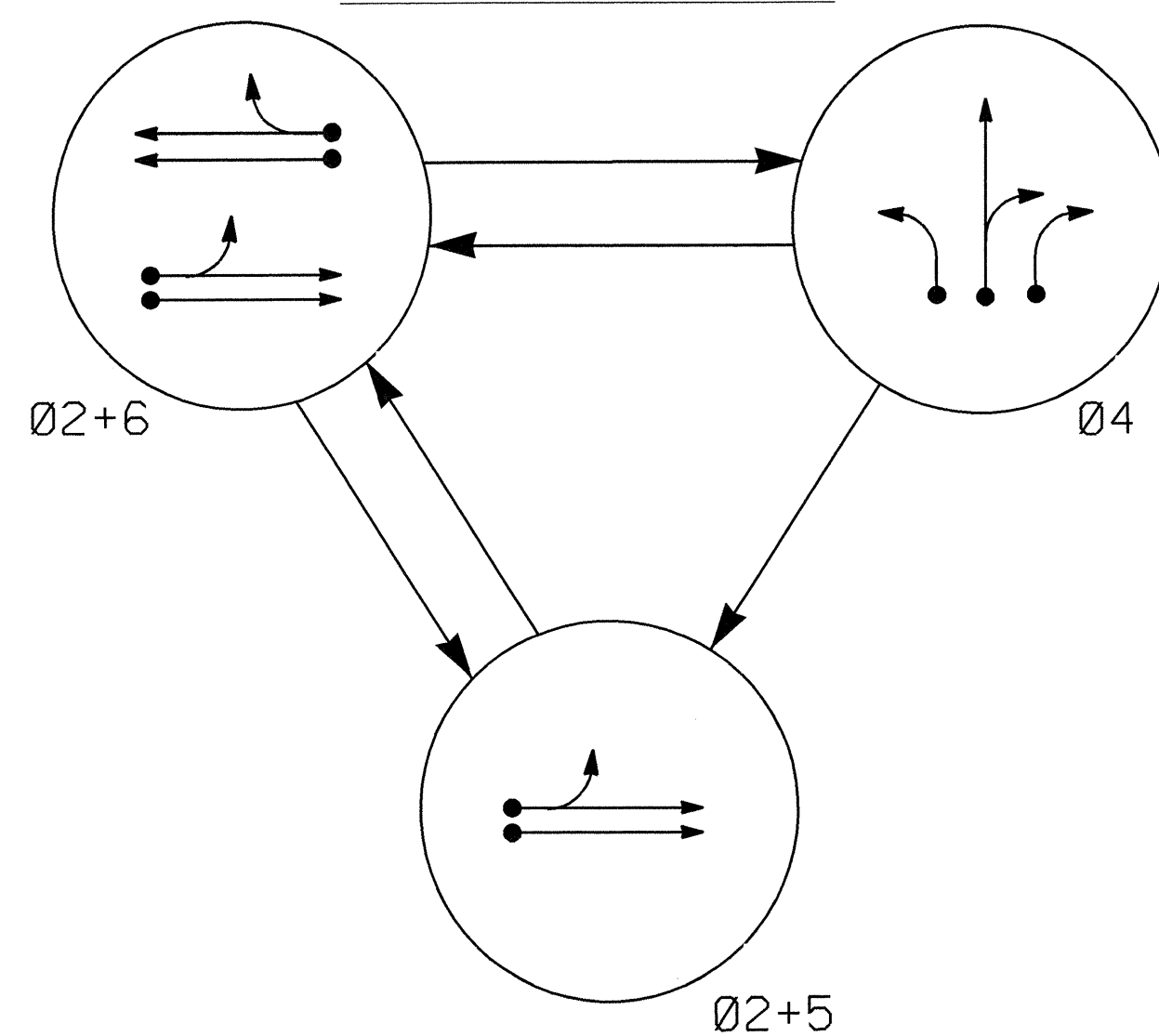


PHASING DIAGRAM



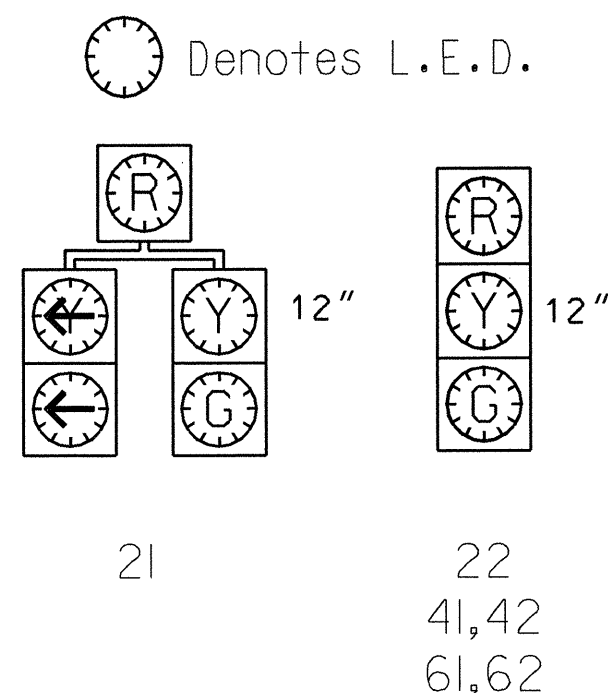
PHASING DIAGRAM DETECTION LEGEND

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

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	Ø2+5	Ø2+6	Ø4	FLASH
21	G	G	R	Y
22	G	G	R	Y
41,42	R	R	G	R
61,62	R	G	R	Y

SIGNAL FACE I.D.



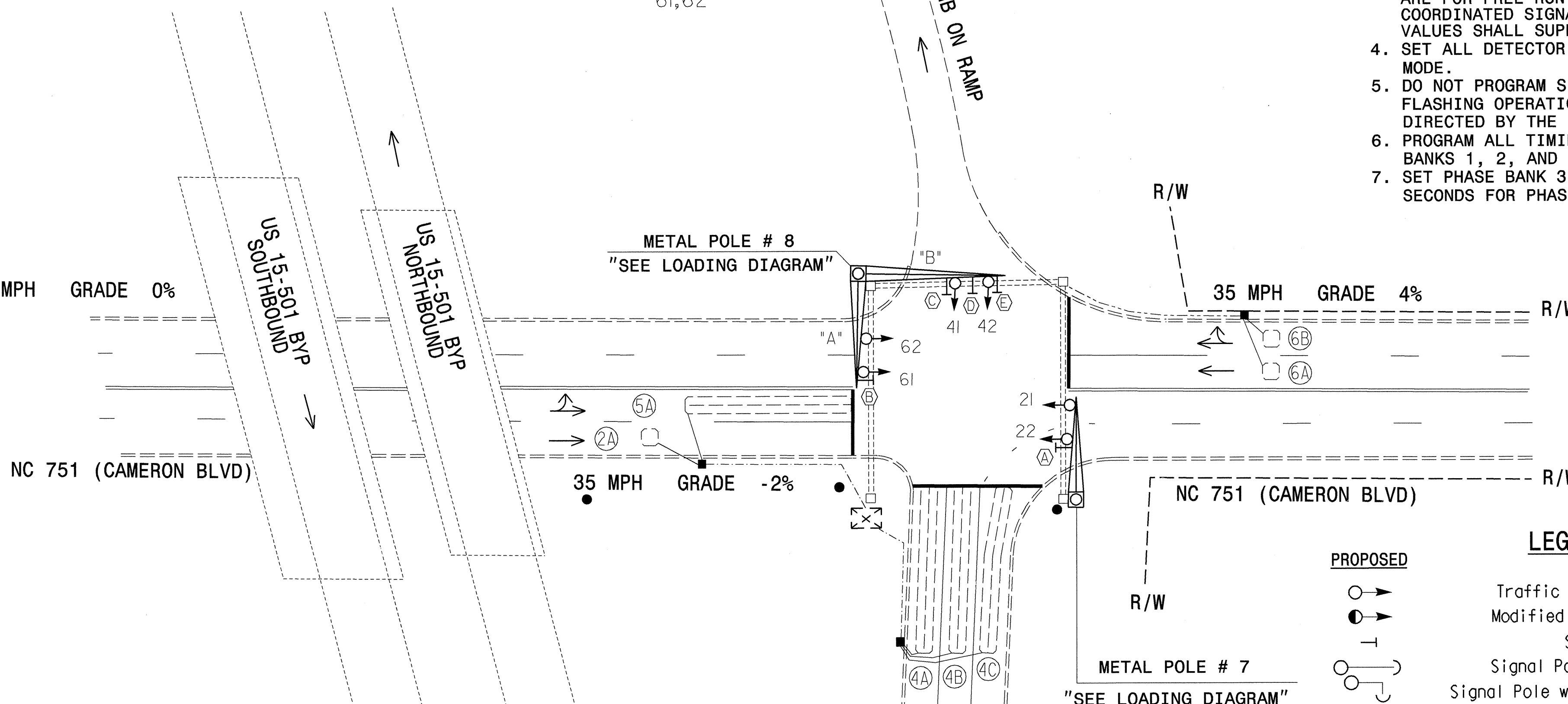
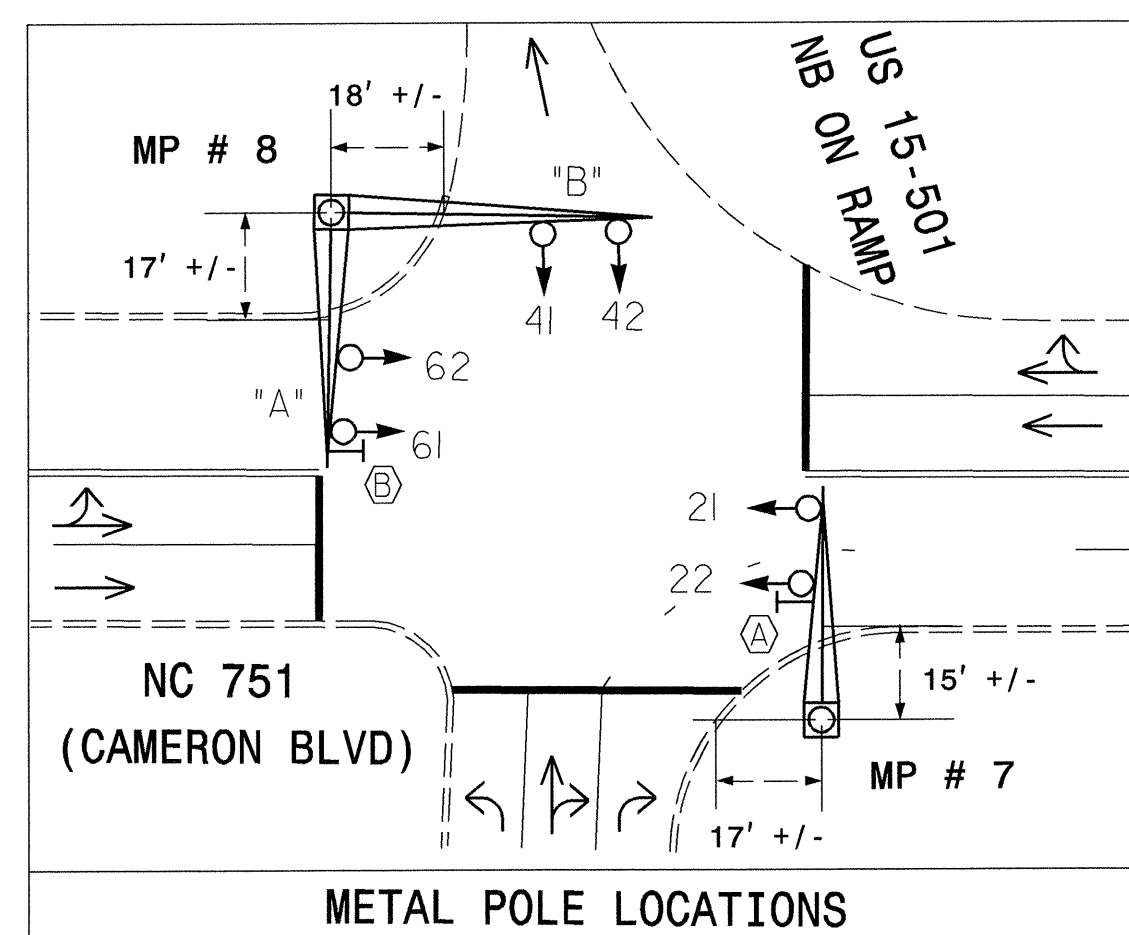
PLAN QUANTITIES

Pay Item	Feet
Signal Cable	605
Messenger Cable	—
Lead-in Cable	210

3 Phase Fully Actuated (Durham Signal System)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT", DATED JANUARY 2002 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2002.
- PAVEMENT MARKINGS ARE EXISTING.
- MAXIMUM TIMES SHOWN IN TIMING CHART ARE FOR FREE-RUN OPERATIONS ONLY. COORDINATED SIGNAL SYSTEM TIMING VALUES SHALL SUPERSEDE THESE VALUES.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- 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.



DETECTOR ZONE AND CONTROLLER INSTALLATION CHART
170 CONTROLLER AND CABINET

ZONE NO.	SIZE (FT)	DIST. FROM STOPBAR (FT)	NEW EXISTING	NEMA PHASE	CONTROLLER PROGRAMMING												STATUS		
					TIMING		ATTRIBUTES										NEW	EXISTING	
					DELAY	CARRY (STRETCH)	1	2	3	4	5	6	7	8	9	10			11
2A	6X6	70	X	Ø2	—	SEC.	—	SEC.										X	
4A	6X60	0	X	Ø4	—	SEC.	—	SEC.						X	X			X	
4B	6X60	0	X	Ø4	10	SEC.	—	SEC.						X	X			X	
4C	6X60	0	X	Ø4	15	SEC.	—	SEC.						X	X			X	
5A	6X60	0	X	Ø2	—	SEC.	—	SEC.						X	X			X	
6A	6X6	70	X	Ø6	—	SEC.	—	SEC.						X	X			X	
6B	6X6	70	X	Ø6	—	SEC.	—	SEC.						X	X			X	

TIMING CHART
170 CONTROLLER

PHASE	Ø2	Ø4	Ø5	Ø6
MINIMUM INITIAL	10 SEC.	7 SEC.	7 SEC.	10 SEC.
VEHICLE EXTENSION	2.0 SEC.	1.0 SEC.	1.0 SEC.	2.0 SEC.
YELLOW CHANGE INT.	4.0 SEC.	4.0 SEC.	4.0 SEC.	4.0 SEC.
RED CLEARANCE	1.5 SEC.	1.5 SEC.	1.5 SEC.	1.5 SEC.
MAXIMUM LIMIT	30 SEC.	20 SEC.	15 SEC.	30 SEC.
RECALL POSITION	VEH RECALL	NONE	NONE	VEH RECALL
VEHICLE CALL MEMORY	YELLOW LOCK	NONE	NONE	YELLOW LOCK
DOUBLE ENTRY	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	2.0 SEC.	1.0 SEC.	1.0 SEC.	2.0 SEC.
REDUCE 0.1 SEC EVERY	— SEC.	— SEC.	— SEC.	— SEC.
MINIMUM GAP	2.0 SEC.	1.0 SEC.	1.0 SEC.	2.0 SEC.

- LEGEND**
- | | | | |
|--|--|--|--|
| | PROPOSED Traffic Signal Head | | EXISTING Traffic Signal Head |
| | PROPOSED Modified Signal Head | | EXISTING Modified Signal Head |
| | PROPOSED Sign | | EXISTING Sign |
| | PROPOSED Signal Pole with Guy | | EXISTING Signal Pole with Guy |
| | PROPOSED Signal Pole with Sidewalk Guy | | EXISTING Signal Pole with Sidewalk Guy |
| | PROPOSED Inductive Loop Detector | | EXISTING Inductive Loop Detector |
| | PROPOSED Controller & Cabinet | | EXISTING Controller & Cabinet |
| | PROPOSED Junction Box | | EXISTING Junction Box |
| | PROPOSED 2" Underground Conduit | | EXISTING 2" Underground Conduit |
| | PROPOSED Directional Arrow | | EXISTING Directional Arrow |
| | PROPOSED Directional Drill | | EXISTING Directional Drill |
| | PROPOSED 2-50 mm Polyethylene Conduit | | EXISTING 2-50 mm Polyethylene Conduit |
| | PROPOSED Metal Pole with Mastarm | | EXISTING Metal Pole with Mastarm |
| | PROPOSED No Right Turn Sign (R3-1) | | EXISTING No Right Turn Sign (R3-1) |
| | PROPOSED No Left Turn Sign (R3-2) | | EXISTING No Left Turn Sign (R3-2) |
| | PROPOSED Left Arrow "ONLY" Sign (R3-5L) | | EXISTING Left Arrow "ONLY" Sign (R3-5L) |
| | PROPOSED Combined Through and Right Arrow Sign (R3-6R) | | EXISTING Combined Through and Right Arrow Sign (R3-6R) |
| | PROPOSED Right Arrow "ONLY" Sign (R3-5R) | | EXISTING Right Arrow "ONLY" Sign (R3-5R) |

SIGNAL UPGRADE

PLANS PREPARED BY :
RUMMEL KLEPPER & KAHL, LLP
consulting engineers
 5800 FARINGDON PLACE SUITE 105
 RALEIGH, NORTH CAROLINA 27609-3960

FOR
DIVISION OF HIGHWAYS

Prepared for the Offices of:

 122 N. McDowell St., Raleigh, NC 27603

US 15-501 BYP NB RAMPS AT NC 751 (CAMERON BOULEVARD)

DIVISION 05 DURHAM COUNTY DURHAM NC
 PLAN DATE: 08-15-04 REVIEWED BY: D.W. MORTON
 PREPARED BY: C.B. HOLDEN R&K PROJECT NO. 302-079-SIG6

REVISIONS: _____ INIT. DATE

SCALE: 0' 15' 30' Horiz.

SEAL

 9-3-04
 SIGNATURE DATE
 SIG. INVENTORY NO. 05-2251