Hybrid Masonry & Steel Structures

Contractors and designers have long known that masonry and steel make good partners.

Masonry is great in compression and steel is great in tension. Put the two together and you have a versatile structural system. Reinforced masonry structures are a staple of the building market and masonry veneer can be backed up by steel stud systems. Often overlooked is the role that masonry infill plays in structural steel frame construction. While common, the masonry is usually considered a non-structural element of the building and as such its contribution to the behavior of the building is not taken into account by the engineer. All that is now changing with an increased focus on masonry infill within structural steel frames.

Software to Make the Engineering Easy

As common as masonry infill in frame buildings is, the engineering that goes into an integrated analysis (considering the effects of the steel frame on the masonry and vice versa) is not simple. Hand calculations are tedious and time-consuming so engineers usually can only evaluate what they think is the worse case and apply that design to the entire structure. Life is about to get easier for engineers and reinforced masonry infill walls should be used more and more as a result.

Software to design "hybrid" masonry and steel structures—buildings with reinforced masonry infill and structural steel frames analyzed as an integrated structural system—is now available. The reinforced masonry infill is used to brace the steel frame, resulting in an efficient use of both materials. The system has the potential to eliminate the need for moment connections in the steel frame or steel cross bracing which makes the installation of both the masonry and the structural steel simpler.

Bentley Systems, Inc. developed the software with the cooperation of the International Masonry Institute, the National Concrete Masonry Association and Ryan-Biggs Associates. Even engineers who are not well versed in finite element analysis should be able to work with the software.

The new "hybrid" masonry and steel analysis option within the software will make it easier for structural engineers to account for the effect of both the reinforced masonry infill and the steel frame treating both as structural elements that work hand-in-hand as an economical and efficient structural system.

For more information on engineering software options please call IMI at 800.IMI.0988.