

AUGUST 2014 MEETING

Wednesday, August 13, 2014 (2.0 PDH)

TECHNICAL PROGRAM

The PTI Version 3 Design Method for MATHCAD 15

Speaker: [John Clark](#), the principal and owner of [John Milton Clark Engineers Inc.](#)

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.

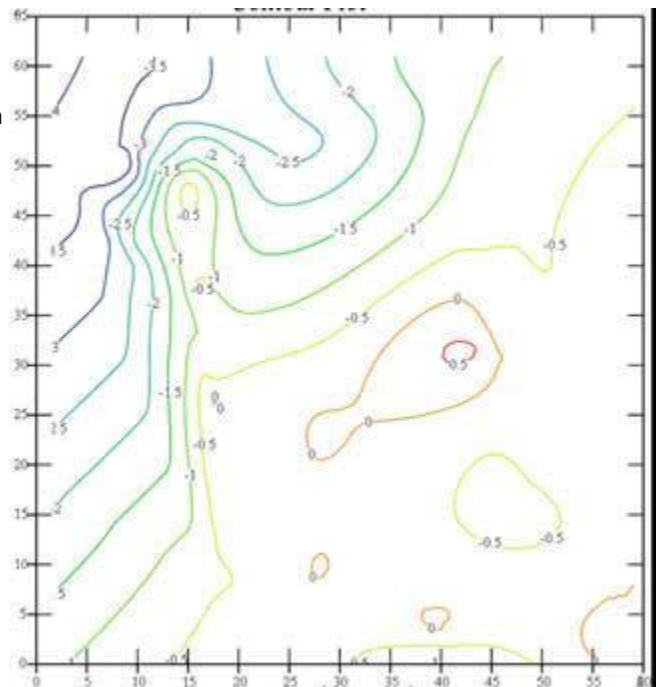
John Clark formed Clark Engineers in 1989, and has subsequently consulted on a broad range of structural areas. These range from general civil and structural engineering to specific forensic failure investigations of foundations and buried tanks; to specialized stress analysis, testing and product design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

PRESENTATION SUMMARY

To an audience of about 65 attendees, Mr. Clark presented an overview of a MathCAD software program that is capable of producing contour maps based on elevation surveys of foundation surfaces.

According to Mr. Clark the advantages of using MathCAD include the facts that MathCAD is an extremely powerful program, the contours can be plotted in any units including, but not limited to, inches, feet, millimeters, etc. Units can also be mixed and customized by the operator if needed. MathCAD will perform all conversions (inches to feet to millimeters, etc.) and has hundreds of built in functions, units, and constants.

Additionally, the plotting process once learned can be performed by any competent AutoCAD operator. MathCAD uses plotting calculator type equations that are live, and not hidden in cells like Excel, can use subscripts, various fonts, symbols, including Greek letters.



The steps involve creating an accurate CAD plan of the foundation with elevation readings. The elevation readings in CAD are established as a Y coordinate. Overlay the plan with a rectangle that encompasses the out-to-out dimensions of the floor plan and set the bottom left hand corner of your rectangle grid as 0, 0. At this point, you extract the data and follow a series of steps that sets the elevation points up for the contour plot, saves the property as an Excel file and then imports the Excel data into MathCAD. MathCAD then converts the points to vectors and plots the vectors as a contour map. The full and exact steps may be seen on the Clark presentation slides (see link below).

Mr. Clark noted that the program written for this presentation is based on the PTI version 3 design method and has

been written for MATHCAD 15, (it will also work in Mathcad Prime 3). It permits multiple studies of length and width to be done simultaneously.

To download a copy of John M. Clark's presentation, click [here](#)

To read summaries of previous FPA Presentations by John M. Clark, please click

[May 2013](#) - How to Use Mathcad to do Contour and Surface Plots for Foundations

[November 2005](#) - Homebuyers Guide for Foundation Evaluation

[February 2002](#) - Design of Buried Structures and Some Similarities to Residential Foundation Design