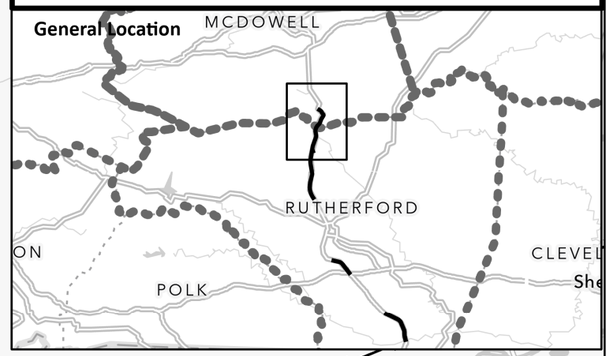
0 0.25 0.5 Miles

WBS - 2025CPT.13.09.10591, ETC Sheet 1

General Location



Vein Mountain

Fero

Thermal City

Union Mills

Rutherford

McDowell

US 221 S

US Highway 221 N

US-221

221

SR-1783
SR-1784
SR-1802
SR-1781
SR-1782
SR-1787
SR-1785
SR-1786
SR-1337
SR-1150
SR-1149
SR-1148
SR-1351
SR-1147
SR-1500
SR-1510
SR-1506
SR-1505
SR-1502
SR-1501
SR-1503
SR-1323
SR-1387
SR-1322
SR-1321
SR-1324
SR-1388
SR-1326
SR-1325
SR-1327

1
6
7

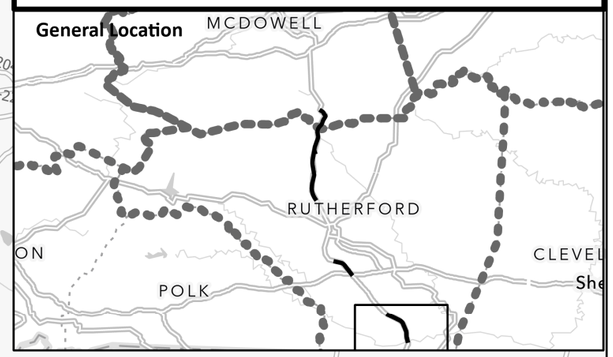
See Inset On Page 4

National Register Boundary

N

MAP_NUMBER	ROUTE	FROM_DESC	TO_DESC	LENGTH
7	UNION MILLS FIRE DEPARTMENT (SR 1510 HUDLOW ROAD)	SR 1510 (HUDLOW ROAD)	.08 MILE	0.01
1	US 221	RUTHERFORD COUNTY	POWER LINE CROSSING	2
6	US 221	WENDOVER LANE (PRIVATE DRIVE)	MCDOWELL COUNTY LINE	7.53

WBS - 2025CPT.13.09.10591, ETC Sheet 2



0 0.25 0.5 Miles

Holly Springs

Harris

Floyd Creek

Bridge 055

Broad River

Bridge 030

Brice

221

US-221

2

4

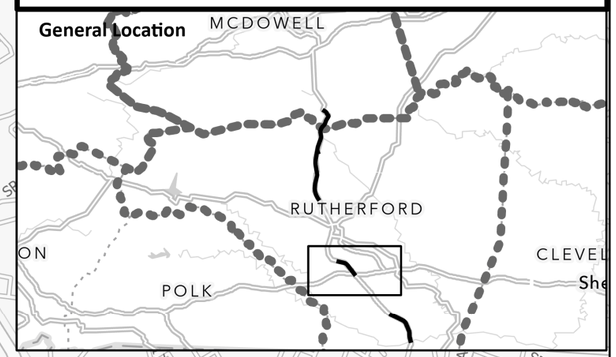
N

MAP_NUMBER	ROUTE	FROM_DESC	TO_DESC	LENGTH
2	US 221 NORTH	BROAD RIVER BRIDGE	FLOYDS CREEK BRIDGE	3.42
4	US 221 SOUTH	FLOYDS CREEK BRIDGE	BROAD RIVER BRIDGE	3.39

NCDOT.GOV, State of North Carolina DOT, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USFWS

WBS - 2025CPT.13.09.10591, ETC Sheet 3

General Location



0 0.25 0.5 Miles

3

5

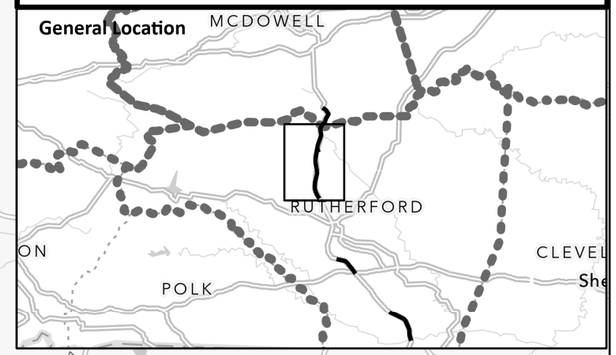
Bridge 631

MAP_NUMBER	ROUTE	FROM_DESC	TO_DESC	LENGTH
3	US 221	US 74 WEST BRIDGE ABUTMENT	SR 1004 (POORS FORD ROAD) + .75 MILES	1.96
5	US 221 SOUTH	US 74 WEST BRIDGE ABUTMENT -.35 MILE	US 74 WEST BRIDGE ABUTMENT	0.28

0 0.25 0.5 Miles

WBS - 2025CPT.13.09.10591, ETC Sheet 4

General Location



1

6

7

See Inset

US Highway 221 N

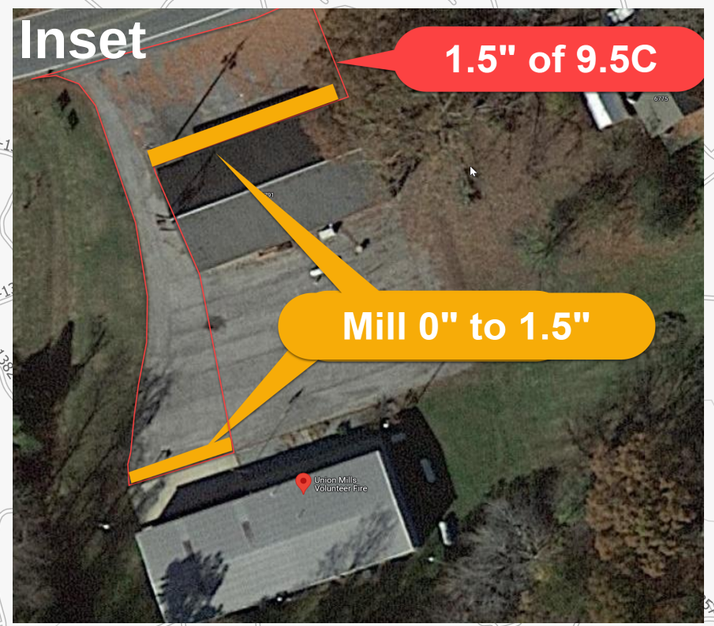
Thermal City

Union Mills

Gilkey

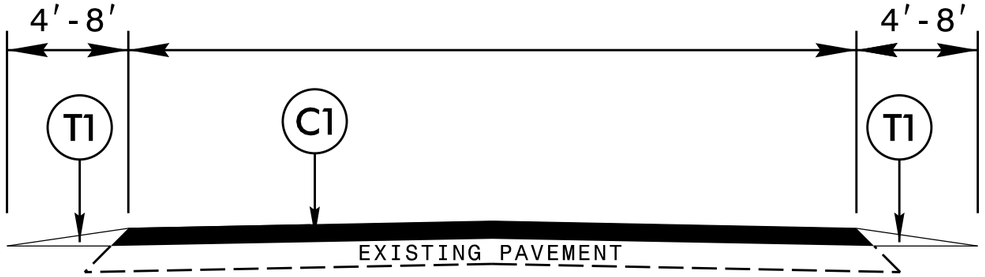
National Register Boundary

Inset

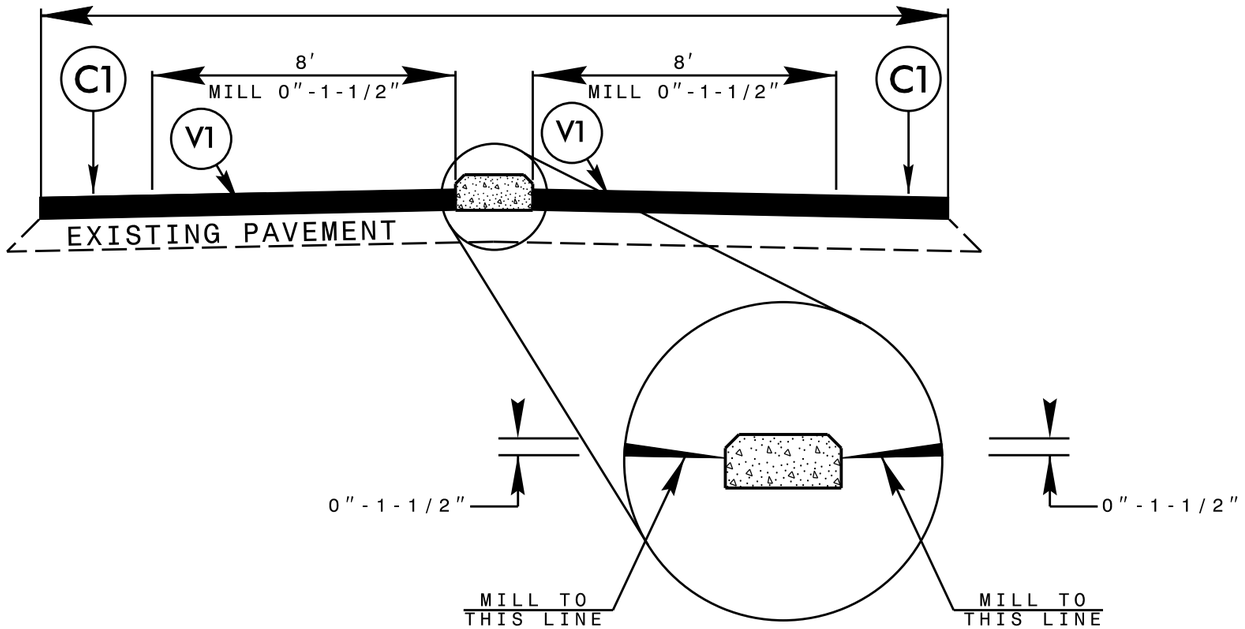


MAP_NUMBER	ROUTE	FROM_DESC	TO_DESC	LENGTH
7	UNION MILLS FIRE DEPARTMENT (SR 1510 HUDLOW ROAD)	SR 1510 (HUDLOW ROAD)	.08 MILE	0.01
1	US 221	RUTHERFORD COUNTY	POWER LINE CROSSING	2
6	US 221	WENDOVER LANE (PRIVATE DRIVE)	MCDOWELL COUNTY LINE	7.53

PROJECT NO.	PAGE NO.
2025CPT.13.09.10591, ETC	5



TYPICAL SECTION #1

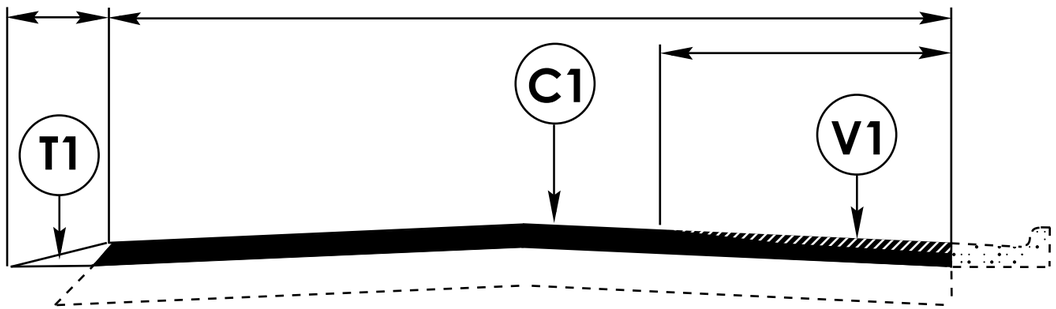


TYPICAL SECTION #2

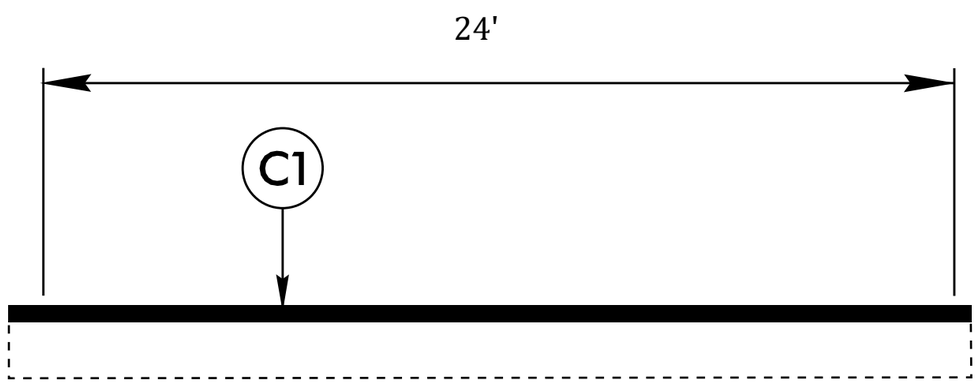
MILLING AROUND ISLANDS.
THIS WILL BE PAID FOR AS 0″ TO 1–1⁄2″.
USE ON MAP NUMBER: MAPS 2 AND 3

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD
T1	SHOULDER RECONSTRUCTION
V1	MILLING ASPHALT PAVEMENT 0" TO 1-1/2" DEPTH
V2	INCIDENTAL MILLING

PROJECT NO.	PAGE NO.
2025CPT.13.09.10591, ETC	6



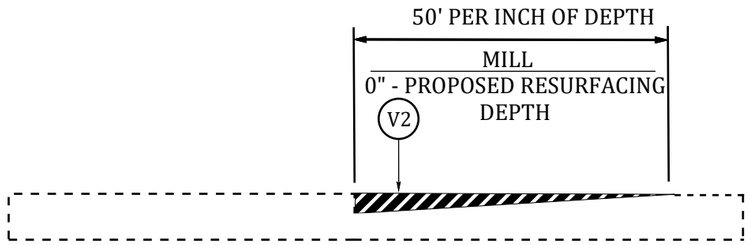
TYPICAL SECTION #3



TYPICAL SECTION #4

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD
T1	SHOULDER RECONSTRUCTION
V1	MILLING ASPHALT PAVEMENT 0" TO 1-1/2" DEPTH
V2	INCIDENTAL MILLING

PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, ETC	7

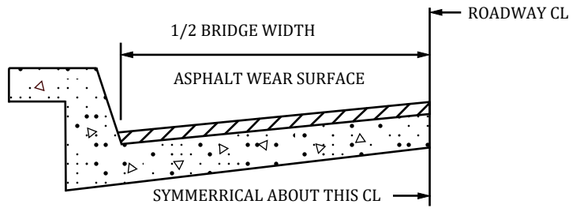


MILLING DETAIL TO TIE INTO EXIST PAVEMENT

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT HE WILL BE REQUIRED TO MILL THE EXISTING ASPHALT PAVEMENT TO ENSURE A PROPER TIE-IN WITH THE EXISTING SURFACE AT THE BEGINNING, END AND Y LINES OF EACH MAP TO BE RESURFACED WITH ASPHALT CONC SURFACE COURSE, TYPE 9.5B OR S9.5C. THIS WILL BE PAID FOR AS INCIDENTAL MILLING.

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 1-1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YARD
T1	SHOULDER RECONSTRUCTION
V1	MILLING ASPHALT PAVEMENT 0" TO 1-1/2" DEPTH
V2	INCIDENTAL MILLING

PROJECT NO.	PAGE NO.
2025CPT.13.09.10591, ETC	8



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.

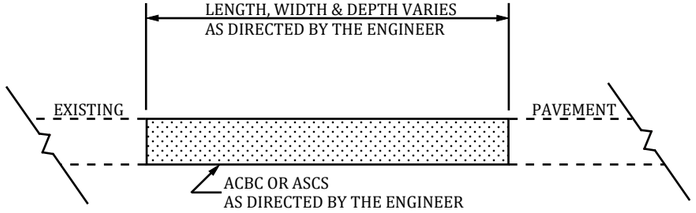
THE PROPOSED WEARING SURFACE SHALL VARY IN THICKNESS AS NECESSARY TO PROVIDE A SMOOTH RIDING SURFACE. THE MINIMUM THICKNESS SHOULD DEPEND ON PAVEMENT TYPE AS FOLLOWS: S4.75A 1/2", S9.5B 1", S9.5C,D 1.5" - 2". ULTRA-THIN HOT MIX ASPHALT ".

NOTES

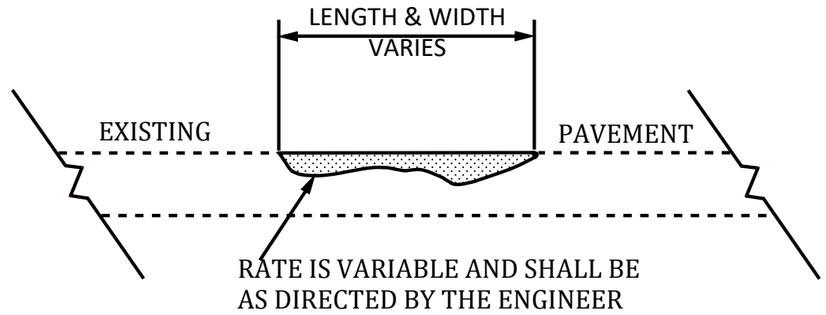
EDGES, PAVEMENT WIDENING, INTERSECTIONS AND BRIDGE FLARES ARE INCLUDED IN THE TABLE OF QUANTITIES.

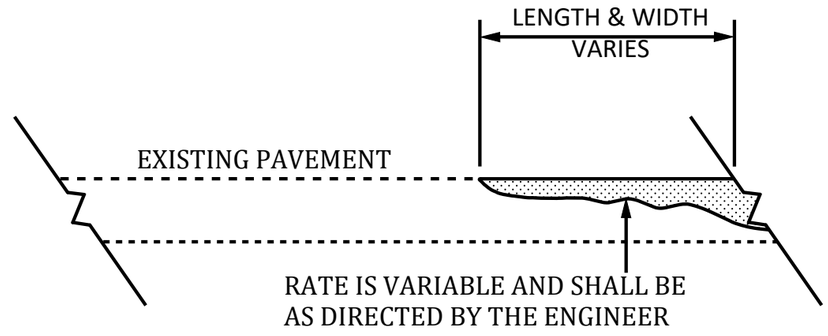
SHOULDERS AND DITCHES ARE TO BE CONSTRUCTED BY OTHERS UNLESS OTHERWISE INDICATED.

BRIDGES ARE TO BE RESURFACED AT LOCATIONS AND TO DEPTH AS DIRECTED BY THE ENGINEER.



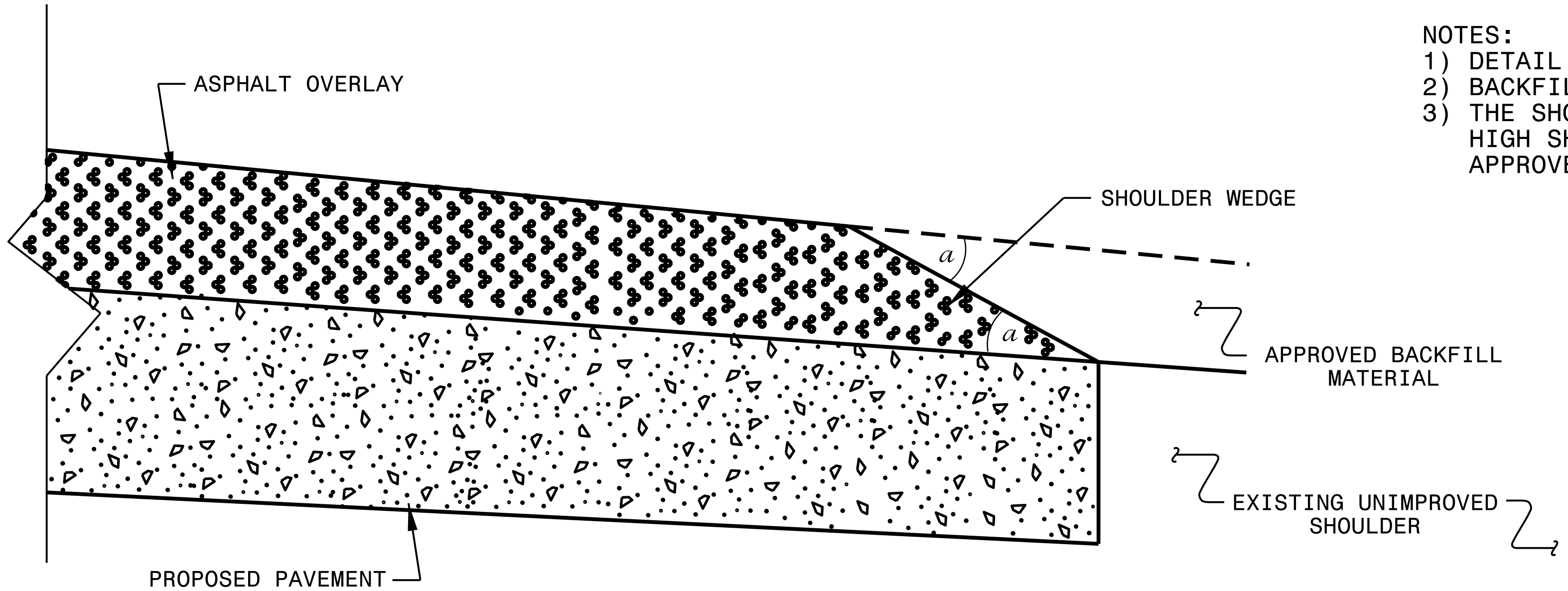
PATCHING EXISTING PAVEMENT





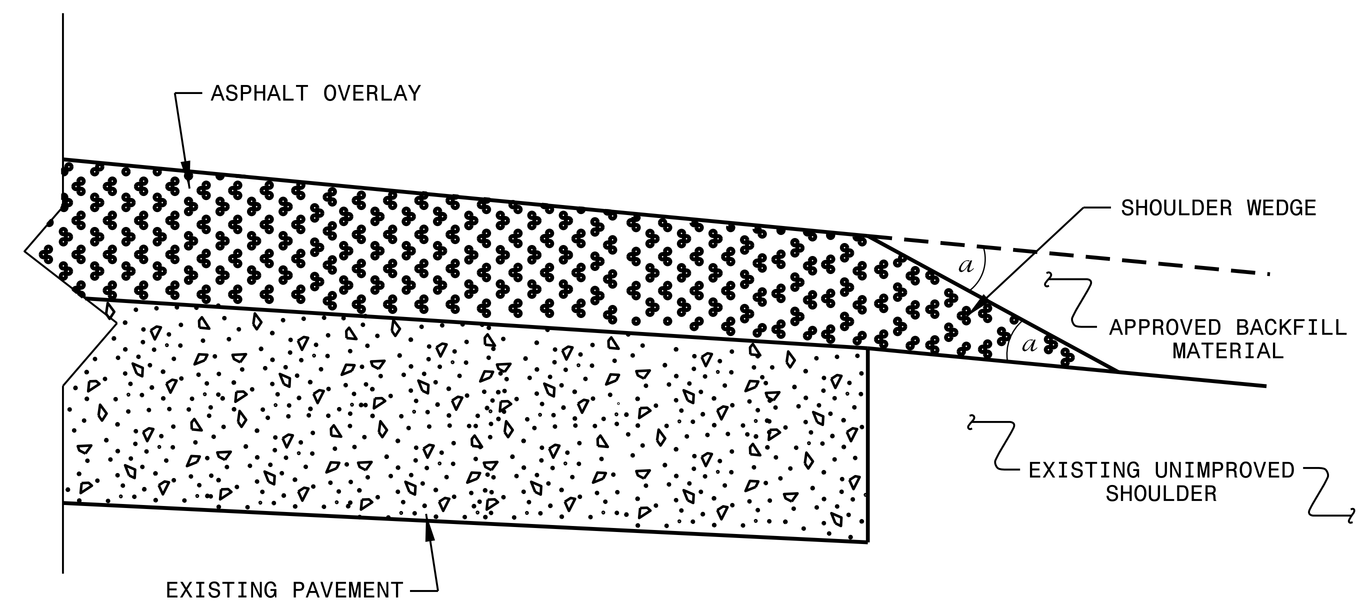
DETAIL SHOWING METHOD OF WEDGING

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.



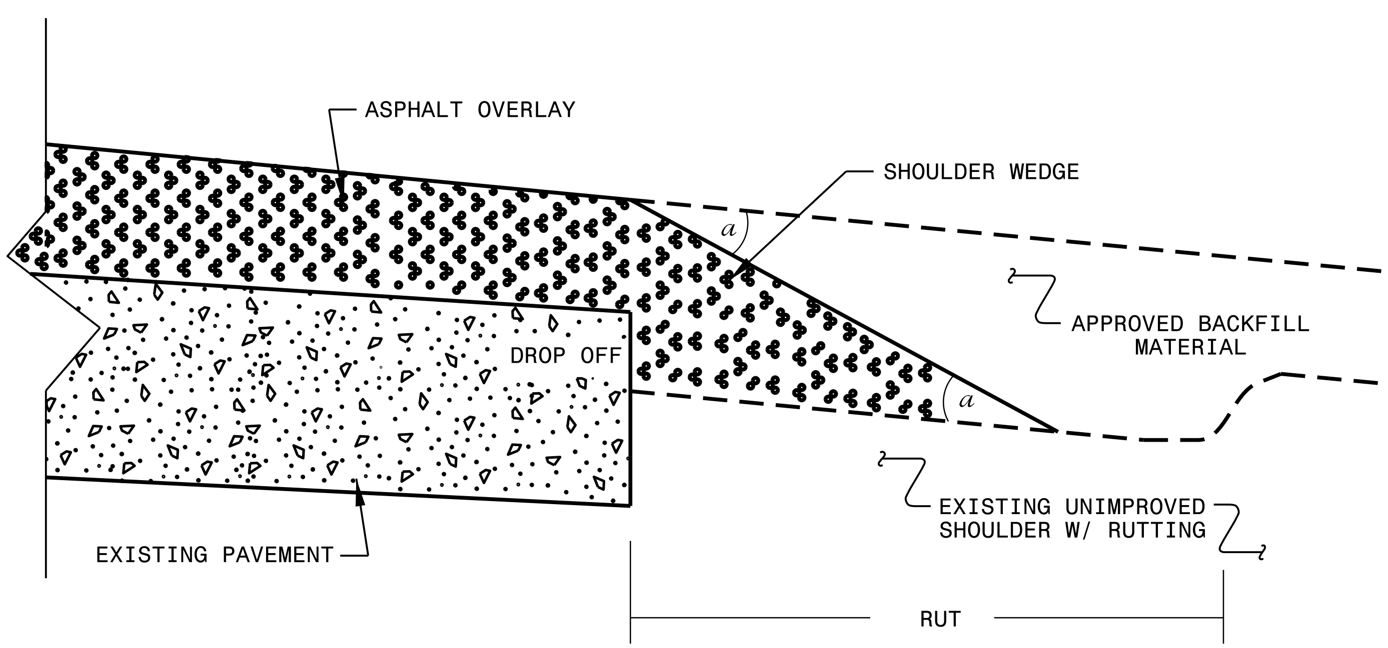
SHOULDER WEDGE DETAIL

(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)

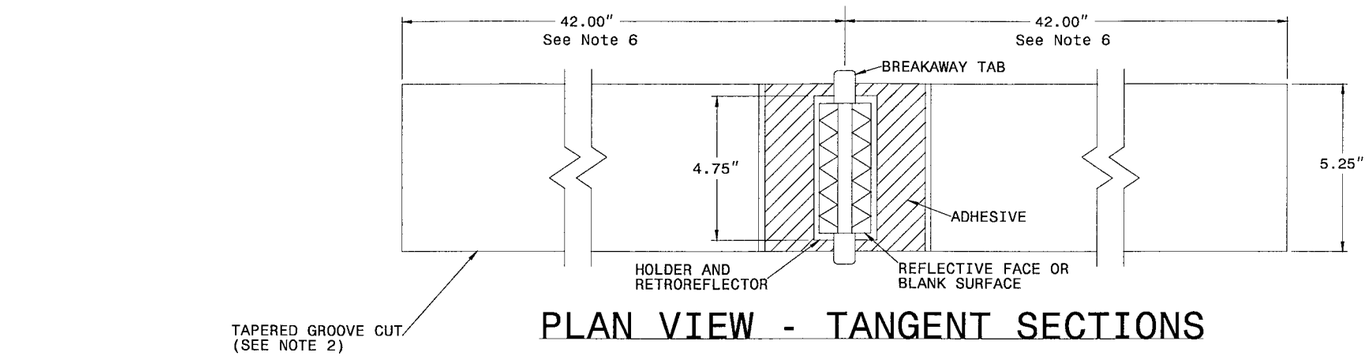
- SHOULDER WEDGE ANGLE = 30°

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

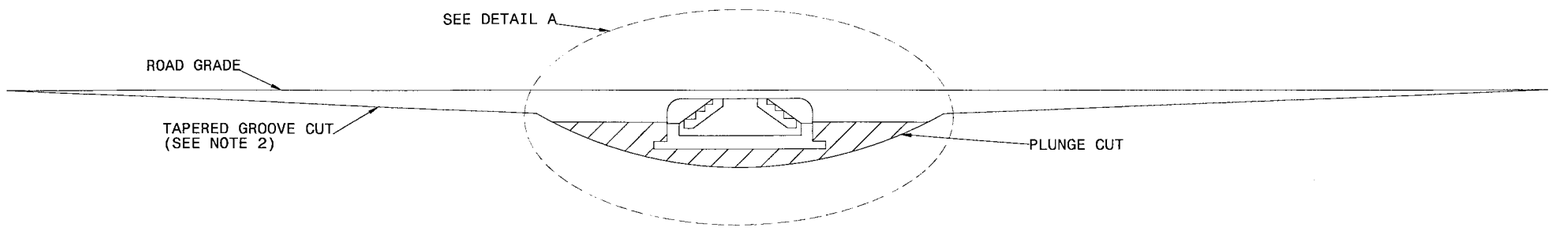
SHOULDER WEDGE DETAILS

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

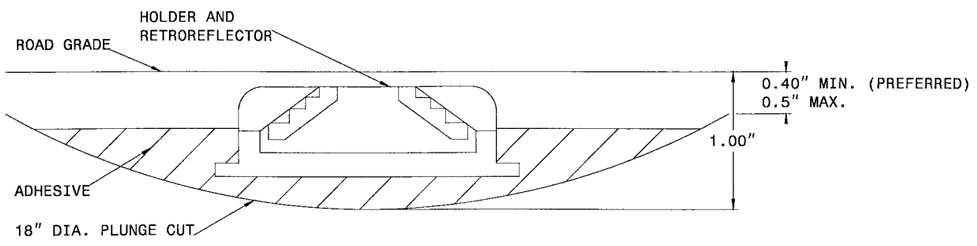
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



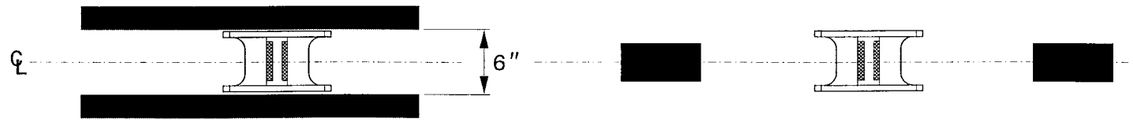
PLAN VIEW - TANGENT SECTIONS



PROFILE VIEW



DETAIL A



MARKER SPACING

NOTES:

1. ALL GROOVE EDGES SHALL BE AT LEAST 2 INCHES FROM ANY SEAM OR PAVEMENT JOINT
2. GROOVE CUTS MAY BE TAPERED OR BEVELED. TAPERED CUTS SHALL START AT ROAD LEVEL ON EACH END AND TAPER AT A FIXED RATE AS SHOWN ON THE PROFILE VIEW. BEVELED GROOVE CUTS SHALL BE 0.5" MAXIMUM DEPTH (0.4" PREFERRED), AND SHALL BE 0.4" MINIMUM DEPTH AT BOTH ENDS OF THE PLUNGE CUT.
3. GROOVE AND PLUNGE CUT SHALL BE CLEAN AND DRY PRIOR TO PLACEMENT OF ADHESIVE.
4. THE EPOXY ADHESIVE SHALL BE THOROUGHLY MIXED UNTIL IT IS UNIFORM IN COLOR, AND APPLIED IN COLOR, AND APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
5. MARKER SHALL BE INSTALLED AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS WITH THE BREAKWAY TABS RESTING ON THE PAVEMENT SURFACE. THE EPOXY SHALL BE FILLED TO THE LEVEL OF THE TOP OF THE MARKER HOLDER. EPOXY SHALL NOT TOUCH THE RETROREFELCTOR.
6. TOTAL GROOVE LENGTH MAY BE SHORTENED TO 54" ON SHARP CURVES IF APPROVED BY THE ENGINEER. GROOVES SHALL NOT OVERLAP WITH LOOP DETECTOR WIRES.

NORTH CAROLINA PROFESSIONAL SEAL 042546 ENGINEER MATTHEW V. SPRINGER

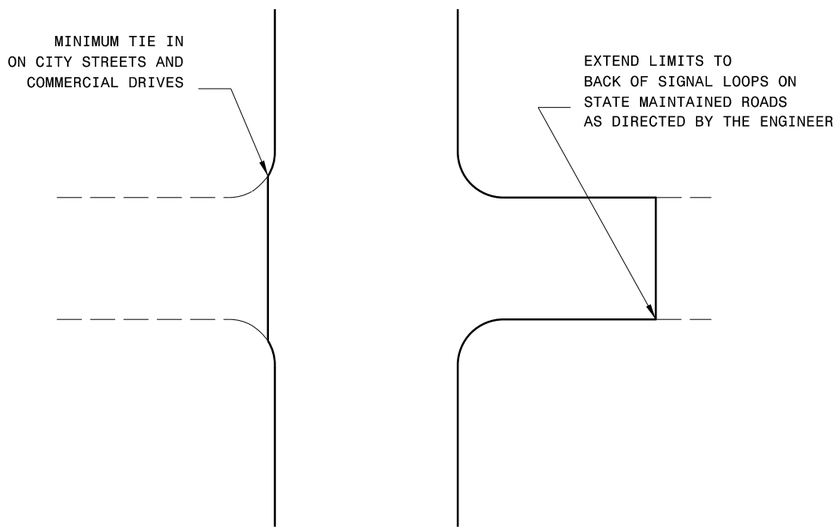
Signed by: Matthew V. Springer

CONTRACTS STANDARDS AND DEVELOPMENT UNIT
Office 919-707-8950 FAX 919-250-4119

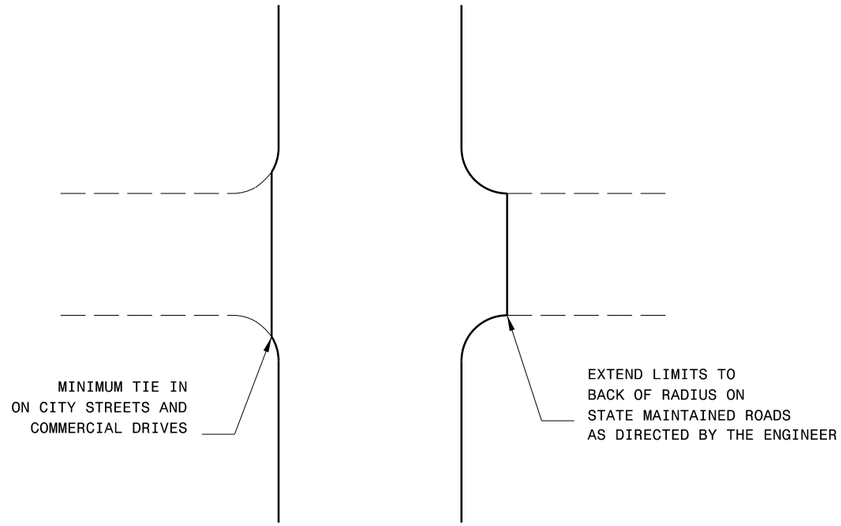
DETAIL OF INLAID CRADLE MARKER

ORIGINAL BY: rgwatson DATE: 02-06-2024
MODIFIED BY: DATE:
CHECKED BY: DATE:
FILE SPEC.:

PROJECT REFERENCE NO.	SHEET NO.
2025CPT.13.09.10591 ETC	11



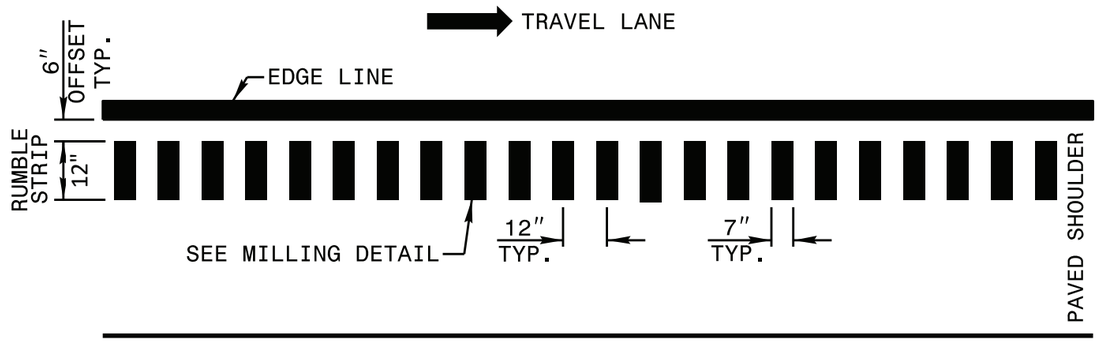
TYPICAL DETAIL OF PROJECT LIMITS AT
SIGNALIZED Y LINES



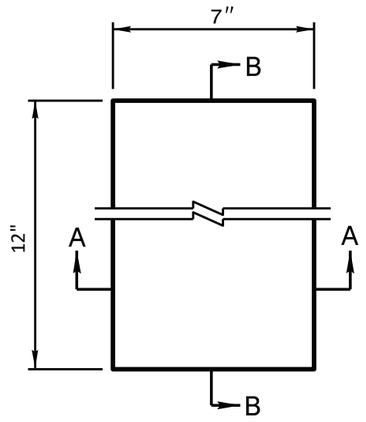
TYPICAL DETAIL OF PROJECT LIMITS AT
UNSIGNALIZED Y LINES

ADDITIONAL INTERSECTIONS (NON-TYPICAL)		
Extend paving limits to back of radius or loop on the following intersections:		
MAP#	STREET NAME	COMMENTS
ALL MAPS	ALL STREETS	50' TYPICAL
		EXTEND PAVING LIMITS PAST BACK OF INITIAL
		SET OF SIGNAL LOOPS OR CONCRETE ISLAND
		5' WHEN PRESENT ON SR ROADS AS DIRECTED
		BY ENGINEER
		FOLLOW DETAILS ABOVE FOR TIE - INS ON ALL
		CITY STREETS AND COMMERCIAL DRIVES

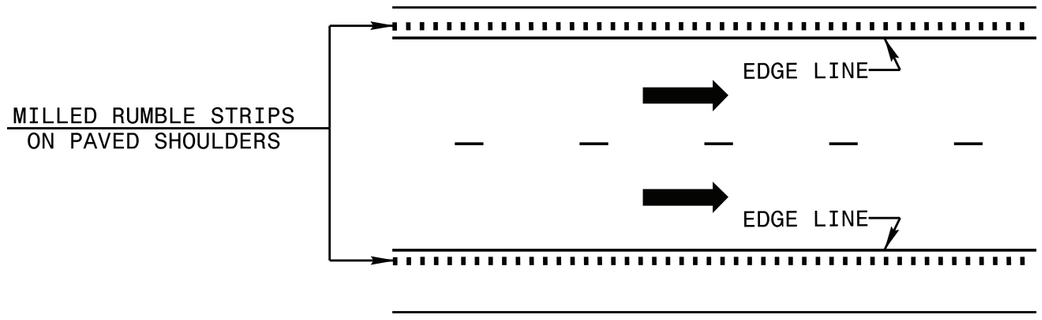
PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, ETC	12



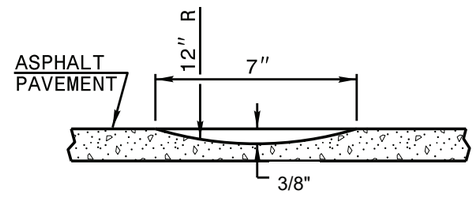
PLAN VIEW
PAVED SHOULDER



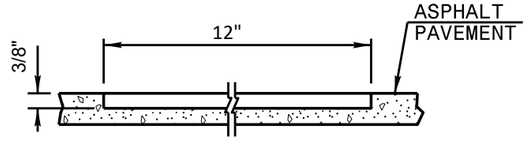
PLAN VIEW
MILLING DETAIL



LANE TREATMENT



SECTION A-A



SECTION B-B

NOTES:

1. SEE TYPICAL SECTIONS AND PLAN SHEETS FOR WIDTHS OF PAVED SHOULDERS.
2. THE MILLING OPERATION SHALL MAINTAIN A MINIMUM CLEARANCE OF 3″ FROM CONSTRUCTION JOINTS.

NORTH CAROLINA PROFESSIONAL SEAL 041993 ENGINEER WILLIAM C. CARVER

DocuSigned by:
William C Carver
163525A8519349F...
05/08/2025

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

2-23

ENGLISH DETAIL DRAWING FOR

RUMBLE STRIPS / STRIPES

TRADITIONAL CENTERLINE RUMBLE STRIP WITH SNOWPLOWABLE MARKERS

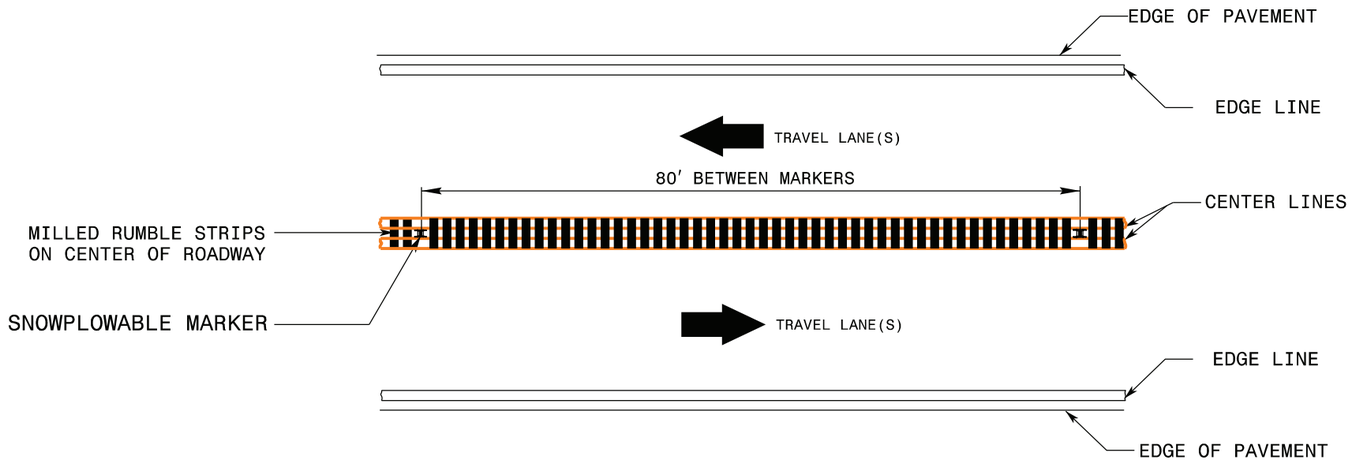
PROJECT NO.	SHEET NO.
2025CPT.13.09.10591. ETC.	13

NORTH CAROLINA PROFESSIONAL SEAL 041993 ENGINEER WILLIAM C. CARVER

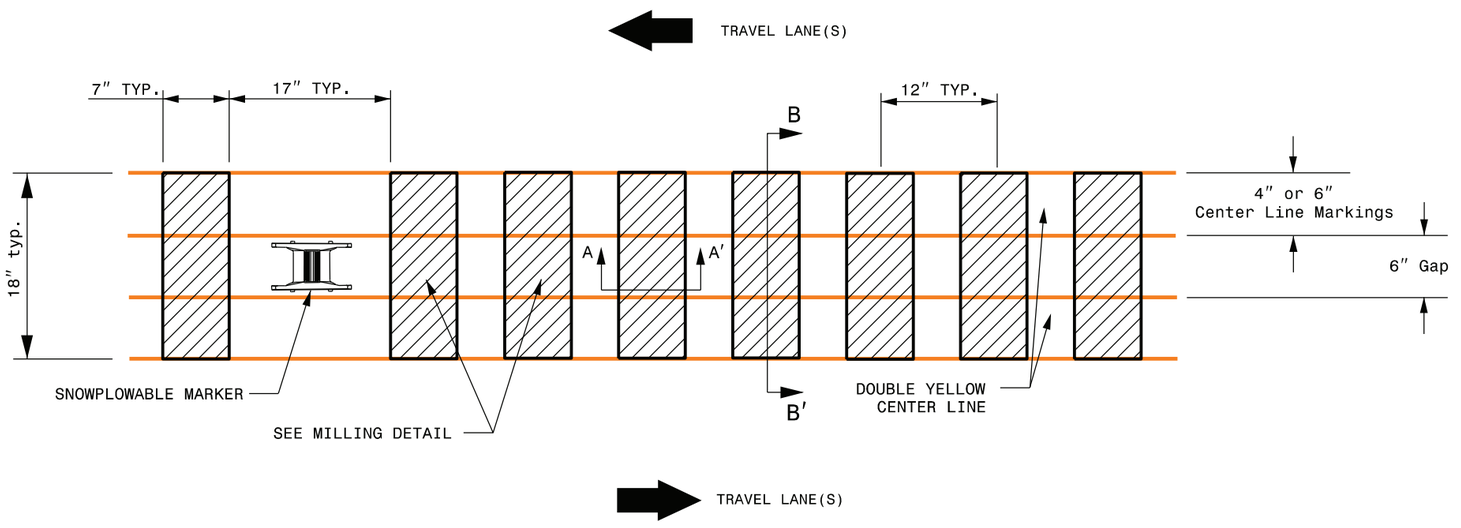
DocuSigned by:
William C Carver
163525A8519349F...

05/07/2025

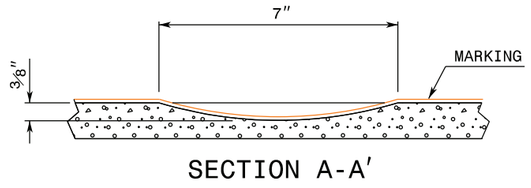
LANE TREATMENT

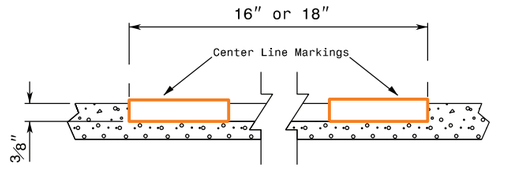


CENTER LINE



MILLING DETAIL





NOTES:

1) REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS.
2) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
3) INSTALL SNOWPLOWABLE MARKERS AT APPROXIMATELY 80′ INCREMENTS. DO NOT MILL RUMBLE STRIPS IN SECTION WHERE SNOWPLOWABLE MARKERS ARE INSTALLED.

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

2-23

ENGLISH DETAIL DRAWING FOR

RUMBLE STRIPS / STRIPES

TRADITIONAL CENTERLINE RUMBLE STRIP WITH SNOWPLOWABLE MARKERS

PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, 2025CPT.13.09.10811	14

SUMMARY OF QUANTITIES

												1220000000-E	1245000000-E	1260000000-E	1308000000-E	1330000000-E	1523000000-E	1524000000-E	1575000000-E	1704000000-E	1841000000-E	1881000000-E	2830000000-N	2845000000-N	4895000000-N		7444000000-E	7456100000-E
PROJECT NO	COUNTY	MAP NO	ROUTE	DESCRIPTION	TYP NO	LANES	LANE TYPE	LENGTH	WIDTH	BEGIN MP	END MP	INCIDENTAL STONE BASE	SHOULDER RECONSTRUCTION	AGGREGATE SHOULDER BORROW	MILLING ASPHALT PAVEMENT, 0" TO 1-1/2"	INCIDENTAL MILLING	ASPHALT CONC SURFACE COURSE, TYPE S9.5C	LEVELING COURSE, TYPE S9.5C	ASPHALT BINDER FOR PLANT MIX	PATCHING EXISTING PAVEMENT	MILLED RUMBLE STRIPS (ASPHALT CONCRETE) (12")	MILLED CENTERLINE RUMBLE STRIPS (ASPHALT CONCRETE), (18")	ADJUSTMENT OF MANHOLES	ADJUSTMENT OF METER BOXES OR VALVE BOXES	INLAID CRADLE MARKER (YELLOW / YELLOW)	INLAID CRADLE MARKER (CRYSTAL / RED)	INDUCTIVE LOOP SAWCUT	LEAD-IN CABLE (14-2)
								MI	FT			TON	SMI	TON	SY	SY	TON	TONS	TON	TON	LF	LF	EA	EA	EA	EA	LF	LF
2025CPT.13.09.10591	McDowell	1	US-221	FROM RUTHERFORD COUNTY TO POWER LINE CROSSING	1	2	2WU	2	23	0	2	35	4.20	546		537	2,660		164	152		10,627			177			
TOTAL FOR PROJ NO. 2025CPT.13.09.10591								**2**				**35**	**4.20**	**546**		**537**	**2,660**		**164**	**152**		**10,627**			**177**			
2025CPT.13.09.10811	Rutherford	2	US-221 N	FROM BROAD RIVER BRIDGE TO FLOYDS CREEK BRIDGE	1,2,3	2	2WD	3.42	30.66	1.7	5.12	5	5.24	682	5,164	4,017	8,342		497	95	23,081				12	813		
2025CPT.13.09.10811	Rutherford	3	US-221	FROM US 74 WEST BRIDGE ABUTMENT TO SR 1004 (POORS FORD ROAD) + .75 MILES	1,2,3,	2	2WD	1.96	18	10.48	12.44	58	3.55	462	1,402	3,194	3,133		189	80	2,436		1	3	148	62	408	20
2025CPT.13.09.10811	Rutherford	4	US-221 S	FROM FLOYDS CREEK BRIDGE TO BROAD RIVER BRIDGE	1,2,3	2	2WD	3.39	31.74	22.13	25.52	5	5.34	695	4,640	3,819	7,740		462	110	24,782			4	6	696		
2025CPT.13.09.10811	Rutherford	5	US-221 S	FROM US 74 WEST BRIDGE ABUTMENT -.35 MILE TO US 74 WEST BRIDGE ABUTMENT	1,2,3	2	2WD	0.29	18	16.41	16.7	5	0.38	50	941	610	727		44	30			1		8	63		
2025CPT.13.09.10811	Rutherford	6	US-221	FROM WENDOVER LANE (PRIVATE DRIVE) TO MCDOWELL COUNTY LINE	1	2	2WU	7.53	24.5	19.74	27.27	150	15.25	2,295		5,917	10,522		632	235		38,369			575			
2025CPT.13.09.10811	Rutherford	7	UNION MILLS FIRE DEPARTMENT	HUDLOW ROAD	4	2		0.01	20	0.08	0.09					1,671	151	151	18									
TOTAL FOR PROJ NO. 2025CPT.13.09.10811								**16.6**				**223**	**29.76**	**4,184**	**12,147**	**19,228**	**30,615**	**151**	**1,842**	**550**	**50,299**	**38,369**	**2**	**7**	**749**	**1,634**	**408**	**20**
															12,147										**2,383**			
GRAND TOTAL								**18.6**				**258**	**33.96**	**4,730**	**12,147**	**19,765**	**33,275**	**151**	**2,006**	**702**	**50,299**	**48,996**	**2**	**7**	**926**	**1,634**	**408**	**20**
															12,147										**2,560**			

PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, 2025CPT.13.09.10811	15

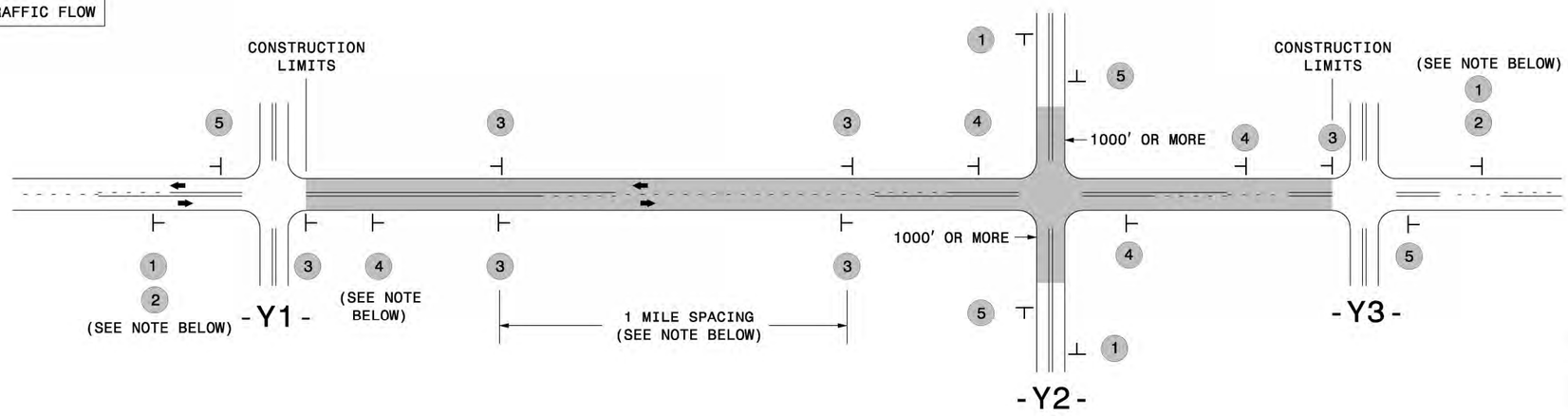
THERMOPLASTIC AND PAINT QUANTITIES

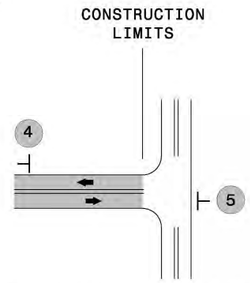
														4413000000-E	4457000000-N	4685000000-E		4695000000-E	4700000000-E	4709000000-E	4720000000-E	4725000000-E				
PROJECT NO	**COUNTY**	**MAP NO**	**ROUTE**	**DESCRIPTION**	**TYP NO**	**LANES**	**LANE TYPE**	**LENGTH**	**WIDTH**	**BEGIN MP**	**END MP**			**WORK ZONE ADVANCE /GENERAL WARNING SIGNING**	**TEMPORARY TRAFFIC CONTROL**	**THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS) YELLOW**	**THERMOPLASTIC PAVEMENT MARKING LINES (4", 90 MILS) WHITE**	**THERMOPLASTIC PAVEMENT MARKING LINES (8", 90 MILS) WHITE**	**THERMOPLASTIC PAVEMENT MARKING LINES (12", 90 MILS) WHITE**	**THERMOPLASTIC PAVEMENT MARKING LINES (24", 90 MILS) WHITE STOP BAR**	**THERMOPLASTIC PAVEMENT MARKING CHARACTER (90 MILS) ONLY**	**THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) LT ARROW**	**THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) RT ARROW**	**THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) MERGE ARROW**	**THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) U-TURN ARROW**	**THERMOPLASTIC PAVEMENT MARKING SYMBOL (90 MILS) LT, STR, RT ARROW**
								MI	**FT**					**SF**	**LS**	**LF**	**LF**	**LF**	**LF**	**LF**	**EA**	**EA**	**EA**	**EA**	**EA**	**EA**
2025CPT.13.09.10591	McDowell	1	US-221	FROM RUTHERFORD COUNTY TO POWER LINE CROSSING	1	2	2WU	2	23	0	2			224	*	17,064	21,272										
TOTAL FOR PROJ NO. 2025CPT.13.09.10591								**2**						**224**	*	**17,064**	**21,272**									
																38,336										
2025CPT.13.09.10811	Rutherford	2	US-221 N	FROM BROAD RIVER BRIDGE TO FLOYDS CREEK BRIDGE	1,2,3	2	2WD	3.42	30.66	1.7	5.12			383		20,525	27,462	12,170		125	12	12	18	5	19	
2025CPT.13.09.10811	Rutherford	3	US-221	FROM US 74 WEST BRIDGE ABUTMENT TO SR 1004 (POORS FORD ROAD) + .75 MILES	1,2,3	2	2WD	1.96	18	10.48	12.44			221		15,411	20,536	825		128	8	5	5			1
2025CPT.13.09.10811	Rutherford	4	US-221 S	FROM FLOYDS CREEK BRIDGE TO BROAD RIVER BRIDGE	1,2,3	2	2WD	3.39	31.74	22.13	25.52			380	*	19,999	24,778	10,187		110		9	10		15	
2025CPT.13.09.10811	Rutherford	5	US-221 S	FROM US 74 WEST BRIDGE ABUTMENT -.35 MILE TO US 74 WEST BRIDGE ABUTMENT	1,2,3	2	2WD	0.29	18	16.41	16.7			32		1,979	3,601	154	35			3	3			1
2025CPT.13.09.10811	Rutherford	6	US-221	FROM WENDOVER LANE (PRIVATE DRIVE) TO MCDOWELL COUNTY LINE	1	2	2WU	7.53	24.5	19.74	27.27			844		71,358	81,114			85						
2025CPT.13.09.10811	Rutherford	7	UNION MILLS FIRE DEPARTMENT	HUDLOW ROAD	4	2	2WU	0.01	20	0.08	0.09															
TOTAL FOR PROJ NO. 2025CPT.13.09.10811								**16.6**						**1,860**	*	**129,272**	**157,491**	**23,336**	**35**	**448**	**20**	**29**	**36**	**5**	**34**	**2**
																286,763						**106**				
GRAND TOTAL								**18.6**						**2,084**	**1**	**146,336**	**178,763**	**23,336**	**35**	**448**	**20**	**29**	**36**	**5**	**34**	**2**
																325,099						**106**				

PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, ETC	TMP-1

SIGNING FOR RESURFACING PROJECTS

LEGEND
- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW





TEE INTERSECTION

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1	ROAD WORK AHEAD 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.
2	NEXT XX MILES 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	LOW/SOFT SHOULDER SP 13107 48″ X 48″	- PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACE 1 MILE APART THEREAFTER. - AT TEE INTERSECTIONS INSTALL INITIALLY ½ MILE FROM INTERSECTION AND SPACE 1 MILE APART THEREAFTER.
4	ROAD UNDER CONST 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	END ROAD WORK 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.

-Y- LINE SIGNING

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.

ROAD WORK AHEAD W20-1 48″ X 48″
PLACED 500′ IN ADVANCE OF FLAGGER.

W20-7 A 48″ X 48″
PLACED 250′ IN ADVANCE OF FLAGGER.

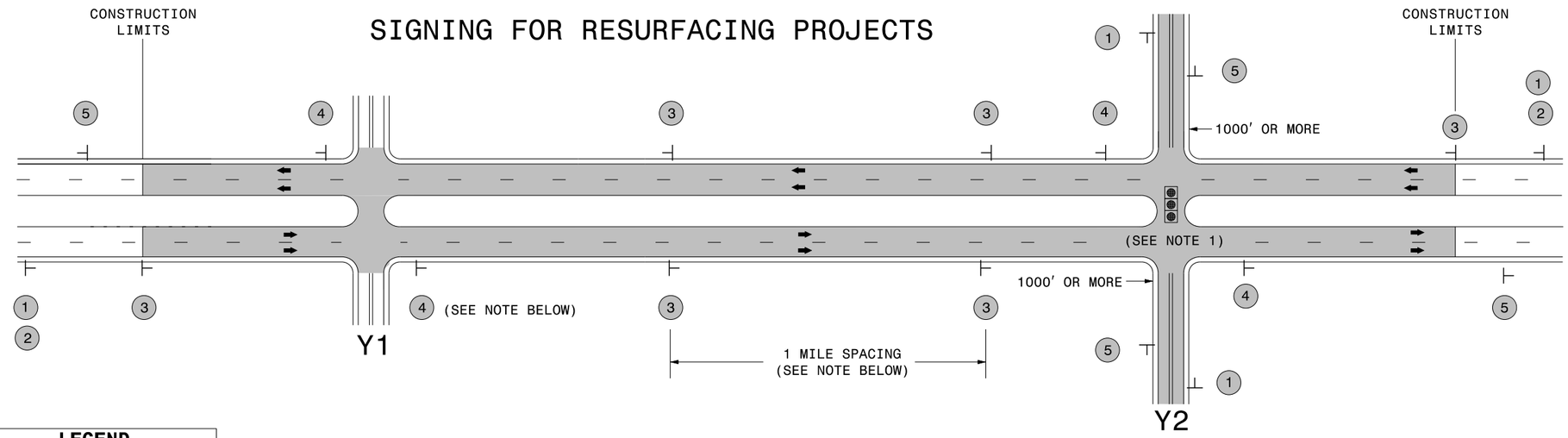
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

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

5/15/2017
SATMUWZTC\Resurfacing\2L2W & AST Resurfacing Details\Resurfacing_AdvWarn_2Ln.dgn
User:kaddis

PROJECT NO.	SHEET NO.
2025CPT.13.09.10591, ETC	TMP-2

SIGNING FOR RESURFACING PROJECTS



LEGEND
- ⊢ STATIONARY SIGN
- ⬅ DIRECTION OF TRAFFIC FLOW

MAINLINE (-L-) SIGNING

SIGNING NOTES AND PLACEMENT PER DIRECTION

1 — ROAD WORK AHEAD, 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.

2 — NEXT XX MILES, W7-3aP, 24″ X 18″
#2 SIGN ONLY USED WHEN RESURFACING LIMITS ARE 2 OR MORE MILES IN LENGTH. ROUND UP TO NEXT WHOLE NUMBER.(NO FRACTIONAL OR DECIMAL NUMBERS)

3 — LOW/SOFT SHOULDER, SP 13107, 48″ X 48″
PLACE INITIALLY AT THE CONSTRUCTION LIMITS AND SPACED 1 MILE APART THEREAFTER. IF NO -Y- LINES EXIST, PLACE 2ND SET ½ MILE FROM THE CONSTRUCTION LIMITS AND THEN SPACE 1 MILE THEREAFTER.

4 — ROAD UNDER CONST, 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.

5 — END ROAD WORK, G20-2 A, 48″ X 24″
PLACE 500′ FOLLOWING THE END OF CONSTRUCTION LIMITS.

-Y- LINE SIGNING

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, ADVANCE WARNING PORTABLE SIGNS SHALL BE USED ALONG THE -Y- LINE AS SHOWN BELOW. REMOVE UPON COMPLETION OF WORK.

ROAD WORK AHEAD, W20-1, 48″ X 48″ — PLACED 500′ IN ADVANCE OF FLAGGER.

W20-7 A, 48″ X 48″ — PLACED 250′ IN ADVANCE OF FLAGGER.

NOTES:

1) MAY USE LAW ENFORCEMENT TO CONTROL TRAFFIC AT SIGNALIZED INTERSECTIONS AS DIRECTED BY THE ENGINEER. PROVIDE PORTABLE "ROAD WORK AHEAD" (W20-1) SIGNS 500′ IN ADVANCE ALONG BOTH APPROACHES FROM THE SIDE STREETS WHEN PAVING PROCEEDS THROUGH THE INTERSECTION.

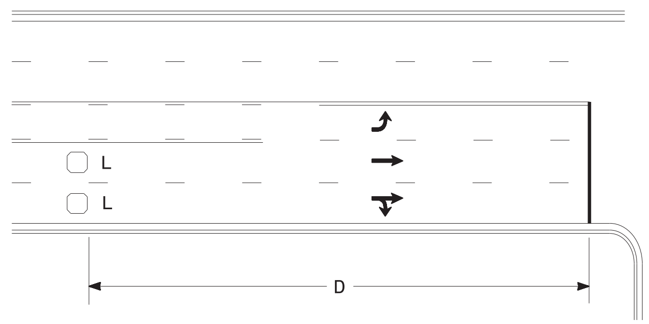
DIVISION OF HIGHWAYS · STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION · WORK ZONE TRAFFIC CONTROL

RESURFACING
ADVANCE WARNING SIGNS
FOR RURAL AND SUBURBAN
MULTI-LANE ROADWAYS
W/ SHOULDER SECTIONS

3/23/2015
C:\Users\rmgarrett\Downloads\Resurfacing_AdvWarn_UrSu_Shldr.dgn
User:rmgarrett

PROJECT REFERENCE NO.	SHEET NO.
2025CPT.13.09.10591 ETC.	SIG-1

High Speed Detection
(≥40 mph)



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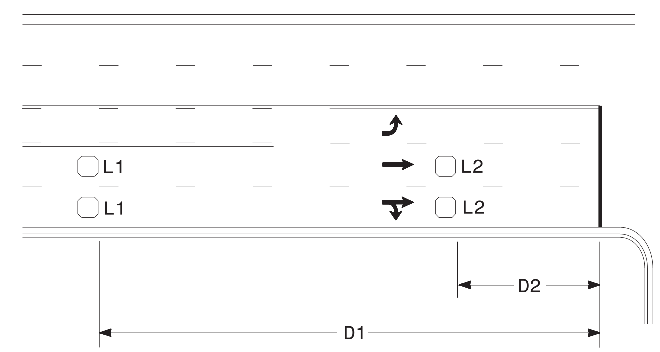


Speed Limit mph	D ft
40	250
45	300
50	355
55	420

L = 6ft X 6ft
Wired separately

Volume Density Operation

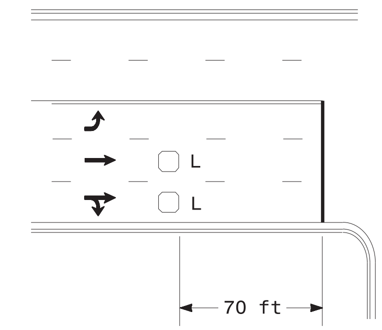
Speed Limit mph	D1 ft	D2 ft
40	250	80
45	300	90
50	355	100
55	420	110

L1 = 6ft X 6ft
Wired in series

L2 = 6ft X 6ft
Wired in series

"Stretch" Operation

Low Speed Detection
(≤35 mph)



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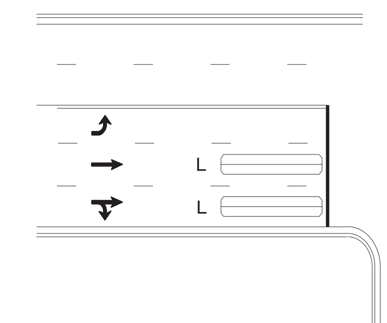
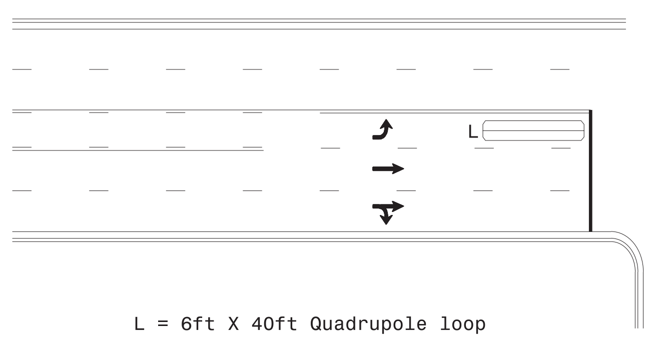


L = 6ft X 6ft
Wired in series

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

Left Turn Lane Detection



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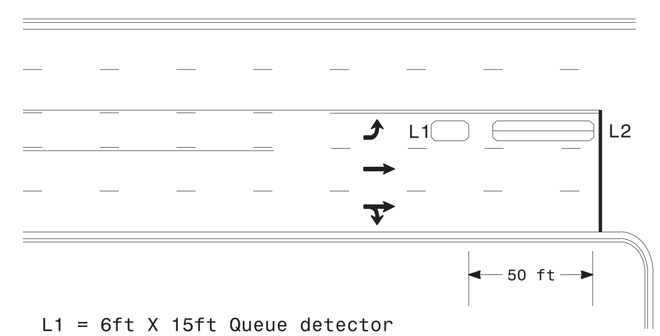


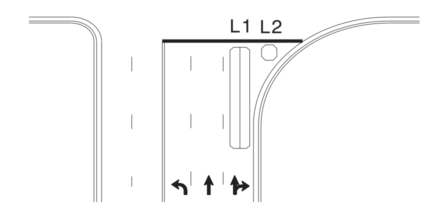
L = 6ft X 40ft Quadrupole loop

Presence Loop Detection

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

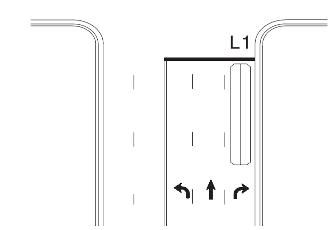
Queue Loop Detection

Right Turn Lane Detection

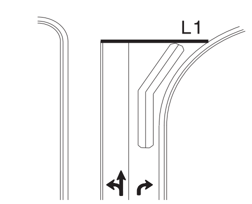


Shared Lane/
Wide Radius Turn

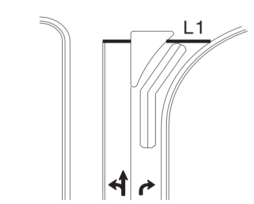
L1 = 6ft X 40ft Quadrupole loop
L2 = 6ft X 6ft [Minimum] Presence loop
Wired separately



Standard Turn

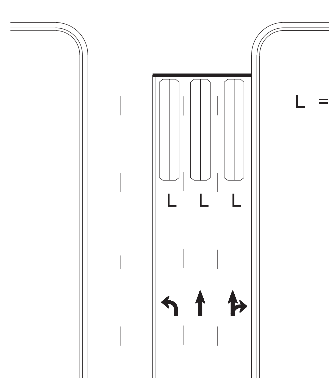


Wide Radius Turn



Channelized Turn

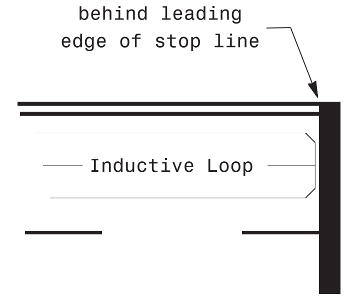
Side Street Detection



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:
Transportation Mobility and Safety Division
State of North Carolina Department of Transportation
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

Typical Signal Loop Locations

PLAN DATE: September 2020	REVIEWED BY: JPG
PREPARED BY: PLA	REVIEWED BY:

SCALE
N/A

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 029904 ENGINEER JASON P. GALLOWAY

9/8/2020
DATE

SIG. INVENTORY NO.

08-SEP-2020 11:54
S:\ITS&SU\ITS Signals\Signal Design Section\Eastern Region\Loop Typical\looptypical2015.dgn
jgalloway