

13 July 2023



The Masonry Institute of Michigan (MIM) seeks to advance the masonry industry and the communities in which we live and work by delivering on our promise to provide the solution for all our partners' industry needs. To this end, our mission is to serve as the region's leading masonry resource through education, promotion, and technical assistance.

One of our most successful tools has been the Generic Wall Design Committee (GWDC), which was formed in the early 1990s and has been instrumental in promoting efficient masonry design since that time. The GWDC comprises individuals and stakeholders from throughout the industry, including contractors, masonry suppliers, masonry producers, architects, engineers, and construction managers. The mission of the GWDC is to provide architects and engineers with the most current, relevant solutions to their masonry designs. As a part of this process, we became aware of various TMS 402/602 code deficiencies which were affecting design and construction. We endeavored to become more active in the code process beginning in 2016 with the 2022 code cycle. We currently have 9 active members contributing as voting or corresponding committee members. We have been very successful initiating changes and developing a network of committee members willing to review our concerns. Because the code is a consensus document the process of getting all invested parties on board is of utmost importance, and we have succeeded in implementing positive change.

As part of our mission, we began a research and design initiative with the following goals:

1. Dowel study.

University of Louisville Research Foundation—under the direction of Dr. W. Mark McGinley, PE, FASTM, FTSM—to evaluate reinforcement lap splices in masonry walls. This research will evaluate lap splices during construction when the grout has cured at intervals of 12 hours and 24 hours. Our goals also include the development of a series of recommendations for changes to the 2012 *Standard Practice for Bracing Masonry Walls Under Construction* (also referred to as the *Standard Practice*). Ultimately this research will seek to harmonize the requirements in the *Standard Practice* and the *Building Code Requirements for Masonry Structures* which will promote jobsite safety, “internal” wall bracing and provide for economical masonry design.

2. Grout lift heights code changes

Restrictive grout lift heights are potentially the costliest code requirement to the masonry industry. The reasoning used in designating these lift heights under the original code provisions is unlikely to hold up under scrutiny particularly in low seismic areas, which constitute most of the geographical US. We initiated a proof-of-concept study to investigate the effects of higher grout lifts, Appendix 1. The results were encouraging, and we made a direct request to the Main Committee of TMS 402/602 to anticipate a request for changes, Appendix 2. We followed up at the structural members committee at the spring meeting in Omaha, NE as that is where the formal change will have to start. The results were encouraging. We'll need to do a formal research project to replicate

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these results. The plan is to begin Research Project II testing by spring, 2024, with the expectation that the final report will be published by the Spring Meeting in 2024. After publication, the research will be submitted to the TMS Journal for peer review.

3. Revit details

Provide for funding to convert all the GWDC details (<https://www.masonryinfo.org/design-details/>) to Revit so they are more usable by architects and engineers.

4. Specification overhaul

Specifications Development for the most common wall assemblies.

Our commitments to date on these items are as follows:

MIM Design/Research Projects	Phase I Lap Splice Lengths	Phase II Grout Lift Heights	Phase III Revit Details	Phase IV Specifications	Total
The Block Foundation	\$ 17,500.00	\$ 17,500.00			\$ 35,000.00
Laborers Local 499			\$ 5,000.00		\$ 5,000.00
Masonry Institute of Iowa	\$ 1,000.00				\$ 1,000.00
BAC Local 2	\$ 28,625.00				\$ 28,625.00
Wire-Bond	\$ 5,000.00	\$ 5,000.00			\$ 10,000.00
Masonry Institute of St. Louis	\$ 3,750.00		\$ 3,750.00		\$ 7,500.00
Michigan Mason Contractors Association	\$ 2,000.00				\$ 2,000.00
Arizona Masonry Council	\$ 4,000.00	\$ 6,000.00			\$ 10,000.00
MCAA					\$ -
NCMA					\$ -
Michigan Contractors Association					\$ -
<b>Total:</b>	\$ 61,875.00	\$ 28,500.00	\$ 8,750.00	\$ -	\$ 99,125.00
<b>Cost:</b>	\$ 85,875.00	\$ 90,000.00	\$ 10,000.00	\$ 5,000.00	\$ 190,875.00
<b>Remaining Needs:</b>	\$ (24,000.00)	\$ (61,500.00)	\$ (1,250.00)	\$ (5,000.00)	\$ (91,750.00)

I am writing this grant request for Phase II, Grout Lift Heights. In surveys of member contractors, it was unanimous that the current lift height maximums are too restrictive for partially reinforced masonry outside of restrictive seismic zones. This masonry makes up a large portion of the market share for reinforced masonry. Discussion at TMS meetings throughout the years has led us to believe that this was unintentional as the focus was primarily on high seismic zone requirements. In fact, the current TMS 402/602 requirements date back to research done in the 1960s. Most of the participating committee members in the early version of the code came from areas with these requirements. When questioned about lift heights the response is that they used what was commonly accepted at the time and had raised them from 4'-0" to 5'-4" recently. There seems to be an openness to making changes but to reach consensus we'll need to put in a lot of work and give some compelling evidence. In support of this effort, we did a proof-of-concept study in cooperation with the MIM, St Marys Cement, MASONPRO, Wiss,

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Janney, Elstner Associates, Somat Engineering, and Davenport Masonry. (4) panels 10'-0" x 10'-8" were constructed (2) with 12" units and (2) with 8" units. Both square ended and stretcher CMUs were used to represent various manufacturers units. The panels were grouted in various methods. The grout was tested and samples for (3) types of compressive tests were made, standard pinwheels, cardboard boxes, and concrete cylinders. We are looking to establish the validity of cardboard box samples compared to traditional pinwheels and ascertain if there is reduction factor which could apply to standard concrete cylinder tests. Using standard concrete cylinders for grout testing would eliminate the inconsistent grout test results we are experiencing commonly. Upon completion the panels were radar scanned and then cut apart to observe the occurrence of voids. The evidence was compelling that both the 8" and 12" units were grouted successfully full height in one lift with no apparent voids.

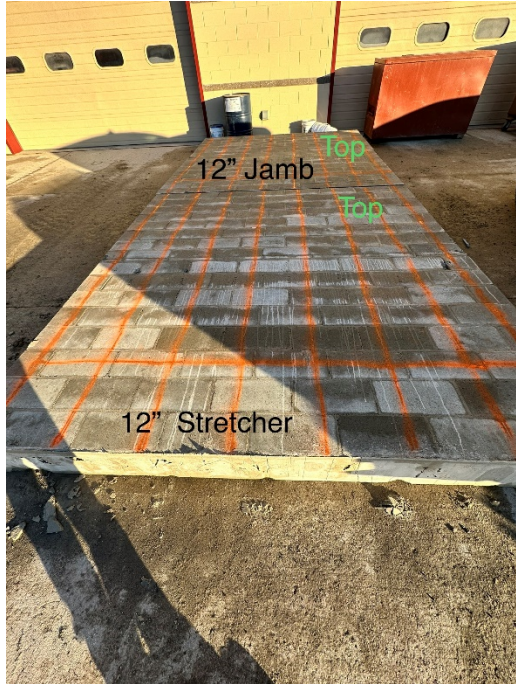


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You can see the full proof of concept results here

<https://drive.google.com/drive/folders/1vomoVxQTlb1CTyjncz2xz---9HfkPknH?usp=sharing>.

We presented the results of this study to the structural members committee at the TMS spring meetings in Omaha, NE. The results were mixed but there is enough interest to proceed. Our intention is to develop a research project to verify our findings. We have enough members with interest to put together a proposal. Because the code is a consensus document, we will need close to 100% support to get a change. For this reason, we intend to put a few of the most vocal detractors on our committee to design the research. That will save us from being second guessed after the fact. We anticipate this research project will need a budget of \$90,000. We intend to use Mark McGinley at the University of Louisville to perform this project. He is currently undergoing our base of wall dowel research and as a long-standing leader of the TMS 402/602 code committees he's the logical choice to lead this project. Other members of the project team will include:

Phil Ledent PE, SE – Executive Director of the Masonry Institute of Michigan

Kyle Lochonic – Senior Project Manager/Estimator at Davenport Masonry, Inc. Holt, MI

Scott Walkowicz PE, FTMS, NCEES - Walkowicz Consulting Engineers, Lansing, MI

Jeff Funkhouser – Project Manager at Sun Masonry, Phoenix, AZ

Jeff Snyder – President of Masonpro, Northville, MI

Kurt Siggard – Concrete Masonry Association of California and Nevada

Paul Scott – Scott Structural Consultants, Phoenix, AZ

Our goal is to get the basic outline of design for the testing protocol completed by the Nov 2023 TMS 402/602 meeting with a final approval by Jan 2024. We would like to get this on the calendar for the spring term of 2024. This will give us enough time to get the information into this code cycle for the second half with the goal of getting changes approved in this cycle. It will take a lot of effort to achieve this, we have the team in place to get results.

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We intend to get at a minimum the maximum lift height or grout changed to 8'-0" (the top of door frames) our goal would be 10'-8", twice the current allowable height. This single item is possibly the costliest provision of the code to date affecting masonry. Reducing the interruptions from grouting by 50% and eliminating the laying of units over bar laps by the same would have a huge impact on our industry, likely resulting in millions of dollars per year of savings.

We are requesting \$40,000 to go towards this testing/research project. We will provide our full Draft Proposal from the University of Louisville for approval prior to receiving funds. Upon completion of the testing, you will be provided with results of the research as intended to be presented to the TMS for peer review. We will provide updates of our results at each TMS 402/602 code meeting as well as copies of ballots for changes issued. The results of those ballots will be forwarded. We request you remain active in this balloting process, influencing any committee members you have contact with and possibly attending some meetings to testify. We believe this can be changed this code cycle generating savings in cost and schedule time for the masonry industry.

Thank you for your consideration.



**Kyle Lochnic** | Estimator

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