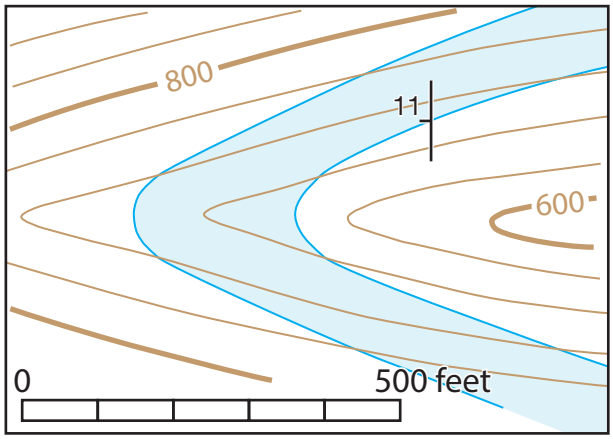


Measuring Bed Thickness Using Topographic Curves

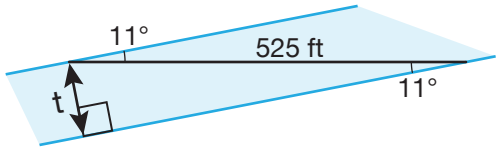
Finding the thickness of an inclined planar unit given the traces of its contacts on a topographic map and the orientation of that unit.

1. Identify an individual topographic contour that crosses both the upper and lower contact of the unit whose thickness you want to measure. In the example shown above, both contacts cross the 720 ft topographic contour on both sides of the stream valley.
2. Carefully draft the strike lines at the 720 ft contour where it crosses the upper and lower contact of the unit.
3. Measure the map distance between the two strike lines drafted in step 2, taking care to measure perpendicular to strike (parallel to the dip direction). In this example, the map distance is between 52 mm and 53 mm, so we'll use 52.5 mm.
4. Use the bar scale to convert the map distance to the full-scale distance in the field. The bar scale shows that 50 mm on the map corresponds to 500 feet in the field. We can solve this problem using proportions.

$$\frac{500 \text{ ft}}{50 \text{ mm}} :: \frac{x}{52.5 \text{ mm}}$$

Rearranging to isolate the unknown value, $x = \dfrac{500 \text{ ft} \times 52.5 \text{ mm}}{50 \text{ mm}} \cong 525 \text{ ft}$

5. To help visualize the thickness problem, construct a cross section perpendicular to strike, so that we can use the dip angle (δ) provided on the map to represent the inclination of the unit's upper and lower contacts.



6. From the diagram above, we see that determining the unit thickness involves solution of a right-triangle problem.

$$\sin(\delta) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\text{thickness} = 525 \text{ ft} \times \sin[11°] \cong 100 \text{ ft}$$