TIP PROJECT: U–4713A

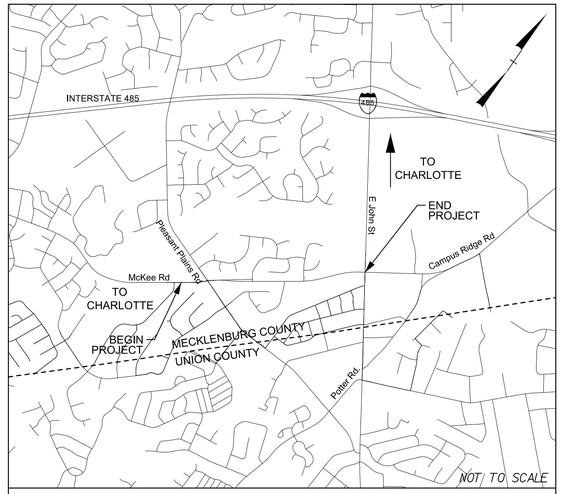
Project No.	Sheet No.
U–4713A	Sig. 1.0

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MECKLENBURG COUNTY

LOCATION: *SR 3440 (MCKEE ROAD EXTENSION) FROM SR 3448 (PLEASANT PLAINS ROAD) TO SR 1009 (E. JOHN STREET)*

TYPE OF WORK: *TRAFFIC SIGNALS*

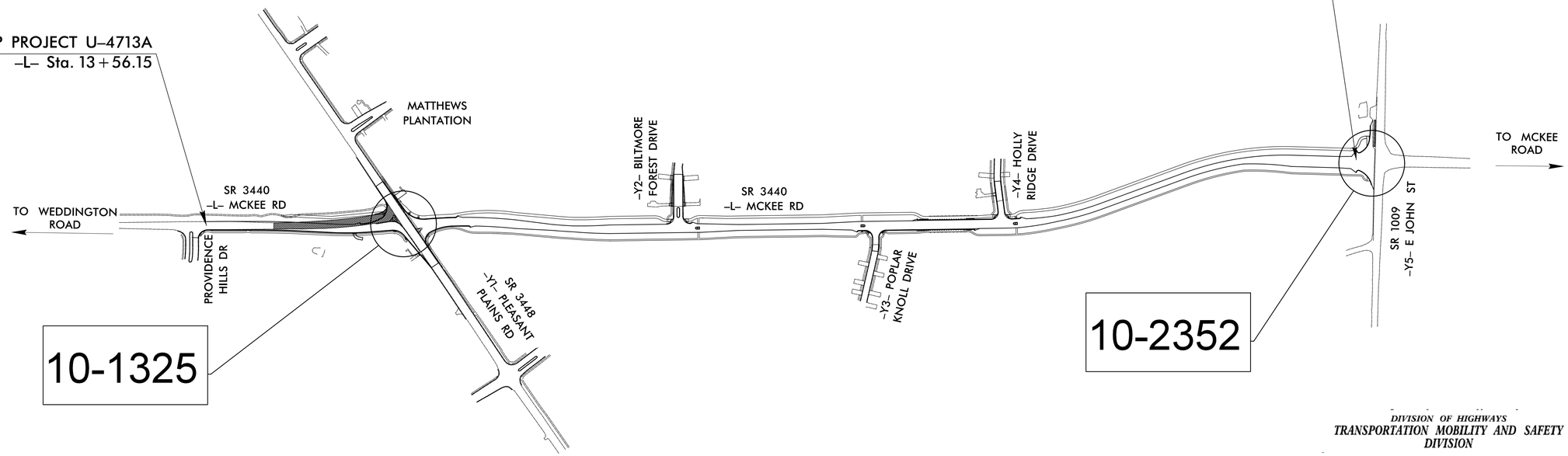


VICINITY MAP

NC GRID
NAD 83 NA 2011

BEGIN TIP PROJECT U–4713A
–L– Sta. 13+56.15

END TIP PROJECT U–4713A
–L– Sta. 60+81.09



DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

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

INDEX OF PLANS

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Sig. 3.0	10–1325T2	SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)
Sig. 4.0	10–1325T3	SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)
Sig. 5.0–5.2	10–1325T4	SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)
Sig. 6.0–6.2	10–1325	SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)
Sig. 7.0–7.3	10–2352	SR 1009 (East John Street) at SR 3440 (McKee Road)/Campus Ridge Road
M1A–M8	--------	Standard Metal Pole Loading Details
SCP 1–8	--------	Cable Routing Plans & Splice Details

NCDOT SIGNAL CONTACT:

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WESTERN REGION SIGNALS ENGINEER

Keith M. Mims, P.E.
STATE SIGNAL EQUIPMENT DESIGN ENGINEER

PLANS PREPARED BY:

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PE NO. F-0102

Stacie L. Phillips, P.E.
TRAFFIC SIGNAL ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by: 5/1/2024
0C87A59ED60B437...
SIGNATURE: ***P.E.***

Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

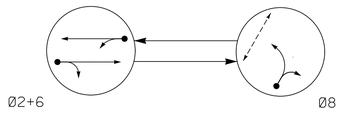
Transportation Mobility and Safety Division · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

TSMO UNIT
750 N.Greenfield Pkwy.Garner,NC 27529

5/1/2024 10:14:38 AM susan.pennington K:*CHL_PRJ*0110036426 - McKee Rd Ex*Signal*S4 - Signal Design*1.0 U-4713.sig.TSH.2023.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 2.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

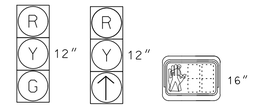
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	FLASH
21, 22, 23	G	R	Y
61	G	R	Y
62	↑	R	Y
81, 82	R	G	R
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

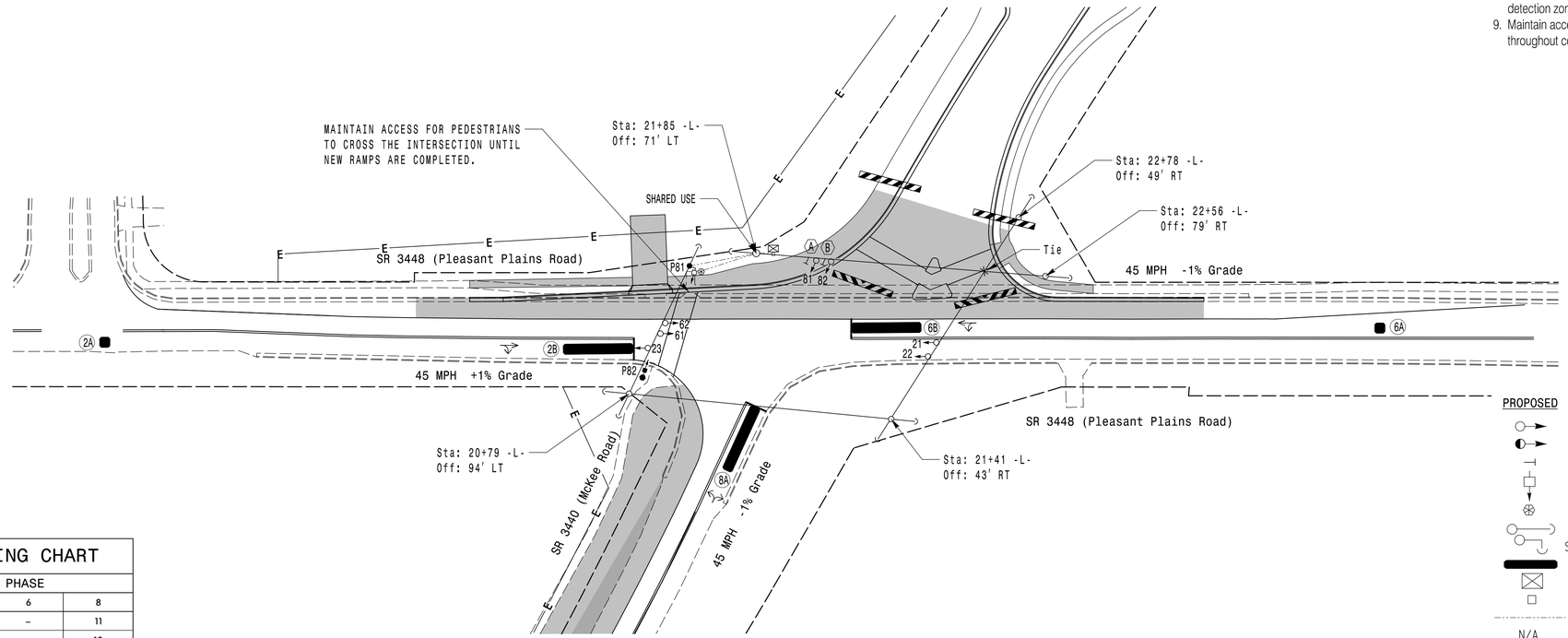
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	300	✳	X	2	-	-	X	X	X	-	X
2B	6X40	0	✳	X	2	5.0	2.0	X	-	X	X	X
6A	6X6	300	✳	X	6	-	-	X	X	X	-	X
6B	6X40	0	✳	X	6	5.0	2.0	X	-	X	X	X
8A	6X40	0	✳	X	8	-	-	X	-	X	-	X

✳ Video Detection

2 Phase
Fully Actuated
Isolated

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. Set all detector units to presence mode.
4. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
8. Install and adjust Video Detection System to achieve detection zones as shown.
9. Maintain access to pedestrian pushbuttons and ramps throughout construction.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
⊛	Type I Pushbutton Post	⊛
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▬	Detector Zones	▬
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	———
—E—	Easement	—E—
→	Directional Arrow	→
▭	Construction Zone	▭
N/A	Curb Ramp	◢
Ⓐ	"TURNING VEHICLES YIELD TO PEDS" Sign (R10-15)	Ⓐ
Ⓑ	Dual Turn Arrow Sign	Ⓑ

MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Walk *	–	–	11
Ped Clear	–	–	13
Min Green *	12	12	7
Passage *	6.0	6.0	2.0
Max 1 *	90	90	30
Yellow Change	4.4	4.6	3.0
Red Clear	1.5	1.5	2.3
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	15	15	–
Time To Reduce *	30	30	–
Minimum Gap	3.0	3.0	–
Advance Walk	–	–	7
Non Lock Detector	–	–	X
Vehicle Recall	MIN RECALL	MIN RECALL	–
Dual Entry	–	–	–

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

Do not adjust walk time for phase 8 lower than what is shown.

PLANS PREPARED IN THE OFFICE OF:
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Signal Upgrade - Temporary Design 1
(TMP Phase 1 & 2)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SCALE 0 40 1"=40'

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE:	August 2023	REVIEWED BY:	SL Phillips
PREPARED BY:	SP Pennington	REVIEWED BY:	

REVISIONS	INIT.	DATE

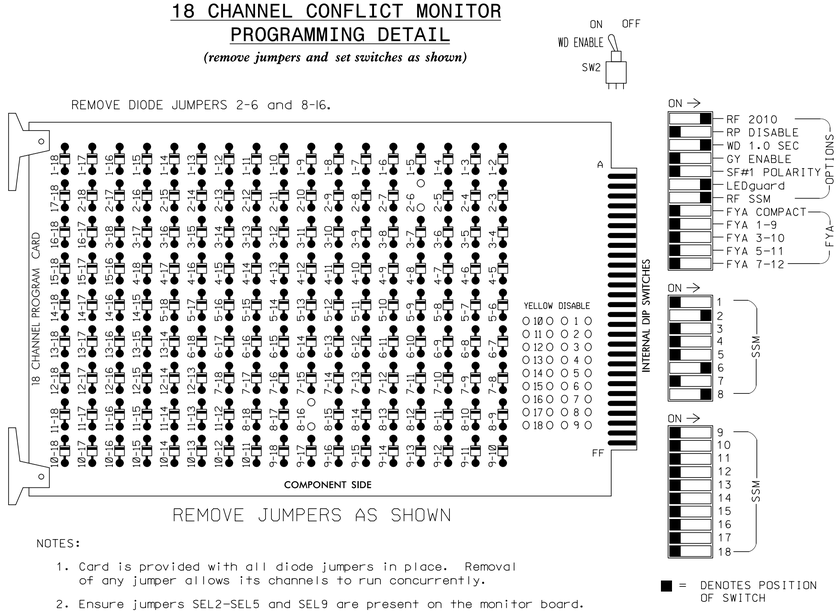
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by: 4/29/2024
SIGNATURE DATE

SIG. INVENTORY NO. 10-1325T1

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program controller to start up in phase 2 Green and 6 Green.
3. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S2, S8, S11, S12
Phases Used.....2, 6, 8, 8PED

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG 2.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22, 23	NU	NU	NU	NU	NU	61	62	NU	NU	81,82	P81, P82	NU	NU	NU	NU	NU	NU
RED		128						134	134			107							
YELLOW		129						135	135			108							
GREEN		130						136				109							
RED ARROW																			
YELLOW ARROW																			
FLASHING YELLOW ARROW																			
GREEN ARROW									136										
✋													110						
🚶													112						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
	L													Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L														

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

FS = FLASH SENSE
ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
PED PUSH BUTTONS												
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

NOTE:
INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

*SPECIAL DETECTOR NOTE

For all detectors install video detection system for vehicle detection. Perform installation according to manufacture's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

COUNTDOWN PEDESTRIAN SIGNAL OPERATION

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

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-1325T1
DESIGNED: August 2023
SEALED: 04/29/2024
REVISED: N/A

Signal Upgrade - Temporary Design 1, 2, and 3
Electrical Detail

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3448 (Pleasant Plains Road)
at
SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

REVISIONS	INIT.	DATE

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

750 N.Greenfield Pkwy,Garner,NC 27529

PLANS PREPARED IN THE OFFICE OF:
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NC License #F-0102
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Raleigh, NC 27601
(919) 677-2000

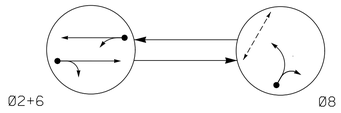
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by:
4/29/2024
DATE

SIG. INVENTORY NO. 10-1325T1

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 3.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

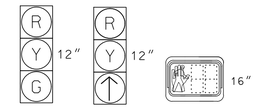
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22, 23	G	R	Y
61	G	R	Y
62	↑	R	Y
81, 82	R	G	R
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



MAXTIME DETECTOR INSTALLATION CHART

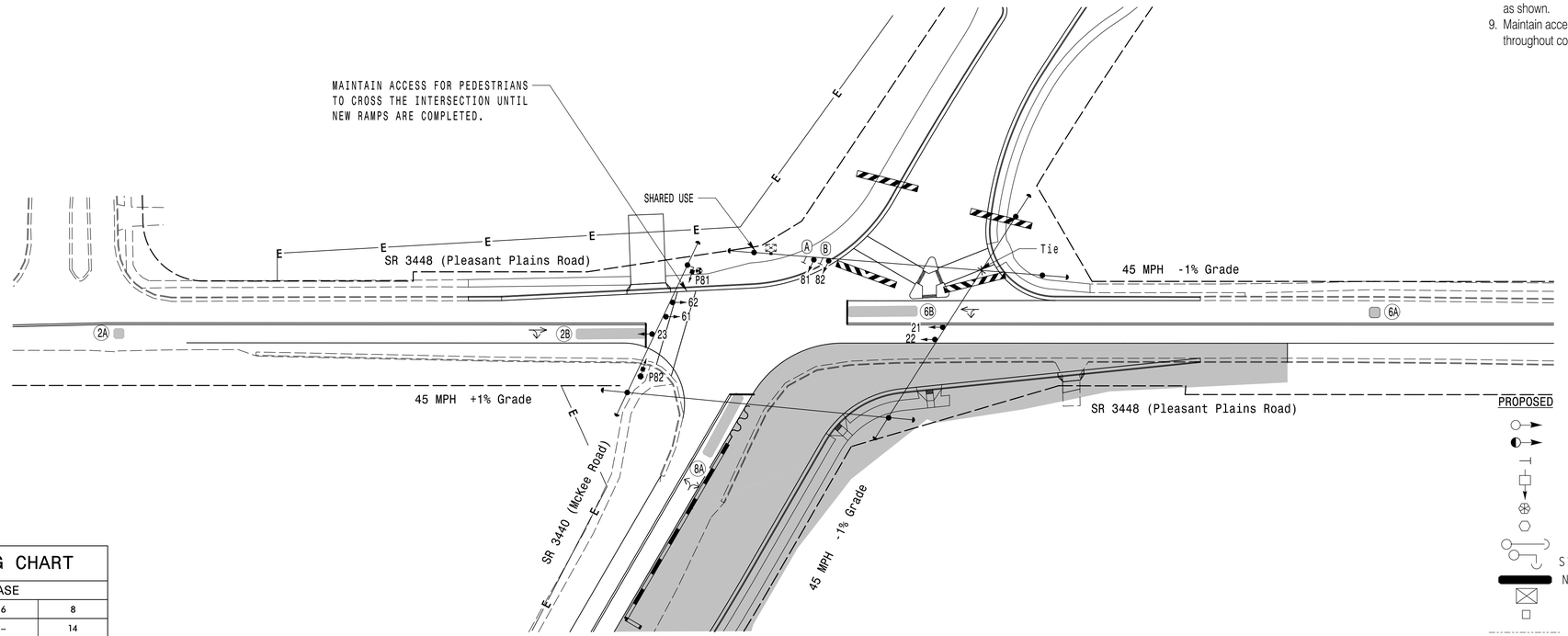
DETECTOR					PROGRAMMING							
VIDEO	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	300	✳	-	2	-	-	X	X	X	-	-
2B	6X40	0	✳	-	2	5.0	2.0	X	-	X	X	-
6A	6X6	300	✳	-	6	-	-	X	X	X	-	-
6B	6X40	0	✳	-	6	5.0	2.0	X	-	X	X	-
8A	6X40	0	✳	-	8	-	-	X	-	X	-	-

✳ Video Detection

2 Phase
Fully Actuated
Isolated

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. Reposition existing signal heads numbered 21, 22, 61, 62, 81 and 82.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
8. Adjust Video Detection System to achieve detection zones as shown.
9. Maintain access to pedestrian pushbuttons and ramps throughout construction.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
⊛	Type I Pushbutton Post	●
⬡	Type II Signal Pedestal	⬢
○—○	Signal Pole with Guy	●—●
○—○	Signal Pole with Sidewalk Guy	●—●
▬	Non-Intrusive Detector Zones	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
----------	2-in Underground Conduit	----------
N/A	Right of Way	————
—E—	Easement	—E—
→	Directional Arrow	→
▭	Construction Zone	▭
N/A	Curb Ramp	◢
Ⓐ	"TURNING VEHICLES YIELD TO PEDS" Sign (R10-15)	Ⓐ
Ⓑ	Dual Turn Arrow Sign	Ⓑ

MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Walk *	–	–	14
Ped Clear	–	–	13
Min Green *	12	12	7
Passage *	6.0	6.0	2.0
Max 1 *	90	90	30
Yellow Change	4.4	4.6	3.0
Red Clear	1.3	1.4	2.1
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	15	15	–
Time To Reduce *	30	30	–
Minimum Gap	3.0	3.0	–
Advance Walk	–	–	7
Non Lock Detector	–	–	X
Vehicle Recall	MIN RECALL	MIN RECALL	–
Dual Entry	–	–	–

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

Do not adjust walk time for phase 8 lower than what is shown.

Signal Upgrade - Temporary Design 2
(TMP Phase 3)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by: 4/29/2024
SIGNATURE DATE

SIG. INVENTORY NO. 10-1325T2

PLANS PREPARED IN THE OFFICE OF:
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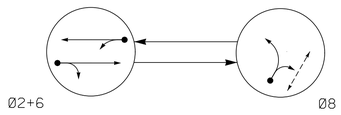
(919) 677-2000

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 4.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

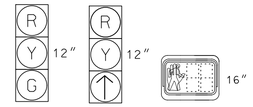
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	PHASE Ø8	PHASE FLASH
21, 22, 23	G	R	Y
61	G	R	Y
62	↑	R	Y
81, 82	R	G	R
P81, P82	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22, 23
61
81, 82

62

P81, P82

MAXTIME DETECTOR INSTALLATION CHART

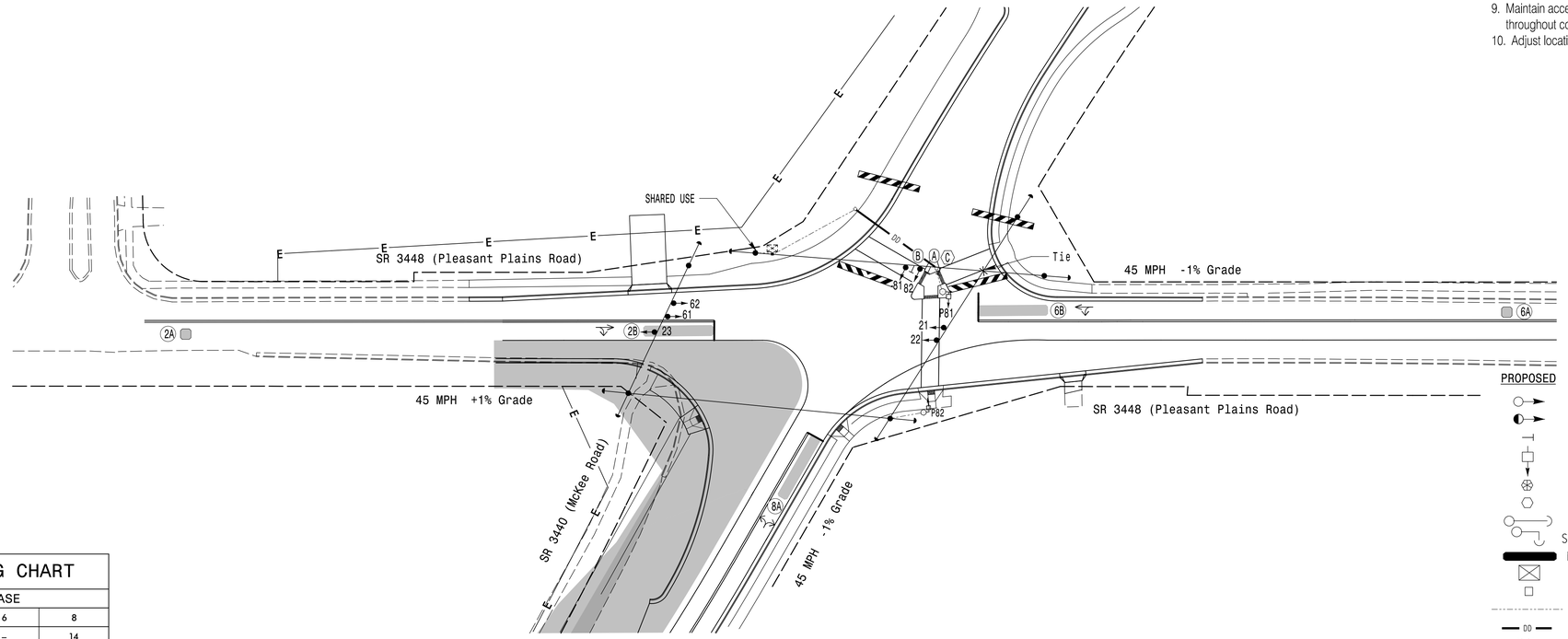
DETECTOR					PROGRAMMING							
VIDEO	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
2A	6X6	300	✳	-	2	-	-	X	X	X	-	-
2B	6X40	0	✳	-	2	5.0	2.0	X	-	X	X	-
6A	6X6	300	✳	-	6	-	-	X	X	X	-	-
6B	6X40	0	✳	-	6	5.0	2.0	X	-	X	X	-
8A	6X40	0	✳	-	8	-	-	X	-	X	-	-

✳ Video Detection

2 Phase Fully Actuated Isolated

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. Reposition existing signal heads numbered 81 and 82.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
8. Adjust Video Detection System to achieve detection zones as shown.
9. Maintain access to pedestrian pushbuttons and ramps throughout construction.
10. Adjust location of sign B as shown on plans.



LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Type I Pushbutton Post	
	Type II Signal Pedestal	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Non-Intrusive Detector Zones	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
DD	Directional Drill	N/A
N/A	Right of Way	
E	Easement	E
	Directional Arrow	
	Construction Zone	
N/A	Curb Ramp	
A	"TURNING VEHICLES YIELD TO PEDS" Sign (R10-15)	A
B	Dual Turn Arrow Sign	B
C	"NO TURN ON RED" Sign (R10-11)	C

MAXTIME TIMING CHART

FEATURE	PHASE 2	PHASE 6	PHASE 8
Walk *	–	–	14
Ped Clear	–	–	13
Min Green *	12	12	7
Passage *	6.0	6.0	2.0
Max 1 *	90	90	30
Yellow Change	4.4	4.6	3.0
Red Clear	1.9	1.3	2.6
Added Initial *	–	–	–
Maximum Initial *	–	–	–
Time Before Reduction *	15	15	–
Time To Reduce *	30	30	–
Minimum Gap	3.0	3.0	–
Advance Walk	–	–	7
Non Lock Detector	–	–	X
Vehicle Recall	MIN RECALL	MIN RECALL	–
Dual Entry	–	–	–

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

Do not adjust walk time for phase 8 lower than what is shown.

Signal Upgrade - Temporary Design 3
(TMP Phase 4)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

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

SR 3448 (Pleasant Plains Road)
at
SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE:	August 2023	REVIEWED BY:	SL Phillips
PREPARED BY:	SP Pennington	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

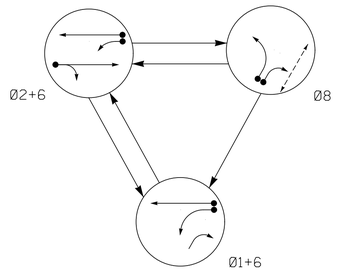
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER TRACIE L. PHILLIPS

DocuSigned by: 4/29/2024
SIGNATURE DATE

SIG. INVENTORY NO. 10-1325T3

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 5.0

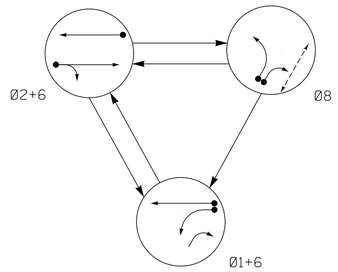
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11	←R	FY	R	Y
21, 22, 23	R	G	R	Y
61	G	G	R	Y
62	↑	↑	R	Y
81	R	R	←R	R
82, 83	FY	R	FY	R
P81, P82	DW	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	PHASE Ø2+6	PHASE Ø8	FLASH
11	←R	R	R	Y
21, 22, 23	R	G	R	Y
61	G	G	R	Y
62	↑	↑	R	Y
81	R	R	←R	R
82, 83	FY	R	FY	R
P81, P82	DW	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR VIDEO	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW ZONE	PROGRAMMING CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	0	✳	X	1	15.0*	-	X	-	X	-	X
					6#	3.0	-	X	-	X	X	X
2A	6X6	300	✳	-	2	-	-	X	X	X	-	-
6A	6X6	300	✳	-	6	-	-	X	X	X	-	-
8A	6X40	0	✳	-	8	3.0	-	X	-	X	-	-
8B	6X40	0	✳	-	8	-	-	X	-	X	-	X

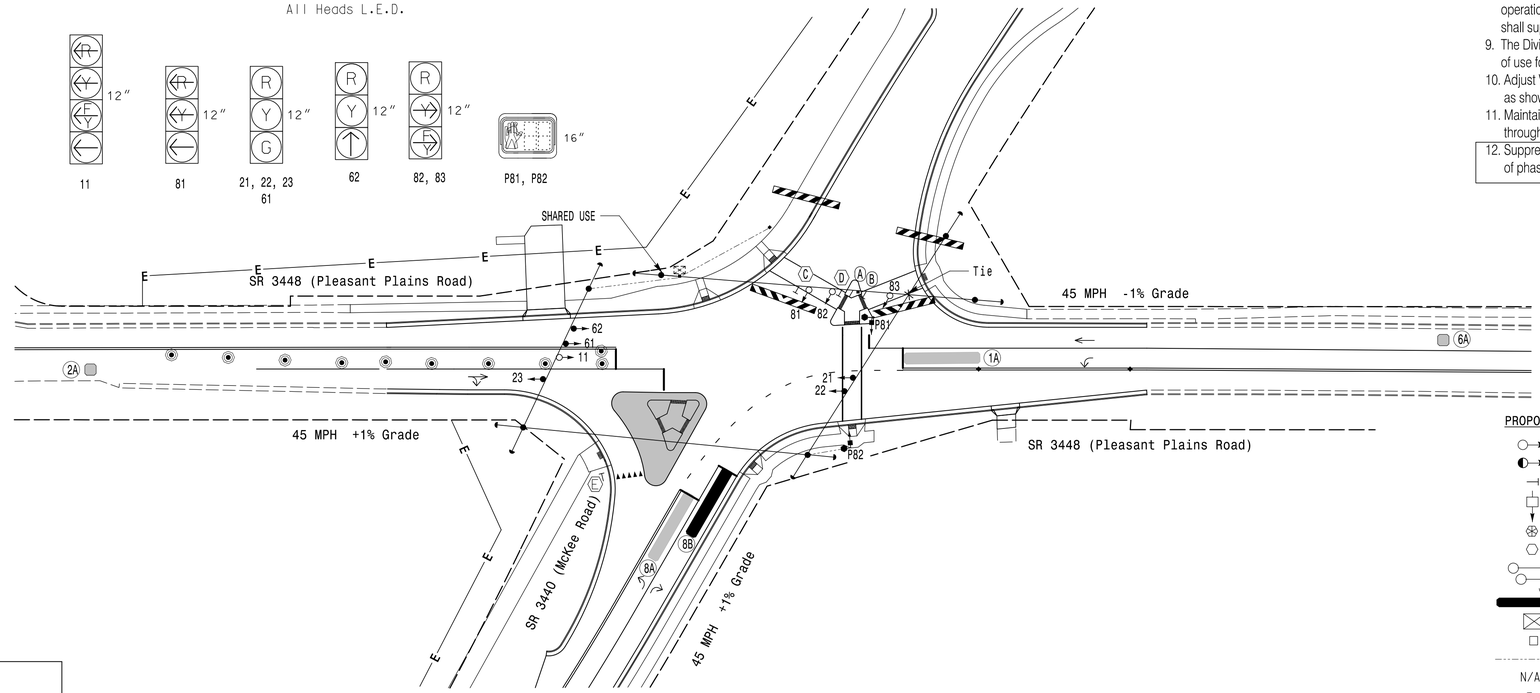
* Disable Delay during Alternate Phasing operation.
\# Disable Phase call for zone during Alternate Phasing operation.
✳ Video Detection

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
⊛	Type I Pushbutton Post	●
⬡	Type II Signal Pedestal	⬢
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▬	Non-Intrusive Detector Zones	▬
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	———
—E—	Easement	—E—
→	Directional Arrow	→
▭	Construction Zone	▭
◉◉◉	Construction Zone Drums	◉◉◉
N/A	Curb Ramp	◢
Ⓐ	"TURNING VEHICLES YIELD TO PEDS" Sign (R10-15)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ
Ⓒ	Left Arrow "ONLY" Sign (R3-5L)	Ⓐ
Ⓓ	Right Arrow "ONLY" Sign (R3-5R)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ

MAXTIME TIMING CHART

FEATURE	PHASE 1	PHASE 2	PHASE 6	PHASE 8
Walk *	–	–	–	14
Ped Clear	–	–	–	13
Min Green *	7	12	12	7
Passage *	2.0	6.0	6.0	2.0
Max 1 *	30	90	90	30
Yellow Change	3.0	4.6	4.6	3.0
Red Clear	3.1	1.5	1.5	3.3
Added Initial *	–	–	–	–
Maximum Initial *	–	–	–	–
Time Before Reduction *	–	15	15	–
Time To Reduce *	–	30	30	–
Minimum Gap	–	3.0	3.0	–
Advance Walk	–	–	–	7
Non Lock Detector	–	–	–	X
Vehicle Recall	–	MIN RECALL	MIN RECALL	–
Dual Entry	–	–	–	–

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

Do not adjust walk time for phase 8 lower than what is shown.

3 Phase Fully Actuated Isolated

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2024and "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. Phase 1 may be lagged.
4. Reposition existing signal heads numbered 21, 22, and 23.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.
10. Adjust Video Detection System to achieve detection zones as shown.
11. Maintain access to pedestrian pushbuttons and ramps throughout construction.
12. Suppress FYA for signal heads 82 and 83 during first 7 seconds of phase 4 ped.

Signal Upgrade - Temporary Design 4
(TMP Phase 5)

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SIG. INVENTORY NO. 10-1325T4

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by: 4/29/2024
SIGNATURE DATE

PLANS PREPARED IN THE OFFICE OF:
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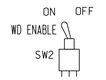
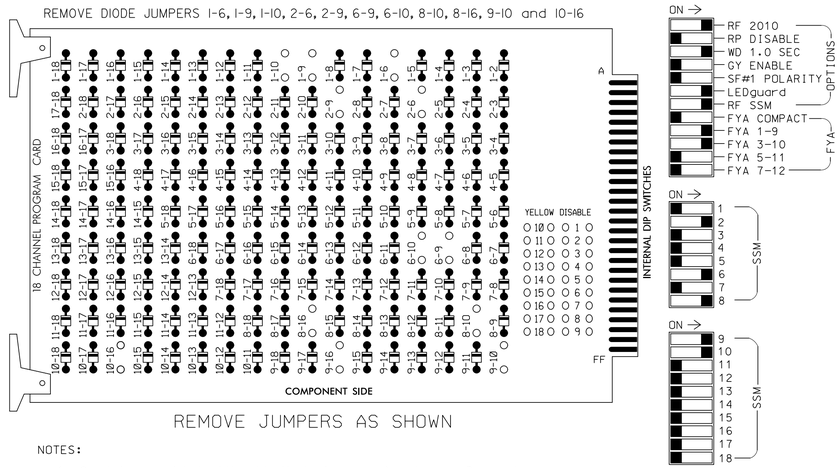
750 N.Greenfield Pkwy,Garner,NC 27529

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)





REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I" U	Ø 1 1A **	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	NOT USED	FS DC ISOLATOR
FILE "I" L	NOT USED												Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J" U	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
FILE "J" L														

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

⊗ Wired Input - Do not populate slot with detector card

FS = FLASH SENSE
ST = STOP TIME

** SPECIAL DETECTOR NOTE

For all detectors, install video detection system for vehicle detection. Perform installation according to manufacture's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

For zone 1A, inputs associated with the typical slots for an NCDOT installation are compatible with time of day instructions located on sheet 2 of this electrical detail.

NOTES

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

EQUIPMENT INFORMATION

Controller.....2070LX
Cabinet.....332 w/ Aux
Software.....Q-Free MAXTIME
Cabinet Mount.....Base
Output File Positions.....18 With Aux. Output File
Load Switches Used.....S1, S2, S8, S11, S12, AUX S1, AUX 2
Phases Used.....1, 2, 6, 8, 8PED
Overlap "1".....*
Overlap "2".....*
Overlap "3".....Not Used
Overlap "4".....Not Used

*See overlap programming detail on sheet 2

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	**	I1U	56	18	1 ★	1	15		X		X	
				-	29 ★	6	3		X		X	
PED PUSH BUTTONS												
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

NOTE: INSTALL DC ISOLATOR IN INPUT FILE SLOT I13.

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L
FILE J
SLOT 2
LOWER

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)

PLANS PREPARED IN THE OFFICE OF:
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PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG 5.1

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8		S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6		15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6		6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11 ★	21,22, 23	NU	NU	NU	NU	NU	61	62	NU	NU	81	P81, P82	11 ★	82,83 ★	NU	NU	NU	NU
RED		128						134	134						A124				
YELLOW	✳	129						135	135										
GREEN		130						136											
RED ARROW												107		A121					
YELLOW ARROW												108		A122	A125				
FLASHING YELLOW ARROW														A123	A126				
GREEN ARROW	127								136			109							
✋													110						
🚶													112						

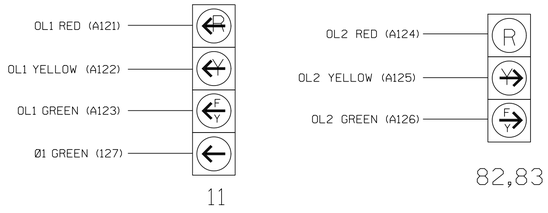
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-1325T4
DESIGNED: August 2023
SEALED: 04/29/2024
REVISED: N/A

Signal Upgrade - Temporary Design 4
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for: NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Traffic Signal Systems Section

750 N.Greenfield Pkwy,Garner,NC 27529

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE:	August 2023	REVIEWED BY:	SL Phillips
PREPARED BY:	SP Pennington	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L PHILLIPS

DocuSigned by: 4/29/2024 DATE

SIG. INVENTORY NO. 10-1325T4

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	2	1,8
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0
FYA Ped Delay	0.0	7.0

← NOTICE FYA PED DELAY

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2
Type	FYA 4 - Section	FYA 4 - Section
Included Phases	-	1,8
Modifier Phases	1	-
Modifier Overlaps	-	-
Trail Green	0	0
Trail Yellow	0.0	0.0
Trail Red	0.0	0.0
FYA Ped Delay	0.0	7.0

← NOTICE INCLUDED PHASE

← NOTICE FYA PED DELAY

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 1A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

	Detector	Call Phase	Delay
1A	1	1	0
	29	0	3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for head 11 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 0 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

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

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-1325T4
DESIGNED: August 2023
SEALED: 04/29/2024
REVISED: N/A

Signal Upgrade - Temporary Design 4
Electrical Detail - Sheet 2 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3448 (Pleasant Plains Road)
at
SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023	REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington	REVIEWED BY:

REVISIONS	INIT.	DATE

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

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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by:
0C87A59ED60B437...
4/29/2024
DATE

SIG. INVENTORY NO. 10-1325T4

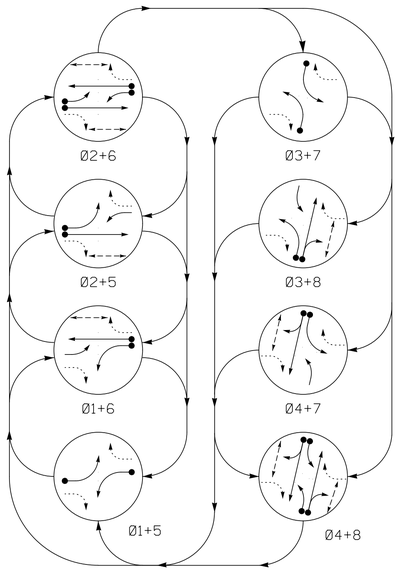
PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 6.0

8 Phase Fully Actuated w/ Alternate Phasing Isolated

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. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.
10. Suppress FYA for signal head 11 during first 4 seconds of phase 2 ped.
11. Suppress FYA for signal head 51 during first 5 seconds of phase 6 ped.

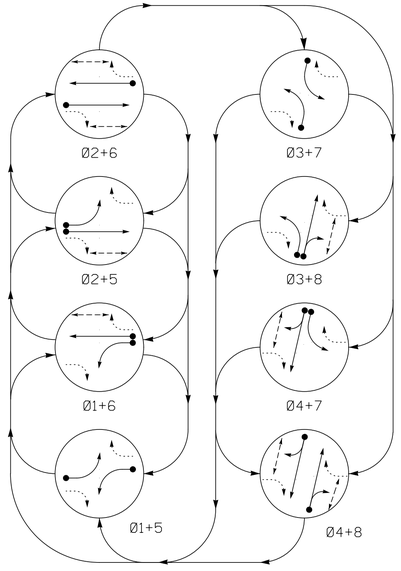
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE								
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11	←●	←—	FY	FY	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21, 22, 23	R	R	G	G	R	R	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←●	←—	FY	FY	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	←●	FY	←—	FY	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
61, 62, 63	R	G	R	G	R	R	R	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←—	FY	←●	FY	~~R~~
81, 82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE								
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8	FLASH
11	←●	←—	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21, 22, 23	R	R	G	G	R	R	R	R	Y
31	~~R~~	~~R~~	~~R~~	~~R~~	←●	←—	~~R~~	~~R~~	~~R~~
41, 42	R	R	R	R	R	R	G	G	R
51	←●	~~R~~	←—	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
61, 62, 63	R	G	R	G	R	R	R	R	Y
71	~~R~~	~~R~~	~~R~~	~~R~~	←—	~~R~~	←●	~~R~~	~~R~~
81, 82	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	W	DW	DW	DW	DW	DRK
P41, P42	DW	DW	DW	DW	DW	DW	W	W	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	DW	W	DW	W	DRK

MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	0	2-4-2	X	1	15.0*	-	X	-	X	-	X
					6#	3.0	-	X	-	X	X	X
2A	6X6	300	6	X	2	-	-	X	-	X	-	X
3A	6X40	0	2-4-2	X	3	15.0*	-	X	-	X	-	X
					8#	3.0	-	X	-	X	-	X
4A	6X40	0	2-4-2	X	4	5.0	2.0	X	-	X	X	X
4B	6X6	300	6	X	4	-	-	X	-	X	-	X
5A	6X40	0	2-4-2	X	5	15.0*	-	X	-	X	-	X
					2#	3.0	-	X	-	X	X	X
6A	6X6	300	6	X	6	-	-	X	-	X	-	X
7A	6X40	0	2-4-2	X	7	15.0*	-	X	-	X	-	X
					4#	3.0	-	X	-	X	-	X
8A	6X40	0	2-4-2	X	8	5.0	2.0	X	-	X	X	X
8B	6X6	300	6	X	8	-	-	X	-	X	-	X

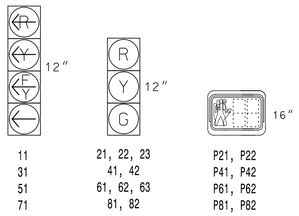
* Reduce Delay to 3 seconds during Alternate Phasing operation.
\# Disable Phase call for loop during Alternate Phasing operation.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



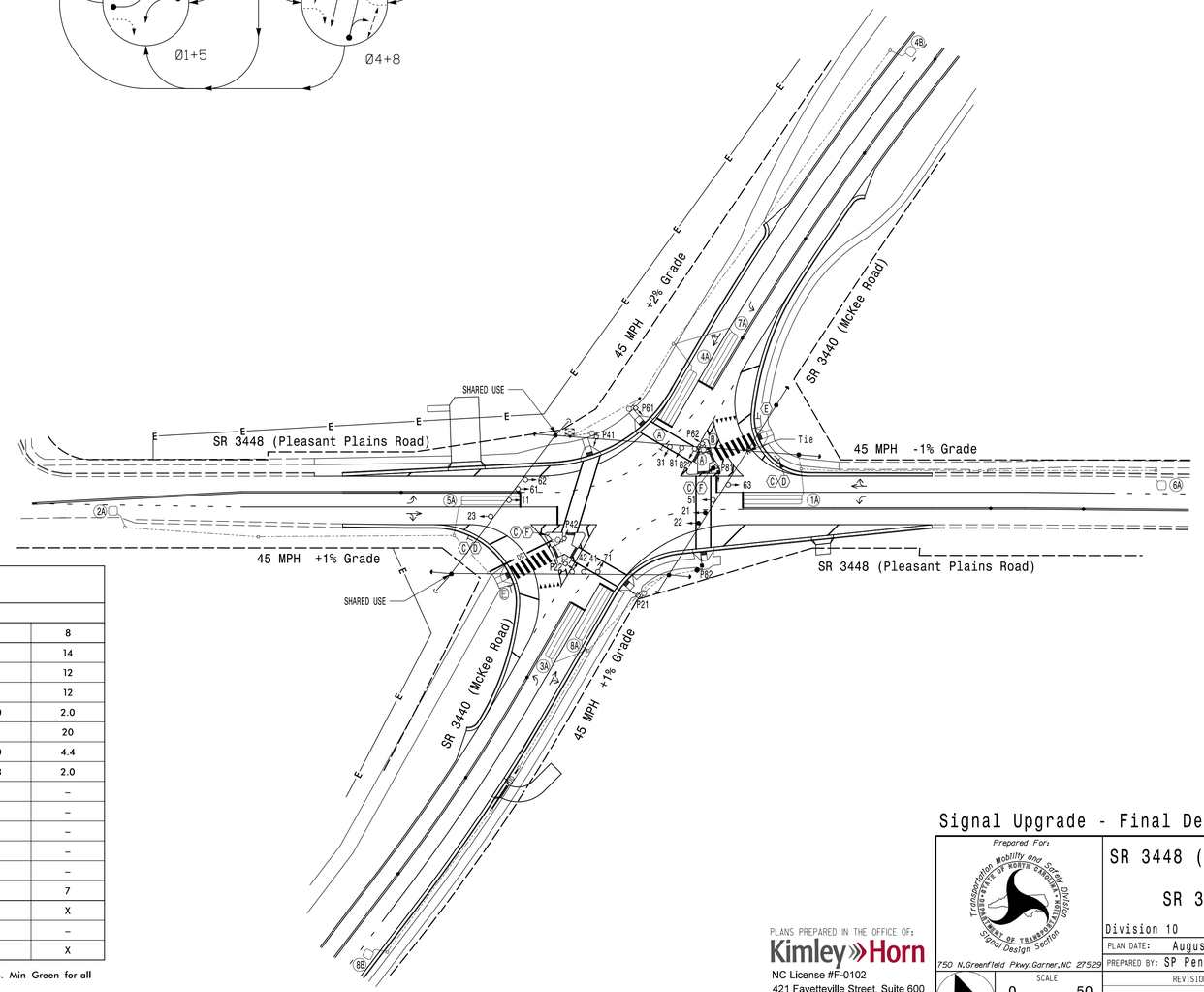
11 31 51 71	21, 22, 23 41, 42 61, 62, 63 81, 82	P21, P22 P41, P42 P61, P62 P81, P82

MAXTIME TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Walk *	–	7	–	14	–	7	–	14
Ped Clear	–	8	–	12	–	9	–	12
Min Green *	7	12	7	7	7	12	7	12
Passage *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	60	20	20	20	60	20	20
Yellow Change	3.0	4.6	3.0	4.4	3.0	4.6	3.0	4.4
Red Clear	3.4	2.1	3.1	2.0	3.5	2.1	3.3	2.0
Added Initial *	–	2.5	–	–	–	2.5	–	–
Maximum Initial *	–	34	–	–	–	34	–	–
Time Before Reduction *	–	15	–	–	–	15	–	–
Time To Reduce *	–	30	–	–	–	30	–	–
Minimum Gap	–	3.0	–	–	–	3.0	–	–
Advance Walk	–	–	–	7	–	–	–	7
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	–	X

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

Do not adjust walk times lower than what is shown.



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□↓	Pedestrian Signal Head With Push Button & Sign	■↓
⬡	Type II Signal Pedestal	⬢
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·····
N/A	Right of Way	– – – –
—E—	Easement	—E—
— DD —	Directional Drill	N/A
→	Directional Arrow	→
N/A	Curb Ramp	◢
Ⓐ	"TURNING VEHICLES YIELD TO PEDS" Sign (R10-15)	Ⓐ
Ⓑ	"NO TURN ON RED" Sign (R10-11)	Ⓑ
Ⓒ	Pedestrian Crossing Sign (W11-2)	Ⓒ
Ⓓ	Diagonal Arrow Left Sign(W16-7PL)	Ⓓ
Ⓔ	"YIELD" Sign (R1-2)	Ⓔ
Ⓕ	Diagonal Arrow Right Sign(W16-7PR)	Ⓕ

Signal Upgrade - Final Design

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

SCALE: 0 50 1"=50'

REVISIONS	INIT.	DATE

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

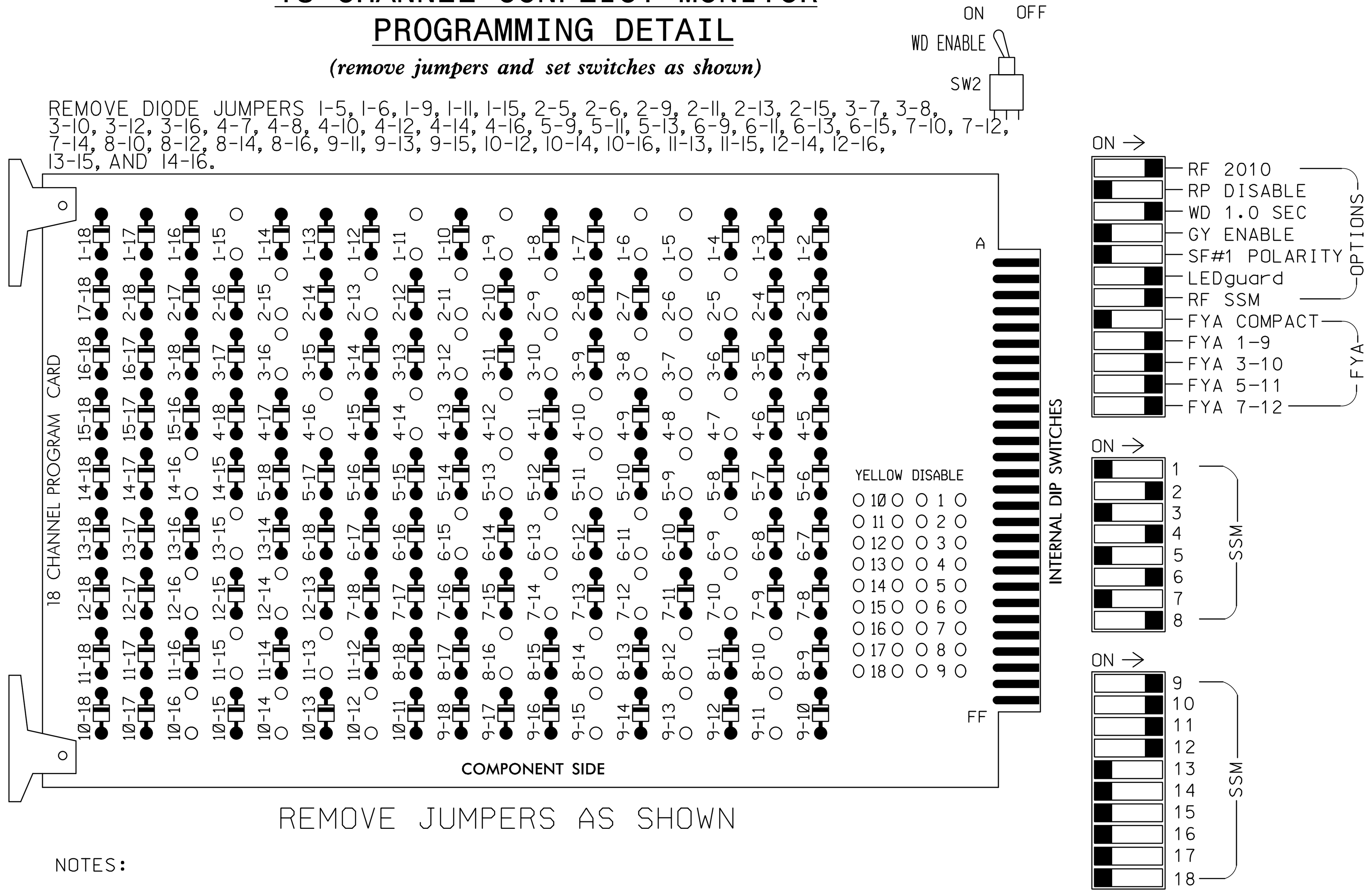
DocuSigned by: 4/29/2024
SIGNATURE DATE

SIG. INVENTORY NO. 10-1325

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 3-7, 3-8, 3-10, 3-12, 3-16, 4-7, 4-8, 4-10, 4-12, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 7-10, 7-12, 7-14, 8-10, 8-12, 8-14, 8-16, 9-11, 9-13, 9-15, 10-12, 10-14, 10-16, 11-13, 11-15, 12-14, 12-16, 13-15, AND 14-16.



REMOVE JUMPERS AS SHOWN

■ = DENOTES POSITION OF SWITCH

NOTES:

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

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Return controller to Factory Defaults before programming per this electrical detail.
3. Program phases 4 and 8 for Dual Entry.
4. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
5. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

Controller...2070LX
Cabinet..332 w/ Aux
Software...Q-Free MAXTIME
Cabinet Mount.......................................Base
Output File Positions...........................18 With Aux. Output File
Load Switches Used.............................S1,S2,S3,S4,S5,S6,S7,S8,S9,S10,S11,S12, AUX S1, AUX S2,AUX S4, AUX 5
Phases Used...1,2,2PED,3,4,4PED,5,6,6PED,8,8PED
Overlap "1"...*
Overlap "2"...*
Overlap "3"...*
Overlap "4"...*

*See overlap programming detail on sheet 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11 ★	21,22, 23	P21, P22	31 ★	41,42	P41, P42	51 ★	61,62, 63	P61, P62	71 ★	81,82	P81, P82	11 ★	31 ★	NU	51 ★	71 ★	NU
RED		128			101			134			107							
YELLOW	✳	129		✳	102		✳	135		✳	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124								
(Don't Walk)			113			104			119			110						
(Walk)			115			106			121			112						

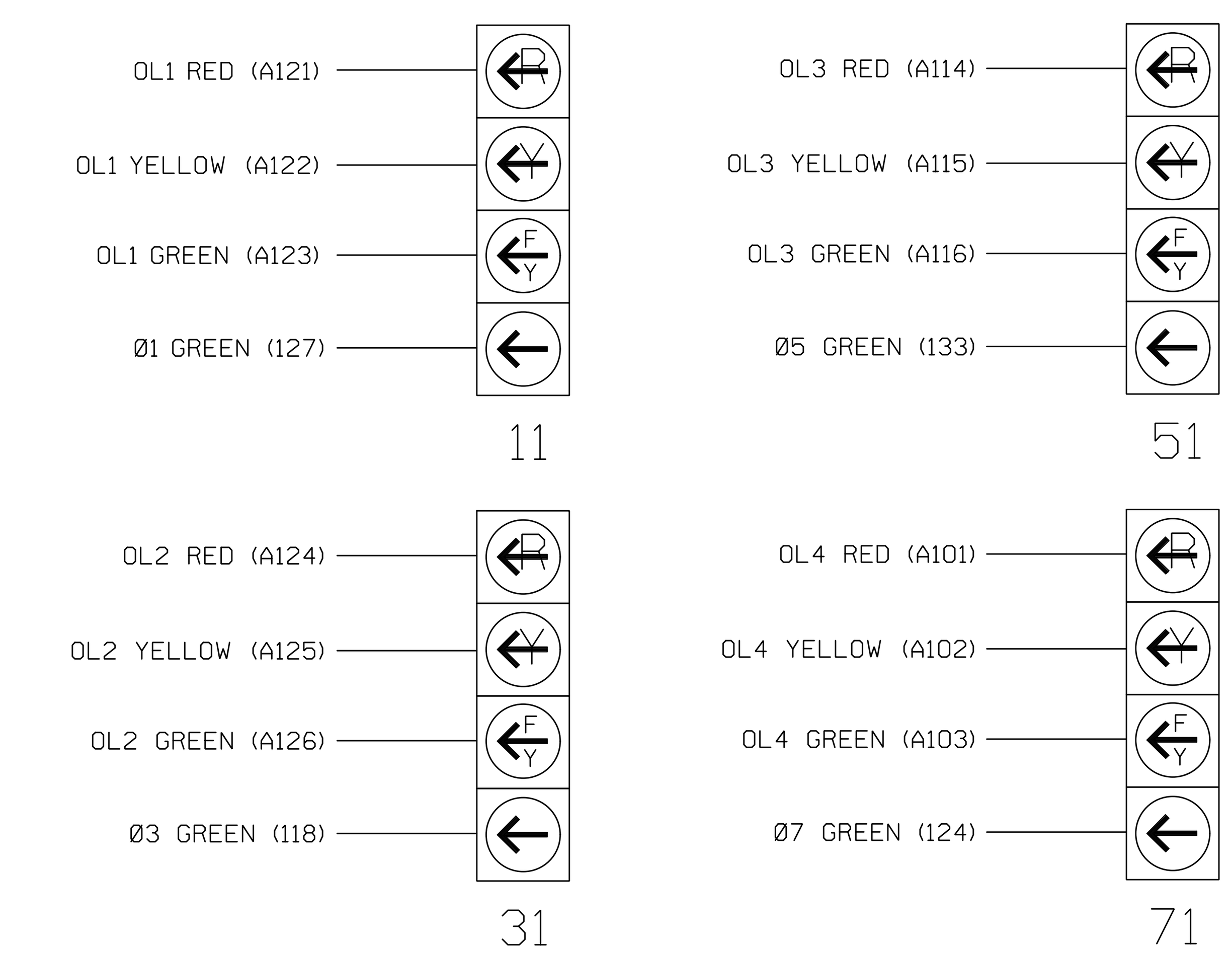
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15.0		X		X	
				-	29 ★	6	3.0		X		X	X
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
				-	30 ★	8	3.0		X		X	
4A	TB4-9,10	I6U	41	3	8	4	5.0	2.0	X		X	X
4B	TB4-11,12	I6L	45	7	9	4			X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15.0		X		X	
				-	31 ★	2	3.0		X		X	X
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
7A	TB5-5,6	J5U	57	19	21 ★	7	15.0		X		X	
				-	32 ★	4	3.0		X		X	
8A	TB5-9,10	J6U	42	4	22	8	5.0	2.0	X		X	X
8B	TB5-11,12	J6L	46	8	23	8			X		X	
PED PUSH BUTTONS												
P21,P22	TB8-4,6	I12U	67	33	2	PED 2						
P41,P42	TB8-5,6	I12L	69	35	4	PED 4						
P61,P62	TB8-7,9	I13U	68	34	6	PED 6						
P81,P82	TB8-8,9	I13L	70	36	8	PED 8						

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

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

INPUT FILE POSITION LAYOUT

(front view)

FILE		1	2	3	4	5	6	7	8	9	10	11	12	13	14
FILE "I"	U	Ø 1 1A	Ø 2 2A	SLOT EMPTY	SLOT EMPTY	Ø 3 3A	Ø 4 4A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	Ø2 PED DC ISOLATOR	Ø6 PED DC ISOLATOR	FS DC ISOLATOR
	L	NOT USED	NOT USED			NOT USED	Ø 4 4B						Ø4 PED DC ISOLATOR	Ø8 PED DC ISOLATOR	ST DC ISOLATOR
FILE "J"	U	Ø 5 5A	Ø 6 6A	SLOT EMPTY	SLOT EMPTY	Ø 7 7A	Ø 8 8A	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY	SLOT EMPTY
	L	NOT USED	NOT USED			NOT USED	Ø 8 8B								

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

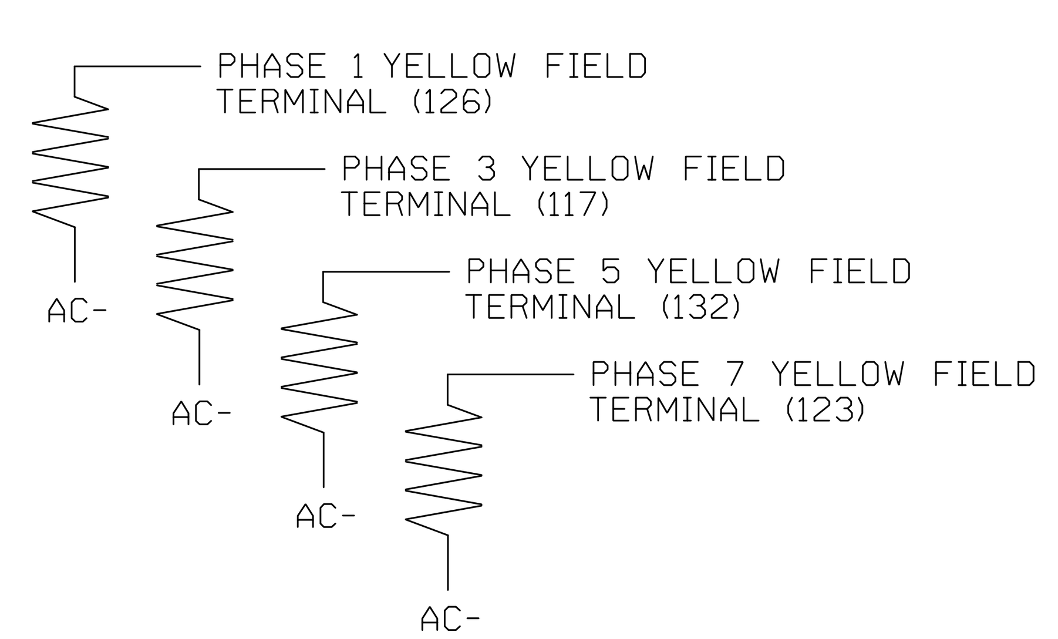
FS = FLASH SENSE
ST = STOP TIME

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

ACCEPTABLE VALUES

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



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-1325
DESIGNED: AUGUST 2023
SEALED: 04/29/2024
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 3448 (Pleasant Plains Road) at SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 | REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington | REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by: 0C87A59ED60B437...
4/29/2024 DATE

SIG. INVENTORY NO. 10-1325

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG 6.2

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0
FYA Ped Delay	4.0	0.0	5.0	0.0

← NOTICE FYA PED DELAY

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	-
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0
FYA Ped Delay	4.0	0.0	5.0	0.0

← NOTICE INCLUDED PHASE

← NOTICE FYA PED DELAY

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 3A, 5A & 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	3

3A

Detector	Call Phase	Delay
7	3	3
30	0	3

5A

Detector	Call Phase	Delay
15	5	3
31	0	3

7A

Detector	Call Phase	Delay
21	7	3
32	0	3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 11, 31, 51, and 71 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the City Traffic Engineer or their representative.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE 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: 10-1325
DESIGNED: AUGUST 2023
SEALED: 04/29/2024
REVISED: N/A

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

SR 3448 (Pleasant Plains Road)
at
SR 3440 (McKee Road)

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACY L. PHILLIPS

DocuSigned by: 4/29/2024 DATE

SIG. INVENTORY NO. 10-1325

PLANS PREPARED IN THE OFFICE OF:
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(919) 677-2000

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

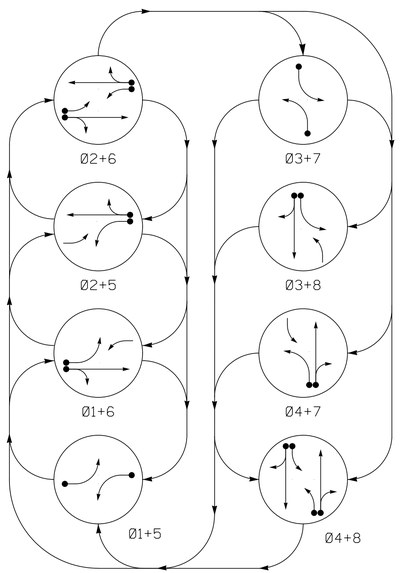
PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 7.0

8 Phase Fully Actuated w/ Alternate Phasing Signal System #11005

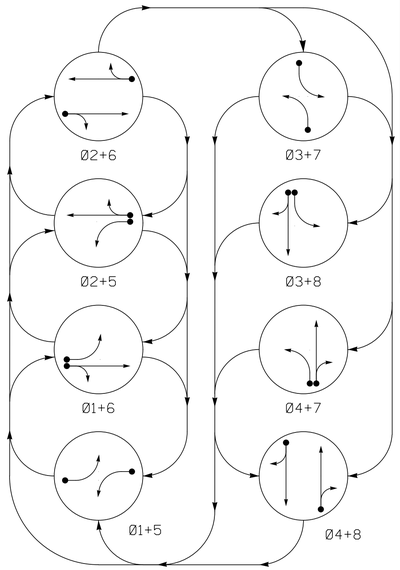
NOTES

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. Phase 1 and/or phase 5 may be lagged.
4. Phase 3 and/or phase 7 may be lagged.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. The Division Traffic Engineer will determine the hours of use for each phasing plan.

DEFAULT PHASING DIAGRAM



ALTERNATE PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←●	←●	F Y	F Y	←R	←R	←R	←R	←Y
21, 22	R	R	G	R	R	R	R	Y	
31	←R	←R	←R	←R	←–	←–	F Y	F Y	←R
41, 42, 43	R	R	R	R	R	R	G	G	R
51	←–	F Y	←–	F Y	←R	←R	←R	←R	←Y
61, 62	R	G	R	G	R	R	R	Y	
71, 72	←R	←R	←R	←R	←–	F Y	←–	F Y	←R
81, 82	R	R	R	R	R	G	R	G	R

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE 1+5	1+6	2+5	2+6	3+7	3+8	4+7	4+8	FLASH
11	←–	←–	←R	←R	←R	←R	←R	←R	←Y
21, 22	R	R	G	G	R	R	R	R	Y
31	←R	←R	←R	←R	←–	←–	←R	←R	←R
41, 42, 43	R	R	R	R	R	R	G	G	R
51	←–	←R	←–	←R	←R	←R	←R	←R	←Y
61, 62	R	G	R	G	R	R	R	R	Y
71, 72	←R	←R	←R	←R	←–	←R	←–	←R	←R
81, 82	R	R	R	R	R	G	R	G	R

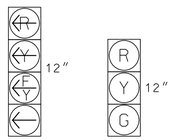
MAXTIME DETECTOR INSTALLATION CHART

DETECTOR					PROGRAMMING						
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
1A	6X40	0	2-4-2	X	1	15.0*	-	X	-	X	-	X
				X	6#	3.0	-	X	-	X	X	X
2A	6X6	300	6	X	2	-	-	X	X	X	-	X
3A	6X40	0	2-4-2	X	3	15.0*	-	X	-	X	-	X
				X	8#	3.0	-	X	-	X	-	X
4A	6X40	0	2-4-2	X	4	5.0	2.0	X	-	X	X	X
4B	6X6	300	6	X	4	-	-	X	-	X	-	X
5A	6X40	0	2-4-2	X	5	15.0*	-	X	-	X	-	X
				X	2#	3.0	-	X	-	X	X	X
6A	6X6	300	6	X	6	-	-	X	X	X	-	X
7A	6X40	0	2-4-2	X	7	15.0*	-	X	-	X	-	X
				X	4#	3.0	-	X	-	X	-	X
8A	6X40	0	2-4-2	X	8	5.0	2.0	X	-	X	X	X
8B	6X6	300	6	X	8	-	-	X	-	X	-	X

* Reduce Delay to 3 seconds during Alternate Phasing operation.
\# Disable Phase call for loop during Alternate Phasing operation.

SIGNAL FACE I.D.

All Heads L.E.D.



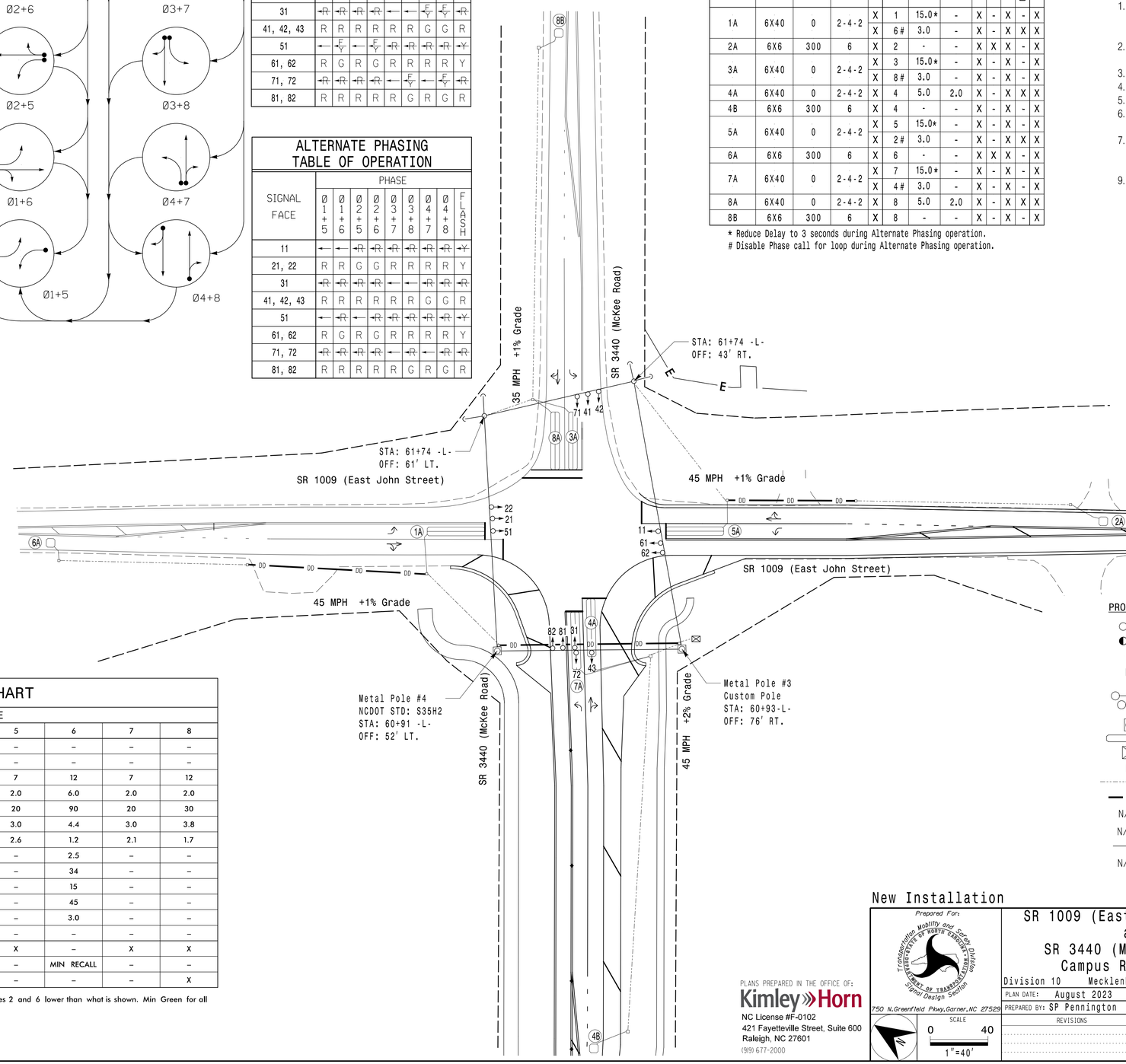
11
31
51
71, 72

21, 22
41, 42, 43
61, 62
81, 82

MAXTIME TIMING CHART

FEATURE	PHASE 1	2	3	4	5	6	7	8
Walk *	–	–	–	–	–	–	–	–
Ped Clear	–	–	–	–	–	–	–	–
Min Green *	7	12	7	7	7	12	7	12
Passage *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max 1 *	20	90	20	30	20	90	20	30
Yellow Change	3.0	4.4	3.0	3.8	3.0	4.4	3.0	3.8
Red Clear	2.6	1.2	2.4	1.7	2.6	1.2	2.1	1.7
Added Initial *	–	2.5	–	–	–	2.5	–	–
Maximum Initial *	–	34	–	–	–	34	–	–
Time Before Reduction *	–	15	–	–	–	15	–	–
Time To Reduce *	–	45	–	–	–	45	–	–
Minimum Gap	–	3.0	–	–	–	3.0	–	–
Advance Walk	–	–	–	–	–	–	–	–
Non Lock Detector	X	–	X	X	X	–	X	X
Vehicle Recall	–	MIN RECALL	–	–	–	MIN RECALL	–	–
Dual Entry	–	–	–	X	–	–	–	X

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



LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
□	Pedestrian Signal Head With Push Button & Sign	■
○	Signal Pole with Guy	●
○	Signal Pole with Sidewalk Guy	●
◎	Metal Strain Pole	◎
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
·····	2-in Underground Conduit	·-·-·
— DD —	Directional Drill	N/A
N/A	Right of Way	————
N/A	Temporary Easement	——E——
→	Directional Arrow	→
N/A	Curb Ramp	

New Installation

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Prepared For: NC Department of Transportation Mobility and Safety Division Traffic Engineering Branch Signal Design Section

SR 1009 (East John Street) at SR 3440 (McKee Road)/ Campus Ridge Road

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips

PREPARED BY: SP Pennington REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACY L. PHILLIPS

DocuSigned by: 4/29/2024 SIGNATURE DATE

SIG. INVENTORY NO. 10-2352

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
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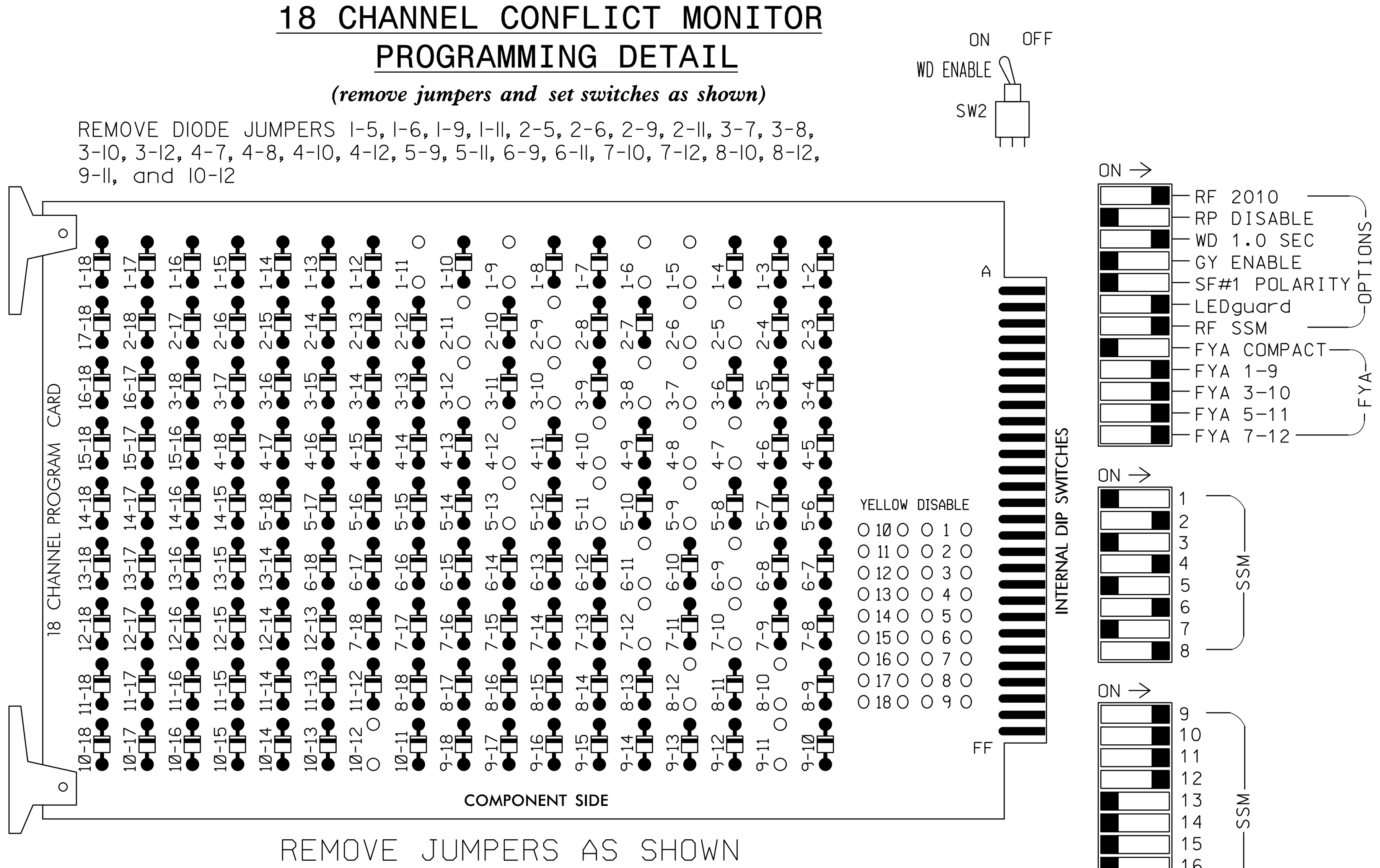
750 N.Greenfield Pkwy.Garner,NC 27529

4/25/2024 7:40:34 AM Gabriella.Pierro K:\MCHL_PRJ\M011036426 - McKee Rd Ext\Signal\S4 - Signal Design\7.0 10-2352_2023.dgn

18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

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



REMOVE JUMPERS AS SHOWN

NOTES:

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

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
1A	TB2-1,2	I1U	56	18	1 ★	1	15.0		X		X	
				-	29 ★	6	3.0		X		X	X
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
3A	TB4-5,6	I5U	58	20	7 ★	3	15.0		X		X	
				-	30 ★	8	3.0		X		X	
4A	TB4-9,10	I6U	41	3	8	4	5.0	2.0	X		X	X
4B	TB4-11,12	I6L	45	7	9	4			X		X	
5A	TB3-1,2	J1U	55	17	15 ★	5	15.0		X		X	
				-	31 ★	2	3.0		X		X	X
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
7A	TB5-5,6	J5U	57	19	21 ★	7	15.0		X		X	
				-	32 ★	4	3.0		X		X	
8A	TB5-9,10	J6U	42	4	22	8	5.0	2.0	X		X	X
8B	TB5-11,12	J6L	46	8	23	8			X		X	

★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

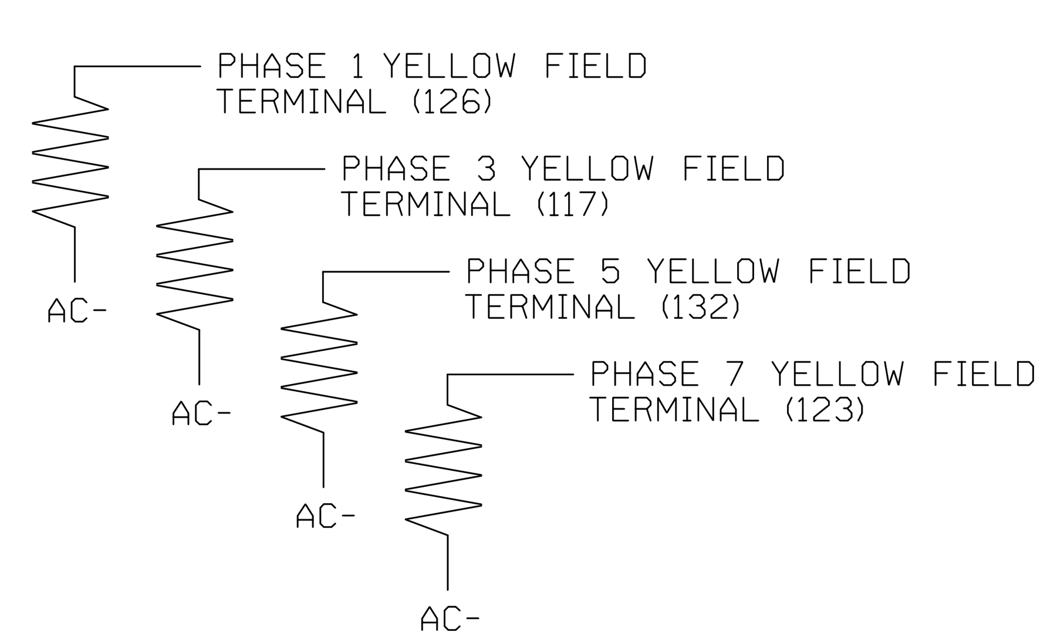
INPUT FILE POSITION LEGEND: J2L

FILE J
SLOT 2
LOWER

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the signal plan.
2. Program phases 4 and 8 for Dual Entry.
3. Program controller to start up in phase 2 Green No Walk and 6 Green No Walk.
4. If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.

EQUIPMENT INFORMATION

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

*See overlap programming detail on sheet 2

INPUT FILE POSITION LAYOUT

(front view)

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

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

FS = FLASH SENSE
ST = STOP TIME

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	11 ★	21,22	NU	31 ★	41,42 43	NU	51 ★	61,62	NU	71,72 ★	81,82	NU	11 ★	31 ★	NU	51 ★	71,72 ★	NU
RED		128			101			134			107							
YELLOW	✳	129		✳	102		✳	135		✳	108							
GREEN		130			103			136			109							
RED ARROW													A121	A124		A114	A101	
YELLOW ARROW													A122	A125		A115	A102	
FLASHING YELLOW ARROW													A123	A126		A116	A103	
GREEN ARROW	127			118			133			124								
(hand symbol)																		
(pedestrian symbol)																		

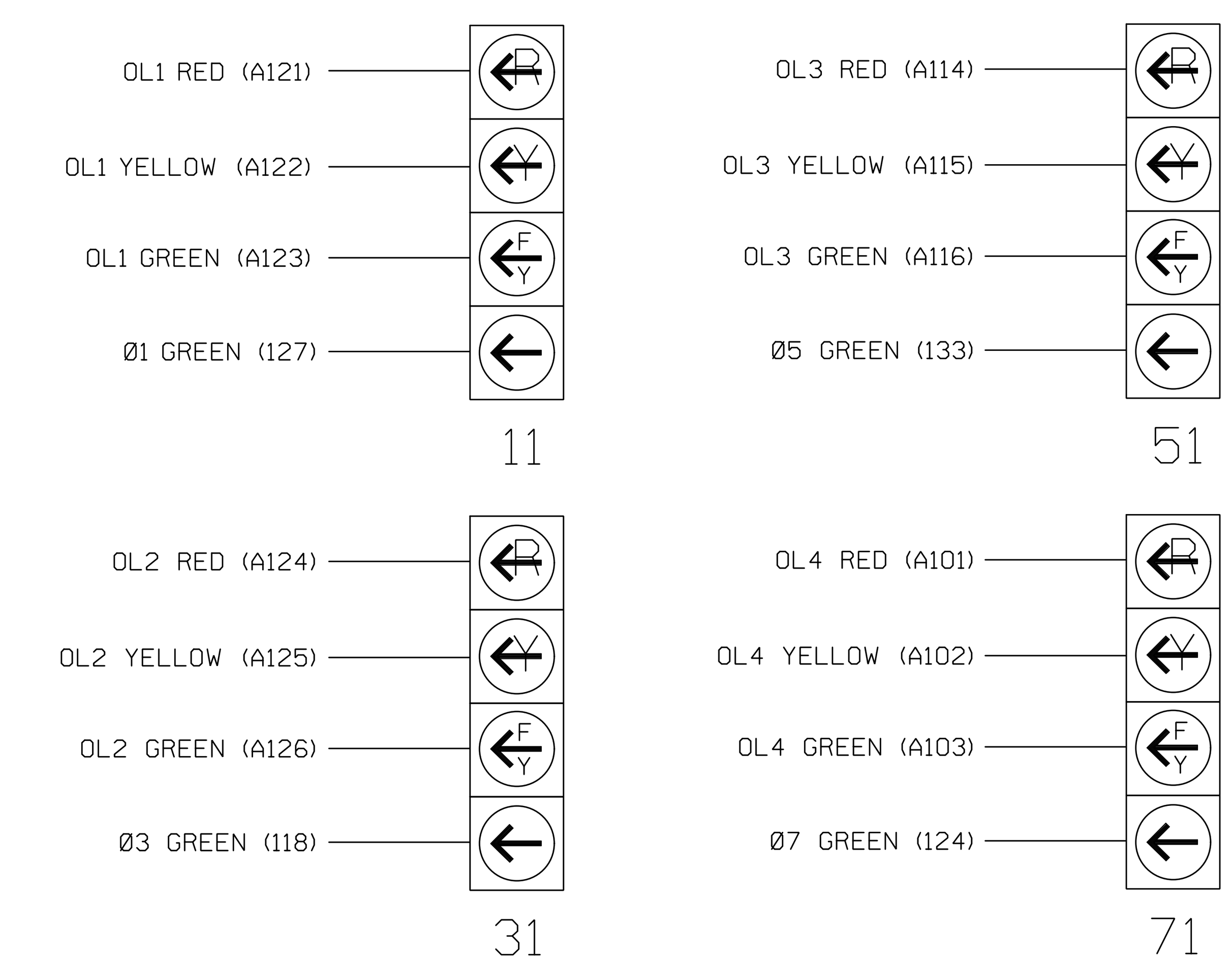
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 10-2352
DESIGNED: AUGUST 2023
SEALED: 04/29/2024
REVISED: N/A

New Installation
Electrical Detail - Sheet 1 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for:

Transportation Mobility and Safety Division — ITS & Signals Management Section — State of North Carolina Department of Transportation

750 N.Greenfield Pkwy,Garner,NC 27529

SR 1009 (East John Street) at SR 3440 (McKee Road)/ Campus Ridge Road

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023	REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington	REVIEWED BY:

REVISIONS	INIT.	DATE

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS

DocuSigned by:
0C87A59ED60B437...
4/29/2024
DATE

SIG. INVENTORY NO. 10-2352

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 7.2

MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	2	4	6	8
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

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

Web Interface
Home >Controller >Overlap Configuration >Overlaps

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

Overlap Plan 2

Overlap	1	2	3	4
Type	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section	FYA 4 - Section
Included Phases	-	-	-	-
Modifier Phases	1	3	5	7
Modifier Overlaps	-	-	-	-
Trail Green	0	0	0	0
Trail Yellow	0.0	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0	0.0

← NOTICE INCLUDED PHASE

MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOPS 1A, 3A, 5A & 7A

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

Web Interface
Home >Controller >Detector Configuration >Vehicle Detectors

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

Plan 2

1A

Detector	Call Phase	Delay
1	1	3
29	0	3

3A

Detector	Call Phase	Delay
7	3	3
30	0	3

5A

Detector	Call Phase	Delay
15	5	3
31	0	3

7A

Detector	Call Phase	Delay
21	7	3
32	0	3

MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

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

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

ALTERNATE PHASING CHANGE SUMMARY

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

OVERLAP PLAN 2: Modifies overlap included phases for heads 11, 31, 51, and 71 to run protected turns only.

VEH DET PLAN 2: Disables phase 6 call on loop 1A and reduces delay time for phase 1 call on loop 1A to 3 seconds.

Disables phase 8 call on loop 3A and reduces delay time for phase 3 call on loop 3A to 3 seconds.

Disables phase 2 call on loop 5A and reduces delay time for phase 5 call on loop 5A to 3 seconds.

Disables phase 4 call on loop 7A and reduces delay time for phase 7 call on loop 7A to 3 seconds.

MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel
Main Menu >Controller >Coordination >Patterns

Web Interface
Home >Controller >Coordination >Patterns

Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

* The Pattern number(s) are to be determined by the City Traffic Engineer or their representative.

FLASHER CIRCUIT MODIFICATION DETAIL

IN ORDER TO ENSURE 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: 10-2352
DESIGNED: AUGUST 2023
SEALED: 04/29/2024
REVISED: N/A

New Installation
Electrical Detail - Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
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Raleigh, NC 27601
(919) 677-2000

ELECTRICAL AND PROGRAMMING DETAILS FOR:

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

SR 1009 (East John Street)
at
SR 3440 (McKee Road)/
Campus Ridge Road

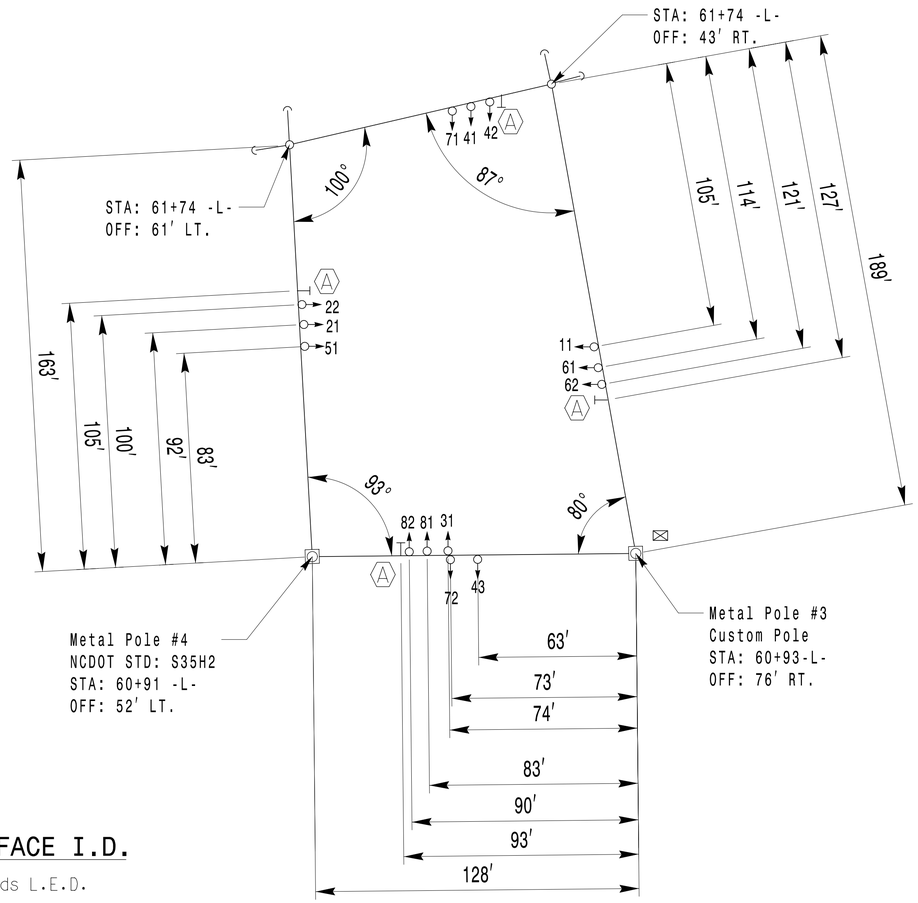
Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023	REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington	REVIEWED BY:

REVISIONS	INIT.	DATE

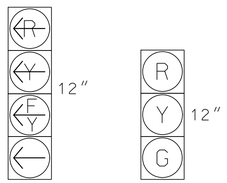
SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACIE L. PHILLIPS
DocuSigned by: 4/29/2024 DATE
SIG. INVENTORY NO. 10-2352

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SIG. 7.3



SIGNAL FACE I.D.

All Heads L.E.D.



11 31 51 71, 72	21, 22 41, 42, 43 61, 62 81, 82

Notes

1. Design the traffic signal structure and foundation in accordance with:
   The 6th Edition 2024 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
   The 2024 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
   The 2024 NCDOT Roadway Standard Drawings.
   The traffic signal project plans and special provisions.
   The NCDOT "Metal Pole Standards" located at the following NCDOT website:
   Https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx

2. Fabricate Metal Pole #3 using design loadings shown. Factory installed accessories for wire entrances along the pole length were determined by project survey information. The contractor may revise attachment heights and radial orientations of wire entrances with approval from the Division Traffic Engineer. Any modifications to the original location of accessories must be reflected on the shop drawings when they are submitted for review and approval.

3. Design a drilled pier foundation that conforms to the requirements of ITSS Project Special Provisions included with and as part of these plans.

LOADING SCHEDULE FOR STRAIN POLES

HEAD	DESCRIPTION	AREA	SIZE	WEIGHT
21, 22 41, 42, 43 61, 62 81, 82	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE, HANGER, AND BALANCE ADJUSTER	9.2 S.F.	25.5" W X 52.0" L	56 LBS
11 31 51 71, 72	SIGNAL HEAD 12"-4 SECTION -WITH BACKPLATE, HANGER, AND BALANCE ADJUSTER	11.5 S.F.	25.5" W X 66.0" L	74 LBS
(A)	STREET NAME SIGN WITH HANGER	12.0 S.F.	18.0" W X 96.0" L	27 LBS

Custom Metal Strain Pole

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

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

SR 1009 (East John Street)
at
SR 3440 (McKee Road)/
Campus Ridge Road

Division 10 Mecklenburg County Matthews

PLAN DATE: August 2023 REVIEWED BY: SL Phillips
PREPARED BY: SP Pennington REVIEWED BY:

SCALE 0 30 1"=30'

REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL SEAL 032607 ENGINEER STACY L PHILLIPS

DocuSigned by:
SIGNATURE 4/29/2024 DATE

SIG. INVENTORY NO. 10-2352

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-1

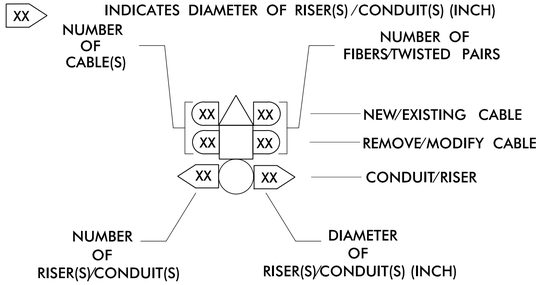
1. INSTALL REA, PE – 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
2. INSTALL COAX CABLE
3. INSTALL ETHERNET CABLE
4. INSTALL SMFO CABLE
5. INSTALL MMFO CABLE
6. INSTALL FIBER OPTIC DROP CABLE ASSEMBLY
7. INSTALL TRACER WIRE
8. TRENCH
9. INSTALL PVC CONDUIT
10. INSTALL RIGID, GALVANIZED STEEL CONDUIT
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. MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE
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. INSTALL POLE MOUNTED SPLICE CABINET
32. INSTALL BASE MOUNTED SPLICE CABINET
33. REMOVE EXISTING SPLICE CABINET
34. INSTALL CABINET FOUNDATION
35. INSTALL CCTV CAMERA POLE MOUNTED CABINET
36. INSTALL CCTV CAMERA ASSEMBLY
37. INSTALL CCTV CAMERA WOOD POLE
38. INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
39. INSTALL JUNCTION BOX
40A. INSTALL OVERSIZED JUNCTION BOX
40B. INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 36" 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 TELEPHONE SERVICE
51. INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
52A. INSTALL DELINEATOR MARKER
52B. INSTALL JUNCTION BOX MARKER
53. STORE 50 FEET OF COMMUNICATIONS CABLE
54. LASH CABLE(S) TO EXISTING COMMUNICATIONS CABLE
55. LASH CABLE(S) TO EXISTING MESSENGER CABLE
56. LASH CABLE(S) TO NEW MESSENGER CABLE
57. MODIFY EXISTING ELECTRICAL SERVICE
58. INSTALL NEW ELECTRICAL SERVICE
59. INSTALL NEW ETHERNET EDGE SWITCH
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
68. INSTALL CELLULAR MODEM AND ANTENNA

LEGEND

- FO — NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR — NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI — EXISTING COMMUNICATIONS CABLE
- REM — EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD — NEW DIRECTIONAL DRILLED CONDUIT
- B&J — NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- S — AERIAL SPLICE ENCLOSURE
- S — UNDERGROUND SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- XX–XXXX — SIGNAL INVENTORY NUMBER
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CABLE STORAGE RACK (SNOW SHOE)
- EXISTING CONTROLLER AND CABINET
- NEW CONTROLLER AND CABINET
- NEW CCTV CABINET
- S — EXISTING SPLICE CABINET
- S — NEW SPLICE CABINET
- SP — SIGNAL POLE
- FLAT PANEL ANTENNA (SINGLE)
- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA

CONSTRUCTION NOTE SYMBOLOGY KEY

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



ATTACHMENT POINT:

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

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System #11005
Construction Notes

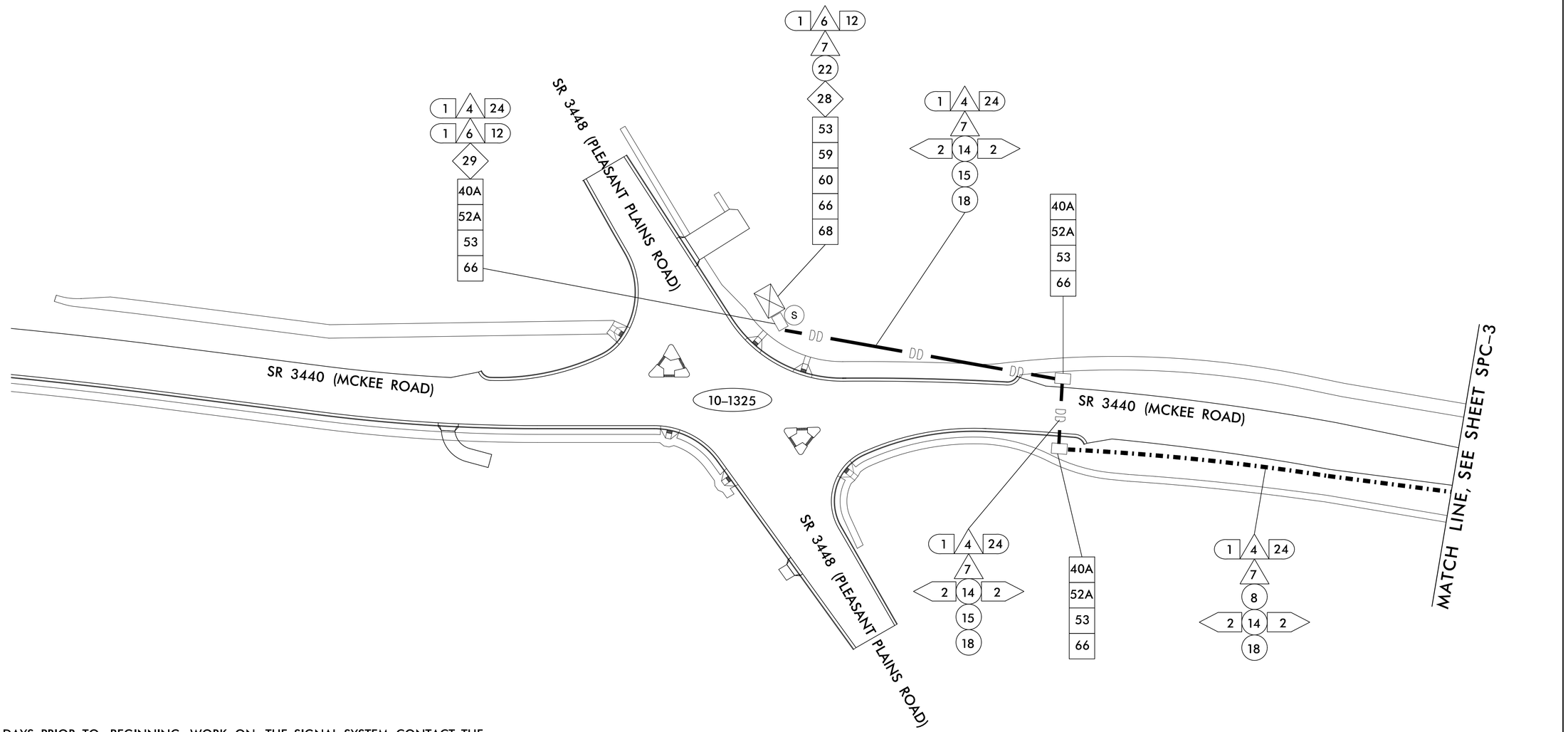
Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	KW Smith
PREPARED BY:	SP Pennington	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH
DocuSigned by: Kevin Smith 3/26/2024
ORIGINATOR SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-2



NOTES:

1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 10 TRAFFIC ENGINEER AT (704) 983–4400 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 DIVISION 10 TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS–BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.

3) CELL MODEM TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DIVISION TRAFFIC ENGINEER AT (704) 983–4400 TO REQUEST THE CELL MODEM. ALLOW EIGHT (8) WEEKS PRIOR TO ANTICIPATED DEPLOYMENT.

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

SCALE
0
NTS

Signal System #11005 Communications Cable and Conduit Routing Plans

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	KW Smith
PREPARED BY:	SP Pennington	REVIEWED BY:	

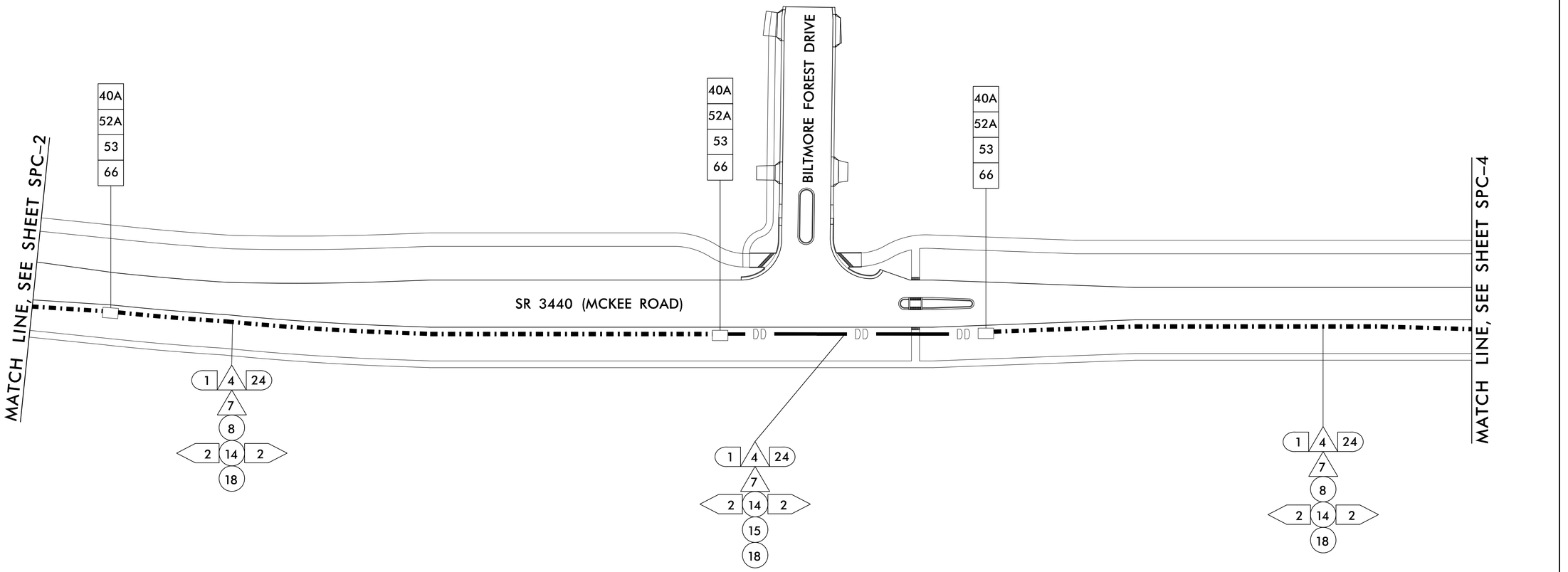
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH

DocuSigned by: Kevin Smith 3/26/2024
SIGNATURE DATE

SIG. INVENTORY NO. _____

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-3



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Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrated Mobility Division
Traffic Engineering Branch
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE
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NTS

Signal System #11005
Communications Cable and Conduit Routing Plans

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

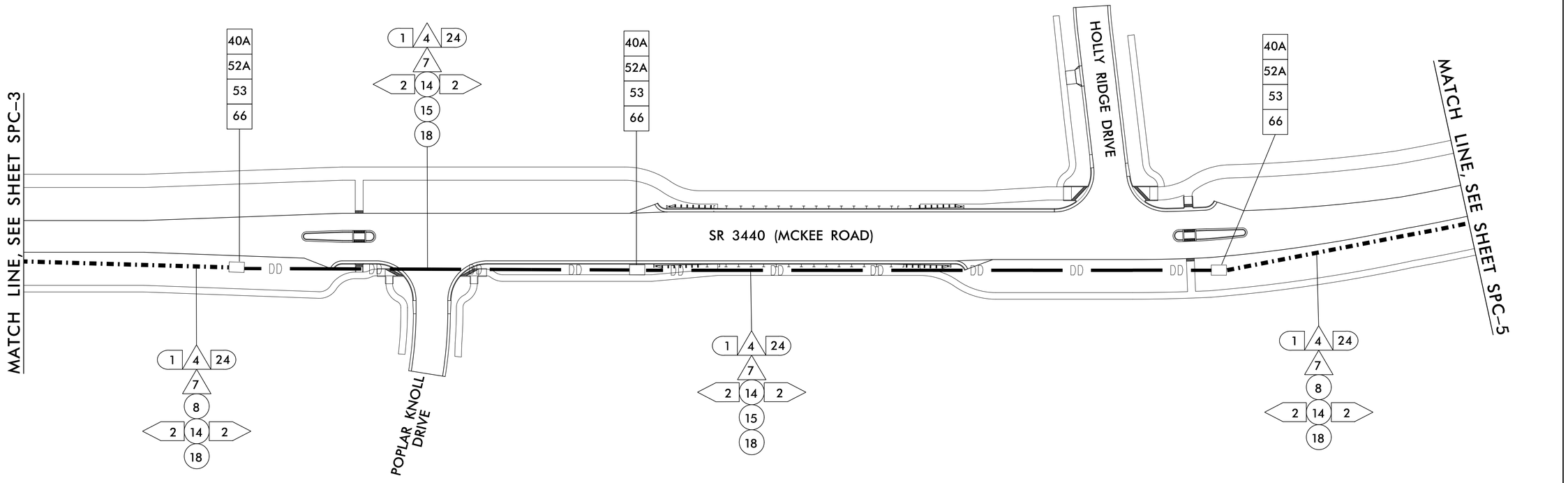
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH

DocuSigned by: Kevin Smith 3/26/2024
SIGNATURE DATE

SIG. INVENTORY NO. _____

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-4



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(919) 677-2000

Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE
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NTS

Signal System #11005
Communications Cable and
Conduit Routing Plans

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

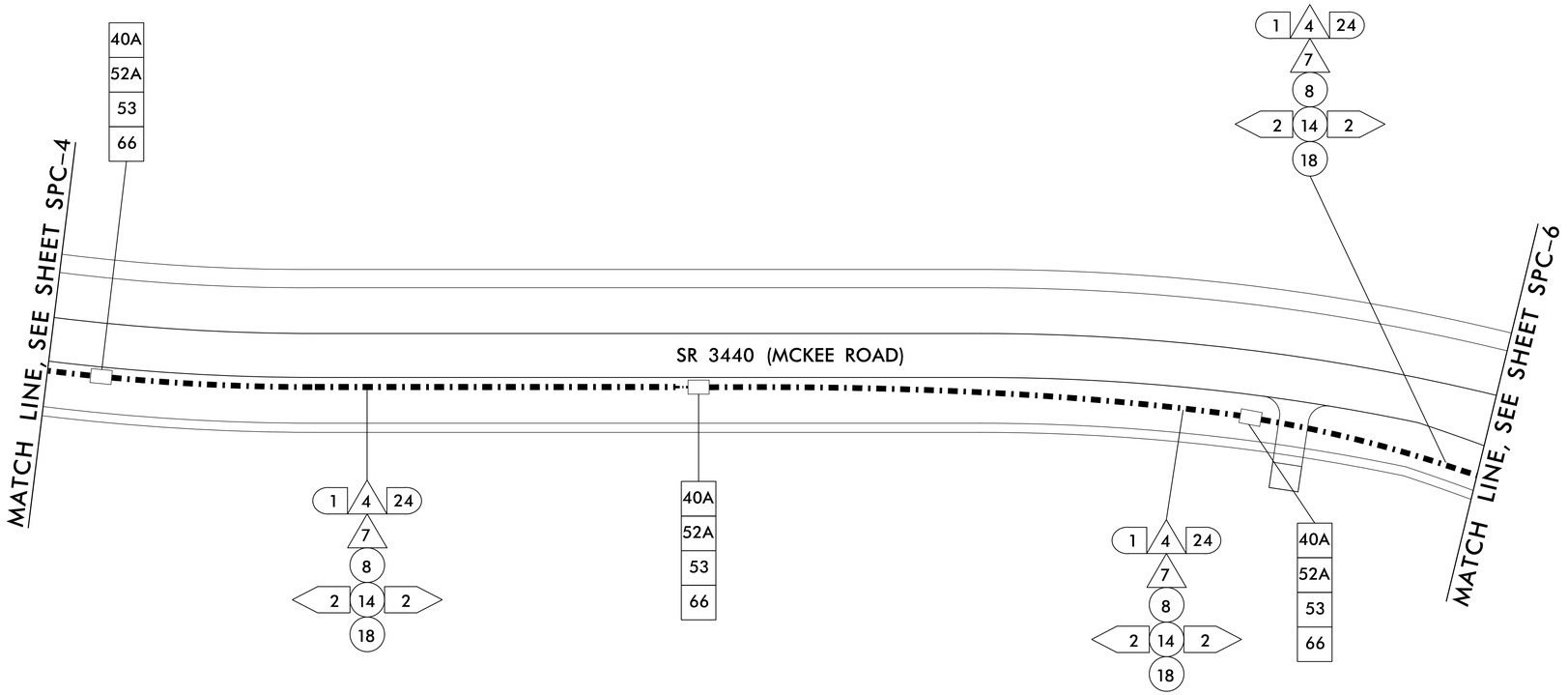
REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH

DocuSigned by: Kevin Smith 3/26/2024
SIGNATURE DATE

SIG. INVENTORY NO.

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-5



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Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrated Mobility and Safe Mobility Division
Intelligent Transportation Systems Section
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System #11005 Communications Cable and Conduit Routing Plans

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

SCALE: 0 NTS

REVISIONS	INIT.	DATE

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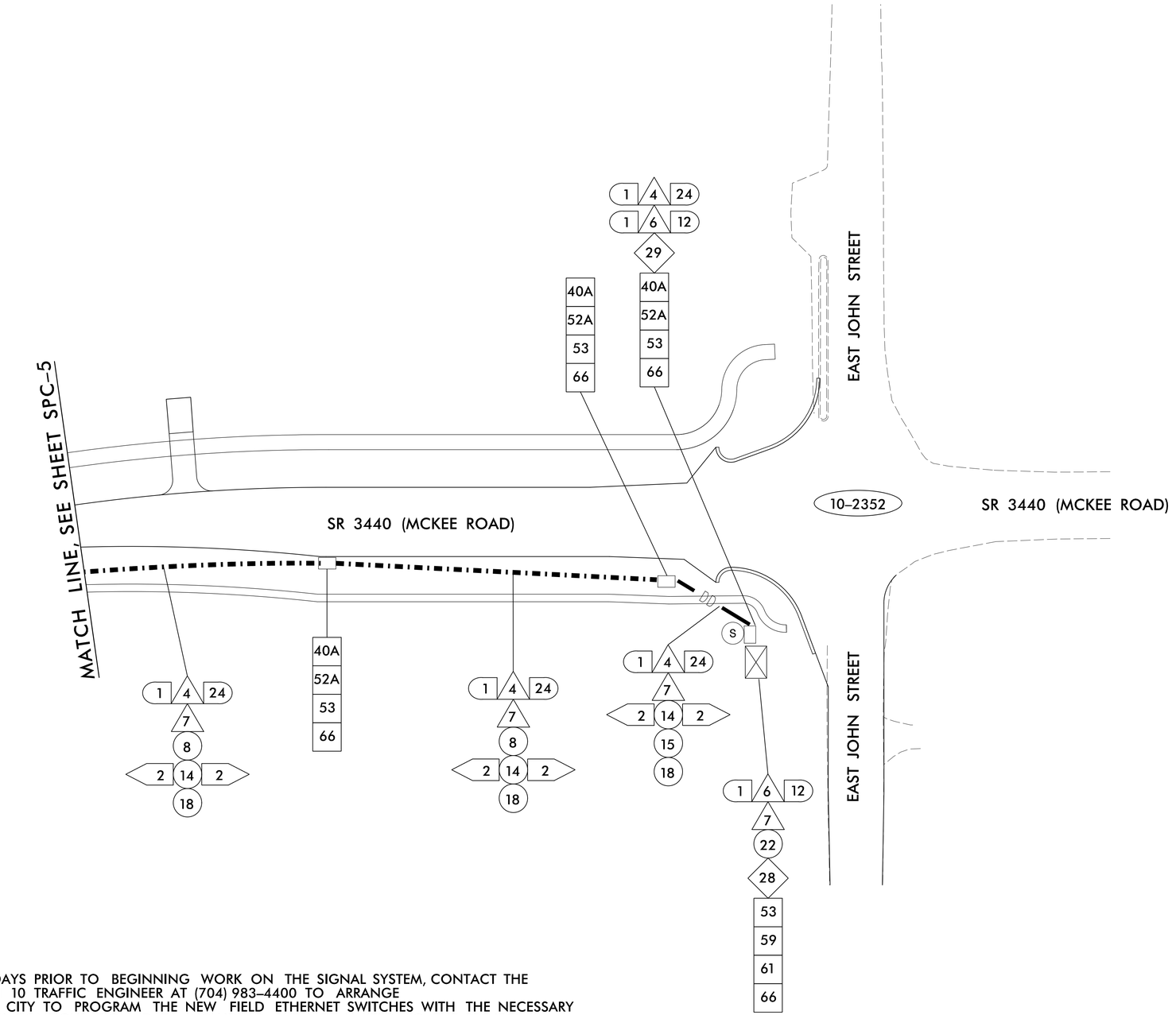
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH
DocuSigned by: Kevin Smith 3/26/2024
SIGNATURE DATE
SIG. INVENTORY NO.

3/26/2024 9:58:00 AM susan.pennington K:\CHL_PRJ\011036426 - McKee Rd Ext\Signal\56 - Cable Routing\SCP-05.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-6



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(919) 677-2000

Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Integrated Mobility and Safety Division
Traffic Engineering Branch
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System #11005
Communications Cable and Conduit Routing Plans
Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

REVISIONS	INIT.	DATE

SCALE 0 NTS

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NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH
DocuSigned by: Kevin Smith 3/26/2024
SIGNATURE DATE
SIG. INVENTORY NO. --------

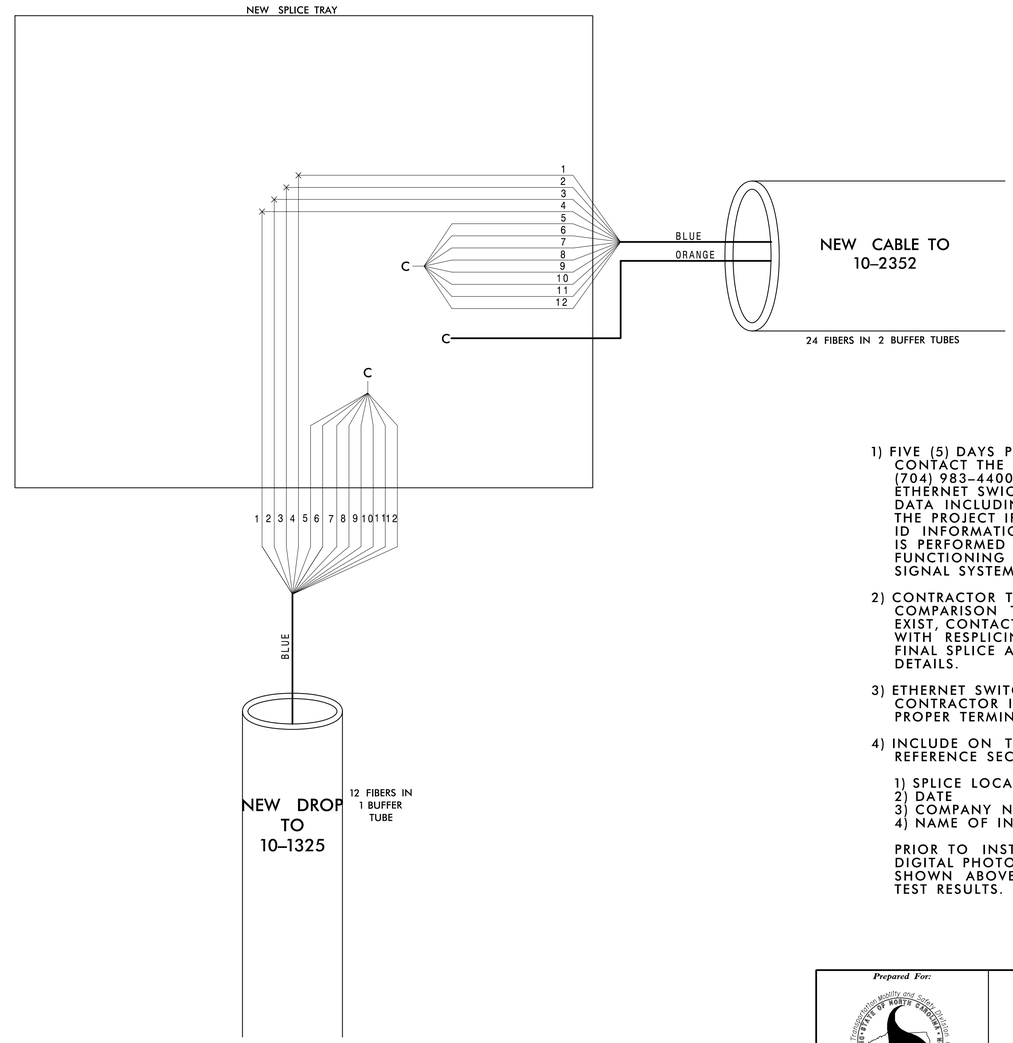
NEW SPLICE ENCLOSURE AT 10–1325

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-7

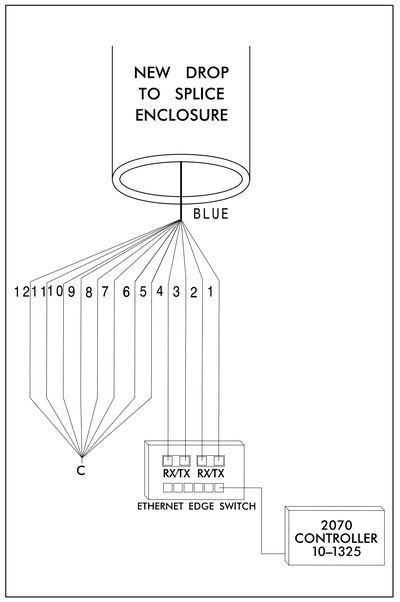
C = CAP AND SEAL
X = FUSION SPLICE

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



CONTROLLER CABINET 10–1325



1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION 10 TRAFFIC ENGINEER AT (704) 983–4400 TO ARRANGE FOR NCDOT TO PROGRAM THE NEW FIELD ETHERNET SWICHES 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 TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

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3) ETHERNET SWITCH TERMINATION CONFIGUATIONS 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.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PLANS PREPARED IN THE OFFICE OF:
Kimley»Horn
NC License #F-0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Prepared For:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE
0
NTS

Signal System #11005
Splice Details

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH

DocuSigned by:
Kevin Smith 3/26/2024
SIGNATURE DATE

CADD Filename:

NEW SPLICE ENCLOSURE AT 10–2352

PROJECT REFERENCE NO.	SHEET NO.
U-4713A	SCP-8

C = CAP AND SEAL
X = FUSION SPLICE

COLOR CODE
TIA/EIA 598–A

(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
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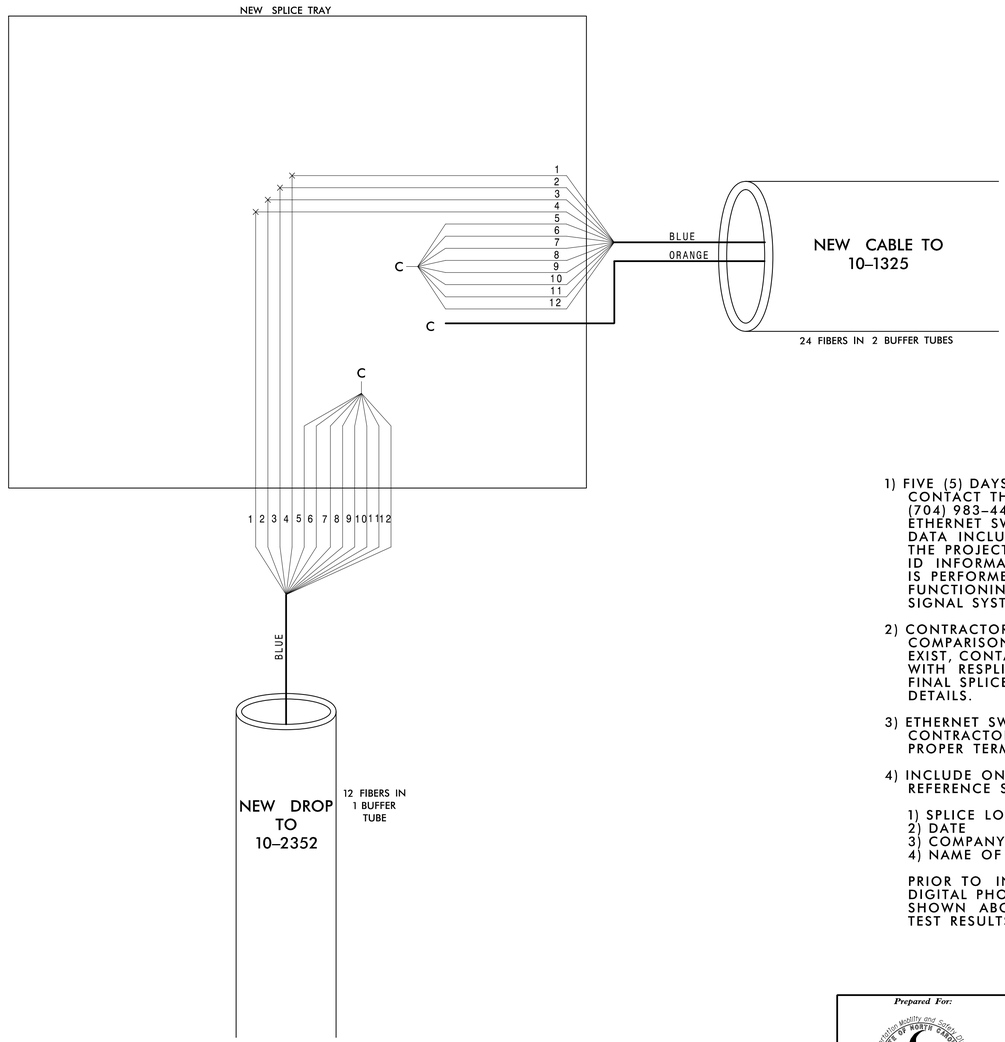
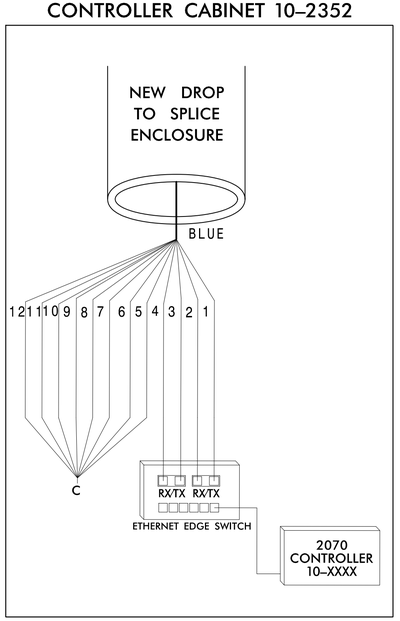


CONTROLLER CABINET 10–2352



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Prepared For:
STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
750 N. Greenfield Pkwy., Garner, NC 27529

Signal System #11005
Splice Details

Division 10 Mecklenburg County Matthews

PLAN DATE:	March 2024	REVIEWED BY:	SP Pennington
PREPARED BY:	SP Pennington	REVIEWED BY:	KW Smith

SCALE: 0 NTS

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 030472 ENGINEER KEVIN W. SMITH
DocuSigned by: Kevin Smith 3/26/2024
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