

Z Group_Birou de Structuri SRL

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Z Group_Birou de Structuri SRL is a young company specialized in computer aided design of complex structures in the structural engineering and industrial fields. The main activity of the company is designing, consulting and construction expertise.

Founded in 2001 in Bucharest, Z Group_Birou de Structuri SRL has become a well-known company on the market through its professionalism and seriousness.

We design: High-rise office and residential buildings (16 stories and more) with large span; Commercial Centres (Malls); Auto showrooms;

Car parks; Houses; Warehouses; Production and industrial halls.

Our team consists of 15 experienced engineers who design (draft) and compute structures subject to seismic forces, who are committed to provide innovative, effective and sustainable design solutions for the most complicated structures, who have the skills to manage complex projects and are dedicated to the success of any project for they have the ability to react promptly and positively to emergency requirements.



Software: Allplan Engineering

Anchor Plaza Downtown - Bucharest, Romania

Structural concept and particularities

This project represents an office building having 2 basements, a ground floor, 24 floors and 1 technical floor. The gross built area is 75.290 m², the total height above the ground is 99.14 m, there are 2 underground basements.

The two basements have different heights: 4.28 m (B1) and 4.00 m (B2).

The typical storey height is 3.74 m

Hydrological conditions

The site is located at the address 55th-59th Calea Vitau, Bucharest and it has an underground aquifer with the upper level at -8.3 m.

Foundation

The underground levels were designed as a rigid box, with a raft foundation of 200 cm in thickness, basement slabs of 35 cm in thickness and interior shear walls (20, 40, 60, 100 cm). From the raft foundation two types of columns start: the reinforced concrete square columns 100 x 100 cm which stop in the slab over the basement and composite columns with a square section of 120 x 120 cm which continue in the superstructure.

Because of the poor foundation soil, the raft foundation will be laid on 120 cm diameter piles that go as deep as -30.40 m.

On the perimeter of the basements there will be an enclosure made of 90 cm diameter secant piles which are going to -30.40 m below the ground surface. These reinforced concrete waterproof piles will be connected on their top with a strong crown beam (130 x 150 cm). In front of the piles there is a perimeter shear wall with the thickness of 40 cm.

The concrete used in foundations is class C30/37 waterproof. The concrete in the reinforced piles is class C25/30. The steel reinforcement used in foundations is PC52 (S355), OB37 (S235).

Structure

The structure is made as a composite system: steel and reinforced concrete.

All columns are rectangular, made of steel tubes 800 x 800 x 50 mm and 900 x 900 x 50 mm (in two corners) and a few columns that are connecting the shear walls

have the Malta Cross section of two profiles HEB700. Interior and perimeter beams are made of steel profiles HEM 700 x 352+.

The coupling beams of central core have sections 100 x 140 cm and they are made of reinforced concrete with a profile HEB700 inside.

On the perimeter of the building there are steel bracings made of tubes a having section of 300 x 500 x 10 mm, placed in X shape, one bracing in every six floors.

The circular core shear walls which contain the stairs and elevators are all 100 cm thick, made of reinforced concrete with rigid reinforcement inside.

The vertical circulation of the building will be done by 8 high speed elevators (3.5 m/s). All the elevators will have 25 stops.

All the slabs are 20 cm thick, except for the terrace floor that has a thickness of 30 cm, which is needed for the heavy equipment that will be placed on the top of the building.

The column axial distance for the office area has been designed as 8.35 m.

This size is creating very suitable working conditions for the open office arrangement and has very big advantages in the basement floors where it allows for a clever parking system.

The concrete used in the super-structure is high class concrete C50/60 in the first 6 floors and C35/45 in the remaining storeys.

The steel in the rigid reinforcement is S355 J2+N, and in the flexible reinforcement it is S355 and S235.

Anchor Plaza Downtown

Bucharest, Romania

Project information

Owner	Anchor Grup, Bucharest
Architect	B-Design, Turkey
General Contractor	Anchor Grup
Engineering Office	Z Group_Birou de Structuri SRL, Bucharest
Location	Bucharest, Romania



Short project description

This project represents the Anchor Plaza office building having 2 basements, a ground floor, 24 floors and 1 technical floor. The underground levels were designed as a rigid box, with a raft foundation of 200 cm in thickness, basement slabs of 35 cm in thickness and interior shear walls (20, 40, 60, 100 cm). The raft foundation rests on 120 cm diameter piles (-30.40 m deep). The structure is made as a composite system: steel and reinforced concrete.

