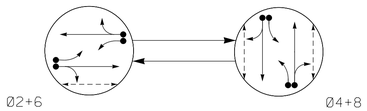
PROJECT REFERENCE NO.	SHEET NO.
U-3308	Sig. 38.0

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

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

EV Preempt Phases

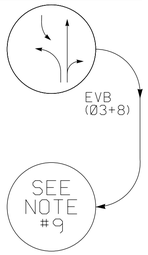


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+6	Ø4+8	EVB	FLASH
21	~~F Y~~	~~R~~	~~R~~	~~Y~~
22,23	G	R	R	Y
31	~~R~~	~~F Y~~	←	~~R~~
41	~~R~~	~~F Y~~	~~F Y~~	~~R~~
42,43	R	G	R	R
61	~~F 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
P81,P82	DW	W	DW	DRK

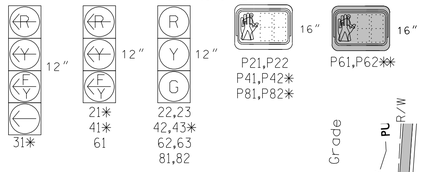
2033 EV PREEMPTION

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 I.D.

All Heads L.E.D.
* See Note 11
** See Note 12



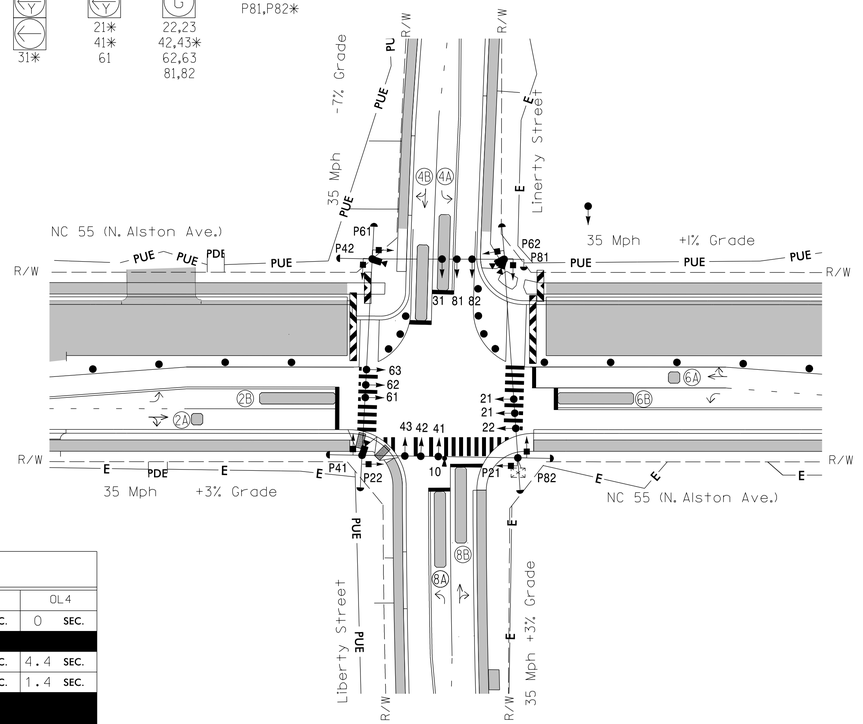
2033 SOFTWARE w/ 2070 CONTROLLER LOOP & DETECTOR UNIT INSTALLATION CHART

INDUCTIVE LOOPS						DETECTOR PROGRAMMING															
							TIMING		ATTRIBUTES										LOOPS	STATUS	
									1	2	3	4	5	6	7	8				
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	NEMA PHASE	DELAY	CARRY (STRETCH)	FULL TIME DELAY	PEDESTRIAN CALL	RESERVED	COUNT	EXTENSION	TYPE 3	CALLING	ALTERNATE *	SYSTEM	NEW	EXISTING
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	*	70	-	*	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																				
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
P81,P82	N/A	N/A	N/A	-	X	8	- SEC.	- SEC.	-	X	-	-	-	-	-	-	-	-	X

* Video Detection Zone

NOTES

1. Refer to "Road Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012.
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. Program all timing information into phase banks 1,2, and 3 unless otherwise noted.
5. Set phase bank 3 maximum limit to 250 seconds for phases used.
6. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
7. Program pedestrian heads to countdown the flashing "Don't Walk" time.
8. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
9. Upon completion of Emergency Vehicle Preemption, controller returns to normal operation.
10. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
11. Reconnect and unbag signal heads #21, #31, #41, #42, #43, and pedestrian signal heads #P41, #P42, #P81, and #P82 during this phase of construction.
12. Pedestrian signal heads #P61 and #P62 to remain disconnected and bagged during this phase of construction.
13. Contractor shall adjust video detection zones as required.



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	→
▭	Work Area	N/A
●	Drums	N/A
E	Construction Easement	N/A
PUE	Permanent Utility Easment	N/A
PDE	Permanent Drainage Easment	N/A
▨	Barricades	N/A
———	Direct Bury	----------
◁	Optical Detector	◆
▭◁	Video Detector	▬◆
▭	Video Detection Area	▭

TIMING CHART
2033 SOFTWARE w/2070 CONTROLLER

PHASE	Ø2	Ø3	Ø4	Ø6	Ø8	OL1	OL3	OL4
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.			
YELLOW CHANGE INT.	3.8 SEC.	4.4 SEC.	4.4 SEC.	3.8 SEC.	4.4 SEC.	3.8 SEC.	3.8 SEC.	4.4 SEC.
RED CLEARANCE	1.8 SEC.	2.1 SEC.	1.4 SEC.	1.8 SEC.	1.4 SEC.	1.8 SEC.	1.8 SEC.	1.4 SEC.
MAXIMUM LIMIT *	50 SEC.	35 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.	- SEC.	4 SEC.			
FLASHING DON'T WALK	14 SEC.	- SEC.	13 SEC.	- SEC.	18 SEC.			
MIN PED CLEARANCE	7 SEC.	- SEC.	7 SEC.	- SEC.	9 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.

Signal Upgrade - Temporary Design 8 (TMP Phase 2, Steps 1-6)

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Signal Design Section
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NC 55 (North Alston Avenue)
at
Liberty St
Division 5 Durham County Durham

PLAN DATE: September 2014 REVIEWED BY: J Hochanadel
PREPARED BY: R Drayton REVIEWED BY:

REVISIONS	INIT.	DATE

SCALE 0 40 1"=40'

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 28430 ENGINEER JEFFREY P. HOCHANADEL

DocuSigned by: 4/02/15 DATE
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SIG. INVENTORY NO. 05-102918

3/20/2015
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