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Solution Papers

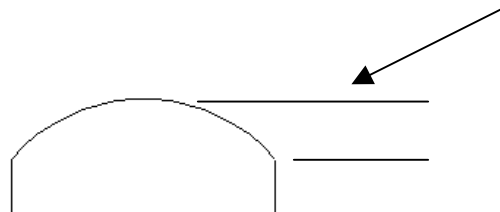
Summary: *Creating a 2D Brick Soldier Course Around an Arch Top Opening*

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Overview: The following procedures below will accurately take you through the steps necessary to create a 2D brick soldier course around an arch top opening. This paper assumes that the opening is not a true half circle round top, but rather an “eyebrow” or archtop.

Solution:

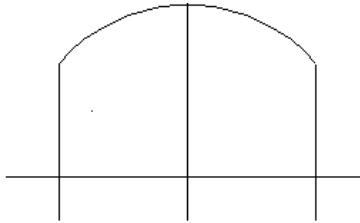
1. Create the arch top opening in the model mode.
2. Create the flat elevation working drawing.
3. We need to determine the radius of the arch. **Zoom area** around the arch top.
4. Using the **Tape Measure tool**, measure the width of the opening. In this example it is 36”.
5. Next measure the distance from the top of the arch to the base of the arch. In this example it is 8 3/16”



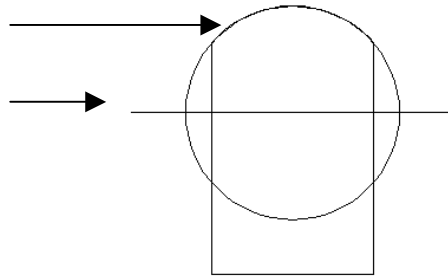
6. To calculate the radius we will use the formula $r = \frac{1}{2} \frac{\text{cord length}^2 + \text{arch drop}^2}{2 \times \text{arch drop}}$. From this we will subtract the arch drop which will leave us the length of the radius to the chord line. In this example this would be:

$$\frac{18^2 + 8.1875^2}{2 \times 8.1875} = 23 \frac{7}{8} - 8.1875 = 15 \frac{11}{16}$$

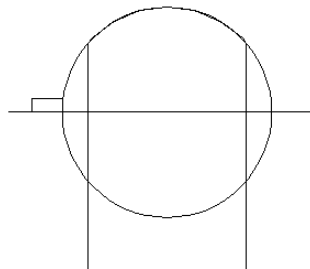
7. We will insert a point to mark the radius center point. Select **Linework → Point**. Measure x18” from the left upper corner and y-15 11/16 down for the point location. **NOTE: this point will be very small and may be hard to see, but it is there.**



8. We will now create a circle with a radius of 23 7/8" using the point as the center.
9. Next create a horizontal line starting from the point (use the P point jump command) and extending both to the left and one to the right.

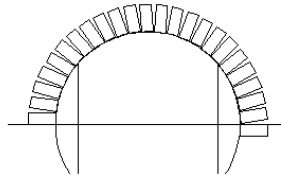


10. **SAVE YOUR WORK ! Select File → Cad Menu.**
11. Select **Zoom All**.
12. Select **Structure → Select → Root. Select Structure → New → Object** and enter A for the name.
13. Next create a brick of the desired size at the location shown below. Select **Draw → Polygon → Rectangle**. Move your cross hair to where the horizontal line intersects the circle on the left. Left click. Right mouse click and select XYZ. The Key-in Relative box opens and enter the brick dimensions, in this example it is x-7", y3", z0. Make sure the **Construction and Relative toggles** are on.

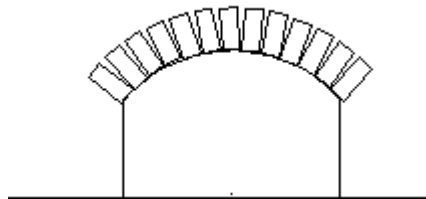


14. Select **Structure → Copy → Radial → Polygon**. Left click on the small rectangle that represents the brick.

15. The **Copy Radial Primitive** dialog box opens. The number of elements will take some practice to learn the correct amount to enter. For this example we will use 24. The Angle of copy will be 180 degrees.
16. You are prompted to **Mark top of axis**. This will be the center of the circle. Right mouse click on select Center and click on the point in the center of the circle. **DO NOT MOVE THE MOUSE !**. You are prompted to Mark the bottom of the axis. Hit the X key on the keyboard. Make sure Construction and Relative are toggled on and enter for Delta Construction X 0, Y0, and Z1'. Leave all other settings as is and OK. This creates an axis in the Z direction for the brick to rotate around.



17. If the spacing is not satisfactory then open the last saved model and repeat the above steps and change the number of elements. If the spacing looks good save the model.
18. The next step is to clean up the extra lines and bricks. **SAVE YOUR WORK !!** Select **Structure → Delete → Lines** and select the horizontal lines we added. Select **Structure → Delete → Circle** and select the circle we created. Select **Structure → Delete → Polygon** and right mouse click and select fence inside and draw a fence around the extra bricks on the left and then on the right.



Now to return to SolidBuilder:

19. Select Tools→Toolbars→Edit, Select Developer, Click OK.
20. Click Open in the developer toolbar; change Files of Type to EX. And open sbstart.ex
21. Click on Execute file (!). This will open Solid Builder back up.
22. Select the Symbol icon. Select Insert from the pull down menus. Select One by one. Select the draft_trim and Next. Click on the Add button. Set Symbol type to Plan, enter a symbol name (maximum 8 characters and no spaces) and set Location option to Free. Make sure the Delete after conversion is toggled off. Click OK and click on the object. It will now be added to the symbols and can be inserted for your future elevation drawings.