

**MAY 21, 2003** - What is the Difference between PVR, PVM and Ym for Geo-Structural Models?

Speaker: John T. Bryant, PhD, P.G., P.E., President of Bryant Consultants, Inc., Carrollton TX, Tel. 972-713-9109.

*Dr. Bryant has BS and PhD degrees from Texas A&M in civil engineering. In addition, he has a BS degree in Geology and an MS in Geomorphology, also from Texas A&M. He is a registered professional engineer in Texas and a registered professional geologist in Tennessee. Since forming Bryant Consultants Inc. in September 1996, Dr. Bryant has developed and patented the GMMIR method for measuring soil resistivity in order to locate moisture and anomalies in 3D. His company specializes in Forensic Engineering and Site Characterization*

## **PRESENTATION SUMMARY**

To an audience of about 30, Dr. Bryant discussed the three categories for predicting soil movements: Empirical, Theoretical Analytical, and Direct Laboratory Swell Test Measurements. The empirical category is based on McDowell's PVR method which Mr. Bryant showed to be highly inaccurate in a 1995 paper. He instead preferred the various theoretical approaches developed by McKeen, Lytton and Fredlund. He said there are two viable methods in using the theoretical approach to predict soil movement: Total Matric Soil Suction and Effective Stress.

Dr. Bryant said we typically have foundation performance issues because we misunderstand the complexity of the soil-structure interaction. He said that subsurface anomalies are typically the rule rather than the exception. He talked about collapsible soils but said there is no documented evidence that they exist in Texas. He presented slides showing subsurface profiling in 2D and 3D using his patented GMMIR Resistivity method and other methods offered by his firm, such as Ground Penetrating Radar (GPR), in order to locate these anomalies. He also showed state-of-the-art methods for site characterization using aerial overlays which is a service his firm offers typically to builders in the Dallas area.

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