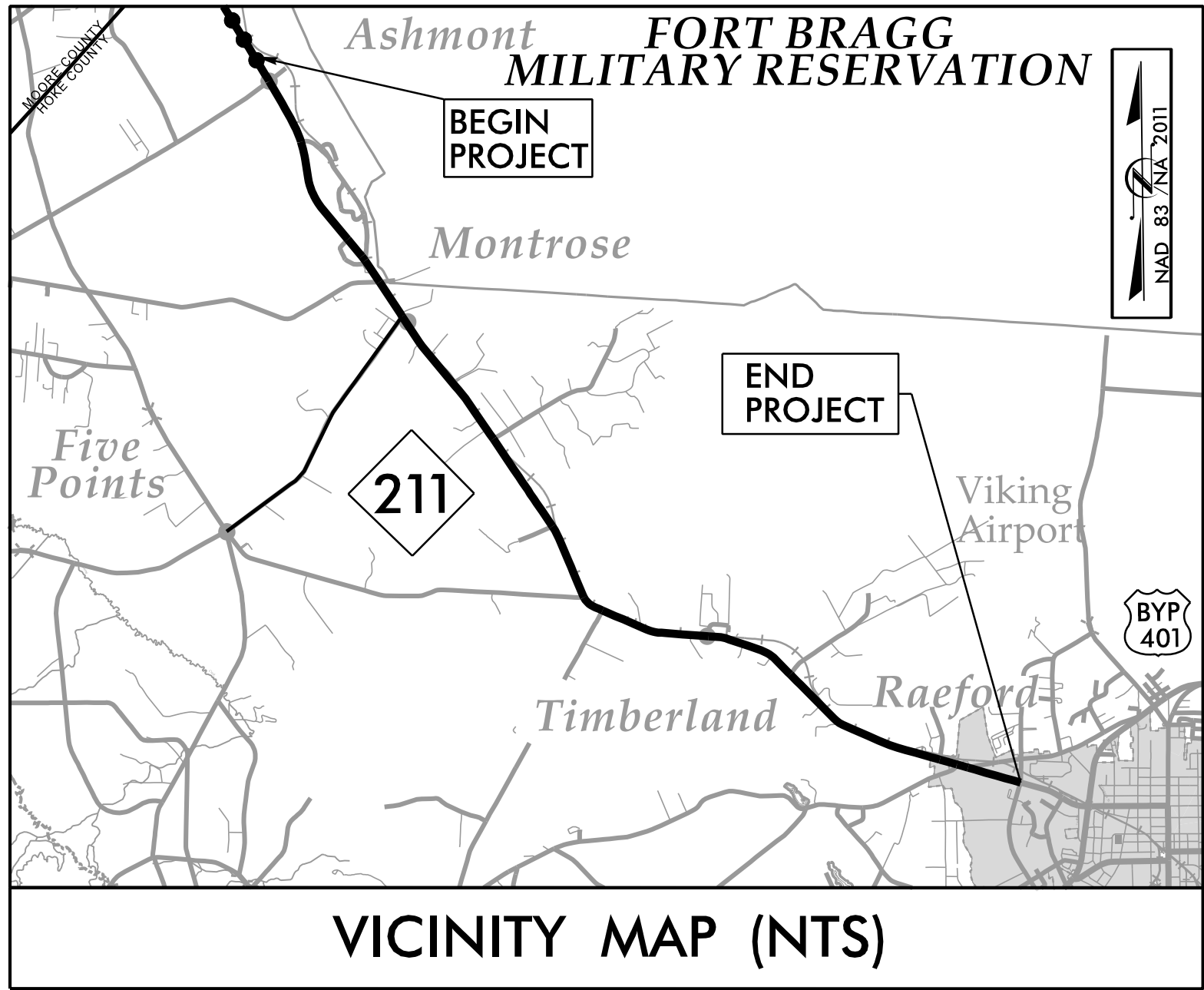


09/08/99
9/25/2024
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default

TIP PROJECT: R-5709C

CONTRACT: C204992



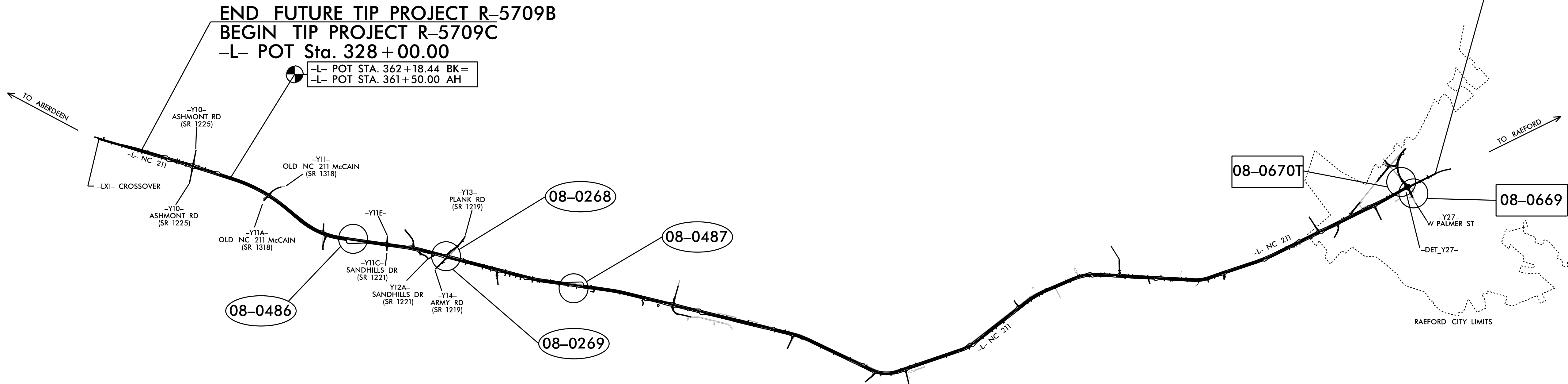
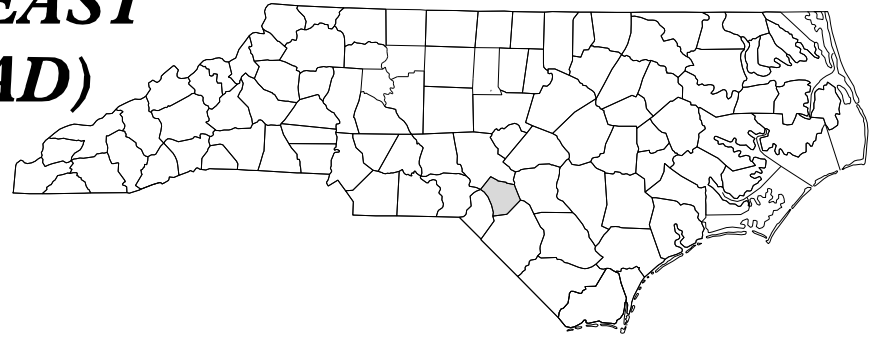
VICINITY MAP (NTS)

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HOKE COUNTY

LOCATION: NC 211 FROM 0.40 MILES NORTH OF SR 1225 (ASHEMONT ROAD) TO EAST OF SR 1244 (WEST PALMER STREET)/SR 1311 (MOCKINGBIRD HILL ROAD) IN RAEFORD.

TYPE OF WORK: TRAFFIC SIGNALS



END TIP PROJECT R-5709C
-L2B- POC Sta. 835 + 30.00

END FUTURE TIP PROJECT R-5709B
BEGIN TIP PROJECT R-5709C
-L- POT Sta. 328 + 00.00

-L- POT STA. 362 + 18.44 BK=
-L- POT STA. 361 + 50.00 AH

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

PLANS PREPARED BY:
RK&K
FOR NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

WP Erickson-Jones, P.E.
PROJECT ENGINEER
Sai Kondapally
PROJECT DESIGN ENGINEER

Sheet #	Reference #
Sig. 1.0	
Sig. 2.0-2.3	08-0486
Sig. 3.0-4.3	08-0268
Sig. 5.0-6.2	08-0269
Sig. 7.0-7.3	08-0487
Sig. 8.0-8.2	08-0669
Sig. 9.0-9.1	08-0670T
Sig. M1A-M9	N/A

Index of Plans

Title Sheet	Location/Description
NC 211 Eastbound at U-Turn North of SR 1219 (Army Rd)	
NC 211 (Aberdeen Rd) at SR 1219 (Plank Rd)	
NC 211 (Aberdeen Rd) at SR 1219 (Army Rd)	
NC 211 Westbound at U-Turn South of SR 1219 (Plank Rd)	
NC 211 (Aberdeen Rd) at SR 1311 (Mockingbird Hill Rd)/SR 1244 (W Palmer St)	
NC 211 (Aberdeen Rd) at SR 1244 (W Palmer St)	
Standard Drawings for Metal Poles	

LEGEND

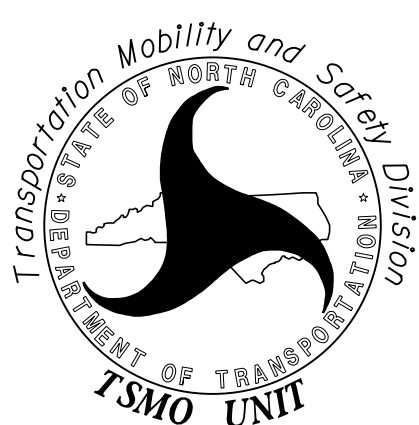
##-####	SIGNAL INVENTORY NUMBER
##-####	SIGNAL TO BE REMOVED

Transportation Systems
Management and Operations Unit

Contacts:

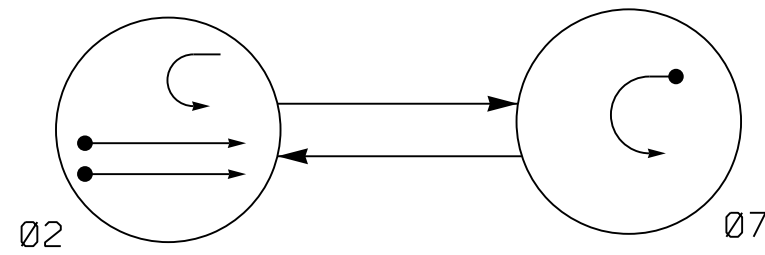
Robert J. Ziemba, P.E. - Central Region Signals Engineer
Ryan W. Hough, P.E. - Signal Equipment Project Engineer

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

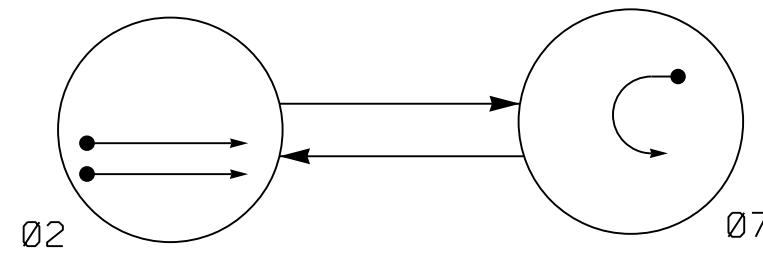


750 N. Greenfield Parkway, Garner, NC 27529

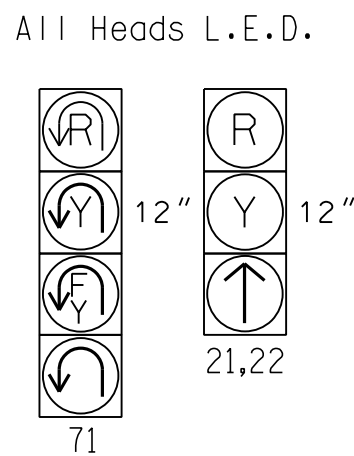
DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.



DEFAULT PHASING TABLE OF OPERATION

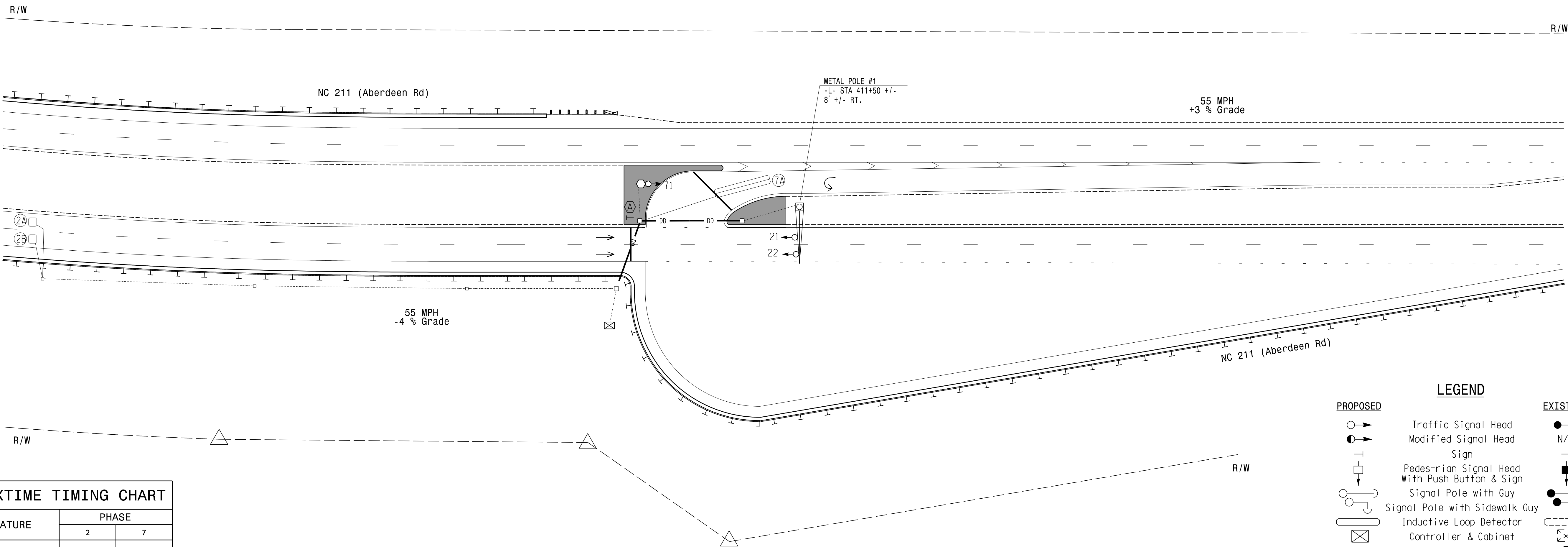
SIGNAL FACE	PHASE		
	Ø 2	Ø 7	FLASH
21,22	↑	R	R
71	↓	↑	↑

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2	Ø 7	FLASH
21,22	↑	R	R
71	↓	↑	↑

PHASING DIAGRAM DETECTION LEGEND

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



MAXTIME TIMING CHART

FEATURE	PHASE	
	2	7
Walk *	-	-
Ped Clear *	-	-
Min Green	14	7
Passage *	6.0	2.0
Max I *	100	25
Yellow Change	5.6	3.0
Red Clear	1.0	5.1
Added Initial *	1.5	-
Maximum Initial *	46	-
Time Before Reduction *	15	-
Time To Reduce *	30	-
Minimum Gap	3.4	-
Advance Walk	-	-
Non Lock Detector	-	X
Vehicle Recall	MIN RECALL	-
Dual Entry	-	-

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

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
2A	6X6	420	5	X	2	-	-	X	X	X	-
2B	6X6	420	5	X	2	-	-	X	X	X	-
7A	6X40	0	2-4-2	X	7	15.0#	-	X	-	X	-

Disable Delay Time During Alternate Phasing Operation.

LEGEND

PROPOSED	EXISTING
Traffic Signal Head	N/A
Modified Signal Head	N/A
Sign	N/A
Pedestrian Signal Head	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 Pole with Mastarm	N/A
Guardrail	N/A
Directional Drill	N/A
Type II Signal Pedestal	N/A
No Left Turn Sign (R3-2)	N/A

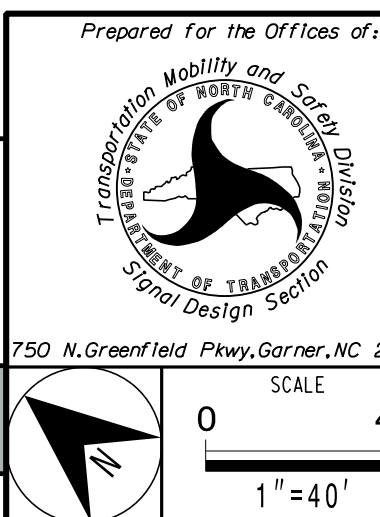
New Installation



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NC 211 Eastbound
At
U-Turn North of
SR 1219 (Army Rd)

Division 8 Hoke County Ashley Heights
PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones
PREPARED BY: VS Kondapally REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL	DATE
PORTER JONES	8/28/2024
SIGNATURE	DATE
SIG. INVENTORY NO.	08-0486

(remove jumpers and set switches as shown)

(remove jumpers and set switches as shown)



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.

(front view)

FS = FLASH SENSE
ST = STOP TIME

(install resistors as shown)



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.

3. Program startup sequence as follows:
From web Interface: Controller>Unit: set STARTUP
CLEARANCE HOLD to 6 sec and ALL RED FLASH EXIT
TIME to 6 seconds.

5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

Controller.....	2070LX
Cabinet.....	332 w/ Aux
Software.....	Q-Free MAXTIME
Cabinet Mount.....	Base
Output File Positions.....	18 With Aux. Output File
Load Switches Used.....	S2, S10, AUX S5.
Phases Used.....	2, 7
Overlap "1".....	NOT USED
Overlap "2".....	NOT USED
Overlap "3".....	NOT USED
Overlap "4".....	*

*See overlap programming detail on sheet 2.

★ For the detectors to work as shown on the signal plans, see the vehicle detector setup Programming Detail for Alternate Phasing on sheet 2.

FILE J _____
SLOT 2 _____
LOWER _____

Sequence 1	
Ring	Sequence Data
1	2,a,7,b
2	

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

(wire signal heads as shown)



Sequence 1	
Ring	Sequence Data
1	2,a,7,b
2	

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

8/27/2024
wpjones
R:\TrOffice\Signals\Design\Signals\Project Split Files\57090*R-5709_08-0486-ED.dgn

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

<u>PHASING</u>	<u>OVERLAP PLAN</u>	<u>VEH DET PLAN</u>
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN
OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE
TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 71 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

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

Overlap	4
Type	FYA 4 - Section
Included Phases	2
Modifier Phases	7
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2	
Overlap	4
Type	FYA 4 - Section
Included Phases	-
Modifier Phases	7
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

← NOTICE INCLUDED PHASE

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Detector	Call Phase	Delay
21	7	0

7A

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0486
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Electrical Detail-Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared for the Offices of:

NC 211 Eastbound
At
U-Turn North of
SR 1219 (Army Rd)

Moore County

Aberdeen

Division 8

PLAN DATE: August 2024

REVIEWED BY:	DT Sears
--------------	----------

REVISIONS

INIT.	DATE
-------	------

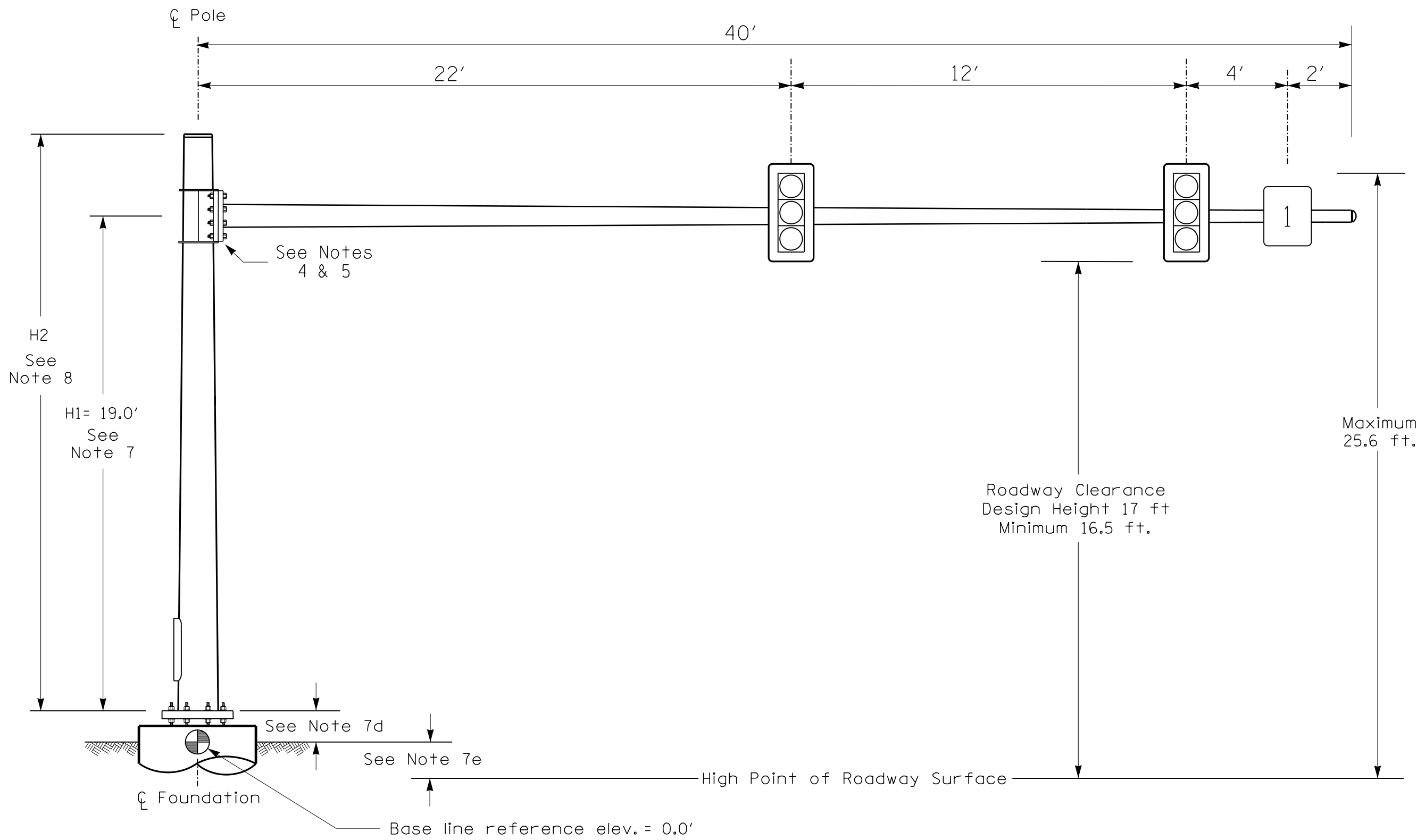
DocuSigned by: [Signature]

Porter Jones 8/28/2024

DATE

SIG. INVENTORY NO. 08-0486

Design Loading for METAL POLE NO. 1



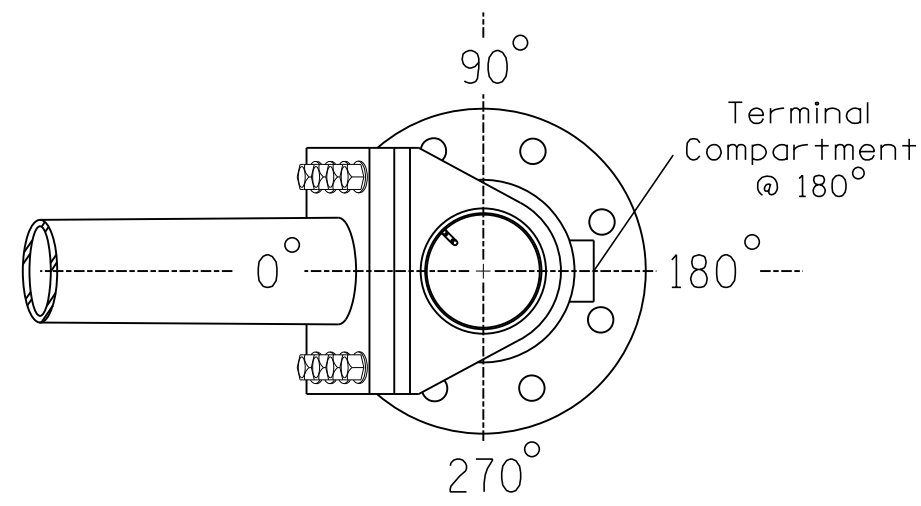
Elevation View

SPECIAL NOTE

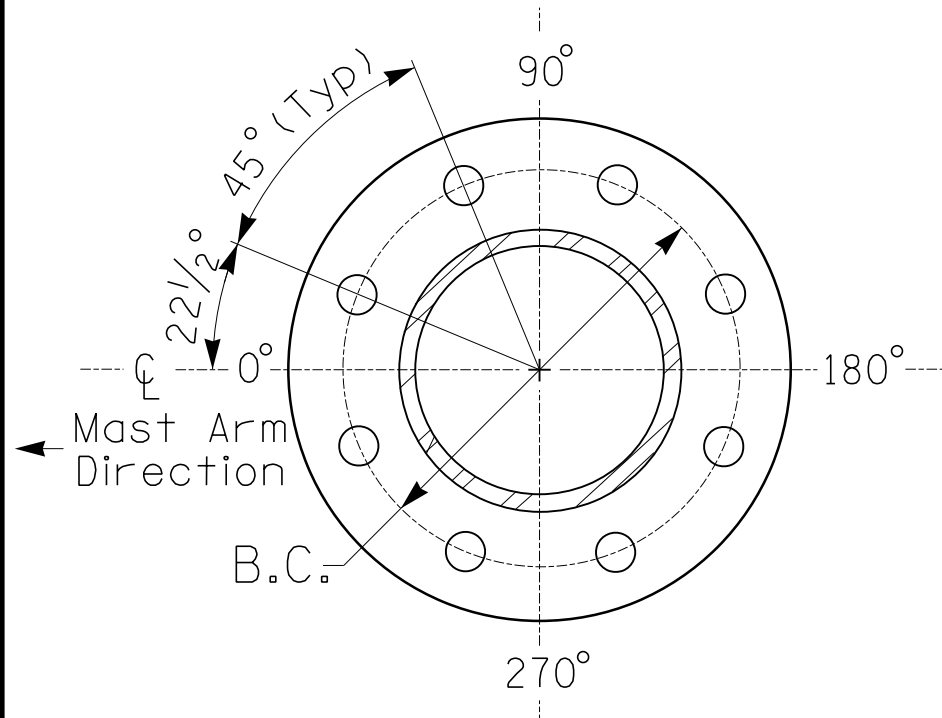
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

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

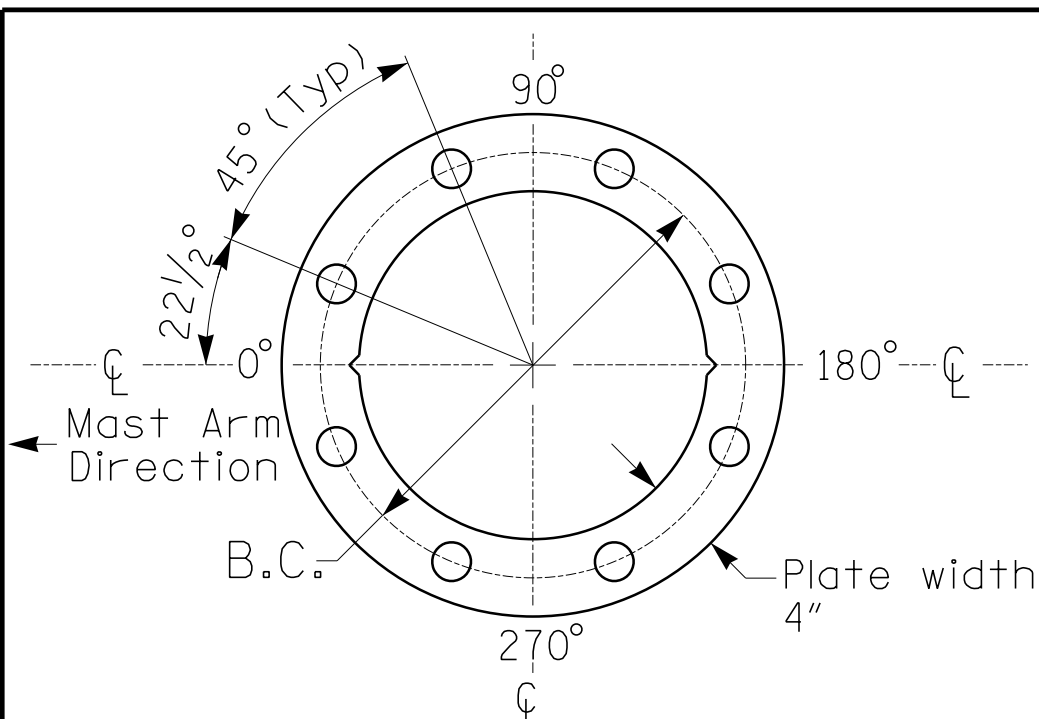


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 6



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

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
1	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

NOTES

DESIGN REFERENCE MATERIAL

- Design the traffic signal structure and foundation in accordance with:
 - The 1st Edition 2015 AASHTO LRFD "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
 - The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
 - The 2024 NCDOT Roadway Standard Drawings.
 - The traffic signal project plans and special provisions.
 - The NCDOT "Metal Pole Standards" located at the following NCDOT website:
<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

DESIGN REQUIREMENTS

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
 - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - Signal heads are rigidly mounted and vertically centered on the mast arm.
 - The roadway clearance height for design is as shown in the elevation views.
 - The top of the pole base plate is 0.75 feet above the ground elevation.
 - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

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NCDOT Wind Zone 4 (120 mph)

 750 N. Greenfield Pkwy, Garner, NC 27529	NC 211 Eastbound At U-Turn North of SR 1219 (Army Rd)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 056142 W. PORTER JONES		
	Division 8 Moore County Aberdeen		INIT. DATE		
	PLAN DATE: August 2024	REVIEWED BY: WP Erickson-Jones	REVISIONS		
	PREPARED BY: VS Kondapally	REVIEWED BY:	INIT. DATE		
SCALE 0 N/A N/A		SIGNATURE Porter Jones DOUGLAS JONES 8/28/2024		DATE 8/28/2024	
		SIC. INVENTORY NO.		08-0486	

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

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

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

Overlap	1	2	7
Type	Normal	FYA 4 - Section	Normal
Included Phases	8, 39	6	3
Modifier Phases	-	-	-
Modifier Overlaps	-	7	-
Trail Green	7	0	7
Trail Yellow	3.0	0.0	3.0
Trail Red	2.4	0.0	2.4
Trail Green Omit Phases	39	-	-

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	7
Type	Normal	FYA 4 - Section	Normal
Included Phases	8, 39	-	3
Modifier Phases	-	-	-
Modifier Overlaps	-	7	-
Trail Green	7	-	7
Trail Yellow	3.0	0.0	3.0
Trail Red	2.4	0.0	2.4
Trail Green Omit Phases	39	-	-

← NOTICE INCLUDED PHASE

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2.
A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO RUN DEFAULT PHASING	1	1
ACTIVE PLAN REQUIRED TO RUN ALTERNATE PHASING	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 31 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.

MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING LOOPS 3A.

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

3A

Plan 2		
Detector	Call Phase	Delay
7	3	0

OUTPUT CHANNEL CONFIGURATION

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	Overlap	7		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	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

→ NOTICE OVERLAP 7
ASSIGNED TO CHANNEL 3

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.

MAXTIME ALTERNATE PHASING PATTERN
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0268T
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Temporary Design
(TMP Phase III Step 2)-Electrical Detail-Sheet 2 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:	NC 211 WB (Aberdeen Rd) At SR 1219 (Plank Rd)	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PORTER JONES
Prepared for the Offices of:	Division 8 PLAN DATE: August 2024 PREPARED BY: VS Kondapally	Hoke County Ashley Heights REVIEWED BY: DT Sears REVIEWED BY: W.P. Erickson-Jones
	750 N. Greenfield Pkwy, Garner, NC 27529	DocuSigned by Porter Jones 8/28/2024
Revisions Table		DATE
RESPONSIVE PEOPLE CREATIVE SOLUTIONS		SIG. INVENTORY NO. 08-0268T

PREEMPTION PROGRAMMING

Front Panel
Main Menu >Controller >Preemption >Preempt Phasing/Preempt Parameters

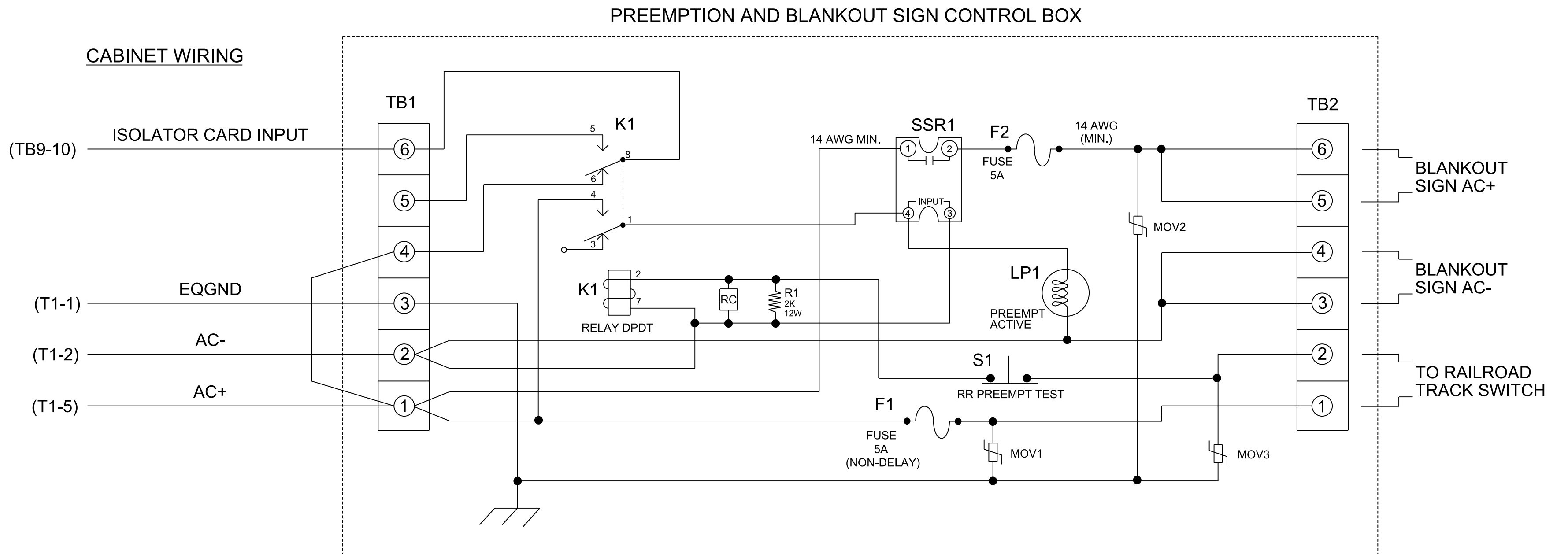
Web Interface
Home >Controller >Preempt Configuration >Preempts

Preempt Configuration

Preempt	1
Enabled	Enabled
Type	Rail Road
Track Phases	39
Track Overlaps	1
Dwell Phases	6
Dwell Overlaps	-
Cycling Phases	-
Cycling Overlaps	-
Exit Phases	3.8
Exit Overlaps	1.7
Delay	0
Max Presence	0
Max Pres Act	Terminate
Enter Min Green	1
Enter Walk	0
Enter Ped Clear	0
Enter Yellow Change	5.6
Enter Red Clear	2.4
Track Green	22
Track Yellow Clr	3.0
Track Red Clear	2.4
Dwell Green	0
Exit Min Green	255
Exit Yellow Change	25.5
Exit Red Clear	25.5
Call Ext Time	1.0
Exit Type	Exit Phases
Not Ovrdr Flash	X
Not Ovrdr Nxt Pre	-
Track Clear Ovrdr	X
Ped Clr During Yellow	X
Entry Omit OLTG	X
Track Reserve	X

RAILROAD PREEMPTION WIRING DETAIL

(wire as shown below)

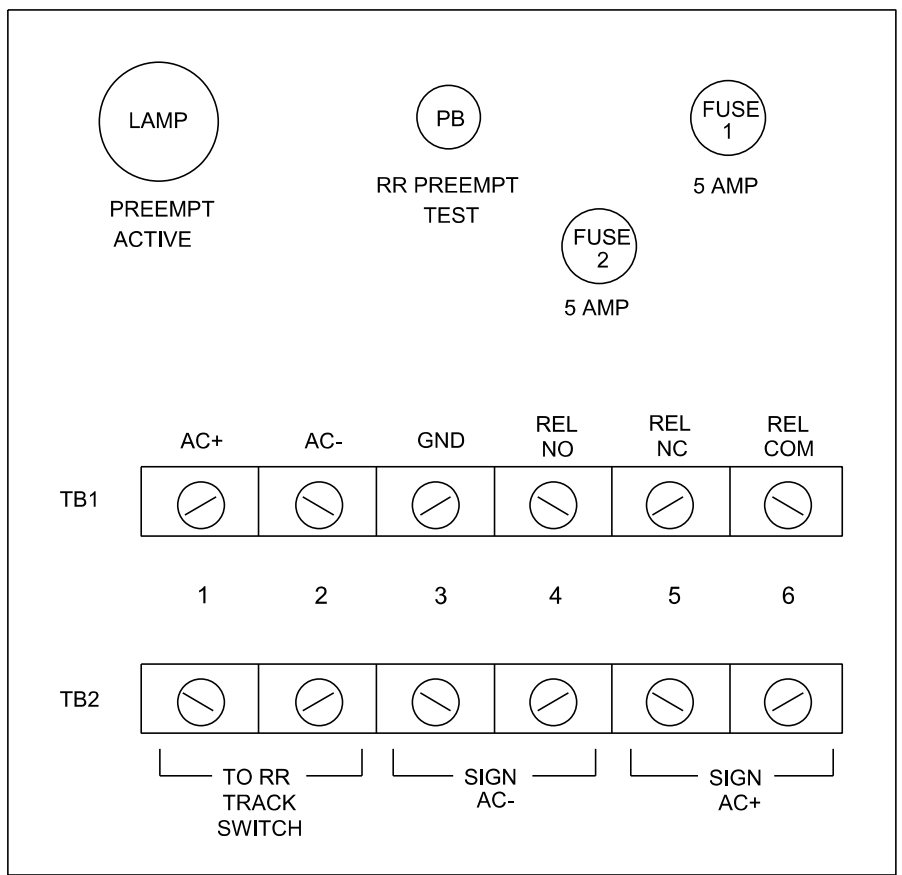


NOTES

1. Relay K1 is shown in the energized (Preempt not active) normal operation state.
2. Relay K1 is a DPDT with 120VAC coil with octal base.
3. Relay SSR1 is a SPST (normally open) Solid State Relay with AC input and AC (25 amp) output.
4. AC Isolator Card shall activate preemption upon removal of AC+ from the input (as shown above). To accomplish this set invert dip switch on AC Isolator Card.

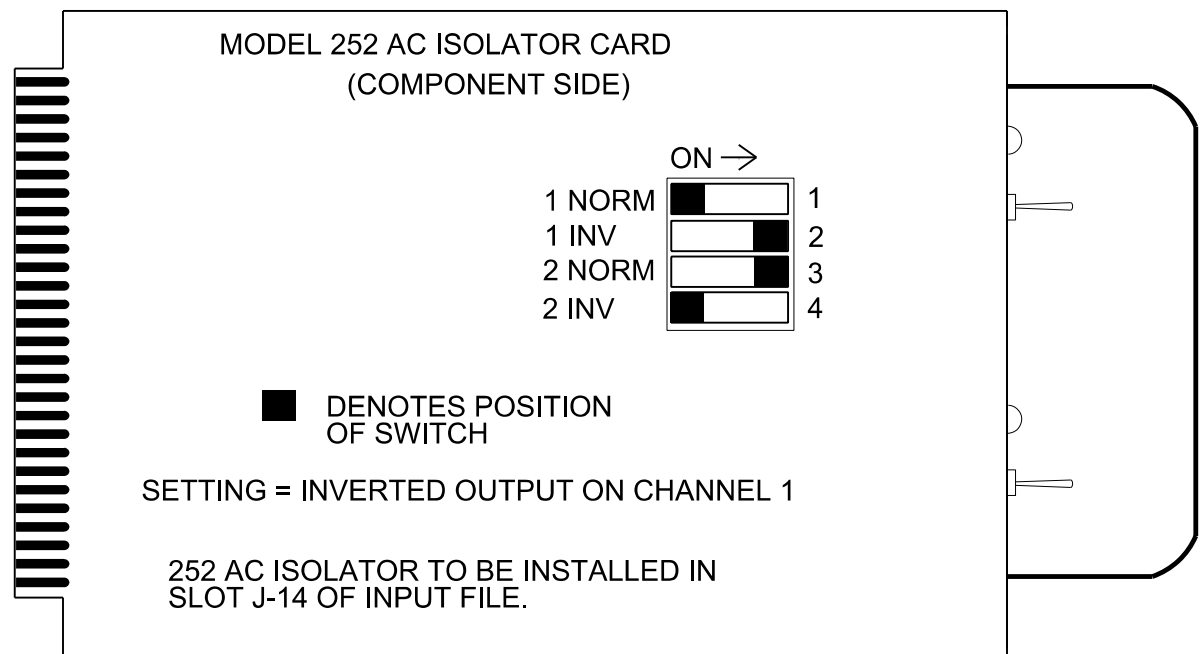
5. **IMPORTANT!!!** A jumper must be added between input file terminals J14-E and J14-K if not already present. Also, terminal TB9-12 (on input panel) shall be connected to AC neutral (jumper may have to be added).

FRONT VIEW



PREEMPT 1 AC ISOLATOR (MODEL 252) OUTPUT PROGRAMMING DETAIL

(set DIP switches as shown below)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0268T
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Temporary Design
(TMP Phase III Step 2)-Electrical Detail-Sheet 3 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

Electrical and Programming Details For:

NC 211 WB (Aberdeen Rd)
At
SR 1219 (Plank Rd)

Division 8 Hoke County Ashley Heights

PLAN DATE: August 2024	REVIEWED BY: DT Sears
------------------------	-----------------------

PREPARED BY: VS Kondapally	REVIEWED BY: W.P. Erickson-Jones
----------------------------	----------------------------------

REVISIONS	INIT.	DATE

[illegible]

SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
056142
W. ENGINEER
PORTER JONES

DocuSigned by:
Porter Jones

8/28/2024

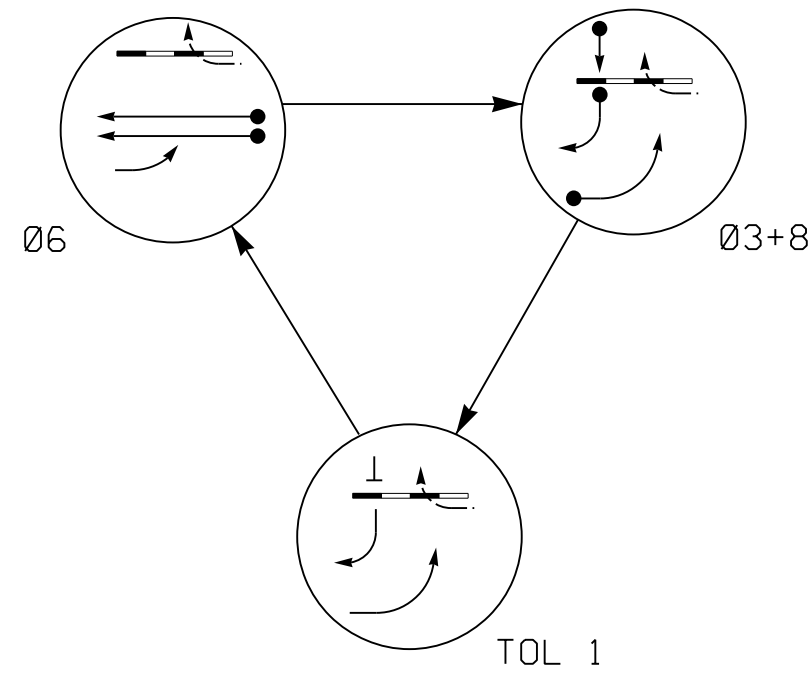
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SIG. INVENTORY NO. 08-0268T

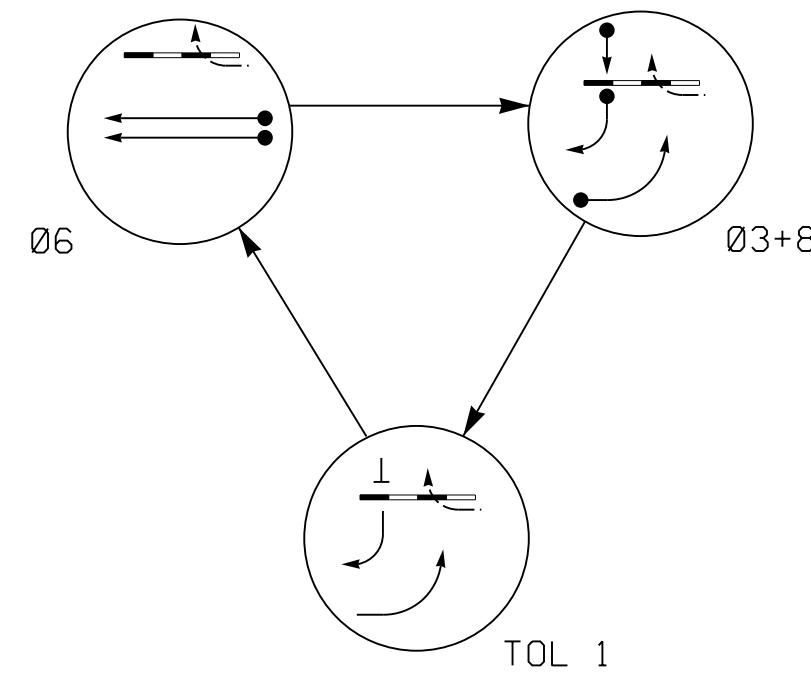
SIG. INVENTORY NO. 08-0268T

8/27/2024
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wpjones

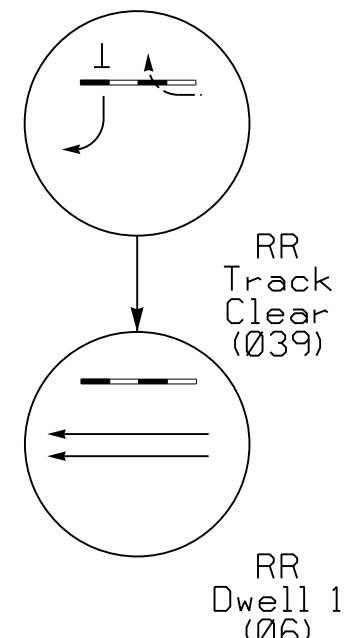
DEFAULT PHASING DIAGRAM



ALTERNATE
PHASING DIAGRAM



RAIL PREEMPT PHASES (High Priority)



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	0 6	0 3 + 8	T O L 1	C L E A R R	D W E L L R	F L A S H R
31	$\leftarrow$	$\leftarrow$	$\leftarrow$	$\leftarrow$	$\leftarrow$	$\leftarrow$
61,62	$\uparrow$	R	R	R	$\uparrow$	R
81,82	R	$\rightarrow$	$\rightarrow$	$\rightarrow$	R	R
83,84	R	$\uparrow$	R	R	R	R

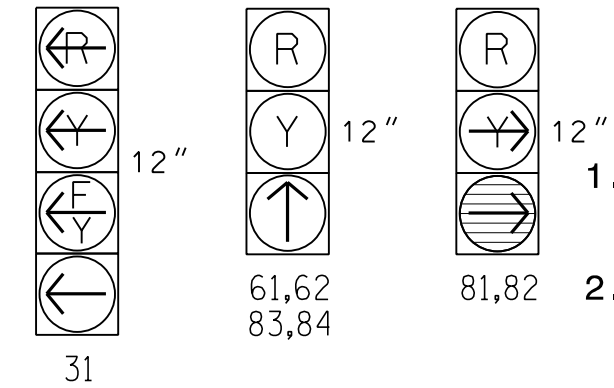
ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE				
	0 6	0 3 + 8	T O L 1	C R 1 R 2 R 3	D W E L L T I M E
31	R	←	←	R	←
61,62	↑	R	R	R	↑
81,82	R	→	→	→	R
83,84	R	↑	R	R	R

SIGNAL FACE I.D.

All Heads L.E.D.

 Denotes Louvered Signal Head



2 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered 61,62,82,83,84.
4. Set all detector units to presence mode.
5. Program phase 40 to run concurrently with all phases during normal operation. Phase 39 must be incompatible with phase 40 and included as a track clear phase.
6. The Division Traffic Engineer will determine the hours of use for each phasing plan.

PHASING DIAGRAM DETECTION LEGEND

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

MAXTIME PREEMPTION CHART

FUNCTION	PRE 1
Type	RAIL ROAD
Exit Phases	3 + 8
Delay	0
Max Presence	0
Enter Min Green	1
Enter Walk	0
Enter Ped Clear	0
Enter Yellow Change	5.6 *
Enter Red Clear	2.4 *
Track Green	22
Track Yellow Change	3.0
Track Red Clear	2.4
Dwell Green	0
Exit Min Green	25.5 *
Exit Yellow Change	25.5 *
Exit Red Clear	25.5 *
Dwell Extend Time	1.0
Exit Type	EXIT PHASES
Require All Red Entry	-

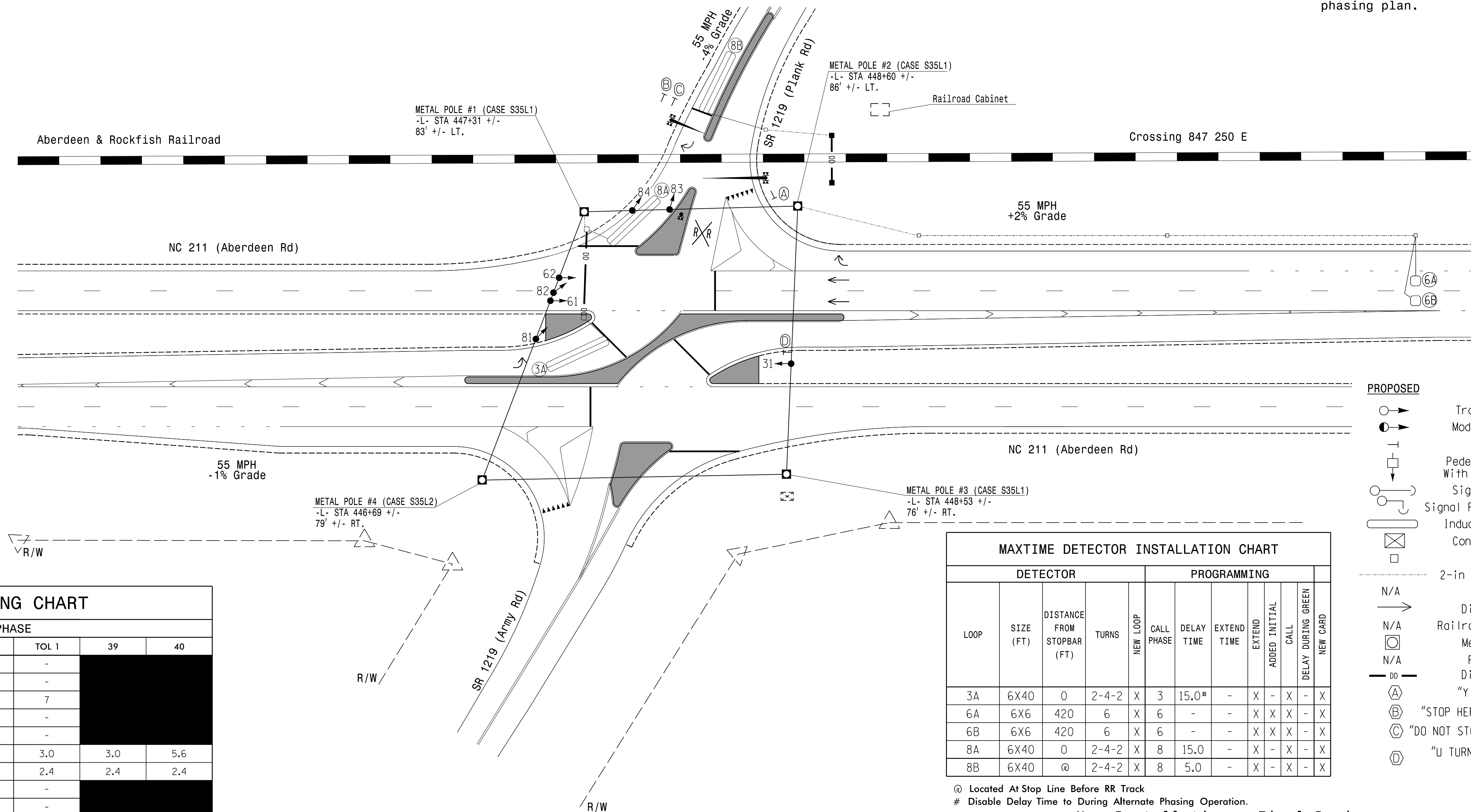
* Controller uses the lesser of the time shown and the normal time used for phase.

THIS SIGNAL IS DESIGNED FOR ADVANCED PREEMPTION

MAXTIME TIMING CHART

FEATURE	PHASE					
	3	6	8	TOL 1	39	40
Walk *	-	-	-	-		
Ped Clear *	-	-	-	-		
Min Green	7	14	7	7		
Passage *	2.0	6.0	2.0	-		
Max 1 *	30	90	30	-		
Yellow Change	3.0	5.0	5.6	3.0	3.0	5.6
Red Clear	2.4	1.1	2.2	2.4	2.4	2.4
Added Initial *	-	1.5	-	-		
Maximum Initial *	-	46	-	-		
Time Before Reduction *	-	15	-	-		
Time To Reduce *	-	30	-	-		
Minimum Gap	-	3.4	-	-		
Advance Walk	-	-	-	-		
Non Lock Detector	X	-	X	-		
Vehicle Recall	-	MIN RECALL	-	MIN RECALL	MIN RECALL	
Dual Entry	X	-	X	X		

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



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
3A	6X40	0	2-4-2	X	3	15.0#	-	X	-	X	-	X
6A	6X6	420	6	X	6	-	-	X	X	X	-	X
6B	6X6	420	6	X	6	-	-	X	X	X	-	X
8A	6X40	0	2-4-2	X	8	15.0	-	X	-	X	-	X
8B	6X40	@	2-4-2	X	8	5.0	-	X	-	X	-	X

④ Located At Stop Line Before RR Track

Disable Delay Time to During Alternate Phasing Operation.

New Installation - Final Design

LEGEND

PROPOSED

- | | | | |
|--|--|--|-----|
| | Traffic Signal Head | | N/A |
| | Modified Signal Head | | N/A |
| | Pedestrian Signal Head | | N/A |
| | Signal Pole with Push Button and Sign | | N/A |
| | Signal Pole with Guy | | N/A |
| | Signal Pole with Sidewalk Guy | | N/A |
| | Inductive Loop Detector Controller & Cabinet | | N/A |
| | Junction Box | | N/A |
| | 2-in Underground Conduit | | N/A |
| | Right of Way | | N/A |
| | Directional Arrow | | N/A |
| | Railroad Gate and Flasher | | N/A |
| | Metal Strain Pole | | N/A |
| | Railroad Tracks | | N/A |
| | Directional Drill | | N/A |
| | "YIELD" Sign (R1-2) | | N/A |
| | "STOP HERE ON RED" Sign (R10-6) | | N/A |
| | "DO NOT STOP ON TRACKS" Sign (R8-8) | | N/A |
| | "U TURN YIELD TO RIGHT TURN" Sign (R10-16) | | N/A |

EXISTING

-

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



DocuSigned by:

Revised: May 1986

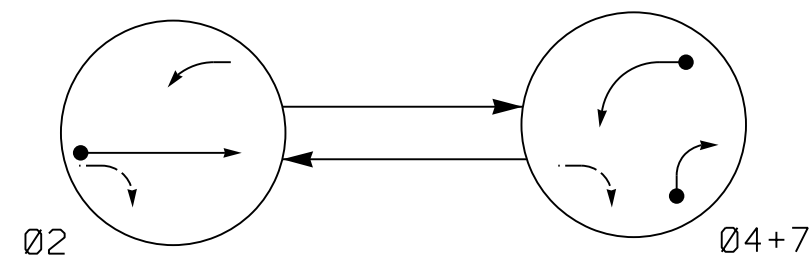
Porter Jones 8/28/20
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SAJ. MURTHY, MS.	00 00 00

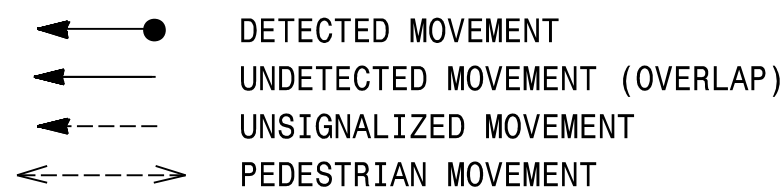
STG. INVENTORY NO. 08-0261

8/27/2024
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wpjones

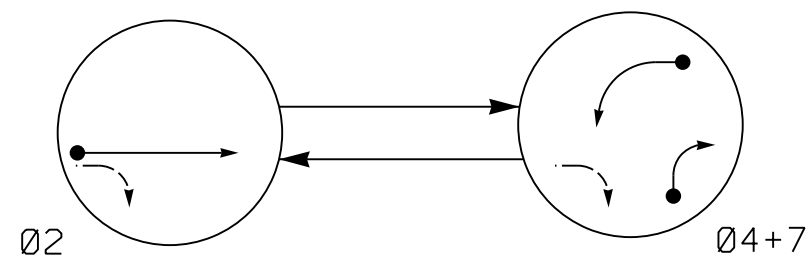
DEFAULT PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

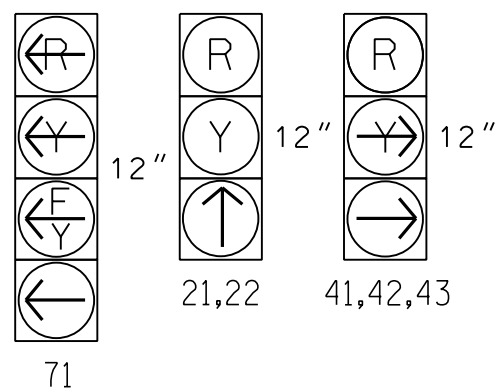


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.

DEFAULT PHASING
TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2	Ø 4 + 7	F L A S H
21,22	↑	R	R
41,42,43	R	→	R
71	←	←	←

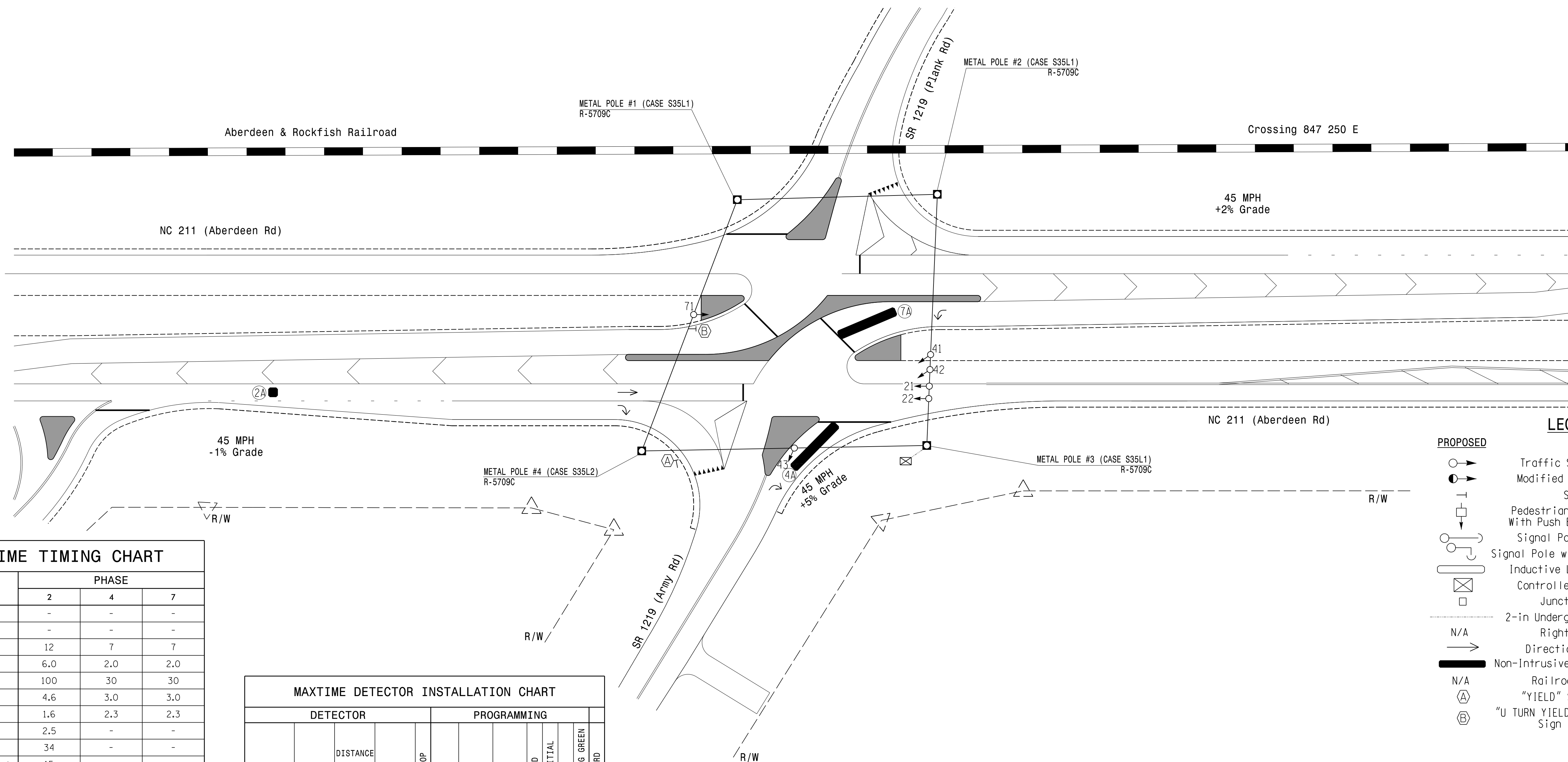
ALTERNATE PHASING
TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2	Ø 4 + 7	F L A S H
21,22	↑	R	R
41,42,43	R	→	R
71	←	←	←

2 Phase
Fully Actuated
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning red on right.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.



MAXTIME TIMING CHART

FEATURE	PHASE		
	2	4	7
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	12	7	7
Passage *	6.0	2.0	2.0
Max 1 *	100	30	30
Yellow Change	4.6	3.0	3.0
Red Clear	1.6	2.3	2.3
Added Initial *	2.5	-	-
Maximum Initial *	34	-	-
Time Before Reduction *	15	-	-
Time To Reduce *	30	-	-
Minimum Gap	3.0	-	-
Advance Walk	-	-	-
Non Lock Detector	-	X	X
Vehicle Recall	MIN RECALL	-	-
Dual Entry	-	X	X

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

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING							
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN	NEW CARD
2A*	6X6	300	*	*	2	-	-	X	X	-	*
4A*	6X40	0	*	*	4	15.0	-	X	-	X	*
7A*	6X40	0	*	*	7	15.0*	-	X	-	X	*

Disable Delay Time to During Alternate Phasing Operation.

* Video Detection Zone

LEGEND

PROPOSED	EXISTING

New Installation - Temporary Design (TMP Phase III Step 2)

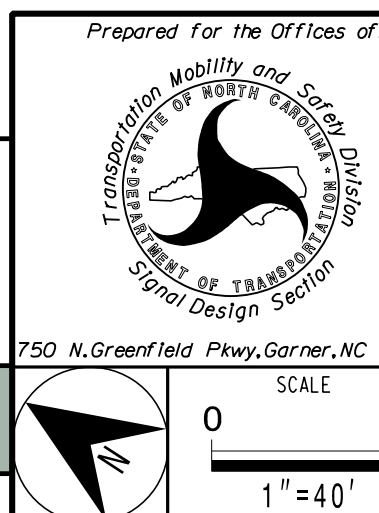
DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED**RK&K**

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NC 211 EB (Aberdeen Rd)
At
SR 1219 (Army Rd)

Division 8 Hoke County Ashley Heights

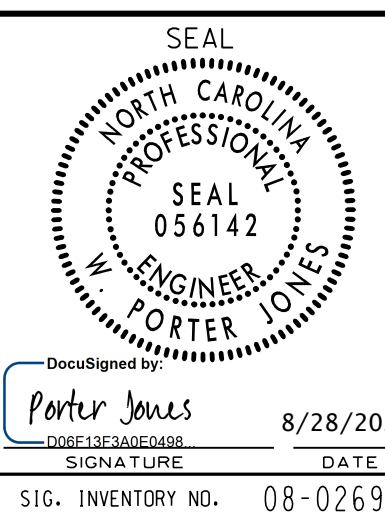
PLAN DATE: August 2024 REVIEWED BY: WP Erickson-Jones

PREPARED BY: VS Kondapally REVIEWED BY:

REVISIONS

INIT.

DATE



Porter Jones

SIGNATURE

DATE 8/28/2024

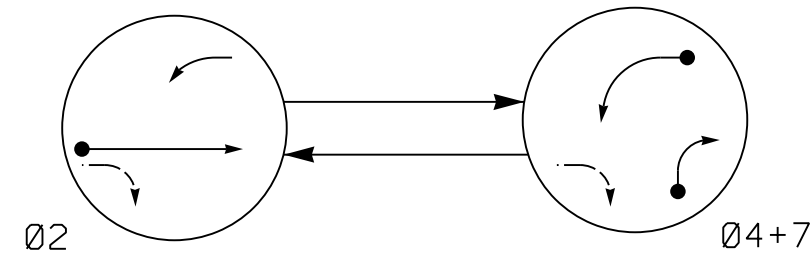
SIG. INVENTORY NO. 08-0269T

2 Phase
Fully Actuated
(Isolated)

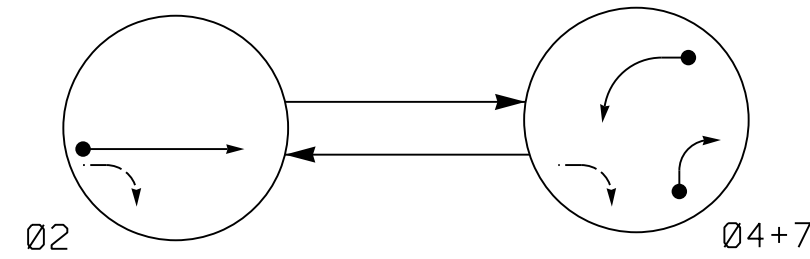
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
2. Reposition existing signal heads numbered 21 and 22.
3. Set all detector units to presence mode. sight distance of vehicles turning red on right.
4. The Division Traffic Engineer will determine the hours of use for each phasing plan.

DEFAULT PHASING DIAGRAM

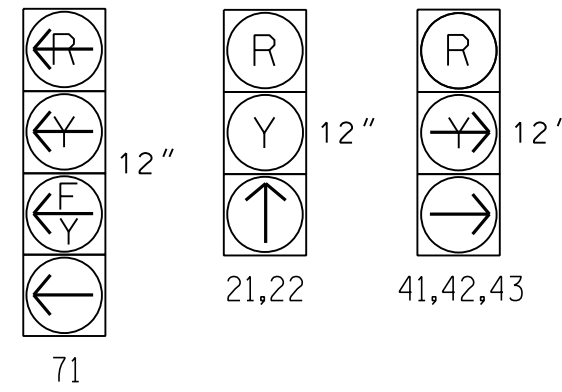


ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.

All Heads L.E.D.



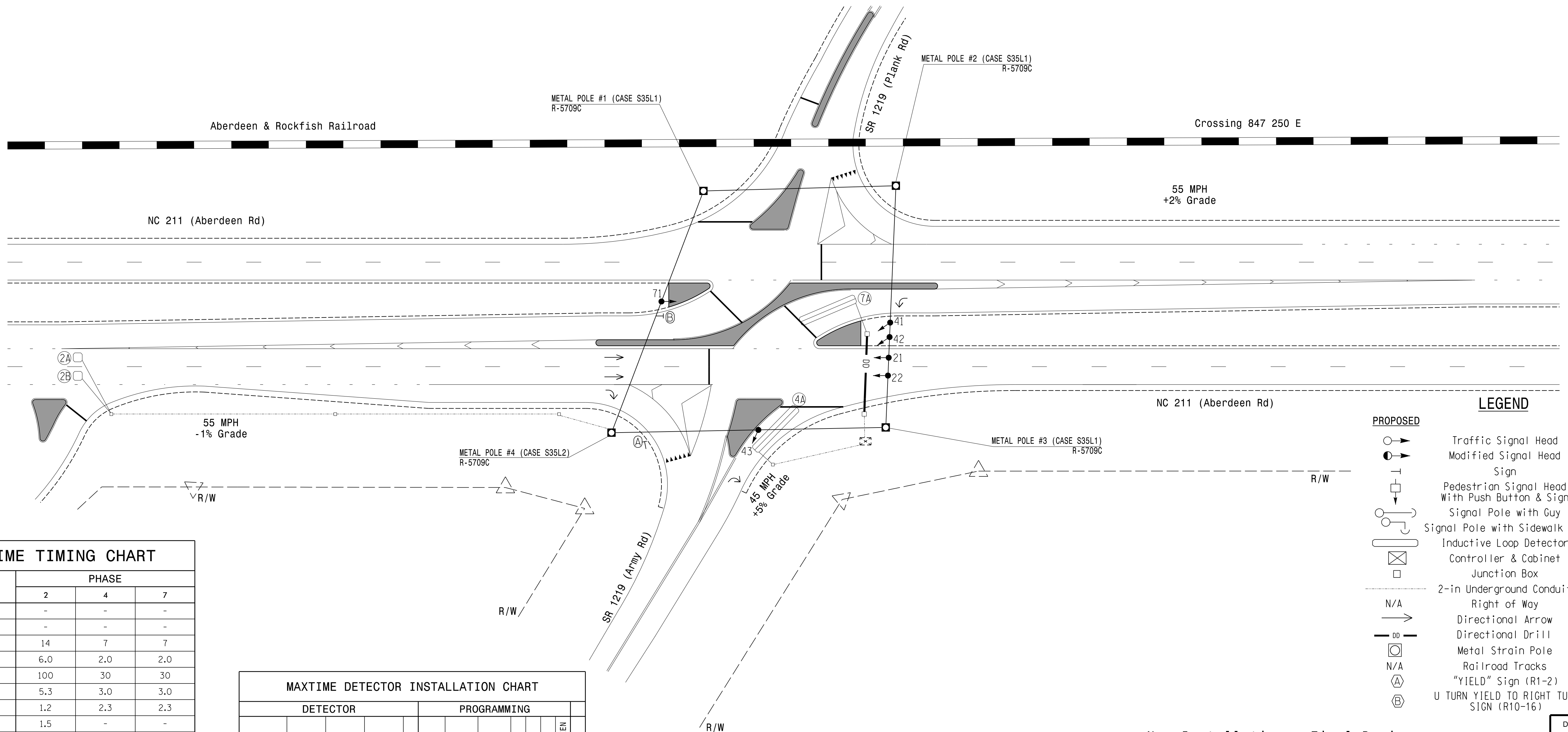
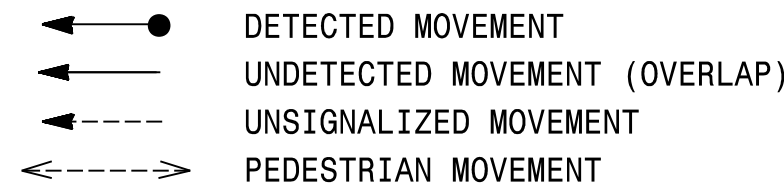
DEFAULT PHASING TABLE OF OPERATION	
---------------------------------------	--

SIGNAL FACE			
	0 2	0 4 + 7	F L A S H
21,22	↑	R	R
41,42,43	R	→	R
71	← F Y	←	← R

ALTERNATE PHASING TABLE OF OPERATION	
1	2
3	4
5	6
7	8
9	10
11	12
13	14
15	16
17	18
19	20
21	22
23	24
25	26
27	28
29	30
31	32
33	34
35	36
37	38
39	40
41	42
43	44
45	46
47	48
49	50
51	52
53	54
55	56
57	58
59	60
61	62
63	64
65	66
67	68
69	70
71	72
73	74
75	76
77	78
79	80
81	82
83	84
85	86
87	88
89	90
91	92
93	94
95	96
97	98
99	100

SIGNAL FACE			
	0 2	0 4 + 7	F L A S H
21,22	↑	R	R
41,42,43	R	→	R
71	←	←	←

PHASING DIAGRAM DETECTION LEGEND



MAXTIME TIMING CHART

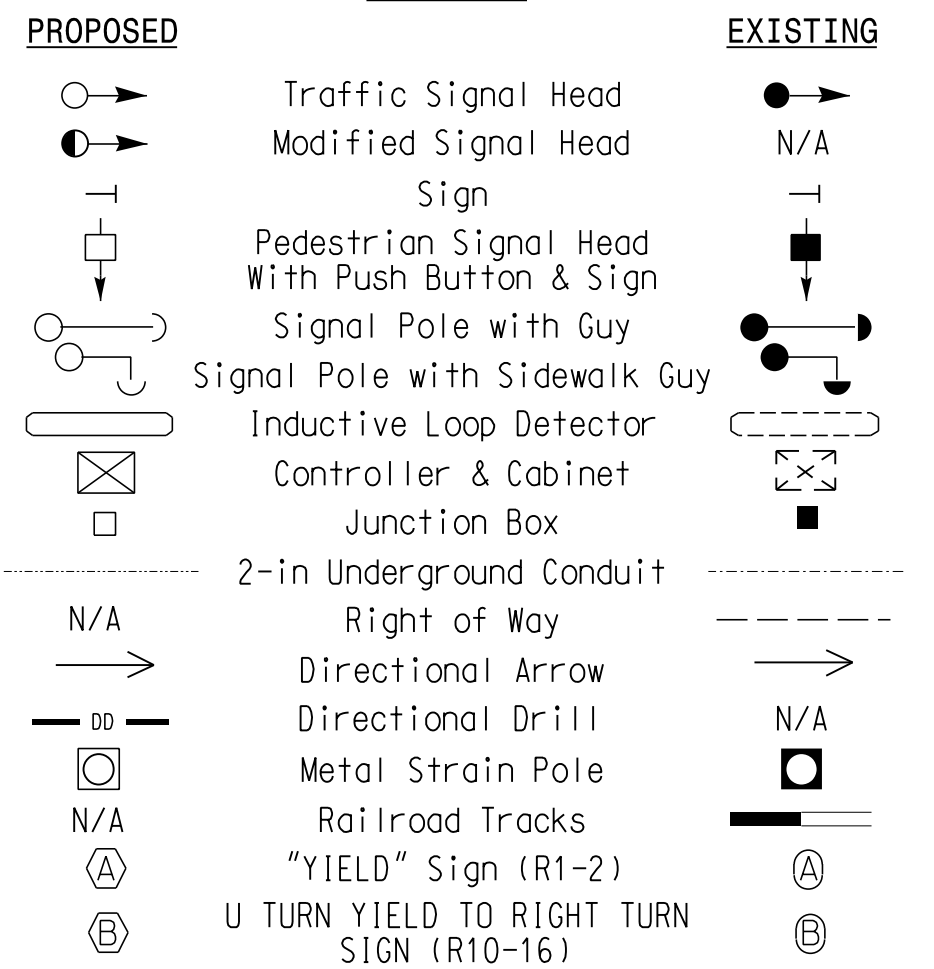
FEATURE	PHASE		
	2	4	7
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	14	7	7
Passage *	6.0	2.0	2.0
Max 1 *	100	30	30
Yellow Change	5.3	3.0	3.0
Red Clear	1.2	2.3	2.3
Added Initial *	1.5	-	-
Maximum Initial *	46	-	-
Time Before Reduction *	15	-	-
Time To Reduce *	30	-	-
Minimum Gap	3.4	-	-
Advance Walk	-	-	-
Non Lock Detector	-	X	X
Vehicle Recall	MIN RECALL	-	-
Dual Entry	-	X	X

MAXTIME DETECTOR INSTALLATION CHART

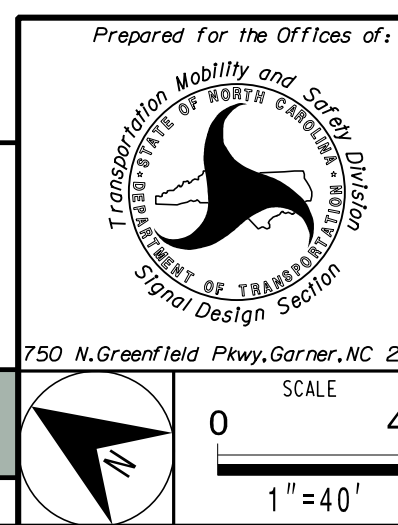
DETECTOR					PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED	INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	420	6	X	2	-	-	X	X	X	X	-	X
4A	6X40	0	2-4-2	X	4	15.0	-	X	-	X	-	-	X
7A	6X40	0	2-4-2	X	7	15.0*	-	X	-	X	-	-	X

Disable Delay Time to During Alternate Phasing Operation.

LEGEND



New Installation - Final Design



NC 211 WB (Aberdeen Rd)
At
SR 1219 (Army Rd)

Division 8 Hoke County Ashley Heights		056142 W. PORTER JONES ENGINEER
PLAN DATE: August 2024	REVIEWED BY: WP Erickson-Jones	
PREPARED BY: VS Kondapally	REVIEWED BY:	
REVISIONS	INIT.	DATE

DocuSign

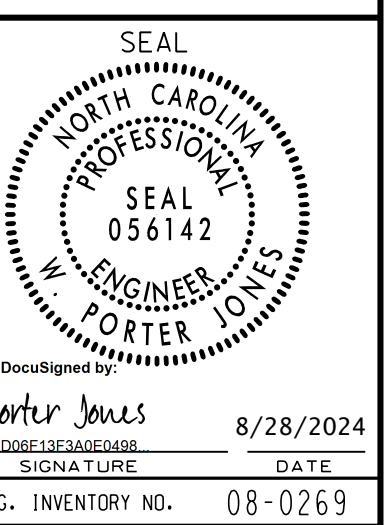
 Porter Jones

8/28/2024
DATE

SIG. INVENTORY NO. 08-0269

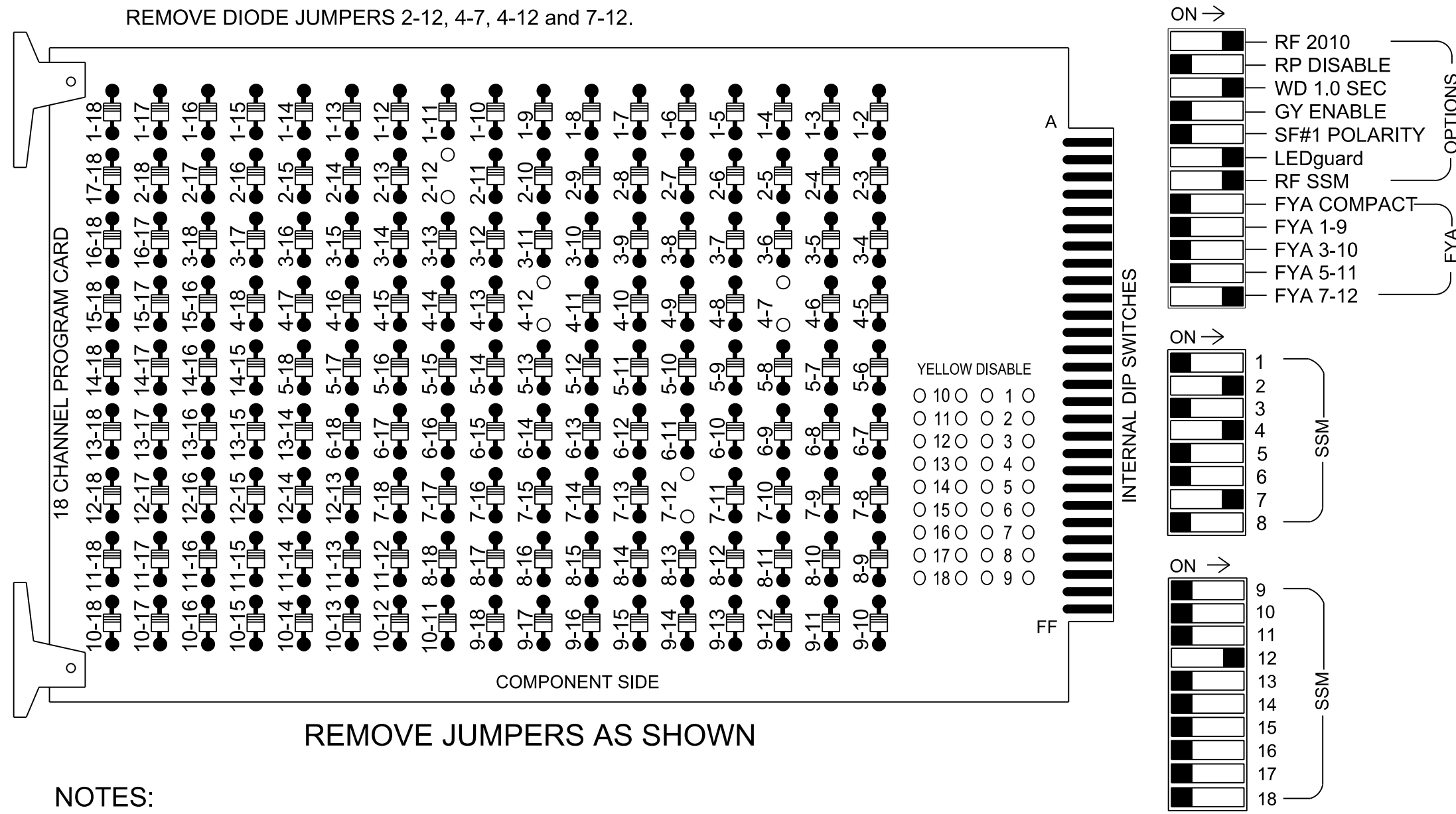
DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

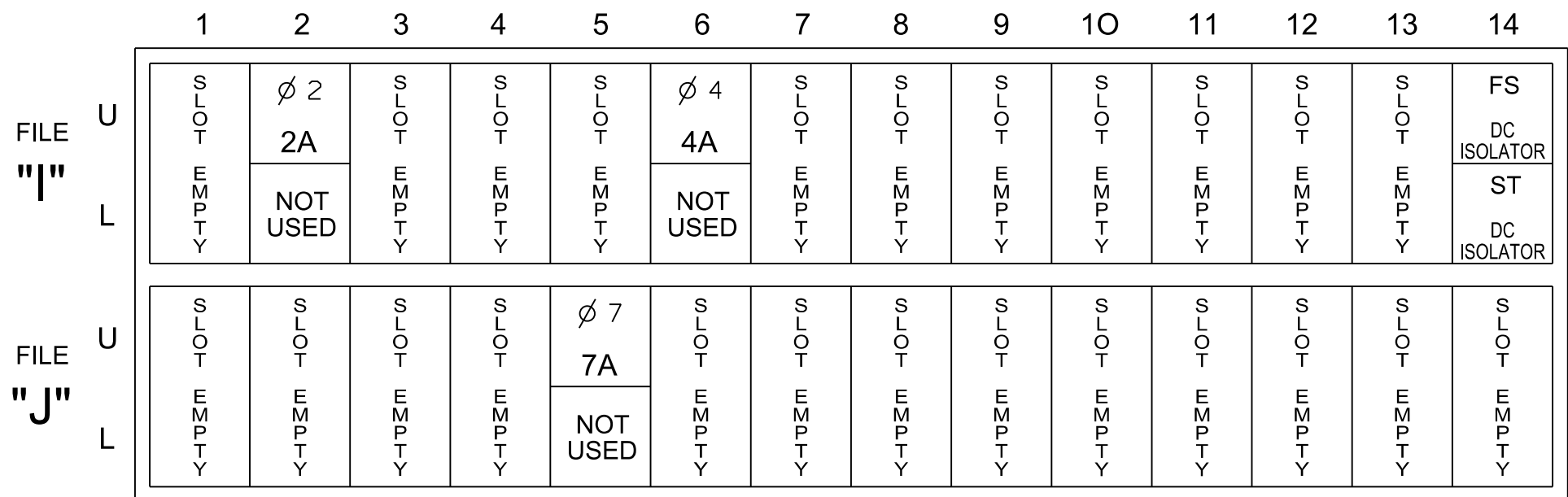


NOTES:

- 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.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

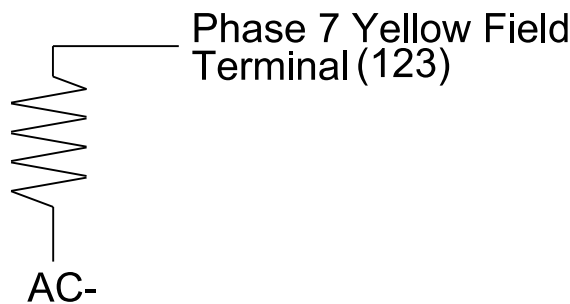
(front view)



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)



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 phases 4 and 7 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk.
- Program startup sequence as follows:
From web Interface: Controller>Unit: set STARTUP CLEARANCE HOLD to 6 sec and ALL RED FLASH EXIT TIME to 6 seconds.
- Ensure all channels are programmed to flash red on the channel configuration screen. From web Interface: Controller>Advanced IO>Channels>Channel Configuration: program all channels to flash red.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

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.....S2, S5, S10,
AUX S5
Phases Used.....2, 4, 7.
Overlap "1".....NOT USED
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....*

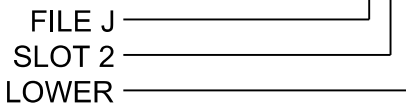
*See overlap programming detail on sheet 2.

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
2A	TB2-5.6	I2U	39	1	2	2			X	X	X	
4A	TB4-9,10	I6U	41	3	8	4	15.0		X		X	
7A	TB5-5.6	J5U	57	19	21 ★	7	15.0		X		X	

★For the detectors to work as shown on the signal plans, see the vehicle detector setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,43	NU	NU	NU	NU	71★	NU	NU	NU	NU	NU	NU	71★	NU
RED		128			101													
YELLOW		129								*								
GREEN																		
RED ARROW																	A101	
YELLOW ARROW					102												A102	
FLASHING YELLOW ARROW																	A103	
GREEN ARROW		130			103					124								

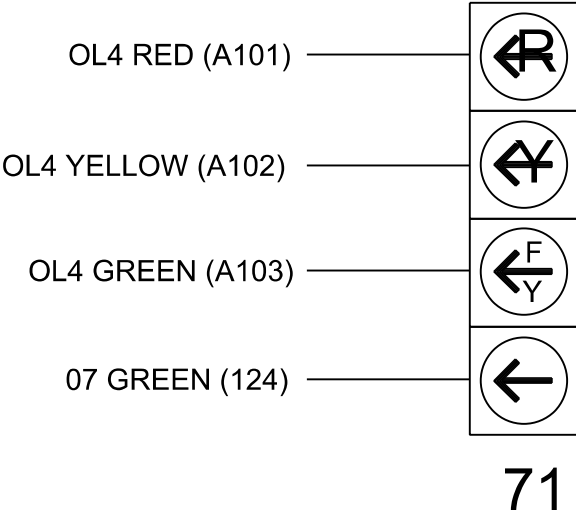
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0269
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

Signal Upgrade-Final Design-Electrical Detail-Sheet 1 of 2

Electrical and Programming Details For:		NC 211 WB (Aberdeen Rd) At SR 1219 (Army Rd)		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Prepared for the Offices of:		Division 8 Hoke County Ashley Heights		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PORTER JONES	
PLAN DATE: August 2024		REVIEWED BY: DT Sears		8/28/2024	
PREPARED BY: VS Kondapally		REVIEWED BY: W.P. Erickson-Jones		DATE	
REVISIONS		INIT.		DATE	
750 N. Greenfield Pkwy, Garner, NC 27529				SIG. INVENTORY NO. 08-0269	

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MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2.
A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	2

ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

OVERLAP PLAN 2: Modifies overlap included phases for head 71 to run protected turns only.

VEH DET PLAN 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR DEFAULT PHASING

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

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

Overlap	4
Type	FYA 4 - Section
Included Phases	2
Modifier Phases	7
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL
FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	4
Type	FYA 4 - Section
Included Phases	-
Modifier Phases	7
Modifier Overlaps	-
Trail Green	0
Trail Yellow	0.0
Trail Red	0.0

NOTICE INCLUDED PHASE

MAXTIME DETECTOR PROGRAMMING DETAIL
FOR ALTERNATE PHASING LOOPS 7A.

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

Detector	Call Phase	Delay
21	7	0

7A

MAXTIME ALTERNATE PHASING PATTERN
PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0269
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

Signal Upgrade-Final Design-Electrical Detail-Sheet 2 of 2

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

Electrical and Programming
Details For:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 211 WB (Aberdeen Rd)
At
SR 1219 (Army Rd)

Division 8Hoke CountyAshley Heights

PLAN DATE: August 2024REVIEWED BY: DT Sears

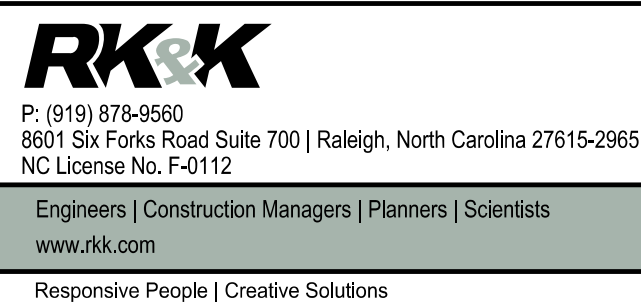
PREPARED BY: VS KondapallyREVIEWED BY: W.P. Erickson-Jones

REVISIONSINIT. DATE

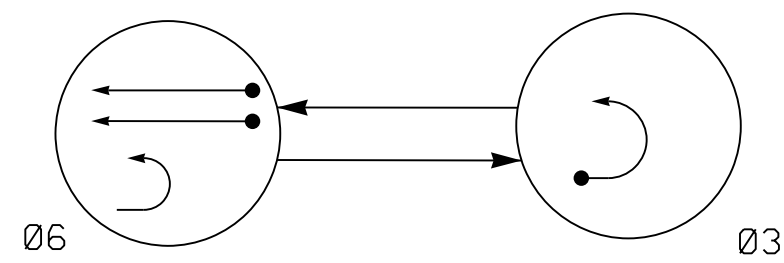


DocuSigned byPorter Jones8/28/2024

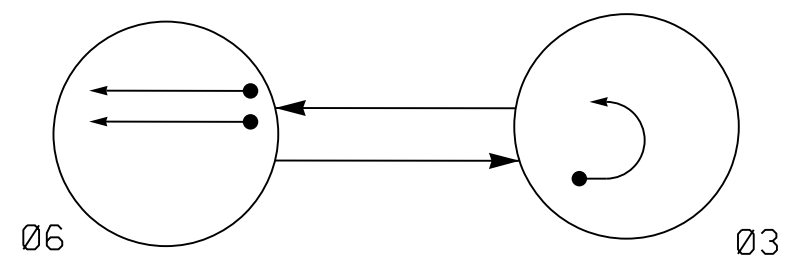
SIG. INVENTORY NO. 08-0269



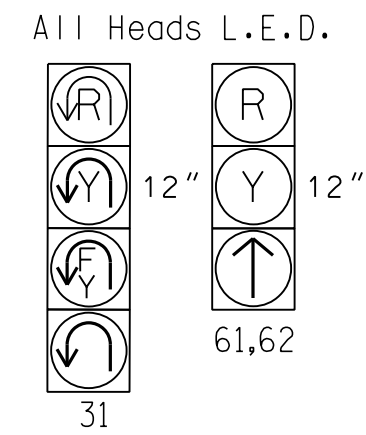
DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



SIGNAL FACE I.D.



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 6	Ø 3	F L A S H
31			
61,62		R	R

ALTERNATE PHASING TABLE OF OPERATION

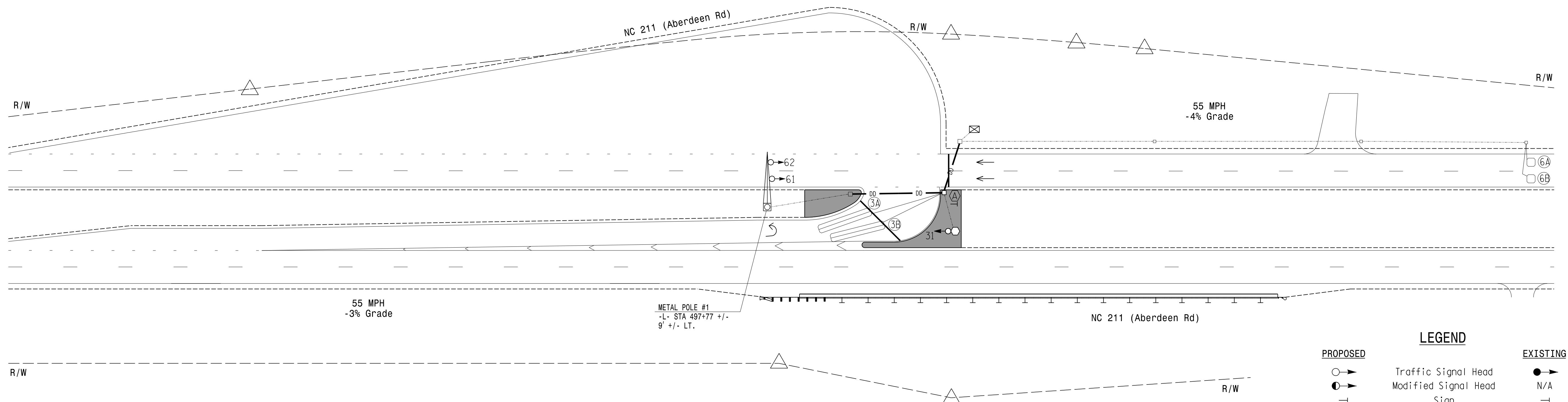
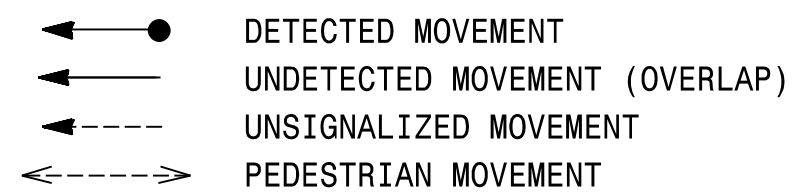
SIGNAL FACE	PHASE		
	Ø 6	Ø 3	F L A S H
31			
61,62		R	R

2 Phase
Fully Actuated
(Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. The Division Traffic Engineer will determine the hours of use for each phasing plan.

PHASING DIAGRAM DETECTION LEGEND



MAXTIME TIMING CHART

FEATURE	PHASE	
	3	6
Walk *	-	-
Ped Clear *	-	-
Min Green	7	14
Passage *	2.0	6.0
Max 1 *	25	100
Yellow Change	3.0	5.6
Red Clear	5.0	1.4
Added Initial *	-	1.5
Maximum Initial *	-	46
Time Before Reduction *	-	15
Time To Reduce *	-	30
Minimum Gap	-	3.4
Advance Walk	-	-
Non Lock Detector	X	-
Vehicle Recall	-	MIN RECALL
Dual Entry	-	-

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

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
3A	6X40	0	2-4-2	X	3	15.0#	-	X	-	X	-	X	X
3B	6X40	0	2-4-2	X	3	15.0#	-	X	-	X	-	X	X
6A	6X6	420	5	X	6	-	-	X	X	X	-	X	X
6B	6X6	420	5	X	6	-	-	X	X	X	-	X	X

Disable Delay Time During Alternate Phasing Operation.

LEGEND

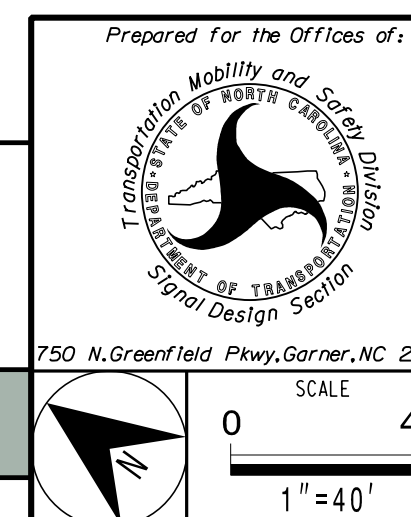
PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head	
	With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Metal Pole with Mastarm	
N/A	Guardrail	
	Directional Drill	
	Type 11 Signal Pedestal	N/A
	No Left Turn Sign (R3-2)	

New Installation

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SEAL

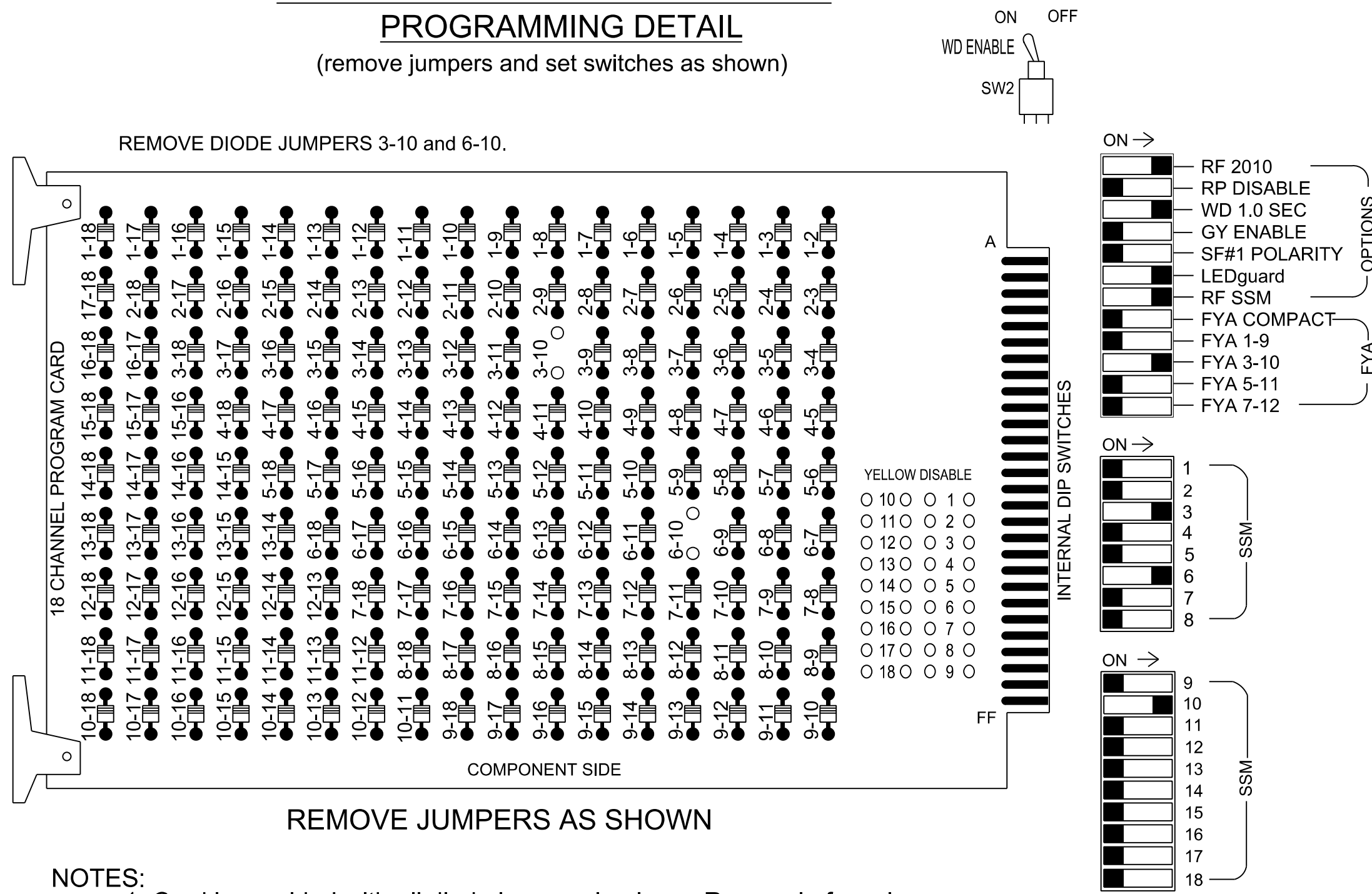
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ENGINEER
W. PORTER JONES

DocuSigned by
Porter Jones 8/28/2024
006E13E3A0E0498
SIGNATURE DATE
SIG. INVENTORY NO. 08-0487

18 CHANNEL IP CONFLICT MONITOR

PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

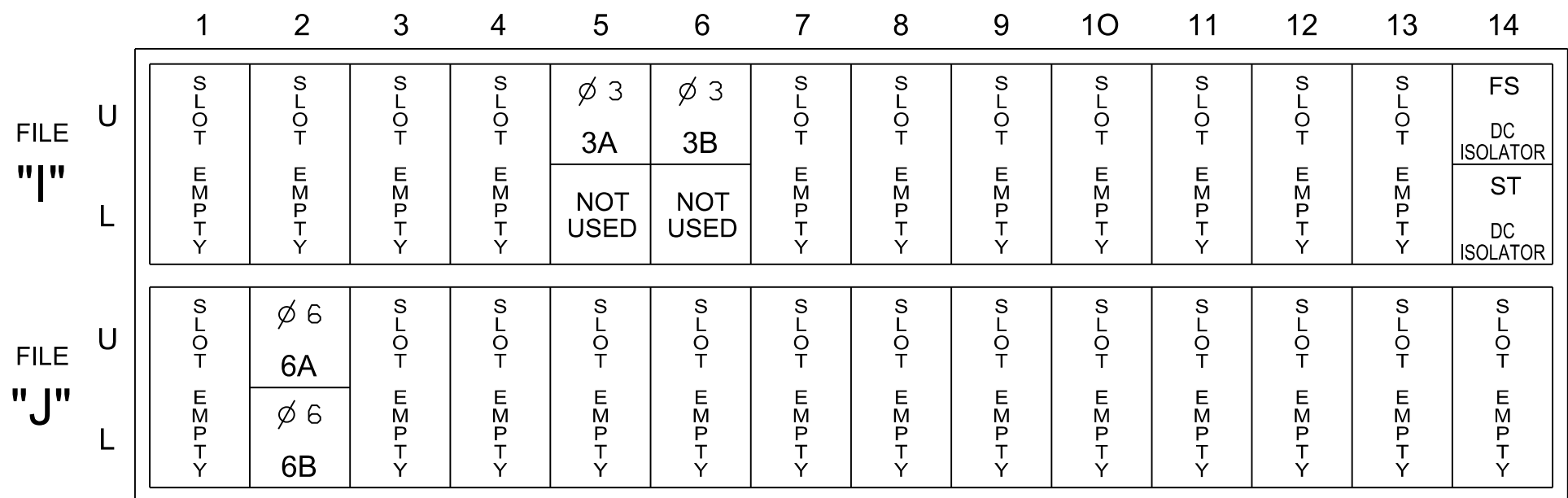


NOTES:

- 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.

INPUT FILE POSITION LAYOUT

(front view)



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 6 Green No Walk.
- Program startup sequence as follows:
From web Interface: Controller>Unit: set STARTUP CLEARANCE HOLD to 6 sec and ALL RED FLASH EXIT TIME to 6 seconds.
- Ensure all channels are programmed to flash red on the channel configuration screen. From web Interface: Controller>Advanced IO>Channels>Channel Configuration: program all channels to flash red.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

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.....S4, S8, AUX S2.
Phases Used.....3, 6
Overlap "1".....NOT USED
Overlap "2".....*
Overlap "3".....NOT USED
Overlap "4".....NOT USED

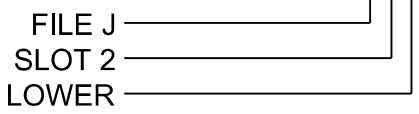
*See overlap programming detail on sheet 2.

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
3A	TB4-5,6	I5U	58	20	7	★	3	15.0		X	X	
3B	TB4-9,10	I6U	41	3	8	★	3	15.0		X	X	
6A	TB3-5,6	J2U	40	2	16	6				X	X	X
6B	TB3-7,8	J2L	44	6	17	6				X	X	

★For the detectors to work as shown on the signal plans, see the vehicle detector setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L



SEQUENCE DETAIL

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

Web Interface
Home >Controller >Sequence

Sequence 1

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



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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.	NU	NU	NU	31★	NU	NU	NU	61,62	NU	NU	NU	NU	NU	31★	NU	NU	NU	NU
RED								134										
YELLOW				*				135										
GREEN																		
RED ARROW														A124				
YELLOW ARROW														A125				
FLASHING YELLOW ARROW														A126				
GREEN ARROW				118				136										

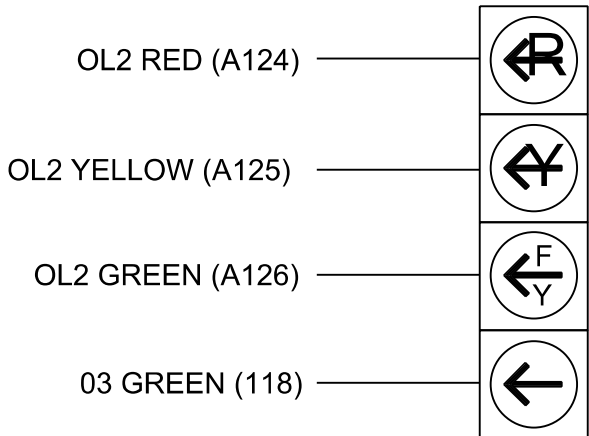
NU = Not Used

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

* See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

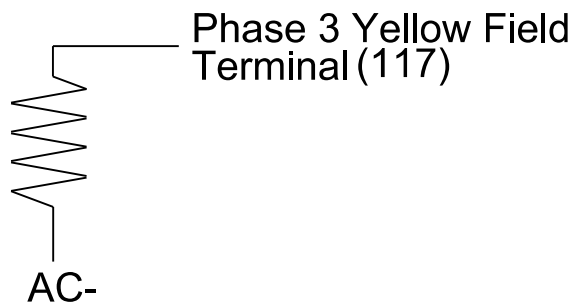


31

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES	
Value (ohms)	Wattage
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0487
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Electrical Detail-Sheet 1 of 2

Electrical and Programming
Details For:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

NC 211 Westbound
At
U-Turn South of
SR 1219 (Plank Rd)

Moore County

Aberdeen

Division 8

PLAN DATE: August 2024

REVIEWED BY: DT Sears

PREPARED BY: VS Kondapally

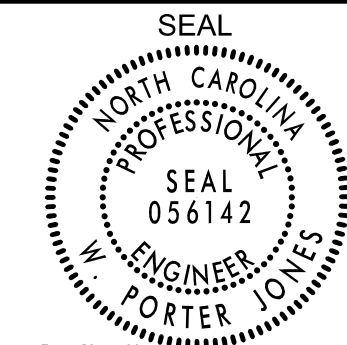
REVIEWED BY: W.P. Erickson-Jones

REVISIONS

INIT.

DATE

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SIGNATURES COMPLETED



DocuSigned by

Porter Jones

080813E3A0E0458

8/28/2024

DATE

SIG. INVENTORY NO.

08-0487

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2. A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

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

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

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 3A AND 3B

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Detector	Call Phase	Delay
7	3	0
8	3	0

3A
3B

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the Division and/or City Traffic Engineer.

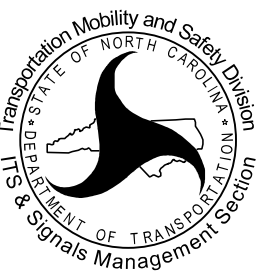
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0487
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Electrical Detail-Sheet 2 of 2

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

Electrical and Programming Details For:

Prepared for the Offices of:



50 N. Greenfield Pkwy, Garner, NC 27529

NC 211 Westbound
At
U-Turn South of
SR 1219 (Plank Rd)

Division 8 Moore County Aberdeen

PLAN DATE: August 2024	REVIEWED BY: DT Sears
------------------------	-----------------------

PREPARED BY: VS Kondapally	REVIEWED BY: W.P. Erickson-Jones
----------------------------	----------------------------------

REVISIONS	INIT.	DATE
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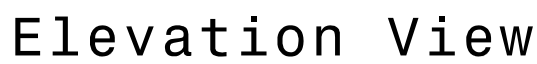
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Seal of the Professional Engineer, North Carolina. The seal is circular with a double-lined border. The outer ring contains the text "NORTH CAROLINA" at the top and "W. PORTER JONES" at the bottom. The inner ring contains the text "PROFESSIONAL" at the top and "ENGINEER" at the bottom. In the center, the text "SEAL" is at the top, "056142" is in the middle, and "W. PORTER JONES" is at the bottom.

Designed by:

8/28/2024

DATE 00 00 00



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

Elevation Differences for:		Pole 1
Baseline reference point at ① Foundation @ ground level		0.0 ft.
Elevation difference at High point of roadway surface		+0.8 ft.
Elevation difference at Edge of travelway or face of curb		+0.8 ft.



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

PROJECT REFERENCE NO.	SHEET NO.
R-5709C	Sig. 7.3

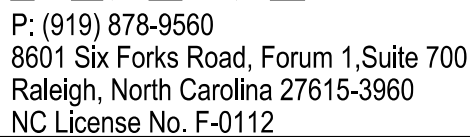
NOTES

DESIGN REFERENCE MATERIAL

- ## DESIGN REQUIREMENTS

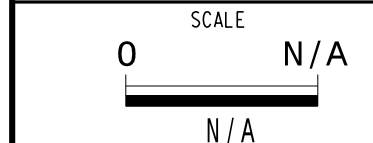
3. Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
3. Design all signal supports using stress ratios that do not exceed 0.9.
4. The camber design for the mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
5. A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements.
6. Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
7. The mast arm attachment height (H1) shown is based on the following design assumptions:
 - a. Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
 - b. Signal heads are rigidly mounted and vertically centered on the mast arm.
 - c. The roadway clearance height for design is as shown in the elevation views.
 - d. The top of the pole base plate is 0.75 feet above the ground elevation.
 - e. Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
8. The pole manufacturer will determine the total height (H2) of each pole using the greater of the following:
 - Mast arm attachment height (H1) plus 2 feet, or
 - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
9. If pole location adjustments are required, the contractor must gain approval from the Engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
10. The contractor is responsible for verifying that the mast arm length shown will allow proper positioning of the signal heads over the roadway.
11. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

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Division 8 Moore County Aberdeen

PLAN DATE: August 2024

PREPARED BY: VS Kondanalli

REVISIONS

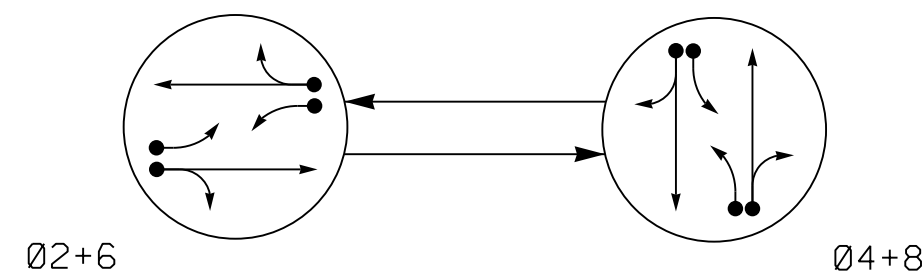
DATE _____

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PROFESSIONAL
SEAL
056142
ENGINEER
W. PORTER JONES

DocuSigned by:
Porter Jones
8/28/2024

SIG. INVENTORY NO. 08-0487

PHASING DIAGRAM



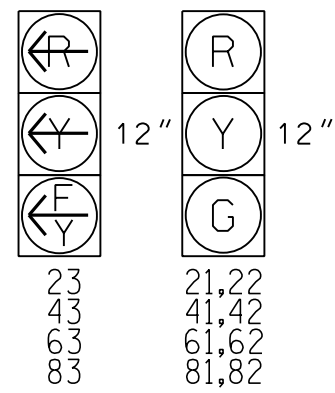
PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
21,22	G	R	R
23	F	R	R
41,42	R	G	R
43	R	F	R
61,62	G	R	R
63	F	R	R
81,82	R	G	R
83	R	F	R

SIGNAL FACE I.D.

All Heads L.E.D.



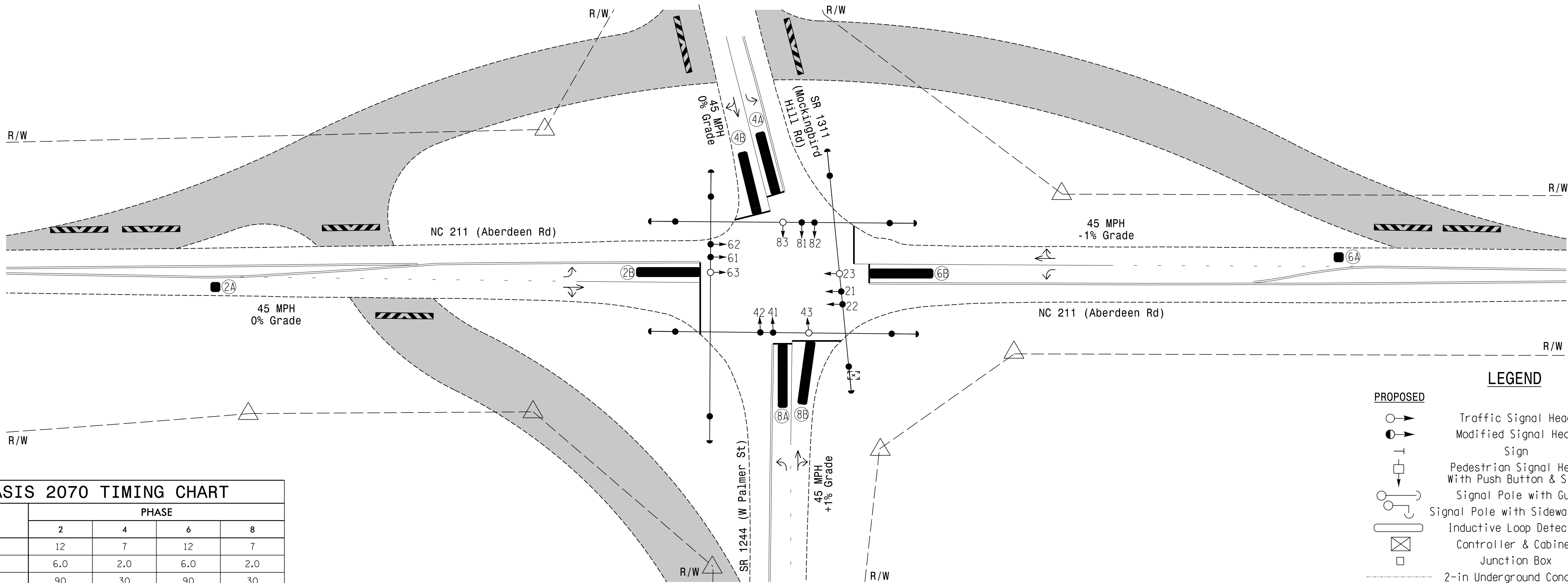
INDUCTIVE LOOPS					DETECTOR PROGRAMMING				
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME
2A*	6X6	300	*	*	2	Y	Y	-	-
2B*	6X40	0	*	*	2	Y	Y	Y	3
4A*	6X40	0	*	*	4	Y	Y	-	3
4B*	6X40	0	*	*	4	Y	Y	-	10
6A*	6X6	300	*	*	6	Y	Y	-	-
6B*	6X40	0	*	*	6	Y	Y	Y	3
8A*	6X40	0	*	*	8	Y	Y	-	3
8B*	6X40	0	*	*	8	Y	Y	-	10

* VIDEO DETECTION ZONE

2 Phase
Fully Actuated
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 41,42,81 and 82.
- 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.

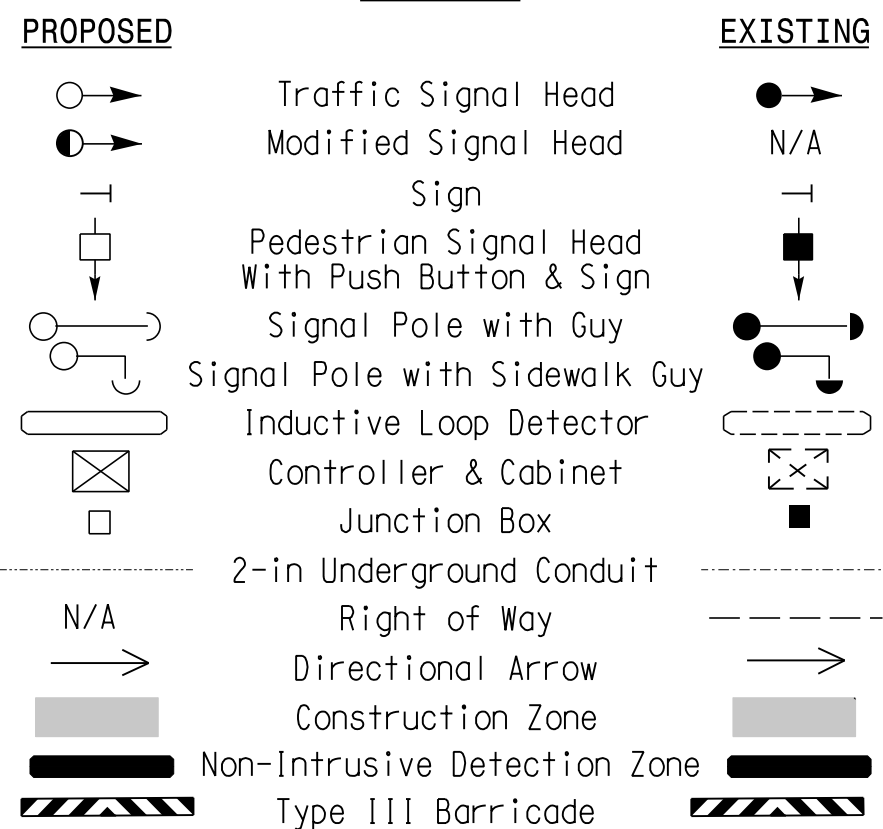


OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	2.0	6.0	2.0
Max Green 1 *	90	30	90	30
Yellow Clearance	4.6	4.5	4.6	4.5
Red Clearance	1.3	1.0	1.3	1.0
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	2.5	-	2.5	-
Max Variable Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

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

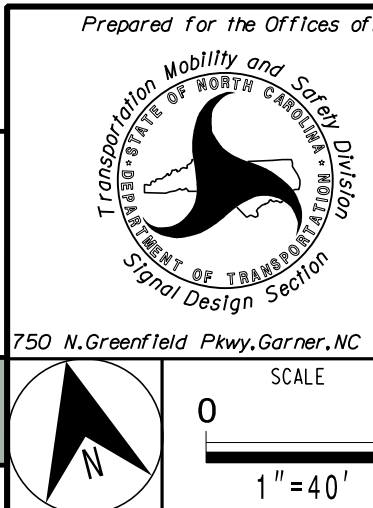
LEGEND



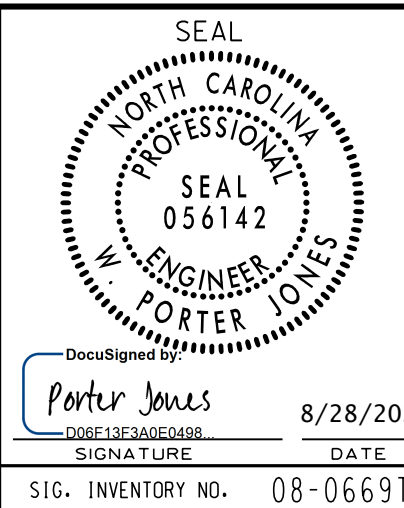
Signal Upgrade - Temporary Design (TMP Phase I Step 2)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

RK&K
P: (919) 878-9560
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NC 211 (Aberdeen Rd) at SR 1311 (Mockingbird Hill Rd) / SR 1244 (W Palmer St)	
Division 8 Hoke County Raeford	
PLAN DATE: August 2024	REVIEWED BY: WP Erickson-Jones
PREPARED BY: VS Kondapally	REVIEWED BY:
REVISIONS	INIT. DATE



DocuSigned by
Porter Jones
08/28/2024
8/28/2024
SIGNATURE DATE
SIG. INVENTORY NO. 08-0669T

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

```

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

```

← NOTICE GREEN FLASH

PRESS ' +

```

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

```

← NOTICE GREEN FLASH

PRESS ' +

```

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 12345678910111213141516
VEH OVL PARENTS: X
VEH OVL NOT VEH:
VEH OVL NOT PED:
VEH OVL GRN EXT:
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...N
GREEN EXTENSION (0-255 SEC).....0
YELLOW CLEAR (0=PARENT, 3-25.5 SEC)...0.0
RED CLEAR (0=PARENT, 0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)....0

```

← NOTICE GREEN FLASH

PRESS ' +

```

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

```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0669T
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

Signal Upgrade-Temporary Design
(TMP Phase I Step 2)-Electrical Detail-Sheet 2 of 2

Electrical and Programming
Details For:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

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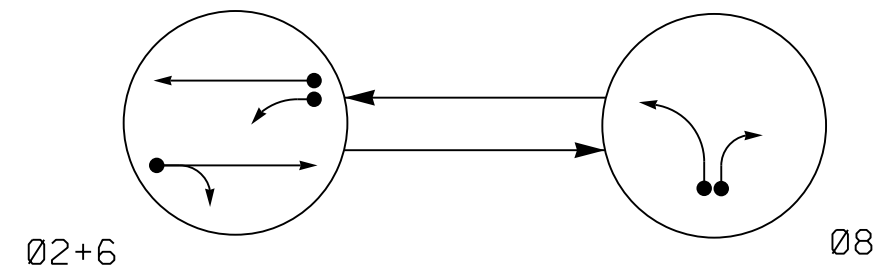
NC 211 (Aberdeen Rd)
at
SR 1311 (Mockingbird Hill Rd)/
SR 1244 (W Palmer St)
Raeford
Hoke County

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

A circular professional engineer seal for the State of North Carolina. The outer ring contains the text "NORTH CAROLINA" at the top and "W. PORTER JONES" at the bottom. Inside this ring, the word "SEAL" is at the top, "PROFESSIONAL" is on the left, and "ENGINEER" is on the right. In the center, the word "SEAL" is above the number "056142". The seal is surrounded by a decorative border of small dots.

Porter Jones 8/28/2024
D08F13F3A0E0498
DATE
SIG. INVENTORY NO. 08-0669T

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

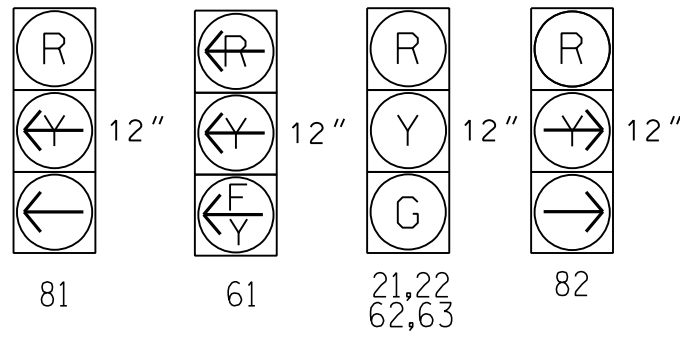
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø8	FLASH
21,22	G	R	R
61	F	R	R
62,63	G	R	R
81	R	←	R
82	R	→	R

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

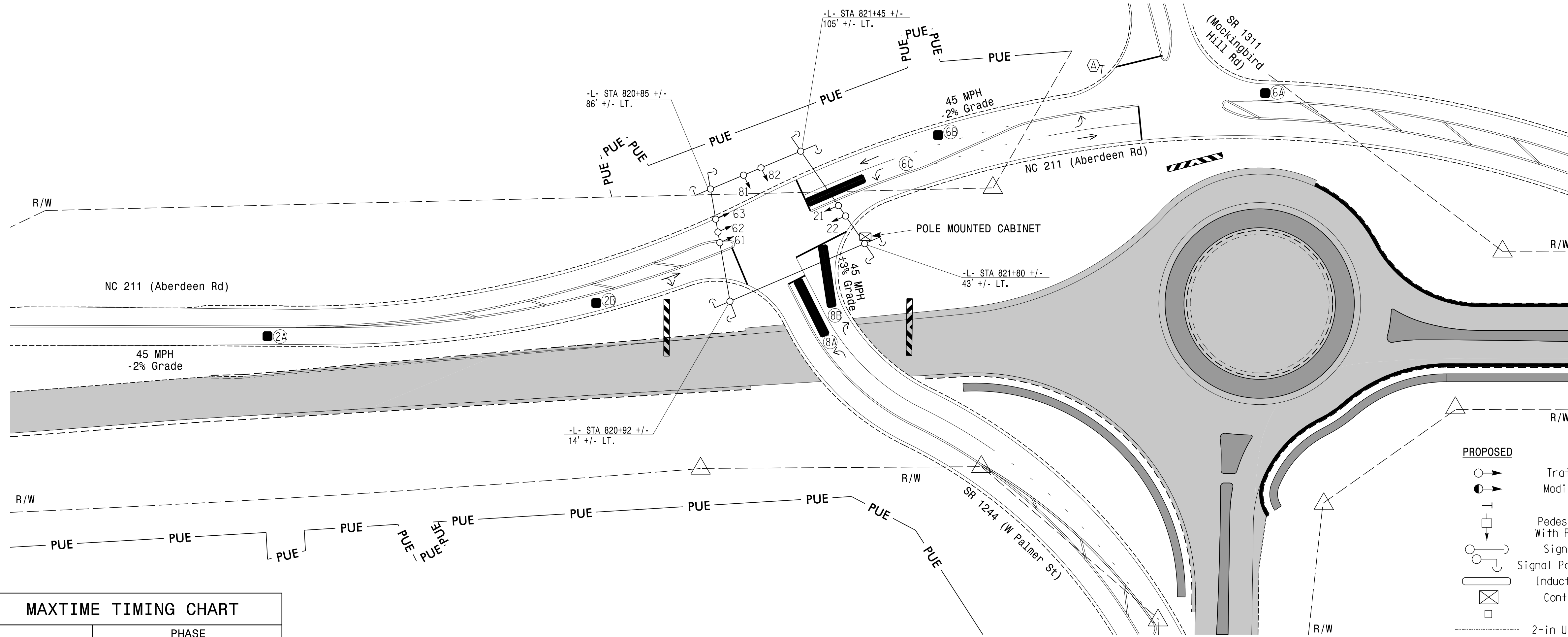
DETECTOR					PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A*	6X6	300	*	*	2	-	1.6	X	-	X	-
2B*	6X6	90	*	*	2	-	-	X	-	X	-
6A*	6X6	300	*	*	6	-	1.6	X	-	X	-
6B*	6X6	90	*	*	6	-	-	X	-	X	-
6C*	6X40	0	*	*	6	-	-	X	-	X	-
8A*	6X40	0	*	*	8	3.0	-	X	-	X	-
8B*	6X40	0	*	*	8	15.0	-	X	-	X	-

* VIDEO DETECTION ZONE

2 Phase
Fully Actuated
(Isolated)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- 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.



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 |
| Construction Zone | N/A |
| Non-Intrusive Detection Zone | N/A |
| Type III Barricade | N/A |
| "STOP" Sign (R1-1) | N/A |
| PUE - Permanent Utility Easement | PUE |

MAXTIME TIMING CHART

FEATURE	PHASE		
	2	6	8
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	12	12	7
Passage *	2.0	2.0	2.0
Max I *	90	90	30
Yellow Change	4.7	4.7	3.0
Red Clear	1.2	1.2	1.9
Added Initial *	-	-	-
Maximum Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Advance Walk	-	-	-
Non Lock Detector	-	-	X
Vehicle Recall	MIN RECALL	MIN RECALL	-
Dual Entry	-	-	-

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

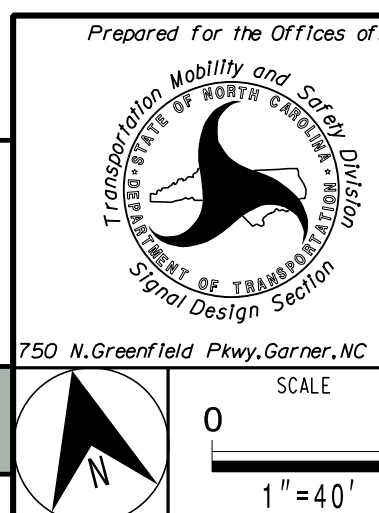
New Installation - Temporary Signal (TMP Phase I Step 3)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

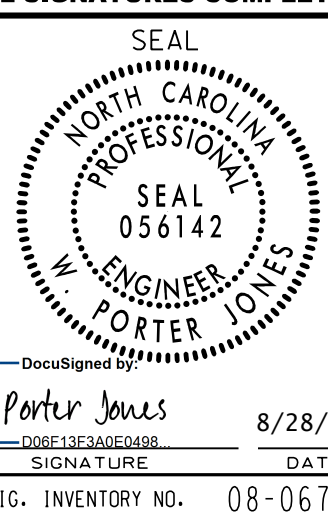
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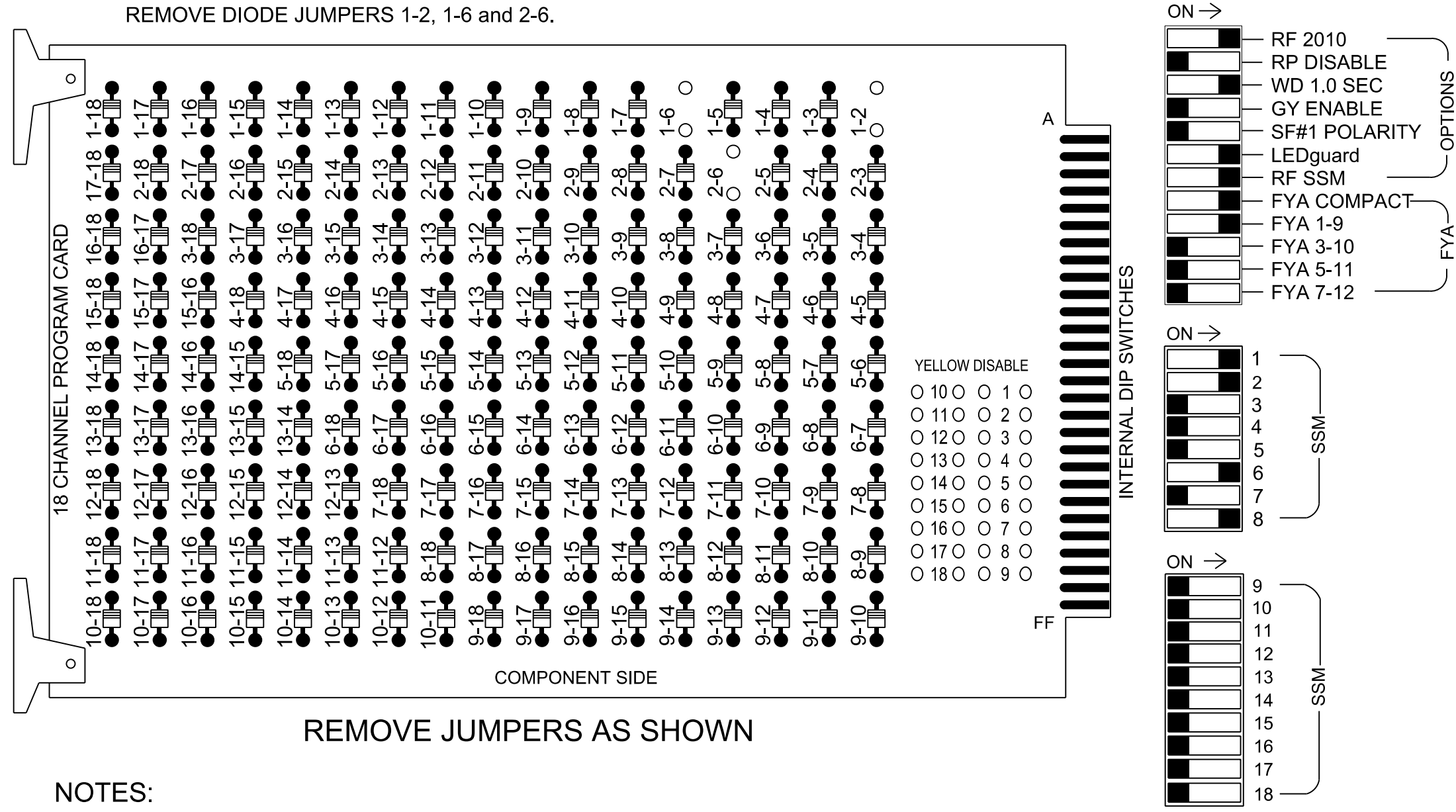
NC 211 (Aberdeen Rd) at SR 1244 (W Palmer St)	
Division 8	Hoke County
PLAN DATE: August 2024	REVIEWED BY: WP Erickson-Jones
PREPARED BY: VS Kondapally	REVIEWED BY:
REVISIONS	INIT. DATE



Porter Jones
8/28/2024
DATE
SIGNATURE
SIC. INVENTORY NO. 08-06701

18 CHANNEL IP CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

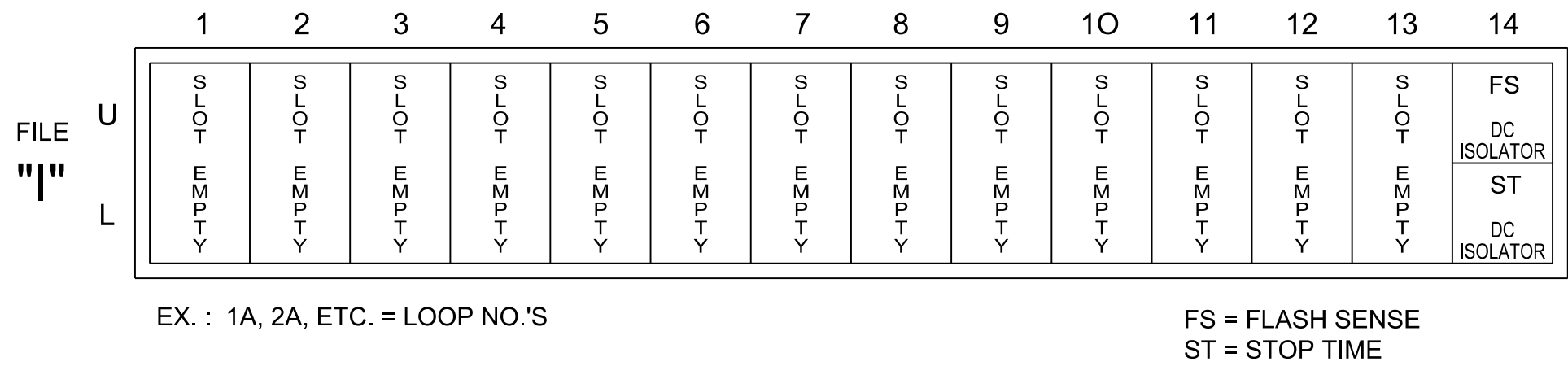


NOTES:

- 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.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

INPUT FILE POSITION LAYOUT

(front view)



MAXTIME OVERLAP PROGRAMMING DETAIL

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

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

SPECIAL DETECTOR NOTE

Install a video detection system for vehicle detection for zones 2A, 2B, 6A, 6B, 6C, 8A and 8B. Perform installation according to manufacturer's directions and NCDOT engineer -approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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.
- Program startup sequence as follows:
From web Interface: Controller>Unit: set STARTUP CLEARANCE HOLD to 6 sec and ALL RED FLASH EXIT TIME to 6 seconds.
- Ensure all channels are programmed to flash red on the channel configuration screen. From web Interface: Controller>Advanced IO>Channels>Channel Configuration: program all channels to flash red.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....336
Software.....Q-Free MAXTIME
Cabinet Mount.....Pole
Output File Positions.....12
Load Switches Used.....S1, S2, S8, S11
Phases Used.....2, 6, 8
Overlap "1".....*
Overlap "2".....NOT USED
Overlap "3".....NOT USED
Overlap "4".....NOT USED

*See overlap programming detail on this sheet.

OUTPUT CHANNEL CONFIGURATION

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	Overlap	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
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16

SIGNAL HEAD HOOK-UP CHART

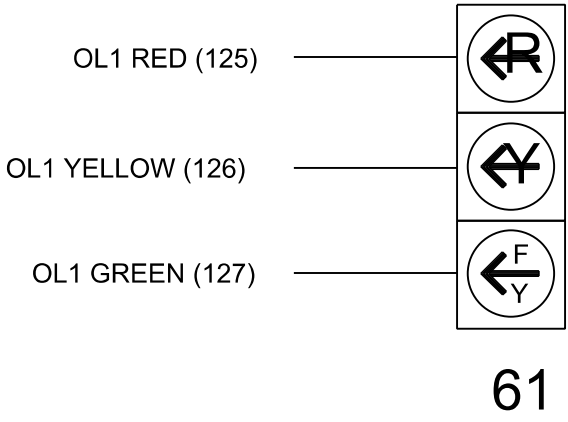
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16
PHASE	OL1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	NU	NU	NU	NU	62,63	NU	NU	81,82	NU
RED		128						134			107	
YELLOW		129						135				
GREEN		130						136				
RED ARROW	125											
YELLOW ARROW	126										108	
FLASHING YELLOW ARROW	127											
GREEN ARROW												109

NU = Not Used

★See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

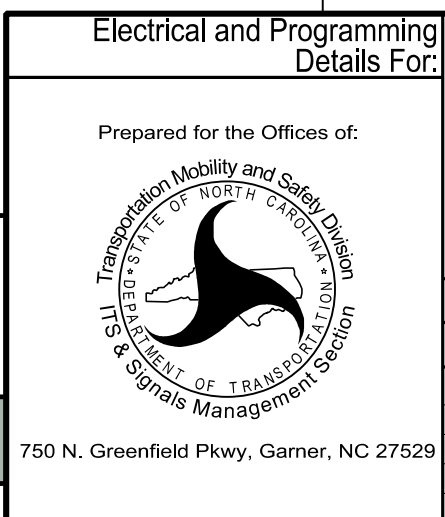
(wire signal heads as shown)



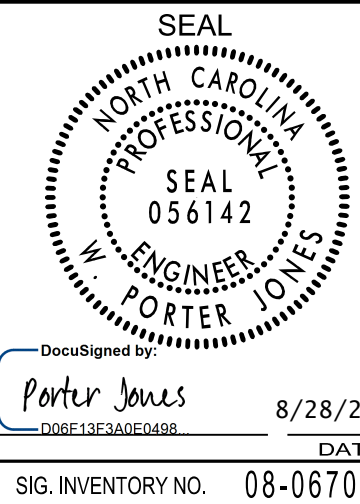
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 08-0670T
DESIGNED: August 2024
SEALED: August 28, 2024
REVISED: N/A

New Installation-Temporary Design
(TMP Phase I Step 3)-Electrical Detail

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



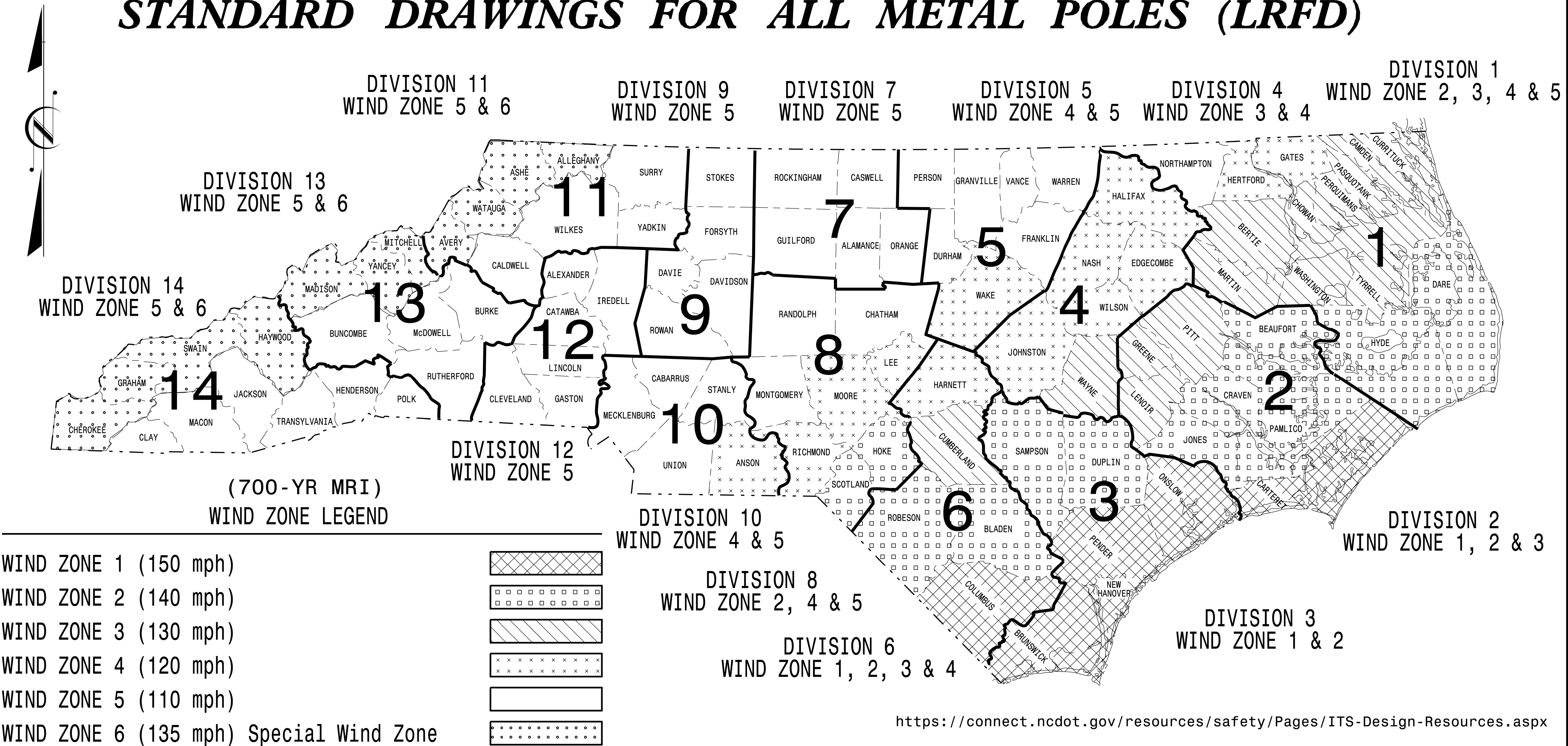
NC 211 (Aberdeen Rd) at SR 1244 (W Palmer St)		Raeford	
Division 8	Hoke County	Reviewed By: DT Sears	
PLAN DATE: August 2024	REVIEWED BY: VS Kondapally	REVIEWED BY: W.P. Erickson-Jones	
REVISIONS	INIT.	DATE	



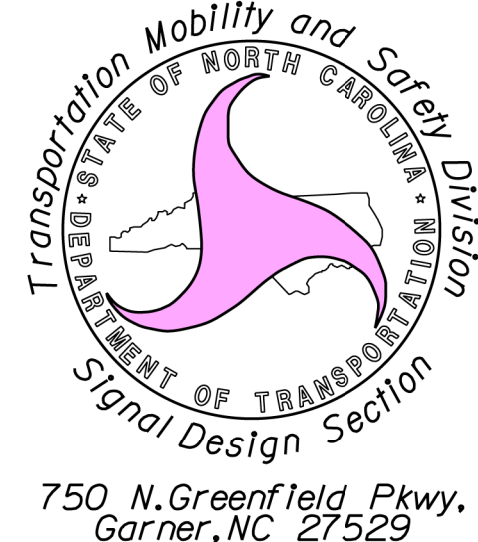
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT I.D.NO.	SHEET NO.
R-5709C	Sig.M1A

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



Prepared In the Offices of:



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	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

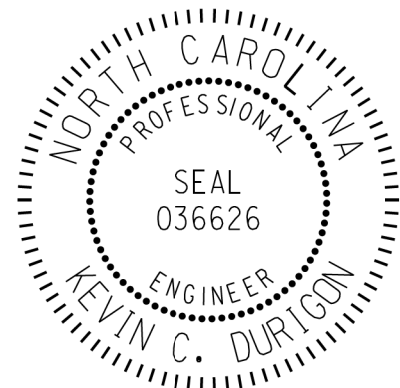
MOBILITY AND SAFETY DIVISION -
TRANSPORTATION SYSTEMS MANAGEMENT
AND OPERATIONS UNIT

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:

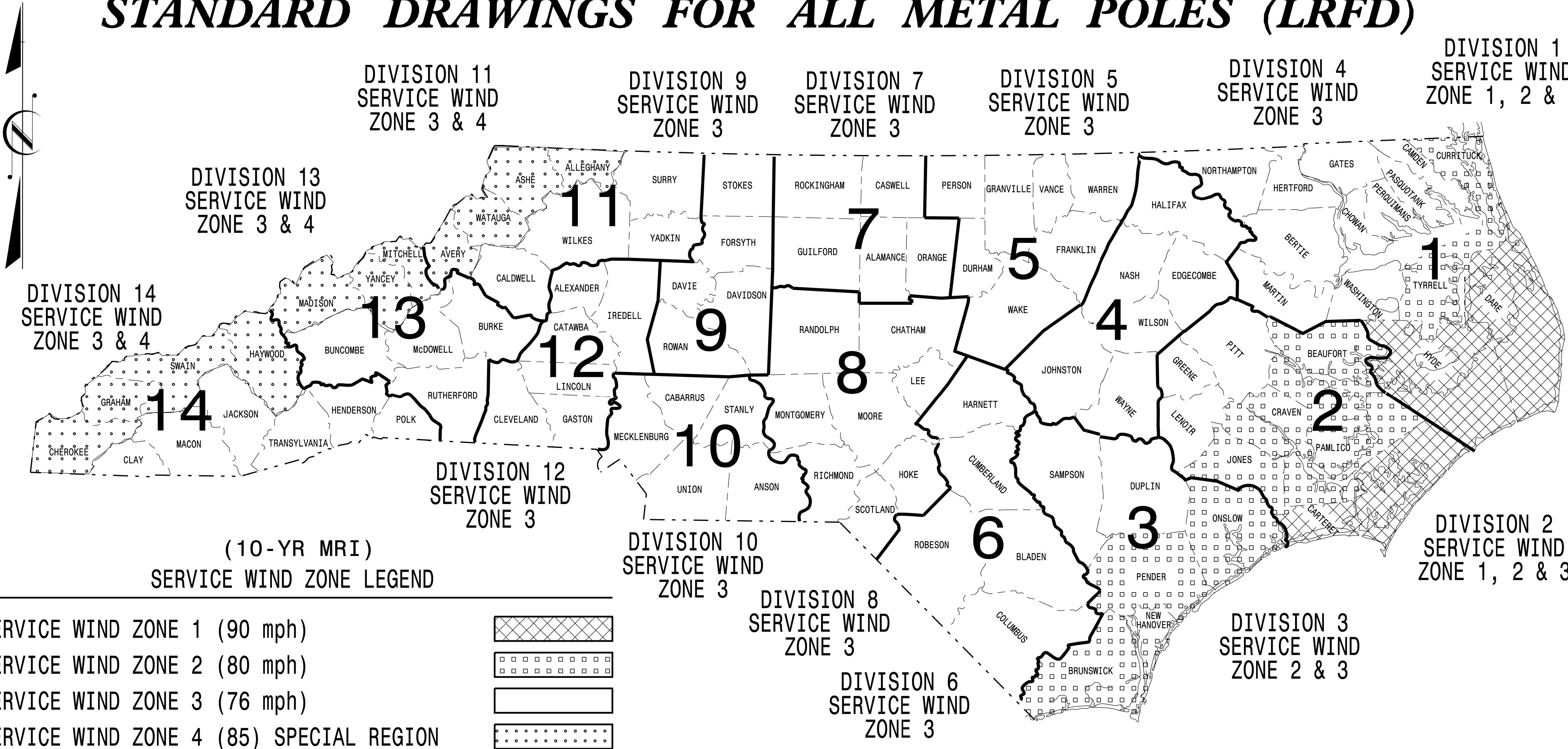
Kevin Durigon
SIGNATURE
4B23DC79B3784DA

09/21/2023
DATE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

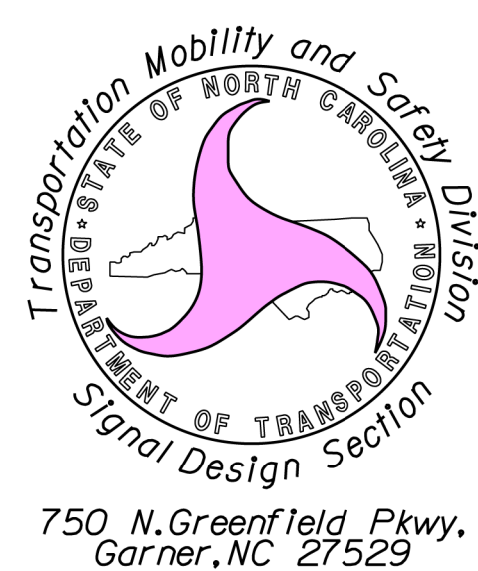
PROJECT I.D. NO.	SHEET NO.
R-5709C	Sig.M1B

STANDARD DRAWINGS FOR ALL METAL POLES (LRFD)



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

Prepared In the Offices of:



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

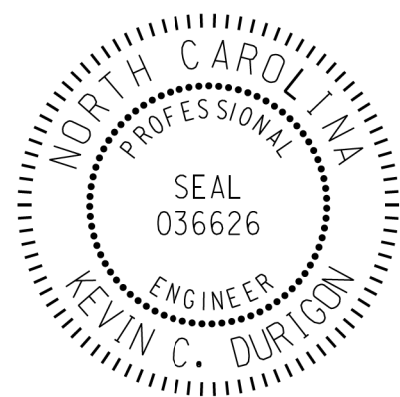
INDEX OF PLANS
DESCRIPTION

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
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Sig. M 9	Typical Fabrication Details-CCTV Camera Poles

NCDOT CONTACTS:
MOBILITY AND SAFETY DIVISION -
TRANSPORTATION SYSTEMS MANAGEMENT
AND OPERATIONS UNIT

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

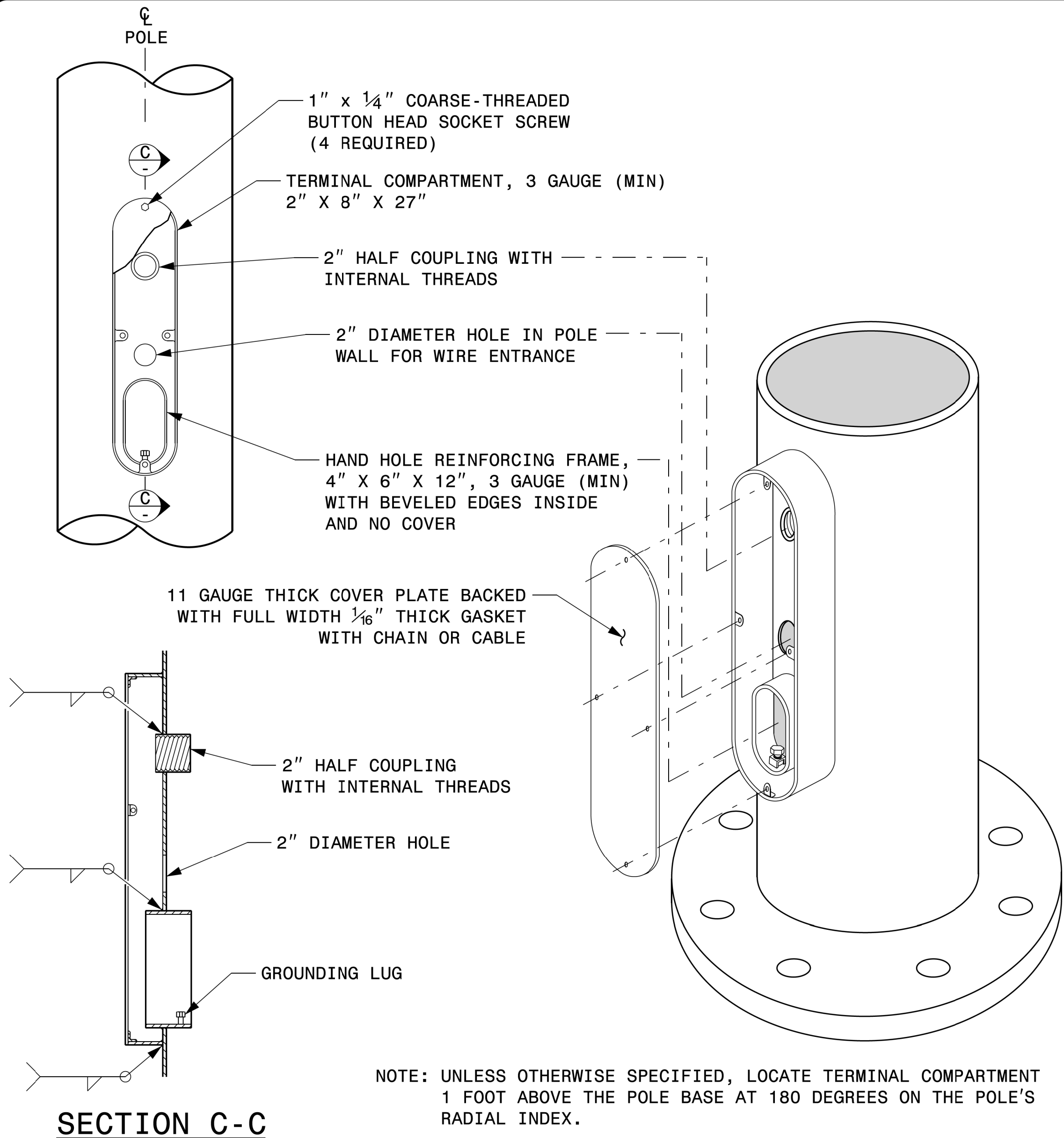
SEAL



DocuSigned by:

Kevin Durigon
SIGNATURE
4B23DC70B3784DA

09/21/2023
DATE



SECTION C-C

TERMINAL COMPARTMENT DETAIL

MFG _____	MFG. DATE: MM/YY _____
SHAFT D/T/L/Y _____	
ARM-A D/T/L/Y _____	
ARM-B D/T/L/Y _____	
A.B. DIA./B.C./L/Y _____	
NCDOT SIG. INV. NO. _____	
NCDOT POLE NO. _____	

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

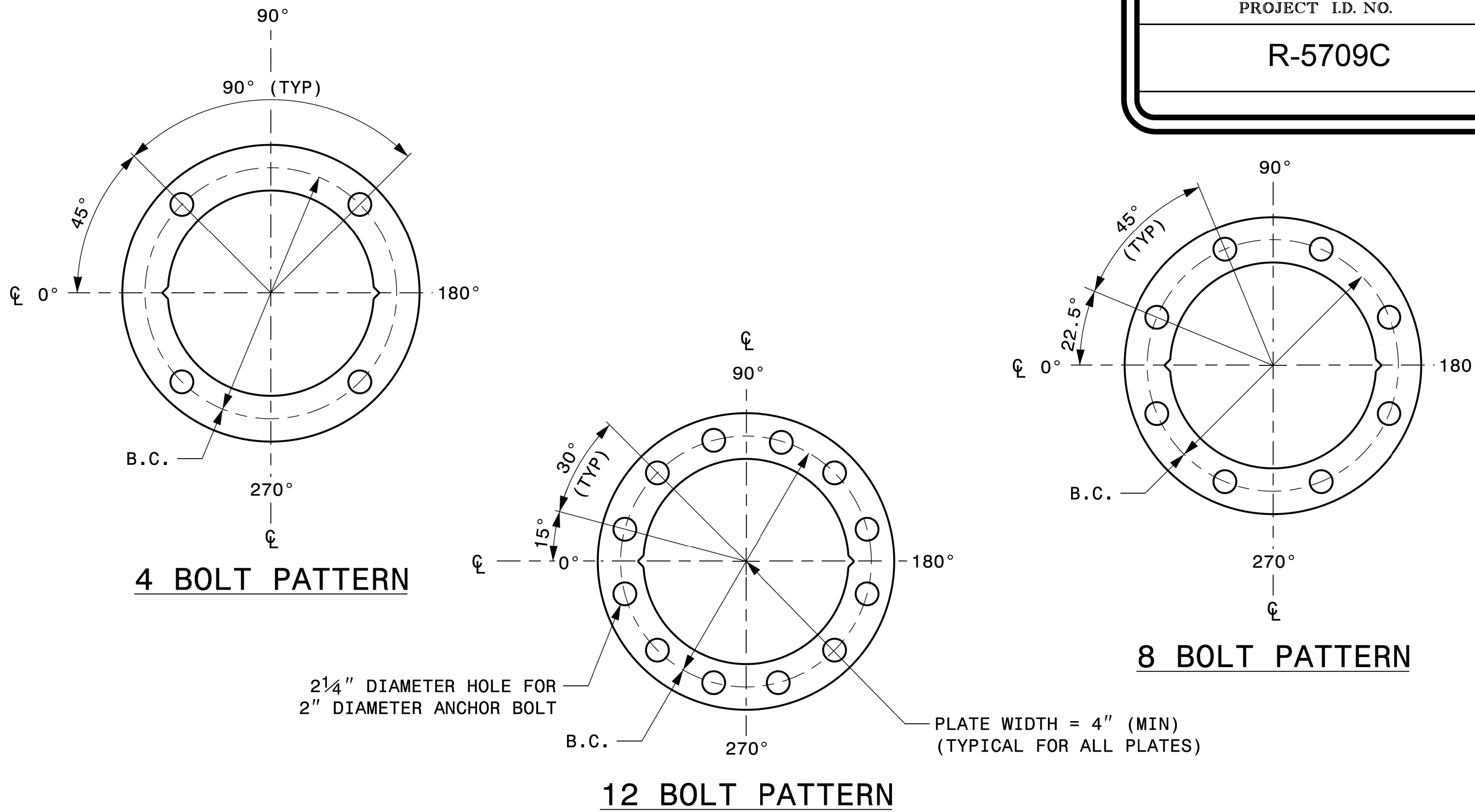
MFG _____	MFG. DATE: MM/YY _____
SECTION D/T/L/Y _____	
NCDOT SIG. INV. NO. _____	
NCDOT POLE NO. _____	

ARM I.D. TAG
(PROVIDE ON EACH SECTION OF
A MULTI-SECTION MAST ARM)

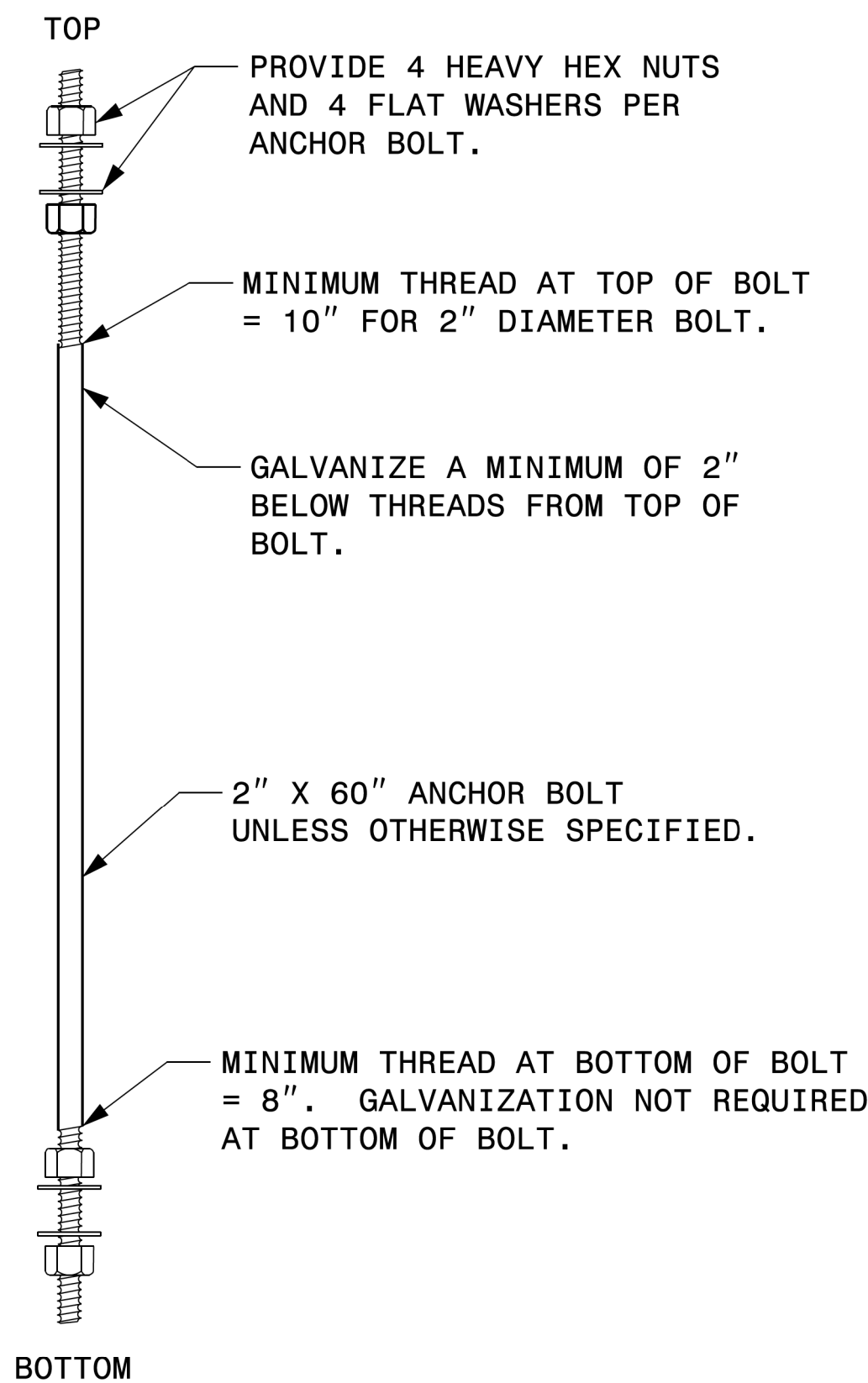
NOTES:

- 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.

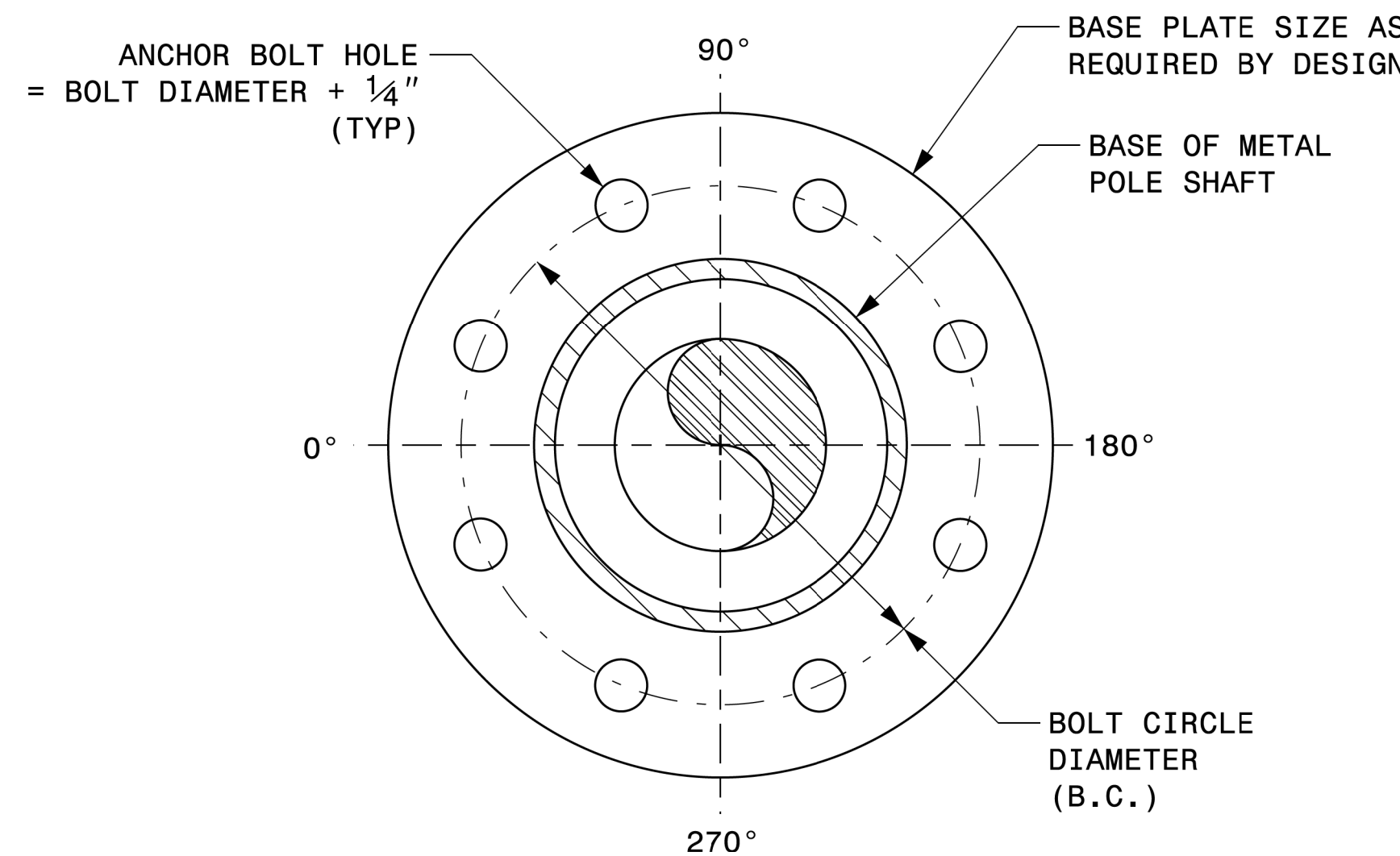
IDENTIFICATION TAG DETAILS



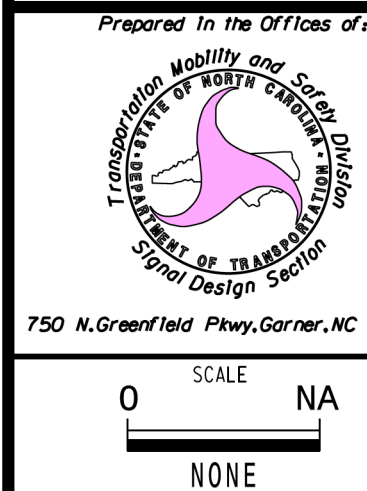
CONSTRUCT TEMPLATES AND PLATES FROM 1/4" (MIN) THICK STEEL. GALVANIZING IS NOT REQUIRED.
BASE PLATE TEMPLATE AND ANCHOR BOLT LOCK PLATE DETAILS



ANCHOR BOLT DETAIL

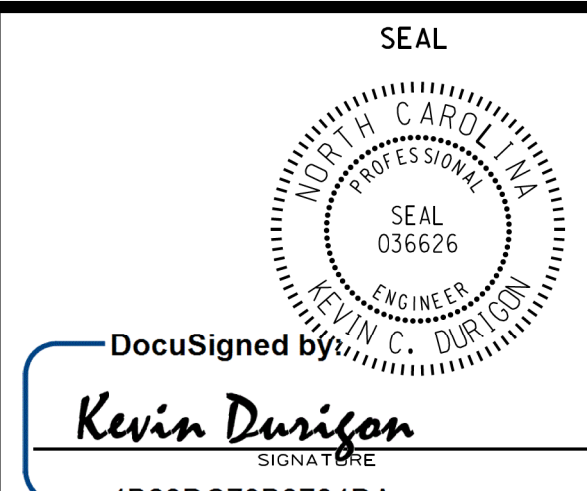


TYPICAL BASE PLATE DETAIL



Typical Fabrication Details
For
All Metal Poles

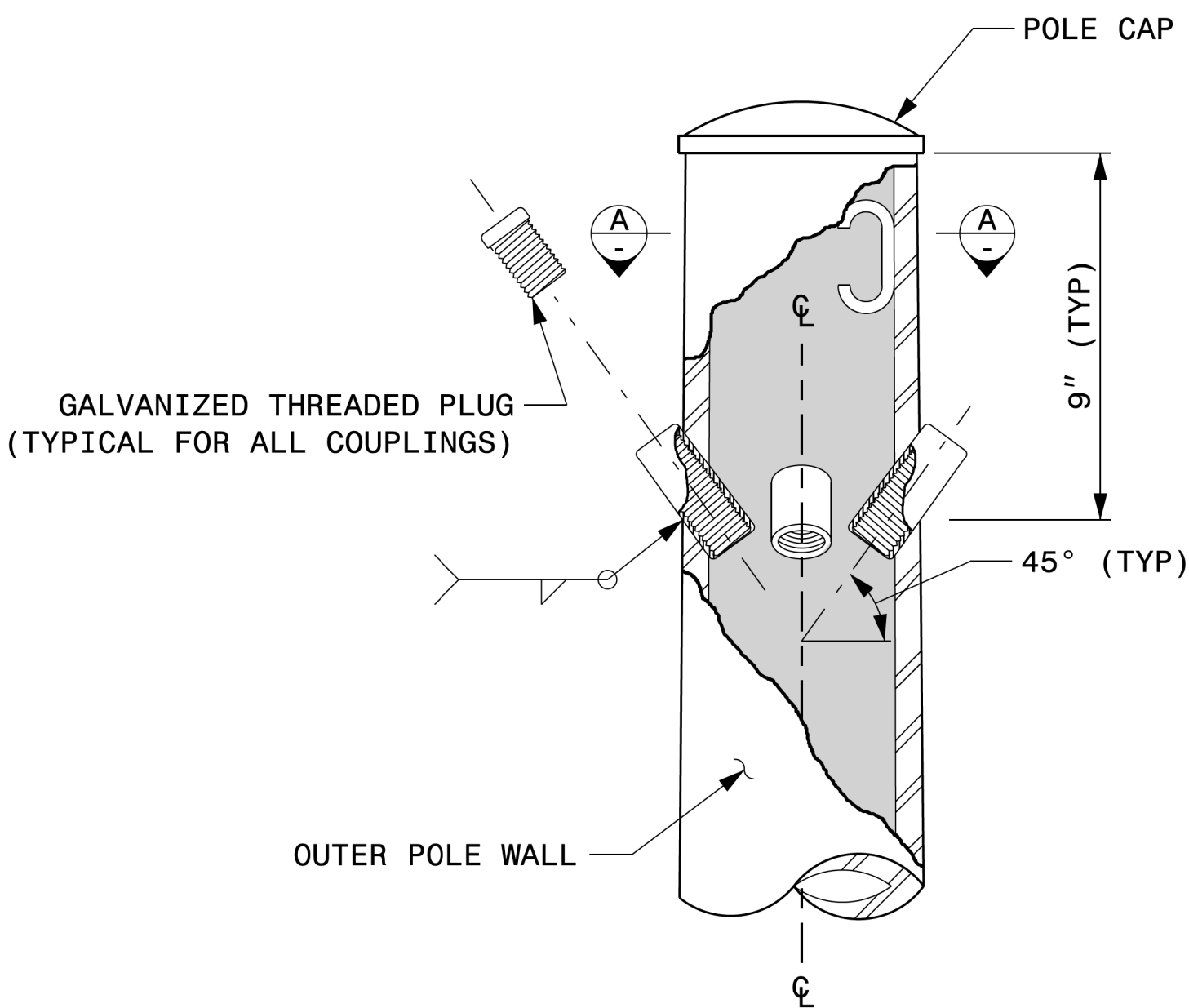
PLAN DATE: SEPTEMBER 2023	DESIGNED BY: C.F. ANDREWS
PREPARED BY: K.C. DURIGON	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE



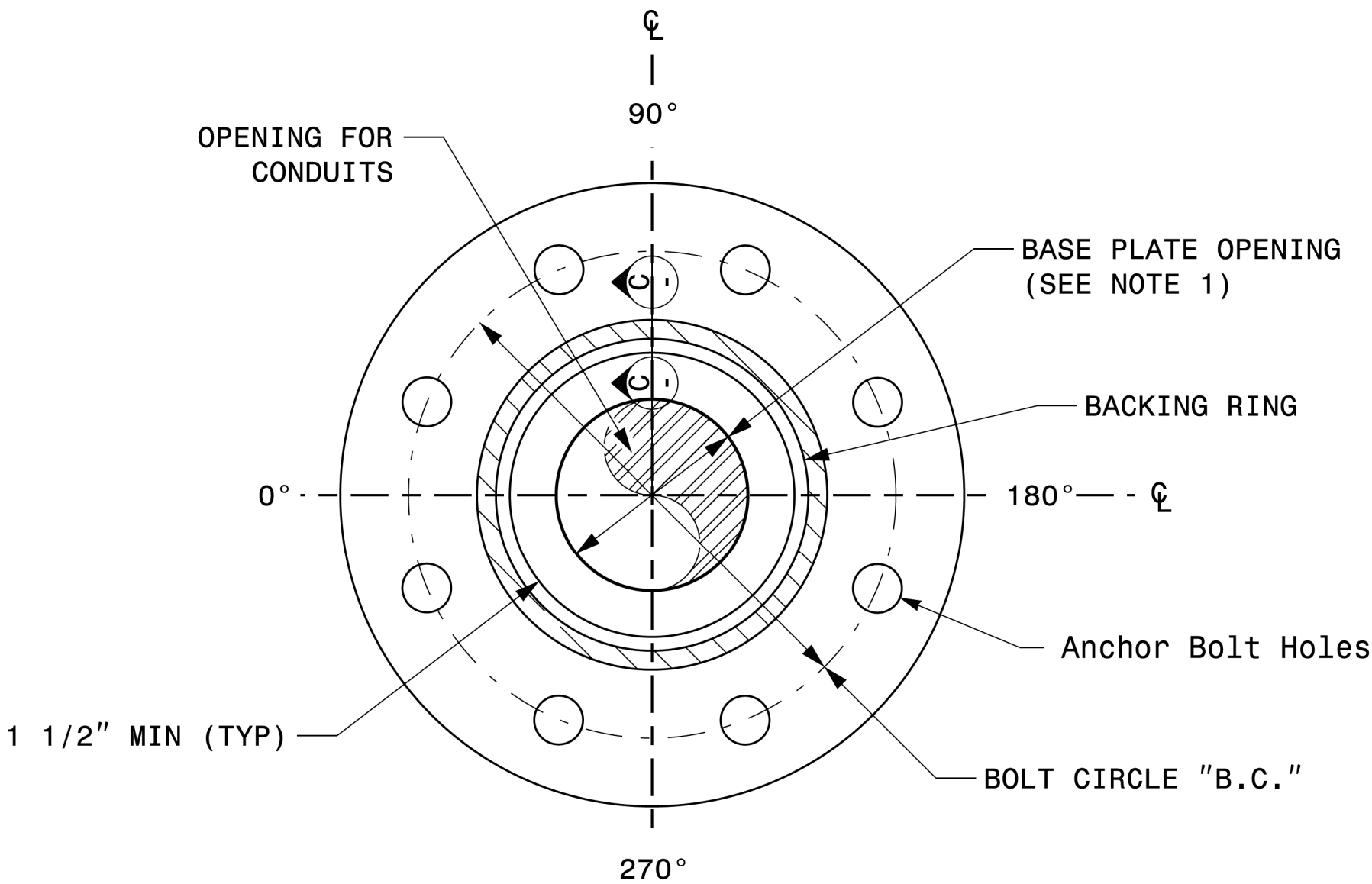
DocuSigned by
Kevin Durigon

09/21/2023
DATE

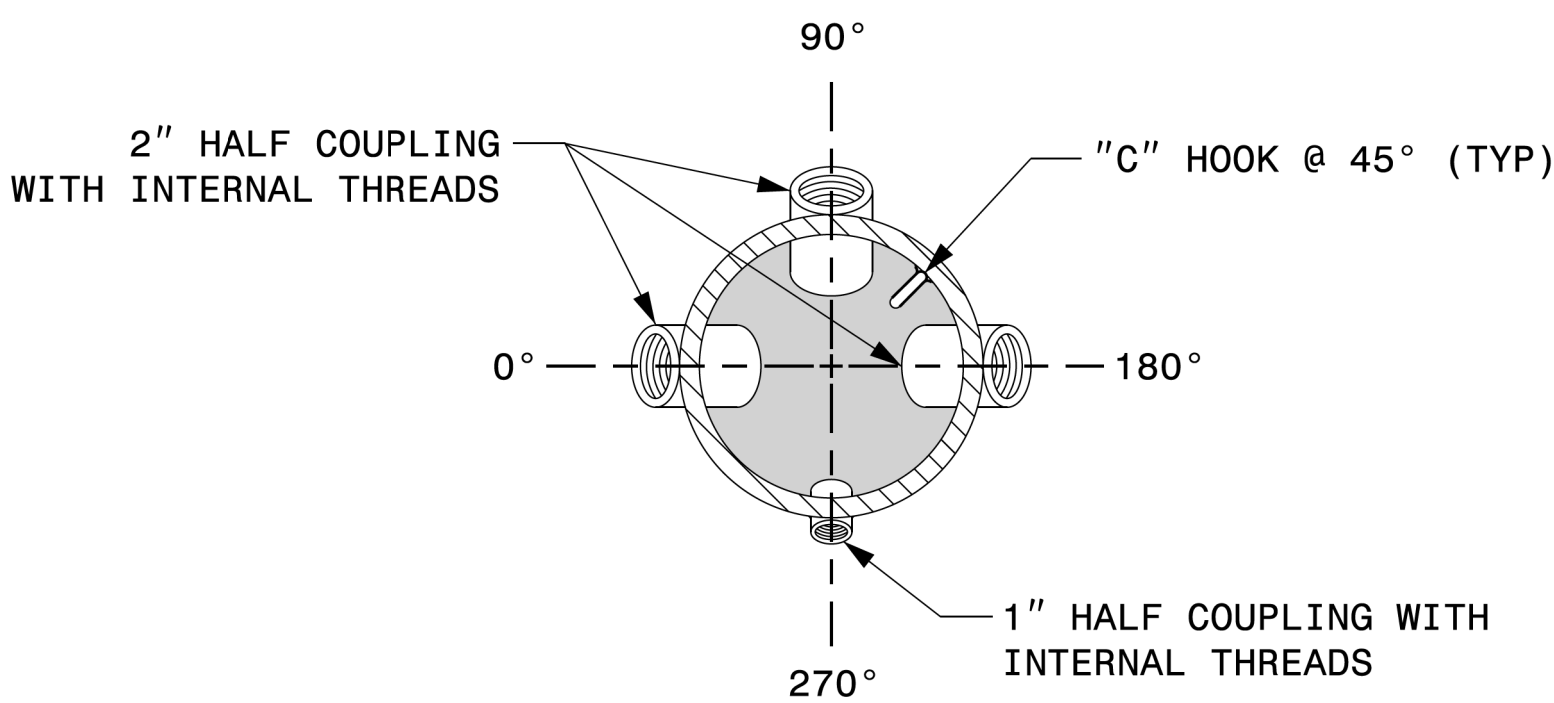
NOTE:
1. OPENING IN POLE BASE PLATE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS 3 1/2" BUT SHALL NOT BE LESS THAN 8 1/2".



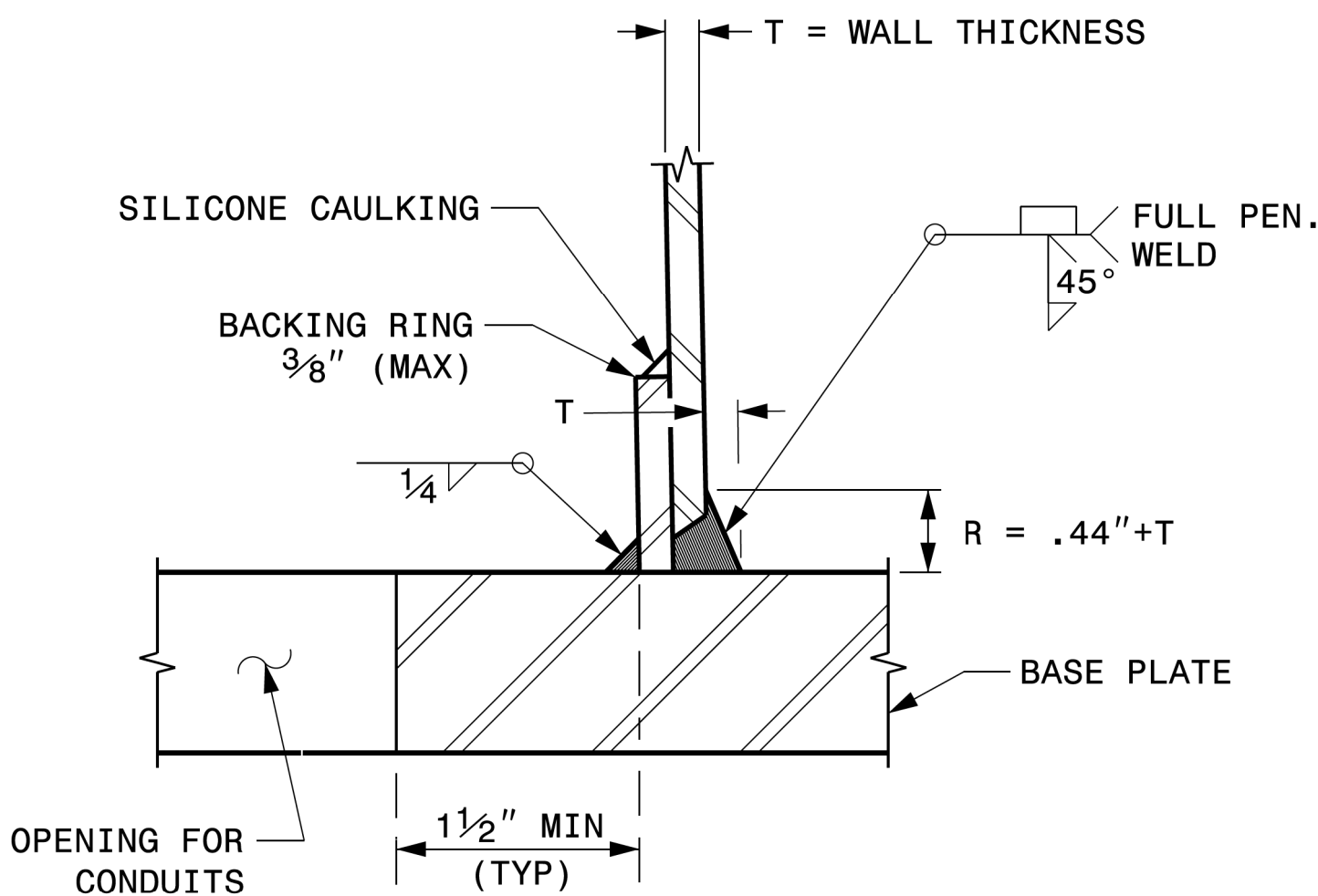
CABLE ENTRANCES AT TOP OF POLE



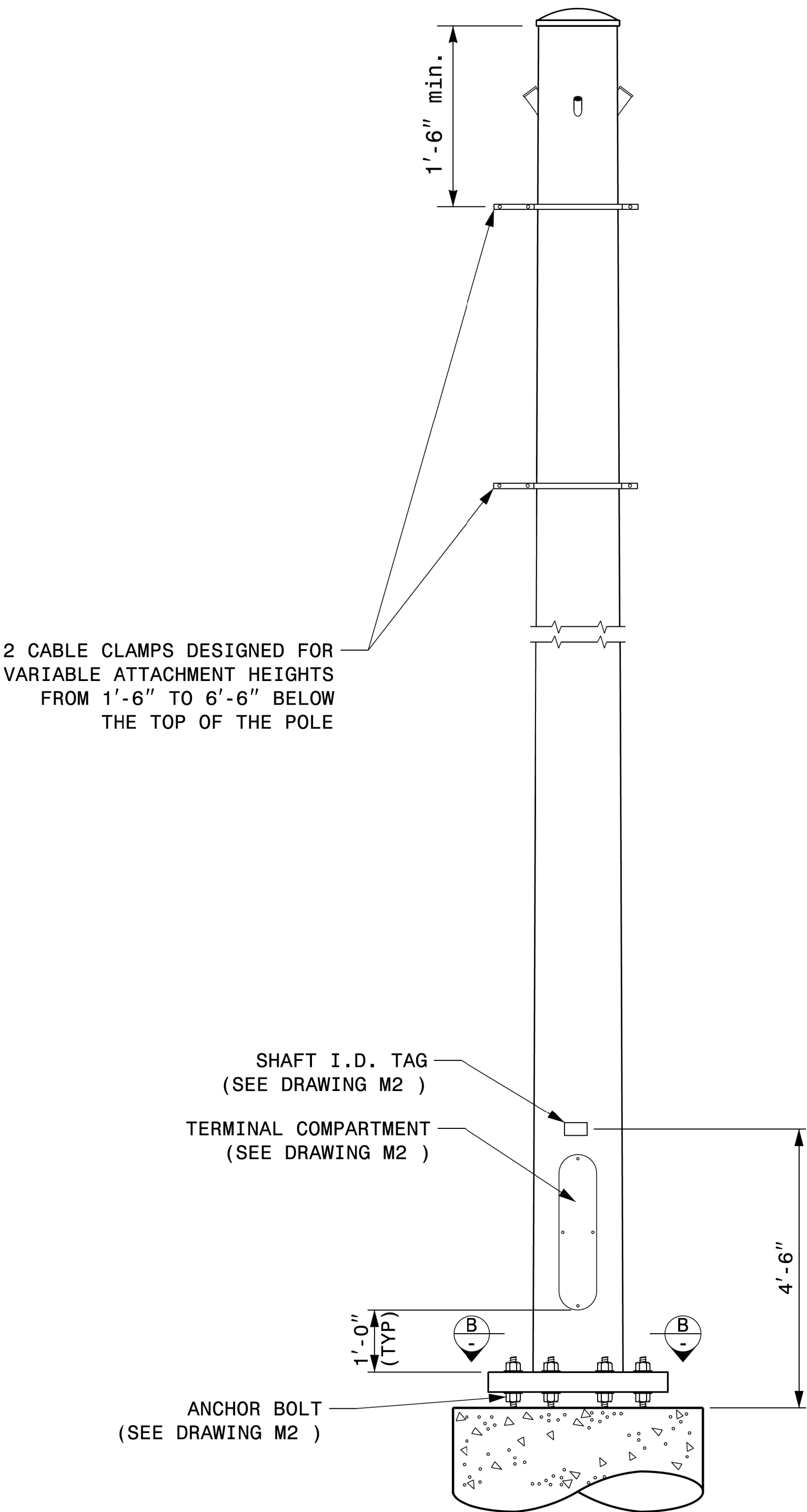
SECTION B-B
POLE BASE PLATE DETAILS
(8 AND 12 BOLT PATTERN)



RADIAL ORIENTATION OF FACTORY INSTALLED
ACCESSORIES AT TOP OF POLE



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

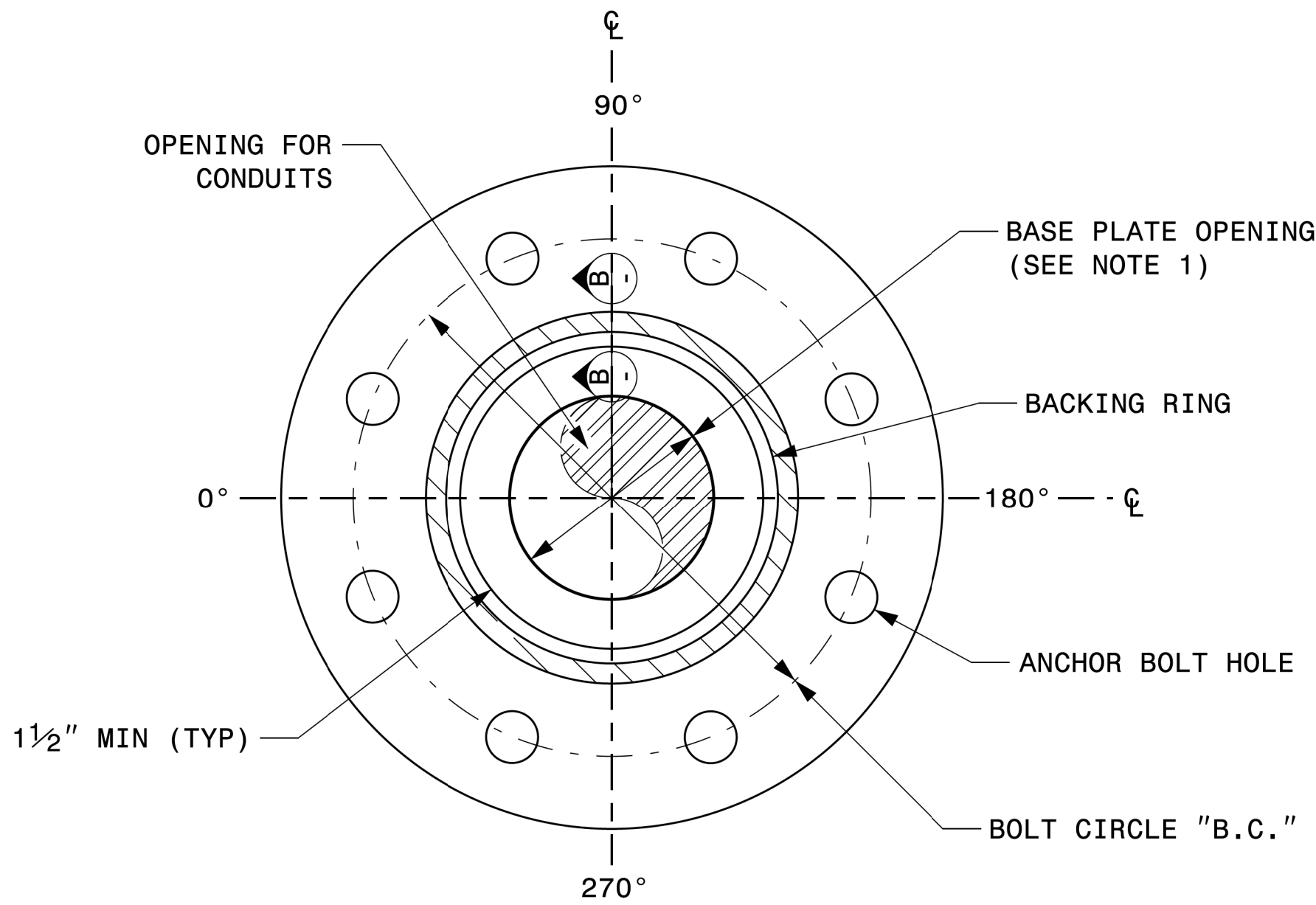


MONOTUBE STRAIN POLE

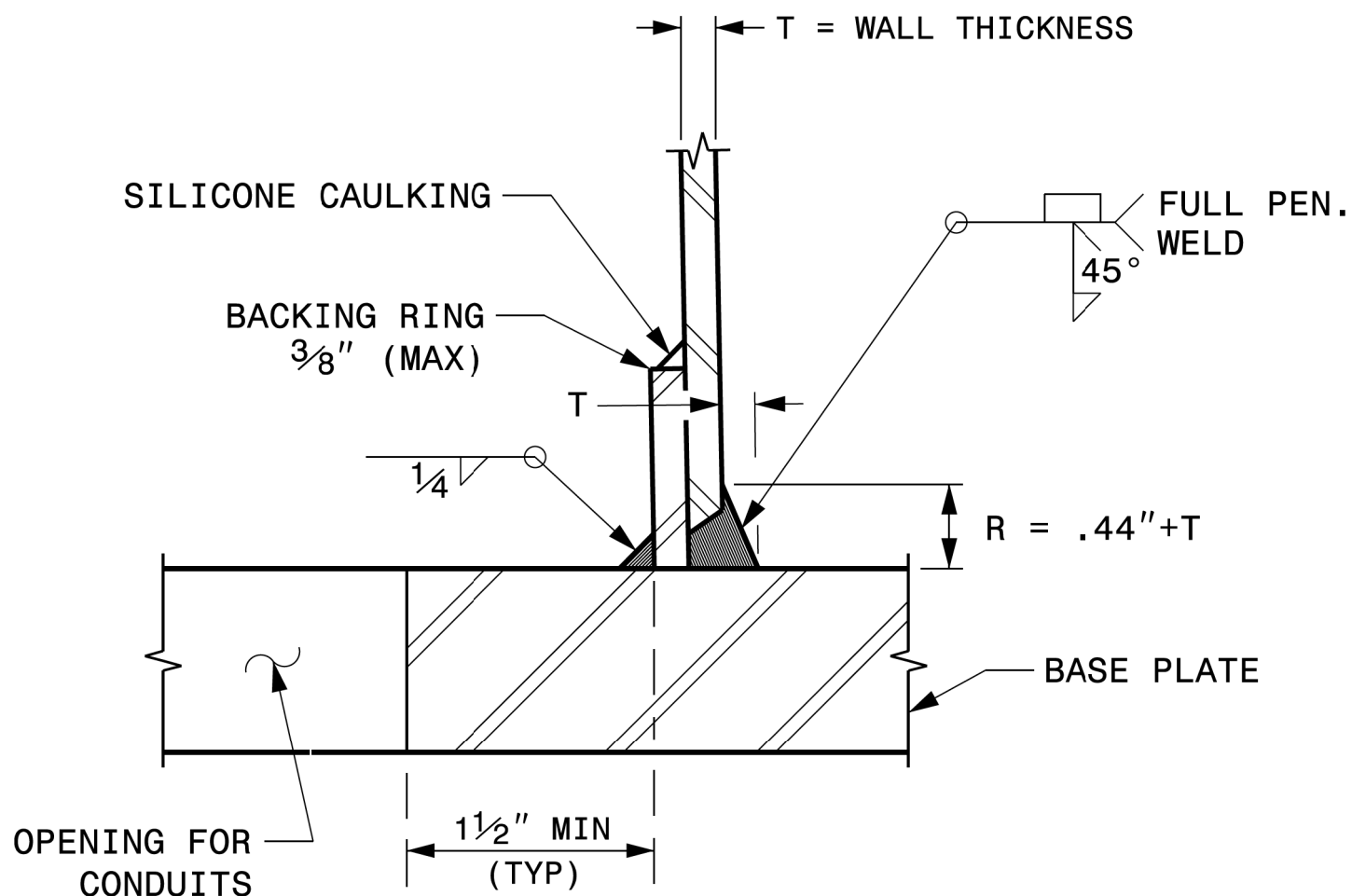
	Typical Fabrication Details For Strain Poles		
	PLAN DATE: SEPTEMBER 2023 DESIGNED BY: K.C. DURIGON PREPARED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR INIT. DATE	

NOTE:

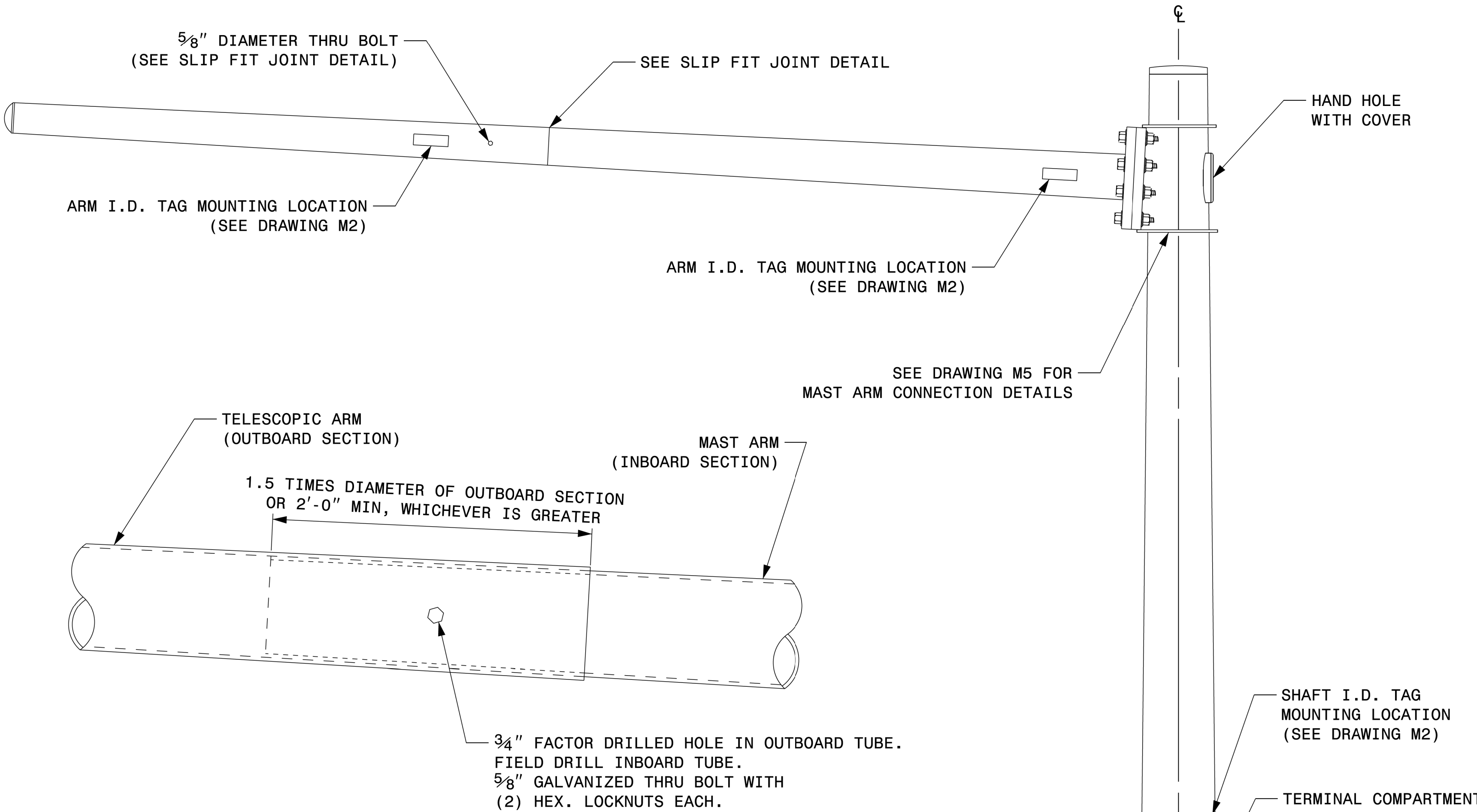
1. OPENING IN POLE BASE PLATE SHALL BE EQUAL TO POLE BASE INSIDE DIAMETER MINUS $3\frac{1}{2}$ " BUT SHALL NOT BE LESS THAN $8\frac{1}{2}$ ".



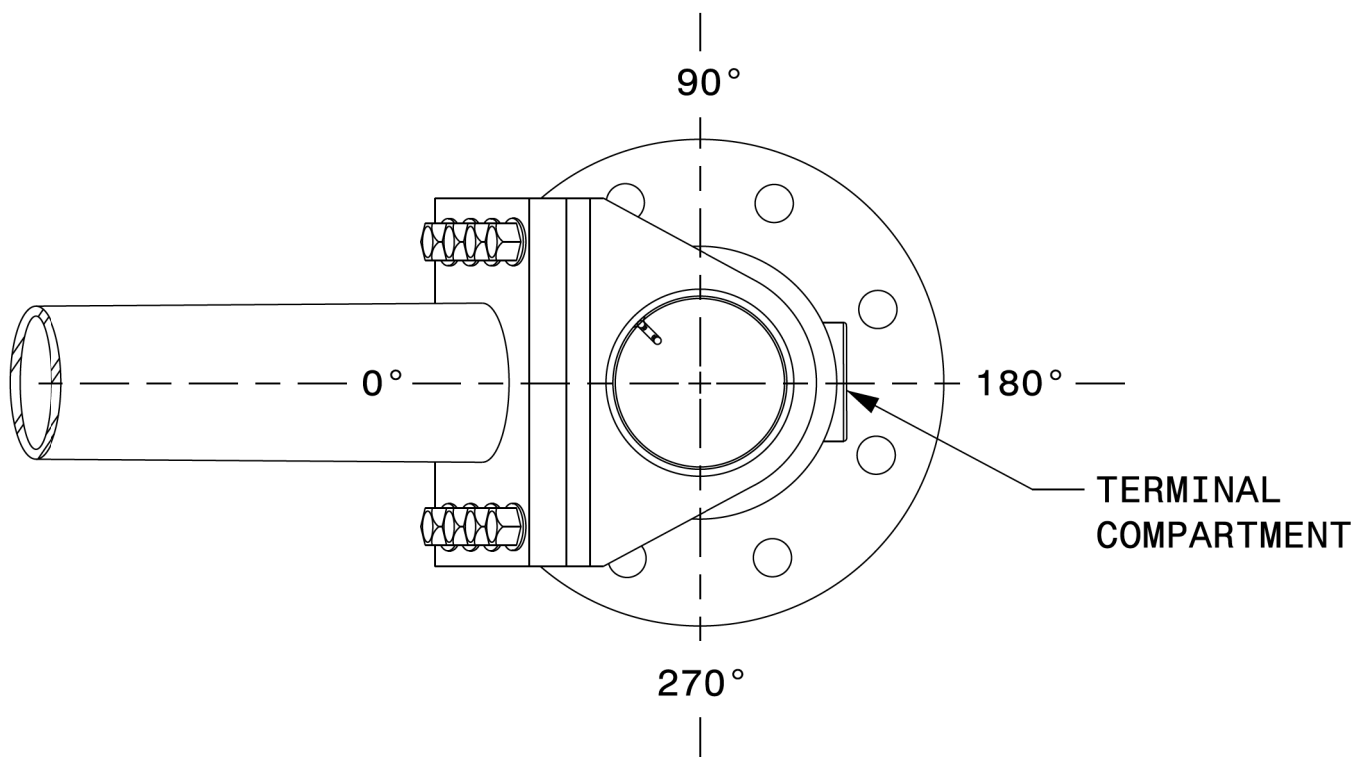
SECTION A-A
POLE BASE PLATE DETAILS



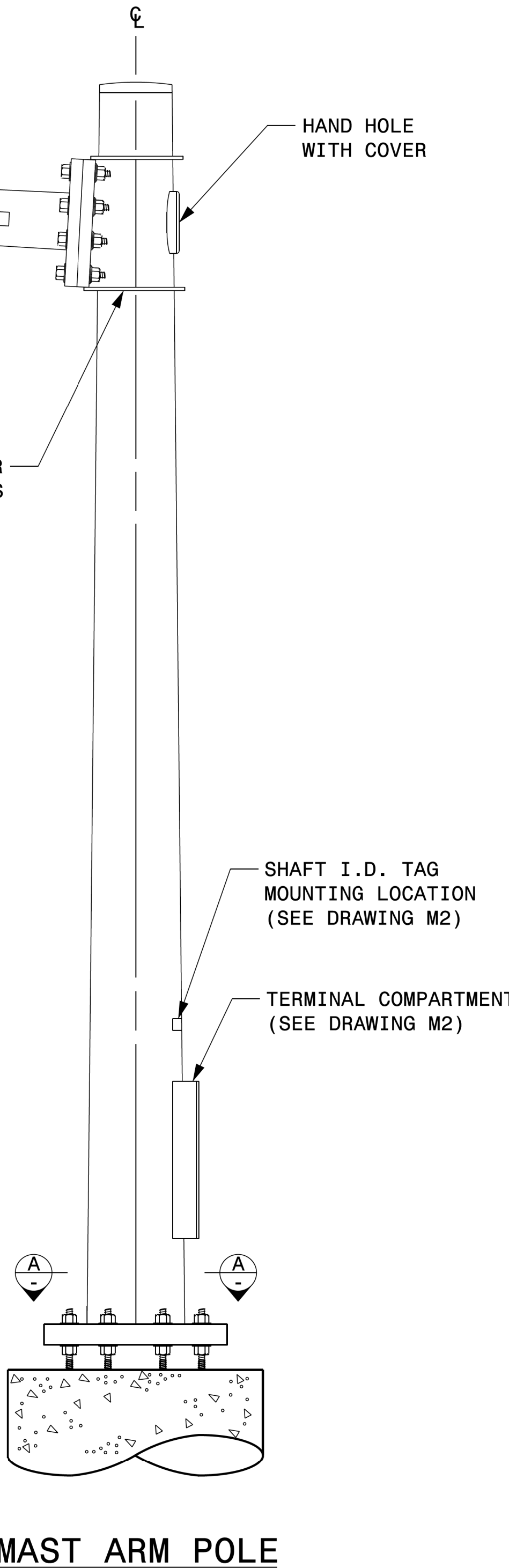
SECTION B-B
(POLE ATTACHMENT TO BASE PLATE)
FULL-PENETRATION
GROOVE WELD DETAIL



SLIP FIT JOINT DETAIL FOR MAST ARM



MAST ARM RADIAL ORIENTATION



Fabrication Details – Mast Arm Poles

	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	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR INIT. DATE	

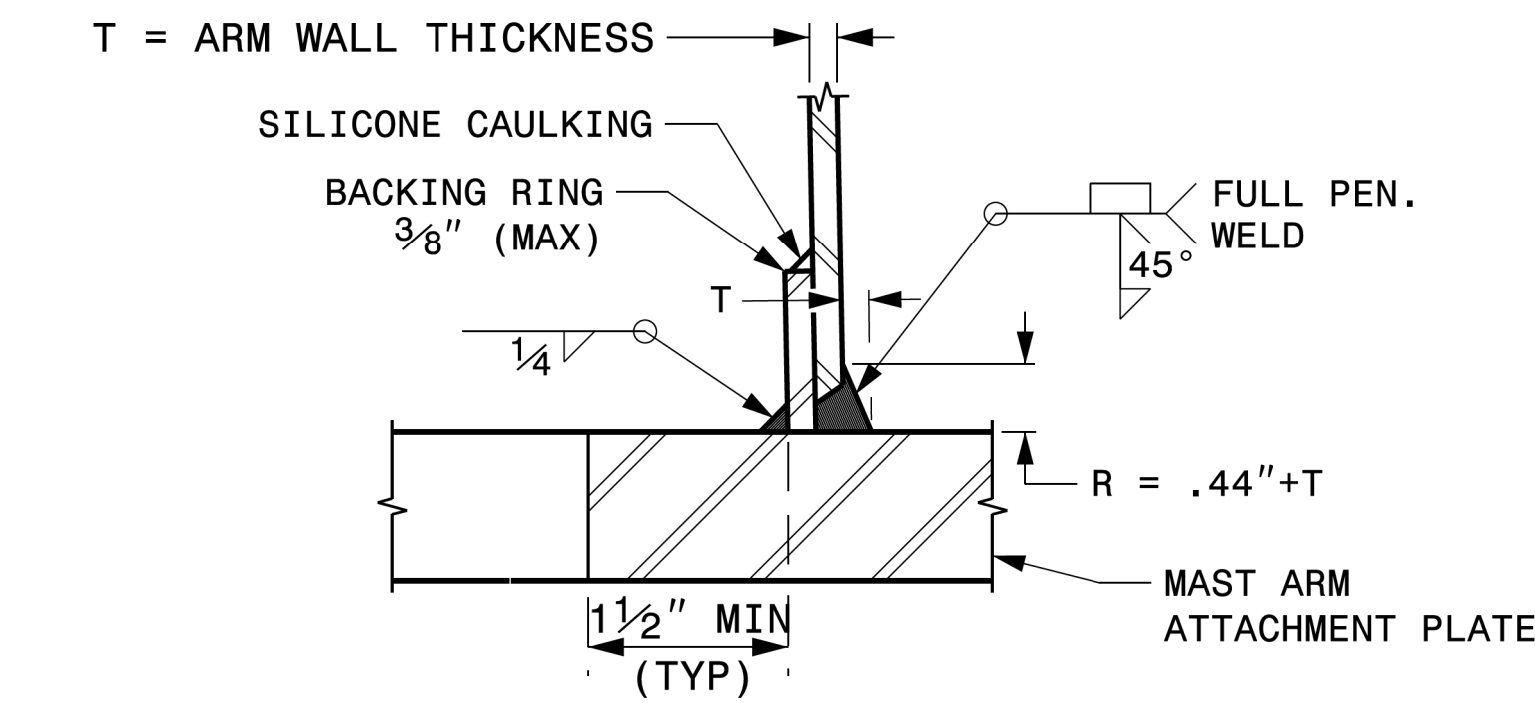
WELDED RING STIFFENED MAST ARM CONNECTION

PROJECT I.D. NO.

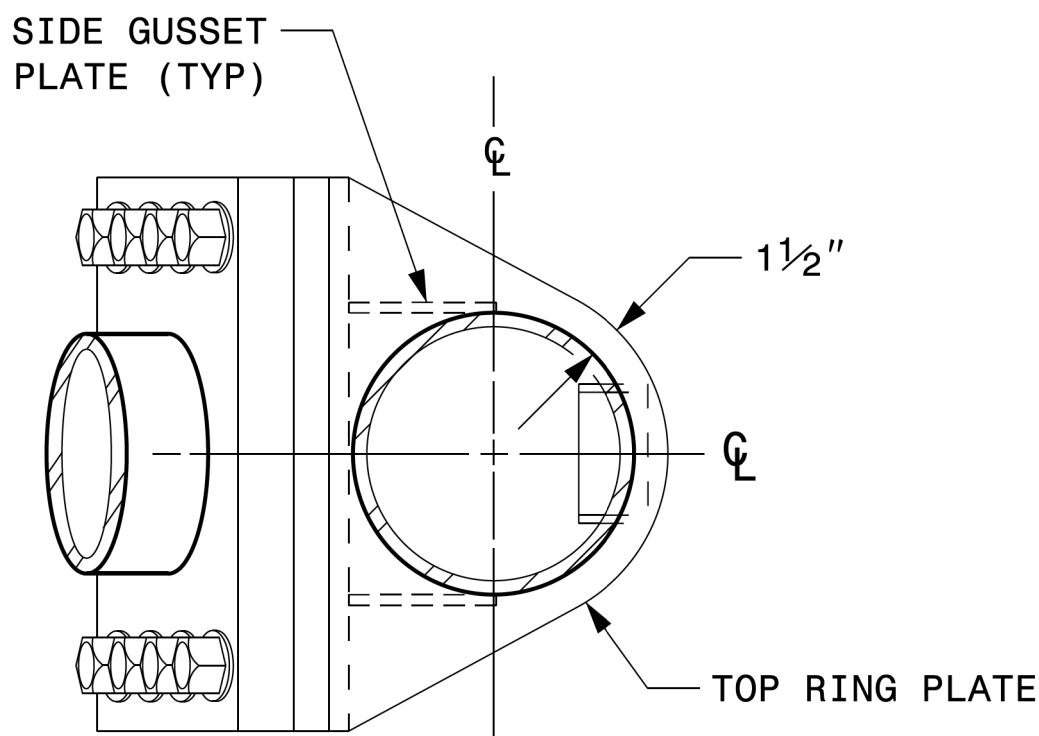
SHEET NO.

R-5709C

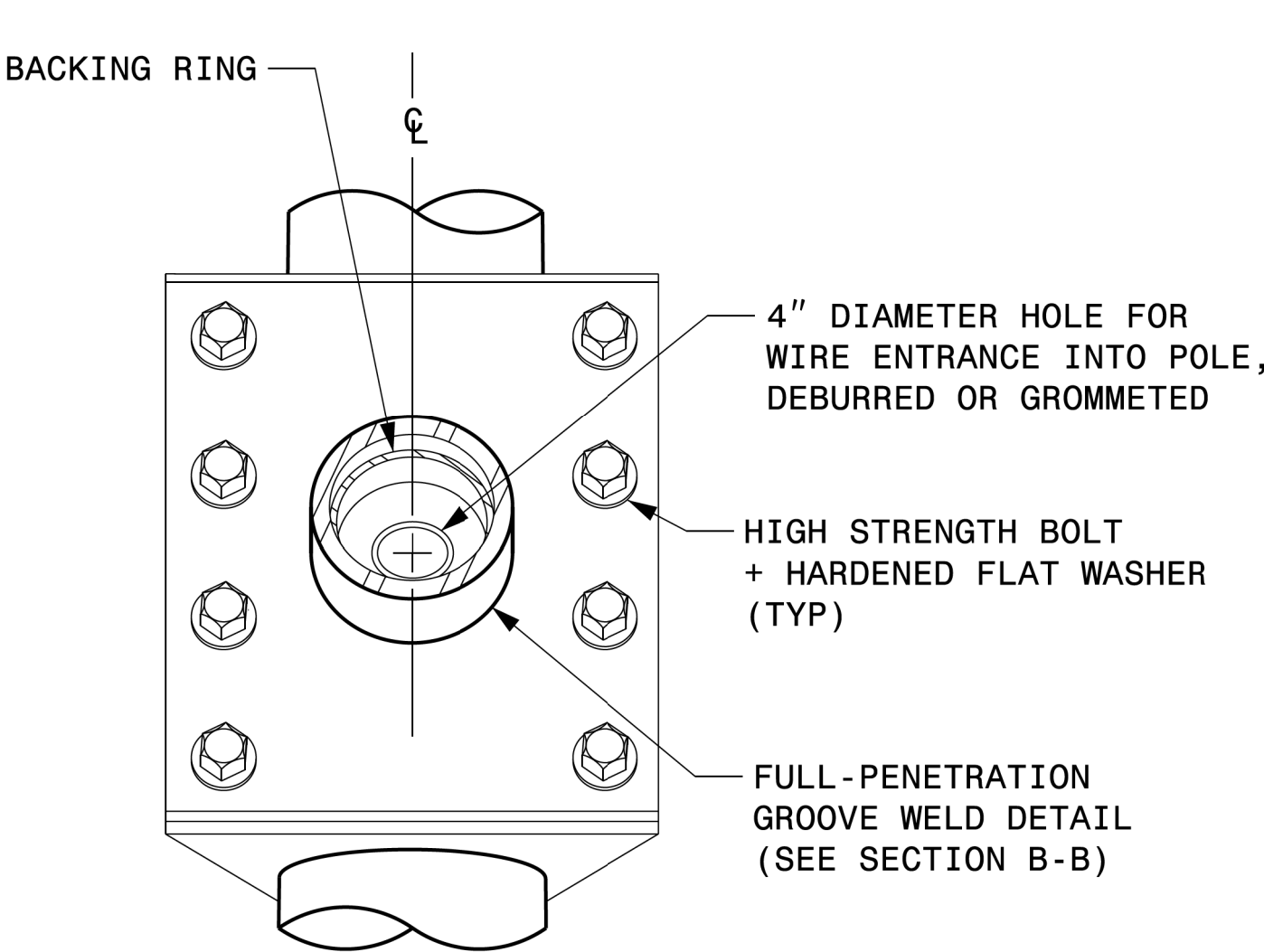
Sig.M5



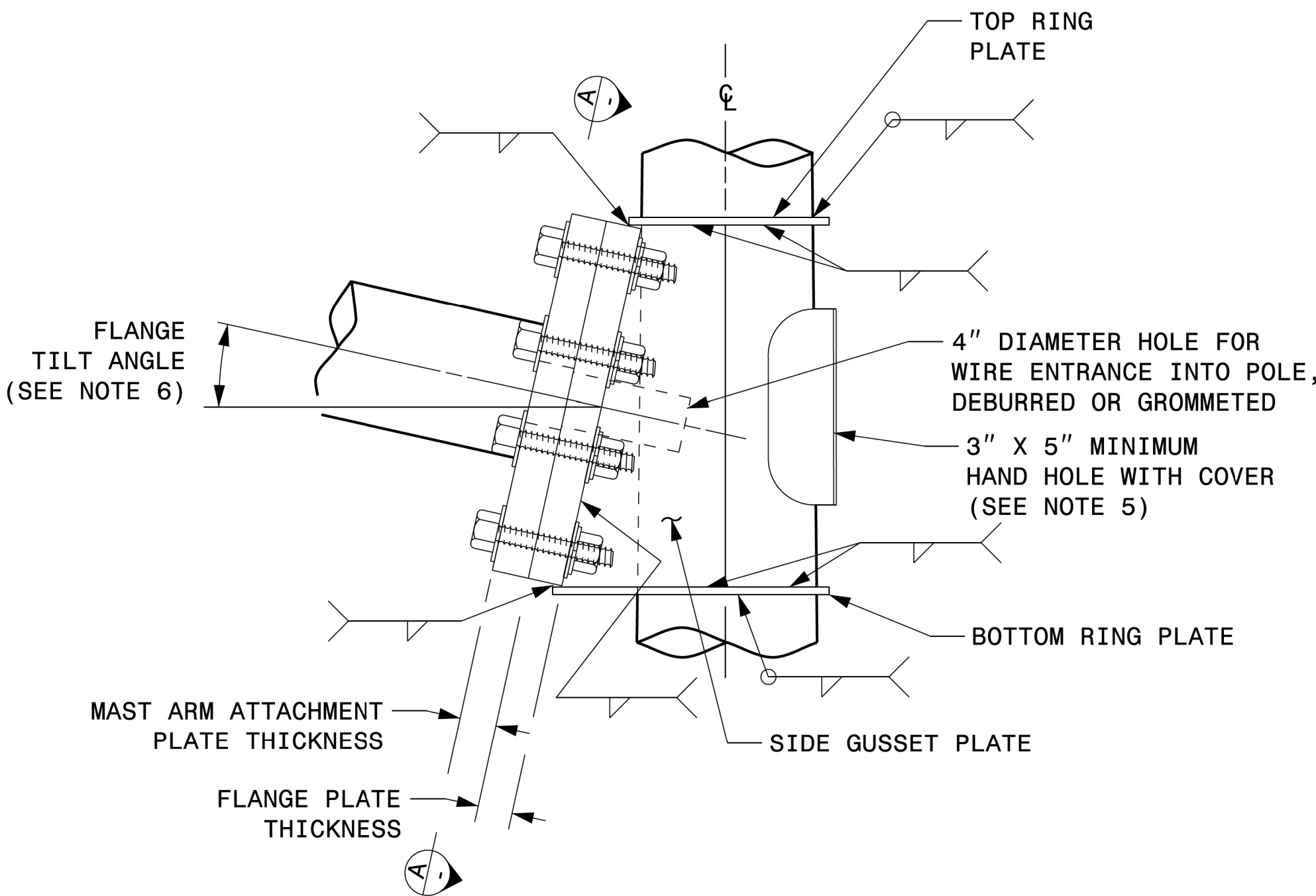
SECTION B-B
FULL-PENETRATION GROOVE WELD DETAIL



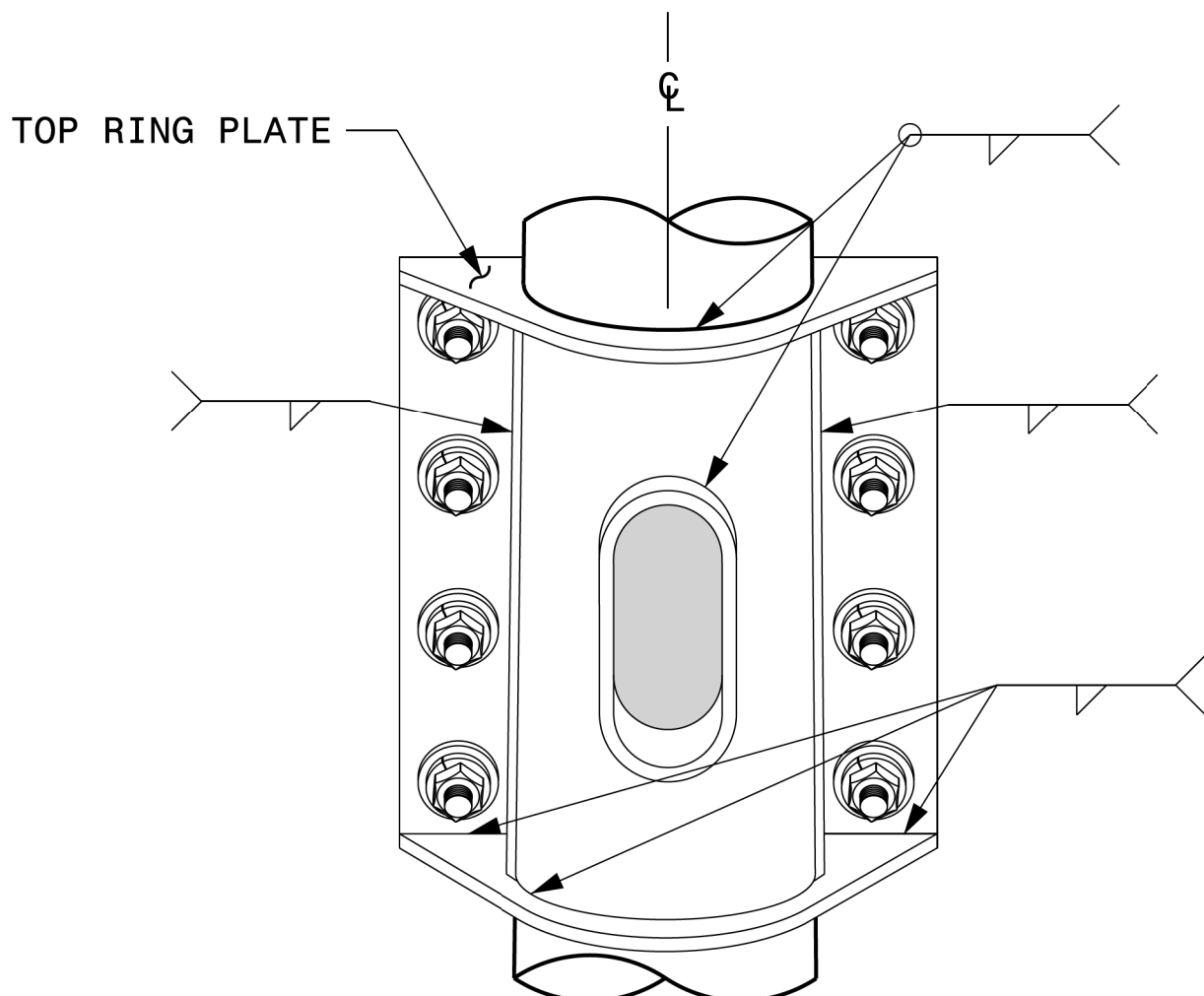
PLAN VIEW



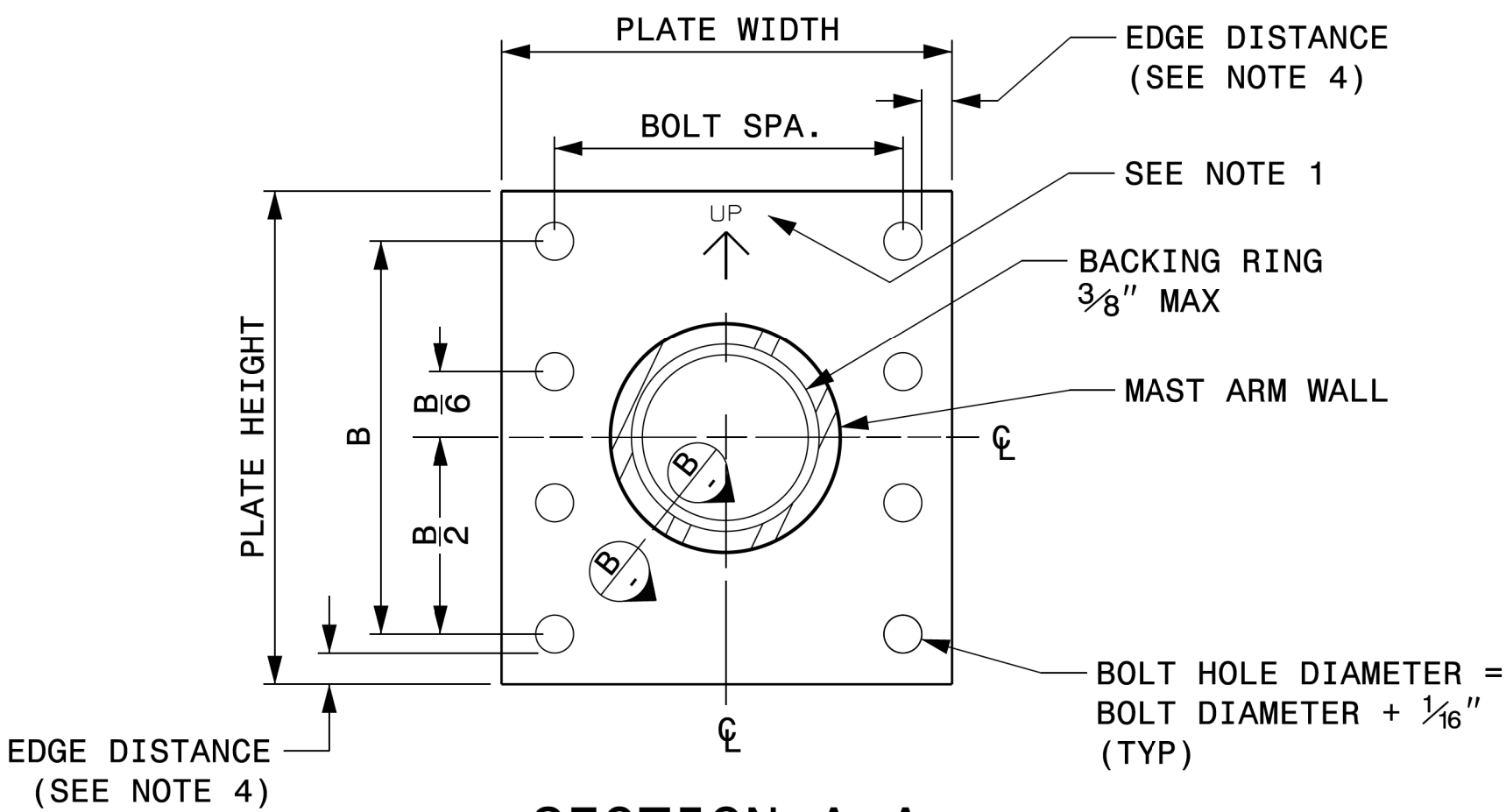
FRONT ELEVATION VIEW



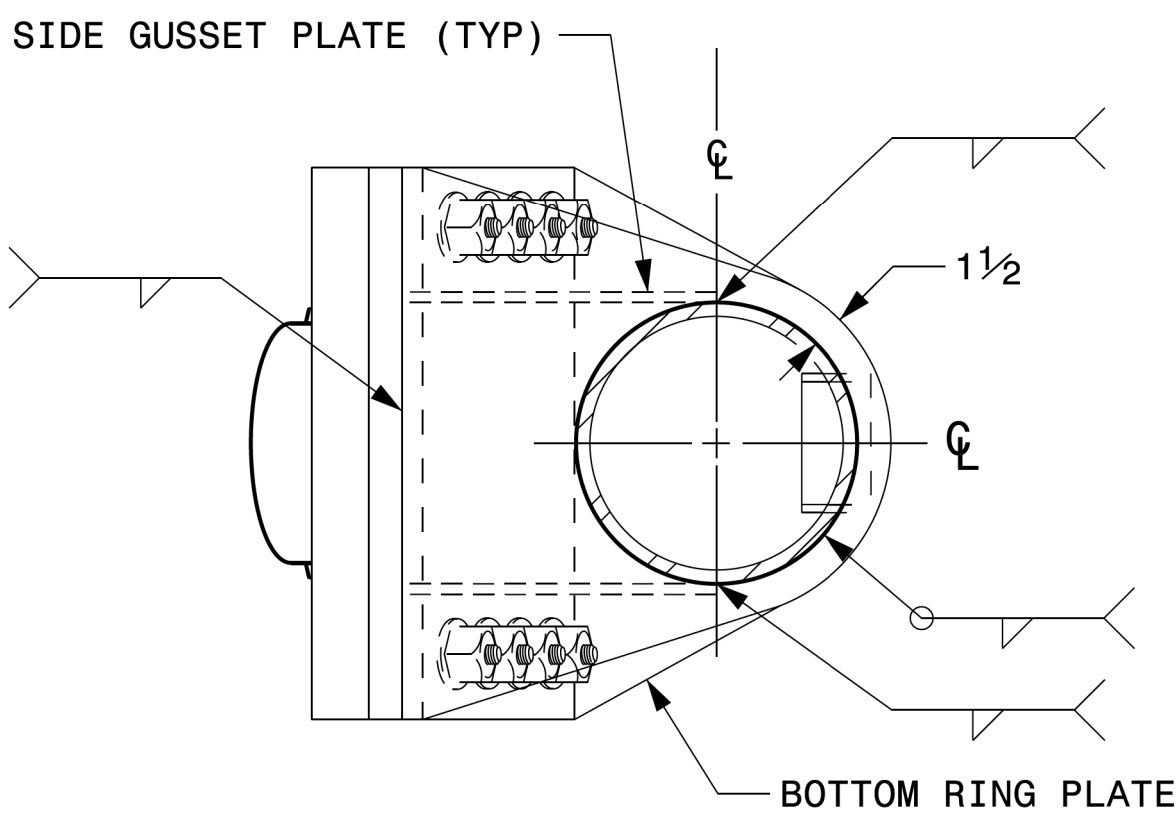
SIDE ELEVATION VIEW



BACK ELEVATION VIEW



SECTION A-A
MAST ARM ATTACHMENT PLATE



BOTTOM 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.

Fabrication Details – Mast Arm Connection

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

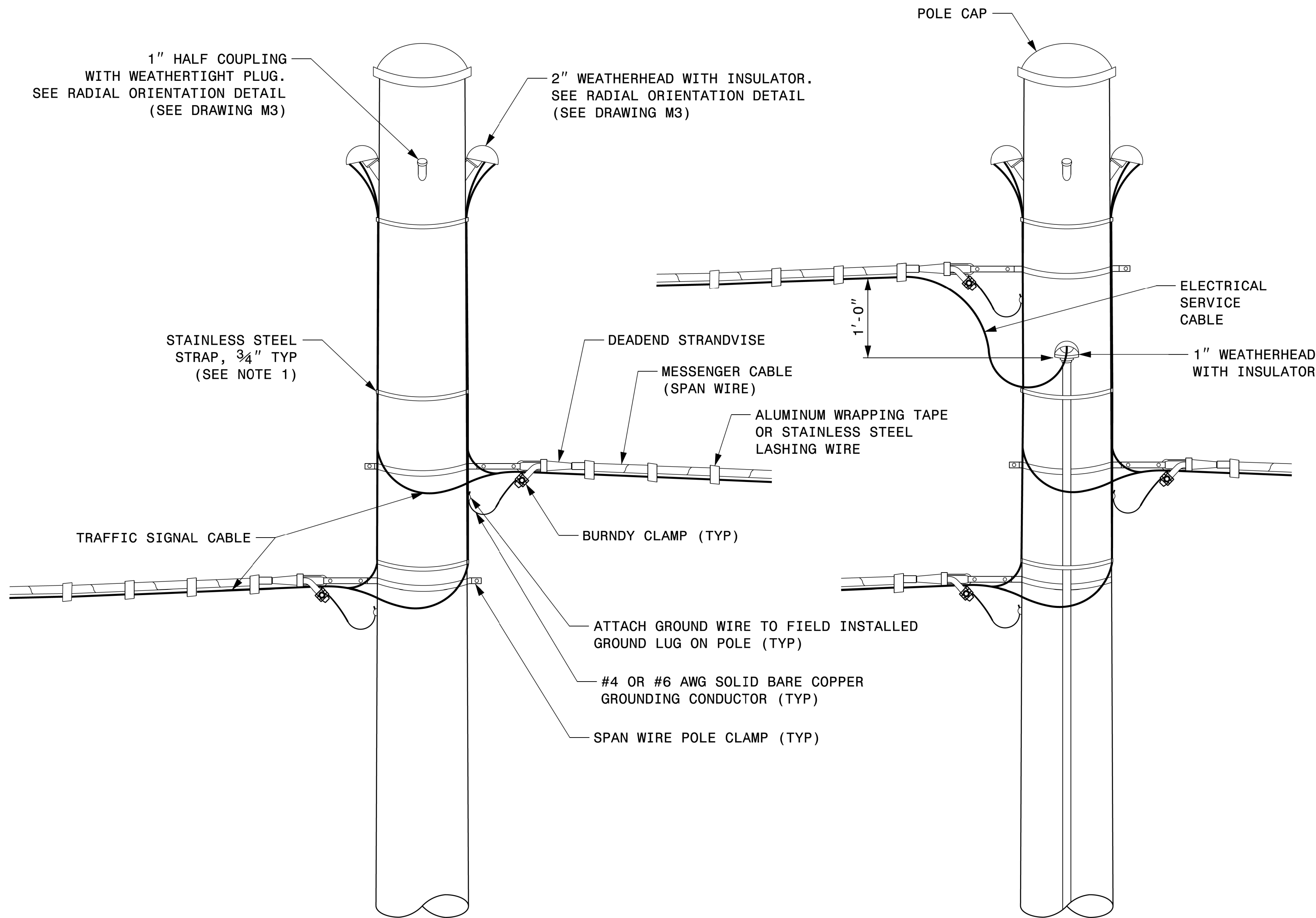
Typical Fabrication Details
For
Mast Arm Connection To Pole

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

SCALE: NA
NONE

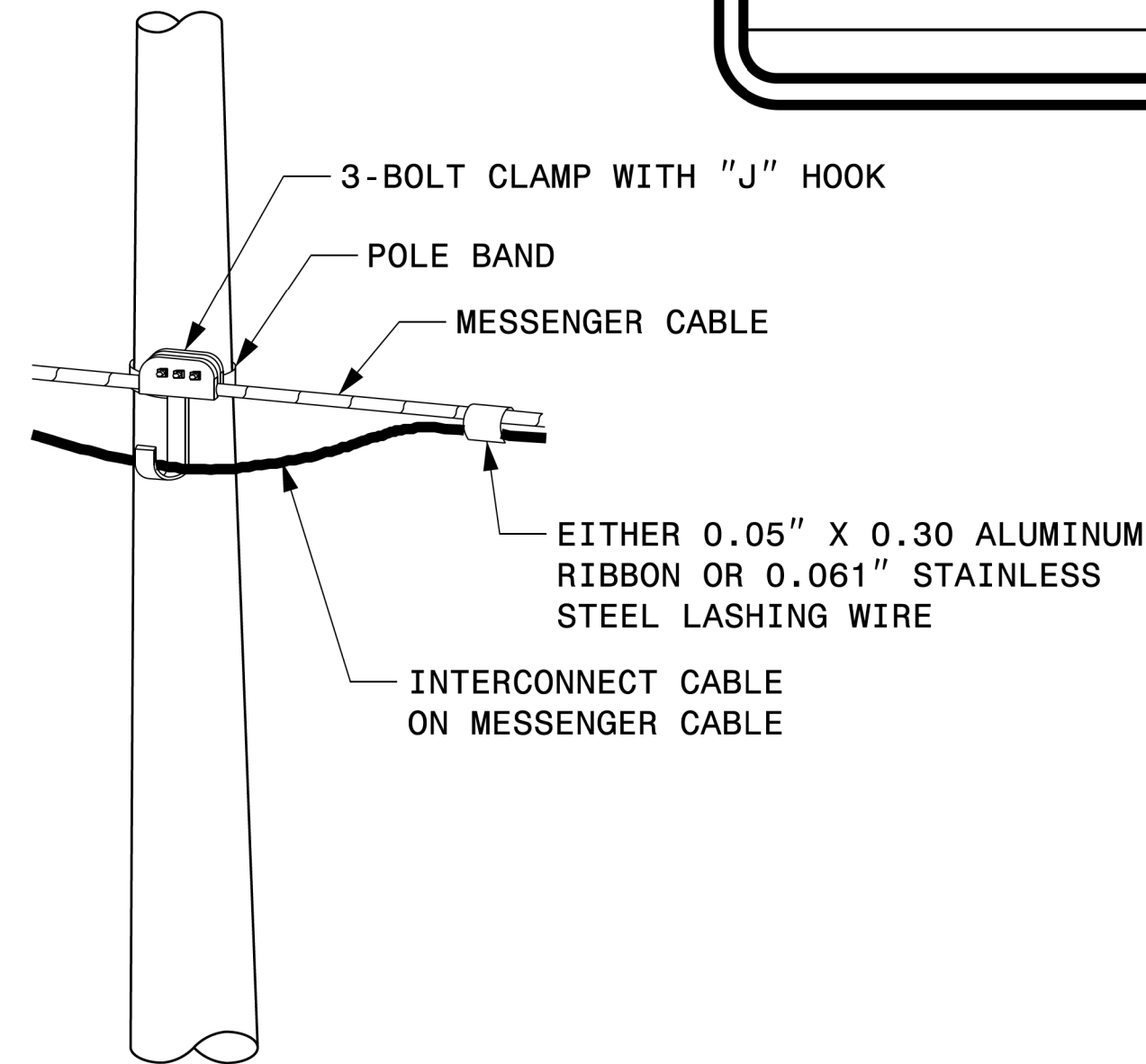
DocuSigned by:

09/21/2023
DATE

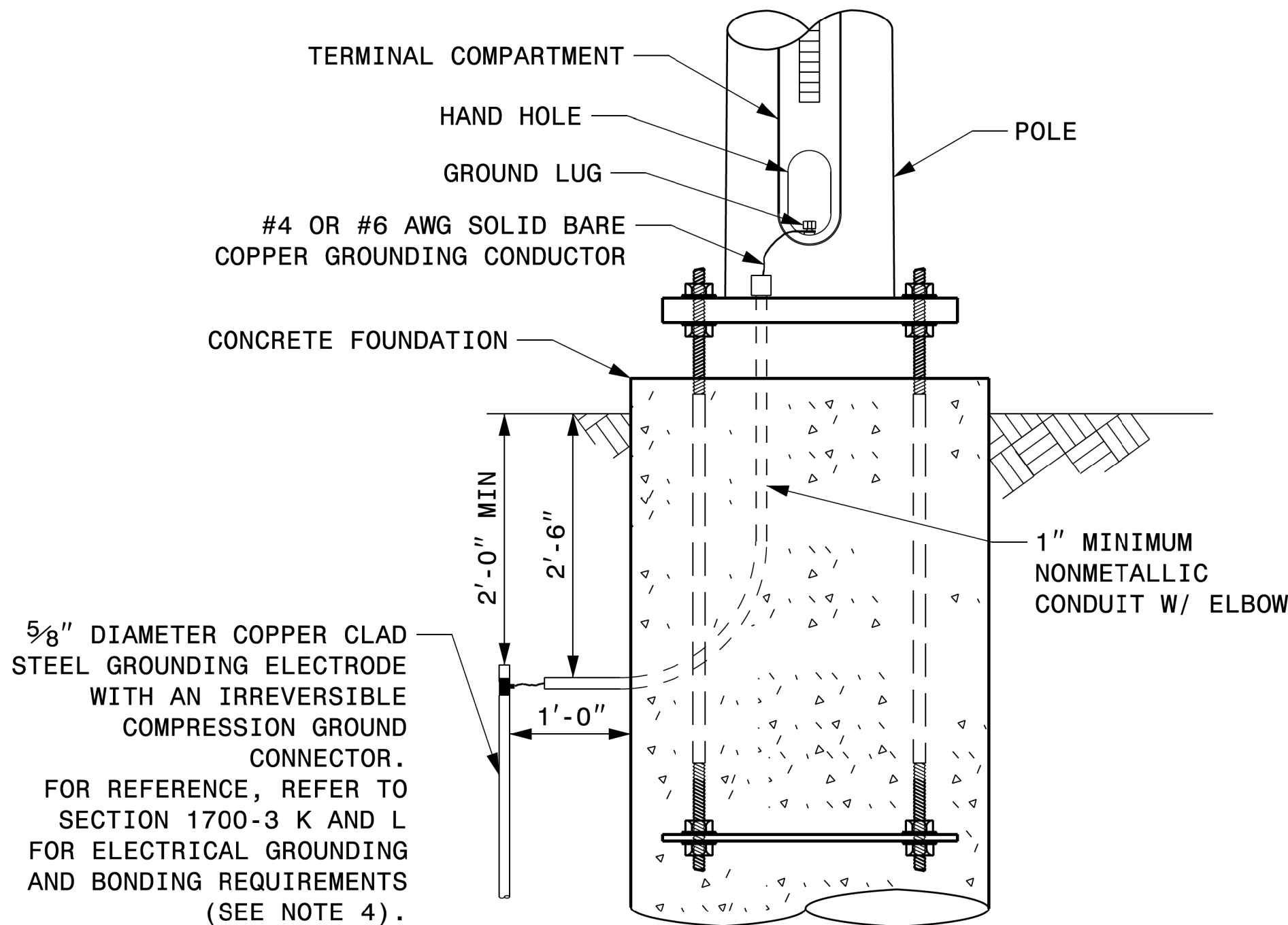


STRAIN POLE ATTACHMENTS

- NOTES:
1. STRAP ALL SIGNAL CABLES TO THE SIDE OF THE POLE WITH $\frac{3}{4}$ " 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



0 SCALE 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

SEAL

DocuSigned by:
Kevin Durigon
09/21/2023
DATE