



Structural Masonry Done Right

by Diane Throop, PE, FASTM, FTMS

Photo courtesy DeStefano Associates

THERE IS LITTLE DEBATE OVER MASONRY'S BEAUTY; ITS WARMTH, VARIETY, AND HAND-CRAFTED APPEAL HAVE NEVER GONE OUT OF STYLE. HOWEVER, BEYOND ITS GOOD LOOKS, THIS TYPE OF WALL ASSEMBLY HAS LONG BEEN A STAPLE IN THE STRUCTURAL BUILDING MARKET.

Depending on the building's configuration and function, masonry can be the primary structural system (load-bearing achieved with bearing and shear walls) or integrated with a steel or reinforced concrete frame in the form of a hybrid masonry and frame system.

Following the recent introduction of several commercially available whole-building, finite-element, structural engineering software programs

that rapidly analyze load-bearing and hybrid buildings,¹ structural masonry is more viable than ever, even in complex configurations. Consequently, designers and specifiers need to make certain that project documents include both architectural and engineering requirements for masonry.

A good place to start...

There are many resources for guidance on structural masonry, but two good starting points for any project are the *Building Code Requirements for Masonry Structures* (i.e. TMS 402-08/ACI 530-08/ASCE 5-08) and the *Specification for Masonry Structures* (i.e. TMS 602-08/ACI 530.1-08/ASCE 6-08).² These documents are often known collectively in the industry as the *Masonry Standards Joint Committee (MSJC) Code and Specification*.



Also pictured on page 20, the Hotchkiss School dormitory demonstrates the versatility of load-bearing concrete masonry units (CMUs). They support the structure and form the backup for the brick veneer.

Photo courtesy DeStefano Associates

bars in a cell, and lower-strength masonry units. Options that may reduce lap splice lengths include:

- using smaller-diameter reinforcing bars spaced more closely together;
- increasing the masonry compressive strength by employing higher strength units; and
- minimizing splices needed by utilizing higher grout pours.

[Tip 17: Consider other splicing options]

In addition to lap splicing, the *MSJC Code and Specification* and *IBC* permit reinforcement spliced with mechanical couplers or welding. Typically, the mechanical couplers add some cost to a project, but may still be cost-effective if in lieu of long lap lengths. Welding of steel reinforcement is difficult and requires certified welders and weldable bar reinforcement. Therefore, while the code permits this option, it is rarely used.

Building the bottom line

Finally, structural masonry is environmentally sound. Masonry materials are produced locally and installed by local labor. Their inherent properties provide fire protection, blast resistance, and acoustical control, thereby serving many functions efficiently. Masonry’s durability is proven. For so many reasons, structural masonry is the right choice.

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Notes

¹With Keith Lashway, PE, this author co-authored an article, “Masonry and Steel: An Old Partnership with New Opportunities,” which appeared in the August 2008 issue of *The Construction Specifier*. Visit www.constructionspecifier.com and select ‘Archives.’

²The Masonry Standards Joint Committee is charged with developing and maintaining the *MSJC Code and Specification*. The group is under the sponsorship of The Masonry Society (TMS), the American Concrete Institute (ACI), and the Structural Engineering Institute of the American Society of Civil Engineers (SEI/ASCE).

³As *MSJC Code and Specification* uses the United States customary system (i.e. “English” units), this article places the approximate metric conversions in parentheses.

⁴For more on AAC, see the July 2008 issue of *The Construction Specifier* for “Designing with Autoclaved Aerated Concrete: New Provisions and Sustainable Properties” by William D. Palmer Jr., PE. Visit www.constructionspecifier.com and select ‘Archives.’

➤➤ ADDITIONAL INFORMATION

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Abstract

With the recent introduction of whole-building software programs that rapidly analyze load-bearing and hybrid buildings, structural masonry is more viable than ever, even

in complex configurations. Consequently, specifiers must ensure project documents include both architectural and engineering requirements for masonry.

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