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6. Multi-Storey Garages in Žilina and Bratislava (Czechoslovakia)

Owner: Corporation of garages owners
 Architect: I. Ehrenberger, I. Vaško
 Engineers: J. Poštulka, J. Kozák, J. Hodák
 Contractor: Vitkovice Steelworks of K. Gottwald, national corporation, Ostrava 6

Dimensions and arrangement:

Total surface, including ramps: 17'000 m²
 Floor surfaces, including ramps: 2'450 m²
 Number of floors: 7
 Total number of parking units: 585
 Space built: 50'100 m³; 85 m³/parking unit
 Column spacing: 5,40/7,20 x 7,50 m
 Clear ceiling height: 2,10 m
 Floor thickness: 40 cm (longitudinal girder)
 Ramp's grade: 11,6 o/o; Ramp's width: 3,50 m
 Parking arrangement: upright, on both sides, parking units are separated by sheet partitions
 Lane's width: 7,20 m
 Parking unit's dimensions: 2,50 x 5,40 m (brutto)
 Live load (excluding permanent load): 3,5 kN/m²

Material used:

Concrete (for floor slabs): total 1'370 m³; 2,35 m³/parking unit
 Steel for concrete: 90 kg/parking unit
 Structural steel: inkl. sheet floor panel and partition: total 1'200 t; 23,6 kg/m³, and 2'220 kg/parking unit

Works duration: 15 months
 Service date: Žilina 1970, Bratislava 1976

Description of the structures

In the transverse section both halves of the building differ from each by one half of the storey. The building's length is a multiple of the unit length 7,5 m, and the building's height a multiple of the storey height 2,50 m. The layout and the height of building could be also different. On the ground-floor, a service shop is usually placed, whereas parking units for individual cars are on upper floors. Each unit is closed by partition walls and doors. The access of the cars into garages is provided by ramps, one for the upstairs and one for the downstairs direction. The upper stories are not insulated.

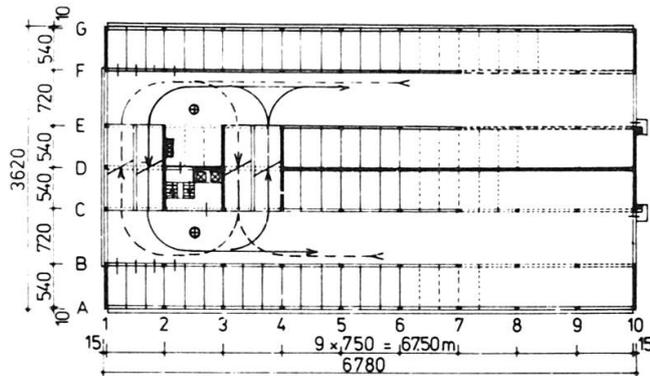


Fig. 1 Typical parking floor

The floor structures consist of rolled joists at a distance of 1,25 m or 2,50 m which support steel sheet panels with reinforced concrete layer. The longitudinal facade girders have been designed as welded double T sections, the upper flanges of which are used as a stop for the wheels of the cars. These girders carry a structure for solid glazing. The middle girders have a welded double T section, as the columns. The vertical wind-bracings are designed either as lattices or as frames. Because the fire loading is only 0,1 kN/m², no fire protection of steel structures is provided.

(J. Kozák, J. Poštulka)

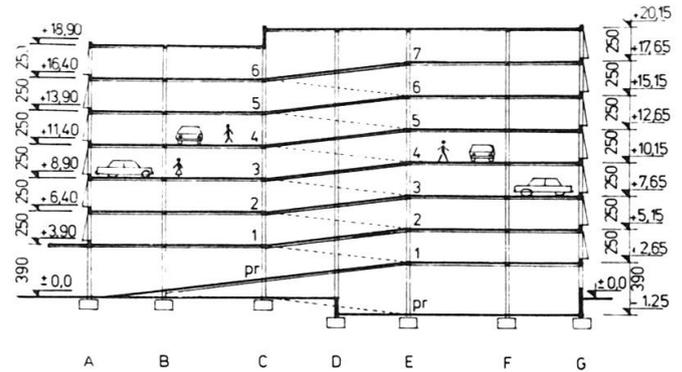


Fig. 2 Vertical section with the ramps

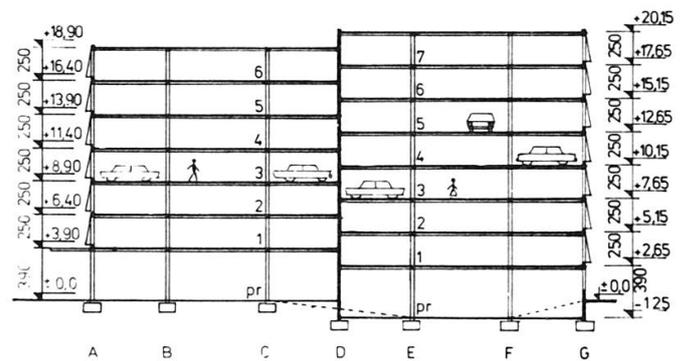


Fig. 3 Typical vertical section

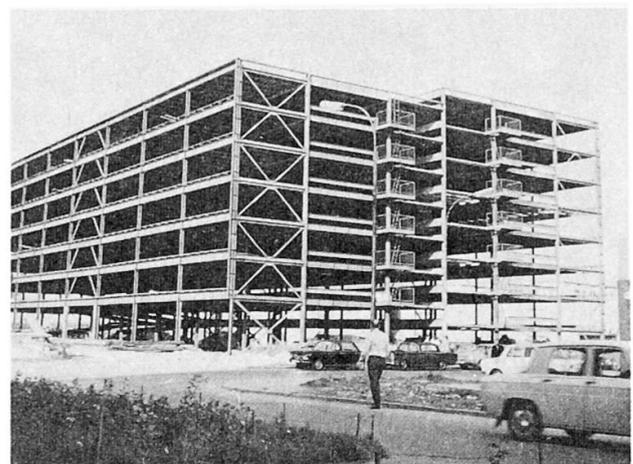


Fig. 4 Steel structures during erection



Fig. 5 Multi-garage-building at Bratislava



Fig. 6 Look on the long side