

PROJECT: R-5515

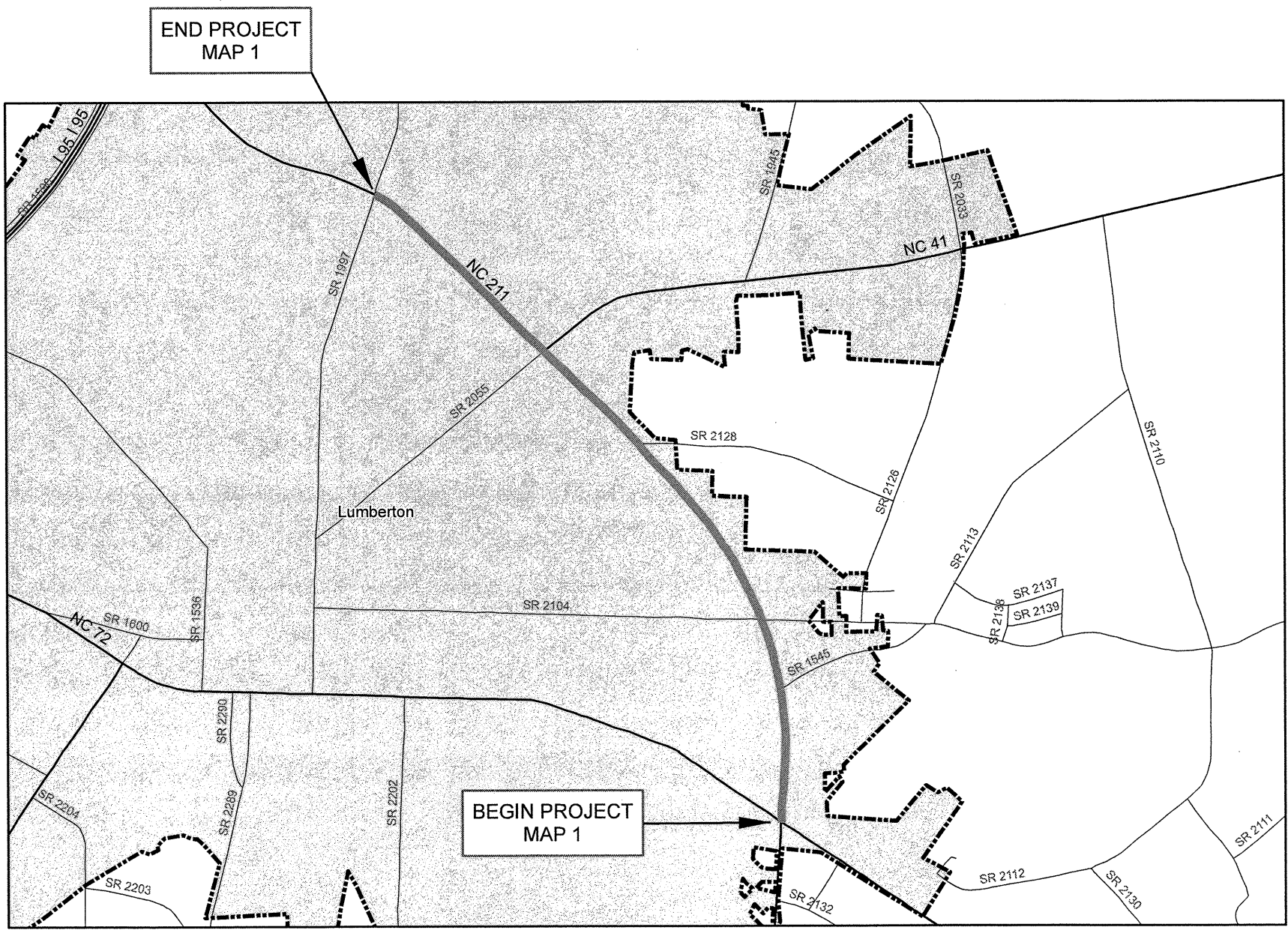
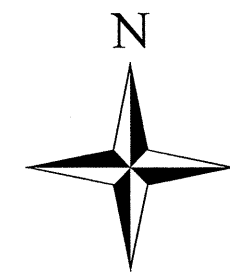
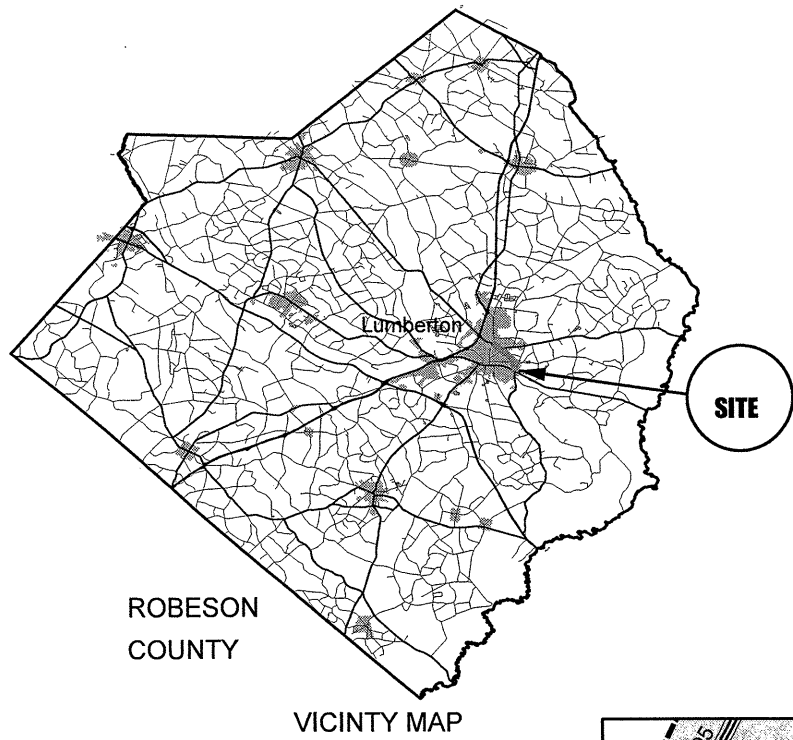
CONTRACT: C203440

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

### ROBESON COUNTY

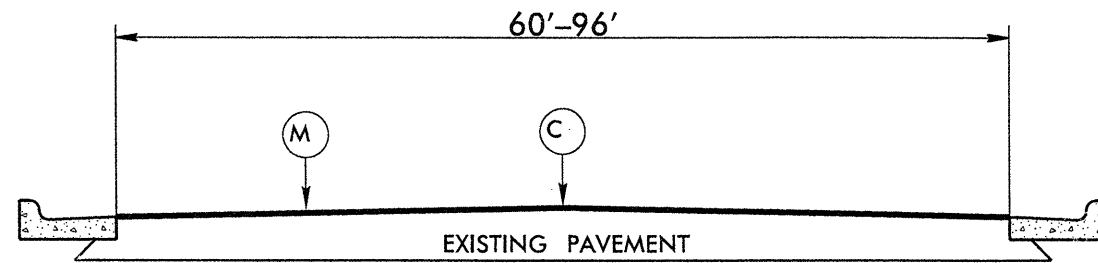
LOCATION: NC 211, LOCATED BETWEEN NC 72  
AND SR 1997  
TYPE OF WORK: MILLING AND RESURFACING

STATE	STATE PROJECT REFERENCE NO.	SHEET	TOTAL SHEETS
N.C.	R-5515	1	
STATE PROJ. NO.	E.A. PROJ. NO.		
45469.3.FR1	STP-0211(28)		



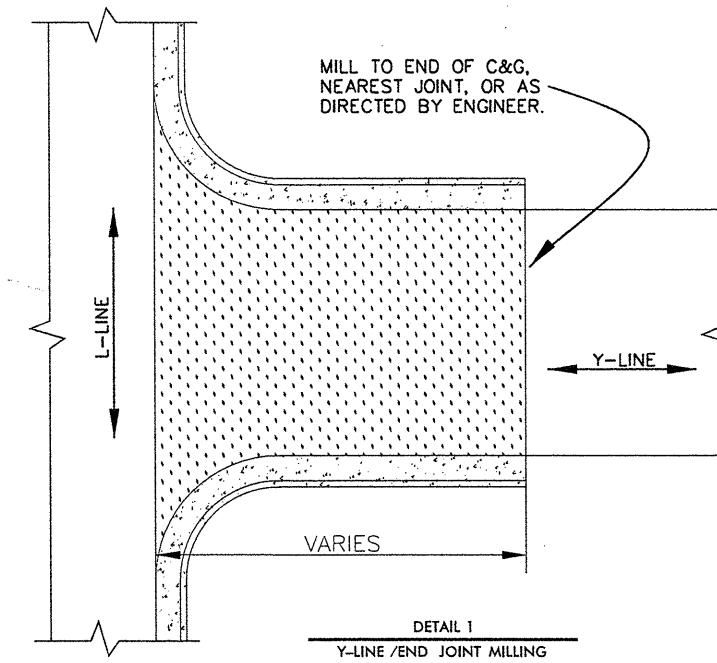
#### Legend

- Project
- Primary Routes
- Secondary Routes
- Municipal Boundaries
- County Boundary



TYPICAL SECTION NO. 1

PAVEMENT SCHEDULE	
C	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
M	MILLING BITUMINOUS PAVEMENT. 1½" DEPTH. FULL WIDTH.



NOTE: INCLUDES INCIDENTAL MILLING AT THE ENDS OF SECTIONS FOR SMOOTH TIE-INS, CURB RADII, AND STREET INTERSECTIONS, AS NEEDED, OR AS DIRECTED BY THE ENGINEER.

PROJECT NO.	SHEET NO.	TOTAL NO.
R-5515	3	

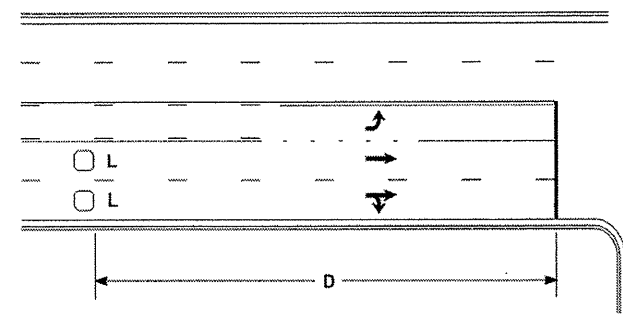
### SUMMARY OF QUANTITIES

PROJECT NO.	COUNTY	MAP NO.	ROUTE	DESCRIPTION	TYP NO.	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	1½" MILLING SY	INCIDENTAL MILLING SY	SURFACE COURSE, S9.5C TONS	ASPHALT BINDER FOR PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	ADJ. OF MANHOLES EA	ADJ. OF METER OR VALVE BOX EA	PAVED TRENCHING (1 CONDUIT-2") LF	UNPAVED TRENCHING (1 CONDUIT-2") LF	JUNCTION BOX (STANDARD SIZE) EA	JUNCTION BOX (OVER-SIZED, HEAVY DUTY) EA	2" RISER WITH WEATHERHEAD EA	INDUCTIVE LOOP SAWCUT LF	LEAD-IN CABLE (142) LF
R-5515	Robeson	1	NC 211	FROM CONST JNT SOUT OF RXR (MP 10.1) TO NC 72 (MP 7.73)	1	NO	NO	1.3	60	55,800	2,000	4,069	240	20	25	5	30.00	300.00	3	3	3	3,500.00	300.00
		"	"	FROM CONST JNT SOUT OF RXR TO NC 72	1	NO	NO	0.5	72	21,120		1,995	118	15									
		"	"	FROM CONST JNT SOUT OF RXR TO NC 72	1	NO	NO	0.5	84	24,640		2,603	154	15									
<b>TOTAL FOR MAP NO. 1</b>								<b>2.3</b>		<b>101,560</b>	<b>2,000</b>	<b>8,667</b>	<b>512</b>	<b>50</b>	<b>25</b>	<b>5</b>	<b>30</b>	<b>300</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3,500</b>	<b>300</b>
<b>TOTAL FOR PROJ NO. R-5515</b>								<b>2.3</b>		<b>101,560</b>	<b>2,000</b>	<b>8,667</b>	<b>512</b>	<b>50</b>	<b>25</b>	<b>5</b>	<b>30</b>	<b>300</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3,500</b>	<b>300</b>
<b>GRAND TOTAL</b>								<b>2.3</b>		<b>101,560</b>	<b>2,000</b>	<b>8,667</b>	<b>512</b>	<b>50</b>	<b>25</b>	<b>5</b>	<b>30</b>	<b>300</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3,500</b>	<b>300</b>

### THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO.	COUNTY	MAP NO.	ROUTE	DESCRIPTION	TYP NO.	LENGTH	WIDTH	4589000000-N	4595000000-E	4510000000-N	4686000000-E		4695000000-E		4710000000-E	4721000000-E	4725000000-E			4810000000-E		4820000000-E	4900000000-N		5255000000-N	
								GENERIC TRAFFIC CONTROL ITEM TEMPORARY TRAFFIC CONTROL LS	GENERIC SIGNING ITEM WORK ZONE ADVANCE GENERAL WARNING SIGNING SF	LAW ENFORCEMENT HR	4" X 120 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	8" X 90 M WHITE THERMO LF	8" X 90 M YELLOW THERMO LF	24" X 120 M WHITE THERMO LF	THERMO MSG ONLY 120 M EA	THERMO LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO STR ARROW 90 M EA	4" WHITE PAINT LF	4" YELLOW PAINT LF	8" WHITE PAINT LF	CRYSTAL & RED MARKERS EA	YELLOW & YELLOW MARKERS EA	PORTABLE LIGHTING LS	
R-5515	Robeson	1	NC 211	FROM CONST JNT SOUT OF RXR (MP 10.1) TO NC 72 (MP 7.73)	1	1.3	60	1	126	120	8,600	27,500	450	125	400	4	101	32	26	8,600	27,500	450	450	325	1	
		"	"	FROM CONST JNT SOUT OF RXR TO NC 72	1	0.5	72																			
		"	"	FROM CONST JNT SOUT OF RXR TO NC 72	1	0.5	84																			
<b>TOTAL FOR MAP NO. 1</b>								<b>2.3</b>	<b>1</b>	<b>126</b>	<b>120</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>125</b>	<b>400</b>	<b>4</b>	<b>101</b>	<b>32</b>	<b>26</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>450</b>	<b>325</b>	<b>1</b>
<b>TOTAL FOR PROJ NO. R-5515</b>								<b>2.3</b>	<b>1</b>	<b>126</b>	<b>120</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>125</b>	<b>400</b>	<b>4</b>	<b>101</b>	<b>32</b>	<b>26</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>450</b>	<b>325</b>	<b>1</b>
<b>GRAND TOTAL</b>								<b>2.3</b>	<b>1</b>	<b>126</b>	<b>120</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>125</b>	<b>400</b>	<b>4</b>	<b>101</b>	<b>32</b>	<b>26</b>	<b>8,600</b>	<b>27,500</b>	<b>450</b>	<b>450</b>	<b>325</b>	<b>1</b>

### High Speed Detection [≥40 mph (64 km/hr)]

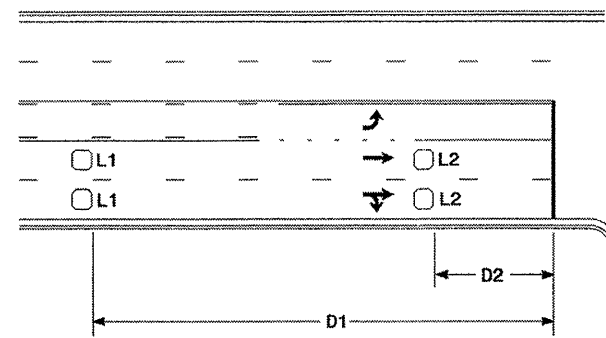


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

L = 6ft X 6ft (1.8m X 1.8m)  
Wired in series for TS1  
Controllers  
Wired separately for TS2,  
170, and 2070L Controllers

Volume Density Operation

OR

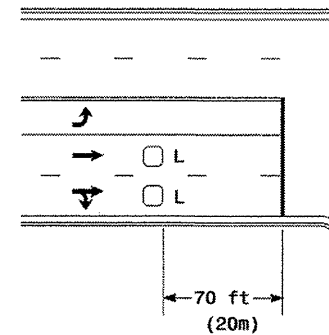


Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

L1 = 6ft X 6ft  
(1.8m X 1.8m)  
Wired in series  
L2 = 6ft X 6ft  
(1.8m X 1.8m)  
Wired in series

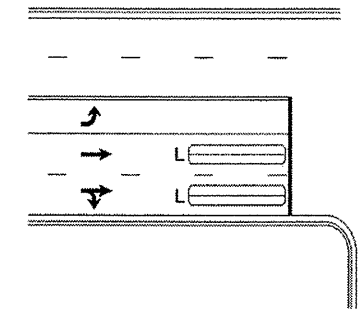
"Stretch" Operation

### Low Speed Detection [≤35 mph (56 km/hr)]



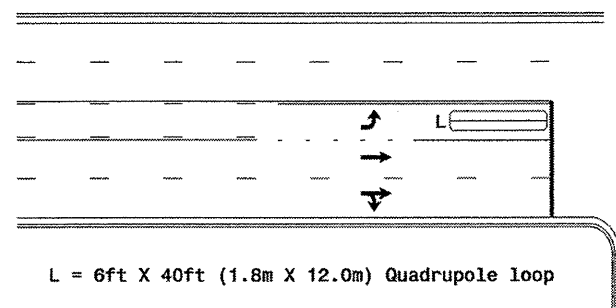
L = 6ft X 6ft (1.8m X 1.8m)  
Wired in series

OR



L = 6ft X 40ft (1.8m X 12.0m)  
Quadrupole loop, wired separately

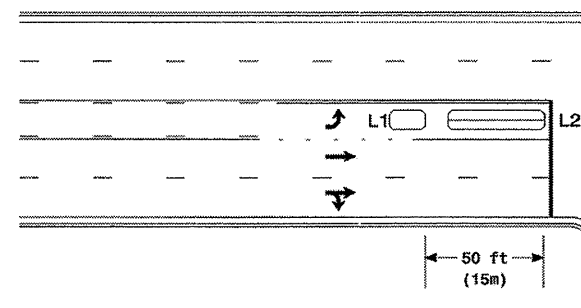
### Left Turn Lane Detection



L = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

Presence Loop Detection

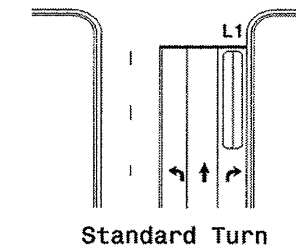
OR



L1 = 6ft X 15ft (1.8m X 4.6m) Queue detector  
L2 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop

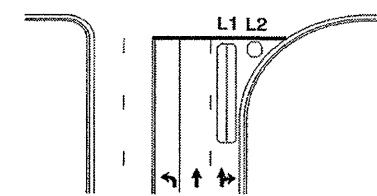
Queue Loop Detection

### Right Turn Lane Detection

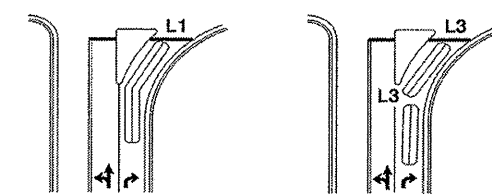


Standard Turn

L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop  
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop  
Wired separately  
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop  
Wired in series

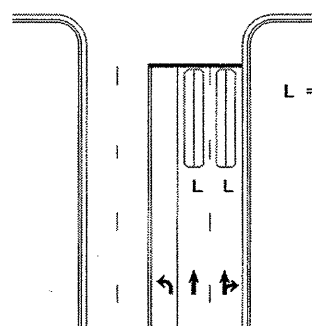


Wide Radius Turn



Channelized Turn

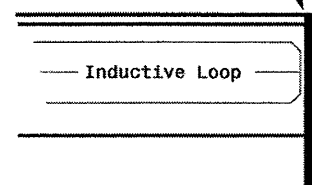
### Side Street Detection



L = 6ft X 40ft (1.8m X 12.0m)  
Quadrupole loop  
Wired to separate  
detectors/channels

### Presence Loop Placement at Stop Lines

Locate loop slightly  
behind leading  
edge of stop line



Note:  
Loop may be located in advance  
of stop line when stop line is  
greater than 15' (4.5m) from edge  
of intersecting roadway; or, when  
loop detects a permissive or  
protected/permissive left turn.

### Recommended Number of Turns

Single 6' X 6' (1.8m X 1.8m)  
loop (wired separately):

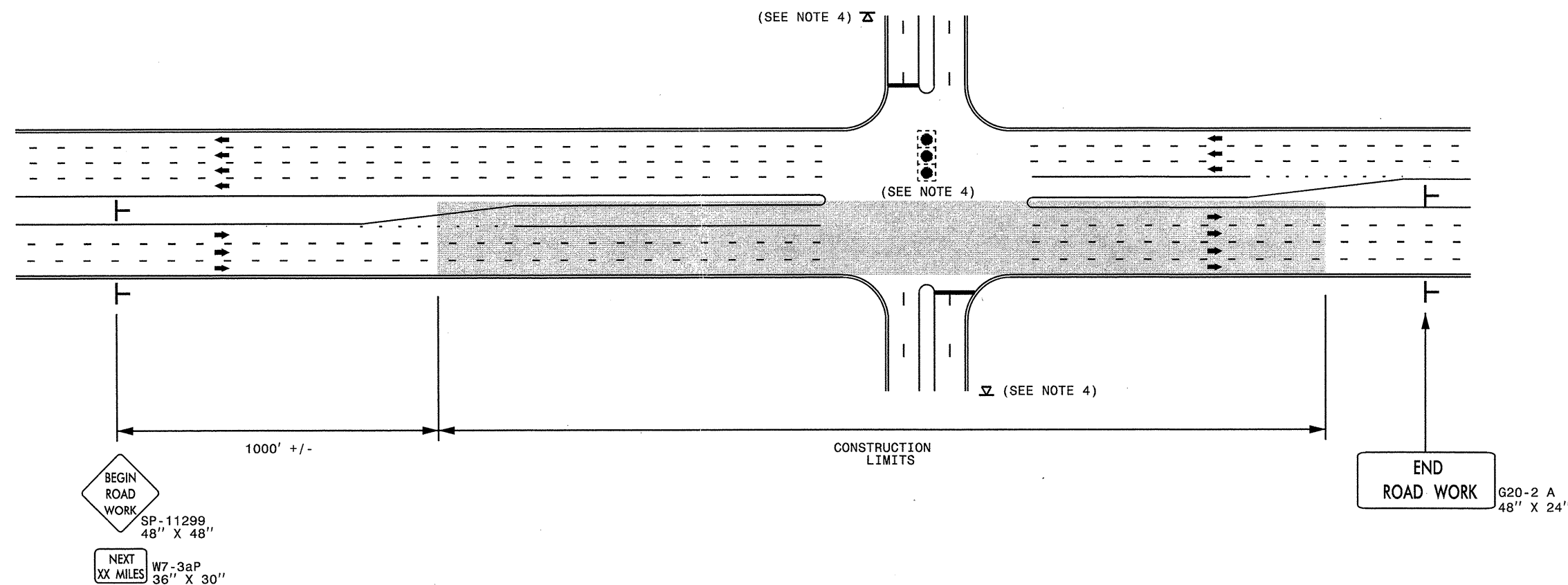
Length of Lead-in ft (m)	Number of Turns
< 250 (75)	3
250-375 (75-115)	4
375-525 (115-160)	5
> 525 (160)	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' (1.8m X 4.6m) Loops:  
Lead-in < 150' (45 m), use 2 turns  
Lead-in > 150' (45 m), use 3 turns

	<b>Typical Loop Locations</b>		
	PLAN DATE: June 2006 PREPARED BY: P. L. Alexander	REVIEWED BY: REVIEWED BY:	

## URBAN / SUBURBAN WORKZONES

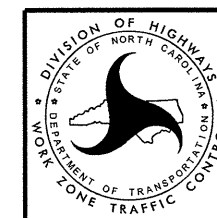


### NOTES:

- 1) 48" x 48" SIZED SIGNS (SP- 11299) MAY BE REDUCED TO 36" X 36" ON ROADWAYS WITH SPEED LIMITS OF 40 MPH OR LESS.
- 2) MOUNT SIGNS THAT ARE LARGER THAN 10 SQUARE FEET IN AREA ON TWO OR MORE WOOD OR U-CHANNEL SUPPORTS. PERFORATED SQUARE TUBING SUPPORT SYSTEMS MAY SUPPORT LARGER AREAS ON A SINGLE SUPPORT. FOLLOW MANUFACTURER'S RECOMMENDATIONS. THESE SYSTEMS SHALL BE NCHRP 350 COMPLIANT AND NCDOT APPROVED.
- 3) ADVANCE WARNING SIGNS NOT REQUIRED ON NON-SIGNALIZED SIDE STREETS.
- 4) USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AND PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500' IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.
- 5) LATERAL CLEARANCE AT ALL SIGN LOCATIONS SHALL BE 2' AS MEASURED FROM THE EDGE OF PAVEMENT OR THE FACE OF THE CURB. WHEN UNABLE TO OBTAIN THE LATERAL CLEARANCE WITHIN THE MEDIAN AREA USE SHOULDER MOUNTS ONLY.
- 6) SIGN MOUNT LOCATIONS SHALL NOT BLOCK SIDEWALKS OR DRIVEWAYS.
- 7) IF STATIONARY GENERAL WARNING SIGNS ARE USED, THEY WILL BE PAID FOR PER SECTION 104 OF THE NCDOT STANDARD SPECIFICATIONS AS EXTRA WORK.
- 8) IF MILLED AREAS ARE NOT PAVED BACK BY THE END OF THE WORK DAY, PORTABLE SIGNS SHALL BE USED TO WARN DRIVERS OF THE PRESENT CONDITIONS. THESE ARE TO INCLUDE, BUT NOT LIMITED TO "ROUGH ROAD" W8-8, "UNEVEN LANES" W8-11, "GROOVED PAVEMENT" W8-15 w/MOTORCYCLE PLAQUE MOUNTED BELOW. THESE ARE TO BE DOUBLE INDICATED ON MULTI-LANE ROADWAYS WITH SPEED LIMITS 45 MPH AND GREATER WHERE LATERAL CLEARANCE CAN BE OBTAINED WITHIN THE MEDIAN AREAS. THESE PORTABLE SIGNS ARE INCIDENTAL TO THE OTHER ITEMS OF WORK INCLUDED IN THE TEMPORARY TRAFFIC CONTROL (LUMP SUM) PAY ITEM.

### LEGEND

- STATIONARY SIGN
- DIRECTION OF TRAFFIC FLOW



**RESURFACING ADVANCE  
WARNING SIGNS FOR  
URBAN / SUBURBAN  
FACILITIES**