



# T Technology - Changing the Face of Construction



**ENGEO VIEW**

November 2019

# How Technology is Changing the Face of Construction

by Ksenia Chabanenko  
TraceAir

According to KPMG's global survey, only 25% of construction executives believe the industry is delivering projects on time and within budget. Equipped with automation software, companies can deliver projects with higher efficiency – below budget and ahead of schedule.

Experts agree that the construction industry will be fully automated in our lifetime. With drones and AI, 3D printing and automated machinery, construction is a perfect stage for showcasing the technological revolution.

A compelling example of how this vision can work today is TraceAir, SaaS for construction, powered by drone data and machine learning, which effectively bridges the gap between the field and the office in three steps:

- Completing drone flyovers to create high-resolution imagery and accurate 3D models of a construction site;
- Comparing the drone topographical model with the design documentation;
- Empowering the entire project team with insights for timely and informed decisions.



The most impactful products result from collaboration between experts in the industry and technology. A great example of such collaboration is the site balance solution developed as a joint effort by ENGEO and TraceAir to address challenges on one of the largest earth-moving projects in California.

About 80% of land development projects experience significant earthwork imbalance issues due to inaccurate original topography, and lack of data and regular updates. Addressing this problem halfway through a project or at the end often costs hundreds of thousands of dollars for soil export/import, as well as months of delay.

These issues can be resolved with solutions like TraceAir, which provides comprehensive estimates to balance the site with minimal resources. The solution developed suggests effective grading strategies and optimal haul roads, prevents delays during the grading stage, and provides easy-to-use tools to check quantities in the field, while making the data instantly available and offering ML-powered insights.

TraceAir analysis and comparison tools have enabled ENGEO to review cross sections and track the corrective grading progress faster. In addition, the site-balancing tools have already proved invaluable in eliminating the guesswork on shrink/bulk estimates.

[Traceair.net](https://Traceair.net)

# Advancing Field Testing Efficiency and Quality

by Gilead Wurman, PhD  
San Ramon, California

ENGEO has begun field deployment of an exciting new technology in soil moisture and density testing: Gauge Integration and Precise Positioning Retrofit, or GIPPR™. The culmination of over a year of in-house development, GIPPR brings nuclear soil density/moisture gauge technology into the 21st century with wireless cellphone control, cloud connectivity, and precise GPS positioning.

GIPPR is designed to easily mount and un-mount from select nuclear gauges, with only minor modifications to the original gauge. When mounted, GIPPR allows our field representatives to take tests, read density and moisture measurements, determine whether the test passes or fails, and upload the results to the cloud—all using a mobile browser on a smartphone.

This all-electronic workflow significantly increases efficiency by taking more tests in less time, allowing more time to observe construction throughout the day. With integrated, high-accuracy GPS and digital data recording, GIPPR simplifies the process of locating and recording test results, and effectively eliminates data entry errors and test mislocations.

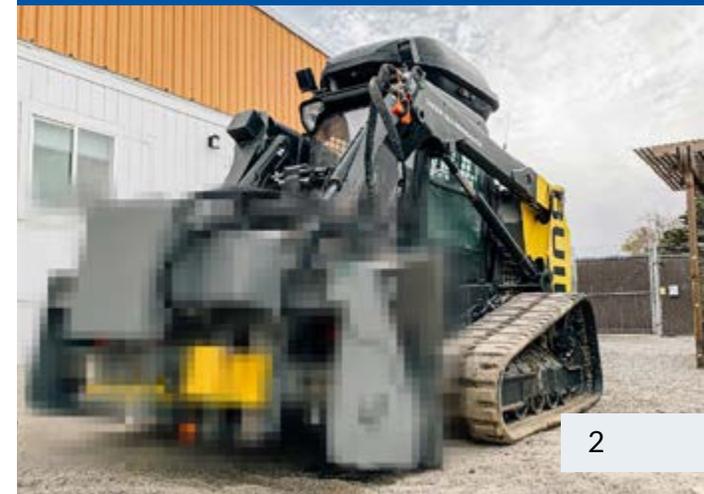
GIPPR's secure communications and auditable, tamper-proof data streams provide peace of mind that project data will hold up to scrutiny, both on a daily basis and for years to come. The technology means that engineers and field technicians can instantly verify the exact location and outcome of every test taken on a project, and

feel confident knowing that the integrity of the data will be maintained as long as it is needed into the future.

ENGEO has applied to patent the technology behind GIPPR, and is the only company to field this technology. We continue to strive, not only to meet or exceed the standards of practice in geotechnical engineering, but to set those standards for the entire industry.

## WATCH THIS SPACE!

New frontier in construction automation coming in future issue.



# ENGEO Acquires Geotechnical Consultants (GTC)

by Carrie Andreotti, CPSM  
Rocklin, California

Two leading geotechnical and environmental engineering firms have joined forces, as ENGEO Incorporated announces a friendly acquisition of Geotechnical Consultants (GTC), a long-time San Francisco local business enterprise (LBE).



Uri Eliahu, President and Neel Neelakantan, Principal

The transaction creates one of Northern California's most comprehensive geoscience companies, with more than 80 registered Geotechnical, Geologic and Environmental professionals and a total staff of more than 300 professionals located throughout California, Nevada, Washington, New Zealand, and Australia.

Uri Eliahu, ENGEO's President and CEO, says, "This merger is all about our clients. We're eager to extend our absolute dedication to GTC's clients and focus on their needs. Likewise, GTC's expertise will bring a new level of service to ENGEO's clients. Combining the companies will result in a powerhouse of talent equipped to tackle any project. This is a great step in advancing ENGEO's vision to be the most admired and trusted service firm in the world."

Neel Neelakantan of GTC, says, "We're excited to tap into ENGEO's formidable resources and bring their unique, client-focused and technical capabilities to our clients. In addition, combining ENGEO's and GTC's intimate familiarity with the Bay Area's geotechnical and seismic setting will significantly enhance the value that we bring to our clients."

Neel Neelakantan, a 30-year industry veteran in San Francisco, will continue to serve projects from the firm's San Francisco office. James Thurber brings 35 years of experience and will continue to lead geologic and hydrogeologic efforts from the Lake Forest office in Orange County.

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## About GTC

Since 1964, GTC has provided consulting services in geotechnical engineering, engineering geology, and hydrogeology, primarily for public infrastructure projects. They bring expertise in these disciplines to a wide range of infrastructure projects such as the planning, design, and construction of pipelines, tunnels, pump stations, municipal buildings, roads, bridges, light rail systems, dams, reservoirs, water and wastewater treatment facilities, outfalls, retaining walls, embankments, airports, and port facilities.

# Future Engineers Put Their Skills to the Test

by Melissa Glickman  
San Ramon, California

The values at ENGEO include a strong dedication to growth and education. This commitment is made not only for current staff, but also for students preparing to graduate and start their engineering careers.

This summer, ENGEO had the opportunity to mentor 14 interns in U.S. by providing hands-on-experience in the office, field, and materials testing laboratory.

The New Zealand internship program is set to begin this November, welcoming five interns to our Auckland, Wellington and Christchurch offices.

ENGEO offers a unique opportunity for interns to get their hands dirty from the start. Interns were exposed to diverse projects in a multi-disciplined environment with guidance and mentorship from our high-performing and passionate team.

Developing future leaders is an important initiative for the industry as it provides valuable collaboration through real-world experience and academics, driving innovation and contributing to a bright future for graduates and the profession.



"I am really appreciative of how quickly I was trusted with important work, and how soon I was able to take on as much responsibility as I could handle. I have grown in ways a text book can not teach."

- Michael Schillage  
Brigham Young University

"I'm thankful I had the opportunity to gain real work experience with ENGEO. I'm pleased with the idea that when I continue my classes throughout my academic year, I'll be able to connect the knowledge and skills from my internship to my courses."

- Tyler Tam  
CSU, Sacramento





## US Regulatory Update

# California Governor Signs SB 330, “Housing Crisis Act of 2019”

Reprinted with permission from the office of State Senator Nancy Skinner.

On October 9, Gov. Gavin Newsom signed into law Senate Bill 330, the Housing Crisis Act of 2019, by state Sen. Nancy Skinner, D-Berkeley. SB 330 is designed to speed up housing construction in California during the next half-decade by slashing the time it takes to obtain building permits, limiting fee increases on housing applications, and barring local governments from reducing the number of homes that can be built.

SB 330 received bipartisan support in both houses of the Legislature, winning approval in the Assembly on a 67-8 vote, and in the state Senate, on a 30-4 vote. The new law takes effect Jan. 1, 2020 and sunsets in 2025.

SB 330 is based on the premise that much of the housing California needs has already been approved in concept by local governments through existing zoning rules, housing elements, and other plans. According to a 2019 report by UCLA Lewis Center for Regional Policy Studies, California cities and counties have approved zoning for 2.8 million new housing units.

But that housing is not getting built. In fact, the number of residential building permits in the first six months of this year plummeted nearly 20% compared with the same period in 2018.

Recent studies have pointed to two major causes for the homebuilding slowdown: Cities and counties often levy burdensome fees on housing projects, and those trying to build housing, whether a single-family home or a multi-unit affordable development, frequently face lengthy delays after submitting their permit application.

SB 330 is designed to address these problems. Until 2025, the new law requires cities and counties to slash the time it takes to process permits for housing that meets the local government's existing rules, and it caps the number of public hearings on a housing project proposal at five. Cities and counties are also prohibited

from hiking fees or changing permit requirements once the project applicant has submitted all the preliminary required information. Additionally, urban areas are barred from changing building design standards, reducing the number of housing units allowed (downzoning), establishing a population cap, or enacting moratoriums on new housing construction.

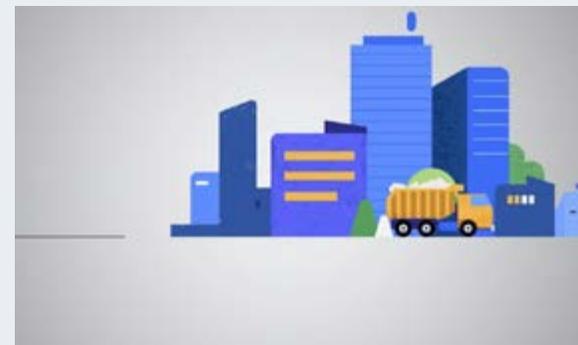
The new law also includes anti-displacement measures: It bans the demolition of affordable and rent-controlled units unless developers replace all of them, pay to rehouse tenants, and offer those renters first right of return at the same rent.

“Scarcity drives up cost, whether you are paying rent or trying to buy a home,” Skinner says. “And the skyrocketing cost of housing hurts all of us, whether it’s our neighbors who are driven out of the communities they grew up in or the many who end up homeless. SB 330 helps us get more housing now. We need it fast.”

Sen. Nancy Skinner represents the 9th Senate District and is the Senate majority whip. Read the full press release at: <https://sd09.senate.ca.gov/> <https://sd09.senate.ca.gov/news/in-the-news>

# Carbon Crunchers

The problem with  
concrete....



ENGEО New Zealand is focusing on the area of carbon sequestration products, with a project underway called Carbon Crunchers.

“We’re looking at creating building products made from material that sucks carbon dioxide out of the atmosphere,” Greg Martin explains. “We’ve got laboratory trials under way in the United States to grow carbon crunching organisms that create limestone by combining calcium and carbon dioxide.”

Talks are now taking place with the University of Canterbury in New Zealand to undertake research on making building products using these carbon crunchers.

# Ancient Mammoth Tooth Discovered in Tomales Bay

by Gilead Wurman, PhD  
San Ramon, California

In early October, ENGEO geologist James Allen received a phone call from the Audubon Society and Golden Gate National Recreation Area about a fossilized mammoth tooth that had been found on the shore of Tomales Bay. The fossil was in the intertidal zone and was actively being eroded away by the waves, so time was of the essence.

James traveled to the site of the find and quickly established a plan to excavate and remove the fossil. With the help of volunteers from GGNRA and the Audubon Society, the tooth was extracted in two days, and now resides at the Audubon Society's Cypress Grove Research Center.

In the process of excavating the fossil, James made note of the unique geology of the fossil site: claystone overlain by a heavy fluvial conglomerate of local greenschist and blueschist, amphibolite, and eclogite. The geology suggests the fossil originated east of Tomales Bay, in the Franciscan Complex near Petaluma.

The Carbon-14 age of the Tomales Mammoth can be correlated with



historic eustatic sea-level change in the Bay Area, and this information, together with the site geology, will help inform our broader understanding of the geologic history of the Bay Area as it pertains to other shoreline projects around the Bay.

The California Environmental Quality Act (CEQA) requires paleontological studies of excavation work, but often a firm finds in review that the person

conducting the paleontology work on-site is not a professional geologist.

ENGEO has paleontologists with PG certification and can provide a higher level of service on paleontology jobs, giving our clients the edge in reviews and often, as in this case, yielding unexpected inspiration in the course of our work.

# Innovation Through Collaboration

Joanne Lynch  
Christchurch, New Zealand



Each year, Team Business Planning events are held in both the United States and New Zealand, and this year 75 employees from our New Zealand and Australia offices met in Christchurch. It's our annual opportunity for the New Zealand and Australia offices to come together and is a key component to creating and reinforcing our culture.

Through these annual events, we have discovered that the best strategy is to have an amazing culture where people are happy and challenged. The concept of ONEGEO was created to embody one purpose and one culture. This is our deliberate effort to collaborate as one family, across disciplines, cities and continents. Encouraging staff from all ENGEO offices to get to know each other,

we increase the sharing of professional knowledge, which means our clients have access to the best in the business wherever their projects are located.

While it's voluntary to attend, we have around 90% participation, which is fantastic engagement. We review projects, highlight technical excellence, and celebrate awards.

"Everyone was really excited to reflect on what we've already accomplished and to see what we can all do together," says Guy Cassidy, ENGEO's Chief Operating Officer for New Zealand and Australia.

Check out the New Zealand day's highlights here:

<https://www.youtube.com/watch?v=SmAgd63jffU&version=3&hl=en%5FUS&rel=0&autohide=1&autoplay=1>



**NBC  
Meteorologist  
Rob Mayeda  
presents at  
ENGEO**

ENGEO welcomed Rob Mayeda, meteorologist with NBC Bay Area, to give a presentation on climate change and the factors accelerating the impact of the extended fire seasons in California.

Rob showed many highly sophisticated, real-time, and predictive graphic models for wind velocities, temperatures, humidity levels, and atmospheric characteristics of weather patterns. His talk was directly applicable to ENGEO's work involving geologic hazard monitoring, construction-phase stormwater, excavation, and other disciplines that rely on weather predictions.

Rob provides weekend forecasts and contributes to weekday weather coverage for NBC Bay Area. He also produces and reports on weather-related news specials, including the award-winning "On Thin Ice," a report on climate change affecting Alaska's glaciers. The American Meteorological Society recognized this with its "Excellence in Scientific Reporting" award for "highlighting the importance of climate change's relevance to future impacts to the San Francisco Bay Area."

Rob's career began as an ABC News production associate for "20/20" and "Primetime Live." He later joined the local news assignment desk at KNBC in Burbank, where he worked in news special projects also seen on CNBC. Before calling NBC Bay Area home, Rob worked at KIRO (CBS) in Seattle and at KCRA (NBC) in Sacramento. Rob is also a guest lecturer at Cal State East Bay for meteorology, geology and planetary science courses.

Follow Rob @RobMayeda



# Celebrating Recent Awards

## Kaikōura Earthquake Recovery - Main North Line Restoration Project Wins Again

KiwiRail, the NZ Transport Agency and the NCTIR project have won another international award, the American Railway Engineering and Maintenance-of-Way Associations (AREMA) 2019 W.W. Hay Award for Excellence. The award recognizes the work done to restore the Main North Line, following the Kaikōura Earthquake.

## 2019 Westpac Auckland Business Awards – North & West Finalists 2019

“These awards bring together businesses to showcase their talent, their strategic thinking, marketing, customer service, and much more. Our winners and finalists are today's employers and tomorrow's wealth providers. They deserve to be recognized and celebrated,” says Auckland Business Chamber CEO Michael Barnett.

## 2019 Westpac Champion Canterbury Awards

The Westpac Champion Business Awards recognize and celebrate the excellence, innovation, and success of businesses and not-for-profit organizations in the Canterbury region in New Zealand. ENGEO entered the Christchurch Casino Champion Service Delivery – Medium/ Large Enterprise, recognizing customer centric businesses driven by effective leadership and an engaged workforce. Winners are selected for achievement of consistent growth and strong financial performance; surpassing the expectations of customers; leading standards of service; and continually innovating to enhance the customer experience. ENGEO was one of three named finalists in this category.

## 2019 Wellington Gold Awards

ENGEO was honored to be recognized as one of five finalists in the ‘Team Gold’ category. The awards acknowledge the Wellington region’s successful businesses and their outstanding owners, managers and teams. The Team Gold category highlights organizations' investment in people, wellness, and HR programs.

