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STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	50138.3.173	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Henderson and Polk Counties

LOCATION:	ROUTE:
HENDERSON COUNTY	U.S. 25
	U.S. 64
	NC 280
POLK COUNTY	I–26

TYPE OF WORK: REPAIR OR REPLACE GUARDRAIL END UNITS

TIP PROJECT: 50138.3.173

CONTRACT: DN00540

09/08/99

20-SEP-2016 08:58
C:\Public2\Microstation Drawings\GUARDRAIL _LS_dln_GRsites.dgn
bgsaltz

GRAPHIC SCALES

0 PLANS

0 PROFILE (HORIZONTAL)

0 PROFILE (VERTICAL)

DESIGN DATA

ADT _____= _____
ADT _____= _____
K = ___ %
D = ___ %
T = ___ % *
V = ___ MPH
* TTST =_ _ DUAL __
FUNC CLASS =
_____
_____ TIER

PROJECT LENGTH

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: _____

LETTING DATE: _____

S.L. Cannon, PE
PROJECT ENGINEER

S.L. Cannon, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

_____
P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

_____
P.E.
SIGNATURE:

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	50138.3.173	1A	

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

Henderson and Polk Counties

INDEX OF SHEETS

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4A	US 25 VICINITY MAP
4B–4E	US 25 SITE LOCATION MAPS
5	HENDERSON COUNTY – US 64 SITE LOCATIONS
5A	US 64 VICINITY MAP
5B–5C	US 64 SITE LOCATION MAPS
6	HENDERSON COUNTY – NC 280 SITE LOCATIONS
6A	NC 280 VICINITY MAP
6B	NC 280 SITE LOCATION MAPS
7	POLK COUNTY – I26 SITE LOCATIONS
7A	I26 VICINITY MAP
7B–7C	I26 SITE LOCATION MAPS
8–17	GUARDRAIL END UNITS (STANDARD DRAWINGS)

TIP PROJECT: 50138.3.173

CONTRACT: DN00540

GRAPHIC SCALES

0 PLANS

0 PROFILE (HORIZONTAL)

0 PROFILE (VERTICAL)

DESIGN DATA

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K = ___ %
D = ___ %
T = ___ % *
V = ___ MPH
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FUNC CLASS =
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PROJECT LENGTH

N/A

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: _____

LETTING DATE: _____

S.L. Cannon, PE
PROJECT ENGINEER

S.L. Cannon, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE:

ROADWAY DESIGN ENGINEER

SIGNATURE:

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09/08/99

8/17/99

REVISIONS

HENDERSON COUNTY - US 25

Point #	Route	End Unit Type	Latitude	Longitude	Description	Approach/Trailing	Detail
1	US 25 S.	BCT	35.279781	-82.402081	I-26 Exit 54	approach	Remove & Replace with GRAU-350 +75LF straight rail
2	US 25 S.	BE	35.234258	-82.418835		approach	Remove & Replace with GRAU-350 +75LF straight rail
3	US 25 S.	TD	35.227359	-82.429457		approach	Remove & Replace with GRAU-350 +75LF straight rail
4	US 25 S.	BCT	35.226337	-82.431185		approach	Remove & Replace with GRAU-350 +75LF straight rail
5	US 25 S.	BCT	35.223316	-82.437887		approach	Remove & Replace with GRAU-350 +75LF straight rail
6	US 25 S.	TD	35.223316	-82.437887		approach	Remove & Replace with GRAU-350 +75LF straight rail
7	US 25 S.	BCT	35.216364	-82.444819		approach	Remove & Replace with GRAU-350 +75LF straight rail
8	US 25 S.	TD	35.199715	-82.451543		approach	Remove & Replace with GRAU-350 +75LF straight rail
9	US 25 S.	BCT	35.198722	-82.451335		approach	Remove & Replace with GRAU-350 +75LF straight rail
10	US 25 S.	TD	35.195363	-82.450869		approach	Remove & Replace with GRAU-350 +75LF straight rail
11	US 25 S.	BCT	35.188776	-82.449075		approach	Remove & Replace with GRAU-350 +75LF straight rail
12	US 25 S.	TD	35.180634	-82.447158	SC Line	approach	Remove & Replace with GRAU-350 +75LF straight rail
13	US 25 N.	TD	35.17548	-82.448358	SC Line	approach	Remove & Replace with GRAU-350 +75LF straight rail
14	US 25 N.	BCT	35.187585	-82.448486		approach	Remove & Replace with GRAU-350 +75LF straight rail
15	US 25 N.	BCT	35.222327	-82.439346		approach	Remove & Replace with GRAU-350 +75LF straight rail
16	US 25 N.	TD	35.224638	-82.434266		approach	Remove & Replace with GRAU-350 +75LF straight rail
17	US 25 N.	BCT	35.225347	-82.43302		approach	Remove & Replace with GRAU-350 +75LF straight rail
18	US 25 N.	BCT	35.258017	-82.408229	Hwy 176	approach	Remove & Replace with GRAU-350 +75LF straight rail

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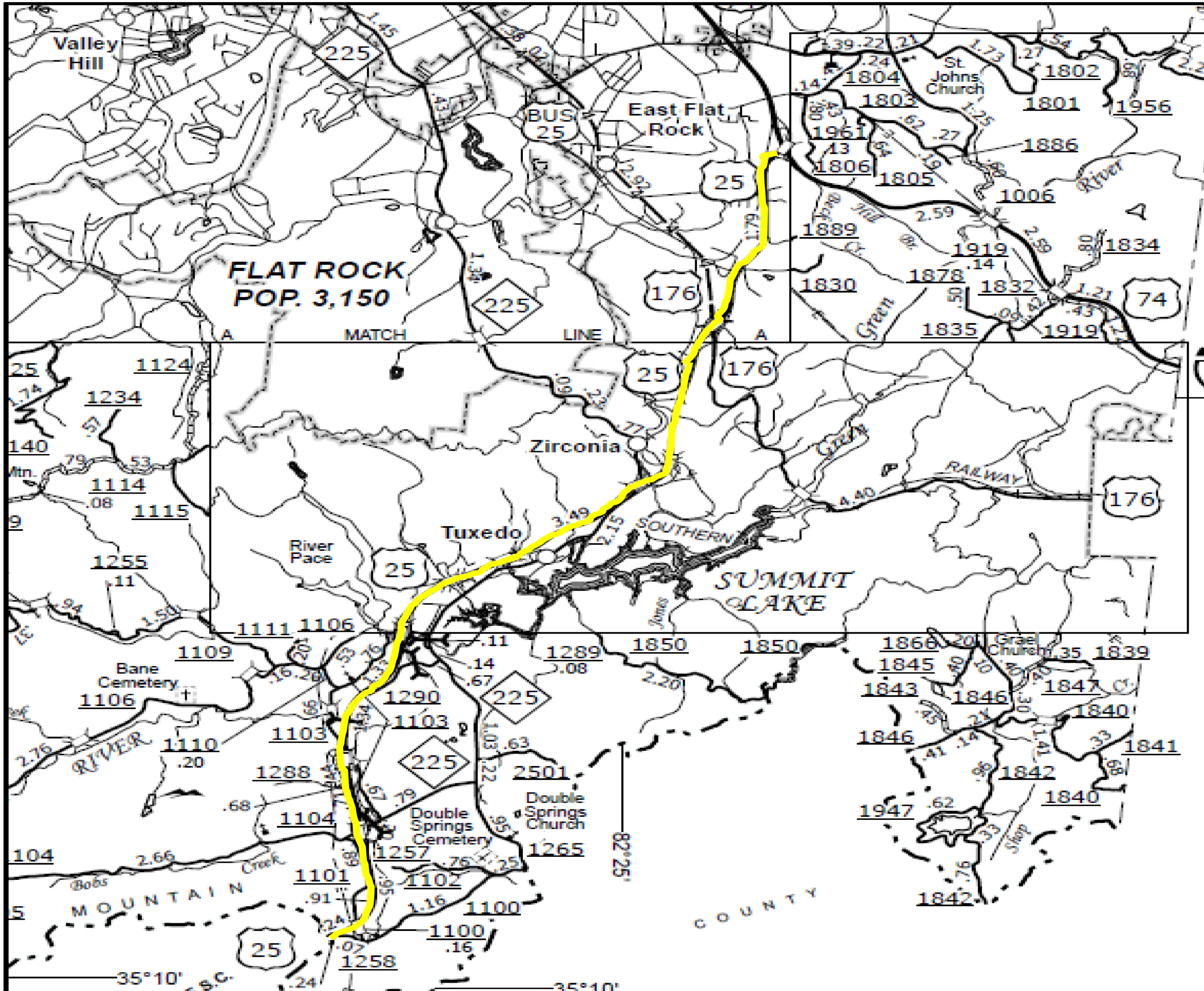
Henderson County Vicinity Map – US 25 – DN 00540

PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	4A



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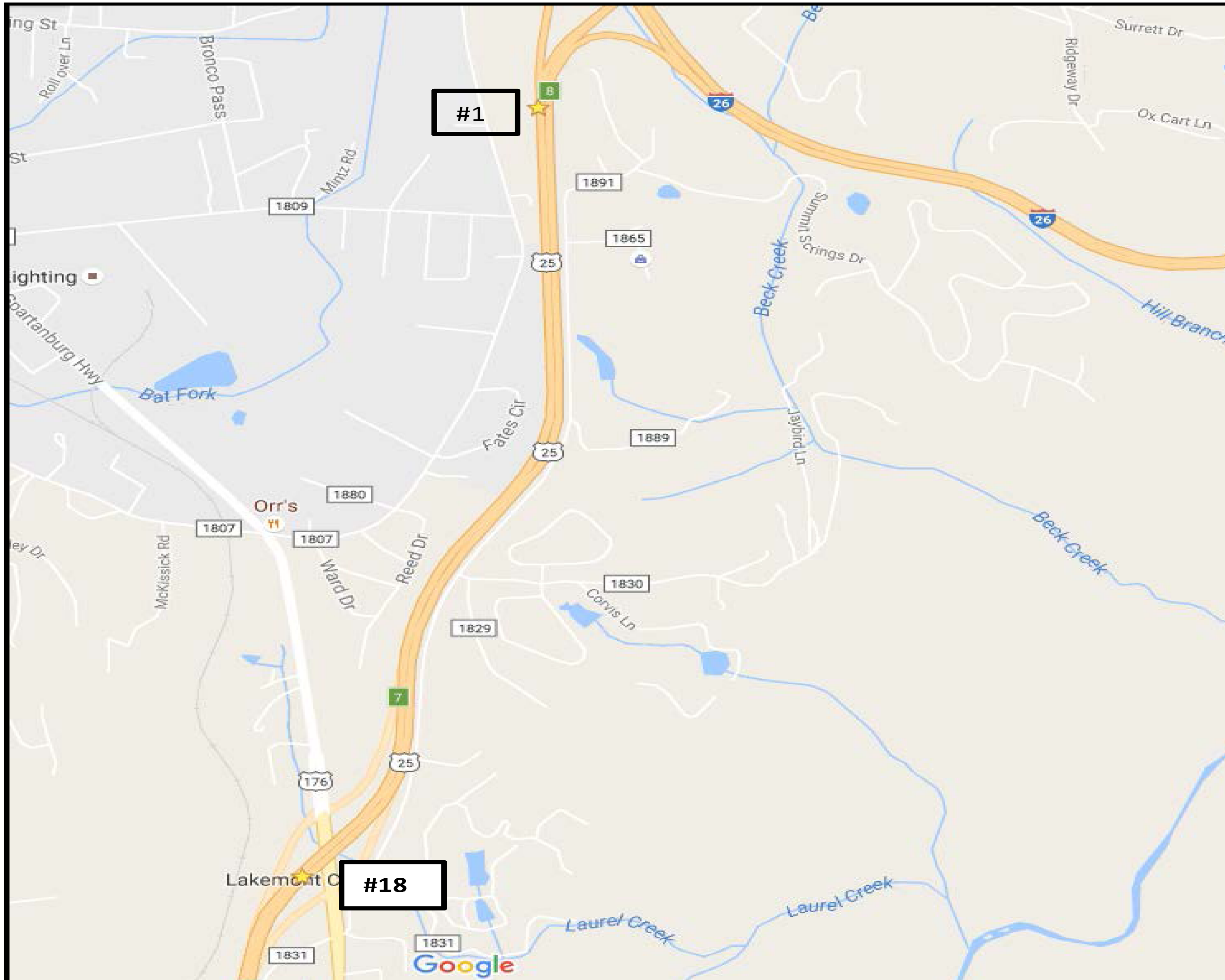
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	4B

Henderson County Site Map – US 25 – DN00540 Site 1 & 18



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REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	4C

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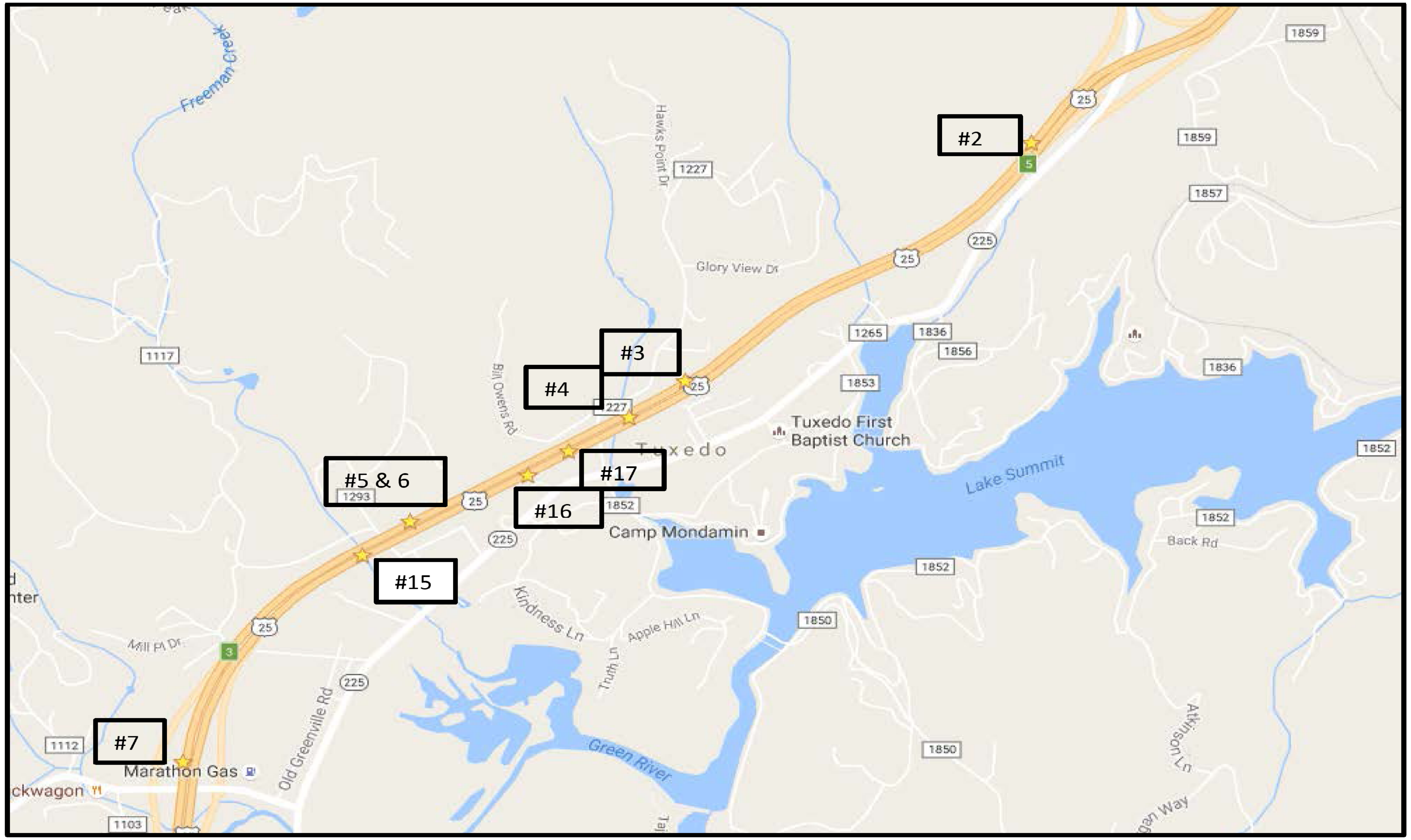
REVISIONS

Henderson County Site Map – US 25 – DN00540 Sites 2-7 & 15-17



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Henderson County Site Map – US 25 – DN00540 Sites 8-12 & 14

PROJECT REFERENCE NO.	SHEET NO.
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REVISIONS

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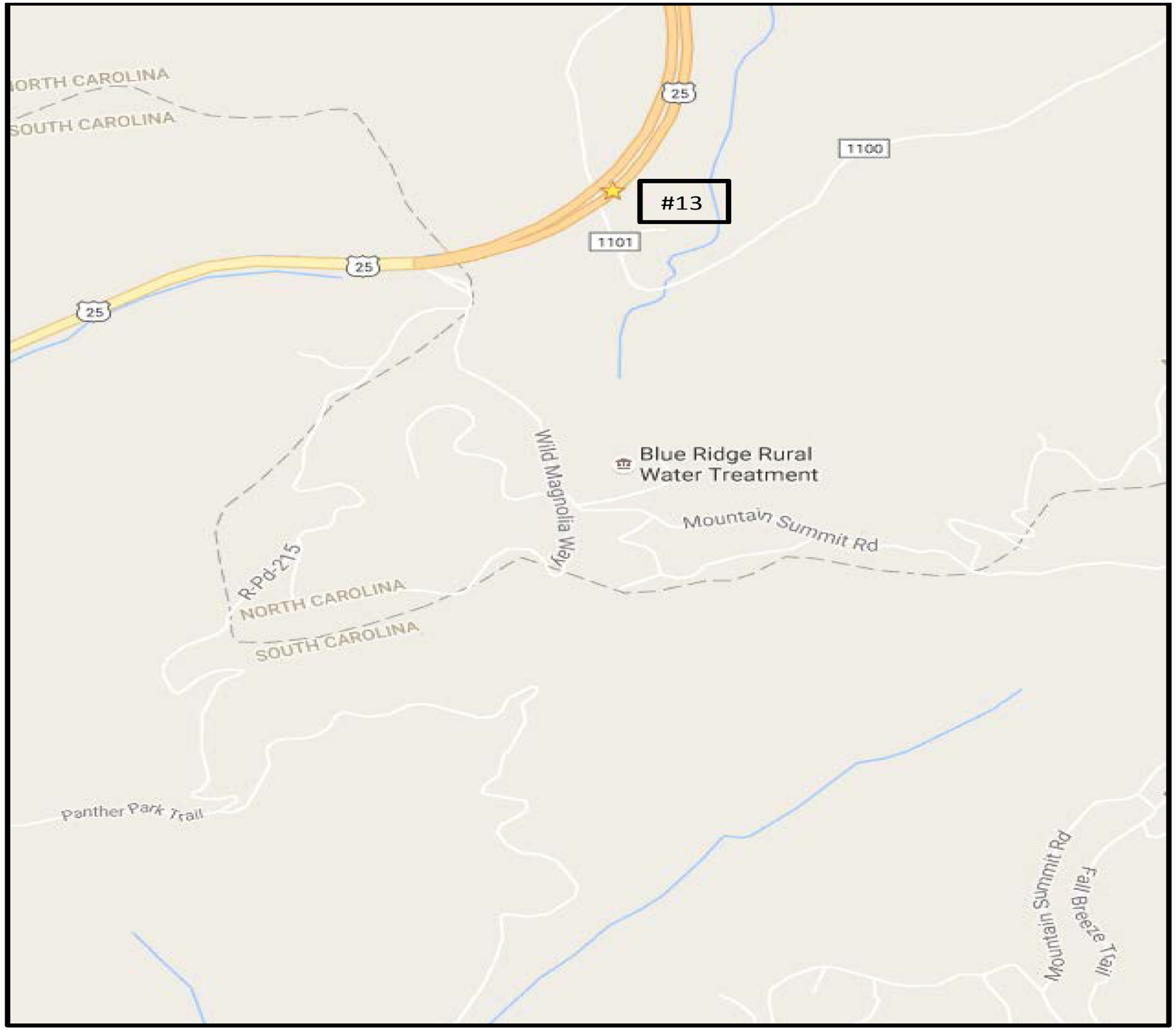
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	4E

Henderson County Site Map – US 25 – DN00540 Site 13



REVISIONS

8/17/99

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$$$$USERNAME$$$$

HENDERSON COUNTY - US 64

Point #	Route	End Unit Type	Latitude	Longitude	Description	Approach/Trailing	Detail
19	US 64 E.	TD	35.319348	-82.457436	King Street	approach	Remove & Replace with GRAU-350 +75LF straight rail
20	US 64 E.	TD	35.319348	-82.457436		approach	Remove & Replace with GRAU-350 +75LF straight rail
21	US 64 E.	TD	35.320723	-82.454154		approach	Remove & Replace with GRAU-350 +75LF straight rail
22	US 64 W.	BCT	35.359053	-82.420649	Fruitland Rd	approach	Remove & Replace with GRAU-350 +75LF straight rail
23	US 64 W.	BCT	35.356445	-82.42428		approach	Remove & Replace with GRAU-350 +75LF straight rail
24	US 64 W.	BCT	35.355386	-82.425646		approach	Remove & Replace with GRAU-350 +75LF straight rail
25	US 64 W.	TD	35.32038	-82.454825		approach	Remove & Replace with GRAU-350 +75LF straight rail
26	US 64 W.	TD	35.320057	-82.455783		approach	Remove & Replace with GRAU-350 +75LF straight rail
27	US 64 W.	TD	35.320057	-82.455783	King Street		Remove & Replace with GRAU-350 +75LF straight rail

REVISIONS

8/17/99

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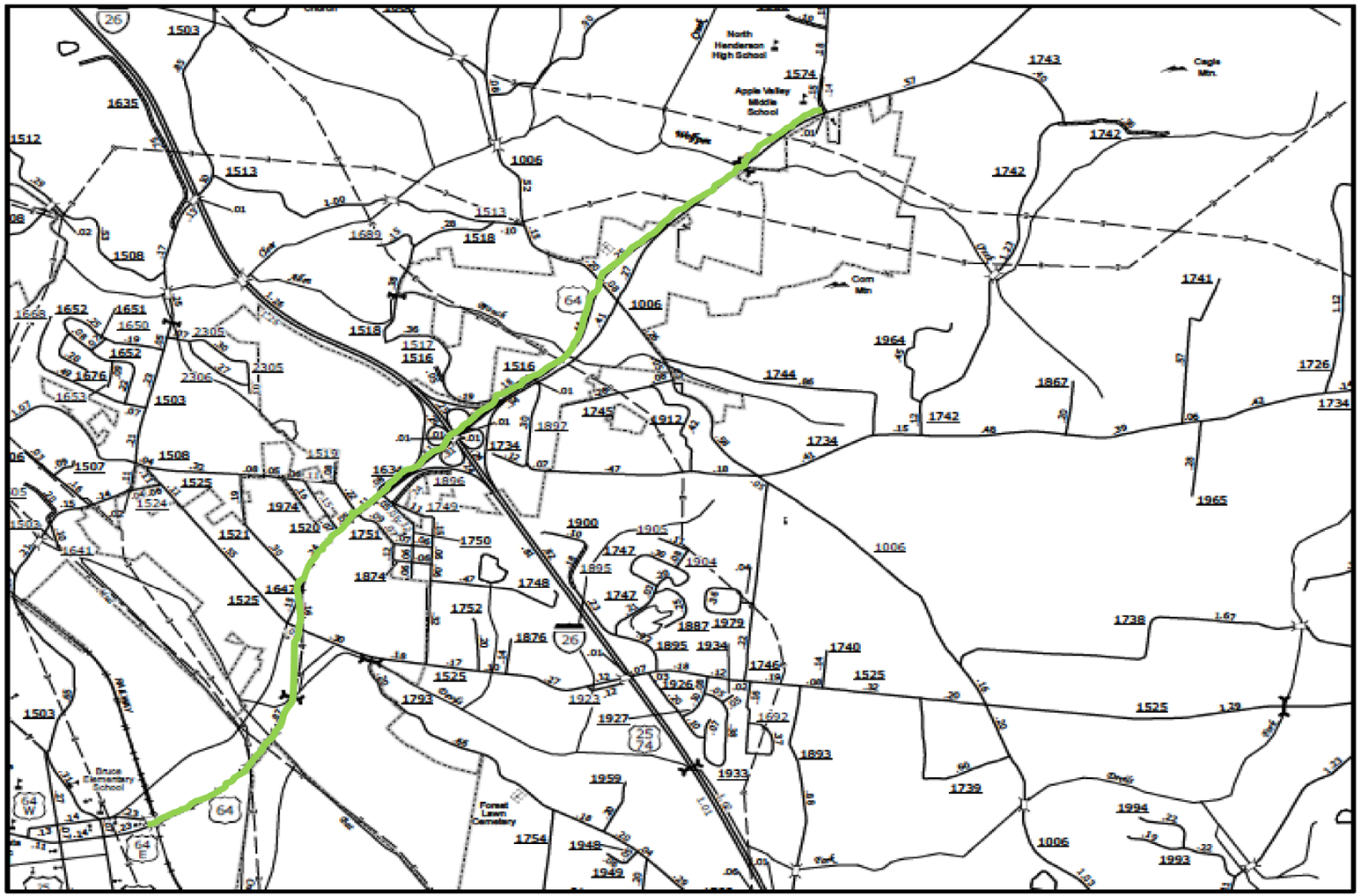
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	5A

Henderson County Vicinity Map – US 64 – DN 00540



REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	5B

8/17/99

REVISIONS

Henderson County Site Map – US 64 – DN0054 Sites 22 - 24

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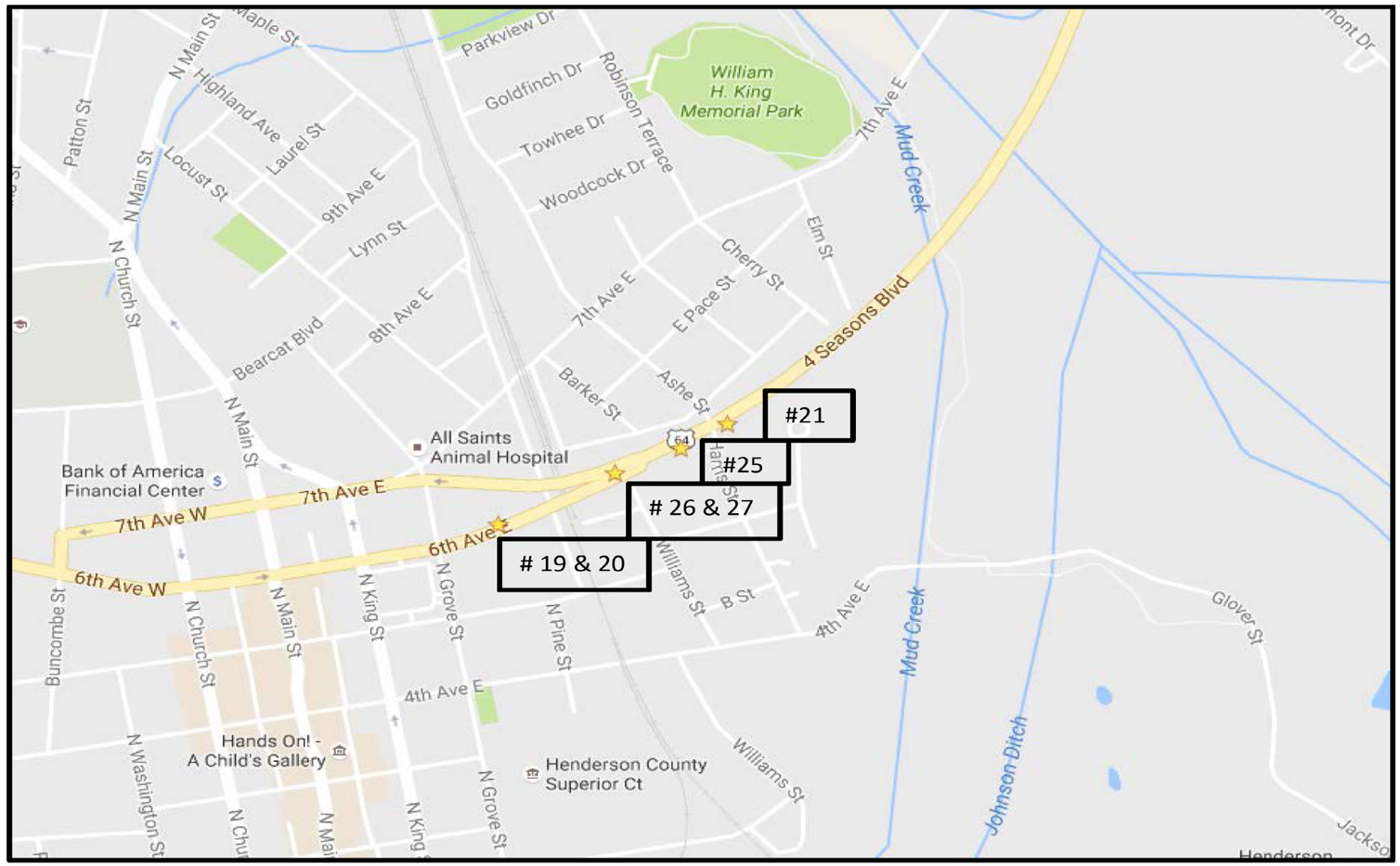
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	5C

Henderson County Site Map – US 64 – DN 00540 Sites 19-21 & 25-26



REVISIONS

8/17/99

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8/17/99

REVISIONS

HENDERSON COUNTY - NC 280

Point #	Route	End Unit Type	Latitude	Longitude	Description	Approach/Trailing	Detail
28	NC 280 W.	BCT	35.418328	-82.546533	Buncombe Co Line	approach	Remove & Replace with GRAU-350 +75LF straight rail
29	NC 280 W.	BCT	35.419012	-82.545803		approach	Remove & Replace with GRAU-350 +75LF straight rail
30	NC 280 W.	BCT	35.416324	-82.54935		approach	Remove & Replace with GRAU-350 +75LF straight rail
31	NC 280 W.	BCT	35.413272	-82.551779		approach	Remove & Replace with GRAU-350 +75LF straight rail
32	NC 280 W.	BCT	35.406536	-82.558676		approach	Remove & Replace with GRAU-350 +75LF straight rail
33	NC 280 W.	BCT	35.397705	-82.569862		approach	Remove & Replace with GRAU-350 +75LF straight rail
34	NC 280 W.	BCT	35.392319	-82.568492	S Mills River Rd	approach	Remove & Replace with GRAU-350 +75LF straight rail
35	NC 280 E.	BCT	35.391312	-82.567953		approach	Remove & Replace with GRAU-350 +75LF straight rail
36	NC 280 E.	BCT	35.395392	-82.568998		approach	Remove & Replace with GRAU-350 +75LF straight rail
37	NC 280 E.	BCT	35.396651	-82.569317		approach	Remove & Replace with GRAU-350 +75LF straight rail
38	NC 280 E.	BCT	35.405243	-82.563018		approach	Remove & Replace with GRAU-350 +75LF straight rail
39	NC 280 E.	BCT	35.405549	-82.561433		approach	Remove & Replace with GRAU-350 +75LF straight rail
40	NC 280 E.	BCT	35.407841	-82.555971		approach	Remove & Replace with GRAU-350 +75LF straight rail
41	NC 280 E.	BCT	35.410592	-82.553621		approach	Remove & Replace with GRAU-350 +75LF straight rail
42	NC 280 E.	BCT	35.412074	-82.552445		approach	Remove & Replace with GRAU-350 +75LF straight rail
43	NC 280 E.	TD	35.419374	-82.544082	S Mill River Rd	approach	Remove & Replace with GRAU-350 +75LF straight rail

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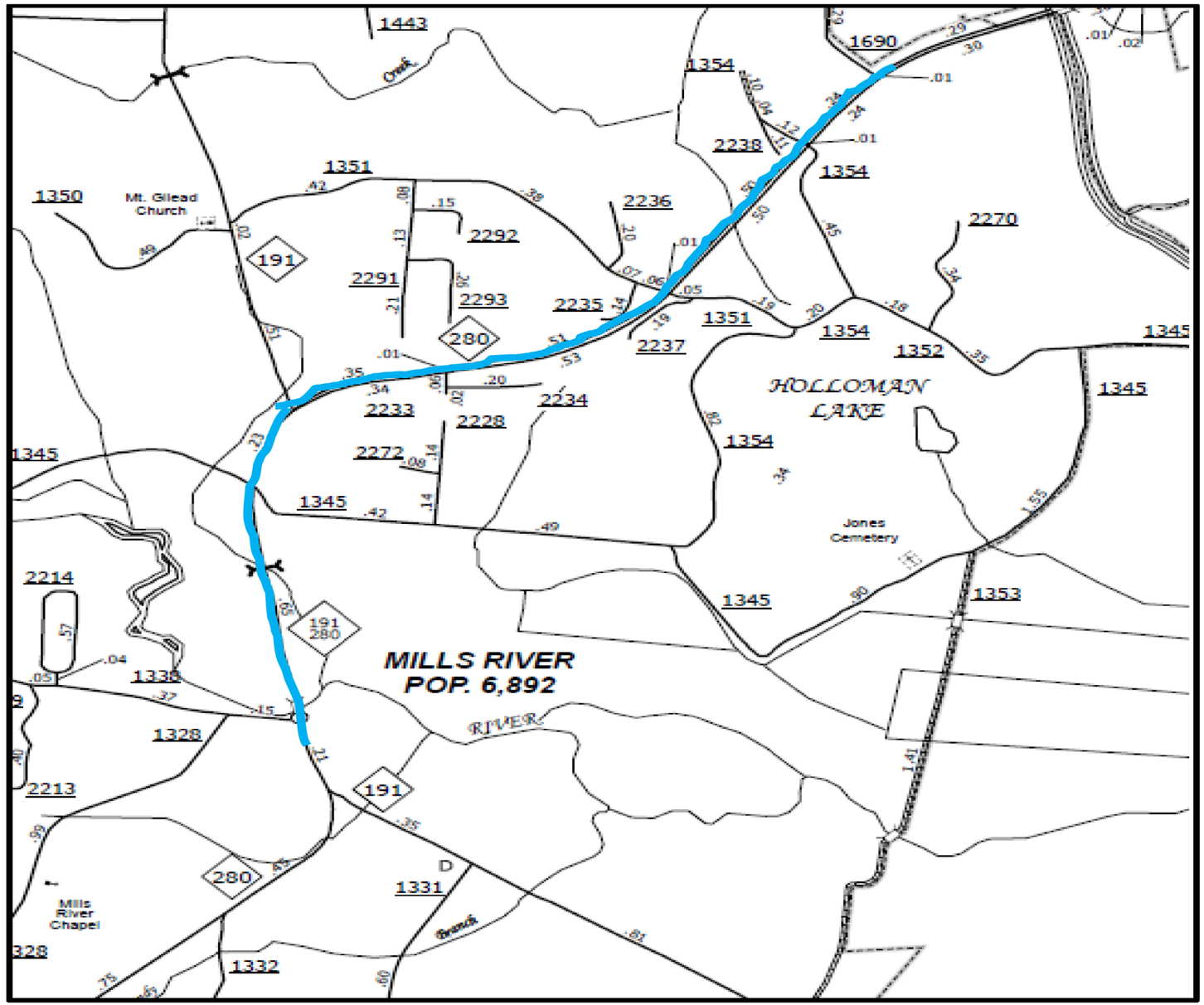
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	6A

Henderson County Vicinity Map – NC 280 – DN 00540



REVISIONS

8/17/99

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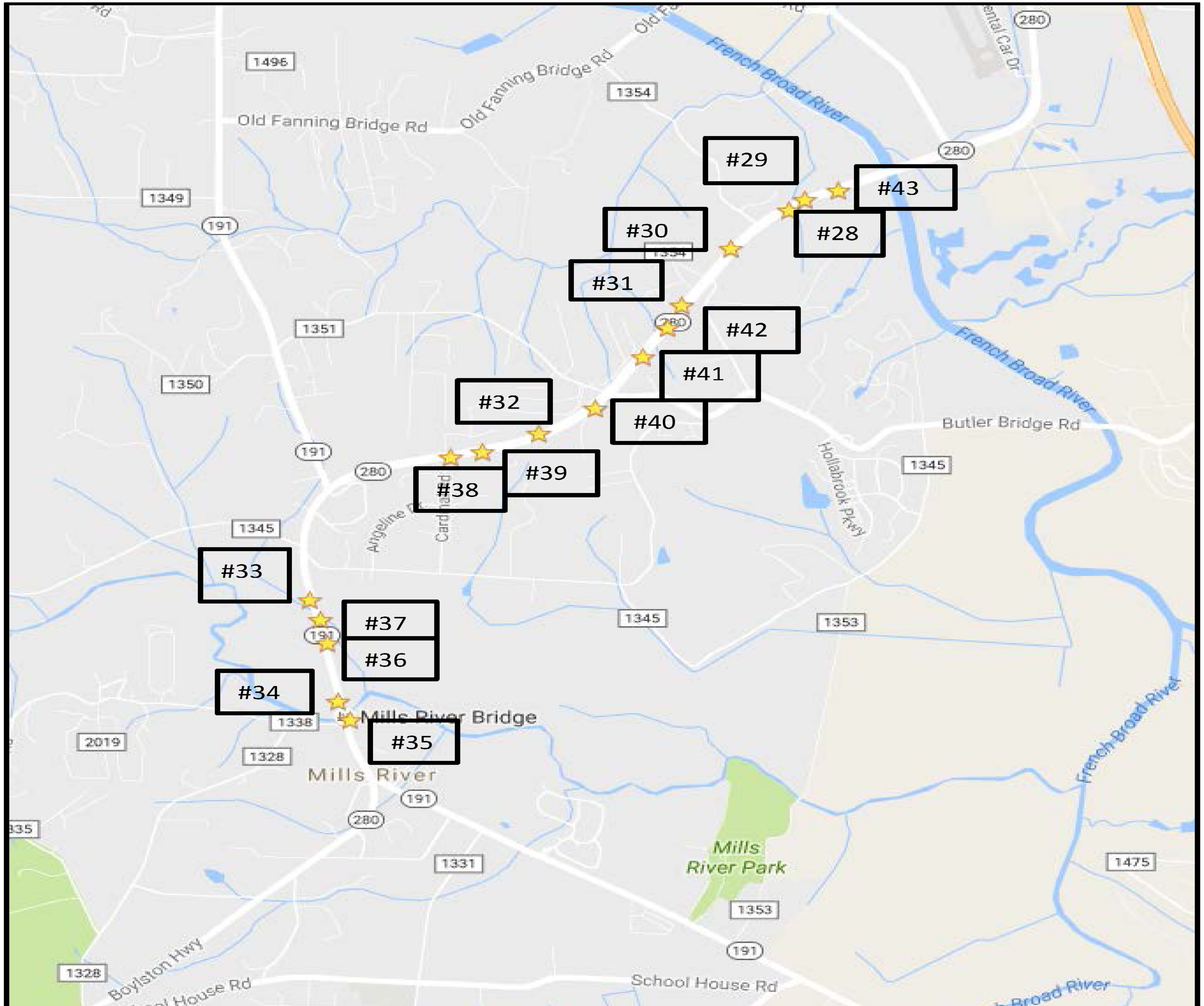
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	6B

Henderson County Site Map – NC 280 – DN 00540 Sites 28-43



8/17/99

REVISIONS

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$$$$USERNAME$$$$

POLK COUNTY - I-26

Point #	Route	End Unit Type	Latitude	Longitude	Description	Approach/Trailing	Detail
44	I-26E	BCT	35.246299	-82.31624	near MM69 outside shoulder		Remove & Replace with GRAU-350 +75LF straight rail
45	I-26E	turn down	35.253633	-82.23415	near MM65 outside shoulder at top of berm		Remove & Replace with GRAU-350 +75LF straight rail
46	I-26E/ US74	BCT	35.251205	-82.21394	off I-26 E on the ramp for US74 E Lt. Lane		Remove & Replace with GRAU-350 +75LF straight rail
47	I-26E/ US74	BCT	35.250687	-82.21234	Ramp for US74E off of I-26E before bridge, rt.		Remove & Replace with GRAU-350 +75LF straight rail
48	I-26E	BCT	35.250646	-82.21232	Exit for Columbus/Tryon on I-26E, Lt.		Remove & Replace with GRAU-350 +75LF straight rail
49	US74E OffRamp	BCT	35.247445	-82.205785	OffRamp from US74W toward Columbus roundabout, right.		Remove & Replace with GRAU-350 +75LF straight rail
50	I-26W OnRamp	BCT	35.24736	-82.20563	OffRamp from US74W toward Columbus roundabout, Left.		Remove & Replace with GRAU-350 +75LF straight rail
51	I-26W	turn down	35.246776	-82.314925	East of Exit 59, blunt end		Remove & Replace with GRAU-350 +75LF straight rail
52	I-26W	turn down	35.246727	-82.31496	East of Exit 59		Remove & Replace with GRAU-350 +75LF straight rail

8/17/99
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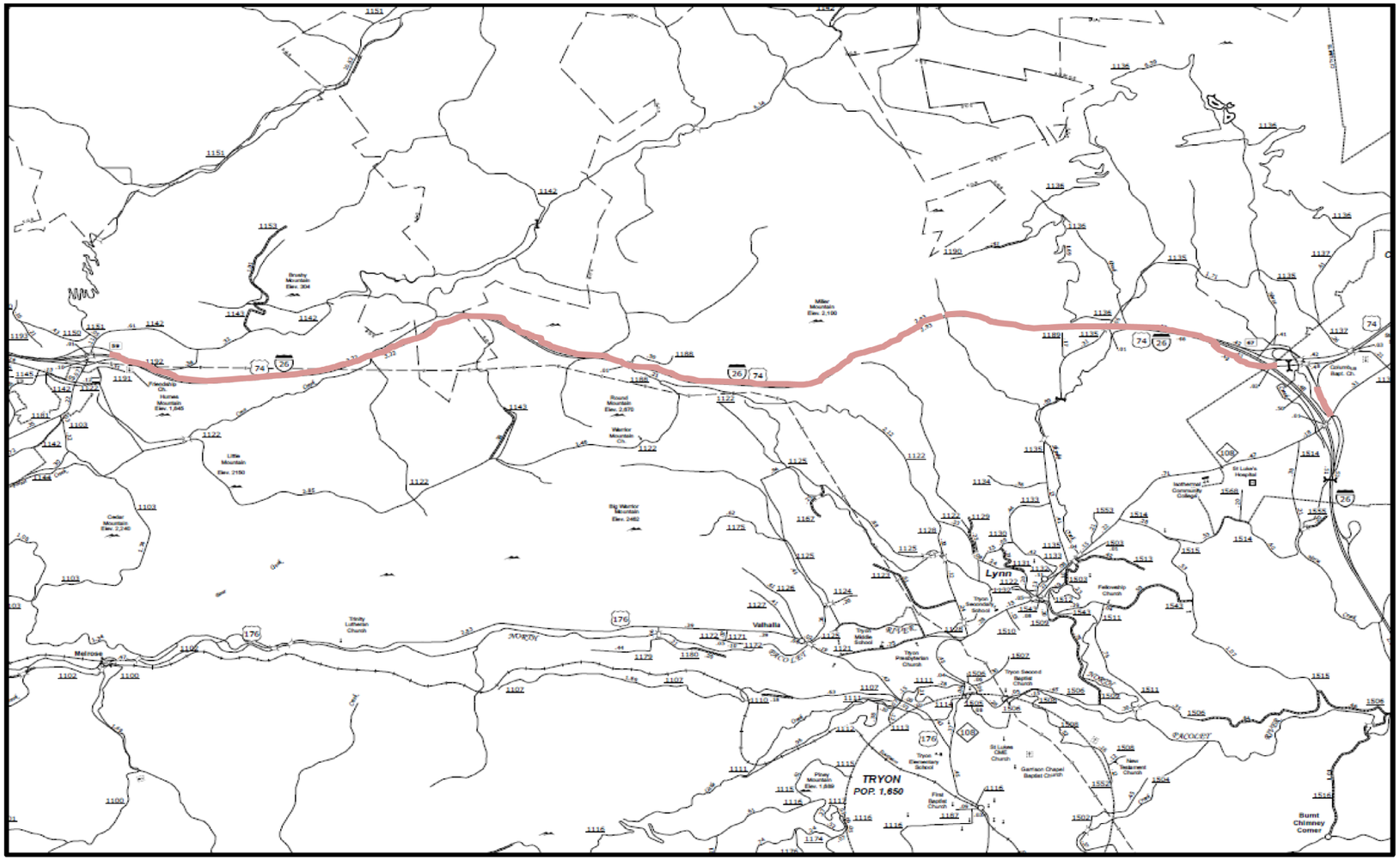
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	7A

Polk County Vicinity Map – I-26 – DN00540



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REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	7B

8/17/99

REVISIONS

Polk County Site Map – I-26 – DN00540 Sites 44 & 51-52

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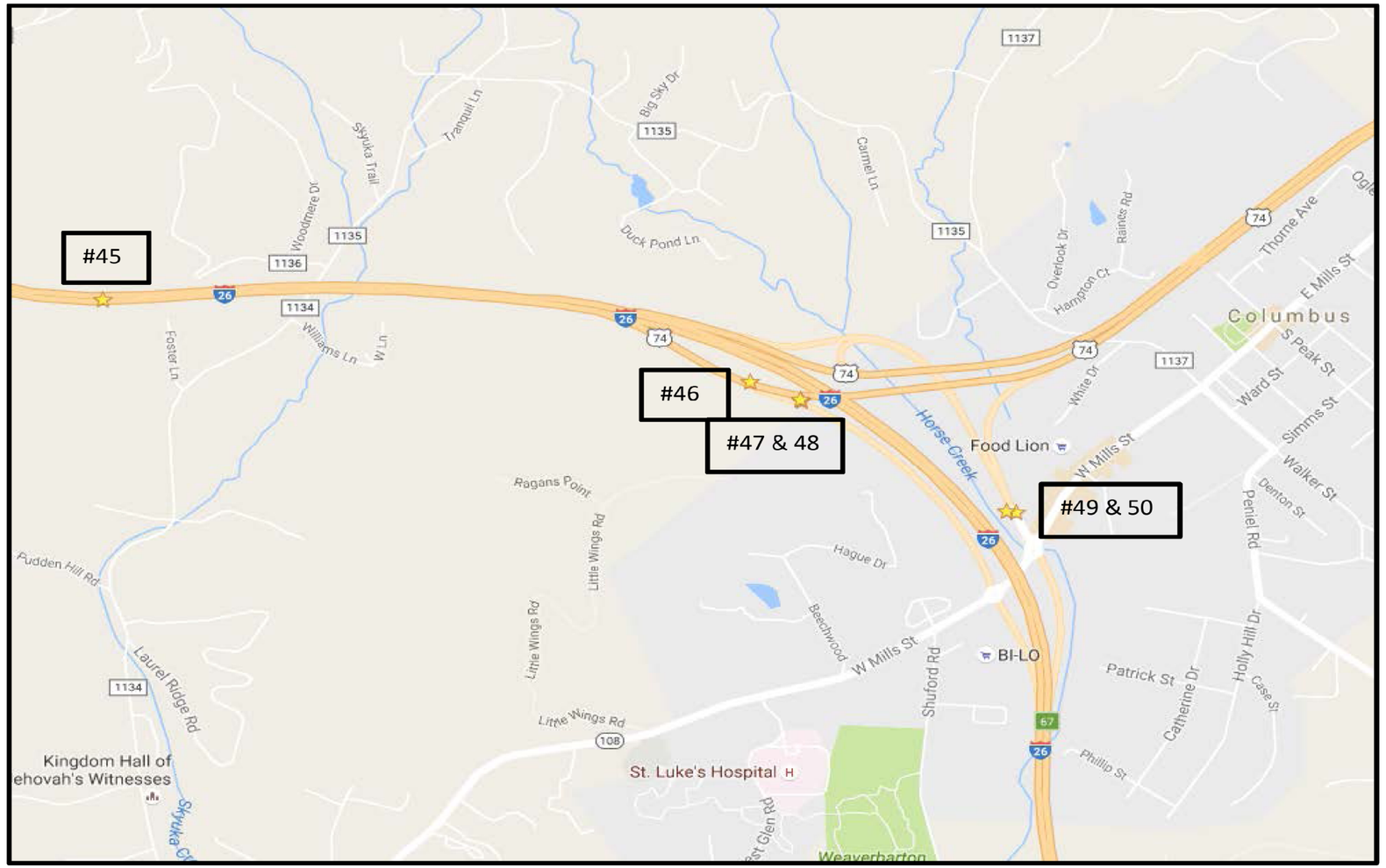
PROJECT REFERENCE NO.	SHEET NO.
50138.3.173	7C

Polk County Site Map – I-26 – DN 00540 Sites 45-50



REVISIONS

8/17/99

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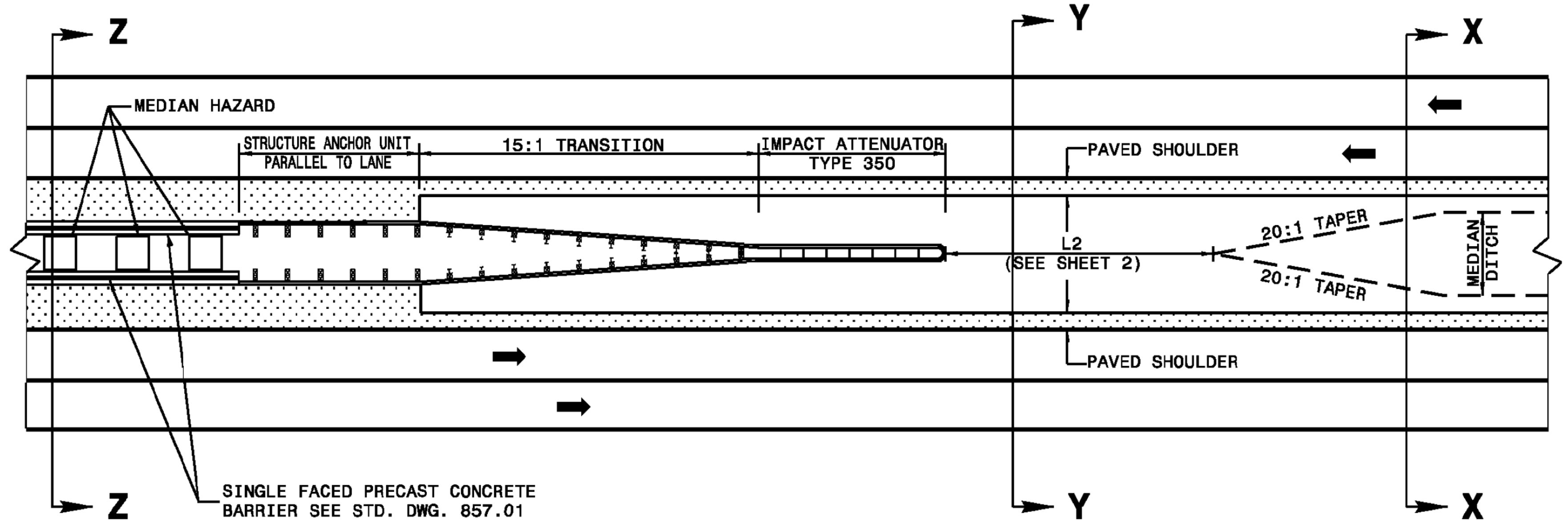
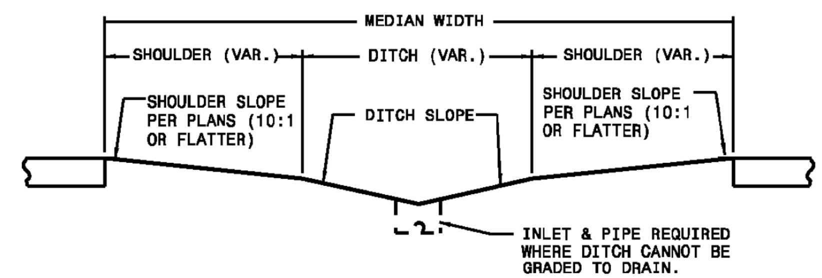
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT





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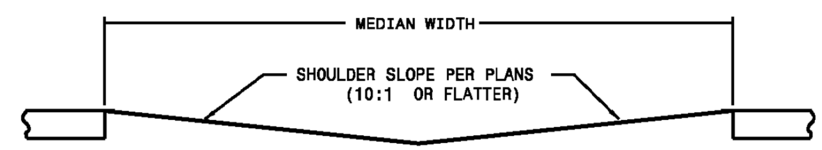

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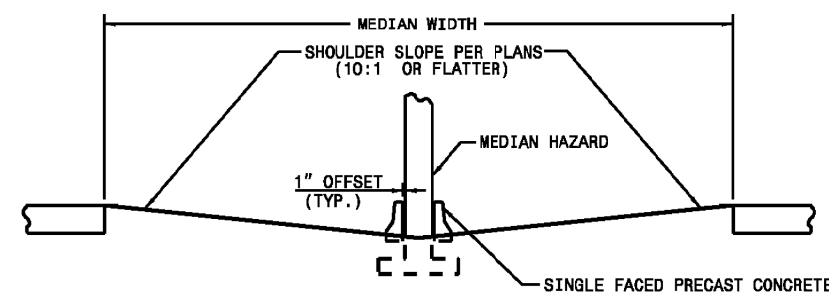

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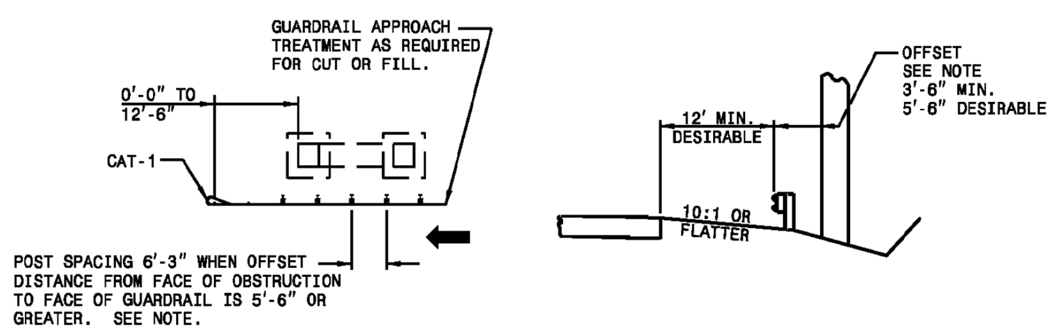

NOTE: WHEN OFFSET DISTANCE FROM FACE OF OBSTRUCTION TO FACE OF GUARDRAIL IS BETWEEN 3'-6" AND 5'-6", BEGIN 3'-1½" POST SPACING AT A POINT 25' BEFORE REACHING THE OBSTRUCTION AND CARRY THROUGHOUT ITS LENGTH. IF THE OFFSET IS LESS THAN 3'-6" USE CONCRETE BARRIER.

DETAIL OF RIGHT SIDE GUARDRAIL AT UNDERPASS

DETAIL OF MEDIAN TREATMENT AT UNDERPASS

SHEET 1 OF 12
862.01

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.
1-12
ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT
SHEET 1 OF12
862.01

REVISIONS

8/17/99

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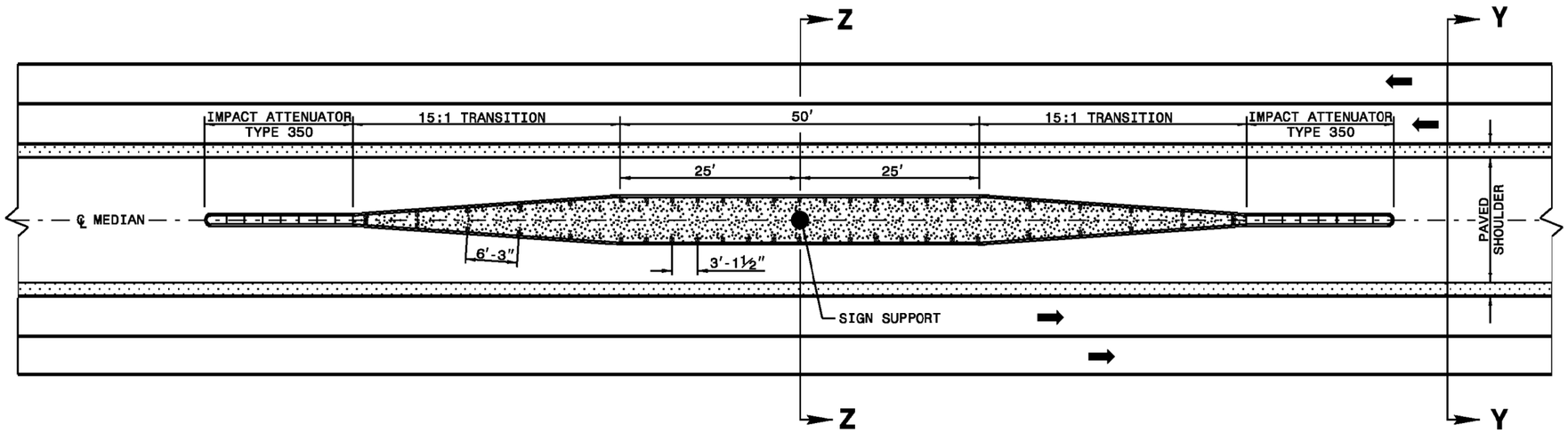
8/17/99

REVISIONS

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

1-12

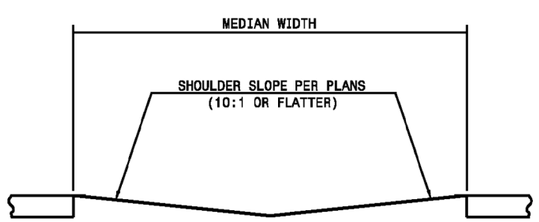
ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT



NOTE SPECIAL LAYER OF PAVEMENT .....

USE 3'-1½" POST SPACING ON THE 50' OF GUARDRAIL PARALLEL TO LANES AND 6'-3" POST SPACING ON 15:1 TRANSITION SECTIONS.

GRADE MEDIAN IN THE VICINITY OF THE SIGN SUPPORT AS ILLUSTRATED IN THE ROADWAY STANDARD DRAWINGS (STARDARD 862.01 SHEET 1 OF 11).



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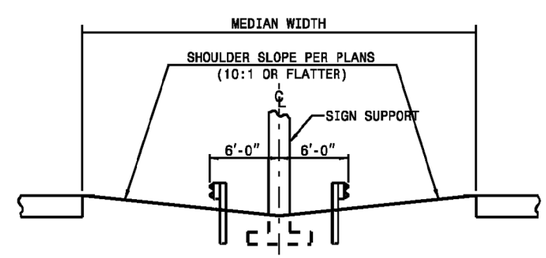

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DETAIL OF GUARDRAIL AT MEDIAN SIGN SUPPORT

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

1-12

ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

SHEET 2 OF 12
862.01

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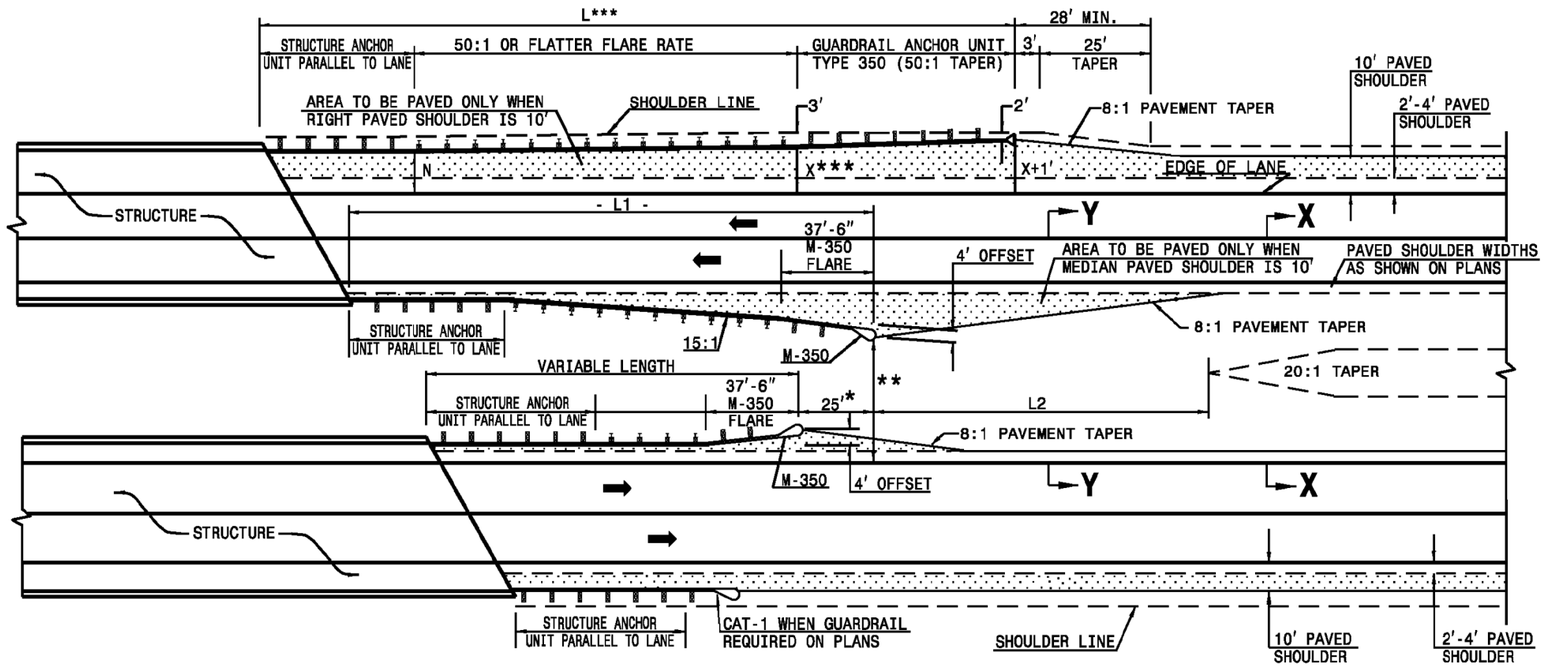
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

1-12

ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT



DIMENSIONS FOR LENGTH OF GUARDRAIL APPROACHING DUAL LANE BRIDGES							
MEDIAN WIDTH	-L-***			-L1-			-L2-
	70 MPH	60 MPH	50 MPH	70 MPH	60 MPH	50 MPH	DIM.
30'	300.0'	250.0'	150.0'	187.5'	162.5'	137.5'	80.0'
36'	300.0'	250.0'	150.0'	212.5'	187.5'	137.5'	60.0'
40' & ABOVE	300.0'	250.0'	150.0'	212.5'	187.5'	137.5'	40.0'

NOTES: * MINOR VARIATION TO THE 25'-0" DIMENSION IS PERMISSIBLE TO ACCOMODATE THE 12'-6" IN GUARDRAIL LENGTHS.

** NO GUARDRAIL IS REQUIRED ON THE TRAILING END WHEN THIS DISTANCE EXCEEDS CLEAR ROADSIDE RECOVERY AREA FOR THE APPROPRIATE DESIGN SPEED.

*** BASED ON "X" OF 12'
USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1A).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

THE DESIGN LAYOUT FOR LENGTHS SHOWN ON THIS STANDARD ARE MINIMUM DESIGN LENGTHS.

SEE SHEET 1 OF 12 FOR SECTIONS XX, YY

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

DETAIL OF GUARDRAIL APPROACHING DUAL LANE BRIDGES

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ENGLISH STANDARD DRAWING FOR
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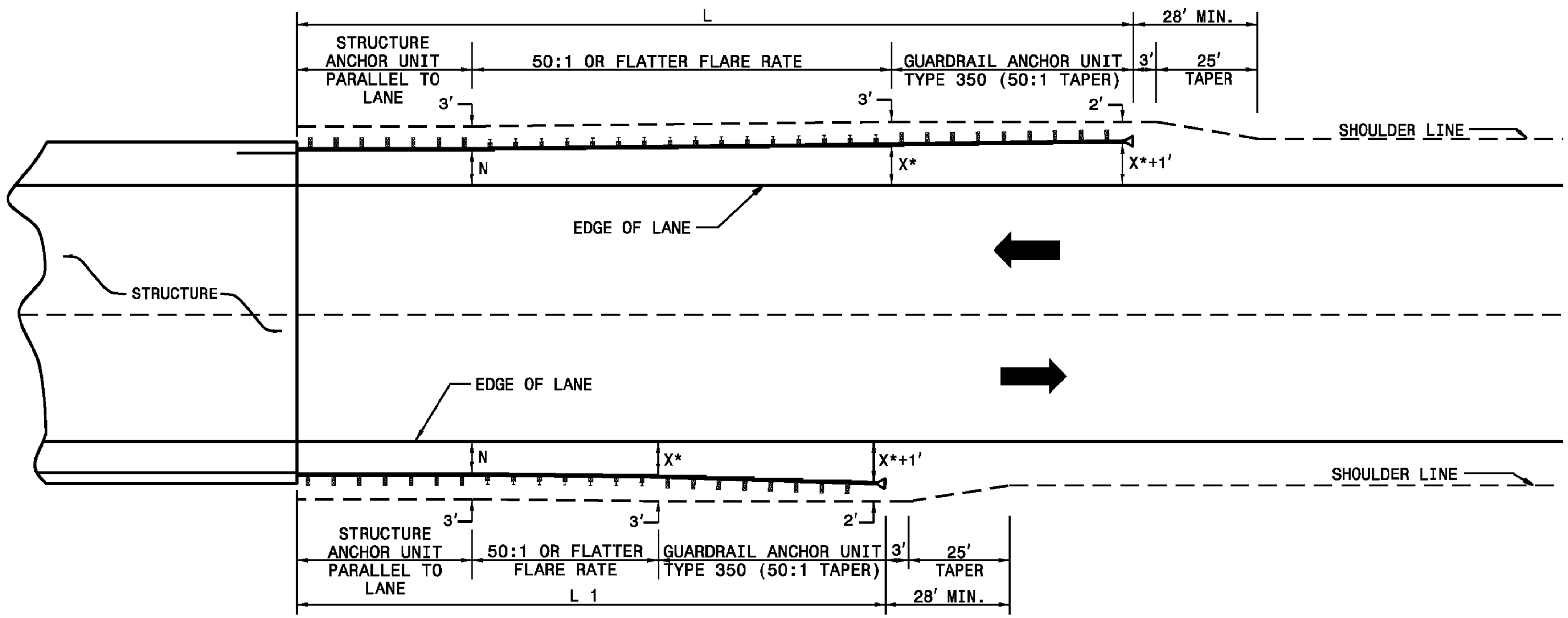

* USE FLARE RATE AS THE CONTROL IF THE "X" DISTANCE IS NOT OBTAINED. ("X" IS BASED ON SHOULDER WIDTHS IN THE HIGHWAY DESIGN BRANCH MANUAL, PART 1, 1-4B, F1).

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS

GUARDRAIL INSTALLATION AT BRIDGE APPROACHES FOR TWO-LANE, TWO-WAY TRAFFIC

DESIGN SPEED (MPH)	"L" APPROACH LENGTH (FT.)				"L1" TRAILING LENGTH (FT.)			
	DESIGN YEAR ADT		CURRENT YEAR ADT		DESIGN YEAR ADT		CURRENT YEAR ADT	
	OVER 2000	1001-2000	400-1000	UNDER 400	OVER 2000	1001-2000	400-1000	UNDER 400
70	362.5′	362.5′	350.0′	287.5′	187.5′	187.5′	175.0′	75.0′
60	300.0′	287.5	275.0′	225.0′	137.5′	137.5′	100.0′	75.0′
50	212.5′	212.5′	200.0′	162.5′	87.5′	75.0′	75.0′	75.0′
40	175.0′	150.0′	137.5′	112.5′	75.0′	75.0′	75.0′	75.0′
X *	8′	6′	4′	4′	8′	6′	4′	4′

ENGLISH STANDARD DRAWING FOR
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LENGTHS AND OFFSETS FOR PROPOSED GUARDRAIL AT TWO LANE - TWO WAY LOCATIONS

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ENGLISH STANDARD DRAWING FOR
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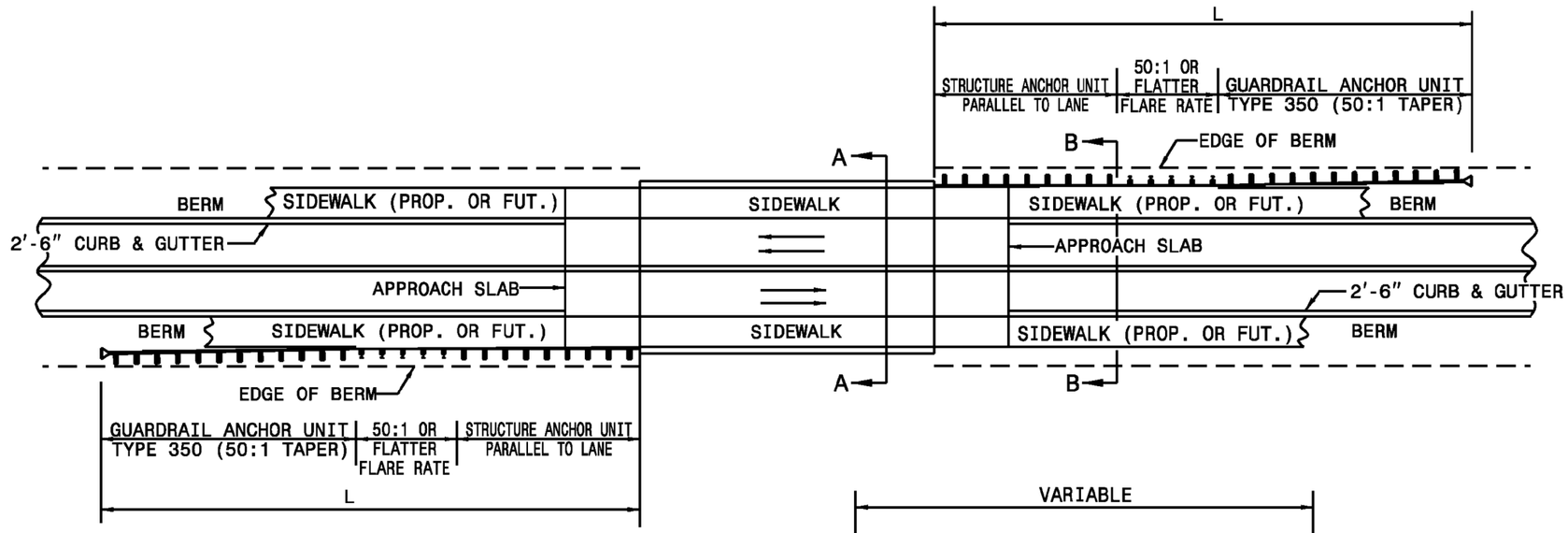
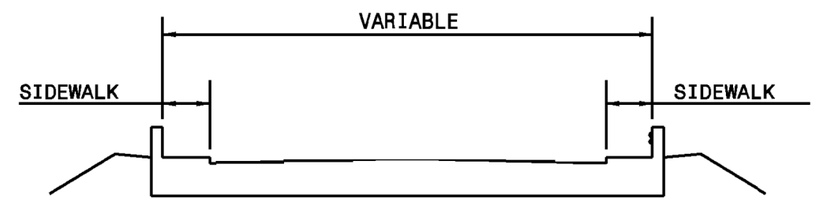
ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT



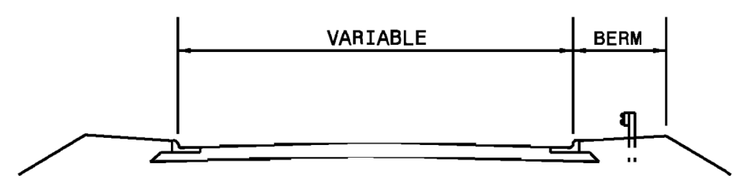
MINIMUM GUARDRAIL LENGTHS "L" REQUIRED AT BRIDGE APPROACHES ON 2'-6" CONCRETE CURB AND GUTTER ROADWAYS	
DESIGN SPEED (MPH)	"L"
40	150'
50	225'

NOTE: "L" VALUES ARE BASED ON NO HAZARDS OTHER THAN END OF BRIDGE BEING PRESENT WITHIN THE CLEAR ZONE.

SEE STD. 862.03 FOR STRUCTURE ANCHOR UNITS.



SECTION A-A



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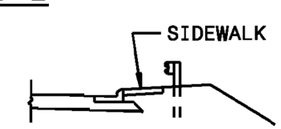

STANDARD GUARDRAIL PLACEMENT AT BRIDGES WITH 2'-6" CONCRETE CURB AND GUTTER

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ENGLISH STANDARD DRAWING FOR
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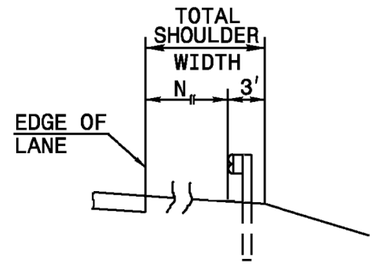
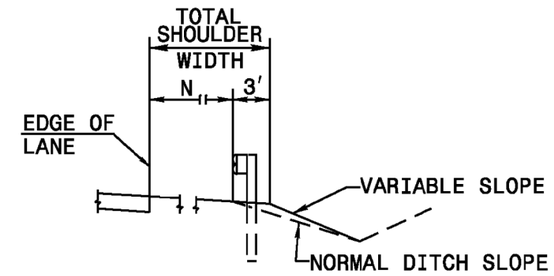
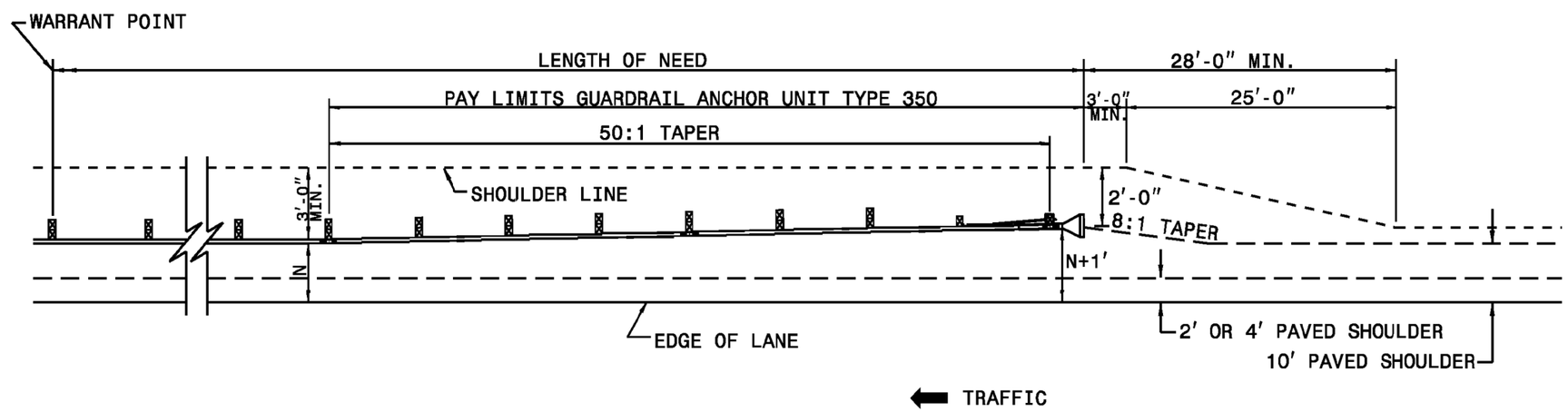


FILL SECTION



CUT SECTION

"N"= DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL WHERE GUARDRAIL IS PARALLEL TO LANE.



DETAIL OF BEGINNING OF GUARDRAIL IN CUT OR FILL SECTION

ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

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ENGLISH STANDARD DRAWING FOR
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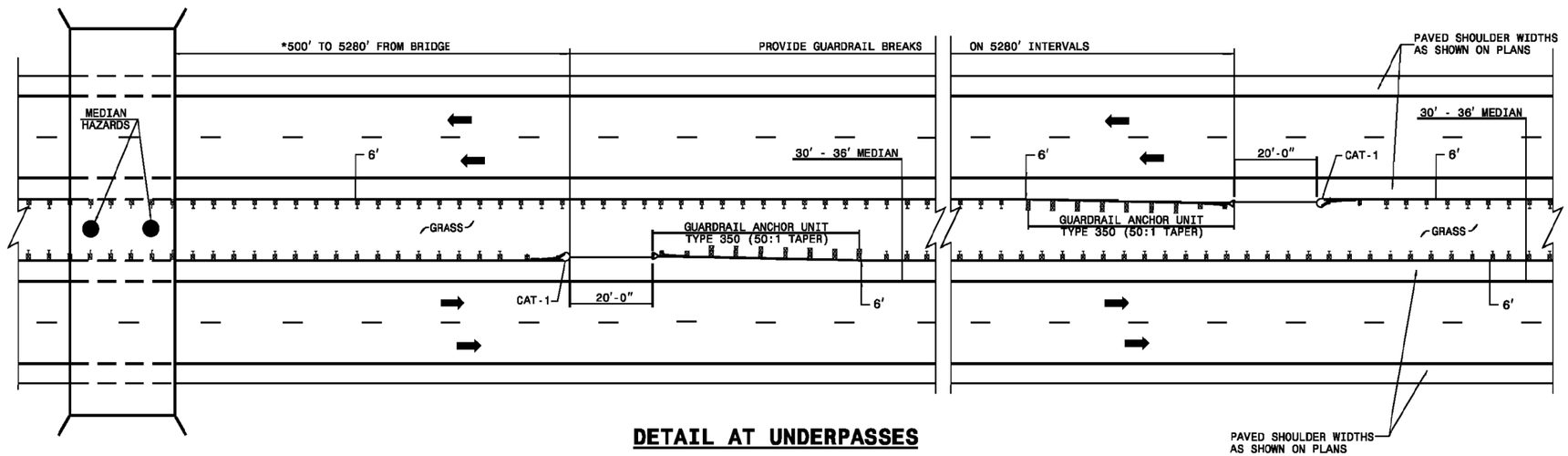
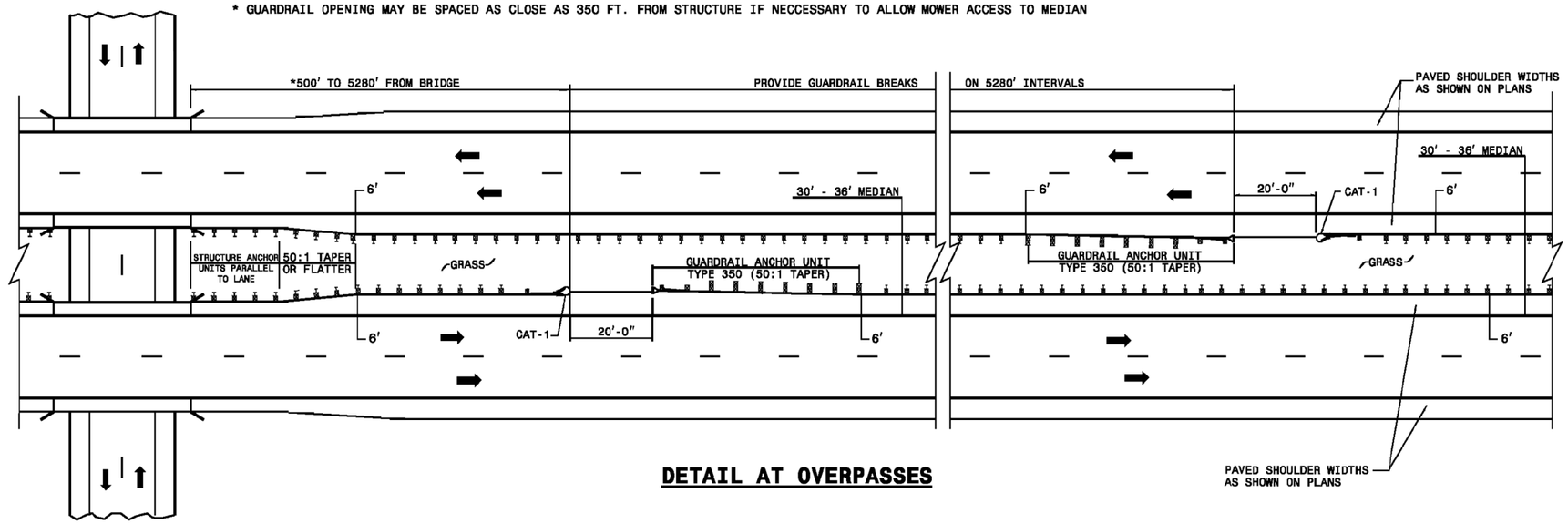


DETAIL AT UNDERPASSES

* GUARDRAIL OPENING MAY BE SPACED AS CLOSE AS 350 FT. FROM STRUCTURE IF NECCESSARY TO ALLOW MOWER ACCESS TO MEDIAN



DETAIL AT OVERPASSES

GUARDRAIL BREAK INTERVALS WITH 30' - 36' MEDIANS

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ENGLISH STANDARD DRAWING FOR
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ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT

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NOTES:

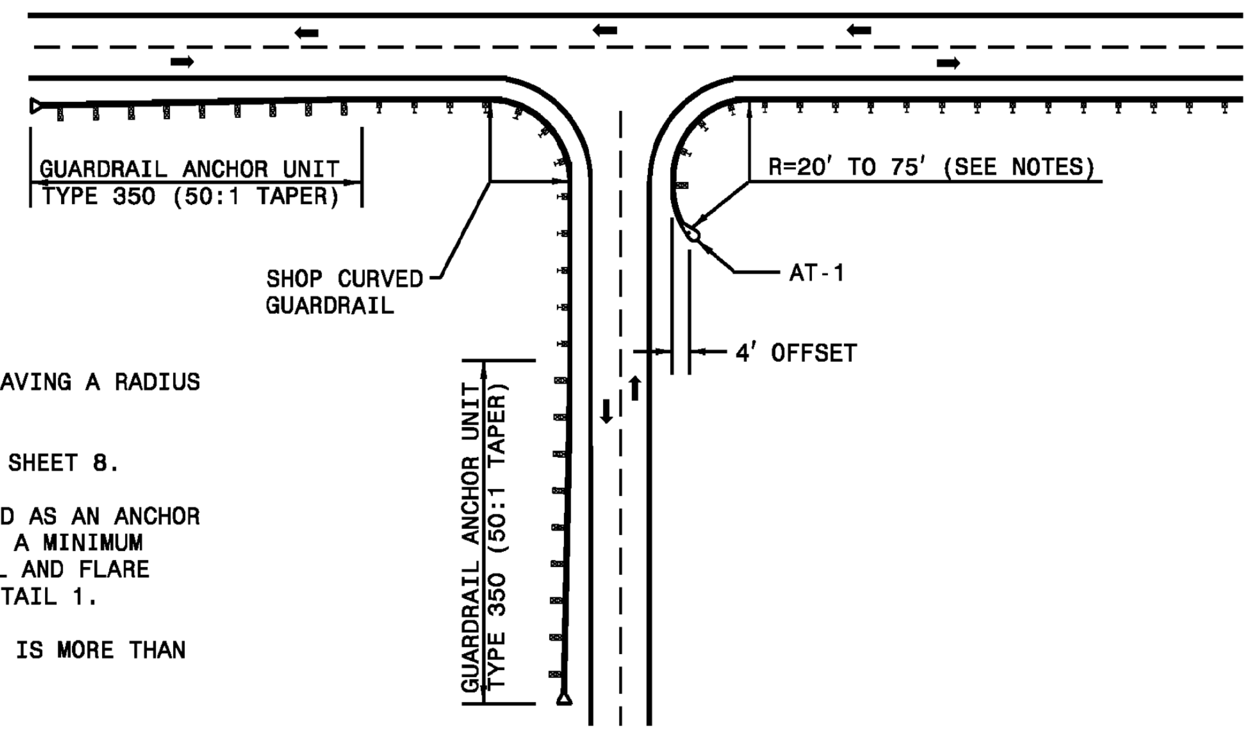
SHOP CURVED GUARDRAIL IS DEFINED AS HAVING A RADIUS OF 150′ OR LESS.

WHEN RADIUS IS LESS THAN 20′ REFER TO SHEET 8.

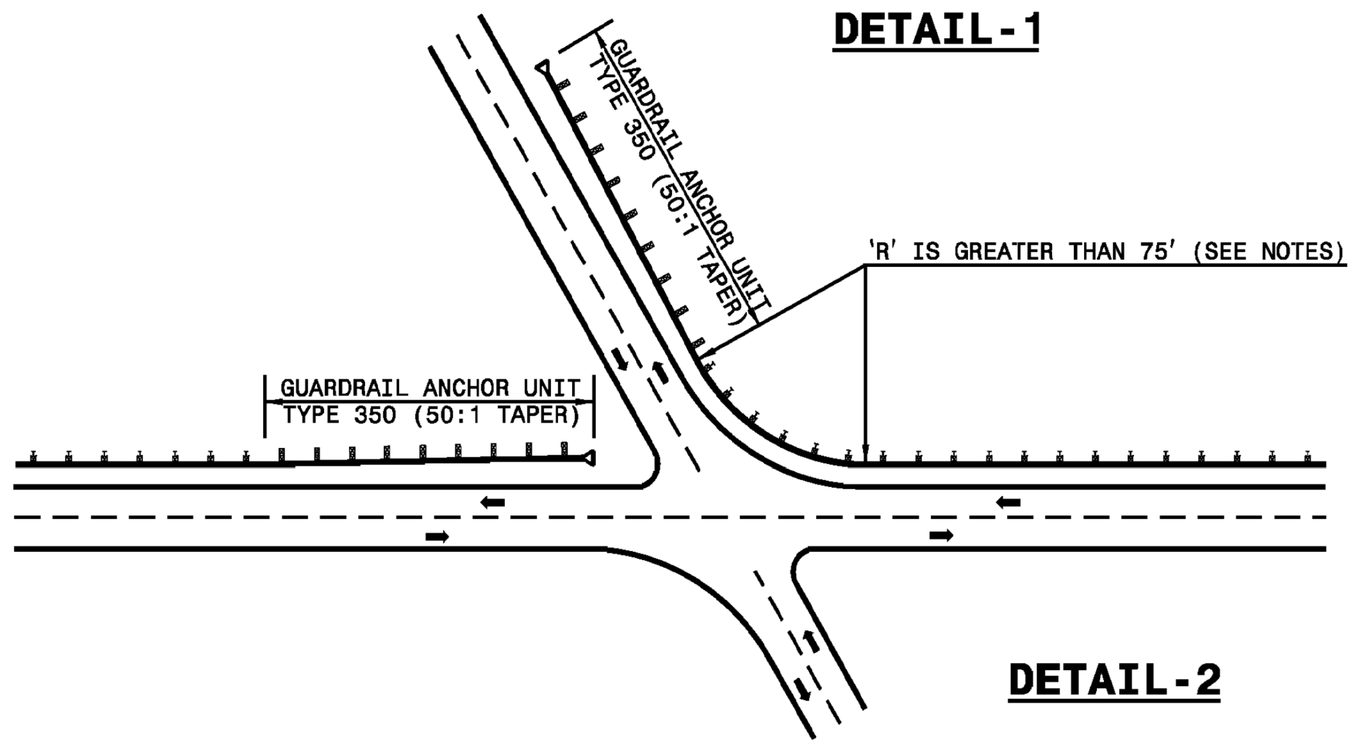
WHENEVER SHOP CURVED GUARDRAIL IS USED AS AN ANCHOR AND THE RADIUS IS FROM 20′ TO 75′, USE A MINIMUM LENGTH OF 50′ OF SHOP CURVED GUARDRAIL AND FLARE WITH AN AT-1 ANCHOR UNIT. REFER TO DETAIL 1.

WHENEVER SHOP CURVED GUARDRAIL RADIUS IS MORE THAN 75′, REFER TO DETAIL 2.

MAINTAIN CLEAR SIGHT DISTANCE.



DETAIL-1



DETAIL-2

GUARDRAIL TREATMENT AT INTERSECTIONS

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ENGLISH STANDARD DRAWING FOR
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ENGLISH STANDARD DRAWING FOR
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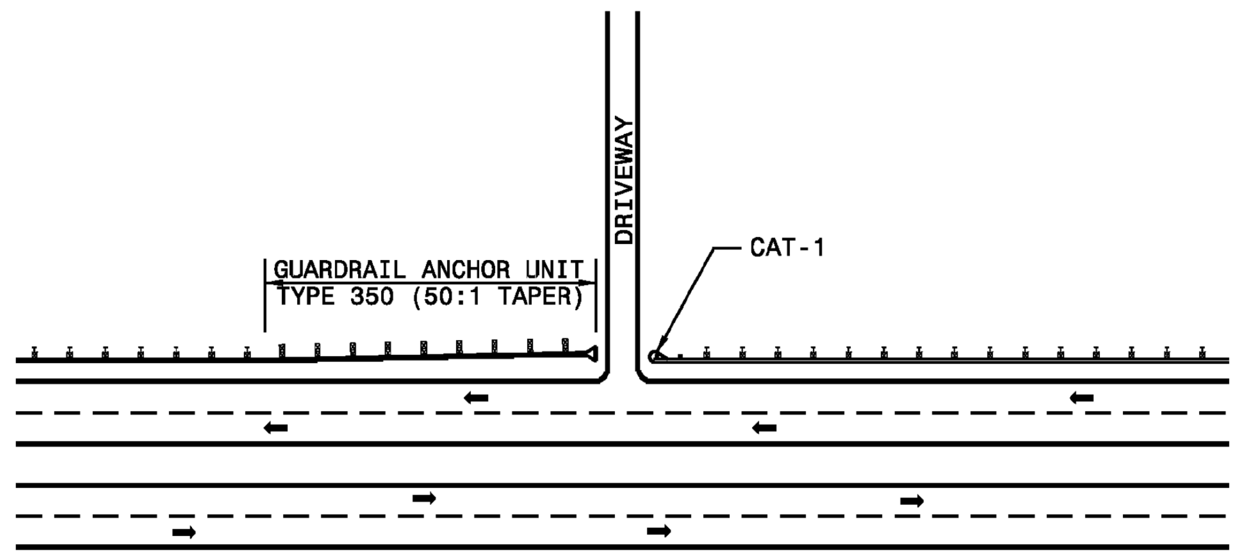
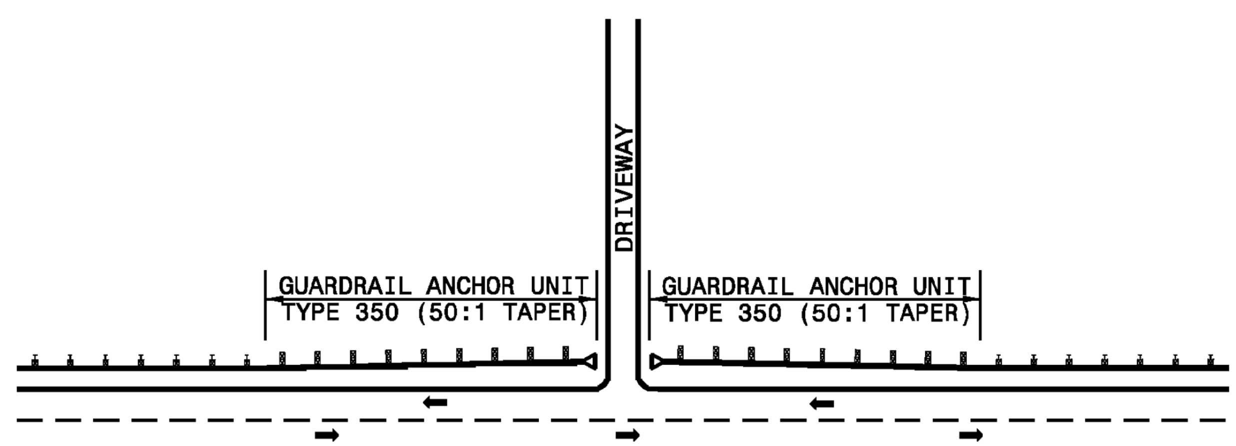


DETAIL-3
DIVIDED HIGHWAY

NOTE: USE DETAIL 3 & 4 WHENEVER 20′ OR LARGER RADIUS CANNOT BE UTILIZED.

MAINTAIN CLEAR SIGHT DISTANCE.



DETAIL-4
UNDIVIDED HIGHWAY

GUARDRAIL TREATMENT AT DRIVEWAYS

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ENGLISH STANDARD DRAWING FOR
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ENGLISH STANDARD DRAWING FOR
GUARDRAIL PLACEMENT
GUARDRAIL TREATMENT AT CURB AND GUTTER

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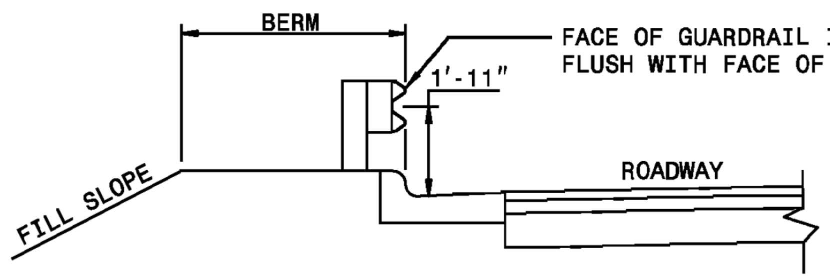
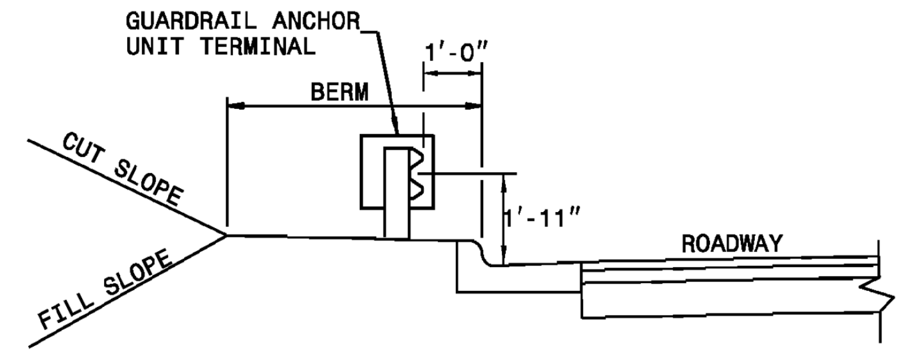
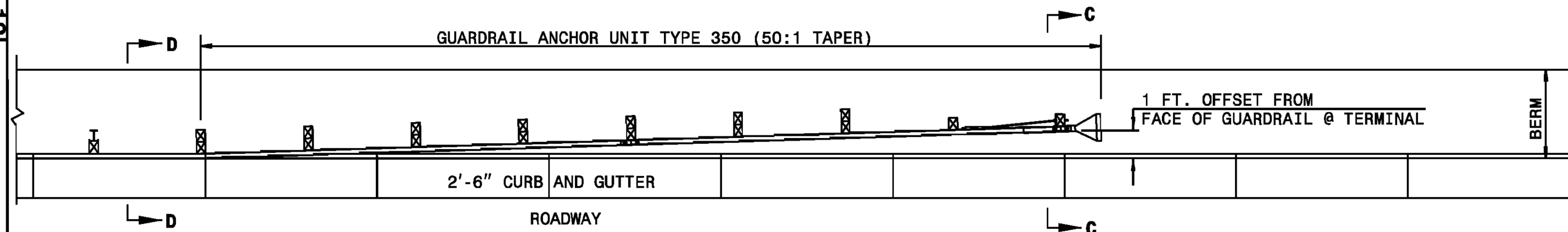


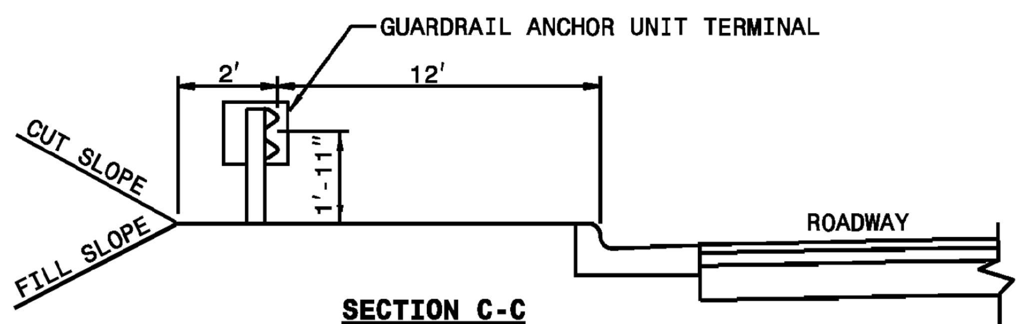
SECTION D-D



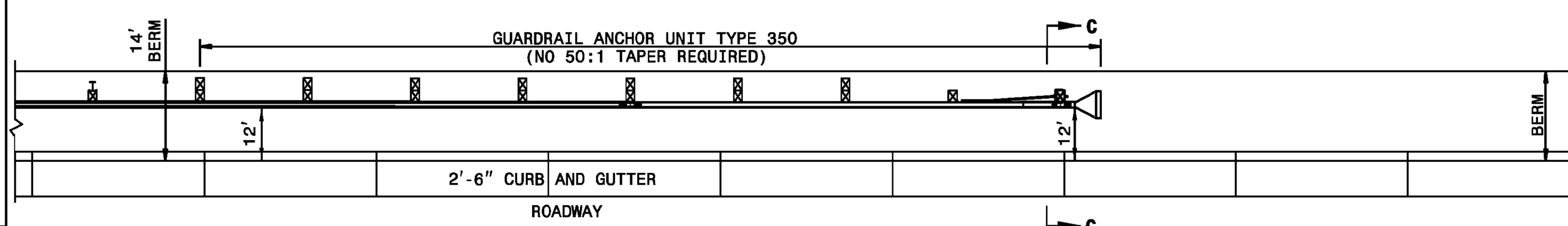
SECTION C-C



GUARDRAIL AT FACE OF CURB



SECTION C-C



GUARDRAIL 12' OFFSET FROM FACE OF CURB

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ENGLISH STANDARD DRAWING FOR
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GUARDRAIL TREATMENT AT CURB AND GUTTER

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