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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

TIP NO.	SHEET NO.
U-6016	SIGN-1
APPROVED: <i>Sean C. Stephens</i>	
DATE: 03-07-2024	
SEAL	
	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SIGNING PLAN
GUILFORD COUNTY

LOCATION: SR 2136 (FLEMING ROAD) AND SR 2124 (LEWISTON ROAD)
IN GREENSBORO

T.I.P.: U-6016

CONTRACT: DG00583

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2024 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
903.10	GROUND MOUNTED SIGN SUPPORTS
904.10	ORIENTATION OF GROUND MOUNTED SIGNS
904.50	MOUNTING OF TYPE 'D', 'E', AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

- . SIGNS FURNISHED BY STATE
- . CONFIRM IN WRITING AT LEAST 4 MONTHS IN ADVANCE, THE ACTUAL DATE THE DEPARTMENT FURNISHED SIGNS WILL BE REQUIRED.
- . IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.
- . WHEN NOT STATIONED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER
- . ALL EXISTING SIGNS ON "U" CHANNEL POST WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.
- . WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-ERECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.
- . THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.
- . SEE ROADWAY PLANS FOR GUARD RAIL DETAILS.

SUMMARY OF QUANTITIES

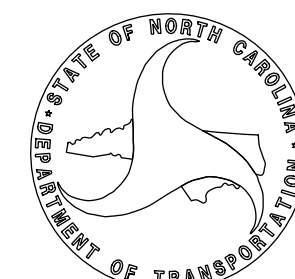
ITEM NO.		ITEM DESCRIPTION	QUANTITY	UNIT
DESC. NO.	SECT. NO.			
4072000000	903	SUPPORTS, 3 LBS STEEL U-CHANNEL	57	L.F.
4102000000	904	SIGN ERECTION, TYPE E	4	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE E.....	1	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL.....	6	EA.
4192000000	907	DISPOSAL OF SUPPORT, U-CHANNEL	1	EA.
4238000000	907	DISPOSAL OF SIGN, D, E OR F.....	2	EA.

INDEX

SHEET NO.	DESCRIPTION
SIGN-1	TITLE SHEET
SIGN-2	TYPE "E" SIGNS
SIGN-3	SIGN DETAIL SHEETS

PLAN SUBMITTED TO:

Chad J. Reimakoski - Design Engineer



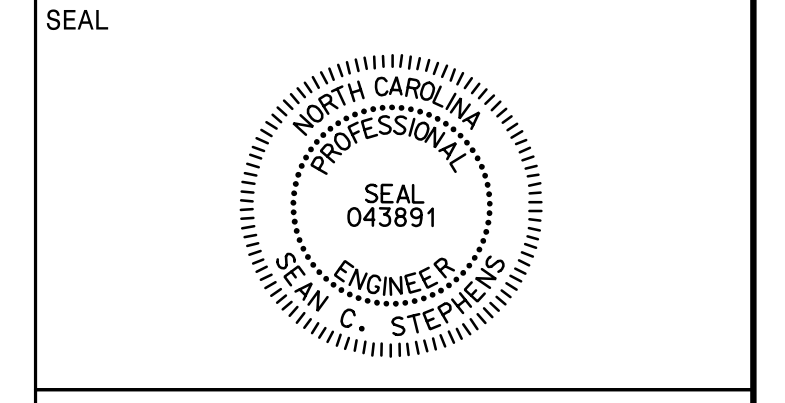
PLAN PREPARED BY: STV Engineers, Inc.

SEAN C. STEPHENS, PE TRAFFIC ENGINEER
 ASHLEY BOUCHARD, PE TRANSPORTATION DESIGNER



APPROVED: *Sean C. Stephens*
REGISTERED PROFESSIONAL ENGINEER

DATE: **03-07-2024**



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

TYPE "E" SIGNS

401 QUANTITY REQ'D 1
 ONE "U" POST PER SIGN

W3-3
30" X 30"

TYPE "E" SIGNS

402 QUANTITY REQ'D 1
 ONE "U" POST PER SIGN

R2-1
24" X 30"

TYPE "E" SIGNS

403 QUANTITY REQ'D 1
 ONE "U" POST PER SIGN

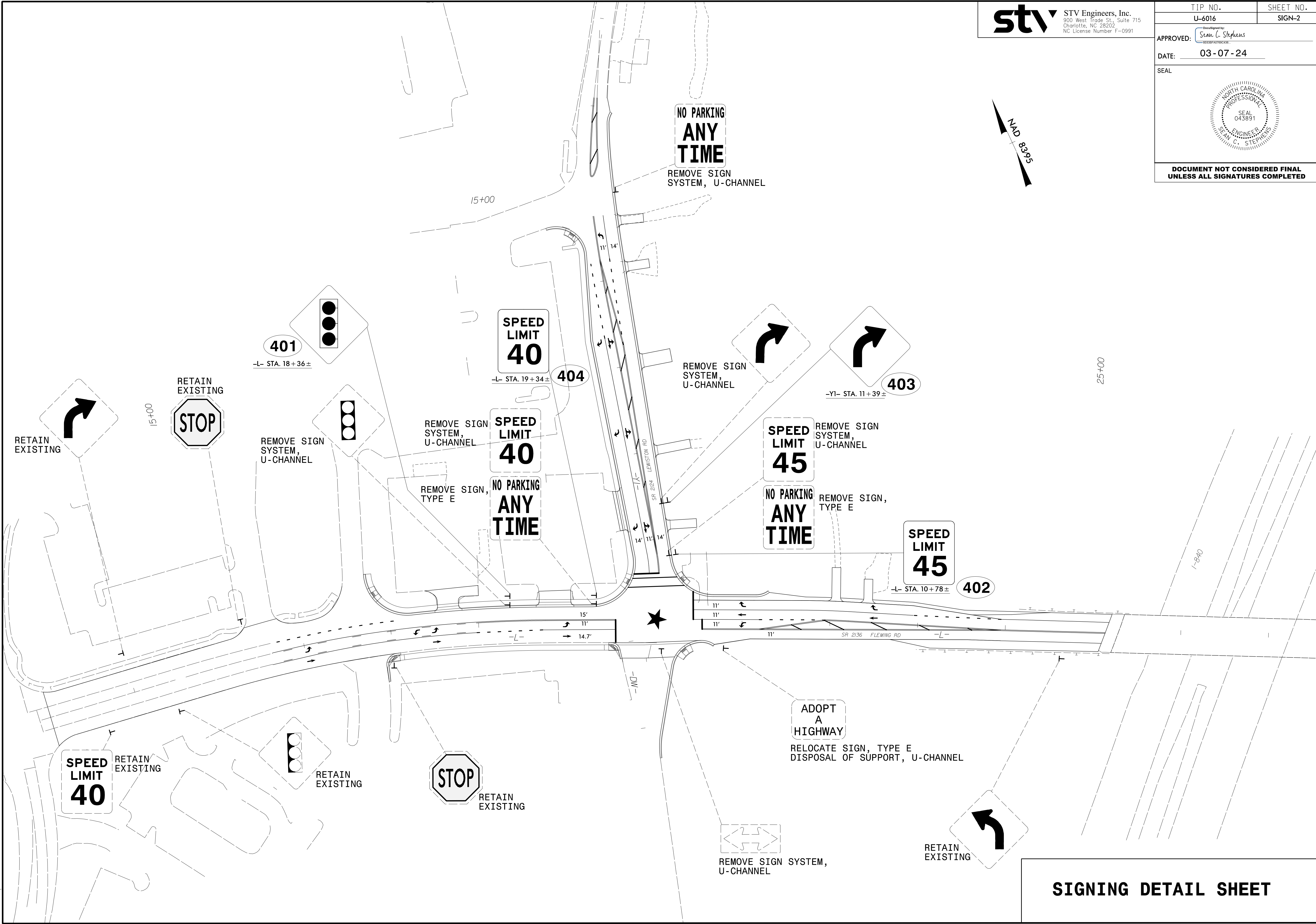
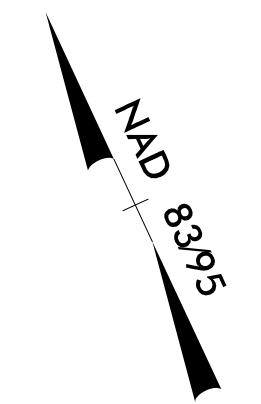
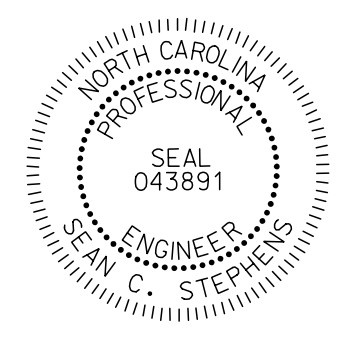
W1-2R
30" X 30"

TYPE "E" SIGNS

404 QUANTITY REQ'D 1
 ONE "U" POST PER SIGN

R2-1
24" X 30"

TYPE "E" SIGNS



SIGNING DETAIL SHEET

3/7/2024
P:\Signing\U-6016-RDY-SIGN-2.dgn
User:ststephsc

2:14:2023 10:05
 \\NCS\Signal\Design\Central Region\Div 7\U-6016\U-6016-sig-tsh.dgn
 Robert J. Ziemba

Project: U-6016

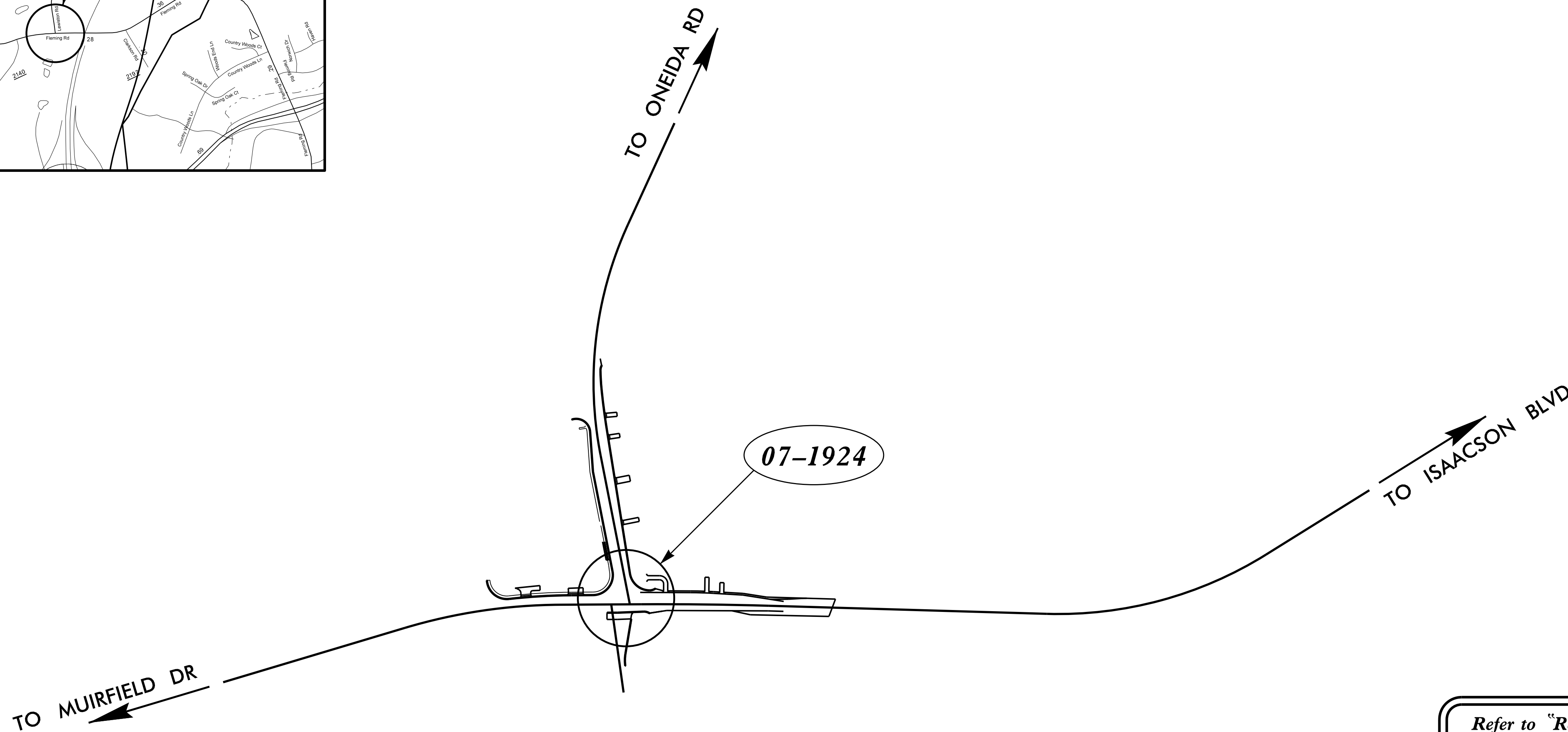
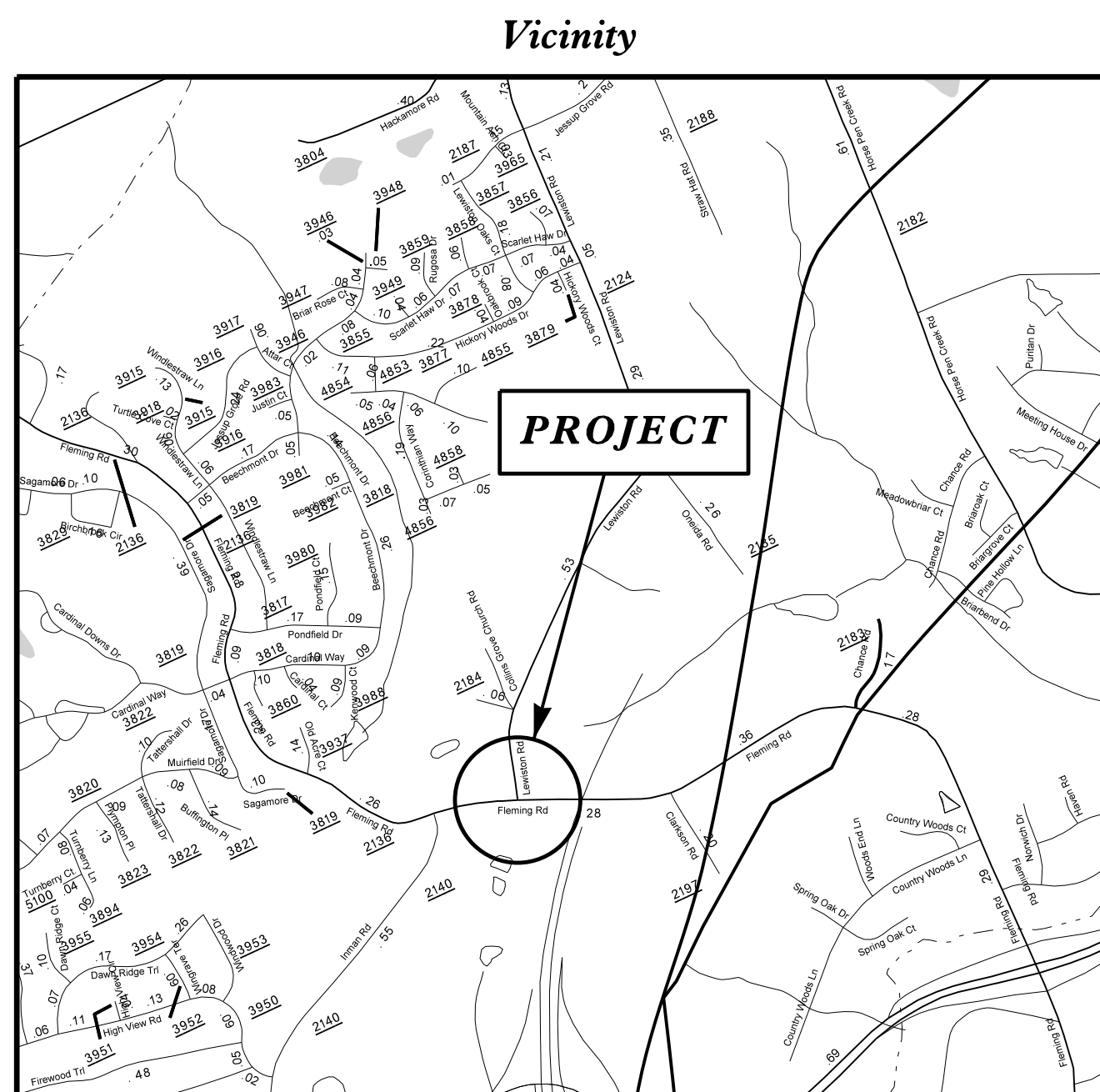
STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

Project No.	Sheet No.
U-6016	Sig. 1.0

GUILFORD COUNTY

**LOCATION: SR 2136 (FLEMING ROAD) AT
 SR 2124 (LEWISTON ROAD)**

TYPE OF WORK: TRAFFIC SIGNALS AND SIGNAL COMMUNICATIONS



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

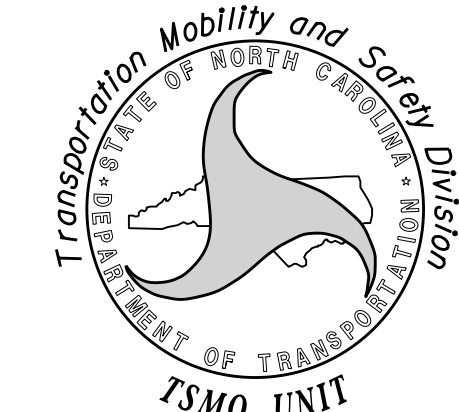
Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	SR 2136 (Fleming Road) at SR 2124 (Lewiston Road)
Sig. 2.0-4.4	07-1924	Signal Communication Plans	
SCP 1-5	-----		

**TRANSPORTATION SYSTEMS
 MANAGEMENT & OPERATIONS**

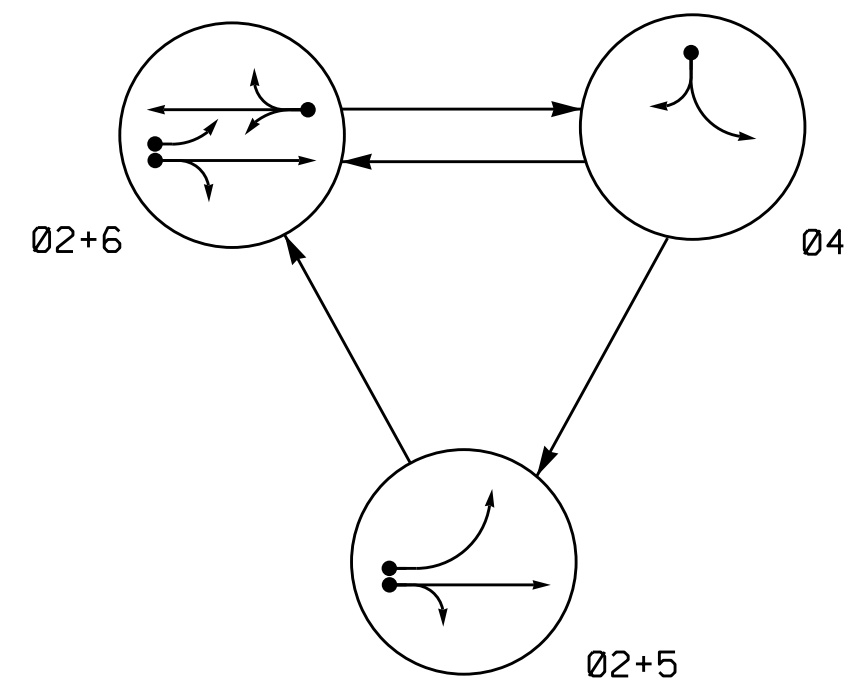
Contacts:

Robert J. Ziemba, PE - Central Region Signals Engineer
D. Todd Joyce, PE - Signal Equipment Design Engineer
Gregg Green - Signal Communications Project Engineer

Prepared in the Office of:
 DIVISION OF HIGHWAYS
 TRANSPORTATION MOBILITY & SAFETY DIVISION



PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	-	-	-	-
62, 63	R	G	R	Y

LOOP & DETECTOR UNIT INSTALLATION CHART
TRAFFICWARE APOGEE SOFTWARE 2070 CONTROLLER

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING								
					PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
2A/S3*	6X6	300	*	*	2	-	-	-	X	X	X	X	*
4A*	6X40	0	*	*	4	-	10.0	-	X	X	-	-	*
4B*	6X40	0	*	*	4	-	15.0	-	X	X	-	-	*
5A*	6X40	0	*	*	5	2	15.0	-	X	X	-	-	*
6A/S4*	6X6	300	*	*	6	-	-	-	X	X	X	X	*

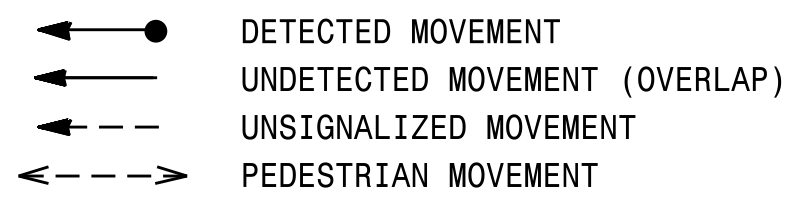
* Video Detection Zone

3 Phase Fully Actuated (Greensboro Signal System)

NOTES

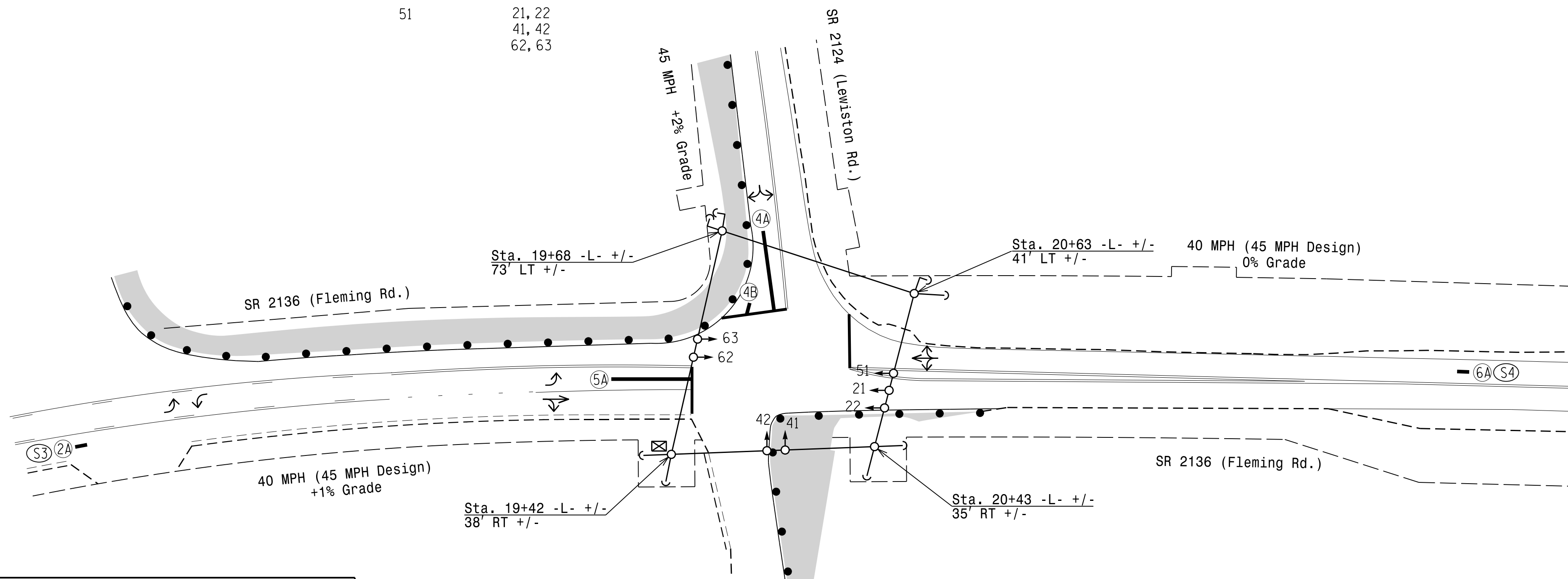
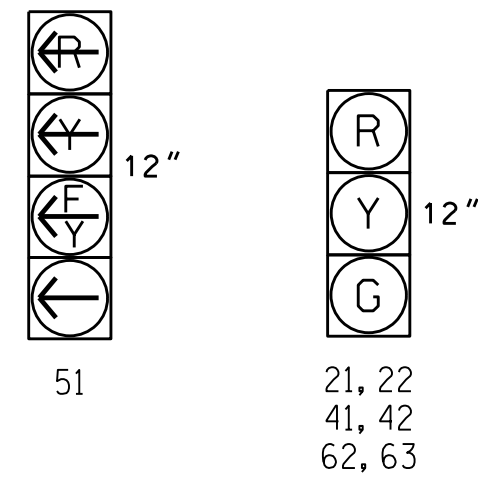
- Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Omit phase 5 during phase 6 on.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing unless otherwise shown.
- This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

All Heads L.E.D.



TRAFFICWARE APOGEE 2070 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Gap, Extension *	6.0	2.0	2.0	6.0
Maximum Green 1 *	60	25	15	60
Maximum Green 2 *	0	0	0	0
Yellow Clear	4.5	3.0	3.0	4.5
Red Clear	1.2	1.9	1.9	1.2
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	2.5	-	-	2.5
Maximum Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	15	-	-	15
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Lock Calls	YES	NO	NO	YES
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

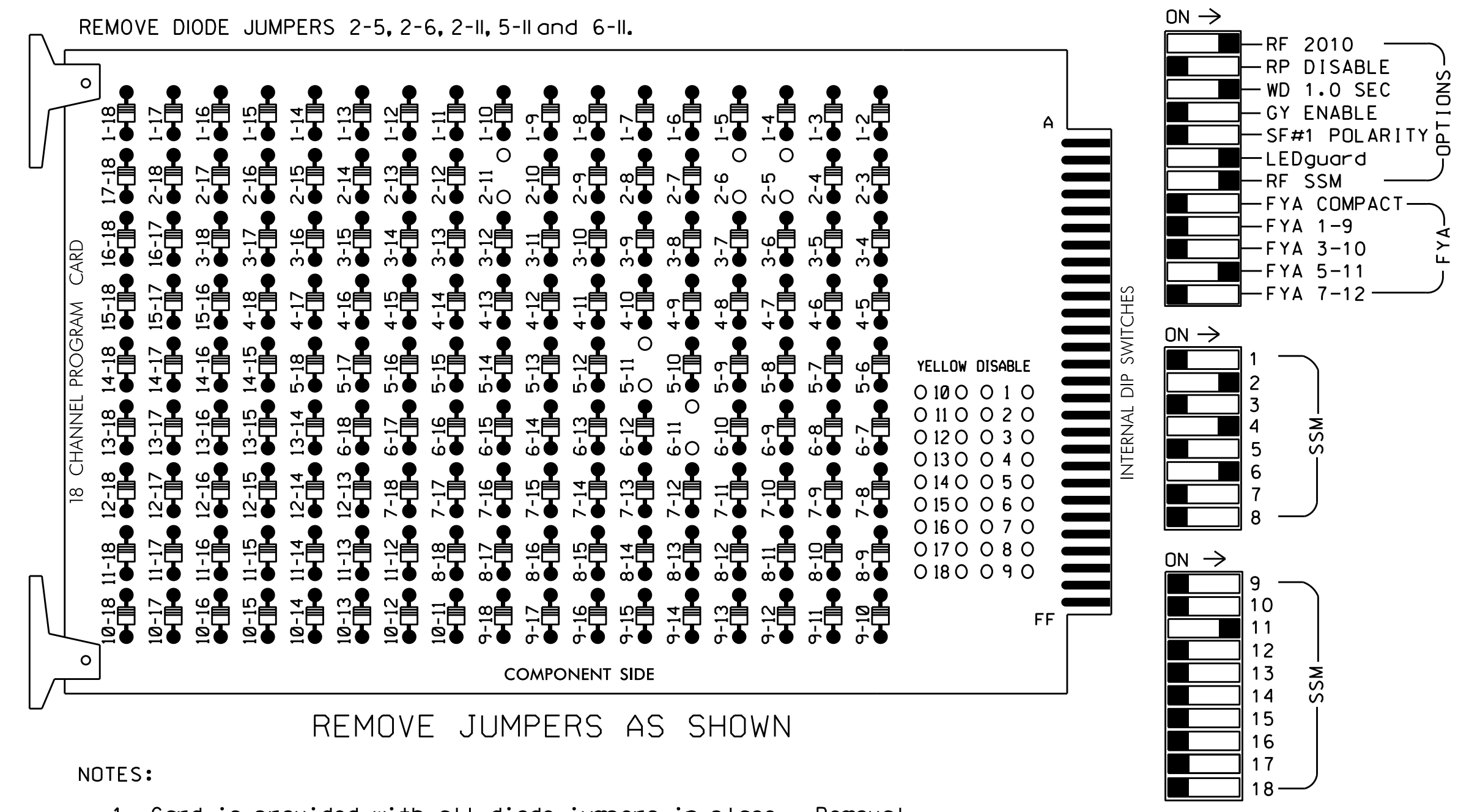
PROPOSED	EXISTING
	N/A
	N/A

Signal Upgrade - Temporary Design 1 (TMP Phase I)

	SR 2136 (Fleming Road) at SR 2124 (Lewiston Road)	
	Division 7 Guilford County Greensboro	SEAL 026486 ROBERT J. L. L. M. E.
PLAN DATE: June 2022 PREPARED BY: J.A. Lohr	REVIEWED BY:	DATE: 09/08/2022
REVISIONS	INIT.	DATE
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

- ### NOTES
- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
 - Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
 - Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
 - Program phases 2 and 6 for Start Up In Green.
 - Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
 - Ensure "Local Flash Start" feature is set to "DRK".
 - Ensure "InhFYARedSt" feature is set to "ON".
 - Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:
FROM MAIN MENU->1->8->7 (I/O LOGIC) Result Src.Fcn TimeOp Time
1208 = 01208 DLY 1
 - The cabinet and controller are part of the City of Greensboro Signal System.

SIGNAL HEAD HOOK-UP CHART

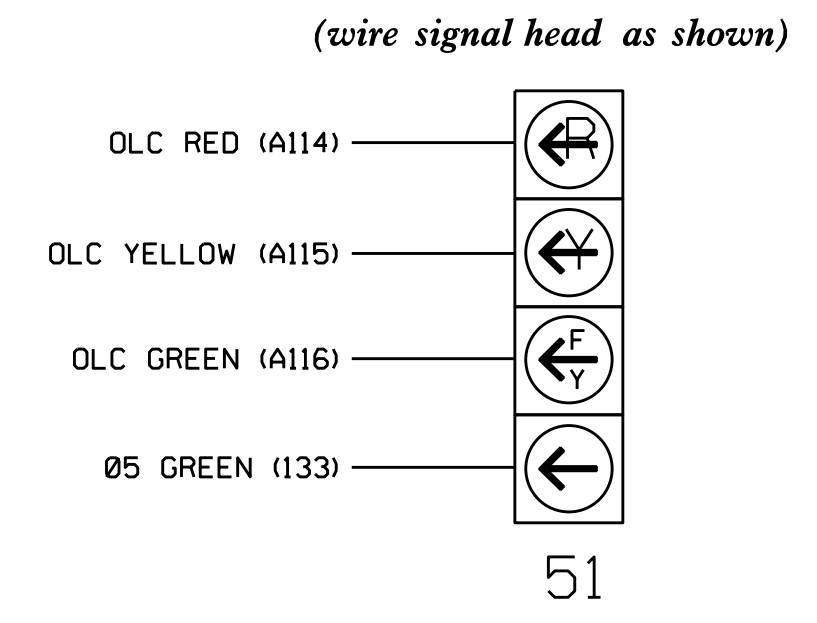
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	62,63	NU	NU	NU	NU	NU	NU	NU	51	NU	NU	
RED		128			101			134											
YELLOW		129			102		*	135											
GREEN		130			103			136											
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

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

EQUIPMENT INFORMATION

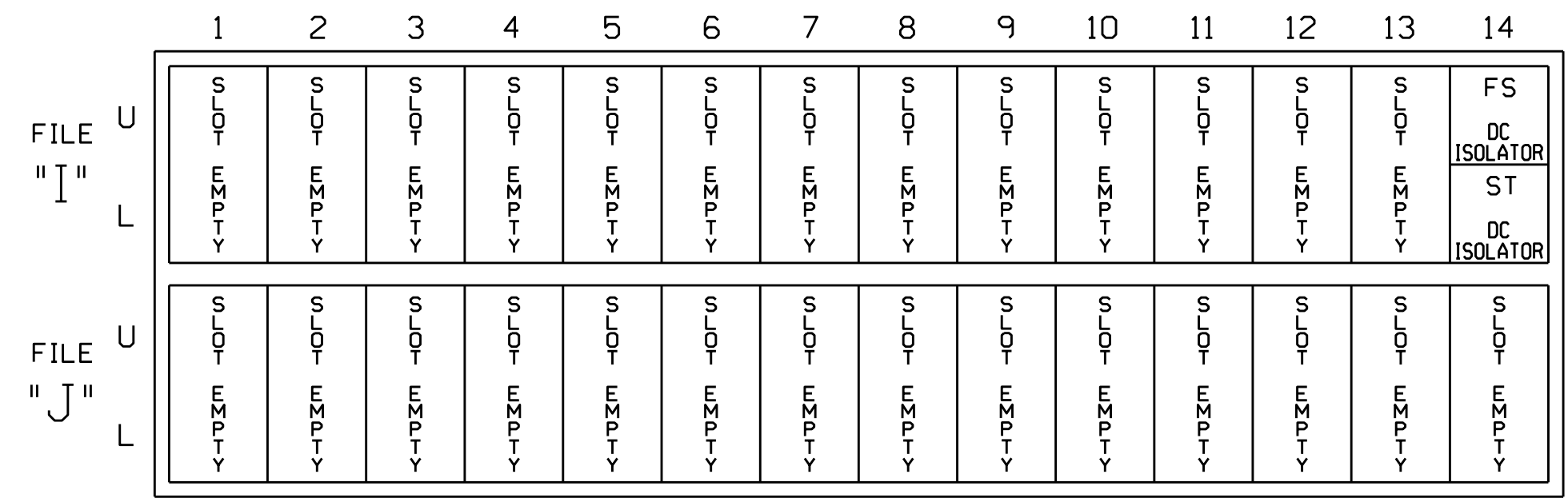
CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....TRAFFICWARE APOGEE
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4
PHASES USED.....2,4,5,6
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED
* See Overlap Programming Detail Sheet 2.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

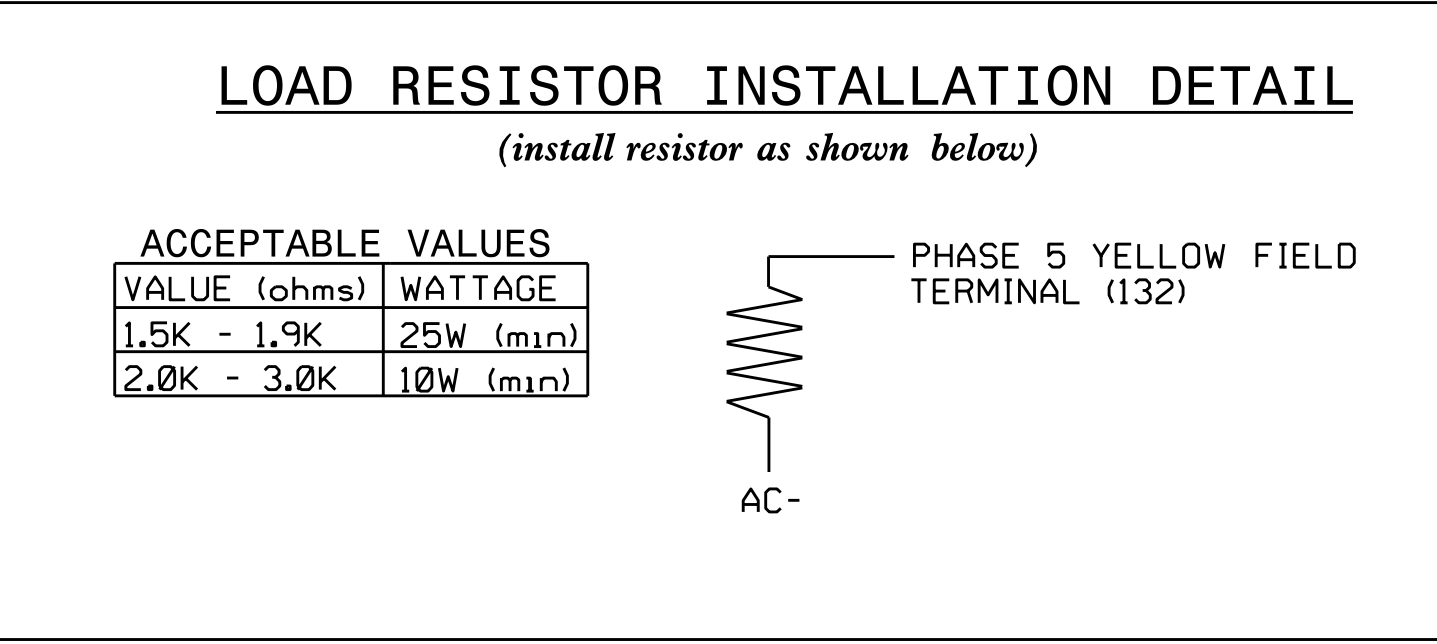


INPUT FILE POSITION LAYOUT

(front view)



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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T1
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

SPECIAL DETECTOR NOTE

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

Electrical Detail - 1 of 3

Electrical and Programming Details For: SR 2136 (Fleming Road) at 2124 (Lewiston Road)

Prepared In the Offices of:

Division 7 Guilford County Greensboro

PLAN DATE: August 2022 REVIEWED BY:

PREPARED BY: Zarrar Zafar REVIEWED BY:

REVISIONS INIT. DATE

Seal: SEAL PROFESSIONAL ENGINEER SEAL 031001 SEAL TODD JOYCE

DocuSigned by: D. Todd Joyce 09/22/2022

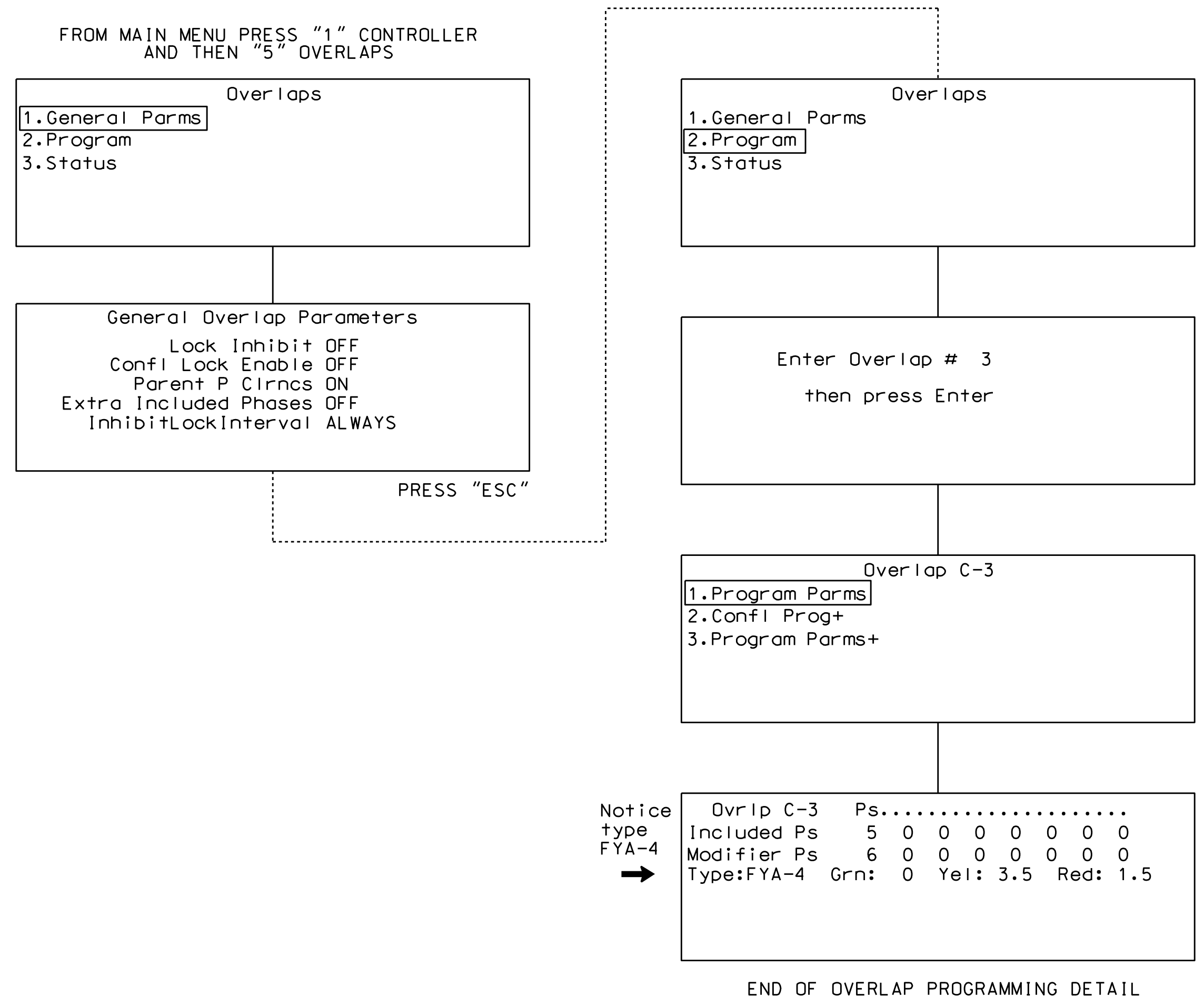
SIG. INVENTORY NO. 07-1924T1

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OVERLAP PROGRAMMING DETAIL FOR OVERLAP C *

(program controller as shown below)

*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details.



CALL, INHIBIT PROGRAMMING DETAIL (USED FOR BACK-UP PROTECTION)

(program controller as shown below)

From Main Menu press '1' (Controller), then '1' (Phases), then '5' (CALL, Inh, Redirect).

P	..Call.Ps..	Inhibit Ps 1111111	>
1	0 0 0 0	12345678 90123456	
2	0 0 0 0	.....
3	0 0 0 0	.....
4	0 0 0 0	.....
5	0 0 0 0	.....
6	0 0 0 0	....X....	
7	0 0 0 0	.....
8	0 0 0 0	.....

PROGRAMMING COMPLETE

This programming will omit phase 5 when phase 6 is "ON".

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1924T1
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

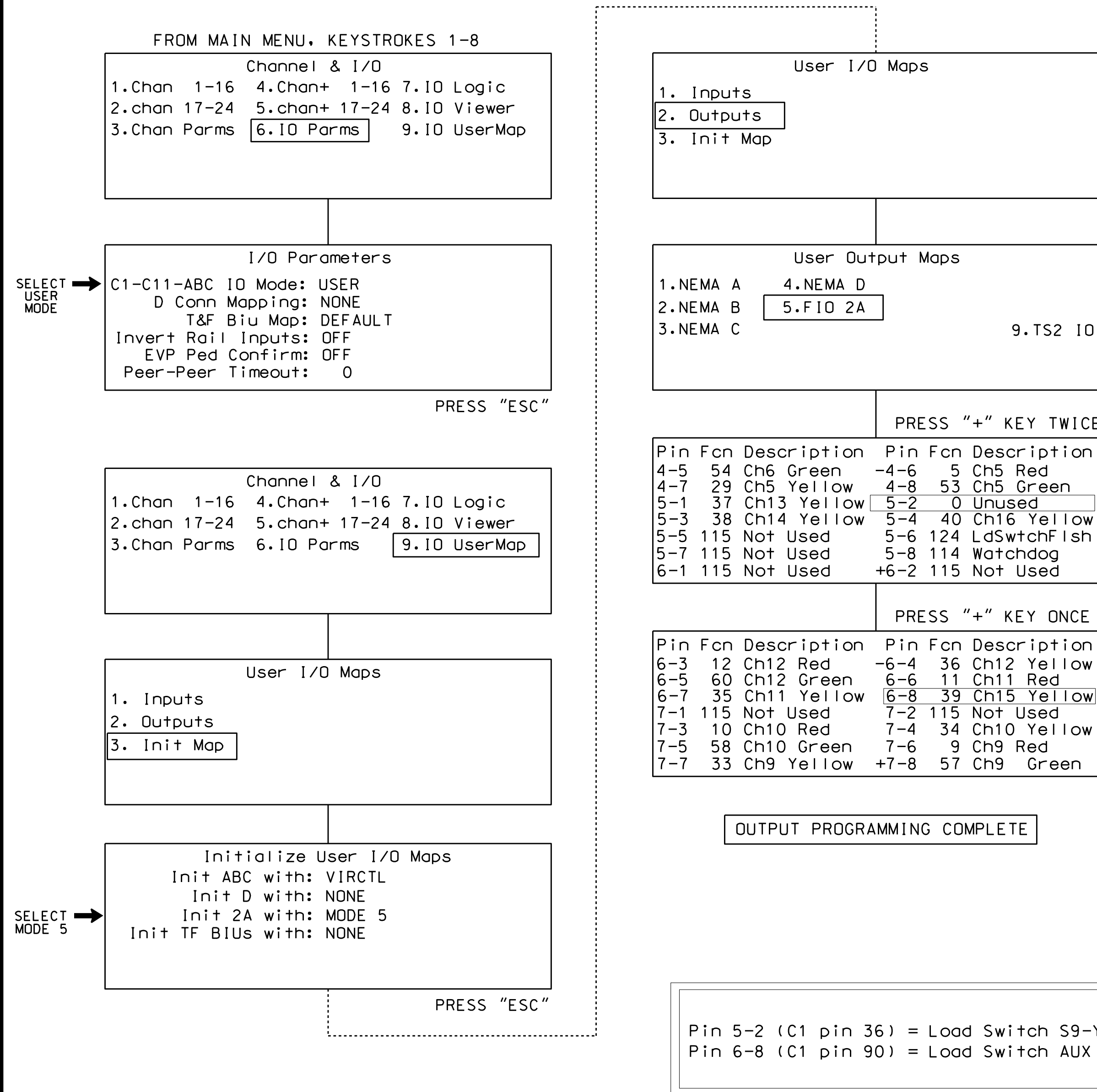
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ZZZJG

Electrical Detail - 2 of 3		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED										
<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared In the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 2136 (Fleming Road) at 2124 (Lewiston Road)</p> <p style="font-size: x-small;">Division 7 Guilford County Greensboro</p> <table style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: August 2022</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: Zarrar Zafar</td> <td>REVIEWED BY:</td> </tr> </table> <table style="width: 100%; font-size: x-small;"> <tr> <td>REVISIONS</td> <td>INIT.</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	PLAN DATE: August 2022	REVIEWED BY:	PREPARED BY: Zarrar Zafar	REVIEWED BY:	REVISIONS	INIT.	DATE				<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <i>Todd Joyce</i> 09/22/2022 ASSOCIATION NO. 07-1924T1</p>
PLAN DATE: August 2022	REVIEWED BY:											
PREPARED BY: Zarrar Zafar	REVIEWED BY:											
REVISIONS	INIT.	DATE										

4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN ENABLE STATUS" to "OFF". The "RUN ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



! Press the "*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

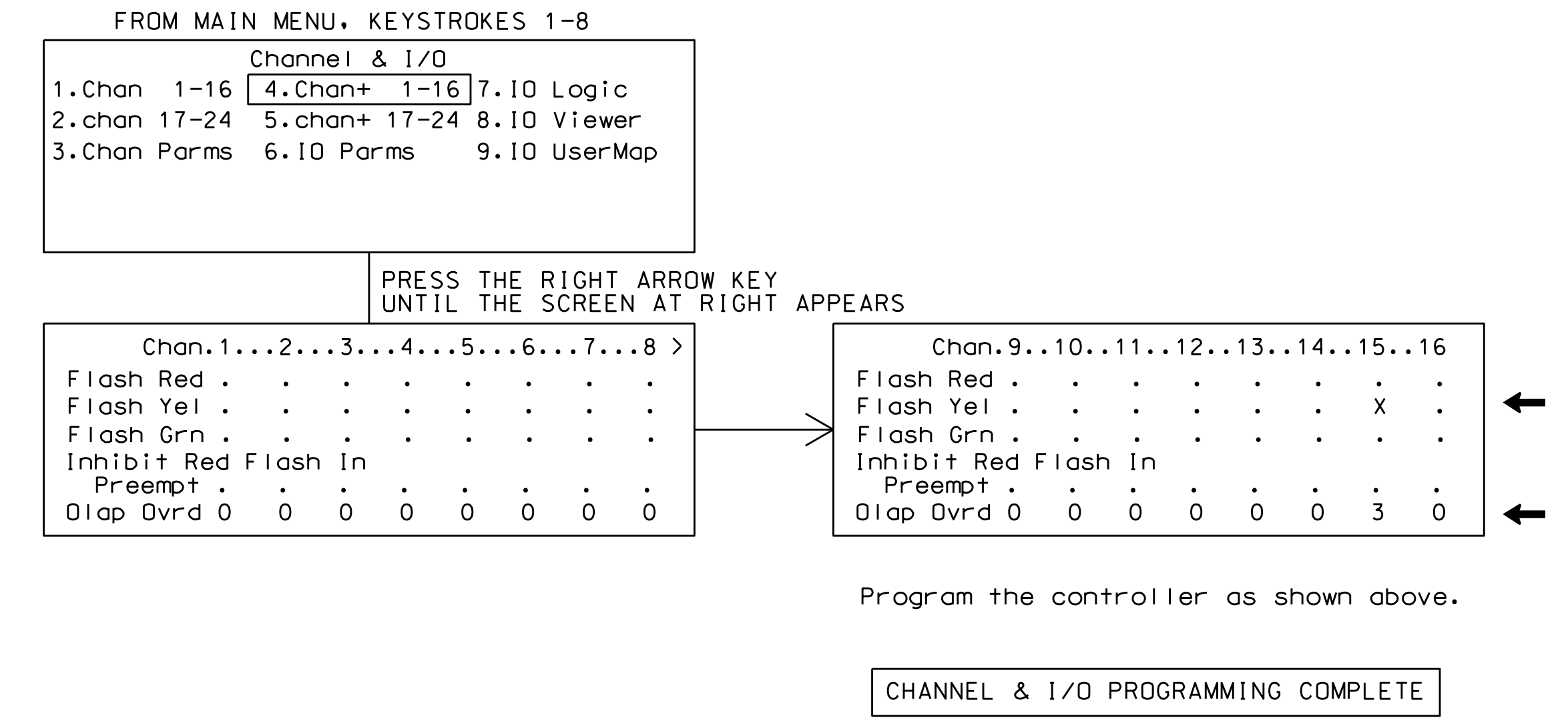
NOTE

I/O re-programming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.



Programming notes:

Pin	Default Fcn Description	Change To: Fcn Description
5-2	39 Ch15 Yellow....	0 Unused

Programming notes:

Pin	Default Fcn Description	Change To: Fcn Description
6-8	59 Ch11 Green	39 Ch15 Yellow

NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T1
 DESIGNED: June 2022
 SEALED: 9/8/2022
 REVISED: N/A

Electrical Detail - 3 of 3

	SR 2136 (Fleming Road) at 2124 (Lewiston Road)		
	Division 7 PLAN DATE: August 2022 PREPARED BY: Zarrar Zafar	Guilford County REVIEWED BY: REVIEWED BY:		Greensboro DATE: 09/22/2022 DATE:

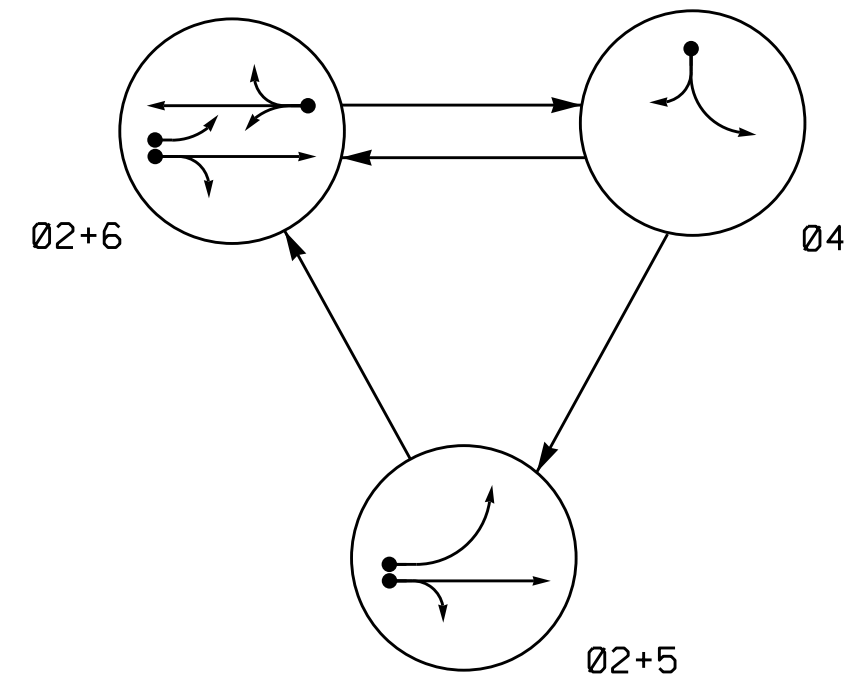
750 N. Greenfield Pkwy, Garner, NC 27529

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 07-1924T1

20-060-2022-1413
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 ZZZZ

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	04	FLASH
21, 22	G	G	R	Y
41, 42	R	R	G	R
51	-	-	-	-
62, 63	R	G	R	Y

LOOP & DETECTOR UNIT INSTALLATION CHART												
INDUCTIVE LOOPS						DETECTOR PROGRAMMING						
ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	URNS	NEW LOOP	PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION ADDED INIT.	SYSTEM LOOP	NEW CARD
2A/S3*	6X6	300	*	*	2	-	-	-	X	X	X	*
4A*	6X40	0	*	*	4	-	10.0	-	X	X	-	*
4B*	6X40	0	*	*	4	-	15.0	-	X	X	-	*
5A*	6X40	0	*	*	5	2	15.0	-	X	X	-	*
6A/S4*	6X6	300	*	*	6	-	-	-	X	X	X	*

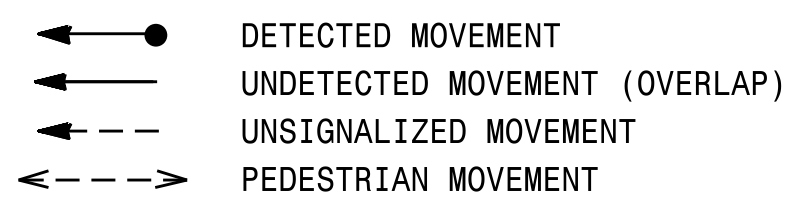
* Video Detection Zone.

3 Phase Fully Actuated (Greensboro Signal System)

NOTES

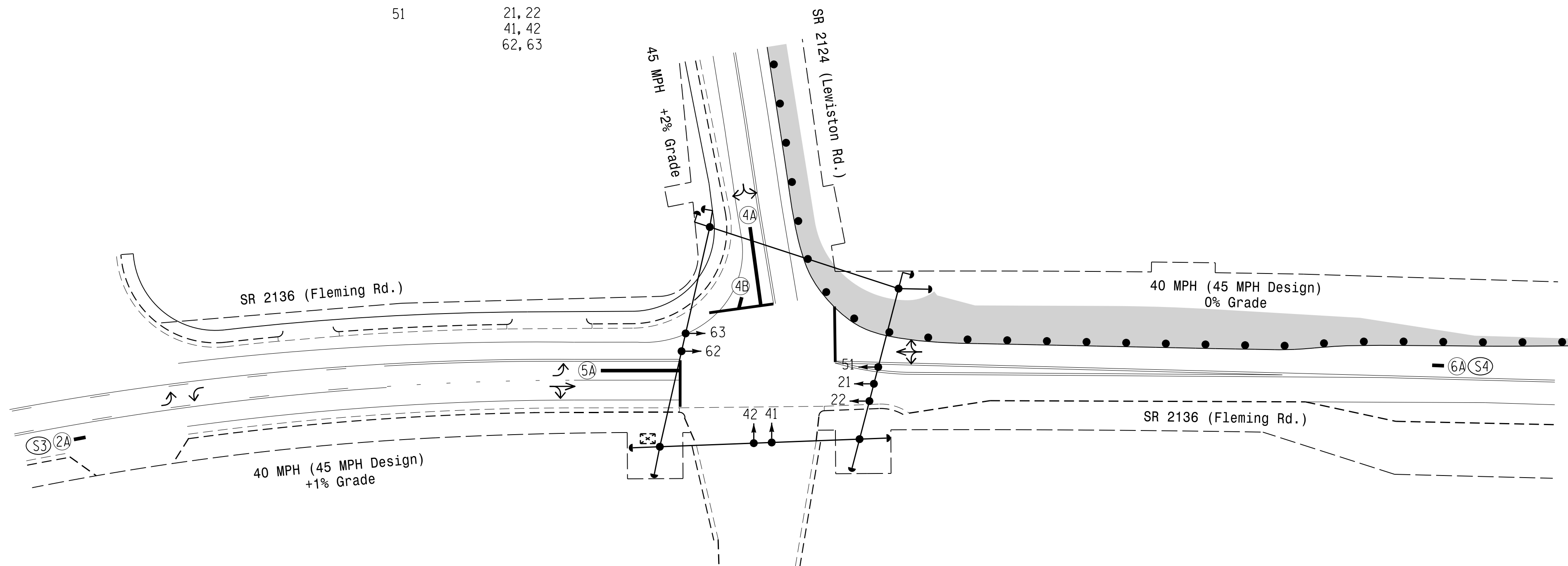
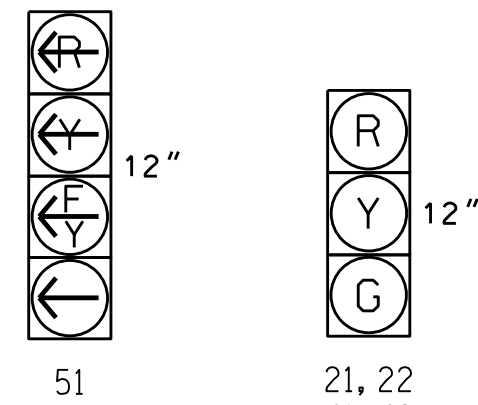
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024 and "Standard Specifications for Roads and Structures" dated January 2024.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Omit phase 5 during phase 6 on.
4. Set all detector units to presence mode.
5. This intersection uses video detection. Install detectors according to the manufacturer's instructions to achieve the desired detection.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

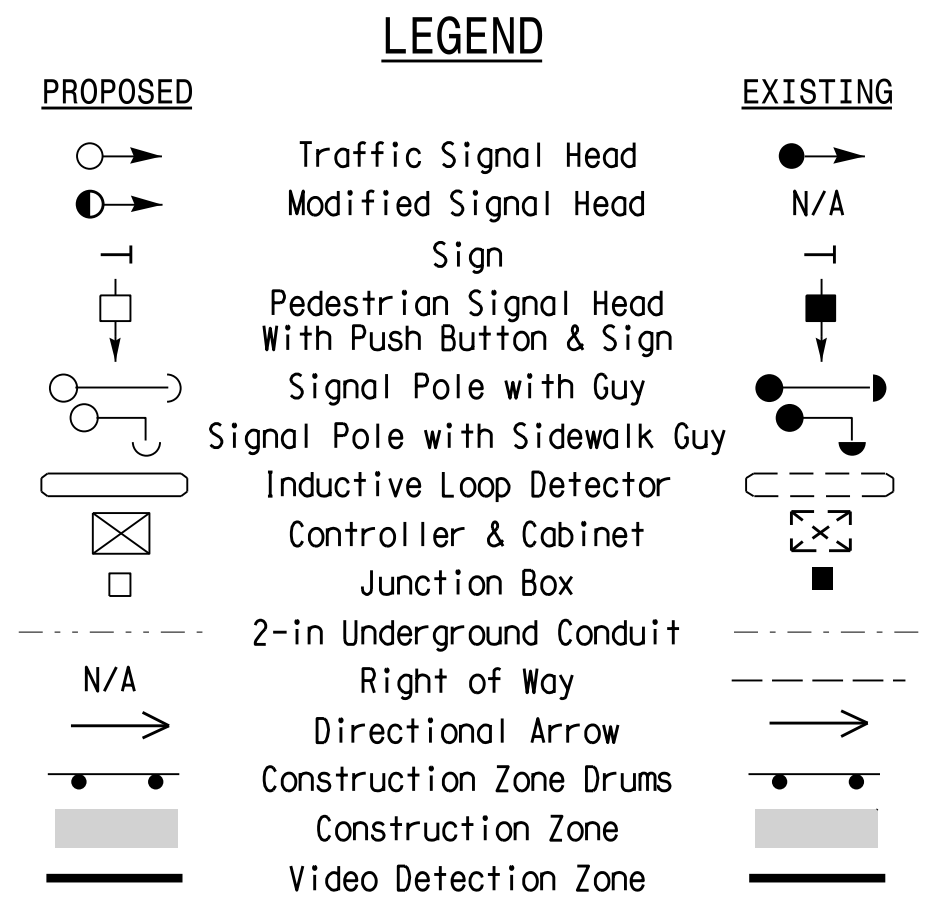
All Heads L.E.D.



TRAFFICWARE APOGEE 2070 TIMING CHART

FEATURE	PHASE			
	2	4	5	6
Min Green *	12	7	7	12
Gap, Extension *	6.0	2.0	2.0	6.0
Maximum Green 1 *	60	25	15	60
Maximum Green 2 *	0	0	0	0
Yellow Clear	4.5	3.0	3.0	4.5
Red Clear	1.2	1.9	1.9	1.2
Walk *	-	-	-	-
Pedestrian Clear	-	-	-	-
Added Initial *	2.5	-	-	2.5
Maximum Initial *	34	-	-	34
Time Before Reduction *	15	-	-	15
Time To Reduce *	15	-	-	15
Minimum Gap	3.0	-	-	3.0
Recall Mode	MIN RECALL	-	-	MIN RECALL
Lock Calls	YES	NO	NO	YES
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

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

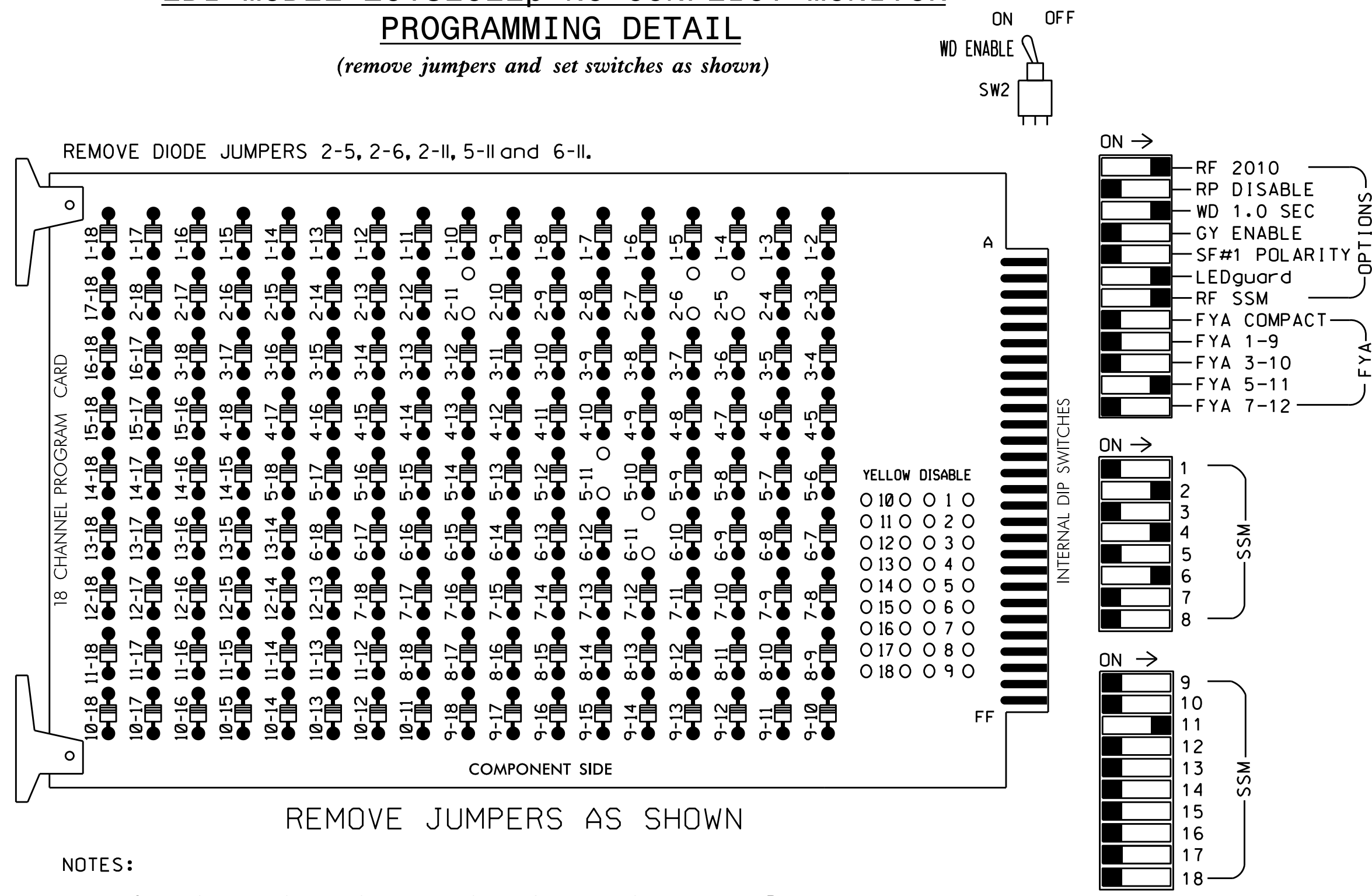


Signal Upgrade - Temporary Design 2 (TMP Phase II)

	SR 2136 (Fleming Road) at SR 2124 (Lewiston Road)		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER ROBERT J. L. L. M. E. 026486
	Division 7 Guilford County Greensboro	PLAN DATE: June 2022 REVIEWED BY:	
PREPARED BY: J.A. Lohr	REVIEWED BY:		DATE: 09/08/2022
REVISIONS	INIT.	DATE	SIG. INVENTORY NO. 07-1924T2

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

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

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "DRK".
- Ensure "InhFYARedSt" feature is set to "ON".
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:
FROM MAIN MENU->1->8->7 (I/O LOGIC) Result Src.Fcn TimeOp Time
1208 = 01208 DLY 1
- The cabinet and controller are part of the City of Greensboro Signal System.

SIGNAL HEAD HOOK-UP CHART

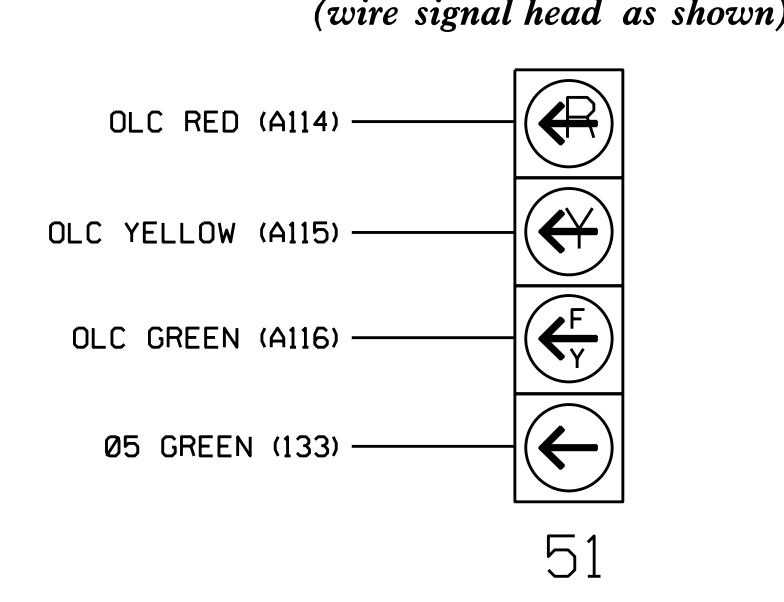
LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	51	62,63	NU	NU	NU	NU	NU	NU	NU	51	NU	NU	
RED		128			101			134											
YELLOW		129			102		*	135											
GREEN		130			103			136											
RED ARROW																		A114	
YELLOW ARROW																			A115
FLASHING YELLOW ARROW																			A116
GREEN ARROW								133											

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

EQUIPMENT INFORMATION

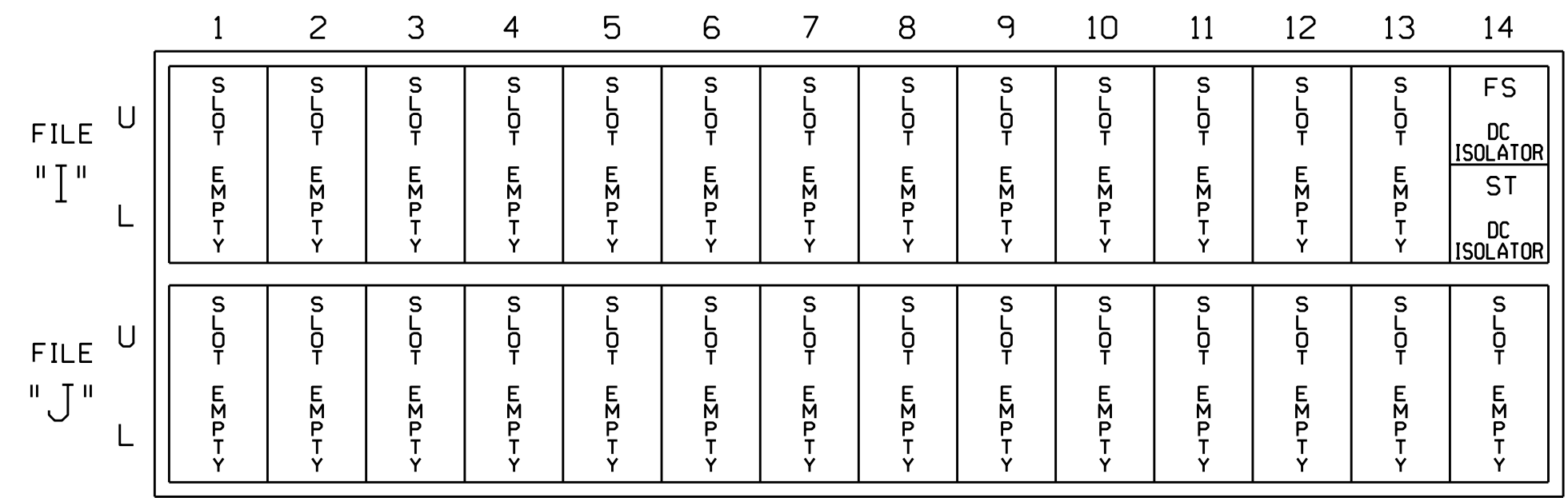
CONTROLLER.....2070
CABINET.....332 W/ AUX
SOFTWARE.....TRAFFICWARE APOGEE
CABINET MOUNT.....BASE
OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
LOAD SWITCHES USED.....S2,S5,S7,S8,AUX S4
PHASES USED.....2,4,5,6
OVERLAP A.....NOT USED
OVERLAP B.....NOT USED
OVERLAP C.....*
OVERLAP D.....NOT USED
* See Overlap Programming Detail Sheet 2.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL



INPUT FILE POSITION LAYOUT

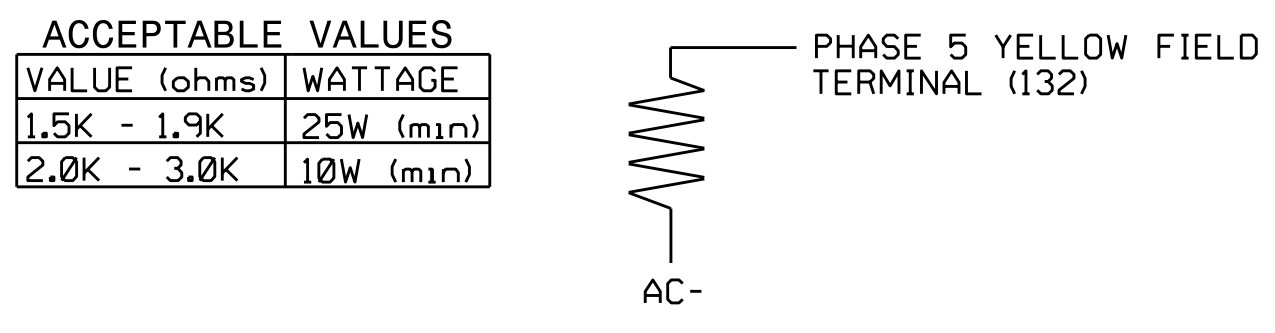
(front view)



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

LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924T2
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

SPECIAL DETECTOR NOTE

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

Electrical Detail - 1 of 3

Electrical AND PROGRAMMING DETAILS FOR: SR 2136 (Fleming Road) at 2124 (Lewiston Road)

Prepared In the Offices of:

Division 7 Guilford County Greensboro

PLAN DATE: August 2022 REVIEWED BY:

PREPARED BY: Zarrar Zafar REVIEWED BY:

REVISIONS: _____ INIT. DATE: _____

DocuSigned by:

09/22/2022 DATE: _____

APR CAD/F0804210

SIG. INVENTORY NO. 07-1924T2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

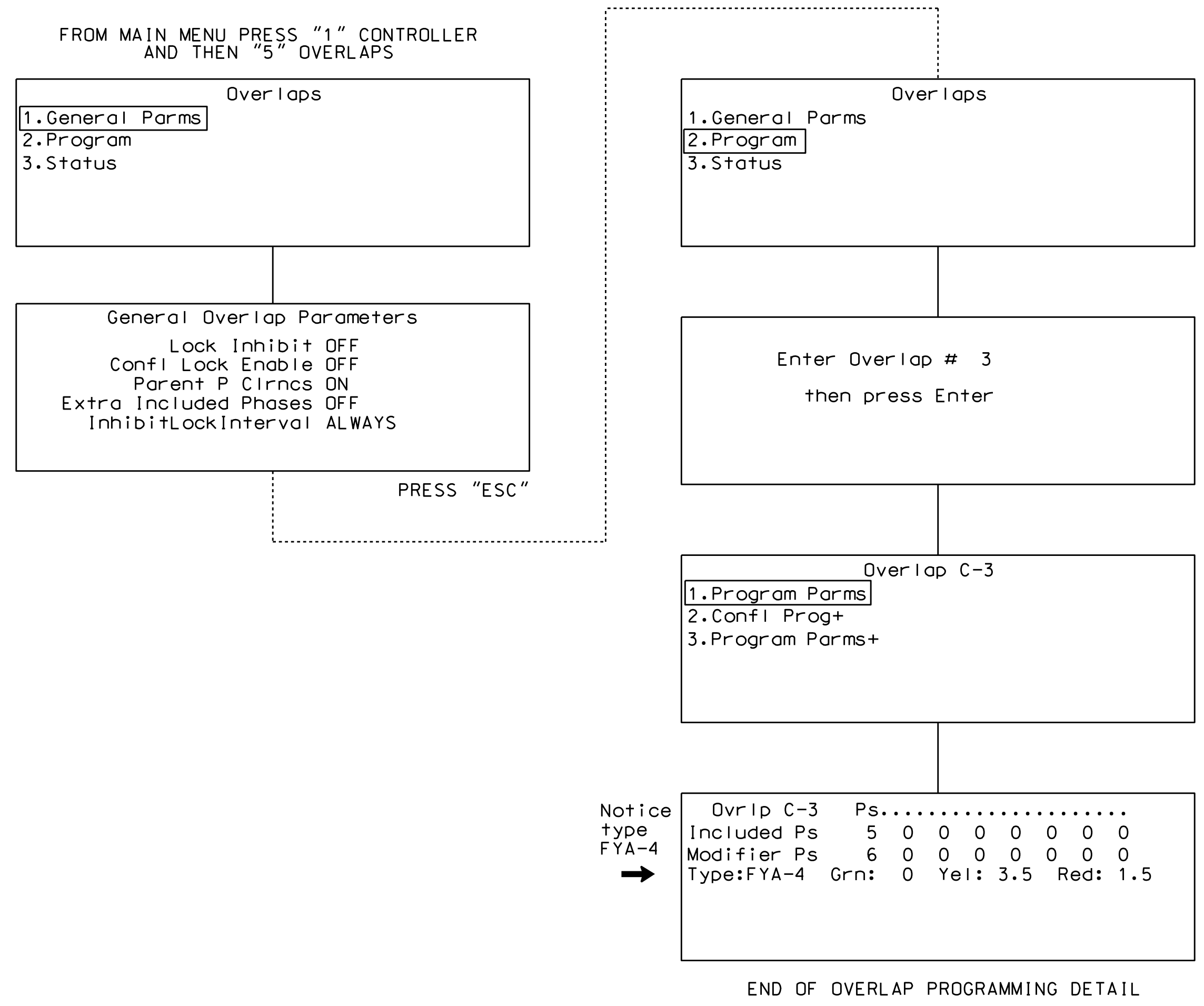
SEAL
STATE OF NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL 031001
TODD JOYCE

13-SEP-2022 1:50 PM S:\IT\SSU\115\Sig\Work\hous\51g_MarkZafar\Plans\071924_Temp and Final\071924T2_smc.e-2022rmd-dgn

OVERLAP PROGRAMMING DETAIL FOR OVERLAP C *

(program controller as shown below)

*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details.



CALL, INHIBIT PROGRAMMING DETAIL (USED FOR BACK-UP PROTECTION)

(program controller as shown below)

From Main Menu press '1' (Controller), then '1' (Phases), then '5' (CALL, Inh, Redirect).

P	..Call.Ps..	Inhibit Ps	1111111	>
1	0 0 0 0	12345678	90123456	
2	0 0 0 0	.....	.....
3	0 0 0 0	.....	.....
4	0 0 0 0	.....	.....
5	0 0 0 0	.....	.....
6	0 0 0 0	....X....	.....
7	0 0 0 0	.....	.....
8	0 0 0 0	.....	.....

PROGRAMMING COMPLETE

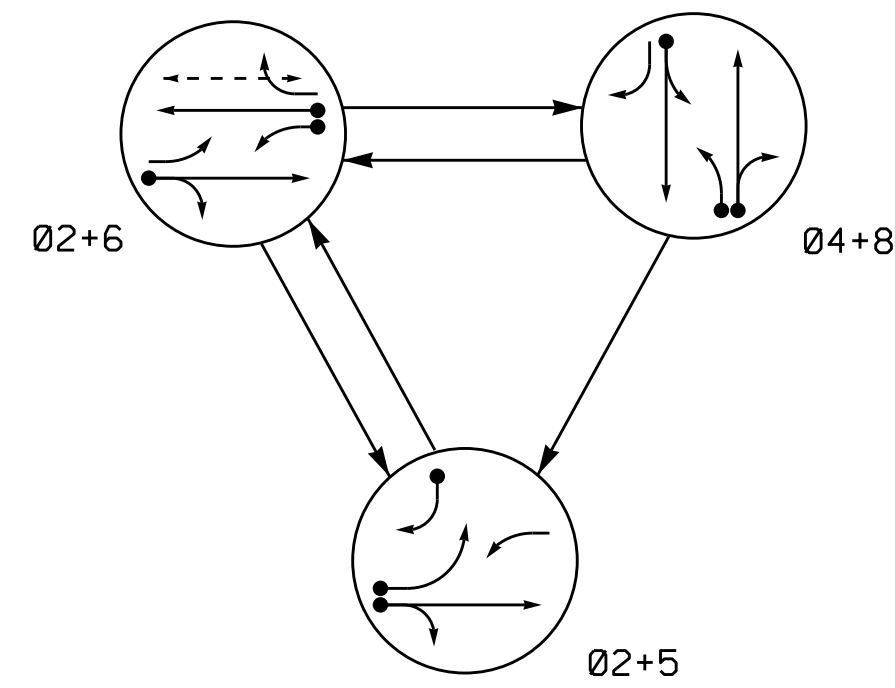
This programming will omit phase 5 when phase 6 is "ON".

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 07-1924T2
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

13-656-2022_12.dwg
*071924T2_smc-6-2022mmda.dgn
ZZZ

Electrical Detail - 2 of 3		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED										
<p style="font-size: small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center;">Prepared In the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 2136 (Fleming Road) at 2124 (Lewiston Road)</p> <p style="font-size: x-small;">Division 7 Guilford County Greensboro</p> <table border="0" style="width: 100%; font-size: x-small;"> <tr> <td>PLAN DATE: August 2022</td> <td>REVIEWED BY:</td> </tr> <tr> <td>PREPARED BY: Zarrar Zafar</td> <td>REVIEWED BY:</td> </tr> </table> <table border="0" style="width: 100%; font-size: x-small;"> <tr> <td>REVISIONS</td> <td>INIT.</td> <td>DATE</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	PLAN DATE: August 2022	REVIEWED BY:	PREPARED BY: Zarrar Zafar	REVIEWED BY:	REVISIONS	INIT.	DATE				<p>SEAL</p> <p style="font-size: x-small;">DocuSigned by: <i>D. Todd Joyce</i> 09/22/2022 ASSOCIATION NO. 07-1924T2</p>
PLAN DATE: August 2022	REVIEWED BY:											
PREPARED BY: Zarrar Zafar	REVIEWED BY:											
REVISIONS	INIT.	DATE										

DEFAULT PHASING DIAGRAM

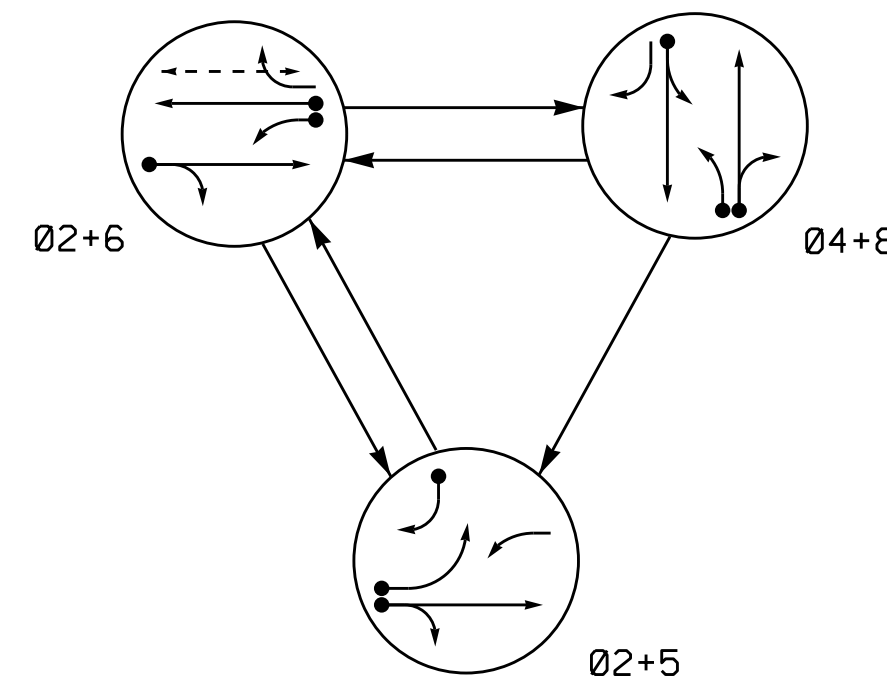


SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	P	R	G	R
51	F	F	R	Y
61	F	F	R	Y
62, 63	R	G	R	Y
64	R	F	R	Y
81	R	R	F	R
82, 83	R	R	G	R
P61, P62	DW	W	DW	DRK

PHASING DIAGRAM DETECTION LEGEND

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

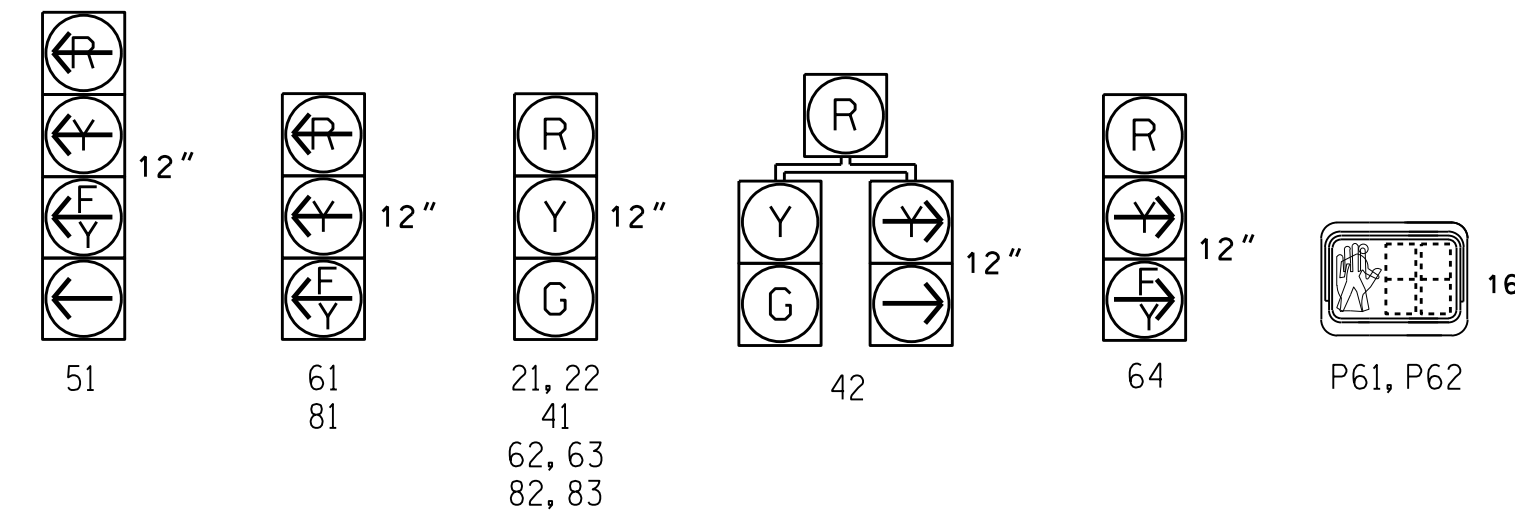
ALTERNATE PHASING DIAGRAM



SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21, 22	G	G	R	Y
41	R	R	G	R
42	P	R	G	R
51	F	F	R	Y
61	F	F	R	Y
62, 63	R	G	R	Y
64	R	F	R	Y
81	R	R	F	R
82, 83	R	R	G	R
P61, P62	DW	W	DW	DRK

SIGNAL FACE I.D.

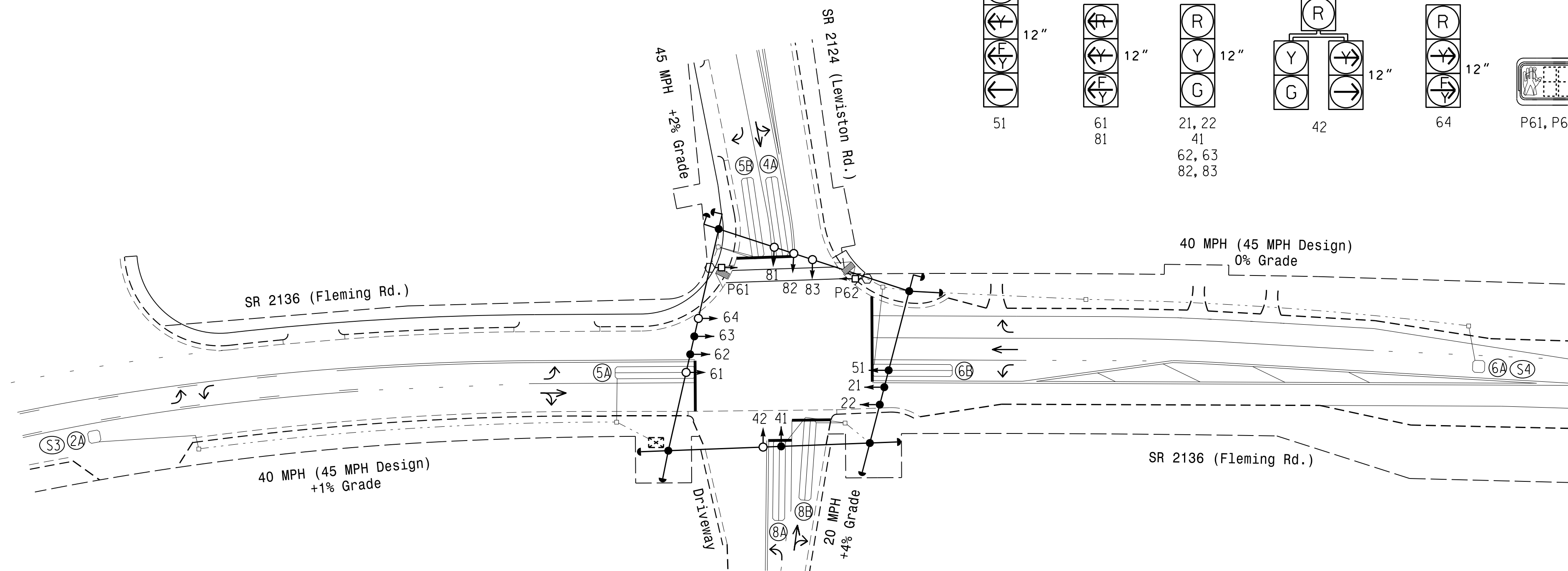
All Heads L.E.D.



3 Phase Fully Actuated (Greensboro Signal System)

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 5 may be logged.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The Division (City) Traffic Engineer will determine the hours of use for each phasing plan.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.



FEATURE	PHASE				
	2	4	5	6	8
Min Green *	12	7	7	12	7
Gap, Extension *	6.0	2.0	2.0	6.0	2.0
Maximum Green 1 *	60	25	15	60	25
Maximum Green 2 *	0	0	0	0	0
Yellow Clear	4.5	4.3	3.0	4.5	4.3
Red Clear	1.2	2.4	2.6	2.4	1.1
Walk *	-	-	-	7	-
Pedestrian Clear	-	-	-	12	-
Added Initial *	2.5	-	-	2.5	-
Maximum Initial *	34	-	-	34	-
Time Before Reduction *	15	-	-	15	-
Time To Reduce *	15	-	-	15	-
Minimum Gap	3.0	-	-	3.0	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Lock Calls	YES	NO	NO	YES	NO
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	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.

TRAFFICWARE APOGEE SOFTWARE 2070 CONTROLLER													
INDUCTIVE LOOPS				DETECTOR PROGRAMMING									
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	SWITCH (PHASE)	DELAY TIME	STRETCH TIME	CALLING	EXTENSION	ADDED INIT.	SYSTEM LOOP	NEW CARD
2A/S3	6X6	300	5	X	2	-	-	-	X	X	X	X	X
4A	6X40	0	2-4-2	X	4	-	3.0	-	X	X	-	-	X
5A	6X40	0	2-4-2	X	5	-	5.0	-	X	X	-	-	X
5B	6X40	0	2-4-2	X	5	-	15.0	-	X	X	-	-	X
6A/S4	6X6	300	5	X	6	-	-	-	X	X	X	X	X
6B	6X40	0	2-4-2	X	6	-	-	-	X	X	-	-	X
8A	6X40	0	2-4-2	X	8	-	3.0	-	X	X	-	-	X
8B	6X40	0	2-4-2	X	8	-	10.0	-	X	X	-	-	X

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
● → Modified Signal Head	■ → N/A
⊥ → Sign	⊥ → N/A
○ ⊥ → Pedestrian Signal Head With Push Button & Sign	○ ⊥ → N/A
○ ⊥ → Signal Pole with Guy	○ ⊥ → N/A
○ ⊥ → Signal Pole with Sidewalk Guy	○ ⊥ → N/A
□ → Inductive Loop Detector	□ → N/A
□ → Controller & Cabinet	□ → N/A
□ → Junction Box	□ → N/A
- - - → 2-in Underground Conduit	- - - → N/A
- - - → Right of Way	- - - → N/A
→ → Directional Arrow	→ → N/A
→ → Curb Ramp	→ → N/A
○ → Type II Signal Pedestal	○ → N/A

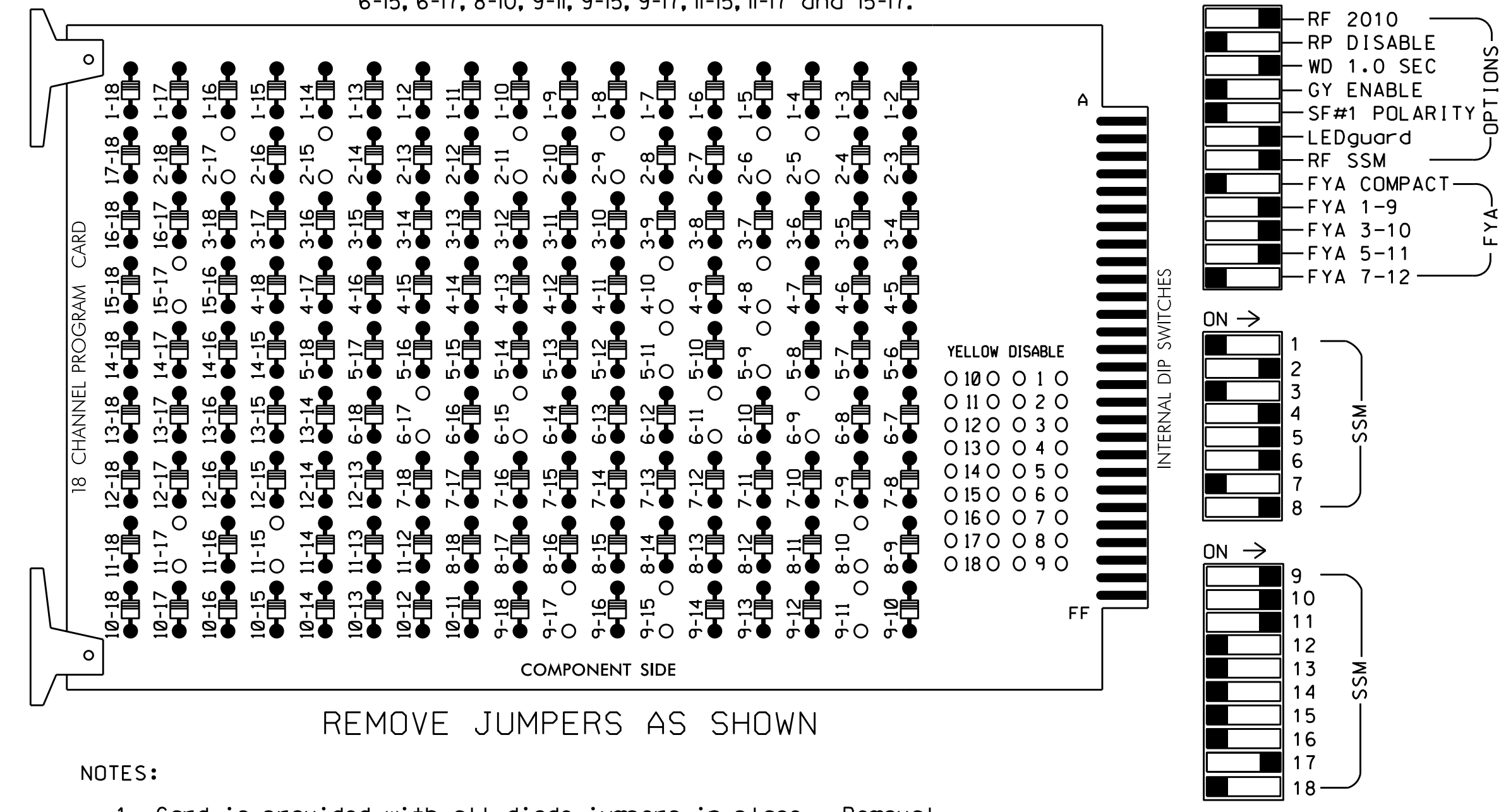
Signal Upgrade - Final Design

	<p>SR 2136 (Fleming Road) at SR 2124 (Lewiston Road)</p>	
	<p>Division 7 Guilford County Greensboro</p>	<p>Division 7 Guilford County Greensboro</p>
<p>PLAN DATE: June 2022</p>	<p>REVIEWED BY:</p>	<p>REVIEWED BY:</p>
<p>PREPARED BY: J.A. Lohr</p>	<p>REVIEWED BY:</p>	<p>REVIEWED BY:</p>
<p>REVISIONS</p>	<p>INIT.</p>	<p>DATE</p>
<p>0 40 SCALE 1"=40'</p>	<p>09/08/2022</p>	<p>DATE</p>
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SIG. INVENTORY NO. 07-1924</p>	<p>DATE</p>

EDI MODEL 2018EClip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-5, 2-6, 2-9, 2-11, 2-15, 2-17, 4-8, 4-10, 5-9, 5-11, 6-9, 6-11, 6-15, 6-17, 8-10, 9-11, 9-15, 9-17, 11-15, 11-17 and 15-17.



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.
- Ensure Conflict Monitor Ethernet port is connected to a Switch port located within the cabinet.

■ = DENOTES POSITION OF SWITCH

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Initialize database in Naztec 2070 local software (Apogee) as FULL-CALTRANS. This initialization should be done prior to programming controller.
- Initialize I/O "C1-C11-ABC IO Mode" to USER (MM 1-8-6). Then set "Init 2A" to MODE 5 (MM 1-8-9-3).
- Program phases 2 and 6 for Start Up In Green.
- Program "Start Up Flash" for 0 sec. The conflict monitor will govern start-up flash time.
- Ensure "Local Flash Start" feature is set to "DRK".
- Ensure "InhFYARedSt" feature is set to "ON".
- Program controller to provide a 1 second delay on the Flash Sense/Local Flash input. Use the following logic statement to provide this functionality:

FROM MAIN MENU->1->8->7 (I/O LOGIC)	Result Src.Fcn	TimeOp Time
	1208 = 01208	DLY 1
- Program phases 4 and 8 for Dual Entry.
- The cabinet and controller are part of the City of Greensboro Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....TRAFFICWARE APOGEE
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 (12-STD, 6-AUX)
 LOAD SWITCHES USED.....S2,S5,S7,S8,S9,S11,AUX S1,
 AUX S2,AUX S3,AUX S4
 PHASES USED.....2,4,5,6,6 PED,8
 OVERLAP A.....*
 OVERLAP B.....*
 OVERLAP C.....*
 OVERLAP D.....NOT USED
 OVERLAP E.....*
 * See Overlap Programming Detail Sheet 2.

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	OLE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	42	51	62,63	P61, P62	NU	82,83	NU	61	81	64	51	NU
RED		128			101		*		134			107				A111		
YELLOW		129			102				135			108						
GREEN		130			103				136			109						
RED ARROW																A121	A124	A114
YELLOW ARROW								132								A122	A125	A112
FLASHING YELLOW ARROW																A123	A126	A113
GREEN ARROW								133	133									
Hand icon													119					
Person icon													121					

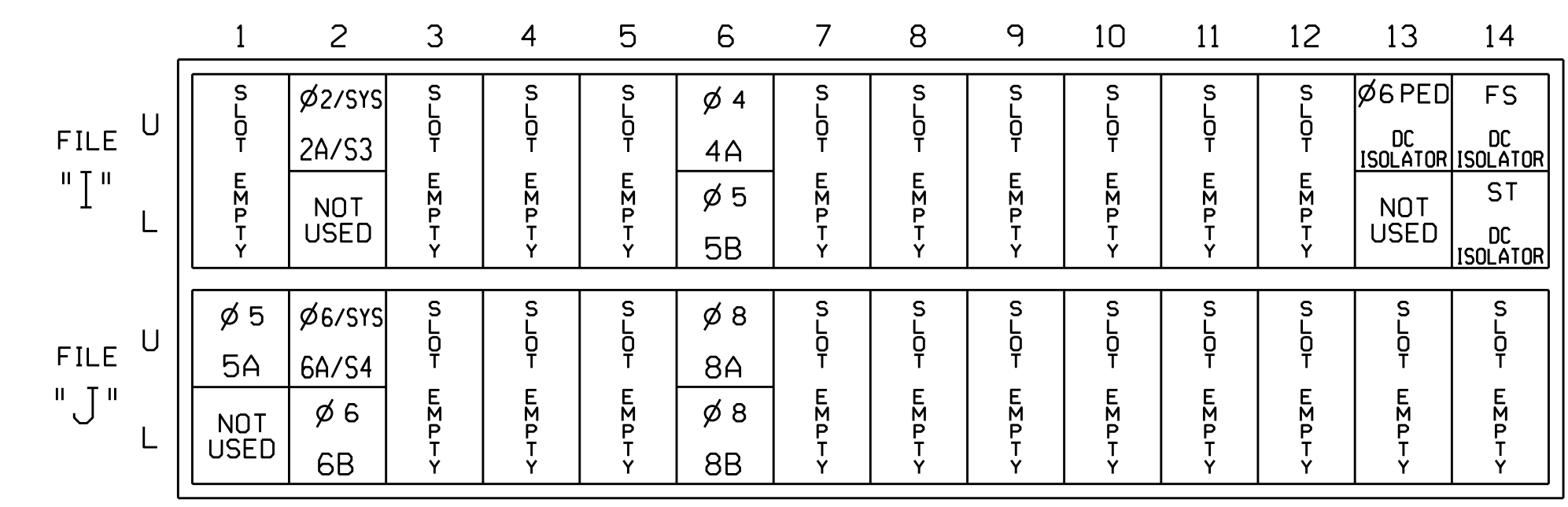
NU = Not Used

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

★ See pictorial of head wiring in detail below.

INPUT FILE POSITION LAYOUT

(front view)



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

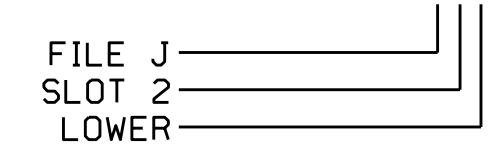
FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	CALL PHASE	SWITCH	DELAY TIME	EXTEND TIME	CALL	EXTEND	ADDED INIT.
2A/S3	TB2-5,6	I2U	39	2	2/SYS				X	X	X
4A	TB4-9,10	I6U	41	8	4				X	X	
5A	TB3-1,2	J1U	55	15	5		3		X	X	
5B	TB4-11,12	I6L	45	9	5		15		X	X	
6A/S4	TB3-5,6	J2U	40	16	6/SYS				X	X	X
6B	TB3-7,8	J2L	44	17	6				X	X	
8A	TB5-9,10	J6U	42	22	8		3		X	X	
8B	TB5-11,12	J6L	46	23	8		10		X	X	
PED PUSH BUTTONS											
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED						

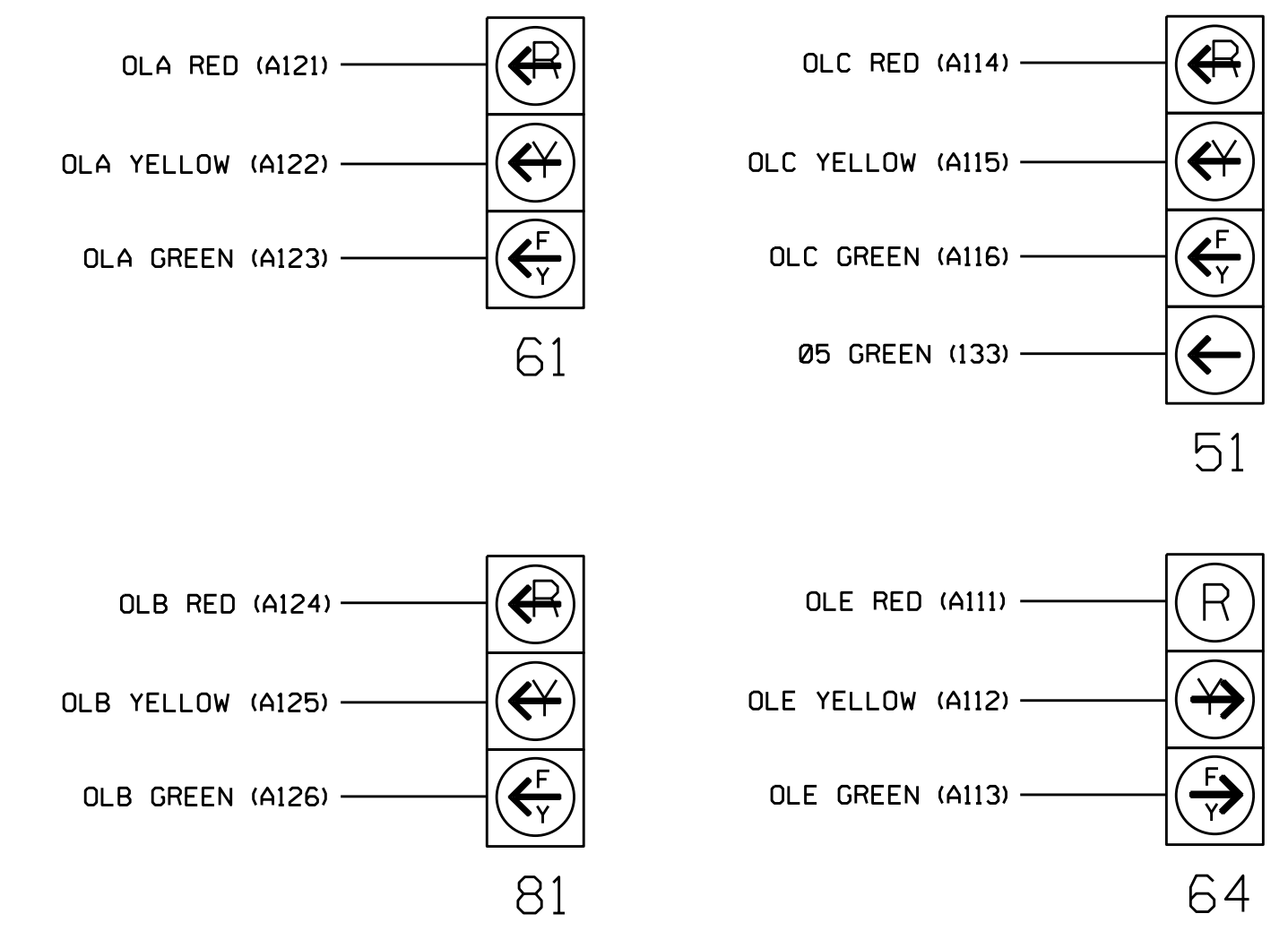
NOTE:
 INSTALL DC ISOLATOR IN INPUT FILE SLOT 113.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

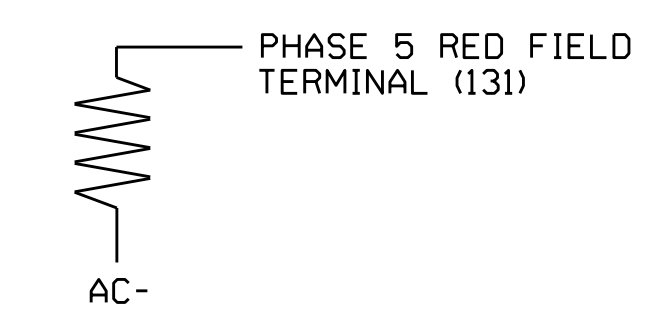
(wire signal heads as shown)



LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - 1 of 4

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SR 2136 (Fleming Road)
 at
 2124 (Lewiston Road)

Division 7 Guilford County Greensboro

PLAN DATE: August 2022 REVIEWED BY:

PREPARED BY: Zarrar Zafar REVIEWED BY:

REVISIONS: INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

09/22/2022

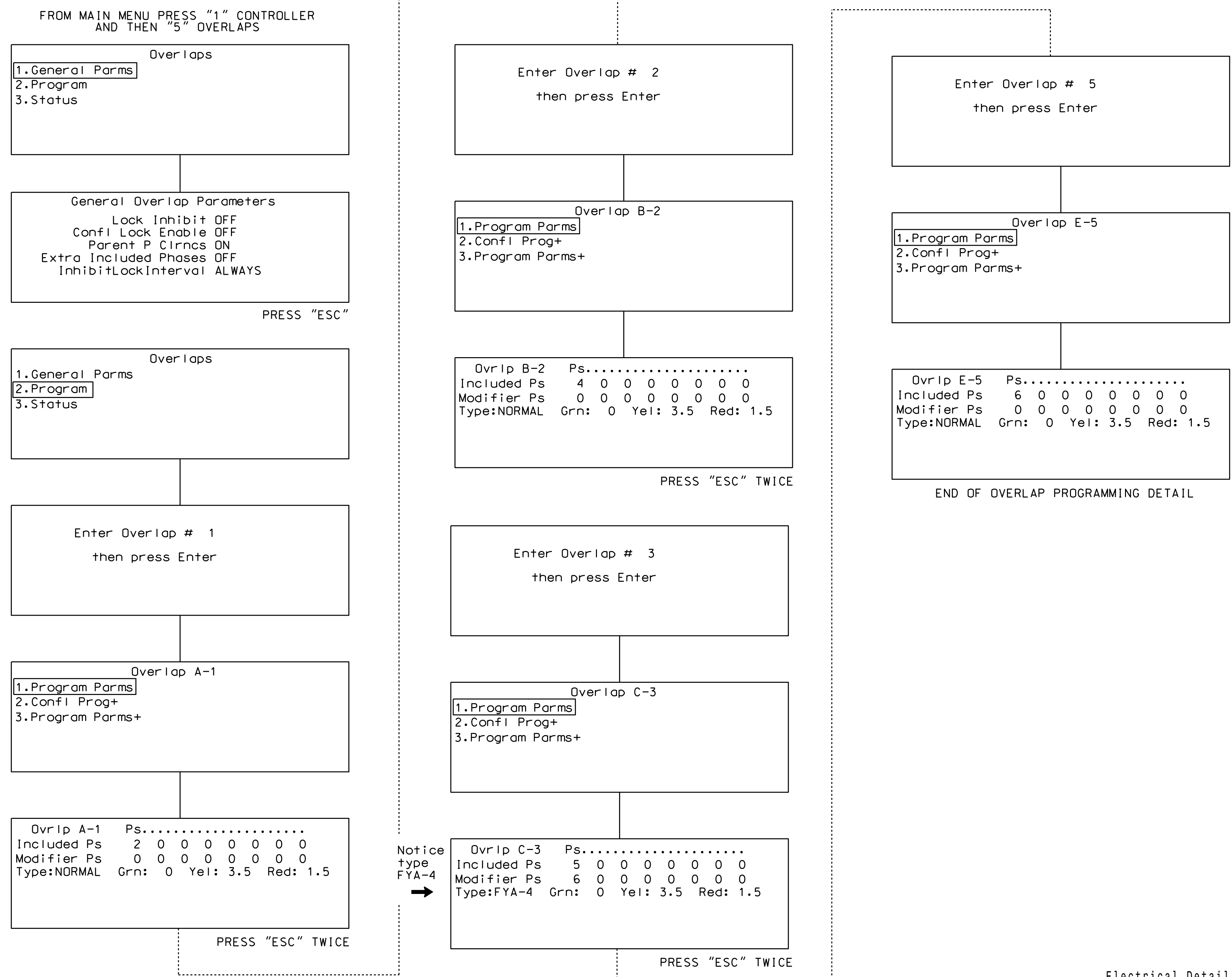
SIG. INVENTORY NO. 07-1924

14-SEP-2022 09:16
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 ZZZZ

**OVERLAP PROGRAMMING DETAIL
FOR OVERLAPS A, B, C and E ***

(program controller as shown below)


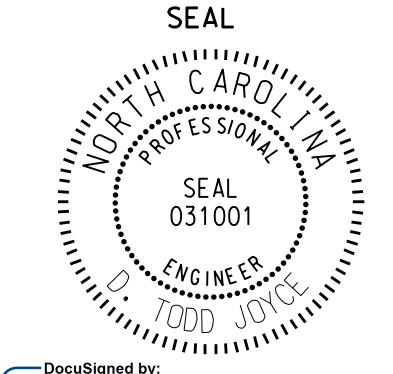
*NOTE FOR ALL OVERLAPS: Use Default values for Overlap 'PLUS' programming details.



Notice type FYA-4 →

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

Electrical Detail - 2 of 4

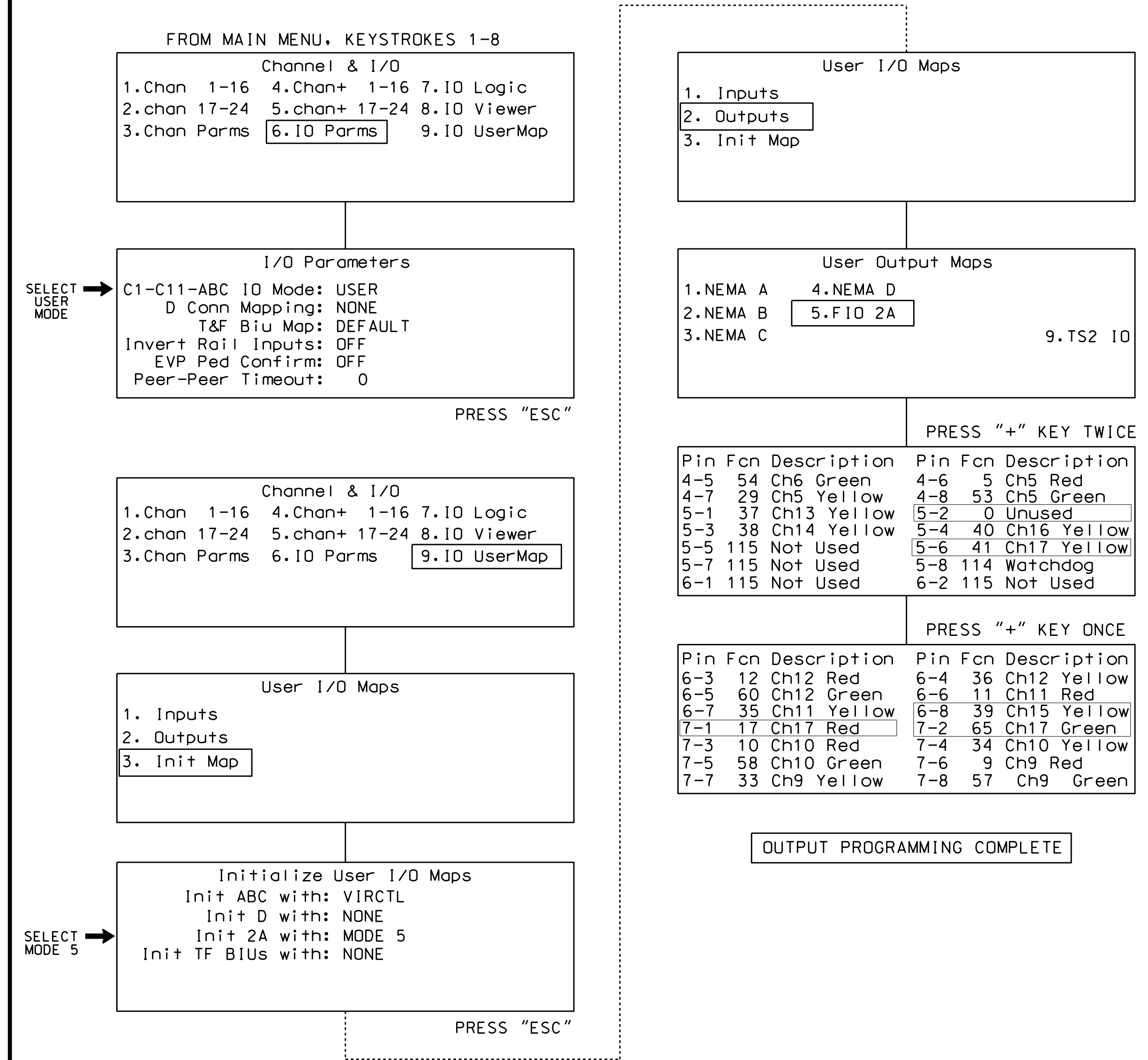
 <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SR 2136 (Fleming Road) at 2124 (Lewiston Road)</p>	<p align="center">SEAL</p> 
	<p>Division 7 Guilford County Greensboro</p> <p>PLAN DATE: August 2022 REVIEWED BY:</p> <p>PREPARED BY: Zarrar Zafar REVIEWED BY:</p>		DocuSigned by: D. Todd Joyce 09/22/2022 SIG. INVENTORY NO. 07-1924

13-SEP-2022 12:19
*011924_5_Sig.4.2_2022mddt.dgn
ZZZgr

4-SECTION PPLT FYA OUTPUT PROGRAMMING DETAIL

(program controller as shown below)

- Before proceeding with output programming, be sure to switch the "RUN-ENABLE STATUS" to "OFF". The "RUN-ENABLE STATUS" setting is located from Main Menu, key strokes 1-7.
- The Flashing Yellow Arrow in a 4-section PPLT FYA head is controlled by a normally unused PED Yellow output. This programming takes a specific PED Yellow output and remaps it to the appropriate Overlap Green output.



Pin 5-2 (C1 pin 36) = Load Switch S9-Y
 Pin 6-8 (C1 pin 90) = Load Switch AUX S4-G
 Pin 7-1 (C1 pin 91) = Load Switch AUX S3-R
 Pin 5-6 (C1 pin 101) = Load Switch AUX S3-Y
 Pin 7-2 (C1 pin 93) = Load Switch AUX S3-G

! Press the "*" key to return to Main Menu. Now go back to "RUN-ENABLE STATUS" and switch to "ON".

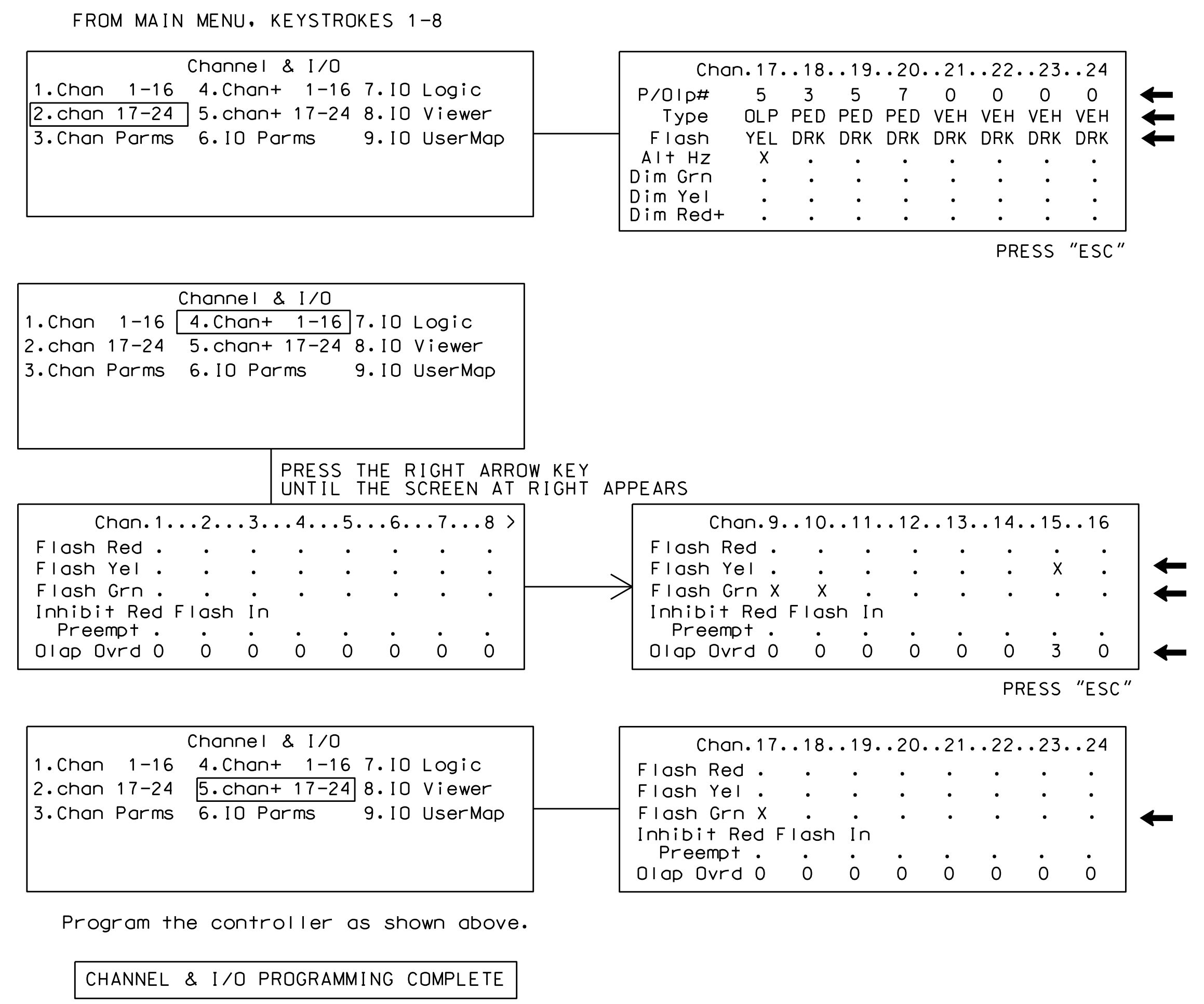
NOTE

I/O reprogramming is necessary for proper FYA operation. See Channel & I/O Programming Detail For FYA Operation on this sheet.

CHANNEL & I/O PROGRAMMING DETAIL FOR FYA OPERATION

(program controller as shown below)

This programming takes the output that drives a Flashing Yellow Arrow and makes it flash. It also specifies which overlap is to be overridden for the FYA to display properly.



NOTE

Output re-mapping is necessary for proper FYA operation. See the 4-Section PPLT FYA Output Programming Detail on this sheet.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 07-1924
 DESIGNED: June 2022
 SEALED: 9/8/2022
 REVISED: N/A

Electrical Detail - 3 of 4

	SR 2136 (Fleming Road) at 2124 (Lewiston Road)		
	Division 7 Guilford County Greensboro	PLAN DATE: August 2022		REVIEWED BY:
PREPARED BY: Zarrar Zafar	REVIEWED BY:	REVISIONS	INIT. DATE
750 N. Greenfield Pkwy, Garner, NC 27529	Documented by: <i>D. Todd Joyce</i> 09/22/2022	DATE	DATE

SIG. INVENTORY NO. 07-1924

13-SEP-2022 15:28
 *011924_Sig.4.3-07-1924.mxd
 z221gr

ALTERNATE PHASING BY TIME OF DAY (TOD) DETAIL

(program controller as shown below)

The purpose of this programming is to turn off Flashing Yellow Arrows (FYA) for signal head 51, and to remove the delay for loop 5A by Time of Day (TOD).

1. Set up Alternate Detector Prog Set# 1

FROM MAIN MENU, KEYSTROKES 5-5

Alternate Detector Programs	
1.Veh Parm	4.Ped Parm
2.Veh Options	
3.Veh Parm+	Prog Set# 1 ← ENTER MAP # 1

2. Select Veh Parm (1) to set up vehicle parameters

Row	Det#	Call	Switch	Delay	Extend	Queue	>
1	0	0	0	0.0	0.0	0	
2	15	5	0	0.0	0.0	0	
3	0	0	0	0.0	0.0	0	
4	0	0	0	0.0	0.0	0	
5	0	0	0	0.0	0.0	0	
6	0	0	0	0.0	0.0	0	
7	0	0	0	0.0	0.0	0	

ESC

3. Select Veh Options (2) to set up Call/Extend options for vehicle detectors

Row	Det#	Call	Extend	Queue	Add.	Init	>
1	0	.	.	.	.	.
2	15	X	X	.	.	.	
3	0	.	.	.	.	.
4	0	.	.	.	.	.
5	0	.	.	.	.	.
6	0	.	.	.	.	.
7	0	.	.	.	.	.

4. From Main Menu go to Time Based Scheduler.

FROM MAIN MENU, KEYSTROKE 4

Time Based Scheduler		
1.Set Date/Time	4.Day Plan	7.Status
2.Easy Schedule	5.Action Table	8.Resrvd
3.Adv Schedule	6.Parameters	9.More

5. Go to Easy Schedule (2) or Advanced Schedule (3) to run day plan.
6. Set up Day Plan Table (4) to schedule Pattern.
7. Set up Action Table (5) to run Pattern.
8. Set up Pattern #1 to turn off Overlap 3, thus turning off FYA outputs. Also enable Detector Group 1.

FROM MAIN MENU, KEYSTROKES 2-6

Pat#	Alt:	POpt	PTime	DetGrp	Call/Inh	>
1		0	0	1	0	
2		0	0	0	0	
3		0	0	0	0	
4		0	0	0	0	
5		0	0	0	0	
6		0	0	0	0	
7		0	0	0	0	

<Pat#	Olp.	Off:	12345678	ASC	CNA1	Max2	Dia
1			.X.....	0	.	.	DFT
2			0	.	.	DFT
3			0	.	.	DFT
4			0	.	.	DFT
5			0	.	.	DFT
6			0	.	.	DFT
7	+		0	.	.	DFT

TOD Programming Complete

FLASHER CIRCUIT MODIFICATION DETAIL


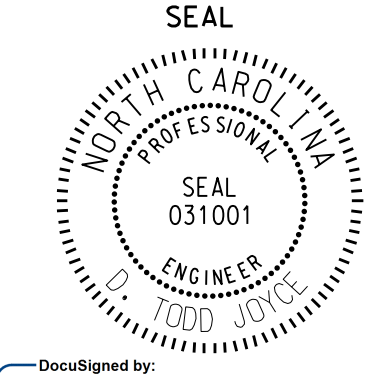
IN ORDER TO INSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

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: 07-1924
DESIGNED: June 2022
SEALED: 9/8/2022
REVISED: N/A

Electrical Detail - 4 of 4

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared In the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	SR 2136 (Fleming Road) at 2124 (Lewiston Road)	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
	Division 7 Guilford County Greensboro PLAN DATE: August 2022 REVIEWED BY: PREPARED BY: Zarrar Zafar REVIEWED BY:	SEAL  SEAL 031001 D. TODD JOYCE ENGINEER	DocuSigned by: 09/22/2022 DATE SIG. INVENTORY NO. 07-1924

- 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 INSTALL 900MHZ ETHERNET RADIO
- 58 INSTALL NEW ELECTRICAL SERVICE
- 59 INSTALL NEW EQUIPMENT CABINET DISCONNECT
- 60 BOND TRACER WIRE TO EQUIPMENT GROUND BUS
DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
- 61 BOND RISER AND MESSENGER CABLE TO POLE GROUND
- 62 BOND RISER TO POLE GROUND
- 63 BOND MESSENGER CABLE TO POLE GROUND
- 64 INSTALL HEAT SHRINK TUBING RETROFIT KIT
- 65 INSTALL MOLDABLE DUCT SEAL
- 66 SLACK SPAN

LEGEND

	NEW FIBER OPTIC COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT

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	

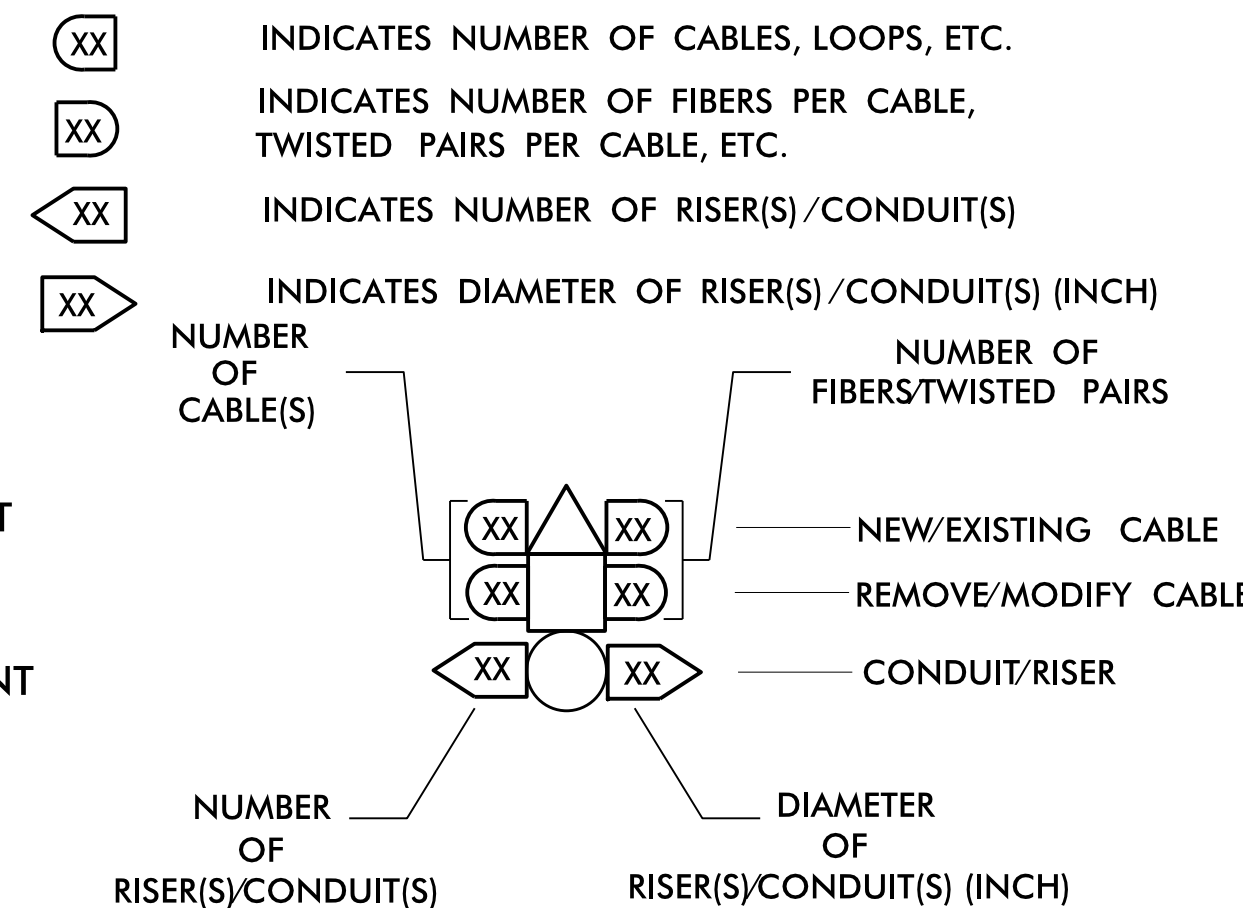
ATTACHMENT POINT:

'SS' YY' DISTANCE ABOVE (IN)/ATTACHMENT POINT REFERENCE POINT

'SS' YY' REFERENCE POINT DISTANCE BELOW (IN)/ATTACHMENT POINT

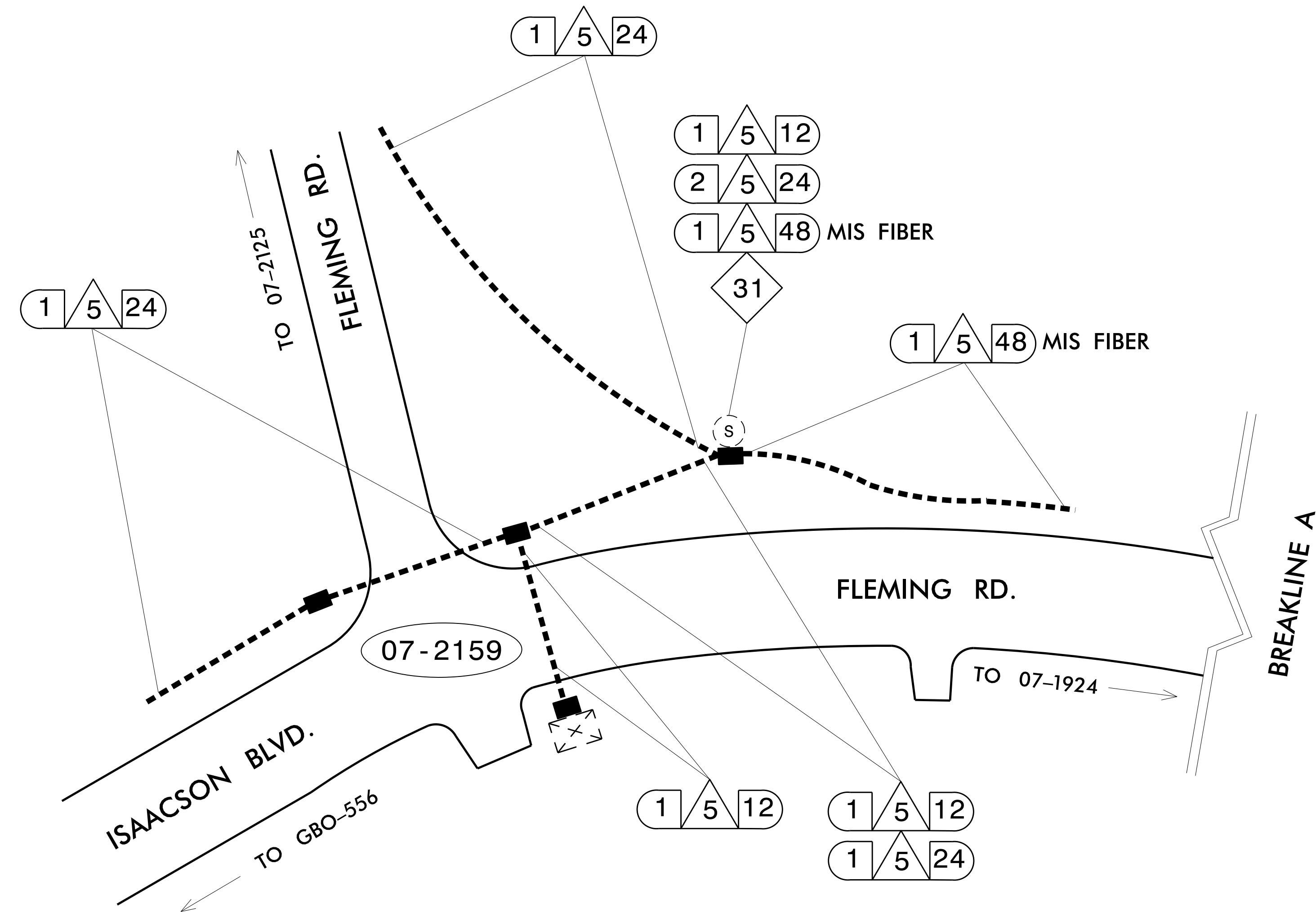
"SS" REFERENCE LOCATION
 FS = FRONT SIDE OF POLE
 BS = BACK SIDE OF POLE

CONSTRUCTION NOTE SYMBOLOGY KEY



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	GREENSBORO SIGNAL SYSTEM COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS		
	DIVISION 7 GUILFORD CO. GREENSBORO PLAN DATE: JUNE 2022 PREPARED BY: D.J. SONDERFAN	REVIEWED BY: DATE:	
250 N. Greenfield Place, Garner, NC 27529			SIGNATURE: DATE: 06/23/2022



1. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE TRAFFIC SIGNAL SYSTEMS COORDINATOR AT (336) 373-4192 TO ARRANGE FOR THE CITY 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 SIGNAL SYSTEM COORDINATOR 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.

**DOCUMENT NOT CONSIDERED FINAL
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	GREENSBORO SIGNAL SYSTEM COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS		
	DIVISION 7 GUILFORD CO. GREENSBORO	PLAN DATE: JUNE 2022 REVIEWED BY: <i>Greg Ginn</i>		PREPARED BY: D.J. SONDERFAN
250 N. Greenfield Place, Garner, NC 27529	SCALE: 0	REVISIONS:	INIT. DATE
SIGNATURE: <i>Matthew T. Carls</i>		DATE: 06/23/2022	

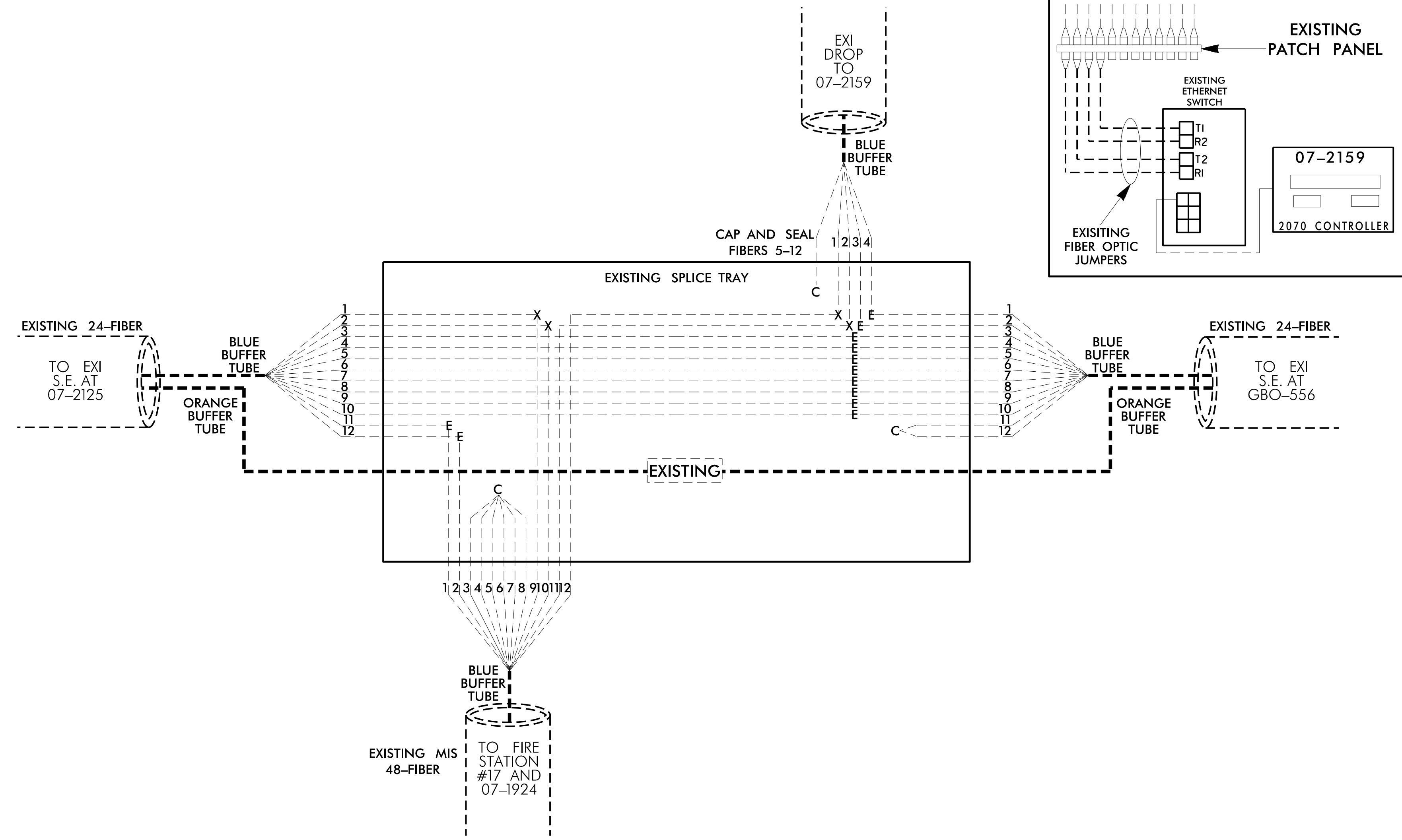
EXISTING UNDERGROUND SPLICE ENCLOSURE
FLEMING RD. AT ISAACSON RD.
SIG. INV. # 07-2159

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
E = EXISTING SPLICE
EXPRESS = EXPRESS ALL FIBERS/
BUFFER TUBES
SPLICE = SPLICE ALL FIBERS/
BUFFER TUBES

COLOR CODE
TIA/EIA 598-A
(1) BLUE (7) RED
(2) ORANGE (8) BLACK
(3) GREEN (9) YELLOW
(4) BROWN (10) VIOLET
(5) SLATE (11) ROSE
(6) WHITE (12) AQUA

CABINET AT INTERSECTION 07-2159

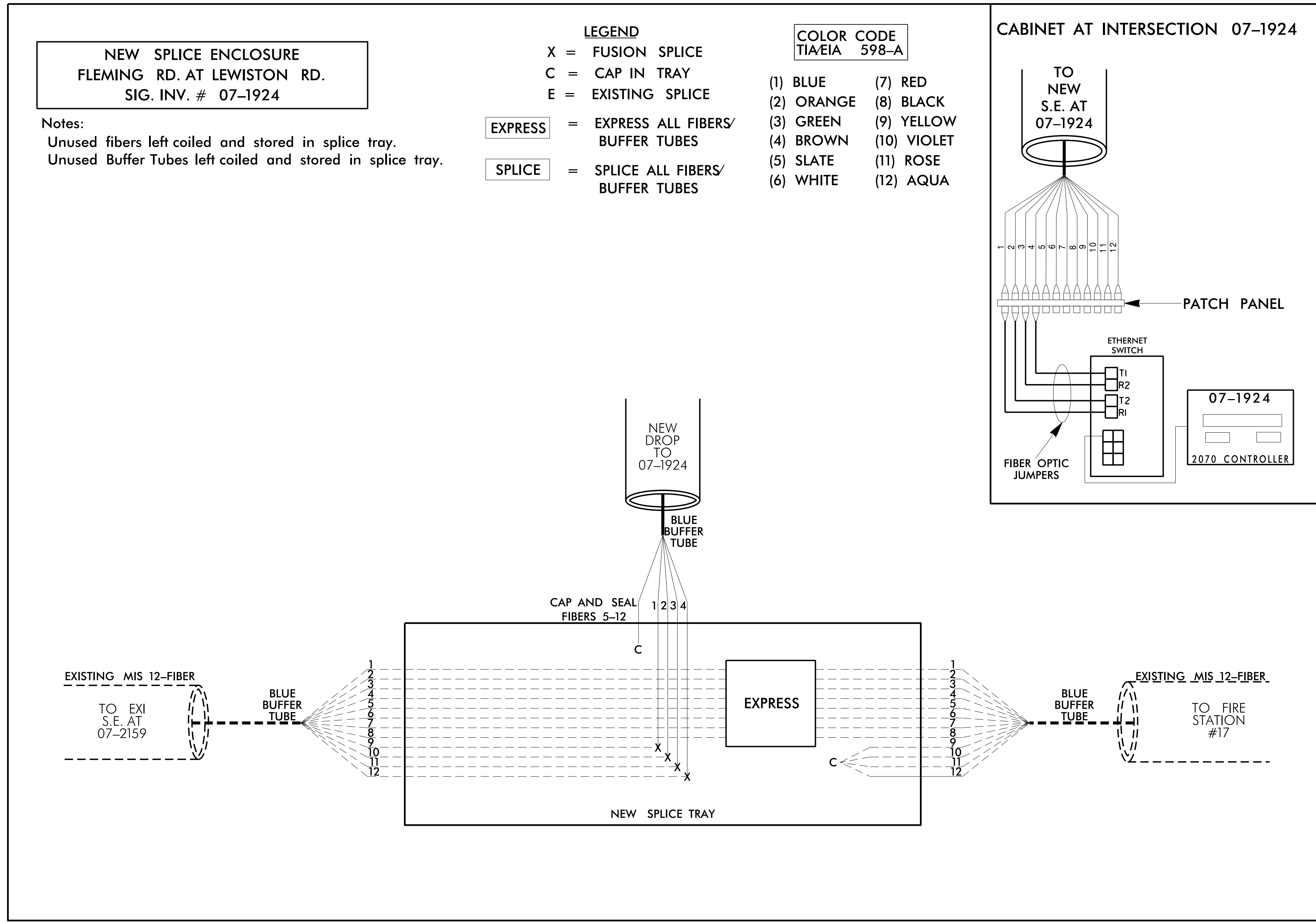


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- ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.
- INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING: REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - SPLICE LOCATION
 - DATE
 - COMPANY NAME
 - 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.

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

<p>250 N. Greenfield Place, Garner, NC 27529</p>	SPLICE DETAIL							
	DIVISION 7 GUILFORD CO., GREENSBORO PLAN DATE: JUNE 2022 PREPARED BY: D.J. SONDERFAN	REVIEWED BY: <i>Greg Grew</i> ENGINEER		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER MATTHEW T. CARLISE No. 042578				
SCALE 	REVISIONS <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	DESCRIPTION				SIGNATURE: <i>Matthew T. Carlisle</i> DATE: 06/23/2022
NO.	DATE	DESCRIPTION						



- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE TRAFFIC SIGNAL SYSTEM COORDINATOR AT (336) 373-4192 TO ARRANGE FOR THE CITY 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 SIGNAL SYSTEMS COORDINATOR 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.
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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.

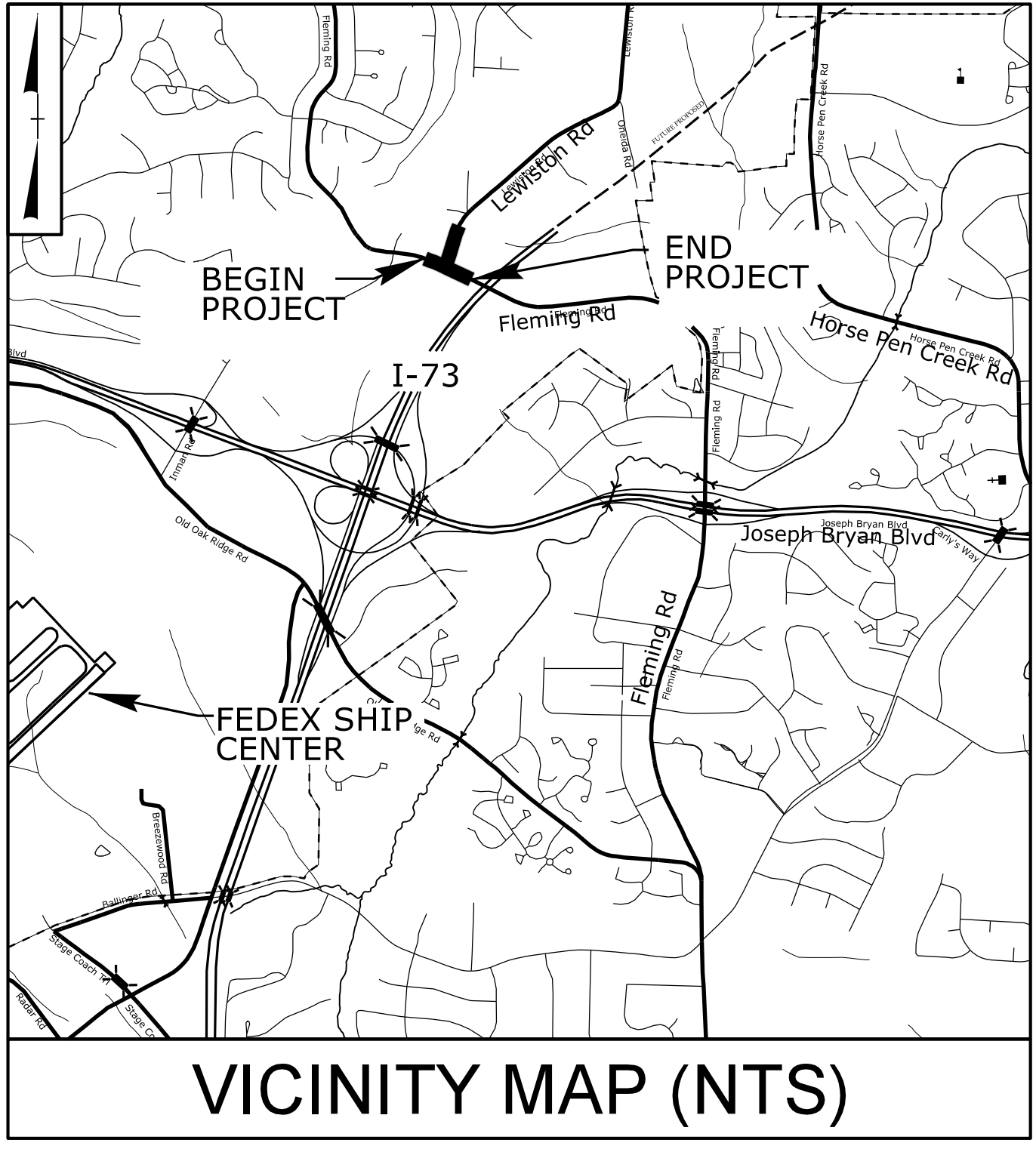
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

<p><small>Prepared in the Offices of:</small></p> <p><small>250 N. Greenfield Place, Garner, NC 27529</small></p>	<p>SPLICE DETAIL</p> <p>DIVISION 7 GUILFORD CO. GREENSBORO</p> <p>PLAN DATE: JUNE 2022 REVIEWED BY: <i>Greg Gruen</i></p> <p>PREPARED BY: D.J. SONDERFAN</p>	<p>SEAL</p> <p>NORTH CAROLINA PROFESSIONAL ENGINEER</p> <p>SEAL 042578</p> <p>MATTHEW T. CARLISLE</p>									
<p>SCALE</p> <p>0</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <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> </tbody> </table>	REVISIONS	INIT.	DATE							<p>SIGNATURE: <i>Matthew T. Carlisle</i></p> <p>DATE: 06/23/2022</p>
REVISIONS	INIT.	DATE									

TIP PROJECT: U-6016

T.I.P. NO.	SHEET NO.
U-6016	UC-1

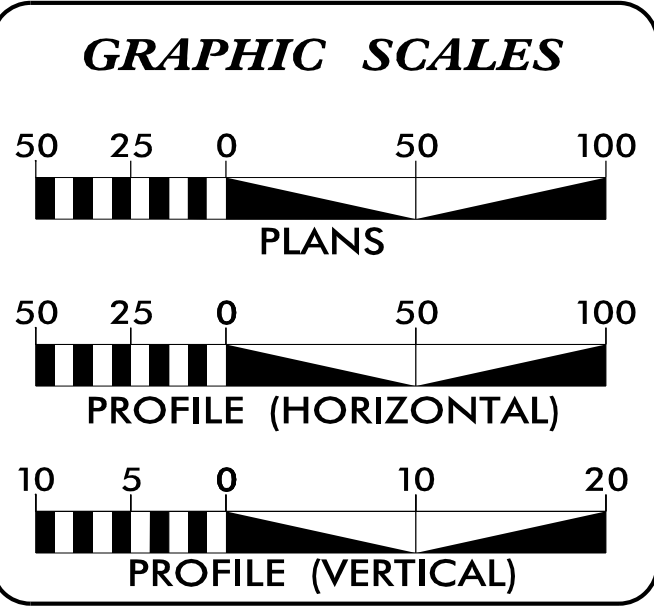
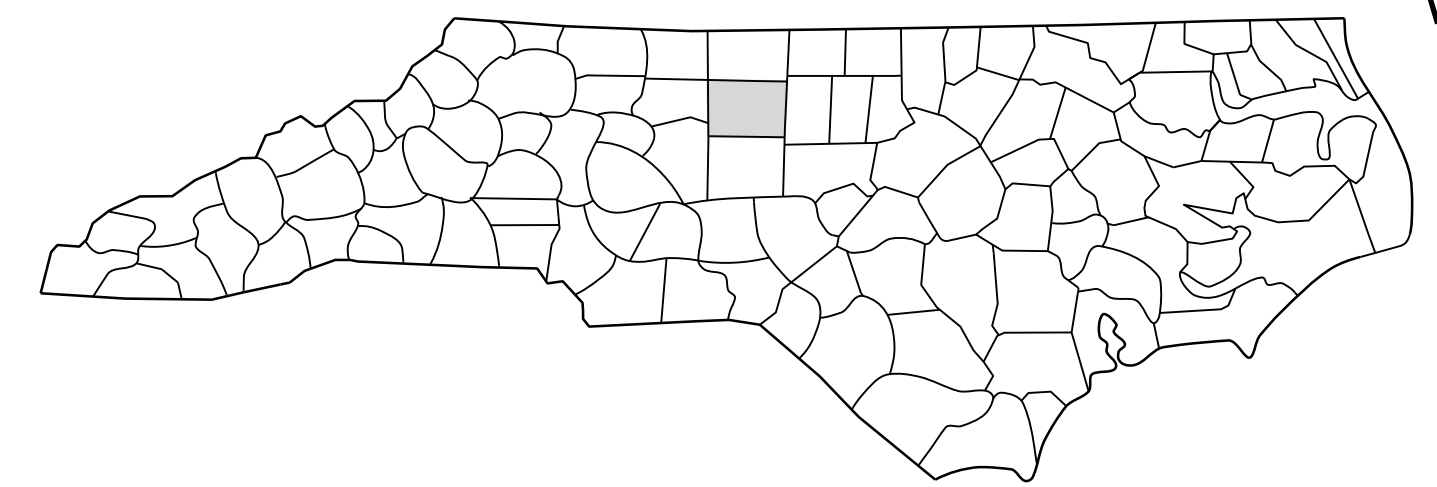
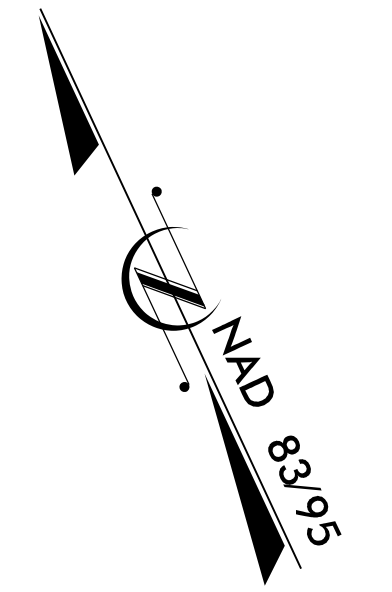
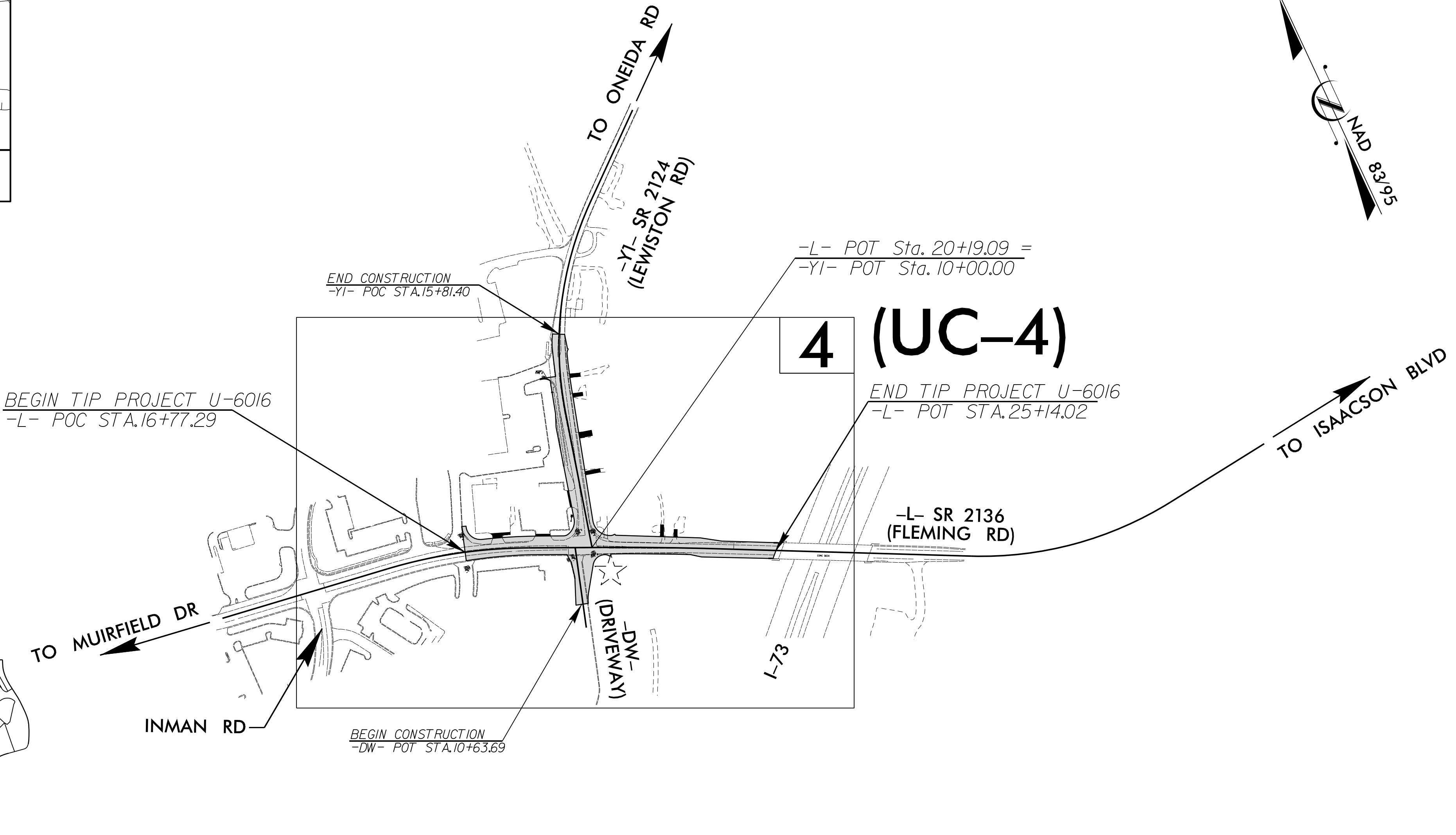
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS GUILFORD COUNTY

LOCATION: SR 2136 (FLEMING RD) AND SR 2124 (LEWISTON RD)
TYPE OF WORK: WATER LINE RELOCATIONS



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UC-1	TITLE SHEET
UC-2	UTILITY SYMBOLOGY
UC-3	NOTES
UC-3A	DETAILS
UC-4	UTILITY CONSTRUCTION SHEET
UC-5	PROFILE SHEET

WATER AND SEWER OWNERS ON PROJECT

(A) CITY OF GREENSBORO

PREPARED IN THE OFFICE OF:

401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513
Ph. (919) 653-0001

CLINT L. STEVENS, P.E. UTILITIES PROJECT MANAGER
JORDAN K. CHAPMAN, E.I. UTILITIES PROJECT ENGINEER
JAMES N. ARNOLD UTILITIES PROJECT DESIGNER

SEAL

060632D777EB420
2/29/2024

**DIVISION OF HIGHWAYS
DIVISION 7**
1584 YANCEVILLE STREET
GREENSBORO NC 27415-4996
PHONE (336) 487-0000
FAX (336) 334-3637

Wright R. Archer, P.E. DIV. ENGINEER
Patty Eason, P.E. DIV. CONSTRUCTION ENGINEER
Chad Reimakoski DIVISION PLANNING ENGINEER
Kelvin Martin DIVISION UTILITY ENGINEER

29-FEB-2024 09:36 \\hinde\local\shores\Server_Files\PROJECTS\2017\A20171201.00_CAL.YX_U-6016\Design\Utilities\Engineering\UC\Proj\U-6016_Ut_1_sh_UC1.psh.dgn \$\$\$USERNAME\$\$\$

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Water Line (Sized as Shown)	
11 1/4 Degree Bend	
22 1/2 Degree Bend	
45 Degree Bend	
90 Degree Bend	
Plug	
Tee	
Cross	
Reducer	
Gate Valve	
Butterfly Valve	
Tapping Valve	
Line Stop	
Line Stop with Bypass	
Blow Off	
Fire Hydrant	
Relocate Fire Hydrant	
Remove Fire Hydrant	REM FH
Water Meter	
Relocate Water Meter	
Remove Water Meter	REM WM
Water Pump Station	
RPZ Backflow Preventer	
DCV Backflow Preventer	
Relocate RPZ Backflow Preventer	
Relocate DCV Backflow Preventer	

PROPOSED SEWER SYMBOLS

Gravity Sewer Line (Sized as Shown)	
Force Main Sewer Line (Sized as Shown)	
Manhole (Sized per Note)	
Sewer Pump Station	

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Power Pole	
Telephone Pole	
Joint Use Pole	
Telephone Pedestal	
Utility Line by Others (Type as Shown)	
Trenchless Installation	
Encasement by Open Cut	
Encasement	

Thrust Block	
Air Release Valve	
Utility Vault	
Concrete Pier	
Steel Pier	
Plan Note	
Pay Item Note	

NOTE
PAY ITEM

EXISTING UTILITIES SYMBOLS

Power Pole		*Underground Power Line	
Telephone Pole		*Underground Telephone Cable	
Joint Use Pole		*Underground Telephone Conduit	
Utility Pole		*Underground Fiber Optics Telephone Cable	
Utility Pole with Base		*Underground TV Cable	
H-Frame Pole		*Underground Fiber Optics TV Cable	
Power Transmission Line Tower		*Underground Gas Pipeline	
Water Manhole		Aboveground Gas Pipeline	
Power Manhole		*Underground Water Line	
Telephone Manhole		Aboveground Water Line	
Sanitary Sewer Manhole		*Underground Gravity Sanitary Sewer Line	
Hand Hole for Cable		Aboveground Gravity Sanitary Sewer Line	
Power Transformer		*Underground SS Forced Main Line	
Telephone Pedestal		Underground Unknown Utility Line	
CATV Pedestal		SUE Test Hole	
Gas Valve		Water Meter	
Gas Meter		Water Valve	
Located Miscellaneous Utility Object		Fire Hydrant	
Abandoned According to Utility Records	AATUR	Sanitary Sewer Cleanout	
End of Information	E.O.I.		

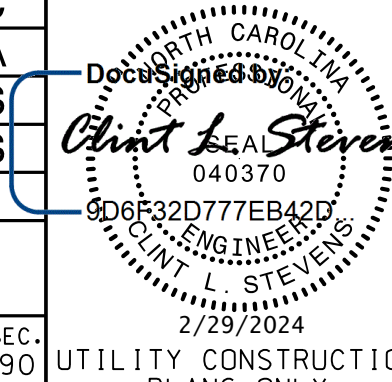
*For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

2017\62067150\U-6016-UC-2\U-6016-UC-2.psh.dgn REV: 2/1/2012



HINDE ENGINEERING
 License No. C-2639
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

PROJECT REFERENCE NO.	SHEET NO.
U-6016	UC-3
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: CLS	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2024.

2. THE EXISTING UTILITIES BELONG TO CITY OF GREENSBORO. THE CONTACT PERSON IS:

SHANE MESSER
 COORDINATOR CONSTRUCTION PROJECTS
 336-574-3550

IN THE EVENT OF A CONFLICT BETWEEN THE UTILITY OWNER'S TECHNICAL SPECIFICATIONS AND NCDOT STANDARD SPECIFICATIONS/PROJECT SPECIAL PROVISIONS, THE MOST STRINGENT SHALL GOVERN.

3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.

4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.

5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.

7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.

8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.

9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

10. ALL WATER LINE INSTALLED ON THIS PROJECT SHALL MEET THE REQUIREMENTS OF THE RULES GOVERNING PUBLIC WATER SYSTEMS. VERTICAL SEPARATION BETWEEN PROPOSED WATER MAINS AND STORM DRAINAGE SHALL BE A MINIMUM OF 18-INCHES PER RECOMMENDED STANDARDS OF WATER WORKS. ALL PROPOSED WATER LINE SHALL HAVE A MINIMUM COVER OF 36-INCHES. PROPOSED WATER MAINS SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF 10-FEET FROM SEWER MAINS (REF. RULE .0904, RULE.0906). UTILITIES BEING RELOCATED OR INSTALLED AS SHOWN ON THE UTILITY CONSTRUCTION PLANS MUST BE ADJUSTED ACCORDINGLY TO MEET THESE CRITERIA.

11. CONTACT THE CITY OF GREENSBORO A MINIMUM OF ONE WEEK PRIOR TO BEGINNING WORK ON THE 16-INCH WATER LINE TO COORDINATE VALVE OPERATIONS AND SHUTDOWNS.

12. THE WATER SHUT DOWN SHALL BE COORDINATED WITH THE CITY OF GREENSBORO'S WATER RESOURCES DEPARTMENT DUE TO A WATER SYSTEM BOOSTER STATON IN THE VICINITY OF THE WORK:

CONTACT SHANE MESSER
 PHONE: 336-574-3550
 SHANE.MESSER@GREENSBORO-NC.GOV

13. CONSTRUCTION INSPECTION REQUIRED FOR ALL WATER LINE RELOCATIONS. CONTRACTOR SHALL CONTACT CITY OF GREENSBORO AT (336) 373-2377 TO SCHEDULE AN INSPECTOR.

UTILITY CONSTRUCTION

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 CHITREES

WATER DETAILS

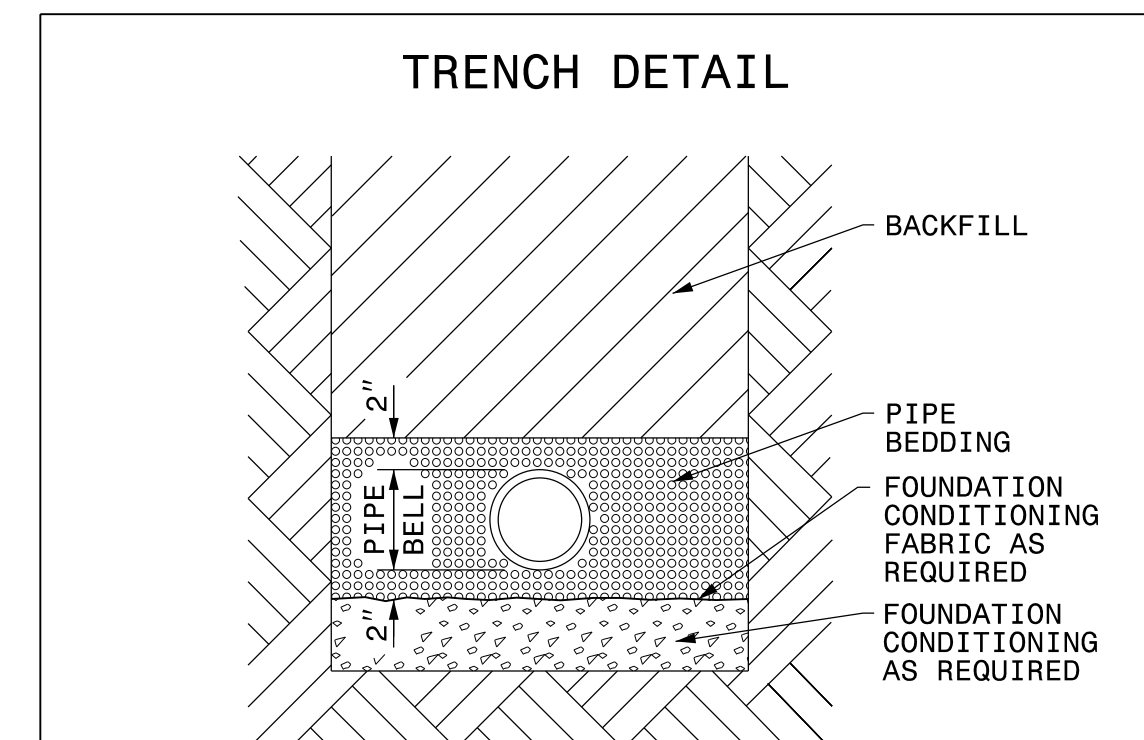
NOT TO SCALE

HINDE ENGINEERING
 License No. C-2639
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

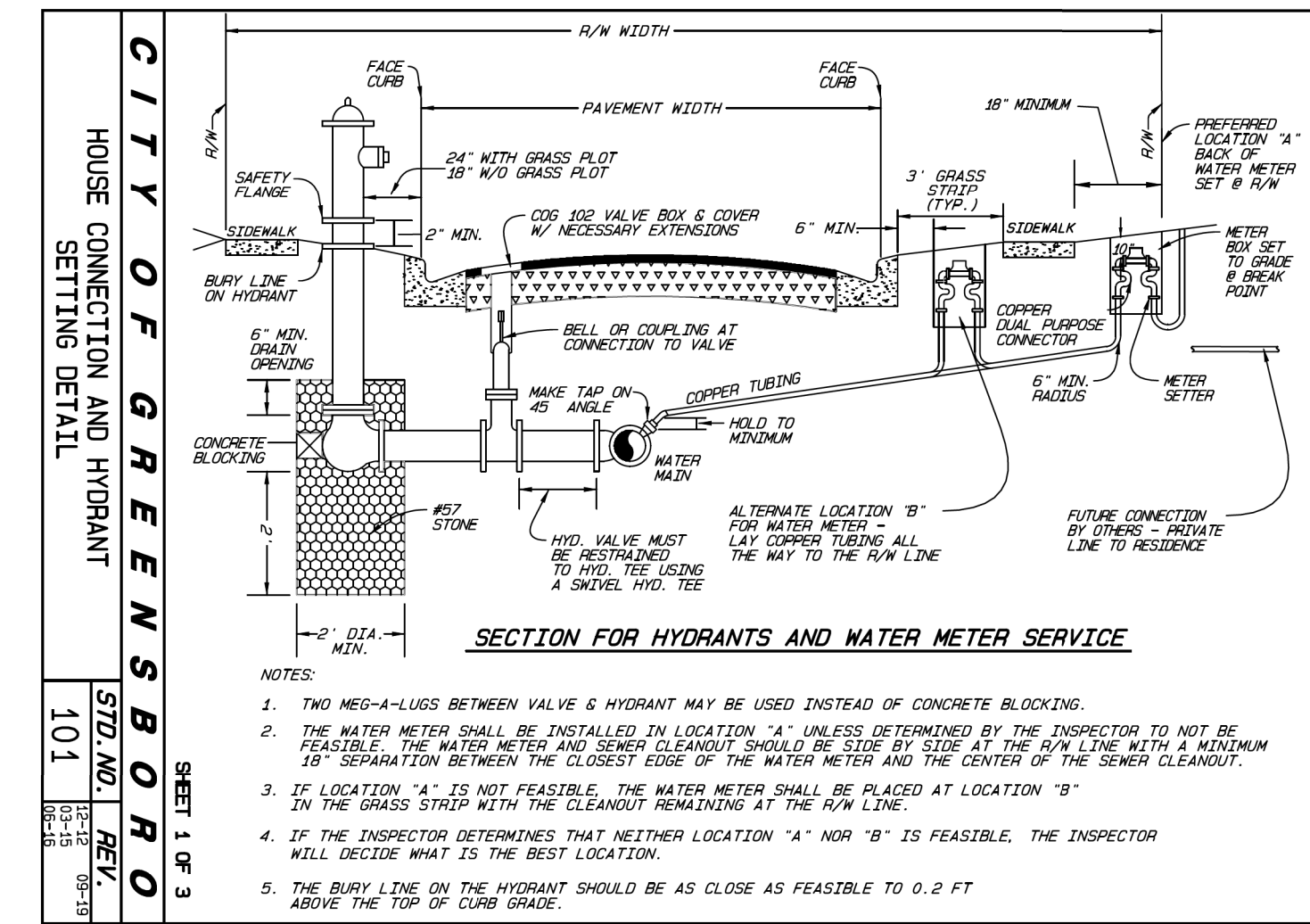
PROJECT REFERENCE NO. U-6016	SHEET NO. UC-3A
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	
UTILITY CONSTRUCTION PLANS ONLY	

UTILITY CONSTRUCTION



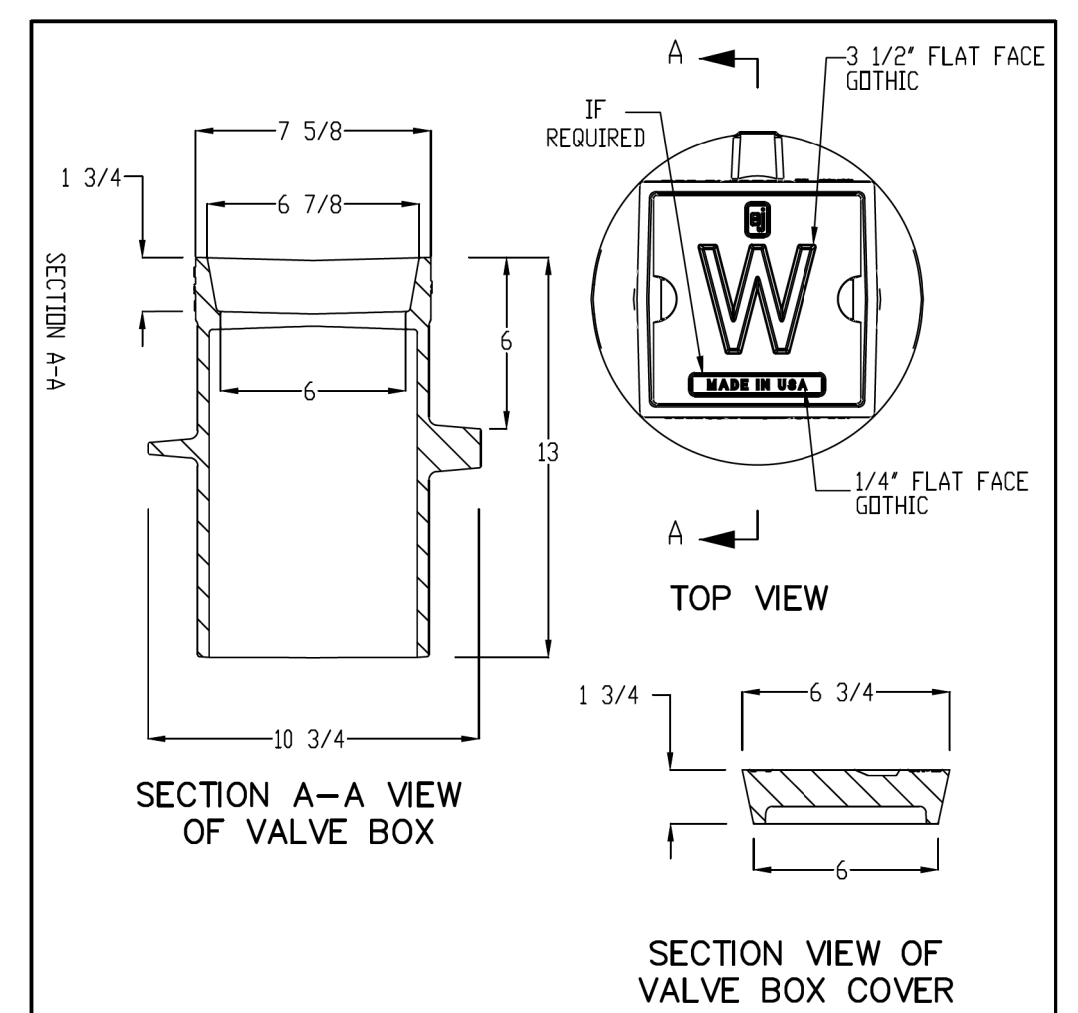
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.

NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)	NOMINAL PIPE SIZE (INCHES)	TRENCH WIDTH (INCHES)
4	28	20	44
6	30	24	54
8	32	30	60
10	34	36	66
12	36	42	72
14	38	48	78
16	40	54	
18	42		



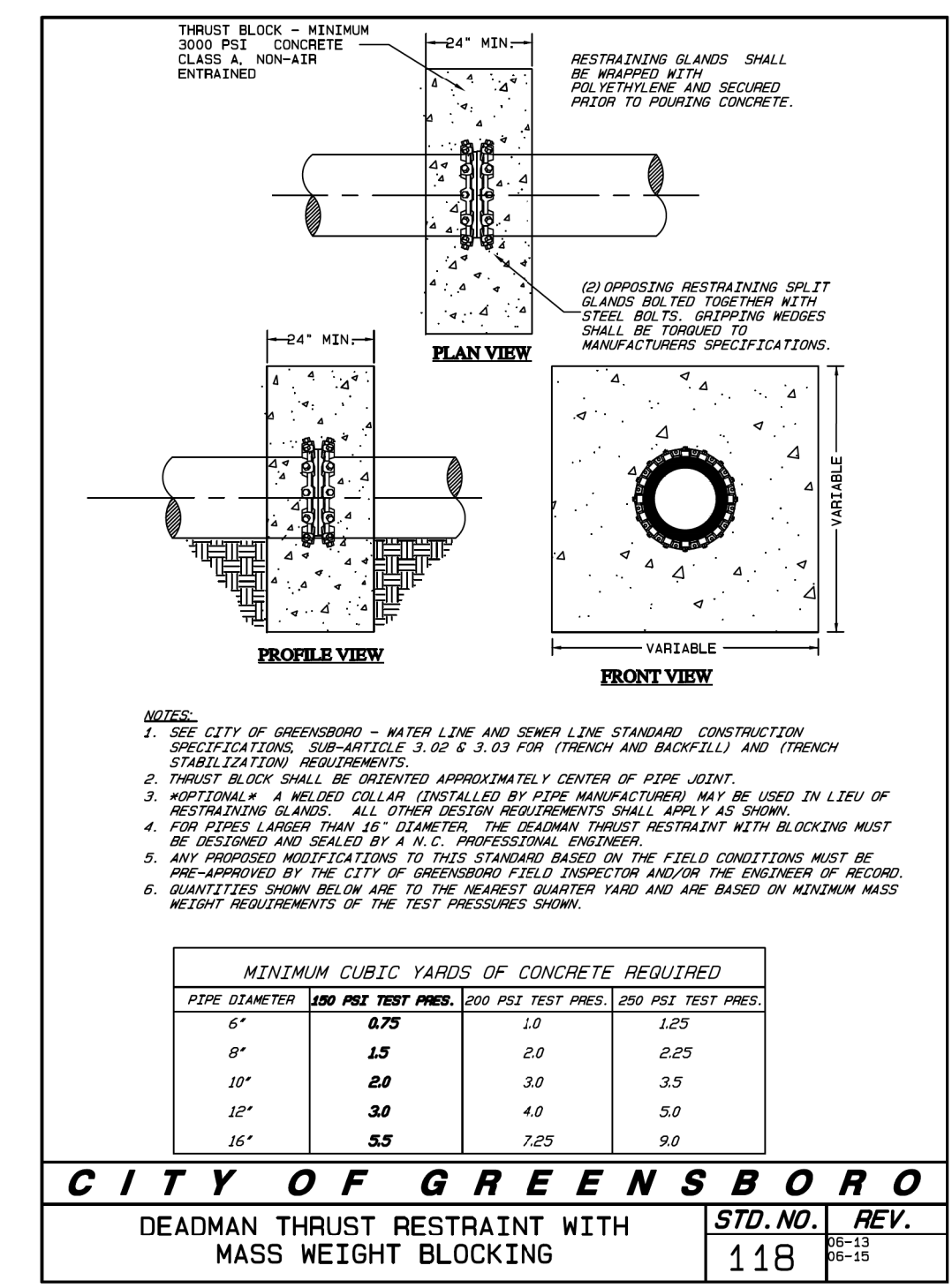
CITY OF GREENSBORO
 HOUSE CONNECTION AND HYDRANT
 SETTING DETAIL
 STD. NO. 101
 REV. 08-13

- NOTES:
- TWO NEG-A-LUGS BETWEEN VALVE & HYDRANT MAY BE USED INSTEAD OF CONCRETE BLOCKING.
 - THE WATER METER SHALL BE INSTALLED IN LOCATION "A" UNLESS DETERMINED BY THE INSPECTOR TO NOT BE FEASIBLE. THE WATER METER AND SENEH CLEANOUT SHOULD BE SIZED 8" DIA. AT THE R/W LINE WITH A MINIMUM 18" SEPARATION BETWEEN THE CLOSEST EDGE OF THE WATER METER AND THE CENTER OF THE SENEH CLEANOUT.
 - IF LOCATION "A" IS NOT FEASIBLE, THE WATER METER SHALL BE PLACED AT LOCATION "B" IN THE GRASS STRIP WITH THE CLEANOUT REMAINING AT THE R/W LINE.
 - IF THE INSPECTOR DETERMINES THAT NEITHER LOCATION "A" NOR "B" IS FEASIBLE, THE INSPECTOR WILL DECIDE WHAT IS THE BEST LOCATION.
 - THE BURY LINE ON THE HYDRANT SHOULD BE 45 CLOSE AS FEASIBLE TO 0.2 FT ABOVE THE TOP OF CURB GRADE.



- NOTES:
- VALVE BOX EXTENSION SHALL BE EITHER 6" DIA. SOIL PIPE OR SCH. 40 PVC PIPE.
 - EXTENSION TO BE ONE SOLID PIECE OF PIPE UNLESS BURIAL DEPTH IS GREATER THAN STANDARD LENGTH OF PIPE. A BELL OR COUPLING SHALL BE UTILIZED AT THE TOP OF VALVE CONNECTION (SEE COG STD #101).
 - LETTER HEIGHT 3-1/2"
 - COUNTERSINK LETTER 3/16"
 - TO BE USED IN PAVED OR NON-PAVED AREAS.
 - ALL CASTINGS SHALL MEET THE REQUIREMENTS OF AASHTO M306.
 - DUE TO VARIATIONS IN CASTINGS OF DIFFERENT MANUFACTURERS, DIMENSIONS SHALL BE WITHIN REASONABLE TOLERANCES AS PRE-APPROVED BY GREENSBORO WATER RESOURCES DEPARTMENT AND/OR FIELD INSPECTOR PRIOR TO INSTALLATION.
 - VALVE BOX MAY BE REQUIRED TO BE "MADE IN U.S.A." IF FEDERAL FUNDS ARE INVOLVED.

CITY OF GREENSBORO
 WATER VALVE BOX AND EXTENSION
 STD. NO. 102
 REV. 03-23 03-12
 08-02 12-12
 09-10 03-15

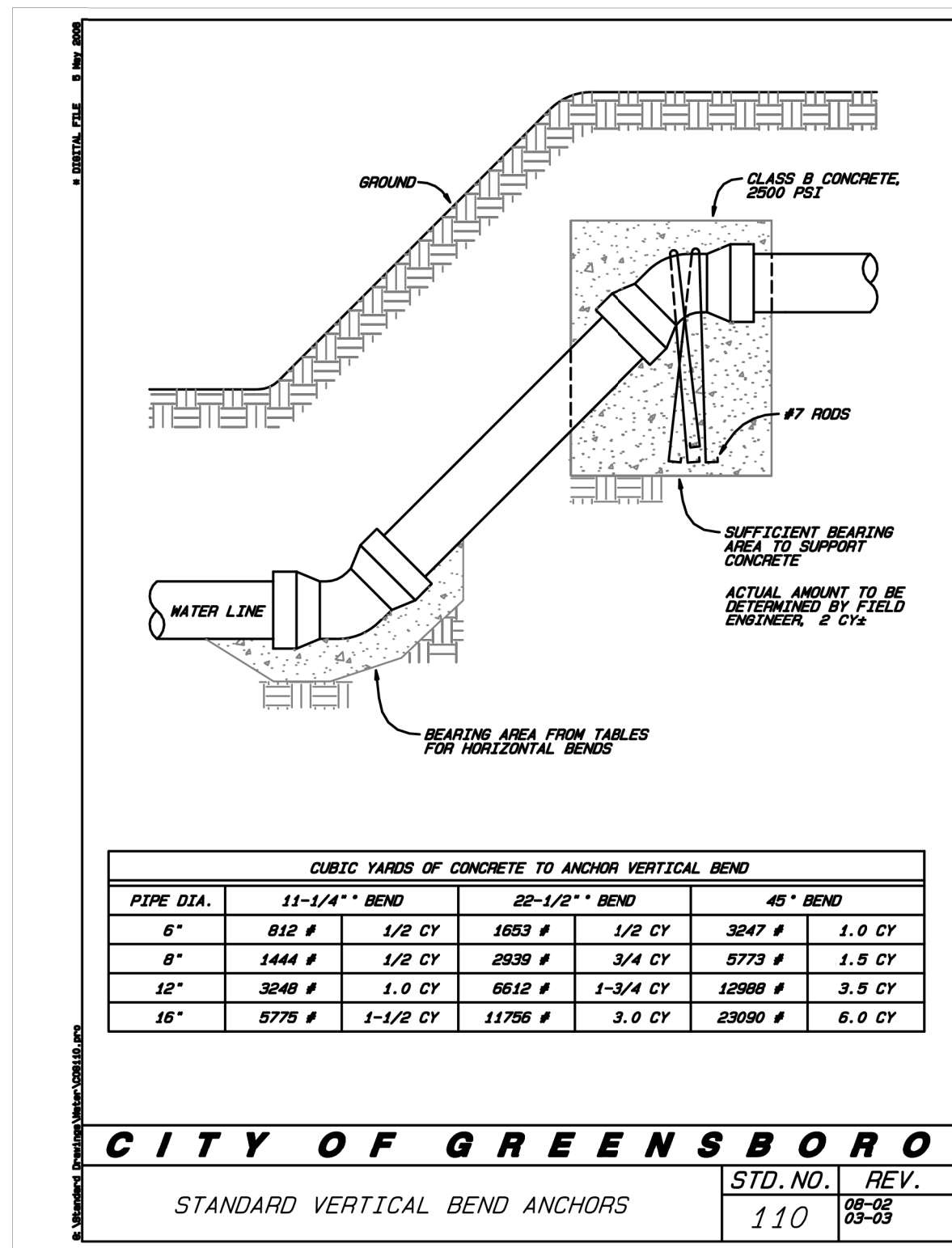


NOTES:

- SEE CITY OF GREENSBORO - WATER LINE AND SENEH LINE STANDARD CONSTRUCTION SPECIFICATIONS, SUB-ARTICLE 3.02 & 3.03 FOR TRENCH AND BACKFILL AND TRENCH STABILIZATION REQUIREMENTS.
- THRUST BLOCK SHALL BE ORIENTED APPROXIMATELY CENTER OF PIPE - 90°.
- OPTIONAL: A WELDED COLLAR (INSTALLED BY PIPE MANUFACTURER) MAY BE USED IN LIEU OF RESTRAINING GLANDS. ALL OTHER DESIGN REQUIREMENTS SHALL APPLY AS SHOWN.
- FOR PIPES LARGER THAN 16" DIAMETER, THE DEADMAN THRUST RESTRAINT WITH BLOCKING MUST BE DESIGNED AND SEALED BY A P.E. PROFESSIONAL ENGINEER.
- ANY PROPOSED MODIFICATIONS TO THIS STANDARD BASED ON THE FIELD CONDITIONS MUST BE PRE-APPROVED BY THE CITY OF GREENSBORO FIELD INSPECTOR AND/OR THE ENGINEER OF RECORD.
- QUANTITIES SHOWN BELOW ARE TO THE NEAREST QUARTER YARD AND ARE BASED ON MINIMUM MASS WEIGHT REQUIREMENTS OF THE TEST PRESSURES SHOWN.

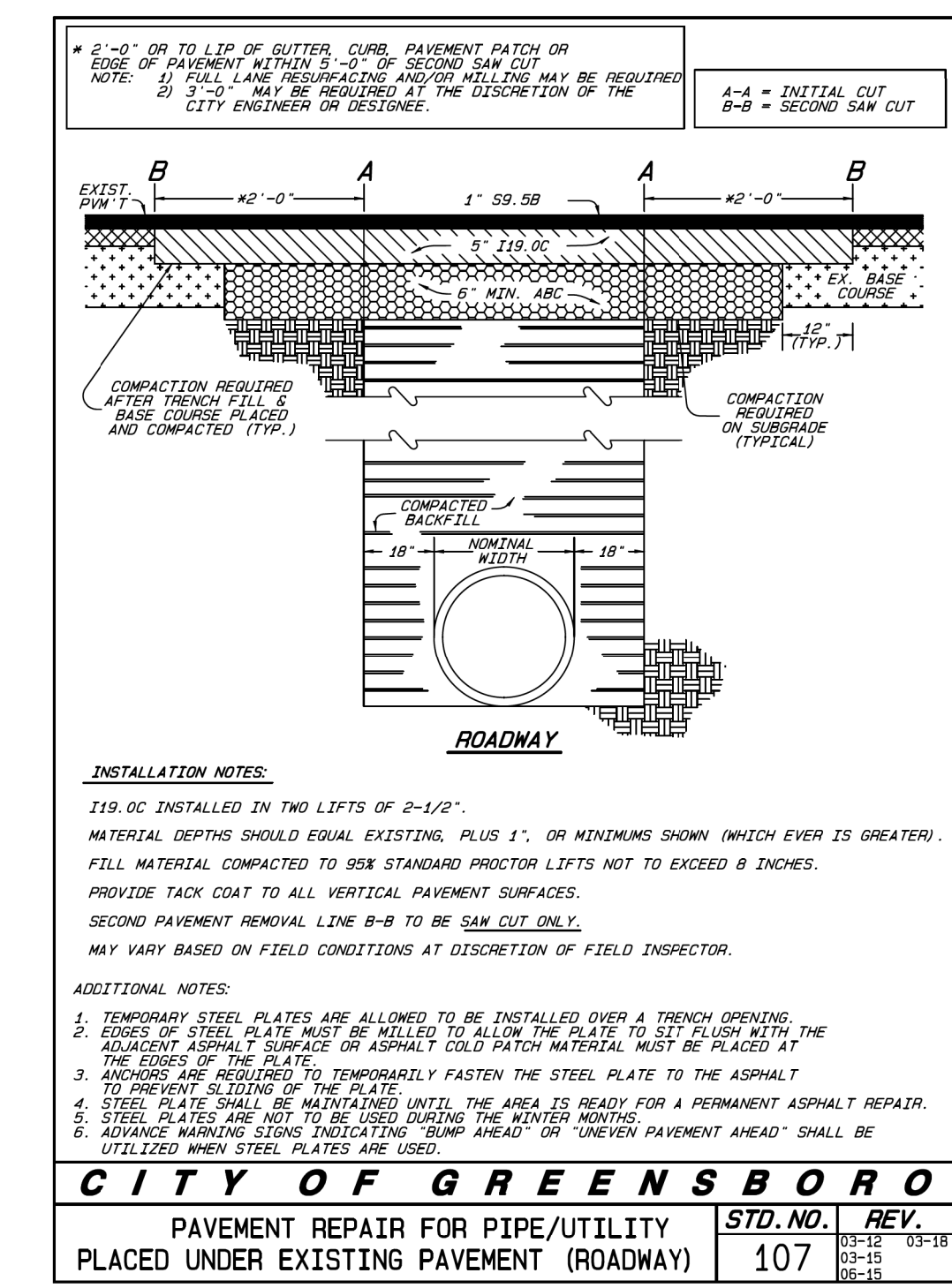
PIPE DIAMETER	150 PSI TEST PRESS.	200 PSI TEST PRESS.	250 PSI TEST PRESS.
6"	0.75	1.0	1.25
8"	1.5	2.0	2.25
10"	3.0	3.0	3.5
12"	3.0	4.0	5.0
16"	5.5	7.25	9.0

CITY OF GREENSBORO
 DEADMAN THRUST RESTRAINT WITH MASS WEIGHT BLOCKING
 STD. NO. 118
 REV. 08-13 09-15



PIPE DIA.	11-1/4" BEND	22-1/2" BEND	45" BEND
6"	812 # 1/2 CY	1653 # 1/2 CY	3247 # 1.0 CY
8"	1444 # 1/2 CY	2939 # 3/4 CY	5773 # 1.5 CY
12"	3248 # 1.0 CY	6612 # 1-3/4 CY	12988 # 3.5 CY
16"	5776 # 1-1/2 CY	11766 # 3.0 CY	23090 # 6.0 CY

CITY OF GREENSBORO
 STANDARD VERTICAL BEND ANCHORS
 STD. NO. 110
 REV. 08-08 03-03



- INSTALLATION NOTES:
- 1/8" OC INSTALLED IN TWO LIFTS OF 2-1/2".
 - MATERIAL DEPTHS SHOULD EQUAL EXISTING, PLUS 1", OR MINIMUMS SHOWN (WHICH EVER IS GREATER).
 - FILL MATERIAL COMPACTED TO 95% STANDARD PROCTOR LIFTS NOT TO EXCEED 8 INCHES.
 - PROVIDE TACK COAT TO ALL VERTICAL PAVEMENT SURFACES.
 - SECOND PAVEMENT REMOVAL LINE B-B TO BE SAW CUT ONLY.
 - MAY VARY BASED ON FIELD CONDITIONS AT DISCRETION OF FIELD INSPECTOR.

- ADDITIONAL NOTES:
- TEMPORARY STEEL PLATES ARE ALLOWED TO BE INSTALLED OVER A TRENCH OPENING.
 - EDGES OF STEEL PLATE MUST BE WELDED TO ALLOW THE PLATE TO SIT FLUSH WITH THE EXISTING ASPHALT SURFACE OR ASPHALT COLD PATCH MATERIAL MUST BE PLACED AT THE EDGES OF THE PLATE.
 - ANCHORS ARE REQUIRED TO TEMPORARILY FASTEN THE STEEL PLATE TO THE ASPHALT TO PREVENT SLIDING OF THE PLATE.
 - STEEL PLATES SHALL BE MAINTAINED UNTIL THE AREA IS READY FOR A PERMANENT ASPHALT REPAIR.
 - STEEL PLATES ARE NOT TO BE USED DURING THE WINTER MONTHS.
 - ADVANCE MARKING SIGNS INDICATING "BUMP AHEAD" OR "UNEVEN PAVEMENT AHEAD" SHALL BE UTILIZED WHEN STEEL PLATES ARE USED.

CITY OF GREENSBORO
 PAVEMENT REPAIR FOR PIPE/UTILITY PLACED UNDER EXISTING PAVEMENT (ROADWAY)
 STD. NO. 107
 REV. 03-12 03-18
 08-02 08-18

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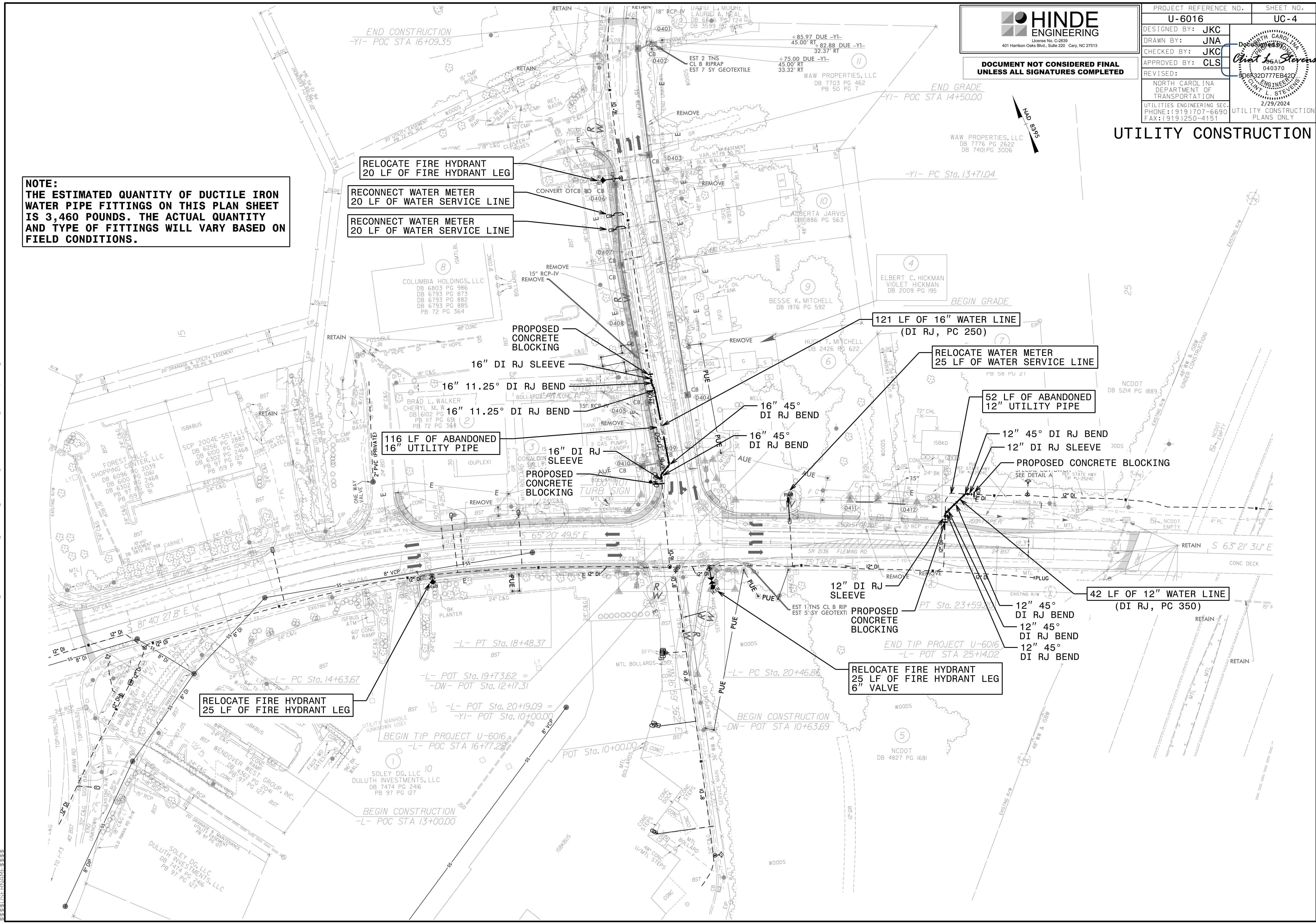
HINDE ENGINEERING
 License No. C-2639
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

PROJECT REFERENCE NO.	U-6016	SHEET NO.	UC-4
DESIGNED BY:	JKC		
DRAWN BY:	JNA		
CHECKED BY:	JKC		
APPROVED BY:	CLS		
REVISED:			
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION		UTILITY CONSTRUCTION PLANS ONLY	
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151			

UTILITY CONSTRUCTION

NOTE:
 THE ESTIMATED QUANTITY OF DUCTILE IRON WATER PIPE FITTINGS ON THIS PLAN SHEET IS 3,460 POUNDS. THE ACTUAL QUANTITY AND TYPE OF FITTINGS WILL VARY BASED ON FIELD CONDITIONS.



RELOCATE FIRE HYDRANT
20 LF OF FIRE HYDRANT LEG

RECONNECT WATER METER
20 LF OF WATER SERVICE LINE

RECONNECT WATER METER
20 LF OF WATER SERVICE LINE

121 LF OF 16" WATER LINE
(DI RJ, PC 250)

RELOCATE WATER METER
25 LF OF WATER SERVICE LINE

52 LF OF ABANDONED
12" UTILITY PIPE

116 LF OF ABANDONED
16" UTILITY PIPE

42 LF OF 12" WATER LINE
(DI RJ, PC 350)

RELOCATE FIRE HYDRANT
25 LF OF FIRE HYDRANT LEG
6" VALVE

RELOCATE FIRE HYDRANT
25 LF OF FIRE HYDRANT LEG

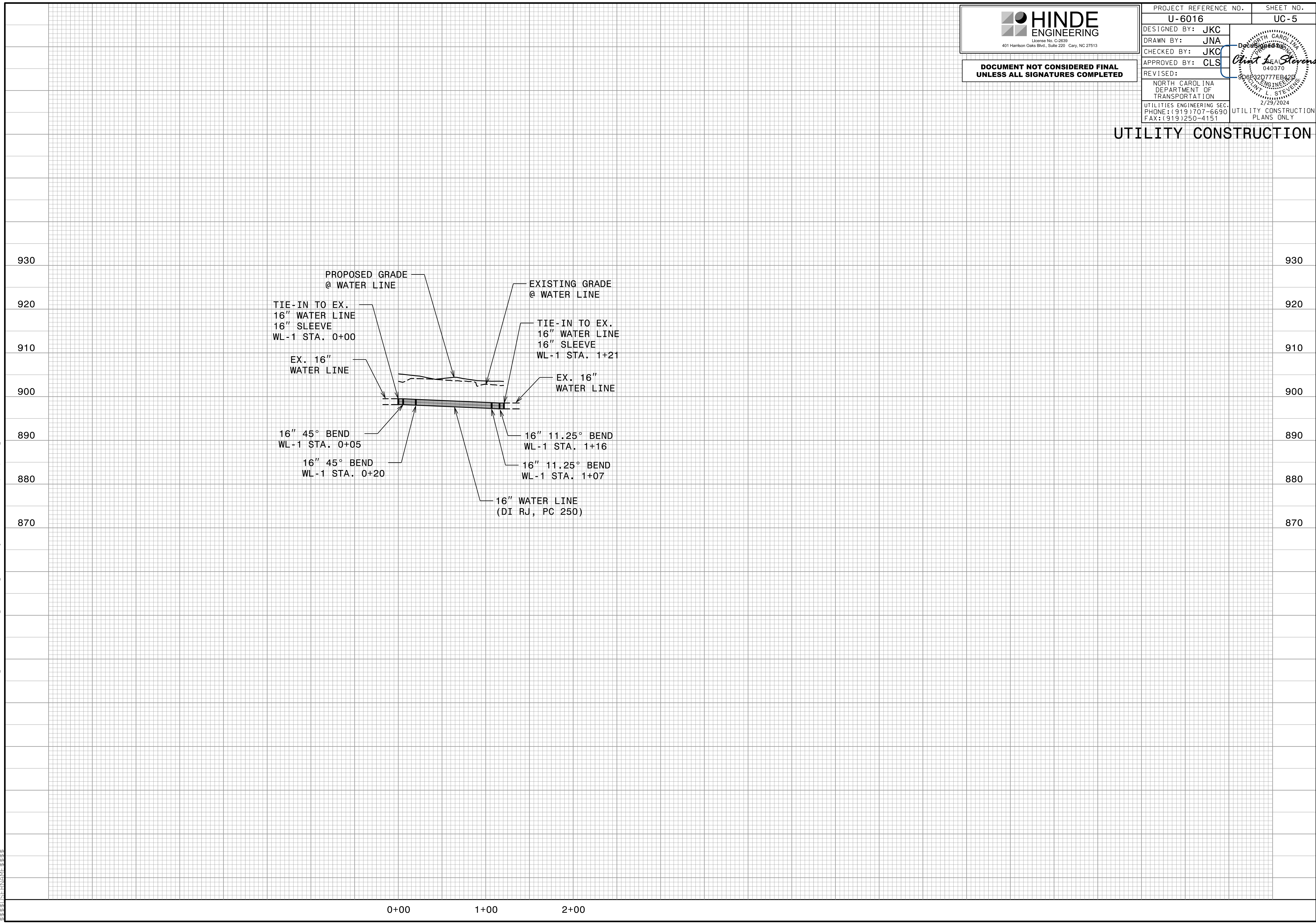
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 2/29/2024 10:43 AM
 33,833 BY: JNA

HINDE ENGINEERING
 License No. C-2639
 401 Harrison Oaks Blvd., Suite 220 Cary, NC 27513

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

PROJECT REFERENCE NO. U-6016	SHEET NO. UC-5
DESIGNED BY: JKC	
DRAWN BY: JNA	
CHECKED BY: JKC	
APPROVED BY: CLS	
REVISED:	
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION	UTILITY CONSTRUCTION PLANS ONLY
UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151	

UTILITY CONSTRUCTION



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TIP PROJECT: U-6016

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

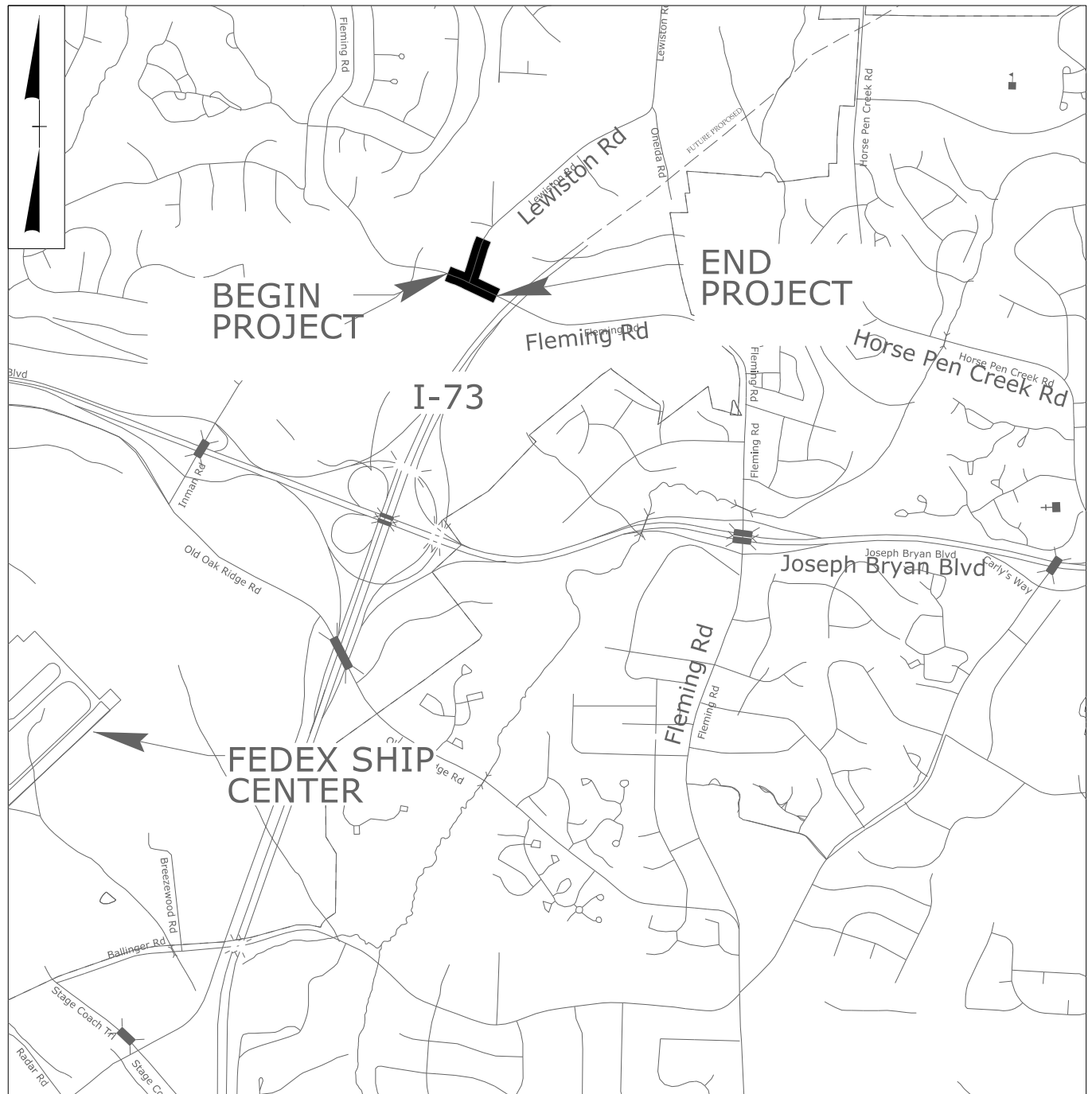
**UTILITIES BY OTHERS PLANS
GUILFORD COUNTY**

**LOCATION: SR 2136 (FLEMING RD) AND SR 2124 (LEWISTON RD)
IN GREENSBORO**

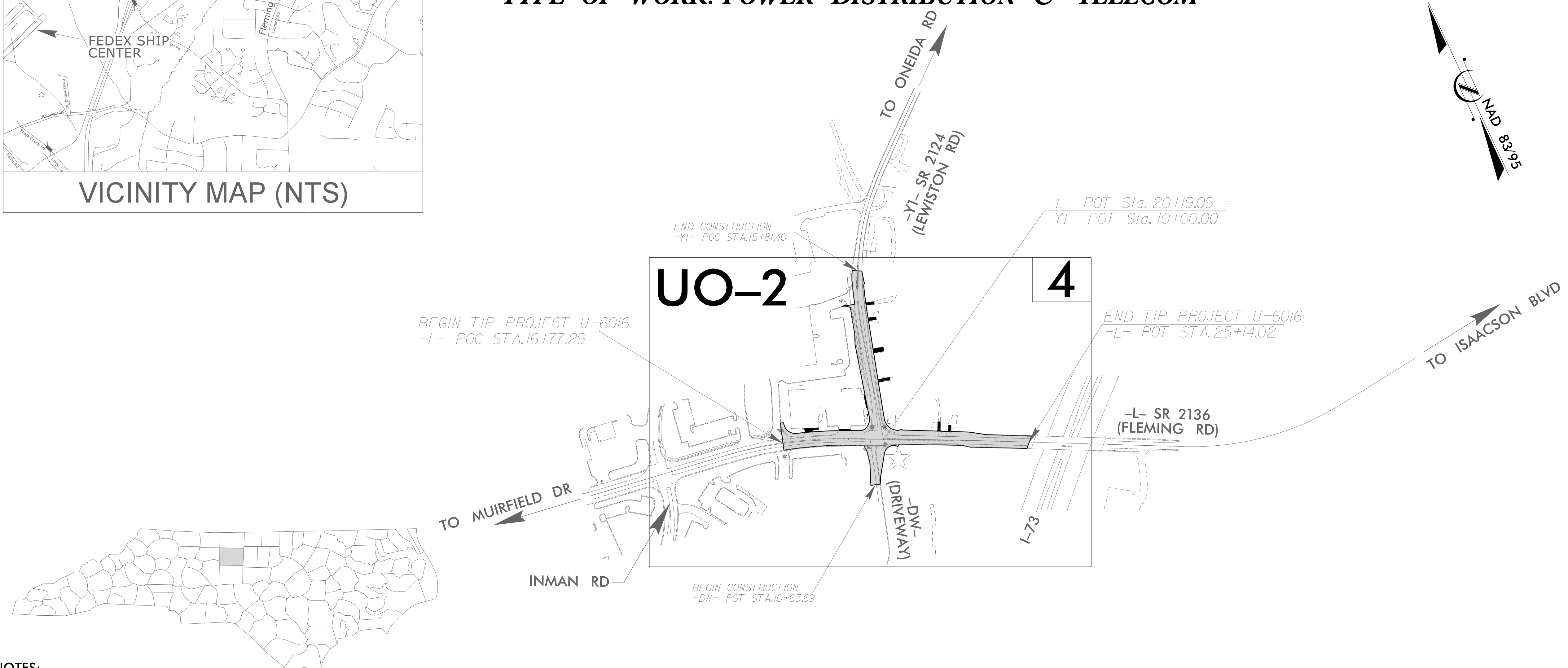
TYPE OF WORK: POWER DISTRIBUTION & TELECOM

T.I.P. NO.	SHEET NO.
U-6016	UO-1

NOTE:
ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

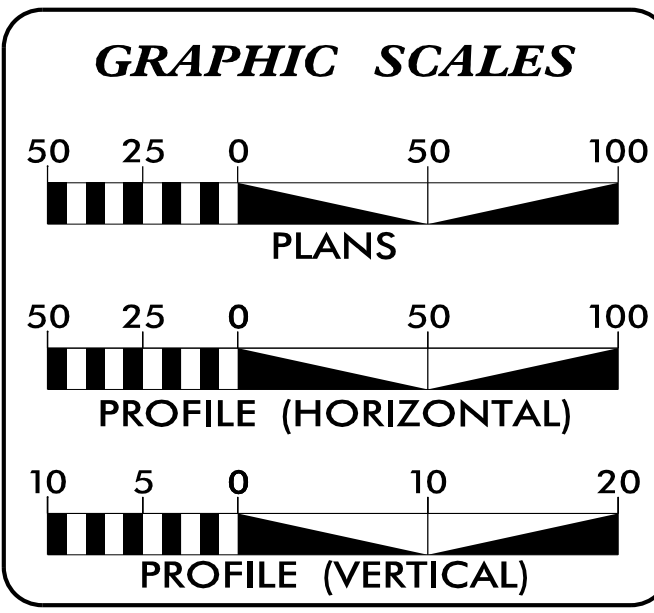


VICINITY MAP (NTS)



- NOTES:
1. THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.
 2. THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF GREENSBORO.
 3. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

★ UPGRADE EXISTING TRAFFIC SIGNAL



INDEX OF SHEETS

SHEET NO.	DESCRIPTION
UO-1	TITLE SHEET
UO-2	UBO PLAN SHEET

UTILITY OWNERS WITH CONFLICTS

(A) POWER DISTRIBUTION - DUKE ENERGY
 (B) TELECOM - AT&T
 (C) TELECOM - NORTH STATE COMMUNICATIONS
 (D) TELECOM - SPECTRUMCHARTER

PREPARED IN THE OFFICE OF:

HINDE ENGINEERING
 License No. C-2639
 10815 Sikes Place, Suite 210 Charlotte, NC 28277
 (704) 814-4407

Clint L. Stevens, PE UTILITY COORDINATION PROJECT MANAGER
 Harris Winters PROJECT UTILITY COORDINATOR
 James N. Arnold PROJECT UTILITY DESIGNER

**DIVISION OF HIGHWAYS
DIVISION 7**

1584 YANCEVILLE STREET
 GREENSBORO, NC 27405
 PHONE (336) 487-0000
 FAX (336) 334-3637

Wright R. Archer, III, PE DIVISION ENGINEER
 Chris Smitherman, PE PROJECT TEAM LEAD
 Chad Reimakoski DIVISION PLANNING ENGINEER
 Kelvin Martin, EI DIVISION UTILITY ENGINEER

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UTILITIES BY OTHERS

NOTE:
 ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



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