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CMHA

HOW IS THE FIRE RESISTANCE OF A CONCRETE MASONRY ASSEMBLY CALCULATED WHEN USING UNCONVENTIONAL AGGREGATES?

The International Building Code (IBC) outlines multiple options for documenting the fire rating of concrete masonry assemblies, including:

- Third party listing services, such as Underwriters Laboratory;
- Full-scale testing in accordance with ASTM E119;
- Standardized calculation procedures, such as ACI/TMS 216.1; and
- Alternative means approved by the building official.

Additional information on determining the fire resistance rating of concrete masonry products is available in CMHA TEK 07-01D, *Fire Resistance Rating of Concrete Masonry Assemblies*.

In recent years manufacturers of concrete masonry products have been exploring the use of alternative materials in the production of concrete masonry units. Some of these materials have not been evaluated using standardized fire resistance test methods or have been evaluated only to a limited degree. Such unconventional materials, which are typically used as a replacement for conventional aggregates, may not be covered within existing codes and standards due to their novelty or proprietary nature.

While test methods such as ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, defines procedures for evaluating the fire resistance properties of concrete masonry assemblies, including those constructed using unconventional constituent materials, there has historically been no defined procedure for applying the results of ASTM E119 testing to standardized calculation procedures available through ACI/TMS 216.1, *Standard Method for Determining Fire Resistance of Concrete and Masonry Construction Assemblies*.

In general, when applying the fire resistance calculation procedure of ACI/TMS 216.1 to products manufactured using non-listed aggregate types, at least two full-scale ASTM E119 tests must be conducted on assemblies containing the unconventional material. Based on the results of the full-scale testing, an expression can be developed in accordance with this industry practice that permits the fire resistance of units produced with such aggregates to be calculated for interpolated values of equivalent thickness and proportion of non-listed aggregate.

Last Revised December 20, 2023

ABOUT CMHA

The Concrete Masonry & Hardscapes Association (CMHA) represents a unification of the Interlocking Concrete Pavement Institute (ICPI) and National Concrete Masonry Association (NCMA). CMHA is a trade association representing US and Canadian producers and suppliers in the concrete masonry and hardscape industry, as well as contractors of interlocking concrete pavement and segmental retaining walls. CMHA is the authority for segmental concrete products and systems, which are the best value and preferred choice for resilient pavement, structures, and living spaces. CMHA is dedicated to the advancement of these building systems through research, promotion, education, and the development of manufacturing guides, design codes and resources, testing standards, and construction practices.