# Making East Asian Scroll Storage Boxes

Protective housing is essential for the long-term care of East Asian scrolls. Storage boxes are a centuries-old solution that protect fragile artwork from contact, pollutants, light, and pests while creating a microclimate to buffer atmospheric changes. By adapting useful features of traditional wooden scroll boxes to modern, inert conservation materials, we have designed a storage box that provides safe and compact housing, is easily produced with materials available in Western conservation facilities, and is comparatively inexpensive.

This document outlines the steps for making a storage box from pre-cut and scored acid-free corrugated board blanks. The box has a tight-fitting, overlapping lid to improve its function as a microclimate and fall-down ends to aid in safe handling of the rolled scroll. Volara sheeting is used to support the length of the scroll. No adhesives are necessary.

Though a variety of acid-free boards may be used to make this box, pre-cut and scored corrugated board blanks are commercially available. These 96-inch long blanks come in two sizes with an interior height and width of 3 ½ inches or 4 inches. These measurements fit most scrolls with or without a roller clamp.
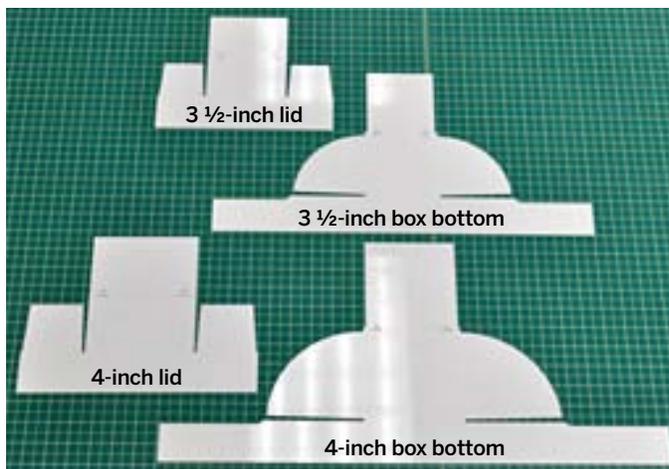
When constructing a box from these blanks, the box length is easily customized to fit the width of the scroll.
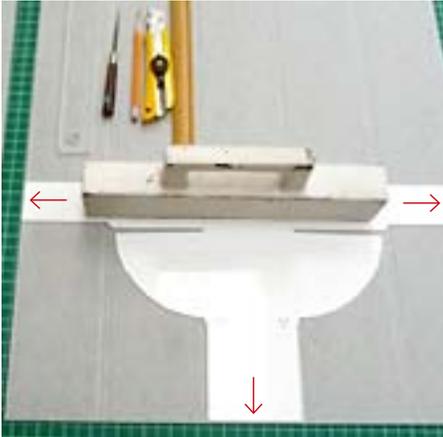

Scroll width
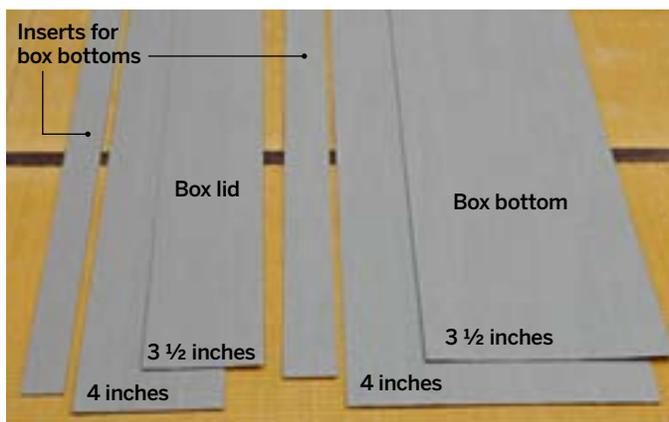
Two sizes of aluminum templates are used in conjunction with the board blanks to mark and cut the fall-down ends of the scroll box. One type of template is used to cut the ends of the box bottom (right) and another for the box lid (left). For more information about the templates, please contact the East Asian Painting Conservation Studio at the Freer and Sackler Galleries by emailing dcsr@si.edu.

In addition to the corrugated board blanks, Volara, and templates, a few basic tools are necessary:

Cutting mat	Ruler
Straight edge	Awl
Weight	Bone folder
Mat knife	Pencil

Inserts for box bottoms
Box lid
Box bottom
3 ½ inches
4 inches
3 ½ inches
4 inches

3 ½-inch lid
3 ½-inch box bottom
4-inch lid
4-inch box bottom

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THE SMITHSONIAN'S MUSEUMS OF ASIAN ART

**CUTTING THE ENDS
OF THE BOX BOTTOM**
To make the bottom of the box, align the longer template with the end and both sides of the pre-scored box blank. Use a weight to hold the template in place.

Use an awl to mark pinholes in the blue board at each of the six holes in the template. These marks will indicate the double lines where the box will be scored and folded to make an end wall. (The arrows indicate where the fold lines will be scored later.)


Using a mat knife, carefully and precisely cut along the edge of the template. Or, mark the edge with a pencil, remove the template, and cut the edge freehand.
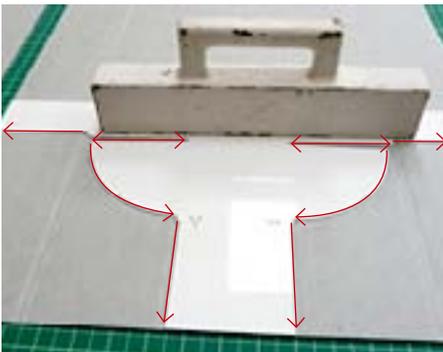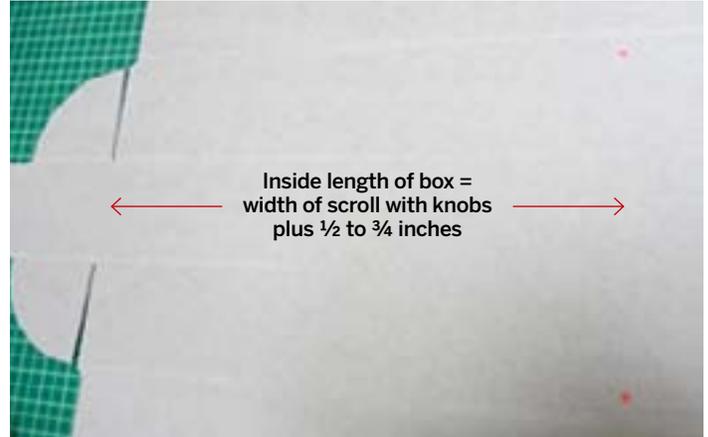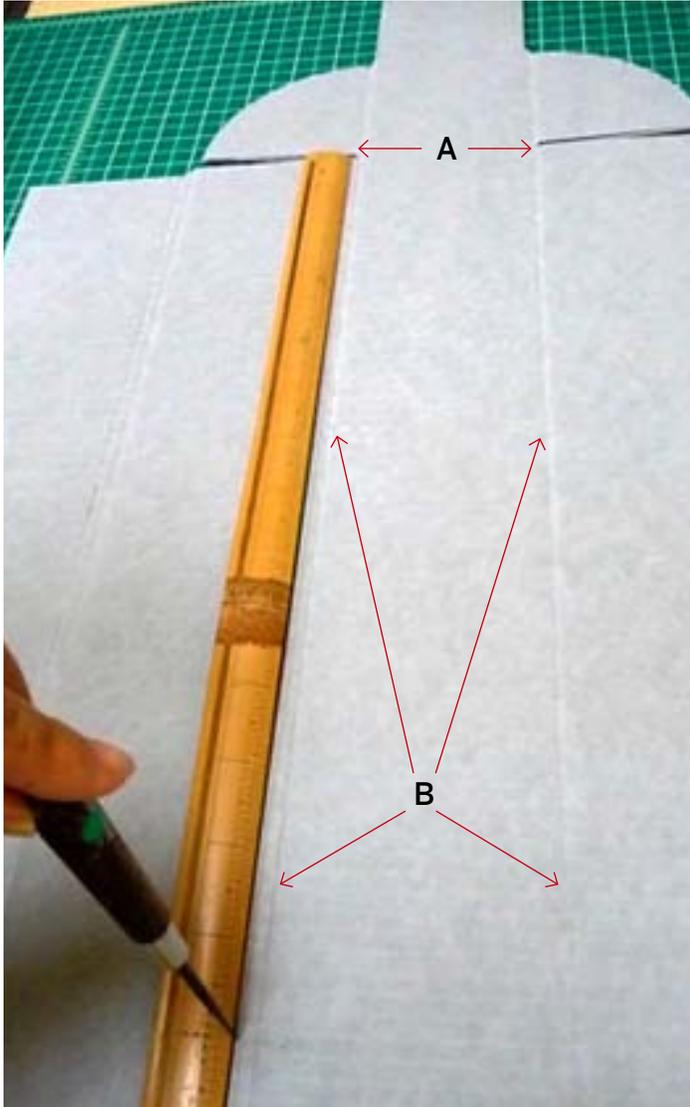

The arrows indicate the steps and direction for cutting along both sides of the template.
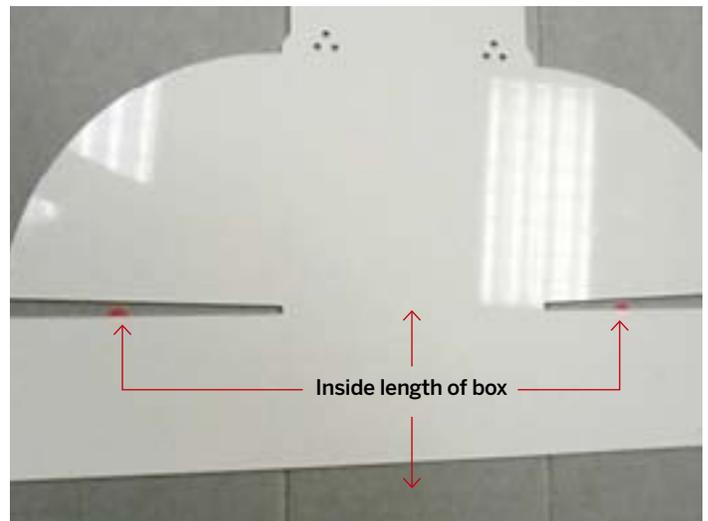

Be careful to completely cut through the blue board in recessed areas and maintain the detail of angles. It is easier to do this when the template is removed.
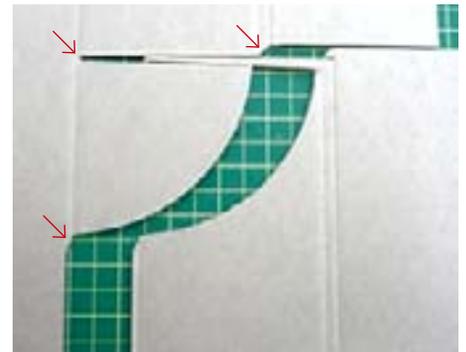
Once the excess board is detached, the edge should look like this. Note the three key areas indicated by arrows.

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The red dots indicate pinholes that mark the length of the box bottom. This length is the width of the scroll including knobs plus ½ to ¾ inches.

CUSTOMIZING THE LENGTH OF THE BOX

Measure and mark the length of the bottom of the box. The inside length of the bottom of the box should be the width of the scroll (with knobs) plus ½ to ¾ inches extra to accommodate the double thickness of the box walls. This length is measured from the inside of the recessed area cut with the template (A). Measure and mark this length twice using the scored lines in the blue board as a guide (B).
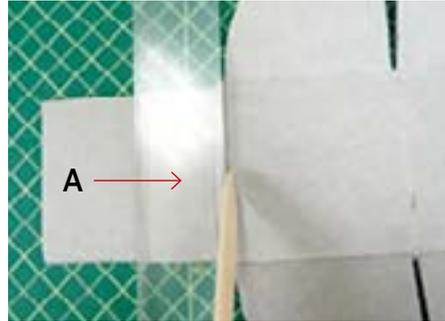
Turn the template around and align the inner straight edge of the template with the pinhole marks. Cut along the template (as before) to make the second end of the box.

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Compress and smooth all the cut edges of the box with a bone folder on both sides of the board.


Align the straight edge with the single and double pinhole marks at the end of the box. Score each line with the tip of the bone folder. Fold over the end flap (A) along these double lines to make one end of the box. Repeat this process at the other end of the box.
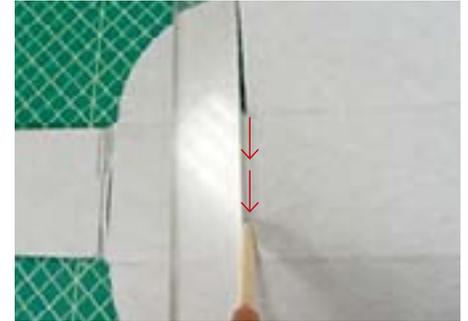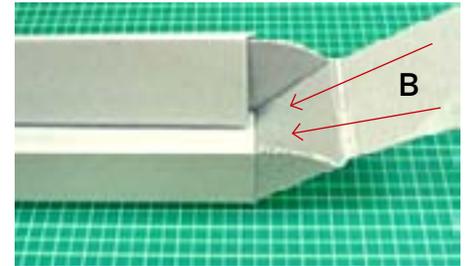

Align the straight edge with the recessed cuts. Score and fold along this line with the bone folder. Fold up the end of the box along this crease to about 90˚. Repeat at the other end of the box.
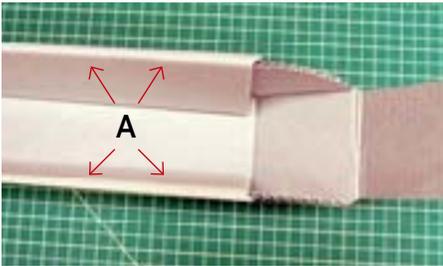
Fold along the double scored lines on the long sides of the box (A) to make double thick walls.
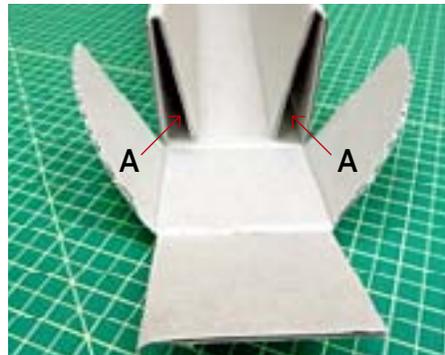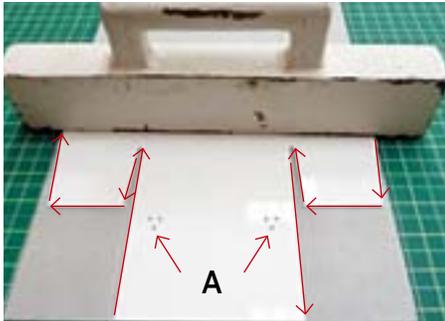

Insert the quarter round tabs (A) into the double-walled sides of the box.

Fold flap (B) over to make the end wall of the box. Repeat at the other end of the box.

Trim a pre-cut blue board insert (3 ½-inches or 4-inches wide) to the inside length of the box. This will help stabilize the bottom of the box. These inserts come with the blue board blanks.


Scroll width

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MAKING THE LID FOR THE STORAGE BOX
Align the box lid template with the end and both sides of the pre-scored lid blank. Use a weight to hold the template in place. Mark the six pinpoints (A) with an awl and cut or mark along the edges of the template on both sides as before.

NOTE: The **inside** length of the lid should be approximately ½ to ¾ inch longer than the **outside** length of the box bottom to accommodate the thickness of the box walls.

Remove the template to cut recessed areas cleanly. Smooth the newly cut edges with the bone folder on both sides.

Align the straight edge along the single and double pinhole marks. Score both lines with the tip of a bone folder or awl. Repeat at the other end of the box.
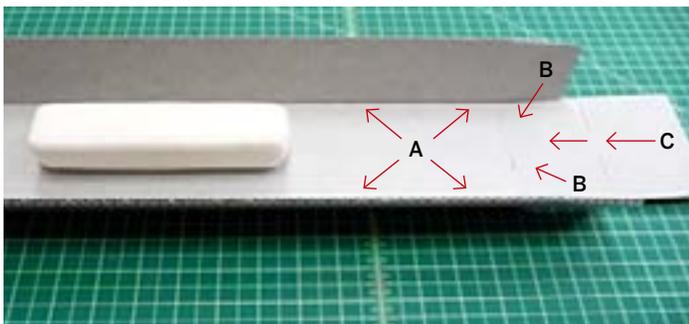
Fold up the long sides of the lid along the single scored lines (A). Fold tabs (B) to 90° and double flap (C) over the tabs (B) to make one end of the lid. The flap (C) should fit snugly. Repeat at the opposite end of the lid.

When folding is complete, the box will look like this (above right).

Pull out the fall-down end walls of the box partway and place the rolled scroll in the box (left). Close the end walls to confirm that the scroll fits easily in the box.

Though a scroll may be wrapped in unbleached cotton muslin and stored in the box, the addition of a Volara cradle will better support and protect the scroll.
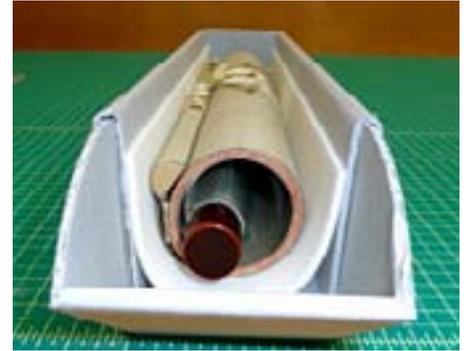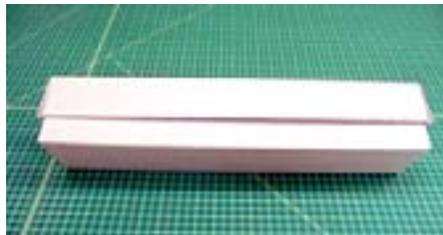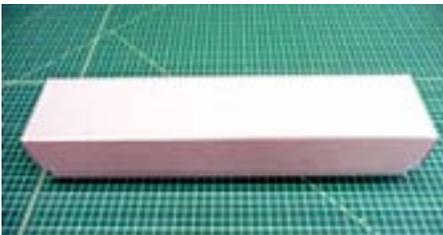
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MAKING THE VOLARA CRADLE
Volara is an inert, closed-cell foam sheeting that comes in ¼-inch thickness. Measure and cut a sheet of Volara to fit the inner length of the box.
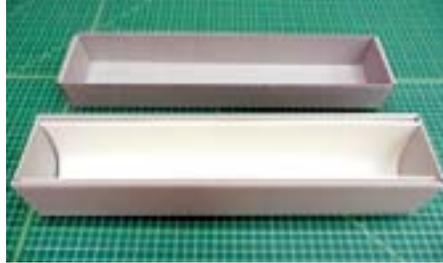
For a 3 ½-inch wide box, the Volara should be cut 7 inches wide. For a 4-inch wide box, the Volara should be 8 inches wide to form the correct U-shaped cradle.

A Volara cradle set into the box will support the scroll along its entire length and help stabilize the scroll when the box is handled.

Corrugated board blanks are available through Hollinger Metal Edge (www.hollingermetaledge. com) by contacting Abby Shaw: AbbyAShaw@ aol.com

For more information about metal box templates, contact the East Asian Painting Conservation Studio at the Freer Gallery of Art and Arthur M. Sackler Gallery: dcsr@si.edu

The completed box (with lid) will look like this (above). Notice that the lid overlaps the side of the box more than halfway, giving it added strength and improving its function as a microclimate.
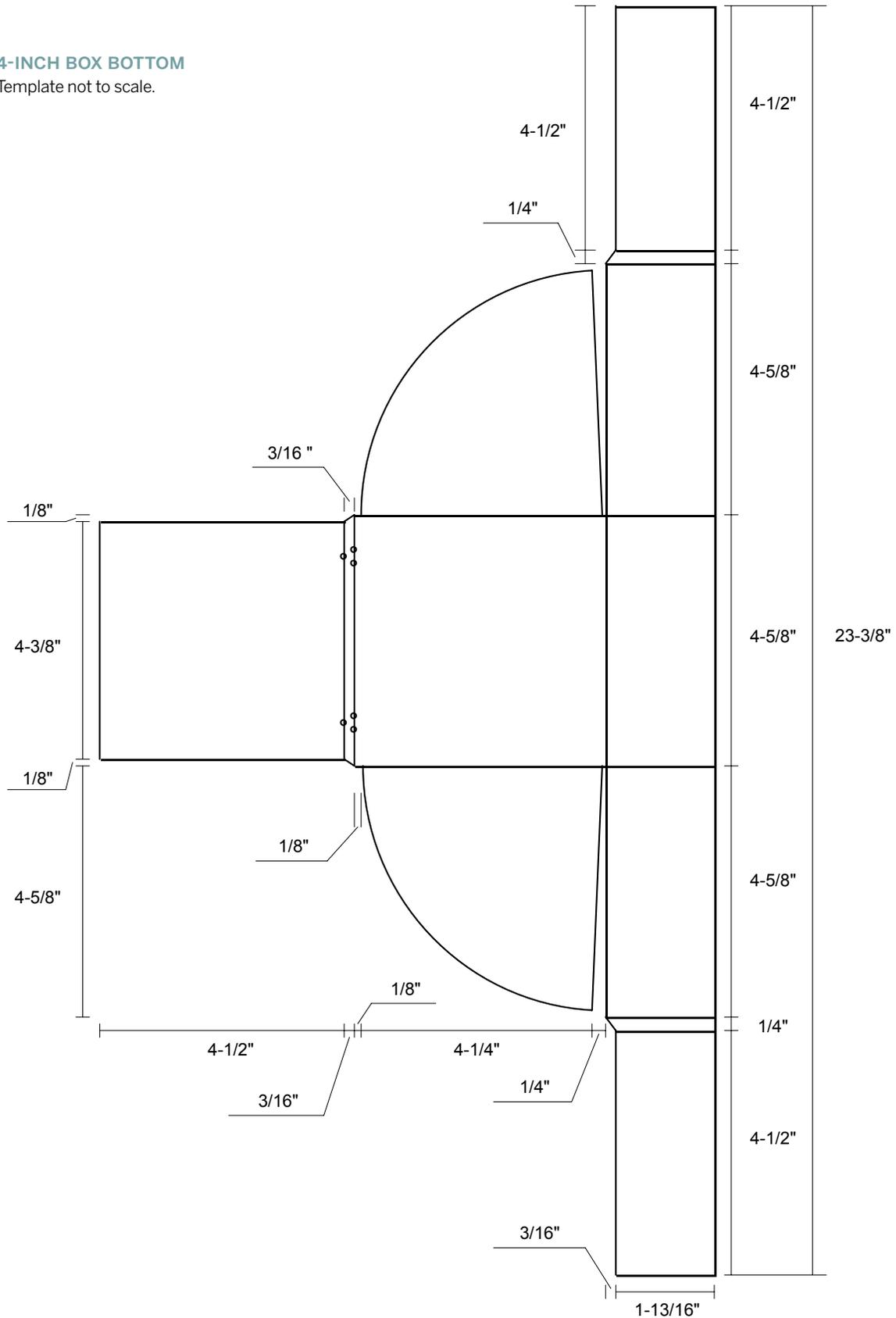
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4-INCH BOX BOTTOM
Template not to scale.

4-1/2"

4-1/2"

1/4"

3/16 "

4-5/8"

1/8"

4-5/8"

4-3/8"

4-5/8"

23-3/8"

1/8"

1/8"

4-5/8"

4-5/8"

1/8"

4-1/2"

4-1/4"

1/4"

3/16"

1/4"

1/4"

4-1/2"

3/16"

1-13/16"

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4-INCH BOX TOP

Template not to scale.

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3 ½-INCH BOX BOTTOM
Template not to scale.

3-5/8"

1/4"

3-5/8"

3-3/4"

3/16 "

1/8"

3-3/4"

3-1/2"

3-3/4"

19"

1/8"

1/8"

3-3/4"

3-3/4"

3-5/8"   3-3/8"   1/4"

3/16"   1/4"

3-5/8"

3/16"

1-13/16"

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3 ½-INCH BOX TOP
Template not to scale.

2-1/16"

1/4"

4-3/16"

2-1/2"

4-3/16"   9-3/16"

1/4"

3/16"

2-1/2"

2-7/16"   2-1/2"   2"

1/4"

7-3/16"

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