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Giant Machine Does Delicate Work in San Francisco's Presidio

Custom rig for Presidio Parkway bridge foundations reduces vibration, protects resources

SAN FRANCISCO, CA – The largest of its kind, it's a machine created specifically for constructing the new Presidio Parkway bridges. It's big, it's blue – and it's an earth-chewing machine currently making its debut in San Francisco. Its purpose? To twist giant, 12-foot-diameter steel casings into the ground, some to a depth of nearly 200 feet. These holes will be filled with steel and concrete to create the seismically safe foundations for the Presidio Parkway's new high viaduct bridges.

Called an oscillator, what makes this machine so unique is the sheer size and depth of the excavation and the technology that significantly reduces noise and eliminates vibration, a requirement in the Presidio, a National Historic Landmark District.

To complement the unique natural setting, the new Presidio Parkway high viaduct bridge was designed with fewer columns and wide spans to open views to the San Francisco Bay and surrounding area. To support the bridge columns, 12-foot-diameter foundation piles are being drilled deep into the ground. In order to dig the huge foundations, the 180,000-pound oscillator was purchased by Malcolm Drilling Company specifically for the Presidio Parkway project.

The machine's unique twisting motion also eliminates disruption to the surrounding ground, minimizing effects on nearby historic and natural resources, and greatly reduces the noise associated with more traditional, brute force pile driving.

"The new Presidio Parkway is being constructed with the utmost care and consideration of the roadway's surroundings inside a national park of historic significance," said Dave Pang, construction manager, Presidio Parkway Project. "This custom oscillator is a good example of how we're using the most advanced technology to build the best project possible. It's very exciting."

<u>How the Oscillator Works</u>

1. The machine oscillates, or twists back and forth, steel pipes (called casings) into the ground. Multiple 40- to 60-foot-long casings must be welded together to reach the full depth of the bridge foundations.
2. As the sections of the casing are inserted into the ground, earth is excavated from within the casing. The casing prevents the ground around the excavated area from collapsing and causing any settling or shifting.

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3. After the earth is removed and a final "rock socket" is drilled into the bedrock to anchor the foundations, steel rebar cages are placed within the socket and casing
4. Then, concrete is poured to fill the casing, which becomes the foundation for a bridge column.

View footage of the oscillator rig and bridge foundation construction in the video section of the press center: www.presidioparkway.org/press_center

View a fact sheet regarding the bridge foundation construction: www.presidioparkway.org/project_docs/files/Oscillator_BridgeFoundationConstruction_Factsheet.pdf

About The Doyle Drive Replacement Project
The replacement of Doyle Drive with the Presidio Parkway is a collaborative effort led by the California Department of Transportation and the San Francisco County Transportation Authority.

Doyle Drive is the portion of Route 101 located within the Presidio of San Francisco that winds 1.5 miles along the northern edge of San Francisco and connects the San Francisco peninsula to the Golden Gate Bridge and the North Bay. Each weekday, more than 100,000 vehicles travel between Marin and San Francisco over the Golden Gate Bridge along Doyle Drive.

Doyle Drive is structurally and seismically deficient and must be replaced. The roadway is facing the same problem that threatens other crucial components of the nation's infrastructure – the ravages of time and continual use. Originally built in 1936, Doyle Drive has reached the end of its useful life. The new Presidio Parkway replacement is based on a world-class design that will improve the seismic, structural and traffic safety of the roadway. It also will be far more sensitive to community needs and to the national park setting, reducing impacts on biological, cultural, historical and natural resources and on the surrounding neighborhoods.

For more information, visit www.presidioparkway.org.
For high resolution images, visit www.presidioparkway.org/contact/press_center.aspx.
Find the Presidio Parkway Project on Twitter or subscribe to the project's RSS feed.

About Malcolm Drilling Company, Inc.
Malcolm Drilling has the largest fleet of rotators, oscillators, and top drive drill rigs in the United States. A leader in the industry, Malcolm Drilling is known for its use of cutting-edge technology to produce the best results for some of the most challenging projects. Founded in 1962, Malcolm is headquartered in San Francisco, with offices throughout California (Hayward, Los Angeles, San Diego, and Stockton) and in Washington, Colorado, Nevada, Utah and Panama. For more information, visit www.malcolmdrilling.com.

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