What's happening in Masonry…

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Gary Porter, Executive Director of the Masonry Advisory Council is called upon with questions about construction concerns and for masonry advice from a variety of Architects, Engineers, Contractors, Developers and Distributor sources. He is dedicated to ongoing education of masonry and shares helpful tips from his professional experience that may be beneficial to you.

The Masonry Arch

In a recent trip to Chicago, I could not help but marvel at the workmanship involved in this masonry arch. There is something very special about how brick is laid to form an arch. This arch in particular caught the eye of this mason! The arch design provides a unique statement for the architecture of this building.

150 N. Clinton St. Chicago, Don Erickson, Architect

One fundamental problem in structural engineering is the bridging of openings. How do we support masonry over a door or window opening? How do we get our materials, supplies and people across a river or ravine? There is evidence that a few millennia ago, an unknown but brilliant mason figured out that many pieces of clay, laid or wedged together, could create this detail and element that we refer to today as a masonry arch. Archaeologists have found evidence of arches in the ruins of Babylonia dating back to 1400 BC. That's over 3,000 years ago!

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Many architects refer to the arch as the most perfect example of form following function. The arch can be both a structural element as well as esthetically pleasing. Through its structural properties, an arch transfers the forces created by loads above into compressive stresses that get transferred to the ground below through the piers (abutments) alongside of the arch. The pushing of the stones in an arch to try and flatten out creates a thrusting action. This is referred to as "arch action". One of the plusses for masonry is that it performs well under compression with the added bonus of conveying a monumental design.

Modern structures incorporating masonry arches today are frequently veneer construction designed to support their own weight and rely on the backup structure for support. Load bearing arches require a good understanding of structural engineering and arch design. A good source for this is the Brick Industry Association technical note #31, #31A and #31C available at www.gobrick.com. The most common types of arches are jack, semicircular, multi-centered, and segmental arches.

Here are some pictures of each type:

Jack Arch

Semi-circular Arch

Multi-centered Arch

Segmental Arch

Masonry arches are a great design element that exhibit a variety of forms to express balance, unity, proportion, scale and character. Arches create a unique and distinct aesthetic appeal that enhance architectural design of buildings everywhere.

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