Ameristeel/AHI arches to support masonry

Frequently asked questions for residential and multifamily applications.

1. **Will the customer need an arched lintel or an arch plate?**
   If masonry will only be supported in the front of an arched opening, they will need an arched lintel. If masonry will need to be supported on the front and the back of an arched opening, they will need an arched plate.

2. **Are straps always needed with an arched lintel or arched plate?** *No. That said, using straps that are welded to the arched lintel or arched plate and the other end of the strap is bolted securely to strong wood or steel framing can strengthen the arch. Sometimes it can be a challenge where to put the straps and how long they need to be. in this case the steel arch can usually be made with adequate strength, so that straps are not needed.*

3. **Is a vertical stiffener always needed with an arched plate?** *Yes. Some clients have insisted to get an arched plate with no vertical stiffener. Then when they came to pick it up, we showed them how a man can stand on top of the plate and cause the rise dimension to change by an inch or two, which shows how weak they are without a stiffener. With a stiffener welded to the plate, a man can stand on top of the arch and the rise dimension usually will not change. A man's weight is very little when compared to a big arch made of brick or natural stone. Two vertical stiffeners can be used if needed (see photo e below).*

4. **Can we help the customer figure out what weight/strength of steel arch is needed to support masonry on their project?** *Yes. To do this we need to ask the client how many feet of masonry will be above the arched opening and if it is clay brick, concrete brick or natural stone. Then we can compare that to the building code to estimate the steel that is needed. City of Fort Worth angle code is one we prefer to use. (Mike Hill or Shane Barron can help with this) Note that we are not engineers and we would recommend that the customer show our completed arch form to an engineer for design approval, before ordering a steel arch. Note that full thickness natural stone for masonry weighs about twice as much as clay brick.*

5. **Can Ameristeel supply an arch that has more than one radius on it?** *No. All the arches that we make will have one radius only. All our arches will look like a portion of a half circle or a smaller portion of a circle. We determine the radius by assessing the span and the rise dimension.*

6. **How long do the legs on the arch need to be?** *The building code refers to a minimum of 4" on each leg. This is referred to as bearing and can be found at R703.7.3. On arched lintels often you can use legs that are longer than 4", which can add strength and rigidity to the arched lintel. On an arched plate, often, the legs cannot be more than about 5" before they may conflict with wood or steel framing.*

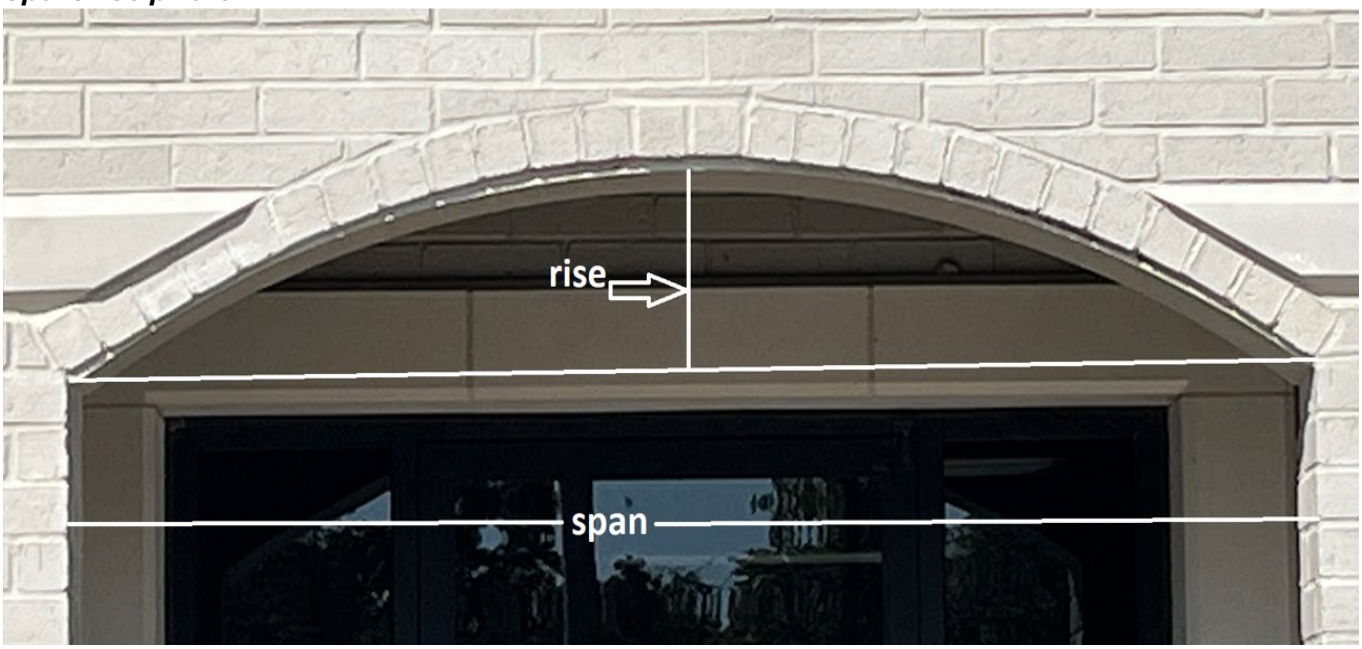
7. **How wide does an arch plate need to be?** *Determine the front to back width of the masonry. Let's say for discussion purposes that is 16". Most customers deduct ½" from that, so in this case a 15 ½" wide arch plate would be needed.*

8. **How wide does the horizontal leg on an arched lintel need to be?** *3" horizontal leg is fine for many king size brick applications although a 4" horizontal leg may be needed for natural stone or modular brick applications.*

9. **How tall does the horizontal leg on an arched lintel need to be?** *These range from as little as 3" to 8" on standard lintels or we can make up to 14" on custom made sizes. The code tells us the overall size that an angle needs to be to support the height of masonry above a specified span on a project. (We can help with this if needed.)*

10. **How do you measure the span?**
-On arch plates if the span (opening between columns) of brick or stone (left column to right column) is 15', make the span on the arch 15'1". If the arch plate is 14'11 span (on a brick/stone span of 15') the plate will not work and will be too short.
On arched lintels- if the span (opening between columns) of brick or stone (left column to right column) is 15', make the span on the arch 15'.

Span/rise photo



11. **How do you measure the rise?**
Often the rise dimension is shown on the plan. If not, you can scale the elevation on the plans to determine the rise. ***Note: That in no case can the rise dimension (times 2) be greater than the span dimension. (Example: A 100" span with a max rise of 50" works fine, <u>but a 100" span with a 51" rise will not work</u>).*** *For arched lintels over a window, the rise has to match the rise on the curved top of the arched window.*

Completed arch Photos

a. **Arched plate**

b. **Arched plate with straps**

c. **Arched angles**

d. **Arched angle with straps**

e. **Arched plate with straps**
(note 2 vertical stiffeners & welded straps on back and bolted straps on front)