

## **MAY 2013 MEETING**

Wednesday, May 8, 2013 (1.0 PDH)

### **TECHNICAL PROGRAM**

#### **How to use Mathcad to do contour and surface plots for foundations**

**Speaker:** John M. Clark is the principal and owner of John Milton Clark Engineers, Inc. Tel: 936-273-6200 John M. Clark is the principal and owner of John Milton Clark Engineers Inc., and is a licensed professional engineer in Texas, New York, and Arizona. Mr. Clark holds a Master of Science in civil engineering from Oklahoma State University in 1976, with emphasis in advanced structural engineering and design, and foundations engineering; and a Bachelor of Science degree in physics from Central State University in Edmond OK in 1972, with minors in mechanical engineering and mathematics.

Mr. Clark worked three years in the pre-stressed concrete manufacturing industry as a quality control inspector and engineer. He next spent about one year with an A & E firm in Oklahoma City working on foundation designs and interstate highway bridge design, and about three years in the petrochemical design field at Bechtel in Houston working as a structural design engineer. He spent 12 years with Owens Corning Fiberglas' Non-corrosive Products Division in its Product Development Group in Conroe, TX, working in the areas of fiberglass tanks and buried FRP tanks and pipe.

Mr. Clark holds two patents in Fiberglass underground storage tanks: No's 4,561,2921 - Design of Fiberglass Double Walled Storage Tanks, and 6,167,608 B1 Tank Upgrading Method and Tank Assembly.

John Clark formed Clark Engineers in 1989, and has subsequently consulted on a broad range of structural areas. These range from general civil and structural engineering to specific forensic failure investigations of foundations and buried tanks, to specialized stress analysis, testing and product design of manufactured structural products, encased buckling analysis of buried structures, composite sandwich structures, and mechanical engineering for manufacturing plants.

### **PRESENTATION SUMMARY**

To a crowd of about 65, John Clark of Clark Engineers in Conroe Texas gave an informative presentation on the some of the uses of MathCAD™. MathCAD™ is a powerful live mathematical calculator. MathCAD™ is essentially a graphics spreadsheet that can be customized for a variety of uses and formats. Mr. Clark demonstrated how MathCAD™ can be used like a spreadsheet to build repetitive and complicated algorithms and formulas into a readable format that is easy to revise and edit.

Mr. Clark then went on to demonstrate how MathCAD is compatible with other software programs such as AutoCAD™ and can be used to convert numeric data into a graphical display. Mr. Clark's office has developed a number of design and analysis tools for Mathcad. One of the tools presented was a technique for inputting field measurements of a floor elevation survey into AutoCAD and then converting the numerical data into both a graphical and 3D model. The elevation plot sheets shown below are illustrations of these sheets. The surface plots provide a three dimensional view of the elevation variation. Also there is a polynomial data fit routine that helps to smooth out the irregularities from construction variation.

