

Structural Identification And Monitoring Of The Light Poles On The Skyway Span Of San Francisco-Oakland Bay Bridge

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The light poles of the San Francisco-Oakland Bay Bridge (SFOBB) are unique in design, geometry, and function. Each light pole is equipped with a damper system to control the ambient vibration. The light poles are tall steel structures geometrically complex, with welded seams and bolted joints. Due to the complexity of the light poles design, there was a need to develop a monitoring system capable of providing real-time response as well as important dynamic features of the structure. The monitoring system was capable of characterizing the full-scale dynamic response and wind-induced vibrations of the light poles. Field measurements of the light poles were recorded for more than a year. The collected data was analyzed to extract the dynamic response as well as to verify the design assumptions for the poles. Furthermore, the acquired data were used to develop a reduced-order representation for change detection and behavior prediction, under extreme events such as earthquakes and strong winds