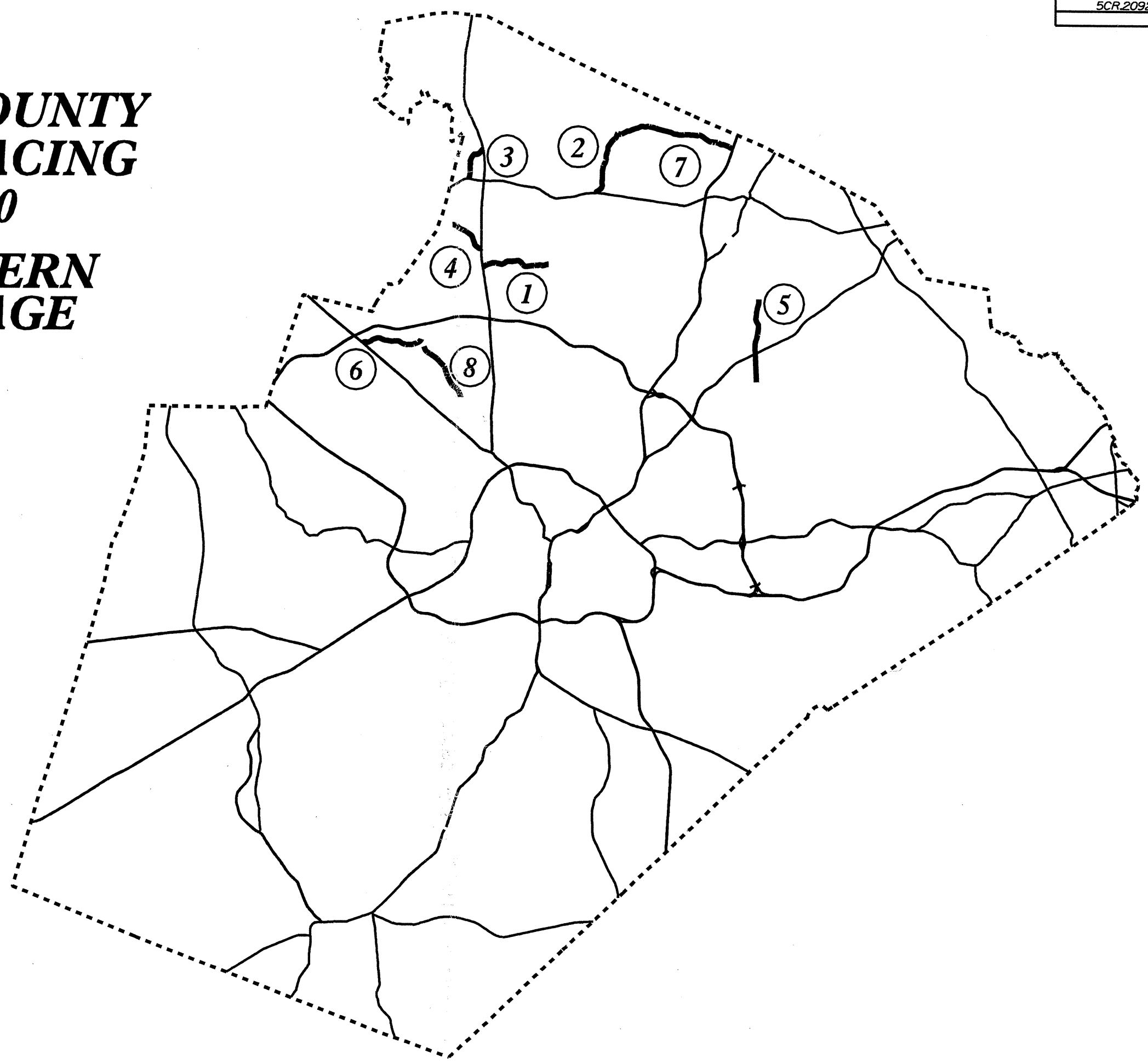
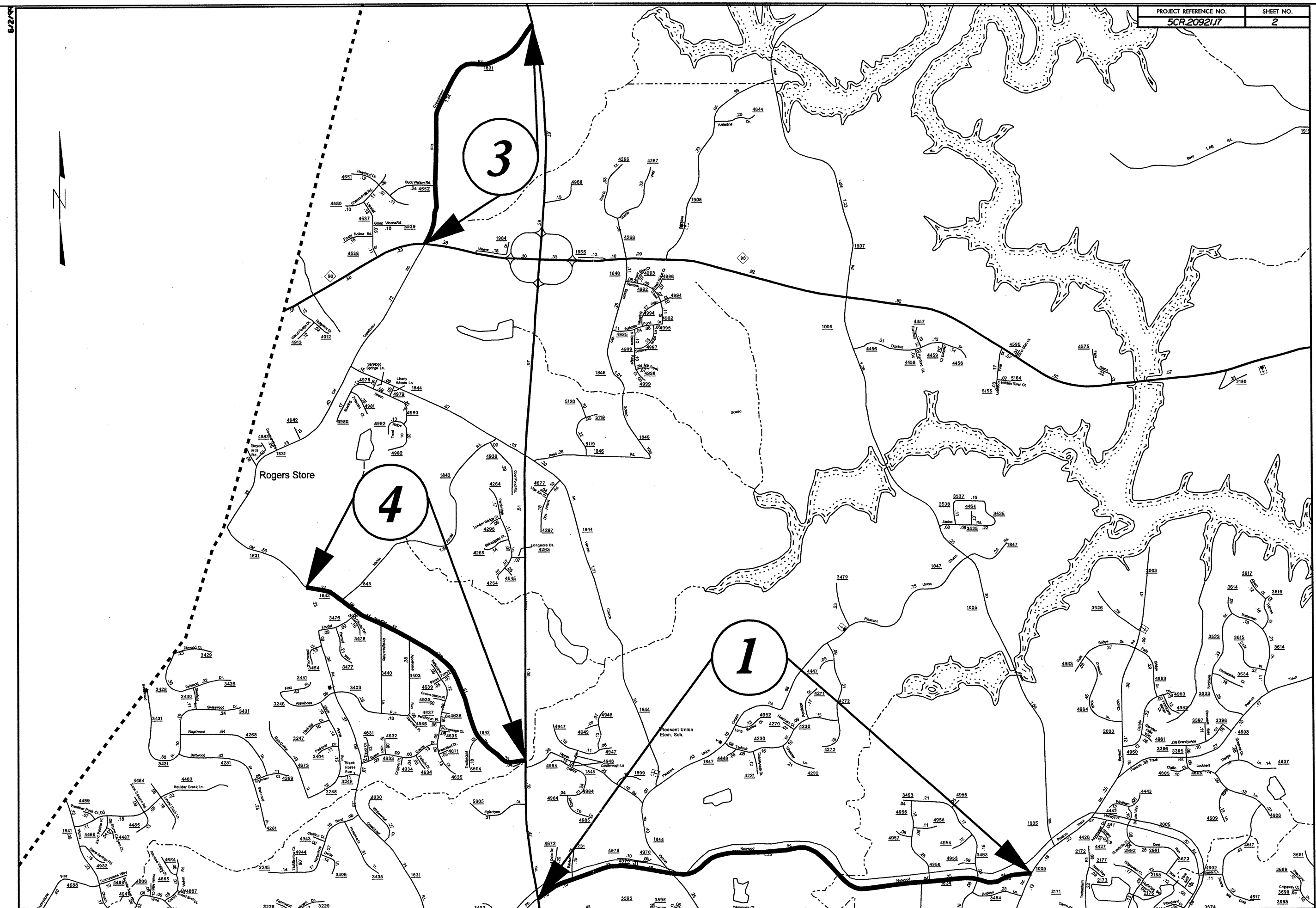
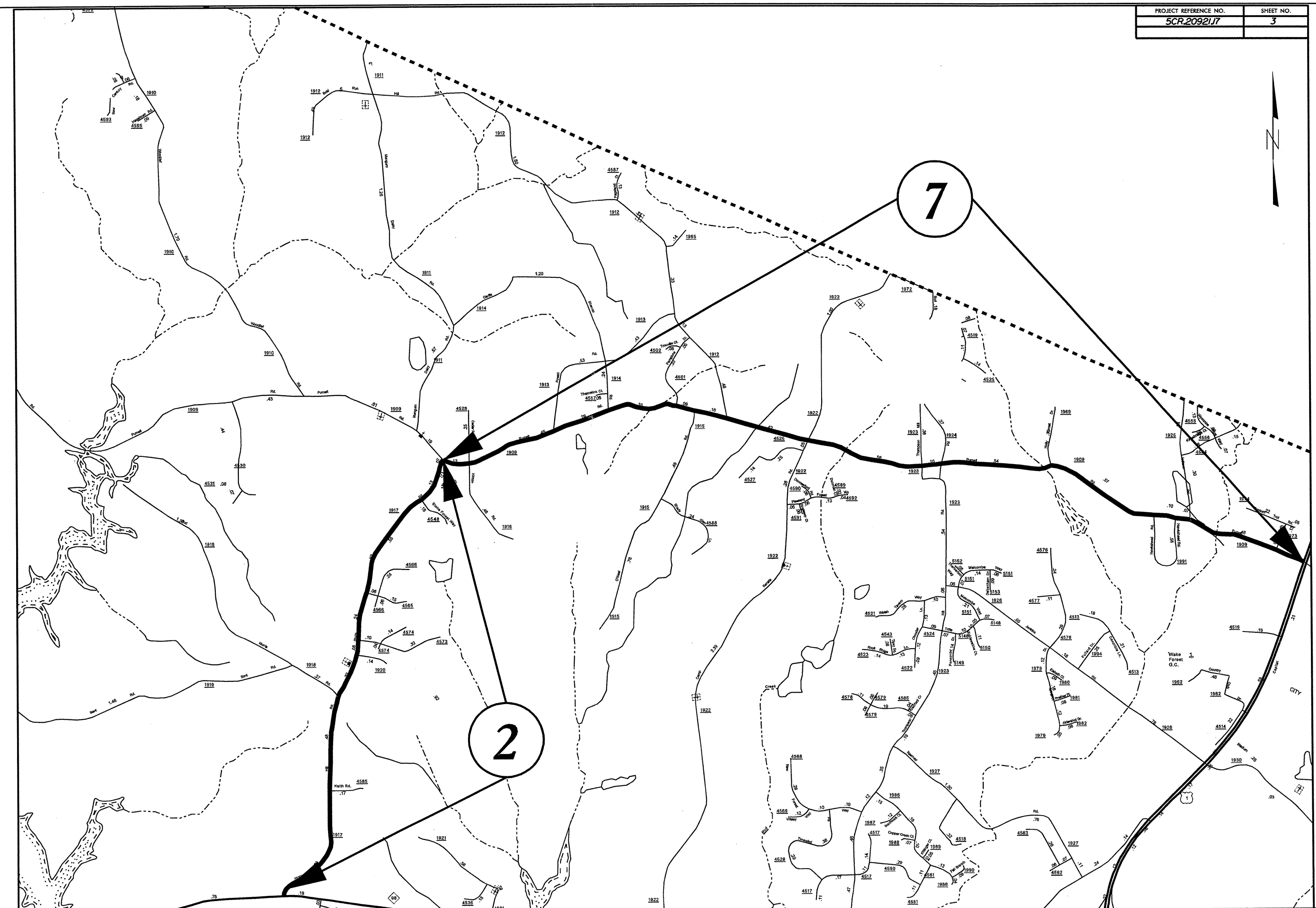


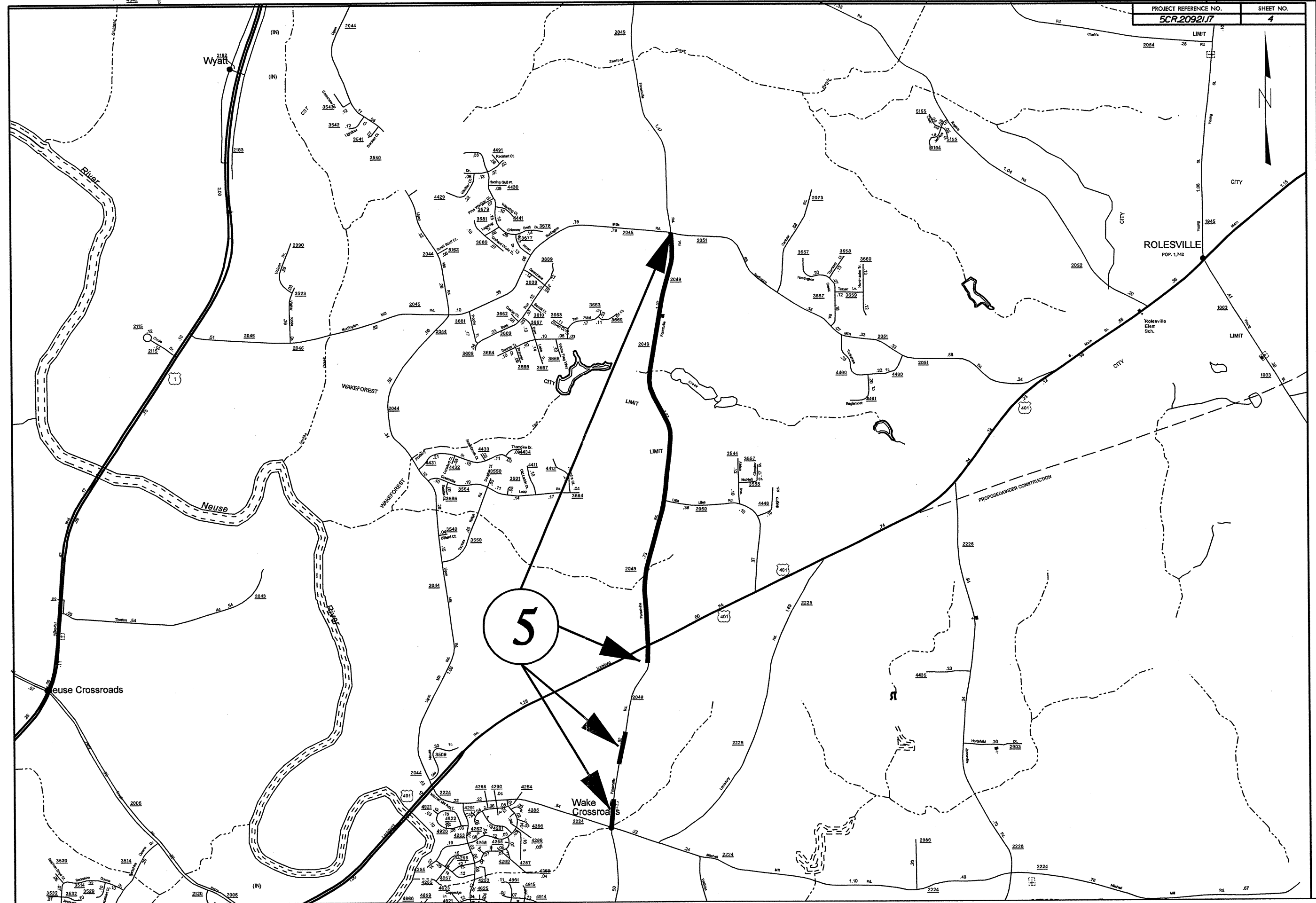
**WAKE COUNTY  
RESURFACING  
2010  
NORTHERN  
PACKAGE**

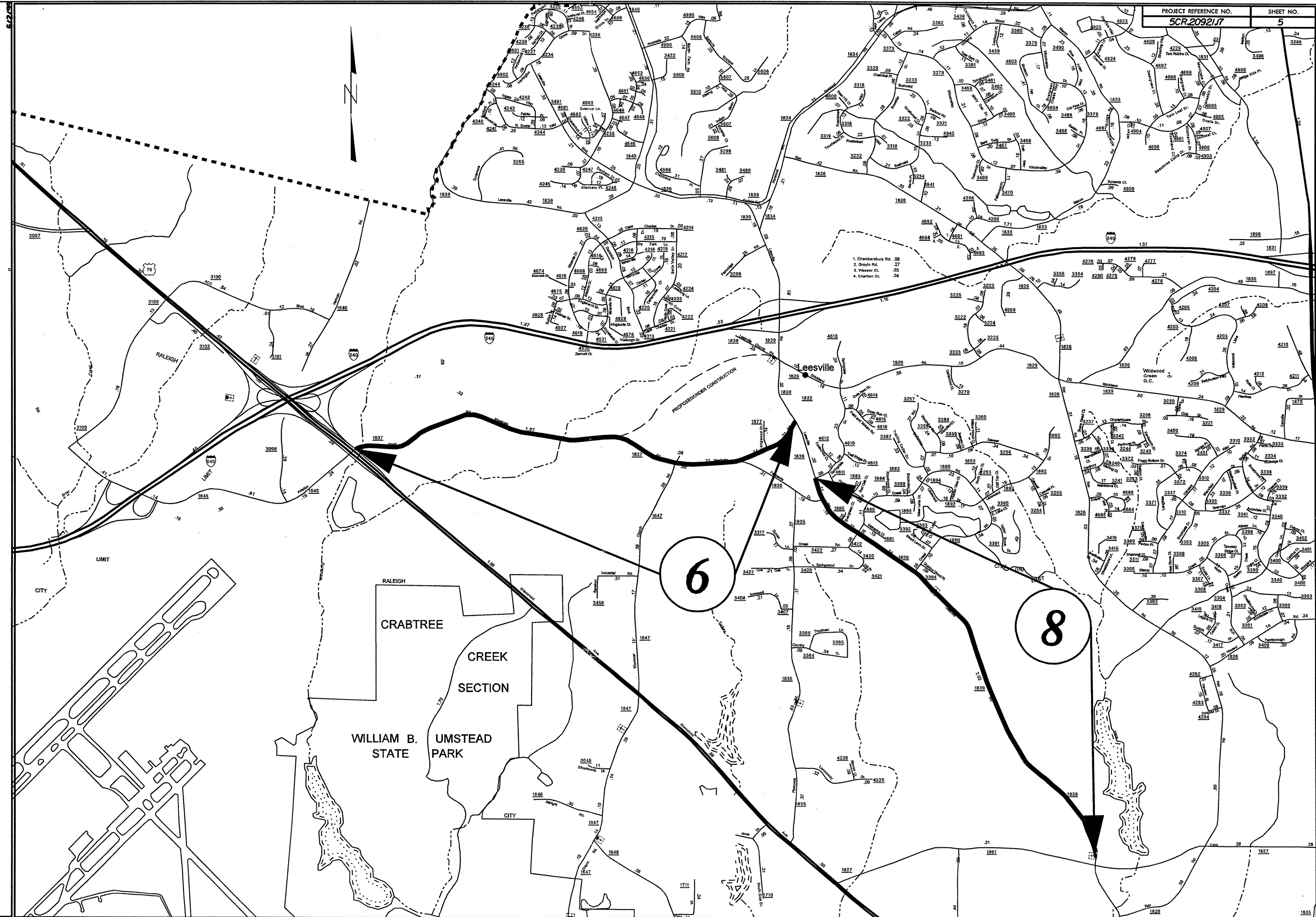




6/22/09



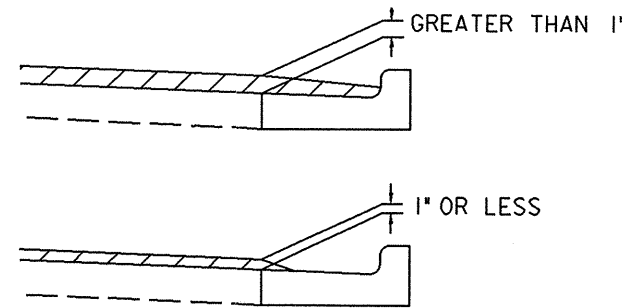




PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
5CR.2092 I.17	6	7

# PAVEMENT SCHEDULE

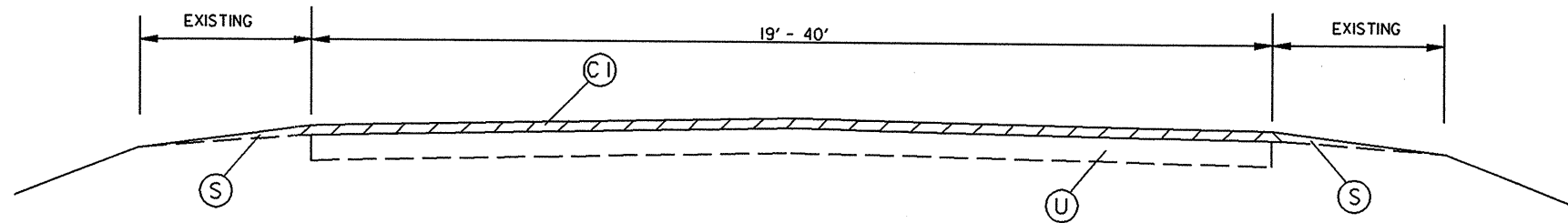
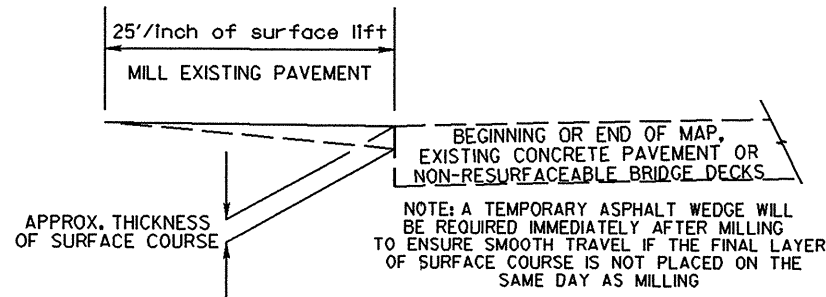
(C)	PROP. APPROX. 1-1/2" ASPH. CONC. SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
(E)	PROP. APPROX. 6" ASPH. CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 684 LBS. PER SQ. YD.
(S)	PROP. SHOULDER RECONSTRUCTION BY CONTRACTOR
(U)	EXISTING PAVEMENT



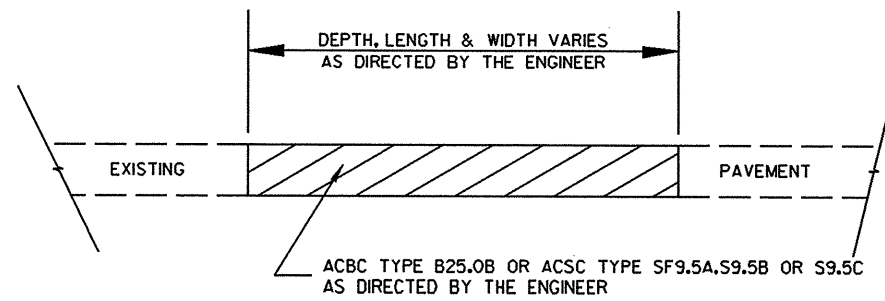
**\*\* RESURFACING DETAIL FOR CURB AND GUTTER SECTIONS**  
RAKE ASPHALT EDGE AT DRIVE CONNECTIONS FOR SMOOTH TRAVEL

**NOTES**

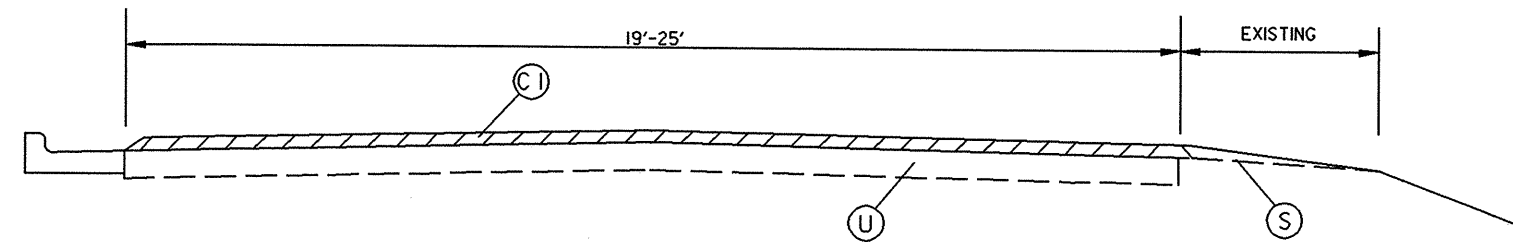
ALL UNPAVED S.R. ROADS TO BE RESURFACED 50' FROM EDGE OF PAVEMENT OF MAIN PROJECT  
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII, OR AS DIRECTED BY THE ENGINEER.  
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.  
BRIDGES TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.



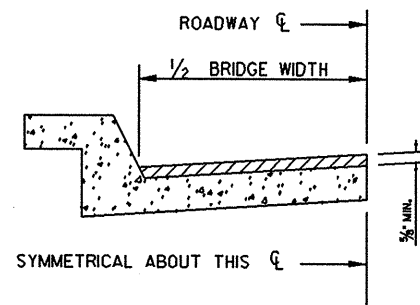
TYPICAL SECTION NO. 1



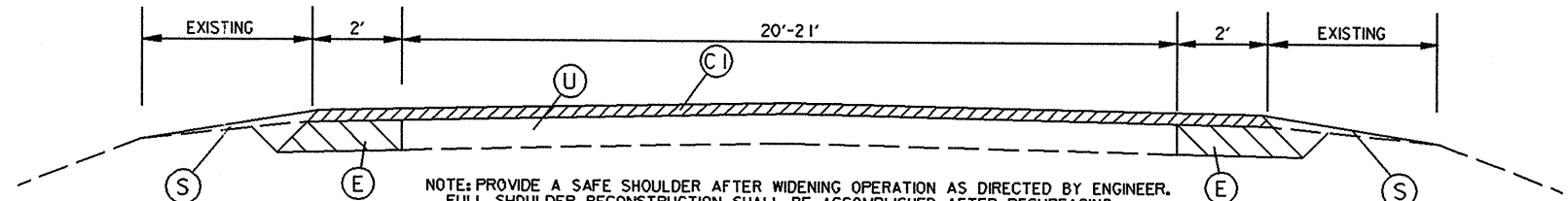
PATCHING EXISTING PAVEMENT



TYPICAL SECTION NO. 2



BRIDGE HALF TYPICAL SECTION



NOTE: PROVIDE A SAFE SHOULDER AFTER WIDENING OPERATION AS DIRECTED BY ENGINEER. FULL SHOULDER RECONSTRUCTION SHALL BE ACCOMPLISHED AFTER RESURFACING. (SEE CONTRACT FOR MAP AND TYPICAL NUMBERS) CONTRACTOR MUST CUT WEEP HOLES DURING WIDENING OPERATIONS FOR DRAINAGE

TYPICAL SECTION NO. 3

FOR BRIDGES WITH FLOOR DRAINS, CARE SHALL BE EXERCISED IN PLACING THE WEARING SURFACE AROUND FLOOR DRAINS SO AS NOT TO HINDER EFFECTIVE DRAINAGE. ALL DRAINS SHALL BE LEFT OPEN.

THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. A THICKNESS OF NOT LESS THAN 3/4" SHALL BE PROVIDED. THE MAXIMUM THICKNESS SHALL PREFERABLY BE 1 1/2" UNLESS IT IS IMPRACTICAL TO PROVIDE A SMOOTH RIDING SURFACE OTHERWISE.

PROJECT NO.	SHEET NO.	TOTAL NO.
5CR.20921.17	7	7

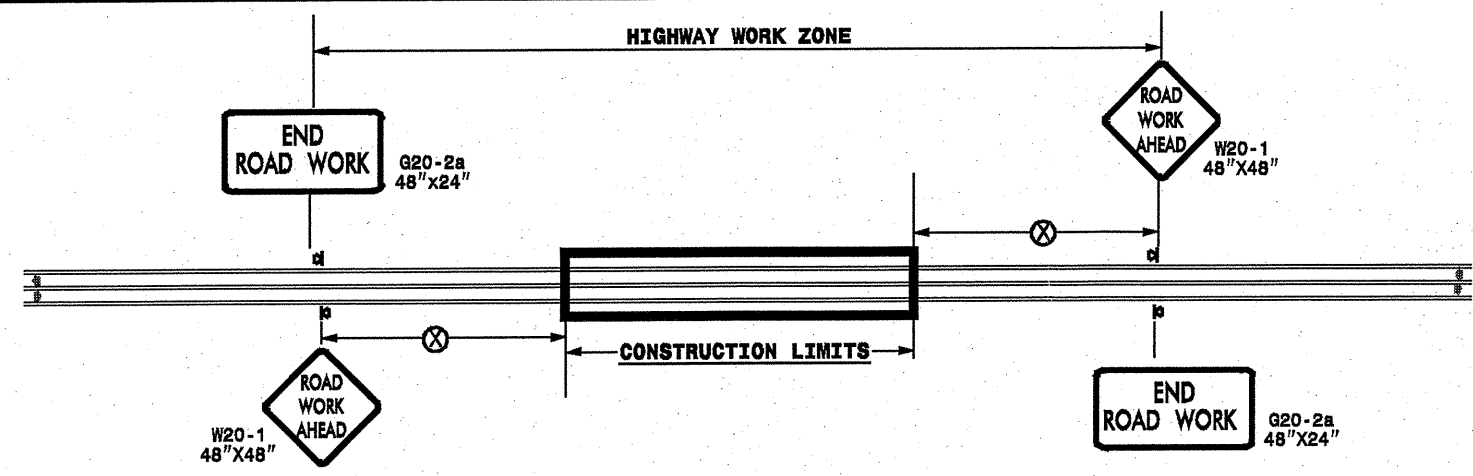
### SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	FINAL SURFACE TESTING REQUIRED	LENGTH MI	WIDTH FT	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	SURFACE COURSE, S9.5B TONS	PG 64-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	ADJUST MANHOLES EA	ADJUST METER OR VALVE BOX EA	SEED & MULCHING AC	INDUCTIVE LOOP LF
5CR.20921.17	Wake	1	SR 1834 - NORWOOD RD	FROM SR 1005 - SIX FORKS RD TO NC 50	1	NO	2.19	23	110	4.38	350		3012	181	1029	1	1	3.18	
<b>TOTAL FOR MAP NO. 1</b>							<b>2.19</b>		<b>110</b>	<b>4.38</b>	<b>350</b>		<b>3012</b>	<b>181</b>	<b>1029</b>	<b>1</b>	<b>1</b>	<b>3.18</b>	
		2	SR 1917 - STONEY HILL RD	FROM NC 98 TO SR 1909 - PURNELL ROAD	1	NO	2.42	25	121	4.84	250		3319	199	450			3.51	
<b>TOTAL FOR MAP NO. 2</b>							<b>2.42</b>		<b>121</b>	<b>4.84</b>	<b>250</b>		<b>3319</b>	<b>199</b>	<b>450</b>	<b>0</b>	<b>0</b>	<b>3.51</b>	
		3	SR 1831 - OLD CREEDMOOR RD	FROM NC 50 TO NC 98	1	NO	1.32	19	66	2.64	100		1384	83	726			1.91	
<b>TOTAL FOR MAP NO. 3</b>							<b>1.32</b>		<b>66</b>	<b>2.64</b>	<b>100</b>		<b>1384</b>	<b>83</b>	<b>726</b>	<b>0</b>	<b>0</b>	<b>1.91</b>	
		4	SR 1842 - SHOOTING CLUB RD.	FROM NC 50 TO SR 1831 - OLD CREEDMORE RD	1	NO	1.48	21	74	2.96	350		1695	102	814			2.15	
<b>TOTAL FOR MAP NO. 4</b>							<b>1.48</b>		<b>74</b>	<b>2.96</b>	<b>350</b>		<b>1695</b>	<b>102</b>	<b>814</b>	<b>0</b>	<b>0</b>	<b>2.15</b>	
		5	SR 2049 - FORESTVILLE RD	FROM SR 2224 - MITCHELL MILL RD TO SR 2045 - BURLINGTON MILLS RD	3	NO	2.46	25	123	4.92	360	2940	3472	335	1144		4	3.57	1,100
<b>TOTAL FOR MAP NO. 5</b>							<b>2.46</b>		<b>123</b>	<b>4.92</b>	<b>360</b>	<b>2940</b>	<b>3472</b>	<b>335</b>	<b>1144</b>	<b>0</b>	<b>4</b>	<b>3.57</b>	<b>1,100</b>
		6	SR 1837 - WESTGATE ROAD	FROM US 70 TO SR 1839 - LEESVILLE RD	1,2	NO	2.32	24	116	2.9	1860		4690	281	1276	9	23	2.10	500
<b>TOTAL FOR MAP NO. 6</b>							<b>2.32</b>		<b>116</b>	<b>2.9</b>	<b>1860</b>	<b>0</b>	<b>4690</b>	<b>281</b>	<b>1276</b>	<b>9</b>	<b>23</b>	<b>2.10</b>	<b>500</b>
		7	SR 1909 - PURNELL RD.	FROM SR 1917 - STONY HILL RD. TO US 1	3	NO	4.5	24	225	9	1200	4519	5897	548	750			6.53	
<b>TOTAL FOR MAP NO. 7</b>							<b>4.5</b>		<b>225</b>	<b>9</b>	<b>1200</b>	<b>4519</b>	<b>5897</b>	<b>548</b>	<b>750</b>	<b>0</b>	<b>0</b>	<b>6.53</b>	
		8	SR 1839 - LEESVILLE RD	FROM PAVEMENT JT. AT SPRINGDALE DR. TO PAVEMENT JT. NEAR LYNN RD.	1,2	NO	2.3	24	115	4.03	1773		4044	243	2300	5	14	2.91	
<b>TOTAL FOR MAP NO. 8</b>							<b>2.3</b>		<b>115</b>	<b>4.03</b>	<b>1773</b>	<b>0</b>	<b>4044</b>	<b>243</b>	<b>2300</b>	<b>5</b>	<b>14</b>	<b>2.91</b>	
<b>TOTAL FOR PROJ NO. 5CR.20921.17</b>							<b>18.99</b>		<b>950</b>	<b>35.67</b>	<b>6243</b>	<b>7459</b>	<b>27513</b>	<b>1972</b>	<b>8489</b>	<b>15</b>	<b>42</b>	<b>25.86</b>	<b>1,600</b>
<b>GRAND TOTAL</b>							<b>18.99</b>		<b>950</b>	<b>35.67</b>	<b>6243</b>	<b>7459</b>	<b>27513</b>	<b>1972</b>	<b>8489</b>	<b>15</b>	<b>42</b>	<b>25.86</b>	<b>1,600</b>

### THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4685000000-E				4686000000-E				4710000000-E				4721000000-E				4725000000-E				4900000000-N	4900000000-N
					4" X 90 M WHITE THERMO LF	4" X 120 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	24" X 120 M WHITE THERMO LF	THERMO MSG STOP 120 M EA	THERMO MSG AHEAD 120 M EA	THERMO MSG ONLY 120 M EA	THERMO MSG SCHOOL 120 M EA	THERMO LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO STR & RT ARROW 90 M EA	THERMO STR ARROW 90 M EA	THERMO LT STR RT ARROW 90 M EA	THERMO STR & LT ARROW 90 M EA	YELLOW & RED MARKERS EA	CRYSTAL & RED MARKERS EA						
5CR.20921.17	Wake	1	SR 1834 - NORWOOD RD	FROM SR 1005 - SIX FORKS RD TO NC 50	23,564	185	27,590	68	4	5			5											145	22	
<b>TOTAL FOR MAP NO. 1</b>					<b>23,564</b>	<b>185</b>	<b>27,590</b>	<b>68</b>	<b>4</b>	<b>5</b>			<b>5</b>											<b>145</b>	<b>22</b>	
		2	SR 1917 - STONEY HILL RD	FROM NC 98 TO SR 1909 - PURNELL ROAD	26,039		25,555	56					1	1										160		
<b>TOTAL FOR MAP NO. 2</b>					<b>26,039</b>		<b>25,555</b>	<b>56</b>					<b>1</b>	<b>1</b>										<b>160</b>		
		3	SR 1831 - OLD CREEDMOOR RD	FROM NC 50 TO NC 98	14,203		13,939	42					1		1									87		
<b>TOTAL FOR MAP NO. 3</b>					<b>14,203</b>		<b>13,939</b>	<b>42</b>					<b>1</b>		<b>1</b>									<b>87</b>		
		4	SR 1842 - SHOOTING CLUB RD.	FROM NC 50 TO SR 1831 - OLD CREEDMORE RD	15,925		15,629	48																98		
<b>TOTAL FOR MAP NO. 4</b>					<b>15,925</b>		<b>15,629</b>	<b>48</b>																<b>98</b>		
		5	SR 2049 - FORESTVILLE RD	FROM SR 2224 - MITCHELL MILL RD TO SR 2045 - BURLINGTON MILLS RD	26,470		16,236	28					2											162		
<b>TOTAL FOR MAP NO. 5</b>					<b>26,470</b>		<b>16,236</b>	<b>28</b>					<b>2</b>											<b>162</b>		
		6	SR 1837 - WESTGATE ROAD	FROM US 70 TO SR 1839 - LEESVILLE RD	24,963	3,400	28,400	222			4		47	10	4	24	2							153	300	
<b>TOTAL FOR MAP NO. 6</b>					<b>24,963</b>	<b>3,400</b>	<b>28,400</b>	<b>222</b>			<b>4</b>		<b>47</b>	<b>10</b>	<b>4</b>	<b>24</b>	<b>2</b>							<b>153</b>	<b>300</b>	
		7	SR 1909 - PURNELL RD.	FROM SR 1917 - STONY HILL RD. TO US 1	48,420		29,700	100	8	10														297		
<b>TOTAL FOR MAP NO. 7</b>					<b>48,420</b>		<b>29,700</b>	<b>100</b>	<b>8</b>	<b>10</b>														<b>297</b>		
		8	SR 1839 - LEESVILLE RD	FROM PAVEMENT JT. AT SPRINGDALE DR. TO PAVEMENT JT. NEAR LYNN RD.	24,748		15,180	530					17	11	5	2								152		
<b>TOTAL FOR MAP NO. 8</b>					<b>24,748</b>		<b>15,180</b>	<b>530</b>					<b>17</b>	<b>11</b>	<b>5</b>	<b>2</b>								<b>152</b>		
<b>TOTAL FOR PROJ NO. 5CR.20921.17</b>					<b>204,332</b>	<b>3,585</b>	<b>172,229</b>	<b>1,094</b>	<b>12</b>	<b>15</b>	<b>4</b>	<b>12</b>	<b>73</b>	<b>22</b>	<b>10</b>	<b>26</b>	<b>2</b>							<b>1,254</b>	<b>322</b>	
<b>GRAND TOTAL</b>					<b>204,332</b>	<b>3,585</b>	<b>172,229</b>	<b>1,094</b>	<b>12</b>	<b>15</b>	<b>4</b>	<b>12</b>	<b>73</b>	<b>22</b>	<b>10</b>	<b>26</b>	<b>2</b>							<b>1,254</b>	<b>322</b>	

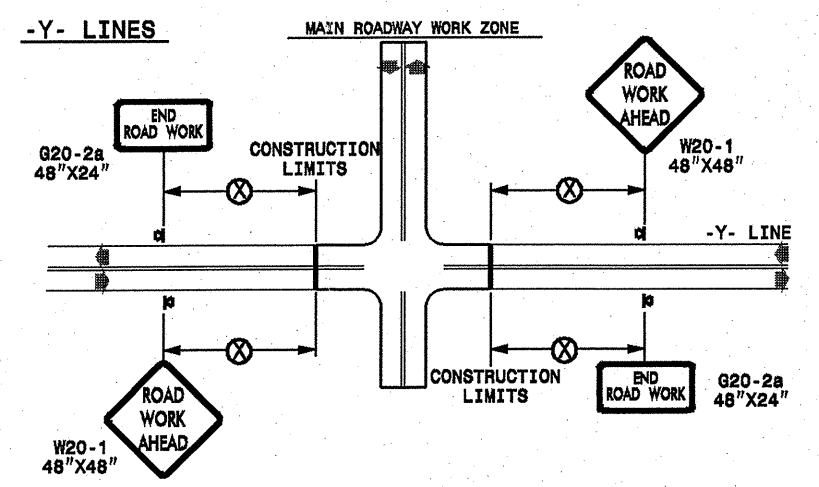
**TWO-WAY UNDIVIDED \*\* (L-LINES)**



POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING
≤ 50	500'
≥ 55	1000'

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

**ROADWAYS INTERSECTING ALONG 2 WAY UNDIVIDED WORK ZONE (Y-LINES)**



**GENERAL NOTES**

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCE WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH PORTABLE WORK ZONE SIGN STANDS SPECIFICALLY DESIGNED FOR ONE ANOTHER. PORTABLE WORK ZONE SIGNS MAY BE ROLL UP OR APPROVED COMPOSITE.
- PROVIDE PORTABLE WORK ZONE SIGN STANDS, PORTABLE SIGNS AND SIGN SHEETING WHICH ARE LISTED ON THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION'S APPROVED PRODUCT LIST OR ACCEPTED AS TRAFFIC QUALIFIED BY THE TRAFFIC CONTROL UNIT.
- \*\* TWO-WAY UNDIVIDED ADVANCE WARNING SIGN CONFIGURATION MAY BE USED ON URBAN MULTI-LANE FACILITIES WHERE CONDITIONS LIMIT THE USE OF DUAL MOUNTED SIGNS AS DETERMINED BY THE ENGINEER.

**LEGEND**

◀ PORTABLE SIGN

➡ DIRECTION OF TRAFFIC FLOW

DETAIL DRAWING  
FOR TWO-WAY UNDIVIDED  
WORK ZONE WARNING SIGNS

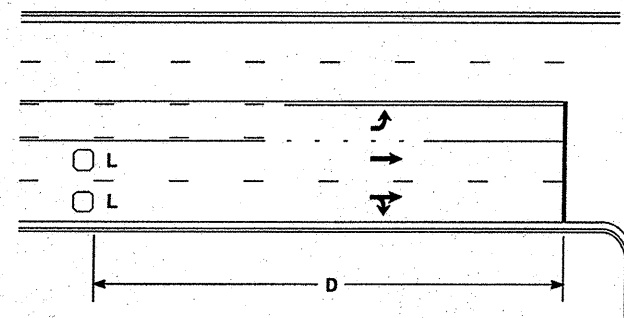
SHEET 1 OF 1

APPROVED: _____	DATE: _____	DETAIL DRAWING FOR TWO-WAY UNDIVIDED ADVANCED WORK ZONE WARNING SIGNS	
SCALE: NONE		REVISIONS	
DATE: _____		7-98	10/01
DWG. BY: _____		10-98	03/04
DESIGN BY: _____		01/01	11/04
REVIEWED BY: _____			

24-BIN-2009 IM47  
 s:\p\p\resur-facing\_030509\resur-facing\_030509\div05\c202409\_5cr209217\_wake.sr.s\c202409\_5cr209217\_2wayundivurbfrwys\july2006.dgn  
 AT WZTC37502



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

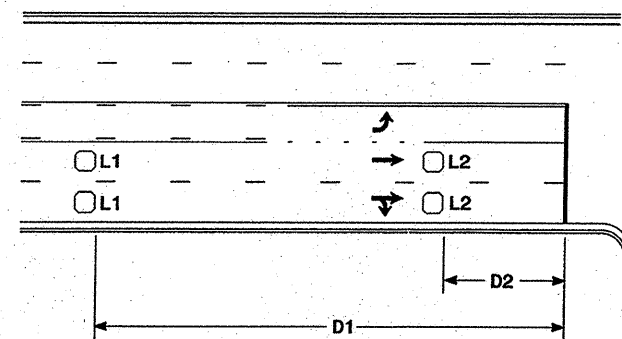


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

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

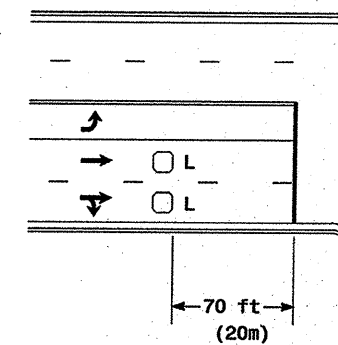


Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

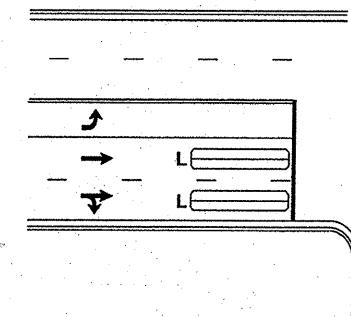
"Stretch" Operation

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



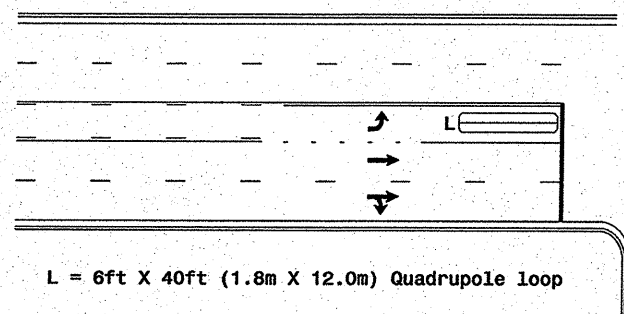
L = 6ft X 6ft (1.8m X 1.8m)  
Wired in series

OR



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

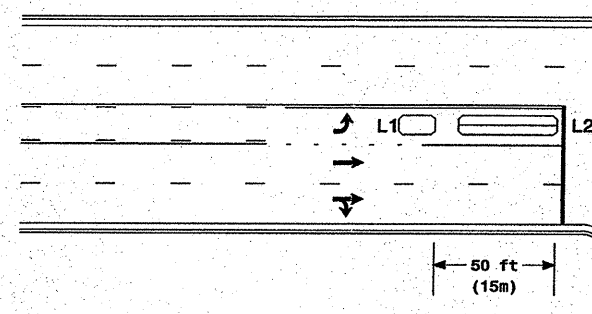
### Left Turn Lane Detection



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

Presence Loop Detection

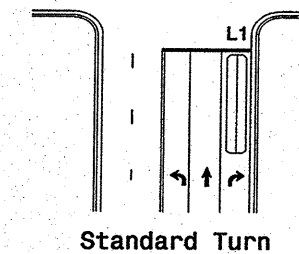
OR



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

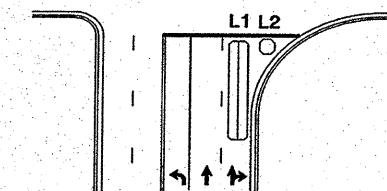
Queue Loop Detection

### Right Turn Lane Detection

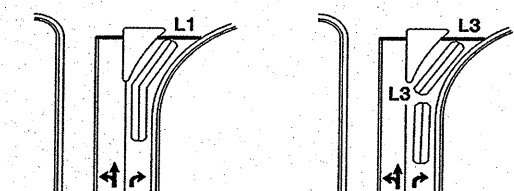


Standard Turn

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

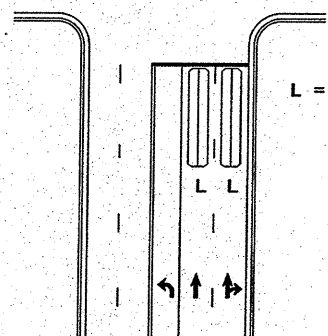


Wide Radius Turn



Channelized Turn

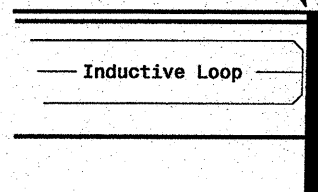
### Side Street Detection



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

	<p>Typical Loop Locations</p>		
	<p>SCALE N/A</p>	<p>PLAN DATE: June 2006 PREPARED BY: P. L. Alexander</p>	

STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

SHEET 1 OF 3  
**1725D01**

STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

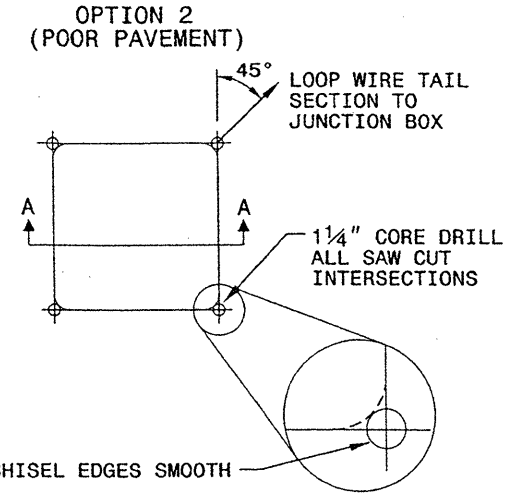
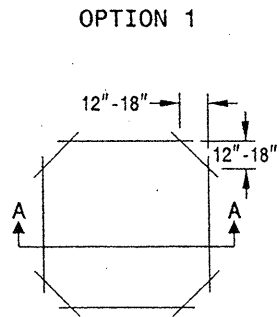
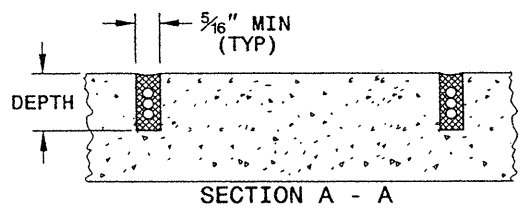
SHEET 1 OF 3  
**1725D01**

**CONVENTIONAL 4-SIDED LOOP**

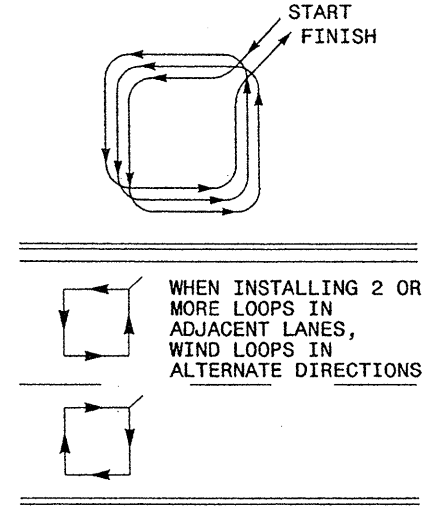
**SAW CUT OPTIONS**

**SAW SLOT DEPTH CHART**

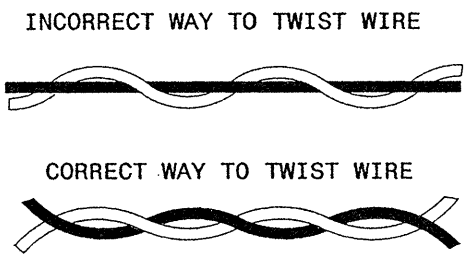
DEPTH (IN)	NO. OF WIRE TURNS					
	2	3	4	5	6	
CONCRETE	2.0	2.0	2.5	2.5	3.0	
ASPHALT	2.0	2.5	3.0	3.0	3.0	



**LOOP WINDING METHOD**



**LOOP WIRE TWISTING METHOD**

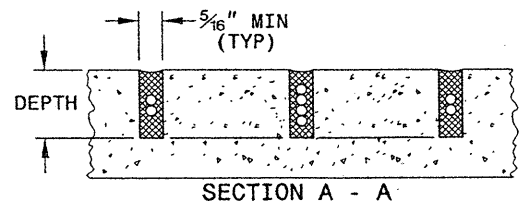
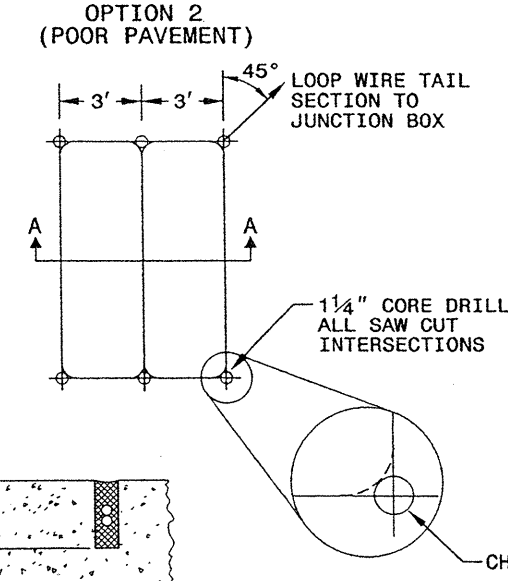
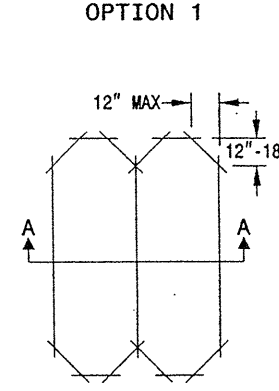


**NOTES**

1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

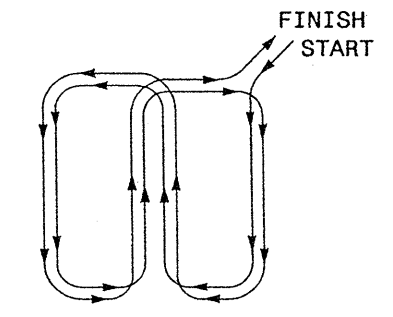
**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



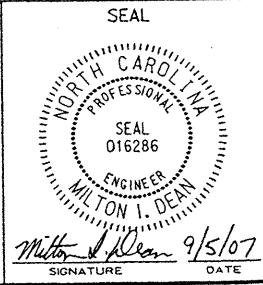
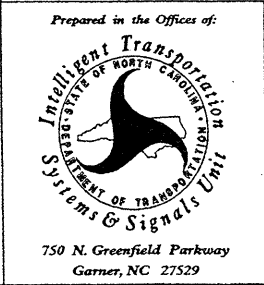
DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

**LOOP WINDING METHOD**



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See Plate for Title



750 N. Greenfield Parkway  
 Garner, NC 27529

9/5/07  
 SIGNATURE DATE

STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

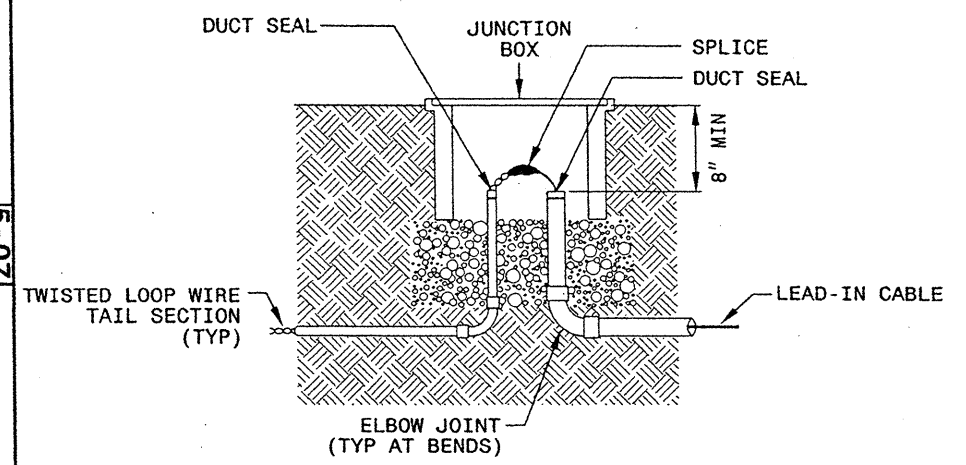
5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 LOOP WIRE DETAILS

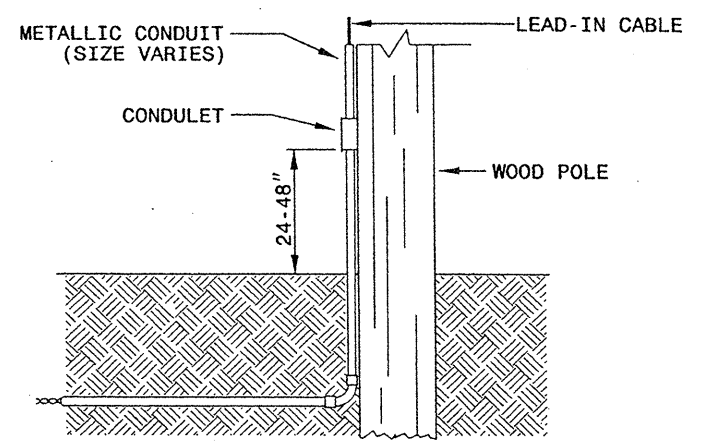
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



**LOOP WIRE AT POLE**

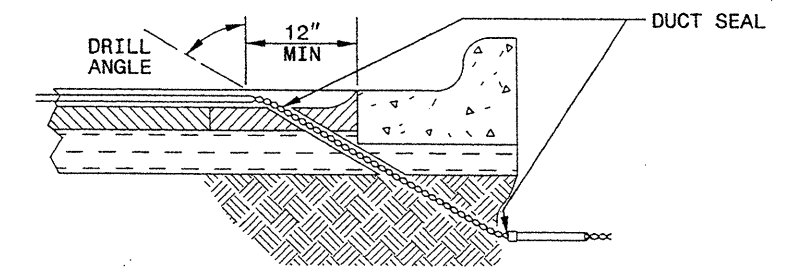


**NOTE**

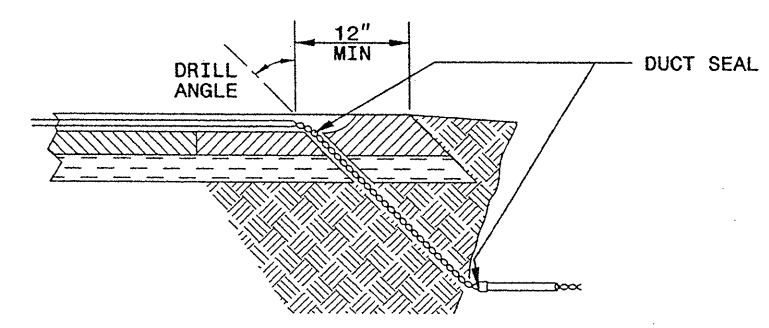
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**LOOP WIRE PAVEMENT EDGE DETAILS**

**LOOP WIRE AT CURB & GUTTER SECTION**



**LOOP WIRE AT PAVEMENT SECTION**



**NOTES**

1. DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
2. TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
3. BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 LOOP WIRE DETAILS

SHEET 2 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
 Garner, NC 27529

SEAL

Wilton I. Dean 9/5/07  
 SIGNATURE DATE

06-SEP-2007 14:00  
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