

08-JUL-2026 15:45 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2412A_Rdy_+tsh.lldgn jscarpenr AT DIV12-329436L

09/08/99

TIP PROJECT: HS-2412A

CONTRACT: DL00382

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

LOCATION: NC 10 FROM MP 7.702 (460' NORTH OF SR 1627/PRUETT RD)
TO MP.15.354 (CLEVELAND/LINCOLN COUNTY LINE).

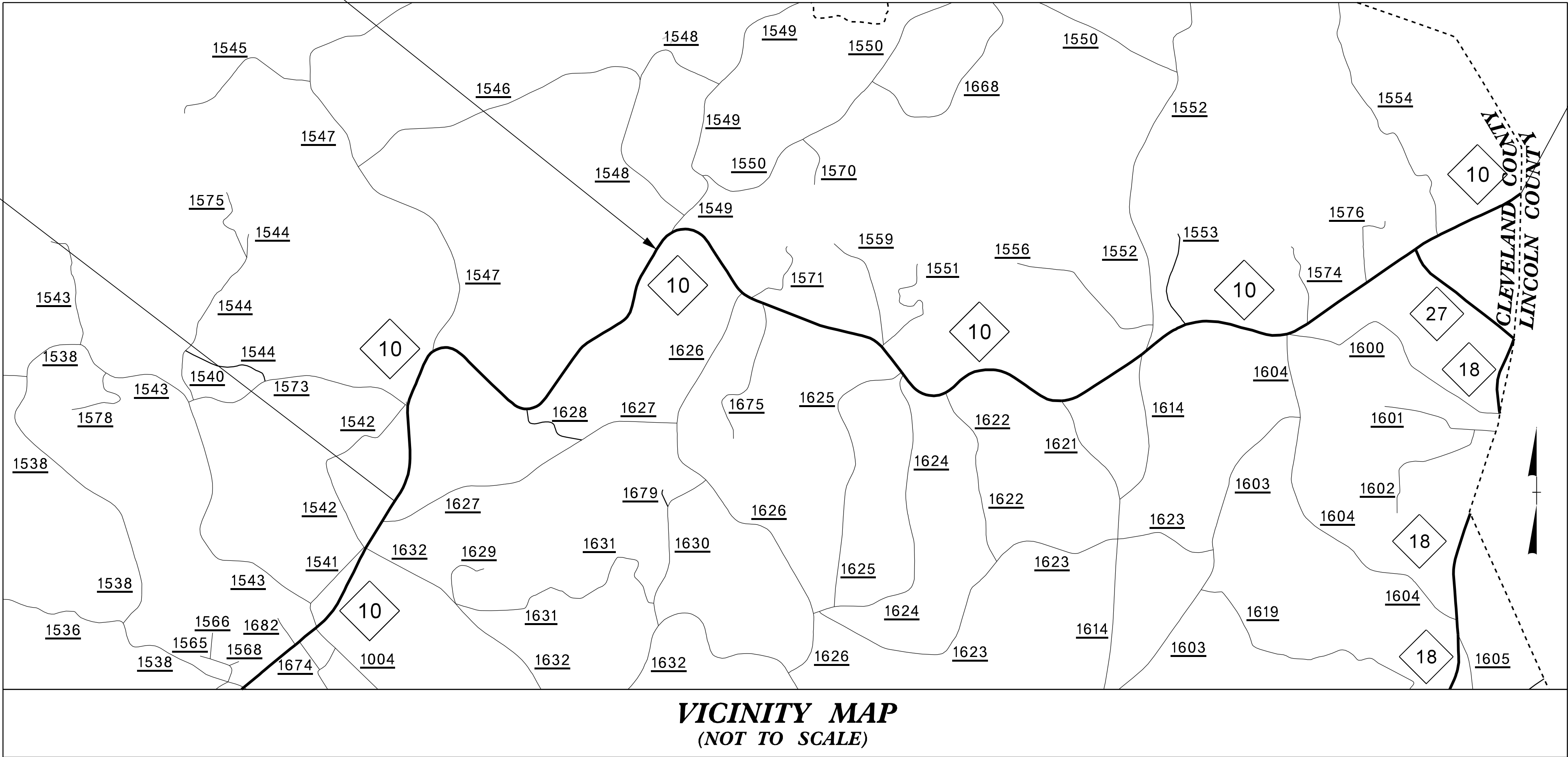
TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE MILLED
SINUSOIDAL RUMBLE STRIPS AND PAVEMENT MARKINGS.

STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	HS-2412A		1	17
STATE PROJ. NO.		F.A. PROJ. NO.	DESCRIPTION	
50984.1.2		N/A	PE	
50984.3.2		N/A	CONST	

MAP 1

BEGIN TIP
PROJECT HS-2412A

END TIP
PROJECT HS-2412A



VICINITY MAP
(NOT TO SCALE)

DESIGN DATA
ADT 2026 = 1800 VPD
V = 55 MPH
FUNC CLASS =
MAJOR COLLECTOR

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2412A = 7.652 MILES
TOTAL LENGTH OF TIP PROJECT HS-2412A = 7.652 MILES

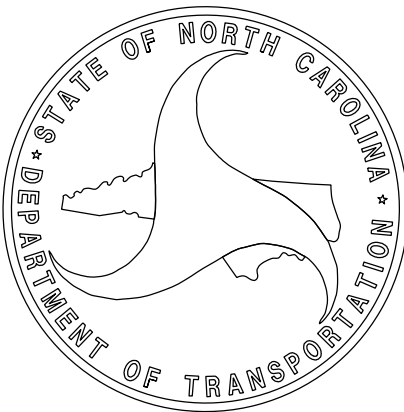
Prepared In the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	JOSHUA B. WHITE, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 8, 2026	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



DocuSigned by:
Joshua B. White
4298E261EFD0CABE

07/09/2026



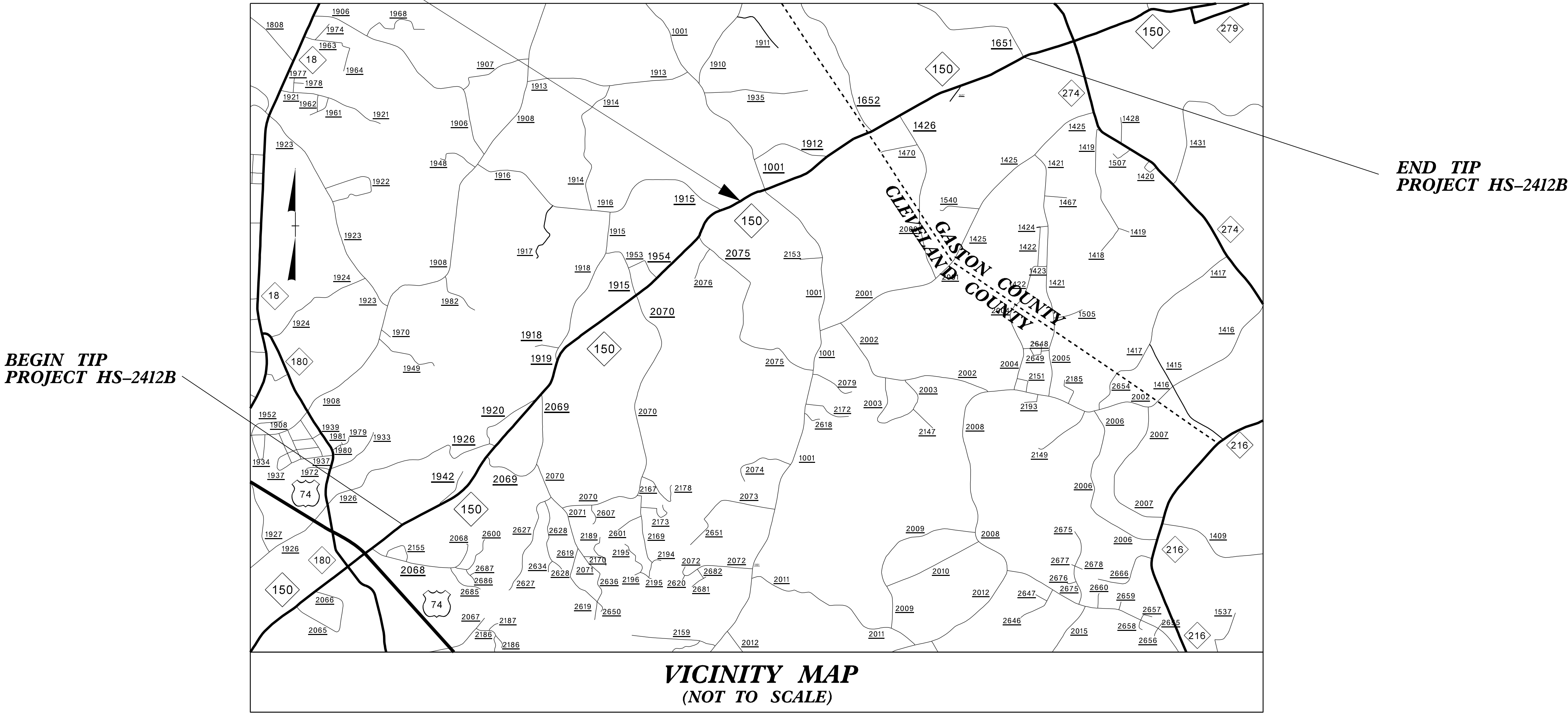
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2412B	2	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
50984.1.3	N/A	PE	
50984.3.3	N/A	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND & GASTON COUNTIES

LOCATION: NC150 BETWEEN 2000' EAST OF SR 2068/TROY RD.
IN CLEVELAND COUNTY (MP.18.730-24.230) TO SR 1651/DELVIEW RD.
IN LINCOLN COUNTY (MP. 0.000-1.547).

MAP 2 TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE MILLED
SINUSOIDAL RUMBLE STRIPS AND PAVEMENT MARKINGS.



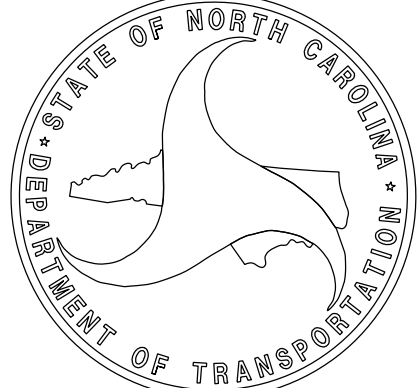
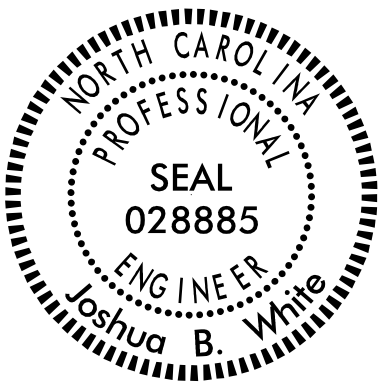
TIP PROJECT: HS-2412B

CONTRACT: DL00382

DESIGN DATA
ADT 2026 = 13,000 VPD
V = VARIABLE
FUNC CLASS =
PRINCIPAL ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2412B = 7.047 MILES
TOTAL LENGTH OF TIP PROJECT HS-2412B = 7.047 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: SEPTEMBER 8, 2026
JOSHUA B. WHITE, PE
PROJECT ENGINEER
JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



07/09/2026

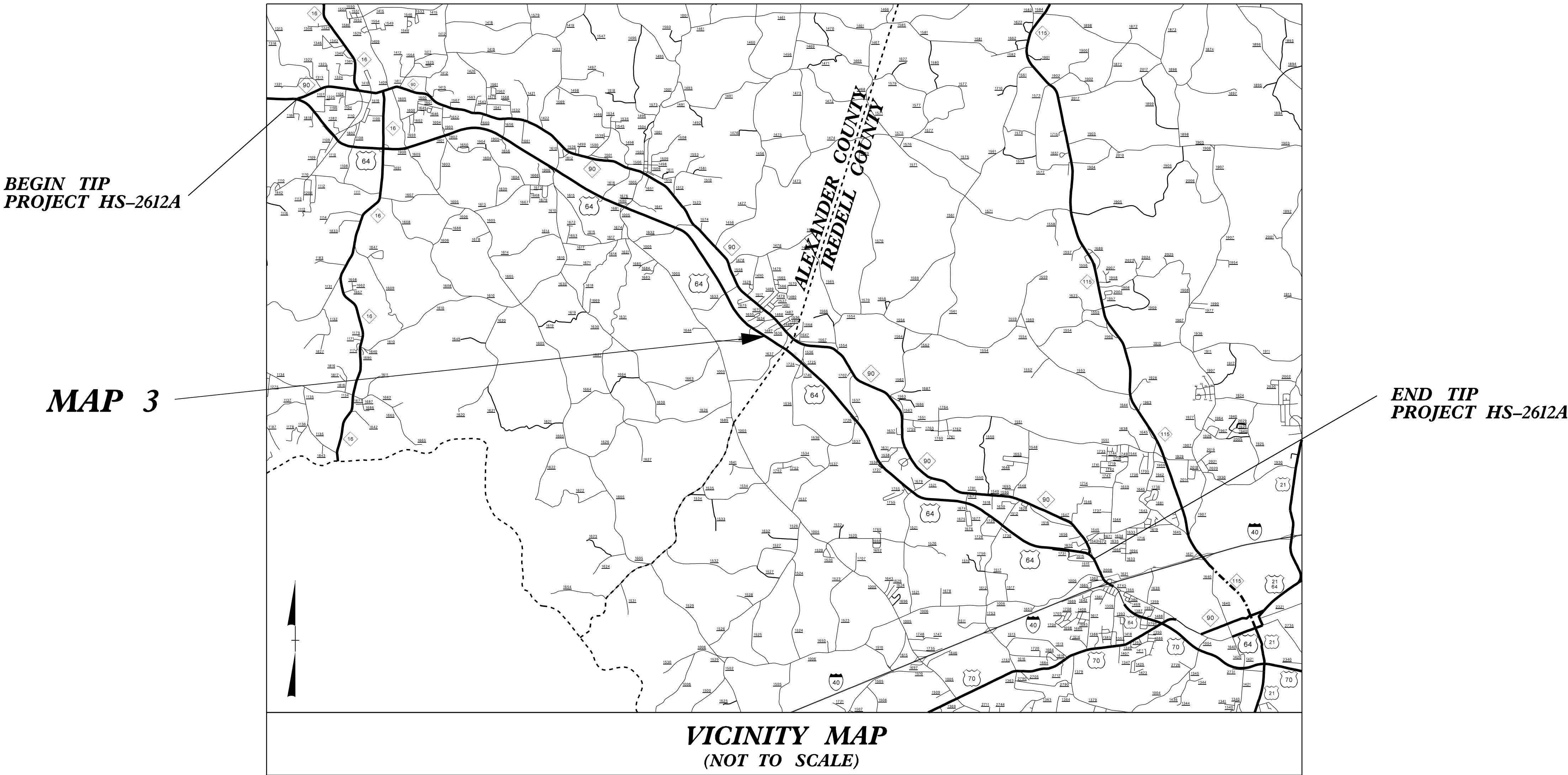
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612A	3	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.2	N/A	PE	
51922.3.2	N/A	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALEXANDER & IREDELL COUNTY

LOCATION: US64 BETWEEN NC90/GOLF CLUB RD. IN ALEXANDER COUNTY (MP 7.903-18.879) AND NC90 IN IREDELL COUNTY (MP 0.000-7.119).

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



DESIGN DATA
ADT 2026 = 8,300 VPD
V = VARIABLE
FUNC CLASS =
MINOR ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612A = 18.095 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612A = 18.095 MILES

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

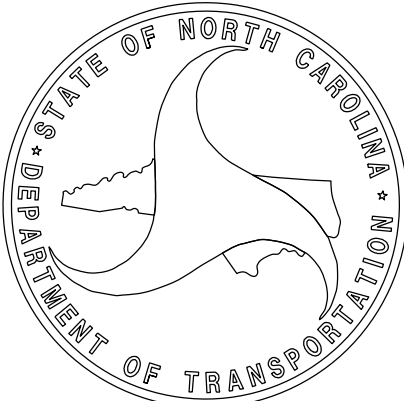
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
SEPTEMBER 8, 2026

JOSHUA B. WHITE, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



DocuSigned by:
Joshua B. White
1298E281EFD048E...

07/09/2026

08-JUL-2026 15:56 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612A-Rdy-fsh_3.dgn jscarpen AT DIV12-329436L

TIP PROJECT: HS-2612A

CONTRACT: DL00382

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612B	4	17
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51922.1.3	N/A	PE	
51922.3.3	N/A	CONST	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALEXANDER COUNTY

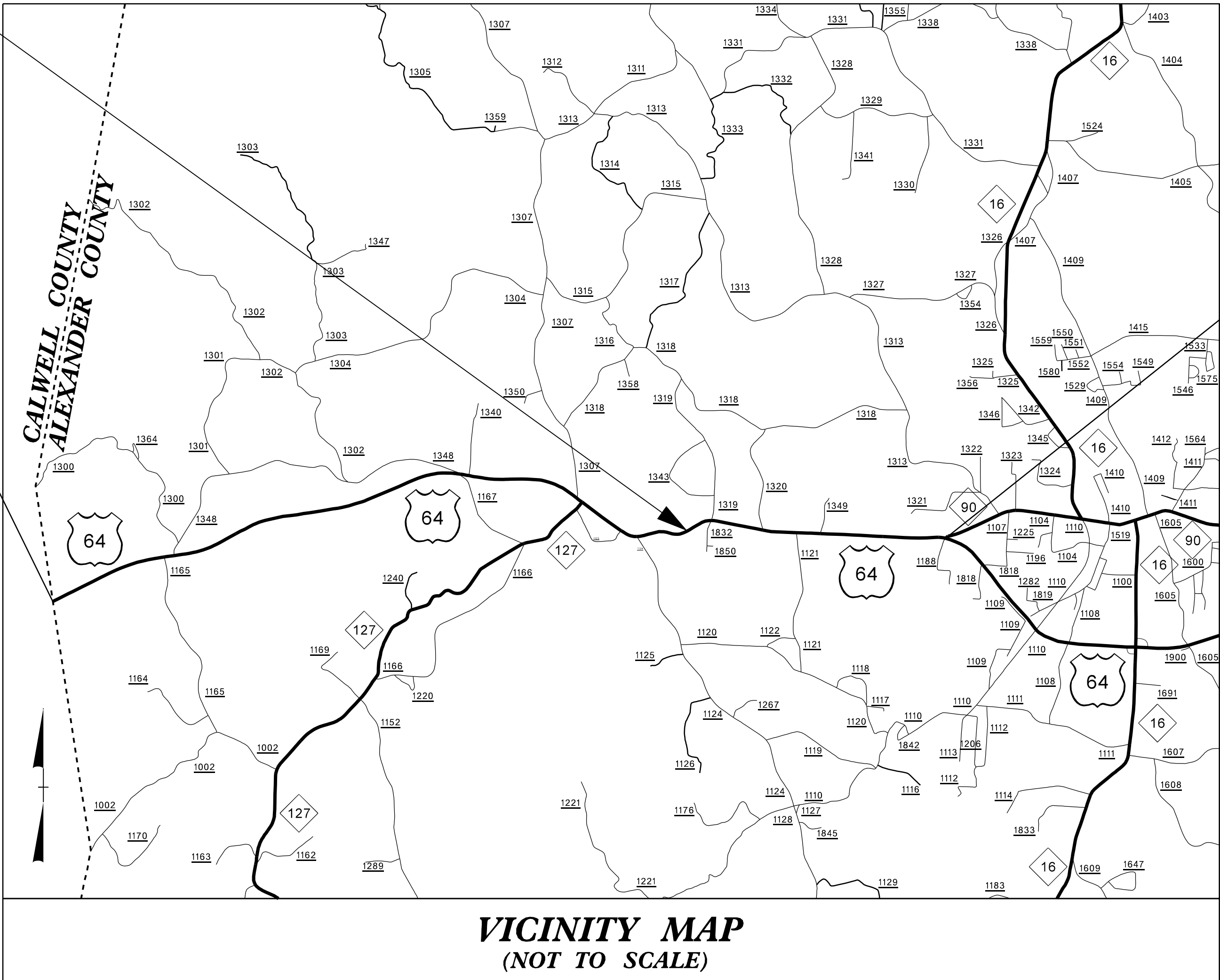
LOCATION: US64/NC90 BETWEEN CALDWELL COUNTY LINE (MP. 0.00) AND
NC90/GOLF CLUB RD. (MP. 7.903) IN ALEXANDER COUNTY.

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

MAP 4

BEGIN TIP
PROJECT HS-2612B

END TIP
PROJECT HS-2612B



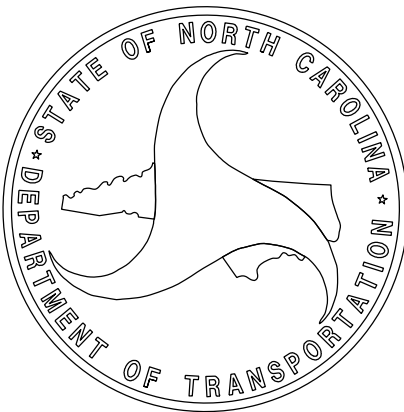
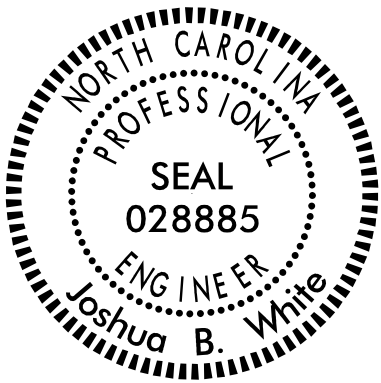
TIP PROJECT: HS-2612B

CONTRACT: DL00382

DESIGN DATA
ADT 2026 = 8,600 VPD
V = VARIABLE
FUNC CLASS =
MINOR ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612B = 7.903 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612B = 7.903 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: SEPTEMBER 8, 2026
JOSHUA B. WHITE, PE
PROJECT ENGINEER
JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



08-JUL-2026 16:01 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612C.Rdy_+tsh_5.dgn jscarpen AT DIV12-329436L

09/08/26

CONTRACT: DL00382

TIP PROJECT: HS-2612C

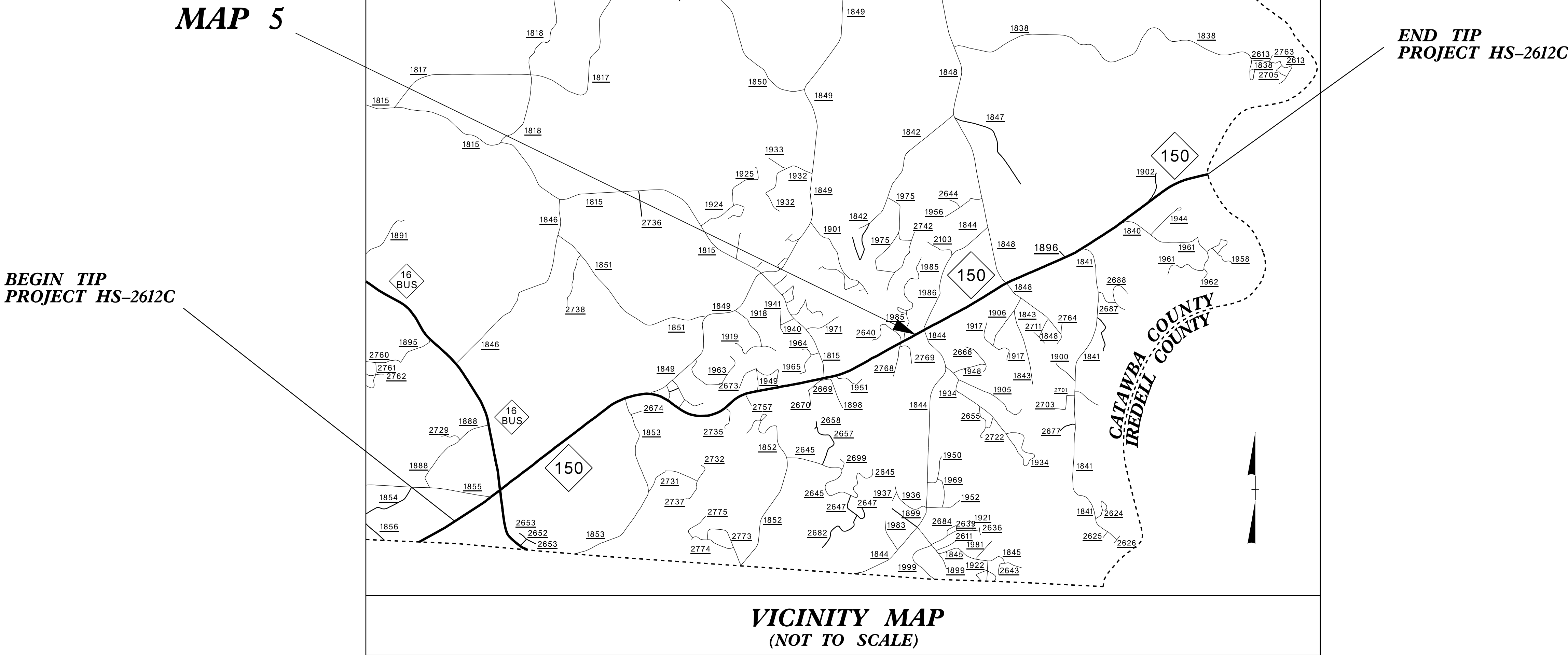
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA COUNTY

LOCATION: NC150 BETWEEN 1975' WEST OF SR 1855/E. MAIDEN RD. (MM. 8.688)
AND THE IREDELL COUNTY LINE (MM. 0.438).

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612C	5	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.4	N/A	PE	
51922.3.4	N/A	CONST.	



DESIGN DATA
ADT 2026 = 16,500 VPD
V = VARIABLE
FUNC CLASS =
PRINCIPAL ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612C = 8.250 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612C = 8.250 MILES

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

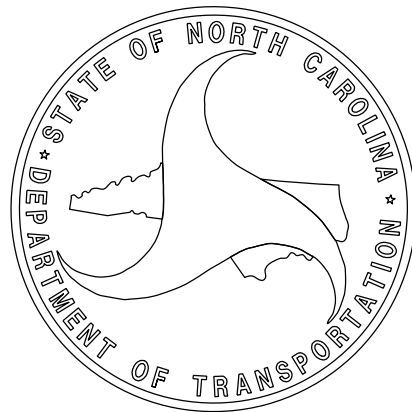
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
SEPTEMBER 8, 2026

JOSHUA B. WHITE, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



07/09/2026

08-JUL-2026 16:04 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612D.Rdy.tsh_6.dgn jscarpen AT DIV12-329436L

09/08/99

CONTRACT: DL00382

TIP PROJECT: HS-2612D

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

IREDELL COUNTY

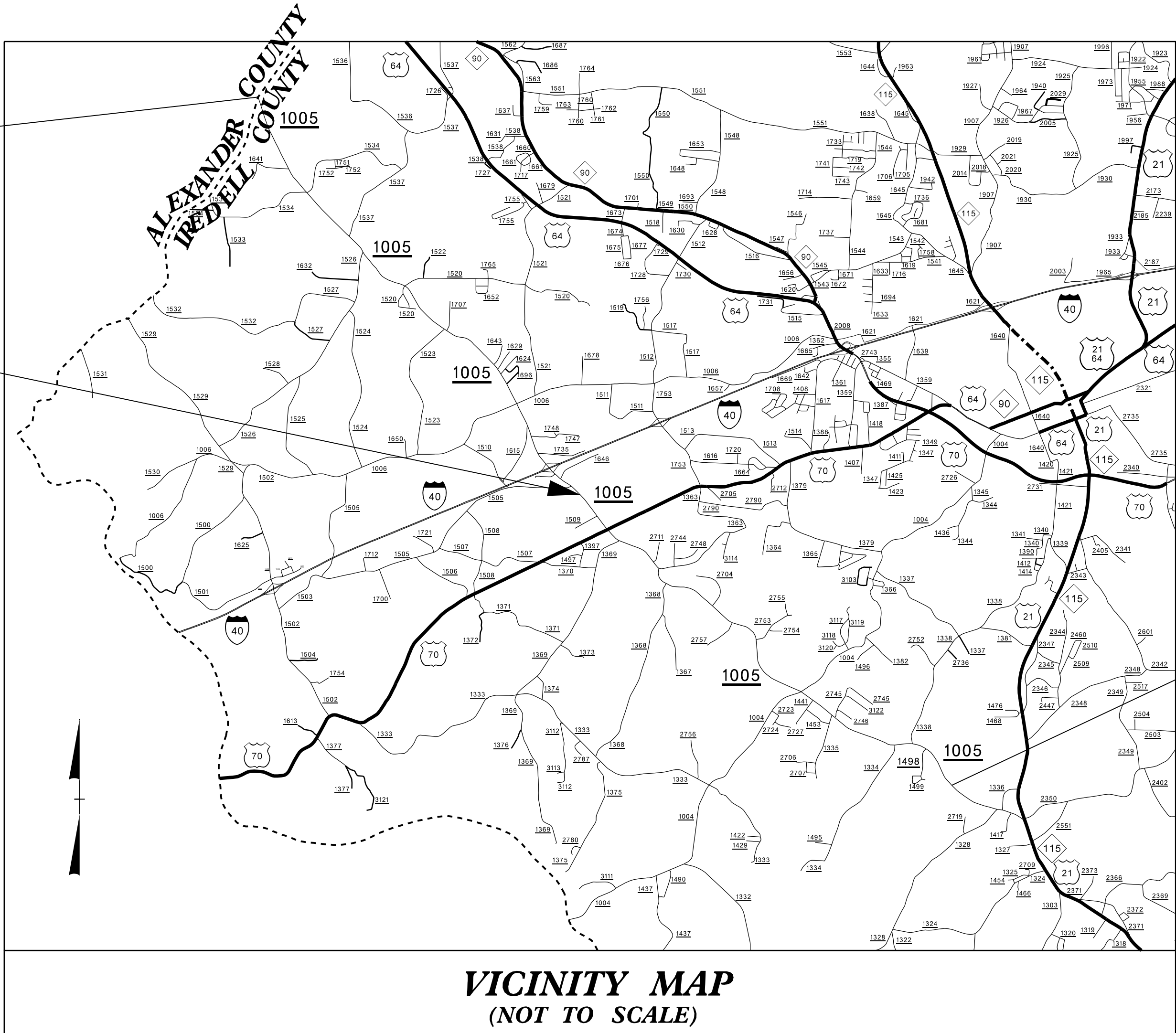
LOCATION: SR 1005 (OLD MOUNTAIN RD.) BETWEEN ALEXANDER COUNTY LINE (MM. 0.000) TO 0.49 MILES SOUTH OF SR 1498 (MM. 12.110/START OF 35 PHM ZONE).

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612D	6	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.5	N/A	PE	
51922.3.5	N/A	CONST	

BEGIN TIP
PROJECT HS-2012D

MAP 6



END TIP
PROJECT HS-2012D

DESIGN DATA
ADT 2026 = 5,100 VPD
V = VARIABLE
FUNC CLASS =
MAJOR COLLECTOR

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612D = 12.110 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612D = 12.110 MILES

Prepared in the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150
2018 STANDARD SPECIFICATIONS
RIGHT OF WAY DATE: N/A
LETTING DATE: SEPTEMBER 8, 2026
JOSHUA B. WHITE, PE
PROJECT ENGINEER
JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER

DocuSigned by:
Joshua White
4299E281EFD0C48E

07/09/2026

NORTH CAROLINA
PROFESSIONAL
SEAL
028885
ENGINEER
Joshua B. White

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

08-JUL-2026 16:06 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612E.Rdy.tsh_7.dgn jscarpen AT DIV12-329436L

09/08/99

CONTRACT: DL00382

TIP PROJECT: HS-2612E

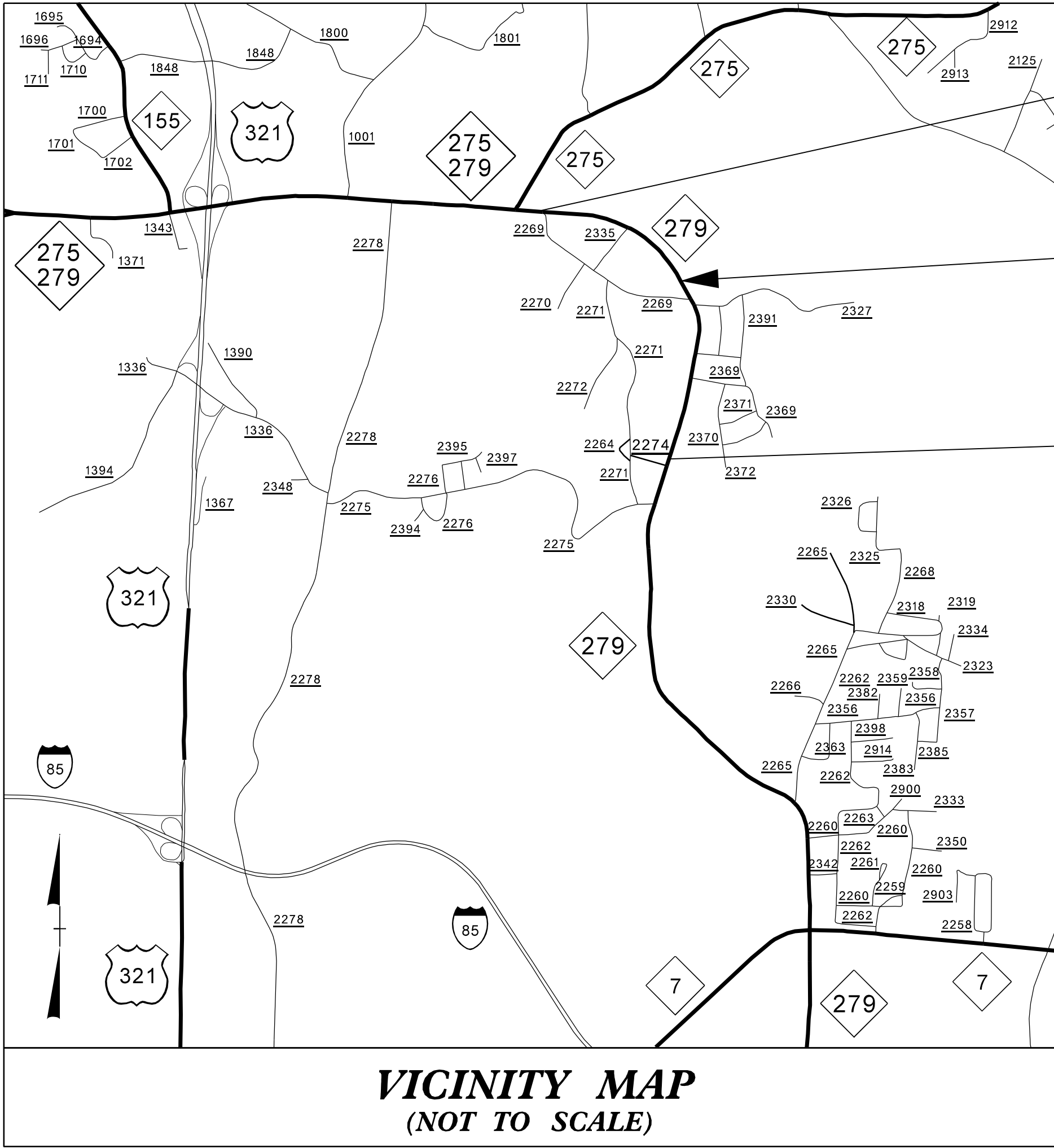
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

LOCATION: NC 279 FROM 300' WEST OF NC 275 (MM. 14.022)
TO 175' NORTH OF SR 2274/GANT RD. (MM. 15.324).

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612E	7	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.6	N/A	PE	
51922.3.6	N/A	CONST	



BEGIN TIP
PROJECT HS-2612E

MAP 7

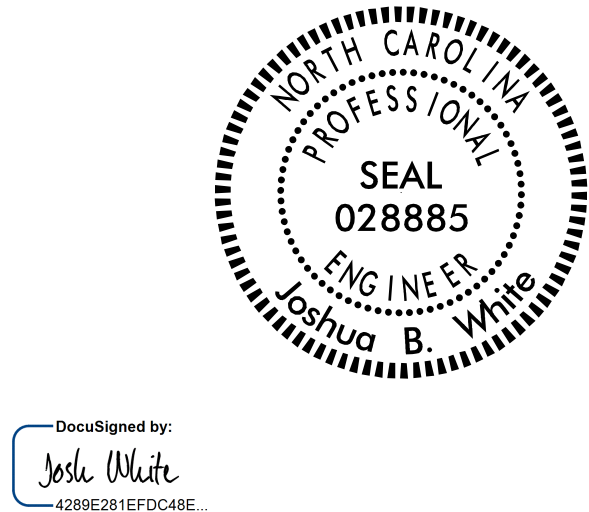
END TIP
PROJECT HS-2612E

DESIGN DATA
ADT 2026 = 13,000 VPD
V = VARIABLE
FUNC CLASS =
PRINCIPAL ARTERIAL

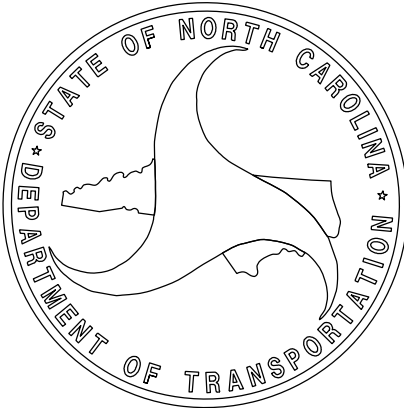
PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612E = 1.302 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612E = 1.302 MILES

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

2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	JOSHUA B. WHITE, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 8, 2026	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



07/09/2026



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612F	8	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.7	N/A	PE	
51922.3.7	N/A	CONST	

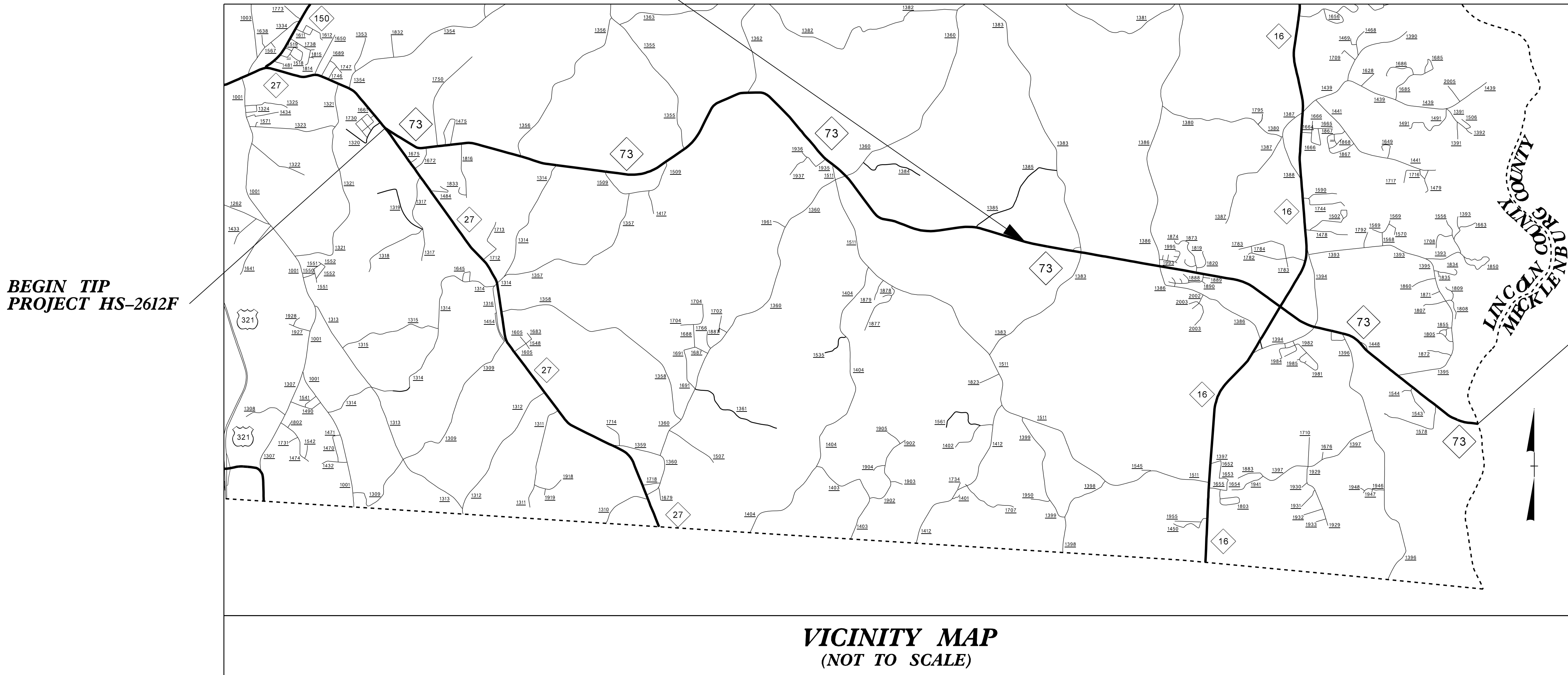
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

LINCOLN COUNTY

MAP 8

LOCATION: NC 73 (MM. 0.000) FROM NC 27 TO
MECKLENBURG COUNTY LINE (MM. 14.236).

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



TIP PROJECT: HS-2612F

CONTRACT: DL00382

DESIGN DATA
ADT 2026 = 22,000 VPD
V = VARIABLE
FUNC CLASS =
PRINCIPAL ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612F = 14.236 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612F = 14.236 MILES

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

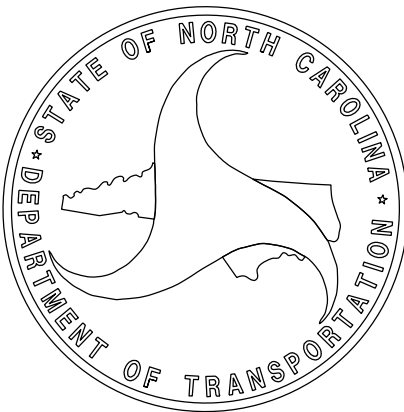
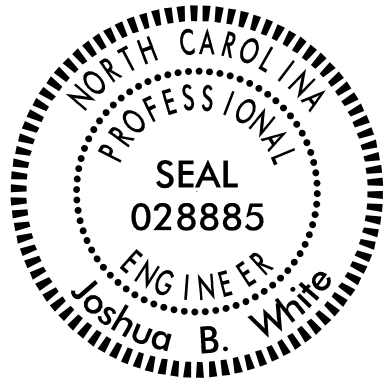
2024 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
N/A

LETTING DATE:
SEPTEMBER 8, 2026

JOSHUA B. WHITE, PE
PROJECT ENGINEER

JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



DocuSigned by:
Josh White
4289E2B1EFD048E

07/09/2026

08-JUL-2026 16:11 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612G.Rdy.tsh_9.dgn jscarpen AT DIV12-329436L

09/08/99

TIP PROJECT: HS-2612G

CONTRACT: DL00382

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

LOCATION: NC 279 FROM 160' WEST OF SR 1630/DICK BEAM RD. (MM. 17.831)
TO COLLEGE RD. (MM. 27.893).

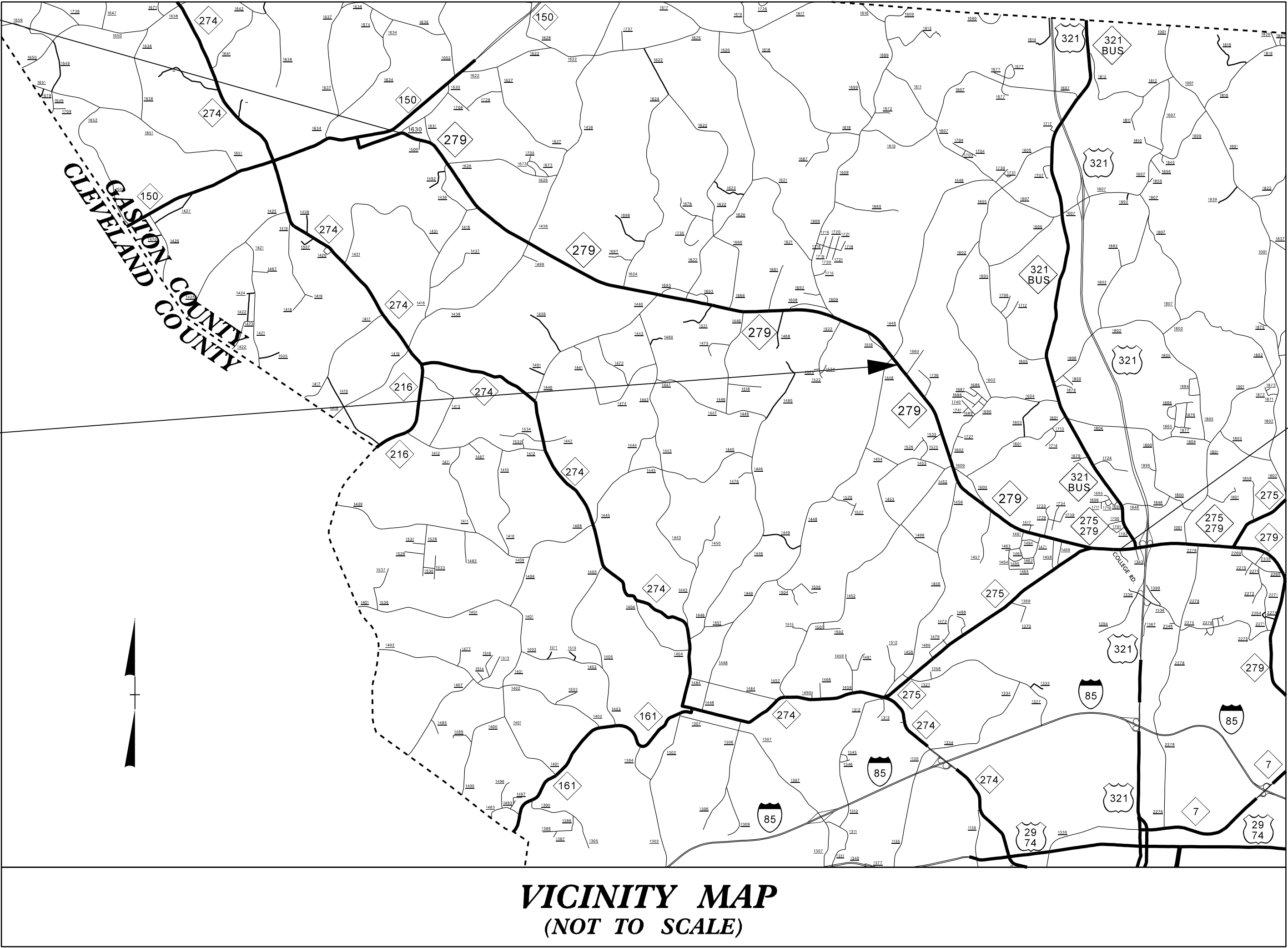
TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE MILLED
SINUSOIDAL RUMBLE STRIPS AND PAVEMENT MARKINGS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612G	9	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.8	N/A	PE	
51922.3.8	N/A	CONST.	

BEGIN TIP
PROJECT HS-2612G

MAP 9

END TIP
PROJECT HS-2612G



DESIGN DATA
ADT 2026 = 21,000 VPD
V = VARIABLE
FUNC CLASS =
ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612G = 10.062 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612G = 10.062 MILES

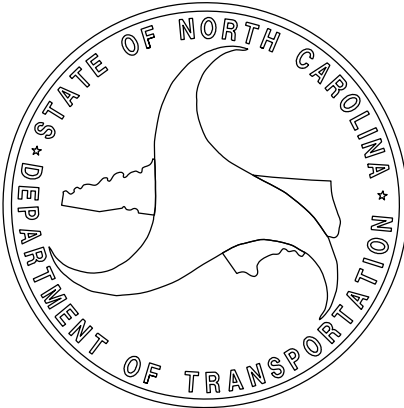
Prepared In the Office of:
DIVISION TWELVE DDC
1710 E. Marion Street, Shelby NC, 28150

2024 STANDARD SPECIFICATIONS	
RIGHT OF WAY DATE: N/A	JOSHUA B. WHITE, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 8, 2026	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER

Seal of the State of North Carolina, Department of Transportation, Professional Engineer Seal, 028885, Joshua B. White

DocuSigned by:
Joshua B. White
4289E281EFD048E...

07/09/2026



08-JUL-2026 16:14 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2612H_Rdy_+tsh_10.dgn jscarpen AT DIV12-329436L

09/08/99

CONTRACT: DL00382

TIP PROJECT: HS-2612H

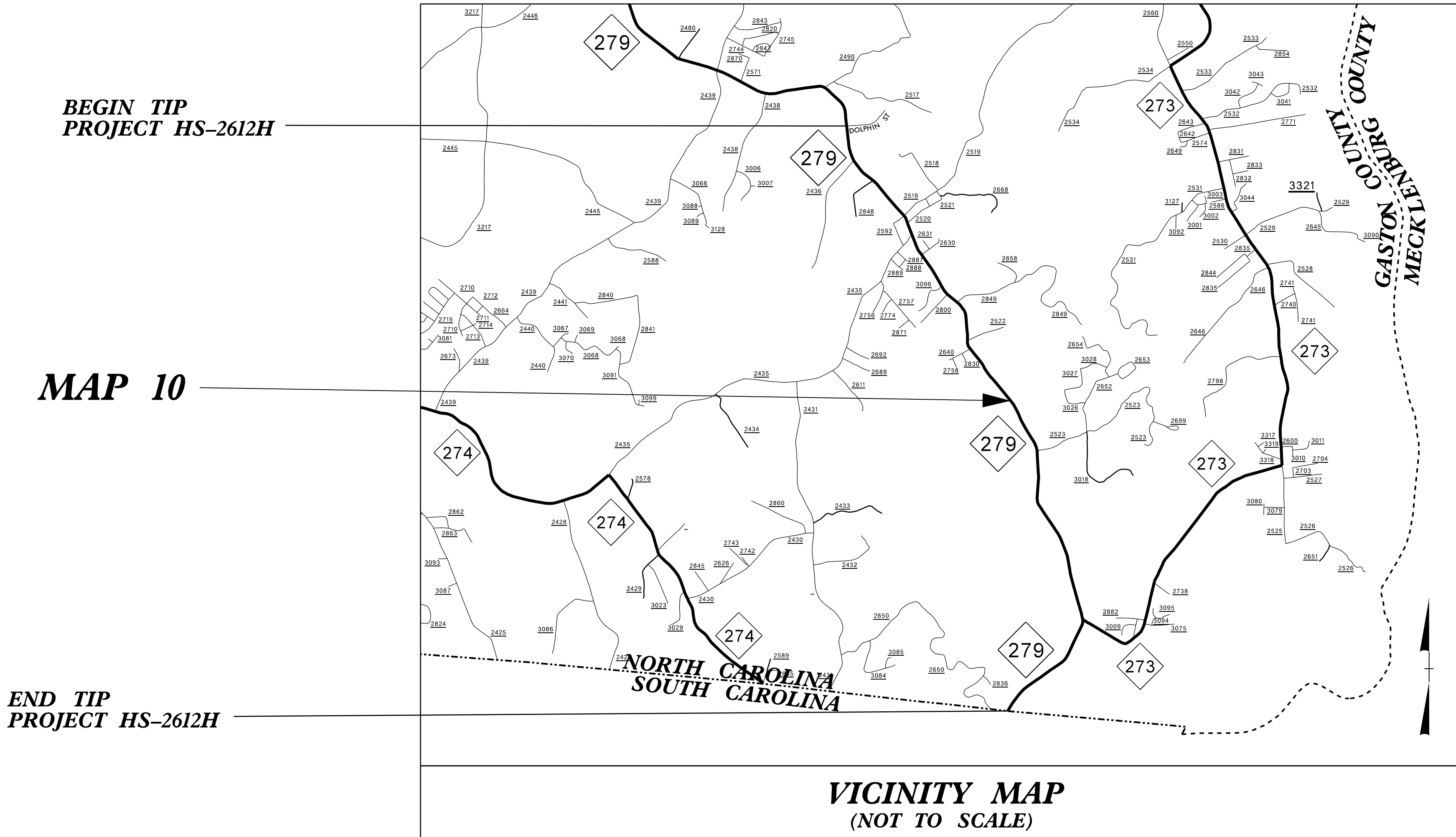
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GASTON COUNTY

LOCATION: NC279 BETWEEN STATE LINE (MM. 0.000)
AND 400 +/- SOUTH OF DOLPHIN ST (MM. 5.385).

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612H	10	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
51922.1.9	N/A	PE	
51922.3.9	N/A	CONST.	

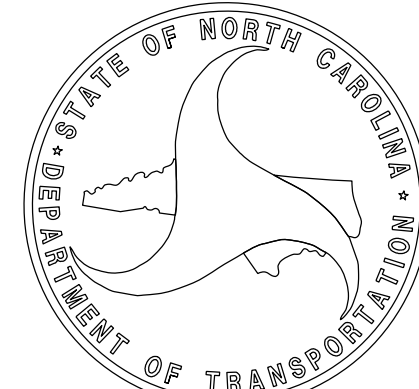
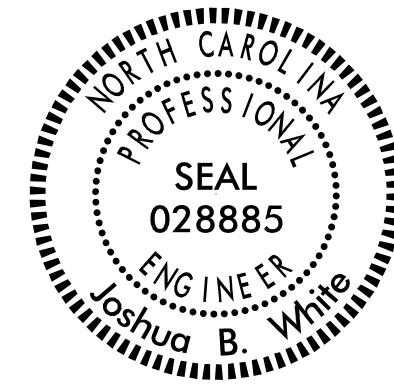


DESIGN DATA
ADT 2026 = 12,000 VPD
V = VARIABLE
FUNC CLASS =
MINOR ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612H = 5.385 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612H = 5.385 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	JOSHUA B. WHITE, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 8, 2026	JOSHUA S. CARPENTER PROJECT DESIGN ENGINEER



DocuSigned by:
Josh White
4289E281EFDC48E

07/09/2026

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2612I	11	17
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
51922.1.10	N/A	PE	
51922.3.10	N/A	CONST.	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CLEVELAND COUNTY

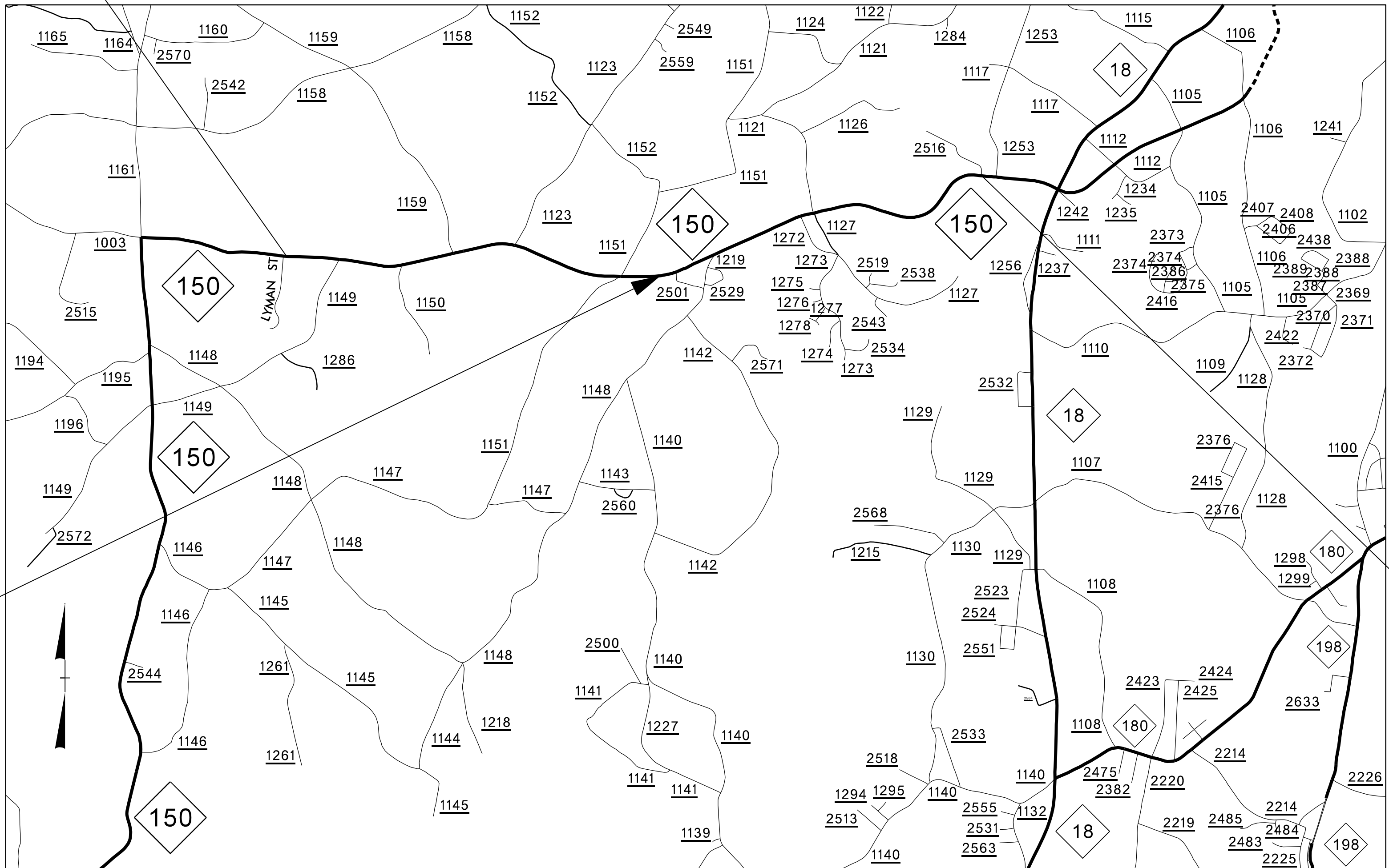
LOCATION: NC150 BETWEEN 150' EAST OF LYMAN ST. (MP. 6.372)
TO SR2516/SUFFORK DR. (MP. 10.960).

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

BEGIN TIP
PROJECT HS-2612I

MAP 11

END TIP
PROJECT HS-2612I



VICINITY MAP
(NOT TO SCALE)

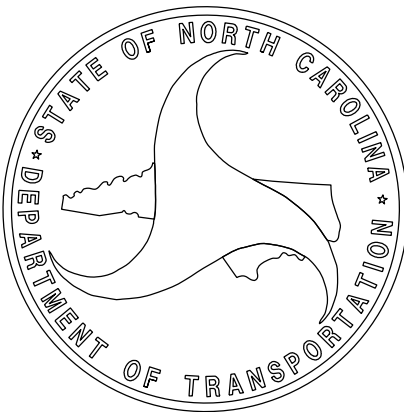
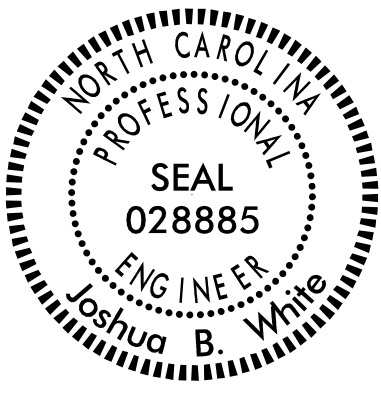
TIP PROJECT: HS-2612I

CONTRACT: DL00382

DESIGN DATA
ADT 2026 = 10,000 VPD
V = VARIABLE
FUNC CLASS =
MINOR ARTERIAL

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2612I = 4.588 MILES
TOTAL LENGTH OF TIP PROJECT HS-2612I = 4.588 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: SEPTEMBER 8, 2026
JOSHUA B. WHITE, PE
PROJECT ENGINEER
JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



09-JUL-2026 09:39 S:\DDC\DL00382 SinusoidalRumble Strip\Plansheets\Cadd Files and S00\HS-2012\RDy_tsh_12.dgn jscarpen AT DIV12-329436L

TIP PROJECT: HS-2012I

CONTRACT: DL00382

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CATAWBA COUNTY

LOCATION: NC 10 FROM 465' EAST OF BRIDGE (MP. 13.551)
TO 380' EAST OF US 321 RAMPS (MP. 14.051).

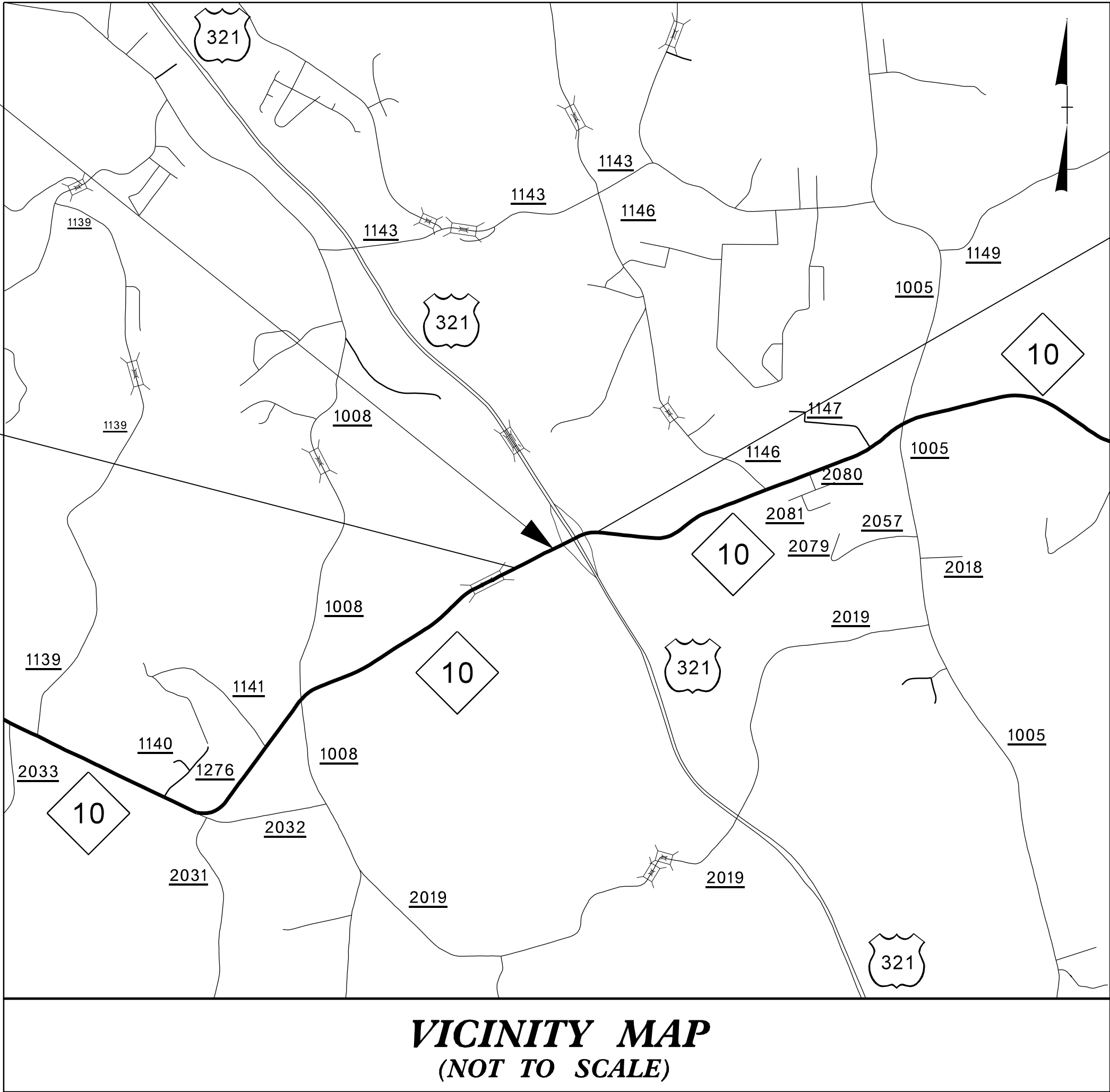
TYPE OF WORK: INSTALLATION OF CENTERLINE AND EDGELINE MILLED
SINUSOIDAL RUMBLE STRIPS AND PAVEMENT MARKINGS.

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	HS-2012I	12	17
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
49331.1.10	4933110	PE	
49331.3.10	4933110	CONST	

MAP 12

BEGIN TIP
PROJECT HS-2012I

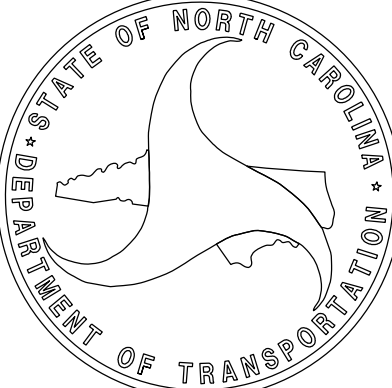
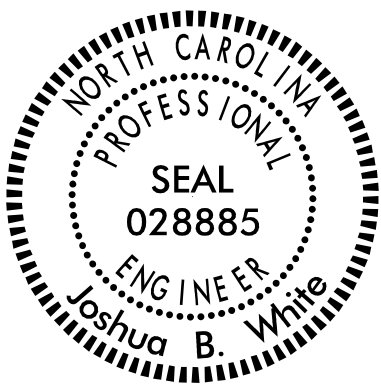
END TIP
PROJECT HS-2012I



DESIGN DATA
ADT 2026 = 7,600 VPD
V = 55 MPH
FUNC CLASS =
MAJOR COLLECTOR

PROJECT LENGTH
LENGTH OF ROADWAY TIP PROJECT HS-2012I = 0.500 MILES
TOTAL LENGTH OF TIP PROJECT HS-2012I = 0.500 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: SEPTEMBER 8, 2026
JOSHUA B. WHITE, PE
PROJECT ENGINEER
JOSHUA S. CARPENTER
PROJECT DESIGN ENGINEER



DocuSigned by:
Joshua B. White
4209E2015FDC48E

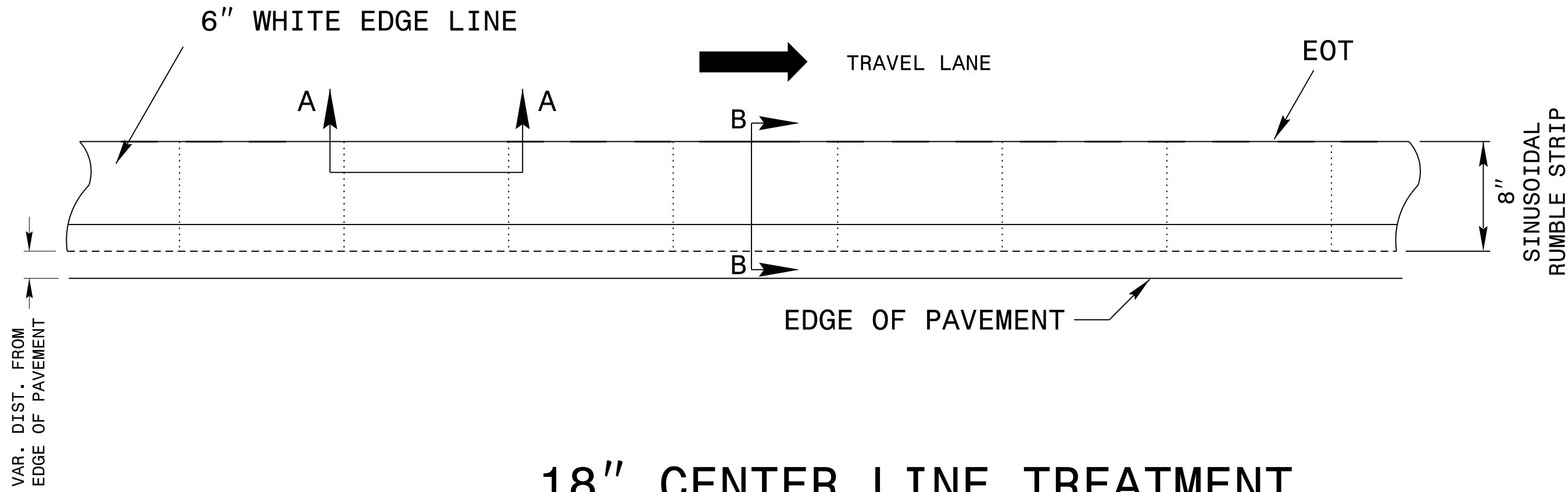
07/09/2026

8" & 18" SINUSOIDAL MILLED RUMBLE STRIP DETAIL

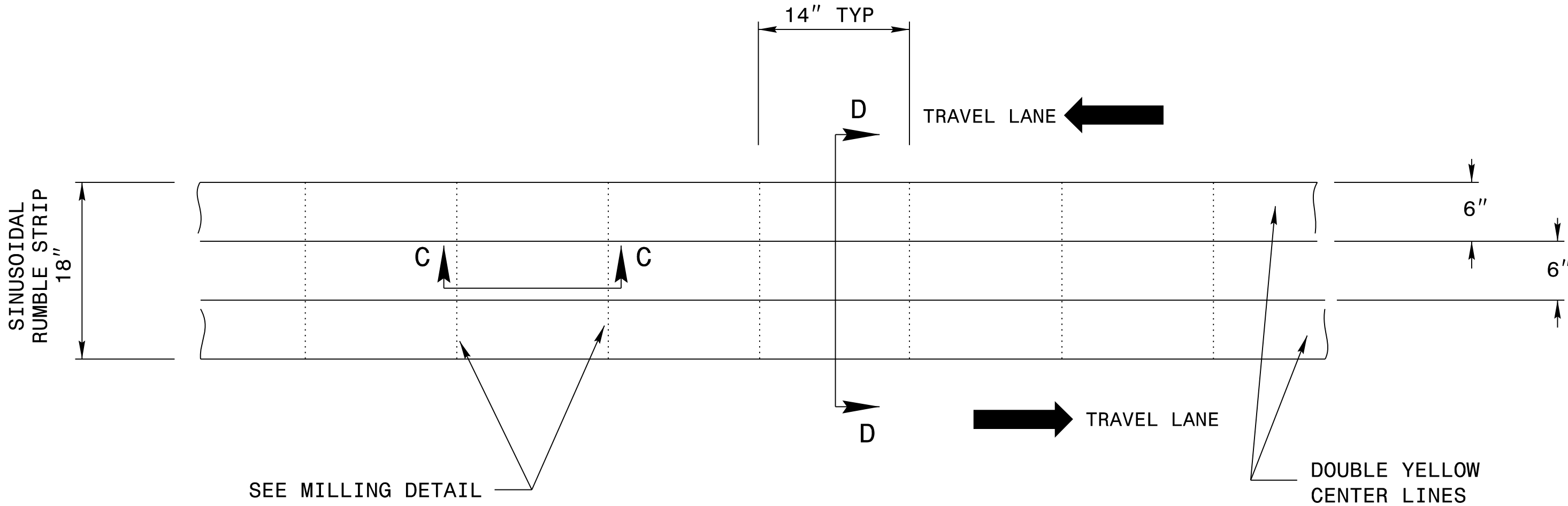
PROJECT REFERENCE NO.	SHEET NO.
HS-24I2A; HS-24I2B; HS-26I2A; HS-26I2B; HS-26I2C; HS-26I2D; HS-26I2E; HS-26I2F; HS-26I2G; HS-26I2H; HS-26I2I	13



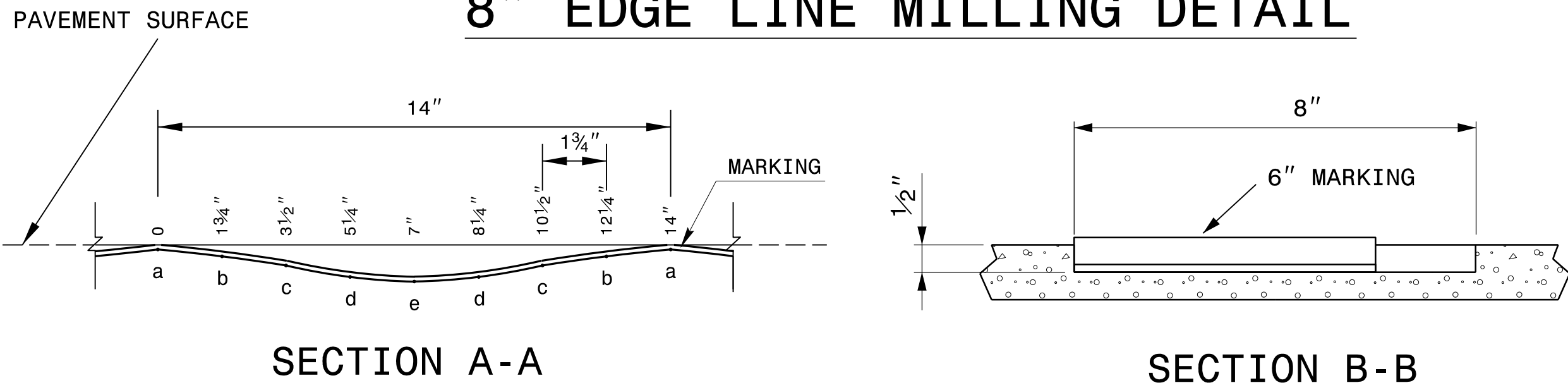
8" EDGE LINE TREATMENT



18" CENTER LINE TREATMENT



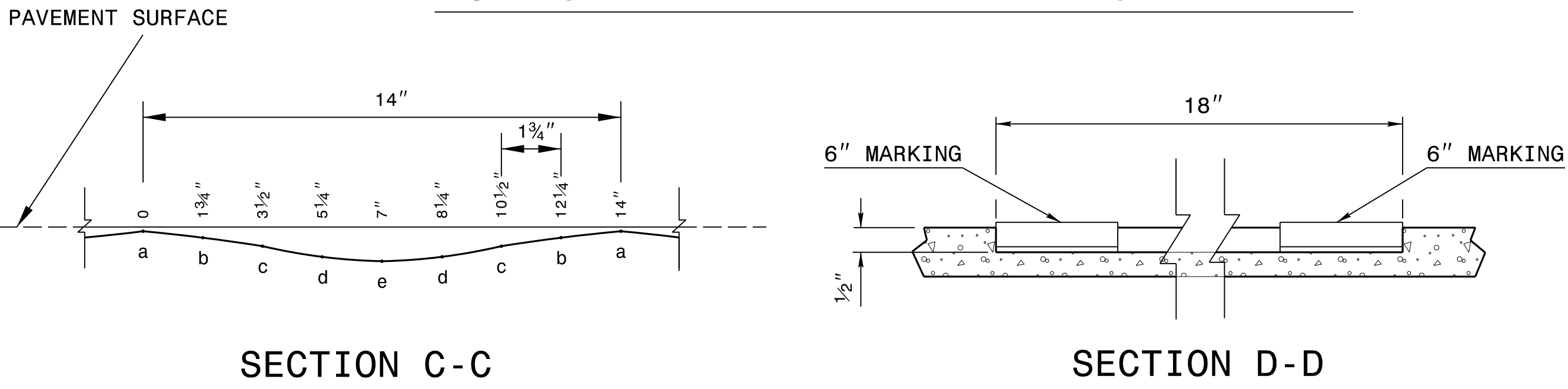
8" EDGE LINE MILLING DETAIL



LOCATION	DEPTH	
	MIL	INCHES
a	62.5	1/16 inch
b	125	1/8 inch
c	219	7/32 inch
d	344	11/32 inch
e	375	3/8 inch

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

18" CENTER LINE MILLING DETAIL

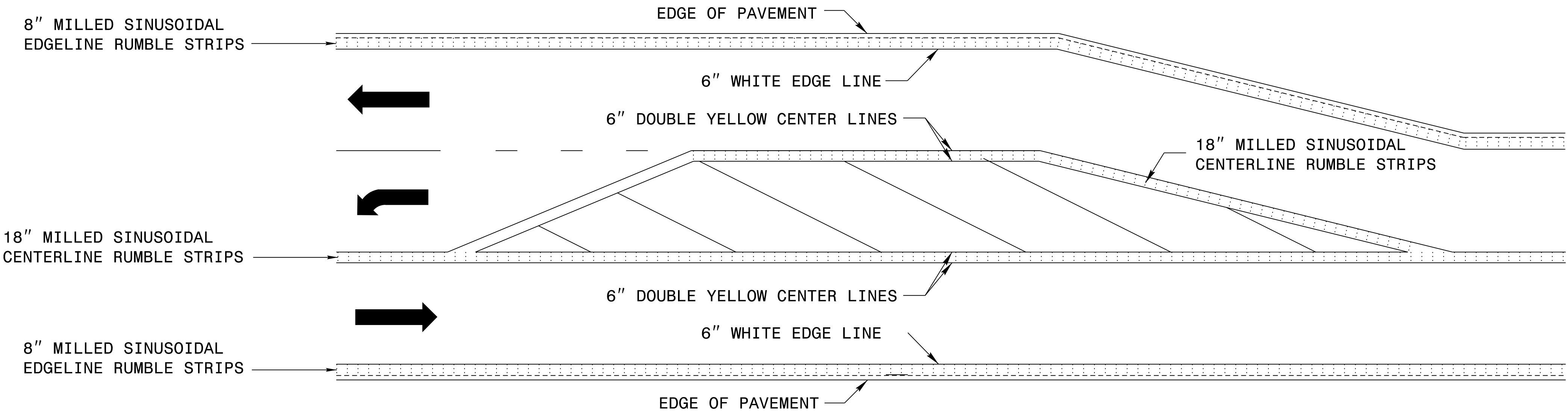


- NOTES:
- 1) EDGELINE SINUSOIDAL RUMBLE STRIPS ARE TO BE INSTALLED TO THE RADIUS POINT AT ALL INTERSECTIONS AND RIGHT TURN LANES.
 - 2) DO NOT INSTALL CENTERLINE SINUSOIDAL RUMBLE STRIPS AT EXISTING CONCRETE CONCRETE ISLANDS.
 - 3) DO NOT INSTALL EDGELINE SINUSOIDAL RUMBLE STRIPS AT EXISTING CONCRETE CONCRETE CURB AND GUTTER.
 - 4) DO NOT INSTALL CENTERLINE OR EDGELINE SINUSOIDAL RUMBLE STRIPS ON BRIDGES.
 - 5) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS
 - 6) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
 - 7) PAVEMENT MARKING MATERIAL SHALL BE THERMOPLASTIC.
 - 8) RETAIN PAVEMENT MARKERS ON ALL MAPS.

* DETAIL NOT TO A SCALE

8" & 18" SINUSOIDAL MILLED RUMBLE STRIP DETAIL

LANE TREATMENT AT TURN LANES AND PAINTED ISLANDS AREAS

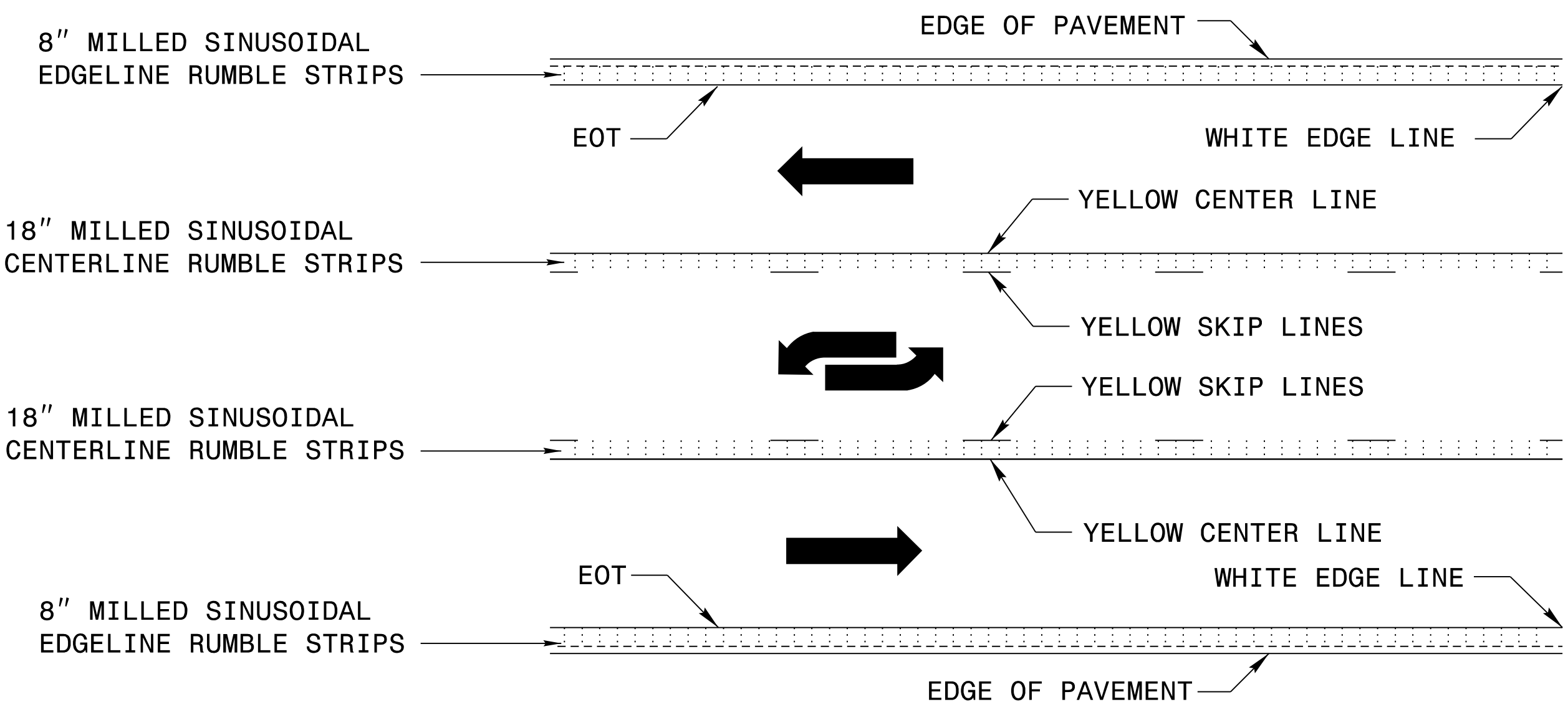


NOTES:

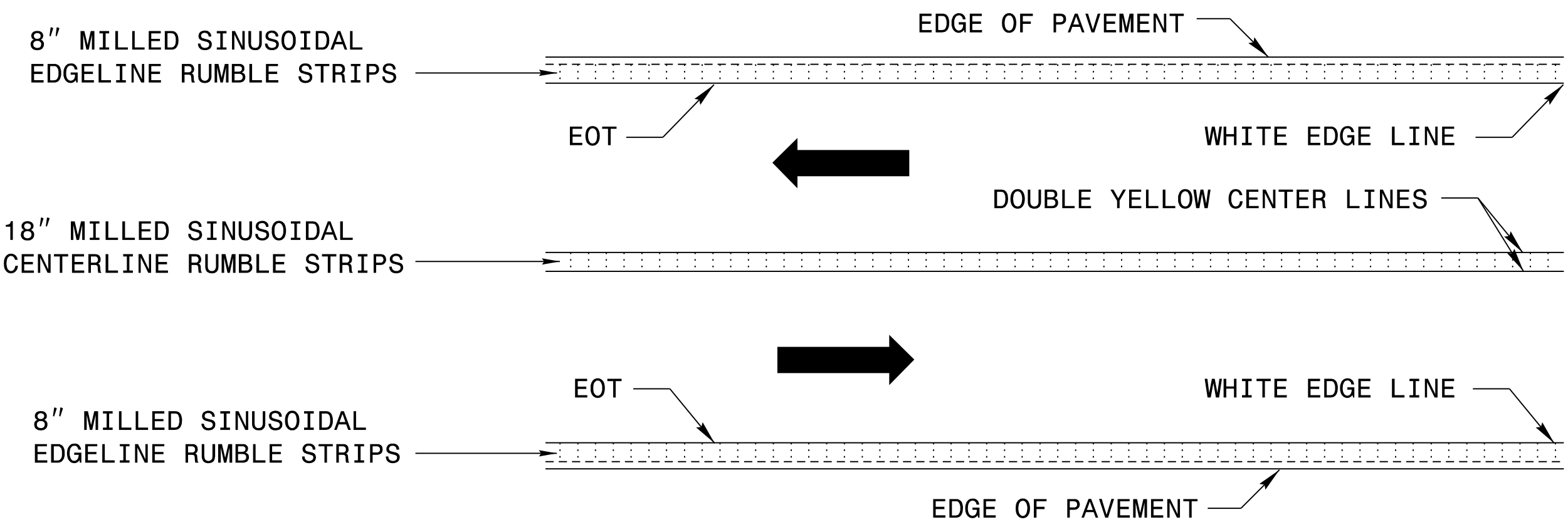
- 1) EDGELINE SINUSOIDAL RUMBLE STRIPS ARE TO BE INSTALLED TO THE RADIUS POINT AT ALL INTERSECTIONS AND RIGHT TURN LANES.
- 2) DO NOT INSTALL CENTERLINE SINUSOIDAL RUMBLE STRIPS AT EXISTING CONCRETE CONCRETE ISLANDS.
- 3) DO NOT INSTALL EDGELINE SINUSOIDAL RUMBLE STRIPS AT EXISTING CONCRETE CONCRETE CURB AND GUTTER.
- 4) DO NOT INSTALL CENTERLINE OR EDGELINE SINUSOIDAL RUMBLE STRIPS ON BRIDGES.
- 5) USING A VACUUM, REMOVE ALL DEBRIS FROM THE MILLINGS JUST PRIOR TO PLACING ANY PAVEMENT MARKINGS
- 6) ENSURE GLASS BEADS ARE SPREAD UNIFORMLY OVER THE ENTIRE SURFACE OF THE PAVEMENT MARKING MATERIAL.
- 7) PAVEMENT MARKING MATERIAL SHALL BE THERMOPLASTIC.
- 8) RETAIN PAVEMENT MARKERS ON ALL MAPS.

* DETAIL NOT TO A SCALE

LANE TREATMENT FOR CONTINUOUS LEFT TURN LANE



LANE TREATMENT FOR TWO LANE TWO WAY ROADWAY



PROJECT REFERENCE NO.	SHEET NO.
HS-24I2A; HS-24I2B; HS-26I2A; HS-26I2B; HS-26I2C; HS-26I2D; HS-26I2E; HS-26I2F; HS-26I2G; HS-26I2H; HS-26I2I	14



DocuSigned by:
Joshua B. White
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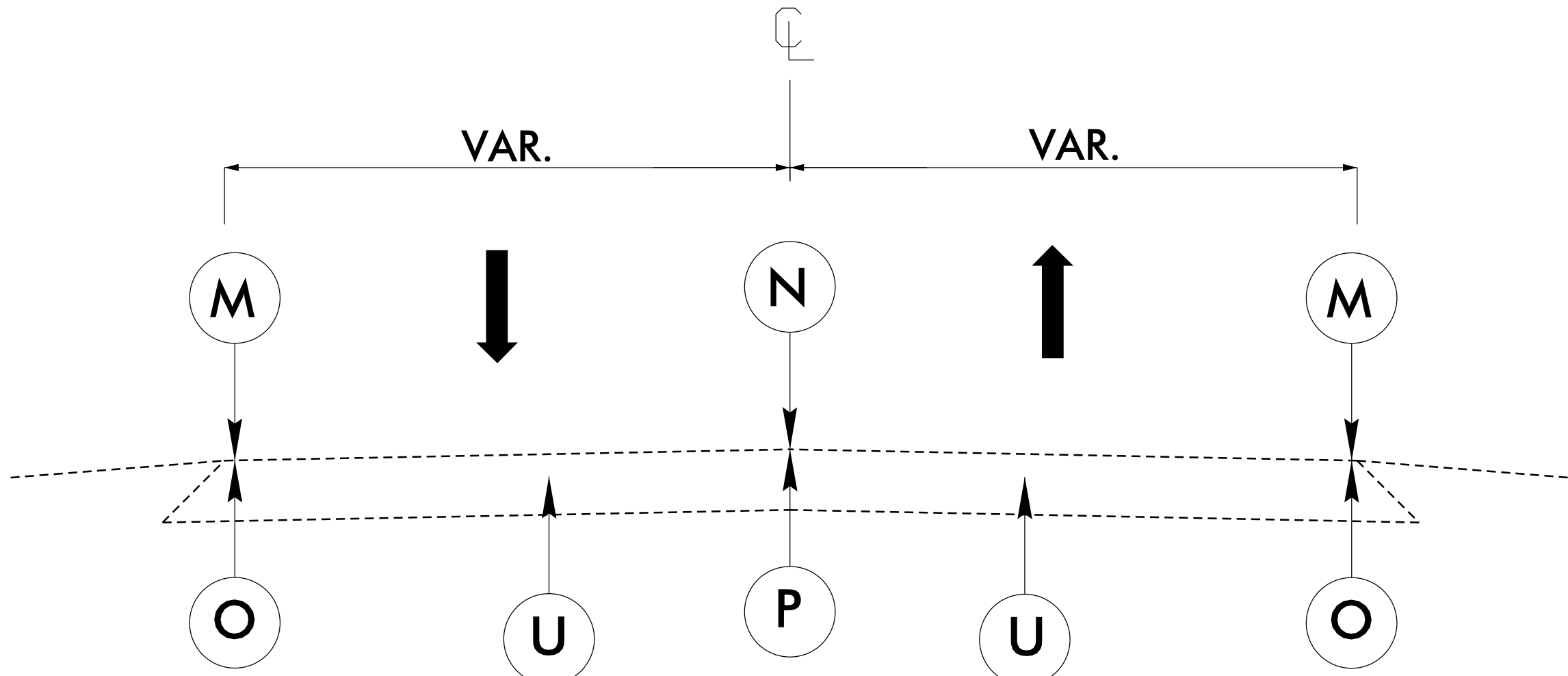
07/09/2026

TYPICAL SECTIONS

PROJECT REFERENCE NO.	SHEET NO.
HS-24I2A; HS-24I2B; HS-26I2A; HS-26I2B; HS-26I2C; HS-26I2D; HS-26I2E; HS-26I2F; HS-26I2G; HS-26I2H; HS-26I2I	15

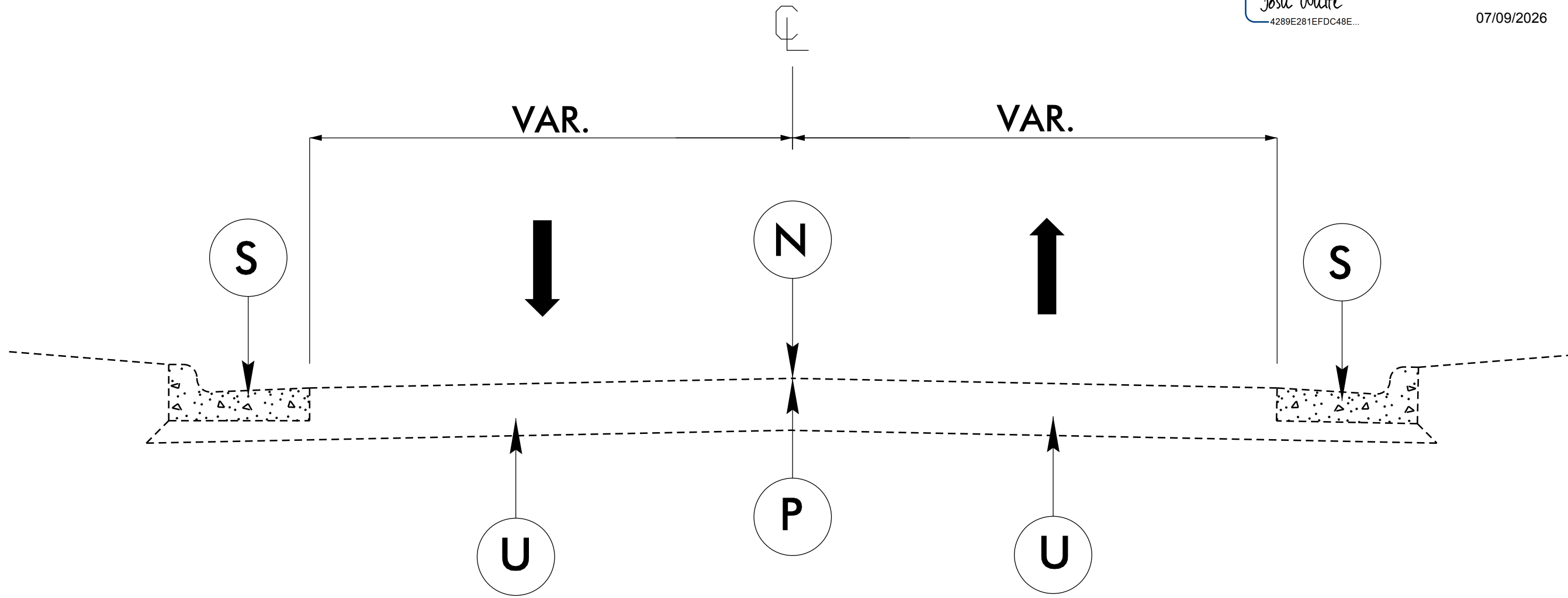


DocuSigned by:
Joshua B. White
4289E281EFDCAE
07/09/2026



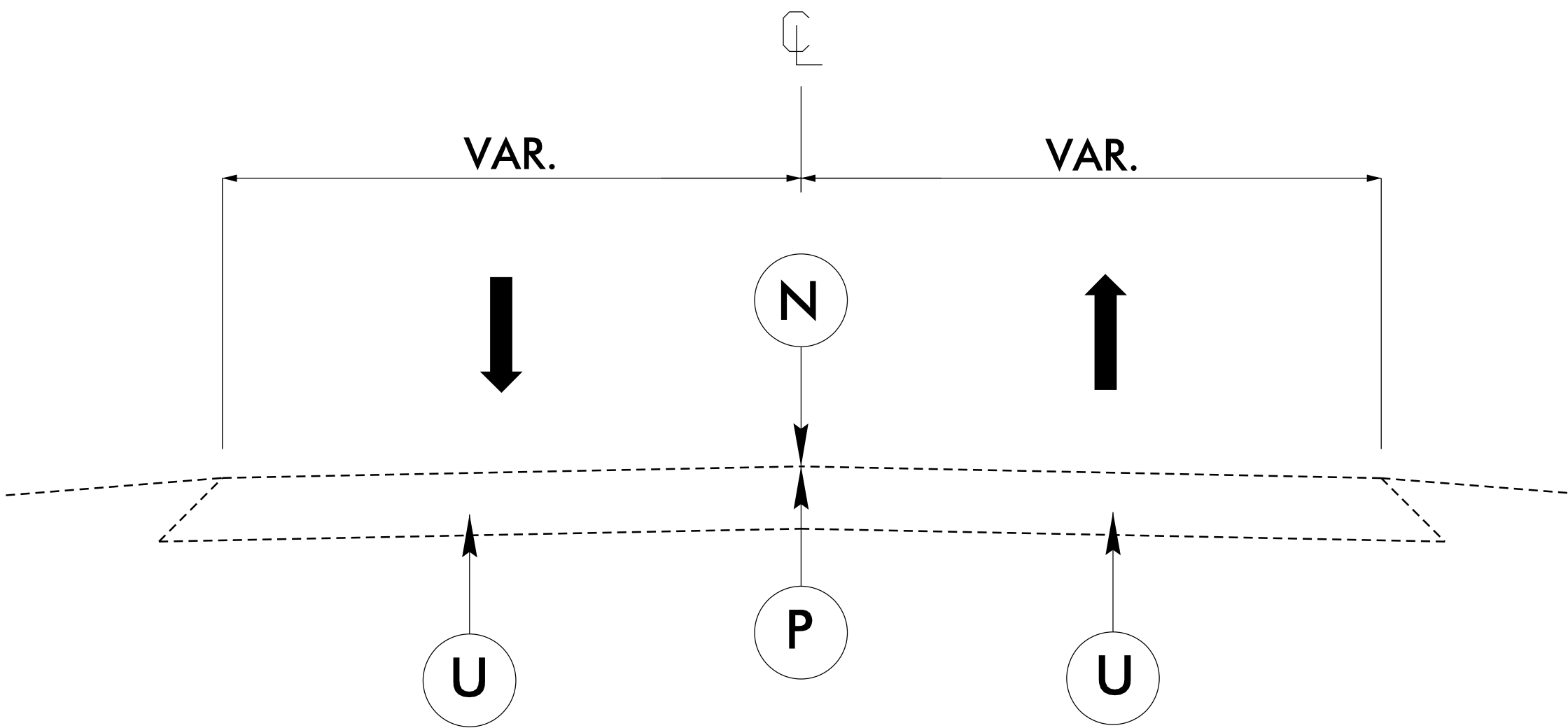
TYPICAL SECTION NO. 1

- USE WITH MAPS:
- 1 – NC 10
 - 2 – NC 150
 - 4 – US 64
 - 5 – NC 150
 - 6 – SR 1005
 - 7 – NC 279
 - 8 – NC 73
 - 9 – NC 279
 - 10 – NC 279
 - 11 – NC 150
 - 12 – NC 10



TYPICAL SECTION NO. 3

- USE WITH MAPS:
- 2 – NC 150 (Putnam St to Delview Rd)



TYPICAL SECTION NO. 2

- USE WITH MAP:
- 3 – US 64

PAVEMENT SCHEDULE	
M	8" EDGE LINE MILLED SINUSOIDAL RUMBLE STRIPS.
N	14" CENTERLINE MILLED SINUSOIDAL RUMBLE STRIPS.
O	6" WHITE THEROMPLASTIC EDGE LINE.
P	6" THERMOPLASTIC DOUBLE YELLOW CENTERLINE.
R	6" THERMOPLASTICE CENTERLINE WITH SKIPS
S	EXISTING 2'6" CONCRETE CURB & GUTTER
U	EXISTING PAVEMENT.

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8/17/99

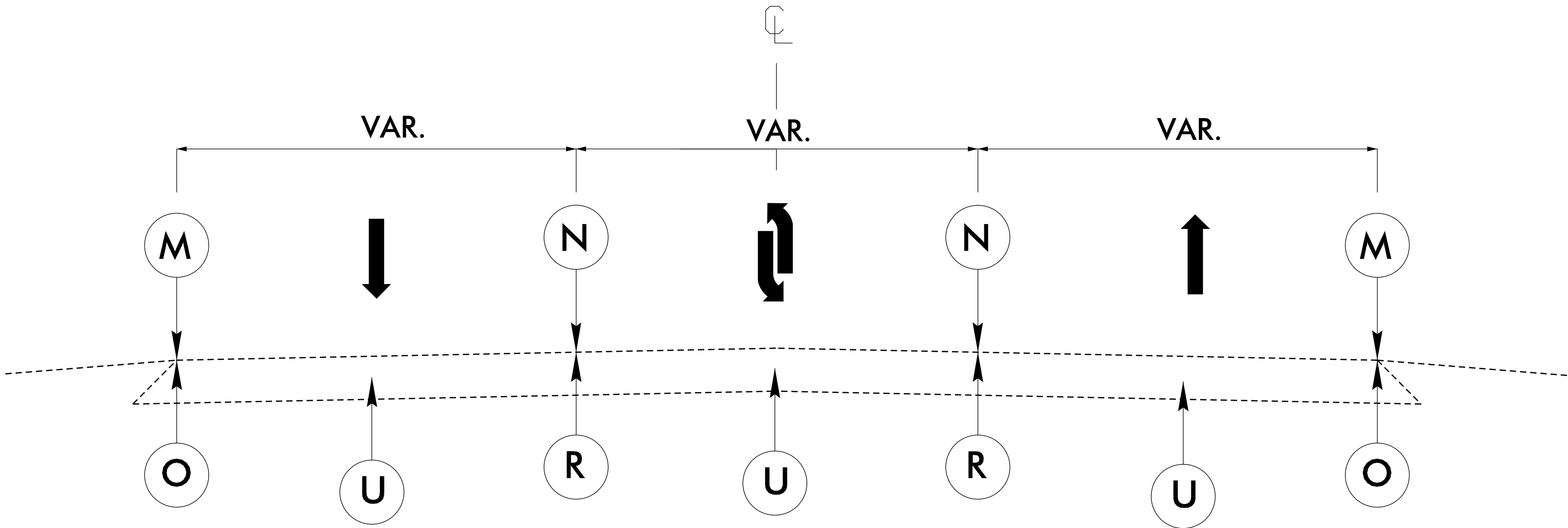
TYPICAL SECTIONS

PROJECT REFERENCE NO.	SHEET NO.
HS-24I2A; HS-24I2B; HS-26I2A; HS-26I2B; HS-26I2C; HS-26I2D; HS-26I2E; HS-26I2F; HS-26I2G; HS-26I2H; HS-26I2I	16



DocuSigned by:
Josh White
4289E281EFDCA8E

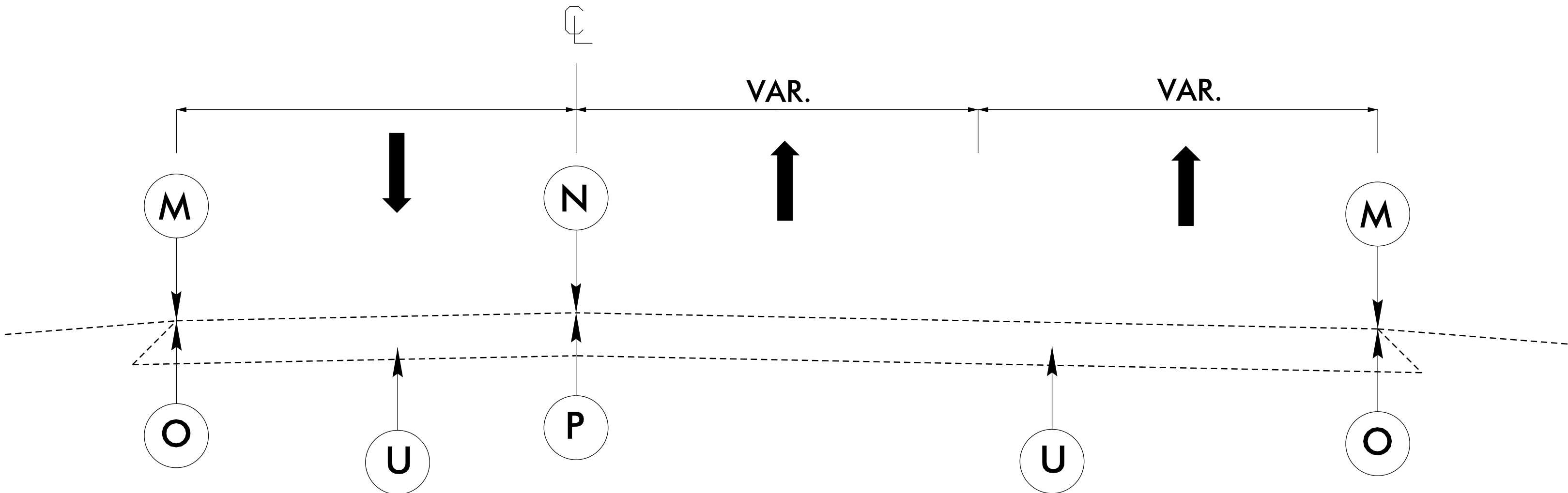
07/09/2026



TYPICAL SECTION NO. 4

USE WITH MAPS:

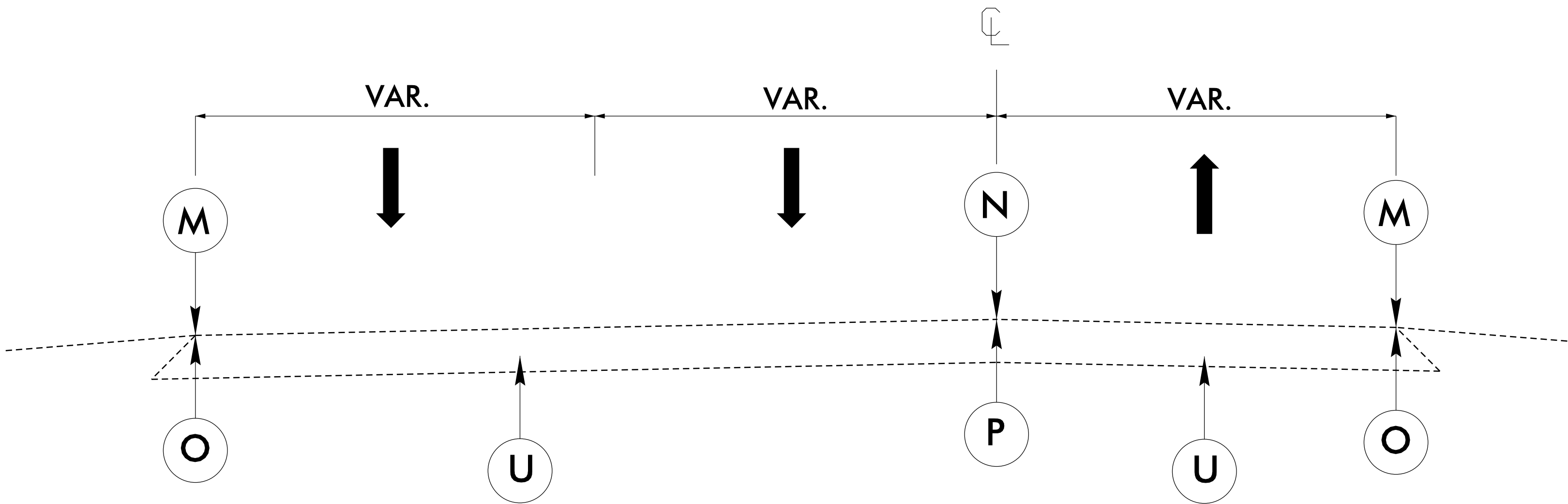
- 8 – NC 73 (Cross Center Rd to Pilot Knob Rd)
- 9 – NC 279 (Tryon School Rd to Bess Town Rd)
- 9 – NC 279 (Ashbrook Park Rd to Pinkey Rd)



TYPICAL SECTION NO. 4

USE WITH MAPS:

- 9 – NC 279 (NC 150 to Whiteside Rd)
- 9 – NC 279 (Timber Dr. to Ashbrook Pard Rd)



TYPICAL SECTION NO. 4

USE WITH MAPS:

- 9 – NC 279 (Bess Town Rd to Cline Learning Center)

PAVEMENT SCHEDULE	
M	8" EDGE LINE MILLED SINUSOIDAL RUMBLE STRIPS.
N	14" CENTERLINE MILLED SINUSOIDAL RUMBLE STRIPS.
O	6" WHITE THEROMPLASTIC EDGE LINE.
P	6" THERMOPLASTIC DOUBLE YELLOW CENTERLINE.
R	6" THERMOPLASTICE CENTERLINE WITH SKIPS
S	EXISTING 2'6" CONCRETE CURB & GUTTER
U	EXISTING PAVEMENT.

								PROJECT REFERENCE #		SHEET NO.	
								HS-2412A; HS-2412B; HS-2612A; HS-2612B; HS-2612C; HS-2612D; HS-2612E; HS-2612F; HS-2612G; HS-2612H; HS-2612I		17	
MILLED SINUSOIDAL RUMBLE STRIP, THERMOPLASTIC PAVEMENT MARKING, AND WORK ZONE SAFETY SIGN QUANTITIES											
						4400000000-E	4457000000-N	1881000000-E	1881000000-E	4695000000-E	4695000000-E
WBS#	COUNTY	MAP NO	ROUTE	DESCRIPTION	LENGTH	WORK ZONE ADVANCE/ GENERAL WARNING SIGNING	TEMPORARY TRAFFIC CONTROL	SINUSOIDAL MILLED RUMBLE STRIP 8"	SINUSOIDAL MILLED RUMBLE STRIP 18"	THERMO PAVEMENT MARKING LINES YELLOW (6", 90 MILS)	THERMO PAVEMENT MARKING LINES WHITE (6", 90 MILS)
						MI	SF	LS	LF	LF	LF
50984.3.2	Cleveland	1	NC 10	MP. 7.702 to MP. 15.354	7.652	144	*	80,806.00	40,403.00	80,806.00	80,806.00
WBS# 50984.3.2 TOTAL					7.652	144		80,806.00	40,403.00	80,806.00	80,806.00
50984.3.3	Cleveland/ Gaston	2	NC 150	MP. 18.73-24.23 (Cleveland) and MP. 0.00-1.547 (Gaston)	7.047	144	*	73,342.00	39,399.00	78,798.00	73,342.00
WBS# 50984.3.3 TOTAL					7.047	144		73,342.00	39,399.00	78,798.00	73,342.00
51922.3.2	Alexander/I redell	3	US 64	MP. 7.903 to MP. 18.879 (Alexander)/ MP 0.00-7.119 (Iredell)	18.095	144	*	-	106,773.00	213,601.00	-
WBS# 51922.3.2 TOTAL					18.095	144		0.000	106,773.00	213,601.00	0.000
51922.3.3	Alexander	4	US 64/NC 90	MP. 0.000 to MP. 7.903	7.903	144	*	83,456.00	44,939.00	89,878.00	83,456.00
WBS# 51922.3.3 TOTAL					7.903	144		83,456.00	44,939.00	89,878.00	83,456.00
51922.3.4	Catawba	5	NC 150	MP. 0.438 to MP. 8.688	8.250	144	*	87,120.00	52,758.00	105,516.00	87,120.00
WBS# 51922.3.4 TOTAL					8.250	144		87,120.00	52,758.00	105,516.00	87,120.00
51922.3.5	Iredell	6	SR 1005 (Old Mountain Rd.)	MP. 0.000 to MP 12.110	12.110	144	*	127,882.00	66,327.00	132,654.00	127,882.00
WBS# 51922.3.5 TOTAL					12.110	144		127,882.00	66,327.00	132,654.00	127,882.00
51922.3.6	Gaston	7	NC 279	MP. 14.022 to MP. 15.324	1.302	144	*	13,750.00	8,139.00	16,278.00	13,750.00
WBS# 51922.3.6 TOTAL					1.302	144		13,750.00	8,139.00	16,278.00	13,750.00
51922.3.7	Lincoln	8	NC 73	MP. 0.000 to MP. 14.236	14.236	144	*	150,332.00	77,185.00	154,370.00	150,332.00
WBS# 50984.3.7 TOTAL					14.236	144		150,332.00	77,185.00	154,370.00	150,332.00
51922.3.8	Gaston	9	NC 279	MP. 17.831 to MP. 27.893	10.062	144	*	106,255.00	68,446.00	136,892.00	106,255.00
WBS# 50984.3.8 TOTAL					10.062	144		106,255.00	68,446.00	136,892.00	106,255.00
51922.3.9	Gaston	10	NC 279	MP. 0.000 to MP. 5.385	5.385	144	*	56,866.00	30,719.00	61,438.00	56,866.00
WBS# 50984.3.9 TOTAL					5.385	144		56,866.00	30,719.00	61,438.00	56,866.00
51922.3.10	Cleveland	11	NC 150	MP. 6.372 to MP. 10.960	4.588	144	*	48,450.00	24,350.00	48,700.00	48,450.00
WBS# 50984.3.10 TOTAL					4.588	144		48,450.00	24,350.00	48,700.00	48,450.00
49331.3.10	Catawba	12	NC 10	MP. 13.551 to MP. 14.051	0.500	144	*	5,280.00	6,210.00	12,420.00	5,280.00
WBS# 49331.3.10 TOTAL					0.500	144		5,280.00	6,210.00	12,420.00	5,280.00
Contract Totals					97.130	1,728.00	1.00	833,539.00	565,648.00	1,131,351.00	833,539.00