

July 5, 2011

ERRATA

“Minimum Retroreflectivity Levels for Blue and Brown Traffic Signs”

Publication No. FHWA-HRT-08-029

Dear Customer:

A technical correction and editorial correction were made to this report after the report was originally published. The following table shows the modifications that were made to this report.

Location	Correction
Page 28, Table 12	Change caption from: “Luminance requirements for white-on-blue sign legends (cd/m ²).” to “Luminance requirements for white-on-brown sign legends (cd/m ²).”
Page 35, Table 17	Replace Table 17 with attached copy.

White-on-Brown Legend Signs

The results of the white-on-brown legend signs are shown in table 12 and figure 16. These results indicate the minimum luminance required for sign legibility for a given percentage of the older driver subject sample. The data are divided by roadway lighting condition (on or off) and presence of glare (on or off).

Table 12. Luminance requirements for white-on-brown sign legends (cd/m²).

Percent Accommodation	Roadway Lighting						No Lighting					
	Glare Off			Glare On			Glare Off			Glare On		
	2.4 m/cm (20 ft/in)	3.6 m/cm (30 ft/in)	4.8 m/cm (40 ft/in)									
10	1.59	1.50	2.30	1.59	2.07	3.01	0.10	0.50	2.10	0.10	0.60	3.80
25	1.59	2.07	3.30	1.65	2.50	4.40	0.10	0.50	3.10	0.17	1.13	5.85
50	1.65	4.28	5.90	1.65	5.87	7.20	0.17	1.13	6.40	0.40	1.90	9.60
75	2.28	7.91	10.50	2.85	9.66	12.80	0.52	2.11	10.30	0.67	4.20	14.40
85	3.45	12.50	12.73	3.07	12.68	16.28	0.79	4.91	12.24	0.94	7.78	16.90
95	7.27	22.10	18.00	6.82	36.49	18.30	2.59	6.65	18.12	4.32	12.05	19.29
98	7.80	23.53	23.51	7.67	46.11	18.79	4.16	7.32	18.23	5.17	13.95	21.27

Table 17. Minimum MR levels.

Sign Color	Sheeting Type (ASTM D4956-11a)				Additional Criteria
	Beaded Sheeting			Prismatic Sheeting	
	I	II	III	III, IV, VI, VIII, IX, XI	
White on green	W*; G ≥ 7	W*; G ≥ 15	W*; G ≥ 25	W ≥ 250; G ≥ 25	Overhead
	W*; G ≥ 7	W ≥ 120; G ≥ 15			Ground mounted
White on blue	W*; B ≥ 3	W*; B ≥ 5	W*; B ≥ 12	W ≥ 250; B ≥ 12	Overhead
	W*; B ≥ 3	W ≥ 120; B ≥ 7			Ground mounted
White on brown	W*; Br ≥ 1	W*; Br ≥ 5	W*; Br ≥ 10	W ≥ 350; Br ≥ 10	Overhead
	W*; Br ≥ 1	W ≥ 150; Br ≥ 5			Ground mounted
Black on yellow or black on orange	Y*; O*	Y ≥ 50; O ≥ 50			①
	Y*; O*	Y ≥ 75; O ≥ 75			②
White on red	W ≥ 35; R ≥ 7				③
Black on white	W ≥ 50				—
<p>The minimum MR levels shown in this table are in units of cd/lx/m² measured at an observation angle of 0.2 ° and an entrance angle of 4.0 °.</p> <p>① For text and fine symbol signs measuring at least 1,200 mm (48 inches) and for all sizes of bold symbol signs.</p> <p>② For text and fine symbol signs measuring less than 1,200 mm (48 inches).</p> <p>③ Minimum Sign Contrast Ratio ≥ 3:1 (white retroreflectivity ÷ red retroreflectivity).</p> <p>* This sheeting type shall not be used for this color for this application.</p>					
Bold Symbol Signs					
<ul style="list-style-type: none"> • W1-1, -2 – Turn and Curve • W1-3, -4 – Reverse Turn and Curve • W1-5 – Winding Road • W1-6, -7 – Large Arrow • W1-8 – Chevron • W1-10 – Intersection in Curve • W1-11 – Hairpin Curve • W1-15 – 270 Degree Loop • W2-1 – Cross Road • W2-2, -3 – Side Road • W2-4, -5 – T and Y Intersection • W2-6 – Circular Intersection 		<ul style="list-style-type: none"> • W3-1 – Stop Ahead • W3-2 – Yield Ahead • W3-3 – Signal Ahead • W4-1 – Merge • W4-2 – Lane Ends • W4-3 – Added Lane • W4-5 – Entering Roadway Merge • W4-6 – Entering Roadway Added Lane • W6-1, -2 – Divided Highway Begins and Ends • W6-3 – Two-Way Traffic • W10-1, -2, -3, -4, -11, -12 – Highway-Railroad Advance Warning 		<ul style="list-style-type: none"> • W11-2 – Pedestrian Crossing • W11-3 – Deer Crossing • W11-4 – Cattle Crossing • W11-5 – Farm Equipment • W11-6 – Snowmobile Crossing • W11-7 – Equestrian Crossing • W11-8 – Fire Station • W11-10 – Truck Crossing • W12-1 – Double Arrow • W16-5p, -6p, -7p – Pointing Arrow Plaques • W20-7a – Flagger • W21-1a – Worker 	
Fine Symbol Signs – Symbol signs not listed as Bold Symbol Signs.					
Special Cases					
<ul style="list-style-type: none"> • W3-1 – Stop Ahead: red retroreflectivity ≥ 7 • W3-2 – Yield Ahead: red retroreflectivity ≥ 7; white retroreflectivity ≥ 35 • W3-3 – Signal Ahead: red retroreflectivity ≥ 7; green retroreflectivity ≥ 7 • W3-5 – Speed Reduction: white retroreflectivity ≥ 50 • For non-diamond-shaped signs such as W14-3 (No Passing Zone), W4-4p (Cross Traffic Does Not Stop), or W13-1, -2, -3, -5 (Speed Advisory Plaques), use largest sign dimension to determine proper minimum retroreflectivity level. 					