

NATIONAL TRANSPORTATION SAFETY BOARD

Office of Research and Engineering
Materials Laboratory Division
Washington, D.C. 20594



May 5, 2008

MATERIALS LABORATORY FACTUAL REPORT

Report No. 08-053

A. ACCIDENT

Place : Minneapolis, Minnesota
Date : August 1, 2007
Vehicle : I-35W Bridge collapse
NTSB No. : HWY07MH024
Investigator : Mark Bagnard

B. COMPONENTS EXAMINED

The components examined were portions of gusset plate removed from the U10 and L11 nodes.

C. DETAILS OF THE EXAMINATION

The examination of the portions taken from the nodes U10 (figure 1) and L11 (figure 2) gusset plates consisted of thickness measurements and hardness measurements. The thickness measurements were taken on the portions of the gusset plates after the paint had been stripped from the material's surface. The measurements were made using a point type micrometer (tables 1 & 2). The hardness measurements were done using the Rockwell hardness B scale (tables 3 & 4).



Figure 1: Portions cut from the U10 gusset plate.



Figure 2: Portions cut from the L11 gusset plate.

Thickness (inch)				
Plate ID	T(1)	T(2)	T(3)	AVG
U10W WP	0.491	0.489	0.490	0.490
U10W EP	0.508	0.509	0.509	0.509
U10E WP	0.505	0.504	0.506	0.505
U10E EP	0.514	0.514	0.515	0.514

Table 1: Thickness measurements on portions of the U10 gusset plate

Thickness (inch)					
Plate ID	T(1)	T(2)	T(3)	T(4)	AVG
L11E EP	0.483	0.479	0.478	0.479	0.480
L11E WP	0.494	0.489	0.487	0.490	0.490
L11W EP	0.485	0.487	0.490	0.486	0.487
L11W WP	0.497	0.498	0.499	0.498	0.498

Table 2: Thickness measurements on portions of the L11 gusset plate

Hardness (HRB)				
Plate ID	T(1)	T(2)	T(3)	AVG
U10W WP	85.6	82.9	82.7	83.7
U10W EP	85.6	83.4	84.4	84.5
U10E WP	84.1	84.4	84.1	84.2
U10E EP	82.4	82.0	82.5	82.3

Table 3: Hardness measurements on portions of the U10 gusset plate

Hardness (HRB)				
Plate ID	T(1)	T(2)	T(3)	AVG
L11E EP	88.1	88.2	88.7	88.3
L11E WP	89.9	93.1	90.9	91.3
L11W EP	89.2	87.8	89.5	88.8
L11W WP	87.7	87.5	89.2	88.1

Table 4: Hardness measurements on portions of the L11 gusset plate

Joseph Panagiotou
Fire & Explosion Investigator