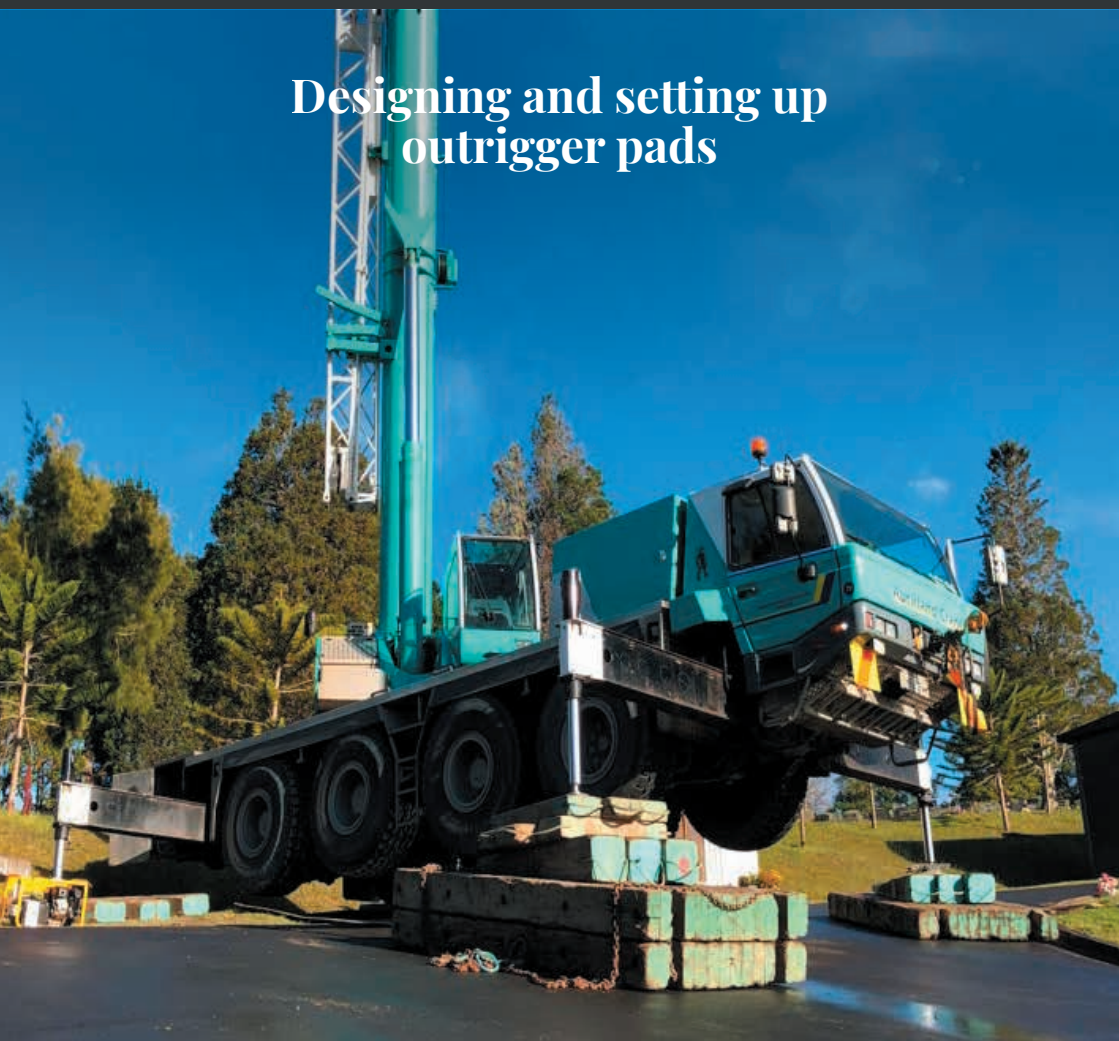


LIFTING MATTERS

Q2 2020

CRANE STABILITY

Designing and setting up
outrigger pads



Thanks to this edition's contributors



CALL FOR CONTENT

Are you an aspiring author? Are you passionate about the safety of your workmates? Do you have an idea for improving safety or efficiency in your workplace? We want to hear from you.

Contribute to Lifting Matters' vision of a safer industry by submitting your ideas and articles to **liftingmatters@writestrategy.com.au**

We are seeking stories about recurring incidents, significant incidents, ideas about safer and more efficient ways of working, any prevalent issues, good reminders, anything of a safety related nature.

You can submit a full article, anywhere from 200 to 1000 words, or you can send us ideas about what you would like to hear us discuss in future issues of Lifting Matters. If you're from a business, we will mention you as a supporter and publish your logo at no cost to you.

We can't wait to hear from you!



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From the Editor

Q2, April - June, 2020

Welcome to the Q2 2020 edition of Lifting Matters.

It is an understatement to say we are currently living in interesting times! Recent months have seen remarkable changes to everyone's lives with the COVID-19 pandemic having a widespread effect across the globe. Because the COVID-19 situation is changing daily we have chosen not to explore it within this issue to avoid publishing out of date information, but please know our thoughts and prayers are with everyone during this challenging and unprecedented time. One thing does remain steady, and that is the importance of safety regardless of how or where we carry out our work and go about daily life.

This issue we are looking at one of the foundational steps in setting up a crane to safely execute a lift: the correct use of outrigger pads, mats, timbers, and wedges. Our feature takes a closer look at outrigger timber stacking, and we shine the spotlight on the planning involved for a site set up with a complex outrigger pad design. We have experts from Universal Cranes, CICA, Worksafe QLD, and Standards Australia weighing in on the conversation of how to prevent incidents relating to outrigger designs. Our Operator's Opinion, People Profile, and LRES Training Management all reinforce the importance and benefits of training in high risk work.

Please get in touch with us! You can visit us on Facebook, LinkedIn or drop us an email any time. If you have an incident report, ideas about safer and more efficient ways of working, widespread issues, valuable reminders or anything else safety related, we want to hear from you. We look forward to working together to protect our people and save lives in the crane industry. Any contributions for our next edition are due by Friday 12 June 2020.

We have printed glossy copies of Lifting Matters available, which we usually offer for crane cabs, cribs and mess halls. With COVID-19 requiring us to be more conscious of spreading germs we discourage sharing printed copies at this time. We can send you hard copies for all your team members or provide an electronic PDF for email distribution. Just send us an email to liftingmatters@writestrategy.com.au with your information.

Stay safe and see you next edition!

Thank you

**DASHELLE BAILEY,
EDITOR**

liftingmatters@writestrategy.com.au



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Outrigger Timber Stacking

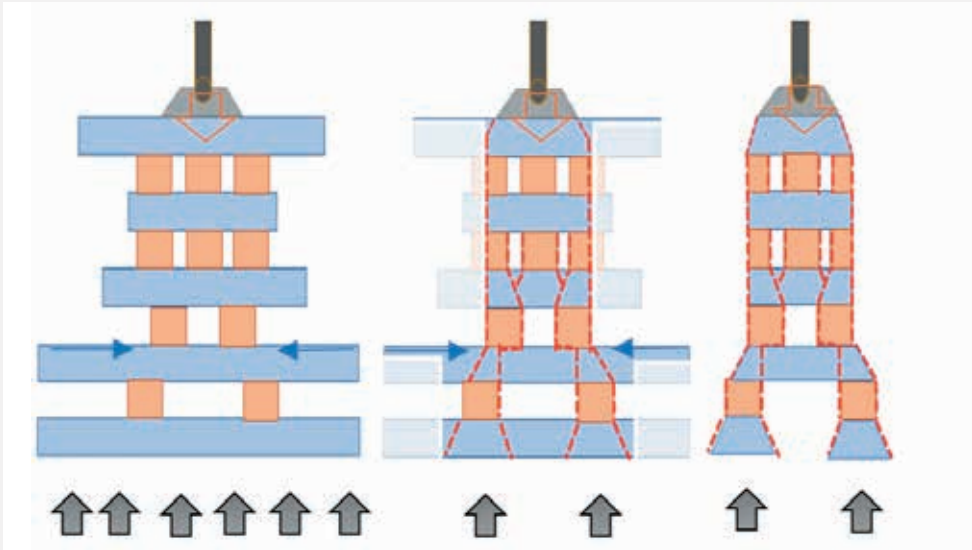
Article contributed by **JOHN HUMPHRIES - CICA**



Crane stability, irrespective of the load being lifted, requires a solid base. The way the outrigger load is transferred to the ground through stacking timbers is a matter that requires close consideration.

If the ground is uneven or if the crane requires raising, a timber stack is usually assembled.

Depending on the environment and materials available, however, a sound stack is not always created and there have been some very ‘creative’ timber stacks that have appeared on the internet from time to time. Whilst many of these stacks survive the physical forces and then the public ridicule on social media, it is important to note that just because an incident did not result, it does not mean that it was a good idea.



The stack is only as strong and stable as the weakest/narrowest point, which in the case demonstrated below, is four beams from the ground. Forces are dispersed diagonally at 45 degrees, so much of the timber is not actually beneficial. The diagram below is what occurs after negating all non-load bearing sections of timber. The first image is far less stable than it looks and vulnerable to lateral forces!

The second blue beam from the ground is subject to a high amount of shear force as there is minimal overlap between the orange beams above and below it. It is important to remember that the timber stack has a second axis which could be even less supportive and stable than the visible axis we see. In an ideal world, the timber stack takes only vertical loads. However, some real-world examples of where this is not the case are:

- Wind causing a load to swing or blowing on the crane structure.
- Incorrectly picking up or laying down a panel.
- An impact to the crane from other plant.
- Impacting the boom on a fixed structure.
- Jerky movements by inexperienced operators or poorly maintained hydraulics.
- Ground movement.

The odds of one or more of the events above occurring are high, therefore timber stacks need adequate resistance to lateral forces. Being a good crane operator requires thinking outside of the box, to make the best of difficult setup locations. The risk mitigation strategies that must be implemented when jacking up a crane include:

1. Using hardwood timbers, a minimum width of 200mm and depth of 75mm.
2. Eliminate any gaps between the timbers where possible.
3. Do not mix and match different timber sizes in the same stack.
4. Use steel bog-mat(s) as the base if available.
5. Ensure the ground beneath is flat, of sufficient bearing capacity and away from any trenches.
6. Do not built the stack to a height of more than 3 times the width.
7. If something does not look right, rethink it.

You may not be able to incorporate all the recommendations above, 100% of the time, however they all help ensure the stability of the setup.■

Incident Gallery



Image source: Vertikal

**December 2011
Raelingen, Norway**

**CAUSE:
NO OUTRIGGER MATS**

A loader crane in Norway lost stability whilst lifting a pallet of blocks into a residential yard. Without any outrigger mats under the jack pads, it punched through the asphalt road and overturned.

A recently constructed extension and terrace was damaged by the crane's boom, but thankfully no one was injured.



Image source: Dennis Symons

Image source: Hamilton Township Professional Firefighters

A 50t Manitex was removing trees from a residential property in New Jersey when a rear outrigger began to sink. The tri-axle crane slipped off its cribbing and partially overturned onto the home.

Fire departments, police, Hazmat Team, and Public Service Electric and Gas all attended the scene. No injuries were reported even though the building was occupied at the time.

December 2019
Hamilton,
New Jersey

CAUSE:
NO OUTRIGGER
MATS



**February 2020
Arnhem,
Netherlands**

**CAUSE:
INSUFFICIENT
SETUP**

Image source: Vertikal

A 3.5t Palfinger truck mounted telescopic lift overturned in the Netherlands, seriously injuring a man who fell around 12 metres.

The machine had been insufficiently set up on small outrigger mats on the side

of the woods so that the man could trim trees. The outriggers on the load side of the truck sunk into the soft ground causing the machine to tip.

Three people received minor injuries when an All-Terrain crane overturned in Genoa, Italy, late last year.

The four axle Marchetti tipped forward when the rear outrigger punched through the ground surface, whilst working on the Morandi Bridge replacement.



Image source: ANSA

November 2019
Genoa, Italy



Image source: Vertikal

A 45t Marchetti Orsa was working on a bridge widening project in the UK, when the edge of the bank began to crumble.

The crane tilted from its platform, and the operator attempted to counterbalance. The telescopic crawler continued to sink sideways before it overturned. The operator jumped clear and was not injured.

It was reported that recent heavy rains had washed away a lot of the material used in the raised platform.

October 2019
Slough, UK

CAUSE:
**FAILURE TO REASSESS
GROUND CONDITIONS
AND PAD DESIGN
AFTER HEAVY RAINS**

August 2015 Hollywood, Florida

CAUSE:

**NO OUTRIGGER
MATS**



Image source: Crane Accidents

A boom truck collapsed onto the roof of an apartment block in Hollywood, Florida.

The outrigger punched through the tarmac whilst it was placing an air conditioning unit onto the roof of the building causing the rig

to overturn. Despite the weak asphalt surface, no outrigger pads had been used.

Damage was limited to the roof and thankfully no one was injured.

June 2015 Bautzen, Germany

CAUSE:

**NO OUTRIGGER
MATS**



Image source: Crane Accidents



A residential job had barely begun when a five axle All-Terrain crane overturned in Germany.

The crane was unloading building materials when a front outrigger punched through the tarmac and a rear outrigger sunk into the ground.

A man was working on a scaffold that was struck by the falling boom. Neither the man nor the operator were seriously hurt.



**November 2014
Stuttgart, Germany**

**CAUSE:
NO OUTRIGGER MATS**



A lack of outrigger mats saw a Merlo Roto overturn at a new community center in Germany.

The 360 degree telehandler was set up on a partially finished block surface with no outrigger mats in use. The ground gave way beneath one of its outriggers and the boom came down, damaging the glass roof of the building.

A four axle truck crane was working in a car park when one of its outriggers punched through the concrete block surface, overturning and crushing two cars. No one was injured in the incident.

The set up consisted of some wood cribbing under the outrigger pads which were clearly insufficient for the ground conditions.



**May 2015
Xiamen,
China**

**CAUSE:
INSUFFICIENT
SETUP**



Installation of Deck Units in Brisbane

An example of good practice



Universal Cranes was contracted to install prestressed deck units at a private residential build in Balmoral, Brisbane. The site was complex with the requirement to setup on a split street sloping road surrounded by power lines, residential housing, vehicular and foot traffic, and a large radius of 44m. With extensive lift studies carried out and safe execution of the lift, the project provides a great example of good practice in outrigger design.

The lift studies determined a GMK4100L was the most suitable crane for the job, with its 60m boom and smaller outrigger base being the primary deciding factors for this complex site layout and operating environment.

In the lead up to the job, Brisbane experienced terrible weather with rain and thunderstorms forecast for lift day. Due to the effect inclement weather would have on an already difficult setup, the job was rescheduled for the following week. However, the GMK4100L wasn't available for this new date so the setup was redesigned to suit a GMK5130, which still provided a good solution for the site demands.



Setup obstacles

The setup was the most crucial part in delivering the job safely. A variety of different mats, pads, timbers, and wedges were to be used to get the GMK5130 ready to lift the deck units.

The crane was moved to the best possible position and the ground was marked as a reference point to commence the build. The main obstacle was a 700mm centre median strip on the upside of the setup that had to be built over. A large pad was created using two 3x1.8m and two 5x1m timber mats along with standard outrigger timbers and wedge timbers to form a platform that the crane could be

reversed onto. Although this was a start, the team were a long way from achieving the required height to level the crane.

The next step was to level each leg so that the machine could be raised inch by inch. Two 5x1m timber mats were used for the rear left hand outrigger to create a level pad to start alleviating issues caused by the gutter. This also lowered the bearing pressure as the adjacent block had been significantly cut. In turn, this enabled the use of two 1.8x1.8m bolted timber outrigger mats, a 1.6x2.0m steel pad, and several layers of outrigger timbers.

The rear right hand position required dirt to be removed from the median strip where

Getting the crane up to height was an incredible effort, adding one layer at a time on each of the rear legs and slewing the crane to transfer the weight before the operator could float the required leg.



a stillage of wedge timbers and outrigger timbers were used to create a level pad. The steel pad was then placed on top of this before outrigger timbers were layered to reach the final height. The two front outriggers were less complex to setup only requiring a handful of timbers on top of the steel pads.

Slow and steady

Getting the crane up to height was an incredible effort, adding one layer at a time on each of the rear legs and slewing the crane to transfer the weight before the operator could float the required leg. The operator remained in constant radio communication with the riggers. The setup took several hours to complete with safety as the number one priority. The crew took extreme care to complete each step in the correct order so the stacks were always stable. A few minor adjustments throughout the process ensured this was achieved. The final height was 2.5m under the rear of the machine with an extremely stable setup allowing the operator to complete the job safely.

Planning is key

The importance of a safe and well-engineered setup is key when working in a difficult environment. The pads/mats were chosen for several reasons, with ease of use and safety predominant factors. Prefabricated mats were the most suitable in reaching the required height and minimising movement for this job. The methodology worked well in the elevated setup, and a great outcome was achieved for the client. ■



The CICA Outrigger App

Article contributed by CICA

Problem

Crane company owners have previously identified the need to make calculations prior to setting up the crane on site easier and less susceptible to error. This need was identified, as a result of the complexity of the calculation as well as inexperience in the workforce. This inexperience was recently highlighted through the Safe Work Australia (SWA) Regulatory review on crane high risk work licenses completed in December 2018.

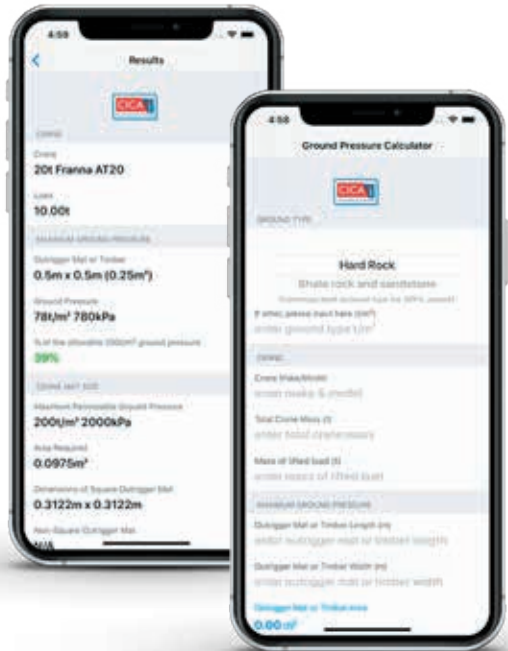
In 2018 the review of the Queensland Mobile Crane Code of Practice began, and ground pressure was identified as a key area to improve knowledge and guidance.

The hazard of ground giving way due to insufficient bearing capacity is a well-known engineering problem. The management of the bearing capacity risk can be mitigated through calculation, but the calculations need to be easily completed by employees that do not have an engineering degree. It is not feasible for engineers to assess every platform around Queensland.

Solution

The Queensland branch of The Crane Industry Council of Australia (CICA) utilised technology to make safe crane operation more feasible by commissioning the development of a free application for use on smart phones and tablets that will assist crane operators, riggers, and doggers in assessing ground conditions before crane set up.

In late 2018, the test app was completed and approved by Apple and Google for use. A working group began testing the app for the value it created i.e. functionality, data analysis and ease of use prior to making it available more broadly.





Challenge 1: The app was modified from original design because it was designed to perform the calculation and provide a result to the user in the field, with confirmation of the ground pressure conditions. The users wanted to capture the information and send it to a supervisor for review if a problem arose. The app was modified to allow for SMS or email communication of the results back to the main office. This data can then be incorporated in the Safety Management Plan or can be reviewed by more experienced lift designers.

Challenge 2: The formula that was first used was based on the existing Mobile Crane Code of Practice. This formula did not account for the advances in crane design that allows less counterweight to be used to lift greater loads. During the review process with manufacturers it was noted that using the formula in this form might under predict the ground pressure. Therefore, the app was modified to make sure users entered information about the crane in a configuration that allows for lifting over the entire slewing range, not the optimised location.

The app was launched on 24 May 2019 and was made freely available to everyone in the crane industry, not just CICA members. With the easy to use app, it puts the engineering calculations at the fingertips of thousands of crane crew personnel. The app is being used to make crane set up on site safer and with expert oversight if required.

The calculations can be integrated into the Safety Management Plan and increase transparency and accountability.

Feedback

Feedback from users has been extremely positive and support for it has been evident in industry publications and on crane user groups on social media. CICA provides education and support on how to use the app at member meetings and again anecdotally, the feedback has been excellent.

The app has had international visibility from Europe, Japan, Canada and the United States.

This app was created by the CICA Queensland Branch which is made up of volunteers. With Steve Gonano leading the charge, they identified the safety hazard and the risks and then invested their own time to consult with workers and other industry stakeholders (i.e. manufacturers) to have the app developed and tested.

The app is freely available to anyone who wishes to download it, just search for the CICA Outrigger App in the app store to download.■



Support of Mobile Plant on Outriggers

Article contributed by Worksafe QLD

The purpose of this safety alert is to highlight the potential risks associated with inadequate support under outrigger feet on mobile plant – particularly on poor ground, including fill.

Many models of elevating work platforms (EWP), mobile cranes, concrete placement booms and telehandlers rely on safe support of outrigger feet to prevent the plant overturning. A number of incidents have occurred around Australia where mobile plant on outriggers has overturned. In 2015, a 70 metre travel tower EWP overturned, resulting in a fatality.

Contributing factors

There can be several reasons why this type of incident occurs, but they often include one or more of the following factors:

1. Soft ground – as a result of fill, ground water, reclaimed ground.

2. Ground subsidence caused by nearby excavations and trenches, underground services and close proximity to creeks and other water courses.

3.

The area of timbers or other pads under the outrigger feet not being adequate for the ground conditions.

4.

Outrigger feet not being level or timber or pads being slippery, contributing to feet slipping off the pads.

5.

Uneven pressure being applied to the ground, such as when outrigger pads or timbers bend.

6.

An increased loading on the outrigger when the boom is directly above it or the boom is being loaded.

7.

Sinking of an outrigger pad while the unit is being operated.

8.

Short-legging of an outrigger where the plant is not designed for short-legging.

Soft ground can be disguised by a relatively thin crust on the surface where the ground has dried out, however, under the surface crust the ground is still soft. The hard crust can give the false perception that the ground has adequate bearing capacity, but when the load on the outrigger increases, one of the feet can suddenly punch through the crust causing the plant to overturn. Photograph 1 is an example of an outrigger pad sitting on the ground where a crust has formed without any indication that the ground is soft (i.e. the pad has not sunk). Photograph 2 shows a view of an outrigger

and pad that have punched through the crust deeply into the ground. *Photographs 1 and 2 apply to the same incident scene.*



Photograph 1: Outrigger pad on fill with no visual signs that the ground is soft



Photograph 2: Outrigger pushed into soft ground after breaking through crust of fill

Action required

The operating instructions from the mobile plant manufacturer should always be followed. Manufacturers and/or their agents in Queensland have a duty to supply information on any conditions necessary to ensure the plant is safe, this includes information on the loads imposed on the ground by outriggers and wheels. Where the information is no longer readily available, a competent person such as a geotechnical engineer should be engaged to assist in developing appropriate information on ground support for the unit.

The person conducting the business or undertaking must provide operators with sufficient training instruction and supervision for them to make an informed assessment as to what ground support is required. This should include documented procedures for checking the outrigger packing based on the EWP specifications and site conditions. The procedures should reference the manufacturer's information on loading applied to the ground and the expected bearing capacity of the site. In some cases it may be necessary to request site specific information to ensure it is suitable for the plant that has been selected.

Once on site, if there are any doubts or obvious signs that the ground may be suspect (i.e. soft ground, fill, underground services, etc.), the operator should seek direction from their employer. There may be a need to engage the services of a competent person, such as a geotechnical engineer, to make an assessment of the ground and then to specify suitable control measures (i.e. ground preparation with crushed rock or the use of steel bog mats under the outrigger feet).

There is a particular need for caution where the ground is made up of fill. Indicators that the ground is fill include the presence of rubble (i.e. broken concrete, bricks, metal, timber) and that the ground doesn't appear to be natural. Where the ground is fill, the operator should not assume that just because there are no obvious signs that the ground is soft that it is able to safely support the plant.

Continual monitoring of outriggers during operation is needed so that the unit can be stopped if the outrigger or pads show any signs of sinking. ■

Further information

Further information can be obtained from the following:

- *Mobile crane Code of Practice 2006 (PDF, 1373.69 KB)*
- *Concrete pumping Code of Practice 2005 (PDF, 896.05 KB)*
- *Australian Standard AS 2550.10: Cranes, hoists and winches – Safe use – Mobile elevating work platforms*



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A Global Crane Industry

Article contributed by Standards Australia

International alignment and cooperation on standards is a top priority for Standards Australia. Having committee experts involved in the development of international crane standards helps promote consistency and ensure Australia has a voice in the space.

As our metropolitan areas grow outward and expand upwards the need for various types of cranes increases. There are currently 750 cranes being utilised across construction sites in Australia alone¹ and plenty more being used in various spaces such as mines, factories and warehouses.

Standards not only aim to assist in the safe, consistent design of cranes but the ongoing maintenance and safety of those who work with and around these cranes every day. From tower and mobile cranes, to runways and monorails there are around 40 current standards that cover the design and safety of these machines.

As the crane industry keeps gaining momentum Standards Australia is committed to continued work with industry in updating and developing best-practice documents for the sector.



¹ https://s28259.pcdn.co/wp-content/uploads/2019/10/RLB-AUS-Crane-Index_Q3_2019.pdf

Crane Standards

Standards Australia's committee for cranes swung into action this year with over 20 draft publications sent to public comment in late February. The standards were updated to align with current international standards which aims to increase consistency across the sector, in turn building the confidence of workers.

"Australian experts already are and will continue to play a significant role in shaping relevant international standards. This cooperation by those from our industry enables safety guidance to be promptly updated and aligned with international practice," said CEO of The Crane Industry Council of Australia, Brandon Hitch. "The documents that headed to public comment will assist in strengthening our national crane sector."

The public consultation period gives those within the industry the opportunity to provide feedback and raise any questions around the draft standards. Hearing from those that work near cranes and on worksites means Standards Australia can gain an even broader perspective on the direction of the drafts.

"Crane safety originates with their design and continues through to their use. It is critical that Australia uses the latest crane standards developed on the world stage and adapted to Australian conditions," said Mr Hitch.

The safety of cranes, their wind load assessment and testing codes and procedures are just a few examples of the

differing standards that headed to public comment.

AS 1418.1 Cranes, hoists and winches General requirements was also updated and sent to public comment. This standard has been revised to align with ISO standards, with modifications that are relevant to the Australian crane industry. As a range of standards reference AS 1481.1, after it is published, the committee will be assessing if any related standards need to be updated.

Before the publication of any of the standards that went to public consultation, the committee will consider all the comments received. If you're interested in the public comment process or projects currently available for public comment, head over to the Standards Australia website www.standards.org.au.

Up and Away

With over 40 current standards and a growing industry there is no doubt the development, alignment and revision of crane standards will continue through 2020 and beyond. Standards Australia encourages feedback, engagement and questions from those in industry, if you would like to get in touch you can reach out directly to the Stakeholder Engagement Team at SEM@standards.org.au. ■

Operator's Opinion

Daniel Litt



Daniel (Chilli) Litt has spent 18 years in the industry, learning the ropes and working his way to his current position of Sales and Crane Supervisor at Universal Cranes. He shares his experiences with us, as well as foundational truths when it comes to safety in the crane industry.

Chilli, how did you come to be in your current role? Perhaps you could give us a summary of your professional journey so far...

I have worn many hats under the Universal Cranes umbrella, starting out as a Heavy Rigid Truck Driver. I believe the old school approach of doing time on the ground and learning the ropes from more experienced employees is so important. This allowed me to have a greater appreciation and understanding of every aspect outside of the crane operator's cab, prior to making the transition to Operator myself. I worked

my way up to Yard Manager, then into a Dispatch role, and have spent the last few years as part of the sales team with a focus on site supervision of project works.

Having worn so many hats, surely you've been exposed to incidents involving unsafe outrigger set up?

When I was rigging, I was on a weekend off with my family, when I got "the call" – there had been an incident with another crane and Universal Cranes had been tasked with up righting it the following day. We tool boxed the meeting at 4am in our yard

before the team headed to site. We took a 130t and 100t Franna, and associated counterweights and lifting gear. On inspection, it became apparent the crane had set one of its outriggers up on top of a pit, which was why it had failed causing the crane to tip over. It was at a school sports oval, and we could tell there was a trench running the width of the oval - the grass was even a different colour! The recovery went without a problem and the stricken crane was driven home within an hour of being upright. Even prior to setting a foot into a crane, this made me VERY aware of the importance of ground conditions and outrigger pad design.

There's so much that can be learned from a simple site inspection! What do you think is the most common action or behaviour you've witnessed when outrigger pads/mats aren't used appropriately?

It is either out of laziness or rushing to get the job done. You should always take the time needed to set the crane up properly on the required timbers or mats.

How do you think we can improve these mindsets?

In my opinion it's up to each one of us individually to take pride in our work, pride in our role, and to instil the importance of setting the crane up correctly to the younger generation. NO-ONE should ever chastise you for wanting to do your job in a professional and safe manner. And if they do?

You should ask yourself if a client willing to compromise on safety and potential lives just to save a dollar is the type of client you want to be working for!

Absolutely! So, what do you feel is the most important safety issue affecting your particular role in the industry today?

To lead by example: I would never ask anybody, whether it be a fellow employee or someone that I had met onsite for the first time, to do anything that I wasn't prepared to do myself. The knowledge you gain from undertaking training and learning from those with experience is such an important foundation, so it's crucial to lead by example.

Thanks for sharing with us Chilli. What would be your final thoughts for those in the industry?

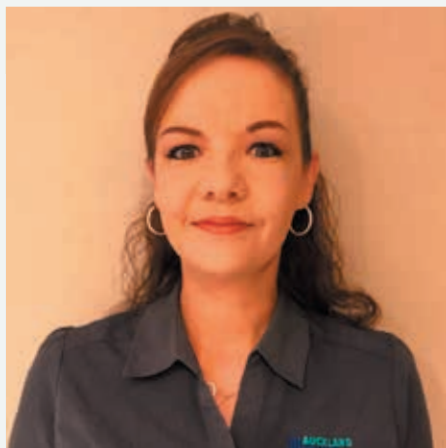
If you're unsure, stop what you're doing and ask the question. Ask your supervisor, ask a workmate. It doesn't matter if you have been in the industry for 3 days or 30 years - 99.9% of people in this industry are more than happy to share their knowledge with you. Knowledge is power, and that power enables you to perform your task safely and go home to your loved ones each night. ■

Sharon Gerber

Sharon Gerber recently joined the Auckland Cranes family as the HSE Manager, bringing with her a wealth of knowledge and experience from her time in the resources industry. We caught up with Sharon to learn more about why health and safety is close to her heart, and how to foster a sustainable safety culture.

Give us a summary of your professional journey so far... What is your current role and how did you come to be in this role?

I knew from a very young age that I wanted to protect people in the workforce, however as a young lady, fresh out of school, I had a mentor assigned to me who encouraged me to go into a field that was more suitable for a “lady”, so I studied Management Accounting. After completing my studies in management, my professional journey started at a Steel Manufacturing company in South Africa which was home to approximately 1500 employees. My interest in risk management did not subside and I somehow managed to undertake various HSE courses and eventually landed a role as a Junior Safety Professional within the organisation.



Sharon Gerber

HSE Manager, Auckland Cranes

During my 10 years in the Steel Industry, my career grew as I gained experience and was promoted from a Junior Safety Professional to a Lead ISO Auditor across the sister companies, primarily focusing on Safety and Quality. In 2008, an opportunity not to be missed arose within BHP Billiton. This opportunity offered construction experience on a mining optimisation project that would house 7500 contractors. During my 8 years in BHP Billiton, I not only gained significant construction experience, but also obtained a Degree in Safety Management and focused largely on Safety and Business Risk Management.

In 2016 I took up an opportunity at a Chrome Mine, as a SHEQ Manager where I was also elected as a spokesperson for Women in Mining for the North West Region. At the end

of 2018, my family and I decided to move to New Zealand where my first role was at a Logistics Company. With the experience I gained in the construction world and my appetite for high risk work, I was delighted to get a job at Auckland Cranes at the end of 2019 as the HSE Manager. The implementation of the Group Safety Framework has been a massive focus point for me since joining.

Going forward I hope to further influence a culture that has a natural ability to proactively identify risk and mitigate it accordingly.

What do you think is the most important issue in crane safety today?

Competency and experience play an imperative role in the risk evaluation process, especially in the crane industry. Ensuring the younger generation are motivated to join the crane industry and that they go through the correct channels to obtain quality training and experience should always remain a focus point.

What motivates you in your role?

This is a topic dear to my heart that I have remained silent on for many years until recently. As a family of five, our lives were turned upside down when my father was fatally injured in a work-related accident. I remember the sorrow I felt for my family, the managers of the company and the

people involved during a very long and draining investigation process after the accident. I had no doubt in my mind from a very early age that I wanted to be part of a system that influences people to work safely, not only to protect themselves but also to protect the company as an entire entity.

How do you help to build an effective safety culture? What do you think are the keys to an effective safety culture?

I believe that a sustainable safety culture is led from the top down, owned and driven by the leaders of the organisation. I also believe that a safety system is imbedded in all other functions of the organisation, hence I do not believe in safety first, I believe in safe operations. ■

Benefits of Training in High Risk Occupations

Article contributed by **RICHARD SKIBA** – LRES Training Management



Safe Work Australia data identifies high risk work occupations. Looking at a profile of these occupations leads to an understanding of the educational background of those workers most at risk and allows identification of training gaps. Further, we can look at ways to encourage skilling and upskilling in areas focusing on the knowledge and skills that may contribute to mitigating the associated risks. This discussion is relevant to mobile crane operation, particularly on road.

Context

Safe Work Australia compiles the Work-related traumatic injury fatalities data set. The data set provides national statistics on all workers and bystanders fatally injured at work.

Table 1 (top right) highlights the mechanisms most likely to cause injury and/or fatality in Australian workplaces with vehicle collision and being hit by moving objects the leading mechanisms. In the context of this data vehicle collisions include road vehicles such as cars and trucks, as well as machines such as aircraft, boats, loaders, tractors, and quad bikes.

Table 1 - Work-related injury fatalities by mechanism of fatal injury, 2018

Mechanism of incident	Number of fatalities	% of injury fatalities
Vehicle collision	44	31%
Being hit by moving objects	24	17%
Falls from a height	18	13%
Being hit by falling objects	15	10%
Being trapped between stationary and moving objects	7	5%
Being trapped by moving machinery	7	5%
Other mechanisms	29	20%
Total	144	100%

[source: Safe Work Australia]

The Work-related injury fatalities by occupation 2018, data outlines that Machinery Operators and Drivers (at 6.2 per 100,000 workers) and Labourers (at 2.9 per 100,000 workers) are the most likely occupations for work-related injury fatalities.

Table 2 - Work-related injury fatalities by occupation, 2018

Industry of employer	Number of fatalities	Fatality rate (fatalities per 100,000 workers)
Machinery Operators and Drivers	51	6.2
Labourers	36	2.9
Technicians and Trades Workers	27	1.5
Managers	16	1.0

[source: Safe Work Australia]

A third data set (overleaf) produced by Safe Work Australia worthy of consideration is related to work-related injury fatalities by industry. This data set illuminates that the highest fatality levels occur in the Agriculture, Forestry and Fishing, and Transport, Postal and Warehousing industries.

Table 3 - Work-related injury fatalities by industry, 2018

Industry of employer	Number of fatalities	Fatality rate (fatalities per 100,000 workers)
Agriculture, forestry & fishing	37	11.2
Transport, postal & warehousing	38	5.9
Mining	9	3.7
Construction	24	2.0
Electricity, gas, water & waste services	3	2.0
Manufacturing	13	1.4

[source: Safe Work Australia]

Considering this data in a superficial manner, it can be seen that risk of work-related injury fatality is highest for Machinery Operators, Drivers and Labourers working in the Agriculture, Forestry and Fishing and Transport, Postal and Warehousing industries, with the most likely risk being related to vehicle collision or being hit by moving objects.

Mobile crane operators generally fall into two of these categories as both machinery operators and drivers. Safe Work Australia also note that operating cranes is complex and dangerous and workers must have the necessary skills and capabilities to do it safely. They identify that every year there are injuries and deaths from work involving cranes.

Global Training in High Risk Work

Use of high risk plant in many countries requires the completion of a qualification in plant operations followed by licencing, normally endorsed by a government regulator. In Australia, a high risk work licence is required for crane operations following the completion of training through a Registered Training Organisation, through Australia’s vocational Education and Training System.

Aside from the licencing rules in place in each country, generally each country has some training system in place for training operators in crane operations, mainly through a system of vocational education and training.

A Truck Driver Example

Using the Department of Employment, Skills, Small and Family Business Job Outlook data as a reference, a profile of a Truck Driver generally can be determined. Academically, the majority of Truck Drivers have completed Year 10 or below (41.6%) and 26.8% have completed vocational education qualifications at Certificate III or IV level in any field of study. The data

highlights the low degree of vocationally qualified truck drivers in the industry.

The job role essentially requires Heavy Vehicle licencing, relevant to the type of truck being operated and may not require any other formal qualification. Some specific job roles may require additional certification such as construction induction card (white card) and/or forklift licence or crane operation licence.

Table 4 - Truck Drivers Highest Level of Education (% Share), ABS Census 2016

Type of Qualification	Truck Drivers	All Jobs Average
Post Graduate/Graduate Diploma or Graduate Certificate	0.5	10.1
Bachelor degree	2.1	21.8
Advanced Diploma/Diploma	3.8	11.6
Certificate III/IV	26.8	21.1
Year 12	16.6	18.1
Year 11	8.5	4.8
Year 10 and below	41.6	12.5

[source: Department of Employment, Skills, Small and Family Business]

The Transport and Logistics Training Package specifies the competency standards for heavy vehicle licencing units, for example through the unit of competency TLILIC2016 Licence to drive a heavy rigid vehicle. Similar units exist for other heavy vehicle classes. Many Registered Training Organisations deliver heavy vehicle licence training and assessment over one to two days, some with delivery and assessment on the same day. Learners are given very little time to develop

competence over time and to consolidate their skills in this arrangement.

The TLILIC2016 Licence to drive a heavy rigid vehicle unit of competency comprises three elements: Drive a heavy rigid vehicle; Monitor traffic and road conditions; and, Monitor and maintain vehicle performance. Across these, there are a total of eleven performance criteria. Very little of the unit components are designed to ensure work

health and safety competence. The unit is not designed to develop competence in vehicle collision avoidance or managing the risk of being hit by moving objects, the two most frequent mechanisms of incident causing fatality.

There are, however, a number of qualifications that utilise the unit of competency, such as RII30115 Certificate III in Surface Extraction Operations, TLI42116 Certificate IV in Driving Operations and UET30719 Certificate III in ESI - Power Systems - Rail Traction. The majority of these include Health and Safety specific units of competency that may adequately train and deliver the required skills and knowledge to reduce, and hopefully prevent, fatality resulting from vehicle collision, being hit by moving objects, falls from a height, being hit by falling objects, being trapped between stationary and moving objects, and being trapped by moving machinery. These units of competency often directly address the noted mechanisms of incident for this industry.

Drivers, at the very least, must be provided with sufficient training to ensure that driving hours regulations (time spent driving and working) are adhered to, required rest breaks are taken, records of driving hours are correctly calculated and kept, vehicle does not exceed mass limits, vehicle and load do not exceed dimension limits, load is appropriately restrained, the speed limit is not exceeded, and all vehicle equipment is correctly functioning.

Training Prevents Major Accidents

National Transport Insurance in its NTARC Major Accident Investigation Report outlines and discusses the causes of major accidents. They revealed that nearly one in three driver error crashes resulted from inadequate following distance which, in the majority of cases, then resulted in a 'ran into rear' crash. They also note driver fatigue and roll over during unloading resulting from incorrect procedures as causes of major accidents. Higher level training may address and prevent these causes in many cases.

The proposition of increased training in the transport industry aligns with the Australian Trucking Association (ATA) submission to the Senate road transport inquiry calling on Governments to implement practical safety measures immediately, to combat the unacceptable number of fatal and serious injury crashes involving trucks. The ATA condone improving driver training and licensing.

Industrial Manslaughter Legislation

As we enter an era of industrial manslaughter legislation, employers are encouraged to seriously consider the value of upskilling their staff. Industrial manslaughter offence usually applies where there has been negligent, or grossly negligent conduct causing death. By drafting the offence as an outcome-based offence (i.e. it is triggered by a specific event, a workplace death), legislators seem to have moved away from the existing approach for safety law offences,

which are mostly limited to providing for risk-based offences in relation to conduct that exposes a person to a risk of death or serious injury or illness, rather than for a specific outcome (a workplace death).

Ashurst outlines that Industrial manslaughter laws are currently in place in Queensland and the ACT, are proposed for Victoria and the Northern Territory, and are being discussed for Western Australia. In Victoria, the new laws will commence on a day to be proclaimed or 1 July 2020 at the latest and negligent conduct before the legislation commences may still be relevant for the purposes of prosecution if an organisation's omission to amend unsafe work policies causes a workplace fatality post-commencement.

Employee Incentives

Currently, a number of financial incentives are available to help employers increase their workforce. Wage subsidies are available through an employment services provider to employers if they hire eligible job seekers. Similar specific program incentives could be implemented for employers in the Agriculture, Forestry and Fishing and Transport, Postal and Warehousing industries for upskilling of employees to Certificate III and Certificate IV level programs delivered in collaboration with Registered Training Organisations. Australian Government, as a stakeholder to health and safety, could in this way show commitment to promoting health and safety and reducing the occurrence of workplace incidents.

Likewise, employee incentives could be offered to individual employees who complete additional training to encourage them to upskill. These could be monetary in nature or could include non-monetary incentives such as flexible work hours, training opportunities, and the ability to work independently. In either case, the rewards and incentives are valuable to an employee because they allow workers to learn new skills and pursue advancement opportunities (Scott, 2019). In turn, the employer benefits from a safer and more skilled workforce.

Conclusion

Given the high incidence of fatality and injury in the Agriculture, Forestry and Fishing and Transport, Postal and Warehousing industries, there is an established need for additional training to occur. Training at Certificate III and certificate IV level is designed to impart the knowledge and skills needed to safely undertake work in the noted high risk occupations.

Encouraging participation in vocational education and training programs should be a priority and responsibility of a range of industry stakeholders. The Vocational Education and Training system is designed to provide suitable training in high risk occupations, however, these are under-utilised in industry. Use of the system as intended, would reduce the occurrence of workplace injuries and fatalities as those at risk would develop the competence to undertake their work safely and to the required industry standards. ■

Any questions?
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Contact us!



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