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Climbing the rack

There is a quiet revolution going on in the mast climber market with usage in many western countries beginning to escalate significantly. Contractors now appear to be getting the message that they are a cost effective and efficient alternative to façade scaffold, not to mention a safer or at least a more predictable access method.

The carrier scaffold contractors like Brogan Scaffold, BFT and SGB have seen the writing on the wall and are moving into mast climbing work platforms in a big way. It now seems that the mast climber rental or rather 'contracting' business - after having started out disastrously with powered access rental companies - is coming to rest in the façade or contract scaffolding rental sector, after having moved there via a few specialist companies.

This evolution certainly makes sense. Good contract scaffolders have the engineering and planning skills, the erection teams and most importantly the mind-set for this business. Not to mention of course, the customer base to really develop the concept. The biggest obstacle they face is to overcome the notion that they are a scaffold company and realise that they need to think of themselves as a façade access specialist.

It can be argued that the mast climbing work platform business takes traditional scaffolders into the powered access business, but a form of powered access that they can understand and excel with. This does not mean that large scaffold companies will take over the mast climber market completely. Far from it. There will always be room for the devoted specialist and many of the big scaffolding companies that are moving into mast climbers are wisely creating - or as in the case of SGB, buying - specialist divisions to handle their mast climbers.

More producers... More product diversity

At the same time mast climber manufacturers are offering an increasingly diverse range of products. This ranges from small trailer mounted mast climbers for low

level and light duty work such as painting, caulking etc... through to mid range products, still the most popular in Europe, to heavy duty - high capacity mast climbers that can not only carry large loads, but also handle substantial cantilever platforms, long decks and multiple levels. In recent years North America has favoured the big heavy duty mast climbers, most often powered by an engine and hydraulics, while Europe has favoured lighter duty models with electric power and drive.

Canadian manufacturers have become the champions of the ultra heavy duty mast climber market and devoted a good deal of effort into promoting factory designed solutions for highly specialised configurations. The two principle manufacturers are Hydro Mobile and Fraco. Both of which have now started to sell in Europe with Fraco making the running. It also has a significant and growing presence in a number of countries on the

continent. The company's first entrance into the UK and Ireland - through Universal Sky Platforms in London - started well and then foundered. Since then it has branched out and been far more successful selling to companies such as Brogan Scaffold.

In order to service these companies it has recently established a majority owned UK affiliate in Middlesex-Fraco (UK), headed by managing director Ken Beesley, who also owns a minority shareholding in the new business. In addition to servicing its UK and Ireland customers, Fraco (UK) is planning to establish its own rental business as the market develops. Scanclimber, Finnish based but manufacturing in Poland, is another company that has done well at the heavier end of the market with its special heavy duty mast that is common across most of its range. Unusually the Scanclimber mast incorporates a ladder on one side which also acts as additional structural support.

Mast climbers do not have the aesthetic or security problems of façade scaffold.

A wide range of cantilevers and wrap-arounds can be incorporated.

There is almost no limit to what can be done with mast climber platforms to profile a façade

Modular and commonality are the latest buzzwords in the industry. AS Climbers of Italy pitched this feature strongly when it opened for business a couple of years ago and has already built up a significant business on both sides of the Atlantic. More recently Hek has announced that it will launch its new modular system range of light, medium and heavy duty mast climbing products at Bauma. Meanwhile Alimak is promising to unveil some new electronics and remote access features that might just change the face of the rack and pinion business?

Is this the age of the mast climber?

With an increasing number of producers coming into the mainstream market with ever wider and more versatile product ranges, the market for mast climbers is likely to continue to grow at an increasing pace. House builders throughout Europe rarely think twice about the access they use for new builds - they typically call in their regular scaffold company and have them erect façade scaffold. In the UK and Ireland this has typically been tube and coupler, due to its cheap purchase cost and almost unlimited versatility. However tube and coupler requires a high level of expertise to both design and erect and it is also becoming increasingly difficult to find young people who are prepared to put up with the manual labour involved, not to mention the challenges of erecting it safely without breaking manual handling rules.

Mast climbers are in comparison relatively easy to erect or install, do not require the same degree of reconfiguring and those using them can work at the absolute ideal height. There is no climbing up and down on ladders and of course materials can be loaded at ground level, which is far safer than in the air. With such benefits it is certain that the mast climber is set to go mainstream and grab a far greater slice of the market than it currently enjoys.

Scanclimber follows slip form tower

C&a mast climbers

Two cooling towers at the Neurath power plant in Germany needed a suitable hoist to transport passengers and materials from ground level to the landing location during the slipform construction. However, with a lower diameter of 108 metres and a 39 metre difference between the bottom and top diameters, the chosen hoist had to cope with the substantial concave profile of the cooling tower.

Since the sliding formwork used for the concrete pour changed height continuously, a key requirement was that the hoist could adapt to the constantly changing structure.

Oy Scaninter Nokia eventually solved the problem together with German contractor Wiemer & Trachte adapting the two tonne capacity Scanclimber SC2032F with 3.2 metre by 1.5 metre cage.

In order to adjust the hoist mast to the concave profile of the structure, precision engineered distance sleeves were inserted between each 1.5 metre mast section on one side in order to give the mast the same curve profile as that of the cooling tower.

A closer spacing of the tie-in anchors - at 12 metre intervals rather than the normal 21 metres - not only helped create the curve, but also made a strong base for the

15 metres of free standing mast - at up to 16 degrees off of vertical! - at the top, which was required to avoid of disruption with the formwork.

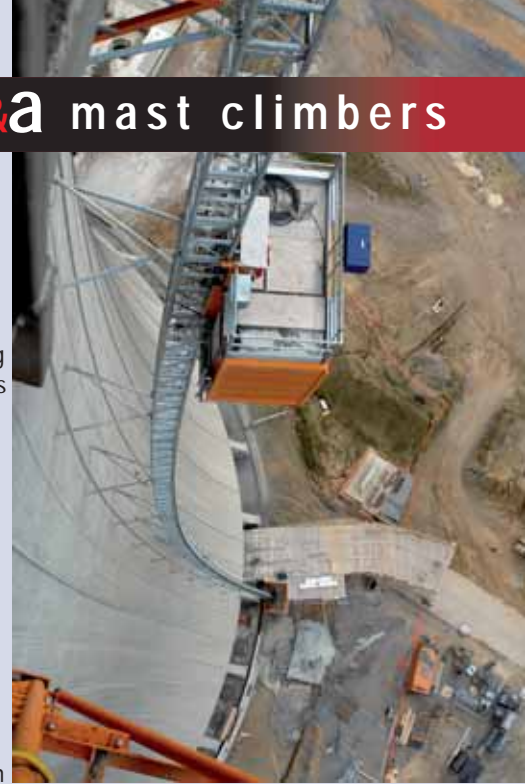
The power supply cable also had to be specially installed. A cable trolley was placed underneath the hoist cage and the ground station was slightly elevated to accommodate this. Due to the changing inclination throughout the entire lift, cable guide problems would have been extremely likely.

In order to overcome this, the cable guides were manufactured with special rollers that minimised the cable tension.

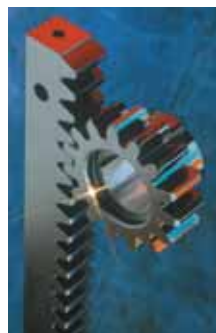
Wiemer & Trachte's new hoist has been working well for the last nine months. The unit also features additional equipment such as a frequency converter which considerably reduces the starting current and thereby provides soft start and stop for a more comfortable ride and an automatic rack lubrication grease pump.

Standard equipment on the Scanclimber SC series hoists -

which range from 800-2000kg capacity - includes overload protection, error code displays and 'clear thru' construction to provide snag free loading of materials on pallets. Cage lengths vary between 2.4 to 3.7 metres long with a maximum standard mast height of up to 300 metres.



The Scanclimber had to overcome the substantial concave profile of the cooling tower.



The heaviest Fraco mastclimbers can incorporate a variety of craneage. Note the hoist access to the crane.

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Accessing the Courts

C&a mast climbers

The new £160million Manchester Civil Courts building is the largest such building since the Royal Courts of Justice were built in London 135 years ago. Designed by Denton Corker Marshall, the slim 16 storey structure is marked by the random cantilevered courtrooms at each end of the building and its 60 metre tall central atrium.

Its design uses fresh air and natural light to reduce energy consumption and deep groundwater to help cool the buildings 47 courtrooms. However, the biggest contributor to its 'sustainability' is the cladding.

Robert Simcock project manager for cladding contractor Josef Gartner said: "There are six different types of walling on this project, two of which proved to be a real challenge. The first was the double skinned facades, with an aluminium/steel/glass unitised curtain wall system as the inner water barrier with an external glass rain screen 1.5m away. The second was the outer wall of the 11 storey atrium, which is glazed on both sides. Both facades feature internal architectural stainless steel walkways between the two skins."

The hanging atrium wall is believed to be the largest of its type in Europe. Its translucency emphasises the visual impact of the internal walkways; but in fact the internal void also functions as a giant ventilation duct to carry warm air upwards and outwards.

Access headaches

"Two major access problems had to be faced from the outset," he said. "We had to be able to handle and fix panes of glass weighing up to 700kg each and we had to have an access solution that allowed us to work on both the inner and outer faces from one side only."

In practice the most challenging area was the courtroom cantilevers, or 'fingers'. The lowest of these is at the first floor level while the highest is nearly 100 metres above ground. Worst of all, each can-

tilever is different, with the courtrooms protruding at seemingly random lengths on both the north/south elevations and on the east, forming a gigantic three dimensional cladding nightmare. Traditional scaffolding could not be designed to satisfy the architects requirements. Suspended platforms were considered, however, they were not stable enough and could



The North and South elevations required two twin mast platforms to be tied in back to back.

not carry the payload, handle the glass or reach into the façade. So in desperation Gartner turned to SGB-Mastclimbers to see if mast climbing work platforms could manage the task.

"The first technical challenge was the load the platforms had to carry - up to 3,500kgs at a time. Then there were the limited opportunities for tying into the structure. And we also had to cope with the fact that the façade wasn't uniform in any direction or on any plane," said SGB-Mastclimbers operations manager, Robert Bryce.

Mast sections

It took 12 months of brain storming and planning for SGB and Gartner to come up with a solution. Eventually 21 mast climbers were deployed, utilising around 3,000 metres of mast sections. One platform was specially built to fit around one of the project's tower

cranes, allowing both to operate independently. Platforms were up to 19 metres in length with a 3.5 tonne lift capacity.

Tying in was a major headache. In some places the first feasible tie-in location was more than 30 metres up. So SGB installed two twin-mast mast climbers back to back and tied together. "Overall we had to develop five special wall ties for the job, including cantilever ties up to 3.5 metres long," said Bryce.

In some areas the platforms could get no closer than two metres from the workface so SGB installed lightweight extensions that could be hooked onto the front edge of the platforms to bridge the gap. All platforms featured full debris netting and were fitted with harness running lines to allow operators to safely remove guardrails for loading and unloading.

Innovative monorail

To cope with the tricky task of handling heavy sheets of laminated high performance glass measuring up to 2.4 x 8 metres and manoeuvring them into position in their frames, SGB devised an innovative overhead

A clever monorail overhead gantry crane was attached to the tops of the masts to handle the 700kg glass panels



Gaining access to three of the sides was a real challenge

monorail gantry crane, which was supported by and attached to the twin masts of each platform. Each mast had to rise 10 metres above the top floor taking the mast height to over 100 metres and requiring a special roof tie-in structure.

With limited storage space on site most deliveries were 'just in time', with cladding components often being transferred from delivery vehicles straight onto the platforms and up to the workface.

Simcock said: "Solving the atrium and 'fingers' challenges was a massive benefit to the whole project. The platform extensions and overhead cranes were brilliant ideas, and the platforms were not just capable of carrying a heavy load, they were stable enough to dance on. The MCWPs were also much quicker to install and dismantle than conventional scaffolding would have been."

The external work is now complete



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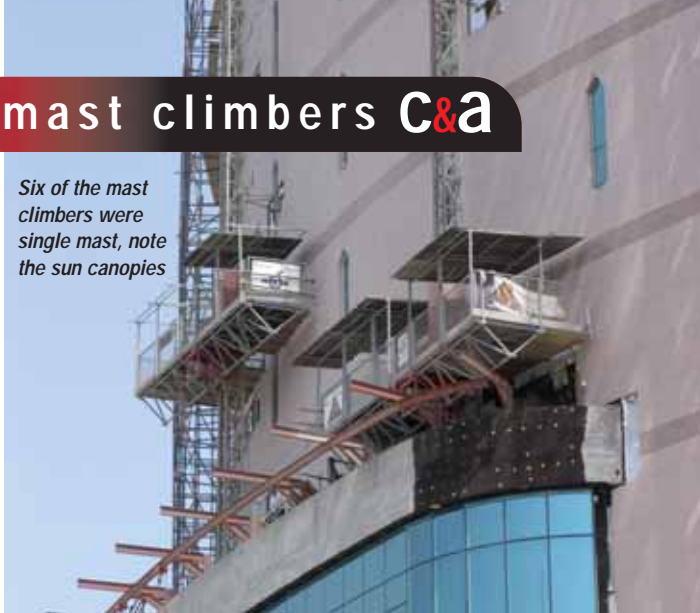


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Six of the mast climbers were single mast, note the sun canopies



Anchors away

To meet the growing demand for sophisticated services, Emirates Telecommunications Corporation (ETISALAT) has undertaken a quick-paced expansion strategy that includes the construction of seven new Customer Services Buildings, one for each Emirate.

One of the new Customer Services buildings, a 33-storey, 185 metre high tower block, with a natural granite stone façade is located in Dubai. The main contractor, Dhabi Contracting, called in Al Laith Scaffolding to provide a solution for the lifting and access required

to attach the heavy granite panels to the massive tower. Al Laith's solution was to surround the tower with mast climbing work platforms. It selected HEK MSM Super mast climbers, including six single-mast machines with heights of 185, 160 and 120 metres and two twin-mast machines with a height of 80 metres. Each system has been installed with an anchor separation of eight metres, with platform lengths varying from four metres up to 19.4 metres. Each mast climber has a different mast height, in line with the positioning of the glass and granite panels on the tower. The glass panels give way to the granite panels, along an angled line. The glass panels will be installed from the inside of the building.

Some of the reasons behind Al Laith and Dhabi Contracting's selection of mast climbers for installation of the granite panels was to dramatically reduce the number of anchor points required, and to speed up the erection and

dismantling time. "In addition, it is more efficient to raise the heavy panels to the required height using the mast climbers, negating the need to tie up a tower crane," says Steve Hellowell, director of operations at Al Laith.

Mast climbers were used to lift and place the granite panels in Dubai.



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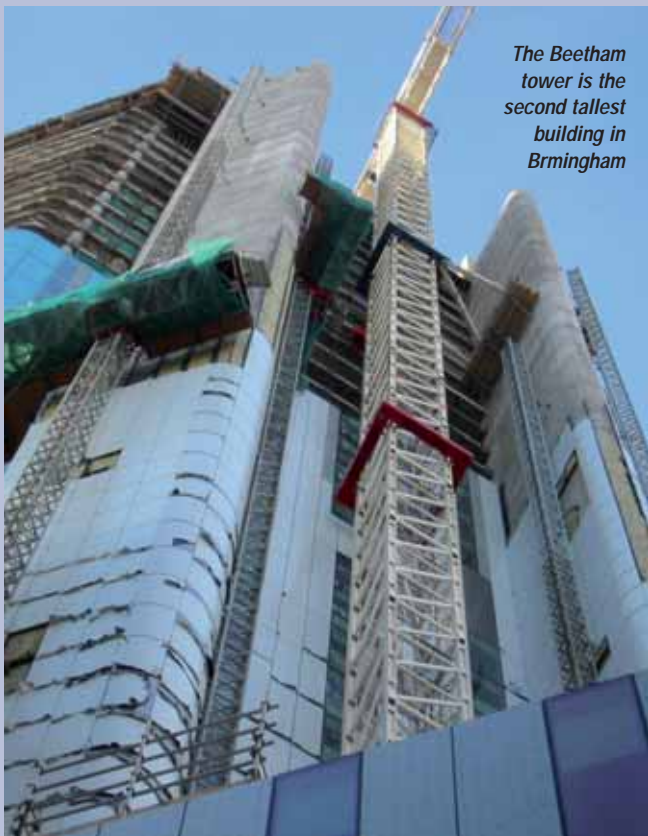
No ground space

The Beetham tower, a combined hotel and apartment complex the second tallest building in Birmingham after the BT Tower is, according to Sovereign access, the tallest new build in the UK to date that has used mast climbing work platforms. The application was unusual due to the fact that the massive tower sits on a site of only a third

of an acre, there was no room for scaffold and only one crane. Sovereign provided the solution for the access by installing the mast climber masts on custom made steel brackets tied into the concrete core walls about 30metres above the ground, thus saving avoiding the use of any ground space at all and of course saving on mast sections.



The masts sat on wall brackets 30m up the tower



The Beetham tower is the second tallest building in Brmingham





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