

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

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

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

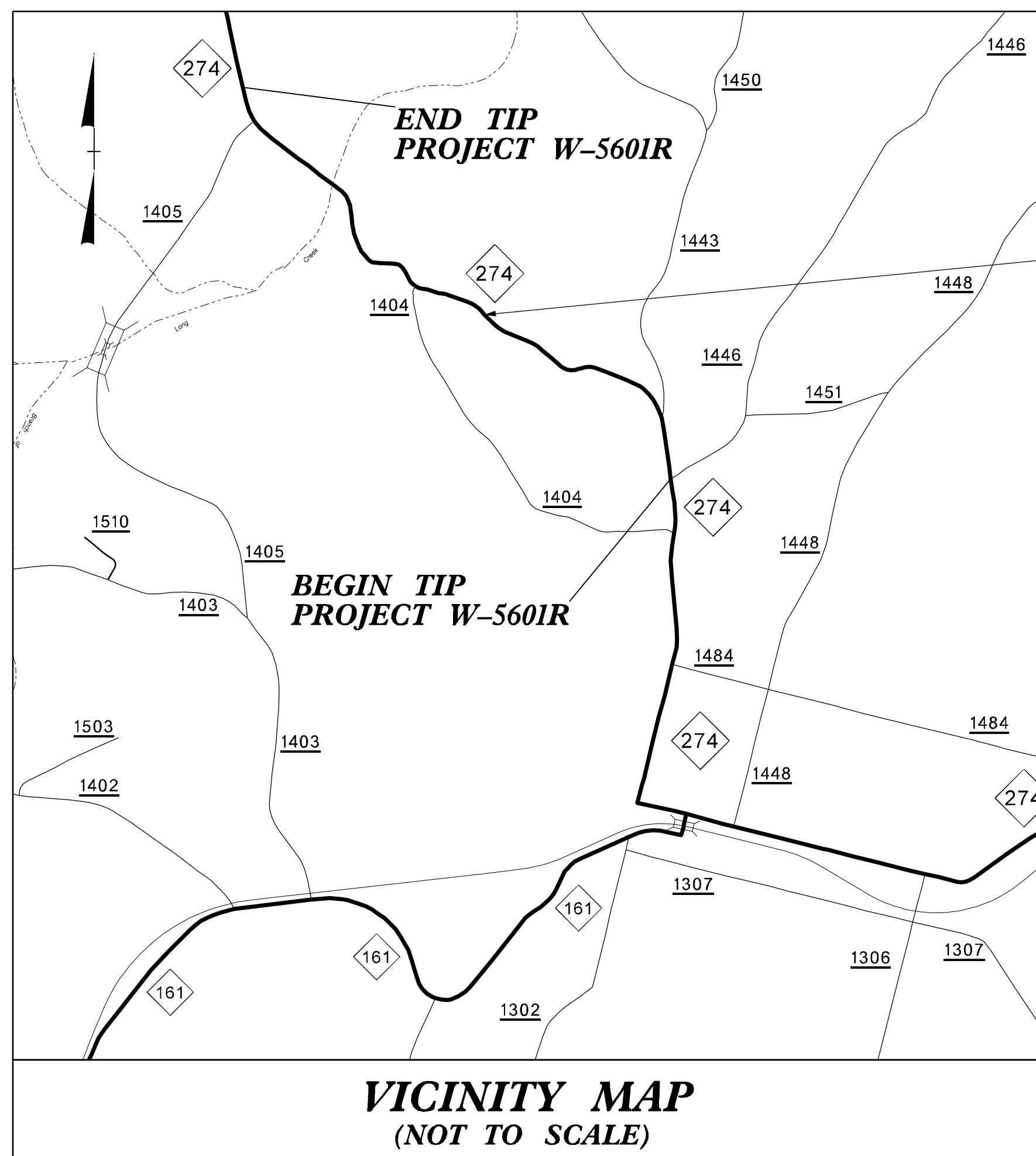
**LOCATION: NC 274 NORTH OF SR 1405 (RAMSEUR RD.)
TO SR 1446 (DAMERON RD.)**

**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5601R	1	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50138.3.253	N/A	PE/CONST	

TIP PROJECT: W-5601R

CONTRACT: DL00300



MAP 1

05-FEB-2024 15:02 S:\DDC\District 1\Cgaston\W-5601R NC 274\SinusoidalRumble Strips Project\Proj\W-5601R_Rdy_tsh.dgn jscarpenfer AT DIVIZ-329436L

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT W-5601R = 0.941 MILES
TOTAL LENGTH OF TIP PROJECT W-5601R = 0.941 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

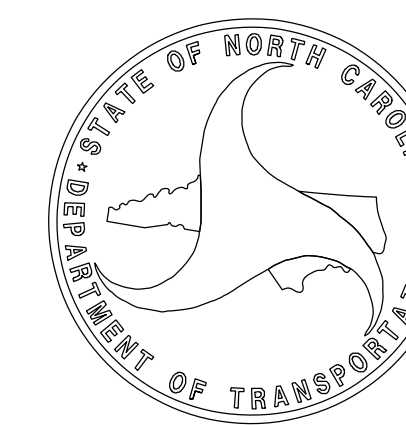
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
MARCH 12, 2024

BRYAN K.D. SOWELL, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



09/08/99

05-FEB-2024 15:06
S:\DDC\District 1\Cadstom\DL00300_SinusoidalRumbleStrips\Proj\SS-6012E.Rdy_+sh.dgn
iscarpenter AT DIV12-329436L

TIP PROJECT: SS-6012E
CONTRACT: DL00300

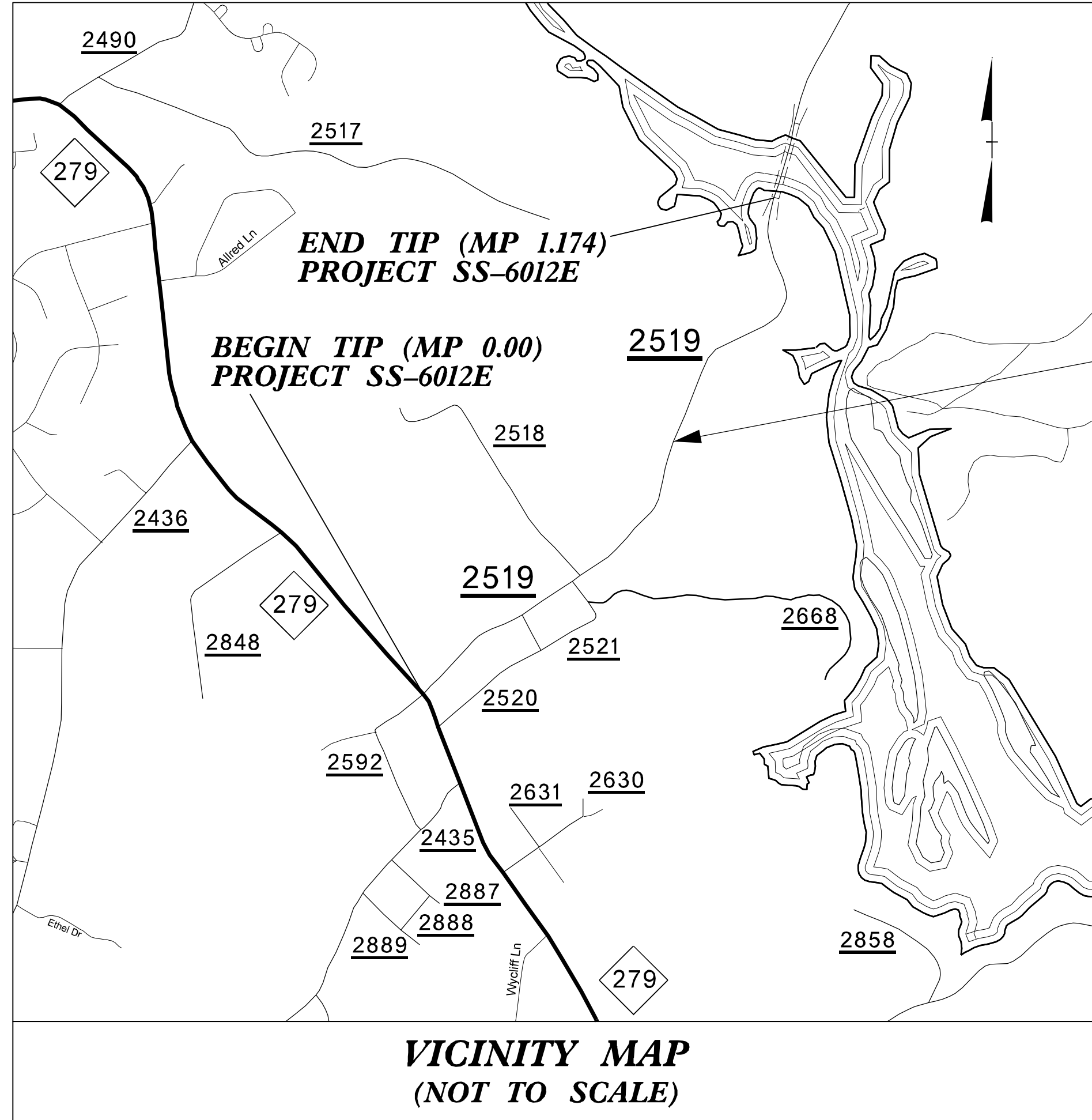
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

**LOCATION: SR 2519 (ARMSTRONG FORD RD.) FROM
MILEPOST 0.00 TO MILEPOST 1.174.**

**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6012E	2	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49129	N/A	PE/CONST	



MAP 2

**VICINITY MAP
(NOT TO SCALE)**

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6012E = 1.180 MILES
TOTAL LENGTH OF TIP PROJECT SS-6012E = 1.180 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

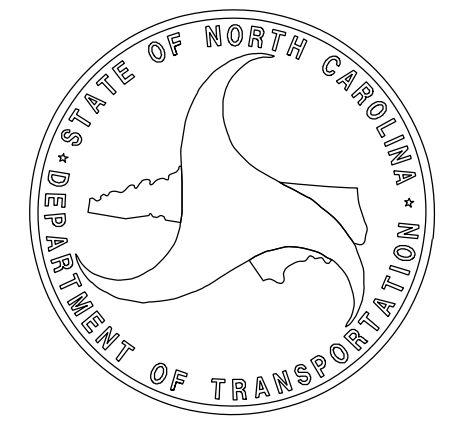
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
MARCH 12, 2024

BRYAN K.D. SOWELL, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

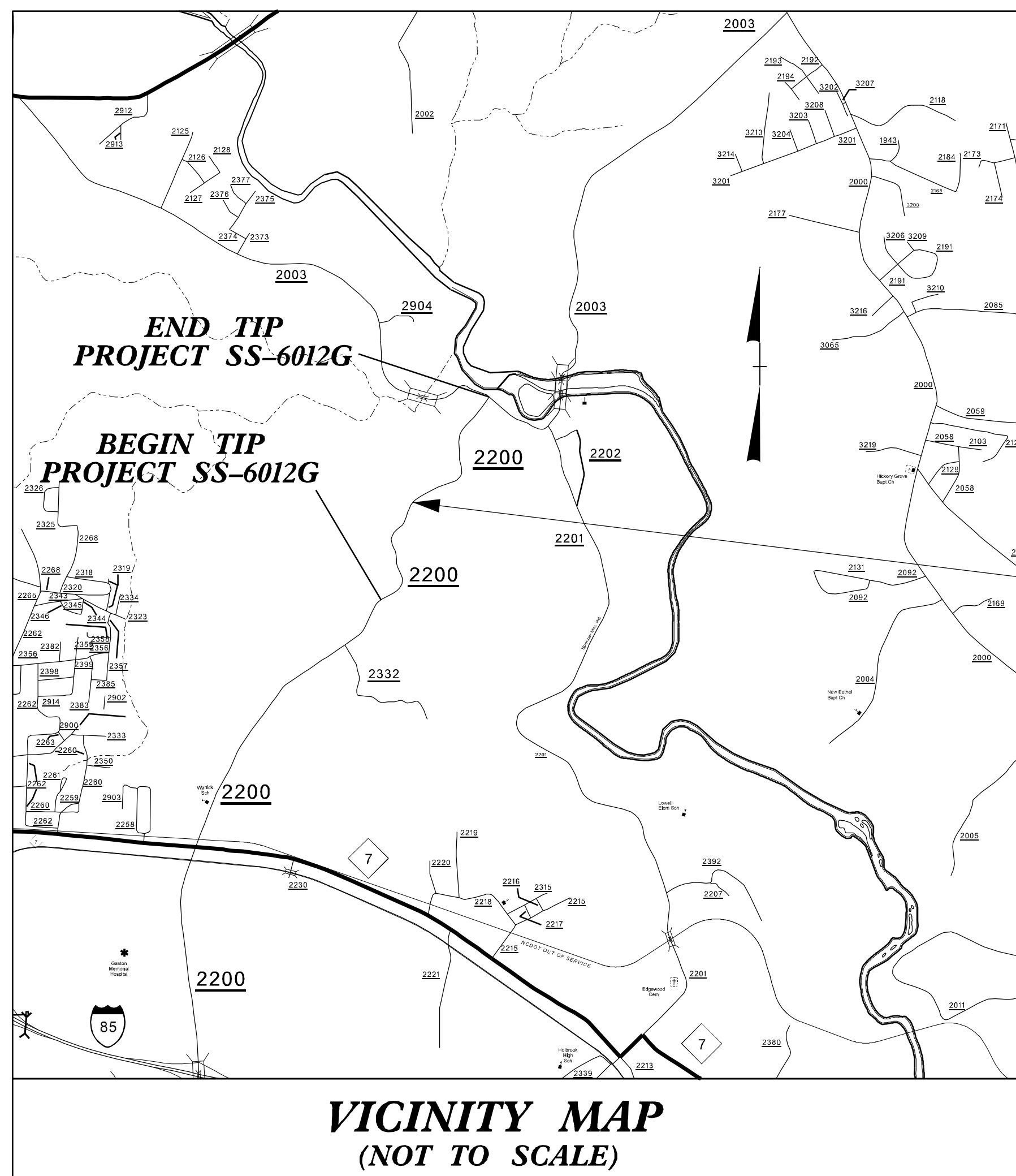
GASTON COUNTY

LOCATION: SR 2200 (RANLO SPENCER MTN. RD.) FROM RANLO MUNICIPAL LIMITS TO SR 2003 (MAIN STREET).

TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE MILLED SINUSOIDAL RUMPLE STRIPS, PAVEMENT MARKINGS AND MARKERS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6012G	3	11
STATE PROJ. NO.	P. A. PROJ. NO.	DESCRIPTION	
49143	N/A	PE/CONST	

TIP PROJECT: SS-6012G
CONTRACT: DL00300



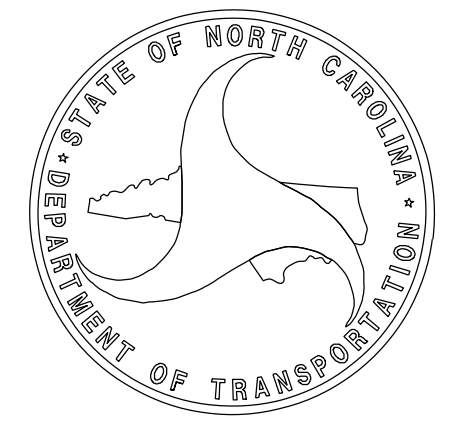
MAP 3

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6012G = 1.174 MILES
TOTAL LENGTH OF TIP PROJECT SS-6012G = 1.174 MILES

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

2018 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	BRYAN K.D. SOWELL, PE PROJECT ENGINEER
LETTING DATE: MARCH 12, 2024	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



05-FEB-2024 15:08
S:\DDC\District 1\Cgaston\DL00300_SinusoidalRumpleStrips\Proj\SS-6012G-Rdy_+sh.dgn
Jscarpenter AT DIV12-329436L

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

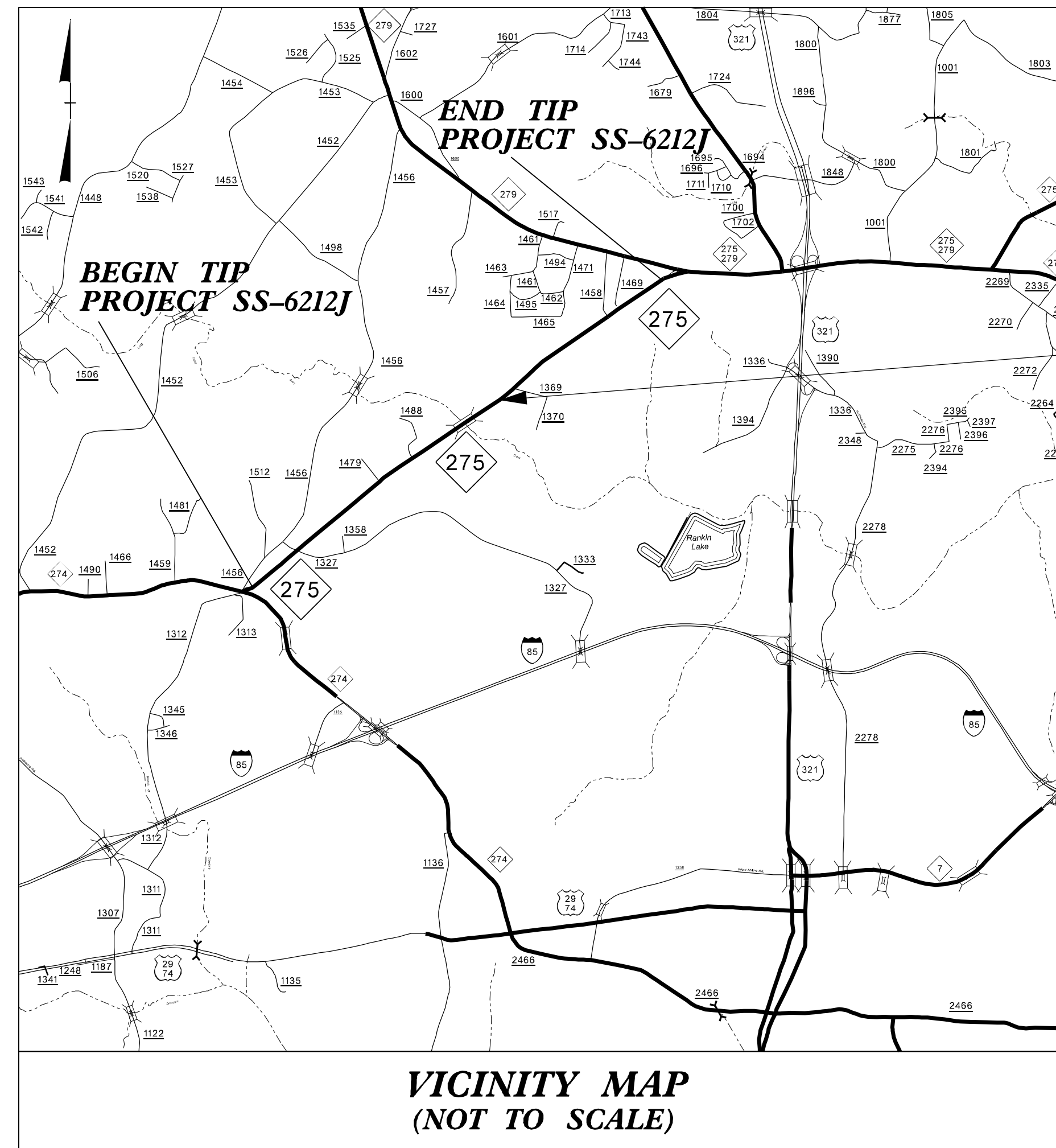
**LOCATION: NC 275 FROM MP. 0.000 TO MP. 3.082
(BETWEEN NC 279 AND NC 274).**

**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6212J	4	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51122	N/A	PE/CONST	

TIP PROJECT: SS-6212J

CONTRACT: DL00300



MAP 4

**VICINITY MAP
(NOT TO SCALE)**

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6212J = 3.082 MILES
TOTAL LENGTH OF TIP PROJECT SS-6212J = 3.082 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

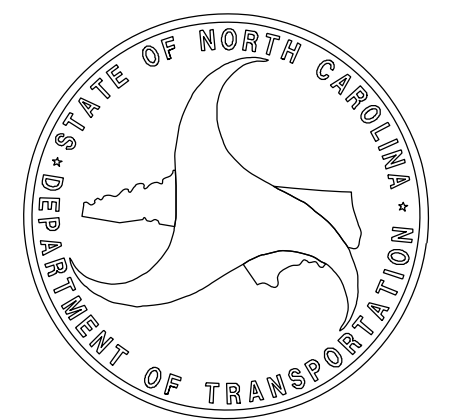
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
MARCH 12, 2024

BRYAN K.D. SOWELL, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

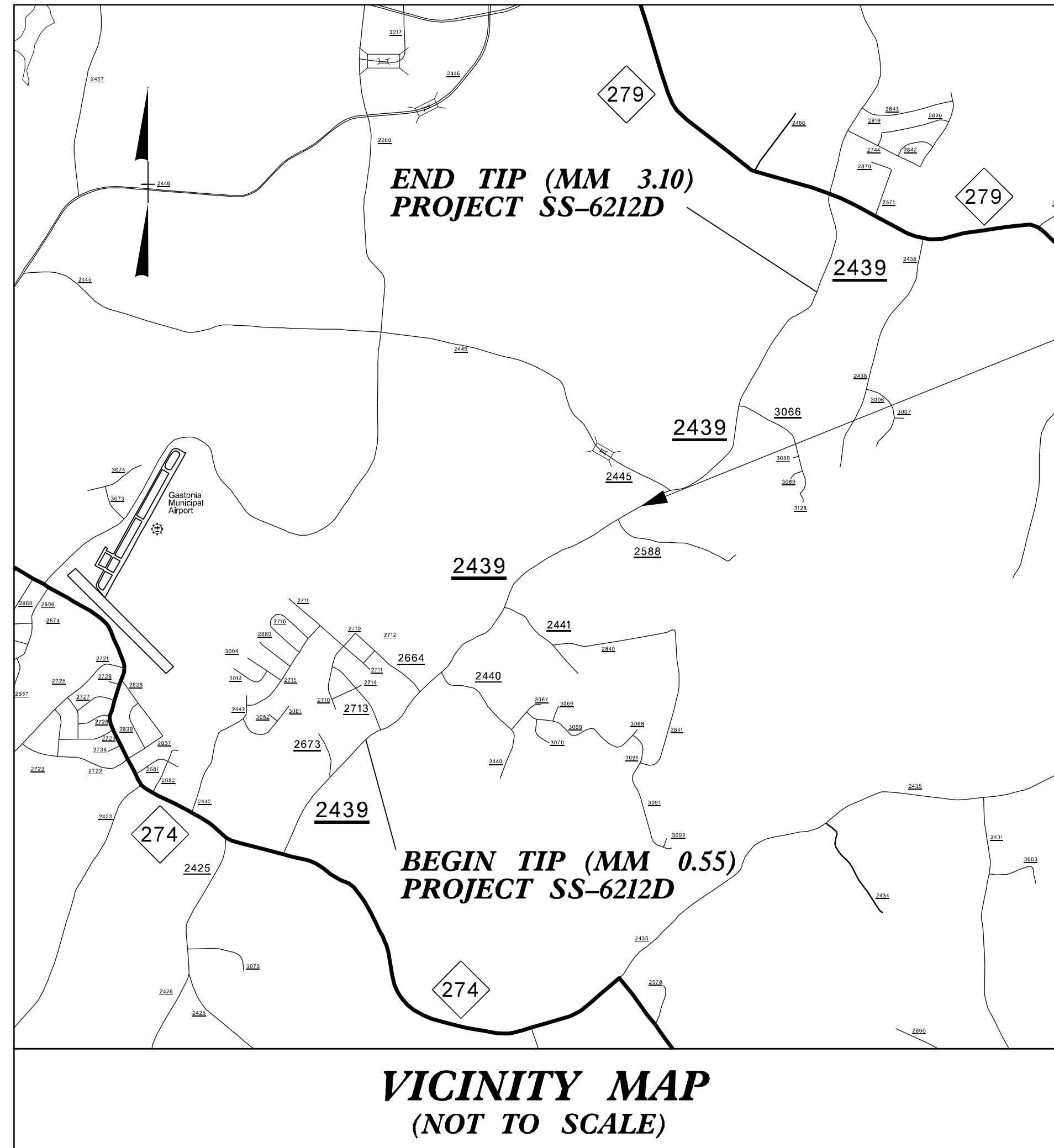
LOCATION: SR 2439 (BEATY RD.) MM. 0.55 TO 3.10.

**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6212D	5	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
50678	N/A	PE/CONST	

TIP PROJECT: SS-6212D

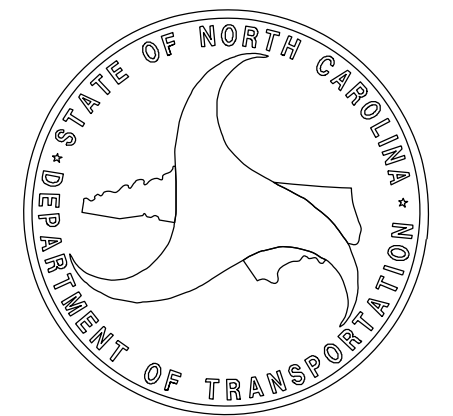
CONTRACT: DL00300



PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT SS-6212D = 2.550 MILES
TOTAL LENGTH OF TIP PROJECT SS-6212D = 2.550 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	BRYAN K.D. SOWELL, PE PROJECT ENGINEER
LETTING DATE: MARCH 12, 2024	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



05-FEB-2024 15:12 S:\DDC\District AT-DIV12-329436L\Gaston\Map\DL00300_SinusoidalRumbleStrips\Proj\SS-6212D_Rdy_+sh.dgn jscarpenfer

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

LOCATION: SR 2425 (PATRICK RD.) MP 0.00 (NC 274) TO STATELINE.

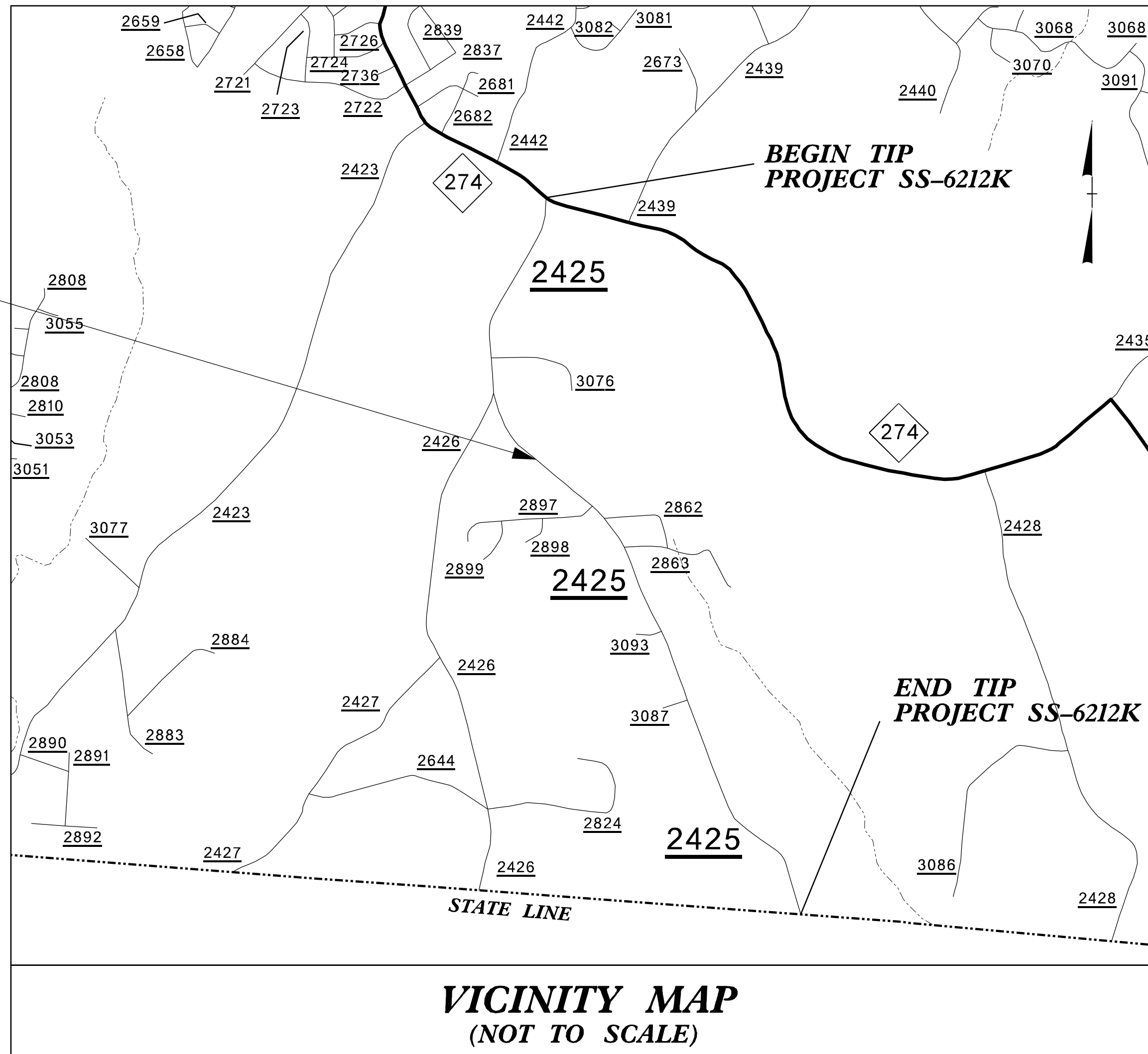
**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6212K	6	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51123	N/A	PE/CONST	

TIP PROJECT: SS-6212K

CONTRACT: DL00300

MAP 6



VICINITY MAP
(NOT TO SCALE)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6212K = 2.372 MILES
TOTAL LENGTH OF TIP PROJECT SS-6212K = 2.372 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

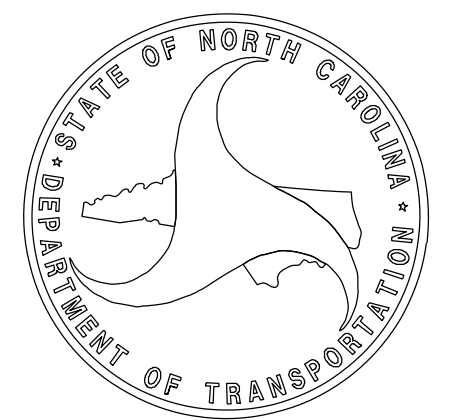
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
MARCH 12, 2024

BRYAN K.D. SOWELL, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



05-FEB-2024 15:14 S:\DDC\District 1\Cgaston\DL00300_SinusoidalRumbleStrips\Proj\SS-6212K_Rdy_+sh.dgn jscarpenfer AT DIV12-329436L

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

**LOCATION: SR 1131 (LINWOOD RD.) IN THE VICINITY OF
LAKEWOOD DR. (BETWEEN TORRENCE RD. AND TRINITY AVE.)**

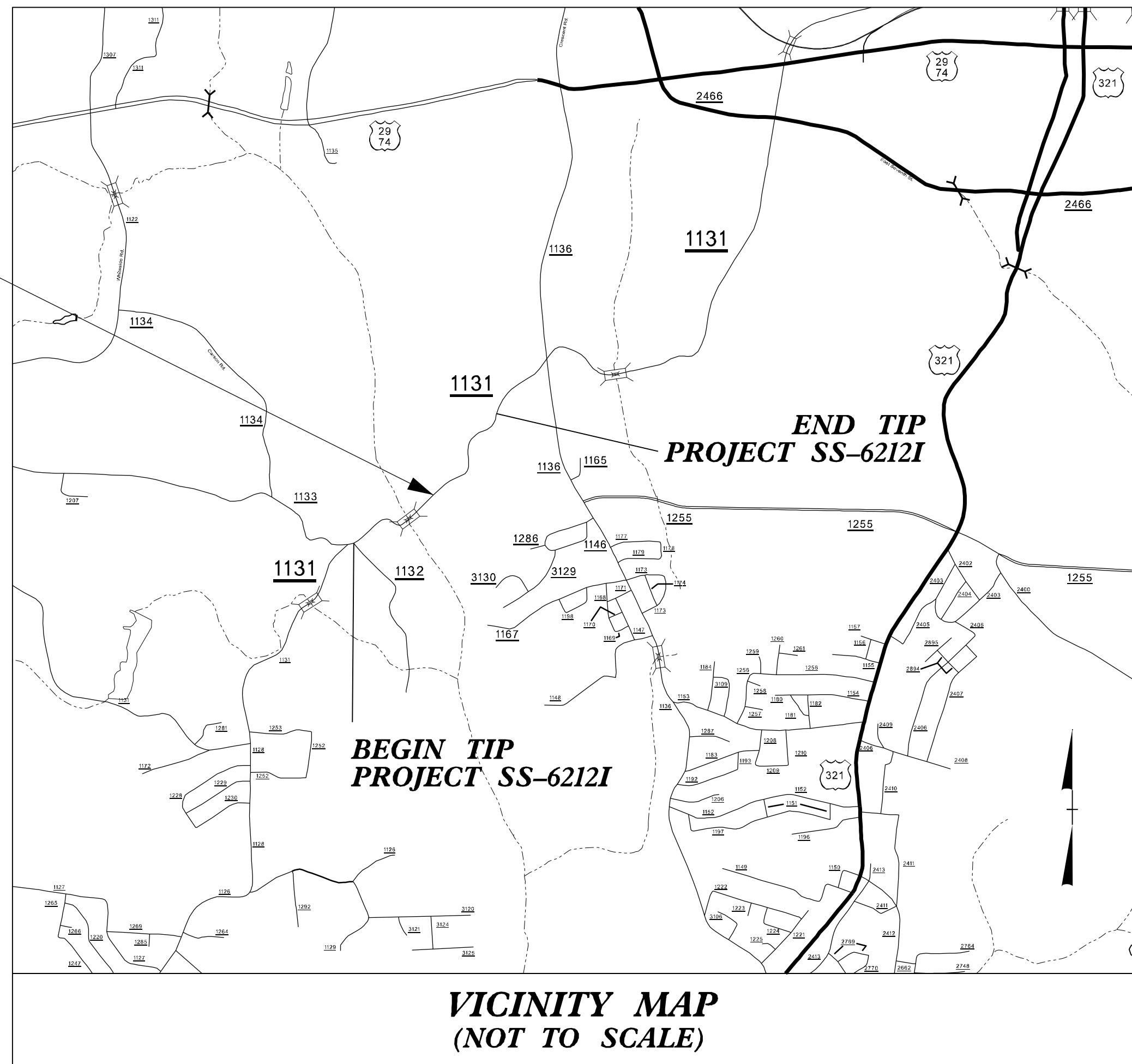
**TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6212I	7	11
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51121	N/A	PE/CONST	

TIP PROJECT: SS-6212I

CONTRACT: DL00300

MAP 7



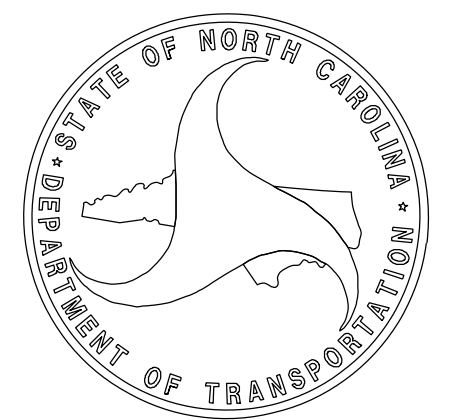
**VICINITY MAP
(NOT TO SCALE)**

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6212I = 0.860 MILES
TOTAL LENGTH OF TIP PROJECT SS-6212I = 0.860 MILES

Prepared in the Office of:
DIVISION OF HIGHWAYS
1710 E. Marion Street, Shelby NC, 28150

2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	BYRAN K.D. SOWELL, PE PROJECT ENGINEER
LETTING DATE: MARCH 12, 2024	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



05-FEB-2024 15:16 S:\DDC\District 1\Cadstom\DL00300_SinusoidalRumbleStrips\Proj\SS-6212I_Rdy_tsh.dgn jscarpenfer AT DIVIZ-329436L

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

LOCATION: SR 2416 (ROBINSON RD.) MP. 3.600 TO 2.900.

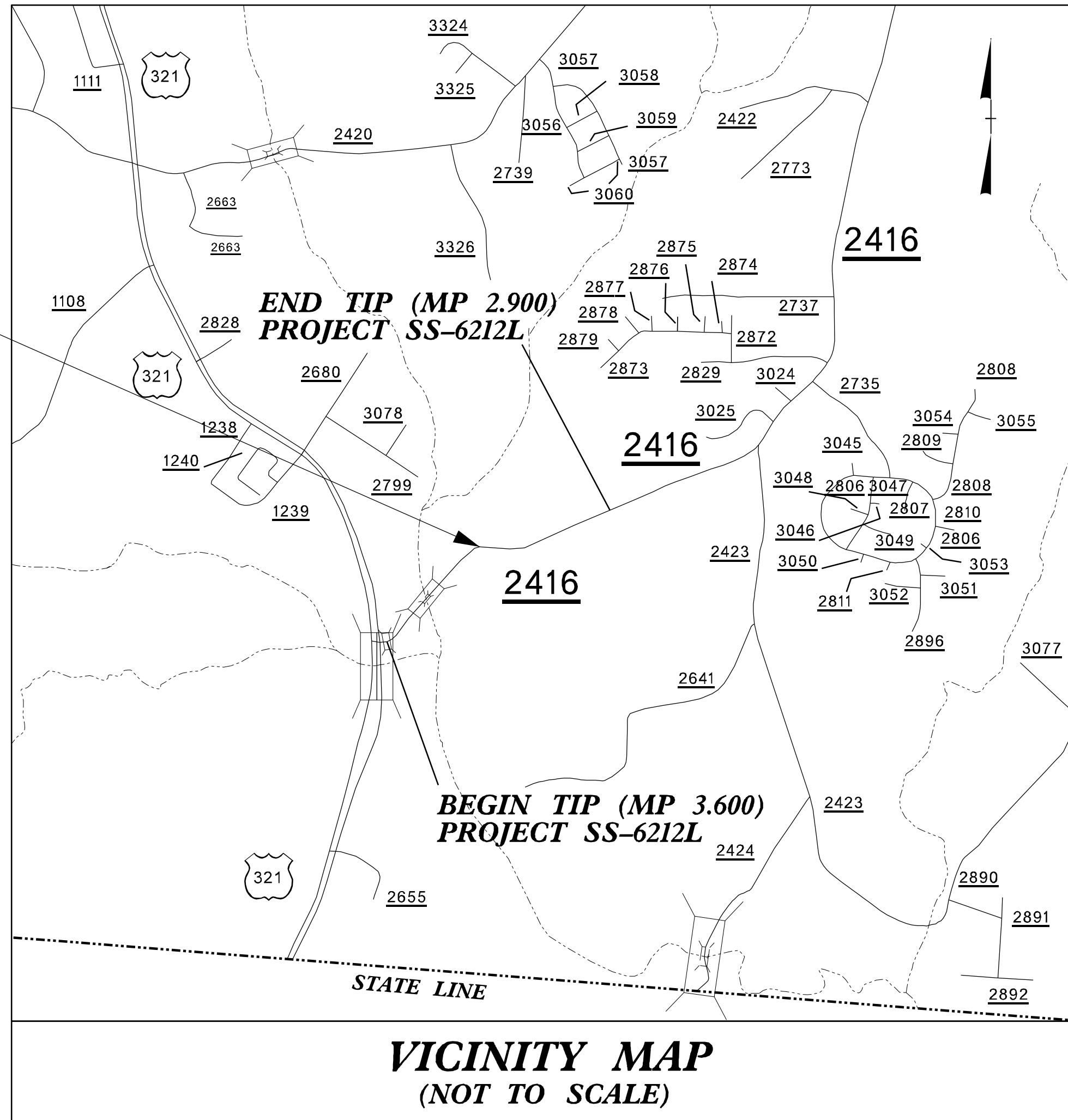
TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE
MILLED SINUSOIDAL RUMBLE STRIPS,
PAVEMENT MARKINGS AND MARKERS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SS-6212L	8	11
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
51124	N/A	PE/CONST	

TIP PROJECT: SS-6212L

CONTRACT: DL00300

MAP 8



PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT SS-6212L = 0.700 MILES
TOTAL LENGTH OF TIP PROJECT SS-6212L = 0.700 MILES

Prepared In the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

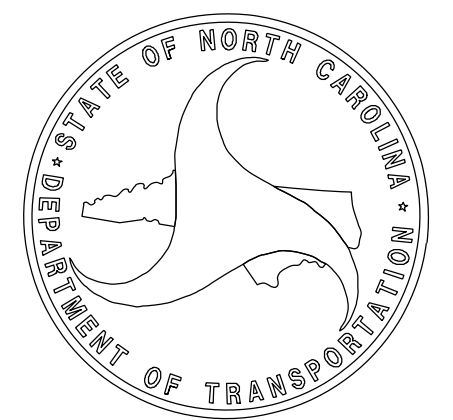
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
MARCH 12, 2024

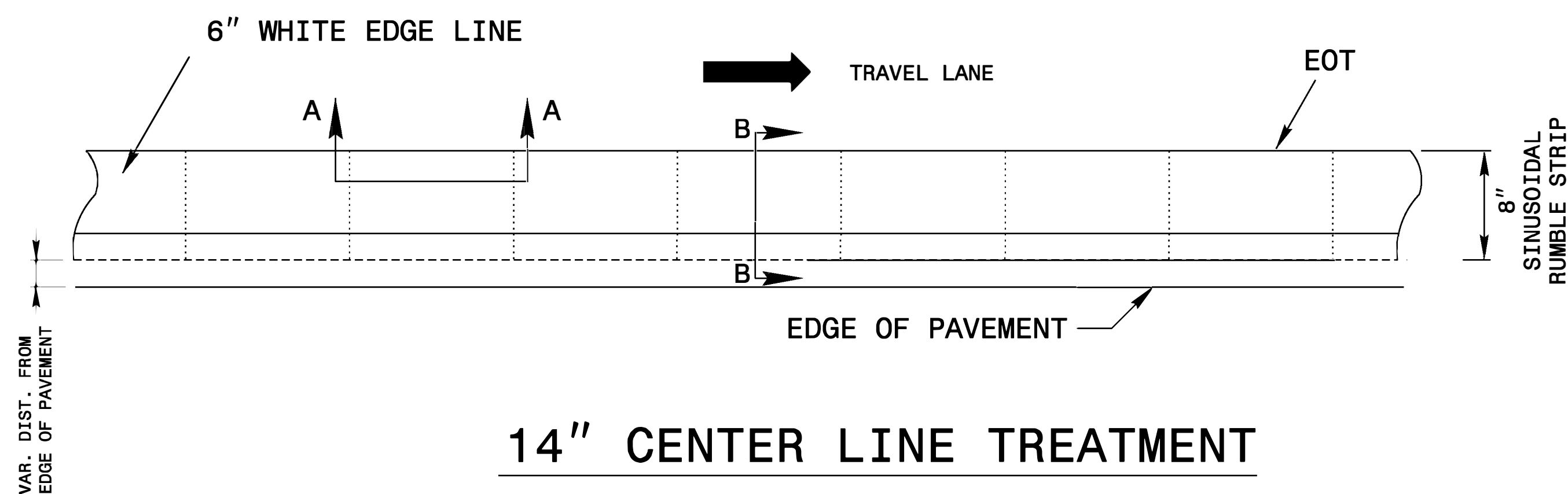
BRYAN K.D. SOWELL, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER

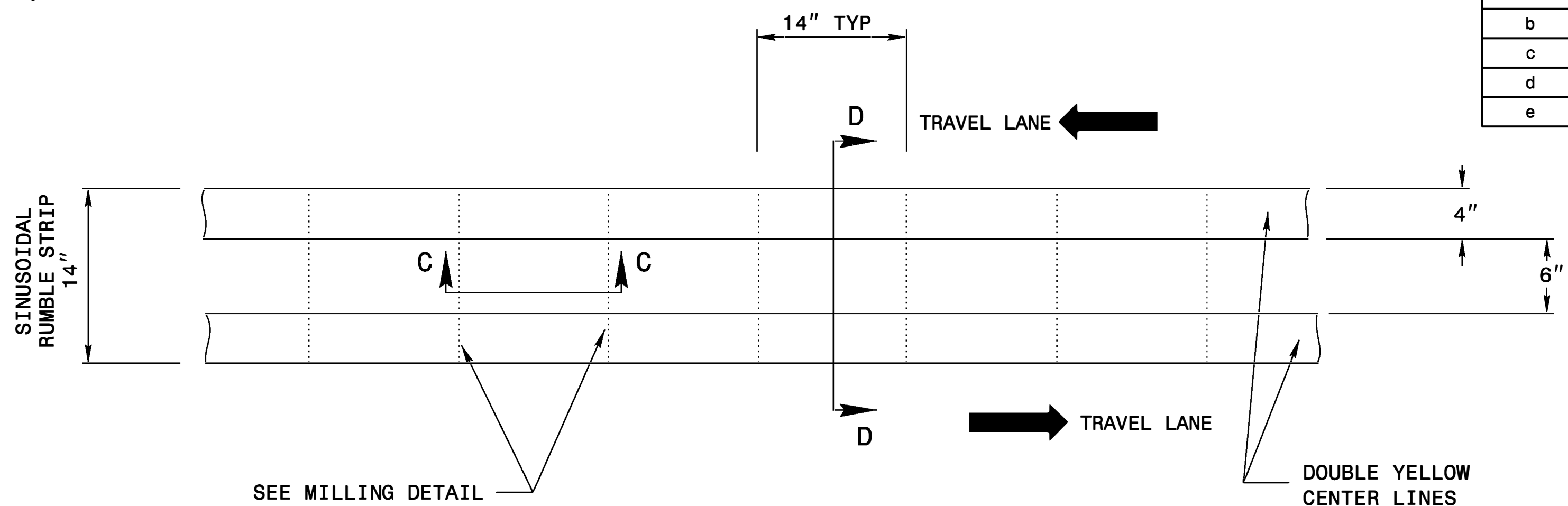


8" & 14" SINUSOIDAL MILLED RUMPLE STRIP DETAIL

8" EDGE LINE TREATMENT



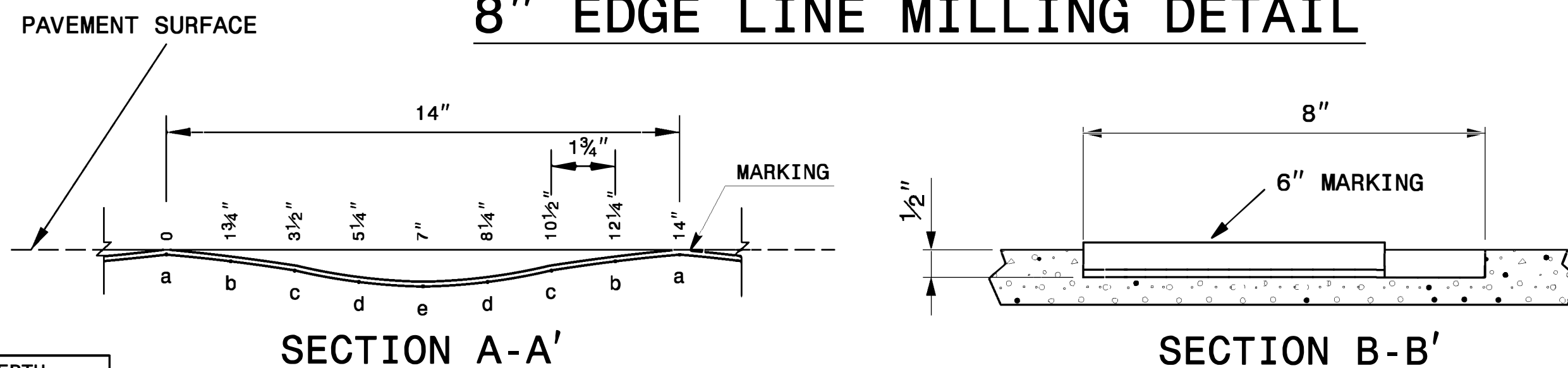
14" CENTER LINE TREATMENT



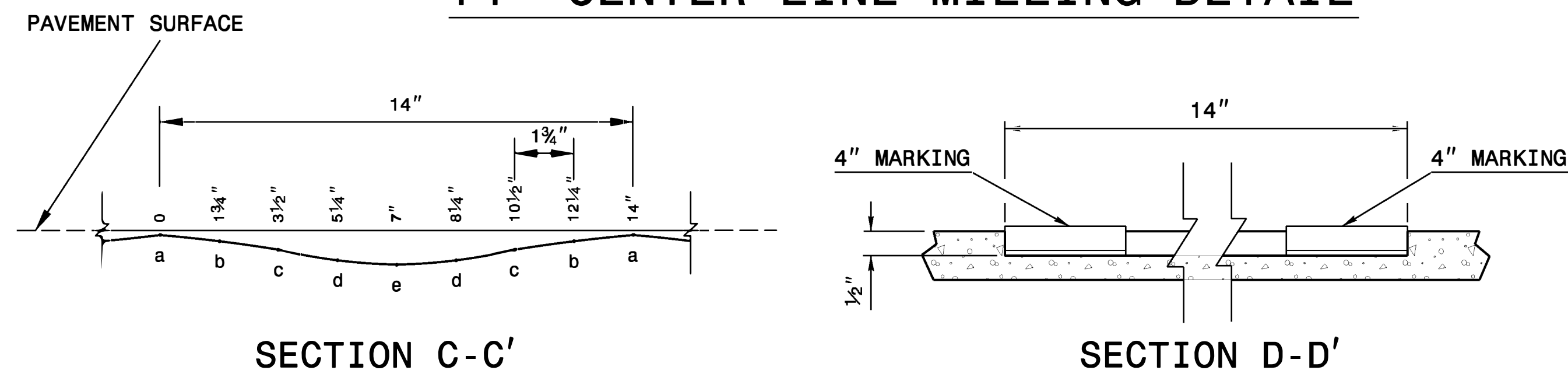
LOCATION	DEPTH	
	MIL	INCHES
a	62.5	1/16"
b	125	1/8"
c	219	7/32"
d	344	1 1/32"
e	375	3/8"

NOTE: SPECIFICATION IN TABLE FROM MNDOT RESEARCH PROJECT FINE REPORT 2016-3: SINUSOIDAL RUMBLE STRIP DESIGN OPTIMIZATION STUDY BY TERHEAR ET. AL. JUNE 2016.

8" EDGE LINE MILLING DETAIL



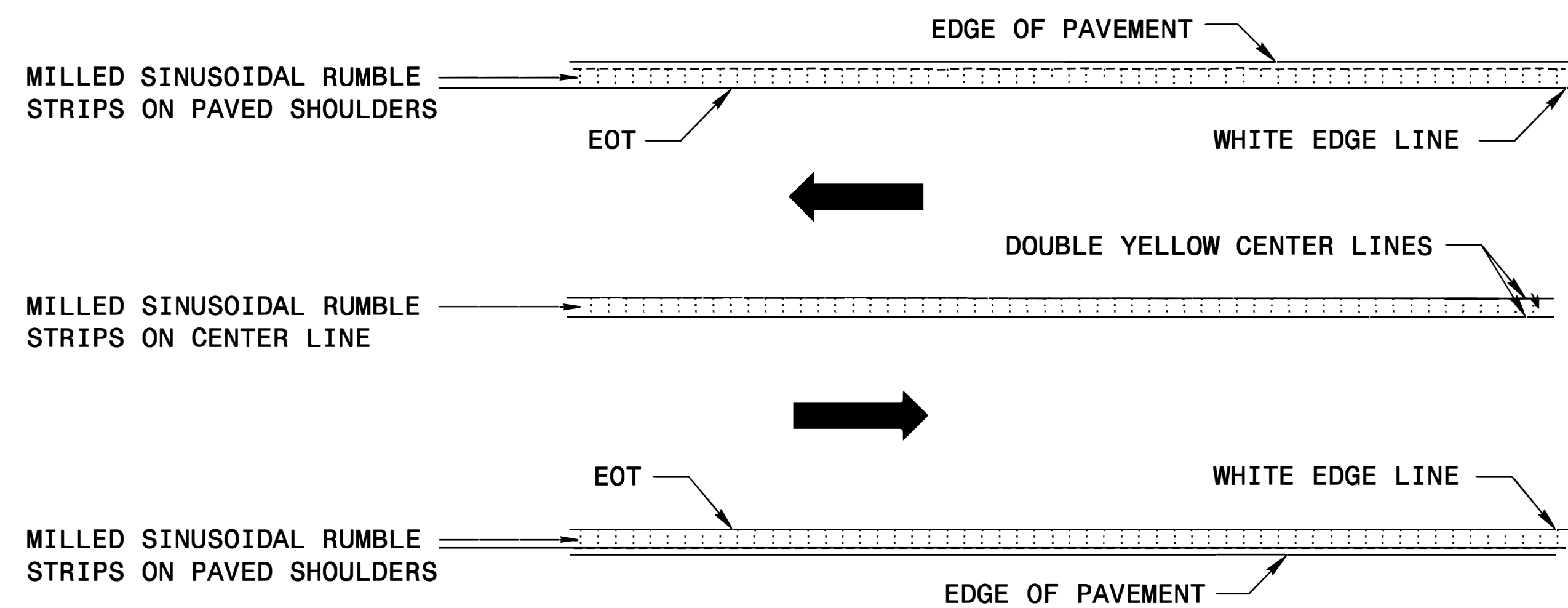
14" CENTER LINE MILLING DETAIL



NOTES:

- 1) INSTALL ONLY EDGELINE SINUSOIDAL RUMBLE STRIPS AND PAVEMENT MARKINGS AT THE FOLLOWING LOCATION: MAP 1 (NC 274).
- 2) INSTALL CENTERLINE AND EDGELINE SINUSOIDAL RUMBLE STRIPS, PAVEMENT MARKINGS AND MARKERS AT THE FOLLOWING LOCATIONS: SR 1131 (LINWOOD RD.); NC 275; SR 2425 (PATRICK RD.); SR 2416 (ROBINSON RD.); SR 2436 (BEATY RD.); SR 2519 (ARMSTRONG FORD RD.); SR 2200 (RANLO-SPENCER MTN. RD.).
- 3) PLACE MILLED SINUSOIDAL RUMBLES AS SHOWN ABOVE IN THIS DETAIL ON BOTH SHOULDERS IN BOTH DIRECTIONS.
- 4) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS
- 5) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
- 6) PAVEMENT MARKING MATERIAL SHALL BE THERMOPLASTIC.
- 7) RETAIN PAVEMENT MARKERS ON THE FOLLOWING MAPS: 1, 4, 5, 7, 8.
- 8) IF SNOWPLOWABLE MARKERS ARE TO BE INSTALLED IN THE CENTERLINE, SKIP A 24" SPACE IN THE RUMBLE STRIPES EVERY 40' OR 80' ACCORDING TO STD. 1250.01.

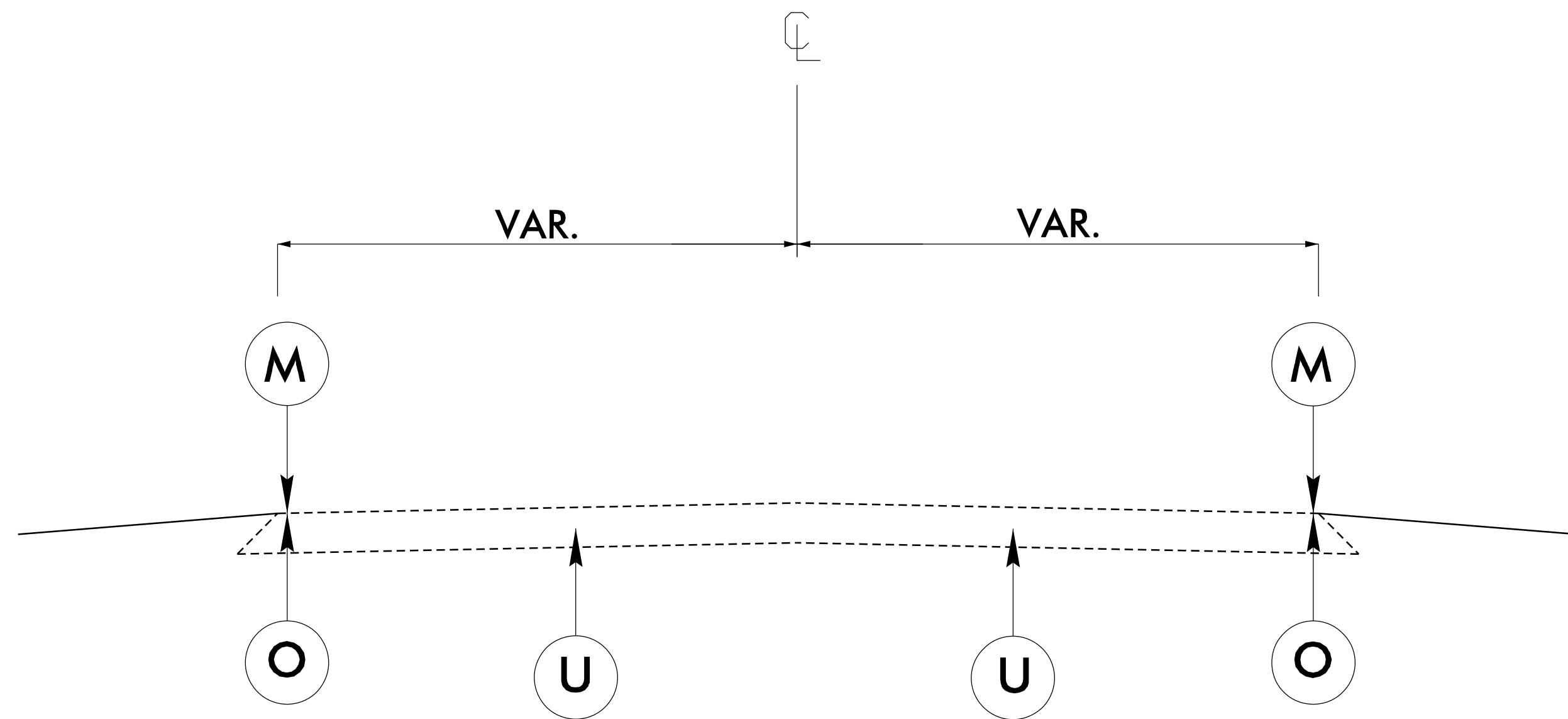
LANE TREATMENT



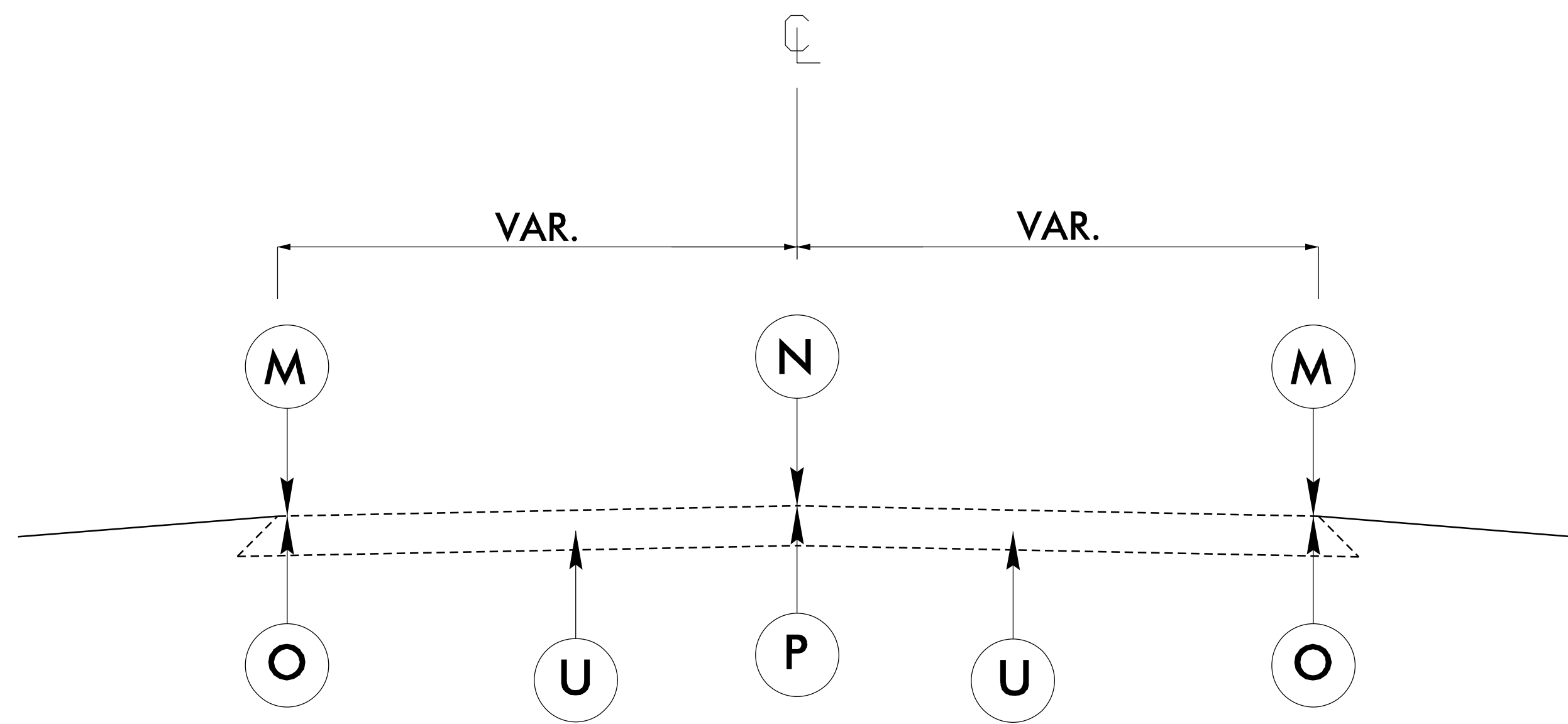
* DETAIL NOT TO A SCALE

05-FEB-2024 15:35 S:\GIS\Projects\2024\003004\SinusoidalRumbleStrip\VP\W-5601R_SS-6012E_G_SS-6212I_J.K.L_Rdy.dtl_2.dgn

TYPICAL SECTIONS



TYPICAL SECTION NO. 1
USE WITH MAP: 1



TYPICAL SECTION NO. 2
USE WITH MAPS: 2-8

PAVEMENT SCHEDULE	
M	EDGE LINE MILLED SINUSOIDAL RUMBLE STRIPS.
N	CENTERLINE MILLED SINUSOIDAL RUMBLE STRIPS.
O	6" WHITE THERMOPLASTIC EDGE LINE.
P	4" THERMOPLASTIC DOUBLE YELLOW CENTERLINE.
U	EXISTING PAVEMENT.

05-FEB-2024 15:19
 S:\DPC\District 1\Gestion\010300_SinusoidalRumbleStrips\Proj\SS-6212K_Pdij_tjpd.dgn
 isccenter AT DIV12-324361

PROJECT REFERENCE #	SHEET NO.
W-5601R; SS-6012E; SS-6012G; SS-6212D; SS-6212I; SS-6212J; SS- 6212K; SS-6212L	11

MILLED SINUSOIDAL RUMBLE STRIP, THERMOPLASTIC MARKING AND MARKER QUANTITIES

WBS#	COUNTY	MAP NO	ROUTE	DESCRIPTION	LENGTH	4400000000-E	4457000000-N	1881000000-E	1881000000-E	4685000000-E	4695000000-E	4850000000-E	4905000000-N	
						WORK ZONE ADVANCE/GENE RAL WARNING SIGNING	TEMPORARY TRAFFIC CONTROL	SINUSOIDAL MILLED RUMBLE STRIP 8"	SINUSOIDAL MILLED RUMBLE STRIP 14"	THERMO PAVEMENT MARKING LINES YELLOW (4", 90 MILS)	THERMO PAVEMENT MARKING LINES WHITE (6", 90 MILS)	REMOVAL OF PAVEMENT MARKING LINES, 4"	NON-CAST IRON SNOW- PLOWABLE MARKER	
						MI	SF	LS	LF	LF	LF	LF	EA	
50138.3.253	Gaston	1	NC 274	From SR 1443 (Dameron Rd.) to NW End of Guardrail at Long Creek	1.14	144			12000			12000	500	
WBS# 50138.3.253 Total							144		12000			12000	500	
49129.3.1	Gaston	2	SR 2519 (Armstrong Ford Rd.)	From MP 0.000 (NC 279) to MM 1.174 (River Bridge)	1.18	144			12460	6230	12460	12460	500	100
WBS# 49129 Total							144		12460	6230	12460	12460	500	100
49143	Gaston	3	SR 2200 (Ranlo-Spencer Mtn. Rd.)	From Ranlo Municipal Limits to SR 2003 (Main St.)	1.17	144			12400	6200	12400	12400	500	100
WBS# 49143 Total							144		12400	6200	12400	12400	500	100
51122	Gaston	4	NC 275	From NC 279 to NC 274	3.08	144			32600	16300	32600	32600	1000	
WBS# 51122 Total							144		32600	16300	32600	32600	1000	
50678	Gaston	5	SR 2439 (Beaty Rd.)	From MP 0.55 to MP 3.10	2.55	144			27000	13500	27000	27000	1000	
WBS# 50678 Total							144		27000	13500	27000	27000	1000	
51123	Gaston	6	2425 (Patrick Rd.)	From NC 274 to SC State Line	2.37	144			25200	12600	25200	25200	1000	175
WBS# 51123 Total							144		25200	12600	25200	25200	1000	175
51121	Gaston	7	SR 1131 (Linwood Rd.)	From SR 1132 (Torrence Rd.) to Trinity Ave.	0.86	144			9000	4500	9000	9000	300	
WBS# 51121 Total							144		9000	4500	9000	9000	300	
51124	Gaston	8	SR 2416 (Robinson Rd.)	From MP 2.900 to 3.600 (US 321)	0.70	144			7400	3700	7400	7400	250	
WBS# 51124 Total							144		7400	3700	7400	7400	250	
Contract Totals					13.05	1,152	1	138060	63030	126060	138060	5050	375	