

## BARAN PROJEKT s.r.o.

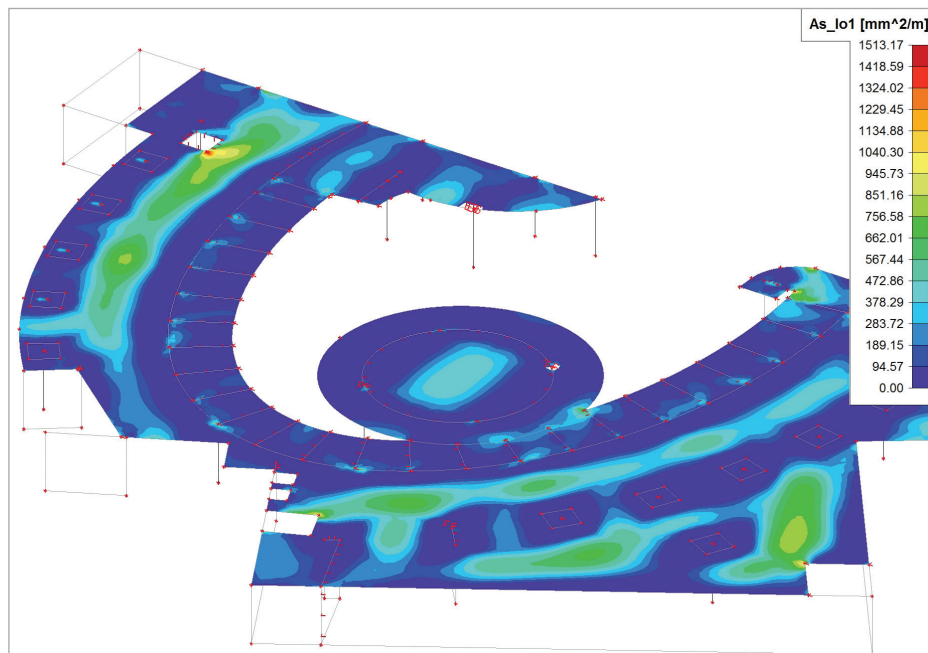
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BARAN PROJEKT s.r.o. was established in May 2006 as a continuation of already elaborated projects of its founder Jozef Baran. After his graduation at the Slovak University of technology in Bratislava in 1976 he started to work as a structural engineer at the state-owned company SPTU, one of the biggest design engineering companies in Slovakia. After the change of the political system in 1990 he passed the examination of a professional qualification, obtained the authorised certificate from the Slovak Chamber of Civil Engineers and in accordance with the new laws he started to work

as a structural engineer - entrepreneur. This work - complex project documentation in the field of structural engineering, static and dynamic analysis as well as the expertises - he has been doing since his graduation.

Some of the many projects that he has worked on as a lead structural engineer can be seen on the website [www.baranprojekt.sk](http://www.baranprojekt.sk).



Software: Scia Engineer

## Mirage Shopping Centre - Zilina, Slovak Republic

### Description of the project

The building is designed as a reinforced concrete monolithic skeleton structure with bracing walls. It consists of two main parts - four-floor bodywork of the existing park house and the new building with eight floors (four underground floors).

The foundation slab of the new building has a thickness of 800 mm and is laid on the clay stone layer 1.5 m under the underground water level.

The foundation slab and the peripheral underground walls are made of watertight reinforced concrete. The vertical load-bearing elements are reinforced concrete monolithic columns and walls.

The walls of the vertical communication cores ensure the stability of the building.

The spans in the main elliptic axis are 10.5 m. There is a primary continuous beam placed on these columns as well as on the secondary conic beams anchored to it and taking the cantilever of 4.2 m.

The cantilever circles around the whole interior space. In the third floor there is a main elliptic beam placed on

the end of the cantilever performing as a support for the great glass dome skylight.

The span of the skylight is 32 m. Horizontal load-bearing elements are beamless solid slabs with reinforced concrete mushroom heads.

The thickness of the slabs is 220 mm and the mushroom heads ensure that the allowed deflections and shear forces are not exceeded.

The existing park house was executed with the possibility of the bodywork for four uniform floors. New architectural design requested different modulus axis. That is why the new massive reinforced concrete grid was designed at that spot, taking the columns of the upper part. Some vertical load-bearing elements of the existing park house had to be strengthened. Here were added the micro piles working together with the existing foundation slab at positions where the pressure in the foundation base was too high.

### The use of Scia Engineer software

The software Scia Engineer was used for the static and dynamic analysis. The Slovak standards were used for the calculation.

Two complete models of the structure were made and all load-bearing elements were designed.

Scia Engineer allowed to model the complicated building very easily. It allowed for the preparation of several alternatives of the structure as well. There were more designs in the process of the work according to client's and architect's demands and Scia Engineer made it possible to change the structure very easily.

The real deflections of the structure were measured on site, and the results are very near to the calculated deflections.



# Mirage Shopping Center

Zilina, Slovak Republic

## Project information

|                     |   |
|---------------------|---|
| Owner               | Mirage Shopping Center a.s.                             |
| Architect           | Michal Divis Architekti s.r.o., Zilina, Slovak Republic |
| General Contractor  | Ekostav Slovak Republic s.r.o.                          |
| Engineering Office  | Michal Divis Architekti s.r.o., Zilina, Slovak Republic |
| Construction Period | From January 2009 to November 2010                      |
| Location            | Zilina, Slovak Republic                                 |



## Short project description

*The project is about the Mirage Shopping Centre of Zilina. Citizens and visitors can enjoy a walk across the covered square, do some shopping in numerous shops offering world-renowned brands and utilise many top-class services. The Mirage Shopping Centre features 4 cinemas, many restaurants, pubs, the town's largest children's corner, bowling and other sport facilities. Mirage offers a high-capacity underground car-park. Unique are the cascading floors with barrier-free access, dominated by a glass dome skylight in the building roof enhancing the feeling that the visitor is actually on a square in open air.*

