

One Sydney Harbour, Sydney, NSW



Although the visible elements of a building may garner more attention, it is the unseen components that can have a more significant impact on its performance, durability, and lifespan.

Building foundations ensure building loads are supported and distributed, and neglecting to implement a robust waterproofing system to such critical components can lead to disastrous consequences for the building's structural integrity and safety.

In high-density urban areas, such as Sydney, Melbourne, Brisbane or Perth, property lines and other site conditions often do not permit the excavation of an open trench outside the perimeter of the foundation, limiting the foundations waterproofing options; to add to the challenge, these projects often feature deep foundations. Under these conditions, a high-performance pre-applied foundation waterproofing system like COLPHENE BSW must be used.

Requirement

Lendlease's One Sydney Harbour is a luxurious residential development situated in Barangaroo, Sydney, consisting of three luxurious waterfront residential towers, reaching 247m (72 floors), 230m (68 floors) and 104m (29 floors) in height. Like all structures, its foundations have a crucial role to play, and it is therefore critical to protect them from water infiltration to avoid cracking and other damage that would

have subsequent repercussions on the building.

Approach

ACOR consultants were contracted by Lendlease to undertake a detailed examination of the plans and specifications for the buildings foundations and identify waterproofing requirements for its protection.

After careful consideration, ACOR opted for SOPREMA's COLPHENE BSW, a below ground waterproofing system with superior adhesion. BSW stands for "Blind Side Waterproofing", since the waterproofing is done on the exterior before the concrete is poured. The system involves installing high-performance waterproofing membranes that fully bond to the structural concrete. They are installed against a soil retention layer system adjacent to the surrounding building, before the concrete is poured for the new foundation.

Benefits

The system benefits from the effects of the exothermic reaction that occurs during the concrete's curing process, as the concrete cures, the surface of COLPHENE BSW membranes softens slightly. This contributes to the adhesion of the membrane to the concrete, preventing the ingress or migration of water around the structure and ensuring complete adhesion, eliminating the risk of water moving laterally between the waterproofing membrane and

foundation structure. These unique properties are complemented by SOPREMA's unique and patented DUO SELVEDGE technology, allowing the side laps of the membrane to be heat-welded using a torch or a heat gun, providing additional waterproofing safety at overlaps.

Waterproofing needs to be considered at the front end of any building construction project—in the design phase of a project. Designers and architects should consult with waterproofing manufacturers and contractors during the design phase to ensure that all requirements are fulfilled. Communication across all stakeholders is key, many problems can be traced back to parties failing to talk with one another or pre-construction meetings not being scheduled properly, so it is crucial to take special care to avoid potential oversights early on.

Waterproofing comes with many considerations, each of which needs to be examined carefully to protect critical components and maintain the health of a building. The complexities can be overwhelming, but that's where having the right expertise and materials can seal the deal.

Architect: Renzo Piano Building Workshop - Italy

Builder: Lendlease

Consultants: ACOR



This artist impression illustrates the key location of the towers. In such a high-density urban areas, with limited site conditions and excavation options, a high performance waterproofing foundation system with superior adhesion is a must. Image taken from One Sydney Harbour site