

Greetings all. Today's Bulletin is about understanding how different factors affect the weight of a load.

If you haven't checked out the [NSW Dogging and Rigging Guide](#) yet, it is well worth spending the time to become familiar with this excellent resource.

Page 16 onwards, covers how the weight of a load affects the way it can be lifted.

When operating cranes, accurate weight estimation is critical for safety and efficiency.

However, it's essential to remember that the weight of materials can be influenced by several factors, making proper calculations and awareness key to successful operations.

Here are some factors to bear in mind:

1. Moisture Content in Materials

- **Timber:** Did you know timber can weigh up to 50% more when wet? This increase in weight is due to the absorption of water, which adds significant bulk. Always assess the condition of timber and factor in potential moisture content, especially after rain or during humid conditions.
- **Concrete:** The weight of concrete can also vary significantly depending on its moisture content, suction, and internal reinforcement. Wet concrete is heavier and may behave differently during lifting and transport.

2. Suction Effects

When loads are raised from moulds, suction can create additional resistance. For example:

- **Wet and muddy conditions:** Sand, mud, or water in the mould can cause suction, requiring extra force to release the load.
- **Potential uncontrolled movement:** Once the load is released, be prepared for sudden shifts or movement. This can pose safety risks, so always plan for controlled handling.

3. Residual Materials in Equipment

Pipes, tanks, motors, gearboxes, and compressors may contain leftover liquids, sludge, or other substances. This residual material can add significant weight and alter the load's centre of gravity. Always inspect and, if possible, drain equipment before lifting.

4. Shape and Volume of the Load

The shape of an object plays a vital role in determining its volume and, consequently, its weight. Understanding how to calculate volume is a crucial skill for crane operators. Below are common formulas:

- **Rectangular objects:** Volume = Length × Width × Height
- **Cylindrical objects:** Volume = $\pi \times (\text{Radius}^2) \times \text{Height}$
- **Spherical objects:** Volume = $(4/3) \times \pi \times (\text{Radius}^3)$

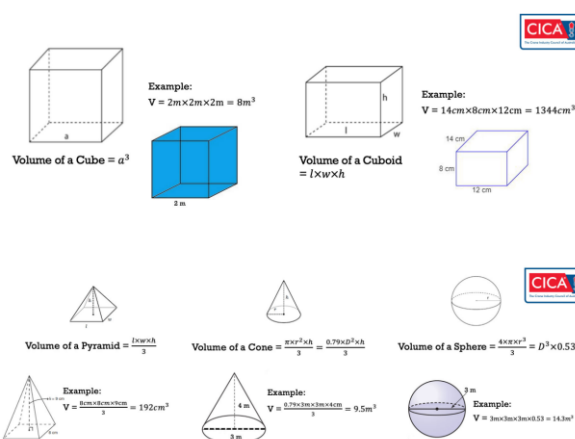


Image 1: Taken from Page 20 of the NSW Rigging and Dogging handbook

5. Environmental Factors

External conditions can also impact load weight and handling:

- **Wind:** High winds can create additional force on large or irregularly shaped loads, increasing the risk of instability.
- **Temperature:** Extreme temperatures can affect material properties, potentially altering weight distribution or structural integrity.

For example, high temperatures can lead to a loss of tensile strength in materials like steel. This weakening can affect the load-bearing capacity of structures.

Extreme cold can increase the strength of some materials like aluminium, but at the cost of reduced ductility, making them more prone to cracking.

For an overview of how temperatures impact traditional building materials, [here is a helpful](#)



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article from AAP (Advanced Architectural Products).

Key Takeaways for Crane Operators

- Always inspect and assess the load thoroughly before lifting.
- Account for variables like moisture, residual contents, and environmental factors in your calculations.
- Use precise tools to measure or estimate weight whenever possible.
- Be cautious of suction effects and plan for controlled release of loads.
- Ensure the crane's capacity matches the actual weight of the load, including any unforeseen variables.

By staying informed and vigilant, crane operators can reduce risks and ensure safe, efficient operations every time.

Knowledge and vigilance are your most valuable tools on the jobsite.

Stay safe, and remember, well-planned lifting keeps everyone on-site secure.

2025 Dates for the CICA Lift Supervisor Course have been released.

The CICA Lift Supervisor Course is a proactive initiative designed to enhance the safety and efficiency of crane operations on construction sites and industrial projects. This program introduces the role of a crane lift supervisor, who acts as a dedicated overseer of all crane-related lifting activities.

For more information and to book your place [click here](#)

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Stay Safe - CICA