

Work Health and Safety Guidance Note

Sizes of Mobile Plant Outrigger Bases Correction to Formula

The correct use of outriggers is essential for the safe operation of mobile plant including cranes and concrete boom pumps. To ensure crane stability outriggers must be positioned on suitable timber or equivalent packers which distribute the maximum applied loads to the soil. A risk assessment must also be conducted on the ground stability.

The information published in the current relevant Assessment Instruments regarding the design and installation of crane outrigger bases is incorrect. The formula is dependant on the maximum permissible bearing pressure of the soil and the loads being supported, but does not take into account the total weight of the crane.

The correct formula is:

$$\text{Area (m}^2\text{)} = 0.65 \times \frac{(\text{CM} + \text{L})}{\text{V}}$$

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CM = Total mass of crane (kN)

L = Total mass of load (kN)

V = Maximum permissible bearing pressure
of soil (kPa)

1 kg = 9.8 N 1 tonne/m² = 9.8 kPa
(These can be rounded for ease of calculation)

To calculate the length of a square outrigger base find the square root of the area.

Example: Total Crane Mass = 29200kg
 Load to be lifted = 15 tonne
 Ordinary Clay soil = 20 tonnes/m²

$$0.65 \times \frac{(286.17 + 147)}{196} = \sqrt{1.437}$$

Answer 1.199 m

(This is the minimum side of each outrigger base)

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