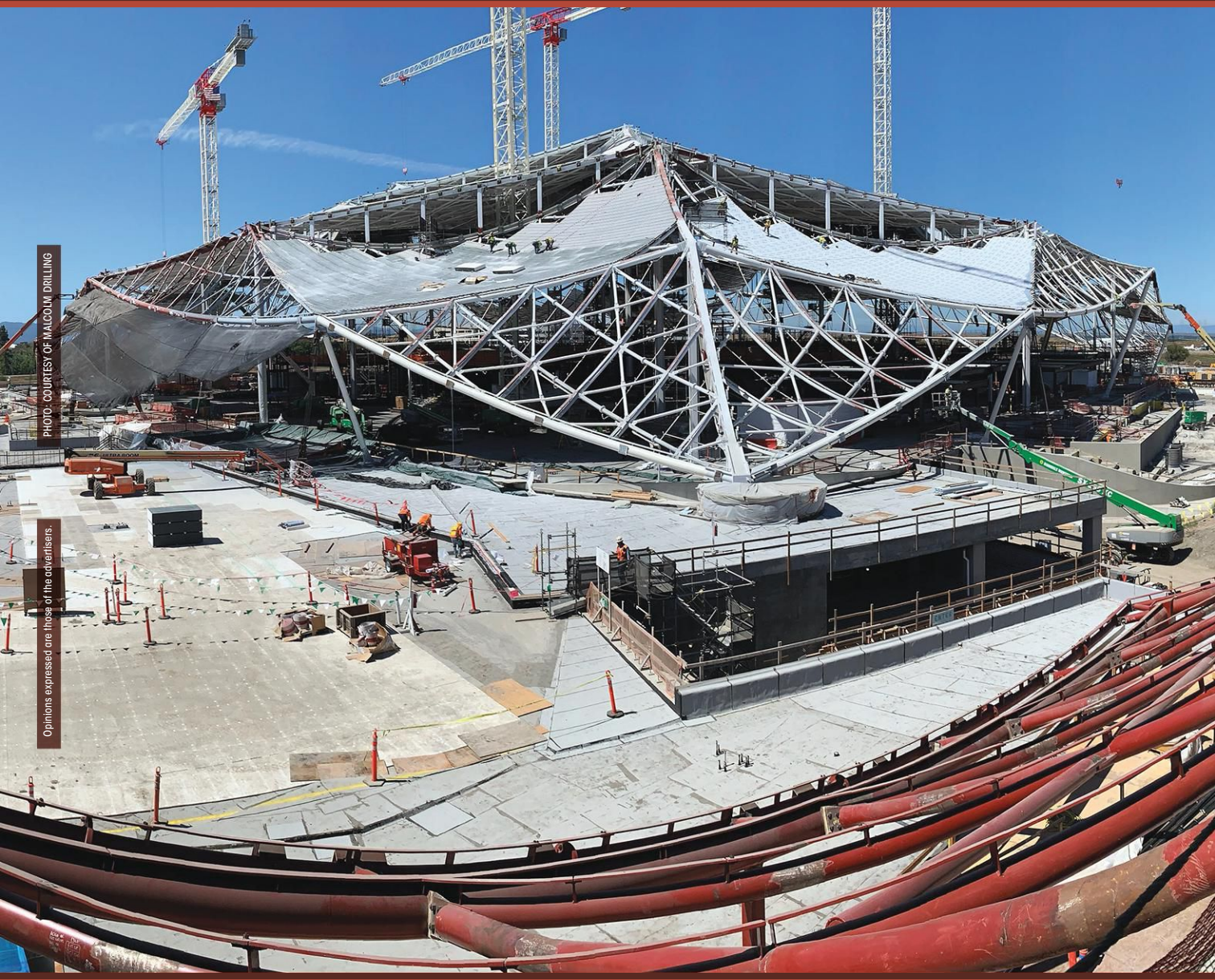


PHOTO: COURTESY OF MALCOLM DRILLING

Supporting Endeavors

Energy piles at the Google Bay View campus create a regenerative facility with an exchanger system that transfers energy.

Meeting infrastructure needs below the surface

By Kate Gawlik

WHAT'S INSIDE

Functional Fiber Networks

The Internet for All initiative was launched by the Biden-Harris Administration in May. Working and learning from home during the pandemic highlighted the disparity in who has and does not have access to the Internet. The program caused some to question if the necessary infrastructure exists to support the endeavor.

With federal and state programs increasing connectivity and expanding 5G networks in rural areas, the opportunity for infrastructure advancements to keep people online and connected is high.

PHOTO: VIOLETASTOIMENOVA/ E+ / VIA GETTY IMAGES

"In the 21st century, you simply cannot participate in the economy if you don't have access to reliable, affordable high-speed internet," says U.S. Commerce Secretary Gina M. Raimondo. "Thanks to President Biden's Bipartisan Infrastructure Law, Americans across the country will no longer be held back by a lack of high-speed internet access."

In conjunction with this, cities like Chicago, Miami and Philadelphia have created student broadband programs. Chicago Connected is a $50-million, four-year program that brings qualifying households free internet. With the pandemic, it was noted that low-income students were falling farther behind. This K-12 internet connectivity program—the largest in the country—is expected to reach 228,000 students by 2024, after already bringing high-speed broadband to 64,000 Chicago public school students.

With such initiatives, many municipalities are left wondering: do they wait for their fiber network to fail and fix it, or should they preemptively start digging? Rural areas with lower rates of connectivity have seen the greatest leap in fixing this problem and bringing updated underground fiber networks to more homes. In addition, as 5G networks are adopted by the telecommunications market, the opportunity for infrastructure advancements is even higher. This is a market to watch for increased construction demand. ◆

Laying the Foundation With Energy Piles

The Google Bay View campus, located adjacent to NASA's Ames Research Center in Mountain View, Calif., houses 4,000 employees on its first ground-up developed campus. In partnership with Brierley Associates, Malcolm Drilling designed and constructed the largest geothermal foundation system in the U.S., incorporating energy piles while providing a sustainable and environmentally friendly solution for the campus.

The foundation system, comprised of drilled displacement piles (Omega piles), incorporates a geothermal cooling and heating system. Of the almost 4,000 Omega piles installed to carry the building loads, about 2,500 piles were equipped with a geothermal loop system, also known as an energy pile. The energy pile is not only the foundation structure but also the exchanger system. It transfers energy from below the ground to the building above using heat pumps. As a result, during the colder winter months, the geothermal system uses ground heat to keep the building warm and reverses this process in the warm summer months where the ground temperatures are used to keep the building cool.

To validate and optimize the design of the energy piles, an extensive pile-load test program was created and installed. The test program allowed the operator and geotechnical engineer to observe the integrity of each pile being installed in real-time.

Having installed energy piles into Google Bay View's foundation system, Malcolm Drilling has helped the facility to become a more environmentally friendly and regenerative facility. Discover more at www.malcolmdrilling.com. ◆

The largest geothermal pile system in the U.S. has nearly 100 miles of pipes and the equivalent of 12 American football fields of covered surface area.

PHOTO: COURTESY OF MALCOLM DRILLING

MALCOLM

Energy Foundations

Malcolm's expertise in developing and implementing sustainable and environmentally friendly foundation solutions are invaluable. Energy Piles are an innovative option to utilize the deep foundation elements to not only support the building loads, but to also harvest energy for heating or cooling. By exchanging thermal energy between the ground and the building, the piles and their integrated geothermal loop system can be utilized as a ground source heat pump. At Google's newest campus, Malcolm installed the largest integrated geothermal pile system in North America. When you need a solution that requires Malcolm's expertise, contact them at **Malcolmdrilling.com**

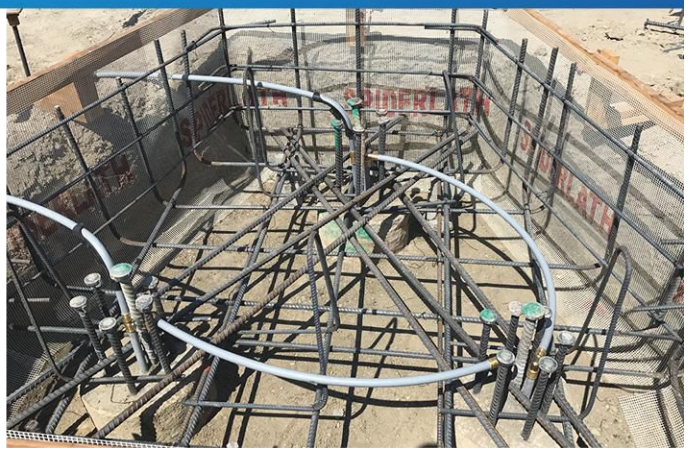
Design Build/Assist

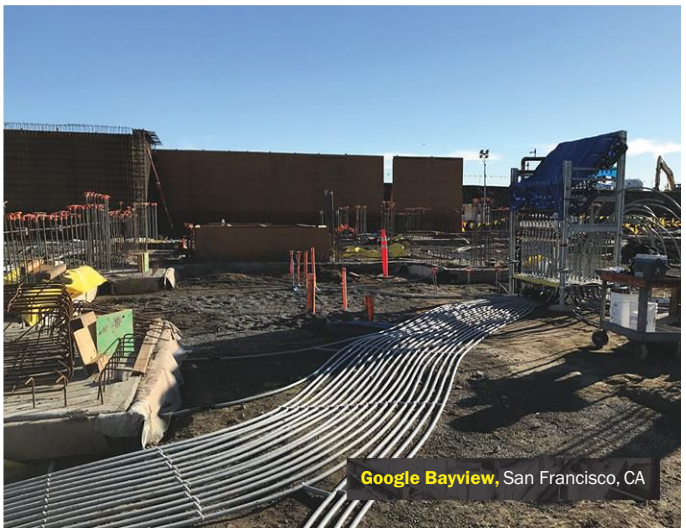
Deep Foundations

Retention Systems

Ground Improvement

Dewatering





Google Bayview, San Francisco, CA