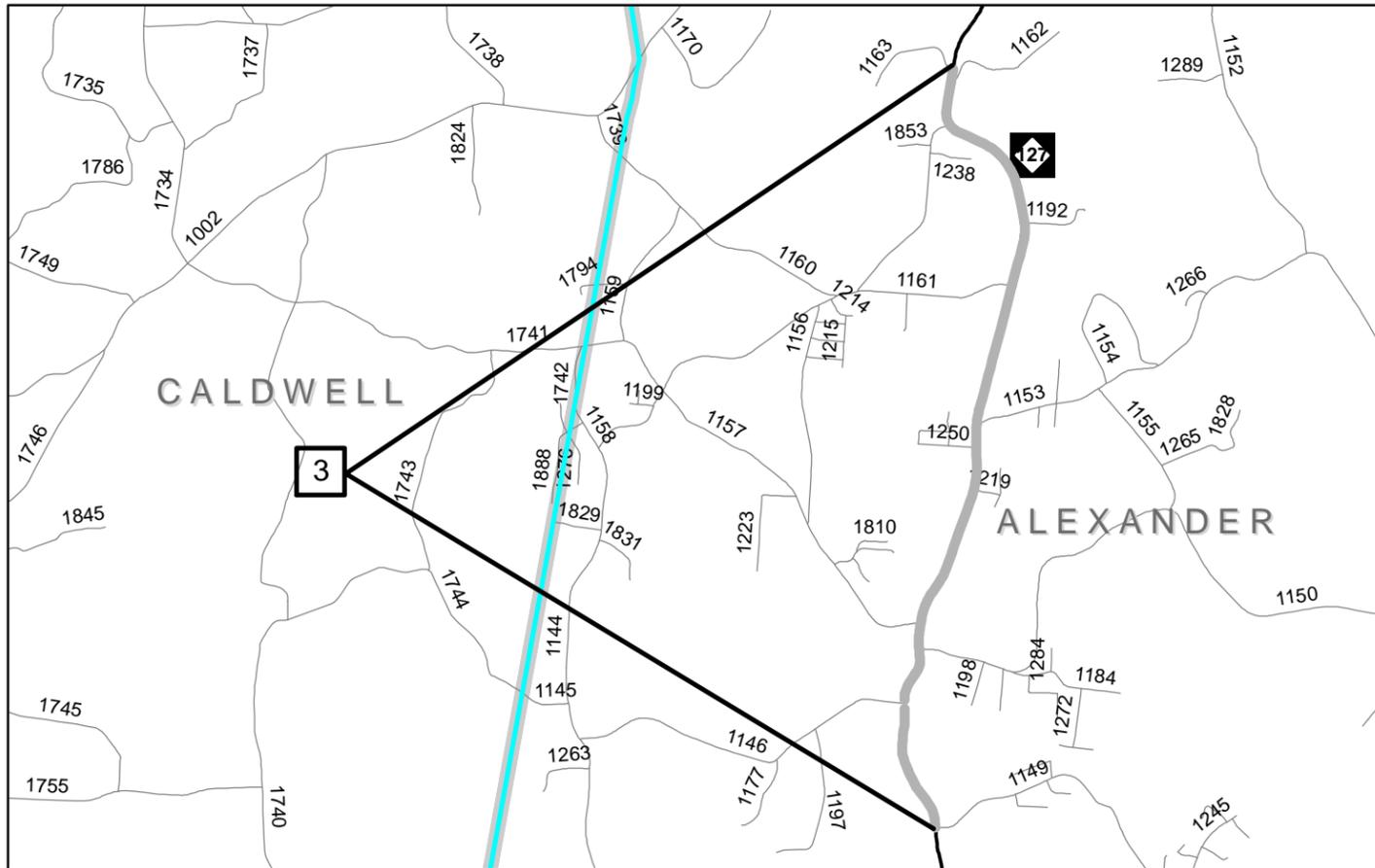
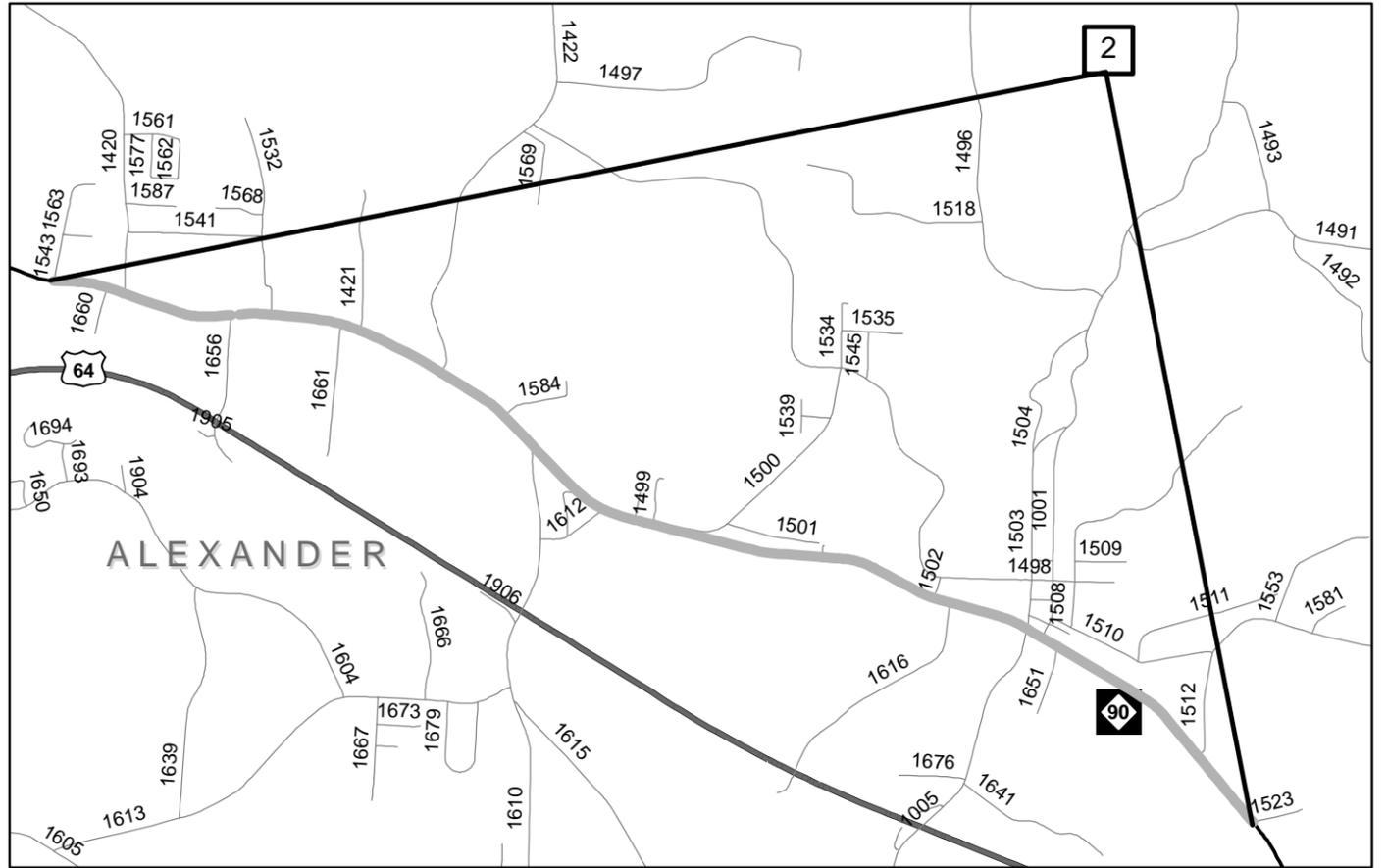
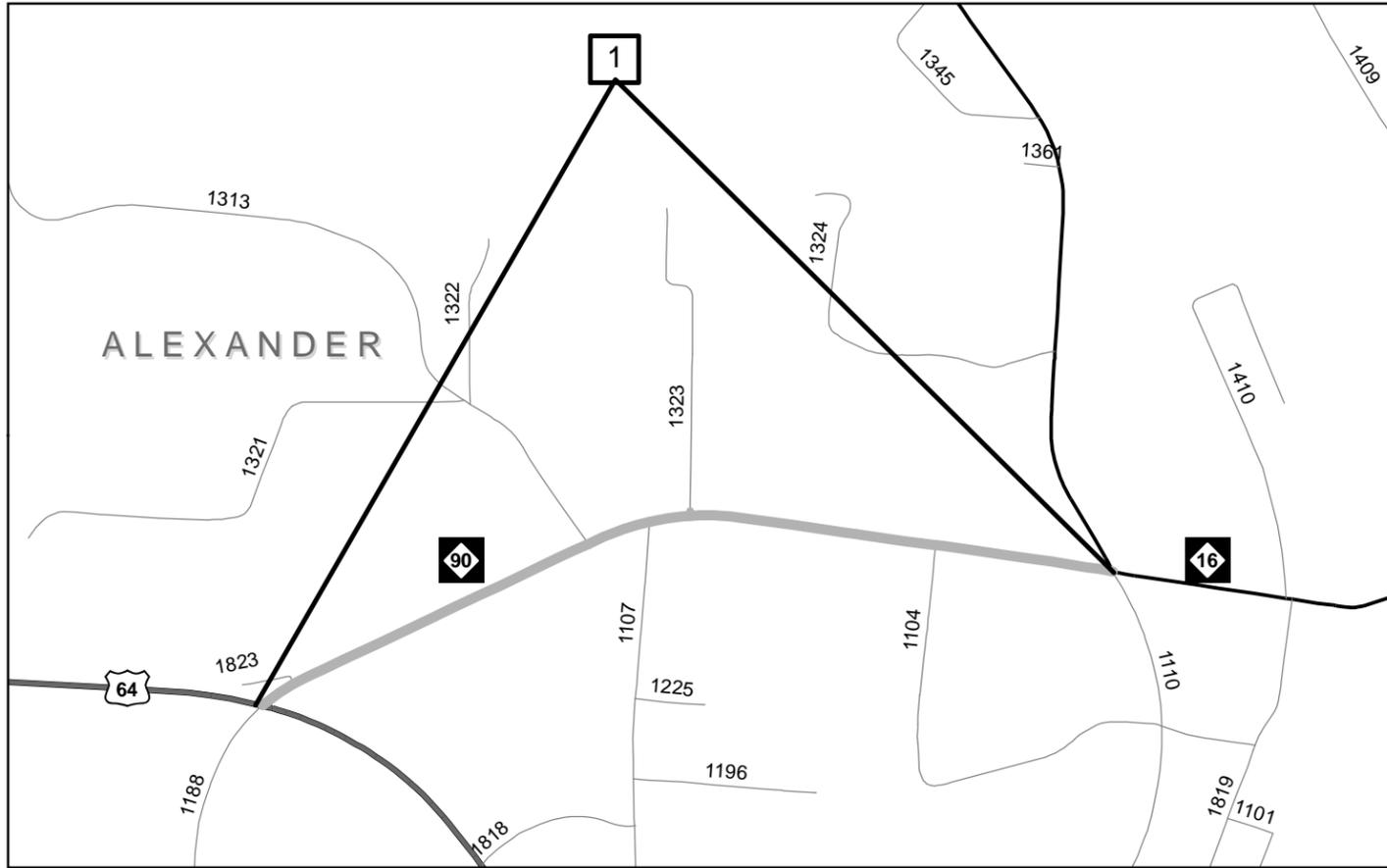
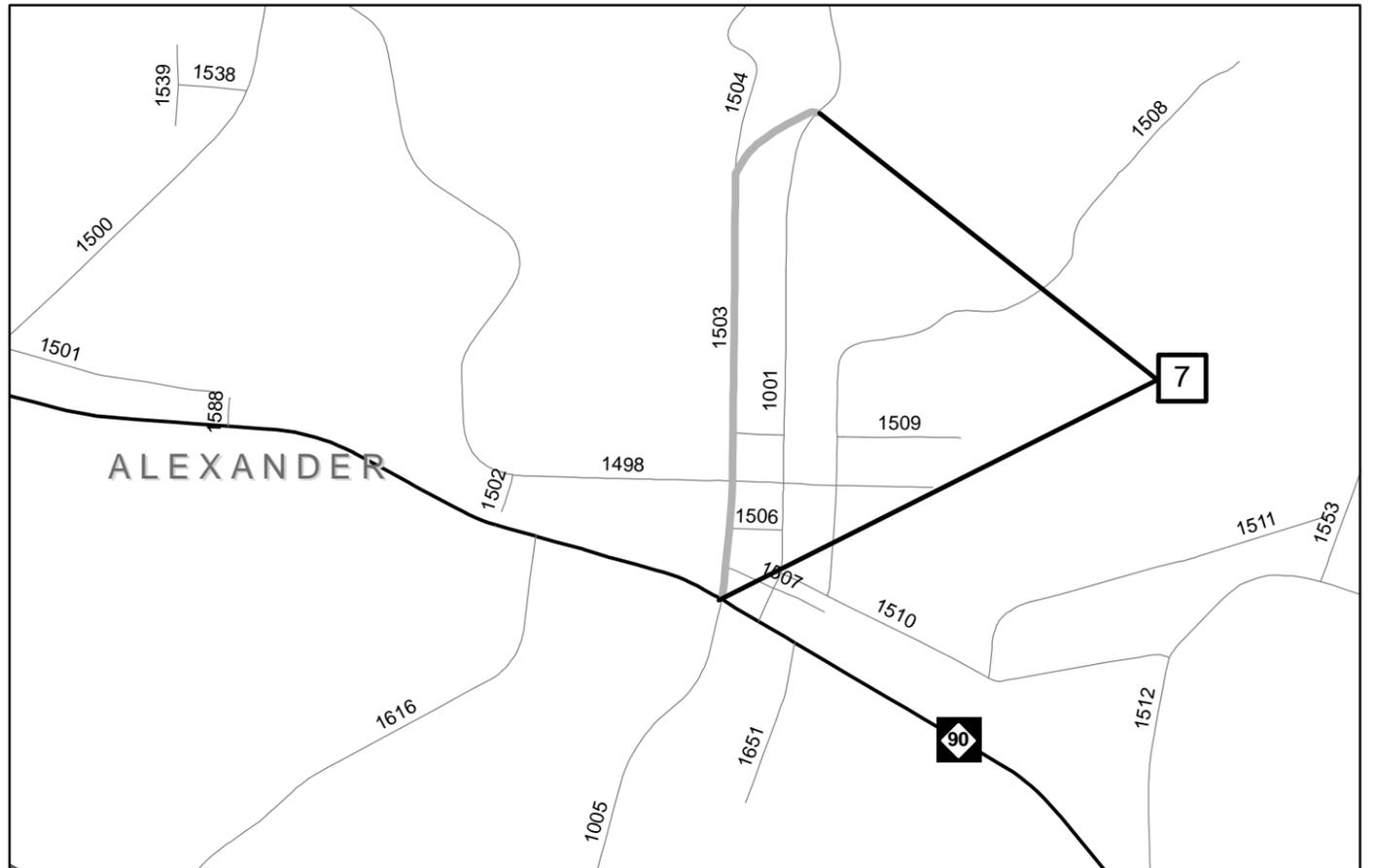
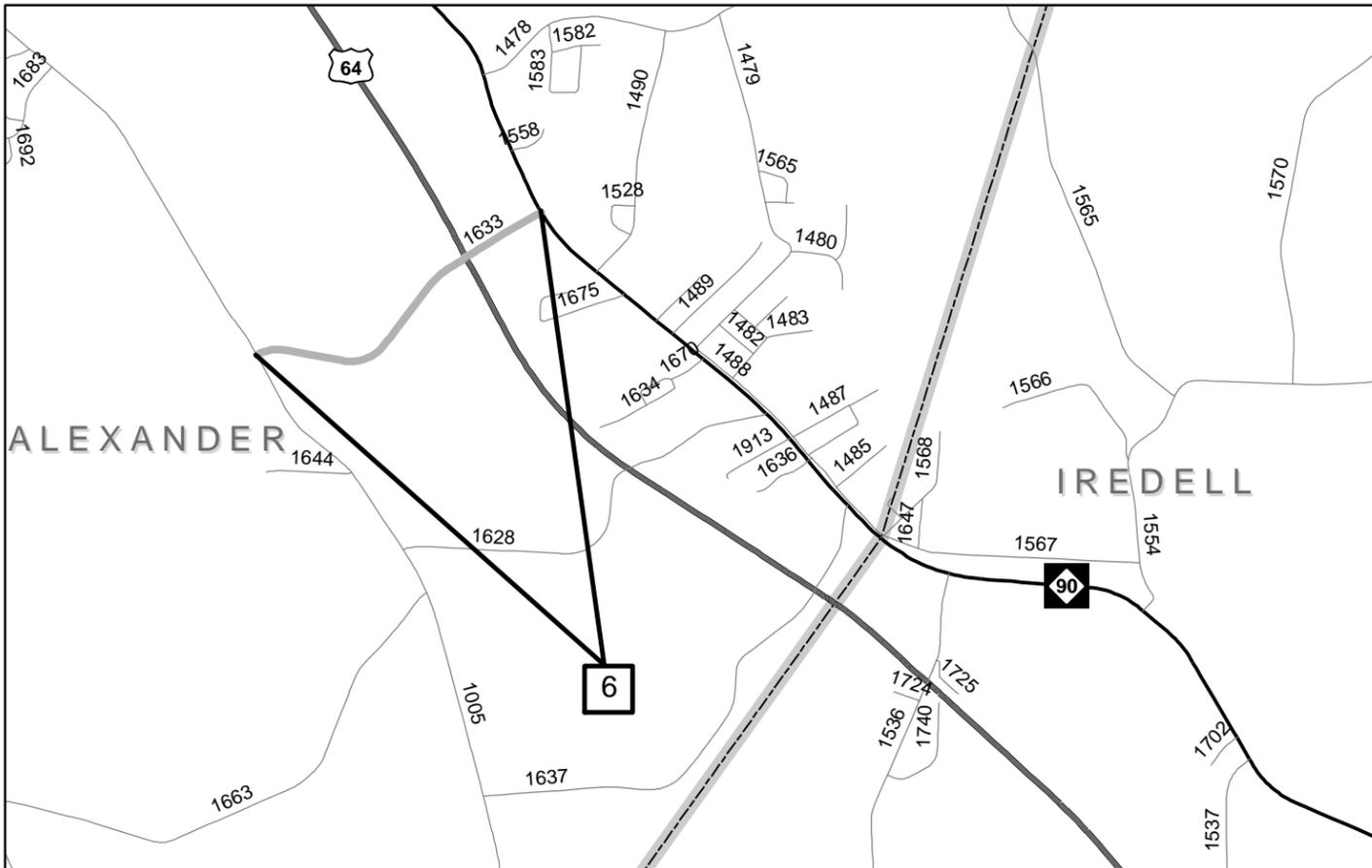
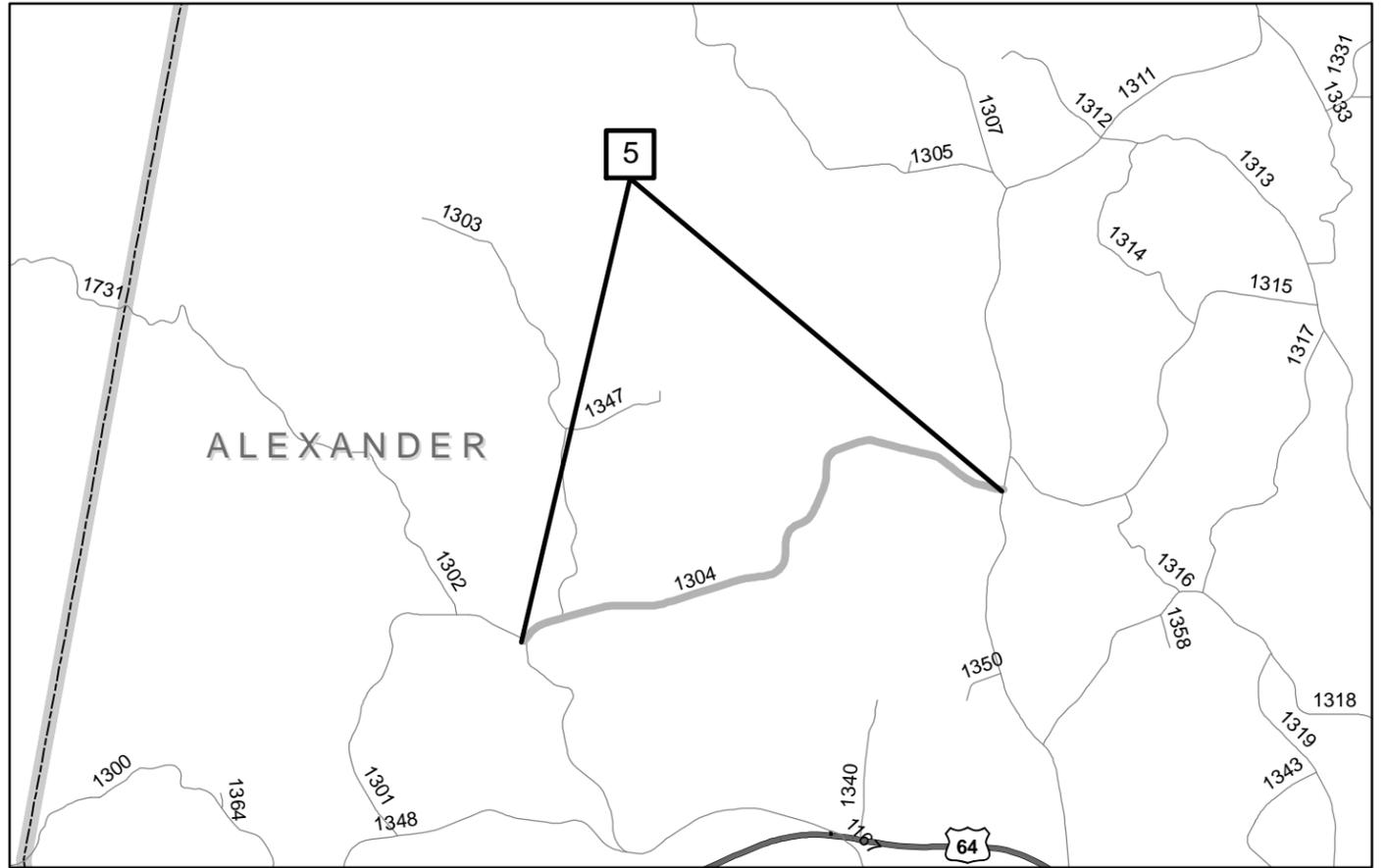
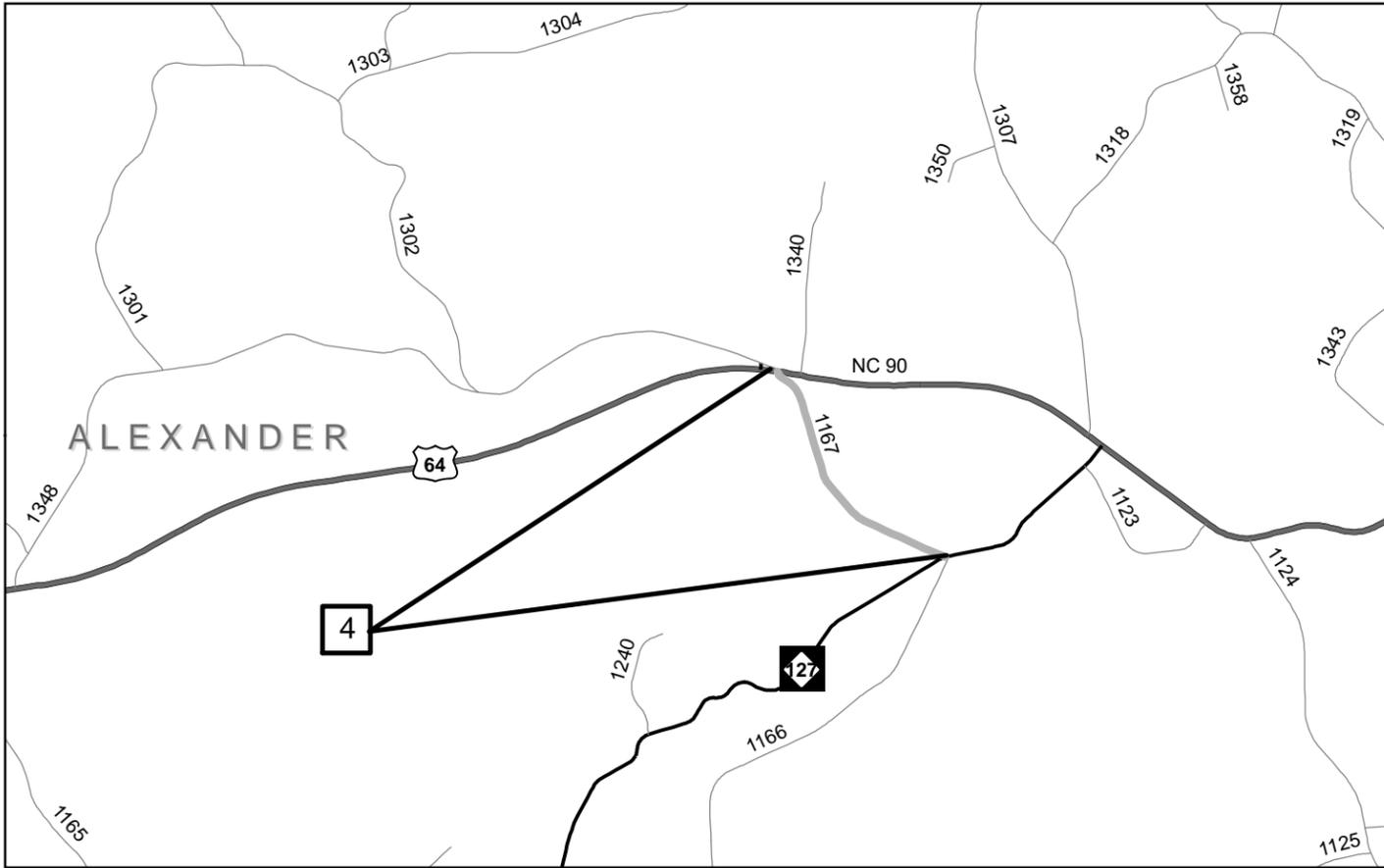


**This electronic collection of documents is provided  
for the convenience of the user  
and is Not a Certified Document –**

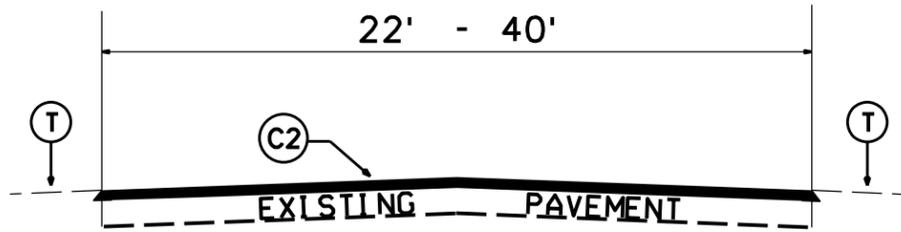
**The documents contained herein were originally issued  
and sealed by the individuals whose names and license  
numbers appear on each page, on the dates appearing  
with their signature on that page.**

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



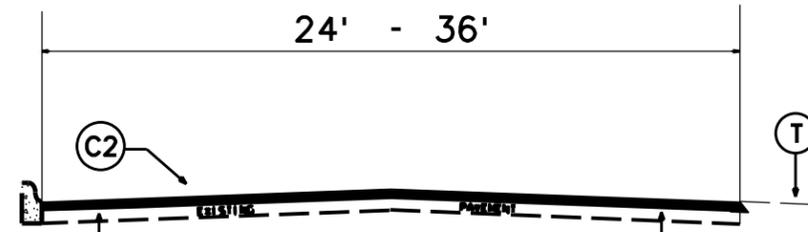


PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
IREDELL COUNTY	4	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
2023CPT. 12.01.10021		PRIMARY RESURFACING
2023CPT. 12.01.20021		SECONDARY RESURFACING



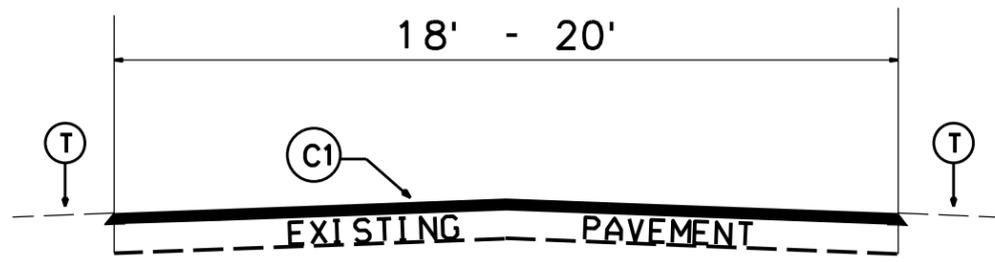
TYPICAL SECTION NO. 1

Map 1 Sta. 0+00 - 47+90  
 Map 2 Sta. 0+00 - 176+88  
 Sta. 187+44 - 233+90  
 Map 3 Sta. 0+00 - 25+05  
 Sta. 37+05 - 192+72



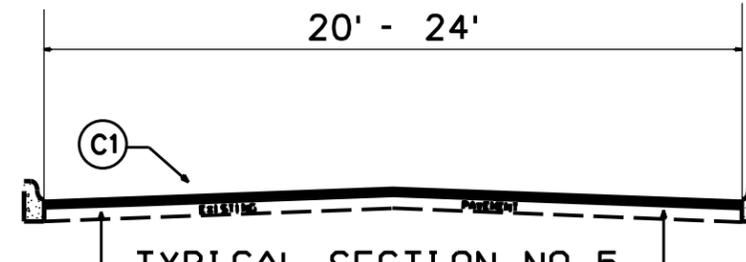
TYPICAL SECTION NO. 4

Map 3 Sta. 25+05 - 37+05



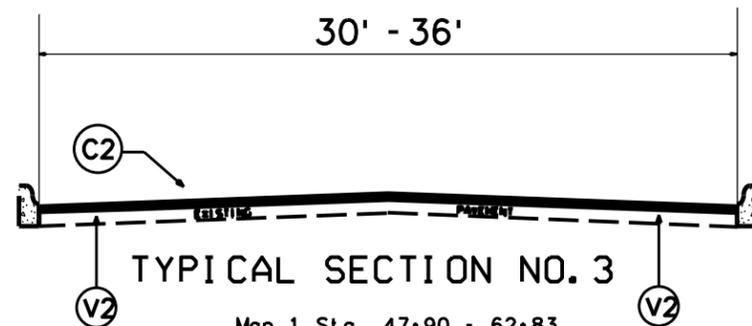
TYPICAL SECTION NO. 2

Map 4, 5, 6 (ALL)  
 Map 7 Sta. 0+00 - 34+34



TYPICAL SECTION NO. 5

Map 7 Sta. 34+34 - 36+96



TYPICAL SECTION NO. 3

Map 1 Sta. 47+90 - 62+83  
 Map 2 Sta. 176+88 - 187+44

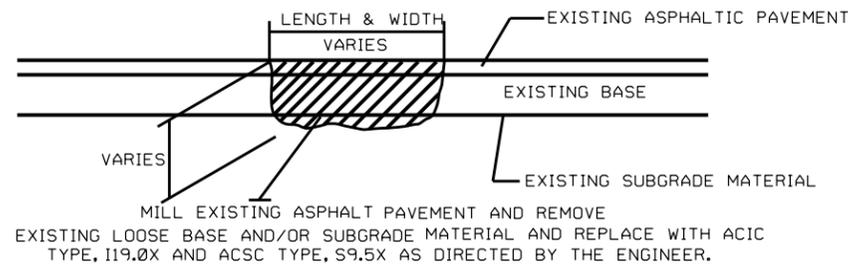
PAVEMENT SCHEDULE

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.
T	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
V1	MILL EXISTING ASPHALT PAVEMENT APPROX. 1" IN DEPTH
V2	MILL EXISTING ASPHALT PAVEMENT APPROX. 1.5" IN DEPTH

2023 - 2024  
 Resurfacing Program  
 Typical Sections  
 Alexander County

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
IREDELL COUNTY	5	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
2023CPT. 12.01.10021		PRIMARY RESURFACING
2023CPT. 12.01.20021		SECONDARY RESURFACING

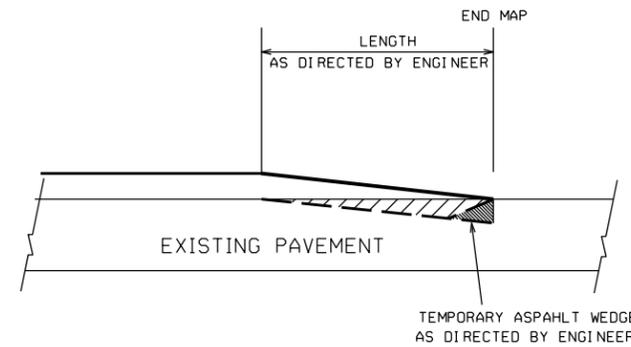
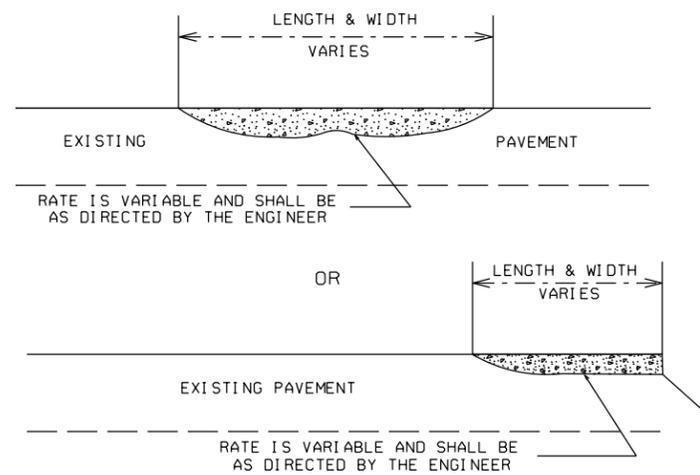
**DETAIL A**  
**PATCHING EXISTING PAVEMENT**



**DETAIL C**  
**MILLING BRIDGE APPROACHES**

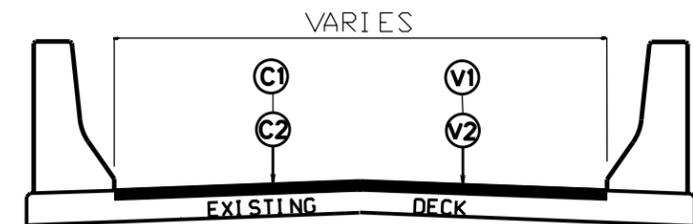


**DETAIL B**  
**ASPHALT CONCRETE SURFACE COURSE**  
**TYPE S9.5X (LEVELING COURSE)**



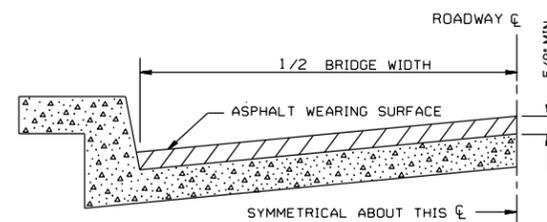
**DETAIL D**  
**TIE-IN (INCIDENTAL) MILLING**

**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**

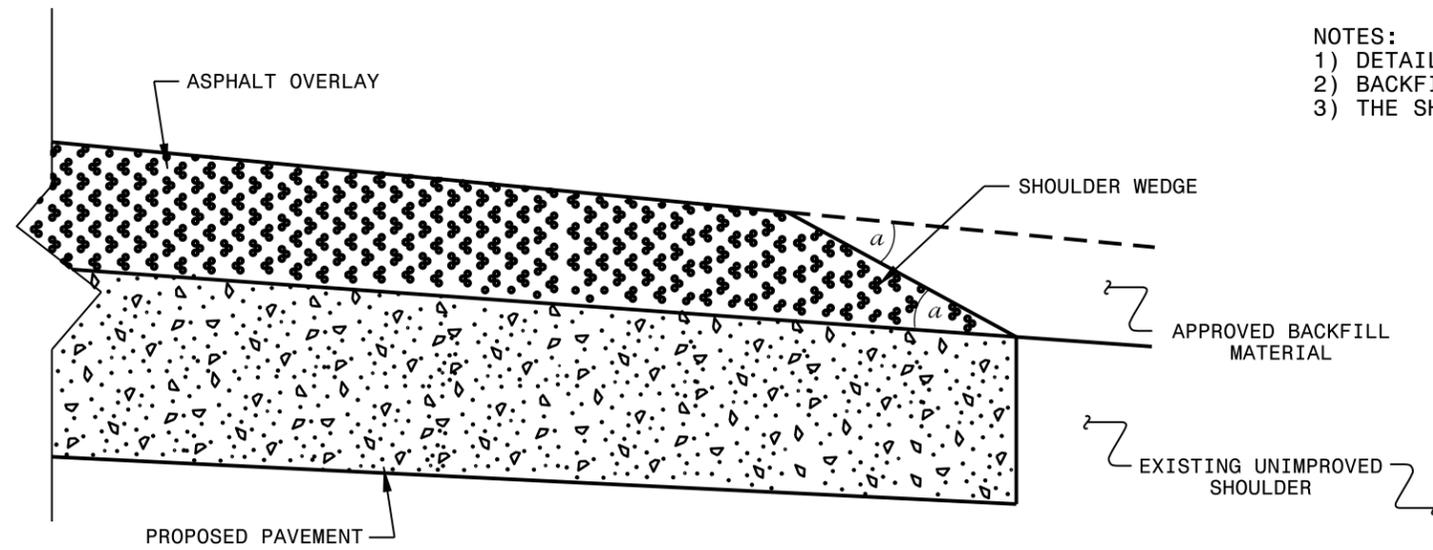
ALL UNPAVED S.R. ROADS TO BE SURFACED 50' FROM EDGE OF PAVEMENT OF MAIN PROJECT.  
ALL PAVED S.R. ROADS TO BE RESURFACED TO THE ENDS OF THE RADII, OR AS DIRECTED BY THE ENGINEER.  
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.  
SHOULDERS AND DITCHES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

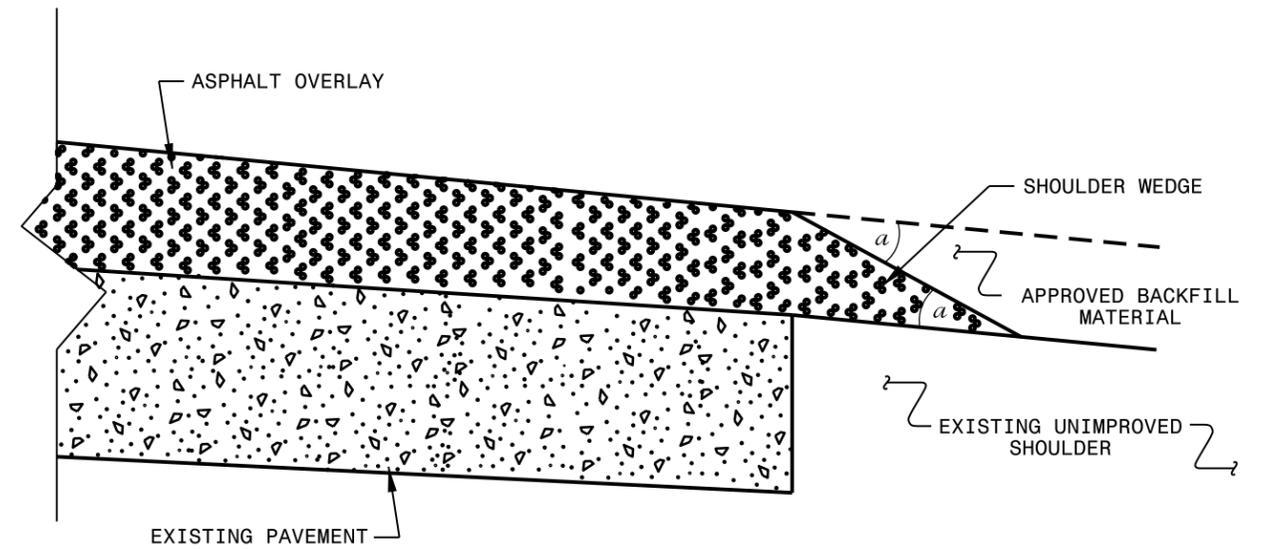
<b>C1</b>	PROP. APPROX. 1.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD.
<b>C2</b>	PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
<b>T</b>	AGGREGATE SHOULDER BORROW (SHOULDER RECONSTRUCTION)
<b>V1</b>	MILL EXISTING ASPHALT PAVEMENT APPROX. 1" IN DEPTH
<b>V2</b>	MILL EXISTING ASPHALT PAVEMENT APPROX. 1.5" IN DEPTH

2023 - 2024  
Resurfacing Program  
Detail Sheet  
Alexander County

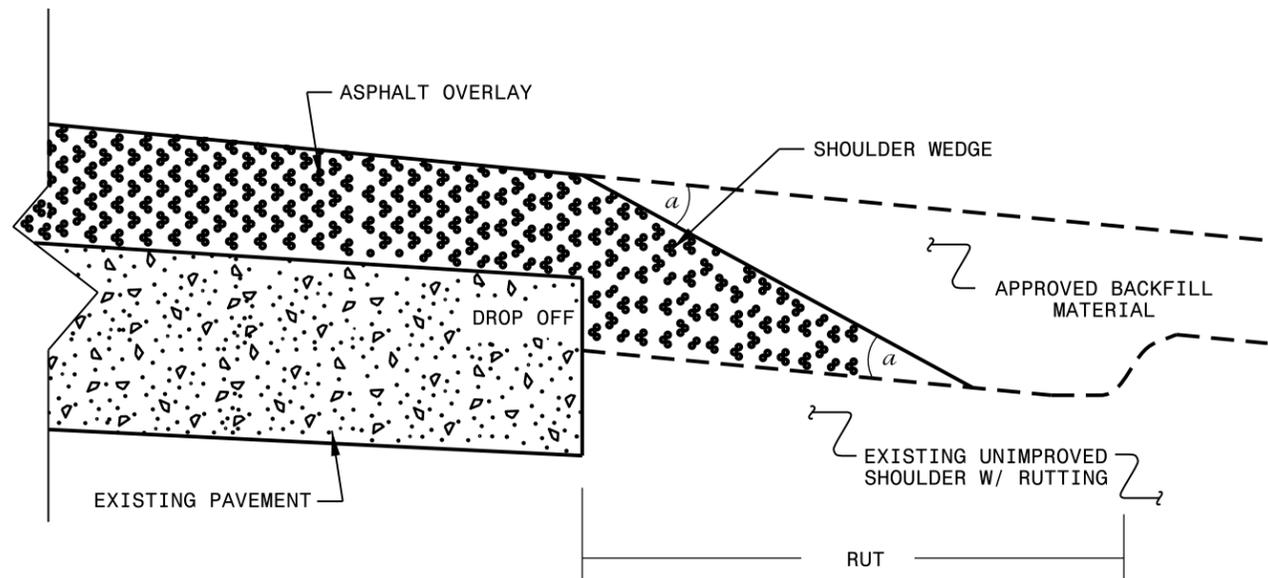
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFc AND ULTRA-THIN BONDED WEARING COURSE.
  - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
  - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS.



**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°

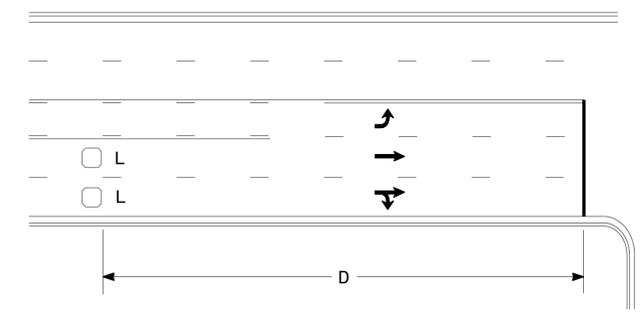
CONTRACT STANDARDS  
AND DEVELOPMENT UNIT  
Office 919-707-6950 FAX 919-250-4119

**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)

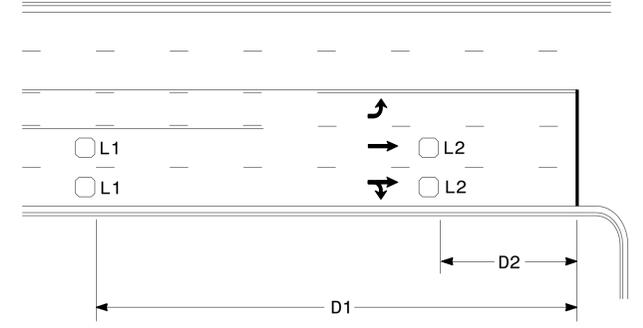


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

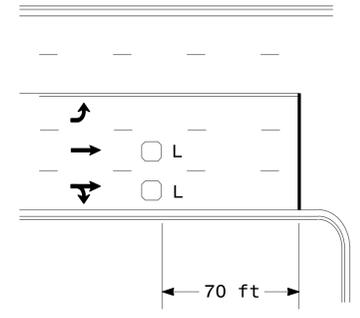


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

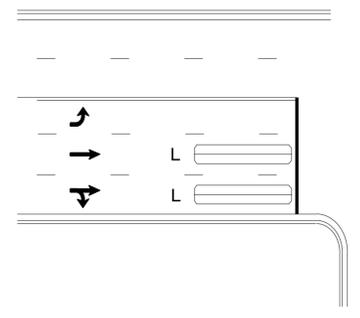
"Stretch" Operation

### Low Speed Detection (≤35 mph)



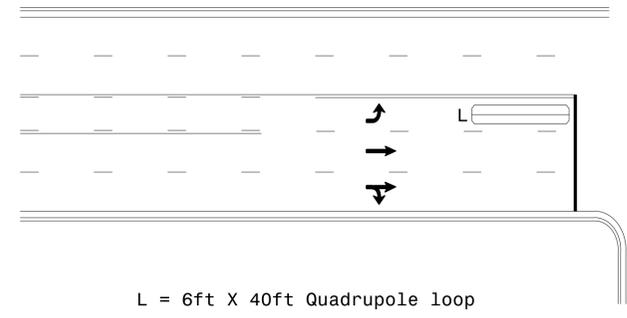
L = 6ft X 6ft  
Wired in series

OR



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

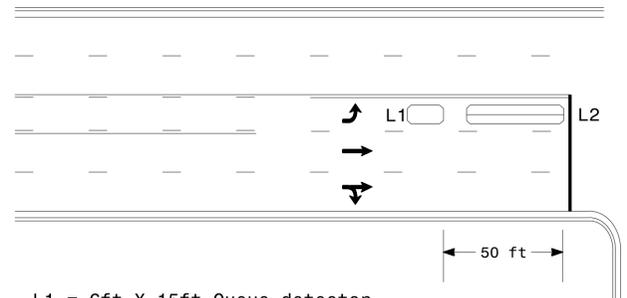
### Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

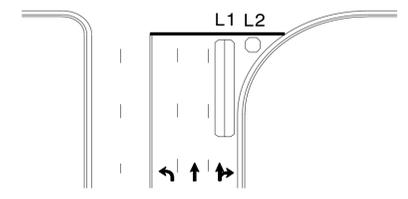
OR



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

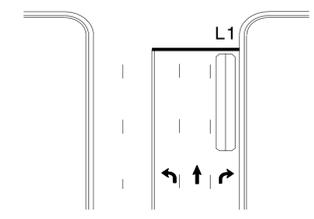
Queue Loop Detection

### Right Turn Lane Detection

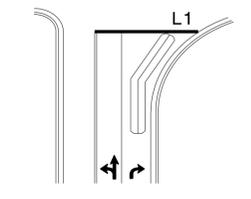


Shared Lane/  
Wide Radius Turn

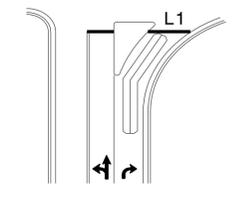
L1 = 6ft X 40ft Quadrupole loop  
L2 = 6ft X 6ft [Minimum] Presence loop  
Wired separately



Standard Turn

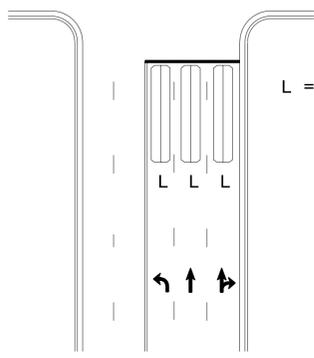


Wide Radius Turn



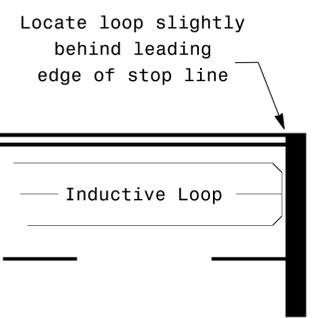
Channelized Turn

### 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

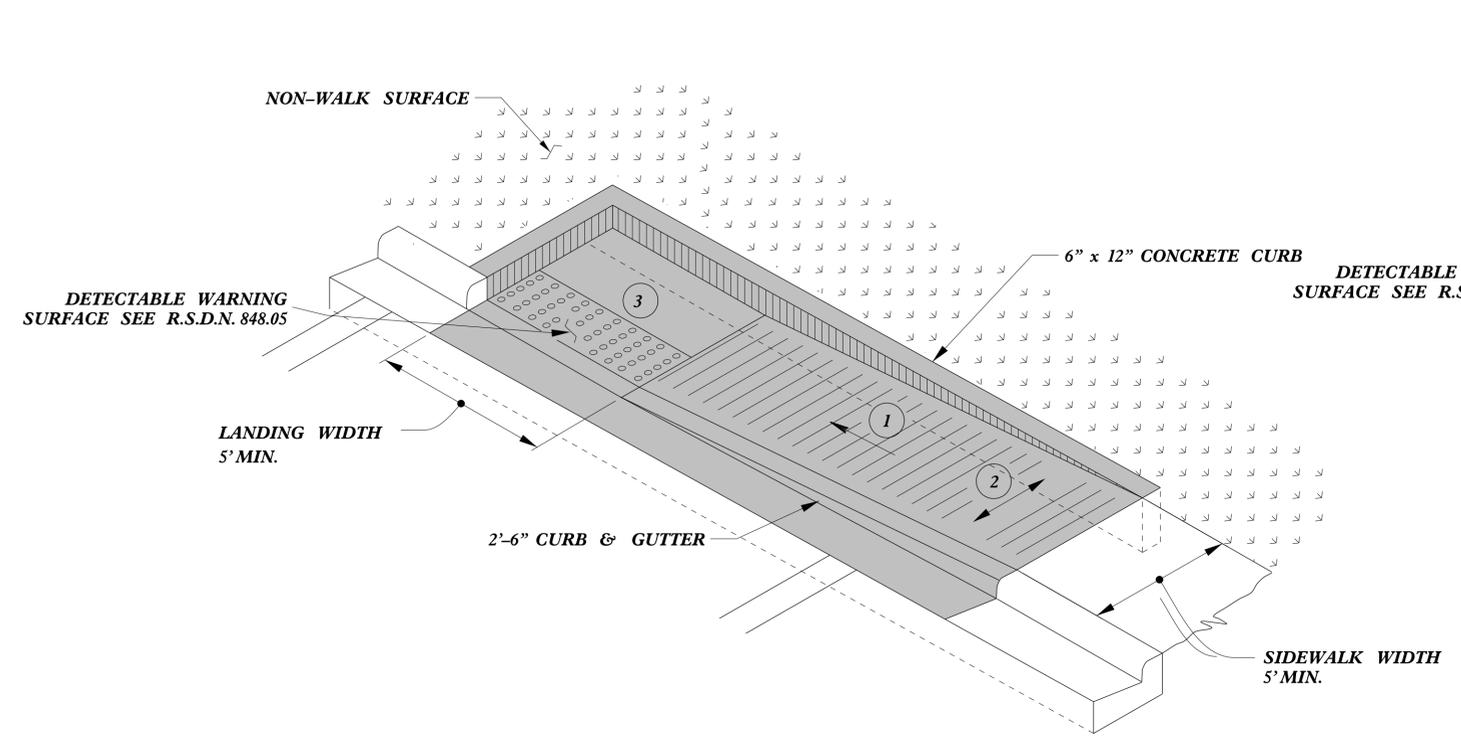


Prepared In the Offices of:		SEAL	
TRANSPORTATION MOBILITY AND SAFETY DIVISION STATE OF NORTH CAROLINA Signal Design Section		NORTH CAROLINA PROFESSIONAL ENGINEER PAMELA L. ALEXANDER 23489	
PLAN DATE: January 2015	REVIEWED BY: JPG	INIT.	DATE
PREPARED BY: PLA	REVIEWED BY:		
REVISIONS			

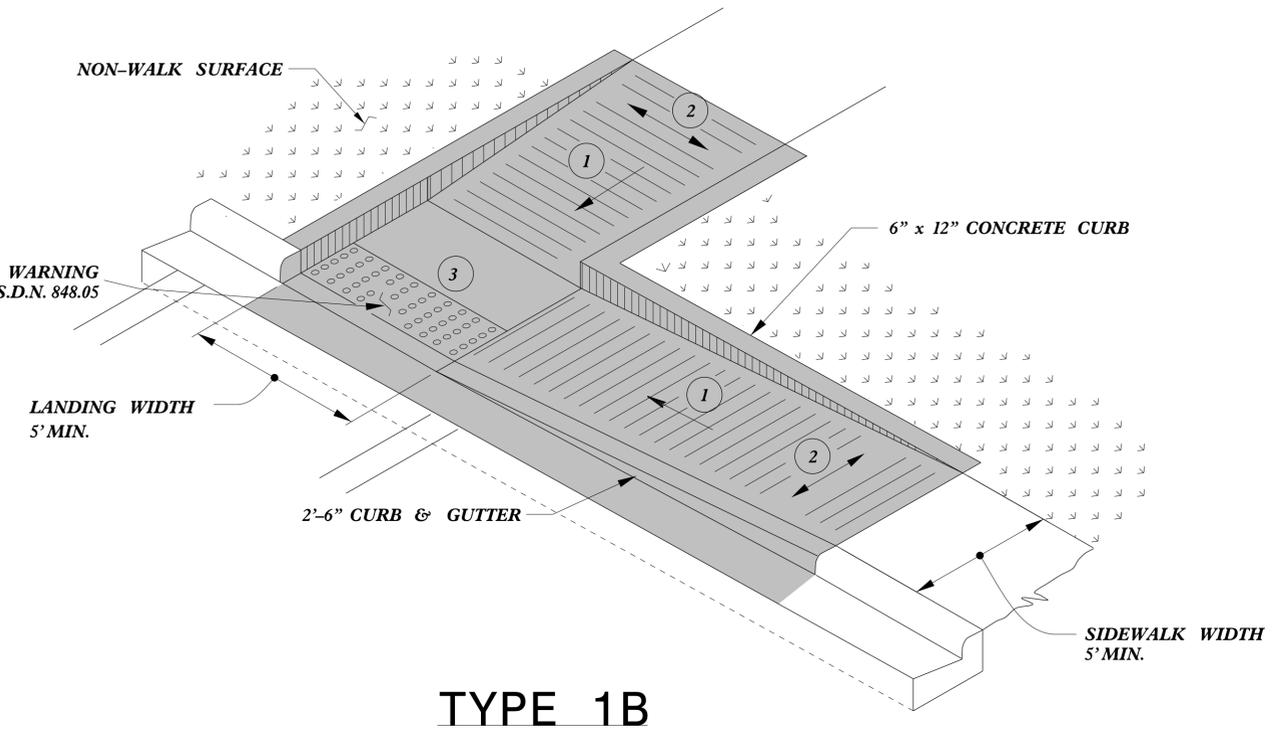
SCALE N/A	SIG. INVENTORY NO.
--------------	--------------------

3D:\AH\2015\12\29  
 S:\ITS\AS\15\SIGNAL\Signal Design\Section\Eastern\Region\loop\yp\lca\2015.dgn  
 paalexander

5/14/99



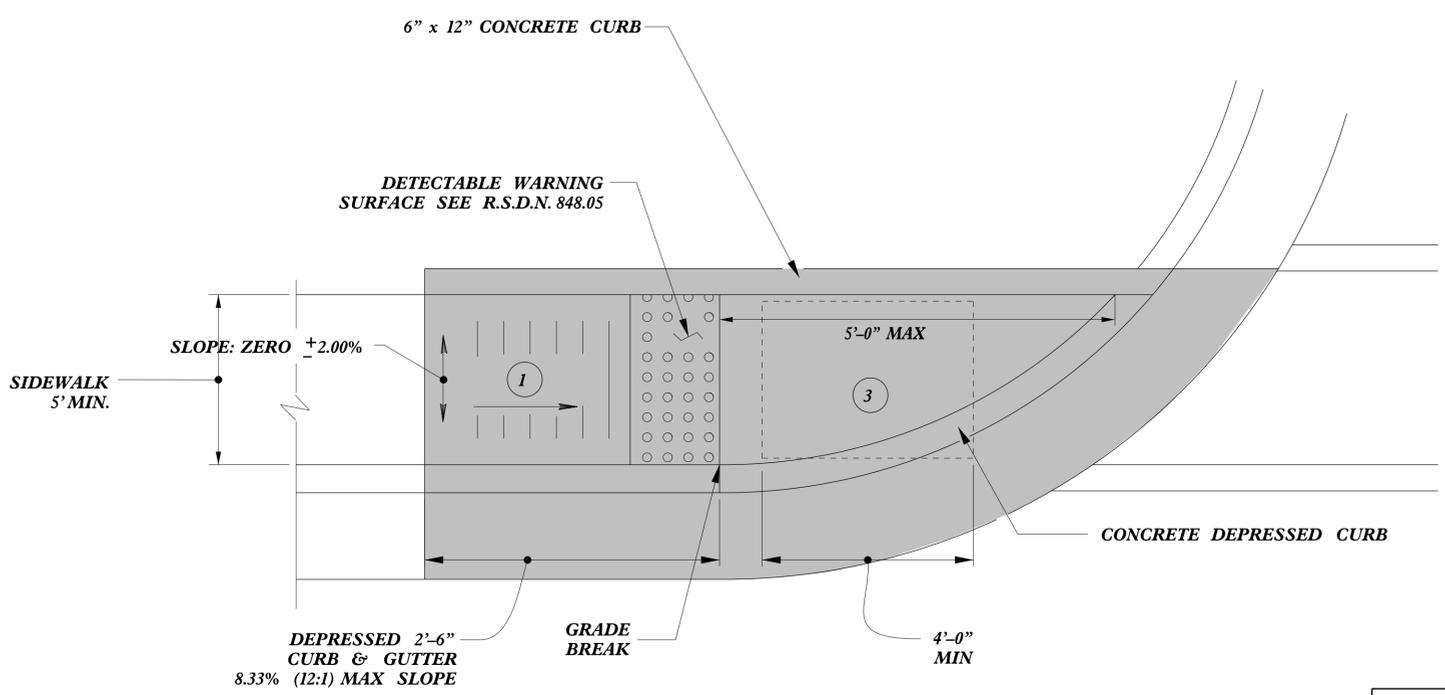
**TYPE 1A**



**TYPE 1B**

**PAY LIMITS FOR 1 CURB RAMP**

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



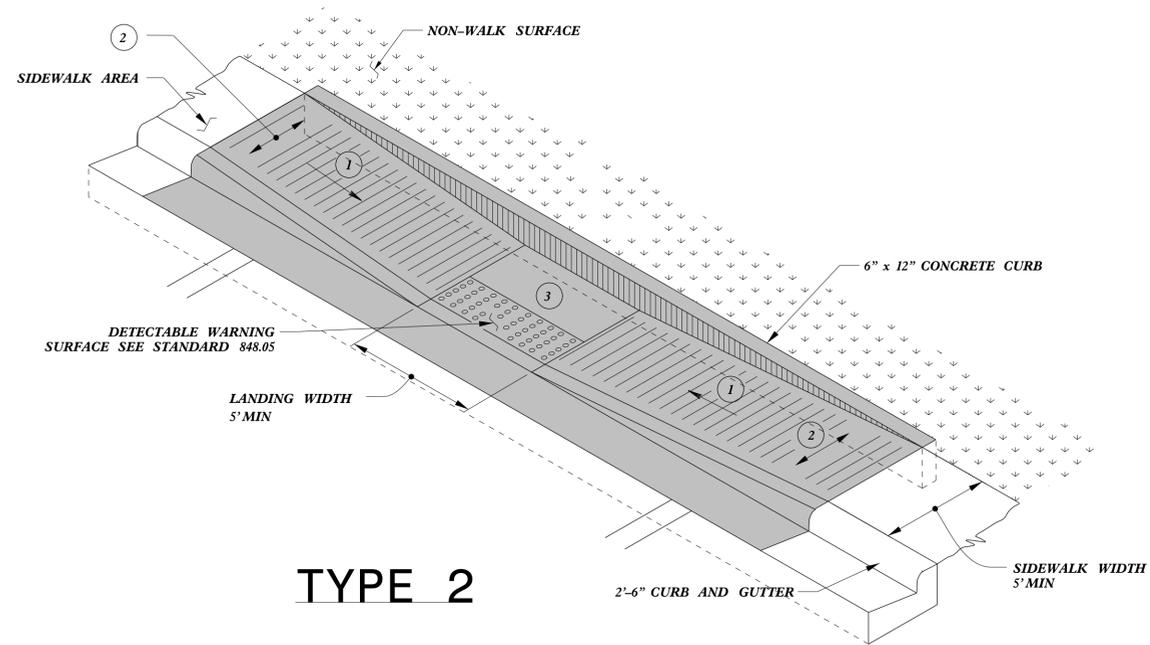
**TYPE 1**



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>CURB RAMPS</b>	
Directional Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC. :stds/2012CurbRamp/CurbRampDetails.dgn	

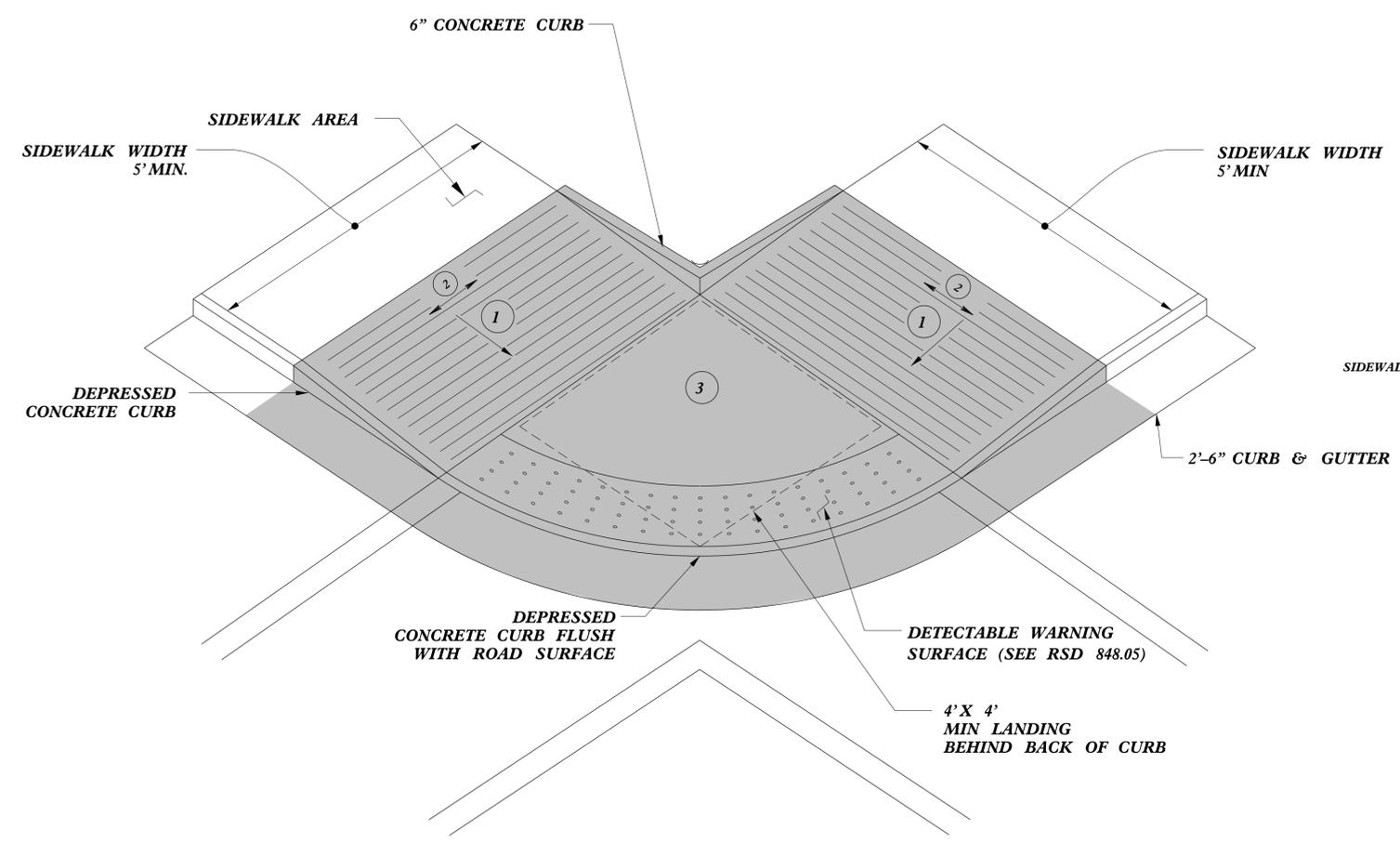
REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES



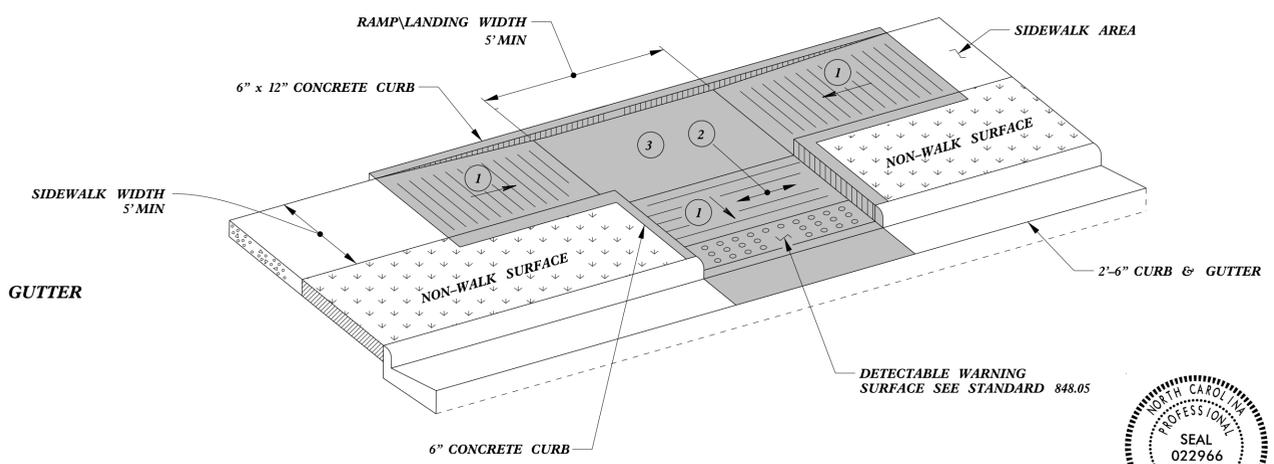
**TYPE 2**

**PAY LIMITS FOR 1 CURB RAMP**

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



**TYPE 2A**



**TYPE 3**

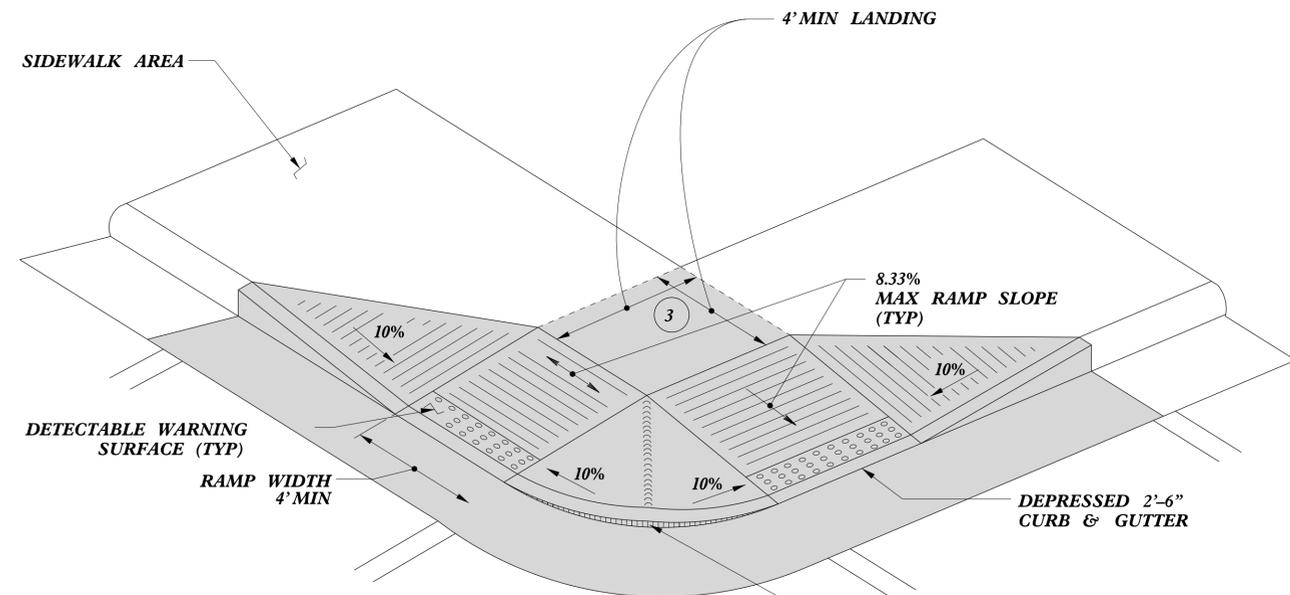


DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

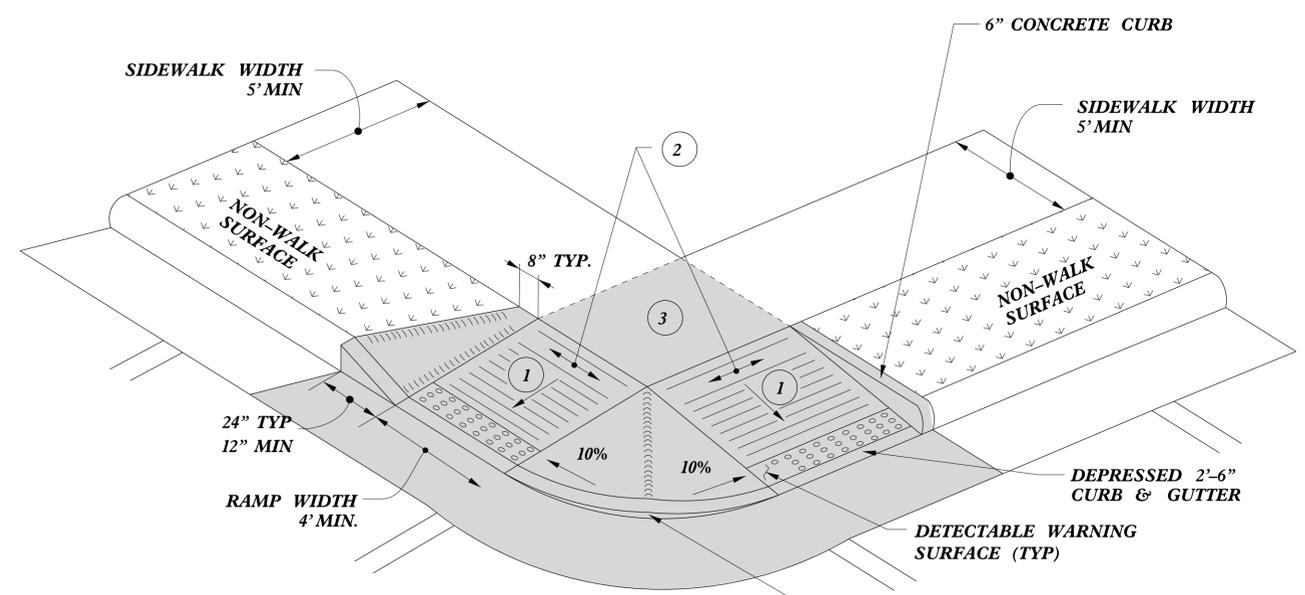
<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>CURB RAMPS</b>	
Parallel Ramps	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn	

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

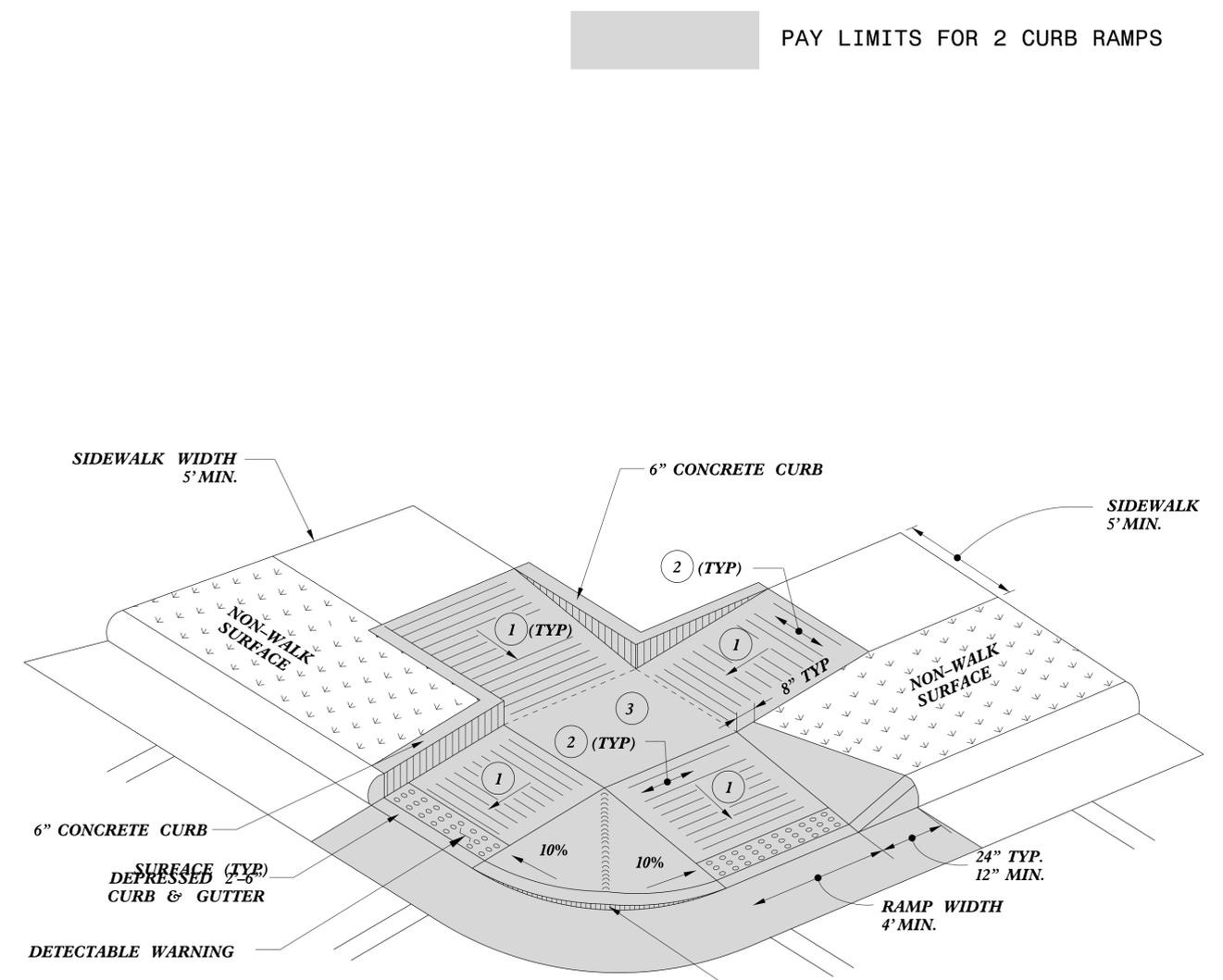
5/14/99  
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**TYPE 4**



**TYPE 4A**



**TYPE 5**

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.

PAY LIMITS FOR 2 CURB RAMPS



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950	FAX 919-250-4119
<b>CURB RAMPS</b>	
Shared Landing	
ORIGINAL BY: J.S. HOWERTON	DATE: 7/7/11
MODIFIED BY:	DATE:
CHECKED BY:	DATE:
FILE SPEC: stds/2012CurbRamp/CurbRampDetails.dgn	

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

5/14/99  
C:\P\2012\STDS\2012CurbRamp\CurbRampDetails.dgn





PROJECT NO.	SHEET NO.	TOTAL NO.
2023CPT.12.01.10021		
2023CPT.12.01.20021		

### THERMOPLASTIC AND PAINT QUANTITIES

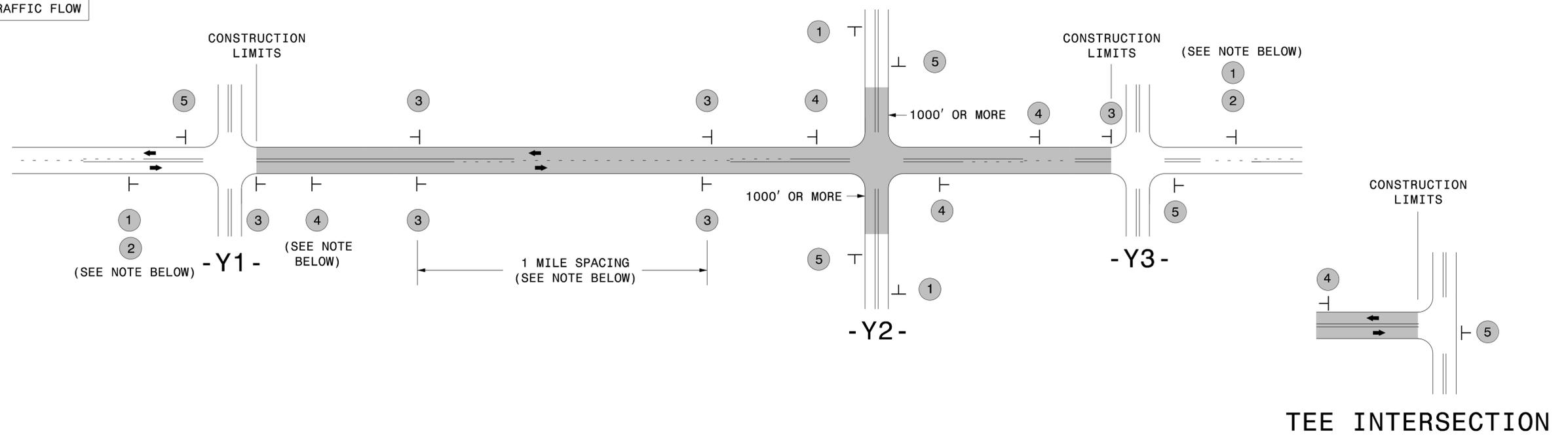
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LENGTH	WIDTH	4400000000-E	4447000000-E	4457000000-N	4695000000-E	4705000000-E	4891000000-E	4721000000-E		4725000000-E				4810000000-E		4890000000-E		4905000000-N		
									WORK ZONE ADVANCE/GENERAL WARNING SIGNING	PEDESTRIAN CHANNELIZING DEVICES	TEMPORARY TRAFFIC CONTROL	8" X 90 M YELLOW THERMO	16" X 90 M WHITE THERMO	24" X 90 M WHITE THERMO	THERMO MSG RXR 90 M	THERMO MSG SCHOOL 90 M	THERMO LT ARROW 90 M	THERMO RT ARROW 90 M	THERMO STR ARROW 90 M	THERMO LT STR RT ARROW 90 M	4" WHITE PAINT	4" YELLOW PAINT	4" HOT SPRAY THERMO LINES WHITE 50 MILS	4" HOT SPRAY THERMO LINES YELLOW 50 MILS	NON-CAST SNOW PLOWABLE MARKERS		
									MI	FT	SF	LF	LS	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA		
2023CPT.12.01.10021	Alexander	1	NC 90	FROM US 64 TO NC 16	1,3	2	1.19	24	150			120		56			12	4	4				15,100	15,100	148		
2023CPT.12.01.10021	Alexander	2	NC 90	FROM SR 1543 (JESSIE MAYS LN.) TO SR 1523 (MARSH PATTERSON LN.)	1,3	2	4.43	24	500			70	300	240	12		53	2					51,460	77,190	467		
2023CPT.12.01.10021	Alexander	3	NC 127	FROM SR 1149 (HERRITAGE FARM DR.) TO SR 1163 (BLUE RIDGE LN.)	1,4	2	3.65	24	410			50		100		12	6	4		2			42,400	45,700	318		
<b>TOTAL FOR PROJ NO. 2023CPT.12.01.10021</b>												<b>240</b>	<b>300</b>	<b>396</b>	<b>12</b>	<b>12</b>	<b>71</b>	<b>10</b>	<b>4</b>	<b>2</b>			<b>108,960</b>	<b>137,990</b>	<b>933</b>		
															<b>24</b>		<b>87</b>						<b>246,950</b>				
2023CPT.12.01.20021	Alexander	4	SR 1167 (D.G. ECHERD RD)	FROM NC 127 TO US 64 / NC 90	2	2	0.81	19	95													18,825	18,825				
2023CPT.12.01.20021	Alexander	5	SR 1304 (MOUNTAIN RIDGE CHURCH RD)	FROM SR 1302 (DOVER CHURCH RD) TO SR 1307 (ALL HEALING SPRINGS RD)	2	2	2.55	19	290													59,245	59,245				
2023CPT.12.01.20021	Alexander	6	SR 1633 (LENTZ RD)	FROM NC 90 TO SR1005 (OLD MTN. RD)	2	2	0.97	20	110													22,500	22,500				
2023CPT.12.01.20021	Alexander	7	SR 1503 (HIDDENITE CHURCH RD)	FROM SR 1001 (SULPHUR SPRINGS RD) TO NC 90	2,5	2	0.7	19	80	20		100	74	4								16,275	16,275	6			
<b>TOTAL FOR PROJ NO. 2023CPT.12.01.20021</b>															<b>4</b>							<b>116,845</b>	<b>116,845</b>	<b>6</b>			
															<b>4</b>							<b>233,690</b>					
<b>GRAND TOTAL</b>									<b>14.3</b>		<b>1,635</b>	<b>20</b>	<b>1</b>	<b>240</b>	<b>400</b>	<b>470</b>	<b>16</b>	<b>12</b>	<b>71</b>	<b>10</b>	<b>4</b>	<b>2</b>	<b>116,845</b>	<b>116,845</b>	<b>108,960</b>	<b>137,990</b>	<b>939</b>
															<b>28</b>		<b>87</b>					<b>233,690</b>	<b>246,950</b>				

# SIGNING FOR RESURFACING PROJECTS

**LEGEND**

┆ STATIONARY SIGN

← DIRECTION OF TRAFFIC FLOW



## MAINLINE (-L-) SIGNING

## -Y- LINE SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION	1	 W20-1 48" X 48"	PLACE 1000' PRIOR TO BEGINNING OF CONSTRUCTION LIMITS. ONLY USED ON -Y- LINES IF RESURFACING LIMITS EXTEND 1000' ALONG -Y- LINE.	NO REQUIRED STATIONARY SIGNING FOR THE FOLLOWING -Y- LINE CONDITIONS:  1) LESS THAN 1000' OF RESURFACING ALONG -Y- LINE 2) SUBDIVISION ROADS 3) DEAD END ROADS  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.  <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	 W7-3aP 24" X 18"	#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	 SP 13107 48" X 48"	- 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	 SP 13106 48" X 48"	- 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	 G20-2 A 48" X 24"	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

5/15/2017 S:\TUXWZTC\Resurfacing\2L2W & AST Resurfacing Details\Resurfacing\_AdvWarn\_2Ln.dgn User:kadai