S.C. ROM CARO SERVICE S.R.L.

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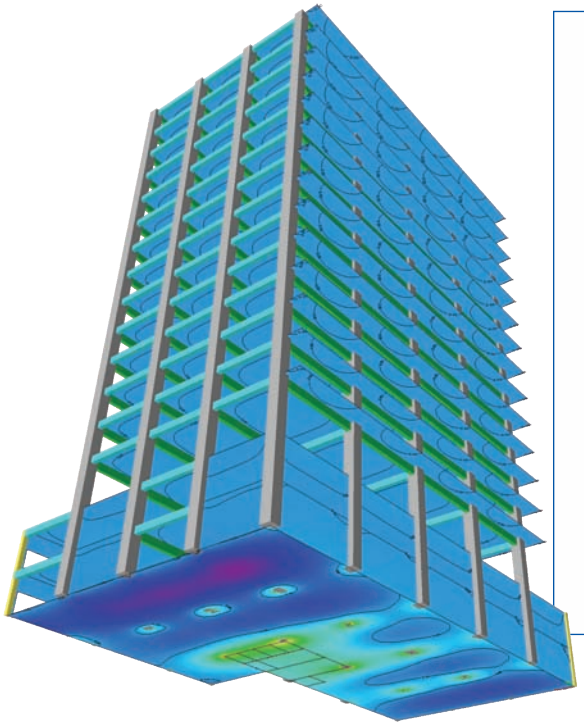
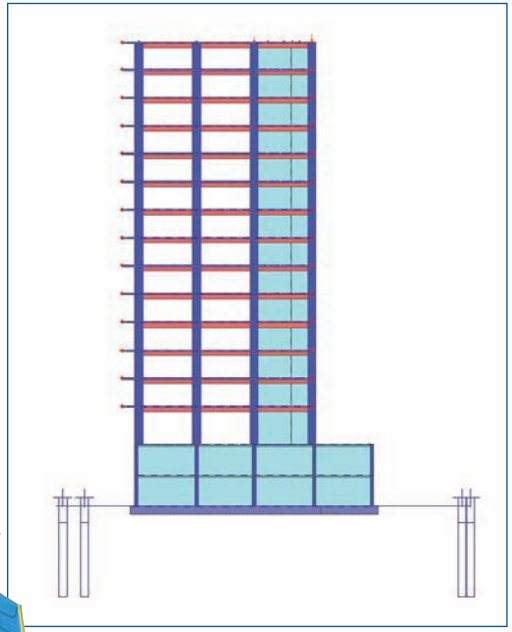
S.C. ROM CARO SERVICE S.R.L.

The company was established in 1992 by engineer Corneliu Mihail Dinca (who unfortunately died before his time) in order to develop civil works.
It is a small company; presently we are working with only 2 own employees but we also collaborate with some other companies. Our company mostly develops small residential houses for one or two families.
Many projects have been developed by our company, but for sure, the largest one has begun in 2007 for a large company in Bucharest. The main goal for this project is to develop in Bucharest a 5 star hotel with all dependencies and with office buildings. In order to realize a project with the best design, not only economically, but also with regard to effectiveness and time-saving solutions for the execution, we analyzed various types of solutions. One of the best examples is the project we present with a solution for the fourteen-storeyed building for offices with 2 basements.





Short Description

Office building, Bucharest

The project is part of a greater complex which includes a luxury hotel and office buildings in the centre of Bucharest. Below the office building have to be created parking spaces for the offices above, that is why the building has 2 levels of basement. The rest of the building is designed for offices as there is an enormous need for of buildings of this type in the surroundings.
The main designing problem for this building was to create a structure to resist the seismic activity.

Project Information

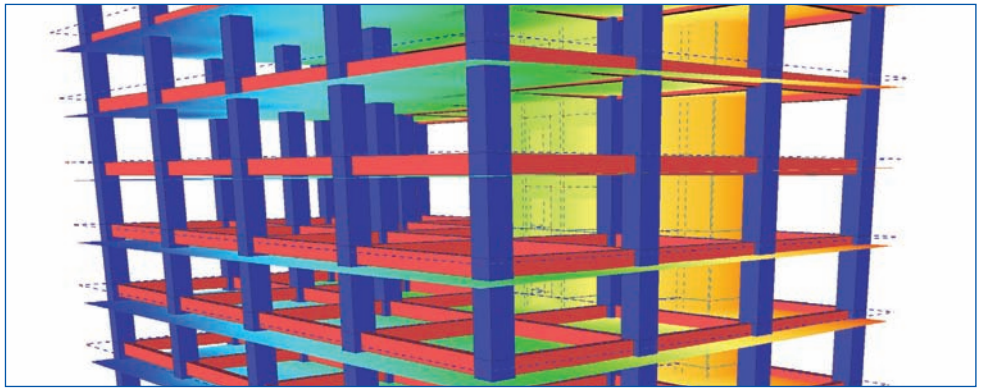
Owner: n/a
Architect: LUCARNA
General Contractor: n/a
Engineering Office: ROM CARO SERVICE S.R.L.

Construction Start: 2008
Construction End: 2011
Location: Bucharest, Romania

The project is part of a large complex including a luxury hotel and office buildings in the centre of Bucharest. The complex will be executed in 4 years. The project has been authorized in the middle of the year 2008.

The main goal for designing this office building is to create as much as necessary parking spaces for the offices above. That is why the building has 2 levels of basement, which is a part of a large basement for the whole constructed area. The rest of the building is designed for offices and spaces which are mandatory for this part of the town. The client requested as much as possible space for his future buildings, because there is a lack of this type of buildings in the surroundings.
The main designing problem for this building was to create a correct structure to resist the seismic design in our country. We must specify that our country has a large depth seismic activity, and the designing problems in this type of activity is to create a building which will endure a seismic wave and will not put in danger the life of people who work in it. For tall buildings, with a structure on reinforced concrete frames or steel frames, the response spectrum and the characteristic period are near the main period of that type of buildings (the designed period for Bucharest is Tc=1.6).

To create that type of building we needed to create many types of structures to satisfy the client's necessities. One of the problems was that the client wanted a curtain wall on all facades, but we were not allowed to put any braces, which is almost imperative for tall buildings. That is why the client rejected a cheaper structure, which was based on a steel structure with bracings and a lot quicker to execute. Therefore the structure for this building will be only from concrete elements: columns, beams and shells on all storeys.



Used software: Scia Engineer, Allplan Engineering

Office building, Bucharest

Our designing team did a remarkably work in a very short time only because of the program's reliability and accuracy. That is why we purchased the SCIA program in the first place. The program computed dynamic and seismic analysis in a very short period of time, in comparison with others design and analysis program (e.g. ETABS). Because our operating system was Windows Vista x64 we encountered some difficulties in running Scia for that type of O.S., but due to fast response from the Nemetschek Group of Romania we quickly resolved that problem.

Another problem was the height of the reinforced concrete frame beams, which, because of the big distance between the columns, was too big. The solution for this problem was to increase the storey height, but for that, we needed to reduce the number of storeys. Then another problem appeared: the reinforced concrete columns were not able to resist the new enlarged beam forces. Therefore we increased the dimensions of the columns up to 1.00 by 1.00 m. Also, for the columns to be able to take the shear forces transmitted by beams, we placed a composed HEB steel profile inside the columns. That type of composite section reduced a lot the displacements and, in addition, increased the stiffness of the structure.
In order to keep the reinforced concrete slab with a small depth, capable to take the designed pressure, and in addition to be able to transmit horizontal forces to columns, we created a deck, which is supported by steel beams network. Those steel beams will be supported by the reinforced concrete beams of the frames.

The rest of the project, with the solution for the type of structure accepted, will be detailed for execution. We are confident that the detailing process will also be dealt with in a satisfactory way with Allplan.