LIFT PLANNING
Your guide to
Crane Association Lift Plans
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Updated April 2016
Introduction

Welcome to Lift Planning: a guide to safer workplaces by using the Crane Association of New Zealand (Inc.) Lift Planning Tools.

These tools create a common standard across New Zealand allowing crane users, operators and riggers to learn and become familiar with one common tool designed to keep lifting operations safe.

We’ve produced this guide to help make Lift Planning easier for you and your team. You can purchase the Lift Planning Tools discussed in this document from shop.cranes.org.nz.

If you need further help completing a Lift Plan or Rigging Plan, The Crane Association can be contacted at www.cranes.org.nz

Why use this guide?

This guide provides simple, useful advice on the processes you need to follow to create a safe lift using the Crane Association Lift Planning Tools.

Crane Association Lift Planning Tools provide a single point where the Industry can learn from its events and share the changes to prevent re-occurrence.

Who is the Crane Association of New Zealand (Inc)?

The Crane Association of New Zealand (Inc.) was established in 1975 by crane owners to represent their interests. Today crane owners of all types are members as are many suppliers to the industry.

The Association places a great deal of importance on training and safety and has succeeded in raising the standards of operation and efficiency across the face of the crane industry.

By supporting its members in these and other operational objectives the New Zealand crane industry has become an international benchmark of success in these areas.

The Association is the voice of the crane industry and recognised by the New Zealand government and the general public alike as the official representative on all matters relating to the safety and operation of cranes.
Lite and Standard Plans

The Crane Association produces two types of Plans. Lite and Standard.

**Lite**
The Lite plans are single page and double sided.

**Standard**
The Standard plans are in duplicate.

Lift Plans - Single and Multi

The Crane Association produces two types of Lift Plans. Single and Multi Crane.

**Single Crane**
The single crane lift plan is designed to address the hazards associated to cranes carrying out single crane standard lifts. The plan is available in both Lite and Standard versions.

**Multiple Crane**
The multiple crane lift plan is designed to address the hazards associated to multiple cranes carrying out a multi crane lift. The plan is available in both Lite and Standard versions.

Rigging Plans

The Crane Association produces a rigging plan that can be used as standalone or as an attachment to a Lift Plan for complex lifts.

**Rigging Plan**
The rigging plan is designed to address the hazards associated to rigging and allows the user to create a visual representation of their plan. The plan is available in both Lite and Standard versions.
The single crane lift plan is designed to address the hazards associated to cranes carrying out single crane standard lifts. The plan is available in both Lite and Standard versions.

| Lift Plan Details | The Lift Plan Details panel identifies the parties involved in the lift and confirms:  
|                  | - the date and time of the lift  
|                  | - the crane in use for the lift  
|                  | - the location of the lift  
|                  | - the default method of control by the dogman  
|                  | - a description of the lift |

| Hazard Checks | The Hazard Checks panel lists common hazards associated to crane operation and load lifting. The complete description of each check box and its meaning is on the inside of the lift plans front cover.  
|               | Each check is a three state check box.  
|               | - A line through indicates not applicable  
|               | - A cross indicates further controls required  
|               | - A tick indicates Ok.  
|               | The hazard checks also confirm operator and dogman / rigger qualifications, and question if fatigue has been managed. |

| Lift Details | The Lift Details panel is used by the crane operator to confirm his/her calculations when planning the lift.  
|             | By calculating the lift the operator must think about the pick up and set down locations and the best configuration for the crane. |

| Lift Sketch | The Lift Sketch panel is one of the most powerful tools used by crane operators to address hazards.  
|            | By drawing the setup location and proximity of hazards the crane operator is able to take into account the three dimensional nature of crane hazards.  
|            | Work Quadrant - Indicates area crane is working in  
|            | Wind Log - Provides an area to record wind speed |
Multiple Crane Lift Plan

The multiple crane lift plan is designed to address the hazards associated to multiple cranes carrying out a multi crane lift. The plan is available in both Lite and Standard versions.

Lift Plan Details

The Lift Plan Details panel identifies the parties involved in the lift and confirm:
- the date and time of the lift
- the location of the lift
- a description of the lift

Hazard Checks

The Hazard Checks panel lists common hazards associated to crane operation and load lifting. The complete description of each check box and its meaning is on the inside of the lift plans front cover.

Each check is a three state check box.
- A line through indicates not applicable
- A cross indicates further controls required
- A tick indicates Ok.

The hazard checks also confirm operators and dogmen / riggers qualifications, and question if fatigue has been managed

Lift Details

The Lift Details panel is used by the lead crane operator to confirm crane lift calculations when planning the lift.

By calculating the lift the lead operator must think about the pick up and set down locations and the best configuration for the cranes in use.

Lift Sketch

The Lift Sketch panel is one of the most powerful tools used by crane operators to address hazards.

By drawing the setup location and proximity of hazards the lead crane operator is able to take into account the three dimensional nature of crane hazards.

Wind Log - Provides an area to record wind speed
The rigging plan is designed to address the hazards associated to rigging and allows the user to create a visual representation of their plan. The plan is available in both Lite and Standard versions.

- **Calculate Weight**
  The Calculate Weight Panel provides a tool for the Rigger to identify and calculate the weight of the lift. Whether it be:
  - Known
  - Certified
  - Manufacturers Plate; or
  - Calculated

- **Sketch Rigging**
  The Sketch Rigging panel provides a tool to be used by riggers to identify all rigging components to be used.
  
  By drawing the rigging the rigger can confirm angles and sling tensions.

- **Rigging Checks**
  The Rigging Checks panel is used by the Rigger to confirm checking each component of rigging is suitable for the lift. The rigger can also use the panel to calculate the weight of the rigging.

- **Hazard Checks**
  The Hazard Checks panel lists common hazards associated to rigging.
  
  Each check is a three state check box.
  - A line through indicates not applicable
  - A cross indicates further controls required
  - A tick indicates Ok.
## 1. Calculate Weight

<table>
<thead>
<tr>
<th>Known:</th>
<th>Certified:</th>
<th>Manufactures Plate:</th>
<th>Previous Lift:</th>
<th>Calculated weight:</th>
</tr>
</thead>
</table>

Further calculations attached: 

Weight: 

kg

## 3. Rigging Checks

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Description</th>
<th>W.T.</th>
<th>Qty</th>
<th>Certified Visual</th>
</tr>
</thead>
</table>

Visual Check: All Rigging is Safe

Further rigging checks on reverse: 

Weight: 

kg

## 4. Hazard Checks

- Tag lines used: 
- Hook, clutch, shackles orientated, correct: 
- Pinch points identified: 
- Centre of gravity established: 
- Further hazard controls on reverse: 

## 5. Acknowledge

- Crane Operator: 
- Rigger/Dogman: 
- Engineer: 

See inside cover for further details. Take the time to read and understand the hazards before ticking above or signing. Use reverse to document further controls.

Mark Centre of Gravity: 

Calculate Sling Tensions and Underline 

www.cranes.org.nz
### Hazard Management

Each Plan includes a Hazard Management section to allow the user to address foreseeable hazards and allocate appropriate controls as required by the Health and Safety at Work (General Risk and Workplace Management) Regulations 2016.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>The Foreseeable Hazard the user has identified as presenting a risk to the operation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk</td>
<td>The initial Risk associated to the Hazard before any controls are assigned and implemented.</td>
</tr>
<tr>
<td></td>
<td>Risk is allocated as:</td>
</tr>
<tr>
<td></td>
<td>- Low Risk</td>
</tr>
<tr>
<td></td>
<td>- Moderate Risk</td>
</tr>
<tr>
<td></td>
<td>- High Risk</td>
</tr>
<tr>
<td></td>
<td>- Very High Risk</td>
</tr>
<tr>
<td>Control</td>
<td>The control to be assigned and implemented to eliminate or minimise the hazard.</td>
</tr>
<tr>
<td>Level of Control</td>
<td>The type of control that is to be applied by using the Hierarchy of Risk Control.</td>
</tr>
<tr>
<td></td>
<td>1. Eliminate</td>
</tr>
<tr>
<td></td>
<td>2. Substitute</td>
</tr>
<tr>
<td></td>
<td>3. Isolate</td>
</tr>
<tr>
<td></td>
<td>4. Engineering</td>
</tr>
<tr>
<td></td>
<td>5. Administration</td>
</tr>
<tr>
<td></td>
<td>6. PPE</td>
</tr>
<tr>
<td>Residual Risk</td>
<td>The residual Risk associated to the Hazard after any controls are assigned and implemented.</td>
</tr>
<tr>
<td></td>
<td>Risk is allocated as:</td>
</tr>
<tr>
<td></td>
<td>- Low Risk</td>
</tr>
<tr>
<td></td>
<td>- Moderate Risk</td>
</tr>
<tr>
<td></td>
<td>- High Risk</td>
</tr>
<tr>
<td></td>
<td>- Very High Risk</td>
</tr>
<tr>
<td>Responsible</td>
<td>The Role responsible for monitoring and ensuring the control is in place and working.</td>
</tr>
</tbody>
</table>
# Hazard Management

Identify hazards that could give rise to reasonably foreseeable risks to health and safety. Use Hierarchy of Risk Control & Risk Ratings to complete.

<table>
<thead>
<tr>
<th>Hazard:</th>
<th>Risk:</th>
<th>Control:</th>
<th>Level of Control:</th>
<th>Residual Risk:</th>
<th>Responsible:</th>
</tr>
</thead>
</table>

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**Example:**
- **Hazard:** Collision
- **Risk:** High
- **Control:** Minimum Approach distance. Boom and load not to come closer than 1 metre. Spotter to stop job if 1 metre limit reached.

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**Emergency Response Plan/Rescue Plan:**

Emergency Response Plan Example: Crane Operator to secure crane and contact emergency services. Doorman to isolate and clear scene. Doorman to provide first aid. Customer to control scene and direct emergency services.

Rescue Plan Example: Crane Operator to lower load/case in the ground. Load/case is marked with marker in search.

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In controlling hazards think what is Reasonably Practicable:

- What can be done - that is, what is possible in the circumstances for ensuring health and safety. Then consider whether it is reasonable in the circumstances to do all that is possible.

Those with responsibilities must Sign Off to acknowledge.

If you use the collision example above cross out example.

Sign off all other.

For further assistance on your Lift Plan see: www.cranes.org.nz

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Additional personnel involved sign here to show all procedures, hazards & controls understood.

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*It is recommended that Crane Operators keep a copy of completed. Safety Plan as record of all Details. Lift Schemes, Hazard Checks and Controls conducted regularly. Site Representatives are asked to photograph or photocopy as required.*
# Risk Assessment Matrix and Hierarchy of Controls

The Risk Assessment Matrix allows you to assess the risk of a hazardous event occurring while particular activities are being performed. All Lift Plans and Rigging Plans use a Risk Assessment Matrix and Hierarchy of Controls to manage risk.

## About

The levels of risk of a hazardous event occurring cover: very low, low, moderate, high, and critical. The severity of potential injury or illness covers:

- catastrophic
- major
- moderate
- minor
- insignificant

The Hierarchy of Controls table takes you through a logical flow of options, from most effective to least effective, to guide you in eliminating and minimising hazardous events.

## Note

You will need to use the Risk Assessment Matrix and the Hierarchy of Controls table for completing the:

- Single Crane Lift Plan
- Multiple Crane Lift Plan
- Rigging Plan

## Ranking of Consequence / Likelihood

The Lift and Rigging Plans include a table to help with ranking of consequence and likelihood.
**Risk Assessment Matrix**

<table>
<thead>
<tr>
<th>LIKELIHOOD</th>
<th>1 - Insignificant</th>
<th>2 - Minor</th>
<th>3 - Moderate</th>
<th>4 - Major</th>
<th>5 - Catastrophic</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - Almost Certain</td>
<td>M-5</td>
<td>H-10</td>
<td>VH-15</td>
<td>VH-20</td>
<td>VH-25</td>
</tr>
<tr>
<td>4 - Likely</td>
<td>M-4</td>
<td>H-8</td>
<td>H-12</td>
<td>VH-16</td>
<td>VH-20</td>
</tr>
<tr>
<td>3 - Possible</td>
<td>L-3</td>
<td>M-6</td>
<td>H-9</td>
<td>H-12</td>
<td>VH-15</td>
</tr>
<tr>
<td>2 - Unlikely</td>
<td>L-2</td>
<td>M-4</td>
<td>M-6</td>
<td>H-8</td>
<td>H-10</td>
</tr>
<tr>
<td>1 - Rare</td>
<td>L-1</td>
<td>L-2</td>
<td>L-3</td>
<td>M-4</td>
<td>M-5</td>
</tr>
</tbody>
</table>

**Risk Level Legend**

- **VH**: VERY HIGH RISK [15 - 25]
  - Intolerable - Do not start activity
- **H**: HIGH RISK [8 - 12]
  - Undesirable - Additional controls required to reduce risk
- **M**: MODERATE RISK [4 - 6]
  - Tolerable - With identified controls fully implemented
- **L**: LOW RISK [1 - 3]
  - Broadly acceptable - manage by routine procedures

**CONSEQUENCE**

1. **Eliminate**
   - Eliminate the hazard
   - completely remove it from the workplace

2. **Minimise**
   - Substitute the hazard
   - with a safer alternative

3. **Isolate**
   - as much as possible away from the workers

4. **Use engineering controls**
   - adapt tools or equipment to reduce the risk.

5. **Use administrative controls**
   - change work practices and organisation.

6. **Use personal protective equipment (PPE)**
   - this is the last option after you have considered all the other options.
## Commodity Weights and Formulae

Each Lift Plan provides the user with access to common commodity weights used to calculate estimated item weights and weight formulae.

<table>
<thead>
<tr>
<th>Commodity Weights</th>
<th>Commodity weights are used to calculate the estimated weight of an item by giving the kilogram per metre cubed. Steel bar and rods are also provided in kilogram per metre.</th>
</tr>
</thead>
</table>
| Weight Formulae    | Standard formulae for calculating weight covering:  
- Rectangles  
- Solid Cylinder  
- Heavy Wall Cylinder  
- Thin Wall Cylinder  
- Irregularly Shaped Objects |
Each Rigging Plan provides the user with access to common rigging charts used to calculate estimated capacity of components used for lifting.

| Rigging Charts | Common Rigging charts provided with each rigging plan include:  
|                | - Chain Slings  
|                | - Synthetic Slings  
|                | - Wire Rope and Fibre Core Slings  
|                | - Eye bolts  
|                | - Shackles |

| Weight Formulae | Standard formulae for calculating weight covering:  
|                 | - Cube  
|                 | - Uneven Cube  
|                 | - Cylinders (Solid)  
|                 | - Cylinders (Hollow) Thin  
|                 | - Cylinders (Hollow) Thick  
|                 | - Round Plates  
|                 | - Wedge  
|                 | - Pyramid (Solid)  
|                 | - Pyramid (Hollow) No Top  
|                 | - Cone (Solid)  
|                 | - Cone (Hollow)  
|                 | - Cone (Hollow) No Top  
|                 | - Ball (Solid)  
|                 | - Ball (Hollow)  
|                 | - Tubular Tanks  
|                 | - Structural Shapes |

| Sling Loading | Each rigging plan includes common formulae for calculating sling loading based on the included angle or sling length. |
for lifting professionals.