LONDON'S ICONIC APARTMENT TOWER REFLECTS LIFE WITH TRELLEBORG'S ANTI-VIBRATION SOLUTIONS

Project: Principal Tower, London
Client: P.J. Carey Contractors Ltd.
Completion date: 2019

PRINCIPAL TOWER: AN AMBITIOUS LUXURY SKYSCRAPER ON A CONSTRAINED SITE

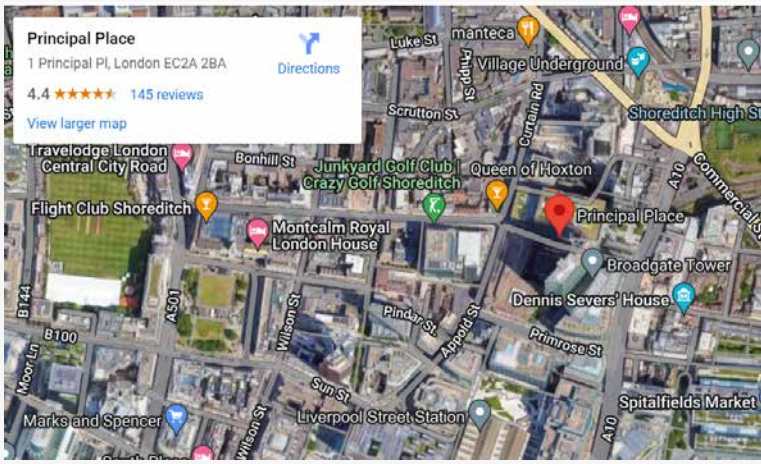
Principal Tower, an impressive 50-story apartment building designed by Foster + Partners, is part of the new mixed-use development called Principal Place. Located in the London Borough of Hackney, near the City of London, it redefines luxurious living. The building is close to a masonry tunnel housing Transport for London's Central Line and sits above six rail lines going into the Liverpool Street station.

BEYOND THE CONVENTIONAL

The construction of Principal Tower, the latest addition to London's skyline, was not without its challenges, particularly with its proximity to the neighboring rail assets. It was evident, quite early on, that the building would require considerable protection from ground-borne vibrations caused by railway operations 24 hours a day, seven days a week.

Unlike the neighboring Broadgate Tower - also isolated by Trelleborg Marine and Infrastructure - and Exchange House, the Principal Tower was designed to conceal any evidence of the rail corridor.

With an unconventional design approach, engineers from WSP developed a structural solution that met Foster & Partners' architectural vision. In addition to engineering complexities, it was also essential to bear in mind the vibrations from the rail tracks and their influence on the building. In this case, designing and delivering an effective vibration and isolation strategy was crucial in ensuring the safety and longevity of the structure.



TAKING COMPLEX SOLUTIONS FROM THE DRAWING BOARD TO SITE

To successfully integrate a reliable VI (vibration isolation) solution into the building, Trelleborg worked closely with structural engineers to thoroughly assess the necessary requirements. This involved identifying the optimal location, design strategy, and ensuring seamless integration with the building's structure. Trelleborg designed an isolation system that incorporates multiple elastomeric bearing assemblies capable of withstanding extremely heavy loads. We designed our solution to be compact and durable enough to withstand high pressures while considering the high loads imposed by the supports and the limited space available.

One of the assemblies was strategically positioned at a compound angle, taking inspiration from the system used on Broadgate Tower. The compact bearings by Trelleborg were expertly engineered to withstand high load while also providing effective isolation.

The supports were custom-designed and provided as complete assemblies, allowing for seamless and hassle-free installation process. They included both vertical support and horizontal restraint elements that prevents movements in all horizontal directions. In addition to the standalone bearings for the slab, specially designed restraints were also used to handle high potential horizontal impact forces, such as those that could occur in a train derailment.

OUR EXPERTISE AT YOUR SERVICE

With our end-to-end engineering approach for the safety and longevity of Principal Tower, we have been able to bring together all the elements necessary for a successful outcome - from concept and design right through to installation.

SUPERIOR TECHNOLOGY, PROVEN RESULTS

Solutions from Trelleborg are rigorously tested to ensure the bearings outlast the building design life. What also guarantees the effectiveness of our solutions is our in-depth knowledge of high load bearings, and special applications coupled with our in-house and research expertise.

Backed by a successful track record of supplying bespoke vibration solutions for key projects across the globe, you can find just the right help with Trelleborg as your end-to-end service partner.

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