Ambient Vibration Testing For FEM Calibration

45 Accelerometers Utilized


Pier W1

Mode 1
f=0.250 Hz

Mode 2
f=0.365 Hz
f=0.252 Hz
f=0.360 Hz

Mode 3
f=0.579 Hz
f=0.581 Hz

Mode 4
f=0.606 Hz
f=0.602 Hz

Mode 5
f=0.666 Hz
f=0.679 Hz

Mode 6
f=0.693 Hz
f=0.716 Hz

Mode 7
f=0.867 Hz
f=0.880 Hz

Mode 8
f=0.966 Hz
f=0.970 Hz

Mode 9
f=1.037 Hz
f=1.037 Hz

Mode 10
f=1.145 Hz
f=1.232 Hz
System Identification using Ambient Vibration Data

Time Domain Measurements
Under Ambient Conditions

Pre-Process to Obtain
Random Decrement Data

Frequency Domain Data from
Pre-Processed RDs

CMIF for All Data Combined,
Determine Mode Shapes from
Singular Vectors

Transformation from Physical to Modal
Space by Modal Filtering, Determine Freq
and Damping

Modal Parameters
Mode Shapes: \{\Phi\}
Freq and Damping:
\omega \text{ and } \sigma