

# Memo

505 Petaluma Blvd South  
 Petaluma, CA 94952  
 Ph (707) 766-7700 Fax (707) 766-7790  
 Email – jreyff@illingworthrodkin.com  
 www.illingworthrodkin.com

**To:** Stefan Galvez, California Department of Transportation  
**From:** JARED MCDANIEL  
**CC:** Ivy Edmonds-Hess, Parsons Brinckerhoff  
 Courtney Cacace, Garcia and Associates  
  
**Date:** October 23, 2009  
  
**Re:** San Francisco-Oakland Bay Bridge East Span Seismic Safety Project, Self-Anchored  
 Suspension Span  
  
**Subject:** T1 Temporary Access Trestle Installation – Hydroacoustic Measurements For  
 October 22, 2009

The California Department of Transportation (Department) is in the process of replacing the existing East Span of the San Francisco-Oakland Bay Bridge (SFOBB) with a new bridge immediately to the north. To facilitate the construction of the Self-Anchored Suspension Span portion of the new East Span, twenty 36-inch diameter steel pipe piles will be installed to support a temporary access trestle (see Figure 1). Hydroacoustic data was collected during impact pile driving of two unattenuated piles. Underwater sound measurements were collected at three locations 10 meters (25 feet), 28 meters (71 feet), and 1,000 meters (2,540 feet) from the piles, at a depth of 2 meters (5 feet) on October 22, 2009 for the impact driving of approximately the last 2 vertical meters (5 feet) of the piles #14 and #16. The driving was completed using the Delmag D32-30 diesel impact hammer. Impact driving on October 22, 2009 began at 0754 hours and ended at 0848 hours. There were approximately 300 pile strikes in this time period. The peak criteria of 206 dB re: 1µPa at 10 meters (25 feet) from the pile and the accumulated sound exposure level (SEL) criterion of 187 dB re 1µPa<sup>2</sup>-sec at 28 meters (71 feet) from the pile were exceeded during the driving. The measurement results including accumulated SEL are summarized Table 1 and Table 2 below.

**Table 1: Summary of Measured Sound Levels for October 22, 2009**

Pile	Time	Location	Peak		SEL	
			dB re: 1µPa		dB re: 1µ <sup>2</sup> -sec	
			Mean	Range	Single Strike	Cumulative <sup>1</sup>
1	0754-0757 & 0820-0824	10 meters	203	202-207	182	202
2	0841-0848	10 meters	205	204-209	181	202
1	0754-0757 & 0820-0824	28 meters	198	196-202	174	194
2	0841-0848	28 meters	201	198-204	176	196

**Table 2: Summary of 28-Meter and 1,000 Meter-Measured Sound Levels for October 22, 2009**

Pile	Time	Location	Peak		RMS	
			dB re: 1µPa		dB re: 1µPa	
			Mean	Range	Mean	Range
1	0754-0757 & 0820-0824	1,000 meters	167	163-168	152	147-169
2	0841-0848	1,000 meters	165	158-169	151	146-156
1	0754-0757 & 0820-0824	28 meters	198	196-202	184	182-187
2	0841-0848	28 meters	201	198-204	187	184-190

**Figure 1**

