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Unical floors for the new Milan Innovation District

THE MILANO INNOVATION DISTRICT (MIND) IS AN URBAN REGENERATION PROJECT AIMED AT TRANSFORMING MILAN INTO A GLOBAL CENTER OF ECONOMIC, CULTURAL AND TOURIST ATTRACTION. UNICAL IS PARTNERING WITH DESIGNERS AND COMPANIES TO ENSURE THAT MIND MEETS THE CRITERIA OF QUALITY, CONTINUOUS EVOLUTION AND SUSTAINABILITY.

MIND is a vast and contemporary international district, a place of knowledge and sustainable growth that is open to anyone who innovates, does research or studies, to institutions and companies alike, as well as to people's private lives.

The project originates from a deep public-private partnership between Arexpo, a public majority-owned company that owns the area, and Lendlease, a multinational real estate company, which invested €2.4 billion to develop this unique and ambitious urban regeneration project. MIND is located on the site of EXPO 2015, a world expo that hosted 141 countries and 21 million visitors, and with an area of about 1 million square meters, it serves as a gateway and hub for a European network in Milan as a key part of its urban development.

MIND entered Unical's archival records for the casting of the largest foundation slab in Europe for the Galeazzi Orthopaedic Institute in a single pour, namely 32,836 cubic meters of concrete in just 94 hours in mid-2019 from six of our production plants in the Lombardy Area.



1. RENDERING OF THE MIND AREA
2. CASTING OPERATIONS BY TRUCK-MOUNTED CONCRETE PUMP
3. APPLYING AND LAYING THE CONCRETE
4. PART OF THE FINISHED FLOOR

Unical was hired by several contractors working in the district to supply over €2 million of concrete throughout 2024, while in the fall the CMB company in Carpi contacted the engineering department for a study on the design of a non-standard industrial floor that would be constructed with a structural screed laid on top of a prefabricated floor inside a building intended for parking. A task force chaired by the designer held a series of meetings to study the components needed to meet the basic requirements and the desired – and sometimes unexpected – quality performance.

The basic concrete had to have a compressive strength of C30/37 in a w/c ratio of 0.50, a consistency class of S5, with a maximum aggregate diameter of 31.5 mm. After several in-depth studies of mixtures performed first in the laboratory and then on an industrial scale, we were able to achieve a restrained expansion of $>250 \mu\text{m/m}$ after 48 hours, as assessed according to UNI 8148 (method B), and a restrained shrinkage of $<150 \mu\text{m/m}$ after 60 days, by using superplasticizing, expansive, shrinkage-reducing admixtures (SRA), and structural fibers for a total amount of approximately 35 kg/mc, supplied by General Admixtures S.p.a. Once these performances were certified, we set about qualifying the product at the concrete batching plant in Pero (MI), by creating a mock-up that simulated the technical, installation and environmental characteristics to demonstrate the end result to the various operators involved.

The task force is of the opinion that floors cast on partially prefabricated slabs should not be considered “concrete floors” in the strict technical sense, since the stresses generated are different and much more intense. The nature and distribution of the stresses are such that even if joints are included to guide the formation of cracks, they could quite plausibly form in unintended locations. Ultimately, the monitoring of the product during both the qualification and performance verification phases led the engineering team to plan



periodic update and data analysis meetings with the designer and the company to track the progress of the supplies and results achieved. These will be accomplished through check-ups and laboratory tests in controlled

environmental conditions so that the mixtures can be adaptively optimized and ensure the consistency of their performance over time, taking into account that the deliveries are scheduled to end in August 2025.

