

## **Historical and cultural context**

The story of this extraordinary place has been marked not only by the local history, economy and culture, but above all by the political choices that have brought this great factory, which lay abandoned for years, back to life – a statement that here, work is a value.

In order to Italianise South Tyrol, Mussolini promoted the industrialisation of the city of Bolzano, offering entrepreneurs strong financial incentives and an abundant supply of energy. Between 1934 and 1939, Montecatini was the first company to settle in the area. Lancia, the Falck steelworks and the Magnesio factory followed suit, making up the great industrial area of Bolzano.

The aluminium factory had proven of strategic importance during the fascist regime as it served for the electrification of the country. After the Second World War it became the biggest producer of aluminium in Italy, employing over 1,700 workers, also thanks to the low-cost energy supplied by the hydroelectric power stations in the surrounding area, which fuelled the factory's aluminium smelting furnaces. In the 1970s, however, the company began to experience a decline in production, leading to the closing down of the two production plants in the early 1990s and to the purchase of part of the land – approximately 9 hectares – by the Autonomous Province of Bolzano. As building land in the city was scarce, a portion of the buildings was immediately demolished to make space for new companies. In 2004, the main buildings of the industrial complex were listed: the two power transformation plants, "Bolzano 1" and "Bolzano 2", and the low buildings facing the road, formerly used as the caretaker's house, the management building and the canteen. This was when the debate began about their possible use.

In the end the choice pointed clearly towards the idea of a research and innovation centre that brings together in one place the Free University of Bolzano, several research centres spread out across the area (Eurac, Laimburg, CasaClima, Fraunhofer, ...) and private businesses, in order to stimulate collaboration and encourage the development of the area's economy and business. This enlightened political decision lay down the right premises for a large urban regeneration operation that promotes the work and the intelligence of our community. The TechPark is called "NOI", which stands for Nature of Innovation. Being committed to innovation inspired by the laws of nature means striving to work sustainably and flexibly, adapting choices to the specific needs of local businesses but also and above all respecting the environment that surrounds us.

The technology centre come to life day by day: over 60 businesses have already moved in and over 500 researchers from various research institutions and the Free University of Bolzano work here. Over the next years we will develop a research campus in partnership with the private sector as well as set up the new department of engineering.

## **Description of the intervention**

In 2010 the planimetric/volumetric and functional programme of the new technology centre was remodelled following the provincial administration's decision to destine the whole of the former Alumix site to the new research centre, excluding the museum use initially required by the competition. The executive project thus became more precise, with a clearer functional organisation of the different factory buildings. The architectural elements were subjected to the strict scrutiny of the Superintendence led he project to find its exact dimensions

– in the ratio between built areas and free areas and in the relationship between the “cultural context” of the pre-existing buildings and the new building, in an exchange founded upon the acknowledgement of the different characters and a synergy towards a shared goal.

The main entrance to NOI Techpark on via Alessandro Volta coincides with the original entrance, aligned with the tall portal of the Bolzano 1 plant. The road-facing building, previously functioning as the caretaker's house and other facilities, hosts the new restaurant-café, open to NOI users as well as to the city's inhabitants. The interiors were completely rebuilt to address the needs dictated by the building's new use. As this was a functional building, its meaning lying mostly in the linguistic and, partly, material harmony with the two plants, it should come as no surprise that only the exterior of the building was listed. The new organisation of the interiors – which in the restaurant room repeats the pre-existing arrangement of pillars and skylights – suggests essentiality and domesticity, greatly contributing to the definition of a coherent and unitary image for the renovated building. Entering through the gate from the street, an elongated square-park opens up, running east-west with views to Castel Firmiano and to the crest of mount Macaion and defined, on the southern side, by the succession of the facades of the

two power transformation plants and of the Black Monolith. In front of the new building stands the old water tower, entirely painted in 2008 by Polish street artist Mariusz Waras on the occasion of Manifesta 7, which finally appears to perfectly “fit in” with the new context. Designed in close connection with the Bolzano 1 plant and featuring internal connections to it on each level, the Black Monolith sits alongside the old building, set slightly back from the corner tower – itself an extension of the original factory – making apparent the logic of addition that governs the complex. Vice versa, on the opposite side, the new volume partly wraps around the old plant, its extension dictating the width of the monolith blocks still to be built on the plot on the opposite side of the new access road to the south of the technology park. On the ground floor of the monolith is the main entrance to NOI Techpark, with the foyer and the area behind it – called NOISE, which stands for NOI Social Experience – destined to become a meeting place for researchers and citizens. The underground floor is taken up by conference rooms of different sizes, whilst the first floor is reserved for the administration offices. The second, third and fourth floors host the offices of the NOI research staff. Bolzano 1 now houses laboratories, workshops and the offices of the young business incubator. Bolzano 2 houses research labs, offices and facilities for the institutions and organisations participating in Techpark.

Compared to the work on the interiors of the restaurant-café, the renovation and functional adaptation of the spaces and structures of the two power transformation plants was far more complex and interesting, both in terms of the solutions adopted and in terms of the outcomes and implications. Although they look somewhat different from the outside – Bolzano 1 is more sophisticated in the design of the elevation, in the variety of Clinker brick used for the cladding and in the extension of the glazing, Bolzano 2 is more austere, both in the form and materials – the two buildings presented very similar characteristics both in terms of the structural skeleton and the organisation of the interiors. These consisted of centres of distribution and service located by the ends of the buildings and of large halls, developed longitudinally with different heights, for the runs of the overhead crane and the three-dimensional cement support frames for the isolating “sprockets” of the power transformation plants. A fascinating “landscape”, as shown by pictures predating the intervention, that appeared to be incompatible with the spaces and functions to be hosted in the two old factories.

The internal characteristics of the Bolzano 2 plant called for a restoration strategy based on a limited extension of the basement floor and a considered “filling” of the elevated spaces. The first operation, necessary to create lab space for the university, entailed the extension of the basement present only underneath a part of the building and only 2.60 metres in height, raising the ceiling height to almost 4 metres. This required demolishing the floor on the ground floor, digging up the foundations, putting metal scaffolding in place to support the structural equipment during the demolition of the old plinths and subsequently re-lining the pillars up to the second-floor floor; finally, along the northern front of the plant a courtyard was dug below ground level to provide the labs with natural light and a view to the outside.

On the ground floor of the building, new double height labs were inserted, following the existing structural organisation. The span of the distribution corridors gives a feeling of the original dimensions of the elevated spaces. On the second floor, the triple height three-dimensional frameworks of the transformation rooms remain almost completely visible, thanks to the use of glass doors and windows for the offices, as well as being evoked by the isolating “sprockets” in the girders running across the corridor. Also, on the second floor, in the wing to the south of the overhead crane, two overlapping levels of labs are hosted in a free-standing volume, detached from the sidewalls and from the ceiling. Covered in waxed black iron sheeting, the parallelepiped also separates the small auditorium from the media library, located respectively at the western and eastern ends, close to the main stairwells.

In Bolzano 1, given the clearer spatial organisation and the state of conservation of the existing structures, the renovation followed a different strategy. The decision was made to confer to the large overhead crane hall the status of “industrial heritage”, restoring it and leaving it empty, characterised by the symbolic gilding of the overhead crane.

The wing to the south of the overhead crane hall, strongly damaged during the dismantling of the furnaces, was rebuilt and raised by three floors; the wings to the north were “filled”, on the first two floors, with a solution similar to the one adopted in Bolzano 2, whilst on the three upper floors a completely different solution for reusing the original space was applied, intending to renovate it whilst preserving its memory. Here the frame of beams and columns composing the structure of the power transformation room were left visible. Following due strengthening through metal structures, small wood and glazing volumes were attached to this frame, spaces for offices and meeting rooms connected by walkways, in a sort of three-dimensional materialisation of the concept of “cluster” inherent to the research activity of NOI Techpark.

The Black Monolith, redesigned and stripped of any accessory element, is the barycentre of the complex of interventions described thus far. Slightly titled by 2 degrees 10 minutes along the northsouth axis, the front of the compact volume is lifted up by a diaphragm and pillars clad in polished aluminium sheets, accompanying access from the external portico to the foyer and sinking into the cavea leading to the underground floor. Through a game of reflections and deformations, they create the illusionistic effect of a co-penetration with the surrounding open space.

Walking along the entrance portico, the interiors of both buildings can be seen at the same time: the main hall of Bolzano 1 with the gilded overhead crane, the whole depth of the foyer of the Black Monolith until the southern front and above, through the glazing, the large roof terrace that the offices and walkways on the second and fourth floors look out on.

Past the entrance and the foyer, lit from above by a sort of crevice, we reach the room that takes up the entire southern part of the ground floor, where thanks to mobile and transformable platforms the space can be

configured and adapted it to every public occasion and citizen event. On the three floors above the first, the space is organised around the large roof terrace, with connecting paths along the western and eastern sides. The offices and meeting rooms are housed in transparent air-conditioned volumes. With the exclusion of the southern front, entirely glazed in anticipation of the construction of additional blocks in the adjacent plot, all sides of the monolith are wrapped in a continuous layered façade, pierced by twelve overlapping glass eyelets that hide the real number of floors in the building and accentuate its "object" character. This is further enhanced by the external aluminium foam panels in dark grey – a calculated choice, because the material and the colour evoke the memory of the site's origins and the reference that inspired the regeneration project.

We believe the foundation of NOI Techpark lies in this very relationship: the old buildings, the carriers of "value" now devoid of their original function, acquire "heritage" value through their new use, their re-insertion into a life cycle. They contribute, together with the Black Monolith, to conferring new "value" to the architectural complex as a whole, transforming a "heavy factory" into a "research factory".

### **Energy and sustainability**

The new building called 'Black Monolith' was conceived as a low energy building and specifically as a "Net Zero Energy Building (NZEB), essentially consuming what it produces. It has a high degree of insulation for the reduction of thermal consumption, and a strong focus on refrigeration and electrical consumption. The building has been selected as pilot for the seventh edition of DIRECTION (Demonstration at European Level of Innovative and Replicable Effective Solutions for very Low Energy new Buildings) dedicated to the study and verification of new buildings with an innovative, economic, replicable solution, to high energy efficiency and low energy consumption.

The Black Monolith was conceived and manufactured to meet the highest energy efficiency requirements. Following the completion of the construction and following inspections by the KlimaHaus inspectors, the new Black Monolith building was certified "KlimaHaus A" for the facades and "KlimaHaus A GOLD" in terms of overall efficiency.