References

Cartuja Qanat



Restoration of former exhibition area of Expo'92 with air conditioning

Disruptive urban transformation through water and Uponor's Thermatop M solution.
Cartuja Qanat is a project of transformation. A vanguard of urban planning of the future and an evolution of the conception of public space through the experience it proposes considering environmental comfort, social exchange and the promotion of sustainable models of urban growth.

The intervention area of the project is Thomas Alva Edison Avenue, in the Cartuja Science and Technology Park (Seville). The project UIA03-301-Cartuja Qanat "Recovering street life in a climate-changing world" is co-financed by the European Regional Development Fund through the Urban Innovative Actions initiative and has a budget of 5 million euros.

Uponor has participated with its solution of Invisible Climate Control through Uponor Thermatop M integrated in 700 square meters of singular roof composed of 9 panels with different degrees of inclination, a total of 125 distribution circuits connected with Uponor Uni Pipe PLUS system and 14 prefabricated distribution manifolds Uponor Comfort Port Duo.

Project Facts:

Location
Sevilla, Spain

Completion
2022

Building Type
Cultural institutions

Address
Parque Científico y Tecnológico de la Cartuja (Sevilla)

Project Type
New building

Partners

Emasesa
Gerencia de Urbanismo
PCT Cartuja
Universidad de Sevilla
Instituto Eduardo Torroja del CSIC
Fundación Innovarcilla

Disruptive urban transformation through water and Uponor's Thermatop M solution

"We had the need to define non-inertial radiant solutions to be integrated into urban elements. Uponor and the Termotecnia Group have been collaborating for more than 15 years in the field of energy efficiency in buildings and their installations. Uponor proposed the solution and provided all the human and material resources".

Dr. Jose Sánchez Ramos, Professor at the University of Seville and scientific-technical co-responsible for the project at the University of Seville.

The Qanat solution is a reinterpretation of the ancient Persian Qanats, hydrogeological infrastructures for capturing a layer of groundwater for suction to the exterior. This reinterpretation manages to quadruple the cooling efficiency of the ancient Qanats by eliminating the need for deep excavations.

An ecosystem where the main element is water, but also earth and air.

"Cartuja Qanat proposes the recovery of private-public open spaces for use in conditions of adequate thermal comfort in a world of climate change. The integral solution guarantees the natural conditioning of the space, the recovery of rainwater and intelligent control," says Dr. Servando Álvarez Domínguez, professor and head of the Thermotechnics Group at the University of Seville and principal investigator of the Cartuja Qanat project.

The solution designed by the Termotecnia Group combines the effective storage of hot/cold water produced by natural techniques with the production of hot/cold air by means of submerged and/or buried ducts in the ground adjacent to the system. Two 30-metre Qanats have been dimensioned to produce more than 50,000 m3/h of air, allowing this open space to be conditioned even when outside temperatures are above 40ºC.

> "When the project developers contacted us, they were planning to air-condition the space using an active slab system, making the most of the water flow from the Qanat. That was when it became clear that the Thermatop system could be perfectly adapted to the unique needs of this semi-open building, as it provided the benefits of an active slab system, but increased the speed of response by reducing the inertial component" Israel Ortega Cubero, Director of Training and Technical Services Uponor Iberia.