



A Tata Steel Enterprise



Case Study

“experimenta – Science Center” in Heilbronn, Germany

Product:

6'600 m² SUPERHOLORIB SHR 51/600

Building owner:

Dieter Schwarz Stiftung gGmbH, Neckarsulm /
Experimenta gGmbH, Heilbronn, Germany

Architect:

Sauerbruch Hutton Gesellschaft von Architekten
mbH, Berlin, Germany

Client:

spannverbund GmbH, Waldems-Esch, Germany

Realisation:

2018 / 2019

Structural engineering:

sbp (Schlaich Bergermann Partner),
Stuttgart, Germany



Creating space for knowledge

experimenta in Heilbronn sets architectural benchmarks



Don't describe it, show it – that appears to be the motto of the “experimenta – Science Center” in Heilbronn in more ways than one. While the interior visualises natural science and technology for people of all ages, this concept is also reflected on the outside in the architecture. It therefore seems outdated to describe with words the new building, which opened in March 2019 on the experimenta site. The largely cubic-looking language of forms with its generously sized glass elements could hardly be more futuristic. At the latest when one takes a look at the interior of the building, it becomes clear what enormous spans are necessary to implement the pentagonal footprints of the individual storeys. It was ultimately made possible by the SUPERHOLORIB® composite steel elements from Montana Building Systems Ltd. These connect slim storey floors with large spans and high cost-effectiveness.

The experimenta – Science Center opened back in 2009 in the former Hagenbucher warehouse building in Heilbronn. The goal of the installation is to make topics from natural science and technology tangible. A modern, new building has supplemented the site on the Krane Island since spring 2019. Directly adjacent to the historic brick building, a highly modern glass complex was constructed that now houses parts of the Science Center such as the so-called Science Dome.

Complex architecture for complex contents

The Heilbronn experimenta is subdivided into three areas: the Discoverer Worlds, the Experience Worlds and the Researcher Worlds. They transcribe topics from metabolism to world view and experimental theatre, and from observatory to chemistry, physics and computer science. The aim here is to give a better understanding of the complex contents above all by means of own experiments and

around 300 participation stations – and it's not only for children, but also for adults. With the new building on the experimenta site the exhibition has not only gained more space, but also completely new spatial options. For example, the so-called Science Dome was installed directly in the front of the multi-storey building. A dome spans this mixture of planetarium and theatre and offers a projection area of 700 metres. The realistic representation of the night sky is easily

possible here. This round shape on the front building is also easily recognisable from the outside.

The five storeys of the new building rise up behind the dome. All the floors of this modern building have a pentagonal footprint; however, they are not placed congruently on top of one another, but laterally offset and thus optically stacked. In this way the massive building elements appear almost to lie airily on top of one another. Apart from the actual exhibition areas, the levels also house the so-called space spiral, which serves to connect the floors. This was ultimately the challenge that lay in implementing the plans of the Berlin-based architect's office Sauerbruch Hutton. The footprints of the individual storeys as well as their connection required an individual design of the storey floors. To do this, suitable construction elements had to be found that fulfilled all the building physics requirements without overtaxing the confined storage space of the building site in Heilbronn city centre.

High-performance and space-saving

The contractor, Spannverbund GmbH, already had the right partner at hand on account of its many years of cooperation with the Swiss company Montana Building Systems Ltd. – a reliable manufacturer with good product quality and perfect delivery reliability. "Most important, though, was of course that we offer a high-quality solution in our SUPERHOLORIB® steel composite profiles, which were a perfect match for the requirements of the project in Heilbronn", explains Project Manager Christoph Schlosser from Montana. A particularly high load-bearing floor solution was necessary for the implementation of the pentagonal storeys of the new experimenta building. The SUPERHOLORIB® profiles, which are made of galvanised sheet steel, were used as the basis for the composite floor decks required here. The composite system combines the building structure properties of steel and concrete. While the steel inserts are embedded in the concrete layer in classic reinforced or

pre-stressed concrete and only serve there to reinforce the concrete, the steel profiles and reinforced concrete parts are connected in steel composite construction by means of the undercut profile shapes. In this way the strengths of both building materials are united. Whereas the steel copes with the tensile forces, the concrete dissipates the compressive forces. This makes the construction of particularly wide floor spans possible. The SUPERHOLORIB® SHR 51 element with a thickness of 1.25 mm used in Heilbronn offered the advantage of prop-free assembly with spans of up to three metres even during the construction phase. That contributed here to a significant saving of time and costs.

The SUPERHOLORIB® elements used were prefabricated in the factory for the error-free and time-saving installation of the individually designed storey floors. A further advantage of the sheet steel panels came to the fore where adaptations were necessary on account of the local conditions: due to their composition





areas that now offer adequate space for the experimenta's so-called theme worlds. At the same time, the spiral in the middle of the building forms an impressive link between the individual storeys. Room-high truss girders with composite steel beams in between them form framework pipes that connect storey-wise to a steel reinforced concrete core. The extensive interior spaces are ultimately based on this inherently rigid overall construction. Apart from the exhibition areas, they also contain recreational areas that offer visitors the space to take in the special architecture. Hence, it is certainly not just its closeness to water that has led to the unusual new building already being referred to as "Heilbronn's architectural beacon".

they could be adapted conveniently and quickly to the on-site conditions. Thanks to the space-saving properties of the product, the storage of the SUPERHOLORIB® packages, which are only 60 centimetres wide and easily stackable, did not overstep the bounds of the construction project with its inner city location.

Heilbronn's architectural beacon

After a construction period of around four years, the new experimenta building was finally opened on 31 March 2019. Extensive archaeological finds had delayed the construction unexpectedly. The extension building for the learning and experience world now shines futuristically alongside the traditional brick building. The five storeys of the geometrically sophisticated building are not only an eye-catcher from the outside: resulted in generously sized, airy exhibition



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