

Tower crane Code of Practice – comparative table

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
<p>1. Introduction 1.1 Legislation 1.2 Australian Standards</p>	<p>The introduction has been updated and restructured to be consistent with other codes of practice. A foreword has been added to provide an overview of the Code of Practice and explain how codes of practice operate.</p> <p>A new 'Scope and Application' section has also been added to explain to readers how to use the code of practice. This section specifies that the word 'should' is used in the Code of Practice to indicate a recommended course of action, while 'may' is used to indicate an optional course of action. The words 'must', 'requires' or 'mandatory' indicate that a legal requirement exists and must be complied with.</p> <p>Sections on legislation and Australian Standards have been removed to be consistent with other codes of practice and relevant legislation/standards are referred to in the body of the Code of Practice.</p> <p>The Introduction now comprises the following sub-sections:</p> <ol style="list-style-type: none"> 1.1 What is a tower crane? 1.2 Who has health and safety duties in relation to tower cranes? 1.3 What is involved in managing risks associated with tower cranes? 1.4 Safe work method statements 1.5 Information, training, instruction and supervision. <p><u>1.1 What is a tower crane?</u></p> <p>This sub-section provides a definition of a tower crane, which aligns with the current <i>Work Health and Safety Regulation 2011</i> (WHS Regulation) and the national guidance material for tower cranes. It also provides a separate definition of a self-erecting tower crane.</p> <p><u>1.2 Who has health and safety duties in relation to tower cranes?</u></p> <p>This sub-section was added to clearly identify the duties applicable to relevant persons involved in the operation of tower cranes, including:</p> <ul style="list-style-type: none"> • a person conducting a business or undertaking (PCBU); • designers, manufacturers, suppliers and importers; • officers such as company directors; and • workers and other people at the workplace. <p>A PCBU has the primary duty to ensure, so far as is reasonably practicable, that workers and other persons are not exposed to health and safety risks arising from the business or undertaking. They also have a duty to ensure the provision and maintenance of safe plant including cranes, and the safe use, handling, storage and transport of plant.</p>

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	<p>Designers, manufacturers, suppliers and importers of plant must ensure, so far as is reasonably practicable, the plant they design, manufacture, import or supply is without risks to health and safety. This includes carrying out analysis, testing or an examination and providing specific information about the plant.</p> <p>Officers, such as company directors, have a duty to exercise due diligence to ensure that the business or undertaking complies with the <i>Work Health and Safety Act 2011</i> (WHS Act) and WHS Regulation.</p> <p>Workers and other people at the workplace must take reasonable care for their own health and safety, cooperate with reasonable policies, procedures and instructions and not adversely affect other people's health and safety.</p> <p><u>1.3 What is involved in managing risks associated with tower cranes?</u></p> <p>This sub-section provides a list of ways that tower crane operations can present a risk of injury to persons, including structural failure, collapse and falling objects. Arcing or flashover when a crane boom comes close to energised electric lines has also been added to this list as a potential risk of injury to persons when operating a tower crane.</p> <p>This sub-section also outlines the steps that duty holders must follow to properly manage health and safety risks with tower cranes. The steps are: (1) identify potential hazards, (2) assess the risks, (3) take actions to control the risks, and (4) check control measures to ensure they are effective.</p> <p>The section also outlines the duty to consult workers and other duty holders before making decisions on health and safety matters.</p> <p><u>1.4 Safe Work Method Statements</u></p> <p>This sub-section outlines the duty to ensure that a Safe Work Method Statement (SWMS) is prepared for high risk construction work before the work starts. SWMSs must identify the type of high risk construction work being done, specify the health and safety hazards and risks arising from the work, describe how the risks will be controlled and describe how control measures will be implemented, monitored and reviewed.</p> <p><u>1.5 Information, training, instruction and supervision</u></p> <p>This section has been added to the Code of Practice to provide an overview of the general requirements associated with the provision of information, training, instruction and supervision to workers. The section cross-references section 9 of the Code of Practice which provides specific advice on the training requirements for tower crane operations.</p>

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<p>2 Managing health and safety 2.1 Risk management 2.2 Consultation 2.3 Training 2.3.1 <i>Types of training</i></p>	<p>The information under these sections has been incorporated into the new Section 1 'Introduction', as noted above.</p>
<p>3 The design of structures 3.1 Matters to be considered when designing a structure</p>	<p>A new Section 2 'Safe design of tower cranes' has been added to the Code of Practice incorporating the following sub-sections:</p> <ul style="list-style-type: none"> 2.1 Design registration of tower cranes 2.2 Crane stability 2.3 Limiting and indicating devices 2.4 Signs on tower cranes <p>The introduction to Section 2 'Safe design of tower cranes' provides a broad definition of a designer of a tower crane and outlines their general duties. It also states the types of matters that a designer of a tower crane should consider, including identifying potential hazards and design solutions as a tower crane is manufactured, transported, installed, commissioned, used, maintained, repaired, de-commissioned, dismantled, disposed of or recycled.</p>
<p>4 Design and plant registration of tower cranes</p>	<p>This section has been removed and the information is now included under the new Section 2.1 Design registration of tower cranes.</p> <p>2.1 <u>Design registration of tower cranes</u></p> <p>This sub-section outlines the design registration requirements for tower cranes. The section has been slightly amended to clarify that tower cranes must be designed by an engineer in accordance with acceptable engineering standards and relevant technical standards. The section also states the requirement for a design verification statement to be prepared and clarifies when a certificate of registrable plant design stops having effect (e.g. when a longer boom is fitted to a tower crane than what was listed in the original design registration submission).</p>

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	<p>2.1.1 <u>Design registration of tower crane base</u></p> <p>This sub-section outlines the requirement to register the design of tower crane bases. The section has been slightly amended to clarify that engineers must design all tower crane bases and that detailed drawings of the crane base and the operating configuration of the crane form part of the design registration application.</p>
<p>5 Risks associated with tower crane operations</p>	<p>This section has been removed and the information is now included under the new Section 1.3 'What is involved in managing risks associated with tower cranes?'</p>
<p>6 Safe design of tower cranes</p>	<p>This section has been removed and the information on the safe design of tower cranes is now included under the new Section 2 'Safe design of tower cranes'. This replicates the same sub-sections, with some minor amendments (discussed below).</p>
<p>6.1 Crane stability</p>	<p>This section is now under Section 2.2 'Crane stability'. No changes have been made to the section.</p>
<p><i>6.1.1 Stabilising and overturning moments</i></p>	<p>This section is now under Section 2.2.1 'Stabilising and overturning moments'. A minor addition was made to this section to clarify that the design verifier is to site and verify that the load chart is the correct one during the design registration process.</p>
<p><i>6.1.2 Footings and foundations</i></p>	<p>This section is now under Section 2.2.2 'Footings and foundations'. No changes have been made to the section. However, the content of this section has also been replicated under the new Section 8 'Additional requirements for self-erecting tower cranes'.</p>
<p><i>6.1.3 Crane ties</i></p>	<p>This section is now under Section 2.2.3 'Crane ties'. A minor addition was made to this section to state that the design and detail of crane ties must be verified by an engineer taking into account the structural adequacy and any potential movement or deformation of the supporting structure.</p>
<p><i>6.1.4 Wind conditions</i></p>	<p>This section is now under Section 2.2.4 'Wind conditions'. A cross-reference has been added to this section to refer to the new Section 7.5.2 for information on wind speeds when using a first aid box.</p>

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6.2 Limiting and indicating devices	This section is now Section 2.3 'Limiting and indicating devices'. No changes have been made to the section.
6.2.1 <i>Reliability of devices</i>	This section is now under Section 2.3.1 'Reliability of devices'. No changes have been made to the section.
6.2.2 <i>Rated capacity limiters</i>	This section is now under Section 2.3.2 'Rated capacity limiters'. The section has been clarified to state that when determining the maximum gross load to be applied to a crane, deductions should be made for the weight of ropes, hooks and rigging gear in accordance with manufacturer's instructions. This is to ensure that overloading does not occur.
6.2.3 <i>Motion limiting devices</i>	This section is now under Section 2.3.3 'Motion limiting devices'. No changes have been made to the section.
6.2.4 <i>Working radius indicator</i>	This section is now under Section 2.3.4 'Working radius indicator'. No changes have been made to the section.
6.2.5 <i>Dual braking systems</i>	This section is now under Section 2.3.5 'Dual braking systems'. No changes have been made to the section.
6.3 Signs on tower cranes	<p>This section is now under Section 2.4 'Signs on tower cranes'. This section has been significantly amended to provide better guidance about the use of signs on tower cranes.</p> <p>The section now explains that signs, regardless of their size, can impact on the effective day-to-day operation of a crane, particularly in windy conditions. The section strongly recommends that signs not be attached to tower crane booms. However, the section clarifies that signs may be used on machine (rear) decks, but these must be certified by an engineer prior to being installed.</p> <p>The section also clarifies that signs may be appropriate to attach to wind sails in certain circumstances. Wind sails may be mandated by manufacturers in particular circumstances to counteract wind effects on the machine deck. In these situations, wind sails can assist with the operation of the crane. There are also reduced safety risks associated with the use of fabric wind sails, given their flexibility in windy conditions and reduced risk of injury if they detach. The amended section states that the engineer for the design of a tower crane must be aware of any requirement to attach wind sails to a boom in order to make any allowances for the size and weight of the sail.</p>

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<p>7 Planning and coordinating tower crane operations</p>	<p>This section is now under Section 3 ‘Planning and coordinating tower crane operations’. The section has been amended to include additional issues that should be considered when planning for tower crane operations. This includes:</p> <ul style="list-style-type: none"> • consideration of proximity to overhead electric lines and appropriate control measures to prevent or minimise risks • ensuring there is at least a two metre distance between the highest extremity of the building worksite to the bottom of a slung load, unless not reasonably practicable • ensuring that an emergency plan has been prepared for each workplace where the crane will operate • consideration of additional doggers or crane coordinators, depending on the size and complexity of the work. <p>The inclusion of these additional issues ensures this section reflects appropriate safety standards and is in line with current industry practice.</p> <p>The section clarifies that the purpose of maintaining a two metre distance between the highest extremity of the building worksite to the bottom of a slung load is to minimise the risk of a load colliding with or striking either the building or persons working in the vicinity of the crane.</p>
<p>7.1 Selecting the crane</p>	<p>This is now under Section 3.1 ‘Selecting the crane’.</p> <p>The section has been amended to provide a cross-reference to Section 8 which details the specific requirements for self-erecting tower cranes.</p>
<p>7.2 Crane crew</p>	<p>This is now under Section 3.2 ‘Crane crew’.</p> <p>This section has been significantly amended to state that the number of persons in a crane crew should be determined by a risk assessment. The risk assessment should address risks such as:</p> <ul style="list-style-type: none"> • collision between cranes and other plant and coordination of multiple cranes, • loads contacting structures or obstructing walkways and other workers, • overhead powerlines, and • the ability of the crane crew to maintain visibility of the load, safely load and unload materials, and assess work areas before unloading deliveries. <p>The section provides examples of control measures to address these risks, such as using alternative cranes, isolating areas during lifts, installing anti-collision devices and systems, using safety observers or additional doggers and fitting cameras to the crane, crane hook or structure.</p>

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	The section clarifies that crane operators should not undertake their own dogging work or supervise a trainee dogger, even if the operator is also a licensed dogger.
7.3 Crane siting	This is now under Section 3.3 'Crane siting'. The section has been slightly amended to ensure that siting tower cranes should occur after consultation with all relevant persons engaged in the work, including the principal contractor, crane owner, crane supplier and project manager.
7.3.1 Crane standing	This is now under Section 3.3.1 'Crane standing'. A slight amendment was made to this section to clarify that a competent person should be verifying the design of the structure.
7.3.2 Collision between the crane with other plant or structures	This is now under Section 3.3.2 'Collision between the crane with other plant or structures'. No changes have been made to this section.
7.3.3 Location of access areas	This is now under Section 3.3.3 'Location of access areas'. No changes have been made to this section.
7.4 Communication	This is now under Section 3.4 'Communication'. No changes have been made to this section.
N/A	A new Section 3.5 'Emergency plan' has been added to the Code of Practice. This section outlines the requirement for PCBUs to ensure that an emergency plan has been prepared for the workplace that provides for emergency procedures, testing of the emergency procedures and information, training and instruction to relevant workers. This section has been included in the Code to highlight the importance of maintaining an emergency plan, particularly in the context of high risk work such as tower crane operations.
N/A	A new Section 3.6 'Lighting' has been added to the Code of Practice. The purpose of this section is to state the importance of crane operators having adequate lighting when climbing and accessing tower cranes. The section provides that if tower cranes are to be accessed outside of daylight hours, appropriate artificial light sources should be used or provided (e.g. personal lighting on crane crew such as headlamps or the installation of permanent lighting in tower crane sections).

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8 Minimising risk of injury from collision	This is now under Section 4 'Minimising risk of injury from collision'. No changes have been made to this section.
8.1 Working near overhead powerlines	This is now under Section 4.1 'Working near overhead electric lines (powerlines)'. This section has been updated to better reflect current electrical safety legislative requirements and provide clearer guidance about working near overhead powerlines and the use of exclusion zones and safety observers (spotters).
<i>8.1.1 Electrical legislation and guidance</i>	This is now under Section 4.1.1 'Electrical safety laws'. This section has been updated to reflect current legislative requirements relating to electrical safety and overhead powerlines.
<i>8.1.2 Planning for work near overhead powerlines</i>	<p>This is now under Section 4.1.2 'Planning for work near overhead powerlines'. This section has been updated to provide clearer guidance on the appropriate control measures when planning for work near overhead powerlines. The section provides that the most effective way of eliminating risks of electric shocks is by turning of the power and that consideration should be given to de-energising or re-routing the electricity supply with the relevant electricity entity.</p> <p>The section also outlines lower order administrative controls that should only be considered when higher order control measures are not reasonably practicable (for example, warning signs, tiger tails or line markers, and warning devices to warn crane operators when the boom enters the exclusion zone).</p>
<i>8.1.3 Exclusion zones</i>	<p>This is now under Section 4.1.3 'Exclusion zones for operating a tower crane near overhead powerlines'.</p> <p>The section sets out the requirements relating to exclusion zones when working near overhead powerlines. Persons conducting a business or undertaking should ensure that workers and the tower crane (and the load) stay at least 3 metres away from overhead powerlines, for voltages up to 132kV, with greater distances applying for voltages above that. If it is not reasonably practicable to maintain the exclusion zone, a risk assessment must be completed for the proposed work and consultation should occur with relevant parties including the electricity entity. Control measures must then be implemented consistent with the risk assessment, and if the line is owned by an electricity entity, any requirements of the entity.</p> <p>A safety observer or 'spotter' should be used if the crane or any part of a load it is carrying is likely to come within an exclusion zone of an overhead powerline. Additional guidance is provided under this section in relation to exclusion zones and the requirements for PCBUs when operating near overhead powerlines. The section also provides guidance on when safety observers (or spotters) are required to be used on site.</p>

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<i>8.1.4 Devices to minimise risk of injury from contact with overhead powerlines</i>	This section has been removed as the information is now covered under Section 4.1.2 'Planning for work near overhead powerlines'.
8.2 Working near other plant (including other cranes and concrete placement booms)	This is now under Section 4.2 'Working near other plant (including other cranes and concrete placement booms)'. No changes have been made to this section.
<i>8.2.1 Ways to minimise risk of injury from a collision with other plant</i>	<p>This is now under Section 4.2.1 'Ways to minimise risk of injury from a collision with other plant'. The section has been updated to recommend that where separate tower cranes share the same air space but are sited on adjacent workplaces, the principal contractor from each workplace should negotiate and implement documented systems of work that includes a procedure to ensure sufficient clearances are maintained between cranes, minimising the risk of contact between parts of the cranes and crane loads. all tower cranes be fitted with an audible warning device. This will help to warn persons who may be at risk from the movement of the plant.</p> <p>The section also clarifies that requirements of the Civil Aviation Safety Authority need to be met where tower cranes are set up in flight paths.</p>
9 Erecting and dismantling tower cranes	This is now under Section 5 'Erecting and dismantling tower cranes. No changes have been made to this section.
9.1 Responsibilities for persons erecting or dismantling tower cranes	This is now under section 5.1 'Responsibilities for persons erecting or dismantling tower cranes'. Minor amendments have been made to this section.
9.2 Minimising risk of injury from crane collapse	This is now under section 5.2 'Minimising risk of injury from crane collapse'.

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<i>9.2.1 Erecting and dismantling – ways to minimise risk of injury from crane collapse</i>	This is now under section 5.2.1 ‘Erecting and dismantling—ways to minimise risk of injury from crane collapse’. Minor amendments have been made to this section.
<i>9.2.2 Climbing tower cranes – ways to minimise risk of injury from crane collapse</i>	This is now under section 5.2.2 ‘Climbing tower cranes—ways to minimise risk of injury from crane collapse’. No changes have been made to this section.
9.3 Minimising risk of injury from falling from a height	This is now under section 5.3 ‘Minimising risk of injury from falling from a height’. Minor amendments have been made to this section to reflect current legislative requirements.
<i>9.3.1 Edge protection systems</i>	This is now under section 5.3.1 ‘Edge protection systems’. Minor amendments have been made to this section to reflect current legislative requirements.
<i>9.3.2 Travel restraint systems</i>	This is now under section 5.3.2 ‘Travel restraint systems’. Minor amendments have been made to this section to reflect current legislative requirements and applicability of relevant Australian Standards.
<i>9.3.3 Fall-arrest harness systems</i>	This is now under section 5.3.3 ‘Fall-arrest harness systems’. Minor amendments have been made to this section to reflect current legislative requirements.
9.4 Minimising risk of injury from falling objects	This is now under section 5.4 ‘Minimising risk of injury from falling objects’. Minor amendments have been made to this section to reflect current legislative requirements. Reference to mesh screens has also been removed, recognising that these are generally not used as a control measure for falling objects.
<i>9.4.1 Exclusion zones</i>	This is now under section 5.4.1 ‘Exclusion zones persons are prohibited from entering’. This section has been updated to clarify that these exclusion zones are distinct from the exclusion zones discussed in section 4.1.3, which apply when operating a tower crane near overhead powerlines.

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9.4.2 <i>Tool lanyards</i>	This is now under section 5.4.2 'Tool lanyards'. This section has been updated to clarify the purpose of tool lanyards and the definition of an anchorage point.
9.4.3 <i>Mesh screens</i>	This section has been removed, recognising the mesh screens are generally not used as a control measure for falling objects.
9.4.4 <i>Scheduling of work</i>	This is now under section 5.4.3 'Scheduling of work'. This section has been updated to clarify that the erection, dismantling, climbing and maintenance of cranes at a worksite should be programmed into the project's schedule of work.
9.4.5 <i>Restraining systems for crane components</i>	This is now under section 5.4.4 'Restraining systems for crane components'. No changes have been made to this section.
10 Commissioning tower cranes	This is now under section 6 'Commissioning tower cranes'. The section has been updated to reflect current legislative requirements and to reference Section 10.3 regarding independent third party inspections at the commissioning stage.
10.1 Responsibilities of persons who commission tower cranes	This is now under Section 6.1 'Responsibilities of persons who commission tower cranes'. Minor amendments have been made to this section to remove reference to unnecessary information.
11 Operational issues	This is now under Section 7 'Operational issues'.
11.1 Roles and responsibilities associated with tower crane operations	This is now under Section 7.1 'Roles and responsibilities associated with tower crane operations'.

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<i>11.1.1 The principal contractor</i>	<p>This is now Section 7.1.1 and has been renamed 'Person conducting a business or undertaking'. This change reflects that as a principal contractor is a person conducting a business or undertaking (PCBU), the section also applies to principal contractors.</p> <p>The section outlines the general role and responsibilities of a PCBU, relevant to the operation of tower cranes.</p>
<i>11.1.2 The crane owner</i>	<p>This is now under Section 7.1.2 'The crane owner'. Minor amendments have been made to this section to reflect current legislative requirements and to specify that crane owners should ensure the design, load chart, maintenance records and all inspection reports of the crane available and signed off before deployment of the crane for use. It also references the need for pre-erection and commissioning inspections, prior to a crane being used, to be carried out by an independent third party.</p>
<i>11.1.3 The crane operator</i>	<p>This is now under Section 7.1.3 'The crane operator'. Minor amendments have been made to reflect current legislative requirements.</p>
<i>11.1.4 Dogger</i>	<p>This is now under Section 7.1.4 'Dogger'. No changes have been made to this section.</p>
11.1 Minimising risk of injury from lifting loads	<p>This is now under Section 7.2 'Minimising risk of injury from lifting loads'. Minor amendments have been made to the section to reflect current legislative requirements.</p>
<i>11.2.1 Control measures to maintain the integrity of lifting gear</i>	<p>This is now under Section 7.2.1 'Control measures to maintain the integrity of lifting gear'. The section has been updated to provide a clearer explanation for the use of slings, particularly nylon slings. Photographs highlighting the correct and incorrect use of slings have been included.</p>
<i>11.2.2 Control measures to minimise risk of injury from crane overload</i>	<p>This is now under Section 7.2.2 'Control measures to minimise risk of injury from crane overload'. No changes have been made to this section.</p>

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<i>11.2.3 Control measures to minimise risk of injury from unsecured and dropped loads</i>	<p>This is now under Section 7.2.3 'Control measures to minimise risk of injury from unsecured and dropped loads'. Minor amendments have been made to this section to reflect current legislative requirements.</p> <p>The 'Material boxes' section has been amended to state that a distinct identification number on a material box will assist in verifying the tare mass and safe working load.</p>
11.2 Safe access on tower cranes	This is now under Section 7.3 'Safe access on tower cranes'. No changes have been made to this section.
11.2.1 Tower ladders	This is now under Section 7.3.1 'Tower ladders'. No changes have been made to this section.
<i>11.2.2 Internal guardrail on tower landings</i>	This is now under Section 7.3.2 'Internal guardrail on tower landings'. This section has been amended to reflect the national cranes guidance material and to remove reference to company names.
<i>11.2.3 Guardrails on machine deck and A-frame platform</i>	This is now under Section 7.3.3 'Guardrails on machine deck and A-frame platform'. This section has been updated to reflect national cranes guidance material and to remove references to company names.
<i>11.2.4 A-frame ladder cage issues</i>	This is now under Section 7.3.4 'A-frame ladder cage'. No changes have been made to this section.
<i>11.2.5 Saddle bag platforms – Favco tower cranes</i>	This section has been renamed and is now under Section 7.3.5 'Cantilevered and hanging platforms'. Minor amendments have been made to this section to ensure consistency with the national cranes guidance material and to remove reference to company names.
<i>11.2.6 Crane jib – non-self-erecting types</i>	This is now under Section 7.3.6 'Crane jib access—non-self-erecting types'. Minor amendments have been made to this section to ensure consistency with the national cranes guidance material.

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11.3 Leaving the crane unattended	<p>This is now under Section 7.4 'Leaving the crane unattended'. Minor amendments have been made to this section to reflect current legislative requirements.</p> <p>The section now states that tower cranes should not be left unattended unless there are adequate systems in place to prevent unauthorised access to the tower crane base.</p> <p>The section has also been amended to clarify that the method of tethering (i.e. securing the boom to prevent slewing) is to comply with manufacturer's instructions, and that for tower cranes with a luffing boom, the crane manufacturer's instructions should specify the correct boom angle.</p>
11.4 Workboxes and first aid boxes	<p>This is now under Section 7.5 'Work boxes and first aid boxes'. This section and sub-sections have been amended to refer to work boxes and first aid boxes separately. This has been done to ensure the features and purpose for work boxes and first aid boxes is clearly differentiated in the Code of Practice.</p>
<i>11.4.1 Features of a crane when using workboxes and first aid boxes</i>	<p>This is now under Section 7.5.3 'Features of a crane when using work boxes and first aid boxes'. Minor amendments have been made to this section to ensure the mentioned criteria are relevant only to tower cranes (and not other types of cranes).</p>
<i>11.4.2 Features of workboxes and first aid boxes</i>	<p>This is now under Section 7.5.1 'Features and use of work boxes'. This section has been amended to only discuss features of work boxes. Minor amendments have been made to the mentioned criteria to reflect contemporary use of work boxes. This includes that a handrail should be provided around the inside of the box perimeter to prevent injury to occupants' hands in the event of the box contacting other obstructions. The section also clarifies that work boxes are to be design registered.</p>
<i>11.4.3 Safety of persons in crane-lifted workboxes</i>	<p>This section has been renamed and is now under Section 7.5.3 'Features and use of first aid boxes'. This section has been changed to only discuss the features of first aid boxes.</p> <p>The design requirements for first aid boxes have been amended. Crane-lifted first aid boxes must now meet the following criteria:</p> <ul style="list-style-type: none"> • The first aid box is to be design registered. • First aid boxes should be clearly identified and marked as first aid boxes. • Boxes are to be provided with sides and a roof except that a horizontal gap may be provided around all sides of the box. • The sides of the box are to be at least 1 metre high, up to a horizontal gap which is not to exceed 250 millimetres in vertical distance.

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	<ul style="list-style-type: none"> • The minimum internal height of the box is to be 2.2 metres. • The minimum internal width of the box is to be 1.2 metres. • The minimum internal length of the box is to be 2.8 metres. • The maximum mesh size of the box is not to exceed 50 millimetres x 50 millimetres (i.e. openings which exceed 0.0025 metres²). • A grab rail is to be provided along the sides of the box and to be recessed to minimise the risk of crush injuries. • If the first aid box is provided with a door this may be provided with outward opening doors, but the door is to be lockable to help prevent inadvertent opening. • Persons in the first aid box are not required to use fall arrest harnesses as the first aid box is enclosed. • Correctly tagged lifting slings must be supplied with the first aid box and attached to lifting points by means of hammerlocks or moused shackles. • The factor of safety for each suspension sling must be at least eight for chains and ten for wire rope. • The SWL, tare mass and design registration number of the first aid box must be marked on the first aid box. • At least one person in the first aid box must hold a dogger's licence class or equivalent to ensure correct directions are communicated to and from the crane operator. • When using first aid boxes, emergency retrieval arrangements should be put in place before the lift so that workers can safely exit the work box in the event of crane failure. <p>The section now includes a photograph of a compliant first aid box to provide additional guidance to the industry.</p> <p>The section also recommends that first aid boxes not be used when wind speeds exceed 54km/hr or in adverse weather conditions such as electrical storms. It also clarifies that the use of first aid boxes is more suitable in locations that are less susceptible to windy conditions such as the side of a building structure which is not as exposed to high winds. When wind speeds exceed 54km/hr, alternative emergency retrieval means should be used such as hoists.</p>
11.5 Fatigue	This section has been removed and reference to fatigue issues has been moved to Section 1.3 'What is involved in managing risks associated with tower cranes'.
<i>11.5.1 Managing fatigue</i>	This section has been removed and reference to fatigue issues has been moved to Section 1.3 'What is involved in managing risks associated with tower cranes'.
11.6 Noise	This section has been removed and reference to fatigue issues has been moved to Section 1.3 'What is involved in managing risks associated with tower cranes'.

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11.7 Ergonomic seating	This section has been removed and reference to fatigue issues has been moved to Section 1.3 'What is involved in managing risks associated with tower cranes'.
11.8 Working in heat	This section has been removed and reference to fatigue issues has been moved to Section 1.3 'What is involved in managing risks associated with tower cranes'.
12 Additional requirements for self-erecting tower cranes	This is now under Section 8 'Additional requirements for self-erecting tower cranes'. The section was updated to include information about the design requirements relating to the footings and foundations for the installation of a self-erecting tower crane.
12.1 Operation of self-erecting tower cranes	This is now under Section 8.1 'Operation of self-erecting tower cranes'. Minor amendments were made to this section to clarify that a crane operator should not undertake their own dogging work or supervise a trainee dogger, even if the operator is also a licensed dogger.
<i>12.1.1 Remote operation</i>	<p>This is now under Section 8.1.1 'Remote operation'. This section has been updated to ensure consistency with the national cranes guidance material and to provide more discussion on the requirements for remote operation. The section now states that a number of doggers should be available to safely complete lifts involving remotely operated tower cranes, particularly where there are multiple drop-off and pick-up points that are out of sight of the operator.</p> <p>The section also states that crane operators should not undertake their own dogging work and if the crane operator needs to undertake other tasks, the remote control should be turned off and secured to prevent unintended activation of remote functions. Effective communications should also be maintained between the crane operator and other personnel.</p>
<i>12.1.2 Erection of barricade around self-erecting tower cranes</i>	This is now under Section 8.1.2 'Erection of barricade around self-erecting tower cranes'. No changes have been made to this section.
13 Training and supervision	This is now under Section 9 'Training and supervision'.

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
13.1 Responsibilities for training and supervision	This is now under Section 9.1 'Responsibilities for training and supervision'. No changes have been made to this section.
13.2 Familiarisation training	This is now under Section 9.2 'Familiarisation training'. No changes have been made to this section. However, Appendix 3 has been amended to create separate familiarisation training checklists for electric cranes and diesel hydraulic cranes.
13.3 Refresher training	This is now under Section 9.3 'Refresher training'. No changes have been made to this section.
<i>13.3.1 Frequency of refresher training</i>	This is now under Section 9.3.1 'Frequency of refresher training'. No changes have been made to this section.
<i>13.3.2 Record of refresher training</i>	This is now under Section 9.3.2 'Record of refresher training'. No changes have been made to this section.
14 Inspecting, testing, maintaining and repairing tower cranes	This is now under Section 10 'Inspecting, testing, maintaining and repairing tower cranes'. No changes have been made to this section.
14.1 'Competent person' for inspecting tower cranes	This is now under Section 10.1 'Competent person' for inspecting tower cranes. The section now cross references to the definition of 'competent person' in Appendix 1.
<i>14.1.1 Inspecting specific parts of a crane</i>	This is now under Section 10.1.1 'Inspecting specific parts of a crane'. Minor amendments have been made to this section to clarify the guidance material.

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
14.1.2 <i>Inspecting a complete crane</i>	This is now under Section 10.1.2 'Inspecting a complete crane'. The section has been updated to ensure that it is consistent with regulatory requirements relating to major inspections and who constitutes a competent person for the purpose of conducting major inspections.
14.1.3 <i>Altering a crane</i>	This is now under Section 10.1.3 'Altering a crane'. No changes have been made to this section.
14.2 Requirements for non-destructive testing	This is now under Section 10.2 'Requirements for non-destructive testing'. This section has been updated to reflect current practice and contemporary requirements relating to non-destructive testing.
14.2.1 <i>Crack testing of booms and counterweight sheave bracket welds</i>	This section has been removed to reflect current practices and requirements relating to non-destructive testing.
14.2.2 <i>Crack testing of band brakes</i>	This section has been removed to reflect current practices and requirements relating to non-destructive testing.
14.2.3 <i>Crack testing of slew ring bolts</i>	This is now under Section 10.2.1 'Crack testing of slew ring bolts'. Minor amendments have been made to this section to reflect current practices and requirements relating to non-destructive testing.
14.2.4 <i>Crack testing of tower bolts</i>	This is now under Section 10.2.2 'Crack testing of tower bolts'. Minor amendments have been made to this section to reflect current practices and requirements relating to non-destructive testing.
14.2.5 <i>Chord thickness testing</i>	This is now under Section 10.2.3 'Chord thickness testing'. Minor amendments have been made to this section to reflect current practices and requirements relating to non-destructive testing.

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
14.3 Pre-erection inspections and tests (on ground inspection)	<p>This is now under Section 10.3 'Independent third party inspections of tower cranes at commissioning'. This is a new section reflecting the recommendation for there to be third party inspections of tower cranes at the commissioning stage (including for pre-erection inspections and commissioning inspections).</p> <p>A new Section 10.3.1 'Definition of independent third party' has been included to define who would constitute an independent third party for the purpose of carrying out pre-erection inspections and commissioning inspections. An independent third party is a person who:</p> <ul style="list-style-type: none"> • has acquired through training, qualification or experience the knowledge and skills to carry out the task • is not associated with the ongoing general repair and maintenance of a particular crane (whether directly or indirectly or through an associated company, including companies who hire or lease a crane). <p>A new Section 10.3.2 'Pre-erection inspections and tests' has been included which covers the information from the former Section 14.3 'Pre-erection inspections and tests (on ground inspection)'. The section has been amended to clarify that these inspections should be conducted by an independent third party to ensure any faults identified with the crane can be fixed and resolved before the crane has been erected.</p> <p>A new Section 10.3.3 'Commissioning inspections and tests' has been included which covers the information from the former Section 14.4 'Commissioning inspections and tests'. The section has been amended to clarify that these inspections should be conducted by an independent third party and that commissioning inspections should occur each time a crane is erected regardless of when an annual inspection of that particular crane has taken place. Minor amendments to suggested items for a commissioning inspection have also been made.</p>
14.4 Commissioning inspections and tests	The information from this section is now included in the new Section 10.3.3 'Commissioning inspections and tests'.
<i>14.4.1 Commissioning report</i>	The information from this section is now included in the new Section 10.3.3 'Commissioning inspections and tests'.
14.5 Pre-operational inspection	This is now under Section 10.4 'Pre-operational inspection'. No changes have been made to this section.

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
14.6 Routine inspection and maintenance	This is now under Section 10.5 'Routine inspection and maintenance'. No changes have been made to this section.
14.7 Annual inspections	This is now under Section 10.6 'Annual inspections (when tower cranes in place for 12 months or longer)'. The section has been amended to clarify that annual inspections should be carried out by a competent person when a crane is erected and has been in place for 12 months or longer.
14.8 10-year major inspection	This section has been renamed and is now under Section 10.7 'Major inspection of tower crane'. Minor amendments have been made to the section to ensure consistency with current regulatory requirements and language.
<i>14.8.1 Key inspection items for a 10-year major inspection</i>	This is now under Section 10.7.1 'Key inspection items for major inspection'. Minor amendments have been made to this section to include 'alignment of the drive shaft between the motor and gear box (where applicable)' to the list of key inspection items. The section has also been amended to clarify that completion of a major inspection does not indicate that the components inspected will have a further 10 year life.
<i>14.8.2 Action following a 10-year major inspection</i>	This is now under Section 10.7.2 'Action following a major inspection'. Minor amendments have been made to the section to ensure consistency with the current WHS regulations.
14.9 Records of inspections and maintenance	This is now under Section 10.8 'Records of inspections and maintenance'. Minor amendments have been made to the section to ensure consistency with current regulatory requirements.
14.10 Tower crane maintenance	This is now under Section 10.9 'Tower crane maintenance'. No changes have been made to this section.
14.11 Tower crane repair	This is now under Section 10.10 'Tower crane repair'. No changes have been made to this section.

2006 Code Section	Tower Crane Code of Practice 2017 and explanation of changes
14.12 Second-hand imported tower cranes	This is now under Section 10.11 'Second-hand imported tower cranes'. The section has been amended to clarify that before a second-hand imported tower crane can be operated for the first time, it should be subject to inspection by an independent third party. The section also states that second-hand imported tower cranes should be subject to a major inspection if the crane is at least 10 years old or there is no documented evidence that shows the crane's history of use or maintenance records. In addition, where the safety of a crane cannot be verified by documentation, it should be subject to a major inspection overseen by an engineer.
Appendix 1: Dictionary	The definitions of 'competent person' and 'engineer' have been updated to clarify the different use of this terminology throughout the Code of Practice. A definition of 'independent third party' has also been included in Appendix 1 in line with the new Section 10.3.1 'Definition of independent third party'. A minor amendment to the definition of 'load chart' has also been made.
Appendix 2: Relevant technical standards	A minor amendment to the list of relevant technical standards has been made, namely to replace the now superseded <i>AS 61508 Functional safety of electrical/electronic/programmable electronic safety related systems</i> with <i>AS 62061 Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems</i> .
Appendix 3: Items for inclusion in a familiarisation training checklist	Appendix 3 has been amended to create separate familiarisation training checklists for electric tower cranes and diesel hydraulic tower cranes. This ensures the specific familiarisation training requirements for each of these types of tower cranes is clearly articulated and can be easily used by tower crane owners.
Appendix 4: Example – Annual crane safety certificate	Minor amendments have been made to the annual crane safety certificate, including removing tick boxes and replace with a line to complete the qualifications of the competent person undertaking the inspection. Another line has also been included to state the inspector's identification number (inspectors will usually have a distinct number and engineers also have an RPEQ identification number). The inclusion of an identification number will assist if there is a complaint made about a particular inspector or engineer.