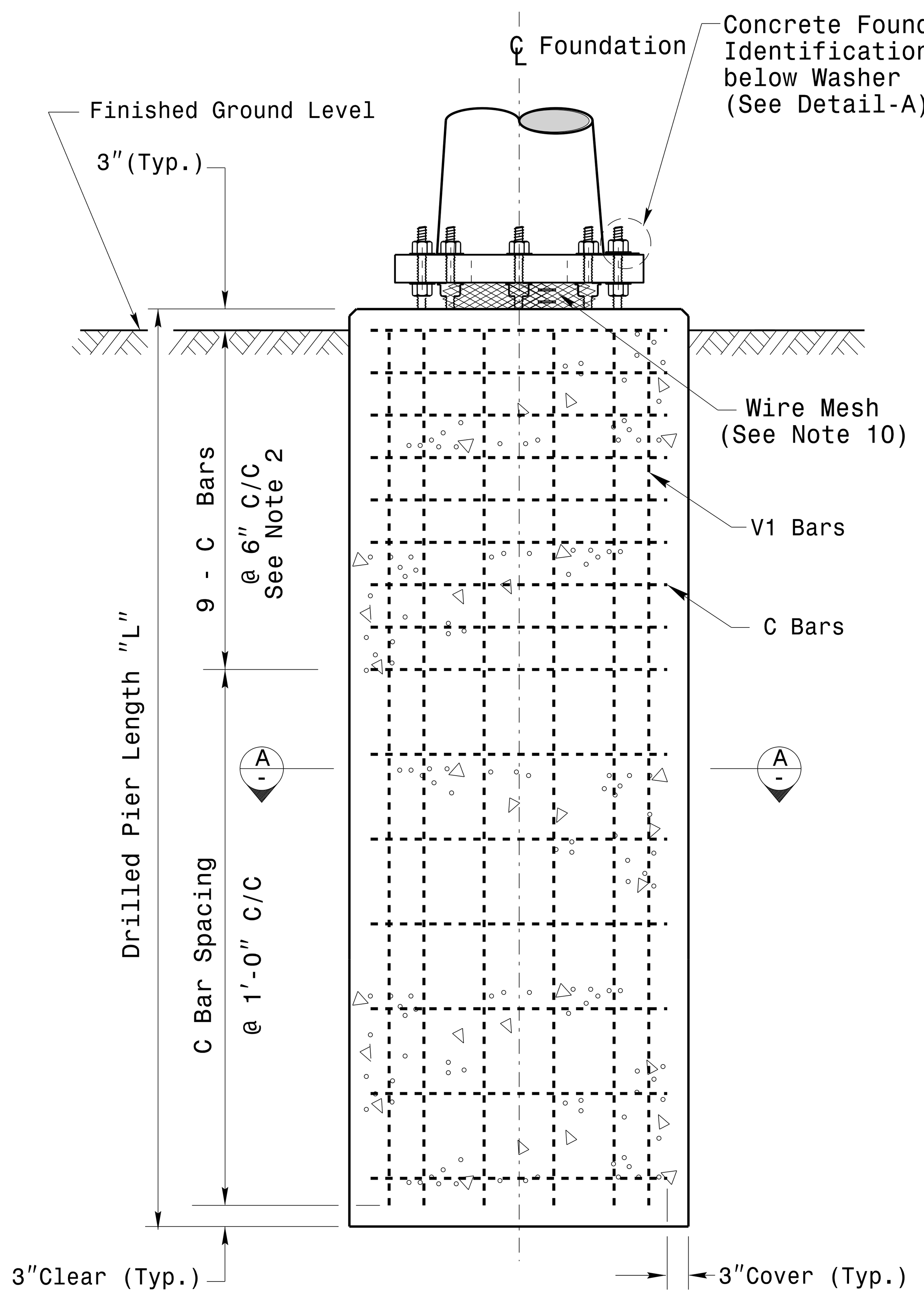
SCALE
0 NA
NONE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR

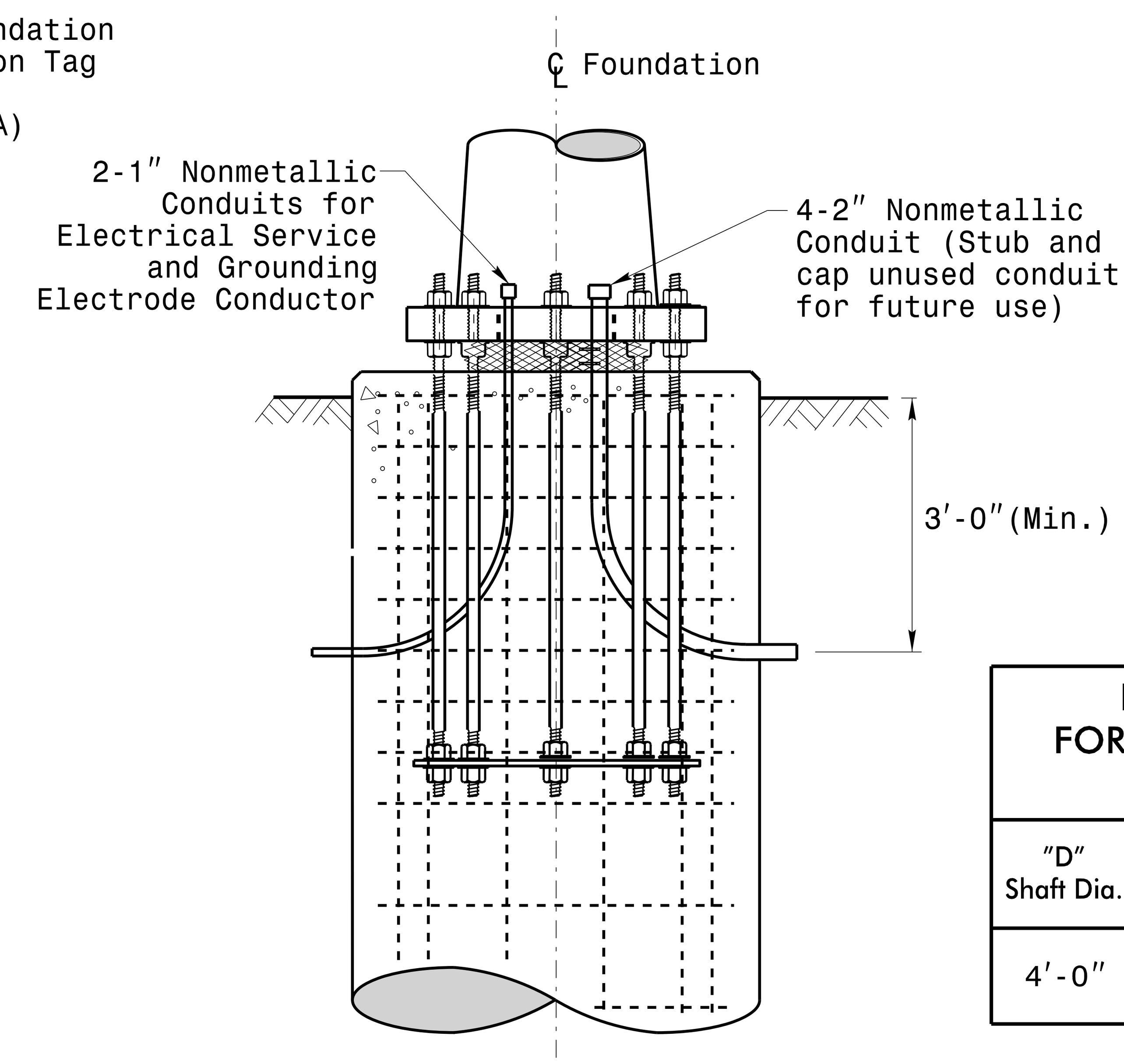
DocuSigned by: Debesh C. Sarkar
SIGNATURE 10/11/2017 DATE

PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M7

Construction Details – Foundations



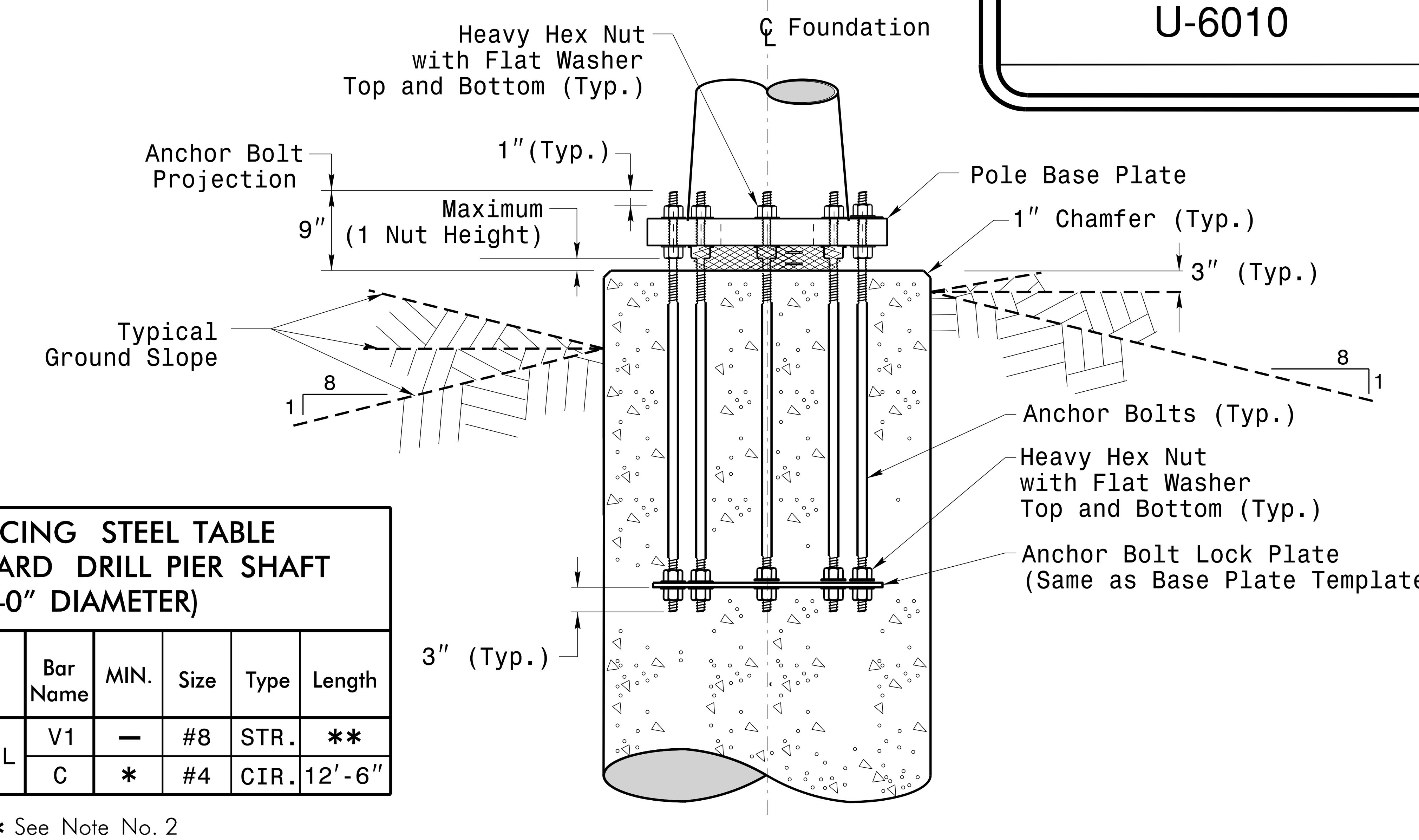
Concrete Shaft Elevation



Typical Foundation Conduit Details

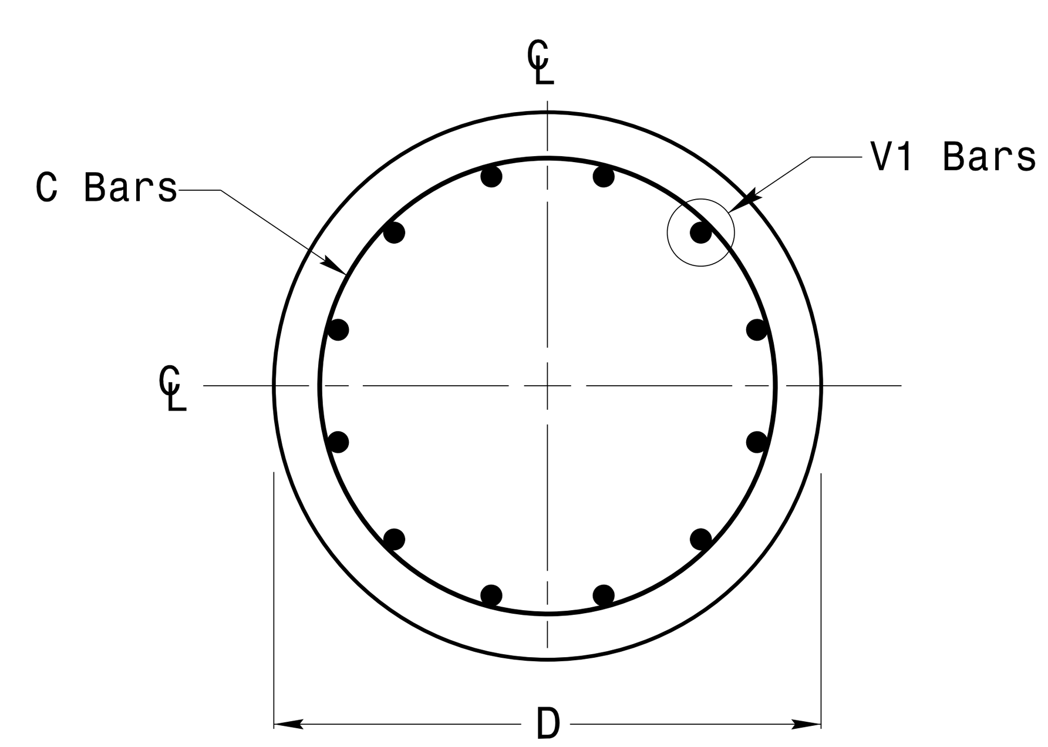
REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'–0″ DIAMETER)						
"D" Shaft Dia.	Conc. Volume (cu. yds.)	Bar Name	MIN.	Size	Type	Length
4'-0″	.465 x L	V1	—	#8	STR.	**
		C	*	#4	CIR.	12'-6″

* See Note No. 2
** See Note No. 3

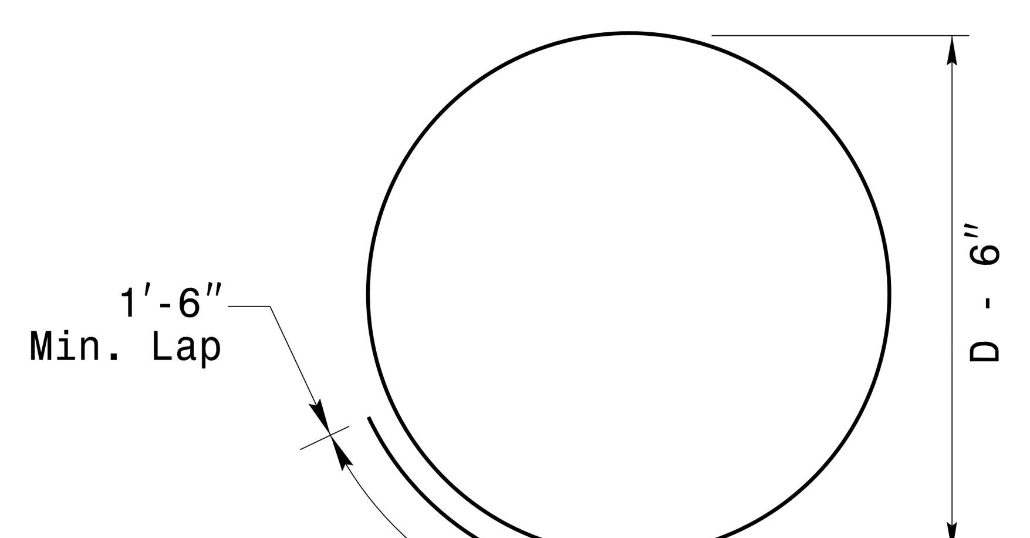


Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Section A-A

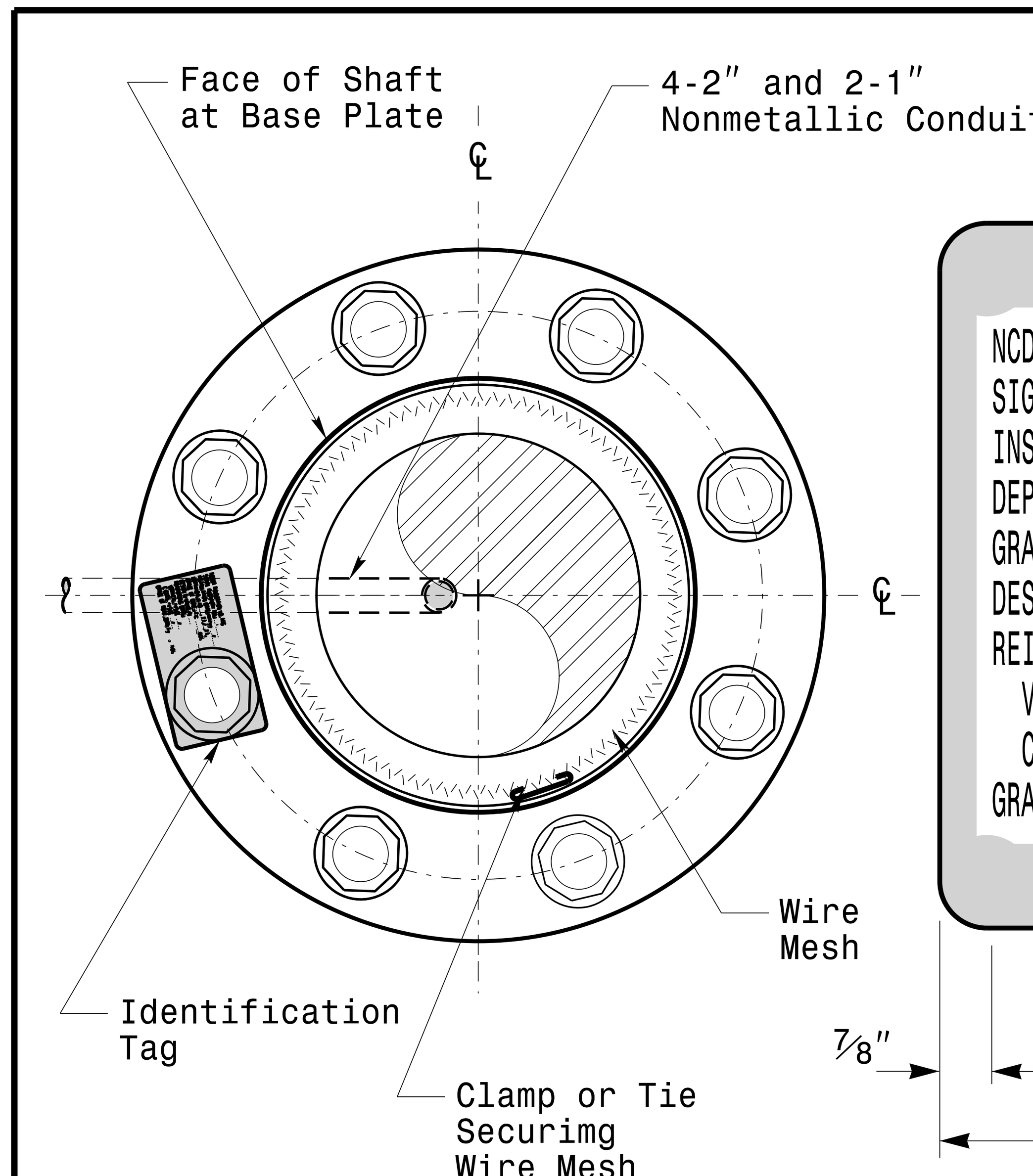


Typical "C" Bar Detail

General Notes:

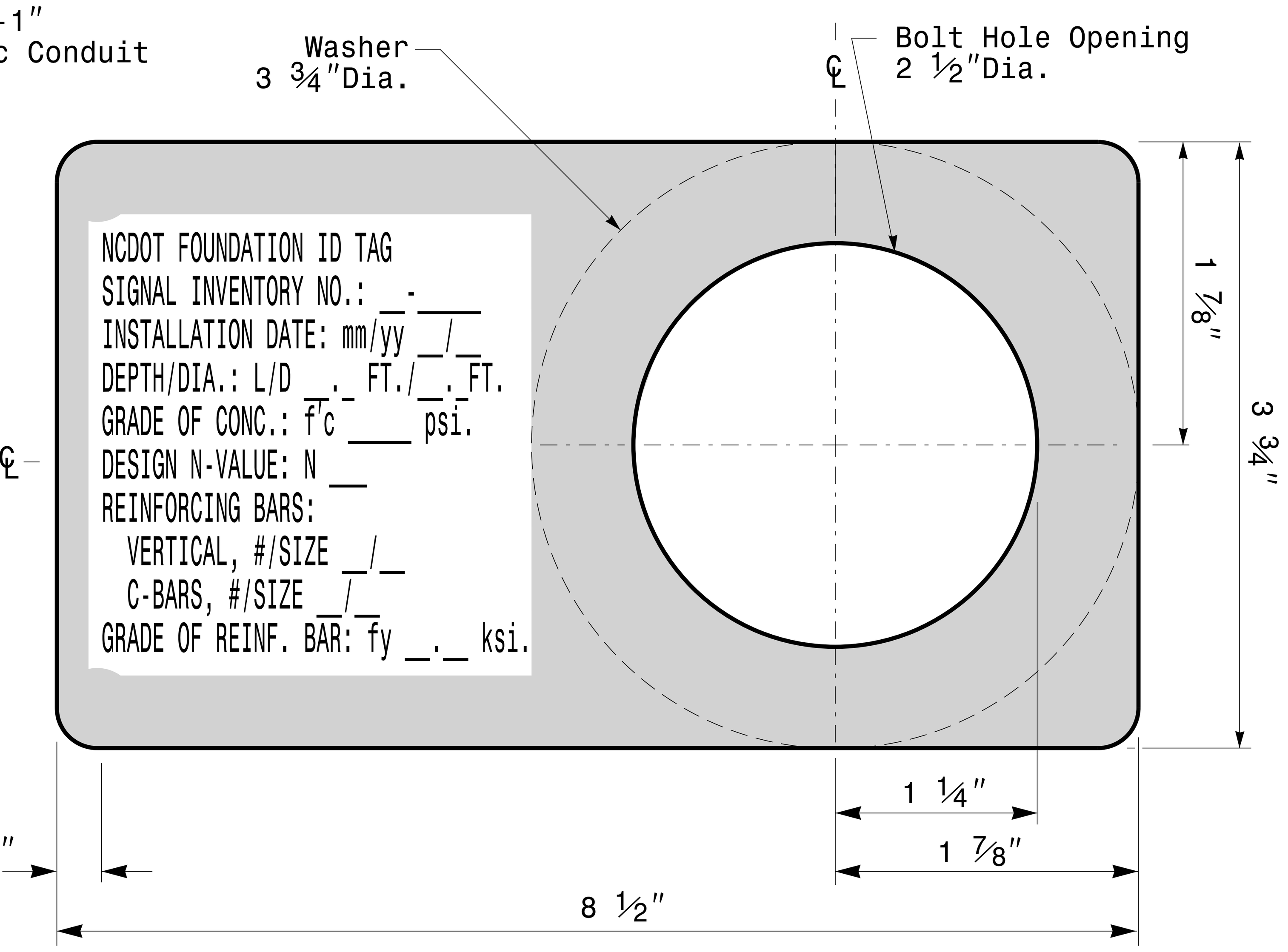
1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3″ at a depth between 2'-0″ and 3'-0″ to facilitate the installation of electrical conduit entering in the cage.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3″ to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2″ to 5″ foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2018 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.

   https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx
7. Use air entrained AA concrete mix with a compression strength of f'c=4500 psi.(min.) after 28 days.
8. Use ASTM A615 grade 60 deformed bars for all reinforcing steel. Maintain at least 3″ cover on all reinforcement.
9. Locate the Identification Tag on the top of the base plate, directly above the conduit's entry point.
10. Provide two layers of galvanized welded 23 gauge (0.25) 6″ wide 4 mesh wire around pipes under the base plate and secure it with ties if necessary.
11. Preferred location for the I.D. Tag is as shown in Detail-A; directly above the conduit entering the foundation.



D = Diameter
L = Length/Depth
mm = Month
yy = Year

Detail-A



Concrete Foundation Identification Tag Details

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

Construction Details For Foundations

PLAN DATE:	OCTOBER 2018	DESIGNED BY:	C.B.COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

SCALE: 0 NA — NONE

REV. NO.	COMMENTS	INIT.	DATE
1	Revised Foundation Tag Details	N.B.	5/11/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR
DocuSigned by: Debesh C. Sarkar
SIGNATURE
10/11/2017
DATE

11-OCT-2017 08:37
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r4zinder

SOIL CONDITION

		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base: Axial (kip)	Reactions at the Pole Base: Shear (kip)	Reactions at the Pole Base: Moment (ft-kip)	Clay: Medium N-Value 4–8	Clay: Stiff N-Value 9–15	Clay: Very Stiff N-Value 16–30	Clay: Hard N-Value >30	Sand: Loose N-Value 4–10	Sand: Medium N-Value 11–30	Sand: Dense N-Value >30	Reinforcement: Longitudinal Bar Size (#)	Reinforcement: Longitudinal Quantity (ea.)	Reinforcement: Stirrups Bar Size (#)	Reinforcement: Stirrups Spacing (in.)
		STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48″ Diameter Drilled Pier Length (L) – Feet							Reinforcement			
					Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	10	8	17	14.5	12.5	8	12	4	12
		S30L3	30	25	2	11	300	19.5	13.5	10	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	10.5	8	17.5	15	13	8	14	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	16	12	9	21	17.5	15	8	16	4	6
		S35H3	35	29	4	16	515	26	17	12.5	9.5	22	18.5	16	8	16	4	6
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11.5	8.5	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	9	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	9	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	13.5	10.5	8	18	15	13.5	8	16	4	6
		S35H1	35	25	4	12	350	21	14	10.5	8.5	18.5	15.5	13.5	8	16	4	6
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6

48″ Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Drilled Pier Length

General Notes:

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

Foundation Selection:

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column under "Standard Foundations" based on soil type and "N" value. Select the appropriate row based on the pole load case.
6. The foundation depth is the value shown in the "Standard Foundations" category where the column and the row intersect.
7. Use Construction Procedures and Design Methods prescribed by FHWA-NHI-10-016 for Reference Drilled Shafts.

PROJECT ID. NO.	SHEET NO.
U-6010	Sig.M8

Standard Strain Pole Foundation–All Soil Condition

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

SCALE: 0 NA — NONE

Standard Strain Pole Foundation for All Soil Conditions

PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.B. COGDELL
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR

REVISIONS	INIT.	DATE
Changed "Foundation Depth" to "Drilled Pier Length"in Conc. Eqn.	N.B.	7/12/2015

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 10/11/2017
DATE

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rtaylor

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-1

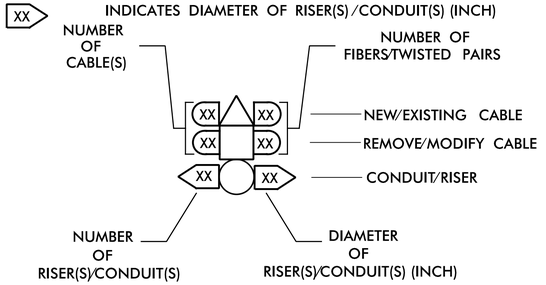
1. INSTALL CATEGORY 6 CABLE
2. INSTALL COAX CABLE
3. INSTALL ETHERNET CABLE
4. INSTALL SMFO CABLE
5. EXISTING SMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
11. INSTALL RIGID, GALVANIZED STEEL RISER WITH 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 WITH HEAT SHRINK RETROFIT KIT
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. MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE
27. INSTALL NEW ETHERNET EDGE SWITCH IN CABINET
28. INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET
29. INSTALL UNDERGROUND SPLICE ENCLOSURE
30. INSTALL AERIAL SPLICE ENCLOSURE
31. MODIFY EXISTING SPLICE ENCLOSURE
32. INSTALL BASE MOUNTED SPLICE CABINET
33. REMOVE EXISTING SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. INSTALL CCTV CAMERA POLE MOUNTED CABINET
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. RELOCATE EXISTING CCTV CAMERA AND METAL POLE TO NEW FOUNDATION
39. INSTALL JUNCTION BOX
40A. INSTALL OVERSIZED JUNCTION BOX
40B. INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
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
48A. REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
48B. REMOVE AND/OR ABANDON COMMUNICATIONS CABLE AND CONDUIT
49. BACK PULL EXISTING COMMUNICATIONS CABLE
50. INSTALL CELL MODEM
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
51A. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 200 FEET OF CABLE
52A. INSTALL DELINEATOR MARKER
52B. INSTALL JUNCTION BOX MARKER
53. STORE 30 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING 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
59. INSTALL NEW ETHERNET EDGE SWITCH
60. BOND TRACER WIRE TO EQUIPMENT GROUND BUS
61. DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
62. BOND RISER AND MESSENGER CABLE TO POLE GROUND
63. BOND RISER TO POLE GROUND
64. BOND MESSENGER CABLE TO POLE GROUND
65. INSTALL HEAT SHRINK TUBING RETROFIT KIT
66. INSTALL MOLDABLE DUCT SEAL
67. SLACK SPAN

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
- S — SPLICE ENCLOSURE
- S — EXISTING SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- EXISTING GUY ASSEMBLY
- XX–XXXX — SIGNAL INVENTORY NUMBER
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CABLE STORAGE RACK (SNOW SHOE)
- EXISTING CONTROLLER AND CABINET
- NEW CCTV CABINET
- S — EXISTING SPLICE CABINET
- S — NEW SPLICE CABINET
- SP — SIGNAL POLE
- FLAT PANEL ANTENNA (SINGLE)
- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA

CONSTRUCTION NOTE SYMBOLOGY KEY

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



ATTACHMENT POINT:

- XX"/SS / YYY — DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT
- YYY / XX"/SS — REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

"SS" REFERENCE LOCATION
FS = FRONT SIDE OF POLE
BS = BACK SIDE OF POLE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

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

SCALE: 0 N/A NONE

CONSTRUCTION NOTES

Division 7 Alamance County Burlington & Graham

PLAN DATE: August 2021	REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: B.E. Wynn	MAN PROJECT NO.:

REVISIONS	INIT.	DATE

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

SIGNATURE DATE

CADD FILE NAME: U-6010 SCP

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-2

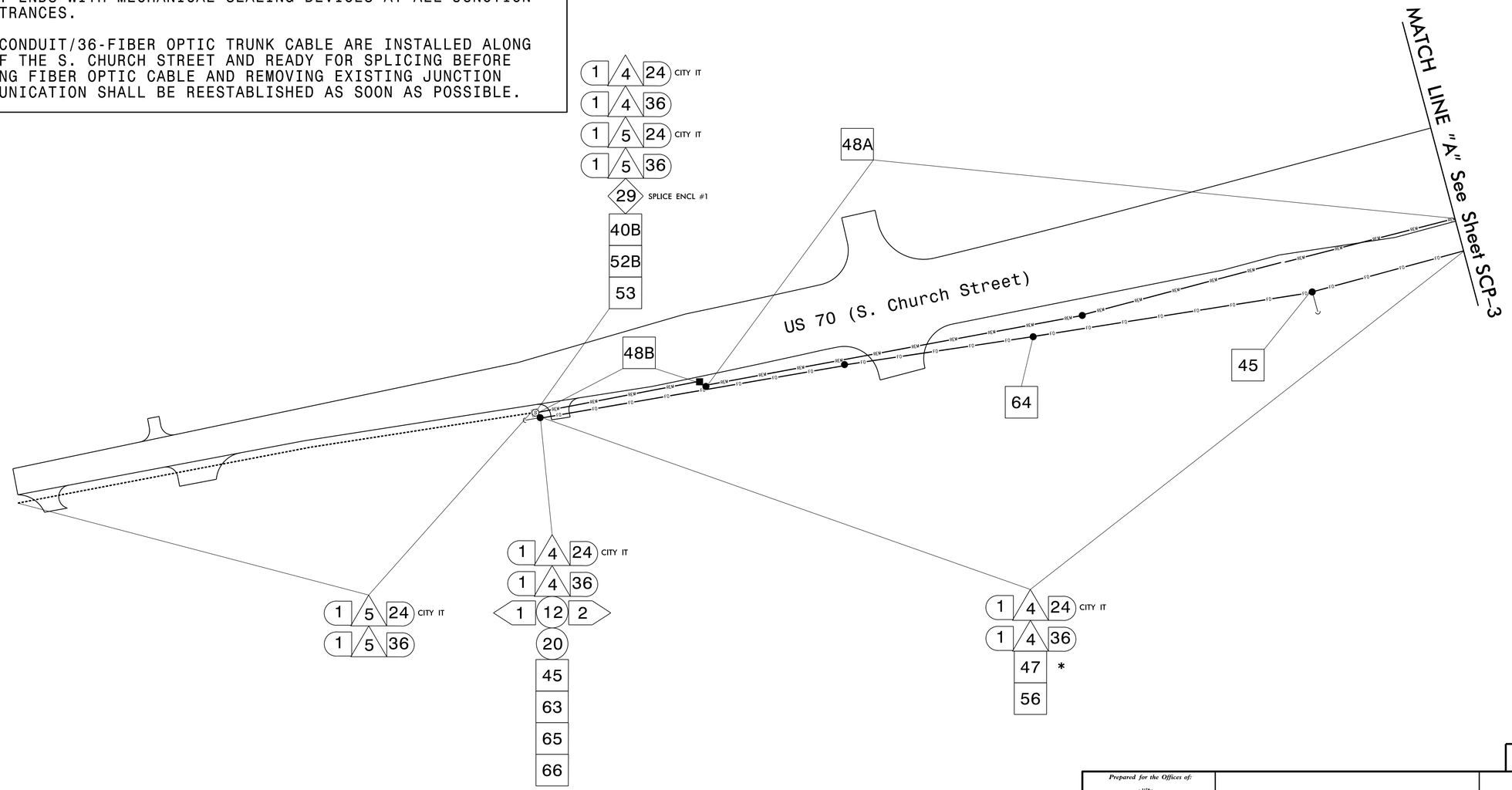
NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSEMS MANAGER AT 336-513-5420 TO ARRANGE FOR THE CITY TO PROGRAM THE NEW ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBSET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC SYSTEMS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3. SEAL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUNCTION BOX/CABINET ENTRANCES.

4. ENSURE NEW CONDUIT/36-FIBER OPTIC TRUNK CABLE ARE INSTALLED ALONG THIS SECTION OF THE S. CHURCH STREET AND READY FOR SPLICING BEFORE CUTTING EXISTING FIBER OPTIC CABLE AND REMOVING EXISTING JUNCTION BOX(ES). COMMUNICATION SHALL BE REESTABLISHED AS SOON AS POSSIBLE.



* ALL NCDOT ATTACHMENT POINTS ARE 40" BELOW POWER FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

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Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
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Prepared for the Offices of:
Transportation Mobility and Safety Division
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N. Greenfield Pkwy, Garner, NC 27529

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 ALAMANCE COUNTY BURLINGTON & GRAHAM

PLAN DATE: August 2021 REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

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

SIGNATURE DATE

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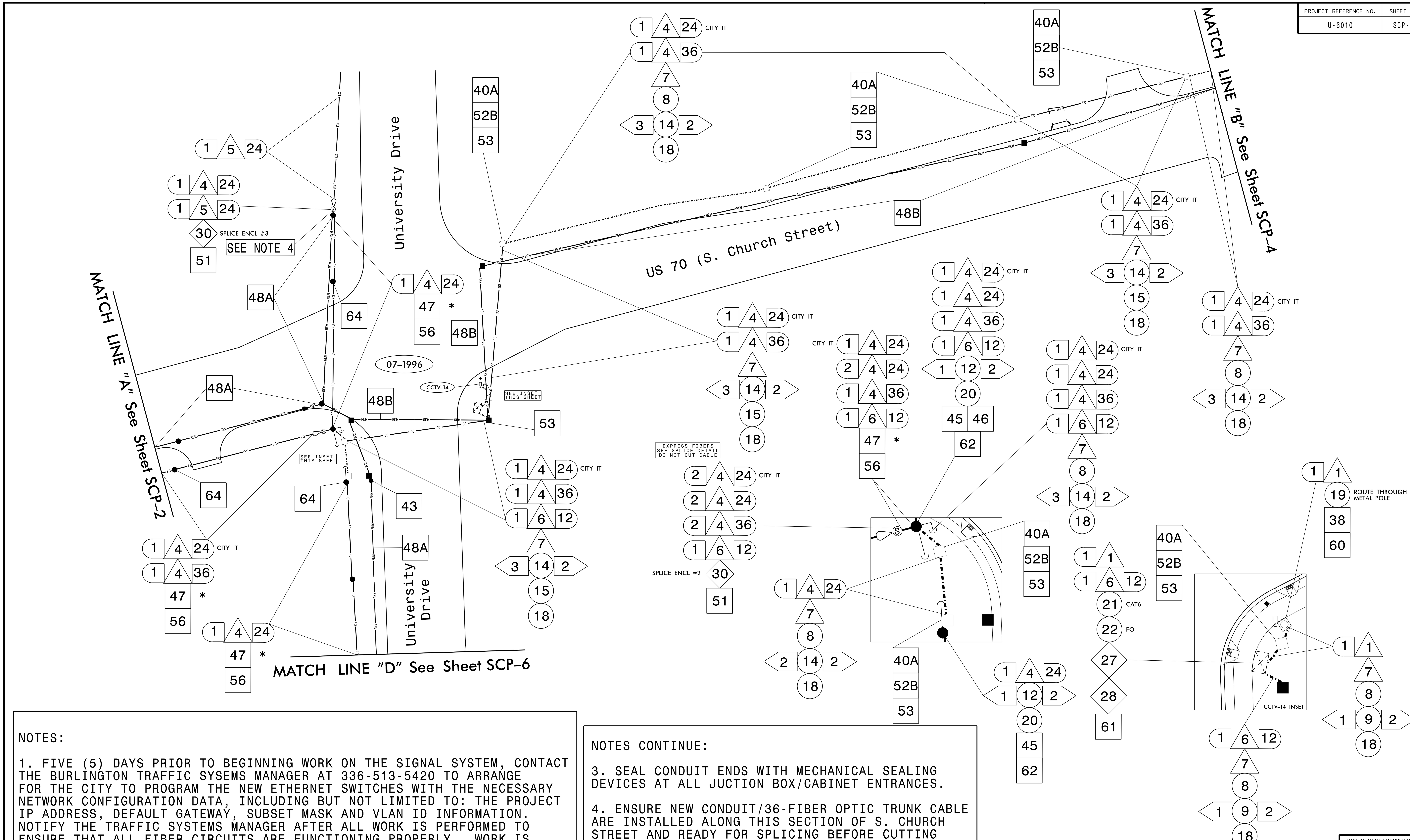

NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSEMS MANAGER AT 336-513-5420 TO ARRANGE FOR THE CITY TO PROGRAM THE NEW ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBSET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC SYSTEMS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

NOTES CONTINUE:

3. SEAL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUCTION BOX/CABINET ENTRANCES.

4. ENSURE NEW CONDUIT/36-FIBER OPTIC TRUNK CABLE ARE INSTALLED ALONG THIS SECTION OF S. CHURCH STREET AND READY FOR SPLICING BEFORE CUTTING EXISTING FIBER OPTIC CABLE AND REMOVING EXISTING JUNCTION BOX(ES). COMMUNICATION SHALL BE REESTABLISHED WITHIN 24-HOURS AFTER CUTTING THE FIBER TO PERFORM CUT OVER TO NEW FIBER.

* ALL NCDOT ATTACHMENT POINTS ARE 40" BELOW POWER FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

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

SCALE 0 50 1"=50'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 ALAMANCE COUNTY BURLINGTON & GRAHAM

PLAN DATE:	August 2021	REVIEWED BY:	G. G. Murr, Jr.
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

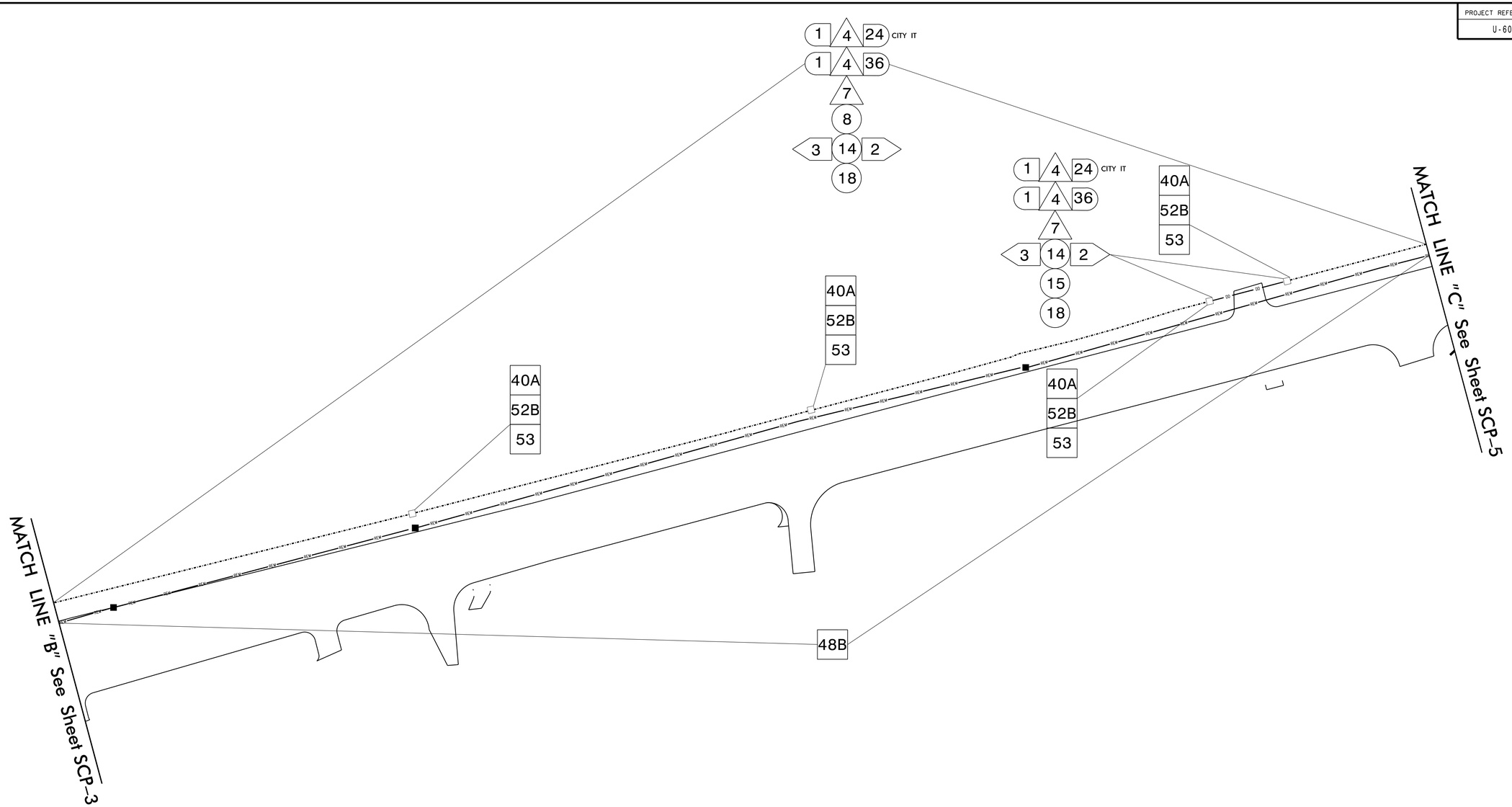
REVISIONS	INIT.	DATE

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

SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-4



NOTES:

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2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

NOTES CONTINUE:

3. SEAL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUCTION BOX/CABINET ENTRANCES.

4. ENSURE NEW CONDUIT/36-FIBER OPTIC TRUNK CABLE ARE INSTALLED ALONG THIS SECTION OF S. CHURCH STREET AND READY FOR SPLICING BEFORE CUTTING EXISTING FIBER OPTIC CABLE AND REMOVING EXISTING JUNCTION BOX(ES). COMMUNICATION SHALL BE REESTABLISHED WITHIN 24-HOURS AFTER CUTTING THE FIBER TO PERFORM CUT OVER TO NEW FIBER.

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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

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE:	August 2021	REVIEWED BY:	G. G. Murr, Jr.
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

REVISIONS	INIT.	DATE

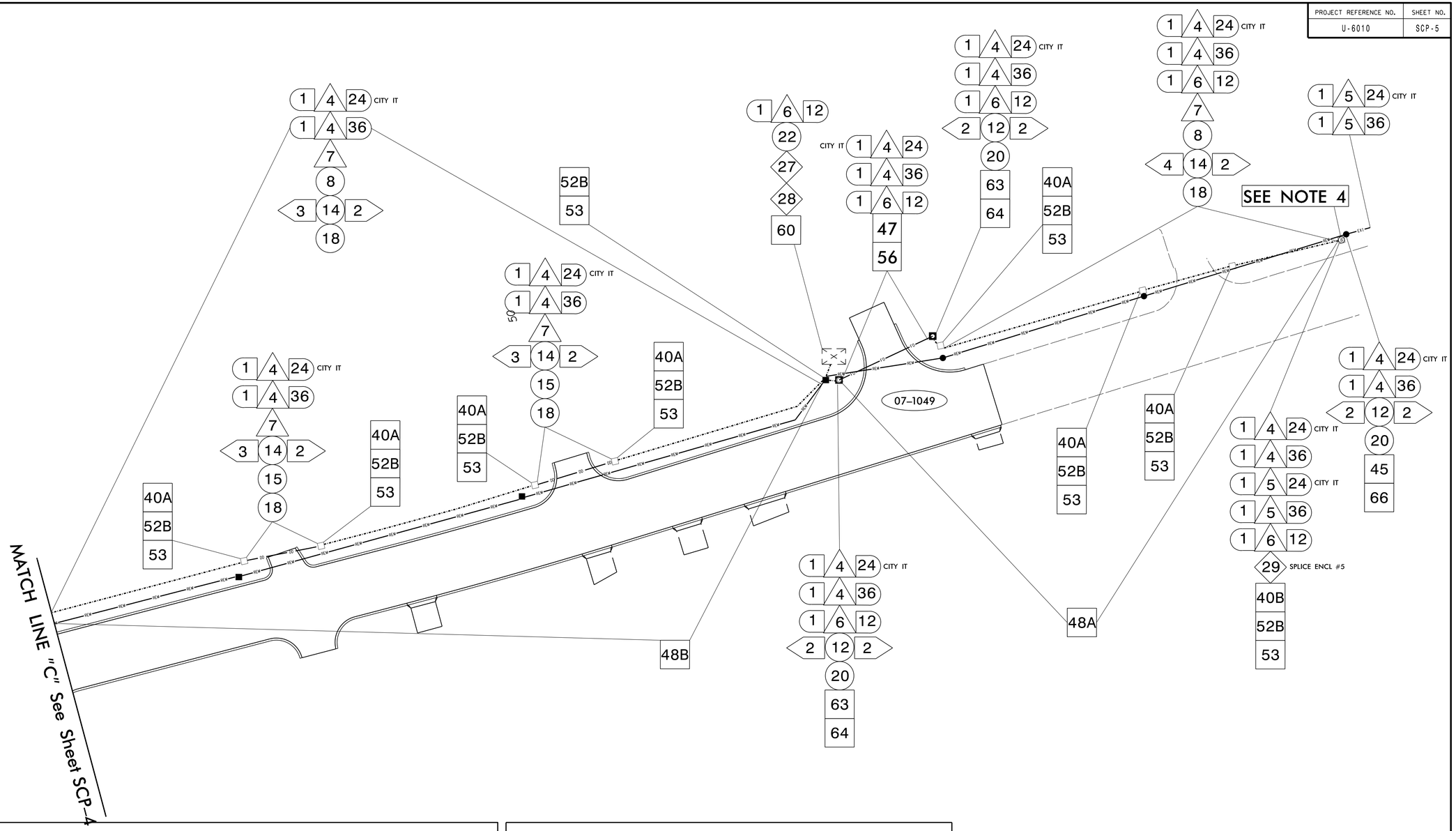
SCALE 0 50 1"=50'

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

SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-5



NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSEMS MANAGER AT 336-513-5420 TO ARRANGE FOR THE CITY TO PROGRAM THE NEW ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBSET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC SYSTEMS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

NOTES CONTINUE:

3. SEAL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUCTION BOX/CABINET ENTRANCES.

4. ENSURE NEW CONDUIT/36-FIBER OPTIC TRUNK CABLE ARE INSTALLED ALONG THIS SECTION OF S. CHURCH STREET AND READY FOR SPLICING BEFORE CUTTING EXISTING FIBER OPTIC CABLE AND REMOVING EXISTING JUNCTION BOX(ES). COMMUNICATION SHALL BE REESTABLISHED WITHIN 24-HOURS AFTER CUTTING THE FIBER TO PERFORM CUT OVER TO NEW FIBER.

SEPI Engineering & Construction, Inc.
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: C-2197

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE: August 2021 | REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn | REVIEWED BY:

REVISIONS	INIT.	DATE

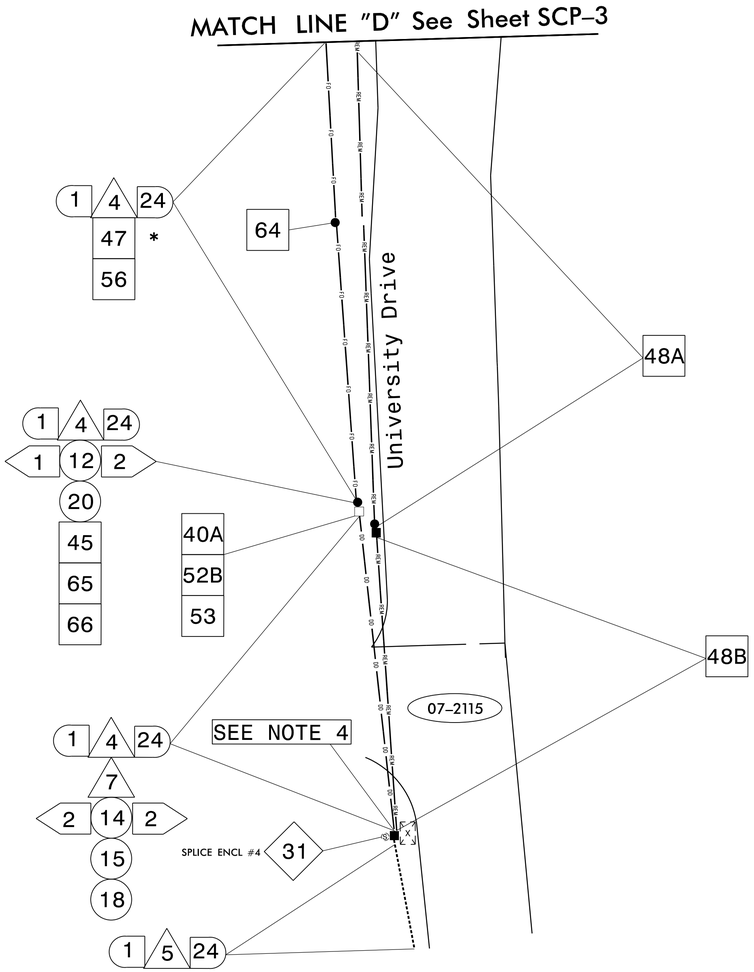
SCALE 0 50 1"=50'

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

SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-6



NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE BURLINGTON TRAFFIC SYSEMS MANAGER AT 336-513-5420 TO ARRANGE FOR THE CITY TO PROGRAM THE NEW ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBSET MASK AND VLAN ID INFORMATION. NOTIFY THE TRAFFIC SYSTEMS MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

NOTES CONTINUE:

3. SEAL CONDUIT ENDS WITH MECHANICAL SEALING DEVICES AT ALL JUCTION BOX/CABINET ENTRANCES.

4. ENSURE NEW CONDUIT/36-FIBER OPTIC TRUNK CABLE ARE INSTALLED ALONG THIS SECTION OF S. CHURCH STREET AND READY FOR SPLICING BEFORE CUTTING EXISTING FIBER OPTIC CABLE AND REMOVING EXISTING JUNCTION BOX(ES). COMMUNICATION SHALL BE REESTABLISHED WITHIN 24-HOURS AFTER CUTTING THE FIBER TO PERFORM CUT OVER TO NEW FIBER.

* ALL NCDOT ATTACHMENT POINTS ARE 40" BELOW POWER FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

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COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE: August 2021 | REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn | REVIEWED BY:

SCALE 0 50 1"=50'

REVISIONS	INIT.	DATE

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

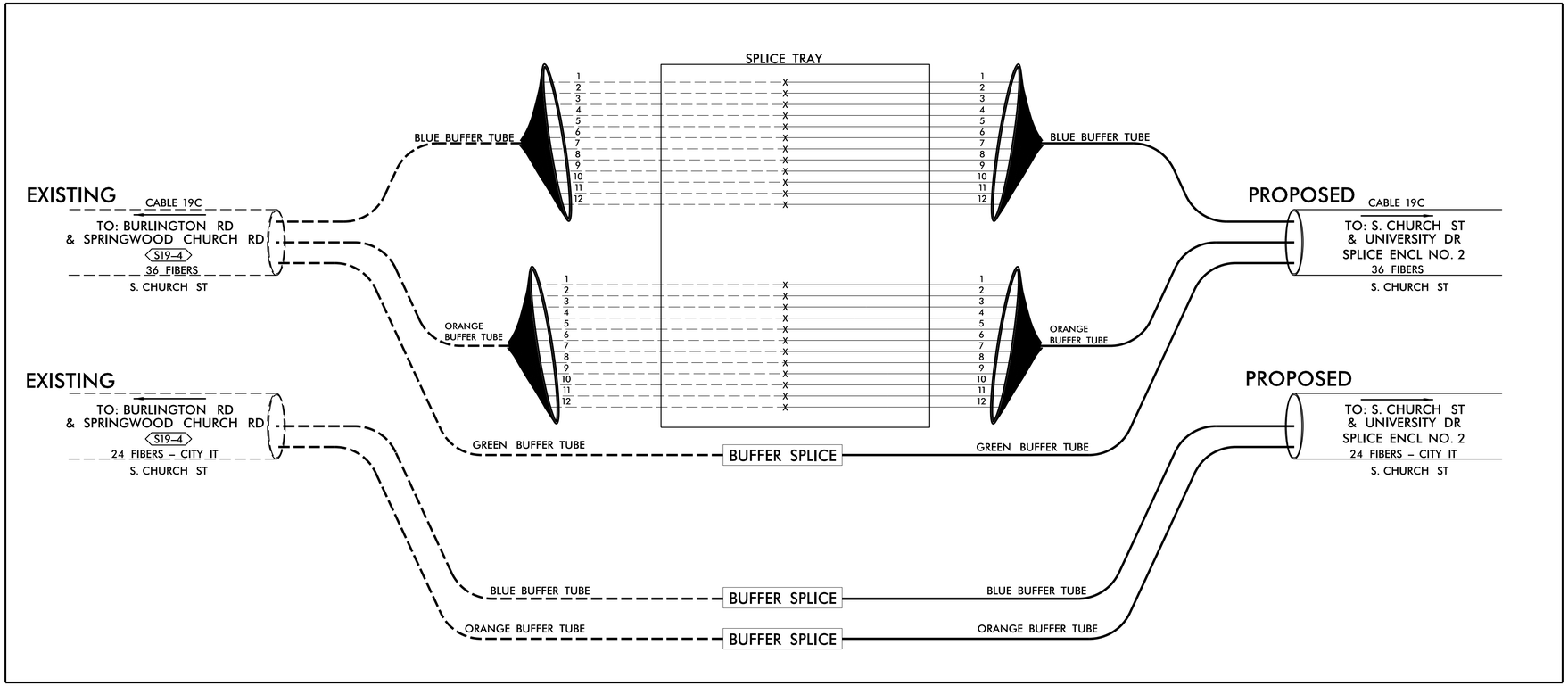
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-7

SPLICE ENCLOSURE NO. 1

S. CHURCH ST WEST OF UNIVERSITY DR
SEE: SCP–2



LEGEND

COLOR CODE TIA/EIA 598–B

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

X = FUSION SPLICE INDIVIDUAL FIBER

C = CAP AND SEAL

EXPRESS = EXPRESS ENTIRE BUFFER TUBE /FIBERS THROUGH WITHOUT CUTTING

BUFFER SPLICE = SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR

EXISTING = EXISTING BUFFER TUBE/FIBERS. DO NOT MODIFY EXISTING SPLICES OR EXPRESSED FIBERS.

NOTES

1. UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
2. UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE
3. EDGE SWITCH CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING THE PROPER TERMINATIONS
4. REFER TO NCDOT PROJECT U–6015 FOR MORE INFORMATION

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FIBER-OPTIC SPLICING DETAILS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE: August 2021 | REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn | REVIEWED BY:

SCALE: 0 N/A — NONE

REVISIONS	INIT.	DATE

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

SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-8

SPLICE ENCLOSURE NO. 2

S. CHURCH ST & UNIVERSITY DR

SEE: SCP–3

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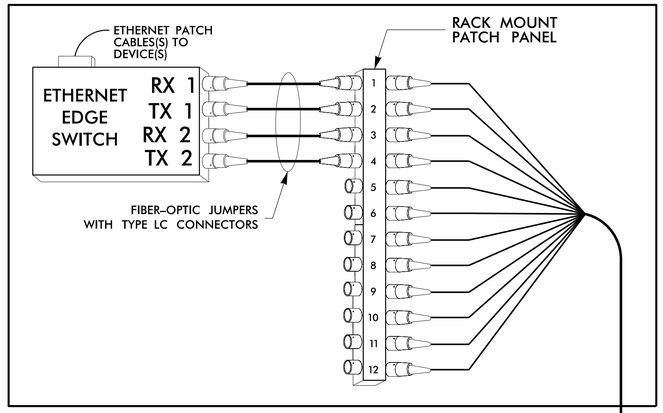
EQUIPMENT CABINET: 07–1996/CCTV 14



12 FIBER DROP CABLE

PROPOSED CABLE: 19B
TO: SPLICE ENCL #3
24 FIBERS
UNIVERSITY DR

PROPOSED CABLE: 18A
TO: UNIVERSITY DR & SHOPPING CENTER SPLICE ENCL #4
24 FIBERS
UNIVERSITY DR

BLUE BUFFER TUBE
ORANGE BUFFER TUBE

SPLICE TRAY

BLUE BUFFER TUBE
ORANGE BUFFER TUBE
GREEN BUFFER TUBE
BLUE BUFFER TUBE
ORANGE BUFFER TUBE

EXPRESS
EXPRESS
EXPRESS
EXPRESS
EXPRESS
EXPRESS

PROPOSED CABLE 19A
TO: S CHURCH ST
EAST OF WESTBROOK AVE
SPLICE ENCL #5
36 FIBERS
S. CHURCH ST

PROPOSED
TO: S CHURCH ST
EAST OF WESTBROOK AVE
S19–4
24 FIBERS – CITY IT
S. CHURCH ST

PROPOSED CABLE 19C
TO: S. CHURCH ST
WEST OF UNIVERSITY DR
SPLICE ENCL NO. 1
36 FIBERS
S. CHURCH ST

PROPOSED
TO: S. CHURCH ST
& UNIVERSITY DR
SPLICE ENCL NO. 2
24 FIBERS – CITY IT
S. CHURCH ST

LEGEND

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FIBER-OPTIC SPLICING DETAILS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE: August 2021 | REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn | REVIEWED BY:

SCALE 0 N/A NONE

REVISIONS	INIT.	DATE

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

SIGNATURE DATE

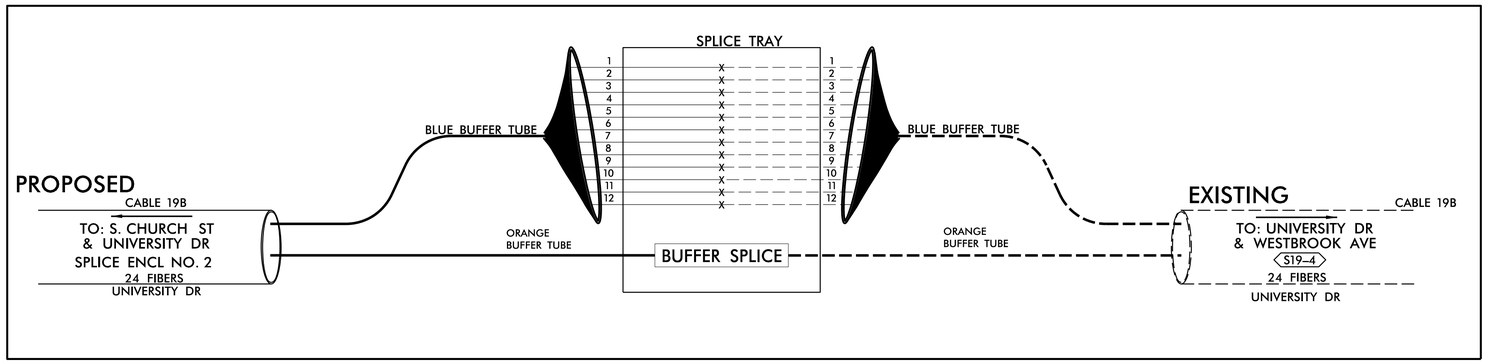
CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-9

SPLICE ENCLOSURE NO. 3

UNIVERSITY DR

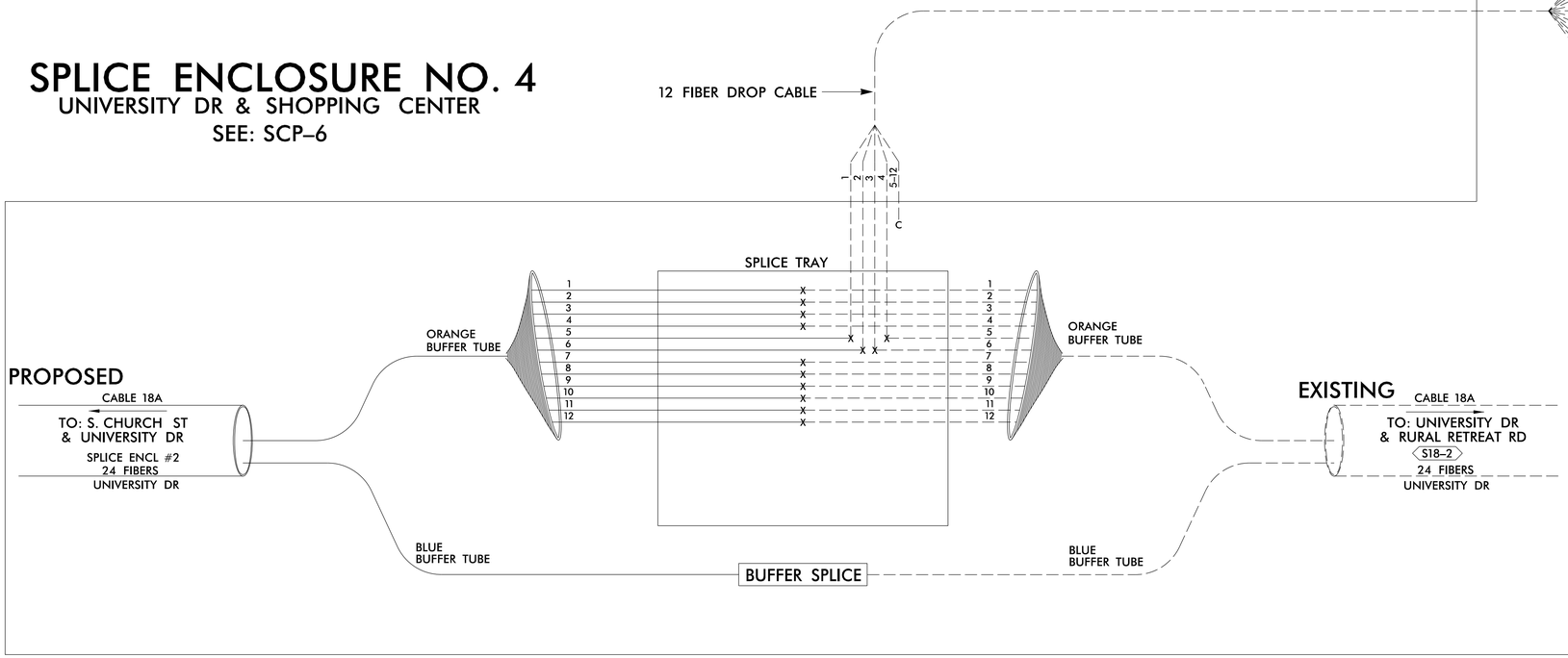
SEE: SCP–3



SPLICE ENCLOSURE NO. 4

UNIVERSITY DR & SHOPPING CENTER

SEE: SCP–6



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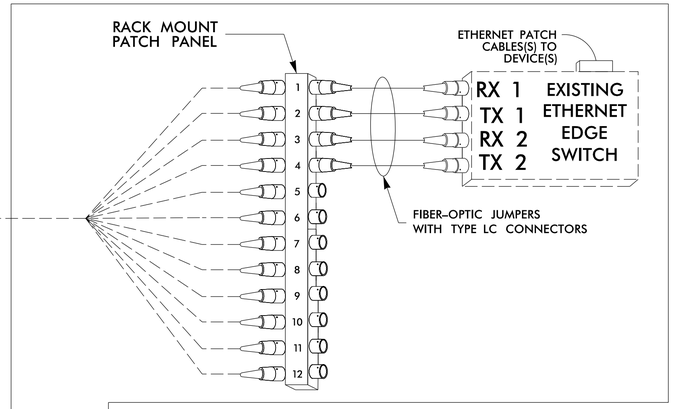

LEGEND

COLOR CODE TIA/EIA 598–B

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FIBER-OPTIC SPLICING DETAILS

DIVISION 7 | ALAMANCE COUNTY | BURLINGTON & GRAHAM

PLAN DATE:	August 2021	REVIEWED BY:	G. G. Murr, Jr.
PREPARED BY:	B.E. Wynn	REVIEWED BY:	

SCALE: 0 N/A NONE

REVISIONS	INIT.	DATE

SEAL

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

SIGNATURE DATE

CADD Filename:

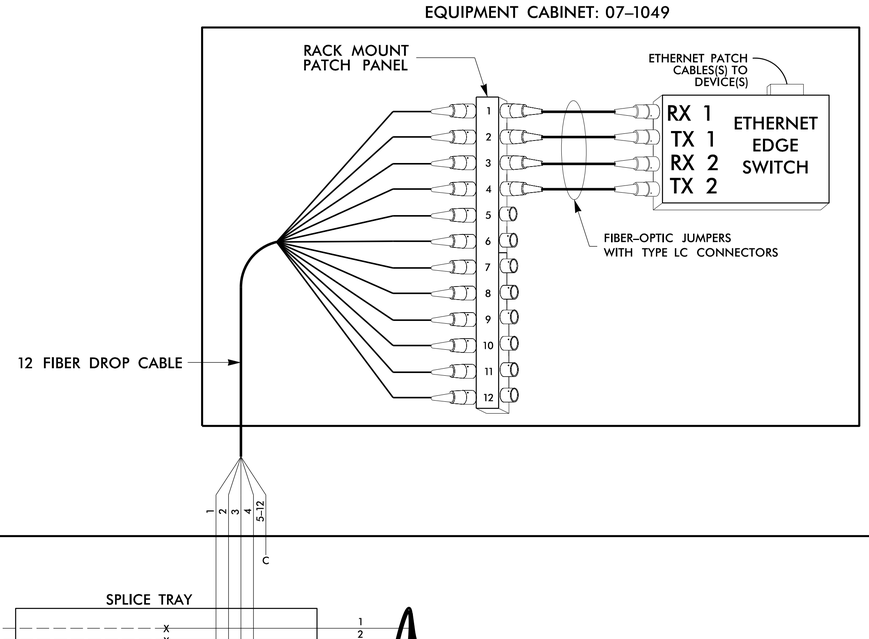
PROJECT REFERENCE NO.	SHEET NO.
U-6010	SCP-10

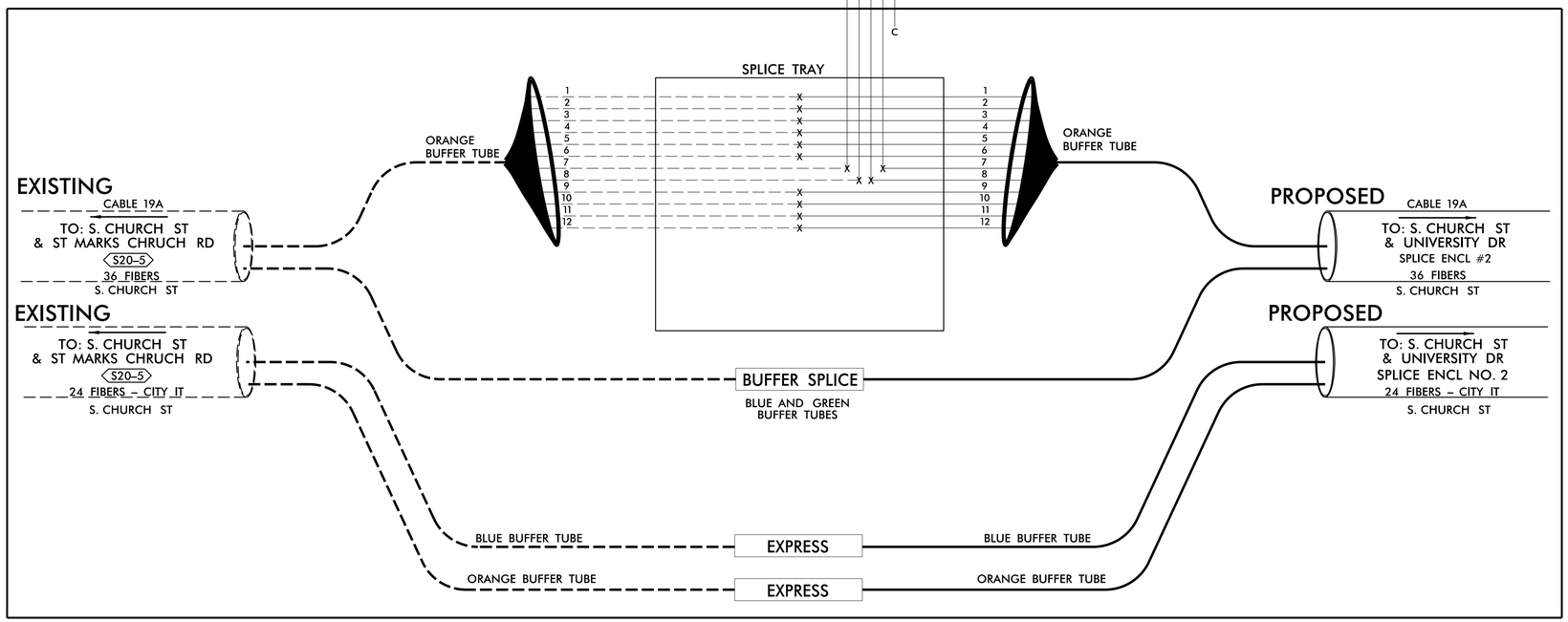
SPLICE ENCLOSURE NO. 5

S. CHURCH ST EAST OF WESTBROOK AVE

SEE: SCP–5

EQUIPMENT CABINET: 07–1049





LEGEND

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FIBER-OPTIC SPLICING DETAILS

DIVISION 7 ALAMANCE COUNTY BURLINGTON & GRAHAM

PLAN DATE: August 2021 REVIEWED BY: G. G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

SCALE 0 N/A NONE

REVISIONS	INIT.	DATE

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

SIGNATURE DATE

CADD Filename: