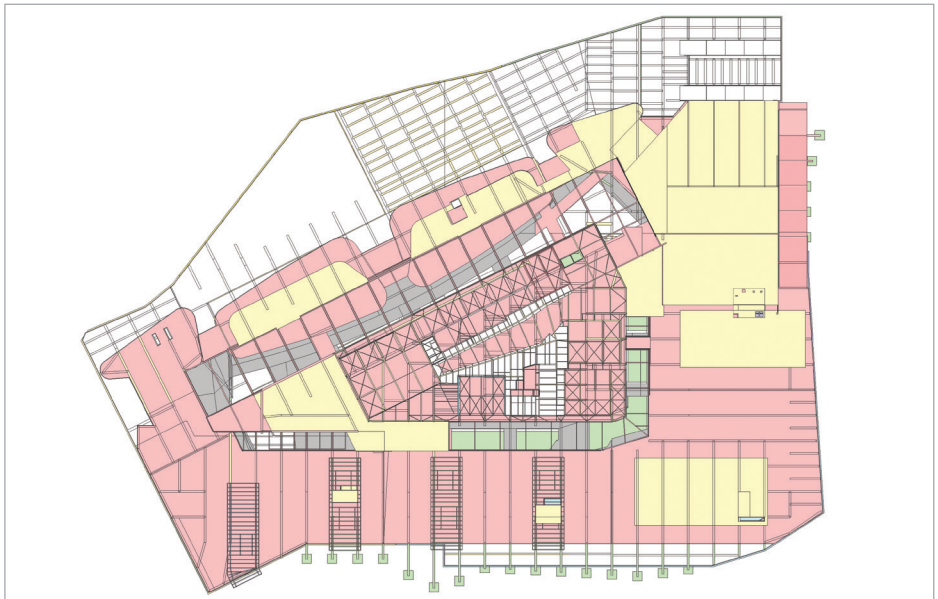
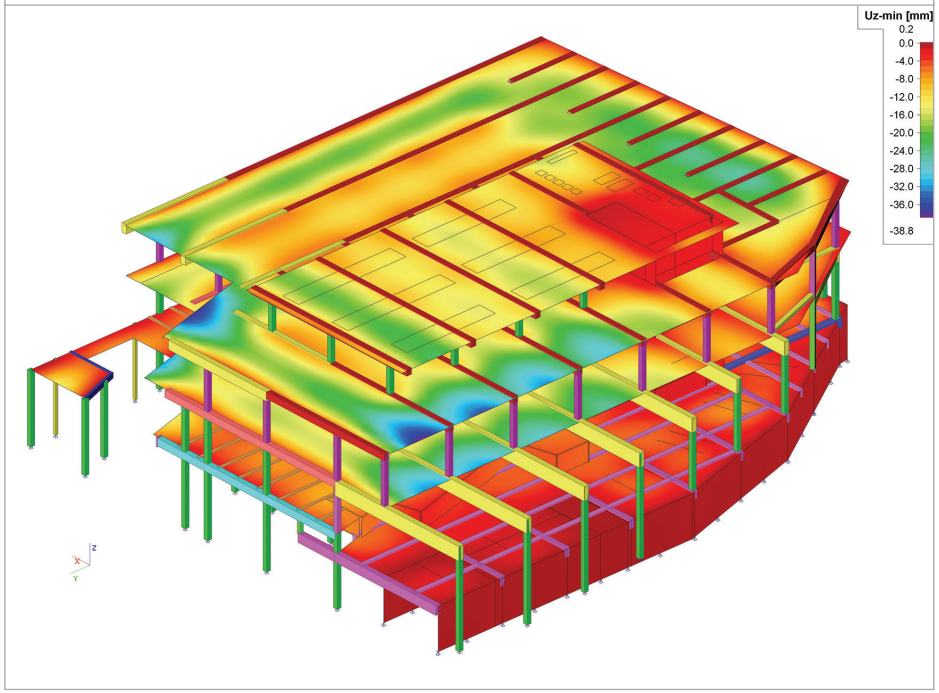
Galerie Šantovka - Olomouc, Czech Republic





Galerie Šantovka in Olomouc is a multifunctional complex with 46,000 m^2 of areas comprising shops, banks, restaurants, a car park with 1,000 spaces, cinemas, an 18-lane bowling leisure facility, warehouses, and service and loading communications. The whole object has a substantially irregular elongated shape graduating from the edges to its centre. Individual parts grow from the coherent basement and are further divided by the internal circular gallery. The largest length reached by the object is 235 m. It is divided into 14 expansion units. The building consists of two underground floors and three overground floors. Two bridge constructions are connected to the object and a third one has been projected. In order to reduce the construction time as much as possible, the object was designed as prefabricated in its greatest part. Only the necessary parts were designed as monolithic. On the 3rd overground floor, occupied by multiplexes and a theatre, it was especially steel constructions that were used, due to variability.

Description of the skeleton

The object is embedded on a monolithic base plate with stilts. The monolithic outside walls are located around the whole perimeter of the object, apart from at the locations of drive-up ramps. The staircases are prefabricated. The basic pillar raster is 8.1 m x 8.1 m, with the stilt raster being twice this measurement. The support system of the 1st overground floor - car park - consists of a reinforced concrete prefabricated skeleton. The reinforced concrete monolithic cores and beams are mutually interconnected by the semi-prefabricated panel-board with a minimum thickness of 250 mm. The beams are designed as standard with a load width of 8.1 m, to a span of 8.1 m. In the places under the tram, the load width is 4.05 m. The standard pillar size is 500/500 mm and a maximum of 700/700 mm. The reinforced concrete cores and walls are 250 mm and 300 mm thick. The support system of the 3rd overground floor - multifunctional premises, restaurants - consists of a similar prefabricated system to that of the lower sections, with added beams of the DELTA BEAM construction system. In certain places, the floor slab is necessarily finished with a reinforced concrete parapet. Bowling and multiplexes - the support system consists of steel pillars distributed around the perimeter and inside the construction, on which the solid-web steel beams are placed. The stability of the whole object is ensured by the wall and ceiling fastening. The wall construction is made of holorib. In the multiplex section, a steel ceiling grid has been designed, on which the corrugated iron with a concrete topping is placed.

Foundation and static load of the object

Prior to the object realisation, it was necessary to construct a lagged building pit for the underground floor development. The construction was built below the groundwater level. The drilled stilts' perimeter was 1,300 mm. The base plate, a maximum of 1,200 mm thick, was designed to also withstand the buoyancy of water up to the level of the inlet holes, because in the case of the load of "1,000-year water", the building would be under threat. The considered load of the multifunctional premises is from 6.5 kN/m^2 to 9 kN/m^2. Ramps for personal vehicles, trucks and sections under the tram have the load set pursuant to the applicable clauses of the ČSN EN 1991. In the places of intensive greenery, the load on the plate is approx. 23 kN/m^2. The climatic load was considered. The seismic load was not decisive in the design.

Description of the Calculation

From the project stage up to the production documentation, the construction was drawn (projected) in 3D, in the Allplan program from the Nemetschek Company. From the drawing program, elements and surfaces were exported through the ifc file in the Scia Engineer program. Subsequently, the construction was divided into expansion units. Individual units were thereafter solved separately. Moreover, other smaller sections were dealt with separately and then re-inserted to the expansion unit. Basic verification in terms of carrying capacity and deformation was evaluated in the Scia program. The whole model contained 5,787 elements - 1D and 1,156 elements - 2D. A total of 49 load conditions were used, in basic and extraordinary combinations. Production documentation of prefabricated constructions was processed for 1,400 various types of elements. The total volume of prefabricated elements was approximately 13,000 m^3.

Software: Allplan Engineering, Scia Engineer

De Bondt s.r.o.

Contact Daniel Dohál
Address Rybárska 7389
91101 Trenčín, Slovakia
Phone +421 327480011
Email ddohal@debondt.sk
Website www.debondt.sk

De Bondt
projektovanie stavieb

The planning and engineering bureau De Bondt, s.r.o., was founded in December 1996 by the parent Dutch company De Bondt B.V. and Slovak associates. Since then, the company has designed and consulted on many industrial, commercial and residential projects all over Europe - the Netherlands, Germany, the Czech Republic, Slovakia, Poland, Finland etc. - and outside Europe - Saudi Arabia, Canada, Afghanistan.

De Bondt, s.r.o. is specialised in providing technical services:

- Statics of steel, reinforced concrete, prestressed concrete and masonry constructions
- Plans and shop drawings for steel and reinforced constructions
- Optimisation of constructions,

and in providing services and consulting for developers - we can provide the complete support and documentation from the feasibility study up to the project documentation, participation in awarding the contract, technical supervision and the final evaluation of project.

Project information

Owner	SMC Development a.s.
Architect	Benoy - United Kingdom, A8000 - Czech Republic
General Contractor	Metrostav a.s.
Engineering Office	De Bondt s.r.o.
Location	Olomouc, Czech Republic
Construction Period	01/2012 to 12/2013

Short description | **Galerie Šantovka**

The Šantovka multifunctional project is emerging in the original location occupied by the MILO Olomouc plant and represents an overall revitalisation of the land in the vicinity of the historical town centre. On the total area of 11 ha, a modern urban district is to be gradually built, with objects for living, commerce as well as administration.
Galerie Šantovka is the first stage of the whole project, offering more than 46,000 m² of leasable areas with approximately 180 commercial units and 1,000 parking places.