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**Water Power Sewer**  
Services of the San Francisco Public Utilities Commission



COMMUNITY, ENVIRONMENT, SEWER, TEAM SPOTLIGHT

## Why Protecting Water Quality in the San Francisco Bay is No Joke to Bessie Tam

*Posted by VINCE MAZZAFERRO on JUNE 4, 2020*

Over the last several years, dozens of new buildings have risen in the area known as Mission Bay, and last year San Francisco celebrated the Metallica-themed grand opening of the new Chase Center. This area of San Francisco is growing with housing, offices, classrooms and medical facilities – and toilets. As Metallica might say, if the toilets don't flush, nothing else matters.

"I couldn't have said it better myself!" says Bessie Tam, SFPUC Project Manager for the Mariposa Pump Station Improvement Project. Tam continues, "as more people come to the Mission Bay area to work, live, and play, the sewer facilities have to keep up."



2nd Annual Women in Construction Expo, Empowering Women to Build our Future, Bessie Tam, SFPUC Project Manager, at the podium.

Originally built in 1954, the Mariposa Pump Station is a sewer pump station that conveys wastewater from the surrounding areas to the Southeast Treatment Plant. To accommodate developments from the service areas, including Mission Bay (UCSF hospitals, Chase Center, and other new buildings), Potrero Hill neighborhood, and Third Street, the pump station needs to be upgraded. When completed, the new pump station is designed to handle the increasing wastewater flows and to meet seismic and sea-level rise requirements.

"The unofficial project motto is 'your #2 is our #1 and we'll leave the 3's to the Warriors,'" Tam says with a smile backed by over 20-years of experience tackling complex construction projects in San Francisco's unique urban environment. While Tam has a good sense of



humor about her work, protecting water quality in the San Francisco Bay is no joke.



Crews work on the force main from the Mariposa Pump Station before demolition work began.



Demolition of the original facility completed this spring.

The Mariposa Pump Station, located at the intersection of Terry A. Francois Boulevard, Mariposa Street, and Illinois Street, includes facilities both above and below ground (some as far down as 31 feet!) which help transport wastewater through the network of pipes

underneath our feet. This location was historically part of the San Francisco Bay and had been filled in with soil, rocks and other debris over time to expand the buildable shoreline. These are not ideal conditions for deep excavation.

“Besides coordinating with other nearby construction projects, one of the major construction challenges was how to safely perform the deep excavation in a small footprint, while protecting nearby utilities and buildings,” says Tam. Typically, deep excavation for sewer work involves traditional shoring method using sheet-piles, where metal sheets are pounded into the ground and interlocked to create a safe workspace and prevent nearby soil from entering the project site. High groundwater and proximity to the Bay at this site was a major consideration.

This project's contractor, Western Water Constructors, Inc. hired a specialty company, SoilFreeze, to implement a “soil-freeze method” for shoring the deep excavation. “Western Water decided to use soil freeze shoring for a variety of reasons. We were concerned about high water levels, varying soil types, and unknown conditions underground,” says Josh McGarva, President of Western Water Inc. “The technique reduced the noise and vibration to nearby businesses and residents compared to traditional shoring methods, while still providing structural integrity. This method was relatively simple, quick, and we are now getting ready to start constructing the structural concrete for the new pump station.”



Located just south of the newly constructed Chase Center, the Mariposa Pump Station will accommodate developments from Mission Bay and Potrero Hill neighborhoods.





Ongoing monitoring of the ground temperature is used to calculate the soil strength and ensure stability.

This method involves the installation of pipes, filled with brine (salt water), into the ground surrounding the excavation site, and then chilling the pipes until it freezes the surrounding groundwater. The result is a solid, continuous and frozen wall, which acts as shoring, allowing the area inside this frozen wall to be excavated. In this case, the high groundwater was not a nuisance to the shoring and excavation, but became part of the shoring itself.

Ongoing monitoring of the ground temperature is used to calculate the soil strength and ensure stability of the shoring system. When the necessary work is complete, the soil and

groundwater are simply allowed to thaw, and the ground returns to preconstruction conditions.

After the above ground structure was demolished, Western Water Inc. and SoilFreeze utilized the soil-freeze shoring method to successfully excavate to a depth of 31-feet in April 2020. Over the next year, crews will continue constructing the new facility, which slated to be completed in Fall/Winter 2021.



Rendering of proposed pump station design.



Soil freeze pipes line the outer rim of the excavation site.

“These upgrades are vital to protecting public health and the SF Bay, as this pump station conveys sewer flows to the treatment plant 24 hours a day, 7-days a week, 365 days a year,” Tam shares. “If you are flushing your toilet, this pump station needs to work. At the same time, the health & safety of our hardworking construction workers and city staff are just as important. During this pandemic, we are taking extra precautions at the project site to ensure workers perform health checks, are social distancing, and preventing any potential spread of COVID-19.”

While construction workers and city staff continue this necessary work to keep the toilets flushing and wastewater flowing, workers have received new training and equipment to meet



the new site-specific health and safety requirements in response to COVID-19.

The SFPUC provides essential water, power and sewer services, and repairing, maintaining and upgrading essential infrastructure is a 24/7 job, even during this public health crisis. SFPUC staff are working closely with the entire City family to monitor developments in the COVID-19 situation and are responding when new information is known to protect the safety of our workers and the public. As essential upgrades continue, please help us by maintaining proper social distance from any construction or maintenance crews you may come across in our construction projects.

The Mariposa Pump Station Improvements Project is part of the Sewer System Improvement Program (SSIP), a 20-year citywide investment to upgrade our aging sewer system and provide a more reliable, sustainable, and seismically safe system now and for future generations.



The original Mariposa Pump Station facility built in 1954 close up.