
While numerous industries have innovated and become more efficient over the past 30 years, productivity in the construction industry continues to stagnate (or even fall!) in the developed markets. In our $10 trillion global industry, these missing gains in productivity translate into $1.6 trillion lost every year!

Recently, The Economist published an enlightening article on the construction industry that pointed to the industry’s fragmented structure and boom-and-bust cycles that result in a risk-averse industry culture reluctant to spend money on technologies (from project-management software to mass production) that have revolutionized many other industries. Hence the tendency to employ more workers rather than invest in new technologies; workers can easily be laid off during downturns.

How can the construction industry’s productivity problem be fixed? Harmonized building codes (to promote mass production) and coordinated public sector contracts to help smooth out the business cycles are important suggestions made by The Economist. In addition, productivity can also be dramatically increased with revolutionary building materials.

Working with our clients around the world, PENETRON has developed key (crystalline) technologies to replace conventional concrete protection methods such as membranes (tedious to install, high failure rates) with smart products, which are applied / added to concrete to provide comprehensive waterproofing, self-healing capabilities and increased durability (adding up to 60 years or more to concrete structures). PENETRON products enable builders to accelerate their construction schedules, improve project efficiency and streamline project costs.

Scroll down for some examples of projects around the world that benefitted from PENETRON’s productivity boost!

Jozef Van Beeck
Director, International Sales & Marketing
PENETRON AT THE CONCRETE & CEMENT EXPO VIETNAM 2017

October 25-26, 2017, PENETRON participated in “Concrete & Cement Expo Vietnam 2017.” The exhibition is the only event in Vietnam focused on cement and concrete-related products and services, showcasing the latest developments in the cement industry and bringing together a large number of producers, equipment manufacturers and service providers.

PENETRON Vietnam showcased the full range of PENETRON waterproofing and concrete durability solutions and the company’s flooring products for industrial applications. Visitors also got a hands-on experience, learning how PENETRON products can benefit their projects and discussing their requirements with local and international experts from PENETRON.

Penetration Team at Concrete & Cement Expo Vietnam 2017.
In September 2017, PENETRON India hosted 35 students and 5 staff members from the Department of Engineering Science/Faculty of Engineering and the Built Environment of the University of Johannesburg, South Africa, under the guidance of Senior Lecturer Deon Kruger (PrEng).

Together with Mr. Sushil Kathar, Managing Director of PENETRON India, the group visited two PENETRON sites in Mumbai witnessed the performance and application of integrated PENETRON products.

Site visits included “The Address” at Ghatkopar and Immensa projects, where contractors and client engineers answered questions about the application and performance of PENETRON solutions on their projects. They also participated in knowledge-sharing on local building practices in both South Africa and India.

The trip for these young, aspiring engineers was made possible in part through the sponsorship of PENETRON South Africa, which continues to support the education of next generation engineers in Africa.

Students of University of Johannesburg during site visits in India

Banja Hydropower Plant, Albania

Europe’s largest generator of renewable energy and leading international hydropower
heavyweight, Statkraft (Norway) opened its first hydropower plant in Albania in September 2016.

The 73 MW Banja power plant is the first of two power plants being constructed in Albania as part of the 256 MW Devoll hydropower project.

Located 65 kilometers (40 miles) southeast of Tirana, the Banja hydropower plant will generate around 255GWh of renewable electricity per year. The plant consists of two main units, as well as an eco-flow unit capable of using the minimum flow for renewable power production. The dam above the power plant is 900 meters long (984 yards), 370 meters wide (404 yards) and 80 meters high (87 yards). It forms a 14-square kilometer (5,405 square miles) reservoir in the Devoll valley that will hold about 400 million cubic meters (520 million cubic yards) of water.

In total, the Devoll project will have an installed capacity of 256 MW, which will increase Albania’s power generating capacity by 17%.

To ensure a permanent waterproofing solution and strengthen critical parts of the construction, PENETRON repair materials, including PENETRON and PENECRETE MORTAR, were used in the control tunnel to seal all construction joints. PENETRON INJECT was applied to fill hollow areas in the concrete structures to restore structural integrity.
The new Linfen City Library in Shangxi Province is located in close proximity to the Fen River and has already become one of the city’s landmark buildings.

Situated in a lush green space near Xiangyun Lake, the unique design distinguishes the building from its surroundings, including bodies of water spanning over 97,000 square meters (24 acres). The total floor space of Linfen’s state-of-the-art library is a stunning 40,000 square meters. This includes 11,000 square meters (118,400 square feet) of archives and 29,000 square meters (312,150 square feet) of library space with a building height of 40 meters (131 feet).

The completely independent, 472 million CNY (71 million USD) archive and library are intelligently merged together as one, blending seamlessly into their environment, while maintaining two separate entrances to each segment of the building.

Due to its close proximity to the Fen River, the project required a permanent and reliable solution to protect its 7,157 square meter (77,000 square feet) basement, which houses an exhibition hall and offices, against any form of water penetration. Ultimately, the client chose PENETRON ADMIX as the only permanent, self-healing concrete protection solution that met the strict waterproofing requirements put forward by the project designers.

E.N.A.D Stadium, Nicosia, Cyprus
Located in the Cypriot capital Nicosia, Ayios Dhometios is home to the renowned, first division basketball team ENAD (Enosis Neon Agiou Dometiou or Union of Youth of Ayios Dometios), which was founded in 1937. The club has won two championship titles and one national cup and is one of the top teams in Cypriot basketball.

In 2016, the club constructed a new stadium for its main sports division, basketball, as well as for football, table tennis, and volleyball.

During the excavation of the construction site, a high groundwater table was noted, leading the project engineers to require a suitable and effective waterproofing solution to protect the concrete of the substructure from any water ingress. Due to its significant advantages of enhanced waterproofing protection, concrete durability and productivity, PENETRON ADMIX was incorporated in all below-grade concrete of the new ENAD stadium. Construction joints were permanently sealed using the PENEBAR SW-55 waterstop. Other components of the PENETRON product range included PENETRON and PENECRETE MORTAR for repair work, such as fixing faulty concrete parts, including honeycombing and cracks larger than 0.4mm.

The specified PENETRON solution ensures seamless operation of the ENAD stadium, protecting the fitness area, squash courts and other facilities in the basement for many years to come.
Located in close proximity to the waterfront in Florianopolis North, Residencial Quay, designed by HB Arquitetas Associades, is one of the island’s latest luxury waterfront apartment complexes.

The Residencial Quay complex features two dozen luxury apartments with amenities that include a wine bar, a bistro restaurant, a swimming pool and lounge, and a fitness spa. The apartments have two- to five-bedroom layouts, ranging from 105-655 m² (1,130-7,000 square feet) in size, all complete with underground parking.

The PENETRON Brazil team worked closely with CFL, the project contractor, during the early stages of construction to provide a reliable and permanent waterproofing solution. With a location directly adjacent to the Jurerê Internacional Beach, the original plans called for asphalt and a bituminous membrane to protect the concrete, where the average depth of the basement and parking garage structures is 1.5 m (5 feet) below the water table.

The high water table and the nearby Atlantic Ocean made the waterproofing of the below-grade concrete a critical and important component of the Residencial Quay project. Rather than selecting a conventional system, CFL decided to rely entirely on an integral waterproofing solution that significantly reduces concrete permeability, water ingress (even under high hydrostatic pressure) and increases the durability and service life of the structure.

PENETRON ADMIX was added to the concrete mix, supplied by Engemix, used in the underground garage, an area of 5,500 m² (60,000 square feet). All concrete joints were permanently sealed with over 300 m (1,000 feet) of PENEBAR SW-55 waterstop. PENETRON ADMIX was also added to concrete used in the Residencial Quay swimming pool (30 m x 11 m x 1.40 m deep) and the spa areas.

The application of PENETRON ADMIX not only allowed the contractor to achieve all waterproofing requirements, but also helped CFL to significantly improve their productivity, resulting in a shorter construction schedule and subsequent cost-savings.
Transforming a once-rough harbor area, the newly established Silo District, an extension of Cape Town’s Victoria & Alfred Waterfront, has become Africa’s new center for contemporary art.

In its center, the Thomas Heatherwick-designed Zeitz Museum of Contemporary Art Africa (MOCAA) is a transformed 9,500 m² (102,250 sf feet) silo complex that was originally built in 1924. It houses the largest exhibition space (6,000 m²; 64,580 sq feet) on the continent, including some 80 galleries spread across nine floors – making it the world’s largest African art gallery. It focuses on 21st-century art from Africa, featuring photography, fashion and multimedia installations. Exhibitions of Africa’s current top-of-the-crop artists, such as William Kentridge, Kudzanai Chiurai, Kendell Geers, Nicholas Hlobo, Penny Siopis, El Anatsui and Mary Sibande - all mainstays at Zeitz MOCAA.

The centerpiece atrium, created by carving grain-shaped openings in the cement walls of a dozen silos, 30 m high (98 feet) and 5.5 m (18 feet) in diameter, gives visitors an impressive welcome. From here, the individual galleries of this 38 million USD redevelopment are accessed by lifts and spiral steel staircases.
The only addition to the otherwise preserved outer structure was the installation of pillowed, multifaceted windows of the newly built, 28-room luxury Silo Hotel, which occupies six floors above the museum and features a penthouse suite and an iconic rooftop bar.

PENETRON products were extensively used to protect all new concrete at Zeitz MOCAA. More than 1,000 meters (3,280 feet) of PENEBAR SW-55 waterstop were used to seal construction joints, as well as the unique, convex glass windows of the Silo Hotel.

PENETRON ADMIX (with an integrated green tracer) was added to all newly-poured below-grade and exposed concrete structures and all on site water tanks. PENECRETE MORTAR and PENETRON coating were utilized to repair some minor honeycomb areas on the project.

The PENETRON South Africa team worked closely with Sutherland Consulting Engineers to ensure the protection of Africa’s most iconic concrete building to date. Click here for project video.