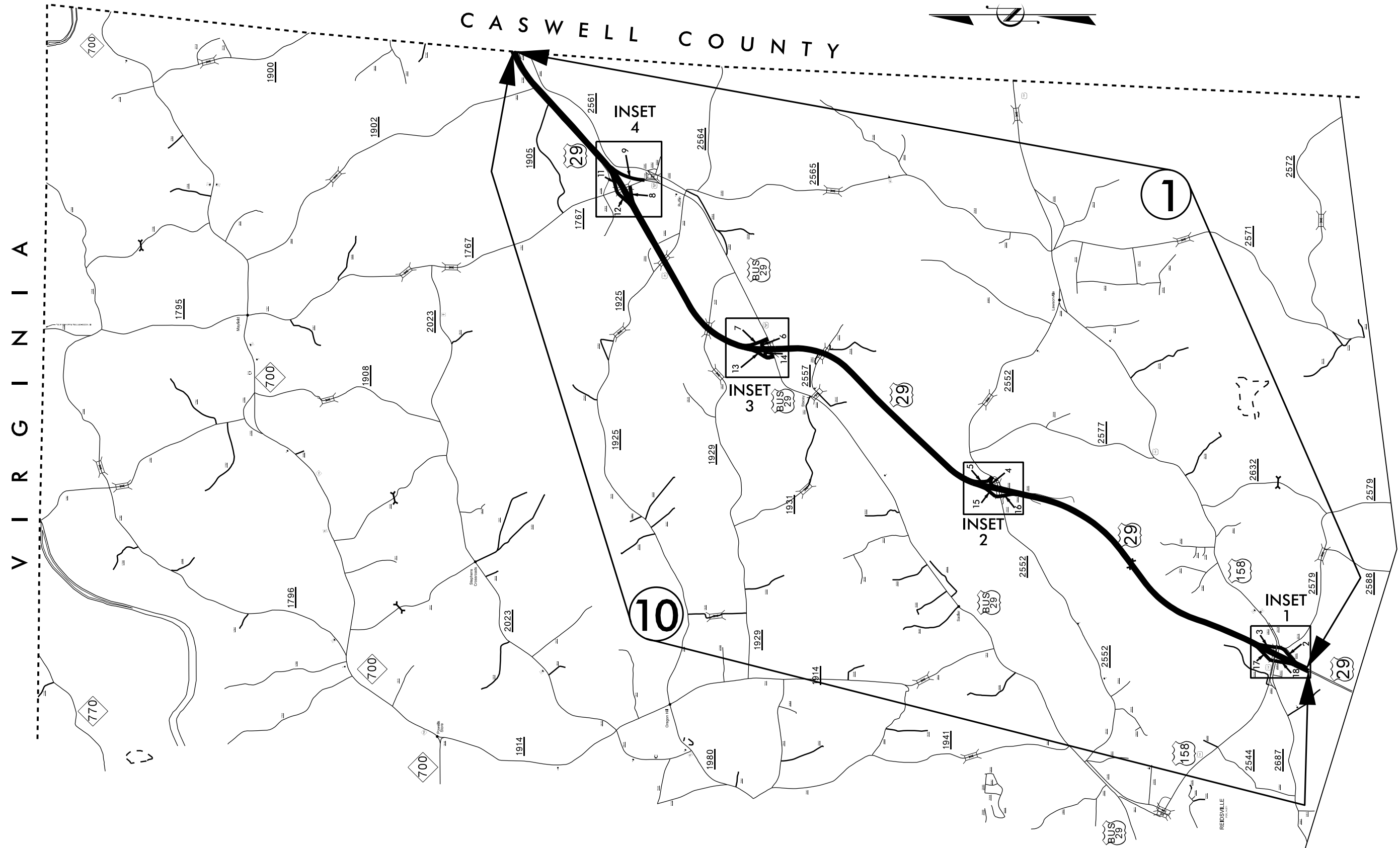


STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	2019CPT.07.01.10791	1	

ROCKINGHAM COUNTY

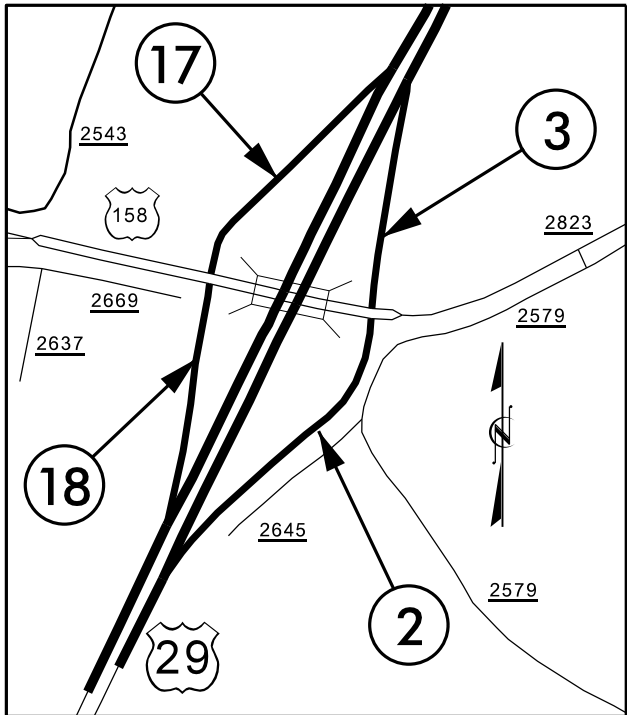


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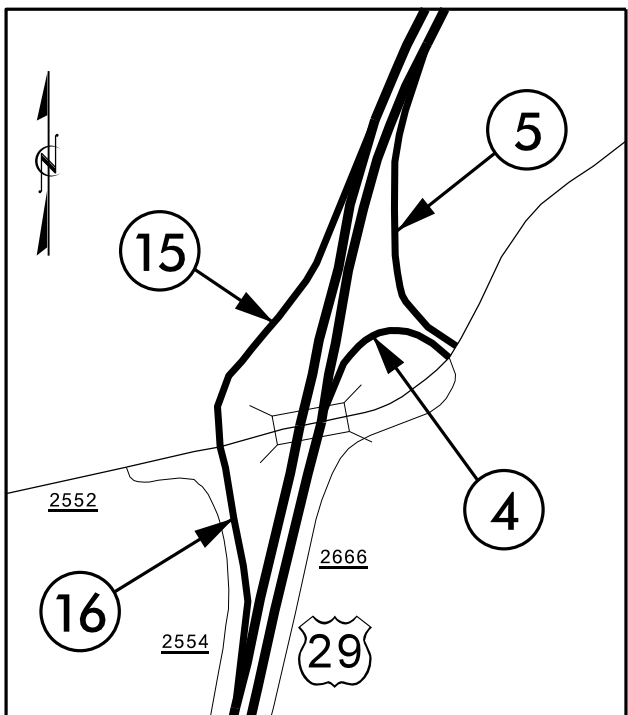
ROCKINGHAM COUNTY

STATE	PROJECT NO.	SHEET NO.
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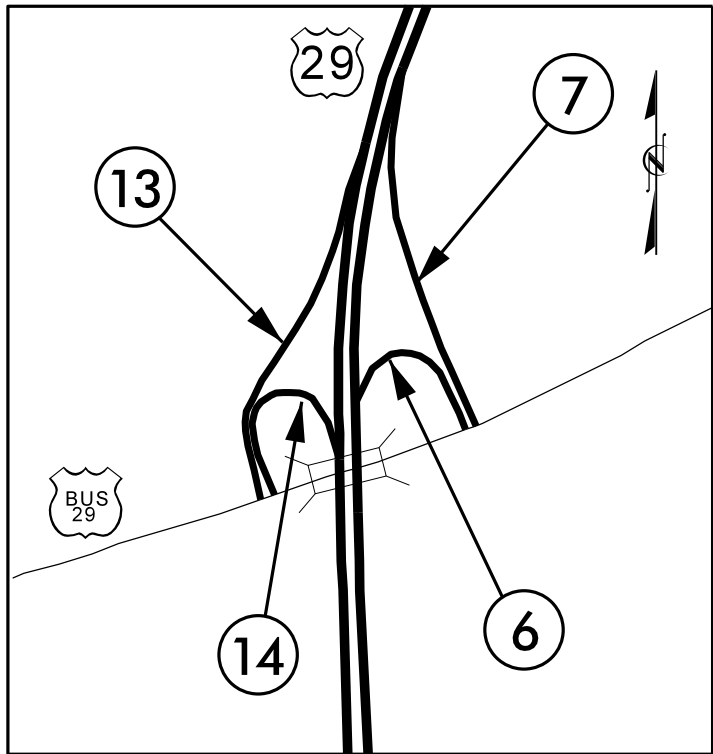
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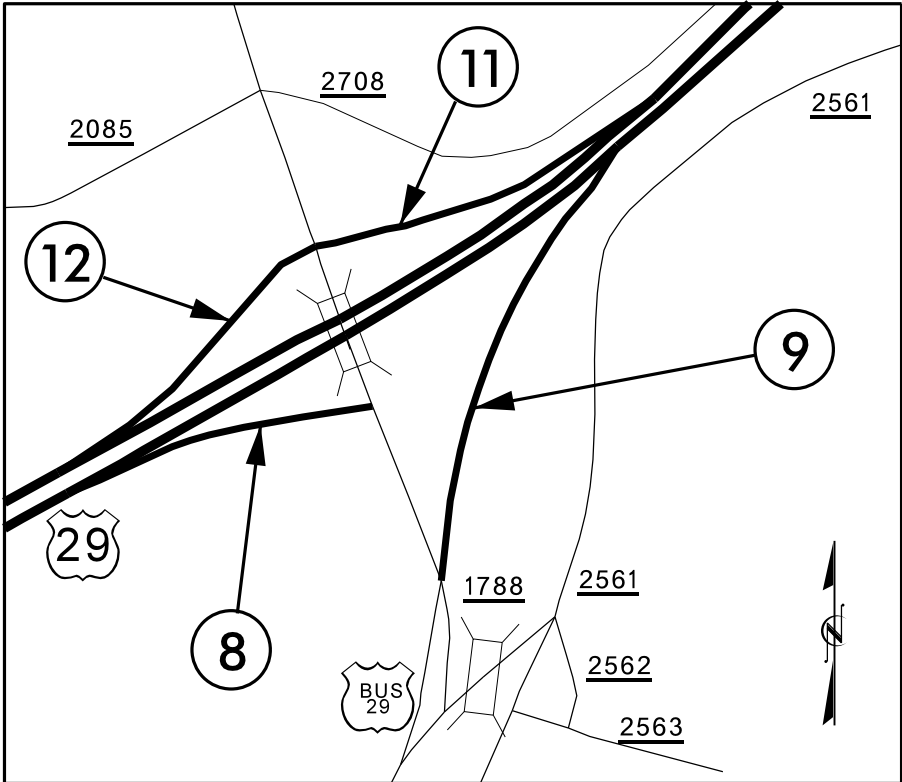
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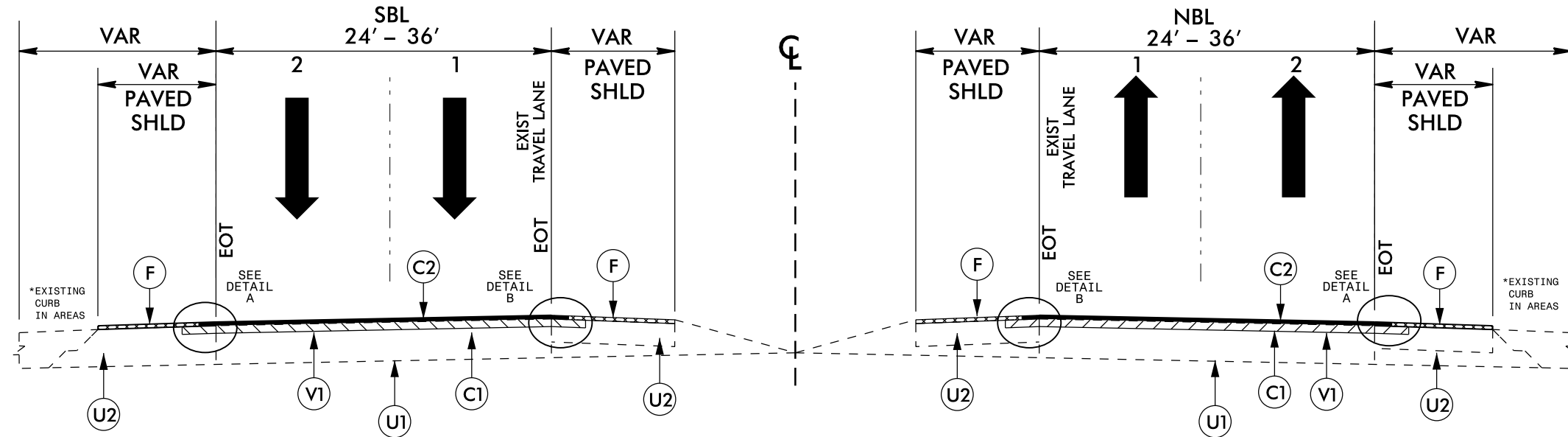


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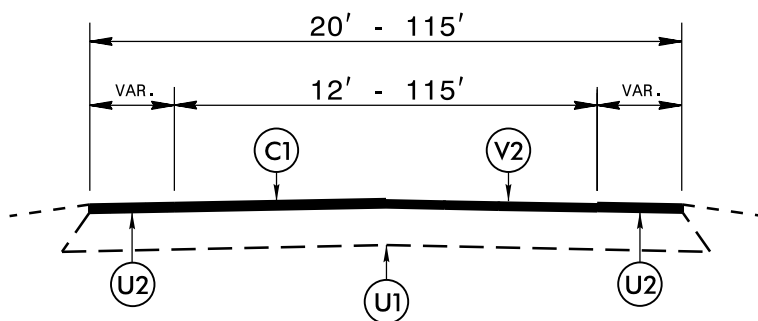
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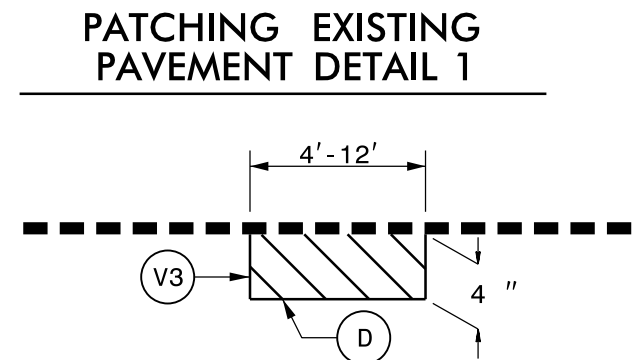


TYPICAL SECTION NO. 1
TO BE USED ON MAPS 1, 10

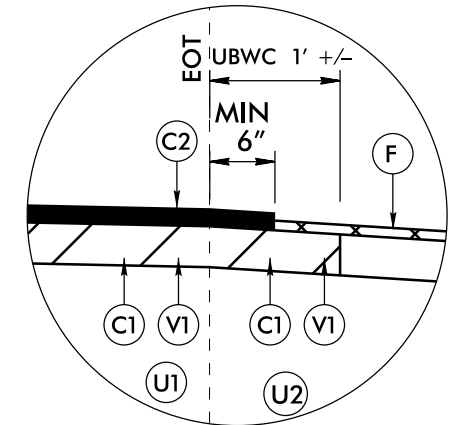
- *NOTE: TYPICAL SECTION CONSTRUCTION SEQUENCE:
1. MILL TRAVEL LANES 2 1/8" TO EDGE OF UBWC EXCEPT IN AREAS WHERE RUMBLE STRIPS ARE IN UBWC MILL TO EDGE OF RUMBLE STRIP (ACCEL AND DECEL LANES) AND FILL WITH 1 1/2" SURFACE COURSE, TYPE S9.5C
 2. OVERLAY TRAVEL LANES PLUS 6" WITH 5/8" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED.
 3. OVERLAY SHOULDERS WITH FOG SEAL



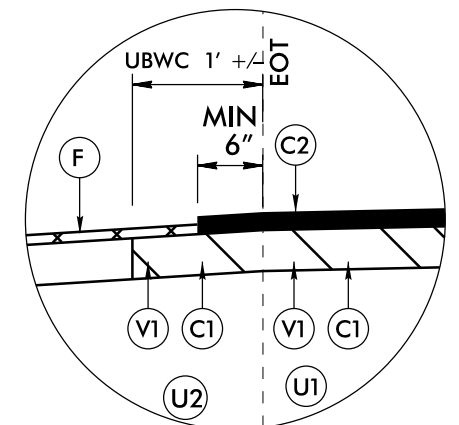
TYPICAL SECTION NO. 2
TO BE USED ON MAPS: 2-9, 11-18



MILL EXISTING ASPHALT PAVEMENT 4" IN DEPTH AND FILL WITH INTERMEDIATE COURSE, TYPE I19.0C AT LOCATIONS AS DIRECTED BY THE ENGINEER.



DETAIL A
OVER LAP SHOULDERS



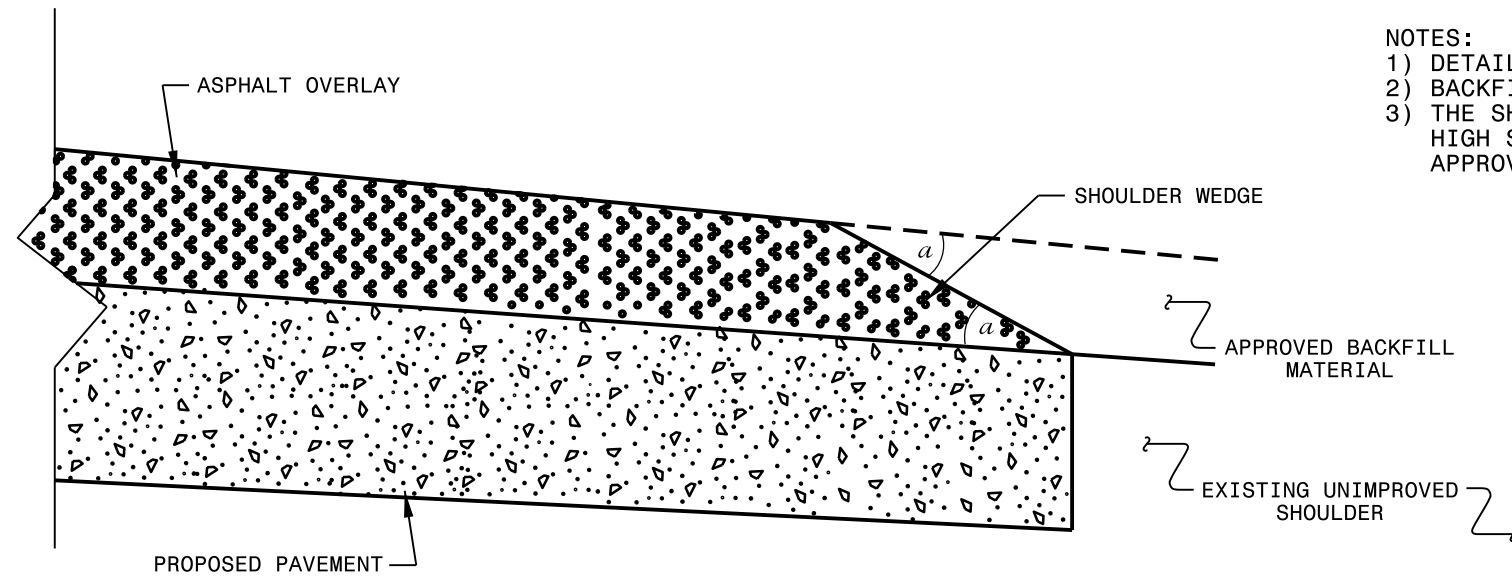
DETAIL B
OVER LAP SHOULDERS

PAVEMENT SCHEDULE

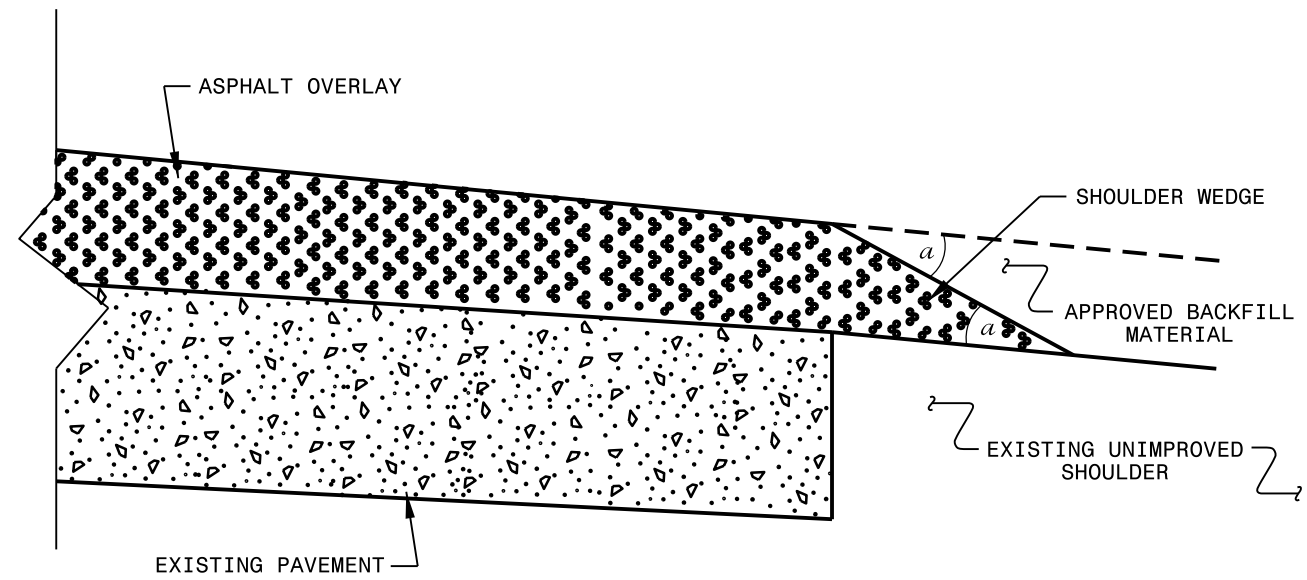
C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.		
C2	PROP. APPROX. 5/8" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 70 LBS PER SQ. YD.		
D	PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS PER SQ. YD.		
F	PROPOSED FOG SEAL TO BE APPLIED TO THE EXISTING PAVED SHOULDER		
U1	EXISTING TRAVELWAY.	U2	EXISTING PAVED SHOULDER.
V1	MILLING ASPHALT PAVEMENT 2 1/8" DEPTH	V2	MILLING ASPHALT PAVEMENT 1 1/2" DEPTH
V3	MILLING ASPHALT PAVEMENT 4" DEPTH		

UBWC = ULTRA-THIN BONDED WEARING COURSE

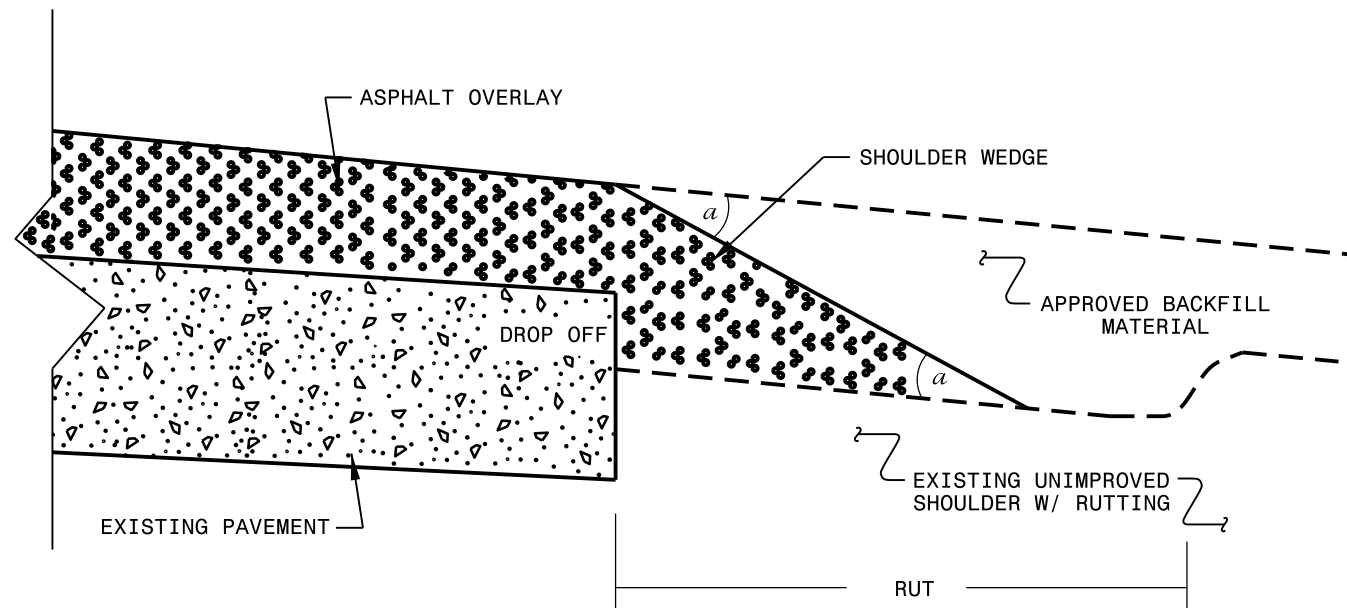
- NOTES:
- 1) DETAIL DOES NOT APPLY TO OGAFC AND ULTRA-THIN BONDED WEARING COURSE.
 - 2) BACKFILL SHOULDER WITH APPROVED MATERIAL.
 - 3) THE SHOULDER WEDGE DEVICE MAY BE DISENGAGED AT PAVED DRIVEWAYS, SIDE STREETS, HIGH SHOULDERS, AND OTHER LOCATIONS NOT FEASIBLE TO CONSTRUCT AS APPROVED BY THE ENGINEER.



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\shoulderwedgedetail.dgn			

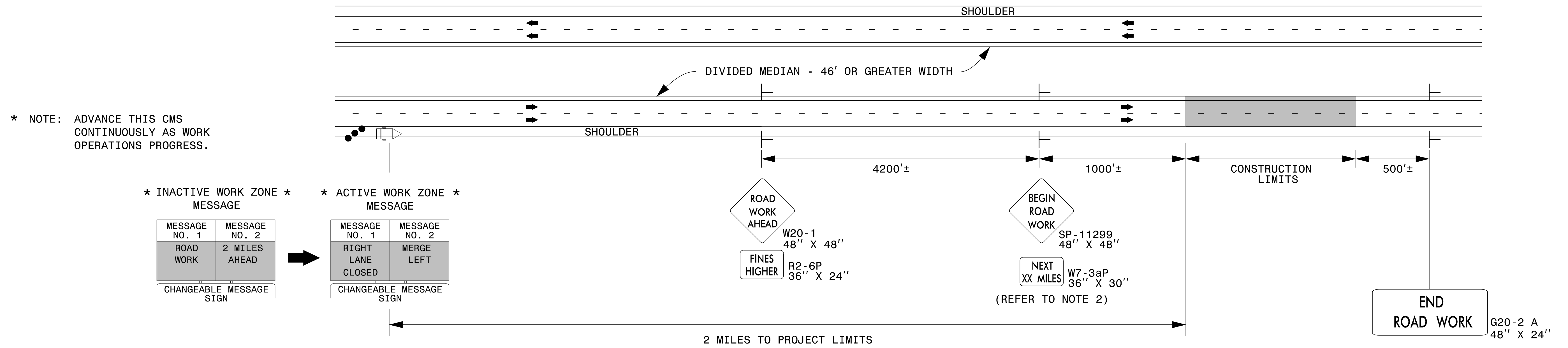
SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	FINAL SURFACE TESTING REQUIRE D	WARM MIX ASPHALT REQUIRE D	LENGTH	WIDTH	122000000-	129700000-E	152300000	15750000	157700000	166200000	170400000	18200000	46000000	46000000	46000000	525500000	7444.-E													
												INCIDENTAL STONE BASE	MILLING ASPHALT PAVEMENT, 2-1/8" DEPTH	MILLING ASPHALT PAVEMENT, 1 1/2" DEPTH	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	ASPHALT BINDER FOR PLANT MIX	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	OPEN- GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED	PATCHING EXISTING PAVEMENT	FOG SEAL	DIGITAL SPEED LIMIT SIGNS	SEQUEN- TIAL FLASH- ING LIGHTS	WORK ZONE PRE- SENCE LIGHT- ING	PORTABLE LIGHTING	INDUC- TIVE LOOP SAW CUT												
												MI	FT	TONS	SY	SY	TONS	TONS	TONS	TONS	EA	EA	EA	LS	LF												
2019CPT.07.01.10791	Rockingham	1	US 29 NB	FROM US 158 (MP 8.32) TO CASWELL CO. (MP 19.04)	1	2	MD	NO	NO	10.72	26			169,469		14,301	844	356	5,829	28	88,048	5	21	15													
		2	RAMP FROM US 29 NB TO US 158	MP 0.04 TO MP 0.285	2	2	MD	NO	NO	0.251	30	10			4,418	373	22										700										
		3	RAMP FROM US 158 TO US 29 NB	MP 0.01 TO MP 0.19	2	2	MD	NO	NO	0.178	30	10			3,133	264	16																				
		4	RAMP FROM US 29 NB TO SR 2552 (NARROW GAUGE RD.)	MP 0.02 TO MP 0.14	2	2	MD	NO	NO	0.132	20				1,549	131	8																				
		5	RAMP FROM SR 2552 (NARROW GAUGE RD.) TO US 29 NB	MP 0.01 TO 0.23	2	2	MD	NO	NO	0.227	23	10			3,063	259	15																				
		6	RAMP FROM US 29 NB TO US 29 BUS.	MP 0.02 TO MP 0.14	2	2	MD	NO	NO	0.13	20				1,525	129	8																				
		7	RAMP FROM US 29 BUS. TO US 29 NB	MP 0.01 TO MP 0.29	2	2	MD	NO	NO	0.277	24	10			3,900	329	19																				
		8	RAMP FROM US 29 NB TO SR 1767 (MAYFIELD RD.)	MP 0.06 TO MP 0.27	2	2	MD	NO	NO	0.206	24	10			2,901	245	14																				
		9	RAMP FROM SR 1767 (MAYFIELD RD.) TO US 29 NB	MP 0.03 TO MP 0.40	2	2	MD	NO	NO	0.383	24	10			5,393	455	27																				
		10	US 29 SB	FROM CASWELL CO. (MP 0.0) TO US 158 (MP 10.75)	1	2	MD	NO	NO	10.75	26				169,033		14,265	842	353	5,795	46	88,293				*											
		11	RAMP FROM US 29 SB TO SR 1767 (MAYFIELD RD.)	MP 0.06 TO MP 0.31	2	2	MD	NO	NO	0.256	20	10			3,004	254	15																				
		12	RAMP FROM SR 1767 (MAYFIELD RD.) TO US 29 SB	MP 0.0 TO MP 0.25	2	2	MD	NO	NO	0.252	20	10			2,957	250	15																				
		13	RAMP FROM US 29 SB TO US 29 BUS.	MP 0.07 TO MP 0.32	2	2	MD	NO	NO	0.25	22	10			3,227	273	16																				
		14	RAMP FROM US 29 BUS. TO US 29 SB	MP 0.01 TO MP 0.16	2	2	MD	NO	NO	0.152	22				1,962	166	10																				
		15	RAMP FROM US 29 SB TO SR 2552 (NARROW GAUGE RD.)	MP 0.07 TO MP 0.30	2	2	MD	NO	NO	0.239	22	10			3,085	261	15																				
		16	RAMP FROM SR 2552 (NARROW GAUGE RD.) TO US 29 SB	MP 0.00 TO 0.17	2	2	MD	NO	NO	0.172	22	10			2,220	188	11																				
		17	RAMP FROM US 29 SB TO US 158	MP 0.02 TO MP 0.24	2	2	MD	NO	NO	0.212	24	10			2,985	252	15																				
		18	RAMP FROM US 158 TO US 29 SB	MP 0.0 TO MP 0.19	2	2	MD	NO	NO	0.173	22	10			2,233	189	11																				
TOTAL FOR PROJ NO. 2019CPT.07.01.10791												24.96		130	338,502	47,555	32,584	1,923	709	11,624	74	176,341	5	21	15												700
GRAND TOTAL												24.96		130	338,502	47,555	32,584	1,923	709	11,624	74	176,341	5	21	15					1						700	

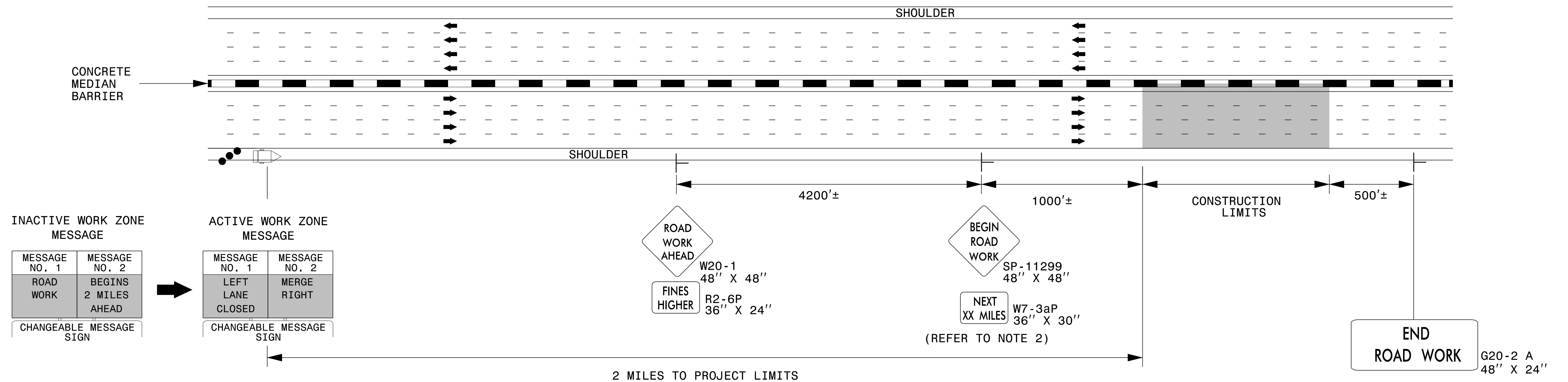
THERMOPLASTIC AND PAINT QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	44000000	44050000	4410000000	4415000000	4420000000	4422000000	4430000000	4445000000	4480000000	4688000000-E				4700000000				4725000000-E				4815000000-E		4825000000	4845000000-N				4905000000-N
										STATIONARY WORK ZONE SIGN	PORTABLE WORK ZONE SIGN	BARRICADE MOUNTED WORK ZONE SIGN	FLASHING ARROW PANELS, TYPE C	CHAGEABLE MESSAGE SIGN	PORTABLE CHANGE- ABLE MESSAGE SIGN (SHORT TERM)	DRUMS	TYPE III BARRICADE	TMA	6" X 90 M YELLOW THERMO	6" X 90 M WHITE THERMO	6" X 120 M WHITE THERMO	12" X 90 M WHITE THERMO	THERMO MERGE LEFT ARROW 90 M	THERMO STR & LT ARROW 90 M	THERMO RT ARROW 90 M	RAMP ARROW 90 M	6" WHITE PAINT	6" YELLOW PAINT	12" WHITE PAINT	PAINT MERGE LEFT ARROW	PAINT STR & LT ARROW	PAINT RT ARROW	PAINT RAMP ARROW	SNOWPLOW- ABLE PAVEMENT MARKERS CRYSTAL/RED				
									MI	FT	SF	SF	SF	EA	EA	DAY	EA	LF	EA	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA					
2019CPT.07.01.10791	Rockingham	1	US 29 NB	FROM US 158 (MP 8.32) TO CASWELL CO. (MP 19.04)	1	2	MD	10.72	26	510	224	26		2	3	32	324	64	2	56,602	56,602	14,150	4,402	12												945		
		2	RAMP FROM US 29 NB TO US 158	MP 0.04 TO MP 0.285	2	2	MD	0.251	30												1,210	1,254					1	1	1	1,254	1,210			1	1	1	14	
		3	RAMP FROM US 158 TO US 29 NB	MP 0.01 TO MP 0.19	2	2	MD	0.178	30												907	920																
		4	RAMP FROM US 29 NB TO SR 2552 (NARROW GAUGE RD.)	MP 0.02 TO MP 0.14	2	2	MD	0.132	20												653	676							1	676	653					1	14	
		5	RAMP FROM SR 2552 (NARROW GAUGE RD.) TO US 29 NB	MP 0.01 TO 0.23	2	2	MD	0.227	23													1,192	1,212								1,212	1,192						
		6	RAMP FROM US 29 NB TO US 29 BUS.	MP 0.02 TO MP 0.14	2	2	MD	0.13	20													678	740							1	740	678				1	14	
		7	RAMP FROM US 29 BUS. TO US 29 NB	MP 0.01 TO MP 0.29	2	2	MD	0.277	24													1,436	1,440								1,440	1,436						
		8	RAMP FROM US 29 NB TO SR 1767 (MAYFIELD RD.)	MP 0.06 TO MP 0.27	2	2	MD	0.206	24													1,080	1,108							1	1,108	1,080				1	14	
		9	RAMP FROM SR 1767 (MAYFIELD RD.) TO US 29 NB	MP 0.03 TO MP 0.40	2	2	MD	0.383	24													2,638	2,635								2,635	2,638						
		10	US 29 SB	FROM CASWELL CO. (MP 0.0) TO US 158 (MP 10.75)	1	2	MD	10.75	26													56,760	56,760	14,190	4,262	12										945		
		11	RAMP FROM US 29 SB TO SR 1767 (MAYFIELD RD.)	MP 0.06 TO MP 0.31	2	2	MD	0.256	20													1,356	1,384							1	1,384	1,356				1	14	
		12	RAMP FROM SR 1767 (MAYFIELD RD.) TO US 29 SB	MP 0.0 TO MP 0.25	2	2	MD	0.252	20													1,340	1,326								1,326	1,340						
		13	RAMP FROM US 29 SB TO US 29 BUS.	MP 0.07 TO MP 0.32	2	2	MD	0.25	22													1,312	1,376							1	1,376	1,312				1	14	
		14	RAMP FROM US 29 BUS. TO US 29 SB	MP 0.01 TO MP 0.16	2	2	MD	0.152	22													782	738								738	782						
		15	RAMP FROM US 29 SB TO SR 2552 (NARROW GAUGE RD.)	MP 0.07 TO MP 0.30	2	2	MD	0.239	22													1,274	1,308							1	1,308	1,274				1	14	
		16	RAMP FROM SR 2552 (NARROW GAUGE RD.) TO US 29 SB	MP 0.00 TO 0.17	2	2	MD	0.172	22													882	900								900	882						
		17	RAMP FROM US 29 SB TO US 158	MP 0.02 TO MP 0.24	2	2	MD	0.212	24													1,112	1,148							1	1,148	1,112				1	14	
		18	RAMP FROM US 158 TO US 29 SB	MP 0.0 TO MP 0.19	2	2	MD	0.173	22													930	920								920	930				1	14	
TOTAL FOR PROJ NO. 2019CPT.07.01.10791									24.96		510	224	26	2	3	32	324	64	2	132,144	132,447	28,340	8,664	24	1	1	8	302,489	245,506	17,328	48	1	1	8	2,002			
GRAND TOTAL									24.96		510	224	26	2	3	32	324	64	2	132,144	132,447	28,340	8,664	24	1	1	8	302,489	245,506	17,328	48	1	1	8	2,002			

DIVIDED MEDIANS WITH WIDTHS 46' OR GREATER



DIVIDED MEDIANS WITH WIDTHS LESS THAN 46' OR WITH PERMANENT MEDIAN BARRIER



NOTES

1. THIS DRAWING IS TO BE USED IN CONJUNCTION WITH THE WORK ZONE VARIABLE SPEED LIMIT USING DIGITAL SPEED LIMIT SIGNS FOR INTERSTATE/FREEWAY RESURFACING PROJECTS DETAIL.
2. FOR SIGN W7-3aP, ROUND TO THE NEAREST MILE.
3. FOR ENTRANCE AND EXIT RAMP, REFER TO RSD 1101.01, SHEET 1, DETAIL B & C.
4. FOR ADDITIONAL NOTES, REFER TO RSD 1101.01, SHEET 1.

LEGEND

- CHANGEABLE MESSAGE SIGN (CMS)
- STATIONARY SIGN
- DIRECTION OF TRAFFIC FLOW
- TRAFFIC DRUM

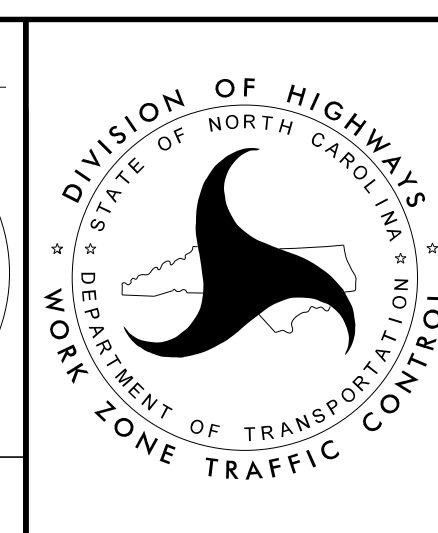
APPROVED: *Steve Kite*

DATE: 2/23/2017

DocuSigned by:
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SEAL 022104
JOHN S. KITE, II
ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

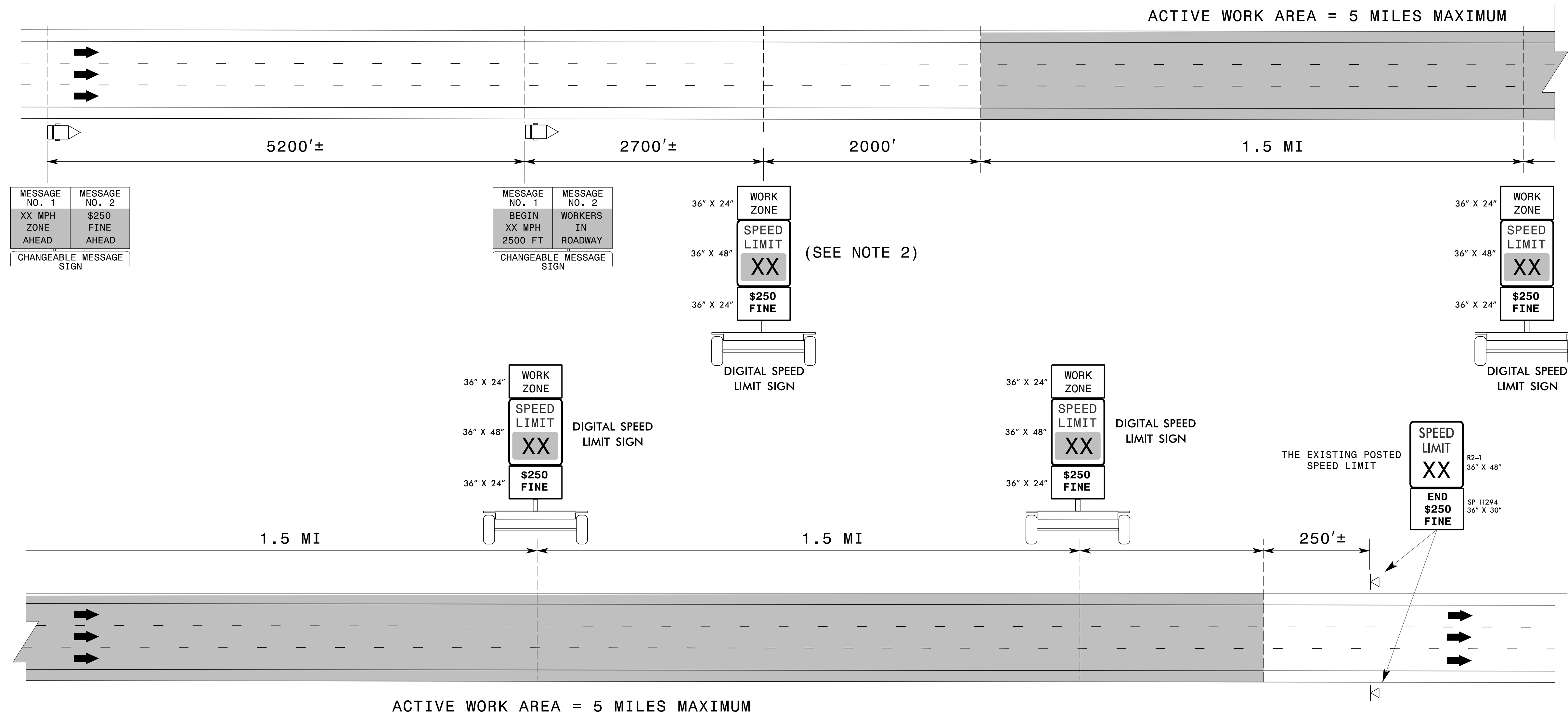


STATIONARY ADVANCE WARNING SIGNS FOR INTERSTATE/FREEWAY RESURFACING PROJECTS

INTERSTATE RESURFACING OPERATIONS WITH DIGITAL SPEED LIMIT SIGNS

2019CPT.07.01.10791

SHEET NO.
TMP-2



WHEN THERE IS NOT ACTIVE WORK IN THE TRAVEL LANE

SPEED LIMIT DISPLAY	CONDITIONS	
	DROP-OFFS BETWEEN OPEN TRAVEL LANES	PAVED SHOULDER DROP-OFFS
USE EXISTING SPEED LIMIT	< 1.0"	≤ 3.0"
REDUCE SPEED LIMIT 5 MPH	1.0" - 2.0"	> 3.0"

DROP-OFFS BETWEEN OPEN TRAVEL LANES SHOULD NOT EXCEED 2.0"

- ### NOTES
1. THE SPEED LIMITS DISPLAYED WITHIN THE ACTIVE WORK AREA MAY VARY BETWEEN 55 MPH AND 70 MPH, DEPENDENT UPON ROAD WORK CONDITIONS AND THE EXISTING SPEED LIMIT. 55 MPH IS ONLY DISPLAYED DURING ACTIVE LANE CLOSURE OPERATIONS.
 2. AT THE FIRST DIGITAL SPEED LIMIT LOCATION, PLACE A DIGITAL SPEED LIMIT SIGN ON BOTH THE INSIDE AND OUTSIDE SHOULDERS, UNLESS DIRECTED OTHERWISE BY THE ENGINEER WHEN THERE IS NOT ENOUGH ROOM ON THE INSIDE SHOULDER DUE TO NARROW MEDIAN AND PERMANENT MEDIAN BARRIER. AT SUBSEQUENT LOCATIONS DOWNSTREAM, PLACE A SINGLE DIGITAL SPEED LIMIT SIGN ON THE OUTSIDE SHOULDER.
 3. THE ENGINEER MAY DETERMINE TO INSTALL THE DIGITAL SPEED LIMIT SIGNS ON THE OUTSIDE SHOULDER OR ON THE MEDIAN SIDE IF THE SIGNS ARE NOT HIGHLY VISIBLE TO ALL MOTORISTS. AT THE FIRST DIGITAL SPEED LIMIT
 4. THIS APPLICATION IS FOR SHORT-TERM ACTIVITIES. THE MAXIMUM ACTIVE WORK AREA IS 5 MILES.
 5. THE DIGITAL SPEED LIMIT SIGNS TAKE PRECEDENCE OVER EXISTING SPEED LIMIT SIGNS. ALL EXISTING SPEED LIMIT SIGNS SHALL BE COVERED OR REMOVED.
 6. THE DIGITAL SPEED LIMITS SIGNS WILL BE INSTALLED (TRAILER MOUNTED OR STATIONARY MOUNTED) IN ADVANCE AND SPACED APPROXIMATELY 1.5 MILES THROUGHOUT THE ACTIVE WORK AREA, UNLESS DIRECTED OTHERWISE.
 7. NCDOT HAS SOLE AUTHORITY OF THE SPEED LIMITS DISPLAYED ON THE DIGITAL SPEED LIMIT SIGNS.
 8. THE WORK ZONE VARIABLE SPEED LIMIT AND THE \$250 SPEEDING PENALTY ARE SEPARATE ORDINANCES THAT MUST BE SIGNED BY THE STATE TRAFFIC ENGINEER TO BE VALID AND ENFORCEABLE. WITHOUT A SIGNED ORDINANCE, THE SPEED LIMIT ON A FACILITY SHALL REMAIN UNCHANGED.

APPROVED: *Steve Kite*
DATE: 2/23/2017

NORTH CAROLINA
PROFESSIONAL
SEAL
022104
ENGINEER
JOHN S. KITE, II

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

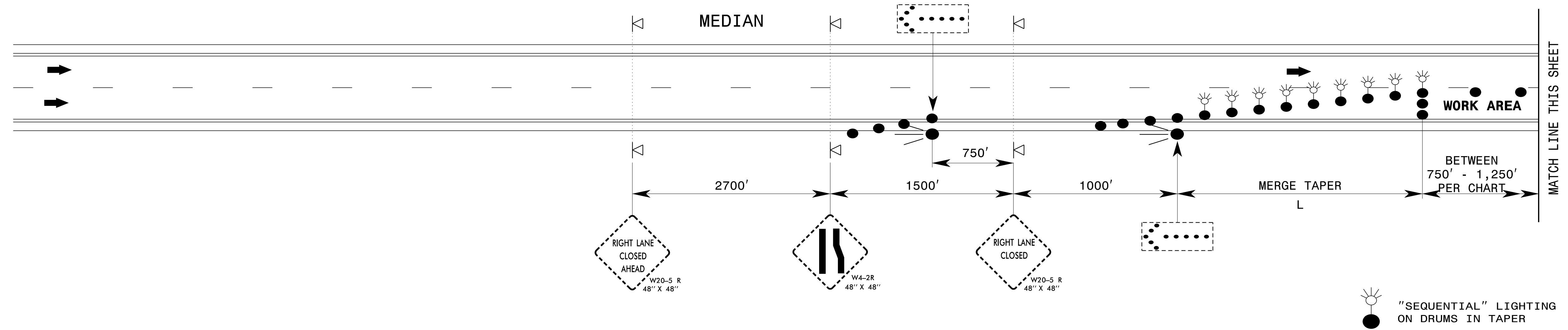
WORK ZONE "VARIABLE"
SPEED LIMIT USING
DIGITAL SPEED LIMIT
SIGNS FOR INTERSTATE/
FREEWAY RESURFACING
PROJECTS

2/23/2017 S:\TMU\WZTC\DesignGroup3\Squad3B\0Data\Interstate Resurfacing Provisions and Details\WVSL\Interstate_DSL.dgn User:kedais

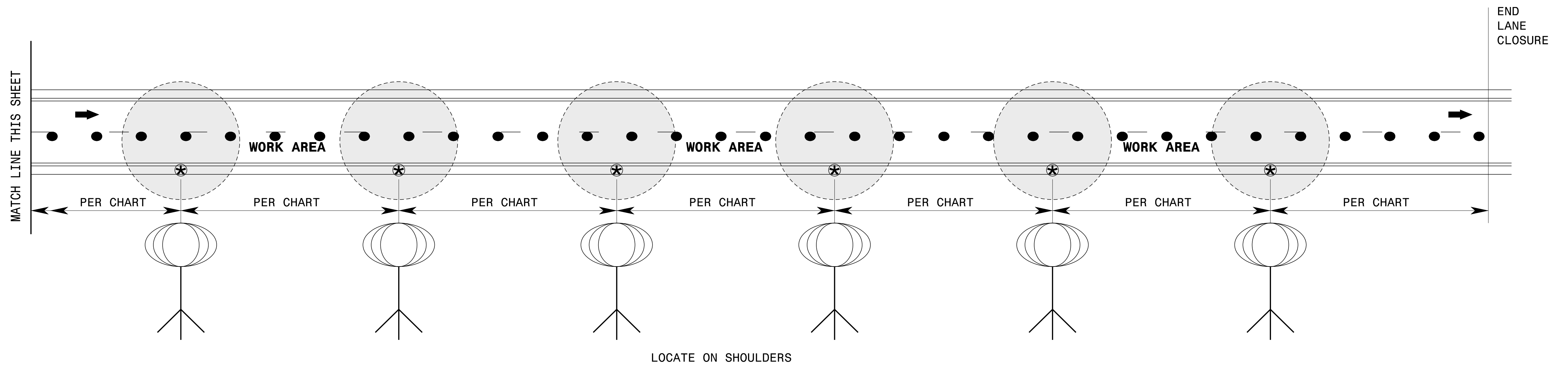
ADVANCE WARNING AREA

2019CPT.07.01.10791

SHEET NO.
TMP-3



WORK ZONE AREA



SPACING CHART

LIGHT OUTPUT (LUMENS)	MINIMUM LIGHTED FIXTURE AREA (SQUARE FEET)	MAXIMUM SPACING (FEET)	LIGHT UNITS (PER MILE)
50,000 TO 65,000	5.5	750'	6
66,000 TO 80,000	5.5	1,000'	5
81,000 TO 100,000	36	1,250'	4

NOTES

- 1) SPACE LIGHT UNITS ACCORDING TO THE CHART.
- 2) EACH LIGHT UNIT SHALL BE CAPABLE OF ELEVATING TO A MINIMUM HEIGHT OF 14' ABOVE THE PAVEMENT.
- 3) PLACE ON PAVED SHOULDER IF POSSIBLE.

APPROVED: *Steve Kite*
DATE: 3/17/2017

DocuSigned by:
E27CE30E1DFC442...

SEAL
022104
ENGINEER
JOHN S. KITE, II

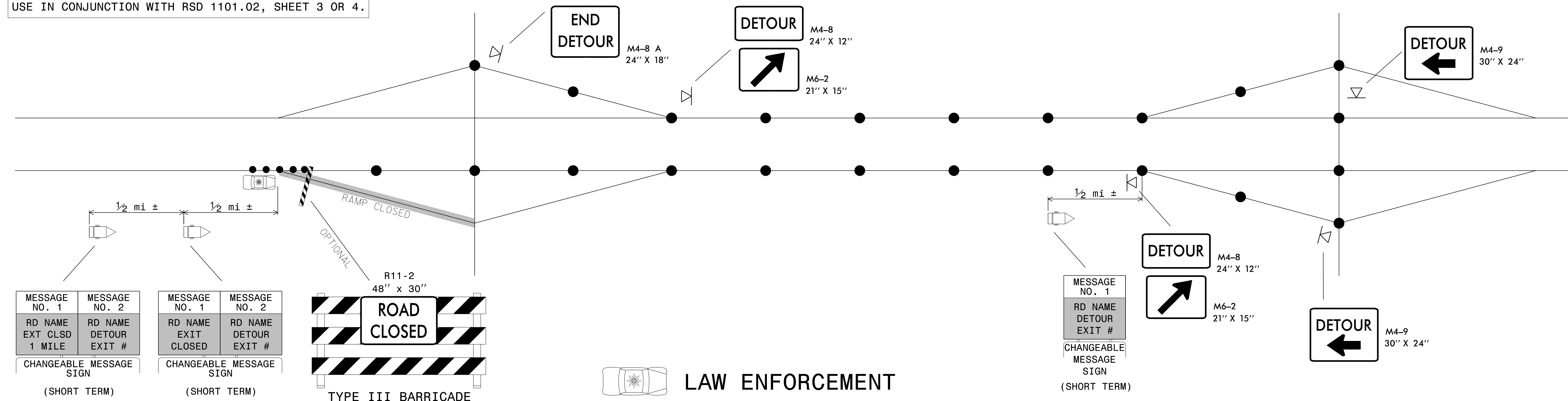
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

SEQUENTIAL FLASHING
WARNING LIGHTS
AND
WORK ZONE
PRESENCE LIGHTING

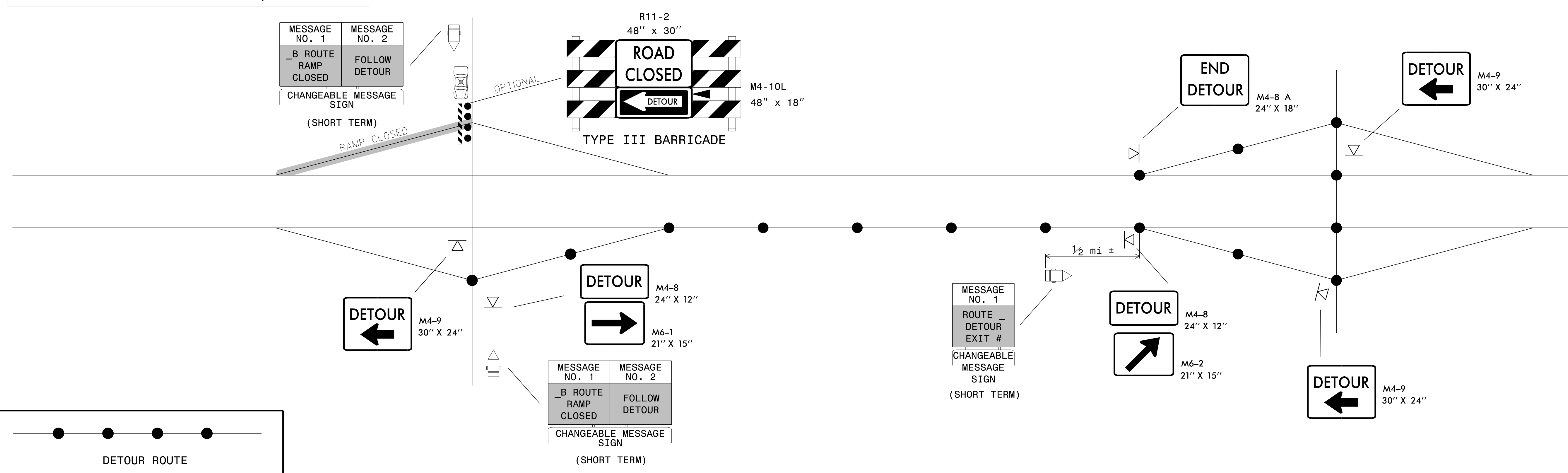
SHORT TERM CLOSURE AND DETOUR OF OFF-RAMP TO ADJACENT INTERCHANGE

USE IN CONJUNCTION WITH RSD 1101.02, SHEET 3 OR 4.



SHORT TERM CLOSURE AND DETOUR OF ON-RAMP TO ADJACENT INTERCHANGE

USE IN CONJUNCTION WITH RSD 1101.02, SHEET 3 OR 4.



GENERAL NOTES:

1. THIS DRAWING IS INTENDED FOR USE DURING SHORT TERM CLOSURES OF INTERSTATE AND FREEWAY RAMPS.
2. RAMP CLOSURES SHALL BE APPROVED BY THE ENGINEER.
3. IF RAMP CLOSURE RESTRICTIONS APPLY, SEE SPECIAL PROVISION, "INTERMEDIATE CONTRACT TIMES AND LIQUIDATED DAMAGES".
4. ADDITIONAL CHANGEABLE MESSAGE SIGNS AND POSSIBLE DETOUR SIGNS MAY BE NECESSARY FOR MORE COMPLEX CLOSURES/DETOURS. COMPENSATION FOR ADDITIONAL DEVICES SHALL BE MADE BASED ON THE UNIT BID PRICE FOR THE RESPECTIVE DEVICE.

APPROVED: *Steve Kite*
DATE: 2/23/2017

DocuSigned by:
Steve Kite
E27CE30E10FC442...

SEAL
022104
JOHN S. KITE, II
ENGINEER

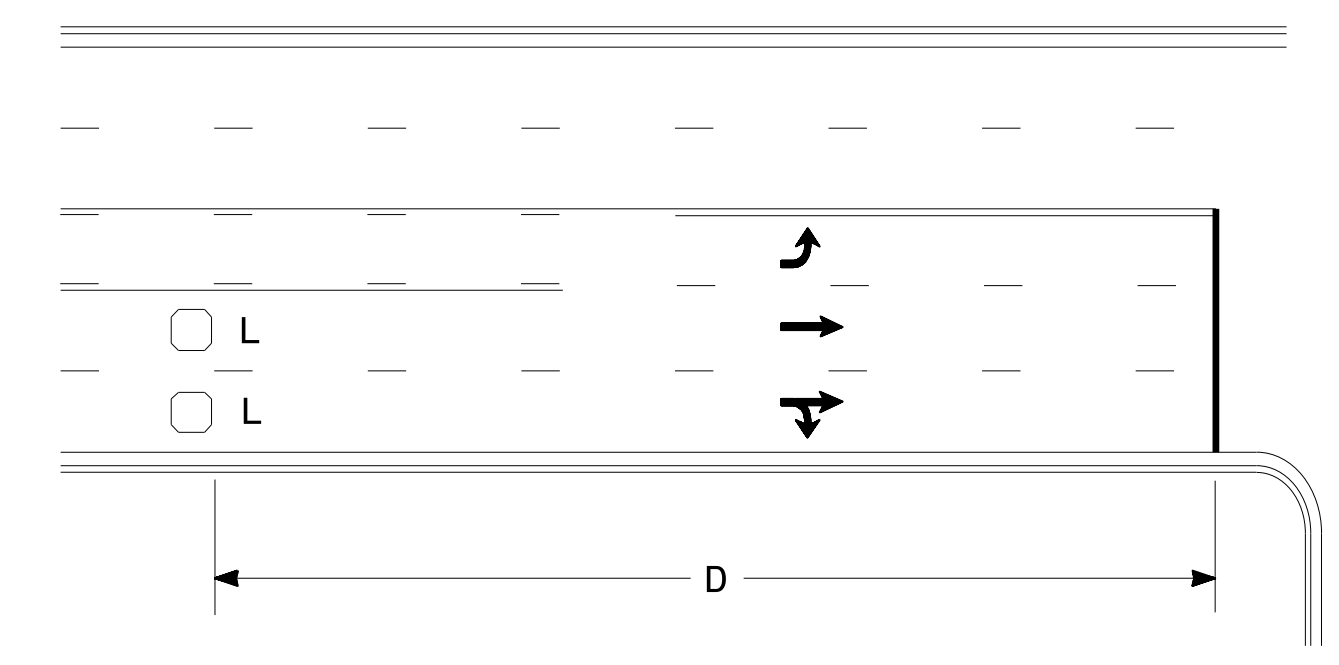
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
WORK ZONE TRAFFIC CONTROL

SHORT TERM CLOSURE
AND DETOUR OF
INTERSTATE/FREEWAY
RAMPS

2/23/2017 S:\TMU\WZTC\DesignGroup3\Squad3B\0Data\Interstate Resurfacing Provisions and Details\TypicalOff-Ramp Detour.dgn User:keddis

High Speed Detection (≥40 mph)

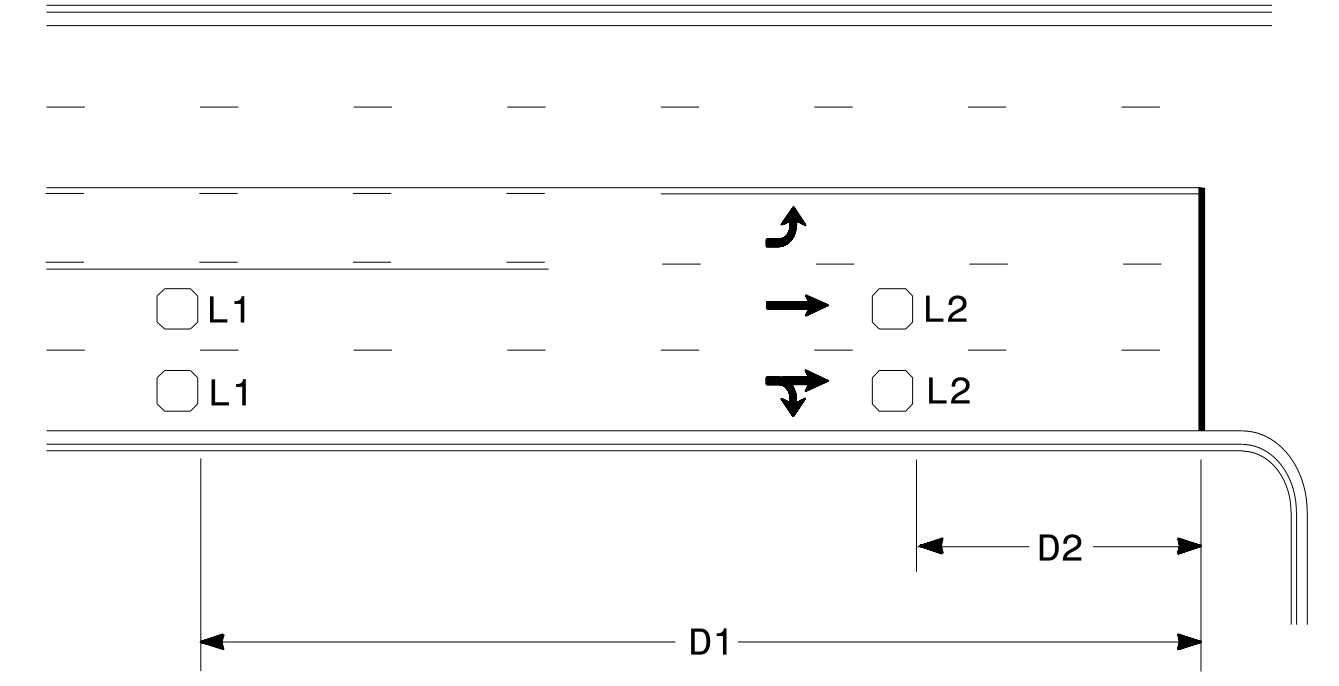


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

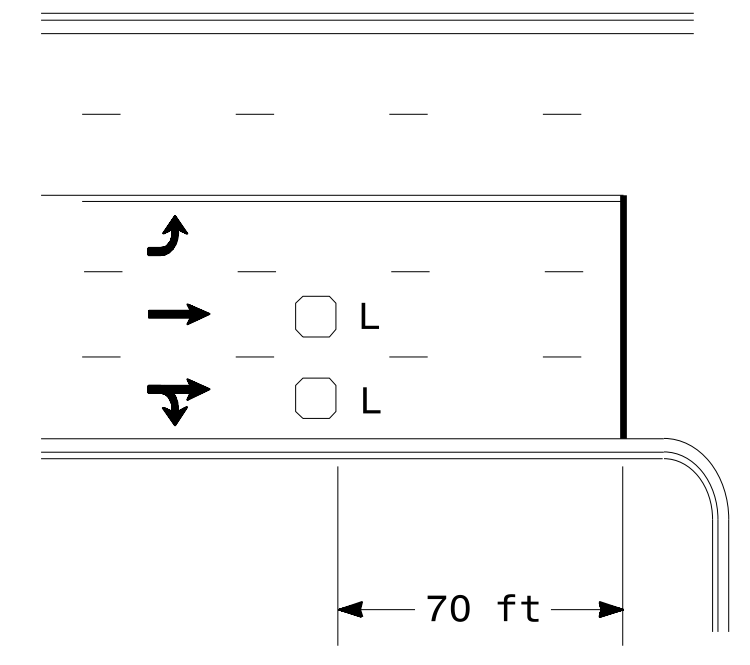


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

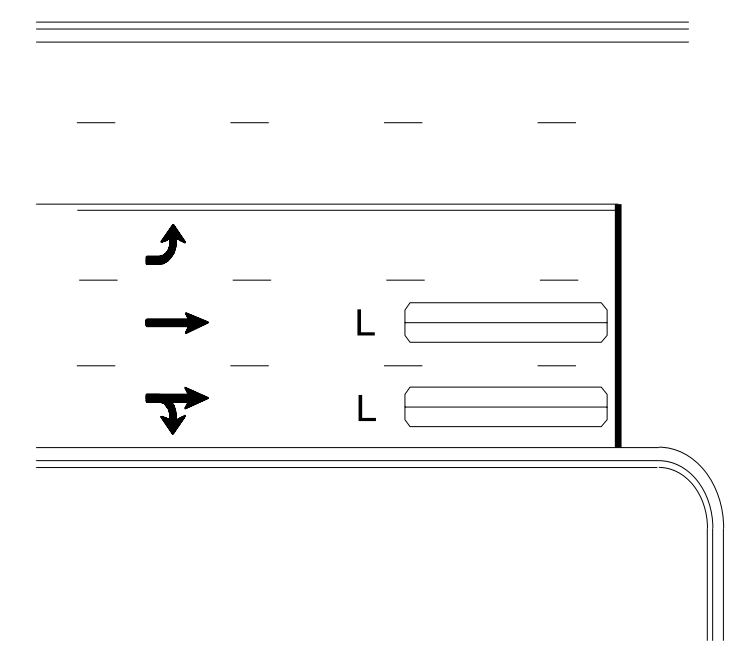
"Stretch" Operation

Low Speed Detection (≤35 mph)



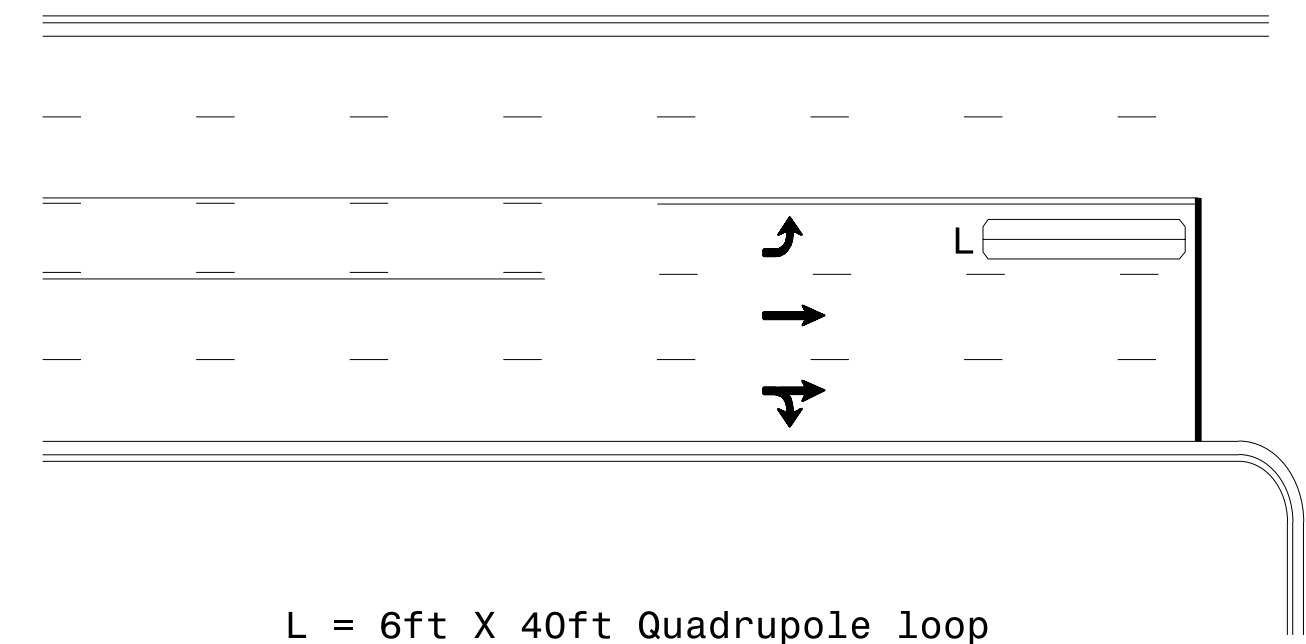
L = 6ft X 6ft
Wired in series

OR



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

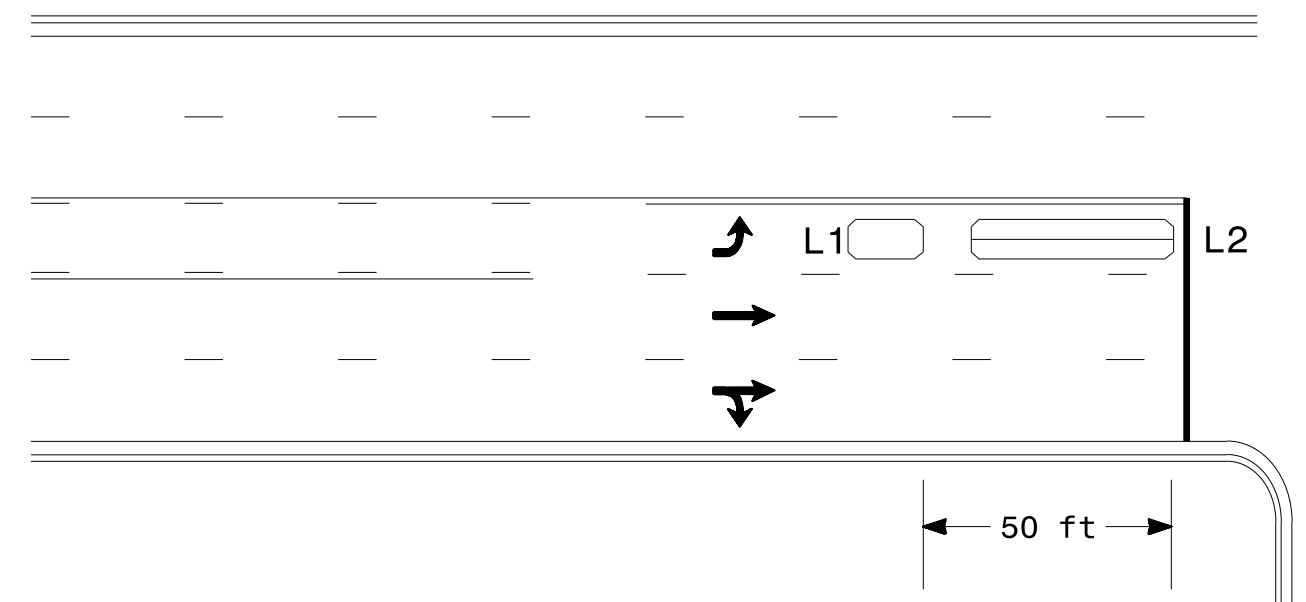
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

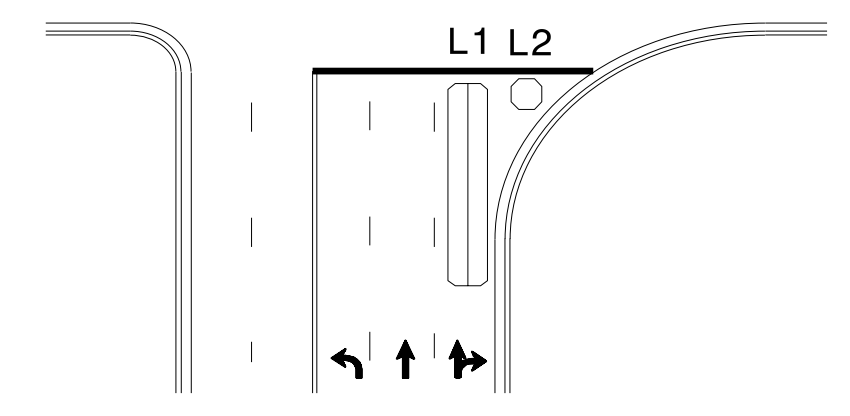
OR



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

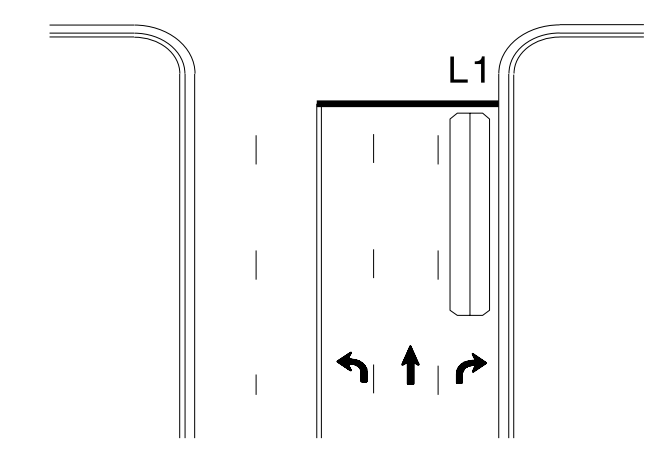
Queue Loop Detection

Right Turn Lane Detection

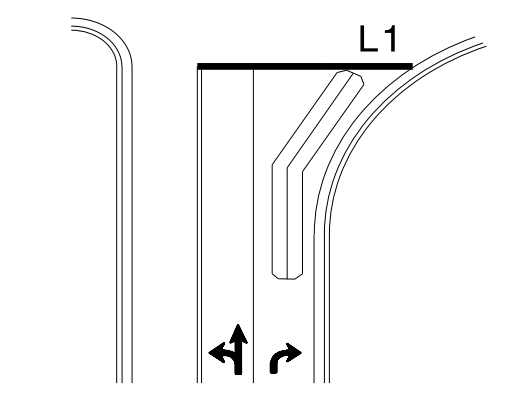


Shared Lane/
Wide Radius Turn

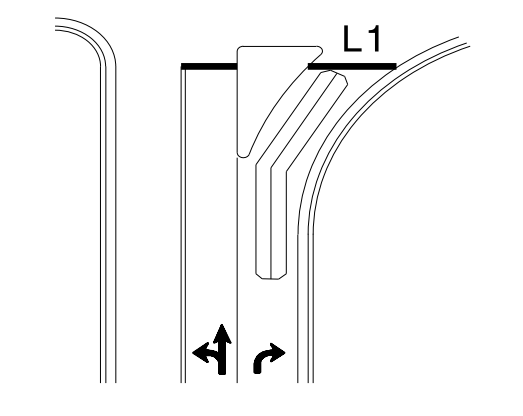
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

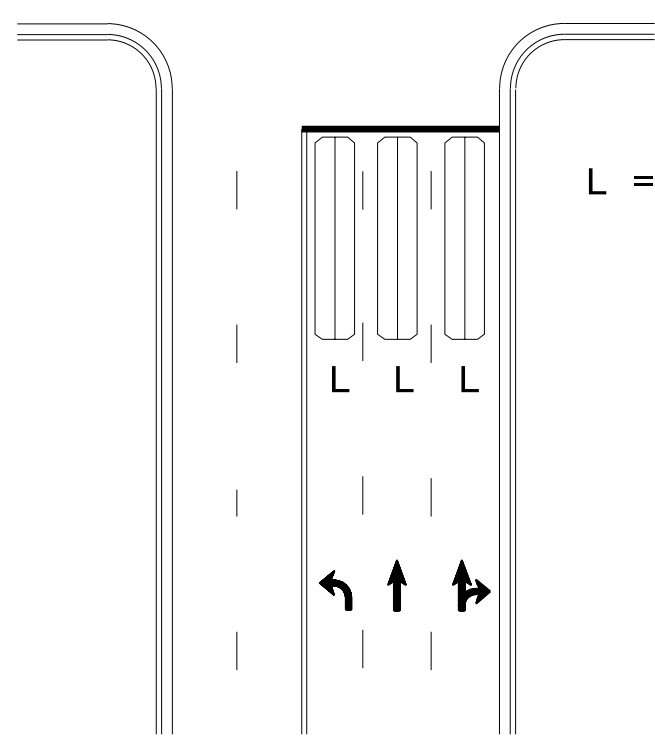


Wide Radius Turn



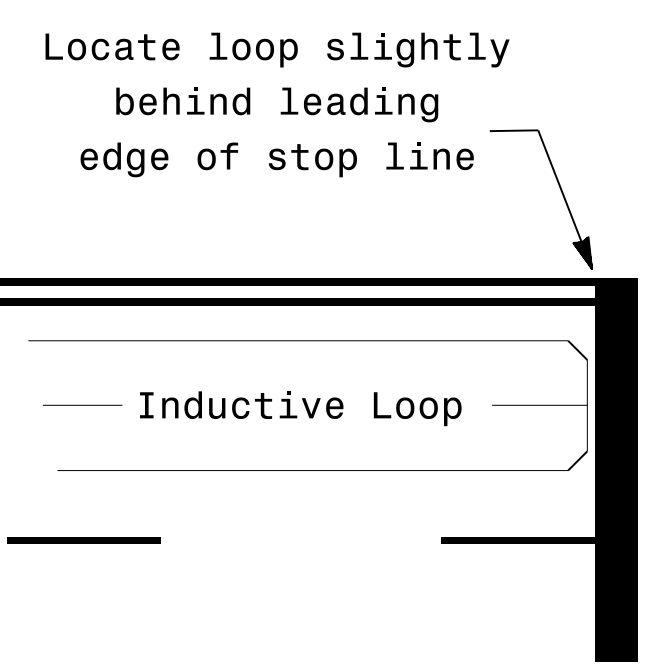
Channelized Turn

Side Street Detection



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

Presence Loop Placement at Stop Lines



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:

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
PAMELA L. ALEXANDER
23489

1/30/2015

3D:\AHU-2015_12\319
 S:\ITS\ASU\15_Signal\esignal_Design_Section\Eastern_Regional\loop\yp\ca\2015.dgn
 paalexander

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

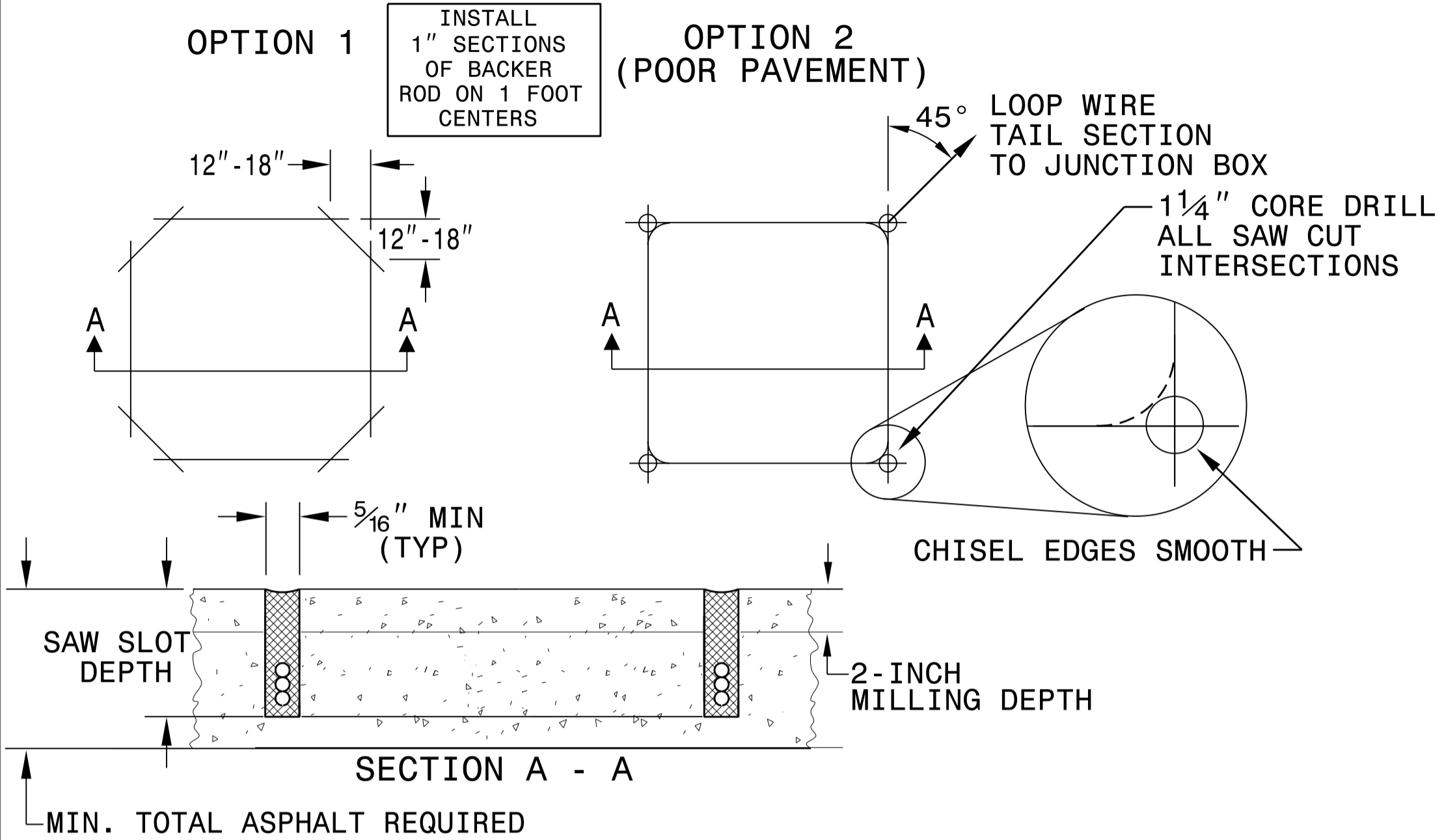


CORRECT WAY TO TWIST WIRE

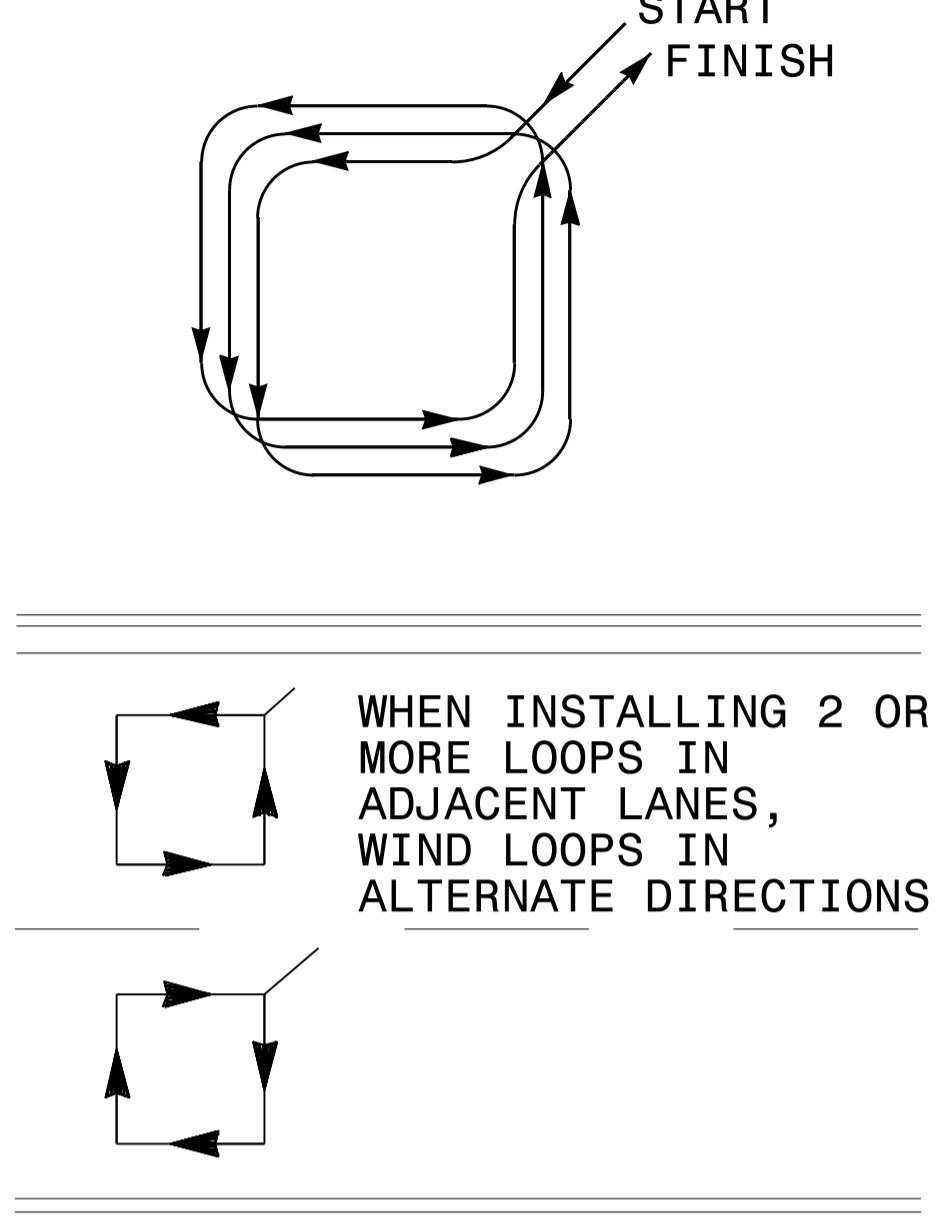


CONVENTIONAL 4-SIDED LOOP

SAW CUT OPTIONS

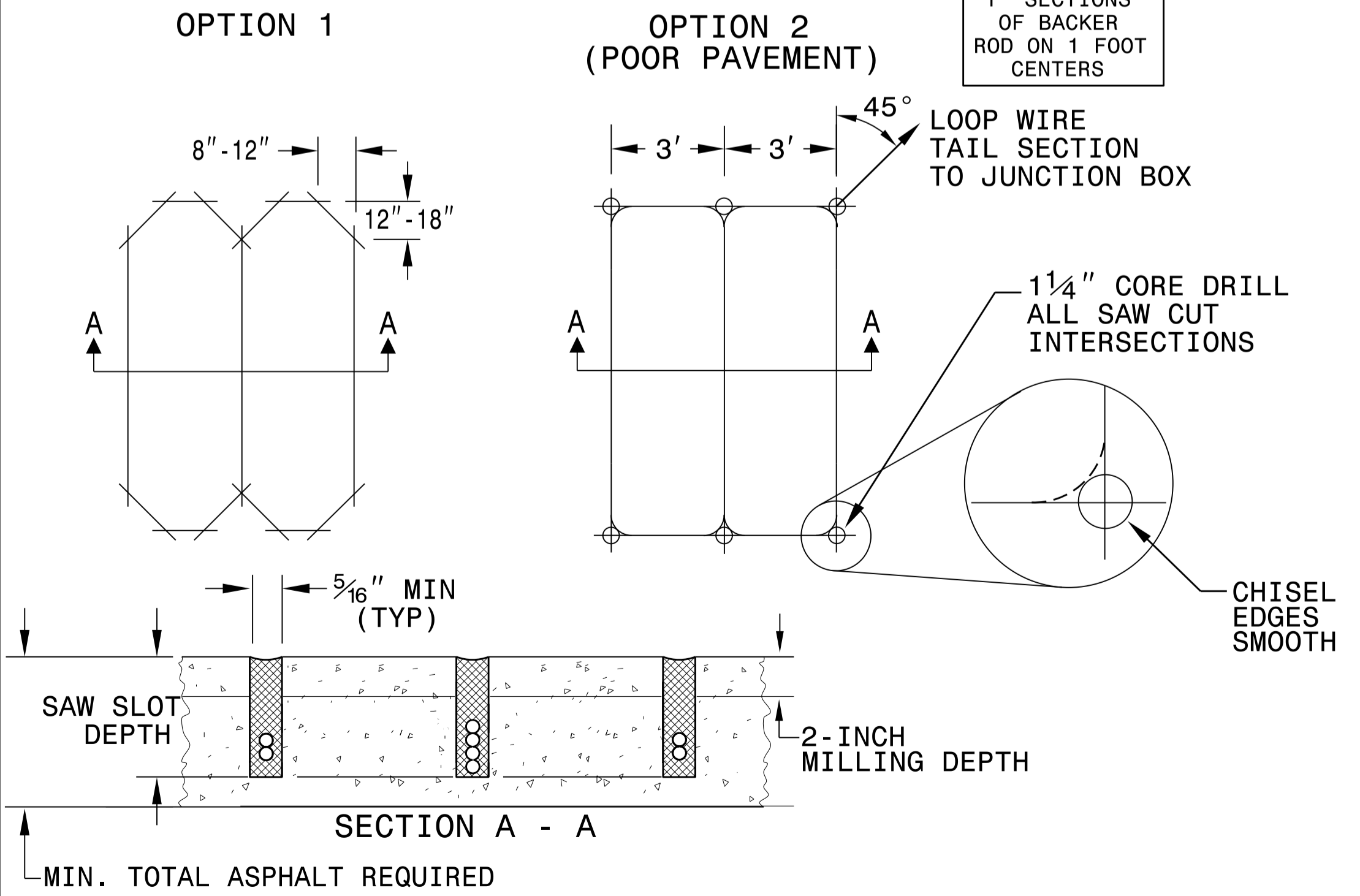


LOOP WINDING METHOD

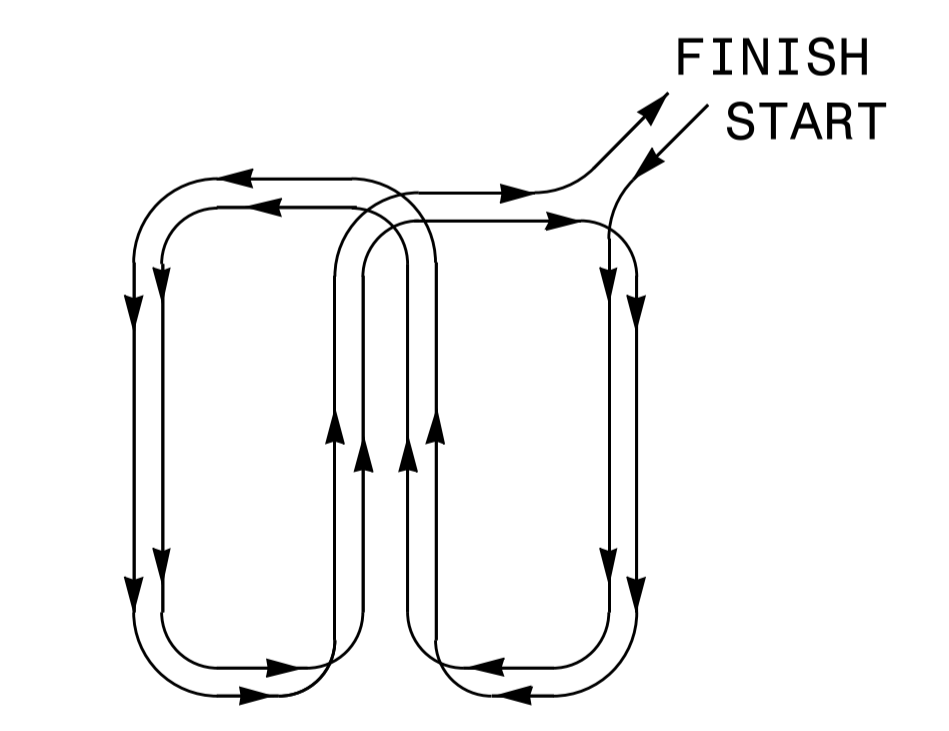


QUADRUPOLE LOOP

SAW CUT OPTIONS

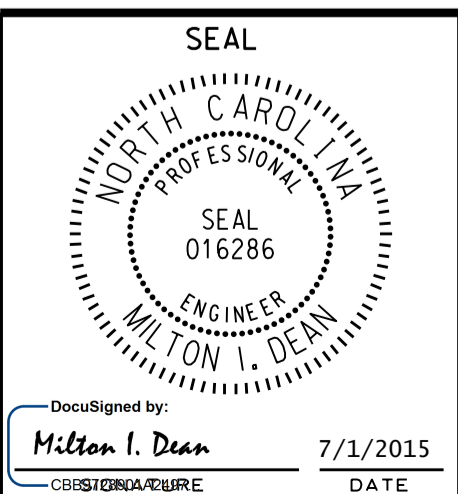
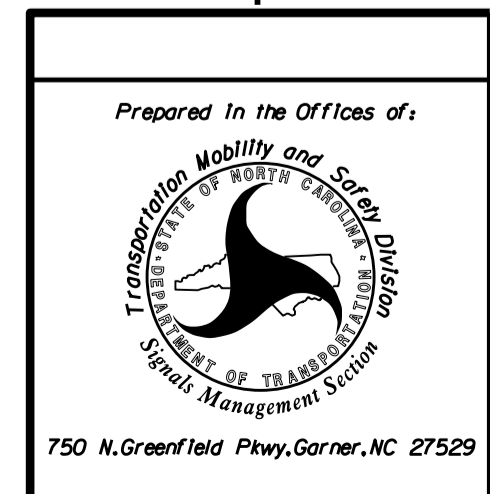


LOOP WINDING METHOD



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



ENGLISH STANDARD DRAWING FOR
DEEP-CUT INDUCTIVE DETECTION LOOPS
(FOR INSTALLATION PRIOR TO MILLING)