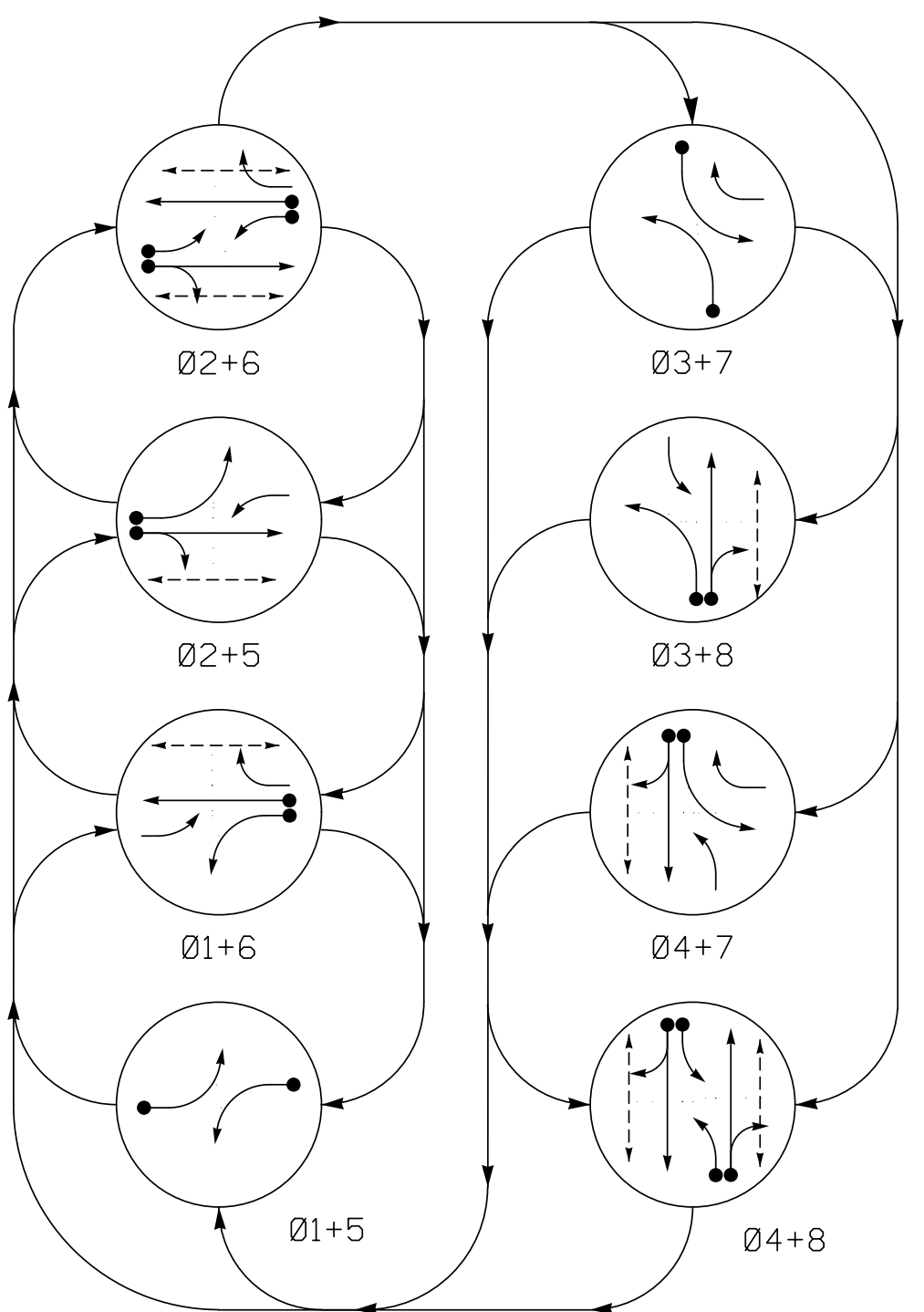


PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV PREEMPT PHASES
(Medium Priority)

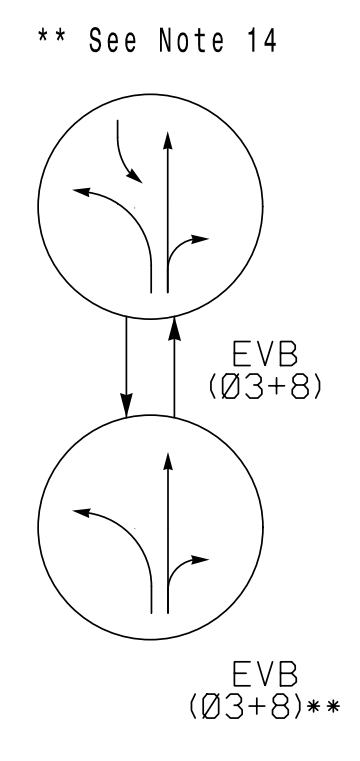
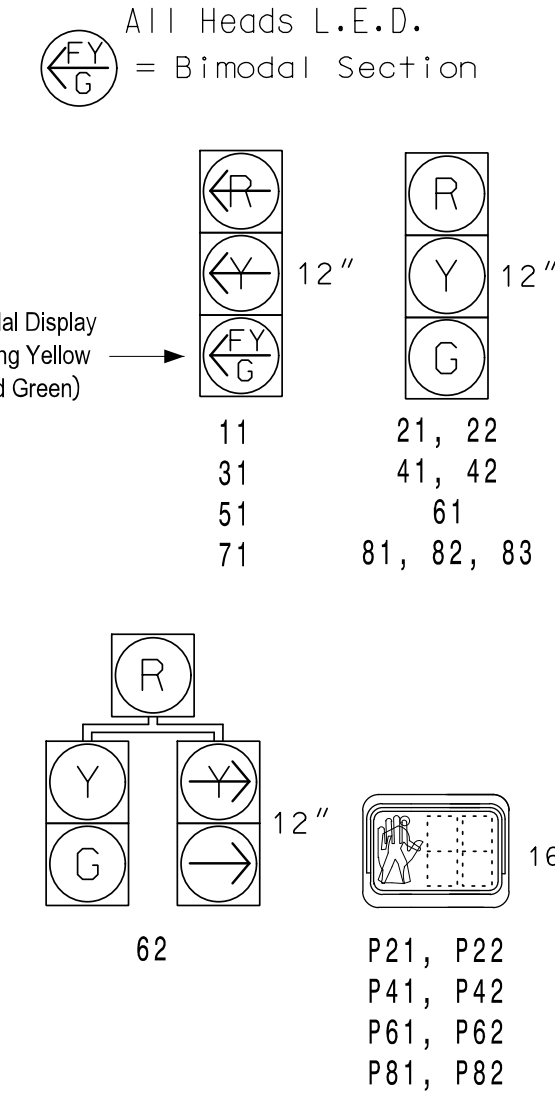


TABLE OF OPERATION

SIGNAL FACE	PHASE								EVB	FLASH
	Ø1+5	Ø2+6	Ø3+7	Ø4+8	Ø1+6	Ø2+5	Ø3+8	Ø4+7		
11	←	←	←	←	←	←	←	←	←	←
21, 22	R	R	G	R	R	R	R	R	R	Y
31	←	←	←	←	←	←	←	←	←	←
41, 42	R	R	R	R	R	R	G	R	R	Y
51	←	←	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	R	R	Y
62	R	G	R	G	R	R	R	R	R	Y
71	←	←	←	←	←	←	←	←	←	←
81, 82, 83	R	R	R	R	R	R	G	R	G	R
P21, P22	DW	DW	W	DW	DW	DW	DW	DW	DRK	
P41, P42	DW	DW	DW	DW	DW	W	W	DW	DRK	
P61, P62	DW	W	DW	W	DW	DW	DW	DW	DRK	
P81, P82	DW	DW	DW	DW	W	DW	W	DW	DRK	

SIGNAL FACE I.D.



2033 SOFTWARE W/ 2070 CONTROLLER LOOP & DETECTOR UNIT INSTALLATION CHART

LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	NEMA PHASE	DELAY	CARRY (STRETCH)	DETECTOR PROGRAMMING										STATUS		
									ATTRIBUTES												
									1	2	3	4	5	6	7	8	9	10			
1A	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
2A	6X6	5	250	X	-	2	- SEC.	1.3 SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
2B	6X6	5	80	X	-	2	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
3A	6X40	2-4-2	0	X	-	3	15 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
4A	6X60	2-4-2	0	X	-	4	10 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
5A	6X40	2-4-2	0	X	-	5	15 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
6A	6X6	5	250	X	-	6	- SEC.	1.3 SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
6B	6X6	5	80	X	-	6	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
7A	6X60	2-4-2	0	X	-	7	15 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
8A	6X40	2-4-2	0	X	-	8	10 SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
P21, P22	-	-	-	X	-	-	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
P41, P42	-	-	-	X	-	-	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
P61, P62	-	-	-	X	-	-	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-
P81, P82	-	-	-	X	-	-	- SEC.	- SEC.	-	-	-	-	-	X	-	-	-	-	-	X	-

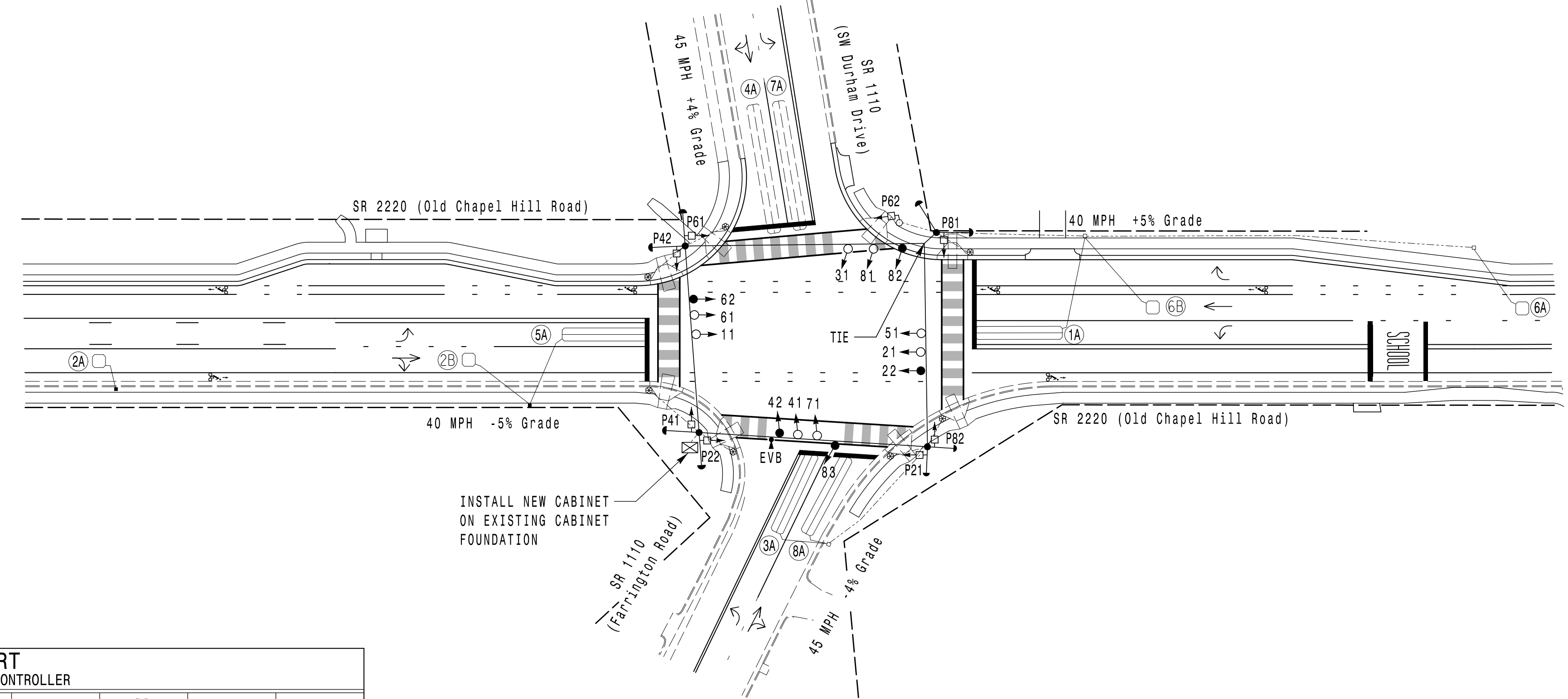
8 Phase Fully Actuated (Isolated)
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions. The PSP can be accessed at the following website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>
- 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 62 and 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.
- Program all timing information into phase banks 1, 2, and 3 unless otherwise noted.
- Set phase bank 3 maximum limit to 250 seconds for phases used.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- This intersection features an optical preemption system. Shown location of optical detector is conceptual only.
- If preempt phasing resides in the barrier being serviced then the opposing 4-section FYA will flash continuously. If preempt phasing requires crossing the barrier the 4-section FYA will display a red arrow.
- Upon completion of emergency vehicle preemption phase, controller returns to normal operation based on vehicle demand.
- Pedestrians pedestals are conceptual and shown for reference only. See sheet P1-P3 for pushbuttons locations details.

2033 SOFTWARE W/ 2070 CONTROLLER EV

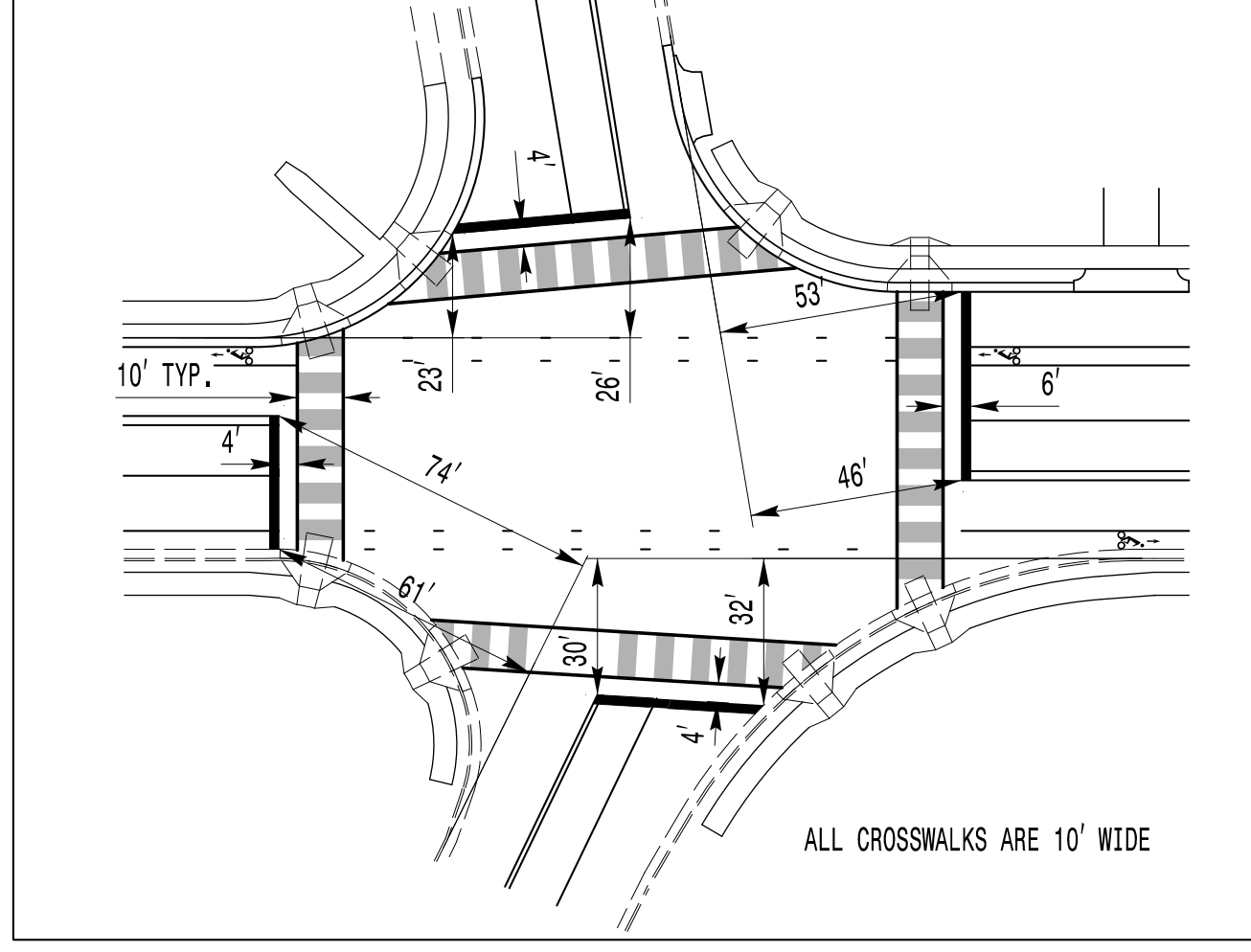
FUNCTION	EVB (PHASE 3+8) SECONDS
DELAY BEFORE PREEMPT	0
PED. CLEAR BEFORE PREEMPT	#
MIN. GREEN BEFORE PREEMPT	1
CLEARANCE TIME	7.0
PREEMPT EXTEND *	2.0

* Timing to be programmed on the Optical Detection Unit.
See Timing Chart this sheet



INSTALL NEW CABINET ON EXISTING CABINET FOUNDATION

STOPLINE AND CROSSWALK LOCATION DIAGRAM



NC Dept of Transportation
Division of Highways
Final Drawing Date: 6/30/2016
ITS & Signals Unit

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
○ → Type I Pushbutton Post	○ → N/A
○ → Type II Signal Pedestal	○ → N/A
○ → Optical Detector	○ → 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

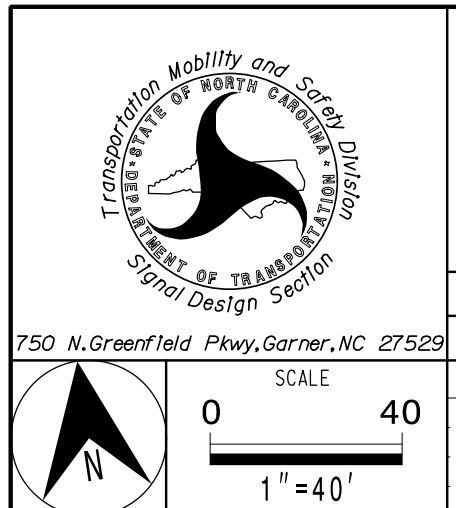
TIMING CHART
2033 SOFTWARE W/ 2070 CONTROLLER

PHASE	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø7	Ø8
MINIMUM INITIAL *	7 SEC.	12 SEC.	7 SEC.	7 SEC.	7 SEC.	12 SEC.	7 SEC.	7 SEC.
VEHICLE EXTENSION *	2.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.
YELLOW CHANGE INT.	3.0 SEC.	4.6 SEC.	3.0 SEC.	4.9 SEC.	3.1 SEC.	4.6 SEC.	3.0 SEC.	4.9 SEC.
RED CLEARANCE	3.1 SEC.	2.4 SEC.	3.2 SEC.	2.0 SEC.	3.1 SEC.	2.4 SEC.	3.2 SEC.	2.0 SEC.
MAXIMUM LIMIT *	15 SEC.	30 SEC.	15 SEC.	20 SEC.	15 SEC.	30 SEC.	15 SEC.	20 SEC.
RECALL POSITION	NONE	VEH. RECALL	NONE	NONE	NONE	VEH. RECALL	NONE	NONE
VEHICLE CALL MEMORY	NONLOCK	YELLOW LOCK	NONLOCK	NONLOCK	NONLOCK	YELLOW LOCK	NONLOCK	NONLOCK
DOUBLE ENTRY	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
WALK *	- SEC.	7 SEC.	- SEC.	7 SEC.	- SEC.	7 SEC.	- SEC.	7 SEC.
FLASHING DON'T WALK	- SEC.	19 SEC.	- SEC.	12 SEC.	- SEC.	20 SEC.	- SEC.	16 SEC.
PED. CLEAR BEFORE PREEMPT	- SEC.	14 SEC.	- SEC.	8 SEC.	- SEC.	16 SEC.	- SEC.	11 SEC.
TYPE 3 LIMIT	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
ALTERNATE EXTENSION	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
ADD PER VEHICLE *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MAXIMUM INITIAL *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MAXIMUM GAP*	2.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.
REDUCE 0.1 SEC EVERY *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MINIMUM GAP	2.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.	2.0 SEC.	1.0 SEC.	2.0 SEC.

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



SR 220 (Old Chapel Hill Road) At SR 1110 (Farrington Road/SW Durham Drive)

Division 5 Durham County Durham

PLAN DATE: MAY 2016 REVIEWED BY: SL PHILLIPS

PREPARED BY: SP PENNINGTON RKA PROJ. NO:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 032607
SL PHILLIPS
6/30/2016

SIG. INVENTORY NO. 05-1673

6/29/2016 4:15:17 PM susan.pennington ***:m:\ev-north.com\EB-4707_Par1_BMP\ans\conf\fig_Signal\sig4 - Signal_Design\sig4-1673_2016.dgn