

MARCH 2007 MEETING

Wednesday, March 8, 2007

TECHNICAL PROGRAM

Construction Dewatering

Speaker: Harry Bagherzadeh of Griffin Dewatering Southwest, LLC., Houston, TX., Tel. 713-676-8000.

PRESENTATION SUMMARY

To an audience of about 30, Harry Bagherzadeh, Ph.D, Project Engineer/Manager of Griffin Dewatering Southwest, LLC., gave a slide presentation entitled, "Construction Dewatering." Mr. Bagherzadeh has a Bachelor of Civil Engineering from University of Minnesota, Master of Science in Civil Engineering and a Master of Science in Agricultural Engineering from South Dakota State University, and a Ph.D. in Agricultural Engineering from Penn State University.

Mr. Bagherzadeh presented several groundwater control methods that are primarily used where the presence of groundwater would inhibit an excavation that is required during construction of a project. Usually, his company is called out to lower the water table caused by a confined or unconfined aquifer. He defined an aquifer as an underground river that occurs in a soil formation that allows water to flow

Mr. Bagherzadeh further defined two types of aquifers. One is a confined aquifer, which is one where the groundwater in the flowable soil formation is sandwiched under pressure between impermeable layers such that when a borehole penetrates the aquifer, the groundwater level rises into the impermeable layer above. The other is an unconfined aquifer, where the soil above is more permeable so that the water table does not rise when penetrated.



Mr. Bagherzadeh described three methods Griffin commonly uses to dewater sites: Wellpoint, Deep Well and Eductor Well. The wellpoint system is used for shallow aquifers, down to 15 or 20 ft, such that a pump at the surface can pull the water out via a single riser by vacuum. The deep well system is installed down to 100 ft or more and has a downhole electric pump that pushes the water to the surface through a single riser. The eductor well can do everything the deep well can and more by using two risers, one of which is a high pressure line (100 - 120 psi) and the other is a return line. The educator orifice at the tip creates a vacuum that helps pull the water to the surface.

All three methods use a header system that loops around the excavation at grade level. The number of wells that tie into the header may be spaced as close as 3 ft, depending on the stratigraphy. The casings, risers and headers are made of PVC. Each system is specially designed for the project, taking into account the soil, groundwater hydrology, excavation size, method of excavation, proximity of nearby structures, the design of the proposed structure, the nature of the contamination, the discharge locations, and the project schedule.

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