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A student magazine about construction and architecture

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NOVOSIBIRSK BRIDGES

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INTERVIEW

PREFACE

Welcome to the world of construction! The industry that shapes the world around us, constructing breathtaking buildings, bridges, and more. Every day, engineers, architects, construction workers, and many others work tirelessly to bring their projects to life. In this magazine, we are looking at iconic structures, industry's societal impast , structural elements, and trends that are shaping the world around us. We tried to make this magazine interesting for everyone: those who are just starting to study and for experienced students. Join us as we explore the world of construction and all of its wonder!

We want express huge gratitude for the support and help creat this journal to Inna Mikhailovna Makarikhina, Associate Professor of the Department of "Foreign Languages" and Vladimir Alekseevich Gvozdev, Director of the Institute of Civil Engineering.

Made as a part of studying English language with Inna Michailovna Makarihina at NSUACE.

Student's diary

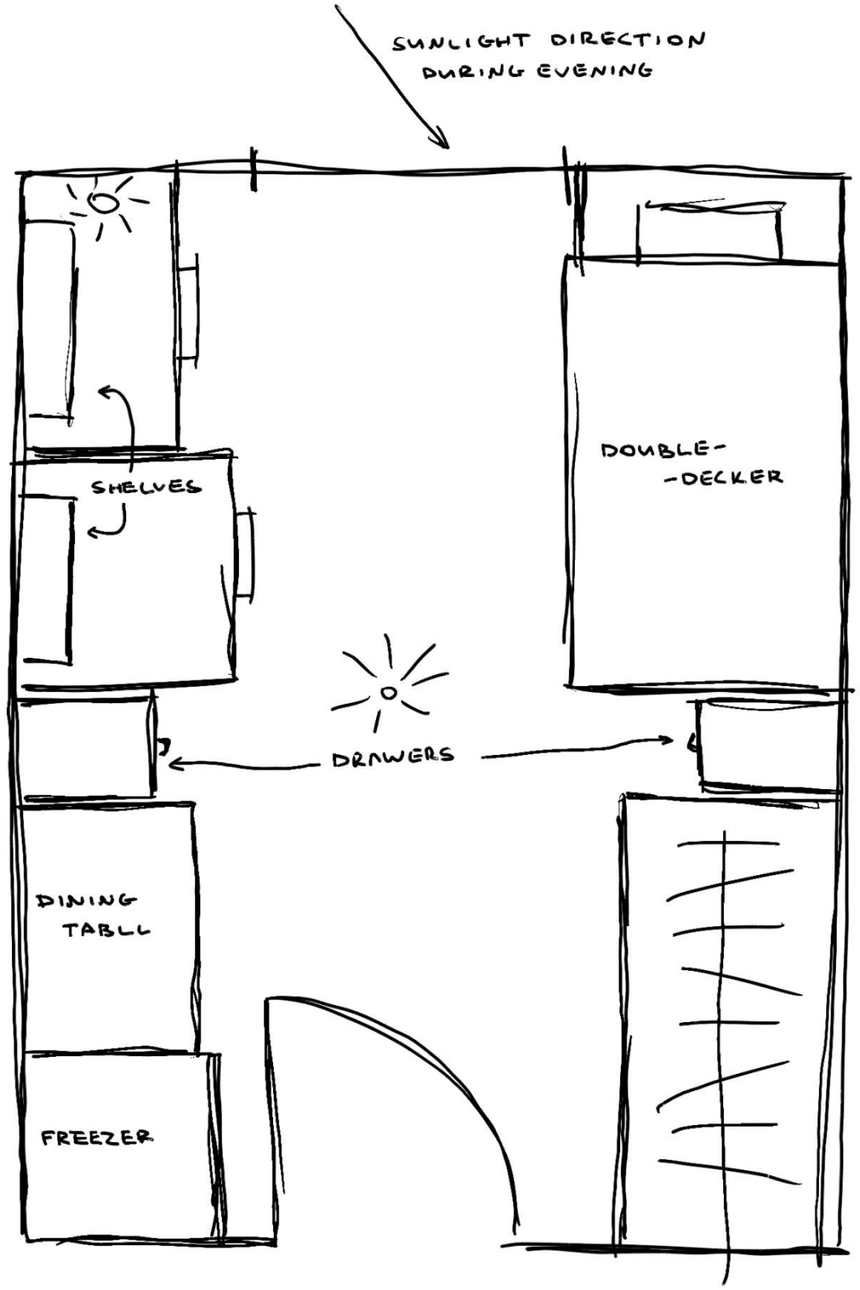
Hi! My name is Angelica and I am a 1st year student in the field of engineering unique buildings and structures. I want to tell you about my life here.

It was in summer...

Let's start with the fact that originally I didn't intend to be a builder and in general to study at NSUACE (Sibstrin). At that time I was planning to go to another university for another specialty, but after words I took USE and had a talk to my mother about my future, I came to the conclusion that I would be a builder (Yes, that's a builder, not an architect, because I was not ready to take creative tests). I had good grades (246 + medal), so I entered without any problems.

Is it true that there are cockroaches in the dormitory?

Since I'm out of town (from the Far East, in case anyone is wondering), I needed a dormitory. I arrived, they checked me in - everything was pretty boring. So I started living with a nice senior girl, who also told me a lot of interesting things. It looked pretty bearable - no hotel, no basement, but somewhere in between. There were no cockroaches, order was carefully monitored, and my room was not cold (not a word about the others). That's all.
OK, I will say something about the shower. It is in a separate building... Yes, it is a significant minus, but after several trips you get used to it and can already live in peace (the shower is really good, but without slippers and a curtain don't even go there).



The August rush

After the orders for admission were announced on August 9, I got in touch with a girl from the university who told me about everything: what I needed for the dormitory, for studies, what sections and circles there were, what teachers were there, and so on. So, when I came to check in on August 28th, I wasn't afraid of anything and knew everything.
Only on August, 29th I could find guys from a stream of the students who had entered the construction of unique buildings and constructions and to communicate with them. That way, I was already able to find my social circle.

Why am I the monitor?!

At the end of August, the building institute management called me and asked if I wanted to be my group monitor. I was stumped for a while, as I had no plans to take this position. I wasn't sure, but then I said yes. Do I regret it? No! The first month was hard, yes, but then it became much easier. I started to take it easier, so my eye stopped twitching in October.

Autumn troubles.

There were 72 people on our stream and we were divided into 3 groups. On September 1, we were given our course books and student identification cards (I was also given an attendance book). And on September 2, I had my first class of my life! Like yesterday I remember, it was the only pair, a maths lecture. It was quite difficult and boring. September was, in fact, the hardest month, because an endless stream of information pours out at you from all angles, which you have to write down or memorize somewhere (especially if you are the monitor).

14.10

Time for firsts

The first event you can look forward to is 'First Time'. You'll have the opportunity to take part in intellectual, sporting and creative activities. The most interesting part, of course, is the creative one. My classmates and I prepared a video for the business card, where we remade the "Avengers" trailer, and for the actual performance we had a dance... Oh, how hard it was! But we got through it all safely.

What are student squads and what do they do?

A student group is a team made up of students from different courses and areas of study. They are involved in various creative, sporting and intellectual activities and take an active part in university life. In our university we have construction, conductor and pedagogical squad.
I am a member of the mixed construction squad "Cascade".

Thanks to them, you can get:
- Your first work experience before you graduate.
- A busy and active student life
- Friends that will become a second family
- Realization of your creative and sporting talents
- New acquaintances from all over Russia
- Warming memories.

In December there was an event called "Sibstrin talents", where all candidates (newcomers) of the squads took part. We showed different numbers, laughed, sang, danced and just had a great time. I even got my first badge, which I pinned to my fight jacket.

Student nightmare

Session... A word that makes many people dread. First, you have to survive in credit week. This is the period when "pass/fail" is posted to your grade book. Every teacher has different requirements. Some of them require you to submit absolutely all your work, some ask you to work during practices and others simply check your attendance. After that, the exams begin...

We had 3 exams: Mathematics, Chemistry and Engineering and Computer Graphics. The teachers gave us the questions that we would meet during the exams.

Thanks to the fact that I passed all the papers with flying colours (and even ahead of the deadline) I was the first to get 'A' in Engineering and Computer Graphics.

I was really worried about maths, because I didn't know if I got mark without taking an exam. Those students who participated in the Olympiads had nothing to worry about, but I had a lot. And how happy I was when the teacher told me I had an 'A' during the tutorial before the exam!
The maths exam was the most difficult one. You had to know almost everything... . Because of this exam, a lot of students were without their scholarship.
(P. S. The guys in the other groups did not have the same problems that we did; they had it easier).

For chemistry I prepared diligently. I spent 10 days studying all the theory I could. And it was worth it! I wrote the exam in 20 minutes, got 'A' and was satisfied.

What about home?

As strange as it may seem, in all the time I have been here, I have never once missed my family. So I decided to stay in the dormitory for New Year's Eve and prepare for chemistry. I was with my newly minted friend (who had already dropped out, ha). We ordered rolls, bought fruit and had a great time in the dorm. After the chimes, we went to watch the fireworks. Explosions could be heard from everywhere, but no fireworks could be seen! A little later, the long-awaited lights came on.
But I went home, of course. On January 18, I was lounging in my beloved bed, stroking my two cats and enjoying the drama.

Something in elfin...

I basically had no problems with my studies. I excelled in everything, I and my teachers were fine with it. Was I overburdened? Hmm... Good question. I managed to go to all classes, to do all homework (sometimes ahead of schedule), to organize a life in a hostel, to give some time to myself (a little later I learned it), to do things for the monitor (to run in the directorate, to journal), to do detachment things (something on the creative department). I wouldn't say I was burned out, but sometimes I wanted to lie on the floor and do nothing.

Environmental Consciousness of the Civil Engineering Universities' Students and Its Impact on the Students' Professional Activities

Environmental consciousness base on environmentalism, which says that every living thing, including nature, has environmental rights that need to be protected. The main focus of the environmental studies is on the interaction of human beings with the various aspects of the environment. Their concern is about the harm caused by human activities and how to conserve the environment. In environmental studies, the scientists study the natural environment. They also study about the built environment. Then, they also focus on the different relationships between these two.

Eco-consciousness includes people with the same set of values. So it is especially important to support the unification of students in clubs and associations for formation of these values. For example, in our university there is a student eco-club "Kodama". Members of this club are engaged in educational activities, develop ideas of projects such as International Youth Schools "Ecopolis", University Green Campus Center of Green Sustainable Development.

Formation of professional environmental competence also needs correct curriculum. Many researchers distinguish the contradiction between the social demand for an environmentally competent specialist and the system of training these specialists. Teaching methods lag behind the trends of environmental science. So it gives rise to discussions in the pedagogical environment.

We found project of Samara State University of Architecture and Civil Engineering very interesting. It is the course "Environmental ethics and aesthetics in modern architecture". This course examines the theory and history of environmental ethics, its main directions and principles, the relationship of environmental ethics and environmental aesthetics and their role in the architect's professional activity. They believe that the goals of the architect's professional activity are the preservation and rational use of natural resources; knowledge and compliance with environmental legislation, regulatory documents on environmental protection and rational use of natural resources. We like that they decided to teach literally environmental philosophy.

Many ask a question: "What will environmental knowledge give me besides the knowledge itself?" Researchers from the North Caucasus Federal University and Peoples' Friendship University of Russia can answer for this question. They found a link between environmental (ecological) awareness and stress resistance. Students with a more developed ecological culture turned out to be more emotionally stable. Apparently, the understanding of processes in the environment and nature somehow affects the perception.

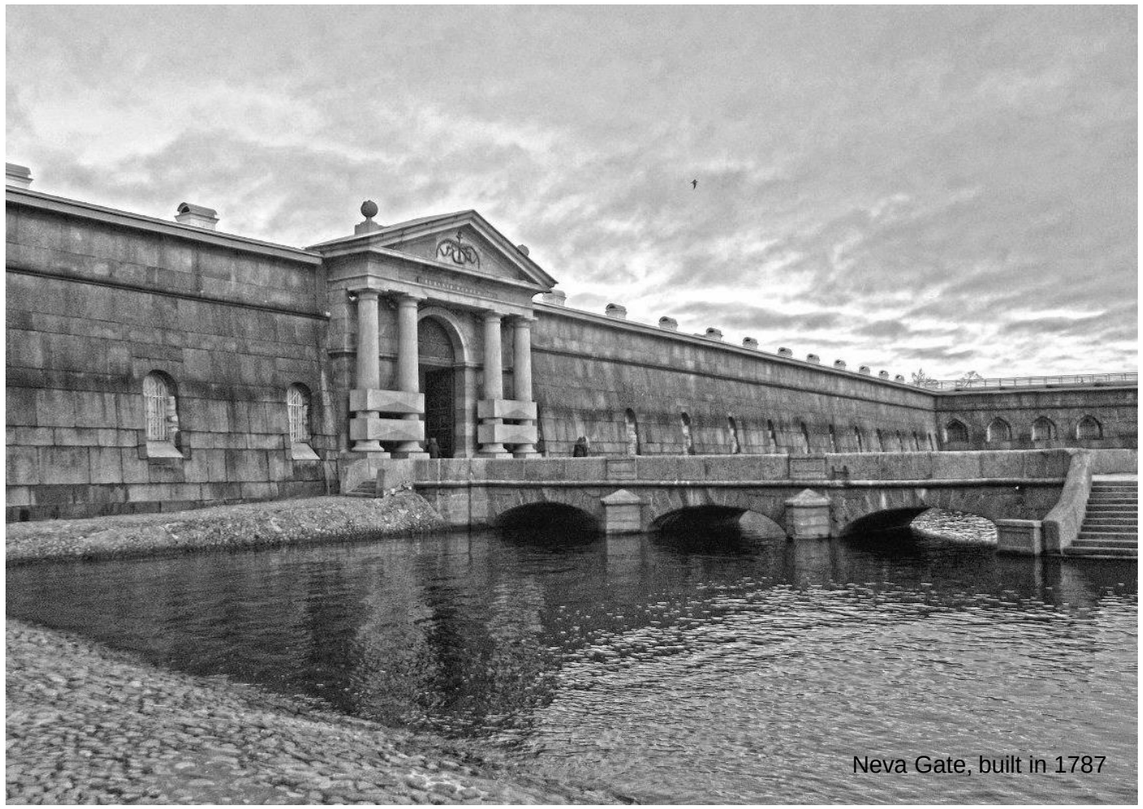
In this way, environmental consciousness the of students not only affects their professional activities in the form of solving the tasks set to reduce the human impact on the environment during the construction and using of buildings, but also spiritual and mental development.

Samara State University of Architecture and Civil Engineering

ELEMENTS OF THE ARCHITECTURE OF ANCIENT ROME, WHICH HAVE PASSED INTO MODERN CONSTRUCTION

In ancient Rome, there was a large-scale construction of various structures. The main building material was concrete, as it was distinguished by its strength. Arched bridges began to be built, later arches became elements of other buildings, which gave the buildings solidity and beauty. The arches were also connected together, which made it possible to strengthen the ceilings, create domes, which later began to be used in many areas of architecture in other countries.
There is, known throughout the world, the Colosseum.
There you can observe the combined arches throughout the territory.
Even now, arches are used in many places. For example, in Russia there is the Neva Gate, consisting of an arch.

Pons Aemilius, rebuilt in stone in 179 BC



Neva Gate, built in 1787

Pantheon, built around 125 AD

Temple of the Portunus, rebuilt around 100 BC

Novosibirsk Opera and Ballet Theatre, built in 1945

The Romans also used columns in many places. So the Temple of the Portunus was built in Rome. Now there are many places where you can see the columns, as this makes the building reliable and beautiful. Many theaters and museums were built in this likeness, for example, the opera house in Novosibirsk.

The Romans did a lot for us, now their elements of architecture are used all over the world. Rome is one of the progenitors of beautiful buildings.

Modern architecture of Novosibirsk

I think there are many beautiful buildings in Novosibirsk, but we will only talk about modern and special ones. To begin with, it would be nice to understand what can be called modern architecture. No style in this architecture is dominant. It uses styles from postmodernism to high-tech style, from interpretations of traditional styles to unusual shapes and designs resembling sculpture on a huge scale. Some use advanced technologies and modern building materials, while others give priority to the use of natural and ecological materials. Modern architecture can be described with such an interesting and little complicated phrase: "This architecture is a desire and an opportunity to design and build something different from what was done in the past and what is usually done today."

However, we are talking about Novosibirsk. Well, I would like to please the residents of this city, as seven buildings from Novosibirsk were among the most significant in the recent history of Russian architecture — they were included in the exposition of the exhibition "Russian Architecture. The newest era". The most significant and interesting projects for the whole of Russia were presented at this exhibition. The following buildings were selected from Novosibirsk:

- Academic Park towers (built in 2012)
- Amsterdam Shopping Center on Geodesic Street, 4/1, built in 2016)
- Novosibirsk Planetarium building (built in 2012)
- Buton Shopping Center (17/1 Krasny Prospekt, built in 2012)
- Ice Floe Business Center (78 Maxim Gorky Street, built in 2011)

It is about these buildings that I would like to consider and tell you more about them.

<u>Hi-tech</u> style, is characterized by the use of simple lines and shapes, frequent reference to elements of constructivism and cubism. Rational use of space, wide use of glass, metal structures and elements outside the building. The color scheme is mainly in white, silver and metallic colors.

«Ball»

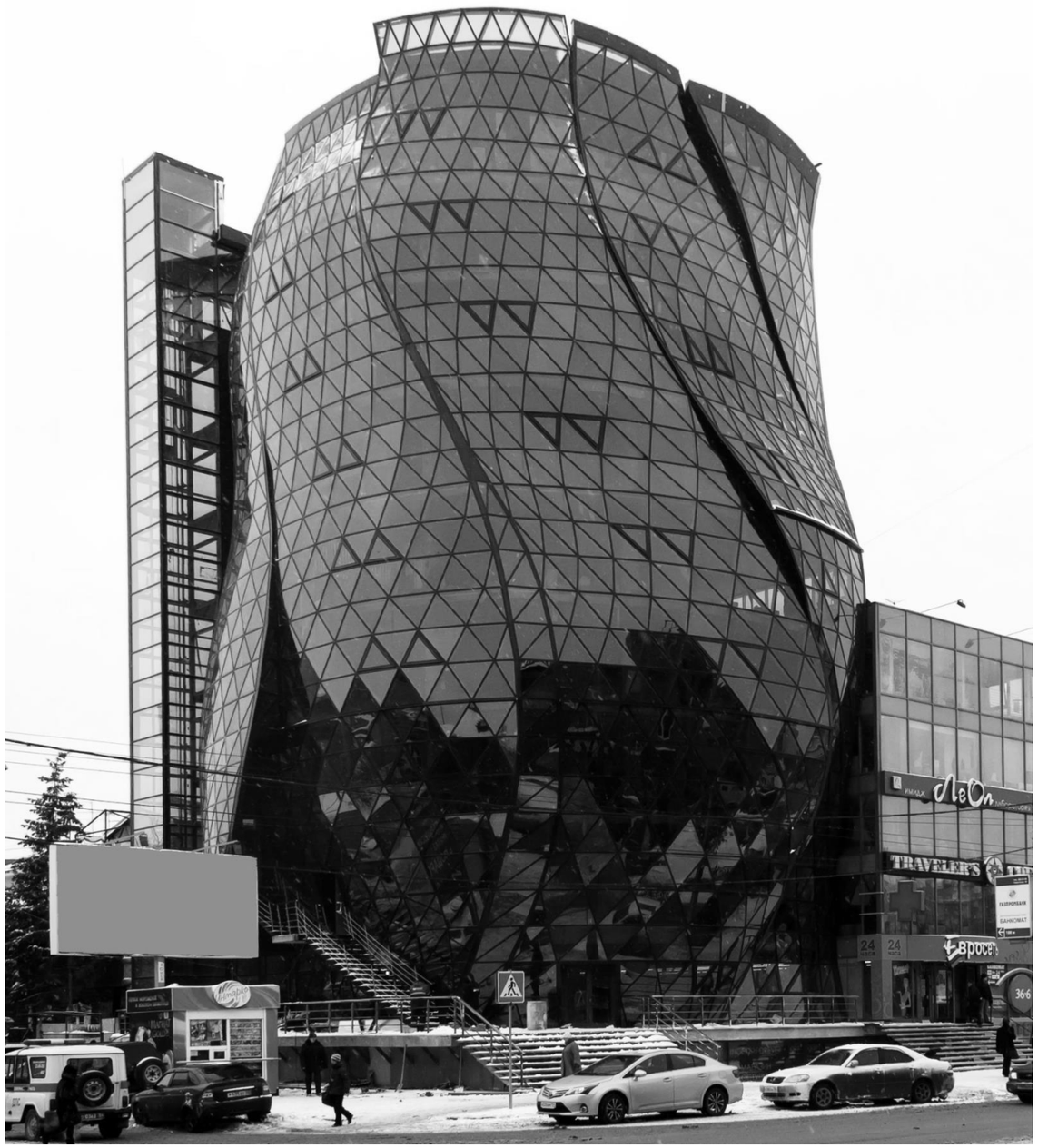
The first building with unusual architecture for Novosibirsk was the cafe "Ball". This object, which stands out against the background of the rest of the development and at the same time successfully inscribed in it, appeared at the Globe Theater, on Nikitin Square.

«Ice Floe»

A few years later, another facility built using the same technology appeared in the city center on the Oktyabrskaya highway – the business center "Cocoon", or as it is also called "Ice Floe". According to the architect Valery Filippov, the building should stand out from the surrounding buildings as much as possible. And he succeeded: among the rectilinear facades of the Soviet era, the futuristic design looks like a provocation. In the "Cocoon" for the first time in Novosibirsk, curved double-glazed windows were used for facade glazing.

«Bud»

The new creation of the Gerasimov-Filippov tandem is the “Buton” shopping center. This is one of the first projects in Russia with free geometry. Each double–glazed window has its own personal dimensions and consists of particularly durable tempered glass and safety laminated glass - due to the partially sheer shape of the building. "A bud is warmth, aspiration, a premonition of discovery, and an ice floe is cold, static," says the father of this creation.



<u>Modern</u> architecture is distinguished by the rejection of classical lines and angles in favor of more decorative lines when using new materials such as metal, concrete, reinforced concrete and glass.

Marriott Hotel

It would be more correct to say about the Novosibirsk Marriott that it is "neo-modern". Moreover, the architects themselves declare that they did not have a goal to make a complete copy of the historical style, they sought to give it a modern interpretation. According to the architects, the new hotel should bring to the life of the city, albeit obsolete, but unfamiliar to the citizens, a rich decor style. And at the same time, it should be combined in scale and color with the surrounding buildings, especially with the main architectural star of Novosibirsk — the Opera Theater. The building has a real stone facade made of specially selected sandstone and granite, as well as curved stained glass, forged fences, facade sculptures (including a three-meter Hestia, the goddess of hearth and hospitality) and bas-reliefs based on Pushkin's fairy tales. In the country, buildings of this type are still a pleasant exception.

<u>Deconstructivism</u> in architecture is a disregard for rules and canons, a chaos of form and appearance. The functionality of buildings goes to the next plan, it is much more important to show people how limitless the author's imagination is and how far it can go.

Academic Park unique towers

The symbol of the Academic Park are two inclined towers connected at the level of the 13th floor by a transitional gallery that hangs directly over the roadway of Nikolayev Street. The characteristic silhouette of the building was popularly nicknamed "geese". The project was supposed to build three such buildings, but in the end only two towers were erected. The first of them housed the Information Technology Center (CIT), the second - the Center for Collective Use (CCP).

There are many beautiful buildings in Novosibirsk, but they do not represent modern architecture. However, this does not make them less beautiful. And I can't not tell you about them.

Novosibirsk Planetarium

10 years ago, a planetarium opened on the Klyuch-Kamyshensky Plateau in Novosibirsk — the largest beyond the Urals and one of the largest in Russia. The domed building with two observatory towers adjacent to it looks like a spaceship landed on the slope of a plateau. Next to the building is the Foucault Tower, where there is a pendulum 15 meters long, it is designed to demonstrate the rotation of the Earth. At the top of this tower, there is an open observation deck, which offers a beautiful view of the surrounding area and, especially, the southern part of the horizon up to the Ob Sea and the city of Berdsk.

Amsterdam on the «Student»

An unusual building has grown up next to the Studentskaya metro station, the facades of which intrigued Novosibirsk residents. The passers-by who find themselves next to him think that they have found themselves somewhere in Holland. Thirteen facades, reminiscent of Bruges or Amsterdam, are separated by a huge glass shell, which will give away the modern origin of the building. People who came to the metro station "Studentskaya" walked to the Gorsky housing estate. And Gorsky was getting upset, and this place became unique and lively in terms of pedestrian traffic. We have made 13 historical facades separated by an atrium under a glass shell. Behind the facades, there are three levels of trading halls. We made the first floor high glass, the third floor is also quite high, and it is made with mezzanines. The total area of the building turned out to be about 20,000 sq. m. m including underground and aboveground floors with a mezzanine.

«Cyprus on the Ob»

Mysterious houses that grew up on stilts near the Bugrinsky Bridge do not leave Novosibirsk residents indifferent. Their architecture is so unusual for the capital of Siberia that it seems to someone that he was in Holland, and someone is mentally transported to Greece or even Malibu. The architecture of the boat station is designed for perception from different distances. Laconic white volumes of buildings with panoramic glazing open to the eye from the opposite shore. Facades with non-repeating decorative inserts, the shape and position of windows are visible from the Bugrinsky Bridge. From the driveway, it becomes clear that decorative inserts differ in material, texture and color. The style of the complex is an example of modern international architecture without imitation of historical styles. Similar types of coastal architecture are found on the coasts of Europe and America.

Over the past few years, Novosibirsk has changed radically: typical buildings have given way to a variety of styles and forms, original design solutions embodied in residential and public complexes.

What was the beginning of the construction development in the city of Novosibirsk?

In 1891, construction began on the Great Siberian Railway, which would connect the eastern and western parts of the Russian Empire. It's the longest railway in the world. One of the most difficult questions was where to cross the wide Ob River. Originally there were plans to build a bridge near the city of Tomsk, which was a major provincial capital, but engineer N.G. Garin-Mikhailovsky suggested the option of building a bridge to the south, where the Ob has the narrowest place of flooding. The project is approved and the Ob' railway station was built at that place. And the workers who had built the bridge formed a settlement, which would later be called Novo-Nikolayevsk. In 1897 the construction of the bridge was finished and the Trans-Siberian railway went further to the east and the development of Novo-Nikolayevsk went upwards.

Thus, the History of Novosibirsk began directly from the first railway bridge over the Ob river, which interesting engineering facts one can read in this article.

BRIDGES OF NOVOSIBIRSK

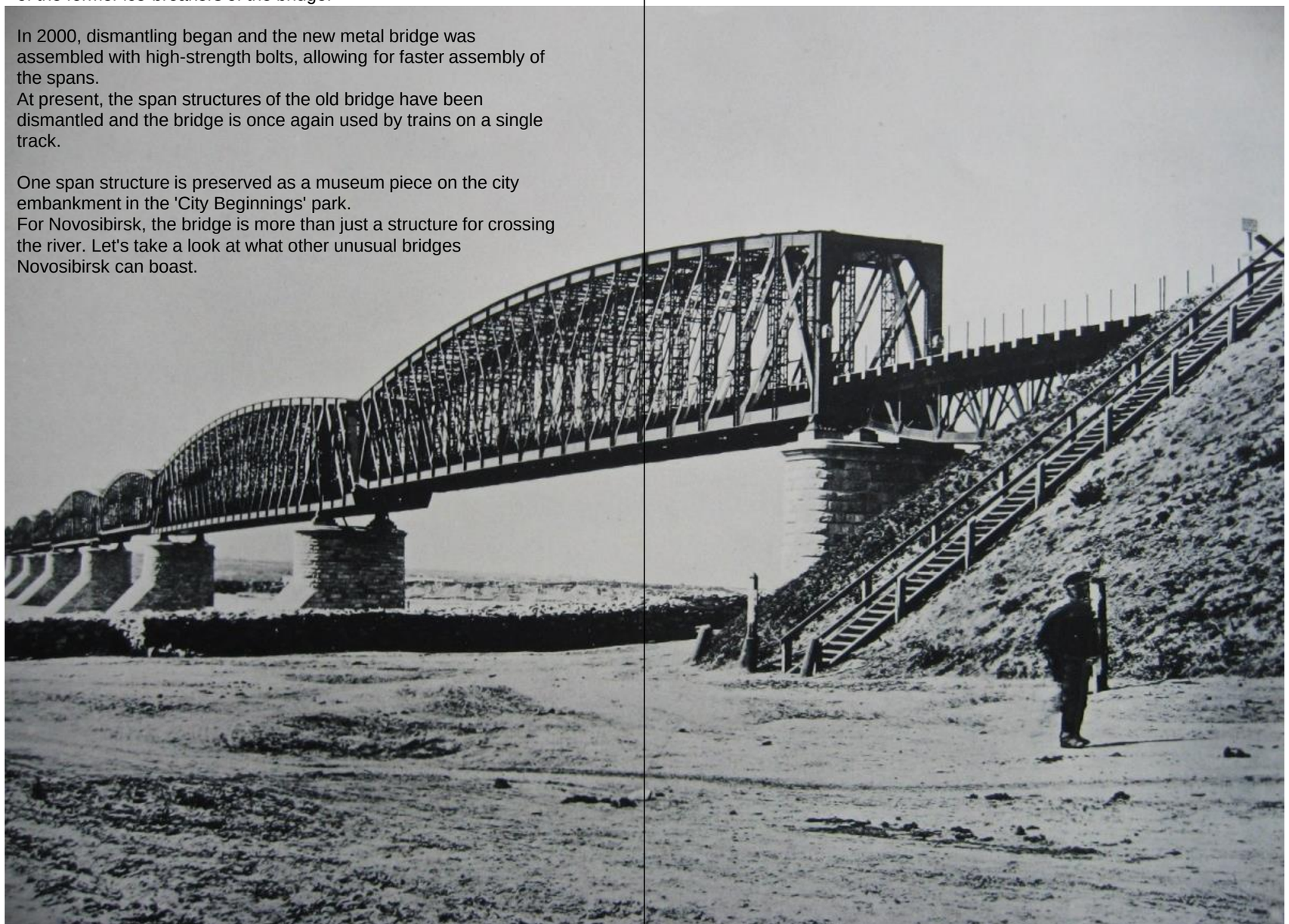
The first railway bridge over the Ob River

The main design of the bridge belonged to Professor N.A. Beleliubsky, an outstanding civil engineer. He was also a scientist in the field of construction mechanics. According to the plan, the bridge had nine spans (about 795 metres), which rested on granite stone abutments, laid on the granite bed of the river. The piers were also ice-breakers.

In the 1930th, after the completion of the Komsomolskiy two-track railway bridge, the "old" bridge lost its importance and was used to pass passenger trains running through the city centre.
After the Novosibirsk Hydroelectric Station started operating, spring ice drifts in the city area ceased, so there was no need for the ice-breakers that existed near the piers of the old bridge. So, later on, the builders erected new reinforced concrete supports on the bases of the former ice-breakers of the bridge.

In 2000, dismantling began and the new metal bridge was assembled with high-strength bolts, allowing for faster assembly of the spans.
At present, the span structures of the old bridge have been dismantled and the bridge is once again used by trains on a single track.

One span structure is preserved as a museum piece on the city embankment in the 'City Beginnings' park.
For Novosibirsk, the bridge is more than just a structure for crossing the river. Let's take a look at what other unusual bridges Novosibirsk can boast.



Oktyabrsky (Communal) Bridge

The first vehicular-pedestrian bridge was opened on 20 October 1955 and it was the first in the practice of bridge building.
The idea of the bridge dates back to the pre-war times. From 1930 to 1931 engineer Vladimir Shukhov, the Russian and Soviet engineer, architect and scientist, worked on one of the new bridge's projects. The project had been ready by 1938 by engineer G.D.Popov and architect K.I.Yakovlev, but construction had to be postponed, because the war had just begun.
On October 17, 1951, the Council of Ministers of the USSR issued a decree on the construction of the October bridge in Novosibirsk. In the beginning of 1952 the preparatory work began.
Unfortunately, it was necessary to correct the project in order to save money in the process of construction. Because of this, the left bank part of the bridge in the middle turned out to be lower than on the edges. In spite of that, the Oktyabrsky Bridge became one of the most recognizable places in the city.
On June 4, 1965 a military pilot Valentin Privalov flew a jet plane under the bridge one meter from the water. It immediately became known not only in the USSR, but also abroad. Despite the proceedings and the courts, Valentin was allowed to fly in the future.
Today, the Oktyabrsky bridge has a powerful social and economic significance for Novosibirsk as a whole. The river crossing has served the active development of the city's left bank, and the coastal park that appeared in the vicinity of the bridge has become a popular recreation spot for citizens.

Novosibirsk Underground Bridge

It is the longest metro bridge in the world. Its total length is 2,145 m (of which the river part is 896 m). It consists of three parts:
1. The right-bank trestle. It is a glazed green box-gallery with window apertures 2 m by 2 m, connecting the bridge crossing to the elevated part of the station "River Station".
2. The bridge crossing is a grey reinforced concrete box, equipped with windows-illuminators, but since the mid-1990s they have been half-closed.
3. The left bank flyover of the metro bridge looks like a glazed green box-gallery with similar window openings of 2 m by 2 m and is more than 1 km long.

The necessity of this bridge appeared when the problem of transport connection between the left and the right bank appeared.
An interesting fact about the bridge is the stretching effect. In winter the bridge becomes shorter, and in summer it is stretched by 50 cm, for which purpose rollers are installed on its supports, relative to the longitudinal axis of which the whole box structure is swinging. The change in the structure's length is due to the large temperature differences.

In 2021 the project of the underground bridge reconstruction was presented, according to which it will be completely glass and equipped with illumination. And in 2022 the reconstruction of the glazing was completed. Passengers now have a panoramic view of the river and the city.

Bugrinsky bridge

Construction began on 17 February 2010 and was completed in October 2014. The bridge has the longest arch span in the CIS.

The first attempt to build the bridge took place in the early 1980s, but numerous problems in the form of re-design of the bridge, perestroika and the break-up of the country.
The next attempt took place in 1997. A proposal was made by the mayor's office to find an investor who would build the bridge crossing and subsequently lease it and collect the tolls. The project was then disrupted by the economic crisis that broke out in 1998.
In 2005, the construction of the Bugrinsky Bridge was resumed. A cable-stayed bridge (a type of suspension bridge consisting of one or more pylons connected to the roadway by steel cables) was chosen almost immediately and almost unanimously as a design model.

The original name of the bridge was "Olovozavodskiy". It was adopted because one of the largest tinworks was located near the structure. But later, the mayor said that the name was obsolete, so the third bridge across the Ob was called "Bugrinsky".

Structure of the construction:

The uniqueness of the constructed bridge is in the size of its main span. For the river-bed section of the bridge a combined system of arches with lagging and inclined hangers (the so called "netted arch") was used. The arch span length is 380 m, which is unique for an arch of this type anywhere in the world. Visually, the 70 m high arch is reminiscent of a giant red bow, one of the main elements of the Novosibirsk coat of arms.

In 2016, the International Federation of Consulting Engineers (FIDIC) awarded the 2016 FIDIC Award of Merit to Stroyproekt Engineering Group, the general designer of the bridge crossing, for the design of the Bugrinsky Bridge. In evaluating the submitted projects, the jury considered innovation, quality, professionalism, transparency, durability and environmental impact.

URBAN STAIRS BASICS

Stairs are an integral part of any living area, people interact with every day. Therefore it is crucial, that they are made well and allow for the most comfortable and fast and safe progression. As a result, a significant number of documents are used to regulate stair parameters.

This article is a dramatic simplification of a cluster of normative documents, regarding accessibility, urban planning and fire safety, meant as a starting point for students of constructional and architectural specialties as well as people interested in reasons behind different urban design solutions.

STAIR COMPONENTS

1
Step is a combination of tread and riser which permits ascent and descent from one floor to another.

2
Tread is the upper horizontal portion of the step over which foot is placed during ascending or descending a stairway.

3
Riser is the vertical member of the step. It is used to support and connect successive treads.

4
Rise is the vertical height between two consecutive treads.

5
Landing is a horizontal platform between two successive flight of a stair. Landing is used as a resting place during use of the stair. It facilitates the change of direction of the flight.
Landing which extends for full width of the staircase is known as half-space landing. Landing extending for only half the width of staircase is known as quarter space landing.

6
Nosing is the projecting part of the tread beyond the face of the riser. Nosing is usually rounded to give
good aesthetic effect to the treads and make staircase convenient and easy to use.

7
Going is the horizontal distance between without the faces of two consecutive risers.

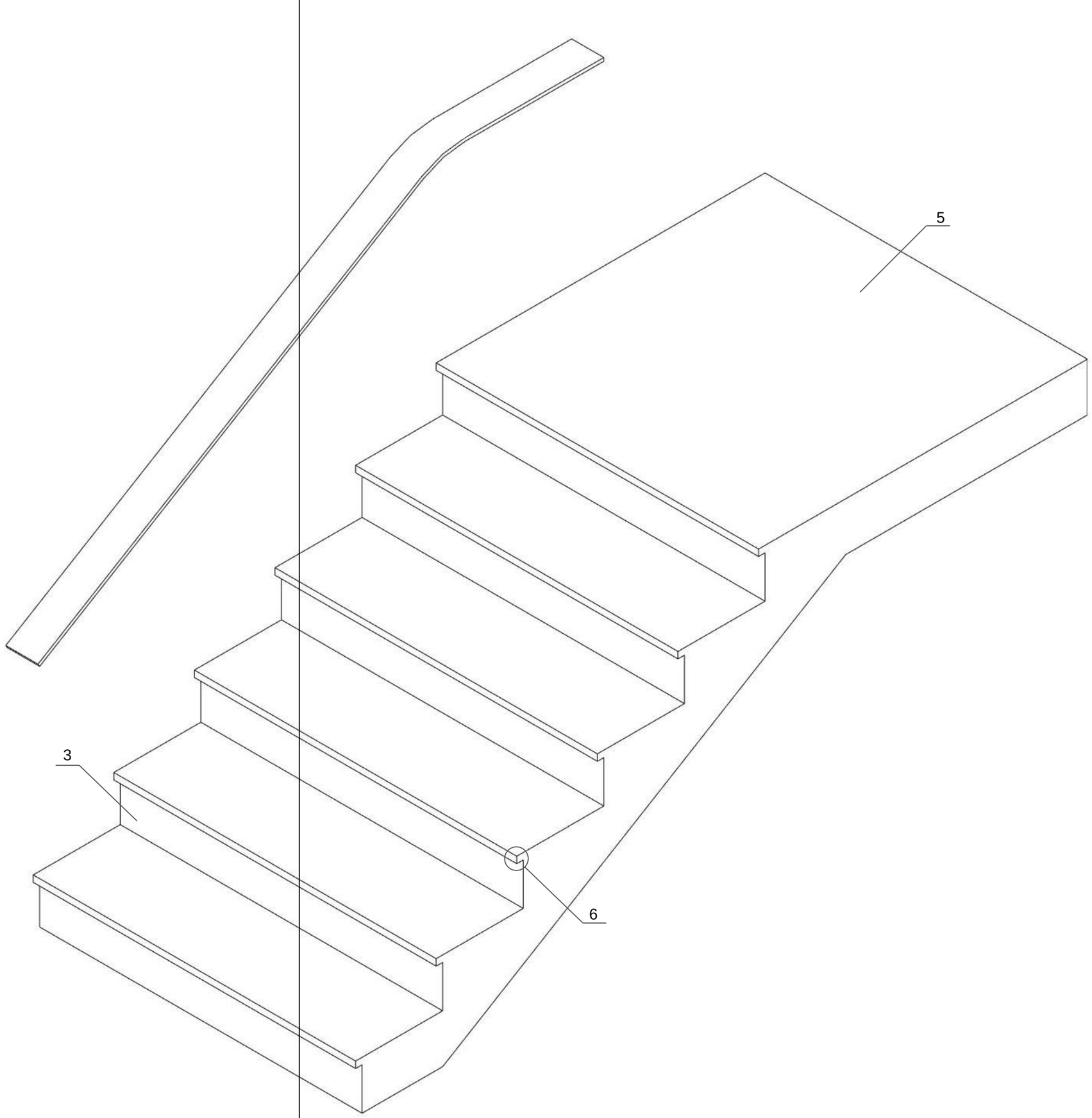
8
Flight is a continuous series of steps without any break between landings or landing and flooring.

9
Hand rail is an inclined rail provided at convenient height over balustrades. The inclination of the rail is parallel to the slope of the stair. It serves as a guard rail and provides assistance to the users of the stair. hand rails can be molded in so many architectural forms. It also acts as a protective bar.

10
Pitch (slope) is the vertical angle made by nosing line of the stair with the horizontal.

11
Run is the total length of the stair in horizontal plane including lengths of landings.

12
Walking line is the approximate line on the stair, adopted by the people during the use of the stair.
This line is located about 40 cm from the centre of the handrail.



STAIRS CLASSIFICATION

Internal, placed on stairwells.

Internal open (not being restricted by walls from both sides).

External open.

STEPS HEIGHT

The standard for the rise according to regulatory standards is 120-250 mm.

For street structures in public buildings, norms of 150-170 mm are applied.

In residential buildings, products are designed according to riser heights of 170-220 mm (due to its sole priority being vertical advancement).

For climbing to the roof and descending to the basement, the permissible maximum height is 250 mm.

STEPS DEPTH

The optimal tread length is set between 250 and 300 mm. there are two reasons for that:
Firstly, to ensure safety, tread is required to accommodate different foot sizes.
At the same time, the steps too deep will create discomfort and confusion for the majority of users, related to the need for adjustment and therefore may become a safety liability, not to mention the low efficiency of such option.

STEPS WIDTH

The width of the march (not including spaces for ramps or handrails) for the movement of one person along the ladder must be not less than 800 mm.

In educational buildings with estimated number of students of 200 and more the width of flights of stairs must be at least 1.5 m.

The width of flights of external stairs should be at least 1.35 m.

RISE TO TREAD RATIO

In XVII century French architect Nicolas-François Blondel devised a formula for an optimal tread (T) to rise (R) ratio, which holds true to this day.
2R + T = 600-640 mm

The best angle of inclination is in the range of 26-38 degrees.

THE NUMBER OF STEPS

One flight of stairs should include between 3 and 12 steps with the maximum of 18.

It is better to make the number of steps in the march odd, so that the movement of a person on the stairs begins and ends with one foot.

Usage of a single step is unacceptable and it must be replaced with a ramp.

OTHER REQUIREMENTS

In residential buildings, above two floors, it is necessary to design several flights of stairs.

In one flight of stairs, the height of the riser cannot differ by more than 5 mm.

Inter-span landing in width cannot be less than 1300 mm.

The space from the front door to the first step of the ladder must be equal to or exceed 1000 mm.

The nosing must not exceed 50 mm (30 mm for timber structures)
It is inadvisable to use steps with open risers, due to possible complications for the disabled and low-mobile.

HANDRAILS

Handrails should be provided at the heights of 0,7 and 0,9 m
If adjacent to a wall, the distance to handrails should be not less than 40 mm.

Handrails should be round in cross-section with subsequent diameter ranging between 30 mm (for children) and 50 mm (for adults).

It is also acceptable to make handrails rectangular in cross-section with width from 25 to 30 mm.

Handrails must be continuous throughout the height of the stairs or ramp.

The ends of the handrails must be rounded and smooth to exclude the possibility of injury.

RAMPS

The outer ramp should have a slope no steeper than 1:20 (5%).

The length of the continuous march of the ramp should not exceed 9 m

It is allowed to design a ramp with a slope not steeper than 1:12 (8%) with a march length of not more than 6 m, if the building area is limited.

With an estimated height difference of 3 m or more, lifting devices should be used instead of a ramp.

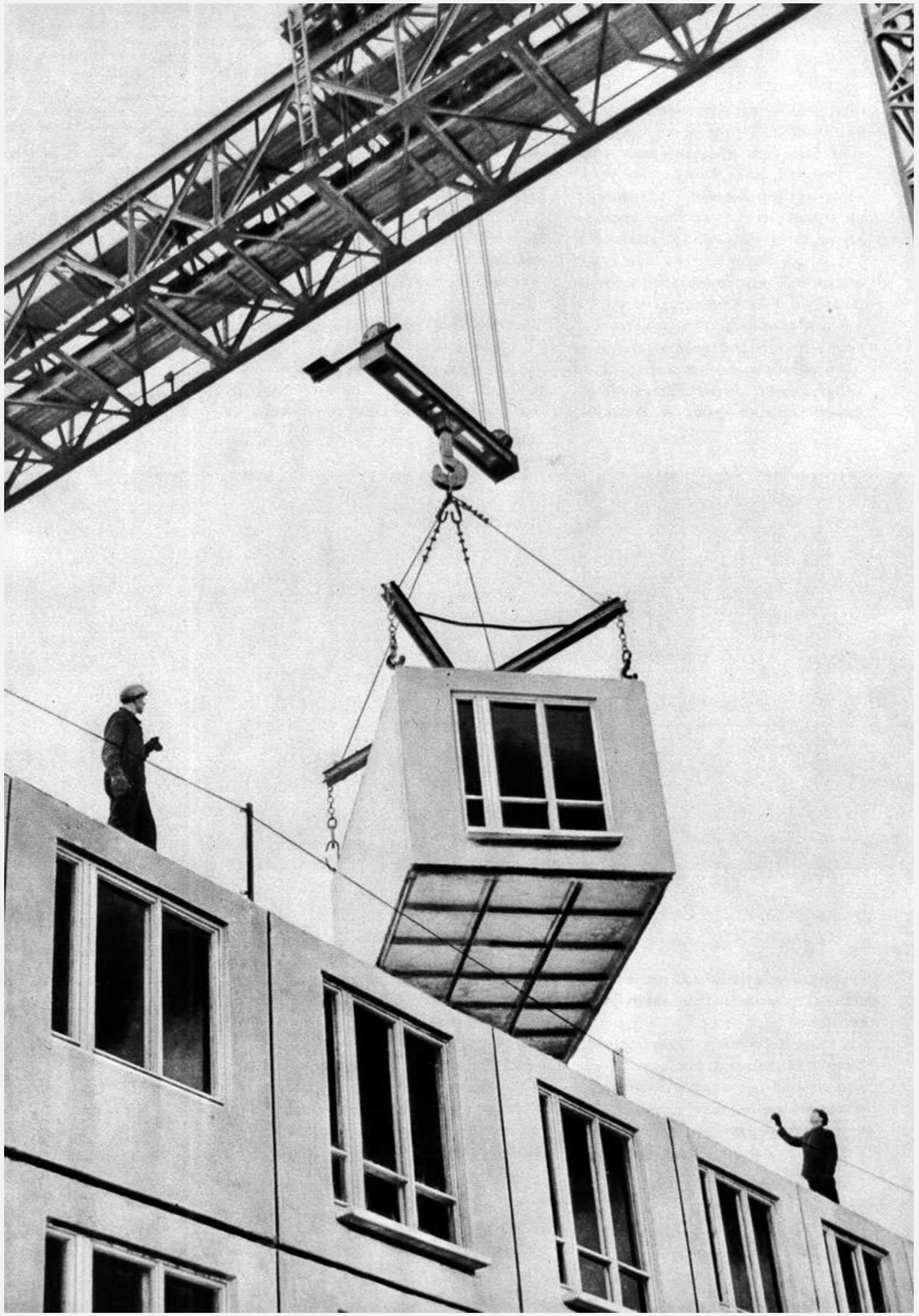
The usage of inventory or roll ramps with width of 750 mm or more and slopes close to those of stationary ramps is acceptable for buildings of architectural heritage or temporary access for the disabled.

At the upper and lower ends of the ramp, free zones should be provided with dimensions of at least 1.5x1.5 m.

Similar areas (at least 1.5x1.5 m) should be provided for each change in the direction of the ramp.

The distance between the handrails of the one-way ramp should be within 0.9-1.0 m.

Panel housing construction: from cheaper production to a new cultural phenomenon



Panels, or houses built by the method of prefabricated panel construction – one of the brightest representatives of the USSR. The scientific development of panel-frame housing construction projects began in 1940 at the Research Institute of Construction Equipment of the Academy of Architecture of the USSR by a team led by G. Kuznetsov. However, the war interrupted these works. At the end of 1943 - beginning of 1944, the question of accelerated construction of permanent, capital housing for builders and operators of an actively expanding network of power plants became acute in the Urals. In this regard, an emergency meeting was held in Sverdlovsk, in the Glavuralenergostroy trust. During the meeting, the issue of high-speed housing construction was resolved. Alexey Timofeevich Smirnov, the chief engineer of the pre-production group, proposed reinforced concrete panels as a material. During a stormy meeting, Smirnov's proposal was approved. July 11, 1944 the management of the trust issues Order No. 74. His catchphrase was: "To organize a factory for the manufacture of building structures and parts." Production was launched in the city of Berezovsky (a suburb of Sverdlovsk), the first panel house in the country was assembled here in December 1945.

And what was in the world? The first houses in which large panels made of reinforced concrete were used appeared in 1910 as part of Forest Hills Gardens, located in one of the suburbs of New York, Queens. This project was a garden city. Named after the engineer and architect Grosvenor Atterbury, the principle of construction is known in Europe as the Atterbury System. In the UK and France, this was preceded by the construction of experimental structures using small-sized concrete elements. These structures used mass—produced elements from other raw materials - wood, metal, etc.

And yet, despite the huge number of panel houses built in the XX century, only Soviet ones have survived. In the rest of the world, this method of construction was not successful, but Soviet engineers refined and reworked this idea. There is no city in Russia where there would not be panels. But why is it that panel construction is gaining momentum in Russia again nowadays? Everything is as simple and clear as it was then – relative cheapness, quick installation are the main advantages of this method. There is only one caveat – these houses were supposed to be temporary, but then, due to the collapse of the Soviet Union, they could not be replaced due to the restructuring of the state. They just didn't have time. And now they are being built, most likely, because of their complete recycling. Since the panel houses were temporary, and also because of their design, there were significant disadvantages - low ceilings, high audibility, cracks, poor thermal insulation, poor engineering infrastructure inside the house.

Well, we have sorted out the history of the panels – it's time to find out their cultural significance. Not so long ago, people were divided into generations – boomers (the older generation, before 2000), zoomers (the youngest generation, after 2003 - 2004). Take the boomers – they found these houses, many lived in them, the panels awaken a sense of nostalgia in them. Zoomers can simply admire the atmosphere of panel houses. Listening to performers like "Buerak", "Silent at Home" and walking around watching the panels around is an invaluable feeling. Probably, the panels have become a cultural phenomenon because of their kind of paradox: it seems to be something old, against the background of a new one.

INSTITUTE OF CIVIL ENGINEERING AND ITS DIRECTOR

Our group of students interviewed the director of the Institute of Construction – Gvozdev Vladimir Alekseevich, the director and an excellent teacher. To begin with, I would like to tell you a little about this man, since notmany people know about his extracurricular life. Vladimir Alekseevich was born into a family of musicians. Most of his relatives were professionally engaged inmusic. However, Vladimir decided to follow in the footsteps of relatives from Voronezh and become a civil engineer. First, he studied at the Voronezh Institute of Civil Engineering, and then transferred to Sibstrin. And here he took the position of dean of the Institute of Construction, as well as a teacher, received the degree of Candidate of Technical Sciences, and the title of associate professor. Vladimir Alekseevich believes that the director should faithfully serve his institute, students and its staff, try to create all the necessary conditions.

Our director pays great attention to work with applicants, as he believes that good applicants make good students and specialists. For them, the university organizes an "Open Day" and other events in schools, universities and various venues. Vladimir Alekseevich does not single out students of certain areas, such as “Design of Civil Sctructures " or “Contsruction of Unique Structures and Buildings", and considers everyone talented and capable. According to him, the students of our university have great opportunities to realize their ideas, build a career and various studies. Sibstrin and its manager are proud that students show themselves only in a good light, winning awards in various Olympiads, conferences and forums.

Vladimir Alekseevich calls the provision of high-quality engineering and construction education and the training of high-quality specialists an unchangeable and wonderful tradition of the University. And he considers discipline, love for his subject, and respect for students to be the main characteristics of a good teacher.

To the students of our University, Vladimir Alekseevich wishes faith, hope and love in the noble profession of a civil engineer.

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