# CICA – Vic / Tas Branch
# Crane Safety Bulletin
# #351 December 2024

Greetings all. Today's Bulletin is about the importance of lift planning tools.

Proper planning enhances safety, prevents costly errors, and ensures compliance with regulations, making these tools indispensable for every operation.

Lift planning tools have become essential in today's crane operations.

These specialised software solutions enable engineers and construction professionals to plan, visualise, and execute crane lifts with unparalleled precision planning.

## Key Features of Lift Planning Tools

### Comprehensive Crane Libraries

Access detailed load charts and specifications for various crane models from different manufacturers.

### Real-Time Calculations

Instantly calculate critical parameters such as:

- Ground bearing pressures
- Rated capacities in different configurations
- Centres of gravity

### Interactive 3D Environment

Plan and visualise lift scenarios in a three-dimensional space, improving risk assessment and scenario planning.

### Collision Detection

Advanced tools warn of potential collisions between the crane, load, and surrounding objects, enhancing on-site safety.

### Integration with Mapping Data

Incorporate real-world data, such as Google Maps, to simulate actual environments for precise lift execution.

Not every job will require or have prior notice to complete the elaborate planning, with their advantages, listed above. This doesn't mean that a lift plan should be forgotten completely.

Simple lift plan templates are available on the CICA website that cover off the basics:

- What is the weight of the lifted load(s)?
- What is the capacity of the crane during the lift?

## Rated Capacity Guidelines in Australia

Definition of rated capacity: Australian Standard AS 1418.1:2021 defines rated capacity as the maximum mass that can be handled at the lift radius or reach for a particular configuration, replacing the older term "safe working load" (SWL). A crane may have many rated capacities but will only have one maximum rated capacity defined by the manufacturer as the greatest load mass for the crane.

By leveraging rated capacities within sophisticated software environments, lift planning tools significantly enhance the safety, efficiency, and precision of crane operations, allowing planners to optimise lifts while staying well within the equipment's safe working limits.

## Why Do Rated Capacities Vary?

Different rated capacities can occur for the same crane depending on:

**Load Radius**: Capacity decreases as the load's horizontal distance from the crane increases.

**Boom Configuration**: Boom length and angle directly impact lifting ability.

**Environmental Conditions**: Wind speed and terrain, such as slopes, can affect stability.

**Attachments and Counterweights**: Tools like fly jibs or the amount of counterweight used influence performance.

**Operating Mode**: Stationary versus pick-and-carry mode yields different capacities.

These complexities are why modern-day load charts are invaluable, providing operators with real-time adjustments based on the crane's specific setup and conditions.

**Standards define and regulate how rated capacities are determined and applied in crane operations:**

Standards like AS 1418 provide specific guidelines for calculating rated capacity, considering factors such as stability and structural capacity. Modern cranes are optimised for both stability and structural capacity so the limiting factor is not known by the operator. The manufacturers have applied internationally accepted tests to determine what the crane capacity is for intended use.

The rated capacity determined by stability must not exceed the appropriate percentage of the tipping load, which varies based on the type of operation:

1. 75% of tipping load for stationary lifting
2. 66% of tipping load for pick and carry operations

Historically, rated capacities varied between Australian and European manufacturers due to differences in standards and calculation methods.

While there may be differences between Australian standards (like AS 1418.5) and international standards (like ISO 4305), both aim to ensure crane safety and performance.

Manufacturers often design cranes to meet multiple standards for use in different markets.

**So what are the differences between standards: AS 1418.5-2002 & ISO 4305:2014?**

**Key Differences**

**Scope**:

- *AS 1418.5-2002*: Is Australian-specific, focusing on mobile cranes.
- *ISO 4305:2014*: An international standard for mobile cranes.

**Load Calculations**:

- *AS 1418.5-2002*: Includes requirements for determining when tipping occurs based on tyres, outriggers, or tracks lifting off the ground.
- *ISO 4305:2014*: Includes requirements for determining when tipping occurs based on an angle of the chassis. When the chassis angle is between 4˚-5˚ tipping has occurred.

**Testing Procedures**:

The outcome of the testing or theoretical calculations will determine the rated capacity of the load charts.

Both standards share the goal of ensuring crane safety and performance.

There are other factors that contribute to determining the rated capacity of the crane configuration.

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 in 2025 click here.

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