Webinar Questions and Responses
Subsurface Data-Enriched Site Intelligence | July 2025

For your CPT example, what was the geology?

As we said on the call, we had not confirmed the location of this CPT log, but we expect that the example was from a site within alluvial depositions of Holocene Age. CPT testing is highly effective in such geological settings. The U.S. map that we displayed, showing locations where CPT is most effective, is dominated by this geologic setting. Over the past decade, more robust CPT tools and push platforms have allowed the use of CPT technology in more areas. With proper review of historic explorations in the area, CPT refusal may be the appropriate termination of exploration.

When deeper data is desired, Measurement While Drilling (MWD) shows great promise to be the perfect companion tool for CPT. Basically, we can probe subsurface with CPT until refusal is encountered. Below that depth we can rotary drill with MWD techniques to render a data-rich profile below CPT refusal.

What are the typical file formats for 3D models that clients normally utilize?

We would have to answer this question at this time with a general response that the profession has not had the opportunity to define what a typical file format would be for 3D subsurface models. Many software vendors either now offer, or they are in the process of developing 3D modeling/visualization capabilities. Terracon has initiated our own plans to develop 3D models for our Site Characterization data. We believe that a critical part of the software will be compatibility with our clients' particular needs. We do plan a functional interaction with AutoCAD Civil 3D, recognizing this as a universal tool for most designers.

I know, Vic, you have been a big proponent of innovation in exploration methods. What changes has Terracon seen in the last 10 to 15 years in terms of moving away from traditional exploring methods (Standard Borings).

The limitations of traditional methods are what drew us to integrate and develop better technology and methods like CPT, MWD, Geophysics, and Stage1/Pivvot over the past 10-15 years. We're not just replacing the old exploration methods with new ones. We're developing the most dynamic, robust site characterization workflow the industry has seen.

Change has been slow. In the past 5 years, due to our effort to enhance the use of CPT for geotechnical engineering, we have seen a significant increase in its acceptance. We would estimate that about 20% of our work is CPT (when SPT would have traditionally been used). However, this is far less than is possible, so we are trying our best to enhance the use and the acceptance of CPT. This webinar is an example of that effort.

Now, with the technology available to capture Measurement While Drilling (MWD) data, we are optimistic about the potential for rapid uptake of this data-rich exploration tool. Not much yet, but we expect MWD methodology to become typical in the next 2-3 years.

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With Terracon's in-house data, can the boring frequency be reduced?

It stands to reason that access to 60 years of exploration data can allow for a reduced field exploration work scope in many areas. This is not only potentially a cost-saving opportunity for our clients but also an excellent sustainability consideration and may reduce exploration time.

What is perhaps even more important is the ability to know what we expect to encounter at a site, so that we can use innovation more effectively. For example, if we see soil conditions that can be explored by CPT, then we can use this advanced technology. Or perhaps we have data to indicate large variation in depth to rock. We can plan for the proper geophysical survey tools to better define this variable, and we may be able to reduce the number of exploration points (aka: soil borings).

I've worked on projects before using Bentley iTwin integrated with OpenGround, LeapFrog, OpenBridge, OpenRoads, etc. How does this 3D characterization work for projects across disciplines, and integrate the design to a single model-first design process?

The Bentley software suites that you mention are among the leaders in this space, and its compatibility with OpenGround is attractive, primarily for transportation projects.

Using the words from your question … we are unaware of this ability for this 3D characterization to work on projects across disciplines. But we see, and we are a part of, efforts to provide a capability for integration into existing civil design and GIS software.

Partnering early with us, and having that end goal in mind, will help us prepare the data collection and formatting to enable this.

What typical limitations would you expect to encounter on this type of deliverable format, and how do you communicate this effectively to the client?

This is certainly a provocative question! We expect that "this type of deliverable format" that you mention is a digital-data-rich deliverable, strong on visualization, limited on the written word. We also mentioned our plans to incorporate embedded engineering to allow foundation capacity and settlement calculation, for example.

Typical limitations that we expect will be primarily related to change management. Our profession is ready to embrace AI-derived solutions, with highly effective visualizations, to the point where, as we mentioned on the Webinar, we will be performing geotechnical engineering like playing a video game! We plan for AI assistants to summarize the engineering, insert the minimal language necessary to convey the message, and render a final work product.

Like integrating visualization with embedded engineering, we expect that the work of the site characterization specialist will become the canvas upon which the geotechnical, civil, and structural engineers provide their final designs.