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THE MOST PRACTICAL AND COST EFFECTIVE METHOD OF SPREADING OUTRIGGER STABILIZER LOADS

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Finally sinking in?

Instilling a new concept or work practice into the mind set can take a long time - weeks, months, years even decades. It is now 14 years since we first published a feature highlighting the importance of spreading loads imposed by outriggers, following a spate of crane and work platform overturns caused by the lack of mats. Since then we have reported on dozens of further incidents - some of them fatal - while highlighting examples of operators failing to use them.

In the intervening years there does appear to have been a transformation, and although no research has been carried out it appears that the number of accidents resulting from outrigger set-up issues has decreased - particularly in Europe. When they do occur they are more likely to be due to the crane set up not programming for short rigging, or using mats too small for very soft ground or voids. Perhaps the message is finally getting through? When Vertical Days was launched 12 years ago, the use of outrigger mats was written into the rules of the show, today it is rare to see them not used at any trade show.

Our campaign also sparked off a number of high-profile campaigns by organisations such as IPAF, the CPA and HSE in the UK and CICA/EWPA in Australia. Their examples have spread throughout world. In the USA OSHA has produced a good deal of information and warning notes, and new crane rules there and in Europe require the monitoring of outrigger set-up linked to working area limitations. It is obvious that the use of mats of whatever material - wood or composite - under the outrigger feet is now much more widespread. There has also been a strong move away from the use of scrap wood

for cribbing under outrigger pads to properly designed and manufactured mats, with an enormous increase in manufacturers producing products as well as investing in new product development, providing users with a fantastic choice and suppliers on both sides of the Atlantic.

But there are still plenty of cases where no form of spreader plate is used. Over the past year this appears to largely have been mobile cranes, particularly boom trucks in North America, where numerous reports of outriggers punching through turf or tarmac continue to come in. In a similar manner in Europe we still see many loader cranes set up without the use of mats or spreader plates, in spite of the fact that they tend to have the smallest built in pads!

As well as far greater choice, modern outrigger mats are lighter, easier to handle, more durable and can often be combined in a modular manner to create much larger mats for larger cranes or aerial work platforms on softer ground. We have also seen an explosion in the number of companies offering ground protection products/temporary roadway with a wide range of different products on offer, from simple easy to use composite mats to high capacity professionally installed temporary roadways, that help take cranes and large platforms over the softest of ground, while eliminating or minimising any damage.

Alternative engineered mats

Larger cranes, big truck mounted lifts and other equipment always requires



DICA FiberMax Crane Pad

c&a

outrigger mats



a solid foundation from which to work. Traditionally this has been an engineered mat, comprising several layers of hardcore and gravel, or heavy timber mats sitting on sand or soft foam, concrete slabs or other materials all of which have to be imported to site and often removed, at substantial cost and environmental impact.

Soil stabilisation option

An alternative form of creating stable ground is soil stabilisation - rotovating cement and additives into the ground which when set increases the ground bearing capacity. This is not new and was first seen on a major contract in the UK during the construction of Stansted Airport in the mid 1980s. However, in today's environmental

age, soil stabilisation seems to tick all the boxes, particularly when compared to other methods such as soil exchange as it requires fewer truck movements, results in shorter construction times, saves resources and reduces CO2 emissions. Typical applications include roadways and trafficked areas for all manner of construction projects from highways to airports.

The process begins with cement being spread on the surface then water, then a soil stabiliser machine such as the Wirtgen WR which uses its rotor to mix the existing ground material with the pre-spread cement. Water is simultaneously injected into the mixing chamber and the resulting homogeneous base course material is graded and then compressed with



compaction equipment. It is used on unstable soils to depths of up to 560mm, binding the soil into a high sub surface with high compressive and shear strength values as well as long term water and frost resistance.

Mammoet's Enviro-Mat

Heavy lifting and transport specialist Mammoet has introduced its own branded variation on soil stabilisation in the form of 'Enviro-Mat'. By using a soil stabilising machine and mixing cement with its 'Enviro-Mat' additive and the soil on site it creates a strong and durable surface that can increase the load bearing capacity of unstable soils by up to 50 tonnes per square metre or more. As with the regular soil stabilisation process, Enviro-Mat mixes the native soil with the additive and ordinary cement, saving earth moving and transport costs along with time. The reductions in a project's carbon footprint are said to be substantial. After the project has been completed, the Enviro-Mat that has been created can remain in place, where it will last for many years, or can be crushed and mixed back into the soil with no negative impact on the surrounding environment. Obviously with the need for a specific stabilising machine it is more cost effective for use on larger areas.

Ronald Kleinjan, director of Mammoet Heavy Duty Pavements said: "Ground preparations are always on the critical path of any project, they affect overall project



The new Premium range from Outriggerpads features integrated steel bar handles.



Outriggerpads have also created a shoe pad for Hinowa Lightlift spider lifts

efficiency and cost effectiveness. Therefore, Enviro-Mat improves a project's efficiency right at the start. We are currently applying this new technology on several of our customers' sites around the world."

Increased demand for temporary roadways

The strong growth in demand for temporary roadways has led to many companies that offer this equipment for rent, investing in more equipment to satisfy the growing demand. For example, in the UK and Germany TPA - part of the Vp group - has recently spent £4 million on additional inventory and vehicles to expand its operations in Scotland. Most of it going into heavy duty aluminium panels.

The company has also taken delivery of six new Scania installation vehicles fitted with remotely operated Epsilon Z cranes complete with a new bespoke panel grab system. A further £250,000 has gone into expanding the existing TPA Portable Roadways depot in Lesmahagow with new offices, a refurbished workshop and the concreting of most of the site. It has also added four more similar truck and crane rigs in Germany where it is competing against cheaper steel plates.

High capacity mats

Outriggerpads - the UK outrigger mat supplier - has expanded its range of spreader plates adding three new products to its Premium range of mats designed for the larger capacity crane market. Manufactured from heavy duty UHMW polyethylene, they are significantly lighter than steel mats and yet can still retain their shape under extreme vertical pressure due to the material's 'muscle memory' properties. They are also completely water resistant and do not corrode or splinter.

The two metre by two metre, 100mm thick mat has a 250 tonne load capacity, weighs less than 400kg and features integrated steel bar handles to ease handling. The 1.1 metre by 1.1 metre, 40mm thick mat has a 60 tonne capacity and weighs less than 47kg. The third new product is a circular 1.2 metre x 50mm pad, with a capacity of 65 tonnes which weighs less than 55kg



TPA has invested in more equipment to satisfy strong demand for temporary roadways



Ideal outrigger mats for an RT scissor lift



Round mats are easier to handle



Mammoet's 'Enviro-Mat' creates a strong and durable surface that can increase the load bearing capacity of unstable soils by up to 50 tonnes per square metre

and is said to be easier to handle.

An updated version of its steel bar handle pads will be launched next year, they feature an additional corner bracket making them stackable and enabling crane operators to lift the full set up in one go.

Dedicated spider lift mat

In addition to the general mats, the company has also created a shoe pad for Hinowa Lightlift spider lifts which fits around the circular foot plate of each outrigger leg and remains in situ when the outriggers are raised and stowed, making it easier and quicker to set up. Attaching the pads to the feet in this way also minimises the risk of theft or loss.

Custom mats and pads

An increasing number of outrigger mat suppliers are now offering branded or customised outrigger mats. The most popular choice being branded versions of a standard mat. UK supplier PCM Fluid Power, which largely targets the loader crane market with load handling attachments and hydraulics has recently launched a new service where

buyers can choose mats from a wide range of colours in order to match their branding, and then add the company logo, contact details and even product information directly to the mat.

As part of the programme it is also offering high visibility mats for pedestrianised and safety sensitive areas and Anti Scuff rubber base pads. The company includes a custom design and personalisation service to help buyers incorporate the changes they require. Branded pads are obviously more easily identified should they be misplaced, moved or left behind on site. As part of the company's expansion in this area it is opening a dedicated crane mat/pad store within its new loader crane attachment and component warehouse at its Long Buckby, Northamptonshire base.



The PCM range of pads

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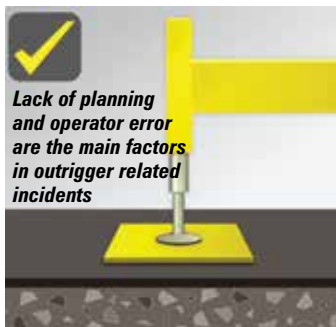
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Reducing incidents

When it comes to outrigger related incidents, good planning is the key as avoiding issues is relatively easy in most cases. When they do occur, it is usually down to one or two factors:

1. Lack of planning

On small more everyday jobs there is often no consideration given in advance to the ground conditions. Only after arriving on site is any thought given to maximum ground bearing pressures, voids or pipes under the ground, even when working in the street. In the face of pressure from the customer to get on with the job, all too often an operator will carry on with the mats he has on board - whether or not they are the correct size. He may of course do a trial lift keeping the load as close to the ground as possible while taking it out to the required radius. However space does not always allow this and in any case a large void can suddenly give way, swallowing up the outrigger or more... even on a test lift.



2. A lazy operator

Over the years we have covered numerous crane and platform overturns where the ground has given way and it is clear from photographs that a perfectly good set of outrigger mats were left stowed on deck rather than used under the outrigger legs as the ground "looked solid enough" or "there was an 80 tonner here last week and it was OK".

Thankfully better work practices and more knowledgeable clients are having a positive impact on reducing such cases, helped of course by the campaigns waged by associations, safety authorities and publications such as C&A.

Outrigger mat size calculators

Outrigger mat/pad calculators are more widely used, with some now available as smart phone apps. The latest is the new spreader plate calculator developed jointly by Outriggerpads and IPAF which aims to help users accurately choose the right pads/mats for each job by accounting for factors such as the maximum allowable ground pressure and the machine load per outrigger. It also helps operators identify where to find the relevant data on the crane or platform itself.

The calculator replaces the IPAF Ready Reckoner and is said to give more accurate results and be more user-friendly. It is available as a web application from the IPAF website www.ipaf.org/en-gb/spreader-pad-calculator and on the Outriggerpads website <http://calculator.outriggerpads.co.uk/>

For the Spreader Pad Calculator to work effectively, you will need to know the maximum load per outrigger and the maximum allowable ground pressure in the same unit of measurement. If you are not sure of the ground pressure, the calculator asks you for the surface materials and you can select the most appropriate type.

The calculator works in four stages

First step is easy, just click the type of machine you are operating - ie with outriggers. The programme does not cater for machines operating free on wheels.

Next, select the unit of measurement you want to work in - for example Load in tonnes/ground pressure in kg per square centimetre, there are six choices. Then you need to know the maximum possible loads inflicted per outrigger for your equipment. If you are unsure, help is given



The new spreader plate calculator can be used on laptops, tablets and smart phones.



or you may have to consult the manufacturer.

You are then asked 'Do you know the ground bearing pressure? After entering the value, the calculator suggests the size of mats - for square and round pads - as well as the thickness. For example if the maximum load per outrigger is five tonnes and the allowable ground pressure is 2kg per square centimetre, then the required surface area is 2,500 square centimetres and mats measuring 500mm square, or 564mm diameter

round and 40mm thick are required.

If you do not know the ground pressure then it asks questions about the ground - is it cohesive or non-cohesive. If non-cohesive is it made up of dense, medium or loose gravel or dense, medium or loose sand. Cohesive asks if it is very stiff, stiff or firm clays, soft clays and silts or mostly rocks. Again the maximum ground pressure is calculated depending which is chosen and the resulting size of pad is displayed.



For the Spreader Pad Calculator to work effectively, you will need to know the maximum load per outrigger and the maximum allowable ground pressure



A crane drops into a car park below in Idaho Falls USA

T.M.C.

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