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Slowly but surely...

It would seem the benefits and cost savings of the mastclimber are still lost on many contractors but the message may just be starting to hit home - at least in certain markets. Traditional access equipment such as façade scaffolding or swing-stage suspended platforms are still widely used even when a mastclimber could transform productivity, convenience and safety. This lack of take-up is surely related to awareness or product availability? But this is starting to change.

Matclimbers and hoists at work in London

For many contractors traditional tube and fitting or system scaffolding has been the solution for most external access problems, particularly façade work, even with its inherent drawbacks and costs. And as we know from many other niche equipment trying to break into a sector, contractors and the construction industry are slow to change - even when many advantages are to be had.

There are however an increasing number of countries that have seen the mastclimber light including parts of Europe - such as the Netherlands, Scandinavia and perhaps surprisingly Eastern Europe - as well as North America and Australasia have substantial mastclimber 'fleets' and the knowledge and commitment to make the most of them.

In Europe's largest powered access market, the UK, the mastclimber sector is continuing to grow, in spite of the fact that there are only a handful of suppliers. Companies such as London-based Brogan Group - one of only a few in the country offering an all-encompassing specialist access solution - is becoming one of the major players with its mastclimber and hoist division recording its highest revenues ever last year. (See page 40)

Mastclimbers are popular in North America

However, the decision on whether to use façade scaffold, hoists or mastclimbers is never an easy or straightforward one and often ends up as a combination of two or three depending on the length and height of the building, contract time and schedule of work. And as the demolition of a concrete tower in Sydney, Australia on page 42 demonstrates, mastclimbers can be adapted to go around all manner of corners as well as curved or circular structures, making them highly adaptable to a multitude of uses.

When to use a mastclimber?

Perhaps the main problem in deciding when to use a mastclimber rather than traditional scaffolding is that there are no absolute rules. Some companies say that mastclimbers should be used on contracts above 20 metres high, while others claim that tube and fitting cost is effective up to 45 metres high. Planning and costing the many different access methods means more pre-contract work which many cannot be bothered with - not for the access equipment! Obviously the higher the project the more the advantage swings towards mastclimbers.

Erecting a HEK MC 450

A circular demolition platform in Sydney

"Above 20 metres or under 20 weeks is ideal territory for mastclimbers"

Construction time may also be crucial. If the contract is more than 20 weeks then traditional scaffolding will begin to have a cost advantage - depending on the type of construction and the scheduling of the work. Higher scaffolds always need a hoist and operator to move people and materials to the various levels and this also needs to be factored into the costings, as well as a method of distributing the materials once delivered to the correct floor.

The aesthetics of the building can also be critical, particularly during the refurbishment of residential tower blocks or historic landmarks. It may be far more preferable to use the more discrete mastclimber than looking at a scaffold-clad building for weeks or months. When not in use the mastclimber platform is often parked out of sight at its lowest position and the slim masts are often difficult to see against the building's elevations.

As well as the usual features of always being at the correct level for the various trades, it should be remembered that mastclimbers also have a reduced number of anchor points so need much less repair work to the façade when the masts are removed. Where space on the ground around the building is limited, the mastclimber can also

The mastclimber is always at the correct level for the various trades

be positioned higher up the face of the building using a cantilevered gallows bracket. And finally leaving the mastclimber in the lower position overnight provides more security than if the building was cloaked in scaffold.

Market challenges

For all the positives, there are of course some negatives. The mastclimber is not your usual item of rental equipment in that the work has to be planned, and the installation needs an approved design and be supplied, erected and dismantled by trained operatives. With depressed rental rates - in many cases due to the plethora of cut price scaffolders - many mastclimber rental companies suffer from insufficient funds to reinvest in enough new equipment, skilled people and training. Like the construction industry in general it needs the infusion of young blood but it is difficult to recruit the best when less demanding careers are readily available.

Brogan on the up and up

London-based Brogan has become one of the major players in the UK mastclimber and hoist sector, recording its highest revenues ever last year. Traditionally known as a scaffold contractor, it erected more than 400 mastclimbers and 200 hoists across the UK last year and claims to be one of only a handful of companies which can offer an all-encompassing specialist access solution.

During 2016 the company provided combined access solutions on a number of prestigious and high profile projects in the capital such as Battersea Power Station (Phase 1) and The Southbank Centre. It recently started work on The Scalpel, a very distinctive £198 million commercial tower block project located on Lime Street in the City of London. This project joins Brogan's growing list of iconic City structures that it has worked on, having previously provided access for the recently completed Walkie Talkie building at 20 Fenchurch Street. When completed the 37 storey Scalpel office tower will stand 192.1 metres high with retail shops at street-level, a basement restaurant on the Leadenhall Street frontage and a café at the Lime Street entrance.

Brogan is supplying main contractor Skanska Construction with a total of five passenger and goods hoists. This includes two, twin hoists servicing 40 landings and standing at 160 metres in height, as well as an additional single hoist. The machinery maximises efficiency for the scope of works and because of the substantial 2,800kg payload needed, was purchased specifically for the project. The twin hoists are some of the largest passenger and goods hoists in the City and can cope with the fit-out on all floors.

Hoist erection at Sovereign Court London

Hoola Towers London

Varoius Brogan projects in London.

The two hoists vary in capacity and have different sized cages. One of the twin hoists measures 5.3 metres long by 1.5 metres wide for one cage and 5.3 metres long by two metres wide on the other. Its maximum lift capacity is 2.4 tonnes. The other twin hoist has smaller cages measuring 4.6 by two metres and 4.6 metres by 1.5 metres, but has a higher 2,800kg maximum lifting capacity. This variation in size and capacity offers versatility and increased efficiency. In addition, both twins travel at a maximum speed of 70 metres a minute, a key feature on a tower of this height. Each hoist has also been fitted with a specialist call system which provides details of wind speed and also alerts drivers which floors need servicing. Hoist operators are also able to communicate with each other which improves efficiency by reducing the number of journeys.

Ian Perry the Skanska project director for the site said: "We are really pleased with Brogan's performance so far as well as the great, new equipment and good service delivery. Successful hoisting is key to any project, but particularly for a high rise construction like this."

The Colossus

The purchase of the large hoists was part of a £2.4 million investment by Brogan in its hoist and mastclimber division last year. Its combined mastclimber and hoist fleet now numbers more than 375 machines, all of which are less than 10 years old. The investment also included the addition of the UK's only mammoth hoist, aptly named by the company as 'Colossus'. The purchase followed the company's regular prospecting trip to Bauma last April.

'Colossus' is a twin mast hoist with a 4,000kg capacity and an internal car measuring three by five metres. Capable of lifting to a height of 350 metres, the unit can accommodate buildings over 100 storeys high and will be used to transport both passengers (up to 45 at one time) and materials on large scale construction projects.

"Our clients are building bigger and better so the size and speed of hoists matters more now than ever," says group managing director James Brogan. "They are looking

to achieve results efficiently and effectively by procuring a reliable service and cutting-edge equipment is a number one priority. This acquisition shows our commitment and desire to be the leading hoists supplier in the UK."

Seeing the light

In addition to existing clients, the company has supplied a record number of mastclimber and/or hoists to new clients over the last 12 months. The company says this is down to various factors including an increase in the popularity of mastclimbers among main contractors and specialist trades alike. Many are now seeing the clear benefits in the results on site - shorter erection/dismantle times, less intrusive dimensions, improved safety and the ability to work at the absolute optimum level.

It says that high demand for hoists has also put increased pressure on rental company fleets and services, and all too often clients are supplied with unreliable and ageing machines. There is also greater demand for larger hoists with only a few companies re-investing and purchasing units in this sector.

Brogan has won the access package - scaffolding and mastclimbers - for the Grade II listed landmark 16 storey building Great Arthur House in the Barbican, London constructed in 1956

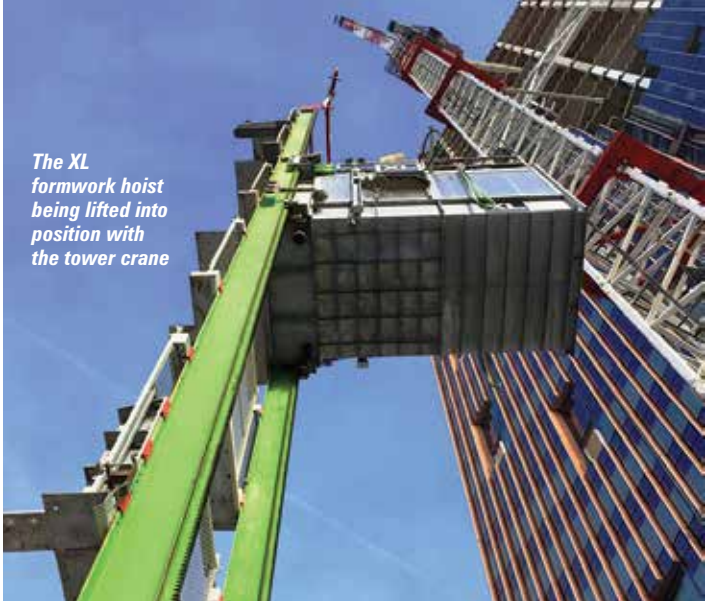
Skills shortage a major issue

With the increased workload, Brogan has to address a common issue in the construction industry - the shortage of skilled staff to support the influx of new clients and projects. The company - which has an IPAF accredited training centre - has successfully recruited a number of installation and service engineers which goes hand in hand with its investment in new machines. Lack of skilled labour is now another of the barriers to entry into the mastclimber and hoist sector.

"With fairly limited competition an outsider would think that this is the reason we are well placed to take advantage of the demand for mastclimbers and hoists," says Brogan. "But what few realise is that with the increased demand you need a strong team of support staff, enough storage space for the machines, a fully equipped and efficient workshop to service and maintain returning machines, adequate transport with lifting equipment to deliver and collect from site and of course, continual investment to ensure that your fleet is modern, reliable and offers variety to your client base."

The company's strategy to meet what it sees as a growing and perhaps game-changing demand in the industry for increasingly varied, high quality machines and the skills and capacity to service them is clearly paying dividends as it continues to receive more enquiries and orders for high profile, iconic projects. The company also celebrated a total of two million man-hours/two years without a reportable accident across all of its services, including scaffolding, mastclimbers and hoists - primarily because of the emphasis placed on diligent planning, effective supervision, management and a trained and competent workforce.

Specialist formwork hoist boosts efficiency



The XL formwork hoist being lifted into position with the tower crane

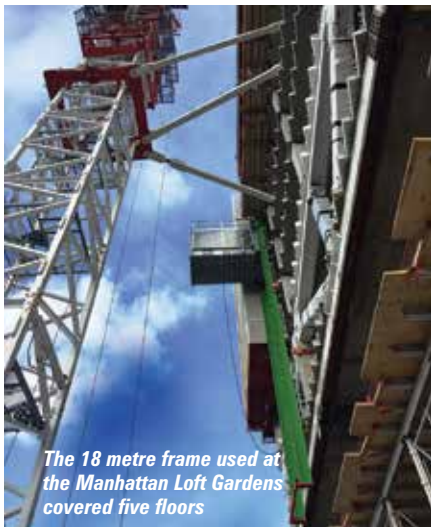
Xavier Lombard formed specialist hoist and mastclimber company XL in 1999 simply naming it with his initials. Based in Paris, France, the company has concentrated on designing access systems to fit specific projects. Its range of systems include construction elevators and material hoists, mastclimbers and custom-made structural formwork.

The company has helped with the construction of many interesting products including providing the suspended formwork hoist used on the Manhattan Loft Gardens project in London last year and the XMH circular work platform used in the top-down demolition of the Barangaroo harbour control tower in Sydney, Australia (see below).

The 42 storey Manhattan Loft Gardens apartment block being built by contractor Bouygues UK involved using XL's formwork hoist to move formwork, men and materials around the upper floors of the building during construction. The system has a height range of up to 24 metres - or eight storeys, freeing up site craneage for other duties. As one floor is completed and work starts on the formwork for the next floor up, the formwork hoist frame is moved up one floor by tower crane. The hoist frame is hooked onto the top slab with support shoes with tie pins which engage into sleeves in the edge of the concrete slab.

The formwork hoist has three frame heights - 12, 18 or 24 metres - with a travel distance of eight, 14 and 20 metres respectively. The 18 metre frame used at the Manhattan Loft Gardens covered five floors of lift and weighed 4,700kg. The 1.7 metre wide and 2.1 metre high hoist cage is available in three lengths - three, 3.5 and four metres - with a maximum capacity of 2,800kg and speeds of 12 or 18 metres a minute. Extended platforms are available measuring 2.6 by 4.2 metres with a 3,000kg capacity and being open can be loaded and unloaded by the tower crane.

The LL suspended system has built-in landing doors and takes less than 30 minutes to move from one floor to another. XL says that savings in construction time of up to 25 percent can be achieved and the system can be used in windy weather when the crane is not in service.



The 18 metre frame used at the Manhattan Loft Gardens covered five floors

Circular demolition platform

There are many large concrete towers in locations where they are surrounded by houses and shops etc where it is unsafe to use explosives to demolish the structure. One solution that is becoming increasingly popular is a work platform at the top of the column from which mini excavators with hydraulic breakers and crushers can systematically break up the structure working from the top downwards.

One such structure is the 87 metre high concrete Barangaroo harbour control tower which has dominated the Sydney skyline since the 1970s, but which became redundant in 2011 when vessel control services were moved to Port Botany. The tower was used to control shipping movements in and out of Port Jackson however as technology advanced and commercial shipping in the harbour dwindled it was no longer necessary to have sightlines on the harbour 24 hours a day.

The controlled demolition is being achieved using remote controlled demolition machines fitted with hydraulic breakers and crushers nibbling away at the concrete and then pushing it down the old elevator shaft in the centre of the tower to ground level where it is collected and taken away to be pulverised and reused. About two to three metres per day is being taken off the height of the tower and 98 percent of the demolished concrete will be recycled. XL provided an XM6 four mast ringed platform for the work deck around the top of the column. The tower is 12 metres diameter at the top and five metres diameter below. The circular mastclimber work platform is 3.5 metres wider with a 6,000kg working capacity to accommodate the two Brokk 180 demolition machines and associated men and equipment. Although the platform can climb and descend, a separate hoist has also been installed to transport people to and from the deck, preventing work disruption and as an emergency back-up.

A circular mastclimber deck used to help demolish the tower

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A better crane loading deck

Samson Equipment has launched the Hardideck loading platform for loading materials onto the upper floors of high rise towers with cranes. Designed in Australia as a crossover between a fixed and a retractable loading platform, the Hardideck aims to prevent the risk of relocating traditional type cantilever loading platforms between floor levels.

The new Hardideck platform range

The platform is made up of two interconnecting halves, an 'inboard' section which is fitted to each floor and remains fixed in position within the building, and an outboard/cantilever section which is relocated between floors. This takes away any risk associated with working on an open edge, eliminating the need for harnesses.

The outer half of the Hardideck platform being lifted into position

Each section weighs less than a tonne, meaning it can be installed and shifted between floors with self-erecting or smaller city tower cranes. Also a load bearing handrail means long materials such as formwork beams can easily be loaded out of a floor without the need for the front opening gates seen on traditional platforms, which can present additional hazards.

The Hardideck is available in two standard sizes with a safe working load of three tonnes - the HD20 with a clear load area of 4.2 metres by two metres and the larger HD25 measuring 4.2 metres by 2.5 metres.

Böcker's new mastclimber

German access and lifting equipment manufacturer Böcker has added a new mastclimber - the Maxi MC 650 - to its mastclimber and hoist product range. Available in single and twin mast configuration the dual mast Maxi MC 650 has a maximum capacity of 6,300kg and platform lengths of up to 34 metres. In single mast form it has a maximum 15 metre platform length and 3,500kg capacity. Lift height is up to 200 metres using 1.5 and/or 1.2 metres mast sections, weighing 140kg and 82kg respectively. In addition to the standard compact fixed base, Böcker also offers a trailer chassis for on-site re-positioning. Features include a distance between ties of 15 metres and a seven metres a minute lift speed.

New HEK MCs

Alimak Hek has been a global leader in the manufacture and supply of mastclimbers since it merged with Dutch mast climber specialist Hek in 2001.

The latest additions to its mastclimber range were unveiled at Bauma last April and included the HEK MC 650 and HEK MC 450. Both platforms are available in a single or twin mast configuration and offer adjustable platform lengths and widths for increased versatility. The HEK MC 450 has a maximum capacity of 2,500kg for a single mast and 4,500kg in twin mast configuration and offers platform lengths from 10 to 30 metres. The HEK MC 650 has an increased capacity - 4,000kg in single and 7,500kg in twin mast. Both have a maximum lift height of 200 metres. Anchor tie distances are eight to 10 metres and speeds of eight and 9.6 metres a second are available, depending on the electricity source available. Platform components are hot-dip galvanised and both the MC 650 and MC 450 are compatible with 650 and 450 masts and accessories enabling increased utilisation of existing construction and materials hoists and transport platform components.

The 20 metre long platform has a lift height of 30 metres


A crew of four worked from the platform making good the concrete surface and sealing around the windows before applying a render to the entire façade

One of the new twin mast Hek MC450 has been used for finishing work on a new hotel/office building in Urdarhvarf, Kopavogur, Iceland. The 20 metre long platform had a lift height of 30 metres and with a 50Hz electric supply the speed of the unit was eight metres a minute. A crew of four worked from the platform making good the concrete surface and sealing around the windows before applying a render to the entire façade.

Avanti joins Alimak

Alimak has also recently acquired Avanti Wind Systems - a leading provider of rack and pinion and ladder-type service elevators, ladders and fall arrest equipment for wind turbine towers, with more than 30,000 units installed. Based in Denmark it operates in nine countries with six production facilities in Denmark, Spain, China, the USA and Brazil.

A Geda hoist for India

German mastclimber and hoist manufacturer Geda has sold the first new hoist aimed at markets outside Europe. The Geda SBL 2000 was first seen at Bauma last April, with the first production unit now at work on a housing complex in Mumbai, India, providing high-quality apartments in Mumbai's Bhayandar East district.

The Samriddhi complex consists of four identical interconnected 20 storey buildings and a three storey car park, the project covers an area of 15 hectares. Construction is well underway with the SBL 2000 - supplied on a rental basis by Mumbai-based rental company ISPAT Infrastructure to India's largest contracting and engineering company Larsen & Toubro - servicing one of the four tower blocks.

Work on the complex is due to be completed at the end of 2017. Unlike other variable Geda hoists, the SBL 2000 is only available in a fixed platform size of 3.2 by 1.45 by 2.1 metres with a load capacity of 2,000kg or 23 people. It has a hoist speed of 55 metres a minute and maximum height of 250 metres. In future the SBL 2000 will be available with both single and twin cabin options.


The SBL 2000 is only available in a fixed platform size of 3.2 by 1.45 by 2.1 metres with a load capacity of 2,000kg or 23 people

Lithium powered ladder hoist

At the opposite end of the scale, Geda recently unveiled the novel BatteryLadderLIFT - a battery powered ladder hoist which uses a high-capacity 24 V/10 Ah lithium ion battery and offers lift heights from 2.5 to 10 metres. With a small load platform it can handle up to 120kg of materials at a hoist speed of 15 metres a minute. The battery powered lift eliminates the need to search for an electricity source on site and is controlled via a wireless remote controller which has a range of about 10 metres. It can also be controlled via a mobile app.

The lift's low weight means easy handling and set-up time takes just five minutes for the shorter ladder lengths. Three different load platform designs are available, depending on the specific usage and the combination of ladders and ladder connectors means lifting heights can be variably adjusted up to the maximum of 10 metres. Battery charging takes just 90 minutes. When not in use as a hoist the ladder frames can be used as a step or inclined ladder up to its maximum height.


The BatteryLadderLIFT offers lift heights from 2.5 to 10 metres