MIOSHA Fact Sheet

Masonry Wall Bracing

The masonry industry has experienced significant changes in materials, designs, and standards in the past 50 years. Before the mid-1990s most designs incorporated unreinforced masonry walls. Majority of the designs today incorporate reinforced masonry and it is not uncommon to have masonry walls vertically spanning 30 to 40 feet.

Masonry walls that are not properly braced are susceptible to blowing down during construction. Until a masonry wall has obtained its final lateral support to the structure, it could cause a catastrophic failure and collapse if not properly braced. MIOSHA investigated a wall collapse accident at a high school addition project, in 1998, which killed four tradesmen and seriously injured two others. A wall collapse is not only a serious hazard affecting masonry industry employees but affects the safety of other construction workers in the immediate vicinity.

Construction Standard Part 2, Masonry Wall Bracing has five major components:

1. **Restricted Zone.**
   a. The masonry contractor must establish where and when restricted zones will be needed and provide a restricted zone plan to the controlling contractor prior to the start of work.
   b. Only trained workers may enter a restricted zone; the training must be documented.
   c. The restricted zone must be clearly delineated by signing in accordance with Rule 207.
   d. Signage must be posted on all unsupported walls more than 8 feet in height.

2. **Monitoring Wind Speed and Evacuation.**
   a. Each employer with employees working in a restricted zone must designate a competent person to monitor the wind speed using a wind measuring device.
   b. Employees must evacuate a restricted zone when wind speed limits are exceeded by either of the following parameters:
      - 20 mph wind speed for unsupported walls during the **initial period**, the period of time, not to exceed 24 hours, during which the masonry wall is being laid above its base or the highest line of bracing as specified in Rule 203. Per Rule 209, at the end of the initial period, the wall shall be braced on both sides if it exceeds the unbraced wall heights as shown in Table 2.
      - 35 mph wind speed for unsupported walls during the **intermediate period** which is the period of time following the initial period until the wall is connected to its final lateral stability supports. See Rule 210.

3. **Wall Bracing Design.**
   Designs and specifications for bracing plans must be available at the jobsite.
   a. Wall bracing systems must be designed by a qualified person and capable of providing stability to the wall for a wind speed of 40 mph.
   b. Walls can be braced using either one of two types of wall bracing systems:
      - A Triangle Wall Bracing System for walls up to 16 feet, as specified in Rule 212.

- A Bracing Plan designed using accepted engineering practices as prescribed in the Standard Practice for Bracing Masonry Walls Under Construction and Masonry Wallbracing Design Handbook. See Rule 211.

4. Training Requirements.

a. Competent persons and those involved in installing, altering, repairing, maintaining, or inspecting the wall bracing system and restricted zone must receive training by a qualified person as prescribed in Rule 205(2).
b. Employees who enter a restricted zone of a masonry wall under construction must receive training by a qualified person in the recognition and avoidance of hazards associated with masonry wall bracing, collapse area/restricted zones, and conditions requiring evacuation as prescribed in Rule 205(3).
c. Training records must be available at the jobsite.

5. Inspections.

a. A competent person must inspect for visual defects all unsupported masonry walls, including the wall bracing system, at the beginning of each shift and after any occurrence that could affect the structural integrity of the wall bracing system or the wall.
b. All damaged or weakened bracing elements must be repaired or replaced immediately. It is particularly important to inspect wall bracing after any high wind event.

Engineering Guidelines:

The Mason Contractors Association of America (MCAA) established the Council for Masonry Wall Bracing to develop a wall bracing standard. The Council published the Standard Practice for Bracing Masonry Walls Under Construction in 1999 and it was revised in 2001, and in 2012, by MCAA. In 2003, the Masonry Wallbracing Design Handbook was also published by MCAA. The Handbook displays over 700 different wall bracing configurations based on the Standard Practice for Bracing Masonry Walls Under Construction. The Handbook serves to assist mason contractors in identifying brace locations for typical applications. All site conditions cannot be taken into account in the Handbook. A registered professional engineer should be consulted for situations not addressed in the Handbook. If using one of the masonry wall bracing designs in the Handbook, the mason contractor must have it available for review at the jobsite along with any additional specifications.

The key to preventing injuries and fatalities related to masonry wall bracing is employee training and frequent/thorough inspections to identify hazards.

For additional assistance, please contact the Construction Safety and Health Division at 517-284-7680 or the Consultation Education and Training Division at 517- 284-7720. Construction Safety and Health Standards can be viewed on the MIOSHA website at www.michigan.gov/mioshastandards. The Masonry Wallbracing Design Handbook and Standard Practice for Bracing Masonry Walls Under Construction may be ordered from the Masonry Institute of Michigan via their website or calling 248-800-6646.