Stump pad footings

The stump holes are dug into the ground with a post hole digger.

Stump footings transfer the building loads to the foundation and are used to support timber framed houses.

Concrete Pad Footings

A concrete pad footing is the simplest and most cost effective footing used for the support and the transfer of building loads to the ground.

Concrete pad footings are "isolated" i.e. there is no connection between them.

The plan indicates that the holes for the footings are 900mm deep and 600mm in diameter.
Concrete Pad Footings

The holes for the concrete pad footings were dug by 'Justin's Auger Service', now Lachlan needs to put in the stumps and fill the hole with concrete. But first he needs to work out the volume of concrete required.

Estimating concrete volume

To estimate the amount of concrete to order you need to find the volume of the hole by multiplying the hole's radius squared by the hole's depth by pi (\(V = \pi r^2 h\)).

For example a hole that has a radius of 200mm (0.2m) and a depth of 600mm (0.6m) would have a volume of:

\[V = \pi r^2 h = 3.142 \times 0.2 \times 0.2 \times 0.6 = 0.075 \text{ m}^3\]

To determine the total volume of concrete necessary for the stumps, multiply the volume in m\(^3\) per hole by the number of holes.

For example, a 12 hole layout would require the volume per hole multiplied by the number of holes.

\[0.075 \times 12 = 0.9 \text{ m}^3\]

You need 0.9 m\(^3\) of concrete for the stumps

Subtract the volume of the stump

To find the volume of the stump involves multiplying the length, width and depth (all in metres) of the stump to arrive at a volume of concrete in cubic metres.

For example the estimated volume of concrete for a stump 100mm (0.1) x 100mm (0.1) set 600mm (0.6) into the hole is calculated as follows:

\[
\text{Volume} = \text{length} \times \text{width} \times \text{depth} \\
= 0.1 \times 0.1 \times 0.6 \\
= 0.006 \text{ m}^3
\]

To determine the total volume of concrete to subtract, multiply the volume in m\(^3\) per stump by the number of stumps.

For example, a 12 hole layout would require the volume per stump multiplied by the number of stumps.

\[0.006 \times 12 = 0.072 \text{ m}^3\]

Using the example holes would subtract 0.072m\(^3\) of concrete from your initial estimate.

For example, 0.9 - 0.072 = 0.828m\(^3\)

You need 0.828m\(^3\) of concrete for the stump footings.
Pre-mixed concrete is ordered in quantities of 0.2 cubic metres, so you would round up the quantity of pre mixed concrete to 1.0m³

Your turn, try this one.

OK, your go.

**ASSESSMENT 6: ESTIMATE CONCRETE VOLUME FOR STUMP FOOTING**

Nathan is ready to order the pre-mixed concrete for the set out above. He has given you the job to estimate the amount of concrete required for the job.

The plan above show that the footings are 900mm deep and 600mm diameter and the 100mmx100mm stump will go into the hole 750mm.

**Working out**

**Volume of the hole**  \( V = \pi r^2 h \) \( \pi = 3.142 \)

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\[ V = \pi r^2 h \]

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Multiply the volume in m³ per hole by the number of holes (multiply the volume in m³ per hole by the number of holes)

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Volume of concrete for a stump (multiplying the length, width and depth (all in metres) of the stump)

Volume per stump multiplied by the number of stumps (multiply the volume in m³ per stump by the number of stumps)

Subtract volume of concrete in the stump from the volume of the hole. (subtract volume of concrete for stumps from your initial estimate)

CONSTRUCT THE FRAMING
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