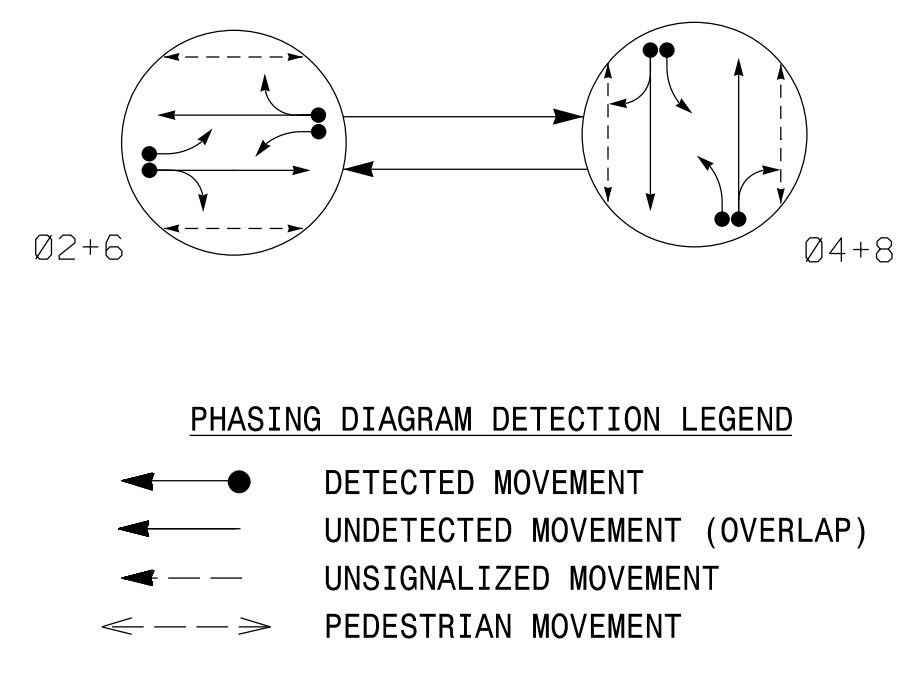
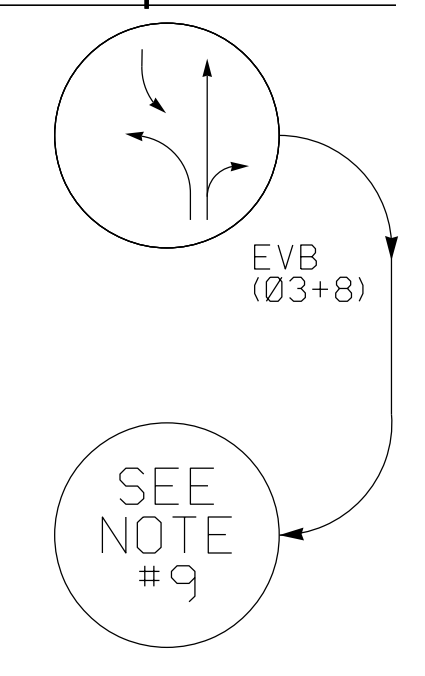


**PHASING DIAGRAM**



**EV Preempt Phases**



2033 EV PREEMPTION	
FUNCTION	EVB (SECONDS)
DELAY BEFORE PREEMPT	0
MIN. PED. CLEAR BEFORE PREEMPT	*
MIN. GREEN BEFORE PREEMPT	1
CLEARANCE TIME	2
PREEMPT EXTEND**	2.0

\* See Timing Chart for Min Ped Clearance  
\*\* Program Timing on Optical Detector Unit

SIGNAL FACE	PHASE			
	Ø 2 + 6	Ø 4 + 8	EV B (Ø 3 + 8)	F T Ø 1 Ø 3 Ø 4
21	Y	R	R	Y
22,23	G	R	R	Y
31	R	Y	Y	R
41	R	Y	Y	R
42,43	R	G	R	Y
61	Y	R	R	Y
62,63	G	R	R	Y
81,82	R	G	G	R
P21,P22	W	DW	DW	DRK
P41,P42	DW	W	DW	DRK
P61,P62	W	DW	DW	DRK
P81,P82	DW	W	DW	DRK

2033 SOFTWARE w/ 2070 CONTROLLER LOOP & DETECTOR UNIT INSTALLATION CHART																		
INDUCTIVE LOOPS				DETECTOR PROGRAMMING														
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEMA PHASE	TIMING		ATTRIBUTES											
					DELAY	CARRY (STRETCH)	1	2	3	4	5	6	7	8	SYSTEM	STATUS		
2A	6x6	*	70	-	2	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
2B	6x40	*	0	-	2	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
4A	6x40	*	0	-	4	3 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
4B	6x40	*	0	-	4	10 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
6A	6x6	*	70	*	6	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
6B	6x40	*	0	*	6	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
8A	6x40	*	0	*	8	3 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*
8B	6x40	*	0	*	8	10 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	*

PEDESTRIAN DETECTION																		
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEMA PHASE	DELAY	CARRY (STRETCH)	1	2	3	4	5							
P21,P22	N/A	N/A	N/A	-	X	2	- SEC.	- SEC.	-	X	-	-	-	-	-	-	-	X
P41,P42	N/A	N/A	N/A	-	X	4	- SEC.	- SEC.	-	X	-	-	-	-	-	-	-	X
P61,P62	N/A	N/A	N/A	-	X	6	- SEC.	- SEC.	-	X	-	-	-	-	-	-	-	X
P81,P82	N/A	N/A	N/A	-	X	8	- SEC.	- SEC.	-	X	-	-	-	-	-	-	-	X

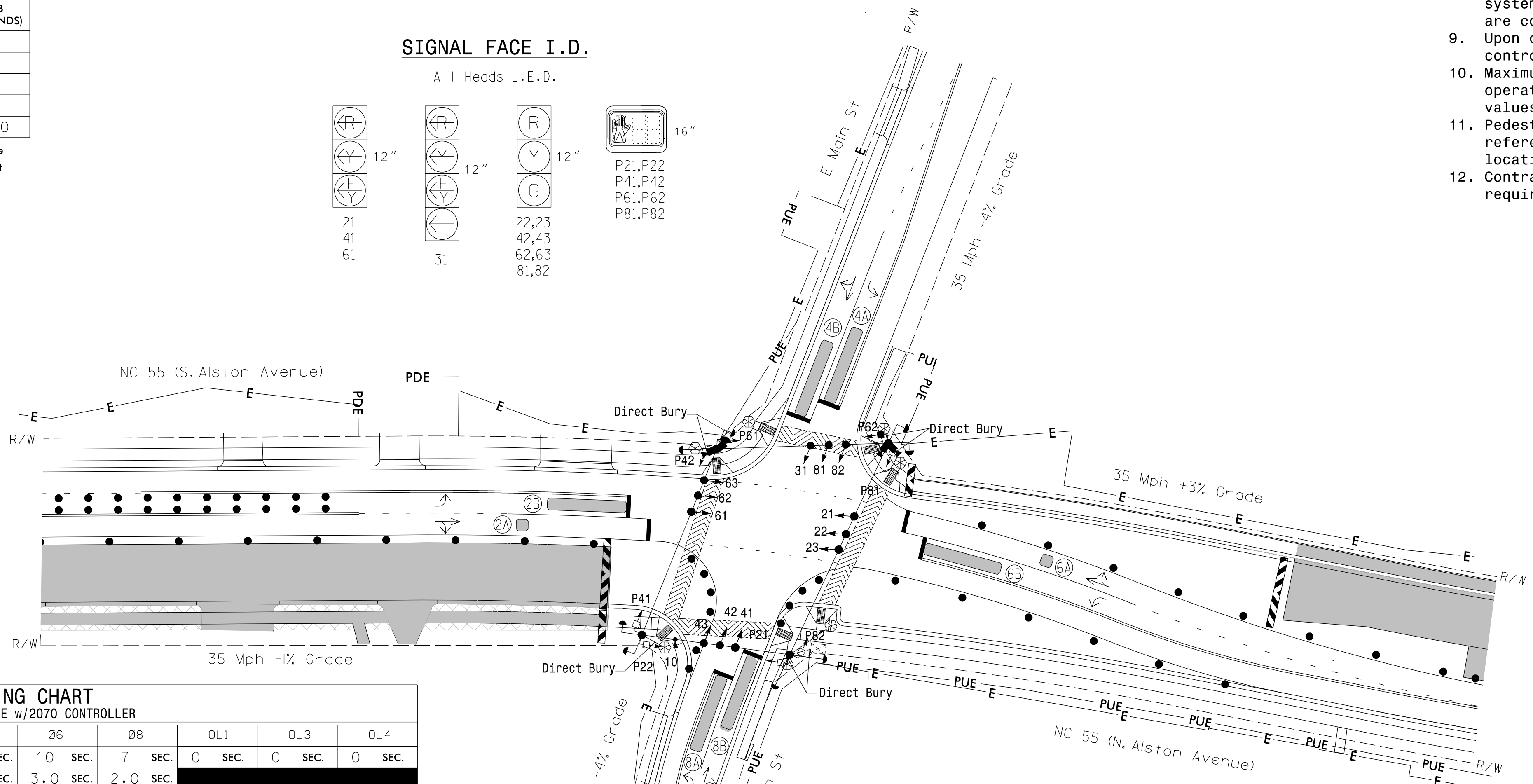
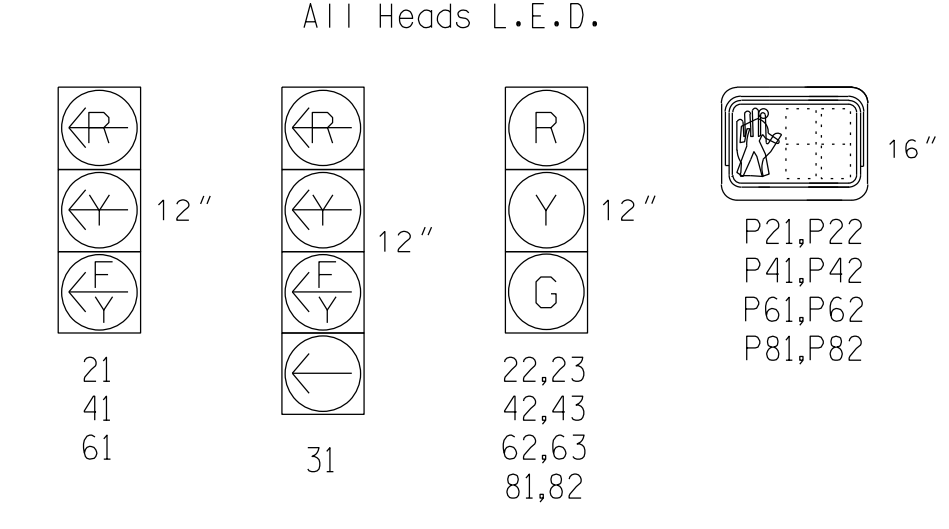
\* Video Detection Zone

**2 Phase Fully Actuated W/ EV Preemption (Durham Signal System)**

**NOTES**

- Refer to "Road Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- 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.
- This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
- Upon completion of Emergency Vehicle Preemption, controller returns to normal operation.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- Contractor shall adjust video detection zones as required.

**SIGNAL FACE I.D.**



PROPOSED		EXISTING	
	Traffic Signal Head		N/A
	Modified Signal Head		N/A
	Pedestrian Signal Head		N/A
	Signal Pole with Guy		N/A
	Signal Pole with Sidewalk Guy		N/A
	Inductive Loop Detector		N/A
	Controller & Cabinet Junction Box		N/A
	2-in Underground Conduit		N/A
	Right of Way		N/A
	Directional Arrow		N/A
	Work Area		N/A
	Drums		N/A
	Construction Easement		N/A
	Permanent Utility Easement		N/A
	Permanent Drainage Easement		N/A
	Direct Bury		N/A
	Optical Detector		N/A
	Type I Pushbutton Post		N/A
	Video Detector		N/A
	Video Detection Area		N/A

TIMING CHART								
2033 SOFTWARE w/2070 CONTROLLER								
PHASE	Ø2	Ø3	Ø4	Ø6	Ø8	ØL1	ØL3	ØL4
MINIMUM INITIAL *	10 SEC.	- SEC.	7 SEC.	10 SEC.	7 SEC.	0 SEC.	0 SEC.	0 SEC.
VEHICLE EXTENSION *	3.0 SEC.	- SEC.	2.0 SEC.	3.0 SEC.	2.0 SEC.	0 SEC.	0 SEC.	0 SEC.
YELLOW CHANGE INT.	3.9 SEC.	4.1 SEC.	4.1 SEC.	3.9 SEC.	4.1 SEC.	3.9 SEC.	3.9 SEC.	4.1 SEC.
RED CLEARANCE	2.8 SEC.	3.1 SEC.	2.2 SEC.	2.8 SEC.	2.2 SEC.	2.8 SEC.	2.8 SEC.	2.2 SEC.
MAXIMUM LIMIT *	50 SEC.	- SEC.	35 SEC.	50 SEC.	35 SEC.	-	-	-
RECALL POSITION	VEH. RECALL	NONE	NONE	VEH. RECALL	NONE	-	-	-
VEHICLE CALL MEMORY	YELLOW LOCK	NONE	NONE	YELLOW LOCK	NONE	-	-	-
DOUBLE ENTRY	OFF	OFF	ON	OFF	ON	-	-	-
WALK *	4 SEC.	- SEC.	4 SEC.	4 SEC.	4 SEC.	-	-	-
FLASHING DON'T WALK	11 SEC.	- SEC.	18 SEC.	10 SEC.	16 SEC.	-	-	-
MIN PED CLEARANCE	6 SEC.	- SEC.	9 SEC.	5 SEC.	8 SEC.	-	-	-
TYPE 3 LIMIT	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	-	-	-
ALTERNATE EXTENSION	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	-	-	-
ADD PER VEHICLE *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	-	-	-
MAXIMUM INITIAL *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	-	-	-
MAXIMUM GAP*	3.0 SEC.	- SEC.	2.0 SEC.	3.0 SEC.	2.0 SEC.	-	-	-
REDUCE 0.1 SEC EVERY *	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	-	-	-
MINIMUM GAP	3.0 SEC.	- SEC.	2.0 SEC.	3.0 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.  
\*\* Timing to be determined by the City of Durham.

**Signal Upgrade - Temporary Design 5 (TMP Phase II, Steps 7-12)**

**SEPI ENGINEERING & CONSTRUCTION**  
1025 Wade Avenue  
Raleigh, NC 27605  
Tel: 919-789-9977  
Fax: 919-789-9591  
License #: C-2197

Prepared for the Offices of:  
**SEPI ENGINEERING & CONSTRUCTION**  
750 N. Greenfield Pkwy, Garner, NC 27529

**NC 55 (South/North Alston Avenue) at E. Main St**  
Division 5 Durham County Durham  
PLAN DATE: September 2014 REVIEWED BY: J Hochanadel  
PREPARED BY: C Lawson REVIEWED BY:

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
28430  
J. HOCHANADEL  
4/02/15  
SIG. INVENTORY NO. 05-103015

3/20/2015 10:11:00 AM C:\Users\c1awson\Documents\2012\Traffic\Signal\21.0\21.0.dgn