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That sinking feeling!

Using some form of material or method to spread the weight of heavy objects, to stop them sinking into soft ground dates back to the earliest of times. The principal is all too obvious and yet hardly a week goes by that we do not receive reports of cranes and work platforms overturning due to being set up on soft or unsuitable ground without some method of spreading and supporting the load.

It is now 15 years since Cranes & Access first published a feature highlighting these issues, following a spate of crane and work platform incidents - some of which were fatal - caused purely by the absence of mats or spreader plates when working on ground that was clearly suspect.

Since then awareness has grown and an increasing number of companies take the issue very seriously, to the point where an entire industry has developed, offering a vast array of products all designed to enable heavy equipment to work on or drive over soft or sensitive ground. But has it made any difference? Looking at the number of incidents reported on the lifting news website Vertikal.net you would be forgiven for thinking not. There are still a significant number of crane and platform overturns caused by either a lack of ground preparation or the absence of mats to spread the point loadings generated by outrigger jacks, heavily loaded wheels or tracks. It seems

that there is still a long, long way to go before the problem is eradicated.

The use of outrigger mats and spreader plates has increased exponentially - particularly in Europe - and anecdotal evidence would suggest that the number of incidents resulting from outrigger setup issues has decreased, while rental companies are more than happy to supply mats with their machines. Certainly more people are aware of the problem, and it can be argued that the continuing high number of incident reports, owes more to the ease of reporting, thanks to the spread of the internet and arrival of a camera in everyone's pocket in the form of a mobile phone, than an absence of progress.

Easy to avoid

So why are we still seeing so many overturns that could so easily have been avoided?

We are told that it is down to a need for more education. As with most incidents overturns are almost



always due to operator error and usually comes down to a lack of information on what lies under the surface, and it has to be said, in some cases laziness or a lack of attention. Pressure applied on the crane operator by site managers can also be a mitigating factor, as they are accused of over cautiousness or simply being difficult!

All too often we receive photographs of machines carrying out a lift with cribbing that has clearly been made up of scrap wood found on an untidy and sloppy job site. Clearly a lack of planning has been the critical first step in such a scenario, and all too often it becomes the critical factor in an incident that at best

causes substantial damage to the crane or platform and shuts down work on the site, and at worst ends in fatalities, while writing off the equipment and causing huge reputational damage to all involved, not to mention years of legal battles which can even result in a prison sentence.

We receive incident reports that at first glance appear to be ground or mat related but on closer examination are simply due to the operator inadvertently slewing the crane counterweight over short rigged outriggers or retracted crawler tracks with the retracted boom fully elevated. Most operators are well aware of forward stability but forget that in many cases the



A soft verge takes another crane



Overturns are almost always caused by operator error.

outrigger mats C&a



With insufficient space to set up, this All Terrain crane used the upturned bucket of an excavator. Not a recommended cribbing method!



Heavy rainfall had reportedly made the edge of the raised platform/road unstable

least stable condition is behind them. This also applies to self-propelled boom lifts, where the least stable position is with the retracted boom fully elevated and no load in the platform - a boom on a slope of more than five degrees with the counterweight facing down the slope will invariably tip rearwards. If anyone is in the platform at this point they become the equivalent of a rock in a trebuchet type catapult. Unless they are wearing a harness - ideally with a very short lanyard - they are likely to end up hitting the ground on an adjacent job site!

Some overturns are caused by an operator trying to set up in an area that is plainly unsuitable, with insufficient flat or load bearing space to deploy the outriggers and mats correctly. It goes without saying that had a thorough site survey been carried in advance such issues would have been spotted and a solution found before the machine arrives. Although in some cases the site was checked, a job plan drawn up only for the operator to discover a last minute change of plan when he arrives on site. All too often we hear "We had planned the lift based on the facts discussed and agreed during the initial site visit, but when our operator arrived there was a last minute change. Our operator did his best to oblige the customer who was under significant time pressure, but he failed to spot XYZ!"

Near miss in London

A recent 'near miss' incident in London concerned the replacement of a rail bridge under a contract Lift. The lifts had been planned in great detail and well worked through, but the bridge and its transporter arrived on site a day early - it was scheduled to arrive after the crane was rigged. This forced a change in plan as the crane could no longer be rigged over the rear. With penalties of £1,000 per minute per train delayed, the crane team

came under great pressure to adapt their plan and so began rigging the crane over the front. Due to visibility issues the operator lifted the counterweight using the crane's Bluetooth controller at a greater radius than had the counterweight truck been able to pull alongside as planned. The controller failed, and not being in the cab he did not feel the rear outriggers lift off the ground. Thankfully two passing site workers spotted it and alerted the crane team which was able to take steps to avoid what might have been a highly disruptive incident. Ideally the team would have called in the Appointed Person/lift planner but naturally tried to work out something on the spot with the client.

In a case reported from Germany last month a large All Terrain crane arrived on site to find that there was insufficient space to set up in the position required - on a raised track - without a good deal of cribbing. The operator had insufficient cribbing on board to cope but appears to have found enough scraps of wood on site to set three of the outriggers, but not the fourth. Under pressure to carry out the lift and get out of the way someone clearly suggested that an excavator be called into help, using its upturned bucket as a form of cribbing! In this case the lift was completed without incident thanks more to luck rather than judgement. The crane company has since issued new instructions to its operators, in a bid to stop this happening in the future.

The requirement for cranes or large truck mounted lifts to travel on unsuitable or poorly constructed tracks highlights an issue that has dogged wind turbine installation work for years with contractors under financial pressure spending less on access roads, resulting in roads that are too narrow or of insufficient quality across their width to safely support the heavy

equipment required to erect the turbines. As a result dozens of cranes, platforms and trucks have rolled over after the road edges have given way.

Beware heavy rain fall

An unusual but related incident occurred earlier this month when a telescopic crawler crane overturned alongside the M4 motorway near Slough in the UK. The 45 tonne Marchetti was working on a bridge widening project and was travelling on a prepared raised platform/road. However heavy rainfall had reportedly washed away much of the Type 1 material, reducing the platform's ability to support the crane and it gave way. The crane was travelling with its tracks in the retracked position and was guided by a spotter. The space available was less than generous, possibly forcing the crane to travel closer to the edge than was ideal, given the week or more of heavy rain.

As the incident highlights, even when a specific platform has been built for the job, its condition needs to be monitored, and possibly tested on a regular basis. The crane operator can play a part in this and ought to walk the route in advance, but to be fair, they are hardly likely to be an expert in the ground bearing ability of an 'engineered platform', although a highly experienced and

canny operator does develop 'an eye' for what is likely to support their crane or not. Such experience requires an operator to remain with the same crane rather than constantly moving from crane to crane.

When setting up any equipment the ground should be inspected and questions asked, and ideally tested, so that suitably sized mats are used, this is especially important when working near buildings, footpaths and roads where the possibility of hidden voids is most prevalent.

This was highlighted in another incident this month - this time in in Valmuevej, near Copenhagen - when a 64 metre Palfinger P 640 truck mount overturned onto the roof of a building. It seems was the rear load side outrigger punched through the pavement into a hidden void, causing the machine to lose stability. Outrigger mats had been used but they were hardly any larger than the machine's jack pads. Thankfully the boom and basket came to rest on the roof a substantial height above the ground on the back side of the building. The two men in the platform - the operator and a stone mason - managed to remain in the platform and were rescued by local fire and rescue service with the help of another platform.

Of course there is little that can be



The operator of this 64 metre Palfinger P 640 truck mount didn't check for hidden voids

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done when an operator is oblivious to potential dangers. The operator of a bucket truck working for the Sam Houston Electric Cooperative on a road north of Houston, Texas had set up alongside an open culvert in order to trim trees away from overhead power lines. The machine's stabilisers barely reached the ground, with one in the ditch, leaving the machine unstable when working over the side, particularly at

maximum outreach. Not surprisingly the lift overturned throwing the operator out of the platform as the lift's boom landed on the power lines cutting electricity to around 500 local residents. Thankfully he had a relatively soft landing and suffered relatively minor injuries. Improved training and awareness is surely the only way to prevent this sort of thing occurring?



Setting up over a ditch can have disastrous results!

Giant crane mats for FM Gru

Italian tower crane manufacturer FM Gru has purchased 16 bespoke crane mats to support four of its cranes during the construction of the Morandi Bridge replacement in Genoa, Italy.

A team from FM Gru visited Vertical Days this year to look for mats large enough to support its 2670 TLX and 2675 TLX flat top cranes. The team met UK-based Outriggerpads, which agreed to produce the 2.4 metre square, 100mm thick bespoke mats, each of which weighs 560kg. Made from high performance UHMW polyethylene, they are said to be more robust than metal or wood equivalents. Each mat has four integrated 'handles' for ease of lifting and handling.

FM Gru managing director Giacomo Fuochi said: "The construction of the new bridge requires mats that are relatively lightweight, yet robust and durable. We were impressed with the service from Outriggerpads, as they were able to manufacture and deliver the mats in a very short period of time."



The mats are 2.4 metres square, 100mm thick and each weigh 560kg



An FM Gru 2675 TLX used for the construction of the Morandi Bridge replacement in Genoa

DICA adds to ProStack product line

US-based DICA has launched the ProStack Slot Lock cribbing block. The blocks are designed to stack and lock together to safely increase cribbing heights. They are made from a combination of recycled material and additives to produce what the company describes as a strong, reliable, and environmentally friendly solution

A SafetyTech base pad and two ProStack block set up has a 454kg/35bar load bearing capacity. Each layer increases cribbing height by 127mm, and the surface allows room for outrigger jack pads of up to 450 x 450mm. The blocks weigh 13.6kg, and include moulded grips make them easier to carry. TuffGrip handles can be added to facilitate carrying two blocks at once. They are guaranteed for 25 years against rot, insect infestation, splitting, cracking or splintering.



The ProStack Slot Lock cribbing block

Ecocrib cribbing blocks

UK based Outriggerpads has launched a new range of composite cribbing and jacking blocks. Manufactured from heavy duty polyethylene, the new range of Ecocrib heavy duty interlocking cribbing blocks can be used anywhere traditional wood cribbing is used, however they have the benefit of firmly interlocking with each other and do not corrode or splinter, while being resistant to water.

They can either be used in two blocks per layer for lighter or less concentrated loading, or three blocks per layer for heavier loadbearing applications. The 600mm long and 150mm square profile blocks are tested for loads of up to 100 tonnes. Each block has two integrated rope handles for ease of lifting and stacking. The stack can be topped by one of three 600mm square top mats, with weights of 20kg, 25kg and 30kg.

Outriggerpads has also launched the Ecostak range of jacking blocks - also manufactured from heavy duty polyethylene, the 300mm square blocks are available with a thickness/height of 30, 80 or 140mm. A 250mm square, 10mm thick insert is also available for levelling off the stack once it has been built.



Ecocrib heavy duty interlocking cribbing blocks are 600mm long and have a 150mm square profile

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