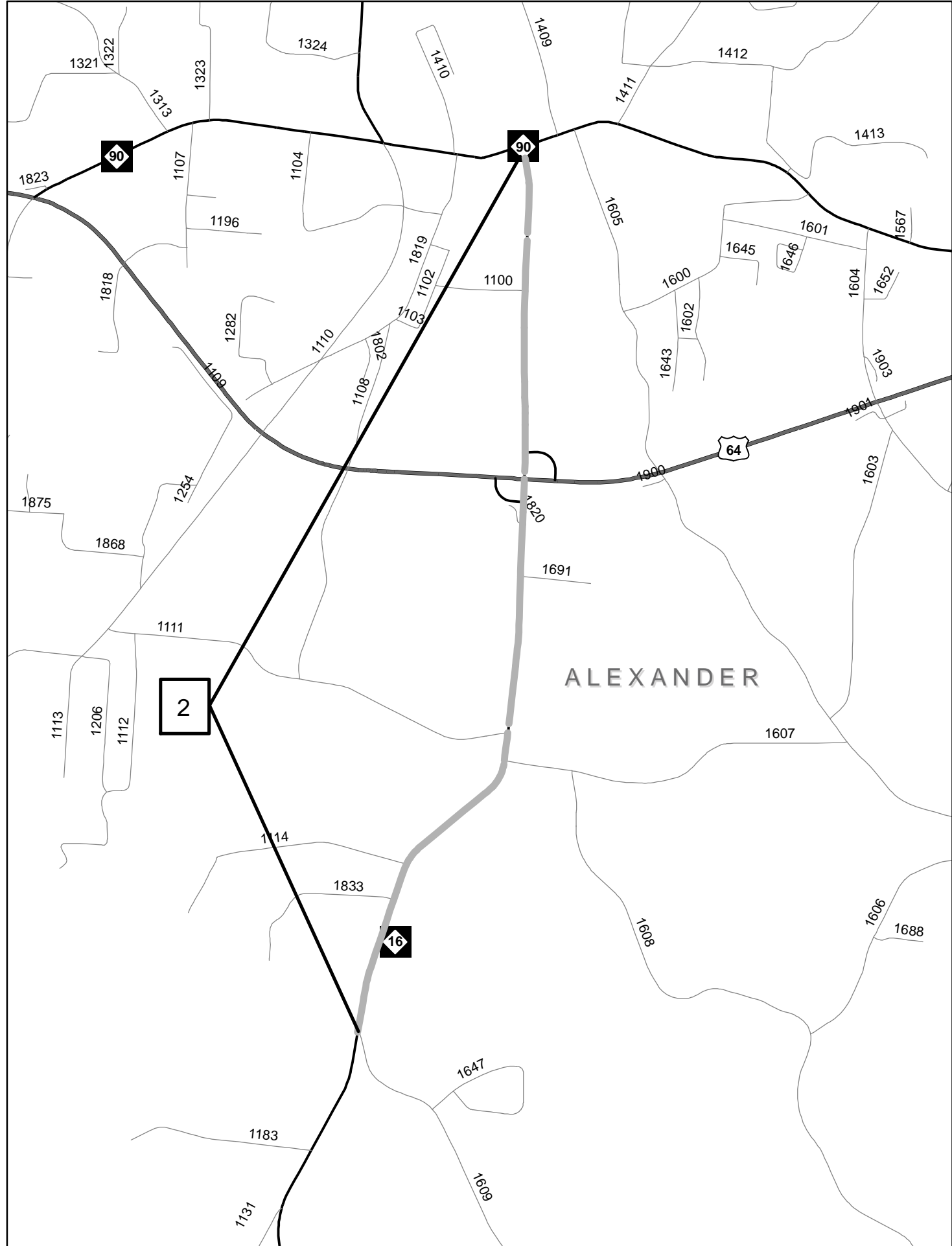
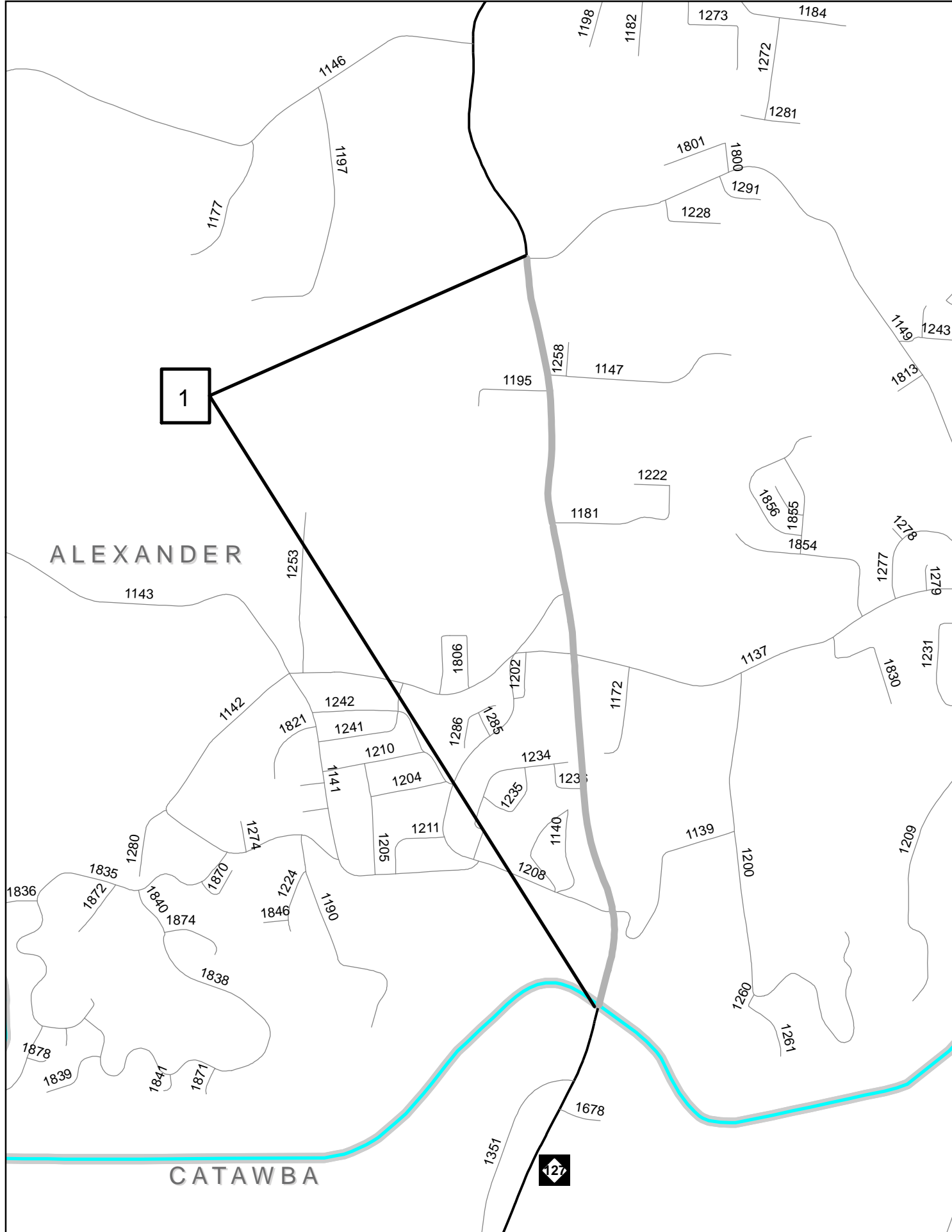
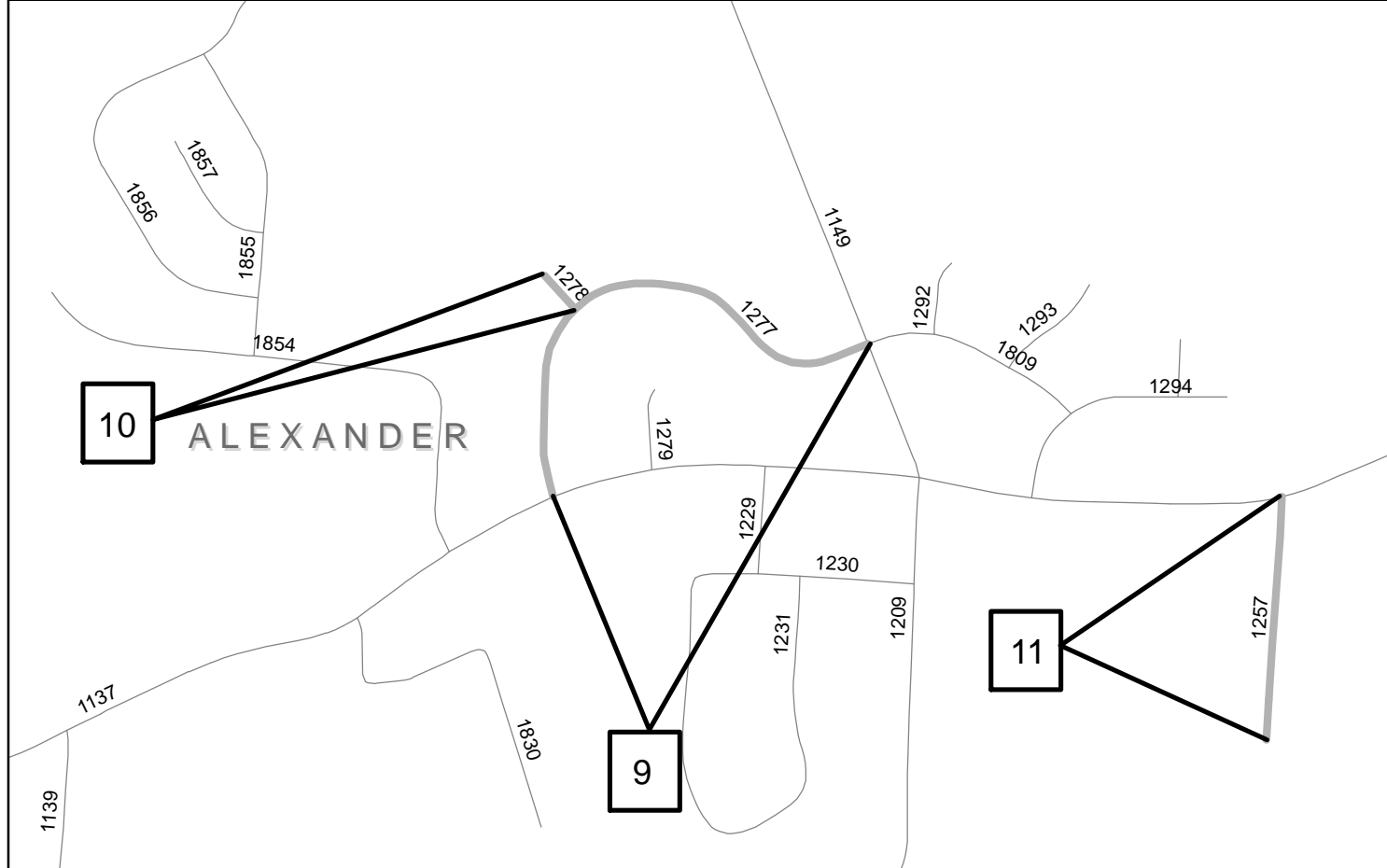
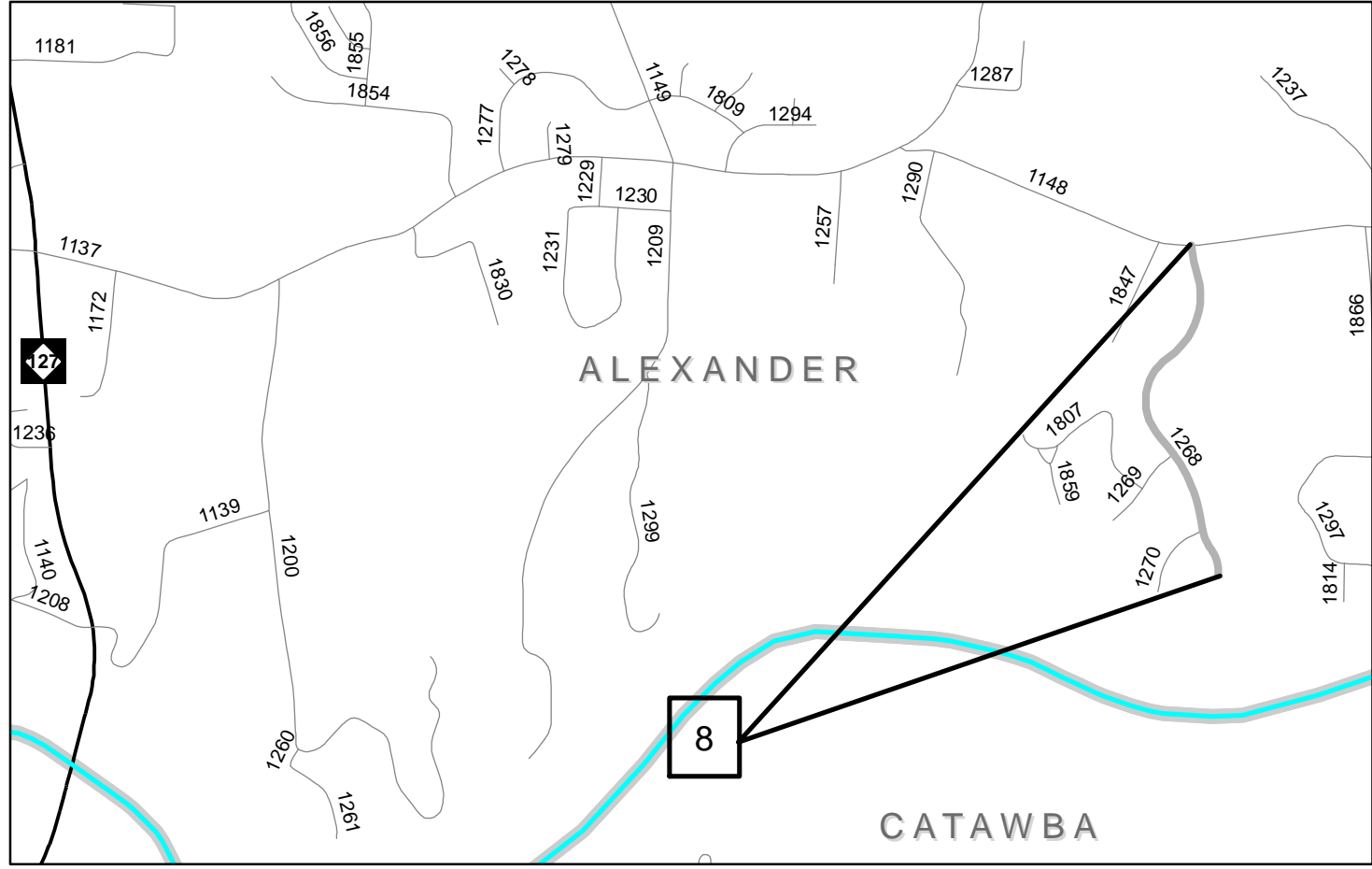
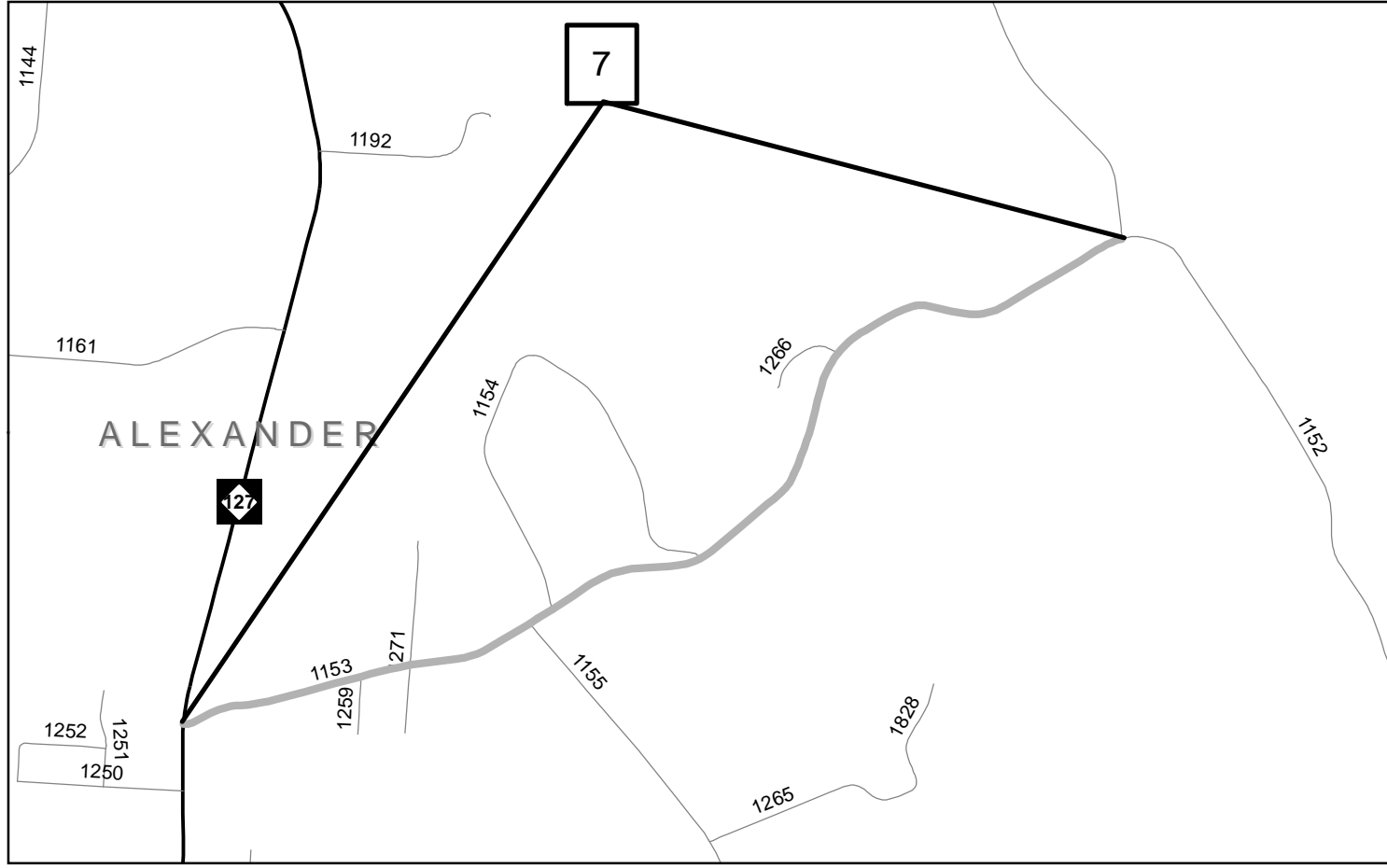


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and is Not a Certified Document –**

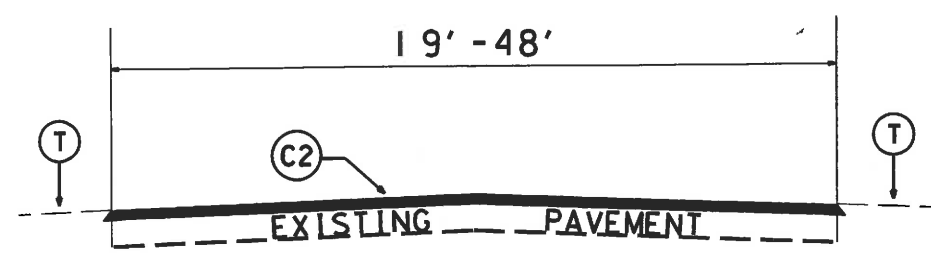
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and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**



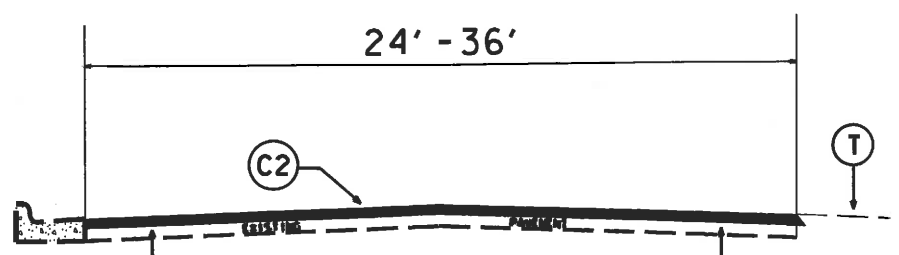


PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
ALEXANDER COUNTY	6	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
2019CPT.12.03.10021		SECONDARY RESURFACING
2019CPT.12.03.20021		



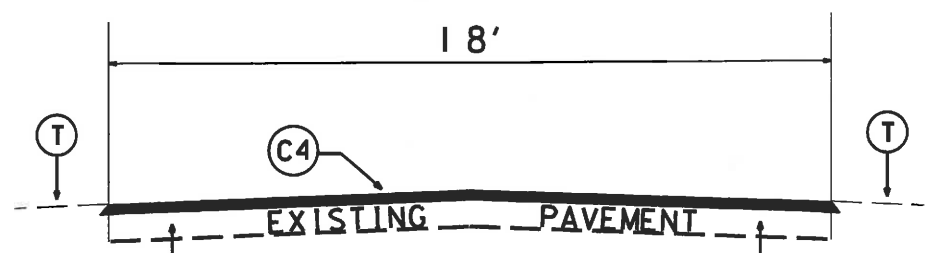
TYPICAL SECTION NO.1

Map 1, 4, 5, 6, 7, 8, 14, 15 (ALL)
 Map 2 0+00 - 49+35
 53+85 - 80+75
 Map 3 6+75 - 84+00



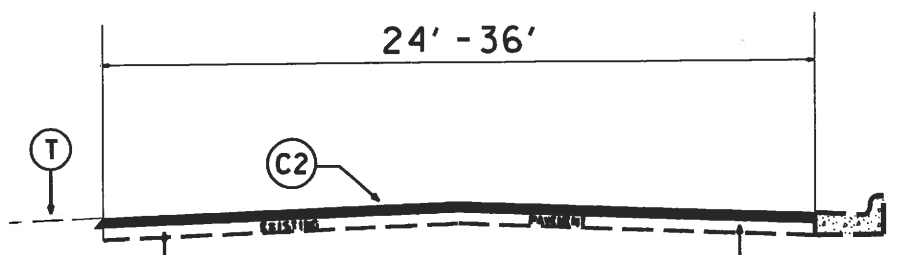
TYPICAL SECTION NO.4

Map 2 88+25 - 108+75



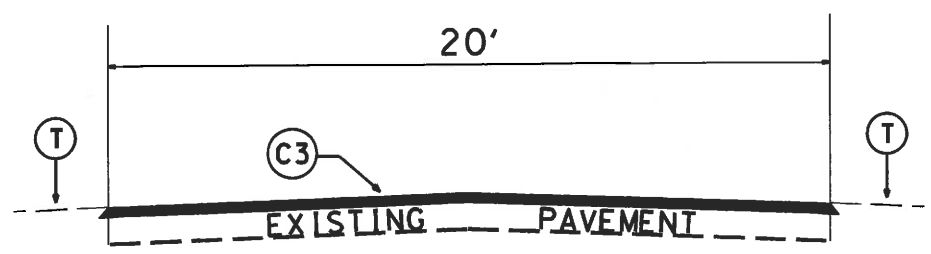
TYPICAL SECTION NO.7

Map 17 (ALL)



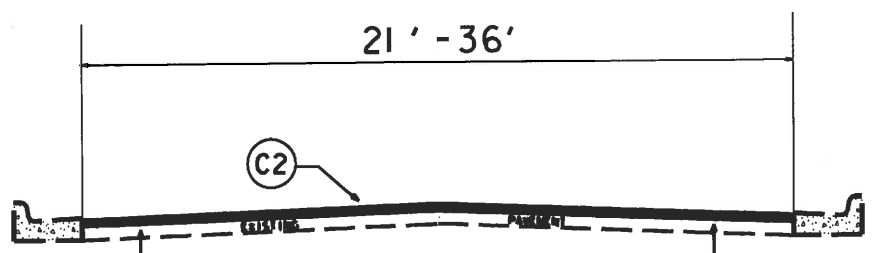
TYPICAL SECTION NO.2

Map 2 49+35 - 53+85



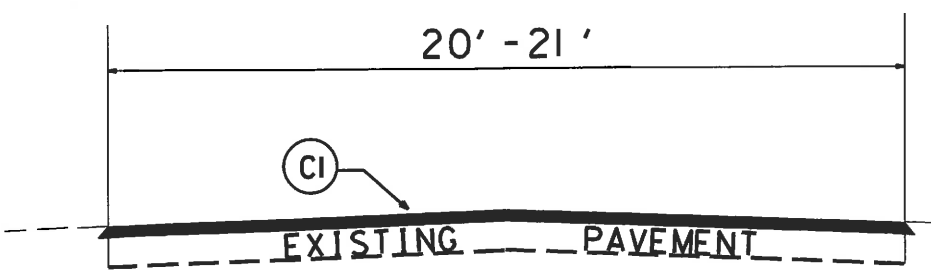
TYPICAL SECTION NO.5

Map 16 (ALL)



TYPICAL SECTION NO.3

Map 2 80+75-88+25
 108+75-157+35
 Map 3 0+00-6+75



TYPICAL SECTION NO.6

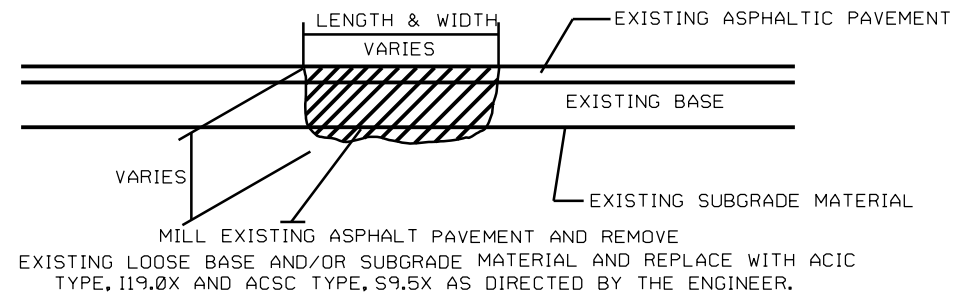
Maps 9, 10, 11, 12, 13 (ALL)

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 1.5" WARM MIX ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C4	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, PLACED IN TWO 1.5" LIFTS AT AN AVERAGE RATE OF 168 LBS. PER SQ. YDS. PER LIFT
T	SHOULDER RECONSTRUCTION (AGGREGATE SHOULDER BORROW)
V1	MILL EXISTING ASPHALT PAVEMENT APPROX. 1.5" IN DEPTH
V2	MILL EXISTING ASPHALT PAVEMENT APPROX. 3.0" IN DEPTH

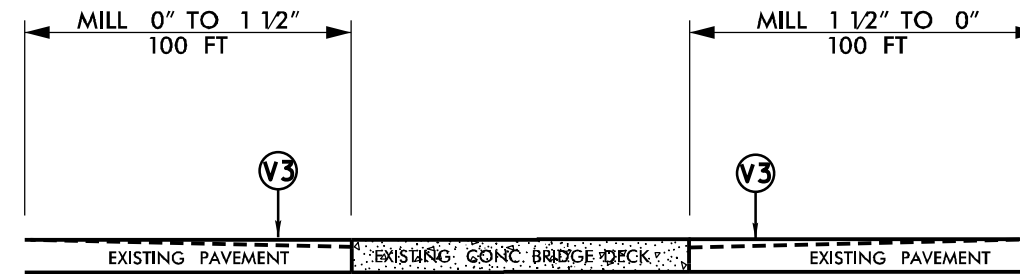
2019 - 2020
 Resurfacing Program
 Typical Sections
 Alexander County

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
ALEXANDER COUNTY	7	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
2019CPT. 12.03.10021		PRIMARY RESURFACING
2019CPT. 12.03.20021		SECONDARY RESURFACING

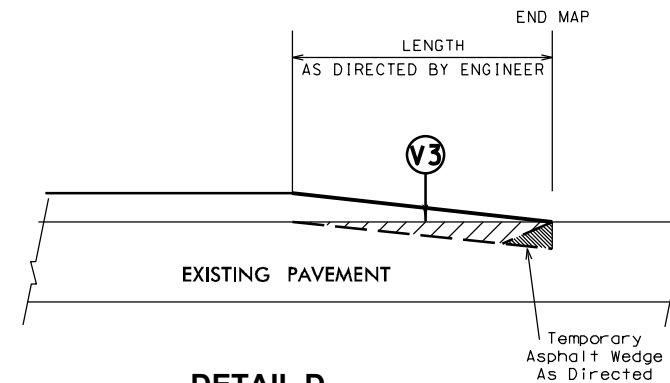
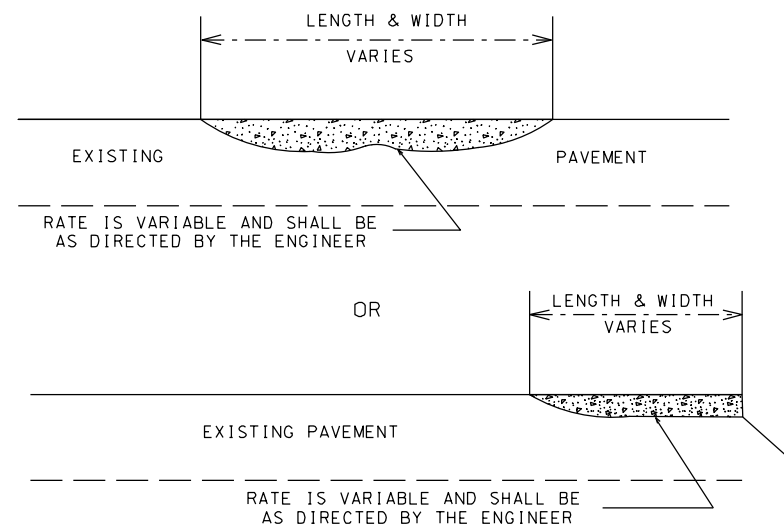
DETAIL A
PATCHING EXISTING PAVEMENT



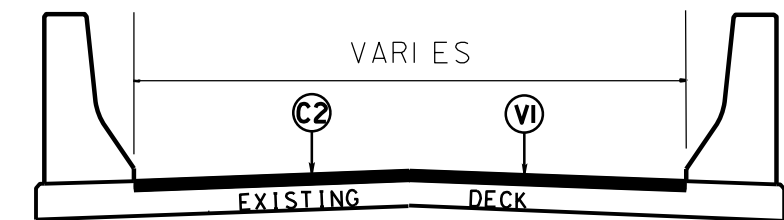
DETAIL C
MILLING BRIDGE APPROACHES



DETAIL B
ASPHALT CONCRETE SURFACE COURSE
TYPE S9.5B & S9.5C (LEVELING COURSE)

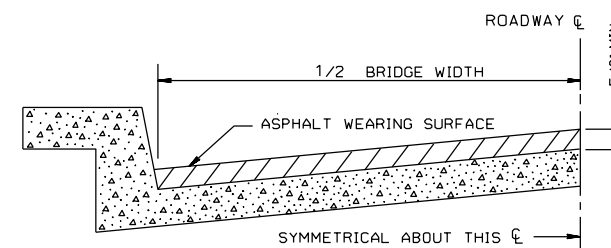


DETAIL D
TIE-IN (INCIDENTAL) MILLING DETAIL



ASPHALT BRIDGE SECTION
Use for all asphalt bridges

DETAIL E
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.

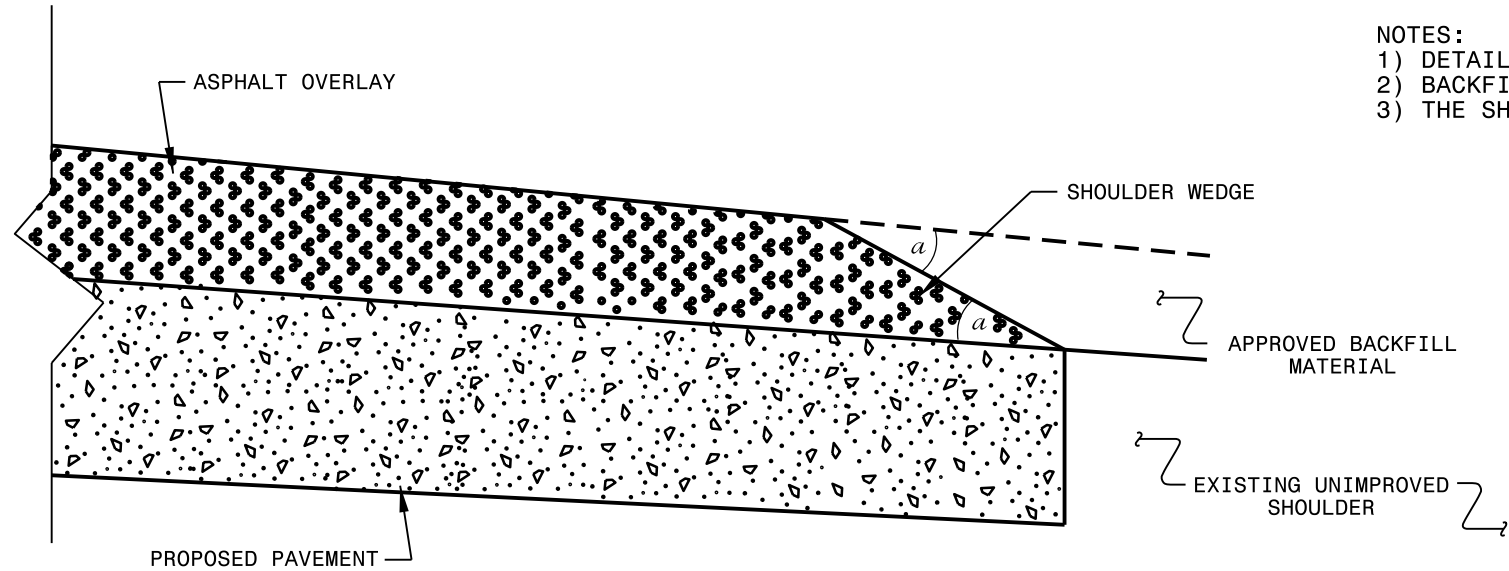
NOTES

ALL UNPAVED S.R. ROADS TO BE SURFACED 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 NOTED.
BRIDGES TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.

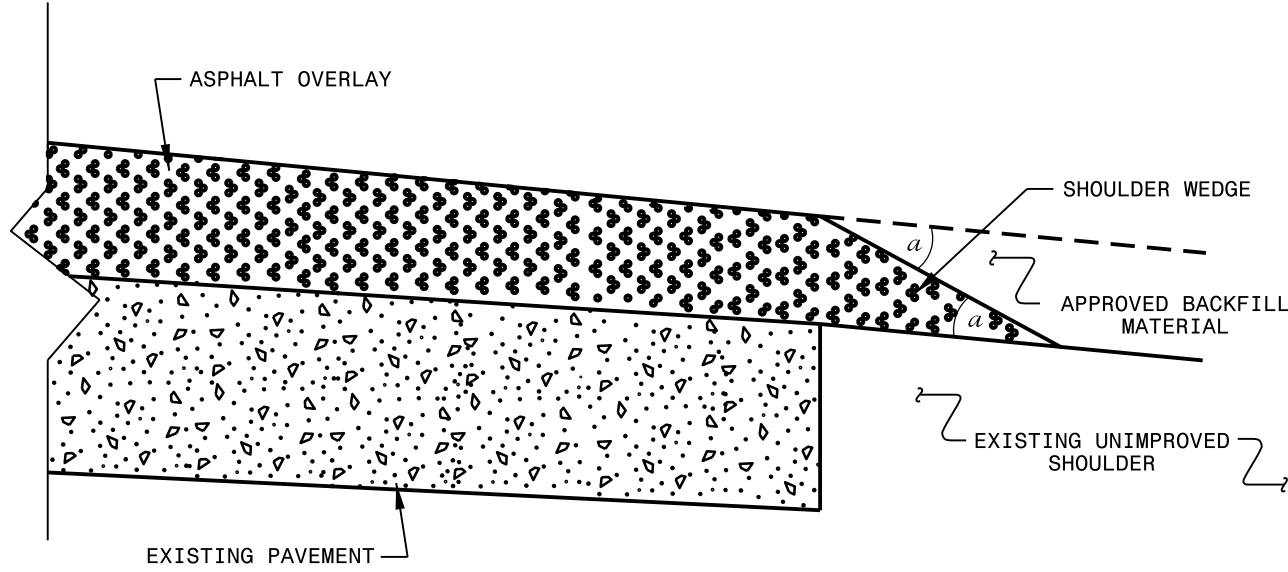
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD.
C2	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 1.5" WARM MIX ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C4	PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, PLACED IN TWO 1.5" LIFTS AT AN AVERAGE RATE OF 168 LBS. PER SQ. YDS. PER LIFT.
T	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
V1	MILL EXISTING ASPHALT PAVEMENT APPROX. 1.5" IN DEPTH
V2	MILL EXISTING ASPHALT PAVEMENT APPROX. 3.0" IN DEPTH
V3	Incidental Milling

2019 - 2020
Resurfacing Program
Typical Sections
Alexander County

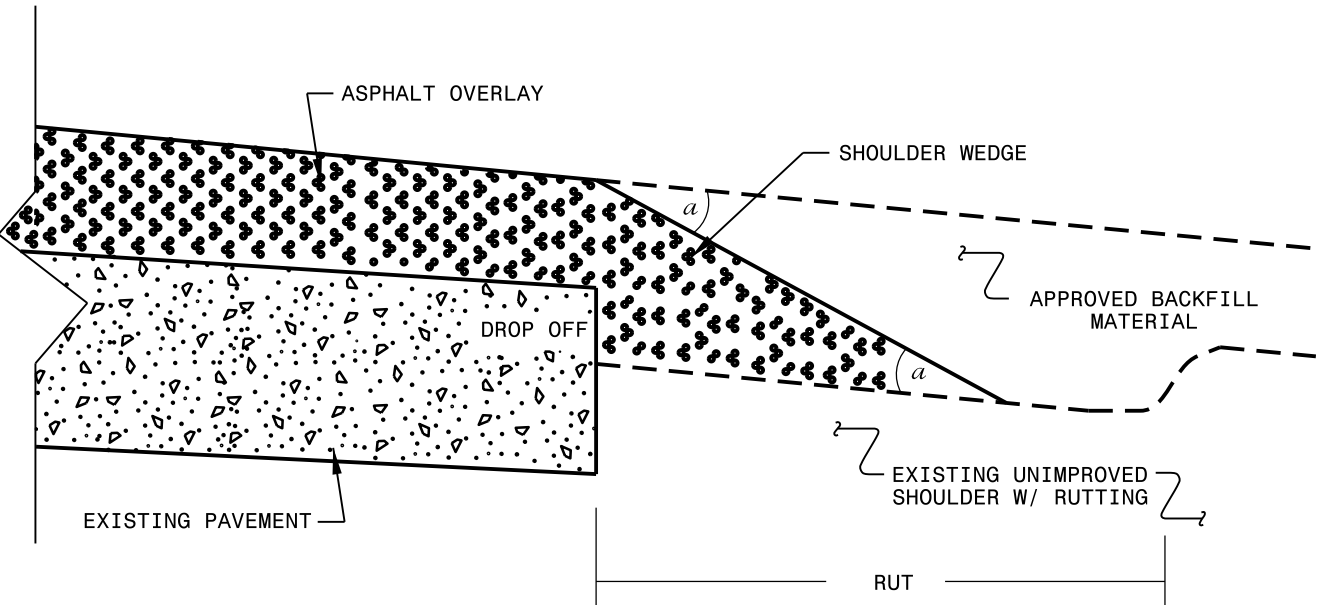
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFB AND ULTRA-THIN BONDED WEARING COURSE.
 - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



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



SHOULDER WEDGE DETAIL
 (Resurfacing Projects w/ NO Widening)



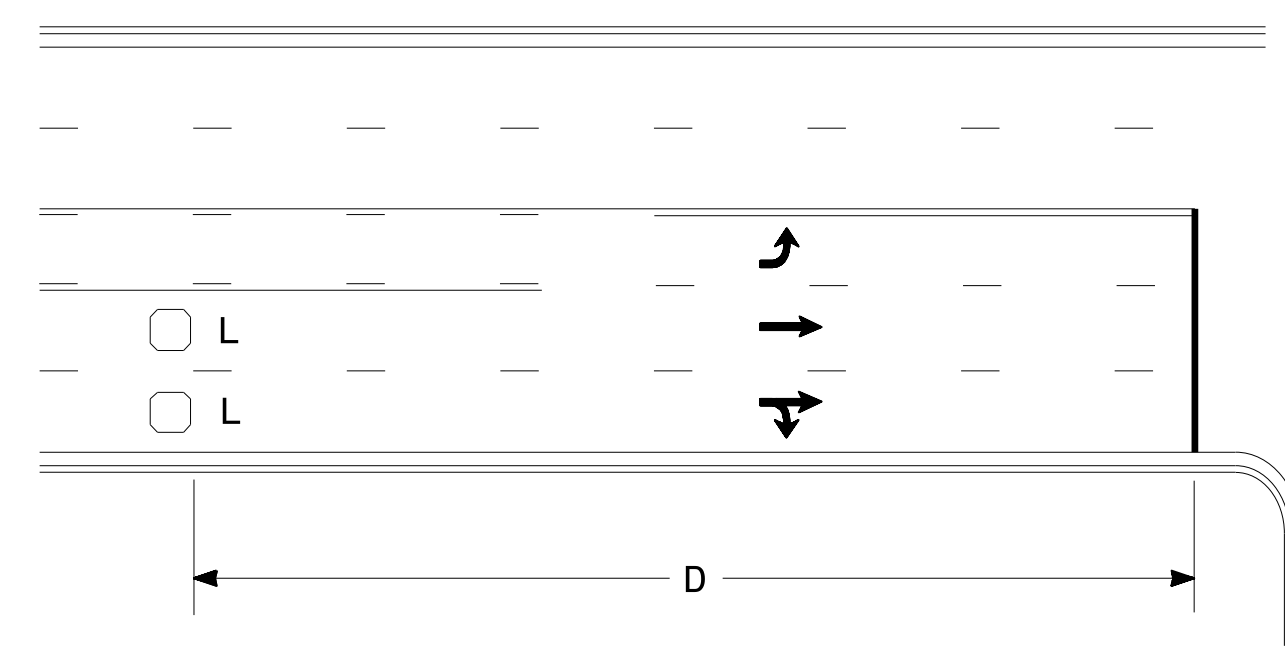
SHOULDER WEDGE DETAIL
 (Resurfacing Adjacent to
 Rutted Shoulder)

- 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: 10/16/12
CHECKED BY:	DATE:
FILE SPEC.: susr/details/stand/shoulderwedgedetail.dgn	

SYSTEMS DESIGN
 USER NAME

High Speed Detection (≥40 mph)

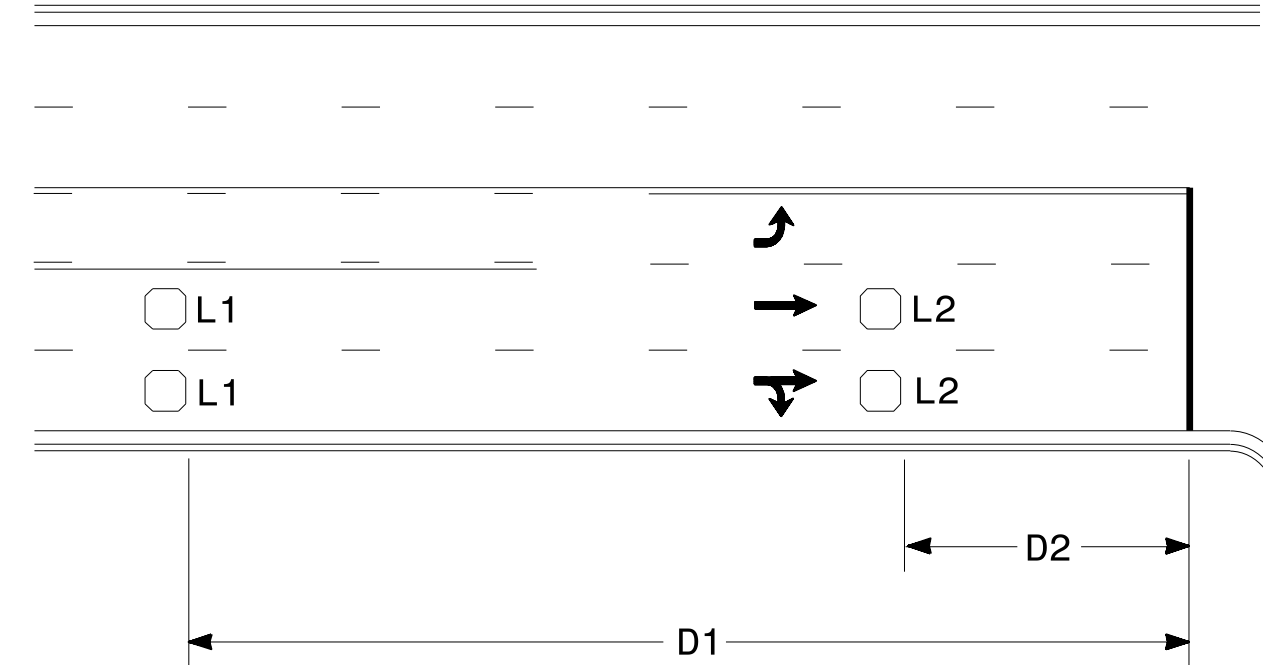


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

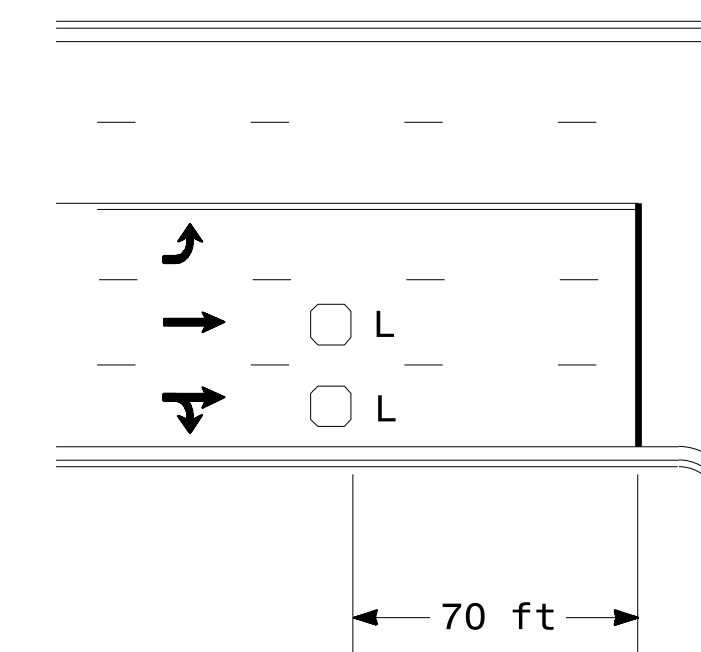


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

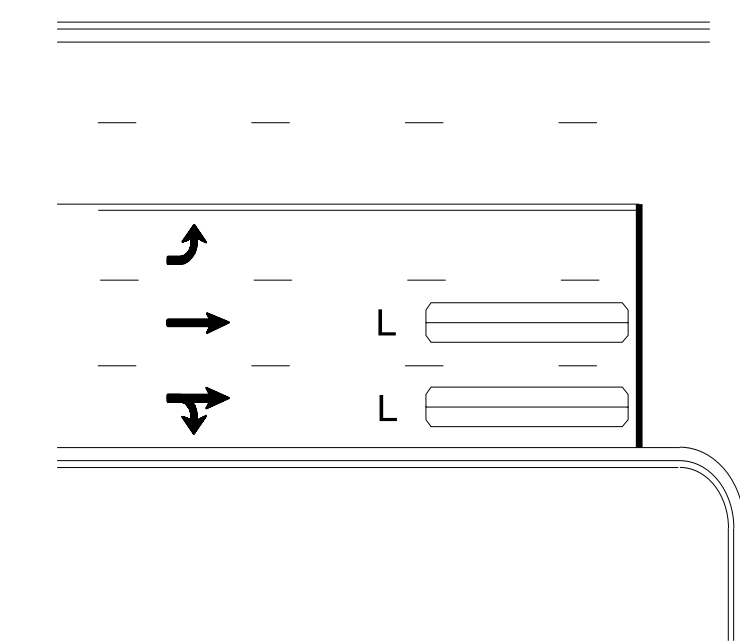
"Stretch" Operation

Low Speed Detection (≤35 mph)



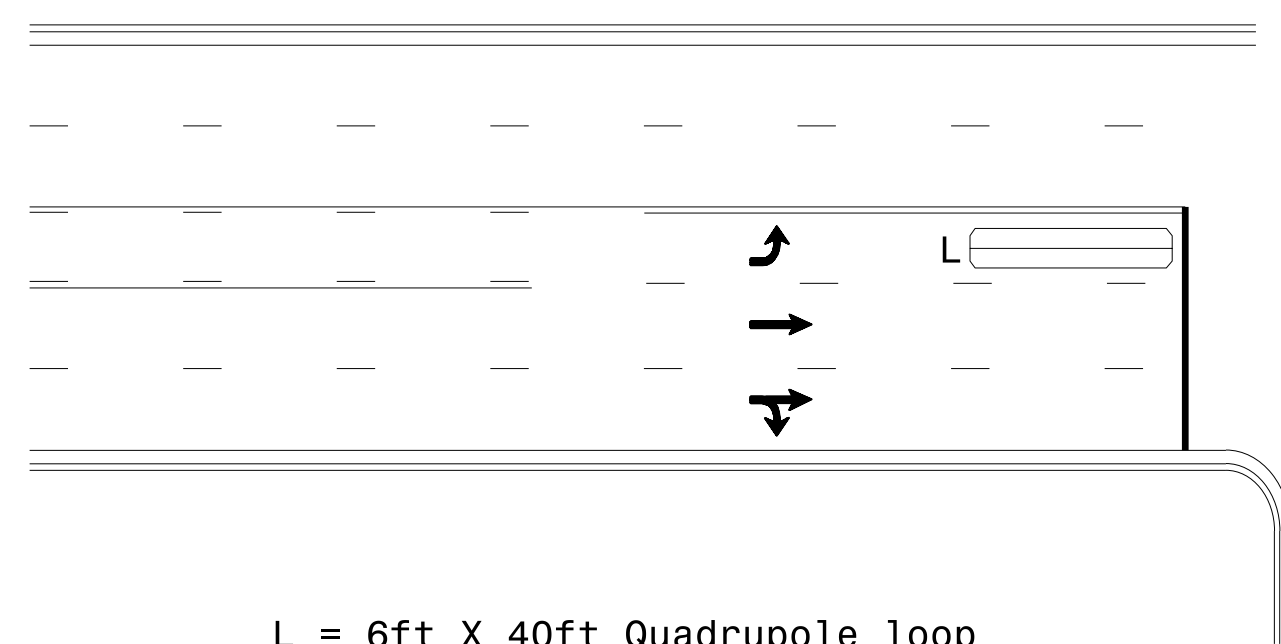
L = 6ft X 6ft
Wired in series

OR



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

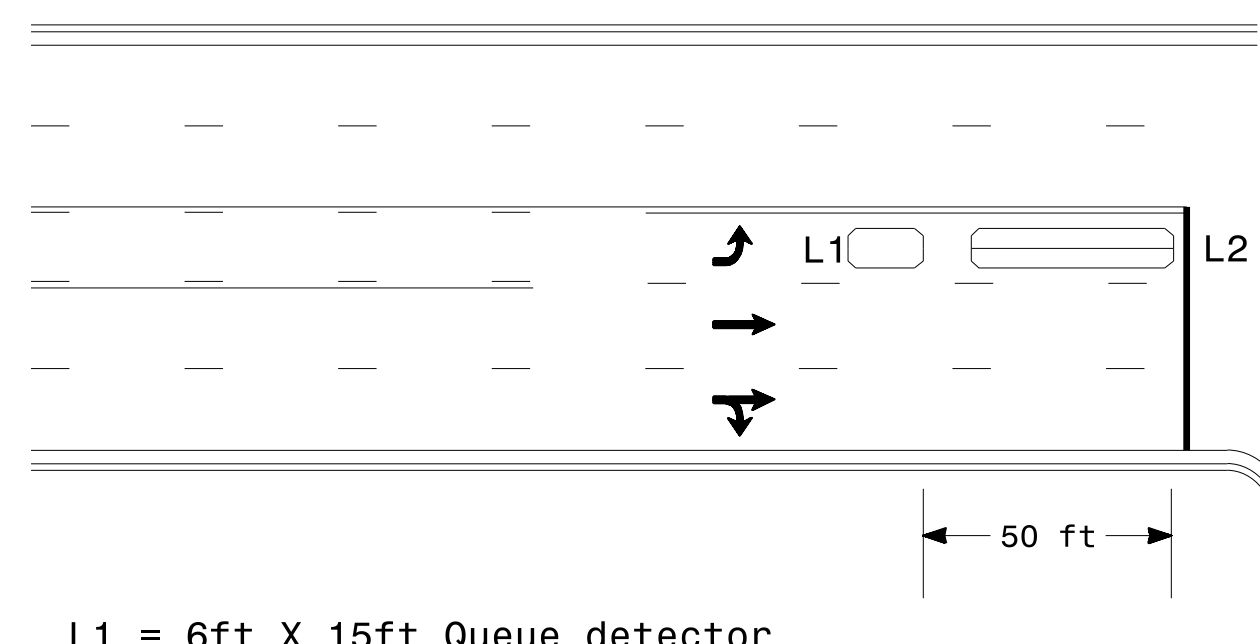
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

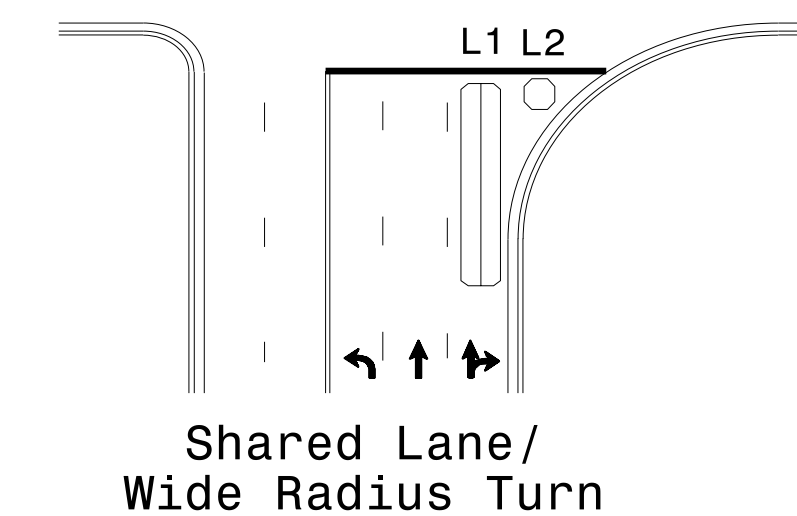
OR



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

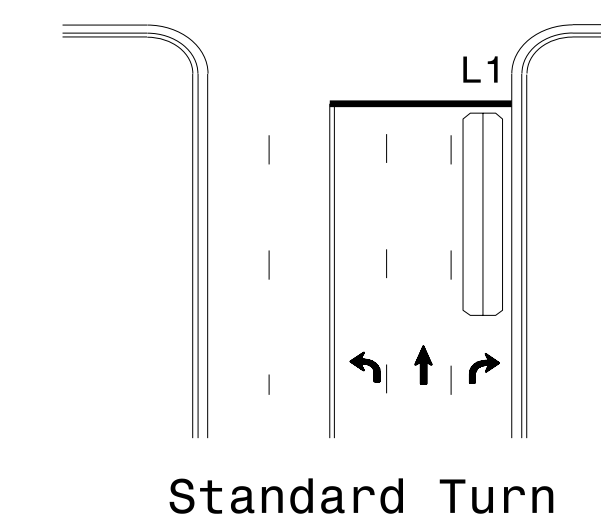
Queue Loop Detection

Right Turn Lane Detection

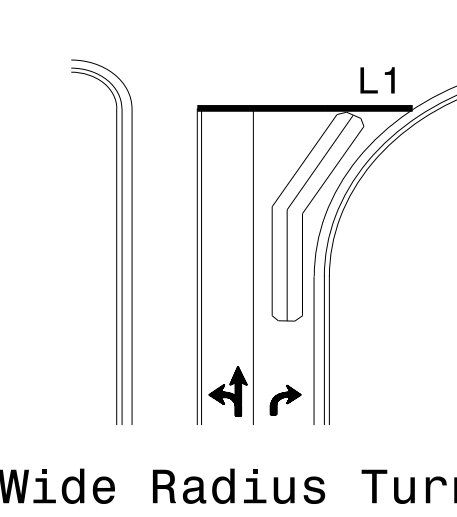


Shared Lane/
Wide Radius Turn

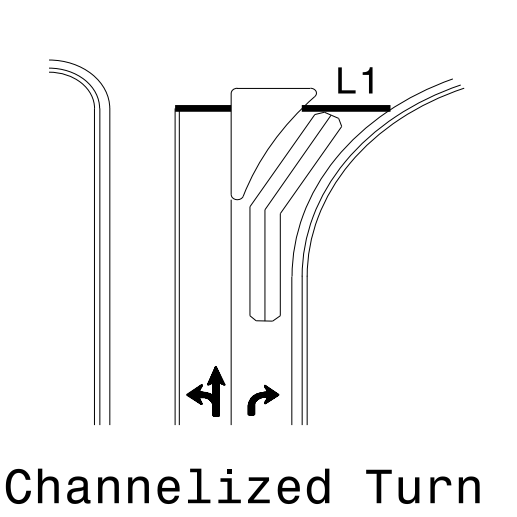
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

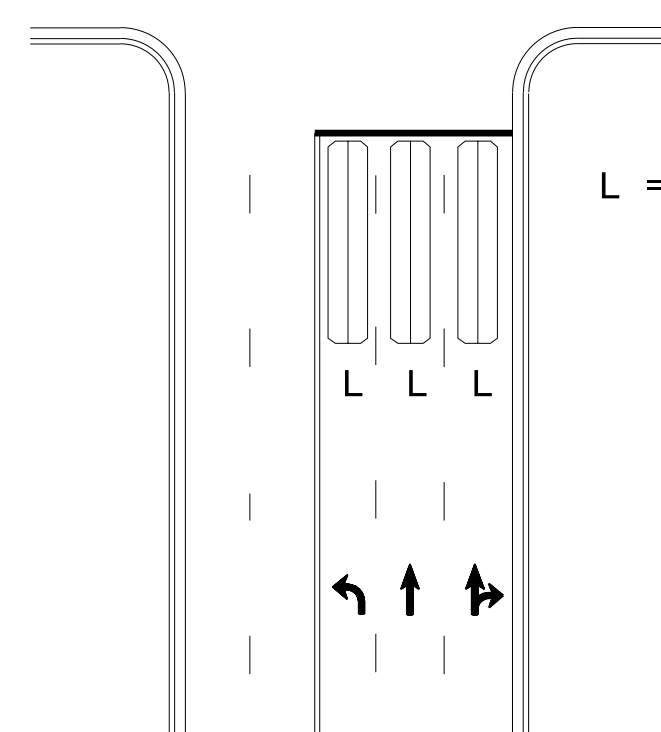


Wide Radius Turn



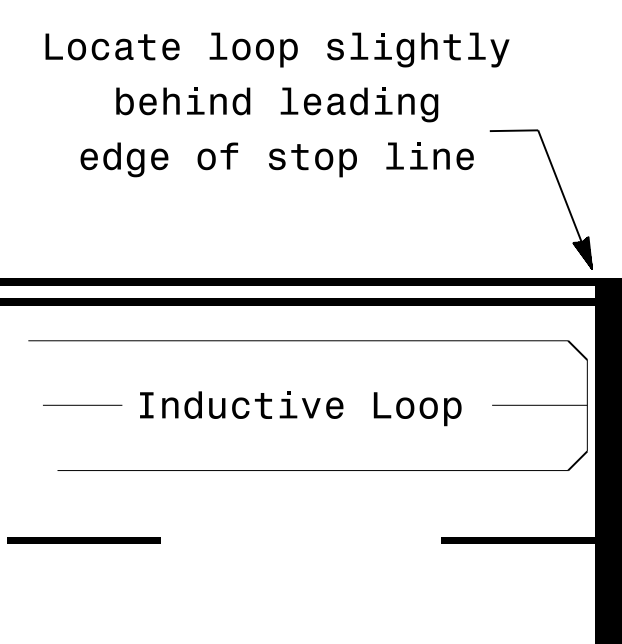
Channelized Turn

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

	<p>Prepared In the Offices of:</p> <p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 23489</p>	
	<p>Typical Signal Loop Locations</p>	
<p>PLAN DATE: January 2015</p> <p>PREPARED BY: PLA</p> <p>SCALE: N/A</p>	<p>REVIEWED BY: JPG</p> <p>REVIEWED BY:</p>	<p>INIT. DATE</p> <p>1/30/2015</p>
<p>REVISIONS</p>		<p>SIG. INVENTORY NO.</p>

PROJECT NO.	SHEET NO.	TOTAL NO.
2019CPT.12.03.10021	10	
2019CPT.12.03.20021		

SUMMARY OF QUANTITIES

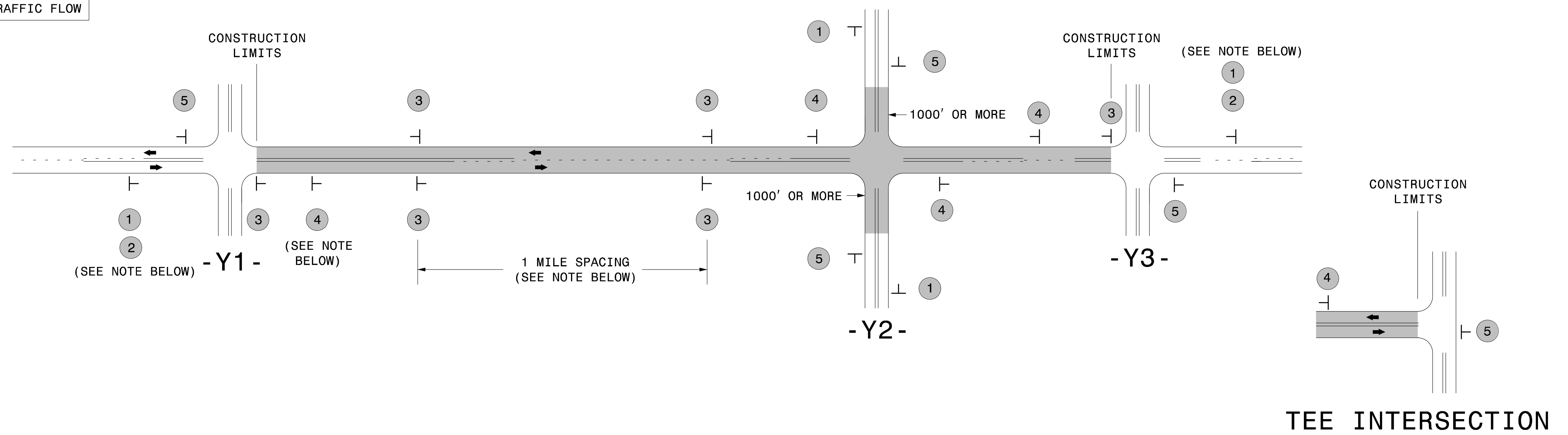
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGTH	WIDTH	0255000000-E	1220000000-E	1245000000-E	1297000000-E	1330000000-E	1519000000-E	1520000000-E	1523000000-E	1524000000-E	1575000000-E	1704000000-E	2830000000-N	2845000000-N	5255000000-N	7324000000-N	7444000000-E	7456000000-E										
												AGGREGATE SHOULDER BORROW	INCIDENTAL STONE BASE	SHOULDER RECONSTRUCTION	1 1/2" MILLING	3" MILLING	INCIDENTAL MILLING	SURFACE COURSE, \$9.5B	LEVELING COURSE, \$9.5B	SURFACE COURSE, \$9.5C	LEVELING COURSE, \$9.5C	ASPHALT BINDER FOR PLANT MIX	PATCHING EXISTING PAVEMENT	ADJ. OF MANHOLES	ADJ. OF METER OR VALVE BOX	PORTABLE LIGHTING	JUNCTION BOX (STANDARD SIZE)	INDUCTIVE LOOP	LEAD-IN CABLE									
												MI	FT	TON	TONS	SMI	SY	SY	SY	TONS	TONS	TONS	TONS	TONS	EA	EA	LS	EA	LF	LF								
2019CPT.12.03.10021	Alexander	1	NC 127	FROM CATAWBA COUNTY LINE TO SR 1149 (HERITAGE FARM ROAD) EXCEPTING THE AREAS WITHIN THE CONSTRUCTION LIMITS OF R-5762 & U-5801	1	2		NO	NO	1.95	24'-36'		250	100	2.93		2,950			3,675	150	274	200			*	*	1,500	300									
2019CPT.12.03.10021	Alexander	2	NC 16	FROM SR 1609 (COUNTY HOME RD PROJECT LIMITS) TO NC 90	1 2 3 4	2		NO	NO	2.98	24'-48'		275	140	3.36	30,000	1,800			6,000	100	367	150	7	2	*	*	2,500	500									
TOTAL FOR PROJ NO. 2019CPT.12.03.10021												4.93		525	240	6.29	30,000	4,750			9,675	250	641	350	7	2									4,000	800		
2019CPT.12.03.20021	Alexander	3	SR 1146 (BETHELEHEM SCHOOL ROAD)	FROM NC 127 TO SR 1144 (ICARD RIDGE ROAD)	1 3	2		NO	NO	1.59	21		275	100	3.18	3,000	600			1,850	450	140	100	1														
2019CPT.12.03.20021	Alexander	4	SR 1149 (HERITAGE FARM ROAD)	FROM NC 127 TO SR 1137 (RINK DAM ROAD)	1	2		NO	NO	1.96	19		325	100	3.92		500			2,050	150	128	250															
2019CPT.12.03.20021	Alexander	5	SR 1139 (CHIGGER RIDGE ROAD)	FROM NC 127 TO SR 1137 (RINK DAM ROAD)	1	2		NO	NO	0.96	19		175	75	1.92		350			1,000	400	86	150															
2019CPT.12.03.20021	Alexander	6	SR 1155 (CEDAR WOODS ROAD)	FROM SR 1153 (DEVIL TRACK ROAD) TO SR 1150 (TEAGUE TOWN ROAD)	1	2		NO	NO	0.66	20		125	50	1.32		100			775	275	64	50															
2019CPT.12.03.20021	Alexander	7	SR 1153 (DEVIL TRACK ROAD)	FROM NC 127 TO SR 1152 (BLANKESHIP ROAD)	1	2		NO	NO	1.76	21		300	100	3.52		850			2,050	150	133	150															
2019CPT.12.03.20021	Alexander	8	SR 1268 (WOOD HOLLOW ROAD)	FROM SR 1148 (RIVER HILLS CT.) TO CUL-DE-SAC	1	2		NO	NO	0.65	20		125	50	1.30		100			750	100	52	200															
2019CPT.12.03.20021	Alexander	9	SR 1277 (HILLSBORO LANE)	FROM SR 1149 (HERITAGE FARM ROAD) TO SR 1137 (RINK DAM ROAD)	6	2		NO	NO	0.43	20		75			50	475	30			32	90																
2019CPT.12.03.20021	Alexander	10	SR 1278 (LEEHI LANE)	FROM SR 1277 (HILLSBORO LANE) TO SR 1277 (HILLSBORO LANE)	6	2		NO	NO	0.08	20			25		50	60	5			4	50																
2019CPT.12.03.20021	Alexander	11	SR 1257 (ROBIN LANE)	FROM SR 1137 (RINK DAM RD.) TO DEAD END	6	2		NO	NO	0.12	21			25		50	250	20			17	50																
2019CPT.12.03.20021	Alexander	12	SR 1201 (RET STAFFORD LANE)	FROM SR 1134 (FRIENDSHIP CHURCH ROAD) TO DEAD END	6	2		NO	NO	0.44	20			50		50	475	30			32	80																
2019CPT.12.03.20021	Alexander	13	SR 1853 (BULLDOG LANE)	FROM SR 1144 (ICARD RIDGE ROAD) TO END OF MAINT.	6	2		NO	NO	0.15	21			25		50	175	15			12	50																
2019CPT.12.03.20021	Alexander	14	SR 1159 (WEBB PRICE ROAD)	FROM SR 1160 (ADVENT CHURCH ROAD) TO SR 1157 (SAM HEFNER ROAD)	1	2		NO	NO	0.68	20		125	100	1.36		75			750	250	61	50															
2019CPT.12.03.20021	Alexander	15	SR 1161 (FELLOWSHIP CHURCH ROAD)	FROM NC 127 TO SR 1144 (ICARD RIDGE ROAD)	1	2		NO	NO	0.70	20		125	50	1.40		100			775	50	50	100															
2019CPT.12.03.20021	Alexander	16	SR 1160 (ADVENT CHURCH ROAD)	FROM SR 1144 (ICARD RIDGE ROAD) TO CALDWELL COUNTY LINE	5	2		NO	YES	1.18	20		200	75	2.36		75			1,300	50	81	150															
2019CPT.12.03.20021	Alexander	17	SR 1238 (HILLSDALE LANE)	FROM SR 1144 (ICARD RIDGE ROAD) TO DEAD END	7	2		NO	NO	0.19	18		200	50	0.38	2,250				450		27																
TOTAL FOR PROJ NO. 2019CPT.12.03.20021												11.55		1,975	950	20.66	3,000	2,250	3,000	1,435	100	11,750	1,875	919	1,520	1												
GRAND TOTAL																	16.48		2,500	1,190	26.95	33,000	2,250	7,750	1,435	100	21,425	2,125	1,560	1,870	8	2	1	1	4,000	800		

SIGNING FOR RESURFACING PROJECTS

LEGEND

┃ STATIONARY SIGN

← DIRECTION OF TRAFFIC FLOW



MAINLINE (-L-) SIGNING

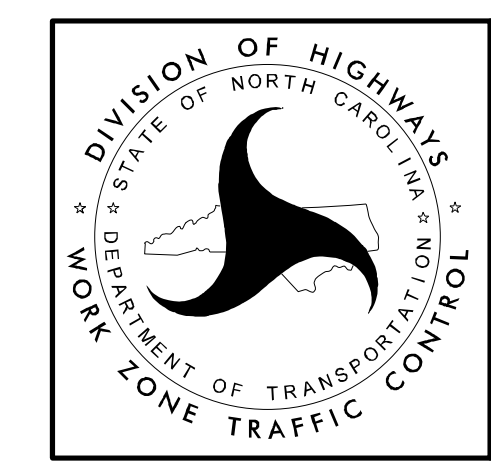
-Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	1		PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	<p>NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:</p> <ol style="list-style-type: none"> 1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE 2) SUBDIVISION ROADS 3) DEAD END ROADS <p>WHEN PAVING/CONSTRUCTION ACTIVITIES PROCEED ACROSS AN UNSIGNED -Y- LINE, PORTABLE ADVANCE WARNING 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;"> W20-1 48" X 48" PLACED 500' IN ADVANCE OF FLAGGER. </div> <div style="text-align: center;"> W20-7 A 48" X 48" PLACED 250' IN ADVANCE OF FLAGGER. </div> </div>
	2		#2 SIGN ONLY USED WHEN CONSTRUCTION LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER. (NO FRACTIONAL OR DECIMAL NUMBERS)	
	3		- PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACE 1 MILE APART THEREAFTER. - AT TEE INTERSECTIONS INSTALL INITIALLY 1/2 MILE FROM INTERSECTION AND SPACE 1 MILE APART THEREAFTER.	
	4		- 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. - FOR TEE INTERSECTIONS, INSTALL WITHIN 500' +/- OF THE INTERSECTION ALONG -L- LINE.	
	5		PLACE 500' FOLLOWING THE END OF CONSTRUCTION LIMITS OR AS SHOWN WHEN WORK ENDS AT A 3-WAY TEE INTERSECTION.	

THE ABOVE SIGNS ARE ALL THAT ARE REQUIRED FOR A CONTRACTOR TO BEGIN A RESURFACING CONTRACT. ANY ADDITIONAL SIGNS REQUESTED BY NCDOT DIVISIONS SHALL BE INSTALLED WITHIN 7 BUSINESS DAYS OF THE START OF CONTRACT WORK.

MAPS LESS THAN 2 MILES

FOR RESURFACING MAPS WITH CONSTRUCTION LIMITS LESS THAN 2 MILES IN LENGTH, NO STATIONARY SIGNS ARE REQUIRED. USE PORTABLE "ROAD UNDER CONSTRUCTION" OR "ROAD WORK AHEAD" SIGNS IN LIEU OF STATIONARY ADVANCE WARNINGS SIGNS.



ADVANCE WARNING SIGNS FOR RURAL AND SUBURBAN 2-LANE ROADWAY RESURFACING

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