EXAMPLE

A 400 m$_2$ (40 x 10 m) area is to be excavated, 1 m deep, with side slopes 2:1. As the width (10 m) is less than 30 times the depth (30 x 1 m), the first method is not accurate (estimated volume would be 400 m$_2$ x 1 m = 400 m$_3$).

Use the second method, where

top area = 400 m$_2$ and base area=base length x base width.

Base length = 40 - (2 x slope x depth) = 40 - (2 x 2 x 1 m) = 36 m

Base width = 10 - (2 x slope x depth)= 10 - (2 x 2 x 1 m) = 6 m

Base area = 36 m x 6 m = 216 m$_2$

Average area = (400 m$_2$ + 216 m$_2$)÷ 2 = 308 m$_2$

Volume therefore = 308 m$_2$ x 1 m= 308 m$_3$.

Above all, for precision, prismodal formula can be used to calculate the volume of soil excavated from pond area (excluding topsoil area):

V= (A+4B+C)/6 *D

Where

A = Top surface area

B = Mid-depth surface area

C = Bottom surface area

D = Average depth of excavation

How to calculate the volume of water in the pond

You have thus calculated the surface area of the pond and the average water depth of the pond. Now, using the figures you have found, you can calculate the volume of water in the pond by multiplying the surface in square metres (m$_2$) by the average water depth in metres (m) to get

Examples

Surface
area

Average
water
depth

Water
volume

the volume of the pond in cubic metres (m$_3$).

SURFACE AREA x AVERAGE DEPTH = VOLUME

(m$_2$) (m) (m$_3$)

235 x 1.0 = 235

450 x 1.2 = 540

2500 x 1.5 = 3750

Note: 1 cubic metre (m$_3$) = 1000 litres (l). To express water volume (in m$_3$) in litres (l)

multiply by 1000. To express water volume (in l) in cubic metres (m_3) divide by 1000.