Building Demolition

structural engineering

By: Mark Duckett, P.E., S.I.
mduckett@robsonforensic.com
800.631.6605

■ Mark is a licensed structural engineer with over 26 years of experience in the design, construction and inspection of all types of structures. He has also worked as a consultant on demolition projects, assisting the demolition contractors. Mark is a Professional Engineer in multiple states and a licensed Special Inspector in the State of Florida.

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Remember the game Jenga? In that game, players take turns to remove a block from the constructed structure and balance it on top, creating a taller and increasingly unstable structure as the game progresses. While simplistic in comparison, similar concepts are shared between the game and building demolition work. It should come as no surprise that a structural engineer would have an advantage in playing that game.

Demolition is defined as the dismantling, razing, destroying or wrecking of any building or structure. Demolition can be thought of as the "reverse" of construction; destroying a building as compared to creating it. However, both processes share many of the same engineering principles, construction techniques and safety concerns. Both processes require that the involved parties have an understanding of the type of structure involved and the need to recognize the order in which members must be installed or strengthened as construction progresses, and which members can be safely removed or weakened incrementally as demolition proceeds.

Hazards abound in demolition work. Although Standards of Care do exist to help manage and reduce the dangers associated with this activity (i.e., ANSI, OSHA, etc.), demolition contractors often fail to perform adequate pre-demolition surveys to detect the presence of certain hazards during the demolition process and accidents sometimes ensue. During demolition, instabilities can occur which may not be readily apparent to an unqualified person without structural engineering knowledge.

Accurately recreating a demolition accident requires intimate knowledge of structures and their constituent materials as well as knowledge as to how the structure was likely originally erected. Members and building sections removed during the demolition process sometimes result in inadequate bracing of the remaining building and/or critical members resulting in lateral instability of the remaining building and/or critical members or overloading of remaining building sections and/or critical members. Premature collapse of the remaining structure, or portions thereof, is often the unfortunate result of those errors.

Evaluation of demolition cases is best addressed by structural engineers; particularly those structural engineers who also have extensive construction knowledge. Along with structural-specific education, training and experience, knowledge of construction sequencing and techniques are invaluable tools that an experienced structural engineer can bring to a demolition case.