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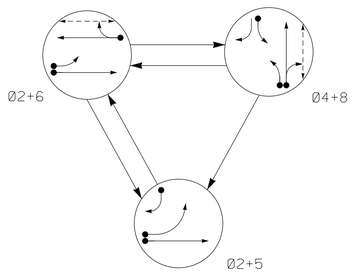
PROJECT REFERENCE NO.	SHEET NO.
U-3308	Sig. 9.0

3 Phase Fully Actuated w/ EV Preemption (Durham Signal System)

PHASING DIAGRAM



EV Preempt Phases

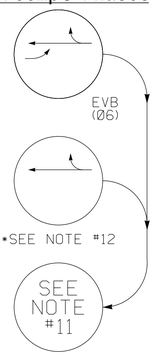


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4+8	EVB	FLASH
21, 22	G	G	R	R	Y
41	~~R~~	~~R~~	~~F Y~~	~~R~~	~~R~~
42	R	R	G	R	R
43	R	R	G	R	R
51	~~←~~	~~F Y~~	~~R~~	~~F Y~~	~~Y~~
61,62	R	G	R	G	Y
81	~~R~~	~~R~~	~~F Y~~	~~R~~	~~R~~
82,83	R	R	G	R	R
P61,P62	DW	W	DW	DW	DRK
P81,P82	DW	DW	W	DW	DRK

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

INDUCTIVE LOOPS						DETECTOR PROGRAMMING															
							TIMING		ATTRIBUTES										STATUS	
LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	NEMA PHASE	DELAY	CARRY (STRETCH)	1 FULL TIME DELAY	2 PEDESTRIAN CALL	3 RESERVED	4 COUNT	5 EXTENSION	6 TYPE 3	7 CALLING	8 ALTERNATE	SYSTEM LOOPS	NEW	EXISTING
2A	6x6	✳	70	✳	-	2	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
4A	6x40	✳	0	✳	-	4	3 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
5A	6x40	✳	0	✳	-	5	15 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
						2	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
5B	6x40	✳	0	✳	-	5	15 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
6A	6x6	✳	70	✳	-	6	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
8A	6x40	✳	0	✳	-	8	- SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
8B	6x40	✳	0	✳	-	8	10 SEC.	- SEC.	-	-	-	-	X	-	X	-	-	-	✳
PEDESTRIAN DETECTION																				
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

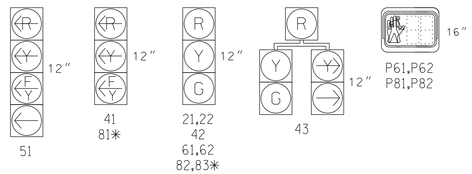
✳ Video Detection Zone

PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

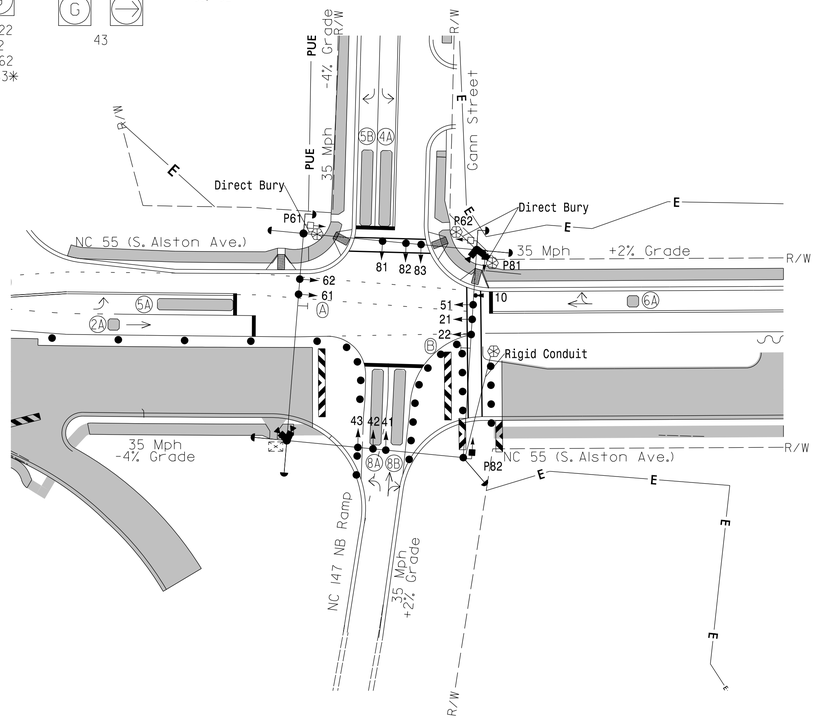
All Heads L.E.D.
✳ See Note 15



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



TIMING CHART
2033 SOFTWARE w/2070 CONTROLLER

PHASE	Ø2	Ø4	Ø5	Ø6	Ø8	OL2	OL4
MINIMUM INITIAL *	10 SEC.	7 SEC.	7 SEC.	10 SEC.	7 SEC.	0 SEC.	0 SEC.
VEHICLE EXTENSION *	3.0 SEC.	2.0 SEC.	2.0 SEC.	3.0 SEC.	2.0 SEC.		
YELLOW CHANGE INT.	4.1 SEC.	3.7 SEC.	4.1 SEC.	4.1 SEC.	3.7 SEC.	3.7 SEC.	3.7 SEC.
RED CLEARANCE	2.3 SEC.	2.6 SEC.	3.2 SEC.	2.3 SEC.	2.6 SEC.	2.6 SEC.	2.6 SEC.
MAXIMUM LIMIT *	50 SEC.	35 SEC.	15 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	ON	OFF	OFF	ON		
WALK *	– SEC.	– SEC.	– SEC.	4 SEC.	4 SEC.		
FLASHING DON'T WALK	– SEC.	– SEC.	– SEC.	8 SEC.	4 SEC.		
MIN PED CLEARANCE	– SEC.	– SEC.	– SEC.	4 SEC.	2 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.	2.0 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.	2.0 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.

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. Phase 5 may be lagged.
4. Reposition existing signal heads #21, #22, #51, #61, #62, and optical detector #10 during this phase of construction.
5. Set all detector units to presence mode.
6. Program all timing information into phase banks 1,2, and 3 unless otherwise noted.
7. Set phase bank 3 maximum limit to 250 seconds for phases used.
8. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
9. Program pedestrian heads to countdown the flashing "Don't Walk" time.
10. This intersection features an optical preemption system. Shown locations of optical detectors are conceptual only.
11. Upon completion of Emergency Vehicle Preemption, controller returns to normal operation.
12. When EVB preemption initializes during side street service signal head 51 will display a red arrow.
13. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
14. Pedestrian Pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
15. Reconnect and unbag signal heads #81, #82, and #83 during Temporary Signal Design 6 TMP Phase 2, Steps 7-12.
16. Contractor shall adjust video detection zones as required.
17. Contractor to maintain pedestrians through construction area.
18. Poles are existing during Temporary Signal Design 6 TMP Phase 2, Steps 7-12.

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	→
Ⓐ	"No Left Turn" (R3-2)	Ⓐ
Ⓑ	"No Right Turn" (R3-1)	Ⓑ
◁	Optical Detector	●◀
▨	Work Area	N/A
●	Drums	N/A
E	Construction Easement	N/A
PUE	Permanent Utility Easement	N/A
▨	Barricades	N/A
⊛	Type I Pushbutton Post	✤
———	Rigid Conduit	----------
———	Direct Bury	----------
▭◁	Video Detector	■◀
▭	Video Detection Area	■

Signal Upgrade - Temporary Design 4 (TMP Phase 2, Steps 1-6)
Signal Upgrade - Temporary Design 6 (TMP Phase 2, Steps 7-12)

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Prepared for the Offices of:
Traffic Engineering Branch
Transportation Mobility and Safety Division
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy,Garner,NC 27529

SCALE 0 40 1"=40'

NC 55 (South Alston Avenue) at NC 147 NB Ramp / Gann Street
Division 5 Durham County Durham

PLAN DATE:	September 2014	REVIEWED BY:	J Hochanadel
PREPARED BY:	C Lawson	REVIEWED BY:	

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 28430 ENGINEER JEFFREY P. HOCHANADEL

DocuSigned by:
4/02/15
DATE
SIG. INVENTORY NO. 05-0284T4/T6

3/20/2015
G:\STransportation\TR13-017.00 NCDOT 2012 Traffic LSA\TR13-017.03 (U-3308 Signals)\Traffic\Signals\Design\Signals\TEMP SIGNALS WITH VIDEO\05-0284\05-0284-dgn
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