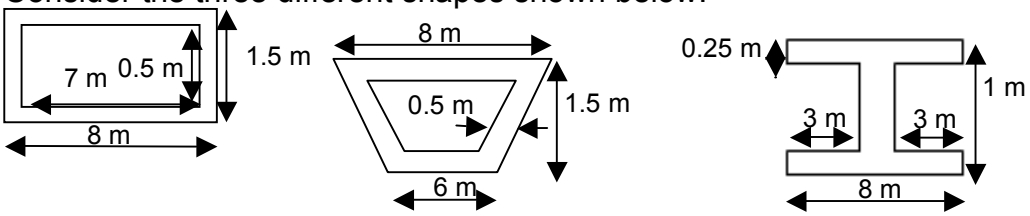
Bridges: Cable-Stayed Bridges in Action
Extension Activities

The deck of your model bridge is not very realistic. In practice decks are 3D shapes.

Consider the three different shapes shown below:



Shape 1 Shape 2 Shape 3

When a 3D shape is viewed end-on, the 2D shape visible is called the cross-section.

<u>Activity 1: Areas and Volumes</u>

Calculate:

a) The area of these shapes. Enter your answers in the table below.

b) If the bridge is 15 m long, what volume of material is needed for each deck?

c) Looking at your volume answers from part b), which shape deck would you suggest building in order to reduce material costs?

Shape	Calculations	Area (m^2)	Calculations	Volume (m^3)
1				
2				
3				

Activity 2: Nets

If you were going to improve the model bridge, the deck would need to be re-designed.

a) Draw two separate nets for improved decks, taking the cross-sections from the first two shapes in Activity 1. Assume the thickness of the cross section is the thickness of your paper. Mark the dimensions on your drawing. Do not forget to add tabs.

Hint: In order to make a net, imagine unfolding the 3D shape until it lies flat. It may help to sketch the 3D shape first.

b) Why is it not possible to make a net for the third shape?

c) Calculate the surface area of each deck. Don't forget to include the end areas, even though they are not visible on your net. It may help you to draw the third shape in 3D since you do not have a net.

Shape	Calculations	Surface Area (m^2)
1		
2		
3		