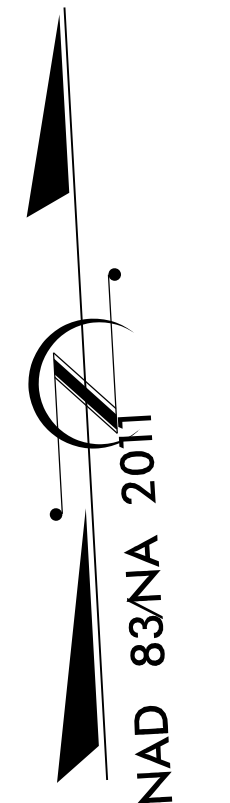
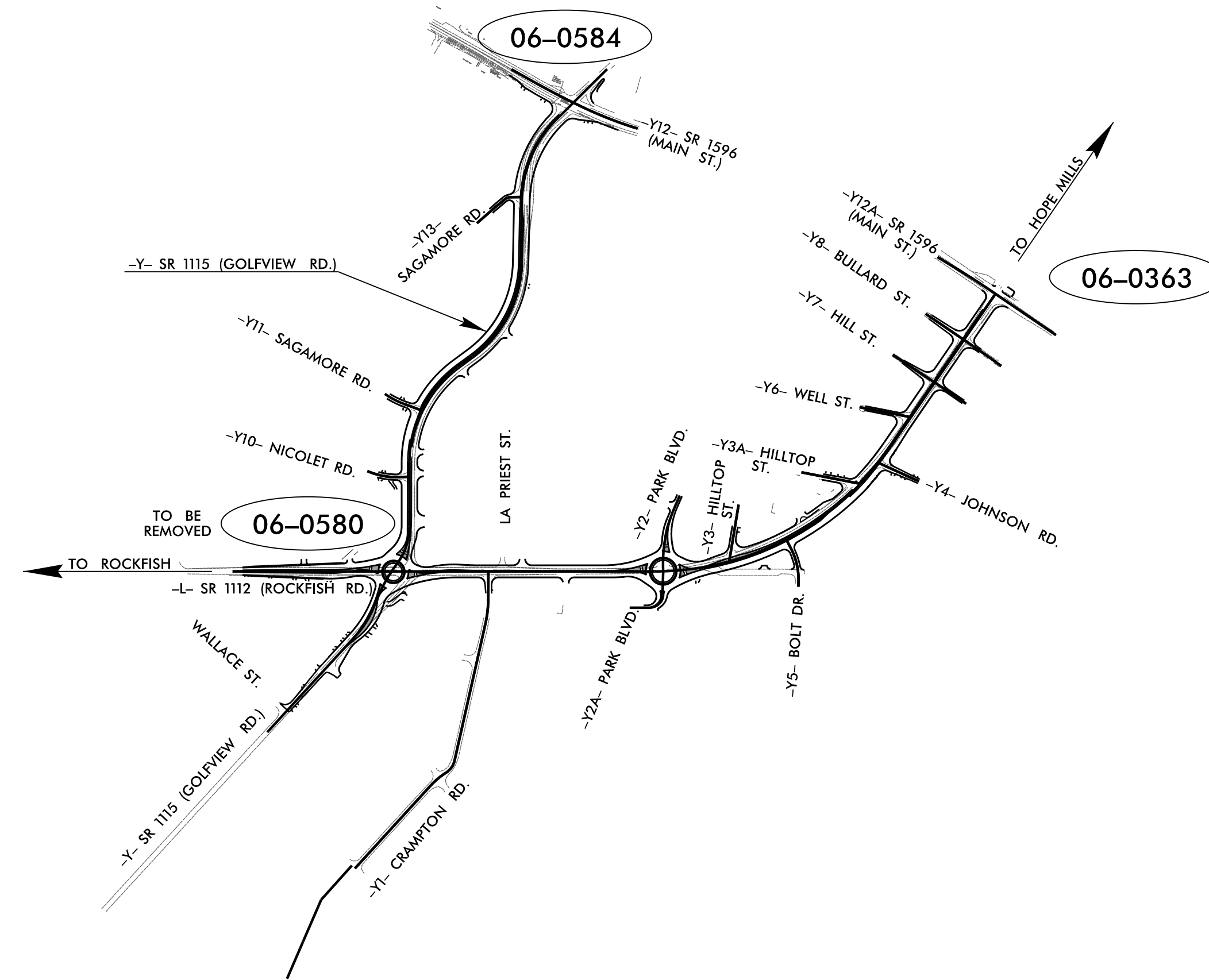
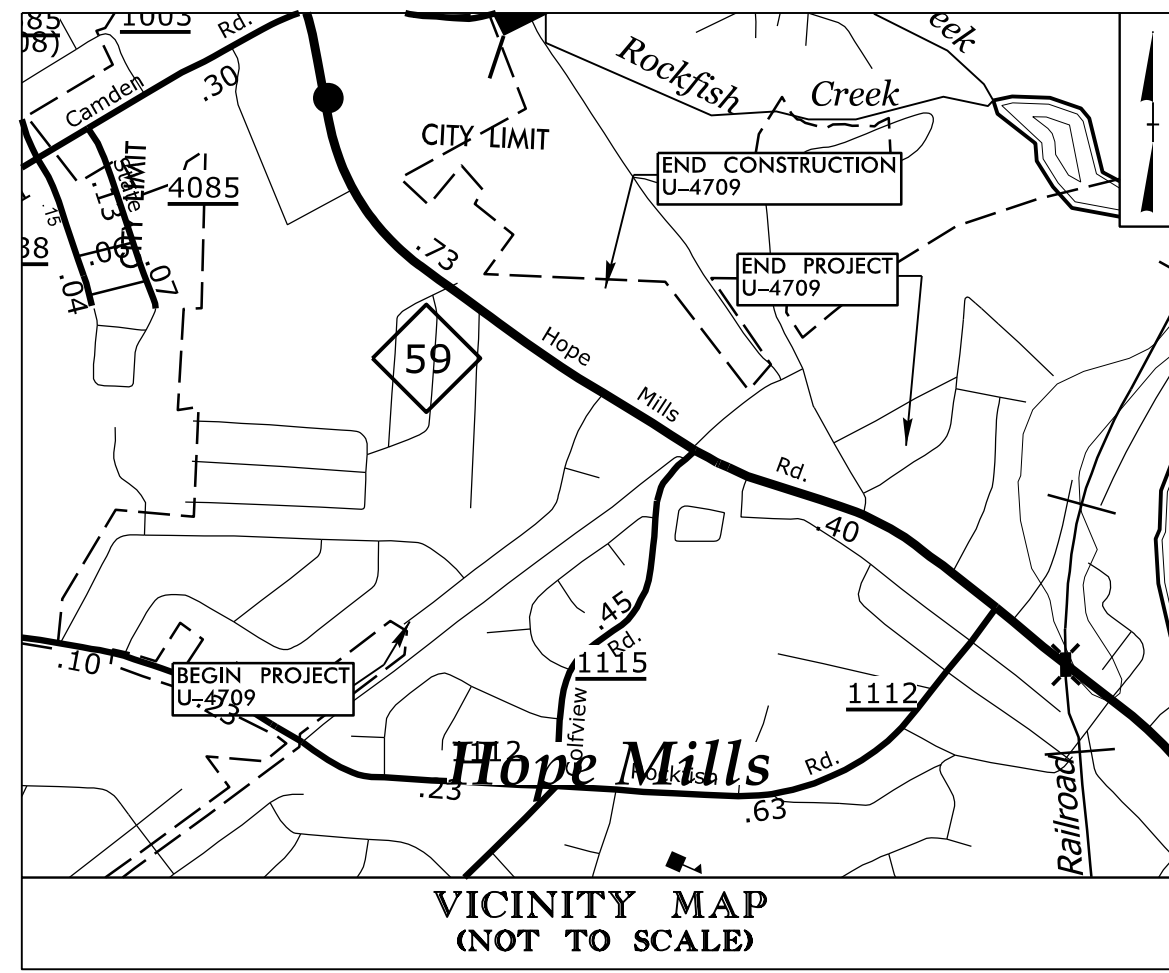


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Project No.	Sheet No.
U-4709	Sig. 1.0

TRAFFIC SIGNAL AND SIGNAL COMMUNICATIONS PLAN
CUMBERLAND COUNTY

LOCATION: SR 1112 (ROCKFISH ROAD) FROM WEST OF SR 1115 (GOLFVIEW ROAD)
TO SR 1596 (MAIN STREET) AND SR 1115 (GOLFVIEW ROAD)
FROM SR 1112 (ROCKFISH ROAD) TO SR 1596 (MAIN STREET)
TYPE OF WORK: TRAFFIC SIGNALS AND TRAFFIC SIGNAL COMMUNICATIONS



CONTRACT: TIP PROJECT: U-4709

CONTRACT:

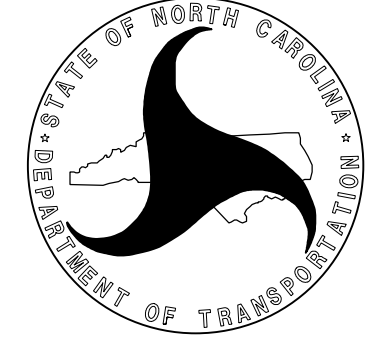
INDEX OF PLANS		
SHEET NUMBER	SIGNAL INV. NUMBER	LOCATION / DESCRIPTION
Sig. 1.0	-	Title Sheet
Sig. 2.0 - Sig. 3.1	06-0580	SR 1112 (Rockfish Road) at SR 1115 (Golfview Road)
Sig. 4.0 - Sig. 5.2	06-0363	NC 59 (N. Main Street) at SR 1112 (Rockfish Road)
Sig. 6.0 - Sig. 7.2	06-0584	NC 59 (N. Main Street) at SR 1115 (Golfview Road)
MIA - M9	-	NCDOT 2024 Metal Pole Standard Drawing Sheets
SCPI - SCP10	-	Signal Communications Plans

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453

TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS UNIT
Contacts:
Zachary M. Little, P.E. - Eastern Region Signals Engineer
Keith M. Mims, P.E. - Signal Equipment Design Engineer
Gregg Green - Signal Communications Project Engineer

Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and Standard Specifications for Roads and Structures" dated January 2024

Prepared for the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION
Transportation Systems Management & Operations Unit



1/11/2024 1:11:09 PM U:\4709\sig-fsh_2022xxxx.dgn USER:deFault

PHASING DIAGRAM

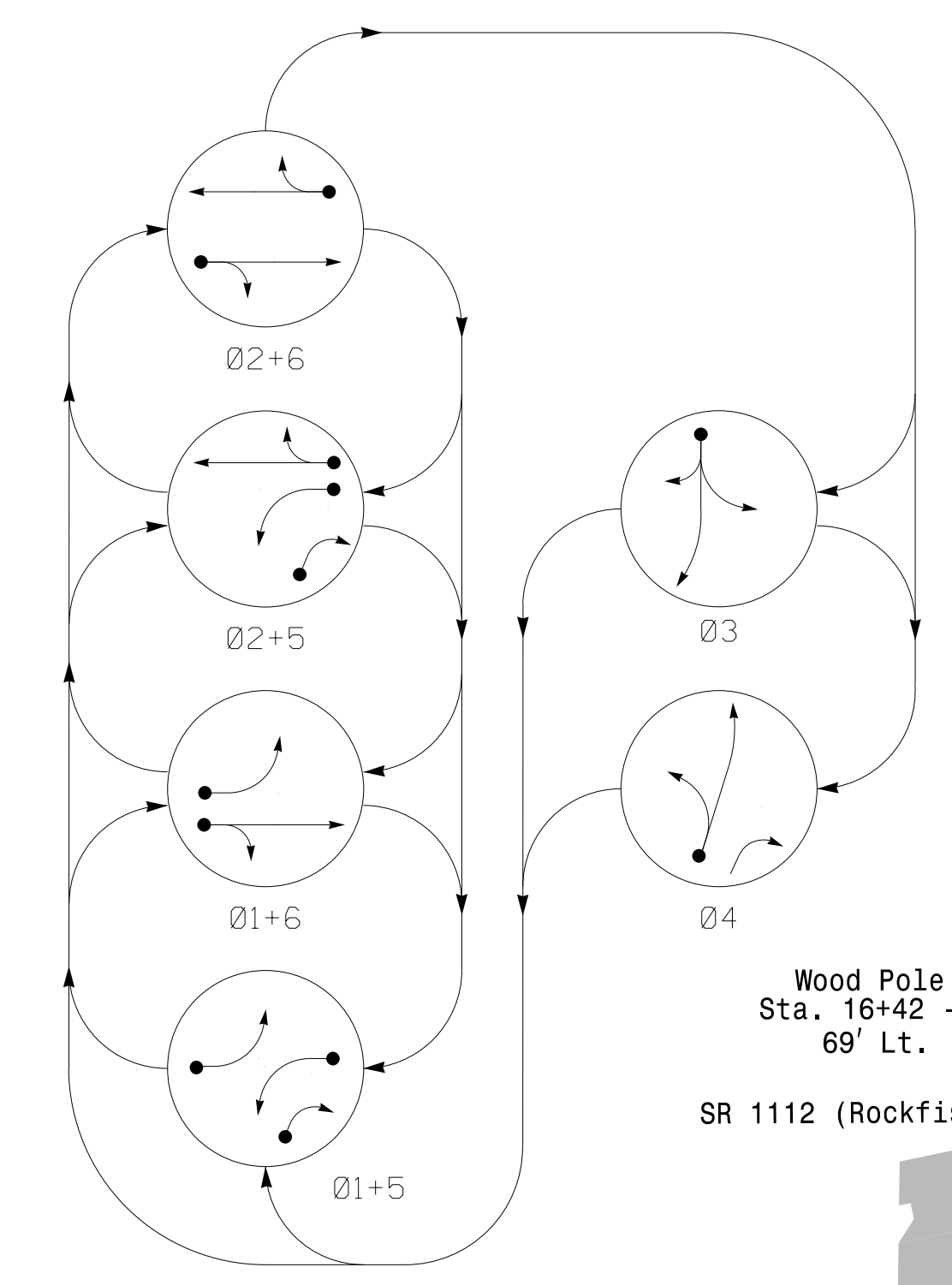
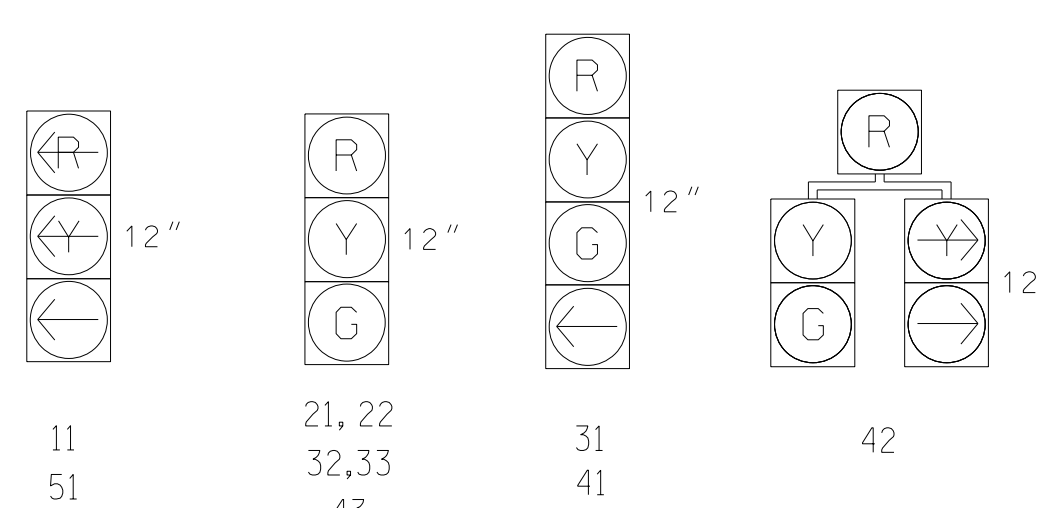


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	01+5	02+5	03	04	05	06
11	←	←	←	←	←	←
21,22	R	R	G	G	R	R
31	R	R	R	R	G	R
32,33	R	R	R	R	G	R
41	R	R	R	R	G	R
42	←	←	←	←	←	←
43	R	R	R	R	R	G
51	←	←	←	←	←	←
61,62	R	G	R	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

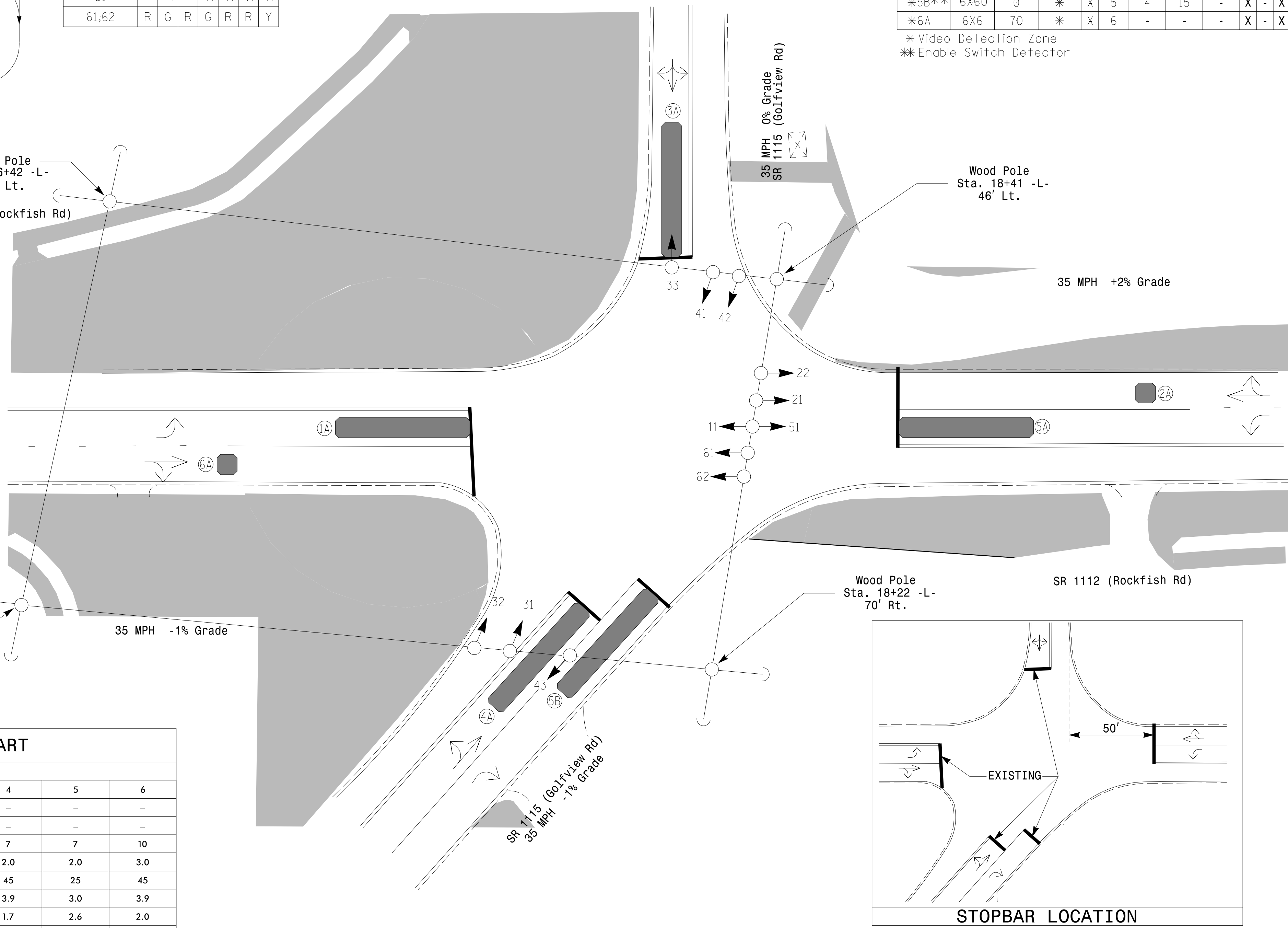
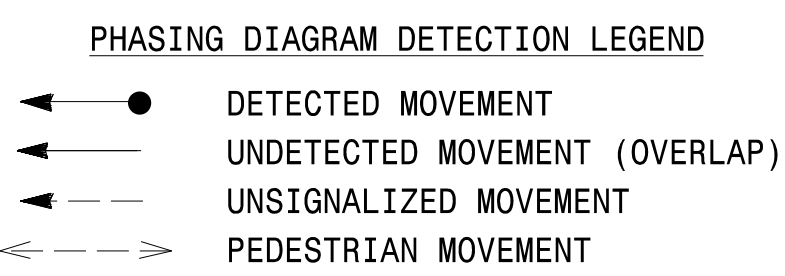
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING							
					CALL PHASE	SWITCH PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN	NEW CARD
*1A	6X60	0	*	X	1	-	-	-	X	-	X	-
*2A	6X6	70	*	X	2	-	-	-	X	-	X	-
*3A	6X60	0	*	X	3	-	-	-	X	-	X	-
*4A	6X60	0	*	X	4	-	-	-	X	-	X	-
*5A	6X60	0	*	X	5	-	-	-	X	-	X	-
*5B**	6X60	0	*	X	5	4	15	-	X	-	X	-
*6A	6X6	70	*	X	6	-	-	-	X	-	X	-

* Video Detection Zone
** Enable Switch Detector

6 Phase Fully Actuated System #D06-03_Hope Mills

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions in order to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Install new controller in existing cabinet.

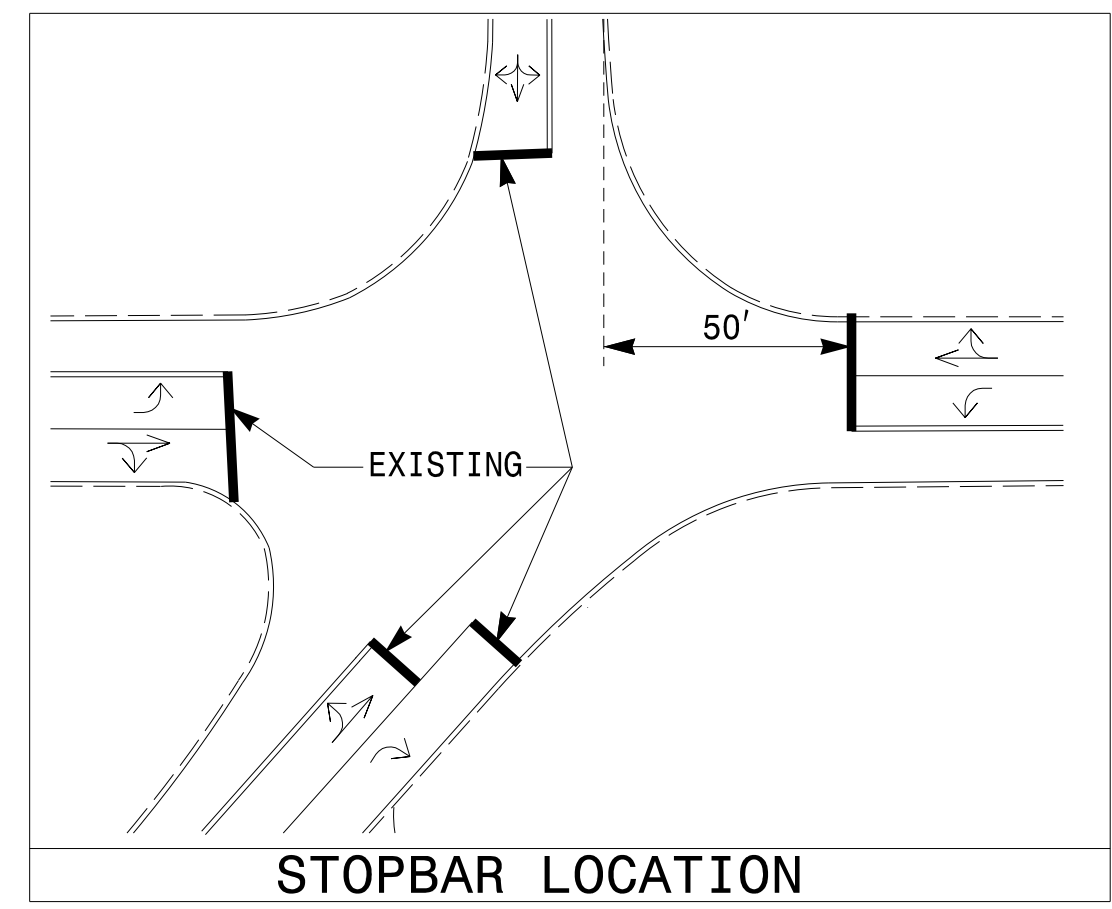
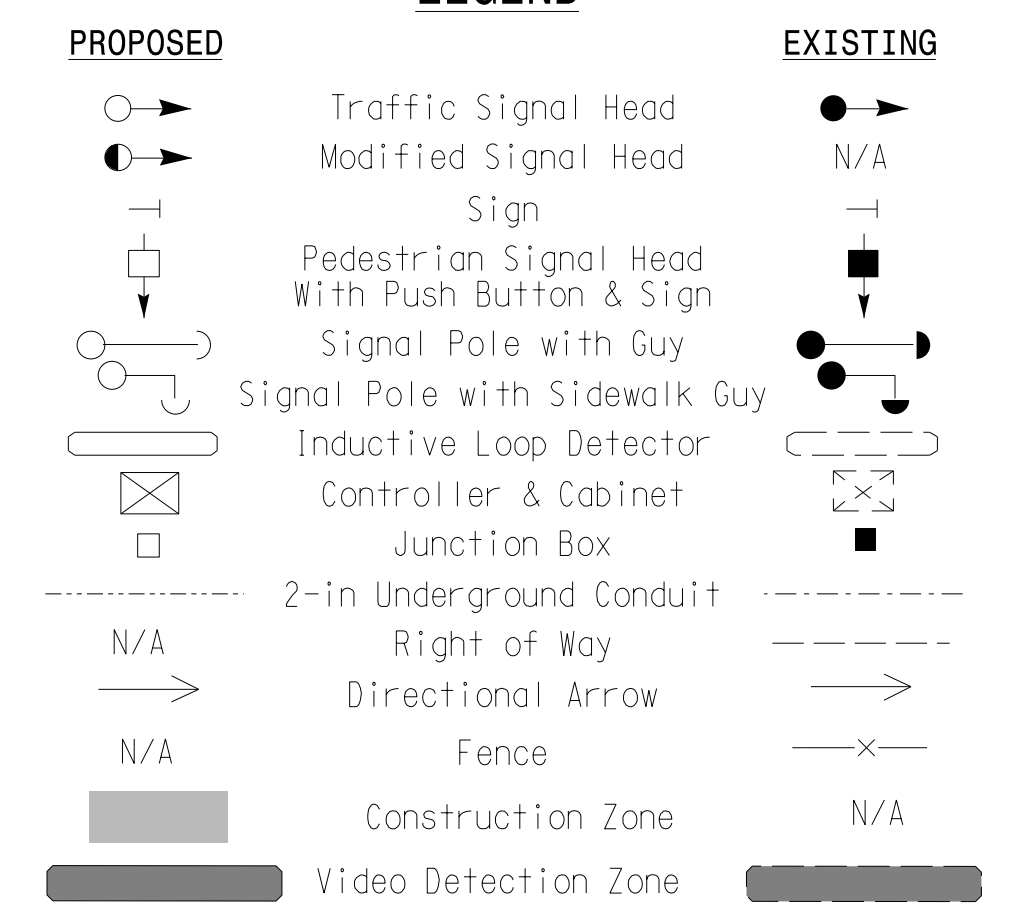


MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-
Min Green *	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max 1 *	25	45	45	45	25	45
Yellow Change	3.0	3.7	3.8	3.9	3.0	3.9
Red Clear	2.4	1.9	2.0	1.7	2.6	2.0
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage 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



Temporary Design 1 (TMP Phase 1)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SR 1112 (Rockfish Road) at SR 1115 (Golfview Road)

Division 06 Cumberland County Hope Mills

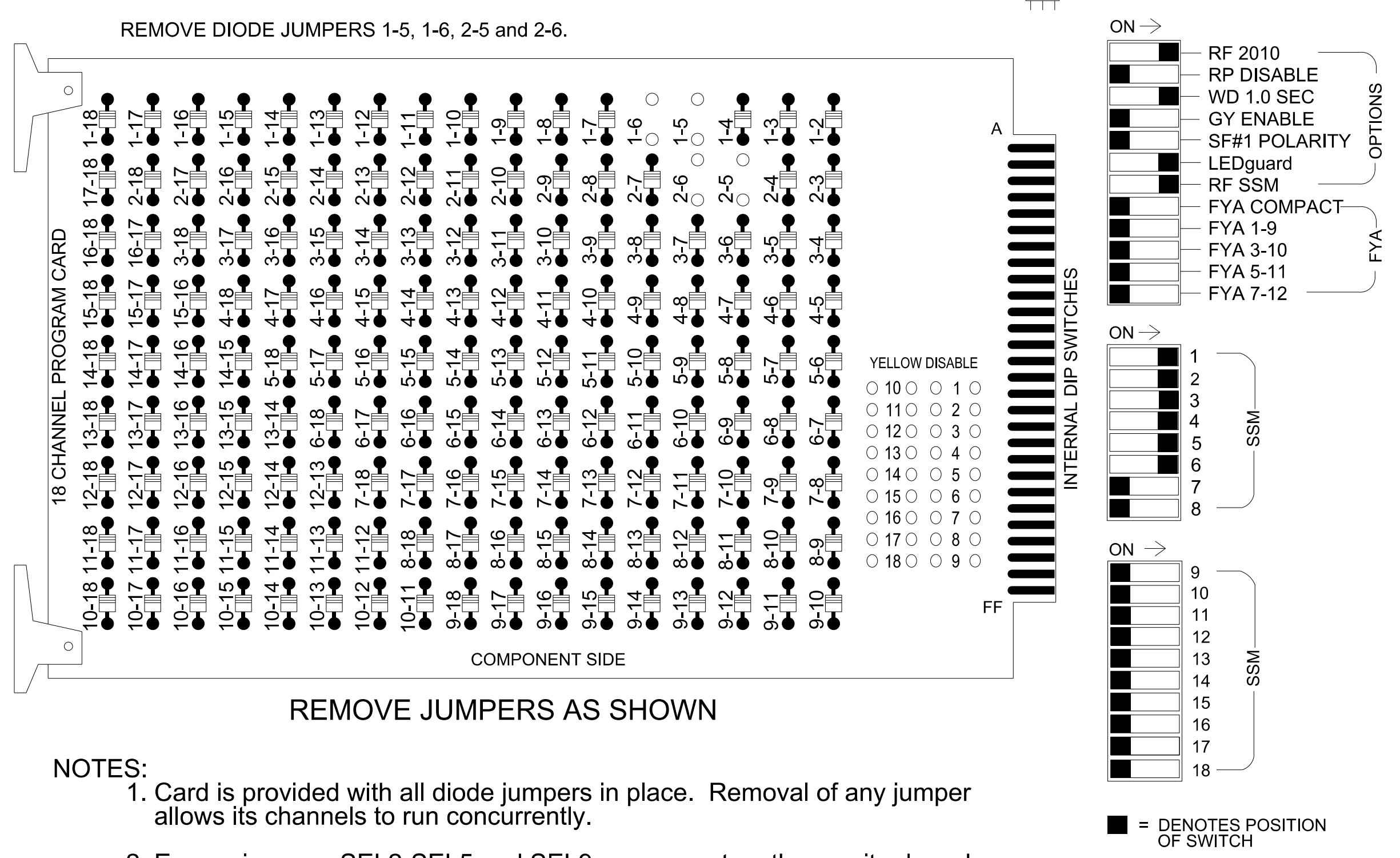
PLAN DATE: May 2024 REVIEWED BY: G.G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

11/12/2024 4:47:09 PM s:\g_dsn_060580T1.dgn USER: gmfout

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....12
 Load Switches Used.....S1, S2, S4, S5, S7, S8
 Phases Used.....1, 2, 3, 4, 5, 6
 OverlapsNONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	NU	31	32,33	41	42,43	NU	42	51	61,62	NU
RED		128		116	116	101	101				134	
YELLOW		129		117	117	102	102				135	
GREEN		130		118	118	103	103				136	
RED ARROW	125									131		
YELLOW ARROW	126								132	132		
GREEN ARROW	127			118		103			133	133		

NU = Not Used

VEHICLE DETECTOR PROGRAMMING FOR ZONE 5B SWITCH PHASE

(program controller as shown)

Front Panel
Main Menu >Controller >Detector >Veh Det Plans

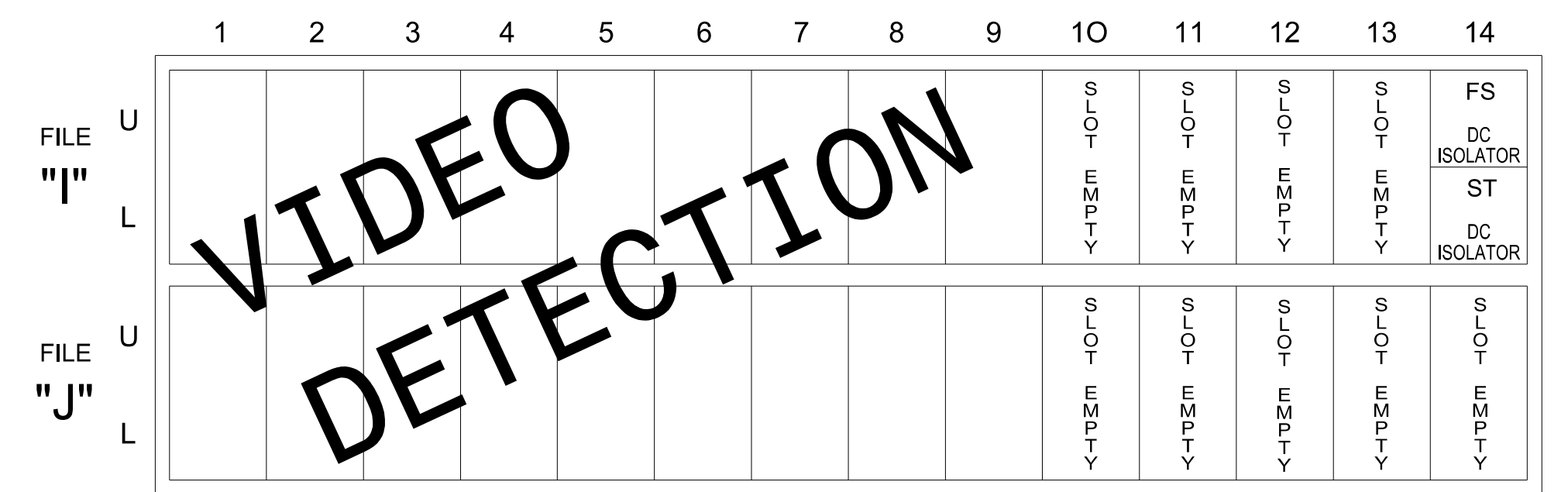
Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

Plan 1

Detector	Call Phase	Call Overlap	Call Ped	Switch Phase	Delay
*	5	-	-	4	15

* Program the detector used for detection zone 5B per this table.

INPUT FILE POSITION LAYOUT (front view)



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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

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

11/12/2024
U-4709_060580T1.dwg
USER: dbrout

Electrical Detail
Temporary Design 1 (TMP Phase I)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared in the Offices of:

Division 6 Cumberland County Hope Mills

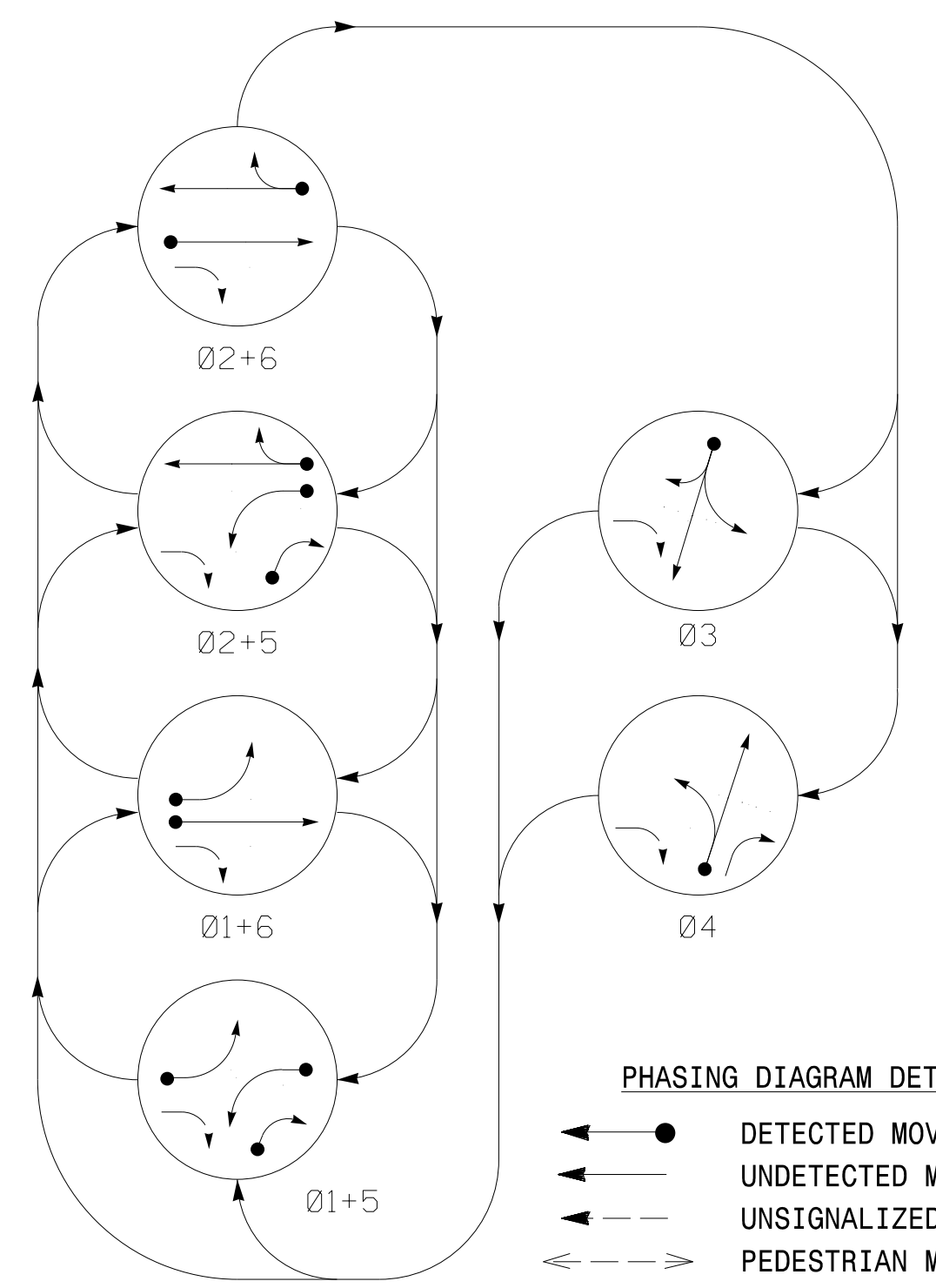
PLAN DATE: May 2024 REVIEWED BY:

PREPARED BY: J.T.Rowe REVIEWED BY: G.G. Murr, Jr.

750 N. Greenfield Pkwy, Garner, NC 27529

Signed by: *John T. Rowe, Jr.*
 20F16AFF6004DR DATE: 11-12-2024
 SIG. INVENTORY NO. 06-0580T1

PHASING DIAGRAM



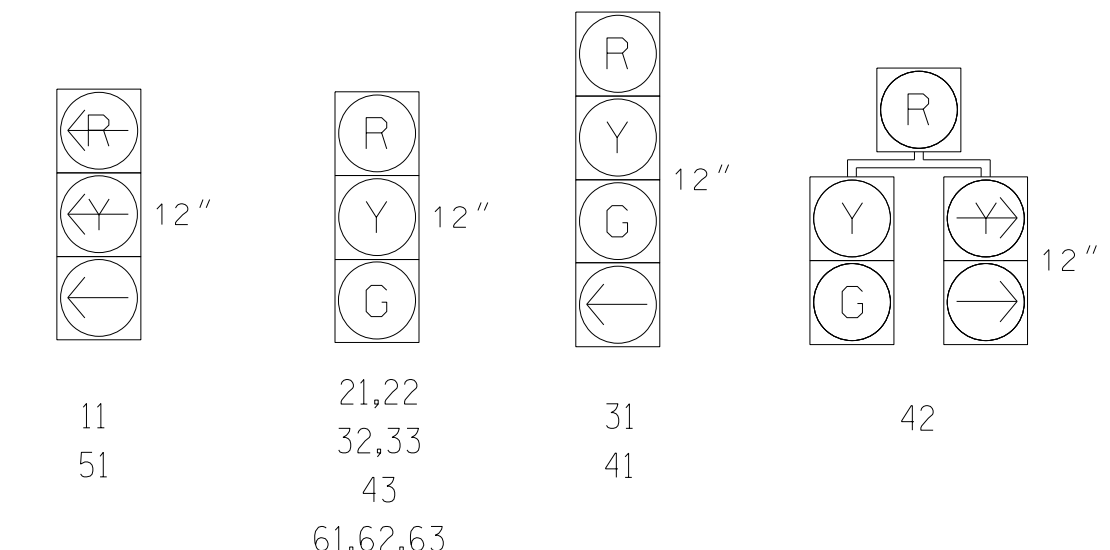
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE						FLASH
	01+5	01+6	02+5	02+6	03	04	
11	←	←	←	←	←	←	
21,22	R	R	G	G	R	R	Y
31	R	R	R	R	G	R	R
32,33	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
43	R	R	R	R	R	G	R
51	←	←	←	←	←	←	
61,62,63	R	G	R	G	R	R	Y

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



MAXTIME DETECTOR INSTALLATION CHART

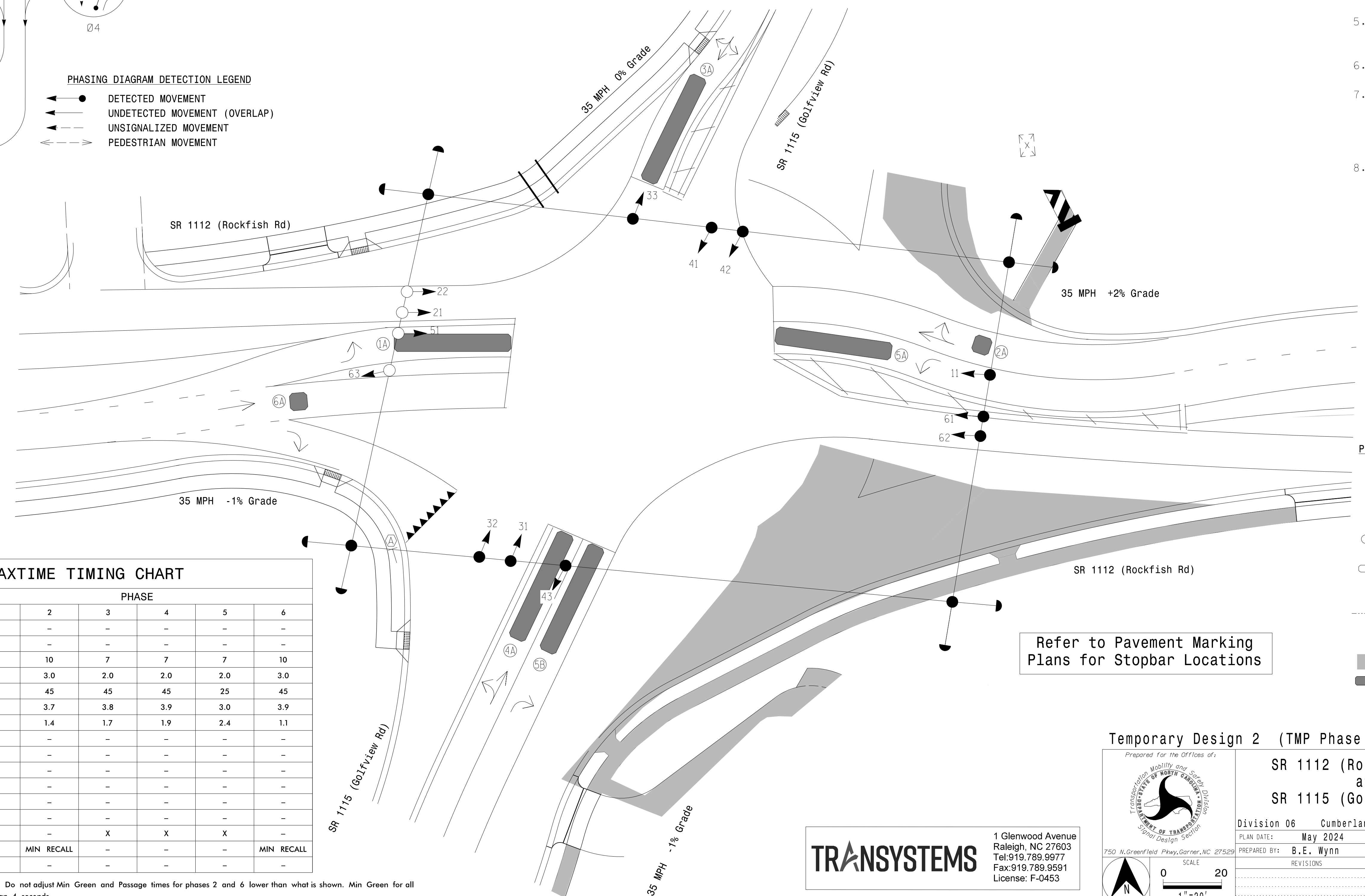
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING						
					CALL PHASE	SWITCH PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN NEW CARD
*1A	6X60	0	*	X	1	-	-	-	X	X	-
*2A	6X6	70	*	X	2	-	-	-	X	X	-
*3A	6X60	0	*	X	3	-	-	-	X	X	-
*4A	6X60	0	*	X	4	-	-	-	X	X	-
*5A	6X60	0	*	X	5	-	-	-	X	X	-
*5B**	6X60	0	*	X	5	4	15	-	X	X	-
*6A	6X6	70	*	X	6	-	-	-	X	X	-

* Video Detection Zone
** Enable Switch Detector

6 Phase Fully Actuated System #D06-03 Hope Mills

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Reposition existing signal heads numbered 11,31,32,33,41,42, 43,61 & 62.
- Set all detector units to presence mode.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

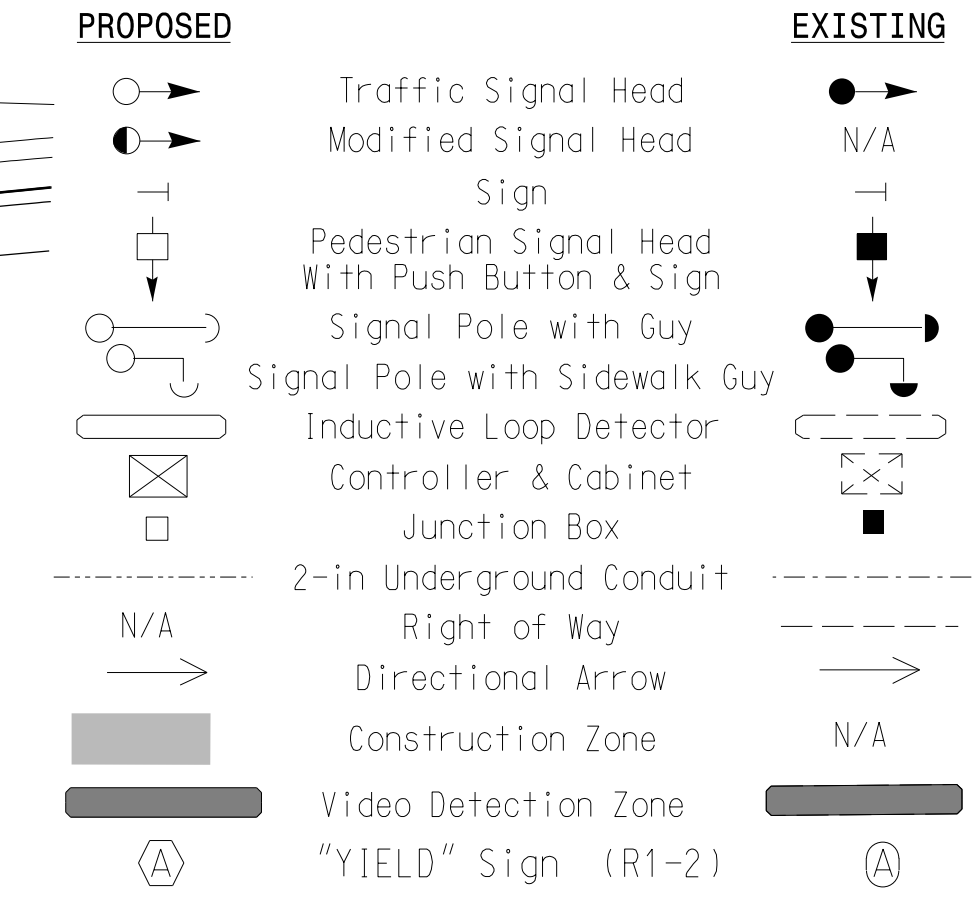


MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-
Min Green *	7	10	7	7	7	10
Passage *	1.0	3.0	2.0	2.0	2.0	3.0
Max I *	25	45	45	45	25	45
Yellow Change	3.0	3.7	3.8	3.9	3.0	3.9
Red Clear	1.9	1.4	1.7	1.9	2.4	1.1
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage 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



Refer to Pavement Marking Plans for Stopbar Locations

Temporary Design 2 (TMP Phase II)

Prepared for the Offices of:

SR 1112 (Rockfish Road) at SR 1115 (Golfview Road)

Division 06 Cumberland County Hope Mills

PLAN DATE: May 2024 REVIEWED BY: G.G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS: INIT. DATE

Signed by: *Bene M. Murr, Jr.*

SCALE: 0 20 1"=20'

SEAL: STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14543

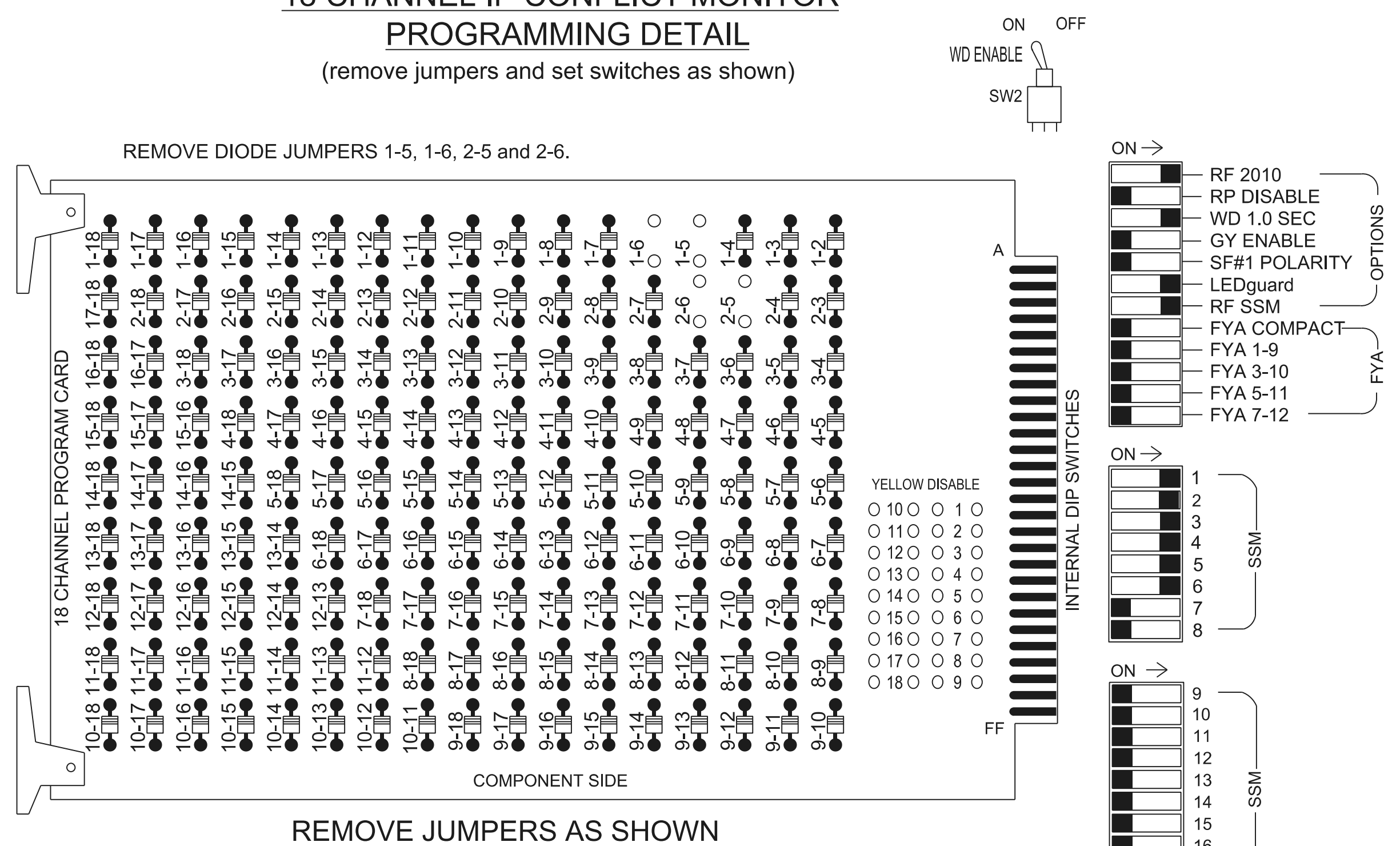
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 06-058012

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- NOTES:
1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 3. Ensure that the 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 plan.
2. Program controller to start up in phase 2 Green No Walk and 6 Green No 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 D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....12
 Load Switches Used.....S1, S2, S4, S5, S7, S8
 Phases Used.....1, 2, 3, 4, 5, 6
 OverlapsNONE

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	11	21,22	NU	31	32,33	41	42,43	NU	42	51	61,62,63	NU
RED		128		116	116	101	101				134	
YELLOW		129		117	117	102	102				135	
GREEN		130		118	118	103	103				136	
RED ARROW	125									131		
YELLOW ARROW	126								132	132		
GREEN ARROW	127			118		103			133	133		

NU = Not Used

VEHICLE DETECTOR PROGRAMMING FOR ZONE 5B SWITCH PHASE

(program controller as shown)

Front Panel
 Main Menu >Controller >Detector >Veh Det Plans

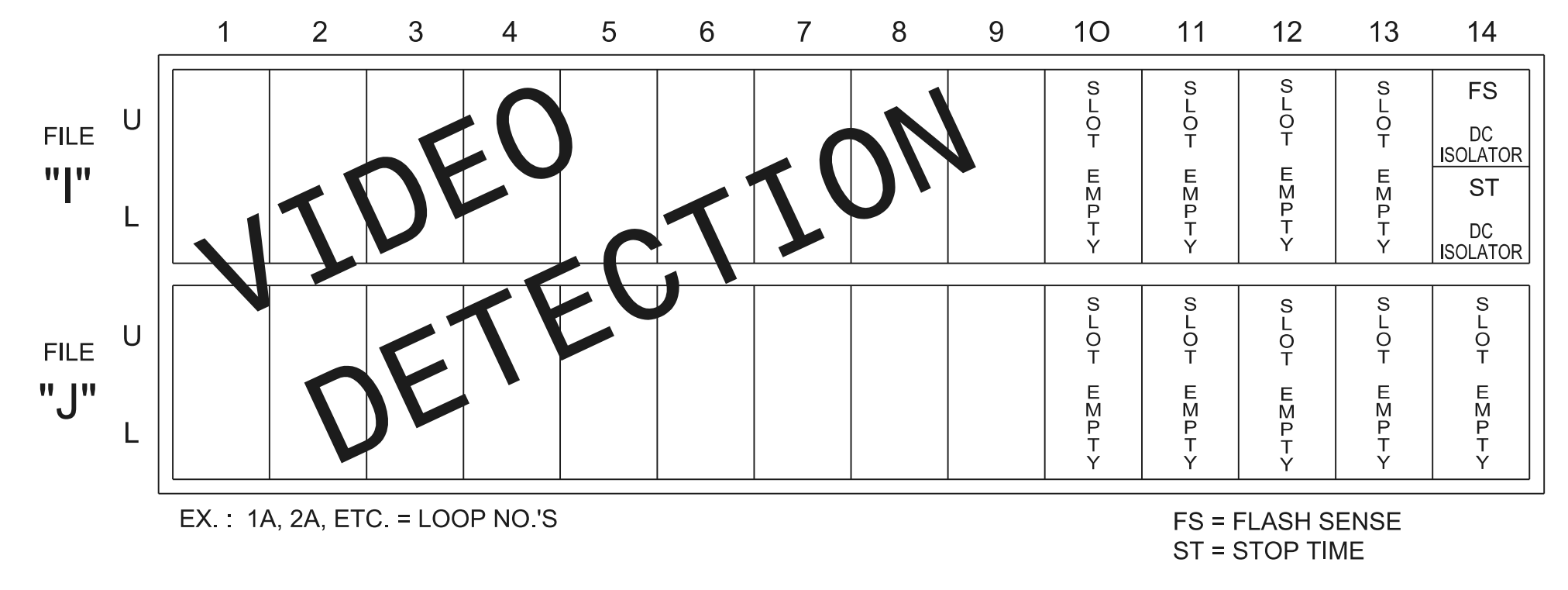
Web Interface
 Home >Controller >Detector Configuration >Vehicle Detectors

Plan 1

Detector	Call Phase	Call Overlap	Call Ped	Switch Phase	Delay
*	5	-	-	4	15

* Program the detector used for detection zone 5B per this table.

INPUT FILE POSITION LAYOUT (front view)



SPECIAL DETECTOR NOTE

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0580T2
 DESIGNED: May 2024
 SEALED: 11-12-2024
 REVISED: N/A

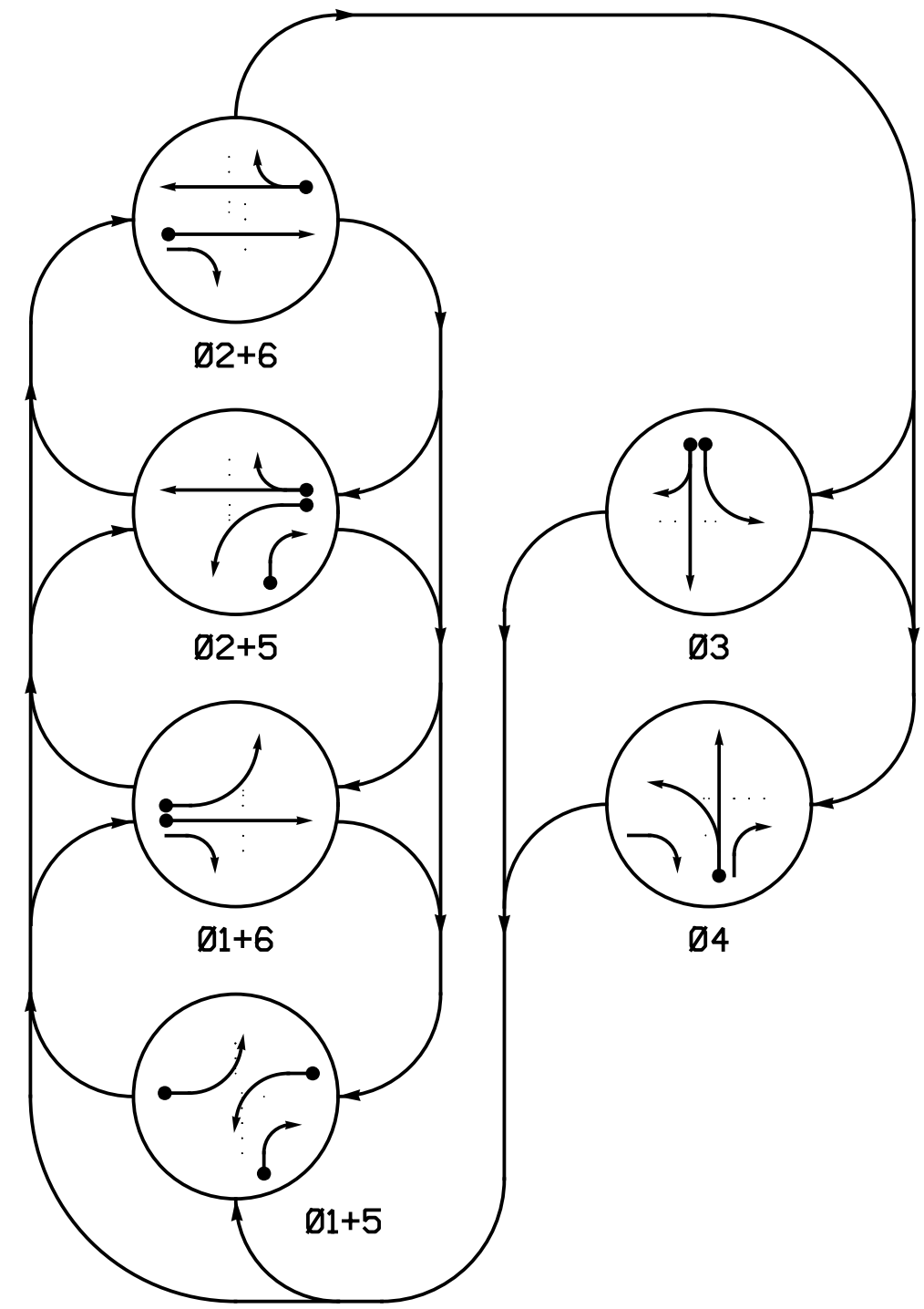
Electrical Detail
 Temporary Design 2 (TMP Phase II)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	SR 1112 (Rockfish Road) at SR 1115 (Golfview Road)		SEAL SEAL 008453 JOHN T. ROWE, JR. ENGINEER
	Division 6 PLAN DATE: May 2024 PREPARED BY: J.T.Rowe	Cumberland County Hope Mills REVIEWED BY: REVIEWED BY: G.G. Murr, Jr.	

1 Glenwood Avenue
 Raleigh, NC 27603
 Tel:919.789.9977
 Fax:919.789.9591
 License: F-0453

PHASING DIAGRAM



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

TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3	Ø 4
11			R	R	R	R
21,22	R	R	G	G	R	Y
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	R	G
42	R	R	R	R	R	G
51			R	R	R	R
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y

MAXTIME DETECTOR INSTALLATION CHART

LOOP/ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	INITIAL CALL	NEW CARD
1A	6X40	+5	2-4-2	-	1	-	-	X	X	X
2A	6X6	70	4	-	2	-	-	X	X	X
3A	6X40	0	2-4-2	-	3	3	-	X	X	X
3B	6X40	0	2-4-2	-	3	10	-	X	X	X
4A*	6X40	0	*	-	4	3	-	X	X	-
5A	6X40	0	2-4-2	-	5	3	-	X	X	X
5B*	6X40	0	*	-	5	15	-	X	X	-
6A	6X6	70	4	-	6	-	-	X	X	X

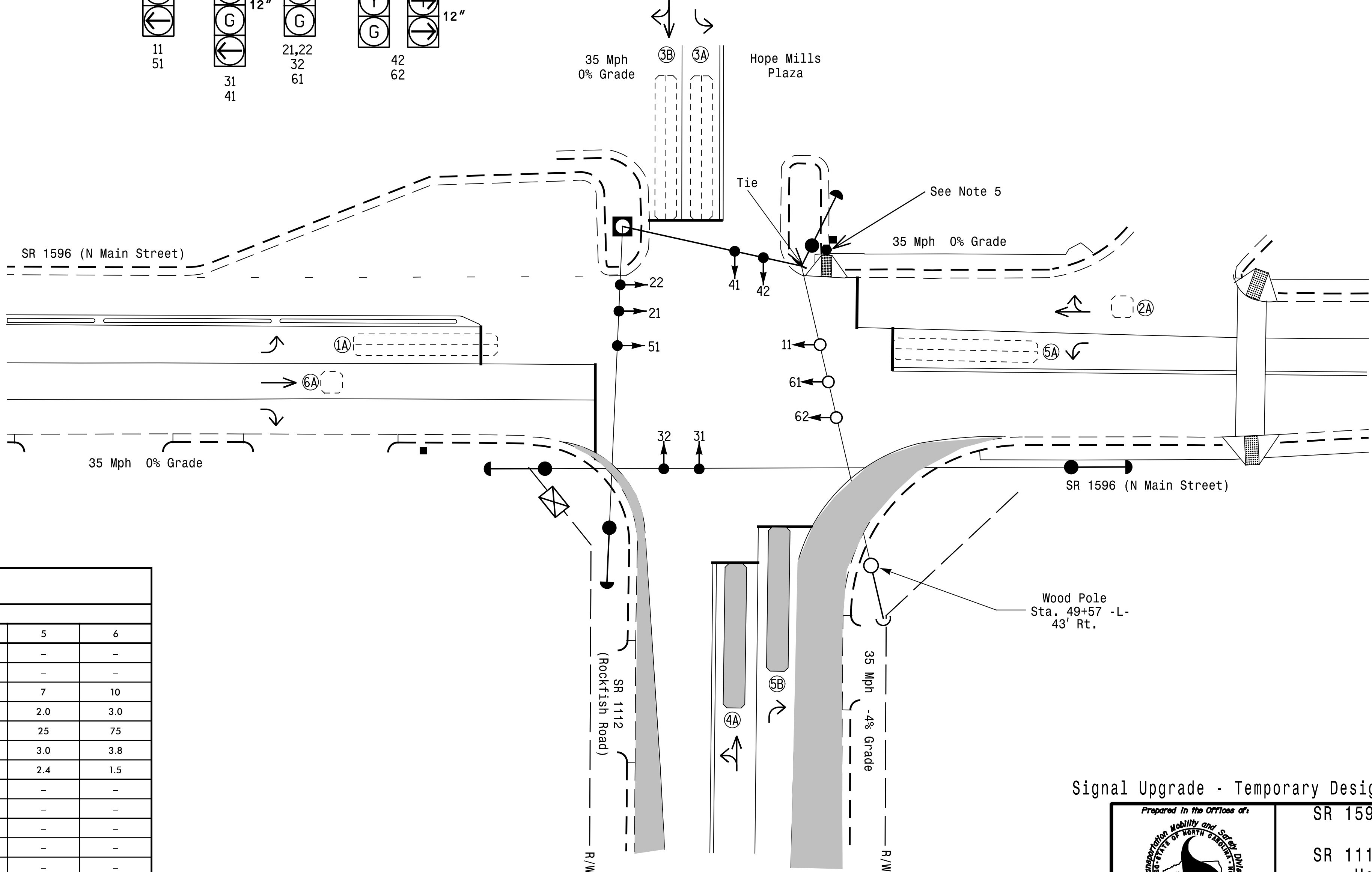
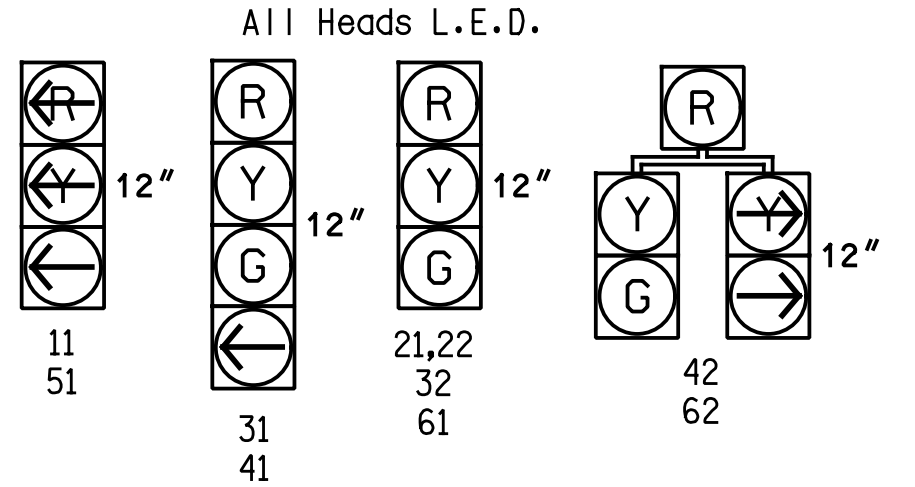
* Video Detection Zone

6 Phase Fully Actuated System #D06-03_Hope Mills

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Remove signal head P41 and pedestal.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- This intersection uses video detection. Install detectors according to manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

SIGNAL FACE I.D.



MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear *	-	-	-	-	-	-
Min Green *	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max I *	30	75	20	25	25	75
Yellow Change	3.0	3.8	3.8	4.1	3.0	3.8
Red Clear	2.6	1.5	1.7	1.6	2.4	1.5
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-

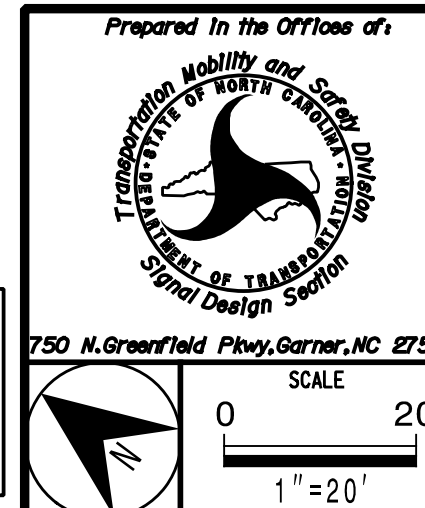
* These values may be field adjusted. Do not adjust Min Green and Passage times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING
○ Traffic Signal Head	● N/A
○ Modified Signal Head	○ N/A
□ Pedestrian Signal Head With Push Button & Sign	□ N/A
□ Signal Pole with Guy	□ N/A
□ Signal Pole with Sidewalk Guy	□ N/A
□ Inductive Loop Detector	□ N/A
□ Controller & Cabinet	□ N/A
□ Junction Box	□ N/A
□ 2-in Underground Conduit	□ N/A
→ Right of Way	→ N/A
→ Directional Arrow	→ N/A
▭ Construction Zone	▭ N/A
○ Type II Signal Pedestal	○ N/A
▭ Video Detection Zone	▭ N/A
□ Metal Strain Pole	□ N/A

Signal Upgrade - Temporary Design 1 (TMP Phase II)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



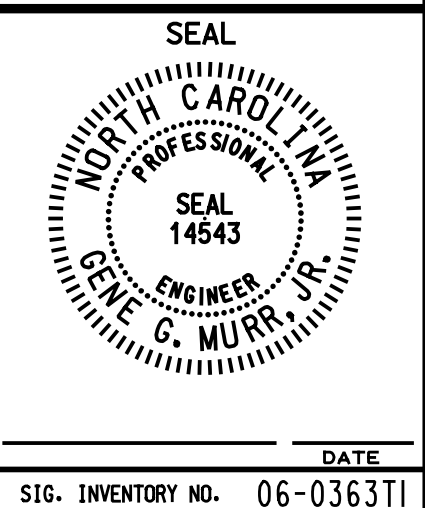
SR 1596 (N Main Street) at SR 1112 (Rockfish Road) / Hope Mills Plaza

Division 6 Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS	INIT.	DATE



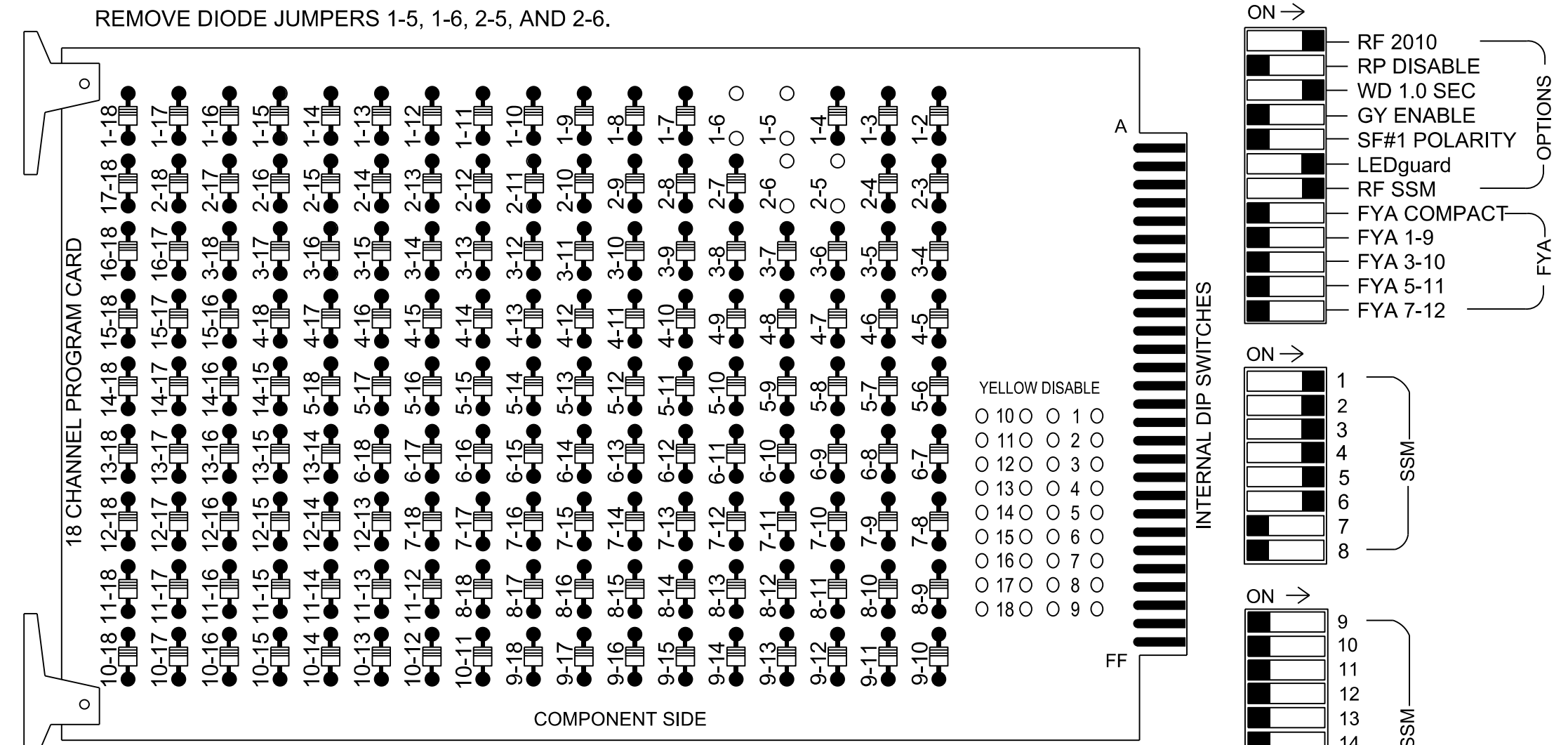
TRANSYSTEMS

1 Glenwood Avenue
 Raleigh, NC 27603
 Tel: 919.789.9977
 Fax: 919.789.9591
 License: F-0453

3/15/2024 X:\2018\180518-018-00 NCDOT Div 6 U-4709\MT\Traffic\Signal\DESIGN\IGNALS\U-4709_s1.q_dgn_06036311.dgn DWG:MT

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S1, S2, S4, S5, S7, S8
 Phases Used.....1, 2, 3, 4, 5, 6
 OverlapsNONE

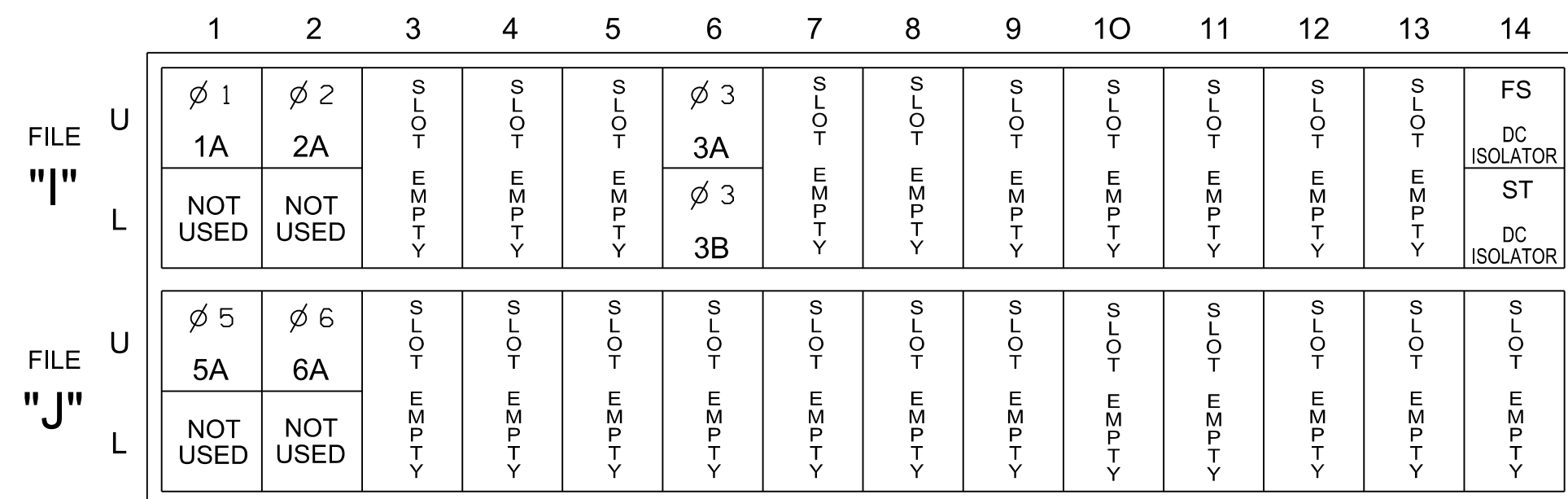
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	3 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32	41	42	62	NU	42	51	61,62	NU	NU	NU	NU	NU	NU
RED	128			116	116	101	101					134						
YELLOW	129			117	117	102	102					135						
GREEN	130			118	118	103	103					136						
RED ARROW	125											131						
YELLOW ARROW	126							102	132	132								
GREEN ARROW	127			118		103	103	133	133									

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



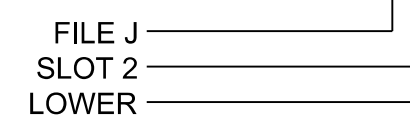
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1			X		X	
2A	TB2-5,6	I2U	39	1	2	2			X		X	
3A	TB4-9,10	I6U	41	3	8	3	3		X		X	
3B	TB4-11,12	I6L	45	7	9	3	10		X		X	
5A	TB3-1,2	J1U	55	17	15	5	3		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X		X	

INPUT FILE POSITION LEGEND: J2L



SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection in zones 4A and 5B. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0363T1
 DESIGNED: March 2024
 SEALED: 03-15-2024
 REVISED: N/A

Electrical Detail

Electrical and Programming Details For:
 Prepared in the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1596 (N. Main Street)
 at
 SR 1112 (Rockfish Road) /
 Hope Mills Plaza
 Cumberland County, North Carolina

Division 6
 PLAN DATE: March 2024
 PREPARED BY: J.T. Rowe
 REVISIONS: _____

REVIEWED BY: G.G. Murr, Jr.
 DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

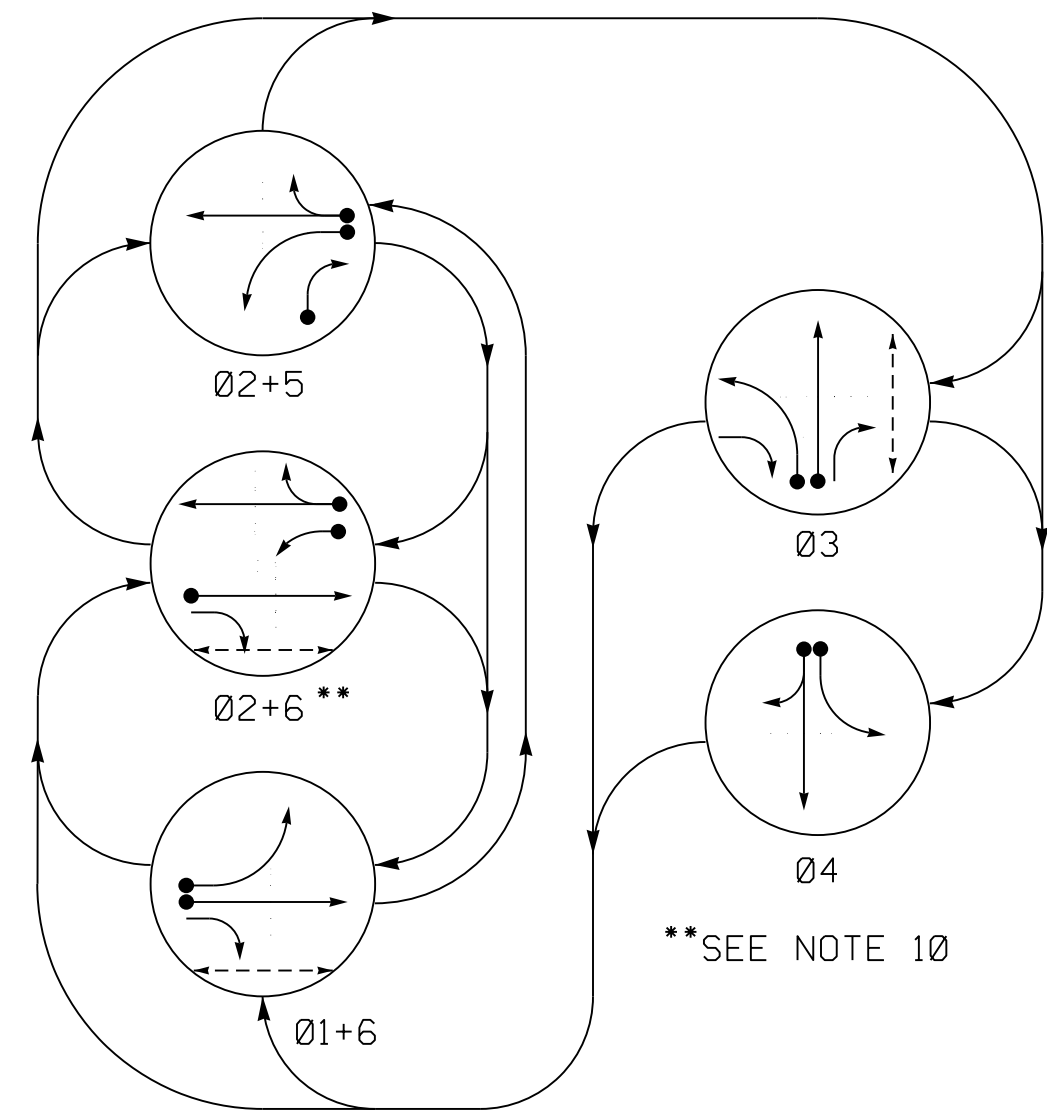
SEAL

 JOHN T. ROWE, JR.
 ENGINEER
 License No. 008453

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 Fax: 919.789.9591
 License: F-0453

3/15/2024
 U-4709_060363T1.dwg
 USER: de.foult

PHASING DIAGRAM



**SEE NOTE 10

TABLE OF OPERATION

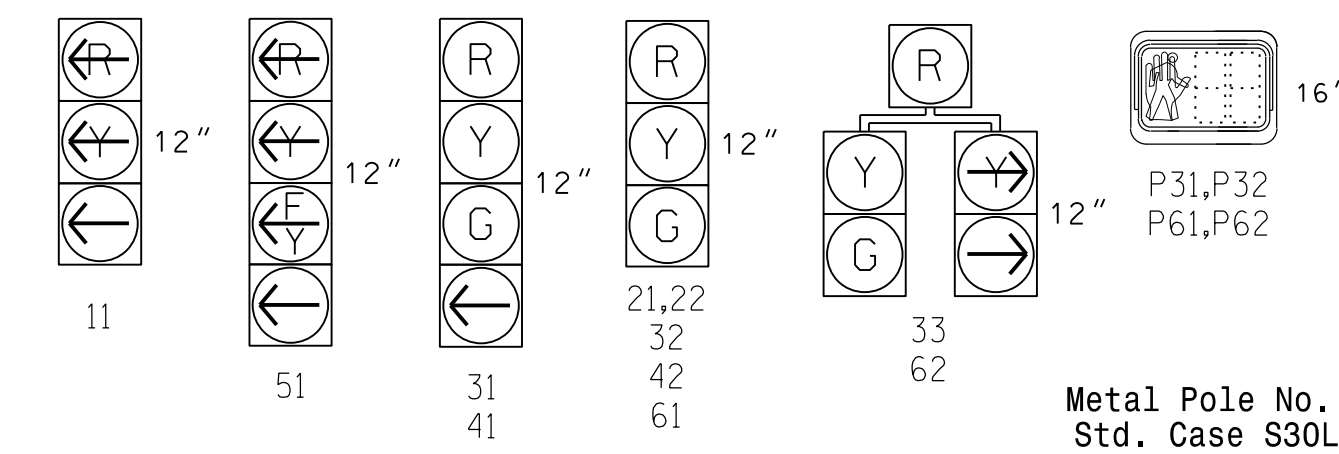
SIGNAL FACE	PHASE					FLASH
	Ø 1+6	Ø 2+6	Ø 2+5	Ø 3	Ø 4	
11	←	←	←	←	←	
21,22	R	G	G	R	R	Y
31	R	R	R	G	R	R
32	R	R	R	G	R	R
33	R	R	R	G	R	R
41	R	R	R	G	R	R
42	R	R	R	G	R	R
51	←	←	←	←	←	Y
61	G	G	R	R	R	Y
62	G	G	R	R	R	Y
P31,P32	DW	DW	DW	W	DW	DRK
P61,P62	W	W	DW	DW	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

PHASING DIAGRAM DETECTION LEGEND

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



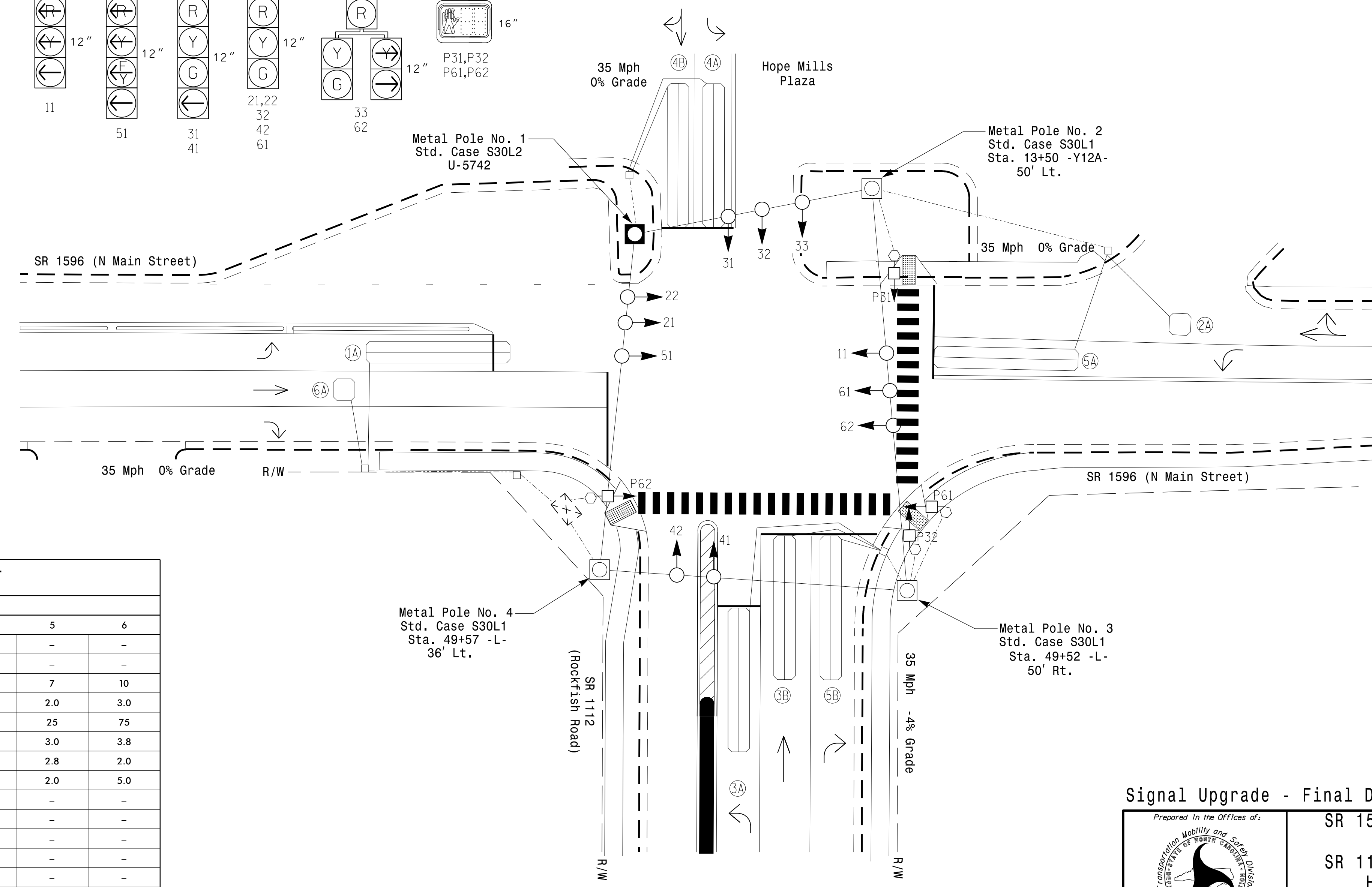
MAXTIME DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DETECTOR			PROGRAMMING						
		DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	+5	2-4-2	X	1	-	-	X	X	-	-
2A	6X6	70	4	X	2	-	-	X	X	-	
3A	6X40	0	2-4-2	X	3	-	-	X	X	-	
3B	6X40	0	2-4-2	X	3	-	-	X	X	-	
4A	6X40	0	2-4-2	X	4	3	-	X	X	X	
4B	6X40	0	2-4-2	X	4	10	-	X	X	-	
5A	6X40	0	2-4-2	X	5	15	-	X	X	-	
5B	6X40	0	2-4-2	X	5	15	-	X	X	X	
6A	6X6	70	4	X	6	-	-	X	X	-	

5 Phase Fully Actuated System #D06-03_Hope Mills

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable backup protect to allow the controller to clear from phase 2+6 to 1+6 by progressing through an all red display.
4. Phase 1 must lead, Phase 5 must lag, and Phase 1 and Phase 5 shall not operate simultaneously.
5. The order of phase 3 and phase 4 may be reversed.
6. Remove signal head P41 and pedestal.
7. Set all detector units to presence mode.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. This intersection uses video detection. Install detectors according to manufacturer's instructions to achieve the desired detection.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. See logic programming. This ensures phases 2+6 run a minimum of 7 seconds.



MAXTIME TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Min Green *	7	10	7	7	7	10
Passage *	2.0	3.0	2.0	2.0	2.0	3.0
Max I *	30	75	20	25	25	75
Yellow Change	3.0	3.8	4.1	3.8	3.0	3.8
Red Clear	2.6	1.5	1.7	1.6	2.8	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	5.0
Added Initial *	-	-	-	-	-	-
Maximum Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Advance Walk	-	-	-	-	-	-
Non Lock Detector	X	-	X	X	X	-
Vehicle Recall	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-

* These values may be field adjusted. Do not adjust Min Green and Passage 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 | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ⊥ → Pedestrian Signal Head With Push Button & Sign | ⊥ → N/A |
| ⊥ → Signal Pole with Guy | ⊥ → N/A |
| ⊥ → Signal Pole with Sidewalk Guy | ⊥ → N/A |
| ⊠ → Inductive Loop Detector | ⊠ → N/A |
| ⊠ → Controller & Cabinet | ⊠ → N/A |
| ⊠ → Junction Box | ⊠ → N/A |
| ⊠ → 2-in Underground Conduit | ⊠ → N/A |
| N/A → Right of Way | N/A → N/A |
| → → Directional Arrow | → → N/A |
| ○ → Type II Signal Pedestal | ○ → N/A |
| ○ → Metal Strain Pole | ○ → N/A |

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

1 Glenwood Avenue
Raleigh, NC 27603
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Fax: 919.789.9591
License: F-0453

SR 1596 (N Main Street)
at
SR 1112 (Rockfish Road) /
Hope Mills Plaza

Division 6 Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.

PREPARED BY: B.E. Wynn REVIEWED BY:

SEAL

SEAL 14543

ENGINEER

G.G. MURR, JR.

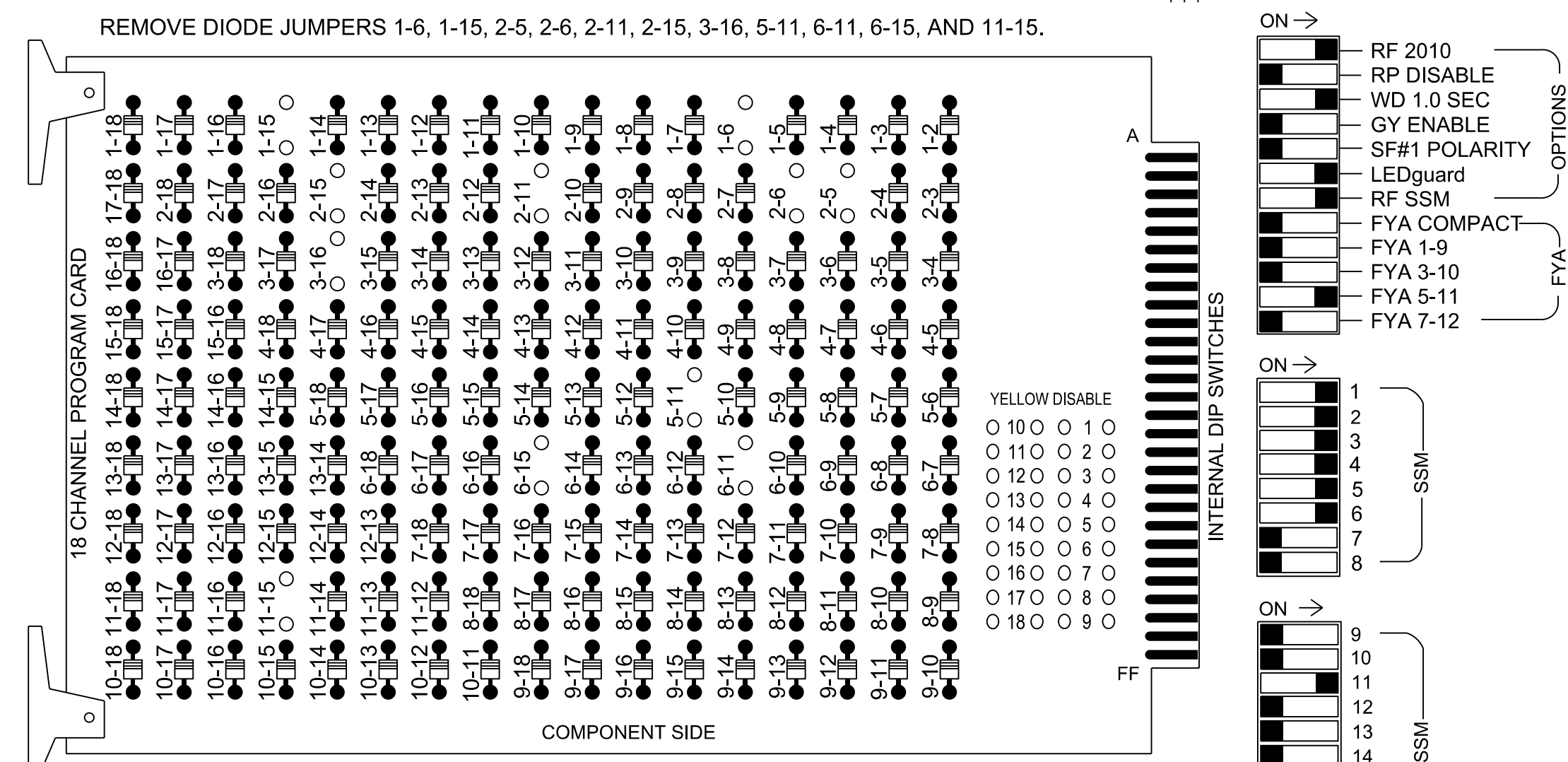
750 N. Greenfield Pkwy, Garner, NC 27529

SCALE 0 20 1"=20'

3/15/2024
U-4709-510.dgn
USER:dbfoult

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE DIODE JUMPERS 1-6, 1-15, 2-5, 2-6, 2-11, 2-15, 3-16, 5-11, 6-11, 6-15, AND 11-15.

REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S1, S2, S4, S5, S7, S8, S9, S12, AUX S4
Phases Used.....	1, 2, 3, 4, 5, 6, 6PED, 3 PED
Overlap "1".....	*
Overlap "2".....	*
Overlap "3".....	*
Overlap "4".....	*

*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	3 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	31	32,33	62	41	42	NU	33	51*	61,62	P61, P62	NU	NU	P31, P32	NU	NU
RED	128			116	116		101	101			*	134						
YELLOW		129		117	117		102	102				135						
GREEN		130		118	118		103	103				136						
RED ARROW	125																	A114
YELLOW ARROW	126				117				132									A115
FLASHING YELLOW ARROW																		A116
GREEN ARROW	127			118	118	103			133	133								
Hand icon													119					110
Ped icon																		121
																		112

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

INPUT FILE POSITION LAYOUT (front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	∅ 1 1A	∅ 2 2A	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ 3 3A	∅ 4 4A	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ 6 PED DC ISOLATOR	FS DC ISOLATOR
FILE "I" L	NOT USED	NOT USED	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ 3 3B	∅ 4 4B	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ 3 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	∅ 5 5A	∅ 6 6A	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T	∅ S T-O-T
FILE "J" L	NOT USED	∅ 5 5B	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E	∅ T P-Z-E

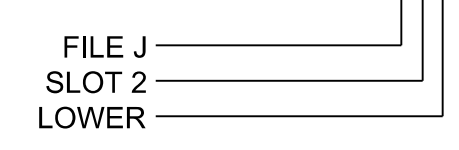
EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1					X	
2A	TB2-5,6	I2U	39	1	2	2				X	X	
3A	TB4-9,10	I6U	41	3	8	3				X	X	
3B	TB4-11,12	I6L	45	7	9	3				X	X	
4A	TB6-1,2	I7U	65	31	10	4	3			X	X	
4B	TB6-3,4	I7L	78	44	11	4	10			X	X	
5A	TB3-1,2	J1U	55	17	15	5	15			X	X	
6A	TB3-5,6	J2U	40	2	16	6				X	X	
5B	TB3-7,8	J2L	44	6	17	5	15			X	X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P31,P32	TB8-8,9	I13L	70	36	8	PED 3						

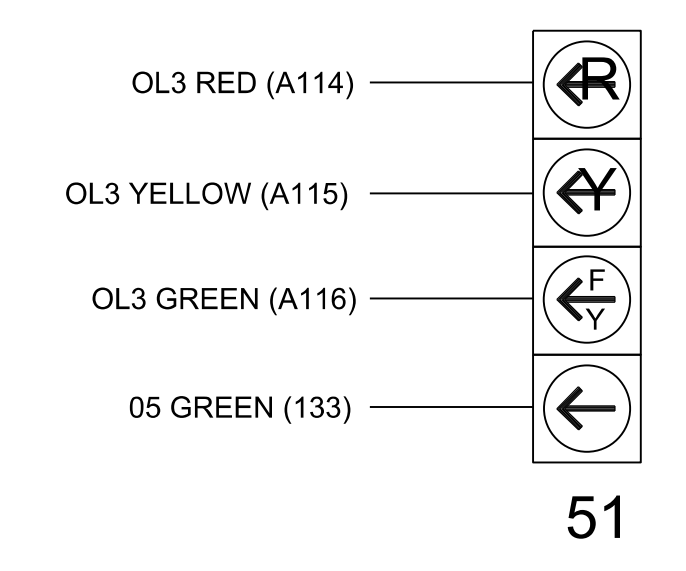
NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

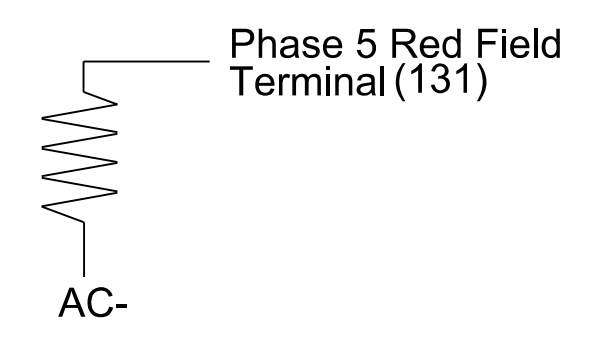
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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: 06-0363
 DESIGNED: March 2024
 SEALED: 03-15-2024
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

Prepared in the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

SR 1596 (N. Main Street)
 at
 SR 1112 (Rockfish Road) /
 Hope Mills Plaza
 Cumberland County
 Hope Mills
 Division 6
 PLAN DATE: March 2024 REVIEWED BY:
 PREPARED BY: J.T. Rowe REVIEWED BY: G.G. Murr, Jr.
 REVISIONS INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
 SEAL

 SEAL
 008453
 ENGINEER
 J. T. ROWE, JR.
 DATE
 SIG. INVENTORY NO. 06-0363

1 Glenwood Avenue
 Raleigh, NC 27603
 Tel: 919.789.9977
 Fax: 919.789.9591
 License: F-0453

TRANSYSTEMS

OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

Overlap	1	2	3	4
Type	Off	Off	FYA 4 - Section	Off
Included Phases	-	-	6	-
Modifier Phases	-	-	5	-
Modifier Overlaps	-	-	-	-
Neagtive Phases	-	-	1	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE NEGATIVE PHASES

PED 3 PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Detector >Ped Det Plans

Web Interface
Home >Controller >Detector Configuration >Pedestrian Detector

Plan 1

Detector	Descriptor	Call Phase	Call Overlap
2		2	0
4		4	0
6		6	0
8		3	0

NOTICE PHASE 3 PED
ASSIGNED TO
DETECTOR 8 PED →

Front Panel
Main Menu >Controller >More>Channels>Channels Config

Web Interface
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2	X			2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6	X		X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1	X		X	9
10	Overlap	2		X	X	10
11	Overlap	3	X			11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	3				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE PHASE 3 PED
ASSIGNED TO CHANNEL 16 →

COMPATIBILITY

Front Panel
Main Menu >Controller >Sequence & Phs Config>
No Served Phase Plans

Web Interface
Home >Controller >Phase Configuration>
No Served Phase Plans

Sequence 1

Phase	No Serve Phase
1	5
2	
3	
4	
5	
6	
7	
8	

BACKUP PREVENTION PROGRAMMING

Front Panel
Main Menu >Controller >Sequence & Phs Config >Backup Prevention >
Backup Protection Plan

Web Interface
Home >Controller> Backup Prevention >Backup Protection Plan

Sequence 1

No Backup Phase	1	2	3	4	5	6	7	8
Serve Phase 2	X	-	-	-	-	-	-	-

ALL RED BACKUP PROGRAMMING

Front Panel
Main Menu >Controller >Sequence & Phs Config>Backup Prevention >
Backup Through Red

Web Interface
Home >Controller >Backup Prevention >Backup Calls Phase Plans >
(scroll down) to Backup Through Red

Backup Through All Red

Sequence	Backup Through All Red
1	YES

SEQUENCE DETAIL

Front Panel
Main Menu >Controller >Sequence & Phs Config>Sequences

Web Interface
Home >Controller >Sequence

Sequence 1

Ring	Sequence Data
1	1,2,a,3,4,b
2	6,5,a,b

← NOTICE REVERSED PHASES 6 AND 5

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0363
DESIGNED: March 2024
SEALED: 03-15-2024
REVISED: N/A

LOGIC PROCESSOR PROGRAMMING

Front Panel
Main Menu >Controller >More >User Programs >Definition

Web Interface
Home >Controller >User Programs Configuration >User Programs Definition



Program 1

Statement	Result	Index	Operation	Parameter A	Index	Parameter B	Index	Delay	Ext
1	Omit Overlap	3	Result=(A or B)	Phase Next	1	Phase On	1	0.0	0.0
2	Phase Phase Omit	5	Result=Latch(A,B)	Phase Green	1	Phase Green	2	0.0	7.0

LOGIC STATEMENT DESCRIPTION

Statement 1 Description: If Phase 1 is NEXT or if Phase 1 is ON, the statement is true, and Overlap 3 (Head 51) is omitted (kept in RED).
Statement 2 Description: If phase 1 is green the statement is true (latch on). Phase 5 is omitted. It remains latched until 7 seconds after phase 2 green is ON.

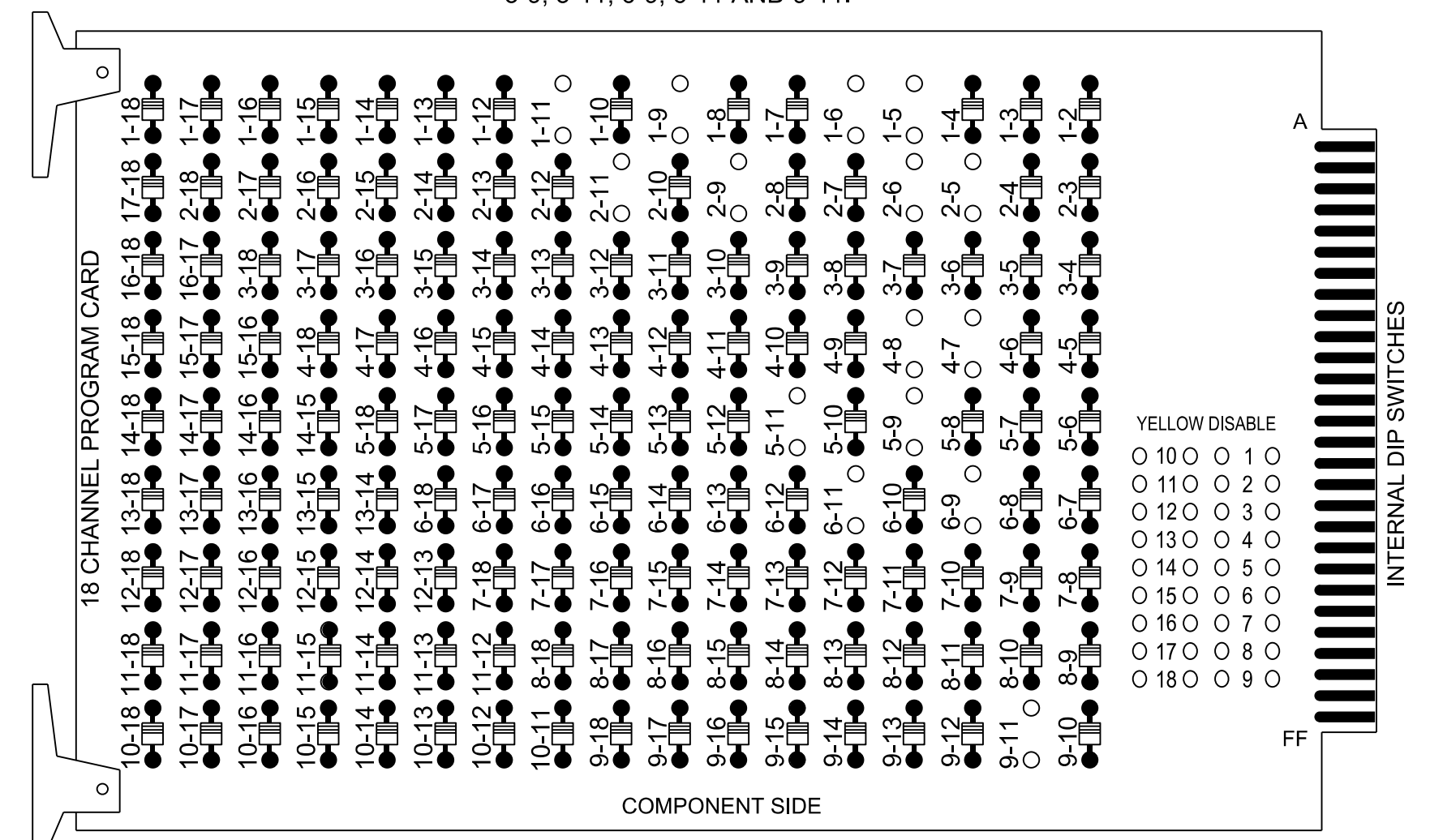
Electrical Detail - Sheet 2 of 2

 <p>750 N. Greenfield Pkwy, Garner, NC 27529 License: F-0453</p>	<p>Prepared in the Offices of:</p> 	<p>SR 1596 (N. Main Street) at SR 1112 (Rockfish Road) / Hope Mills Plaza</p> <p>Division 6 Cumberland County Hope Mills</p> <p>PLAN DATE: March 2024 REVIEWED BY: J.T. Rowe PREPARED BY: J.T. Rowe REVIEWED BY: G.G. Murr, Jr.</p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER JOHN T. ROWE JR. SEAL 008453</p>
	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		<p>DATE SIG. INVENTORY NO. 06-0363</p>

18 CHANNEL IP 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, 4-7, 4-8, 5-9, 5-11, 6-9, 6-11 AND 9-11.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phase 4 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S1, S2, S5, S7, S8, S10, S11,
 AUX S1, AUX S4
 Phases Used.....1, 2, 4, 5, 6, 7, 8
 Overlap "1".....*
 Overlap "2".....*
 Overlap "3".....*
 Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

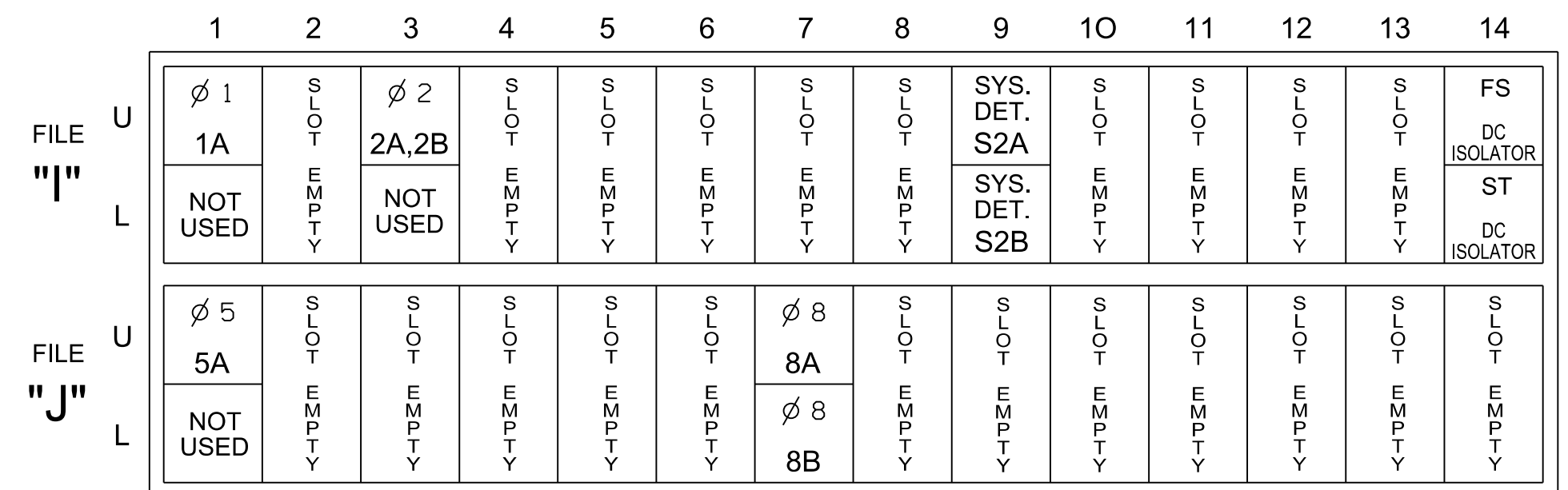
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11*	21,22	NU	NU	41,42	NU	51*	61,62	NU	71,72	81,82	NU	11*	NU	NU	51*	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW											122		A121			A114		
YELLOW ARROW											123		A122			A115		
FLASHING YELLOW ARROW													A123			A116		
GREEN ARROW	127							133			124							

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- * See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

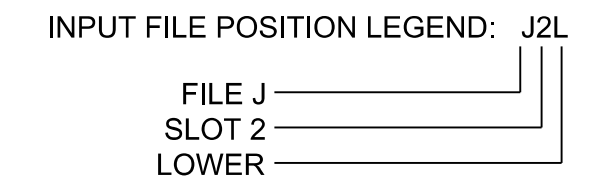
FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A ¹	TB2-1,2	I1U	56	18	1	1	15		X		X	
2A,2B	TB2-9,10	I3U	63	29	4	2			X		X	
*S2A	TB6-9,10	I9U	60	22	13	SYS			X		X	
*S2B	TB6-11,12	I9L	62	24	14	SYS			X		X	
5A ²	TB3-1,2	J1U	55	17	15	5	15		X		X	
8A	TB7-1,2	J7U	66	32	24	8	3		X		X	
8B	TB7-3,4	J7L	79	45	25	8	15		X		X	

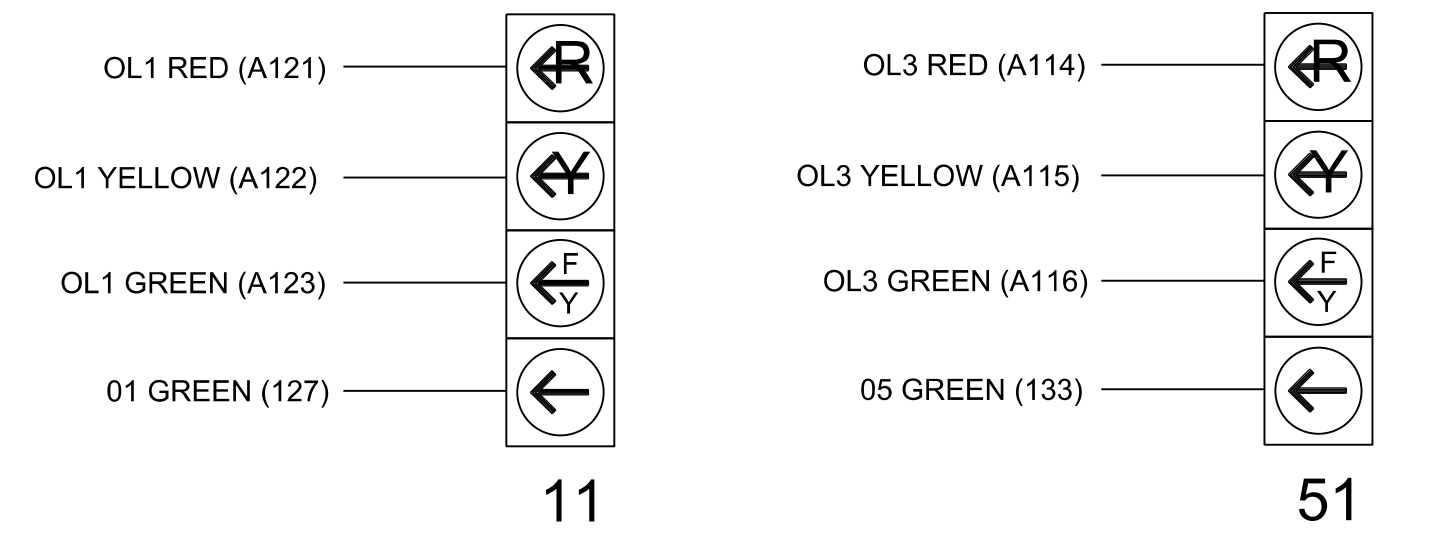
* System detector only. Remove any assigned vehicle phase.

- Remove jumper from I1-W to J4-W on rear of input file, if present.
- Remove jumper from J1-W to I4-W on rear of input file, if present.



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



OVERLAP PROGRAMMING

Front Panel
Main Menu > Controller > Overlap > Overlap Parameters/Overlap Timings

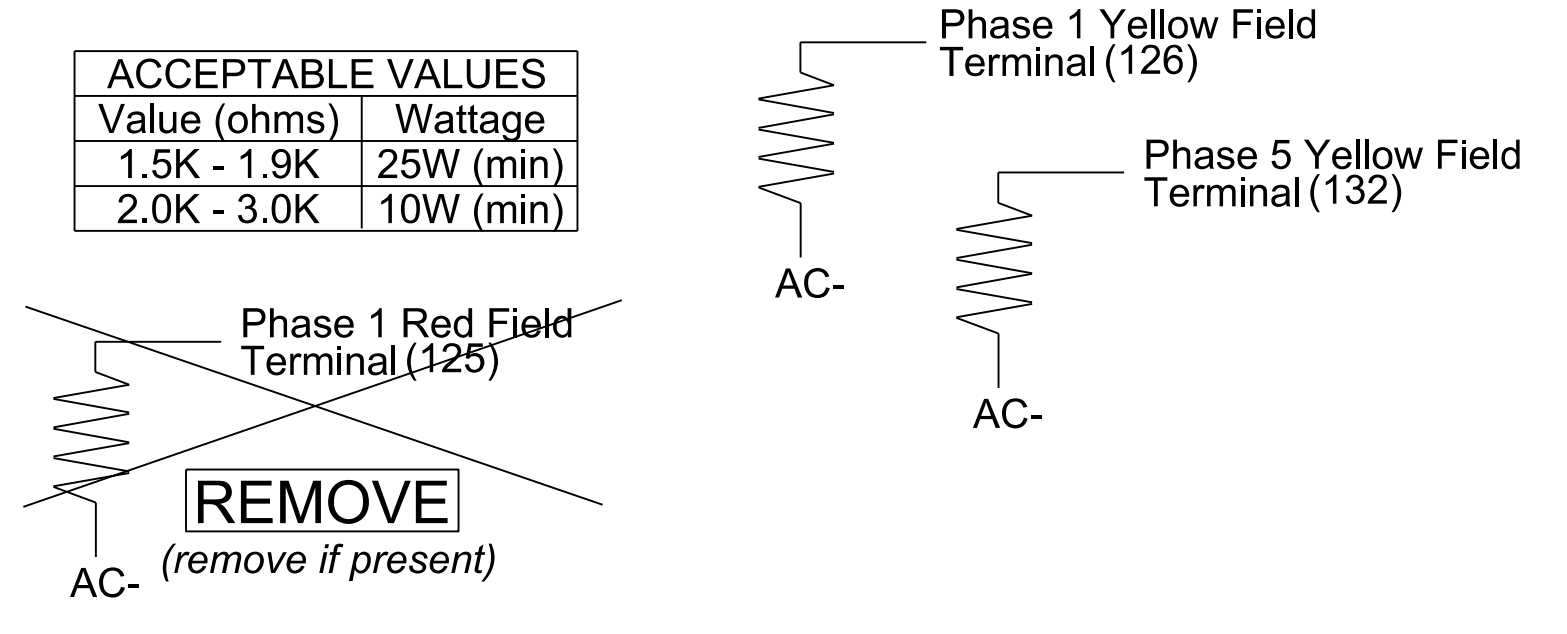
Web Interface
Home > Controller > Overlap Configuration > Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	OFF	FYA 4 - Section	OFF
Included Phases	2		6	
Modifier Phases	1		5	
Modifier Overlaps	-		-	
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)



SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection in zones 4A, 6A, 6B, 7A, 7B, S6A, and S6B. Perform installation according to manufacturer's directions and NCDOT engineer approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0584T1
 DESIGNED: March 2024
 SEALED: 03-15-2024
 REVISED: N/A



1 Glenwood Avenue
 Raleigh, NC 27603
 Tel: 919.789.9977
 Fax: 919.789.9591
 License: F-0453

Electrical Detail

Electrical and Programming Details For:

Prepared in the Offices of:

SR 1596 (N. Main Street) at SR 1115 (Golfview Road)

Division 6 Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY:

PREPARED BY: J.T. Rowe REVIEWED BY: G.G. Murr, Jr.

REVISIONS	INIT.	DATE

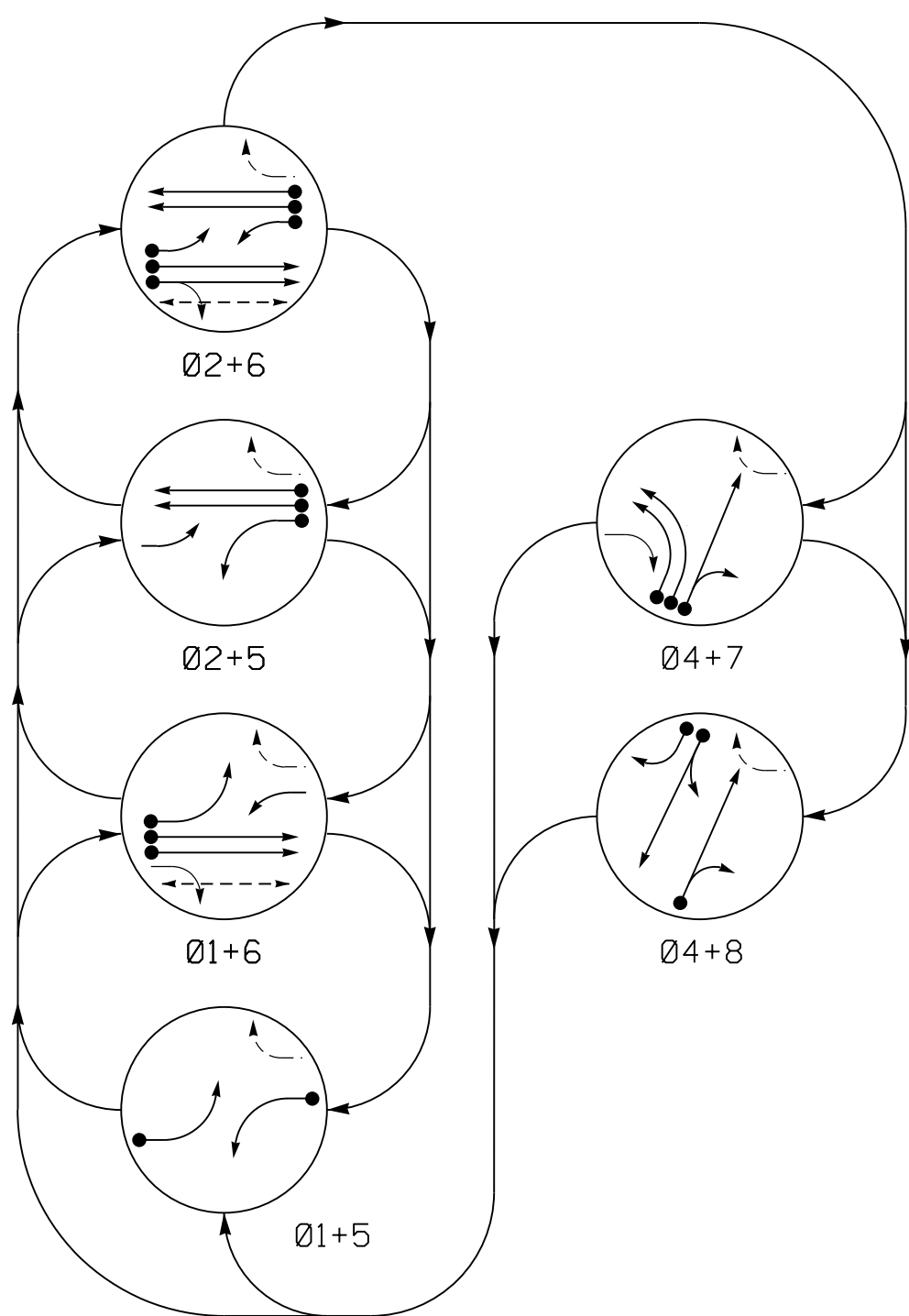
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

DATE

SIG. INVENTORY NO. 06-0584T1

PHASING DIAGRAM



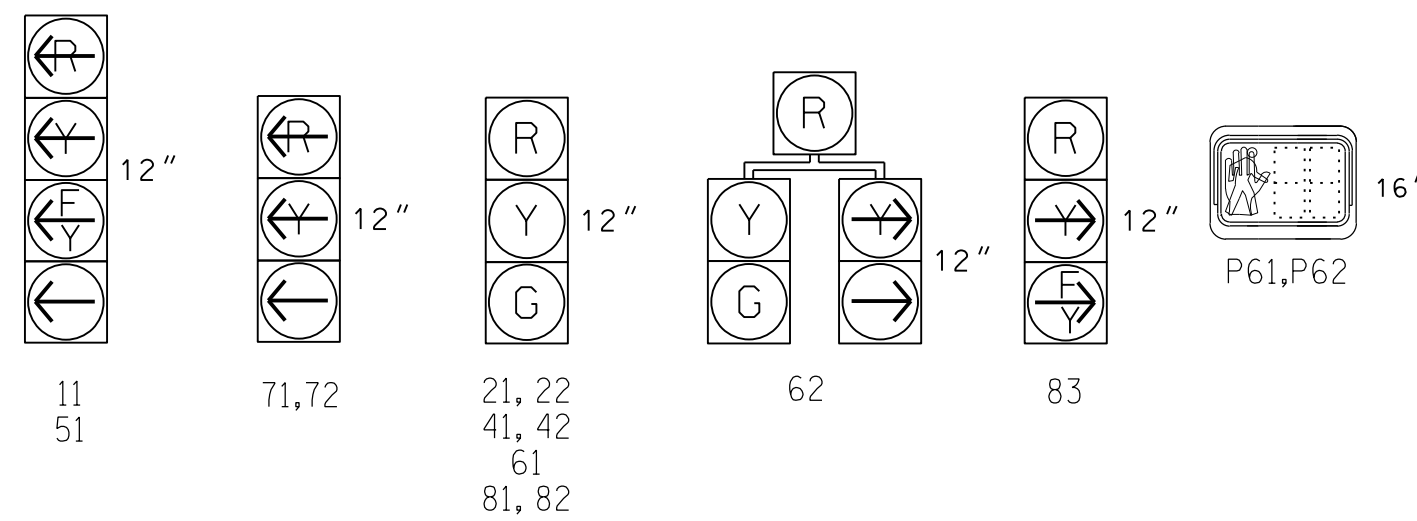
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE						FLASH
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+7	Ø4+8	
11	←	←	←	←	←	←	→
21, 22	R	R	G	G	R	R	Y
41, 42	R	R	R	R	G	G	R
51	←	←	←	←	←	←	→
61	R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y
71, 72	←	←	←	←	←	←	→
81, 82	R	R	R	R	R	R	G
83	R	R	R	R	R	R	Y
P61,P62	DW	W	DW	W	DW	DRK	

SIGNAL FACE I.D.

All Heads L.E.D.

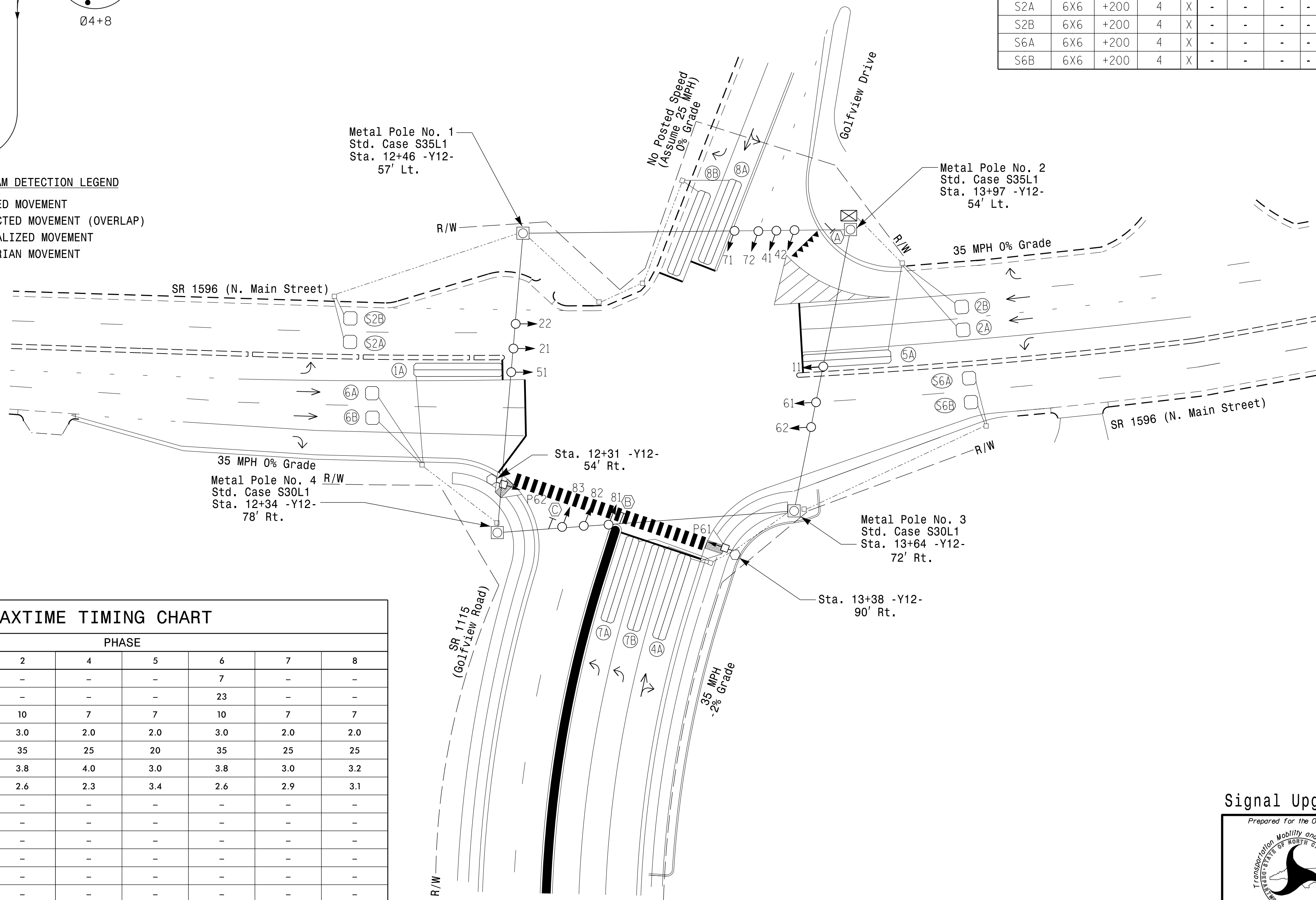


MAXTIME DETECTOR INSTALLATION CHART										
DETECTOR					PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN NEW CARD
1A	6X40	0	2-4-2	X	1	15	-	X	X	X
2A,2B	6X6	70	4	X	2	-	-	X	X	X
4A	6X40	0	2-4-2	X	4	10	-	X	X	X
5A	6X40	0	2-4-2	X	5	15	-	X	X	X
6A,6B	6X6	70	4	X	6	-	-	X	X	X
7A	6X40	0	2-4-2	X	7	-	-	X	X	X
7B	6X40	0	2-4-2	X	7	-	-	X	X	X
8A	6X40	0	2-4-2	X	8	3	-	X	X	X
8B	6X40	0	2-4-2	X	8	15	-	X	X	X
S2A	6X6	+200	4	X	-	-	-	-	-	X
S2B	6X6	+200	4	X	-	-	-	-	-	X
S6A	6X6	+200	4	X	-	-	-	-	-	X
S6B	6X6	+200	4	X	-	-	-	-	-	X

6 Phase Fully Actuated System #D06-03_Hope Mills

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Refer to Pavement Marking Plans for Stopbar and Crosswalk locations.



LEGEND

- | PROPOSED | EXISTING |
|--|----------|
| ○➔ Traffic Signal Head | ●➔ N/A |
| ○➔ Modified Signal Head | ○➔ N/A |
| ⊥ Sign | ⊥ N/A |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ N/A |
| ⊥ Signal Pole with Guy | ⊥ N/A |
| ⊥ Signal Pole with Sidewalk Guy | ⊥ N/A |
| ⊥ Inductive Loop Detector | ⊥ N/A |
| ⊥ Controller & Cabinet | ⊥ N/A |
| ⊥ Junction Box | ⊥ N/A |
| ⊥ 2-in Underground Conduit | ⊥ N/A |
| ➔ Right of Way | ➔ N/A |
| ➔ Directional Arrow | ➔ N/A |
| ⊙ Metal Strain Pole | ⊙ N/A |
| ○ Type II Signal Pedestal | ○ N/A |
| ⊙ "YIELD" Sign (R1-2) | ⊙ N/A |
| ⊙ "LEFT TURN YIELD ON GREEN" Sign (R10-12) | ⊙ N/A |
| ⊙ "RIGHT TURN ON RED MUST YIELD TO U-TURN" Sign (R10-30) | ⊙ N/A |

MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	4	5	6	7	8	
Walk *	-	-	-	-	7	-	-	
Ped Clear	-	-	-	-	23	-	-	
Min Green *	7	10	7	7	10	7	7	
Passage *	2.0	3.0	2.0	2.0	3.0	2.0	2.0	
Max I *	25	35	25	20	35	25	25	
Yellow Change	3.0	3.8	4.0	3.0	3.8	3.0	3.2	
Red Clear	3.2	2.6	2.3	3.4	2.6	2.9	3.1	
Added Initial *	-	-	-	-	-	-	-	
Maximum Initial *	-	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	-	
Advance Walk	-	-	-	-	-	-	-	
Non Lock Detector	X	-	X	X	-	X	X	
Vehicle Recall	-	MIN RECALL	-	-	MIN RECALL	-	-	
Dual Entry	-	-	X	-	-	-	-	

* These values may be field adjusted. Do not adjust Min Green and Passage 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-Final Design

1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453

SR 1596 (N. Main Street)
at
SR 1115 (Golfview Road)

Division 6 Cumberland County Hope Mills

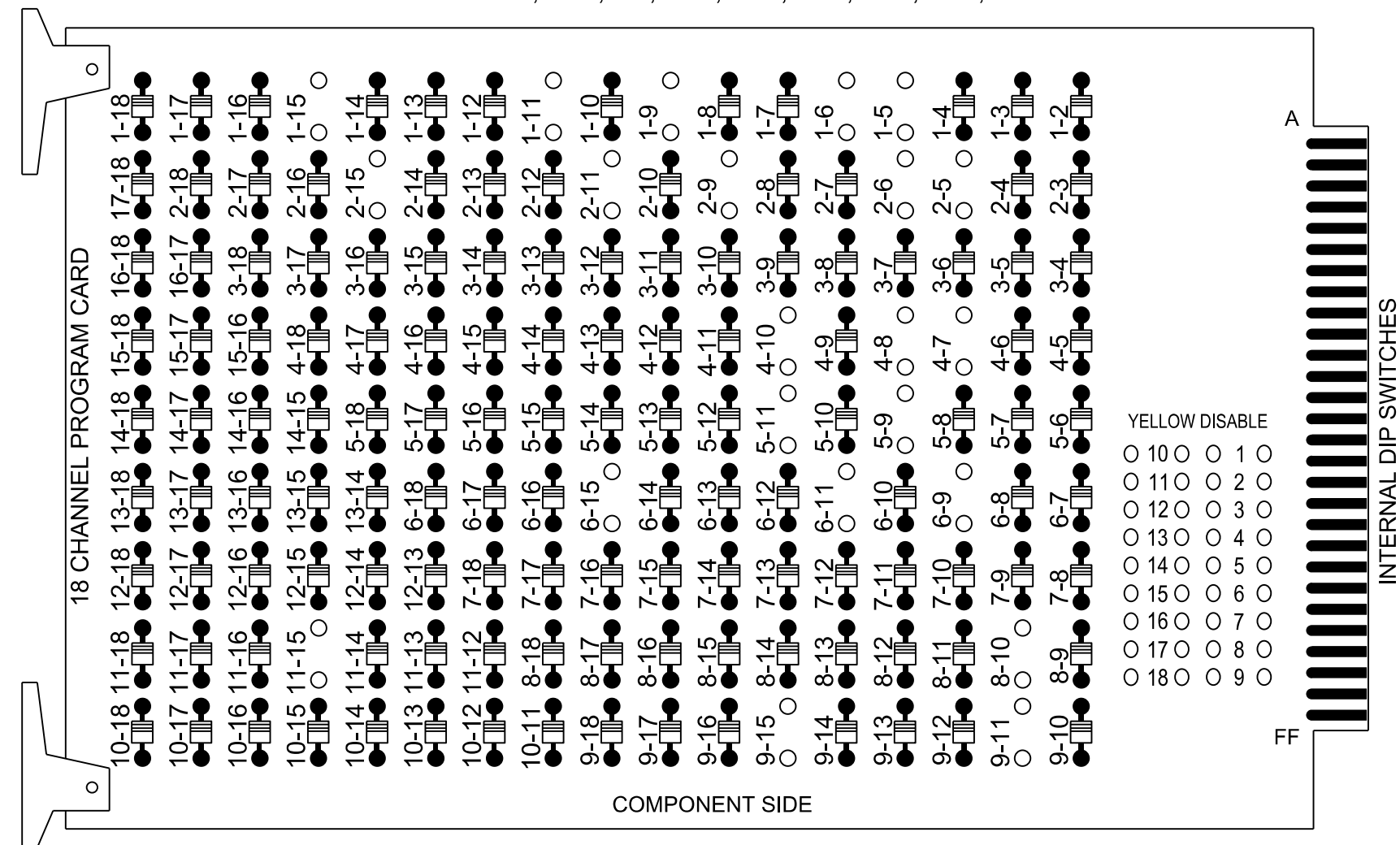
PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: B.E. Wynn REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

18 CHANNEL IP 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, 4-7, 4-8, 4-10, 5-9, 5-11, 6-9, 6-11, 6-15, 8-10, 9-11, 9-15, AND 11-15.



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
- Program phase 4 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the D06-03 Hope Mills System.

EQUIPMENT INFORMATION

Controller.....2070LX
 Cabinet.....332 w/ Aux
 Software.....Q-Free MAXTIME
 Cabinet Mount.....Base
 Output File Positions.....18 With Aux. Output File
 Load Switches Used.....S1, S2, S5, S7, S8, S9, S10, S11,
 AUX S1, AUX S2, AUX S4
 Phases Used.....1, 2, 4, 5, 6, 6PED, 7, 8
 Overlap "1".....*
 Overlap "2".....*
 Overlap "3".....*
 Overlap "4".....*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

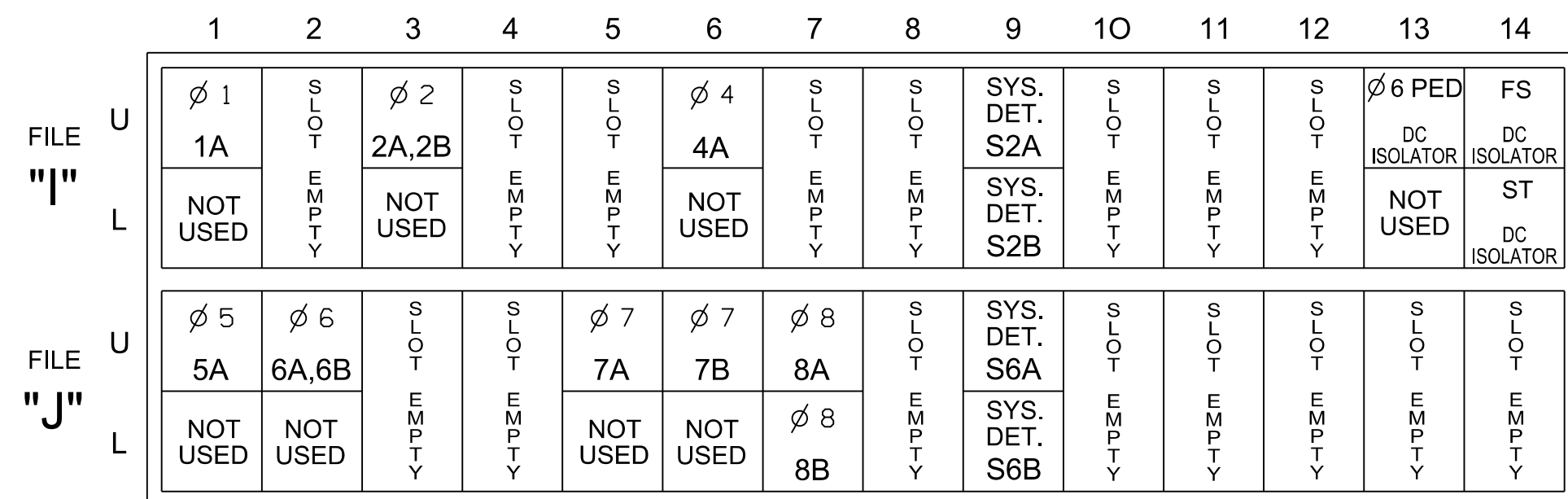
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	P61, P62	62	71,72	81,82	NU	11	83	NU	51	NU
RED		128			101			134			107					A124		
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW											122				A121			A114
YELLOW ARROW											123	123			A122	A125		A115
FLASHING YELLOW ARROW															A123	A126		A116
GREEN ARROW	127						133			124	124							
Hand icon													119					
Walking person icon																		

NU = Not Used

- * Denotes install load resistor. See load resistor installation detail this sheet.
- * See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

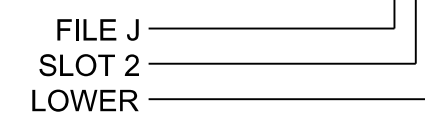
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1	1	15		X		X	
2A,2B	TB2-9,10	I3U	63	29	6				X		X	
4A	TB4-9,10	I6U	41	3	8	4	10		X		X	
*S2A	TB6-9,10	I9U	60	22	13	SYS			X		X	
*S2B	TB6-11,12	I9L	62	24	14	SYS			X		X	
5A	TB3-1,2	J1U	55	17	15	5	15		X		X	
6A,6B	TB3-5,6	J2U	40	2	16	6			X		X	
7A	TB5-5,6	J6U	57	19	21	7			X		X	
7B	TB5-9,10	J6U	42	4	22	7			X		X	
8A	TB7-1,2	J7U	66	32	24	8	3		X		X	
8B	TB7-3,4	J7L	79	45	25	8	15		X		X	
*S6A	TB7-9,10	J9U	59	21	27	SYS			X		X	
*S6B	TB7-11,12	J9L	61	23	28	SYS			X		X	
PED PUSH BUTTONS												
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						

*System detector only. Remove any assigned vehicle phase.

NOTE: INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

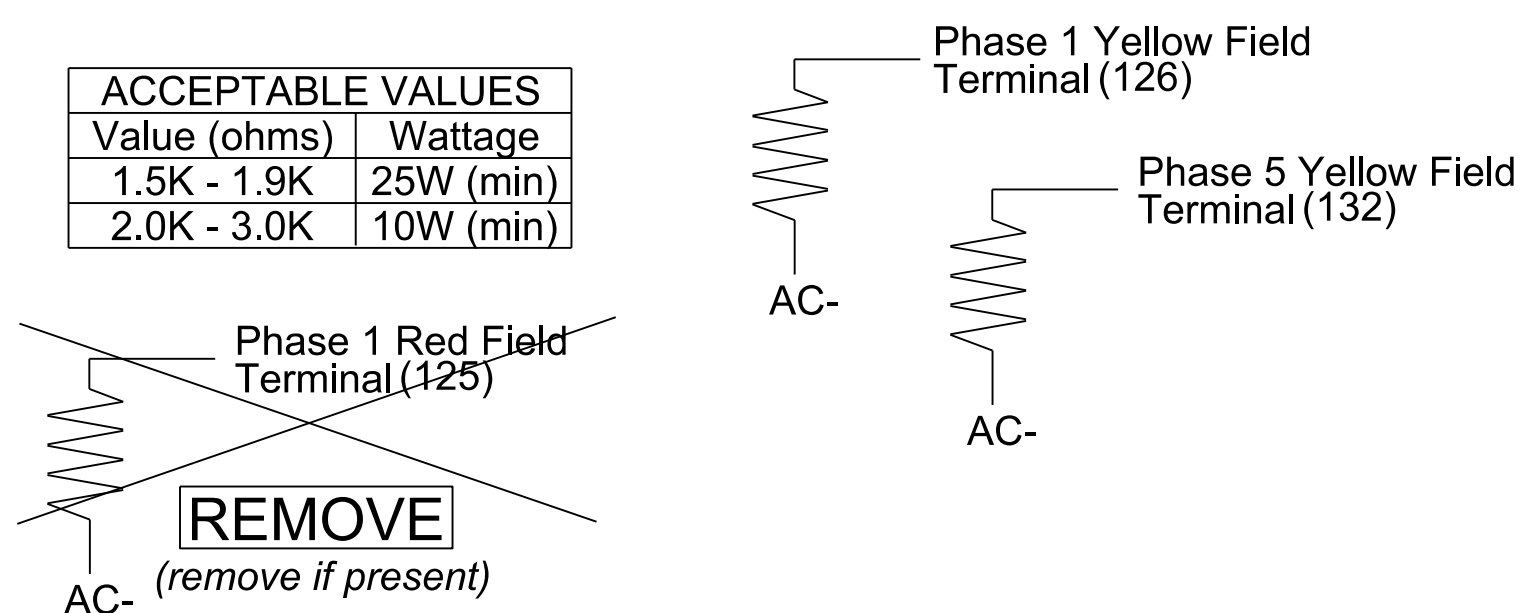
INPUT FILE POSITION LEGEND: J2L



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

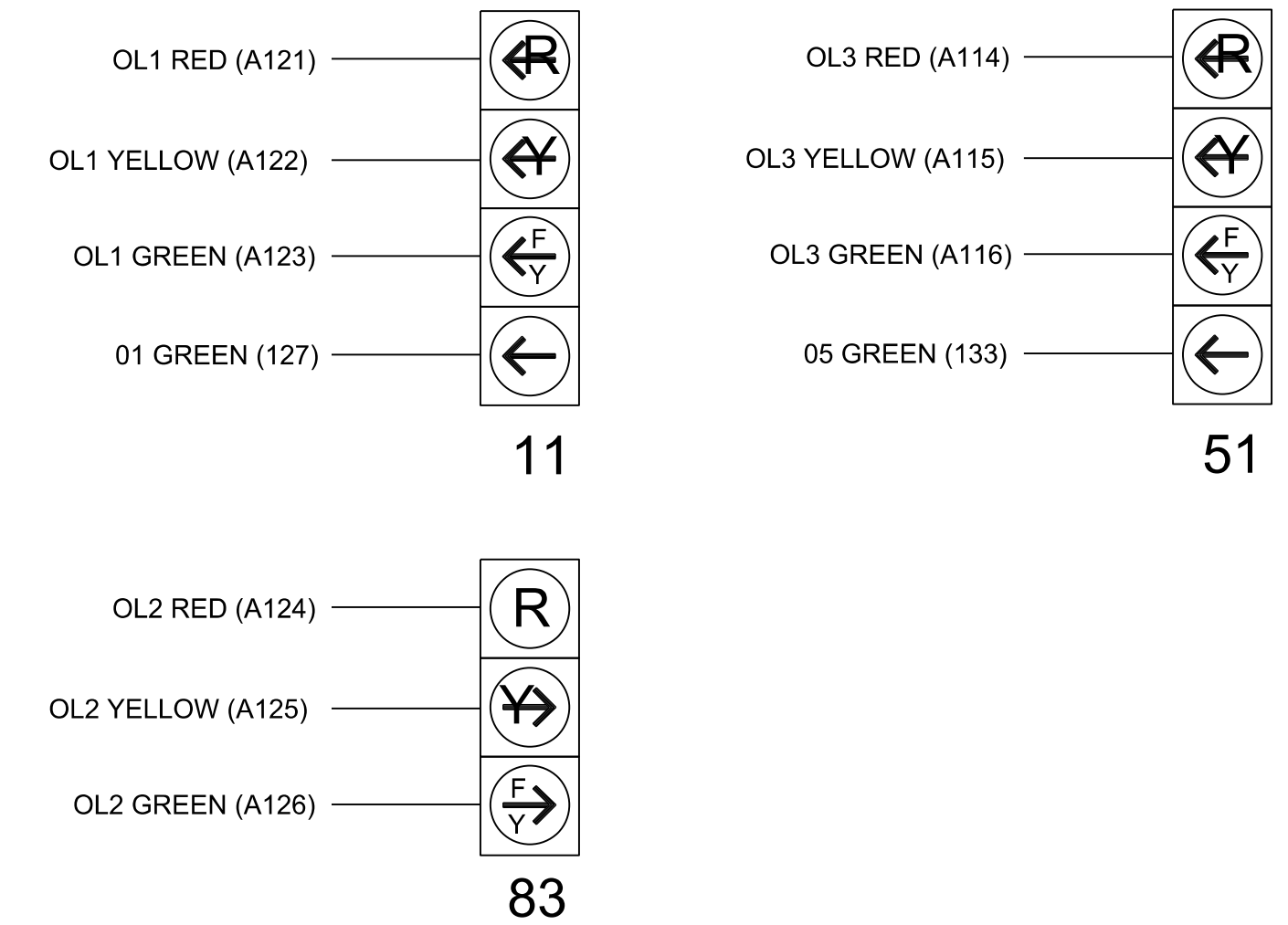
Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

TRANSYSTEMS

1 Glenwood Avenue
 Raleigh, NC 27603
 Tel:919.789.9977
 Fax:919.789.9591
 License: F-0453

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0584
 DESIGNED: March 2024
 SEALED: 03-15-2024
 REVISED: N/A

Electrical Detail - Sheet 1 of 2

<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 1596 (N. Main Street) at SR 1115 (Golfview Road)</p> <p>Division 6 Cumberland County Hope Mills</p> <p>PLAN DATE: March 2024 REVIEWED BY:</p> <p>PREPARED BY: J.T. Rowe REVIEWED BY: G.G. Murr, Jr.</p> <p>REVISIONS INIT. DATE</p>	<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> <p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEERS JOHN T. ROWE, J.E.</p> <p>DATE</p> <p>SIG. INVENTORY NO. 06-0584</p>
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OVERLAP PROGRAMMING

Front Panel
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface
Home >Controller >Overlap Configuration >Overlaps
Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	OFF
Included Phases	2	8	6	.
Modifier Phases	1	.	5	.
Modifier Overlaps
Trail Green	0	0	0	0
Trail Yellow	0:0	0:0	0:0	0:0
Trail Red	0:0	0:0	0:0	0:0

FLASHER CIRCUIT MODIFICATION DETAIL

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

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

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0584
DESIGNED: March 2024
SEALED: 03-15-2024
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

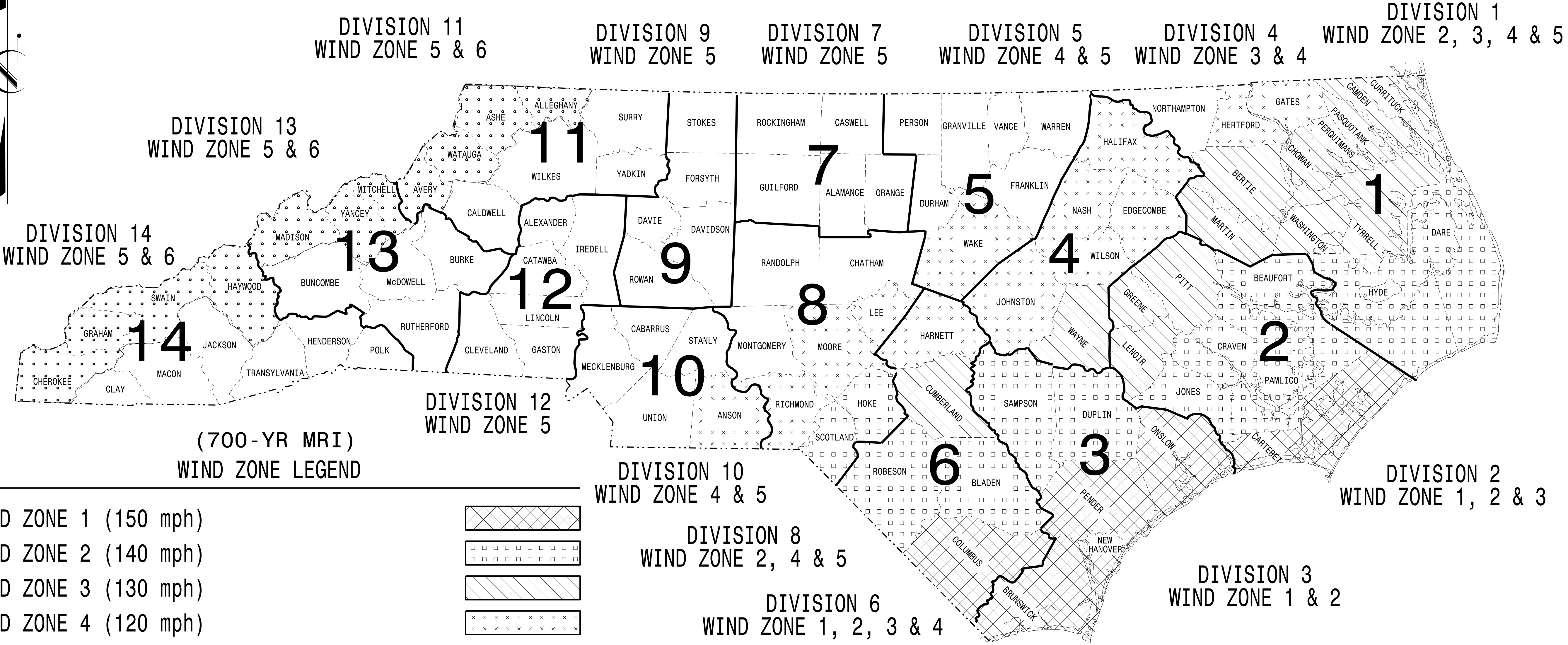
1 Glenwood Avenue
Raleigh, NC 27603
Tel:919.789.9977
Fax:919.789.9591
License: F-0453

<p style="font-size: x-small;">Electrical and Programming Details For:</p> <p style="font-size: x-small;">Prepared in the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>SR 1596 (N. Main Street) at SR 1115 (Golfview Road)</p> <p style="font-size: x-small;">Division 6 Cumberland County Hope Mills</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: March 2024</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: J.T. Rowe</td> <td>REVIEWED BY: G.G. Murr, Jr.</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	PLAN DATE: March 2024	REVIEWED BY:	PREPARED BY: J.T. Rowe	REVIEWED BY: G.G. Murr, Jr.	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DATE</p>
PLAN DATE: March 2024	REVIEWED BY:																	
PREPARED BY: J.T. Rowe	REVIEWED BY: G.G. Murr, Jr.																	
REVISIONS	INIT.	DATE																

3/15/2024
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D:\m\m

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



WIND ZONE 1 (150 mph)	
WIND ZONE 2 (140 mph)	
WIND ZONE 3 (130 mph)	
WIND ZONE 4 (120 mph)	
WIND ZONE 5 (110 mph)	
WIND ZONE 6 (135 mph) Special Wind Zone	

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

NC DOT METAL POLE STANDARDS

03-001-2023 1P-07
S:\IT\AS\11\115\Sig\Drawings\Drawings\2024\Metal Pole Standards\2024 Sig-M1A Standard 411 Metal Pole (700-yr MRI).cdm
Kdurigon

Prepared In the Offices of:

750 N. Greenfield Pkwy.
Garner, NC 27529

Designed in conformance
with the latest
2020 Interim to the
1st Edition 2015

**AASHTO
LRFD**

Standard Specifications for
Highway Signs, Luminaires,
and Traffic Signals

DRAWING NUMBER	INDEX OF PLANS DESCRIPTION
Sig. M 1A	Statewide Wind Zone Map (700-yr MRI)
Sig. M 1B	Statewide Wind Zone Map (10-yr MRI)
Sig. M 2	Typical Fabrication Details-All Metal Poles
Sig. M 3	Typical Fabrication Details-Strain Poles
Sig. M 4	Typical Fabrication Details-Mast Arm Poles
Sig. M 5	Typical Fabrication Details-Mast Arm Connection
Sig. M 6	Typical Fabrication Details-Strain Pole Attachments
Sig. M 7	Construction Details-Foundations
Sig. M 8	Standard Strain Pole Foundation-All Soil Conditions
Sig. M 9	Typical Fabrication Details-CCTV Camera Poles

**MOBILITY AND SAFETY DIVISION -
TRANSPORTATION SYSTEMS MANAGEMENT
AND OPERATIONS UNIT**

D.Y. ISHAK - STATE SIGNALS ENGINEER
K. DURIGON, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER
B. WALKER, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER

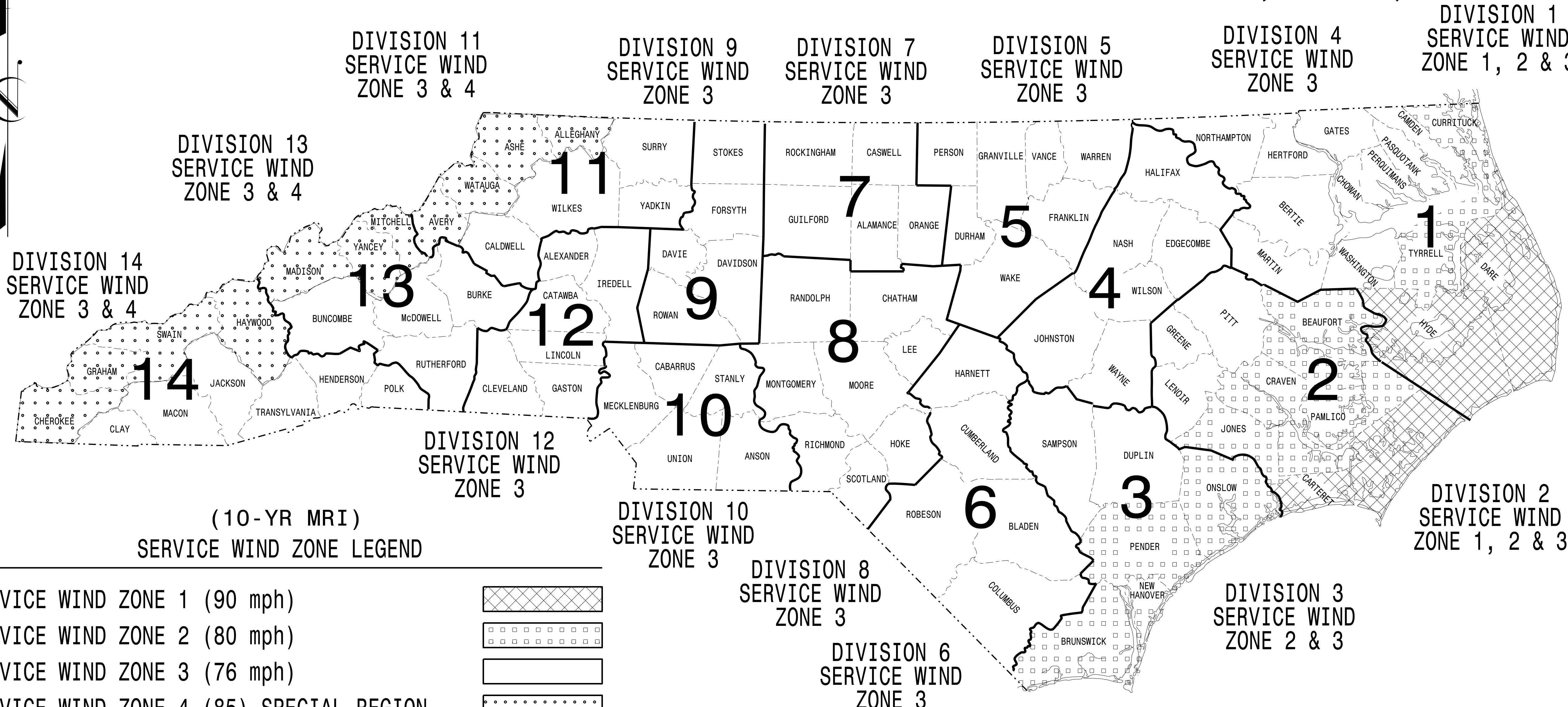
SEAL

DocuSigned by:
Kevin Durigon
SIGNATURE
4B23DC79B3764DA

09/21/2023
DATE

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



(10-YR MRI)
SERVICE WIND ZONE LEGEND

SERVICE WIND ZONE 1 (90 mph)	
SERVICE WIND ZONE 2 (80 mph)	
SERVICE WIND ZONE 3 (76 mph)	
SERVICE WIND ZONE 4 (85) SPECIAL REGION	

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

NC DOT METAL POLE STANDARDS

03-OCT-2023 10:51 S:\M1\AS1\ITS_Signals\Structures\Drawings\2024_Metal_Pole_Standards\10-yr_MRI1.dgn

Prepared in the Offices of:

750 N. Greenfield Pkwy.
Garner, NC 27529

Designed in conformance with the latest 2020 Interim to the 1st Edition 2015

AASHTO LRFD

Standard Specifications for Highway Signs, Luminaires, and Traffic Signals

DRAWING NUMBER	INDEX OF PLANS DESCRIPTION
Sig. M 1A	Statewide Wind Zone Map (700-yr MRI)
Sig. M 1B	Statewide Wind Zone Map (10-yr MRI)
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Sig. M 7	Construction Details-Foundations
Sig. M 8	Standard Strain Pole Foundation-All Soil Conditions
Sig. M 9	Typical Fabrication Details-CCTV Camera Poles

NCDOT CONTACTS:

**MOBILITY AND SAFETY DIVISION -
TRANSPORTATION SYSTEMS MANAGEMENT
AND OPERATIONS UNIT**

D.Y. ISHAK - STATE SIGNALS ENGINEER

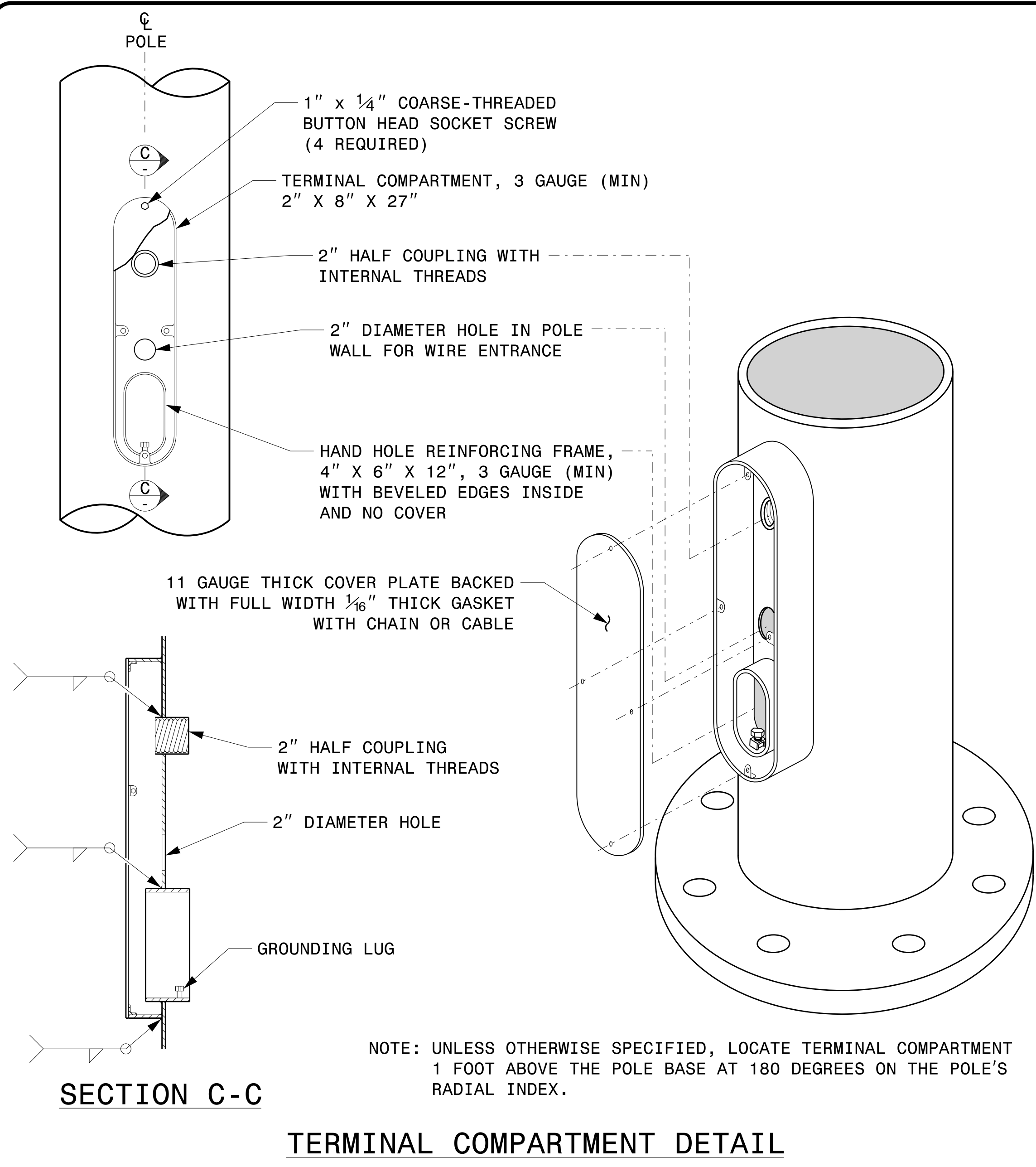
K. DURIGON, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER

B. WALKER, P.E. - ITS AND SIGNALS STRUCTURAL ENGINEER

SEAL

DocuSigned by:
Kevin Durigon
SIGNATURE
4B23DC78B3784DA

09/21/2023
DATE



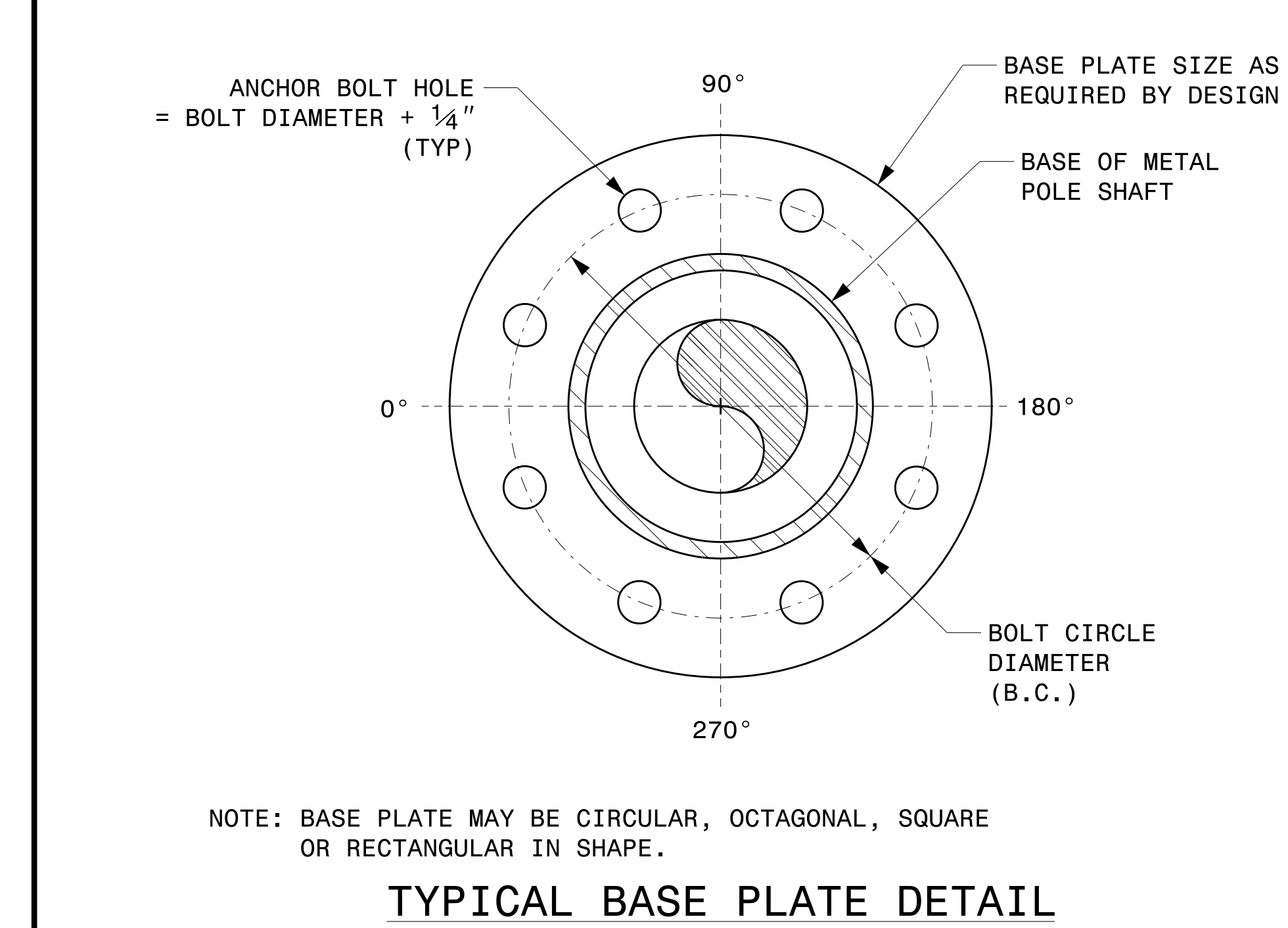
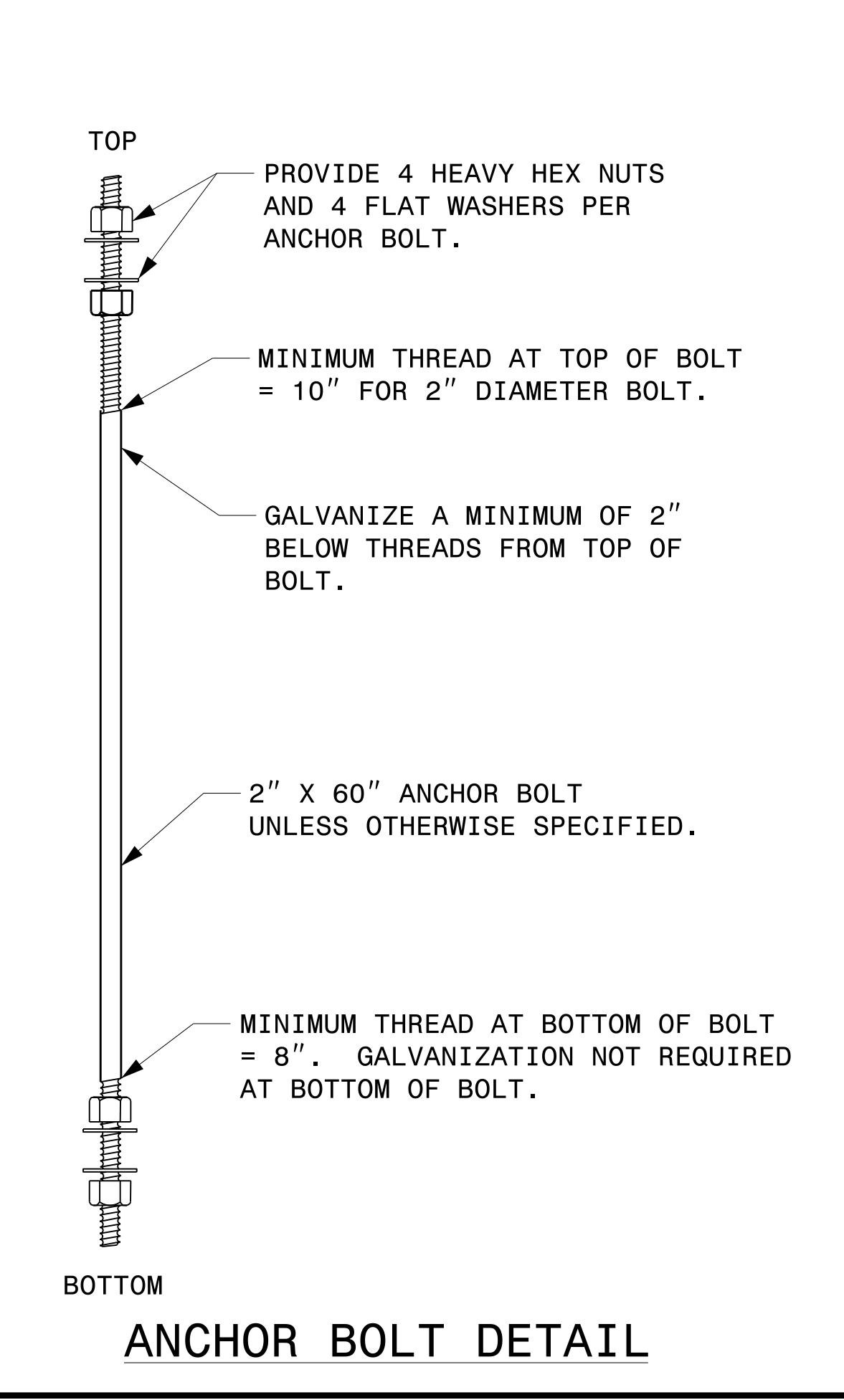
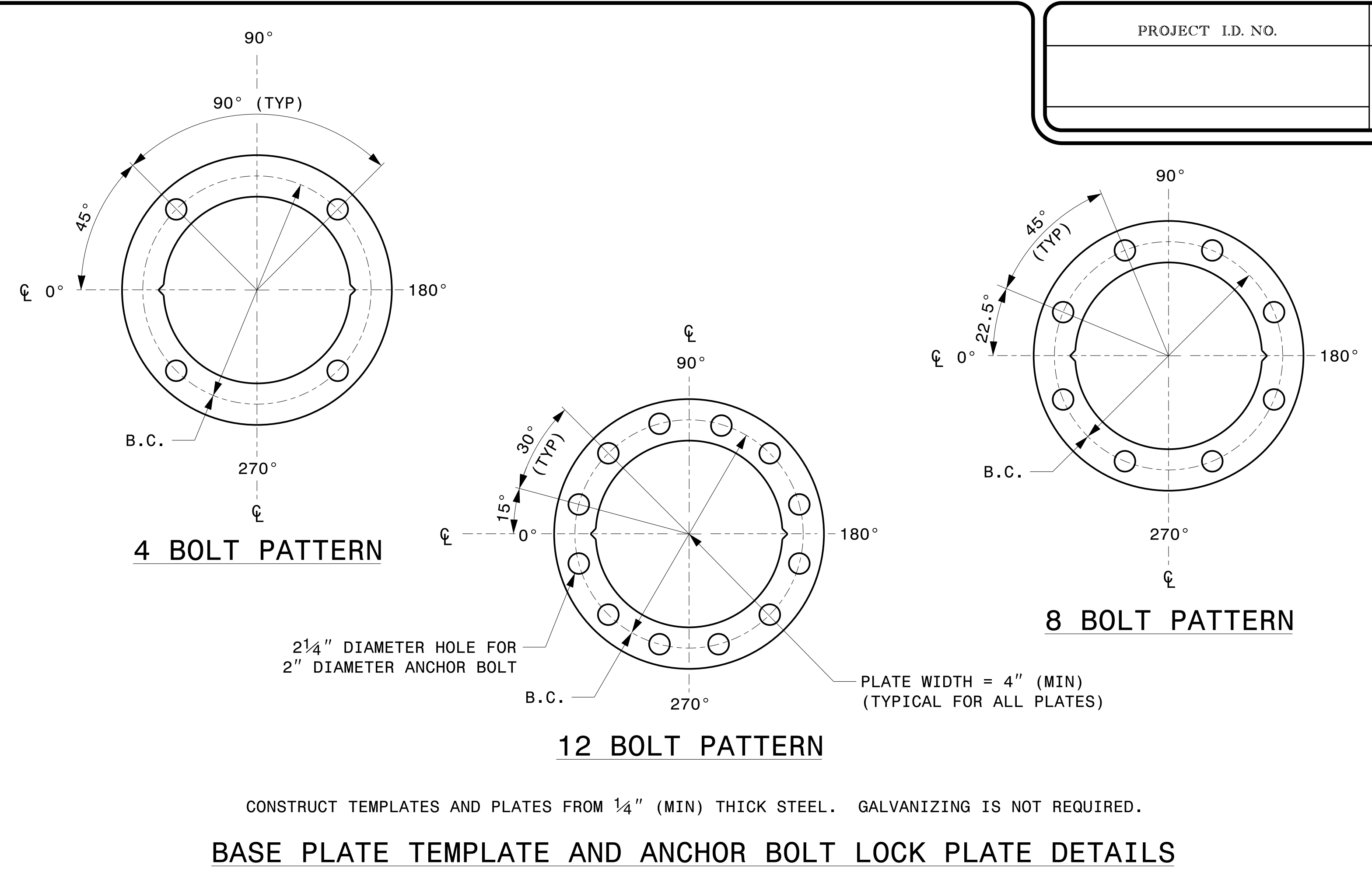
IDENTIFICATION TAG DETAILS

MFG _____ MFG. DATE: MM/YY	MFG _____ MFG. DATE: MM/YY
SHAFT D/T/L/Y _____	SECTION D/T/L/Y _____
ARM-A D/T/L/Y _____	NCDOT SIG. INV. NO. _____
ARM-B D/T/L/Y _____	NCDOT POLE NO. _____
A.B. DIA./B.C./L/Y _____	ARM I.D. TAG (PROVIDE ON EACH SECTION OF A MULTI-SECTION MAST ARM)
NCDOT SIG. INV. NO. _____	
NCDOT POLE NO. _____	

SHAFT I.D. TAG
(PROVIDE ON SHAFT OF STRAIN POLES
AND MAST ARM POLE SHAFT)

NOTES:

- D = DIAMETER, T = THICKNESS, L = LENGTH, Y = YIELD STRENGTH
- A.B. = ANCHOR BOLT
- B.C. = BOLT CIRCLE OF ANCHOR BOLTS
- IF STANDARD DESIGN, INCLUDE CASE NUMBER IN ADDITION TO POLE NUMBER ON "NCDOT POLE NO." LINE.
- SIGNAL INV. NUMBER AND POLE I.D. NUMBER. SEE DRAWING M3 AND M4 FOR MOUNTING POSITIONS OF I.D. TAGS.



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For All Metal Poles

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F. ANDREWS
 PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SCALE: 0 NA NONE

DocuSigned by: **Kevin Durigon** 09/21/2023

SEAL: KEVIN C. DURIGON, ENGINEER, SEAL 036626, SIGNATURE

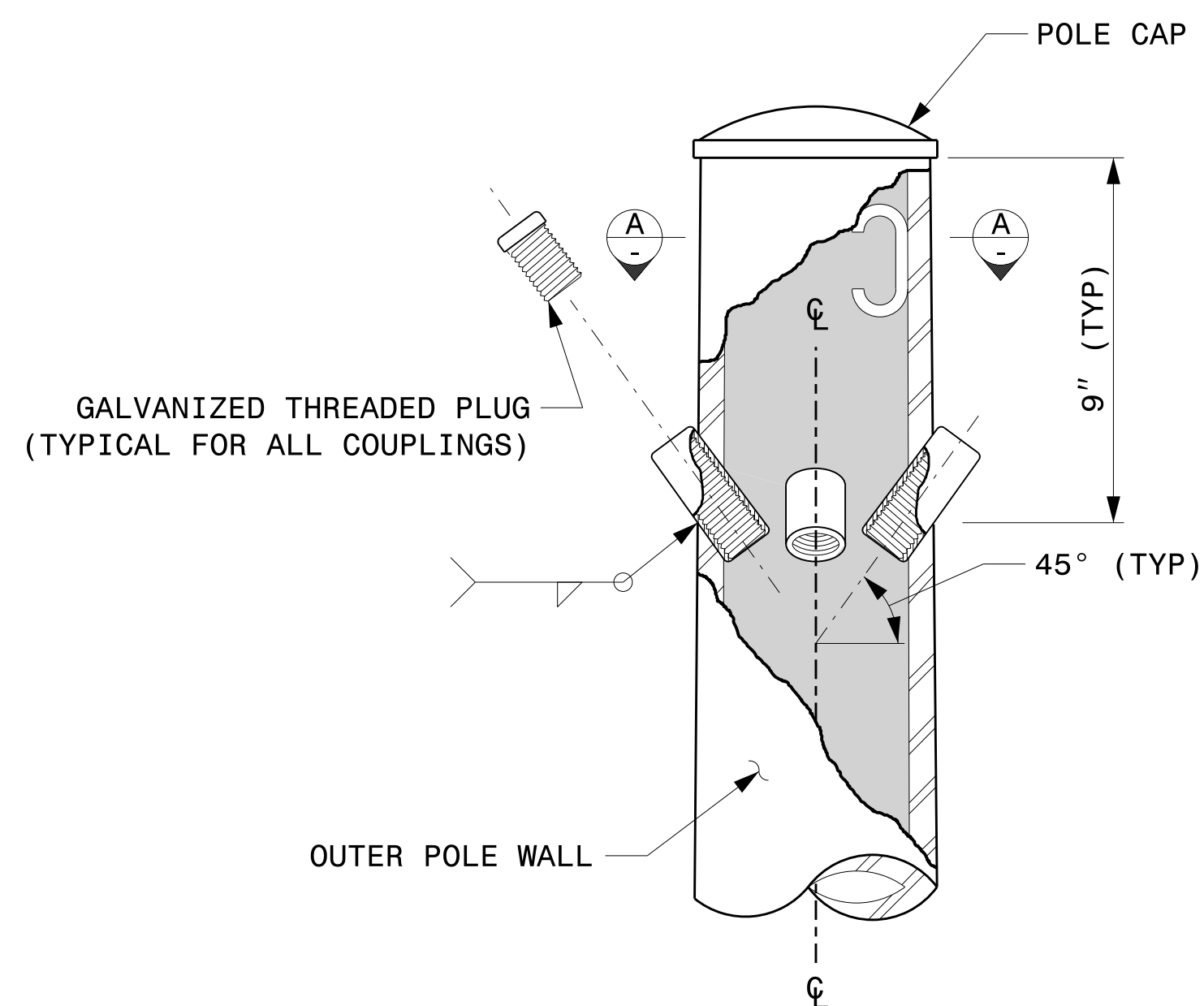
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Fabrication Details – All Metal Poles

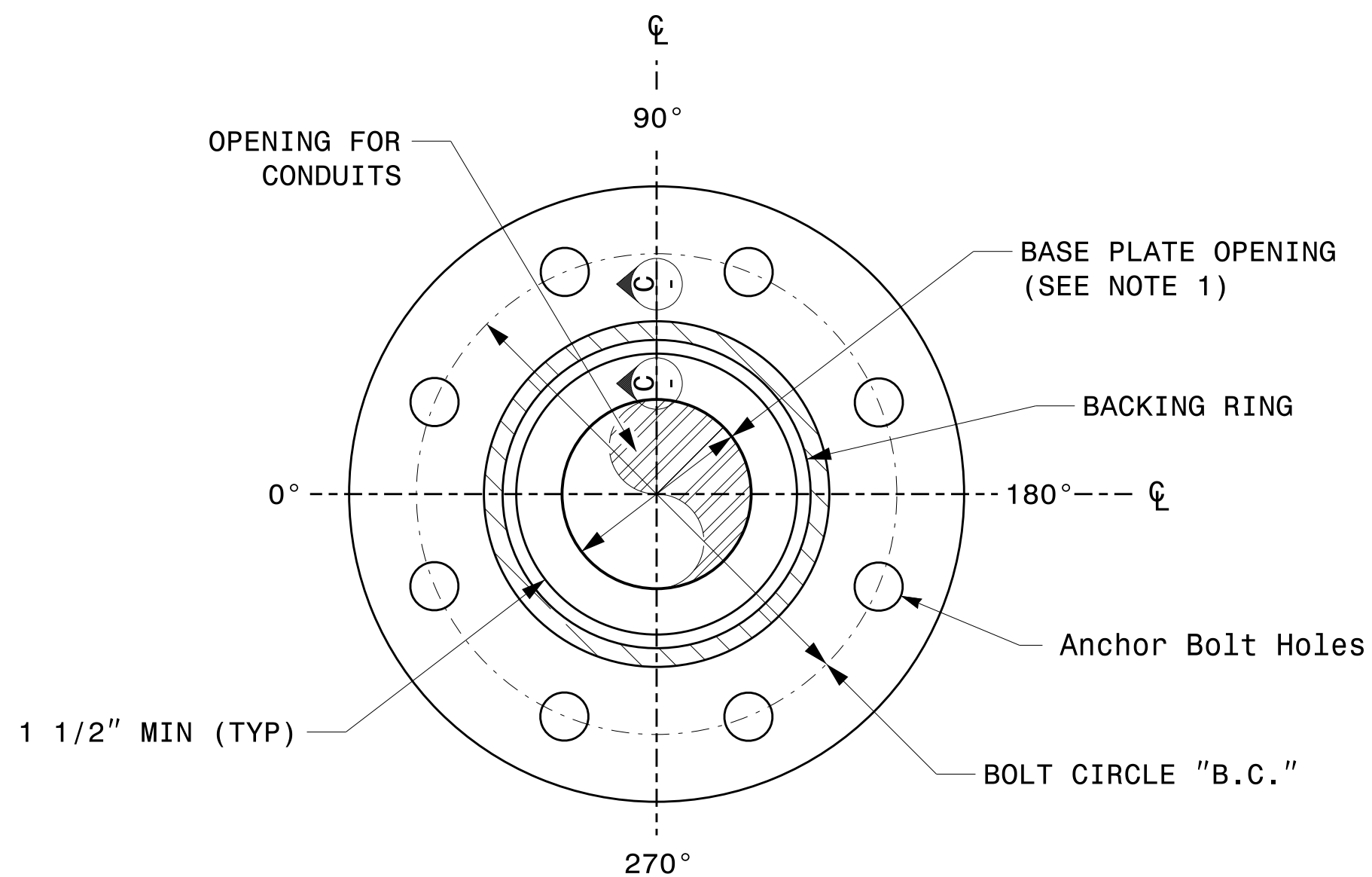
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NOTE:

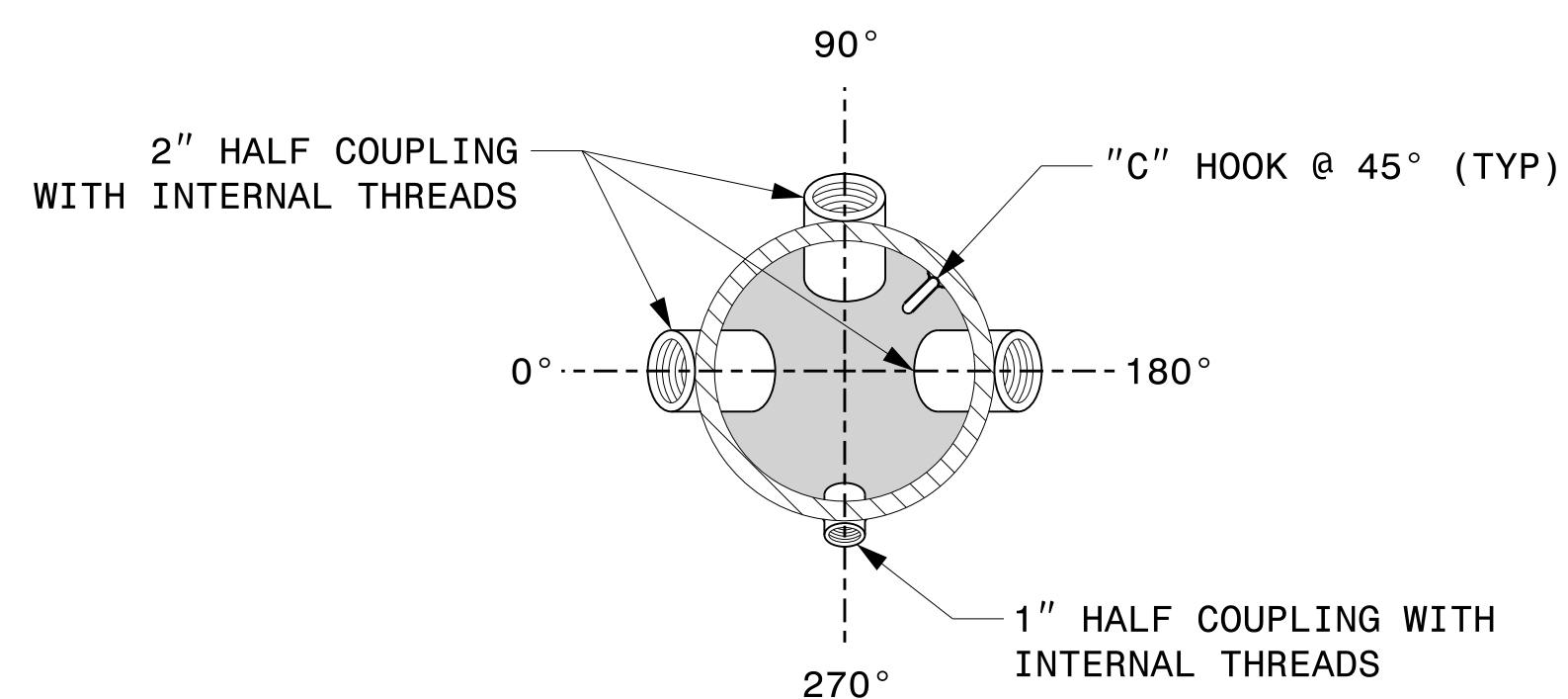
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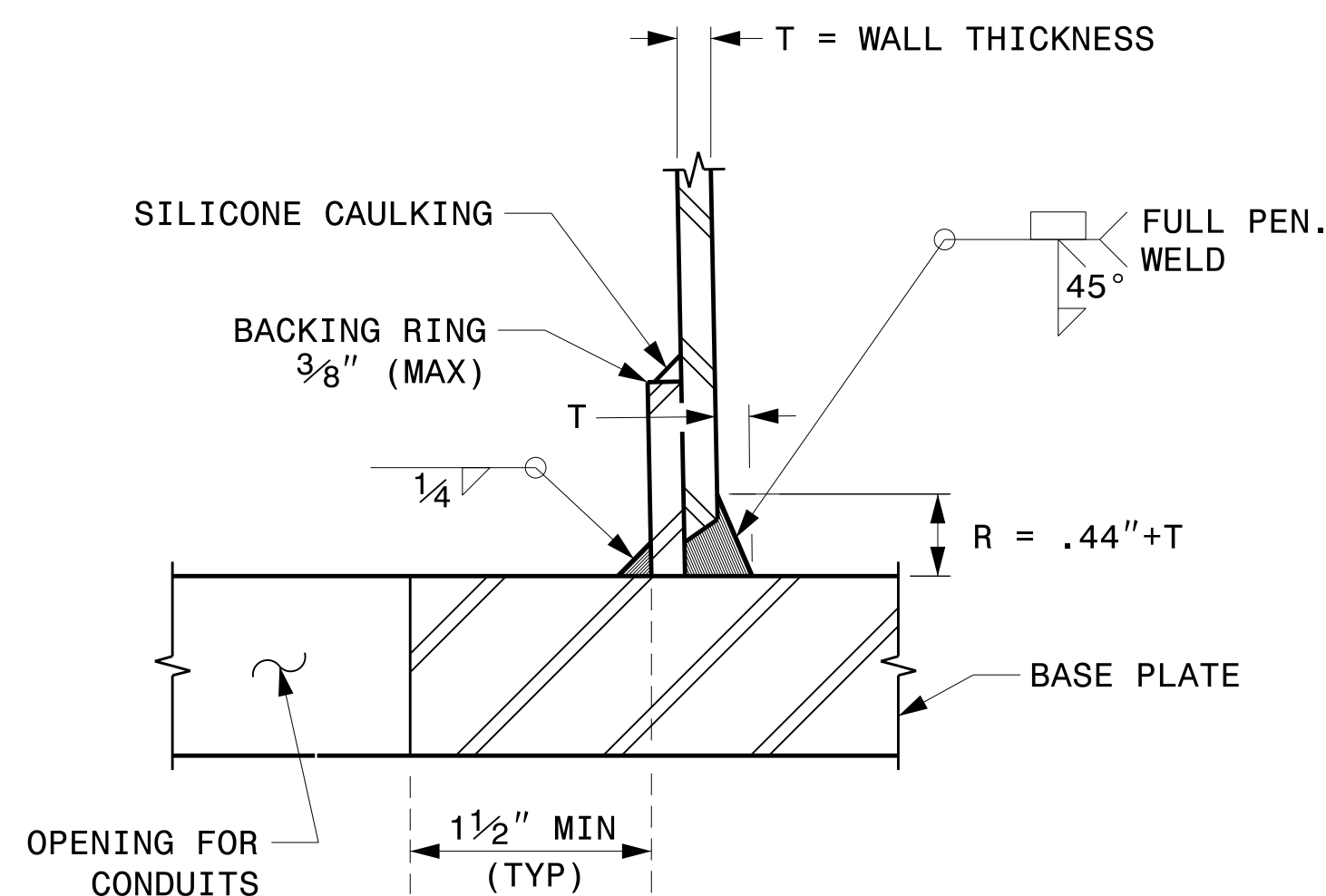
CABLE ENTRANCES AT TOP OF POLE



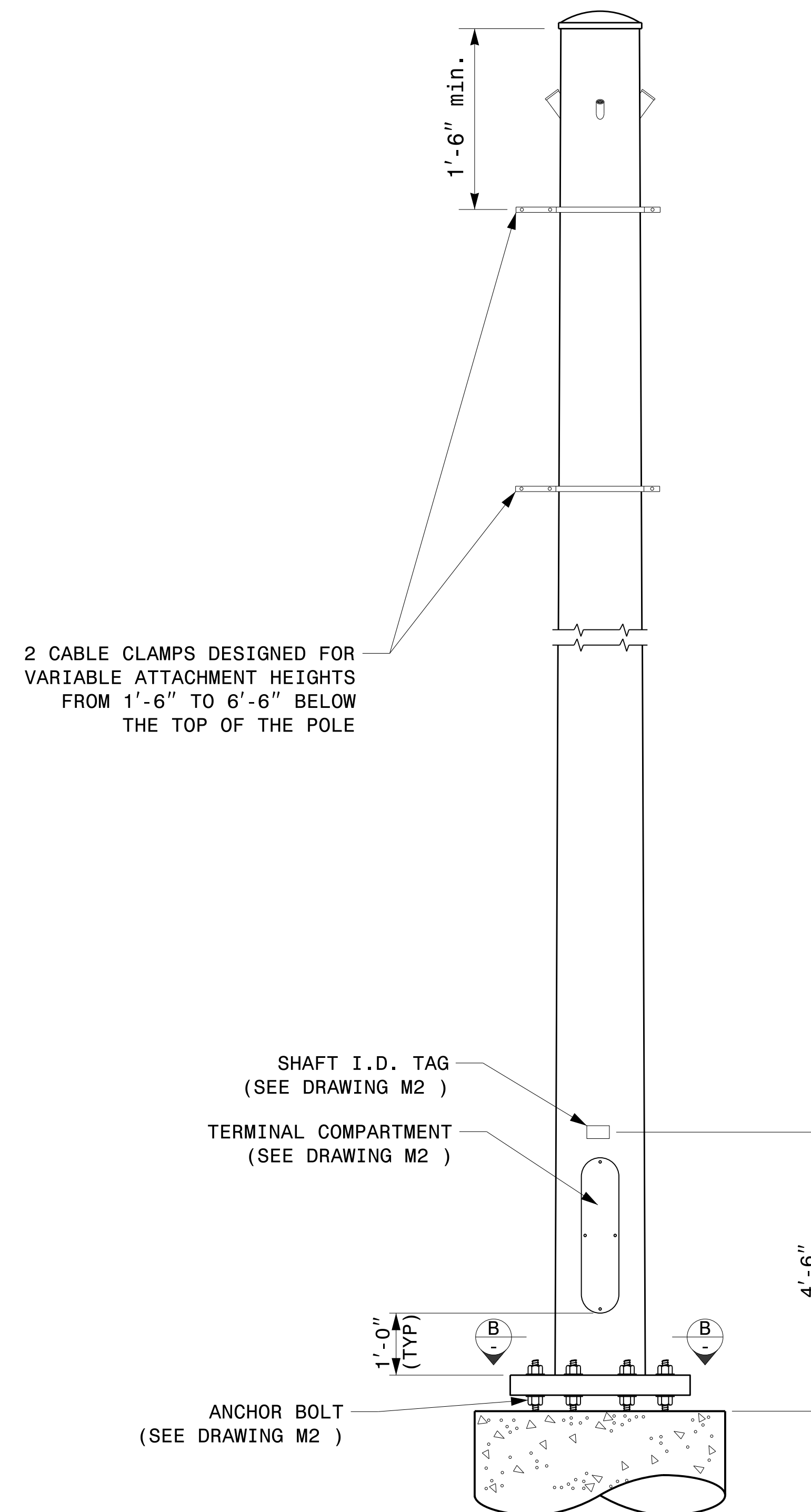
SECTION B-B
POLE BASE PLATE DETAILS
(8 AND 12 BOLT PATTERN)



SECTION A-A
RADIAL ORIENTATION OF FACTORY INSTALLED
ACCESSORIES AT TOP OF POLE



SECTION C-C
(POLE ATTACHMENT TO BASE PLATE)
FULL-PENETRATION
GROOVE WELD DETAIL



MONOTUBE STRAIN POLE

08-dt-2023 10:37
S:\SSS\415\SIGNAL\Signal Design\Section\Structures\Drawings\2024\Monot Pole Str Drawing for LRF\2024 Sig.M3 Str. Fabrication Details-Strain Poles.dgn
Kedar Durigon

Prepared in the Offices of:

SCALE: 0 NA NONE

Typical Fabrication Details For Strain Poles	
PLAN DATE: SEPTEMBER 2023	DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

DocuSigned by:
Kevin Durigon
SIGNATURE

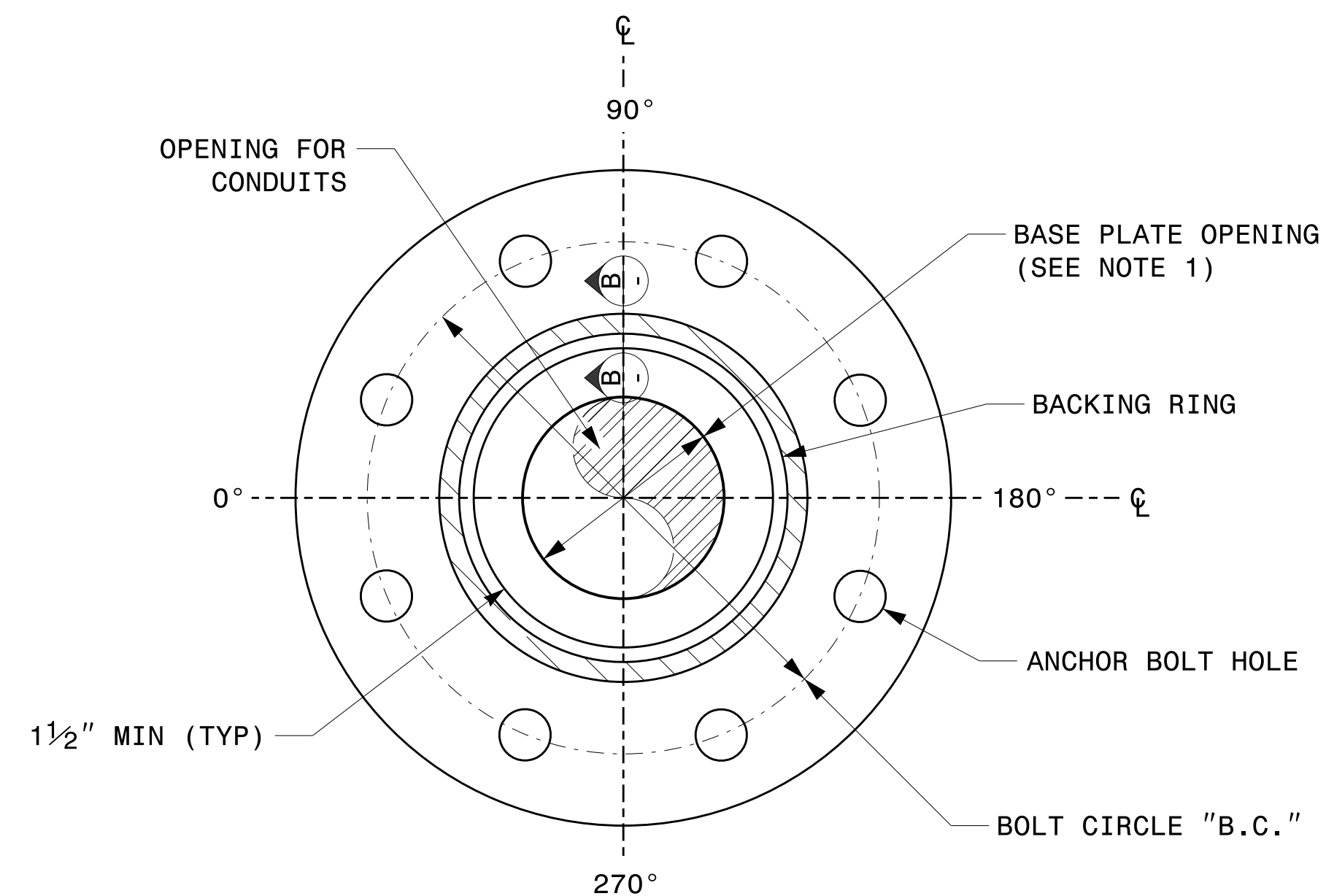
9/23/2023
DATE

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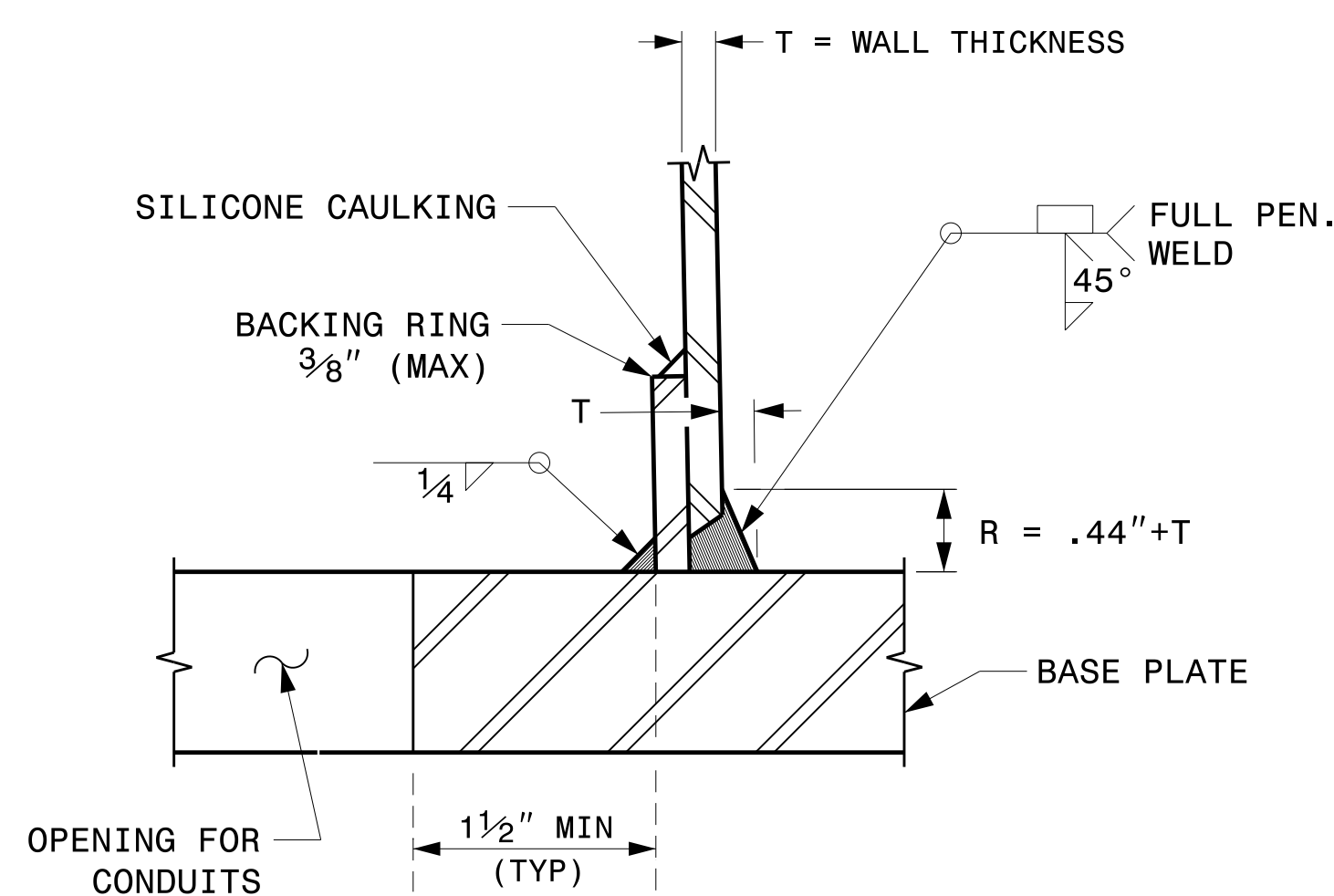
Fabrication Details – Strain Poles

NOTE:

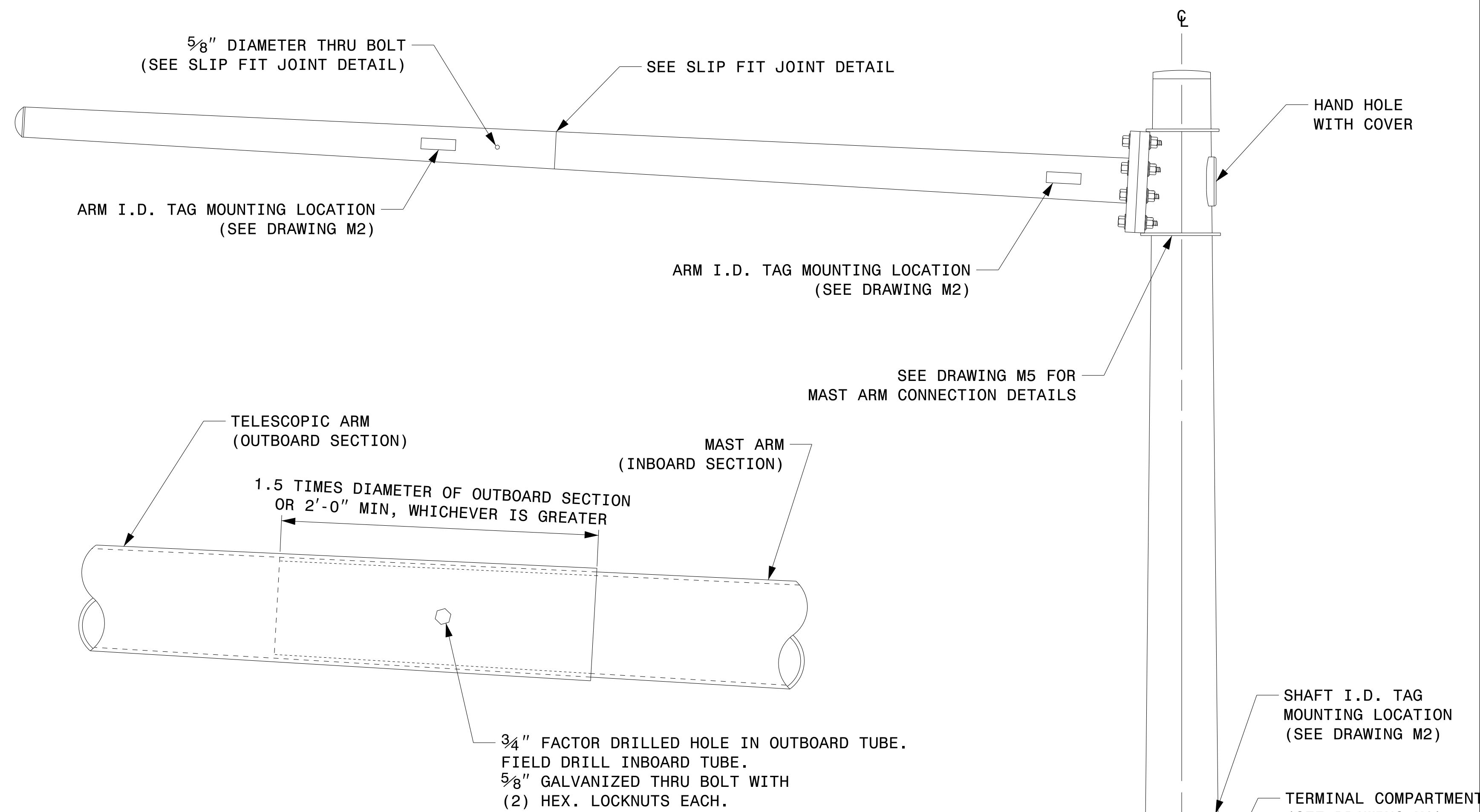
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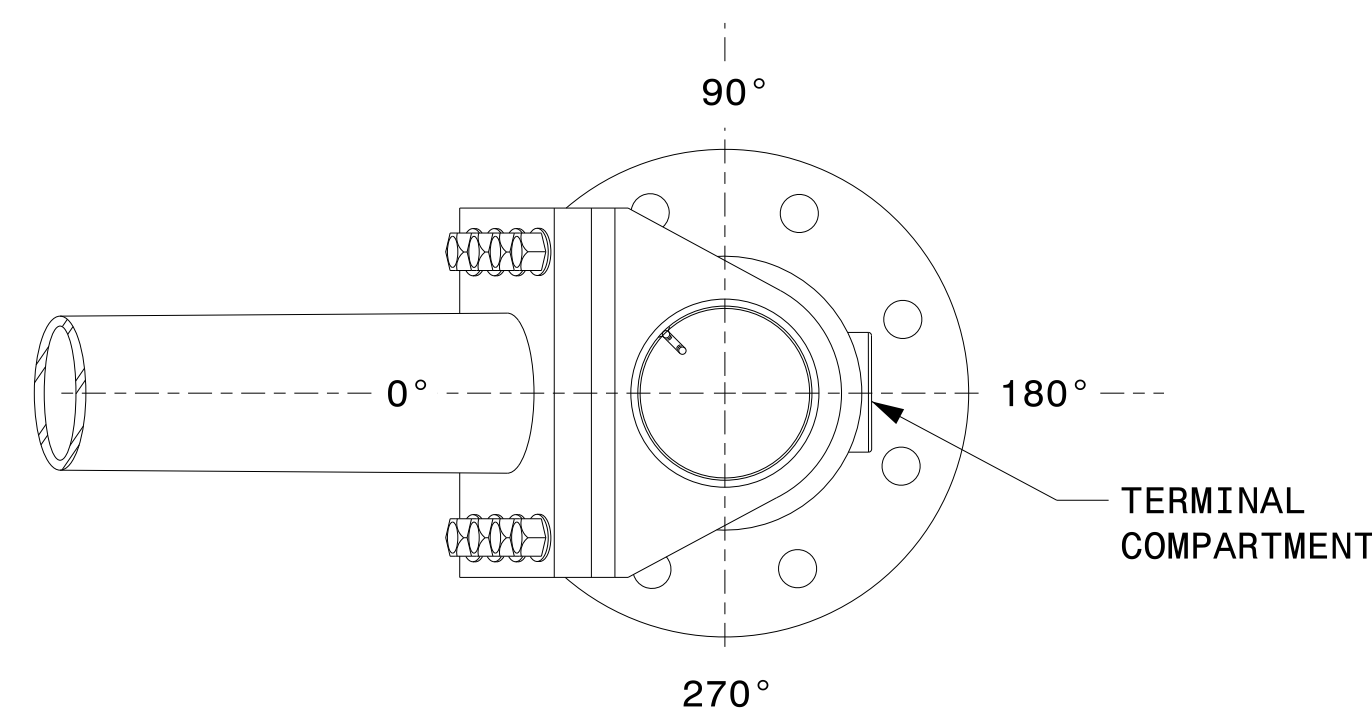
SECTION A-A
POLE BASE PLATE DETAILS



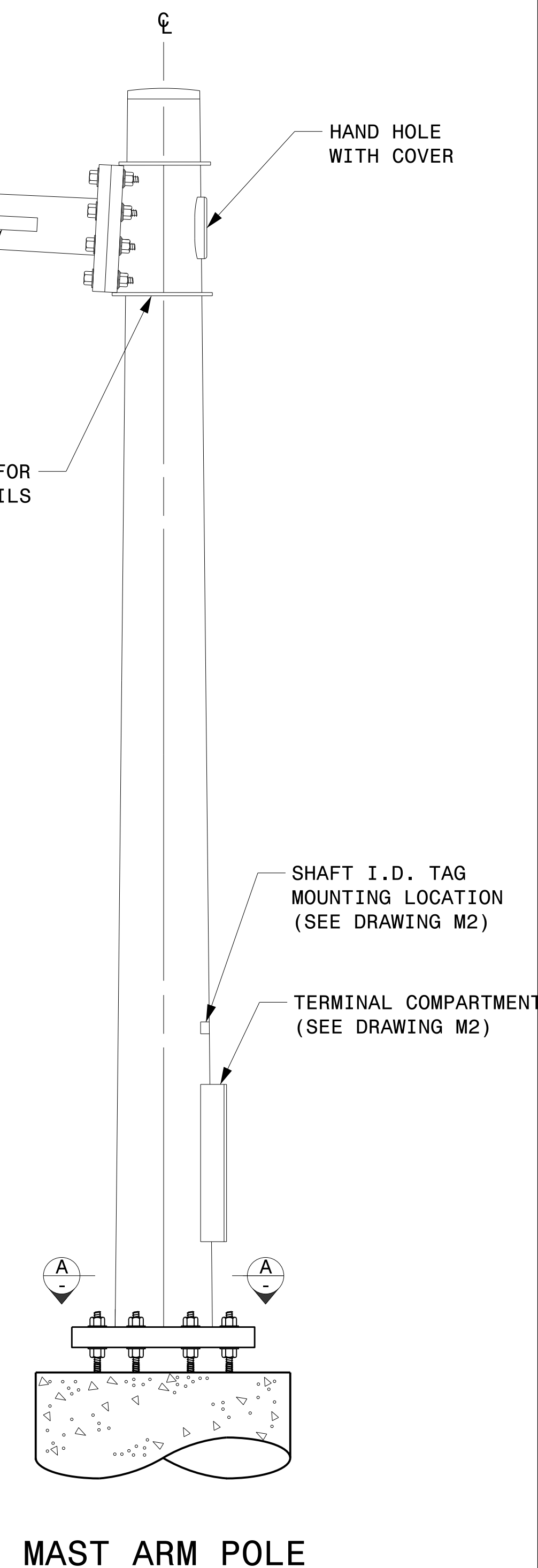
SECTION B-B
(POLE ATTACHMENT TO BASE PLATE)
FULL-PENETRATION
GROOVE WELD DETAIL



SLIP FIT JOINT DETAIL FOR MAST ARM



MAST ARM RADIAL ORIENTATION



MAST ARM POLE

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: NA
NONE

Typical Fabrication Details For Mast Arm Poles	
PLAN DATE: SEPTEMBER 2023	DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

DocuSigned by:
Kevin Durigon
09/21/2023

09-drt-2023-10-31E
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Kedar Durigon

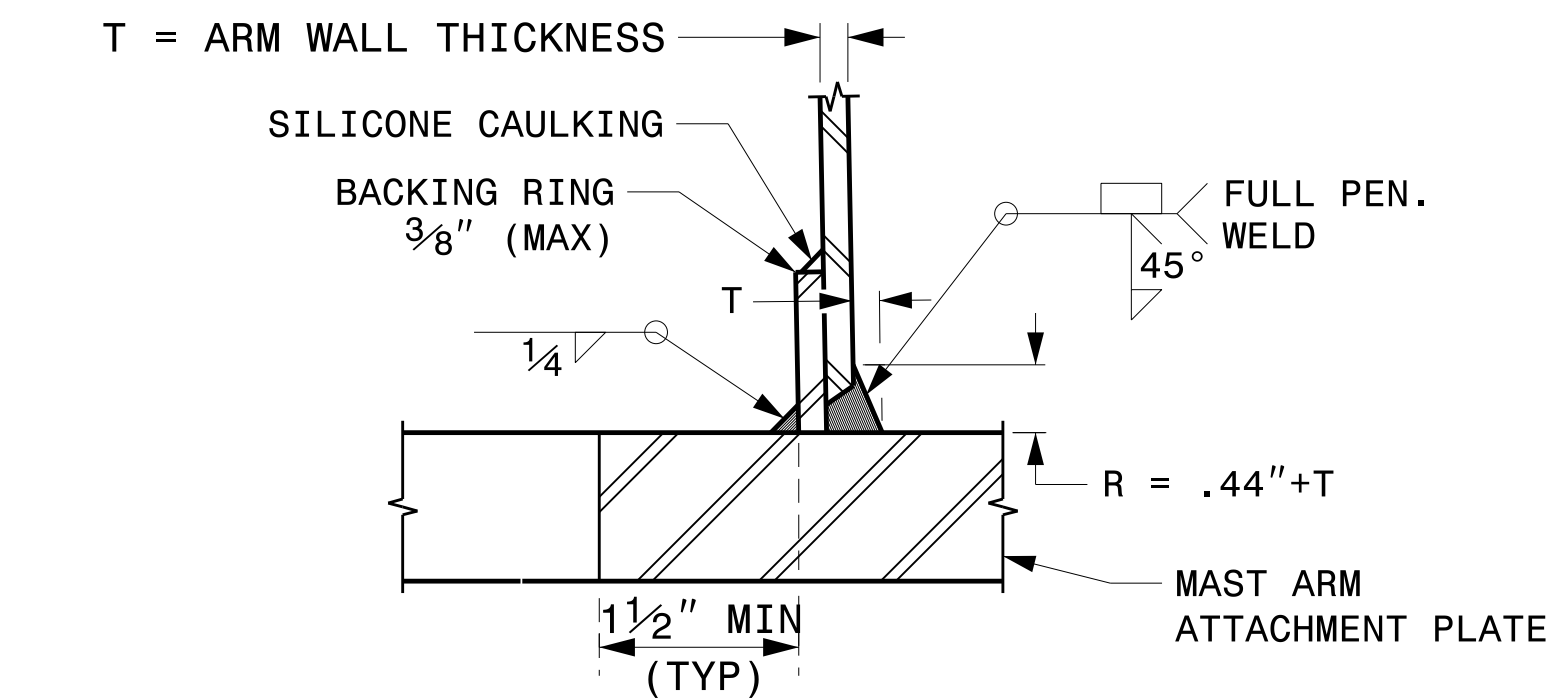
Fabrication Details – Mast Arm Poles

WELDED RING STIFFENED MAST ARM CONNECTION

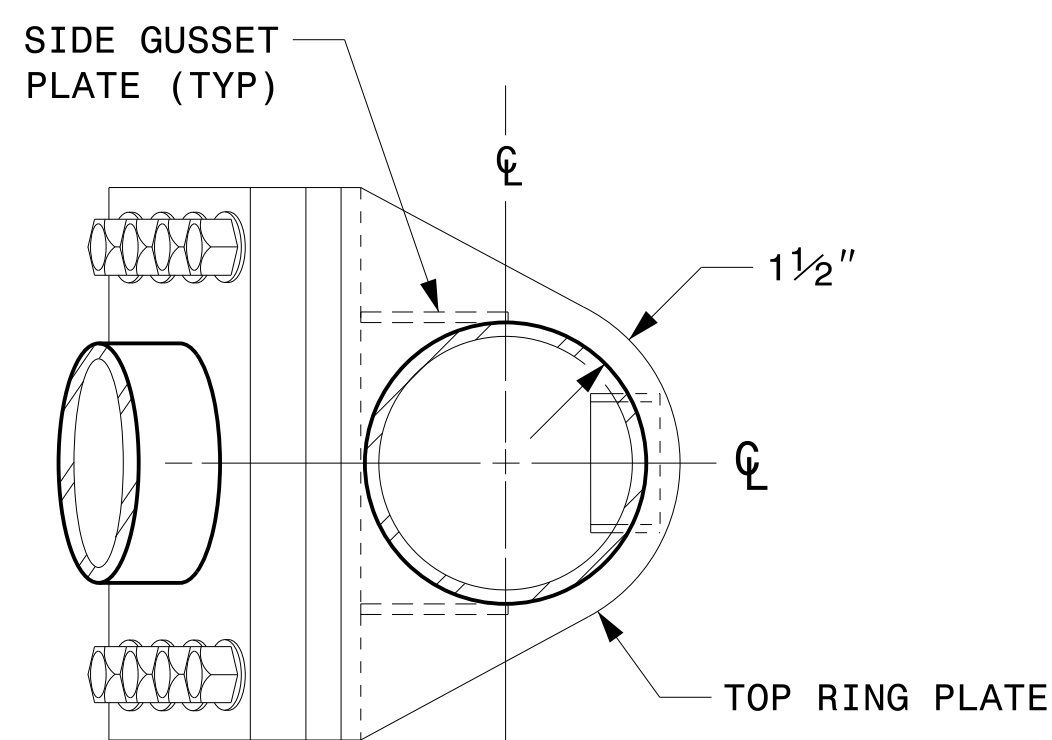
PROJECT I.D. NO.

SHEET NO.

Sig.M5



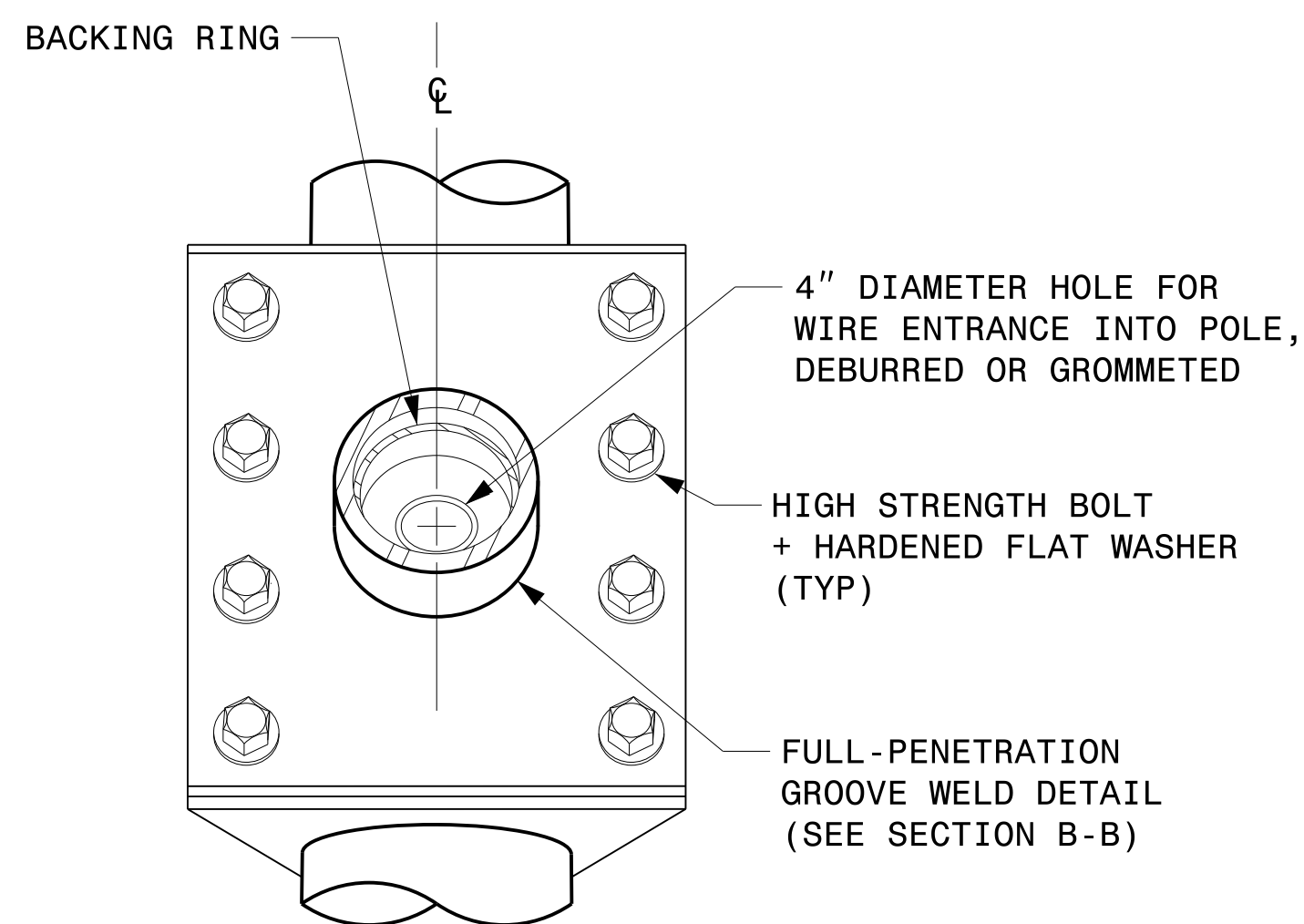
**SECTION B-B
FULL-PENETRATION GROOVE WELD DETAIL**



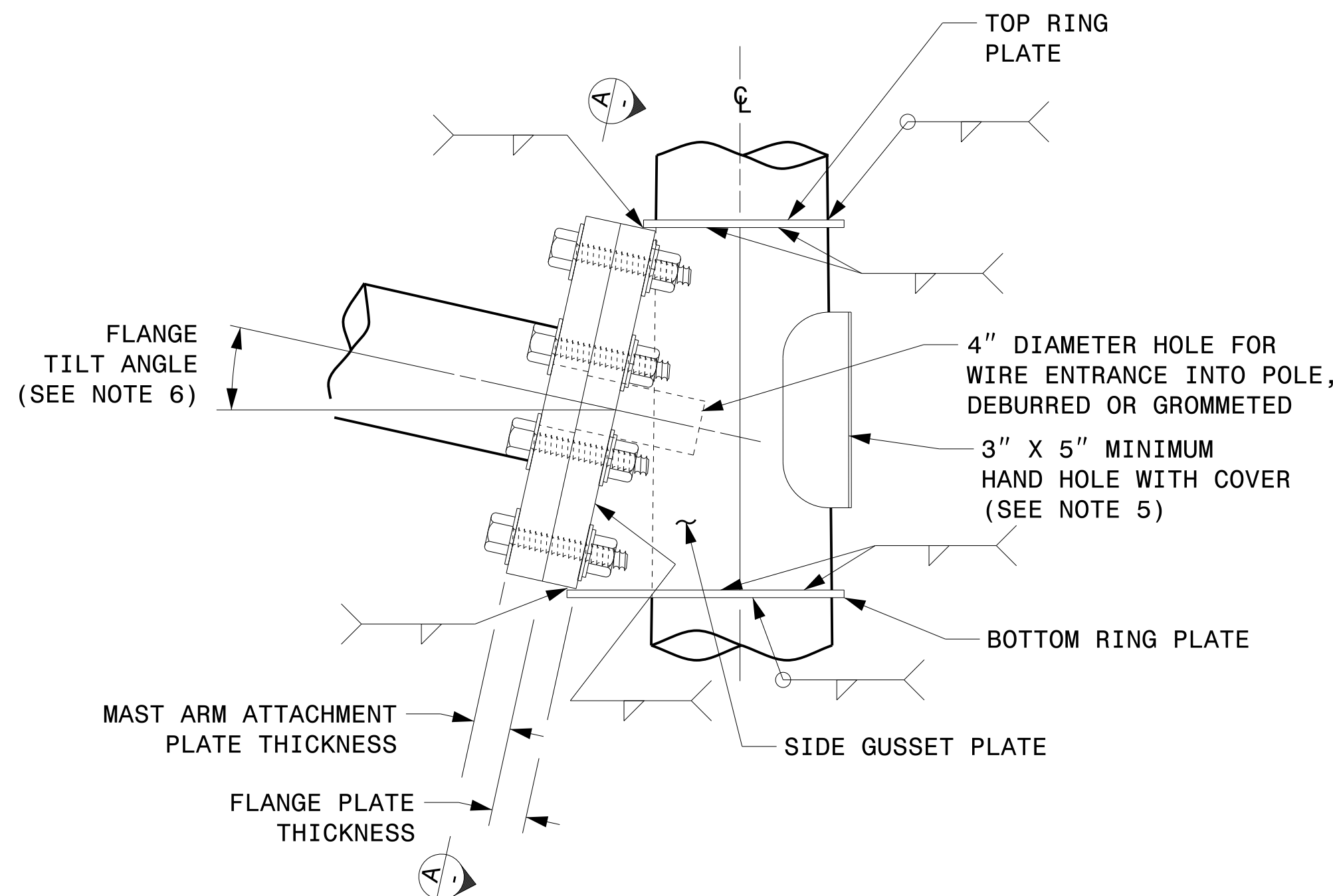
PLAN VIEW

NOTES:

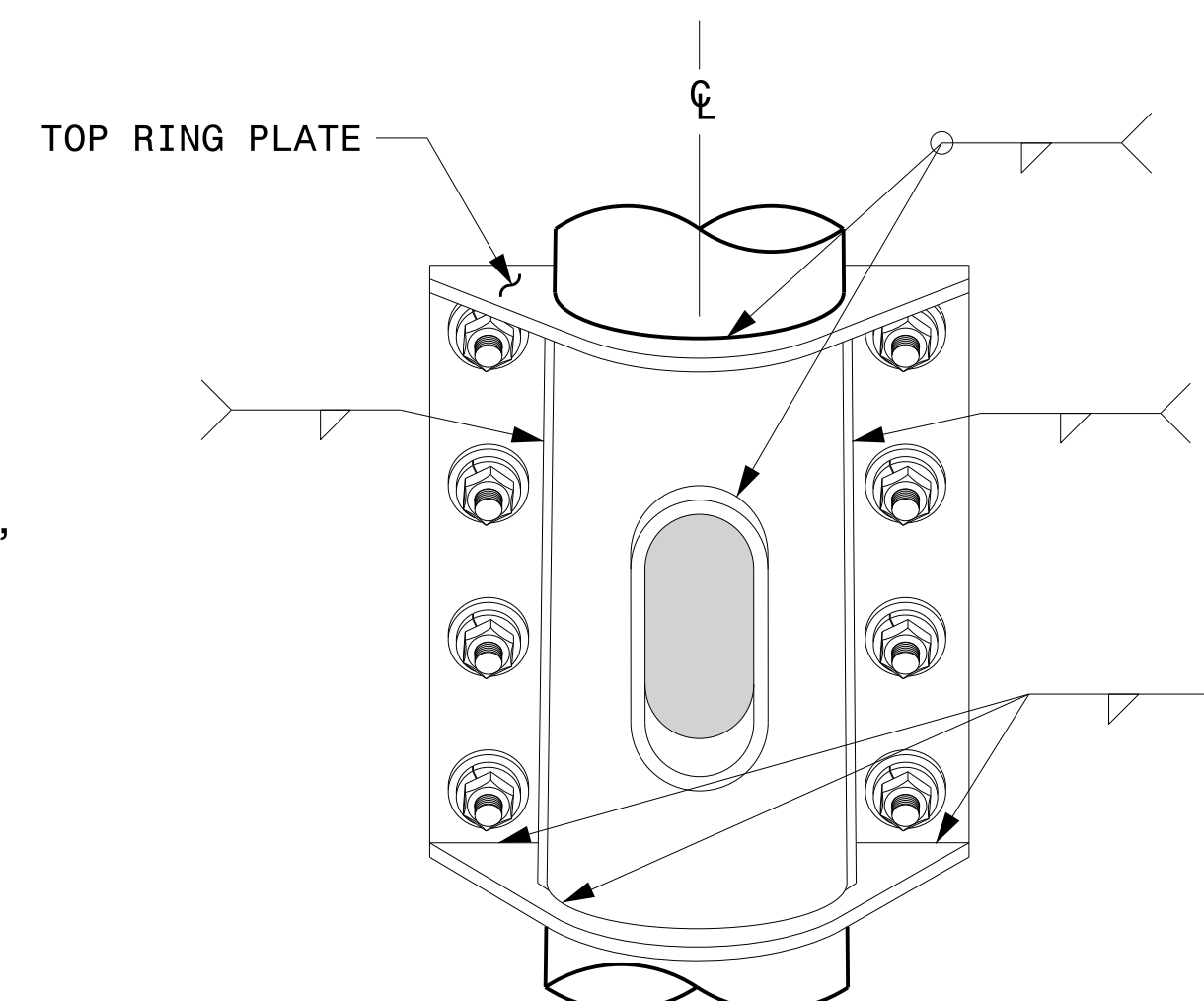
1. PROVIDE A PERMANENT MEANS OF IDENTIFICATION ABOVE THE MAST ARM TO INDICATE PROPER ATTACHMENT ORIENTATION OF THE MAST ARM.
2. DESIGNER WILL DETERMINE THE SIZE OF ALL STRUCTURAL COMPONENTS, PLATES, FASTENERS, AND WELDS SHOWN UNLESS THEY ARE ALREADY SPECIFIED.
3. FABRICATOR IS RESPONSIBLE FOR PROVIDING APPROPRIATE HOLES AT DRAINAGE POINTS TO DRAIN GALVANIZING MATERIALS.
4. FOR MINIMUM EDGE DISTANCE AND NOMINAL BOLT HOLE SIZE, FOLLOW THE LATEST AISC STEEL CONSTRUCTION MANUAL.
5. PROVIDE UPPER HANDHOLE AS NECESSARY WHEN SHAFT EXTENSIONS ARE REQUIRED 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.



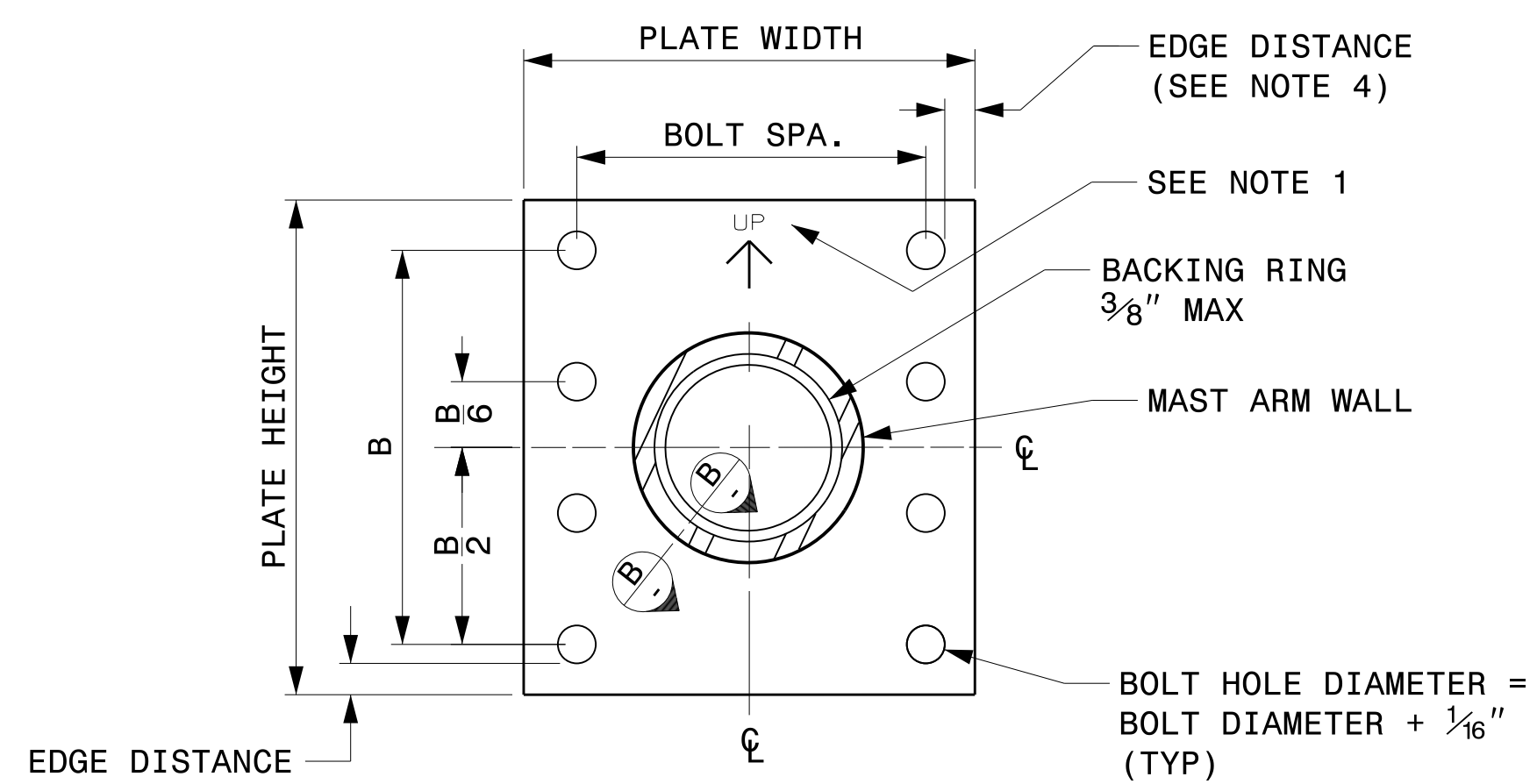
FRONT ELEVATION VIEW



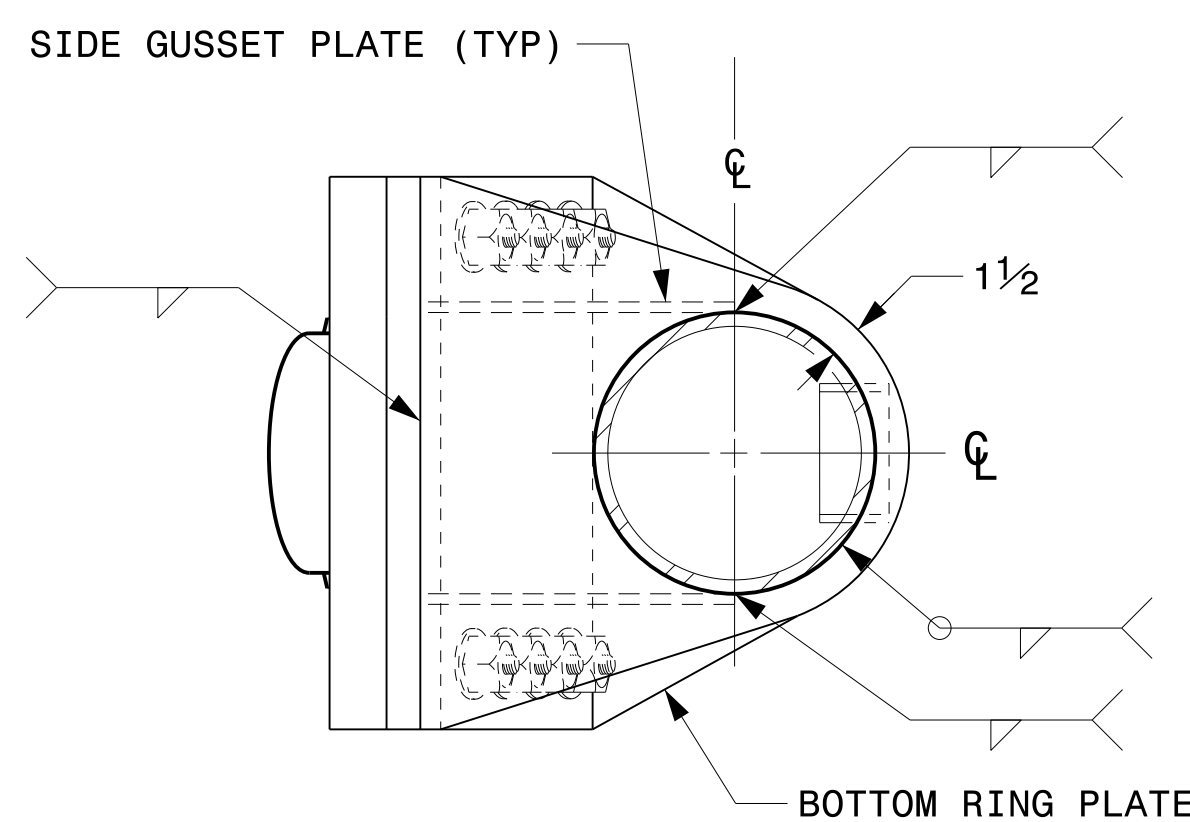
SIDE ELEVATION VIEW



BACK ELEVATION VIEW



**SECTION A-A
MAST ARM ATTACHMENT PLATE**

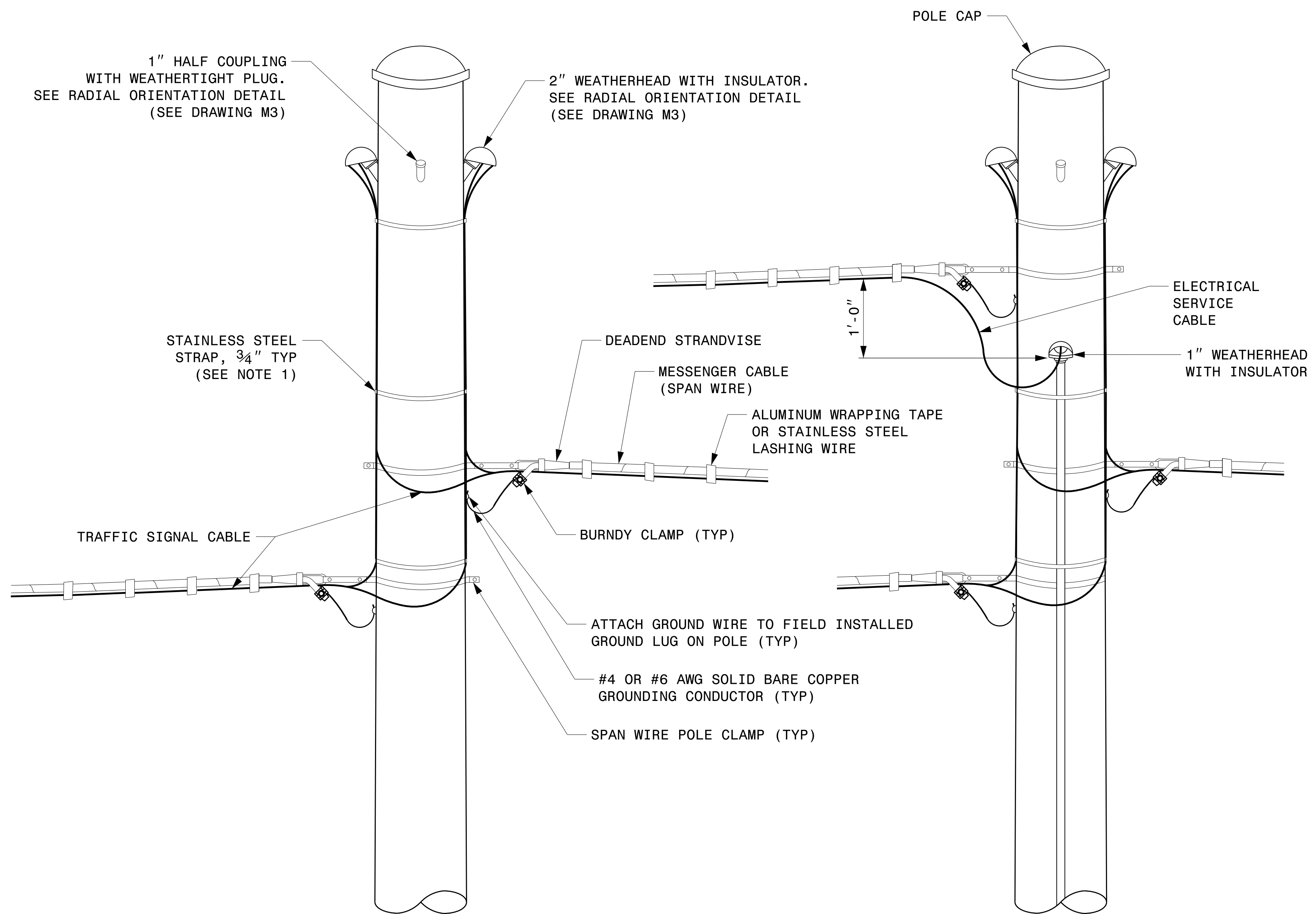


BOTTOM VIEW

<p style="font-size: small;">Prepared in the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Mast Arm Connection To Pole</p> <p style="font-size: x-small;">PLAN DATE: SEPTEMBER 2023 DESIGNED BY: C.F. ANDREWS PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR</p>	<p>SEAL</p>												
<p>SCALE</p> <p>0 NA</p> <p>NONE</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="font-size: x-small;">REVISIONS</th> <th style="font-size: x-small;">INIT.</th> <th style="font-size: x-small;">DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p>DocuSigned by:</p> <p><i>Kevin Durigon</i></p> <p style="font-size: x-small;">4B23DC79B3784DA</p>
REVISIONS	INIT.	DATE												
		<p>09/21/2023</p> <p style="font-size: x-small;">DATE</p>												

03-dt-2023-10-30
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Kedar Tagon

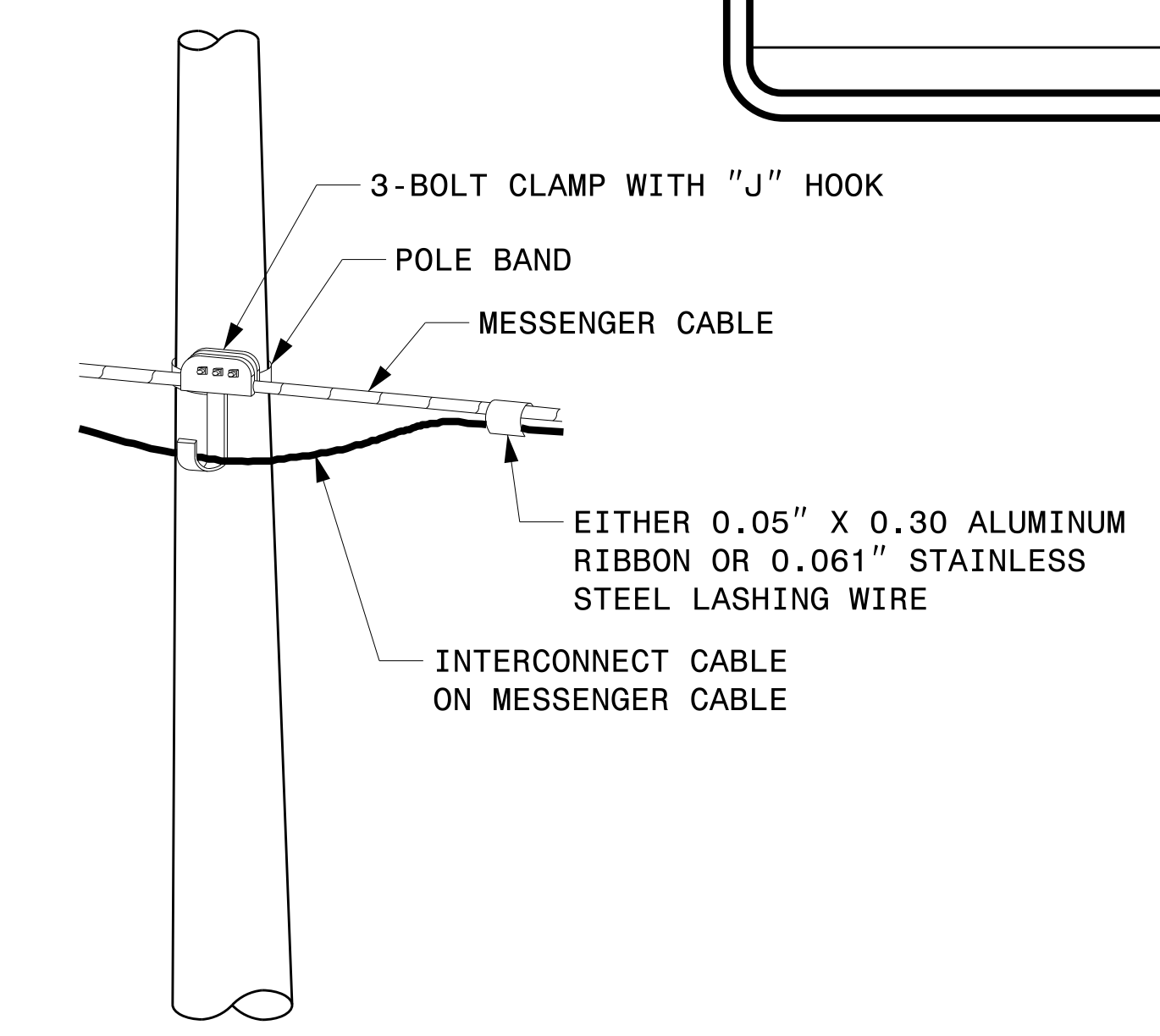
Fabrication Details – Mast Arm Connection



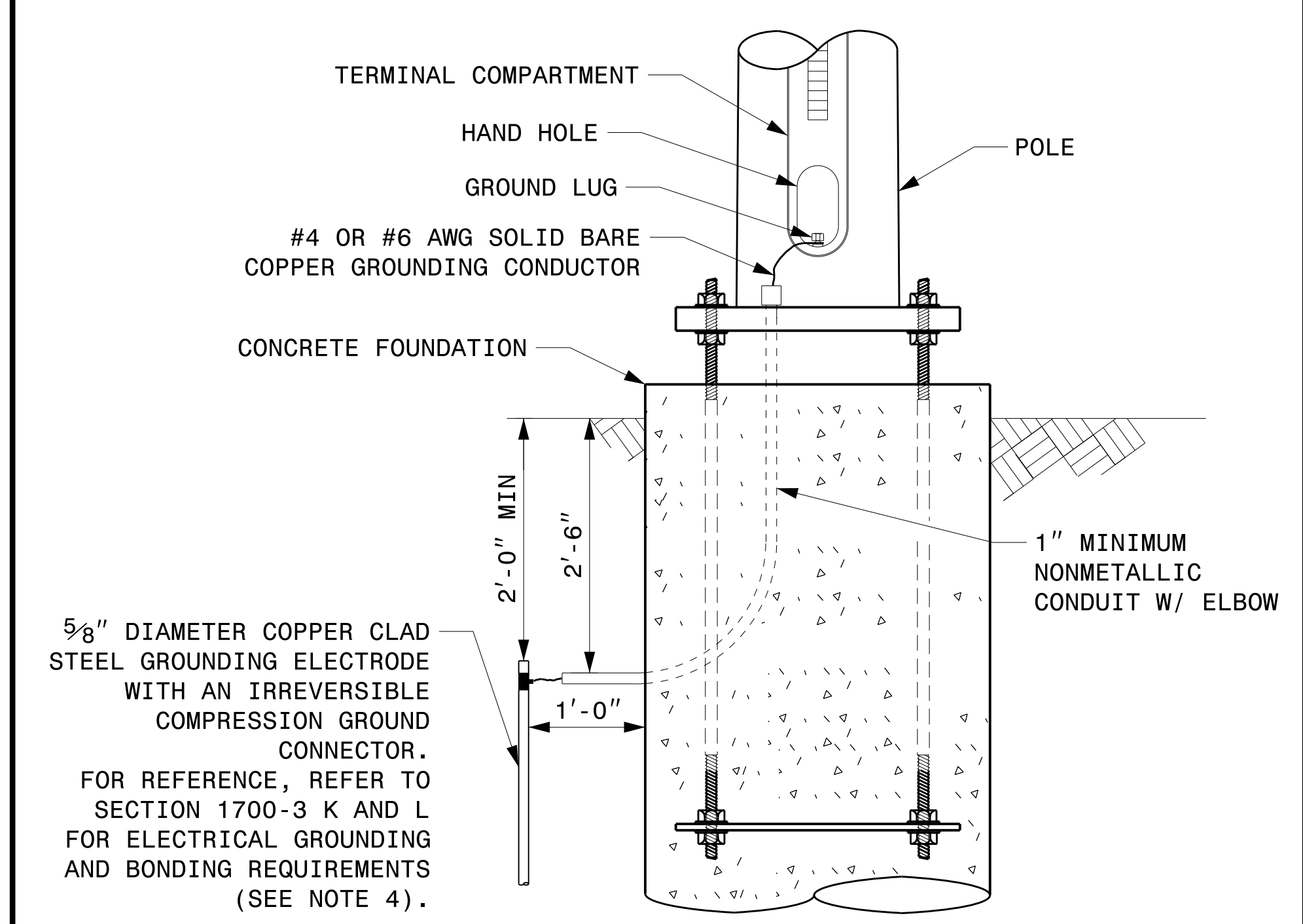
STRAIN POLE ATTACHMENTS

NOTES:

1. STRAP ALL SIGNAL CABLES TO THE SIDE OF THE POLE WITH 3/4" STAINLESS STEEL STRAPS WHEN THE DISTANCE BETWEEN SPAN WIRE ATTACHMENT CLAMP AND WEATHERHEADS EXCEEDS 3'-0".
2. PROVIDE MINIMUM TWO SPAN WIRE 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 2024.



ATTACHMENT OF CABLE TO INTERMEDIATE METAL POLE



METAL POLE GROUNDING DETAIL FOR STRAIN POLE AND MAST ARM

Prepared in the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529
 SCALE: 0 NA NONE

Typical Fabrication Details For Strain Pole Attachments	
PLAN DATE: SEPTEMBER 2023	DESIGNED BY: C.F. ANDREWS
PREPARED BY: K.C. DURIGON	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

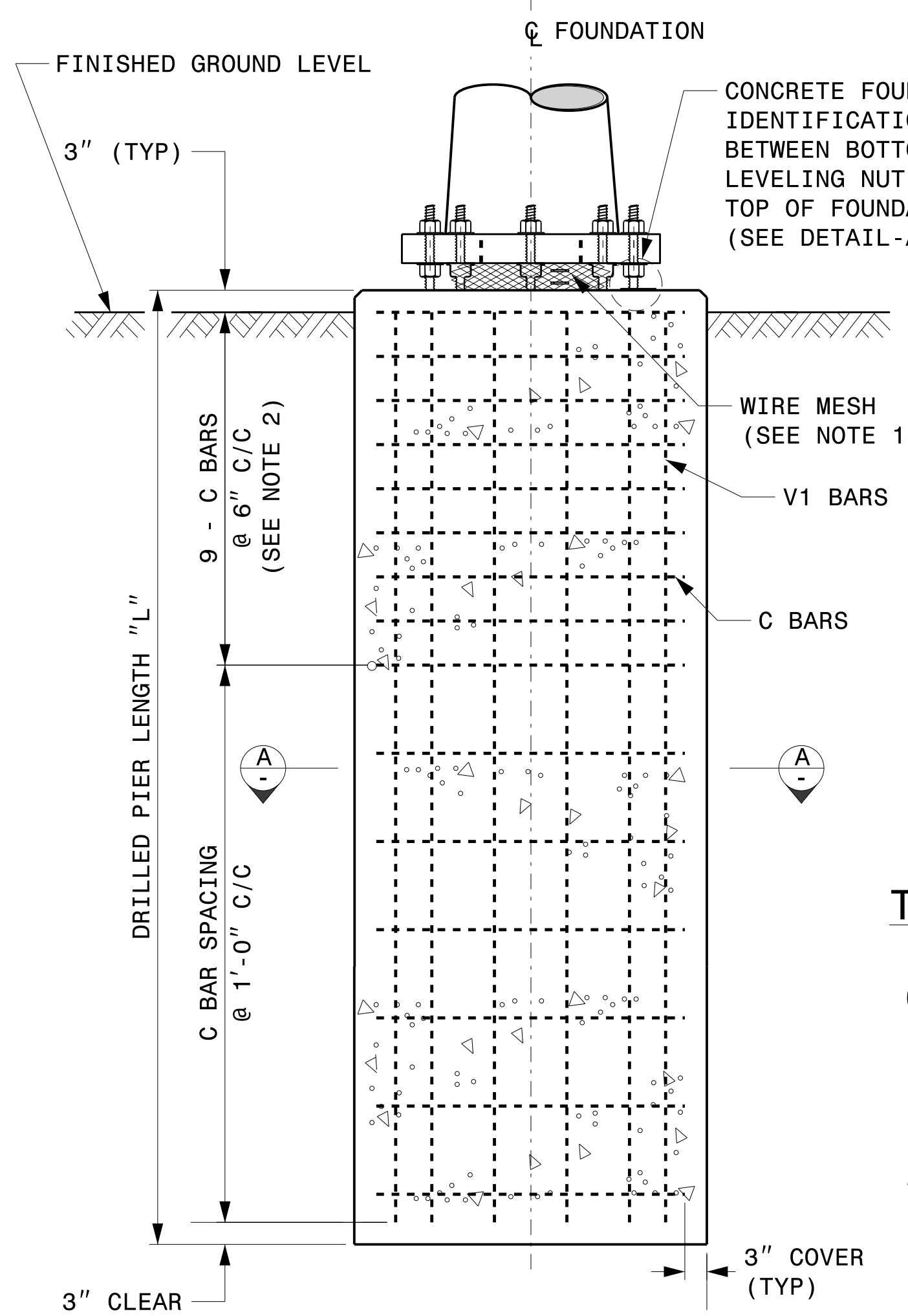
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 Kevin Durigon
 4B23DC79B3784DA
 SEAL

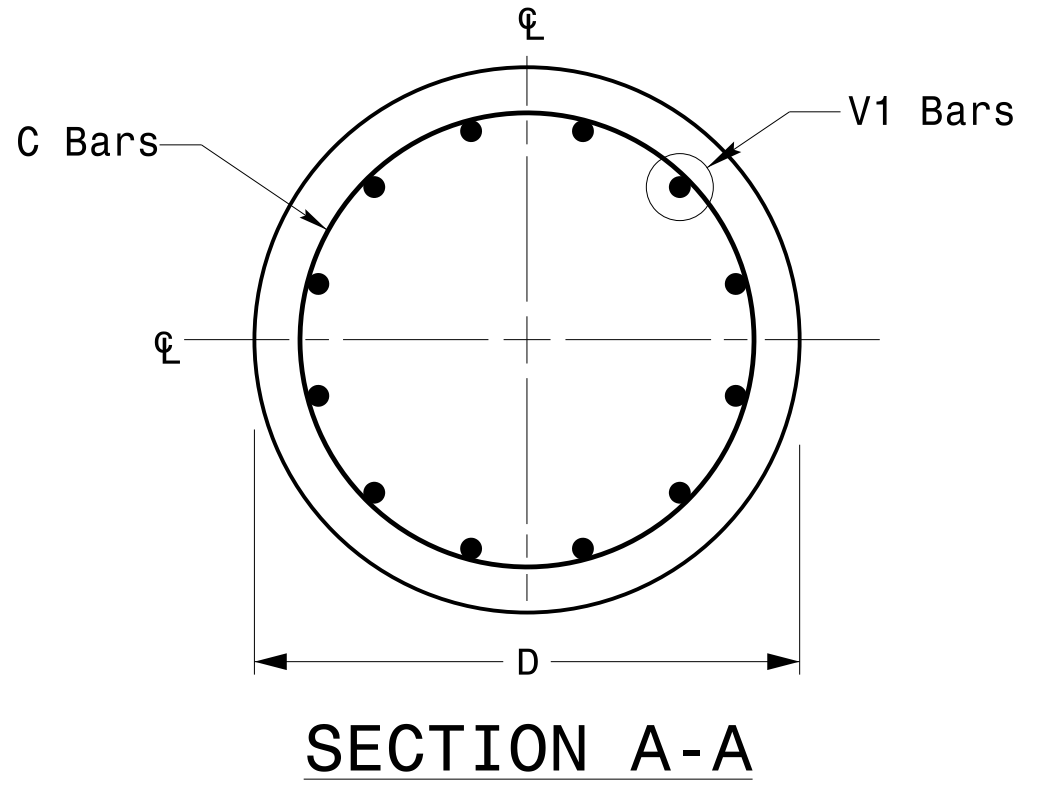
 SEPTEMBER 21, 2023
 DATE

03-dt-2023-10-41
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 Kedar Tigon

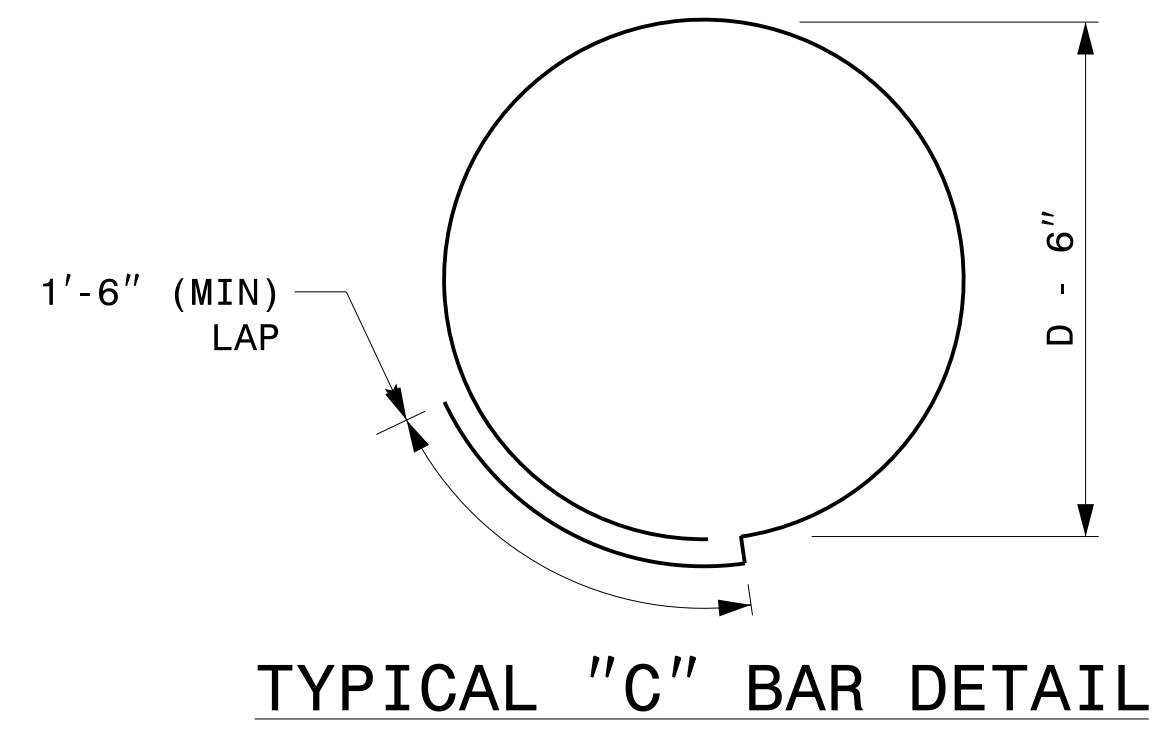
Fabrication Details – Strain Pole Attachments



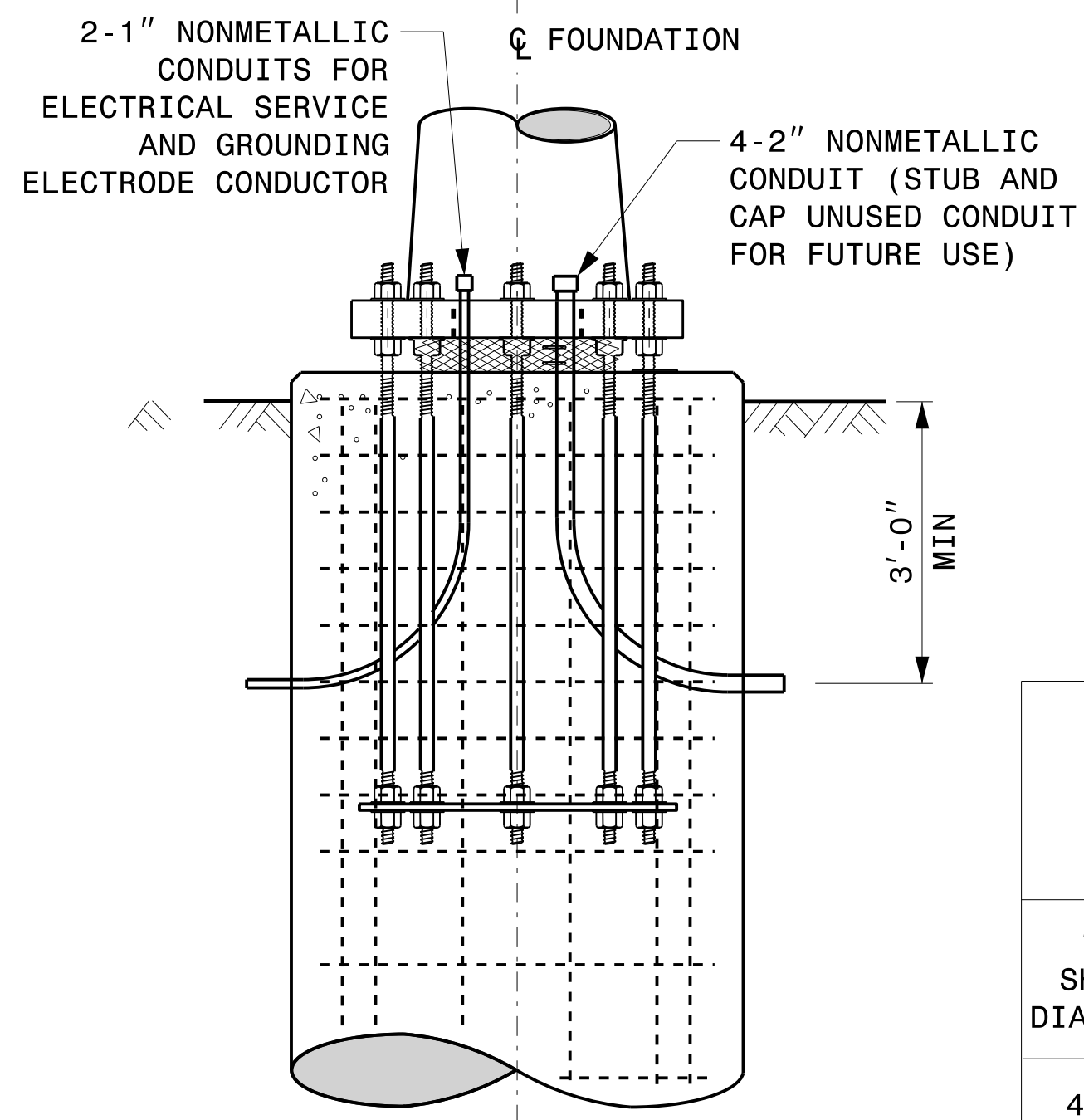
CONCRETE SHAFT ELEVATION



SECTION A-A



TYPICAL "C" BAR DETAIL



TYPICAL FOUNDATION CONDUIT DETAILS

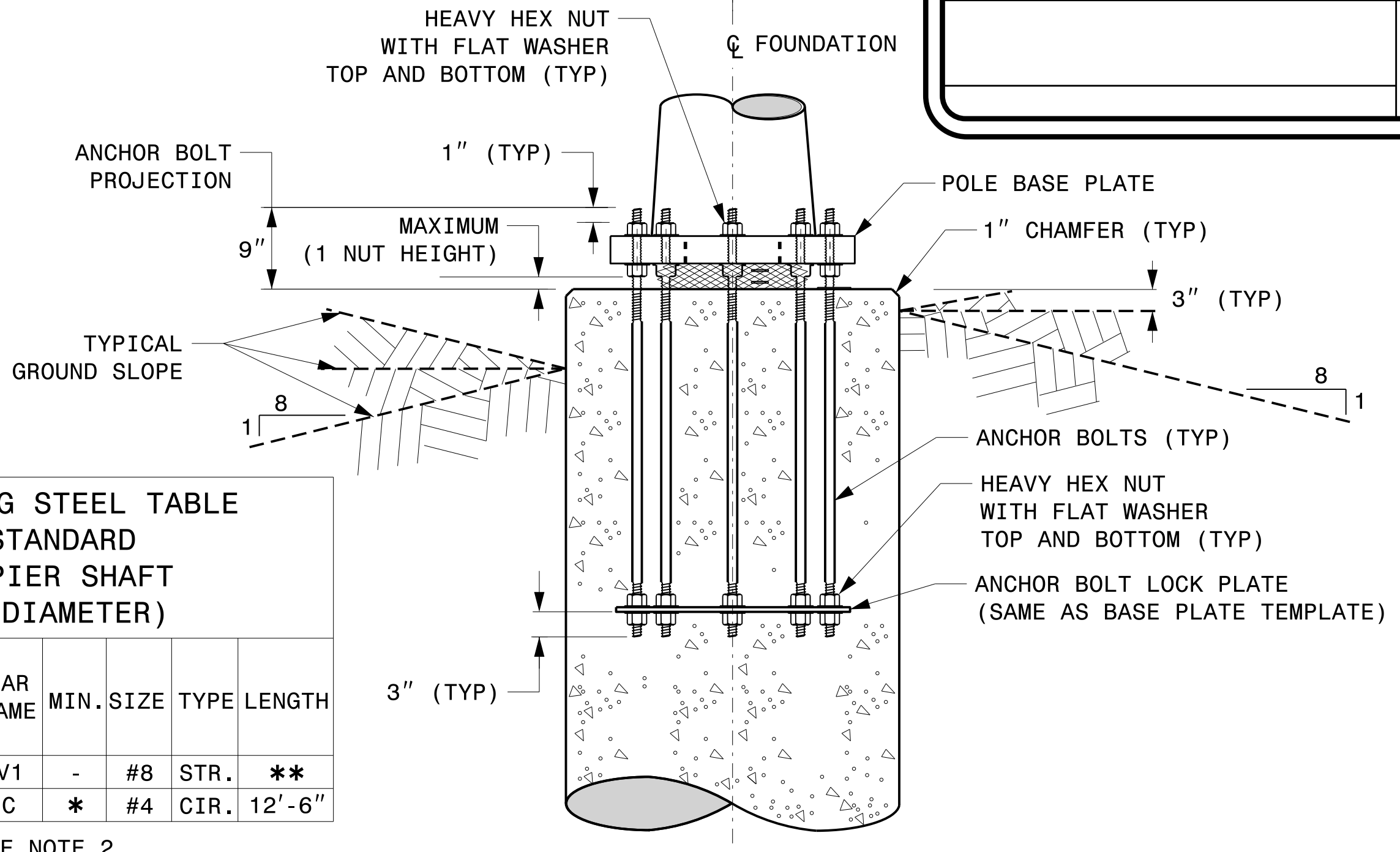
GENERAL NOTES:

- IF ACTUAL SUBSURFACE CONDITIONS DIFFER SIGNIFICANTLY FROM BORING DATA, CONTACT THE ENGINEER BEFORE EXCAVATING OR PLACING CONCRETE.
- 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.
- 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.
- PROVIDE 2" TO 5" FOUNDATION PROJECTION ABOVE GROUND LEVEL, DEPENDING ON THE GROUND SLOPE.
- 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.
- CONSTRUCT FOUNDATIONS IN ACCORDANCE WITH NCDOT STANDARD PROVISIONS SP09 R005- FOUNDATIONS AND ANCHOR ROD ASSEMBLIES FOR METAL POLES. ALL APPLICABLE 2024 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](https://connect.ncdot.gov/resources/Specifications%20and%20Special%20Provisions.aspx)
- USE AIR ENTRAINED AA CONCRETE MIX WITH A COMPRESSION STRENGTH OF $f'c=4500$ psi (MIN) AFTER 28 DAYS.
- USE ASTM A615 GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL. MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
- LOCATE IDENTIFICATION TAG ON TOP OF THE FOUNDATION, DIRECTLY ABOVE THE CONDUIT'S ENTRY POINT.
- PROVIDE TWO LAYERS OF 4 MESH GALVANIZED WELDED 23 GAUGE (0.025) 6" WIDE AROUND PIPES UNDER THE BASE PLATE AND SECURE IT WITH TIES IF NECESSARY.
- PREFERRED LOCATION FOR THE I.D. TAG IS AS SHOWN IN DETAIL-A: DIRECTLY ABOVE THE CONDUIT ENTERING THE FOUNDATION.

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'-0" DIAMETER)

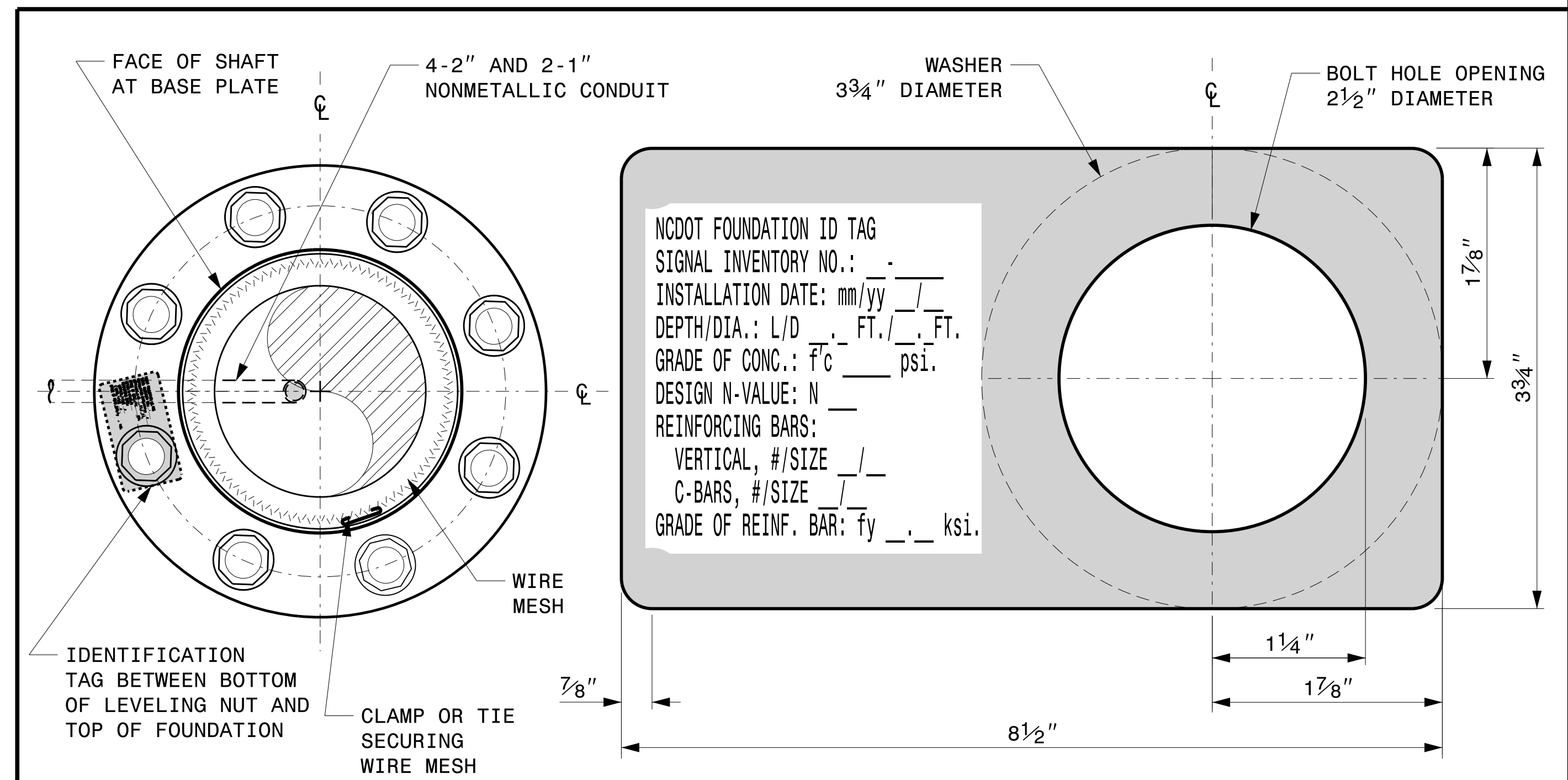
"D" SHAFT DIAMETER	CONCRETE VOLUME (CU. YDS)	BAR NAME	MIN. SIZE	TYPE	LENGTH
4'-0"	.465 X L	V1	#8	STR.	**
		C	#4	CIR.	12'-6"

* SEE NOTE 2
** SEE NOTE 3



TYPICAL FOUNDATION ANCHOR BOLT DETAILS

(REINFORCING CAGE NOT SHOWN FOR CLARITY)



CONCRETE FOUNDATION IDENTIFICATION TAG DETAILS

D = DIAMETER
L = LENGTH / DEPTH
mm = MONTH
yy = YEAR

DETAIL-A

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: NA
NONE

Construction Details For Foundations

PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR

REVISIONS	INIT.	DATE

SEAL

DocuSigned by:
Kevin Durigon
4B23DC78F8784DA

09/21/2023
DATE

03-dt-2023-10-4f S:\SS\0415\Sig.M7.Stu. Construction Details-Strain Poles.dgn Kedar Tigon

Construction Details - Foundations

SOIL CONDITION

STANDARD STRAIN POLES						STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) – Feet							Reinforcement			
Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups	
			Axial (kip)	Shear (kip)	Moment (ft-kip)	Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30	Bar Size (#)	Quantity (ea.)	Bar Size (#)	Spacing (in.)
S26L1	26	22	2	9	210	19.5	12.5	9	6.5	15.5	14.5	13	8	12	4	12
S26L2	26	23	2	10	240	19.5	12	9	6.5	15.5	14.5	13	8	12	4	12
S26L3	26	25	2	11	260	20.5	12	10	8	16	15	13	8	12	4	12
S30L1	30	22	2	9	230	19	11	9	7	15.5	14	12.5	8	12	4	12
S30L2	30	23	2	10	270	20	12	10	8	16	14.5	13	8	12	4	12
S30L3	30	25	2	11	290	21	12	10	8	17	15	13.5	8	12	4	12
S30H1	30	25	3	13	355	23	13	11	9	18	16.5	14.5	8	12	4	12
S30H2	30	29	3	15	405	25	14	11	9	19	17.5	15.5	8	14	4	12
S30H3	30	29	3	16	430	26	15	12	9	20	18	16	8	14	4	6
S35L1	35	22	3	8	260	19.5	12	10	8	15.5	14.5	13	8	12	4	12
S35L2	35	23	3	10	300	21	12	10	8	16.5	15	13.5	8	12	4	12
S35L3	35	25	3	10	320	21.5	13	10	8	17	15.5	14	8	12	4	12
S35H1	35	25	3	12	390	23.5	14	11	9	18	17	15	8	14	4	12
S35H2	35	29	4	14	460	26	15	12	9	20	18	16	8	14	4	6
S35H3	35	29	4	16	495	28.5	15	13.5	10	21.5	19	17	8	14	4	6

GENERAL NOTES:

- VALUES SHOWN IN THE "REACTIONS AT THE POLE BASE" COLUMN REPRESENT THE MINIMUM ACCEPTABLE CAPACITY ALLOWED FOR DESIGN USING A COMBINED FORCE RATIO (CFR) OF 1.00.
- USE CHAIRS AND SPACERS TO MAINTAIN PROPER CLEARANCE.
- FOR FOUNDATION, ALWAYS USE AIR-ENTRAINED CONCRETE MIX.

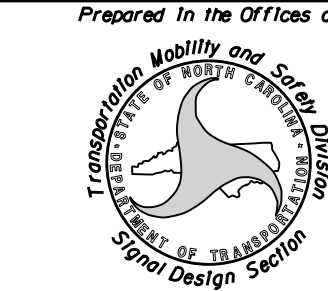
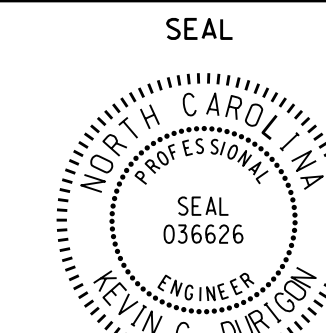
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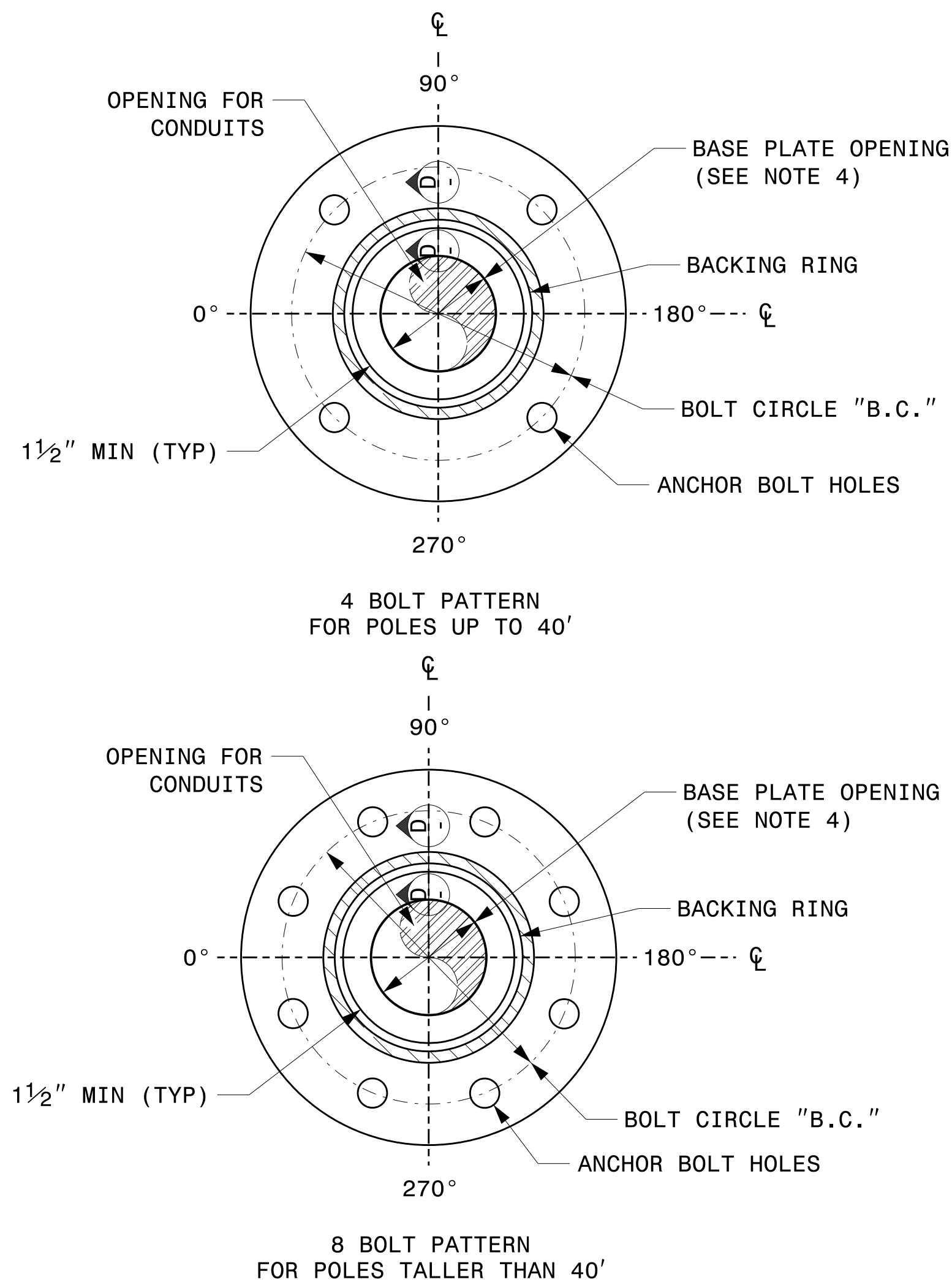
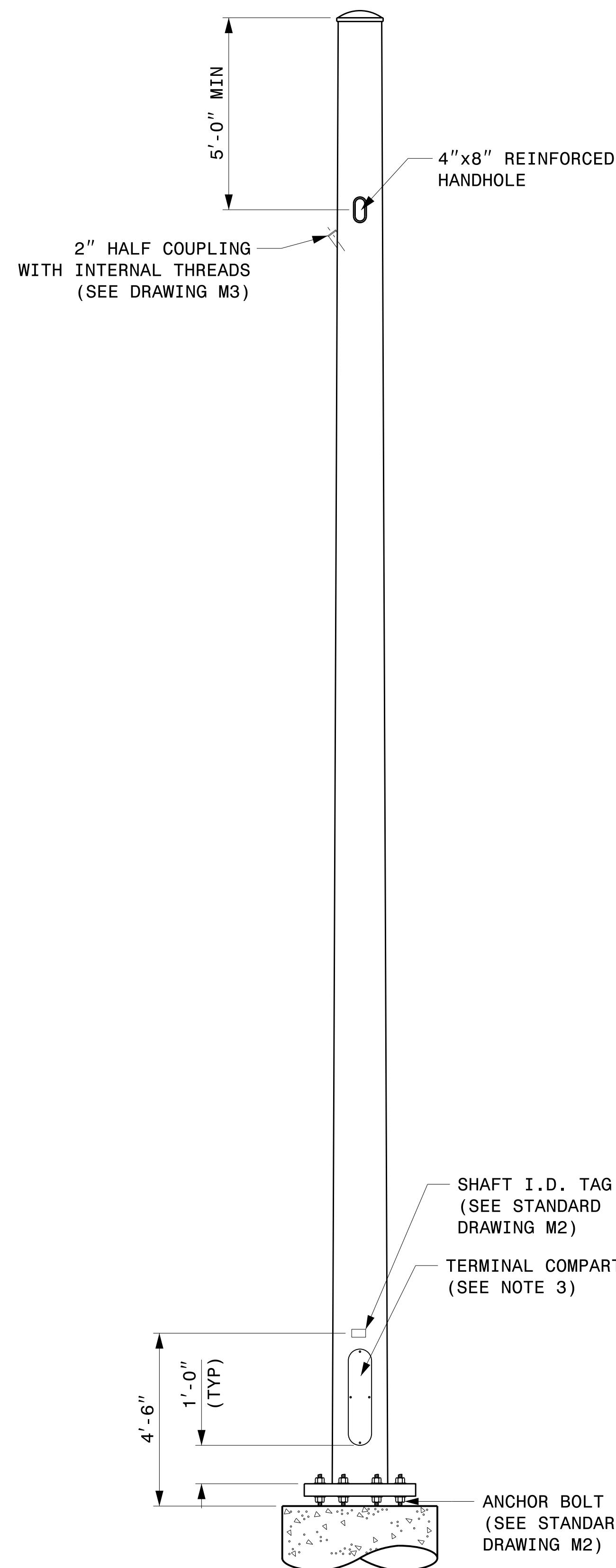
- PERFORM A STANDARD PENETRATION TEST AT EACH PROPOSED FOUNDATION SITE TO DETERMINE "N" VALUE.
- SELECT THE APPROPRIATE WIND ZONE FROM M1 DRAWING.
- SELECT THE SOIL TYPE (CLAY OR SAND) THAT BEST DESCRIBES THE SOIL CHARACTERISTICS.
- GET THE APPROPRIATE STANDARD POLE CASE NUMBER FROM THE PLANS OR FROM THE ENGINEER.
- SELECT THE APPROPRIATE COLUMN UNDER "STANDARD FOUNDATIONS" BASED ON SOIL TYPE AND "N" VALUE. SELECT THE APPROPRIATE ROW BASED ON THE POLE LOAD CASE.
- THE FOUNDATION DEPTH IS THE VALUE SHOWN IN THE "STANDARD FOUNDATIONS" CATEGORY WHERE THE COLUMN AND THE ROW INTERSECT.
- USE CONSTRUCTION PROCEDURES AND DESIGN METHODS PRESCRIBED BY FHWA-NHI-10-016 MANUAL FOR DRILLED SHAFTS.

48" DIAMETER FOUNDATION CONCRETE VOLUME (CUBIC YARDS) = (0.465) x DRILLED PIER LENGTH

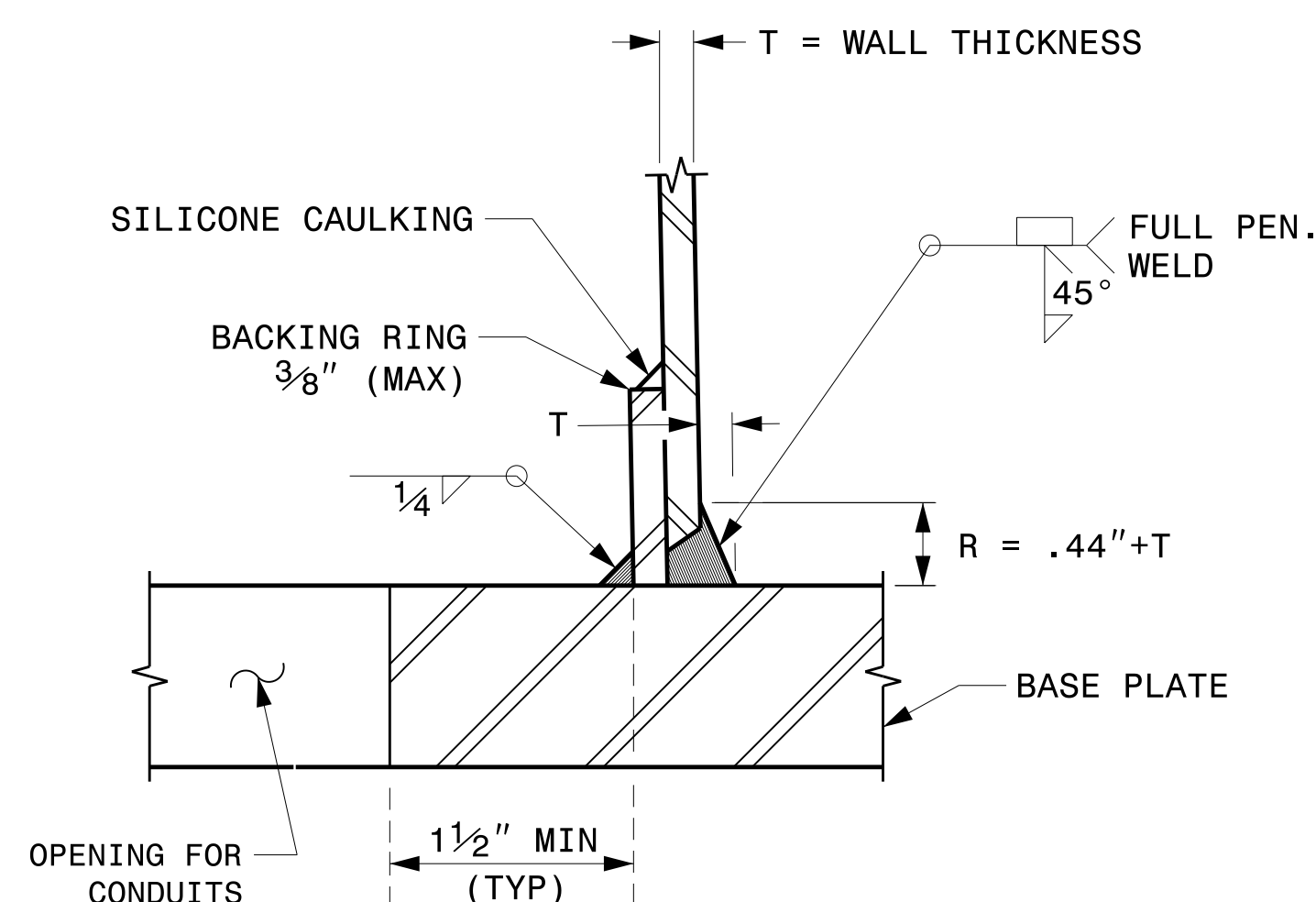
09-21-2023 10:46 S:\ISSUES\Signal Design Section\Structures\Drawings\2024 Merol Pole Str. Drawings for LRF\0204_Sig.M8 Str. Strain Pole Found.-Saturated Soil Condition.dgn Kedar Tigon

Standard Strain Pole Foundation – All Soil Conditions

 <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Standard Strain Pole Foundation for All Soil Conditions</p>							
	<p>PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON</p> <p>PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>		INIT.	DATE			
INIT.	DATE							
<p>SCALE: 0 NONE</p>			<p>09/21/2023 DATE</p>					



BASE PLATE DETAILS



SECTION D-D
 (POLE ATTACHMENT TO BASE PLATE)
FULL - PENETRATION GROOVE WELD DETAIL

CCTV CAMERA POLE
 (NOT TO SCALE)

NOTES:

1. THIS DRAWING PROVIDES BASIC DETAILS FOR CCTV POLES. PROJECT REQUIREMENTS MAY REQUIRE SPECIAL FACTORY PREPS THAT ARE NOT SHOWN ON THESE DETAILS.
2. DETAILS FOR INTERNAL CAMERA LOWERING SYSTEMS ARE NOT SHOWN.
3. POLE MOUNTED CABINETS MAY REQUIRE MODIFICATIONS TO THE LOWER HANDHOLE OPENING TO MOUNT CABINETS. 4" X 8" REINFORCED HANDHOLES ARE ACCEPTABLE OPTIONS, AND MAY BE PREFERRED.
4. OPENING IN POLE BASE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3 1/2" BUT SHALL NOT BE LESS THAN 8 1/2".
5. USE COMPACT SECTION CRITERIA D/T RATIO PER AASHTO LTS-LRFD 1ST EDITION SECTION 5.7.2.

02-dct-2023-10-15
 S:\ISSUES\15 Signal\Signal Design\Structures\Drawings\2024 Merit Pole Std Drawings for LRF02024 Sig.M9 Fabrication Details - CCTV Poles.dgn
 Kedar Figon

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For CCTV Poles	
PLAN DATE: SEPTEMBER 2023	DESIGNED BY: K.C. DURIGON
PREPARED BY: K.C. DURIGON	REVIEWED BY: C.F. ANDREWS
REVISIONS	INIT. DATE

DocuSigned by:

Kevin Durigon

4B23DC79B3784DA

09/21/2023

DATE

Fabrication Details – CCTV Camera Poles

- 1 INSTALL CATEGORY 6 CABLE
- 2 INSTALL COAX CABLE
- 3 INSTALL ETHERNET CABLE (CATEGORY 6)
- 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
- 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
- 48 REMOVE EXISTING COMMUNICATIONS 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
- 59A RELOCATE EXISTING 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

	NEW FIBER OPTIC COMMUNICATIONS CABLE
	NEW TWISTED PAIR COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT
	NEW BORED AND JACKED CONDUIT
	NEW JUNCTION BOX
	EXISTING JUNCTION BOX
	NEW WOOD POLE
	EXISTING WOOD POLE
	AERIAL SPLICE ENCLOSURE
	EXISTING AERIAL SPLICE ENCLOSURE
	SPLICE ENCLOSURE
	EXISTING SPLICE ENCLOSURE
	NEW METAL POLE
	EXISTING METAL POLE
	EXISTING CCTV ASSEMBLY
	NEW STANDARD GUY ASSEMBLY
	NEW SIDEWALK GUY ASSEMBLY
	EXISTING GUY ASSEMBLY
	SIGNAL INVENTORY NUMBER
	NEW CABLE STORAGE RACKS (SNOW SHOES)
	EXISTING CABLE STORAGE RACK (SNOW SHOE)
	EXISTING CONTROLLER AND CABINET
	NEW CCTV CABINET
	EXISTING SPLICE CABINET
	NEW SPLICE CABINET
	SIGNAL POLE
	FLAT PANEL ANTENNA (SINGLE)
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
	YAGI ANTENNA (SINGLE)
	OMNI ANTENNA

CONSTRUCTION NOTE SYMBOLOGY KEY

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

ATTACHMENT POINT:

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

"SS" REFERENCE LOCATION

FS = FRONT SIDE OF POLE

BS = BACK SIDE OF POLE

TRANSYSTEMS

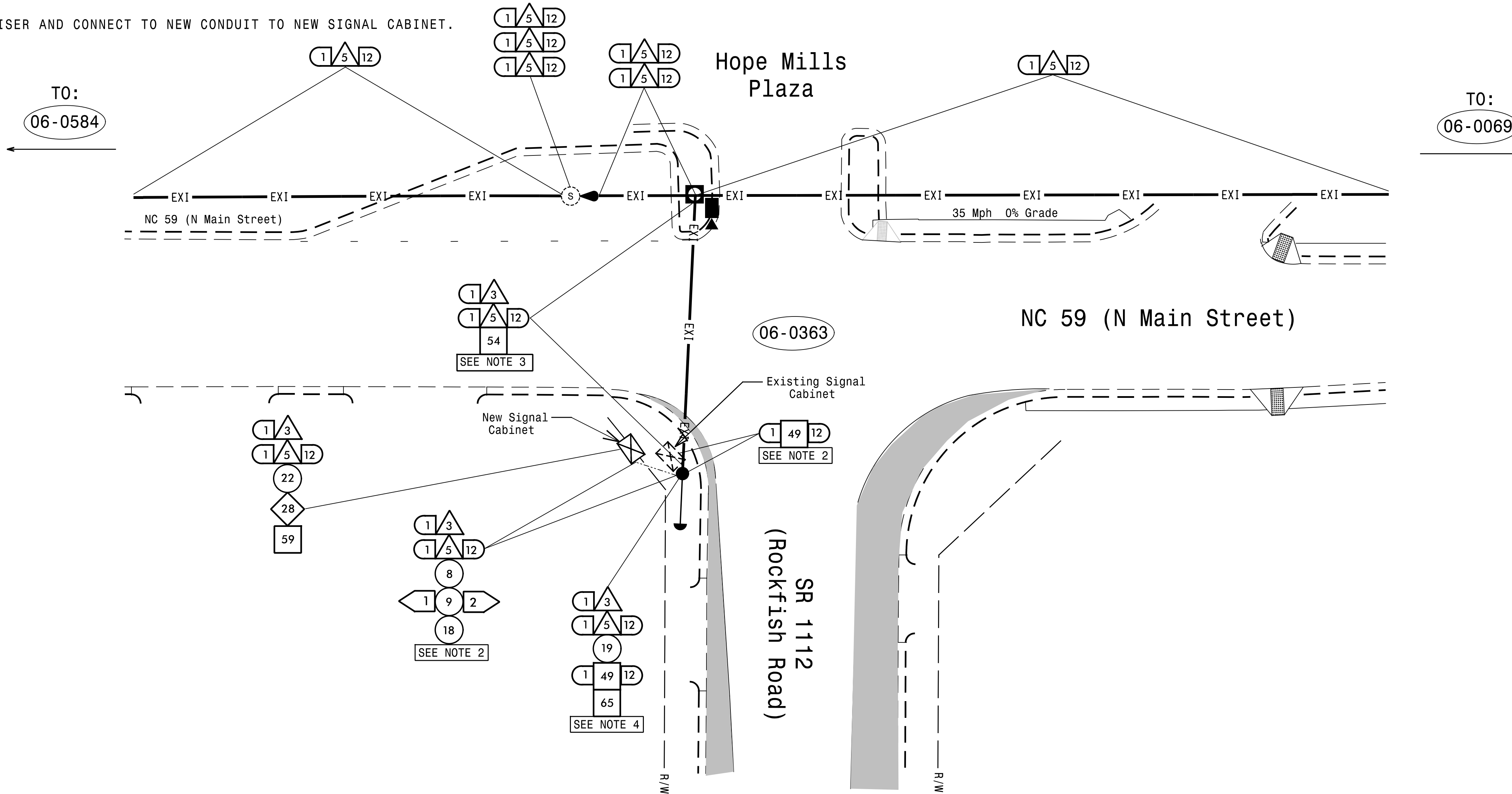
1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453

	Signal System #D06-03 Hope Mills	
	CONSTRUCTION NOTES	
Division 6	Cumberland County	Hope Mills
PLAN DATE: March 2024	REVIEWED BY: G.G. Murr, Jr.	
PREPARED BY: B.E. Wynn	MAN PROJECT NO.:	
REVISIONS	INIT.	DATE
SIGNATURE: _____ DATE: _____		
CADD FILE NAME: U-4709 SCP		

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CABLE ROUTING NOTES

- CONTACT THE NCDOT TRAFFIC SIGNAL SUPERVISOR AT 910-364-0606 AND PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE PRIOR TO DISTURBING THE EXISTING FIBER SPLICES.
- DISCONNECT EXISTING 12-FIBER DROP CABLE FROM SIGNAL CABINET AND BACK PULL EXISTING DROP CABLE TO THE TOP OF THE POLE, REROUTE TO NEW SIGNAL CABINET AS SHOWN ONCE NEW RISER AND CONDUIT HAVE BEEN INSTALLED.
- DELASH EXISTING ETHERNET CABLE (CAT-6) VIDEO CABLE RUNNING FROM THE CCTV CAMERA TO THE EXISTING CABINET. LASH NEW ETHERNET CABLE (CAT-6) VIDEO CABLE TO THE EXISTING MESSENGER CABLE RUNNING FROM THE CCTV CAMERA TO THE EXISTING SIGNAL POLE AND INTO THE NEW SIGNAL CABINET.
- INTERCEPT EXISTING RISER AND CONNECT TO NEW CONDUIT TO NEW SIGNAL CABINET.



3/15/2024 X:\2018\180518-018-00 NCDOT DIV 6 U-4709\TMP\Traffic\Signal\DESIGN\REGIONAL COMMUNICATIONS\U-4709scp-dgn DWG

TRANSYSTEMS
 1 Glenwood Avenue
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(TMP Phase II)

Prepared for the Office of:
 Transportation Mobility and Safety
 STATE OF NORTH CAROLINA
 Signal Design Section

Signal System #D06-03 Hope Mills
 TEMPORARY
 COMMUNICATION CABLE
 AND CONDUIT ROUTING PLAN
 Division 6, Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.
 PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 1"=20'

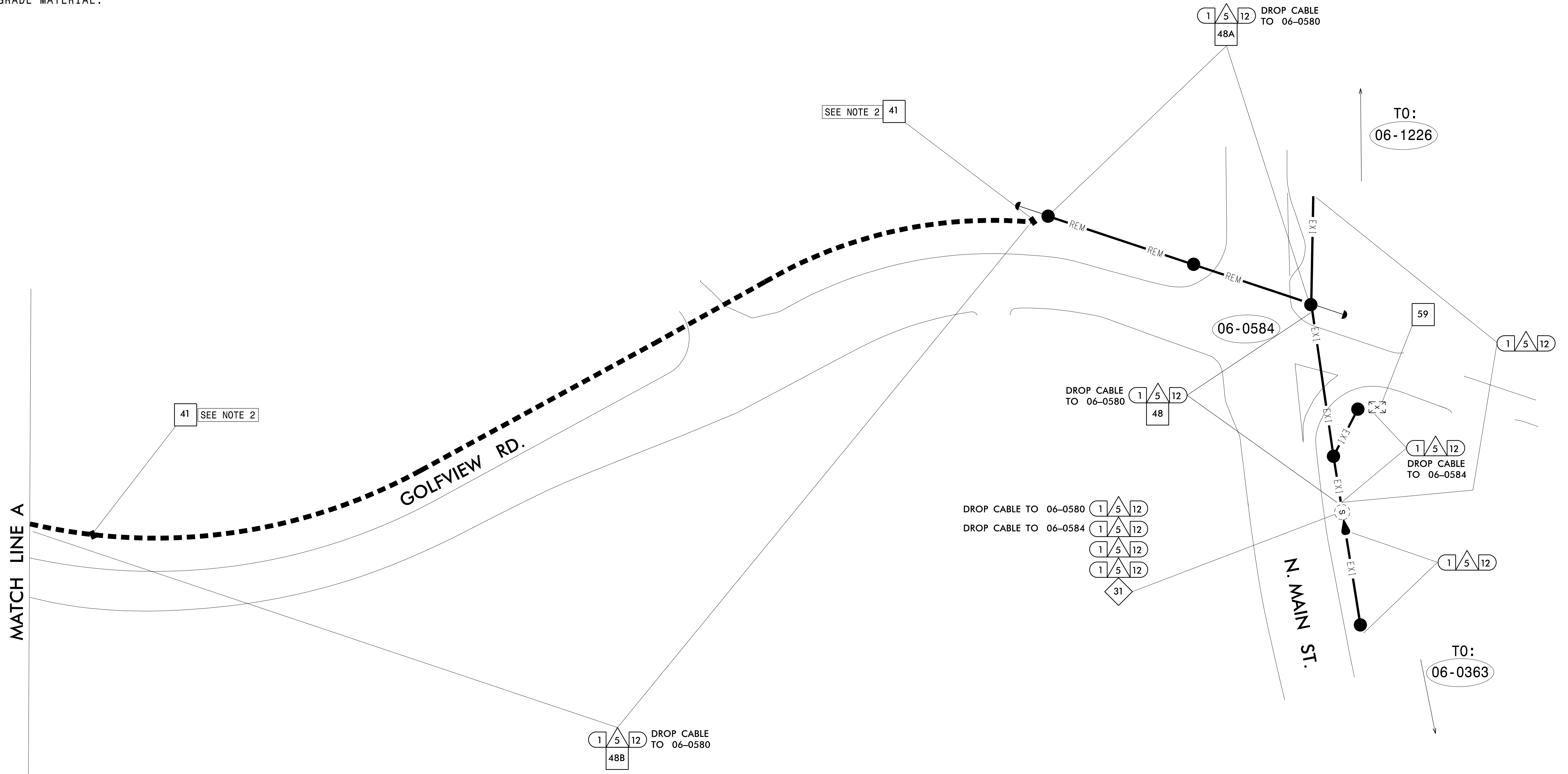
SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 14543
 GENE G. MURR, JR.

SIGNATURE DATE
 SIG. INVENTORY NO.

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CABLE ROUTING NOTES

1. CONTACT THE NCDOT TRAFFIC SIGNAL SUPERVISOR AT 910-364-0606 AND PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE PRIOR TO DISTURBING THE EXISTING FIBER SPLICES.
2. REMOVE EXISTING JUNCTION BOXES AS SHOWN AND BACKFILL WITH APPROVED SUBGRADE MATERIAL.

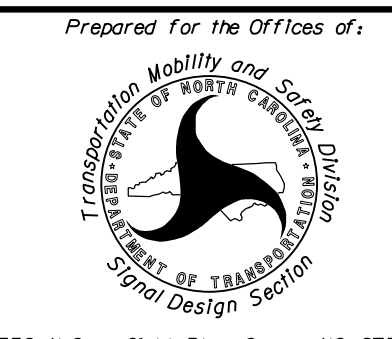


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1 Glenwood Avenue
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 Fax: 919.789.9591
 License: F-0453

(TMP Phase I)

Prepared for the Offices of:


Signal System #D06-03 Hope Mills
TEMPORARY COMMUNICATION CABLE AND CONDUIT ROUTING PLAN
 Division 6, Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.
 PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 0 50
1" = 50'

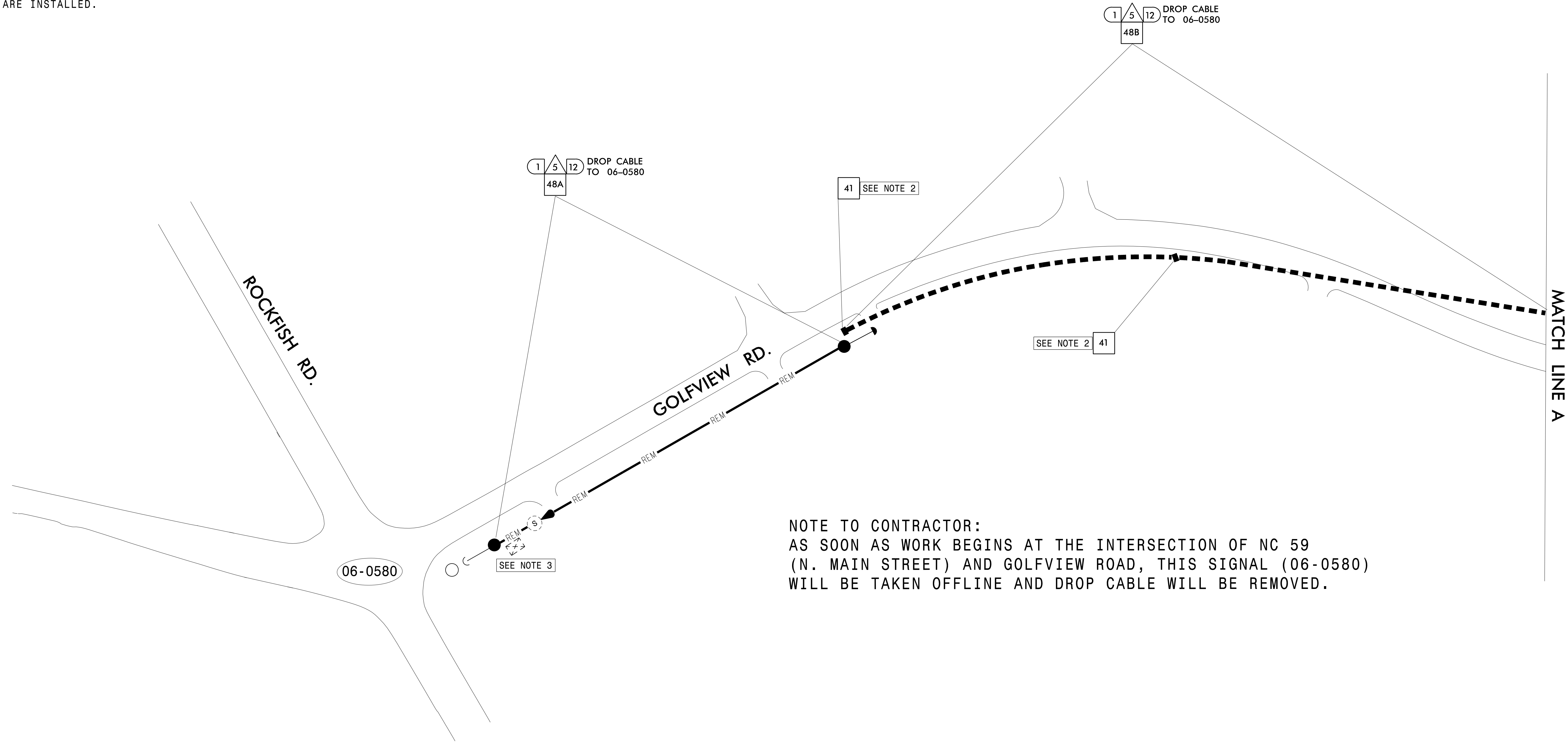
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CABLE ROUTING NOTES

1. CONTACT THE NCDOT TRAFFIC SIGNAL SUPERVISOR AT 910-364-0606 AND PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE PRIOR TO DISTURBING THE EXISTING FIBER SPLICES.
2. REMOVE EXISTING JUNCTION BOXES AS SHOWN AND BACKFILL WITH APPROVED SUBGRADE MATERIAL.
3. REMOVE EXISTING DOWNGUY AFTER NEW DOWNGUY AND NEW TEMPORARY SIGNAL SPAN ARE INSTALLED.



NOTE TO CONTRACTOR:
 AS SOON AS WORK BEGINS AT THE INTERSECTION OF NC 59 (N. MAIN STREET) AND GOLFFVIEW ROAD, THIS SIGNAL (06-0580) WILL BE TAKEN OFFLINE AND DROP CABLE WILL BE REMOVED.

(TMP Phases I and II)

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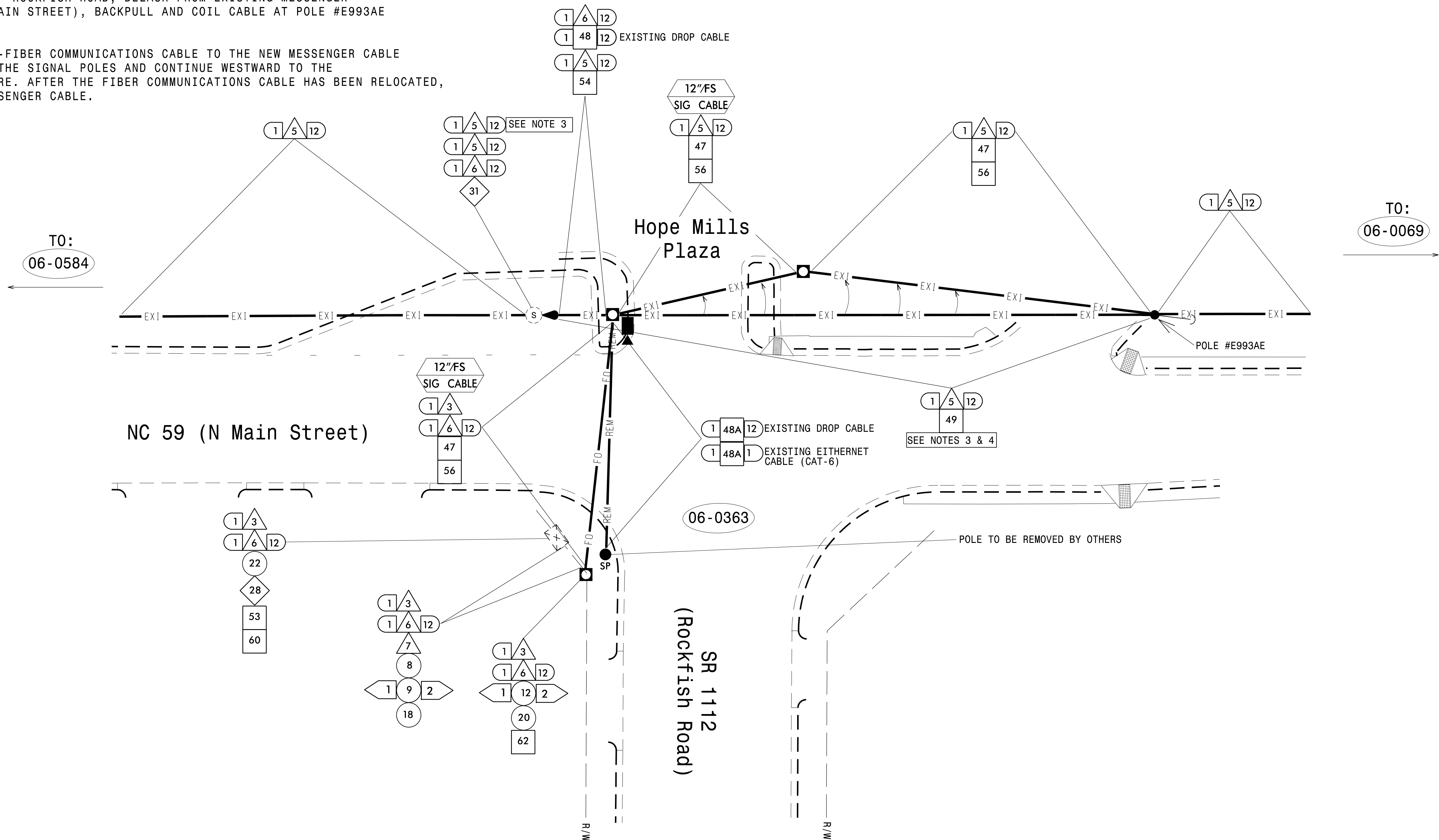
	Signal System #D06-03 Hope Mills		
	TEMPORARY COMMUNICATION CABLE AND CONDUIT ROUTING PLAN		
Prepared for the Offices of: Department of Transportation Signal Design Section 750 N. Greenfield Pkwy, Garner, NC 27529	Division 6, Cumberland County Hope Mills PLAN DATE: March 2024 PREPARED BY: B.E. Wynn	REVIEWED BY: G.G. Murr, Jr. REVIEWED BY:	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 14543 GENE G. MURR, JR.
REVISIONS _____ _____ _____		INIT. DATE _____ _____ _____	SIGNATURE DATE _____ _____

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CABLE ROUTING NOTES

- CONTACT THE NCDOT TRAFFIC SIGNAL SUPERVISOR AT 910-364-0606 AND PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE PRIOR TO DISTURBING THE EXISTING FIBER SPLICES.
- RECORD EXISTING SPLICE ARRANGEMENTS IN EXISTING SPLICE ENCLOSURES AND SIGNAL CABINETS PRIOR TO BEGINNING WORK ASSOCIATED WITH SPLICING IN THE NEW AND/OR RELOCATED FIBER. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED PRIOR TO RE-SPLICING.
- CUT THE EXISTING 12-FIBER COMMUNICATIONS CABLE AT THE EXISTING AERIAL SPLICE ENCLOSURE WEST OF ROCKFISH ROAD, DELASH FROM EXISTING MESSENGER WESTWARD ALONG NC 59 (MAIN STREET), BACKPULL AND COIL CABLE AT POLE #E993AE AS SHOWN.
- LASH THE EXISTING 12-FIBER COMMUNICATIONS CABLE TO THE NEW MESSENGER CABLE RUNNING TO AND BETWEEN THE SIGNAL POLES AND CONTINUE WESTWARD TO THE EXISTING SPLICE ENCLOSURE. AFTER THE FIBER COMMUNICATIONS CABLE HAS BEEN RELOCATED, REMOVE THE EXISTING MESSENGER CABLE.



3/15/2024
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FINAL PHASE

Prepared for the Offices of:

Signal System #D06-03 Hope Mills
COMMUNICATION CABLE AND CONDUIT ROUTING PLAN
 Division 6, Cumberland County Hope Mills

PLAN DATE: March 2024 REVIEWED BY: G.G. Murr, Jr.
 PREPARED BY: B.E. Wynn REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE: 1" = 20'

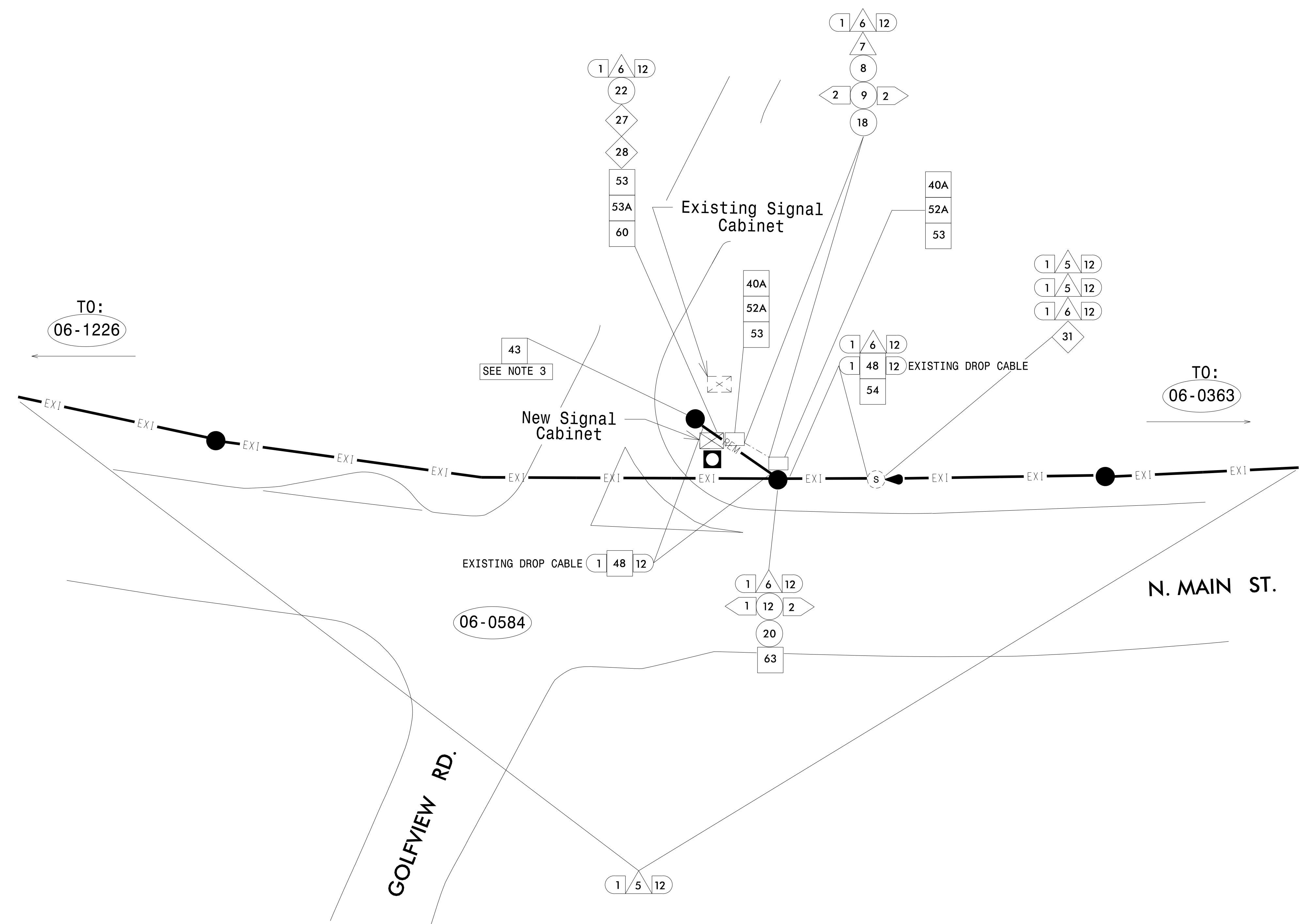
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 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 14543
 GENE G. MURR, JR.

SIGNATURE _____ DATE _____
 SIG. INVENTORY NO. _____

CABLE ROUTING NOTES

1. CONTACT THE NCDOT TRAFFIC SIGNAL SUPERVISOR AT 910-364-0606 AND PROVIDE A MINIMUM OF 5 WORKING DAYS NOTICE PRIOR TO DISTURBING THE EXISTING FIBER SPLICES.
2. RECORD EXISTING SPLICE ARRANGEMENTS IN EXISTING SPLICE ENCLOSURES AND SIGNAL CABINETS PRIOR TO BEGINNING WORK ASSOCIATED WITH SPLICING IN THE NEW AND/OR RELOCATED FIBER. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED PRIOR TO RE-SPLICING.
3. REMOVE EXISTING POLE AFTER NEW DROP CABLE IS IN PLACE AND OLD DROP CABLE AND MESSENGER CABLE HAVE BEEN REMOVED.



11/12/2024
...U-4709scdp.dgn
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FINAL PHASE

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 1 Glenwood Avenue
 Raleigh, NC 27603
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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
 SCALE
 0 30
 1" = 30'

Signal System #D06-03 Hope Mills	
COMMUNICATION CABLE AND CONDUIT ROUTING PLAN	
Division 6. Cumberland County	Hope Mills
PLAN DATE: July 2024	REVIEWED BY: G.G. Murr, Jr.
PREPARED BY: B.E. Wynn	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 14543
 GENE G. MURR, JR.
 Signed by: Gene G. Murr, Jr.
 11/12/24
 DATE
 SIG. INVENTORY NO.

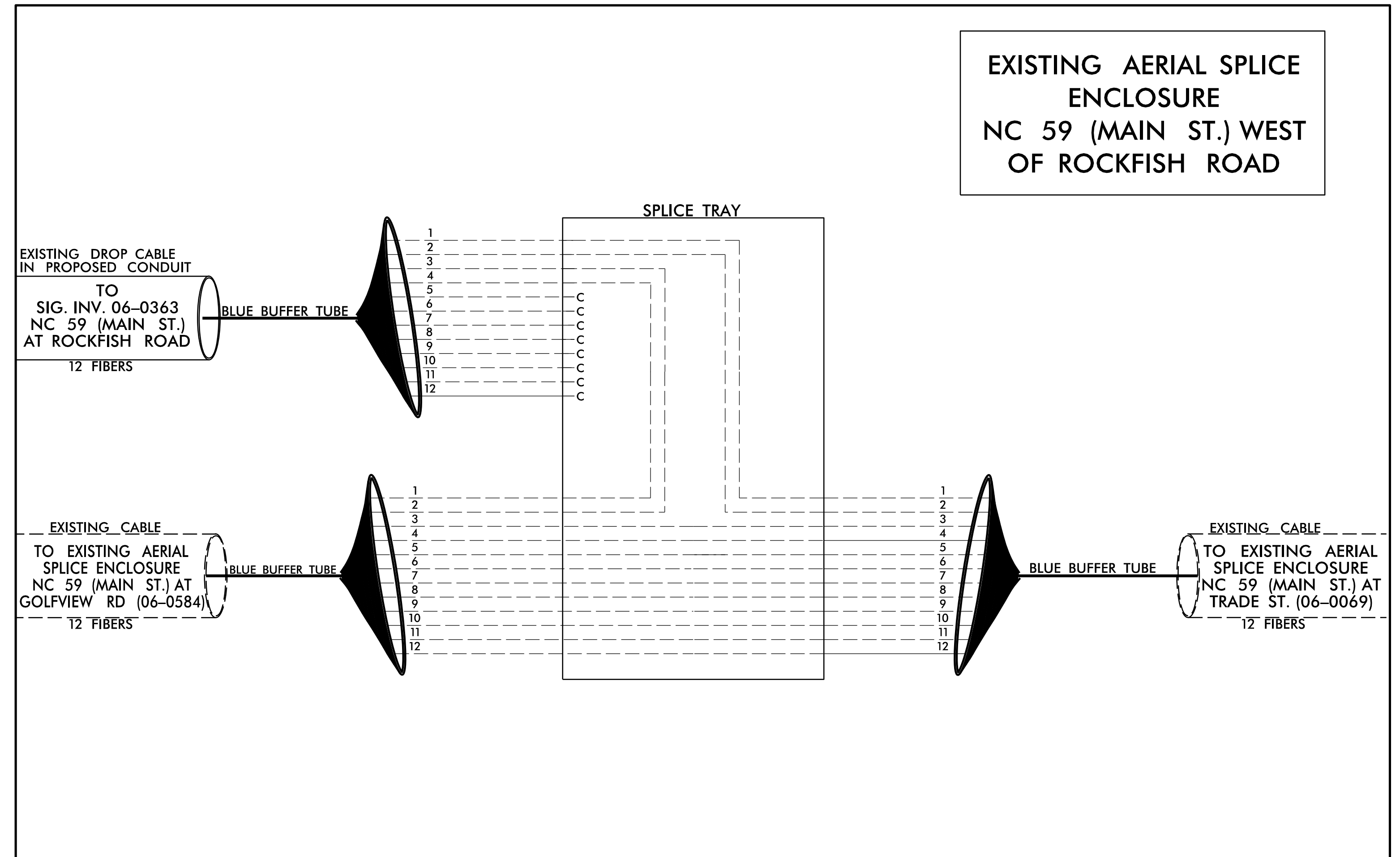
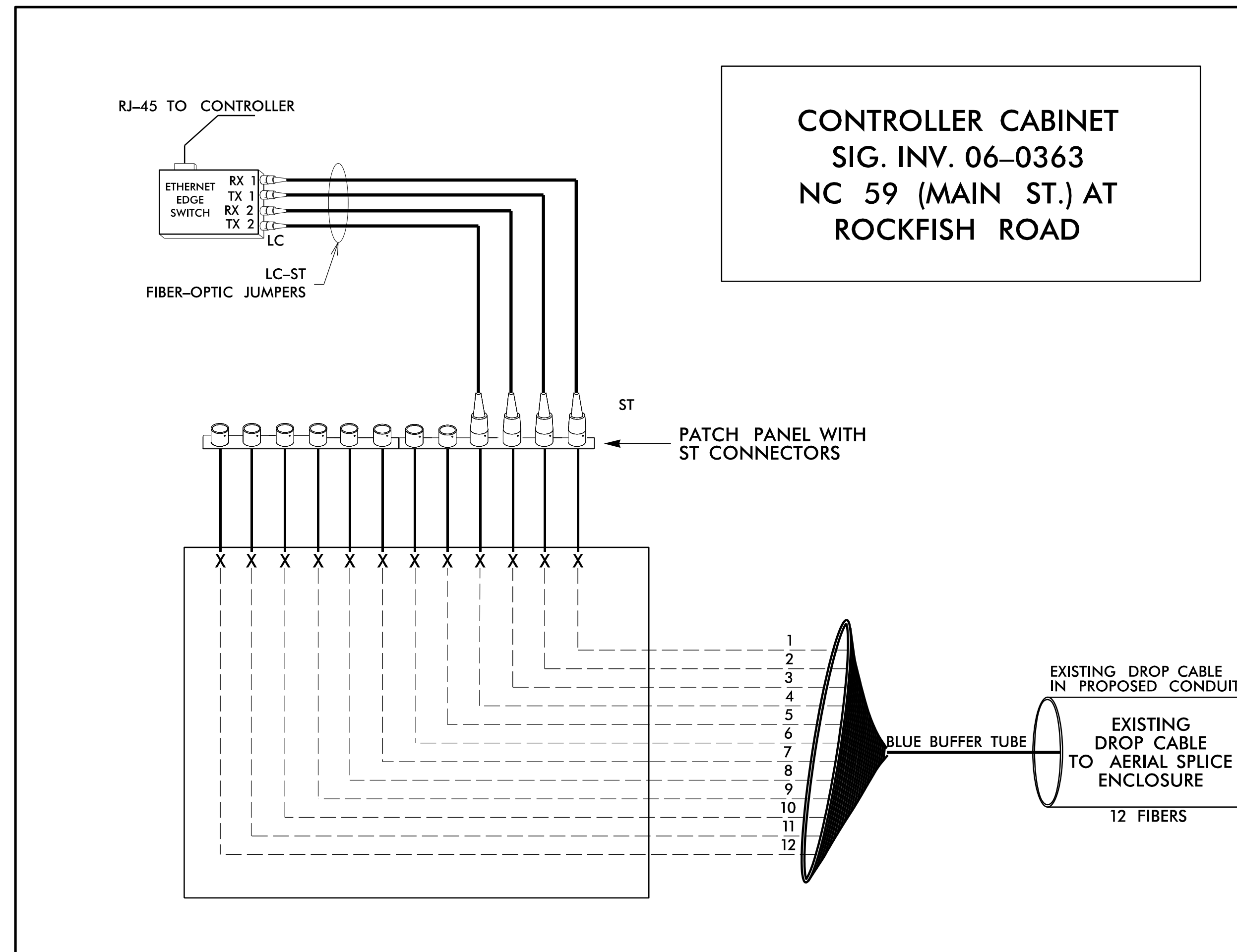
NOTES

- 1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 6 TRAFFIC SIGNAL SUPERVISOR AT (910) 364-0606 TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY DIVISION 6 TRAFFIC SIGNAL SUPERVISOR 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) ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND ENSURING PROPER TERMINATIONS.
- 4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - a) SPLICE LOCATION
 - b) DATE
 - c) COMPANY NAME
 - d) NAME OF INDIVIDUAL PERFORMING THE SPLICING
- 5) PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.
- 6) UNUSED FIBERS LEFT COILED AND STORED IN SPLICE TRAY
- 7) UNUSED BUFFER TUBES LEFT COILED AND STORED IN SPLICE ENCLOSURE

LEGEND

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

NOTE TO CONTRACTOR:
EXISTING DROP CABLE RUNNING TO SIGNAL CABINET 06-0363 TO BE BACKPULLED, RELOCATED INTO NEW RISER AND CONDUIT, AND TERMINATED IN NEW SIGNAL CABINET. REFER TO SHEET SCP-2.



TRANSYSTEMS

1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453

Prepared for the Offices of:
TRANSPORTATION MOBILITY AND LOGISTICS DIVISION
DEPARTMENT OF TRANSPORTATION
Signal Design Section

Signal System #D06-03 Hope Mills
TEMPORARY SPLICE DETAILS

DIVISION 6 CUMBERLAND COUNTY HOPE MILLS

PLAN DATE: March 2024 REVIEWED BY: G. G. Murr, Jr.
PREPARED BY: B. E. Wynn REVIEWED BY:

REVISIONS: _____ INIT. DATE

SCALE: 0 NONE N/A

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 14543
GENE G. MURR, JR.
SIGNATURE DATE
CADD File name:

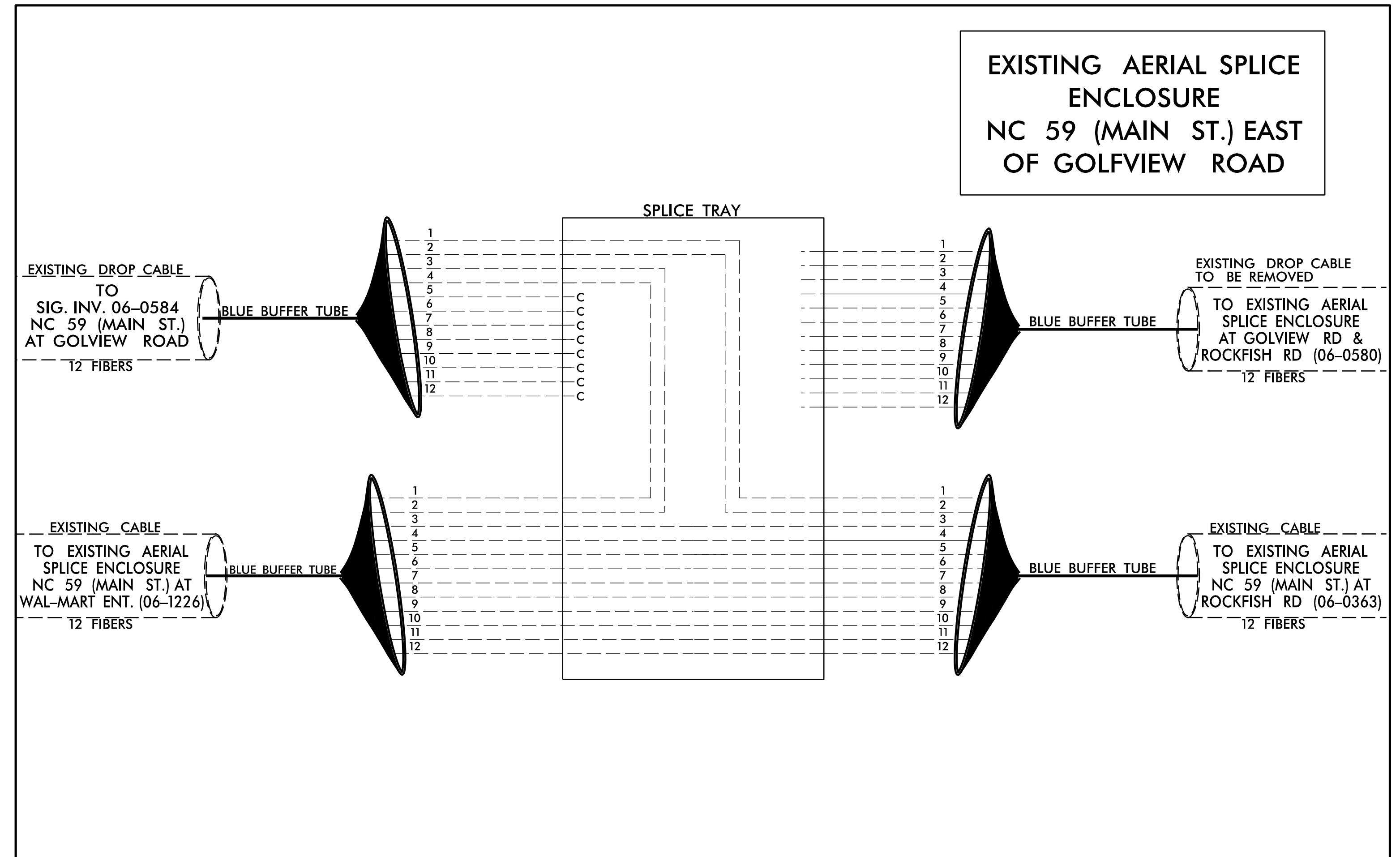
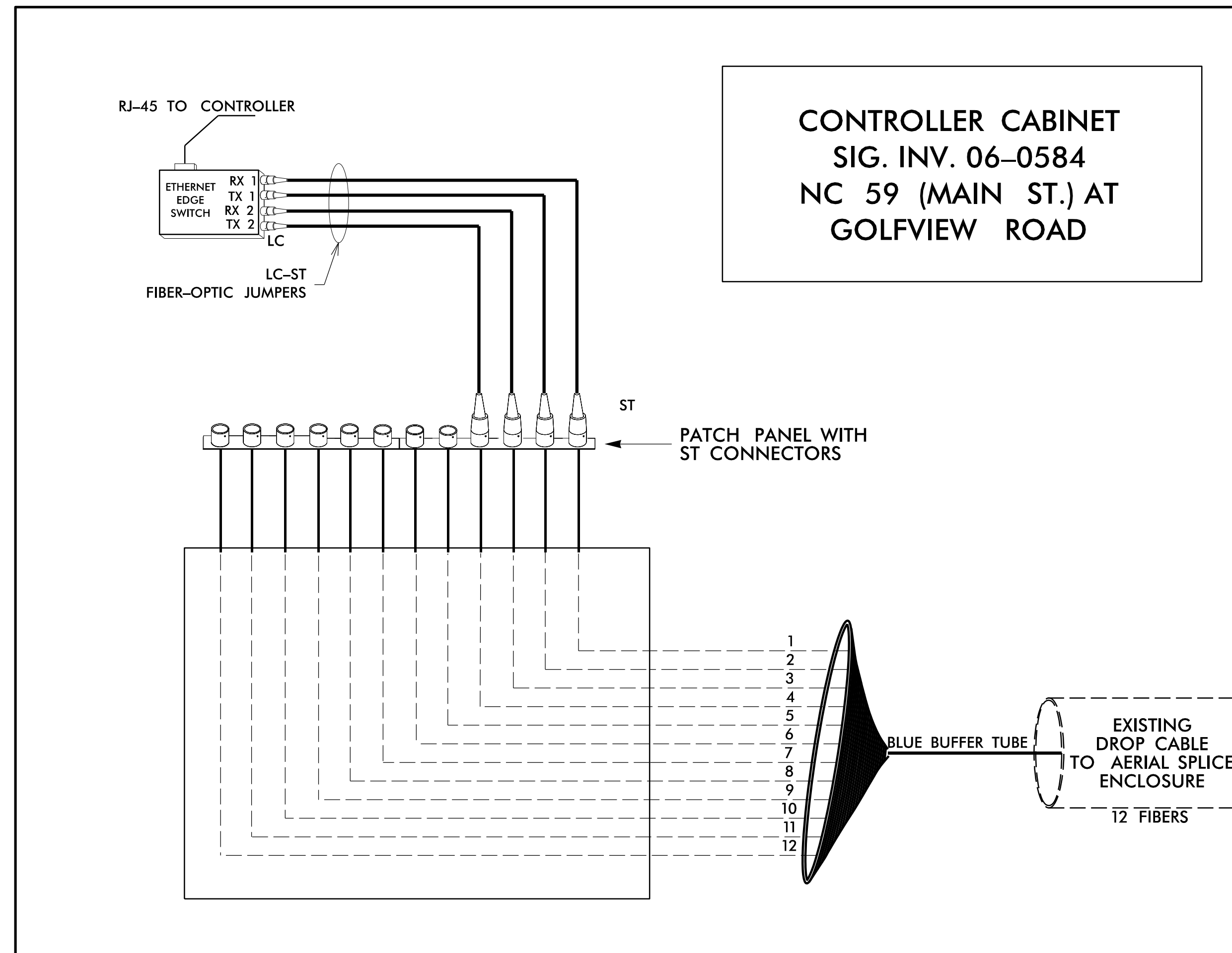
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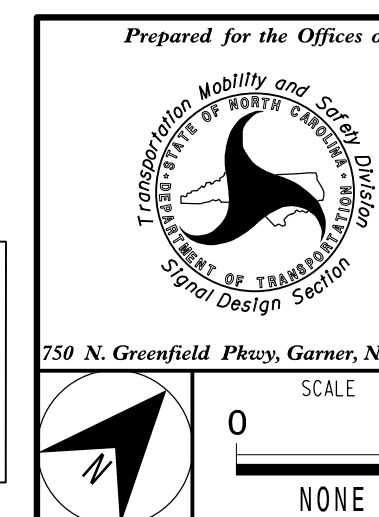
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REFER TO SHEET SCP-3.



TRANSYSTEMS

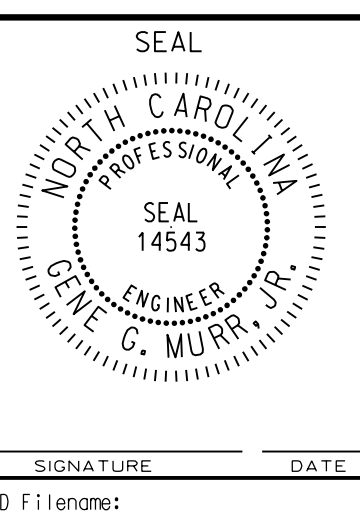
1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
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Signal System #D06-03 Hope Mills
TEMPORARY SPLICE DETAILS

DIVISION 6	CUMBERLAND COUNTY	HOPE MILLS
PLAN DATE: March 2024	REVIEWED BY: G. G. Murr, Jr.	
PREPARED BY: B. E. Wynn	REVIEWED BY:	
REVISIONS	INIT.	DATE

SIGNATURE: _____ DATE: _____
CADD Filename: _____



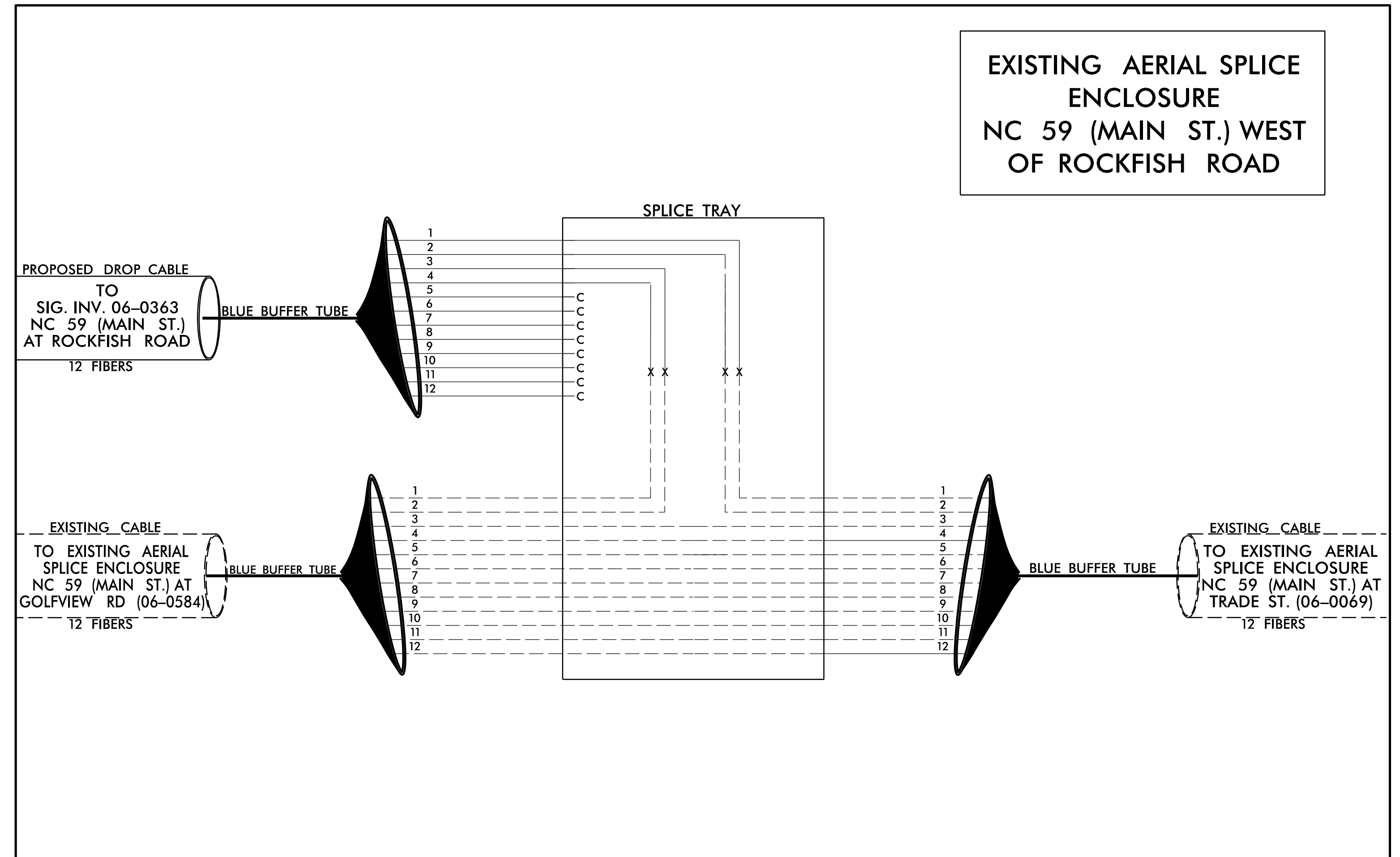
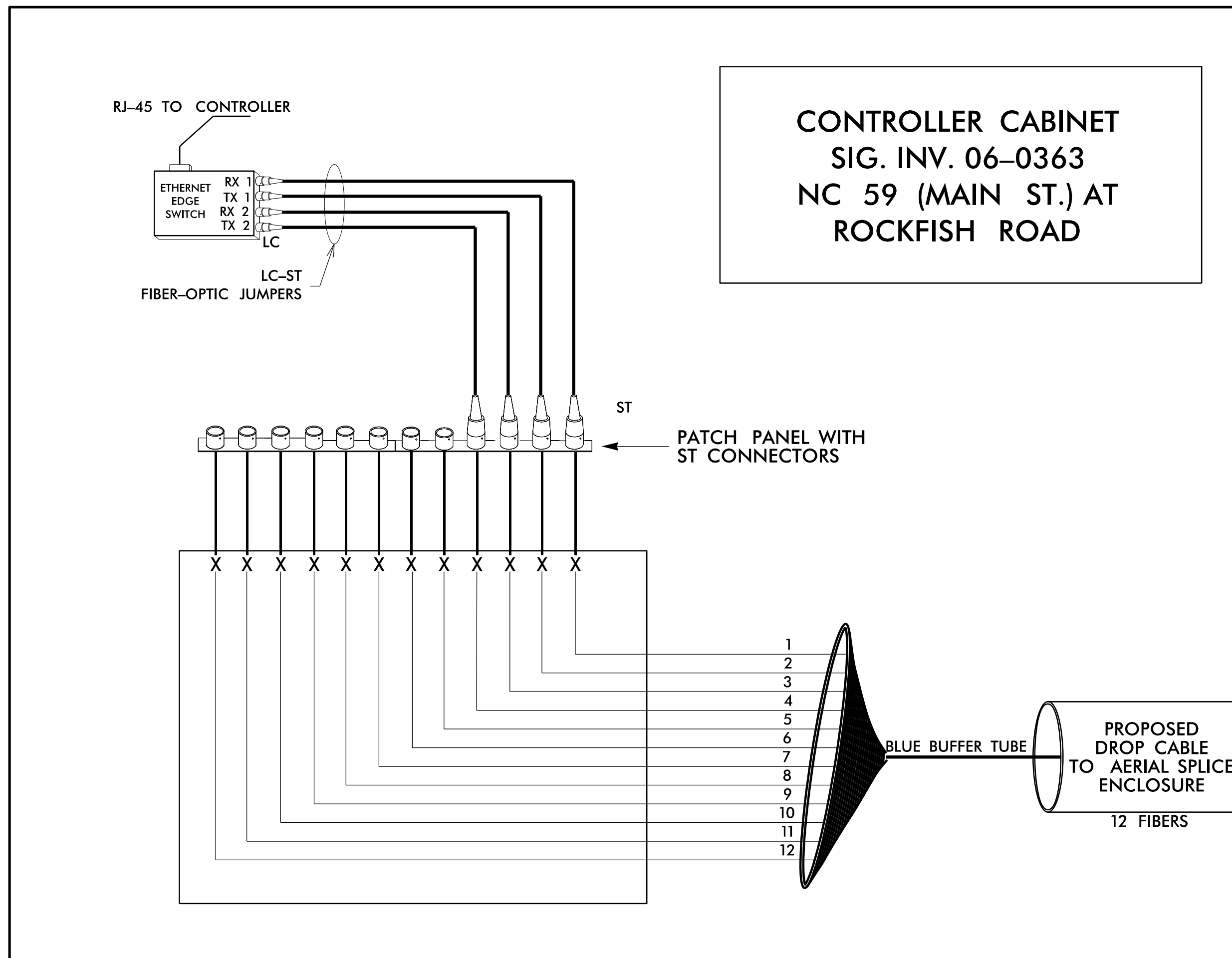
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REFER TO SHEET SCP-5.



TRANSYSTEMS
 1 Glenwood Avenue
 Raleigh, NC 27603
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 Fax: 919.789.9591
 License: F-0453

Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

Signal System #D06-03 Hope Mills
FINAL SPLICE DETAILS
 DIVISION 6 CUMBERLAND COUNTY HOPE MILLS
 PLAN DATE: March 2024 REVIEWED BY: G. G. Murr, Jr.
 PREPARED BY: B. E. Wynn REVIEWED BY:
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SEAL

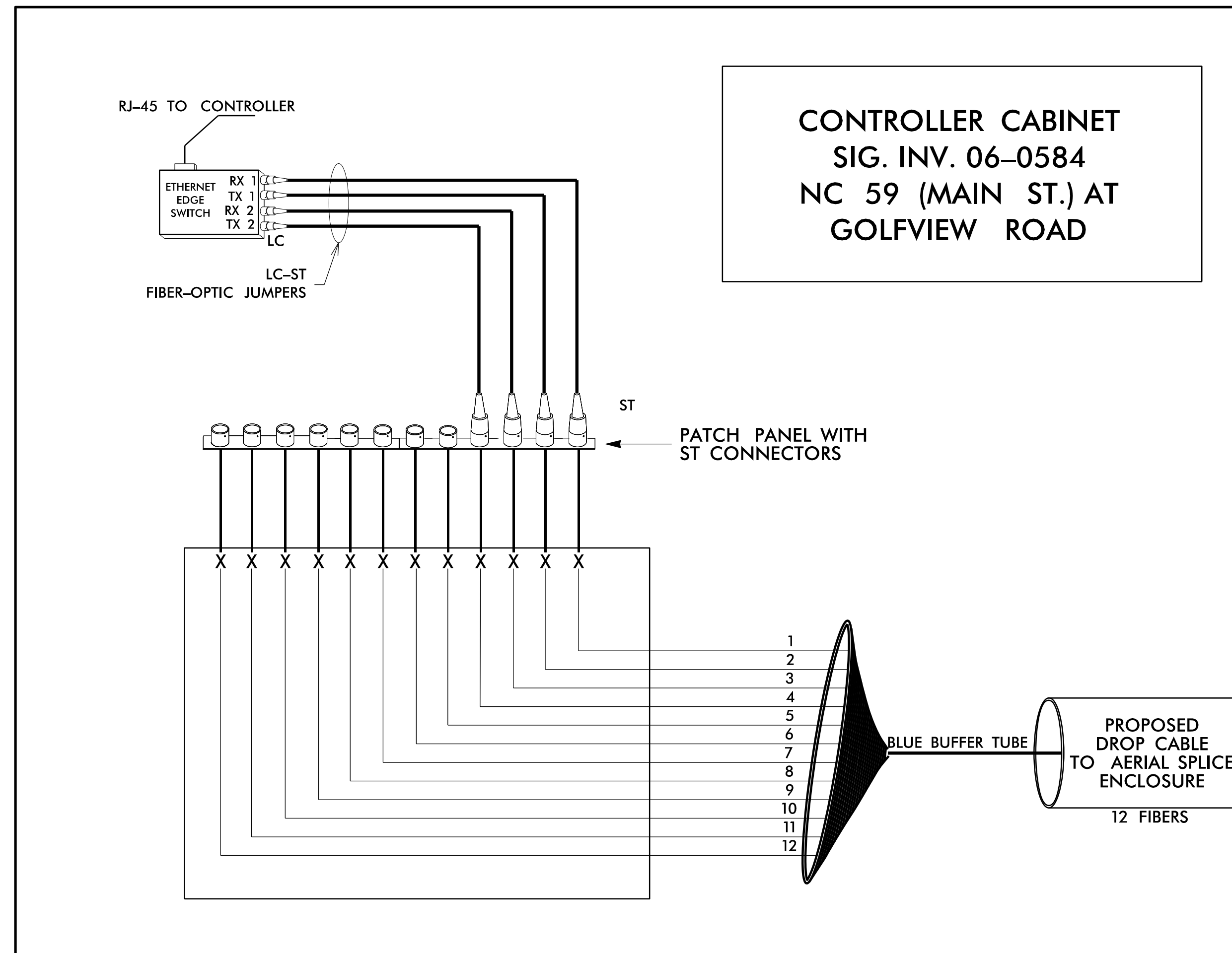
 GENE C. MURR, JR.
 ENGINEER
 SEAL 14543
 SIGNATURE: _____ DATE: _____
 CADD Filename: _____

NOTES

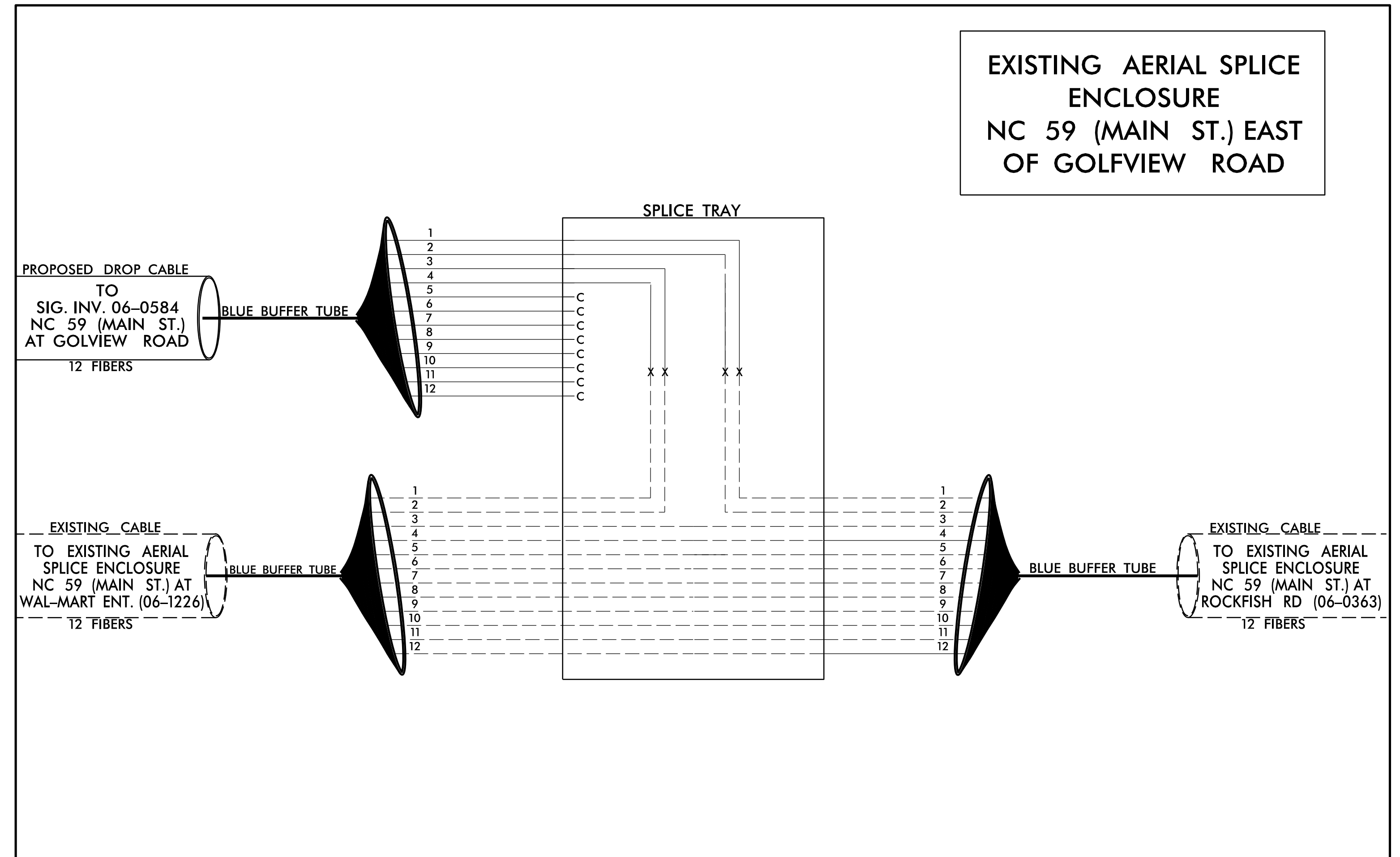
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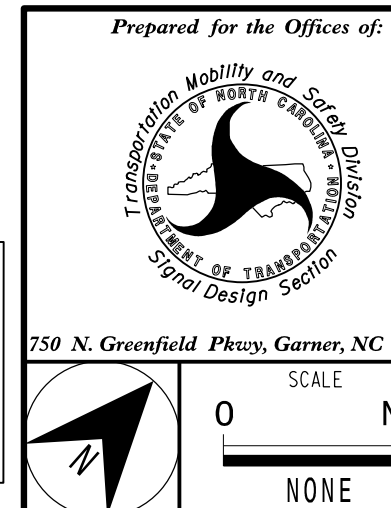


REFER TO SHEET SCP-6.



EXISTING AERIAL SPLICE ENCLOSURE
NC 59 (MAIN ST.) EAST OF GOLFVIEW ROAD

TRANSYSTEMS
1 Glenwood Avenue
Raleigh, NC 27603
Tel: 919.789.9977
Fax: 919.789.9591
License: F-0453



Signal System #D06-03 Hope Mills
FINAL SPLICE DETAILS

DIVISION 6	CUMBERLAND COUNTY	HOPE MILLS
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