

Lessons learned from one of New Zealand's most challenging civil engineering projects: rebuilding the earthquake damaged pipes, roads, bridges and retaining walls in the city of Christchurch 2011 - 2016.

## Critical Risk 4 Health and Safety Toolbox – lifting operations

**Story:** Health and Safety

**Theme:** Programme Management

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A document which outlines how to safely carry out lifting operations, created to discuss with site staff at on-site “toolbox talks”.

This document has been provided as an example of a tool that might be useful for other organisations undertaking complex disaster recovery or infrastructure rebuild programmes.

For more information about this document, visit [www.scirtlearninglegacy.org.nz](http://www.scirtlearninglegacy.org.nz)



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## Health and Safety Toolbox 4

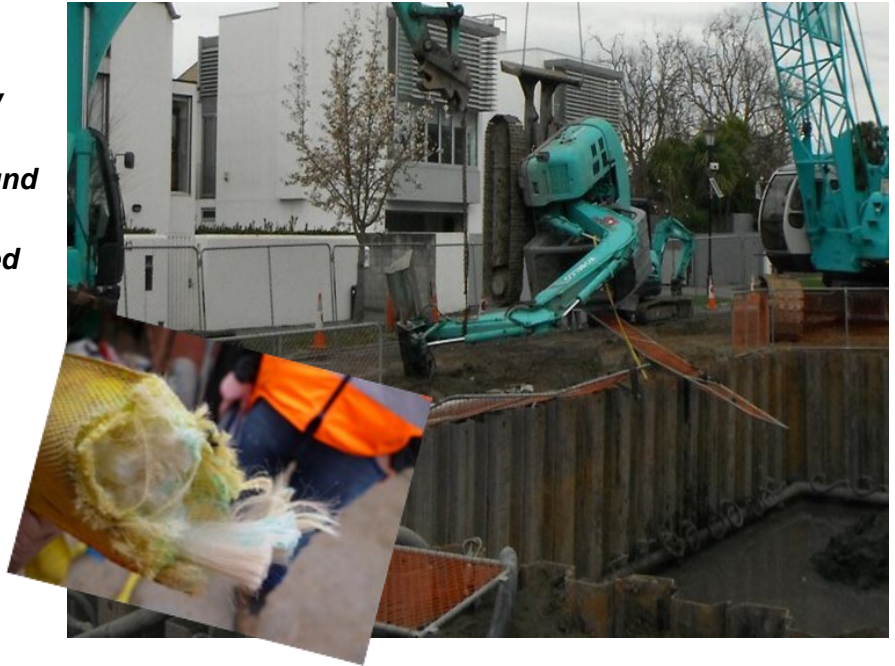
### Critical risk– Lifting Operations

Lifting operations are our **number 4 critical risk** because of the potential consequences:

- ⇒ Crushing and fractures by being pinned by a load
- ⇒ Being struck by failure of an under-rated chain or sling
- ⇒ Crushing by tipping of lifting plant or equipment
- ⇒ Strike to overhead services

*On the 7th August 2013, a site crew were lowering a 6T digger into an excavation (approx. 2m above ground level) when the 3T strop wrapped around the boom of the digger failed causing the front of the excavator to rotate round and fall to the ground.*

*All personnel were clear of the drop zone so there were no injuries*



### How can we prevent this?

#### 1. **PLAN:**

- ⇒ Write a "Lift Plan" when you need to lift anything out of the ordinary
- ⇒ Ensure all those involved in the Lift are trained
- ⇒ Get the right gear for what you will be lifting

#### 2. **Before you start:**

- ⇒ Discuss the Risks involved in the lift before you start the operation
- ⇒ Ensure lifting gear is certified
- ⇒ Check your gear for damage before every lift– chains and lifting points
- ⇒ Agree on how you will communicate during the lifting operation

#### 3. **During the lifting operation:**

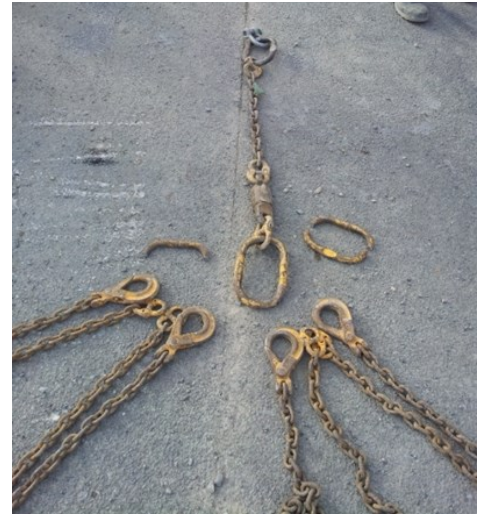
- ⇒ Use a test lift to check the stability and balance of the load
- ⇒ Dogman (or a person trained in slinging and lifting) controls the safe movements of the load
- ⇒ A spotter controls the safe area around the load
- ⇒ Only authorised people enter the **EXCLUSION ZONE** around the lifting equipment
- ⇒ Always use the tagline to position the load
- ⇒ Remove the bucket if lifting with an excavator

**Stop and review your lifting method if something changes on site**

## It is important we use lifting gear correctly

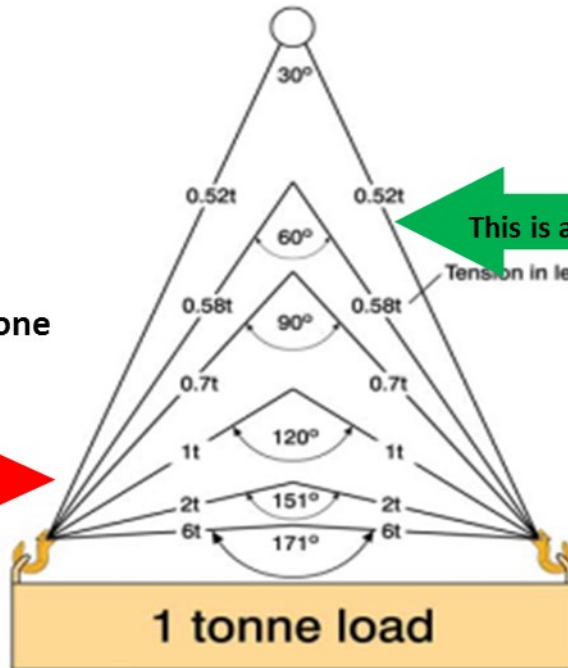
*The GOAL= As safe in the air-as it was on the ground*

*If you need to release sheet piling or “trench boxes”- best practice to pull one end at a time and “walk it up” with a series of straight pull than try and yank it up by slewing the boom*



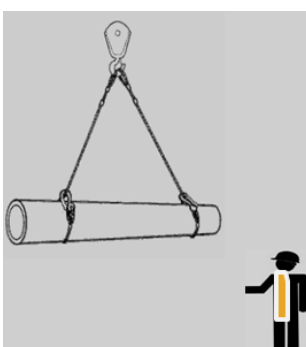
Best lift is a vertical one

Worst lift is this one



## The DROP ZONE

The DROP ZONE is a restricted area directly underneath a suspended load– effectively it is a **no go zone**



Use a tag line



## Lifting operations: communication and hand signals

It doesn't matter what signals you use— as long as everyone on the site agrees



Up



Down



Hold



Left



Right

## Check your gear



ACID DAMAGE



MELTING/CHARRING



CUTS ON WEB FACE



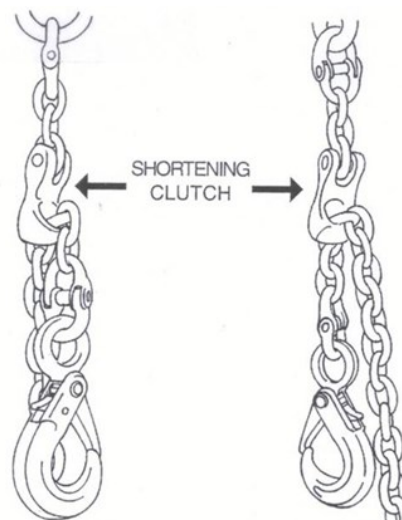
EXCESSIVE WEAR



EDGE TEAR



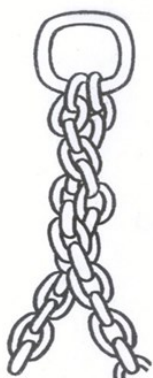
PUNCTURE



INCORRECT

CORRECT

DON'T  
TWIST



DON'T  
KNOT



GOUGES



EXCESSIVE WEAR



STRETCHING



CRACKS



BENT LINKS