



crane
ASSOCIATION

OF NEW ZEALAND (INC)

**for
lifting
professionals.**

LIFT PLANNING

Your guide to

Crane Association Lift Plans





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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.



Single Crane Lift Plan

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.

<p>Lift Plan Details</p>	<p>The Lift Plan Details panel identifies the parties involved in the lift and confirms:</p> <ul style="list-style-type: none"> - 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
<p>Hazard Checks</p>	<p>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.</p> <p>Each check is a three state check box.</p> <ul style="list-style-type: none"> - A line through indicates not applicable - A cross indicates further controls required - A tick indicates Ok. <p>The hazard checks also confirm operator and dogman / rigger qualifications, and question if fatigue has been managed.</p>
<p>Lift Details</p>	<p>The Lift Details panel is used by the crane operator to confirm his/her calculations when planning the lift.</p> <p>By calculating the lift the operator must think about the pick up and set down locations and the best configuration for the crane.</p>
<p>Lift Sketch</p>	<p>The Lift Sketch panel is one of the most powerful tools used by crane operators to address hazards.</p> <p>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.</p> <p>Work Quadrant - Indicates area crane is working in Wind Log - Provides an area to record wind speed</p>



1. Lift Plan Details

Customer: _____

Site Representative: _____

Crane Supplier: _____

Crane Make/Model: _____

Crane Operator: _____

Date & Time of the lifts: _____

Communication: radio hand signals other

Lift Description: _____

Crane Operator: Dogman

Site Representative / Customer: _____

Sign to show you have read and understood the Lift Plan and all Hazard Checks including Hazards and Controls that maybe on the back of this plan.

HAZARDS MUST BE IDENTIFIED BEFORE C-RANE OPERATIONS COMMENCE

4. Lift Sketch**

Draw the crane and the load. Show obstacles (radius) and load movement - direction. How close are Power Lines or hazards?

Wind Log m/s

0	1.0
1	1.2
2	1.4
3	1.5
4	1.6
5	1.7
7	1.9
8	2.0
9	2.1
10	2.2
11	2.3
12	2.4

Shade in Wind Quadrant

2. Hazard Checks**

Tick to indicate OK and Checked. Safe to continue. A Cross indicates further controls are required see reverse. A line through indicates N/A.

Hazard notification required: Weissenitz load notification

Crane Hazards: _____

Crane Operator ticketed: _____

Dogman ticketed: _____

Fatigue managed: _____

PPE correct: _____

Crane cert correct: _____

Lifting equip certs correct: _____

Rating charts correct: _____

Counterweight correct: _____

Reeving correct: _____

Outriggers Ext / Pinned: _____

Vision conditions checked: _____

Weather conditions checked: _____

Traffic managed: _____

Radio's checked: _____

Airport notified: _____

Crane is earthed: _____

Ground conditions checked: _____

Underground services are clear: _____

Obstructions checked: _____

Rigging methodology discussed: _____

Load support checked: _____

The lift will use a tag line: _____

Loose objects removed from load: _____

No simultaneous operations: _____

Manage checks: _____

Confined space checked: _____

Environment checked: _____

Additional Hazard Controls On Reverse if Required

Addresses Hazards Identified on Lift. Finalizes Isolate Minimise on Reverse

** 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.

3. Lift Details**

Crane Operator to calculate. Dogman to initial below as checked.

Weight of the load:	kg	Lift #	kg	Lift #
Weight of rigging:	kg	kg	kg	kg
Weight of hooks (main and auxiliary):	kg	kg	kg	kg
Total:	kg	kg	kg	kg
Boom length:	m	m	m	m
Pick up radius:	m	m	m	m
Set down radius:	m	m	m	m
Max radius:	m	m	m	m
SWL at max radius:	kg	kg	kg	kg
Communication:				
Lift checked initial:				

Further hazard controls and lift details on reverse (Hazard Management)

** Only use one plan per setup position. Document maximum / worst case lifts / max radius / max weight. Lifts that are the same but of a lesser weight are covered by max weight calculations.



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	<p>The Lift Plan Details panel identifies the parties involved in the lift and confirm:</p> <ul style="list-style-type: none"> - the date and time of the lift - the location of the lift - a description of the lift
Hazard Checks	<p>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.</p> <p>Each check is a three state check box.</p> <ul style="list-style-type: none"> - A line through indicates not applicable - A cross indicates further controls required - A tick indicates Ok. <p>The hazard checks also confirm operators and dogmen / riggers qualifications, and question if fatigue has been managed</p>
Lift Details	<p>The Lift Details panel is used by the lead crane operator to confirm crane lift calculations when planning the lift.</p> <p>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.</p>
Lift Sketch	<p>The Lift Sketch panel is one of the most powerful tools used by crane operators to address hazards.</p> <p>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.</p> <p>Wind Log - Provides an area to record wind speed</p>

5. Acknowledge**

Lead Crane Operator
Lead Dogman
Site Rep / Customer
Engineer Approving Lift

Sign to show you have read and understood the Lift Plan and all Hazards Checks including Hazards and Controls that may be on the back of this plan.

4. Lift Sketch**

Draw the crane and the load. Show obstacles (radius) and load movement - direction. New Setup Position = New lift plan

Wind Log

0	1.2
1	1.3
2	1.8
3	1.1
4	1.8
5	1.7
6	1.8
7	1.9
8	2.0
9	2.1
10	2.2
11	2.3
12	2.4

3. Lift Details**

	Crane A	Crane B	Crane C	Crane D	Crane E	Max Load Weight: kg
Crane ID:						
Crane Operator:						
Spotter:						
Weight Hooks & Rigging:	kg	kg	kg	kg	kg	kg
Load Pickup	kg	kg	kg	kg	kg	kg
Load Distribution:	kg	kg	kg	kg	kg	kg
Gross Lift Weight:	kg	kg	kg	kg	kg	kg
Include Extra SWL Margin:	kg	kg	kg	kg	kg	kg
Max Pickup Radius:	m	m	m	m	m	m
SWL at Pickup:	kg	kg	kg	kg	kg	kg
Communication Method:						
Load Setdown	kg	kg	kg	kg	kg	kg
Load Distribution:	kg	kg	kg	kg	kg	kg
Gross lift Weight:	kg	kg	kg	kg	kg	kg
Include Extra SWL Margin:	kg	kg	kg	kg	kg	kg
Max Setdown Radius:	m	m	m	m	m	m
SWL at Setdown:	kg	kg	kg	kg	kg	kg
Communication Method:						
Client Supplied:						
Eng Calculated:						
Known weight:						
Weight at Pickup:	kg	kg	kg	kg	kg	kg
SWL Margin %:	20%	33%				
Weight at Setdown:	kg	kg	kg	kg	kg	kg
SWL Margin %:	20%	33%				
Calculation Checked Initial:						

1. Lift Plan Details

Customer: _____

Site Representative: _____

Lead Crane Operator: _____

Engineer: _____

Date & Time of the lift: _____

Lift Description: _____

Lead Dogman: _____

First Aider: _____

Location: _____

2. Hazard Checks**

Tick to indicate OK and Checked as per inside cover. Safe to continue. A Cross indicates further controls are req. (see reverse). A Tree through 1 indicates 100%.

Hazard notification required: Load (kg), SWL (kg), Hazard (describe)

Crane Hazards: _____

Crane Operators ticketed: _____

Dogmen ticketed: _____

Fatigue managed: _____

PPE correct: _____

Crane certs correct: _____

Lifting equip certs correct: _____

Rating charts correct: _____

Counterweights correct: _____

Reevings correct: _____

Outriggers Ext / Pinned: _____

Vision conditions checked: _____

Weather conditions checked: _____

Traffic managed: _____

Radio's checked: _____

Airport notified: _____

Electrical hazards: _____

Cranes are earthed: _____

Ground conditions checked: _____

Underground services are clear: _____

Obstructions checked: _____

Rigging methodology discussed: _____

Loose objects removed from load: _____

No simultaneous operations: _____

Margate checks: _____

Environment checked: _____

** See inside cover for further details. Take the time to read and understand the Hazards before taking above or signing. Use reverse to document further controls.
*** Only use one plan per setup position. Each lift details to be documented. Use the reverse for further details. CRANES IN USE DURING HAZARD CHECK. PLAN, NEVER-LEAVE TO CHECK ALL CRANES IN USE DURING HAZARD CHECK.

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.

Calculate Weight	<p>The Calculate Weight Panel provides a tool for the Rigger to identify and calculate the weight of the lift. Whether it be:</p> <ul style="list-style-type: none"> - Known - Certified - Manufacturers Plate; or - Calculated
Sketch Rigging	<p>The Sketch Rigging panel provides a tool to be used by riggers to identify all rigging components to be used.</p> <p>By drawing the rigging the rigger can confirm angles and sling tensions.</p>
Rigging Checks	<p>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.</p>
Hazard Checks	<p>The Hazard Checks panel lists common hazards associated to rigging.</p> <p>Each check is a three state check box.</p> <ul style="list-style-type: none"> - A line through indicates not applicable - A cross indicates further controls required - A tick indicates Ok.



1. Calculate Weight

Known: Certified: Manufactures Plate: Previous Lift:

Calculated weight:

Further calculations attached: Weight: kg

Sketch your plan on how the rigging will work. Mark rigging by item number, and circle

3. Rigging Checks

List circled rigging here and confirm capacity, certification and/or visual checks.

Item Type	Description	WLL	Qty	Certified Visual	Weight

Visual Check All Rigging Is Safe

4. Hazard Checks

Tag lines used: Hook, clutch, shackle orientation correct:

Sharp edges protected: Pinch points identified:

Loose objects removed: Centre of gravity established:

Work area isolated: Further hazard controls on reverse:

Further rigging checks on reverse: Weight: kg

Tick to indicate OK and checked safe to continue. A cross indicates further controls are required see reverse. A line through indicates n/a

5. Acknowledge

Crane Operator:

Rigger/Dogman:

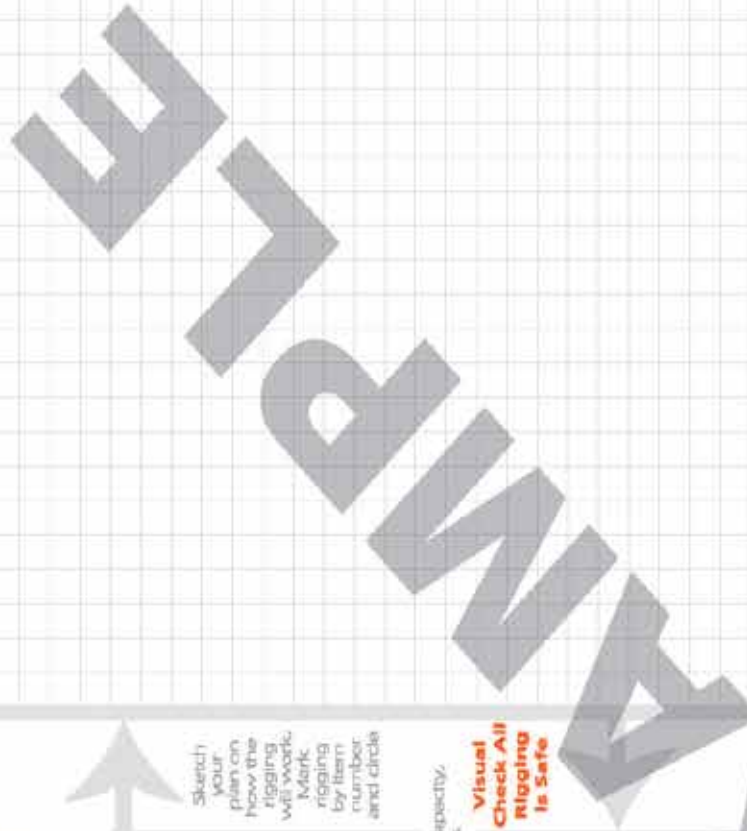
Engineer:

Sign to show you have read and understood the LIFT plan and all Hazard Checks including Hazards and Controls that maybe on the back of this plan.

* 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.

2. Sketch Rigging

Mark Centre of Gravity:



Mark Centre of Gravity:



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.

Hazard	The Foreseeable Hazard the user has identified as presenting a risk to the operation.
Risk	<p>The initial Risk associated to the Hazard before any controls are assigned and implemented.</p> <p>Risk is allocated as:</p> <ul style="list-style-type: none"> - Low Risk - Moderate Risk - High Risk - Very High Risk
Control	The control to be assigned and implemented to eliminate or minimise the hazard.
Level of Control	<p>The type of control that is to be applied by using the Hierarchy of Risk Control.</p> <ol style="list-style-type: none"> 1. Eliminate 2. Substitute 3. Isolate 4. Engineering 5. Administration 6. PPE
Residual Risk	<p>The residual Risk associated to the Hazard after any controls are assigned and implemented.</p> <p>Risk is allocated as:</p> <ul style="list-style-type: none"> - Low Risk - Moderate Risk - High Risk - Very High Risk
Responsible	The Role responsible for monitoring and ensuring the control is in place and working.

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.

Hazard: Risk: Control: Level of Control: Residual Risk: Responsible:

Hazard:	Risk:	Control:	Level of Control:	Residual Risk:	Responsible:
Example: Collision	H High Risk	Minimum Approach distance Boom and load not to come closer than 1 metres Spotter to stop job if 1 metre limit reached.	5 Active	L Low Risk	Spotter / Crane Operator / Dogman
Emergency Response Plan / Rescue Plan					

Emergency Response Plan Example: Crane Operator to security office, and contact emergency services dial 111. Dogman to isolate and freeze alarm. Dogman to provide first aid. Customer to control scene and direct emergency services. Rescue Plan Example: Crane Operator to lower. Man cage to the ground. If legged area marked with 17 range in switch.

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 On to acknowledge if you use the collision example above cross out example. For further assistance on your Lift Plan see: www.cranes.org.nz

Sign on to lift plan

.....

.....

.....

It is recommended that Crane Operators keep a history of completed Lift Plans as a record of completed Lift Details, Lift Switches, Hazard Checks and Controls conducted regularly. Our Register tables are asked to photograph or photocopy if required.



highest standard - safety first

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.

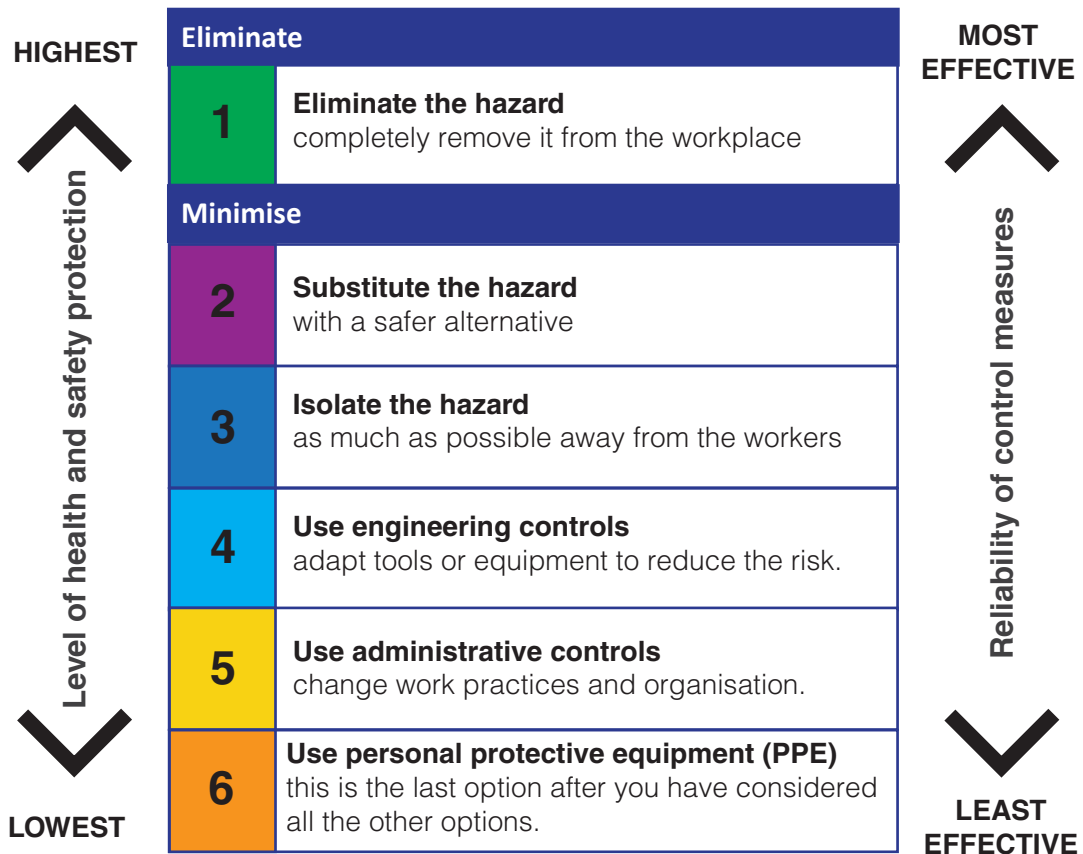
<p>About</p>	<p>The levels of risk of a hazardous event occurring cover: very low, low, moderate, high, and critical. The severity of potential injury or illness covers:</p> <ul style="list-style-type: none"> › catastrophic › major › moderate › minor › insignificant <p>The Hierarchy of Controls table takes you through a logical flow of options, from most effective to least effective, to guide you in eliminating and minimising hazardous events.</p>
<p>Note</p>	<p>You will need to use the Risk Assessment Matrix and the Hierarchy of Controls table for completing the:</p> <ul style="list-style-type: none"> › Single Crane Lift Plan › Multiple Crane Lift Plan › Rigging Plan
<p>Ranking of Consequence / Likelihood</p>	<p>The Lift and Rigging Plans include a table to help with ranking of consequence and likelihood.</p>

Risk Assessment Matrix

LIKELIHOOD	CONSEQUENCE				
	1 - Insignificant	2- Minor	3 - Moderate	4 - Major	5 - Catastrophic
5 - Almost Certain	M-5	H-10	VH-15	VH-20	VH-25
4 - Likely	M-4	H-8	H-12	VH-16	VH-20
3 - Possible	L-3	M-6	H-9	H-12	VH-15
2 - Unlikely	L-2	M-4	M-6	H-8	H-10
1 - Rare	L-1	L-2	L-3	M-4	M-5

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





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.

Commodity Weights	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.
Weight Formulae	Standard formulae for calculating weight covering: <ul style="list-style-type: none">- Rectangles- Solid Cylinder- Heavy Wall Cylinder- Thin Wall Cylinder- Irregularly Shaped Objects



Rigging

Each Rigging Plan provides the user with access to common rigging charts used to calculate estimated capacity of components used for lifting.

Rigging Charts	<p>Common Rigging charts provided with each rigging plan include:</p> <ul style="list-style-type: none"> - Chain Slings - Synthetic Slings - Wire Rope and Fibre Core Slings - Eye bolts - Shackles
Weight Formulae	<p>Standard formulae for calculating weight covering:</p> <ul style="list-style-type: none"> - 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	<p>Each rigging plan includes common formulae for calculating sling loading based on the included angle or sling length.</p>





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