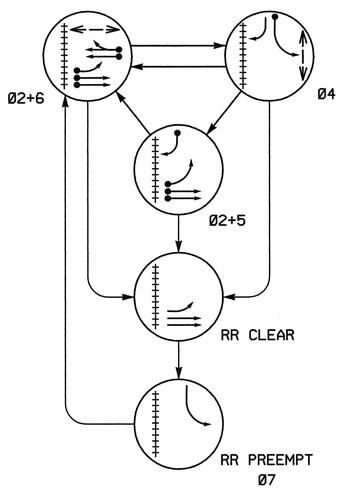
PROJECT REFERENCE NO.	SHEET NO.
U-4010	SIG. 16

3 PHASE FULLY ACTUATED W/RAILROAD PREEMPTION (DURHAM SIGNAL SYSTEM)

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

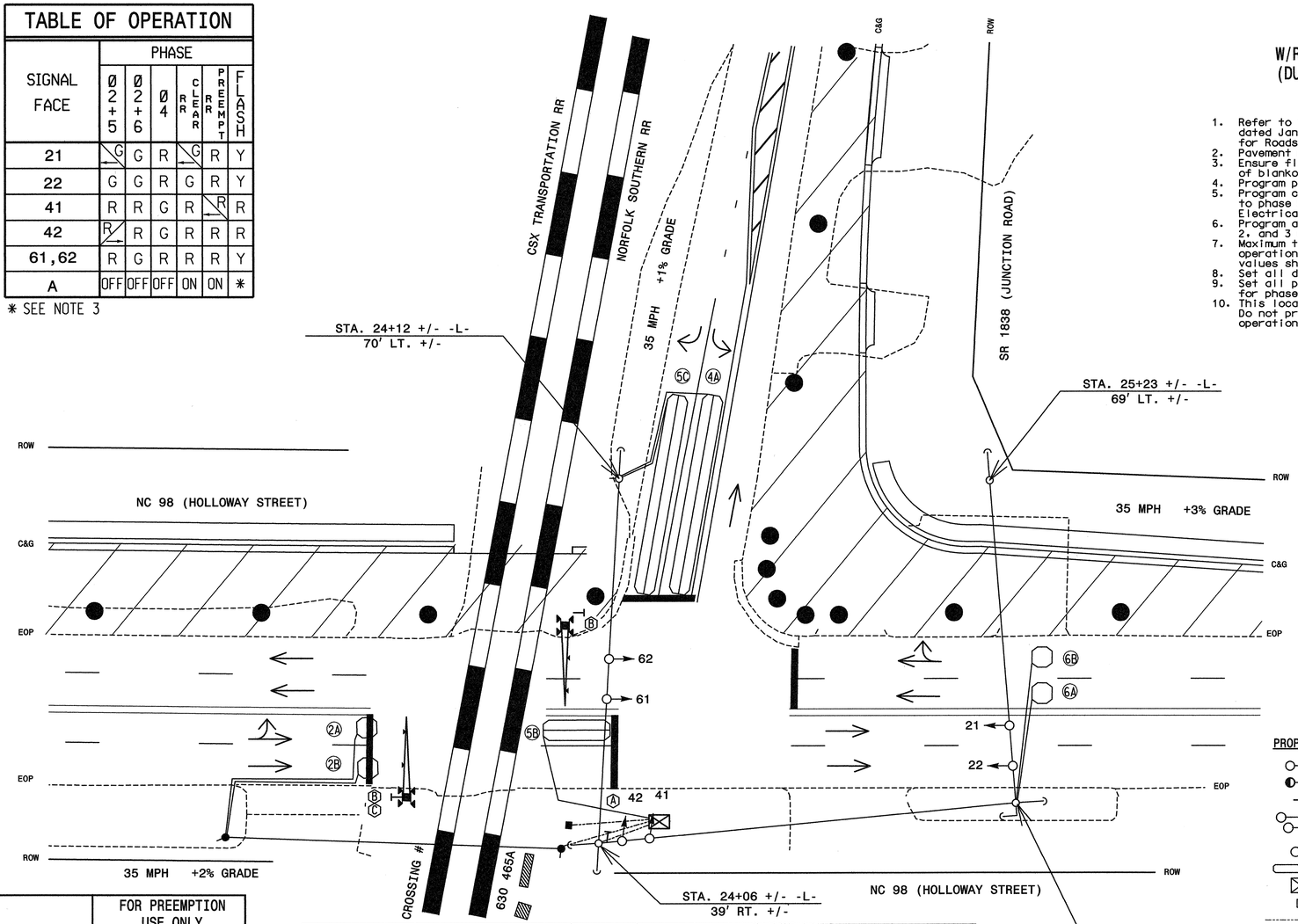
TABLE OF OPERATION

SIGNAL FACE	PHASE Ø2+5	Ø2+6	Ø4	RR CLEAR	RR PREEMPT	FLASH
21	G	G	R	G	R	Y
22	G	G	R	G	R	Y
41	R	R	G	R	R	R
42	R	R	G	R	R	R
61,62	R	G	R	R	R	Y
A	OFF	OFF	OFF	ON	ON	*

* SEE NOTE 3

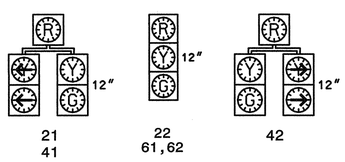
NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2002 and "Standard Specifications for Roads and Structures" dated January 2002.
2. Pavement markings are existing.
3. Ensure flashing operation does not alter operation of blankout signs.
4. Program phase 5 as protective/permissive.
5. Program controller to clear from phases 2 + 6 to phase 5 by progressing through phase 4 (see Electrical Details).
6. Program all timing information into phase banks 1, 2, and 3 unless otherwise noted.
7. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values shall supersede these values.
8. Set all detector units to presence mode.
9. Set all phase bank 3 maximum limit to 250 seconds for phases used.
10. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.



SIGNAL FACE I.D.

Denotes L.E.D.



TIMING CHART
170 CONTROLLER

PHASE	Ø2	Ø4	Ø5	Ø6	FOR PREEMPTION USE ONLY
MINIMUM INITIAL	10 SEC.	7 SEC.	7 SEC.	10 SEC.	--
VEHICLE EXTENSION	3.0 SEC.	1.0 SEC.	3.0 SEC.	3.0 SEC.	--
YELLOW CHANGE INT.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.
RED CLEARANCE	1.0 SEC.	1.0 SEC.	1.0 SEC.	1.0 SEC.	1.0 SEC.
MAXIMUM LIMIT	45 SEC.	25 SEC.	15 SEC.	45 SEC.	--
RECALL POSITION	VEH. RECALL	NONE	NONE	VEH. RECALL	NONE
VEHICLE CALL MEMORY	YELLOW LOCK	NONE	NONE	YELLOW LOCK	NONE
DOUBLE ENTRY	OFF	OFF	OFF	OFF	OFF
WALK	- SEC.	- SEC.	- SEC.	- SEC.	--
FLASHING DON'T WALK	- SEC.	- SEC.	- SEC.	- SEC.	--
TYPE 3 LIMIT	- SEC.	- SEC.	- SEC.	- SEC.	--
ALTERNATE EXTENSION	- SEC.	- SEC.	- SEC.	- SEC.	--
ADD PER VEHICLE	- SEC.	- SEC.	- SEC.	- SEC.	--
MAXIMUM INITIAL	- SEC.	- SEC.	- SEC.	- SEC.	--
MAXIMUM GAP	3.0 SEC.	1.0 SEC.	3.0 SEC.	3.0 SEC.	--
REDUCE 0.1 SEC EVERY	- SEC.	- SEC.	- SEC.	- SEC.	--
MINIMUM GAP	3.0 SEC.	1.0 SEC.	3.0 SEC.	3.0 SEC.	--

LOOP & DETECTOR UNIT INSTALLATION CHART
170 CONTROLLER AND CABINET

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,2B	6X6	4	70	X		2	SEC.	SEC.					X		X		–	X	
4A	6X60	2-4-2	0	X		4	3 SEC.	SEC.					X		X		–	X	
5B	6X30	2-4-2	0	X		2	3 SEC.	SEC.	X				X		X		–	X	
						5	15 SEC.	SEC.					X		X		–	X	
						4	15 SEC.	SEC.							X		–	X	
5C	6X60	2-4-2	0	X		5	SEC.	SEC.					X		X		–	X	
						4	15 SEC.	SEC.							X		–	X	
6A,6B	6X6	4	70	X		6	SEC.	SEC.					X		X		–	X	

RAILROAD PREEMPTION

FUNCTION	SECONDS
DELAY BEFORE PREEMPT	0
TRACK CLEARANCE GREEN	13

LEGEND

PROPOSED		EXISTING
	Traffic Signal Head	
	Modified Signal Head	N/A
	Sign	
	Signal Pole with Guy	
	Signal Pole with Sidewalk Guy	
	Utility Pole	
	Inductive Loop Detector	
	Controller & Cabinet	
	Junction Box	
	2-in Underground Conduit	
N/A	Right of Way with Marker	
	Directional Arrow	
	Pavement Marking Arrow	
N/A	Construction Zone	
N/A	Construction Drum	
N/A	Railroad Tracks	
N/A	Railroad Gate	
N/A	Railroad Cabinet	
Ⓐ	L.E.D. Blankout Sign "NO RIGHT TURN - TRAIN"	Ⓐ
Ⓑ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓑ
Ⓒ	"STOP HERE WHEN FLASHING" Sign (R8-10)	Ⓒ

PLAN QUANTITIES

Pay Item	Feet
Signal Cable	690
Messenger Cable	420
Lead-in Cable	750

TEMPORARY DESIGN 1 - CONSTRUCTION PHASE I

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

Prepared in the Offices of:
Traffic Engineering and Safety Systems Branch
Signals and Geometrics Section
122 N. McDowell St., Raleigh, NC 27603

NC 98 (HOLLOWAY STREET)
AT
SR 1838 (JUNCTION ROAD)

DIVISION 5 DURHAM CO. DURHAM

PLAN DATE: JANUARY 2004 REVIEWED BY: MAK
PREPARED BY: CED REVIEWED BY:

SCALE 0 20 1"=20'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 17464 ENGINEER MARGARET ANN KUBILINS

SIGNATURE DATE

SIG. INVENTORY NO. 05-0138 T1