

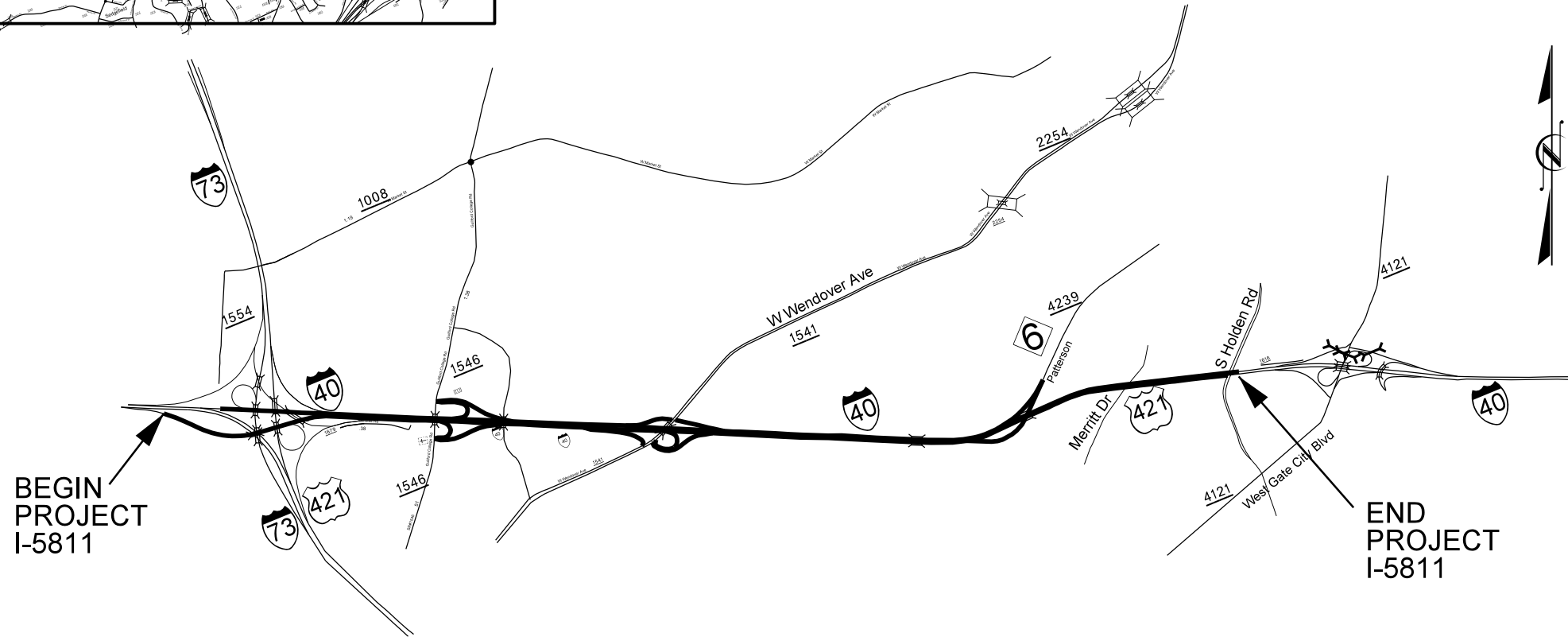
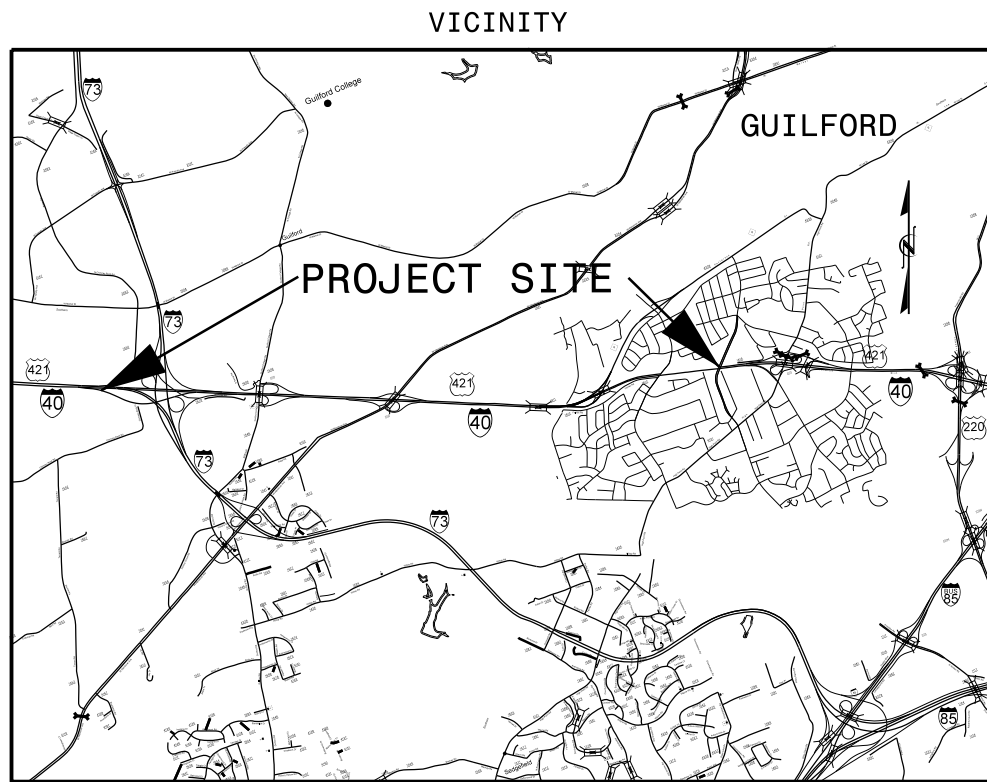
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5811	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50454.1.1	NHPIM-0040(9)214	I-5811 (PE)	
50454.3.1	NHPIM-0040(9)214	I-5811 (CONST)	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

LOCATION: I-40 FROM WEST OF I-73 TO EAST OF HOLDEN ROAD (NS) OVERPASS IN GREENSBORO

TYPE OF WORK: PAVEMENT REHABILITATION



TIP PROJECT: I-5811

CONTRACT: C204122

GRAPHIC SCALES
NOT TO SCALE

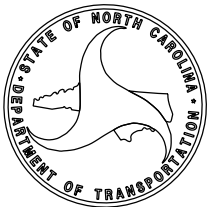
DESIGN DATA

PROJECT LENGTH
I-5811 = 4.72 miles

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

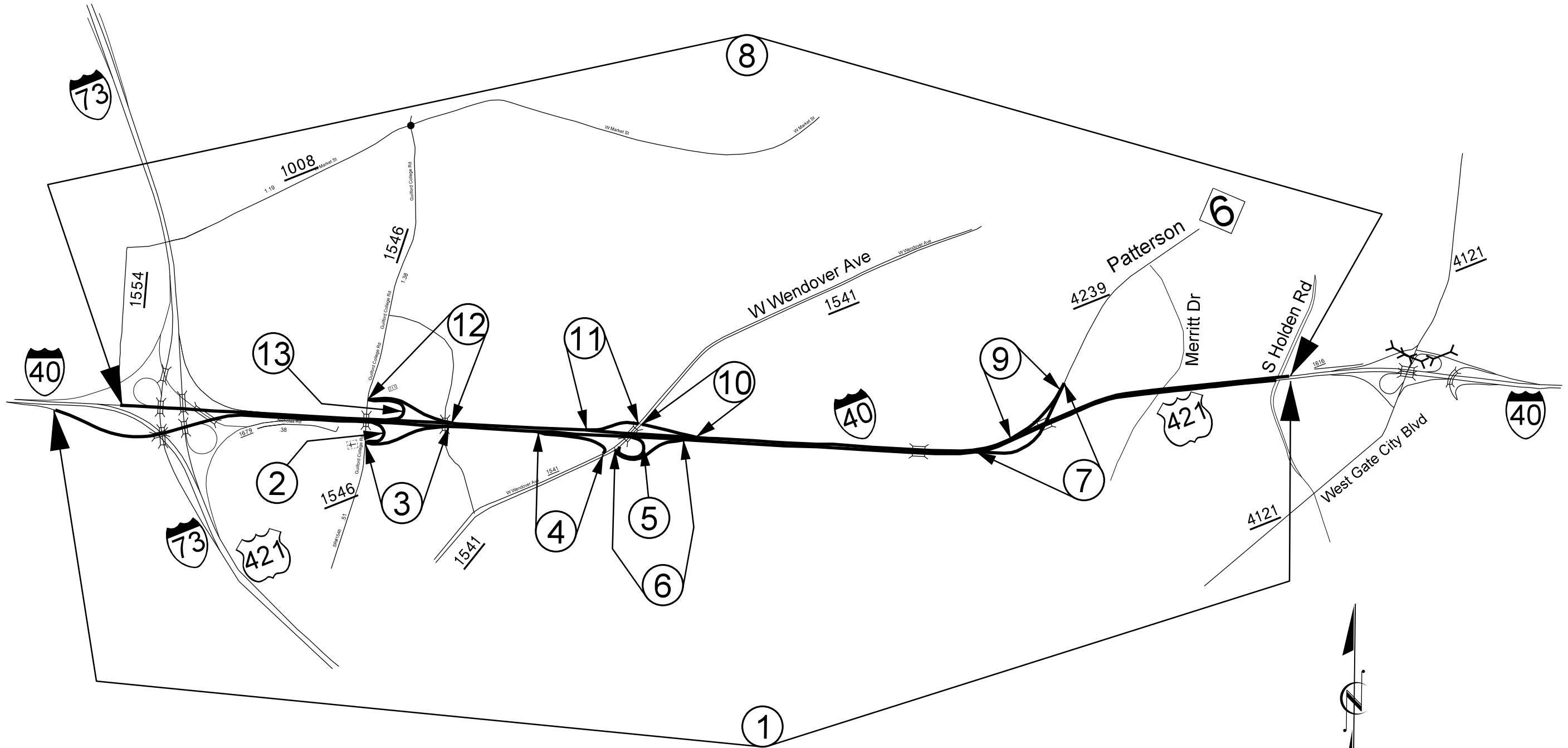
2018 STANDARD SPECIFICATIONS

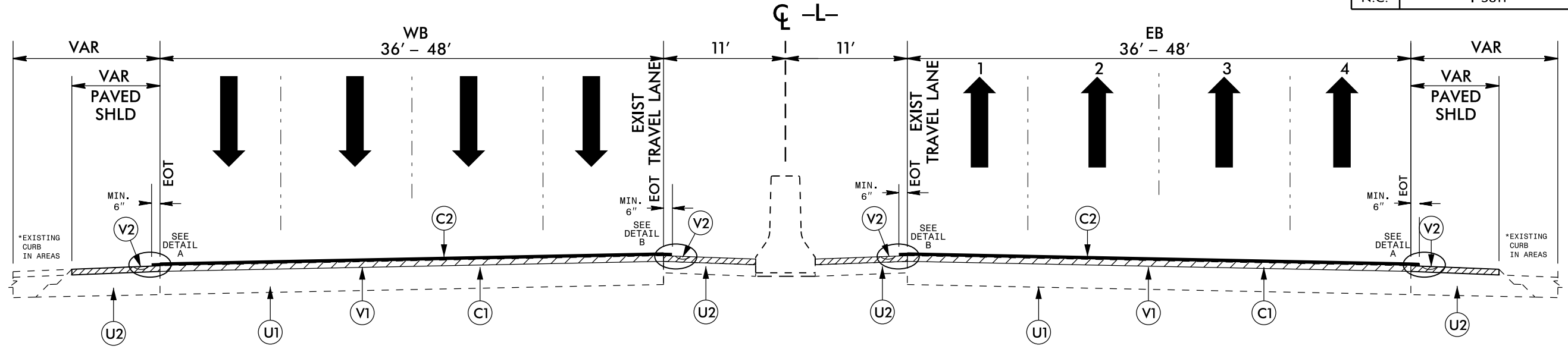
LETTING DATE:
June 19, 2018



STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5811	2	

GUILFORD COUNTY

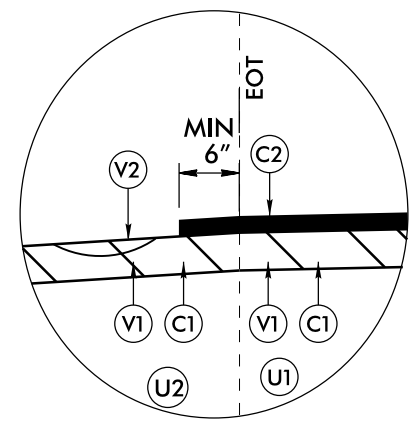




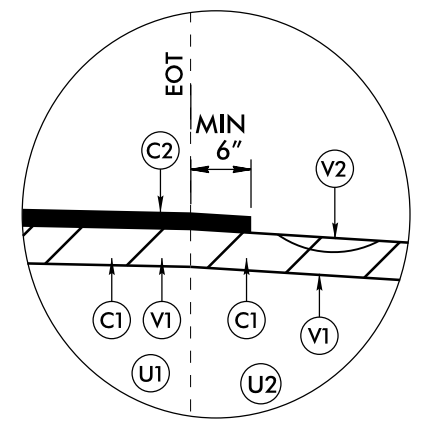
TYPICAL SECTION NO. 1
TO BE USED ON MAPS 1, 8

MAP 1: STA. 10+00 TO STA. 259+10 EB/NB
MAP 8: STA. 10+00 TO STA. 247+77 WB/SB

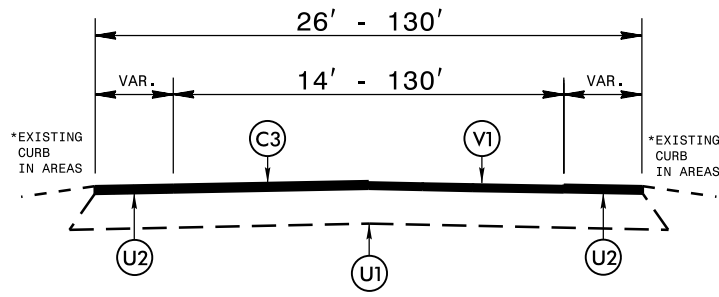
*NOTE: TYPICAL SECTION CONSTRUCTION SEQUENCE:
1. MILL TRAVEL LANES AND SHOULDERS 1½" AND FILL WITH 1½" SURFACE COURSE, TYPE S9.5D
2. OVERLAY TRAVEL LANES WITH ¾" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED



DETAIL B
OVER LAP SHOULDERS

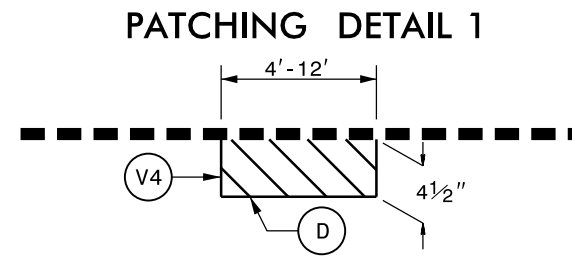


DETAIL A
OVER LAP SHOULDERS



TYPICAL SECTION NO. 2
TO BE USED ON MAPS 2 THRU 7, 9 THRU 13

*NOTE: TYPICAL SECTION CONSTRUCTION SEQUENCE:
1. MILL TRAVEL LANES AND SHOULDERS 1½" AND FILL WITH 1½" SURFACE COURSE, TYPE S9.5C



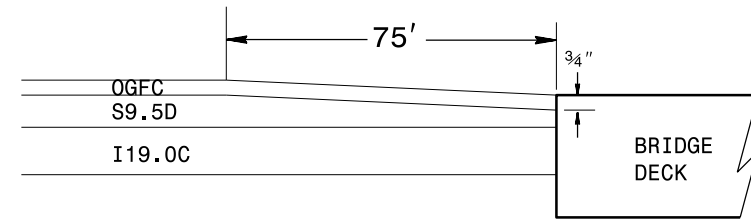
MILL EXISTING ASPHALT PAVEMENT 4½" IN DEPTH AND FILL WITH INTERMEDIATE COURSE, TYPE I19.0C AT LOCATIONS AS DIRECTED BY THE ENGINEER.

PAVEMENT SCHEDULE

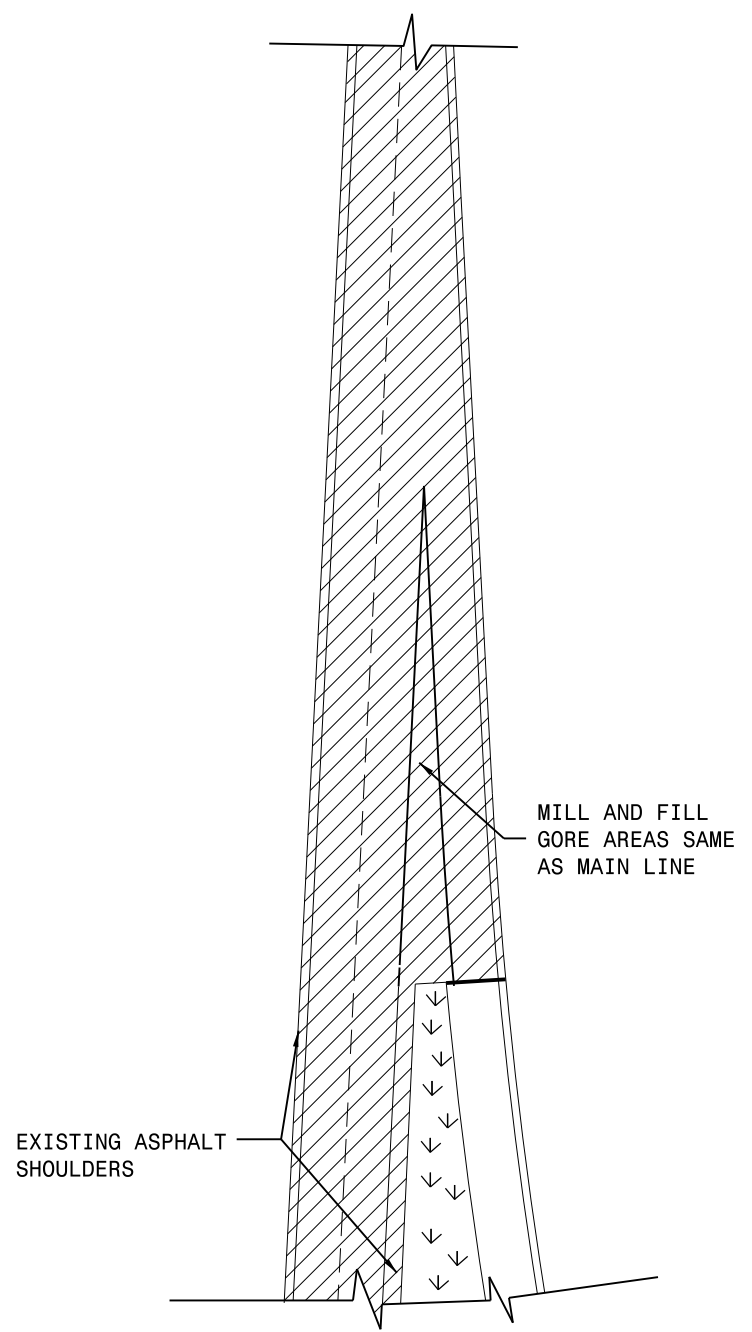
C1	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. ¾" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS PER SQ. YD.
C3	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	PROP. APPROX. 4½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
U1	EXISTING TRAVELWAY.
U2	EXISTING PAVED SHOULDER.
V1	MILLING ASPHALT PAVEMENT 1½" DEPTH
V2	MILLED RUMBLE STRIP
V3	MILLING ASPHALT PAVEMENT 0 - ¾" DEPTH.
V4	MILLING ASPHALT PAVEMENT 4 ½" DEPTH

5/14/99
10-APR-2018 17:06
er:\Documents\jg\m\sc\scor-d\I-5811\I-5811 Typical Sh3.dgn

STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5811	4	

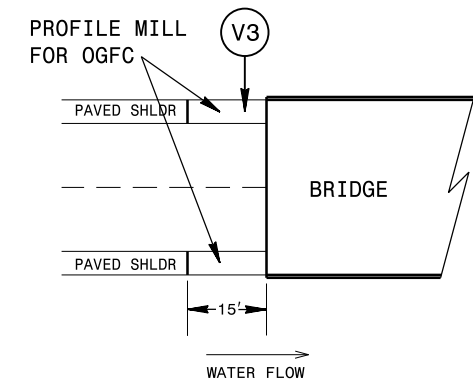


INCIDENTAL MILLING PAVEMENT
DETAIL AT BRIDGE

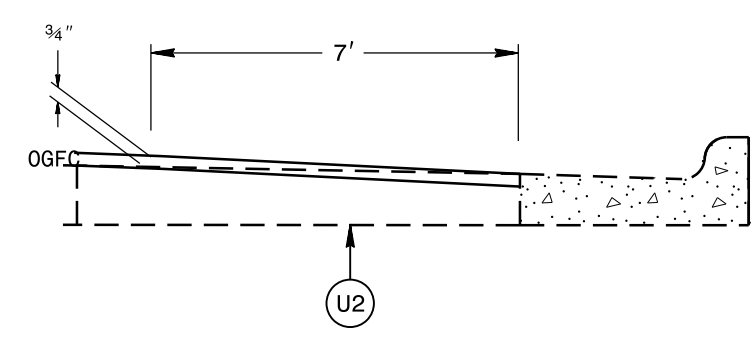


DETAIL - GORE AREAS

MILLING DETAIL 1



MILLING DETAIL 2



PROFILE MILL EXISTION
ASPHALT PAVEMENT 0" - 3/4"

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5D, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C2	PROP. APPROX. 3/4" OPEN-GRADED ASPHALT FRICTION COURSE, TYPE FC-1 MODIFIED, AT AN AVERAGE RATE OF 90 LBS PER SQ. YD.
C3	PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
D	PROP. APPROX. 4 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD.
U1	EXISTING TRAVELWAY.
U2	EXISTING PAVED SHOULDER.
V1	MILLING ASPHALT PAVEMENT 1 1/2" DEPTH
V2	MILLED RUMBLE STRIP
V3	MILLING ASPHALT PAVEMENT 0 - 3/4" DEPTH.
V4	MILLING ASPHALT PAVEMENT 4 1/2" DEPTH

04-APR-2018 14:51
 C:\Users\pjp\p\p\ter\Documents\misc\discard\I-5811\I-5811 typical Sh4.dgn
 plotter AI_CSD-202592

PROJECT NO.	SHEET NO.	TOTAL NO.
I-5811	7	

SUMMARY OF DRAINAGE REPAIR

MAP #	STATION	LOCATION	REMOVE & REPLACE CONCRETE APRON & BACKFILL	FLOWABLE FILL EXCAVATABLE
		LT or RT		
			EA	CY
1	11+93	RT		1
1	13+86	RT		1
TOTAL FOR MAP 1			0	2
4	16+80	RT		1
TOTAL FOR MAP 4			0	1
8	130+05	RT	1	
TOTAL FOR MAP 8			1	0
GRAND TOTAL			1	3

SUMMARY OF CURB RAMP TYPE

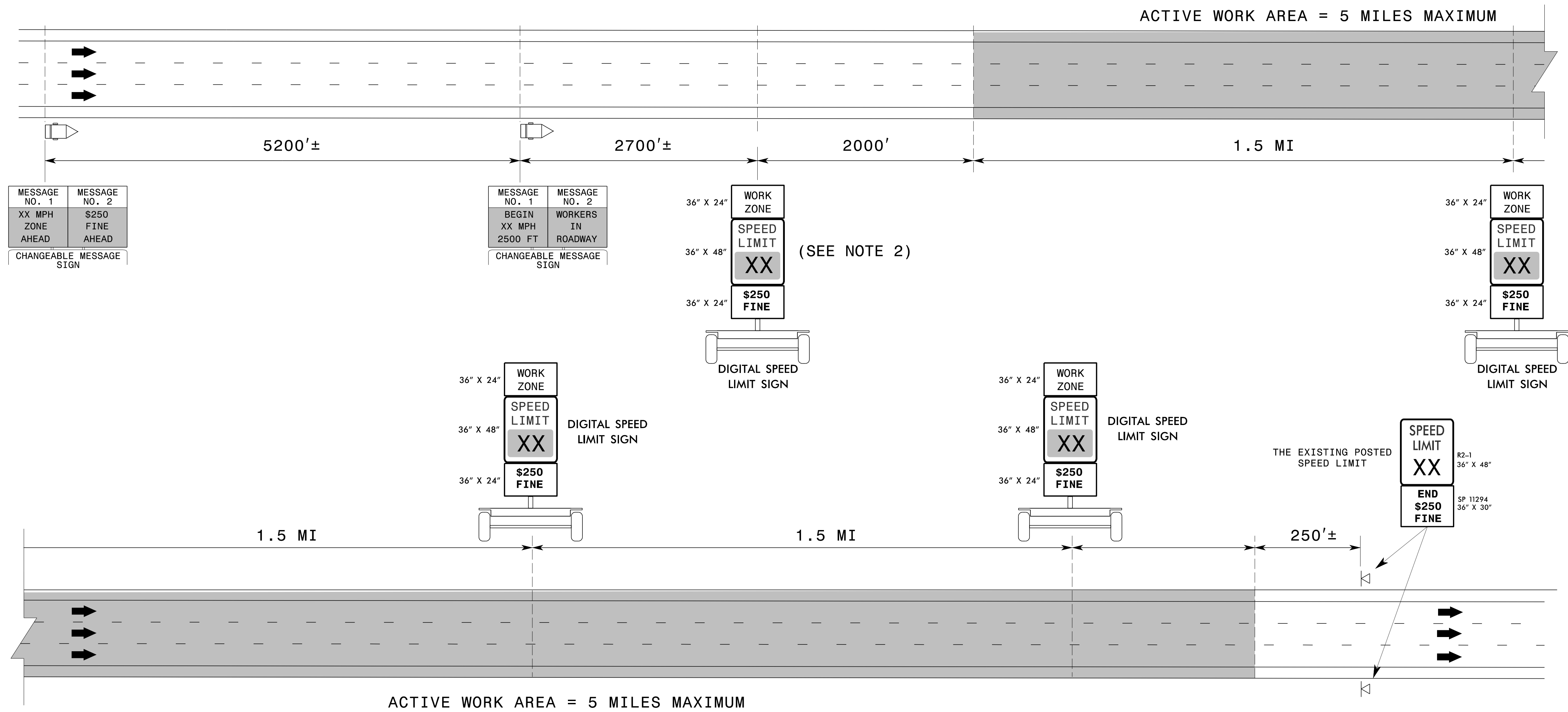
Map #	Sect. #	Location	Retrofit	Type 1	Type 1 Mod.	Type 1A	Type 1B	Type 2	Type 2A	Type 3	Type 4	Type 4A	Comments
			EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	
4	2	Off Ramp to Wendover Ave.			2								Remove/Replace
10	3	Off Ramp to Wendover Ave.		1	1								Remove/Replace
TOTAL				1	3								
								4					

PROJECT NO.	SHEET NO.	TOTAL NO.
I-5811	8	

SUMMARY OF QUANTITIES

PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LAN ES	LANE TYPE	FINAL SURFACE TESTING REQUIRED	WARM MIX ASPHALT REQUIRED	LENGT H		WID TH	INCI-DENTAL STONE BASE	MILLING ASPHALT PAVEMENT, 1 1/2" DEPTH	MILLING ASPHALT PAVEMENT, 0" TO 3/4"	INCI-DENTAL MILLING	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	ASPHALT CONC SURFACE COURSE, TYPE S9.5D	ASPH. BINDER FOR PLANT MIX	POLYMER MODIFIED ASPHALT BINDER FOR PLANT MIX	OPEN-GRADED ASPH. FRIC. COURSE, TYPE FC-1 MODIFIED	PATCHING EXISTING PAVEMENT	MILLED RUMBLE STRIPS	FLOW-ABLE FILL (EXCAVATION TABLE)	REMOVE AND REPLACE CONC APRON	REMOVE AND REPLACE CURB RAMP STD. 848.06 & DETAIL	WORK ZONE DIGITAL SPEED LIMIT SIGNS	SEQUENTIAL FLASHING WARNING LIGHTS	WORK ZONE PRESENCE LIGHTING	6" HOT SPRAY THERMO (WHITE) 50 MILS	6" HOT SPRAY THERMO (YELLOW) 50 MILS	12" HOT SPRAY THERMO (WHITE) 50 MILS	PORTABLE LIGHTING	WAT TLE	INDUC-TIVE LOOP SAW CUT				
										MI	FT																									TONS	SY	SY	SY
I-5811	Guilford	1	I-40 EB	FROM WEST OF I-73 TO EAST OF HOLDEN ROAD (NS) OVERPASS	1	4	MD	NO	NO	0.384	78			17,572	25	820		1,478		113	464		49,820	2			5	36	15	37,365	24,910	7,874	*	40					
		"	"	BRIDGE (SKIP)	1	2	MD	NO	NO	0.056	78							431		33	135																		
		"	"		1	2	MD	NO	NO	0.112	78			5,125		410																							
		"	"		1	2	MD	NO	NO	0.036	94			1,985				167		13	65																		
		"	"		1	2	MD	NO	NO	0.292	60			10,278				865		66	267																		
		"	"		1	2	MD	NO	NO	0.075	94			4,136				348		28	141																		
		"	"		1	2	MD	NO	NO	0.282	71			11,746				988		77	341																		
		"	"		1	2	MD	NO	NO	0.026	85			1,297				109		9	44																		
		"	"		1	2	MD	NO	NO	0.169	66			6,544				551		41	154																		
		"	"		1	2	MD	NO	NO	0.047	87			2,399				202		16	70																		
		"	"		1	2	MD	NO	NO	0.313	71			13,038				1,097		86	378																		
		"	"		1	2	MD	NO	NO	0.08	75			3,520				296		24	112																		
		"	"		1	2	MD	NO	NO	0.132	93			7,202				606		50	257																		
		"	"		1	2	MD	NO	NO	0.225	71			9,372				789		62	272																		
		"	"		1	2	MD	NO	NO	0.022	85			1,097				92		8	40																		
		"	"		1	2	MD	NO	NO	0.101	67			3,970				334		25	92																		
		"	"		1	2	MD	NO	NO	0.03	87			1,531				129		10	51																		
		"	"		1	2	MD	NO	NO	0.036	73			1,542				130		10	44																		
		"	"		1	2	MD	NO	NO	0.779	73			33,362				2,807		217	942																		
		"	"		1	2	MD	NO	NO	0.091	77			4,111		410		346		26	110																		
		"	"	BRIDGE (SKIP)	1	2	MD	NO	NO	0.033	77																												
		"	"		1	2	MD	NO	NO	0.124	78			5,674		410		477		36	150																		
		"	"		1	2	MD	NO	NO	0.064	92			3,454				291		24	118																		
		"	"		1	2	MD	NO	NO	0.258	59			8,930	25	310		752		57	236																		
		"	"	BRIDGE (SKIP)	1	2	MD	NO	NO	0.047	59																												
		"	"		1	2	MD	NO	NO	0.905	59			31,325	25	6,200		2,637		201	826																		
TOTAL FOR MAP NO. 1										4.719				189,210	75	8,560		15,922		1,232	5,309		49,820	2			5	36	15	37,365	24,910	7,874			40				
I-5811	Guilford	2	OFF LOOP RAMP	FROM EB 40 TO SR 1546 (GUILFORD COLLEGE ROAD)	2	2	MD	NO	NO	0.073	31	6		1,328			112		7			25														600			
		"	"		2	2	MD	NO	NO	0.039	46			1,053			89		5																				
		"	"		2	2	MD	NO	NO	0.005	94			276			23		1																				
TOTAL FOR MAP NO. 2										0.117		6		2,657				224		13		25																600	
I-5811	Guilford	3	ON RAMP	FROM SR 1546 (GUILFORD COLLEGE ROAD) TO EB 40	2	2	MD	NO	NO	0.006	46	12		225			14		1																				
		"	"		2	2	MD	NO	NO	0.014	37			304			26		2																				
		"	"		2	2	MD	NO	NO	0.025	32			469			40		2																				
		"	"		2	2	MD	NO	NO	0.117	33			2,265			191		11																				
		"	"		2	2	MD	NO	NO	0.071	27			1,125			95		6																				
TOTAL FOR MAP NO. 3										0.233		12		4,388				366		22																			
I-5811	Guilford	4	OFF RAMP	FROM EB 40 TO SR 1541 (WENDOVER AVENUE)	2	2	MD	NO	NO	0.112	28	11		1,840			155		9			25		1		2									20	350			
		"	"		2	2	MD	NO	NO	0.108	67			4,245			357		21																				
TOTAL FOR MAP NO. 4										0.22		11		6,085				512		30		25		1		2											20	350	
I-5811	Guilford	5	OFF LOOP RAMP	FROM EB 40 TO SR 1541 (WENDOVER AVENUE)	2	2	MD	NO	NO	0.093	31	8		1,691			143		9			25														350			
		"	"		2	2	MD	NO	NO	0.052	26			793			67		4																				
		"	"		2	2	MD	NO	NO	0.015	26			229			19		1																				
TOTAL FOR MAP NO. 5										0.16		8		2,713				229		14		25																	350
I-5811	Guilford	6	ON RAMP	TO EB 40 FROM SR 1541 (WENDOVER AVENUE)	2	2	MD	NO	NO	0.018	40	11		608			51		3																				
		"	"		2	2	MD	NO	NO	0.076	28			1,248			105		6																				
		"	"		2	2	MD	NO	NO	0.057	29			970			82		5																				
		"	"		2	2	MD	NO	NO	0.073	26			1,114																									

INTERSTATE RESURFACING OPERATIONS WITH DIGITAL SPEED LIMIT SIGNS



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"

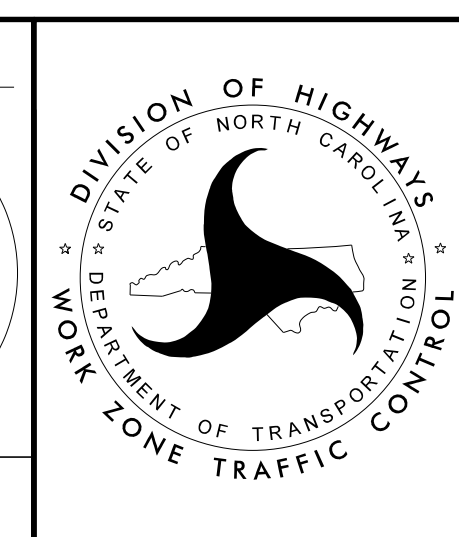
DROP-OFFS BETWEEN OPEN TRAVEL LANES SHOULD NOT EXCEED 2.0"

- ### 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*
DocuSigned by:
E27CE30E1DFC442...
 DATE: 2/23/2017

SEAL
 022104
 JOHN S. KITE, II
 ENGINEER

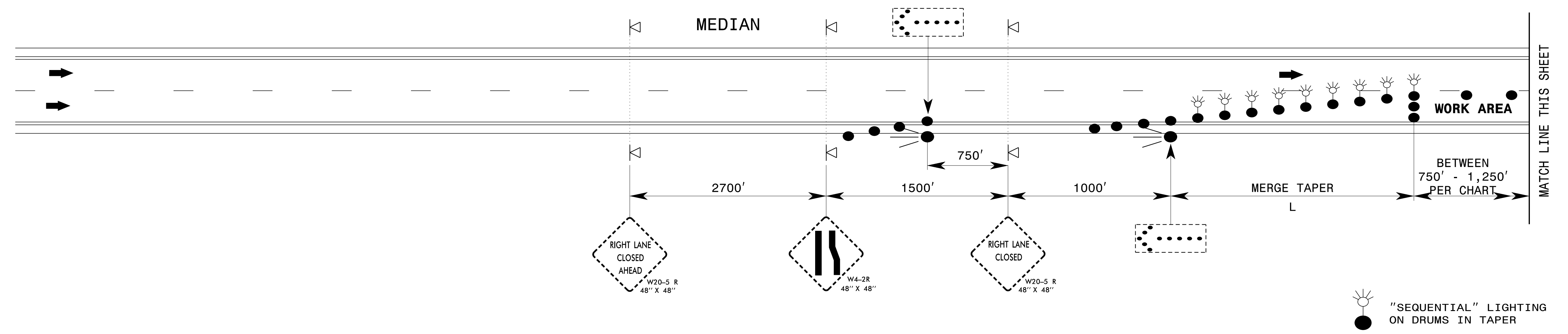
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UNLESS ALL SIGNATURES COMPLETED



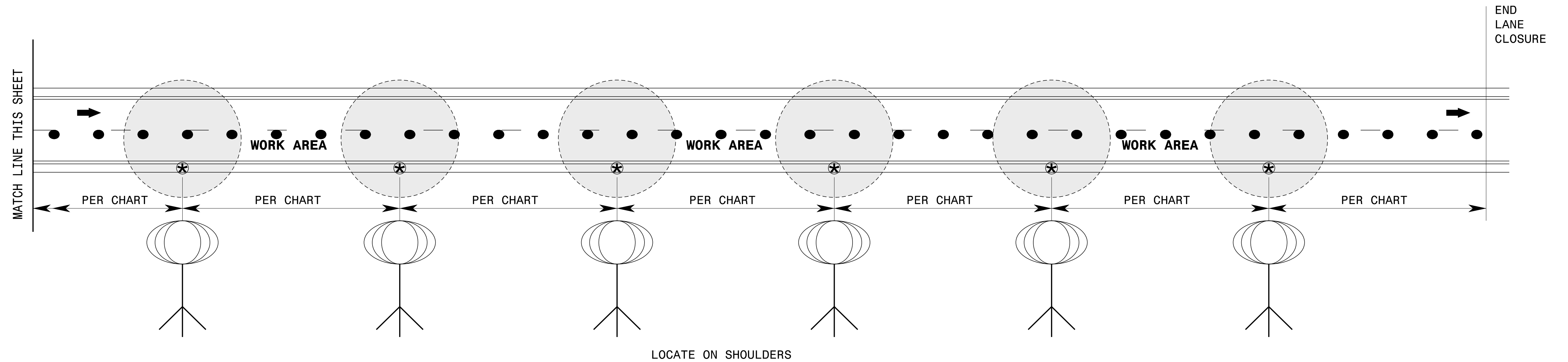
WORK ZONE "VARIABLE"
SPEED LIMIT USING
DIGITAL SPEED LIMIT
SIGNS FOR INTERSTATE/
FREEWAY RESURFACING
PROJECTS

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

ADVANCE WARNING AREA



WORK ZONE AREA



LOCATE ON SHOULDERS

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

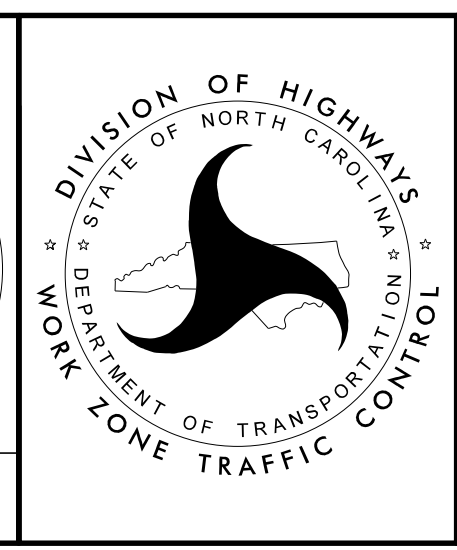
- 1) SPACE LIGHT UNITS ACCORDING TO THE CHART.
- 2) EACH LIGHT UNIT SHALL BE CAPABLE OF ELEVATING TO A MINIMUM HEIGHT OF 14' ABOVE THE PAVEMENT.
- 3) PLACE ON PAVED SHOULDER IF POSSIBLE.

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

DocuSigned by:
 E27CE30E1DFC442...

SEAL
 022104
 JOHN S. KITE, II
 ENGINEER

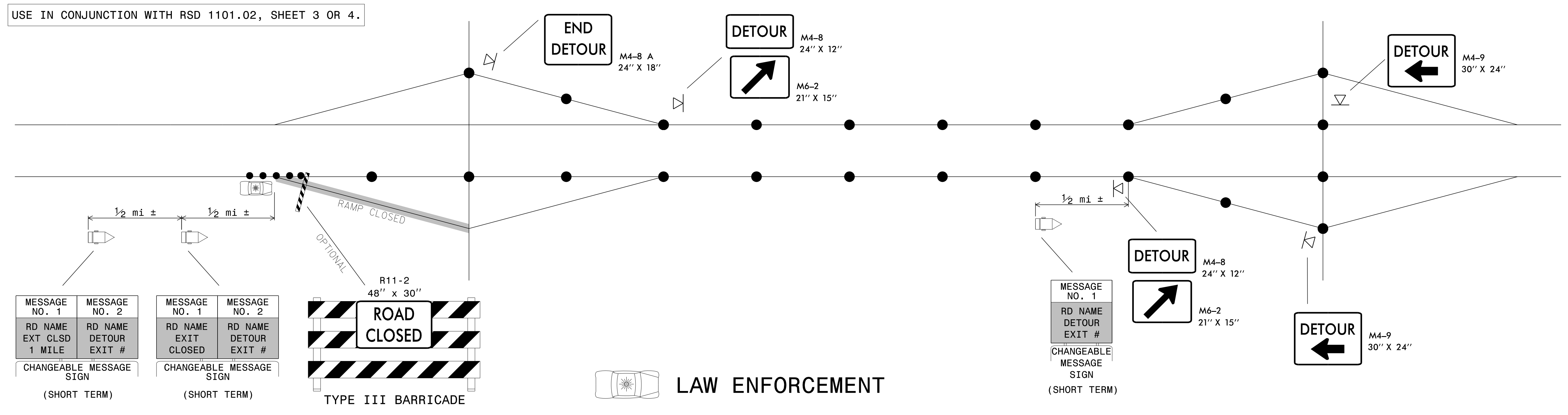
**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**



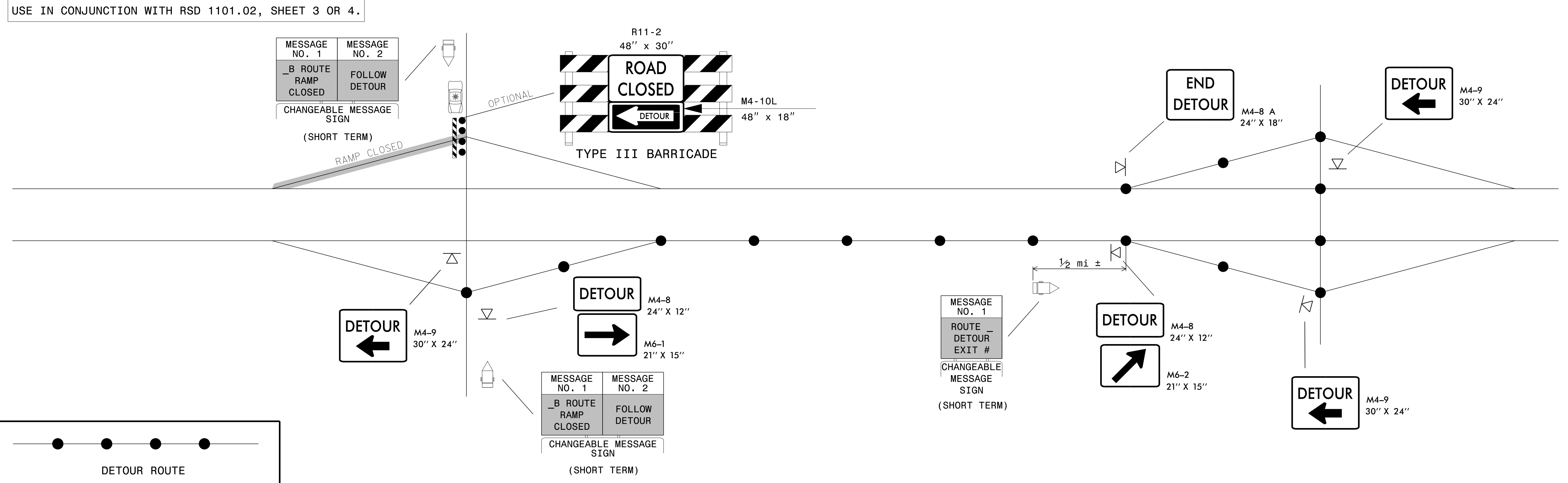
**SEQUENTIAL FLASHING
 WARNING LIGHTS
 AND
 WORK ZONE
 PRESENCE LIGHTING**

3/17/2017 S:\TMD\WZTC\DesignGroup3\Squad3B\Data\Inter-state Resurfacing Provisions and Details\Detail Drawings\Sequential.and.Presence Lighting_20170227.dgn User:kedais

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



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



GENERAL NOTES:

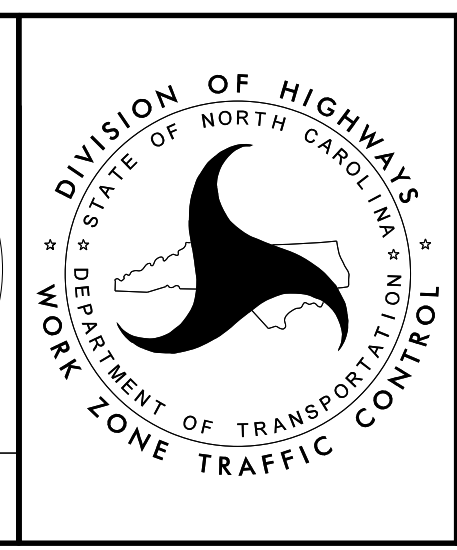
1. THIS DRAWING IS INTENDED FOR USE DURING SHORT TERM CLOSURES OF INTERSTATE AND FREEWAY RAMPS.
2. RAMP CLOSURES SHALL BE APPROVED BY THE ENGINEER.
3. IF RAMP CLOSURE RESTRICTIONS APPLY, SEE SPECIAL PROVISION, "INTERMEDIATE CONTRACT TIMES AND LIQUIDATED DAMAGES".
4. ADDITIONAL CHANGEABLE MESSAGE SIGNS 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**



**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

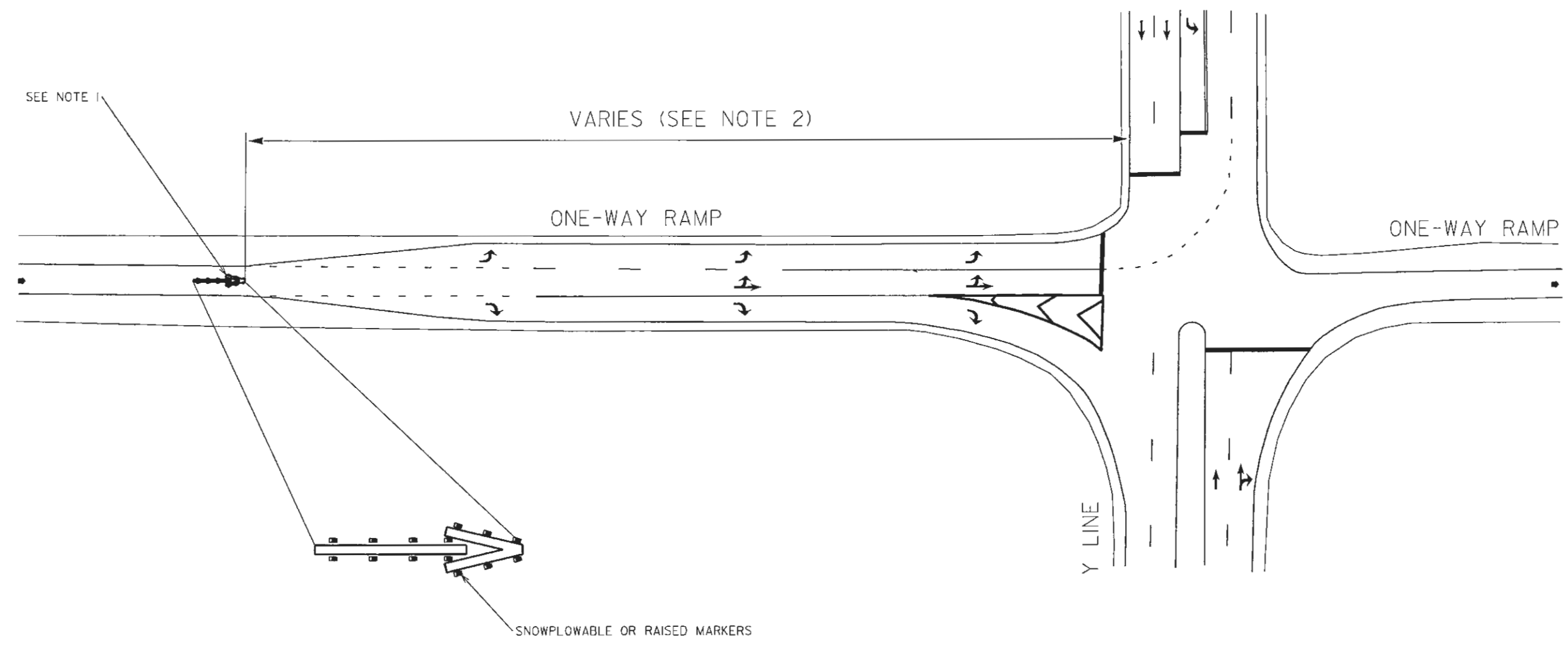
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DETAIL FOR
PAVEMENT MARKINGS
WRONG WAY RAMP ARROW
ONE-LANE EXIT RAMP AT MULTI-LANE APPROACH

ENGLISH STANDARD DETAIL FOR
PAVEMENT MARKINGS
WRONG WAY RAMP ARROW
ONE-LANE EXIT RAMP AT MULTI-LANE APPROACH

ASPHALT TREATMENT



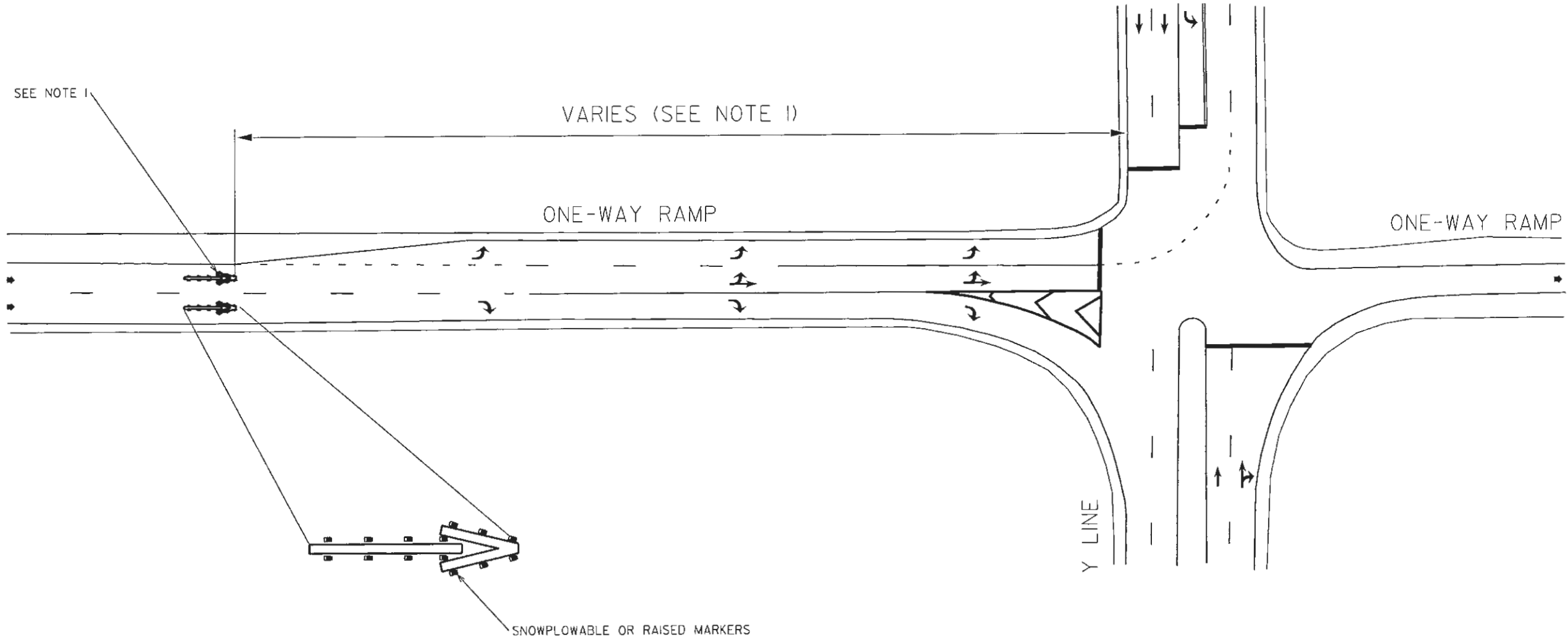
- NOTES:
- 1) REFER TO THE 2018 ROADWAY STANDARD DRAWING 1205.08, SHEET 1 OF 9 FOR RAMP ARROW DIMENSION REQUIREMENTS.
 - 2) PLACEMENT OF WRONG-WAY RAMP ARROW VARIES AND SHOULD BE LOCATED JUST BEFORE THE MULTI-LANE APPROACH.
 - 3) INSTALL MARKERS (SNOWPLOWABLE/RAISED) IN ACCORDANCE TO THE ROADWAY STANDARD DETAIL.
 - 4) MARKING SHALL BE THERMOPLASTIC MATERIAL.

LEGEND	
	DIRECTION OF TRAFFIC FLOW
	PAVEMENT MARKING SYMBOLS

STATE OF NORTH CAROLINA
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DIVISION OF HIGHWAYS
RALEIGH, N.C.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
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ASPHALT TREATMENT



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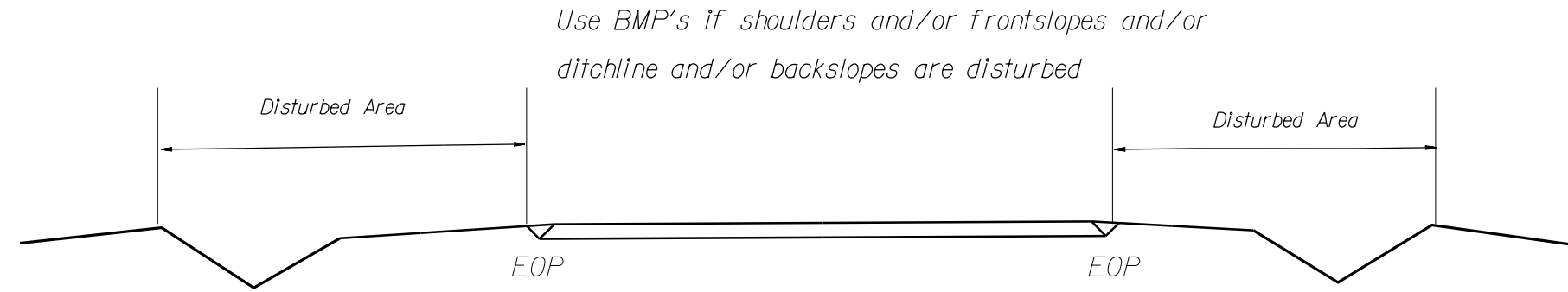
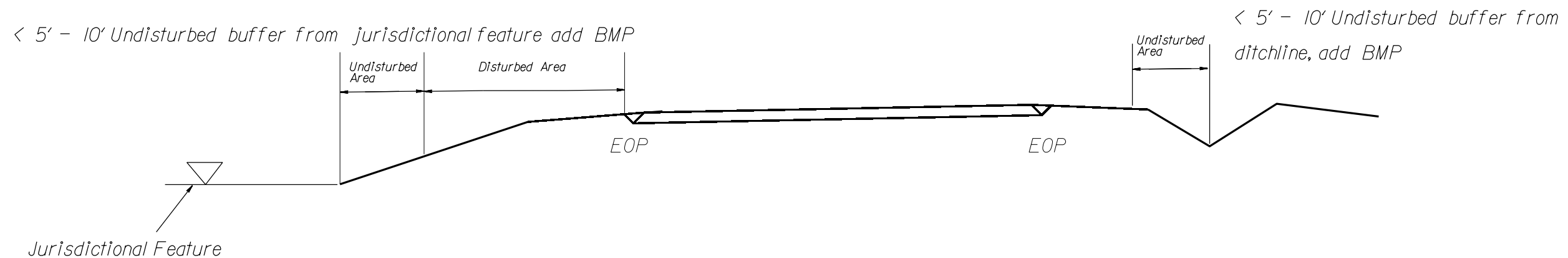
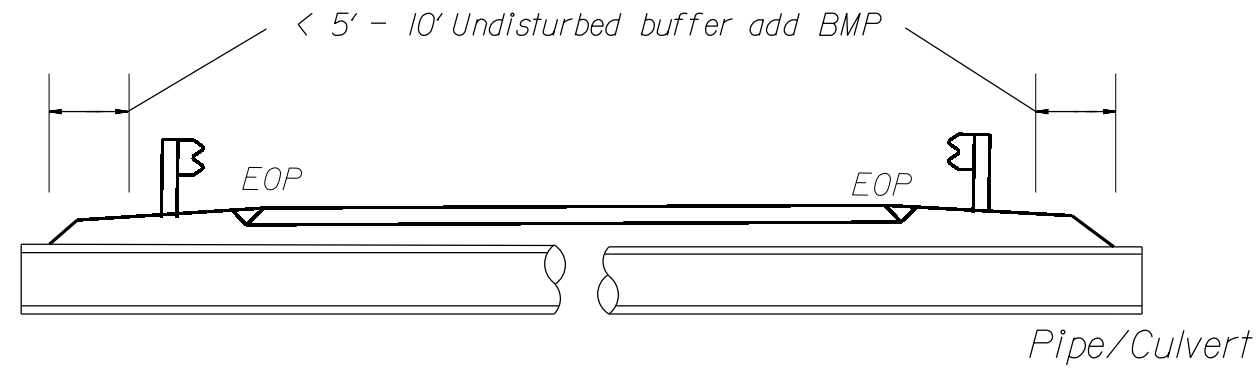
ENGLISH STANDARD DETAIL FOR
PAVEMENT MARKINGS
WRONG WAY RAMP ARROW
TWO-LANE EXIT RAMP AT MULTI-LANE APPROACH

ENGLISH STANDARD DETAIL FOR
PAVEMENT MARKINGS
WRONG WAY RAMP ARROW
TWO-LANE EXIT RAMP AT MULTI-LANE APPROACH

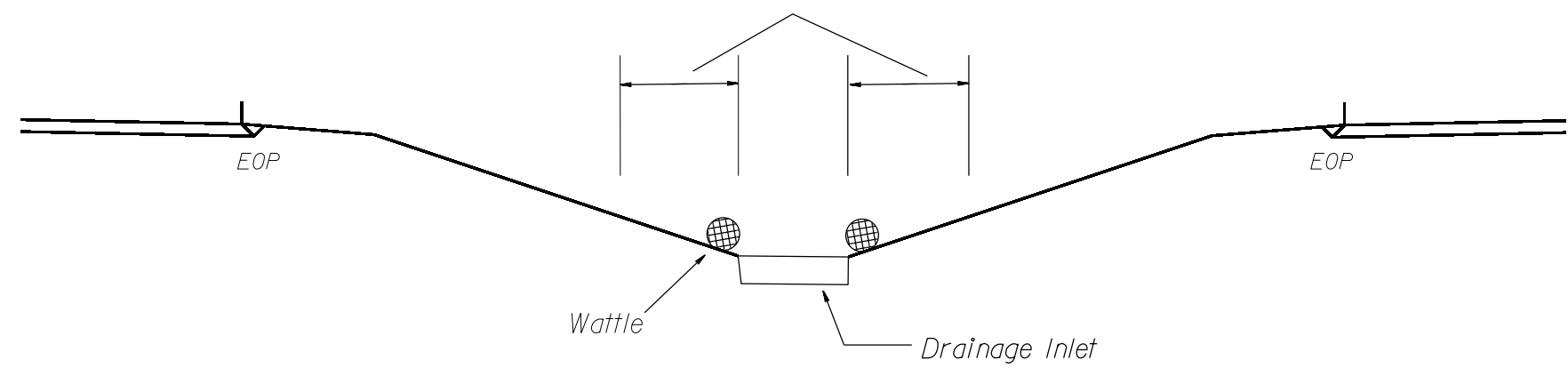
NOTES: Less than 5' - 10' undisturbed buffer from ROW, ditchline, water feature, or drainage inlet, add BMP.

BMP Options: Wattle or Hardened Aggregate.

EROSION CONTROL DETAIL

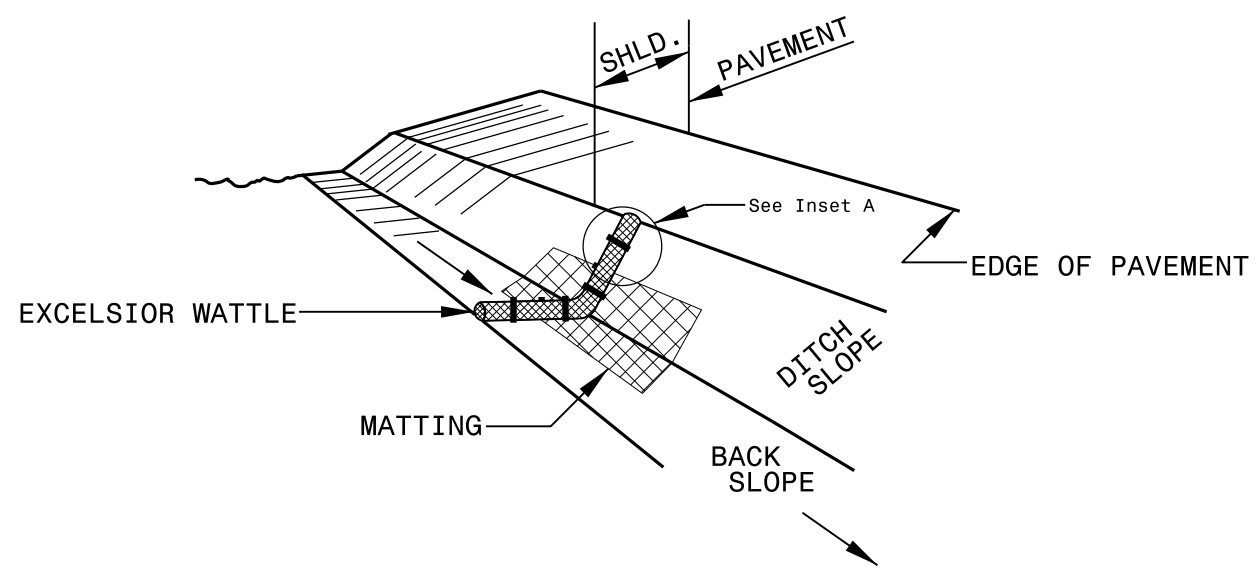


< 5' - 10' Undisturbed buffer from inlet, add wattle

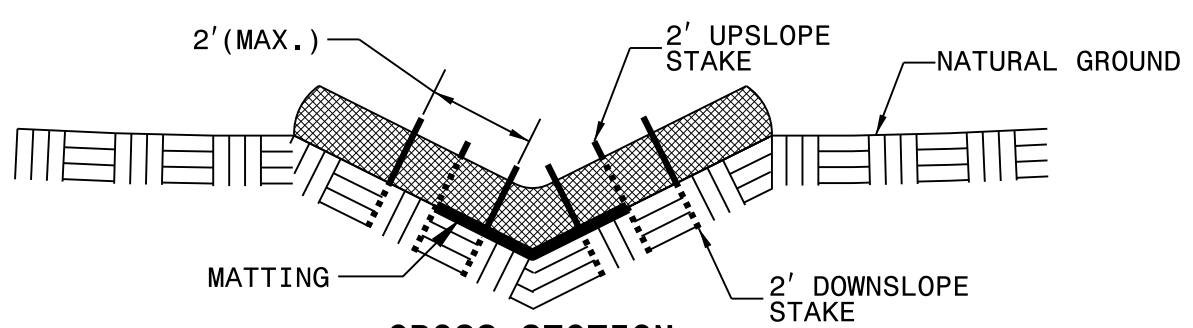


NOT TO SCALE

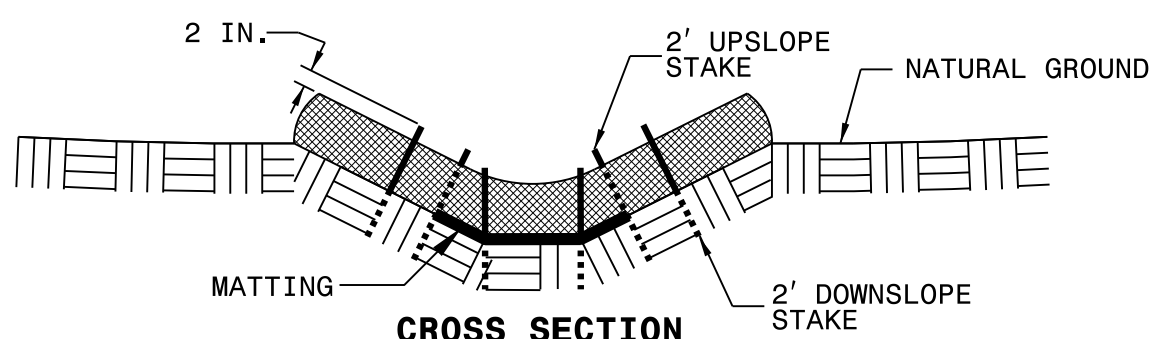
WATTLE DETAIL



ISOMETRIC VIEW



CROSS SECTION VEE DITCH



CROSS SECTION TRAPEZOIDAL DITCH

NOTES:

USE MINIMUM 12 IN. DIAMETER EXCELSIOR WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

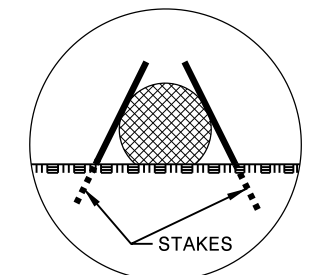
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

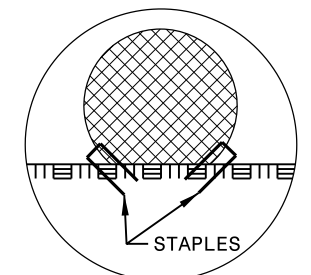
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

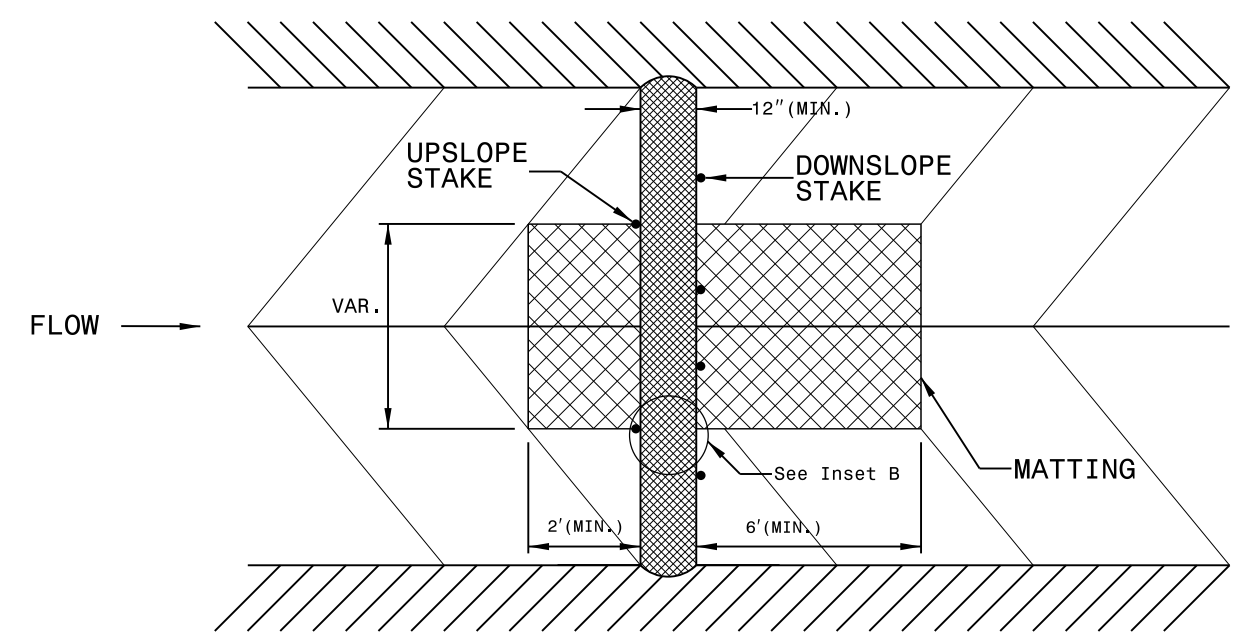
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



INSET A

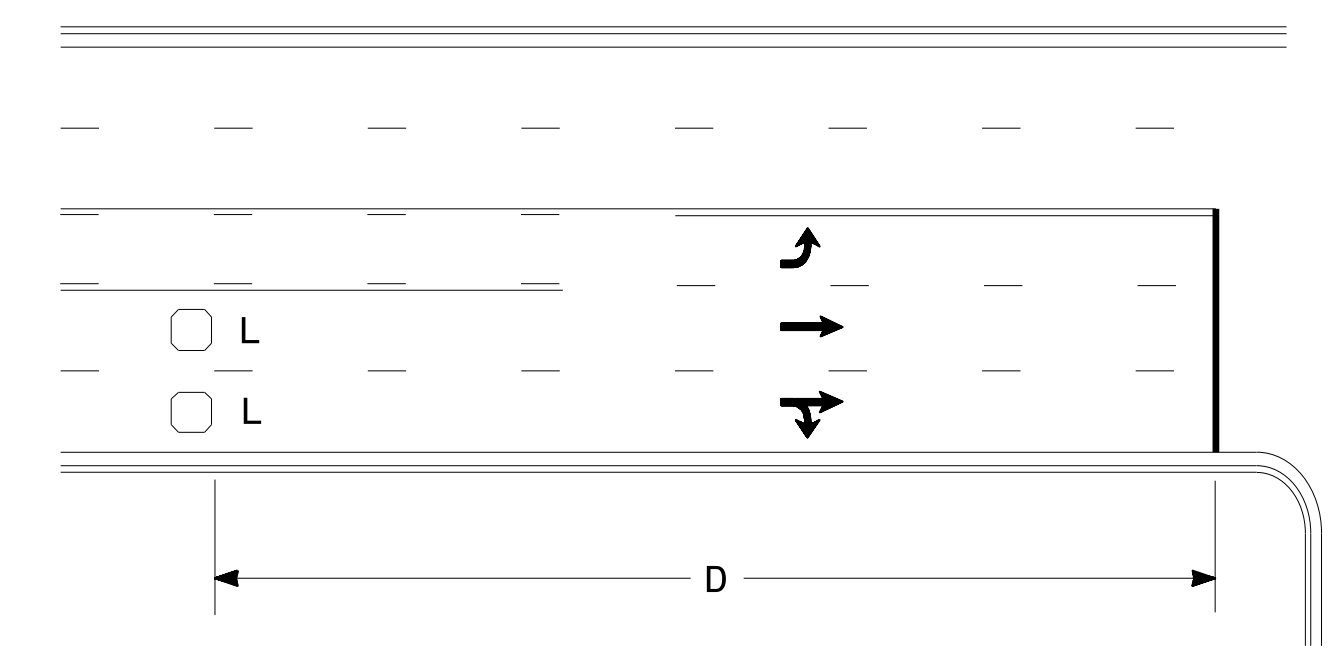


INSET B



TOP VIEW

High Speed Detection (≥40 mph)

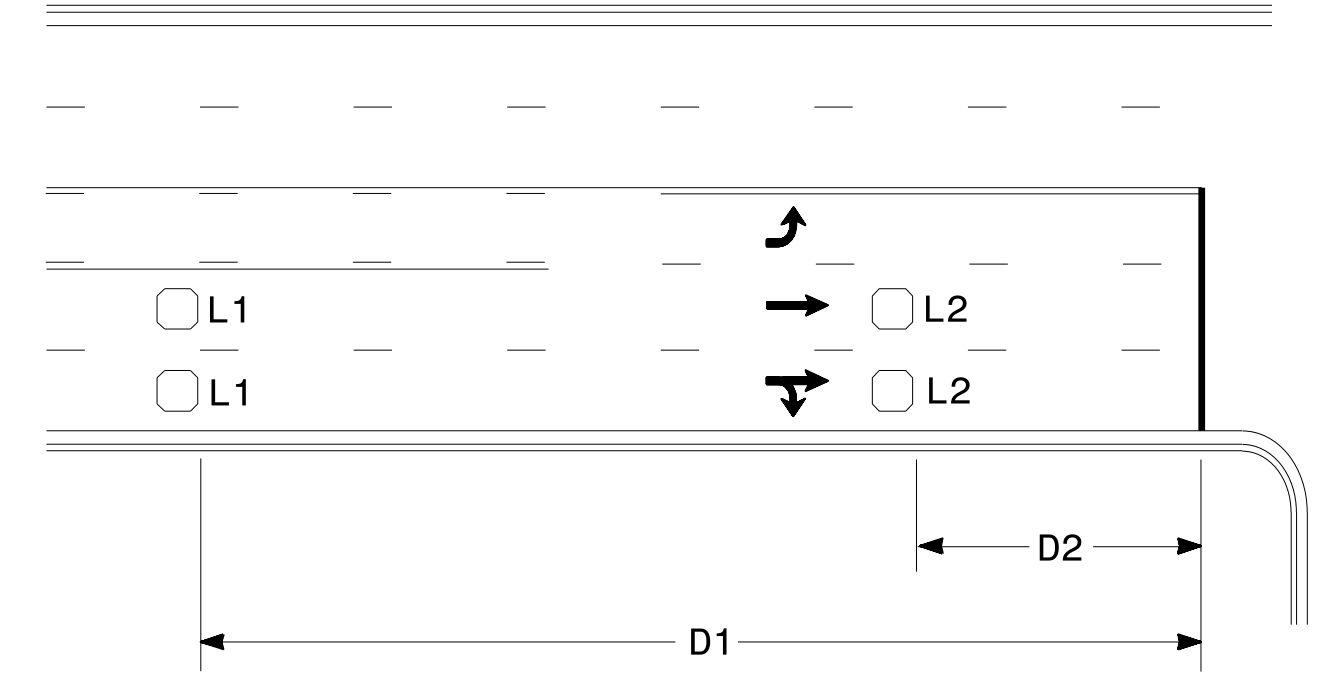


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

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

Volume Density Operation

OR

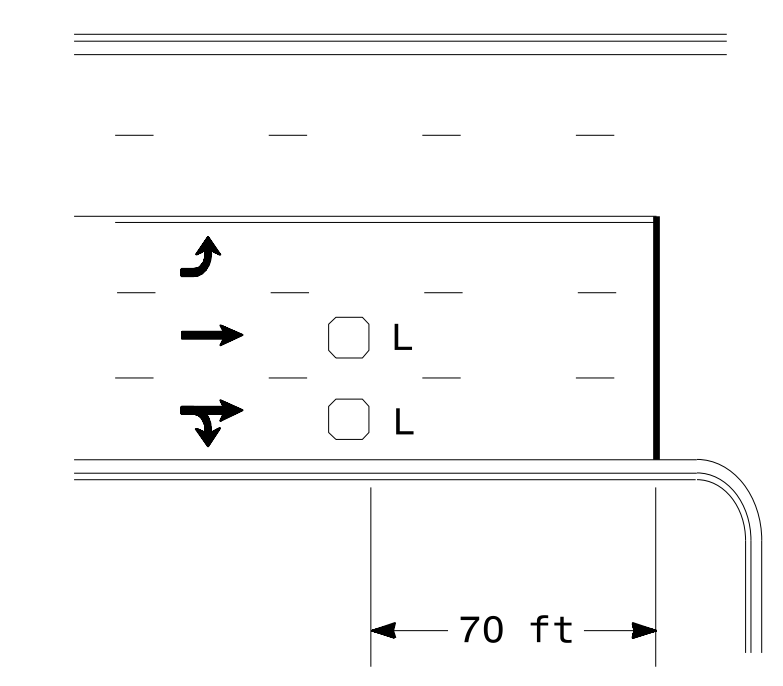


Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

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

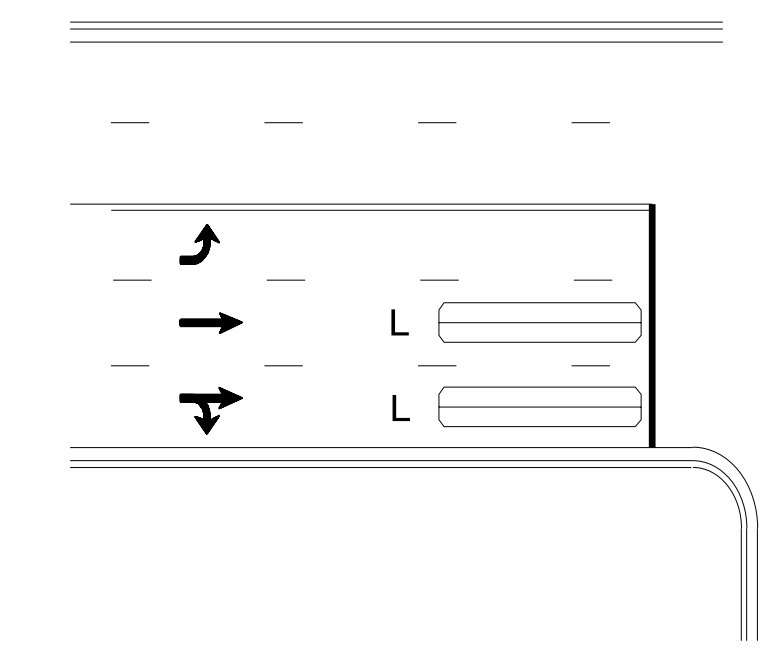
"Stretch" Operation

Low Speed Detection (≤35 mph)



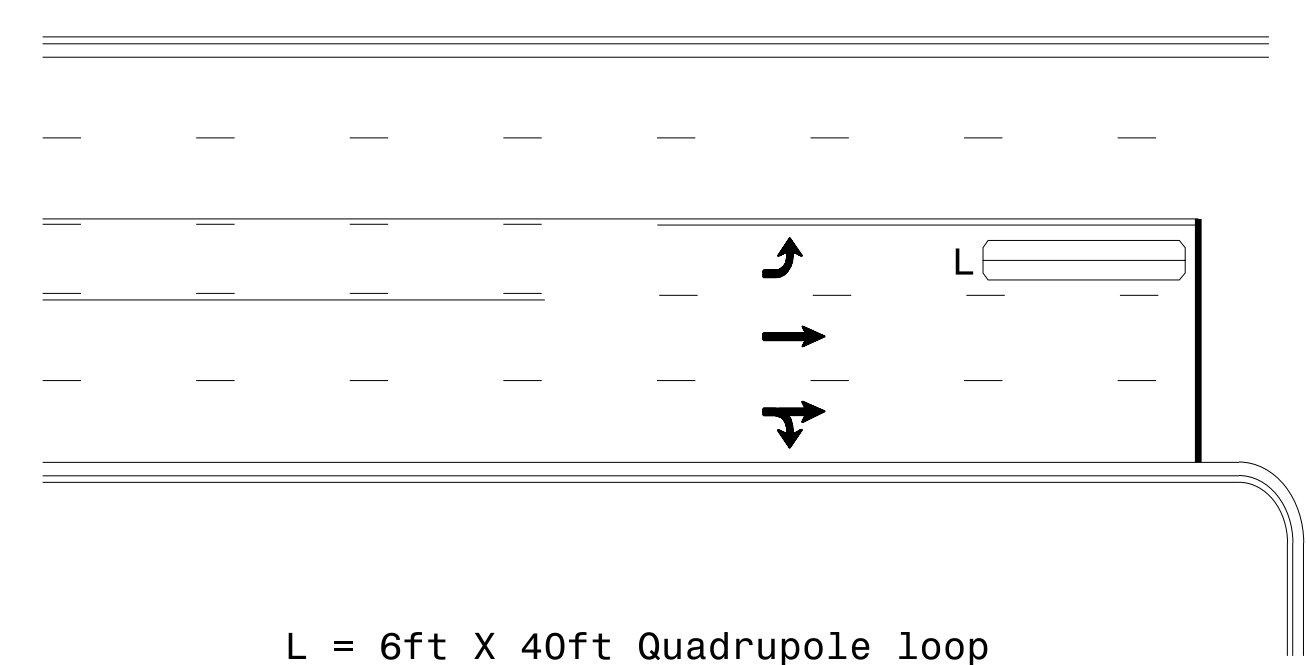
L = 6ft X 6ft
Wired in series

OR



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

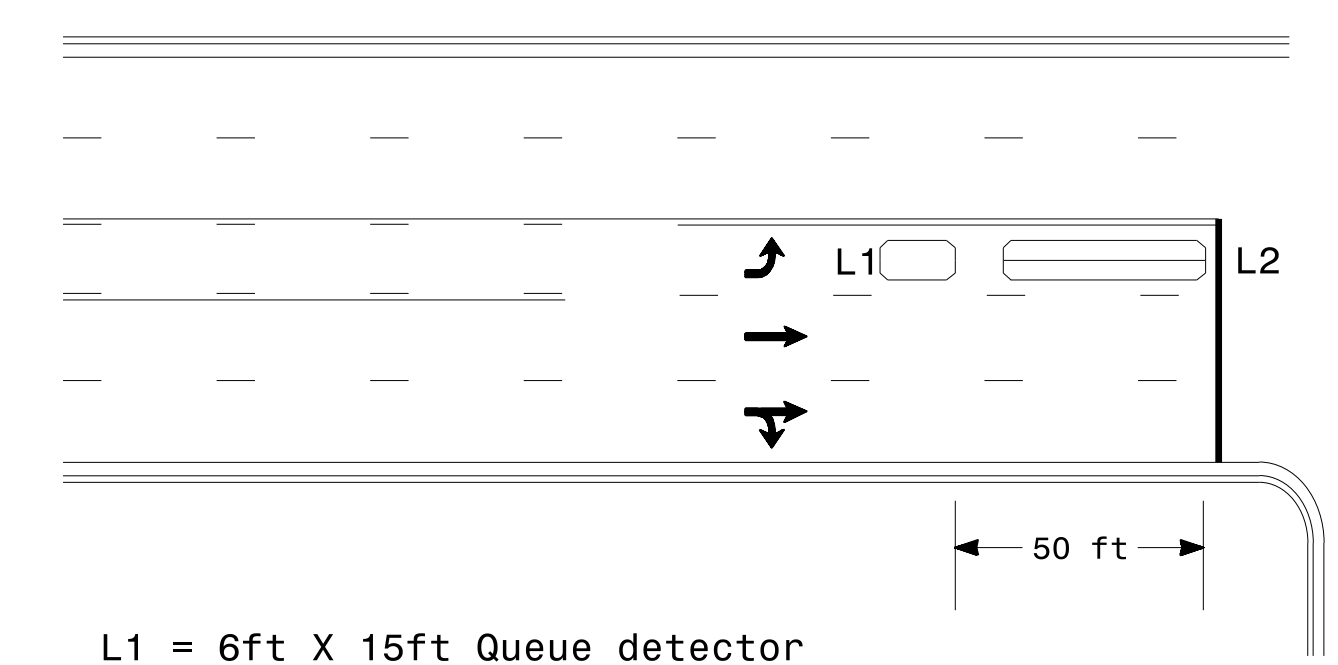
Left Turn Lane Detection



L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

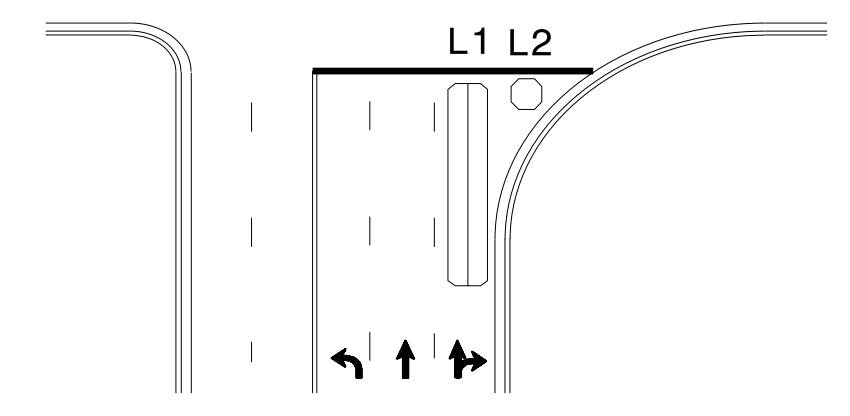
OR



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

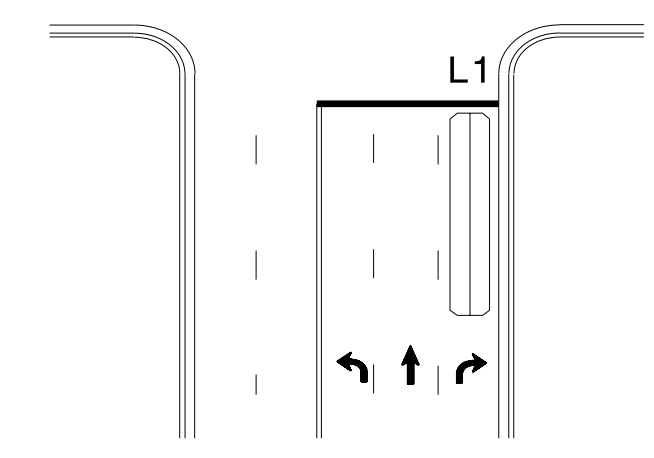
Queue Loop Detection

Right Turn Lane Detection

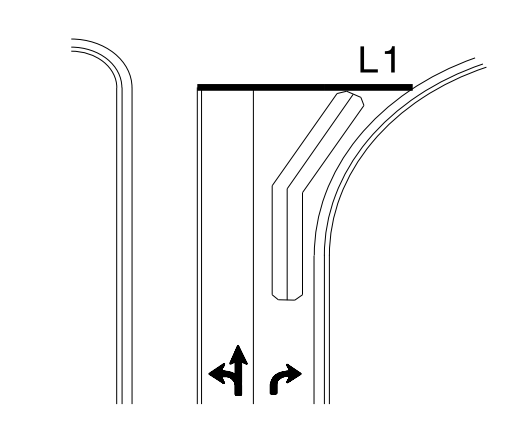


Shared Lane/
Wide Radius Turn

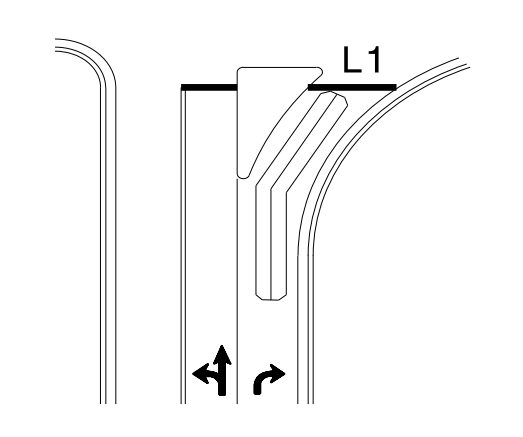
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

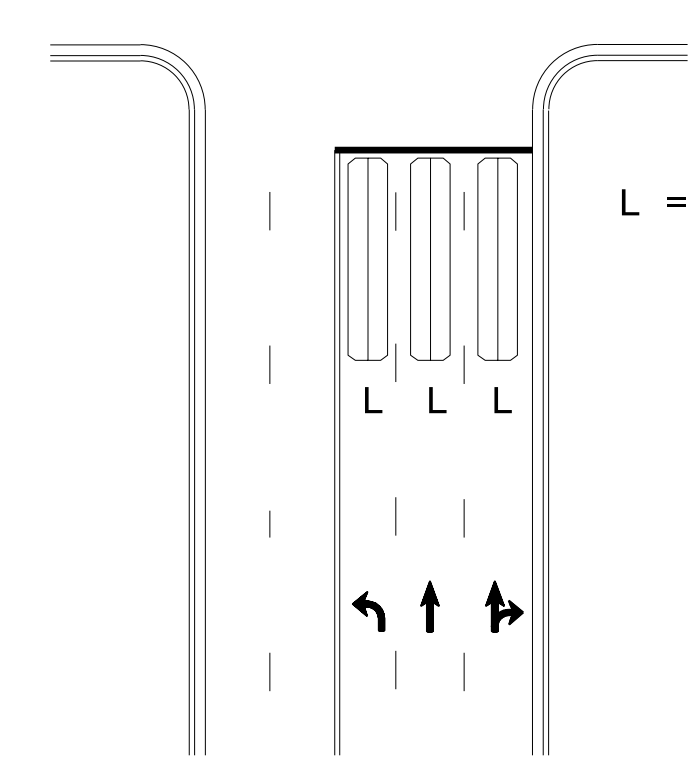


Wide Radius Turn



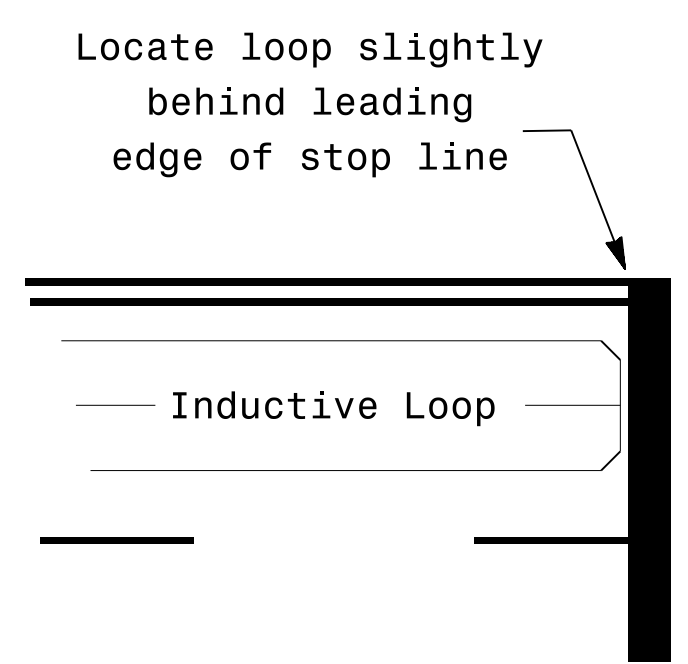
Channelized Turn

Side Street Detection



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

Presence Loop Placement at Stop Lines



Locate loop slightly
behind leading
edge of stop line

Note:
Loop may be located in advance
of stop line under any of the
following conditions:
1) stop line is greater than 15'
from edge of intersecting
roadway
2) loop detects a permissive or
protected/permissive left turn
3) for an exclusive right turn
lane

Recommended Number of Turns

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

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

Quadrupole loops: Use 2-4-2 turns
6' X 15' Loops:
Lead-in < 150', use 2 turns
Lead-in > 150', use 3 turns

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Signal Loop Locations

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

SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
PAMELA L. ALEXANDER
23489

1/30/2015

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 paalexander

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RALEIGH, N.C.

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

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

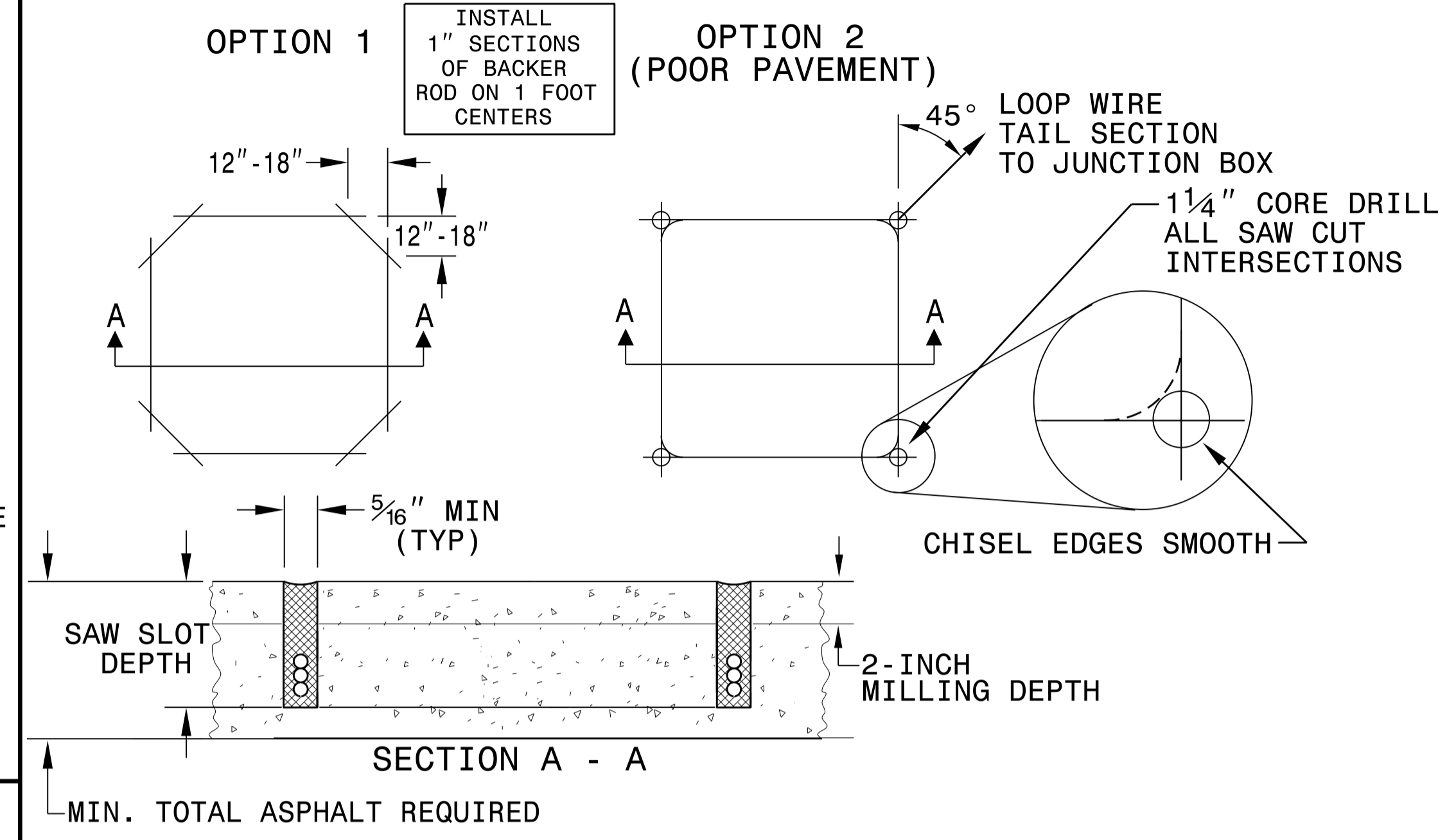


CORRECT WAY TO TWIST WIRE

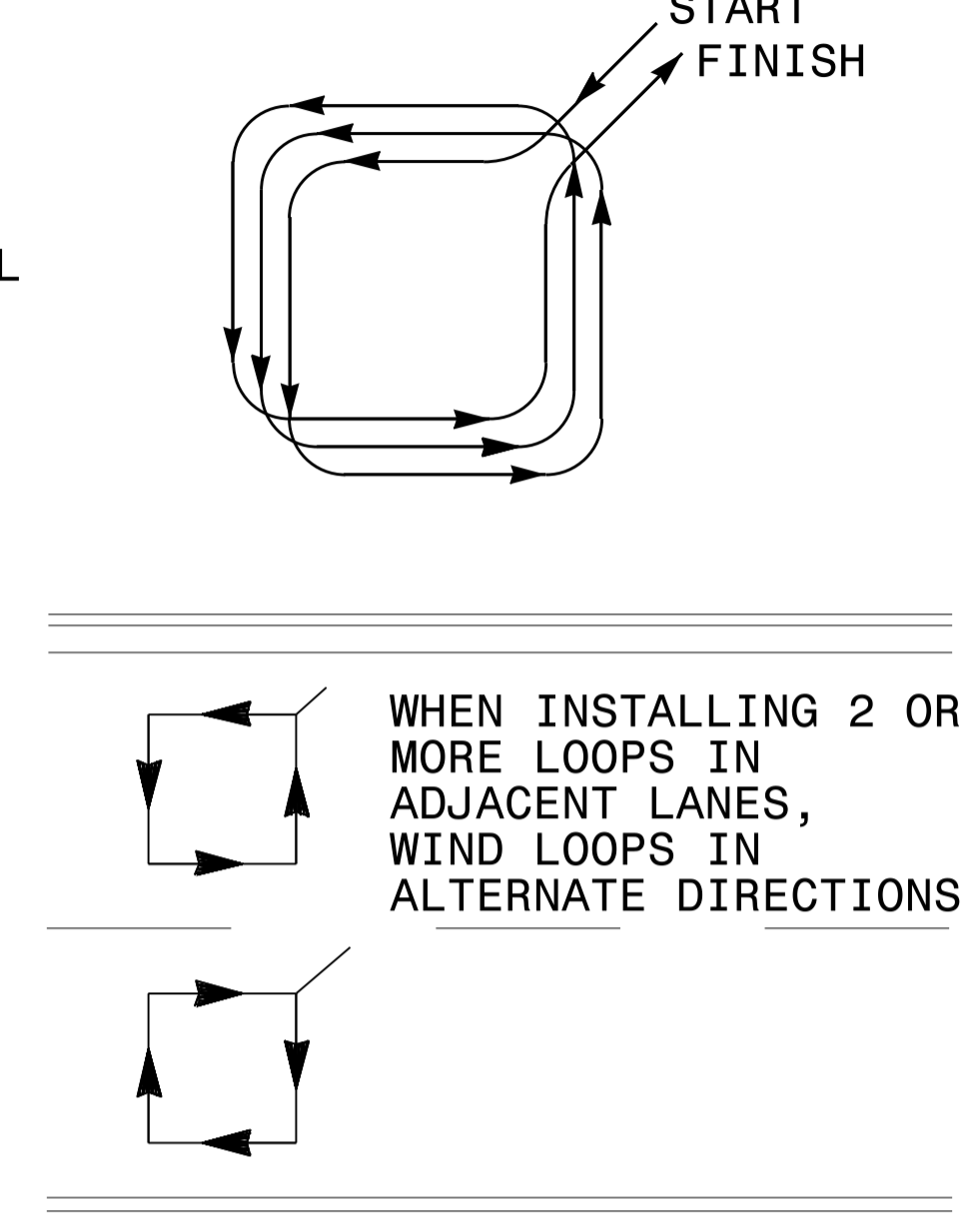


CONVENTIONAL 4-SIDED LOOP

SAW CUT OPTIONS

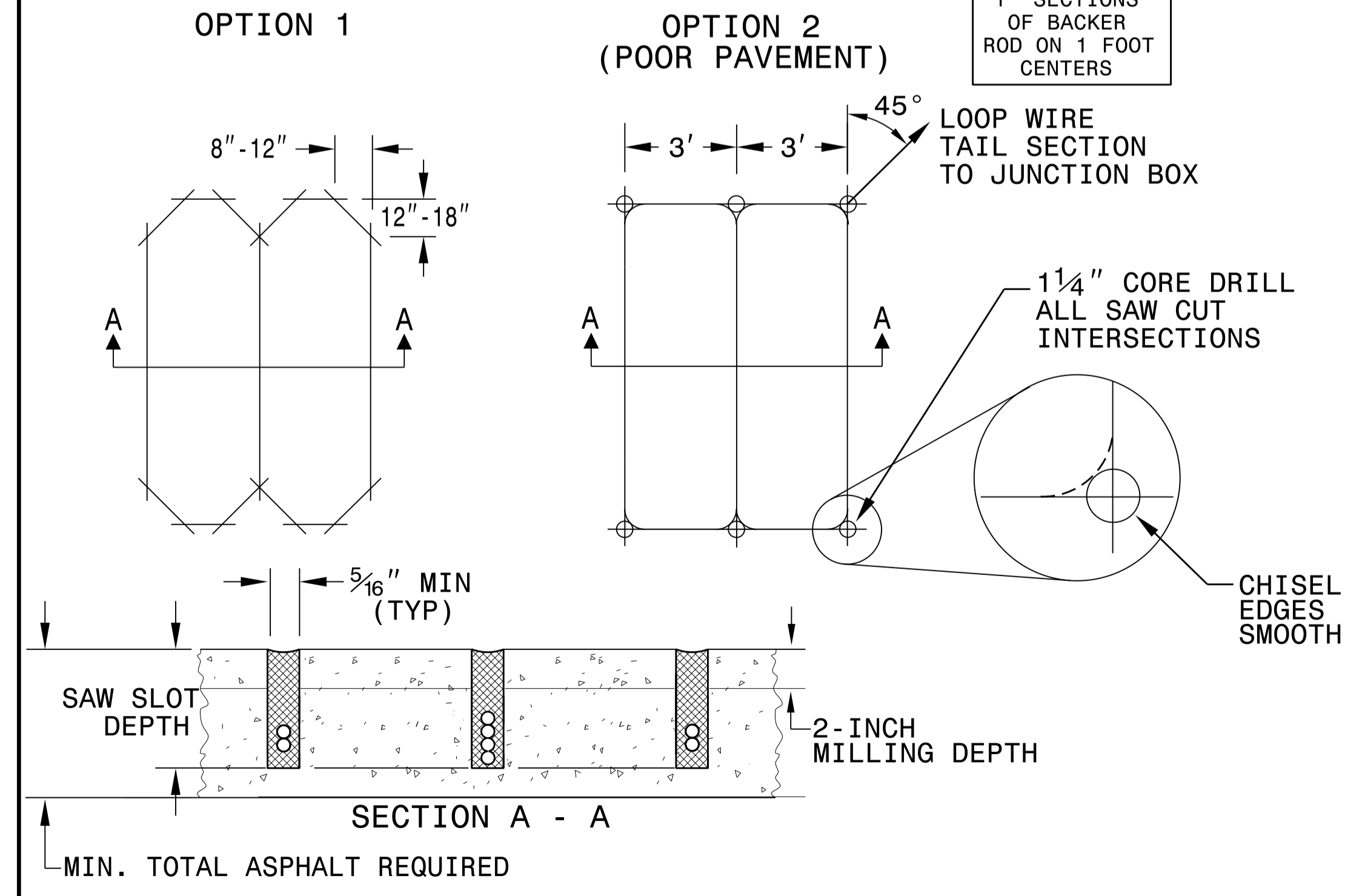


LOOP WINDING METHOD

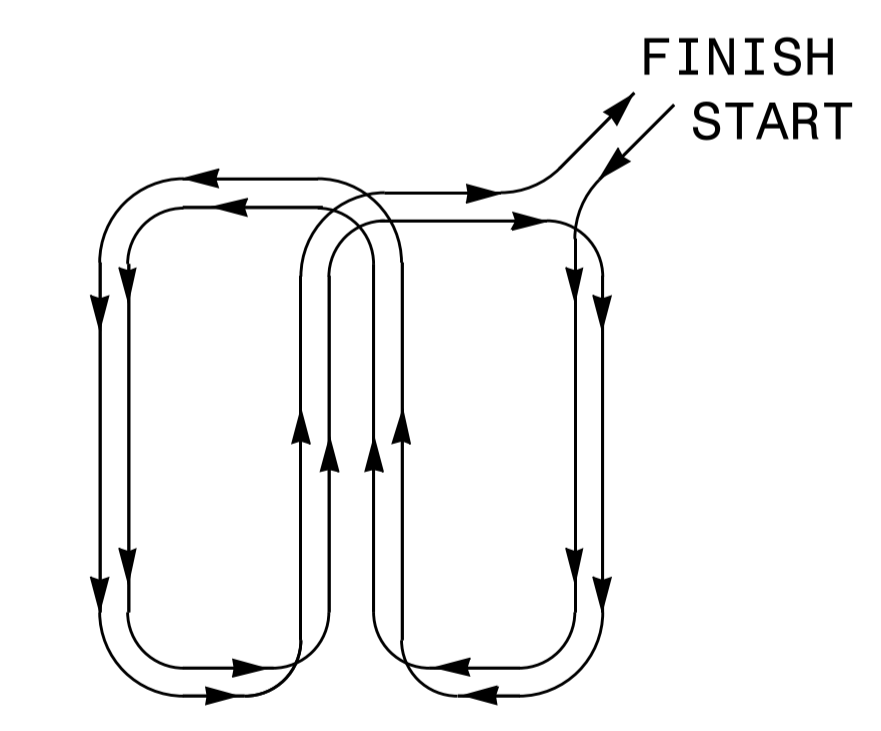


QUADRUPOLE LOOP

SAW CUT OPTIONS

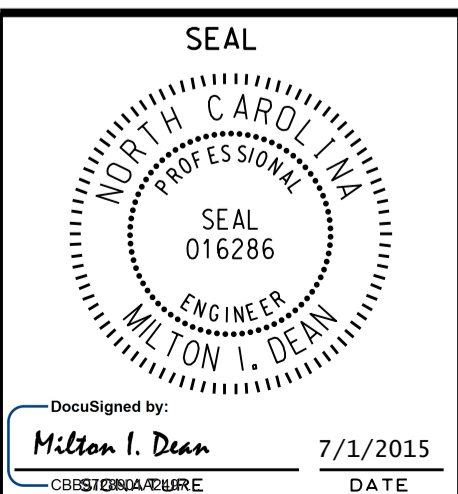
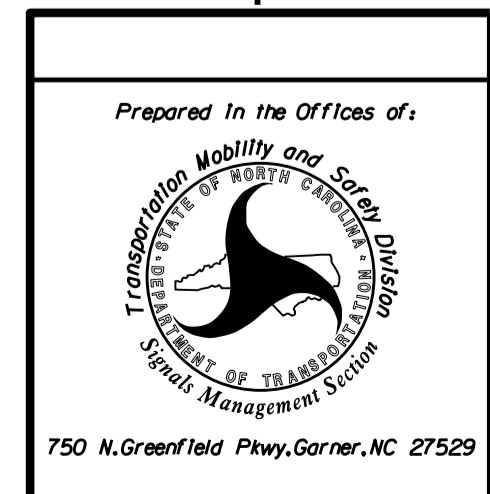


LOOP WINDING METHOD



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
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