

**WOLFFKRAN**

Der Leitwolf.  
The leader of the pack.



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Case Study: **8 Bishopsgate**

# High profile office construction at 8 Bishopsgate, London poses unique challenges to crane climbing and construction.



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**London – February 2023**

Constructing a 50-storey building anywhere in central London is never exactly straightforward, but when it's a luxurious, innovative structure on the corner of two of the most well-known streets in central London, the stakes are just a little higher. 8 Bishopsgate combines beautiful, high-quality materials with elegant detailing to offer 570,000 sq ft of premium office space in a landmark location. The challenge, however, was where and how to install the craneage required for the build.

*"We at WOLFFKRAN Limited were invited by construction managers, Lendlease to work with the 8 Bishopsgate team, and client Stanhope at an*

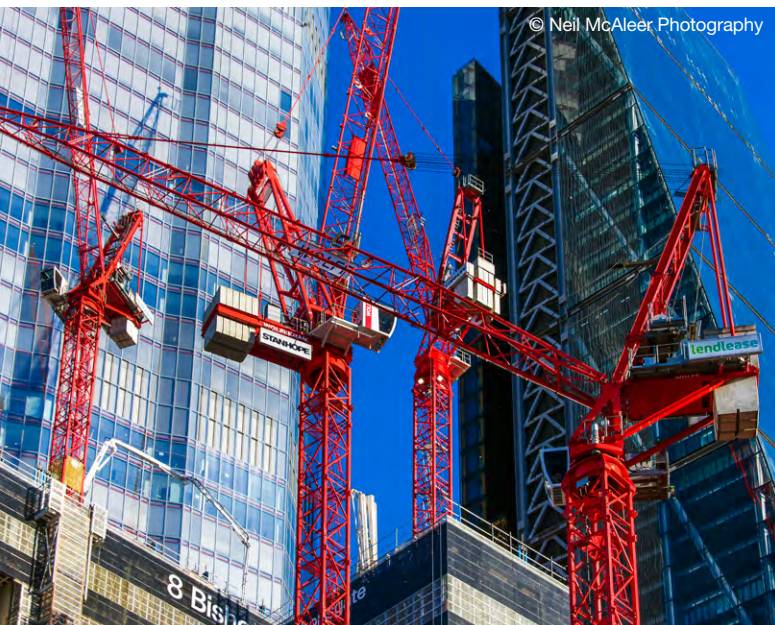
*early stage to understand the challenges and provide cranes and services to support the construction program."* explained Adrian Hawkins,

WOLFFKRAN Sales Director. *"After many changes to both the client's requirements and our own recommendations, we agreed that four tower cranes would be required on site at any one time, with two cranes moving onto the building's two cores when they reached full height."*

One of these cranes however - TC1a - would require some clever thinking and a unique design if it was to work at all. Crane TC1a was to be a WOLFF 275 B, with a 45m jib that would be parked at 13m radius out of service. This crane would need to climb up the inside of a lift shaft that was only 2.9m wide. Additionally, it's sway had to be

kept to an absolute minimum to ensure it did not clash with the jump-form rig being used to construct the shaft.

Use of 2m wide mast sections was considered, but eventually discounted for two reasons. *"The tower would not have been stiff enough to limit the sway sufficiently if we'd used 2m sections"* commented Bernard Holman, WOLFFKRAN Engineering Manager *"and the dimensions of the climbing collars was still too big to fit within the confines of the 2.9m lift shaft."* he continued. Therefore, a sway-limiting 2.3m internal climber would have to be used, but without the use of the climbing collars!



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### Lateral thinking for a vertical solution

The solution to this seemingly impossible challenge came from two unique engineering solutions working in harmony.

Firstly, to take the vertical load from the crane, the extending support beams in the bottom of the KSH E 23 would be extended into pockets cast into the core walls. To take the horizontal loads at the bottom of the internal climber and at the top of the clamping section, M100 threaded chocks were used which were attached to the corner posts of the climber. These were wound out when the crane had to be clamped in position or wound in when the crane was climbing. Industrial machine moving skates were also attached to the climber to act as guides to allow the crane to follow the lift shaft when climbing - the rollers of

the skates reducing friction to a minimum.

The second part was the method of suspension of the ladders used to support the crane as it climbed. As part of the internal climbing system, the telescopic ladder support beams were located on two special beams which were located in pockets cast into the core walls. These special beams had rotating ends which folded down out of the way as the beams were lifted up to the next set of pockets, then rotated back and located into the next pockets up to take the weight of the crane.

Whenever a new process is introduced, or there are changes to an existing method of working, extra time and care is always needed. Lendlease Lifting Manager, Steve Murphy explains: *"The WOLFFKRAN internal climbing system is an established and*



*well-known system. However, the modifications to enable it to work in the confines of this tight lift shaft initially took some getting used to. I remember our first climb took around 14 or 15 hours one Saturday, with the guys taking their time to understand how the threaded chocks and machine skates integrated with the system they knew.*

*Over the course of the project, everyone became more and more familiar with the new requirements and each climb became slicker and faster. The last climb carried out using the system was the fastest*

*and enabled the crane to be climbed 15.2m in just 6 hours." he commented.*

### Real time data for real time savings

Capturing crane utilisation data has, for some time, remained an ongoing challenge. Typically, at the peak of a project with four cranes, the principal contractor would require a secretary to capture crane utilisations recorded on paper by the operators. This would allow the Appointed Persons or Crane Supervisors to concentrate on their more important tasks, such as

For a better understanding of how a conventional internal climbing system operates, take a look at our short animation by snapping this QR code or visiting: <https://youtu.be/VqFWIEZaLFA>.



reviewing lift plans, ensuring on-site compliance, and checking lifting methodologies.

On the 8 Bishopsgate project, WOLFFKRAN set out to trial a system of acquiring crane utilisation data without the need of a secretary - one that wouldn't take up anyone else's

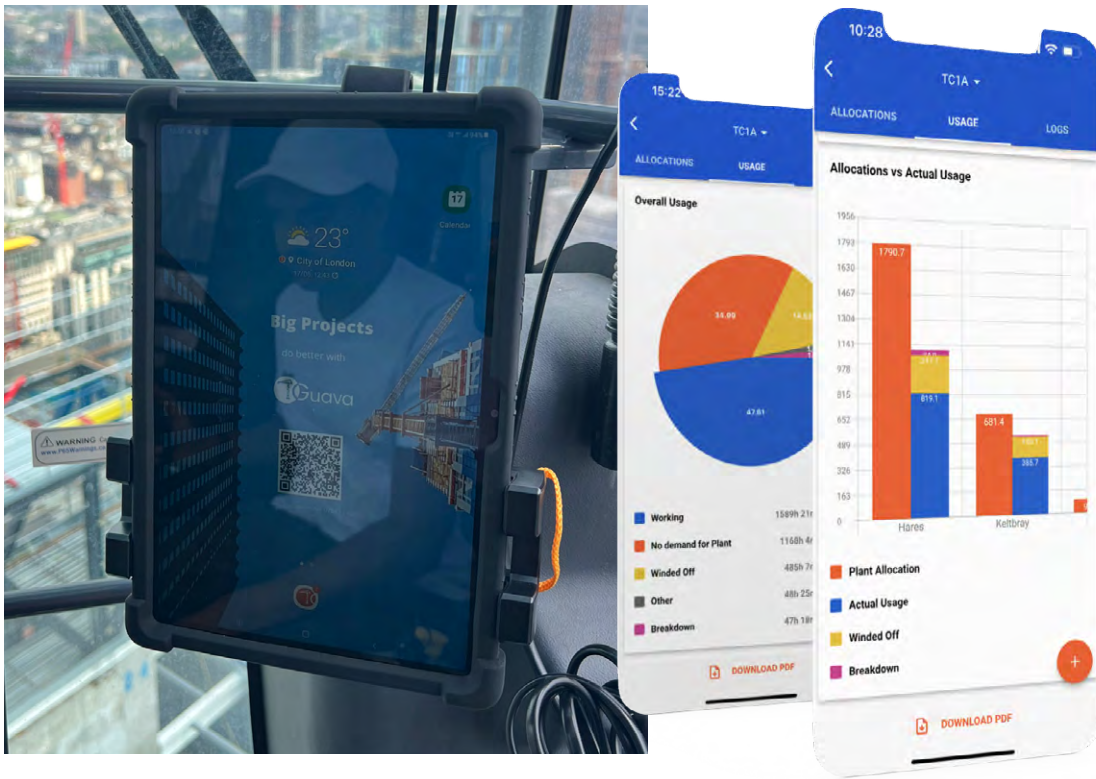
time and which would be easier for crane operators.

Appointed Person, Alan Stewart tells us more: *"The solution we implemented is called 1Guava. It's a mobile and desktop app that brought all the teams together and provided evidence of sub-*

*contractor hook time usage vs their allocations. Each crane cab had a tablet installed in it and the operators simply had to press 'Play' and 'Stop' to capture usage by various sub-contractors."* The system was up and running within 24 hours and clean data started to

pour in. Selected stakeholders were able to view real-time reports from anywhere, making it easier to plan and evidence sub contractors' utilisation of any crane on the project. 1Guava can also be used to accept, rebook or decline booking requests by sub-contractors and is an invaluable tool in eliminating sub-contractor disputes and enabling maximum utilisation. *"Everyone involved was really impressed with the speed of the system roll-out and the live reports have been a total game-changer. 1Guava has really taken the hassle out of that aspect of the job"* concluded Alan.

8 Bishopsgate has relied on 1Guava for clean crane utilisation data ever since, and we are proud to be the first offer to our customers this pioneering technology in crane management and utilisation tracking on the 1Guava platform.



### Crane details

TC	WOLFF Crane	Tower Height	Lifting Capacity	Tip Load	Max. Working Radius	Details
TC1X	355 B	28.2m	28t	6.7t	50m	No tying or climbing.
TC1a	275 B	54.75m then internally climb 12 times to 170m	1 fall - 12t stage 1/2 fall - 17.3t stage 2	1 fall - 6.2t stage 1/2 fall - 5.9t stage 2	45m	internal climbing, 12 times.
TC1b	166 B	22.5m and is tied to the north core at level 51 and 52	12t up to 18.7m	2.6t	45m	steel grillage.
TC2	224 B	63m then tie and climb 3 times to 117m	16t	4.6t	45m	3 times climbed.
TC3a	355 B	49.5m tower height on spigots bolted to a steel grillage at lower ground floor level (+14.5m) with one tie, then tie and climb 4 times to 148.5m on HT23 tower.	14t up to 28m	4.6t	55m	4 times climbed.
TC3B	166 B	72m tower height on spigots bolted to the top of south core at level 24 (+108.050m), with a tie to the north core. Then tie and climb twice to 108m.	12t	4.4t	40m	2 times climbed. Jib to be reduced to 40m before final climb. Crane to be slew locked before TC1b erected.
TC4	275 B	42.75m	24t	7.6t	40m	steel grillage

**A challenging build in challenging times**

The Central London location of this project along with neighbouring projects, necessitated the use of a just-in-time delivery schedule. Thanks to outstanding support from our transport provider, Gordons, we were able to efficiently load and unload in the single lane service area without obstructing others or being obstructed ourselves.

Naturally, the height of the cranes meant consideration to changing weather conditions was also a priority. Regular forecast monitoring was in place to ensure the safety of all site operatives, with the works ideally continuing 24 hours a day via shift patterns across crane operators, lifting supervisors and appointed persons.

Adding to the complexities of the job itself, all works were carried out during the Covid-19 pandemic. This required all personnel to adhere to strict control measures to ensure social distancing was maintained or wear suitable PPE if this was not practical.

**8 Bishopsgate now approaching completion in March 2023**

To find out more about this unique project, or to discuss your own tower crane requirements, please get in touch today.

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