

JUST THE FAQs

questions we made up
about ... MASONRY

Question: Table 2 of TMS 602-11/ACI 530.1-11/ASCE 6-11, *Specification for Masonry Structures*, seems to provide conservative values for the specified compressive strength of concrete masonry construction, f'_m . To achieve greater economy in our designs, we often choose to make and test prisms instead of using these tabulated values. Is there any attempt being made to reduce the conservatism in Table 2?

Answer

Table 2 of TMS 602 has been a part of building codes and standards for decades, providing a convenient method (Unit Strength method) of correlating assembly compressive strength (f'_m) to unit compressive strength and mortar type. This approach to specifying or verifying concrete masonry assembly strength, however, is recognized as a tradeoff between the table's convenience and inherent conservatism. This conservatism is a byproduct of the table's original data, which was

developed when testing practices were not as refined as today.

To improve economy in design,

the National Concrete Masonry Association (NCMA) began compiling prism test data several years ago to create a new unit strength table that is more representative of contemporary prism testing practices. The results indicated:

- Compressive strengths are generally higher than previously used in Table 2, TMS 602.
- The mortar compressive strength does not impact the measured prism compressive strength unless very high strength units are used.
- Prisms constructed using Type S and Type N follow the same general trends, but Type N mortar has a statistical maximum of approximately 2,600 psi.
- The most significant revelation from this research is that the weakest combination



Prism specimen following compression testing.

of permitted unit strength and mortar type produces an assembly compressive strength of over 2,000 psi.

A proposed new unit strength table stemming from this investigation is illustrated in the table below. It is being reviewed by the Masonry Standards Joint Committee for potential inclusion to the proposed update of TMS 602-11/ACI 530.1-11/ASCE 6-11, *Specification for Masonry Structures*. Once adopted, the ease and convenience of the unit strength method will continue, albeit without the inherent conservatism in previous versions of this table. The research shows conclusively that properly constructed and tested concrete masonry always produces prism strengths greater than 2,000 psi, regardless of mortar type. Therefore, in the near future, there will be no need to specify f'_m values less than 2,000 psi. The increased net area compressive strengths (f'_m) derived from the proposed table will facilitate the design of more economical and sustainable concrete masonry structures.

The full version of the research report and its conclusions will be posted summer 2012 at the following link: www.ncma.org/resources/design/Pages/ResearchReports.aspx.

Changing Masonry Standards

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Proposed New Unit Strength Correlation for Concrete Masonry

Net Area Compressive Strength of Concrete Masonry Unit, psi (MPa)	Net Area Compressive Strength of Masonry, psi (MPa)	
	Type M or S Mortar	Type N Mortar
2,000 (13.8)	2,000 (13.8)	2,000 (13.8)
2,500 (17.2)	2,500 (17.2)	2,500 (17.2)
3,000 (20.7)	2,700 (18.6)	2,600 (17.9)
3,500 (24.1)	2,800 (19.3)	-
4,000 (27.6)	3,100 (21.4)	-
4,500 (31.0)	3,200 (22.1)	-
5,000 (34.5)	3,600 (24.8)	-
5,500 (37.9)	4,000 (27.6)	-

