

localization of the Polytechnic museum branch inside. The technical exhibitions and Ural museum expositions will be introduced as well. It will allow presenting as full as possible the history and perspectives of Ural engineering school, which rebirth now with the special attention in Sverdlovsk region. One more important component of the Center – is multifunctional library, providing the access to national and world informational sources on basis of usage the opportunities of new modern information technologies.

The main goal of the constructing such unusual for Pervoouralsk building is: “to restrain the leakage of the talented youth to the capitals, to form in small town comfortable conditions for researches and creativity, to rise the interest to the modern art, and to educate citizens in a cultural way.” That is why the location of the building as it is: 40 kilometers far from the region center city Yekaterinburg, which is the cultural center as well and where regular exhibitions, creative events take place.

The building is constructed on the territory of an ex-Oldtube plant and is situated on the shore of a town pound. ICC is constructing on the vast spacious area and is visible from all sides. This location harmonically includes new building in surrounding and complements it: in the new town area among modern blocks of flats on the town embankment.

The Innovative Cultural Center is urged to change the comprehension of culture among inhabitants of town Pervouralsk, and likely in future this building will become the symbol of the town.

“Vysotskiy” skyscraper

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The architectural appearance of Ekaterinburg city combines various styles and directions. Small provincial merchant houses of classicism era are next to Soviet times buildings devoid of excessive pretentiousness. The high-altitude business centers grow up against the background of these low-rise constructions. The skyscraper "Vysotskiy", listed in the Guinness Book of Records as the tallest multifunctional complex in the Ural-Siberian and Central Asian regions, it has got a particular prominence.

The structure is also unique because it is the only skyscraper in Russia designed by Ural engineers without any foreign support. The developer Andrey Gavrilovskiy decided to build the maximum possible under the current building legislation high-rise construction, reaching 188.3 meters (54 floors). To do this he found two talented professionals: the architect Vladimir Grachev and the designer Andrey Molokov. Thanks to their work "Vysotskiy" acquired a strict silhouette and simple geometric shapes, showing a typical example of the high-tech, which was originated in the 1970s in Europe. A characteristic feature of

this direction is the use of glass facades. The application of glass as coating material goes back to the end of the XIX century, when rationalistic directions began to emerge in architecture. Built in London in the period of rationalism the Crystal Palace is in its own way a prototype of the Ekaterinburg's skyscraper. It was a giant glass greenhouse, fastened by metal structures. This exhibition facility established new standards in construction, focusing on functionality and simplicity.

The change of the architectural preferences vector led to the improvement of glass technology at the turn of XIX and XX centuries. In particular, German scientists patented the production of polyvinyl chloride (PVC material), from which plastic windows are made now. However, the mass output started only by the end of the first half of the XX century. A little bit later, a new method of glass production called float-technology was developed. In this process, liquid glass is poured onto the molten tin. Cooling on a perfectly smooth surface of the metal, the glass becomes a sheet that is ready for cutting and further technological processing. The float-system significantly improves the functional characteristics of manufactured glass; among them are stable thickness. High surface quality does not require further polishing due to the absence of optical defects. In addition, this method is characterized by high productivity of the process, what accordingly reduces production prime cost. Due to the above-mentioned advantages, modern glass as the material for window open ingsand facades glazing is produced using this technology.

Ordinary window glass is not used in facade construction because of its low strength characteristics. The growing popularity in architecture of the big glass surfaces requires special large-dimension float-glass, named for great proportions "Jumbo". It is produced by the method of thermal polishing and has improved thermal physic and optical characteristics. Apparently, such Jumbo-size glass panes were used in the construction of the "Vysotskiy" business center. For instance, on the ground floor, exceeding all the other floors of the building for more than three times, double-glazed windows of extra-large size from 1900 mm to 5901 mm were installed.

In the production of architectural glass, composing the facade of the Ural skyscraper, magnetron sputtering technology was used. The magnetron method implies the use of vacuum magnetron installation, where refined sheet glass is transferred to. Under the influence of the electromagnetic field, superfine layers of metals and other elements changing the properties of the product are applied on the surface of the glass. This process allows achieving high rates of heat insulation, sunlight protection and optical transmission. As for the aesthetic side, the deposition gives a characteristic tint to the glass. The glass surface of "Vysotskiy" is slightly toned; its color spectrum ranges from dark gray to sky blue. Despite the fact that heat loss of a glass facade is two to three times higher than for conventional walls comparing with the same indicators. A low emissive coating maintains a comfortable temperature all year round. In

summer, heat is reflected from outside and in winter remains inside the building as in the greenhouse effect that resulted in a favorable microclimate. This makes possible the application of glass in the construction of the walls in the harsh weather conditions of the Ural capital. In addition, a pressure drop inside the double-glazed window can be the consequence of the outside low temperature. Air is compressed there and pulls the central part of the glass. A so-called "lens effect" appears and therefore the mirror surface begins to distort the reflected image. To eliminate the undesirable effect the outer glass is made thick enough. In addition, the increase of glass walls thickness is necessary for security. So, for the facade of the Yekaterinburg high-rise structure the special durable glass was used, withstanding loads up to 120 kg per square meter.

In facing of the concerned construction the structural stained-glass windows are applied. Structural glazing allows creating a solid glass surface of the building. This type of panoramic facade glazing is characterized by the absence of the external load-bearing columns and girth rails, at the same time fastening elements are transferred as much as possible onto inner side to create a sense of structural integrity. Glasses are connected to each other by means of clamps and aluminum profiles. The choice of aluminum as the base material was not made randomly. The point is that PVC profile widely used in the window manufacture is not the best solution for high-rise construction. Plastic profile possesses low strength characteristics and so requires strong internal steel reinforcement. In view of heavy weight and low heat-insulating properties of plastic facade structures the preference is given to the aluminum profile, much lighter and resistant to the exposures, as well as capable to carry considerable loads without additional reinforcement. Modern technologies help to solve the problem of its heat and acoustic insulation successfully. Thermo break Integrating in aluminum profile, representing a polymeric insert between the outer and inner tubes allows to create high-quality heat insulation systems. The technology of structural glazing is based on fastening of double-glazed windows to the facade of the building using sealant. That extra strong silicone sealant is used, what does not collapse under the influence of sunlight. The absence of gaps eliminates clogging of joints with dust and dirt and ingress of water. Glass panels of "Vysotskiy" interlock by accurate black seams, allowing to create a practically uniform sparkling mirror surface without metal bindings and any visible external bearing elements.

Constructive solutions of the building do not provide load-bearing walls. The inner space is only limited by external walls and pillars. In the structure of the skyscraper the technical solutions are laid that completely prevent vibrations caused by an earthquake. The business center is equipped with system of combined extract-and-input ventilation and air-conditioning. In every room heat convectors and cooling fan coils are installed allowing to maintain optimal temperature. Automated dispatch control system monitors the signals of numerous sensors checking pressure, temperature and rate of the air currents

movement inside the building. The skyscraper is supplied with the system of automatic fire alarm signaling, which follows up the uninterrupted operation of 6500 smoke detectors. "Vysotskiy" is the only building project in Yekaterinburg where three fire-fighting systems are applied: fireplugs, sprinkler system within the rooms and sprinkler system for watering of the facades. The latter is made so that in case of fire the glasses do not burst from the overheating, creating an additional thrust inside the building. Any structure of the building can withstand at least 240 minutes of direct fire exposure. An autonomous boiler room leaves out the dependence of the skyscraper from the city heat supply system. For optimal operation of the equipment, the building is divided into four zones, between them there are technical floors where this equipment is located. Heat exchangers are also placed there, allowing to separate the water systems by pressure.

In view of the foregoing, it can be concluded that "Vysotskiy" business center represents the object of modern architecture, created using high-quality materials and up-to-date systems of maintenance. On the present stage of the building sector development in Russia, particularly in Yekaterinburg, the erection of high-altitude constructions with cladding glass following Western models represents only a small proportion of the total construction industry volume. However, the interesting fact is that the world's first building with facade glazing was built in the Soviet Union. It became the House of the Centrosoyuz in Moscow, erected in 1936 by distinguished architect Charles E. Le Corbusier. Soviet architects and designers have laid the foundations for the use of glass walls in the construction industry. Nevertheless, this practice is now being actively developed in Europe and America, largely leaving behind Russia in this area. The skyscraper "Vysotskiy" is a clear indicator that big industrial Russian cities do not want to lag global trends, and probably soon will bring the situation in the construction field to a new level.

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The Palace of team sports

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In this article we will tell about the palace of team sports in Ekaterinburg, which is a very interesting structure. It was achieved by its unique characteristics. We will consider them.

The Palace of team sports«Uralochka» (block A) was commissioned on June 11, 2003. Then block B was built in July 2006. Gyms, the health and recreation center for athletes (massage room, sauna, solarium),the hotel for 48 people, a café, an administrative part and a press center are located in the new building.

The total area of the administrative and training complex is about eight thousand square meters. The governor of Sverdlovsk region Eduard Rosselinitiated the start of the construction. He put the first symbolic stone in the foundation of the future palace. The Palace is aunique building of European class. The construction of such palace was necessary in Ekaterinburg, because the ice palace of sport, at the same time the place where basketball and mini football competitions were hold, was over loaded and needed reconstruction, and other indoor sport halls in the city had capacity of not more than 1000 viewers. The first thing that catches your eye when you look at the Palace is its cosmic design. The roof of the palace similar to the flying saucer became one of the present city sights and fits perfectly into the landscape of the embankment of the river Iset. The dome of the palace is an ellipse with the axes of 68 and 84 meters and the weight is over 10000 tons. Itimpressesits size and originality as outside as inside. The open metal frame of the dome is a distinctive characteristic of this palace. The dome is one of the flattest in the world [1].

A multifunctional media-cube, installed under the main sports arena, gives a large possibility in the field of informing fans during games: from various demonstration videos to show interesting moments of the game in slow speed video replay. Besides, the information system of the palace allows do direct translations games on TV and in the Internet.

The opening of the palace was timed to the beginning of international volleyball cup named after the first President of Russia B.N. Yeltsin. From 11