

Kryton waterproofs

upcoming Malaysian district



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Petaling Jaya is the third largest urban centre in Selangor, Malaysia and was the country's first planned town. It is often referred to as the twin sister of the popular tourist destination Kuala Lumpur because of its abundance of natural beauty along with shopping and dining areas. Petaling Jaya began as a small town, spanning only two km in length. It is now a major metropolitan hub that approximately half a million people call home.

As a result of more people flocking to Petaling Jaya to live and play, the city has had to grow rapidly, expanding business and residential developments. Leading the way

is the city's newest development, Zenith Corporate Park, which is located in the suburb of Kelana Jaya. Zenith is being designed to transform the area from an up-and-coming neighbourhood to the city's central business district.

Spreading over nine acres, Zenith will serve a catchment population of 50,000 people within a one-km radius. When complete, it will offer more than one million sq ft of office, retail and residential space. The first phase will feature 80 three- and four-storey shops and offices. The second phase will be composed of a 13-storey office



Spanning nine acres, Zenith will serve a catchment population of 50,000 people within a one-km radius.

tower and 20-storey mixed purpose tower.

During the design phase, waterproofing methods became a major focal point. Even though Petaling Jaya and the surrounding area's climate is most often warm and sunny, it is also well known for its heavy rainfall. On average, the city sees 125 mm of rain every month. Additionally, monsoon season stretches from September to April, three-quarters of the year, and can lead to devastating floods.

Concrete is naturally porous. Water penetration can lead to steel reinforcement corrosion, causing cracking, spalling and even long-term structural damage. If left untreated, the effects of water penetration can be catastrophic to concrete structures and a developer's bottom line. Waterproofing concrete is the best way to protect construction projects and ensure they remain dry and durable well into the future.

Zenith Corporate Park's development team is led by SMI Cityhomes Sdn Bhd (SMIC). The SMIC team faced a number of challenges when selecting their waterproofing system. Due to the development's scope and construction timeline, affordability and ease of application were crucial. The team also recognised that some concrete waterproofing systems deteriorate over time. Given the potential for harsh weather, the team needed something that would last long-term and in the face of prolonged wet conditions. The developer needed to minimise any future repair costs and at the same time, decrease any potential inconveniences for future residents, tenants and patrons.

Traditional external membrane waterproofing has been the method of choice for decades and was likely a form of waterproofing considered by the SMIC team. Membranes form a water barrier under, around and

above concrete, blocking intrusion into the concrete structure. A key benefit of membrane technology is that the concrete will be completely waterproof on the first day of installation, provided the membrane was installed correctly. In addition, the waterproofing ability of membranes is independent of the concrete itself. This means that while the system requires a smooth surface, it can still be effective on concrete that has not been perfectly placed, finished or cured. Finally, some membranes have good elastomeric properties that are beneficial for bridging concrete cracks.

However, installation of membranes can be labour intensive and time consuming. Sheet membranes can easily be punctured or torn during backfilling operations and can also separate at the seams during use, which leads to difficult and costly repairs. Builders are often required to leave extra space around the concrete structure to effectively apply membranes. This reduces the overall

building footprint, meaning lost dollars for the property owner. In addition, most membrane systems cannot be used on blind wall applications, where there is no space for membrane installation. Because of these challenges, delays in construction are common and financial losses grow.

Conventional membrane technology also presents a number of negative environmental impacts. Many times membranes are applied using adhesives with highly volatile organic compounds. The vapour from these compounds can cause harm to the atmosphere. Membrane materials are also often made from petroleum, which carries a number of its own environmental risks and impacts.

The multiple application and performance challenges have caused many people, including the development team for Zenith Corporate Park, to look for an alternative. Integral crystalline waterproofing technology has transformed the way concrete structures are



The Krystol Waterstop System is an advanced joint design system that provides both a physical and chemical waterproofing barrier.



Using KIM makes waterproofing concrete a quick and easy process that does not impede construction timelines.

waterproofed and repaired. These progressive systems waterproof from inside the concrete's pores, creating entirely waterproof structures. It was one of these systems that SMIC chose to waterproof their new business hub.

Crystalline technology comes in the form of a dry powder composed of Portland cement, fine silica sand and a specific blend of chemicals. When added or applied to concrete, crystalline chemicals facilitate crystal growth, which transforms concrete into a water-resistant barrier. The new, long, narrow crystals block the flow of water by filling the natural pores, capillaries and hairline cracks in concrete.

Crystalline chemicals sit dormant in concrete until the presence of water reactivates them. When water re-enters the concrete, crystals begin to grow again, sealing and waterproofing the concrete. This unique self-sealing ability makes crystalline technology a permanent waterproofing solution. It becomes more effective over time and reduces long term repair and maintenance costs. As an added benefit, it is also non-toxic, non-flammable, recyclable and odourless.

Crystalline waterproofing systems become more effective with time. They will not wear away, puncture, tear or become damaged. They can be effectively used with cast-in-place, shotcrete or precast methods and are not limited by corners, seams or odd-shaped areas. Because crystalline admixtures are integrated into the concrete mix, required labour and potential for human error is reduced and backfilling can begin as soon as the concrete hardens, saving time on the construction site.

Zenith Corporate Park's project team selected

Kryton's Krystol® Concrete Waterproofing System, which uses advanced integral crystalline waterproofing technology. The system is composed of the Krystol Waterstop System as well as Kryton's flagship product, Krystol Internal Membrane (KIM). The Krystol Waterstop System is an advanced joint design system that provides both a physical and chemical waterproofing barrier. KIM is an admixture that can be added to the concrete mix at the time of batching. Using KIM makes waterproofing concrete a quick and easy process that does not impede construction timelines.

Using the complete Krystol Concrete Waterproofing System eliminates the need for external waterproofing membranes. It saves time and money because onsite preparation and membrane installation is not required and an application team is not needed to install the membrane. Because the Krystol system does not deteriorate over time, it increases the longevity of the concrete and provides peace-of-mind for the developer, property tenants and residents.

KIM recently achieved SIRIM certification in Malaysia. SIRIM, a Malaysian government-run, market-driven organisation, is the national authority on research, technology, standards and quality. SIRIM certification is necessary for all government projects and demonstrates a certain level of quality and trust in a product. The reputable backing of the product, in combination with its ability to save time and money and outperform and outlast other competing waterproofing products, made it a natural choice for Zenith Corporate Park's team.

In April 2008, Kryton began actively working on the development. Once it is complete, more than 15,000 cu m of below-grade surfaces will have been waterproofed with Kryton's products. In all, more than 80,000 kgs of KIM admixture will be used in the basement slabs and elevator pits and 1500 m of joints in retaining walls and basement slab-to-slab areas will be treated with the Krystol Waterstop System.

Recently, Kryton products were also selected to waterproof all above-grade and superstructure areas. More than 12,000 kgs of Kryton's Krystol T1 product will be used to waterproof the driveways, walkways and scupper drains. Krystol T1 is a cementitious slurry treatment that is brush-applied to the surface of concrete structures. Approximately 15,000 cu m of concrete will be treated with Krystol T1.

Zenith Corporate Park's scope and innovative, contemporary building methods continue to turn heads around the world. Commercial sales launched in August 2007 and immediately reflected the interest in the development and area. More than 95 percent of the three- and four-storey shops and offices sold in the first two weeks of its soft launch and the remainder sold out shortly afterwards. Zenith Corporate Park is due to open its doors to the public in 2010. There is no doubt it will set the stage for further growth and transformation in the Kelana Jaya neighbourhood and city of Petaling Jaya.

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