

Forensic Engineering **PART II**

By Jim Drebelbis, Kan64

Here is a more illustrative diagram of the work that forensic engineers like myself are involved with on a daily basis. It illustrates several aspects of engineering: thermo, wind loading on a building, construction to exclude air infiltration.



This is a cut-away section of a house located on the bay in Corpus Christi TX. It was the subject of a mold-related lawsuit. A warm, humid breeze constantly blows.

The house has an AC system that is designed to handle 3 air changes per day; the house experiences 13. This equates to about 750,000 cu ft of extra hot humid air infiltrating into the house every day. The problem is that warm air blowing against the house creates pressurize area around the porch (wind loading). This pressure is relieved through a continuous soffit vent that creates a pressurized condition in the attic (architectural design goof). Air blows down into the habitable space through walls, ceiling penetrations, and separations in the construction (air infiltration problem). This overloads the HVAC system with unconditioned air, so it cannot accommodate the latent heat load (thermodynamic problem). The hot humid air hits the cool surfaces of the house and condenses out

Reprinted with the permission of the Triangle Review the magazine of Triangle Fraternity, a national social fraternity of engineers, architects, scientists and mathematicians published quarterly. National offices located at 120 S. Center St., Plainfield, IN 46168-1214



water that feeds the mold (thermodynamic and biological problem). Clearly this is a comprehensive problem that was ignored in the design of this house. Unfortunately for the Architect and the owners of the house, Mother Nature doesn't care and CAN put all the pieces together to create a nightmare of a cooling problem.

James R. Drebelbis, AIA, P.E. has over thirty years of experience in designing and evaluating buildings. Mr. Drebelbis holds licenses as both a Professional Engineer and as an Architect. His experience in performing forensic engineering began over 25 years ago. In 1996, he founded Drebelbis Engineering to deliver services to the unique needs of insurance adjusters and attorneys. The company is based on architectural and engineering technology and business acumen. Jim received his BS in Architectural Engineering from the University of Kansas and his MBA from Western Michigan University. Drebelbis Engineering is a Dallas-based forensic engineering firm offering consultation in engineering and architectural building technology to the legal and insurance professions. Drebelbis Engineering strives to provide technically competent and responsive investigation reported in a clear and unbiased manner.

