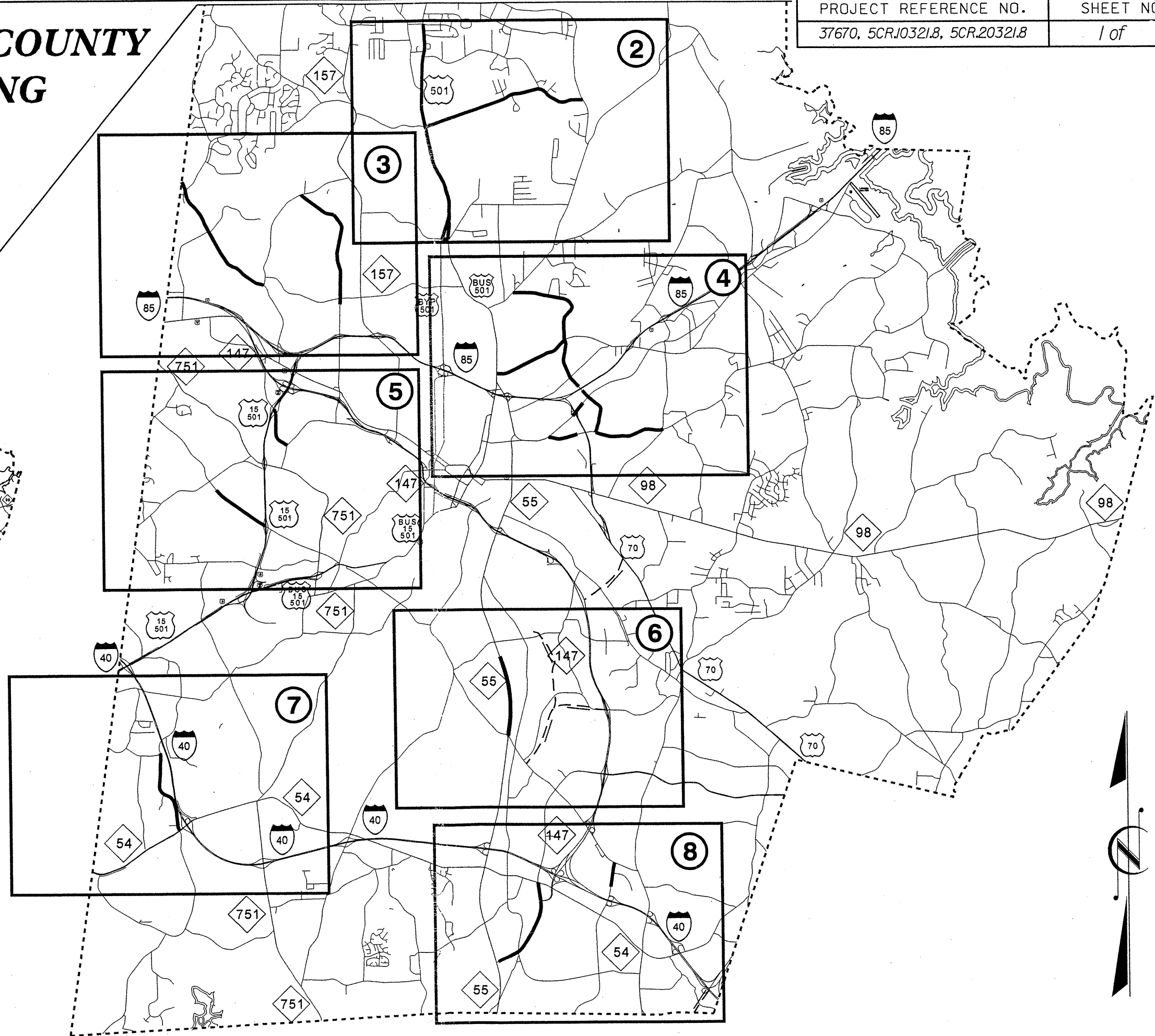
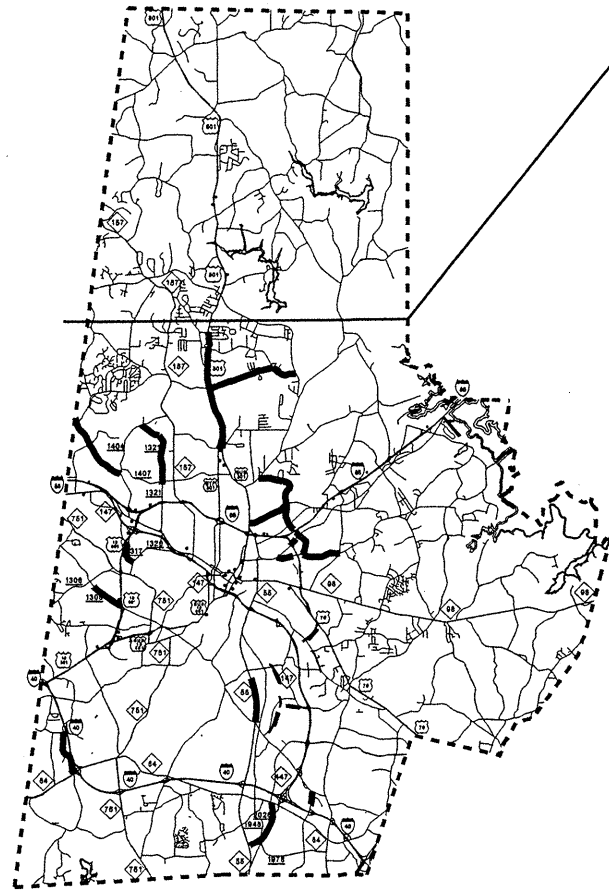
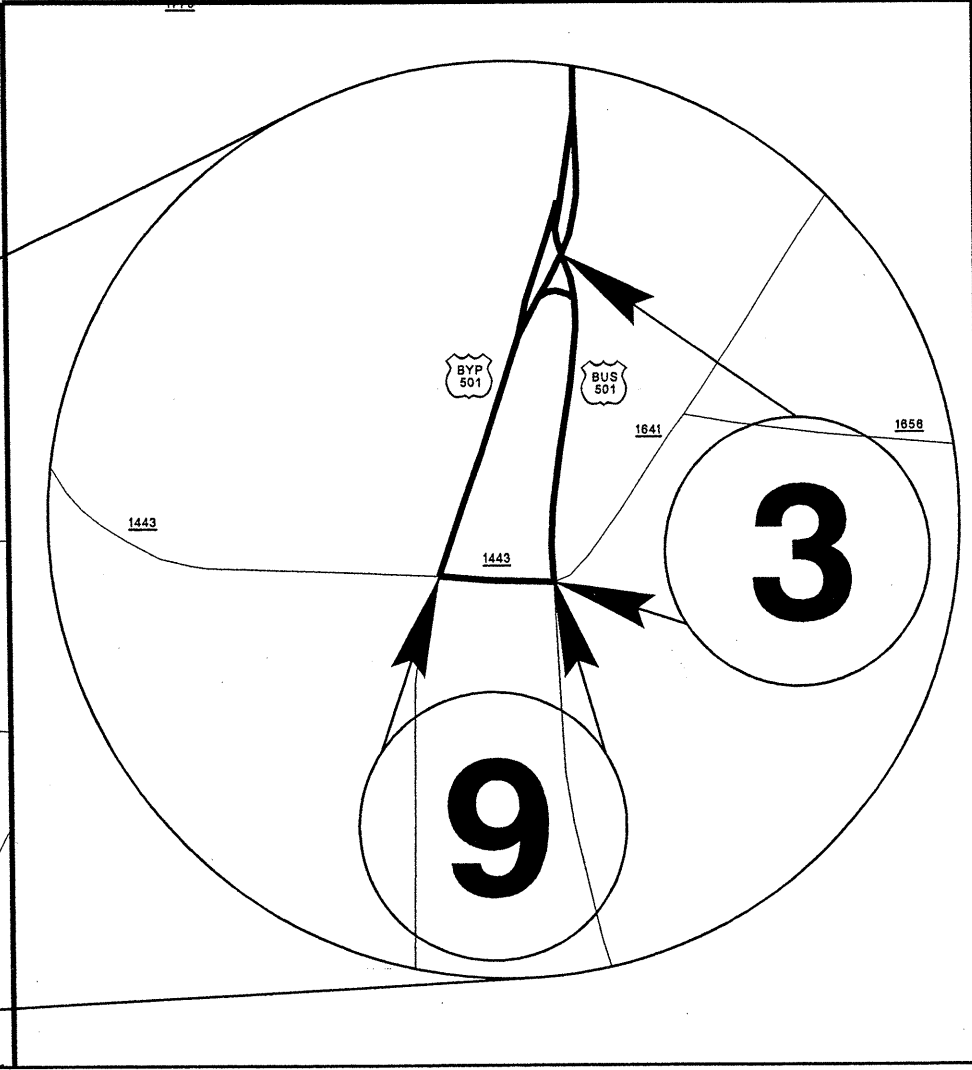
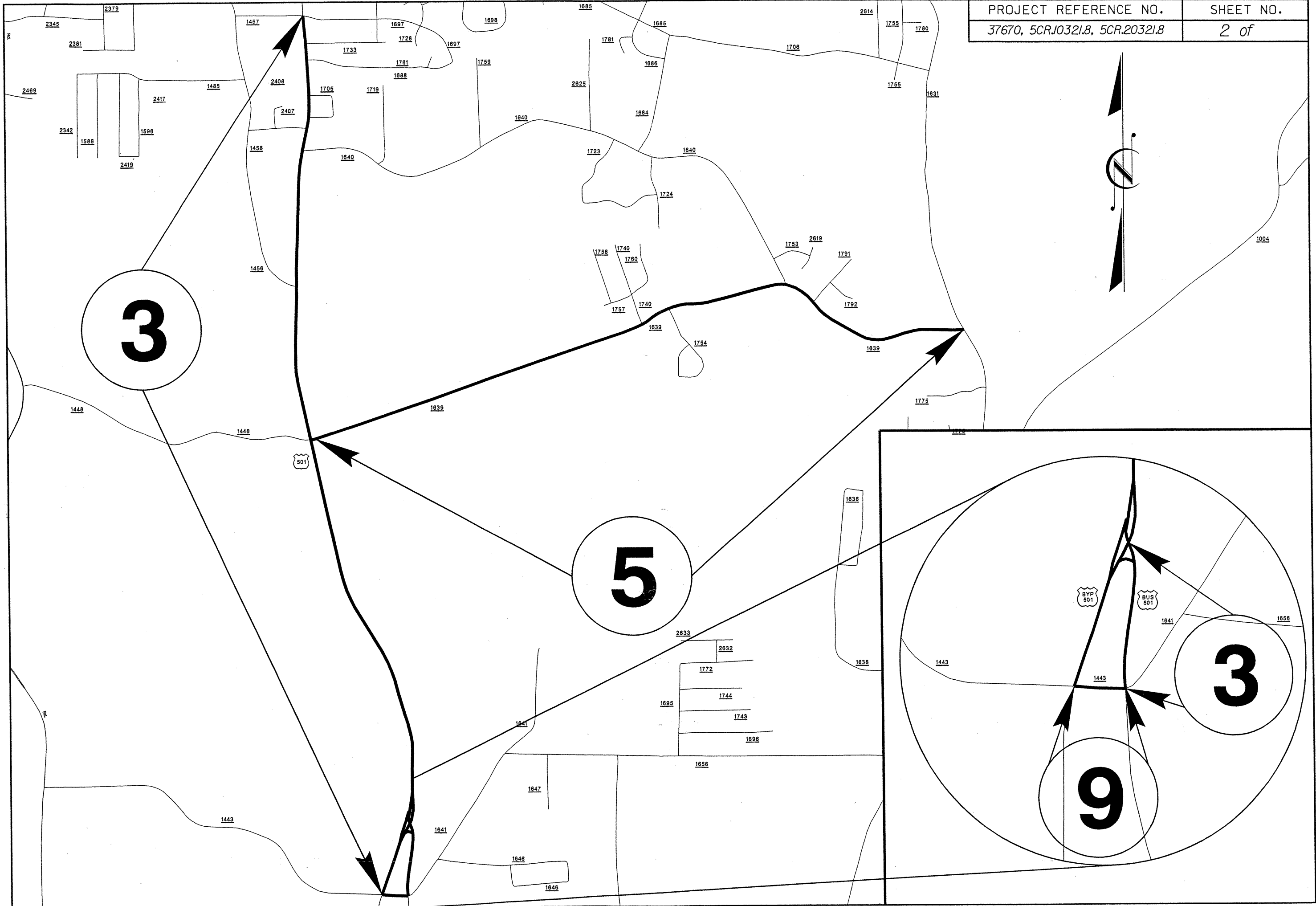


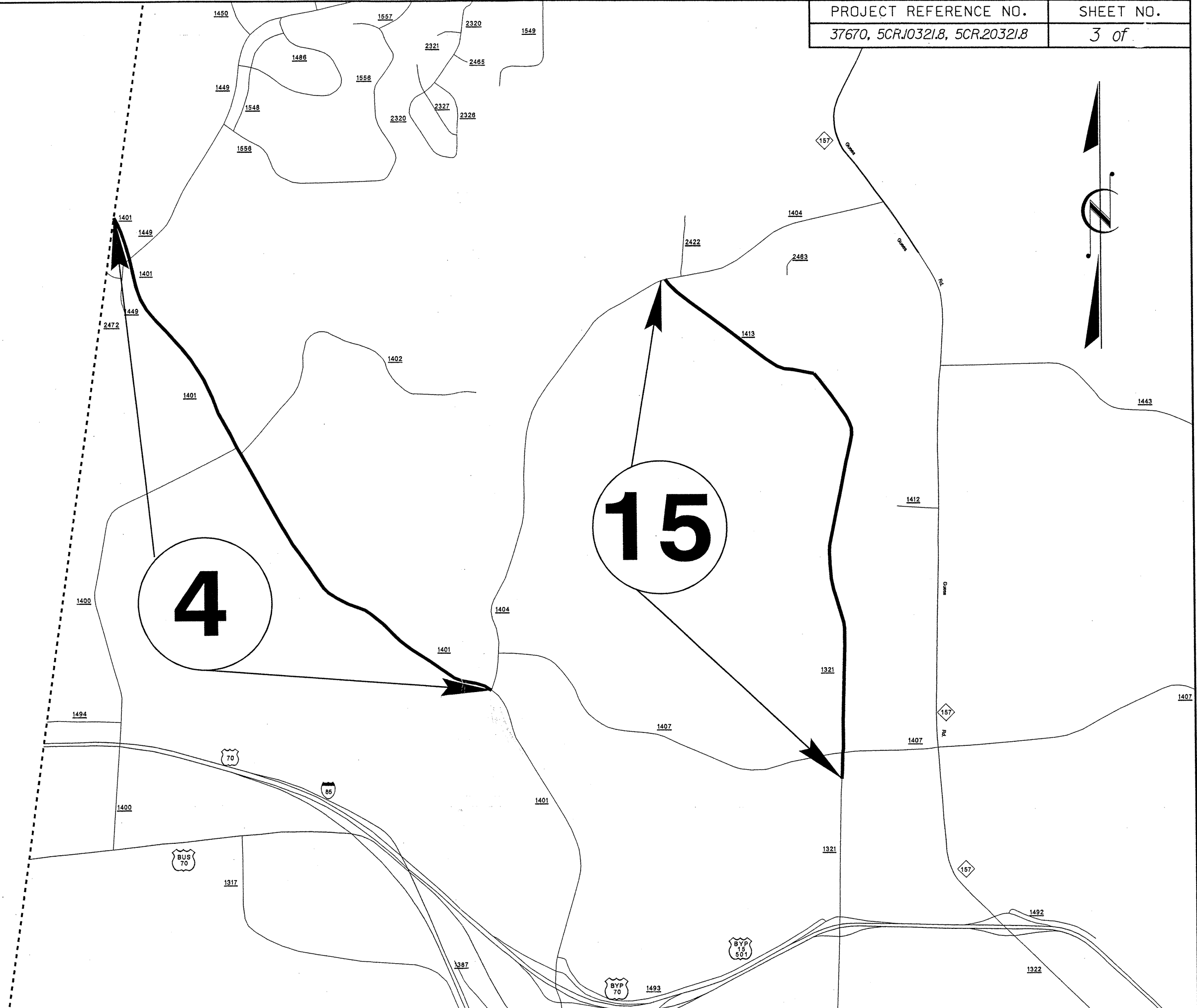
# 2008 DURHAM COUNTY RESURFACING

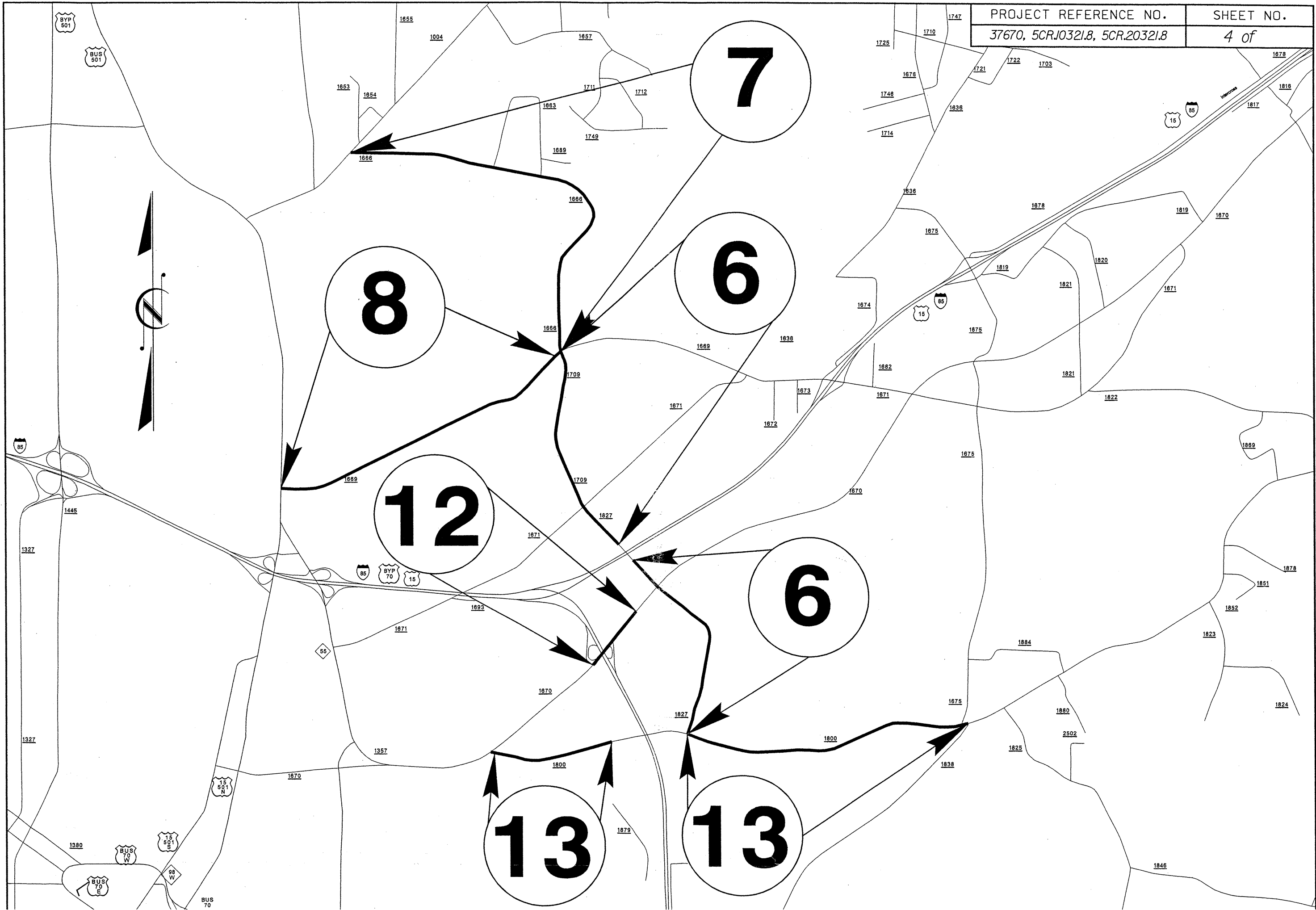
PROJECT REFERENCE NO.  
37670, 5CR.10321.8, 5CR.20321.8

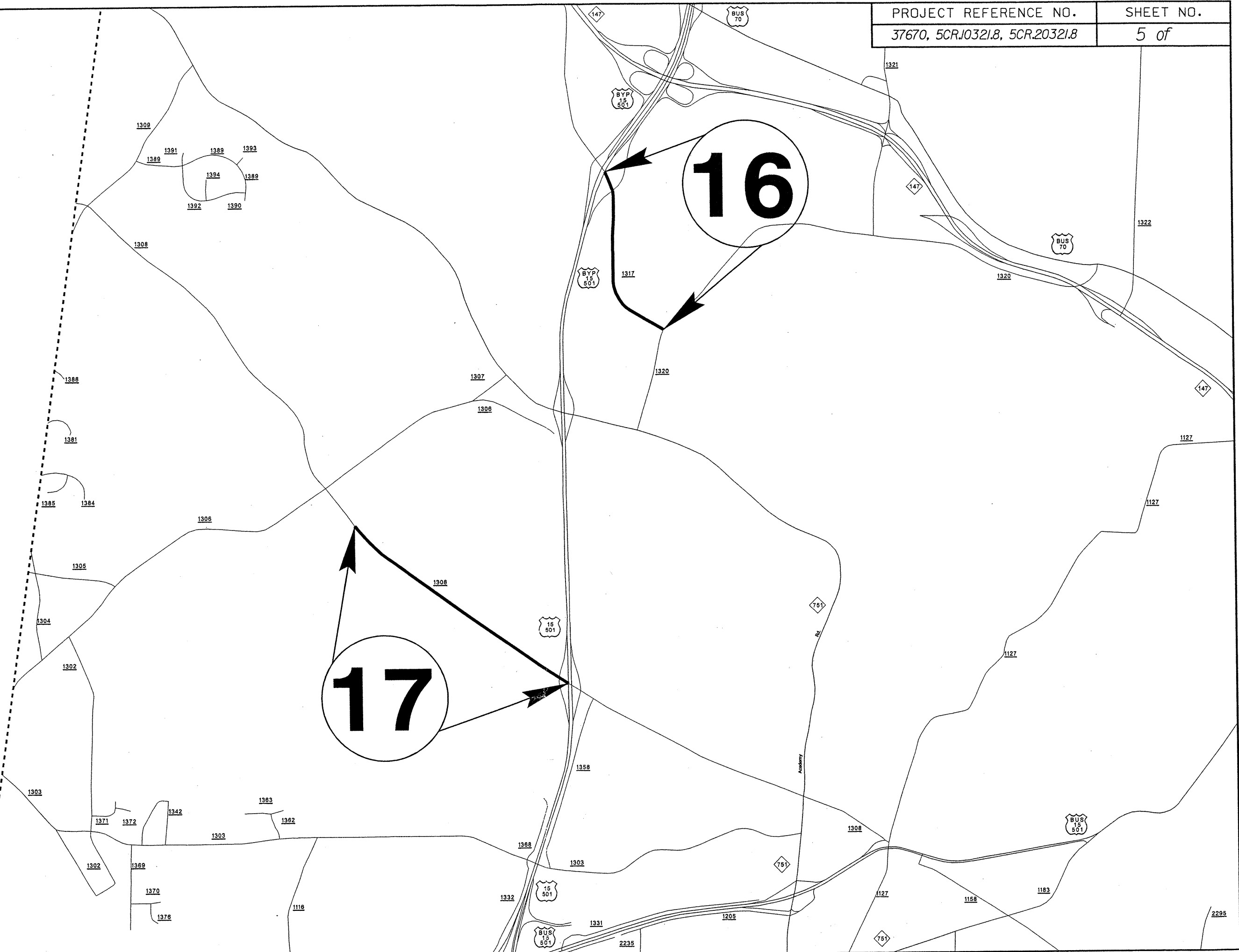
SHEET NO.  
1 of







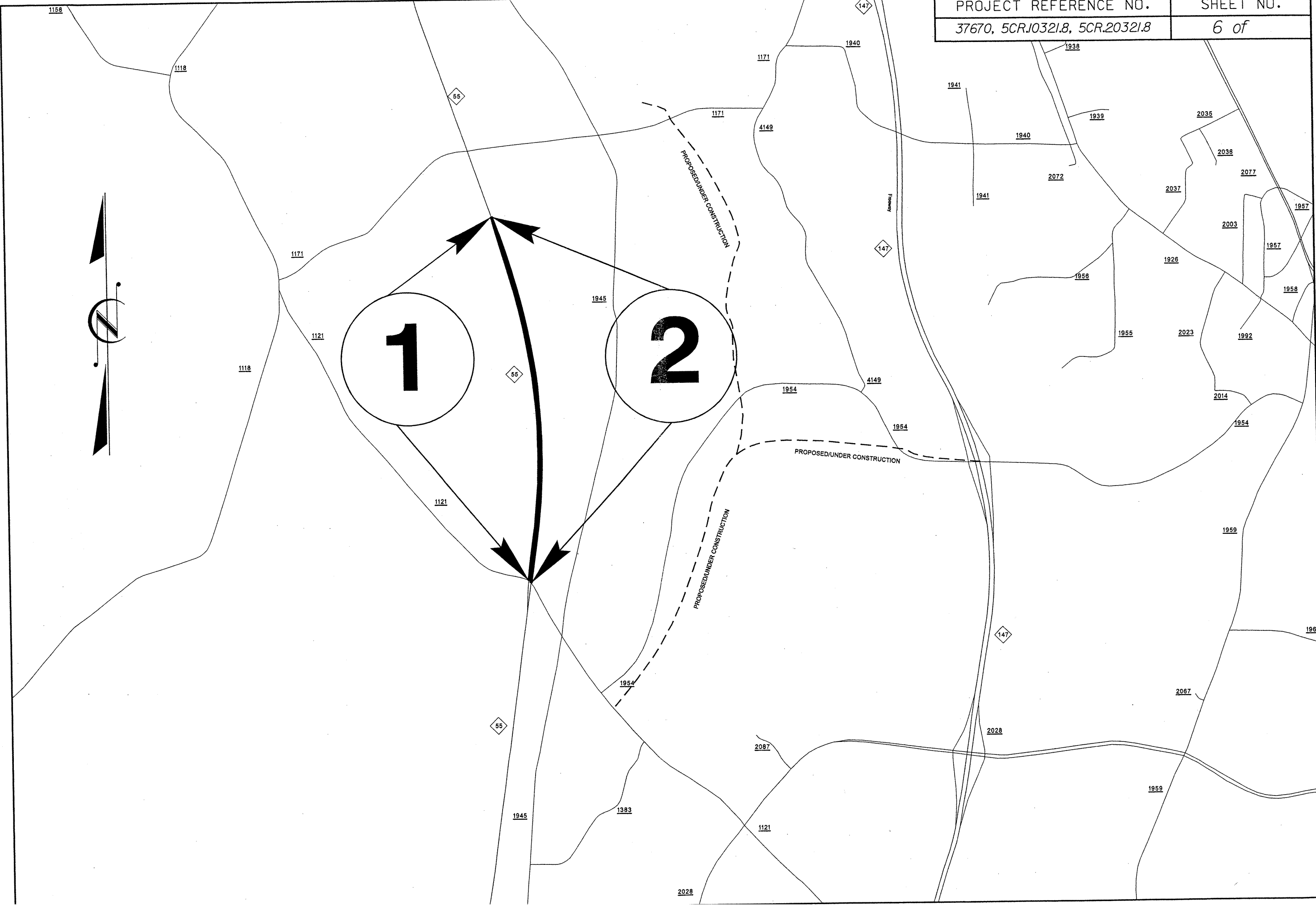


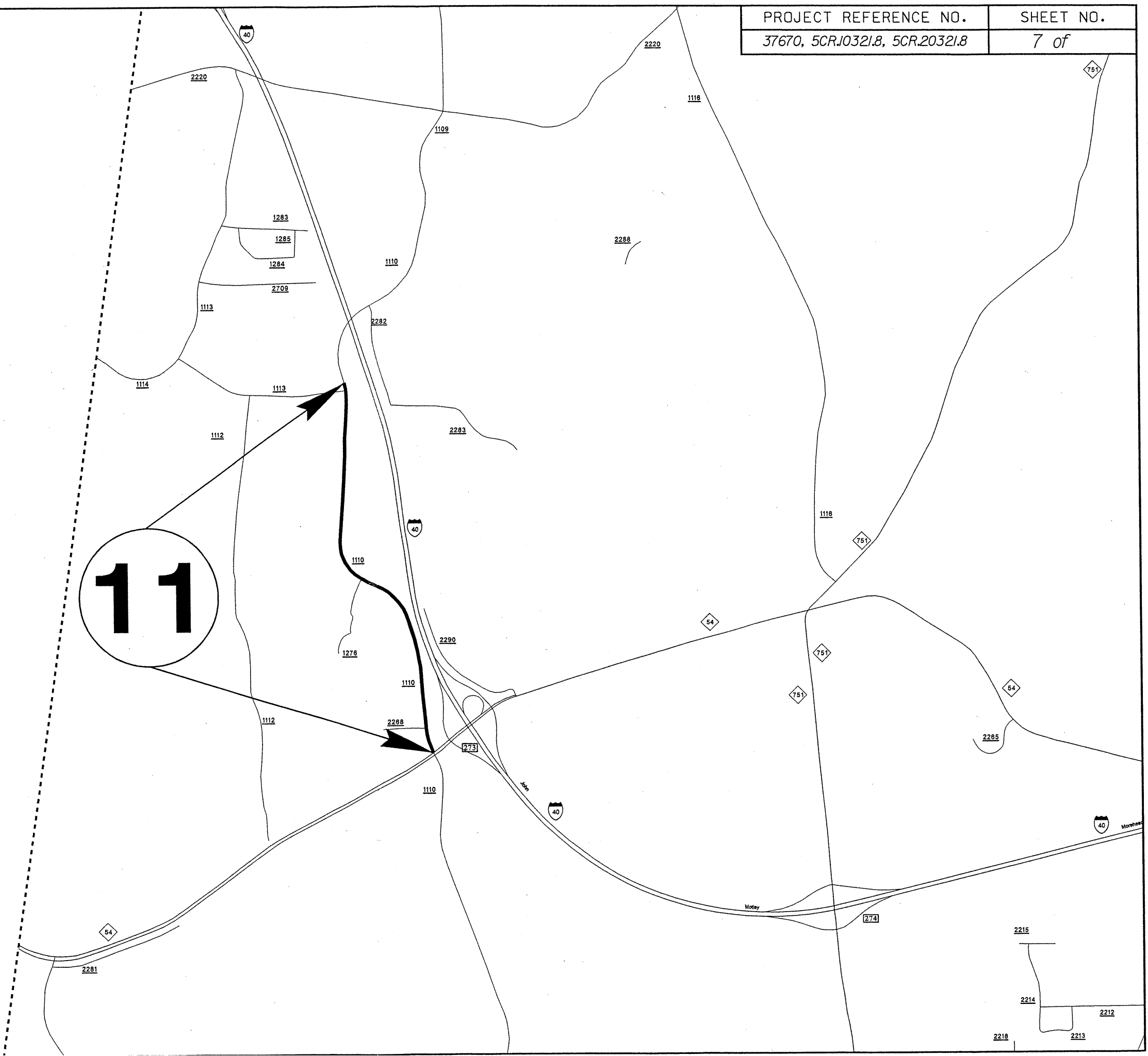


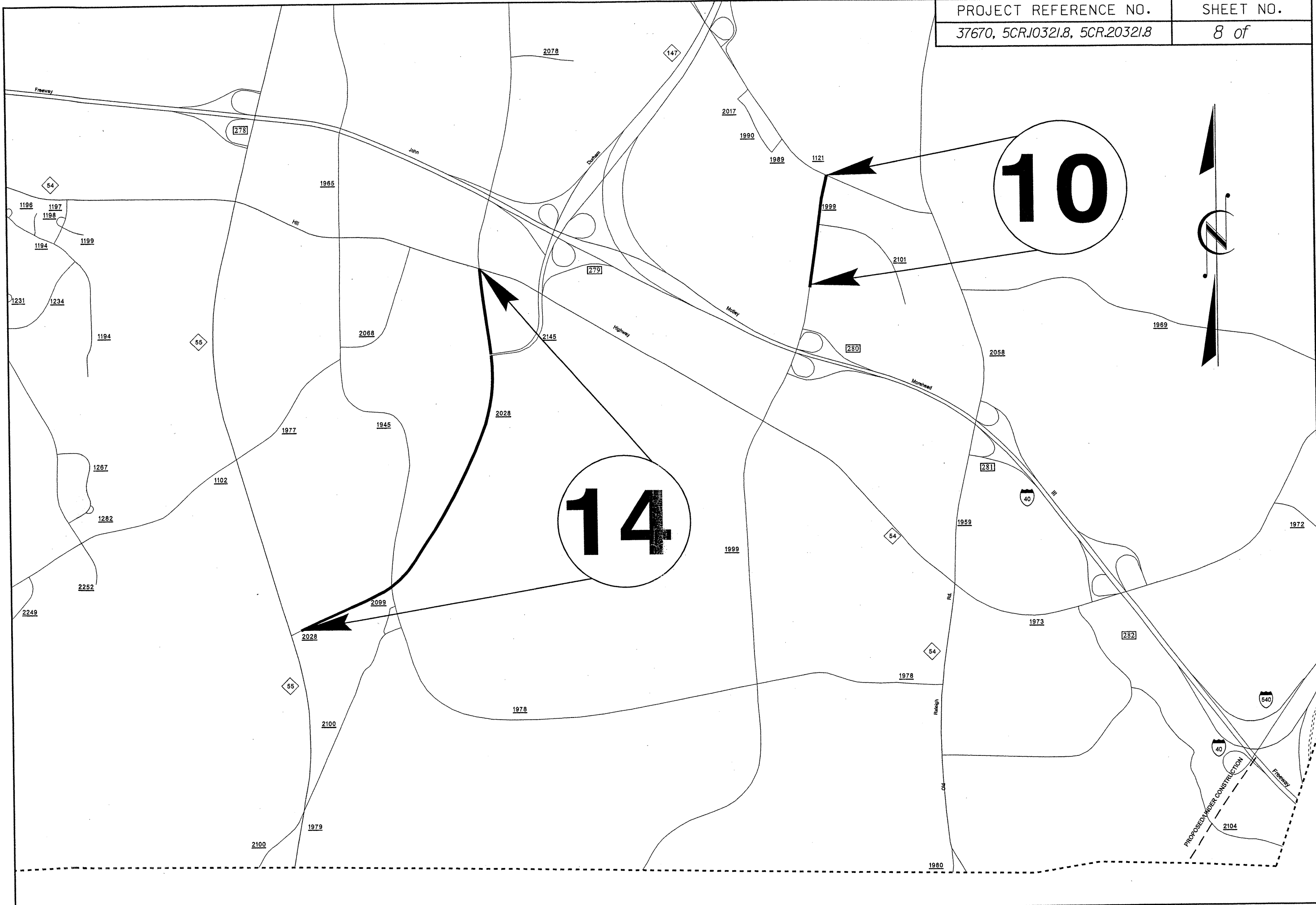


1

2







10

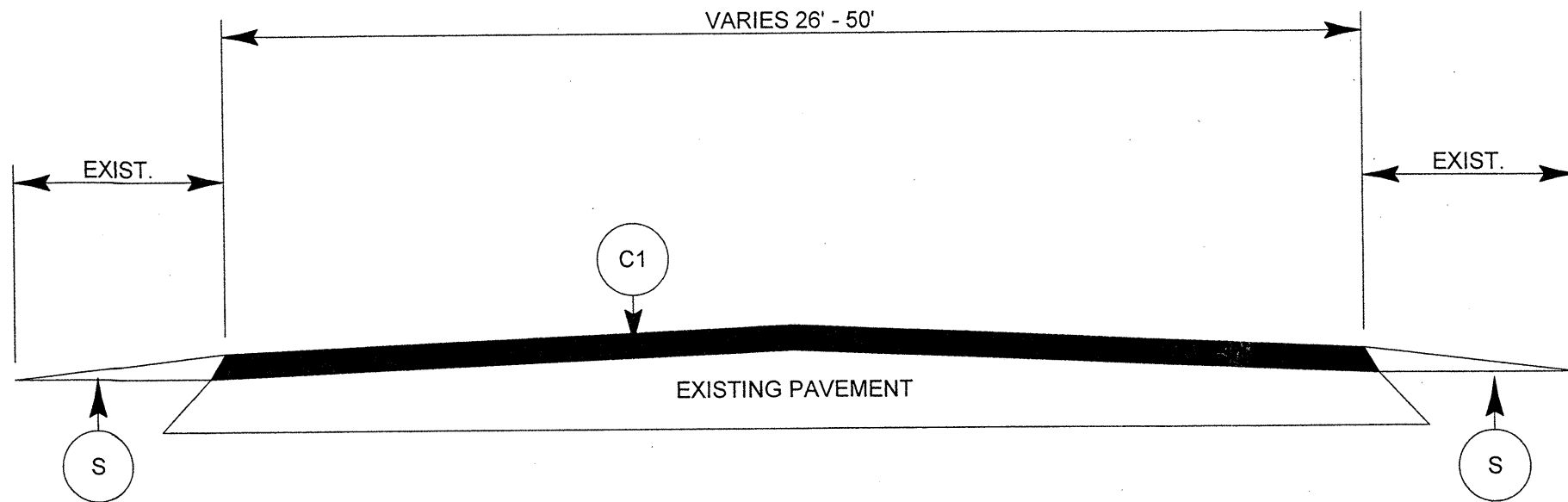
14



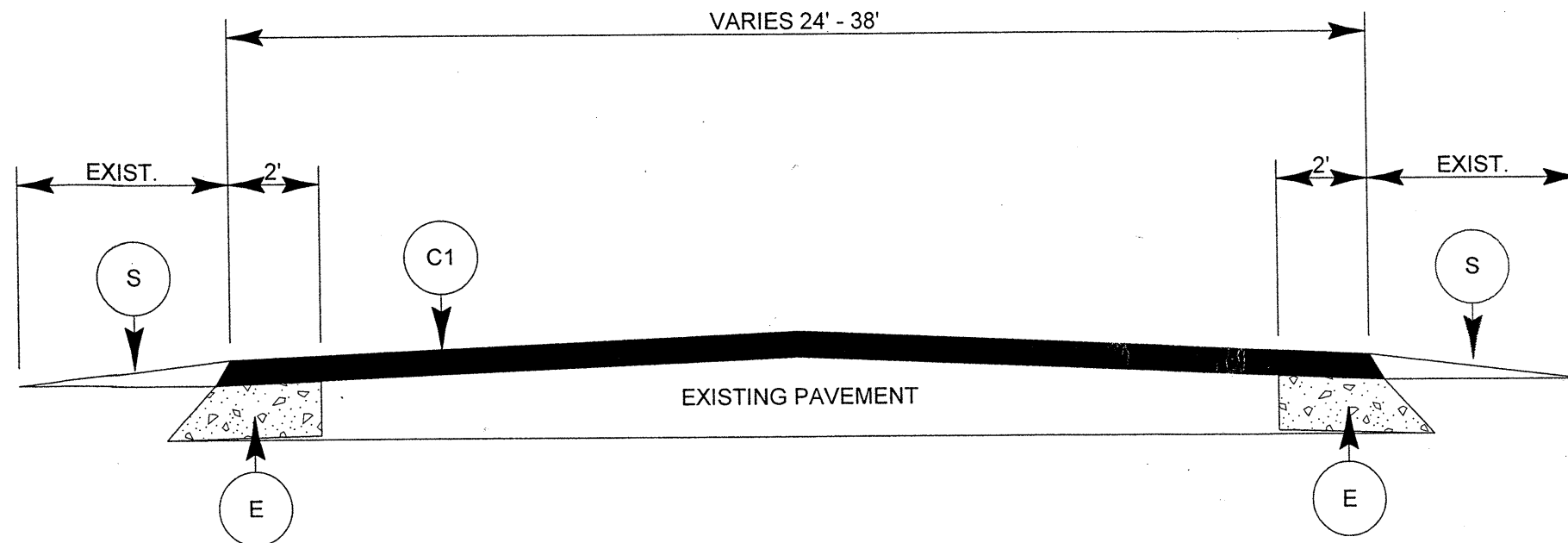
PROPOSED WIDER CONSTRUCTION



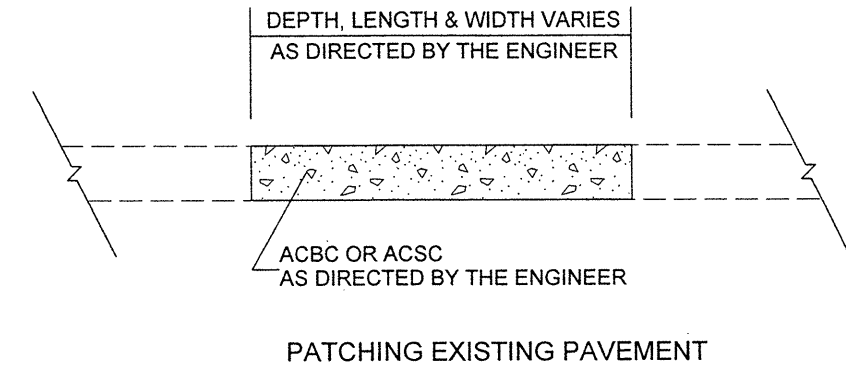
PROJECT NO.	SHEET NO.	TOTAL SHEETS
37670, 5CR.10321.8, 5CR.20321.8,	9	



TYPICAL SECTION NO. 1

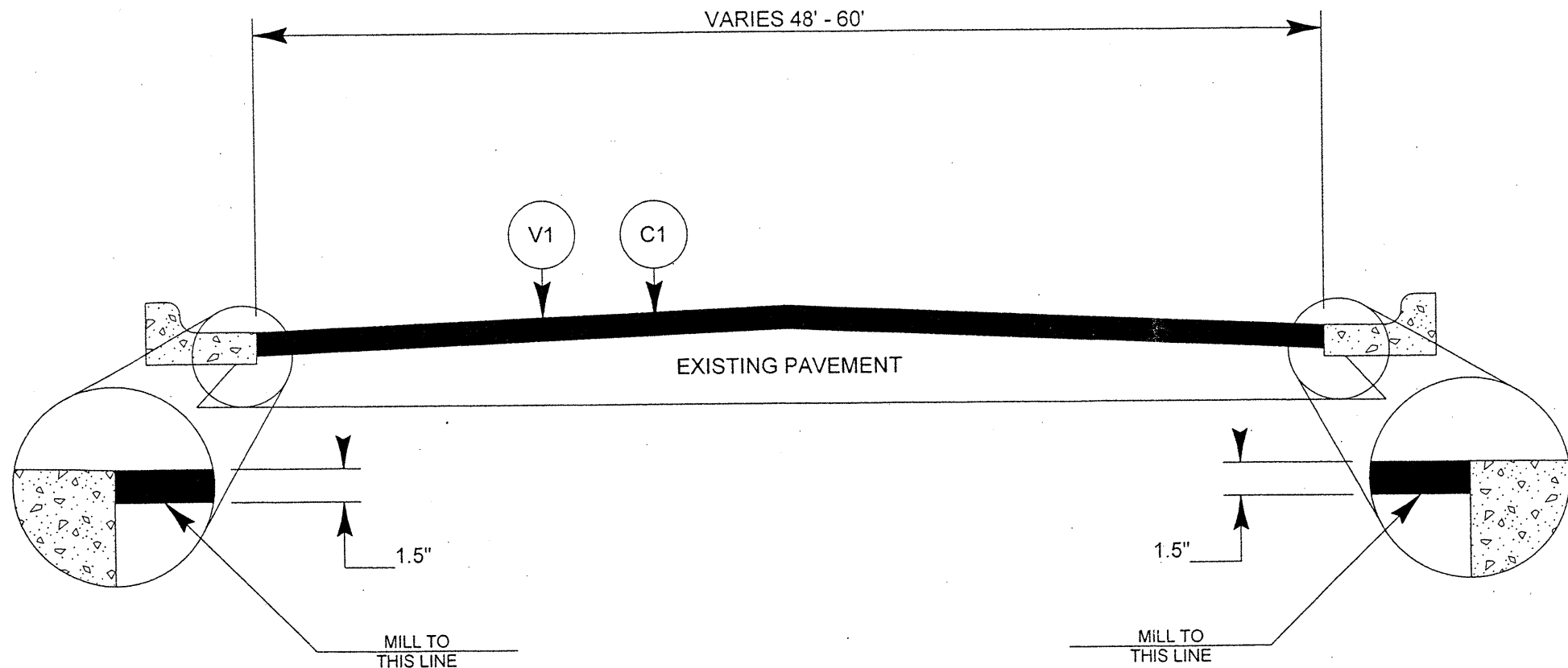


TYPICAL SECTION NO. 2

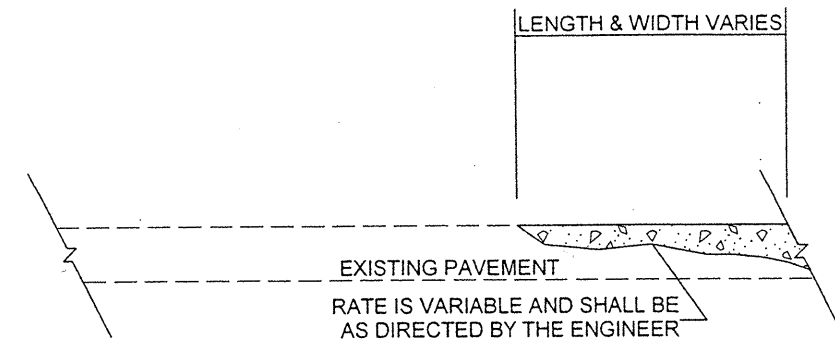
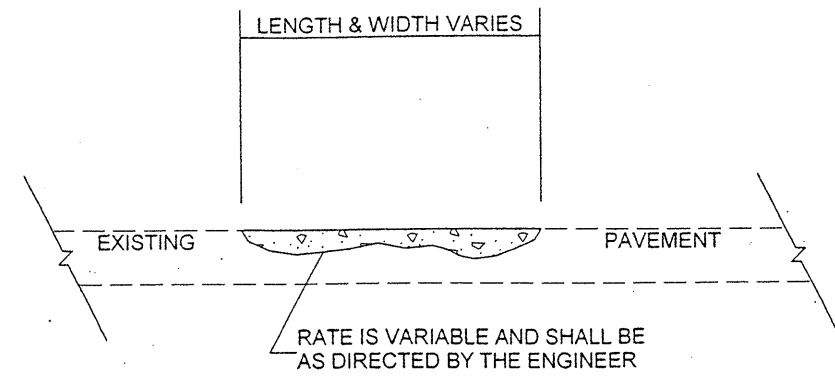


PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT THE AVERAGE RATE OF 168 LBS PER SQ YD.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT THE AVERAGE RATE OF 168 LBS PER SQ YD.
C3	LEVELING COURSE, S9.5B. SEE SUMMARY OF QUANTITIES FOR SPECIFIC MAPS.
E	PROP. APPROX. 12.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT THE AVERAGE RATE OF 684 LBS PER SQ YD. IN EACH OF TWO LIFTS
S	SHOULDER RECONSTRUCTION.
V1	MILLING 1.5" - 3" TO RE-ESTABLISH GUTTER PROFILE
V2	MILL 1.5" UNDER US 15-501 BRIDGE (MAP 17)

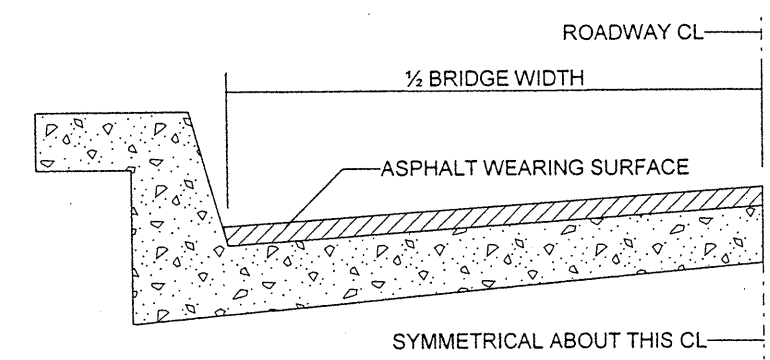
PROJECT NO.	SHEET NO.	TOTAL SHEETS
37670, 5CR.10321.8, 5CR.20321.8,	10	



TYPICAL SECTION NO. 3



ASPHALT CONCRETE SURFACE COURSE (LEVELING COURSE)



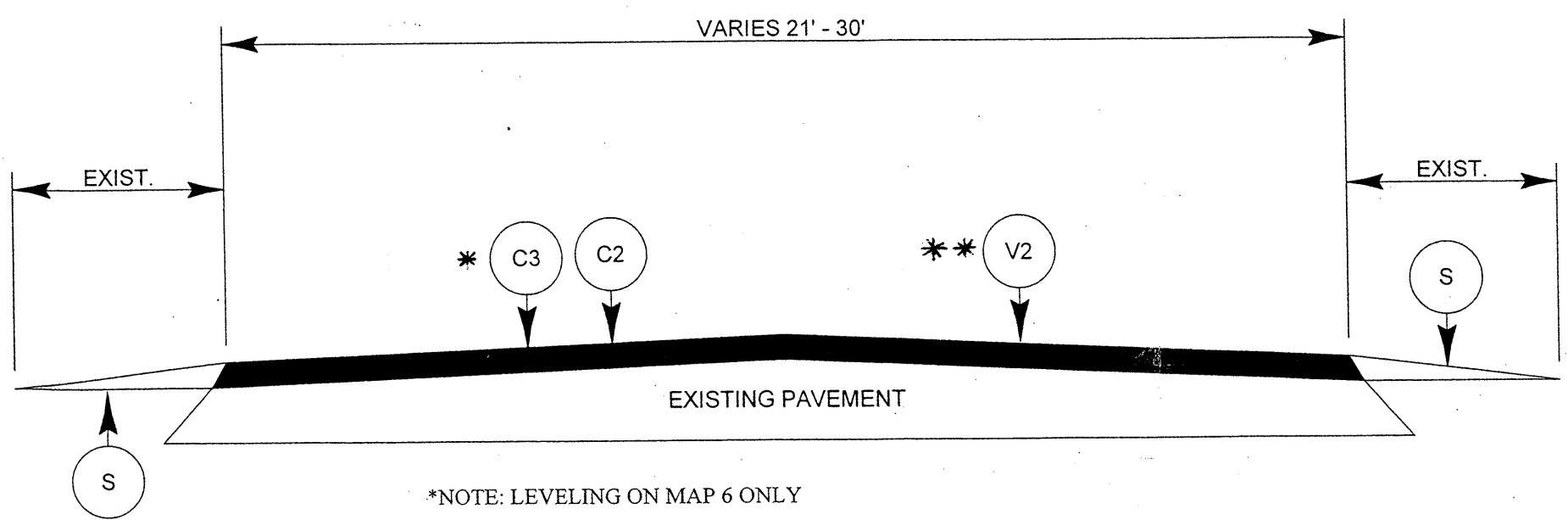
BRIDGE HALF TYPICAL SECTION

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 5/8" SHALL BE PROVIDED. THE MAXIMUM THICKNESS SHALL PREFERABLY BE 1 1/2" UNLESS IT IS IMPRACTICAL TO PROVIDE A SMOOTH RIDING SURFACE OTHERWISE.

**NOTES**

ALL UNPAVED 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. SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS UNLESS OTHERWISE INDICATED. BRIDGES ARE TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.

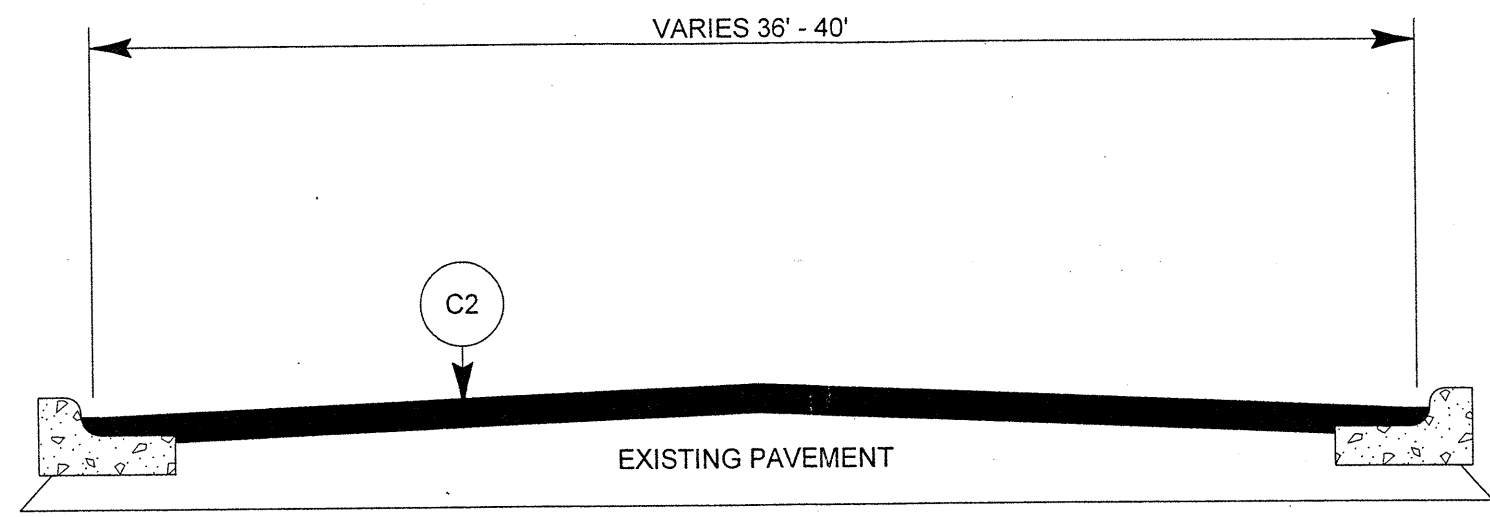


\*NOTE: LEVELING ON MAP 6 ONLY

\*\*NOTE: ON MAP 17, MILL 3 LANE SECTION BETWEEN US 15-501 RAMPS UNDER BRIDGE TO MAINTAIN CLEARANCE.

TYPICAL SECTION NO. 4

PROJECT NO.	SHEET NO.	TOTAL SHEETS
37670, 5CR.10321.8, 5CR.20321.8,	11	



TYPICAL SECTION NO. 5

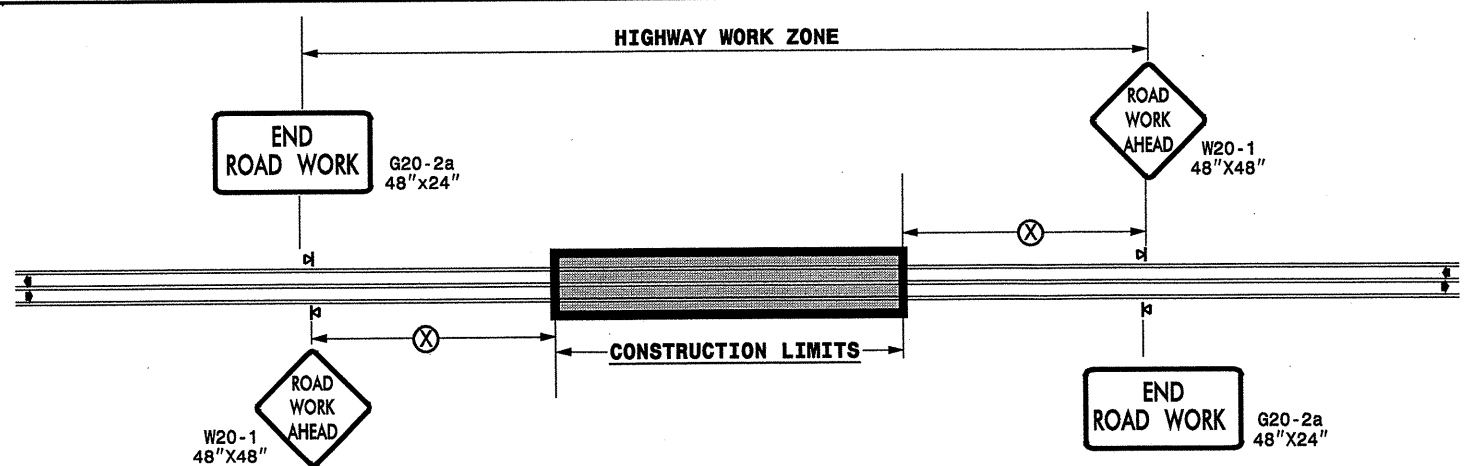
PROJECT NO.	SHEET NO.	TOTAL NO.
37670, 5CR.10321.8 5CR.20321.8,	<b>12</b>	

## SUMMARY OF QUANTITIES

PROJECT NO.	COUNTY	MAP NO.	ROUTE	DESCRIPTION	TYP NO.	LENGTH MI.	WIDTH FT.	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	1 1/2" MILLING SY	1.5" TO 3" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0C TONS	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, TYPE S9.5B TON	SURFACE COURSE, S9.5C TONS	PG 64-22 PLANT MIX TONS	PG 70-22 PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	MANHOLES EA	METER OR VALVE BOX EA	SEED & MULCHING AC	INDUCTIVE LOOP LF	LEAD-IN CABLE (18-4) LF				
37670	Durham	1	NC 55 SB	FROM END OF C&G TO SR 1121 (CORNWALLIS RD)	1	1.2	26	20	2.4			650				1,795		108			1.80	3,000	500					
		2		NC 55 NB	FROM SR 1121 (CORNWALLIS RD) TO BEGIN C&GION	2	1.2	24	40	2.4			1200	2180			1,587	94	95	900			1.80					
		TOTAL FOR PROJ NO. 37670						2.4		60	4.8			1850	2180		3,382	94	203	900			3.60	3,000	500			
5CR.10321.8	Durham	3	US 501	FROM US 501 BUS TO SR 1457 (TOM WILKINSON)	3	2.8	60				105600					8,296		498	515	15	1		5,000	2,000				
		"		US 501 BUS	FROM SR 1443 (HORTON RD) TO US 501	3	0.2	48				5632						474		28	20	5			4,000	500		
		"		US 501 BYPASS	FROM SR 1443 (HORTON RD) TO US 501	3	0.2	60				7040						593		36	95				2,000	500		
TOTAL FOR MAP NO. 3						3.2		0	0		118272	0	0		9,363		562	630	20	1			11,000	3,000				
TOTAL FOR PROJ NO. 5CR.10321.8						3.2		0	0		118272	0	0		9,363		562	630	20	1			11,000	3,000				
5CR.20321.8	Durham	4	SR 1401 (COLE MILL RD)	FROM SR 1404 (ROSE OF SHERON) TO END CG	5	0.1	40							129			8		20	5			500	250				
		"		"	FROM END CG TO NEW PVT (UMSTEAD)	4	1.9	26	100	3.8			818					174		275	7	5	2.28	500	250			
		"		"	FROM SR 1449 (UMSTEAD) TO OCL	4	0.1	24	50	0.2								122		7	50	5		0.12				
		TOTAL FOR MAP NO. 4						2.1		150	4		0			818	0	3158		189	345	17	5	2.40	1,000	500		
		5		SR 1639 (INFINITY RD)	FROM US-501 TO END C&G	4, 5	0.34	22	10	0.3					525				757		45		1		0.41	500	250	
		"		"	FROM END C&G TO SR 1631 (SNOWHILL RD)	4	2.46	22	100	4.92					30				2763		166		5	5	2.95			
		TOTAL FOR MAP NO. 5						2.8		110	5.22		0		555	0	3520		211		150	6	5	3.36	500	250		
		6		SR 1709 (MIDLAND TERRACE)	FROM SR 1800 (CHEEK RD) TO NEW PVT (I-85 BRIDGE)	4	0.6	22	100	1.2					1104				746	200	58		4		0.72	500	250	
		"		"	FROM NEW PVT (I-85 BRIDGE) TO SR 1669 (CLUB BLVD)	4	0.7	22	100	1.4					100				1141		68		6		0.84	500	250	
		TOTAL FOR MAP NO. 6						1.3		200	2.6		0	1204	0	1887	200			126		100	10		1.56	1,000	500	
		7		SR 1666 (DEARBORN DRIVE)	FROM SR 1669 (CLUB BLVD) TO SR 1004 (OLD OXFORD)	4	1.5	22	200	3					717				1767		106		9	5	1.80	1,000	500	
		8		SR 1669 (E. CLUB BLVD)	FROM BUS 501 (ROXBORO ST.) TO C&G	4	0.35	30	50	0.7					150				552		33		17	2	0.42	500	250	
"	"	FROM C&G TO SR 1709 (MIDLAND TERRACE)	4	0.95	24	100	1.9					350				1163		70		27	2	1.14	500	250				
TOTAL FOR MAP NO. 8						1.3		150	2.6		0	500	0	1715	0			103		290	44	4	1.56	1,000	500			
9	SR 1443 (HORTON RD)	FROM US 501 BYP TO US 501 BUS	3	0.1	48						2816						244		15				2,000	500				
10	SR 1999 (DAVIS DR)	FROM NEW PVT (NORTH OF I-40) TO SR 1121 (E. CORNWALLIS)	4	0.4	48							230				1000		60				1.20						
11	SR 1110 (FARRINGTON RD)	NC 54 TO NEW PVMNT BEYOND SR 1113 (EPHESUS CHURCH RD)	4	1.64	24	100	3.28					150				2190		131				1.97						
12	SR 1670 (GEER ST)	FROM NEW PVT TO NEW PVT (HARDEE ST)	4	0.27	26	80	0.54					120				358		21				0.32						
13	SR 1800 (CHEEK RD)	FROM SR 1670 (E. GEER) TO NEW PVT BEFORE HARDEE ST	4	0.43	22	50	0.86					100				483		29		1		0.52						
"	"	FROM SR 1827 (MIDLAND TERRACE) TO SR 1838 (JUNCTION RD)	4	1.1	22	100	2.2					100				1235		74		4	2	1.32						
TOTAL FOR MAP NO. 13						1.53		150	3.06		0	200	0	1718	0			103		295	5	2	1.84					
14	SR 2028 (TW ALEXANDER)	FROM NEW PVT TO SR 1945 (S. ALSTON AVE.)	4	0.4	24							60				449		27				0.48	1,500	500				
"	"	FROM SR 1945 (S. ALSTON AVE.) TO NC 54	4	0.9	24	25	1.8					130				3765		226		3	1	1.08	1,000	250				
TOTAL FOR MAP NO. 14						1.3		25	1.88		0	190	0	4214	0			253		70	3	1	1.56	2,500	750			
15	SR 1321 (HILLDALE RD)	FROM 500' SOUTH OF HORTON RD TO SR 1404 (ROSE OF SHARON)	4	1.1	22	50	2.2					50				621		37		2	3	1.32						
16	SR 1317 (MORREENE RD)	FROM SR 1320 (ERWIN RD.) TO BRIDGE OVER US 15-501 (RESTRIPE 3 LANE SECTIONS WHERE POSSIBLE)	4, 5	0.66	33							100				1077		65		14	6	0.40	500	250				
17	SR 1308 (CORNWALLIS RD)	FROM 15-501 TO NEW PAVEMENT PAST RIDGE ROAD	4	1.1	22					2200		133				1299		78				1.32	1,000	500				
TOTAL FOR PROJ NO. 5CR.20321.8						17.1		1215	32.98	2200	2816	4967	0	24524	200	244	1,483	15	2,160	110	31	20.61	10,500	4,250				
GRAND TOTAL						22.7		1275	37.78	2200	121088	6817	2180	24524	200	12,989	1,577	780	3,690	130	32	24.21	24,500	7,750				



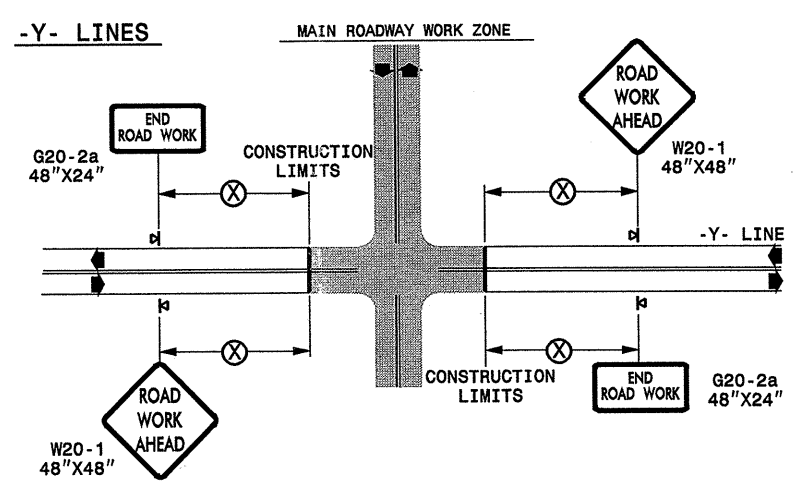
**TWO-WAY UNDIVIDED \*\* (L-LINES)**



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)**



DETAIL DRAWING  
FOR TWO-WAY UNDIVIDED  
WORK ZONE WARNING SIGNS

**GENERAL NOTES**

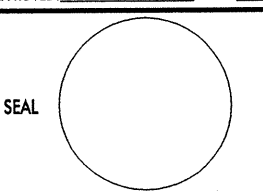
- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH 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

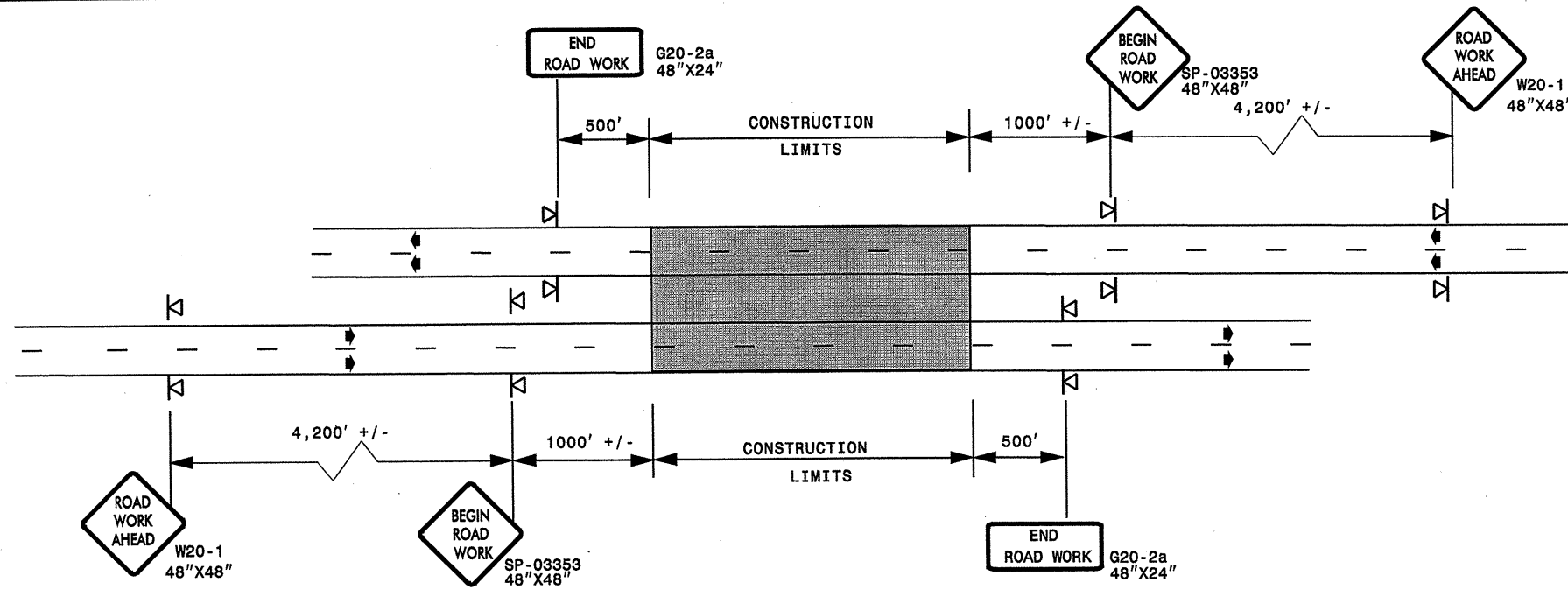
SHEET 1 OF 1

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

03-JAN-2008 2:07  
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 pseymore AT WZTCC237502

**ADVANCE WORK ZONE WARNING SIGNING FOR FREEWAYS (4 LANES OR GREATER)**

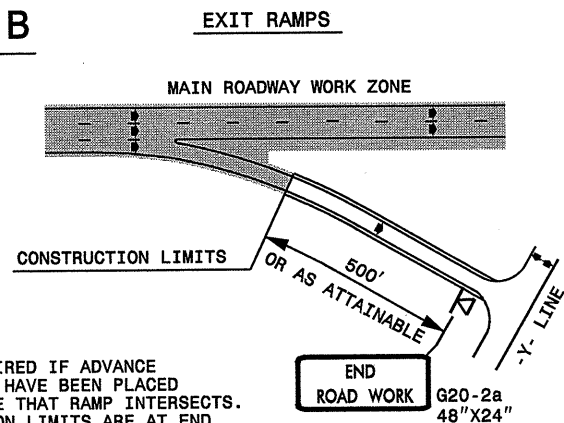
**DETAIL A**



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

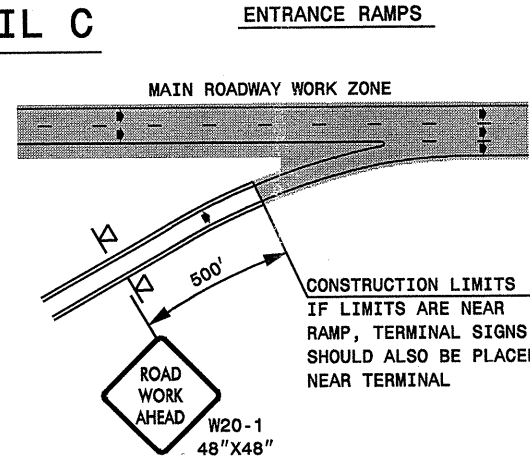
**ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)**

**DETAIL B**



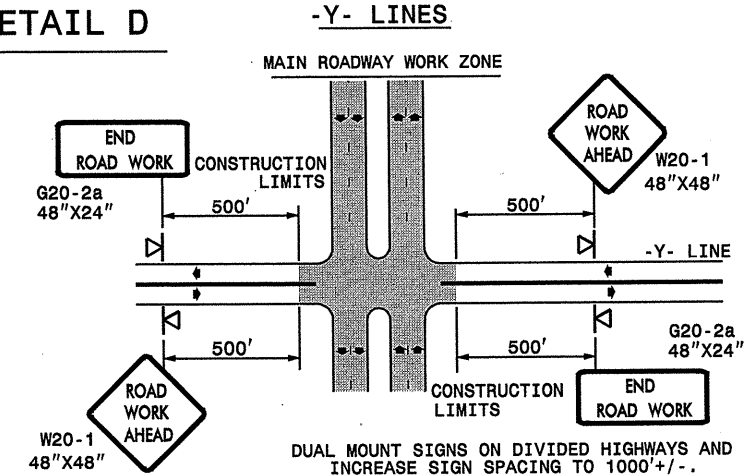
NOTE:  
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

**DETAIL C**



CONSTRUCTION LIMITS IF LIMITS ARE NEAR RAMP, TERMINAL SIGNS SHOULD ALSO BE PLACED NEAR TERMINAL.

**DETAIL D**



DUAL MOUNT SIGNS ON DIVIDED HIGHWAYS AND INCREASE SIGN SPACING TO 1000'+/-.

**GENERAL NOTES**

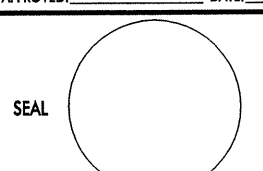
- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCE WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE PORTABLE WORK ZONE SIGNS ONLY WITH 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 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 FREEWAYS WORK ZONE WARNING SIGNS (SHORT-DURATION LANE CLOSURES)**

SHEET 1 OF 1

APPROVED: _____	DATE: _____	DETAIL DRAWING FOR FREEWAYS 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: _____			

03-JAN-2008 2:409  
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 pseymore AT WZTC231502

**SP 03353**

<p>SIGN NUMBER: SP-03353 TYPE: A QUANTITY: 1 SIGN WIDTH: 4'-0" HEIGHT: 4'-0" TOTAL AREA: 16.0 Sq.Ft. BORDER TYPE: FLUSH RECESS: 0.59" WIDTH: 0.75" RADII: 1.38" NO. Z BARS: N/A LENGTH: N/A</p>	<p>BACKG COLOR: Fluorescent Orange COPY COLOR: Black</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table>	SYMBOL	X	Y	WID	HT																																														<p>DESIGN BY: CL DOWNEY PROJECT ID: ALL PROJECTS CHECKED BY: CHECKED DIV: DIV STD #: W20-1 DATE: Aug 20, 2003</p>	<p>BORDER R=1.38" TH=0.75" IN=0.59"</p>								
SYMBOL	X	Y	WID	HT																																																									
<p>USE NOTES: 2, 4 1. Legend and border shall be direct applied Type VII reflective sheeting. 2. Legend and border shall be direct applied non-reflective sheeting. 3. Shields shall be Type VII reflective sheeting on 0.032" (0.8mm) aluminum and demountable. 4. Background shall be Type VII reflective sheeting. 5. Background shall be Type I reflective sheeting. 6. Center arrow(s) vertically on sign. 7. Bottom panel shall be yellow Type III sheeting. Legend shall be direct applied black non-reflective sheeting. Yellow panel is:</p>																																																													
<p>LETTER POSITIONS</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="10">Letter spacings are to start of next letter</th> <th>Series/Size</th> </tr> <tr> <th colspan="10"></th> <th>Text Length</th> </tr> </thead> <tbody> <tr> <td>B</td><td>E</td><td>G</td><td>I</td><td>N</td><td></td><td></td><td></td><td></td><td></td> <td>22.4</td> <td>21.6</td> </tr> <tr> <td>R</td><td>O</td><td>A</td><td>D</td><td></td><td></td><td></td><td></td><td></td><td></td> <td>23.4</td> <td>19.6</td> </tr> <tr> <td>W</td><td>O</td><td>R</td><td>K</td><td></td><td></td><td></td><td></td><td></td><td></td> <td>22.6</td> <td>21.2</td> </tr> </tbody> </table> <p>Spacing Factor is 1 unless specified otherwise</p>				Letter spacings are to start of next letter										Series/Size											Text Length	B	E	G	I	N						22.4	21.6	R	O	A	D							23.4	19.6	W	O	R	K							22.6	21.2
Letter spacings are to start of next letter										Series/Size																																																			
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B	E	G	I	N						22.4	21.6																																																		
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STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

DETAIL DRAWING FOR  
 WORK ZONE SIGNS  
 BEGIN ROAD WORK

**GENERAL NOTES FOR SIGN SP-03353 "BEGIN ROAD WORK"**

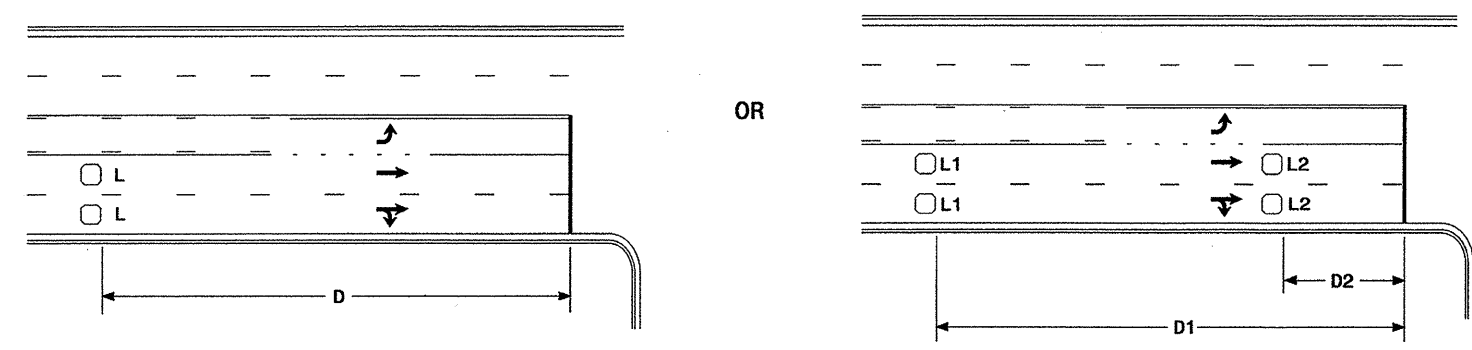
- SIGN SP-03353 "BEGIN ROAD WORK" ONLY APPLIES TO FULL CONTROL AND PARTIAL CONTROL OF ACCESS ROADWAYS
- WHEN USED, INSTALL SIGN SP-03353 "BEGIN ROAD WORK" ACCORDING TO DETAIL FOR FREEWAY WORK ZONE SIGNS

APPROVED: _____	DATE: _____	DETAIL DRAWING FOR ADVANCED WORK ZONE WARNING SIGN DESIGNS	
SEAL	SCALE: NONE		REVISIONS
	DATE: 08/03		04/04
	DWG. BY:		11/04
	DESIGN BY:		
REVIEWED BY:			

03-JAN-2008 2:11  
 \\DOT\DFSROOT\ON\GROUPS-WZTCCC\designgroup4\resurfacing\resurfacing2007\Div05\C201997\_31670etc-Durham\_NC355etc\C201997\_31670etc\_SignDesignsJuly2006.dgn  
 pseymore AT WZTCCC237502



### 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

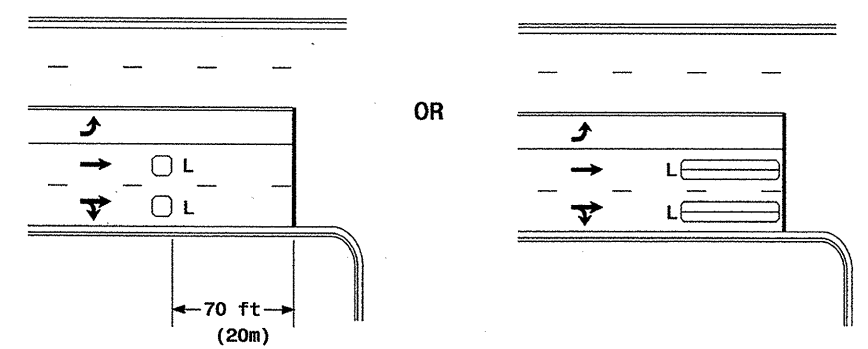
Volume Density Operation

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

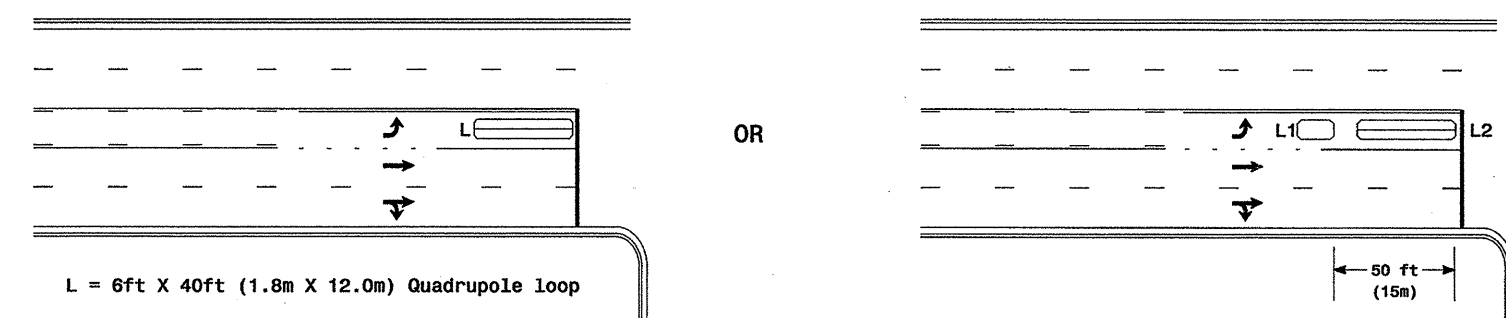
### Low Speed Detection [≤35 mph (56 km/hr)]



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

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

### Left Turn Lane Detection



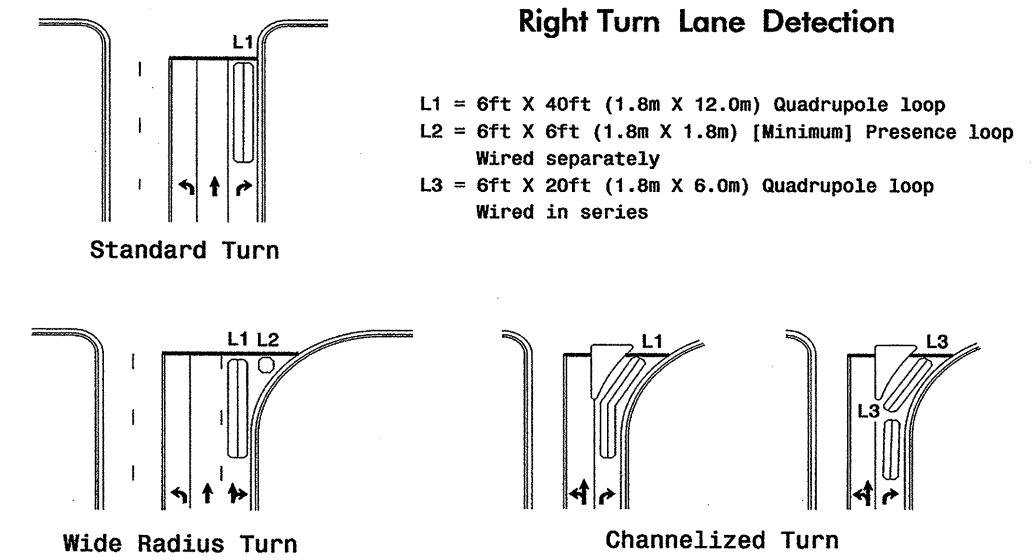
L = 6ft X 40ft (1.8m X 12.0m) Quadrupole Loop

Presence Loop Detection

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

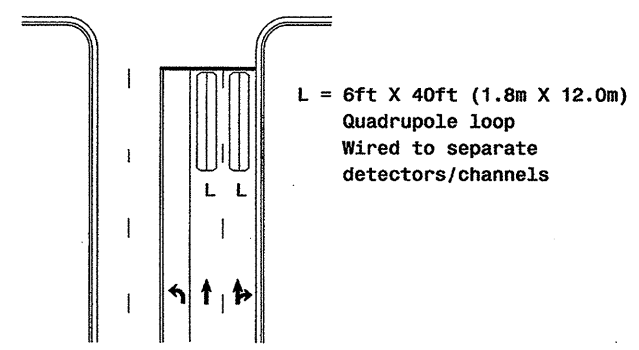
Queue Loop Detection

### Right Turn Lane Detection



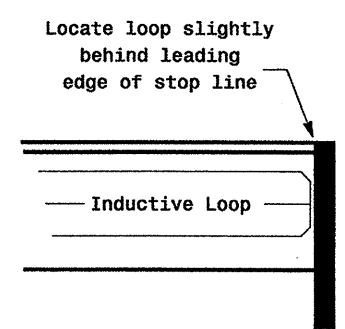
L1 = 6ft X 40ft (1.8m X 12.0m) Quadrupole loop  
L2 = 6ft X 6ft (1.8m X 1.8m) [Minimum] Presence loop  
Wired separately  
L3 = 6ft X 20ft (1.8m X 6.0m) Quadrupole loop  
Wired in series

### 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

Prepared in the Office of:  
  
 122 N. McDowell St., Raleigh, NC 27603  
 SCALE: N/A

#### Typical Loop Locations

PLAN DATE: June 2006	REVIEWED BY:
PREPARED BY: P. L. Alexander	REVIEWED BY:
REVISIONS	INIT. DATE
✓ Revise pavement markings	ae 12/1/06
SIGNATURE	DATE
SIG. INVENTORY NO.	

SEAL  
 NORTH CAROLINA  
 PROFESSIONAL ENGINEER  
 SEAL 2348  
 P. L. Alexander  
 6/6/06

19-000-006 11/05  
 as it is shown in the turn in the loop type (cat) 2006.dgn  
 pollex@ncdot.gov

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

INDUCTIVE DETECTION LOOPS  
ENGLISH DETAIL DRAWING FOR

SHEET 1 OF 3  
1725D01

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

INDUCTIVE DETECTION LOOPS  
ENGLISH DETAIL DRAWING FOR

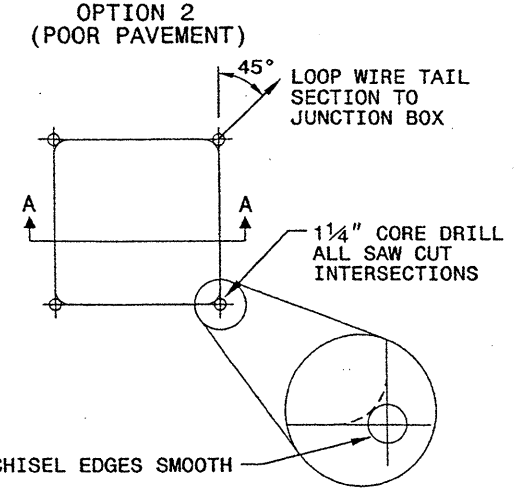
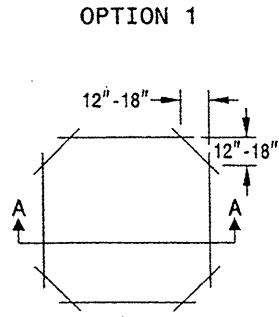
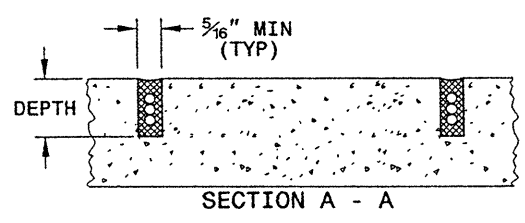
SHEET 1 OF 3  
1725D01

**CONVENTIONAL 4-SIDED LOOP**

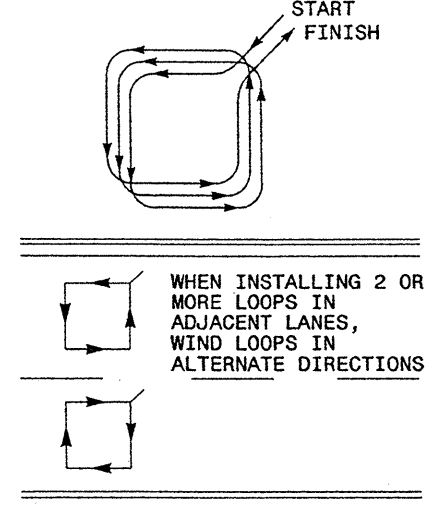
**SAW CUT OPTIONS**

**SAW SLOT DEPTH CHART**

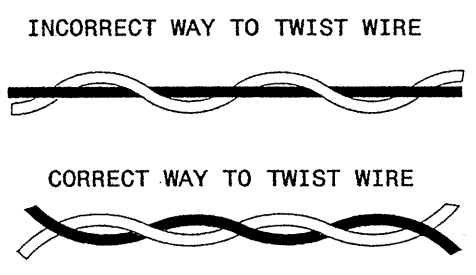
DEPTH (IN)	NO. OF WIRE TURNS					
	2	3	4	5	6	
CONCRETE	2.0	2.0	2.5	2.5	3.0	
ASPHALT	2.0	2.5	3.0	3.0	3.0	



**LOOP WINDING METHOD**



**LOOP WIRE TWISTING METHOD**

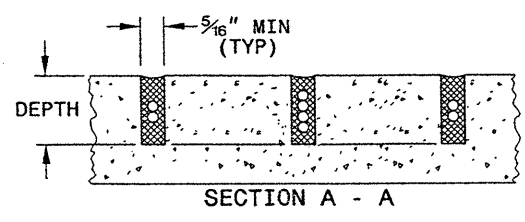
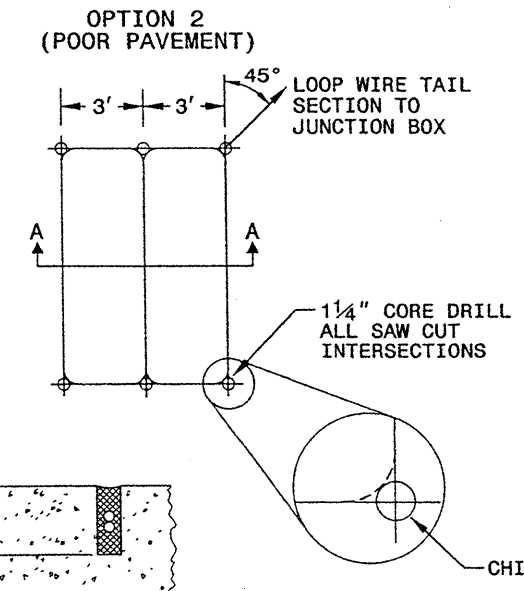
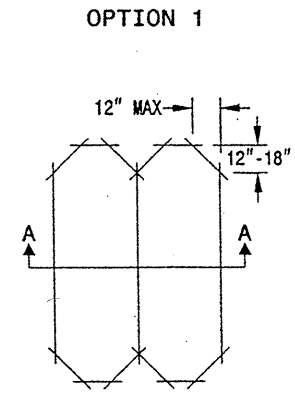


**NOTES**

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.

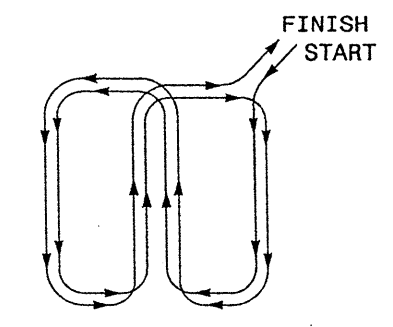
**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



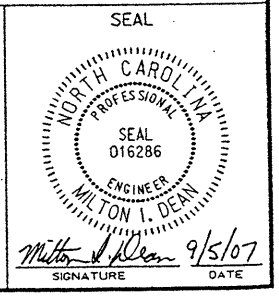
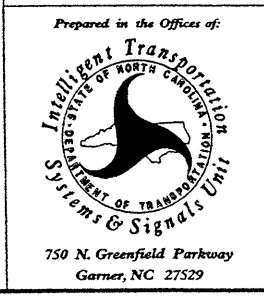
DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

**LOOP WINDING METHOD**



05-SEP-2007 14:00 c:\documents and settings\zml17116\desktop\standard metal pole sheets\1725D01.mxd zml17116

See Plate for Title



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DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

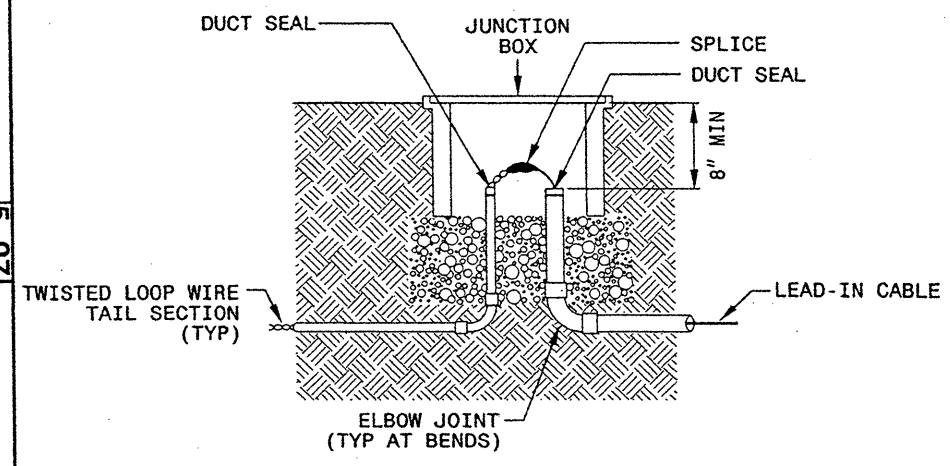
5-07

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

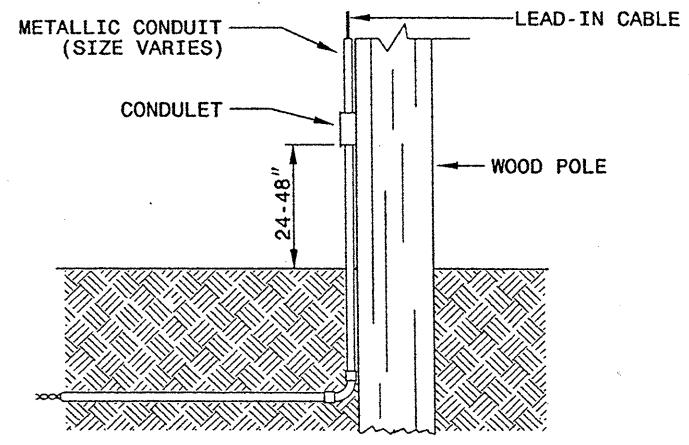
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



**LOOP WIRE AT POLE**

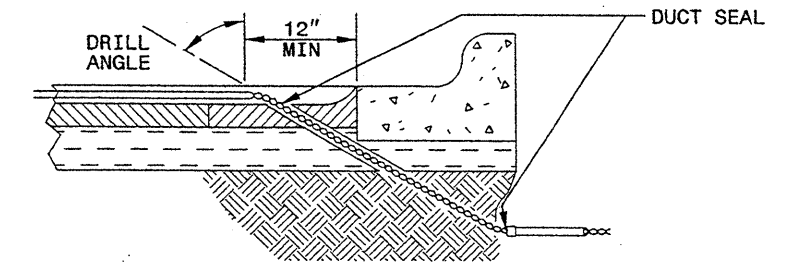


**NOTE**

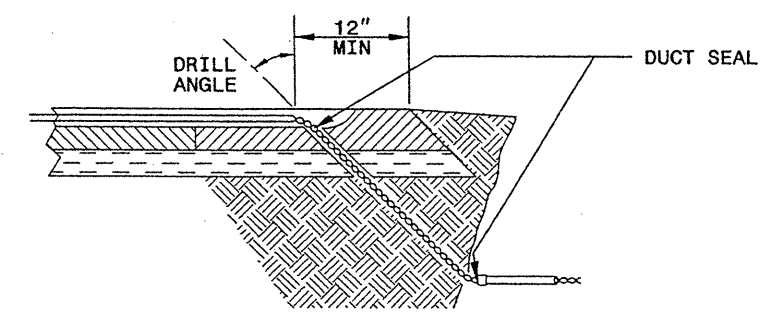
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**LOOP WIRE PAVEMENT EDGE DETAILS**

**LOOP WIRE AT CURB & GUTTER SECTION**



**LOOP WIRE AT PAVEMENT SECTION**



**NOTES**

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

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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

Milton I. Dean 9/5/07  
SIGNATURE DATE

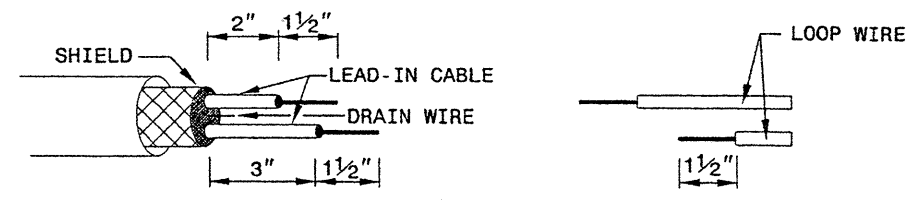
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

5-07

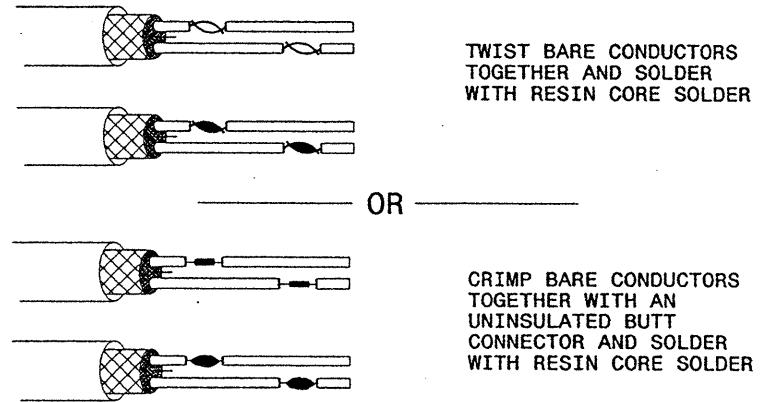
ENGLISH DETAIL DRAWING FOR  
**INDUCTION DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

**STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE**

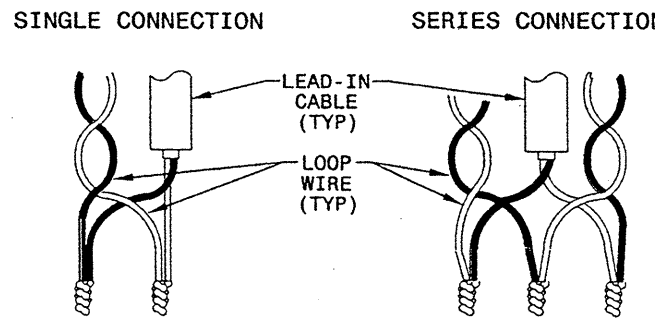


**STEP 2. CONNECT AND SOLDER**

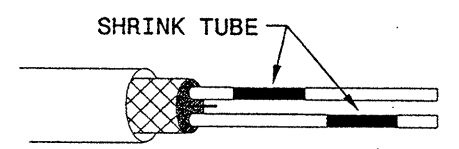


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

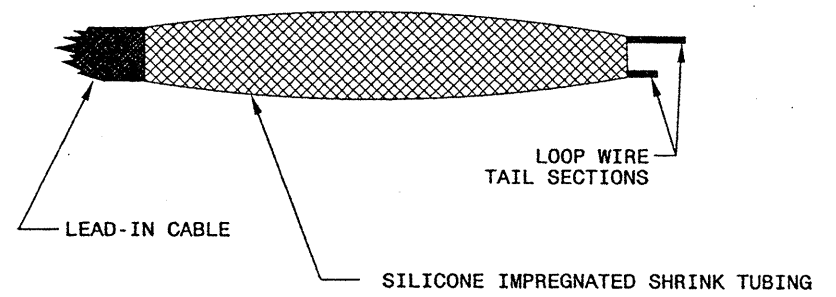
**LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS**



**STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY**



**STEP 4. ENVIRONMENTALLY PROTECT SPLICE**



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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

Milton I. Dean 9/5/07  
SIGNATURE DATE

05-SEP-2007 14:01  
c:\csc\scs\p1s\0507\09\0507\0103\m072301.dwg  
sheet:1725D01\_03.dwg

# TWO LANE, TWO WAY WORK ZONE (L-LINES)

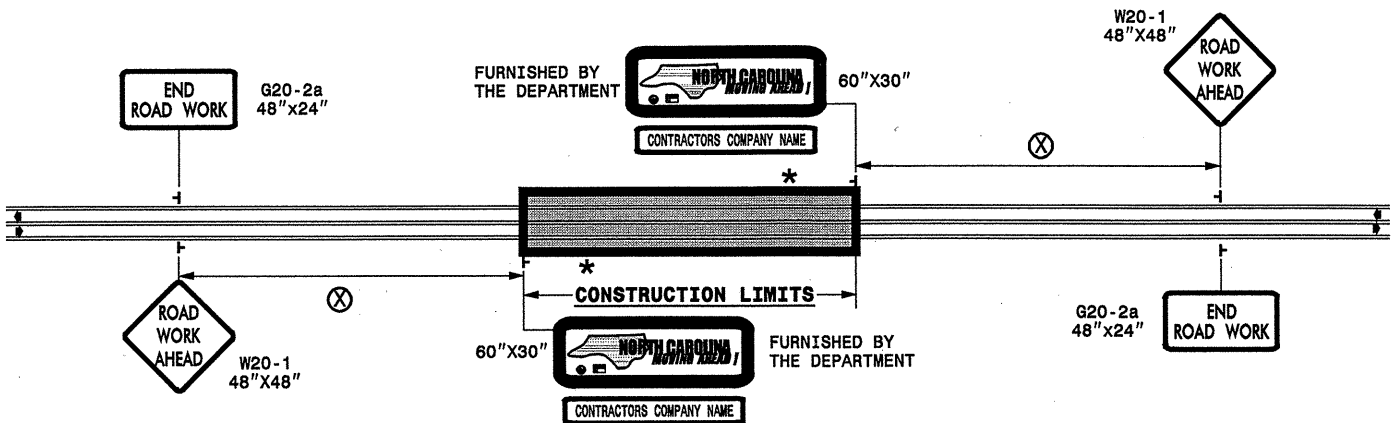
WBS Elements: 37670,  
5CR.10321.8 & 5CR.20321.8

PROJ. REFERENCE NO. See to the Left	SHEET NO. NCMA-1
--	---------------------


POSTED SPEED LIMIT (M.P.H.)	RECOMMENDED MINIMUM SIGN SPACING
P.S.L. ≤ 50	350'
P.S.L. ≥ 55	500'

**\* ROAD WORK NEXT XX MILES** G20-1A 60"x24"

THIS SIGN TO BE USED ON PROJECTS LONGER THAN 2 MILES THE NUMBER DISPLAYED ON THE SIGN IS TO BE A WHOLE NUMBER ROUNDED UP TO THE NEXT MILE IT'S TO BE LOCATED 1,500 FEET INSIDE OF THE CONSTRUCTION LIMITS



FURNISHED BY THE DEPARTMENT



60"x30"

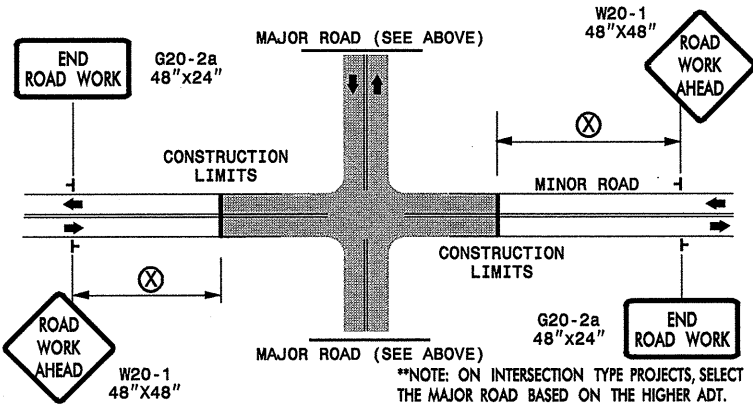
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CONTRACTORS COMPANY NAME

60" Max. X 12"

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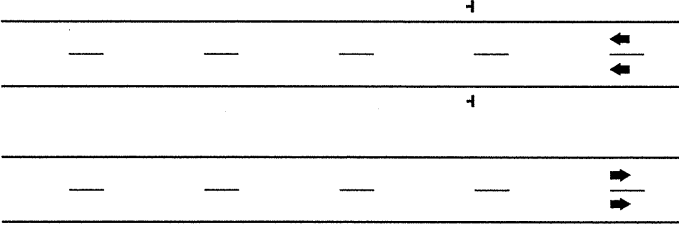
# INTERSECTIONS (-Y- LINES)



# FREEWAYS / INTERSTATES

DUAL MOUNT "ROAD WORK AHEAD" SIGNS 1,000' IN ADVANCE OF PROJECT LIMITS

DUAL MOUNT "MOVING AHEAD" SIGNS 500' IN ADVANCE OF PROJECT LIMITS



## GENERAL NOTES

- USE FLUORESCENT ORANGE SHEETING (TYPE VII OR HIGHER) ON ALL ADVANCED WORK ZONE SIGNS.
- DO NOT INSTALL ADVANCE WARNING SIGNS MORE THAN 3 DAYS PRIOR TO BEGINNING OF WORK.
- SIGNS SHOWN ARE REQUIRED FOR WORK ZONES THAT WILL REMAIN IN EFFECT OVERNIGHT. FOR SHORT-TERM DAILY MAINTENANCE TYPE OPERATIONS, THIS SIGNING APPLICATION IS OPTIONAL; MAY USE ONLY APPLICABLE ROADWAY STANDARD DRAWINGS INSTEAD. HOWEVER, IF THIS SIGNING APPLICATION IS USED, SIGNS MAY BE PORTABLE MOUNTED. 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.
- ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE, FIELD ADJUST AS NECESSARY OR AS DIRECTED.
- USE 3LB STEEL U-CHANNEL POST OR 4" X 4" WOOD POST FOR ALL WORK ZONE SIGNS. 3LB STEEL U-CHANNEL POSTS MUST MEET THE REQUIREMENTS OF STANDARD SPECIFICATION SECTION 1094-1(B), MAY BE GALVANIZED STEEL, OR MAY BE PAINTED GREEN BY THE POST MANUFACTURER. SQUARE STEEL TUBING POSTS HAVING EQUIVALENT STRENGTH OF THE 3 LB STEEL U-CHANNEL POST ARE ALSO ACCEPTABLE FOR USE. ERECT SIGNS PER ROADWAY STANDARD DRAWING 1110.01. PAYMENT FOR WOOD POSTS, 3LB STEEL U-CHANNEL AND SQUARE STEEL TUBING POSTS WITH SIGNS WILL BE MADE ACCORDING TO STANDARD SPECIFICATION "WORK ZONE SIGNS" SECTION 1110.
- WHEN NECESSARY, USE SPLICING IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1110.01. REMOVE ENTIRE POST WHEN REMOVING SIGNS WITH SPLICED POSTS.
- DO NOT BACK BRACE SIGN SUPPORTS.

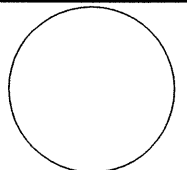
**LEGEND**

┆ STATIONARY SIGN

◀ DIRECTION OF TRAFFIC FLOW

DETAIL DRAWING FOR ADVANCE  
 WARNING WORK ZONE SIGNS

SHEET 1 OF 1

APPROVED: _____ DATE: _____	<b>ADVANCE WARNING WORK ZONE SIGNS FOR "MOVING AHEAD"</b>	
SEAL 	SCALE: NONE	REVISIONS
	DATE: 07/03	11/04
	DWG. BY: JSK	12/04
	DESIGN BY: JSK	
REVIEWED BY: SK		