Project No.	Sheet No.
I–5878, I–5883, I–5986B	Sig. 1.0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

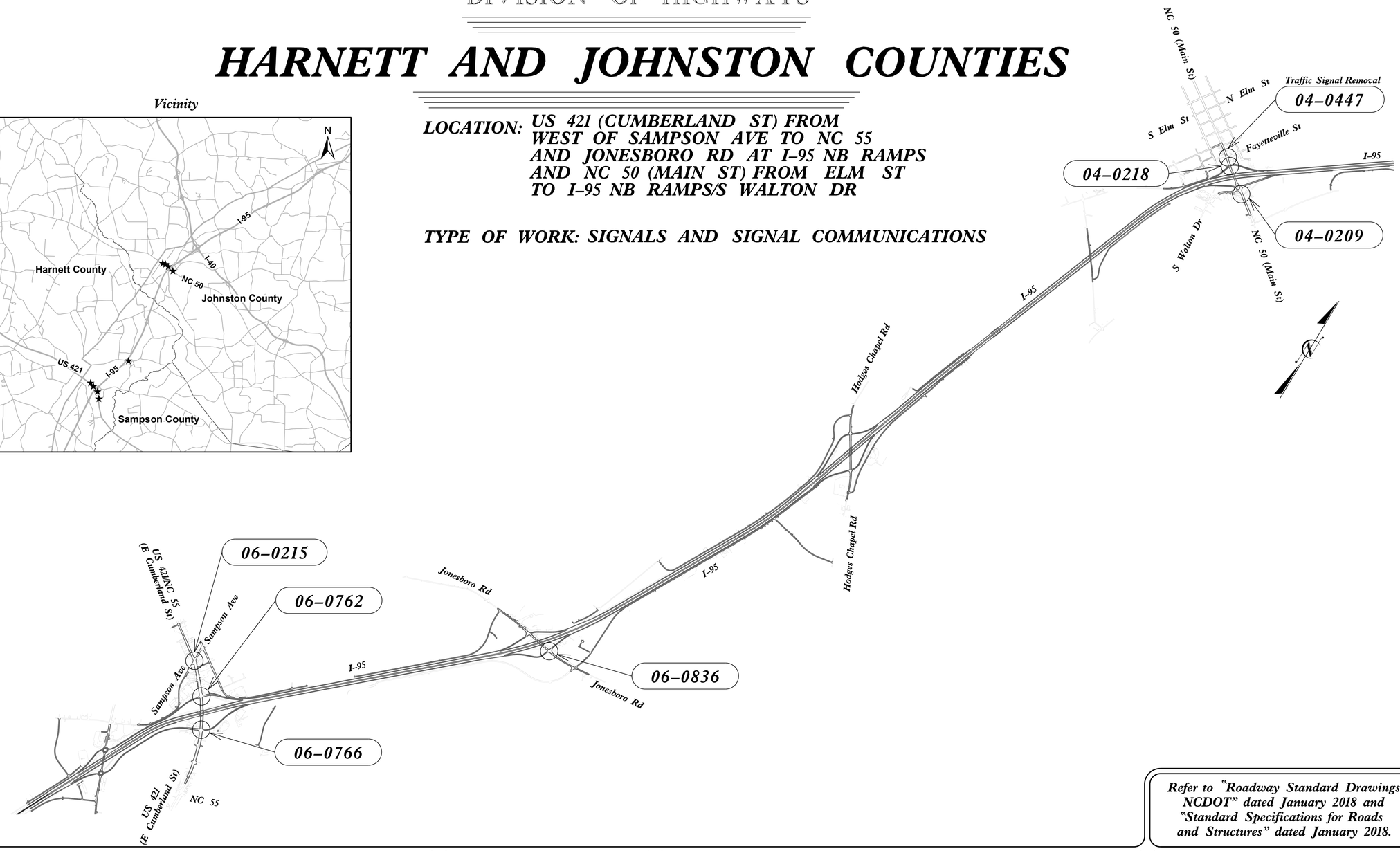
HARNETT AND JOHNSTON COUNTIES

Project: I–5878, I–5883, I–5986B

Vicinity

LOCATION: US 421 (CUMBERLAND ST) FROM WEST OF SAMPSON AVE TO NC 55 AND JONESBORO RD AT I–95 NB RAMPS AND NC 50 (MAIN ST) FROM ELM ST TO I–95 NB RAMPS/S WALTON DR

TYPE OF WORK: SIGNALS AND SIGNAL COMMUNICATIONS



Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.

Index of Plans

Sheet #	Reference #	Location/Description
SIG–1.0	----	Title Sheet
SIG–2.0–2.2	06–0215	US 421/NC 55 (E Cumberland Street) at Sampson Ave
SIG–3.0–3.2	06–0762	US 421/NC 55 (E Cumberland Street) at I–95 SB Ramps
SIG–4.0–4.2	06–0766	US 421/NC 55 (E Cumberland Street) at I–95 NB Ramps
SIG–5.0	06–0836	Jonesboro Road at I–95 NB Ramps Flashing Beacon
SIG–6.0–6.2	04–0218T1	NC 50 (Main Street) at I–95 SB Ramps – Temp 1
SIG–7.0–7.2	04–0218	NC 50 (Main Street) at I–95 SB Ramps – Final
SIG–8.0–8.3	04–0209T1	NC 50 (Main Street) at I–95 NB Ramps – Temp 1
SIG–9.0–9.2	04–0209T2	NC 50 (Main Street) at I–95 NB Ramps – Temp 2
SIG–10.0–10.1	----	2018 Standard Plate Sheets
SIG–M1–M8	----	Standard Drawings for Metal Poles
SCP–1–2	----	Signal Communications Construction Notes
SCP–3–6	----	Signal Communications Plans – Signal System #D06–02 DUNN
SCP–7–9	----	Signal Communications Plans – Signal System #D04–20 BENSON
SCP–10–12	----	Signal Communications Splice Diagrams

Prepared for NCDOT in the Office of:

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Kelly M Cory, PE, PTOE
PROJECT DESIGN ENGINEER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
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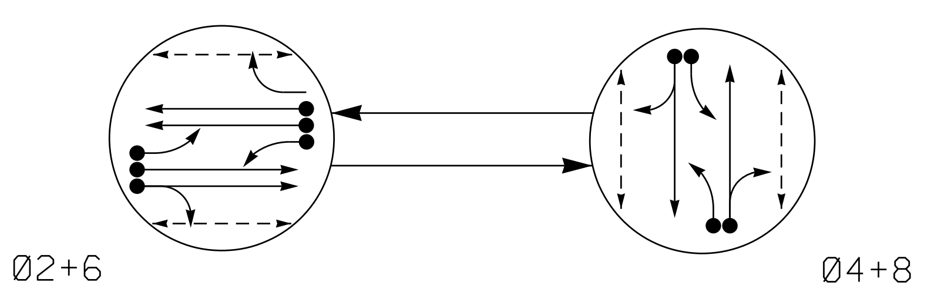
Heidi Berggren, EI – Signal Communications Project Design Engineer

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION
ITS and Signals Unit
750 N. Greenfield Parkway, Garner, NC 27529

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-2.0

PHASING DIAGRAM

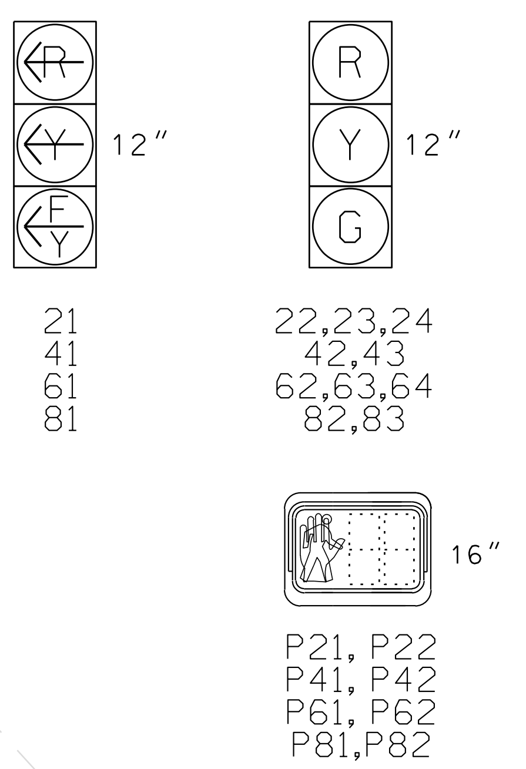


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	X	2	Yes	-	-	-	N	-	X
2B	6X6	70	4	X	2	Yes	-	-	-	N	-	X
2C	6X40	0	2-4-2	X	2	Yes	-	3	-	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	3	-	N	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	10	-	N	-	X
6A	6X6	70	4	X	6	Yes	-	-	-	N	-	X
6B	6X6	70	4	X	6	Yes	-	-	-	N	-	X
6C	6X40	0	2-4-2	X	6	Yes	-	3	-	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	3	-	N	-	X
8B	6X40	0	2-4-2	X	8	Yes	-	10	-	N	-	X

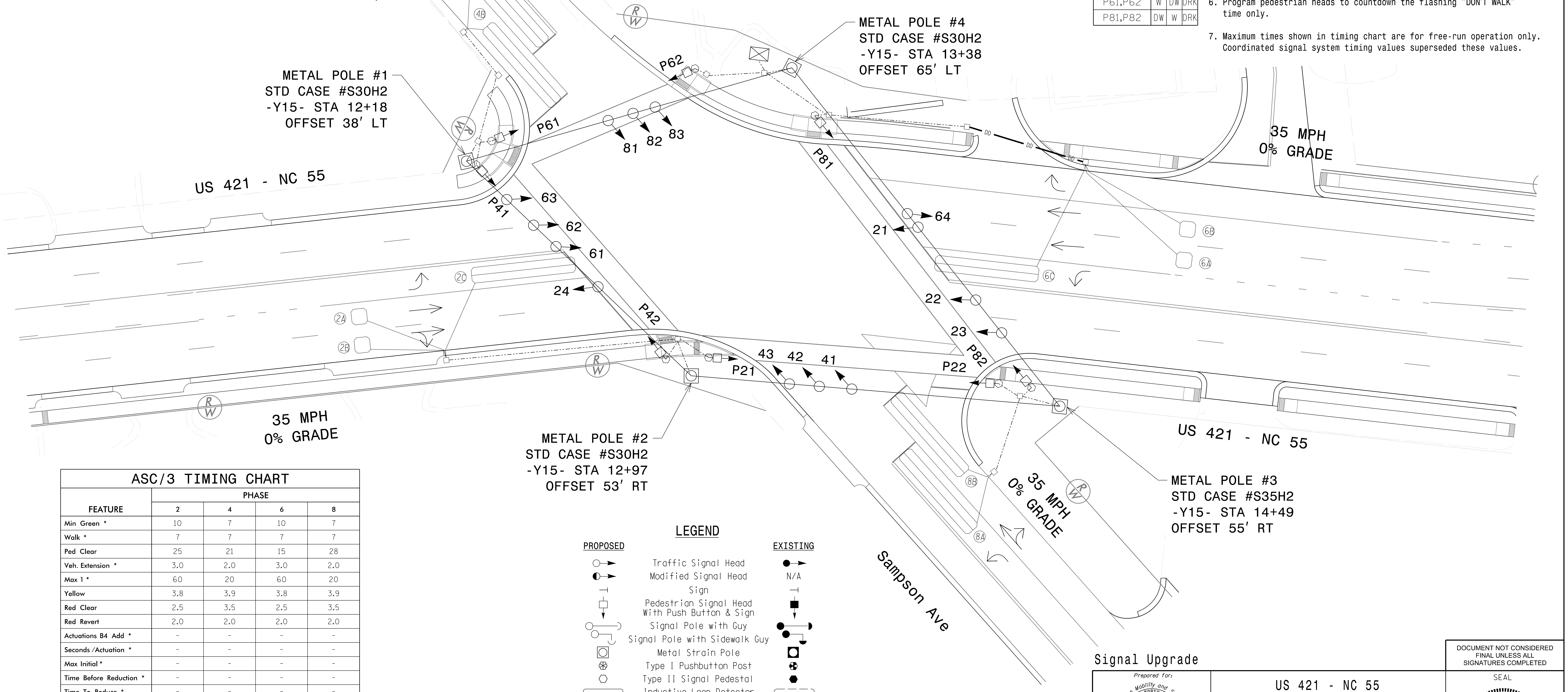
TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
21	←F/Y	←R	←Y
22,23,24	G	R	Y
41	←R	←F/Y	←R
42,43	R	G	R
61	←F/Y	←R	←Y
62,63,64	G	R	Y
81	←R	←F/Y	←R
82,83	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

2 Phase
Fully Actuated
Signal System #D06-02 Dunn
US 421-NC 55 (Dunn)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "DON'T WALK" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



ASC/3 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	25	21	15	28
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	60	20	60	20
Yellow	3.8	3.9	3.8	3.9
Red Clear	2.5	3.5	2.5	3.5
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
	Directional Arrow	
N/A	Wheelchair Ramp	

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Signal Upgrade

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

US 421 - NC 55
at
Sampson Ave

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

SCALE
0 20
1" = 20'

REVISIONS	INIT.	DATE

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SEAL
038970
KELLY M CORY

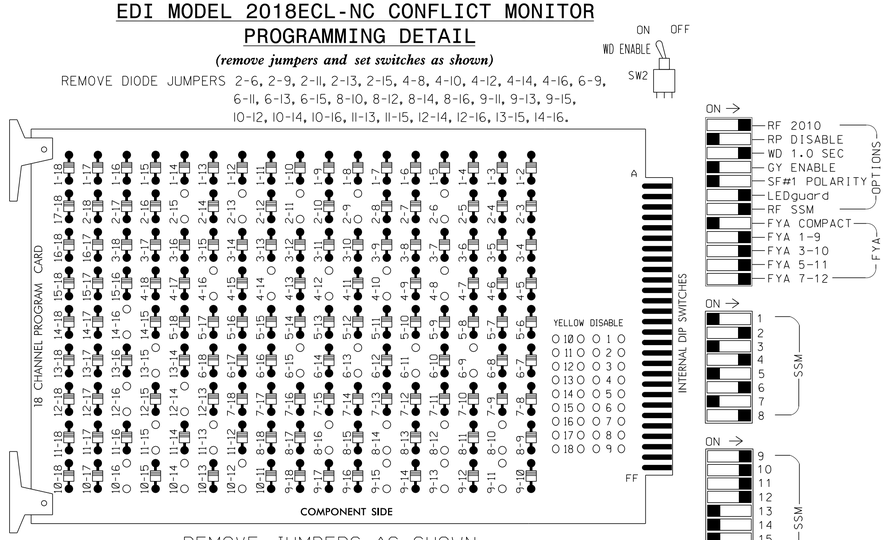
DocuSigned by:
Kelly M Cory
E2F270FFB1C142E...
SIGNATURE
4/26/2021
DATE

SIG. INVENTORY NO. 06-0215

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-10, 4-12, 4-14, 4-16, 6-9, 6-11, 6-13, 6-15, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Walk and 6 Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
5. The cabinet and controller are part of the Signal System #D06-02 Dunn.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 W/ AUX OUTPUT FILE
LOAD SWITCHES USED.....S2,S3,S5,S6,S8,S9,S11,S12 AUX S1,AUX S2,AUX S4,AUX S5
PHASES USED.....2,2PED,4,4PED,6,6PED,8,8PED
OVERLAP "A".....*
OVERLAP "B".....*
OVERLAP "C".....*
OVERLAP "D".....*

* See overlap programing detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-2.1

SIGNAL HEAD HOOK-UP CHART

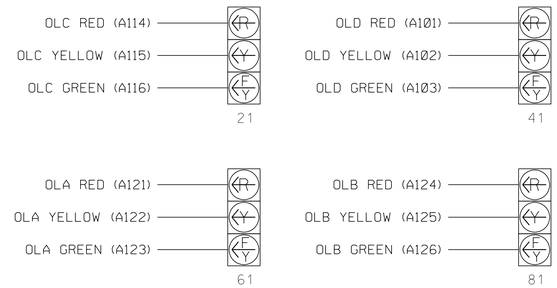
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	22,23, 24	P21, P22	NU	42,43	P41, P42	NU	62,63, 64	P61, P62	NU	82,83	P81, P82	61 ★	81 ★	NU	21 ★	41 ★	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW																		
✋			113			104			119			110						
🚶			115			106			121			112						

NU = Not Used

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				N
2B	TB2-7,8	I2L	43	12	2	YES				N
2C	TB2-9,10	I3U	63	32	2	YES		3		N
4A	TB4-9,10	I6U	41	4	4	YES		3		N
4B	TB4-11,12	I6L	45	14	4	YES		10		N
6A	TB3-5,6	J2U	40	6	6	YES				N
6B	TB3-7,8	J2L	44	16	6	YES				N
6C	TB3-9,10	J3U	64	36	6	YES		3		N
8A	TB5-9,10	J6U	42	8	8	YES		3		N
8B	TB5-11,12	J6L	46	18	8	YES		10		N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED					

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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: 06-0215
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

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Electrical Detail - Sheet 1 of 2

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Traffic Engineering Branch, Traffic Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

US 421 - NC 55
at
Sampson Ave

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory 4/26/2021
E8F2F6FD464342E SIGNATURE DATE

SIG. INVENTORY NO. 06-0215

$$$$USERNAME$$$$
$$$$SYSTIME$$$$
$$$$SYSDATE$$$$

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

Select TMG VEH OVLP [A] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[A] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

↓

OVERLAP B

Select TMG VEH OVLP [B] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[B] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

↓

OVERLAP C

Select TMG VEH OVLP [C] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[C] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

Toggle Once

↓

OVERLAP D

Select TMG VEH OVLP [D] and 'OTHER/ECONOLITE'

```
TMG VEH OVLP...[D] TYPE:OTHER/ECONOLITE
  PHASES 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6
INCLUDED . . . X . . . . . .
PROTECT  . . . . . .
PED PRTC . . . . . .
NOT OVLP . . . . . .
FLSH GRN . . . 1 . . . . . .
LAG X PH . . . . . .
LAG 2 PH . . . . . .

LAG GRN 0.0 YEL 0.0 RED 0.0 ADV GRN 0.0
```

END PROGRAMMING

$$$$SYSTIME$$$$
$$$$SYSTIME24$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-2.2

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: 06-0215
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 421 - NC 55
at
Sampson Ave

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory 4/26/2021
ESEAL SIGNATURE DATE

SIG. INVENTORY NO. 06-0215

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-3.0

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø4	FLASH
11	~~←~~	~~F Y~~	~~R~~	~~Y~~
21,22	R	G	R	Y
41	~~R~~	~~R~~	~~←~~	~~R~~
42,43	R	R	G	R
61,62	G	G	R	Y
P41,P42	DW	DW	W	ORK

SIGNAL FACE I.D.

All Heads L.E.D.

ASC/3 DETECTOR INSTALLATION CHART

DETECTOR						PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15	-	N	-	X
					6	Yes	-	-	-	N	-	X
2A	6X6	70	4	X	2	Yes	-	-	-	N	-	X
2B	6X6	70	4	X	2	Yes	-	-	-	N	-	X
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	X
4B	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	X
4C	6X40	0	2-4-2	X	4	Yes	-	15	-	N	-	X
6A	6X6	70	4	X	6	Yes	-	-	-	N	-	X
6B	6X6	70	4	X	6	Yes	-	-	-	N	-	X

3 Phase
Fully Actuated
Signal System #D06-02 Dunn
US 421-NC 55 (Dunn)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
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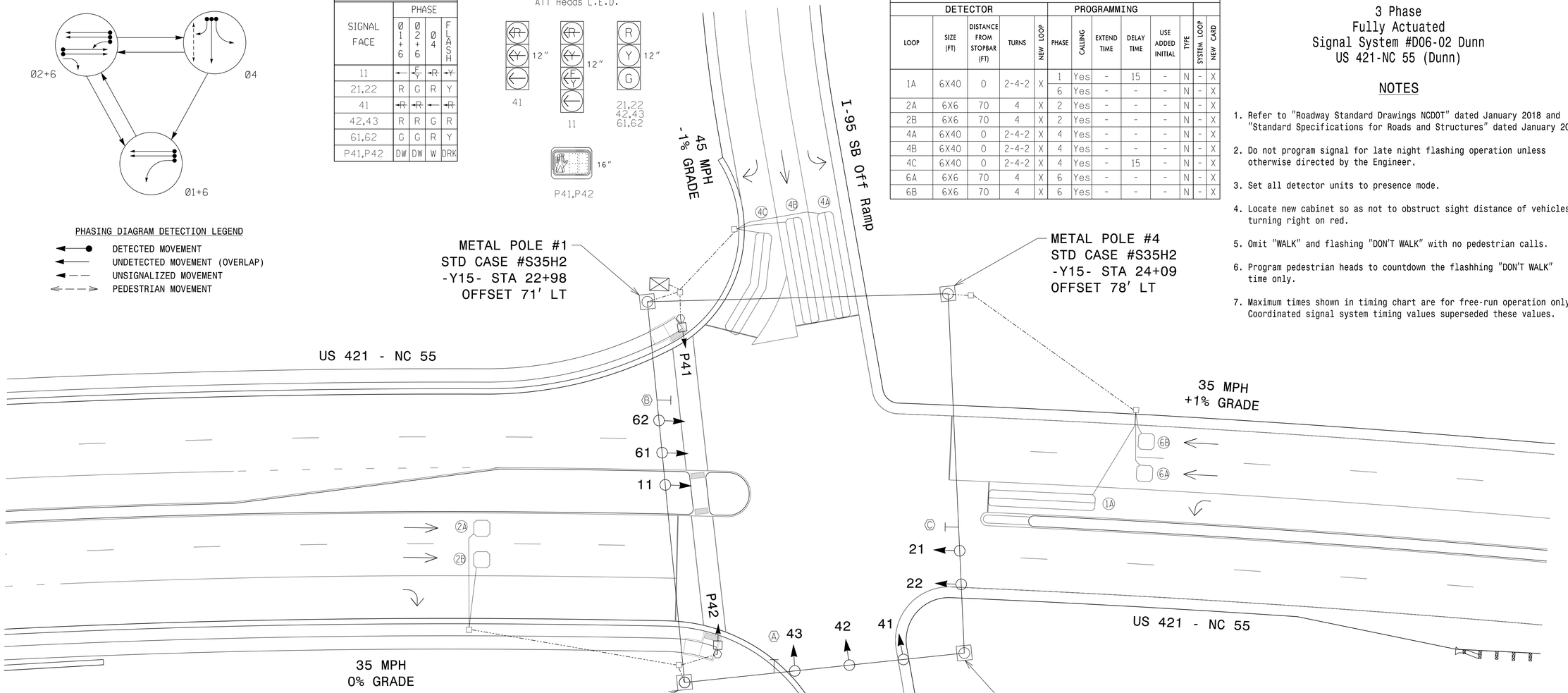

ASC/3 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green *	7	10	7	10
Walk *	-	-	7	-
Ped Clear	-	-	27	-
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	20	60	20	60
Yellow	3.0	3.8	4.7	3.8
Red Clear	2.8	2.0	1.8	2.0
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
◎	Metal Strain Pole	■
⬡	Type II Signal Pedestal	⬢
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----	2-in Underground Conduit	----
N/A	Right of Way	----
→	Directional Arrow	→
Ⓐ	Turning Vehicles Yield to Pedestrians (R10-15) Sign	Ⓐ
Ⓑ	No Right Turn (R3-1) Sign	Ⓑ
Ⓒ	No Left Turn (R3-2) Sign	Ⓒ
N/A	Wheelchair Ramp	

Signal Upgrade

Michael Baker
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Phone: (919) 463-5490 · MBAKERINTL.COM
NC License No. : F-1084

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

SCALE 0 20 1" = 20'

US 421 - NC 55
at
I-95 SB Ramp/CD Road

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

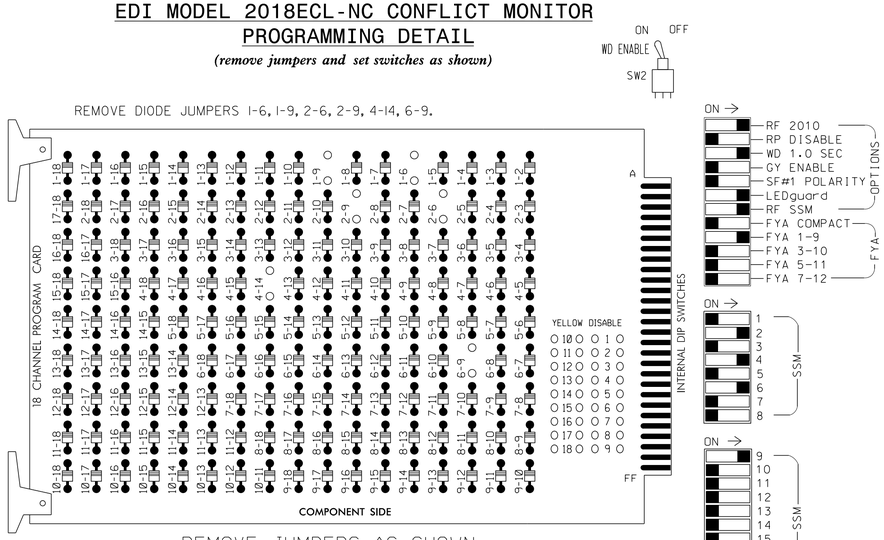
DocuSigned by: Kelly M Cory E2E270EEB1C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 06-0762

$$$$USERNAME$$$$ $$$$DGN$$$$ $$$$XYZ$$$$ $$$$LMES$$$$

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
5. The cabinet and controller are part of the Signal System #D06-02 Dunn.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 W/ AUX OUTPUT FILE

LOAD SWITCHES USED.....S1,S2,S5,S6,S8,AUX S1
PHASES USED.....1,2,4,4PED,6
OVERLAP "A".....✳
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

✳ See overlap programing detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-3.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5		S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4		14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4		4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	NU	NU	41	42,43	P41,P42	NU	61,62	NU	NU	NU	NU	11 ★	NU	NU	NU	NU	NU
RED		128				101			134										
YELLOW	✳	129				102			135										
GREEN		130				103			136										
RED ARROW					101									A121					
YELLOW ARROW					102									A122					
FLASHING YELLOW ARROW														A123					
GREEN ARROW	127				103														
✋							104												
🚶							106												

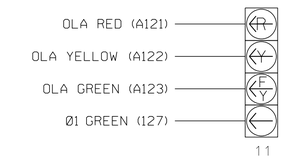
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N
2A	TB2-5,6	I2U	39	2	2	YES				N
2B	TB2-7,8	I2L	43	12	2	YES				N
4A	TB4-9,10	I6U	41	4	4	YES				N
4B	TB4-11,12	I6L	45	14	4	YES				N
4C	TB6-1,2	I7U	65	34	4	YES		15		N
6A	TB3-5,6	J2U	40	6	6	YES				N
6B	TB3-7,8	J2L	44	16	6	YES				N
PED PUSH BUTTONS										
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOT I12.

[1] Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

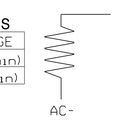
COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0762
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

US 421 - NC 55
at
I-95 SB Ramp/CD Road

Division 6 | Harnett County | Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M. CORY

DocuSigned by: Kelly M Cory 4/26/2021
ENGINEER SIGNATURE DATE

SIG. INVENTORY NO. 06-0762

$$$$$$SYSTIME$$$$$$
$$$$$$SYSTIME$$$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-3.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select `2. CONTROLLER`
2. From CONTROLLER Submenu select `2. VEHICLE OVERLAPS`

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0762
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING
DETAILS FOR:

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

US 421 - NC 55
at
I-95 SB Ramp/CD Road

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
SEAL 038970
KELLY M CORY

DocuSigned by:
Kelly M Cory
E2F270FFB1C142E...

SIGNATURE	DATE
Kelly M Cory	4/26/2021

SIG. INVENTORY NO. 06-0762

$$$$$SYSTIME$$$$$
$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-4.0

PHASING DIAGRAM

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	PHASE Ø2+6	PHASE Ø8	FLASH
21,22	G	G	R	Y
51	←	~~F~~	~~R~~	~~Y~~
61,62	R	G	R	Y
81	~~R~~	~~R~~	~~←~~	~~R~~
82,83	R	R	G	R

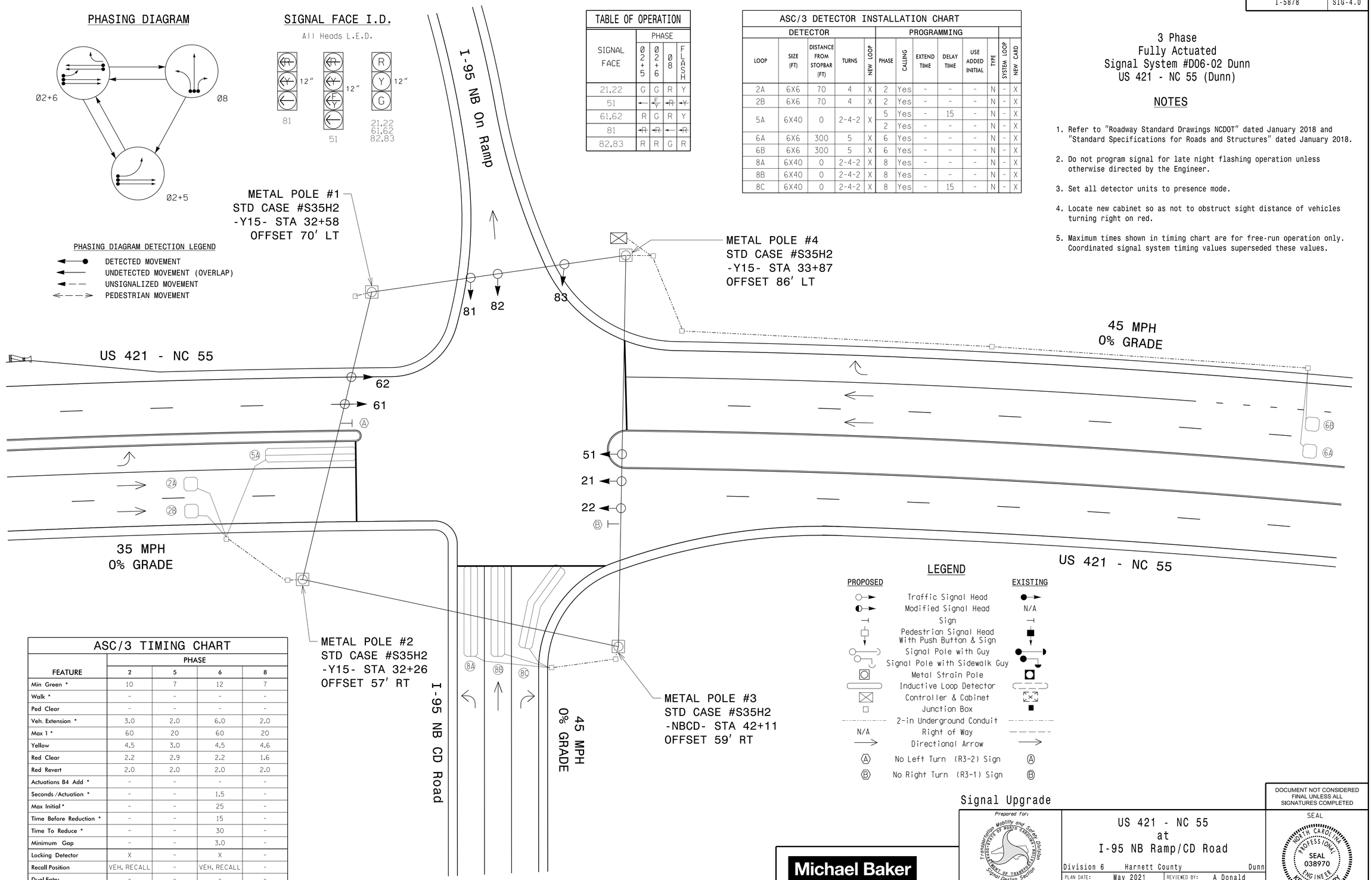
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	4	X	2	Yes	-	-	-	N	-	X
2B	6X6	70	4	X	2	Yes	-	-	-	N	-	X
5A	6X40	0	2-4-2	X	5	Yes	-	15	-	N	-	X
					2	Yes	-	-	-	N	-	X
6A	6X6	300	5	X	6	Yes	-	-	-	N	-	X
6B	6X6	300	5	X	6	Yes	-	-	-	N	-	X
8A	6X40	0	2-4-2	X	8	Yes	-	-	-	N	-	X
8B	6X40	0	2-4-2	X	8	Yes	-	-	-	N	-	X
8C	6X40	0	2-4-2	X	8	Yes	-	15	-	N	-	X

3 Phase
Fully Actuated
Signal System #D06-02 Dunn
US 421 - NC 55 (Dunn)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
◎	Metal Strain Pole	◘
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
-----	2-in Underground Conduit	-----
N/A	Right of Way	------
→	Directional Arrow	→
Ⓐ	No Left Turn (R3-2) Sign	Ⓐ
Ⓑ	No Right Turn (R3-1) Sign	Ⓑ

ASC/3 TIMING CHART

FEATURE	PHASE 2	PHASE 5	PHASE 6	PHASE 8
Min Green *	10	7	12	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	3.0	2.0	6.0	2.0
Max 1 *	60	20	60	20
Yellow	4.5	3.0	4.5	4.6
Red Clear	2.2	2.9	2.2	1.6
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	1.5	-
Max Initial *	-	-	25	-
Time Before Reduction *	-	-	15	-
Time To Reduce *	-	-	30	-
Minimum Gap	-	-	3.0	-
Locking Detector	X	-	X	-
Recall Position	VEH. RECALL	-	VEH. RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

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

SCALE 0 20 1" = 20'

US 421 - NC 55
at
I-95 NB Ramp/CD Road

Division 6 Harnett County Dunn

PLAN DATE:	May 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

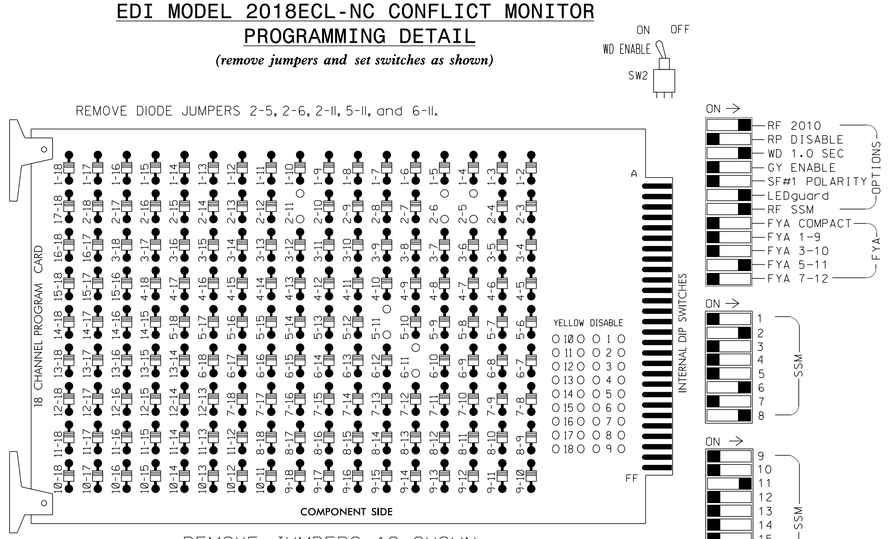
DocuSigned by: Kelly M Cory 5/9/2021
SIGNATURE DATE

SIG. INVENTORY NO. 06-0766

09-MAY-2021 20:47
Z:\Projects\5986B\Traffic\Signals\Design\Signals\I-5986B_SIG-04.dgn
KMCory
AT CARYLCORY

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
5. The cabinet and controller are part of the Signal System #D06-02 Dunn.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 W/ AUX OUTPUT FILE

LOAD SWITCHES USED.....S2,S7,S8,S11,AUX S4
PHASES USED.....2,5,6,8,
OVERLAP "A".....NOT USED
OVERLAP "B".....NOT USED
OVERLAP "C".....✳
OVERLAP "D".....NOT USED

✳ See overlap programing detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-4.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11		S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8		16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8		8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	51★	61,62	NU	NU	81	82,83	NU	NU	NU	NU	51★	NU	NU
RED		128						134				107							
YELLOW		129					✳	135				108							
GREEN		130						136				109							
RED ARROW											107						A114		
YELLOW ARROW											108						A115		
FLASHING YELLOW ARROW																	A116		
GREEN ARROW							133				109								

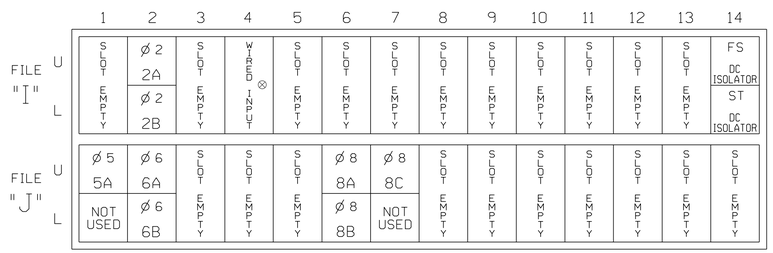
NU = Not Used

✳ 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

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

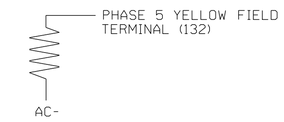
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
2A	TB2-5,6	I2U	39	2	2	YES				N
2B	TB2-7,8	I2L	43	12	2	YES				N
5A [3]	TB3-1,2	J1U	55	5	5	YES		15		N
	-	I4U	47	22	2	YES				N
6A	TB3-5,6	J2U	40	6	6	YES				N
6B	TB3-7,8	J2L	44	16	6	YES				N
8A	TB5-9,10	J6U	42	8	8	YES				N
8B	TB5-11,12	J6L	46	18	8	YES				N
8C	TB7-1,2	J7U	66	38	8	YES		15		N

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

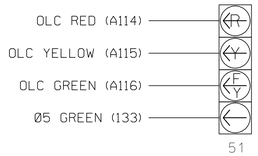
LOAD RESISTOR INSTALLATION DETAIL

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



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-0766
DESIGNED: March 2021
SEALED: 05/09/2021
REVISED: N/A

Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Cary, North Carolina 27518
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NC License No. : F-1084
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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 - NC 55
at
I-95 NB Ramp/CD Road

Division 6 | Harnett County | Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY
DocuSigned by: Kelly M Cory 5/9/2021
SIGNATURE SIGNATURE DATE

SIG. INVENTORY NO. 06-0766

$$$$USERNAME$$$$
$$$$SESSION$$$$
$$$$TIME$$$$
$$$$DATE$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SIG-4.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP C

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

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

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

FLASHING ARROW OUTPUT.....CH11 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0766
DESIGNED: March 2021
SEALED: 05/09/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: Mobility and Safety Division, NCDEPARTMENT OF TRANSPORTATION, Traffic Engineering Branch & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

US 421 - NC 55
at
I-95 NB Ramp/CD Road

Division 6 | Harnett County | Dunn

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038970 KELLY M CORY

DocuSigned by: Kelly M Cory 5/9/2021
ENGINEER'S SIGNATURE DATE

SIG. INVENTORY NO. 06-0766

$$$$$$SYSTIME$$$$$$
$$$$$$USERNAME$$$$$$
$$$$$$DGNFILE$$$$$$
$$$$$$RSCFILE$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5883	SIG-5.0

SIGNAL FACE I.D.

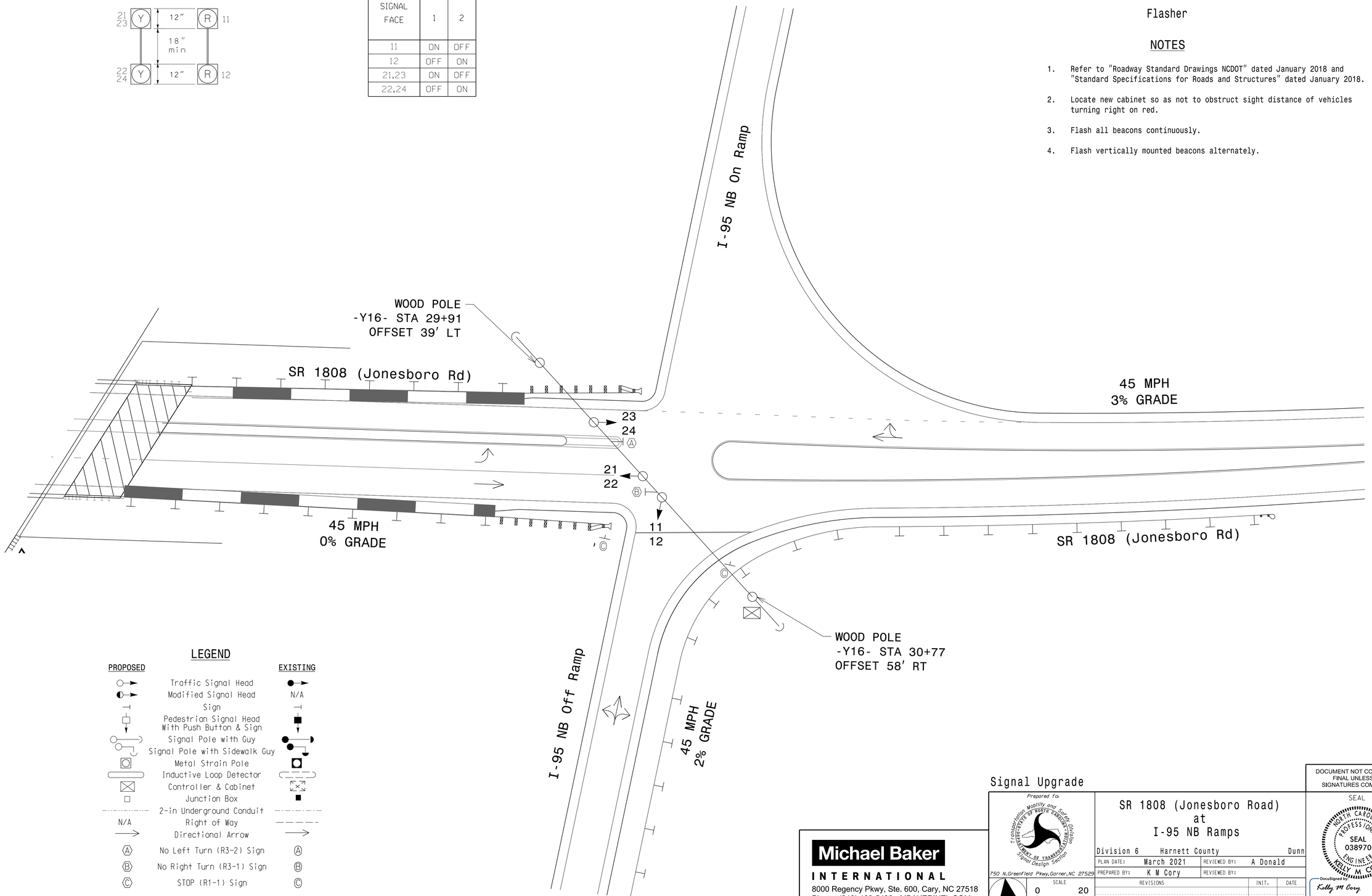
All Heads L.E.D.

TABLE OF OPERATION		
SIGNAL FACE	INTERVAL 1	INTERVAL 2
11	ON	OFF
12	OFF	ON
21,23	ON	OFF
22,24	OFF	ON

Flasher

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
3. Flash all beacons continuously.
4. Flash vertically mounted beacons alternately.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
A	No Left Turn (R3-2) Sign	A
B	No Right Turn (R3-1) Sign	B
C	STOP (R1-1) Sign	C

Signal Upgrade

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

SR 1808 (Jonesboro Road)
at
I-95 NB Ramps

Division 6 Harnett County Dunn

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

SCALE: 0 20 1" = 20'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

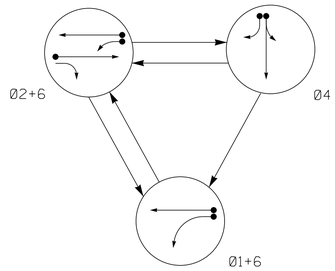
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY
DocuSigned by: Kelly M Cory 5/9/2021
ESEAL/DIGITAL SIGNATURE DATE

SIG. INVENTORY NO. 06-0836

$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-6.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

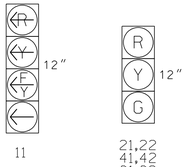
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø4	PHASE FLASH
11	←	←FY	←R	←Y
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



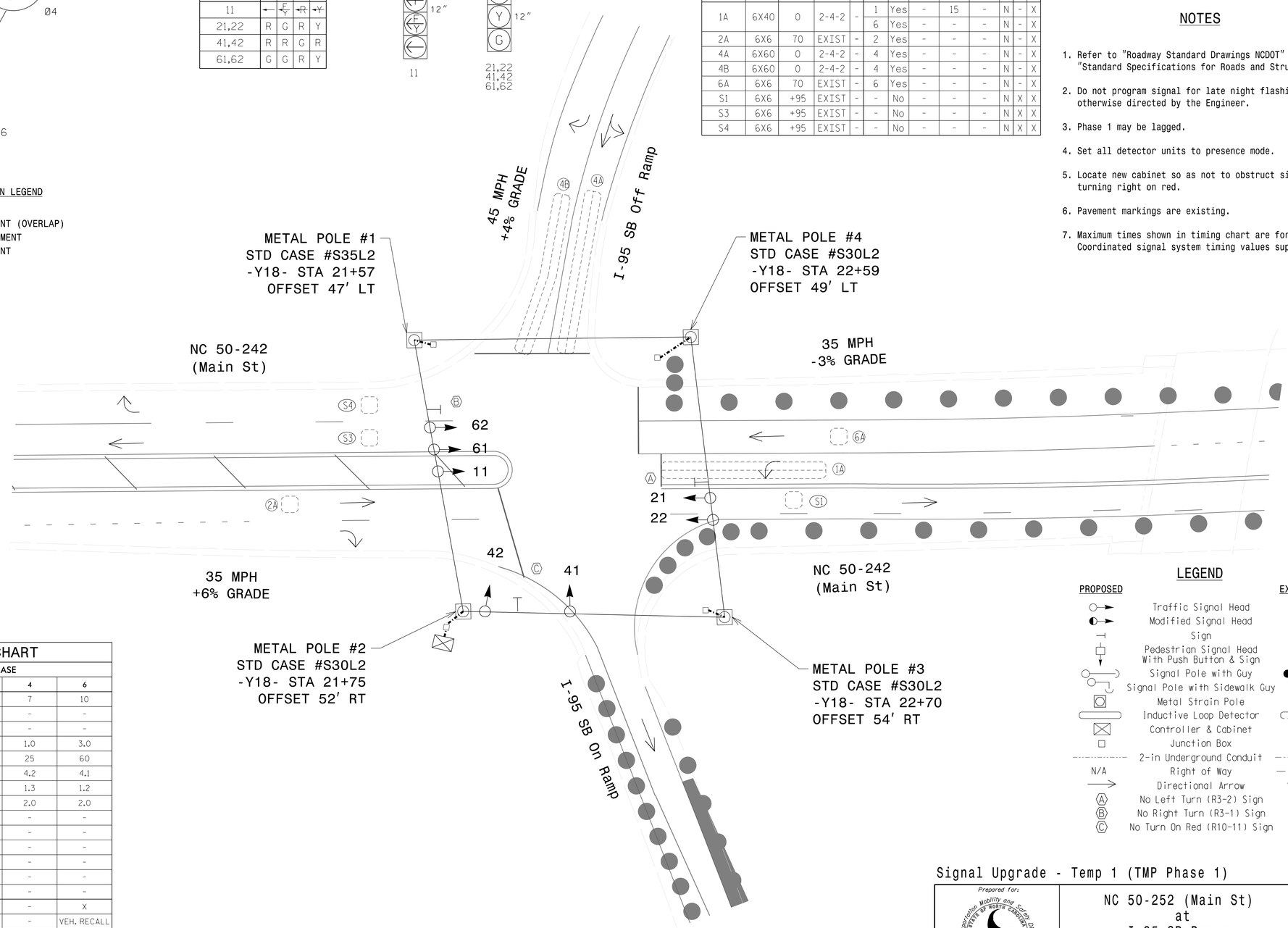
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	15	-	N	-	X
					6	Yes	-	-	-	N	-	X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
S1	6X6	+95	EXIST	-	-	No	-	-	-	N	X	X
S3	6X6	+95	EXIST	-	-	No	-	-	-	N	X	X
S4	6X6	+95	EXIST	-	-	No	-	-	-	N	X	X

3 Phase
Fully Actuated
Signal System #D04-20 Benson
NC 50-242 (Main St)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Pavement markings are existing.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
◎	Metal Strain Pole	◘
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	----------
→	Directional Arrow	→
Ⓐ	No Left Turn (R3-2) Sign	Ⓐ
Ⓑ	No Right Turn (R3-1) Sign	Ⓑ
Ⓒ	No Turn On Red (R10-11) Sign	Ⓒ

ASC/3 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green *	7	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	1.0	3.0	1.0	3.0
Max 1 *	25	60	25	60
Yellow	3.0	4.1	4.2	4.1
Red Clear	1.9	1.2	1.3	1.2
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

$$$$SYSTIMES$$$$
$$$$SYSTIMES$$$$
$$$$USERNAME$$$$

Signal Upgrade - Temp 1 (TMP Phase 1)

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

NC 50-252 (Main St)
at
I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

SCALE 0 20 1" = 20'

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

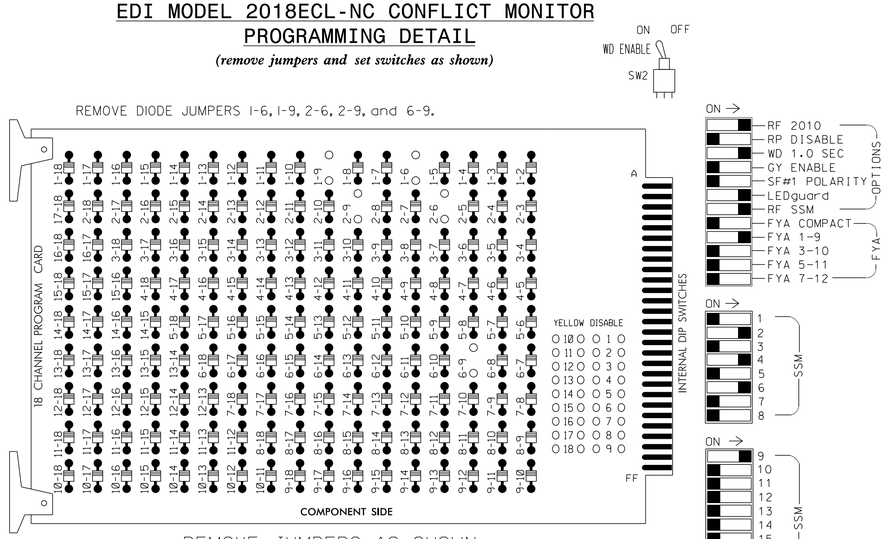
SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038970 KELLY M CORY

DocuSigned by: Kelly M Cory E2E2D0EE81C142E... SIGNATURE 4/26/2021 DATE

SIG. INVENTORY NO. 04-0218TI

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
4. The cabinet and controller are part of Signal System #D04-20 Benson.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 W/ AUX OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S5,S8,AUX S1
PHASES USED.....1,2,4,6
OVERLAP "A".....✳
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

✳ See overlap programing detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-6.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11 ★	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	NU	NU	11 ★	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	✳	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED				Ø 4 4B			SYS. DET. S3					ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø 6 6A	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SYS. DET. S4	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED							NOT USED					

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

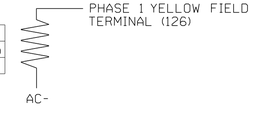
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N
2A	TB2-5,6	I2U	39	2	2	YES				N
4A	TB4-9,10	I6U	41	4	4	YES				N
4B	TB4-11,12	I6L	45	14	4	YES				N
✳ S1	TB6-9,10	I9U	60	11	SYS	NO				N
✳ S3	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES				N
✳ S4	TB7-9,10	J9U	59	15	SYS	NO				N

✳ System detector only. Remove any assigned vehicle phase.

[1] Add jumper from I1-W to J4-W, on rear of input file.

LOAD RESISTOR INSTALLATION DETAIL

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: 04-0218T1
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

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Electrical Detail - Sheet 1 of 2 - Temp 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 50-252 (Main St) at I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M. CORY

DocuSigned by: Kelly M Cory E2E270DEF85C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0218T1

$$$$$$SYSTIME$$$$$$
$$$$$$SYSDATE$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-6.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

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

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0218T1
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2 - Temp 1

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Traffic Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

NC 50-252 (Main St)
at
I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

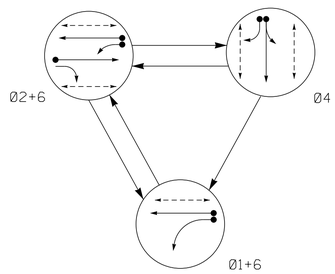
DocuSigned by: Kelly M Cory E2E270EFB5C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0218T1

$$$$$SYSTIME$$$$$
$$$$$SESSION$$$$$
$$$$$USERNAME$$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-7.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

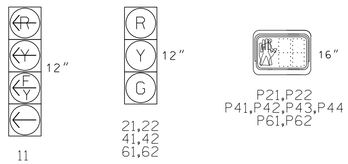
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø4	FLASH
11	←	← Y	↑ R	↑ Y
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
P21,P22	DW	W	DW	DRK
P41,P42 P43,P44	DW	DW	W	DRK
P61,P62	W	W	DW	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



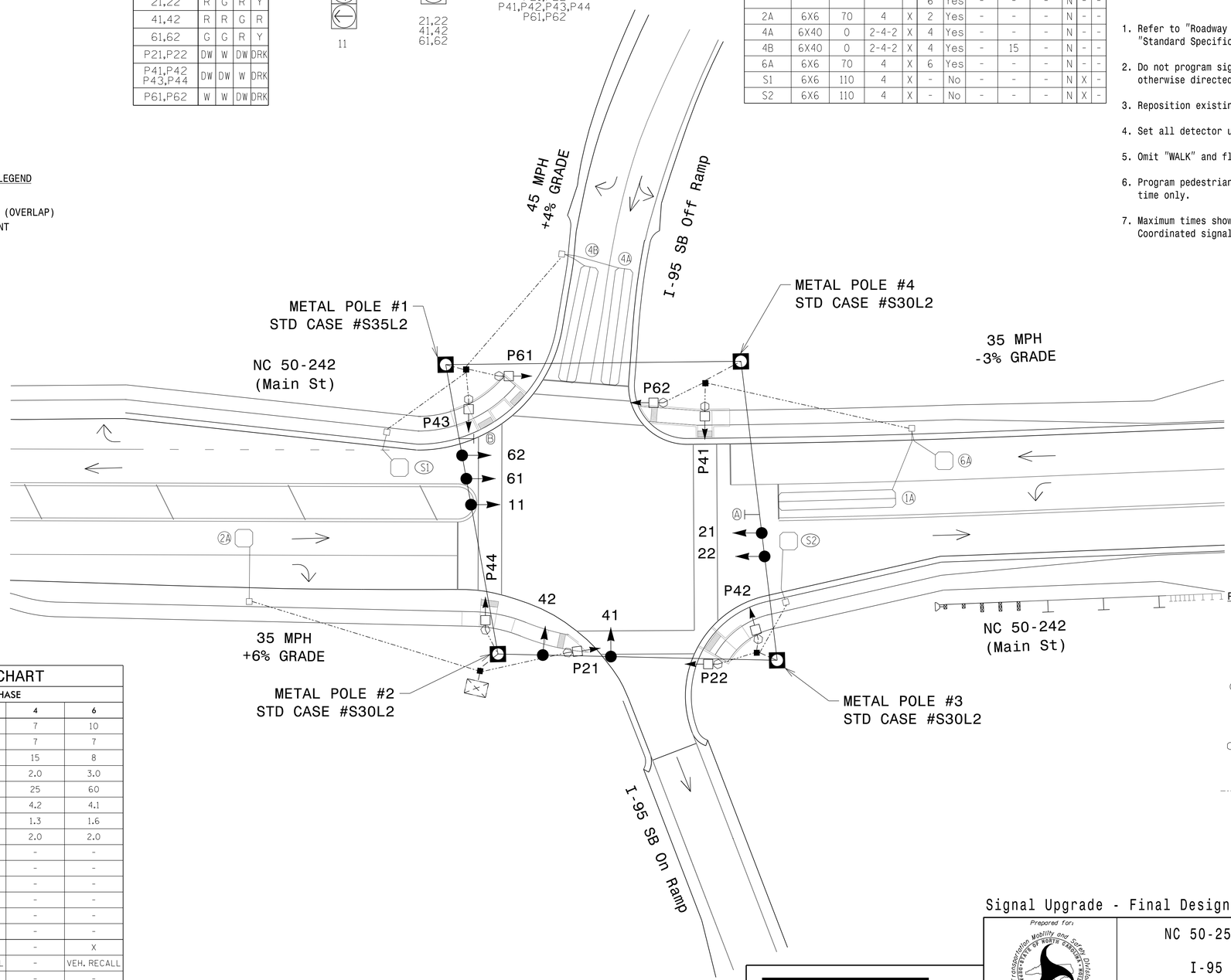
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR						PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	X	1	Yes	-	15	-	N	-	-
					6	Yes	-	-	-	N	-	-
2A	6X6	70	4	X	2	Yes	-	-	-	N	-	-
4A	6X40	0	2-4-2	X	4	Yes	-	-	-	N	-	-
4B	6X40	0	2-4-2	X	4	Yes	-	15	-	N	-	-
6A	6X6	70	4	X	6	Yes	-	-	-	N	-	-
S1	6X6	110	4	X	-	No	-	-	-	N	X	-
S2	6X6	110	4	X	-	No	-	-	-	N	X	-

3 Phase
Fully Actuated
Signal System #D04-20 Benson
NC 50-242 (Main St)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Reposition existing signal heads numbered 42, 61 and 62.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashhing "DON'T WALK" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Metal Strain Pole	
	Type II Signal Pedestal	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	No Left Turn (R3-2) Sign	
	No Right Turn (R3-1) Sign	
N/A	Wheelchair Ramp	

ASC/3 TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 4	PHASE 6
Min Green *	7	10	7	10
Walk *	-	7	7	7
Ped Clear	-	8	15	8
Veh. Extension *	2.0	3.0	2.0	3.0
Max 1 *	25	60	25	60
Yellow	3.0	4.1	4.2	4.1
Red Clear	2.3	1.6	1.3	1.6
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	X	-	X
Recall Position	-	VEH. RECALL	-	VEH. RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

$$$$SYSTIMES$$$$
$$$$SYSVERSION$$$$
$$$$USERNAME$$$$

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared for: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Transportation Mobility and Safety Division Signal Design Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 50-252 (Main St)
at
I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE: March 2021 REVIEWED BY: A Donald

PREPARED BY: K M Cory REVIEWED BY:

SCALE 0 20 1" = 20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021

SIGNATURE DATE

SIG. INVENTORY NO. 04-0218

Michael Baker
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8000 Regency Pkwy, Ste. 600, Cary, NC 27518
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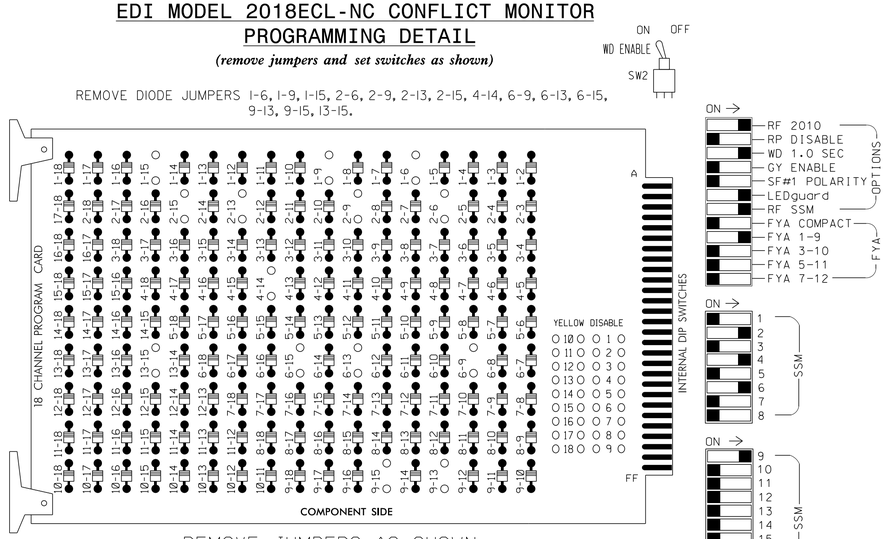
NC License No. : F-1084

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS I-6, I-9, I-15, 2-6, 2-9, 2-13, 2-15, 4-14, 6-9, 6-13, 6-15, 9-13, 9-15, 13-15.



REMOVE JUMPERS AS SHOWN

NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = DENOTES POSITION OF SWITCH

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
3. Program controller to start up in phase 2 Walk and 6 Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
5. The cabinet and controller are part of Signal System #D04-20 Benson.

EQUIPMENT INFORMATION

CONTROLLER.....2070LX
CABINET.....332 W/ AUX
SOFTWARE.....ECONOLITE ASC3-2070
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 W/ AUX OUTPUT FILE
LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S8,S9,AUX S1
PHASES USED.....1,2,2PED,4,4PED,6,6PED
OVERLAP "A".....✳
OVERLAP "B".....NOT USED
OVERLAP "C".....NOT USED
OVERLAP "D".....NOT USED

✳ See overlap programing detail on sheet 2

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-7.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	P21, P22	NU	41,42	P41,P42, P43,P44	NU	61,62	P61, P62	NU	NU	NU	11★	NU	NU	NU	NU	NU
RED		128			101			134										
YELLOW	✳	129			102			135										
GREEN		130			103			136										
RED ARROW													A121					
YELLOW ARROW													A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127																	
✋			113			104			119									
🚶			115			106			121									

NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

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.

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø4 4A	SLOT EMPTY	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED				Ø4 4B			SYS. DET. S2			Ø4 PED DC ISOLATOR	NOT USED	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	Ø6 6A	SLOT EMPTY	WIRED INPUT ⊗	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L		NOT USED												

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N
2A	TB2-5,6	I2U	39	2	2	YES				N
4A	TB4-9,10	I6U	41	4	4	YES				N
4B	TB4-11,12	I6L	45	14	4	YES		15		N
✳ S1	TB6-9,10	I9U	60	11	SYS	NO				N
✳ S2	TB6-11,12	I9L	62	13	SYS	NO				N
6A	TB3-5,6	J2U	40	6	6	YES				N
PED PUSH BUTTONS										
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED					
P41,P42, P43,P44	TB8-5,6	I12L	69	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED					

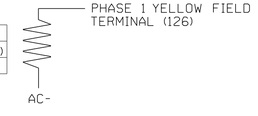
NOTE:
INSTALL DC ISOLATORS IN INPUT FILE SLOTS I12 AND I13.

✳ System detector only. Remove any assigned vehicle phase.

[1] Add jumper from I1-W to J4-W, on rear of input file.

LOAD RESISTOR INSTALLATION DETAIL

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: 04-0218
DESIGNED: March 2021
SEALED: 4/26/2021
REVISED: N/A

Electrical Detail - Sheet 1 of 2 - Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: North Carolina Department of Transportation, Mobility and Safety Division, Traffic Engineering Branch, Traffic Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

NC 50-252 (Main St)
at
I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E...
4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0218

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NC License No. : F-1084

$$$$$$SYSTIME$$$$$$
$$$$$$SYSTIMESS$$$$$$
$$$$$$USERNAME$$$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-7.2

ECONOLITE ASC/3-2070 OVERLAP PROGRAMMING DETAIL

(program controller as shown)

1. From Main Menu select `2. CONTROLLER`
2. From CONTROLLER Submenu select `2. VEHICLE OVERLAPS`

OVERLAP A

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

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

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

FLASHING ARROW OUTPUT.....CH9 ISOLATE

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0218
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2 - Final

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 50-252 (Main St)
at
I-95 SB Ramps

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

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

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NC License No. : F-1084

SEAL
SEAL 038970
KELLY M CORY

DocuSigned by:
Kelly M Cory
E2F270FFB1C142E...

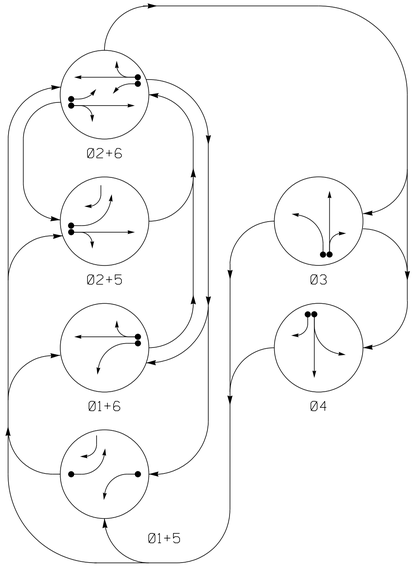
SIGNATURE	DATE
Kelly M Cory	4/26/2021

SIG. INVENTORY NO. 04-0218

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-8.0

6 Phase
Fully Actuated
Signal System #D04-20 Benson
NC 50-242 (Main St)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

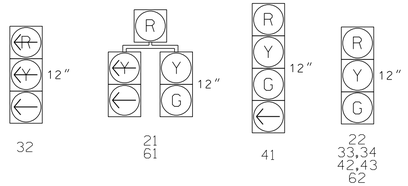


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21	←R	R	←G	G	R	R	Y
22	R	R	G	G	R	R	Y
32	~~←R~~	~~R~~	~~←R~~	~~R~~	~~←~~	~~R~~	~~R~~
33,34	R	R	R	R	G	R	R
41	R	R	R	R	←G	R	R
42,43	R	R	R	R	G	R	R
61	←R	G	R	G	R	R	Y
62	R	G	R	G	R	R	Y

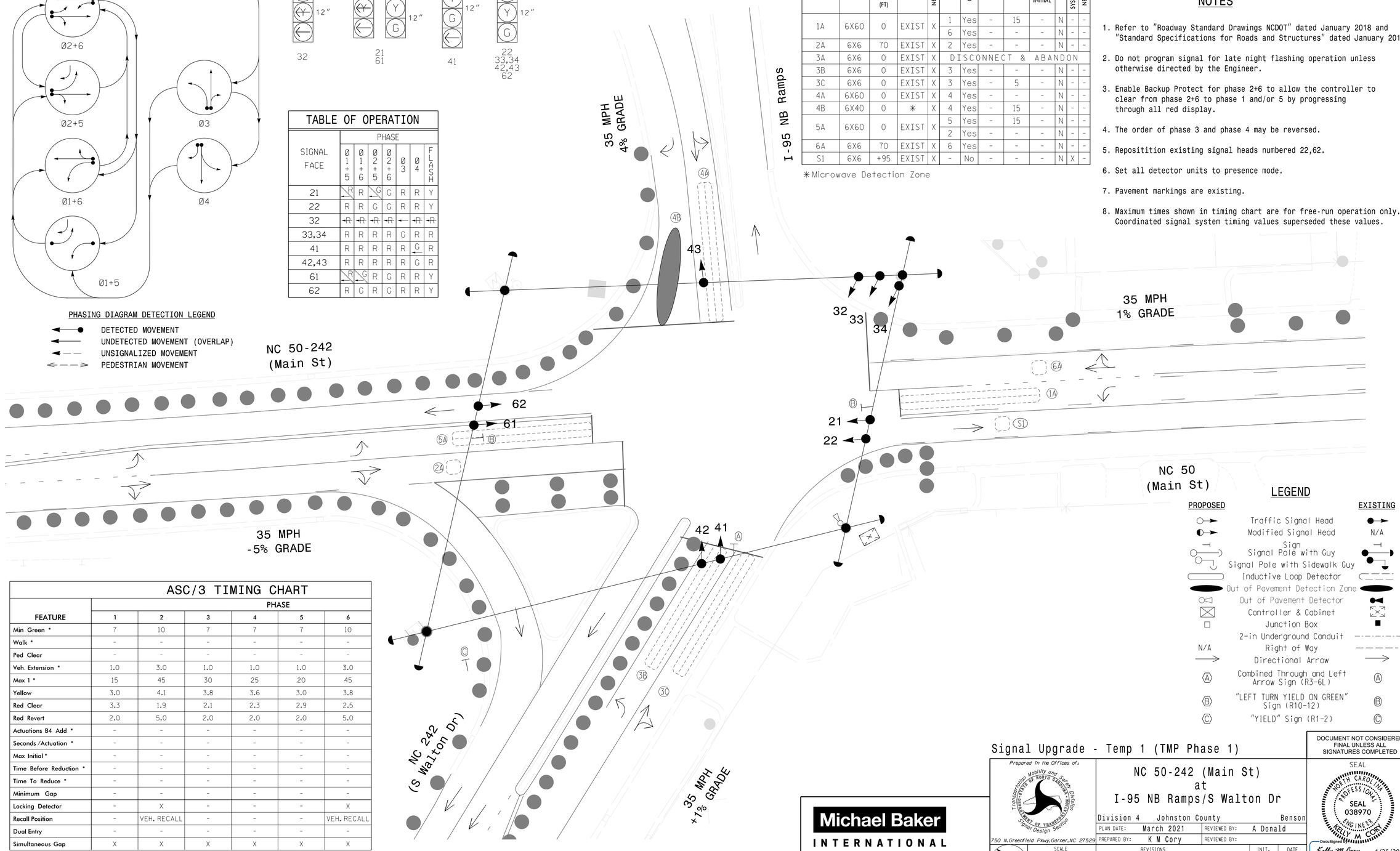
ASC/3 DETECTOR INSTALLATION CHART

DETECTOR LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	EXIST	X	1	Yes	-	15	-	N	-	-
					6	Yes	-	-	-	N	-	-
2A	6X6	70	EXIST	X	2	Yes	-	-	-	N	-	-
3A	6X6	0	EXIST	X	DISCONNECT & ABANDON							
3B	6X6	0	EXIST	X	3	Yes	-	-	-	N	-	-
3C	6X6	0	EXIST	X	3	Yes	-	5	-	N	-	-
4A	6X60	0	EXIST	X	4	Yes	-	-	-	N	-	-
4B	6X40	0	✳	X	4	Yes	-	15	-	N	-	-
5A	6X60	0	EXIST	X	5	Yes	-	15	-	N	-	-
					2	Yes	-	-	-	N	-	-
6A	6X6	70	EXIST	X	6	Yes	-	-	-	N	-	-
S1	6X6	+95	EXIST	X	-	No	-	-	-	N	X	-

✳Microwave Detection Zone

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Enable Backup Protect for phase 2+6 to allow the controller to clear from phase 2+6 to phase 1 and/or 5 by progressing through all red display.
4. The order of phase 3 and phase 4 may be reversed.
5. Repositition existing signal heads numbered 22,62.
6. Set all detector units to presence mode.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⬭	Out of Pavement Detection Zone	⬭
⋈	Out of Pavement Detector	⋈
⊠	Controller & Cabinet	⊠
□	Junction Box	■
	2-in Underground Conduit	
N/A	Right of Way	
→	Directional Arrow	→
Ⓐ	Combined Through and Left Arrow Sign (R3-6L)	Ⓐ
Ⓑ	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	Ⓑ
Ⓒ	"YIELD" Sign (R1-2)	Ⓒ

ASC/3 TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6
Min Green *	7	10	7	7	7	10
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	3.0	1.0	1.0	1.0	3.0
Max 1 *	15	45	30	25	20	45
Yellow	3.0	4.1	3.8	3.6	3.0	3.8
Red Clear	3.3	1.9	2.1	2.3	2.9	2.5
Red Revert	2.0	5.0	2.0	2.0	2.0	5.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X
Recall Position	-	VEH. RECALL	-	-	-	VEH. RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

$$$$SIGTIMES$$$$
$$$$SIGTIMES_REVISION$$$$
$$$$USERNAME$$$$

Signal Upgrade - Temp 1 (TMP Phase 1)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 50-242 (Main St)
at
I-95 NB Ramps/S Walton Dr

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

SCALE 0 20 1" = 20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0209TI

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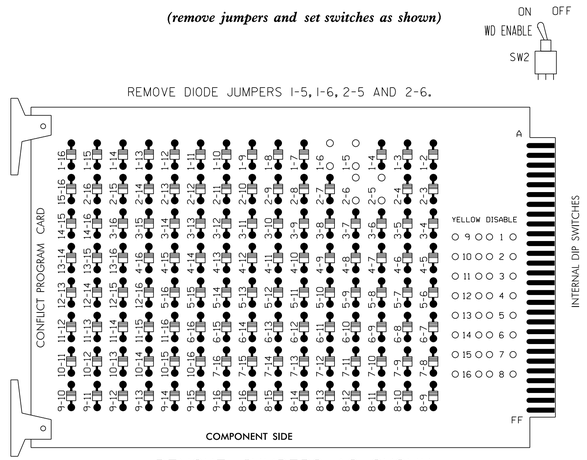
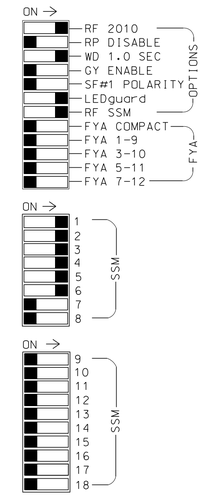
NC License No. : F-1084

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN



■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
4. The cabinet and controller are part of Signal System #D04-20 Benson.

EQUIPMENT INFORMATION

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

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-8.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S2P	S3		S4		S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3		4		4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	61	21,22	NU	32	33,34	41	42,43	NU	21	61,62	NU	NU	NU	NU
RED	✳	128			116	101	101		✳	134				
YELLOW		129			117	102	102			135				
GREEN		130			118	103	103			136				
RED ARROW				116										
YELLOW ARROW	126			117					132					
GREEN ARROW	127			118		103			133					

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø1 1A	Ø2 2A	SLOT EMPTY	WIRED ⊗ INPUT	NOT USED	Ø3 3C	Ø4 4A	SLOT EMPTY	SYS. DET. S1	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L	NOT USED	NOT USED			Ø3 3B	NOT USED	NOT USED		NOT USED					ST DC ISOLATOR
FILE "J"	U	Ø5 5A	Ø6 6A	SLOT EMPTY	WIRED ⊗ INPUT	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED												

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

FS = FLASH SENSE
ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND TIME	DELAY TIME	ADDED INITIAL	DETECTOR TYPE
1A [1]	TB2-1,2	I1U	56	1	1	YES		15		N
	-	J4U	48	26	6	YES				N
2A	TB2-5,6	I2U	39	2	2	YES				N
3B	TB4-7,8	I5L	58	3	3	YES				N
3C	TB4-9,10	I6U	41	4	3	YES		5		N
4A	TB6-1,2	I7U	65	34	4	YES				N
5A [2]	TB3-1,2	J1U	55	5	5	YES		15		N
	-	I4U	47	22	2	YES				N
6A	TB3-5,6	J2U	40	6	6	YES				N
✳ S1	TB6-9,10	I9U	60	11	SYS	NO				N

✳ System detector only. Remove any assigned vehicle phase.

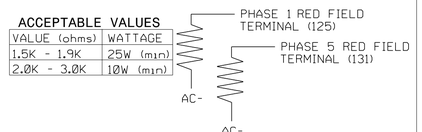
[1] Add jumper from I1-W to J4-W. on rear of input file.

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

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

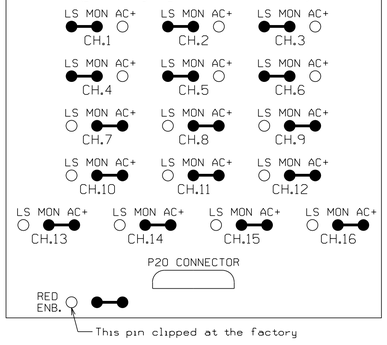
ACCEPTABLE VALUES	
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



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

RED MONITOR BOARD PROGRAMMING

(position jumpers as shown below)



SPECIAL DETECTOR NOTE

For loop 4B, install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-0209T1
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

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NC License No. : F-1084

Electrical Detail - Sheet 1 of 3 - Temp 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

NC 50-242 (Main St)
at
I-95 NB Ramps/S Walton Dr

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

Prepared for:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Section
750 N.Greenfield Pkwy.Garner,NC 27529

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY
DocuSigned by: Kelly M Cory E2F270FFB1C142E...
4/26/2021
SIGNATURE DATE
SIG. INVENTORY NO. 04-0209T1

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-8.2

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL TO PREVENT POSSIBLE BACKUP/RED REVERT ISSUE

(program controller as shown)

Under very specific circumstances when backing up from 2+6 to 1+6 or 2+6 to 2+5, the controller will not reserve phase 2 or phase 6 after going through Red Clear and Red Revert. This logic ensures backup protect and Red Revert work properly.

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [2. LOGIC STATEMENTS]

ENTER A "1" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    1  COPY FROM:  1  ACTIVE:N  (T/F)
IF     VEH YELLOW ON PH     2    IS   ON
AND    CTR ON PHASE CHECK   3    IS   OFF
AND    CTR ON PHASE CHECK   4    IS   OFF

THEN   LP  SET LOGIC FLAG   1        ON

ELSE
```

IF PHASE 2 IS CLEARING AND THERE ARE NO SIDE STREET CALLS, SET A LOGIC FLAG.

ENTER A "2" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    2  COPY FROM:  2  ACTIVE:N  (T/F)
IF     LP FLAG              1    IS   ON

THEN   CTR CALL PHASE       1        ON

ELSE
```

IF THE LOGIC FLAG IS SET, THE CONTROLLER IS BACKING UP TO PHASE 1 SO PLACE A CONTROLLER CALL TO PHASE 1.

ENTER A "3" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    3  COPY FROM:  3  ACTIVE:N  (T/F)
IF     VEH GREEN ON PH      1    IS   ON

THEN   LP SET LOGIC FLAG    1        OFF

ELSE
```

PHASE 1 IS BEING SERVED SO CLEAR THE LOGIC FLAG AND RELEASE THE PHASE 1 CONTROLLER CALL.

ENTER A "4" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    4  COPY FROM:  4  ACTIVE:N  (T/F)
IF     VEH YELLOW ON PH     6    IS   ON
AND    CTR ON PHASE CHECK   3    IS   OFF
AND    CTR ON PHASE CHECK   4    IS   OFF

THEN   LP  SET LOGIC FLAG   5        ON

ELSE
```

IF PHASE 6 IS CLEARING AND THERE ARE NO SIDE STREET CALLS, SET A LOGIC FLAG.

ENTER A "5" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    5  COPY FROM:  5  ACTIVE:N  (T/F)
IF     LP FLAG              5    IS   ON

THEN   CTR CALL PHASE       5        ON

ELSE
```

IF THE LOGIC FLAG IS SET, THE CONTROLLER IS BACKING UP TO PHASE 5 SO PLACE A CONTROLLER CALL TO PHASE 5.

ENTER A "6" IN THE LP# FIELD, PRESS 'ENTER', AND PROGRAM AS SHOWN.

```
LP#:    6  COPY FROM:  6  ACTIVE:N  (T/F)
IF     VEH GREEN ON PH      5    IS   ON

THEN   LP SET LOGIC FLAG    5        OFF

ELSE
```

PHASE 5 IS BEING SERVED SO CLEAR THE LOGIC FLAG AND RELEASE THE PHASE 5 CONTROLLER CALL.

END PROGRAMMING

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

ENABLE LOGIC PROCESSOR STATEMENTS 1-6 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO ENABLE THEM.

```
LOGIC STATEMENT CONTROL
          1  2  3  4  5  6  7  8  9  0  1  2  3  4  5
LP 1-15   E  E  E  E  E  E  .  .  .  .  .  .  .  .  .
LP 16-30  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 31-45  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 46-60  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 61-75  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
LP 76-90  .  .  .  .  .  .  .  .  .  .  .  .  .  .  .
```

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0209T1
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

$$$$$$SYSTEMS$$$$$
$$$$$$SIGNALS_VERSION$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$

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NC License No. : F-1084

Electrical Detail - Sheet 2 of 3 - Temp 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signals Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 50-242 (Main St)
at
I-95 NB Ramps/S Walton Dr

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0209T1

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-8.3

ECONOLITE ASC/3-2070 BACKUP PROTECTION ENABLE PROGRAMMING

(program controller as shown)

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

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

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

END PROGRAMMING

NOTE

1. 'B' without a 'C' programmed for the 'TIMING' (row) phase inhibits the controller from servicing the 'BACKUP' (column) phase when the 'TIMING' (row) phase is active, or next, until the controller goes through Red Revert and Red Clear. Make sure the proper Red Revert and Red Clear times shown on the Signal Design plan are programmed in the controller phase timing.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0209T1
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 3 of 3 - Temp 1

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: Traffic Engineering Branch, Traffic Engineering Unit, Transportation Mobility and Safety Division, NC Department of Transportation, Traffic Engineering & Signal Management Section

750 N.Greenfield Pkwy.Garner,NC 27529

NC 50-242 (Main St)
at
I-95 NB Ramps/S Walton Dr

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0209T1

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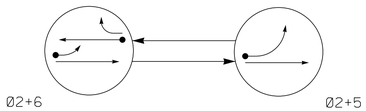
KMCory AT CARY.KCORY

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-9.0

PHASING DIAGRAM

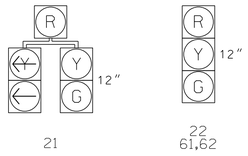


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



ASC/3 DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
5A	6X40	0	✳	X	5	Yes	-	15	-	N	-	X
6A	6X6	70	✳	X	6	Yes	-	-	-	N	-	X

✳ Microwave Detection Zone

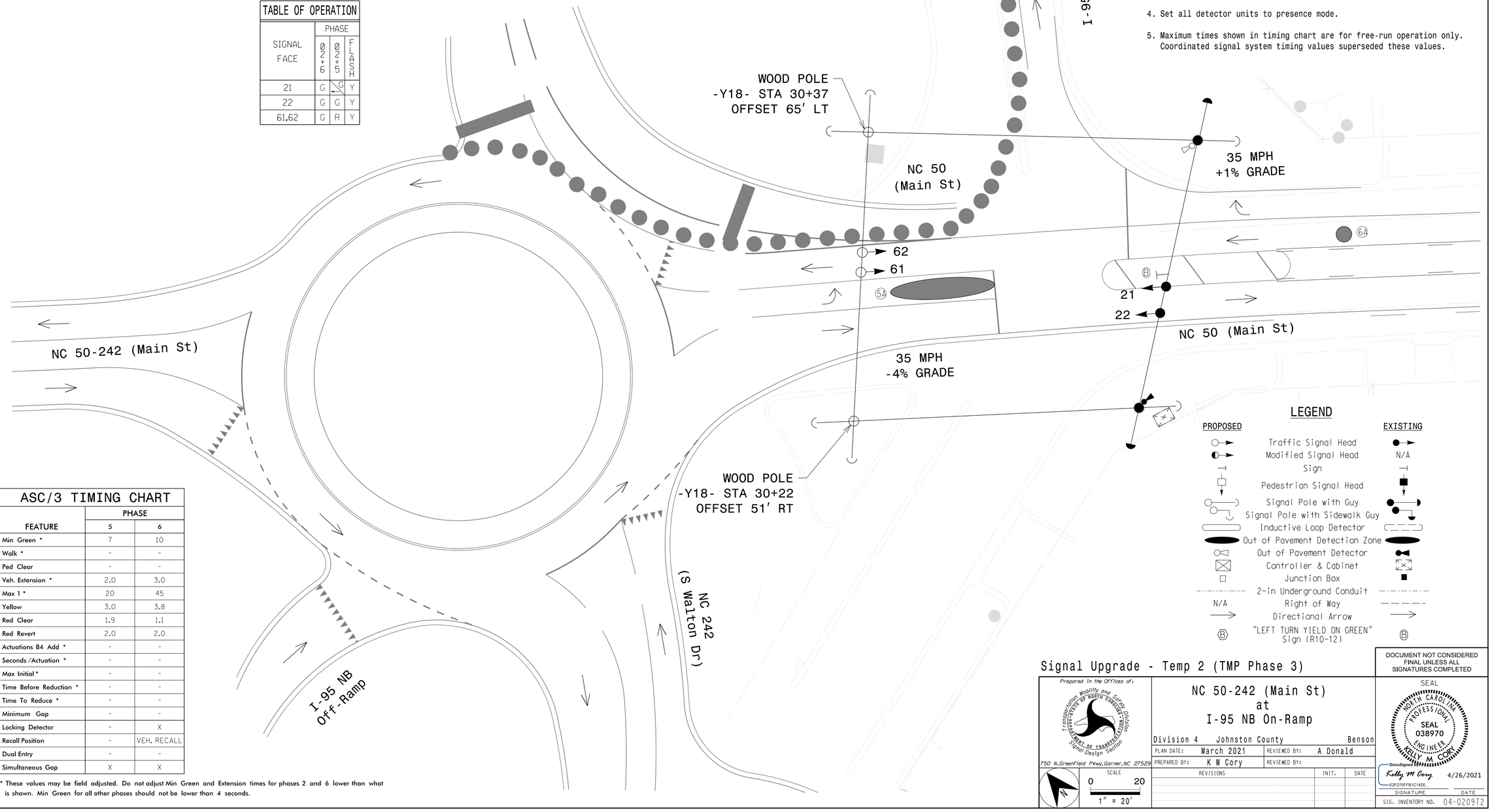
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø2+5	FLASH
21	G	G	Y
22	G	G	Y
61,62	G	R	Y

2 Phase
Fully Actuated
Signal System #D04-20 Benson
NC 50-242 (Main St)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Repositition existing signal heads numbered 21,22.
4. Set all detector units to presence mode.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values superseded these values.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
▼	Pedestrian Signal Head	■
○—	Signal Pole with Guy	●—
○—🚶	Signal Pole with Sidewalk Guy	●—🚶
▭	Inductive Loop Detector	▭
⬭	Out of Pavement Detection Zone	⬭
○⋈	Out of Pavement Detector	●⋈
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	- - - - -
→	Directional Arrow	→
Ⓑ	"LEFT TURN YIELD ON GREEN" Sign (R10-12)	Ⓑ

ASC/3 TIMING CHART

FEATURE	PHASE 5	PHASE 6
Min Green *	7	10
Walk *	-	-
Ped Clear	-	-
Veh. Extension *	2.0	3.0
Max 1 *	20	45
Yellow	3.0	3.8
Red Clear	1.9	1.1
Red Revert	2.0	2.0
Actuations B4 Add *	-	-
Seconds /Actuation *	-	-
Max Initial *	-	-
Time Before Reduction *	-	-
Time To Reduce *	-	-
Minimum Gap	-	-
Locking Detector	-	X
Recall Position	-	VEH. RECALL
Dual Entry	-	-
Simultaneous Gap	X	X

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

$$$$SYSTIME$$$$
$$$$SYSTIME$$$$
$$$$VERSION$$$$
$$$$USERNAME$$$$

Signal Upgrade - Temp 2 (TMP Phase 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

NC 50-242 (Main St)
at
I-95 NB On-Ramp

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	A Donald
PREPARED BY:	K M Cory	REVIEWED BY:	

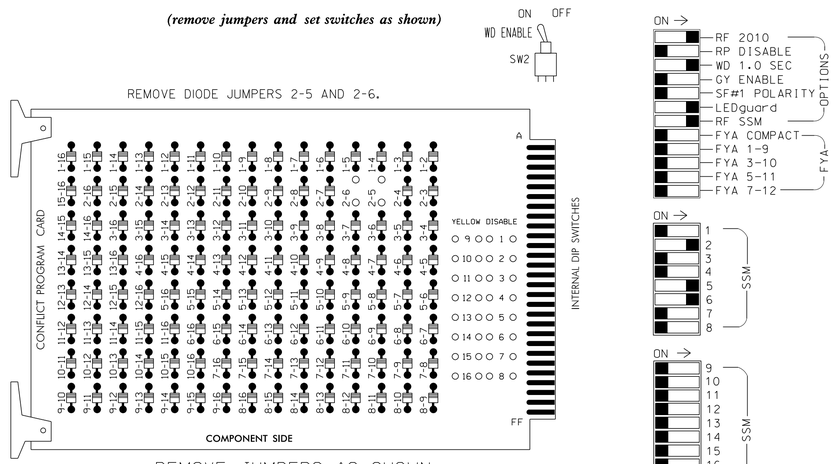
SCALE
0 20
1" = 20'

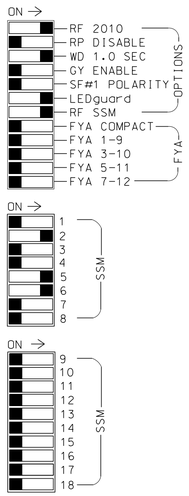
REVISIONS	INIT.	DATE

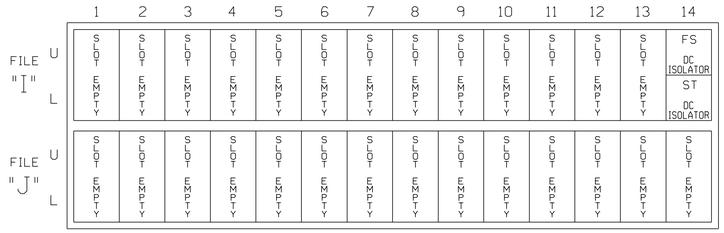
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

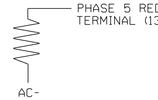
DocuSigned by: Kelly M Cory 4/26/2021
E2F270FFB1C142E...
SIGNATURE DATE

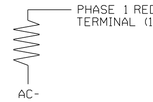
SIG. INVENTORY NO. 04-0209T2











PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-9.1

EDI MODEL 2010ECL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
4. The cabinet and controller are part of Signal System #D04-20 Benson.

EQUIPMENT INFORMATION

CONTROLLER.............2070LX
CABINET................332
SOFTWARE...............ECONOLITE ASC3-2070
CABINET MOUNT..........BASE
OUTPUT FILE POSITIONS...12
LOAD SWITCHES USED......S2,S5,S6
PHASES USED............2,5,6
OVERLAPS...............NONE

SIGNAL HEAD HOOK-UP CHART

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

NU = Not Used

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

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	FS DC ISOLATOR
	L														ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

SPECIAL DETECTOR NOTE

Install a multizone microwave detection system for vehicle detection for zone 5A and 6A. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

LOAD RESISTOR INSTALLATION DETAIL

ACCEPTABLE VALUES

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

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

LOAD RESISTOR REMOVAL DETAIL

ACCEPTABLE VALUES

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

NOTE: Remove this resistor, which was installed in Temp 1, as this phase has now been removed from the signal design

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0209T2
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

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NC License No. : F-1084

Electrical Detail - Sheet 1 of 2 - Temp 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
750 N.Greenfield Pkwy,Garner,NC 27529

NC 50-242 (Main St)
at
I-95 NB On-Ramp

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W M Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
SEAL 038970
KELLY M CORY

DocuSigned by:
Kelly M Cory
E2F270FFB1C142E...

SIGNATURE	DATE
Kelly M Cory	4/26/2021

SIG. INVENTORY NO. 04-0209T2

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SIG-9.2

ECONOLITE ASC/3-2070 LOGIC PROCESSOR PROGRAMMING DETAIL TO REMOVE PREVENTION OF POSSIBLE BACKUP/RED REVERT ISSUE

(program controller as shown)

Reprogram controller as shown to remove logic used to ensure backup protect and Red Revert, this logic is no longer needed with the current phasing.

1. From Main Menu select [1. CONFIGURATION]
2. From CONFIGURATION Submenu select [8. LOGIC PROCESSOR]
3. From LOGIC PROCESSOR Submenu select [1. LOGIC STATEMENT CONTROL]

DISABLE LOGIC PROCESSOR STATEMENTS 1-6 BY POSITIONING THE CURSOR OVER THE FIELDS SHOWN BELOW AND USING THE TOGGLE KEY TO DISABLE THEM.

LOGIC STATEMENT CONTROL

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
LP 1-15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 16-30	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 31-45	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 46-60	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 61-75	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
LP 76-90	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

END PROGRAMMING

ECONOLITE ASC/3-2070 DISABLE BACKUP PROTECTION PROGRAMMING

(program controller as shown)

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

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

ENABLE BACKUP PREVENT

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

END PROGRAMMING

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 04-0209T2
DESIGNED: March 2021
SEALED: 04/26/2021
REVISED: N/A

Electrical Detail - Sheet 2 of 2 - Temp 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:
Traffic Engineering Branch, Traffic Engineering Unit, Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Signals Management Section
750 N.Greenfield Pkwy.Garner,NC 27529

NC 50-242 (Main St)
at
I-95 NB On-Ramp

Division 4 Johnston County Benson

PLAN DATE:	March 2021	REVIEWED BY:	W W Yalch
PREPARED BY:	K M Cory	REVIEWED BY:	

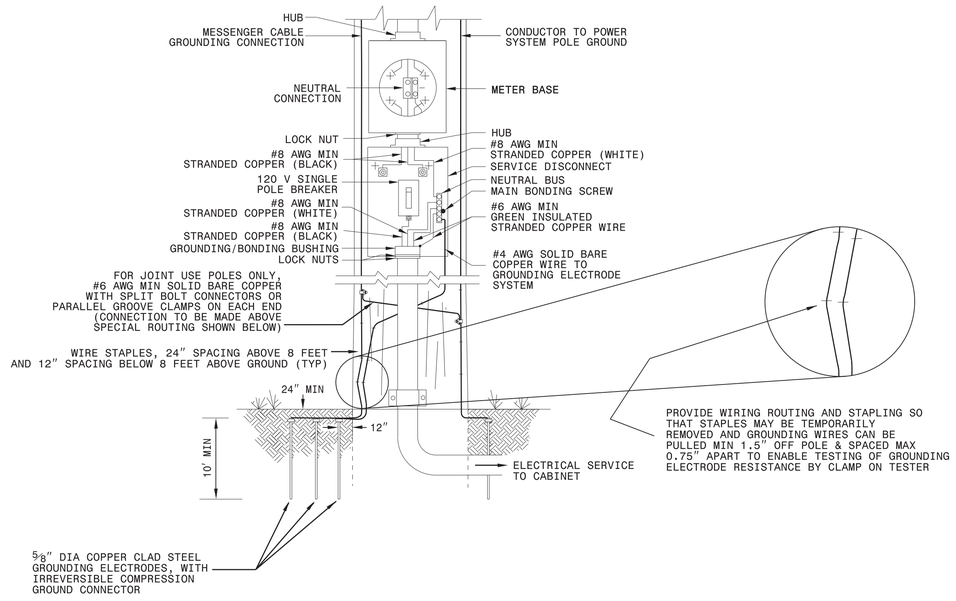
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

SIG. INVENTORY NO. 04-0209T2

PROJECT NO.	SHEET NO.
I-5878, I-5883, I-5986B	Sig.10.0



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

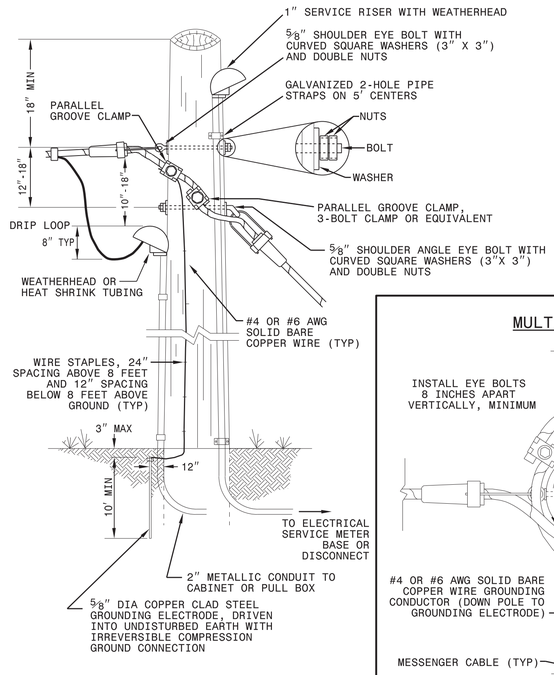
ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

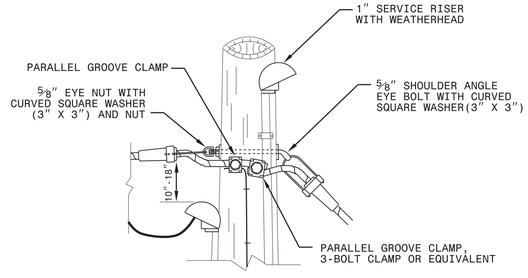
SHEET 1 OF 1

1700D01

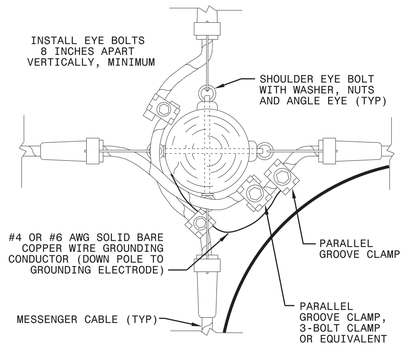
TWO-BOLT METHOD (PREFERRED)



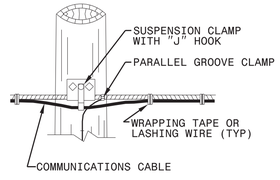
ONE-BOLT METHOD



MULTIPLE SPANS



COMMUNICATIONS CABLE AT INTERMEDIATE POLE



NOTE

FOR CONNECTING MESSENGER TO MESSENGER, USE PARALLEL GROOVE CLAMP, 3-BOLT CLAMP OR EQUIVALENT. FOR CONNECTING COPPER WIRE TO MESSENGER, USE PARALLEL GROOVE CLAMP.

1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

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

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032108 ENGINEER MOHD A. ASLAMI

DocuSigned by: Mohd Aslami
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10/11/2017
DATE

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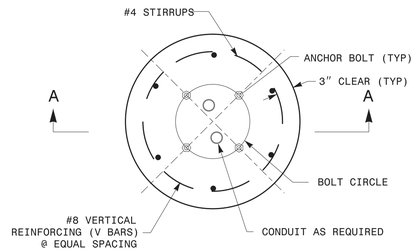
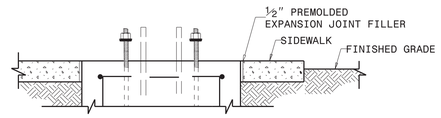
PROJECT NO.	SHEET NO.
I-5878, I-5883, I-5986B	Sig.10.1



PEDESTAL FOUNDATION - PLAN VIEW

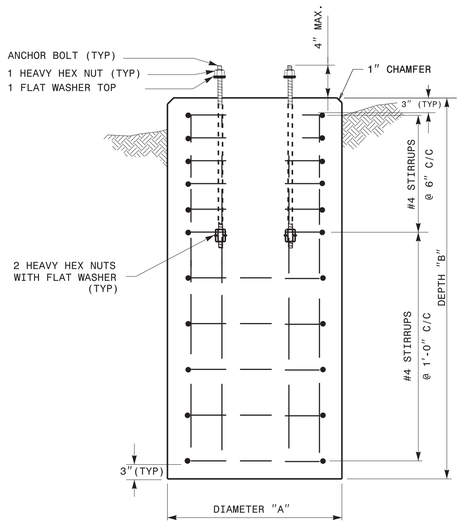


PEDESTAL FOUNDATION DETAILS FOR SIDEWALK

NOTES:

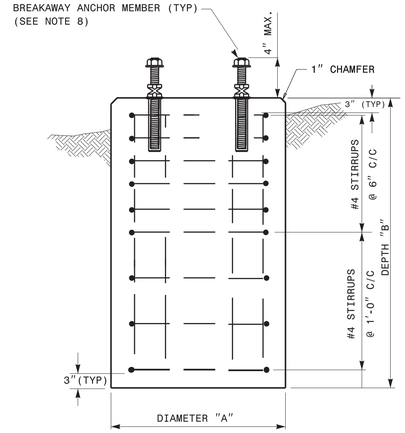
1. CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
2. COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
3. USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION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

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



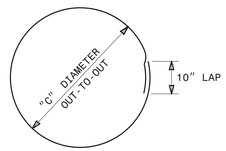
TYPES I, II & III

SECTION A-A

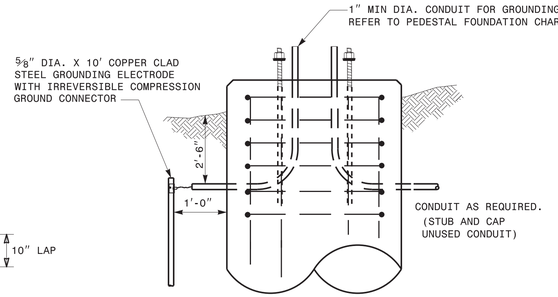


TYPES I & II ONLY

SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

PEDESTAL FOUNDATION TYPE AND SIZE

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

REINFORCING STEEL SCHEDULE

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

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

1-18

ENGLISH STANDARD DRAWING FOR

PEDESTALS

FOUNDATIONS

SHEET 1 OF 1

1743D01

See Plate for Title

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Prepared in the Offices of:

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

750 N. Greenfield Parkway
Garner, NC 27529

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

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

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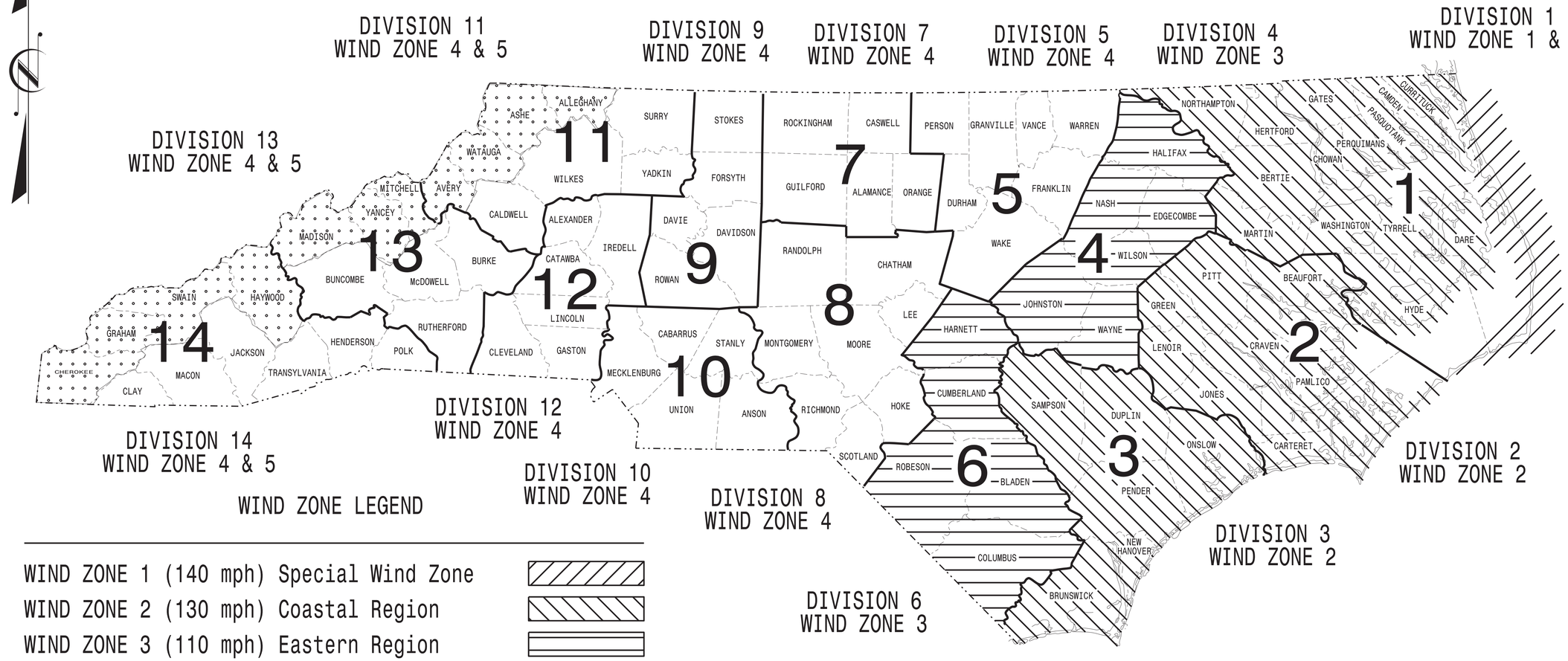
POLE STANDARDS

NCDOT METAL POLES

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PROJECT I.D. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M1

STANDARD DRAWINGS FOR ALL METAL POLES



WIND ZONE LEGEND

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

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

Prepared In the Offices of:

Transportation Mobility and Safety Division
Signal Design Section
STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

750 N.Greenfield Pkwy.
Garner,NC 27529

Designed in conformance with the latest 2015 Interim to the 6th Edition 2013

AASHTO

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

INDEX OF PLANS

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION – ITS AND SIGNALS UNIT

M.M. MCDIARMID, P.E. – STATE ITS AND SIGNALS ENGINEER

J. P. GALLOWAY, P.E. – STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. – ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL

NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

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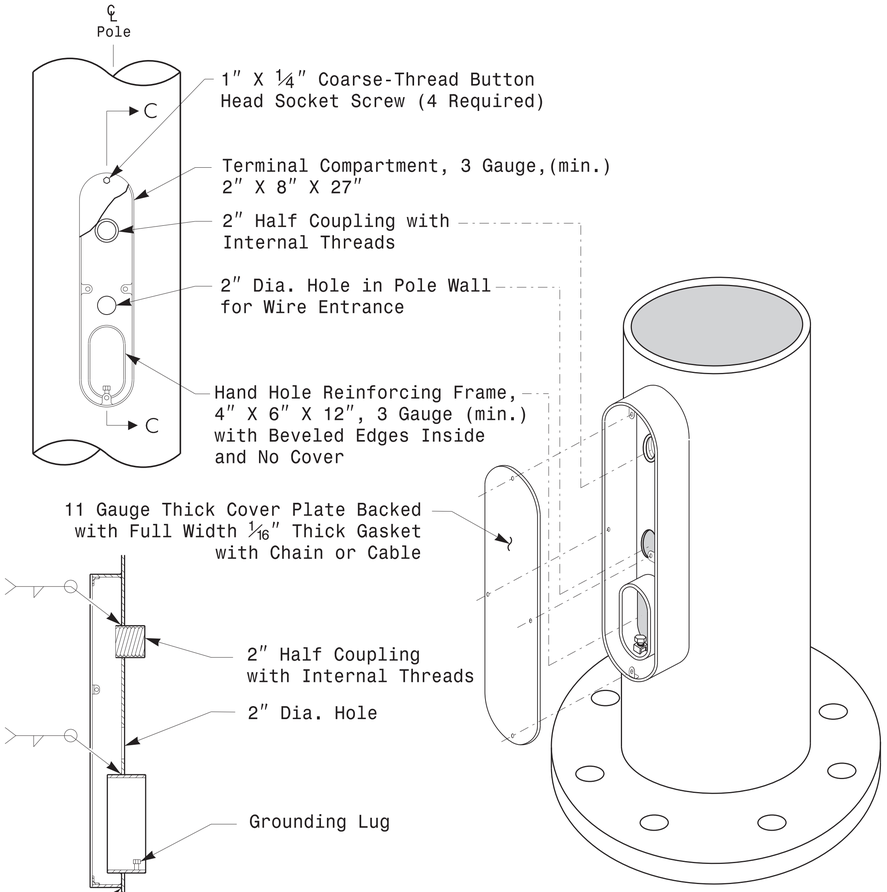
10/11/2017
DATE

PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M2

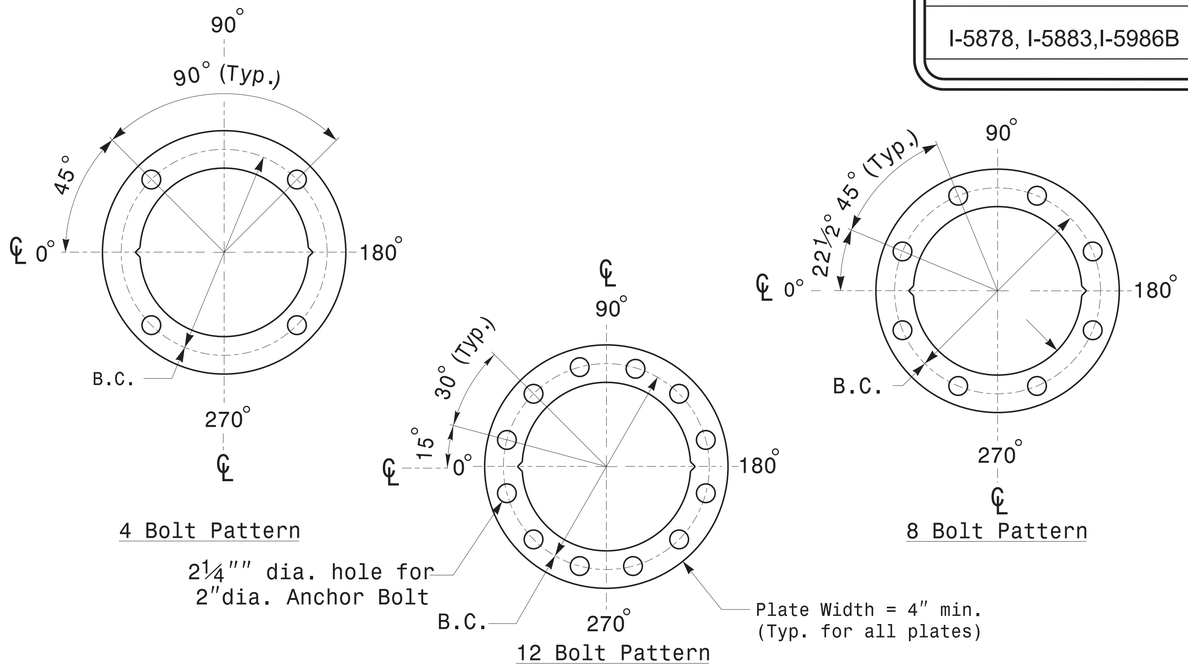
Fabrication Details – All Metal Poles



Section C-C

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

Terminal Compartment Detail



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

Base Plate Template and Anchor Bolt Lock Plate Details

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

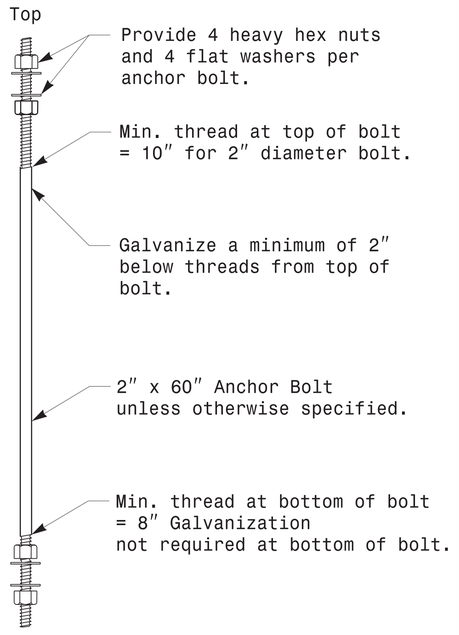
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

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

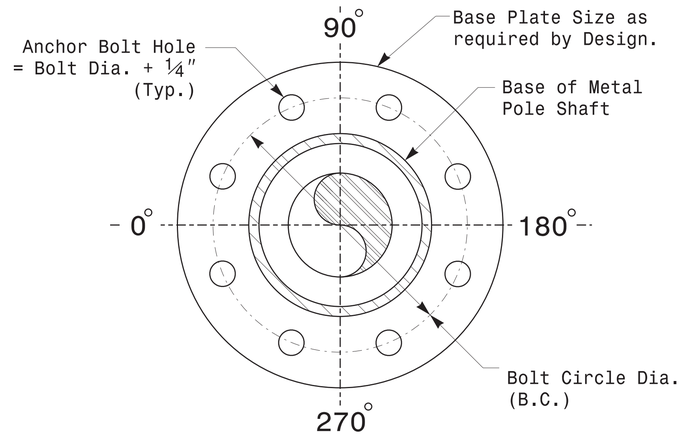
Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)

Notes:
1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details



Anchor Bolt Detail



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

Typical Base Plate Detail

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

Typical Fabrication Details For All Metal Poles

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

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44E8E32E147E4C4...

10/11/2017
DATE

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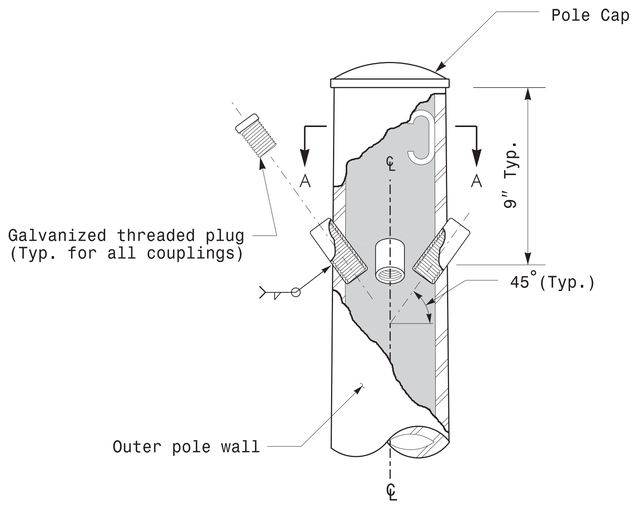
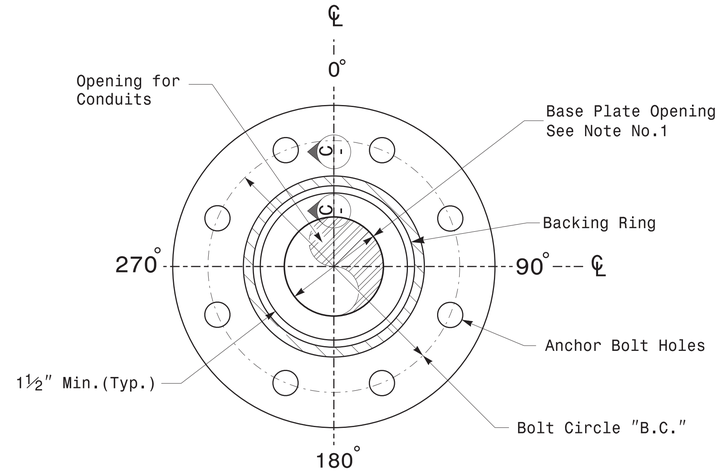
PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M3

Fabrication Details – Strain Poles



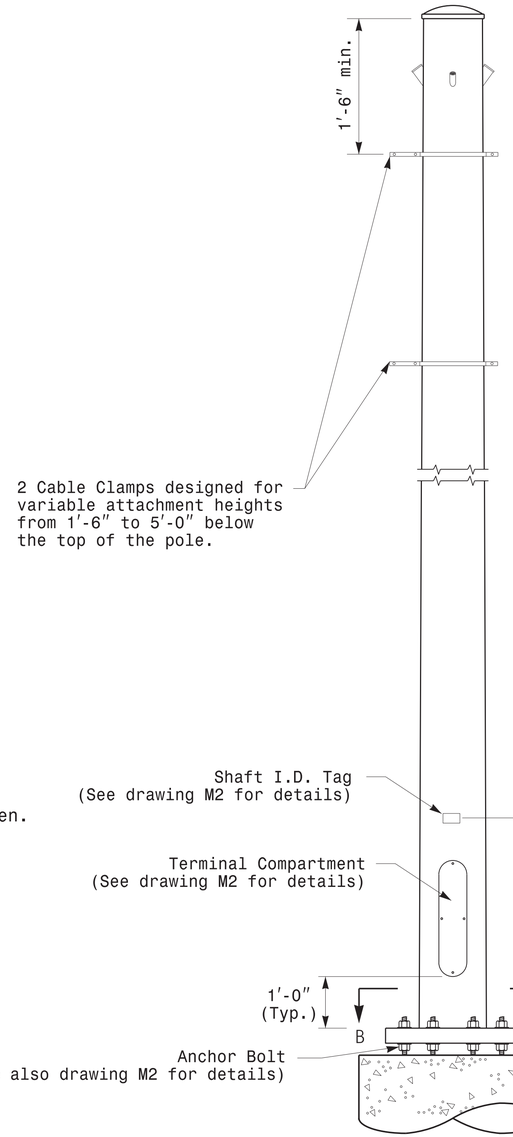
Cable Entrances at Top of Pole

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

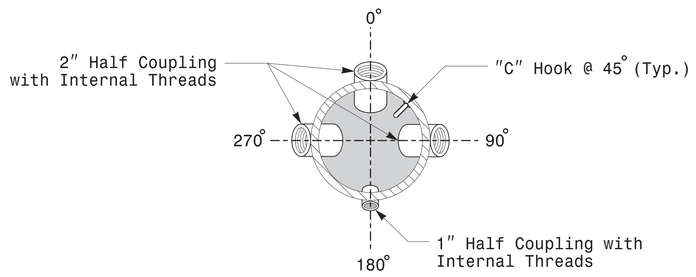


Section B-B

Pole Base Plate Details
(8 and 12 Bolt Pattern)

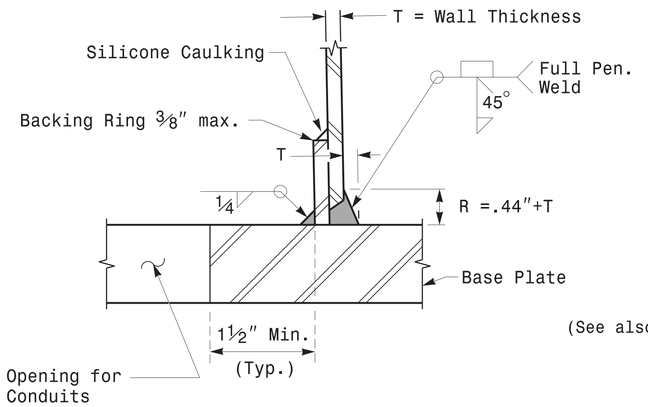


Monotube Strain Pole



Section A-A

Radial Orientation for Factory Installed
Accessories at Top of Pole



Section C-C
(Pole Attachment to Base Plate)

Full-Penetration
Groove Weld Detail

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Poles

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
SEAL
028094
ENGINEER
DEBESH C. SARKAR

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

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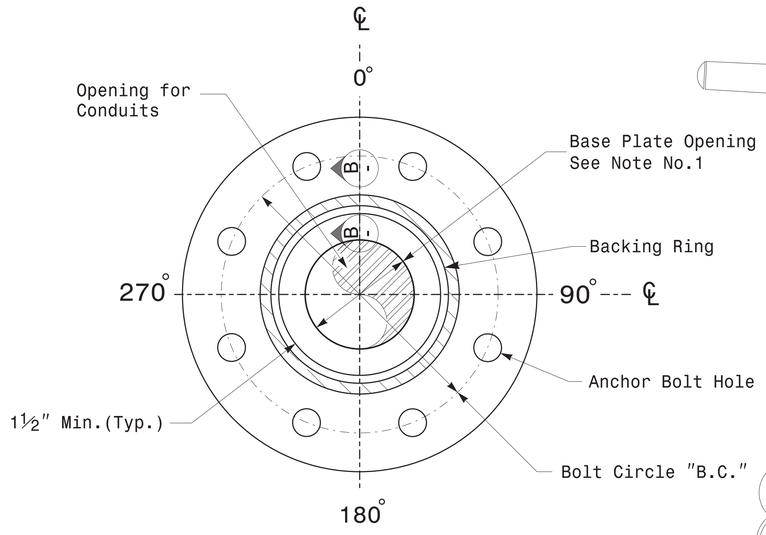
PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M4

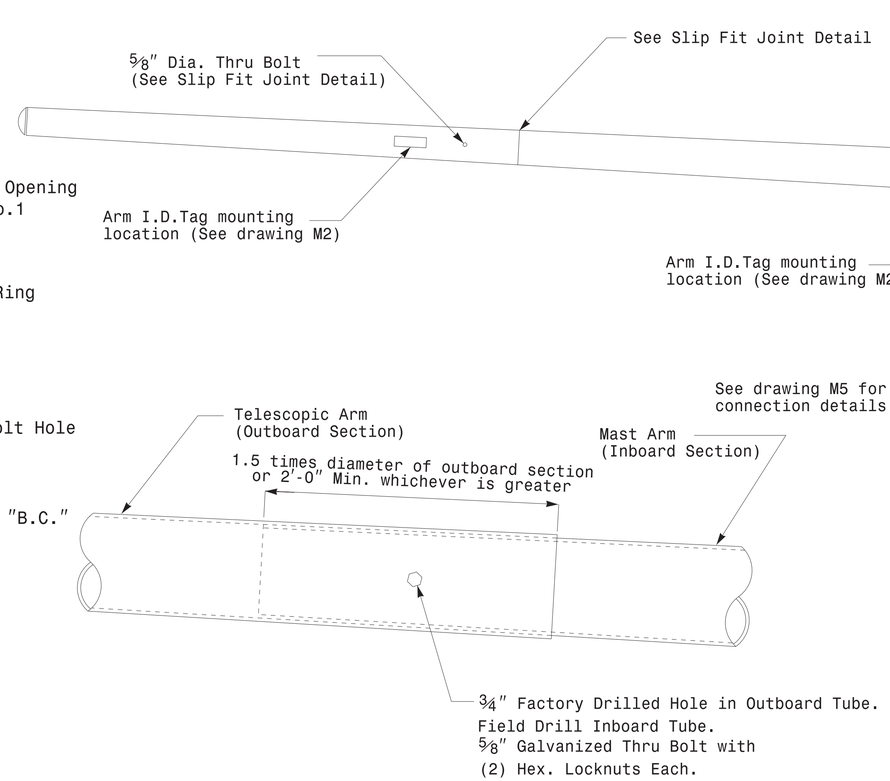
Fabrication Details – Mast Arm Poles

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

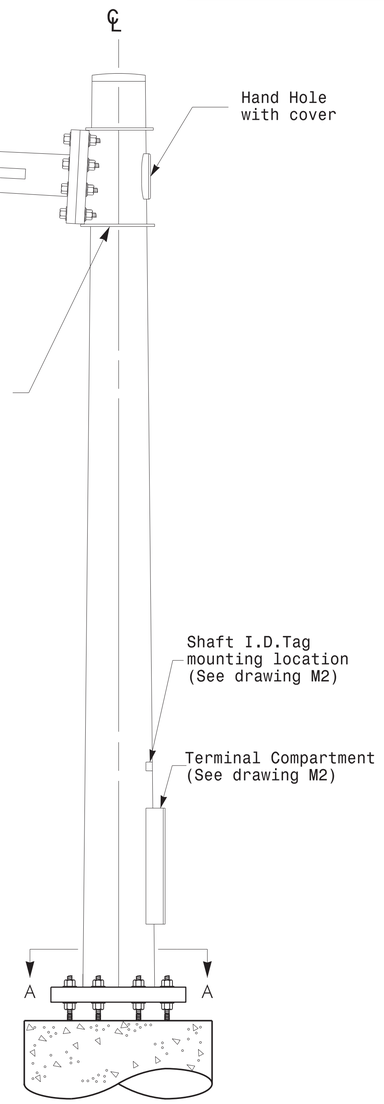


Section A-A

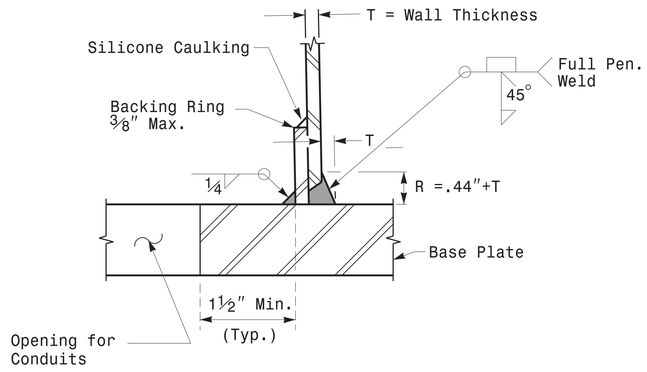
Pole Base Plate Details



Slip Fit Joint Detail for Mast Arm



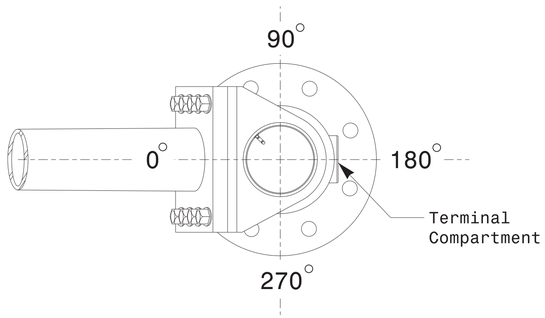
Mast Arm Pole



Section B-B

(Pole Attachment to Base Plate)

Full-Penetration Groove Weld Detail



Mast Arm Radial Orientation

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

SCALE
0 NA
NONE

Typical Fabrication Details For Mast Arm Poles

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

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

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

11-OCT-2017 08:33
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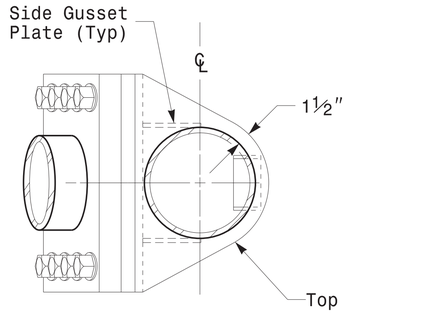
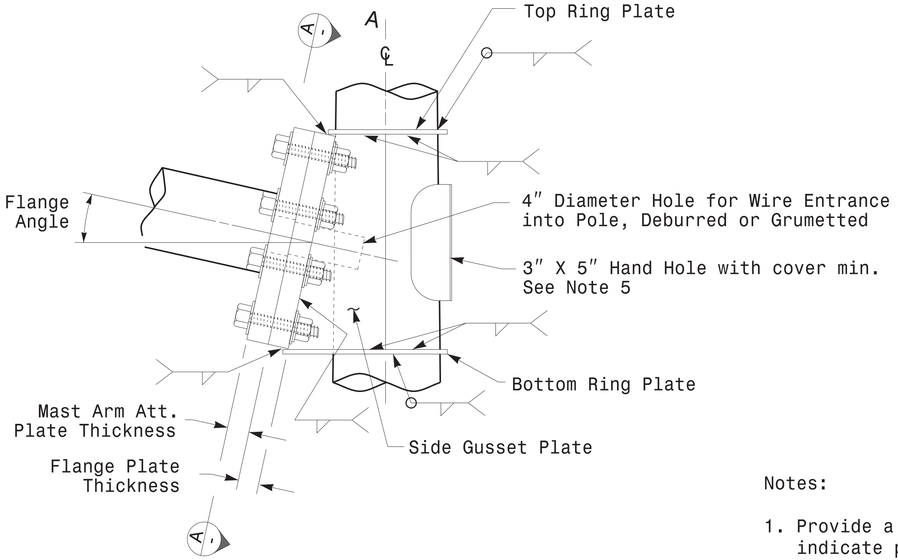
Welded Ring Stiffened Mast Arm Connection

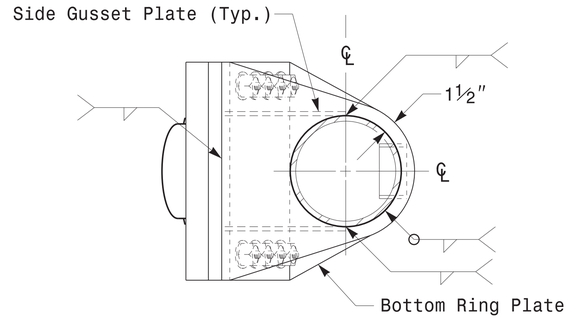
PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M5



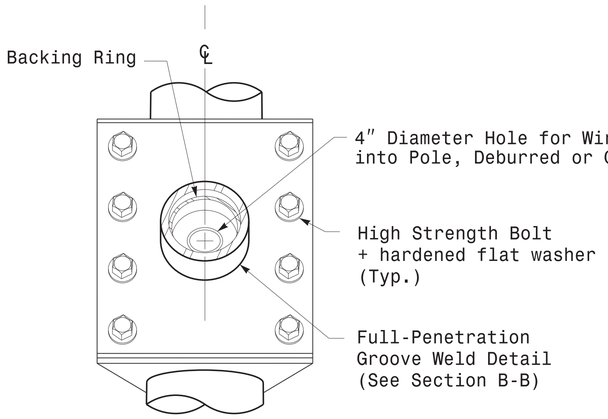
Plan View



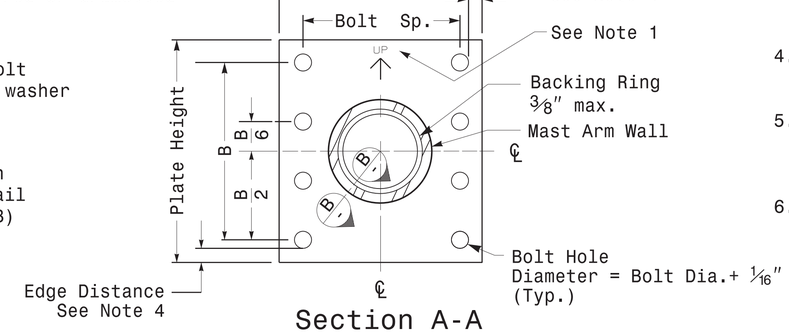
Side Elevation View



Bottom View



Front Elevation View

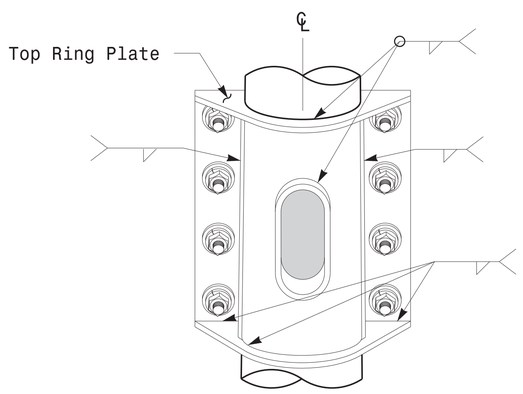


Section A-A

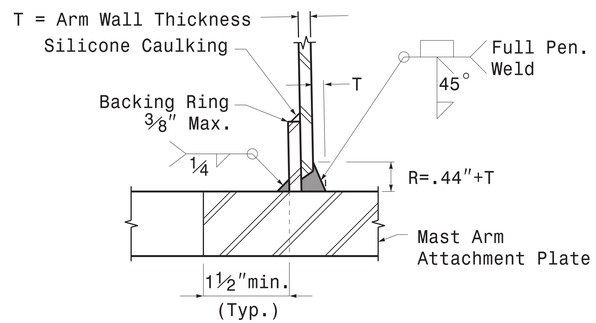
Mast Arm Attachment Plate

Notes:

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are reguired for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



Back Elevation View



Section B-B

Full-Penetration Groove Weld Detail

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

Typical Fabrication Details For Mast Arm Connection To Pole

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

REVISIONS	INIT.	DATE

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

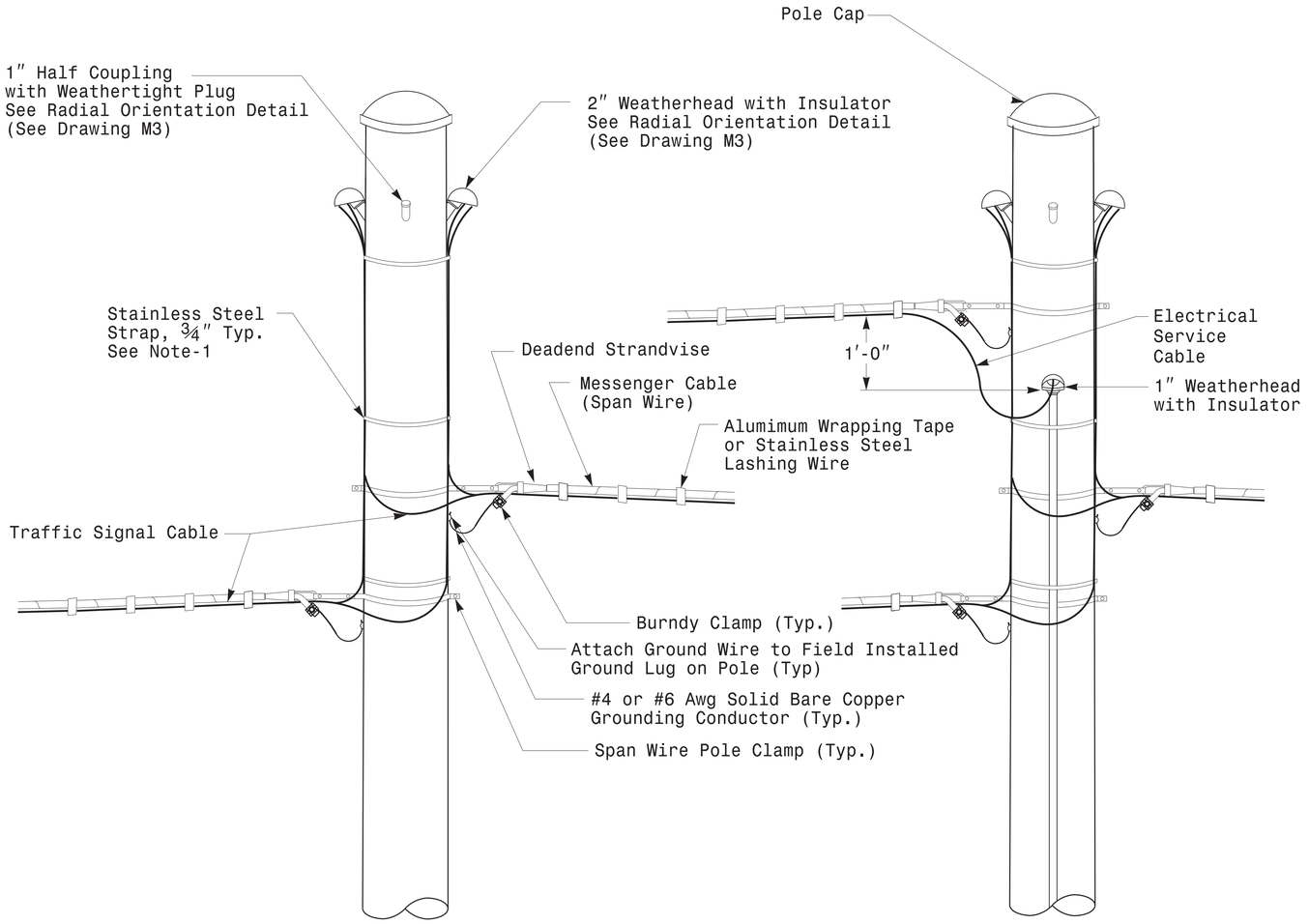
DocuSigned by: Debesh C. Sarkar 44E8E32E147E4C4...

10/11/2017
DATE

Fabrication Details — Mast Arm Connection

PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M6

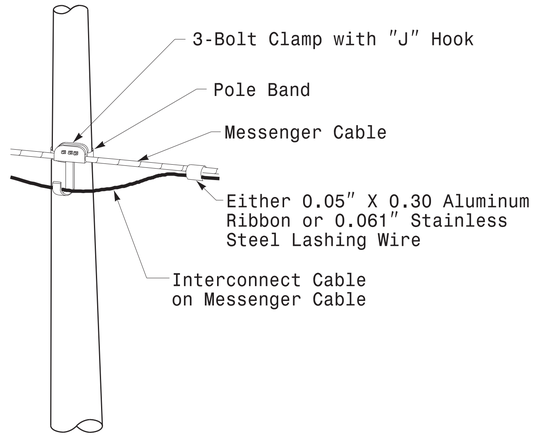
Fabrication Details – Strain Pole Attachments



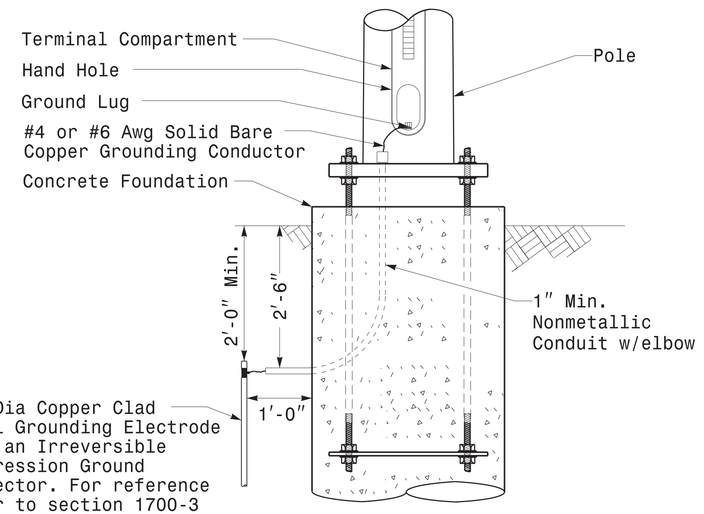
Strain Pole Attachments

NOTE:

1. Strap all signal cables to the side of the pole with ¾″ stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3′-0″.
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2018.



Attachment of Cable to Intermediate Metal Pole



Metal Pole Grounding Detail For Strain Pole and Mast Arm

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

SCALE
0 NA
NONE

Typical Fabrication Details
For
Strain Pole Attachments

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

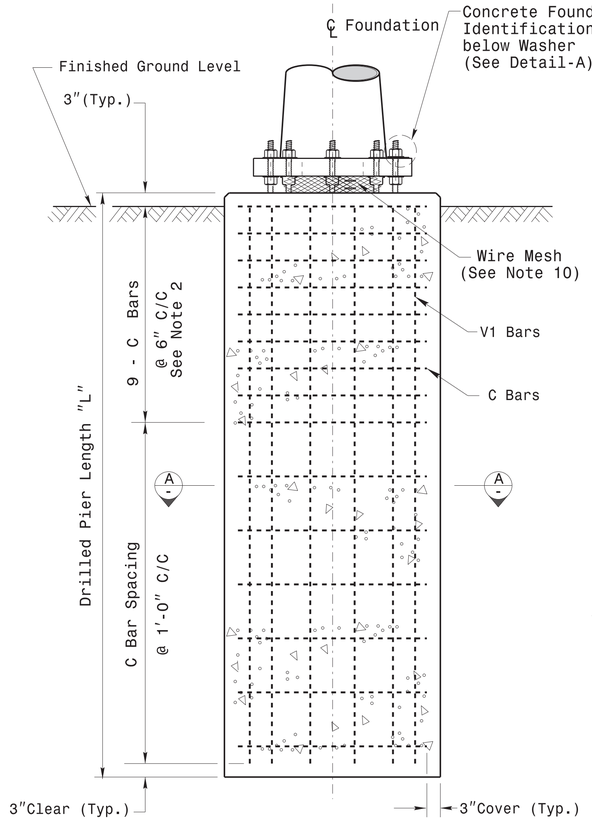
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

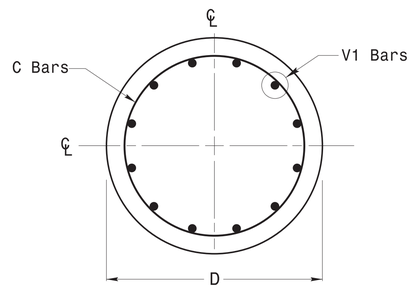
DocuSigned by: Debesh C. Sarkar
44E8E32E147E4C4...
10/11/2017
DATE

PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M7

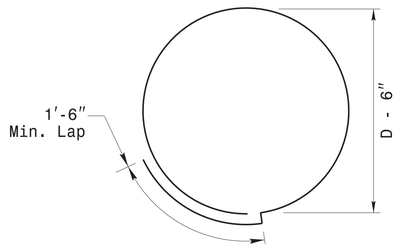
Construction Details — Foundations



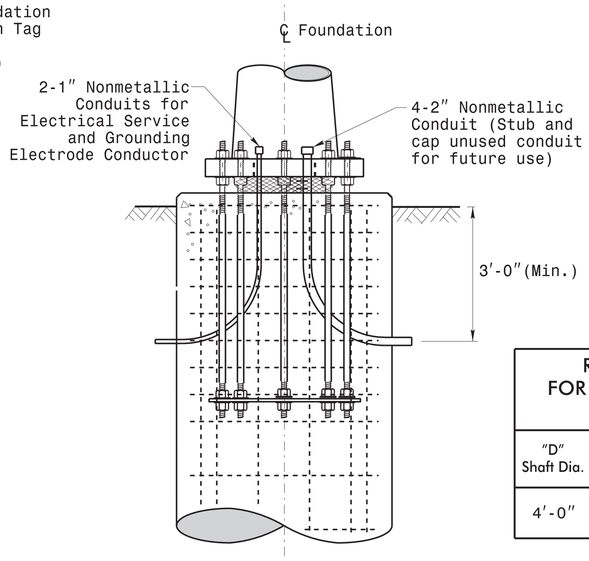
Concrete Shaft Elevation



Section A-A



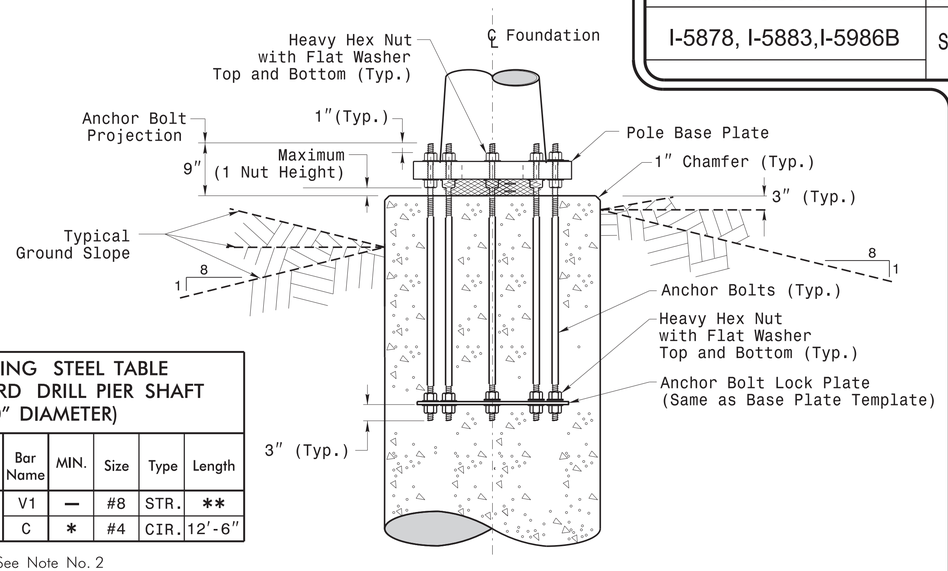
Typical "C" Bar Detail



Typical Foundation Conduit Details

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

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



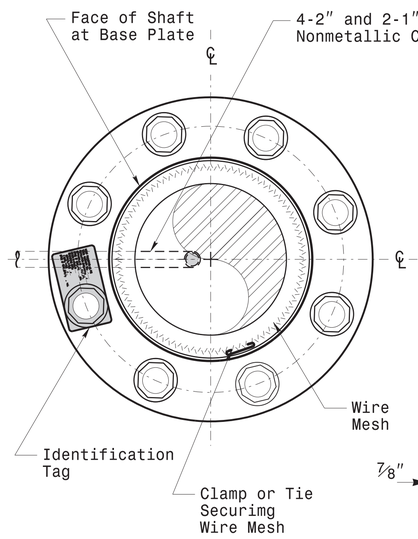
Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)

General Notes:

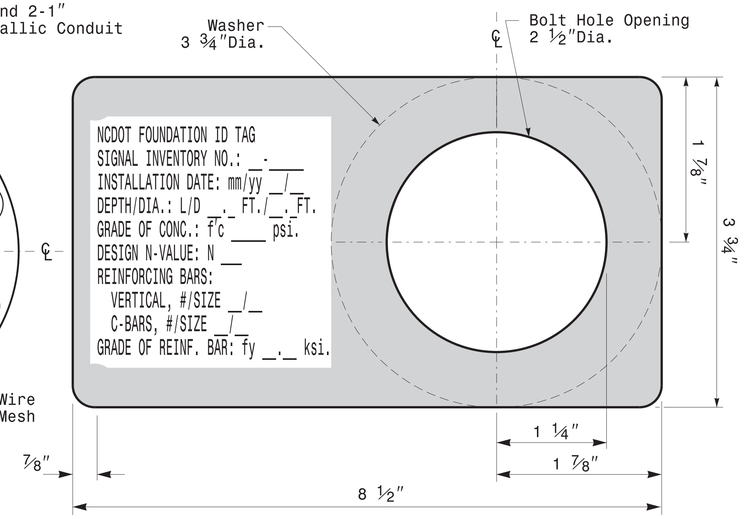
1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in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

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



Detail-A

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



Concrete Foundation Identification Tag Details

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

Construction Details For Foundations

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

SCALE: 0 NA NONE

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

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

DocuSigned by: Debesh C. Sarkar 44EBE32E147E4C4...

10/11/2017
DATE

11-OCT-2017 08:37
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rnzimser

SOIL CONDITION

PROJECT ID. NO.	SHEET NO.
I-5878, I-5883,I-5986B	Sig.M8

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

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

General Notes:

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

Foundation Selection:

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

Standard Strain Pole Foundation–All Soil Condition

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

Standard Strain Pole Foundation for All Soil Conditions

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

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

SCALE: 0 NA — NONE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 028094 ENGINEER DEBESH C. SARKAR

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

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PROJECT REFERENCE NO.	SHEET NO.
I-5878, I-5883, I-5986B	SCP-1

1 INSTALL COAX CABLE

2 INSTALL ETHERNET CABLE

3 EXISTING ETHERNET (OR COAX) CABLE

4 INSTALL SMFO CABLE

5 EXISTING SMFO CABLE

6 INSTALL FIBER OPTIC DROP CABLE

7 INSTALL TRACER WIRE

8 TRENCH

9 INSTALL PVC CONDUIT

10 INSTALL RIGID, GALVANIZED STEEL CONDUIT

11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD

12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL

13 INSTALL OUTER–DUCT POLYETHYLENE CONDUIT

14 INSTALL POLYETHYLENE CONDUIT

15 DIRECTIONAL DRILL CONDUIT

16 BORE AND JACK CONDUIT

17 INSTALL CABLE(S) IN EXISTING CONDUIT

18 INSTALL CABLE(S) IN NEW CONDUIT

19 INSTALL CABLE(S) IN EXISTING RISER

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 INSTALL NEW ETHERNET EDGE SWITCH

27 INSTALL NEW FIBER OPTIC TRANSCEIVER

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 INTERCONNECT CENTER /SPLICE ENCLOSURE

32 INSTALL POLE MOUNTED SPLICE CABINET

33 INSTALL BASE MOUNTED 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 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION

39 INSTALL JUNCTION BOX

40A INSTALL OVERSIZED JUNCTION BOX

40B INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")

41 REMOVE EXISTING JUNCTION BOX

42 INSTALL WOOD POLE

43 REMOVE EXISTING WOOD POLE

44 INSTALL AERIAL GUY ASSEMBLY

45 INSTALL STANDARD GUY ASSEMBLY

46 INSTALL SIDEWALK GUY ASSEMBLY

47 INSTALL MESSENGER CABLE

48A REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE

48B REMOVE EXISTING COMMUNICATIONS CABLE

49 BACK PULL EXISTING COMMUNICATIONS CABLE

50 INSTALL CELL MODEM AND ANTENNA

51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE

52A INSTALL DELINEATOR MARKER

52B INSTALL JUNCTION BOX MARKER

53A STORE 20 FEET OF COMMUNICATIONS CABLE

53B STORE 50 FEET OF EACH 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 EQUIPMENT CABINET DISCONNECT

60 BOND TRACER WIRE TO EQUIPMENT GROUND BUS

61 DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS

62 BOND RISER AND MESSENGER CABLE TO POLE GROUND

63 BOND RISER TO POLE GROUND

64 BOND MESSENGER CABLE TO POLE GROUND

65 INSTALL HEAT SHRINK TUBING RETROFIT KIT

66 INSTALL MOLDABLE DUCT SEAL

67 SLACK SPAN

LEGEND

FO	NEW FIBER OPTIC COMMUNICATIONS CABLE
EXI	EXISTING COMMUNICATIONS CABLE
REM	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
DD	NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
S	AERIAL SPLICE ENCLOSURE	S
S	UNDERGROUND SPLICE ENCLOSURE	S
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL/EQUIPMENT CABINET	
S	SPLICE CABINET	S
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
SP	SIGNAL POLE	SP
XX–XXXX	SIGNAL INVENTORY NUMBER	XX–XXXX

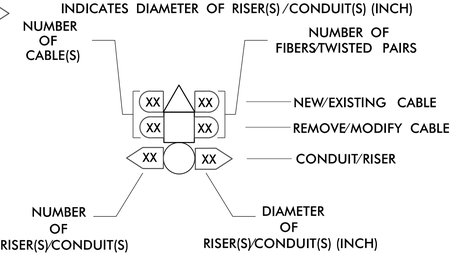
CONSTRUCTION NOTE SYMBOLOGY KEY

XX INDICATES NUMBER OF CABLES, LOOPS, ETC.

XX INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.

XX INDICATES NUMBER OF RISER(S)/CONDUIT(S)

XX INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



ATTACHMENT POINT:

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

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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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Prepared for: STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION Integrated Mobility and Safety Division ITS & Signals Management Section

750 N.Greenfield Pkwy,Garner,NC 27529

CONSTRUCTION NOTES

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory 4/26/2021
SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
I-5878, I-5877, I-5986B	SCP-2

LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- EXISTING MASTER RADIO LOCATION
- XX-XXXX — SIGNAL INVENTORY NUMBER
- EXISTING METAL POLE WITH MAST ARM
- EXISTING WOOD POLE
- NEW METAL POLE
- SP — SIGNAL POLE
- EXISTING METAL POLE
- NEW OVERSIZED JUNCTION BOX
- EXISTING OVERSIZED JUNCTION BOX
- EXISTING CONDUIT
- EXI — EXISTING COMMUNICATIONS CABLE

NOTES FOR WIRELESS COMMUNICATIONS:

1. INSTALL COAXIAL CABLE:
   A. ON WOOD POLES, REQUIRING A NEW RIGID GALVAINIZED STEEL RISE, INSTALL A 2″ RISER WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   B. ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A 1/2″ HOLE UP THROUGH THE BOTTOM OF MAST MAR FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
   C. ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
   D. BETWEEN THE POINT OF EXITING THE RISER, METAL POLE, OR MAST ARM , AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4″ STAINLESS STEEL STRAPS EVERY 12″.
2. IF AN EXISTING 2″ SPARE RIGID GALVANIZED STEEL RISE IS AVAILABLE, INSTALL COAXIAL CABLE IN THE SPARE RISER.
3. INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN. (NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
4. MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRIC SAFETY CODE.
5. INSTALL WIRELESS SERIAL RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET. (NOTE: RF ANTENNA DISCONNECT SWITCH AND DECAL ARE NOT REQUIRED WHEN THE ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
6. REFERENCE ″WIRELESS RADIO ANTENNA TYPCIAL DETAILS.″

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8000 Regency Pkwy, Ste. 600, Cary, NC 27518
Phone: (919) 463-5490 · MBAKERINTL.COM
NC License No. : F-1084

Prepared for: NCDOT Transportation Mobility and Safety Division, Traffic Engineering Branch, Traffic Signal & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

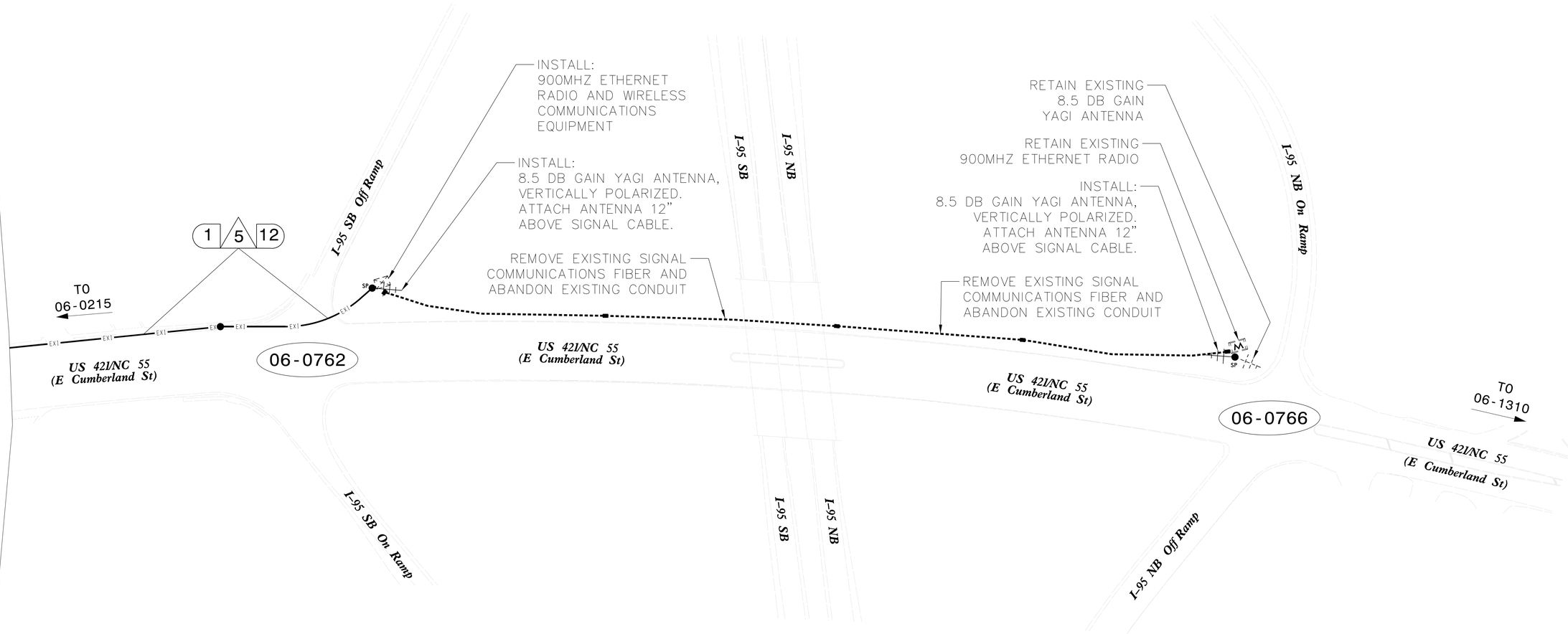
WIRELESS COMMUNICATIONS CONSTRUCTION NOTES

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY
DocuSigned by: Kelly M Cory E2537DFFB1C142E... SIGNATURE
4/26/2021 DATE

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-3



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 6 TRAFFIC ENGINEER AT (910) 364-0606 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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. CELL MODEM TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DIVISION TRAFFIC 6 ENGINEER AT (910) 364-0606 TO REQUEST THE CELL MODEM. ALLOW 8 WEEK LEAD TIME BEFORE ANTICIPATED DEPLOYMENT.

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Prepared for:
NC Department of Transportation
Transportation Mobility and Safety Division
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 60 1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
TEMP 1 (TMP Phase I)

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

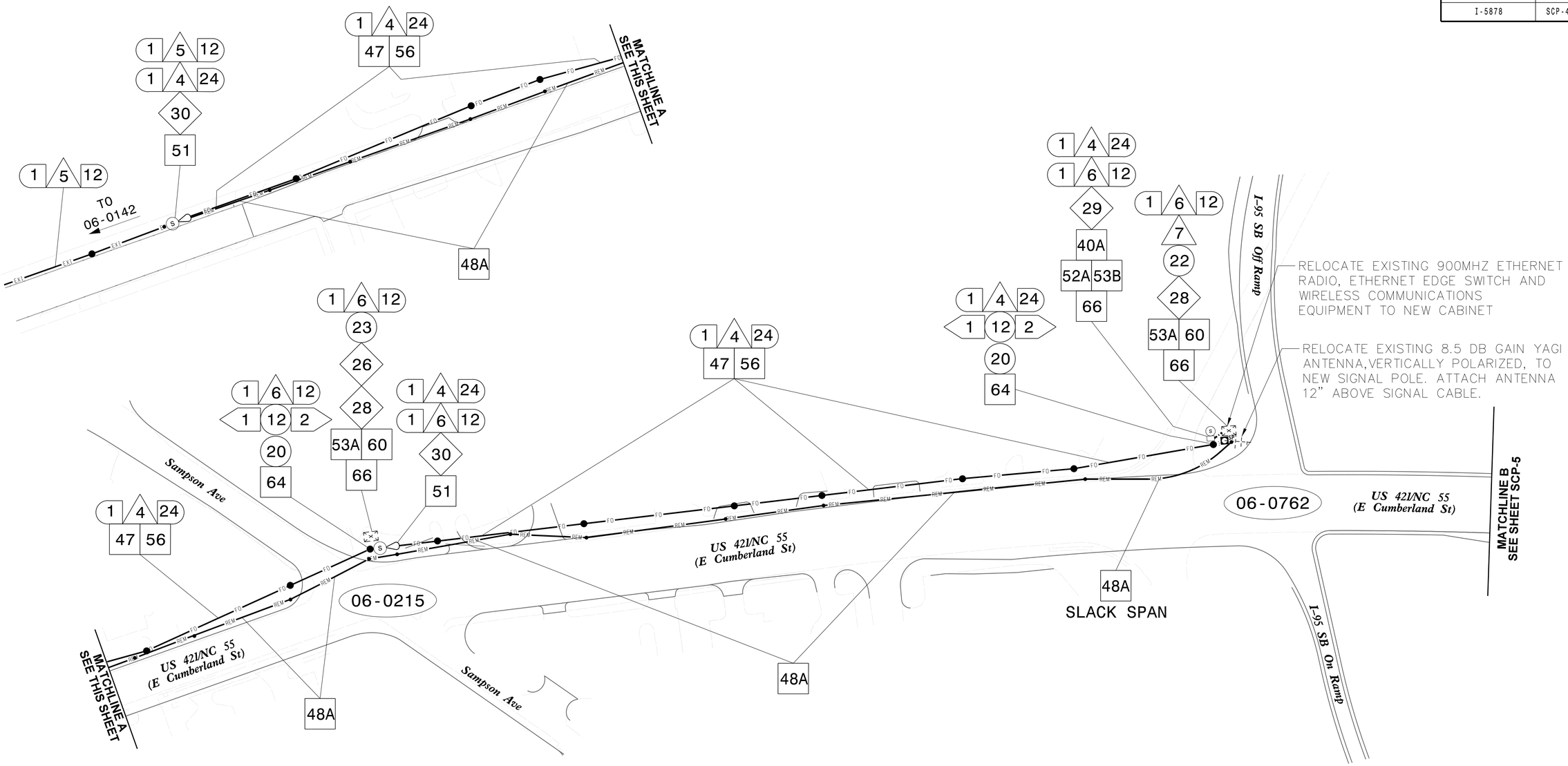
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-4



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 6 TRAFFIC ENGINEER AT (910) 364-0606 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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.

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NC License No. : F-1084

Prepared for:
Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 60
1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
TEMP 2 (TMP Phase II to V)
DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

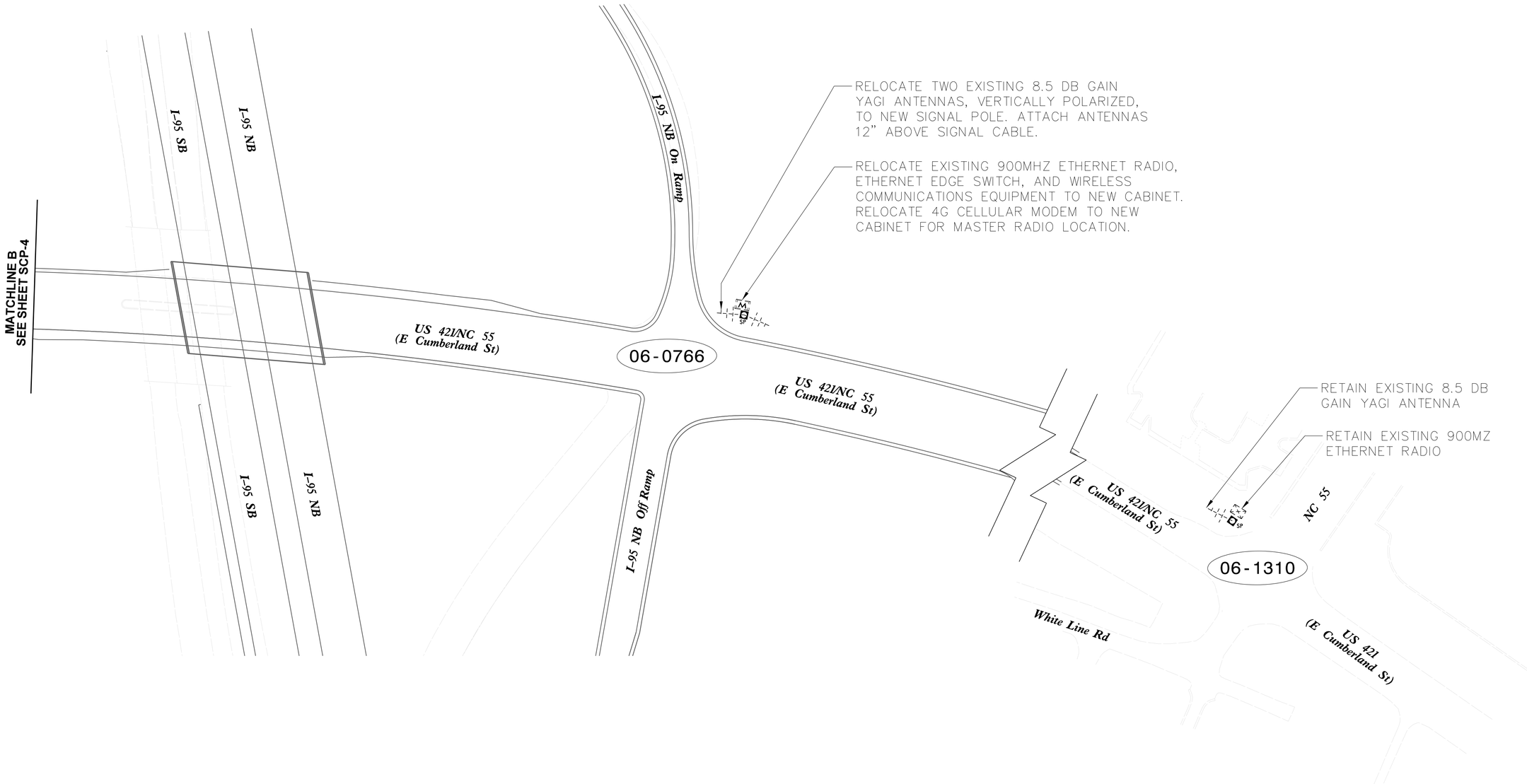
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038970 KELLY M CORY

DocuSigned by: Kelly M Cory 4/26/2021
E2F270FFB1C142E...
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-5



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 6 TRAFFIC ENGINEER AT (910) 364-0606 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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.

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Prepared for:
US Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Traffic Engineering & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 60
1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
TEMP 2 (TMP Phase II to V)

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

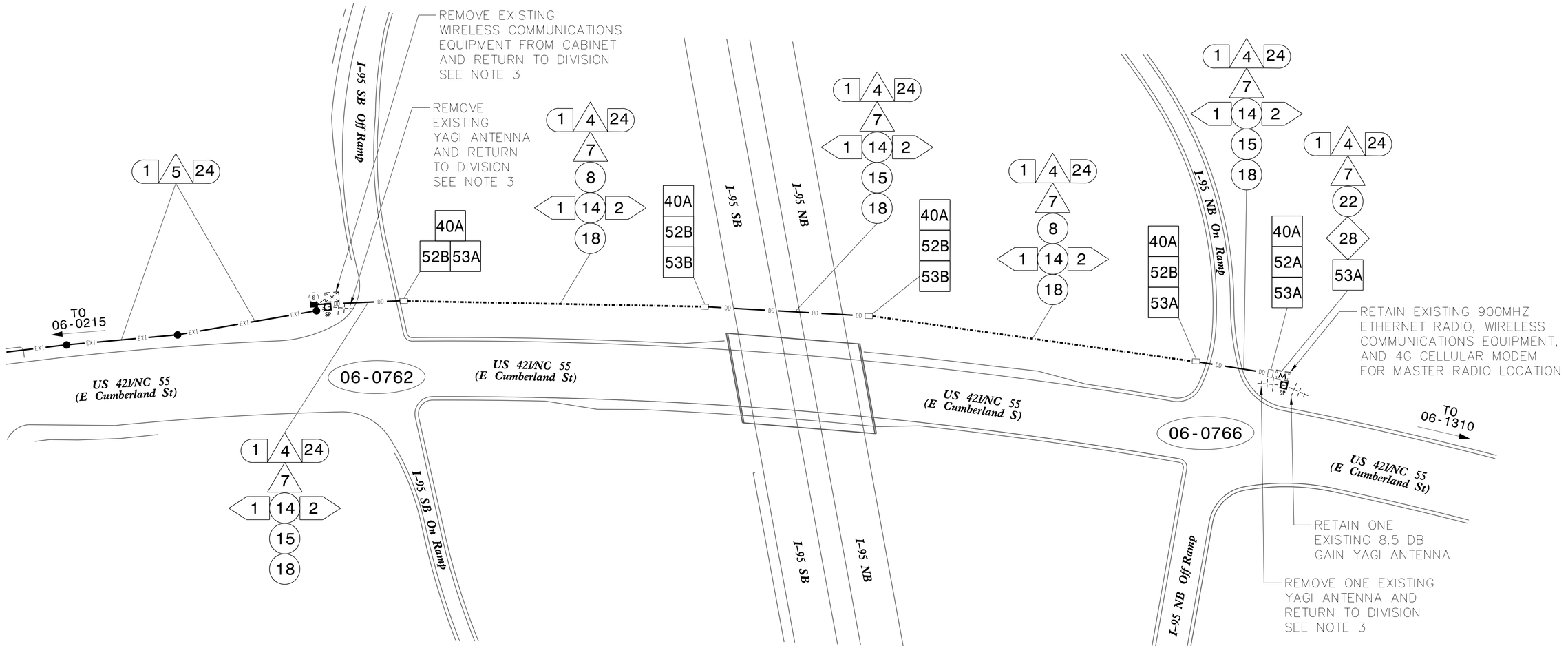
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory 4/26/2021
E2F270FFB1C142E...
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-6



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 6 TRAFFIC ENGINEER AT (910) 364-0606 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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. ONCE FIBER HAS BEEN INSTALLED AND THE SYSTEM IS UP AND OPERATIONAL, REMOVE EXISTING WIRELESS EQUIPMENT AND YAGI ANTENNA AND RETURN TO DIVISION 6 AT 450 TRANSPORTATION DRIVE, FAYETTEVILLE, NC 28301.

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750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 60 1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
FINAL

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

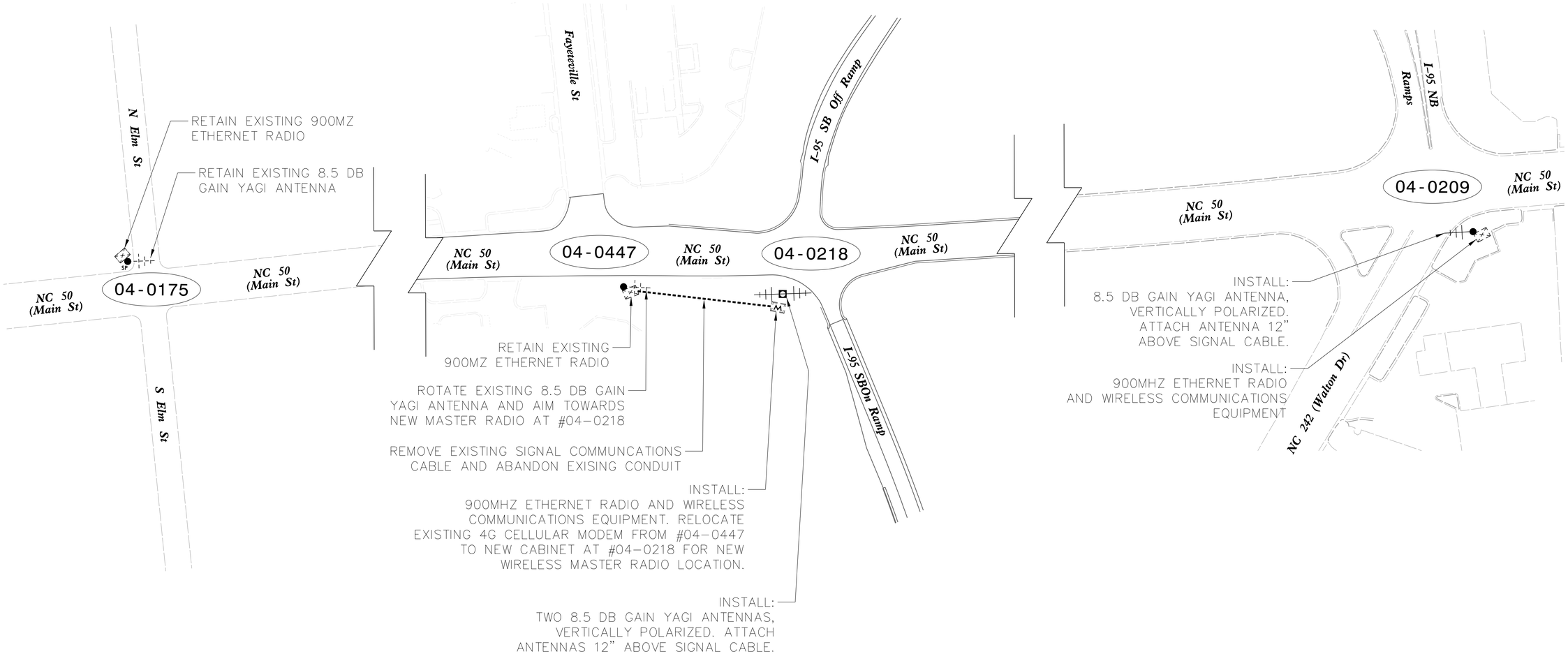
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M. CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SCP-7



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 4 TRAFFIC ENGINEER AT (252) 640-6505 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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.

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Prepared for:
Transportation Mobility and Safety Division
NC DEPARTMENT OF TRANSPORTATION
Traffic Engineering Branch
750 N.Greenfield Pkwy.Garner,NC 27529

SCALE
0 60
1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D04-20 BENSON
TEMP 1 (TMP Phase I)

DIVISION 04 JOHNSTON CO. BENSON

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

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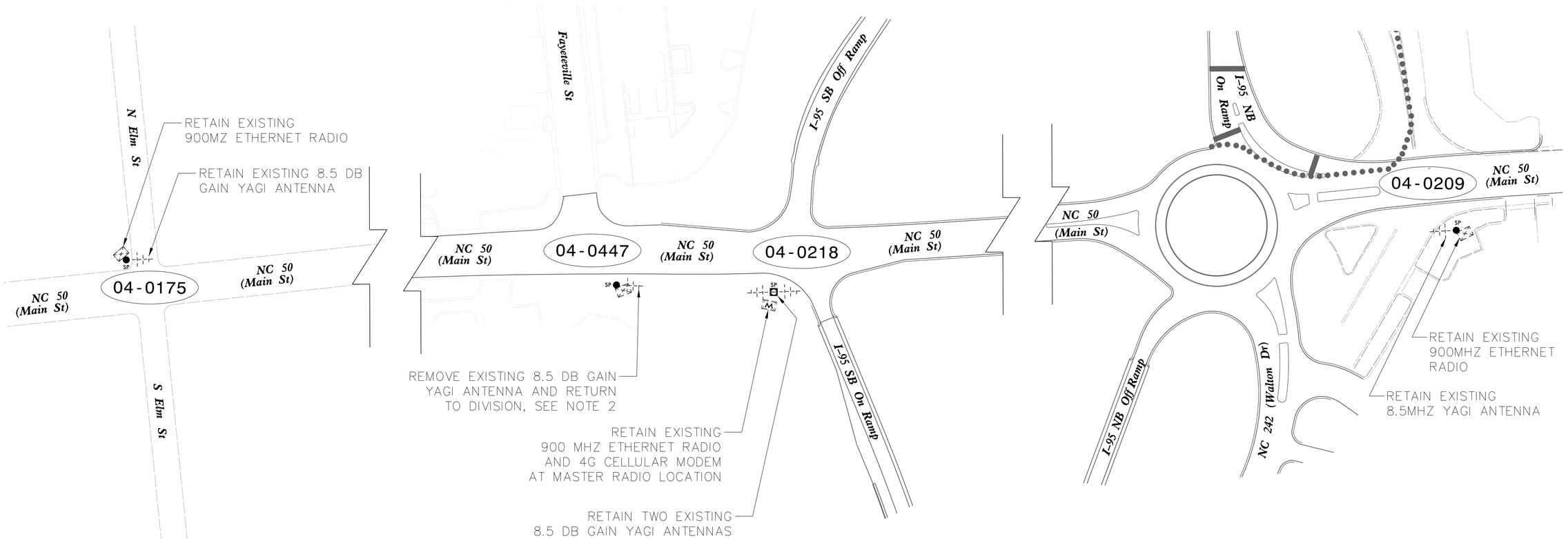
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... SIGNATURE 4/26/2021 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SCP-8



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 4 TRAFFIC ENGINEER AT (252) 640-6505 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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. REMOVE THE EXISTING WIRELESS EQUIPMENT AND YAGI ANTENNA AND RETURN TO DIVISION 4 AT 509 WARD BOULEVARD, WILSON, NC 27895.

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

SCALE
0 60
1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D04-20 BENSON
TEMP 2 (TMP Phase 3)

DIVISION 04 JOHNSTON CO. BENSON

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

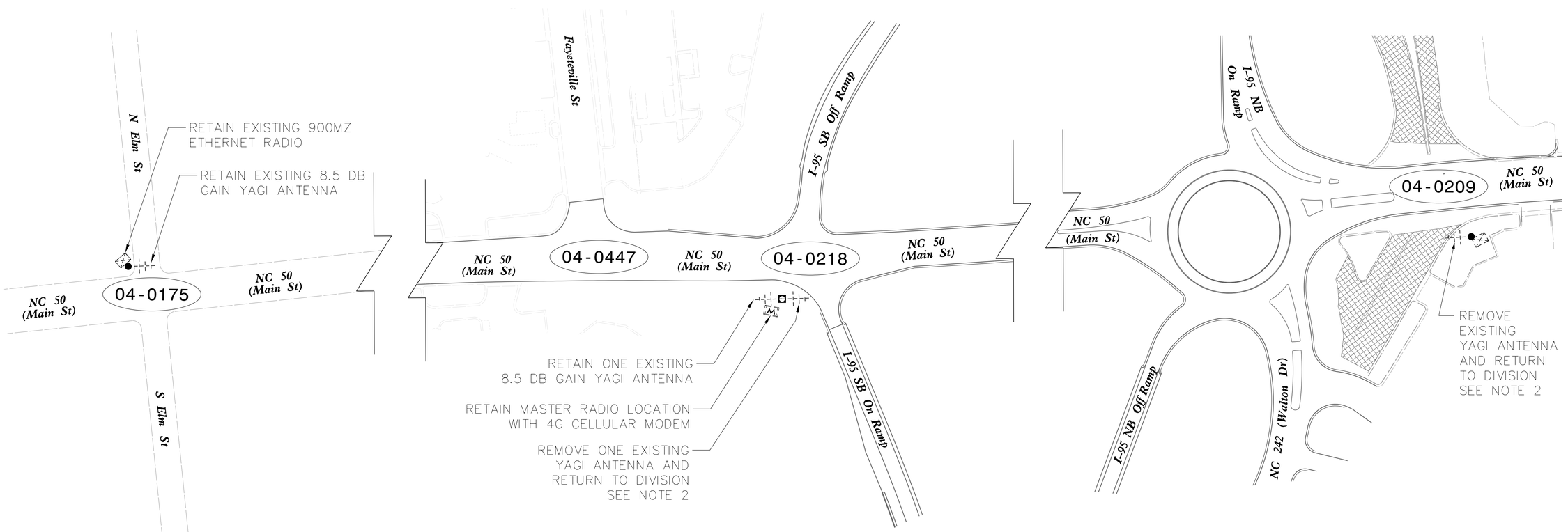
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E...
SIGNATURE 4/26/2021
DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5986B	SCP-9



GENERAL NOTES:

1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 4 TRAFFIC ENGINEER AT (252) 640-6505 TO ARRANGE FOR THE DIVISION TRAFFIC ENGINEER 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 THE DIVISION TRAFFIC ENGINEER WHEN 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. REMOVE THE EXISTING WIRELESS EQUIPMENT AND YAGI ANTENNA AND RETURN TO DIVISION 4 AT 509 WARD BOULEVARD, WILSON, NC 27895.

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NC Transportation Mobility and Safety Division
Traffic Engineering Branch
Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE
0 60
1"=60'

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D04-20 BENSON
FINAL

DIVISION 04 JOHNSTON CO. BENSON

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E...
SIGNATURE 4/26/2021 DATE

CADD Filename:

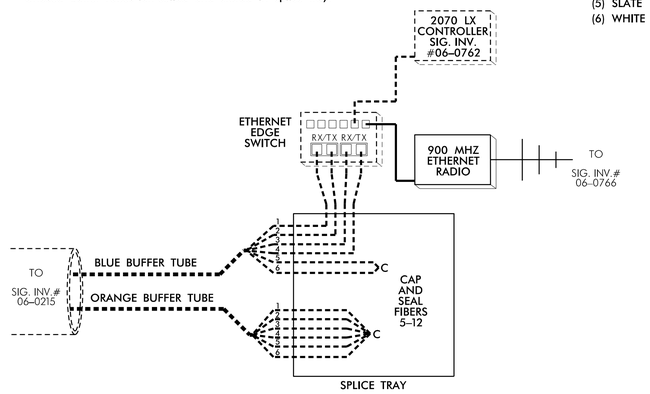
PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-10

US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 SB RAMPS
SIG. INV. # 06-0762

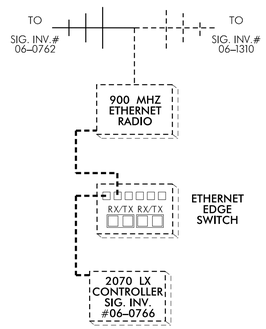
LEGEND
X = FUSION SPLICE
C = CAP IN TRAY

COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

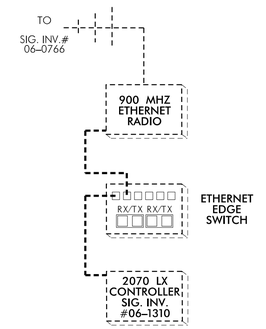
Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.



US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 SB RAMPS
SIG. INV. # 06-0766



US 421/NC 55 (E CUMBERLAND AVE)
AT NC 55
SIG. INV. # 06-1310



NOTES:

1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 6 TRAFFIC ENGINEER, FRANK D. WEST, JR, AT 910-364-0606 TO ARRANGE FOR THE DIVISION 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 THE NCDOT DIVISION 6 TRAFFIC ENGINEER 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 / ENSURING PROPER TERMINATIONS.

4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

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.

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Prepared for:
NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
SPLICE DETAILS - TEMP 1

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... 4/26/2021
SIGNATURE DATE

CADD Filename:

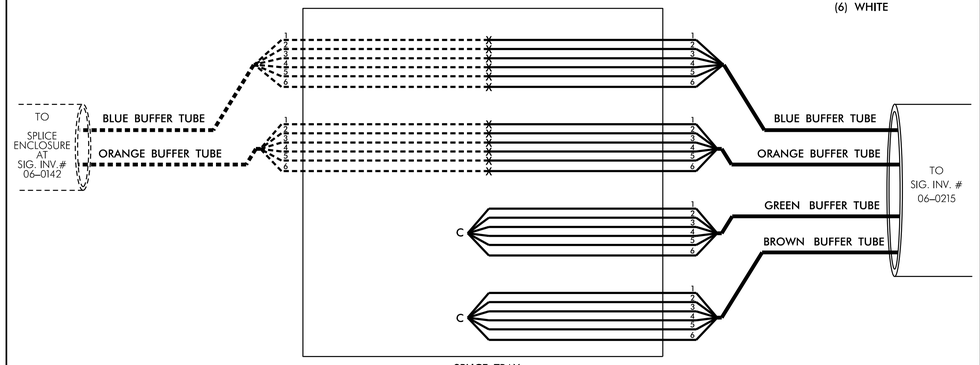
PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-11

AERIAL SPLICE ENCLOSURE
US 421/NC 55 (E CUMBERLAND AVE)
BETWEEN 06-0142 AND 06-0215

LEGEND
X = FUSION SPLICE
C = CAP IN TRAY

COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

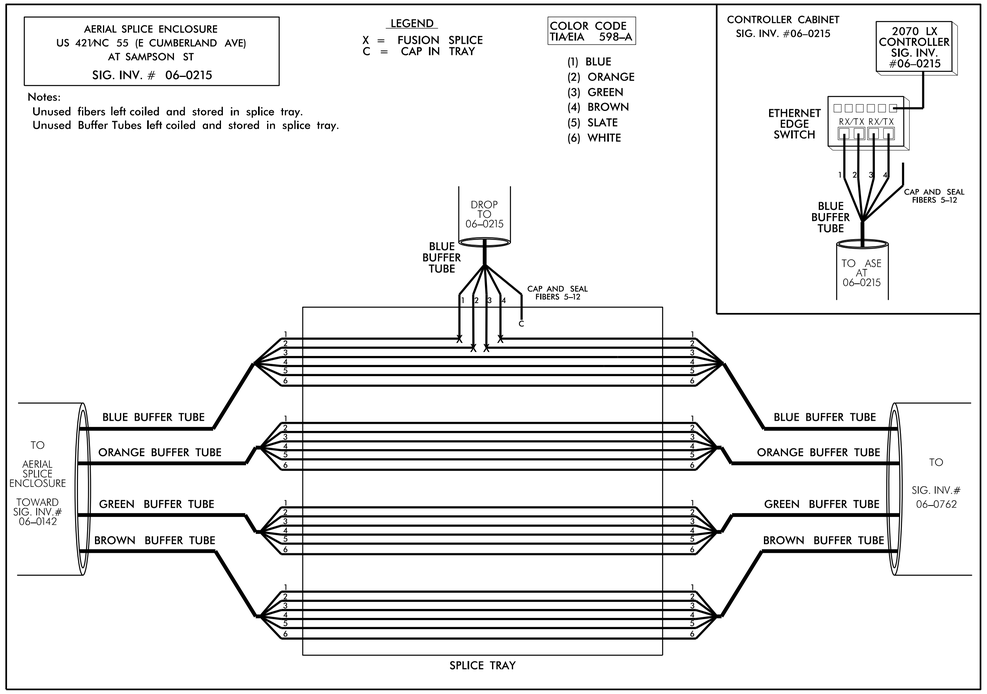


AERIAL SPLICE ENCLOSURE
US 421/NC 55 (E CUMBERLAND AVE)
AT SAMPSON ST
SIG. INV. # 06-0215

LEGEND
X = FUSION SPLICE
C = CAP IN TRAY

COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

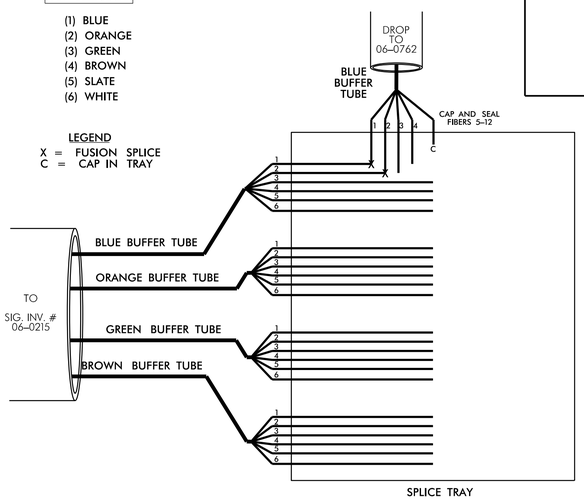


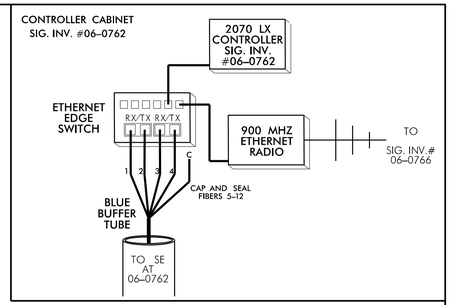
UNDERGROUND SPLICE ENCLOSURE
US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 SB RAMPS
SIG. INV. # 06-0762

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

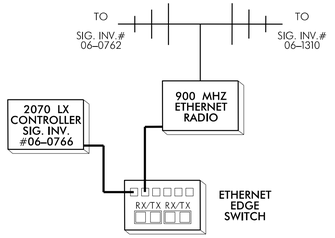
COLOR CODE TIA/EIA 598-A
(1) BLUE
(2) ORANGE
(3) GREEN
(4) BROWN
(5) SLATE
(6) WHITE

LEGEND
X = FUSION SPLICE
C = CAP IN TRAY

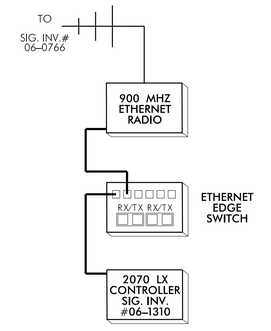




US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 NB RAMPS
SIG. INV. # 06-0766



US 421/NC 55 (E CUMBERLAND AVE)
AT NC 55
SIG. INV. # 06-1310



NOTES:

1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 6 TRAFFIC ENGINEER, FRANK D. WEST, JR, AT 910-364-0606 TO ARRANGE FOR THE DIVISION 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 THE NCDOT DIVISION 6 TRAFFIC ENGINEER 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 /ENSURING PROPER TERMINATIONS.

4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

1) SPLICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

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.

Michael Baker
INTERNATIONAL
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NC License No. : F-1084

Prepared for:
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
IT Telecommunications & Signals Management Section
750 N.Greenfield Pkwy,Garner,NC 27529

SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
SPLICE DETAILS - TEMP 2

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY

DocuSigned by: Kelly M Cory E2F270FFB1C142E... SIGNATURE 4/26/2021 DATE

CADD Filename:

PROJECT REFERENCE NO.	SHEET NO.
I-5878	SCP-12

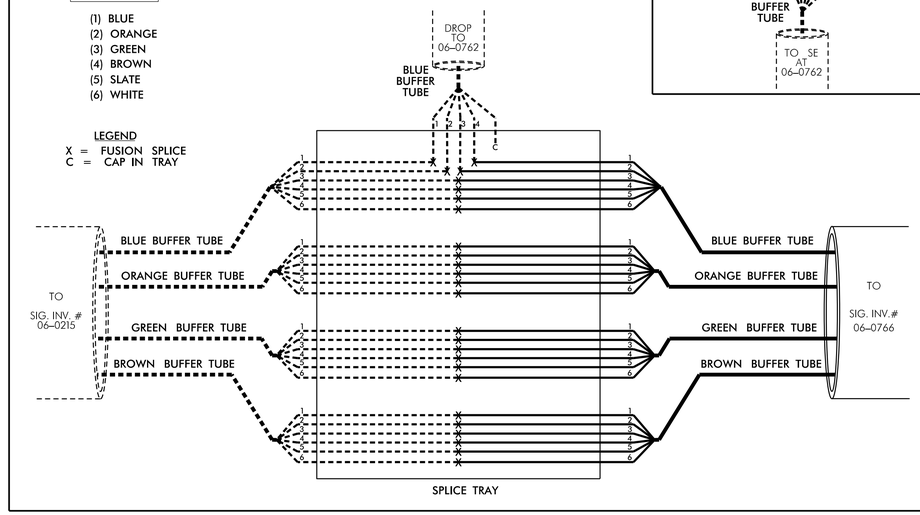
UNDERGROUND SPLICE ENCLOSURE
US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 SB RAMPS
SIG. INV. # 06-0762

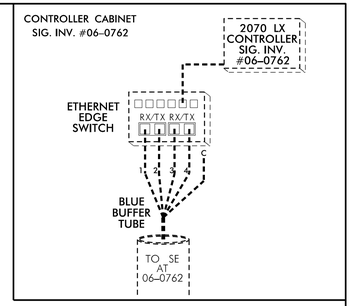
Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

COLOR CODE
TIA/EIA 598-A

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

LEGEND
X = FUSION SPLICE
C = CAP IN TRAY





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UNDERGROUND SPLICE ENCLOSURE
US 421/NC 55 (E CUMBERLAND AVE)
AT I-95 NB RAMPS
SIG. INV. # 06-0766

Notes:
Unused fibers left coiled and stored in splice tray.
Unused Buffer Tubes left coiled and stored in splice tray.

LEGEND
X = FUSION SPLICE
C = CAP IN TRAY

COLOR CODE
TIA/EIA 598-A

(1) BLUE
(2) ORANGE
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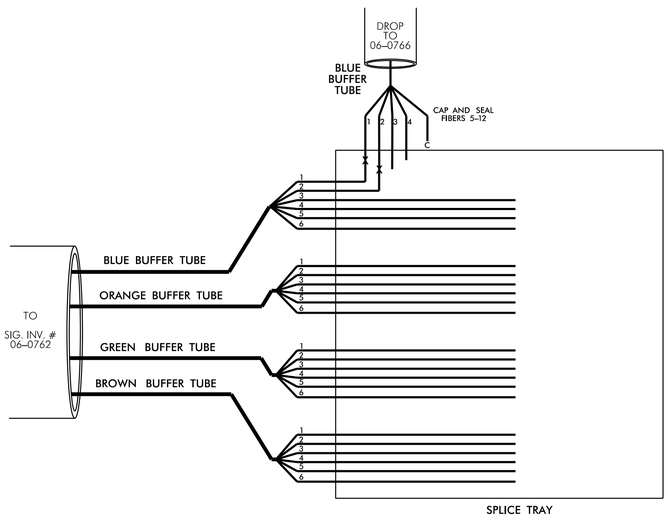
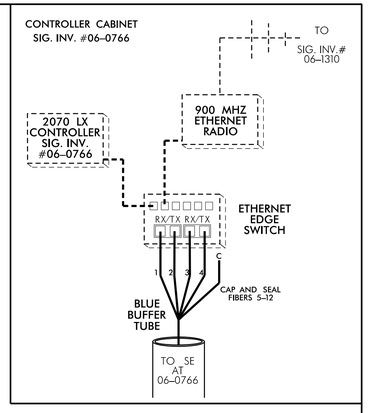
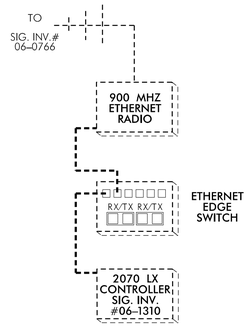
(5) SLATE
(6) WHITE





US 421/NC 55 (E CUMBERLAND AVE)
AT NC 55
SIG. INV. # 06-1310



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SIGNAL COMMUNICATIONS PLANS
SIGNAL SYSTEM #D06-02 DUNN
SPLICE DETAILS - FINAL

DIVISION 06 HARNETT CO. DUNN

PLAN DATE:	March 2021	REVIEWED BY:	K M Cory
PREPARED BY:	S Tamm	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 038970 ENGINEER KELLY M CORY
DocuSigned by: Kelly M Cory E2F270FFB1C142E...
4/26/2021
SIGNATURE DATE

CADD Filename: