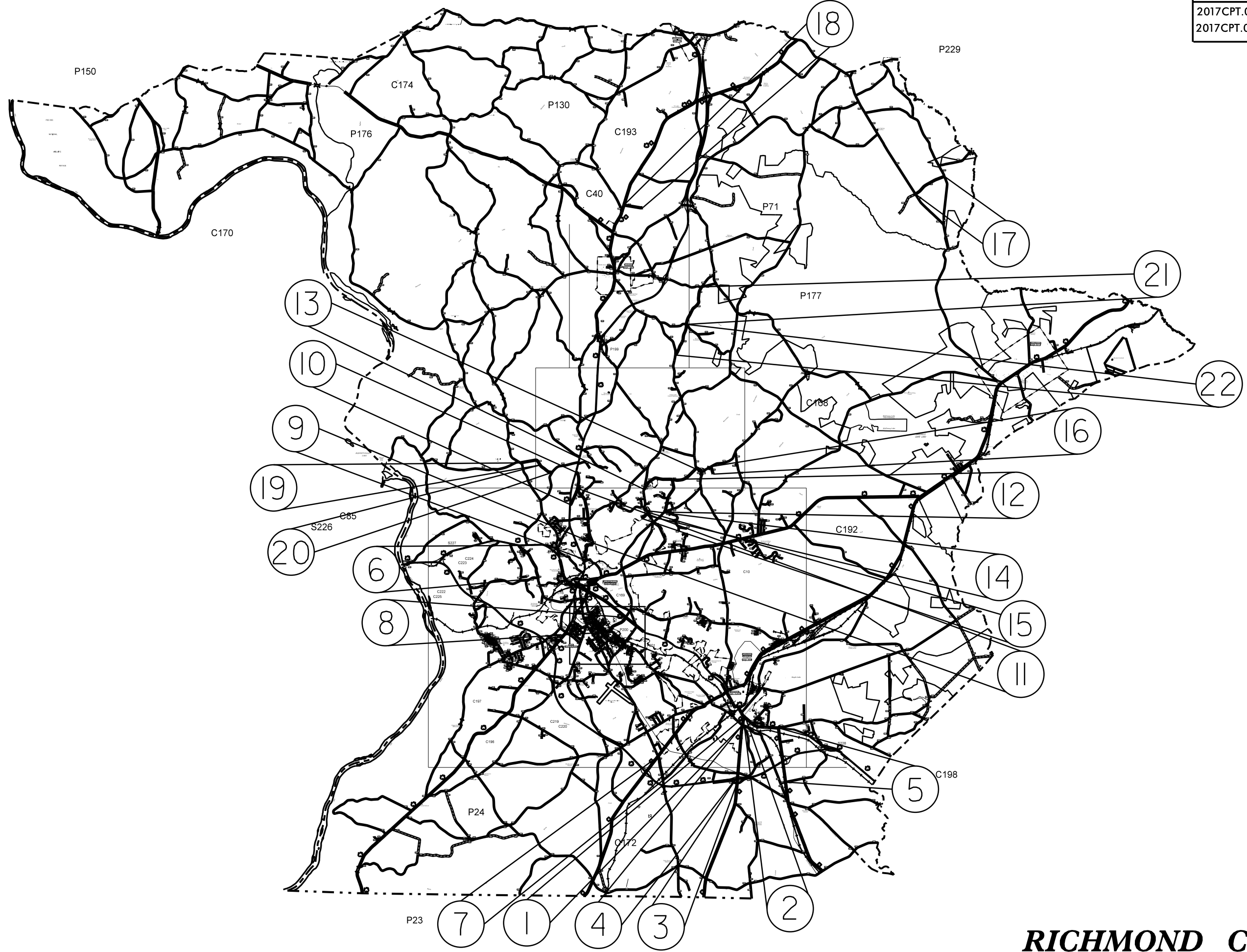


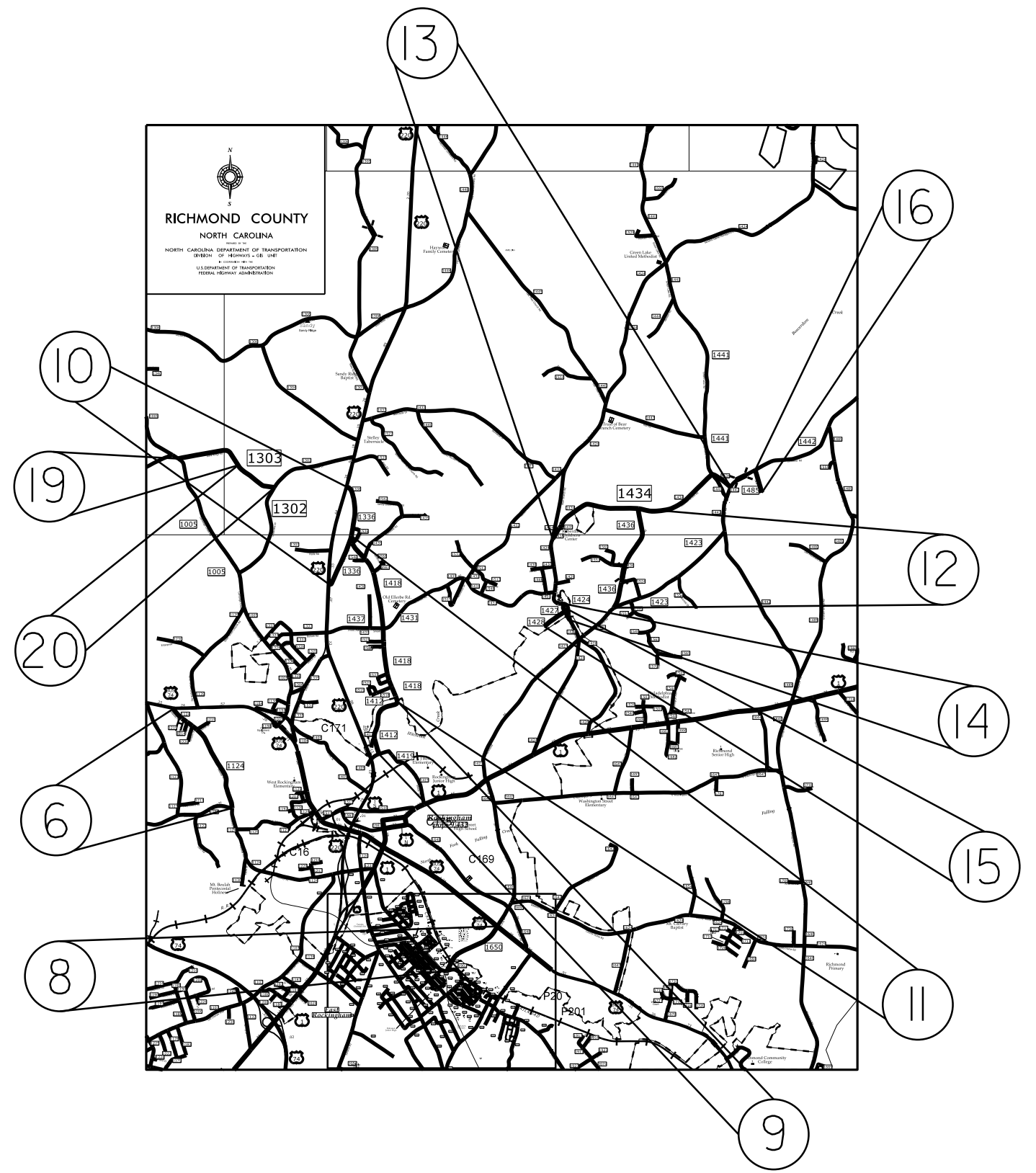
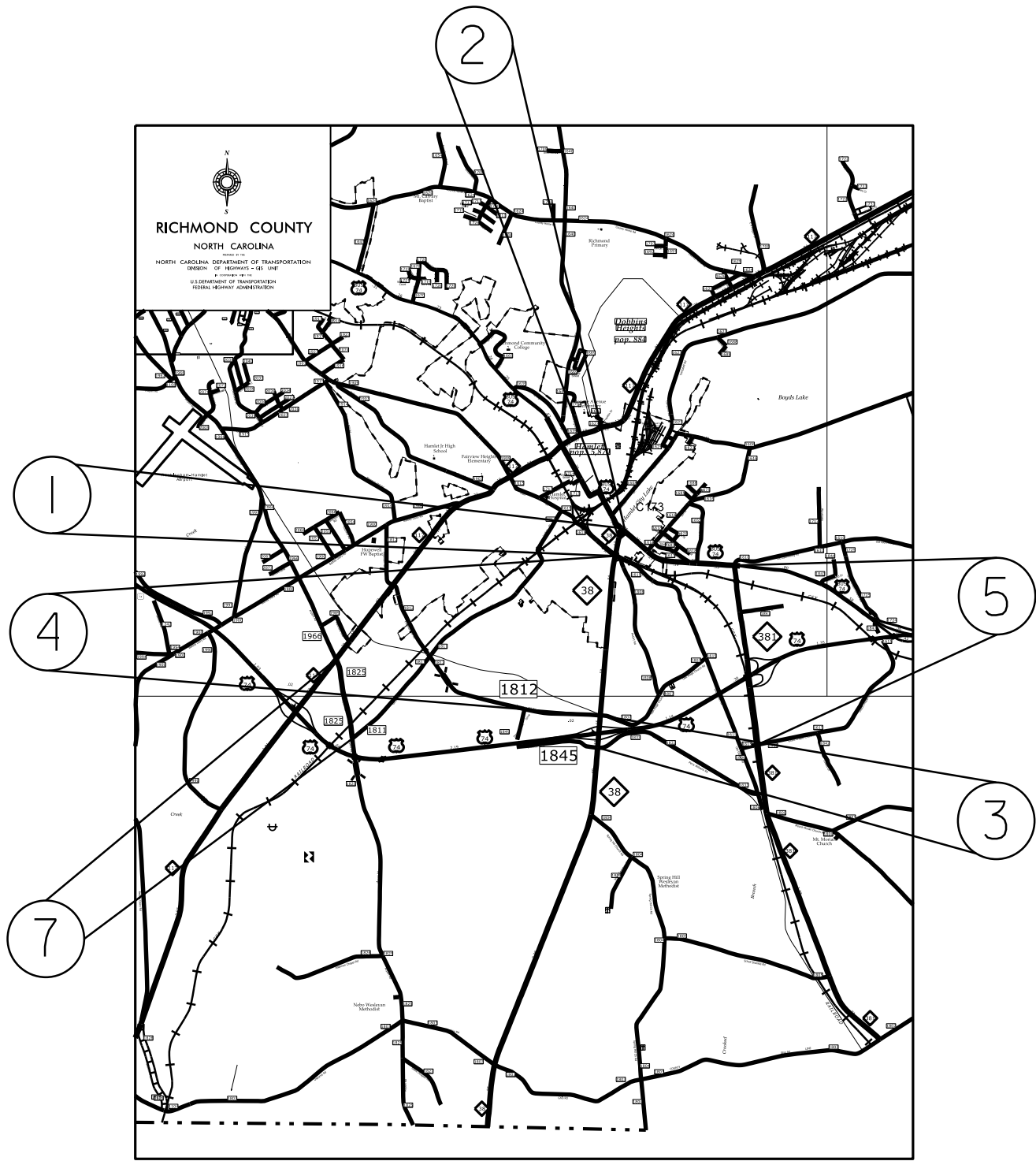
**This electronic collection of documents is provided  
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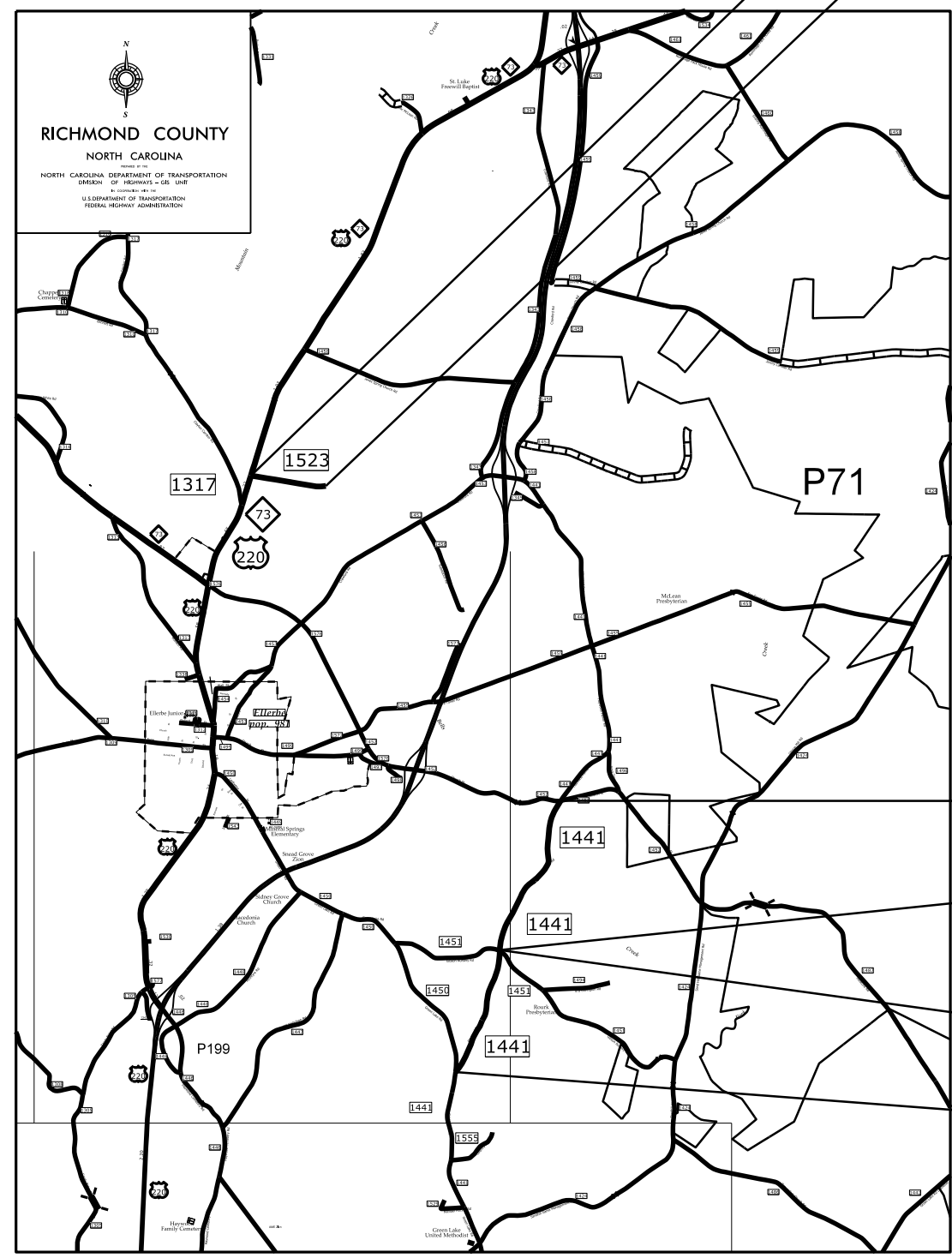
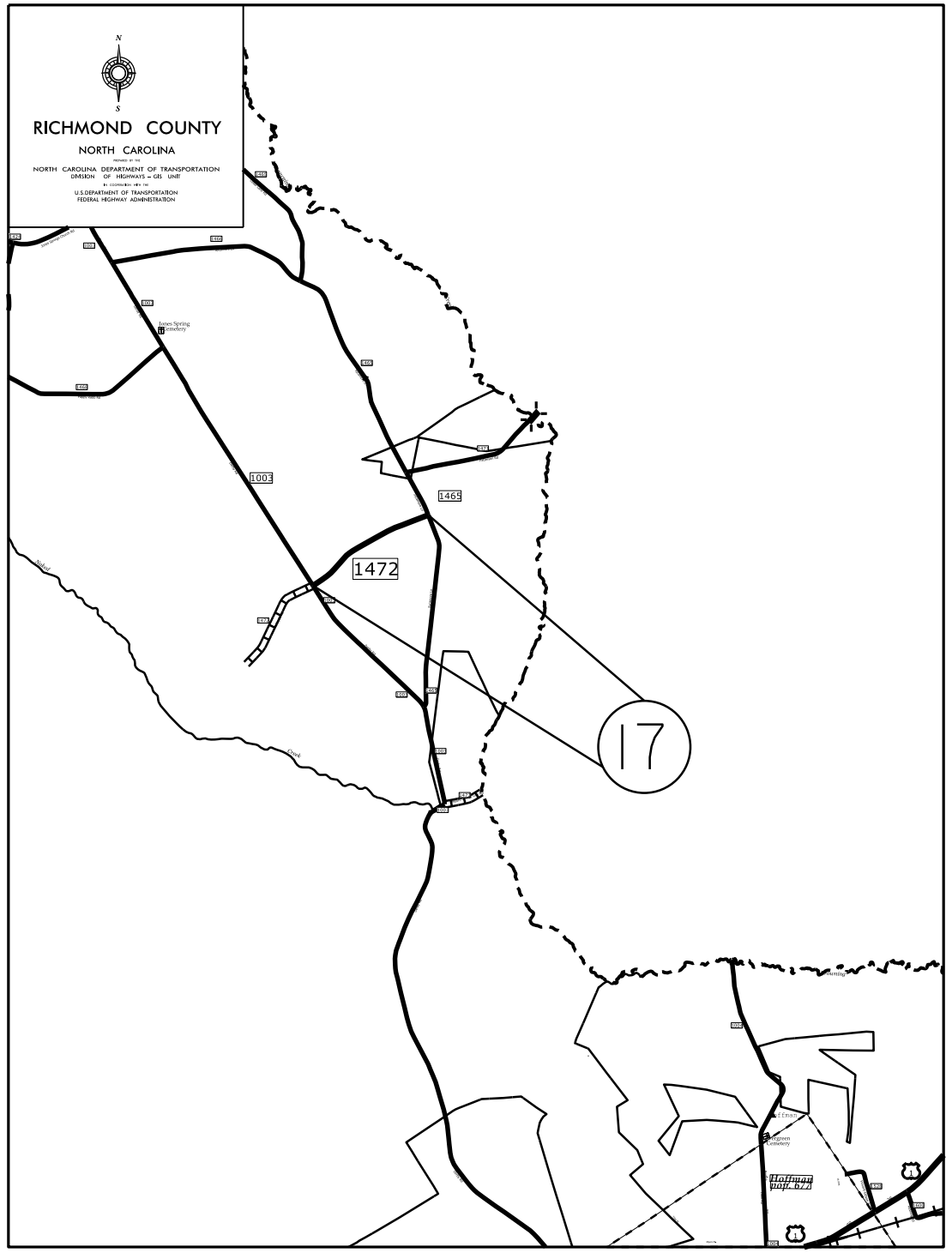
**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
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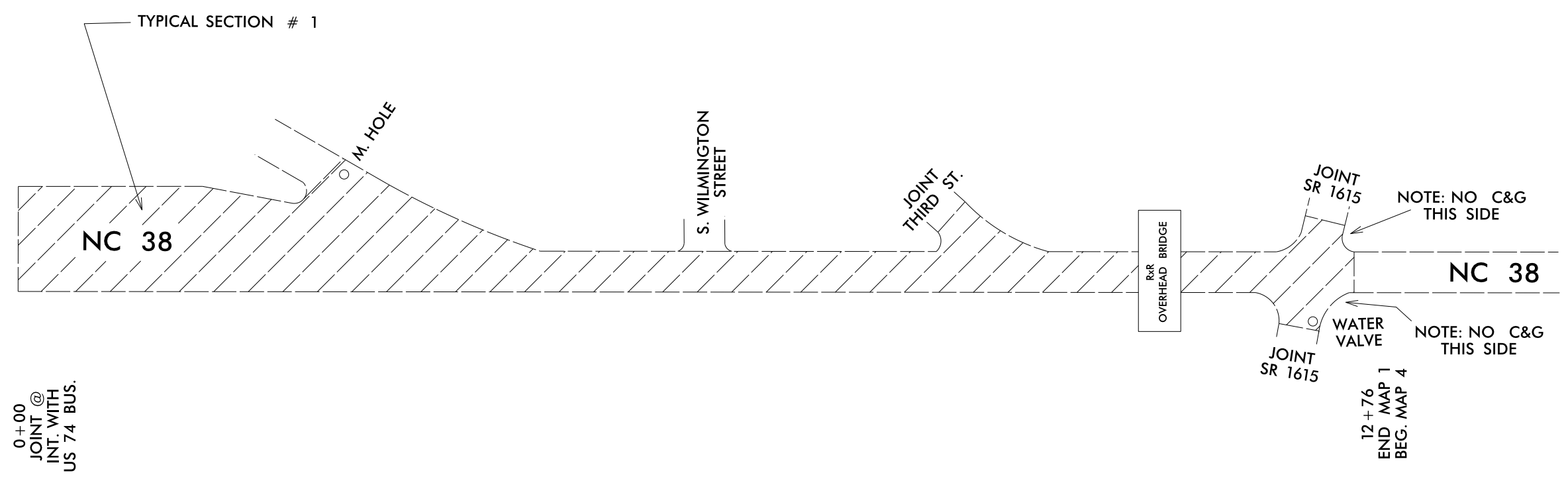
***RICHMOND COUNTY***



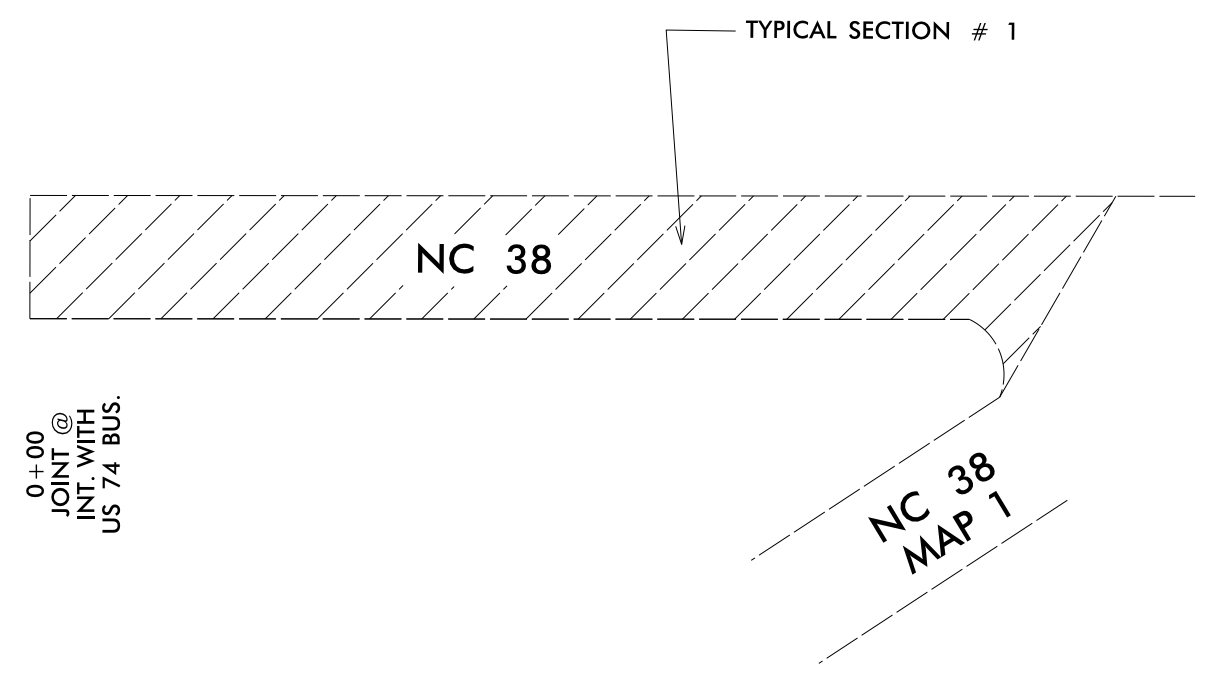


# RICHMOND COUNTY

MAP 1  
NC 38

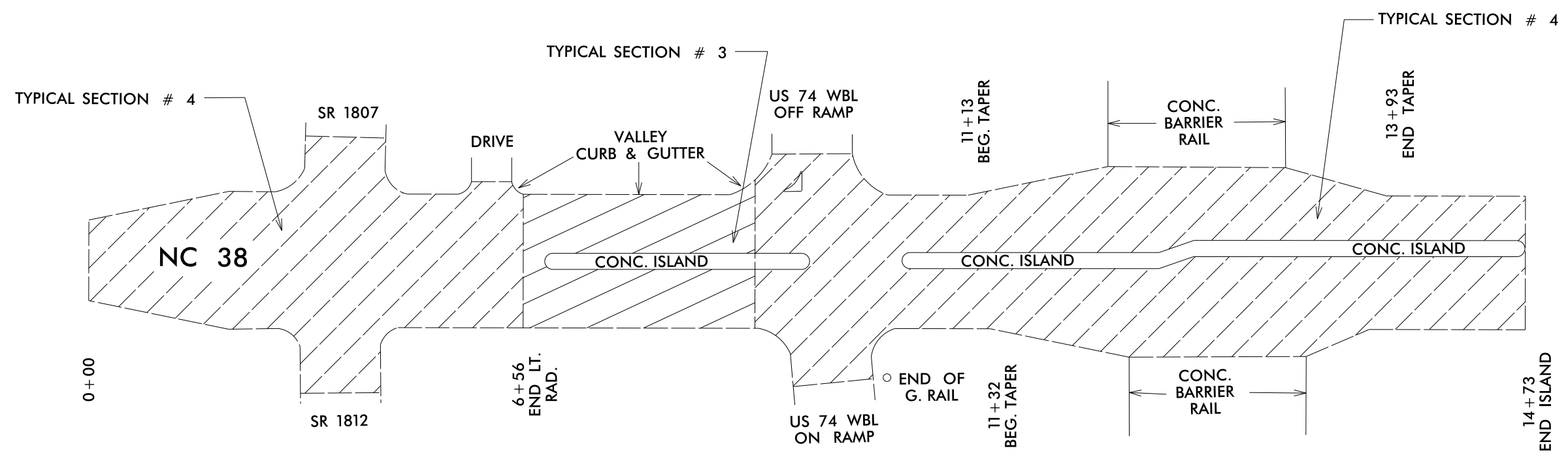


MAP 2  
NC 38

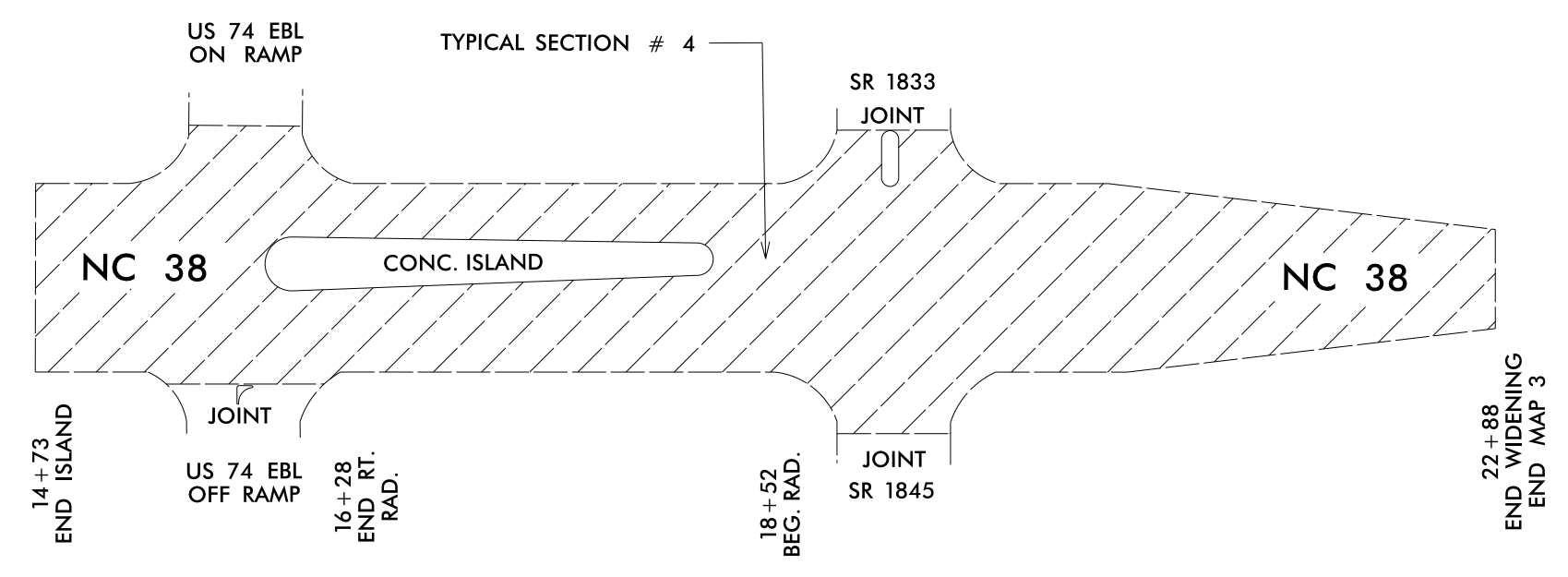


# RICHMOND COUNTY

MAP 3  
NC 38

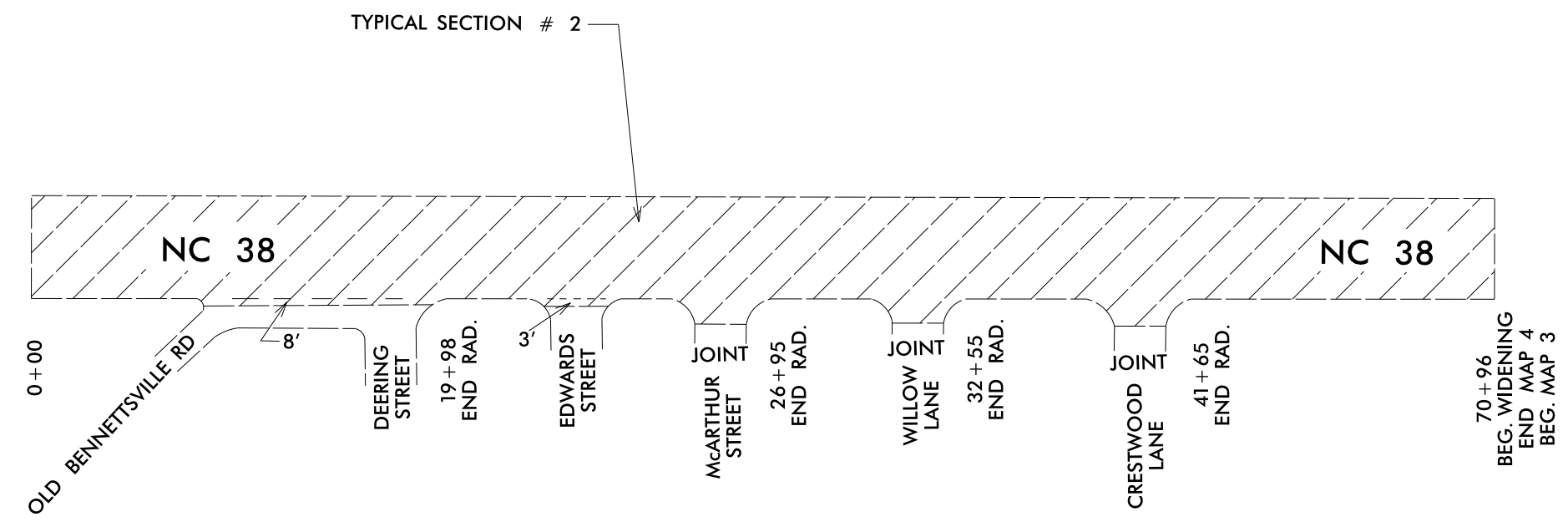


MAP 3  
NC 38



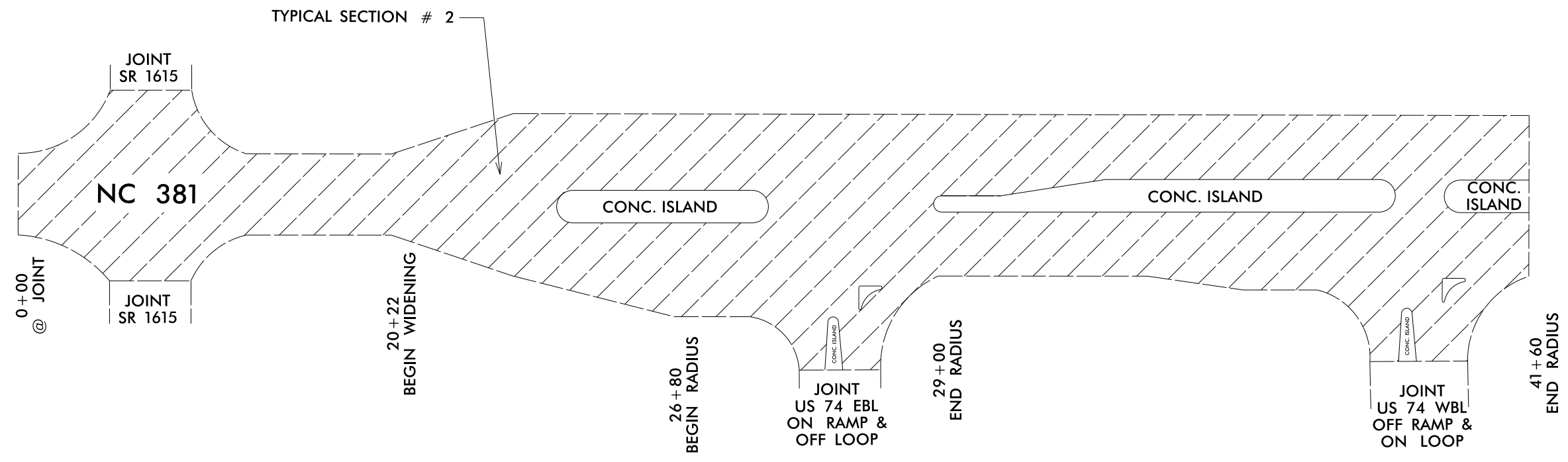
# RICHMOND COUNTY

MAP 4  
NC 38

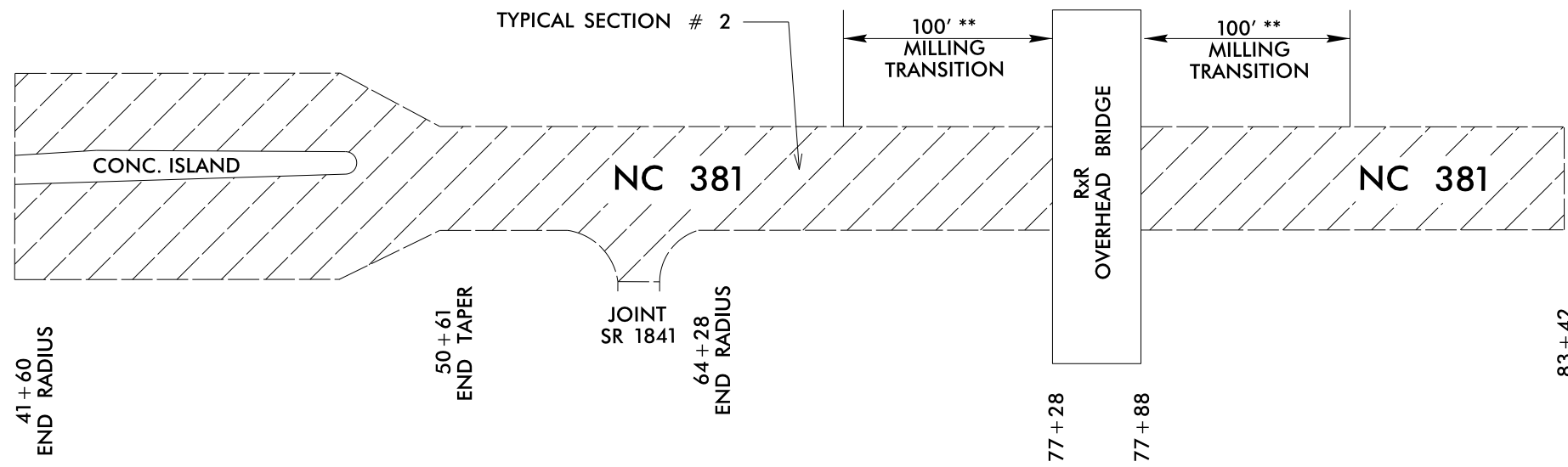


# RICHMOND COUNTY

MAP 5  
NC 381



MAP 5  
NC 381

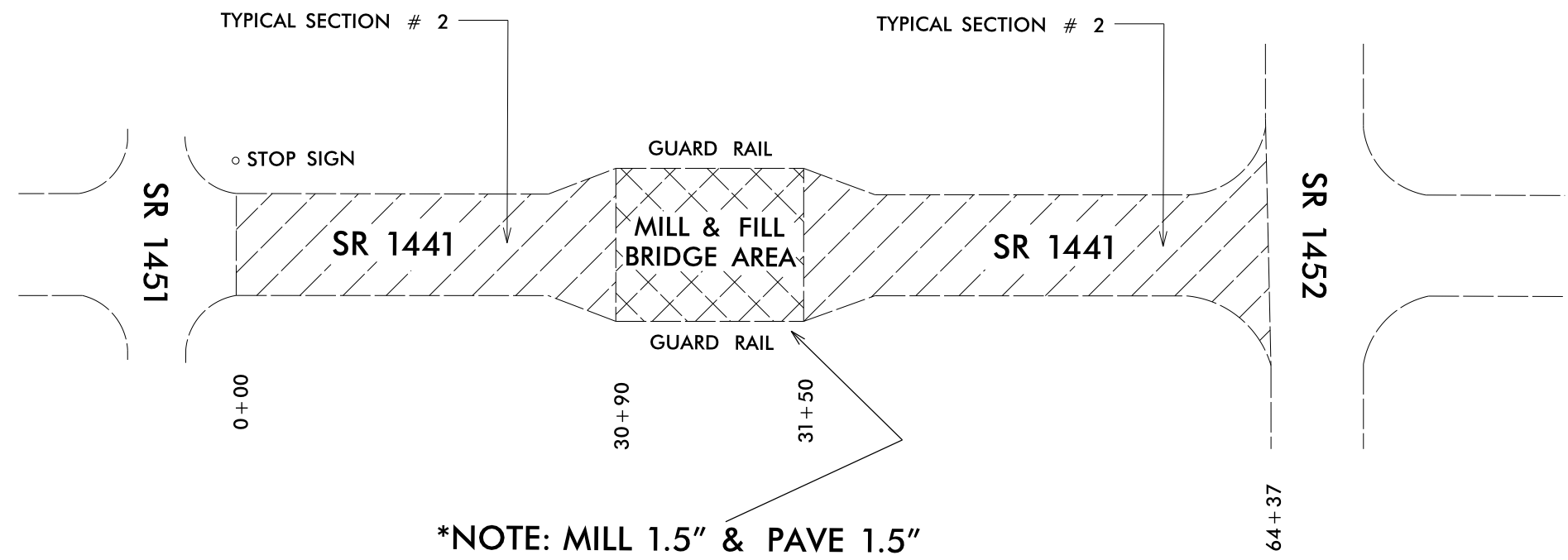


NOTE: MILL 1.5" UNDER BRIDGE AND REPLACE WITH 1.5" OF S9.5B. MAINTAIN VERTICAL CLEARANCE UNDER BRIDGE. TRANSITION MILLING FROM 0" TO 1.5" \*\* (PAID AS INCIDENTAL MILLING).



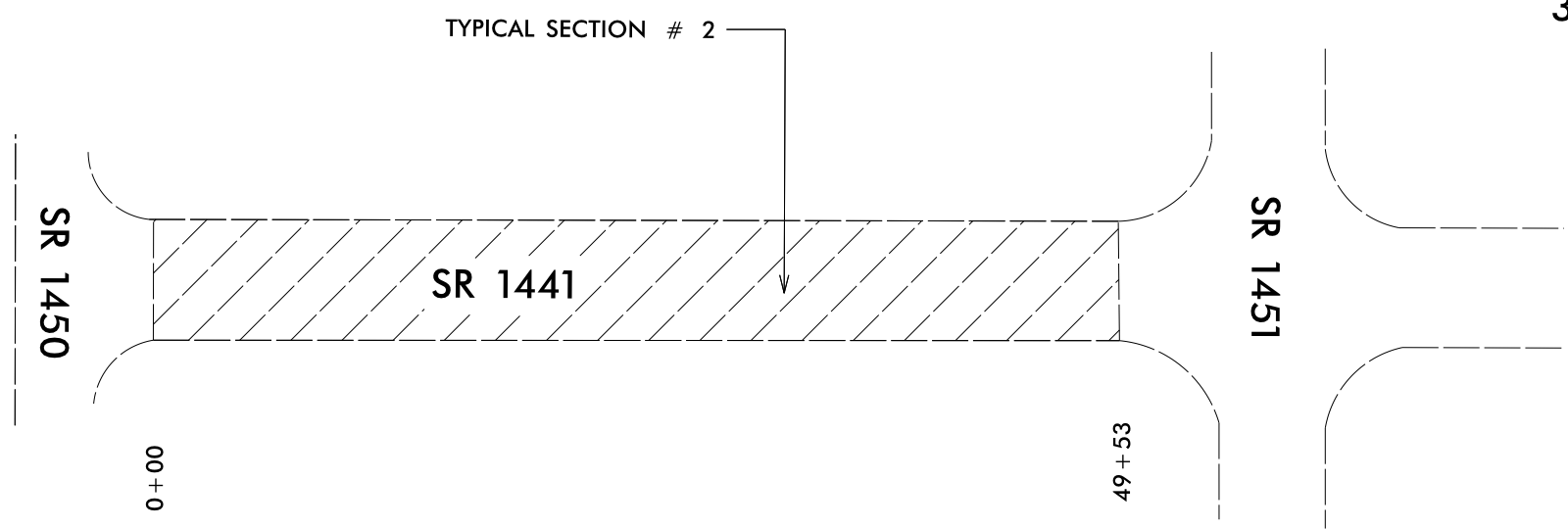
# RICHMOND COUNTY

MAP 21  
SR 1441

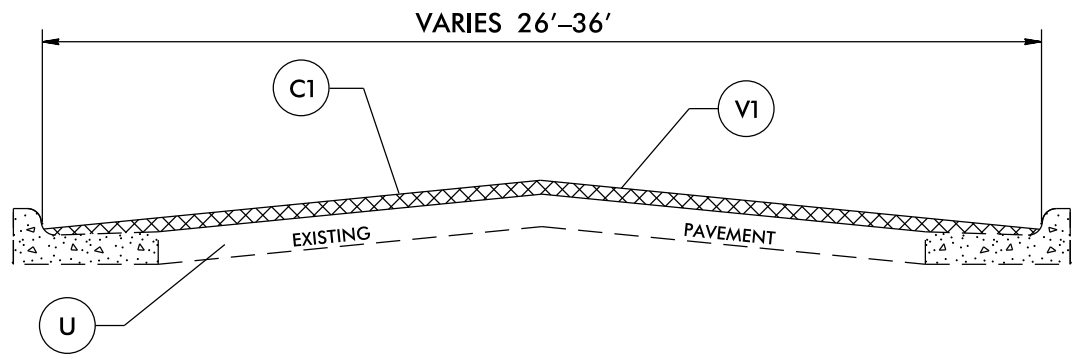


\*NOTE: MILL 1.5" & PAVE 1.5"  
OF S9.5B.  
(SEE BRIDGE #67 DETAIL)

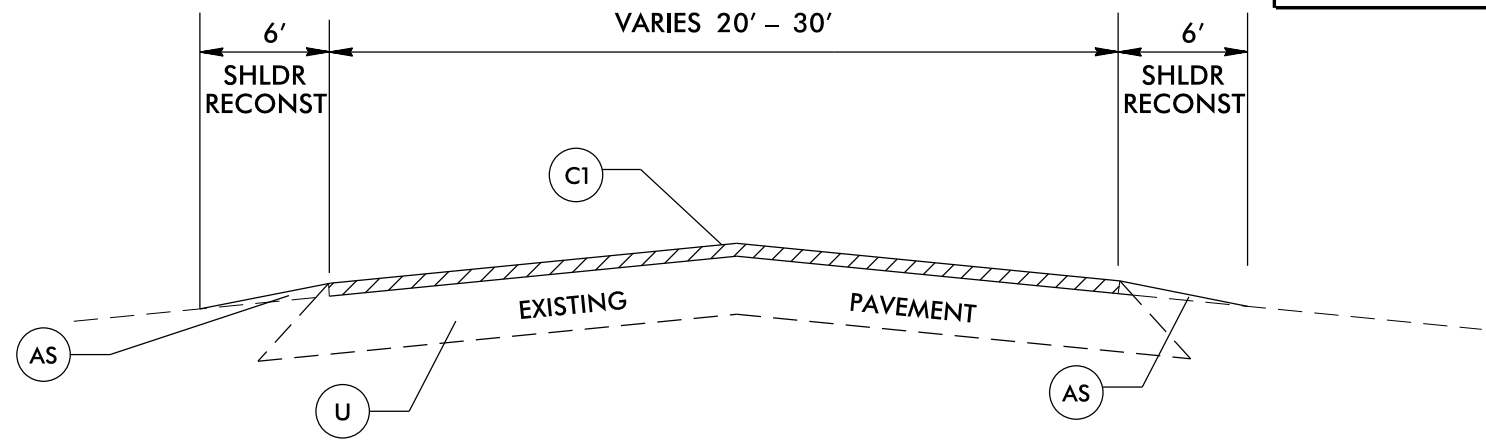
MAP 22  
SR 1441



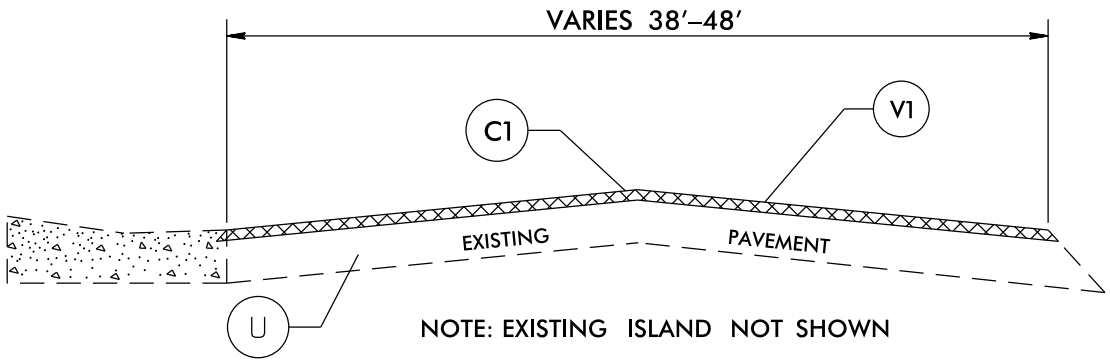
\*NOTE: PATCHING DEPTH WILL BE  
3" AND REPLACED WITH 3"  
OF I19.0B



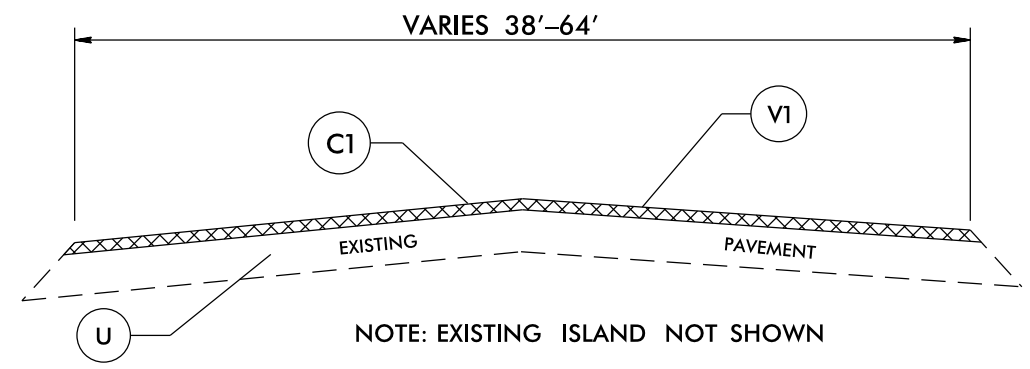
**TYPICAL SECTION NO. 1**



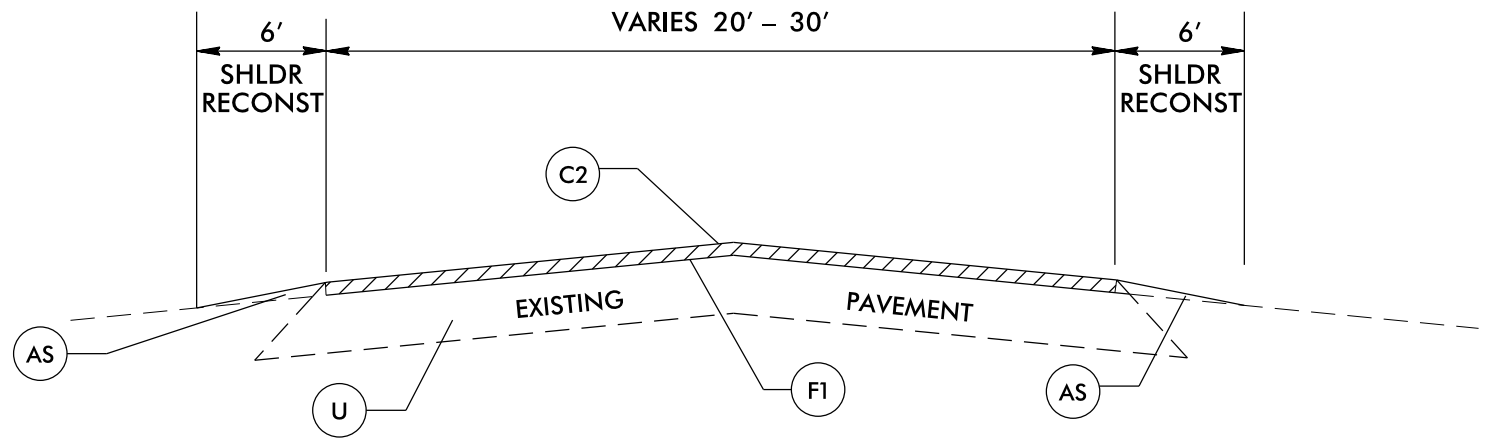
**TYPICAL SECTION NO. 2**



**TYPICAL SECTION NO. 3**



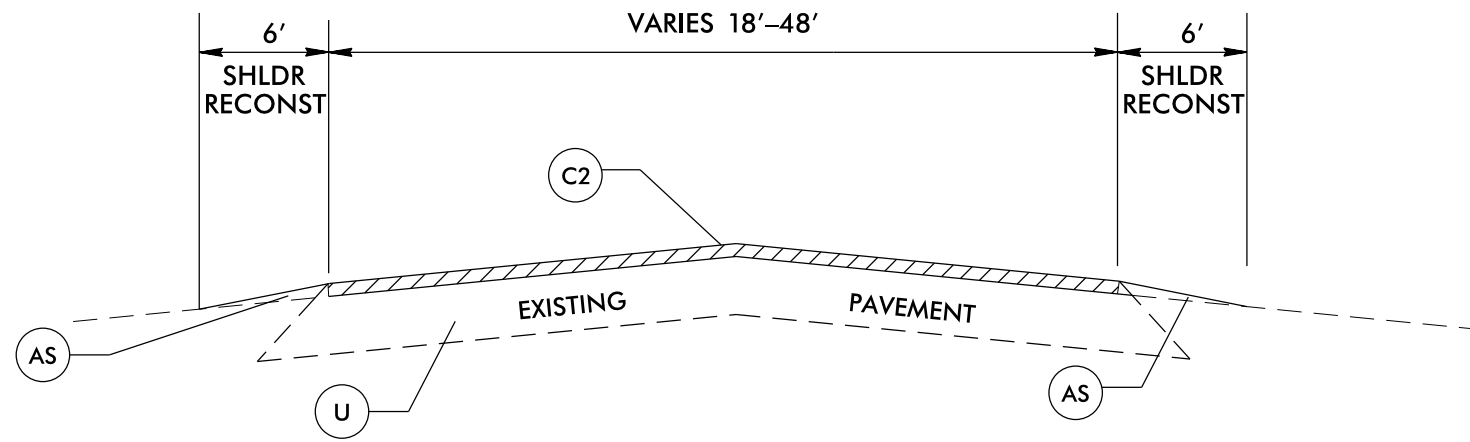
**TYPICAL SECTION NO. 4**



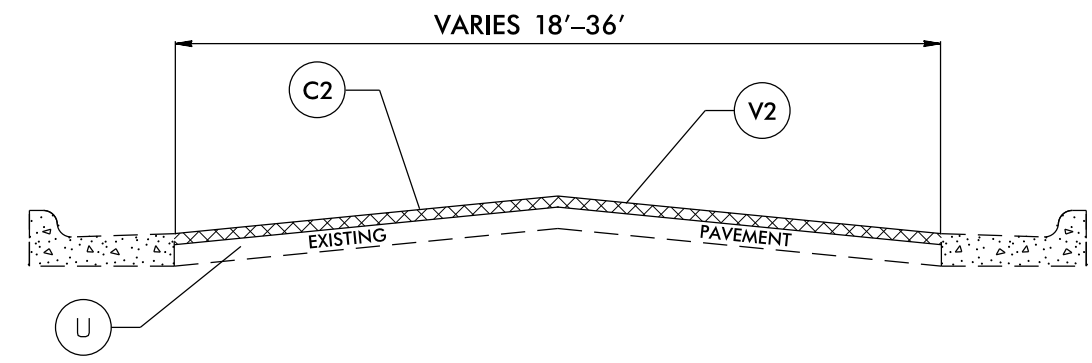
**TYPICAL SECTION NO. 5**

<b>PAVEMENT SCHEDULE</b>	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
F1	ASPHALT SURFACE TREATMENT, SINGLE SEAL
AS	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT.
V1	MILLING 1½" IN DEPTH.

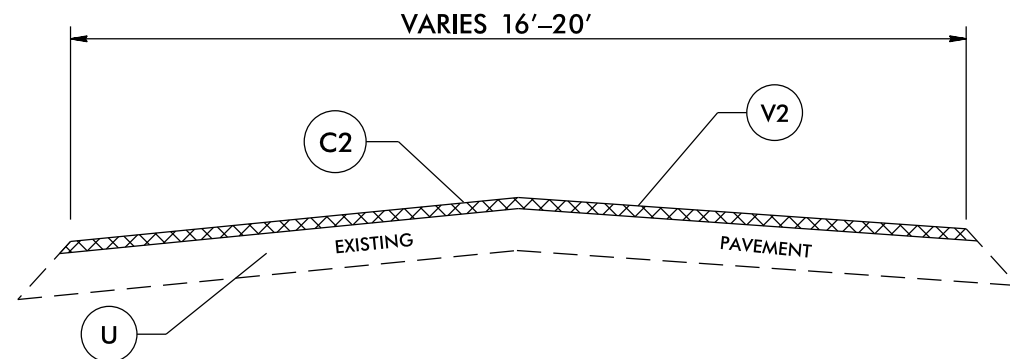
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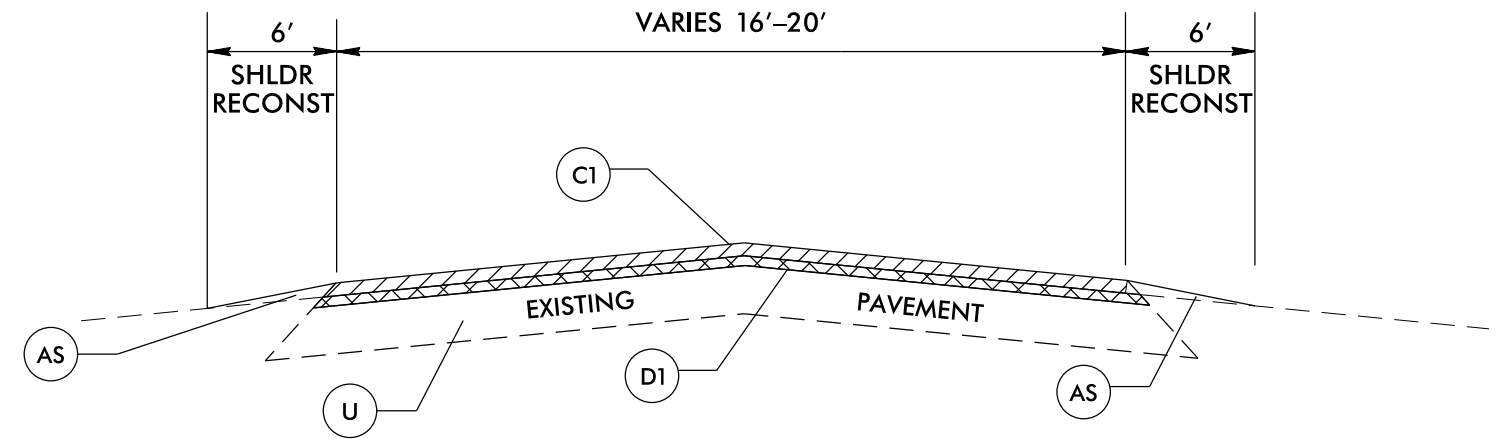
**TYPICAL SECTION NO. 6**



**TYPICAL SECTION NO. 7**

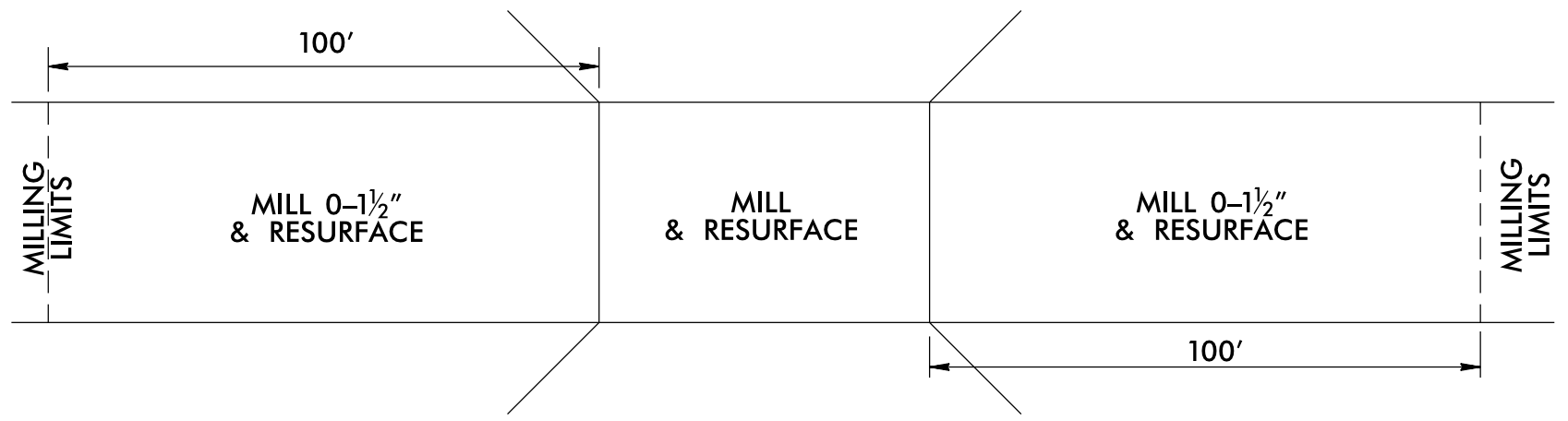


**TYPICAL SECTION NO. 8**

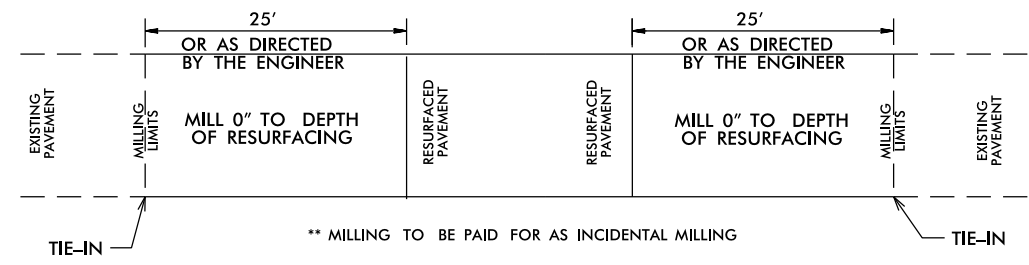


**TYPICAL SECTION NO. 9**

<b>PAVEMENT SCHEDULE</b>	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
F1	ASPHALT SURFACE TREATMENT, SINGLE SEAL
AS	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT.
V1	MILLING 1½" IN DEPTH.
V2	MILLING 1¼" IN DEPTH.

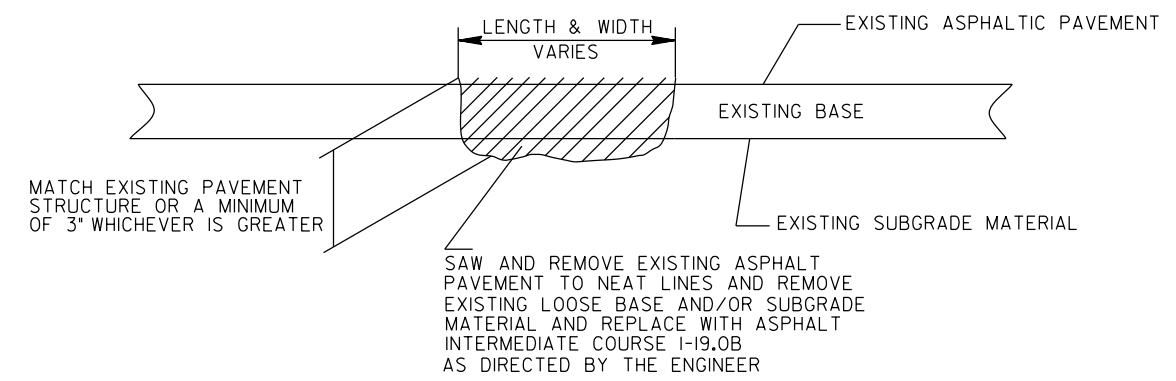


\* MILLING SHALL BE PAID FOR UNDER INCIDENTAL MILLING



**PAVEMENT TIE-IN DETAIL**

**DETAILS OF PATCHING EXISTING PAVEMENT PRIOR TO RESURFACING**  
**DETAIL**



**PAVEMENT SCHEDULE**

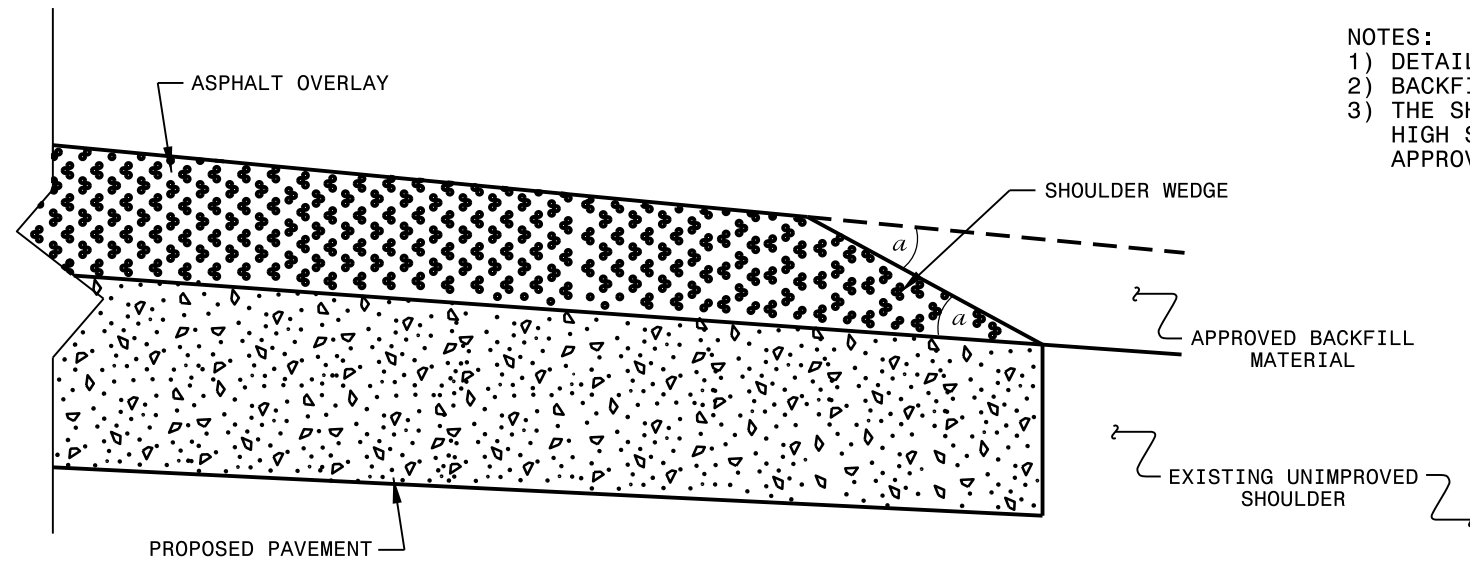
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.0B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD.
D1	PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
F1	ASPHALT SURFACE TREATMENT, SINGLE SEAL
AS	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
U	EXISTING PAVEMENT.
V1	MILLING 1 1/2" IN DEPTH.
V2	MILLING 1 1/4" IN DEPTH.

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17 MAY 2016 16:44  
2017-05-24 10:57:41  
C:\Users\Richmond\Documents\2016-Submittal\Richmond-July-2016-Submittal\Richmond-July-2016-Submittal.dgn

etc

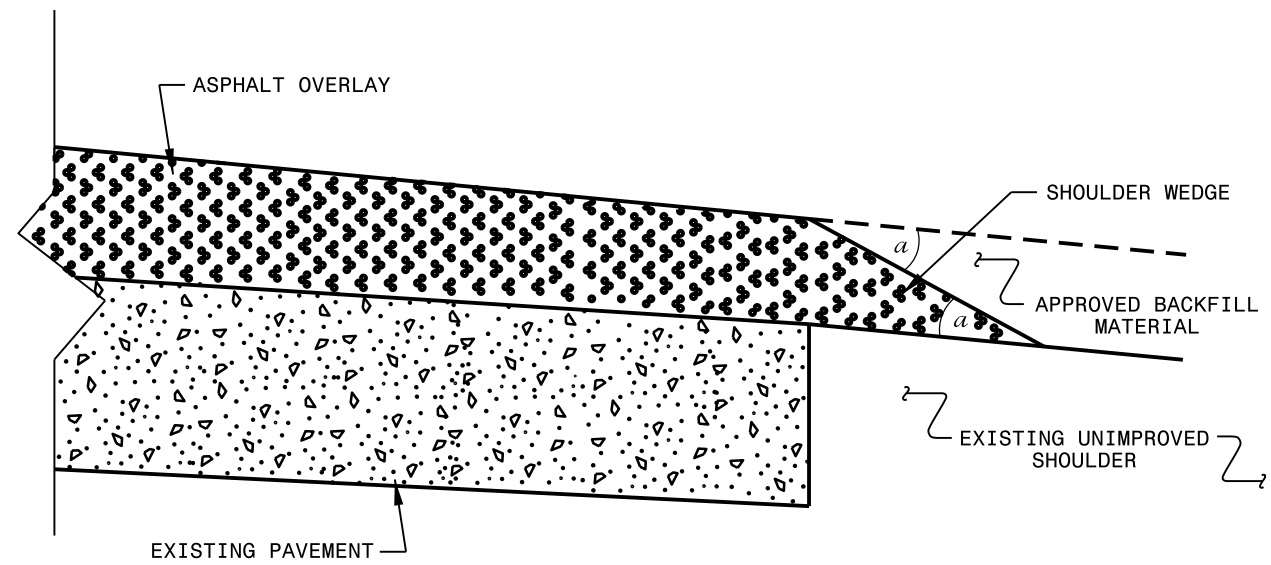
**NOTES:**

- 1) DETAIL DOES NOT APPLY TO OGAFB AND ULTRA-THIN BONDED WEARING COURSE.
- 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
- 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.



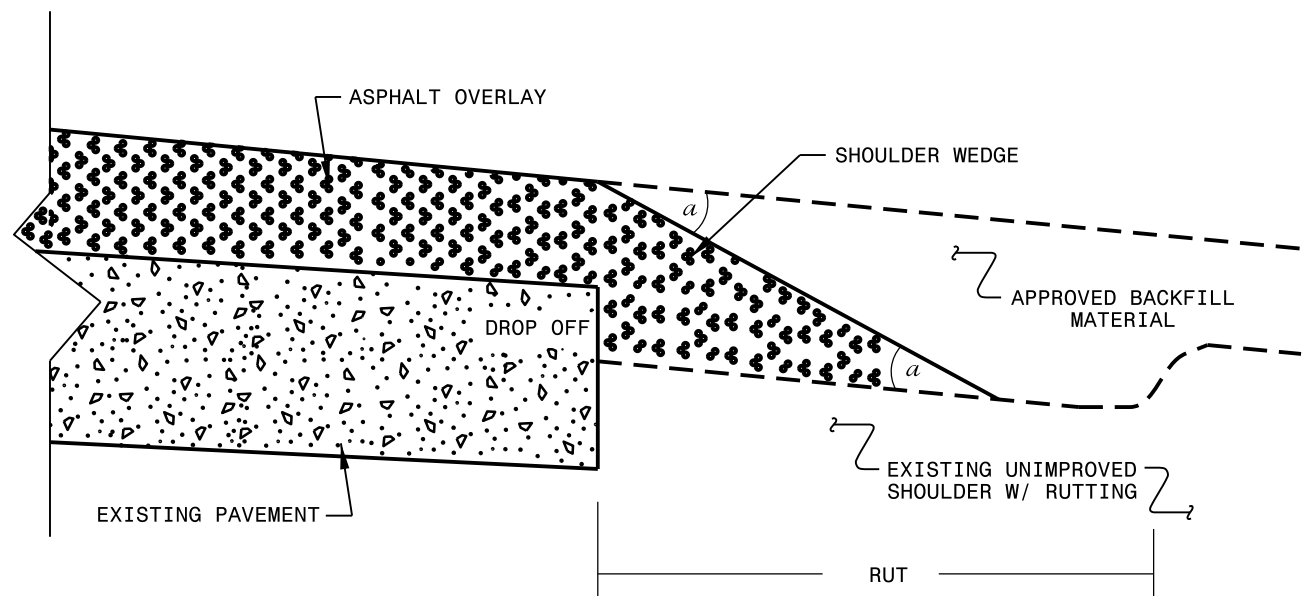
**SHOULDER WEDGE DETAIL**

(Resurfacing Projects w/ Widening or with Existing Paved Shoulder having no dropoffs)



**SHOULDER WEDGE DETAIL**

(Resurfacing Projects w/ NO Widening)



**SHOULDER WEDGE DETAIL**

(Resurfacing Adjacent to Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

**CONTRACT STANDARDS AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**SHOULDER WEDGE DETAILS**

ORIGINAL BY: T.SPELL DATE: 7-19-11  
 MODIFIED BY: DATE: 2/2/16  
 CHECKED BY: DATE:  
 FILE SPEC.: s:\usr\details\stand\shoulderwedge\detail.dgn

26 MAY 2016 10:58 AM  
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PROJECT NO.	SHEET NO.	TOTAL NO.
2017CPT.08.03.10771 2017CPT.08.03.20771	13	

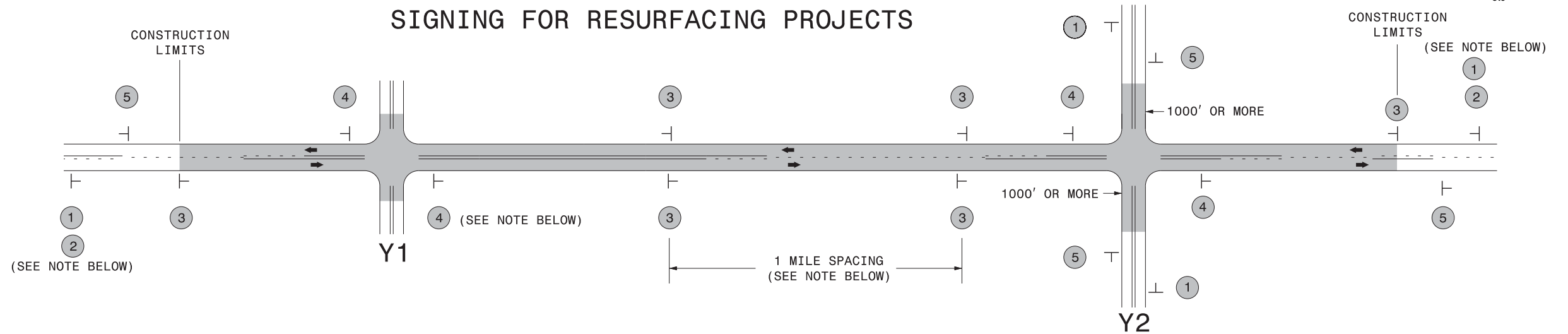
## SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH MI	WIDTH FT	AGGREGATE SHOULDER BORROW TON	SHOULDER RECONSTRUCTION SMI	1.5" MILLING SY	1.25" MILLING SY	INCIDENTAL MILLING SY	INTERMEDIATE COURSE, 119.0B TONS	SURFACE COURSE, S9.5B TONS	LEVELING COURSE, S9.5B TONS	SURFACE COURSE, SF9.5A TON	ASPHALT BINDER FOR PLANT MIX TONS	PATCHING EXISTING PAVEMENT TONS	ASPHALT SURFACE TREATMENT, SINGLE SEAL SY	EMULSION FOR ASPHALT SURFACE TREATMENT GAL	ADJ. OF MAN-HOLES EA	ADJ. OF METER OR VALVE BOXES EA	INDUCTIVE LOOP SAWCUT LF		
2017CPT.08.03.10771	Richmond	1	NC 38	FROM US 74 BUS. TO SR 1615 (MAIN ST)	1	2	2WD	NO	NO	0.24	26-36			5,034				280			17	50			1	1	590		
		2	NC 38	FROM US 74 BUS. TO NC 38 S	1	2	2WD	NO	NO	0.05	28			816				80			5								
		3	NC 38	FROM BEG. WIDENING AT SR 1812 (FREEMAN MILL RD) TO END WIDENING AT SR 1833 (PERRY WILLIAMS RD)	3,4	2	MD	NO	NO	0.43	38-64					16,746						94	1,341					3	
		4	NC 38	FROM SR 1615 (MAIN ST) TO BEG. WIDENING AT SR 1812	2	2	2WD	NO	NO	1.34	26			376	2.68			867				117	1,341			1	1		
		5	NC 381	FROM SR 1615 (GRACE CHAPEL CH. RD) TO US 74 BUS.	2	2	2WD	NO	NO	1.58	30			443	3.16	200		800				2,730			164	32			
<b>TOTAL FOR PROJ NO. 2017CPT.08.03.10771</b>										<b>3.64</b>		<b>819</b>	<b>5.84</b>	<b>22,796</b>		<b>1,667</b>		<b>6,595</b>			<b>397</b>	<b>2,764</b>			<b>2</b>	<b>5</b>	<b>590</b>		
2017CPT.08.03.20771	Richmond	6	SR 1124 (MIDWAY RD)	FROM US 74 BUS. TO SR 1109 (GALESTOWN RD)	5	2	2WD	NO	NO	1.14	20	320	2.28			595				1,085	73	5	14,326	5,015		1			
		7	SR 1825 (AIRPORT RD)	FROM NC 117 TO SR 1811 (GIN MILL RD)	6	2	2WD	NO	NO	0.71	22	200	1.42					1,304			765	51	10						
		8	SR 1650 (LONG DR)	FROM SR 1903 (MILL RD) TO US 74 BUS	6,7	2	2WD	NO	NO	0.64	22-38	168	1.20			1,260		1,187				670	45	25			2	5	450
		9	SR 1412 (HAMER RD)	FROM SR 1419 (ASLINGTON ST) TO SR 1418 (NORTHAM RD)	6	2	2WD	NO	NO	0.63	24	177	1.26					915				665	45	3					
		10	SR 1336 (BILLY COVINGTON RD)	FROM US 220 TO US 220	6	2	2WD	NO	NO	0.87	22-36	244	1.74					848				890	60	12					
		11	SR 1418 (NORTHAM RD)	FROM SR 1412 (HAMER RD) TO SR 1336 (BILLY COVINGTON RD)	6	2	2WD	NO	NO	1.66	22	465	3.32					402				1,805	121	39				4	
		12	SR 1436 (TERRY BRIDGE RD)	FROM SR 1423 (RICHMOND RD EXT) TO SR 1434 (ROBERDEL SCHOOL RD)	6	2	2WD	NO	NO	1	21	280	2.00					583				945	63	97					
		13	SR 1434 (ROBERDEL SCHOOL RD)	FROM 1442 (LEDBETTER RD) TO SR 1424 (ROBERDEL RD)	6	2	2WD	NO	NO	1.98	22	555	3.96									1,980	133	24					
		14	SR 1427 (HAMMONDS ST)	FROM SR 1424 (ROBERDEL RD) TO SR 1424 (ROBERDEL RD)	7,8	2	2WU	NO	NO	0.15	19					1,774						135	9	2				1	
		15	SR 1428 (SPIVEY ST)	FROM SR 1424 (OLD ROBERDEL RD) TO END MAINT.	7,8	2	2WU	NO	NO	0.26	18					2,831						215	14	15				1	
		16	SR 1485 (LEDBETTER RD)	FROM SR 1442 (GREEN LAKE RD) TO END OF MAINT.	6	2	2WU	NO	NO	0.17	18	48	0.34									145	10						
		17	SR 1472 (MCBRYDE RD)	FROM SR 1003 TO SR 1465 (SYCAMORE LN)	6	2	2WD	NO	NO	1	20	280	2.00					1,223			1,145	940	137	50					
		18	SR 1523 (ELLERBEE HATCHERY RD)	FROM US 220 TO END OF MAINTENANCE	6	2	2WD	NO	NO	0.56	20	157	1.12					278				500	34	30					
		19	SR 1303 (DAVE KINGS RD)	FROM FUTURE R-3421B TO SR 1005 (CARTLEDGE CRK RD)	9	2	2WD	NO	NO	0.76	16	213	1.52					712	1,125	665			94	131					
		20	SR 1303 (DAVE KINGS RD)	FROM SR 1302 (CRESTVIEW DR) TO FUTURE R-3421B	9	2	2WD	NO	NO	0.19	16	54	0.38					356	305	180			25	61					
		21	SR 1441 (HAYWOOD PARKER RD)	FROM SR 1451 (GIBSON NURSERY RD) TO SR 1452 (MILLSTONE RD)	2	2	2WD	NO	NO	1.22	20	342	2.44	335				1,935				1,265	76	45				1	
		22	SR 1441 (HAYWOOD PARKER RD)	FROM SR 1450 (GREEN LAKE RD) TO SR 1451 (GIBSON NURSERY RD)	2	2	2WD	NO	NO	0.94	20	264	1.88					667				1,020	61	167					
		<b>TOTAL FOR PROJ NO. 2017CPT.08.03.20771</b>										<b>13.88</b>		<b>3,767</b>	<b>26.86</b>	<b>335</b>	<b>5,865</b>	<b>11,005</b>	<b>1,430</b>	<b>3,130</b>	<b>1,145</b>	<b>10,740</b>	<b>1,051</b>	<b>716</b>	<b>14,326</b>	<b>5,015</b>	<b>2</b>	<b>13</b>	<b>450</b>
		<b>GRAND TOTAL</b>										<b>17.52</b>		<b>4,586</b>	<b>32.70</b>	<b>23,131</b>	<b>5,865</b>	<b>12,672</b>	<b>1,430</b>	<b>9,725</b>	<b>1,145</b>	<b>10,740</b>	<b>1,448</b>	<b>3,480</b>	<b>14,326</b>	<b>5,015</b>	<b>4</b>	<b>18</b>	<b>1,040</b>

## THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	441300000	44570000	468500000-E		468600000-E		469500000-E		47000000	47050000	47100000	47210000	472500000-E				477000000	481000000-E		485000	490000000-N		490500000-N				
										WORK ZONE ADV./GEN. WARN. SIGNING SF	TEMP. TRAFFIC CONTROL LS	4" X 90 M WHITE THERMO LF	4" X 90 M YELLOW THERMO LF	4" X 120 M YELLOW THERMO LF	4" X 120 M WHITE THERMO LF	8" X 90 M YELLOW THERMO LF	8" X 90 M WHITE THERMO LF	12" X 90 M YELLOW THERMO LF	16" X 120 M WHITE THERMO LF	24" X 120 M WHITE THERMO LF	THERM O RXR 120 M EA	THERM O STR ARROW 90 M EA	THERMO LT ARROW 90 M EA	THERM O RT ARROW 90 M EA	THERMO STR & RT ARROW 90 M EA	COLD APPL PL PM LINES, TYPE ** (4", II) LF	4" WHITE PAINT LF	4" YELLOW PAINT LF	4" LINE REMO VAL LF	YEL. & MARKERS EA	CRYSTA L & RED MARKERS EA	SNOW PLOWABLE E Y & Y MARKERS EA	SNOW PLOWABLE C & R MARKERS EA			
2017CPT.08.03.10771	Richmond	1	NC 38	FROM US 74 BUS. TO SR 1615 (MAIN ST)	1	2	2WD	0.24	26-36	152		144		2,276		156					60		3					144	2,276				22			
		2	NC 38	FROM US 74 BUS. TO NC 38 S	1	2	2WD	0.05	28	6				524										2					524				5			
		3	NC 38	FROM BEG. WIDENING AT SR 1812 (FREEMAN MILL RD) TO END WIDENING AT SR 1833 (PERRY WILLIAMS RD)	3,4	2	MD	0.43	38-52	158	*		6,950	1,975	2,740	1,120						85		133		6	7	3			7,950	4,715			35	42
		4	NC 38	FROM SR 1615 (MAIN ST) TO BEG. WIDENING AT SR 1812	2	2	2WD	1.34	26	224			13,800		13,840	55								15									120			
		5	NC 381	FROM SR 1615 (GRACE CHAPEL CH. RD) TO US 74 BUS.	2	2	2WD	1.58	30	224			17,088	4,750	12,120	850			259	50			72		5	4	3						220	38		
<b>TOTAL FOR PROJ NO. 2017CPT.08.03.10771</b>												<b>37,982</b>	<b>6,725</b>	<b>31,500</b>	<b>2,025</b>	<b>156</b>	<b>259</b>	<b>135</b>		<b>280</b>		<b>16</b>	<b>11</b>	<b>6</b>			<b>8,094</b>	<b>7,515</b>			<b>402</b>	<b>80</b>				
												<b>44,707</b>	<b>6,725</b>	<b>33,525</b>		<b>415</b>							<b>33</b>			<b>15,609</b>				<b>482</b>						
2017CPT.08.03.20771	Richmond	6	SR 1124 (MIDWAY RD)	FROM US 74 BUS. TO SR 1109 (GALESTOWN RD)	5	2	2WD	1.14	20	128		10,725		9,741	54																	81				
		7	SR 1825 (AIRPORT RD)	FROM NC 117 TO SR 1811 (GIN MILL RD)	6	2	2WD	0.71	22	80		7,574		6,054	10						100	68	4									51				
		8	SR 1650 (LONG DR)	FROM SR 1903 (MILL RD) TO US 74 BUS	6,7	2	2WD	0.64	22-38	72		5,988		6,938	110						100	70	4		2	2	1		5,990	6,940		90	8			
		9	SR 1412 (HAMER RD)	FROM SR 1419 (ASLINGTON ST) TO SR 1418 (NORTHAM RD)	6	2	2WD	0.63	24	71		6,495		6,480	64																	47				
		10	SR 1336 (BILLY COVINGTON RD)	FROM US 220 TO US 220	6	2	2WD	0.87	22-36	98		9,166		7,079	38																62					
		11	SR 1418 (NORTHAM RD)	FROM SR 1412 (HAMER RD) TO SR 1336 (BILLY COVINGTON RD)	6	2	2WD	1.66	22	186		16,708		15,679	130																123					
		12	SR 1436 (TERRY BRIDGE RD)	FROM SR 1423 (RICHMOND RD EXT) TO SR 1434 (ROBERDEL SCHOOL RD)	6	2	2WD	1	21	112				10,146	18													604		604	68					
		13	SR 1434 (ROBERDEL SCHOOL RD)	FROM 1442 (LEDBETTER RD) TO SR 1424 (ROBERDEL RD)	6	2	2WD	1.98	22	222		20,874		19,626	6																136					
		14	SR 1427 (HAMMONDS ST)	FROM SR 1424 (ROBERDEL RD) TO SR 1424 (ROBERDEL RD)	7,8	2	2WU	0.15	19	16	*																									
		15	SR 1428 (SPIVEY ST)	FROM SR 1424 (OLD ROBERDEL RD) TO END MAINT.	7,8	2	2WU	0.26	18	30																										
		16	SR 1485 (LEDBETTER RD)	FROM SR 1442 (GREEN LAKE RD) TO END OF MAINT.	6	2	2WU	0.17	18	19																										
		17	SR 1472 (MCBRYDE RD)	FROM SR 1003 TO SR 1465 (SYCAMORE LN)	6	2	2WD	1	20	112		10,581		7,372	16																	67				
		18	SR 1523 (ELLERBEE HATCHERY RD)	FROM US 220 TO END OF MAINTENANCE	6	2	2WD	0.56	20	63																										
		19	SR 1303 (DAVE KINGS RD)	FROM FUTURE R-3421B TO SR 1005 (CARTLEDGE CRK RD)	9	2	2WD	0.76	16	86		6,116		6,116																		52				
		20	SR 1303 (DAVE KINGS RD)	FROM SR 1302 (CRESTVIEW DR) TO FUTURE R-3421B	9	2	2WD	0.19	16	22		389		372																		14				
		21	SR 1441 (HAYWOOD PARKER RD)	FROM SR 1451 (GIBSON NURSERY RD) TO SR 1452 (MILLSTONE RD)	2	2	2WD	1.22	20	137		12,887		12,822																		82				
		22	SR 1441 (HAYWOOD PARKER RD)	FROM SR 1450 (GREEN LAKE RD) TO SR 1451 (GIBSON NURSERY RD)	2	2	2WD	0.94	20	106		9,906		9,906																		64				
		<b>TOTAL FOR PROJ NO. 2017CPT.08.03.20771</b>												<b>117,409</b>		<b>118,331</b>	<b>446</b>				<b>200</b>	<b>138</b>	<b>8</b>		<b>2</b>	<b>2</b>	<b>1</b>	<b>604</b>	<b>5,990</b>	<b>6,940</b>	<b>604</b>	<b>937</b>	<b>8</b>			
														<b>118,777</b>										<b>5</b>			<b>12,930</b>			<b>945</b>						
		<b>GRAND TOTAL</b>									<b>17.52</b>	<b>2,324</b>	<b>1</b>	<b>155,391</b>	<b>6,725</b>	<b>149,831</b>	<b>2,471</b>	<b>156</b>	<b>259</b>	<b>135</b>	<b>200</b>	<b>418</b>	<b>8</b>	<b>16</b>	<b>13</b>	<b>8</b>	<b>1</b>	<b>604</b>	<b>14,084</b>	<b>14,455</b>	<b>604</b>	<b>937</b>	<b>8</b>	<b>402</b>	<b>80</b>	
														<b>162,116</b>		<b>152,302</b>		<b>415</b>							<b>38</b>			<b>28,539</b>		<b>945</b>		<b>482</b>				

# SIGNING FOR RESURFACING PROJECTS



LEGEND	
T	STATIONARY SIGN
←	DIRECTION OF TRAFFIC FLOW

## MAINLINE (-L-) SIGNING

## -Y- LINE SIGNING

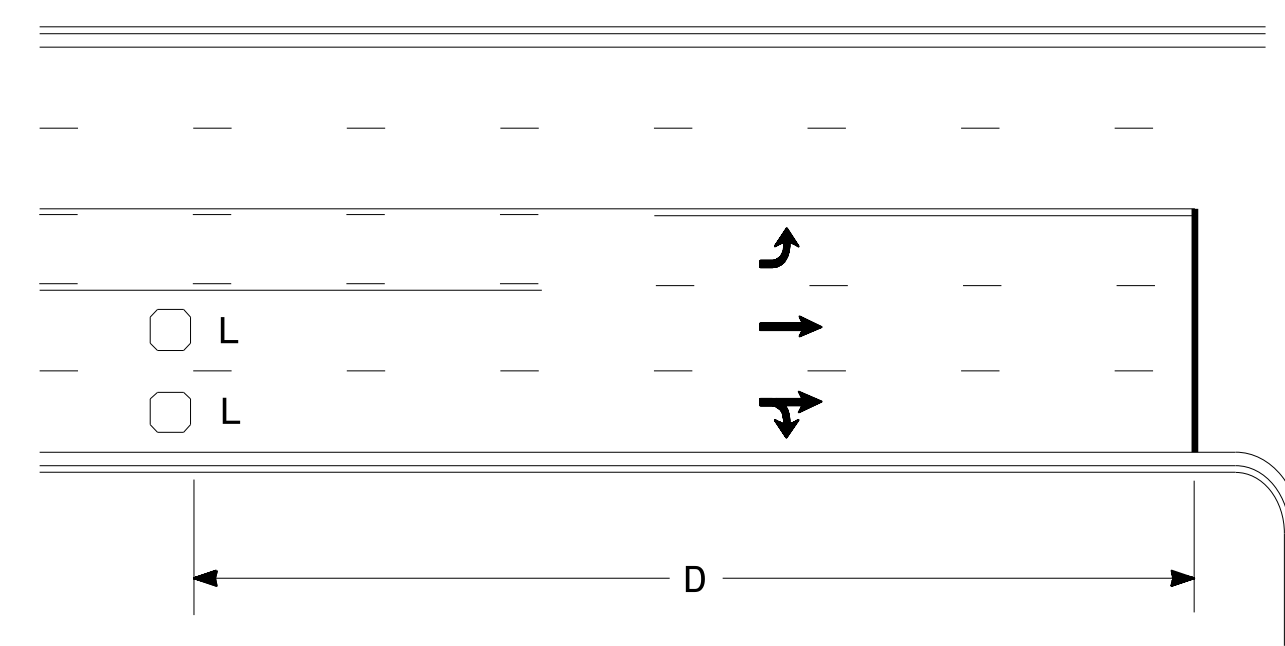
SIGNING NOTES AND PLACEMENT PER DIRECTION	1	2	3	4	5	
						<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> <li>1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE</li> <li>2) SUBDIVISION ROADS</li> <li>3) DEAD END ROADS</li> </ol> <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, ADVANCE WARNING PORTABLE SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">   <small>W20-1 48" X 48"</small> </div> <div style="text-align: center;">   <small>W20-7 A 48" X 48"</small> </div> </div> <p>PLACED 500' IN ADVANCE OF FLAGGER. PLACED 250' IN ADVANCE OF FLAGGER.</p>
	PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	#2 SIGN ONLY USED WHEN RESURFACING LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)	PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET 1/2 MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.	THESE ARE FOR -Y- LINES THAT ARE "THROUGH" ROADWAYS. DEAD END AND SUBDIVISION ROADS ARE NOT "THROUGH" ROADWAYS. INSTALL 500' +/- FROM EACH -Y- LINE APPROACH AS SHOWN ABOVE. FOR MULTIPLE -Y- LINES THAT ARE SEPARATED BY 0.25 MILES OR LESS, TREAT AS A SINGLE UNIT AND INSTALL WITHIN 500' OF EACH APPROACH. A MAXIMUM OF 2 SIGN SETS PER MILE. DO NOT INSTALL WHEN -Y- LINES ARE WITHIN 0.5 MILES FROM "END ROAD WORK" SIGN.	PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS.	

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**RESURFACING  
ADVANCE WARNING SIGNS  
FOR  
RURAL AND SUBURBAN  
2 LANE ROADWAYS**



### High Speed Detection (≥40 mph)

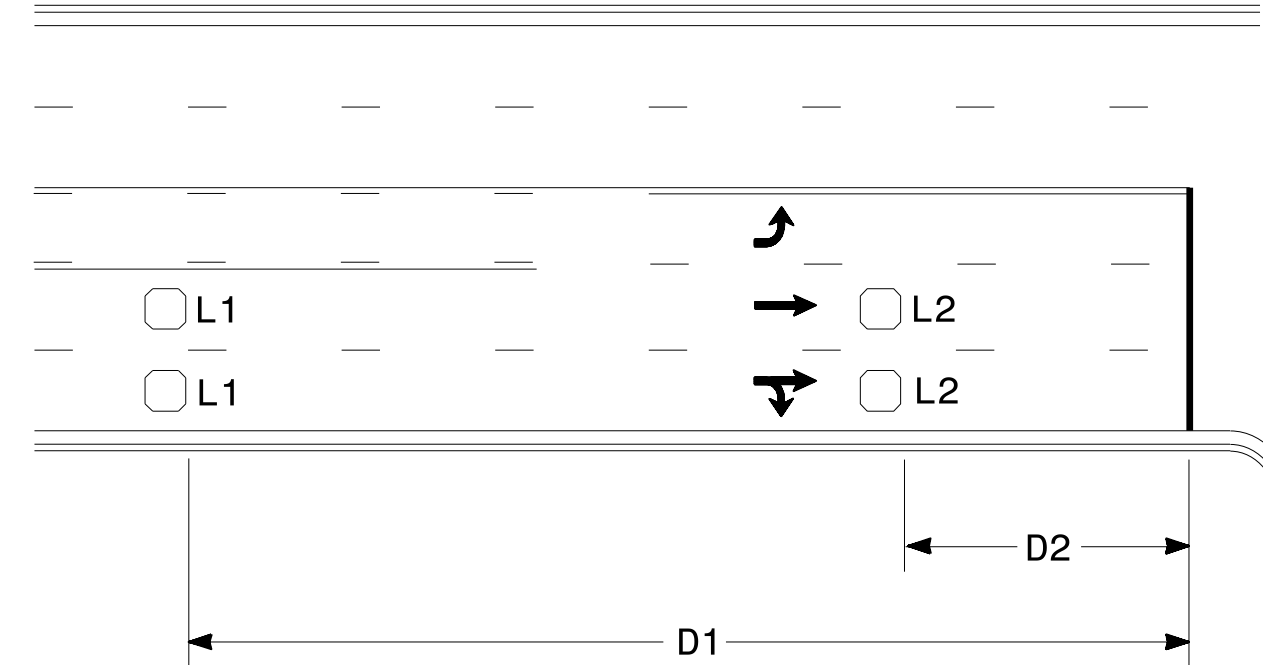


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

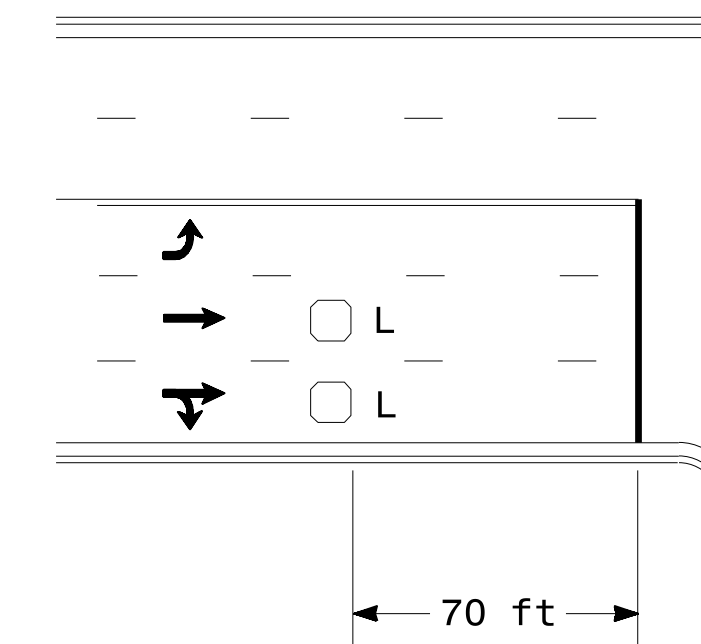


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft  
Wired in series  
L2 = 6ft X 6ft  
Wired in series

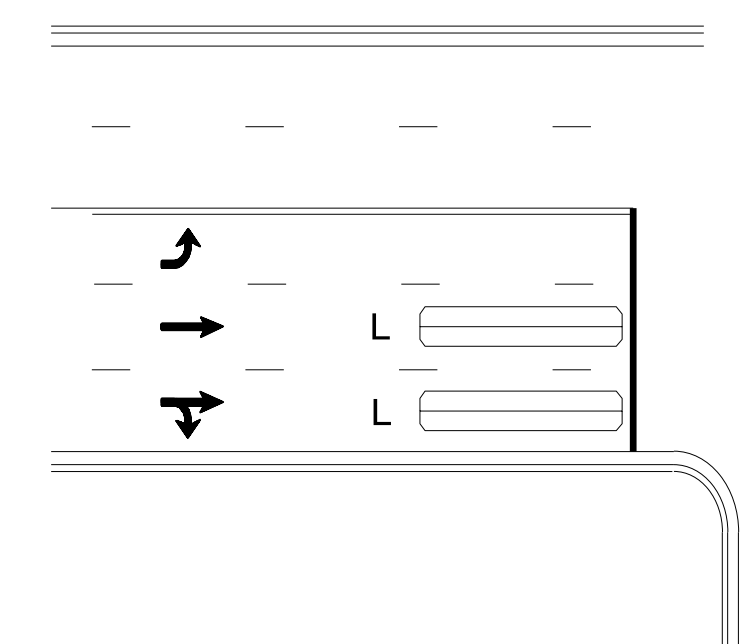
"Stretch" Operation

### Low Speed Detection (≤35 mph)



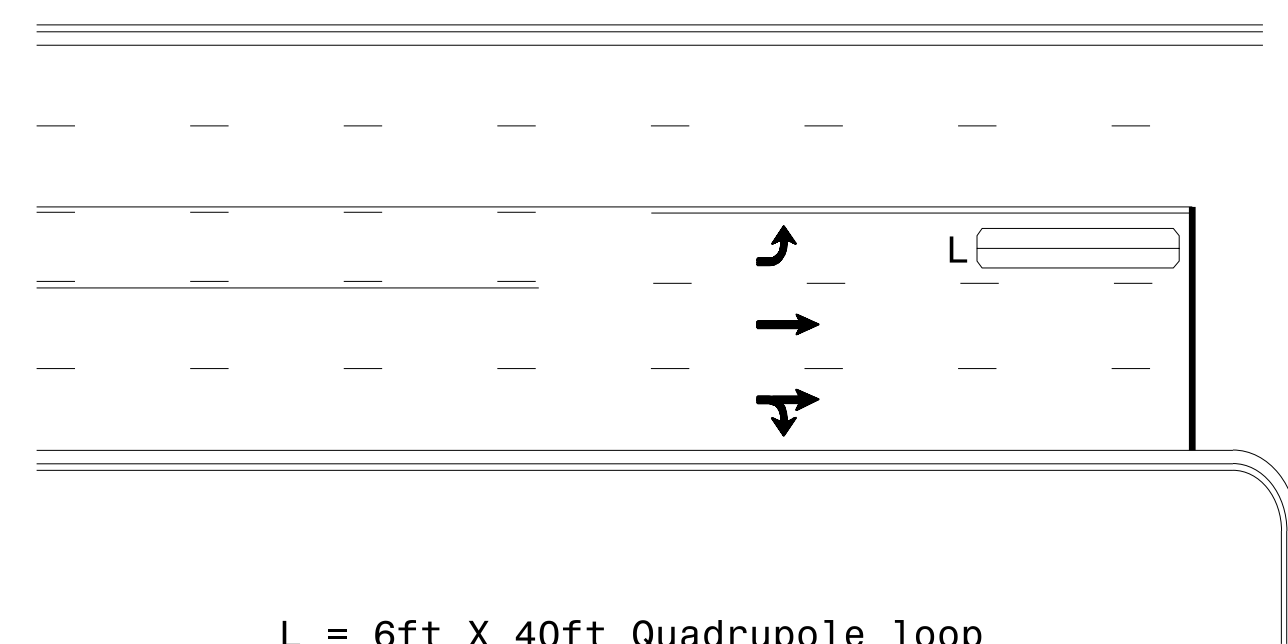
L = 6ft X 6ft  
Wired in series

OR



L = 6ft X 40ft  
Quadrupole loop, wired separately

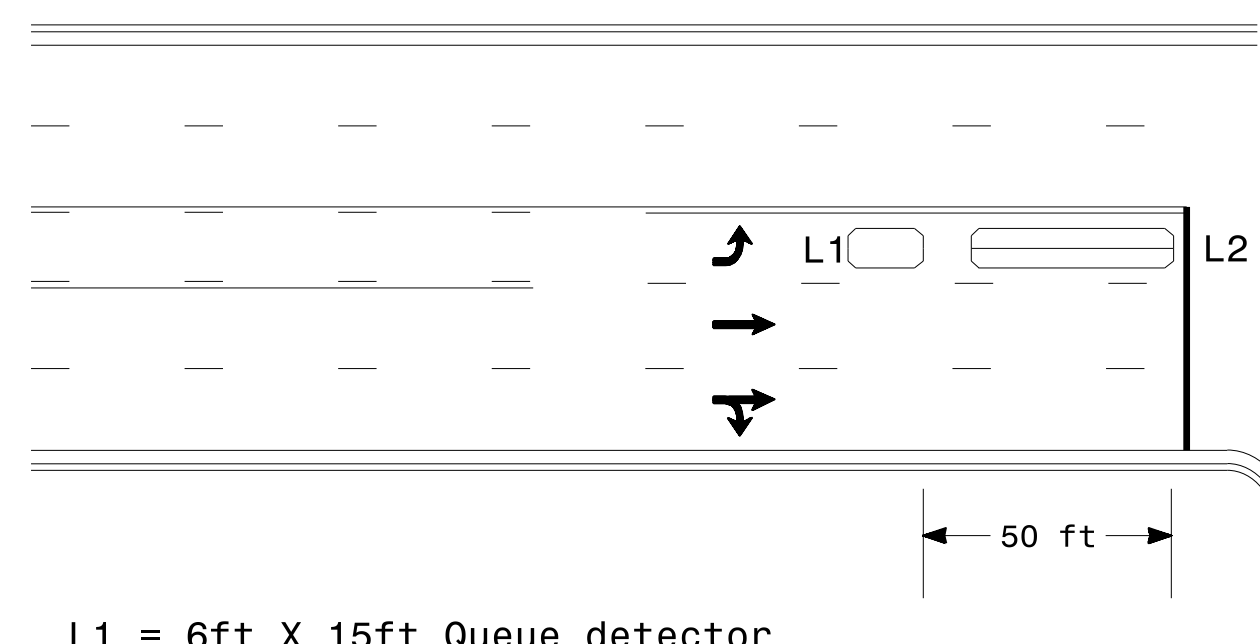
### Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

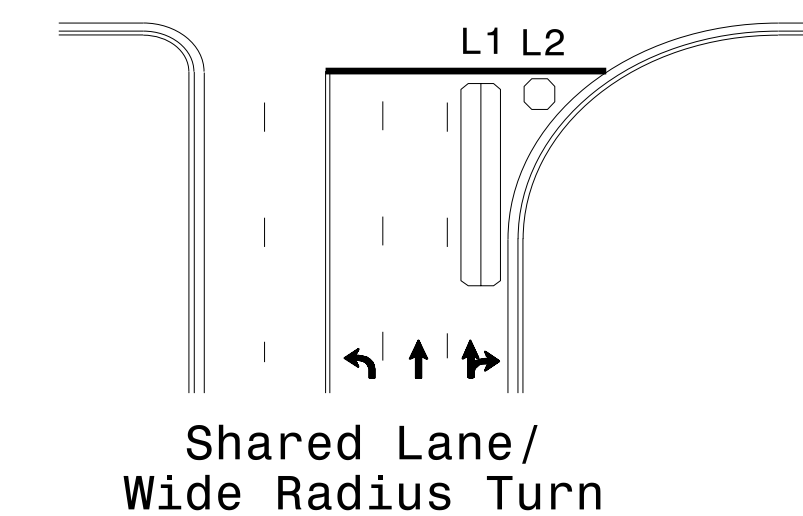
OR



L1 = 6ft X 15ft Queue detector  
L2 = 6ft X 40ft Quadrupole loop

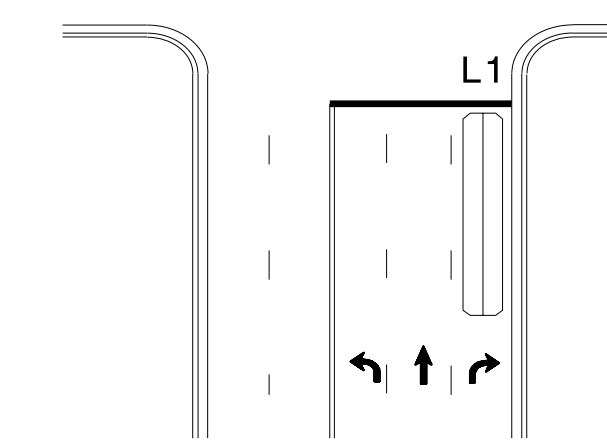
Queue Loop Detection

### Right Turn Lane Detection

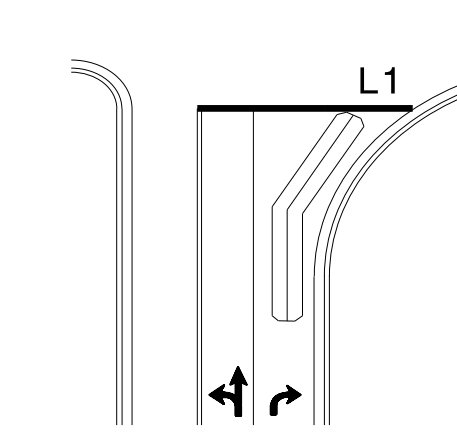


Shared Lane/  
Wide Radius Turn

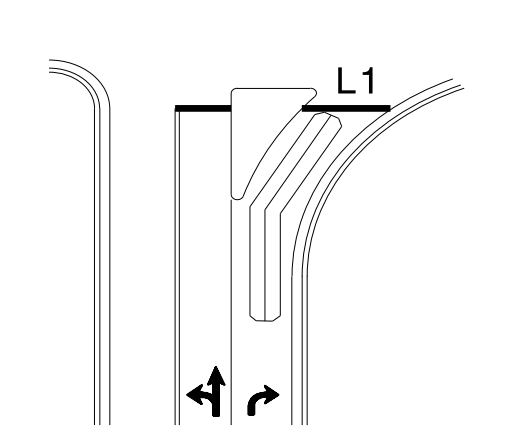
L1 = 6ft X 40ft Quadrupole loop  
L2 = 6ft X 6ft [Minimum] Presence loop  
Wired separately



Standard Turn

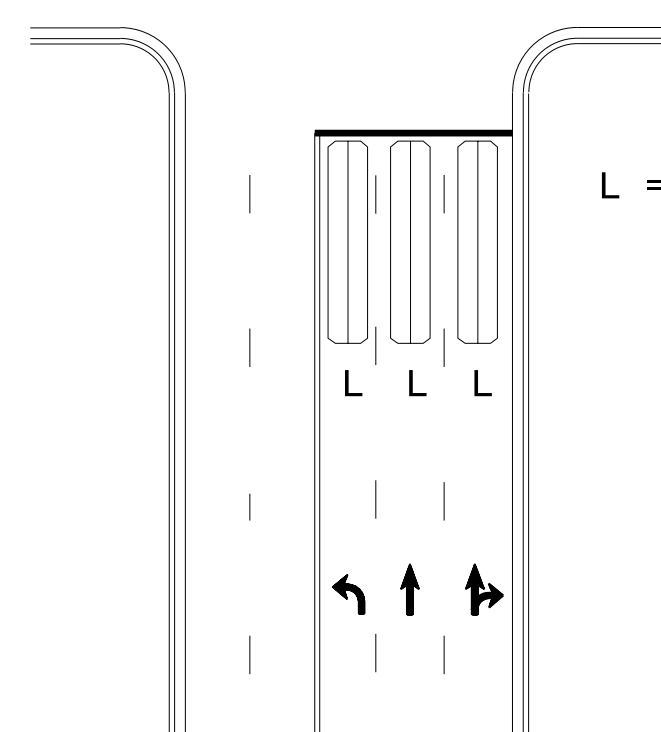


Wide Radius Turn



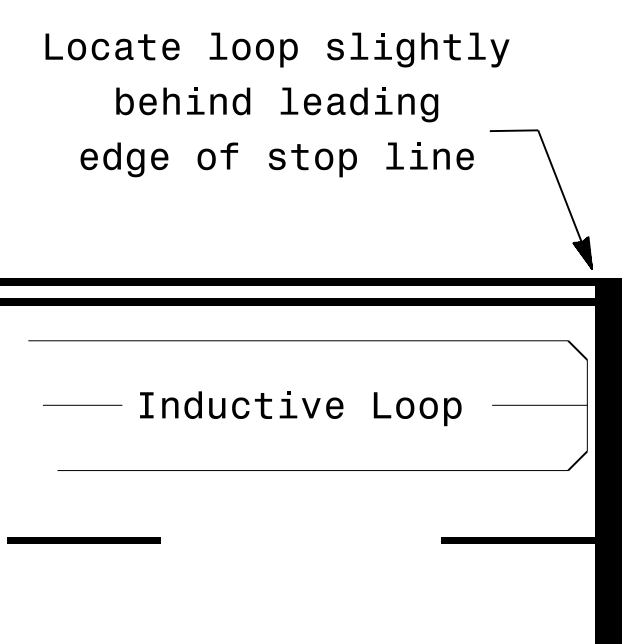
Channelized Turn

### Side Street Detection



L = 6ft X 40ft  
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 under any of the  
following conditions:  
1) stop line is greater than 15'  
from edge of intersecting  
roadway  
2) loop detects a permissive or  
protected/permissive left turn  
3) for an exclusive right turn  
lane

### Recommended Number of Turns

Single 6' X 6' loop  
(when wired separately):

Length of Lead-in ft	Number of Turns
< 250	3
250-375	4
375-525	5
> 525	6

Quadrupole loops: Use 2-4-2 turns

6' X 15' Loops:  
Lead-in < 150', use 2 turns  
Lead-in > 150', use 3 turns

750 N. Greenfield Pkwy, Garner, NC 27529

#### Typical Signal Loop Locations

PLAN DATE: January 2015	REVIEWED BY: JPG
PREPARED BY: PLA	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL  
NORTH CAROLINA  
PROFESSIONAL ENGINEER  
PAMELA L. ALEXANDER  
23489

DocuSigned by:  
P. Alexander  
1/30/2015 10:44:44 AM

SIG. INVENTORY NO.