Engineered Monitoring Solutions

PROJECT PROFILE

Umpqua River Bridge Structural Health Monitoring System

Reedsport, Oregon

Client:

Oregon Department of Transportation

A statewide structural health monitoring (SHM) system was designed for ODOT by Engineered Monitoring Solutions. The SHM system incorporates a number of different bridges including the Umpqua River Bridge in Reedsport, Oregon. The bridge provides the crossing of Highway 101 over the Umpqua River. The bridge is primarily a concrete bridge with a length of approximately 2,200 feet. The middle span is a steel swing span that pivots on a bearing at midspan to allow passage of boat traffic.

The objective of the SHM system is to monitor the performance of the swing span during operation of the bridge. The swing span is opened and closed using two hydraulic lines. ODOT is collecting data regarding span orientation, hydraulic pressure required to open and close the span, wind speed and wind direction. Span orientation is measured with a rotary encoder. A Measurement and Control Unit (MCU) collects the data from the sensors during a bridge opening at a rate of 100HZ (100 times per second). The MCU also performs calculations and temporarily stores the data until it is automatically forwarded to the SHM data management system using a radio connection to a nearby maintenance station and ODOT's wide area computer network.

The data is being managed by the SHM data management system that permits reviewing of the historical data from a remote location using a web browser. Bridge engineers periodically review the data to assess the on going performance of the swing span.