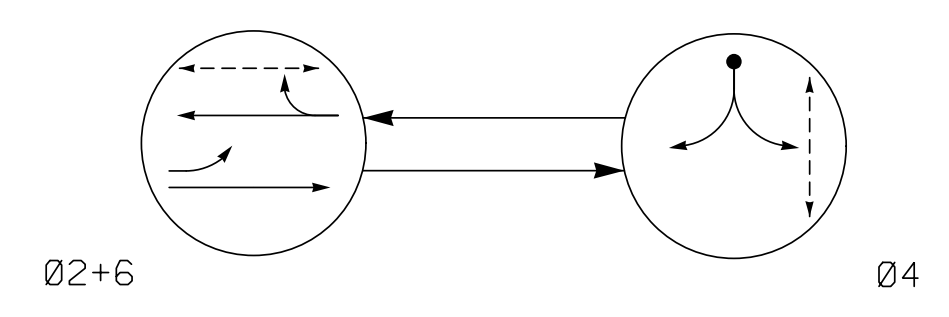


PHASING DIAGRAM



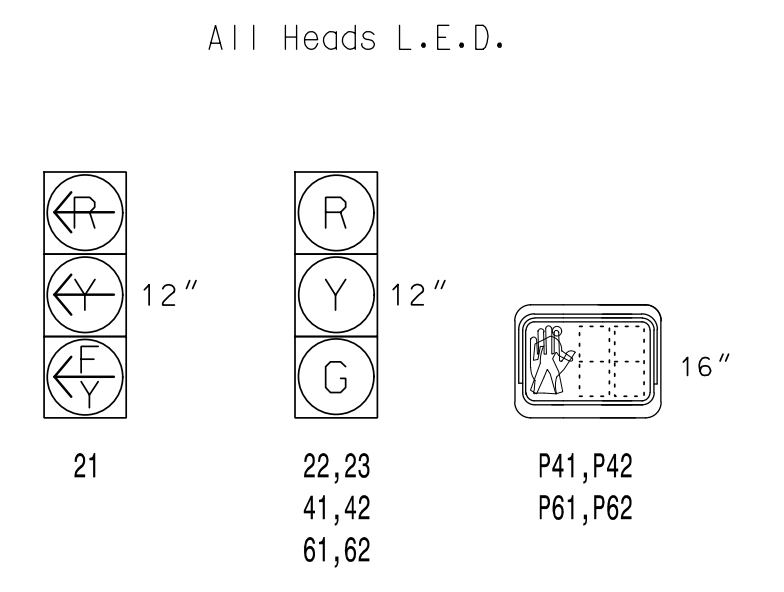
PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←...→ UNSIGNALIZED MOVEMENT
- ←- - - - -> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø4	FLASH
21	F	R	Y
22,23	G	R	Y
41,42	R	G	Y
61,62	G	R	Y
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK

SIGNAL FACE I.D.



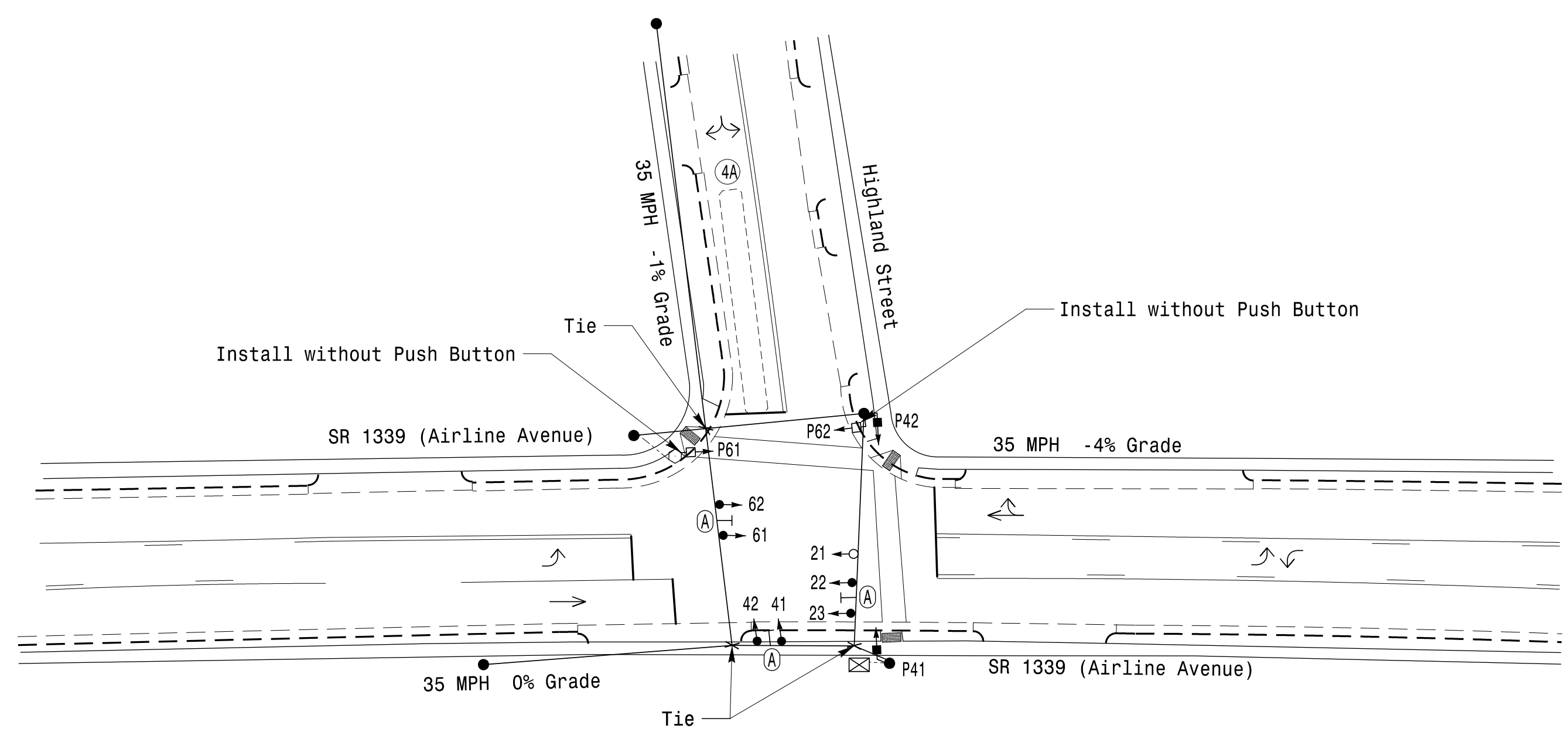
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
4A	6X60	0	EXIST	-	4	Yes	-	10	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal head(s) numbered 22 & 23.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls on phase 4.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on a new cabinet foundation.
- Existing signal heads 21 & 22 have been relabeled to 22 & 23, respectively.
- Rewire all intersection equipment to new cabinet.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed signal heads shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0058.



TIMING CHART

FEATURE	PHASE		
	2	4	6
Min Green *	10	7	10
Walk *	-	4	4
Ped Clear	-	12	11
Veh. Extension *	-	1.0	-
Max I *	35	20	35
Yellow	4.1	3.0	4.1
Red Clear	1.7	2.1	1.7
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	-	PED / MAX
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
●→ Modified Signal Head	○→ N/A
↓ Pedestrian Signal Head With Sign	↓ N/A
○ Type II Signal Pedestal	● Signal Pole with Guy
○ Signal Pole with Sidewalk Guy	● Signal Pole with Sidewalk Guy
⊠ Inductive Loop Detector	⊠ Inductive Loop Detector
□ Controller & Cabinet Junction Box	■ Controller & Cabinet Junction Box
- - - - - 2-in Underground Conduit	- - - - - 2-in Underground Conduit
N/A Right of Way	- - - - - Right of Way
→ Directional Arrow	→ Directional Arrow
N/A Curb Ramp	↯ Curb Ramp
Ⓐ Street Name Sign (D3-1)	Ⓐ Street Name Sign (D3-1)

Signal Upgrade

Prepared For:

 750 N. Greenfield Pkwy, Garner, NC 27529
 NC License #0102
 421 Fayetteville Street, Suite 600
 Raleigh, NC 27601
 (919) 677-2000

**SR 1339 (Airline Avenue)
at
Highland Street**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: CF Davis REVIEWED BY: KP Baumann

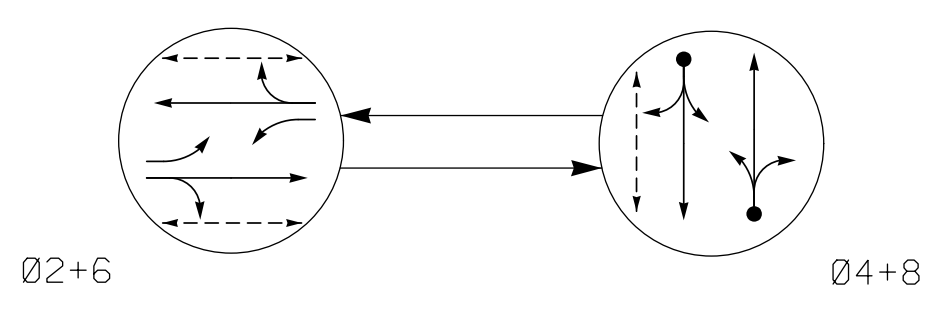
REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 KEVIN P. BAUMANN
 ENGINEER
 3/11/2022
 DATE
 SIG. INVENTORY NO. 12-0058

3/9/2022 11:15:17 AM Don'tell,Curt 3/9/2022 11:15:17 AM Don'tell,Curt 3/9/2022 11:15:17 AM Don'tell,Curt ***K:\meyer-horn.com\SE-RAL\MRAL-TIP\DK-TIS\011036569_Gastonia Signal System9_Signal\SW4 - Signal Design\ME120058-2021.dgn

PHASING DIAGRAM



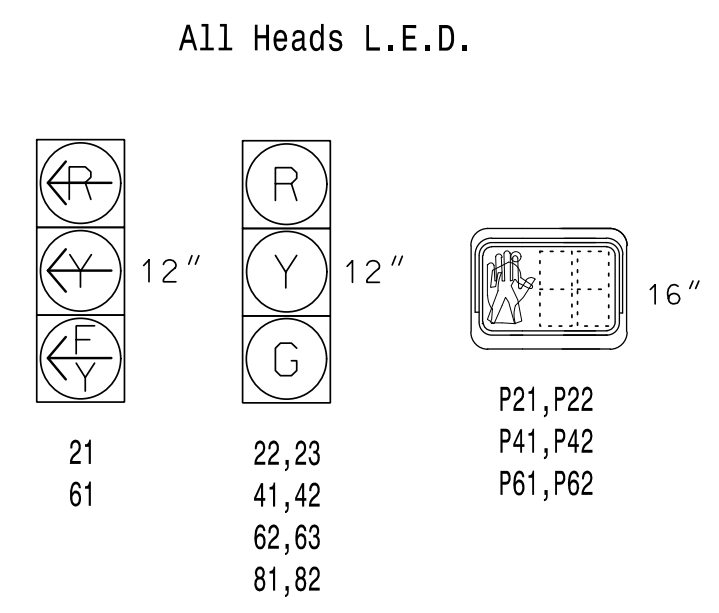
PHASING DIAGRAM DETECTION LEGEND

- ◄● DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄- UN SIGNALIZED MOVEMENT
- ◄- - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	F L H S
21	F	R	Y
22,23	G	R	Y
41,42	R	G	R
61	F	R	Y
62,63	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK

SIGNAL FACE I.D.

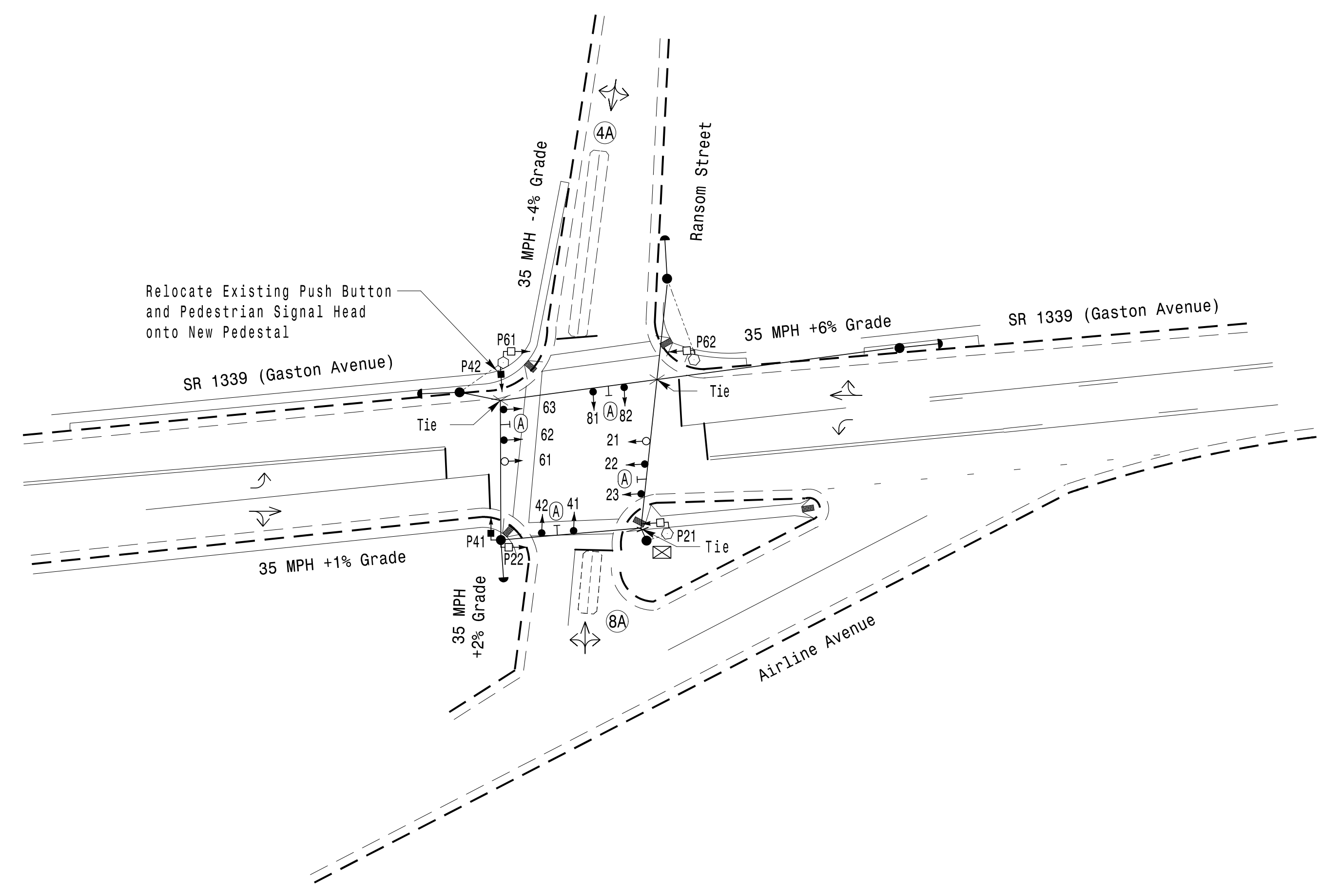


DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					TYPE	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL			
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
8A	6X20	0	2-4-2	-	8	Yes	-	-	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 22, 23, 62, and 63.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Existing signal heads 21, 22, 61, and 62 have been relabeled to 22, 23, 62, and 63, respectively.
- Install new cabinet on the existing foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed signal heads shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset #0059.



FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	4	4	4	-
Ped Clear	7	11	8	-
Veh. Extension *	-	2.0	-	3.0
Max I *	45	25	45	25
Yellow	3.8	4.1	3.8	4.1
Red Clear	1.5	2.1	1.5	2.1
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds /Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX RECALL	-	MAX RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

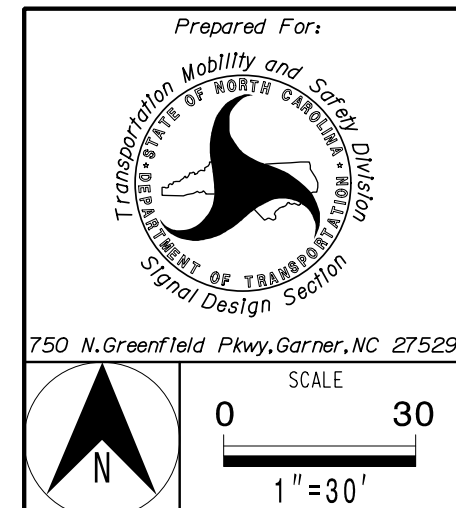
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
●→ Modified Signal Head	○→ Sign
□→ Pedestrian Signal Head With Push Button & Sign	■→ Signal Pole with Guy
○→ Type II Signal Pedestal	●→ Signal Pole with Sidewalk Guy
○→ Signal Pole with Guy	⊠→ Inductive Loop Detector
⊠→ Inductive Loop Detector	⊠→ Controller & Cabinet
□→ Junction Box	■→ Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A → Right of Way	→ Directional Arrow
N/A → Directional Arrow	↗ Curb Ramp
Ⓐ → Street Name Sign (D3-1)	Ⓐ → Street Name Sign (D3-1)

Signal Upgrade

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



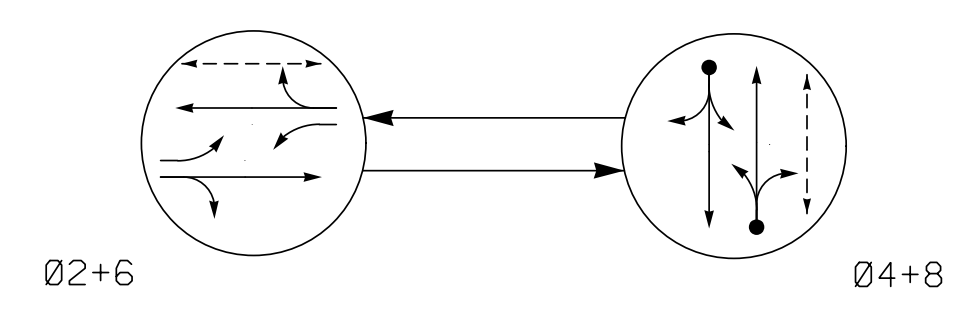
SR 1339 (Gaston Avenue) at Ransom Street	
Division 12	Gaston County Gastonia
PLAN DATE: May 2021	REVIEWED BY: SL Phillips
PREPARED BY: LL Matney	REVIEWED BY: KP Baumann
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Kevin P. Baumann
DATE: 3/11/2022
SIGNATURE: _____
DATE: _____
SIG. INVENTORY NO. 12-0059

3/9/2022 11:15:20 AM DanHelle.Curr1 ***Kimley-Horn.comSE_RAL\MRAL\TIPDK\TIS\011036569_Gastonia Signal System9_Signal\SW4 - Signal Design\ME120059-2021.dgn

PHASING DIAGRAM



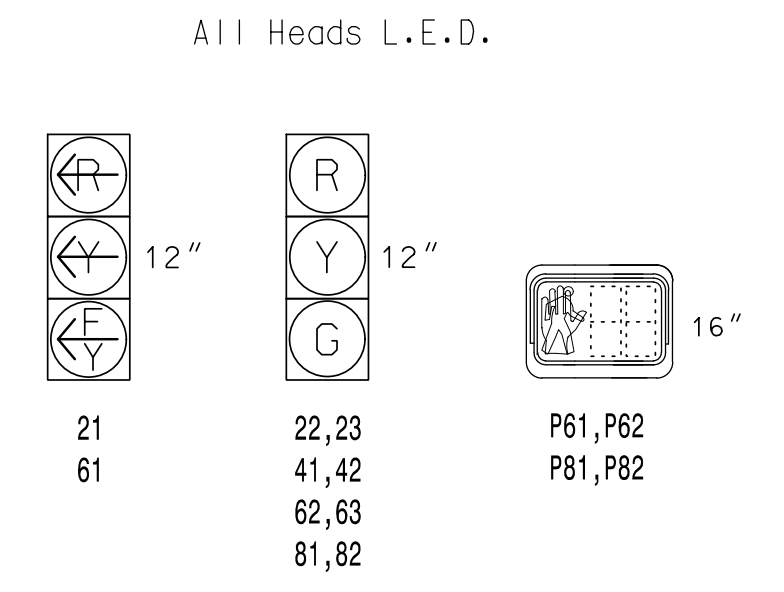
PHASING DIAGRAM DETECTION LEGEND

- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←--- UNSIGNALIZED MOVEMENT
- ←---> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21	F	R	Y
22,23	G	R	Y
41,42	R	G	R
61	F	R	Y
62,63	G	R	Y
81,82	R	G	R
P61,P62	W	DW	DRK
P81,P82	DW	W	DRK

SIGNAL FACE I.D.



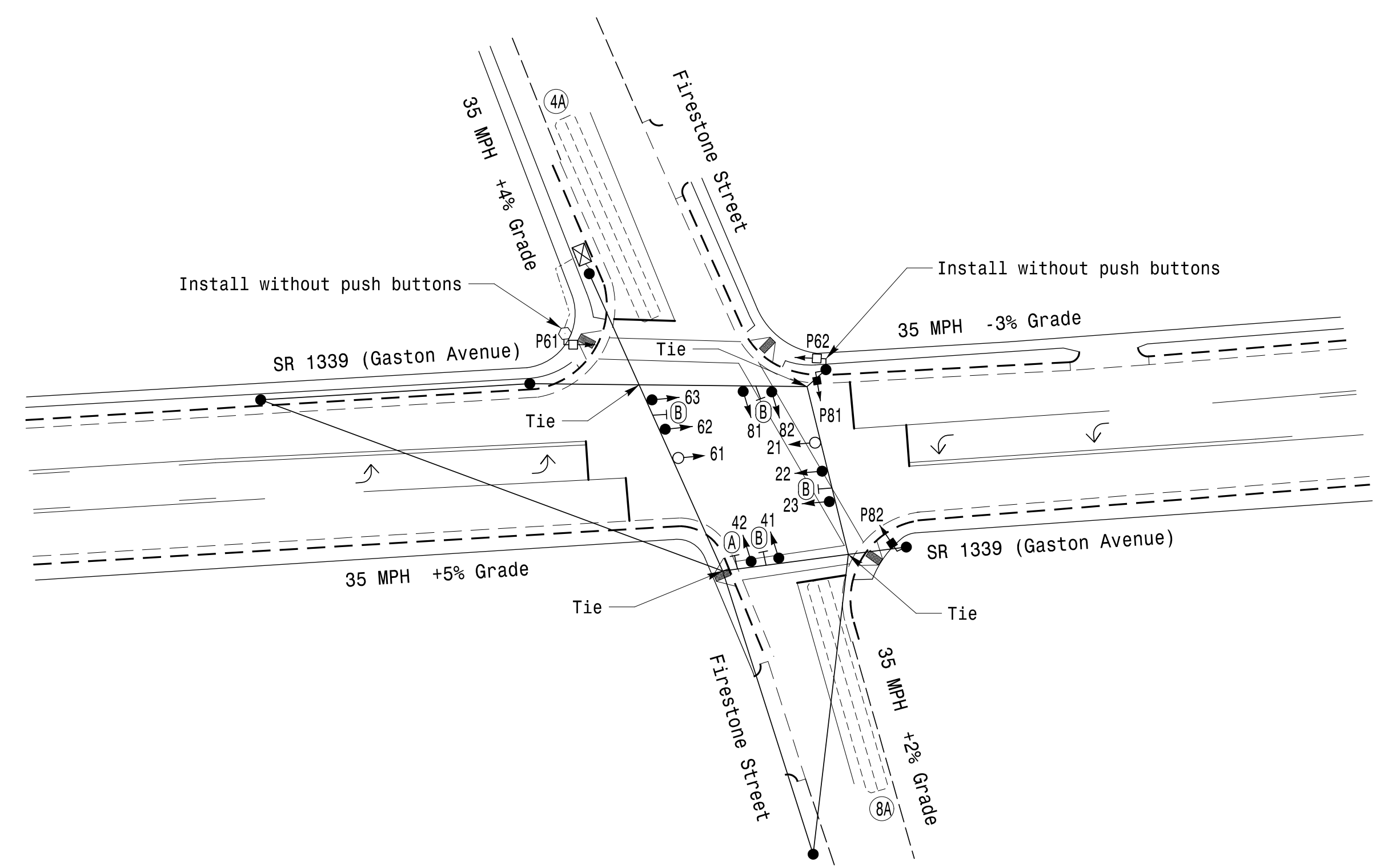
DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X60	0	2-4-2	-	4	Yes	-	10	-	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	10	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System

NOTES

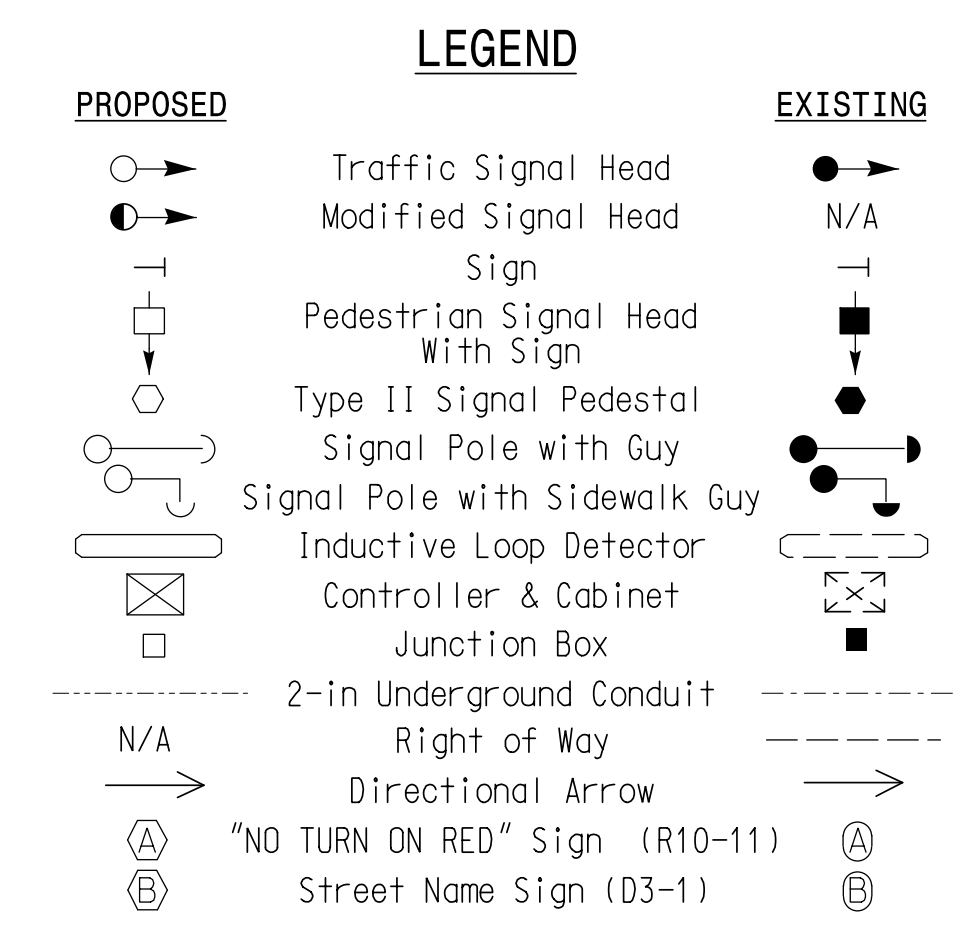
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Reposition existing signal heads numbered 22, 23, 62, 63, and P81.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls on phase 8.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Existing signal heads 21, 22, 61, & 62 have been relabeled to 22, 23, 62, & 63, respectively.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed signal heads shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0060.



TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	-	-	7	7
Ped Clear	-	-	9	15
Veh. Extension *	-	2.0	-	2.0
Max 1 *	35	20	35	20
Yellow	4.1	3.7	4.1	3.7
Red Clear	1.6	1.7	1.6	1.7
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	PED/MAX	-	PED/MAX	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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



Signal Upgrade

Prepared For:
Kimley-Horn

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

SR 1339 (Gaston Avenue) at Firestone Street

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

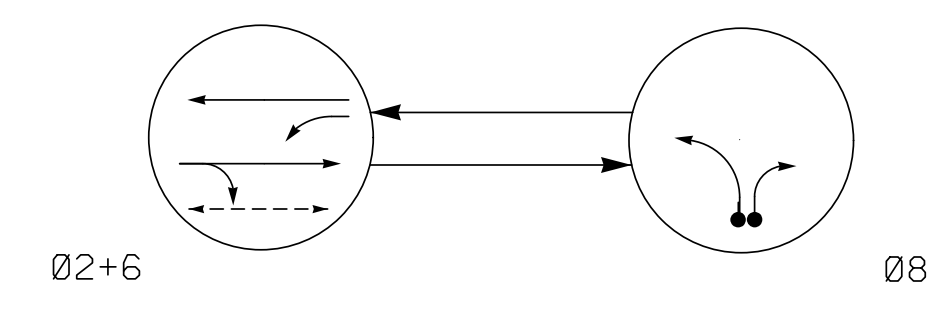
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Kevin P. Baumann
3/11/2022

SIG. INVENTORY NO. 12-0060

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PHASING DIAGRAM



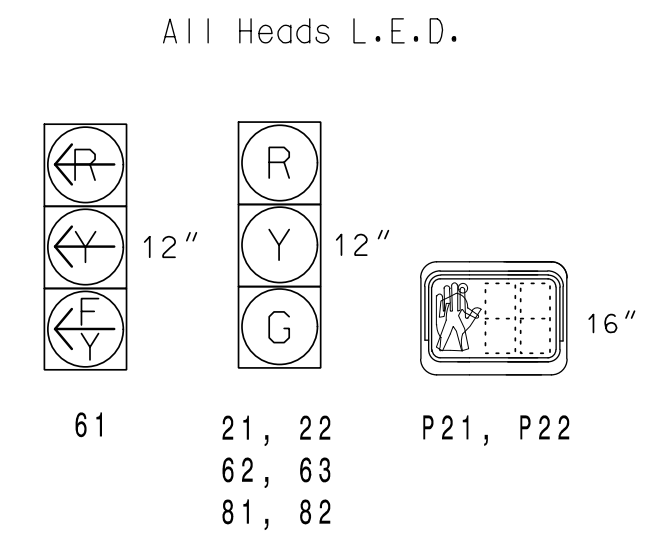
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	G	R	Y
21, 22	G	R	Y
61	W	DW	DRK
62, 63	G	R	Y
81, 82	R	G	R
P21, P22	W	DW	DRK

SIGNAL FACE I.D.



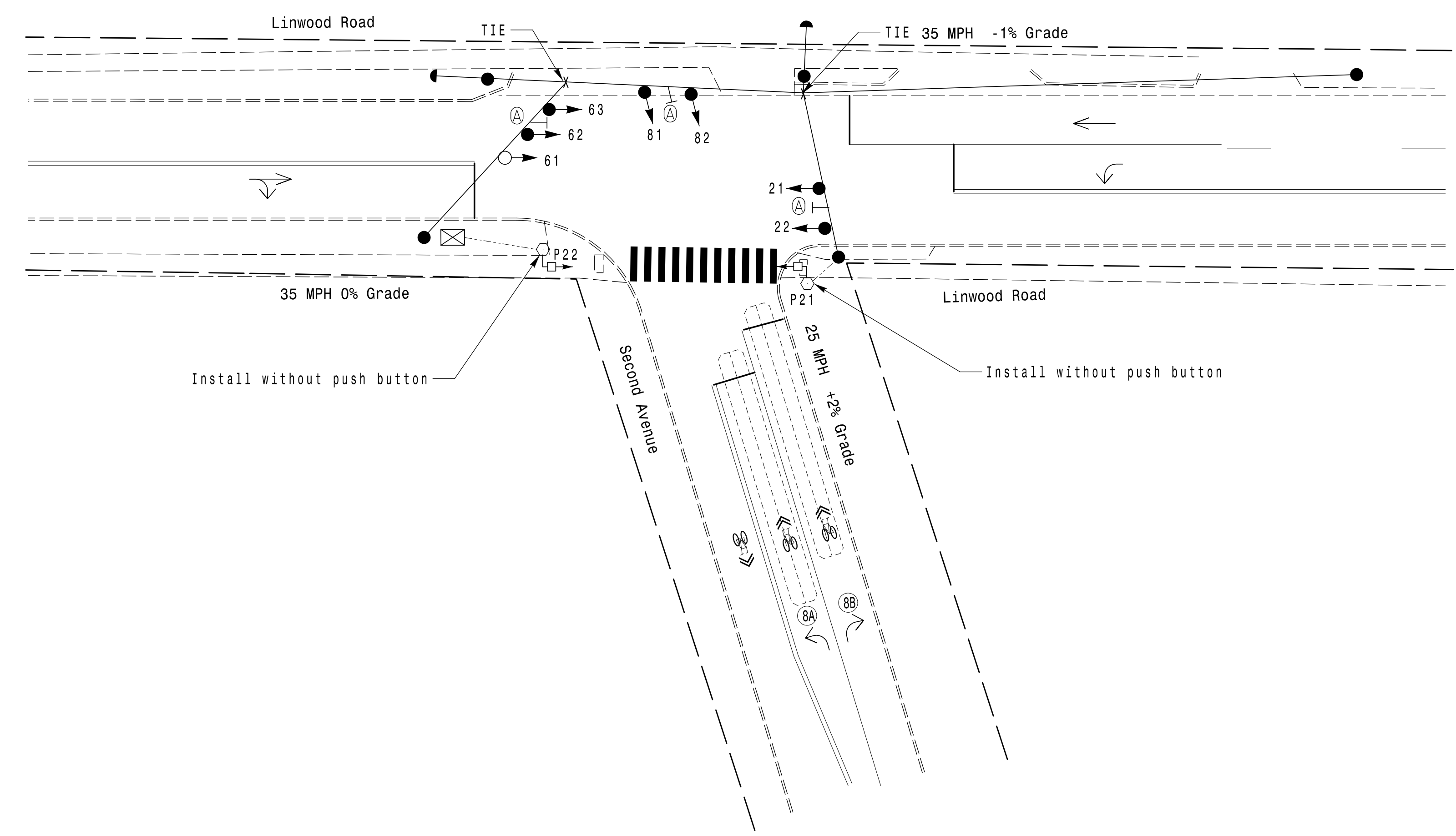
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
8A	6X60	+5	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	-	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Existing phase 4 has been changed to phase 8 on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian signal heads and pedestals shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset: #0061

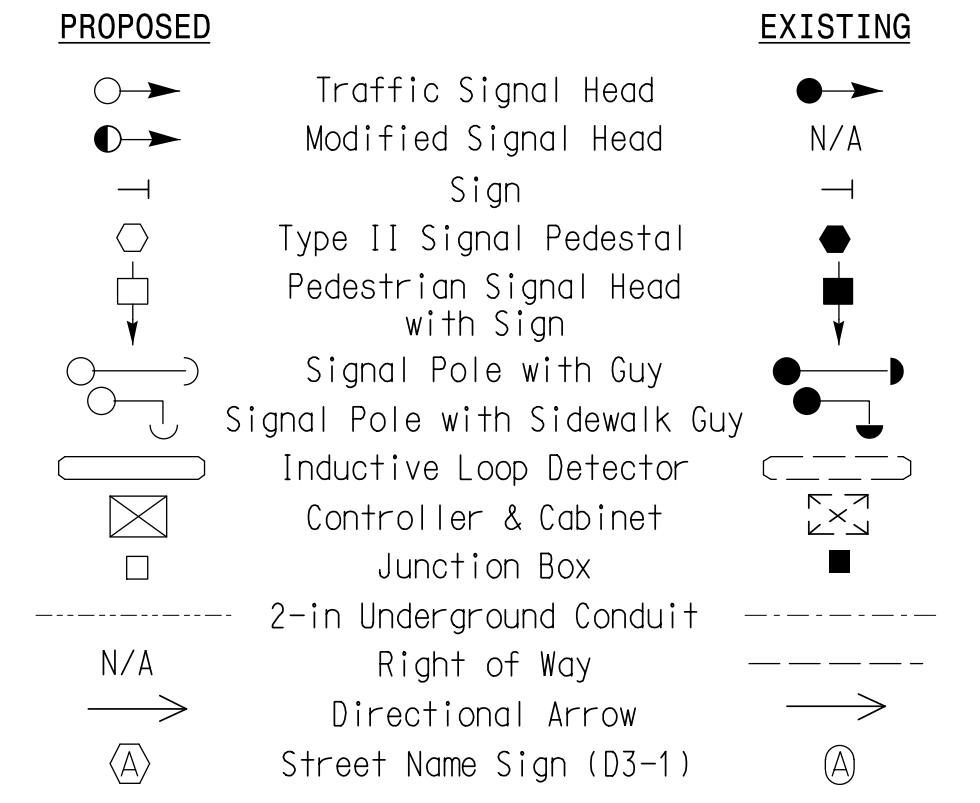


TIMING CHART

FEATURE	PHASE		
	2	6	8
Min Green *	10	10	7
Walk *	4	-	-
Ped Clear	8	-	-
Veh. Extension *	-	-	2.0
Max I *	45	45	25
Yellow	3.9	3.9	3.0
Red Clear	2.2	2.2	2.3
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	PED/MAX	MAX RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

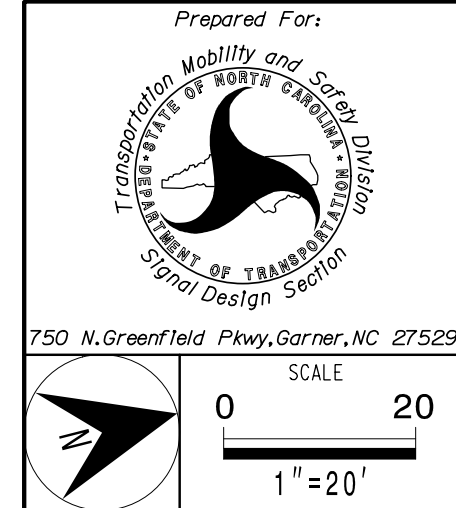
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND



Signal Upgrade

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



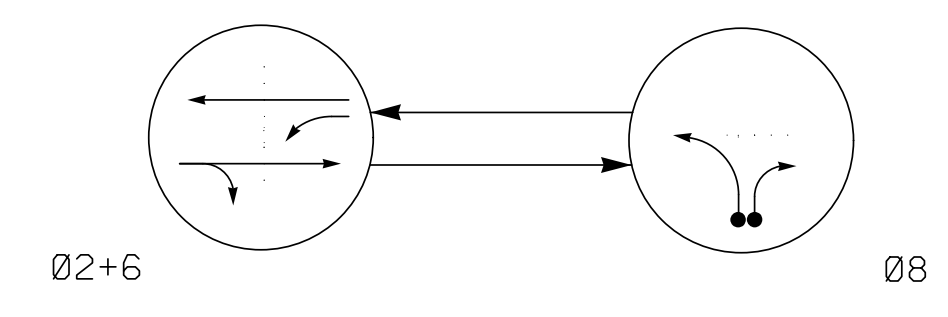
Prepared For:		Linwood Road at Second Avenue	
Division 12	Gaston County	Gastonia	
PLAN DATE:	May 2021	REVIEWED BY:	SL Phillips
PREPARED BY:	SP Pennington	REVIEWED BY:	KP Baumann
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Digitally signed by: *Kevin P. Baumann*
DATE: 3/11/2022
SHEET NO.: 12-0061

3/9/2022 11:13:23 AM D:\m181\le_c\p\1... **k:\miley-horn.com\SEL\RAL\IP\OK... ITS\01\03\6569 Gastonia Signal System\9 Signal Design\20061-2021.dgn

PHASING DIAGRAM



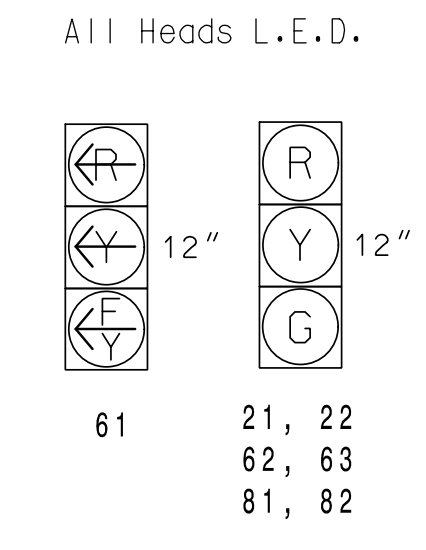
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	08	FLASH
21, 22	G	R	Y
61	Y	Y	Y
62, 63	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.



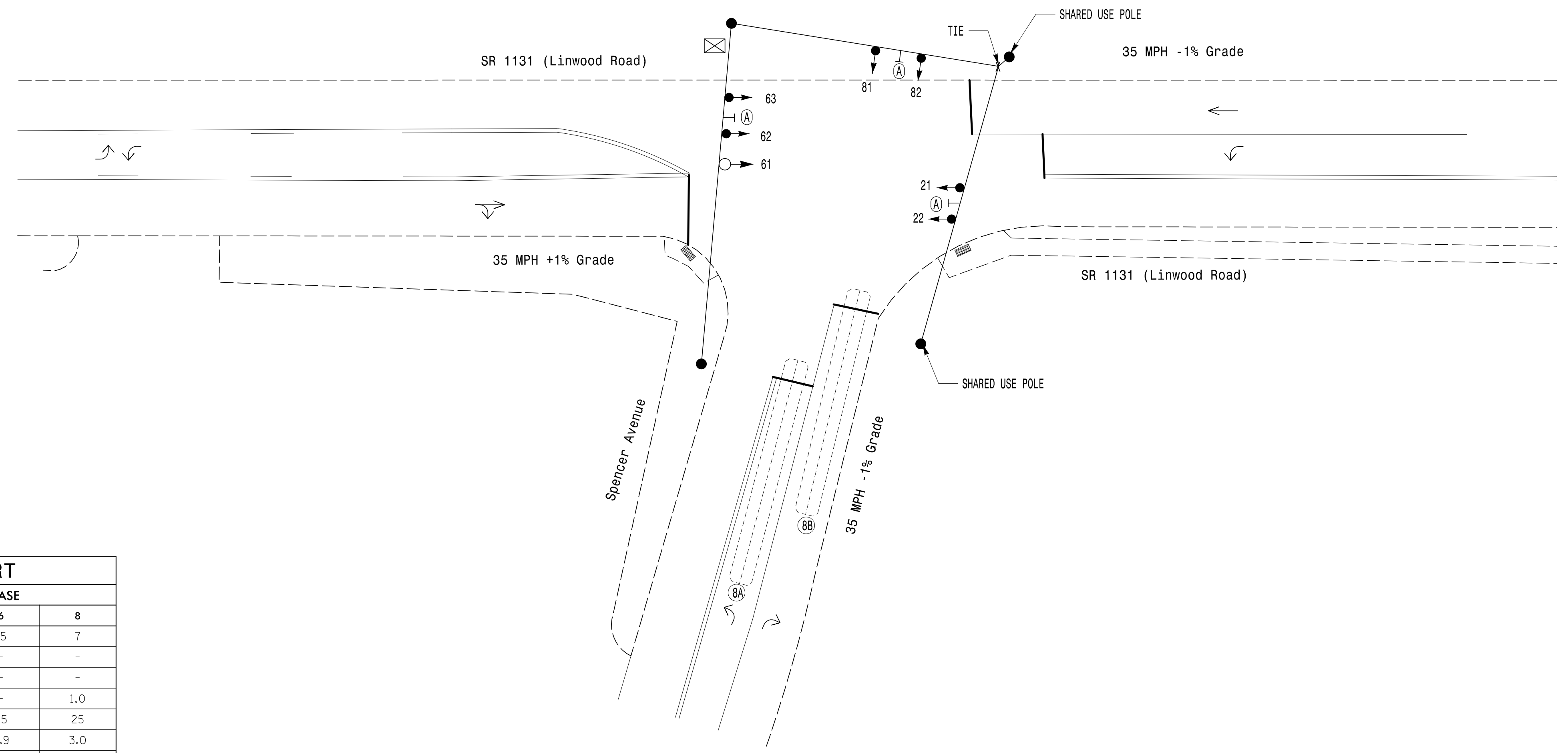
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
8A	6X60	+5	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	10	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Existing phase 4 has been changed to phase 8 on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. Install new cabinet on the existing cabinet foundation.
10. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
11. City system data
Controller Asset: #0063

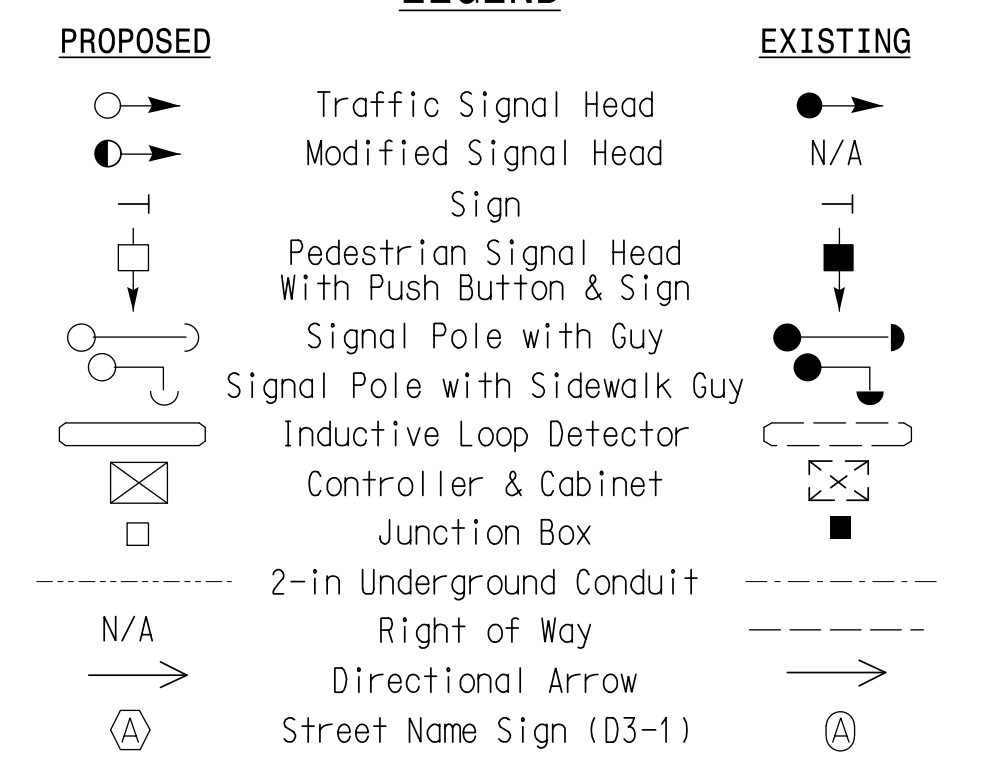


TIMING CHART

FEATURE	PHASE		
	2	6	8
Min Green *	15	15	7
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	-	-	1.0
Max I *	45	45	25
Yellow	3.9	3.9	3.0
Red Clear	1.4	1.4	2.4
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	MAX RECALL	-
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

LEGEND



Signal Upgrade

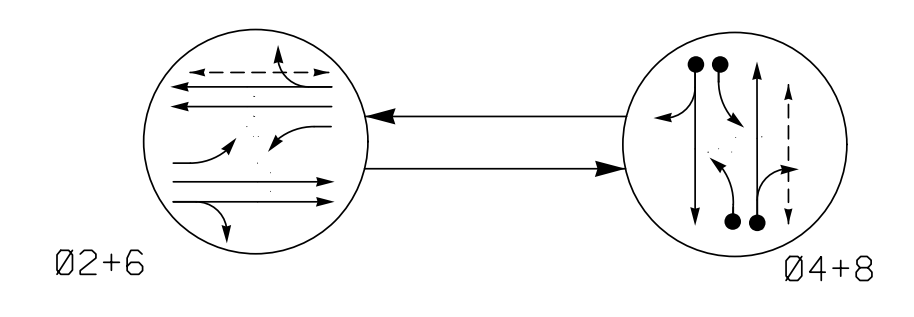
PLANS PREPARED IN THE OFFICE OF:
Kimley-Horn
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

	SR 1131 (Linwood Road) at Spencer Avenue	
	Division 12	Gaston County
	PLAN DATE: May 2021 PREPARED BY: SP Pennington	REVIEWED BY: SL Phillips REVIEWED BY: KP Baumann
SCALE: 1" = 20' 	REVISIONS:	INIT. DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/11/2022
DATE
SIC. INVENTORY NO. 12-0063

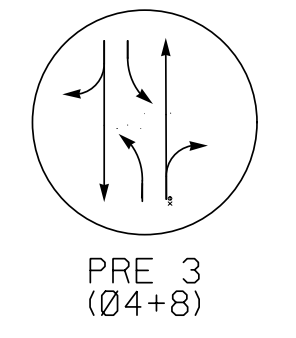
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

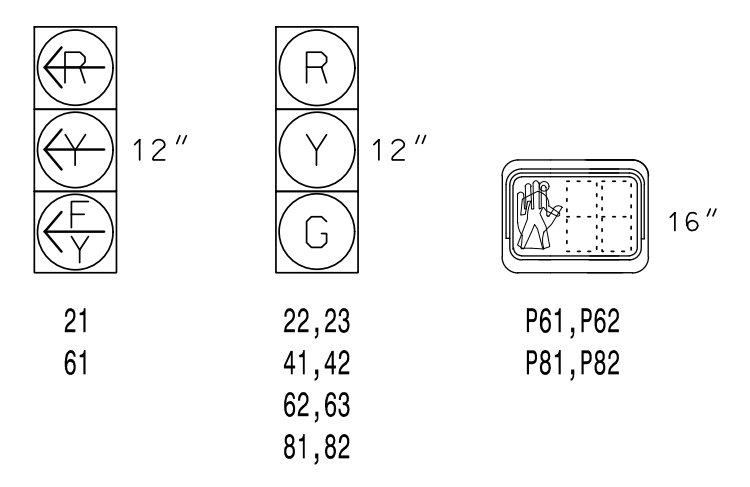
 ● DETECTED MOVEMENT
 ○ UNDETECTED MOVEMENT (OVERLAP)
 - UNSIGNALIZED MOVEMENT
 - PEDESTRIAN MOVEMENT

EV PREEMPT PHASES (Medium Priority)



SIGNAL FACE	PHASE			
	Ø2+6	Ø4+8	P81, P82	P61, P62
21	Y	R	R	Y
22, 23	G	R	R	Y
41, 42	F	G	G	R
61	F	R	R	Y
62, 63	G	R	R	Y
81, 82	R	G	G	R
P61, P62	W	DW	DW	DRK
P81, P82	DW	W	DW	DRK

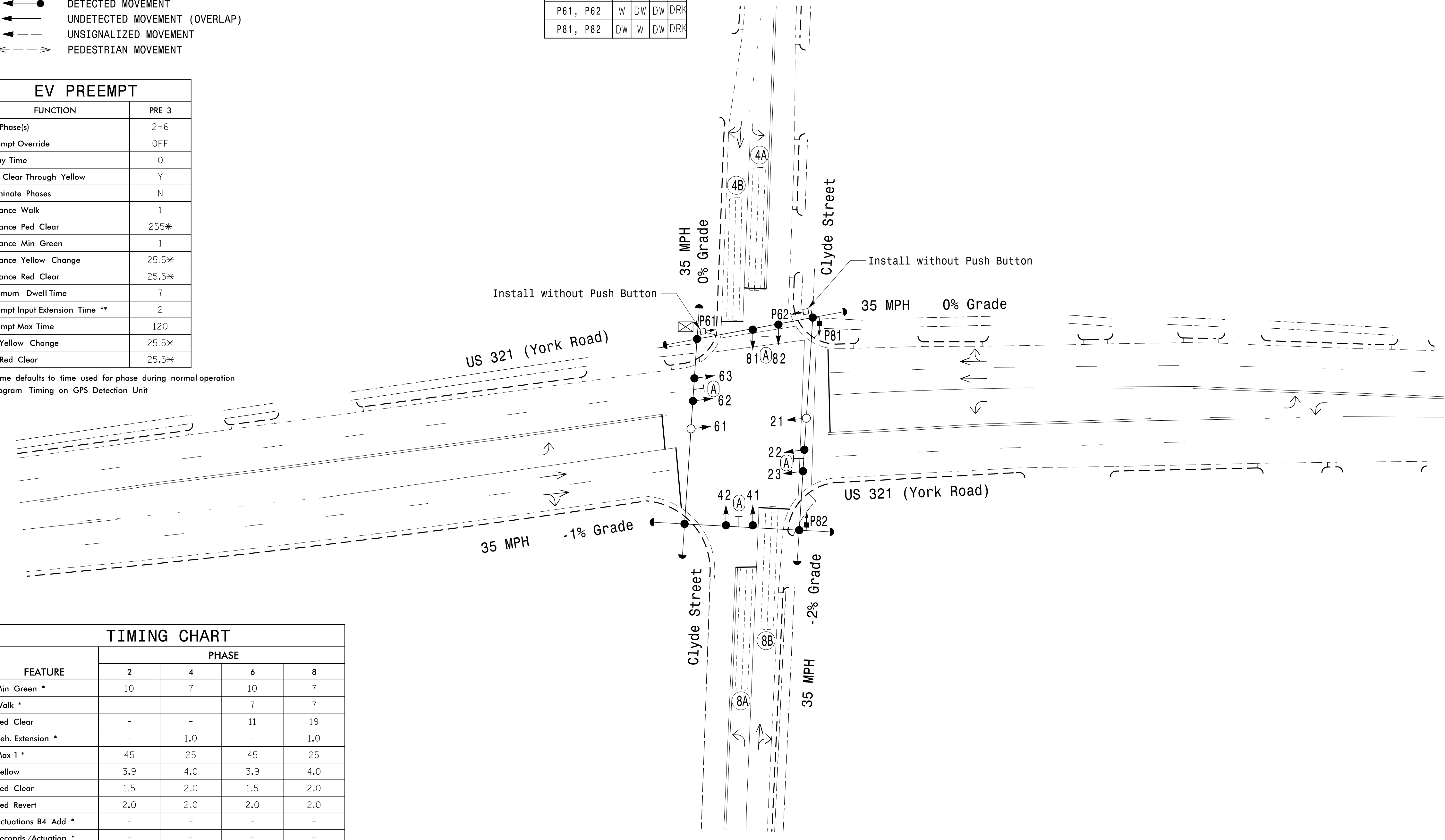
SIGNAL FACE I.D.



DETECTOR INSTALLATION CHART											
DETECTOR				PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	SYSTEM LOOP	NEW CARD
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	X
4B	6X60	0	2-4-2	-	4	Yes	-	5	-	N	X
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	N	X
8B	6X60	0	2-4-2	-	8	Yes	-	5	-	N	X

EV PREEMPT	
FUNCTION	PRE 3
Exit Phase(s)	2+6
Preempt Override	OFF
Delay Time	0
Ped Clear Through Yellow	Y
Terminate Phases	N
Entrance Walk	1
Entrance Ped Clear	255*
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Minimum Dwell Time	7
Preempt Input Extension Time **	2
Preempt Max Time	120
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

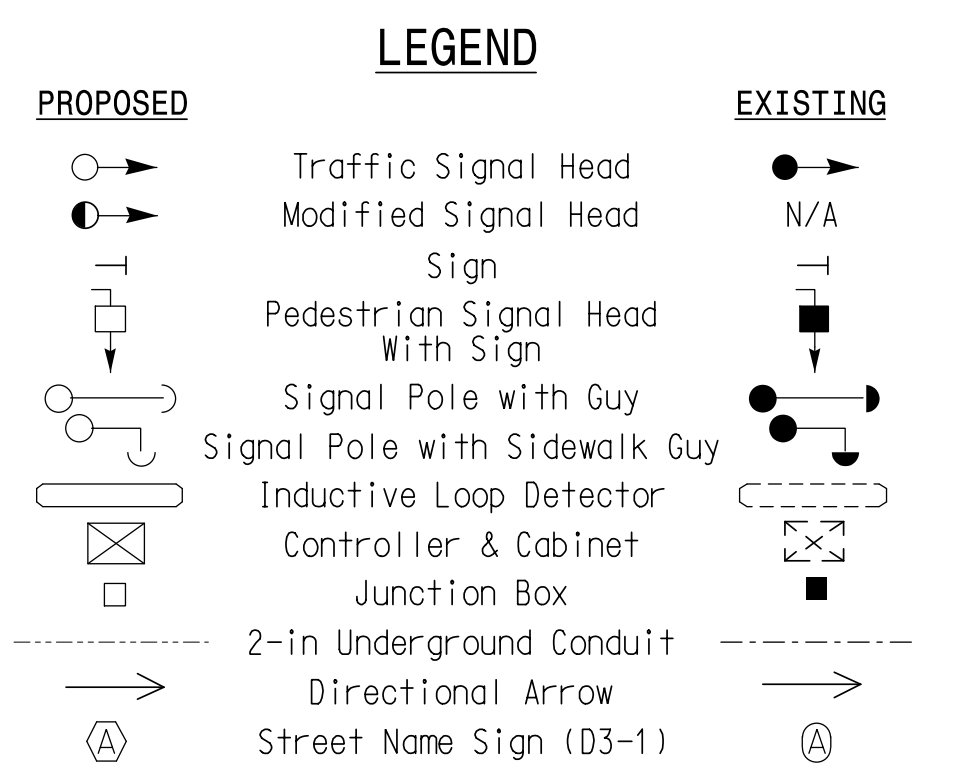
* Time defaults to time used for phase during normal operation
** Program Timing on GPS Detection Unit



FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	-	-	7	7
Ped Clear	-	-	11	19
Veh. Extension *	-	1.0	-	1.0
Max I *	45	25	45	25
Yellow	3.9	4.0	3.9	4.0
Red Clear	1.5	2.0	1.5	2.0
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	PED/MAX	-	PED/MAX	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

- 2 Phase Semi-Actuated w/ Emergency Vehicle Preemption Gastonia Signal System**
- NOTES**
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
 - Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
 - Reposition existing signal heads numbered 22, 23, 62, and 63.
 - Set all detector units to presence mode.
 - In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
 - Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
 - Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls on phase 8.
 - Program pedestrian heads to countdown the flashing "Don't Walk" time only.
 - Remove existing "Yield" signs-(R1-2).
 - Pavement markings are existing.
 - Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
 - Install new cabinet on the existing cabinet foundation.
 - All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
 - All proposed pedestrian signal heads shall be black in color. See Project Special Provisions for details.
 - Reconnect lead-in cable to separate loops 4A, 4B, 8A, & 8B as shown.
 - Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
 - City system data:
Controller Asset #0065.

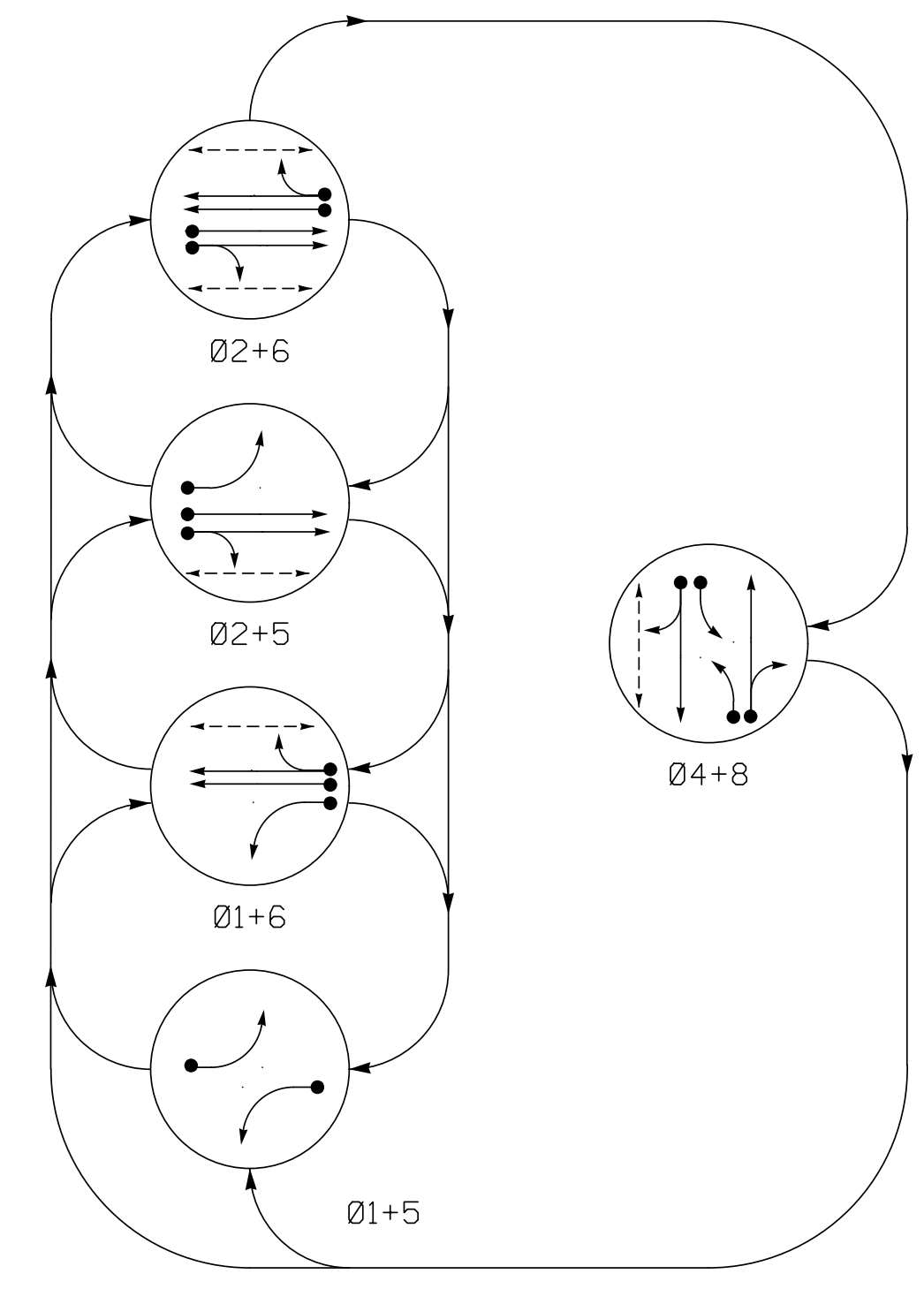


Signal Upgrade

 PLANS PREPARED IN THE OFFICE OF: Kimley-Horn 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	Prepared For: TRANSPORTATION MOBILITY AND SAFETY DIVISION DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
	US 321 (York Road) at Clyde Street		Division 12 Gaston County Gastonia	
PLAN DATE: May 2021 PREPARED BY: DM Curri	REVIEWED BY: SL Phillips REVIEWED BY: KP Baumann	Date: 3/11/2022 Signature: [Signature] Signature: [Signature]		
SCALE: 1" = 30'		S.I.G. INVENTORY NO. 12-0065		

3/9/2022 11:13:45 AM Dantelle.Curri

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

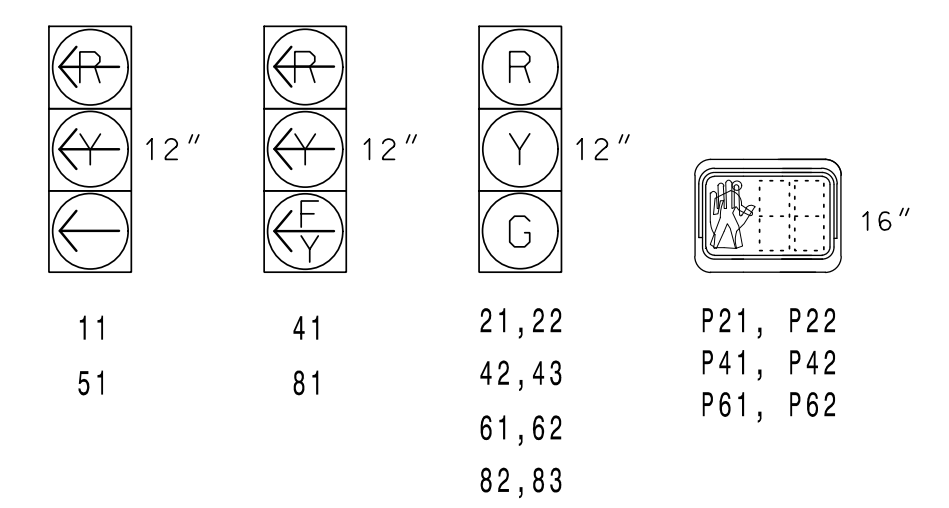
- DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UNSIGNALIZED MOVEMENT
- ⇄ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE				
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 8
11	←	←	→	→	→
21, 22	R	R	G	G	R
41	←	←	→	→	→
42, 43	R	R	R	R	G
51	←	←	→	→	→
61, 62	R	G	R	G	R
81	←	←	→	→	→
82, 83	R	R	R	G	R
P21, P22	DW	DW	W	W	DRK
P41, P42	DW	DW	DW	DW	DRK
P61, P62	DW	W	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.

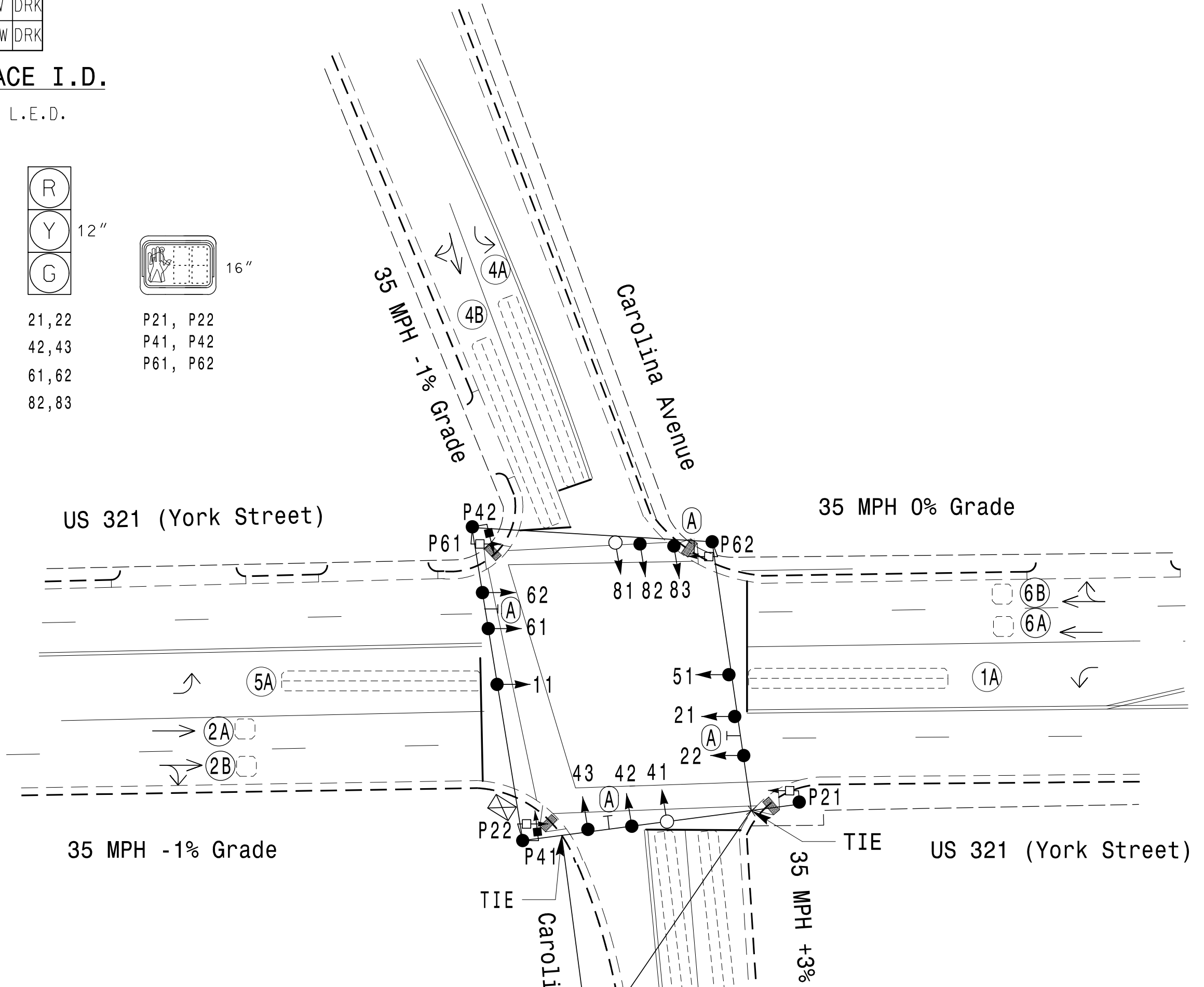


DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	3	-	N	-	X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	10	-	N	-	X
5A	6X60	0	2-4-2	-	5	Yes	-	3	-	N	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	0	2-4-2	-	8	Yes	-	10	-	N	-	X

5 Phase Fully Actuated Gastonia Signal System

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 42, 43, 82, and 83.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Remove existing "Left Turn Only" sign (R3-5L).
- Pavement markings are existing
- Install new cabinet on the existing cabinet foundation.
- Existing signal heads 41, 42, 81, and 82 have been relabeled to 42, 43, 82, and 83, respectively.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian signal heads shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset #0066.

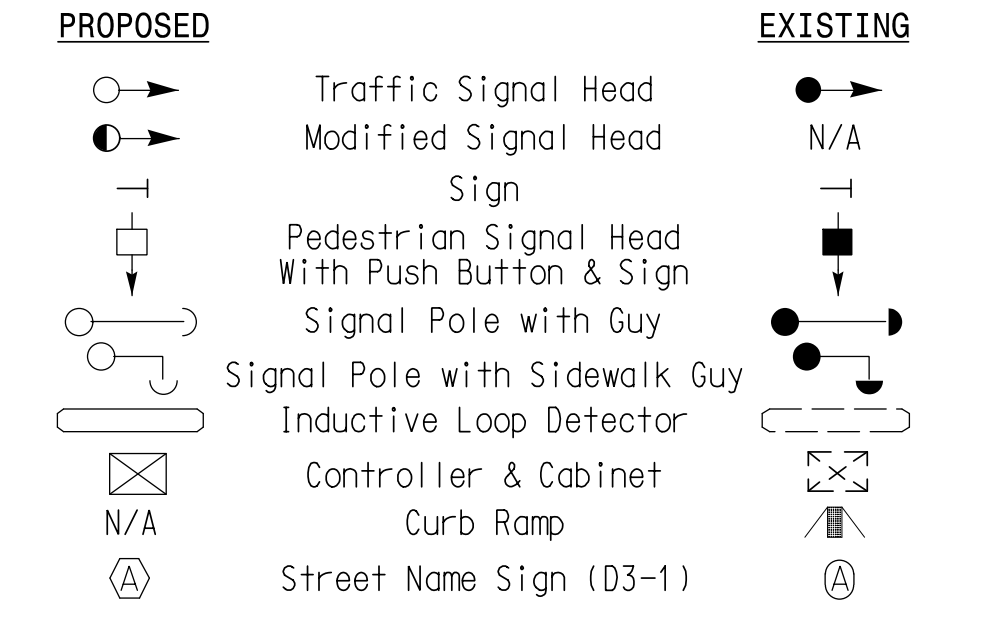


TIMING CHART

FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	10	7	7	10	7	
Walk *	-	7	7	-	7	-	
Ped Clear	-	17	22	-	14	-	
Veh. Extension *	1.0	3.0	1.0	1.0	3.0	2.0	
Max I *	20	45	25	20	45	25	
Yellow	3.0	3.9	3.9	3.0	3.8	3.9	
Red Clear	1.9	1.6	2.5	2.3	1.4	2.5	
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	
Actuations B4 Add *	-	-	-	-	-	-	
Seconds / Actuation *	-	-	-	-	-	-	
Max Initial *	-	-	-	-	-	-	
Time Before Reduction *	-	-	-	-	-	-	
Time To Reduce *	-	-	-	-	-	-	
Minimum Gap	-	-	-	-	-	-	
Locking Detector	-	X	-	-	X	-	
Recall Position	-	MIN RECALL	-	-	MIN RECALL	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	

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

LEGEND



Signal Upgrade

Prepared For:

 750 N. Greenfield Pkwy, Garner, NC 27529
 NC License #0102
 421 Fayetteville Street, Suite 600
 Raleigh, NC 27601
 (919) 677-2000

US 321 (York Street) at Carolina Avenue

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: CF Davis REVIEWED BY: KP Baumann

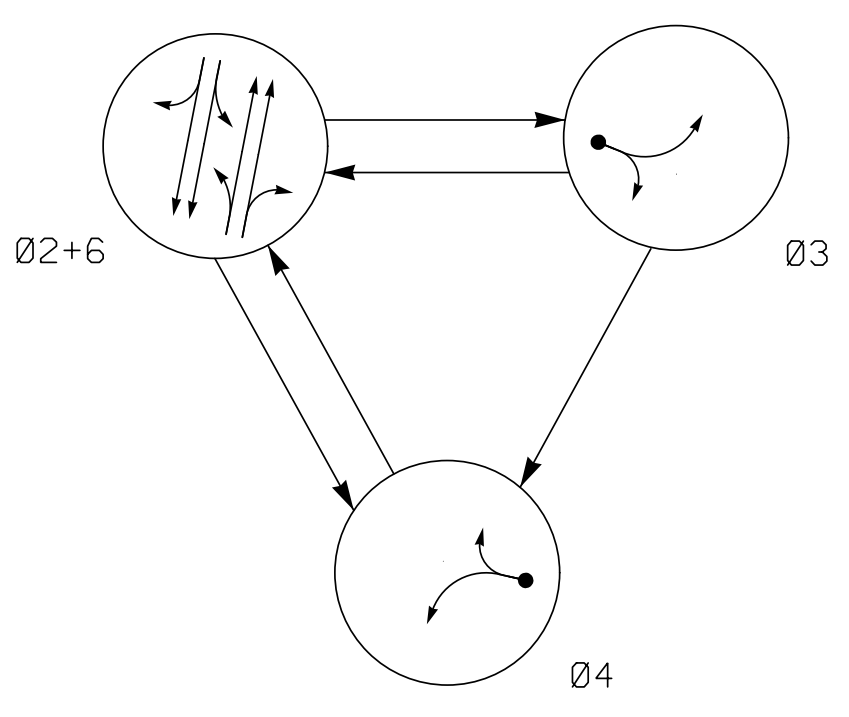
REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 KEVIN P. BAUMANN
 ENGINEER
 3/11/2022
 DATE
 SIG. INVENTORY NO. 12-0066

3/9/2022 11:13:47 AM Dantellb.Cur1 ***Kimley-Horn.com/E-RAL/IRAL_TIP/DK-LTS/K01036569_Gastonia Signal System9_Signal/WS4 - Signal Design/12066-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

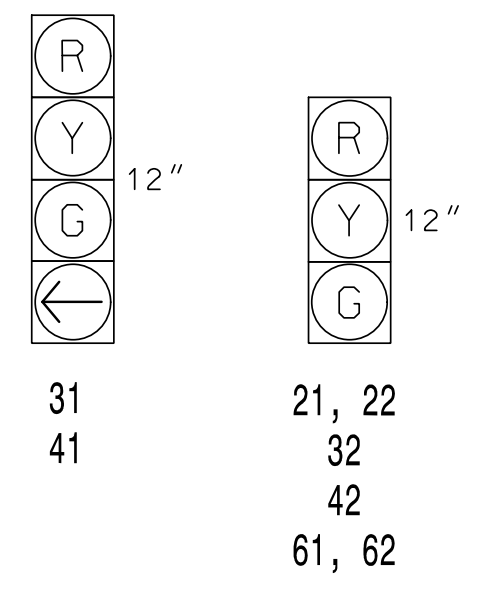
SIGNAL FACE	PHASE			
	Ø 2 + 6	Ø 3	Ø 4	FLIGHT
21, 22	G	R	R	Y
31	R	G	R	R
32	R	G	R	R
41	R	R	G	R
42	R	R	G	R
61, 62	G	R	R	Y

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
3A	6X40	0	2-4-2	-	3	Yes	-	-	-	N	-	X
3B	6X6	0	EXIST	-	3	Yes	-	10	-	N	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	-	-	N	-	X
S1	6X6	+540	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+540	EXIST	-	-	No	-	-	-	N	X	X

SIGNAL FACE I.D.

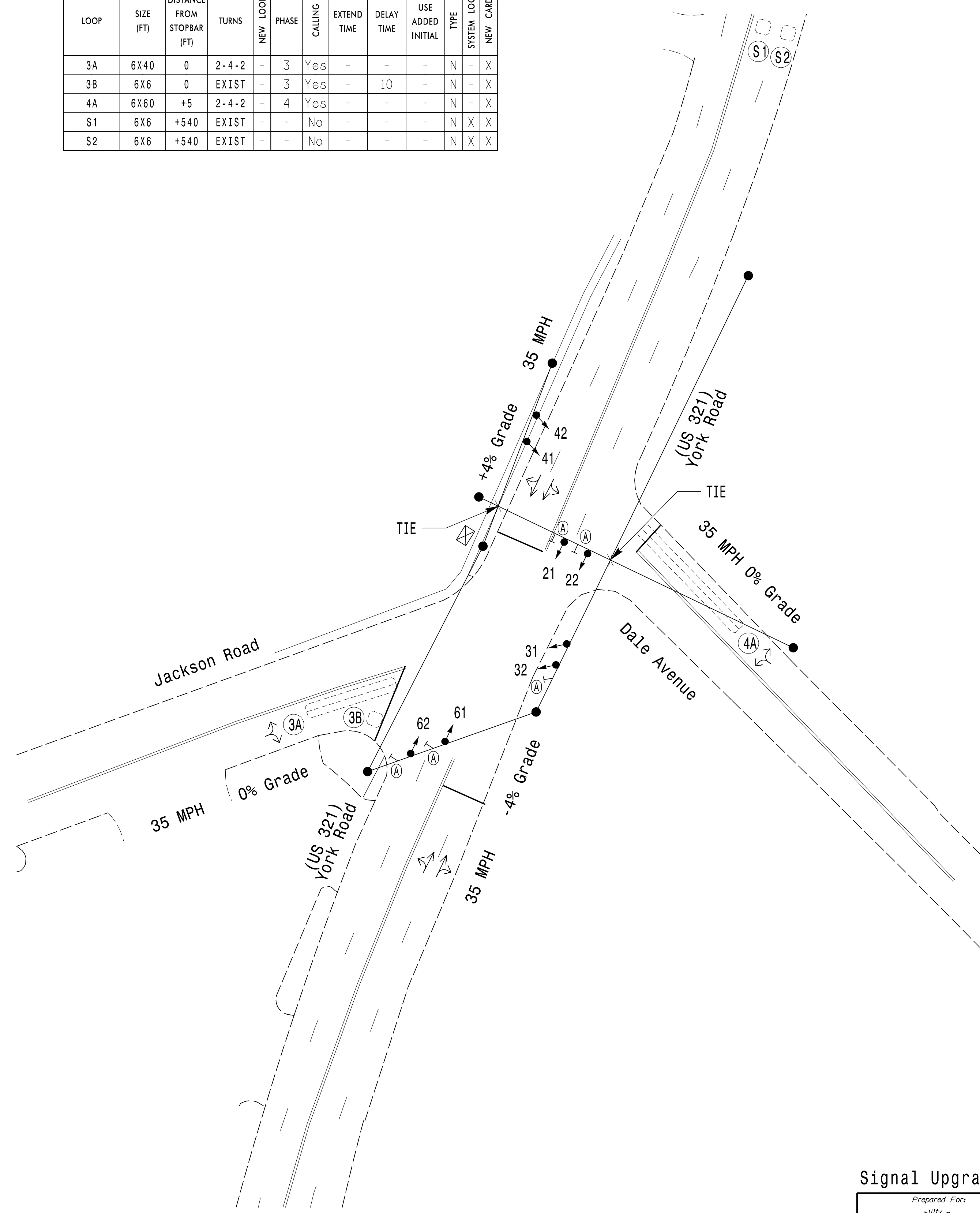
All Heads L.E.D.



TIMING CHART

FEATURE	PHASE			
	2	3	4	6
Min Green *	10	10	7	10
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	-	3.0	2.0	-
Max 1 *	45	25	25	45
Yellow	4.1	3.0	3.0	4.1
Red Clear	3.0	3.9	4.1	3.0
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX RECALL	-	-	MAX RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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



3 Phase Semi-Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset: #0067

LEGEND

- | PROPOSED | EXISTING |
|----------|----------|
| | |
| | N/A |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| N/A | |
| | |
| | |

Signal Upgrade

Prepared For:

 750 N. Greenfield Pkwy, Garner, NC 27529
 NC License #0102
 421 Fayetteville Street, Suite 600
 Raleigh, NC 27601
 (919) 677-2000

(US 321) York Rd. at Jackson Rd./Dale Ave.

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

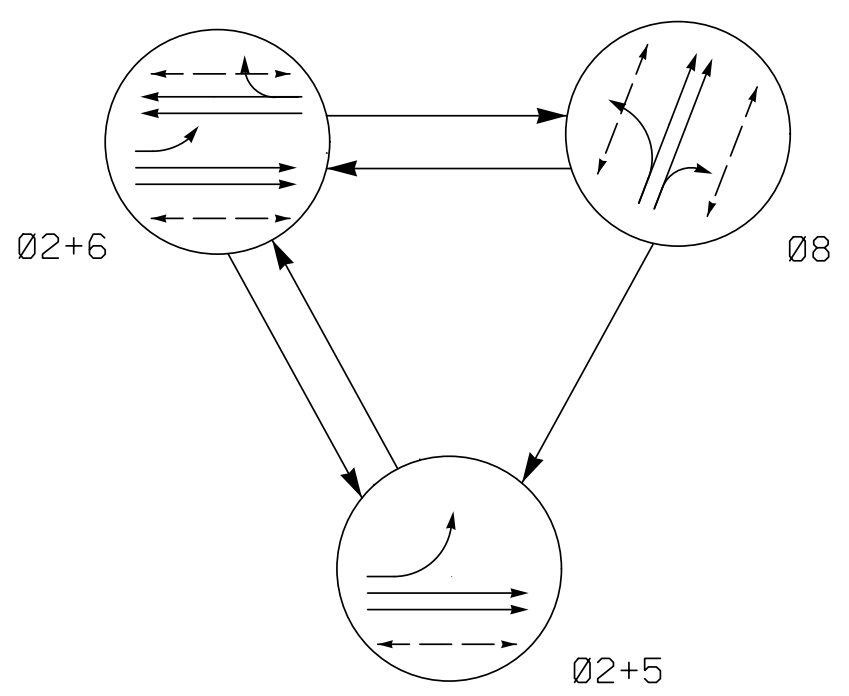
DocuSigned by:

 DATE: 3/11/2022

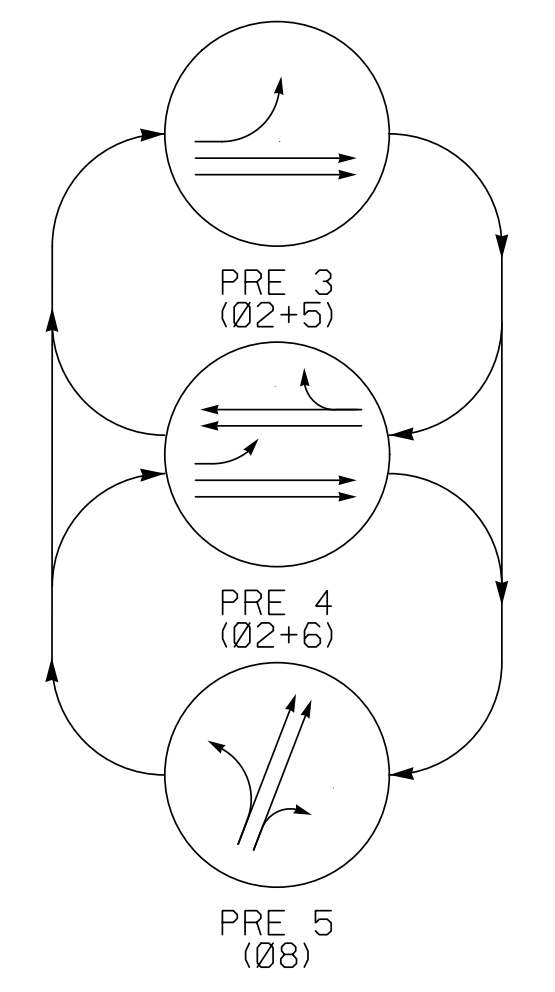
SIG. INVENTORY NO. 12-0067

3/9/2022 11:13:50 AM Dantellb.Cur1 ***Kimley-Horn.com\\E-RAL\\RAL-TIP\\DK-LTS\\011036569 Gastonia Signal System9 Signal\\KS4 - Signal Design\\C12067-2021.dgn

DEFAULT PHASING DIAGRAM



DEFAULT EV PREEMPT PHASES (Medium Priority)

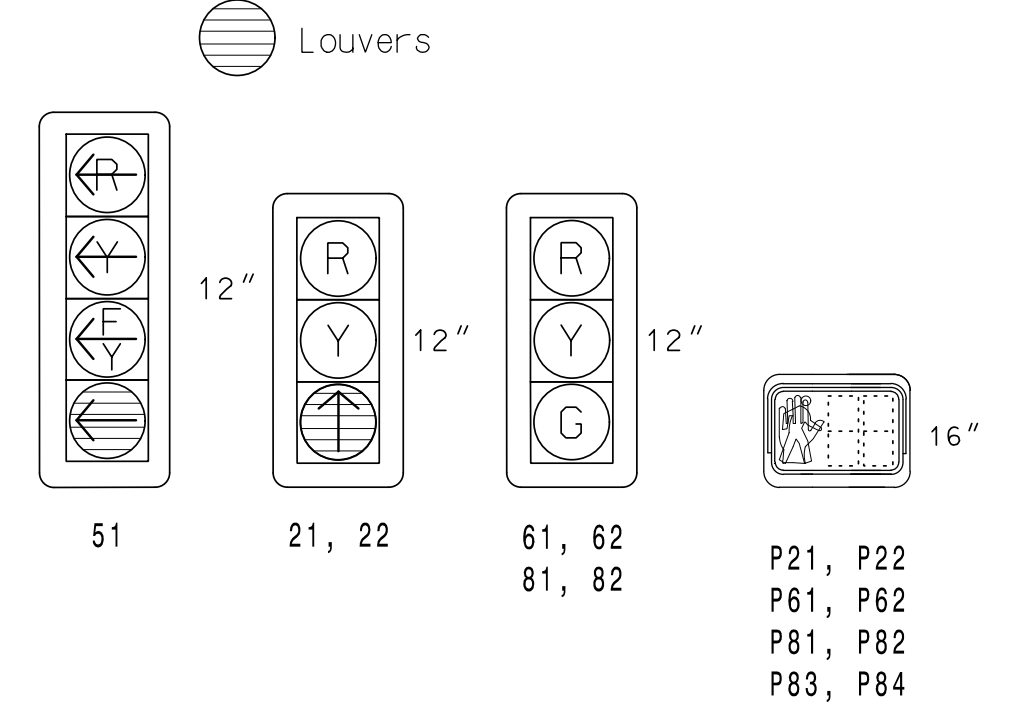


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

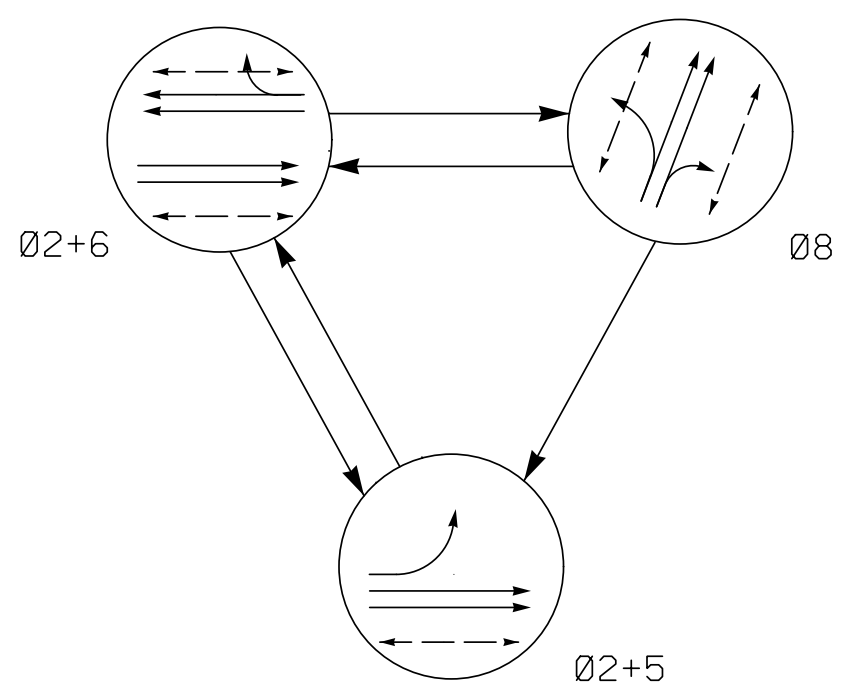
All Heads L.E.D.
All heads have backplates with reflective borders.



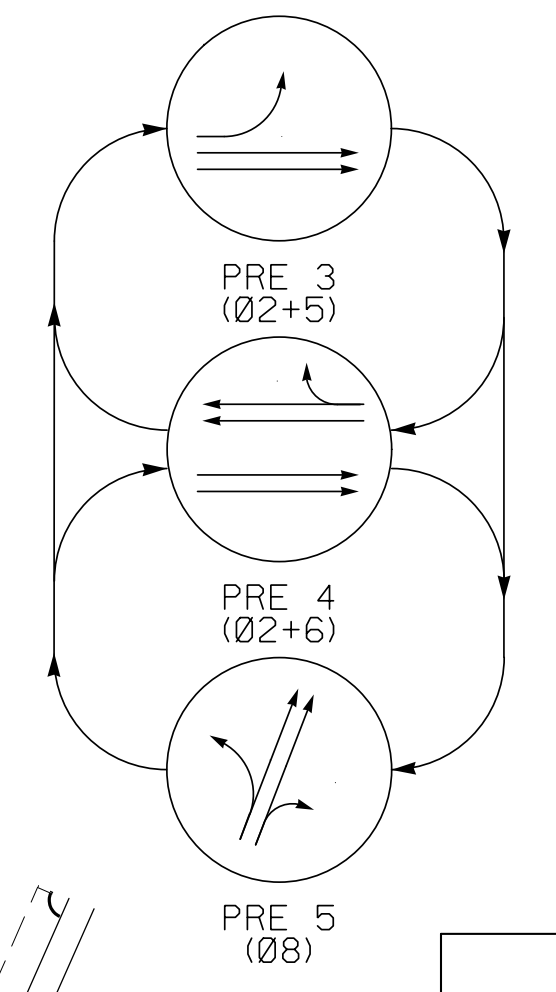
DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	02+5	02+6	08	PRE 3	PRE 4	PRE 5	FLASH	
21, 22	↑	↑	R	↑	↑	R	Y	
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	R	G	R	Y	
81, 82	R	R	G	R	R	G	R	
P21, P22	W	W	DW	DW	DW	DW	DRK	
P61, P62	DW	W	DW	DW	DW	DW	DRK	
P81, P82	DW	DW	W	DW	DW	DW	DRK	
P83, P84	DW	DW	W	DW	DW	DW	DRK	

ALTERNATE PHASING DIAGRAM



ALTERNATE EV PREEMPT PHASES (Medium Priority)



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	02+5	02+6	08	PRE 3	PRE 4	PRE 5	FLASH	
21, 22	↑	↑	R	↑	↑	R	Y	
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	R	G	R	Y	
81, 82	R	R	G	R	R	G	R	
P21, P22	W	W	DW	DW	DW	DW	DRK	
P61, P62	DW	W	DW	DW	DW	DW	DRK	
P81, P82	DW	DW	W	DW	DW	DW	DRK	
P83, P84	DW	DW	W	DW	DW	DW	DRK	

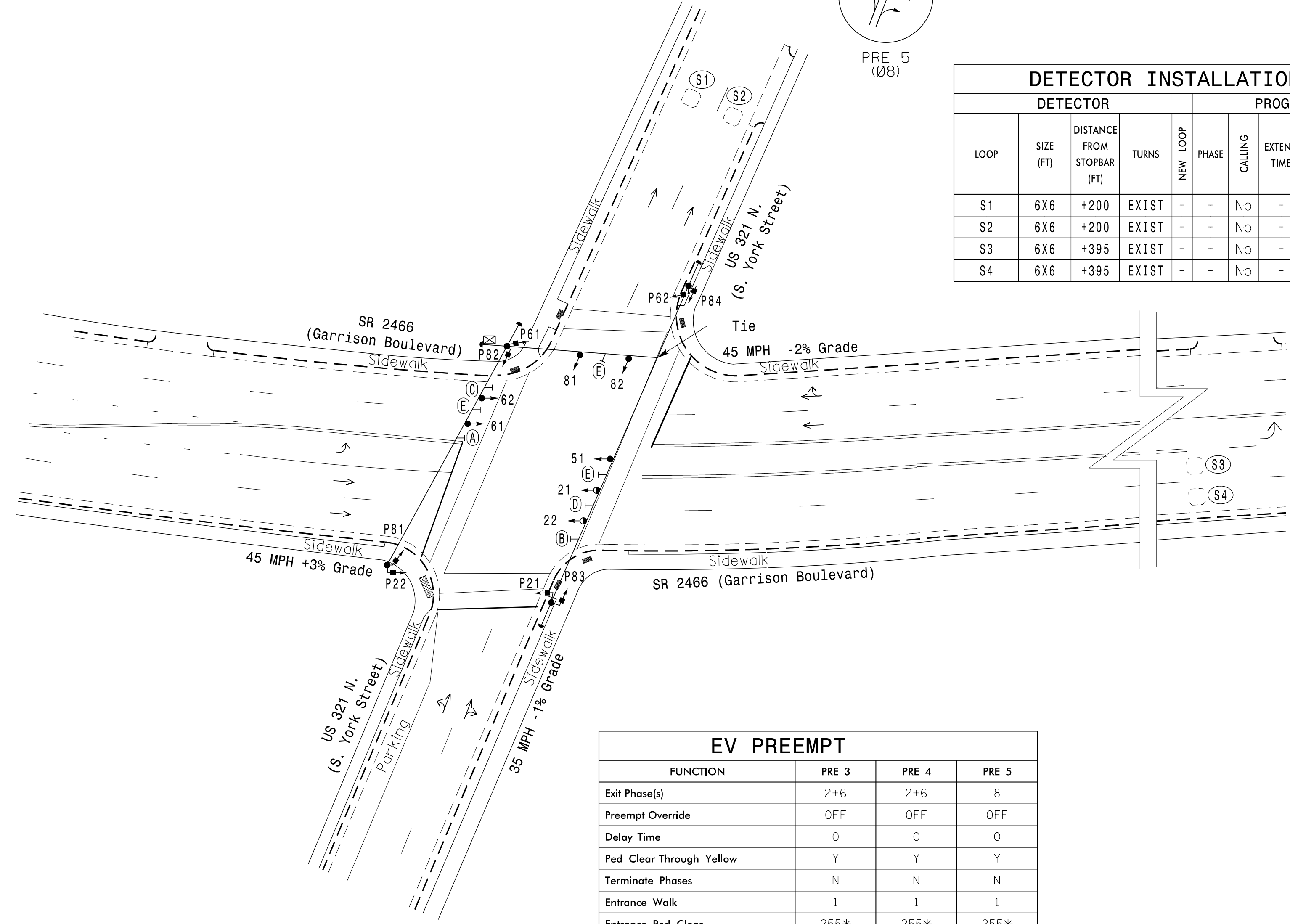
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
S1	6X6	+200	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	+200	EXIST	-	-	No	-	-	-	N	X	X
S3	6X6	+395	EXIST	-	-	No	-	-	-	N	X	X
S4	6X6	+395	EXIST	-	-	No	-	-	-	N	X	X

3 Phase Pre-Timed w/ Alternate Phasing Operation and Emergency Vehicle Preemption Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- The City Engineer or their representative 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 shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Existing signal heads 41 and 42 have been relabeled to 81 and 82, respectively.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City system data: Controller Asset #0068.



EV PREEMPT

FUNCTION	PRE 3	PRE 4	PRE 5
Exit Phase(s)	2+6	2+6	8
Preempt Override	OFF	OFF	OFF
Delay Time	0	0	0
Ped Clear Through Yellow	Y	Y	Y
Terminate Phases	N	N	N
Entrance Walk	1	1	1
Entrance Ped Clear	255*	255*	255*
Entrance Min Green	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*
Minimum Dwell Time	7	7	7
Preempt Input Extension Time **	2	2	2
Preempt Max Time	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*

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

TIMING CHART

FEATURE	PHASE			
	2	5	6	8
Min Green *	12	7	12	7
Walk *	7	-	7	7
Ped Clear	9	-	9	22
Veh. Extension *	-	-	-	-
Max 1 *	45	20	45	30
Yellow	4.7	3.0	4.7	3.9
Red Clear	1.6	2.9	1.6	2.3
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	PED/MAX	MAX RECALL	PED/MAX	PED/MAX
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ Traffic Signal Head	○ Traffic Signal Head
○ Modified Signal Head	○ Modified Signal Head
○ Pedestrian Signal Head With Sign	○ Pedestrian Signal Head With Sign
○ Type II Signal Pedestal	○ Type II Signal Pedestal
○ Signal Pole with Guy	○ Signal Pole with Guy
○ Signal Pole with Sidewalk Guy	○ Signal Pole with Sidewalk Guy
⊗ Inductive Loop Detector	⊗ Inductive Loop Detector
□ Controller & Cabinet	□ Controller & Cabinet
□ Junction Box	□ Junction Box
○ 2-in Underground Conduit	○ 2-in Underground Conduit
○ Right of Way	○ Right of Way
→ Directional Arrow	→ Directional Arrow
(A) No Left Turn Sign (R3-2)	(A) No Left Turn Sign (R3-2)
(B) No Right Turn Sign (R3-1)	(B) No Right Turn Sign (R3-1)
(C) "ONE WAY" Sign (R6-1R)	(C) "ONE WAY" Sign (R6-1R)
(D) "ONE WAY" Sign (R6-1L)	(D) "ONE WAY" Sign (R6-1L)
(E) Street Name Sign (D3-1)	(E) Street Name Sign (D3-1)

Signal Upgrade

Prepared For: **US 321 N. (S. York Street) at SR 2466 (Garrison Boulevard)**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

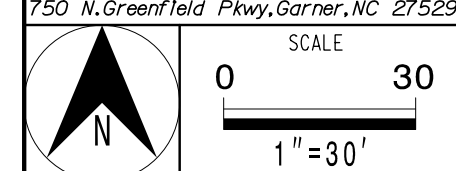
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

Discussed by: _____ DATE: 3/11/2022

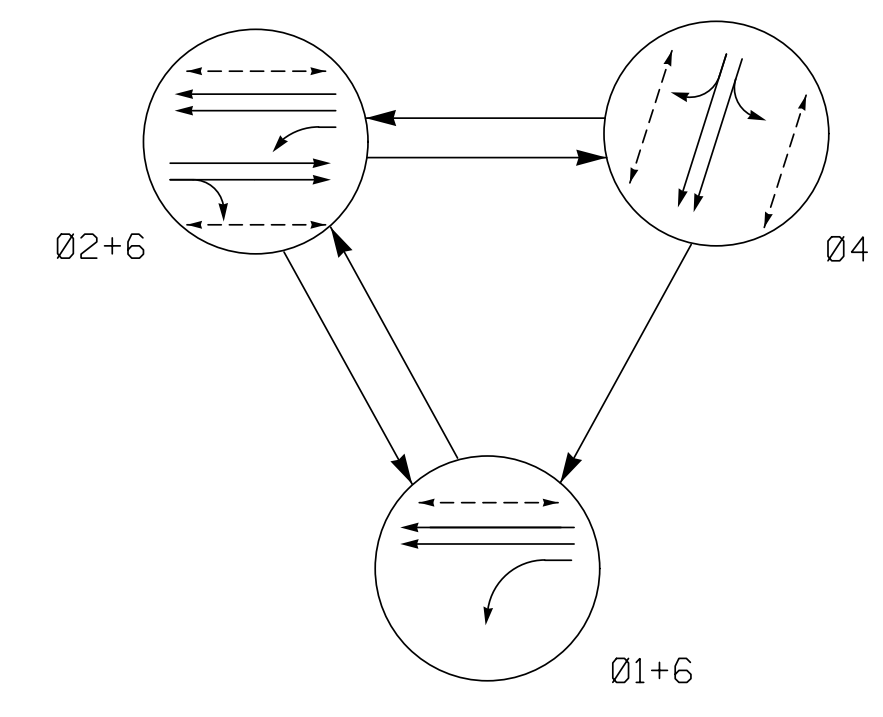
SIG. INVENTORY NO. 12-0068

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



3/9/2022 11:16:02 AM Don'tell,Curri ***Kinley-Horn.com/E-RAL/MRAL_TIP/DK-TIS/K01036569/Gastonia/Signal_System/Signal_Signals4 - Signal_Design/12066-2021.dgn

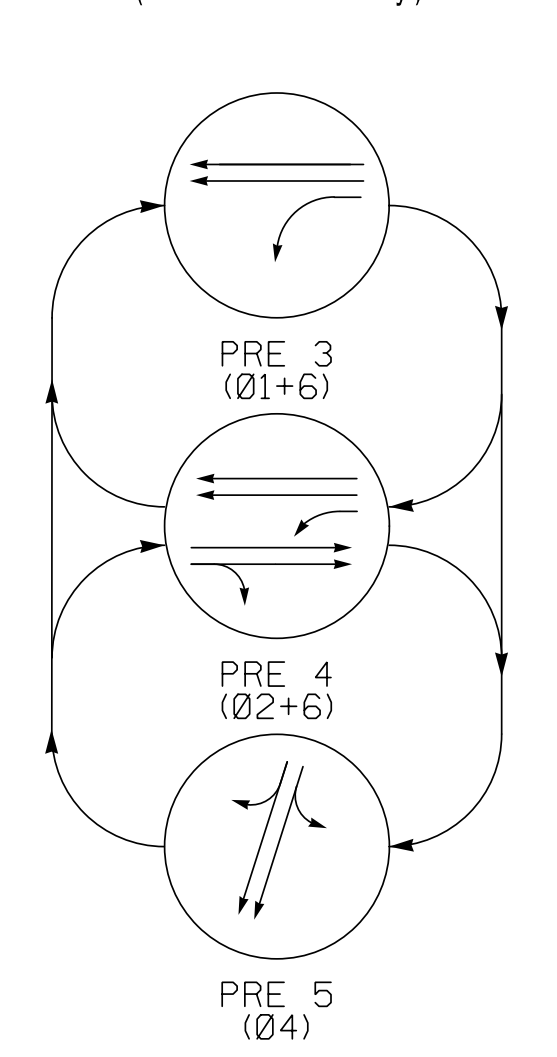
DEFAULT PHASING DIAGRAM



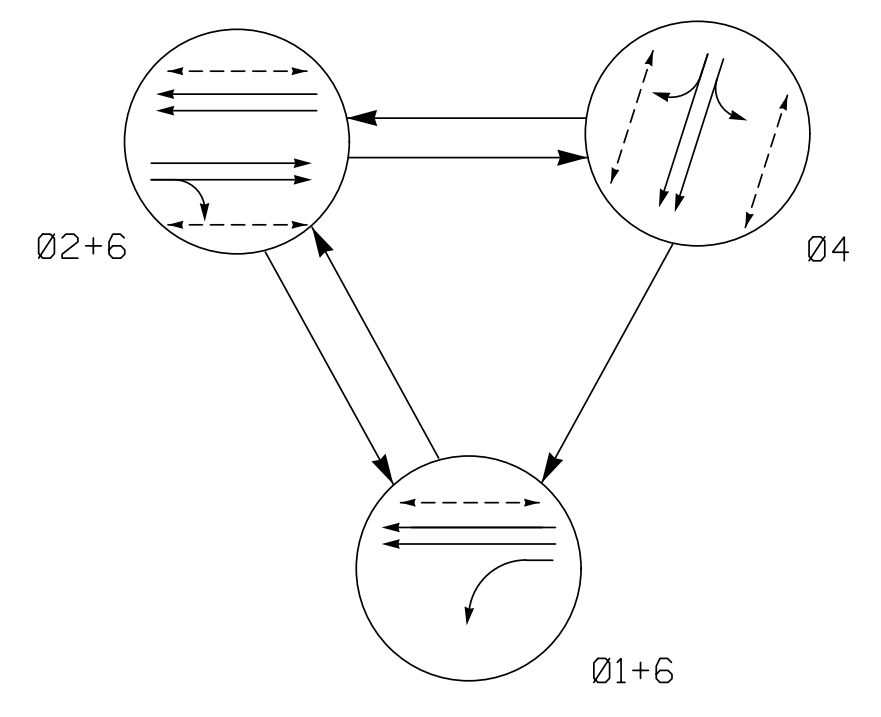
DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1 + 6	Ø 2 + 6	Ø 4	PRE 3	PRE 4	PRE 5
11	←	←	←	←	←	←
21,22,23	R	G	R	R	G	R
41,42	R	G	R	R	G	R
61,62	↑	↑	↑	↑	↑	↑
P21,P22	DW	W	DW	DW	DW	DRK
P41,P42 P43,P44	DW	DW	W	DW	DW	DRK
P61,P62	W	W	DW	DW	DW	DRK

DEFAULT EV PREEMPT PHASES (Medium Priority)



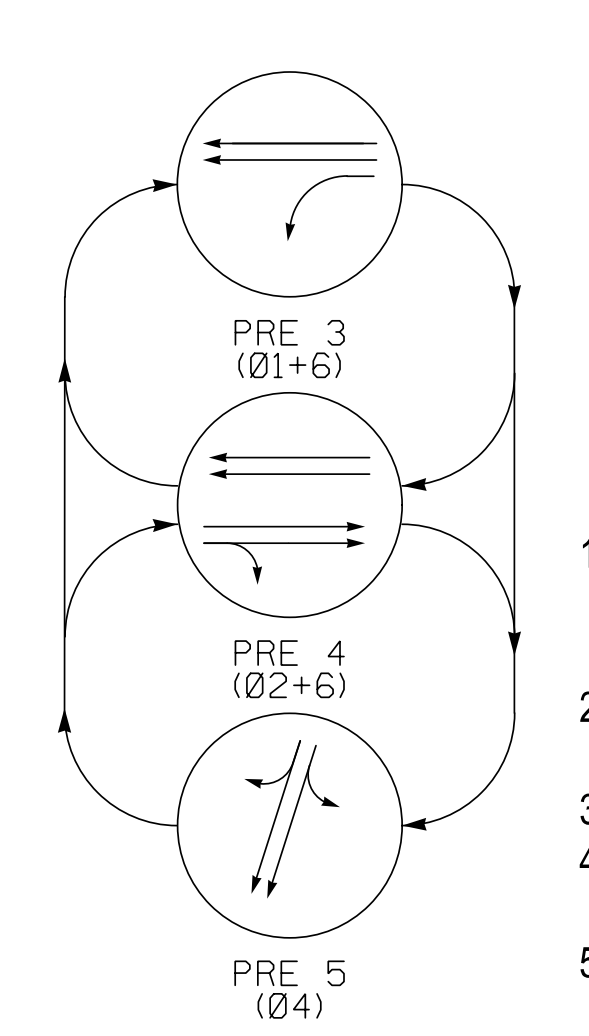
ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1 + 6	Ø 2 + 6	Ø 4	PRE 3	PRE 4	PRE 5
11	←	←	←	←	←	←
21,22,23	R	G	R	R	G	R
41,42	R	G	R	R	G	R
61,62	↑	↑	↑	↑	↑	↑
P21,P22	DW	W	DW	DW	DW	DRK
P41,P42 P43,P44	DW	DW	W	DW	DW	DRK
P61,P62	W	W	DW	DW	DW	DRK

ALTERNATE EV PREEMPT PHASES (Medium Priority)



3 Phase Pre-Timed w/ Alternate Phasing Operation and Emergency Vehicle Preemption Gastonia Signal System

NOTES

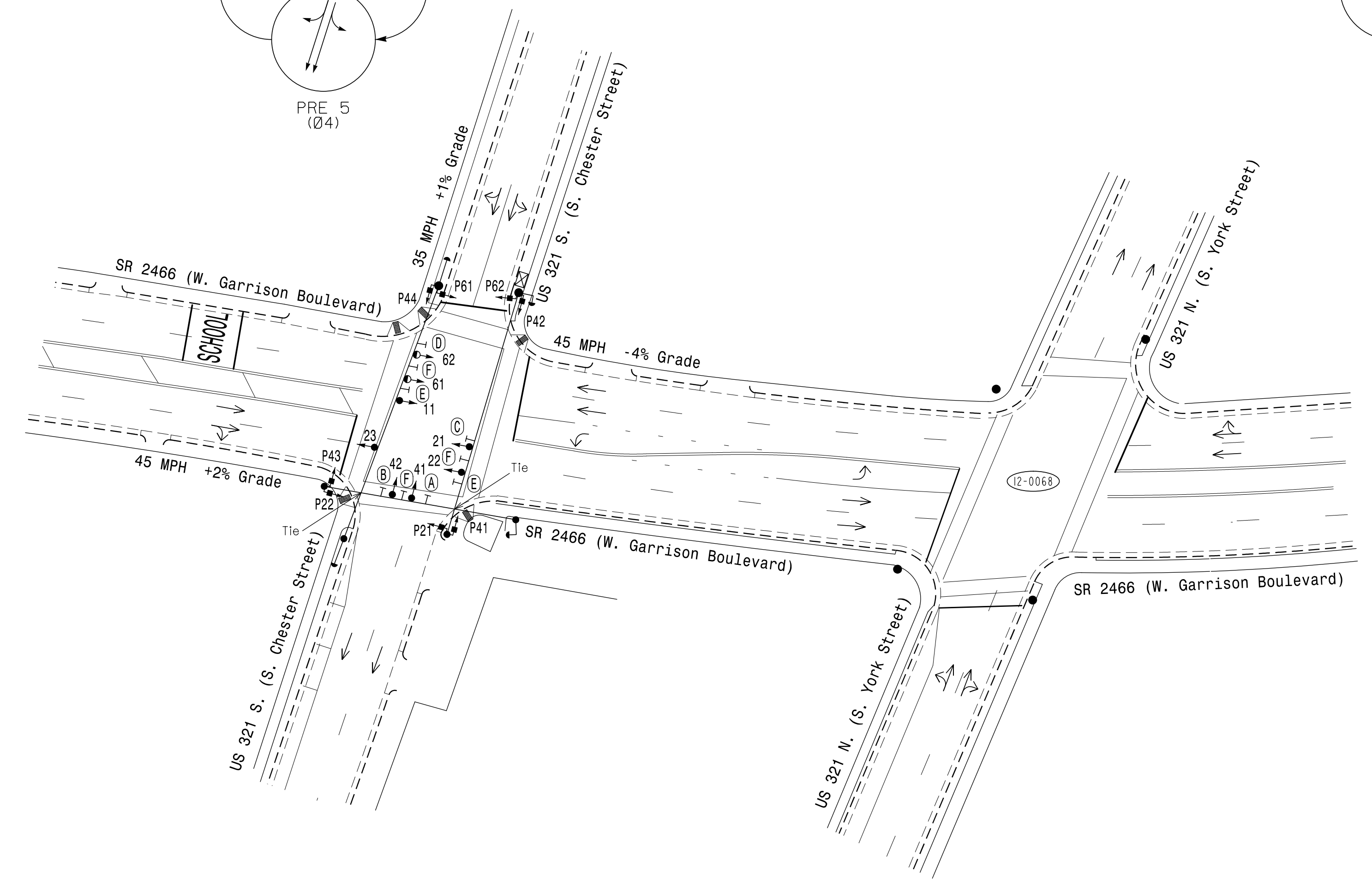
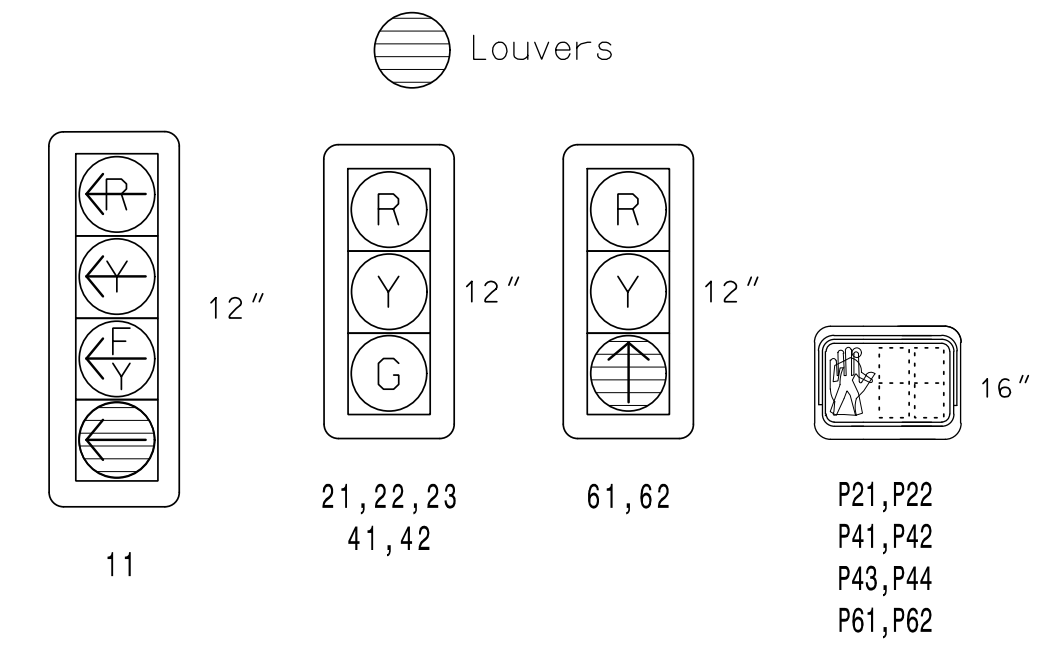
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 may be lagged.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
6. Pavement markings are existing.
7. The City Engineer or their representative will determine the hours of use for each phasing plan.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. Install new cabinet on the existing cabinet foundation.
10. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
11. Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
12. City of system data: Controller Asset #0069.

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← ○ UNSIGNALIZED MOVEMENT
- ← ○ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.
All heads have backplates with reflective borders



FEATURE	PHASE			
	1	2	4	6
Min Green *	7	12	7	12
Walk *	-	7	7	7
Ped Clear	-	12	20	8
Veh. Extension *	-	-	-	-
Max 1 *	20	45	30	45
Yellow	3.0	4.9	3.8	4.9
Red Clear	2.1	1.5	1.8	1.5
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX RECALL	PED/MAX	PED/MAX	PED/MAX
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

EV PREEMPT			
FUNCTION	PRE 3	PRE 4	PRE 5
Exit Phase(s)	2+6	2+6	4
Preempt Override	OFF	OFF	OFF
Delay Time	0	0	0
Ped Clear Through Yellow	Y	Y	Y
Terminate Phases	N	N	N
Entrance Walk	1	1	1
Entrance Ped Clear	255*	255*	255*
Entrance Min Green	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*
Minimum Dwell Time	7	7	7
Preempt Input Extension Time **	2	2	2
Preempt Max Time	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*

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

This plan supersedes the plan signed and sealed on 3/11/2022

LEGEND	
PROPOSED	EXISTING
○ → Traffic Signal Head	● → Traffic Signal Head
○ → Modified Signal Head	N/A
○ → Pedestrian Signal Head With Sign	○ → Pedestrian Signal Head With Sign
○ → Signal Pole with Guy	○ → Signal Pole with Guy
○ → Signal Pole with Sidewalk Guy	○ → Signal Pole with Sidewalk Guy
○ → Inductive Loop Detector	○ → Inductive Loop Detector
○ → Controller & Cabinet	○ → Controller & Cabinet
○ → Junction Box	○ → Junction Box
○ → 2-in Underground Conduit	○ → 2-in Underground Conduit
N/A	○ → Right of Way
○ → Directional Arrow	○ → Directional Arrow
N/A	○ → Curb Ramp
○ → Combined Through and Left Arrow Sign (R3-6L)	○ → Combined Through and Left Arrow Sign (R3-6L)
○ → Combined Through and Right Arrow Sign (R3-6R)	○ → Combined Through and Right Arrow Sign (R3-6R)
○ → No Left Turn Sign (R3-2)	○ → No Left Turn Sign (R3-2)
○ → No Right Turn Sign (R3-1)	○ → No Right Turn Sign (R3-1)
○ → One Way Sign (R6-1L)	○ → One Way Sign (R6-1L)
○ → Street Name Sign (D3-1)	○ → Street Name Sign (D3-1)

Signal Upgrade

Prepared For:
Kimley-Horn

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

US 321 S. (S. Chester Street) at SR 2466 (W. Garrison Boulevard)

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ DATE: _____

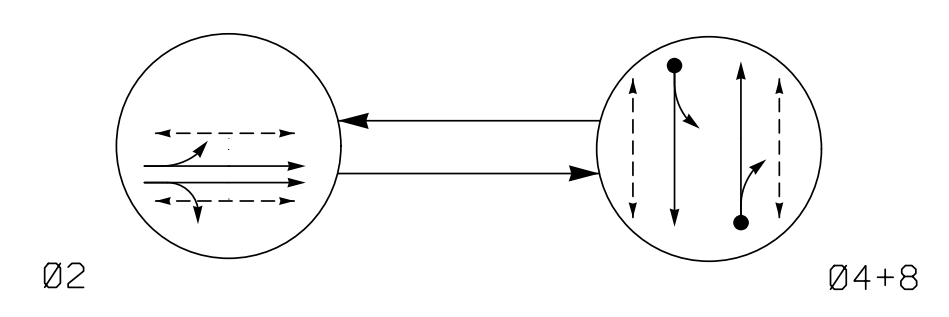
SCALE: 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Seal of North Carolina Professional Engineer
K. P. BAUMANN
4/7/2022
DATE: 4/7/2022
SIG. INVENTORY NO. 12-0069

4/7/2022 2:45:55 PM Dan.Hill@k-h.com

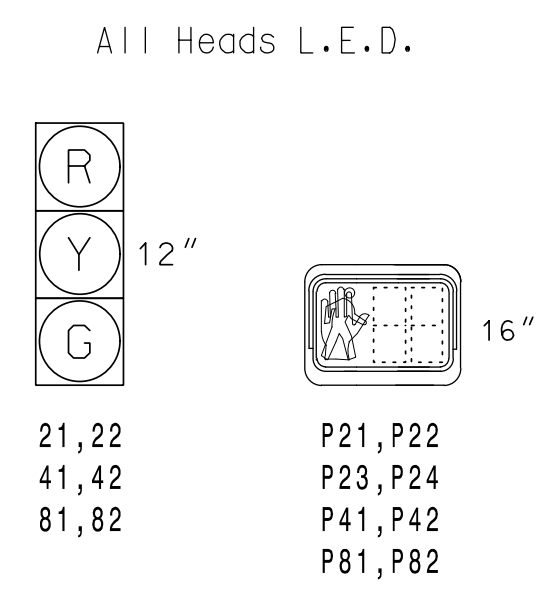
PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND
DETECTED MOVEMENT
UNDETECTED MOVEMENT (OVERLAP)
UNSIGNALIZED MOVEMENT
PEDESTRIAN MOVEMENT

TABLE OF OPERATION table with columns for SIGNAL FACE, PHASE, and detection codes.

SIGNAL FACE I.D.

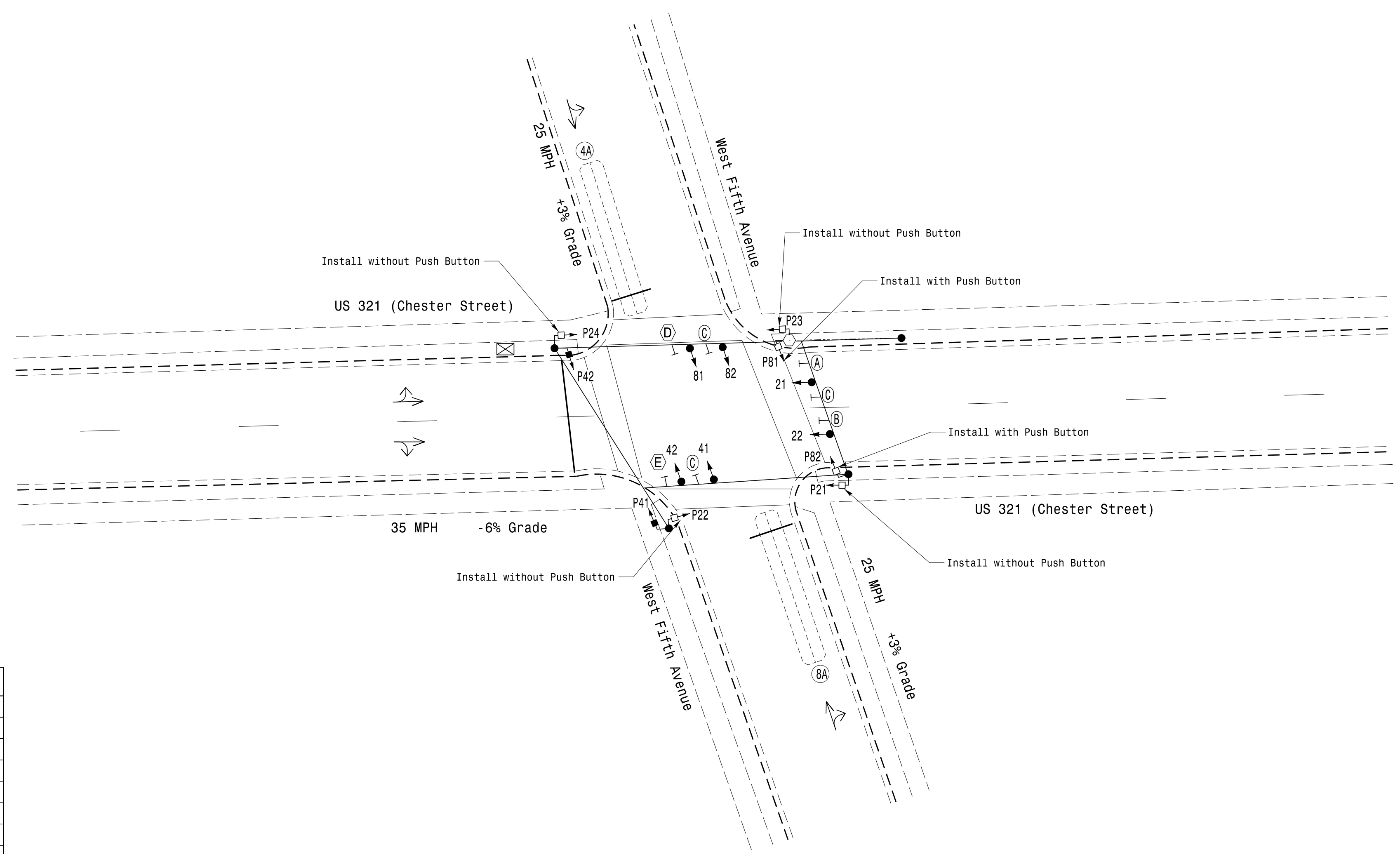


DETECTOR INSTALLATION CHART table with columns for LOOP, SIZE, DISTANCE, TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, LOOP SYSTEM, NEW CARD.

2 Phase Semi-Actuated Gastonia Signal System

NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018...
2. Do not program signal for late night flashing operation...
3. Set all detector units to presence mode.
4. In the event of loop replacement, refer to the current ITS and Signal Design Manual...
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls on phase 4 and phase 8.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
8. Pavement markings are existing.
9. Maximum times shown in timing chart are for free-run operation only.
10. Install new cabinet on the existing cabinet foundation.
11. All new cabinets and base extenders shall be black in color.
12. All proposed pedestrian signal heads shall be black in color.
13. All proposed pedestrian pedestals and pushbutton posts shall be black in color.
14. City system data: Controller Asset #0071.



TIMING CHART table with columns for FEATURE and PHASE (2, 4, 8) and various timing values.

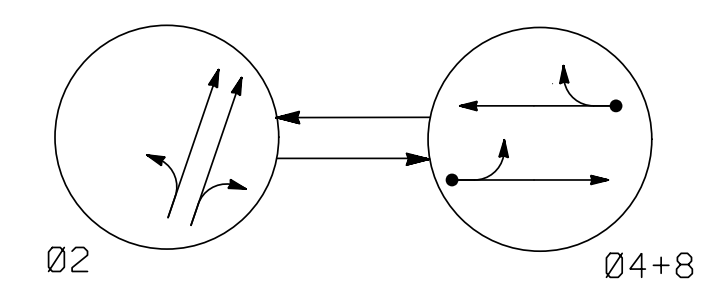
LEGEND table with columns for PROPOSED and EXISTING symbols and descriptions.

Signal Upgrade

Project information block including Kimley-Horn logo, project name (US 321 at West Fifth Avenue), division (12), location (Gastonia), dates, and signatures.

3/9/2022 11:16:06 AM Don@l1e.curf1 ***kimley-horn.com\\SELRAL\\IP\\OK-ITS\\01030569 Gastonia Signal System9 Signal Design\\20071-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2	Ø4+8	FLIGHT
21, 22	G	R	Y
41, 42	R	G	R
81, 82	R	G	R

DETECTOR INSTALLATION CHART

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

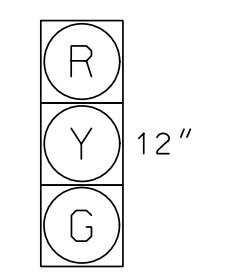
2 Phase Semi-Actuated Gastonia Signal System

NOTES

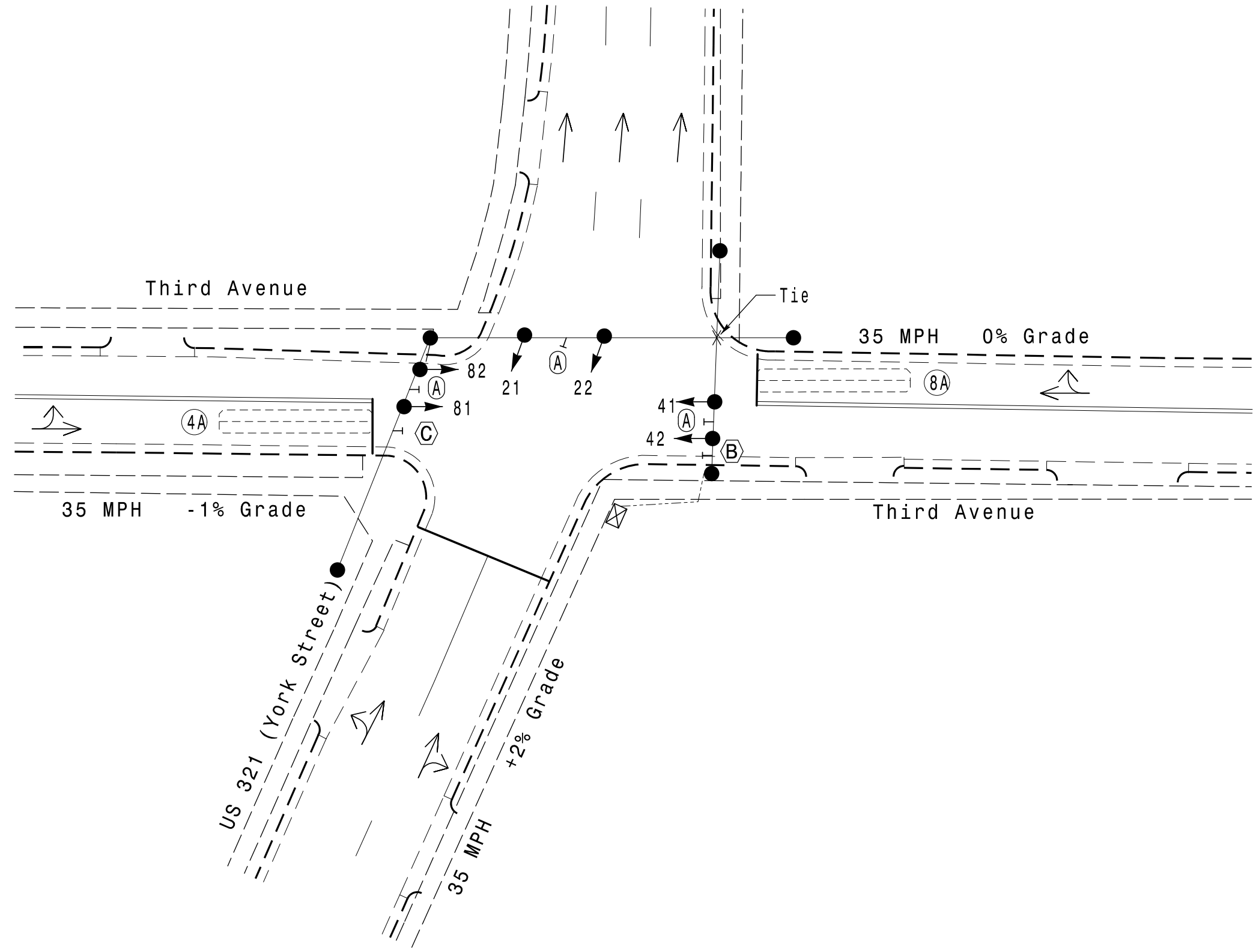
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Install new cabinet on a new cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Rewire all intersection equipment to new cabinet.
- City system data:
Controller Asset: #0072

SIGNAL FACE I.D.

All Heads L.E.D.



21, 22
41, 42
81, 82



FEATURE	PHASE		
	2	4	8
Min Green *	10	7	7
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	-	2.0	2.0
Max 1 *	45	25	25
Yellow	3.7	3.9	3.9
Red Clear	1.2	1.5	1.5
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	MAX RECALL	-	-
Dual Entry	-	X	X
Simultaneous Gap	X	X	X

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

LEGEND

- | PROPOSED | EXISTING |
|--|-------------------------------------|
| ○ → Traffic Signal Head | ● → N/A |
| ● → Modified Signal Head | ○ → N/A |
| ⊥ Sign | ⊥ Sign |
| ⊥ Pedestrian Signal Head With Push Button & Sign | ⊥ Pedestrian Signal Head |
| ○ → Signal Pole with Guy | ● → Signal Pole with Guy |
| ○ → Signal Pole with Sidewalk Guy | ● → Signal Pole with Sidewalk Guy |
| ⊠ Inductive Loop Detector | ⊠ Inductive Loop Detector |
| □ Controller & Cabinet Junction Box | □ Controller & Cabinet Junction Box |
| --- 2-in Underground Conduit | --- 2-in Underground Conduit |
| N/A Right of Way | --- Right of Way |
| → Directional Arrow | → Directional Arrow |
| Ⓐ Street Name Sign (D3-1) | Ⓐ Street Name Sign (D3-1) |
| Ⓑ No Right Turn Sign (R3-1) | Ⓑ No Right Turn Sign (R3-1) |
| Ⓒ No Left Turn Sign (R3-2) | Ⓒ No Left Turn Sign (R3-2) |

3/9/2022 11:13:21 AM Dantellb.Curr1 ***k:\mley-horn.com\SE-RAL\MRAL-TIP\DK-LTS\011036569_Gastonia Signal System\Signal\KWS4 - Signal Design\B120072-2021.dgn

Signal Upgrade

 Prepared For: Transportation Mobility and Safety Division DEPARTMENT OF TRANSPORTATION SIGNAL DESIGN SECTION 750 N. Greenfield Pkwy, Garner, NC 27529 NC License #0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	US 321 (York Street) at Third Avenue		DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED Kevin P. Baumann ENGINEER DATE: 3/11/2022 SIGNATURE: _____ DATE: _____
	Division 12 Gaston County Gastonia PLAN DATE: May 2021 REVIEWED BY: SL Phillips PREPARED BY: DM Curri REVIEWED BY: KP Baumann	REVISIONS INIT. DATE	

PHASING DIAGRAM

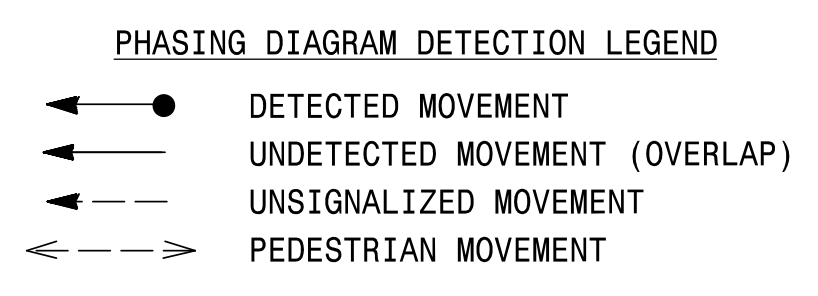
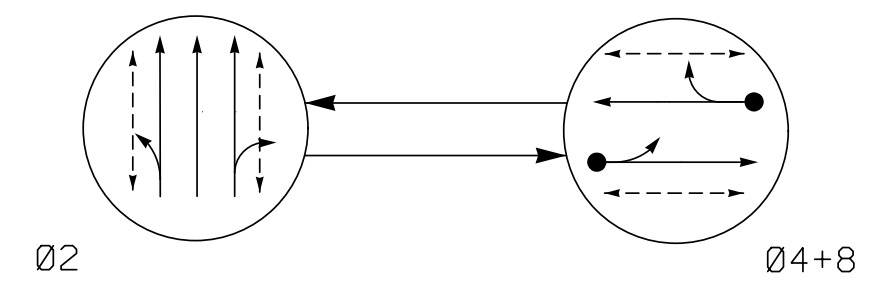
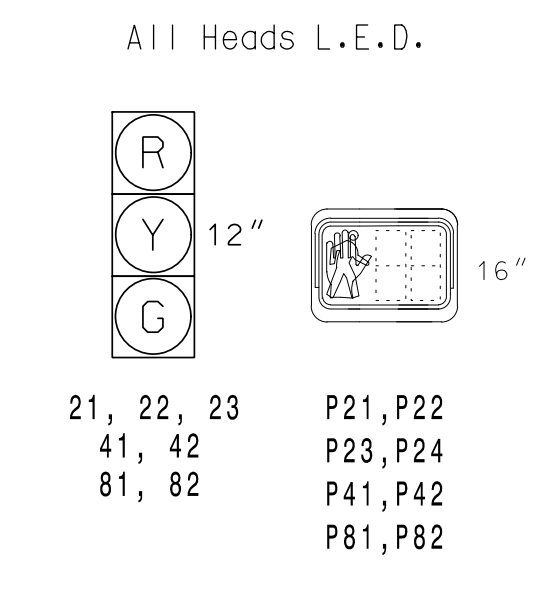


TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2	Ø4+8	FLASH
21, 22, 23	G	R	Y
41, 42	R	G	R
81, 82	R	G	R
P21, P22, P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.



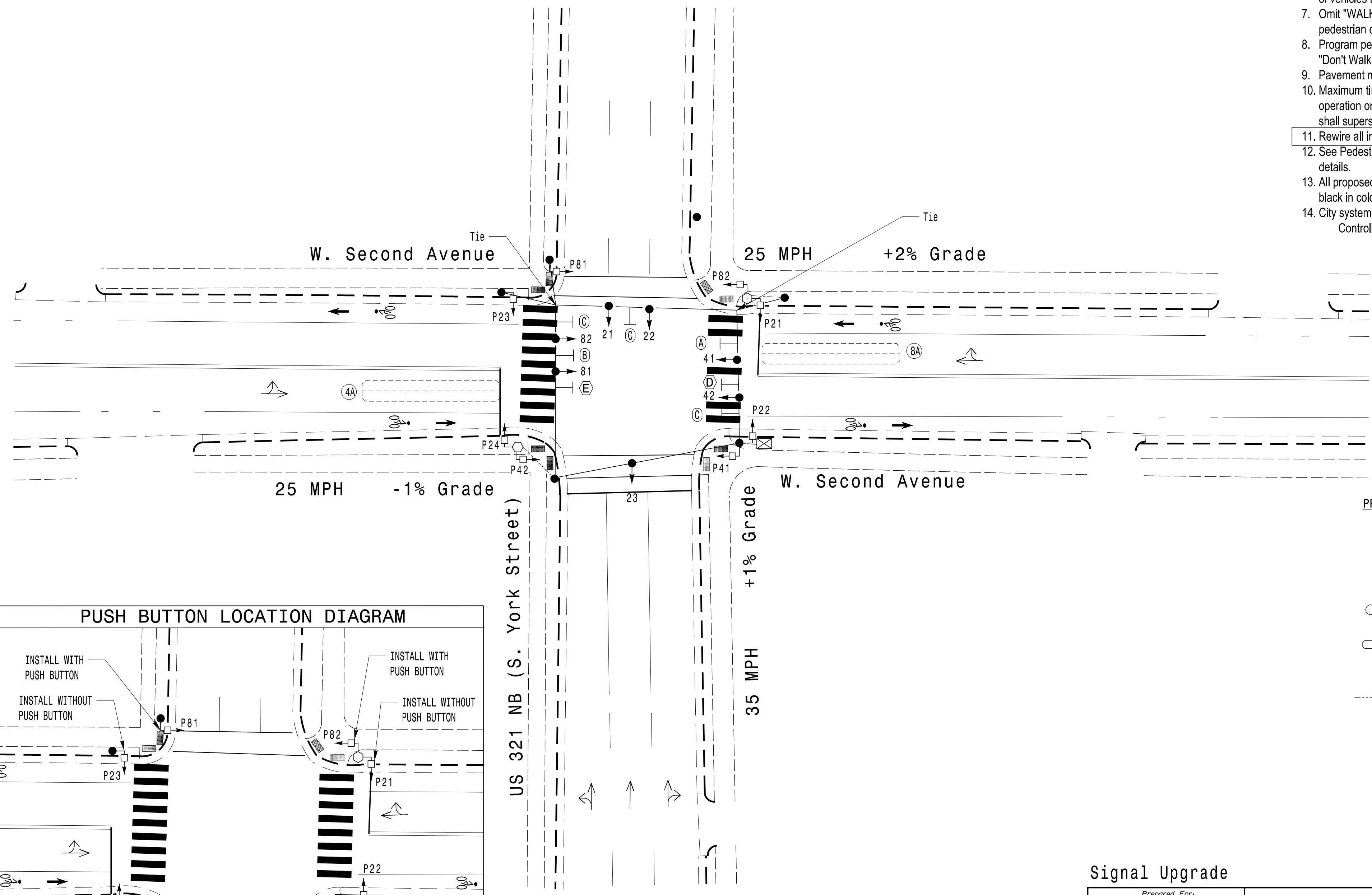
DETECTOR INSTALLATION CHART

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

2 Phase Semi-Actuated Gastonia Signal System

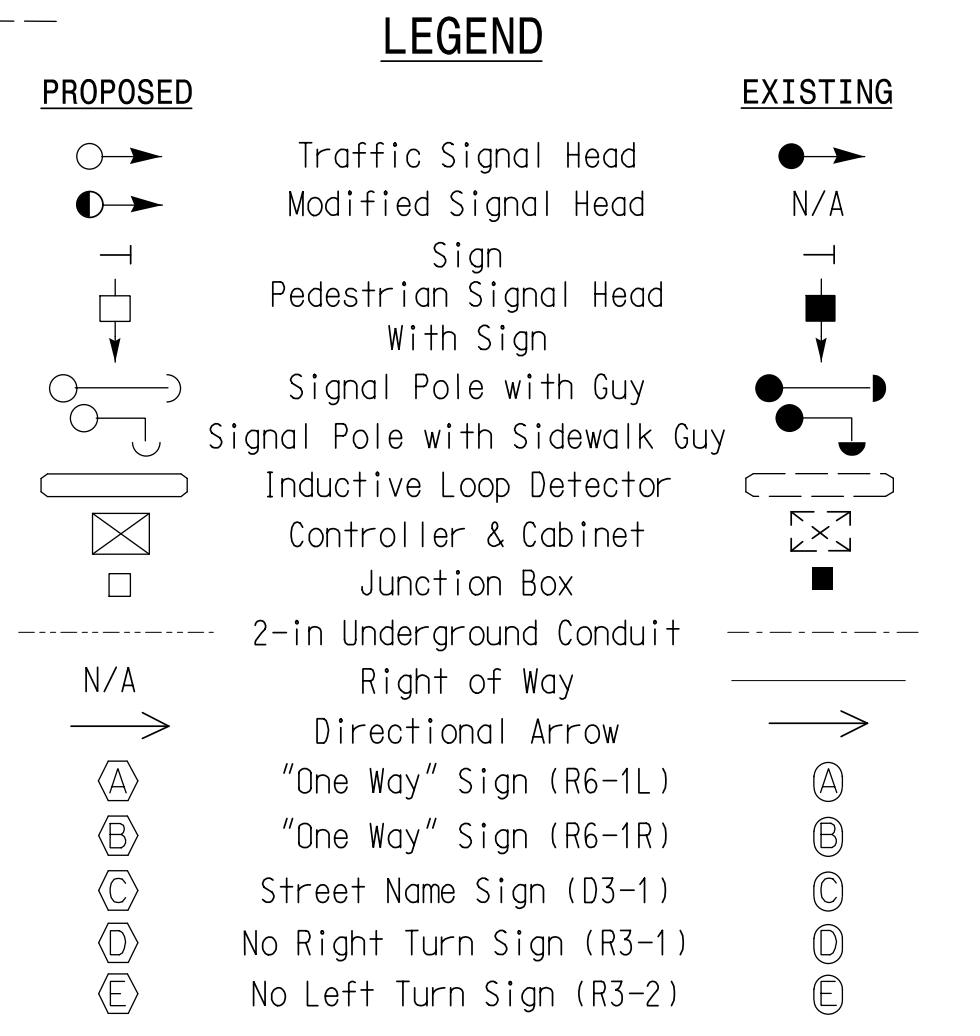
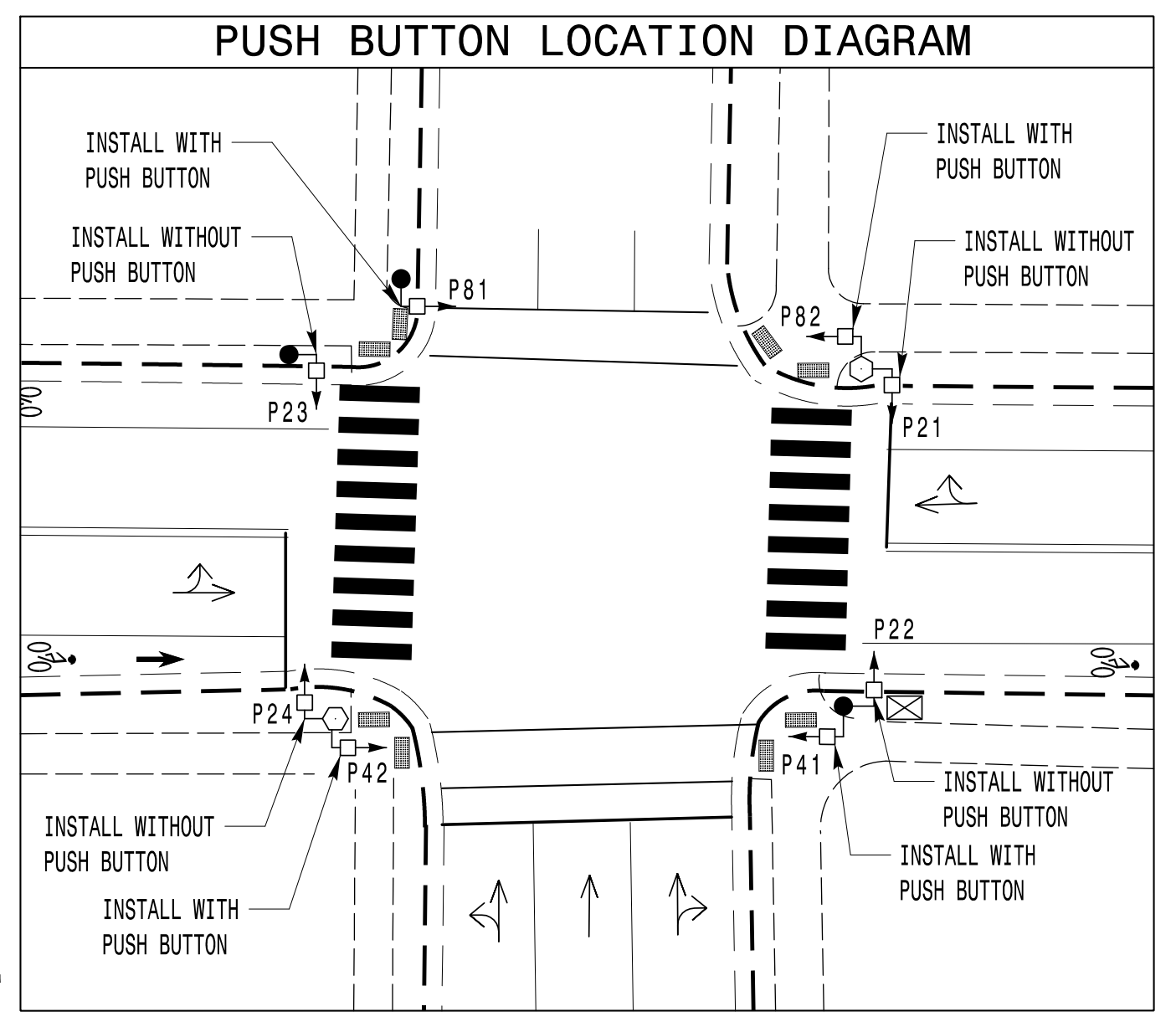
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Install new cabinet on a new cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Revire all intersection equipment to new cabinet.
- See Pedestrian Push Button Location Diagram for additional details.
- All proposed pedestrian signal heads and pedestals shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset: #0073



TIMING CHART

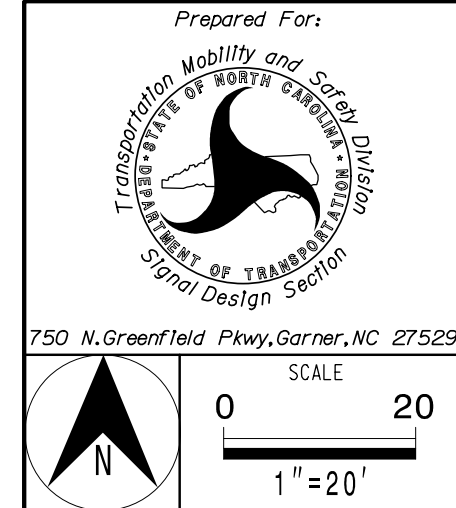
FEATURE	PHASE		
	2	4	8
Min Green *	10	7	7
Walk *	4	4	4
Ped Clear	10	10	10
Veh. Extension *	-	2.0	2.0
Max 1 *	40	20	20
Yellow	3.8	3.2	3.2
Red Clear	1.8	1.7	1.7
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	PED/MAX	-	-
Dual Entry	-	X	X
Simultaneous Gap	X	X	X



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

Signal Upgrade

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



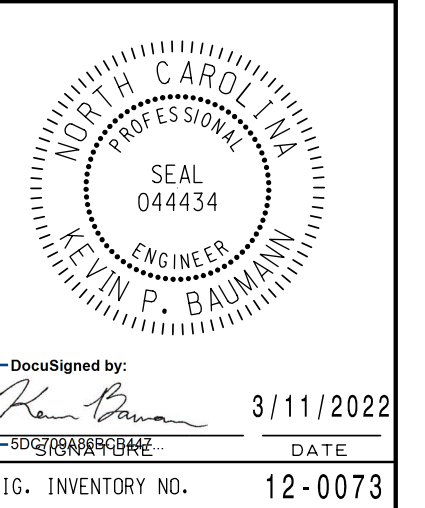
US 321 NB (South York Street) at West Second Avenue

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



3/9/2022 11:13:29 AM Don@le.curf1 ***kimley-horn.com\\S\\RAL\\R\\RAL_IP\\OK_LITS\\01036569_Gastonia_Signal_System\\9_Signal_Design\\M120073-2021.dgn

PHASING DIAGRAM

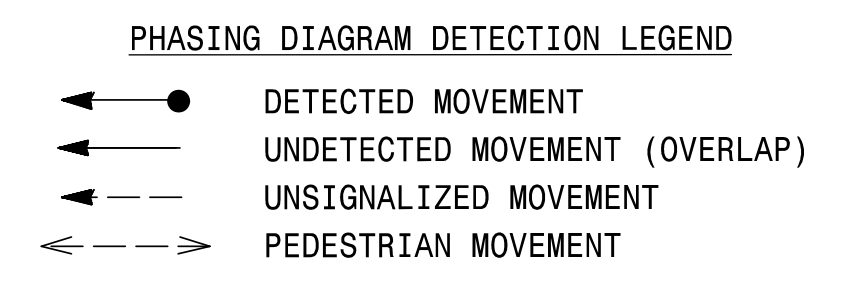
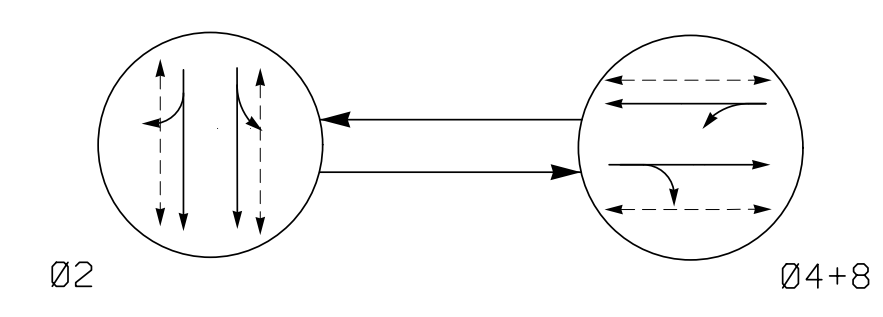
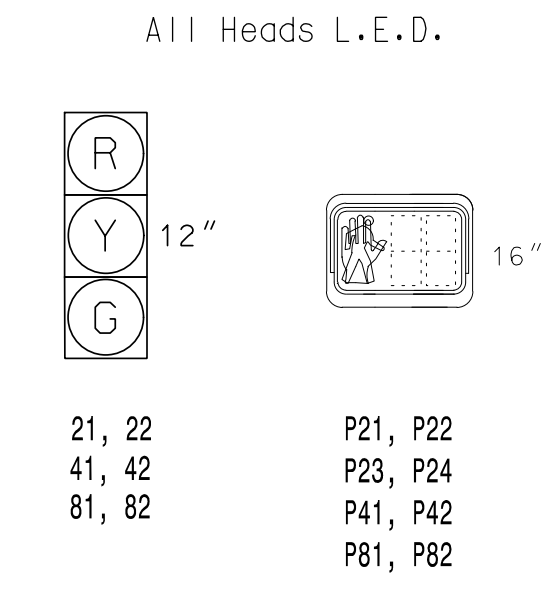


TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2	Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
81, 82	R	G	R
P21, P22	W	DW	DRK
P23, P24	DW	W	DRK
P41, P42	DW	W	DRK
P81, P82	DW	W	DRK

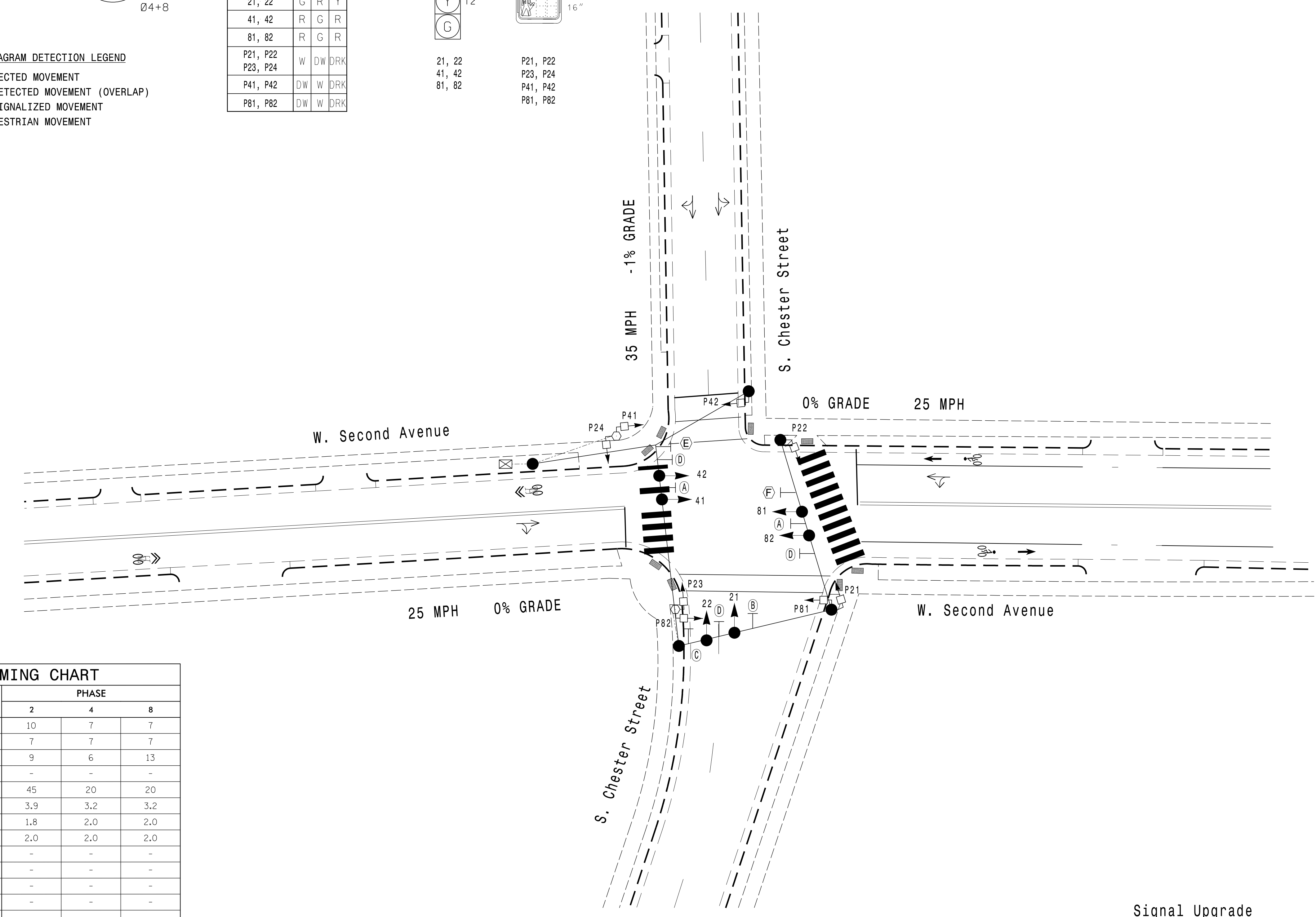
SIGNAL FACE I.D.



**2 Phase
Pre-Timed
Gastonia Signal System**

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Install new cabinet on a new cabinet foundation.
4. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
5. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
6. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
7. Pavement markings are existing.
8. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
9. Rewire all intersection equipment to new cabinet
10. All proposed pedestrian signal heads and pedestals shall be black in color. See Project Special Provisions for details.
11. City system data:
Controller Asset: #0074



TIMING CHART

FEATURE	PHASE		
	2	4	8
Min Green *	10	7	7
Walk *	7	7	7
Ped Clear	9	6	13
Veh. Extension *	-	-	-
Max I *	45	20	20
Yellow	3.9	3.2	3.2
Red Clear	1.8	2.0	2.0
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	PED/MAX	PED/MAX	PED/MAX
Dual Entry	-	X	X
Simultaneous Gap	X	X	X

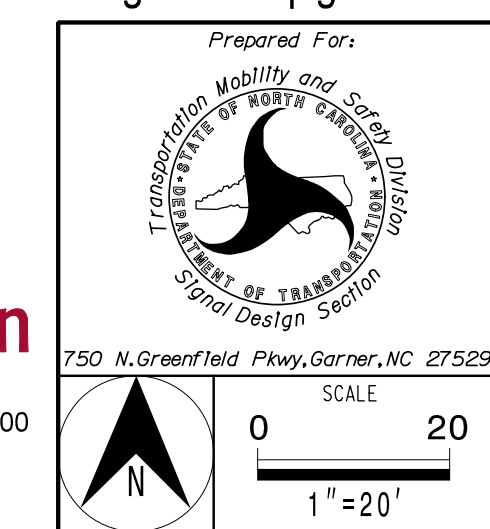
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
○ → Modified Signal Head	○ → N/A
⊥ Pedestrian Signal Head with Sign	⊥
○ ⊥ Signal Pole with Guy	○ ⊥
○ ⊥ Signal Pole with Sidewalk Guy	○ ⊥
⊠ Inductive Loop Detector	⊠
□ Controller & Cabinet	□
□ Junction Box	□
- - - 2-in Underground Conduit	- - -
- - - Right of Way	- - -
→ Directional Arrow	→
→ Pavement Marking Arrow	→
(A) "One Way" Sign (R6-1)	(A)
(B) Combined Through and Left Arrow Sign (R3-6L)	(B)
(C) Combined Through and Right Arrow Sign (R3-6R)	(C)
(D) Street Name Sign (D3-1)	(D)
(E) No Right Turn Sign (R3-1)	(E)
(F) No Left Turn Sign (R3-2)	(F)

Signal Upgrade

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



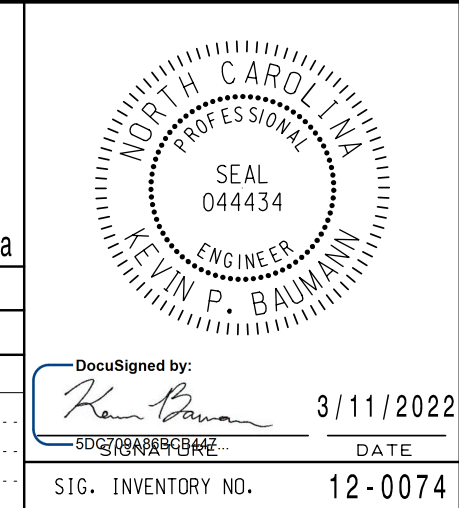
**S. Chester Street
at
W. Second Avenue**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021	REVIEWED BY: SL Phillips
PREPARED BY: DM Curri	REVIEWED BY: KP Baumann

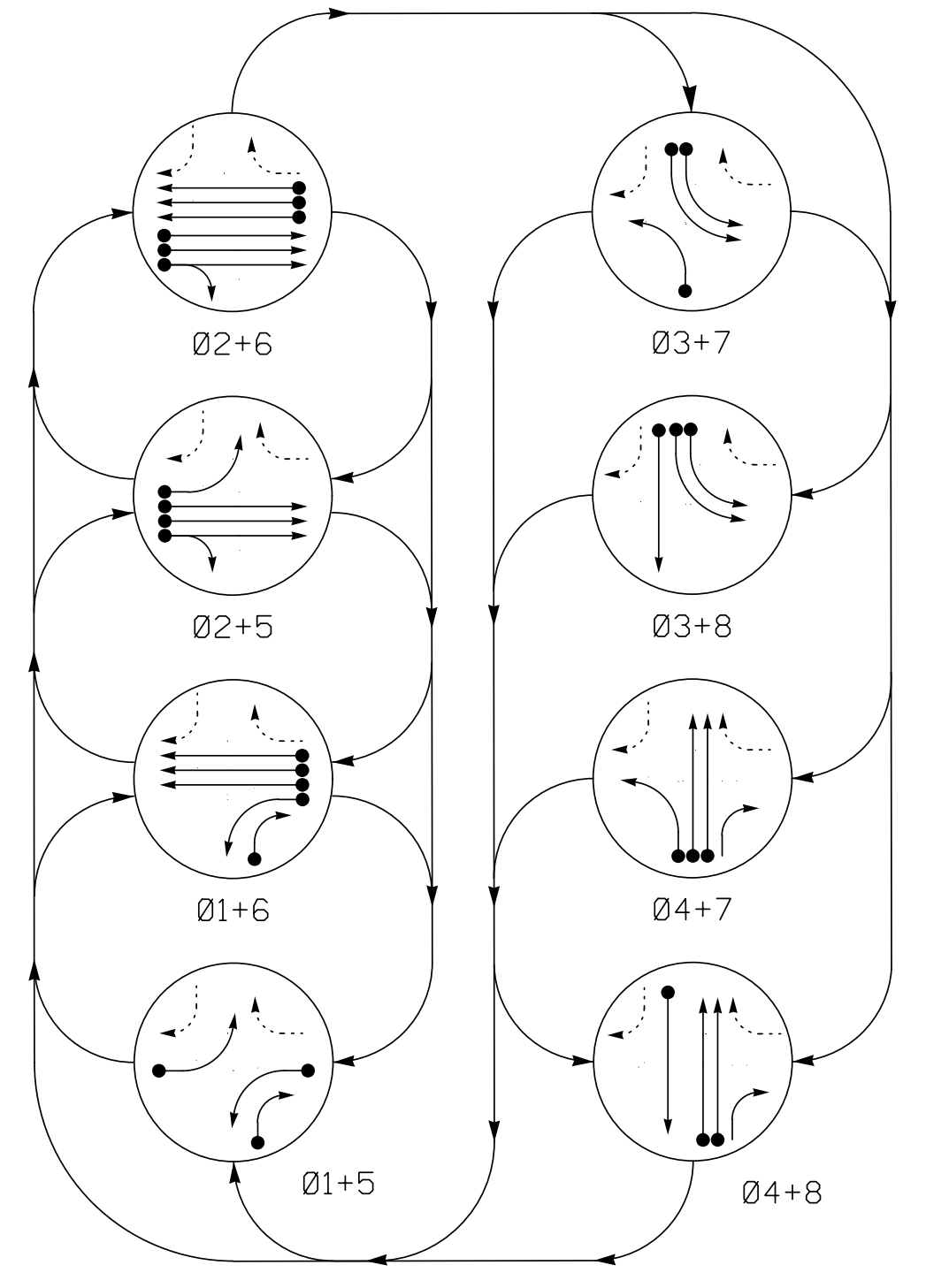
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by:
Kevin P. Baumann
3/11/2022
DATE
SIC. INVENTORY NO. 12-0074

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.

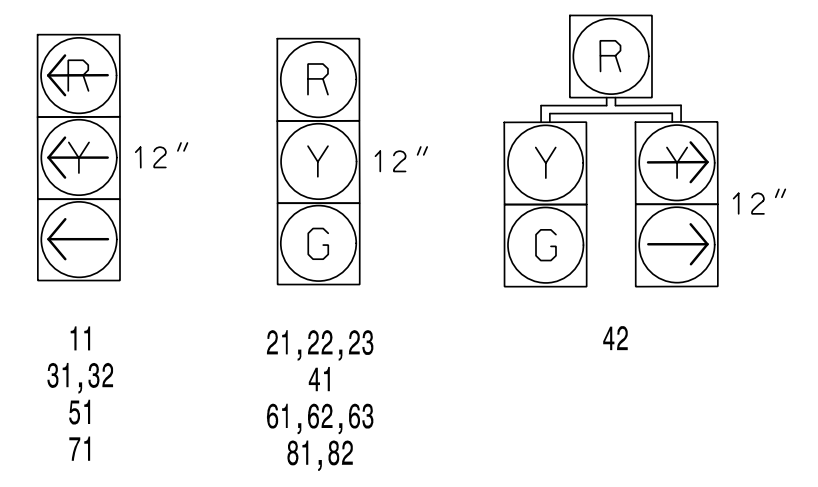


TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8	
11	←	←	←	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R	R	R	Y
31,32	←	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←	←
61,62,63	R	G	R	G	R	R	R	R	Y
71	←	←	←	←	←	←	←	←	←
81,82	R	R	R	R	R	G	R	G	R
SIGN "G"	*	*	*	*	*	*	*	*	OFF
SIGN "H"	*	*	*	*	*	*	*	*	OFF
SIGN "I"	*	*	*	*	*	*	*	*	OFF
SIGN "J"	*	*	*	*	*	*	*	*	OFF

* Changeable Trailblazer Sign controlled remotely

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	-	-	N	-	X
1B	6X60	0	2-4-2	-	1	Yes	-	15	-	N	-	X
2A	6X6	277	EXIST	-	2	Yes	-	-	X	N	-	X
2B	6X6	277	EXIST	-	2	Yes	-	-	X	N	-	X
2C	6X6	277	EXIST	-	2	Yes	-	-	X	N	-	X
3A	6X60	0	2-4-2	-	3	Yes	-	-	-	N	-	X
3B	6X60	0	2-4-2	-	3	Yes	-	-	-	N	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	-	-	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6C	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
7A	6X60	0	2-4-2	-	7	Yes	-	-	-	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	N	-	X

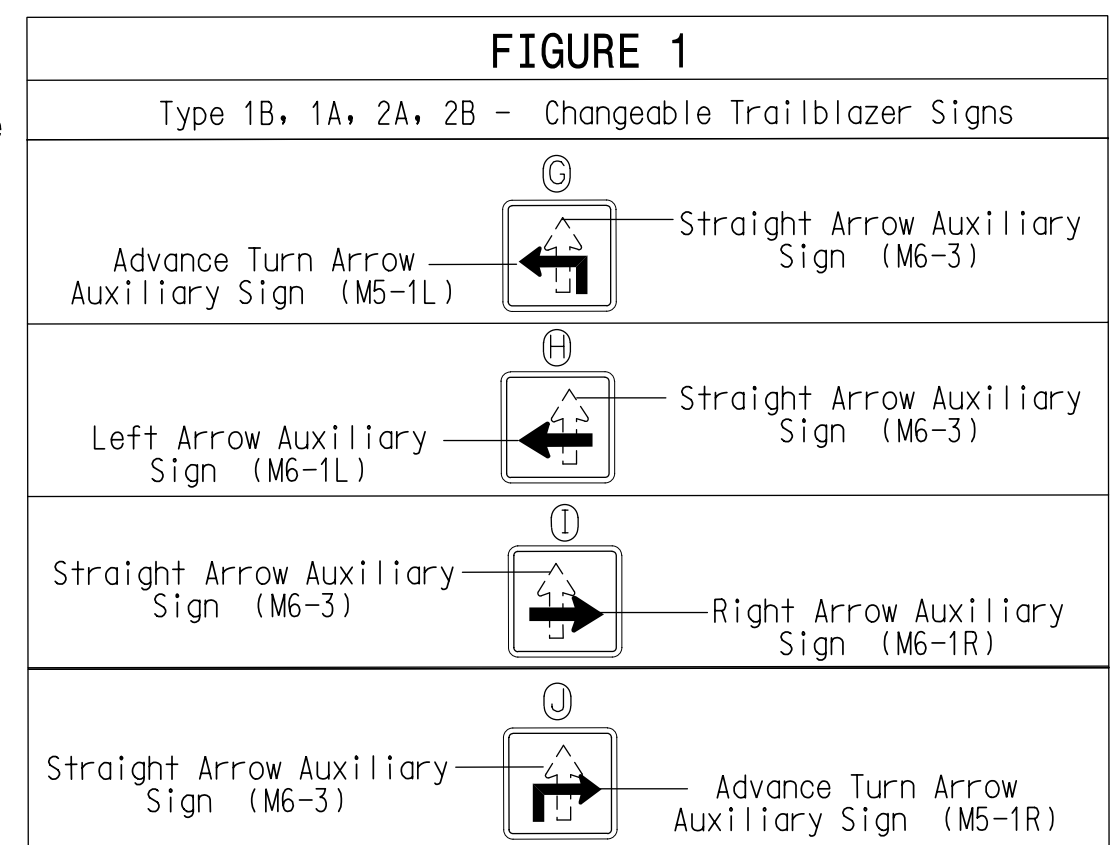
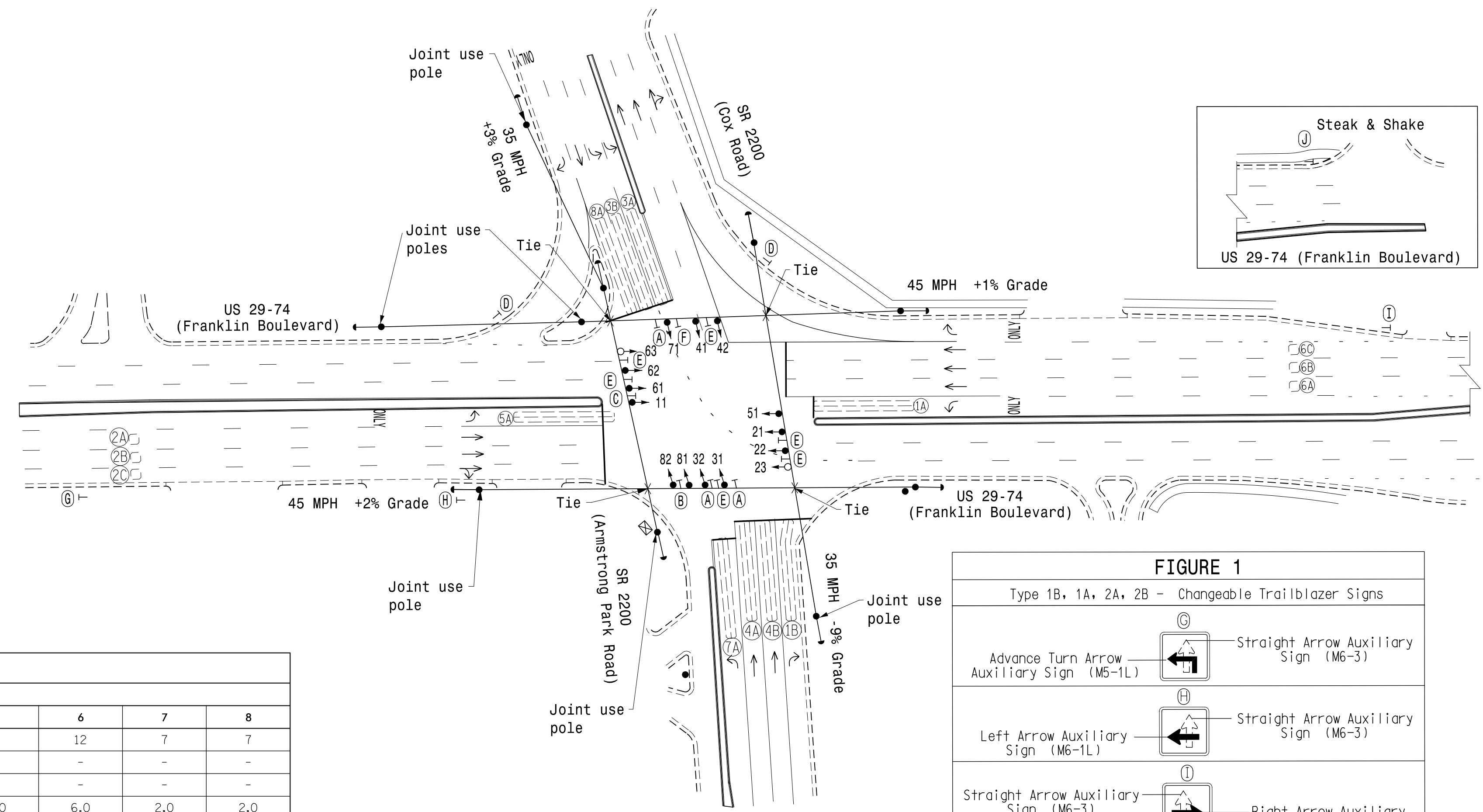
8 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 21, 22, 61, and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City system data: Controller Asset #0077

LEGEND

- | PROPOSED | EXISTING |
|--|----------|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → 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 |
| ○ → Left Arrow "ONLY" Sign (R3-5L) | ○ → N/A |
| ○ → Through Arrow "ONLY" Sign (R3-5A) | ○ → N/A |
| ○ → "U-TURN YIELD TO RIGHT TURN" Sign (R10-16) | ○ → N/A |
| ○ → "YIELD" Sign (R1-2) | ○ → N/A |
| ○ → Street Name Sign (D3-1) | ○ → N/A |
| ○ → No U-Turn Sign (R3-4) | ○ → N/A |
| ○ → Type 1B Changeable Trailblazer sign (See Figure 1) | ○ → N/A |
| ○ → Type 1A Changeable Trailblazer sign (See Figure 1) | ○ → N/A |
| ○ → Type 2A Changeable Trailblazer sign (See Figure 1) | ○ → N/A |
| ○ → Type 2B Changeable Trailblazer sign (See Figure 1) | ○ → N/A |



TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	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	3.0	4.3	3.0	4.6	3.0	4.4	3.3	3.7
Red Clear	2.9	2.2	3.6	2.2	2.4	2.2	3.3	2.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	32	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

Signal Upgrade

Prepared For:

 TRANSPORTATION MOBILITY AND SAFETY SOLUTIONS, INC.
 750 N. Greenfield Pkwy, Garner, NC 27529
 NC License #0102
 421 Fayetteville Street, Suite 600
 Raleigh, NC 27601
 (919) 677-2000

US 29-74 (Franklin Boulevard) at SR 2200 (Armstrong Park Road/ Cox Road)

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: DM Curri REVIEWED BY: KP Baumann

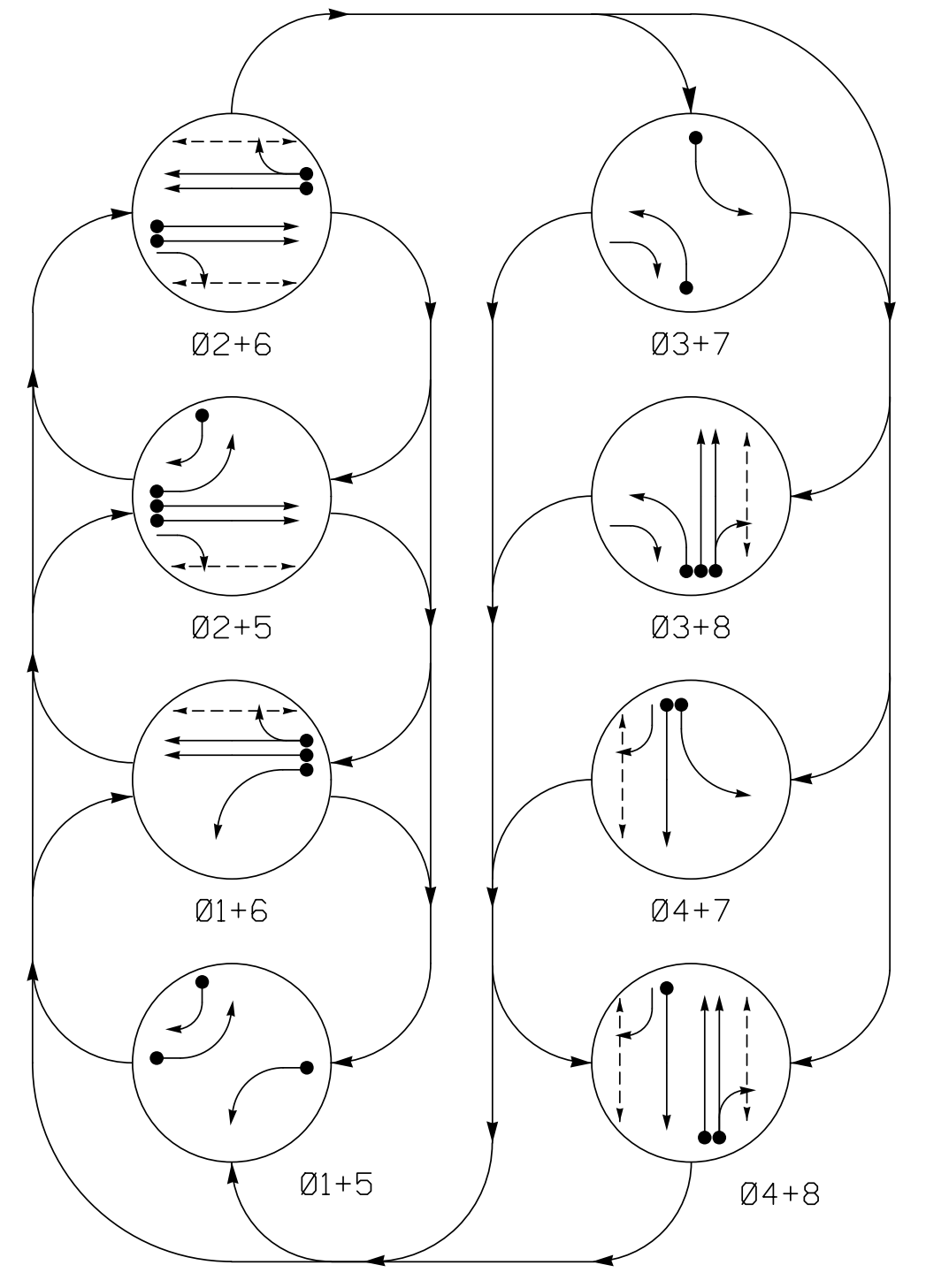
REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

KEVIN P. BAUMANN
 ENGINEER

Disciplined by: _____ DATE: 3/11/2022
 SIGNATURE: _____ DATE: _____
 SIG. INVENTORY NO. 12-0077

PHASING DIAGRAM



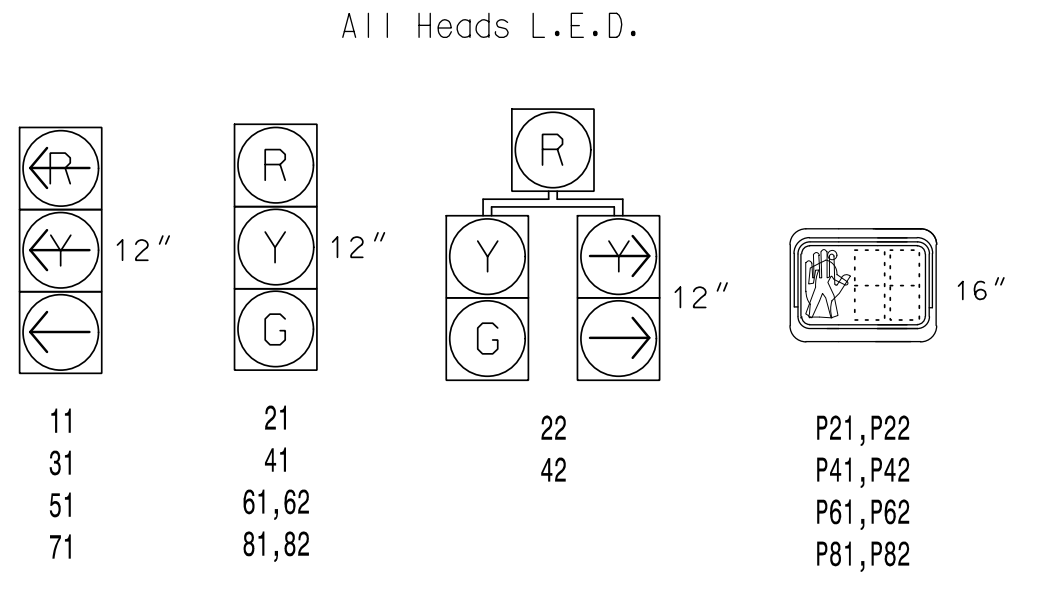
PHASING DIAGRAM DETECTION LEGEND

- ◄● DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UN SIGNALIZED MOVEMENT
- ◄ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81,82	R	R	R	R	R	R	G	R
P21,P22	DW	DW	W	W	DW	DW	DW	DRK
P41,P42	DW	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	DW	W	DW	DRK

SIGNAL FACE I.D.



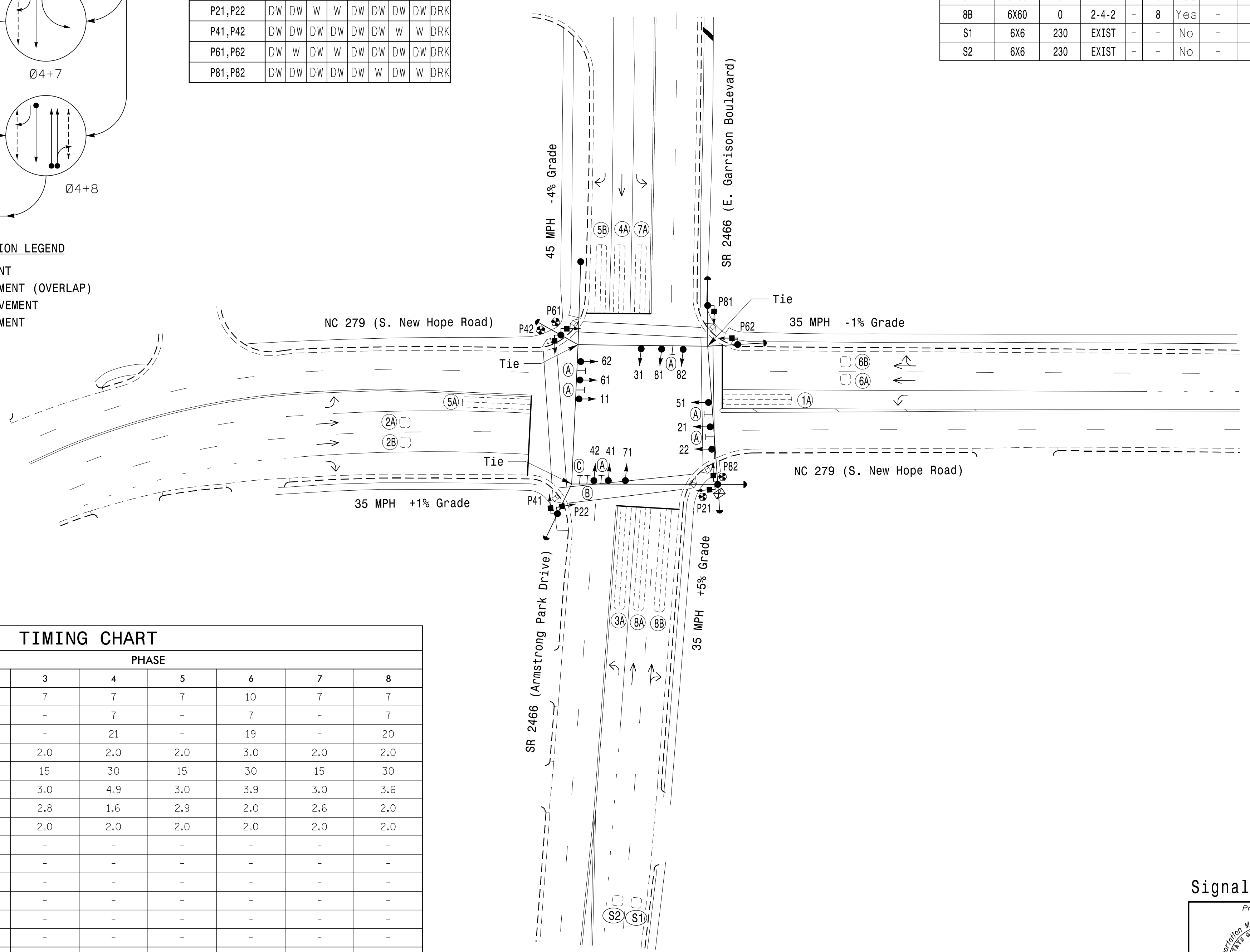
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	3	-	N	-	X
2A	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
3A	6X60	0	2-4-2	-	3	Yes	-	3	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	3	-	N	-	X
5B	6X40	0	2-4-2	-	5	Yes	-	15	-	N	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	3	-	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	0	2-4-2	-	8	Yes	-	10	-	N	-	X
S1	6X6	230	EXIST	-	-	No	-	-	-	N	X	X
S2	6X6	230	EXIST	-	-	No	-	-	-	N	X	X

8 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0079.



TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	10	7	7	7	10	7	7
Walk *	-	7	-	7	-	7	-	7
Ped Clear	-	20	-	21	-	19	-	20
Veh. Extension *	2.0	3.0	2.0	2.0	2.0	3.0	2.0	2.0
Max I *	15	30	15	30	15	30	15	30
Yellow	3.0	3.8	3.0	4.9	3.0	3.9	3.0	3.6
Red Clear	2.9	2.1	2.8	1.6	2.9	2.0	2.6	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

LEGEND

- | | | | |
|--|--|--|--|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | Existing Modified Signal Head |
| | Proposed Pedestrian Signal Head | | Existing Pedestrian Signal Head |
| | Proposed Type I Pushbutton Post | | Existing Type I Pushbutton Post |
| | Proposed Type II Signal Pedestal | | Existing Type II Signal Pedestal |
| | Proposed Signal Pole with Guy | | Existing Signal Pole with Guy |
| | Proposed Signal Pole with Sidewalk Guy | | Existing Signal Pole with Sidewalk Guy |
| | Proposed Inductive Loop Detector | | Existing Inductive Loop Detector |
| | Proposed Junction Box | | Existing Junction Box |
| | Proposed 2-in Underground Conduit | | Existing 2-in Underground Conduit |
| | Proposed Right of Way | | Existing Right of Way |
| | Proposed Directional Arrow | | Existing Directional Arrow |
| | Proposed Curb Ramp | | Existing Curb Ramp |
| | Proposed Street Name Sign | | Existing Street Name Sign |
| | Proposed "NO TURN ON RED" Sign (R10-11) | | Existing "NO TURN ON RED" Sign (R10-11) |
| | Proposed Right Arrow "ONLY" Sign (R3-5R) | | Existing Right Arrow "ONLY" Sign (R3-5R) |

Signal Upgrade

Prepared For:
Kimley-Horn

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

NC 279 (S. New Hope Road)
at
SR 2466 (E. Garrison Boulevard/ Armstrong Park Drive)

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

SCALE: 1" = 40'

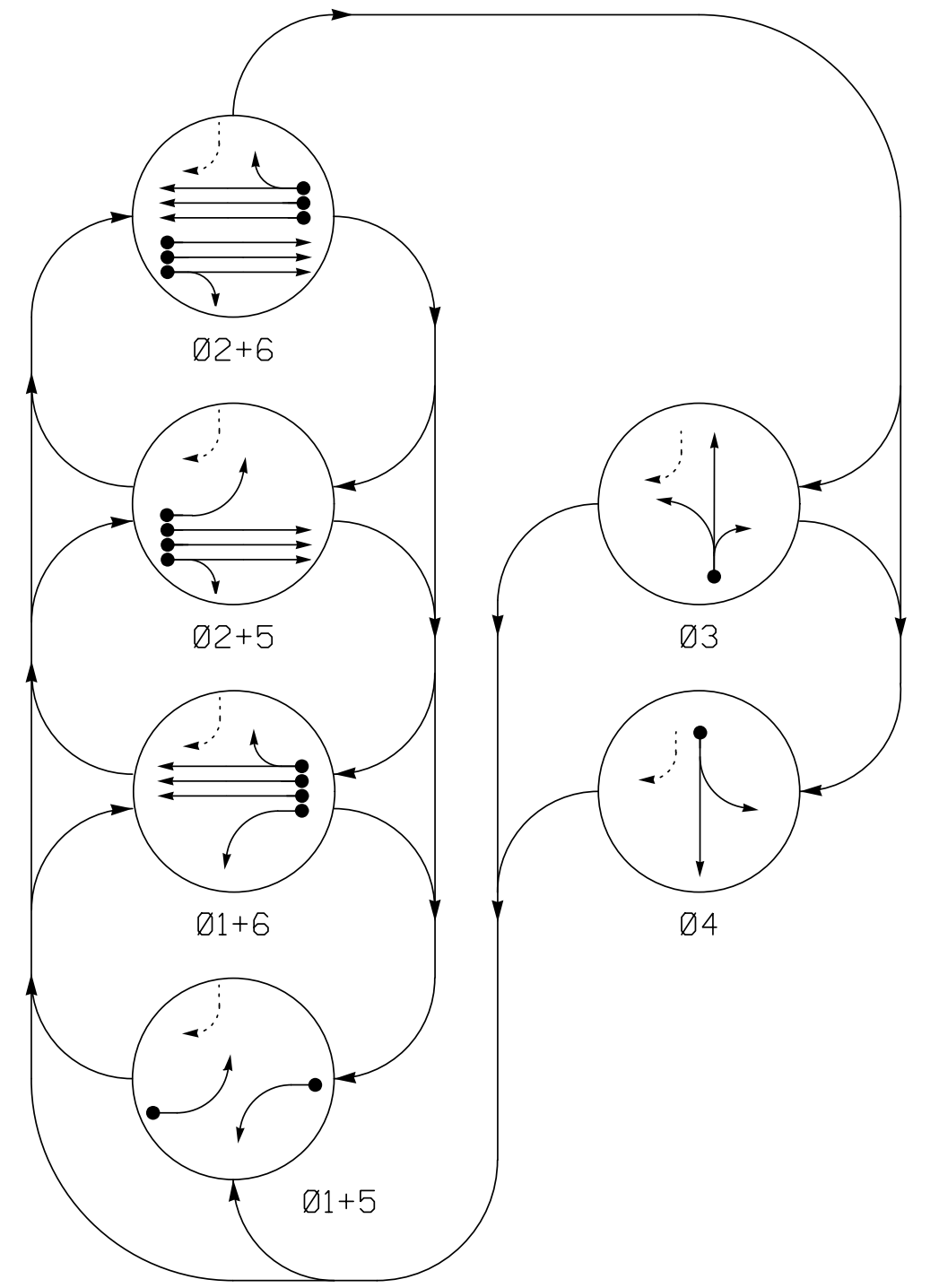
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Discussed by: 3/11/2022

SIG. INVENTORY NO. 12-0079

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PHASING DIAGRAM



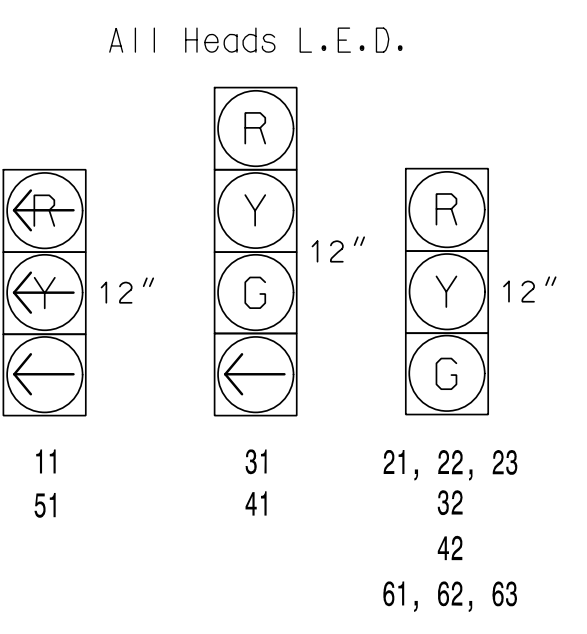
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 3	Ø 4
11	←	←	←	←	←	←
21,22,23	R	R	G	G	R	R
31	R	R	R	R	G	R
32	R	R	R	R	G	R
41	R	R	R	R	R	C
42	R	R	R	R	G	R
51	←	←	←	←	←	←
61,62,63	R	G	R	G	R	R

SIGNAL FACE I.D.



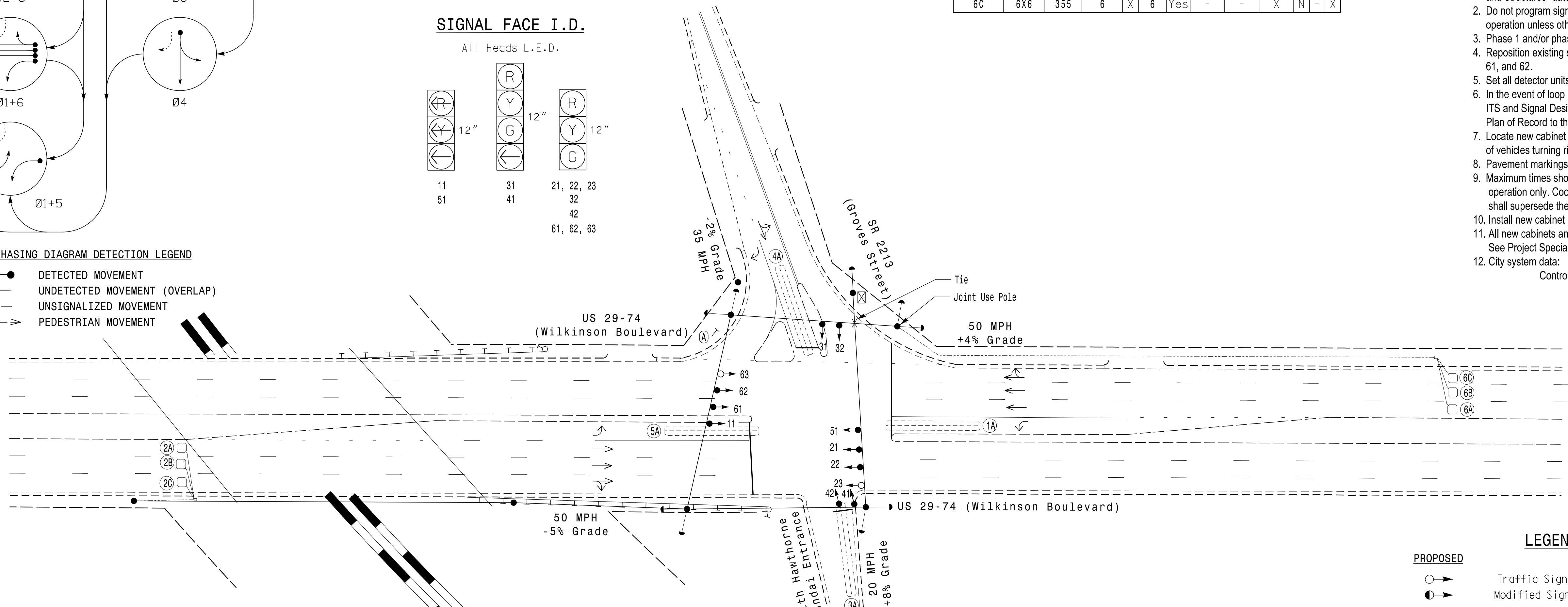
DETECTOR INSTALLATION CHART

DETECTOR				PROGRAMMING								
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	-	-	N	-	X
2A	6X6	355	6	X	2	Yes	-	-	X	N	-	X
2B	6X6	355	6	X	2	Yes	-	-	X	N	-	X
2C	6X6	355	6	X	2	Yes	-	-	X	N	-	X
3A	6X60	+5	2-4-2	-	3	Yes	-	10	-	N	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	-	-	N	-	X
6A	6X6	355	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	355	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	355	6	X	6	Yes	-	-	X	N	-	X

6 Phase Fully Actuated Gastonia Signal System

NOTES

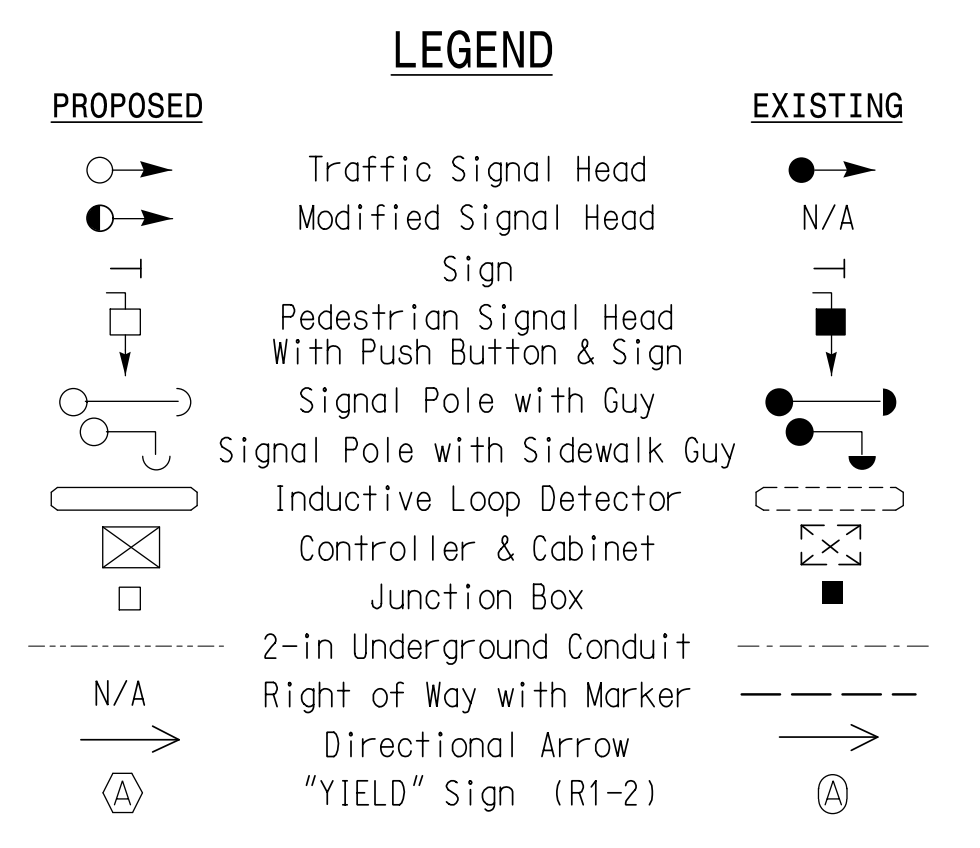
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 21, 22, 61, and 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City system data: Controller Asset #0080



TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	14	7	7	7	14
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	2.0	1.0	1.0	6.0
Max 1 *	20	70	25	25	20	70
Yellow	3.0	5.4	3.0	4.0	3.1	4.5
Red Clear	2.3	1.9	3.2	2.4	2.6	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	1.0	-	-	-	1.0
Max Initial *	-	40	-	-	-	40
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.1	-	-	-	3.1
Locking Detector	-	X	-	-	-	X
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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



Signal Upgrade

Prepared For:

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

US 29-74 (Wilkinson Blvd.)
at
SR 2213 (Groves St.)/Keith Hawthorne Hyundai Entrance
 Division 12 Gaston County Gastonia

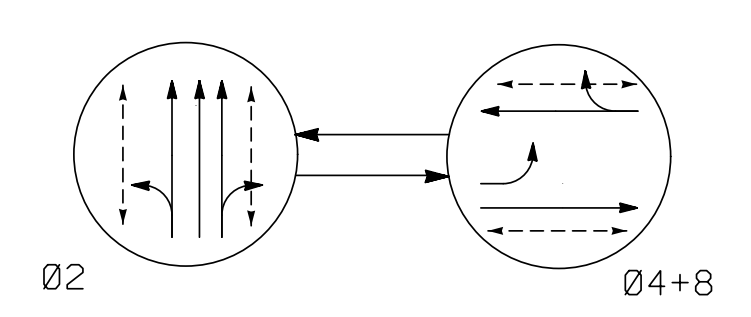
PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: DM Curri REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

 KEVIN P. BAUMANN
 ENGINEER
 3/11/2022
 DATE
 SIGNATURE
 DATE
 SIG. INVENTORY NO. 12-0080

PHASING DIAGRAM



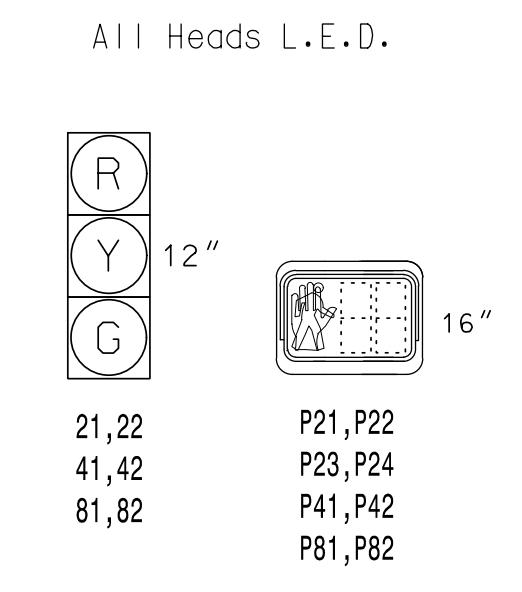
PHASING DIAGRAM DETECTION LEGEND

- → DETECTED MOVEMENT
- → UNDETECTED MOVEMENT (OVERLAP)
- ⋯ → UNSIGNALIZED MOVEMENT
- ⚡ → PEDESTRIAN MOVEMENT

TABLE OF OPERATION

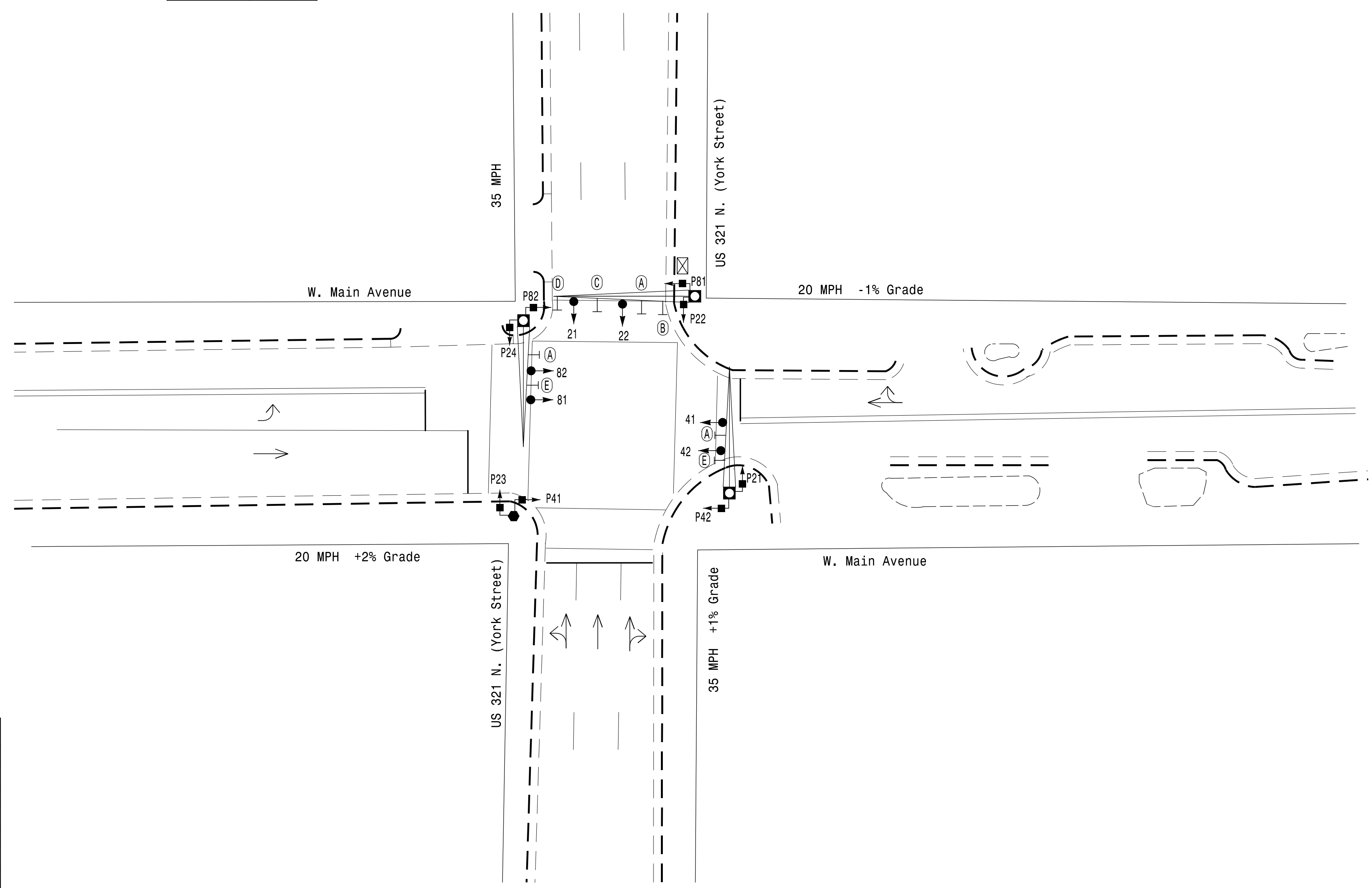
SIGNAL FACE	PHASE		
	Ø2	Ø4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
81, 82	R	G	R
P21, P22 P23, P24	W	DW	DRK
P41, P42	DW	W	DRK
P81, P82	DW	W	DRK

SIGNAL FACE I.D.



**2 Phase
Pre-Timed
Gastonia Signal System**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
4. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
5. Pavement markings are existing.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
7. Install new cabinet on the existing cabinet foundation.
8. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
9. City system data:
Controller Asset #0086.



TIMING CHART

FEATURE	PHASE		
	2	4	8
Min Green *	10	7	10
Walk *	4	4	4
Ped Clear	10	7	9
Veh. Extension *	-	-	-
Max I *	45	25	25
Yellow	3.8	3.0	3.0
Red Clear	1.2	2.1	2.1
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	-	-	-
Max Initial *	-	-	-
Time Before Reduction *	-	-	-
Time To Reduce *	-	-	-
Minimum Gap	-	-	-
Locking Detector	-	-	-
Recall Position	PED/MAX	PED/MAX	PED/MAX
Dual Entry	-	X	X
Simultaneous Gap	X	X	X

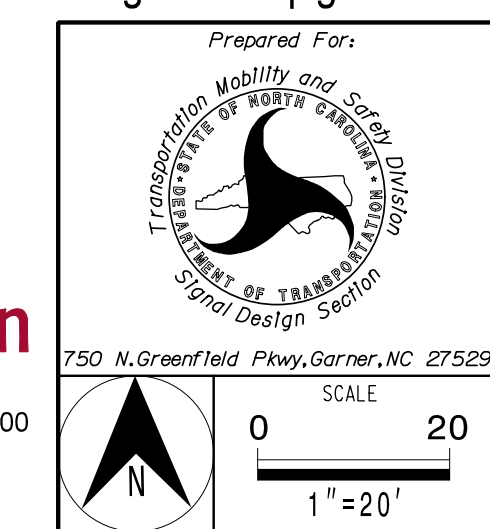
* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
○ → Modified Signal Head	○ → N/A
⊥ Sign	⊥
⊥ Pedestrian Signal Head With Sign	⊥
○ Type II Signal Pedestal	●
⊥ Metal Pole with Mastarm	⊥
⊥ Inductive Loop Detector	⊥
⊥ Controller & Cabinet	⊥
⊥ Junction Box	⊥
⊥ 2-in Underground Conduit	⊥
→ Right of Way	→
→ Directional Arrow	→
(A) Street Name Sign (R3-1)	(A)
(B) Combined Through and Right Arrow Sign (R3-6R)	(B)
(C) Through Arrow "ONLY" Sign (R3-5A)	(C)
(D) Combined Through and Left Arrow Sign (R3-6L)	(D)
(E) One Way Sign (R6-1)	(E)

Signal Upgrade

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



**US 321 N. (York Street)
at
W. Main Avenue**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS	INIT.	DATE

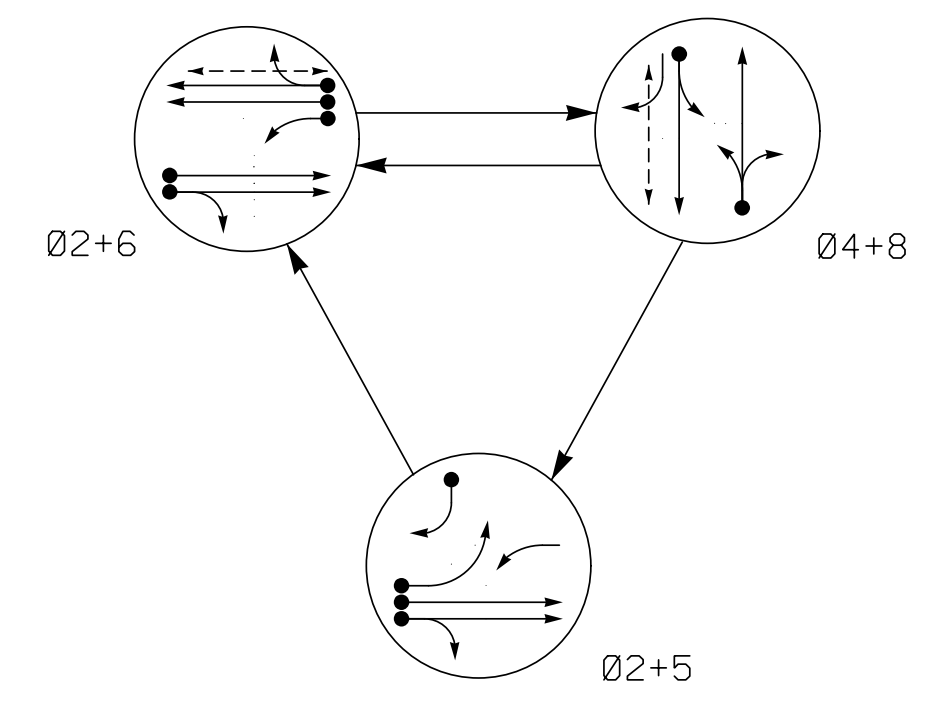
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Kevin P. Baumann
3/11/2022

SIG. INVENTORY NO. 12-0086

3/9/2022 11:15:24 AM D:\m181\le_c\curf1 ***k\miley-horn.com\SEL\RAL\IP\OK-LITS\011036569 Gastonia Signal System\9_Signal Design\2006-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←---→ UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

EV PREEMPT PHASES
(Medium Priority)

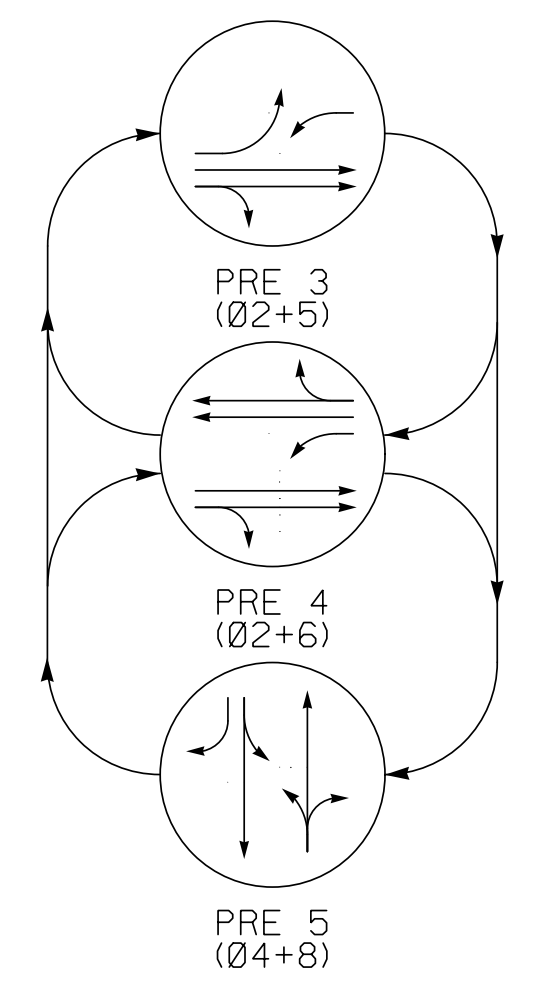


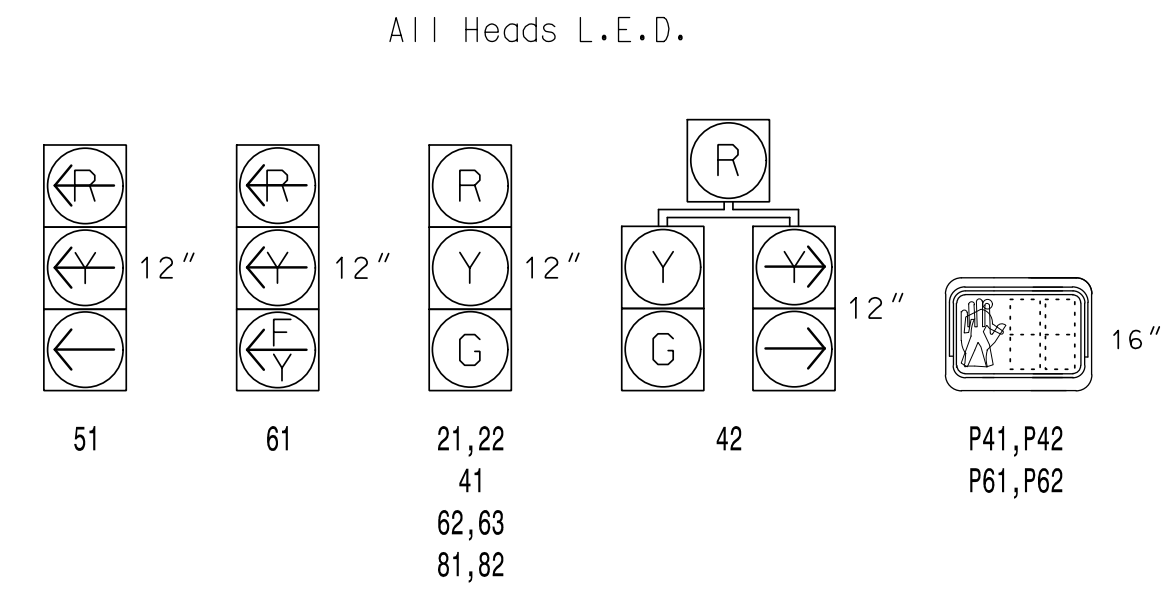
TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø 2+5	Ø 2+6	Ø 4+8	PRE 3	PRE 4	PRE 5	Ø 2+5	Ø 4+8
21, 22	G	G	R	G	G	R	Y	
41	R	R	G	R	R	G	R	
42	R	R	G	R	R	G	R	
51	←	←	←	←	←	←	←	
61	←	←	←	←	←	←	←	
62, 63	R	G	R	G	R	G	R	Y
81, 82	R	R	G	R	R	G	R	
P41, P42	DW	DW	W	DW	DW	DRK		
P61, P62	DW	W	DW	DW	DW	DRK		

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A	6X6	300	EXIST	-	2	Yes	1.8	-	-	N	-	X
2B	6X6	300	EXIST	-	2	Yes	1.8	-	-	N	-	X
2C	6X6	80	EXIST	-	2	Yes	-	-	-	N	-	X
2D	6X6	80	EXIST	-	2	Yes	-	-	-	N	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	3	-	N	-	X
5A	6X40	+5	2-4-2	-	5	Yes	-	-	-	N	-	X
5B	6X40	+5	2-4-2	-	5	Yes	-	5	-	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-
6B	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-
6C	6X40	0	2-4-2	-	6	Yes	-	3	-	G	-	X
8A	6X40	+5	2-4-2	-	8	Yes	-	-	-	N	-	X

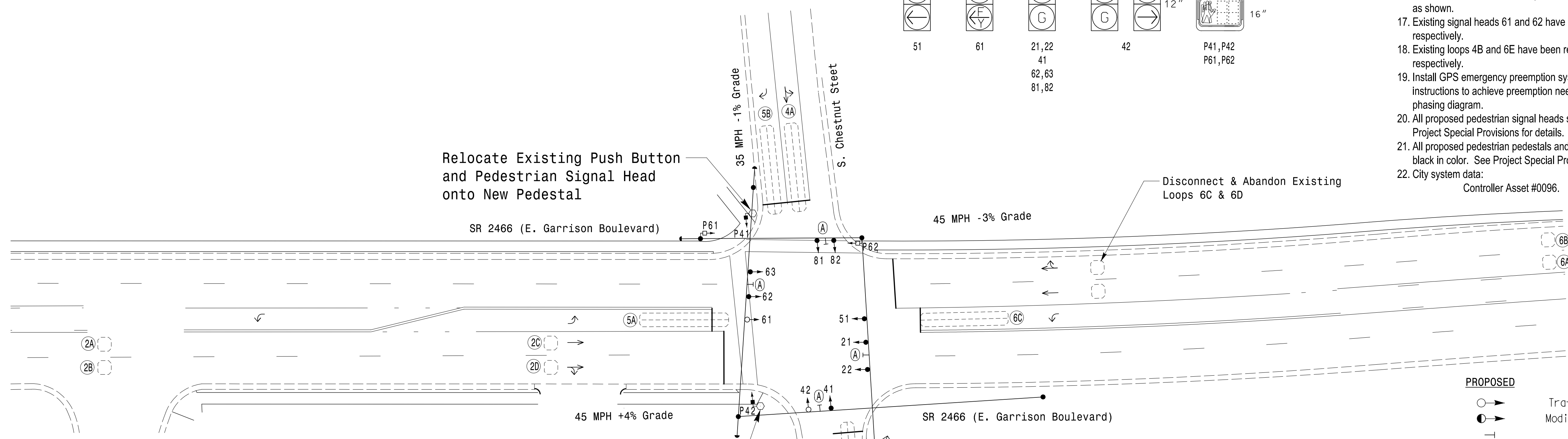
SIGNAL FACE I.D.



3 Phase Fully Actuated w/ Emergency Vehicle Preemption Gastonia Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 5 may be lagged.
4. Reposition existing signal heads numbered 62 and 63.
5. Set all detector units to presence mode.
6. In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
7. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
10. Remove existing "Left Turn Only" sign-(R3-5L).
11. Pavement markings are existing.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
13. Disconnect and abandon existing loops 6C and 6D.
14. Install new cabinet on the existing cabinet foundation.
15. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
16. Reconnect lead-in cable to separate loops 2A, 2B, 2C, 2D, 6A & 6B, as shown.
17. Existing signal heads 61 and 62 have been relabeled to 62 and 63, respectively.
18. Existing loops 4B and 6E have been relabeled to 5B and 6C, respectively.
19. Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
20. All proposed pedestrian signal heads shall be black in color. See Project Special Provisions for details.
21. All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
22. City system data: Controller Asset #0096.



TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green *	12	7	7	12	7
Walk *	-	7	-	7	-
Ped Clear	-	17	-	14	-
Veh. Extension *	2.0	2.0	2.0	6.0	2.0
Max I *	45	25	15	45	25
Yellow	4.8	3.9	3.0	4.8	3.9
Red Clear	1.2	2.2	2.3	1.2	2.2
Red Revert	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-
Seconds /Actuation *	-	-	-	1.5	-
Max Initial *	-	-	-	34	-
Time Before Reduction *	-	-	-	15	-
Time To Reduce *	-	-	-	30	-
Minimum Gap	-	-	-	3.0	-
Locking Detector	X	-	-	X	-
Recall Position	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X

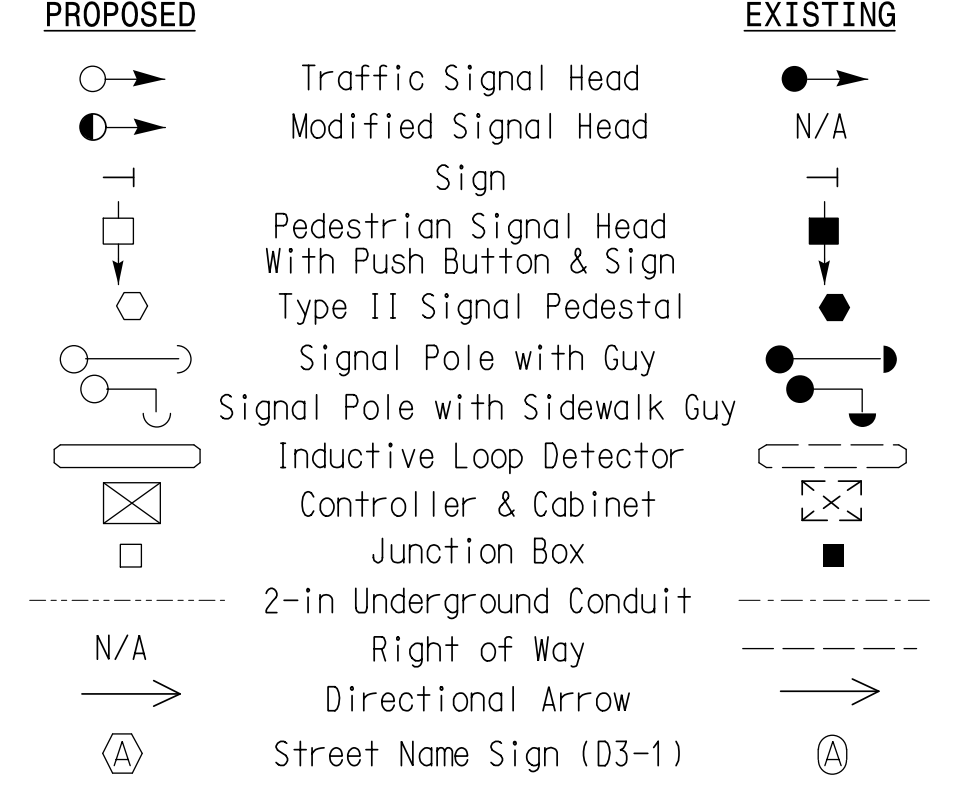
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

EV PREEMPT

FUNCTION	PRE 3	PRE 4	PRE 5
Exit Phase(s)	2+6	2+6	4+8
Preempt Override	OFF	OFF	OFF
Delay Time	0	0	0
Ped Clear Through Yellow	Y	Y	Y
Terminate Phases	N	N	N
Entrance Walk	1	1	1
Entrance Ped Clear	255*	255*	255*
Entrance Min Green	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*
Minimum Dwell Time	7	7	7
Preempt Input Extension Time **	2	2	2
Preempt Max Time	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*

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

LEGEND



Signal Upgrade

Prepared For:
Kimley-Horn

PLANS PREPARED IN THE OFFICE OF:
Kimley-Horn
NC License #0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 617-2000

SR 2466 (E. Garrison Boulevard) at S. Chestnut Street

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

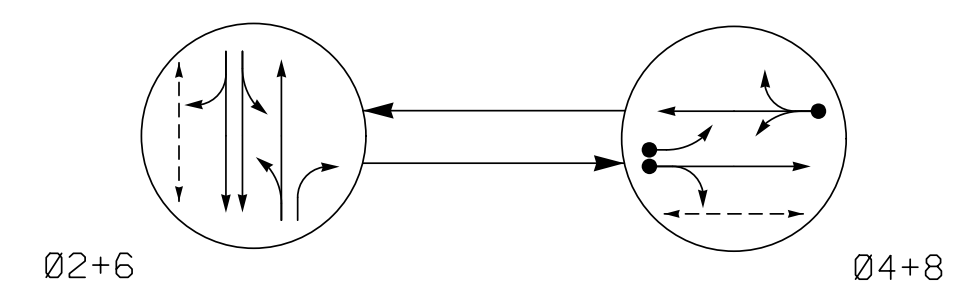
REVISIONS: _____ INITI: _____ DATE: _____

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Discussed by: _____ DATE: 3/11/2022
DATE: _____
SIG. INVENTORY NO. 12-0096

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PHASING DIAGRAM



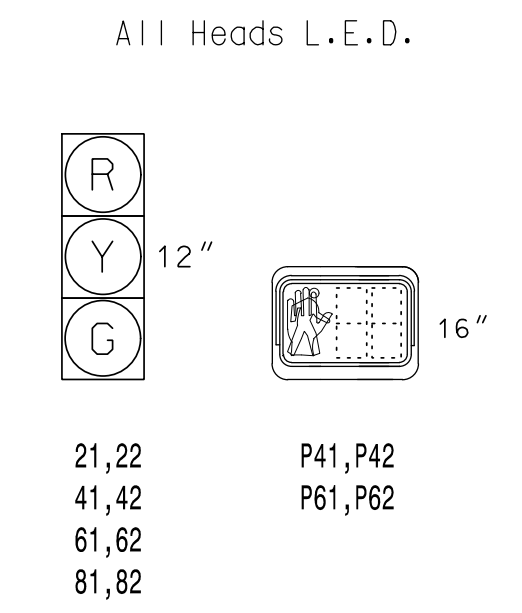
PHASING DIAGRAM DETECTION LEGEND

- ◄●◄ DETECTED MOVEMENT
- ◄◄◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄--- UNSIGNALIZED MOVEMENT
- ◄---> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø2+6	Ø4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK

SIGNAL FACE I.D.



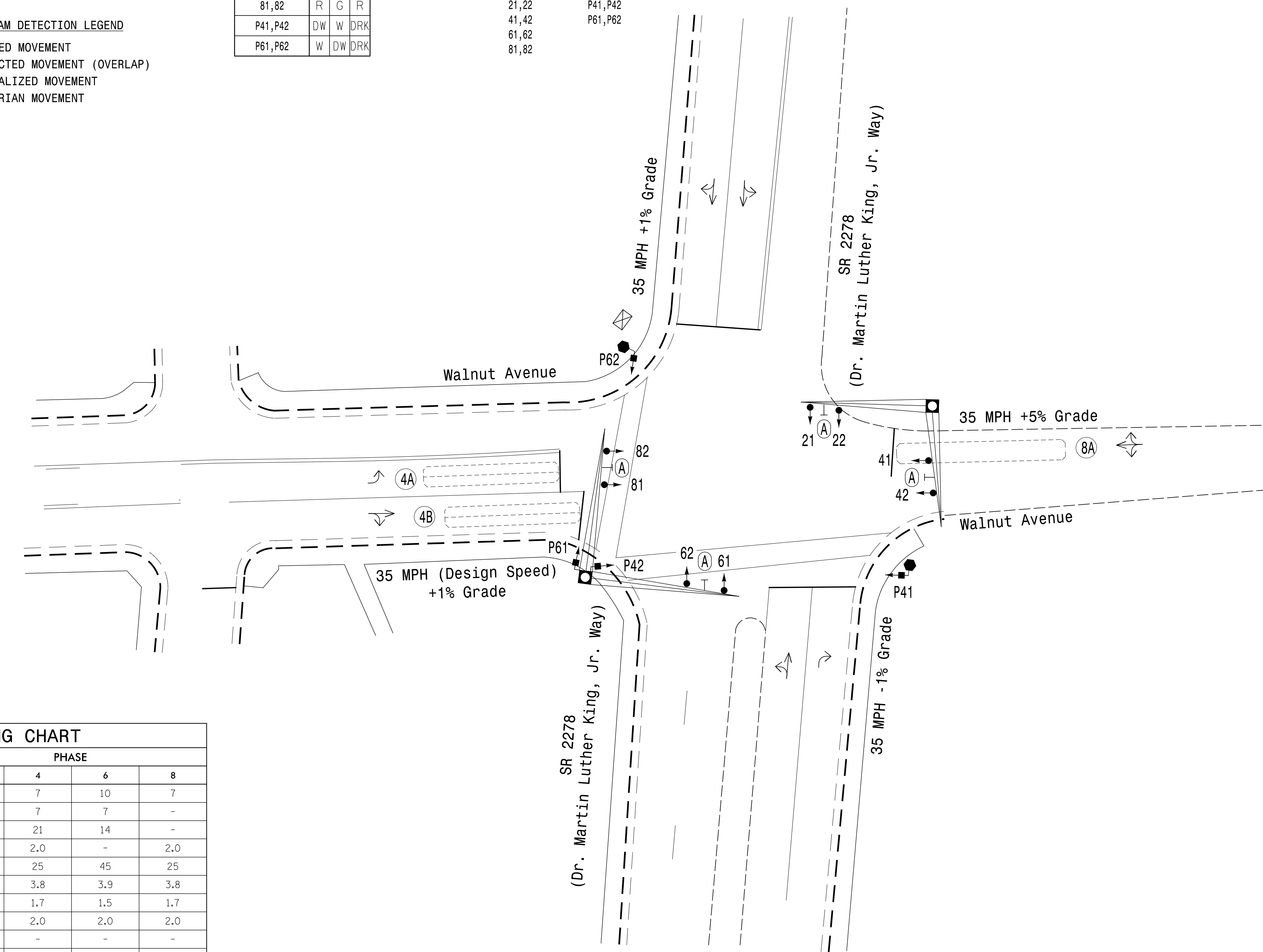
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DETECTOR				PROGRAMMING						
		DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
4A	6X40	0	2-4-2	-	4	Yes	-	3	-	N	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	5	-	N	-	X
8A	6X50	0	EXIST	-	8	Yes	-	5	-	N	-	X

2 Phase Semi-Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls on phase 4.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Existing phase 4 has been changed to phase 8 on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0097.



TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	-	7	7	-
Ped Clear	-	21	14	-
Veh. Extension *	-	2.0	-	2.0
Max I *	45	25	45	25
Yellow	3.9	3.8	3.9	3.8
Red Clear	1.5	1.7	1.5	1.7
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX RECALL	-	PED/MAX	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

	PROPOSED Traffic Signal Head		EXISTING Traffic Signal Head
	PROPOSED Modified Signal Head		EXISTING N/A
	PROPOSED Pedestrian Signal Head With Push Button & Sign		EXISTING N/A
	PROPOSED Metal Pole with Mastarm		EXISTING Metal Pole with Mastarm
	PROPOSED Signal Pole with Guy		EXISTING Signal Pole with Guy
	PROPOSED Signal Pole with Sidewalk Guy		EXISTING Signal Pole with Sidewalk Guy
	PROPOSED Inductive Loop Detector		EXISTING Inductive Loop Detector
	PROPOSED Controller & Cabinet		EXISTING Controller & Cabinet
	PROPOSED Junction Box		EXISTING Junction Box
	PROPOSED 2-in Underground Conduit		EXISTING 2-in Underground Conduit
	PROPOSED Right of Way		EXISTING Right of Way
	PROPOSED Directional Arrow		EXISTING Directional Arrow
	PROPOSED Street Name Sign (D3-1)		EXISTING Street Name Sign (D3-1)

Signal Upgrade

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

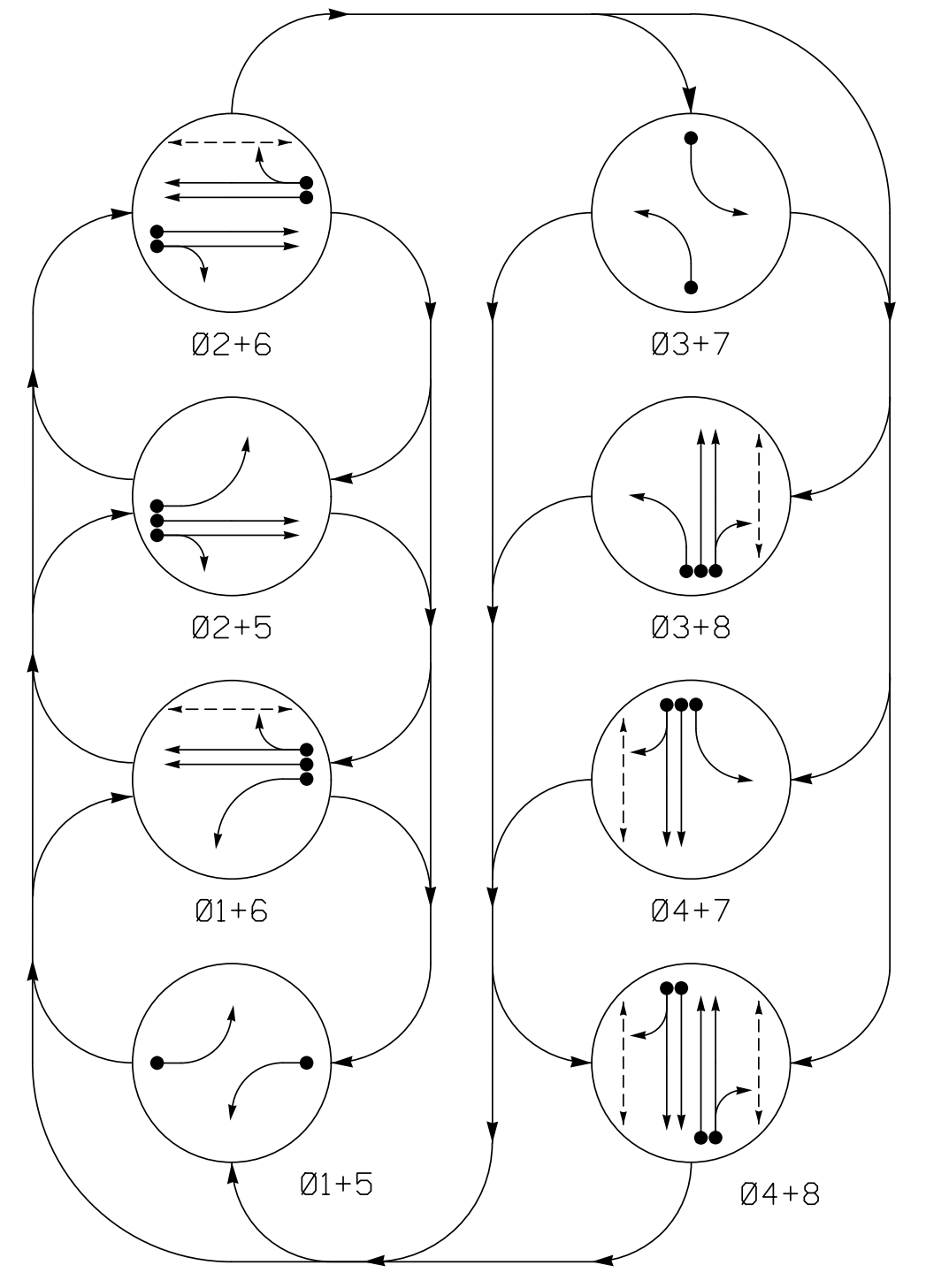
SR 2278 (Dr. Martin Luther King, Jr. Way) at Walnut Avenue	
Division 12	Gaston County Gastonia
PLAN DATE: May 2021	REVIEWED BY: SL Phillips
PREPARED BY: CF Davis	REVIEWED BY: KP Baumann
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Kevin P. Baumann
3/11/2022
DATE
SIC. INVENTORY NO. 12-0097

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PHASING DIAGRAM



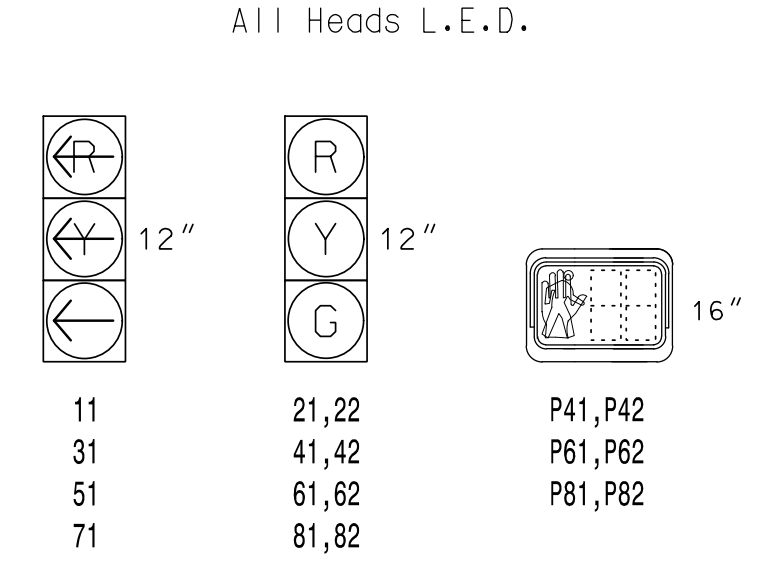
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 2 + 6	Ø 3 + 7	Ø 4 + 8	Ø 1 + 6	Ø 2 + 5	Ø 3 + 8	Ø 4 + 7
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	R
31	←	←	←	←	←	←	←	←
41,42	R	R	R	R	R	R	G	G
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	R
71	←	←	←	←	←	←	←	←
81,82	R	R	R	R	R	G	R	G
P41,P42	DW	DW	DW	DW	DW	DW	W	DRK
P61,P62	DW	W	DW	W	DW	DW	DW	DRK
P81,P82	DW	DW	DW	DW	W	DW	W	DRK

SIGNAL FACE I.D.



DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X40	0	2-4-2	-	1	Yes	-	3	-	N	-	X
2A	6X40	0	2-4-2	-	2	Yes	-	-	-	N	-	X
2B	6X40	0	2-4-2	-	2	Yes	-	-	-	N	-	X
3A	6X40	0	2-4-2	-	3	Yes	-	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X40	0	2-4-2	-	5	Yes	-	3	-	N	-	X
6A	6X40	0	2-4-2	-	6	Yes	-	-	-	N	-	X
6B	6X40	0	2-4-2	-	6	Yes	-	-	-	N	-	X
7A	6X40	0	2-4-2	-	7	Yes	-	-	-	N	-	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	-	-	N	-	X

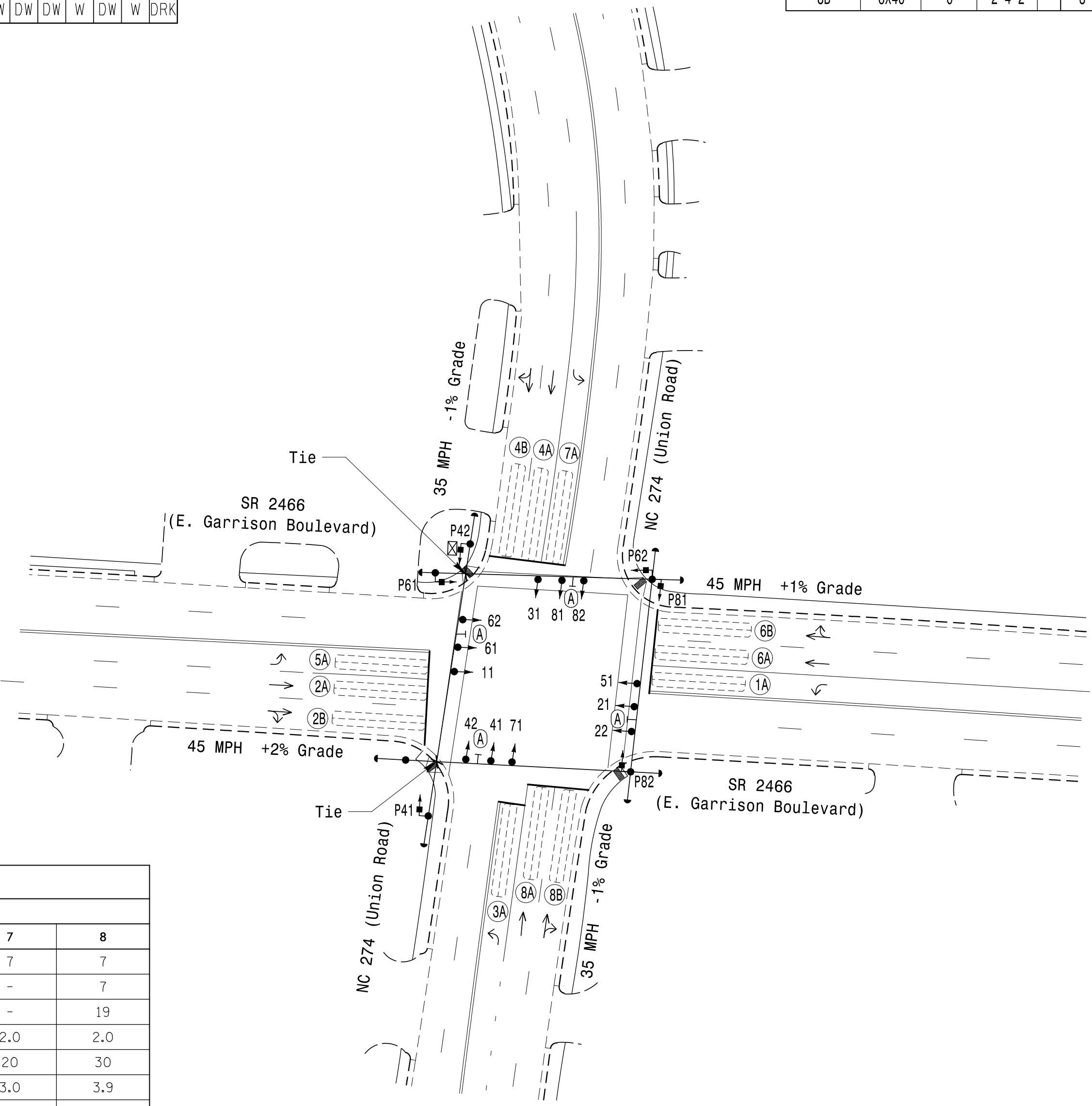
8 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Existing phases 3, 4, 7, & 8 have been changed to phases 7, 8, 3 & 4 respectively on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
- City of system data:
Controller Asset #0098.

LEGEND

- | | | | |
|--|-------------------------------|--|-------------------------------|
| | Traffic Signal Head | | Traffic Signal Head |
| | Modified Signal Head | | N/A |
| | Pedestrian Signal Head | | N/A |
| | Signal Pole with Guy | | Signal Pole with Guy |
| | Signal Pole with Sidewalk Guy | | Signal Pole with Sidewalk Guy |
| | Inductive Loop Detector | | Inductive Loop Detector |
| | Controller & Cabinet | | Controller & Cabinet |
| | Junction Box | | Junction Box |
| | 2-in Underground Conduit | | 2-in Underground Conduit |
| | Right of Way | | Right of Way |
| | Directional Arrow | | Directional Arrow |
| | Curb Ramp | | Curb Ramp |
| | Street Name Sign (D3-1) | | Street Name Sign (D3-1) |



TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	7	-	7	-	7
Ped Clear	-	-	-	21	-	16	-	19
Veh. Extension *	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Max 1 *	20	45	20	30	20	45	20	30
Yellow	3.0	4.3	3.0	3.9	3.0	4.4	3.0	3.9
Red Clear	2.6	1.3	2.6	1.7	2.4	1.3	2.3	1.7
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	-	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

Signal Upgrade

Prepared For:
Kimley-Horn

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

**SR 2466 (E. Garrison Boulevard)
at
NC 274 (Union Road)**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL 044434
K. P. BAUMANN
ENGINEER

Discussed by: _____ DATE: 3/11/2022
Signature: _____ DATE: _____
SIGNED FOR: _____ DATE: _____

SIG. INVENTORY NO. 12-0098

3/9/2022 11:16:12 AM Don'tell,Curr1 ***K:\m\ey-horn.com\SE-RAL\MRAL-T\15\011036569_Gastonia Signal System9_Signal\KWS4 - Signal Design\120098-2021.dgn

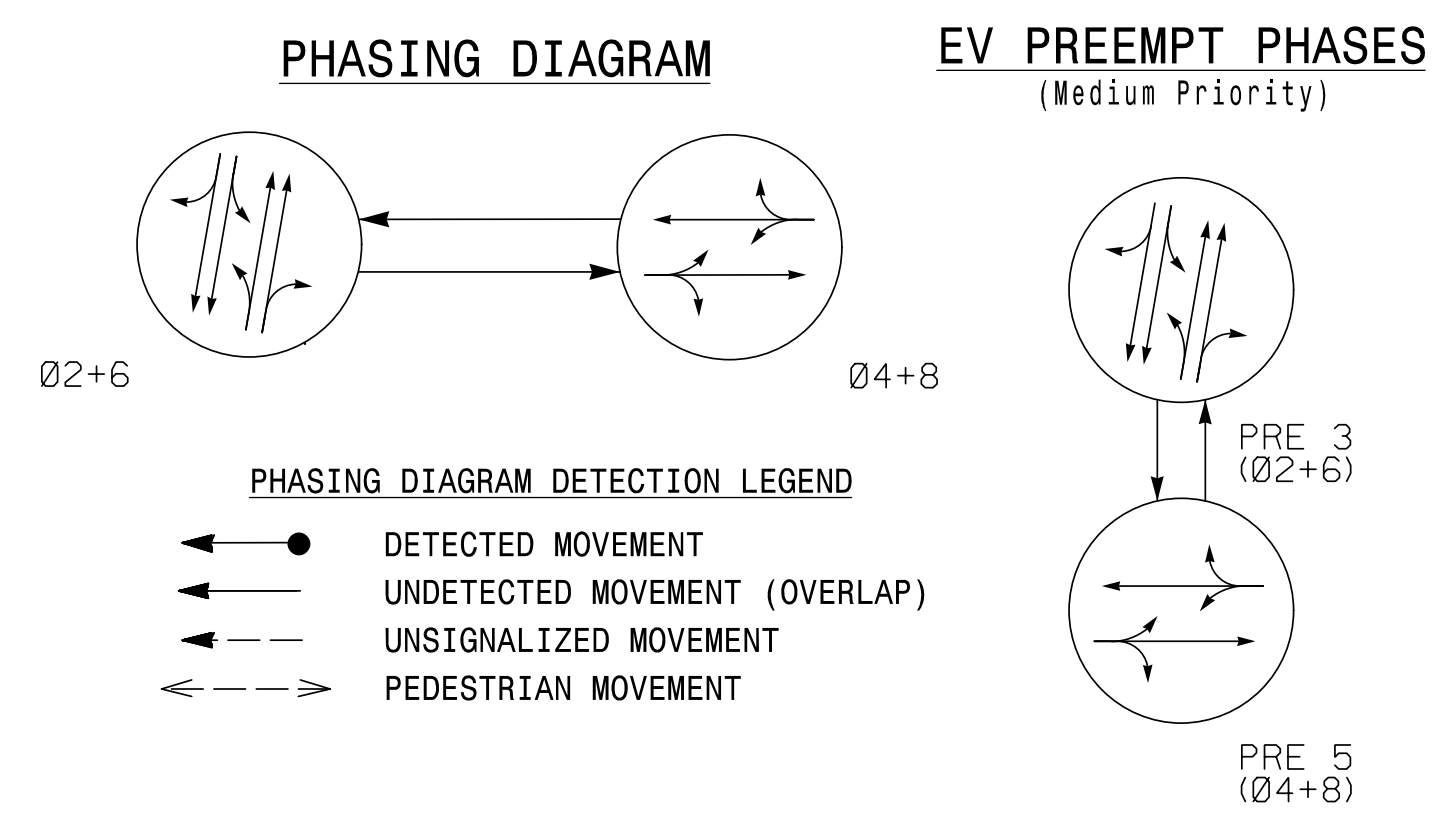


TABLE OF OPERATION

SIGNAL FACE	PHASE				
	02+6	04+8	PRE 3	PRE 5	HEADS
21,22	R	G	R	Y	
41,42	R	G	R	G	R
61,62	G	R	G	R	Y
81,82	R	G	R	G	R

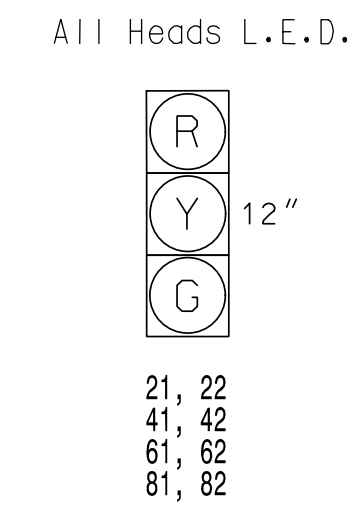
EV PREEMPT

FUNCTION	PRE 3	PRE 5
Exit Phase(s)	2+6	4+8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	N	N
Terminate Phases	N	N
Entrance Walk	-	-
Entrance Ped Clear	-	-
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	7	7
Preempt Input Extension Time **	2	2
Preempt Max Time	120	120
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

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

- ### 2 Phase Pre-Timed w/ Emergency Vehicle Preemption Gastonia Signal System
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
 2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
 3. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
 4. Pavement markings are existing.
 5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
 6. Install new cabinet on the existing cabinet foundation.
 7. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
 8. Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
 9. City system data:
Controller Asset: #0102

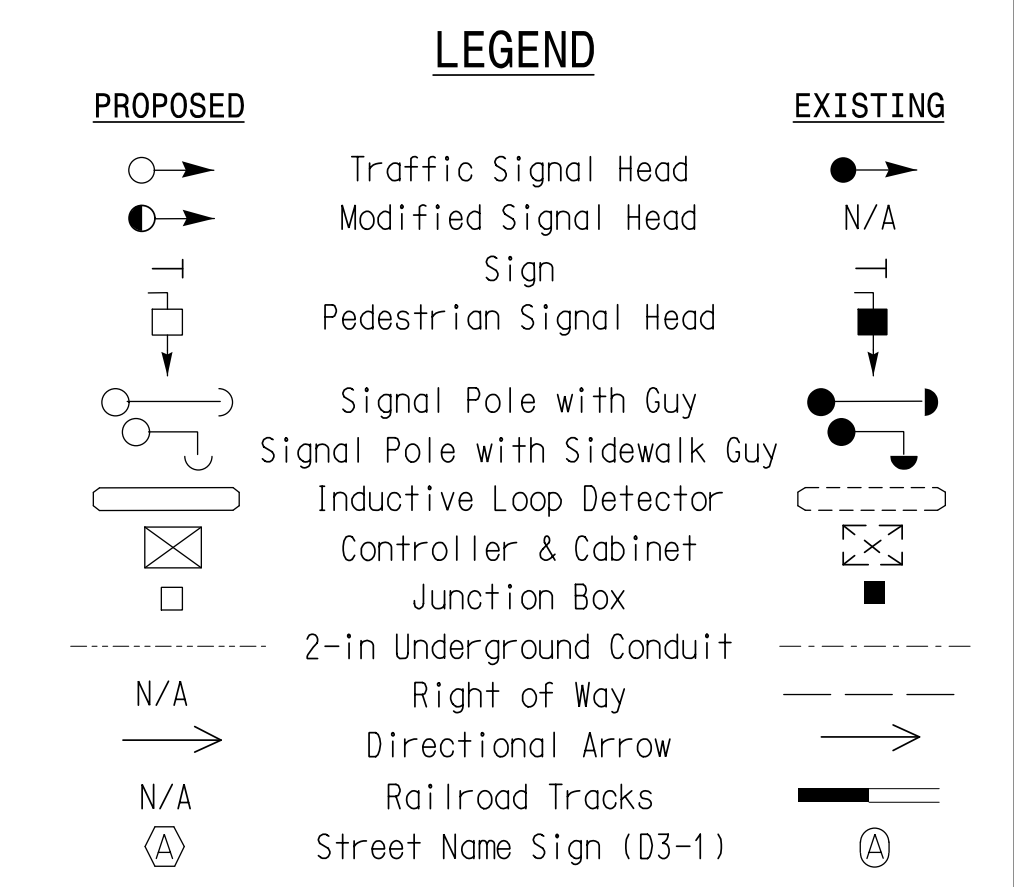
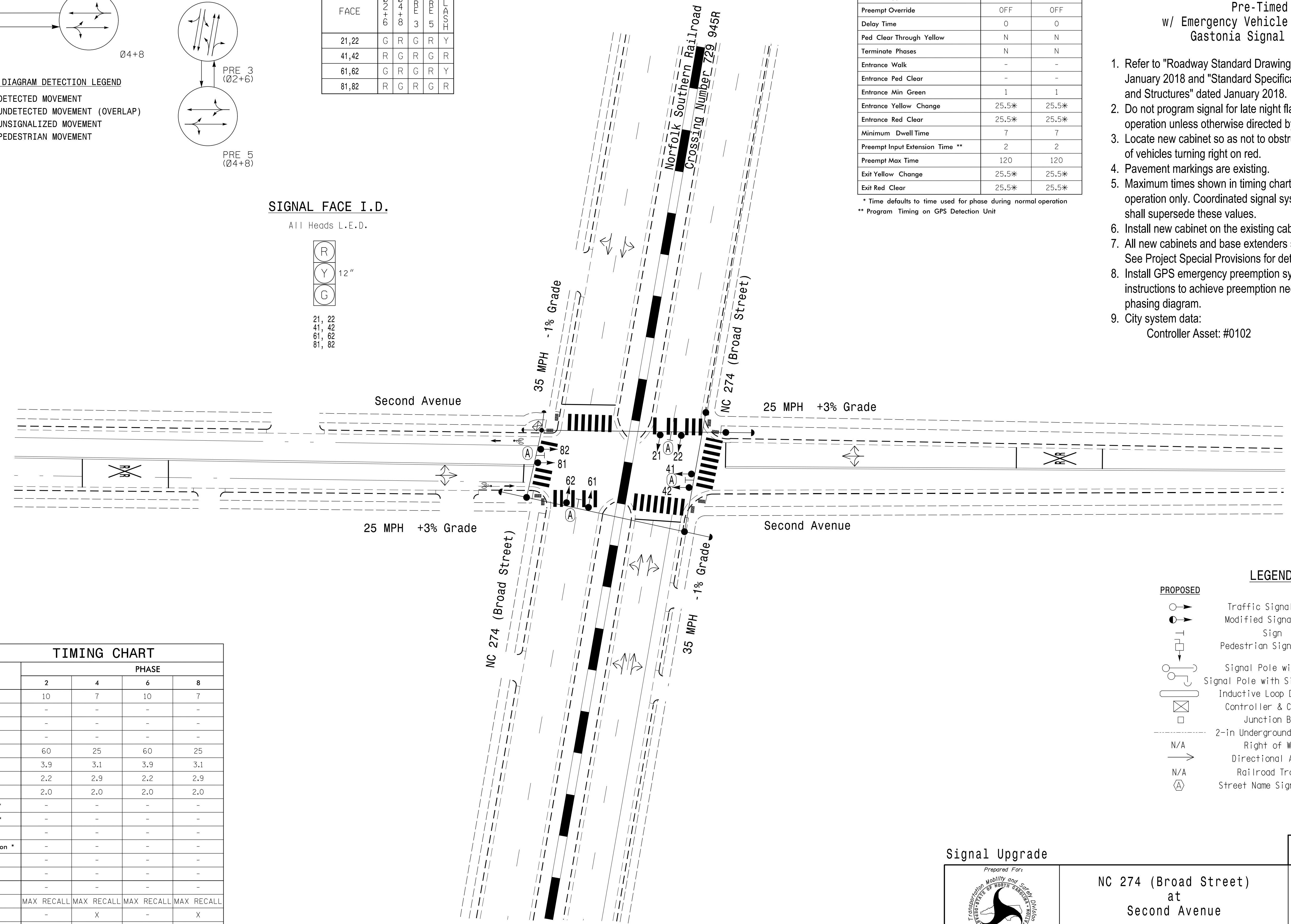
SIGNAL FACE I.D.



TIMING CHART

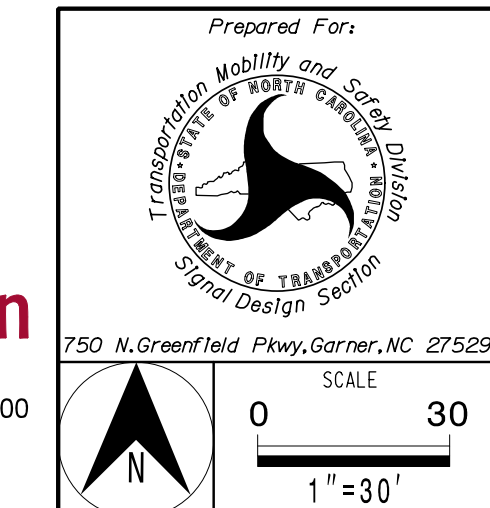
FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	-	-	-	-
Max I *	60	25	60	25
Yellow	3.9	3.1	3.9	3.1
Red Clear	2.2	2.9	2.2	2.9
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	MAX RECALL	MAX RECALL	MAX RECALL	MAX RECALL
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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



Signal Upgrade

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



NC 274 (Broad Street) at Second Avenue

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

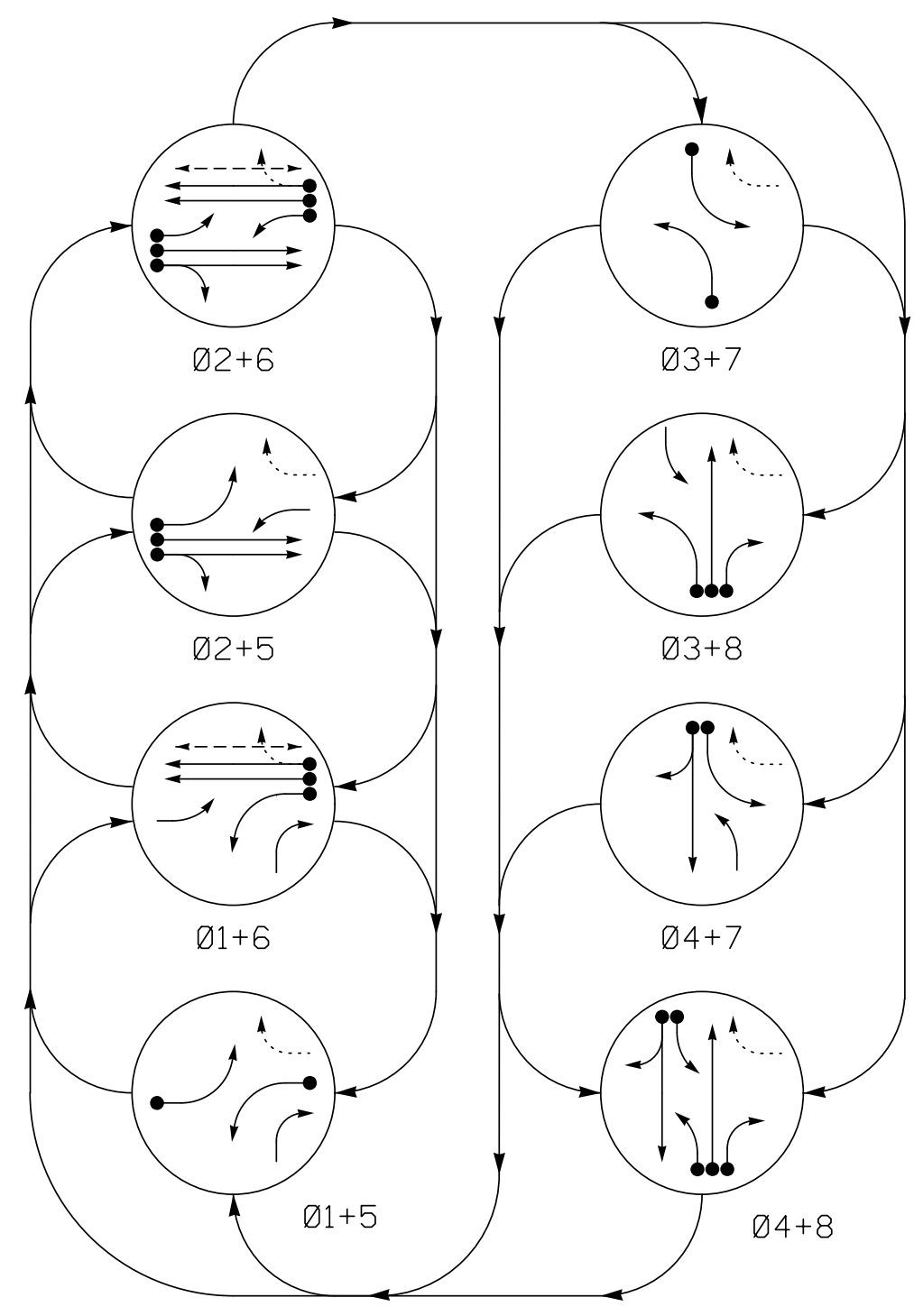
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Designed by: DATE: 3/11/2022
SIGNATURE: _____ DATE: _____
SIG. INVENTORY NO. 12-0102

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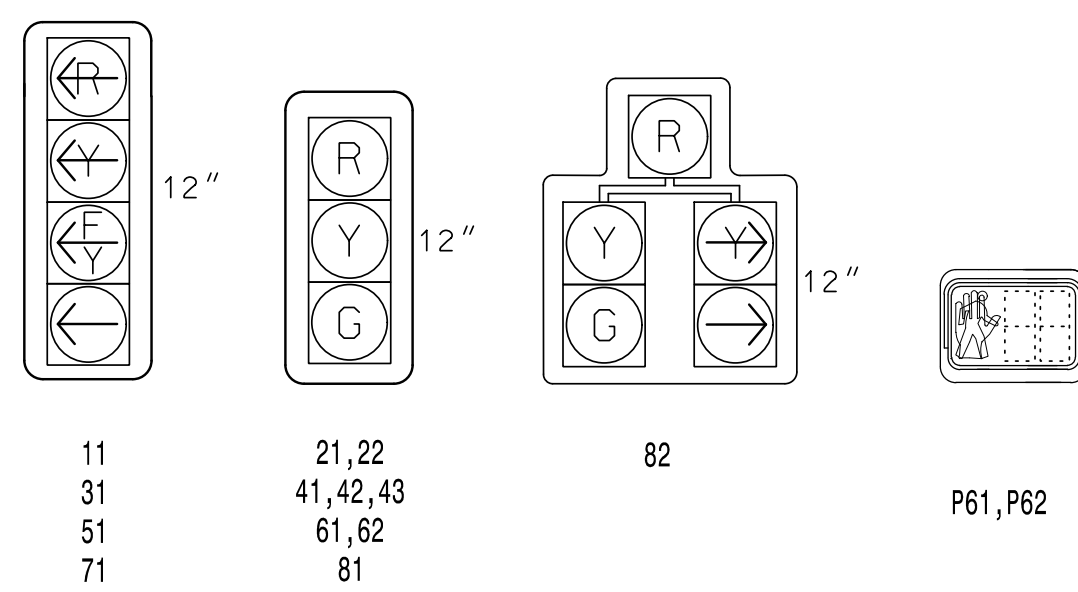
DEFAULT PHASING DIAGRAM



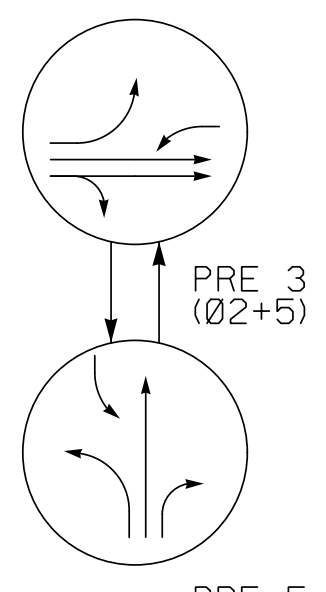
PHASING DIAGRAM DETECTION LEGEND
 ● DETECTED MOVEMENT
 ○ UNDETECTED MOVEMENT (OVERLAP)
 - - UNSIGNALIZED MOVEMENT
 - - - PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

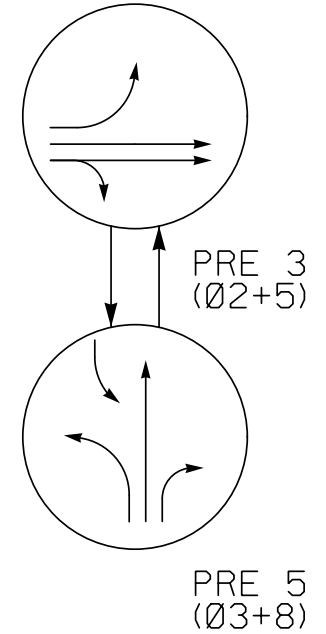
All Heads L.E.D.
 All Heads have Backplates with reflective borders



DEFAULT EV PREEMPT PHASES (Medium Priority)



ALTERNATE EV PREEMPT PHASES (Medium Priority)



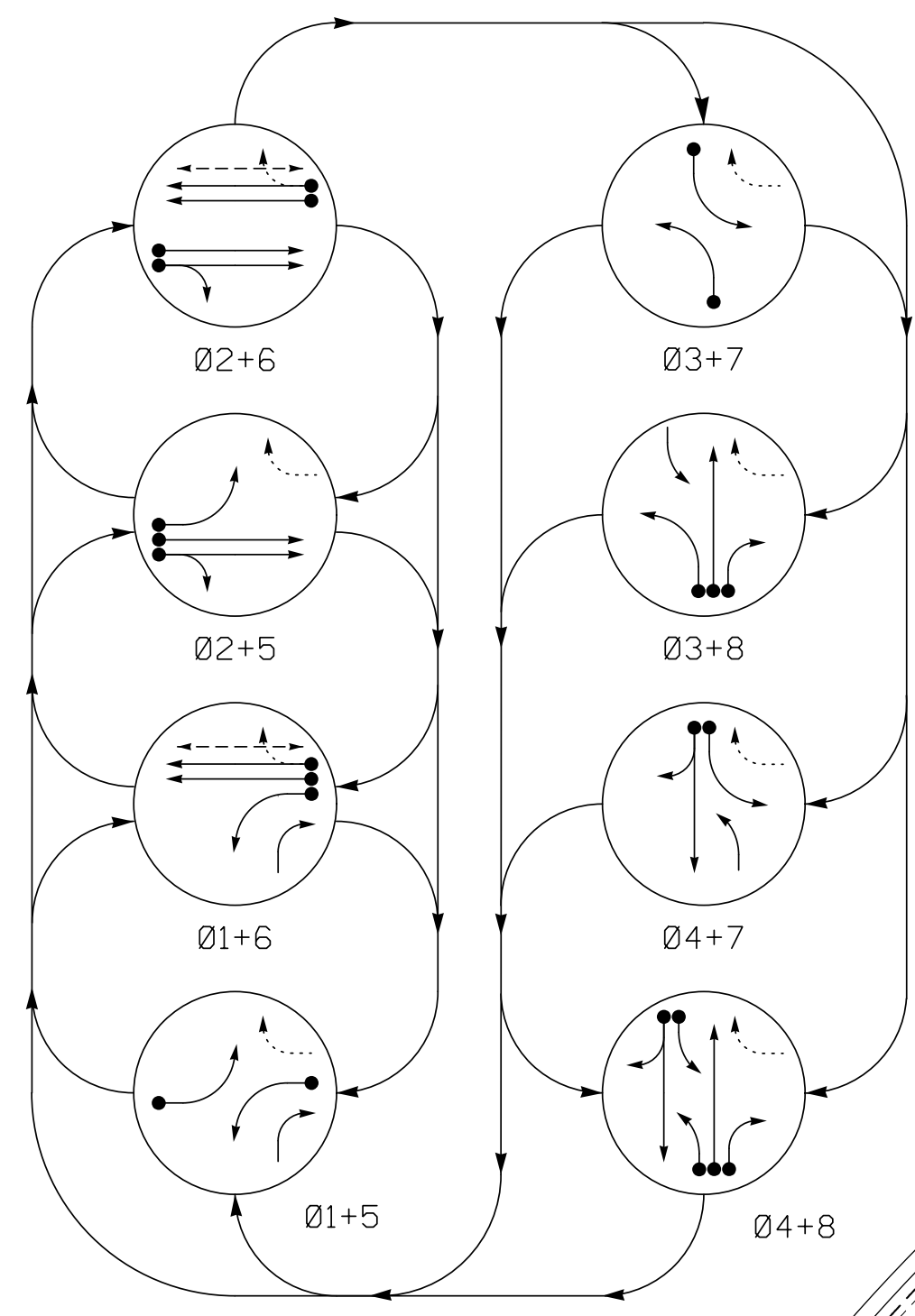
DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+5	02+5	03+7	04+7	04+8	P61	P62	FLASH
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41,42,43	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	R	G	G	R
P61,P62	DW	W	DW	W	DW	DW	DW	DRK

ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE							
	01+6	02+6	03+8	04+8	P61	P62	FLASH	
11	←	←	←	←	←	←	←	←
21,22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41,42,43	R	R	R	R	R	G	G	R
51	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
71	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	R	G	G	R
P61,P62	DW	W	DW	W	DW	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	5*	-	N	-	X
2A	6X6	300	EXIST	-	6#	Yes	-	-	-	G	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
3A	6X60	+5	2-4-2	-	3	Yes	-	15	-	N	-	X
4A	6X40	+5	2-4-2	-	4	Yes	-	3	-	N	-	X
5A	6X60	0	2-4-2	-	2#	Yes	-	-	-	G	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
7A	6X40	+5	2-4-2	-	7	Yes	-	15	-	N	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	3	-	N	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	10	-	N	-	X

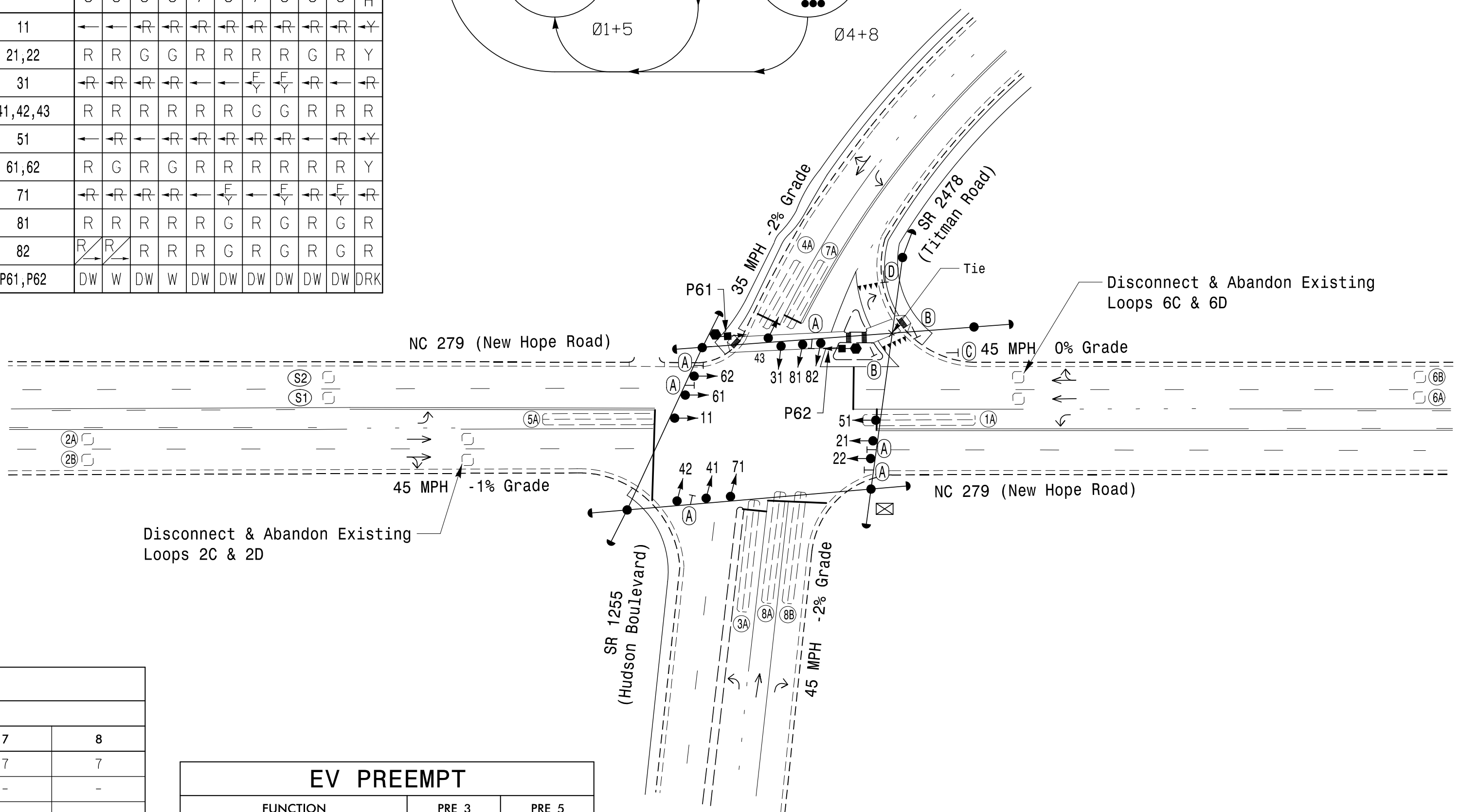
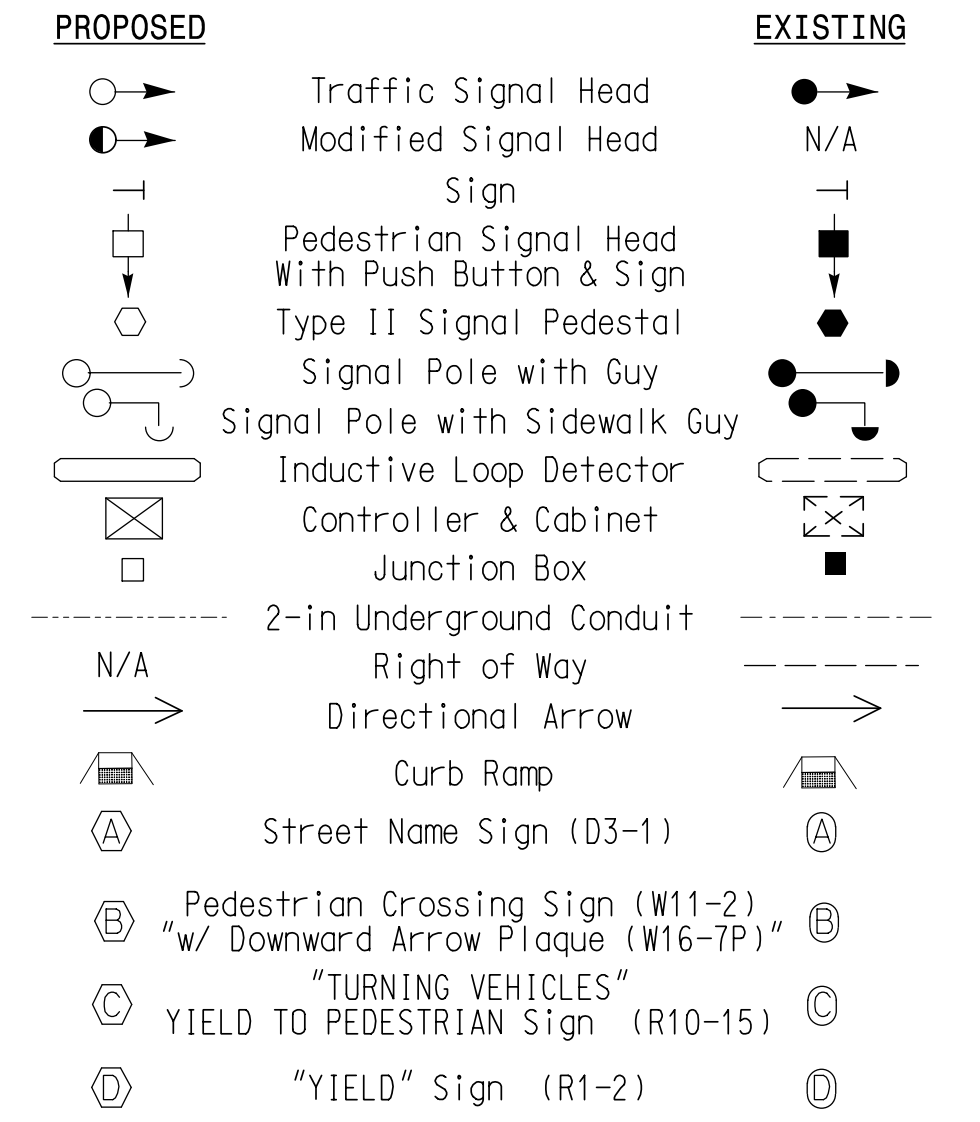
* Reduce Delay to 3 seconds during Alternate Phasing operation.
 # Disable Phase call for loop during Alternate Phasing operation.

8 Phase Fully Actuated w/ Alternate Phasing Operation and Emergency Vehicle Preemption Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- The City Engineer or their representative 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 shall supersede these values.
- Disconnect and abandon existing loops 2C, 2D, 6C, & 6D.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City of system data:
 Controller Asset #0103.

LEGEND



TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	12	7	7	7	12	7	7
Walk *	-	-	-	-	-	4	-	-
Ped Clear	-	-	-	-	-	13	-	-
Veh. Extension *	1.0	6.0	1.0	2.0	1.0	6.0	2.0	1.0
Max 1 *	15	45	20	25	15	45	20	25
Yellow	3.0	4.6	3.0	4.7	3.0	4.6	3.0	4.7
Red Clear	2.9	1.4	2.3	1.8	2.9	1.4	2.4	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5	-	-
Max Initial *	-	34	-	-	-	34	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	3.0	-	-	-	3.0	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	X	-	-	-	X
Simultaneous Gap	X	X	X	X	X	X	X	X

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

EV PREEMPT

FUNCTION	PRE 3	PRE 5
Exit Phase(s)	2+6	4+8
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	Y	Y
Terminate Phases	N	N
Entrance Walk	1	1
Entrance Ped Clear	25.5*	25.5*
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	7	7
Preempt Input Extension Time **	2	2
Preempt Max Time	120	120
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

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

Signal Upgrade

Prepared For:

 Kimley-Horn
 NC License #0102
 421 Fayetteville Street, Suite 600
 Raleigh, NC 27601
 (919) 677-2000

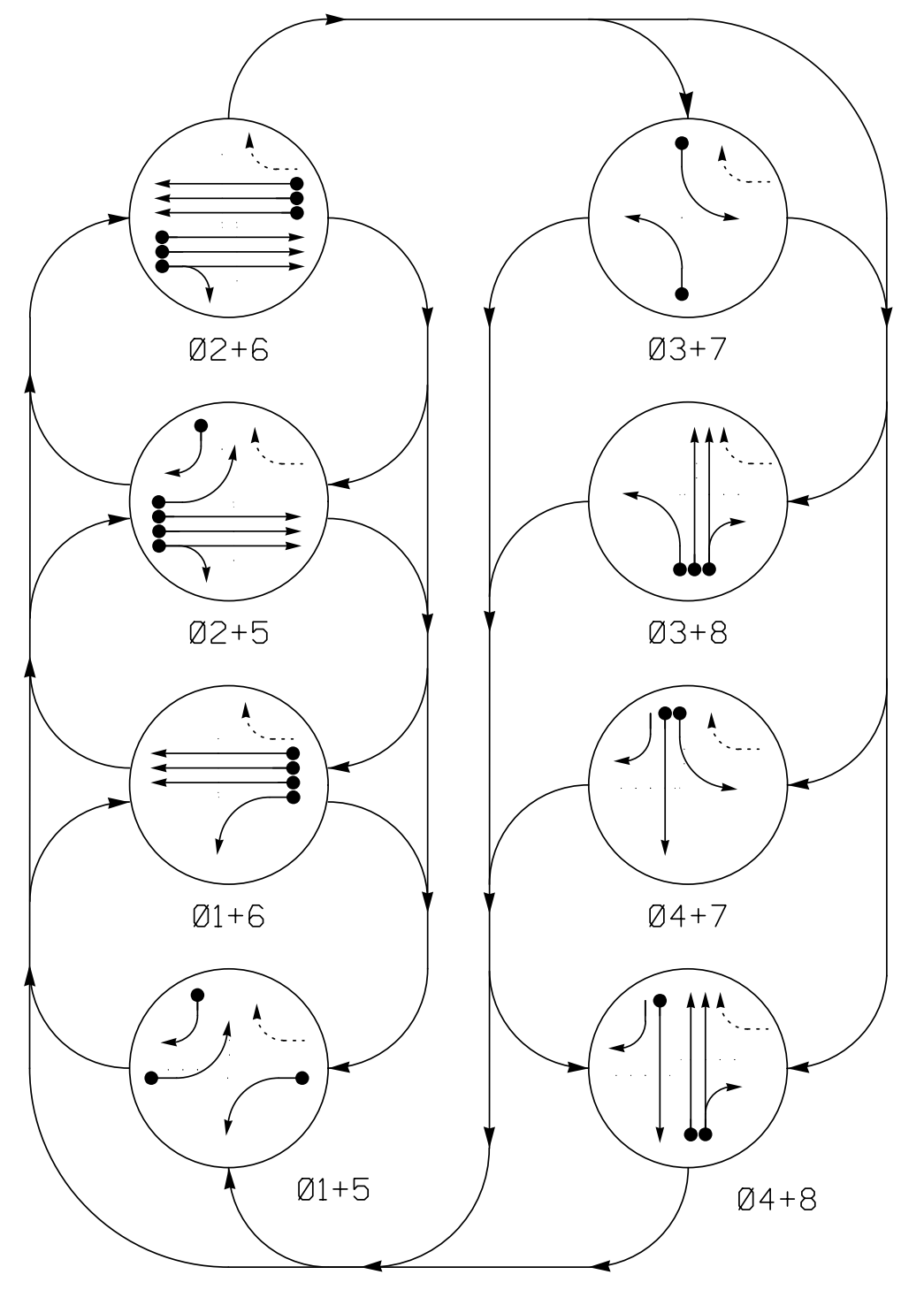
NC 279 (New Hope Road)
 at
 SR 1255 (Hudson Boulevard) /
 SR 2478 (Titman Road)
 Division 12 Gaston County Gastonia
 PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: CF Davis REVIEWED BY: KP Baumann

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Discussed by: 3/11/2022
 DATE: _____
 SIGNATURE: _____
 SIG. INVENTORY NO. 12-0103

3/9/2022 11:16:15 AM Dan1116.Cur1 ***K:\mley-horn.com\SE-RAL\MRAL_TIP\DK-LTS\011036569_Gastonia Signal System9_Signal\SW54 - Signal Design\120105-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

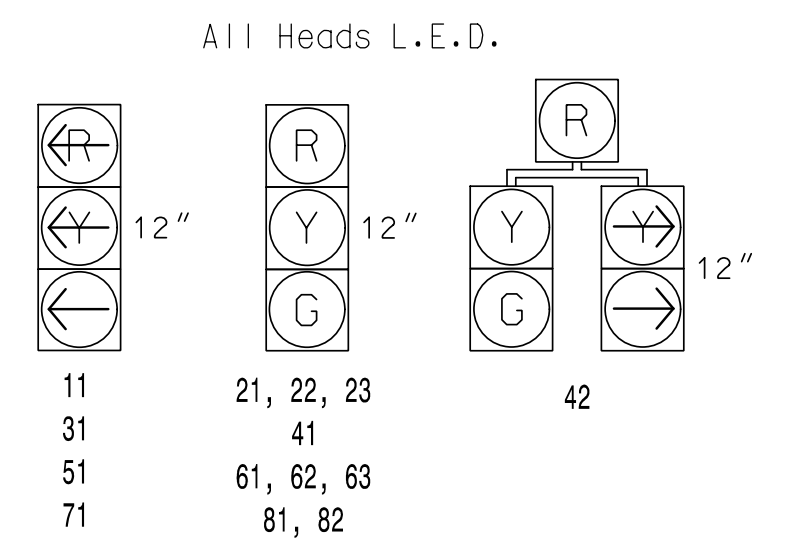
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- ◄ — UNDETECTED MOVEMENT (OVERLAP)
- ◄ - - - UNSIGNALIZED MOVEMENT
- ◄ - - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE								FLASH
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 3 + 7	Ø 3 + 8	Ø 4 + 7	Ø 4 + 8	
11	←	←	→	→	←	←	→	→	—
21, 22, 23	R	R	G	G	R	R	R	R	Y
31	←	←	→	→	←	←	→	→	—
41	R	R	R	R	R	R	G	G	R
42	R	R	R	R	R	R	G	G	R
51	←	←	→	→	←	←	→	→	—
61, 62, 63	R	G	R	G	R	R	R	R	Y
71	←	←	→	→	←	←	→	→	—
81, 82	R	R	R	R	R	G	R	G	R
SIGN 'C'	*	*	*	*	*	*	*	*	OFF
SIGN 'D'	*	*	*	*	*	*	*	*	OFF
SIGN 'E'	*	*	*	*	*	*	*	*	OFF
SIGN 'F'	*	*	*	*	*	*	*	*	OFF

* Changeable Trailblazer Sign controlled remotely

SIGNAL FACE I.D.



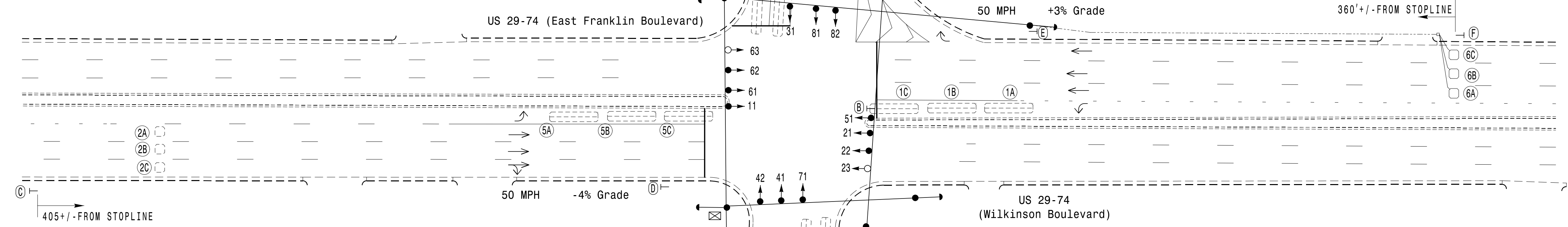
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X30	65	2-4-2	-	1	Yes	-	-	-	N	-	X
1B	6X30	30	2-4-2	-	1	Yes	-	-	-	N	-	X
1C	6X30	+5	2-4-2	-	1	Yes	-	-	-	N	-	X
2A	6X6	335	EXIST	-	2	Yes	-	-	X	N	-	X
2B	6X6	335	EXIST	-	2	Yes	-	-	X	N	-	X
2C	6X6	335	EXIST	-	2	Yes	-	-	X	N	-	X
3A	6X60	20	2-4-2	-	3	Yes	-	-	-	N	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X30	65	2-4-2	-	5	Yes	-	-	-	N	-	X
5B	6X30	30	2-4-2	-	5	Yes	-	-	-	N	-	X
5C	6X30	+5	2-4-2	-	5	Yes	-	-	-	N	-	X
5D	6X40	+5	2-4-2	-	5	Yes	-	10	-	N	-	X
6A	6X6	355	6	X	6	Yes	-	-	X	N	-	X
6B	6X6	355	6	X	6	Yes	-	-	X	N	-	X
6C	6X6	355	6	X	6	Yes	-	-	X	N	-	X
7A	6X60	+5	2-4-2	-	7	Yes	-	-	-	N	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	+5	2-4-2	-	8	Yes	-	5	-	N	-	X

8 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late right flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Phase 3 and/or phase 7 may be lagged.
- Reposition existing signal heads numbered 21, 22, 61, and 62.
- Set all detector units to presence mode.
- Relabel existing loop 4B as 5D.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City system data: Controller Asset #0151



LEGEND

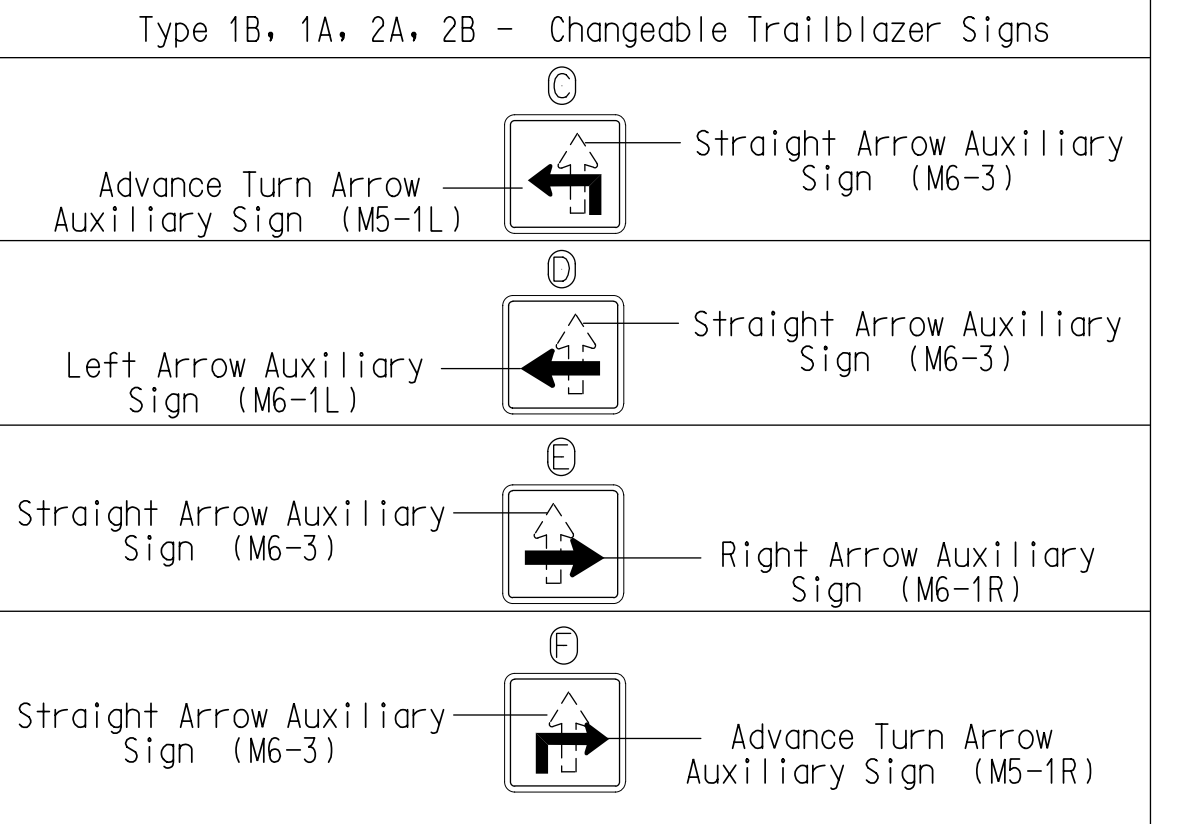
- | | | | |
|--|---|--|---|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | Existing Modified Signal Head |
| | Proposed Pedestrian Signal Head | | Existing Pedestrian Signal Head |
| | Proposed Signal Pole with Guy | | Existing Signal Pole with Guy |
| | Proposed Signal Pole with Sidewalk Guy | | Existing Signal Pole with Sidewalk Guy |
| | Proposed Inductive Loop Detector | | Existing Inductive Loop Detector |
| | Proposed Junction Box | | Existing Junction Box |
| | Proposed 2-in Underground Conduit | | Existing 2-in Underground Conduit |
| | Proposed Right of Way | | Existing Right of Way |
| | Proposed Directional Arrow | | Existing Directional Arrow |
| | Proposed "YIELD" Sign (R1-2) | | Existing "YIELD" Sign (R1-2) |
| | Proposed U-Turn "MUST YIELD" Sign (R3-27) | | Existing U-Turn "MUST YIELD" Sign (R3-27) |
| | Proposed Type 1B Changeable Trailblazer sign (See Figure 1) | | Existing Type 1B Changeable Trailblazer sign (See Figure 1) |
| | Proposed Type 1A Changeable Trailblazer sign (See Figure 1) | | Existing Type 1A Changeable Trailblazer sign (See Figure 1) |
| | Proposed Type 2A Changeable Trailblazer sign (See Figure 1) | | Existing Type 2A Changeable Trailblazer sign (See Figure 1) |
| | Proposed Type 2B Changeable Trailblazer sign (See Figure 1) | | Existing Type 2B Changeable Trailblazer sign (See Figure 1) |

TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green *	7	14	7	7	7	14	7	7
Walk *	-	-	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max I *	20	90	20	30	20	90	20	30
Yellow	3.0	5.2	3.0	4.4	3.0	4.6	3.2	3.7
Red Clear	2.9	1.7	3.3	2.7	3.1	1.7	3.3	2.4
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-	-	-
Seconds / Actuation *	-	1.0	-	-	-	1.0	-	-
Max Initial *	-	38	-	-	-	40	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	30	-	-	-	30	-	-
Minimum Gap	-	2.8	-	-	-	3.1	-	-
Locking Detector	-	X	-	-	-	X	-	-
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X	X	X

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

FIGURE 1



Signal Upgrade

Prepared For:
US 29-74 (Wilkinson Boulevard)
at
SR 2329 (Main Street/ Redbud Drive)

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

REVISIONS: _____ INIT: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Designed by:

DATE: 3/11/2022

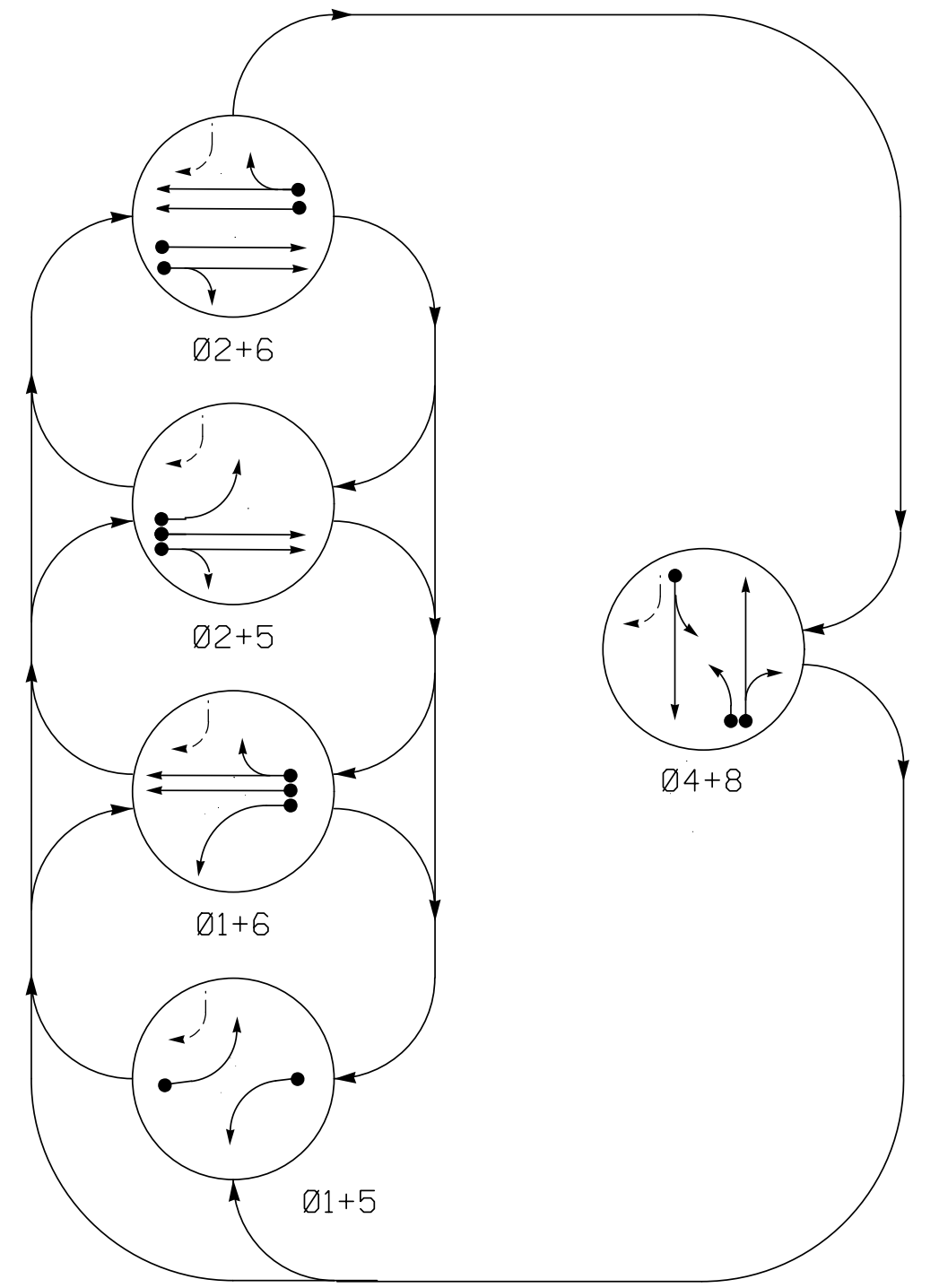
SIG. INVENTORY NO. 12-0151

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

750 N. Greenfield Pkwy, Garner, NC 27529
SCALE: 1" = 40'

3/9/2022 11:12:26 AM Dantelle.Curri ***Kinley-Horn.com/E:\RAL\MRAL\IP\DK-LTS\011036569_Gastonia Signal System9_Signal\SW54 - Signal Design\A120151-2021.dgn

PHASING DIAGRAM

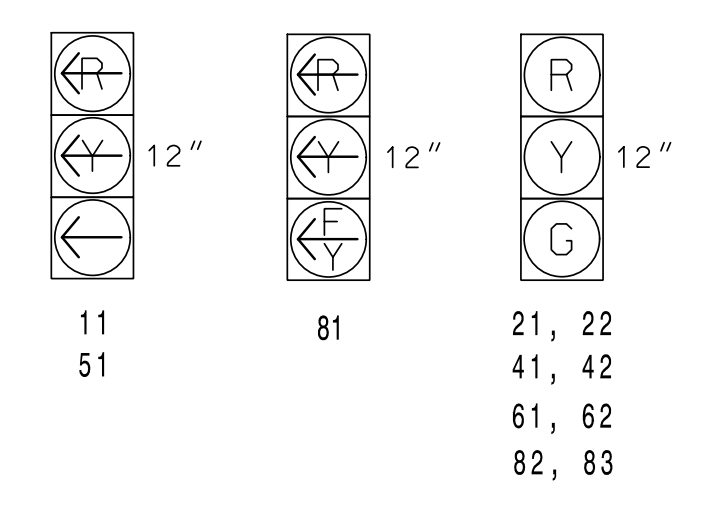


PHASING DIAGRAM DETECTION LEGEND

- ◄● DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄ UN SIGNALIZED MOVEMENT
- ◄ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE					L	P
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8		
11	←	→	→	→	→	→	→
21, 22	R	R	G	G	R	Y	Y
41, 42	R	R	R	R	G	R	Y
51	←	←	←	←	←	←	←
61, 62	R	G	R	G	R	Y	Y
81	←	←	←	←	←	←	←
82, 83	R	R	R	R	G	R	Y

SIGNAL FACE I.D.
All Heads L.E.D.

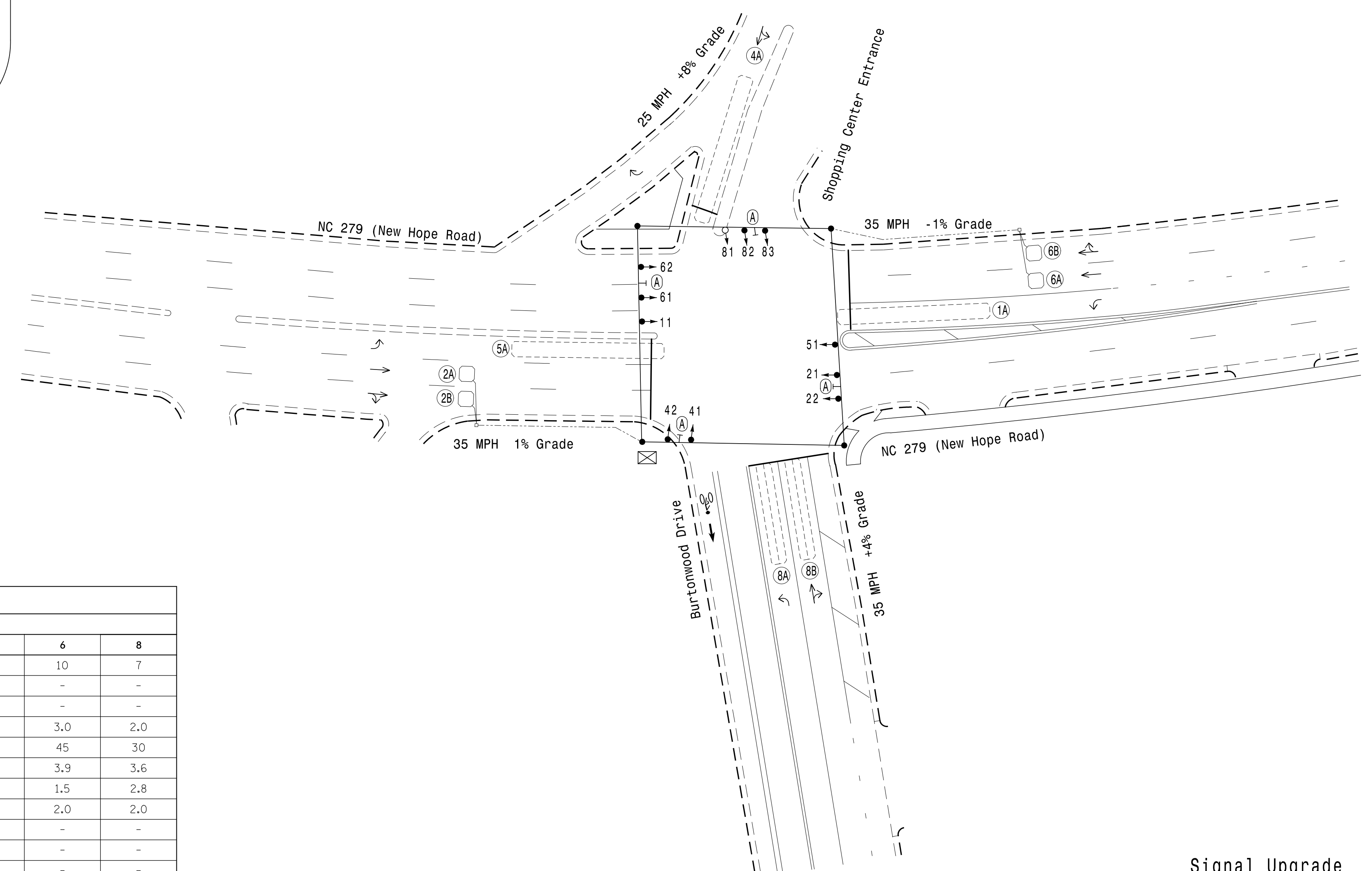


DETECTOR INSTALLATION CHART											
DETECTOR						PROGRAMMING					
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM
1A	6X60	+5	EXIST	-	1	Yes	-	-	-	N	X
2A	6X6	70	6	X	2	Yes	-	-	-	N	X
2B	6X6	70	6	X	2	Yes	-	-	-	N	X
4A	6X60	+5	EXIST	-	4	Yes	-	-	-	N	X
5A	6X60	+5	EXIST	-	5	Yes	-	-	-	N	X
6A	6X6	70	6	X	6	Yes	-	-	-	N	X
6B	6X6	70	6	X	6	Yes	-	-	-	N	X
8A	6X40	0	2-4-2	-	8	Yes	-	-	-	N	X
8B	6X40	0	2-4-2	-	8	Yes	-	5	-	N	X

5 Phase Fully Actuated Gastonia Signal System

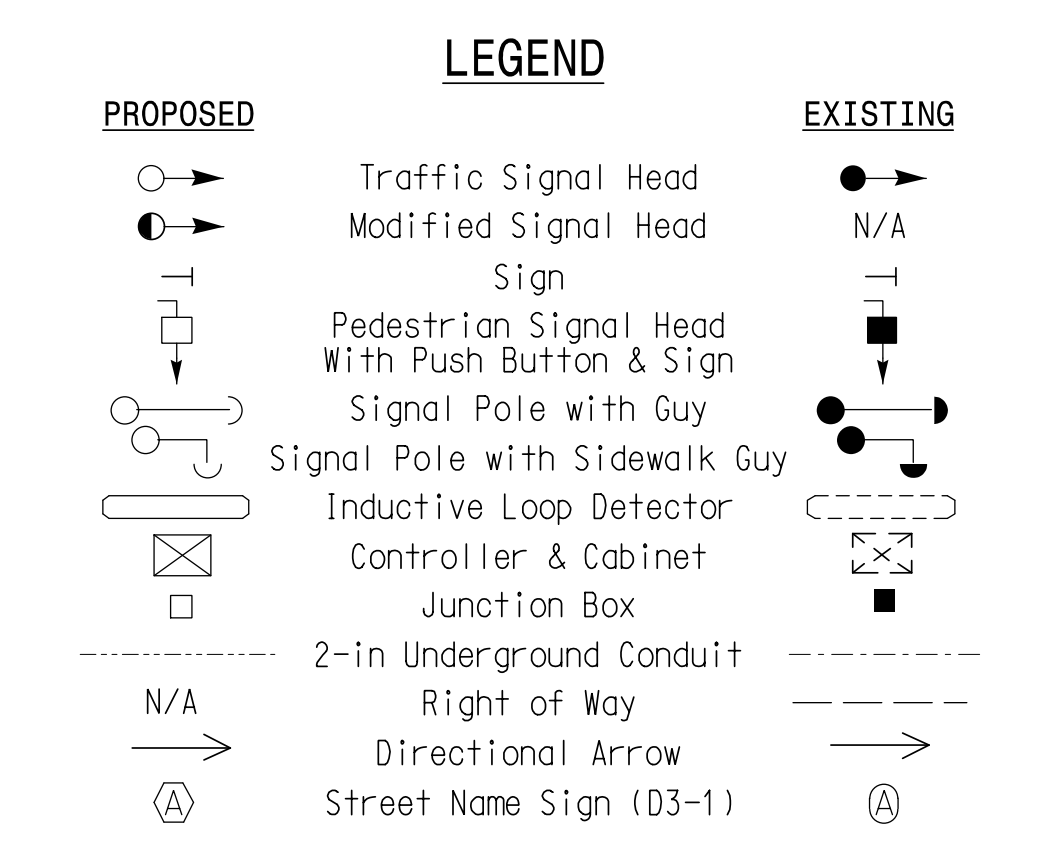
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal heads numbered 82 and 83.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Remove existing "Left Turn" - "Yield" Combination Sign (R1-2)
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Existing signal heads 81 and 82 have been relabeled to 82 and 83, respectively.
- City system data:
Controller Asset #0152.



FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	10	7	7	10	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	3.0	2.0	1.0	3.0	2.0
Max 1 *	20	45	30	20	45	30
Yellow	3.0	3.8	3.6	3.0	3.9	3.6
Red Clear	2.3	1.4	2.8	1.8	1.5	2.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds /Actuation *	-	-	-	-	-	-
Max Initial *	-	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-	-
Time To Reduce *	-	-	-	-	-	-
Minimum Gap	-	-	-	-	-	-
Locking Detector	-	X	-	-	X	-
Recall Position	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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



Signal Upgrade

Prepared For:
Kimley-Horn
750 N. Greenfield Pkwy, Garner, NC 27529
NC License #0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

NC 279 (New Hope Road)
at
Burtonwood Drive /
Shopping Center Entrance

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

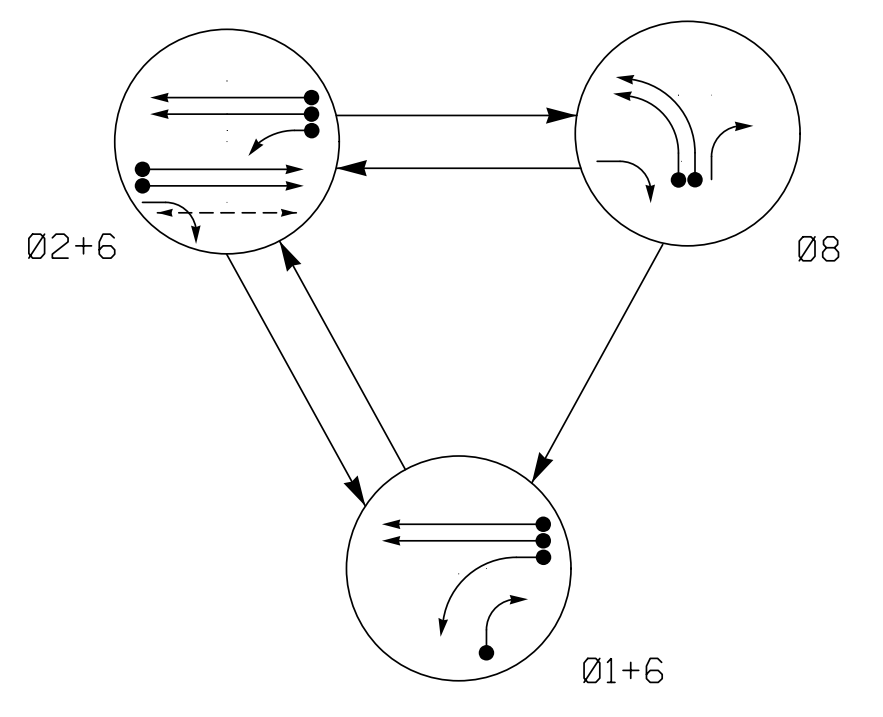
REVISIONS: _____ INIT: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Discussed by: _____ DATE: 3/11/2022
Signature: _____ DATE: _____
SIG. INVENTORY NO. 12-0152

3/9/2022 11:16:44 AM Don'tell,Curri ***K:\mley-horn.com\SE_RAL\MRAL_T\15\011036569_Gastonia\Signal_System\Signal_Signals\54 - Signal_Design\G120152-2021.dgn

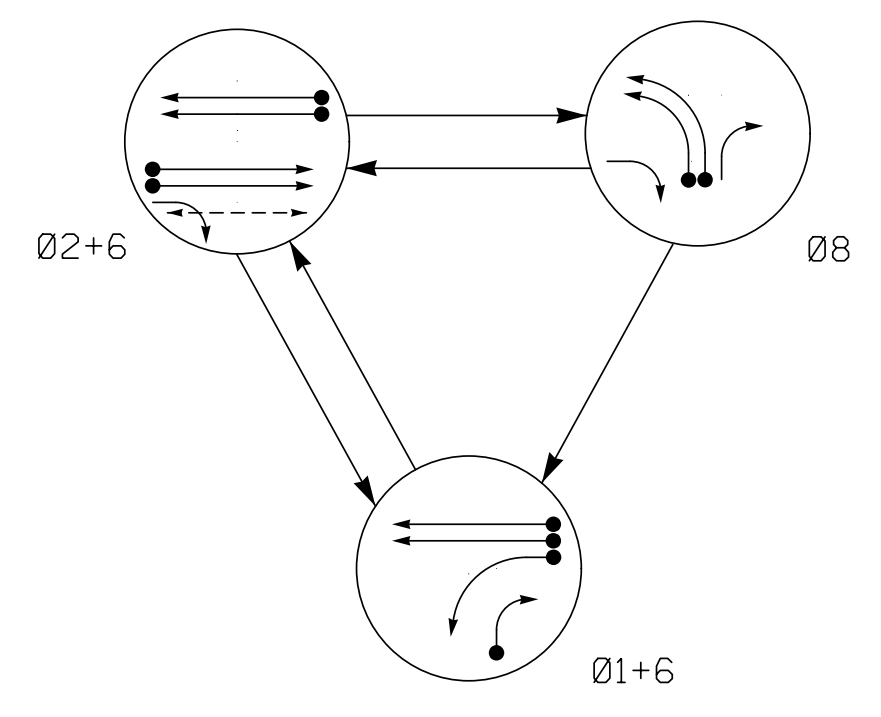
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (01+6, 02+6, 08, F L H S A B), and signal face abbreviations.

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

Table with columns: SIGNAL FACE, PHASE (01+6, 02+6, 08, F L H S A B), and signal face abbreviations.

DETECTOR INSTALLATION CHART

Table with columns: LOOP, SIZE (FT), DISTANCE FROM STOPBAR (FT), TURNS, NEW LOOP, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, SYSTEM LOOP, NEW CARD.

* Disable Delay during Alternate Phasing operation. # Disable Phase call for loop during Alternate Phasing operation.

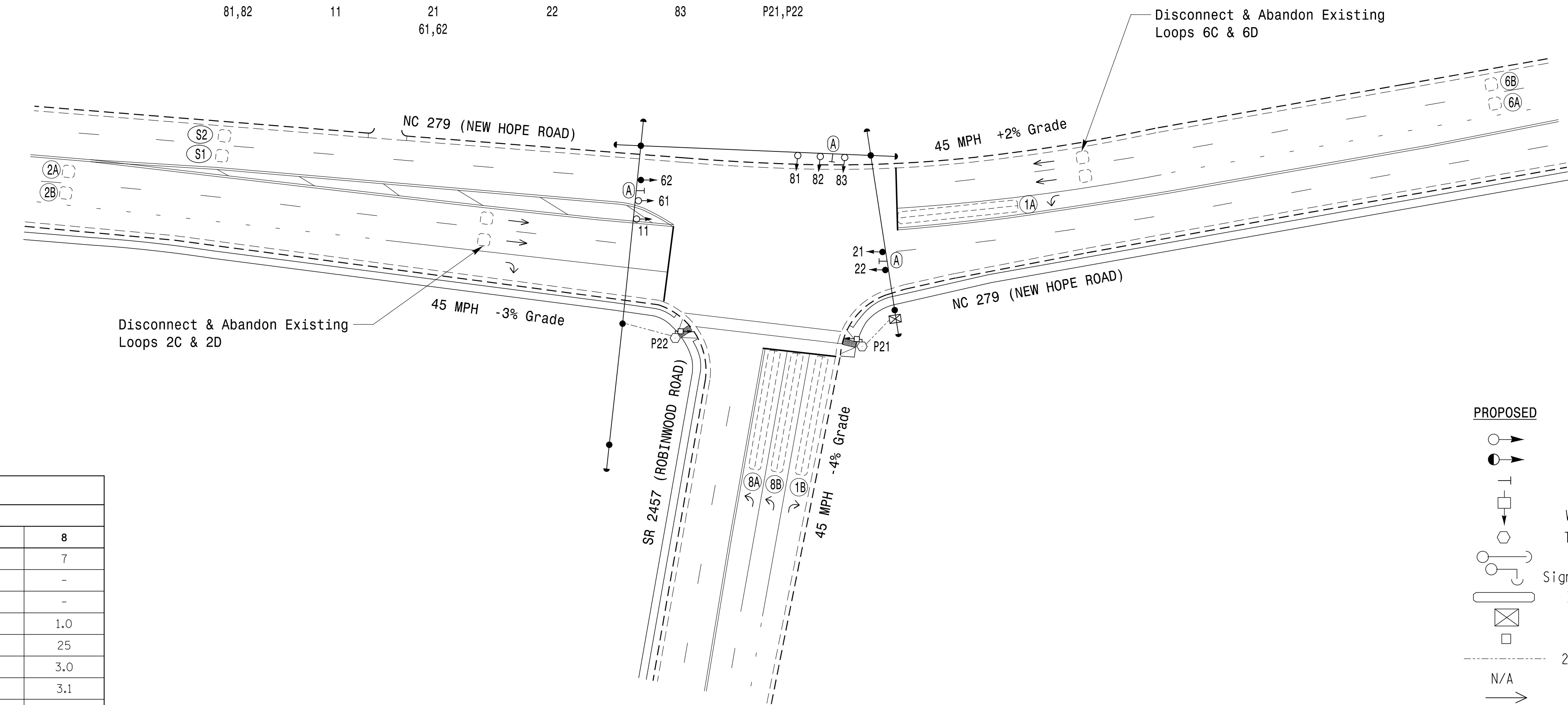
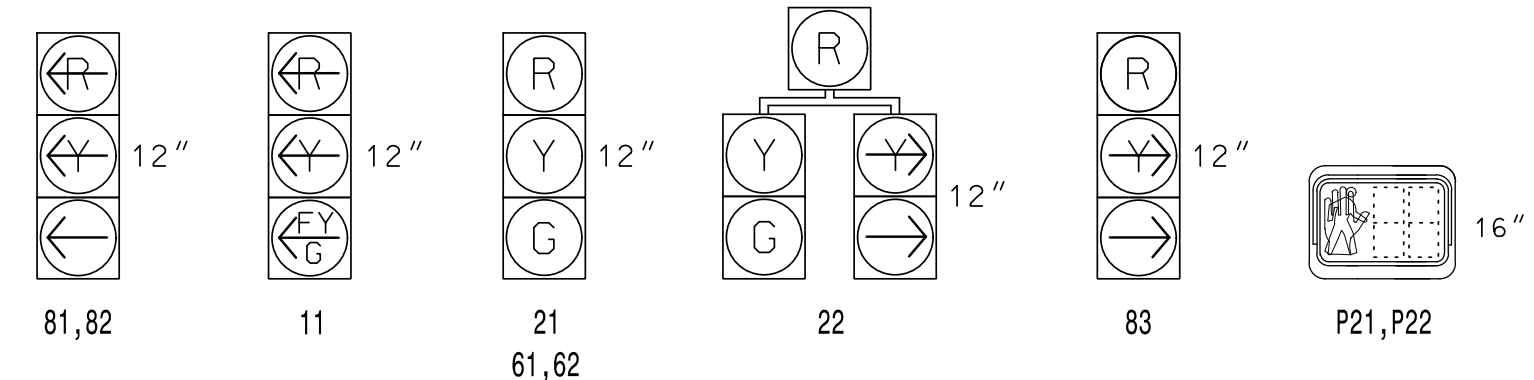
PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT (solid arrow with dot)
UNDETECTED MOVEMENT (OVERLAP) (dashed arrow)
UNSIGNALIZED MOVEMENT (dotted arrow)
PEDESTRIAN MOVEMENT (dashed arrow with vertical line)

SIGNAL FACE I.D.

All Heads L.E.D.

FY/G = Bimodal Section



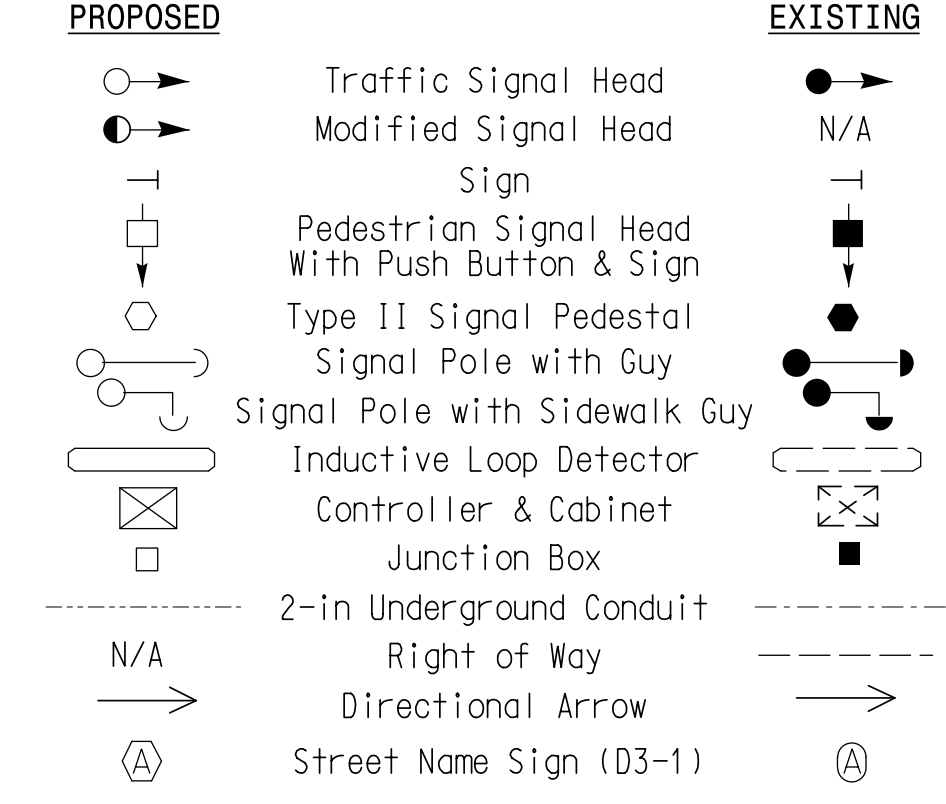
TIMING CHART

Timing chart table with columns: FEATURE, PHASE 1, PHASE 2, PHASE 6, PHASE 8.

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

- 3 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia Signal System
NOTES
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018...
2. Do not program signal for late night flashing operation...
3. Phase 1 may be lagged.
4. Reposition existing signal head numbered 62.
5. Set all detector units to presence mode.
6. Locate new cabinet so as not to obstruct sight distance...
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Remove existing "Left Turn on Green" Ball sign (R10-12).
10. Pavement markings are existing.
11. The City Engineer or their representative will determine the hours of use for each phasing plan.
12. Maximum times shown in timing chart are for free-run operation only.
13. Disconnect and abandon existing loops 2C, 2D, 6C, and 6D.
14. Install new cabinet on the existing cabinet foundation.
15. All new cabinets and base extenders shall be black in color.
16. Reconnect lead-in cable to separate loops 2A, 2B, 6A, and 6B, as shown.
17. Existing phase 4 has been changed to phase 8 on this plan.
18. All proposed pedestrian signal heads shall be black in color.
19. All proposed pedestrian pedestals and pushbutton posts shall be black in color.
20. City of system data: Controller Asset #0154.

LEGEND

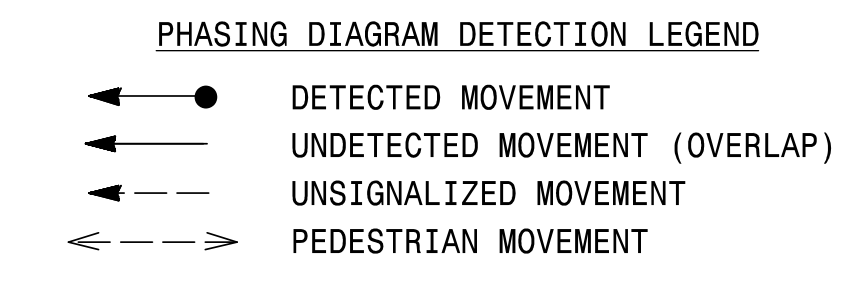
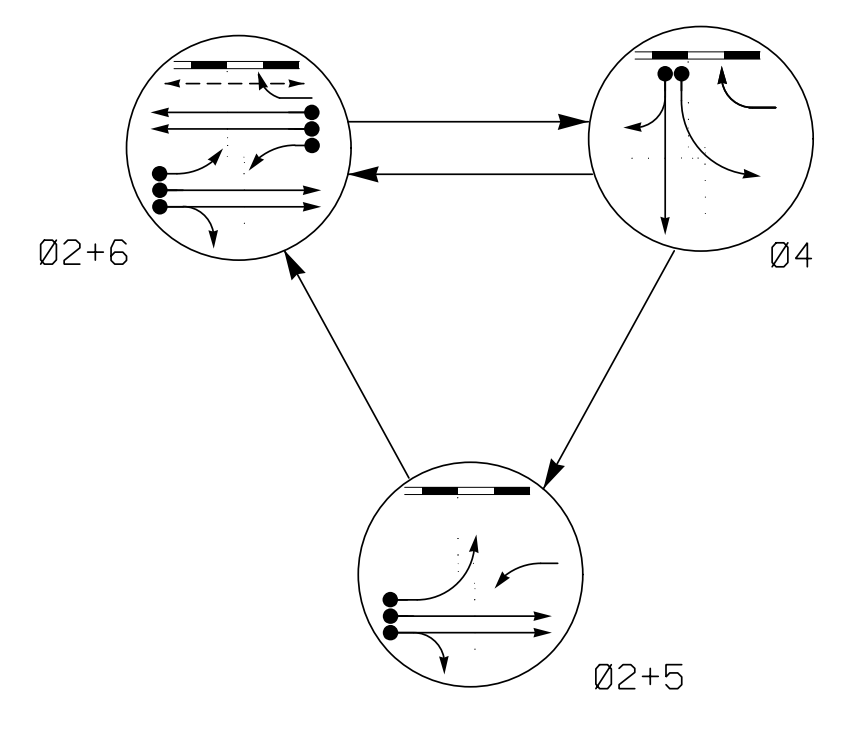


Signal Upgrade

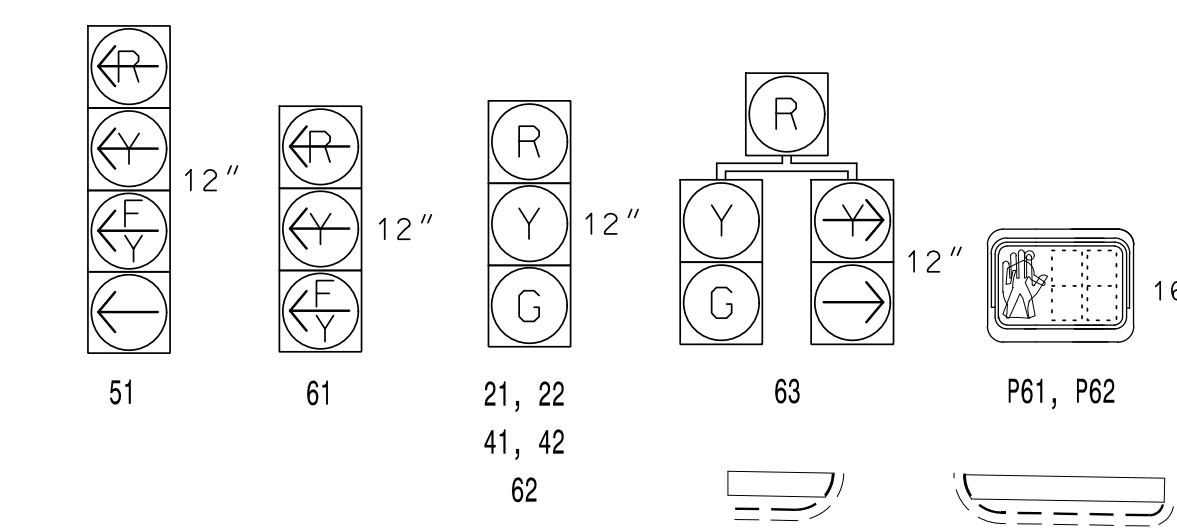
Project information block including: Prepared For (Kimley-Horn), Project Name (NC 279 at SR 2457), Division (12), County (Gaston), City (Gastonia), Plan Date (May 2021), Reviewers (MC Burke, SL Phillips, KP Baumann), Scale (1"=40'), and a professional engineer seal for Kevin P. Baumann.

3/9/2022 11:16:17 AM DanHill@curr1 ***K:\mly-horn.com\SE-RALI\RALI_TIP\DK-LTS\011036569_Gastonia_Signal_System\9_Signal\53.0-2021.dgn

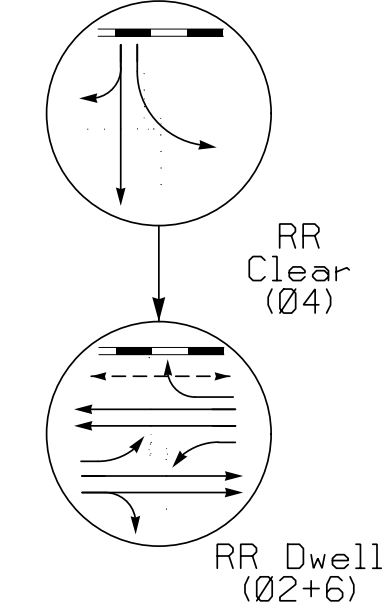
DEFAULT PHASING DIAGRAM



SIGNAL FACE I.D. All Heads L.E.D.



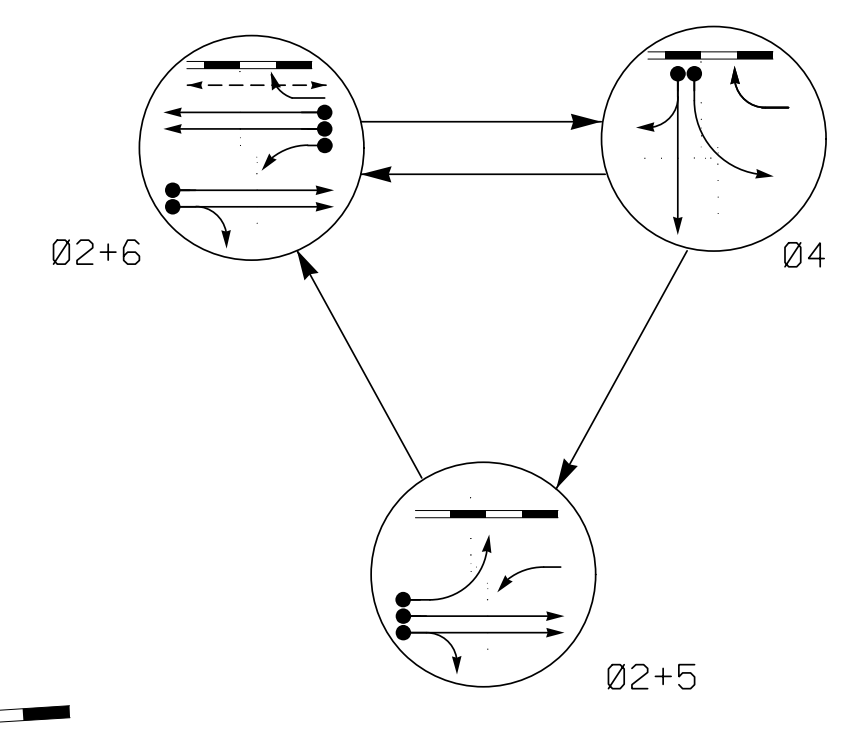
DEFAULT RAIL PREEMPT PHASES (High Priority)



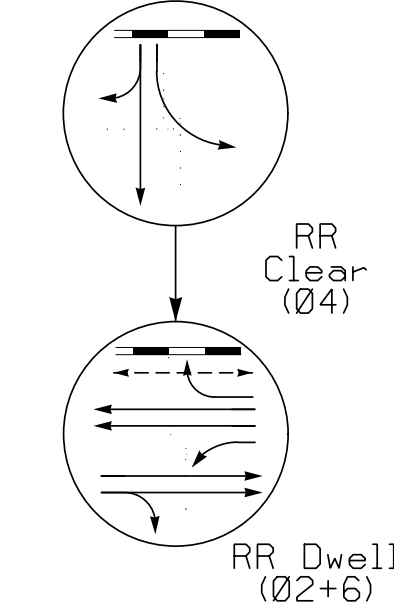
DEFAULT PHASING TABLE OF OPERATION

Table with columns for Signal Face and Phase (02+5, 04, 02+6, C, D, F, L, S, H). Rows include faces 21, 22; 41, 42; 51; 61; 62; 63; and P61, P62.

ALTERNATE PHASING DIAGRAM



ALTERNATE RAIL PREEMPT PHASES (High Priority)



ALTERNATE PHASING TABLE OF OPERATION

Alternate phasing table of operation with columns for Signal Face and Phase. Rows include faces 21, 22; 41, 42; 51; 61; 62; 63; and P61, P62.

3 Phase Fully Actuated w/ Railroad Preemption and Alternate Phasing Operation Gastonia Signal System

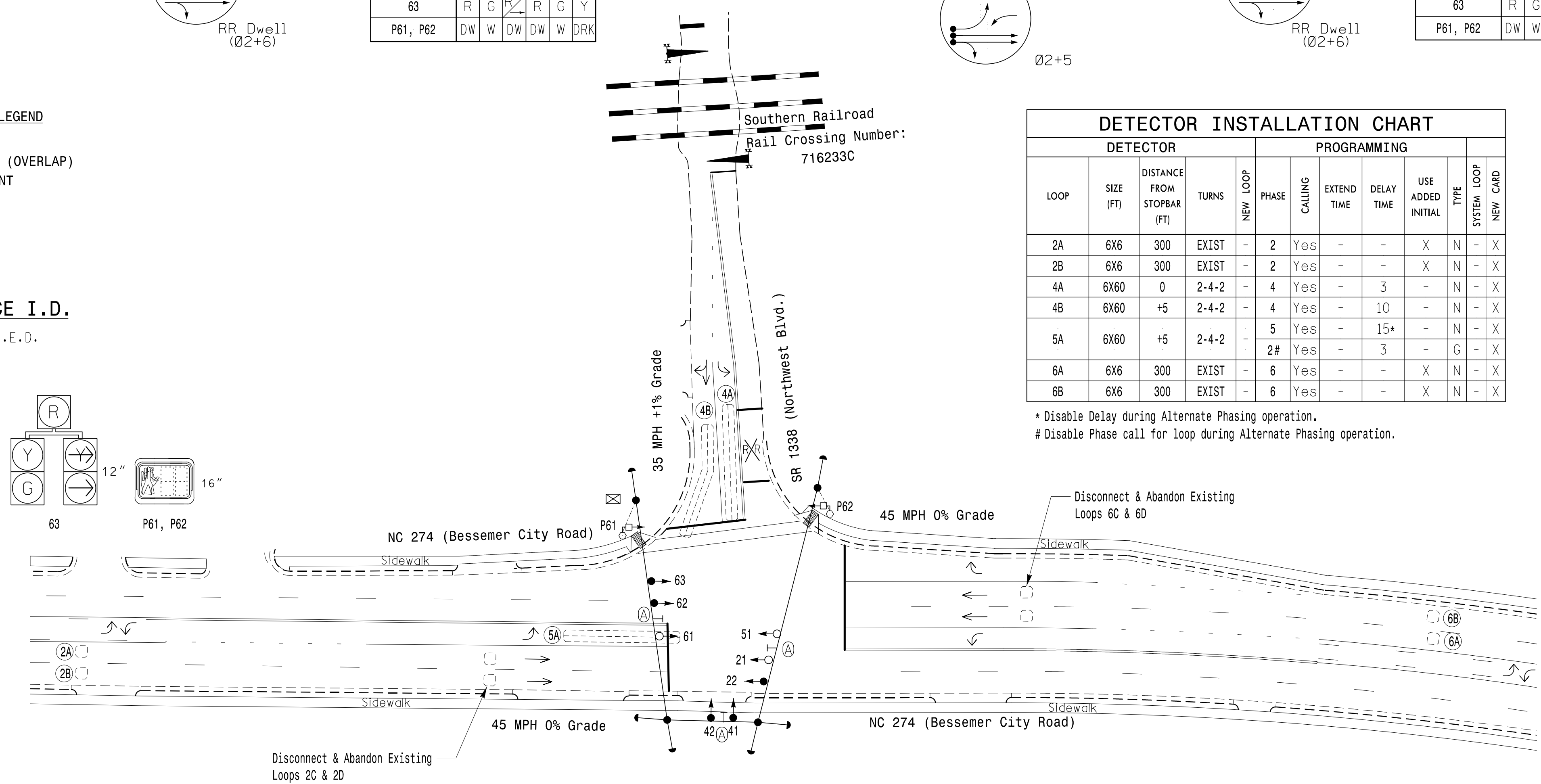
NOTES

- 1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. This location contains railroad preempt phasing. Do not program for late night flashing operation.
3. Phase 5 may be lagged.
4. Set all detector units to presence mode.
5. In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
6. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Program pedestrian heads to countdown the flashing "Don't Walk" time only.
9. Pavement markings are existing.
10. The City Engineer or their representative will determine the hours of use for each phasing plan.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
12. Disconnect and abandon existing loops 2C, 2D, 6C and 6D.
13. Install new cabinet on the existing cabinet foundation.
14. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
15. All proposed pedestrian signal heads shall be black in color. See Project Special Provisions for details.
16. All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
17. Reconnect lead-in cable to separate loops 2A, 2B and 6A, 6B as shown.
18. City system data: Controller Asset #0155.

DETECTOR INSTALLATION CHART

Detector installation chart with columns for Loop, Size, Distance from Stopbar, Turns, New Loop, Phase, Calling, Extend Time, Delay Time, Use Added Initial, Type, Loop System, Loop Card. Rows include loops 2A, 2B, 4A, 4B, 5A, 6A, and 6B.

* Disable Delay during Alternate Phasing operation.
Disable Phase call for loop during Alternate Phasing operation.



TIMING CHART

Timing chart table with columns for Feature and Phases 2, 4, 5, 6. Rows include Min Green, Walk, Ped Clear, Veh. Extension, Max 1, Yellow, Red Clear, Red Revert, Actuations B4 Add, Seconds / Actuation, Max Initial, Time Before Reduction, Time To Reduce, Minimum Gap, Locking Detector, Recall Position, Dual Entry, and Simultaneous Gap.

* 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.

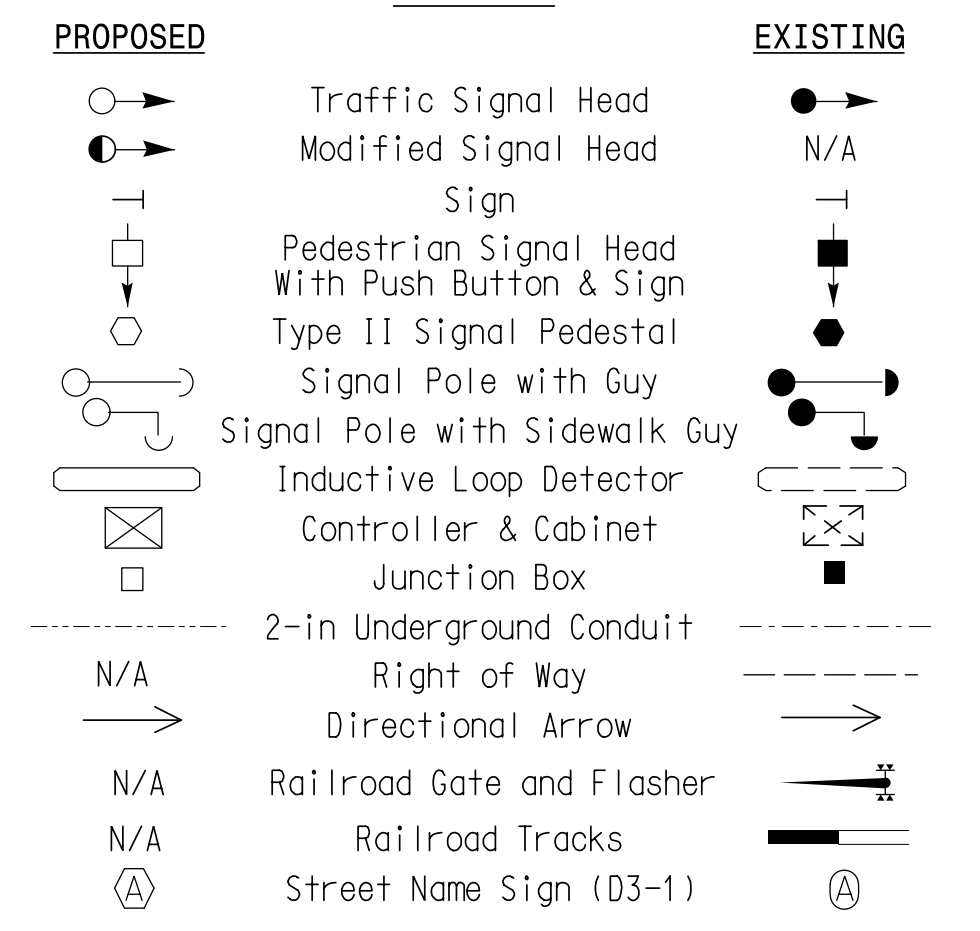
RR PREEMPT

RR Preempt table with columns for Function and Pre 1. Rows include Exit Phase(s), Preempt Override, Delay Time, Ped Clear Trough Yellow, Terminate Phases, Track Clear Reserve, Entrance Walk, Entrance Ped Clear, Entrance Min Green, Entrance Yellow Change, Entrance Red Clear, Track Clear Min Green, Track Clear Yellow Change, Track Clear Red Clear, Min Dwell Time, Exit Yellow Change, and Exit Red Clear.

* Time defaults to time used for phase during normal operation

THIS SIGNAL WAS DESIGNED FOR ADVANCE PREEMPTION

LEGEND

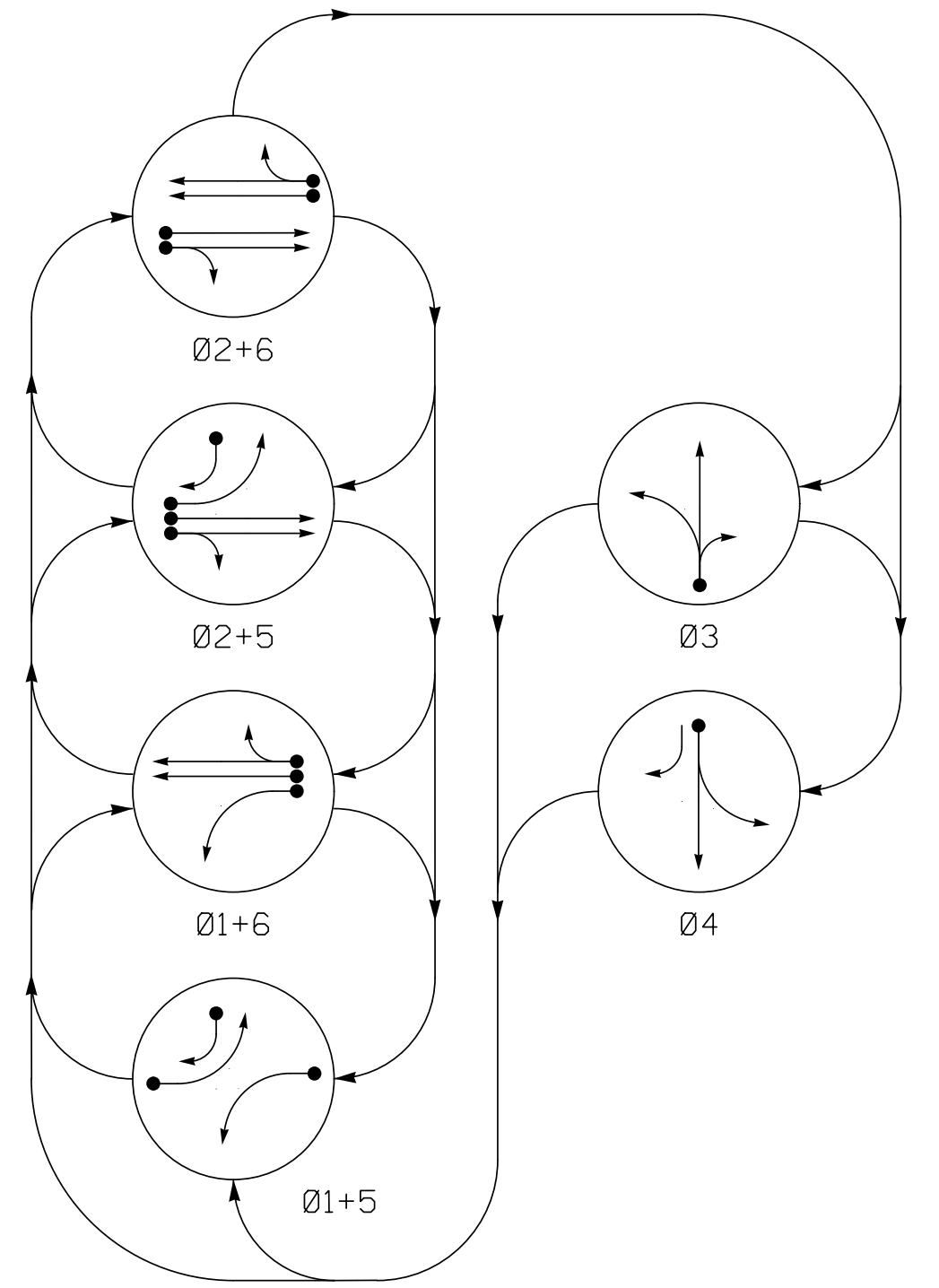


Signal Upgrade

Project information block including Kimley-Horn logo, project name (NC 274 at SR 1338), location (Gastonia), plan date (May 2021), and signatures of SP Pennington and KP Baumann. Includes a scale bar (1"=40') and a document not considered final seal.

Vertical text on the left margin: 3/9/2022 11:13:52 AM DanTelleCur1 \\KIMLEY-HORN\COMPS\RAI\MRAL_TPIDK-TIS\01036569_Gastonia_Signal_System\Signal\54 - Signal Design\20155-2021.dgn

PHASING DIAGRAM

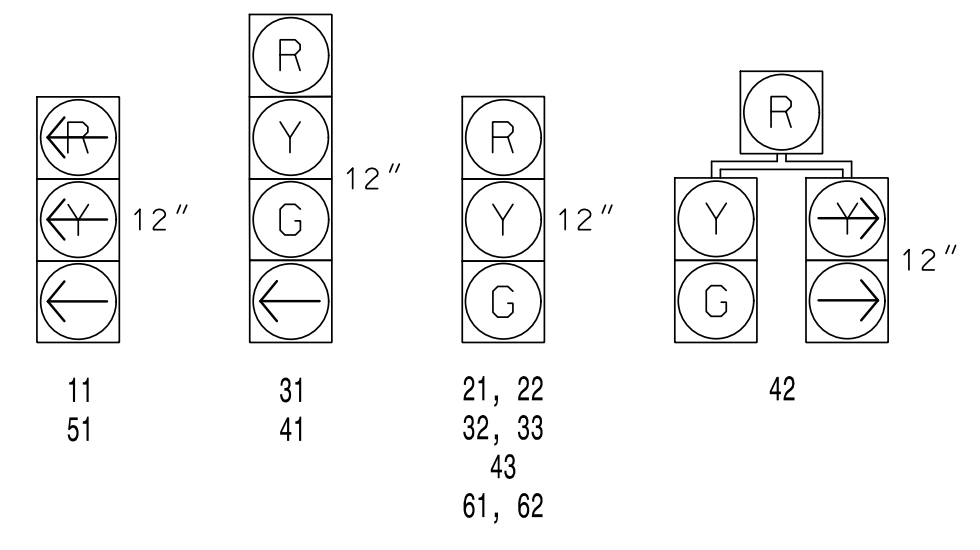


PHASING DIAGRAM DETECTION LEGEND

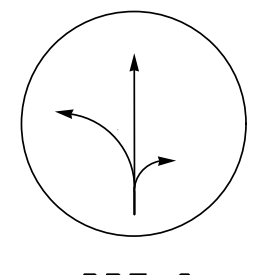
- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



EV PREEMPT PHASES (Medium Priority)



PRE 3 (Ø3)

TABLE OF OPERATION

SIGNAL FACE	PHASE											
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3	Ø4	P	F	H	S	F	
11	←	←	←	←	←	←	←	←	←	←	←	←
21, 22	R	R	G	G	R	R	R	Y				
31	R	R	R	R	G	R	G	R				
32, 33	R	R	R	R	G	R	G	R				
41	R	R	R	R	R	G	R	R				
42	R	R	R	R	R	G	R	R				
43	R	R	R	R	R	G	R	R				
51	←	←	←	←	←	←	←	←				
61, 62	R	G	R	G	R	R	R	Y				
SIGN 'B'	*	*	*	*	*	*	*	OFF				

*Changeable Trailblazer Sign controlled remotely

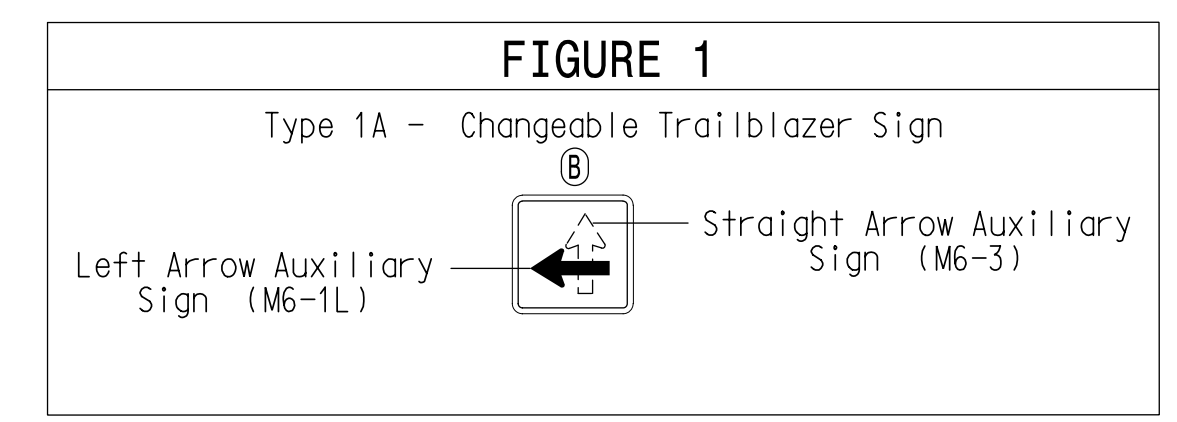
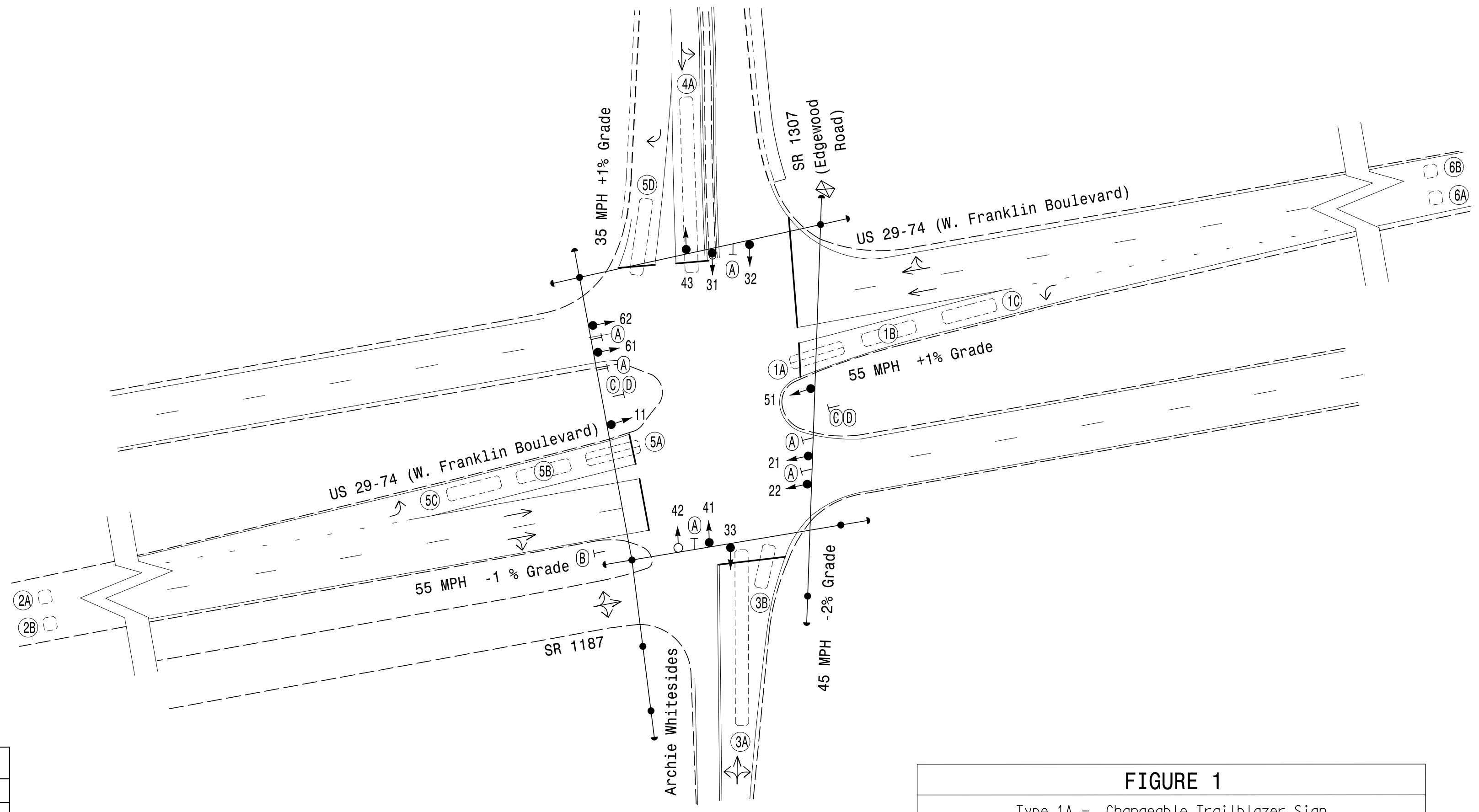
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X25	+5	2-4-2	-	1	Yes	-	-	-	N	-	Y
1B	6X25	30	EXIST	-	1	Yes	-	-	-	N	-	Y
1C	6X25	60	EXIST	-	1	Yes	-	-	-	N	-	Y
2A	6X6	420	EXIST	-	2	Yes	-	-	-	N	-	Y
2B	6X6	420	EXIST	-	2	Yes	-	-	-	N	-	Y
3A	6X80	+5	EXIST	-	3	Yes	-	10	-	N	-	Y
3B	6X20	+5	EXIST	-	3	Yes	-	10	-	N	-	Y
4A	6X80	+5	EXIST	-	4	Yes	-	-	-	N	-	Y
5A	6X25	+5	2-4-2	-	5	Yes	-	-	-	N	-	Y
5B	6X25	30	EXIST	-	5	Yes	-	-	-	N	-	Y
5C	6X25	60	EXIST	-	5	Yes	-	-	-	N	-	Y
5D	6X35	+5	EXIST	-	5	Yes	-	10	-	N	-	Y
6A	6X6	420	EXIST	-	6	Yes	-	-	-	N	-	Y
6B	6X6	420	EXIST	-	6	Yes	-	-	-	N	-	Y

6 Phase Fully Actuated Gastonia City System w/ Emergency Vehicle Preemption

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Existing loop 4B has been relabeled to 5D.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City system data:
Controller Asset: #0157



TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	14	10	10	7	14
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	1.0	1.0	1.0	6.0
Max 1 *	25	120	60	75	25	120
Yellow	3.0	5.3	4.7	3.8	3.0	5.1
Red Clear	4.0	1.0	2.0	3.2	3.9	1.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	46	-	-	-	46
Time Before Reduction *	-	20	-	-	-	20
Time To Reduce *	-	40	-	-	-	40
Minimum Gap	-	3.4	-	-	-	3.4
Locking Detector	-	X	-	-	-	X
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

EV PREEMPT

FUNCTION	PRE 3
Exit Phase(s)	2+6
Preempt Override	OFF
Delay Time	0
Ped Clear Through Yellow	N
Terminate Phases	N
Entrance Walk	-
Entrance Ped Clear	-
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Minimum Dwell Time	7
Preempt Input Extension Time **	2
Preempt Max Time	120
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

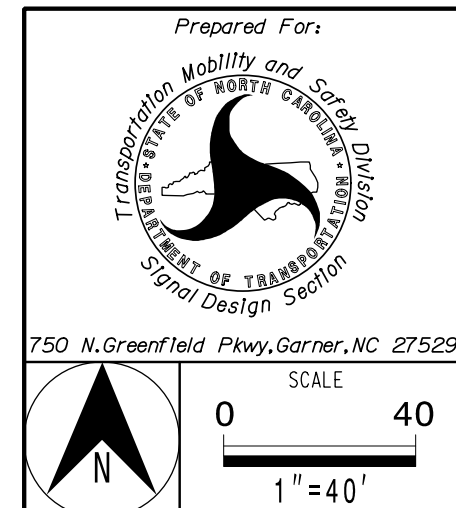
* Time defaults to time used for phase during normal operation.
** Program Timing on GPS Detection Unit.

LEGEND

- | PROPOSED | EXISTING |
|--|----------------------------------|
| ○→ Traffic Signal Head | ●→ N/A |
| ●→ Modified Signal Head Sign | |
| □→ Pedestrian Signal Head With Push Button & Sign | |
| ○→ Signal Pole with Guy | ●→ Signal Pole with Sidewalk Guy |
| □→ Inductive Loop Detector Controller & Cabinet | □→ Pull Box |
| □→ 2-in Underground Conduit | |
| → Directional Arrow | → |
| (A) Street Name Sign (Ø3-1) | (A) |
| (B) Type 1A Changeable Trailblazer sign (See Figure 1) | (B) |
| (C) Keep Right Sign (R4-7) | (C) |
| (D) Object Marker (ØM1-3) | (D) |

Signal Upgrade

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



US 29-74 (W. Franklin Boulevard) at SR 1307 (Edgewood Road / Archie Whitesides)
Division 12 Gastonia City System
PLAN DATE: May 2021
REVIEWED BY: SL Phillips
PREPARED BY: CF Davis
REVIEWED BY: KP Baumann

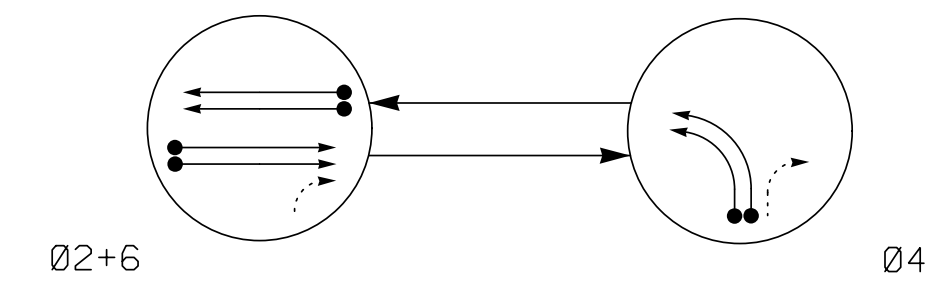
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

3/11/2022
DATE

SIG. INVENTORY NO. 12-0157

3/9/2022 11:13:54 AM Dan.Hill@k-h.com 115x011036569 Gastonia Signal System9 Signal.kws4 - Signal Design\201517-2021.dgn

PHASING DIAGRAM

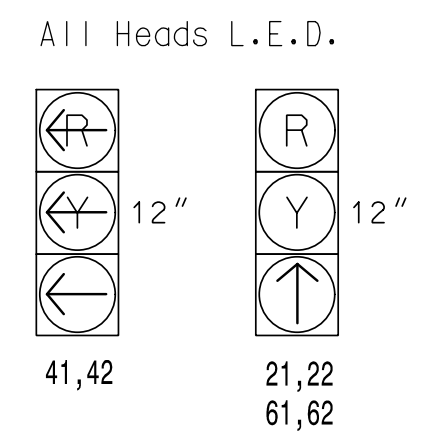


- PHASING DIAGRAM DETECTION LEGEND**
- ←● DETECTED MOVEMENT
 - ← UNDETECTED MOVEMENT (OVERLAP)
 - ←..... UNSIGNALIZED MOVEMENT
 - ←- - - PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2 + 6	Ø 4	F
21,22	↑	R	Y
41,42	←R	←	←R
61,62	↑	R	Y

SIGNAL FACE I.D.



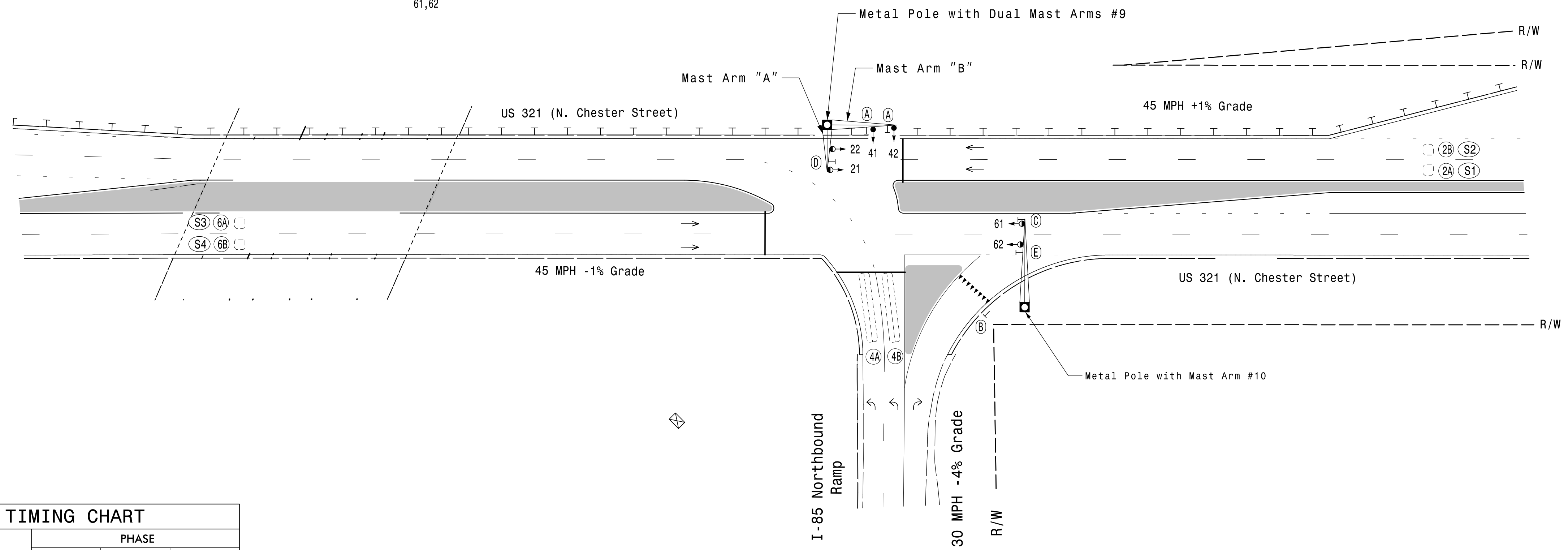
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A/S1	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
2B/S2	6X6	300	EXIST	-	2	Yes	-	-	X	N	X	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
6A/S3	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X
6B/S4	6X6	300	EXIST	-	6	Yes	-	-	X	N	X	X

2 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Modify signal heads numbered 21, 22, 61, and 62, as shown.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Existing signal heads 62 & 61 have been relabeled to 61 & 62, respectively.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0162.



TIMING CHART

FEATURE	PHASE		
	2	4	6
Min Green *	12	7	12
Walk *	-	-	-
Ped Clear	-	-	-
Veh. Extension *	6.0	2.0	6.0
Max I *	90	25	90
Yellow	4.4	3.0	4.6
Red Clear	1.2	3.3	1.3
Red Revert	2.0	2.0	2.0
Actuations B4 Add *	-	-	-
Seconds / Actuation *	1.5	-	1.5
Max Initial *	34	-	34
Time Before Reduction *	15	-	15
Time To Reduce *	30	-	30
Minimum Gap	3.0	-	3.0
Locking Detector	X	-	X
Recall Position	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-
Simultaneous Gap	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ → Traffic Signal Head	● → 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	--- 2-in Underground Conduit
N/A → Right of Way	N/A → Right of Way
→ Directional Arrow	→ Directional Arrow
○ → Metal Pole with Mastarm	○ → Metal Pole with Mastarm
N/A → Guardrail	N/A → Guardrail
(A) Left Arrow "ONLY" Sign (R3-5L)	(A) Left Arrow "ONLY" Sign (R3-5L)
(B) "YIELD" Sign (R1-2)	(B) "YIELD" Sign (R1-2)
(C) No U-Turn Sign (R3-4)	(C) No U-Turn Sign (R3-4)
(D) No Left Turn Sign (R3-18)	(D) No Left Turn Sign (R3-18)
(E) No Right Turn Sign (R3-1)	(E) No Right Turn Sign (R3-1)

Signal Upgrade

Prepared For: **US 321 (N. Chester Street) at I-85 Northbound Ramp**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

PREPARED BY: CF Davis REVIEWED BY: KP Baumann

750 N. Greenfield Pkwy, Garner, NC 27529

NC License #0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

Scale: 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

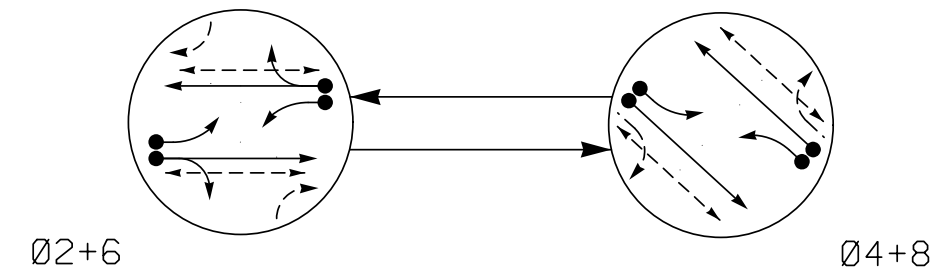
Seal: NORTH CAROLINA PROFESSIONAL ENGINEER KEVIN P. BAUMANN SEAL 044434

3/11/2022

SIG. INVENTORY NO. 12-0162

3/9/2022 11:15:28 AM Dantelle.Curt1 ***Kimley-Horn.comSE-RAL1\MRAL1\JPD\151001036569 Gastonia Signal System9 Signal.kws4 - Signal Design\ME120162-2021.dgn

PHASING DIAGRAM

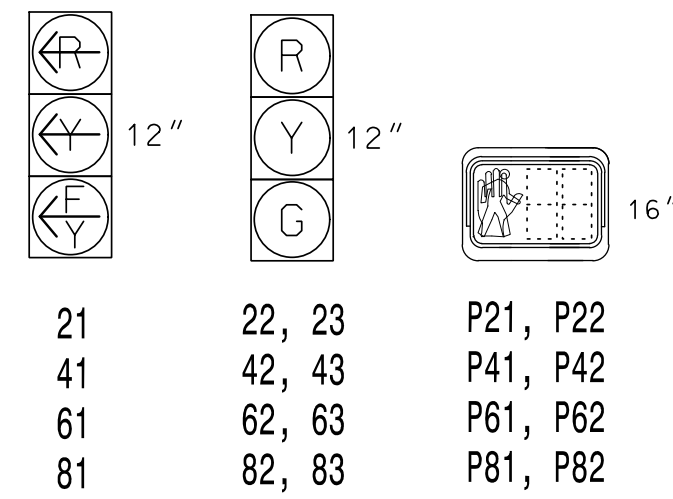


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

All Heads L.E.D.



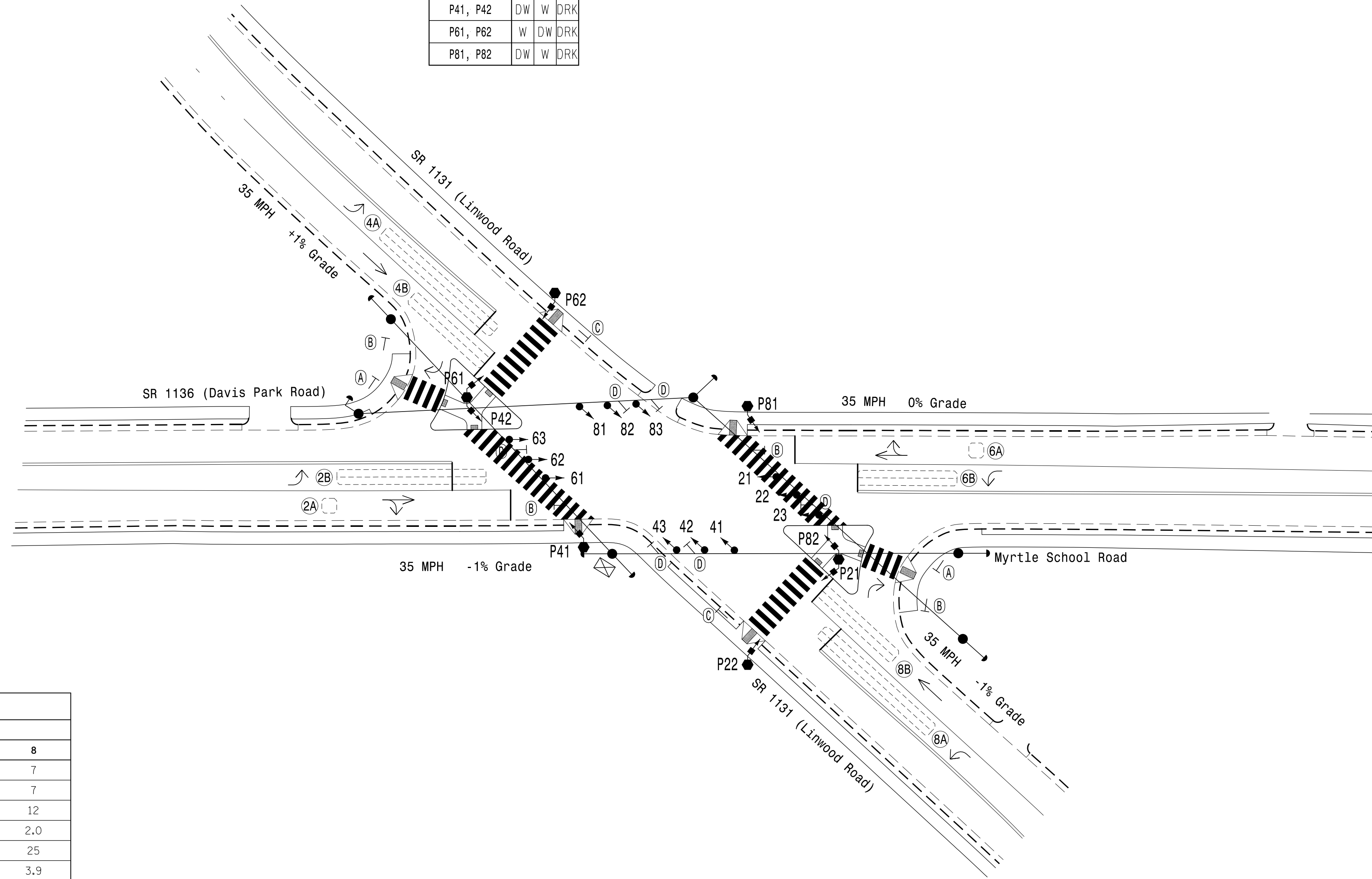
SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21	F	R	Y
22, 23	G	R	Y
41	F	R	Y
42, 43	R	G	R
61	F	R	Y
62, 63	G	R	Y
81	F	R	Y
82, 83	R	G	R
P21, P22	W	DW	DRK
P41, P42	DW	W	DRK
P61, P62	W	DW	DRK
P81, P82	DW	W	DRK

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
2A	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
2B	6X60	+13	2-4-2	-	2	Yes	-	-	-	N	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	3	-	N	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	3	-	N	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
6B	6X40	0	2-4-2	-	6	Yes	-	-	-	N	-	X
8A	6X60	+5	2-4-2	-	8	Yes	-	3	-	N	-	X
8B	6X40	0	2-4-2	-	8	Yes	-	3	-	N	-	X

2 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City system data:
Controller Asset: #0165



LEGEND

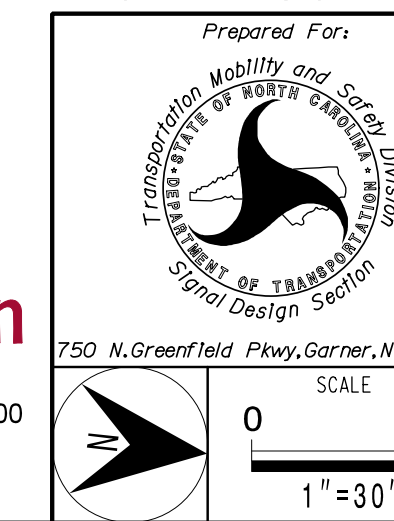
PROPOSED	EXISTING
○ →	● →
○ → ○	N/A
○	○
□	□
□	□
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○
○ → ○	○ → ○

FEATURE	PHASE			
	2	4	6	8
Min Green *	10	7	10	7
Walk *	7	7	7	7
Ped Clear	8	12	8	12
Veh. Extension *	3.0	2.0	3.0	2.0
Max 1 *	45	25	45	25
Yellow	3.9	3.9	3.9	3.9
Red Clear	2.3	3.1	2.3	3.1
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

Signal Upgrade

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



Prepared For: **SR 1136 (Davis Park Rd.) / Myrtle School Road at SR 1131 (Linwood Rd.)**
 Division 12 Gaston County Gastonia
 PLAN DATE: May 2021 REVIEWED BY: SL Phillips
 PREPARED BY: CF Davis REVIEWED BY: KP Baumann

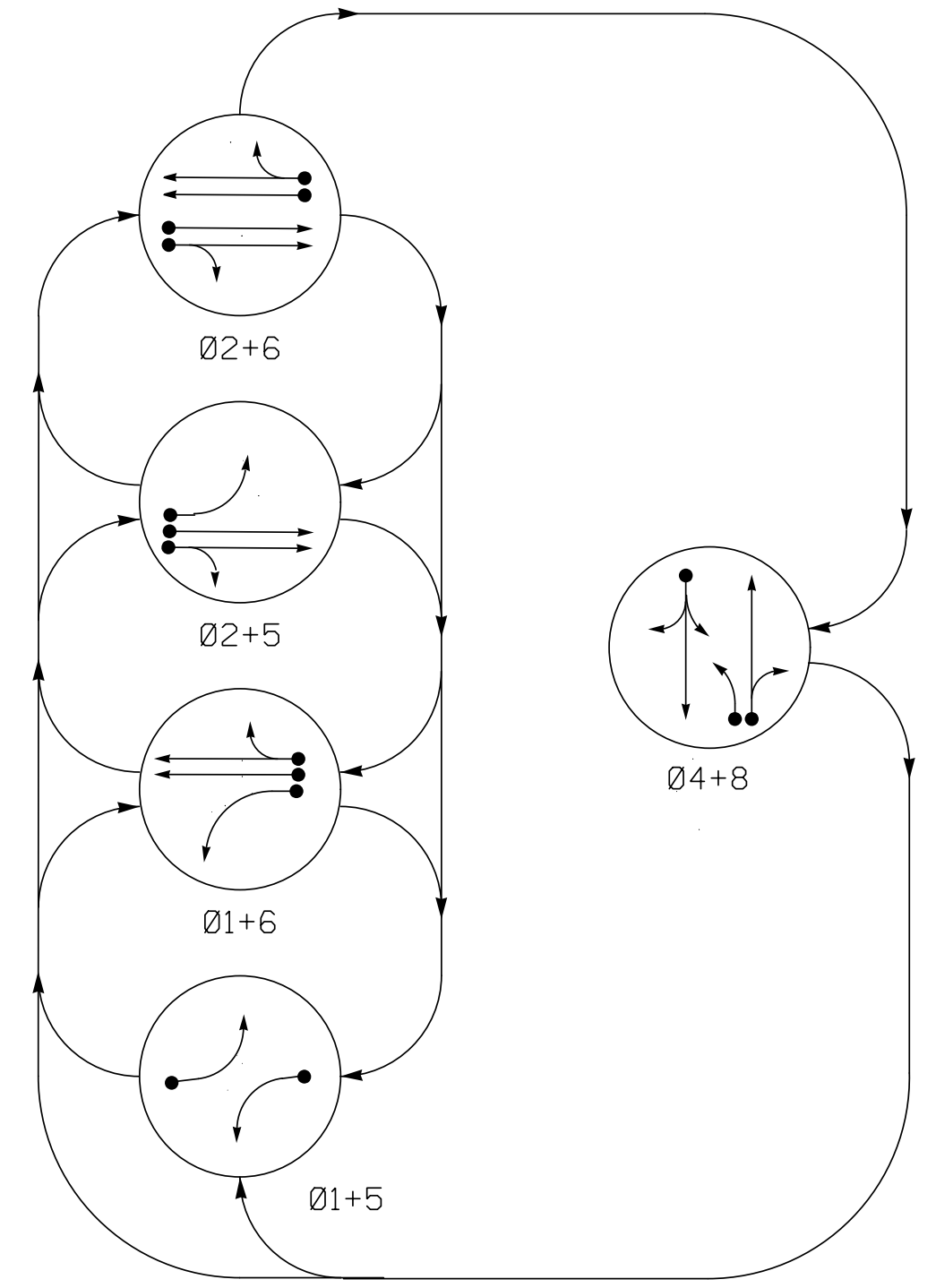
REVISIONS: _____ DATE: _____

Signature: _____ DATE: 3/11/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIG. INVENTORY NO. 12-0165

PHASING DIAGRAM

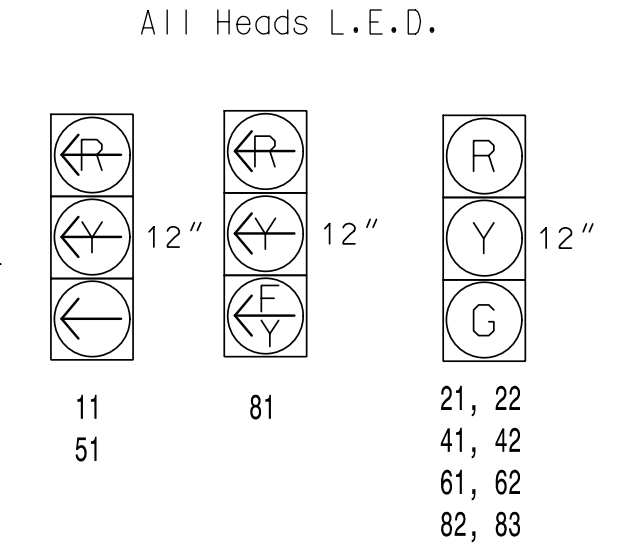


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE	PHASE					
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 4+8	F H S D
11	←	←	→	→	→	→
21, 22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
51	←	←	→	→	→	→
61, 62	R	G	R	G	R	Y
81	←	←	→	→	→	→
82, 83	R	R	R	R	G	R

SIGNAL FACE I.D.

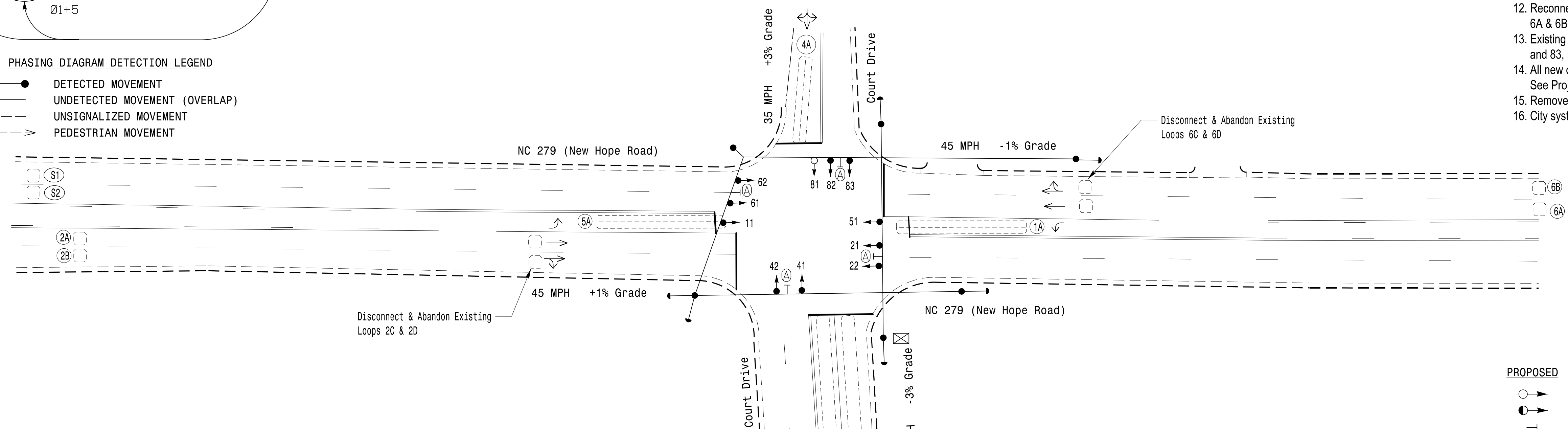


DETECTOR INSTALLATION CHART												
DETECTOR					PROGRAMMING							
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	+5	2-4-2	-	1	Yes	-	-	-	N	-	X
2A	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	-	-	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X60	0	EXIST	-	8	Yes	-	-	-	N	-	X
8B	6X60	0	EXIST	-	8	Yes	-	-	-	N	-	X
S1	6X6	+390	EXIST	-	-	NO	-	-	-	N	X	X
S2	6X6	+390	EXIST	-	-	NO	-	-	-	N	X	X

5 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Reposition existing signal head numbered 82.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Disconnect and abandon existing loops 2C, 2D, 6C & 6D.
- Install new cabinet on the existing cabinet foundation.
- Reconnect lead-in cable to separate loops 2A & 2B and 6A & 6B, as shown.
- Existing signal head 81 and 82 have been relabeled to 82 and 83, respectively.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Remove existing signs R1-2 and R3-5L.
- City system data:
Controller Asset #0169.



FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	1.0	6.0	2.0	1.0	6.0	1.0
Max I *	20	45	30	20	45	30
Yellow	3.0	4.4	4.1	3.0	4.6	4.1
Red Clear	1.9	1.5	2.0	2.1	1.5	2.0
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	1.5	-
Max Initial *	-	34	-	-	34	-
Time Before Reduction *	-	15	-	-	15	-
Time To Reduce *	-	30	-	-	30	-
Minimum Gap	-	3.0	-	-	3.0	-
Latching Detector	-	X	-	-	X	-
Recall Position	-	MIN RECALL	-	-	MIN RECALL	-
Dual Entry	-	-	X	-	-	X
Simultaneous Gap	X	X	X	X	X	X

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

PROPOSED		EXISTING	
○ →	Traffic Signal Head	● →	N/A
○ →	Modified Signal Head	○ →	N/A
⚡	Pedestrian Signal Head	⚡	N/A
⚡	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
N/A	Right of Way	N/A	N/A
→	Directional Arrow	→	N/A
Ⓐ	Street Name Sign (D3-1)	Ⓐ	N/A

Signal Upgrade

Prepared For:
Kimley-Horn

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

NC 279 (New Hope Road) at Court Drive

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

PREPARED BY: SP Pennington REVIEWED BY: KP Baumann

REVISIONS: _____ INIT: _____ DATE: _____

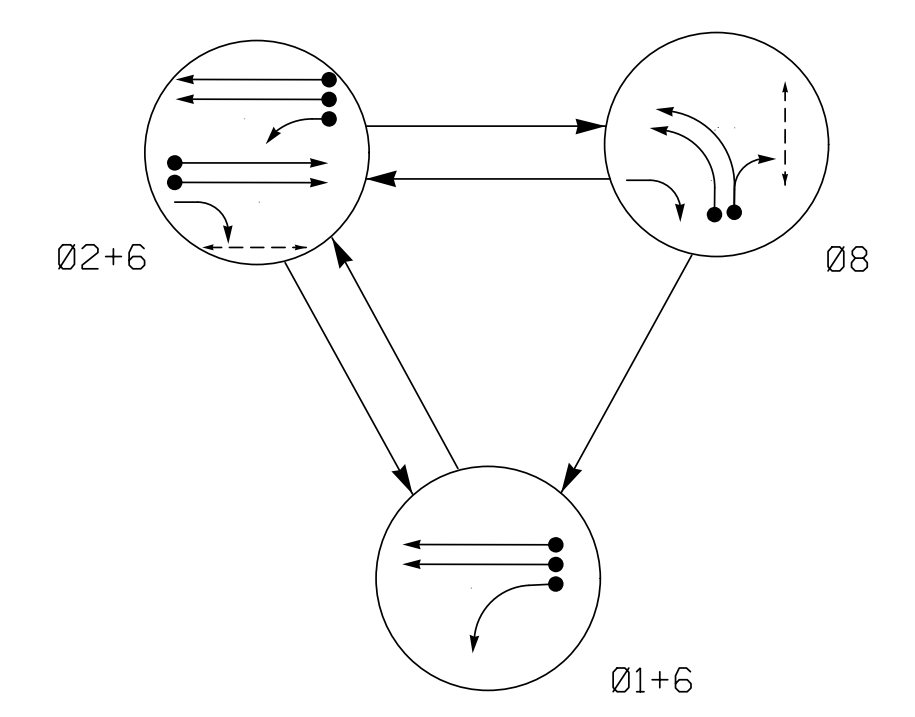
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Discussed by: _____ DATE: 3/11/2022

SIG. INVENTORY NO. 12-0169

3/9/2022 11:16:47 AM DanHilleb.Cur1 ***Kinley-Horn.com/E:\RALI\MRAL\TIP\DK-TIS\011036569_Gastonia Signal System9_Signal\SW54 - S1\Signal Design\G120169-2021.dgn

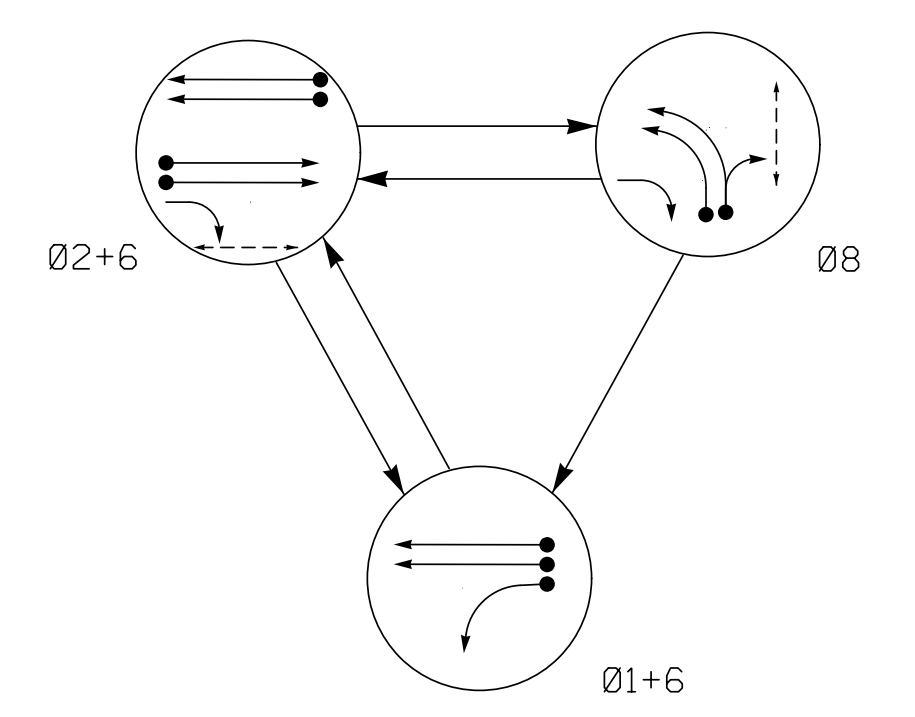
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø8	FLASH
11	←	←	←	←
21	R	G	R	Y
22	R	G	R	Y
61, 62	G	G	R	Y
81, 82	R	R	G	R
P21, P22	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø1+6	Ø2+6	Ø8	FLASH
11	←	←	←	←
21	R	G	R	Y
22	R	G	R	Y
61, 62	G	G	R	Y
81, 82	R	R	G	R
P21, P22	DW	W	DW	DRK
P81, P82	DW	DW	W	DRK

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	10*	-	N	-	X
2A	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	X	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	X
8A	6X20	0	EXIST	-	8	Yes	-	3	-	N	-	X
8B	6X20	+5	EXIST	-	8	Yes	-	5	-	N	-	X

* Disable Delay during Alternate Phasing operation.
Disable Phase call for loop during Alternate Phasing operation.

3 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia Signal System

NOTES

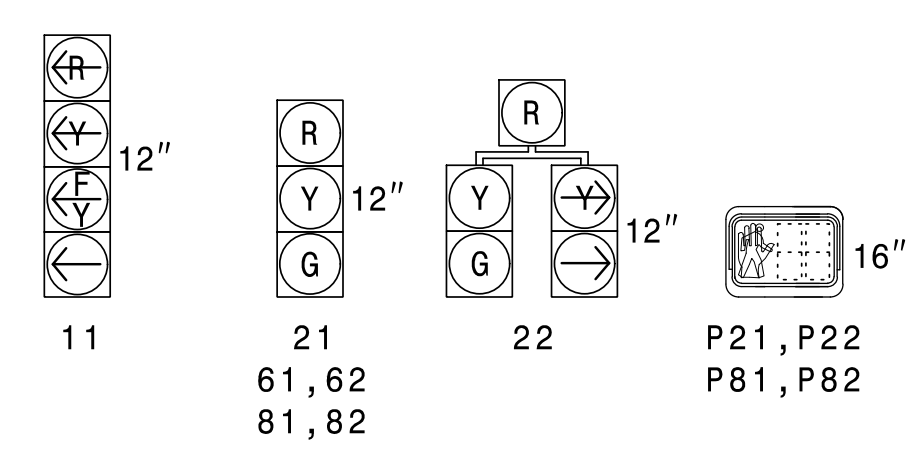
- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal head numbered 62.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- The City Engineer or their representative 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 shall supersede these values.
- Disconnect and abandon existing loops 2C, 2D, 6C, & 6D.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Reconnect lead-in cable to separate loops 2A, 2B, 6A, & 6B, as shown.
- Do NOT install backplates on Metal Pole #1.
- Existing phase 4 has been changed to phase 8 on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
- City system data: Controller Asset #0173.

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

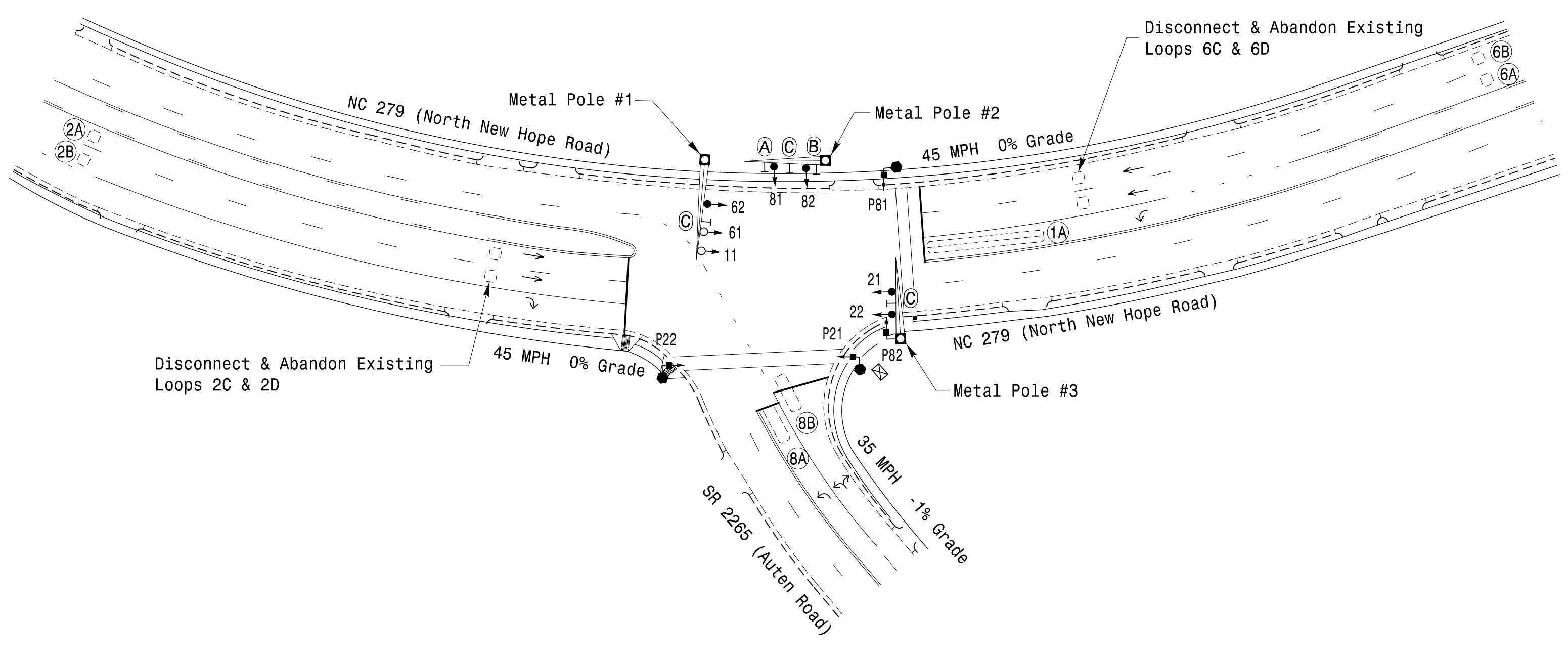
All Heads L.E.D.



TIMING CHART

FEATURE	PHASE			
	1	2	6	8
Min Green *	7	12	12	7
Walk *	-	7	-	7
Ped Clear	-	22	-	17
Veh. Extension *	1.0	6.0	6.0	2.0
Max I *	15	60	60	30
Yellow	3.0	4.5	4.5	3.0
Red Clear	3.6	2.3	2.3	3.6
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	1.5	1.5	-
Max Initial *	-	34	34	-
Time Before Reduction *	-	15	15	-
Time To Reduce *	-	30	30	-
Minimum Gap	-	3.0	3.0	-
Locking Detector	-	X	X	-
Recall Position	-	MIN RECALL	MIN RECALL	-
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

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

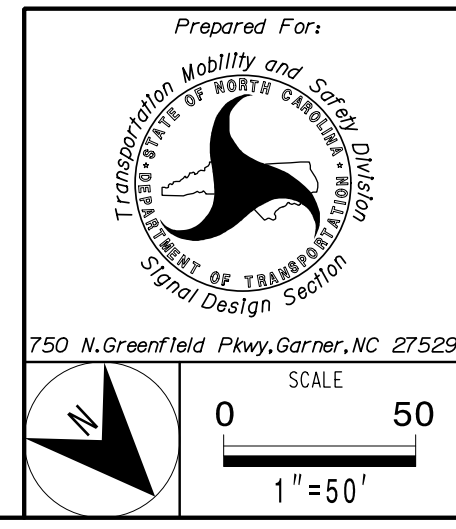


LEGEND

- | | |
|--|------------------------------------|
| PROPOSED | EXISTING |
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → N/A |
| ○ → Type II Signal Pedestal | ○ → N/A |
| ○ → Metal Pole with Mastarm | ○ → N/A |
| ○ → Inductive Loop Detector | ○ → N/A |
| ○ → Controller & Cabinet | ○ → N/A |
| ○ → Junction Box | ○ → N/A |
| ○ → Underground Conduit | ○ → N/A |
| ○ → Directional Arrow | ○ → N/A |
| (A) Left Arrow "ONLY" Sign (R3-5L) | (A) Left Arrow "ONLY" Sign (R3-5L) |
| (B) Dual Turn Arrows Sign (R3-18) | (B) Dual Turn Arrows Sign (R3-18) |
| (C) Street Name Sign (D3-1) | (C) Street Name Sign (D3-1) |

Signal Upgrade

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



NC 279 (North New Hope Road) at SR 2265 (Auten Road)			
Division 12	Gaston County	Gastonia	
PLAN DATE: May 2021	REVIEWED BY: SL Phillips		
PREPARED BY: EE Dogbe	REVIEWED BY: KP Baumann		
REVISIONS	INIT.	DATE	

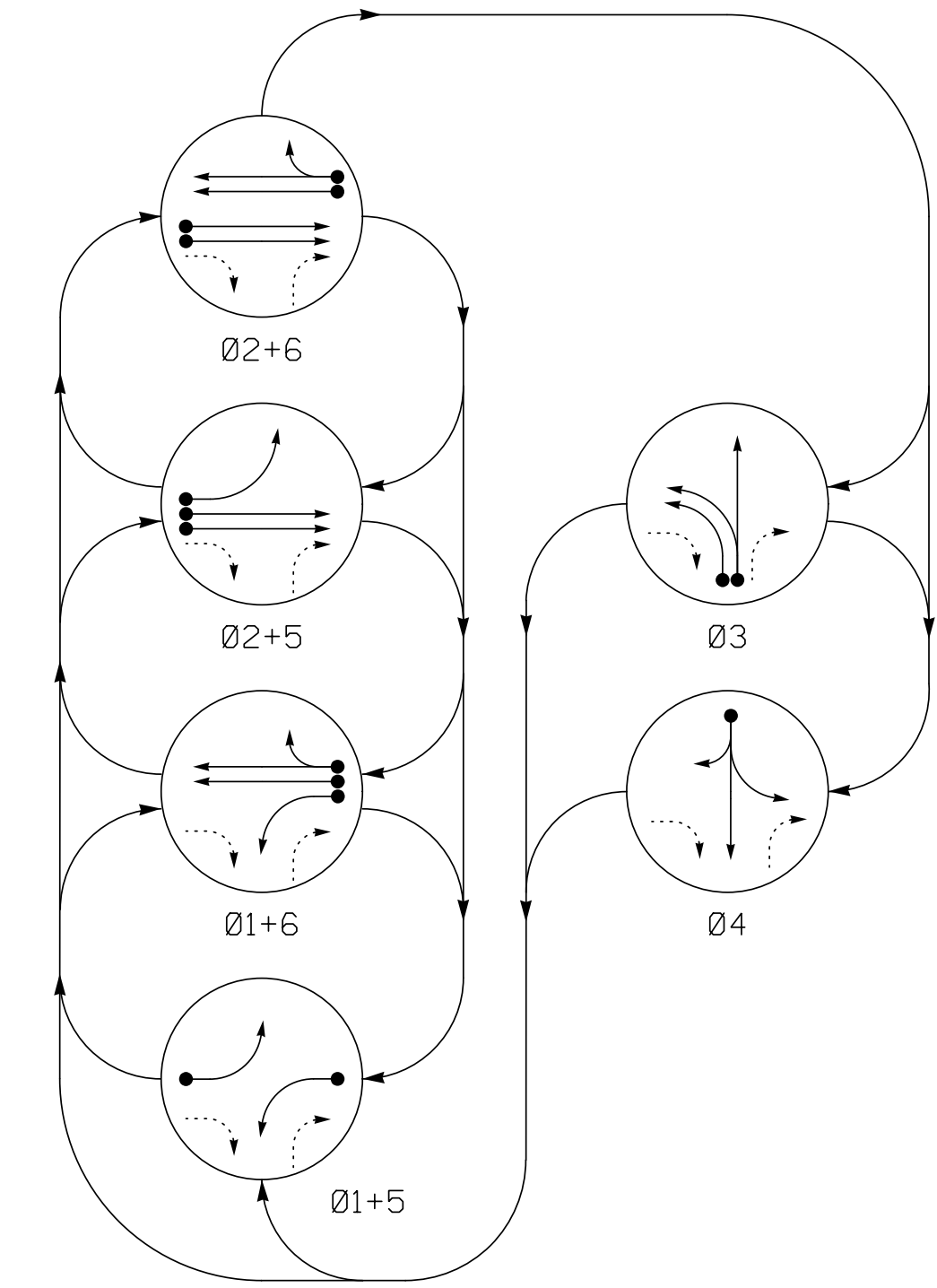
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
Kevin P. Baumann
3/11/2022

SIG. INVENTORY NO. 12-0173

3/9/2022 11:16:50 AM Dantellie.Curt1 \\K:\m\ey-horn.com\SEC_RAL\RAL_IP\DK_LTS\011036569_Gastonia Signal System9_Signal\KWS4 - S1\signal_Design\G120173-2021.dgn

PHASING DIAGRAM



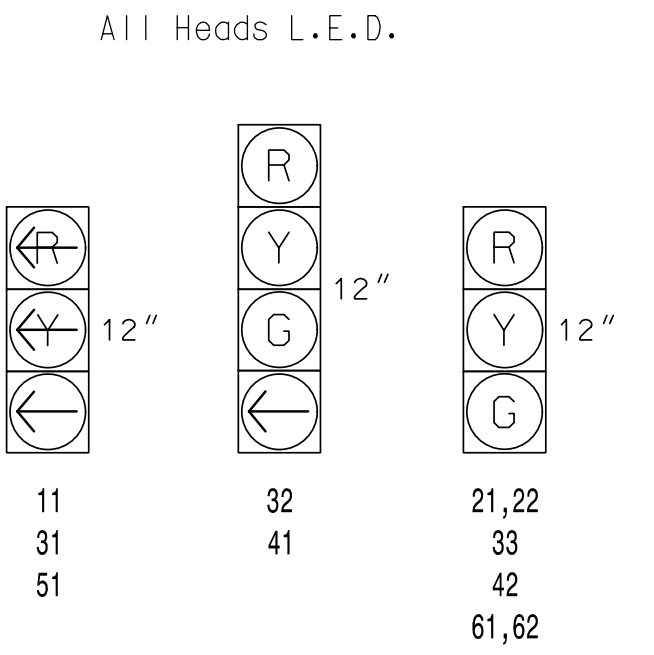
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø 1+5	Ø 1+6	Ø 2+5	Ø 2+6	Ø 3	Ø 4	PEDESTRIAN
11	←	→	←	→	←	→	↕
21,22	R	R	G	G	R	R	Y
31	←	←	←	←	←	←	↕
32	R	R	R	R	G	R	R
33	R	R	R	R	G	R	R
41	R	R	R	R	R	G	R
42	R	R	R	R	R	G	R
51	←	←	←	←	←	←	↕
61,62	R	G	R	G	R	R	Y

SIGNAL FACE I.D.



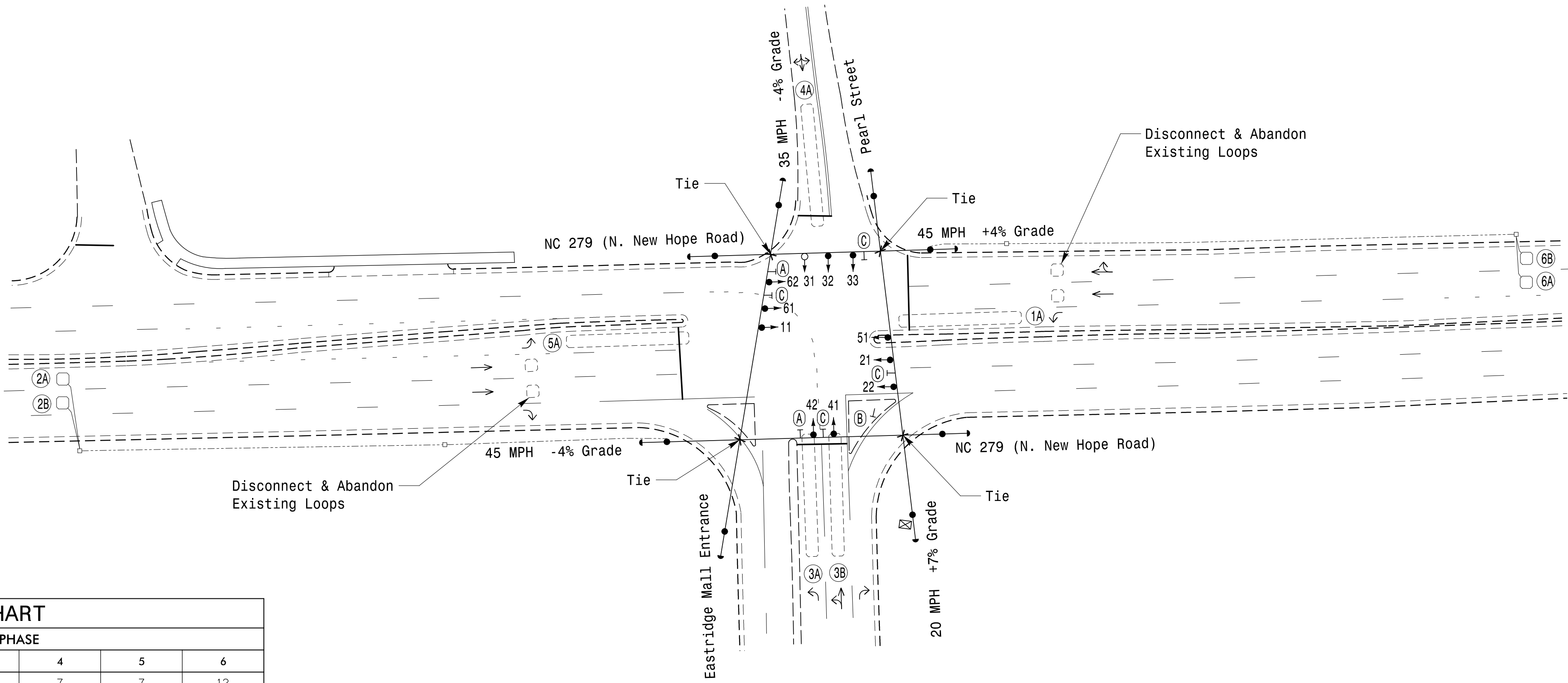
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING								
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD	
1A	6X60	+5	EXIST	-	1	Yes	-	-	-	-	N	-	X
2A	6X6	300	6	X	2	Yes	-	-	X	N	-	X	-
2B	6X6	300	6	X	2	Yes	-	-	X	N	-	X	-
3A	6X60	+5	EXIST	-	3	Yes	-	-	-	N	-	X	-
3B	6X60	+5	EXIST	-	3	Yes	-	-	-	N	-	X	-
4A	6X70	+5	EXIST	-	4	Yes	-	-	-	N	-	X	-
5A	6X60	+5	EXIST	-	5	Yes	-	-	-	N	-	X	-
6A	6X6	300	6	X	6	Yes	-	-	X	N	-	X	-
6B	6X6	300	6	X	6	Yes	-	-	X	N	-	X	-

6 Phase Fully Actuated Gastonia Signal System

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Phase 1 and/or phase 5 may be lagged.
4. The order of phase 3 and phase 4 may be reversed.
5. Reposition existing signal heads numbered 32 & 33.
6. Set all detector units to presence mode.
7. In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
8. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
9. Remove existing Left Arrow "ONLY" sign-(R3-5L) and existing Combined Through and Left Arrow sign-(R3-6L).
10. Pavement markings are existing.
11. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
12. Install new cabinet on the existing cabinet foundation.
13. Disconnect and abandon existing loops 2A, 2B, 6A, & 6B and re-cut new loops as shown on plan.
14. Existing signal heads 31 & 32 have been relabeled to 32 & 33, respectively.
15. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
16. Reconnect lead-in cable to separate loops 2A, 2B, 6A & 6B, as shown.
17. City of system data: Controller Asset #0176.

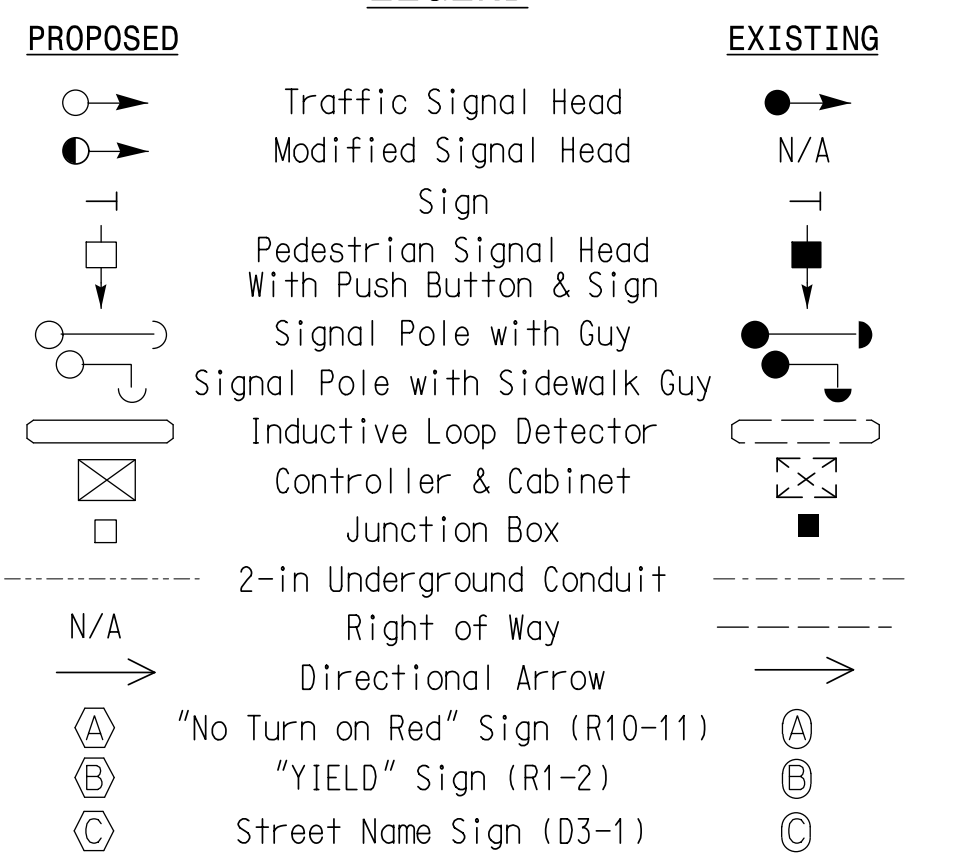


TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	2.0	1.0	1.0	6.0
Max I *	20	45	15	15	10	45
Yellow	3.0	4.9	3.0	4.1	3.0	4.2
Red Clear	2.8	1.8	3.1	1.8	3.1	1.8
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	1.5	-	-	-	1.5
Max Initial *	-	34	-	-	-	34
Time Before Reduction *	-	15	-	-	-	15
Time To Reduce *	-	30	-	-	-	30
Minimum Gap	-	3.0	-	-	-	3.0
Locking Detector	-	X	-	-	-	X
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

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

LEGEND



Signal Upgrade

Prepared For:
Kimley»Horn

750 N. Greenleaf Pkwy, Garner, NC 27529
NC License #0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

NC 279 (N. New Hope Road)
at
Pearl Street and Eastridge Mall Entrance

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

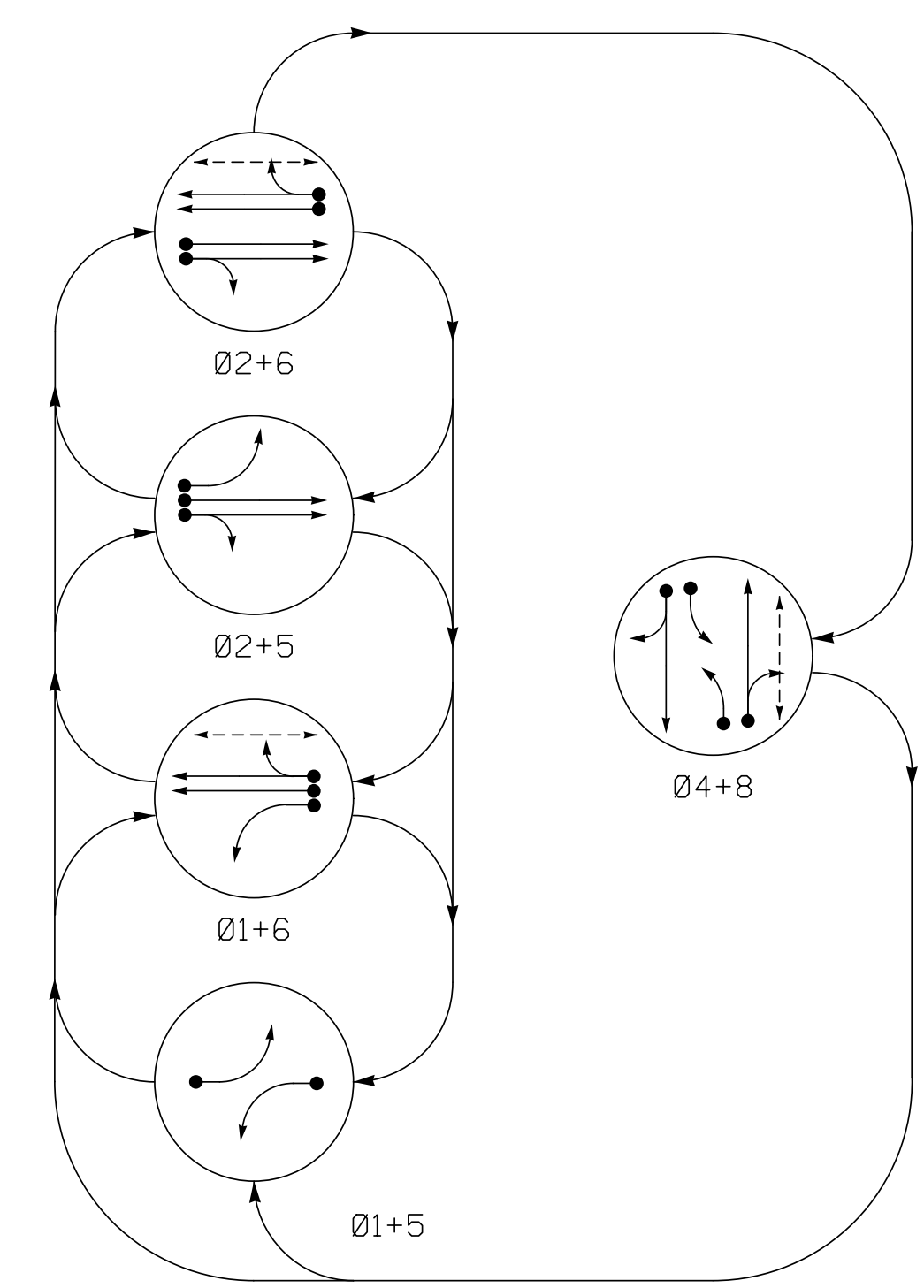
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1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 3/11/2022
SIGNATURE: [Signature]
DATE: [Blank]
SIG. INVENTORY NO. 12-0176

3/9/2022 11:16:52 AM Don'tell,Cur1 ***Kimley-Horn.com\\E-RAL\\RAL\\RAL\\IPDK-ITS\\011036569 Gastonia Signal System9 Signal\\SWS4 - Signal Design\\020176-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV PREEMPT PHASES (Medium Priority)

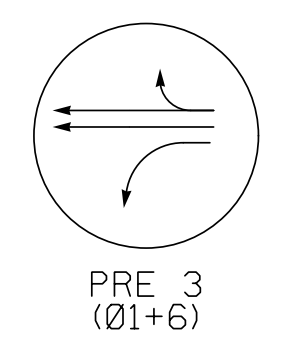


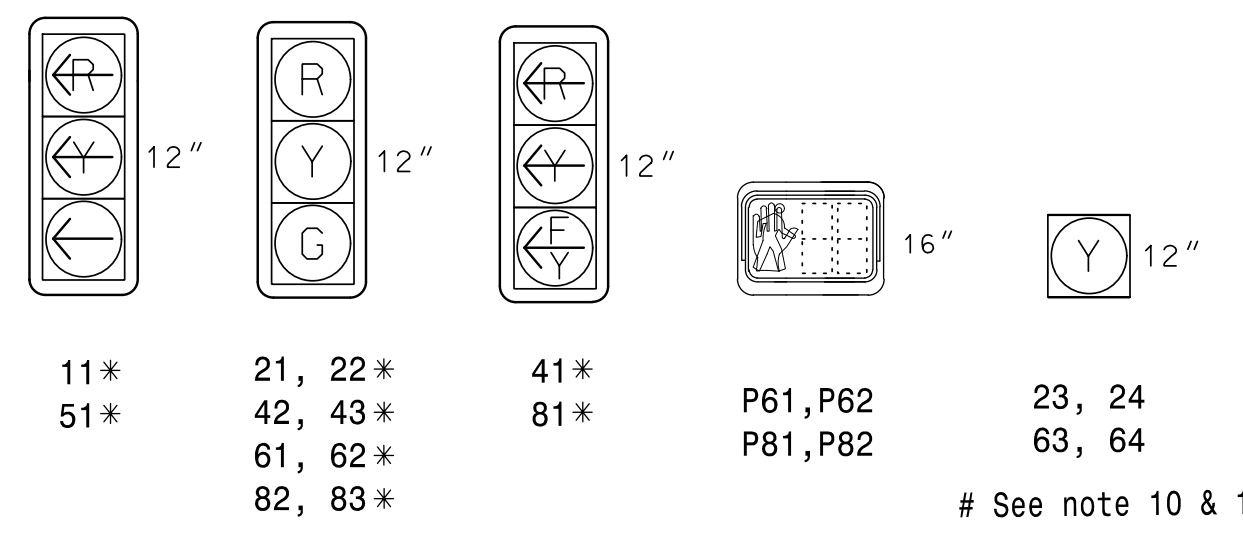
TABLE OF OPERATION

SIGNAL FACE	PHASE							
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 8	FLASH		
11	←	←	←	←	←	←	←	←
21, 22	←	←	←	←	←	←	←	←
23, 24	FY	FY	DRK	DRK	FY	DRK	FY	DRK
41	←	←	←	←	←	←	←	←
42, 43	R	R	R	R	G	R	G	R
51	←	←	←	←	←	←	←	←
61, 62	R	G	R	G	R	G	R	Y
63, 64	FY	DRK	FY	DRK	FY	DRK	FY	DRK
81	←	←	←	←	←	←	←	←
82, 83	R	R	R	R	G	R	G	R
P61, P62	DW	W	DW	W	DW	DRK	W	DRK
P81, P82	DW	DW	DW	DW	W	DRK	W	DRK

FY = Flashing Yellow

SIGNAL FACE I.D.

All Heads L.E.D.
* Backplates with reflective borders



See note 10 & 11

DETECTOR INSTALLATION CHART

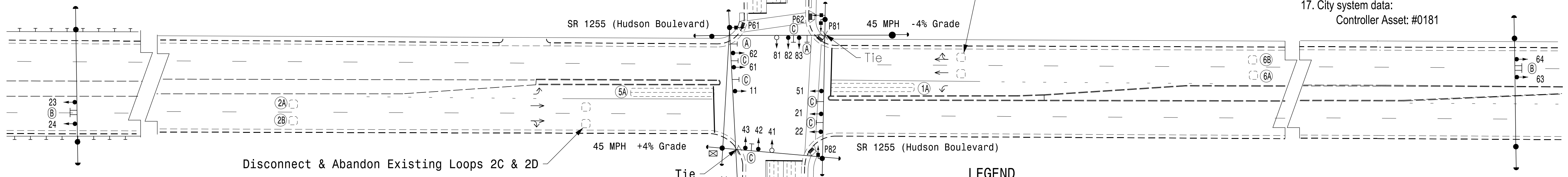
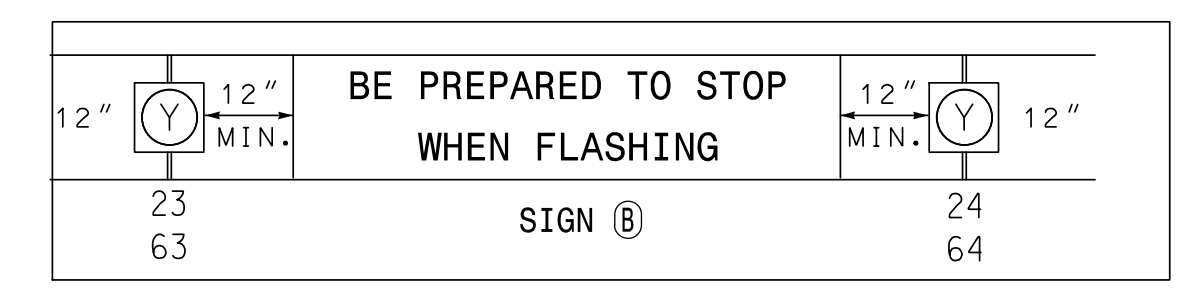
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	-	-	N	-	X
2A	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	-
2B	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	-
4A	6X60	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X60	0	2-4-2	-	4	Yes	-	10	-	N	-	X
5A	6X60	0	2-4-2	-	5	Yes	-	-	-	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-
6B	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-
8A	6X60	0	2-4-2	-	8	Yes	-	-	-	N	-	X
8B	6X60	0	2-4-2	-	8	Yes	-	10	-	N	-	X

5 Phase Fully Actuated w/ Emergency Vehicle Preemption Gastonia City System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Disconnect and abandon existing loops 2C, 2D, 6C, and 6D.
- Flash beacons 23 & 24 six seconds prior to the end of phase 2 green.
- Flash beacons 63 & 64 six seconds prior to the end of phase 6 green.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City system data:
Controller Asset: #0181

FIGURE 1



Disconnect & Abandon Existing Loops 2C & 2D

LEGEND

- | PROPOSED | EXISTING |
|---|----------|
| ○ → Traffic Signal Head | ● → N/A |
| ○ → Modified Signal Head | ○ → N/A |
| ○ → Sign | ○ → N/A |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → N/A |
| ○ → Signal Pole with Guy | ○ → N/A |
| ○ → Signal Pole with Sidewalk Guy | ○ → N/A |
| ○ → Inductive Loop Detector | ○ → N/A |
| ○ → Controller & Cabinet | ○ → N/A |
| ○ → Junction Box | ○ → N/A |
| ○ → 2-in Underground Conduit | ○ → N/A |
| ○ → Right of Way | ○ → N/A |
| ○ → Directional Arrow | ○ → N/A |
| ○ → Guard Rail | ○ → N/A |
| (A) "NO TURN ON RED" Sign (R10-11) WITH "7:00-9:00 AM, 2:00-4:00 PM" SIGN (R2-57) | (A) N/A |
| (B) See Figure 1 | (B) N/A |
| (C) Street Name Sign (D3-1) | (C) N/A |

FEATURE	PHASE						
	1	2	4	5	6	8	
Min Green *	7	12	7	7	12	7	
Walk *	-	-	-	-	7	7	
Ped Clear	-	-	-	-	10	20	
Veh. Extension *	1.0	6.0	2.0	1.0	6.0	2.0	
Max 1 *	15	45	30	15	45	30	
Yellow	3.0	4.2	3.7	3.0	4.9	3.7	
Red Clear	2.1	1.1	2.0	2.6	1.5	2.0	
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	
Actuations B4 Add *	-	-	-	-	-	-	
Seconds / Actuation *	-	1.5	-	-	1.5	-	
Max Initial *	-	34	-	-	34	-	
Time Before Reduction *	-	20	-	-	20	-	
Time To Reduce *	-	40	-	-	40	-	
Minimum Gap	-	3.0	-	-	3.0	-	
Locking Detector	-	X	-	-	X	-	
Recall Position	-	MIN RECALL	-	-	MIN RECALL	-	
Dual Entry	-	-	X	-	-	X	
Simultaneous Gap	X	X	X	X	X	X	

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

EV PREEMPT	
FUNCTION	PRE 3
Exit Phase(s)	2+6
Preempt Override	OFF
Delay Time	0
Ped Clear Through Yellow	Y
Terminate Phases	N
Entrance Walk	1
Entrance Ped Clear	25.5*
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Minimum Dwell Time	7
Preempt Input Extension Time **	2
Preempt Max Time	120
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

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

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

Signal Upgrade

SR 1255 (Hudson Boulevard) at Lynhaven Drive/Lyon Street

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: INIT. DATE

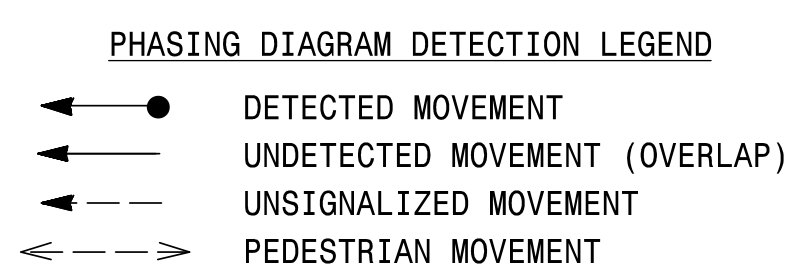
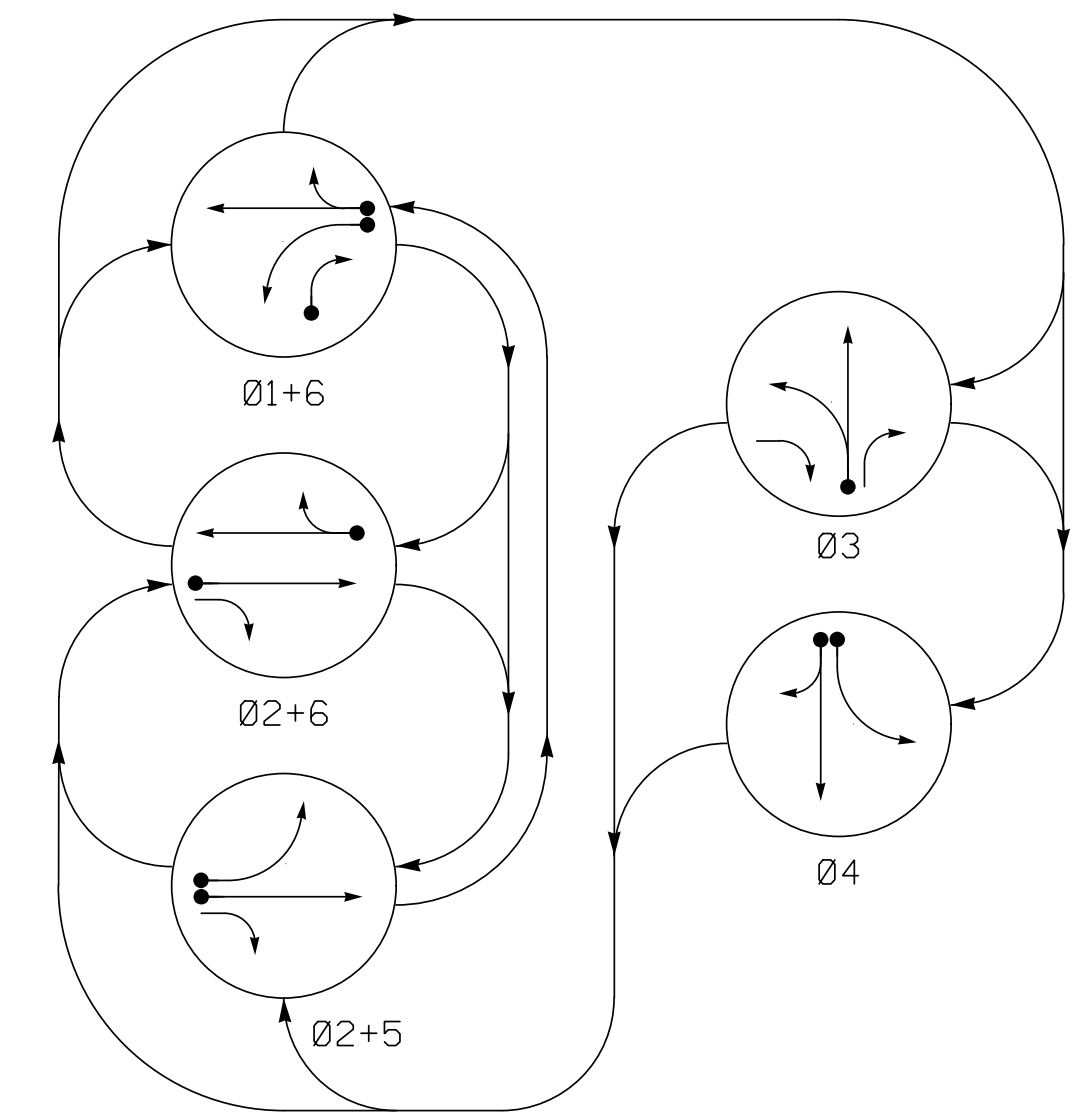
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3/11/2022

SIG. INVENTORY NO. 12-0181

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PHASING DIAGRAM



EV PREEMPT PHASES
(Medium Priority)

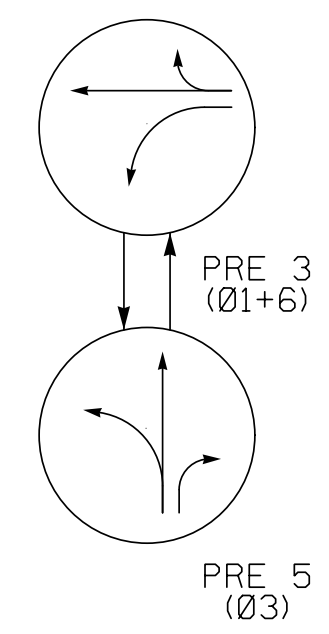
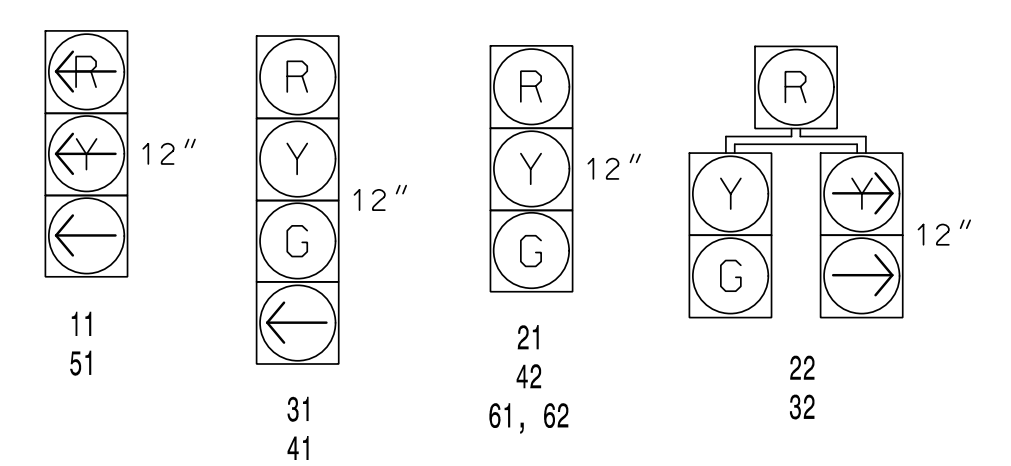


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	02+5	02+6	01+6	03	04	04+5
11	R	R	R	R	R	R
21	G	G	R	R	R	Y
22	G	G	R	R	R	Y
31	R	R	R	G	R	R
32	R	R	R	G	R	R
41	R	R	R	R	G	R
42	R	R	R	R	G	R
51	R	R	R	R	R	R
61,62	R	G	G	R	R	Y

SIGNAL FACE I.D.

All Heads L.E.D.



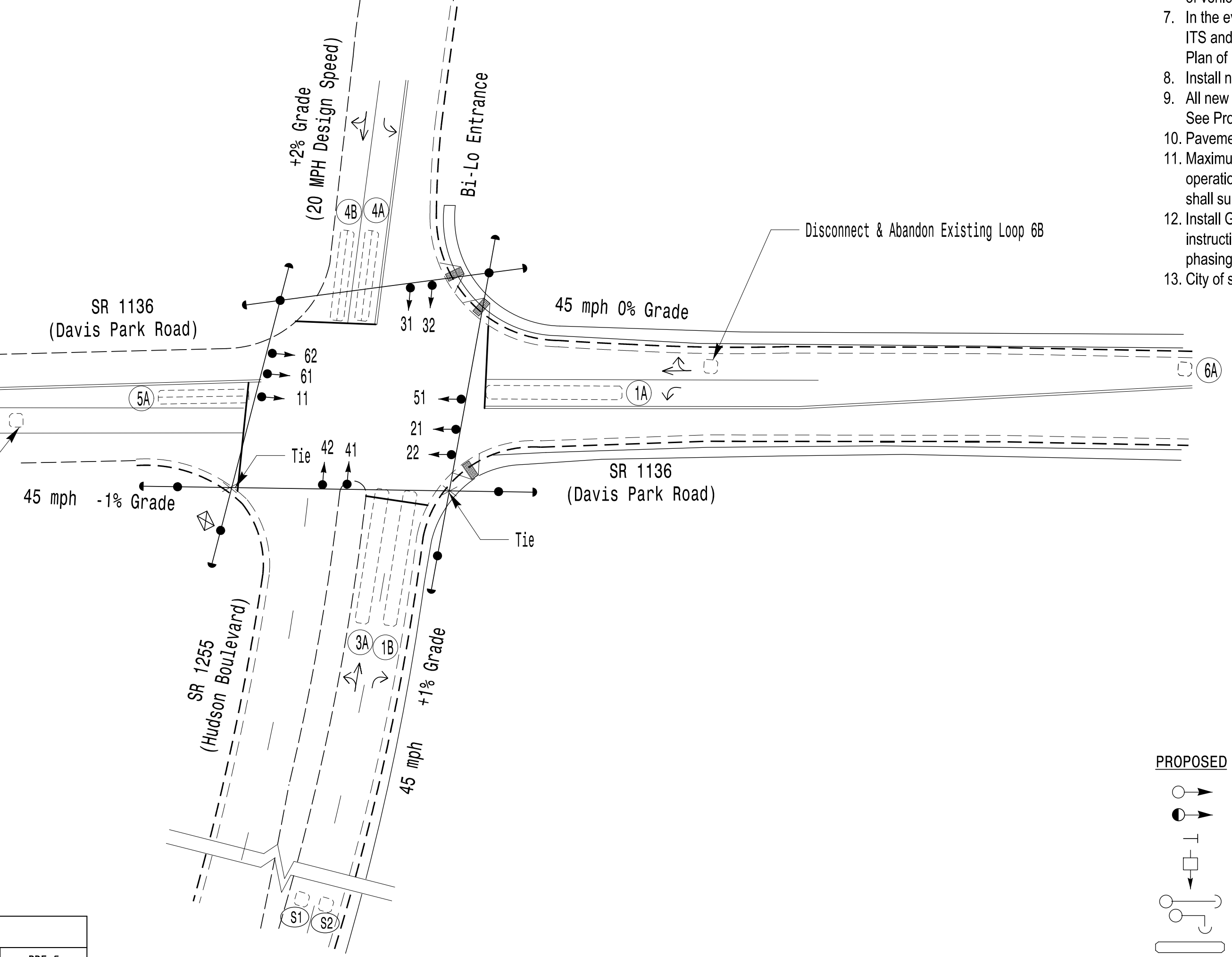
DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD
1A	6X60	0	EXIST	-	1	Yes	-	3	-	N	-	Y
1B	6X60	+5	EXIST	-	1	Yes	-	15	-	N	-	Y
2A	6X6	385	EXIST	-	2	Yes	-	-	X	N	-	Y
3A	6X60	+5	EXIST	-	3	Yes	-	-	-	N	-	Y
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	Y
4B	6X40	0	2-4-2	-	4	Yes	-	10	-	N	-	Y
5A	6X40	0	2-4-2	-	5	Yes	-	-	-	N	-	Y
6A	6X6	300	EXIST	-	6	Yes	-	-	X	N	-	Y
S1	6X6	300	EXIST	-	-	No	-	-	-	N	X	Y
S2	6X6	300	EXIST	-	-	No	-	-	-	N	X	Y

5 Phase Fully Actuated w/ Emergency Vehicle Preemption Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- The order of phase 3 and phase 4 may be reversed.
- Set all detector units to presence mode.
- Disconnect and abandon existing loops 2B and 6B.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City of system data: Controller Asset #0190.



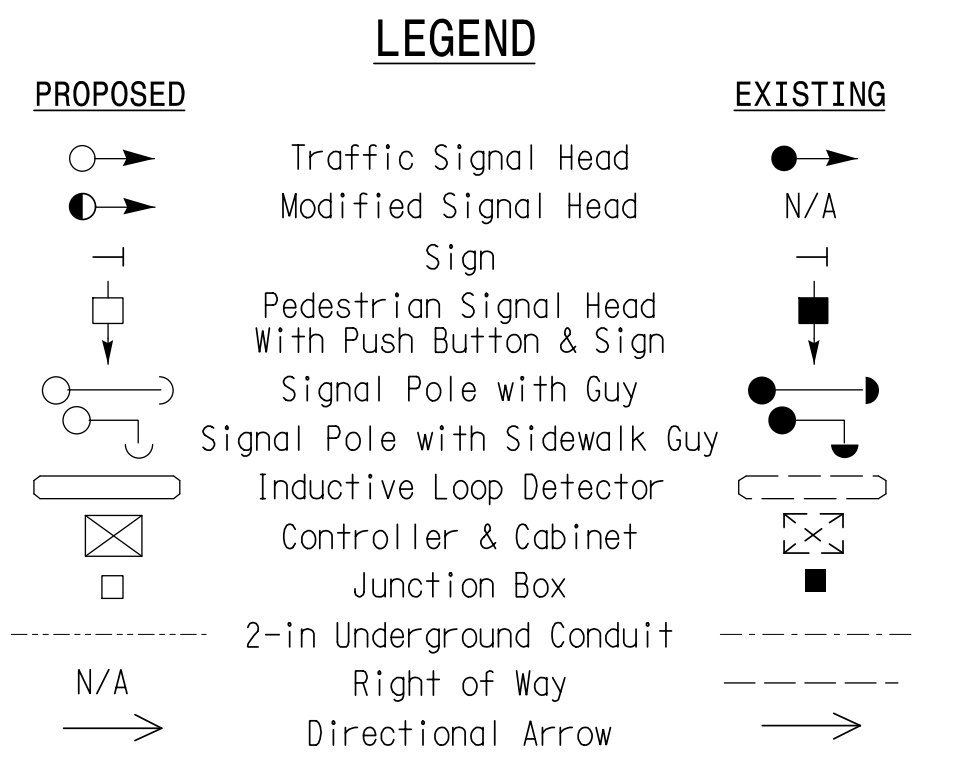
TIMING CHART

FEATURE	PHASE					
	1	2	3	4	5	6
Min Green *	7	12	7	7	7	12
Walk *	-	-	-	-	-	-
Ped Clear	-	-	-	-	-	-
Veh. Extension *	2.0	6.0	1.0	1.0	2.0	6.0
Max 1 *	20	45	25	25	20	45
Yellow	3.0	4.6	4.4	3.0	3.0	4.5
Red Clear	2.6	1.3	1.2	2.1	2.3	1.3
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-	-	-
Seconds / Actuation *	-	2.5	-	-	-	2.5
Max Initial *	-	43	-	-	-	34
Time Before Reduction *	-	20	-	-	-	20
Time To Reduce *	-	40	-	-	-	40
Minimum Gap	-	4.5	-	-	-	3.0
Locking Detector	-	X	-	-	-	X
Recall Position	-	MIN RECALL	-	-	-	MIN RECALL
Dual Entry	-	-	-	-	-	-
Simultaneous Gap	X	X	X	X	X	X

EV PREEMPT

FUNCTION	PRE 3	PRE 5
Exit Phase(s)	2+5	4
Preempt Override	OFF	OFF
Delay Time	0	0
Ped Clear Through Yellow	N	N
Terminate Phases	N	N
Entrance Walk	-	-
Entrance Ped Clear	-	-
Entrance Min Green	1	1
Entrance Yellow Change	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*
Minimum Dwell Time	7	7
Preempt Input Extension Time **	2	2
Preempt Max Time	120	120
Exit Yellow Change	25.5*	25.5*
Exit Red Clear	25.5*	25.5*

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



Signal Upgrade

Prepared For: **SR 1136 (Davis Park Rd.) at SR 1255 (Hudson Blvd.) / Bi-Lo Entrance**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

PREPARED BY: LL Matney REVIEWED BY: KP Baumann

750 N. Greenfield Pkwy, Garner, NC 27529

NC License #0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000

SCALE: 1" = 40'

REVISIONS: INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

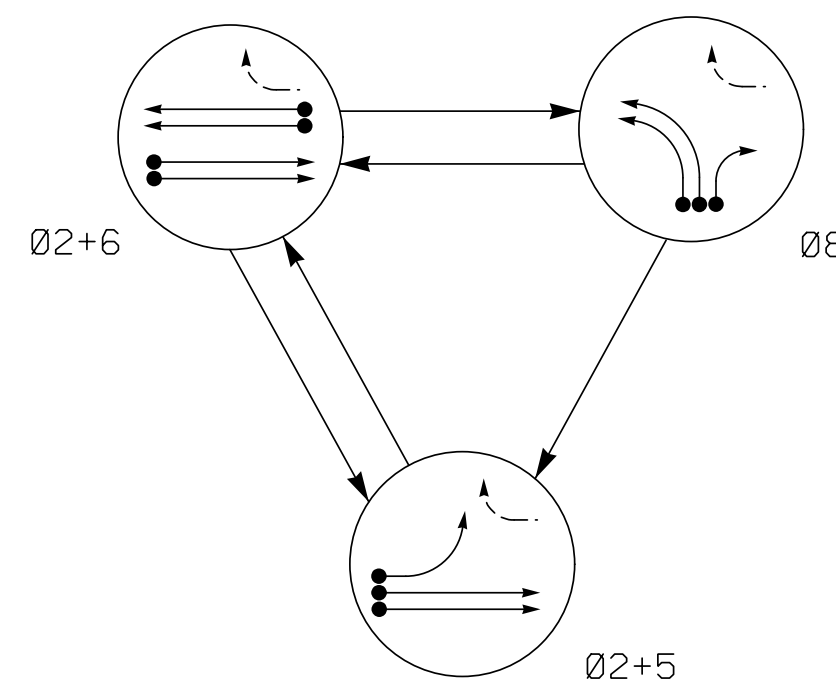
Seal of Professional Engineer: KETIN P. BAUMANN, SEAL 044434

Signature: [Signature] DATE: 3/11/2022

SIG. INVENTORY NO. 12-0190

3/9/2022 11:14:01 AM DanHelleCur1 ***k:\mley-horn.com\SE_RAL\MRAL_TPD\K-TIS\011036569_Gastonia Signal System\Signal\SW4 - Signal Design\120190-2021.dgn

PHASING DIAGRAM



EV PREEMPT PHASES (Medium Priority)

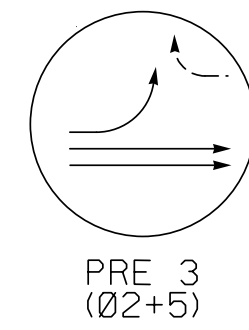
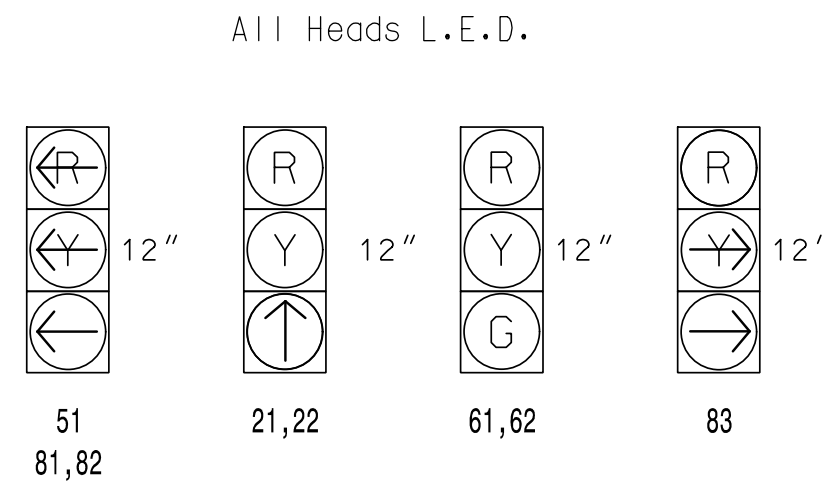


TABLE OF OPERATION table with columns for SIGNAL FACE, PHASE, and timing details.

SIGNAL FACE I.D.



DETECTOR INSTALLATION CHART table with columns for LOOP, SIZE, DISTANCE FROM STOPBAR, TURNS, PHASE, CALLING, EXTEND TIME, DELAY TIME, USE ADDED INITIAL, TYPE, LOOP SYSTEM, and NEW CARD.

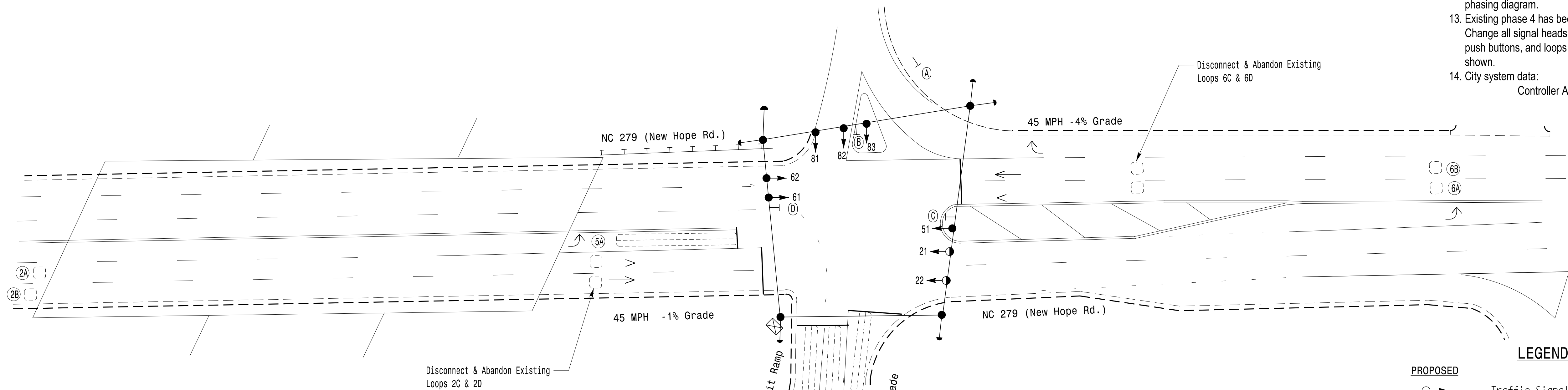
3 Phase Fully Actuated w/ Emergency Vehicle Preemption Gastonia Signal System

NOTES

- List of 14 notes detailing installation requirements, timing, and system data for the emergency vehicle preemption system.

PHASING DIAGRAM DETECTION LEGEND

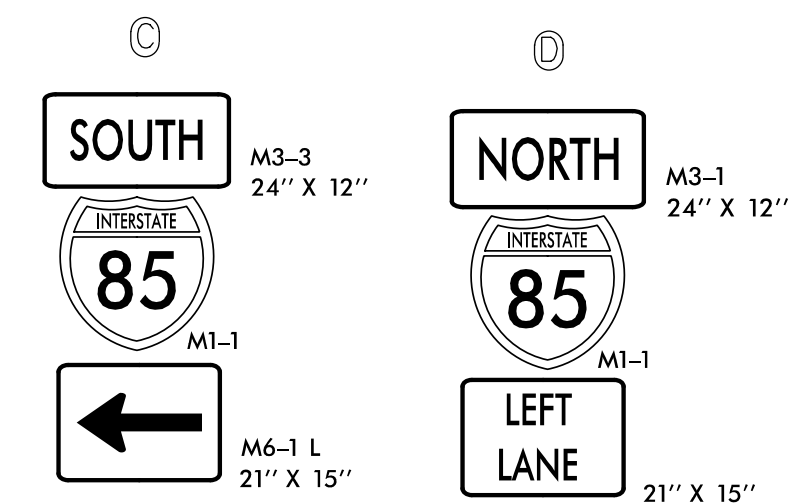
- Legend for phasing diagram: DETECTED MOVEMENT, UNDETECTED MOVEMENT (OVERLAP), UNSIGNALIZED MOVEMENT, PEDESTRIAN MOVEMENT.



TIMING CHART table with columns for FEATURE and PHASE (2, 5, 6, 8) and timing values.

EV PREEMPT table with columns for FUNCTION and PRE 3, listing preemption settings.

LEGEND section defining symbols for PROPOSED and EXISTING traffic signal heads, poles, and signs.



Signal Upgrade

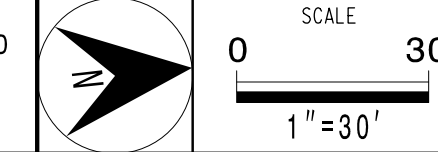
Professional seal and signature of K. P. Baumann, Engineer, State of North Carolina.

Project information: NC 279 (New Hope Rd.) at I-85 Southbound Ramp, Division 12, Gaston County, Gastonia. Includes dates and reviewer names.

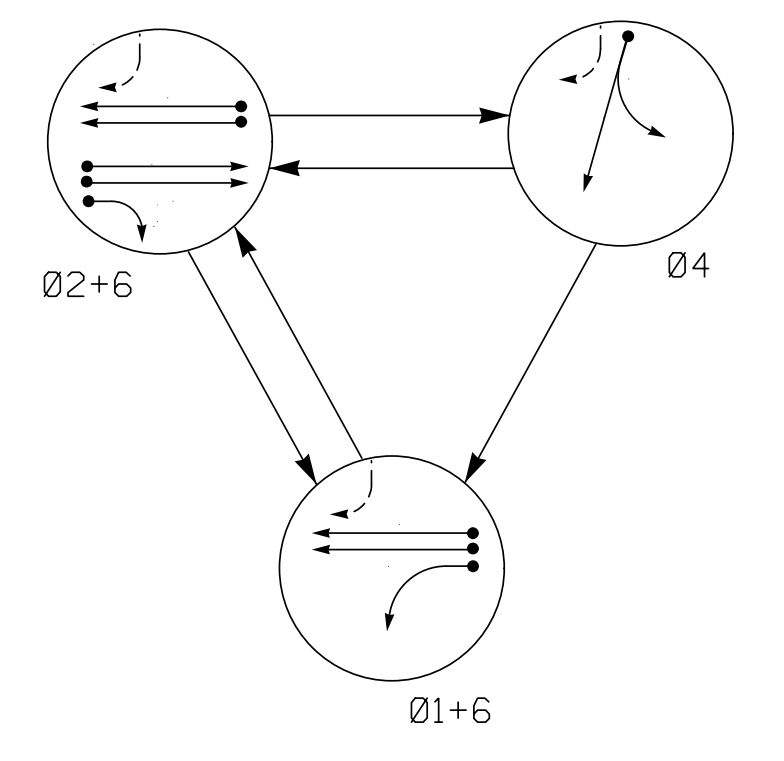
Professional seal and signature of K. P. Baumann, Engineer, State of North Carolina.

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

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



PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV PREEMPT PHASES
(Medium Priority)

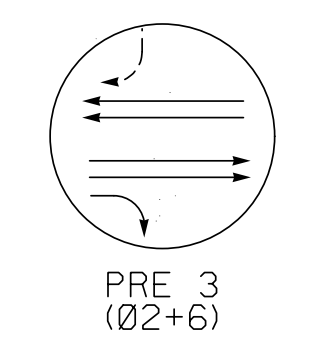
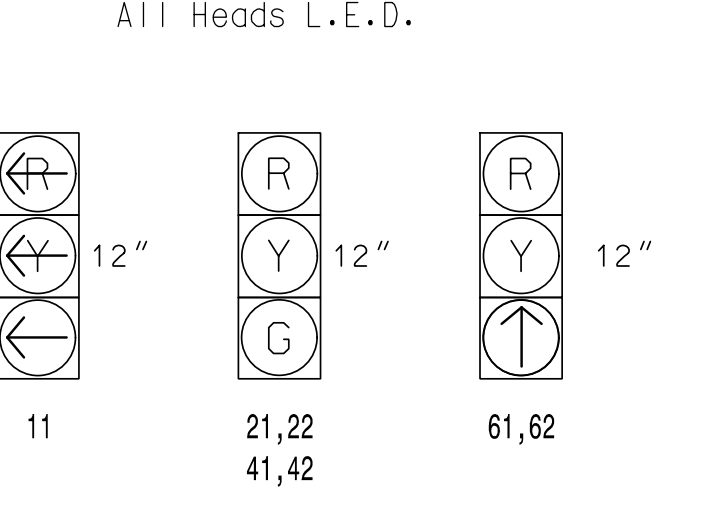


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø1+6	Ø2+6	Ø4	P	L	R
11	←	→	→	→	→	→
21, 22	R	G	R	G	Y	
41, 42	R	R	G	R	R	
61, 62	↑	↑	R	↑	Y	

SIGNAL FACE I.D.



DETECTOR INSTALLATION CHART

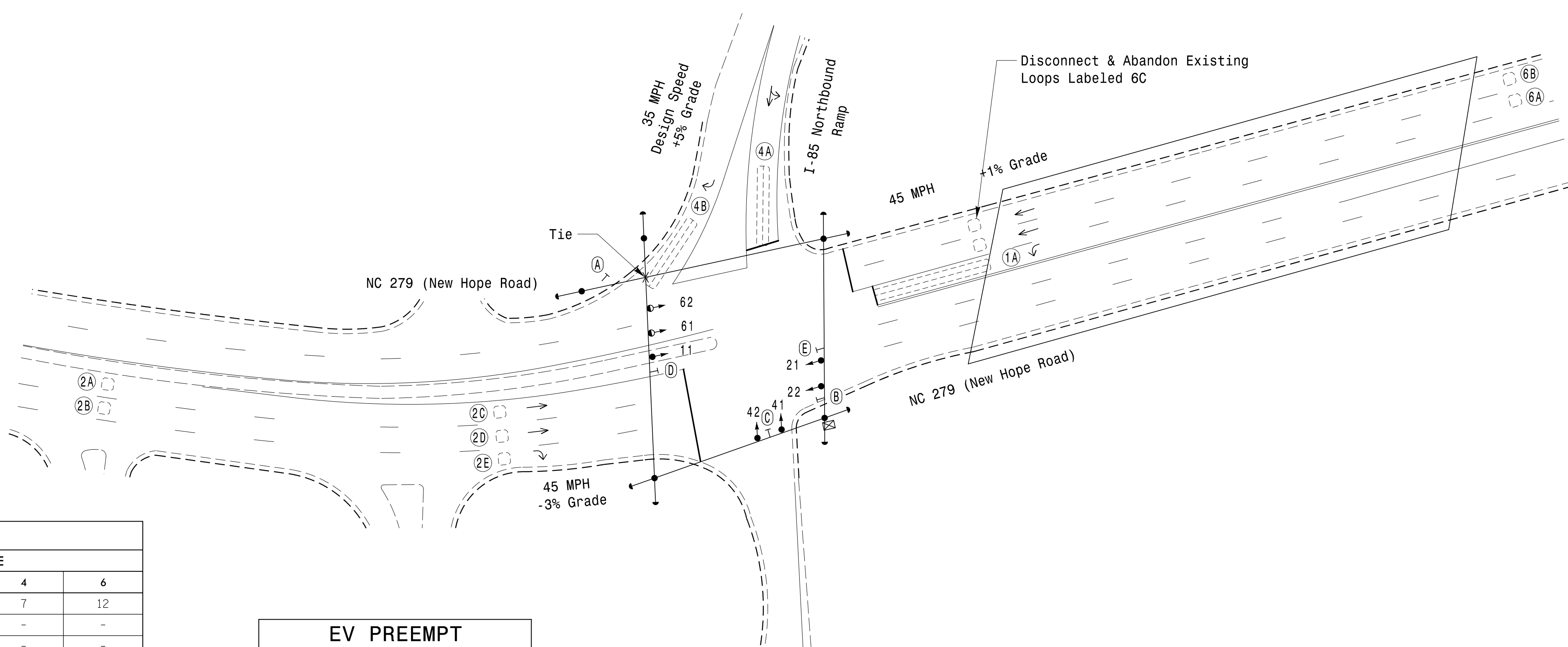
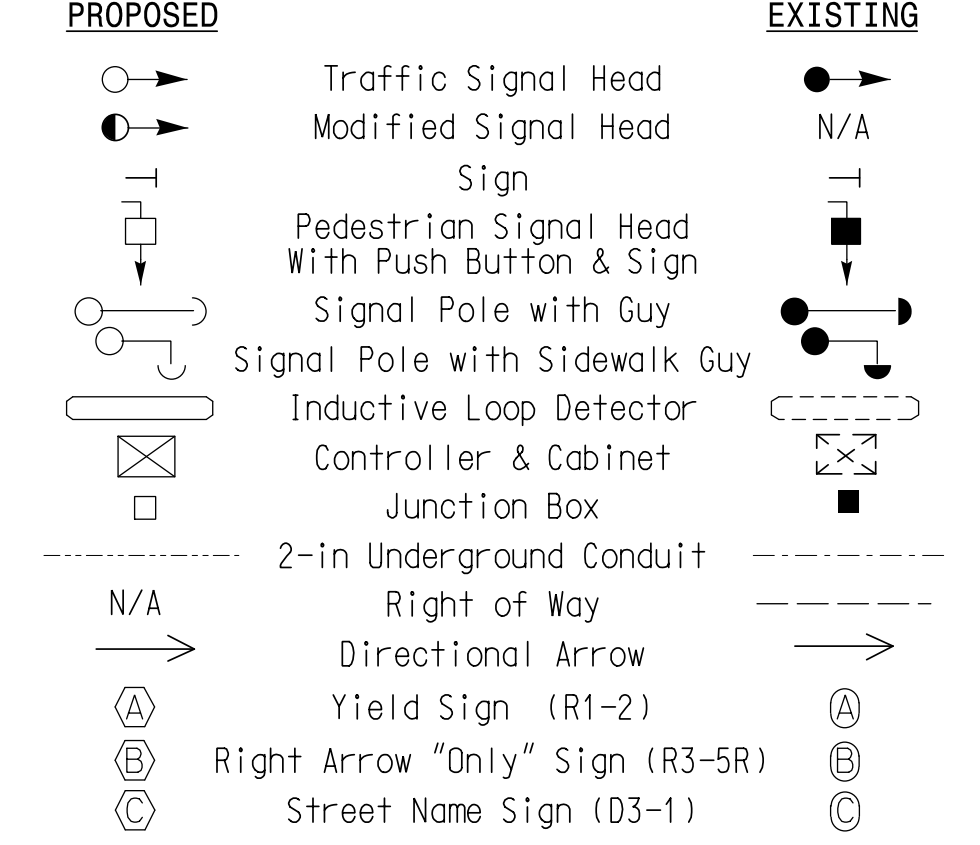
LOOP	DETECTOR			PROGRAMMING								
	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
1A	6X60	0	2-4-2	-	1	Yes	-	-	-	N	-	X
2A	6X6	300	EXIST	-	2	Yes	1.6	-	-	N	-	X
2B	6X6	300	EXIST	-	2	Yes	1.6	-	-	N	-	X
2C	6X6	90	EXIST	-	2	Yes	-	-	-	N	-	X
2D	6X6	90	EXIST	-	2	Yes	-	-	-	N	-	X
2E	6X6	90	EXIST	-	2	Yes	-	-	-	N	-	X
4A	6X40	0	2-4-2	-	4	Yes	-	-	-	N	-	X
4B	6X40	0	2-4-2	-	4	Yes	-	5	-	N	-	X
6A	6X6	350	EXIST	-	6	Yes	-	-	X	N	-	X
6B	6X6	350	EXIST	-	6	Yes	-	-	X	N	-	X

3 Phase Fully Actuated w/ Emergency Vehicle Preemption Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Disconnect and abandon existing loops labeled 6C.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- Reconnect lead-in cable to separate loops 2A, 2B, 2C, 2D, 2E, 6A & 6B, as shown.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- City system data:
Controller Asset #0195.

LEGEND



TIMING CHART

FEATURE	PHASE			
	1	2	4	6
Min Green *	7	12	7	12
Walk *	-	-	-	-
Ped Clear	-	-	-	-
Veh. Extension *	2.0	2.0	2.0	6.0
Max 1 *	20	45	30	45
Yellow	3.0	4.8	3.6	4.4
Red Clear	2.8	1.0	1.9	1.0
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	1.5
Max Initial *	-	-	-	39
Time Before Reduction *	-	-	-	15
Time To Reduce *	-	-	-	30
Minimum Gap	-	-	-	3.9
Locking Detector	-	X	-	X
Recall Position	-	MIN RECALL	-	MIN RECALL
Dual Entry	-	-	-	-
Simultaneous Gap	X	X	X	X

EV PREEMPT

FUNCTION	PRE 3
Exit Phase(s)	2+6
Preempt Override	OFF
Delay Time	0
Ped Clear Through Yellow	N
Terminate Phases	N
Entrance Walk	-
Entrance Ped Clear	-
Entrance Min Green	1
Entrance Yellow Change	25.5*
Entrance Red Clear	25.5*
Minimum Dwell Time	7
Preempt Input Extension Time **	2
Preempt Max Time	120
Exit Yellow Change	25.5*
Exit Red Clear	25.5*

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

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

Signal Upgrade

Prepared For:
Kimley-Horn

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

NC 279 (New Hope Road) at I-85 Northbound Ramp

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

REVISIONS: _____ DATE: _____

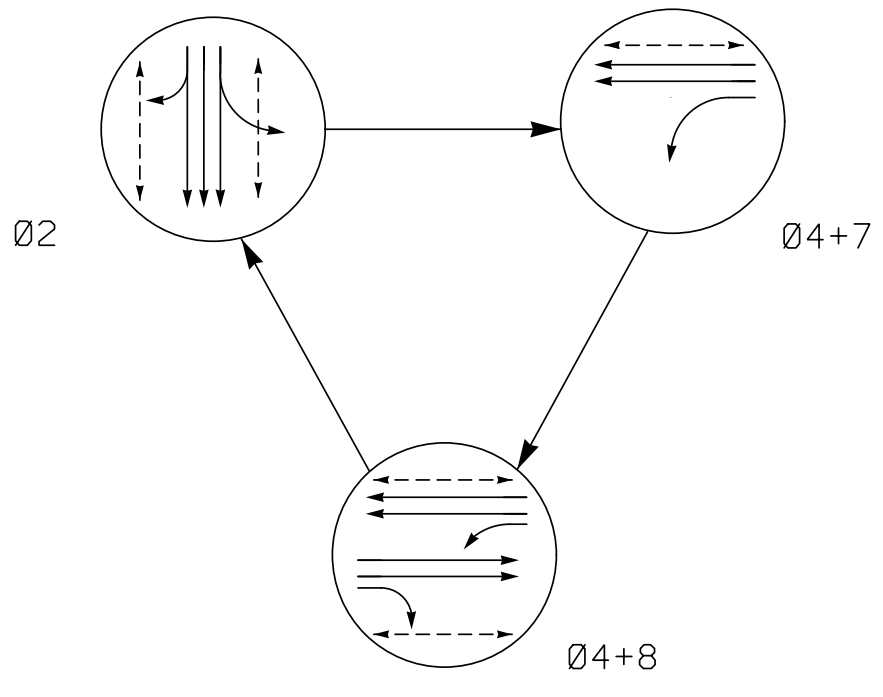
INITIALS: _____ DATE: _____

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Discussed by: _____ DATE: 3/11/2022
DATE: _____
SIG. INVENTORY NO. 12-0195

3/9/2022 11:16:57 AM Dan.Hill@k-h.com Signal Design Section

DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø 2	Ø 4 + 7	Ø 4 + 8	PRE 3	PRE 4	PRE 5	FLASH
21,22,23	G	R	R	G	R	R	Y
41,42	R	↑	↑	R	↑	↑	R
71	←	←	←	←	←	←	←
81,82,83	R	R	G	R	R	G	R
P21,P22 P23,P24	W	DW	DW	DW	DW	DW	DRK
P41,P42	DW	W	W	DW	DW	DW	DRK
P81,P82	DW	DW	W	DW	DW	DW	DRK

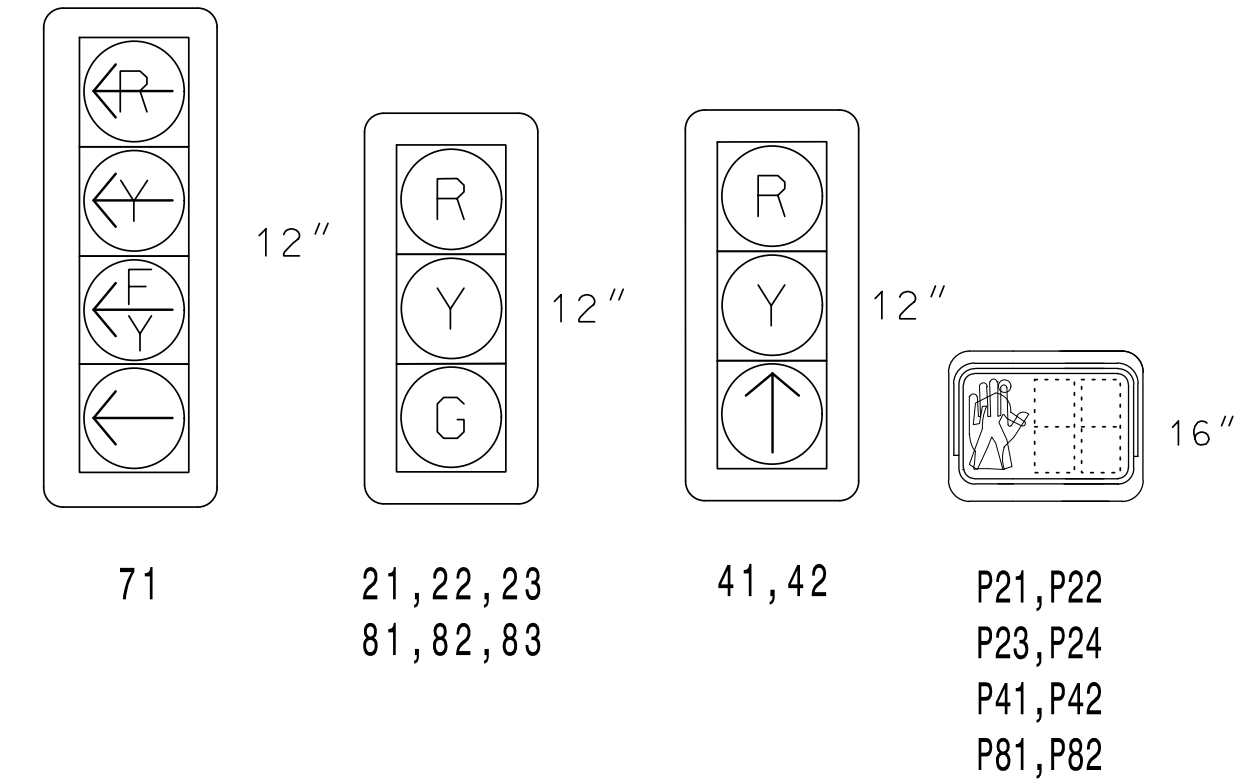
PHASING DIAGRAM DETECTION LEGEND

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

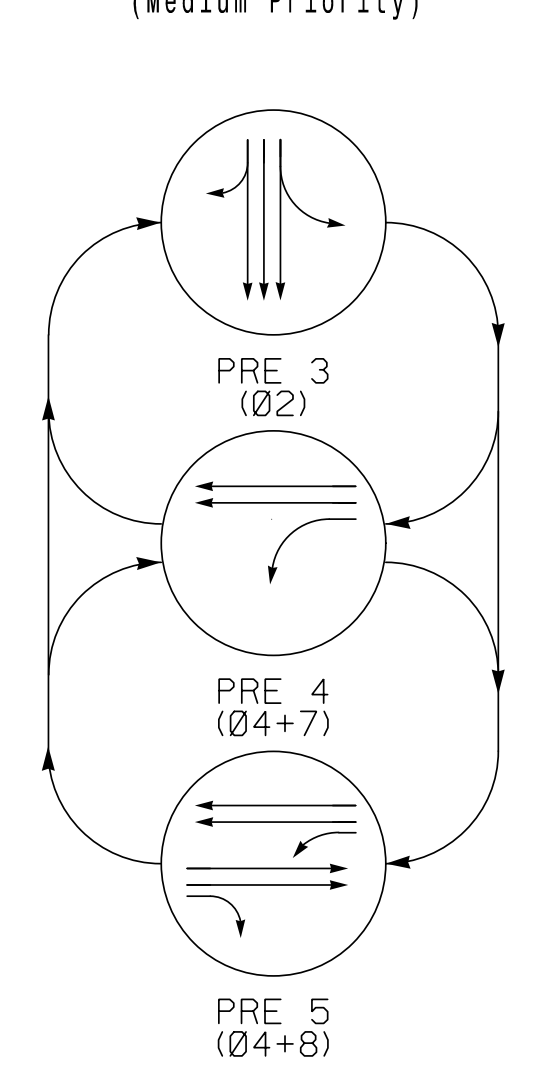
SIGNAL FACE I.D.

All Heads L.E.D.

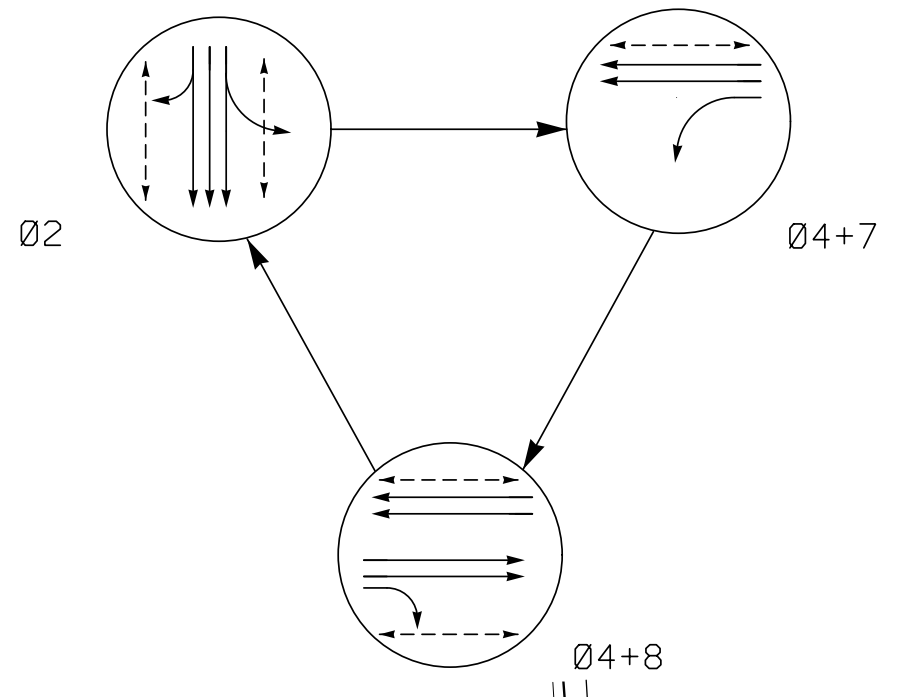
All heads have backplates with reflective borders



DEFAULT EV PREEMPT PHASES (Medium Priority)



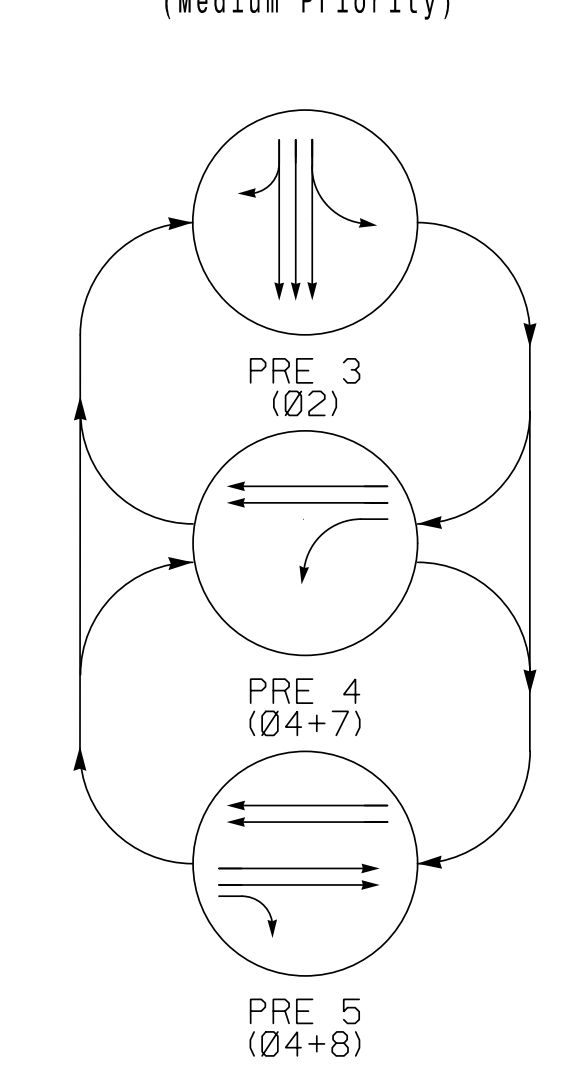
ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE						
	Ø 2	Ø 4 + 7	Ø 4 + 8	PRE 3	PRE 4	PRE 5	FLASH
21,22,23	G	R	R	G	R	R	Y
41,42	R	↑	↑	R	↑	↑	R
71	←	←	←	←	←	←	←
81,82,83	R	R	G	R	R	G	R
P21,P22 P23,P24	W	DW	DW	DW	DW	DW	DRK
P41,P42	DW	W	W	DW	DW	DW	DRK
P81,P82	DW	DW	W	DW	DW	DW	DRK

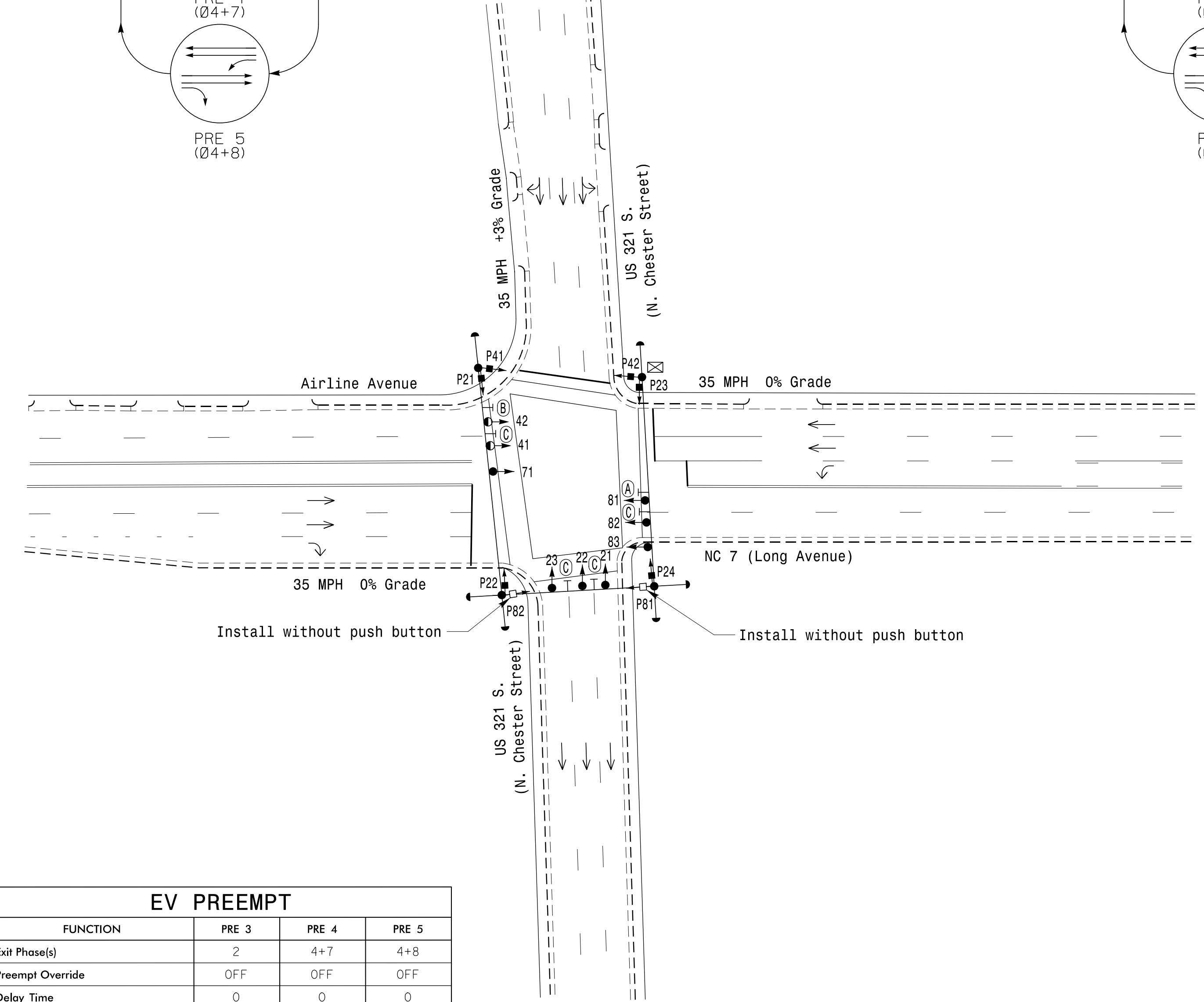
ALTERNATE EV PREEMPT PHASES (Medium Priority)



3 Phase Pre-Timed w/ Alternate Phasing Operation and Emergency Vehicle Preemption Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 7 may be lagged.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- The City Engineer or their representative 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 shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Existing phases 3, 4, and 8 have been changed to phases 7, 8, and 4 respectively on this plan. Change all signal heads, pedestrian signal heads, pedestrian push buttons, and loops as needed to achieve the phasing shown.
- Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed signal heads shall be black in color. See Project Special Provisions for details.
- City of system data: Controller Asset #0203.



EV PREEMPT

FUNCTION	PRE 3	PRE 4	PRE 5
Exit Phase(s)	2	4+7	4+8
Preempt Override	OFF	OFF	OFF
Delay Time	0	0	0
Ped Clear Through Yellow	Y	Y	Y
Terminate Phases	N	N	N
Entrance Walk	1	1	1
Entrance Ped Clear	25.5*	25.5*	25.5*
Entrance Min Green	1	1	1
Entrance Yellow Change	25.5*	25.5*	25.5*
Entrance Red Clear	25.5*	25.5*	25.5*
Minimum Dwell Time	7	7	7
Preempt Input Extension Time **	2	2	2
Preempt Max Time	120	120	120
Exit Yellow Change	25.5*	25.5*	25.5*
Exit Red Clear	25.5*	25.5*	25.5*

TIMING CHART

FEATURE	PHASE			
	2	4	7	8
Min Green *	10	7	7	7
Walk *	7	7	-	7
Ped Clear	23	14	-	11
Veh. Extension *	-	-	-	-
Max 1 *	60	30	15	30
Yellow	3.7	3.8	3.0	3.8
Red Clear	1.8	1.5	2.3	1.5
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	-	-	-	-
Recall Position	PED / MAX	PED / MAX	MAX RECALL	PED / MAX
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

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

LEGEND

PROPOSED	EXISTING
○ Traffic Signal Head	● Traffic Signal Head
● Modified Signal Head	N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Sign	⊥ Pedestrian Signal Head With Sign
○ Signal Pole with Guy	● Signal Pole with Guy
○ Signal Pole with Sidewalk Guy	● Signal Pole with Sidewalk Guy
⊠ Inductive Loop Detector	⊠ Inductive Loop Detector
⊠ Controller & Cabinet Junction Box	⊠ Controller & Cabinet Junction Box
--- 2-in Underground Conduit	--- 2-in Underground Conduit
N/A Right of Way	--- Right of Way
→ Directional Arrow	→ Directional Arrow
(A) No Left Turn Sign (R3-2)	(A) No Left Turn Sign (R3-2)
(B) No Right Turn Sign (R3-1)	(B) No Right Turn Sign (R3-1)
(C) Street Name Sign (D3-1)	(C) Street Name Sign (D3-1)

Signal Upgrade

Prepared For: **US 321 S. (N. Chester Street) at NC 7 (Long Avenue) / Airline Avenue**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips

PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

Scale: 1" = 40'

Document Not Considered Final Unless All Signatures Completed

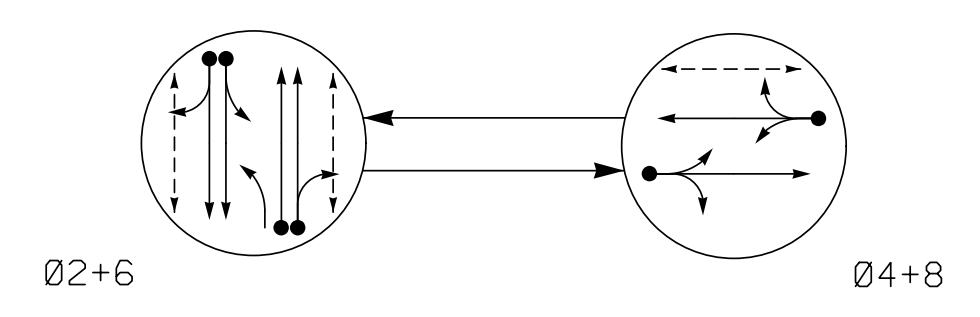
Signature: *[Signature]* DATE: 3/11/2022

SIG. INVENTORY NO. 12-0203

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

3/9/2022 11:15:30 AM DanHille.Cur1 ***Kimley-Horn.com/E:\RAL\MRAL\TIP\DK-TIS\011036569_Gastonia Signal System9_Signal\KMS4 - Signal Design\ME120205-2021.dgn

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	FLASH
21,22	G	R	Y
41,42	R	G	R
61,62	G	R	Y
81,82	R	G	R
P21,P22	W	DW	DRK
P41,P42	DW	W	DRK
P61,P62	W	DW	DRK

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	SYSTEM LOOP	NEW CARD
2A	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
2B	6X6	70	EXIST	-	2	Yes	-	-	-	N	-	X
4A	6X60	0	2-4-2	-	4	Yes	-	10	-	N	-	X
6A	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
6B	6X6	70	EXIST	-	6	Yes	-	-	-	N	-	X
8A	6X60	0	2-4-2	-	8	Yes	-	10	-	N	-	X

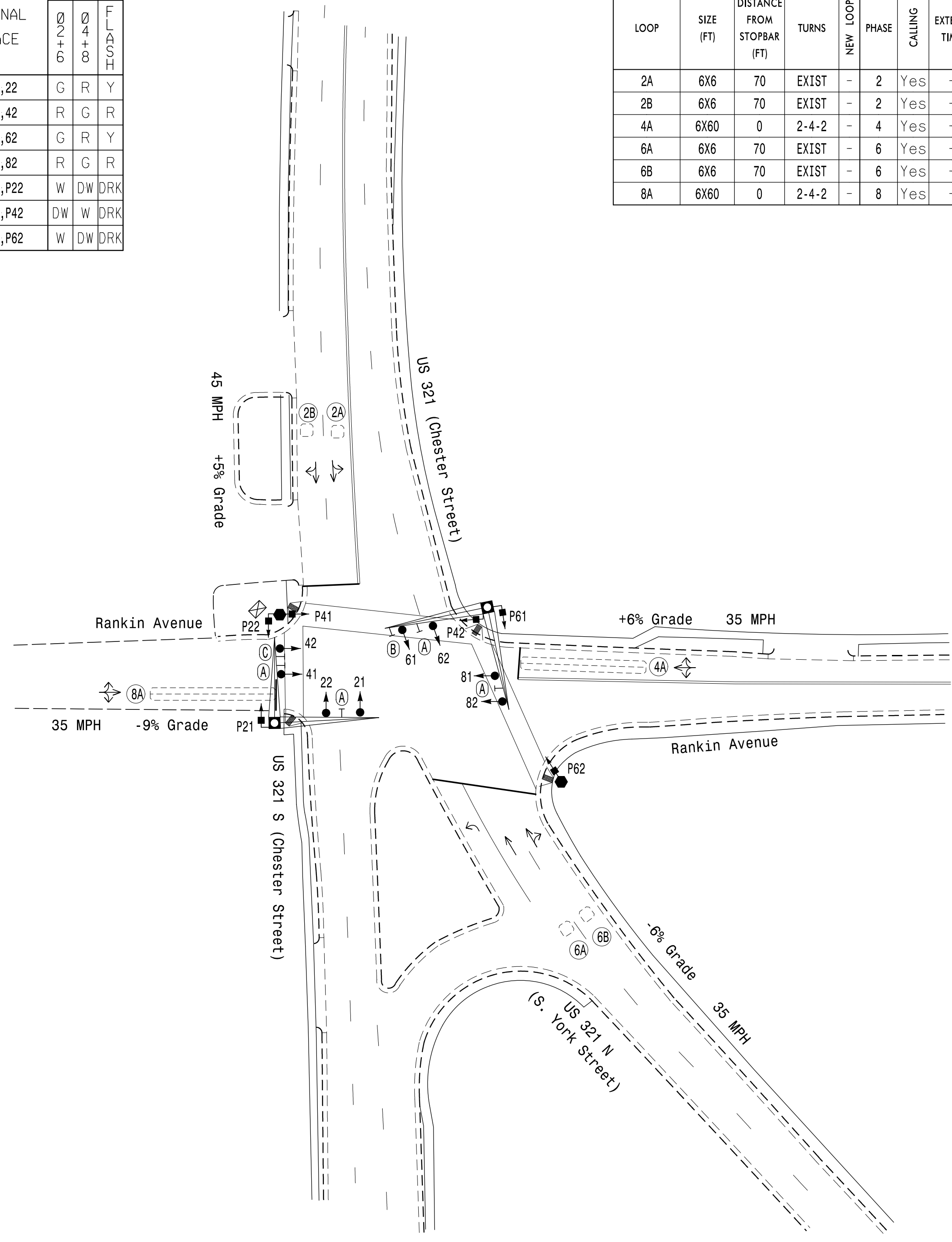
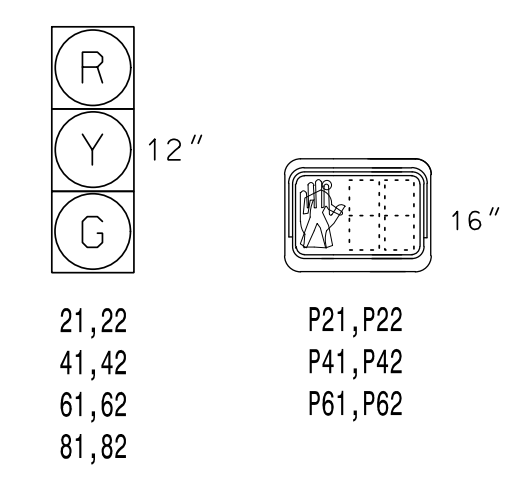
2 Phase Fully Actuated Gastonia Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
- Install new cabinet on the existing cabinet foundation.
- Reconnect lead-in cable to separate loops 2A, 2B, 6A, & 6B, as shown.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- City of system data:
Controller Asset #0213.

SIGNAL FACE I.D.

All Heads L.E.D.



TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green *	12	7	12	7
Walk *	7	7	7	-
Ped Clear	11	21	18	-
Veh. Extension *	3.0	2.0	3.0	2.0
Max I *	45	25	45	25
Yellow	4.3	4.6	4.3	4.6
Red Clear	2.0	3.0	2.0	3.0
Red Revert	2.0	2.0	2.0	2.0
Actuations B4 Add *	-	-	-	-
Seconds / Actuation *	-	-	-	-
Max Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Locking Detector	X	-	X	-
Recall Position	MIN RECALL	-	MIN RECALL	-
Dual Entry	-	X	-	X
Simultaneous Gap	X	X	X	X

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

LEGEND

PROPOSED	EXISTING
○ Traffic Signal Head	● Traffic Signal Head
◐ Modified Signal Head	N/A
⊥ Sign	⊥ Sign
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ Pedestrian Signal Head
⊥ Metal Pole with Mastarm	⊥ Metal Pole with Mastarm
⊥ Inductive Loop Detector	⊥ Inductive Loop Detector
⊥ Controller & Cabinet	⊥ Controller & Cabinet
⊥ Junction Box	⊥ Junction Box
⊥ 2-in Underground Conduit	⊥ 2-in Underground Conduit
N/A Right of Way	⊥ Right of Way
→ Directional Arrow	→ Directional Arrow
○ Type II Signal Pedestal	● Type II Signal Pedestal
N/A Curb Ramp	⊥ Curb Ramp
⊥ Street Name Sign (D3-1)	⊥ Street Name Sign (D3-1)
⊥ Left "ONLY" Sign (R3-5L)	⊥ Left "ONLY" Sign (R3-5L)
⊥ "NO TURN ON RED" Sign (R10-11)	⊥ "NO TURN ON RED" Sign (R10-11)

Signal Upgrade

Prepared For:
Kimley-Horn

750 N. Greenfield Pkwy, Garner, NC 27529
NC License #0102
421 Fayetteville Street, Suite 600
Raleigh, NC 27601
(919) 677-2000

**US 321 S. (Chester Street) /
US 321 N. (S. York Street)
at
Rankin Avenue**

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: CF Davis REVIEWED BY: KP Baumann

REVISIONS: _____ INIT. DATE

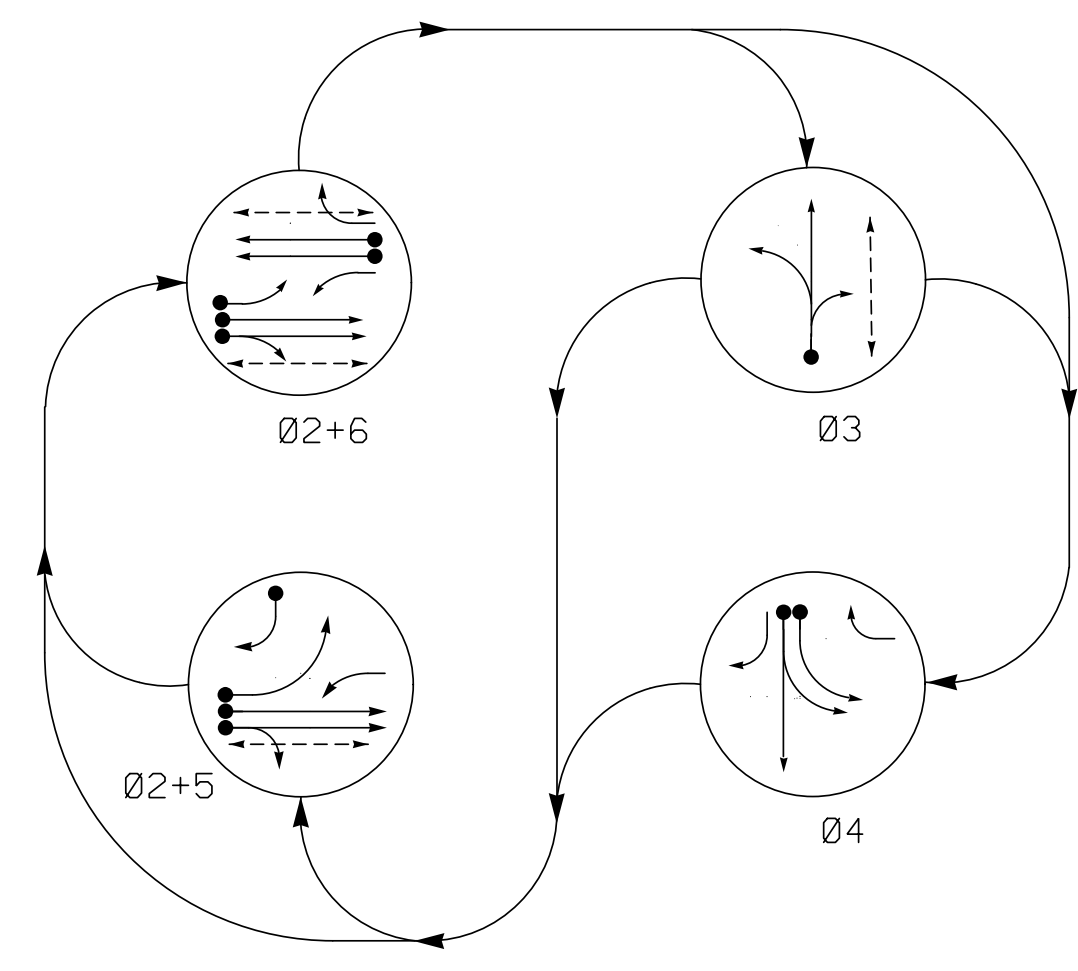
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3/11/2022

SIG. INVENTORY NO. 12-0213

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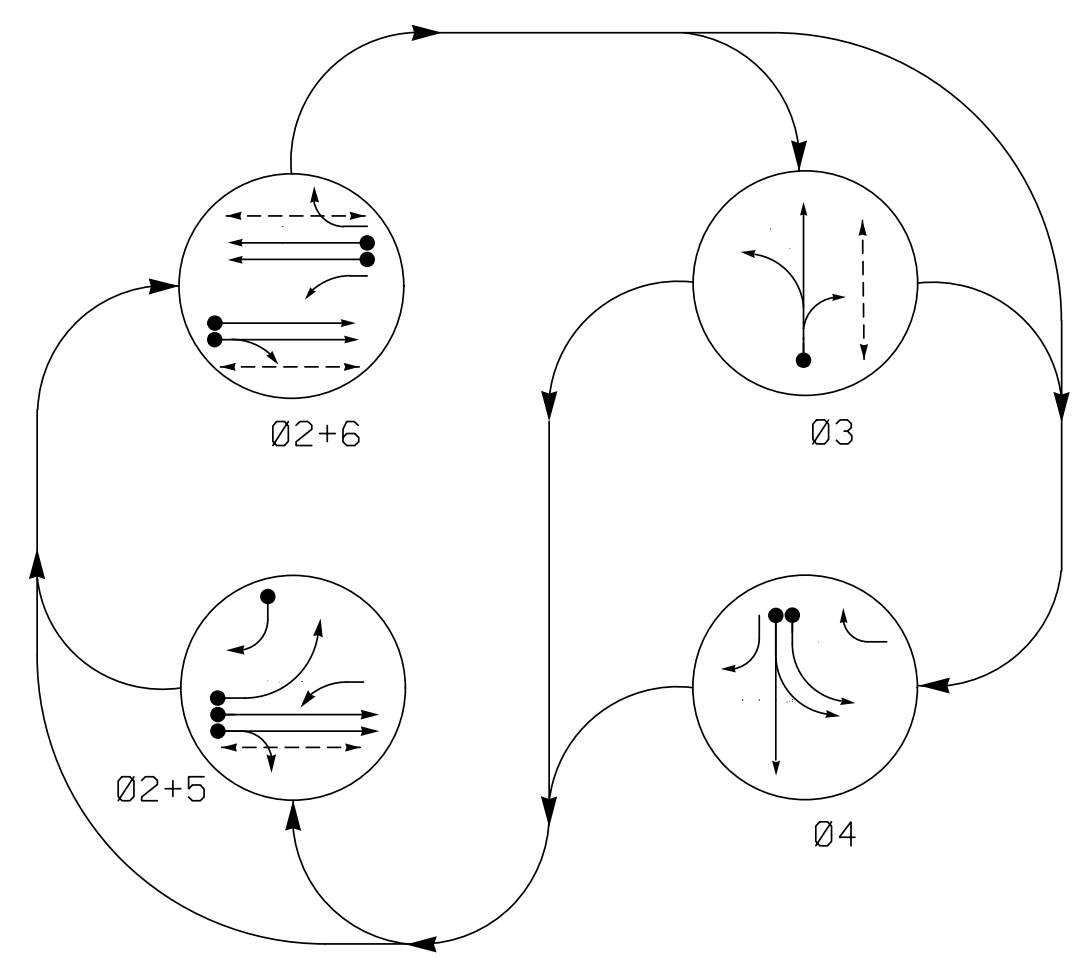
DEFAULT PHASING DIAGRAM



DEFAULT PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE				
	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21, 22	G	G	R	R	Y
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
43	R	R	R	G	R
51	F	F	R	R	Y
61	F	F	R	R	Y
62	R	G	R	R	Y
63	R	G	R	R	Y
P21, P22	W	W	DW	DW	DRK
P31, P32	DW	DW	W	DW	DRK
P61, P62	DW	W	DW	DW	DRK

ALTERNATE PHASING DIAGRAM



ALTERNATE PHASING TABLE OF OPERATION

SIGNAL FACE	PHASE				
	Ø2+5	Ø2+6	Ø3	Ø4	FLASH
21, 22	G	G	R	R	Y
31	R	R	G	R	R
32	R	R	G	R	R
41	R	R	R	G	R
42	R	R	R	G	R
43	R	R	R	G	R
51	F	F	R	R	Y
61	F	F	R	R	Y
62	R	G	R	R	Y
63	R	G	R	R	Y
P21, P22	W	W	DW	DW	DRK
P31, P32	DW	DW	W	DW	DRK
P61, P62	DW	W	DW	DW	DRK

DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING								
					PHASE	CALLING	EXTEND TIME	DELAY TIME	USE ADDED INITIAL	TYPE	LOOP SYSTEM	NEW CARD	
2A	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	-	X
2B	6X6	300	EXIST	-	2	Yes	-	-	-	X	N	-	X
3A	6X30	+3	2-4-2	-	3	Yes	-	10	-	-	N	-	X
4A	6X60	+5	2-4-2	-	4	Yes	-	3	-	-	N	-	X
4B	6X60	+5	2-4-2	-	4	Yes	-	-	-	-	N	-	X
5A	6X60	+5	2-4-2	-	5	Yes	-	15*	-	-	N	-	X
					2#	Yes	-	3	-	-	G	-	X
5B	6X60	+5	2-4-2	-	5	Yes	-	15	-	-	N	-	X
6A	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-	X
6B	6X6	300	EXIST	-	6	Yes	-	-	-	X	N	-	X

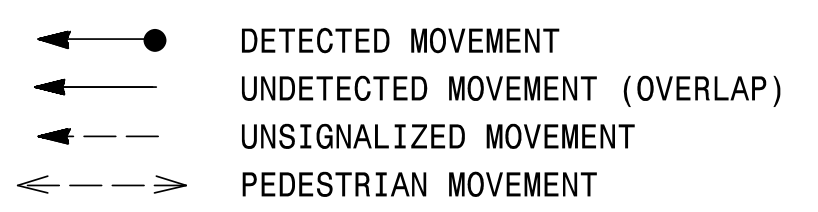
* Reduce delay to 3 seconds during Alternate Phasing Operation.
Disable Phase call for loop during Alternate Phasing Operation.

4 Phase Fully Actuated w/ Alternate Phasing Operation Gastonia Signal System

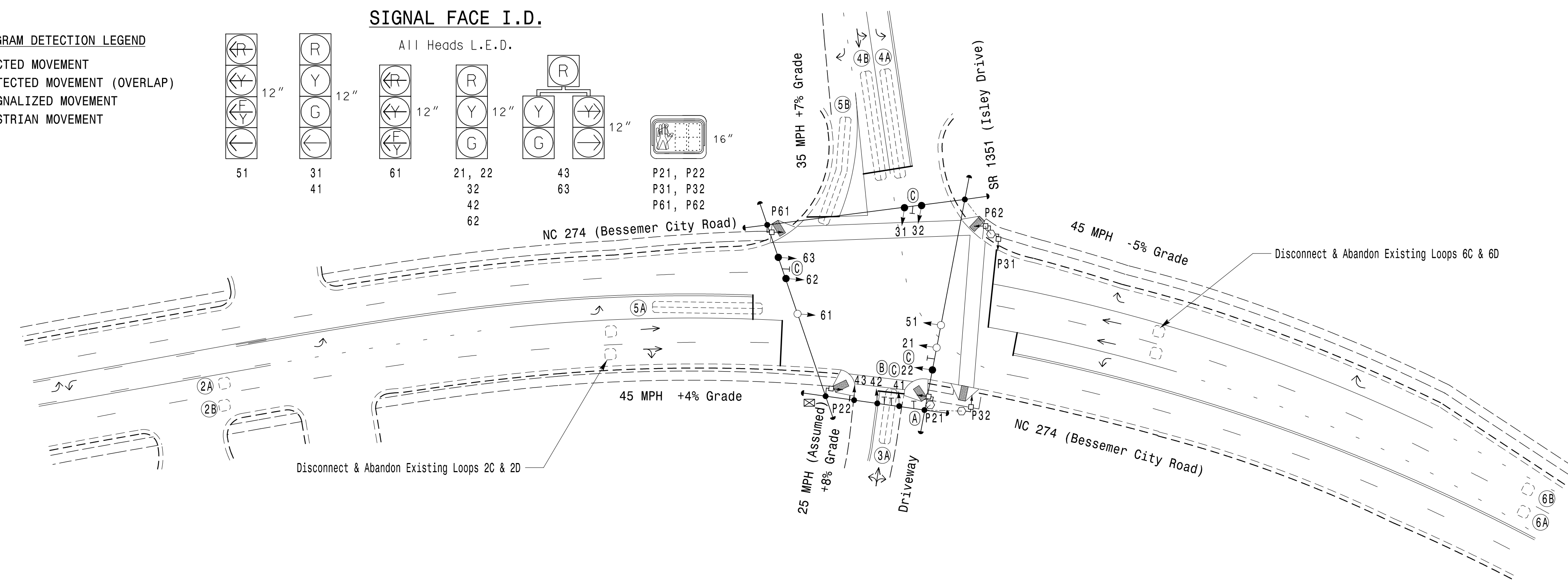
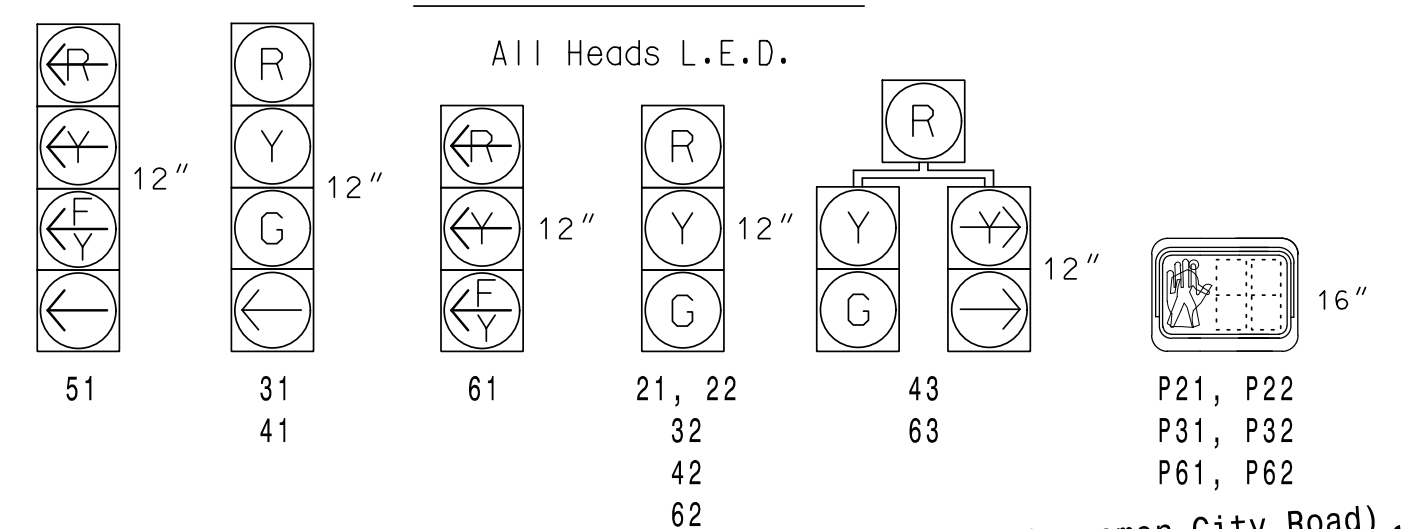
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 5 may be lagged.
- The order of phase 3 and phase 4 may be reversed.
- Reposition existing signal head numbered 22.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signal Design Manual and submit a Plan of Record to the Signal Design Section.
- Omit "WALK" and flashing "DONT WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- The City Engineer or their representative 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 shall supersede these values.
- Abandon and disconnect existing loops 2C, 2D, 6C, and 6D.
- Install new cabinet on the existing cabinet foundation.
- All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian signal heads shall be black in color. See Project Special Provisions for details.
- All proposed pedestrian pedestals and pushbutton posts shall be black in color. See Project Special Provisions for details.
- Reconnect lead-in cable to separate loops 2A, 2B, 6A, and 6B, as shown.
- City system data:
Controller Asset #0234

PHASING DIAGRAM DETECTION LEGEND



SIGNAL FACE I.D.

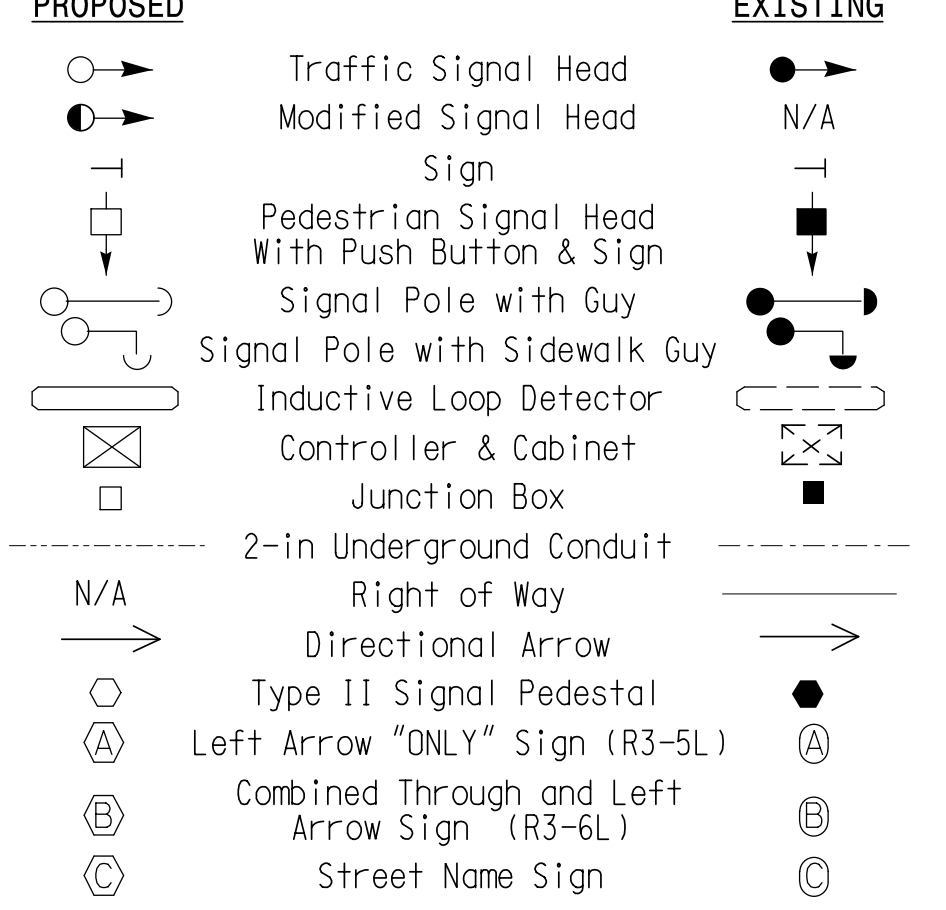


TIMING CHART

FEATURE	PHASE					
	2	3	4	5	6	
Min Green *	12	7	7	7	12	
Walk *	7	7	-	-	7	
Ped Clear	6	23	-	-	27	
Veh. Extension *	6.0	2.0	2.0	2.0	6.0	
Max 1 *	55	20	20	15	55	
Yellow	5.0	3.0	3.5	3.0	5.0	
Red Clear	2.1	2.6	3.1	3.3	2.1	
Red Revert	2.0	2.0	2.0	2.0	2.0	
Actuations B4 Add *	-	-	-	-	-	
Seconds /Actuation *	1.5	-	-	-	1.5	
Max Initial *	34	-	-	-	34	
Time Before Reduction *	15	-	-	-	15	
Time To Reduce *	30	-	-	-	30	
Minimum Gap	3.0	-	-	-	3.0	
Locking Detector	X	-	-	-	X	
Recall Position	MIN RECALL	-	-	-	MIN RECALL	
Dual Entry	-	-	-	-	-	
Simultaneous Gap	X	X	X	X	X	

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

LEGEND



Signal Upgrade

Prepared For:
Kimley-Horn

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

NC 274 (Bessemer City Road) at SR 1351 (Isley Drive)

Division 12 Gaston County Gastonia

PLAN DATE: May 2021 REVIEWED BY: SL Phillips
PREPARED BY: DM Curri REVIEWED BY: KP Baumann

SCALE: 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by:
K. P. Baumann
3/11/2022

SIG. INVENTORY NO. 12-0234

3/9/2022 11:14:03 AM DanHill@Curri ***K:\Inley-Horn.com\SE-RAL\MRAL-TIP\DK-TIS\011036569 Gastonia Signal System9 Signal\SW4 - Signal Design\NC120234-2021.dgn