

JULY 2005 MEETING

Wednesday, July 13, 2005

TECHNICAL PROGRAM

Slope Stability in Harris County

Speaker: Ronald Langston, P.E., with Harris County Flood Control District (HCFCD), Tel. 713-316-4802. Mr. Langston has worked for the Harris County Flood Control District for the past 5 years as a geotechnical engineer. He is a P. E. with 40 years of experience in geotechnical engineering. Prior to his employment by the HCFCD, Mr. Langston was a geotechnical engineering consultant.

PRESENTATION SUMMARY

To an audience of about 50 Mr. Lanston gave a PowerPoint presentation entitled, "Slope Stability in Harris County," which included the following:

- Overview of slope stability and review of causes and types of slope failures
- HCFCD's requirements for geotechnical investigations
- HCFCD's design requirements for slopes
- Factors in analyzing slope stability and HCFCD's research pertaining to slope stability.



Mr. Langston said Harris County is spending \$7 - \$8 million a year repairing failed slopes along their bayous, detention basins, and drainage ways. Even though methods for analyzing slope stability have been around since the 1920's, the county has had thousands of slope failures. In an effort to curtail future repair costs, the county has issued a new Policy, Criteria and Procedure Manual in October 2004, which can be freely downloaded at: http://www.hcfcd.org/dl_manuals.html.

With this new manual, the county now sets minimum criteria for obtaining a geotechnical investigation, including minimum number of borings and minimum boring depths. They also now specify minimum stability analyses, including short term, rapid draw-down and long term analyses. If these minimums are not done, they will not approve the project. Regardless of the outcome of the analyses, the engineers also have to use flatter embankment slopes, including a minimum 4:1 slope for grass-lined channels and 3:1 for grass-lined basins. Concrete-lined channels and basins are performing better and can be sloped at 2:1.

Mr. Lanston believes that engineers have been failing to account for the reduced shear strength near the toe of the slopes where the soil is weathered prior to inundation. His slide show had several photos of slope failures that included deep toe failures, shallow toe failures, and sloughing failures. The slides also showed more environmentally-friendly and aesthetically-pleasing drainage ways the county is now constructing.

To download Mr. Langston's slide presentation, [click here](#).

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