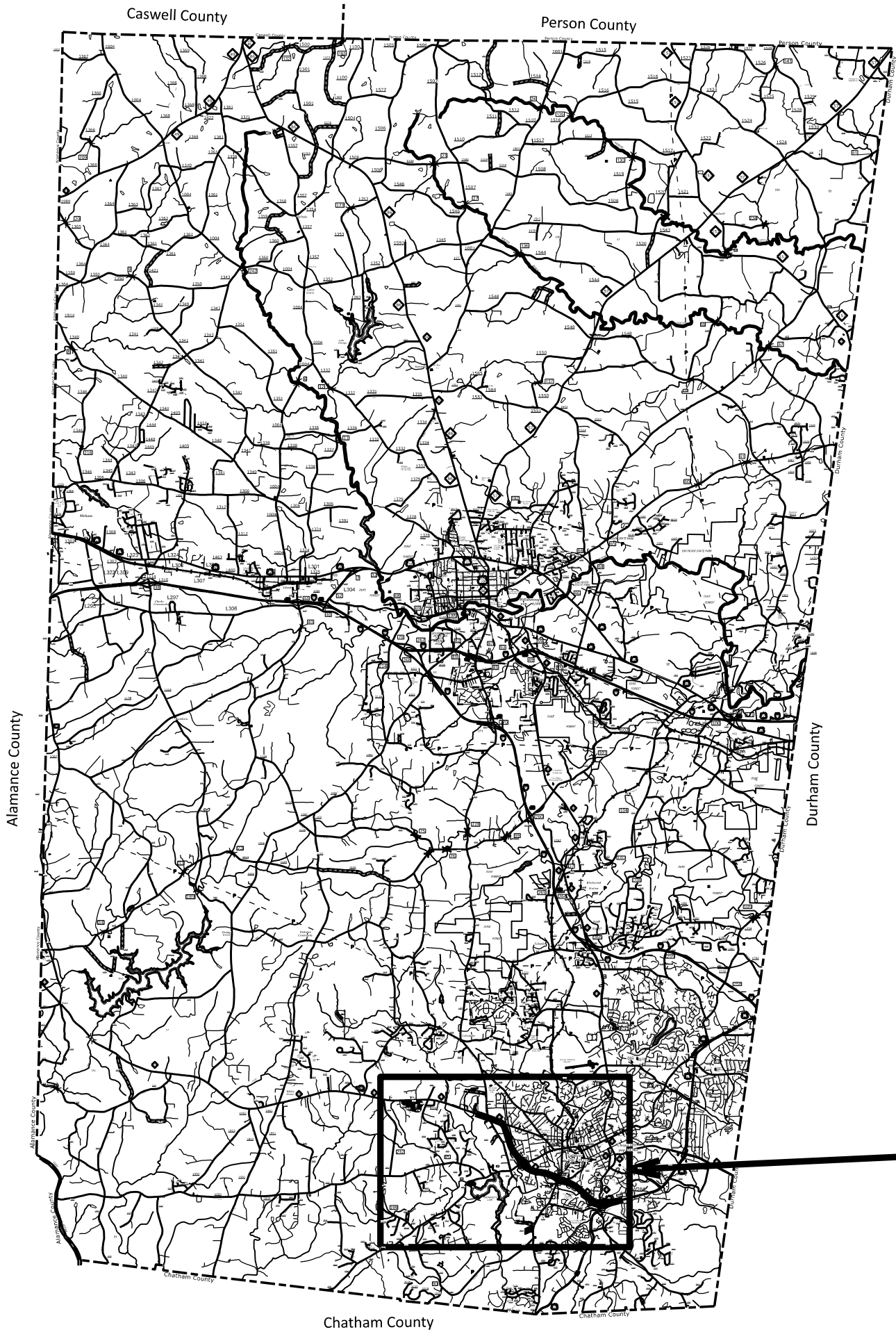


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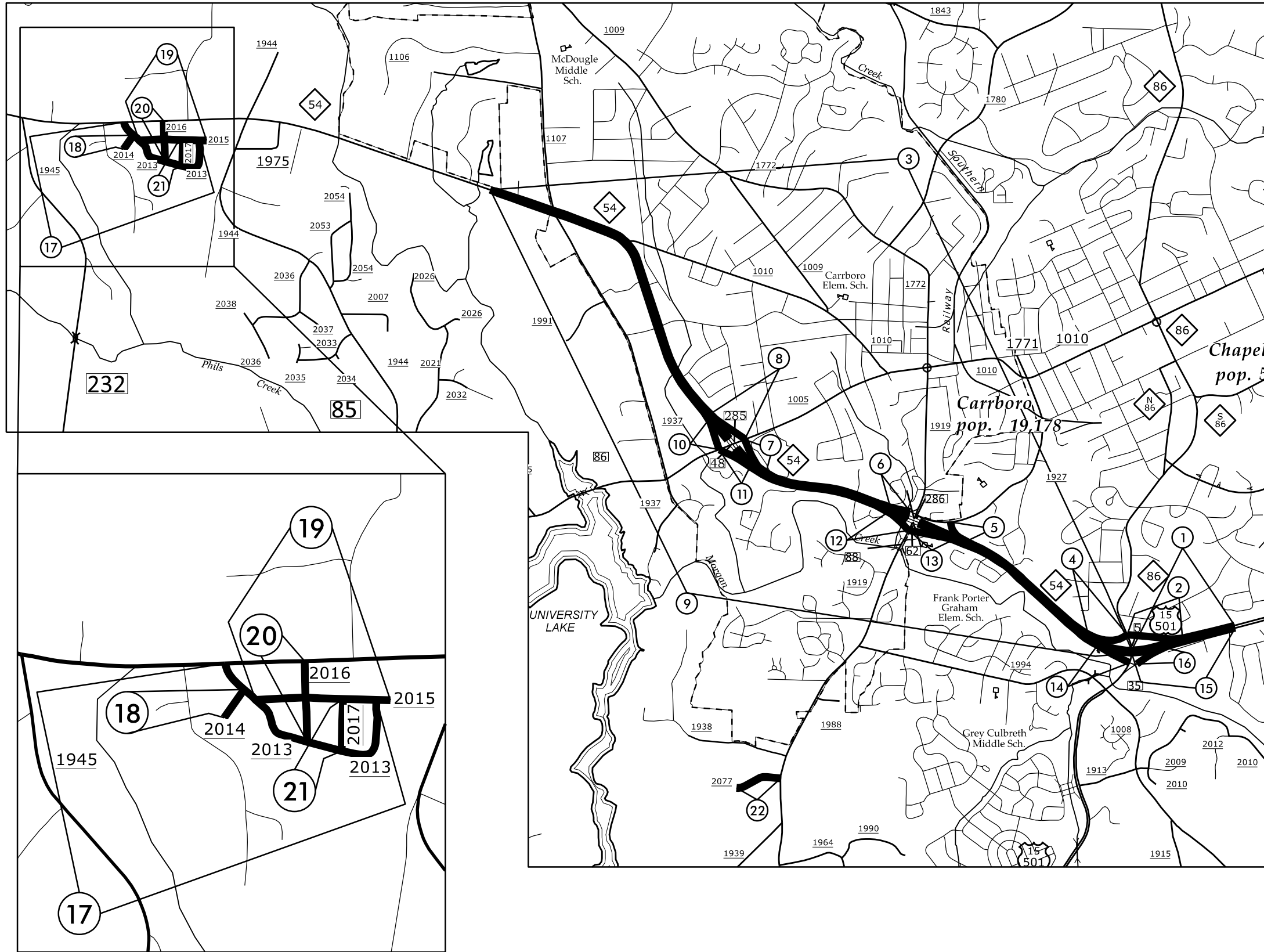
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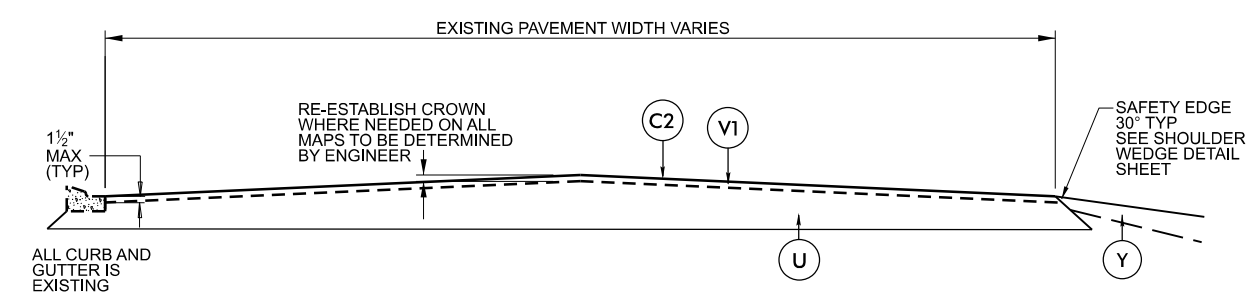
PROJECT REFERENCE NO.	SHEET NO.
2024CPT.07.02.10681, 2024.07.02.20681	1



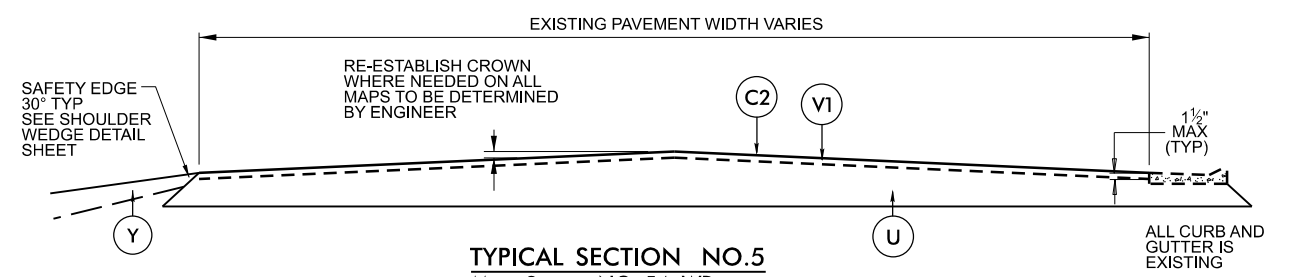
Sheet  
No. 2



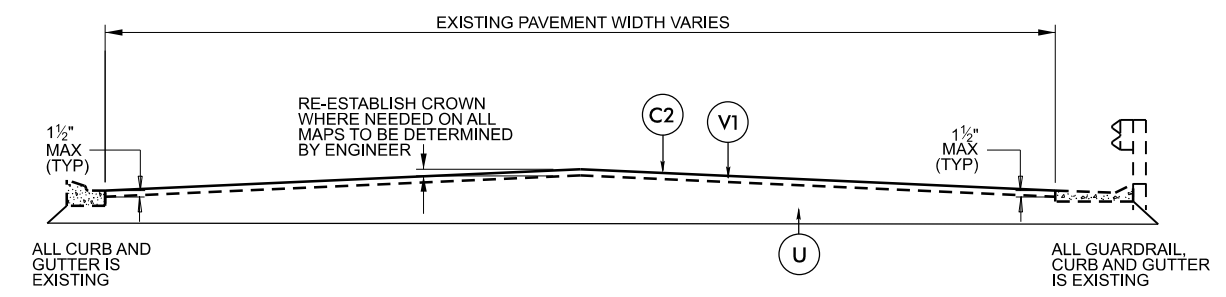
- Map 1 NC 54 WB/US 15-501 SB
- Map 2 NC 54 WB/US 15-501 SB Ramp to NC 86
- Map 3 NC 54 WB  
\*Do Not Resurface Bridge #285 and #286
- Map 4 NC 54 WB Ramp from NC 86
- Map 5 NC 54 WB Ramp to SR 1927 - S. Merritt Mill Rd
- Map 6 NC 54 WB Ramp from SR 1919 - S. Greensboro St
- Map 7 NC 54 WB Ramp to SR 1005 - Jones Ferry Rd
- Map 8 NC 54 WB Ramp from SR 1005 - Jones Ferry Rd
- Map 9 NC 54 EB  
\*Do Not Resurface Bridge #48 and #62
- Map 10 NC 54 EB Ramp to SR 1005 - Jones Ferry Rd
- Map 11 NC 54 EB Ramp from SR 1005 - Jones Ferry Rd
- Map 12 NC 54 EB Ramp to SR 1919 - Smith Level Rd
- Map 13 NC 54 EB Ramp from SR 1919 - Smith Level Rd
- Map 14 NC 54 EB Ramp to US 15-501
- Map 15 NC 54 EB/US 15-501 NB
- Map 16 NC 54 EB/US 15-501 NB Ramp from US 15-501
- Map 17 SR 2013 - Shannon Dr
- Map 18 SR 2014 - Brenda Ct
- Map 19 SR 2015 - Terrace View Dr
- Map 20 SR 2016 - Southern Dr
- Map 21 SR 2017 - Welcome Dr
- Map 22 SR 2077 - Antler Point Rd



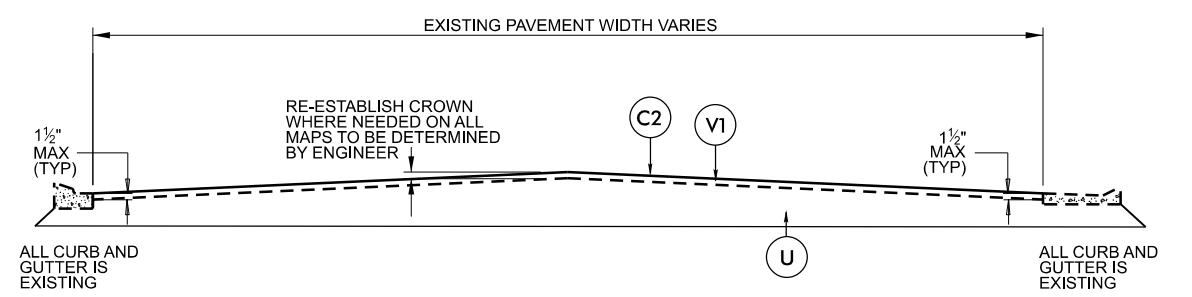
**TYPICAL SECTION NO.1**  
 Map 1 NC 54 WBUS 15-501 SB  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB  
 Map 15 NC 54 EB/US 15-501 NB



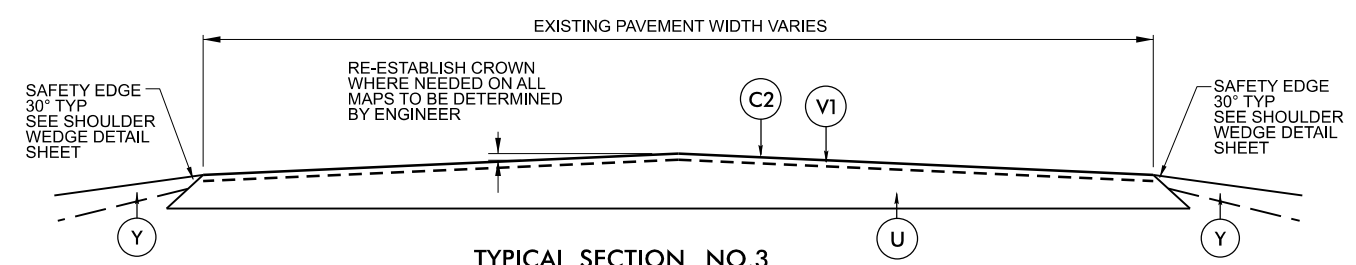
**TYPICAL SECTION NO.5**  
 Map 3 NC 54 WB  
 Map 4 NC 54 WB Ramp from NC 86  
 Map 5 NC 54 WB Ramp to SR 1927 - S. Merritt Mill Rd  
 Map 6 NC 54 WB Ramp from SR 1919 - S. Greensboro St  
 Map 8 NC 54 WB Ramp from SR 1005 - Jones Ferry Rd  
 Map 9 NC 54 EB  
 Map 13 NC 54 EB Ramp from SR 1919 - Smith Level Rd



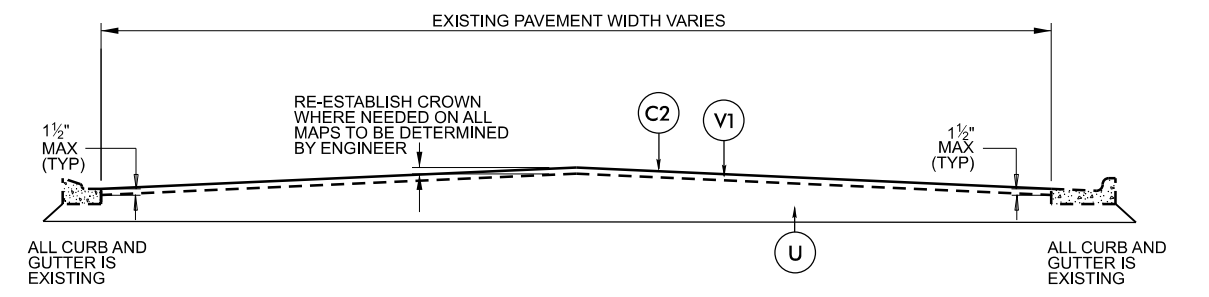
**TYPICAL SECTION NO.2**  
 Map 1 NC 54 WBUS 15-501 SB  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB



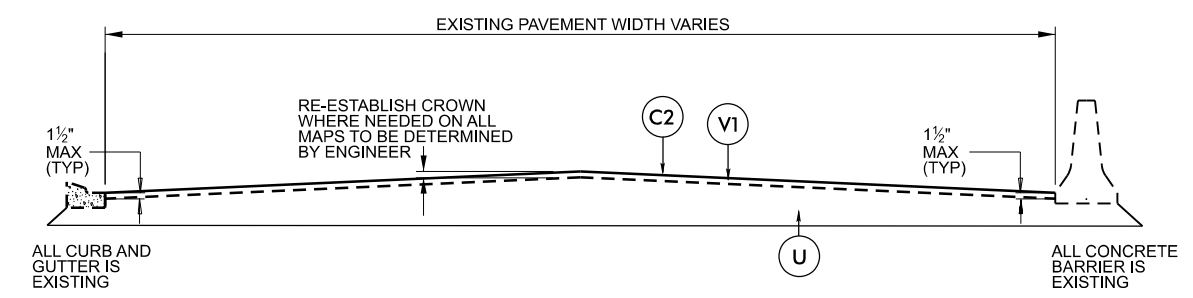
**TYPICAL SECTION NO.6**  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB  
 Map 15 NC 54 EBUS 15-501 NB



**TYPICAL SECTION NO.3**  
 Map 2 NC 54 WBUS 15-501 SB Ramp to NC 86  
 Map 3 NC 54 WB  
 Map 4 NC 54 WB Ramp from NC 86  
 Map 5 NC 54 WB Ramp to SR 1927 - S. Merritt Mill Rd  
 Map 6 NC 54 WB Ramp from SR 1919 - S. Greensboro St  
 Map 7 NC 54 WB Ramp to SR 1005 - Jones Ferry Rd  
 Map 8 NC 54 WB Ramp from SR 1005 - Jones Ferry Rd  
 Map 9 NC 54 EB  
 Map 10 NC 54 EB Ramp to SR 1005 - Jones Ferry Rd  
 Map 11 NC 54 EB Ramp from SR 1005 - Jones Ferry Rd  
 Map 12 NC 54 EB Ramp to SR 1919 - Smith Level Rd  
 Map 13 NC 54 EB Ramp from SR 1919 - Smith Level Rd  
 Map 16 NC 54 EB/US 15-501 NB Ramp from US 15-501



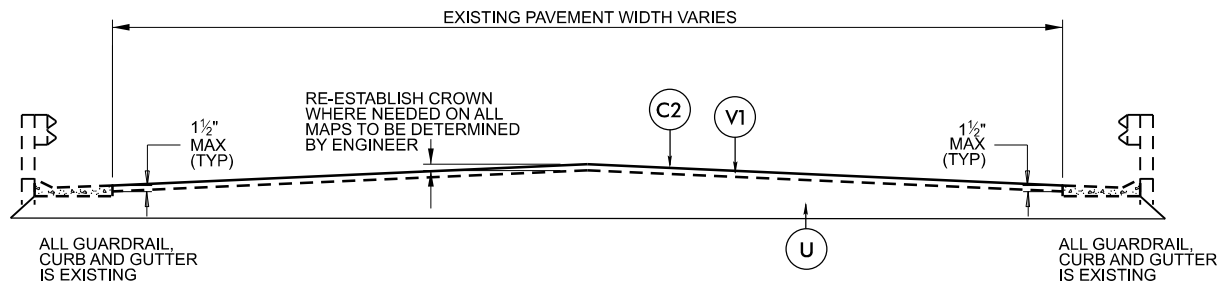
**TYPICAL SECTION NO.7**  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB



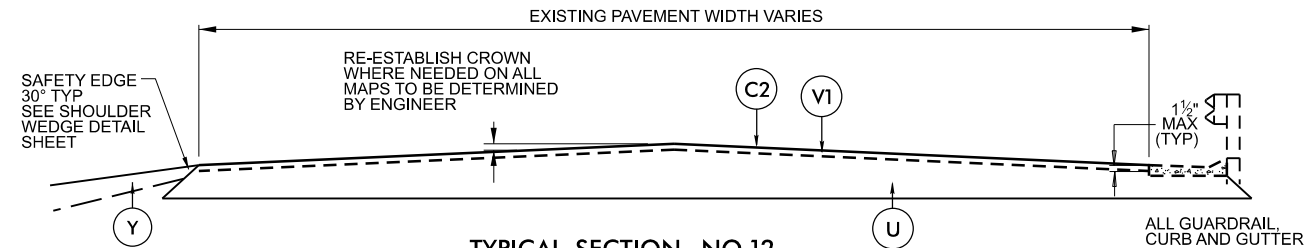
**TYPICAL SECTION NO.4**  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB

Note:  
 Map 3 - Do Not Resurface Bridge #285 and #286  
 Map 9 - Do Not Resurface Bridge #48 and #62

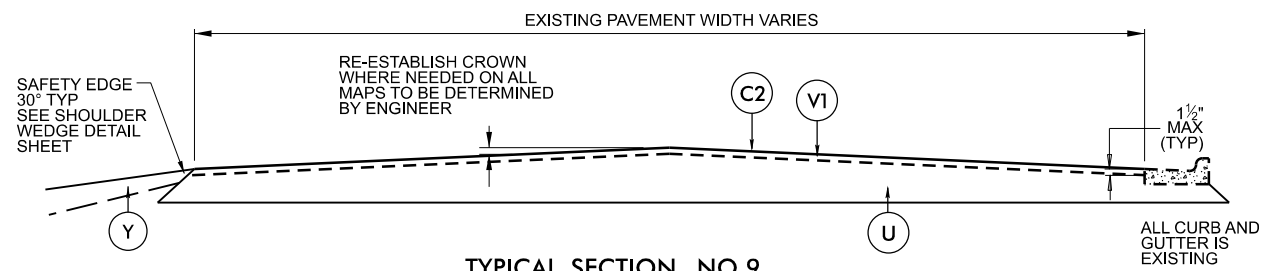
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.B, TO BE APPLIED AT AN AVERAGE RATE OF 165 LBS PER SQ. YD.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.C, TO BE APPLIED AT AN AVERAGE RATE OF 168 LBS PER SQ. YD.
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
F	AST MAT COAT, #78M
U	EXISTING PAVEMENT
V1	MILL ASPHALT PAVEMENT, 1 1/2" DEPTH
V2	MILL ASPHALT PAVEMENT, 4" DEPTH
Y	SHOULDER WEDGE (SEE DETAIL)



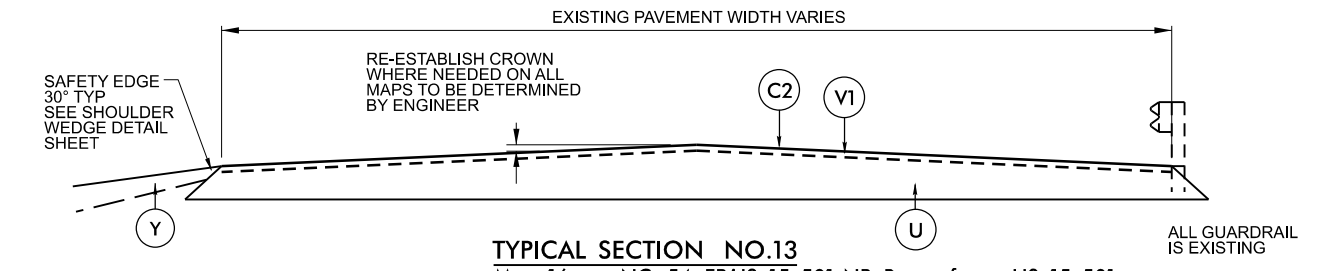
**TYPICAL SECTION NO.8**  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB



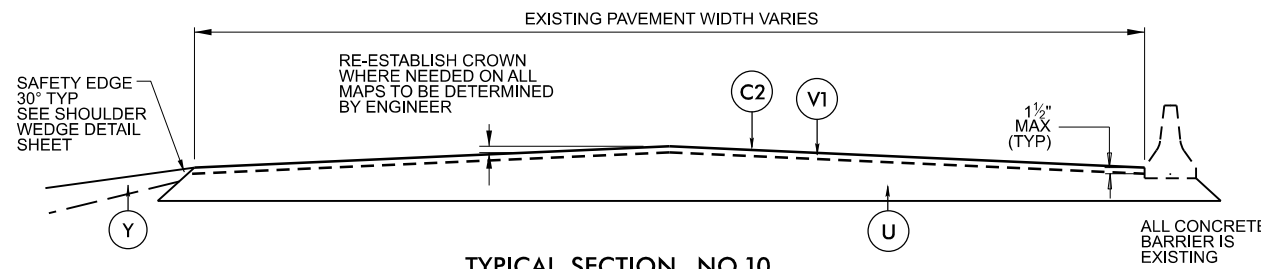
**TYPICAL SECTION NO.12**  
 Map 14 NC 54 EB Ramp to US 15-501



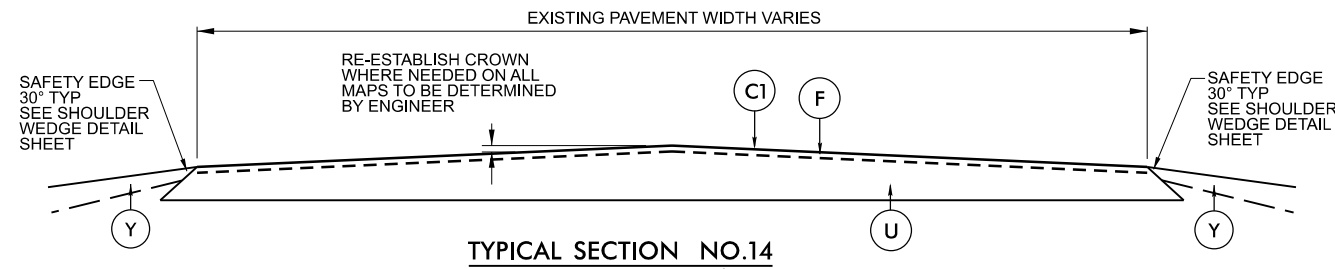
**TYPICAL SECTION NO.9**  
 Map 6 NC 54 WB Ramp from SR 1919 - S. Greensboro St  
 Map 7 NC 54 WB Ramp to SR 1005 - Jones Ferry Rd



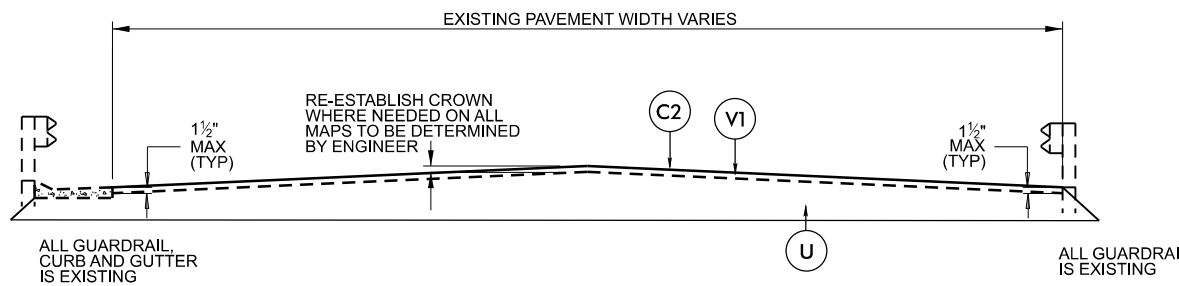
**TYPICAL SECTION NO.13**  
 Map 16 NC 54 EBUS 15-501 NB Ramp from US 15-501



**TYPICAL SECTION NO.10**  
 Map 7 NC 54 WB Ramp to SR 1005 - Jones Ferry Rd

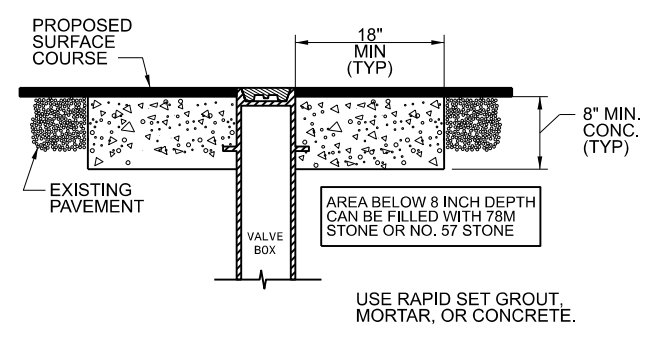


**TYPICAL SECTION NO.14**  
 Map 17 SR 2013 - Shannon Dr  
 Map 18 SR 2014 - Brenda Ct  
 Map 19 SR 2015 - Terrace View Dr  
 Map 20 SR 2016 - Southern Dr  
 Map 21 SR 2017 - Welcome Dr  
 Map 22 SR 2077 - Antler Point Rd

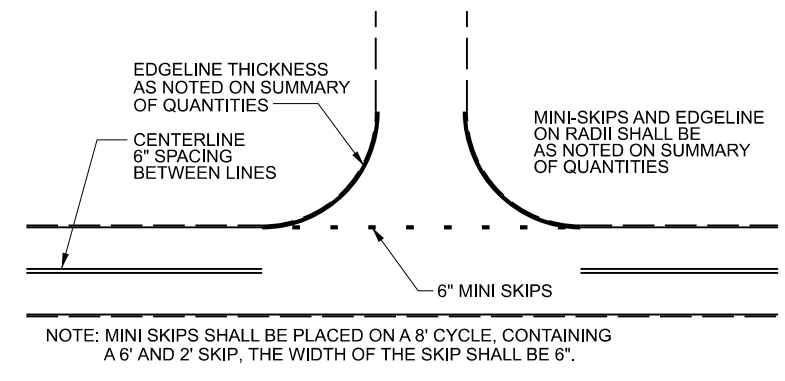


**TYPICAL SECTION NO.11**  
 Map 3 NC 54 WB  
 Map 9 NC 54 EB

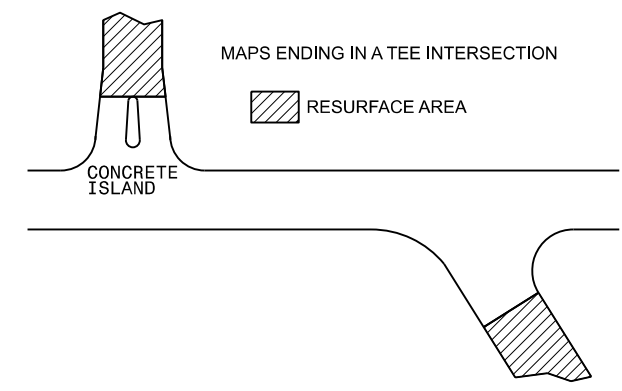
PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.B, TO BE APPLIED AT AN AVERAGE RATE OF 165 LBS PER SQ. YD.
C2	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.C, TO BE APPLIED AT AN AVERAGE RATE OF 168 LBS PER SQ. YD.
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
F	AST MAT COAT, #78M
U	EXISTING PAVEMENT
V1	MILL ASPHALT PAVEMENT, 1 1/2" DEPTH
V2	MILL ASPHALT PAVEMENT, 4" DEPTH
Y	SHOULDER WEDGE (SEE DETAIL)



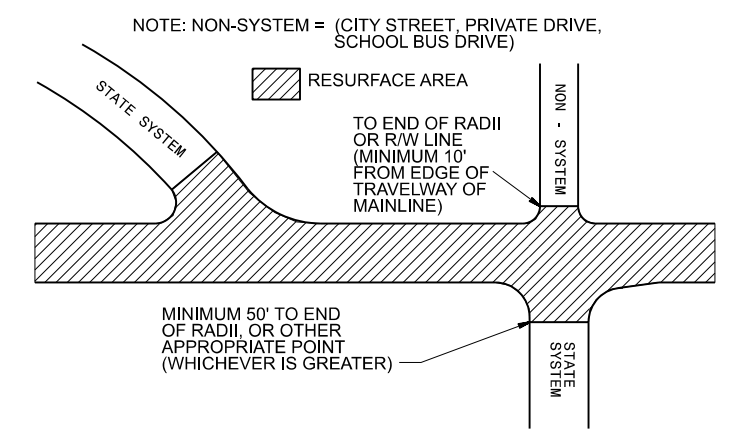
**STANDARD CONCRETE ENCASMENT FOR VALVE CASTINGS IN PAVEMENT**



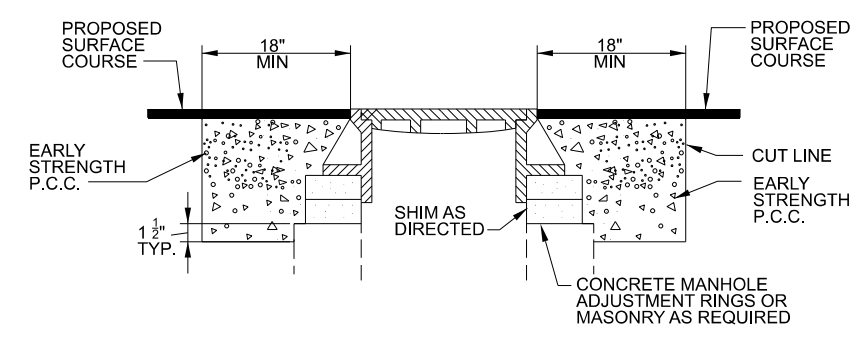
**NON-SIGNALIZED INTERSECTIONS**  
TO BE USED AS DIRECTED BY ENGINEER



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

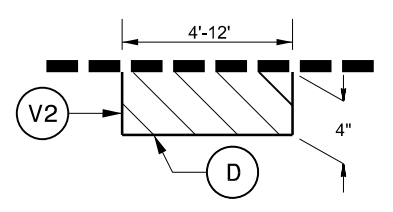


**PAVING DETAIL 2**  
**MAIN LINE IS BEING RESURFACED**



- 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 CLASS B CONCRETE MAY BE USED WHEN ADJUSTMENTS ARE NOT IN THE TRAVEL LANE.

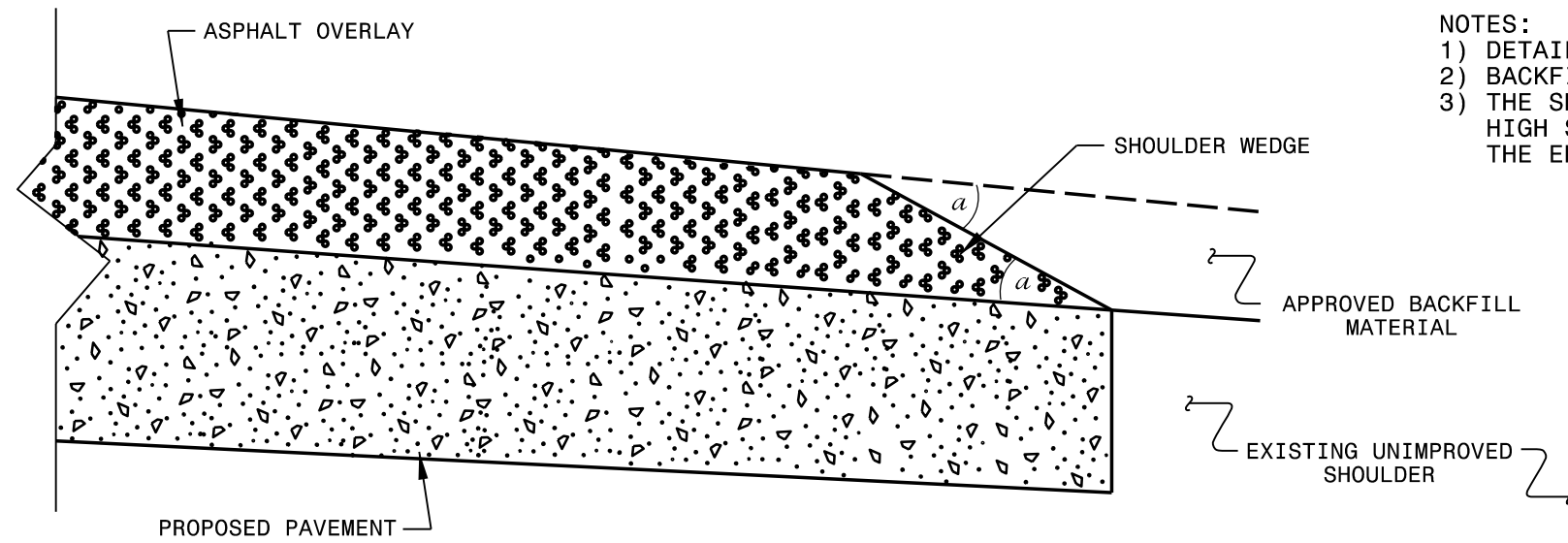
**STANDARD CONCRETE ENCASMENT FOR MANHOLE CASTINGS IN PAVEMENT**



MILL FILL WITH INTERMEDIATE COURSE TYPE I19.0C AT LOCATIONS AS DIRECTED BY THE ENGINEER.

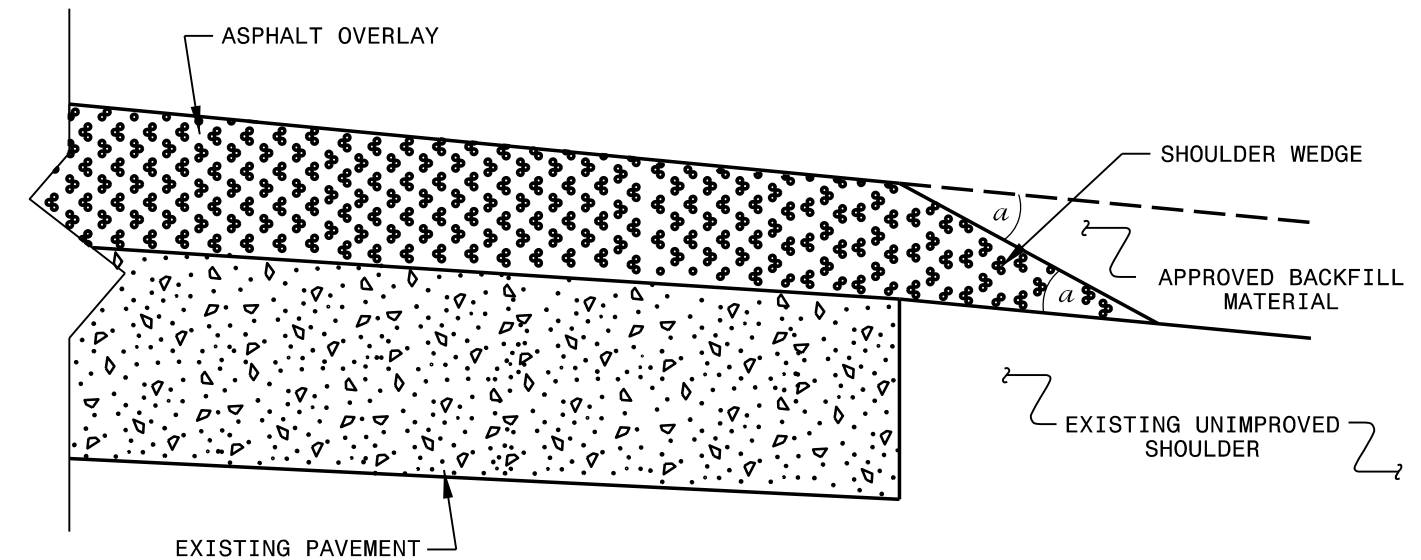
**PATCHING EXISTING PAVEMENT DETAIL**

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.B, TO BE APPLIED AT AN AVERAGE RATE OF 165 LBS PER SQ. YD.
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5.C, TO BE APPLIED AT AN AVERAGE RATE OF 168 LBS PER SQ. YD.
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
F	AST MAT COAT, #78M
U	EXISTING PAVEMENT
V1	MILL ASPHALT PAVEMENT, 1½" DEPTH
V2	MILL ASPHALT PAVEMENT, 4" DEPTH
Y	SHOULDER WEDGE (SEE DETAIL)

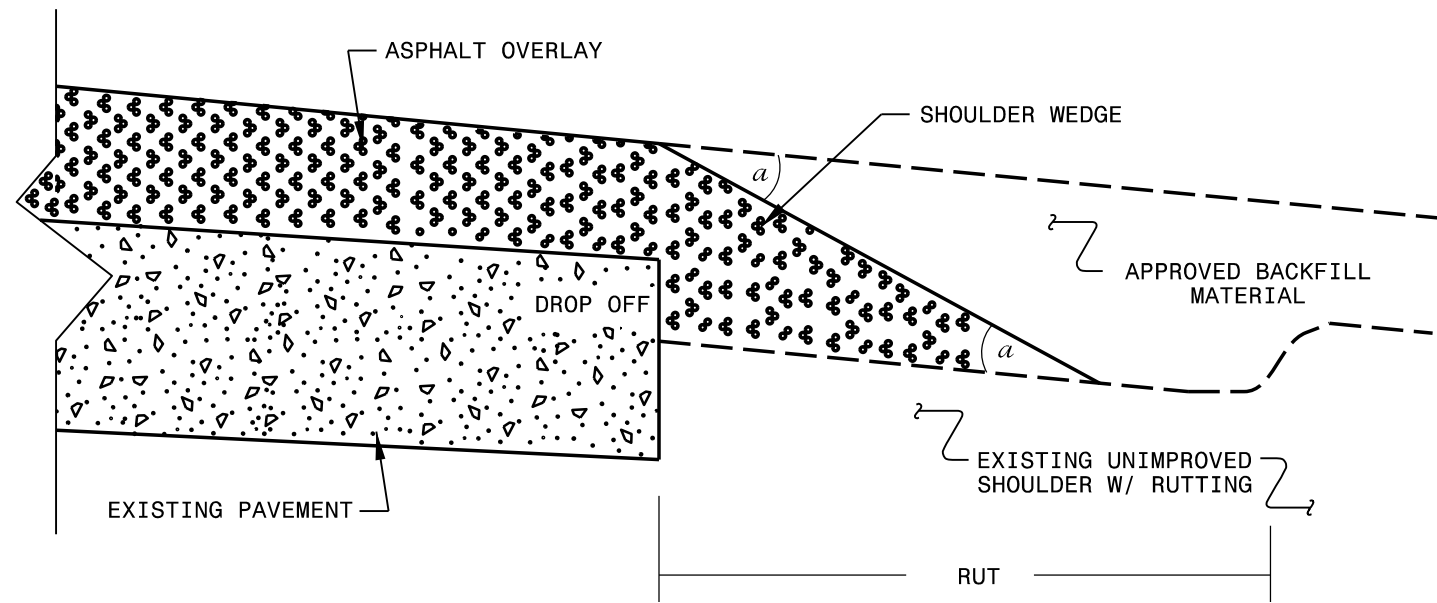


- NOTES:  
 1) DETAIL DOES NOT APPLY TO OGAFB AND ULTRA-THIN BONDED WEARING COURSE.  
 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.  
 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS AND SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS DIRECTED BY THE ENGINEER.

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



**SHOULDER WEDGE DETAIL**  
 (Resurfacing Projects w/ NO Widening)

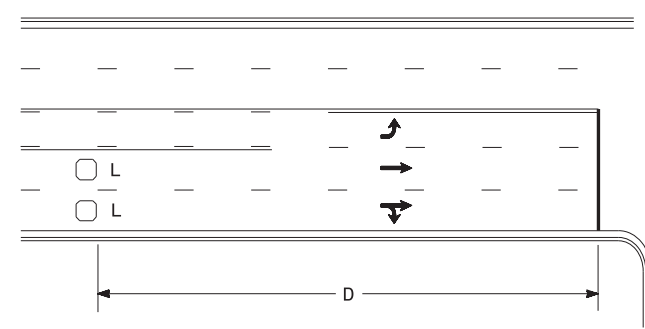


**SHOULDER WEDGE DETAIL**  
 (Resurfacing Adjacent to Rutted Shoulder)

- SHOULDER WEDGE ANGLE = 30°

<b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>	
Office 919-707-6950 FAX 919-250-4119	
<b>SHOULDER WEDGE DETAILS</b>	
ORIGINAL BY: T.SPELL	DATE: 7-19-11
MODIFIED BY:	DATE: 10/16/12
CHECKED BY:	DATE:
FILE SPEC.: s:\usr\detail\stand\shoulderwedgedetail.dgn	

### High Speed Detection (≥40 mph)

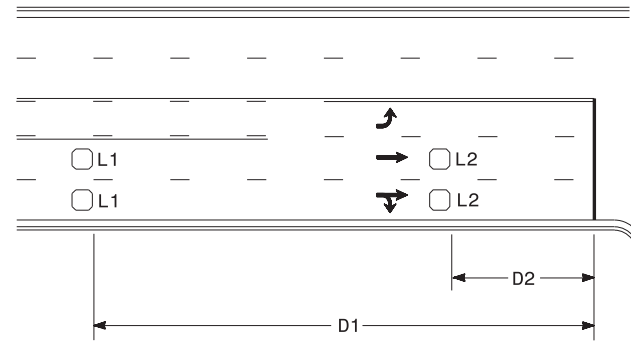


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

L = 6ft X 6ft  
Wired separately

Volume Density Operation

OR



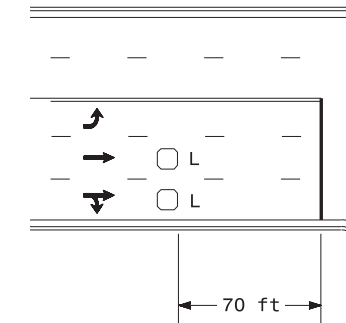
Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft  
Wired in series

L2 = 6ft X 6ft  
Wired in series

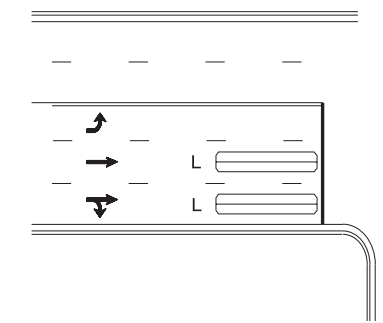
"Stretch" Operation

### Low Speed Detection (≤35 mph)



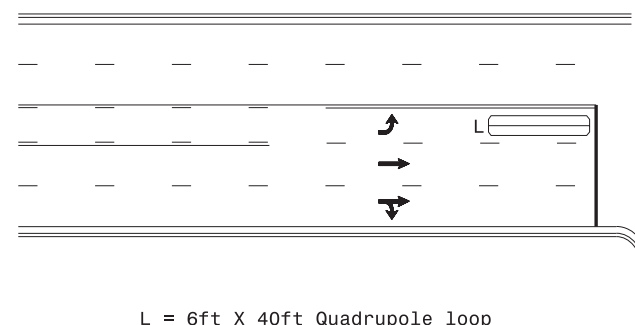
L = 6ft X 6ft  
Wired in series

OR



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

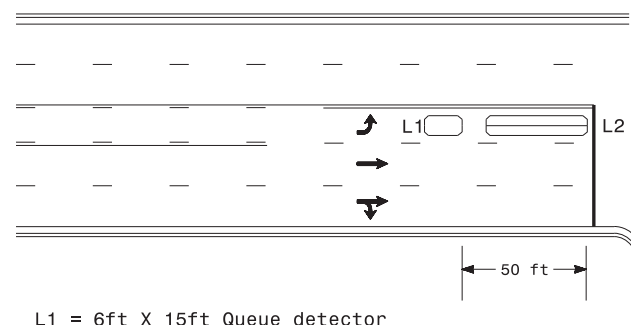
### Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

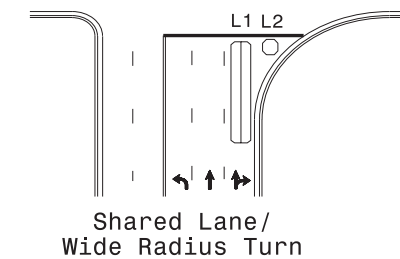
OR



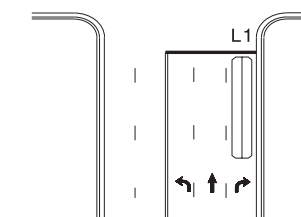
L1 = 6ft X 15ft Queue detector  
L2 = 6ft X 40ft Quadrupole loop

Queue Loop Detection

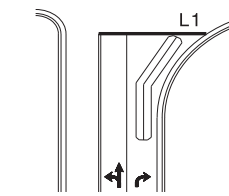
### Right Turn Lane Detection



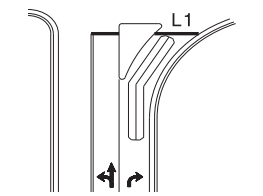
L1 = 6ft X 40ft Quadrupole loop  
L2 = 6ft X 6ft [Minimum] Presence loop  
Wired separately



Standard Turn

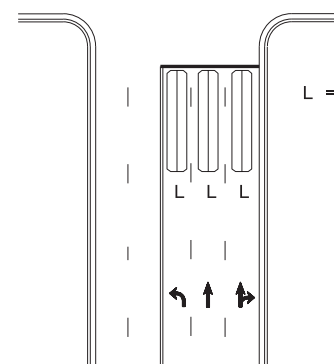


Wide Radius Turn



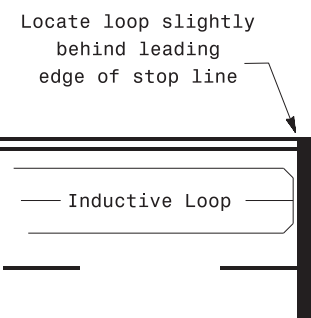
Channelized Turn

### Side Street Detection



L = 6ft X 40ft  
Quadrupole loop  
Wired to separate  
detectors/channels

### Presence Loop Placement at Stop Lines



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

	<b>Typical Signal Loop Locations</b>		
	PLAN DATE: September 2020 PREPARED BY: PLA	REVIEWED BY: JPG REVIEWED BY:	
REVISIONS:	INIT. DATE:	DATE:	DATE: 9/8/2020



**NOTES**

- OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
- MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
- WIRE LOOPS CONNECTED TO THE SAME DETECTOR IN SERIES.
- LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS.
- USE A SERIES OF ONE INCH PIECES OF BACKER ROD SPACED ONE FOOT APART ALONG THE ENTIRE LENGTH OF THE FEEDER SLOT AND LOOP SAW SLOT.
- CONSULT LOOP SEALANT MANUFACTURER TO DETERMINE CURING TIME REQUIRED PRIOR TO MILLING.
- REFER TO STANDARD DRAWING 1725.01 SHEETS 2 AND 3 FOR ADDITIONAL REQUIREMENTS.

**SAW SLOT DEPTH CHART**  
ASSUMING 2" MILLING DEPTH

DEPTH (IN)	MAX NO. OF WIRE LAYERS				
	2	3	4	5	6
SAW SLOT DEPTH	4.0	4.5	5.0	5.0	5.0
MINIMUM TOTAL ASPHALT DEPTH REQUIRED	5.0	5.5	6.0	6.0	6.0

**LOOP WIRE TWISTING METHOD**

INCORRECT WAY TO TWIST WIRE

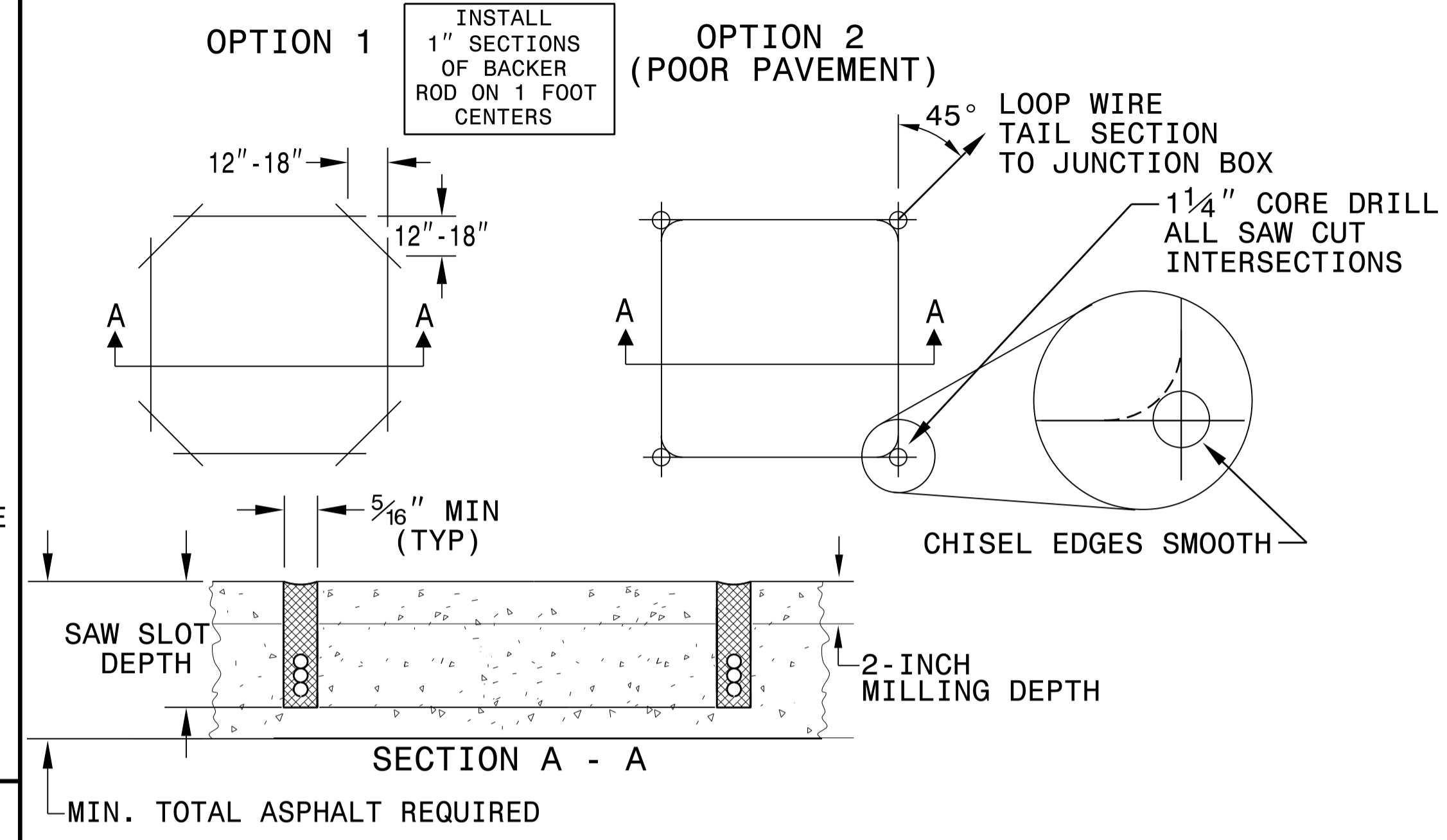


CORRECT WAY TO TWIST WIRE

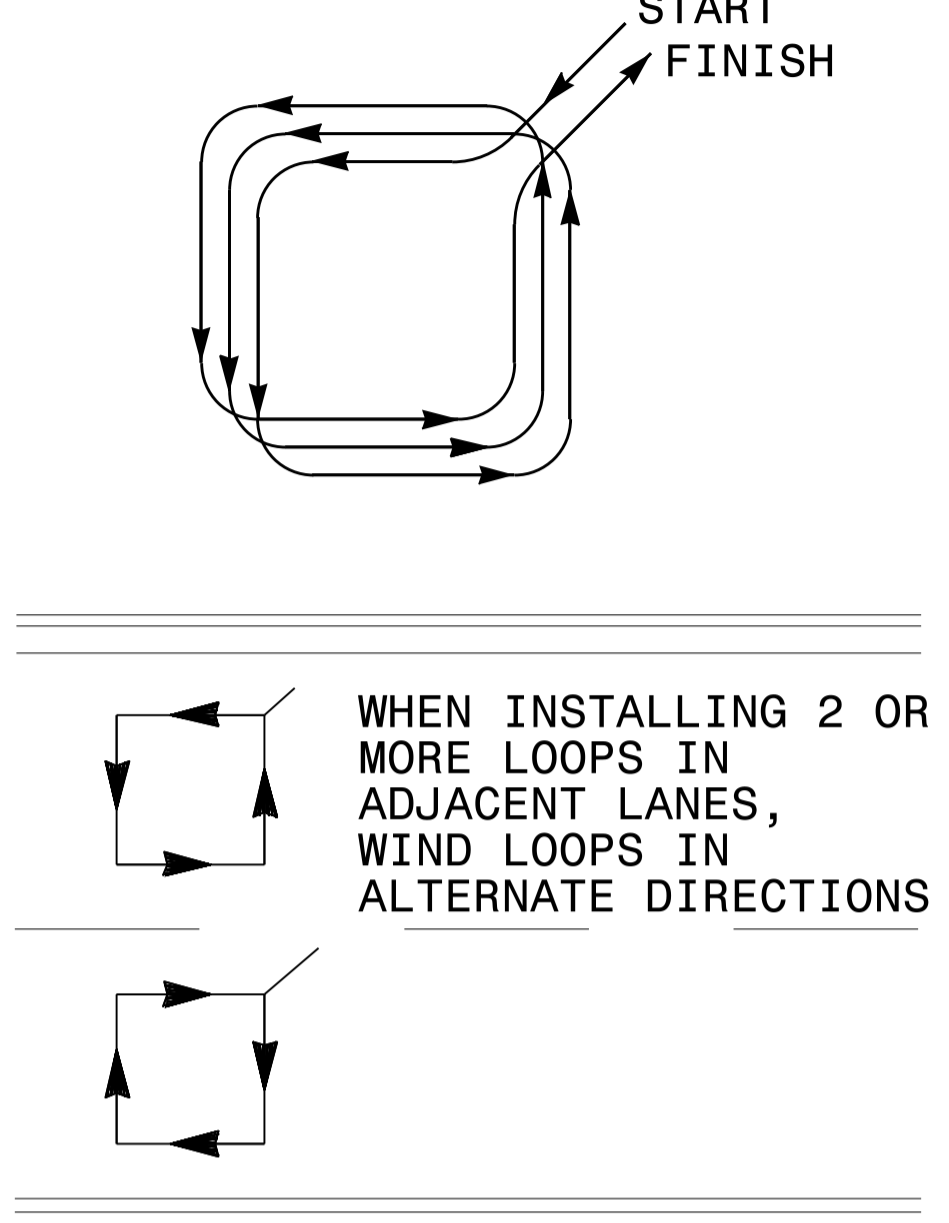


**CONVENTIONAL 4-SIDED LOOP**

**SAW CUT OPTIONS**

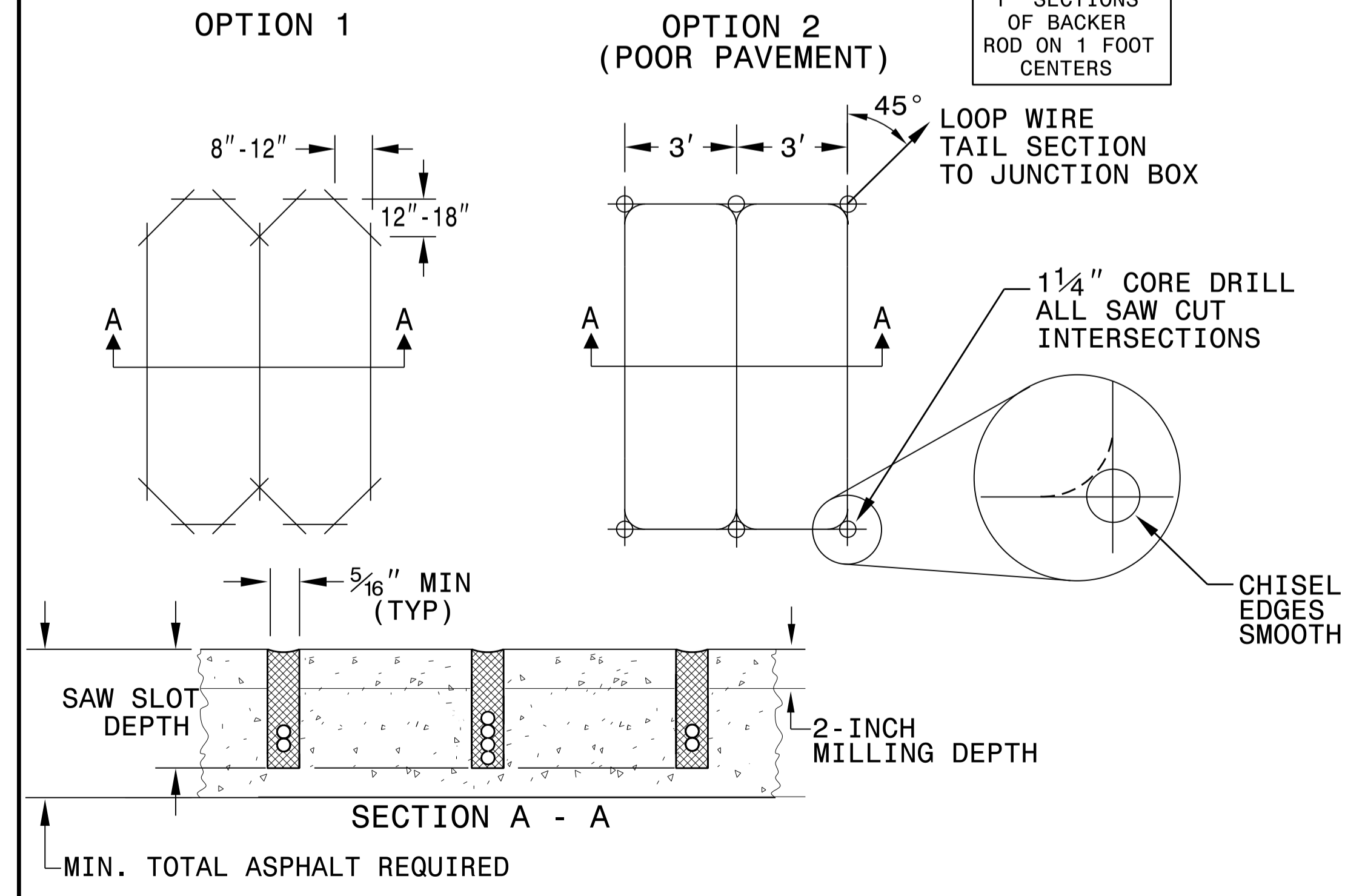


**LOOP WINDING METHOD**

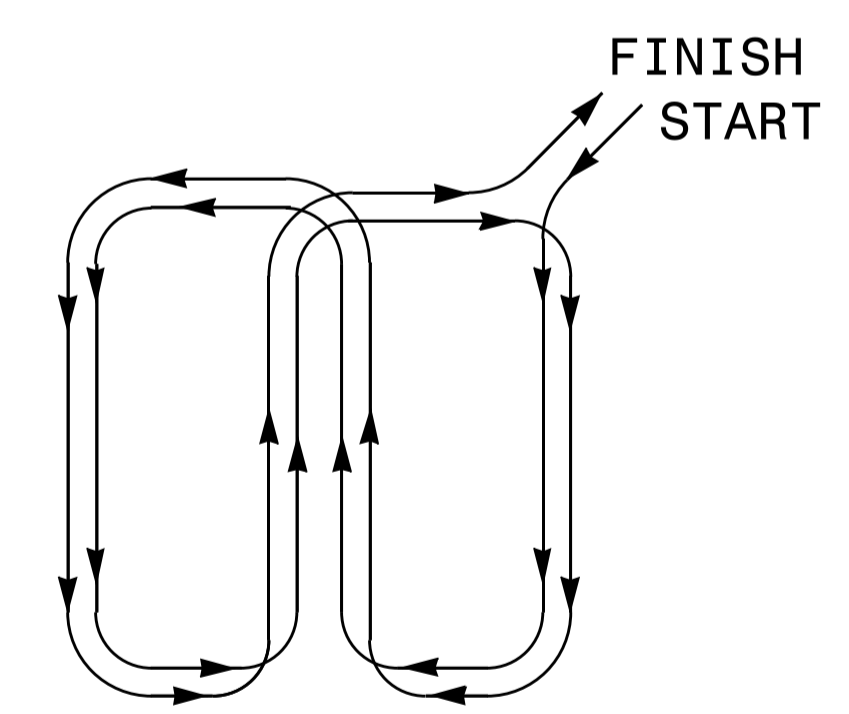


**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



**LOOP WINDING METHOD**



**REVISIONS**

1. REMOVED TWISTING NOTES FROM TAIL SECT. TO JUNCTION BOX. 2/26/08 MWH
2. REVISED SECTION A - A DETAILS. 6/29/15 JTP

