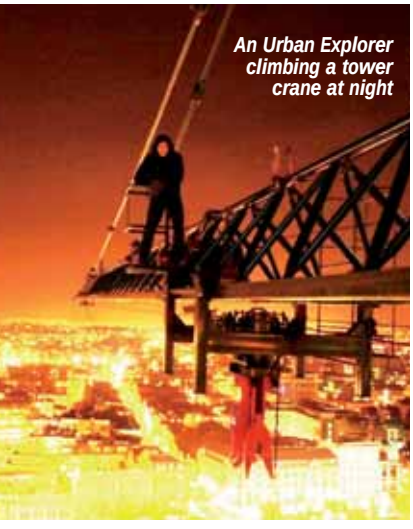
Tower crane safety still a major cause for concern


East 91st Street, New York May 2008

Recent incidents involving 'Urban Explorers' - youngsters after an adrenalin rush by climbing tower cranes at night - highlight some of the unwanted and unnecessary safety risks involved with tower cranes. Very few crane accidents can be traced to a mechanical failure, the vast majority are down to human error, usually due to lack of common sense, fatigue, training or experience or a combination of all four.

Tower cranes have unfortunately made the front page news in both the UK and the USA for all the wrong reasons over the past couple of years, with the high profile accidents in Liverpool, Croydon, Battersea, several in New York, Miami and more. Although tower cranes have a far better safety record than most other construction equipment and certainly far better than mobile cranes, when they do go down they are highly visible and the accidents much more severe often including multiple fatalities.


New York, March 2008


An Urban Explorer climbing a tower crane at night

The Heath & Safety Executive, always at the centre of any major incident in the UK, had initially agreed to give a useful insight interview with Cranes & Access. However, at the last moment it declined, primarily because senior personnel in various departments were covering their backs and did not want to 'carry the can' in case our visit and coverage unveiled something they did not want.

I'm sorry, but isn't the industry looking to the HSE for guidance and decisions? To wimp-out of an opportunity to put its message over to its prime audience because no-one would accept responsibility is quite frankly pathetic. And mirrors the perceived attitude of the Executive in dealing with accidents - blame and prosecute, not help and advise. At least they made the decision not to talk to us quickly enough, something that cannot be said for resolving and publicising the findings of an accident investigation. So without input from the HSE, we continue…...with the HSE/ government and its decision to proceed with an official register of tower cranes.

It is early days yet, but it is thought that the register will initially be voluntary becoming mandatory at a future date. The register will contain a variety of information including crane make, model, location, managing organisation and owner. But which bit of the tower crane will be in the register? With so many different sections, contractors themselves have a hard job of keeping track of some of the bits. Perhaps the register might lead to a car MOT type test after certain 'bits' have been operational for so many years? What it hopes to achieve I am not sure but it has the backing of the Construction Plant-hire Association (CPA) whose head, Colin Wood, said: "we (the association) totally support this move if it gives confidence to the general public and extra statutory paperwork can be avoided."

If the recent trend of fatal accidents continues it will certainly not increase public confidence and you can be sure there will be additional paperwork - its government driven!

In New York - the city with probably the worst tower crane record in the western world - the Department of Buildings has just announced a raft of 'new rules (about 40) aimed at making high-risk sites safer and to correct the problems that led to two deadly crane collapses that killed nine people last year. In fact, it looks as if it is to introduce something along the lines of a crane register, where officials can see a crane's maintenance history and age online, similar to that available for used cars in the USA.

One new rule requires more frequent (but non specific) inspections of older cranes. Spot inspections around the city last November found that 25 percent of the 38 active tower cranes were more than 30


AGF offers tower crane safety systems including anti collision as fitted to these cranes in Manchester

years old. Perhaps there really is something in older cranes being more at risk. The accident on First Avenue/East 91st street involved a Kodiak crane that was almost 25 years old.

A register would show - with enough information - a relationship between age, maintenance and reliability (or accidents), but does it need a register to do this?

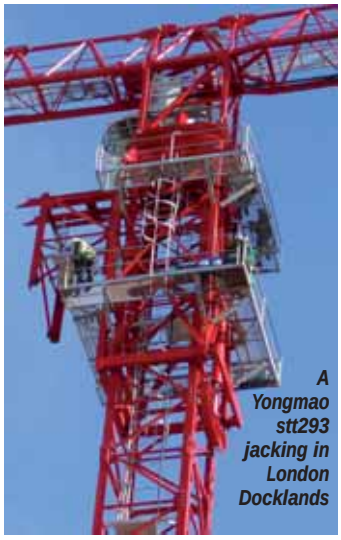
Contract time pressures and operator/erector carelessness are factors that are hard to eradicate without a major change in mentality. Most airline pilots for example still use a written check list before every flight, checking off the item as they go, this in spite of them knowing the checklist back to front.

Better training, sensible hours and more experienced operators, banksmen, slingers, erectors and maintenance engineers who are allowed to work without cutting corners to save time, will reduce errors, but there is a cost - minimal in relation to the overall project cost - but a significant percentage of the current crane rental cost.

Technology such as anti-collision or zoning systems built-in or added to tower cranes has also contributed toward improving safety, which of course, aids productivity. These also provide a vital operator aid, reducing stress and enabling the operator to focus more on manoeuvring and handling loads around busy sites.

Accidents result in a huge loss of time while investigations are in progress; loss of equipment if a collision is involved; damage to building components and of course the consequences of dealing with a fatality or serious injury. The measured costs can be massive on their own, while the cost to a contractor's damaged reputation even greater.

Advanced technology is contributing to safer working environments, provided they are properly utilised and form part of a total safety management policy which should



A Yongmao stt293 jacking in London Docklands

also include ongoing training.

One such example is the enhanced security now possible with wireless technology facilitating communication between cranes without the need to run cables around the site. Being wireless the information can be made more readily available. Today, it is possible for a crane supervisor or site manager, using his desk top PC, in conjunction with systems from technology providers such as SMIE to see in real-time, the operation of each tower crane, the movement and load parameters.

Alerts can be set for any disconnection of safety systems, over-rides or malfunctions. This information can be via the wireless connection or even over the Internet making remote supervision possible.

Other products are available that incorporate a data logger or 'black box' that records the crane operations to aid incident investigation and enable management to analyse, in detail, crane operations, near misses, the number of times the crane has moved into a restricted zone and more. The wireless technology also enables remote diagnostics of faults so system failures can be remedied in the shortest possible time. They also enable a site manager to reschedule deliveries and work patterns to take advantage of an interruption on one area, by scheduling work in overlap zones.

Croydon, June 2007

Advanced communication systems, new slinging attachments, arrangements, methods and advances in crane design are constantly evolving requiring new restrictions or operating parameters. These will all require additional training and an effective communication plan. Even site workers not involved with tower cranes need to be aware of risks, not only around them but also overhead.

New York, May 2007

More experienced operators also need regular retraining and assessment as systems change and develop over the years. The more experienced operators will often say that anti-collision and zoning systems are unnecessary and reduce their productivity. What they usually mean is that they object to an automatic braking system that brings the crane to a smooth stop when nearing a critical condition instead of the hard braking they prefer to use. Hard braking makes load control more difficult to manage and places additional strains on the crane's mechanical systems and structure. It is, as such, an unsafe practice.

It is not only tower crane manufacturers and specialist companies that are working to make tower crane operations safer. An increasing number of rental companies and contractors are also taking the responsibility more seriously.

Select Plant Hire, one of the world's largest tower crane rental specialists, emphasises the importance of training and safety awareness.

"Safety within our business is paramount, which is why we use proven safety devices to aid our drivers on multi-crane environments - we consider them almost a mandatory requirement," says general manager Duncan Salt. "Of course, there can be some circumstances where their use is not feasible. In which case we need to ensure that there is an extremely robust risk-assessment in place, but such exceptions are rare."

"We are very proud of our drivers, many having been with us for a number of years and they all appreciate the emphasis we put on their safety. We have our own training programmes where we train and evaluate drivers, banksmen, slingers and erectors. Every tower crane driver is fully evaluated and given additional training as appropriate. All drivers also undergo regular medical assessments."

Select employs assessors whose job it is to constantly oversee the tower crane teams to quickly identify and implement remedial action where necessary. There is also a safety and compliance manager who focuses on ensuring that the company policy of 'best practice' is adhered to at all times.

51st Street, Manhattan March 2008

"Safety is something that Select and our parent company, Laing O'Rourke take seriously and will thoroughly investigate every breach or possible breach such as near misses."

Safety should never be compromised which is the line the HSE takes. Perhaps it should try and help companies realise this rather than telling them they got it wrong after the event.

Towers to the West, towers to the East

Last month's issue of Cranes & Access highlighted the advances Chinese manufacturers are making in the crawler crane sector. It would also appear that something similar is happening with tower cranes. The major European tower crane manufacturing countries such as France, Germany, Spain and Italy now have not only a global downturn to deal with, but also a real and growing export threat from China.

Yongmao, perhaps China's most international tower crane manufacturer has been distributed with some success in Europe by Brussels-based Jin Long since late 2006, by London Tower Cranes, it has also had some success in the USA and Australia. Other Chinese brands are much less known - mostly unheard of - outside of China, but are now pushing exports, mainly to markets in the developing world.

The recent Bauma China exhibition saw companies such as Shenyang Shendiao Tower Crane Manufacture (SYSD), Deying, Dahan, Zhejiang Huba Construction Machinery, Zoomlion, Jianglu Machinery and Electronics Technology (CNGC), Useter Crane, Sichuan, Jincheng and Yongmao showing a wide variety of luffing, flat-top and saddle-jib cranes. The range of products on offer is growing considerably and it is only a matter of time before they start to make an impact on the more established brands.

The big western manufacturers are not sitting idly by - many are looking at building either the whole crane or at least some of their more basic labour intensive components in the Peoples Republic. Potain is probably leading this charge having built tower cranes at its plant Zhangjiagang city for several years. In 2006 it added a new 120,000 square metre facility to replace the existing plant, which is also available to build other Manitowoc crane group products.

Of the Chinese manufacturers, Shenyang-based Useter, formed just a year ago, already has a respectable range. Its latest is the JL316-24 - a 60 metre, luffing jib crane which 3.7 tonne jib tip capacity. This year it is planning to extend its range into the 500 to 2,000 tonne/metres range - with maximum loads up to 50 tonnes and jibs to 80 metres - aimed at infrastructure contracts.

CNGC has launched a new luffing jib tower crane - the QTD 480 - which can take 7.5 tonnes out to 50 metres. Yongmao's latest topless crane - the STT 753 has a 40 tonne maximum lift capacity and can handle 5.4 tonnes at up to 80 metres.

Deying is currently looking for dealers in Europe for its CE marked TC7030 saddle-jib tower crane. Maximum jib length is 70 metres, at which the crane can lift three tonnes, while maximum capacity is 12 tonnes with a115 metre under hook height.

New M D T tops the range

Potain is set to launch the largest model in its MDT tower crane range, the MDT 368. Available in two capacity versions, the 12 tonne L12 and the MDT 368 L16 with 16 tonne maximum capacity.

Potain's new MDT 368 features a hinged counterjib that folds for transport

The company says the new crane combines existing features that are popular with customers - with some new modifications - such as faster erecting and dismantling times with easier transportation. The new crane's 75 metre jib length and relevant lifting capabilities, requires a 21.7 metre counter jib which is too long for transport on a standard truck. To overcome this, Potain engineers have incorporated a neat hinge mechanism, allowing this section to fold for transport.

Customers will also benefit from the configuration options available as the crane's jib sections are interchangeable other Potain MDT cranes - the 268 and 308. A choice of mast sections is also available either the standard two by two metre or the larger 2.45 metre K mast.

Maximum height-under-hook is 93.7 metres and for both versions there is a choice of hoists with either the 55kW 75 or 75kW 100 LVF 30 Optima units. On the MDT 368 L16 there is also a new trolley, the 6 DVF 6 which can reach speeds of 100 metres a minute with a four tonne load.

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Jost luffer

German tower crane manufacturer, Jost, has launched its latest new model, the JTL 208.12 which features a 55 metre jib and a maximum lift capacity of 12 tonnes. The company now has more than 100 hydraulic luffing cranes operating in the UK alone, thanks to the countries over-sailing legislation.

Jost designers say that its hydraulic luffing jib system offers greater safety against accidents involving an unexpected gust of wind from the front of the crane, compared to a conventional rope luffing jib system. This allows it to park its jib at the maximum angle overnight, ideal on very compact or tight job sites. The Jost JTL 208.12 is the largest of four models with a hydraulic luffing jib, the others have 40, 45 and 50 metre jib lengths.

Jost says the new 200 tonne/metre crane is designed for challenging construction and erection jobs. It intends to market the crane worldwide, but the first unit is working in the UK.

All Jost cranes and mast systems are designed for transport via standard containers and its Cacon system - a combination of cabin and electric cabinet - is connected to the crane by way of a simple plug and socket.

As well as its 68 to 616 tonne metre luffing cranes, Jost offers a series of topless saddle cranes from 72 to 712 tonne/metres.

Configure it out

Wolffkran has launched a new online crane configurator allowing its customers to configure their Wolffkran fleet around the clock from anywhere in the world, using simple internet access and a regular web browser to obtain proposals and alternatives as well as differentiated costs including information on whether to buy or rent.

Available in English and German, the user goes through an initial individual registration before accessing a complete cost overview. The configurator allows customers to choose defined variants according to their individual requirements.

"Many of our global customers need detailed information on our products, irrespective of place and working hours and in turn a performance and cost appropriate solution for their projects," says Klaus Buch, originator of the configurator and Wolffkran European sales manager. "We were the first crane manufacturer providing detailed crane data online such as loads on the support frame, central ballast weights or scaled CAD data. The online crane configurator is the direct result of continuous development of our premium customer service."

Only a few clicks away

The complete range of cranes is available on the system which also includes Wolffkran's rental fleet. A pre-selection can be made by entering a specific requirement such as the lifting capacity or jib radius or by entering the desired crane type. This is then followed by entering the required hook height, crane base and hoisting winch performance. The appropriate crane is then configured within seconds. The impacts on the required central ballast weight and also on the resulting support frame loads are shown immediately. The user can also see alternative configurations and then download a scale drawing of the selected crane, as an Auto Cad or PDF file. Time consuming, self created and imprecise drawings are replaced by digital drawings. The dwg-files - which can be edited - are also directly transferable into the drafts for the proposed machinery planning for the building site.

Customised registration

Registered users benefit from seeing not only the prices of the chosen crane configuration, but also the estimated assembly costs.

Wolffkran says that once registered, the system can always recognise the user and further process simplifications can be easily integrated. So for example any customer discounts are automatically saved for the specific cost calculation. The digital supply and demand interface simplifies the process engineering for fleet managers and construction site planners.

"Our objective was to provide concise information in an innovative and reliable format, especially for the crane rental segment" adds Buch.

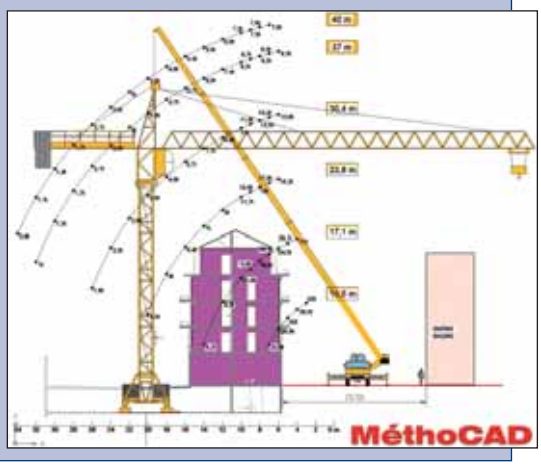
You can try out the crane configurator on http://krankonfigurator.wolffkran.de/

New MéthoCAD modules

MéthoCAD is launching 20 new modules this spring, including an upgrade to its existing package for tower cranes which allows the user to select the type and size of mobile crane needed to dismantle the crane. This is particularly useful when a site is nearing completion, and the space around the tower crane is more restricted than envisaged at the original planning stage.

The new module allows the user to check the required mobile crane boom length, its angle and the loads allowed to safely dismantle the tower crane. The software shows easy to understand diagrammatic visualisation of the plan and elevation of the crane, showing the loads at each position of the crane hook.

Also checked are the access roads - widths and turning radius - to ensure that the mobile is also able to reach the set-up point and that it has the required space and clearance distances to position the outriggers.



Potain at the Olympics

Eight Potain MD285 tower cranes are being used for the Olympic stadium.

The 2012 Olympic stadium in the Lower Lea Valley in Stratford, London is beginning to take shape with the help of eight Potain tower cranes. Construction of the stadium - designed by Sir Peter Crook and HOK Sport - began last May and is believed to be costing about £470 million.

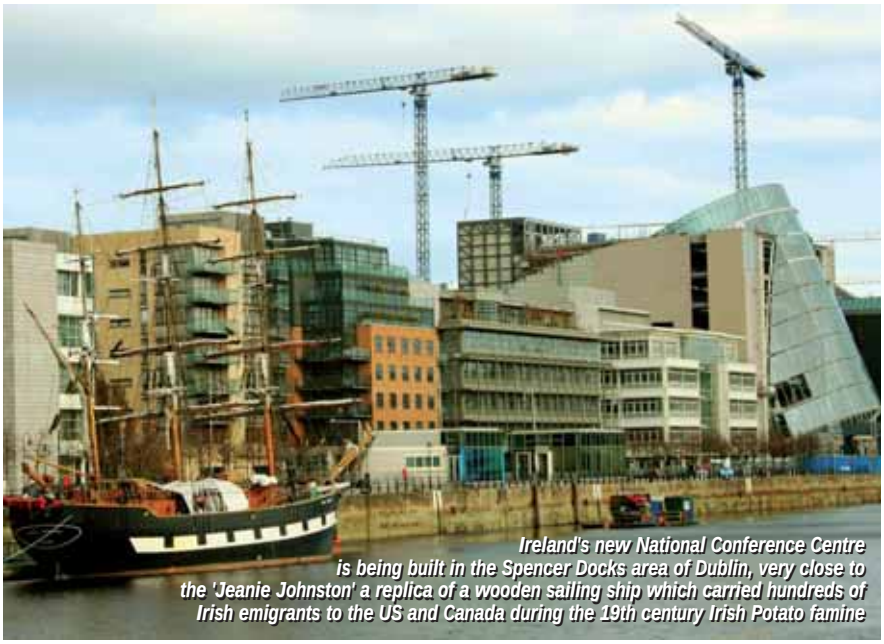
Contractor McAlpine is using eight Potain MD285 tower cranes with jibs varying from 50 to 65 metres with heights under hook ranging between 45.9 metres and 60.9 metres. Maximum capacity of the MD285 is 12 tonnes with jib tip capacities of 4.5, 3.7, 3.1 and 2.65 tonnes for the 50, 55, 60 and 65 metre jibs respectively. Foundations are nearing completion with about 4,000 piles already installed making way for the 10,000 tonnes of steel to be used in the superstructure apparently making it the lightest Olympic stadium to date.

Dublin National Conference Centre

Stafford Tower Cranes - Linden Comansa dealer in Ireland - has supplied three flat-top cranes from the Spanish manufacturer for the construction of Ireland's National Conference Centre.

The Centre has been designed by Kevin Roche, one of Ireland's most renowed architects and winner of the Pritzker Prize for Architecture. One of his most popular creations is the Museum of Modern Art (MoMA) in New York.

This landmark building is being built in the central Spencer Docks area, close to one of Dublin's most popular tourist spots - the ship 'Jeanie Johnston' - a replica of a wooden sailing ship built in Quebec in 1847, which carried hundreds of Irish emigrants to the United States and Canada during the Irish Potato famine of the mid 19th century.



Ireland's new National Conference Centre is being built in the Spencer Docks area of Dublin, very close to the 'Jeanie Johnston' a replica of a wooden sailing ship which carried hundreds of Irish emigrants to the US and Canada during the 19th century Irish Potato famine

The three cranes - all 21 LC 290 models - have been working on site since 2007 and will continue until completion of the project in late spring of this year, although the venue is not expected to open until 2010.

The 21 LC 290 has a maximum capacity of 18 tonnes with 2.7 tonnes at the jib tip. It has a maximum freestanding height of 64.9 metres and a maximum jib length of 74 metres. The cranes have been climbed to more than 80 metres to meet project requirements.

Spencer Dock Convention Centre Dublin has been chosen by the Irish Government for the design, build and finance of the venue, as well as operating it for 25 years, after which the facility will revert to the State. During this period, Ireland will pay the company an annual charge, for a total investment of €380 million. The Government expects the venue to be a new landmark site for Ireland and key for its tourist and economic development over the next few years.

During the last twelve months, Stafford Tower Cranes has expanded its activities beyond Ireland and is now active in a Joint Venture partnership as official Linden Comansa dealer in Dubai (United Arab Emirates) and has plans for further expansion in the future.

A pack of Wolffs

The new residential and business quarter - Überseequartier - in the HafenCity Hamburg, Germany is employing seven different Wolff tower crane models, with a total of 14 cranes currently on site. Started in 2007 the work, which is situated between the river Alster and river Elbe, is not scheduled for completion until 2011/12 although the first phases are due to be finished this May when the cranes will be dismantled.

Maximum use was made of the tower cranes during assembly, reducing the need for additional mobile cranes. The Wolff 4517 city was erected by a Wolff 6531.12 cross, and a Wolff 71SL was assembled by a Wolff 5520.6. The cranes were erected in six phases with the largest a Wolff 6522 FL 6/12 having an under the hook height of 84.3 metres and a 55 metre jib capable of a maximum lift of 12 tonnes and 2.9 tonnes at maximum radius.

The new eight hectare Überseequartier will be home to 1,000 people, a work place for up to 7,000, while 40,000 are expected to use the leisure and shopping facilities.

A total of 14 Wolff cranes are being used on the Überseequartier - in the HafenCity Hamburg, Germany

The twin towers

Six Liebherr tower cranes - four EC-B series flat-tops and two fast-erecting series H - are being used on the two year construction of the City Gate office complex project in the Romanian capital of Bucharest.

Main contractor for the 80 million project is Greek-based Technicaanonima Pantechniki with the help of Rumanian construction company Bog'art SRL.

Built on the main road between Bucharest's city centre and the Henry Coanda International Airport, the two 18 storey City Gate Towers - each 75 metres high - will form the gateway to the ROM-EXPO Trade Fair Centre.

Construction work began in the summer of 2007 and involves four flat top cranes - three 110 EC-B 6 FR.tronic and one 130 EC-B 6 FR.tronic, along with two 32 H fast-erecting units. The cranes were built in Spain by Liebherr-Industrias Metálicas of Pamplona and delivered directly to site. The flat-top cranes feature the 'Connect and Work' system which has a completely pre-installed compact head element, quick-action fastenings for jibs and counter-jibs and the patented LiConnect connection system.

The cranes are mounted on Liebherr's 120 HC tower system and climbed in five metre increments to hook heights of 91.5 metres and 101.6 metres. The cranes also feature stepless drive systems which allow precision positioning when lifting loads up to six tonnes.

Somewhere over the rooftops

High above the city of Hamburg, refurbishment work is currently being carried out on a 1970's public administration building to convert it to the latest German heat and insulation requirements. The work is complicated as the building will remain in use throughout. Hamburg construction company Theo Urbach is using a new 180 tonne/metre Terex Comedil CTT181/B-8 flat top tower crane which was delivered by Terex distributor Proschwitz.

The Comedil CTT 181/B-8 has a maximum lifting capacity of eight tonnes and maximum jib length of 65 metres with 1.9 tonnes capacity at the tip. The modular jib system, tower element connections and cross-shaped base structure - allow fast, easy erection, while lightweight components make it possible to use a small mobile crane for erection.

Joachim Wulf, president of Theo Urbach said: "This crane size is always in high demand when it comes to our construction projects. Terex Comedil provides the quality and performance that we expect at an excellent price/performance ratio."

A world first

The world's first hydraulic lift of a Jost crane recently took place at The Cube in Birmingham. BuildAbility - Birmingham Development Company's construction arm - raised the two specially designed Jost JT312 topless cranes - supplied by London Tower Cranes - from 54 and 63 metres to their full height of 99 and 101metres respectively.

Unusually, the cranes are painted black in keeping with The Cube brand and are thought to be the first black tower cranes to be seen in the UK since Buckingham Palace was constructed. Specifically made base tower sections were produced so that both cranes could meet The Cube's 70 metre finished height when completed in spring 2010.

The first climb of a Jost crane.

Installed in just under six hours, the German-built climbing frame was fixed onto the crane tower to allow the hydraulic jacking of the frame and careful insertion of six new tower sections, each measuring six metres in height.

The Cube is a 23 storey mixed use building which will include a boutique hotel, waterside cafés, designer retail stores, offices, 244 apartments of which well over half have already been sold and a rooftop restaurant let to D&D London, formerly Conran. The building is encased in an intricate anodised aluminium fretwork while inside an open glass atrium twists as it climbs the height of the building.