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# City workers

Lifting in confined city locations often requires more planning, greater care and is certainly easier using equipment specifically designed for the job. Over the past few years there has been an increase in the number and type of 'city' cranes. We take a look at the latest and most popular products that make city lifts not only easier and less costly, but often carry out lifts that are impossible with standard cranes. in formulating the standard.

Taller buildings, narrower streets and more densely populated areas mean that city lifting operations are very often more difficult than in rural or suburban areas. This fact has not gone un-noticed by crane manufacturers, which have introduced equipment such as 'City' All Terrain cranes, mobile self erecting tower cranes, spider cranes and articulated tower cranes in an effort to ease some of the problems encountered when working in increasingly confined city environments.

## Mobile tower cranes

One of the problems encountered in city work is the increased height of the buildings combined with narrow streets which make it difficult for larger cranes to set up far enough away from the building to place the item – even when using a jib. Big ATs that can handle luffing jibs, need additional transport, time and space to rig and de-rig which often needs a road closure causing more traffic and pedestrian disruption. Load bearing issues can also be a major issue.

A perfect alternative is a mobile tower crane. Available from manufacturers such as Spierings and Liebherr, these combine the advantages of a classic tower crane with the mobility of an AT crane. Even the larger capacity mobile towers are particularly compact on the road and generally travel fully equipped and ready to work - they can literally be set up and ready to

go within 15 minutes of arrival with no outside assistance required. With a mast and cab height of



around the 30 metre mark and a jib that can be elevated up to 45 degrees above the horizontal they are ideal for lifting air conditioning units onto the roof of a multi-storey building up to 11 storeys.

*The mobile tower crane such as this Spierings is ideal for working in narrow streets and buildings up to 11 storeys*



They can stand close into the building, the operator has a perfect view of the lift at all times and they

can be in and out within an hour or two. The alternative of a 250 tonne mobile with long boom and luffing jib, could easily take all day and that with a well organised support crew. The resulting cost, time and road congestion makes you wonder why anyone would choose such an alternative? The larger mobile tower cranes can place up to a 5.5 tonne load to a maximum radius of 60 metres at a height of over 30 metres and can therefore cover a large number of jobs.

So when working in the city, the mobile tower wins hands-down - unless, of course, the load is really substantial and has to be placed at a long radius. The mobile tower crane is however arguably more complicated to maintain and more expensive to run than an All Terrain and may not seem as versatile, which is perhaps why some companies are put off adding them to their fleets and why they are not as popular as they should be.

## The City Boy

The Dutch, of all nationalities, truly understand the benefits of mobile tower cranes, whereas in the UK, Germany and most other markets the concept is still very much a niche. Their popularity in the Netherlands has made local producer Spierings, the market leader. Spierings' new 'City Boy' model may help expand the concept. Launched at Bauma last year, the crane is a massive leap forward in mobile tower design, being more compact yet offering a 28.5 metre tower, 53 metre hook height, and seven tonne maximum capacity at 36 metres. The City Boy also uses a new Eco direct electric drive system - which claims to

*Oversailing issues means that compact hydraulic luffers are increasingly popular*



reduce fuel consumption by more than 50 percent - using a compact 400kW main electric motor powered by a lithium ion battery pack. Regenerative braking channels energy back into the batteries extending life and mobile range although this can be supplemented by a small diesel engine which powers a generator further topping up the batteries and powering the auxiliary hydraulics that drive the rear axle for extra grunt in challenging ground conditions. The crane can also use a mains AC power cable.

However its most striking feature is the single cab used for both road travel and lifting operations. During the mast erection process the cab rotates and transforms from a two seat road cab, into a one man crane cab. The prototype City Boy should be demonstrated over the next few months, in spite of financial challenges within the group. The

combination of improved performance in a more compact package, with environmentally friendly credentials may now convince more users to adopt the concept - price permitting.

### City tower cranes

Over-sailing/trespass laws in some countries, such as the UK, mean that luffing jib cranes are essential for most confined city sites. As small infill sites have become more prevalent, the focus on out-of-service dimensions has grown. This has spurred the development of a range of compact city cranes, that are easy to erect and that offer a small out of service radius. The Jost range of compact luffers that use a hydraulic cylinder rather than cables to luff the jib offered contractors a very small out of service radius as well as avoiding the risk of the jib blowing back over the rear.

However, more recently the old

concept (first launched in 1961) of the articulated or folding jib crane has been resurrected by Swedish company Artic Crane. Working with London-based crane company City Lifting, the 84 tonne/metre Raptor 84 has an out of service radius of just four metres. The first two cranes are already working in London with a third due shortly.

For city work, the small out-of-service radius is not its only advantage. The design also allows loads to be lifted very close to the tower - a real positive if the only location for the crane is within the building's footprint. However, with such a small out-of-service radius and a two tonne capacity at a 32 metre radius, it is often possible to find a position outside of the building but still within the site. While these cranes naturally appeal to countries where over-sailing is an issue, they are also handy when working alongside railways or roads where slewing over traffic with a load may not be permitted. Even if it is allowed, it is always better to avoid such practices if possible.

### Spider cranes

If the user definition of a city crane is one that can access and work in restricted areas then the ultimate city lifter has to be the spider crane. The world market is dominated by two Japanese manufacturers - Maeda and Unic - which have obviously gained a lot of experience developing cranes specifically for the congested cities of their home market. The cranes are compact enough to work from the pavement, from inside the building, from a roof top or other elevated locations, where disruption can be entirely eliminated.

The spiders initially gained popularity in Europe installing glazing on multi-storey buildings but are now the first choice for any lifting application with limited access or to replace manual handling with jobs such as internal steelwork or escalator installation/replacement. It is also true that a little lateral thinking is also needed to maximise the spider's potential.

There are numerous cases of spider cranes eliminating huge traffic



*Two spider cranes solve a lifting problem at Addenbrookes Hospital, Cambridge*



*Compact spider cranes can access areas other cranes cannot reach*

disruption and reducing costs by being able to track through a building to lift a load negating the need for a big crane to reach over the building.

One such job at Addenbrookes Hospital in Cambridge required a lift in an enclosed courtyard. The contractors' solution was a fully rigged 500 tonne mobile complete with road closure and major disruption, just to lift a couple of tonnes. JT Cranes' solution was to supply two spider cranes - a Unic 506 and 706 - which accessed the inner courtyard through a tunnel, the 706 then lifted the smaller crane onto a roof to carry out the lift.

Although not as compact as a spider when travelling, the mini crawler crane offers a useful alternative particularly as its lack of stabilisers results in a smaller working footprint. Its pick and carry facility is also a worthwhile benefit.

The growing awareness of small cranes has also given a boost to the small pick & carry cranes which are enjoying a revival, particularly in the



*Spierings City Boy*

UK Hire Network



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A two tonne capacity Jekko MPK20W pick and carry crane in a busy London street

2-3 tonne capacity sector. And whilst this type of crane is traditionally employed in industrial applications, contractors working in the congested city sites are becoming aware of their capabilities for solving tricky lifting problems.

### Mobile City cranes

The word City crane conjures up different concepts for different companies. For a tower crane specialist it may be a small flat top, for mobile crane operators though it is a single cab All Terrain - a cross between an AT and a Rough Terrain. The concept has been around for more than 20 years - 35 years if you count the PPM14:07 - starting in Japan where congestion is of course a very serious issue. It was taken up by Swiss company Compact Truck in 1992 with Demag - now Terex - following soon after. Under Terex ownership the Demag range of City cranes blossomed with two, three and four axle models.

But interest in the sector appears to have 'flagged' in recent years. That is until the past 18 months, Grove unveiled its first ever City All Terrain crane - the GCK3045 - at Intermat in 2009. City cranes are notoriously difficult to build and in a wise move, Grove opted for a joint venture with Japanese manufacturer Kobelco, a past master of manufacturing the small City crane and the originator

of the concept launching the seven tonne RK70 in 1989 which is still a much loved crane.

The GCK 3045 is a compact, single cab, nose-down, three-axle crane with 45 tonne capacity at 2.5 metres. Main boom is 34 metres and has an optional 6.3 to 10.2 metre 'twist' jib which attaches through a simple elevation of the boom and then a twist of the jib by the operator before pinning into position. The entire operation is said to be a one-man job and can be done within the crane's 2.55 metre overall width, meaning full boom and jib can be rigged in a narrow street or aisle. The hook block stows automatically for travel.

The GCK 3045 is just over nine metres long, three metres high and 2.55 metres wide. To facilitate working in narrow locations, the crane also has a choice of five outrigger widths and the ability to set up with asymmetrical outrigger settings.

Liebherr a company with a 'nose' for when the time is right for a new crane idea, launched a 45 tonne at three metres City crane - the LTC 1045-3.1 - at Bauma last year. In the month or two following the show, Liebherr said that it has taken orders for 70 of the compact cranes - with deliveries set to start around now. The most innovative feature on the Liebherr is its telescopic arm

Grove renewed interest in the City AT unveiling its GCK3045-2 inn 2009



A Valla crane used to install cladding panels



The Locatelli ATC20 is the most compact city type AT crane currently available in Europe

mounted cab. In transport mode the cab is 'pushed' to the front of the chassis which helps in driving the crane, particularly at higher speeds. When working, the cab is retracted to a traditional superstructure position, with its better visibility. The crane can also be ordered with an elevation cylinder for the cabs telescopic arm to provide up to 7.8 metres of elevation, giving operators a much improved view of the site and load. Unlike Liebherr's

first attempt at a City type AT, the LTC1045-3.1 uses a traditional drivetrain, rather than Hydrostatic. Until the arrival of the Grove and Liebherr cranes, Terex Demag with its 30 and 40 tonne City cranes virtually had the European City crane market to itself and it still boasts the most experience in the market. You can be certain that if the City crane takes off as the crane market picks up Terex will be ready to respond.



Latest City AT is Liebherr's 45 tonne LTM1045 seen here at its launch at Bauma



A few UK crane companies have bought 13 tonne Kato KRM 13H



A Terex AC 40 City working in New York

### The Italian option

Italian-based Locatelli has also dabbled in this market for several years. Its ATC20 is the only European crane that captures the spirit of the small Japanese city cranes of the 1990s, such as the Kobelco RK160, Kato MR100 and CR250 or Tadano Crevo models.

At less than two metres wide, just over three metres high and six metres long it is exceptionally compact. Yet it boasts a 26 metre tip height on its main boom which extends to 34 metres with offsetable jib. Boom nose mounted forks and an aerial work platform are also available, taking it into the territory of the 360 degree telehandler, which some would argue has taken over a part of this market, although not among 'true crane men' who do not seem to appreciate their capabilities.

Locatelli also showed a three axle 40 tonne city crane, the ATC40 at Bauma in 2007 but has been slow to commercialise it.

### Yearning for Japanese minis

Although not available in Europe for around 10 years or so, many crane rental companies still hanker after the Japanese cranes. A few UK crane companies, such as Lee Lifting and John Sutch Cranes have imported 13 tonne Kato KRM13H City cranes as six month old 'used' models. Liverpool-based Sutch is very pleased with the crane which thanks to its 30 metre boom and luffing fly jib achieves a good rental rate and is very much in demand.

# London robot invasion

The UK's specialist equipment rental company Hewden supplied a 100 tonne AT crane to give an army of giant Audi robots a helping hand in their invasion of London's Trafalgar Square.

Usually hard at work welding and gluing car bodies on an Audi production line, the eight automotive robots were positioned on a plinth 5.5 metres in the air alongside the Square's iconic lions and Nelson's column. The whole project was part of OUTRACE, London Design Festival 2010's spectacular Trafalgar Square installation created by designers Clemens Weisshaar and Reed Kram and enabled by Audi AG.

Once installed the general public - both visitors to the Square as well as on-line audiences - were allowed to take control of the industrial robots and interact with the installation.

Once logged in, users could create a short message, which the robots would then reproduce via three-dimensional LED light traces in the air. Each unique light trace was simultaneously recorded and uploaded to the website through a system of high definition cameras.

Production design company Event Concept tasked Hewden with providing a full contract lift service, including crane operator. Trafalgar Square's location in the heart of one of the world's busiest cities, provided Hewden with a testing challenge to safely and efficiently lift the eight robots and associated power equipment and services within the confines of the Square.

Meticulous planning was required to ensure all eight robot lifts were successful, with the Hewden operational team

Hewden helps position the Audi robots in Trafalgar Square



carrying out a full risk assessment beforehand. Working through the night to minimise any disruption, the Hewden team completed all lifts within their designated six-hour time period.

Alan Brown, crane supervisor for Hewden said: "It's not everyday that we are called upon to help eight robots take centre stage in Trafalgar Square! This project, in the heart of the capital, required skill and precision in a short time period to keep disruption to an absolute minimum. The lifts were a great success, with everything in place by 3am so there was no disruption to the morning rush hour."

## Off to the Tower....

**At the end of last year Ainscough Crane was on-site at the Tower of London, on the banks of the River Thames. The crane rental company was providing a range of lifting services supporting the installation of the annual winter ice rink attraction positioned in the dry-moat beneath the Tower.**

Three cranes were used - a 25 tonne Kato City, a 250 tonne Liebherr LTM 1250-1 and 100 tonne Liebherr LTM 1100/2 - to lift elements of the arena structure, along with pedestrian access, a 'pop-up' building and visitor facilities.

The project was conducted on a contract lift basis planned and supervised by Ainscough.

One of the most complex elements was the lifting of three chillers, each weighing five tonnes, ready to freeze the ice.

"The project was meticulously planned to ensure public safety, whilst this impressive seasonal attraction was built," said Steve Scott, Ainscough's contract lift manager. "The three mobile cranes used gave us the required positioning for the lifts, and we enforced load-distribution measures

to ensure we did not exceed the 25 tonne limits on the upper level cobbled stone pedestrian area."

Three cranes were used in lifting various elements supporting the ice rink attraction in the dry moat beneath the Tower

