

NOVEMBER 2016 MEETING

Wednesday, November 9, 2016 (1.0 PDH)

TECHNICAL PROGRAM

Bulkhead Failures: Inspections, Repair and Analysis

Speaker: [John M. Clark, P.E.](#), with [Clark Engineers](#), Houston TX, Tel. 936.273.6200.

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

The unpredictable cycle of Texas droughts and flooding can put lakefront properties to the test. Learning the early signs of bulkhead distress can help homeowners save thousands of dollars on costly repairs to bulkheads and to their houses.

A bulkhead is a retaining wall or partition built along a waterfront property to retain soil on the high side. It is used on lake front properties to

extend property at the lake's edge. Bulkheads help to increase the area of a lot and assist in construction of boat docks for mooring with adequate water depth. The common design method for determining how strong a bulkhead wall needs to be is to use the "full pool" water depth – the normal water elevation – for calculating the horizontal forces on the bulkhead wall. However, if the water level has a large drop, the soil pressure on the high soil retaining side of the bulkhead can increase significantly and eventually cause catastrophic failures.

These types of failures on lake front properties have become a common problem in the last five years or so.

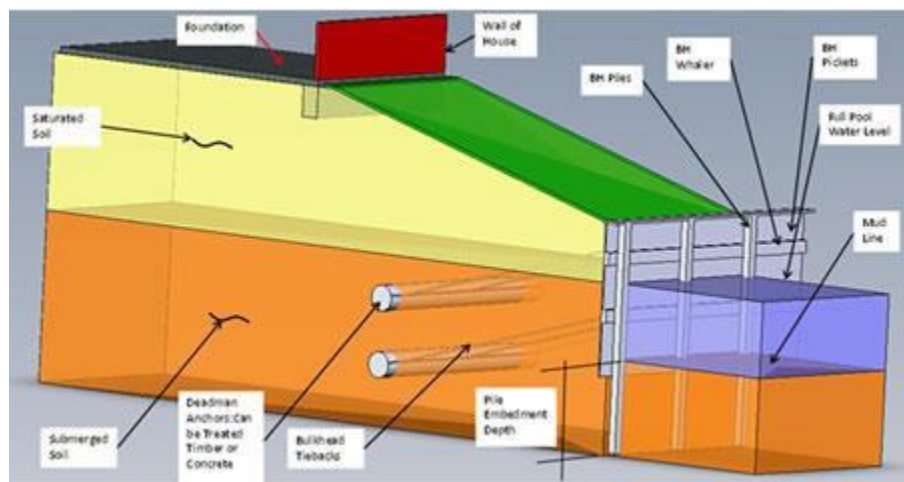
Mr Clark will provide discussion on bulkhead failures and design methodology, inspection methods, and suggested repair methods.

PAST FPA PRESENTATIONS

To read summaries of previous FPA presentations by Mr. Clark, please click:

[June 10, 2015](#) - Seismic Design of Flexible Buried Structures - Applied to tanks, Pipe Lines and Rigid Rectangular Culverts

[August 13, 2014](#) - The PTI Ver. 3 Design Method for MATHCAD 15



[May 08, 2013](#) - How to use Mathcad to do contour and surface plots for foundations

[November 09, 2005](#) Homebuyers Guide for Foundation Evaluation

[February 20, 2002](#) - Design of Buried Structures and Some Similarities to Residential Foundation Design