

Masonry r2p Partnership



SAFETY INTERVENTIONS REDUCING BACK INJURIES IN MASONRY

Situation

- The work performed by masonry craft workers is physically demanding.
- Bricklayers and other masonry craft workers have the highest rate of back injuries with lost workdays among construction workers.

Safety Issues

- Laying brick and block creates risks for shoulder and low back injuries due to the:
 - ✓ weight of the materials;
 - ✓ frequency of lifting materials and twisting;
 - ✓ height of work and materials; and
 - ✓ distance of work from workers.

Interventions

The following are four of the options identified by masonry industry stakeholders and researchers to eliminate or reduce the risks.

1. Mast Climbing/Adjustable Scaffolds

- Mast climbing scaffolding (mast climbers) and other adjustable scaffolds when installed and used correctly can enhance safety and productivity. These scaffolds can be adjusted to position workers at the optimum location for performing work – between knee and shoulder height – which reduces their risk for musculoskeletal disorders, such as sprains, strains, and low back injuries.
- In a survey¹ of 42 masonry contractors who use mast climbers:
 - ✓ Roughly 70% cited increased productivity as the greatest advantage of this equipment;
 - ✓ More than 60% said mast climbers save time; and
 - ✓ More than 50% viewed them as safer than other types of scaffolding.

- A [Mast Climber](http://www.masonryr2ppartnership.com) website developed by the Masonry r2p Partnership contains a quick overview of the equipment, safety and training requirements, regulations, and manufactures.



www.masonryr2ppartnership.com
click on [Mast Climber web-based resource](#)

2. Single-Web Block

- Open ended, single-web, concrete masonry units (CMU), also called H-block, reduce the need for lifting heavy materials overhead (photo 1) by allowing bricklayers to place CMU block around rebar, pipes and other vertical obstructions (photo 2).



Photo 1 - Laying CMU over rebar



Photo 2 - Laying H-Block around rebar

- In 2012, a new provision was added to ASTM C90 Standard Specification for Loadbearing Concrete Masonry Units, which allows for a single web configuration (a minimum ¾ inch thickness) to be used in the same applications as three-web/two cell blocks.
- The use of single-web units, has several potential benefits including: increased productivity due to the lower weight and reduced fatigue, and higher wall R-values. This

type of unit also eliminates the need to lift the CMU above shoulder level reducing the risk for back and shoulder injuries.

- A study of ergonomic best practices in the masonry industry found that contractors who use H-Block often, particularly when there is frequent vertical rebar, noted an increase in productivity.ⁱ

3. Autoclaved Aerated Concrete (AAC)

- AAC is a light-weight block. The standard size is 8"X8" X24" and weighs roughly 30lbs, but AAC is also available in a variety of other weights and sizes.
- AAC is handled with two hands, and uses a thin bed of mortar (ASTM C1660-09). Using AAC, or other lightweight block, reduces strain and loading on bricklayers' backs, and lowers their risk of developing low back pain and injuries. In addition, studies have found an increase in productivity when using lighter weight blocks.



4. Two-Mason Lift Technique

- A 12" concrete block (CMU) can weigh up to 65 pounds. Lifting this amount of weight repeatedly over the course of a work-day increases the risk of low back pain and injuries.
- Use of a two-mason lift team reduces the strain of repetitive heavy lifting and twisting that leads to many musculoskeletal disorders by distributing the weight between two workers. In addition, studies have shown that such an approach may improve productivity by reducing worker fatigue.

Learn More

To find information about how to deal with ergonomic hazards and find solutions or learn more about the Partnership's work visit:

- [IMI Technology Brief: Autoclaved Aerated Concrete Masonry Units](http://www.imiweb.org/design_tools/tech_briefs/01.02_%20AAC%20MASONRY%20UNITS.pdf) at www.imiweb.org/design_tools/tech_briefs/01.02_%20AAC%20MASONRY%20UNITS.pdf
- CPWR [Return on Investment Calculator](http://www.safecalc.org): CMU Example www.safecalc.org – “Click to Begin” & “Load an Example” – select “CMU Based on Unit of Material.”
- [Two-mason Lift Team](http://www.elcosh.org/en/video/20/a000048/two-mason-lift-technique.html) at: www.elcosh.org/en/video/20/a000048/two-mason-lift-technique.html.
- www.ChooseHandSafety.org for information on how to select hand tools to avoid musculoskeletal injuries, and other information on hand safety (selecting gloves, and more).
- [The Electronic Library of Construction Occupational Safety & Health](http://www.elcosh.org/) at <http://www.elcosh.org/>
- [Masonry Research to Practice Partnership](http://www.masonryr2ppartnership.com) at www.masonryr2ppartnership.com

Share Your Solution

There are many viable ergonomics solutions available to reduce shoulder and back injuries among bricklayers and other masonry craft workers.

To share your thoughts on the options mentioned or provide one of your own email: *IMI's National Training Director Robert Arnold* at BArnold@imiweb.org; or *National Safety Coordinator Mike Kassman* at MKassman@imiweb.org.

ⁱ Ergonomic Best Practices in Masonry: Regional Differences, Benefits, Barriers, and Recommendations for Dissemination; Hess et al. 2010, Journal of Occupational and Environmental Hygiene, 7: 446-455