

## JANUARY 2014 MEETING

Wednesday, January 8, 2014 (1.5 PDH)

### TECHNICAL PROGRAM

#### Overall View of Techniques - Ground Improvement Specialists

**Speaker:** [Chad Gordon](#) joined Menard in July 2013 as Business Development Manager. In this role, Chad leads the company's sales and business development efforts in the Gulf Coast region. Menard is a specialty design build ground improvement contractor that provides ground improvement services for sites with soft ground. Ground improvement is used to reduce settlement and increase bearing capacity for soft soils.

Chad earned his Bachelors of Science in Civil Engineering from Texas A&M University. Before joining Menard, he worked as a geotechnical engineering consultant based in Houston, Texas.

### PRESENTATION SUMMARY

To an audience of about 50 Chad Gordon provided an overview of ground improvement methods with the primary focus on wick drains and Controlled Modulus Columns (CMC's). The discussion focused on techniques that are relevant to the gulf coast.

Mr. Gordon discussed methods to select or determine the most effective method when choosing the best technology or technique for ground improvement. The three primary categories that drive the selection are Densify, Consolidated, and Stiffen. Charts and graphs were presented to assist in the selection process including optimized treatment depth, machinery, and soil materials.



Ground improvement can offer economical alternatives to conventional systems such as driven piles. Improvement methods such as wick drains are most suitable for coastal sands and dredged areas and are not considered effective for clay soils. The use and application of wick and strip drains was discussed at length. Maximum depths for wick drain applications were indicated to be 160+ feet deep and used most commonly for large mass applications such as tanks. Numerous examples were presented.

Controlled Modulus Columns (CMC's) were also discussed at length. The method used creates a bore hole to the required depth, and then the bore hole is filled with grout which provides a strong dense replacement material. The grout is injected into the bore hole through an annulus as the drilling head is withdrawn from the bore hole. The method of column installation does not remove in place soils but rather displaces the soils laterally which densifies the surrounding soils creating a bore hole with rigid walls and very little spoils material. The method reduces bulging of the replacement material when it is placed in the bore hole.

Mr. Gordon noted that every CMC job produced by Menard is designed using a variety of software programs including LPILE™, etc. Each bore hole can be monitored real time to measure a variety of data. Real time measurements ensure that all work meets design and specification requirements without the need for corrective work. For cost effectiveness, the column depths and sizes can be varied to maximize material efficiency. Numerous projects and examples were shown including the use of CMC's to support Mechanically Stabilized Earth (MSE) walls and levees in both swampy and seismic areas.

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