

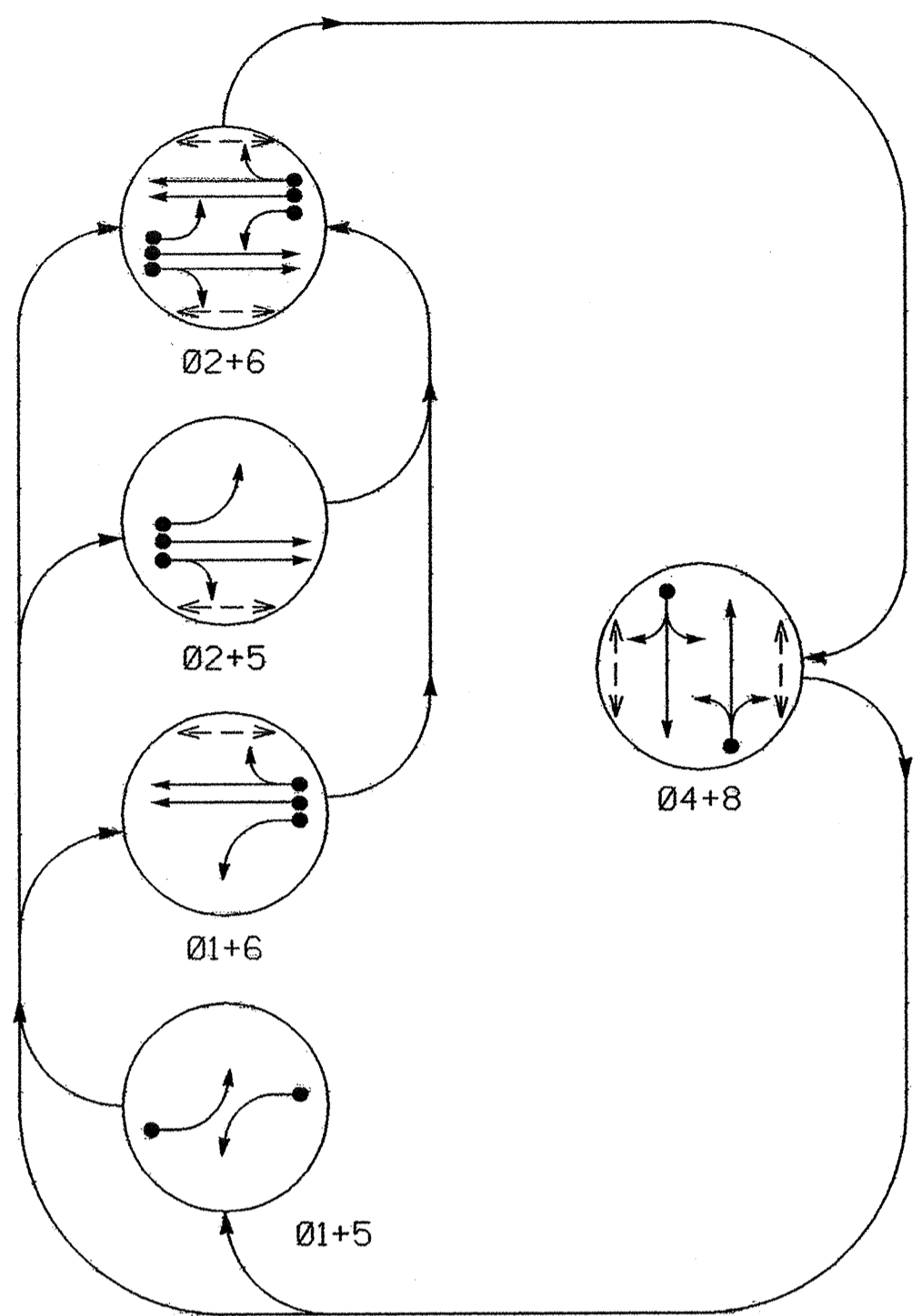
5 PHASE FULLY ACTUATED (DURHAM SIGNAL SYSTEM) NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specifications for Roads and Structures" dated January 2002.
2. Program phase 1 as protected/permitted.
3. Program phase 5 as protected/permitted.
4. Program controller to clear from phases 2 + 6 to phases 1 and/or 5 by progressing through phases 4 + 8 (see Electrical Details).
5. Program all timing information to phase banks 1, 2, and 3 unless otherwise noted.
6. Maximum times show in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
7. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
8. Set all detector units to presence mode.
9. Set phase bank 3 maximum limit to 250 seconds for phases used.
10. Do not program signal for late night flashing unless otherwise directed by the engineer.

TABLE OF OPERATION

SIGNAL FACE	PHASE					FLASH
	Ø1 + 5	Ø2 + 6	Ø4 + 5	Ø2 + 6	Ø4 + 8	
21	R	R	G	G	R	Y
22	R	R	G	G	R	Y
41, 42	R	R	R	R	G	R
61	R	G	R	G	R	Y
62	R	G	R	G	R	Y
81, 82	R	R	R	R	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

PHASING DIAGRAM

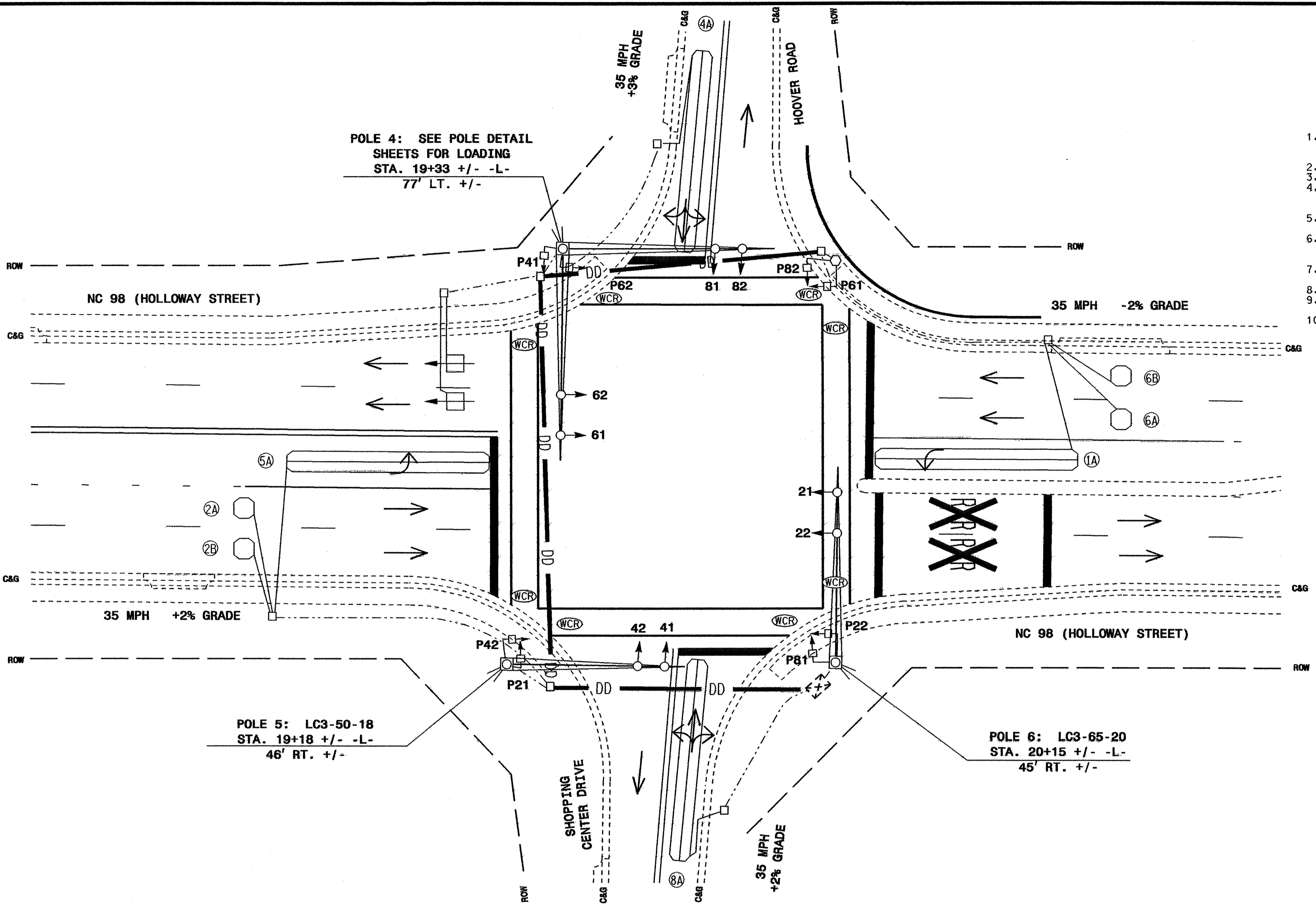
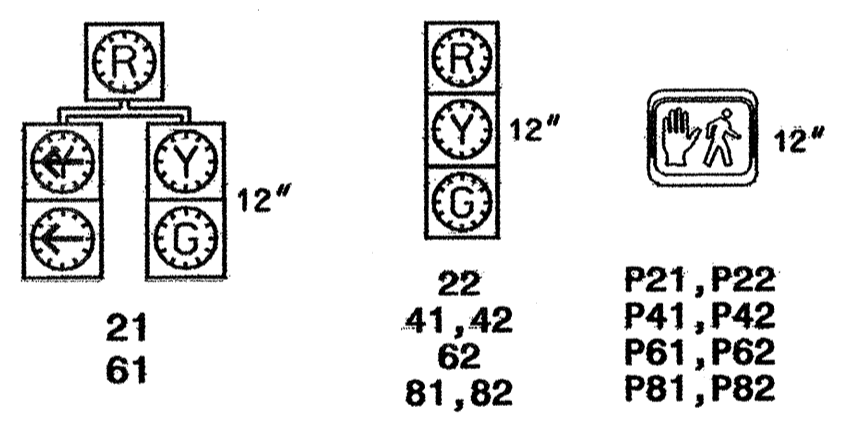


PHASING DIAGRAM DETECTION LEGEND

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

SIGNAL FACE I.D.

○ Denotes L.E.D.



TIMING CHART 170 CONTROLLER

PHASE	Ø1	Ø2	Ø4	Ø5	Ø6	Ø8
MINIMUM INITIAL	7 SEC.	10 SEC.	7 SEC.	7 SEC.	10 SEC.	7 SEC.
VEHICLE EXTENSION	1.0 SEC.	3.0 SEC.	1.0 SEC.	1.0 SEC.	3.0 SEC.	1.0 SEC.
YELLOW CHANGE INT.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.
RED CLEARANCE	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.	2.0 SEC.
MAXIMUM LIMIT	15 SEC.	45 SEC.	25 SEC.	15 SEC.	45 SEC.	25 SEC.
RECALL POSITION	NONE	VEH. RECALL	NONE	NONE	VEH. RECALL	NONE
VEHICLE CALL MEMORY	NONE	YELLOW LOCK	NONE	NONE	YELLOW LOCK	NONE
DOUBLE ENTRY	OFF	OFF	ON	OFF	OFF	ON
WALK	- SEC.	4 SEC.	4 SEC.	- SEC.	4 SEC.	4 SEC.
FLASHING DON'T WALK	- SEC.	18 SEC.	19 SEC.	- SEC.	14 SEC.	21 SEC.
TYPE 3 LIMIT	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
ALTERNATE EXTENSION	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
ADD PER VEHICLE	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MAXIMUM INITIAL	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MAXIMUM GAP	1.0 SEC.	3.0 SEC.	1.0 SEC.	1.0 SEC.	3.0 SEC.	1.0 SEC.
REDUCE 0.1 SEC EVERY	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.	- SEC.
MINIMUM GAP	1.0 SEC.	3.0 SEC.	1.0 SEC.	1.0 SEC.	3.0 SEC.	1.0 SEC.

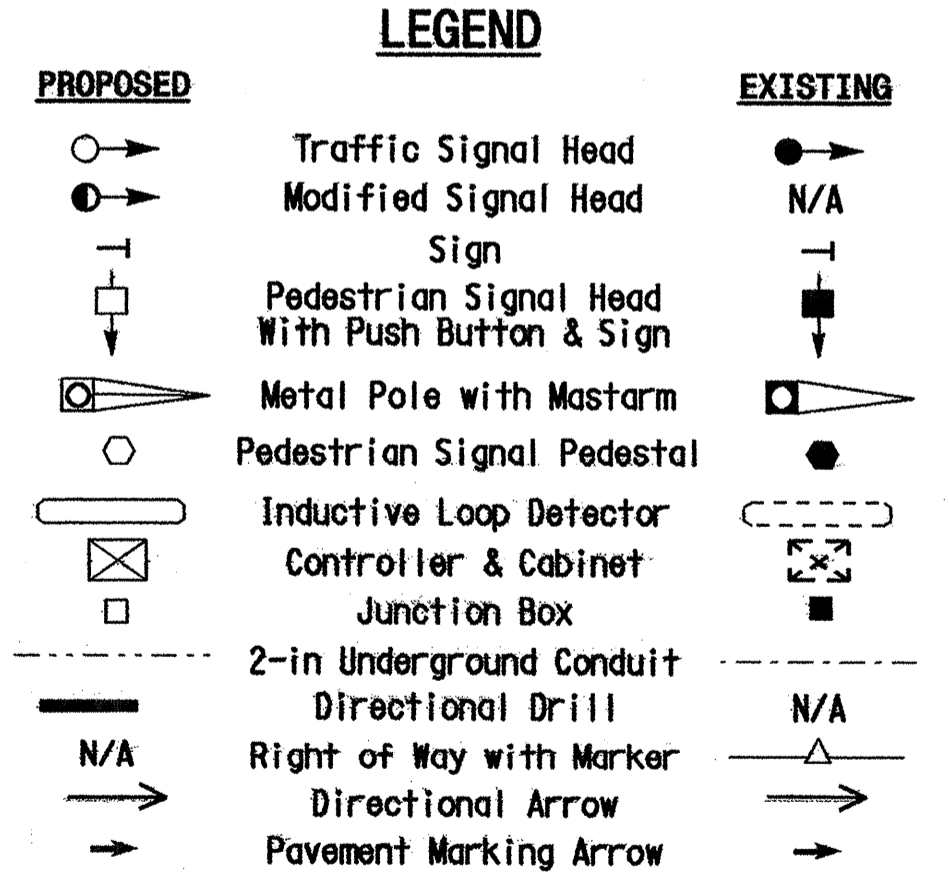
LOOP & DETECTOR UNIT INSTALLATION CHART 170 CONTROLLER AND CABINET

LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DETECTOR PROGRAMMING															
						NEMA PHASE	TIMING		ATTRIBUTES								SYSTEM LOOPS	NEW	EXISTING		
							DELAY	CARRY (STRETCH)	1	2	3	4	5	6	7	8					
1A	6X60	2-4-2	0	X		1	15 SEC.	SEC.						X	X	-	X				
						6	3 SEC.	SEC.						X	X	-	X				
2A, 2B	6X6	4	70	X		4	15 SEC.	SEC.						X	X	-	X				
4A	6X60	2-4-2	0	X		2	3 SEC.	SEC.						X	X	-	X				
						4	5 SEC.	SEC.						X	X	-	X				
5A	6X60	2-4-2	0	X		2	3 SEC.	SEC.						X	X	-	X				
						5	15 SEC.	SEC.						X	X	-	X				
						4	15 SEC.	SEC.						X	X	-	X				
6A, 6B	6X6	4	70	X		6	5 SEC.	SEC.						X	X	-	X				
8A	6X60	2-4-2	0	X		8	5 SEC.	SEC.						X	X	-	X				
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
SYSTEM MICROLOOP PROBES			+120	X		N/A														X	X

PLAN QUANTITIES

Pay Item	Feet
Signal Cable	3100
Messenger Cable	0
Lead-in Cable	1790

PLAN PREPARED IN THE OFFICE OF:
Kubilins
 TRANSPORTATION GROUP, INC.
 201 PRODUCTION DR., 2ND FLOOR
 YORKTOWN, VA 23693
 PH: (757) 594-1419 FAX: (757) 594-9010



SIGNAL UPGRADE - FINAL DESIGN

Prepared in the Office of:
NC 98 (HOLLOWAY STREET) AT HOOPER ROAD/SHOPPING CENTER DRIVE

DIVISION 5 DURHAM CO. DURHAM
 PLAN DATE: JANUARY 2004 REVIEWED BY: WAK
 PREPARED BY: CED REVIEWED BY:
 SCALE: 1"=20'

122 N. McDowell St., Raleigh, NC 27603
 PH: (757) 594-1419 FAX: (757) 594-9010

SEAL

 SIGNATURE: *W. Ann Kubilins* DATE: *1/14/04*
 SIG. INVENTORY NO. 05-1655