

Gully dams—Estimating earthworks and storage volumes

The graph below allows you to estimate the volume of earthworks in a gully dam. Before using the graph you need to go to Figure 1 and choose a gully shape that best matches your dam site and then assign a 'k' value. Next, estimate the width (W) and height (H) of the embankment.

To use the graph:

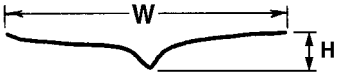


- start with the embankment width (W)—e.g. 145 m
- draw a vertical line to meet height (H)—e.g. 4 m
- draw a horizontal line to meet 'k'—e.g. 1.4
- draw a line down to meet earthworks volume (E).

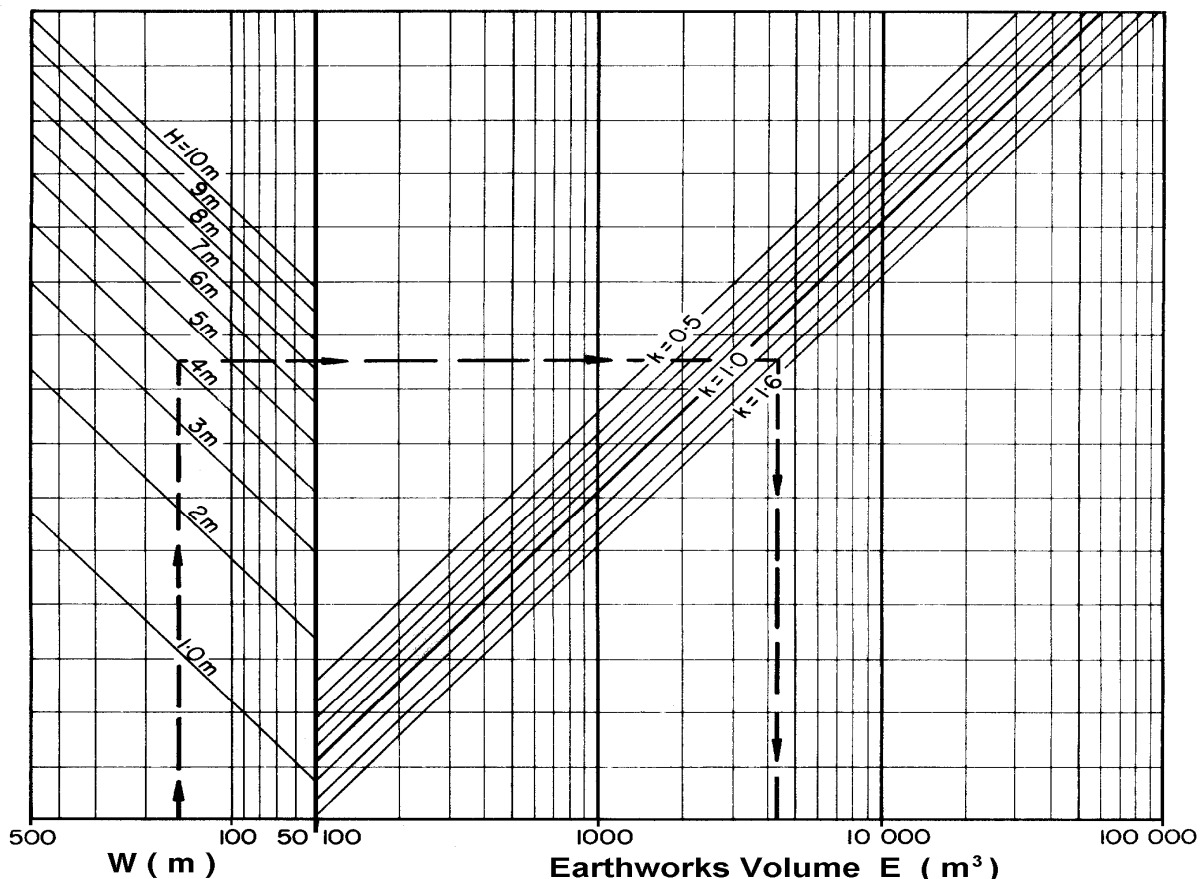
The answer to the example is 4300 m³.

Earthworks volume (E) can also be approximated by substituting the values in the following equation:

$$E = 1.05 k W H (H+1)$$

Figure 1.

Gully Shape	k value
	0.5 to 0.8
	0.8 to 1.2
	1.2 to 1.6



The **storage volume** for a gully dam can be estimated using the graph on the right. Before using the graph you need to go to Figure 2 and choose a gully shape that best matches your dam site and then assign a 'k' value. Go to Figure 3 and estimate embankment width (W), storage depth (D) and storage back-up length (L).

To use the graph:

- start with the 'k' value, for example 0.8
- draw a vertical line to meet width (W)—e.g. 200 m
- draw a horizontal line to meet depth (D)—e.g. 4 m
- draw a line down to meet length (L)—e.g. 100 m
- draw a line across to meet storage volume (V_s).

The answer to the example is 14 megalitres.

Storage volume (V_s) can also be approximated by substituting the values in the following equation:-

$$V_s = (0.22 k W D L) \div 1000$$

Figure 2.

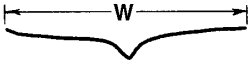
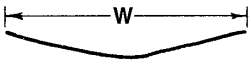
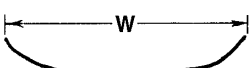
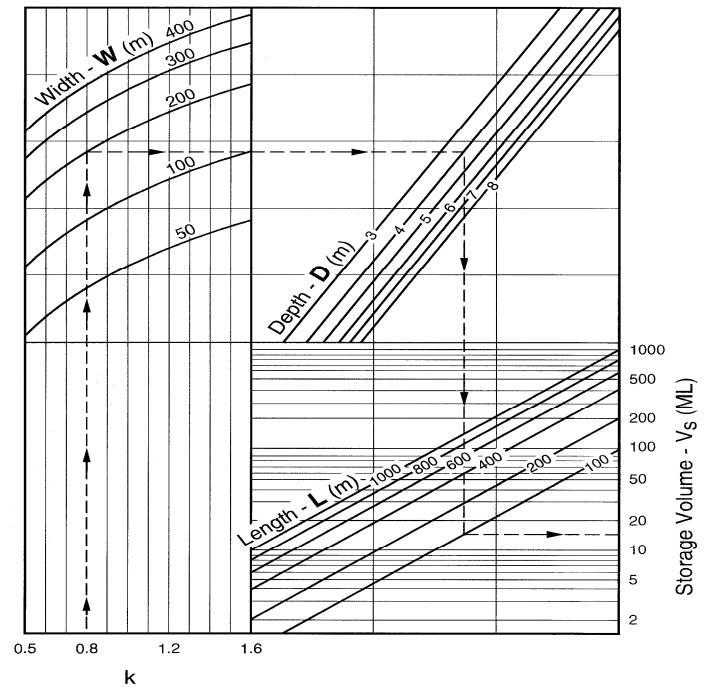
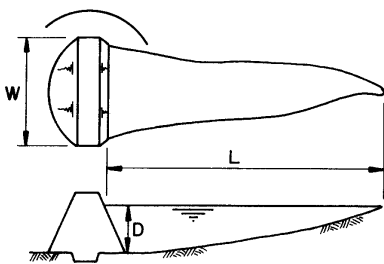
Gully Shape	k value
	0.5 to 0.8
	0.8 to 1.2
	1.2 to 1.6

Figure 3.



November 2011

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