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# Are selferectors on the up?

The lack of interest and sales in the UK and Ireland for self-erecting tower cranes (SETC) is one of the modern lifting mysteries. Go anywhere else in Europe and the countryside will be littered with them, involved in projects from single and small housing developments to blocks of flats and even road bridge construction. So why the dearth of self-erectors in the UK and Ireland and to a similar extent North America?

One possible reason is a welldeveloped rental industry in the UK which has changed the mentality of equipment ownership putting off many end users from investing in their own equipment.

Why buy an expensive crane to build a house when it might be sitting idle for 20 weeks of the year? Another is that historically the UK and USA have never really embraced the small tower crane concept. On smaller and low rise construction sites builders have traditionally rented in mobile cranes to lift any items that they could not be manhandled. In more recently times - over the past 25 years or so - the telescopic handler taken over the lighter lifting duties, such as moving and lifting materials so that cranes are only rented for the bigger or higher lifts. The same applies to North America although telehandlers there are taking over from the 'bare lease' rental of small Rough Terrain cranes that contractors tend to keep on site for lifting duties. Only France confounds the either/or theory by using a large number of self-erecting tower cranes and a large number of telehandlers.

Who in their right mind would buy a self-erector? Well unless you are a contractor with a stream of small developments of one or two houses or a small block of apartments you wouldn't. However even for a one off development you should seriously consider renting one.

While contractors in most parts of the developed world tend to be very 'conservative' (or should that be slow) to adopt new methods of construction, the telehandler was relatively quickly accepted in those countries where it is now strong driven primarily by the palletisation of building materials delivered to site. While loader cranes can unload such loads freeing the truck up to move onto its next job, the challenge is moving the material to where it is needed or to a storage area. A small tower crane is ideal for this, at least on smaller sites, however many would argue that the telehandler is more versatile, and versatility is something that short term rental companies love. Specialist equipment is far too restrictive.

Over the past two decades the telehandler has developed into





the 'do everything site machine' with manufacturers offering increasingly higher lift heights, a vast array of attachments and 360 degree rotation which allows larger models to double up as a small crane as well as a material handler.

### Telehandler v SETC?

The telehandler is now the most popular item of construction equipment - in those countries where it has been adopted - and as demand has increased the rental industry has invested heavily in them, with tens of thousands of them are available to rent, in the UK, Ireland and USA and possibly France where they are the second most popular rental item after aerial lifts. Because of the large population and the rental industry's cut-throat nature, the smaller sizes are available at very competitive rates. However looking at the UK, the larger fixed frame models up to 18 metres have weekly rental rates of between £325 and £450 with 360 degree machines fetching around £600 per week and the 25 metre plus telehandlers between £1,200 and £1,500 a week (Cranes & Access 2012 rental rate guide). Compare this to a cost of between £400 and £750 for a self-erector.

But is the telehandler the best machine for the job? Over the past few years there has been and clamp-down on site safety in the UK and in particular movements of equipment around the site. Engine emissions are also a growing problem with equipment on many sites in cities now requiring the additional cost of DPF (diesel particulate filters) or additives to reduce pollution on older, less compliant engines. Rising fuel costs is another significant factor for mobile equipment as well as tyres and puncture repairs, noise and keeping the public road free from mud etc. The list goes on and on... ... None of these factors however affect the self-erecting tower crane.

With sites becoming ever more compact and confined some are becoming too small for anything but the most compact telehandler to operate. And even if you persist in using a telehandler you will probably need to rent in a mobile crane to help with lifting in some larger or more bulky items or to place the top panels in timber frame construction. One mobile crane lift may well pay for one week's rental of your self-erector.

### tower cranes



Potain Igo 85A



### On the up.....

Perhaps UK and to a lesser extent US contractors are finally realising that there is a cost-effective alternative – one which continental Europe has been using widely fo almost 50 years – and this may be the reason behind the increasing demand over the past 12 months.

Estimates vary but the total UK and Ireland self-erector fleet may be as small as 175 and 200 units, down from a peak of 300. Up to a year ago there were three main players in the rental market – Mantis Cranes, Ladybird Cranes and Belgian-owned Arcomet. However with Arcomet deciding to pull out of the UK - both as the Potain dealer for new cranes as well as its rental fleet – it leaves just two major players with around 150 cranes between them. Although Arcomet had a fleet of around 40 in the 2011 (Cranes & Access Top 30 rental company report) it is thought it had just 20 to 25 units left when it finally decided to exit the market.

Doing the simple maths, a reduced number of cranes usually means more work for the remaining rental companies. However Mantis Cranes chief executive Seamus McMenamin thinks there may be another reason.

"The UK construction industry is quite reserved in its attitude to new methods, but it always looks at reducing costs. With the downturn in the economy, we are now finding major contractors – companies familiar with using tower cranes on the larger contracts – chasing smaller jobs but still with the mentality of using a crane."

Unfortunately the decision to use a tower crane or not is usually made by the contract quantity surveyor and this will inevitably come down to which is cheapest on paper. And because it is often purely calculated on the number of week's rental rate, the telehandler usually comes out on top.

"A self-erector immediately overcomes potential safety issues with equipment moving constantly around the site as well as emissions, noise and fuel costs," says McMenamin. "It also only requires a very small site footprint, needs no reinstatement and keeps the majority of the site clear for drainage and earthworks to be completed perhaps saving a few weeks on the overall contract time.





When you look at a tower crane you have to see the benefits to the whole contract and not just the number of lifts. It is getting these facts over to the decision makers at the design stage or before the contract starts that is very difficult and probably the main reason they are not more popular in the UK."

"Ireland was more of an end user market with the owner of the company often on the site and he could see the benefits of using a crane throughout the whole contract," adds Robert Rowlette of Mantis Cranes. "Rental rates are currently low all over the UK and would not sustain investment in new equipment. In Ireland there is now a cautious air of optimism and this year there has been a few structural steel projects where the self-erecting cranes have been used. It has been slim pickings over the past five years and recovery is going to be very slow but we are hopeful."

### **Undercutting rental rates**

Despite the overall reduction in fleet numbers and seemingly increased utilisation, some rental companies still drastically undercut each other on rental rates. We have heard of numerous instances of say one company quoting £700 per week only to be undercut at £500, which many would say is unviable.

Market rental rates vary with size not type of crane - within guite a tight range. The smallest selferectors go for about £400 per week and the largest around £700 to £750, a relatively small spread considering the range of products which may have maximum reach differential that runs from 16 to 50 metres. And although there are only a small proportion of cranes outside of the Mantis and Ladybird fleets, there is robust regional pricing with smaller rental companies making sure they remain in the 'driving seat' locally. Some of these cranes tend to be much older and have been purchased second or third hand.

According to Robert Bird of Ladybird there has to be a minimum price for any self-erector of about £400 to £500 a week, just to cover the regular maintenance, rope and pulley replacement and occasional breakdowns.

"If an invertor needs replacing it can cost £3,000 which can account for six weeks of hire," he says. "The rental rate has to cover the normal maintenance and replacements."

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## tower cranes





The sector is not alone in having low rental rates restricting investment in new equipment. Take the example of a rental company which bought a self-erecting crane with a 40 metre jib tip for close to £70,000 about seven years ago. The weekly rental rate at the top end may be £700 but to buy the crane new now would set you back around £100,000 yet the rental rate has not improved at all. Not the sort of return that would entice companies to enter the sector. For good or bad, self-erectors do last a long time and developments are small, so many rental companies are not under pressure to replace older equipment. A new set of sheaves and hoist rope and a crane can be like new.

Rental rates in the much more mature continental European market are about two percent per month, but companies aim to make money on the residual values of the equipment. At the moment this is true with certain makes of crane -Liebherr and Potain for example which are globally tradable - other manufacturers even where the quality is good or even better, do not have the brand name recognition and therefore attract lower prices.

### Where are SETCs used?

Most self-erectors are used on large houses, care homes, timber framed construction and smaller apartment blocks, many on 10 to 20 week contracts. General guidance suggests that a self-erecting tower crane should be used when lifting up to about 100 tonne metres and hook heights of around 21 metres any bigger than that and a top slewing tower crane should be used or rather a crane with an elevated operators cab. There are a number of larger self-erectors on the market such as Potain's largest model - the Igo T130 - which has a maximum extended tower height of 36.2 metres and an eight tonne capacity at 18.6 metres, but this type of self-erector does have an elevated operators cab.

### Advantages?

Accepting all the advantages of a self-erector over a telehandler as a given, one of the main advantages when compared to a city or traditional tower crane is that it is generally much quicker and cheaper to install. On average to install and remove a self-erector costs about £2,000 each operation compared with about £6,000 for a tower, although this can vary significantly depending on the ground etc... That £8,000 difference in the fixed costs is significant over a short contract. Taking a weekly rental of £500 per week means the self-erector can be installed and working 16 weeks for the fixed costs of a crane that needs a specific base. For something with a little more mast height, yet still being pedestrian operated you have the city crane. These may be slightly less expensive to rent however they usually cost more for installation and removal.

One type of self-erector that may be worth seeking out is one powered by single phase AC/mains electricity. Cranes that require a three phase generator obviously



need re-fuelling which is getting more and more expensive, whereas a single phase powered crane costs a fraction to run. Unfortunately there are very few of these cranes available for rent in the UK and they tend to be popular. Ladybird Crane Hire has several Potain Igo 21s which can be powered by 220 volt single phase electricity.

Like many 'new-fangled' ideas the uptake of the self-erecting tower crane in Anglo Saxon markets has been severely restricted by the

Mantis 35.10

construction industry's blinkered attitude, not helped by a crane rental sector that is simply not geared up to run this type of crane and which prefers its road going mobiles.

However rising costs, environmental and safety issues may well force contractors to look at this method of construction – and they may be pleasantly surprised. They will then need to pressurise their rental supplier to invest, or like many continental European builders, buy their own.







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## Ladybird Crane



There aren't many crane companies that also own and run a micro brewery - Bromsgrove, UK based Ladybird Cranes does though. The company is behind Bird ales which began brewing in 2009 and is increasingly seen around the West Midlands and which uses part of its head office building.

Since purchasing the Potain UK rental fleet in 2003, Ladybird Crane Hire has built up a fleet which now totals around 70 Potain Self-erectors - the largest Potain fleet in the UK. The company was also appointed as the UK Potain self-erecting crane distributor about a year ago.

"The UK market for self-erecting cranes has been resilient in recent years, despite lower levels of construction activity," says managing director Robert Bird. "Contractors are focusing on costs and operation and self-erecting cranes are a cost-effective single source for material handling. Compared with other European markets the UK is still relatively small. The more customers use self-erecting cranes though, the more they are coming back, which is positive news for the industry."

Ladybird Crane Hire has taken delivery of two Potain Igo 50 self-erecting cranes and has another on order. They are among a handful of new cranes from any manufacturer to arrive in the UK in the last five years.





### tower cranes

"As a result of the recession, companies have focused on their core businesses and for some this has seen the disposal of poorly utilised cranes," he says. "This has reduced the number of self-erecting cranes available in the country and brought some balance back to the market. In addition to this we are seeing an increase in demand with developments taking shape around the country – many of which are small scale residential sites that are perfect candidates for selferecting cranes."

"The recession also meant that the sale of new self-erecting cranes were few and far between so many of the cranes in the market are at least five years old now. Whilst good quality, well maintained cranes have a service life of more than 20 years, some larger companies limit the age of equipment used on their projects to 10 years so fleet owners are starting to look at upgrading their cranes."

"We expect to see an influx of new equipment in the coming years as rental companies look to modernise and expand their fleets in line with rising demand for the latest



equipment – and for some of us that expansion starts now."

Ladybird's two Igo 50 cranes which arrived in February are currently working on their first projects – one is working at a high-end home build in Purley, while the other is helping to build a small apartment block in Kidderminster. A third has just arrived. The Igo 50 is the largest in Potain's Igo range with a four tonne capacity and a 40 metre jib with 1.1 tonnes maximum lift at the tip and 23 metres under hook height.

## **Mantis Cranes**

Mantis Cranes is a specialist crane rental company offering self-erecting and City type tower cranes throughout Great Britain.

What may be a surprise to many is that Durham-based Mantis Cranes is an UK registered company and while it gets support from Ireland it is entirely self-reliant. As well as its Durham facility it has another depot in Wellingborough and has a partnership with Cornwall-based CJ Trading adding to its national coverage. It has a range of cranes from 23 to 45 metres.

"At the top end of the range we have a number of units of the Potain HDT80 a 'great workhorse' of a machine with a maximum lift of



6,000kg and capable of lifting 1,250kg at 45 metres with a height under the hook of up to 34.2 metres," says chief executive Seamus McMenamin.

At the other end of the size range it has the Mantis TC25, a crane which the company has designed and manufactured since 2006. The company was set up in 1999 is the only manufacturer of self-erecting cranes outside of mainland Europe with manufacturing facilities in Killygordon, Ireland. The TC25 is a self-erecting trailer crane and features ease of mobility, siting and erection. It is a self-contained unit built on a road-going chassis and the crane has fixed ballast so that one articulated tractor unit can move the 20 tonne rig to site in a single vehicle journey.

The TC25 has a maximum capacity of 2,000kg and can take a 750kg load to 25 metres at a hook height of 19 metres. Mounted on high speed axles for road use at 80km an hour, it can be operational within 30 minutes having hydraulic outriggers for self-levelling. It is self-contained with its own on-board generator and has dual hitch with either fifth wheel coupling for road use or towing eyes for on-site movement. According to Mantis the crane is proving very popular in its hire fleet particularly with the timber and light steel frame sectors. Other cranes in the fleet have jib lengths of 32, 35 and 40 metres.

Mantis is also starting a new business (Mantis Access) covering the truck mounted aerial lift market and is looking to become a distributor/dealer for a major manufacturer and will hopefully be launching this new venture at Vertikal Days at the end of June.

### A Mantis 35.10





## tower cranes

# Phnom Bakheng temple restoration

Phnom Bakheng is one oldest and most threatened monuments of Angkor, Cambodia. Dating back to the late ninth century the hill-top temple is known more for its panoramic view of the much larger Angkor Wat temple situated about 1.5km away. However over the centuries Phnom Bakheng has suffered the ravages of nature and war but is now being damaged by tourism with over 1,000 visitors climbing over its fragile structure every year.

The stepped pyramid structure has 60 sandstone towers rising from the corners of five terraces and was built by King Yasovarman as the centrepiece of his new capital, Yasodharapura, now part of the Angkor Archaeological Park in north western Cambodia and the home of other magnificent temples of the Khmer empire.

The temple has serious structural issues, with shifting of the stones allowing undergrowth and water ingress to erode the structure. Restoration work by the World Monuments Fund (WMF) began in 2004 when urgent stabilisation work to the temple's collapsed south west corner was carried out.



To help with the current restoration, the WMF decided to use a compact and easily transportable selferecting tower crane for lifting and placing materials.

"Taking into consideration the position of the temple, we decided that a self-erecting tower crane was the answer," says Ben Haley, WMF communications manager. "We opted to invest in a Terex CBR 24 Plus which can be erected quickly and easily and allows us to lift the stone blocks and other materials up to a maximum of two tonnes and up to its maximum radius of 24 metres."

Work was to start at the North East corner of the temple however because of the uneven ground and the presence of a collapsed brick shrine, a substantial raised reinforced concrete platform was constructed to form a solid base for the crane and a bridge over the shrine. The platform was supported by steel beams sitting on concrete pads and had to be strong enough to carry the total 9.3 tonne weight of the crane which includes 8.46 tonnes (nine x 940kg concrete ballast blocks) of counterweight. Once the platform was completed, the CBR 24 Plus was transported up the hill to the temple along a very steep, narrow path that had been



The temple has suffered the ravages of nature and war but is now being damaged by thousands of tourists



widened by a locally rented dozer. The crane was then winched into position with the aid of a temporary ramp using sand bags. Once on the platform the crane was erected with the help of a Terex technician and began with the restoration of the lower terrace on the northern half of the East elevation. This involved dismantling some of the structure together with an archaeological dig. Some emergency stabilisation and protection of the surrounding brick structures were also completed.

Any stones had to be numbered before being moved to safe storage areas. The work area was determined by the reach of the crane, space required for storage and the size of the conservation workshop.



# America's Cup racing yachts

The oldest trophy in international sport - the America's Cup - was first contested in 1851. Today, the America's Cup World Series (ACWS) is an enormous global venture that includes 11, AC45 wingsail catamarans involved in races where speeds approach 30 knots (35mph). A Liebherr 81 K fast-erecting tower crane is helping take the boats in and out of the water every day.

The series travels from venue to venue on a 160 metre cargo ship that carries 1,500 tonnes of gear, including the boats, equipment and 110 containers that transform into a full-scale village directly on the pier for boat repair, maintenance, operations, storage and hospitality. Setup and teardown takes approximately a week.

Once the ship arrives at its destination, the Liebherr 81 K is quickly set up alongside the pier by Graham Goff, the wing and platform logistics manager. The crane remains in place for the duration of the event and is used to raise and hold each sail during installation.

The crane then lifts each boat in or out of the water - each lift taking about 20 minutes.

"It only takes about two hours to set up or dismantle the crane and I can do it myself in most cases," says Goff. "When the boats are practicing and racing, we use the 81 K every day to get them into and out of the water. We couldn't keep on schedule without it."

Goff has even designed a special lifting system so

he can release the hook from the sail after placing the boat without climbing up the mast. He first saw the Liebherr crane when he was in New Zealand looking into renting a crane to lift the boats. The high cost of renting

a mobile crane compared to a Liebherr 71K was a good incentive to try it out. After using the 71K for a month, Goff purchased the 81K as the series permanent crane.

"I love how smooth the



machine operates with the frequency drive, especially when setting the AC45 sails onto the body and lifting the boats," says Goff. "No matter what I'm doing, I know that the crane will be accurate even at full speed."

The graphic display on the controller features a simple menu guide and shows important operational data in one view. In addition, the electronic monitoring system provides information on loads, driving modes and other operational functions. The fine positioning mode - Micromove - reduces hoist speed to 25 percent, so that loads can be precisely positioned without the hoist gear brake being applied.

"I haven't used the older technology contactor control since we started using the frequency drive," says Goff who has crane operator certifications in several countries. "The controls on the 81 K simply improve my ability to do my job."

The 81 K also features a cab for optimum visibility, and the Americas Cup wanted a machine that could operate anywhere in the world using local power, whatever the voltage or frequency, which the 81 K does from a connection point on the lower frame.

"We have travelled all over the world with the 81 K," says Goff. "In the 2011-2012 Series, we started in Newport, Rhode Island and then San Diego and San Francisco, California. The crane travels well by boat, road and rail. As someone involved in logistics, the efficiency we gain by using the 81 K to get the boats in and out of the water is invaluable."



