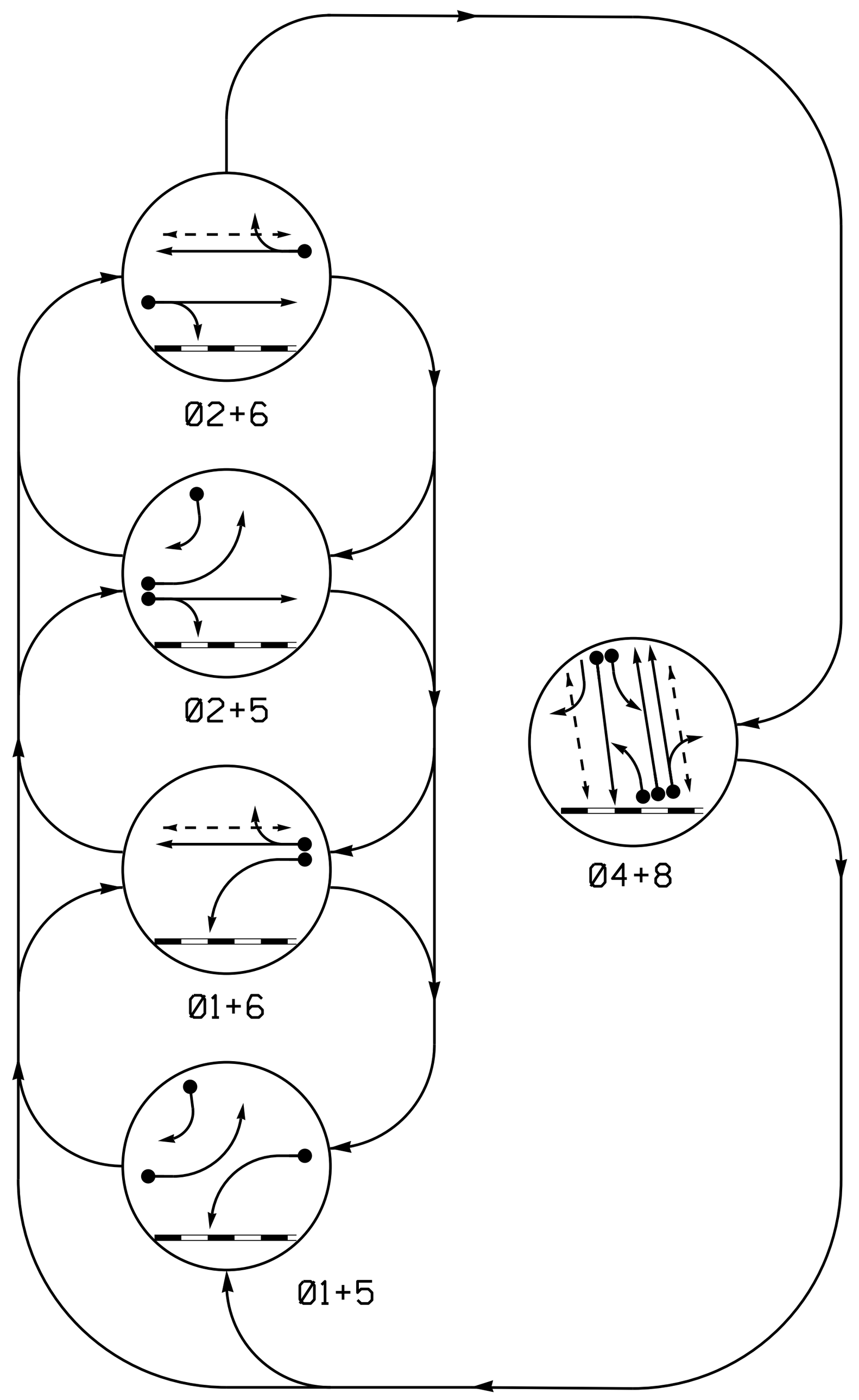
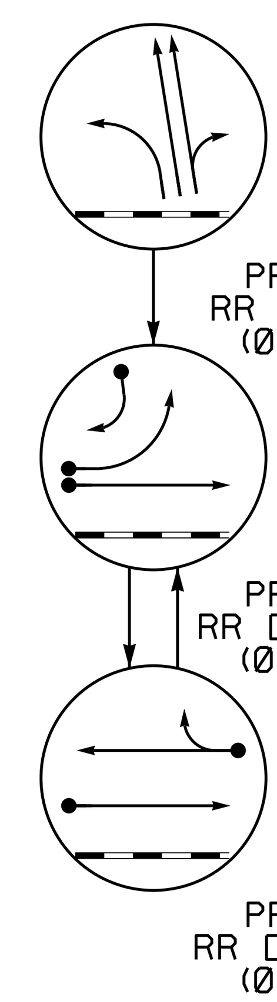
PHASING DIAGRAM



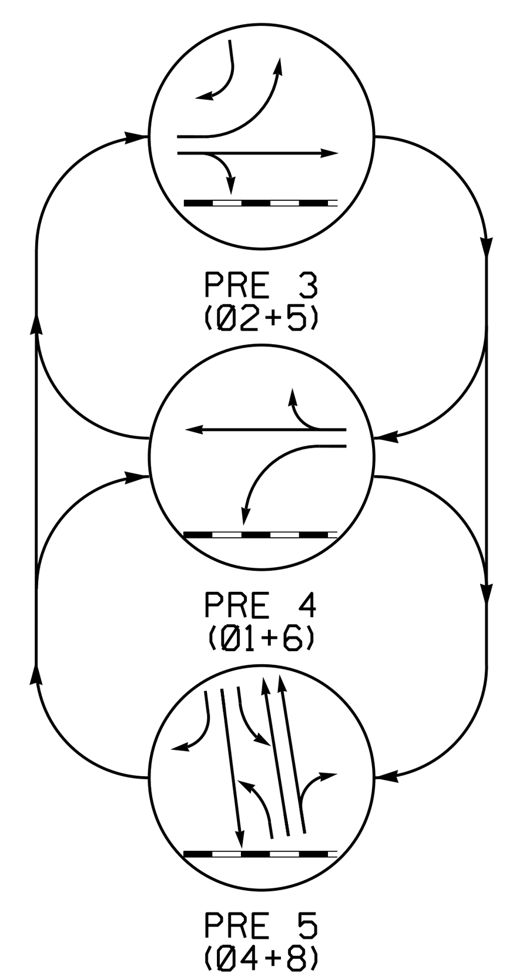
RAIL PREEMPT PHASES

(High Priority)



EV PREEMPT PHASES

(Medium Priority)



PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	PRE 3	PRE 4	PRE 5	RR CLEAR	RR DWELL 1	RR DWELL 2	FLASH
11	←	←	←R	←R	←R	←R	←	←R	←R	←R	←R	←R
21, 22	R	R	G	G	R	G	R	R	R	G	G	Y
41	R	R	R	R	G	R	R	G	R	R	R	R
42	R/→	R	R/→	R	G	R/→	R	G	R	R/→	R	R
51	←	←R	←	←R	←R	←	←R	←R	←R	←	←R	←R
61, 62	R	G	R	G	R	R	G	R	R	R	G	Y
81	R	R	R	R	G	R	R	G	G/←	R	R	R
82	R	R	R	R	G	R	R	G	G	R	R	R
P41, P42	DW	DW	DW	DW	W	DW	DW	DW	DW	DW	DW	DRK
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DW	DW	DW	DRK
P81, P82	DW	DW	DW	DW	W	DW	DW	DW	DW	DW	DW	DRK
Sign A	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	*

* See Note 11

LOOP & DETECTOR INSTALLATION CHART

ASC/3-2070EN2 CONTROLLER w/ TS-2 CABINET

INDUCTIVE LOOPS: LOOP NO.	SIZE (ft)	DIST. FROM STOPBAR (ft)	TURNS	NEW	EXISTING	DETECTOR UNITS: NEMA PHASE	NEW	EXISTING	TIMING: FEATURE	TIME (sec.)	ADDED INITIAL	DET. TYPE
1A	6X40	0	2-4-2	X	-	1	-	X	DELAY	3	–	S
2A	6X6	320	EXIST	-	X	2	-	X	EXTEND	2.1	–	N
2B	6X6	80	EXIST	-	X	2	-	X	-	-	–	S
4A	6X40	+10	2-4-2	-	X	4	-	X	DELAY	3	–	S
4B	6X40	+10	2-4-2	-	X	4	-	X	-	-	–	S
5A	6X40	+5	2-4-2	-	X	5	-	X	DELAY	3	–	S
5B	6X40	+10	2-4-2	-	X	5	-	X	DELAY	15	–	S
6A	6X6	320	EXIST	-	X	6	-	X	EXTEND	2.1	–	N
6B	6X6	80	EXIST	-	X	6	-	X	-	-	–	S
8A	6X40	+5	2-4-2	-	X	8	-	X	DELAY	3	–	S
8B, 8C	6X40	+5	2-4-2	-	X	8	-	X	DELAY	5	–	S

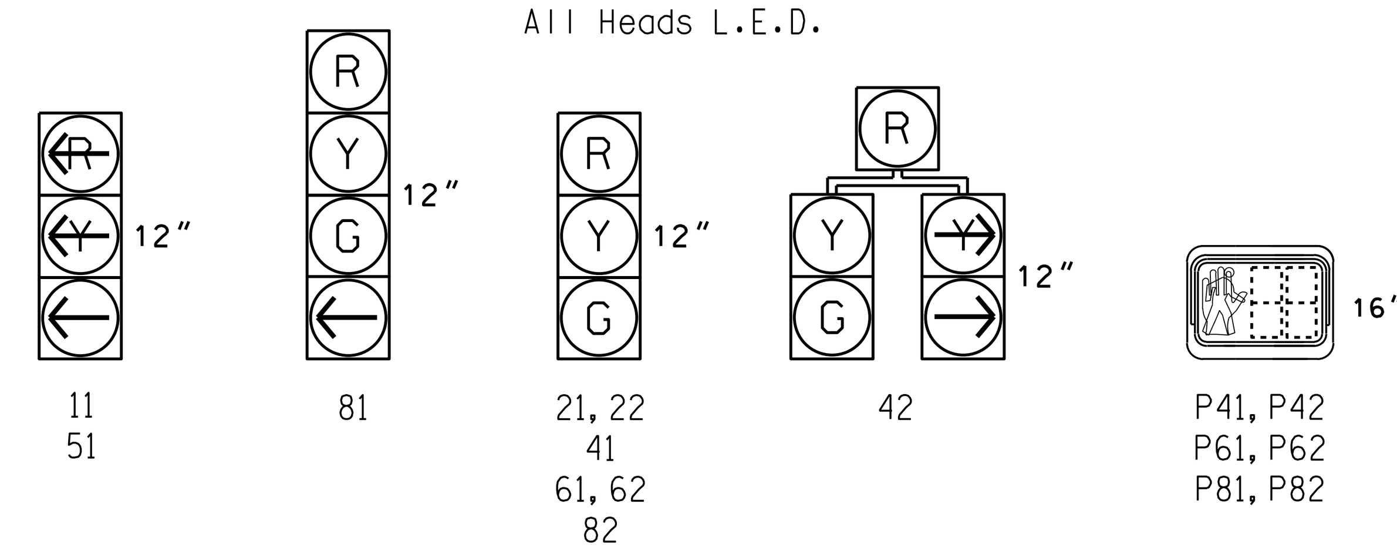
5 Phase
Fully Actuated
w/ Railroad and EV Preemption
(Cary Signal System)

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 preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 and/or phase 5 may be lagged.
4. Set all detector units to presence mode.
5. Align crosswalks with existing curb ramps.
6. Pavement markings are existing unless otherwise shown.
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. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
10. Optical detector 10 calls PRE 3.
    Optical detector 20 calls PRE 4.
    Optical detector 30 calls PRE 5.
    Optical detector 40 calls PRE 5.
11. Ensure flashing operation does not alter operation of blankout sign.
12. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
13. Cary signal system data:
    Fiber channel # 20.

SIGNAL FACE I.D.

All Heads L.E.D.



EMERGENCY VEHICLE PREEMPTION

FUNCTION	PRE 3	PRE 4	PRE 5
DELAY BEFORE PREEMPT	0	0	0
PMT OVERRIDE	OFF	OFF	OFF
PED CLEAR THROUGH YELLOW	Y	Y	Y
TERMINATE PHASES	N	N	N
ENTRANCE WALK	1	1	1
ENTRANCE PED CLEAR	9	9	9
ENTRANCE MIN GREEN	1	1	1
ENTRANCE YELLOW CLEAR	25.5*	25.5*	25.5*
ENTRANCE RED CLEAR	25.5*	25.5*	25.5*
MIN DWELL GREEN	7	7	7
MAX CALL TIME	120	120	120
EXIT PHASE(S)	2+6	2+6	4+8
EXIT YELLOW CLEAR	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.

TIMING CHART

ASC/3-2070EN2 CONTROLLER

PHASE	Ø1	Ø2	Ø4	Ø5	Ø6	Ø8
MINIMUM GREEN *	7 SEC.	12 SEC.	7 SEC.	7 SEC.	12 SEC.	7 SEC.
VEHICLE EXT. *	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.
YELLOW CHANGE INT.	3.0 SEC.	4.5 SEC.	4.5 SEC.	3.0 SEC.	4.4 SEC.	4.5 SEC.
RED CLEARANCE	2.4 SEC.	1.7 SEC.	1.8 SEC.	2.6 SEC.	1.8 SEC.	1.8 SEC.
MAX. 1 *	15 SEC.	45 SEC.	35 SEC.	15 SEC.	45 SEC.	35 SEC.
RECALL POSITION	NONE	MIN. RECALL	NONE	NONE	MIN. RECALL	NONE
LOCK DET.	OFF	ON	OFF	OFF	ON	OFF
WALK *	– SEC.	– SEC.	7 SEC.	– SEC.	7 SEC.	7 SEC.
PED. CLEAR	– SEC.	– SEC.	15 SEC.	– SEC.	16 SEC.	14 SEC.
VOLUME DENSITY	OFF	OFF	OFF	OFF	OFF	OFF
ACTUATION B4 ADD *	– VEH.	– VEH.	– VEH.	– VEH.	– VEH.	– VEH.
SEC. PER ACTUATION *	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.
MAX. INITIAL *	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.
TIME B4 REDUCTION *	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.
TIME TO REDUCE *	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.
MINIMUM GAP	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.	– SEC.
DUAL ENTRY	OFF	OFF	ON	OFF	OFF	ON
SIMULTANEOUS GAP	ON	ON	ON	ON	ON	ON

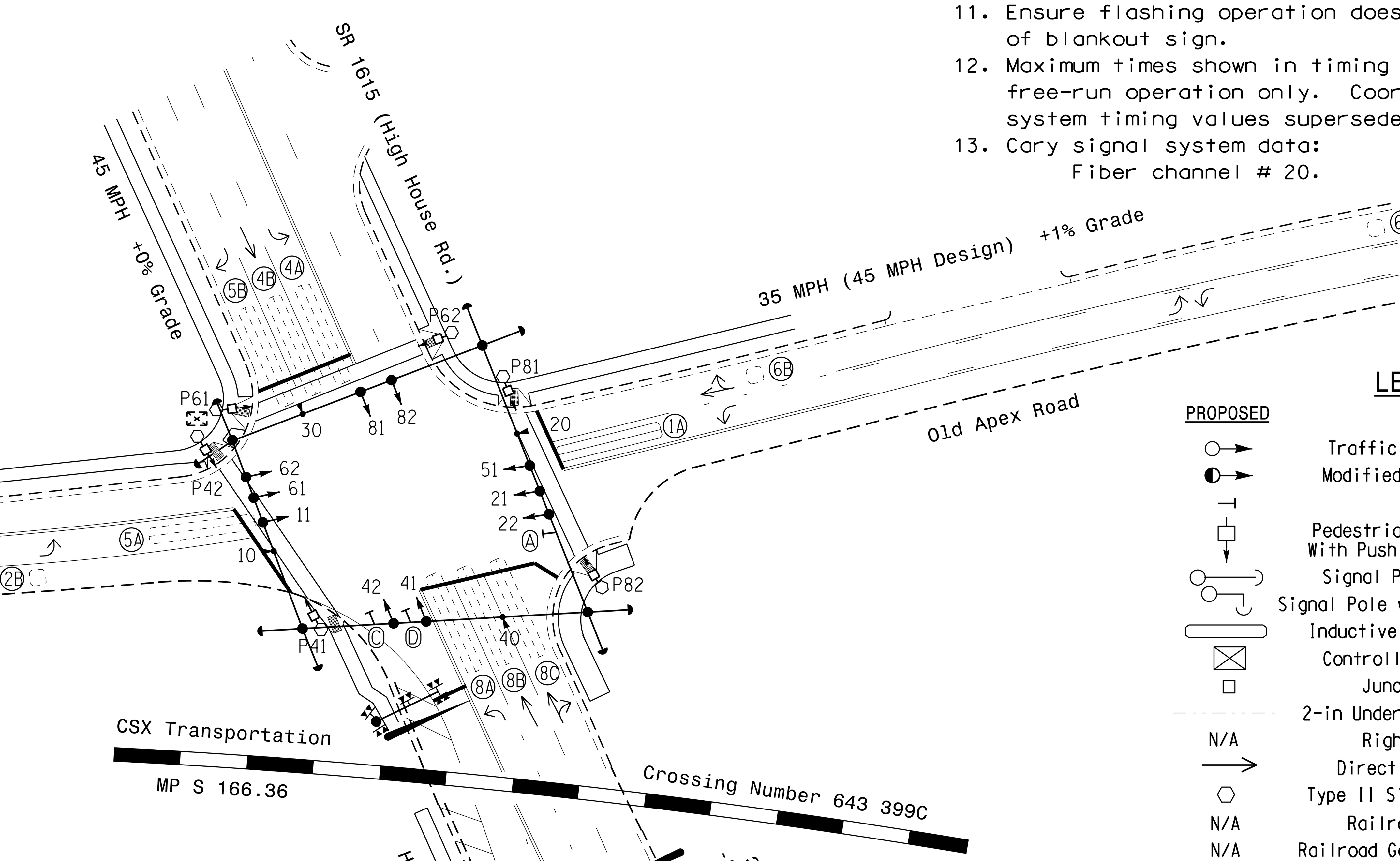
* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

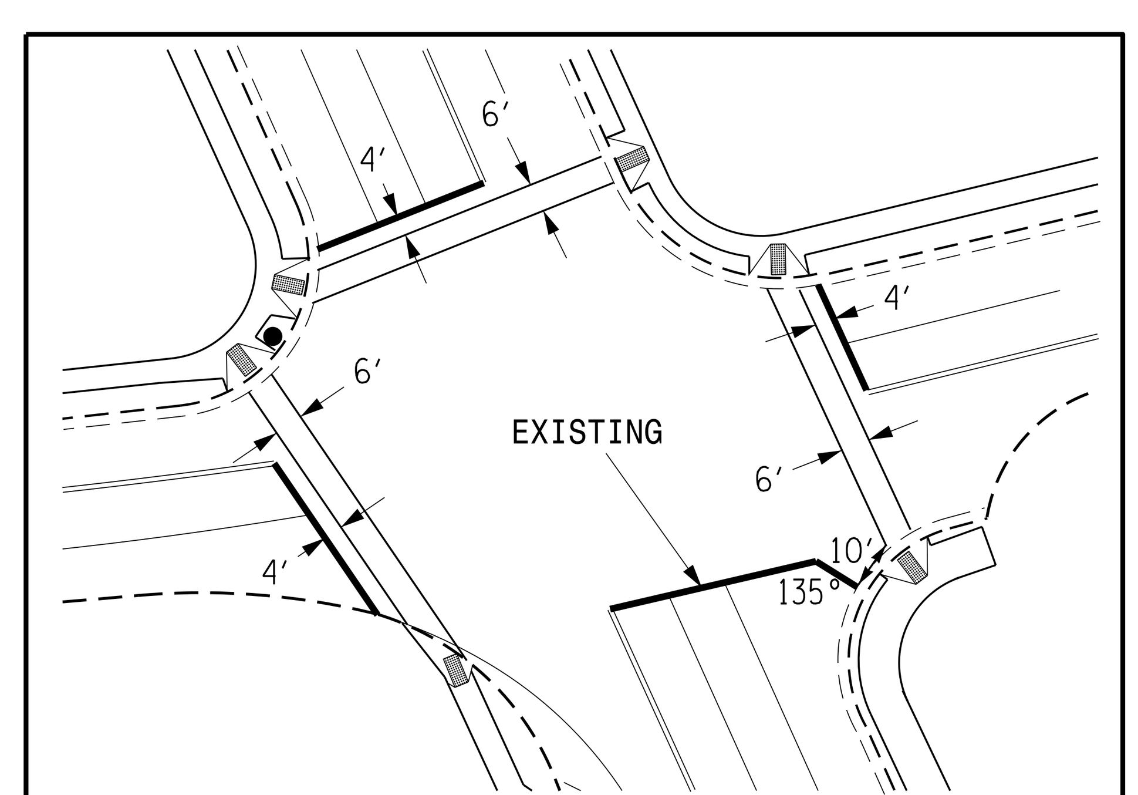
This signal was designed for simultaneous preemption.

RAILROAD PREEMPTION

FUNCTION	SECONDS
DELAY BEFORE PREEMPT	0
PMT OVERRIDE	ON
PED CLEAR THROUGH YELLOW	Y
TERMINATE PHASES	N
TRACK CLEAR RESERVICE	Y
ENTRANCE WALK	1
ENTRANCE PED CLEAR	5
ENTRANCE MIN GREEN	1
ENTRANCE YELLOW CLEAR	25.5*
ENTRANCE RED CLEAR	25.5*
TRACK CLEAR MIN GREEN	18
TRACK CLEAR YELLOW CLEAR	4.5
TRACK CLEAR RED CLEAR	1.8
MIN DWELL GREEN	12
EXIT PHASE(S)	4+8
EXIT YELLOW CLEAR	25.5*
EXIT RED CLEAR	25.5*

* Time defaults to time used for phase during normal operation.





PROPOSED STOPBAR LOCATIONS

This plan supersedes the plan signed and sealed on 6/26/19.

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Pedestrian Signal Head With Push Button & Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way	
	Directional Arrow	
	Type II Signal Pedestal	
N/A	Railroad Tracks	
N/A	Railroad Gate and Flasher	
N/A	Railroad Cantilever	
N/A	Curb Ramp	
Ⓐ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	Right Arrow "ONLY" Sign (R3-5R)	Ⓒ
Ⓓ	"ONCOMING TRAFFIC MAY HAVE EXTENDED GREEN" Sign (W25-2)	Ⓓ

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

Signal Upgrade

Prepared in the Offices of: Transportation Mobility and Safety Division, Signal Design Section, State of North Carolina Department of Transportation

750 N.Greenfield Pkwy.Garner.NC 27529

Old Apex Road at SR 1615 (High House Road)

Division 5 | Wake County | Cary

PLAN DATE:	October 2019	REVIEWED BY:	
PREPARED BY:	J.A. Lohr	REVIEWED BY:	

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZIEMBA

DocuSigned by: 10/23/2019 DATE

SIG. INVENTORY NO. 05-1188

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