



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 07-11

Regarding Standard Drawing for Low Volume (ADT \leq 400) Local Roads

Effective immediately, standard drawing RD01-TS-1A should be used for the design of low-volume (current ADT \leq 400) roadways classified as local roads for all projects begun after April 20, 2007 instead of standard drawing RD01-TS-1. For additional guidance not covered on the standard drawing, designers should reference AASHTO "Guidelines for Geometric Design of Very Low-Volume Local Roads (ADT \leq 400)," 2001. For projects with design speeds greater than 40 mph, designers shall continue using standard drawing RD01-TS-1. Any exception to the use of standard drawing RD01-TS-1A on low volume local roads should be approved by the Design Division Director or the appropriate Assistant Director.

Until the drawing is added to the standard drawings, it is to be printed with the plans. The drawings shall be identified on the lower left side of the index sheet "**To be printed with plans**".

A copy of the drawing is attached. No metric standard drawing will be developed for this application.

ROADWAY DESIGN STANDARDS – ENGLISH

<u>Drawing Number</u>	<u>Current Revision Date</u>	<u>Drawing Title</u>
RD01-TS-1A		DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS (ADT \leq 400)

Original signed by Jeff C. Jones
Jeff C. Jones, Civil Engineering Director
Design Division

April 20, 2007
JCJ:MJA:mja
Attachment

GENERAL NOTES

- 1 THIS STANDARD DRAWING IS INTENDED TO BE USED FOR THE DESIGN OF LOW-VOLUME (CURRENT ADT < 400) ROADWAYS CLASSIFIED AS LOCAL ROADS. FOR ADDITIONAL GUIDANCE NOT COVERED ON THIS SHEET, REFERENCE SHOULD BE MADE TO AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF VERY LOW-VOLUME LOCAL ROADS (ADT < 400)", 2001.
- 2 PROJECT WITH DESIGN SPEEDS GREATER THAN 40 MPH SHALL USE STANDARD DRAWING RD01-15-1.
- 3 FOR INTERSECTION SIGHT DISTANCE, SEE PAGES 40 TO 47 OF THE AASHTO "GUIDELINES FOR GEOMETRIC DESIGN OF VERY LOW-VOLUME LOCAL ROADS (ADT < 400)", 2001.
- 4 IF NO ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE TRAVELWAY PLUS CLEAR ZONE.
- 5 IF ABOVE GROUND UTILITIES ARE INVOLVED, MINIMUM RIGHT-OF-WAY SHOULD BE SUFFICIENT TO ACCOMMODATE THE UTILITIES OUTSIDE THE CLEAR ZONE.
- 6 DESIGNER SHOULD CONSIDER ANY KNOWN SITE-SPECIFIC SAFETY PROBLEMS AND TYPICAL DAILY USE OF THE ROADWAY WHEN DETERMINING ROADWAY GEOMETRIES ON A CASE-BY-CASE BASIS. SITE-SPECIFIC SAFETY PROBLEMS MAY BE INDICATED BY CRASH DATA, SKID MARKS, ROADSIDE DAMAGE, SPEED DATA, OR CONCERNS RAISED BY LOCAL OFFICIALS POLICE OR LOCAL RESIDENTS.
- 7 FOR EXISTING ROADS, CROSS-SECTION WIDTHS NEED NOT BE MODIFIED, EXCEPT IN THOSE CASES WHERE THERE IS KNOWN EVIDENCE OF A SITE-SPECIFIC SAFETY PROBLEM AS LONG AS THE MINIMUM CRITERIA, AS SHOWN IN THE TABLE BELOW, IS MET.
- 8 FOR THIS STANDARD THE FOLLOWING ARE THE POSSIBLE ROADWAY USES:
 - A. RURAL LOCAL ROADS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ADJUTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.
 - B. RECREATIONAL AND SCENIC ROADS SERVE SPECIALIZED LAND USES, INCLUDING PARKS, TOURIST ATTRACTIONS, AND RECREATION FACILITIES, SUCH AS CAMPSITE OR BOAT-LAUNCH FACILITIES.
 - C. INDUSTRIAL OR COMMERCIAL ACCESS ROADS SERVE DEVELOPMENTS THAT MAY GENERATE A SIGNIFICANT PROPORTION OF TRUCK OR OTHER HEAVY VEHICLE TRAFFIC.
 - D. URBAN LOCAL ROADWAYS SERVE A DUAL FUNCTION OF PROVIDING ACCESS TO ADJUTING PROPERTIES AS WELL AS PROVIDING THROUGH OR CONNECTING SERVICE BETWEEN OTHER LOCAL ROADS.
- 9 ROADWAY SURFACE TYPE SHOULD MATCH EXISTING SURFACE OR SHALL BE DETERMINED BY LOCAL ENGINEER. WHEN EXISTING SURFACE IS ASPHALT, SEE DESIGN GUIDELINES FOR PAVEMENT DESIGN GUIDANCE.

DESIGN LOADING:
 ALL NEW AND REHABILITATED BRIDGES SHALL BE DESIGNED FOR HL-93 LOADING.
 FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS, THE MINIMUM CLEAR WIDTH FOR NEW BRIDGES SHALL BE 18 FEET. FOR EXISTING BRIDGES, THE MINIMUM CLEAR WIDTH AS APPLICABLE.

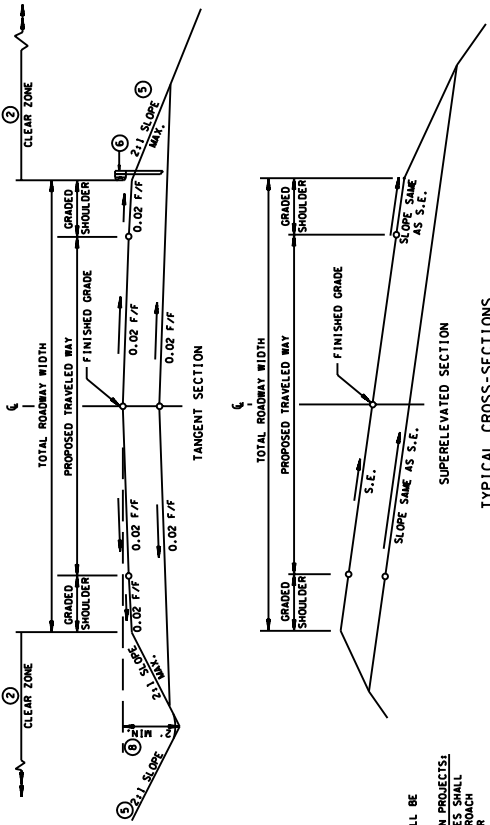


TABLE 2
 MINIMUM CLEAR WIDTHS AND DESIGN LOADINGS FOR NEW AND RECONSTRUCTED BRIDGES

DESIGN ADT (VEH/DAY)	DESIGN LOADING (STRUCTURAL CAPACITY)	MINIMUM CLEAR WIDTH (FEET)
0 TO 100	HL-93	18
101 TO 400	HL-93	20

TABLE 3
 MINIMUM CLEAR WIDTHS AND DESIGN LOADINGS FOR EXISTING BRIDGES TO REMAIN IN PLACE

DESIGN ADT (VEH/DAY)	DESIGN LOADING (STRUCTURAL CAPACITY)	MINIMUM CLEAR WIDTH (FEET)
0 TO 100	R-15	18
101 TO 400	R-15	20

- FOOTNOTES**
- 1 FOR BRIDGE PROJECTS WHERE THE TOTAL APPROACH ROADWAY WIDTH (TRAVELED WAY PLUS SHOULDERS) IS SURFACED, THAT SECTION WITHIN SELECTED FROM THE TOTAL APPROACH ROADWAY WIDTH. THE MINIMUM CLEAR WIDTH SHOULD BE LESS THAN THE EXISTING ROADWAY WIDTH, AS DETERMINED ABOVE. HOWEVER, ON UNIMPROVED RURAL ROADS, WITHOUT DEFINED TRAVELED WAY OR DEFINED SHOULDERS, THE WIDTH DETERMINED FROM TABLE 1 WILL SUFFICE.
 - 2 SITE-SPECIFIC CONDITIONS AND ENGINEERING JUDGMENT OF THE DESIGNER SHOULD BE THE TWO PRIMARY DETERMINANTS OF THE APPROPRIATE CLEAR ZONE WIDTH FOR LOW-VOLUME LOCAL ROADS. AT LOCATIONS WHERE A CLEAR ZONE OF 6 FEET OR MORE IN WIDTH CAN BE PROVIDED AT LOW COST AND WITH MINIMUM SOCIAL/ENVIRONMENTAL IMPACT, SUCH CLEAR ZONE SHOULD BE CONSIDERED. WHERE PROVISION OF A CLEAR ZONE IS NOT PRACTICAL, NONE IS REQUIRED.
 - 3 FOR THE DESIGN OF SUPER ELEVATION TRANSITIONS, USE THE SUPER ELEVATION DESIGN SPEED LISTED DIRECTLY ABOVE THE SELECTED MINIMUM HORIZONTAL CURVE RADIUS. FOR EXISTING ROADS WHERE SUPER ELEVATION IS NOT PRESENT AND NO SUPER ELEVATION TRANSITIONS ARE REQUIRED, THE SUPER ELEVATION DESIGN SPEED SHOULD BE THE DESIGN SPEED. SUPER ELEVATION IS NEEDED AS DETERMINED BY THE DESIGNER. THE DESIGNER SHOULD ASSESS THE PROJECT SITE AND USE ENGINEERING JUDGMENT WHEN MAKING THIS DETERMINATION. FOR UNIMPROVED ROADS, REMOVAL OF NORMAL CROWN BY SUPER ELEVATING THE ENTIRE ROADWAY AT THE NORMAL CROSS SLOPE MAY BE USED OR SUPER ELEVATION MAY BE ELIMINATED.
 - 4 THESE STRUCTURES SHOULD BE ANALYZED INDIVIDUALLY, TAKING INTO CONSIDERATION THE CLEAR WIDTH PROVIDED, TRAFFIC VOLUMES, REMAINING LIFE OF THE STRUCTURE, PEDESTRIAN VOLUMES, SNOW STORAGE, DESIGN SPEED, ACCIDENT RECORD, AND OTHER PERTINENT FACTORS.
 - 5 MAXIMUM 2(H+1)(V) OR AS RECOMMENDED BY THE GEOTECHNICAL OFFICE. WHEN A 2(H+1)(V) SLOPE IS USED, AND THE FILL HEIGHT EXCEEDS SIX FEET, GUARDRAIL SHOULD BE CONSIDERED. WHERE RIGHT-OF-WAY IS NOT AN ISSUE, STANDARD DRAWING RD01-5-11 (CASE 11) SUPPLIES THE DESIGNER.
 - 6 SEE GUARDRAIL STANDARD DRAWINGS (S-OR-SERIES) FOR GUARDRAIL PLACEMENT. FOR LOW-VOLUME LOCAL ROAD BRIDGE REPLACEMENT PROJECTS, USE MINIMUM GUARDRAIL SHOWN ON STANDARD DRAWING S-OR-23A. FOR ALL OTHER PROJECTS, GUARDRAIL SHOULD BE MADE TO THE AASHTO "ROADSIDE DESIGN GUIDE", 2006.
 - 7 CURB-TO-CURB OR BETWEEN RAILS, WHICHEVER IS THE LESSER.
 - 8 MINIMUM DITCH OR SWALE SHALL BE 2 FOOT DEEP WITH 2(H+1)(V) SIDE SLOPES. THIS DITCH OR SWALE SHALL BE USED UNLESS CONDITIONS NECESSITATE OTHERWISE (SUCH AS DISCHARGE IN DITCH OR UNDERMINING OF ROADWAY SURFACE).
 - 9 DESIGN SPEED SHOULD BE SELECTED BASED ON ACTUAL OR ANTICIPATED OPERATING SPEED AND CONDITIONS ON THE ROAD BEING DESIGNED.

TABLE 1
 DESIGN STANDARDS FOR LOW-VOLUME LOCAL ROADS AND STREETS (ADT < 400)

DESIGN SPEED (MPH)	15	20	25	30	35	40
MINIMUM TOTAL ROADWAY WIDTH BY USE (FEET)	15	18	18	18	18	20
RECREATIONAL AND SCENIC ROADS	18	18	18	18	18	20
INDUSTRIAL/COMMERCIAL ACCESS	20	20	21	23	23	23
URBAN LOCAL ROADS	20	20	20	20	20	20
LOW DEVELOPMENT DENSITY (2.0 OR LESS DWELLINGS/ACRE)	20	20	20	20	20	20
MEDIUM DEVELOPMENT DENSITY (2.1 TO 6 DWELLINGS/ACRE)	28	28	28	28	28	28
RURAL LOCAL, RECREATIONAL AND SCENIC ACCESS ROADS	15	15	20	20	30	35
45 MAX. S.E.	70	70	125	125	300	420
65 MAX. S.E.	65	65	115	115	275	380
85 MAX. S.E.	60	60	105	105	250	350
INDUSTRIAL/COMMERCIAL ACCESS	15	20	25	25	30	35
45 MAX. S.E.	70	125	205	205	300	420
65 MAX. S.E.	65	115	185	185	275	380
85 MAX. S.E.	60	105	170	170	250	350
URBAN LOCAL ROADS	15	20	25	30	35	40
45 MAX. S.E.	40	80	145	230	345	490
65 MAX. S.E.	40	75	165	215	320	450
85 MAX. S.E.	40	70	155	205	305	420
UNPAVED ROADWAYS	50	70	105	150	205	270
NORMAL CROWN	50	70	105	150	205	270
MINIMUM STOPPING SIGHT DISTANCE (FEET)	65	90	115	135	170	215
ADT 0 TO 100 (VEH/DAY)	65	95	125	165	205	250
ADT 0 TO 100 (VEH/DAY)	2	4	7	9	14	22
ADT 101 TO 400 (VEH/DAY)	2	5	8	13	20	29
SAG VERTICAL CURVE	10	17	26	37	49	64
TYPE OF TERRAIN	9	8	7	7	7	7
LEVEL	12	11	11	10	10	9
ROLLING	17	16	15	14	13	12
MOUNTAINOUS	17	16	15	14	13	12
MINIMUM - K - VALUES	17	16	15	14	13	12
MAXIMUM GRADE (%)	17	16	15	14	13	12
SUPERELEVATION	17	16	15	14	13	12

SEE STANDARD DRAWING RD01-SE-2 AND RD01-SE-3