

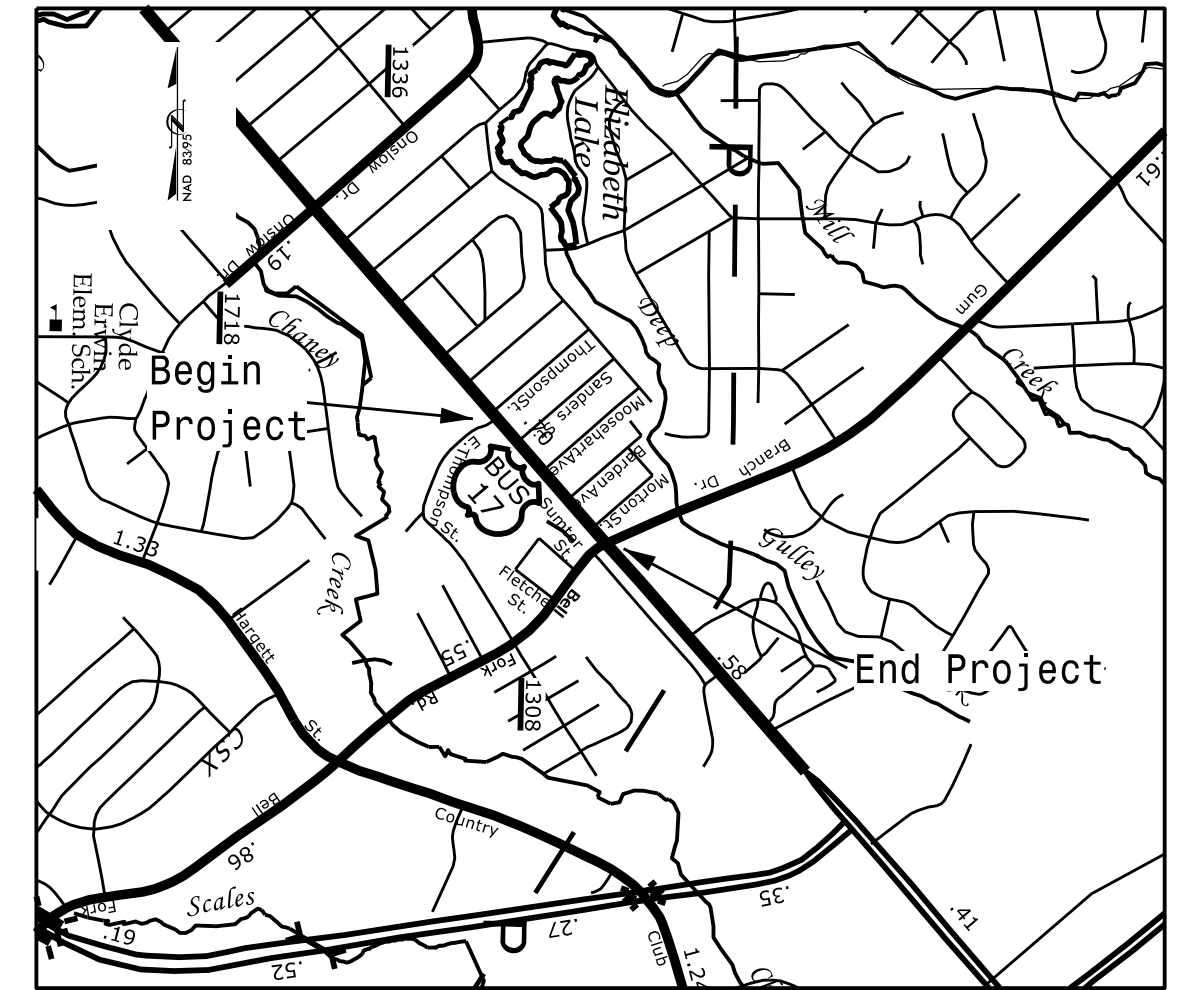
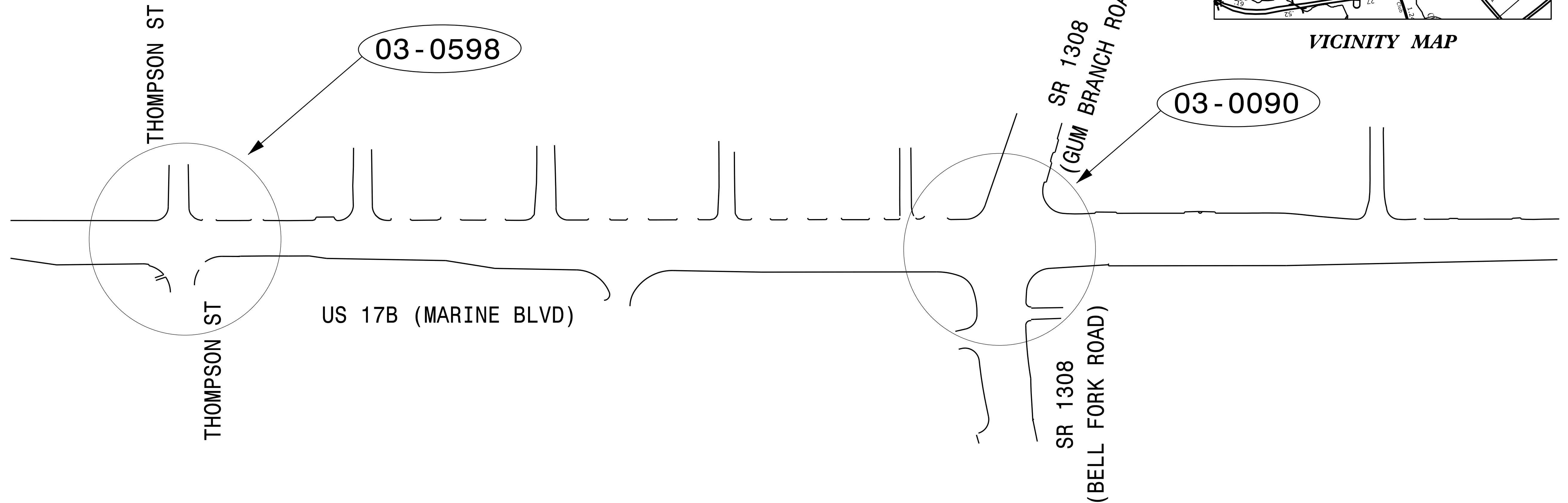
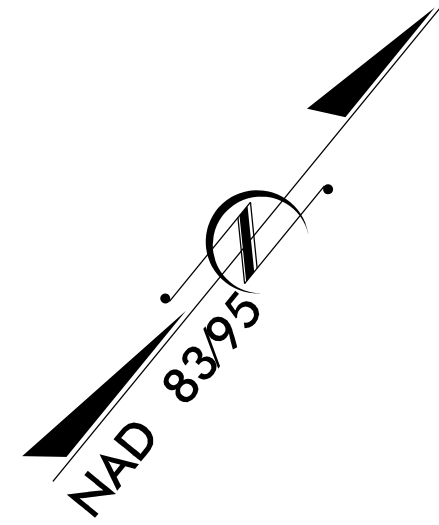
Project: U-5728

Contract: C205040

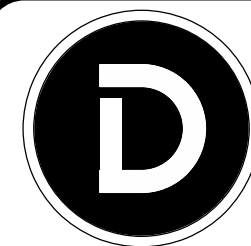
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Onslow County

LOCATION: US 17 BUS. (MARINE BOULEVARD) AT
THOMPSON STREET TO
US 17 BUS. (MARINE BOULEVARD) AT
SR 1308 (GUM BRANCH ROAD/BELL FORK ROAD)
TYPE OF WORK: TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS



VICINITY MAP



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03-XXXX

Modified Signal

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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	-----	Title Sheet
Sig. 2.0-4.4	03-0090	US 17 BUS. (Marine Boulevard) at SR 1308 (Gum Branch Road/Bell Fork Road)
SCP-1 - SCP-4	-----	Communications Plan

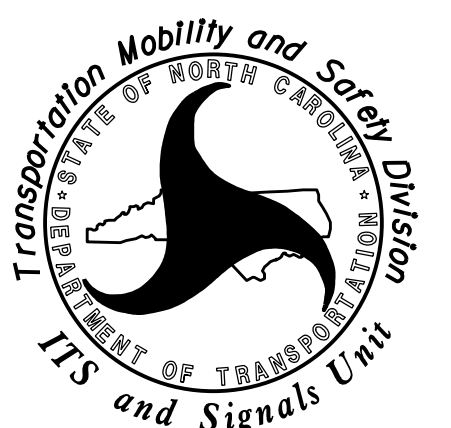
TRANSPORTATION SYSTEMS MANAGEMENT &
OPERATIONS UNIT

Zachary Little, PE - Eastern Region Signals Engineer

D. Todd Joyce, PE - Signal Equipment Design Engineer

Taylor A. Kenion - State Signal System Design Engineer

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION



750 N. Greenfield Parkway, Garner, NC 27529
Telephone: (919) 773-2800

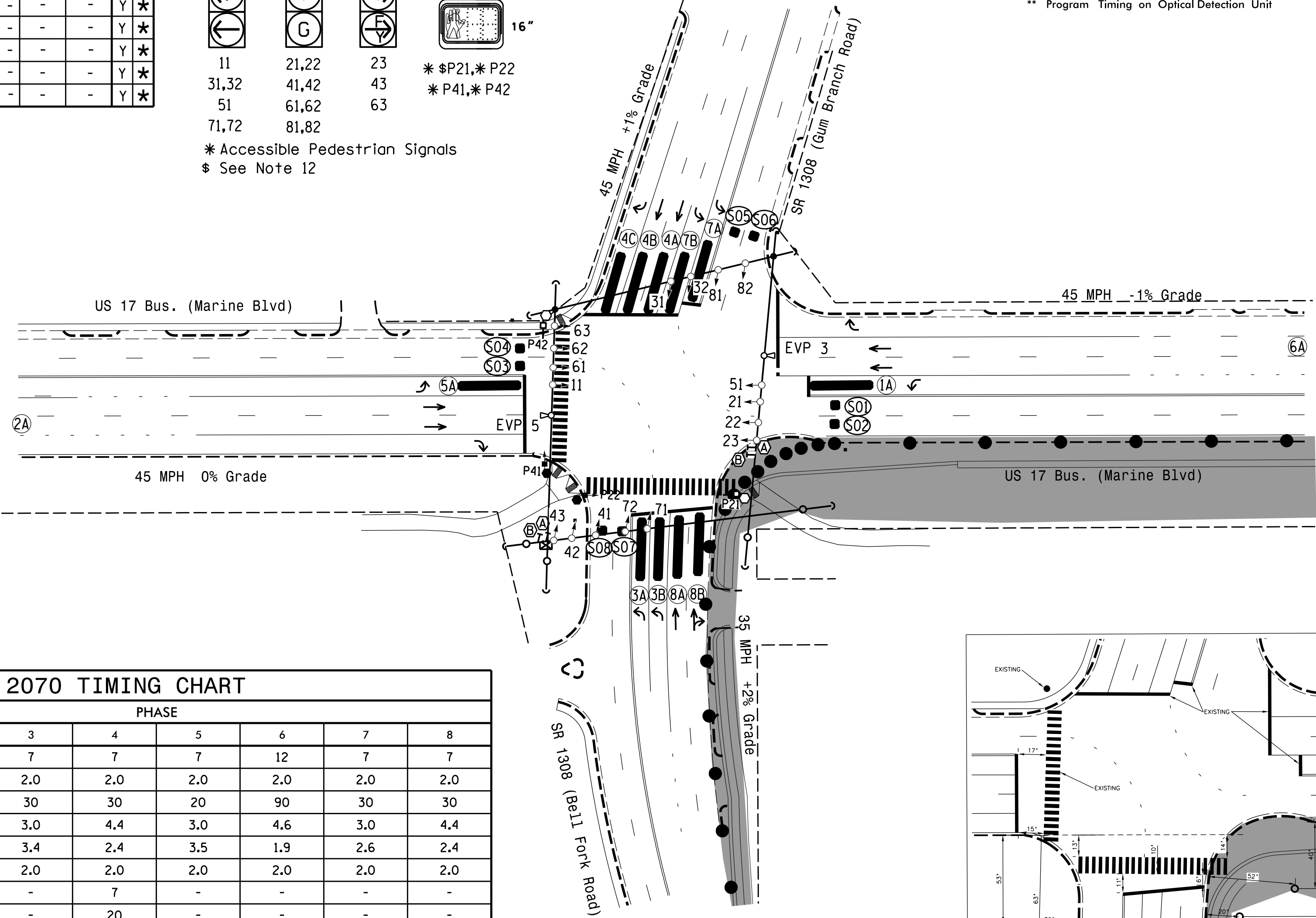
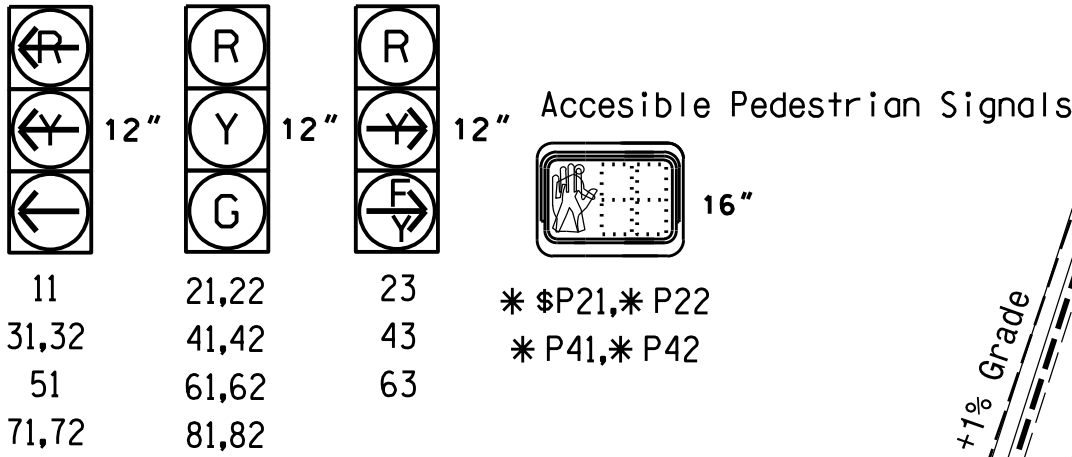
OASIS 2070L LOOP & DETECTOR INSTALLATION											
INDUCTIVE LOOPS				DETECTOR PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP NEW CARD
1A	*	0	*	-	1	Y	Y	-	-	3	- *
2A	*	*	*	-	2	Y	Y	-	-	-	- *
3A	*	0	*	-	3	Y	Y	-	-	-	- *
3B	*	0	*	-	3	Y	Y	-	-	-	- *
4A	*	0	*	-	4	Y	Y	-	-	-	- *
4B	*	0	*	-	4	Y	Y	-	-	-	- *
4C	*	0	*	-	4	Y	Y	-	-	15	- *
5A	*	0	*	-	5	Y	Y	-	-	3	- *
6A	*	*	*	-	6	Y	Y	-	-	-	- *
7A	*	0	*	-	7	Y	Y	-	-	3	- *
7B	*	0	*	-	7	Y	Y	-	-	-	- *
8A	*	0	*	-	8	Y	Y	-	-	-	- *
8B	*	0	*	-	8	Y	Y	-	-	10	- *
S01	*	0	*	-	-	-	-	-	-	-	Y *
S02	*	0	*	-	-	-	-	-	-	-	Y *
S03	*	0	*	-	-	-	-	-	-	-	Y *
S04	*	0	*	-	-	-	-	-	-	-	Y *
S05	*	0	*	-	-	-	-	-	-	-	Y *
S06	*	0	*	-	-	-	-	-	-	-	Y *
S07	*	0	*	-	-	-	-	-	-	-	Y *
S08	*	0	*	-	-	-	-	-	-	-	Y *

* Multizone Microwave Detection

MICROWAVE DETECTION				
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	NB		SB	
Type	PRIORITY		PRIORITY	
Level	2	QUEUE	2	QUEUE
Discovery Zone(ft)	<750	-	<750	-
Detection ZoneRange(ft)	600-100	150-100	600-100	150-100
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	30	20	90	30	30
Yellow Clearance	3.0	4.6	3.0	4.4	3.0	4.6	3.0	4.4
Red Clearance	3.7	1.9	3.4	2.4	3.5	1.9	2.6	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7	-	-	-	-
Don't Walk 1	-	25	-	20	-	-	-	-
Advanced Walk	-	**	-	***	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
** See Note # 10
*** See Note # 11

OASIS 2070 EV PREEMPT		
FUNCTION	PRE 3	PRE 5
Interval 1 – Dwell Green	255	255
Interval 1 – Dwell Yellow	0.0*	0.0*
Interval 1 – Dwell Red	0.0*	0.0*
Interval 5 – Exit Green	1	1
Interval 5 – Yellow	0.0	0.0
Interval 5 – Red	0.0	0.0
Exit Phase(s)	2+6	2+6
Priority	MED	MED
Delay Time	0.0	0.0
Min Green Before Pre	1	1
Ped Clear Before Pre	0*	0*
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	12	12
Dwell Max Time (Minutes)	2	2
Enable Backup Protection	N	N
Ped Clear Through Yellow	Y	Y
Omit Overlaps	-	-
Preempt Extend**	2	2

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

8 Phase
Fully Actuated
w/Emergency Vehicle Preemption
Jacksonville City Signal System

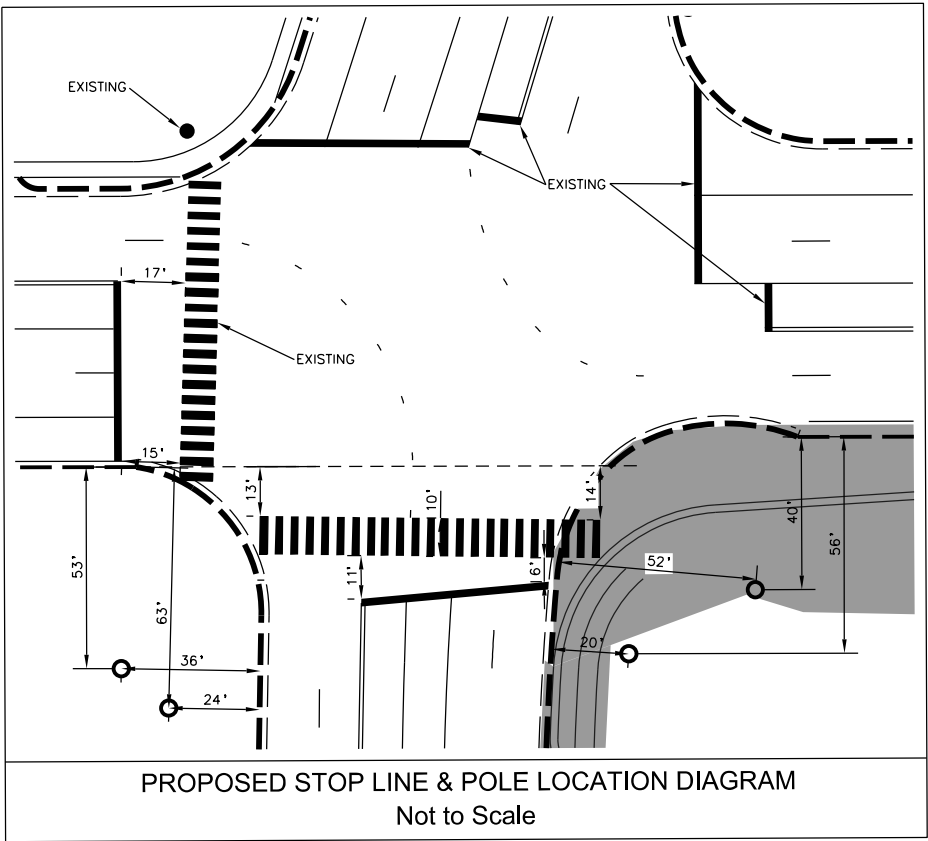
PROJECT REFERENCE NO.	SHEET NO.
U-5728	Sig. 2.0

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- To provide a leading pedestrian interval on phase 2 program FYA head(s) numbered 23 to delay for 7 seconds after the start of the phase 2 walk interval. See Electrical Details for programming.
- To provide a leading pedestrian interval on phase 4 program FYA head(s) numbered 43 to delay for 6 seconds after the start of the phase 4 walk interval. See Electrical Details for programming.
- Relocate existing ped pedestal and pushbutton P21 to temp location on a temporary helical foundation. Feed temp ped heads from the overhead span.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Controller Asset #0090

LEGEND

PROPOSED	EXISTING
	N/A
	N/A
N/A	
N/A	



Project #: 230906

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Temporary Design 1; (TMP 2 Step 1)
Signal Upgrade - Sheet 1 of 2

US 17 Bus. (Marine Boulevard)
at
SR 1308 (Gum Branch Road /
Bell Fork Road)

Division 3 Onslow County Jacksonville

PLAN DATE: July 2026 REVIEWED BY: D. Bennett

PREPARED BY: B. Dowell REVIEWED BY:

REVISIONS

INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

Seal of Donald R. Bennett II, Professional Engineer, State of North Carolina, License No. 020608

Signed: Donald R. Bennett II

7/21/2026

SIGNATURE DATE

SIG. INVENTORY NO. 03-009011

8 Phase
Fully Actuated
w/Emergency Vehicle Preemption
Jacksonville City Signal System

PROJECT REFERENCE NO.	SHEET NO.
U-5728	Sig. 2.1

NOTES

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- Relocate existing ped pedestal and pushbutton P21 to temp location on a temporary helical foundation. Feed temp ped heads from the overhead span.
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- Controller Asset #0090

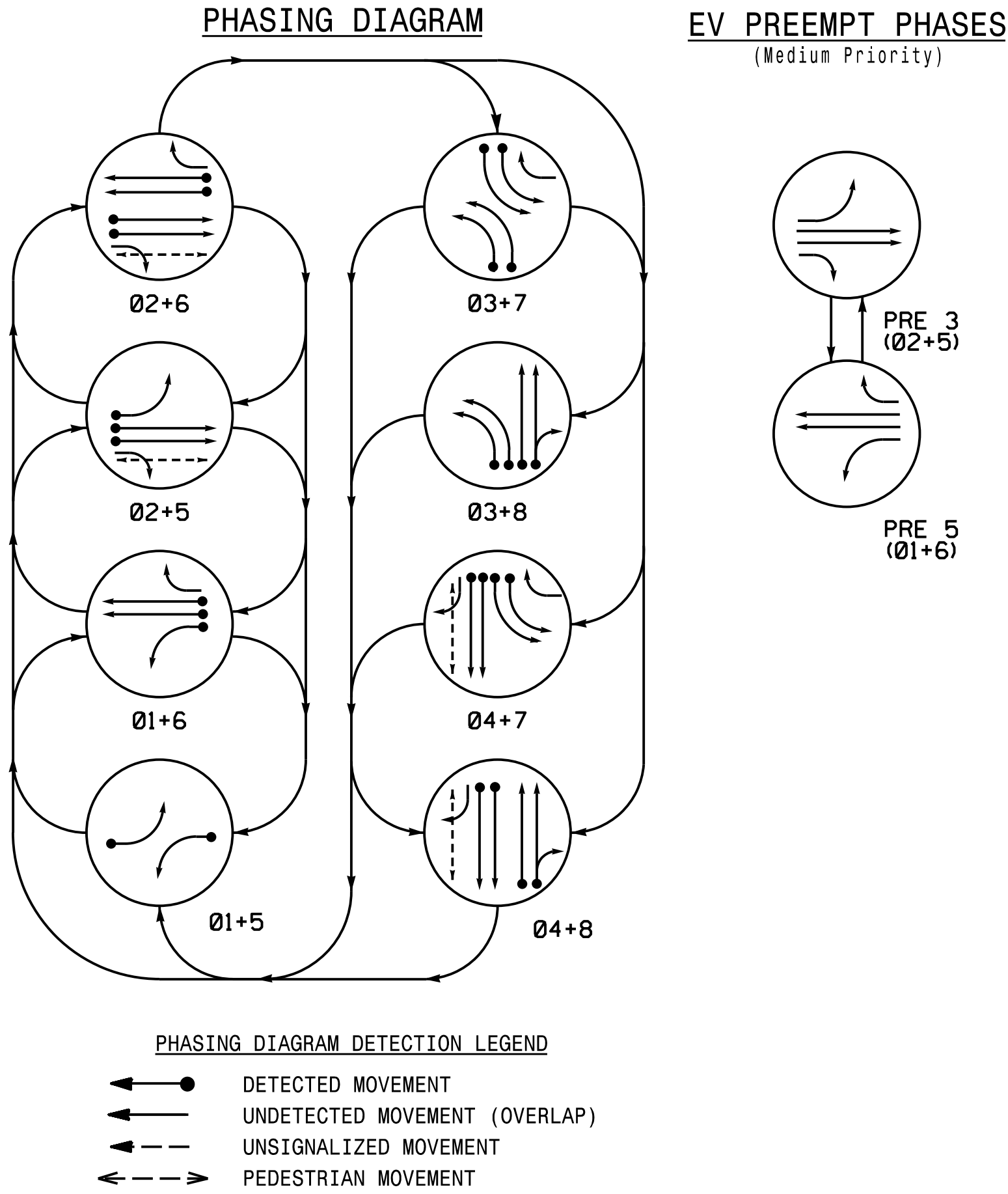


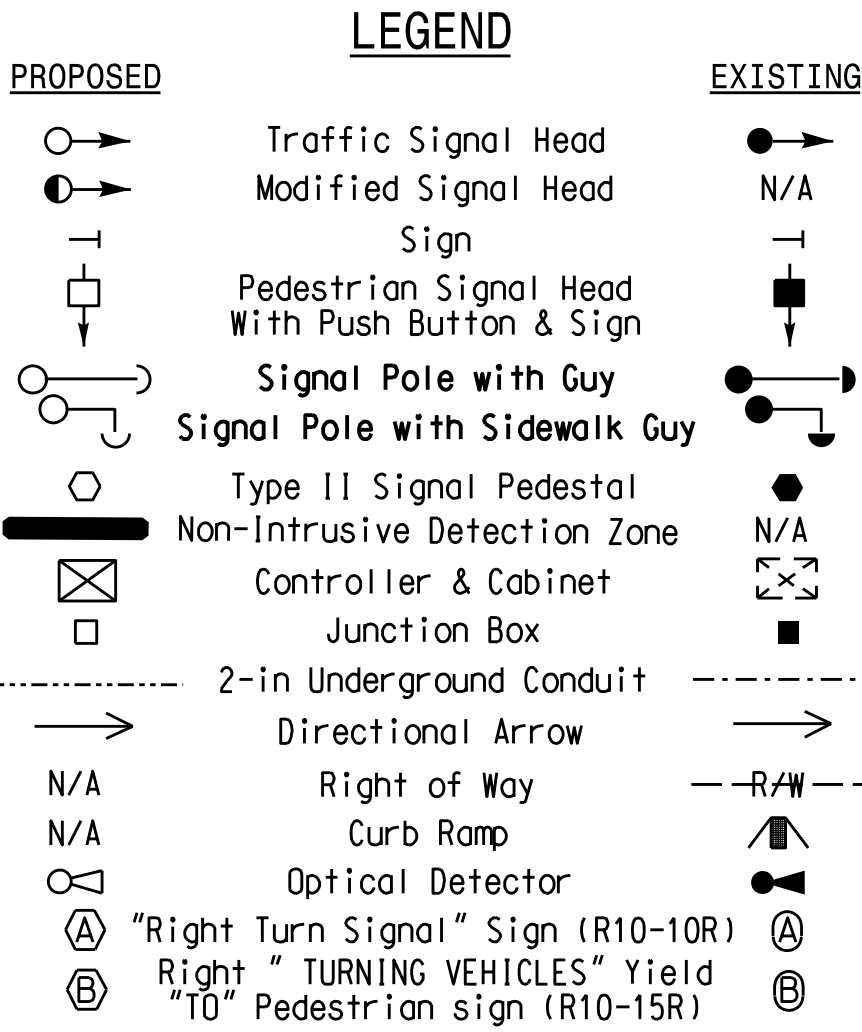
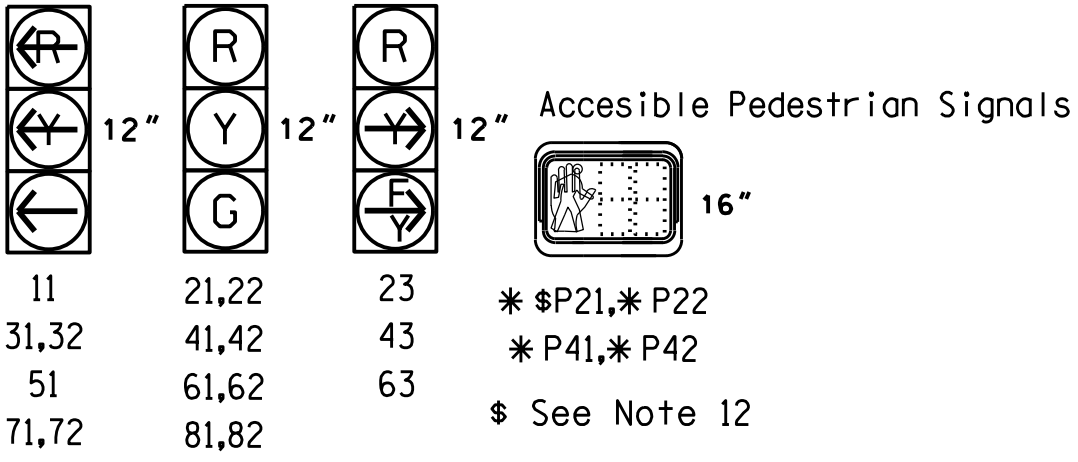
TABLE OF OPERATION											
SIGNAL FACE	PHASE										
	0 1 + 5	0 1 + 6	0 2 + 5	0 2 + 6	0 3 + 7	0 3 + 8	0 4 + 7	0 4 + 8	E V P 3	E V P 5	F L A S H
11	—	—	—	—	—	—	—	—	—	—	—
21,22	R	R	G	G	R	R	R	R	G	R	R
23	R	R	F	F	R	R	R	R	F	R	R
31,32	—	—	—	—	—	—	—	—	—	—	—
41,42	R	R	R	R	R	R	G	G	R	R	R
43	R	R	R	R	R	R	F	F	R	R	R
51	—	—	—	—	—	—	—	—	—	—	—
61,62	R	G	R	G	R	R	R	R	R	G	R
63	R	F	R	F	F	R	F	R	R	F	R
71,72	—	—	—	—	—	—	—	—	—	—	—
81,82	R	R	R	R	R	G	R	G	R	R	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DW	DW	DRK

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Bell Fork
P22		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Bell Fork
P41		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Marine
P42		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Marine

* Accessible Pedestrian Signals

SIGNAL FACE I.D.

All Heads L.E.D.



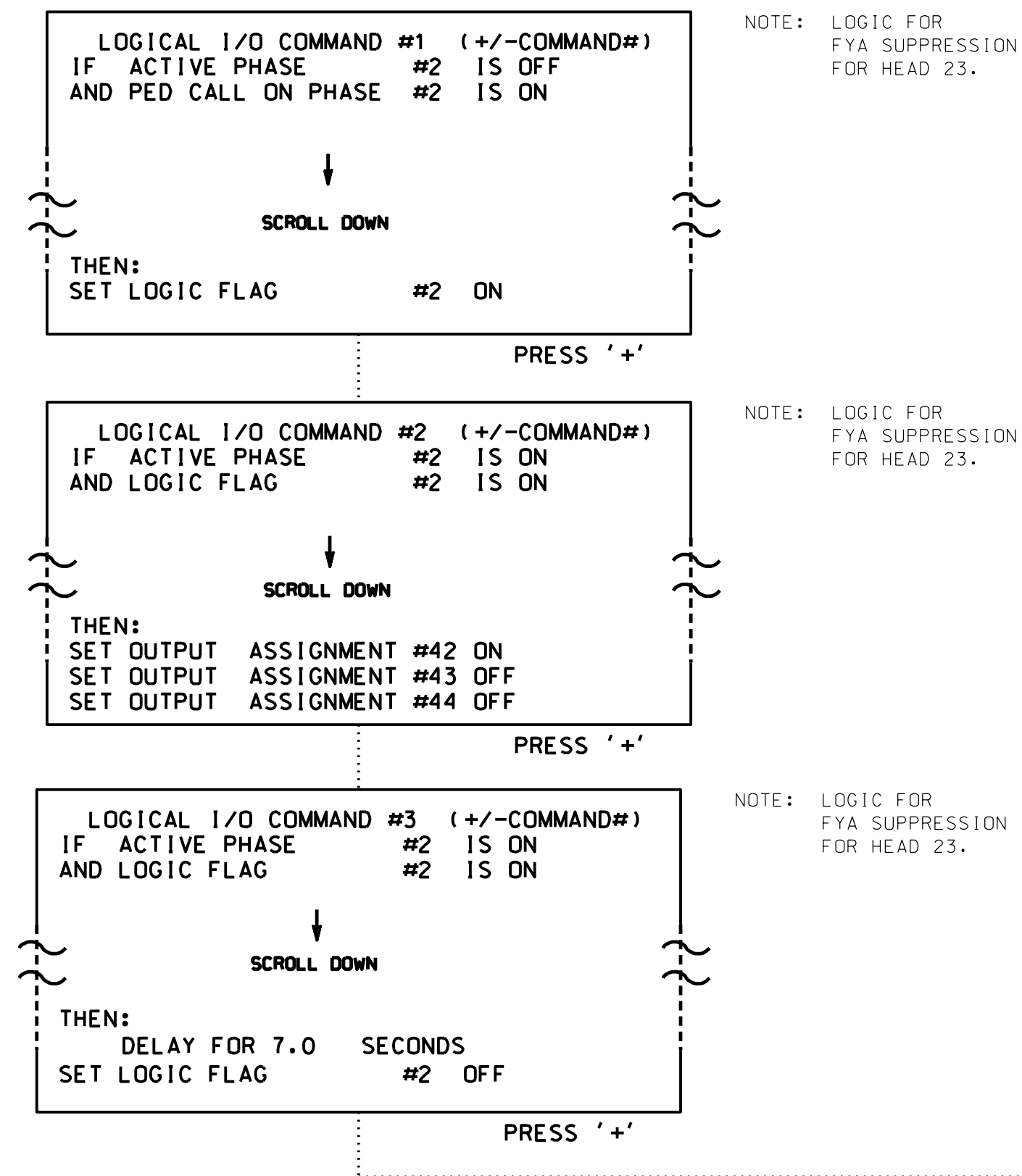
Temporary Design 1; (TMP 2 Step 1)
Signal Upgrade - Sheet 2 of 2



	US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road / Bell Fork Road)																			
	Division 3 Onslow County Jacksonville PLAN DATE: July 2026 REVIEWED BY: D. Bennett PREPARED BY: B. Dowell REVIEWED BY:																			
	<table><thead><tr><th>REVISIONS</th><th>INIT.</th><th>DATE</th></tr></thead><tbody><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></tbody></table>	REVISIONS	INIT.	DATE										<table><tr><td>SIGNATURE</td><td>DATE</td></tr><tr><td>Donald R. Bennett II</td><td>7/21/2026</td></tr><tr><td>SIG. INVENTORY NO.</td><td>03-009011</td></tr></table>	SIGNATURE	DATE	Donald R. Bennett II	7/21/2026	SIG. INVENTORY NO.	03-009011
REVISIONS	INIT.	DATE																		
SIGNATURE	DATE																			
Donald R. Bennett II	7/21/2026																			
SIG. INVENTORY NO.	03-009011																			

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



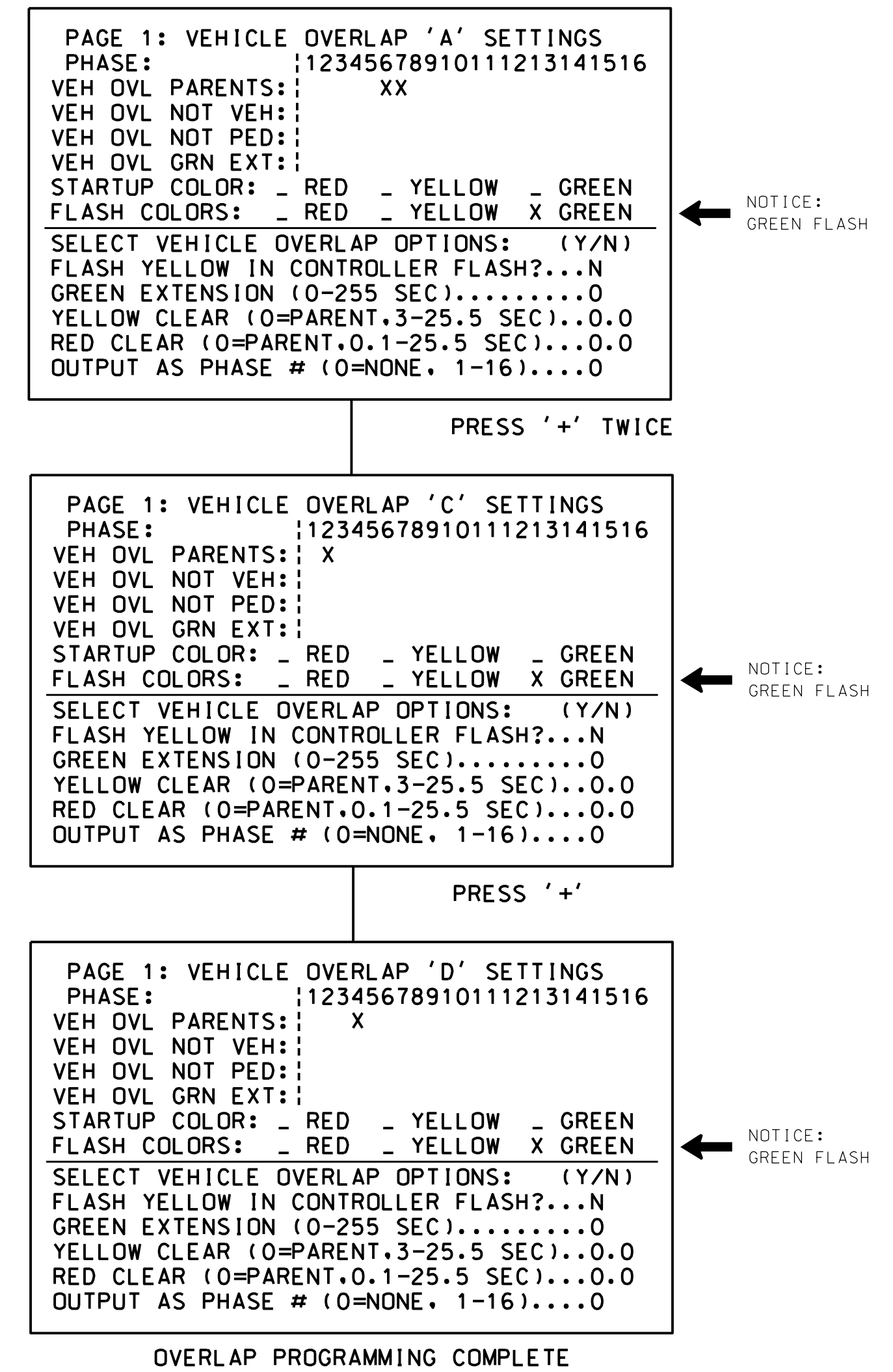
```

OUTPUT 39 = Over lap D Red
OUTPUT 40 = Over lap D Yellow
OUTPUT 41 = Over lap D Green
OUTPUT 42 = Over lap C Red
OUTPUT 43 = Over lap C Yellow
OUTPUT 44 = Over lap C Green

```

(program controller as shown below)

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



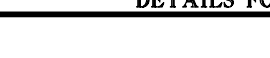
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THE SIGNAL DESIGN: 03-0090
DESIGNED: July 2026
SEALED: 7-21-2026
REVISED: N/A

Project #: 230906



Temporary Design 1 (TMP Phase 2-Step1)
Electrical Detail - Sheet 2 of 3

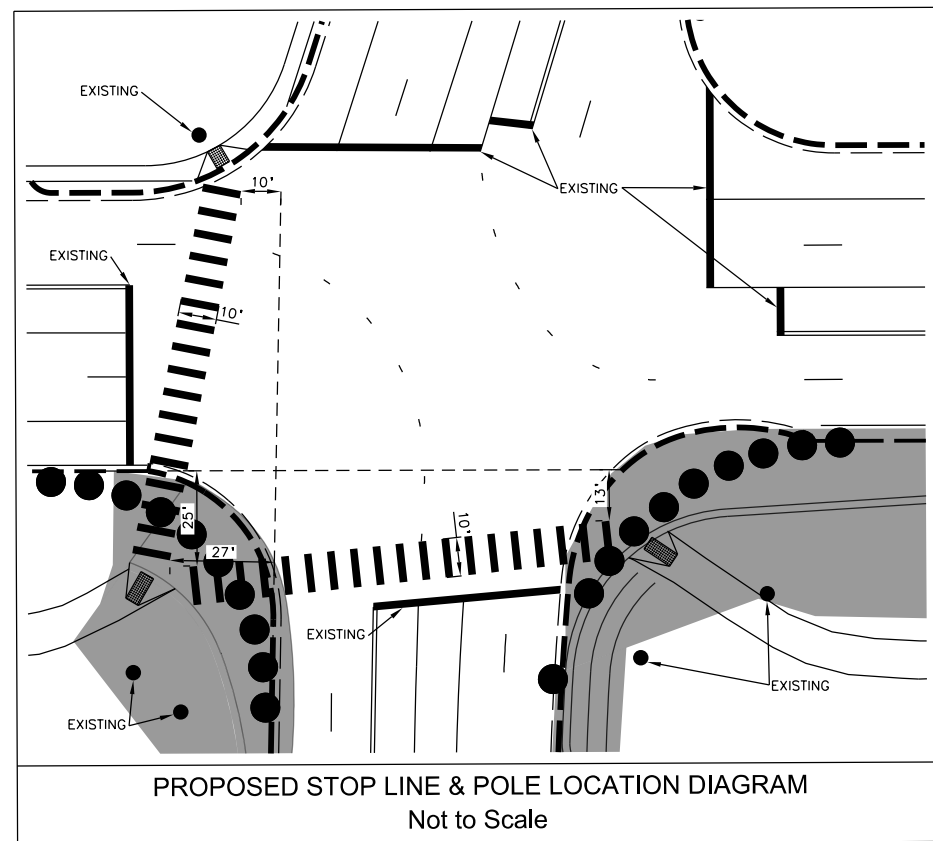
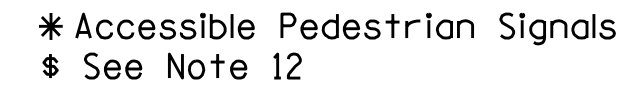
**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road/ Bell Fork Road)
Prepared for: 	
750 N.Greenfield Pkwy,Carrner,NC 27259	

* Multizone Microwave Detection

SIGNAL FACE I.D.

All Heads L.E.D.



* 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.

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

- | PROPOSED | LEGEND | EXISTING |
|----------|--|----------|
| | Traffic Signal Head | |
| | Modified Signal Head | N/A |
| | Sign | |
| | Pedestrian Signal Head | |
| | Signal Pole With Push Button & Sign | |
| | Signal Pole with Guy | |
| | Signal Pole with Sidewalk Guy | |
| | Type II Signal Pedestal | |
| | Non-Intrusive Detection Zone | N/A |
| | Controller & Cabinet | |
| | Junction Box | |
| | 2-in Underground Conduit | |
| | Directional Arrow | |
| N/A | Right of Way | |
| N/A | Curb Ramp | |
| | Optical Detector | |
| (A) | "Right Turn Signal" Sign (R10-R10R) | (A) |
| (B) | Right "TURNING VEHICLES" Yield
"TQ" Pedestrian Sign (R10-15R) | (B) |

Prepared For:  Transportation Mobility and Safety Division DEPARTMENT OF TRANSPORTATION Signal Design Section	US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road / Bell Fork Road)	SEAL 																						
Division 3 Onslow County Jacksonville																								
PLAN DATE: July 2026		REVIEWED BY: D. Bennett																						
PREPARED BY: B. Dowell		REVIEWED BY:																						
750 N. Greenfield Pkwy, Garner, NC 27525		Signed By:  02C83701D4B4FC...																						
SCALE 		7/21/2026																						
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INIT.	DATE																							

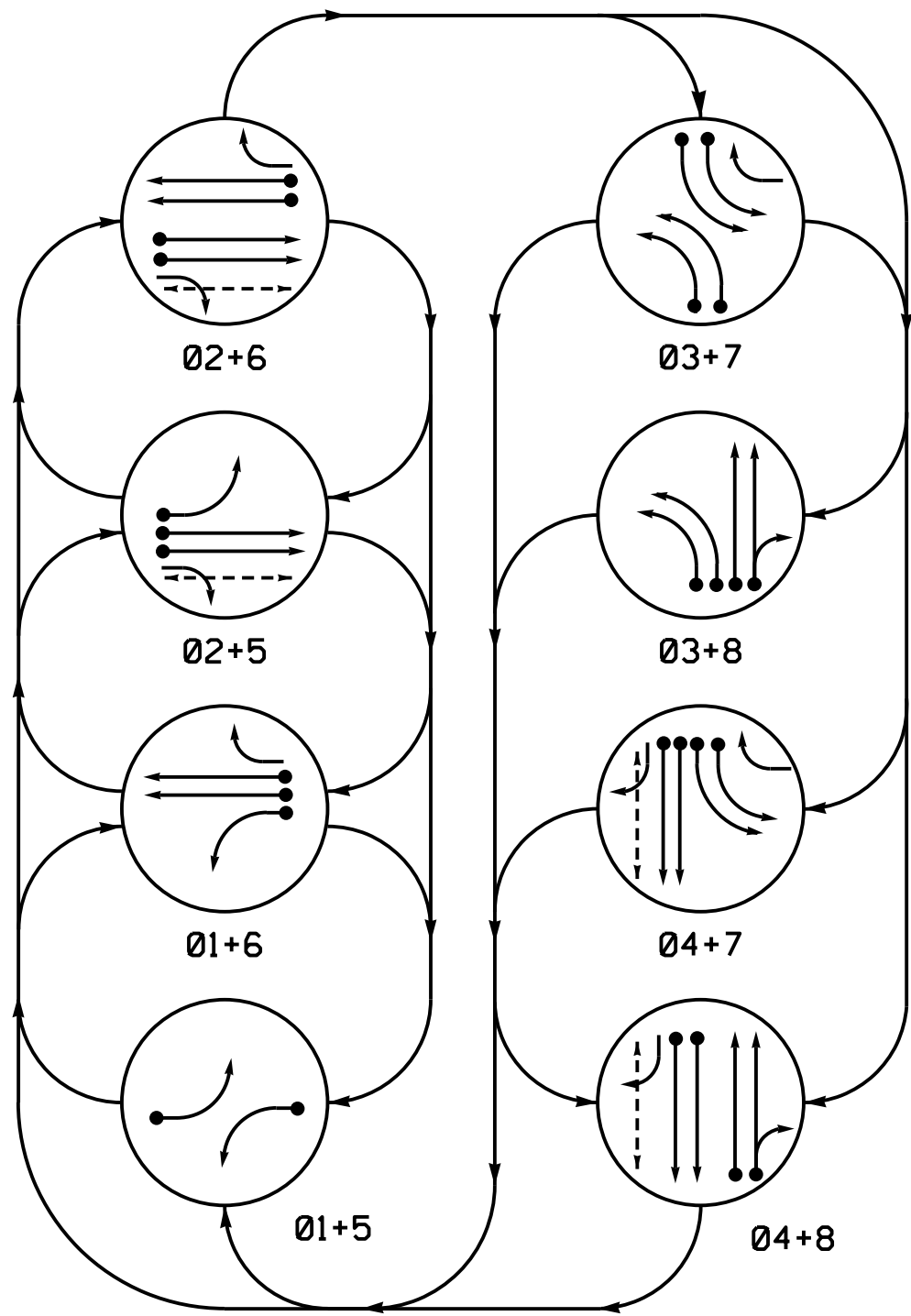
8 Phase
Fully Actuated
w/Emergency Vehicle Preemption
Jacksonville City Signal System

PROJECT REFERENCE NO.	SHEET NO.
U-5728	Sig. 3.1

NOTES

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- Controller Asset #0090

PHASING DIAGRAM



EV PREEMPT PHASES

(Medium Priority)

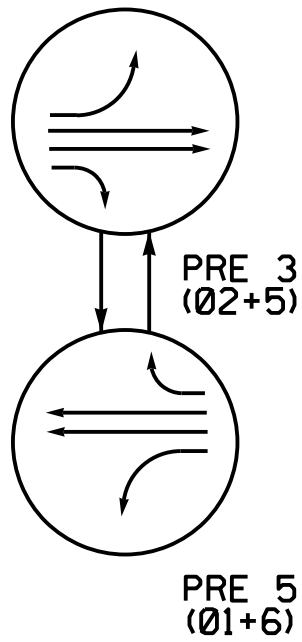


TABLE OF OPERATION

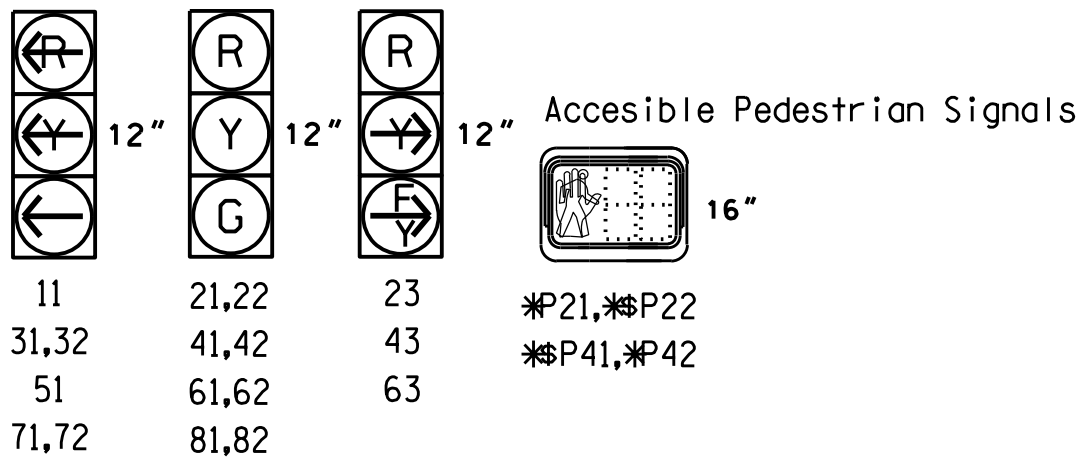
SIGNAL FACE	PHASE											
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8	EVP 3	EVP 5	FL 23	FL 43
11	←←	←←	→→	→→	←←	←←	→→	→→	←←	←←	→→	→→
21,22	R	R	G	G	R	R	R	R	G	R	R	R
23	R	R	←←	←←	R	R	R	R	←←	←←	R	R
31,32	→→	→→	←←	←←	←←	←←	→→	→→	→→	→→	←←	←←
41,42	R	R	R	R	R	R	G	G	R	R	R	R
43	R	R	R	R	R	R	←←	←←	R	R	R	R
51	←←	←←	←←	←←	→→	→→	→→	→→	←←	←←	→→	→→
61,62	R	G	R	G	R	R	R	R	R	R	G	R
63	R	←←	R	←←	←←	←←	R	←←	R	R	←←	R
71,72	→→	→→	→→	→→	←←	←←	→→	→→	→→	→→	←←	←←
81,82	R	R	R	R	R	G	R	G	R	R	R	R
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DW	DW	DRK	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DW	DW	DRK	DRK

PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←→ UNDETECTED MOVEMENT (OVERLAP)
- ←-- UN SIGNALIZED MOVEMENT
- ←--> PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



* Accessible Pedestrian Signals
\$ See Note 12

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	●→
○ Type II Signal Pedestal	●
▬ Non-Intrusive Detection Zone	N/A
⊠ Controller & Cabinet	⊠
□ Junction Box	■
----- 2-in Underground Conduit	-----
→ Directional Arrow	→
N/A Right of Way	--R/W--
N/A Curb Ramp	▲
○ Optical Detector	●
Ⓐ "Right Turn Signal" Sign (R10-10R)	Ⓐ
Ⓑ Right "TURNING VEHICLES" Yield	Ⓑ
Ⓒ "T" Pedestrian sign (R10-15R)	Ⓒ

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION			
SIGNAL FACE	VOICE	TONES	SPEECH MESSAGE
P21		X	Walk (Percussive Tone)
	X		Flashing Don't Walk / Don't Walk Wait, Wait to cross Bell Fork (Percussive Tone)
P22		X	Walk (Percussive Tone)
	X		Flashing Don't Walk / Don't Walk Wait, Wait to cross Bell Fork (Percussive Tone)
P41		X	Walk (Percussive Tone)
	X		Flashing Don't Walk / Don't Walk Wait, Wait to cross Marine (Percussive Tone)
P42		X	Walk (Percussive Tone)
	X		Flashing Don't Walk / Don't Walk Wait, Wait to cross Marine (Percussive Tone)

* Accessible Pedestrian Signals

Temporary Design 2 (TMP Phase 5-Step 1)
Signal Upgrade - Sheet 2 of 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

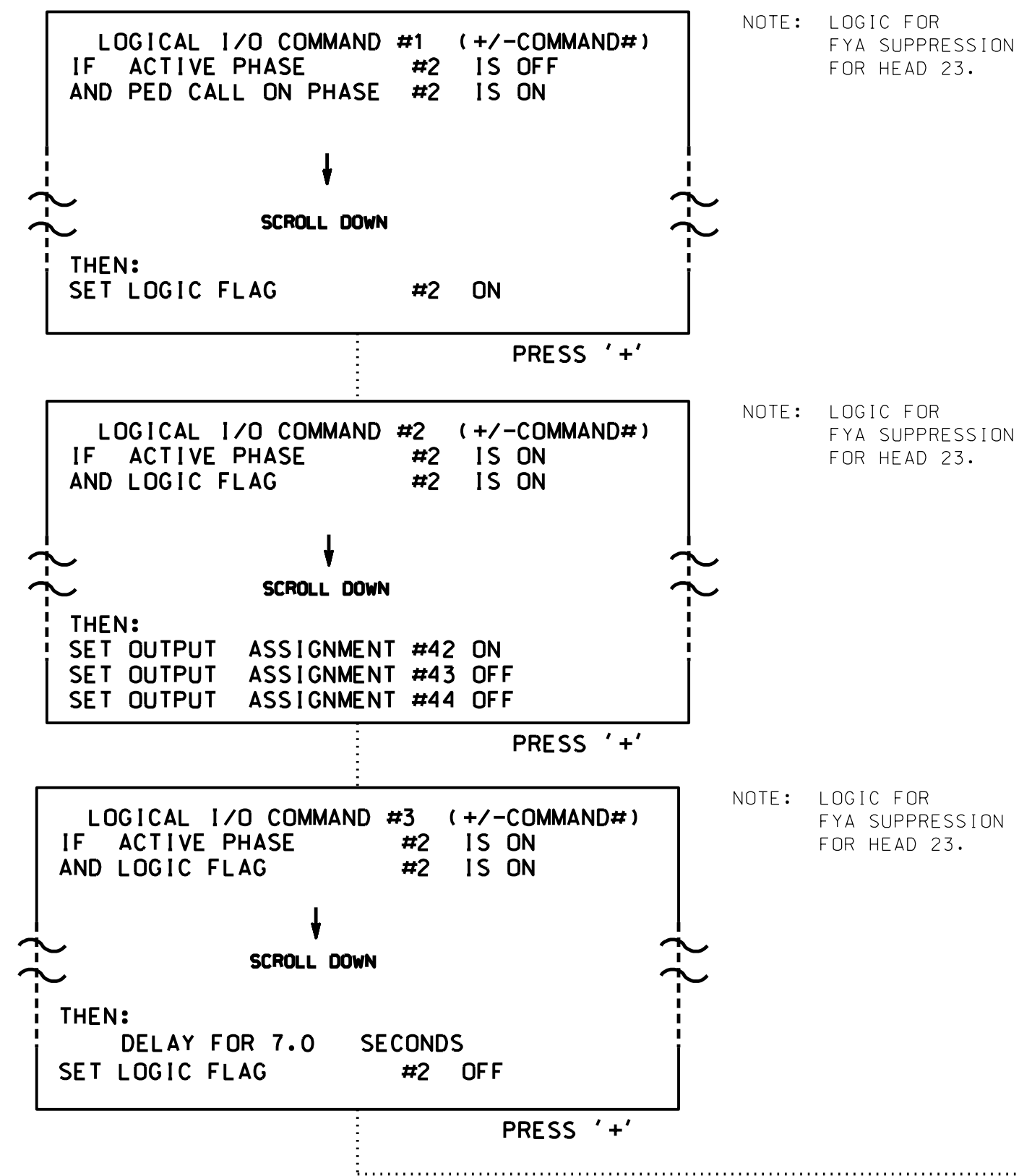
	US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road / Bell Fork Road)	
	Division 3 Onslow County Jacksonville PLAN DATE: July 2026 REVIEWED BY: D. Bennett PREPARED BY: B. Dowell REVIEWED BY: _____ SIGNATURE DATE SIG. INVENTORY NO. 03-009012	

Project #: 230906



(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



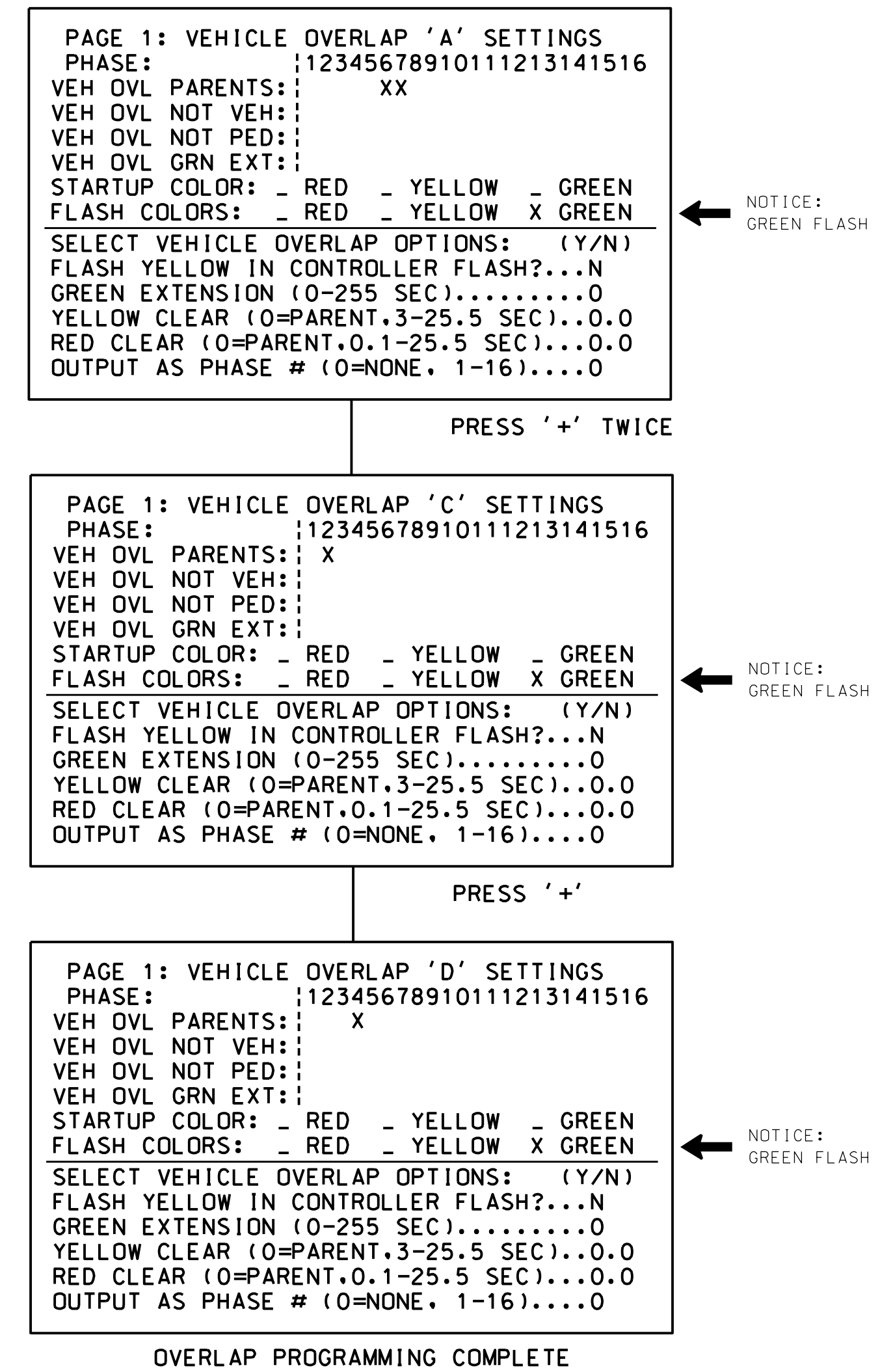
```

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

```

(program controller as shown below)

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



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0090
DESIGNED: July 2026
SEALED: 7-21-2026
REVISED: N/A

Project #: 230906



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NCBELS FIRM LICENSE NO. C-2522

Temporary Design 2 (TMP Phase 5-Step1)
Electrical Detail - Sheet 2 of 3

**DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED**

ELECTRICAL AND PROGRAMMING DETAILS FOR:	US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road/ Bell Fork Road)	SEAL 																												
Prepared for: 	Division 03 Onslow County Jacksonville	SIGNED  Donald R. Bennett II 02CE83701D4DB4FC...																												
750 N. Greenfield Pkwy, Garner, NC 27529	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">PLAN DATE: July 2026</td> <td style="width: 33%;">REVIEWED BY: D. Bennett</td> </tr> <tr> <td>PREPARED BY: B. Dowell</td> <td>REVIEWED BY:</td> </tr> </table>	PLAN DATE: July 2026	REVIEWED BY: D. Bennett	PREPARED BY: B. Dowell	REVIEWED BY:	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">REVISIONS</th> <th style="width: 20%;">INIT.</th> <th style="width: 20%;">DATE</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	REVISIONS	INIT.	DATE																					
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		7/22/2026 <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">SIGNATURE</th> <th style="width: 40%;">DATE</th> </tr> <tr> <td>SIG. INVENTORY NO. 03-009072</td> <td> </td> </tr> </table>	SIGNATURE	DATE	SIG. INVENTORY NO. 03-009072																									
SIGNATURE	DATE																													
SIG. INVENTORY NO. 03-009072																														

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART													
INDUCTIVE LOOPS				DETECTOR PROGRAMMING									
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
1A	*	0	*	Y	1	Y	Y	-	-	-	-	*	
1B	*	0	*	Y	1	Y	Y	-	-	15	-	*	
2A	*	*	*	Y	2	Y	Y	-	-	-	-	*	
3A	*	0	*	Y	3	Y	Y	-	-	-	-	*	
3B	*	0	*	Y	3	Y	Y	-	-	-	-	*	
4A	*	0	*	Y	4	Y	Y	-	-	-	-	*	
4B	*	0	*	Y	4	Y	Y	-	-	-	-	*	
4C	*	0	*	Y	4	Y	Y	-	-	15	-	*	
5A	*	0	*	Y	5	Y	Y	-	-	-	-	*	
5B	*	0	*	Y	5	Y	Y	-	-	-	-	*	
6A	*	*	*	Y	6	Y	Y	-	-	-	-	*	
7A	*	0	*	Y	7	Y	Y	-	-	3	-	*	
7B	*	0	*	Y	7	Y	Y	-	-	-	-	*	
8A	*	0	*	Y	8	Y	Y	-	-	-	-	*	
8B	*	0	*	Y	8	Y	Y	-	-	-	-	*	
S01	*	0	*	Y		-	-	-	-	-	Y	*	
S02	*	0	*	Y		-	-	-	-	-	Y	*	
S03	*	0	*	Y		-	-	-	-	-	Y	*	
S04	*	0	*	Y		-	-	-	-	-	Y	*	
S05	*	0	*	Y		-	-	-	-	-	Y	*	
S06	*	0	*	Y		-	-	-	-	-	Y	*	
S07	*	0	*	Y		-	-	-	-	-	Y	*	
S08	*	0	*	Y		-	-	-	-	-	Y	*	

★ Multizone Microwave Detection

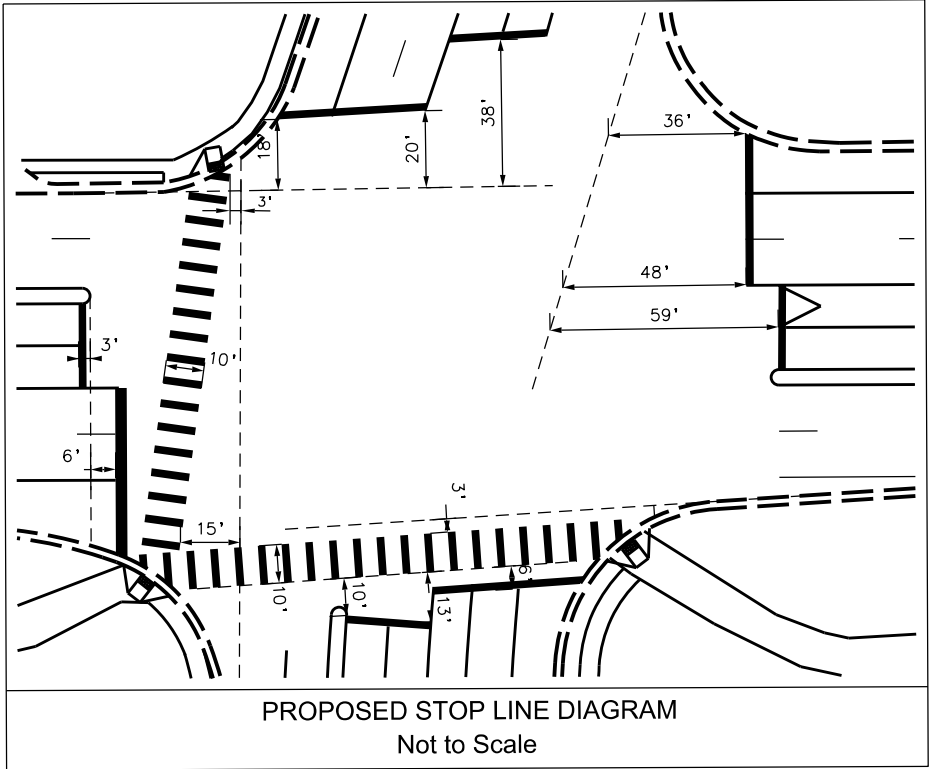
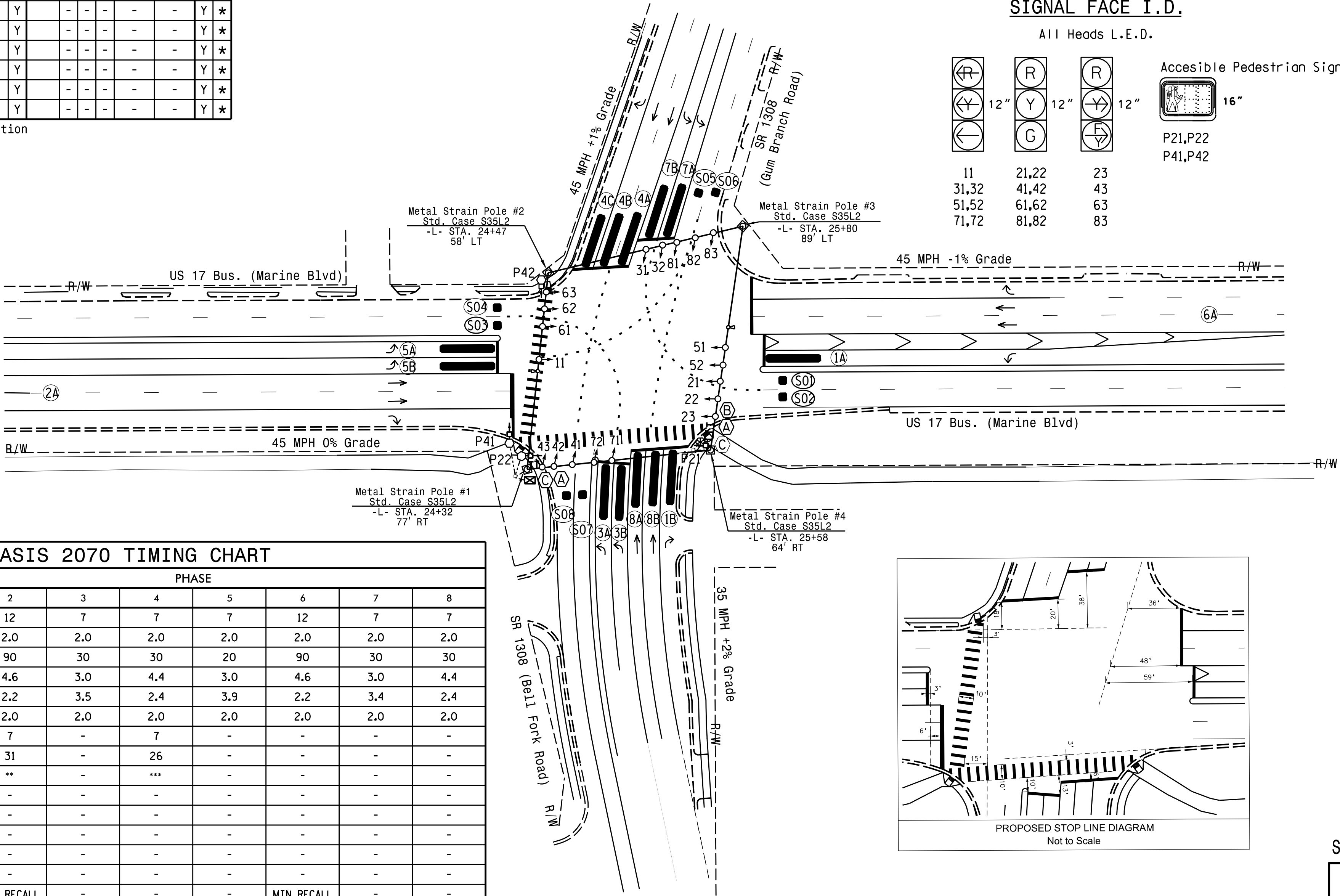
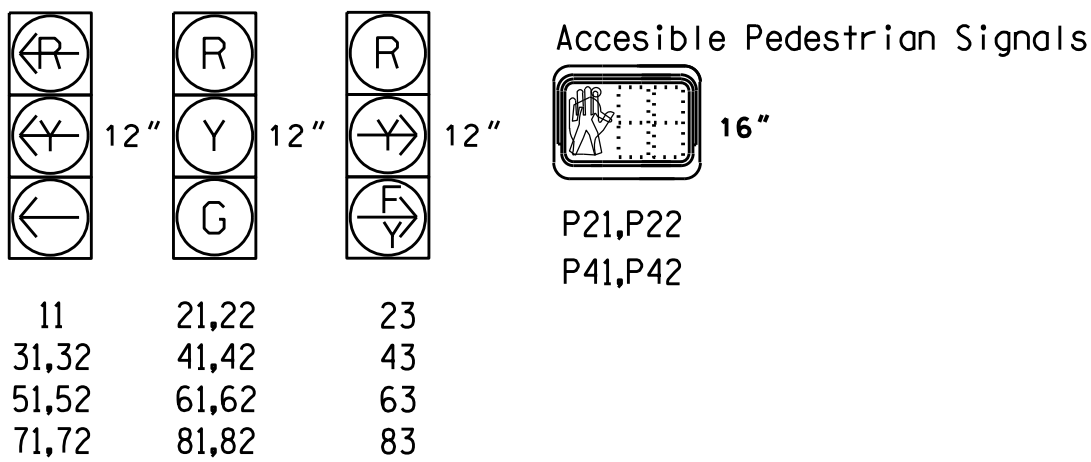
MICROWAVE DETECTION				
FUNCTION	Sensor 1 (2A)		Sensor 2 (6A)	
Channel	1		1	
Phase	2		6	
Direction of Travel	NB		SB	
Type	PRIORITY		PRIORITY	
Level	2	QUEUE	2	QUEUE
Discovery Zone(ft)	<750	-	<750	-
Detection ZoneRange(ft)	600-100	150-100	600-100	150-100
Enable Speed	Y	Y	Y	Y
Speed Range (mph)	35-100	1-35	35-100	1-35
Enable Estimated Time of Arrival	Y	N	Y	N
Estimated Time of Arrival (sec)	2.5-6.5	-	2.5-6.5	-

OASIS 2070 EV PREEMPT		
FUNCTION	PRE 3	PRE 5
Interval 1 – Dwell Green	255	255
Interval 1 – Dwell Yellow	0.0*	0.0*
Interval 1 – Dwell Red	0.0*	0.0*
Interval 5 – Exit Green	1	1
Interval 5 – Yellow	0.0	0.0
Interval 5 – Red	0.0	0.0
Exit Phase(s)	2+6	2+6
Priority	MED	MED
Delay Time	0.0	0.0
Min Green Before Pre	1	1
Ped Clear Before Pre	0*	0*
Yellow Clear Before Pre	0.0*	0.0*
Red Clear Before Pre	0.0*	0.0*
Dwell Min Time	12	12
Dwell Max Time (Minutes)	2	2
Enable Backup Protection	N	N
Ped Clear Through Yellow	Y	Y
Omit Overlaps	-	B
Preempt Extend**	2	2

* Time defaults to time used for phase during normal operation
** Program Timing on Optical Detection Unit

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 TIMING CHART								
FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	12	7	7	7	12	7	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	30	20	90	30	30
Yellow Clearance	3.0	4.6	3.0	4.4	3.0	4.6	3.0	4.4
Red Clearance	3.9	2.2	3.5	2.4	3.9	2.2	3.4	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	-	7	-	-	-	-
Don't Walk 1	-	31	-	26	-	-	-	-
Advanced Walk	-	**	-	***	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	ON	-	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.
** See Note # 10
*** See Note # 11

8 Phase
Fully Actuated
w/Emergency Vehicle Preemption
Jacksonville City Signal System

PROJECT REFERENCE NO.	SHEET NO.
U-5728	Sig. 4.0

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features accessible pedestrian signals utilizing percussive tone walk indications and/or speech messages.
- To provide a leading pedestrian interval on phase 2 program FYA head(s) numbered 23 to delay for 7 seconds after the start of the phase 2 walk interval. See Electrical Details for programming.
- To provide a leading pedestrian interval on phase 4 program FYA head(s) numbered 43 to delay for 7 seconds after the start of the phase 4 walk interval. See Electrical Details for programming.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- This intersection uses multi-zone microwave detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Controller Asset #0090

LEGEND

PROPOSED	EXISTING
	N/A
	N/A
	N/A
N/A	
N/A	

Signal Upgrade - Sheet 1 of 2

Project #: 230906

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NCBELS FIRM LICENSE NO. C-2522

Prepared for:
TRANSPORTATION MOBILITY AND SAFETY DIVISION
UNIVERSITY OF NORTH CAROLINA
STATE OF NORTH CAROLINA
Signal Design Section

750 N. Greenfield Pkwy, Garner, NC 27529

0 SCALE 50
1"=50'

US 17 Bus. (Marine Boulevard)
at
SR 1308 (Gum Branch Road /
Bell Fork Road)

Division 3 Onslow County Jacksonville

PLAN DATE: July 2026 REVIEWED BY: D. Bennett

PREPARED BY: B. Dowell REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

Signed By: Donald R. Bennett II
2CEB3701D4DBFC...

7/21/2026

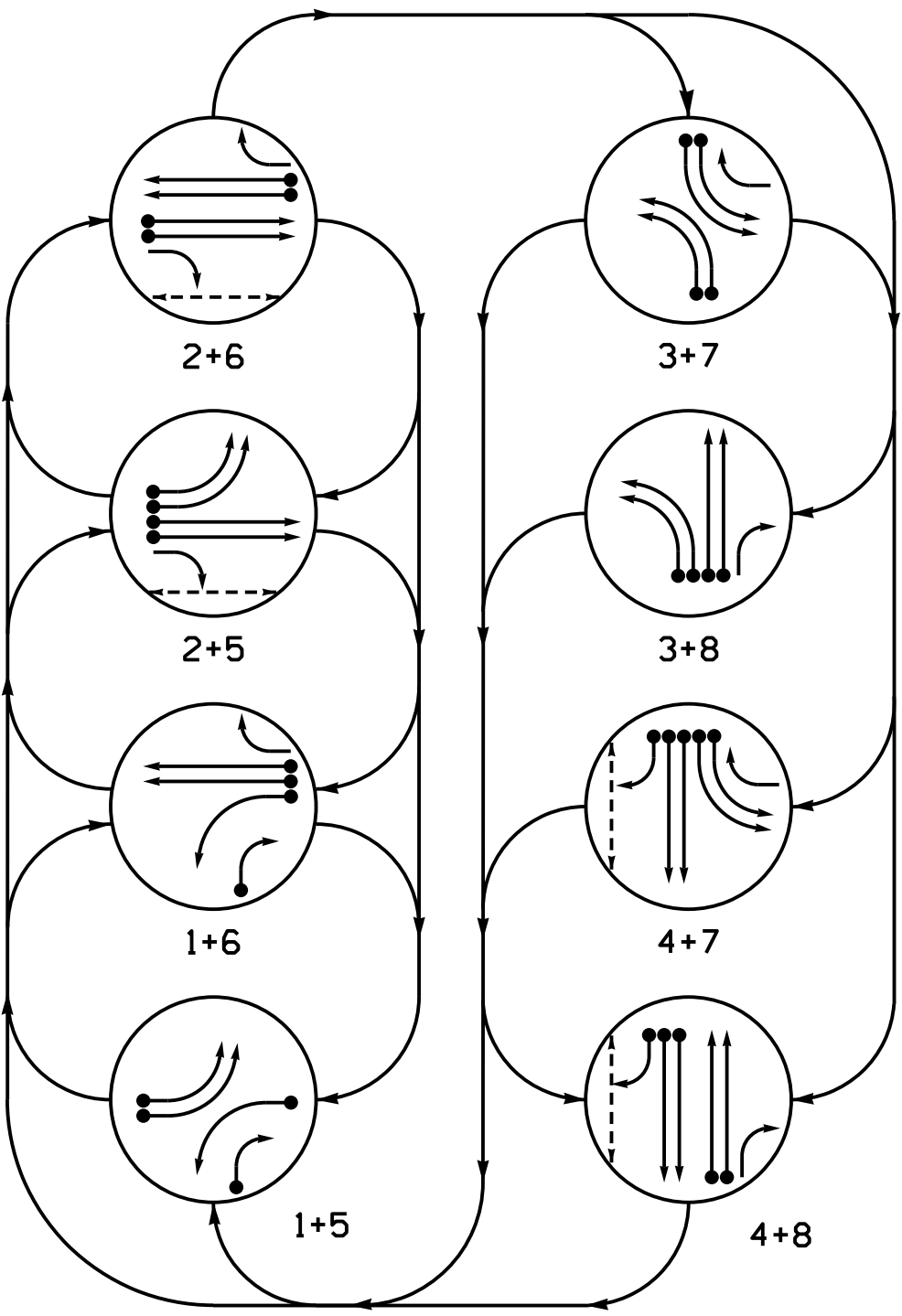
SIGNATURE DATE
SIG. INVENTORY NO. 03-0090

8 Phase
Fully Actuated
w/Emergency Vehicle Preemption
Jacksonville City Signal System

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- Controller Asset #0090

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV PREEMPT PHASES
(Medium Priority)

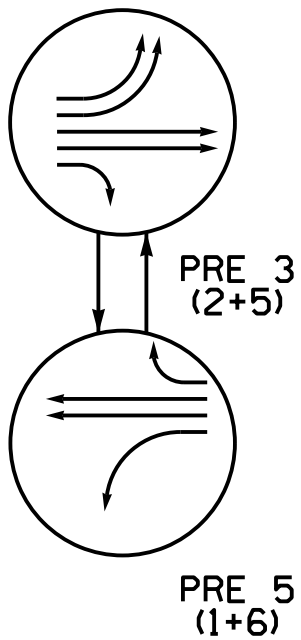
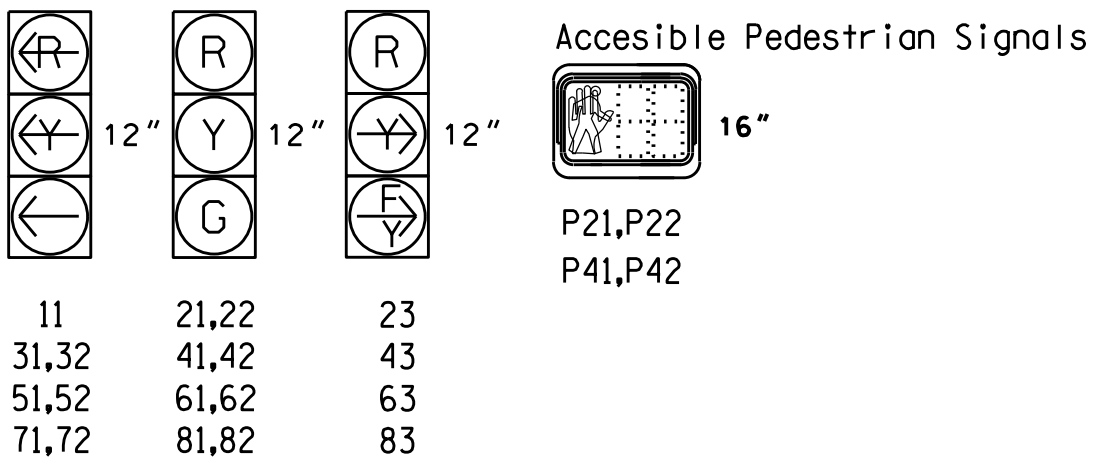


TABLE OF OPERATION

SIGNAL FACE	PHASE											
	1 + 5	1 + 6	2 + 5	2 + 6	3 + 7	3 + 8	4 + 7	4 + 8	PRE 3	PRE 5	FLASH	
11	---	---	---	---	---	---	---	---	---	---	---	
21,22	R	R	G	G	R	R	R	R	G	R	R	
23	R	R	F	F	R	R	R	R	F	R	R	
31,32	---	---	---	---	---	---	---	---	---	---	---	
41,42	R	R	R	R	R	R	G	G	R	R	R	
43	R	R	R	R	R	R	F	F	R	R	R	
51,52	---	---	---	---	---	---	---	---	---	---	---	
61,62	R	G	R	G	R	R	R	R	R	G	R	
63	R	F	R	F	F	R	F	R	R	F	R	
71,72	---	---	---	---	---	---	---	---	---	---	---	
81,82	R	R	R	R	G	R	G	R	R	R	R	
83	F	F	R	R	F	R	F	R	R	R	R	
P21,P22	DW	DW	W	W	DW	DW	DW	DW	DW	DW	DRK	
P41,P42	DW	DW	DW	DW	DW	DW	W	W	DW	DW	DRK	

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

- | PROPOSED | EXISTING |
|--|----------|
| Traffic Signal Head | N/A |
| Modified Signal Head | N/A |
| Sign | N/A |
| Pedestrian Signal Head With Push Button & Sign | N/A |
| Metal Strain Pole | N/A |
| Type I Pushbutton Post | N/A |
| Type II Signal Pedestal | N/A |
| Inductive Loop Detector | N/A |
| Non-Intrusive Detection Zone | N/A |
| Controller & Cabinet | N/A |
| Junction Box | N/A |
| 2-in Underground Conduit | N/A |
| Directional Drill | N/A |
| Directional Arrow | N/A |
| Right of Way | N/A |
| Curb Ramp | N/A |
| Optical Detector | N/A |
| "Right Turn Signal" Sign (R10-10R) | N/A |
| "Right Turn "ONLY" Sign (R3-5R) | N/A |
| "TURNING VEHICLES" Yield "TO" | N/A |
| Pedestrians Sign (R10-15R) | N/A |

ACCESSIBLE PEDESTRIAN SIGNAL OPERATION				
SIGNAL FACE	VOICE	TONES	INTERVAL	SPEECH MESSAGE
P21		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Marine Blvd
P22		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Marine Blvd
P41		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Bell Fork Road
P42		X	Walk	(Percussive Tone)
	X		Flashing Don't Walk / Don't Walk	Wait, Wait to cross Bell Fork Road

Signal Upgrade - Sheet 2 of 2

Project #: 230906

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Prepared for
TRANSPORTATION
MOBILITY AND SAFETY DIVISION
SIGNAL DESIGN SECTION

750 N. Greenfield Pkwy, Garner, NC 27529

0 SCALE 50
1"=50'

US 17 Bus. (Marine Boulevard)
at
SR 1308 (Gum Branch Road /
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Division 3 Onslow County Jacksonville

PLAN DATE: July 2026 REVIEWED BY: D. Bennett

PREPARED BY: B. Dowell REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL

SEAL
020608
ENGINEER
DONALD R. BENNETT II
2CEB8701D4D84FC...

7/21/2026

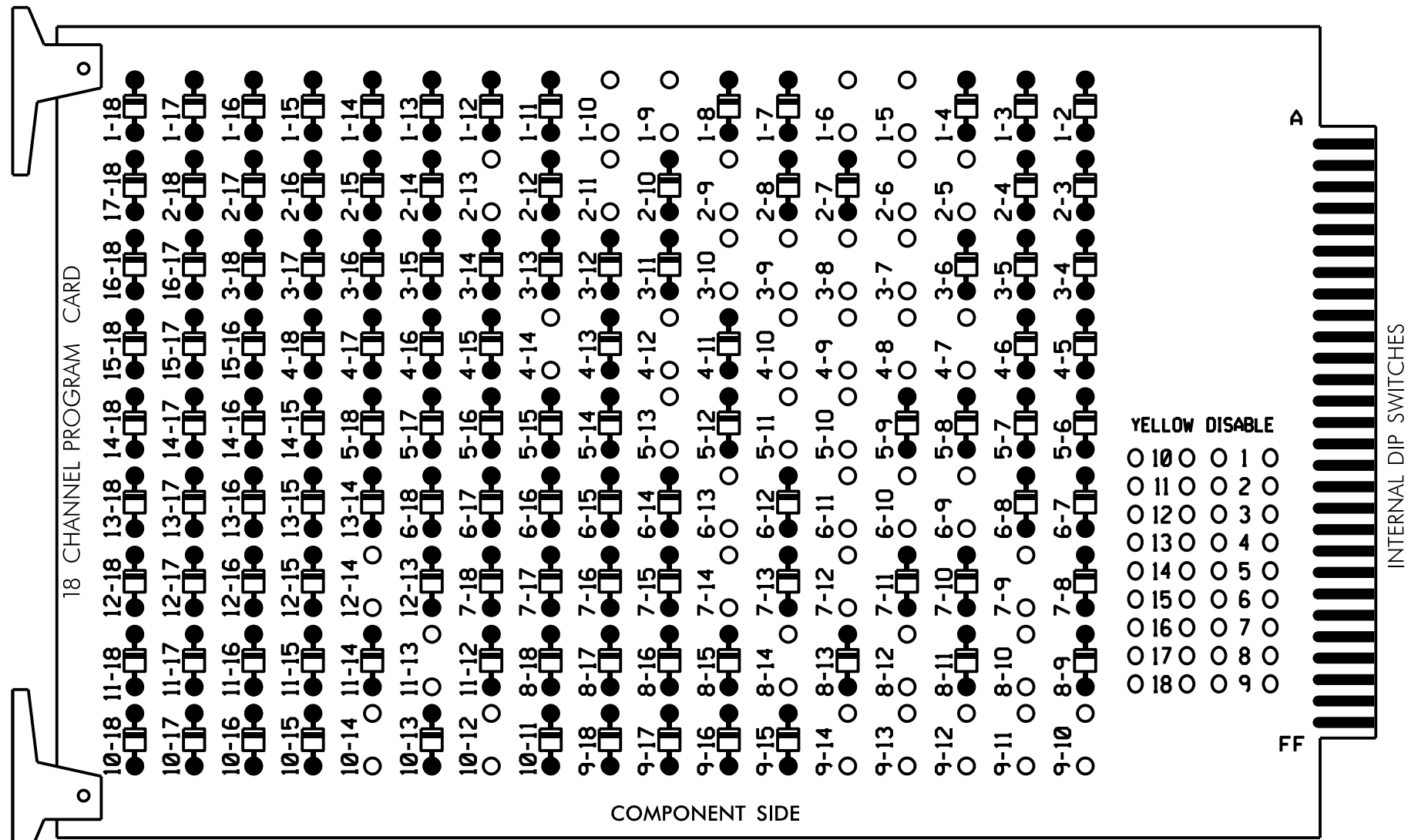
SIGNATURE DATE

SIG. INVENTORY NO. 03-0090

18 CHANNEL IP CONFLICT MONITOR
PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 as First Phases
- Do not program phases 2 and 4 for Startup Ped Call.
- Disable all phases for Start up in Green.
- Disable all phases for Yellow Flash.
- Program overlaps 1 and 2 as Wag Overlaps.
- The cabinet and controller are part of the Jacksonville City Signal System.

EQUIPMENT INFORMATION

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

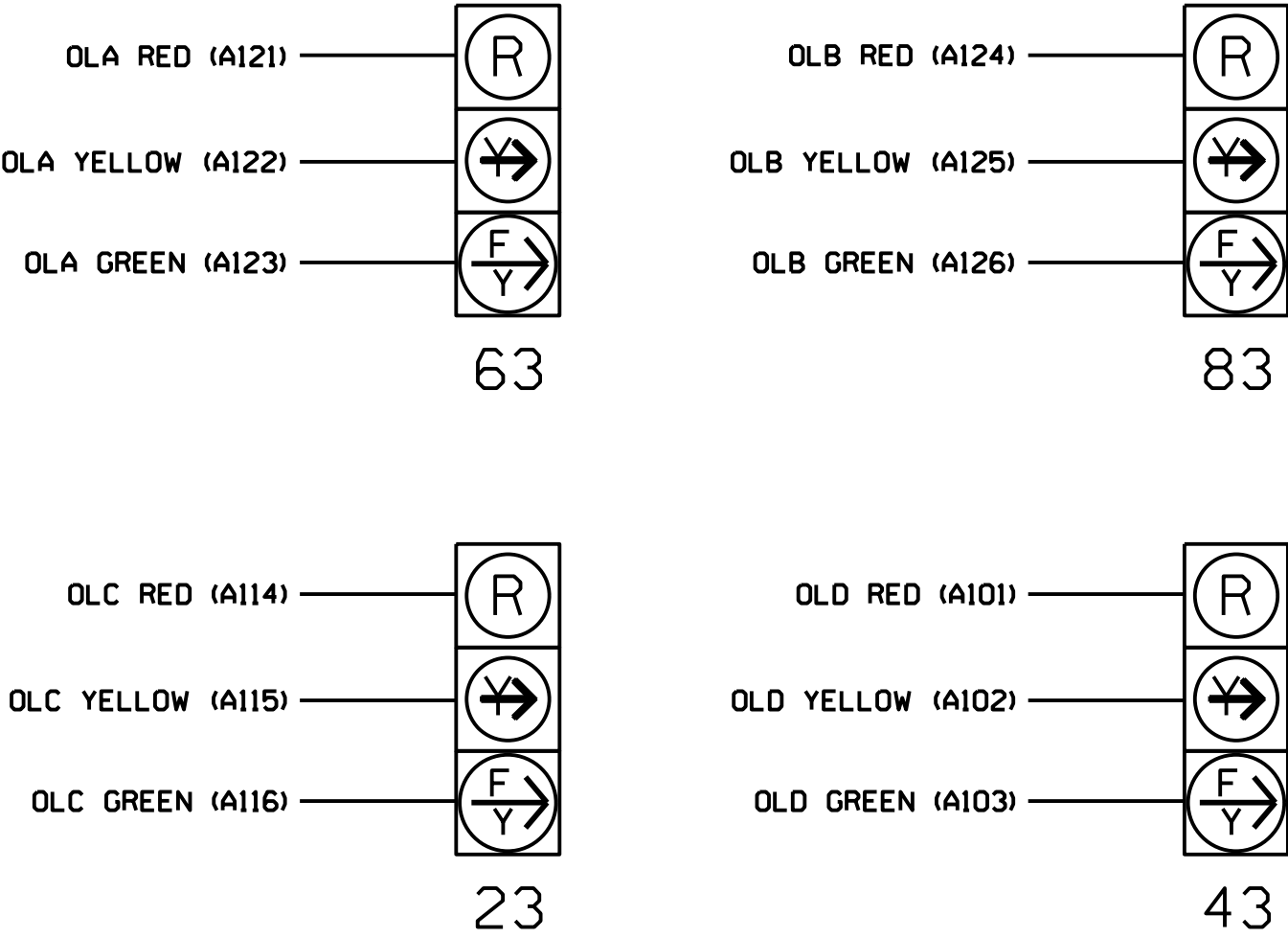
SIGNAL HEAD HOOK-UP CHART

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	31,32	41,42	P41, P42	51,52	61,62	NU	71,72	81,82	NU	63★	83★	NU	23★	43★	NU
RED		128			101			134			107		A121	A124		A114	A101	
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125			116			131			122								
YELLOW ARROW	126			117			132			123			A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124								
Hand icon				113			104											
Walking person icon				115			106											

NU = Not Used

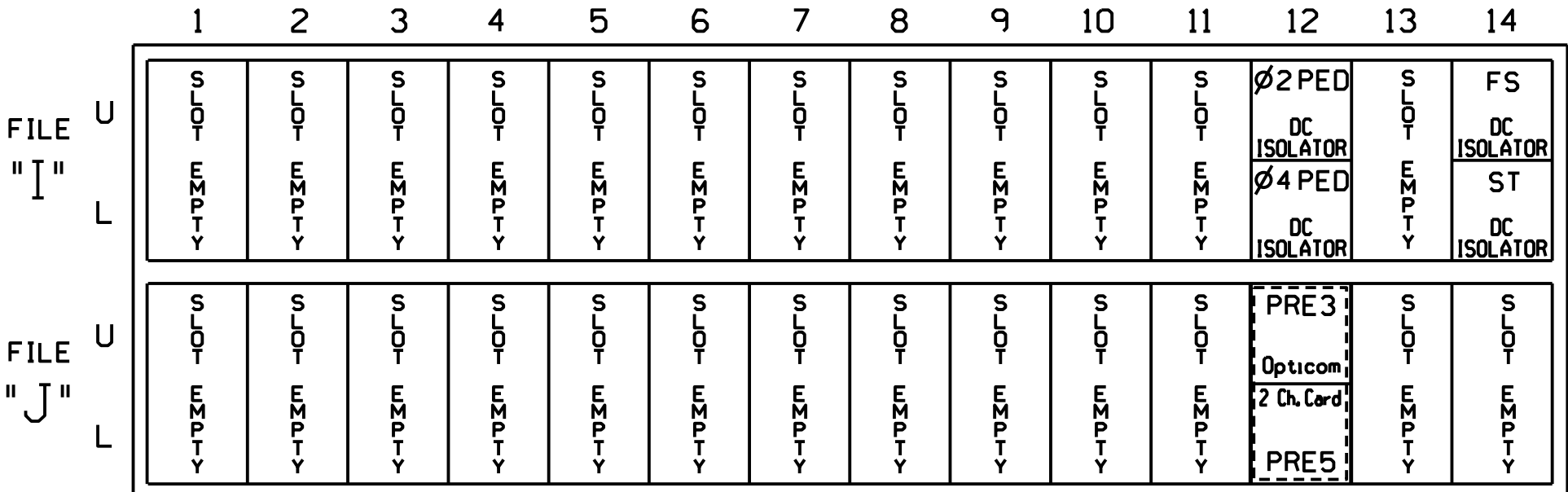
FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
PED PUSH BUTTONS											
P21,P22	TB8-4,6	112U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	112L	69	31	PED 4	4 PED					

NOTE:
INSTALL DC ISOLATORS
IN INPUT FILE SLOT 112.

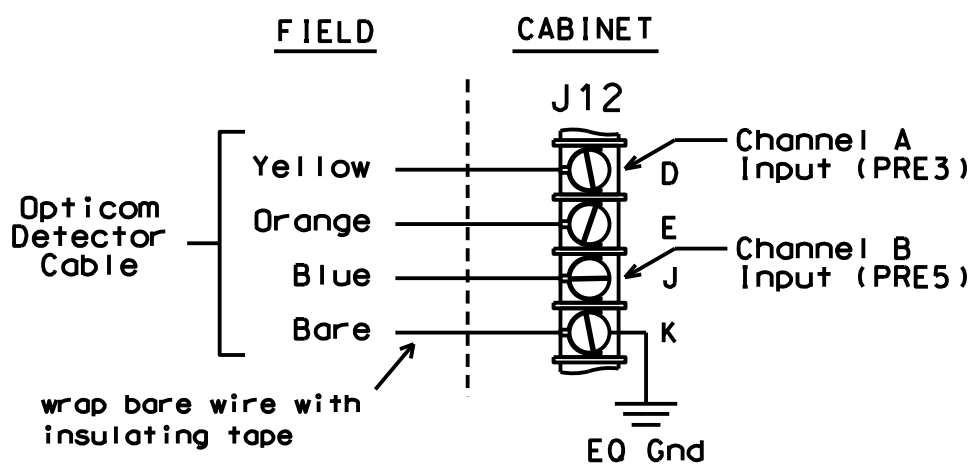
INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

SPECIAL DETECTOR NOTE

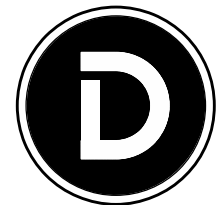
Install a multizone microve detection zone for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

TYPICAL OPTICOM FIELD WIRE DETAIL

(input file, rear view)



Project #: 230906



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WINSTON-SALEM, NC 27101
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NCBELS FIRM LICENSE NO. C-2522

Electrical Detail - Sheet 1 of 3

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

US 17 Bus. (Marine Boulevard)
at
SR 1308 (Gum Branch Road/
Bell Fork Road)

Division 03 Onslow County Jacksonville

PLAN DATE: July 2026 REVIEWED BY: D. Bennett

PREPARED BY: B. Dowell REVIEWED BY:

REVISIONS

INIT. DATE

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



Signed by:
Donald R. Bennett II
20260710D084FC...

7/21/2026

SIGNATURE DATE

SIG. INVENTORY NO. 03-0090

ACCESSIBLE PEDESTRIAN SIGNAL (APS)
INSTALLATION NOTES

1. Install push buttons and APS equipment per manufacturer’s instructions.
2. Provide a dedicated cable to each push button per manufacturer’s instructions.
3. If APS equipment is mounted in cabinet, use filtered power (i.e., Controller Receptacle) to power APS equipment. Do not use Equipment Receptacle, which is a GFCI outlet.
4. Never attempt to operate a standard contact closure push button with the APS system unless cabinet is re-wired for standard button operation or unless explicitly allowed by the manufacturer.
5. Place manufacturer’s instructions in cabinet with cabinet prints, signal plans, and electrical details.
6. An APS push button station that is designed to work without the need for interfacing with a pedestrian signal head shall be installed for applications where a push button is installed in a median without a pedestrian signal head.
7. A push button with a single tactile arrow that point in both directions of travel shall be installed if the median separates two parallel crosswalks.

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.

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: 03-0090
DESIGNED: July 2026
SEALED: 07-21-2026
REVISED: N/A

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS ‘8’ (OVERLAPS). THEN
‘1’ (VEHICLE OVERLAP SETTINGS).

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

NOTICE:
PARENT PHASES

NOTICE:
GREEN FLASH

PRESS ‘+’

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

NOTICE:
GREEN FLASH

PRESS ‘+’

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

NOTICE:
GREEN FLASH

PRESS ‘+’

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

NOTICE:
GREEN FLASH

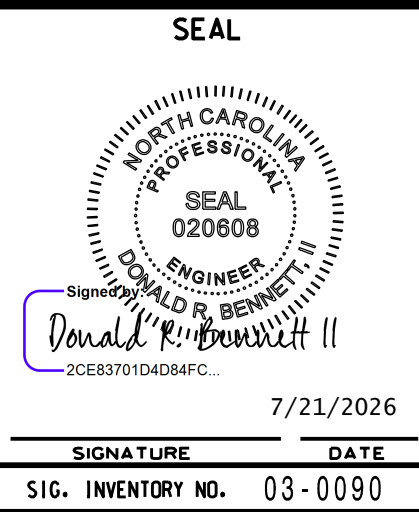
OVERLAP PROGRAMMING COMPLETE

Electrical Detail - Sheet 2 of 3

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road/ Bell Fork Road)	
Division 03	Onslow County Jacksonville
PLAN DATE: July 2026	REVIEWED BY: D. Bennett
PREPARED BY: B. Dowell	REVIEWED BY:
REVISIONS	INIT. DATE



EMERGENCY VEHICLE PREEMPTION
PROGRAMMING DETAIL

(program controller as shown below)

From Main Menu press 'A' (Preemption), then '1' (Standard Preemptions). Press 'NEXT' as needed to advance to Preempts 3 and 5.

PREEMPTION #3			SETTINGS (NEXT:1-10)															
INTERVAL/TIMING			CLEAR/DWELL PHASES															
GRN	YEL	RED	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	255	0.0	0.0															
2	0	0.0	0.0															
3	0	0.0	0.0															
4	0	0.0	0.0															
5	1	0.0	0.0															
EXIT CALLS																		
OPTIONS																		
PRIORITY (Y/N TO SELECT)			MED															
DELAY TIMER (0-255 SEC)			0															
MIN GREEN BEFORE PRE (0= DEFAULT)....			1															
PED CLEAR BEFORE PRE (0= DEFAULT)....			0															
YELLOW CLEAR BEFORE PRE (0= DEFAULT)....			0															
RED CLEAR BEFORE PRE (0= DEFAULT)....			0															
DWELL MIN TIMER (0-255 SEC)			12															
DWELL MAX TIMER (0=OFF,1-255MIN)			0															
DWELL HOLD-OVER TIMER (0-255)			0															
LATCH CALL?			N															
LINK TO NEXT PREEMPT?			N															
ENABLE BACKUP PROTECTION?			N															
HOLD CLEAR 1 PHASES DURING DELAY? ..			N															
FAST GREEN FLASH DWELL PHASES?			N															
PED CLEARANCE THROUGH YELLOW?			Y															
INHIBIT OVERLAP GREEN EXTENSION?			N															
SERVICE DURING SOFTWARE FLASH?			N															
REST IN RED DURING DWELL INTERVAL? ..			N															
FLASH DWELL INTERVAL?			N															
ALLOW PEDS IN DWELL INTERVAL?			N															
RE-TIME DWELL INTERVAL?			N															
OVERLAPS:			ABCDEFGHIJKLMNOP															
DWELL INT FLASH YELLOW																		
OMIT OVERLAPS:																		

PRESS 'NEXT' TWICE

PREEMPTION #5			SETTINGS (NEXT:1-10)															
INTERVAL/TIMING			CLEAR/DWELL PHASES															
GRN	YEL	RED	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	255	0.0	0.0															
2	0	0.0	0.0															
3	0	0.0	0.0															
4	0	0.0	0.0															
5	1	0.0	0.0															
EXIT CALLS																		
OPTIONS																		
PRIORITY (Y/N TO SELECT)			MED															
DELAY TIMER (0-255 SEC)			0															
MIN GREEN BEFORE PRE (0= DEFAULT)....			1															
PED CLEAR BEFORE PRE (0= DEFAULT)....			0															
YELLOW CLEAR BEFORE PRE (0= DEFAULT)....			0															
RED CLEAR BEFORE PRE (0= DEFAULT)....			0															
DWELL MIN TIMER (0-255 SEC)			12															
DWELL MAX TIMER (0=OFF,1-255MIN)			0															
DWELL HOLD-OVER TIMER (0-255)			0															
LATCH CALL?			N															
LINK TO NEXT PREEMPT?			N															
ENABLE BACKUP PROTECTION?			N															
HOLD CLEAR 1 PHASES DURING DELAY? ..			N															
FAST GREEN FLASH DWELL PHASES?			N															
PED CLEARANCE THROUGH YELLOW?			Y															
INHIBIT OVERLAP GREEN EXTENSION?			N															
SERVICE DURING SOFTWARE FLASH?			N															
REST IN RED DURING DWELL INTERVAL? ..			N															
FLASH DWELL INTERVAL?			N															
ALLOW PEDS IN DWELL INTERVAL?			N															
RE-TIME DWELL INTERVAL?			N															
OVERLAPS:			ABCDEFGHIJKLMNOP															
DWELL INT FLASH YELLOW																		
OMIT OVERLAPS:			X															

PROGRAMMING COMPLETE

Program extend time
on optical detector
unit for 2.0 seconds.

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL
TO PRODUCE FYA SUPPRESSION

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5 AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)	
IF ACTIVE PHASE	#2 IS OFF
AND PED CALL ON PHASE	#2 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	SET LOGIC FLAG #2 ON

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 23.

LOGICAL I/O COMMAND #2 (+/-COMMAND#)	
IF ACTIVE PHASE	#2 IS ON
AND LOGIC FLAG	#2 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	SET OUTPUT ASSIGNMENT #42 ON
	SET OUTPUT ASSIGNMENT #43 OFF
	SET OUTPUT ASSIGNMENT #44 OFF

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 23.

LOGICAL I/O COMMAND #3 (+/-COMMAND#)	
IF ACTIVE PHASE	#2 IS ON
AND LOGIC FLAG	#2 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	DELAY FOR 7.0 SECONDS
SET LOGIC FLAG	#2 OFF

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 23.

LOGICAL I/O COMMAND #4 (+/-COMMAND#)	
IF ACTIVE PHASE	#4 IS OFF
AND PED CALL ON PHASE	#4 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	SET LOGIC FLAG #4 ON

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 43.

LOGICAL I/O COMMAND #5 (+/-COMMAND#)	
IF ACTIVE PHASE	#4 IS ON
AND LOGIC FLAG	#4 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	SET OUTPUT ASSIGNMENT #39 ON
	SET OUTPUT ASSIGNMENT #40 OFF
	SET OUTPUT ASSIGNMENT #41 OFF

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 43.

LOGICAL I/O COMMAND #6 (+/-COMMAND#)	
IF ACTIVE PHASE	#4 IS ON
AND LOGIC FLAG	#4 IS ON
↓	
SCROLL DOWN	
↓	
THEN:	DELAY FOR 7.0 SECONDS
SET LOGIC FLAG	#4 OFF

NOTE: LOGIC FOR
FYA SUPPRESSION
FOR HEAD 43.

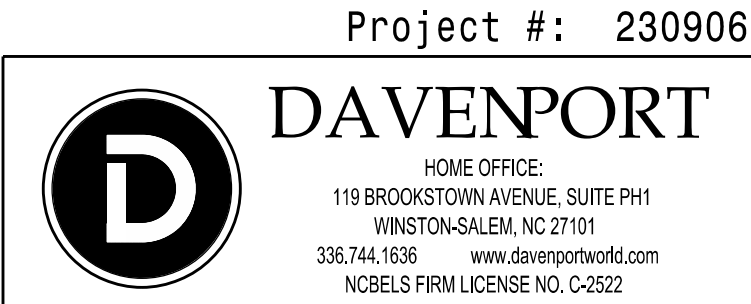
LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 39 = Overlap D Red
OUTPUT 40 = Overlap D Yellow
OUTPUT 41 = Overlap D Green
OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 03-0090
DESIGNED: July 2026
SEALED: 07-21-2026
REVISED: N/A

Electrical Detail - Sheet 3 of 3



US 17 Bus. (Marine Boulevard) at SR 1308 (Gum Branch Road/ Bell Fork Road)		
Division 03	Onslow County	Jacksonville
PLAN DATE: July 2026	REVIEWED BY: D. Bennett	
PREPARED BY: B. Dowell	REVIEWED BY:	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SEAL	
Signed: Donald R. Bennett II	
7/21/2026	
SIGNATURE	DATE
SIG. INVENTORY NO. 03-0090	

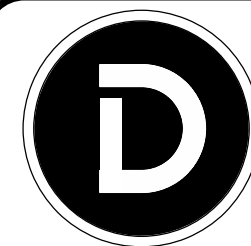
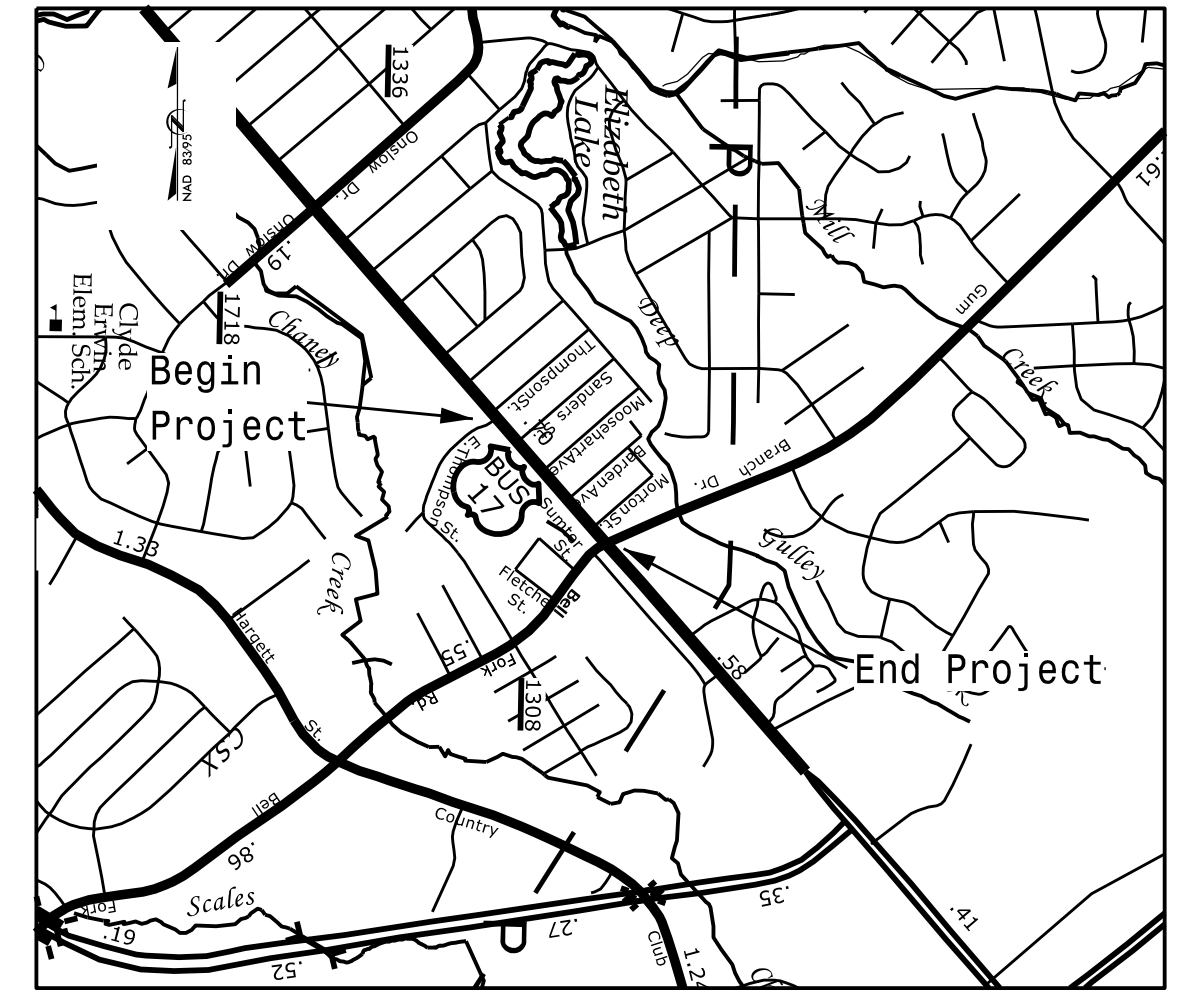
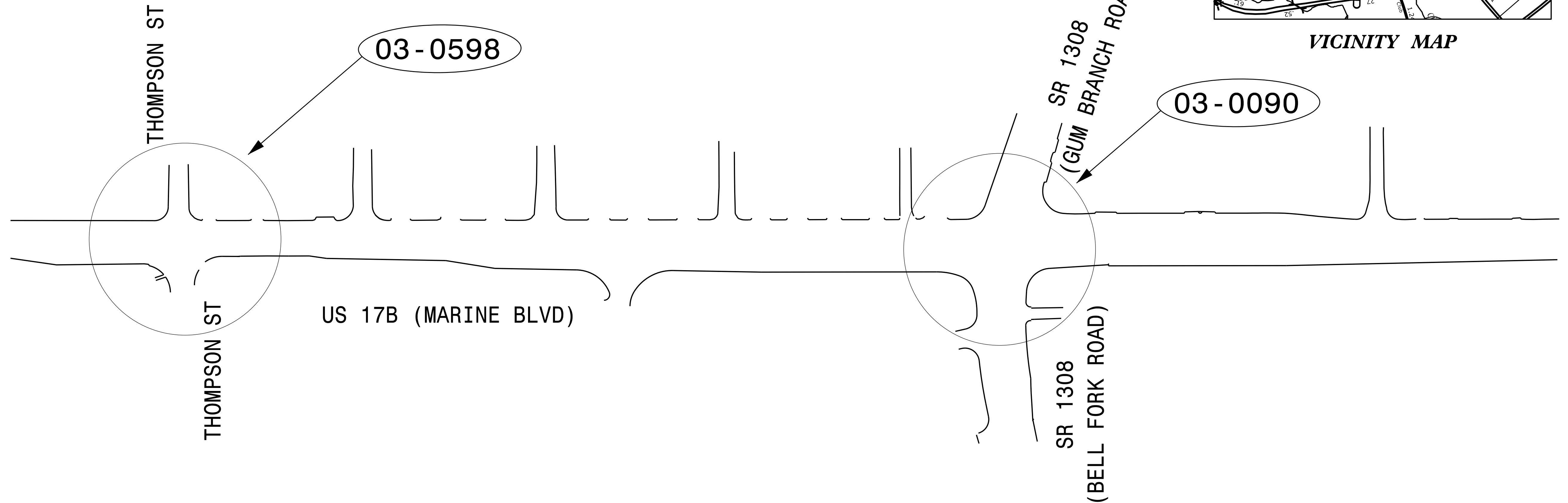
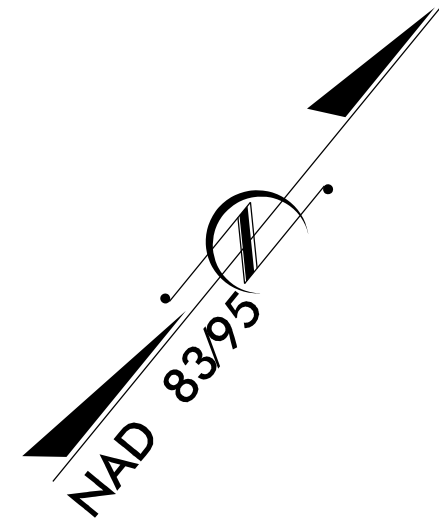
Project: U-5728

Contract: C205040

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Onslow County

LOCATION: US 17 BUS. (MARINE BOULEVARD) AT
THOMPSON STREET TO
US 17 BUS. (MARINE BOULEVARD) AT
SR 1308 (GUM BRANCH ROAD/BELL FORK ROAD)
TYPE OF WORK: TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS



DAVENPORT

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WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

03-XXXX

Modified Signal

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

Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1.0	-----	Title Sheet
Sig. 2.0-4.4	03-0090	US 17 BUS. (Marine Boulevard) at SR 1308 (Gum Branch Road/Bell Fork Road)
SCP-1 - SCP-4	-----	Communications Plan

TRANSPORTATION SYSTEMS MANAGEMENT &
OPERATIONS UNIT

Zachary Little, PE - Eastern Region Signals Engineer

D. Todd Joyce, PE - Signal Equipment Design Engineer

Taylor A. Kenion - State Signal System Design Engineer

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION



750 N. Greenfield Parkway, Garner, NC 27529
Telephone: (919) 773-2800

1	INSTALL COAX CABLE
2	INSTALL ETHERNET CABLE
3	EXISTING ETHERNET (OR COAX) CABLE
4	INSTALL SMFO CABLE
5	EXISTING SMFO CABLE
6	INSTALL 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
48C	REMOVE EXISTING MESSENGER
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

FO

EXI

REM

DD

NEW

EXISTING

OVERSIZED JUNCTION BOX

WOOD POLE

AERIAL SPLICE ENCLOSURE

UNDERGROUND SPLICE ENCLOSURE

METAL POLE

CCTV ASSEMBLY

STANDARD GUY ASSEMBLY

SIDEWALK GUY ASSEMBLY

CABLE STORAGE RACKS (SNOW SHOES)

SIGNAL/EQUIPMENT CABINET

SPLICE CABINET

FLAT PANEL ANTENNA (SINGLE)

YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION

YAGI ANTENNA (SINGLE)

OMNI ANTENNA

SIGNAL POLE

SIGNAL INVENTORY NUMBER

XX-XXXX

XX-XXXX

XX"SS

YYY

YYY

XX"SS

ATTACHMENT POINT:

DISTANCE ABOVE (IN)ATTACHMENT POINT

REFERENCE POINT

DISTANCE BELOW (IN)ATTACHMENT POINT

"SS" REFERENCE LOCATION

FS = FRONT SIDE OF POLE

BS = BACK SIDE OF POLE

XX

XX

XX

XX

XX

XX

INDICATES NUMBER OF CABLES, LOOPS, ETC.

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

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

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

NEW/EXISTING CABLE

REMOVE/MODIFY CABLE

CONDUIT/RISER

City of Jacksonville
Signal System
Construction Notes

Division 3 Onslow County Jacksonville

PLAN DATE: July 2026 REVIEWED BY: D. Bennett

PREPARED BY: J. Dollarhite REVIEWED BY:

REVISIONS INIT. DATE

750 N. Greenfield Pkwy, Garner, NC 27529

D

DAVENPORT

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336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

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SIGNATURES COMPLETED

SEAL

Seal of the State of North Carolina
Professional Engineer
SEAL
020608
Donald R. Bennett II
2CEB3701D4D84FC...

7/21/2026

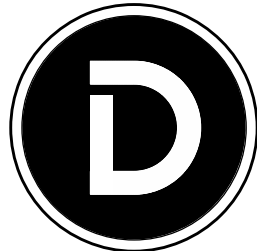
SIGNATURE DATE

SIG. INVENTORY NO.



- 1) REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2024, "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024, AND ALL APPLICABLE SECTIONS OF THE LATEST VERSION OF THE GENERIC PROJECT SPECIAL PROVISIONS.
- 2) CONTACT THE DIVISION TRAFFIC ENGINEER AT 910-341-2200 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM TO ARRANGE FOR NCDOT 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 AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
- 3) THE CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF CITY AND NCDOT COMMUNICATIONS CABLING AS DIRECTED BY THESE PLANS. ONCE ALL CITY AND NCDOT COMMUNICATIONS CABLING HAS BEEN REMOVED AND/OR TRANSFERRED, NOTIFY DIVISION UTILITY ENGINEER, TIM GODWIN, TGGODWIN@NCDOT.GOV, 910-341-2007 (WORK), 910-200-2641 (CELL) TO COORDINATE WITH THE POLE OWNER FOR REMOVAL.
- 4) 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.
- 5) CONTACT STEPHANIE KUTZ AT 717-475-5662 (CELL) OR 919-938-6453 (WORK) TO COORDINATE THE LOCATION OF EXISTING CITY 12-FIBER CABLE ROUTE BETWEEN POLE 291-07-011 AND POLE 291-07-017 TO BE TRANSFERRED TO NEW POLE LINE.

Project #: 230906

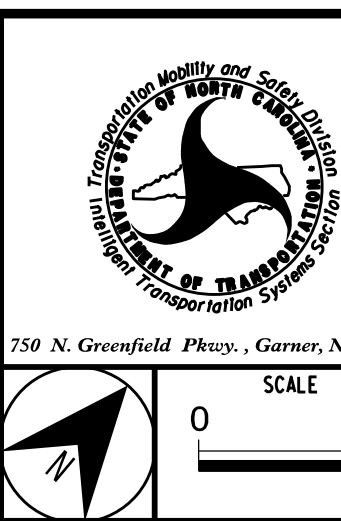


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WINSTON-SALEM, NC 27101
336.744.1636 www.davenportworld.com
NCBELS FIRM LICENSE NO. C-2522

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

SEAL



City of Jacksonville
Signal System
Communication Cable and
Conduit Routing Plan

Division 3 Onslow County Jacksonville

PLAN DATE: July 2026	REVIEWED BY: D. Bennett
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PREPARED BY: J. Dollarhite	REVIEWED BY:
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REVISIONS	INIT.	DATE
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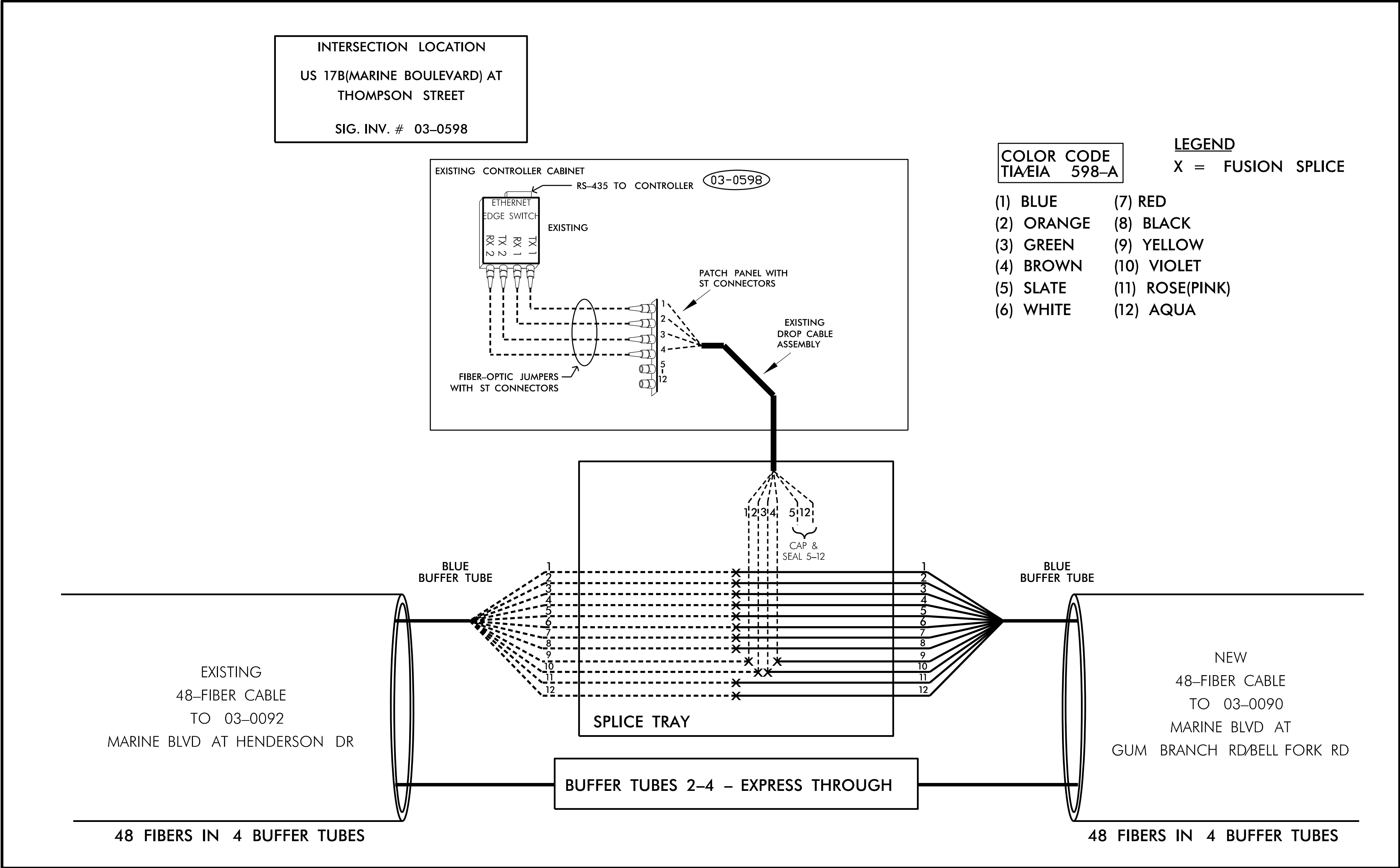


Signed by  Donald R. Bennett II
2CE83701D4D64FC...

7/21/202

SIGNATURE _____ DATE _____

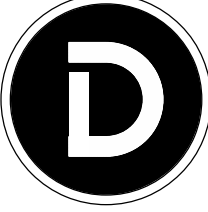
Existing Aerial Splice Enclosure



- NOTES:
- 1) NOTIFY THE CITY OF JACKSONVILLE TRANSPORTATION MANAGER, STEPHANIE KUTZ, AT 910-938-6453 (WORK) OR 717-475-5662 (CELL) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRANSPORTATION MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL IS BACK UP AND OPERATIONAL.
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 - 3) ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING AND ENSURING PROPER TERMINATIONS.
 - 4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

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

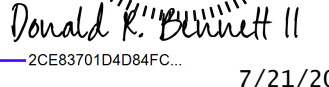
PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.



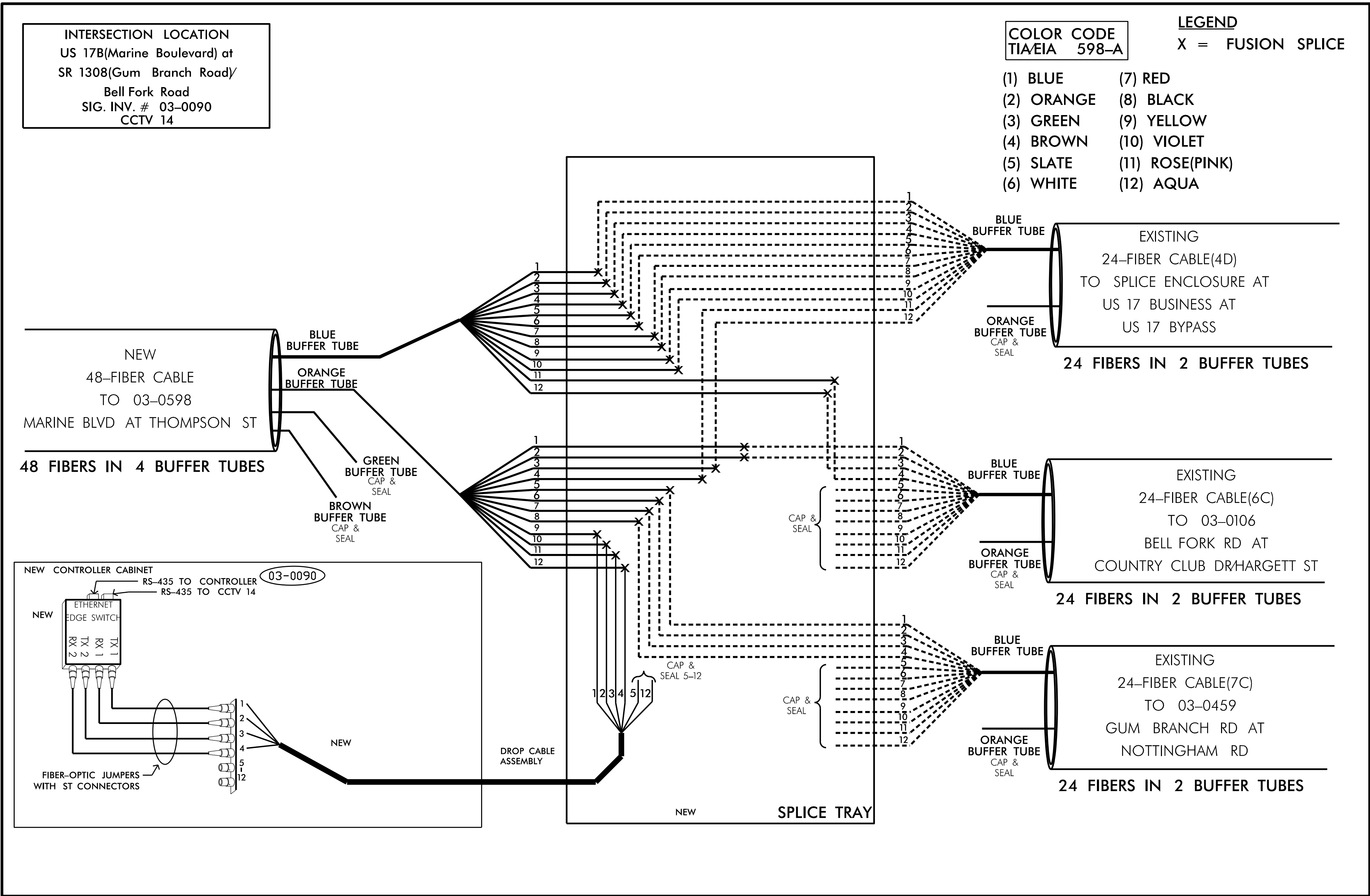
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NCBELS FIRM LICENSE NO. C-2522

FIBER OPTIC SPLICE DETAIL FOR:		City of Jacksonville Signal System Splice Detail		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
		Division 3 Onslow County Jacksonville		SEAL	
PLAN DATE: July 2026		REVIEWED BY: R. Hinshaw		SEAL 020608 PROFESSIONAL ENGINEER DONALD R. BENNETT II	
PREPARED BY: D. Bennett		REVIEWED BY:		Signed by: 	
REVISIONS		INIT.		DATE	
				7/21/2026	
				SIGNATURE DATE	
				SIG. INVENTORY NO. 03-0598	

PROJECT REFERENCE NO.	SHEET NO.
U-5728	SCP 4



NOTES:

- 1) NOTIFY THE CITY OF JACKSONVILLE TRANSPORTATION MANAGER, STEPHANIE KUTZ, AT 910-938-6453 (WORK) OR 717-475-5662 (CELL) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRANSPORTATION MANAGER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL IS BACK UP AND OPERATIONAL.
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FIBER OPTIC SPLICE DETAIL FOR:	City of Jacksonville Signal System Splice Detail						SEAL		
 STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION TRANSPORTATION SYSTEMS DIVISION 750 N. Greenfield Pkwy., Garner, NC 27529	Division 3		Onslow County		Jacksonville		 Signed _____ <i>Donald R. Bennett II</i> 2C837D10DBFC...	7/21/2026 SIGNATURE DATE	
	PLAN DATE:		July 2026		REVIEWED BY:				R. Hinshaw
	PREPARED BY:		D.Bennett		REVIEWED BY:				
	REVISONS				INIT.	DATE			
SIG. INVENTORY NO. 03-0090									