

Title	Describe, set up, and use fall arrest and rescue systems in a tower crane environment		
Level	4	Credits	15

Purpose	<p>This unit standard is for people who work at heights while on a tower crane, or within a tower crane environment.</p> <p>People credited with this unit standard are able to: identify types of fall arrest and fall restraint systems used in tower crane activities and on structures, their storage and location, and describe the application of controls for compliance with the Health and Safety in Employment Act 1992 (HSE Act); identify and maintain fall arrest and fall restraint equipment and systems; identify and install anchor points for fall arrest systems; set up fall arrest and fall restraint systems in a tower crane environment; and set up and use a tower crane rescue system in a simulated situation while working at height in a tower crane lattice jib environment.</p>
----------------	--

Classification	Cranes > Crane Operation
-----------------------	--------------------------

Available grade	Achieved
------------------------	----------

Explanatory notes

1 *Compliance* is required with the hierarchy of controls outlined in the HSE Act – elimination of significant hazards, isolation of significant hazards when elimination is not practicable, and minimisation of significant hazards where elimination and isolation are not practicable.

2 **Definitions**

Hazards – those occurrences, processes, substances or situations as determined by the company that are an actual or potential cause or source of harm associated with, but not limited to: process, activities, environment, equipment, materials, work organisation, site and facilities. Contributing factors may include noise, vibration, temperature, pressure and mechanical, ergonomic stressors, chemical agents, environmental corrosion.

Codes of Practice – any issued code of practice approved by the Minister of Labour under Section 20 of the HSE Act, and any work carried out in accordance with that code. Specifically the Publications: *Best Practice Guideline for Scaffolding in New Zealand*, at <http://www.osh.govt.nz/order/catalogue/scaffolding.shtml>, and *Safe work at heights*, at <http://www.osh.dol.govt.nz/order/catalogue/safeworkatheights.shtml>.

Standards – any New Zealand or other recognised Standards that provide technical guidance and specifications that include but are not limited to: AS/NZS 1891 *Industrial fall-arrest systems and devices, Part 1 Harnesses and ancillary equipment*,

and Part 3 *Fall-arrest devices; AS/NZS 4488.2 Industrial rope access systems – Selection, use, and maintenance.*

Standards may also be specified in Regulations.

Organisation – any business engaging, controlling, or employing people where tower cranes are erected, modified, removed, serviced, or repaired.

Tower Crane Safety Plan – a tower crane and construction site specific document that demonstrates an organisation's means of compliance with the HSE Act, and includes but is not limited to:

- assignment of responsibilities for tower crane and on-site implementation;
- hazard identification methods;
- accident investigation and report methods;
- tower crane and on-site emergency procedures;
- tower crane and on-site communication strategy;
- strategy for the coordination of on-site trade activities;
- on-site audit procedures.

Work at heights or height work is where any person could fall more than three metres.

Fall arrest systems are designed to arrest a person in the event of a fall.

Fall restraint systems are designed to restrain and prevent a fall.

- 3 *Legislation and regulations* includes but is not limited to – the HSE Act, and Health and Safety in Employment Regulations 1995 (HSER).
- 4 In the context of this unit standard height work can apply to work carried out in relation to tower crane – erection, modification, removal, servicing, and repair. The types of structures from which height work is carried out include – platforms, lattice type jibs, building tie structures.
- 5 **Assessment**
For the purposes of assessment against outcome five of this standard, the fall arrest system must have been designed by another party. The fall arrest system designer's installation instructions, and manufacturer's specifications, must be made available to the candidate.

Outcomes and evidence requirements

Outcome 1

Identify types of fall arrest and fall restraint systems used in tower crane activities and on structures, their storage and location, and describe the application of controls for compliance with the HSE Act.

Evidence requirements

- 1.1 Legal obligations of the employer in relation to fall arrest, fall restraint, height work, and associated on-site safety activities are described in accordance with the HSE Act and HSER.

Range	Sections 6 to 13 of the HSE Act, Regulations 21, 66, 67, and 69 of HSER.
-------	--

- 1.2 The requirements of standards and codes of practice are described in terms of fall arrest, fall restraint, height work, and associated safety activities.
- Range design and organisational requirements, general safety, permanent fixed access and platforms, temporary non-fixed access and platforms, safety harnesses.
- 1.3 Hazards associated with height work are identified for a specified on-site situation.
- Range hazards may include but are not limited to – weather conditions, unguarded openings or crane structure perimeters, inappropriate designs; no methods for prevention or arresting a fall of persons or materials, lack of guard-rails, lack of knowledge and experience, lack of safe access to work area, falling debris and/or objects, lack of pre-assembling on ground, inappropriate method used for height activity, unsuitable or defective equipment and plant, lack of safety and protective clothing, no anchorage points, inadequate anchorage points, harnesses or attachments worn in an unsafe manner when not in use.
- 1.4 Controls used when carrying out height work and using fall arrest and fall restraint systems are described in terms of their applications to health and safety.
- Range controls include but are not limited to – prior planning – design, drawings, layout; certification and competency of workers; guarding; safety nets; structural and activity inspections; supervision; equipment and plant condition and fit for purpose checks; on-site emergency procedures – sudden unexpected restrained fall of person/s, malfunction of safety fall arrest system.

Outcome 2

Identify and maintain fall arrest and fall restraint equipment and systems.

Evidence requirements

- 2.1 Types of fall arrest and fall restraint equipment are described in terms of the tower crane work to be undertaken, and the placement of the fall arrest system.
- Range includes but is not limited to – characteristics and limitations of fall arrest system; ropes, restraints, lanyard, harness, vertical ladders, crane suspended man cages, personal fall arrest equipment, spelygeigar.

- 2.2 Fall arrest and fall restraint equipment is inspected for compliance with HSE Act in accordance with company maintenance and recording requirements.
- Range may include compliance with documents such as – the erection, modification, or removal safety plan; the fall arrest equipment log; records of inspection of anchorage points; manufacturer’s specifications and installation instructions.
- 2.3 Tower crane specific hazards that determine the type of fall arrest and fall restraint system and equipment to be used are identified, and the selected equipment logged in accordance with HSE Act and company procedures.
- Range crane specific hazards – impacts of environmental condition, limitations of equipment, fitting of equipment.
- 2.4 Fall arrest equipment is fitted, and knots are tied, in accordance with manufacturer’s instructions, and comply with the HSE Act, AS/NZS 8191, and tower crane safety plan; and are consistent with selected fall arrest system.
- Range includes but is not limited to – fall arrest system types 1, 2, 3; equipment – shock absorber, karabiners, rope, lanyards, harnesses, belts, restraints, slings; knots – figure 8 on the bite and on the trace, double fisherman’s knot.
- 2.5 Equipment used on the fall arrest and fall restraint system is protected from physical hazards.
- Range hazards include but are not limited to – fire, welding, chemicals, impact, environmental corrosion, friction.
- 2.6 The location of rescue system equipment is identified, and the storage method described in accordance with company procedures.
- 2.7 The components and limitations of the rescue system are described in accordance with manufacturer’s specifications and company procedures.

Outcome 3

Identify and install anchor points for fall arrest and fall restraint systems.

Evidence requirements

- 3.1 Types of anchors are described in terms of their features, strengths and weaknesses, the height work to be undertaken, and the placement of the fall arrest equipment.
- Range types of anchors – natural, purpose built, registered, non-registered; features – types of shock absorbers, loading weight factors and their effects.

3.2 Anchor systems are installed and set up in accordance with the HSE Act and site safety plan, and are consistent with the requirements for a full fall arrest and fall restraint.

Range loading weight factors and their effects, braking strain, height placement;
anchor systems include – karabiners, ropes, slings.

3.3 Anchor systems used on the fall arrest system are protected from physical hazards in accordance with company procedures.

Range includes but is not limited to – fire, welding, chemicals, environmental corrosion, impact, friction.

Outcome 4

Set up fall arrest systems in a tower crane environment.

Evidence requirements

4.1 Fall arrest systems are set up in each environment in relation to the tower crane work to be undertaken, and the placement of the fall arrest equipment, is in accordance with company procedures.

Range environment – fall arrest system types 1, 2, 3.

Outcome 5

Set up and use a tower crane rescue system in a simulated situation while working at height in a tower crane lattice jib environment.

Evidence requirements

5.1 Types of emergencies are identified and described in terms of those that may arise when using a tower crane rescue system.

Range evidence is required for at least four different emergencies.

5.2 A rescue plan is compiled that is consistent with the tower crane safety plan, and HSE Act.

Range plan must include – rescue techniques applied during a failure of a fall arrest system, recovery of a person who has sustained a fall when employing a fall arrest system.

5.3 The rescue system is implemented in accordance with the fall arrest system designer's installation instructions, and company procedures.

5.4 A simulated rescue is undertaken using all components of the rescue system in accordance with manufacturer's specifications, and company procedures.

- 5.5 The rescue system is recovered, inspected, logged, and stored in accordance with company procedures.

Planned review date	31 December 2016
----------------------------	------------------

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 November 2006	30 June 2013
Review	2	15 March 2012	N/A

Consent and Moderation Requirements (CMR) reference	0025
--	------

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Please note

Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact The Skills Organisation at reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.