

STEEL RAIL BRIDGE MONITORING

A rock quarry train drove over a short span of a steel rail bridge at 90 mph. The train had drive units on both ends and 8 cars in between. For comparison, LVDTs were installed under the bridge to monitor the vertical displacement of the bridge. The Dynamic Monitoring System was set up to monitor the bridge at similar locations as the installed LVDT instruments. The camera that was selected for the monitoring was able to collect videos at 500 Hz. 0.1 mm measurement resolution was achieved during the test.

The displacement of the bridge can be viewed in the graph below. The initial dips of the data represent the measured displacement of almost 1.4mm caused by the heavier drive-unit. As the 8 cars passed over the monitoring point, the displacement was measured to be 0.8 mm. As the final drive-unit passed over the monitoring point, about 1.4 mm of displacement was observed.

The data represents the similarity in data sets between the LVDT and the Dynamic Monitoring System and shows how accurate the Video Gauge software can measure the dynamic event. The benefit of the DMS is that high resolution measurements can be achieved from a system that is not fixed to the object being monitored.

