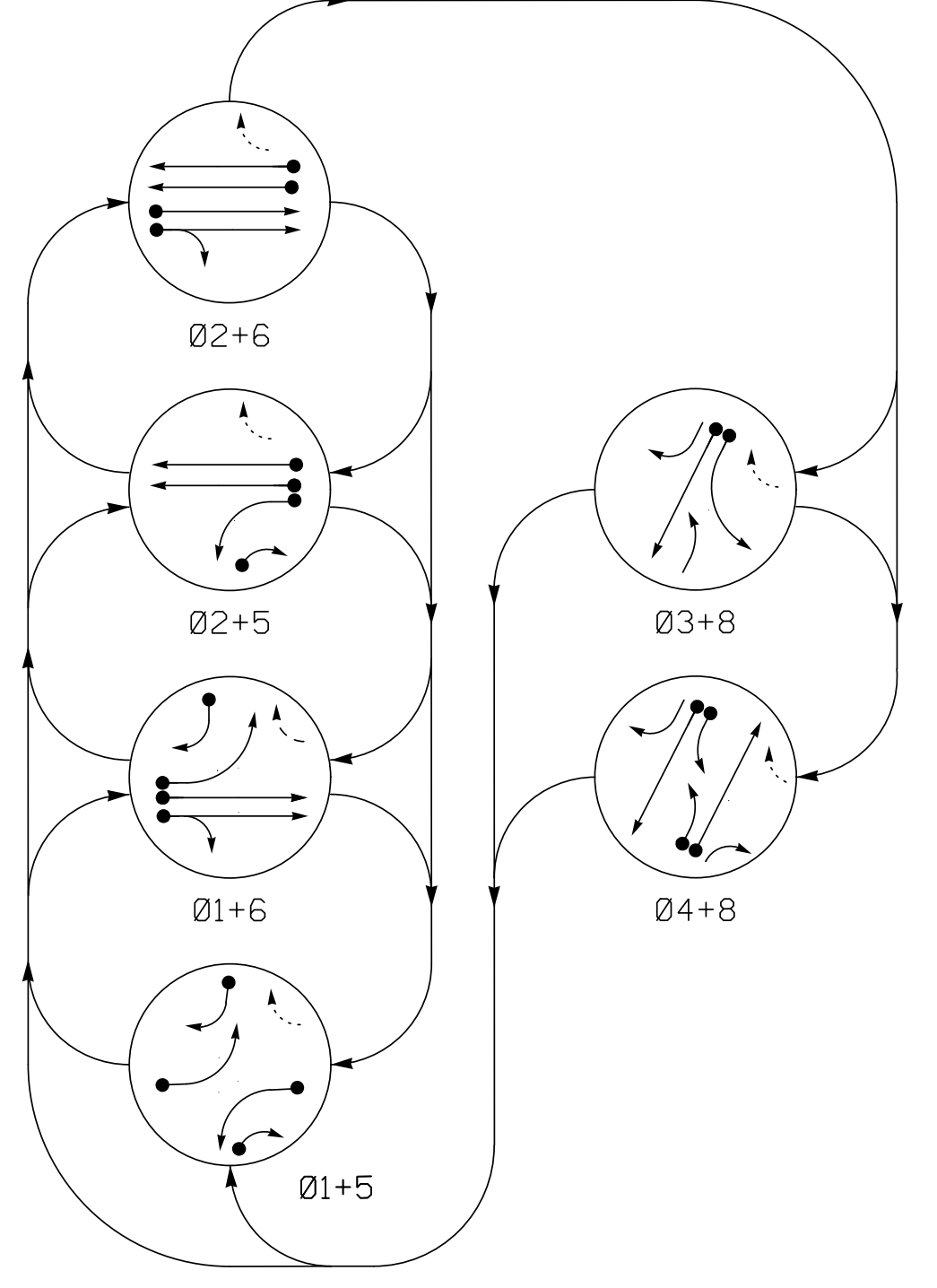
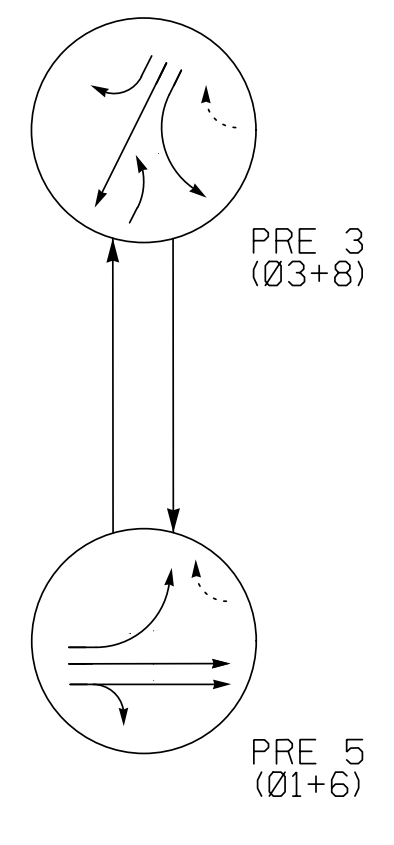


**DEFAULT PHASING DIAGRAM**



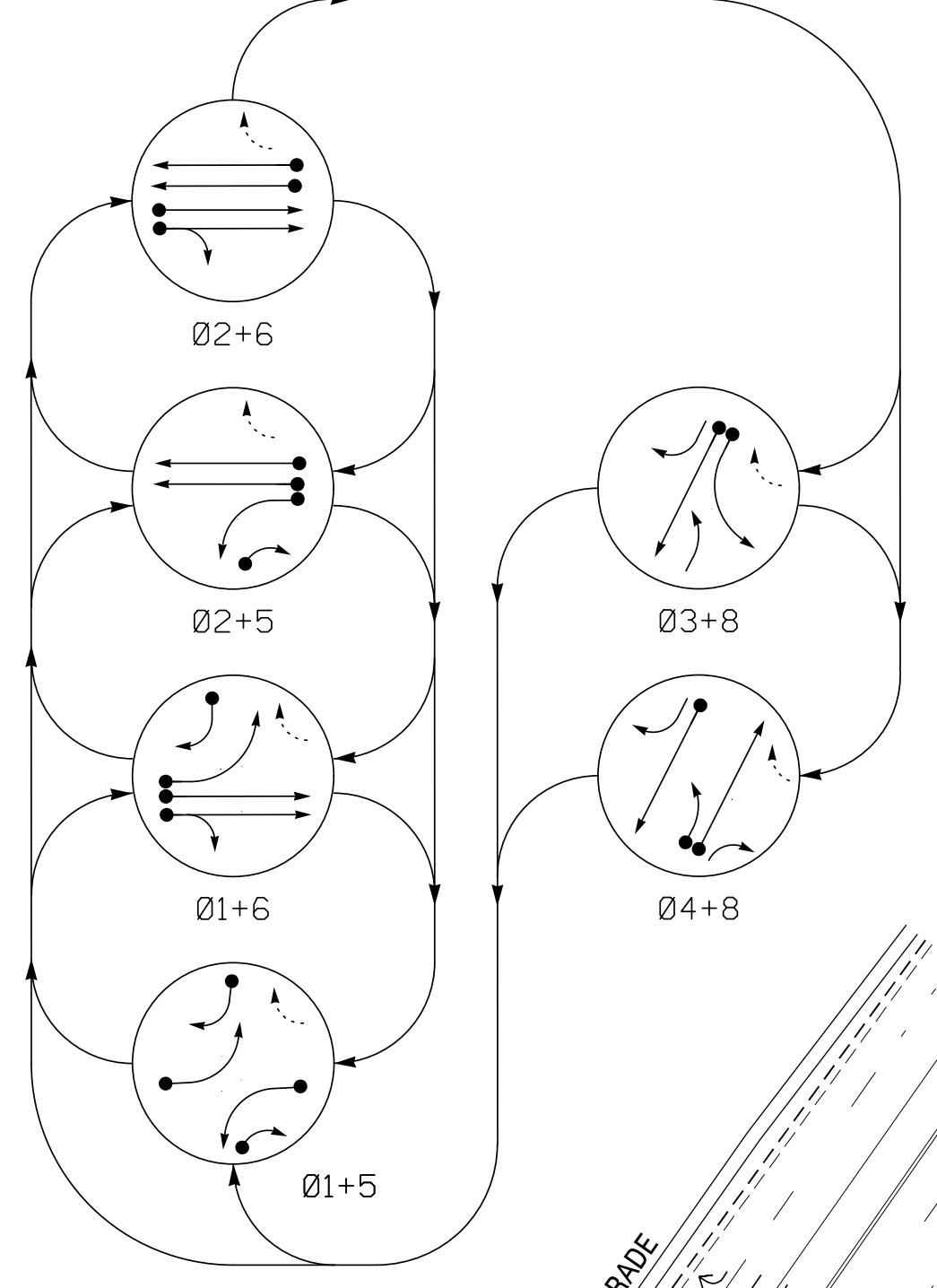
**DEFAULT EV PREEMPT PHASES (Medium Priority)**



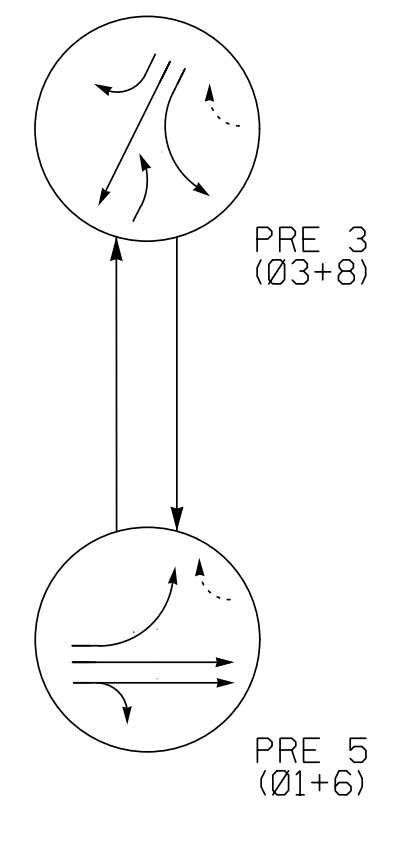
**DEFAULT PHASING TABLE OF OPERATION**

| SIGNAL FACE | PHASE |      |      |      |      |       |       |       |
|-------------|-------|------|------|------|------|-------|-------|-------|
|             | Ø1+5  | Ø1+6 | Ø2+5 | Ø2+6 | Ø3+8 | PRE 3 | PRE 5 | FLASH |
| 11          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 21, 22      | R     | R    | G    | G    | R    | R     | R     | Y     |
| 31          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 41          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 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     | G     | Y     |
| 81          | R     | R    | R    | R    | G    | G     | R     | R     |
| 82          | R     | R    | R    | R    | G    | G     | R     | R     |

**ALTERNATE PHASING DIAGRAM**



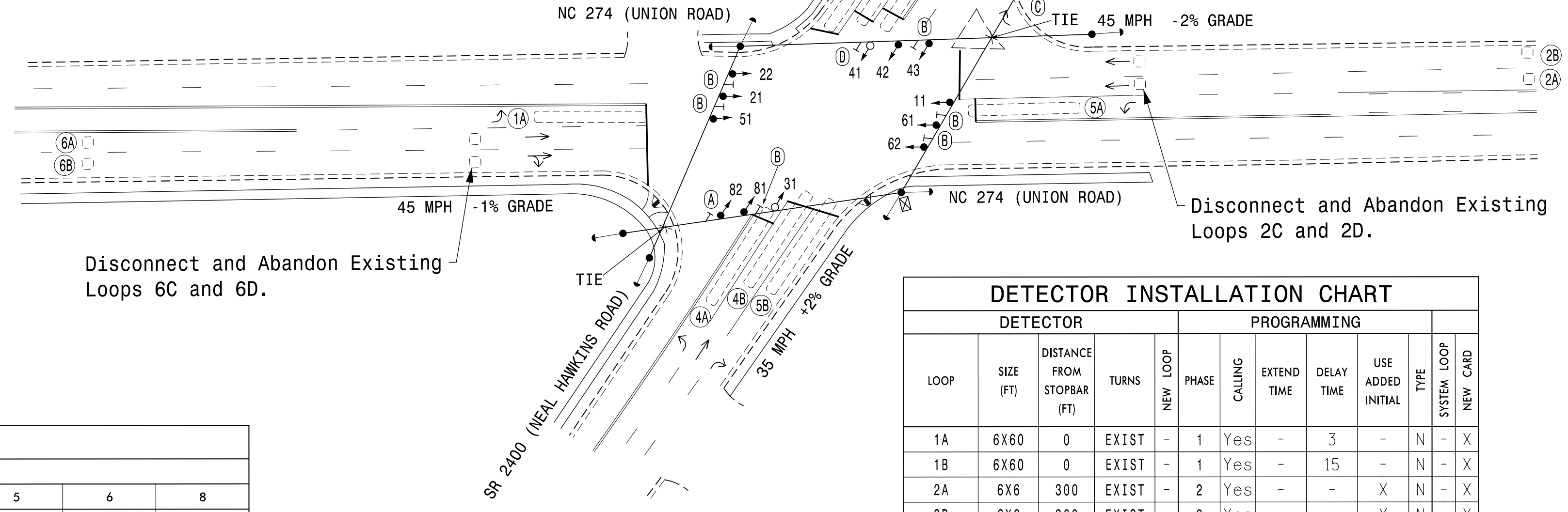
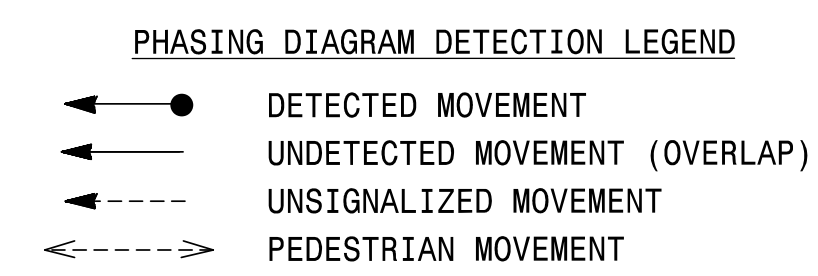
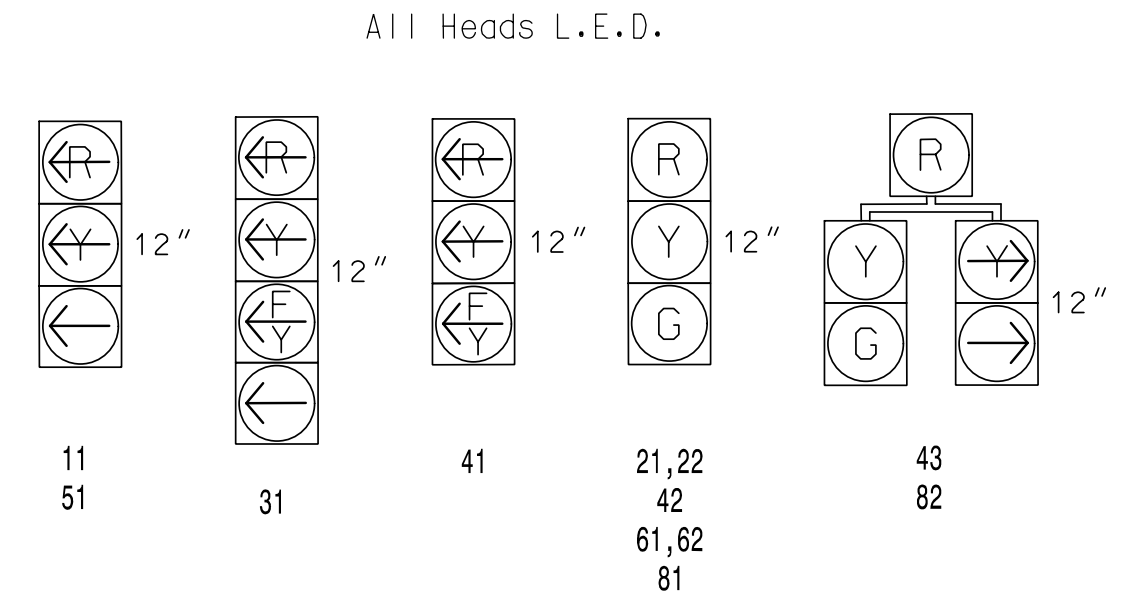
**ALTERNATE EV PREEMPT PHASES (Medium Priority)**



**ALTERNATE PHASING TABLE OF OPERATION**

| SIGNAL FACE | PHASE |      |      |      |      |       |       |       |
|-------------|-------|------|------|------|------|-------|-------|-------|
|             | Ø1+5  | Ø1+6 | Ø2+5 | Ø2+6 | Ø3+8 | PRE 3 | PRE 5 | FLASH |
| 11          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 21, 22      | R     | R    | G    | G    | R    | R     | R     | Y     |
| 31          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 41          | ←     | ←    | ←    | ←    | ←    | ←     | ←     | ←     |
| 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     | G     | Y     |
| 81          | R     | R    | R    | R    | G    | G     | R     | R     |
| 82          | R     | R    | R    | R    | G    | G     | R     | R     |

**SIGNAL FACE I.D.**

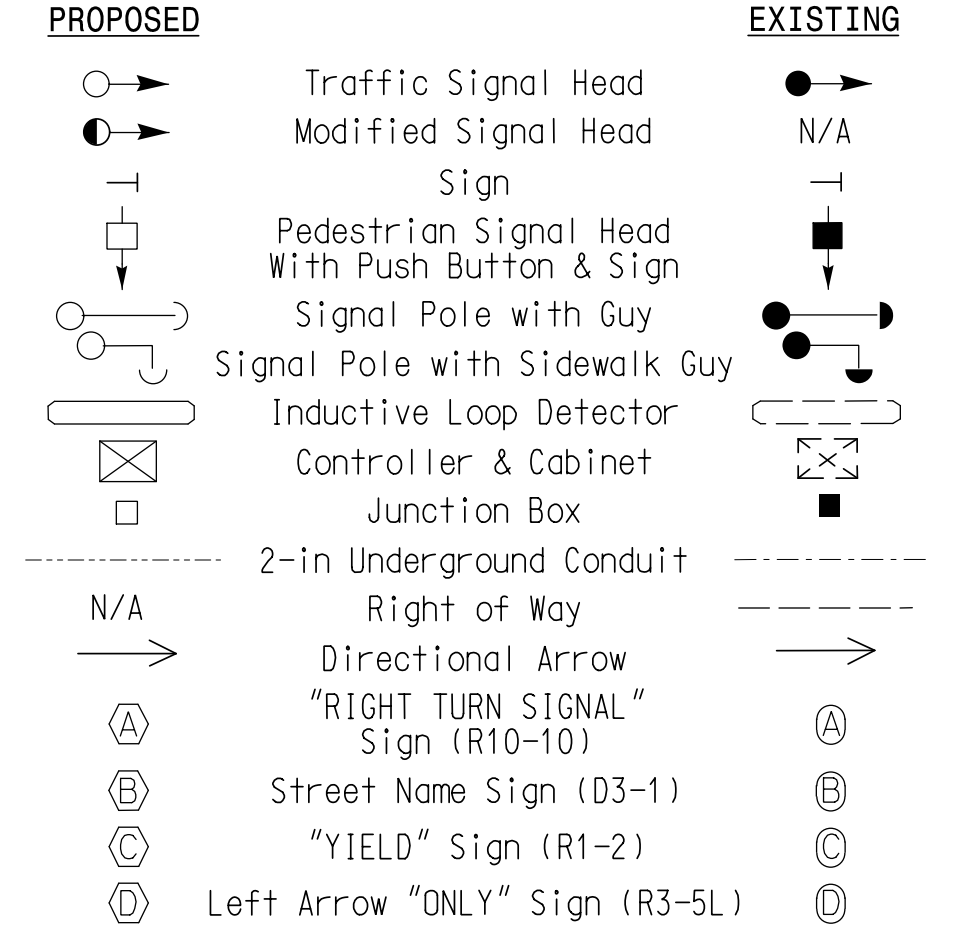


**6 Phase Fully Actuated w/ Alternate Phasing Operation and Emergency Vehicle Preemption Gastonia Signal System**

**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 and/or phase 5 may be lagged.
4. Phase 3 may be lagged.
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. Pavement markings are existing.
9. The City Engineer or their representative will determine the hours of use for each phasing plan.
10. Reposition existing signal heads 11, 21, 22, 51, 61, and 62.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
11. Install new cabinet on the existing cabinet foundation.
12. All new cabinets and base extenders shall be black in color. See Project Special Provisions for details.
13. Remove existing "Left Turn Yield on Green" ball sign-(R10-12).
14. Install GPS emergency preemption system per manufacturer's instructions to achieve preemption needed, as shown in phasing diagram.
15. City of system data: Controller Asset #0245.

**LEGEND**



**TIMING CHART**

| FEATURE                 | PHASE |            |     |     |     |            |     |  |
|-------------------------|-------|------------|-----|-----|-----|------------|-----|--|
|                         | 1     | 2          | 3   | 4   | 5   | 6          | 8   |  |
| Min Green *             | 7     | 12         | 7   | 7   | 7   | 12         | 7   |  |
| Walk *                  | -     | -          | -   | -   | -   | -          | -   |  |
| Ped Clear               | -     | -          | -   | -   | -   | -          | -   |  |
| Veh. Extension *        | 1.0   | 6.0        | 2.0 | 2.0 | 1.0 | 6.0        | 2.0 |  |
| Max 1 *                 | 20    | 45         | 25  | 25  | 20  | 45         | 25  |  |
| Yellow                  | 3.0   | 4.7        | 3.1 | 5.1 | 3.0 | 4.6        | 5.1 |  |
| Red Clear               | 3.9   | 2.8        | 2.3 | 2.5 | 3.5 | 2.8        | 2.5 |  |
| Red Revert              | 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   |  |

**EV PREEMPT**

| FUNCTION                        | PRE 3 | PRE 5 |
|---------------------------------|-------|-------|
| Exit Phase(s)                   | 4+8   | 2+6   |
| 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              | 10    | 10    |
| 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* |

**DETECTOR INSTALLATION CHART**

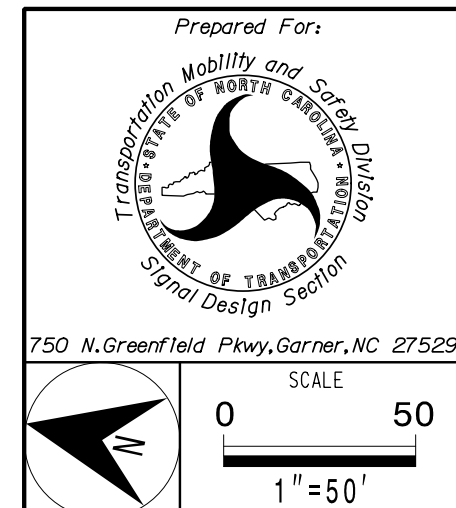
| LOOP | SIZE (FT) | DISTANCE FROM STOPBAR (FT) | TURNS | NEW LOOP | PROGRAMMING |         |             |            |                   |      |             |          |
|------|-----------|----------------------------|-------|----------|-------------|---------|-------------|------------|-------------------|------|-------------|----------|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

**Signal Upgrade**

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
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Raleigh, NC 27601  
(919) 677-2000



Prepared For:  
**NC 274 (Union Road) at SR 2400 (Neal Hawkins Road) and SR 2446 (Robinwood 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

3/11/2022  
DATE  
SIGNATURE  
DATE  
SIG. INVENTORY NO. 12-0245

3/9/2022 11:14:21 AM Dantelle.Curr1 \\K:\mley-horn.com\SE-RALI\MRAL-TFIDK-LTS\011036569 Gastonia Signal System9 Signal\KWS4 - Signal Design\020245-2021.dgn