

TST #184-A

Wall Opening Dangers

Creating openings in concrete walls presents a very real danger-and it is probably not a danger that most sawing and drilling operators think about. The danger is with air pressure and the weight of the concrete piece that is going to be removed to make the opening.

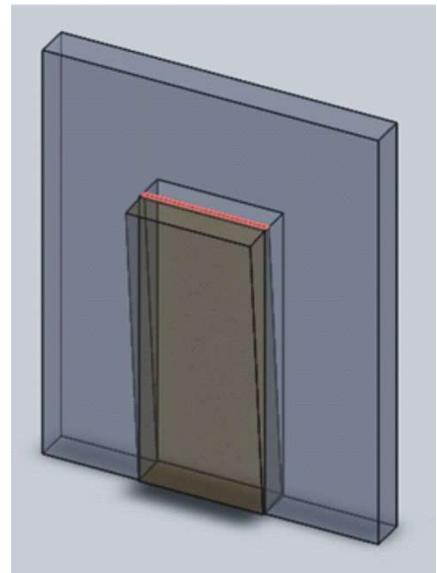
Out-dated or improper training on how to secure cut pieces of concrete is a big problem. Some of the reasons why operators could endanger themselves or others while cutting are: using tapered wedges instead of strapping the wall opening, the misconception that a 10-inch-thick, or greater, cut wall piece will not tip out because it will jam in the wall, or simply the pressure to get the work done as quickly as possible are just some of the reasons why operators are putting themselves in harm's way while cutting.

Changes in air pressure, wind or other induced vibrations can easily overcome the static weight of a cut section and cause it to move or shift, allowing the section to fall. For example,

- A 10-foot by 10-foot opening in a wall is 100 square feet of concrete.
- If the wall was 8 inches thick, the piece being removed would weigh 10,000 pounds.
- Each square foot has 144 square inches of surface area, giving the total area of concrete being removed 14,400 square inches of surface.

If this work was done in a building with other openings, even overhead doors at the other end of the building, simply opening one of these overhead door away from the work area would have the potential to create enough pressure to push the cut opening from the wall. This makes it imperative that openings be strapped to the wall once cut free, especially when the cut at the bottom may not be perfectly horizontal and may be slippery because of the slurry created during the cutting process.

The combination of a tapered horizontal cut, slurry, and the air pressure on the door opening being cut can work with each other to easily move the cut piece. This movement can quickly occur if something changes the amount of positive pressure in the room, such as a door being slammed closed. When this happens, a pressure wave is created and the operator may experience a sensation in the inner ear or a small shake to the entire body. This pressure wave momentarily increases the air pressure in the room or building.

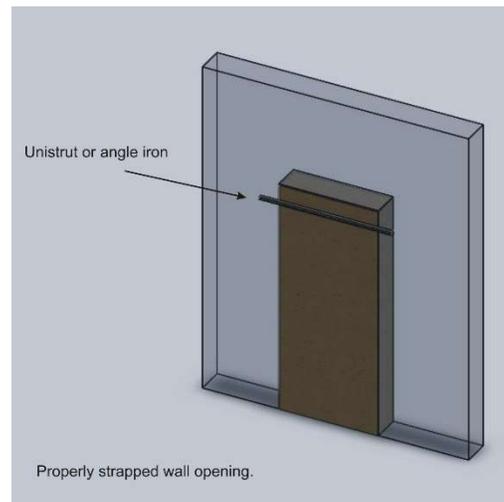


A 10-inch-thick section shifted 0.375 inches, forcing pressure on the top edge of the opening.

For a person to feel the pressure wave, it has to be several times greater than the normal building pressure. If the pressure wave increases the building air pressure by just 1 psi, the force on an opening can result in a concrete door opening jumping out of a wall.

The only positive method for securing a cut piece in a wall opening is by strapping. Strapping is a method in which a metal plate, angle iron, or Unistrut is attached to both the opening and the remaining wall section by drop-in or wedge-type anchors. This may take extra time, but it is time well spent to guarantee the safety of the operator. Wedges should not be used to secure wall openings in place.

It is important to remember and employ safe practices when cutting openings, while being aware of changes in environmental conditions. A change in air pressure while cutting an opening can present a larger danger than first thought. Always strap the cut pieces securely.



Wall Opening Dangers Quiz

The following statements should be answered with "True" or "False." Answers below.

1. An air pressure change of just 1 psi in a building can creates enough force to move a 10' x 10' x 8" thick wall opening.
2. Using wedges to secure a wall opening is acceptable provided you use 12 wedges per opening.
3. Opening an overhead or personnel door can change the air pressure in a building.
4. The only positive method of securing a cut wall opening is by strapping.
5. Strapping is a method in which a metal plate, angle iron, or Unistrut is attached to both the opening and the remaining wall section by drop-in or wedge-type anchors.

Employee Name: _____

Signature: _____ Date: _____

Answers:

1. True
2. False
3. True
4. True
5. True