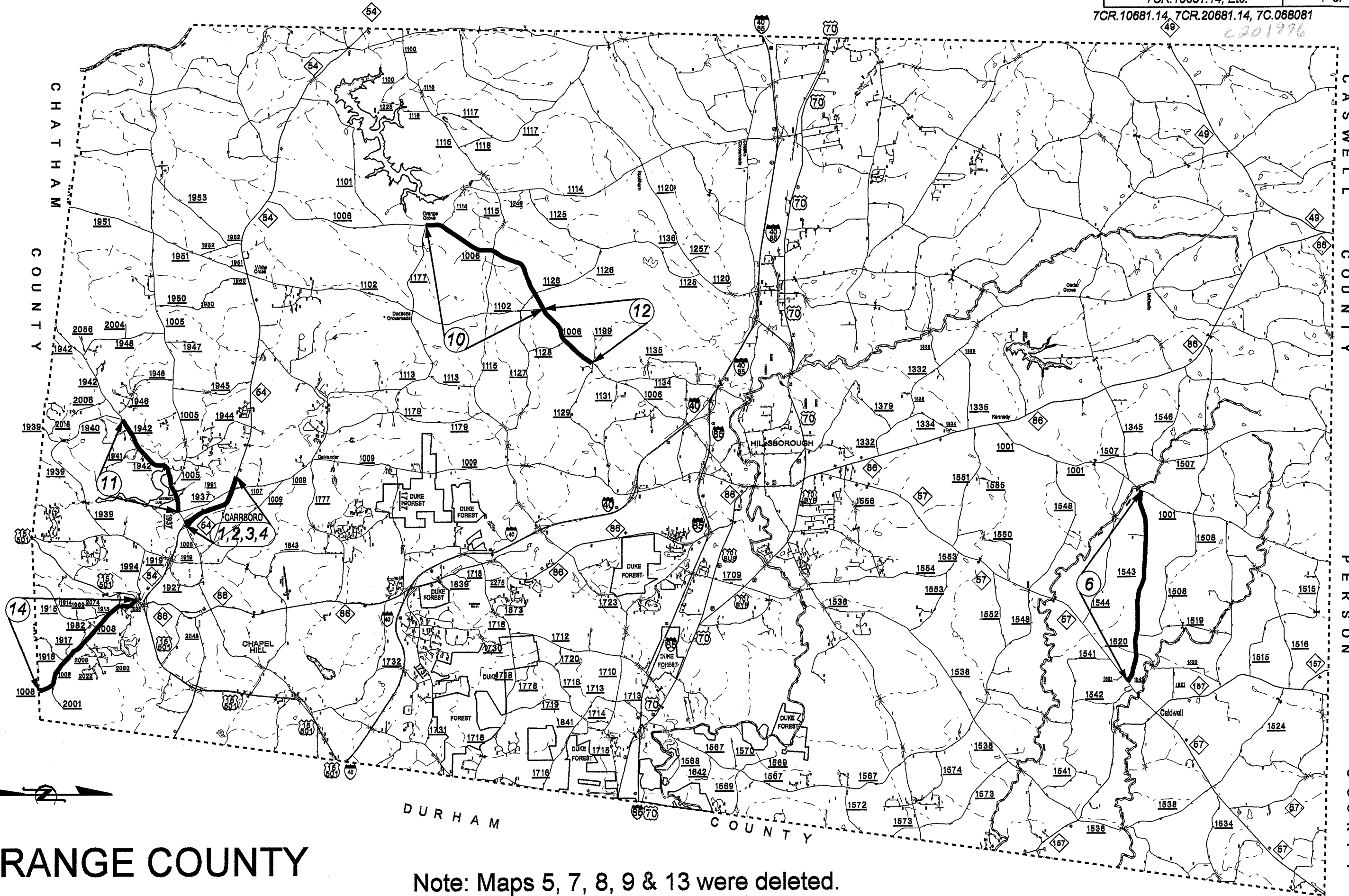
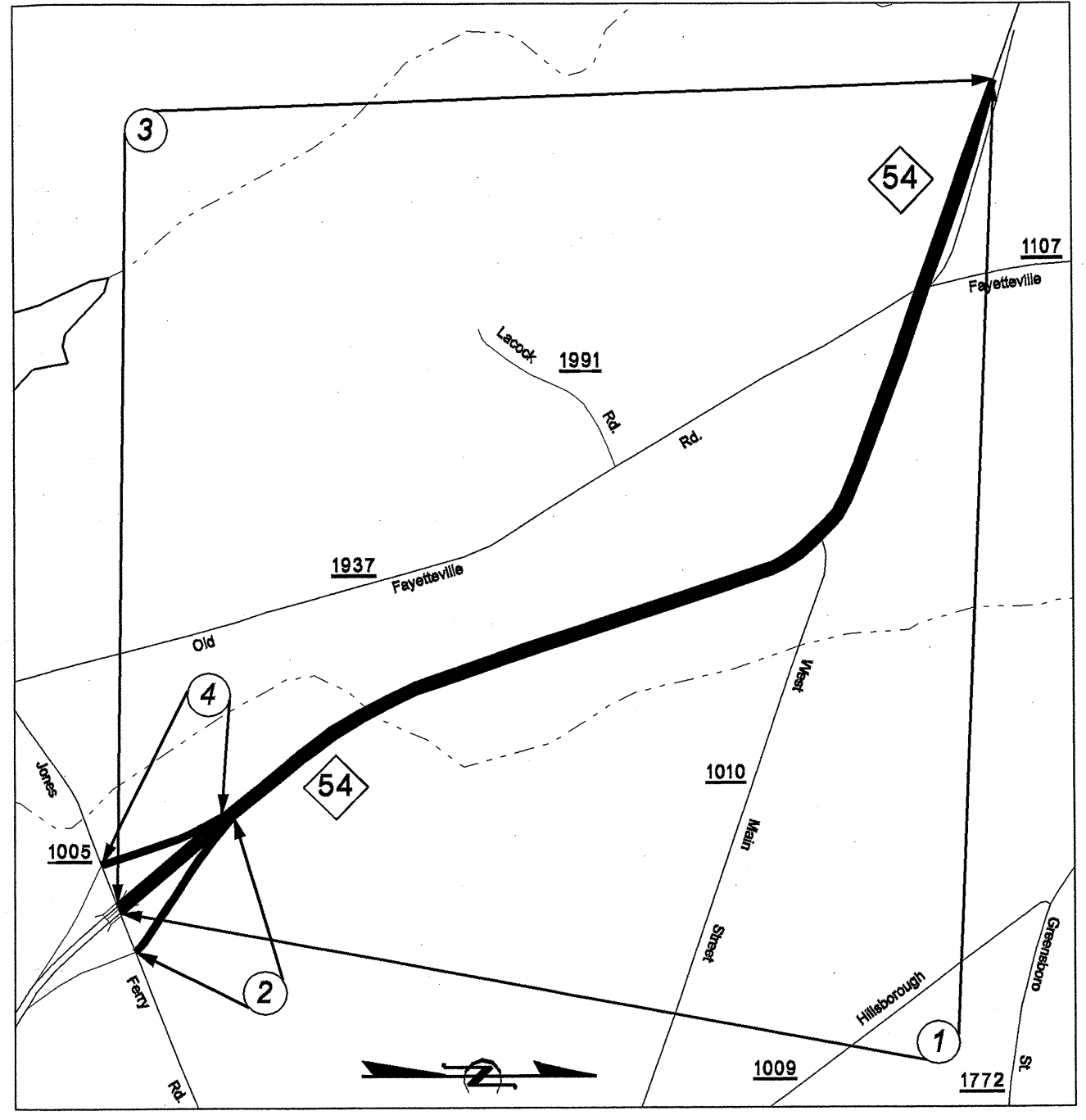
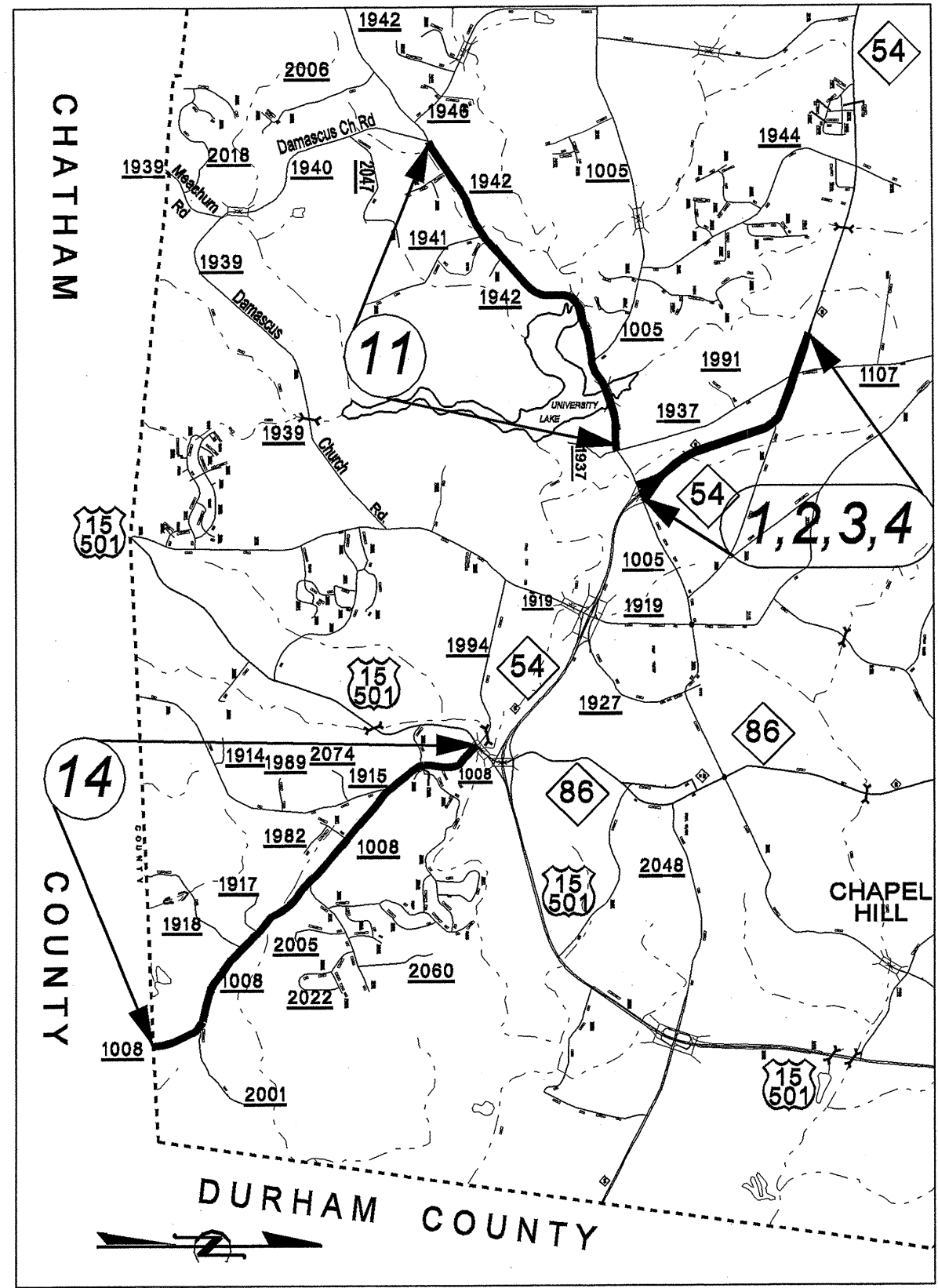


7CR.10681.14, 7CR.20681.14, 7C.068081  
2201996

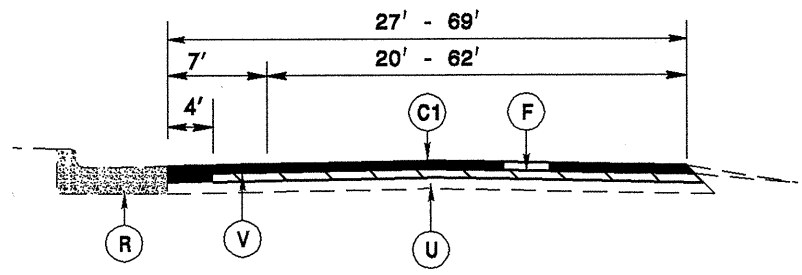


# ORANGE COUNTY

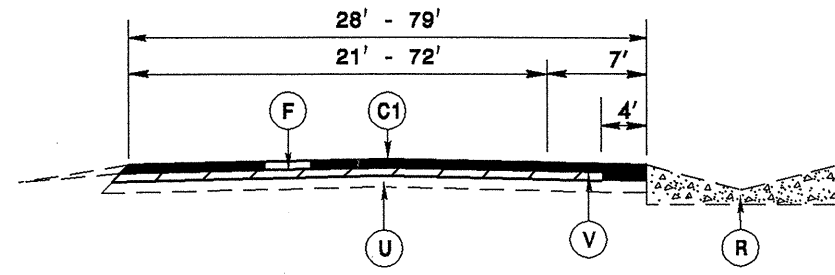
Note: Maps 5, 7, 8, 9 & 13 were deleted.



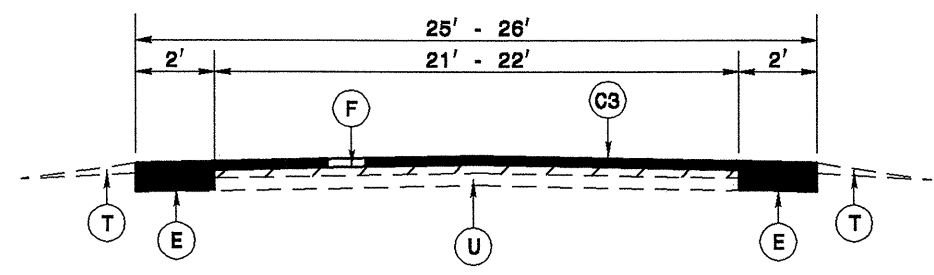
ORANGE COUNTY



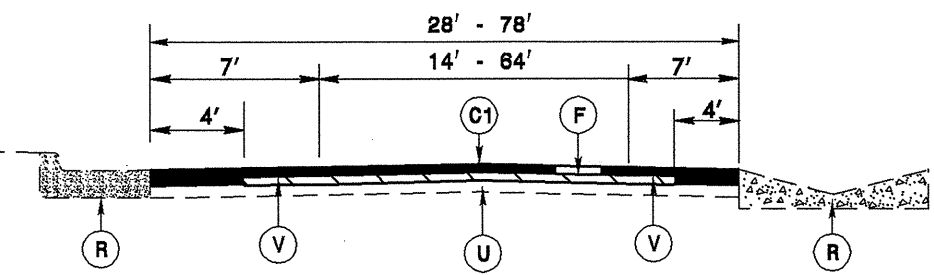
USED ON MAP 1,3  
**TYPICAL SECTION NO. 1**



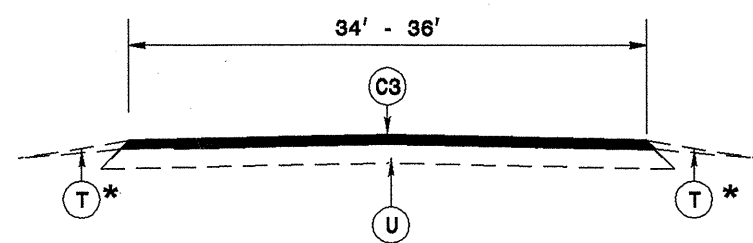
USED ON MAP 1,2  
**TYPICAL SECTION NO. 6**



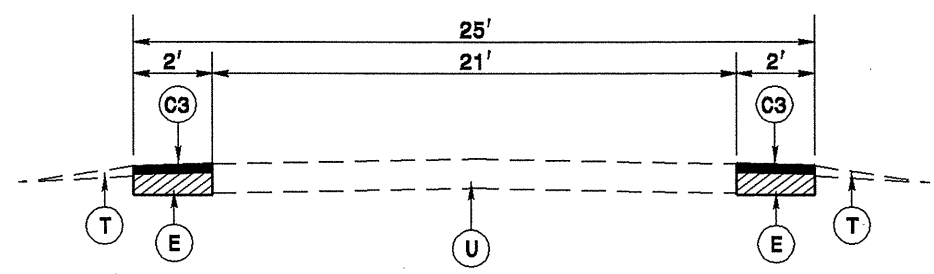
USED ON MAPS 10 & 14  
**TYPICAL SECTION NO. 11**



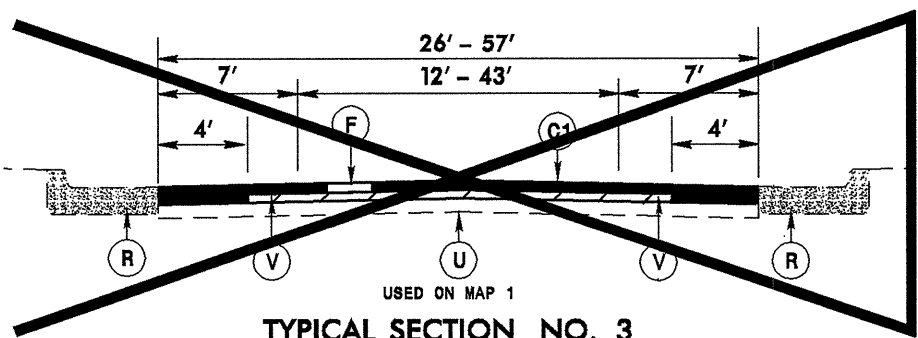
USED ON MAP 1,2,3,4  
**TYPICAL SECTION NO. 2**



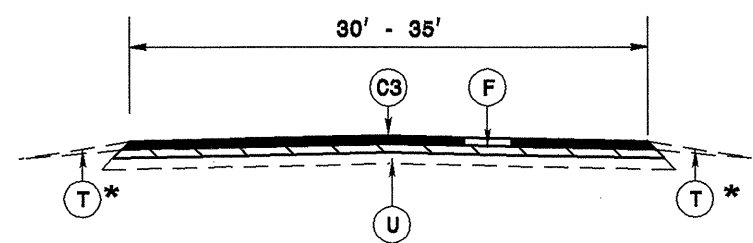
\* SHOULDER RECONSTRUCTION TO BE DETERMINED BY PROJECT ENGINEER  
USED ON MAP 11  
**TYPICAL SECTION NO. 7**



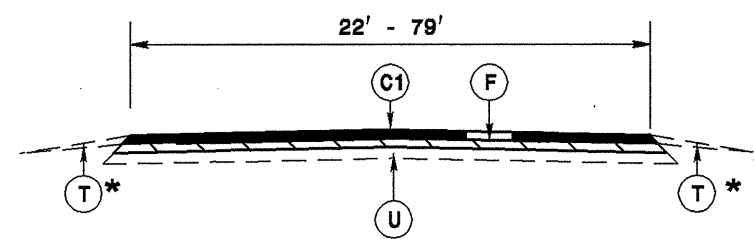
USED ON MAP 12  
**TYPICAL SECTION NO. 12**



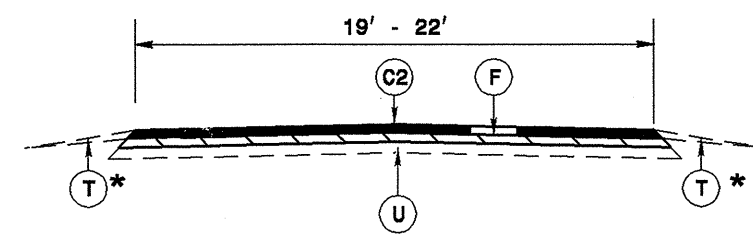
USED ON MAP 1  
**TYPICAL SECTION NO. 3**



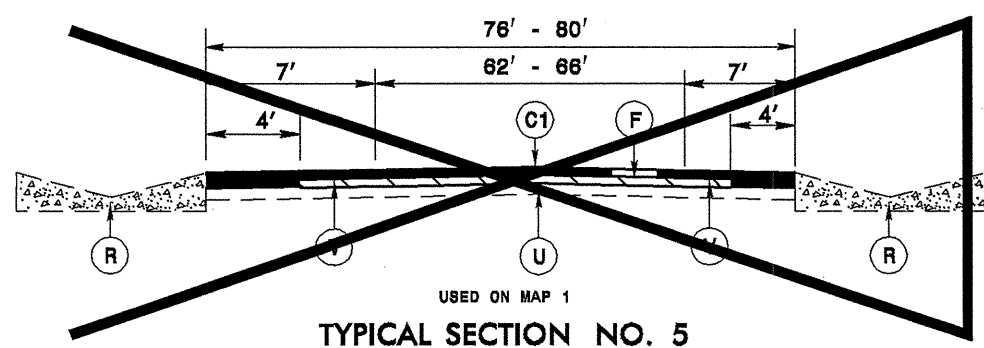
\* SHOULDER RECONSTRUCTION TO BE DETERMINED BY PROJECT ENGINEER  
USED ON MAP 14  
**TYPICAL SECTION NO. 8**



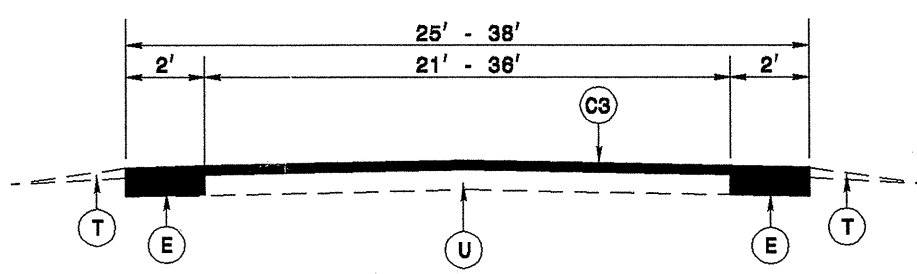
\* SHOULDER RECONSTRUCTION TO BE DETERMINED BY PROJECT ENGINEER  
USED ON MAP 1,2,4  
**TYPICAL SECTION NO. 4**



\* SHOULDER RECONSTRUCTION TO BE DETERMINED BY PROJECT ENGINEER  
USED ON MAPS 6  
**TYPICAL SECTION NO. 9**



USED ON MAP 1  
**TYPICAL SECTION NO. 5**



USED ON MAP 11  
**TYPICAL SECTION NO. 10**

**PAVEMENT SCHEDULE**

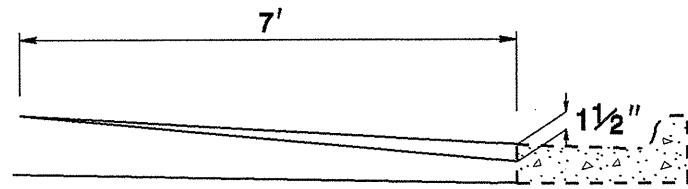
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 138 LBS. PER SQ. YD.
C3	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD.
E	PROP. APPROX. 7" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 399 LBS. PER SQ. YD. IN EACH OF TWO LAYERS
F	ASPHALT SURFACE TREATMENT, 78M MAT
R	EXISTING 2-6 CURB AND GUTTER OR EXISTING CONCRETE DITCH
T	SHOULDER RECONSTRUCTION
U	EXISTING PAVEMENT
V	MILL FROM EP OUT 7', 0" - 1 1/2"

5/14/99  
SYSTEMS/CONSTRUCTION

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	7CR.10681.14, ETC	4	6

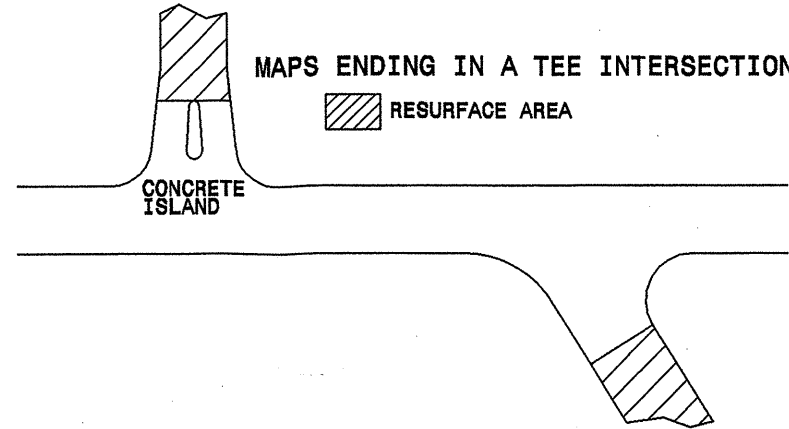
7CR.20681.14, 7C.068081

**MILLING DETAIL FOR V1**

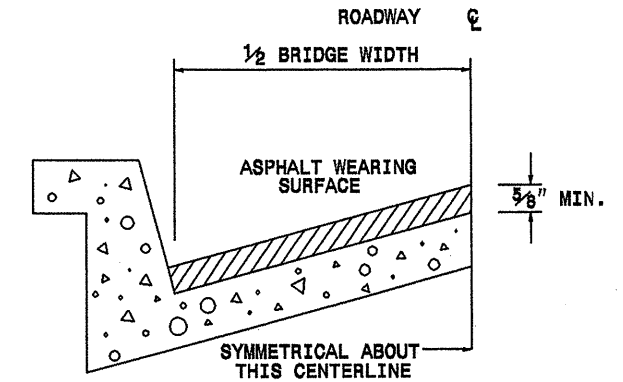
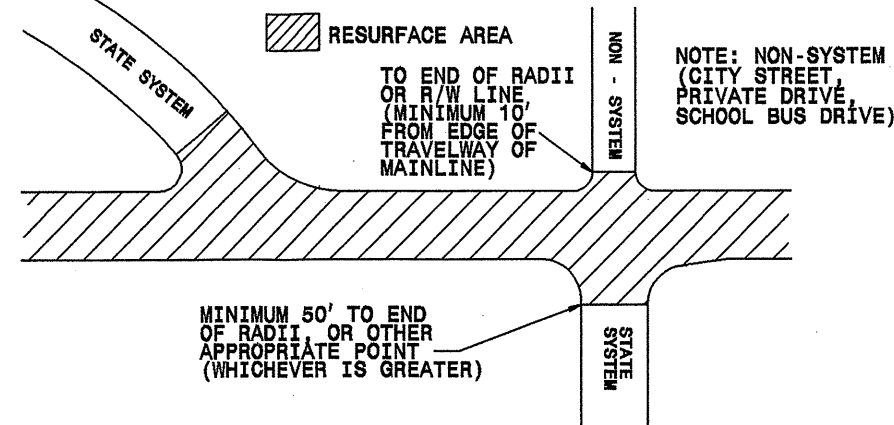


MILL EXISTING ASPHALT PAVEMENT 1 0-1 1/2" AT LOCATIONS AS DIRECTED BY THE ENGINEER

**PAVING DETAIL 1  
MAIN LINE IS NOT BEING RESURFACED**



**PAVING DETAIL 2  
MAIN LINE IS BEING RESURFACED**



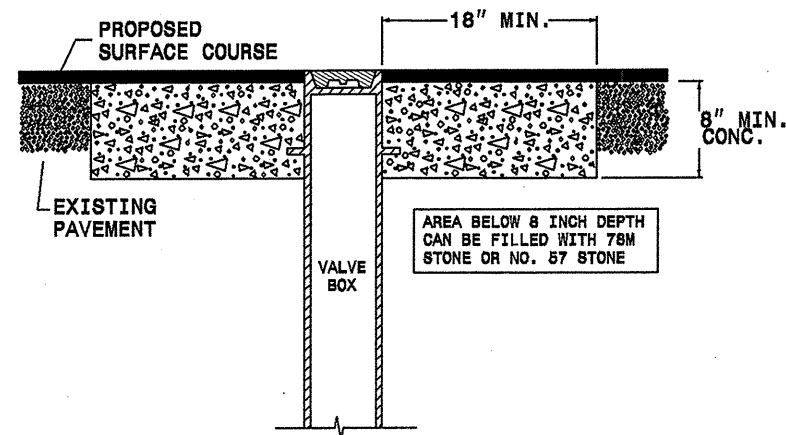
**BRIDGE HALF TYPICAL SECTION**

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.

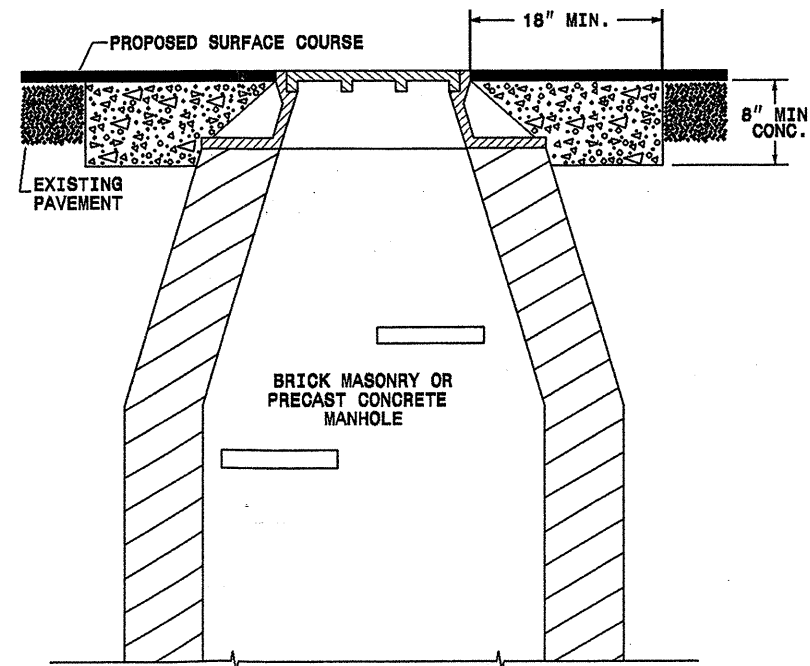
**NOTES**

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

**STANDARD CONCRETE ENCASEMENT FOR MANHOLE & VALVE CASTINGS IN PAVEMENT  
DETAIL DRAWING NO. 858.01**



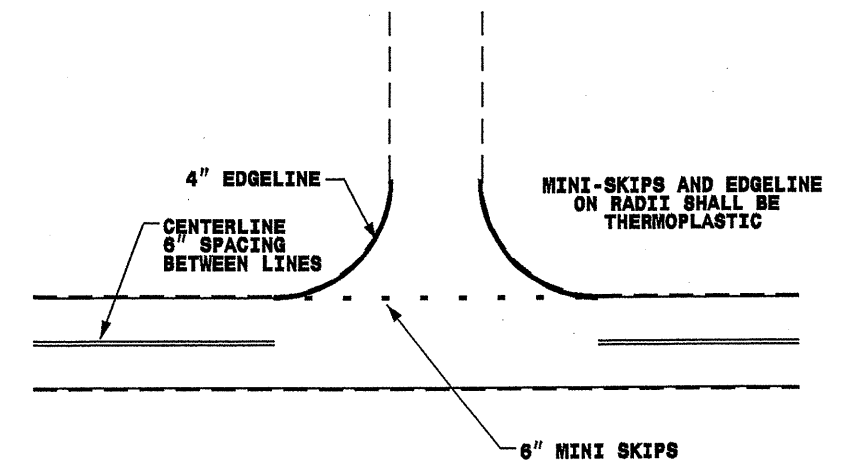
USE RAPID SET GROUT, MORTAR, OR CONCRETE  
CLASS B CONCRETE MAY BE USED WHEN ADJUSTMENTS ARE NOT IN THE TRAVEL LANE.



**NOTES:**

- MORTAR SHALL BE MIXED TO NCDOT SPECIFICATIONS.
- ALL FAULTY EXISTING BRICKWORK TO BE REMOVED AND REPLACED WITH NEW BRICK MASONRY.
- EXCAVATION FOR THE ADJUSTMENT SHALL BE SHEER CUT ON ALL SIDES.
- RAPID SET GROUT, MORTAR, OR CONCRETE SHALL BE USED

**TO BE USED AT ALL  
NON-SIGNALIZED INTERSECTIONS  
(NOT TO SCALE)**



NOTE: MINI SKIPS SHALL BE PLACED ON A 10' CYCLE, CONTAINING AN 8' AND 2' SKIP, THE WIDTH OF THE SKIP SHALL BE 6".

PROJECT NO.	SHEET NO.	TOTAL NO.
7CR.10681.14, 7CR.20681.14 & 7C.068081	5	6

## SUMMARY OF QUANTITIES

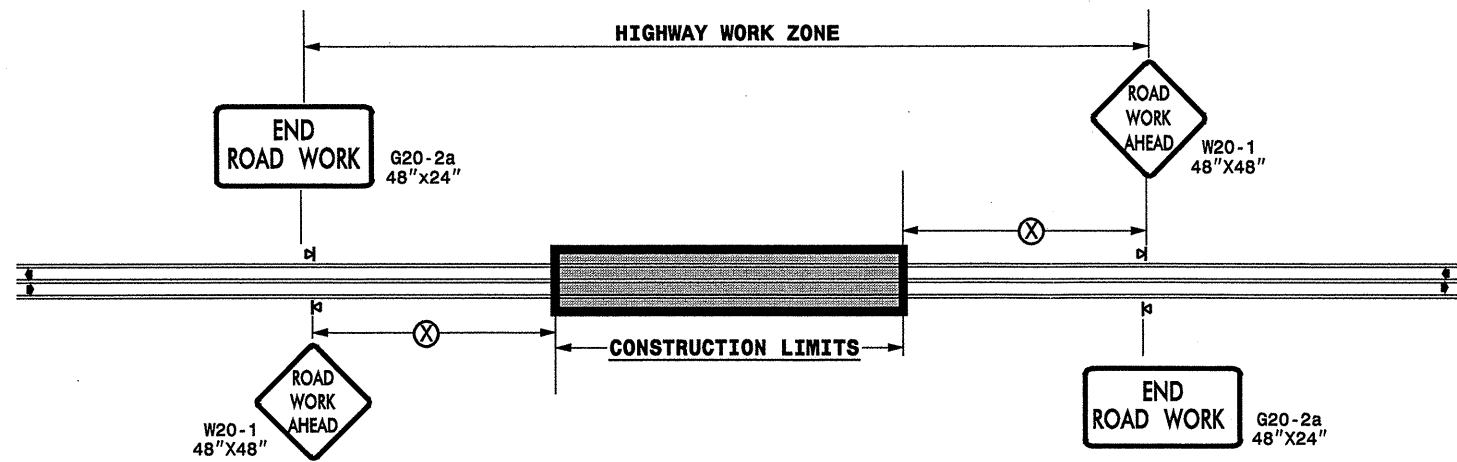
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LENGTH MI	WIDTH FT	INCIDENTAL STONE BASE TONS	SHOULDER RECONSTRUCTION SMI	0" TO 1.5" MILLING SY	INCIDENTAL MILLING SY	BASE COURSE, B25.0B TONS	SURFACE COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TONS	PG 64-22 PLANT MIX TONS	AST MAT COAT 78M SY	RETROFIT. EXIST. WHEELCHAIR RAMPS EA	ADJ. OF MANHOLES EA	ADJ. OF METER OR VALVE BOX EA	SEED & MULCHING AC	RESIDENTIAL SEEDING AC	TRENCHING (UNPAVED) (1) (2") LF	PULL BOX (STANDARD) LF	INDUCTIVE LOOP SAW CUT LF	LEAD-IN CABLE (14-2) LF
7CR.10681.14	Orange	1	NC 54 WB	FROM JONES FERRY BRIDGE TO PAVEMENT JOINT .34 MILES W. OF SR1107 (OLD FAYETTEVILLE RD)	1,2,4,6	1.64	28-79			9,028	242		3,162		190	32,316	8	6	13			20	1	3,500	20
7CR.10681.14	Orange	2	NC 54 EB ON RAMP	FROM SR 1005 (JONES FERRY RD) TO NC 54 WEST BOUND	2,4,6	0.16	22-121			77			213		13	2,452			1						
7CR.10681.14	Orange	3	NC 54 EB	FROM BEGIN GRASS ISLAND WEST OF SR 1107 (OLD FAYETTEVILLE RD) TO WEST EDGE OF BRIDGE OF SR 1005 (JONES FERRY RD)	1,2	1.40	27-69	25		8,713	283		2,541		153	25,051	7	7	1						
7CR.10681.14	Orange	4	NC 54 WB OFF RAMP	FROM NC 54 EAST BOUND TO SR1005 (JONES FERRY RD)	2,4	0.12	25-74						180		11	2,077									
<b>TOTAL FOR PROJ NO. 7CR.10681.14</b>						<b>1.64</b>		<b>25</b>	<b>0.00</b>	<b>17,818</b>	<b>525</b>		<b>6,096</b>	<b>0</b>	<b>367</b>	<b>61,896</b>	<b>15</b>	<b>13</b>	<b>15</b>	<b>0.00</b>	<b>0.00</b>	<b>20</b>	<b>1</b>	<b>3,500</b>	<b>20</b>
7CR.10681.14	Orange	6	SR 1543 (LITTLE RIVER CHURCH RD)	FROM NC 57 TO SR 1001 (WALNUT GROVE CH RD)	9	4.00	19-22	133	1.24					3,228	210	44,663				0.25	0.20				
7CR.10681.14	Orange	10	SR 1006 (ORANGE GROVE RD)	FROM SR 1102 (DODSON CROSSROADS) TO SR 1177 (DAIRYLAND RD)	11	3.16	25	125	6.32			3,391		4,062	410	38,931				1.38	1.00				
7CR.10681.14	Orange	11	SR 1942 SR 1005 (JONES FERRY RD)	FROM SR 1937 (OLD FAYETTEVILLE RD) TO SR 1940 (DAMASCUS CH RD)	7,10	2.40	21-36	78	4.80			2,550		3,371	329				2	1.24	0.50				
7CR.10681.14	Orange	12	SR 1006 (ORANGE GROVE RD)	FROM NEW JOINT AT SR 1102 (DODSON CROSSROADS) TO SR 1199 (TREE FARM ROAD)	12	1.50	4	132	3.00			1,610		300	89					1.00	1.00				
<b>TOTAL FOR PROJ NO. 7CR.20681.14</b>						<b>11.06</b>		<b>468</b>	<b>15.36</b>	<b>0</b>	<b>0</b>	<b>7,551</b>	<b>0</b>	<b>10,961</b>	<b>1,038</b>	<b>83,594</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3.87</b>	<b>2.70</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
7C.068081	Orange	14	SR 1008 (MT CARMEL CH RD)	FROM JOINT EAST OF NC15-501 TO CHATHAM COUNTY LINE	8,11	2.74	26-35	160	5.48			2,725		3,865	369	36,860		1	5	1.00	1.00				
<b>TOTAL FOR PROJ NO. 7C.068081</b>						<b>2.74</b>		<b>160</b>	<b>5.48</b>	<b>0</b>	<b>0</b>	<b>2,725</b>	<b>0</b>	<b>3,865</b>	<b>369</b>	<b>36,860</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>1.00</b>	<b>1.00</b>				
<b>GRAND TOTAL</b>						<b>15.44</b>		<b>653</b>	<b>20.84</b>	<b>17,818</b>	<b>525</b>	<b>10,276</b>	<b>6,096</b>	<b>14,826</b>	<b>1,774</b>	<b>182,350</b>	<b>15</b>	<b>14</b>	<b>22</b>	<b>4.87</b>	<b>3.70</b>	<b>20</b>	<b>1</b>	<b>3,500</b>	<b>20</b>

PROJECT NO. 7CR.10681.14, 7CR.20681.14 & 7C.068081	SHEET NO. <b>6</b>	TOTAL NO. <b>6</b>
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### THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	4" X 90 M WHITE THERMO LF	4" X 90 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	4" X 120 M YELLOW THERMO LF	6" X 90 M WHITE THERMO LF	6" X 120 M WHITE 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 BUSLANE 120 M EA	THERMO MSG SCHOOL 120 M EA	THERMO STR ARROW 90 M EA	THERMO LT ARROW 90 M EA	THERMO RT ARROW 90 M EA	THERMO STR & RT ARROW 90 M EA	THERMO MERGE LEFT ARROW 90 M EA	4" WHITE PAINT LF	4" YELLOW PAINT LF
7CR.10681.14	Orange	1	NC 54 WB	FROM JONES FERRY BRIDGE TO PAVEMENT JOINT .34 MILES W. OF SR 1107 (OLD FAYETTEVILLE)	9,613	10,672	3,251		44		1,727	1,363	317	21		11	11	3	7	3		
7CR.10681.14	Orange	2	NC 54 WB ON RAMP	FROM SR 1005 (JONES FERRY RD) TO NC 54 WEST BOUND	728	728																
7CR.10681.14	Orange	3	NC 54 EB	FROM BEGIN GRASS ISLAND WEST OF SR 1107 (OLD FAYETTEVILLE RD) TO WEST EDGE OF BRIDGE OF SR 1005 (JONES FERRY RD)	6,084	6,877	3,191		24		1,596		333	21		8	10	4	8			
7CR.10681.14	Orange	4	NC 54 EB OFF RAMP	FROM NC 54 EAST BOUND TO SR1005 (JONES FERRY RD)	575	575	40						44				3	3				
<b>TOTAL FOR PROJ NO 7CR.10681.14</b>					<b>17,000</b>	<b>18,852</b>	<b>6,482</b>		<b>68</b>		<b>3,323</b>	<b>1,363</b>	<b>694</b>	<b>42</b>		<b>19</b>	<b>24</b>	<b>10</b>	<b>15</b>	<b>3</b>		
					<b>35,852</b>		<b>6,482</b>				<b>4,686</b>			<b>42</b>			<b>71</b>					
7CR.20681.14	Orange	6	SR 1543 (LITTLE RIVER CHURCH RD)	FROM NC 57 TO SR 1001 (WALNUT GROVE CH RD)	800					92											83,460	66,600
7CR.20681.14	Orange	10	SR 1006 (ORANGE GROVE RD)	FROM SR 1102 DODSON CROSSROADS TO SR 1177 DAIRYLAND RD	900				120												67,420	62,306
7CR.20681.14	Orange	11	SR 1942/SR 1005 (JONES FERRY RD)	FROM SR 1107 JUST EAST OF OLD FAYETTEVILLE RD TO SR 1940 DAMASCUS CH RD.	25,040		86	24,953		60	90	26	111									
7CR.20681.14	Orange	12	SR 1006 (ORANGE GROVE ROAD)	FROM NEW JOINT AT SR 1102 (DODSON CROSSROADS) TO SR 1199 (TREE FARM ROAD)																	31,400	
<b>TOTAL FOR PROJ NO. 7CR.10681.14</b>					<b>26,740</b>		<b>86</b>	<b>24,953</b>	<b>120</b>	<b>60</b>	<b>90</b>	<b>26</b>	<b>111</b>								<b>182,280</b>	<b>128,906</b>
					<b>26,740</b>		<b>25,039</b>				<b>116</b>											<b>311,186</b>
7C.068081	Orange	14	SR 1008 (MT CARMEL CH RD)	FROM JOINT EAST OF NC15-501 TO CHATHAM COUNTY LINE	28,936		162	29,594		166		161					5	2				
<b>TOTAL FOR PROJ NO. 7C.068081</b>					<b>28,936</b>		<b>162</b>	<b>29,594</b>		<b>166</b>		<b>161</b>					<b>5</b>	<b>2</b>				
					<b>28,936</b>		<b>29,756</b>				<b>161</b>							<b>7</b>				
<b>GRAND TOTAL</b>					<b>72,676</b>	<b>18,852</b>	<b>6,730</b>	<b>54,547</b>	<b>188</b>	<b>226</b>	<b>3,413</b>	<b>1,550</b>	<b>805</b>	<b>42</b>		<b>19</b>	<b>29</b>	<b>12</b>	<b>15</b>	<b>3</b>	<b>182,280</b>	<b>128,906</b>
					<b>91,528</b>		<b>61,277</b>				<b>4,963</b>			<b>42</b>			<b>78</b>				<b>311,186</b>	

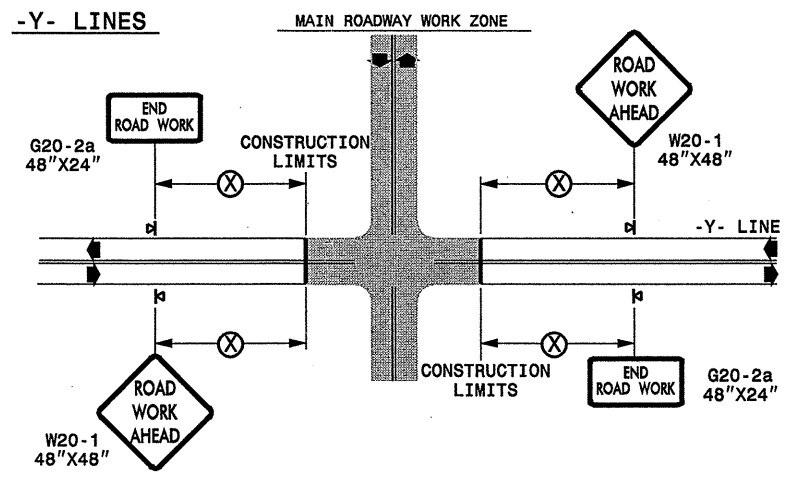
**TWO-WAY UNDIVIDED \*\* (L-LINES)**



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 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

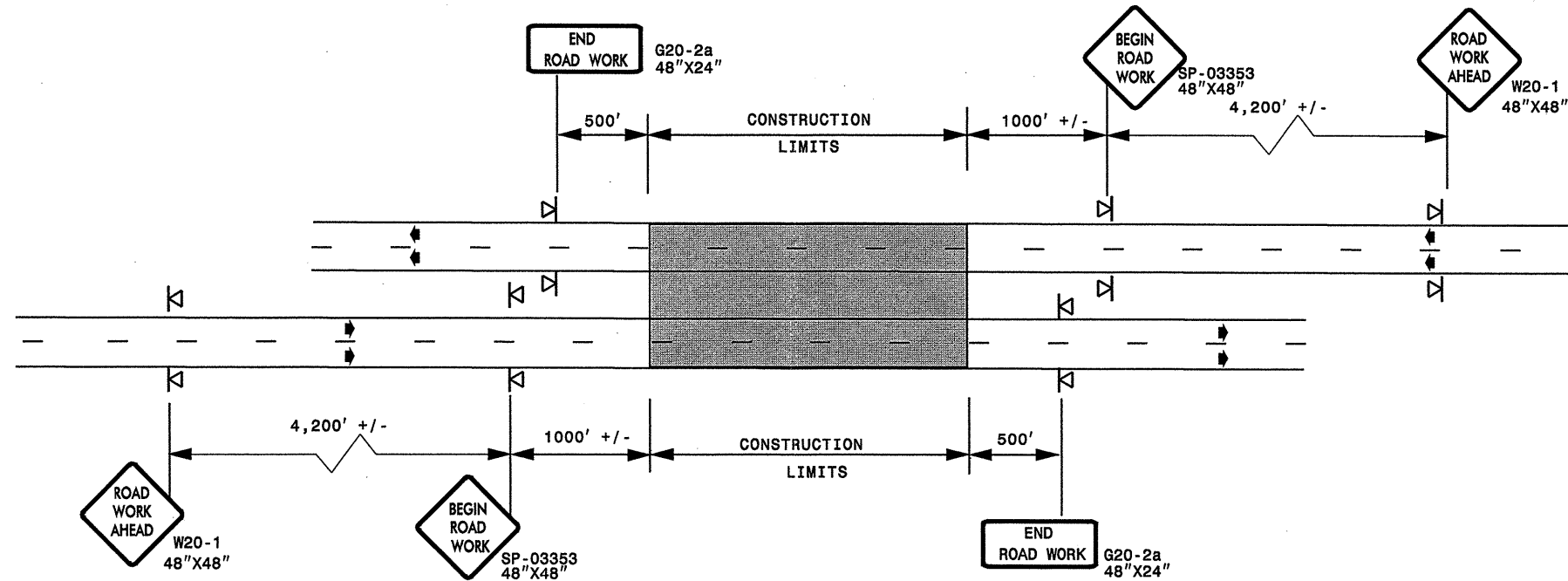
DETAIL DRAWING  
FOR TWO-WAY UNDIVIDED  
WORK ZONE WARNING SIGNS

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

10-DEC-2007 20:45  
 \\DOT\DFSR00101\GROUPS\WZTCCC\design\group4\resurfacing\resurfacing2007.dwg\c201996.7c068081et.c.2wayundivurbfrwysjuly2006.dgn  
 pseymore AT WZTCC237502

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

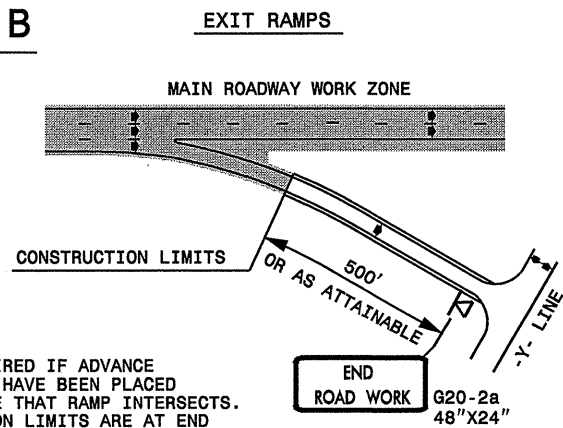
DETAIL A



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

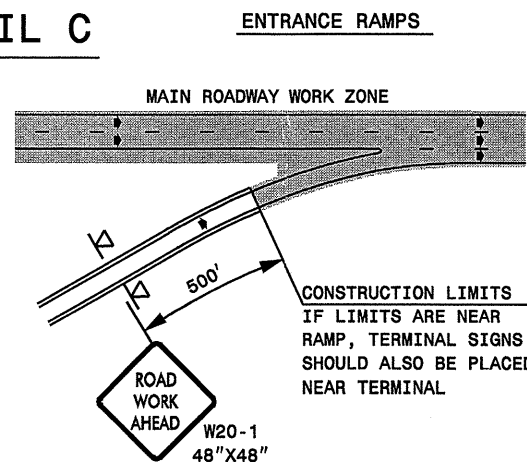
ROADWAYS INTERSECTING ALONG FREEWAY WORK ZONE (Y-LINES)

DETAIL B



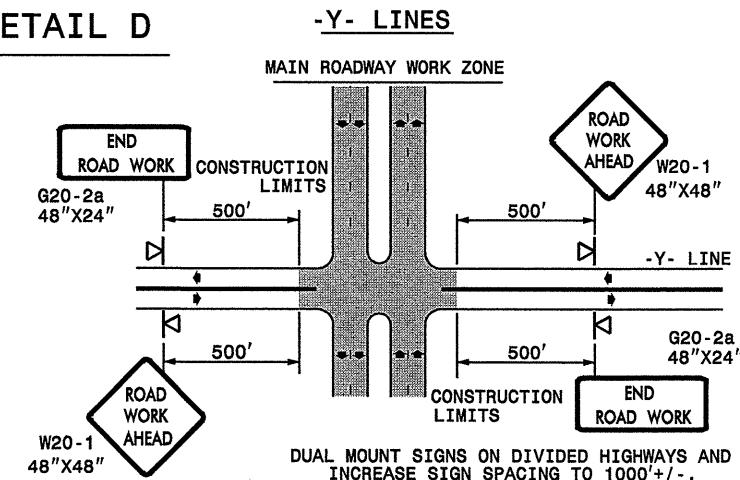
NOTE:  
SIGN NOT REQUIRED IF ADVANCE WARNING SIGNS HAVE BEEN PLACED ALONG -Y- LINE THAT RAMP INTERSECTS. IF CONSTRUCTION LIMITS ARE AT END OF RAMP, PLACE SIGN AT END OF RAMP.

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	
SEAL 			DATE: _____	REVISIONS
	DWG. BY: _____	7-98	10/01	
	DESIGN BY: _____	10-98	03/04	
	REVIEWED BY: _____	01/01	11/04	

10-DEC-2007 20:46  
 \\DOT\DF\SR00701\GROUPS-WZTCC\designgroup4\resurfacing\resurfacing2007\div07\c201996-7c068081etc\orange\_us54etc\c201996-7c068081etc\free4lanesgreatJuly2006.dgn  
 psevmore AT WZTCC231502



**SP 03353**

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" RADIUS: 1.38" NO. Z BARS: N/A LENGTH: N/A	BACKG COLOR: Fluorescent Orange COPY COLOR: Black	DESIGN BY: CL DOWNEY PROJECT ID: ALL PROJECTS	CHECKED BY: CHECKED DIV: DIV	STD #: W20-1 DATE: Aug 20, 2003
	SYMBOL	X	Y	WID
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:				
LETTER POSITIONS Letter spacings are to start of next letter		BORDER R=1.38" TH=0.75" IN=0.59"		

Letter	B	E	G	I	N		Series/Size	Text Length
BEGIN	22.4	6.3	4.6	5.4	2.5	3.8	C7	21.6
ROAD	23.4	5	5.2	5.6	3.8	23.4	C7	19.6
WORK	22.6	6.4	5.6	5.2	4	22.6	C7	21.2

Spacing Factor is 1 unless specified otherwise  
 FILENAME: SPECTRUMX  
 NORTH CAROLINA D.O.T. SIGN DETAIL

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"**

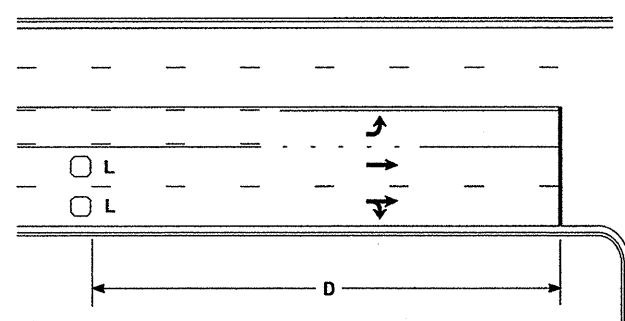
- SIGN SP-03353 "BEGIN ROAD WORK" ONLY APPLIES TO FULL CONTROL AND PARTIAL CONTROL OF ACCESS ROADWAYS
- WHEN USED, INSTALL SIGN SP-03353 "BEGIN ROAD WORK" ACCORDING TO DETAIL FOR FREEWAY WORK ZONE SIGNS

SHEET 1 OF 1

APPROVED: _____ DATE: _____	DETAIL DRAWING FOR ADVANCED WORK ZONE WARNING SIGN DESIGNS	SCALE: NONE		REVISIONS
SEAL		DATE: 0803		0404
		DWG. BY: _____		1104
	DESIGN BY: _____			
	REVIEWED BY: _____			

IO-DEC-2007 20:47  
 \\DOT\DFSROOT\TON\GROUPS-WZTCCC\design\group4\resur-facing\resur-facing2007.dwg AT 200996...7C068081etc...or-ange-us54etc\c20996...7c068081etc...SignDesigns\July2006.dgn  
 psey@more AT WZTCCC237502

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

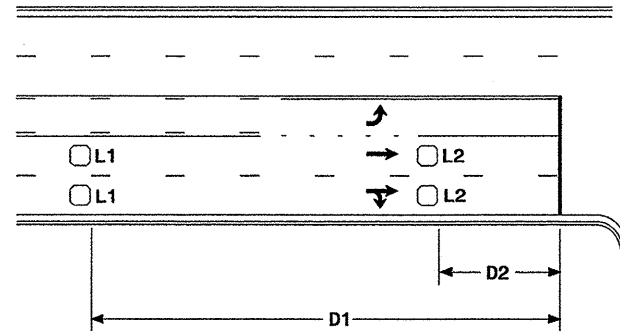


Speed Limit mph (km/hr)	D ft (m)
40 (64)	250 (75)
45 (72)	300 (90)
50 (80)	355 (110)
55 (88)	420 (130)

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

OR



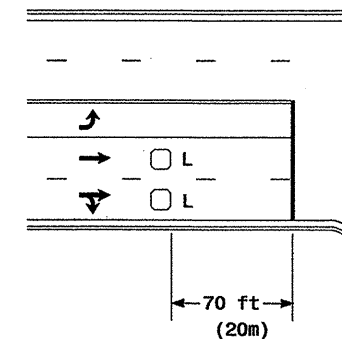
Speed Limit mph (km/hr)	D1 ft (m)	D2 ft (m)
40 (64)	250 (75)	80 (25)
45 (72)	300 (90)	90 (27)
50 (80)	355 (110)	100 (30)
55 (88)	420 (130)	110 (35)

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

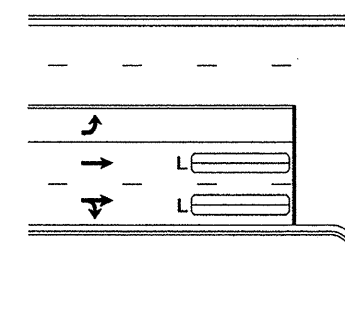
### Low Speed Detection [≤35 mph (56 km/hr)]

7C.068081, 7CR.10681.14 & 7CR.20681.14



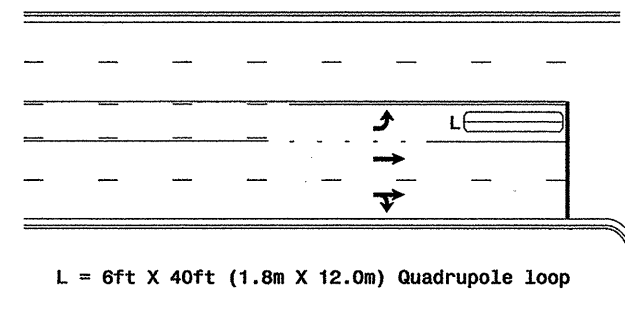
L = 6ft X 6ft (1.8m X 1.8m)  
Wired in series

OR



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

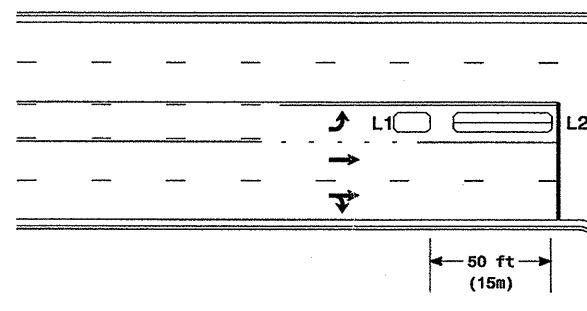
### Left Turn Lane Detection



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

Presence Loop Detection

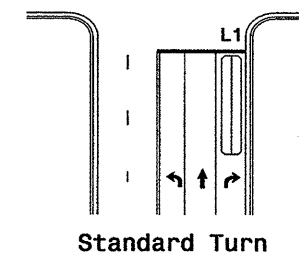
OR



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

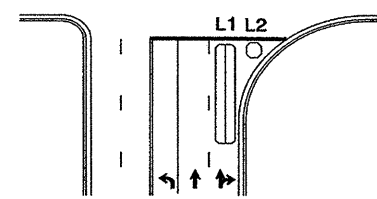
Queue Loop Detection

### Right Turn Lane Detection

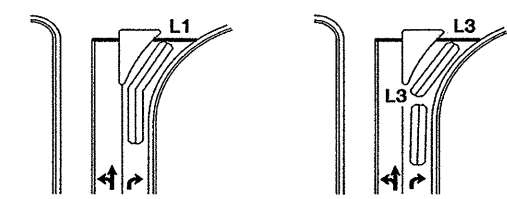


Standard Turn

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

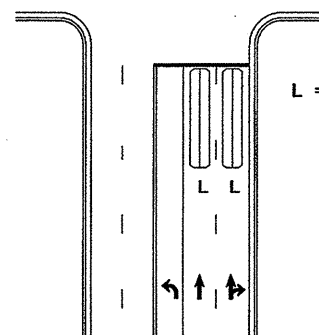


Wide Radius Turn



Channelized Turn

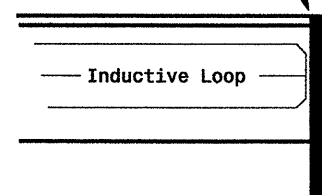
### Side Street Detection



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

Prepared in the Office of  
Traffic Engineering and Safety  
UNIVERSITY OF NORTH CAROLINA  
SCHOOL OF TRANSPORTATION  
SCIENCE AND GEOMETRICS SYSTEMS  
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  
✓ Revise pavement markings  
INIT. DATE  
DATE  
SIGNATURE  
DATE  
SIG. INVENTORY NO.

SEAL  
NORTH CAROLINA  
PROFESSIONAL ENGINEER  
SEAL  
23486  
P L ALEXANDER

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

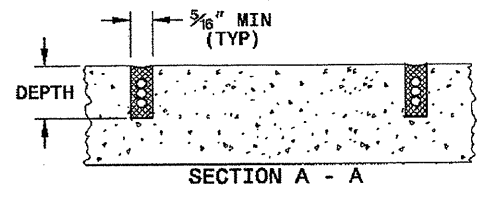
INDUCTIVE DETECTION DRAWING FOR  
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3  
1725D01

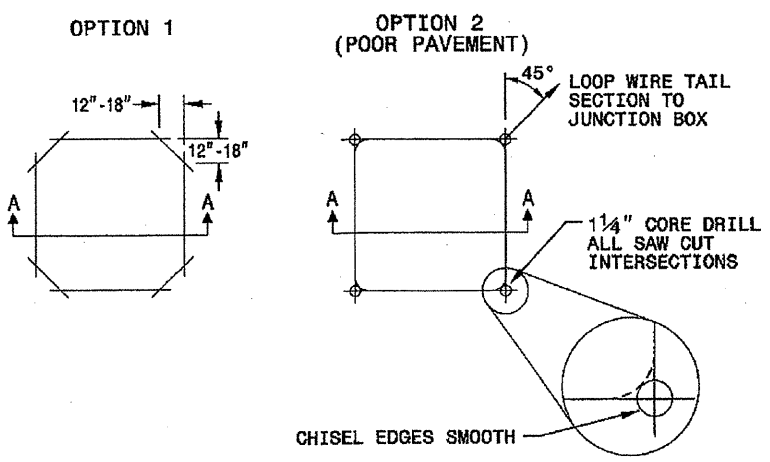
**CONVENTIONAL 4-SIDED LOOP**

**SAW SLOT DEPTH CHART**

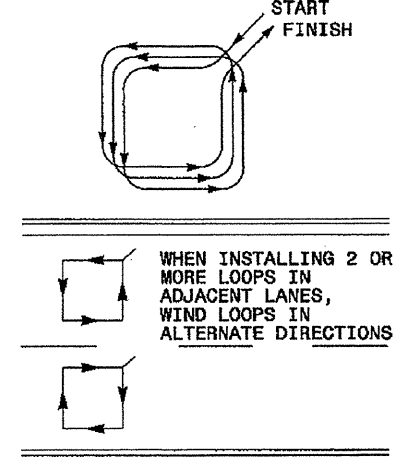
DEPTH (IN)	NO. OF WIRE TURNS					
	2	3	4	5	6	
CONCRETE	2.0	2.0	2.5	2.5	3.0	
ASPHALT	2.0	2.5	3.0	3.0	3.0	



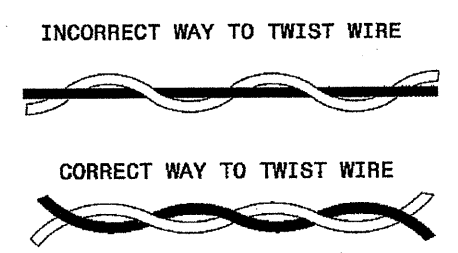
**SAW CUT OPTIONS**



**LOOP WINDING METHOD**



**LOOP WIRE TWISTING METHOD**

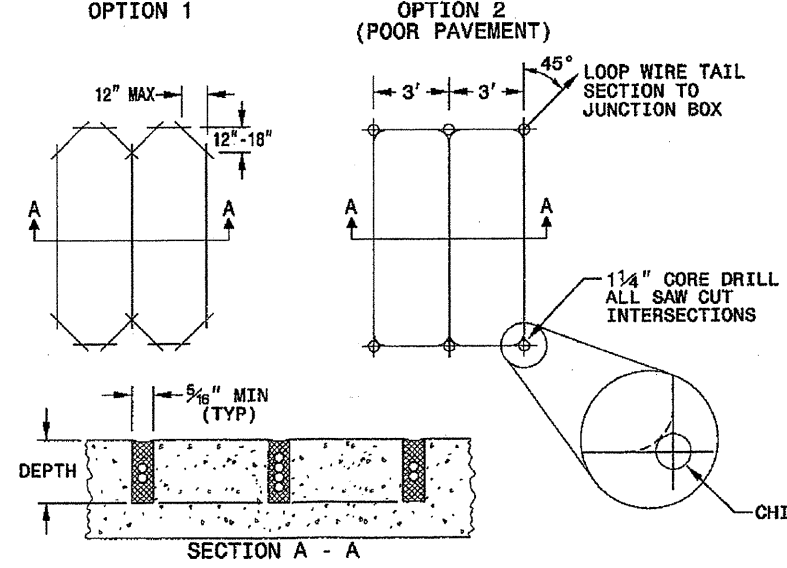


**NOTES**

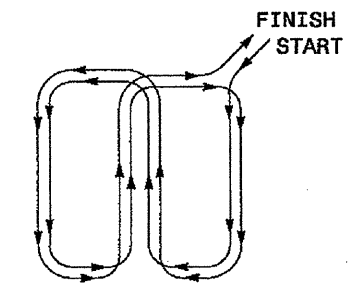
1. OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
2. MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
3. WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
4. LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



**LOOP WINDING METHOD**

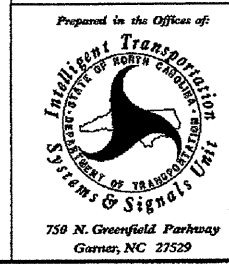


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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

INDUCTIVE DETECTION DRAWING FOR  
INDUCTIVE DETECTION LOOPS

SHEET 1 OF 3  
1725D01

See Plate for Title



SEAL

016286

Milton I. Deen 9/5/07

SIGNATURE DATE

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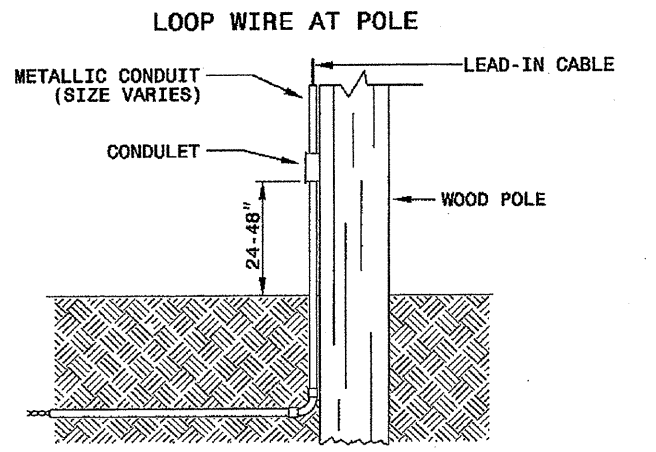
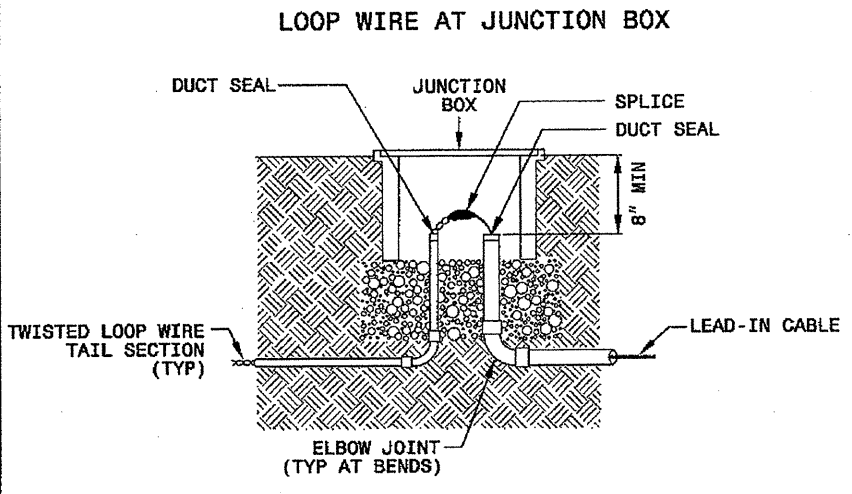
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

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

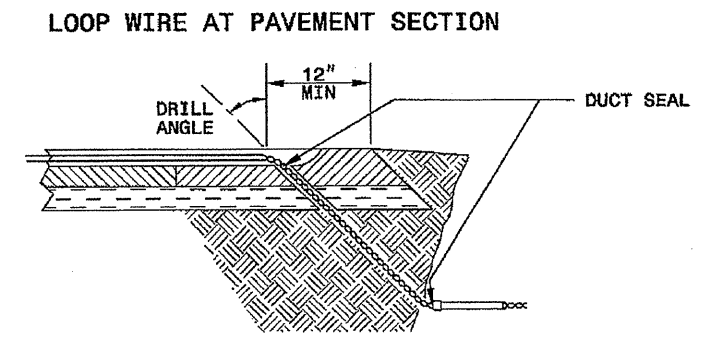
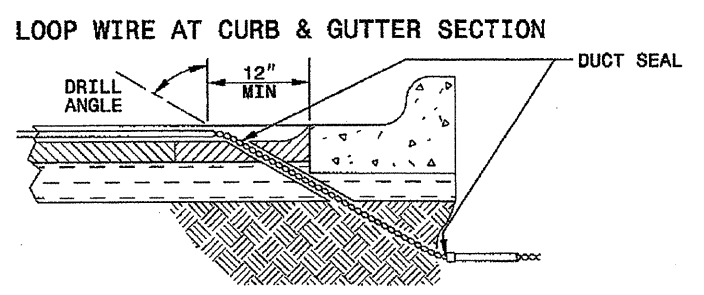
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**



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

**LOOP WIRE PAVEMENT EDGE DETAILS**



- 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.

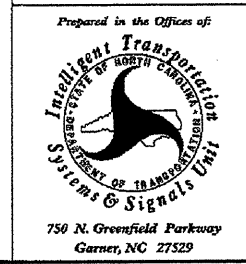
STATE OF NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

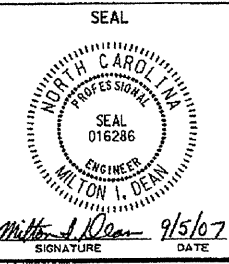
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 LOOP WIRE DETAILS

SHEET 2 OF 3  
**1725D01**

See Plate for Title



Prepared in the Offices of:  
 750 N. Greenfield Parkway  
 Garner, NC 27529



Milton I. Dean 9/5/07  
 SIGNATURE DATE

06-SEP-2007 14:00  
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 2/11/16

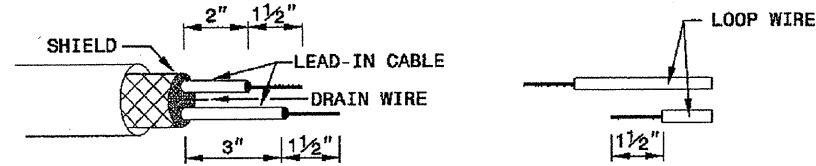
STATE OF  
 NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

5-07

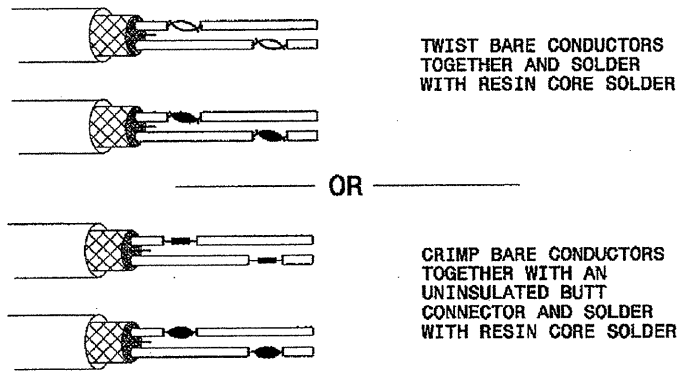
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
 SPLICING FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

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

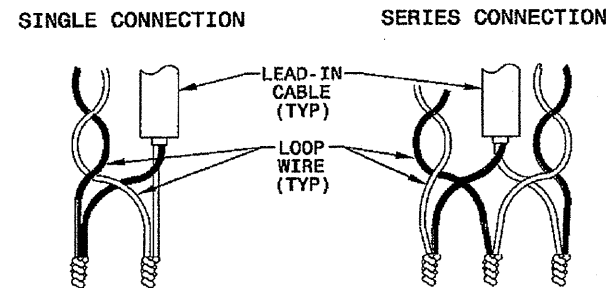


**STEP 2. CONNECT AND SOLDER**

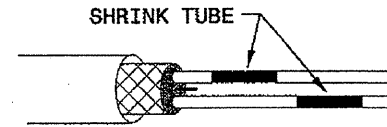


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

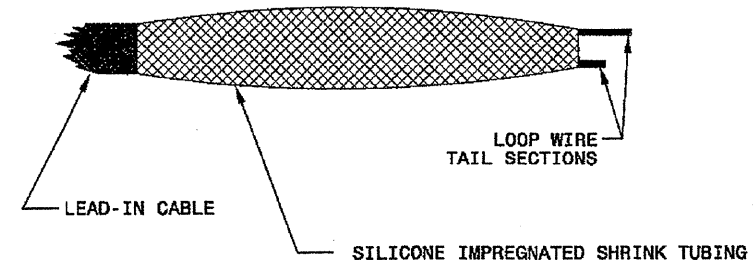
**LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS**



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



**STEP 4. ENVIRONMENTALLY PROTECT SPLICE**



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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

