DECEMBER, 2005 MEETING

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TECHNICAL PROGRAM

Investigation and Repair of Structural Concrete

Speaker: Dilip Choudhuri, P.E. with Walter P. Moore / Structural Diagnostics Services Group, Tel. No. 713-630-7300.

PRESENTATION SUMMARY

To a room of about 40, Mr. Choudhuri, a licensed professional engineer in Texas specializing in the areas of seismic damage assessment, construction defects and structural failure analysis of steel, masonry, timber, concrete, and pre-stressed concrete system, presented two case studies on the failure of structural concrete.

The first case study concerned the structural failure of a precast double tee floor system supporting the floor of a hotel ball room. It involved a 30-story building built about 1970. It had no structural issues until recently when the main ballroom floor suddenly obviously sagged to the point it had and to be closed off. The double tee joists had been constructed 4 inches too short, requiring an on-site fix consisting of a clip be bolted into the support beam. The beam failed, primarily because the vertical spacing of the clip's bolts was too little. The reason it failed after so many years was because of the dynamic loading from the ballroom in combination with the reduced capacity from the deficient bolt spacing that caused a progressive failure. The repair involved a steel saddle structure that will be inspected on a quarterly basis.

The second case study concern another hotel's cast-in-place reinforced concrete frame that displayed local structural distress. Shear type cracks were found. Old cracks had been painted and had opened wider since painting. The impact echo technique was used for crack evaluation. It was found that the stirrups were not properly installed and were not in conformance with the original design drawings. The solution entailed the adding of steel columns and tie rods that were drilled into the beams.

PAST PRESENTATIONS (click here)