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WHITE TOWER

Conservation Management Plan and Restoration Project

Final Report

This report is prepared by the Arch-Group Podelniki according to the grant agreement between the Schusev State Museum of Architecture and the Getty Foundation #R—ORG-202048143 dated May 27, 2020 for the preparation of a conservation management plan for Reisher's White Tower in Ekaterinburg, Russia. The report is published with the assistance of the Getty Foundation through its Keeping It Modern initiative.

Cover photo:
White Tower, 2017. *Photo by Konstantin Antipin.*

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BRIEF PROFILE OF THE WHITE TOWER

Architect: **Moisey Reisher**
Design: **1929–1930**
Construction: **1930–1931**
Load-bearing structure: **monolithic reinforced concrete**

Status and full name:
Federal cultural heritage site in Russia "Water Tower" (since 1974)

Address:
2a Bakinskikh Comissarov Str., Ekaterinburg, Russia

User:
Sverdlovsk Regional Public Organisation "Group of Architectural Initiatives, Events and Communications" (since 2012)

Owner:
Agency for the Management and Use of Historical and Cultural Monuments
auipik.ru

CONTENT

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White Tower. 2015 *Photo by Fedor Telkov.*

Introduction

This publication stems from the culmination of our work related to the Getty Foundation grant.

We embarked on this endeavor not only to provide an account of our accomplishments to the grantor, but also meticulously organize the wealth of information about the White Tower. We aimed to distill, reflect upon, and consolidate our experience working with this unique heritage site. Moreover, we sought to define our objectives for the forthcoming phases of our work and outline the paths we've uncovered to address them.

Publication Contents:

`Section 1` focuses on general information about the project. Here we introduce the team and tell how our journey with the White Tower began, discuss the routes we've walked and the objectives we set for our work under the Getty Foundation grant from 2020 to 2023.

`Section 2` delves into the history of the tower from 1929 to 2012. We give an in-depth description of all available information on its design and construction, the urban context of that period and its transformations, tell about architect Moisey Reisher, explore potential parallels and influences, and the ongoing quest for a new function of the tower.

`Section 3` narrates the recent history of the tower that is related to to the activities of the architectural group Podelniki. We describe design and research work carried out from 2012 to 2020, leading up to the restoration and adaptation.

`Section 4` presents the restoration project itself. Here we publish the results of an extensive work made by a large team that was led by the *Rozhdestvenka* architectural bureau from 2020 to 2023. This work and its underlying research were the focal points of the Getty Foundation grant.

`Section 5` is reserved for conclusions and final remarks.

1.1 Authors of This Report. Arch-group Podelniki and the White Tower Team since 2012

This text was written by a group of individuals. Behind a collective "we" there are Evgeny Volkov, Tatiana Zubkova, Polina Ivanova, Pavel Loginov, and Antonina Savilova. The text and illustrations draw upon materials generated during the work of the *Rozhdestvenka* bureau and many other specialists involved both in the preliminary research and restoration.

Moreover, it would be fair to mention the architectural group Podelniki and the international team of the "White Tower" project among the authors of this report as well.

The Arch-group Podelniki was founded in 2007 by graduates of the Ural Architectural Academy in order to realize various projects together such as exhibitions, tours, and installation festivals. Through these projects, they aimed to make architecture a subject of public attention and interest.

In 2012, the group got an official registration as a public organization named the "Group of Architectural Initiatives, Events, and Communications."

Status of a registered non-commercial organization with heritage preservation as one of its statutory goals allows for an opportunity to receive heritage architecture for gratuitous use. Including such iconic and significant monuments as the White Tower. In that same year, 2012, the previous user relinquished their rights to the tower, leaving it without an owner. Soon we submitted necessary documents to the appropriate government body. As a result, thanks to a series of coincidences, which, in hindsight, appear almost fateful, Podelniki became responsible for the future of this architectural masterpiece.

The White Tower is not the only project of the arch-group, but it is the most significant one that keeps them united. Podelniki members also work for other architectural bureaus and engage in architectural research. They are often referred to as "activist-civic organizers," but a more accurate description would be "passionate professionals."

As the project developed, experts from various fields also joined the group.

Tatiana Zubkova, upon her graduation from the Ural Academy of Architecture in 2010, presented a diploma project for adapting the tower into a planetarium. Since then, she has become a successful restoration specialist, and in 2020, joined the project as the "technical client" of the restoration. She ensures that the project aligns with the potential users' demands and coordinates the work of the project team with the requirements of various approving authorities.

Dr.-Ing Werner Lorenz, professor at the Brandenburg University of Technology and a globally recognized expert in the preservation of historical structures. In 2013 he supervised a Russian-German student workshop, during which his students conducted an initial technical survey of the tower. In 2023, he proposed a meeting to brainstorm the final technical decisions in the restoration project. This meeting took place in Yerevan.

Narine Tyutcheva is the founder and managing director of the *Rozhdestvenka* bureau. Her architectural practice in heritage preservation is rightfully considered the best in Russia. In 2014, Narine Tyutcheva agreed to become the academic supervisor for the conservation project and fulfilled this role on a voluntary basis. Starting in 2020, after receiving the grant from the Getty Foundation, she led the team from her bureau in the comprehensive restoration project.

Evgeny Redikultsev, a leading expert in reinforced concrete structures in the Urals. He also participated in the annual cleanup days at the White Tower and personally cleared it of debris. In 2023, during the conference in Yerevan, Evgeny shared his professional, precise, and well-founded remarks on methods of reinforcing concrete structures.

This list could be continued. The White Tower brings many people together.

1.2 How and Why did We Engage in the White Tower?

Our fascination with the White Tower has endured for over a decade. It is not merely another Ekaterinburg's architectural landmark or a recognizable modernist structure. On the one hand, the White Tower possesses immense symbolic capital and value; on the other, it remained abandoned for several decades and was being widely associated with decay.

In the 21st century, the tower's symbolic meaning underwent transformation. In the early 2000s, it was already famous among a niche group of architecture enthusiasts and specialists. Its photograph appeared in Richard Pare's book, "The Lost Vanguard: Russian Modernist Architecture 1922–1932" (Monacelli Press, 2007).

[pic.1] **An inscription inside the tower "Bury your dreams." 2013.**

[pic.2] **Photo of rapper MC Bandit in front of the White Tower. The artist shows a tattoo with the building on his forearm.**

However, for city residents, the tower remained a gloomy, abandoned ruin on the outskirts of a remote, industrial, and crime-ridden neighborhood. Also at that time, the tower could be spotted in homemade music videos by local rap artists from the Uralmash district [pic.1-2]. At first, visitors would often tell us stories about how the tower was a gathering place for marginalized individuals, and that some terrible things occurred there.

It was as if there were two towers: professionals saw an icon, while the townspeople saw a "dark tower." These two worlds were so not ready to listen to each other that it even resulted in a confrontation.

We perceived the White Tower as a masterpiece, and since 2010, have become interested in its future. In 2011, we organized our first cleanup day there, still in partnership with the tower's previous user.

The catalyst for our project was an event that could be treated as hooliganism, mischief, or as an artistic gesture. In the spring of 2012, someone placed a sign above the entrance to the tower saying “Museum of Sh*t.” To some extent, this inscription reflected reality: by that time, the tower had been abandoned for so long that the ground floor was being used as a public restroom.

A photograph of this sign appeared in local media, sparking a debate about the tower’s fate. The public discussion took quite an unexpected turn: there was a proposal to “demolish it so that it wouldn’t bring shame onto the city.” Fortunately, expert community came to the monument’s defense. However, the gap between the two images of the tower became evident, as did the urge to do something about it. It was in response to both the professional community’s and the city residents’ demand to activate the tower that our relatively young public organization managed to get the tower for indefinite and free use.

The first few years were spent shaping and promoting a new image of the tower as a prominent landmark and a symbol of the city, not just an elite asset for architectural experts. What is especially valuable to us is that it became an epitome of a civil society initiative.

We were lucky that both local and national experts joined us in promoting the project.

For example:

Tatlin Publishing named an architectural festival after the White Tower, the festival took place in Ekaterinburg between 2012 and 2014.

A model of the tower was exhibited in the Russian Pavilion at the Venice Biennale in 2014.

The image of the tower is featured in the logo of the major all-Russian construction forum “100+” and the logo of the “Football in Every Courtyard” program, which supports local football teams in the Uralmash district. [pic.3]

A metal badge with the tower’s image won the best souvenir award at the All-Russian souvenir competition festival “Tourist Souvenir” in 2018. [pic.4]

Today, you can find an image of the tower on various Ekaterinburg souvenirs, on a variety of items from jewelry to sweaters and city sculptures.

[pic.3] **“100+” construction forum uses the image of the White Tower in its logo.** *Photo from their website.*

[pic.4] **Souvenirs with the White Tower: postcards, stickers, badges, and rings.**

We deeply value that the tower’s restoration project is also gaining its symbolic worth. In 2015, the Tower was part of an exhibition at the Museum of Architecture in Moscow (MUAR) along with other outstanding examples of Soviet avant-garde architecture: The White Tower in Ekaterinburg, Melnikov House in Moscow, Factory-Kitchen in Samara, a theater in Rostov, and Melnikov’s automobile park in Moscow. A year later, this exhibition was presented at the Milan Triennale.

The story of the tower as a symbol of a community involvement in preserving architectural heritage has become well-known in Russia. In 2017, Google included the White Tower case in its all-Russian project “Away from the Capitals.” Additionally, Archdaily published an article about the conservation work done by the architectural group Podelniki.

1.3 Project Stages in 2012–2020

Suddenly and to some extent unexpectedly, we became in charge of the White Tower, but we already had a good understanding of what we should avoid doing.

Our predecessors’ experience suggested that we should not start planning the process only having the tower’s final function in mind. This approach posed a significant risk of stumbling at the outset. For instance, the first adaptation project created in 1971 encountered problems with organizing evacuation routes in case of a fire and failed right away.

At the same time, it was evident that we should start with cleaning the tower of debris, stop vandalism, and halt the deterioration of structures.

Since 2012, our goal has been to preserve the White Tower physically and reintegrate it into the city life.

The steps toward this goal was a “ladder” of consecutive actions.

1) In 2012, we began organizing cleanup days.

2) In 2013, the first structural survey took place.

3) In 2014-2015, a conservation project was developed and approved. It was implemented step by step in 2015-2016.

4) In 2016, the tower was connected to electricity.

5) Since 2016, after the conservation was complete, the tower was open for tours and served as a cultural venue.

6) In 2018, we organized the “Forum of Tower and Underground Keepers,” which gathered and shared experiences of similar projects and helped formulate our technical specifications for the restoration.

Throughout this time, the project has gained friends and partners forming a community of committed custodians of the tower. In order to secure funding, we learned to conduct crowdfunding campaigns, attract sponsors, and win grants. We accumulated experience in cooperating with government agencies and public institutions.

By 2020, we were ready to commence the restoration project, which became the primary focus of our grant application to the Getty Foundation.

1.4 Goals and Objectives of the Grant

The primary goal of the grant was to develop a restoration and adaptation project for the tower and obtain the entire set of documentation, approvals, and permits necessary to implement it. And besides, make the project public and transparent.

This goal breaks down into several tasks:

- surveying the tower
- developing a draft and then a detailed work project for restoration and adaptation for a new suitable function that would preserve the tower’s appearance and authenticity
- obtaining approvals from all necessary authorities
- estimating the cost of implementation and verifying it by an external (government) auditor
- presenting the project publicly and showcasing it on different levels

The specific types of work that were meant to be done using the Getty Foundation grant run as follows:

I. Preliminary studies and research

Preliminary studies and scientific research include:

- gathering, digitizing and analyzing historical and archival information about construction and further use of the building including repairs and conservation works at previous periods
- creating measured models (based on the the previous design) by means of special equipment (2D or may be 3D scan) meeting the restoration requirements
- technical surveying. Visual survey of the building: its specific features and defects (e.g. insulation). Documenting defects (photos) and preparing a scheme based on measured drawings
- geological surveying
- surveying engineering systems
- exploring the condition of materials and constructions, carrying out laboratory tests and instrumental research

II. Design

This part includes all the detailed architectural, structural and engineering design plans and sketches that were needed in order to get permissions and launch restoration.

Main parts of the Project are as follows:

- Architectural Design
- Construction Design
- Landscape Design and External Engineering Networks
- Engineering Documentation (heating, air conditioning, sewage, electricity etc.)
- Fire Safety
- Environmental Protection
- Technological Design (Equipment)
- Cost Estimates

III. Expert review and government approval

The set of permits and approvals includes:

- Approval of archaeological research by the state historical and cultural expertise.
- Approval of the restoration project by the state historical and cultural expertise.
- Approval of the restoration and adaptation project by the state authority responsible for protecting cultural heritage sites.
- Approval from the cost estimate expertise.

Approval from the state historical and cultural expertise on ensuring the preservation of the site when conducting work on the territory of a heritage site.

IV. Public relations

Public activities within the project:

Expert discussion and specialists' evaluation of the project.

Presentations at professional platforms.

Coverage in the media and attracting attention to publications on the project's website.

Organizing an exhibition inside the tower.

Implementation of the grant program 2020–2023

All in all, the program took three years. Putting aside significant part of work dedicated to getting the contract signed and some legal preparation, the grant project had three consecutive stages:

1) preliminary research

2) preparing the project of restoration and adaptation for approval by cultural heritage protection authorities

3) developing a detailed work plan, a project of connection to external networks and calculating the cost of realization

Concise timeline of the grant project realization:

Fall 2020: signing a three-party contract and searching for subcontractors.

Winter 2020 – Spring 2021: the first stage of work. Preliminary research (historical and cultural studies and field inspection of the tower), developing a research plan, gaining permission to use instrumental methods of research from an authorized body for heritage protection.

Summer – Winter 2021: development of a preliminary design project. Setting operational tasks, discussing the possibilities of access for the people with limited mobility.

Winter – Summer 2022: discussion of the adaptation project within a work group "Designer — Technical Client". Shift to the "Project" phase.

Summer 2022: creating all technical conditions for connecting to external networks.

September 2022: approval of the project by the State Historical and Cultural Expertise.

Summer – Fall 2022: discussing the project with technical consultant specialists.

October 2022: presentation at the "100+" Forum and the start of a public discussion.

21 December 2022: the second stage completed. Restoration and adaptation project developed: coordination and approval of the State Heritage Preservation Office of the Sverdlovsk Region.

Winter 2023: development of a detailed restoration plan.

16–18 February 2023: international conference in Yerevan.

Spring 2023: changes to the detailed work plan according to the conference conclusions.

Spring – Summer 2023: drafting the cost estimates.

Summer 2023: state expertise of the cost estimates *by Rosgosexpretisa*.

September 2023: the third stage completed. Developed the Work Project and the estimates of realization costs: obtained an approval from the state cost estimate examination.

1.5 Institutions and Stakeholders

The tower has always been and remains the property of the Russian Federation. In 2012, the responsible state entity overseeing the tower was *Rosimushchestvo (Russian property)*.

It was *Rosimushchestvo* that issued an order and entered into an agreement, which transferred the tower to the Arch-group Podelniki for indefinite and free use. Following the reorganization of state bodies, the tower came under management of the Federal Agency for the Management and Use of Monuments of History and Culture, which replaced *Rosimushchestvo* as the state party in the agreement.

Then, the responsibility for implementing the state policy in the field of heritage preservation lies with the Department for the Protection of Cultural Heritage Sites of the Sverdlovsk Region. This office approves the restoration project, reviews and approves the results of the historical and cultural expertise, and issues permits for conducting work.

In addition, there is the Federal Historical and Cultural Expertise that consists of a group of independently certified experts who provide an assessment of whether the project complies with the legislation requirements on cultural heritage preservation.

As for the examination of project documentation for compliance with modern reliability and safety standards, it is the responsibility of the *Glavgosexpertisa (main state expertise)*. However, in our case, the examination by *Glavgosexpertisa* was avoided (more on this in Section 4).

Finally, *Rosgosexpretisa* is another expert body that, in our case, was responsible for verifying the accuracy of the cost estimates.

1.6 Faces of the Project

The project's success relied on the contribution of several key partners.

Firstly, the grant was administered by the Schusev State Museum of Architecture (later in the text MUAR), which oversaw project coordination, fund allocation, interaction with the Getty Foundation, legal and financial aspects.

Pavel Kuznetsov led the project as the museum's first deputy director, managing all aspects from preparing grant application and participating in the 2020 spring competition to project launch in July 2020. This included substantive discussions with the *Rozhdestvenka* architectural bureau, project budgeting, liaising with the Getty Foundation, and making reports, including this final one.

Secondly, the main contractor of the restoration design project was RDNK Architects (later in the text Rozhdestvenka bureau). It is an organization founded by Narine Tyutcheva in 1992, a leading architect dealing with heritage sites in Russia. Expert works such as archeological research, geological survey and other were carried out by local contractors under the supervision of RDNK.

Thirdly, the arch-group Podelniki, founded and led by Polina Ivanova at the project's outset, functioned as the official user of the building. They were responsible for the technical supervision of the design process, maintaining contact with public authorities, and collaborating with MUAR to engage the professional community and publishing houses.

MUAR (Moscow)
Team leader — Pavel Kuznetsov

- *Project supervision;*
- *Communication with the Getty Foundation;*
- *International advisory committee meeting organization;*
- *Media publications;*
- *Reporting to the Getty Foundation on the completed work and work in progress;*
- *Project presentation.*

Rozhdestvenka architectural bureau (RDNK, Moscow)
Team leader — Narine Tyutcheva

- *Historical, archival and bibliographic research;*
- *Architectural restoration design project;*
- *Federal Historical and Cultural Expertise.*

PODELNIKI (Ekaterinburg)
Team leader — Polina Ivanova

- *Administrative work with local authorities; paperwork; technical supervision of project documentation;*
- *State Expert Appraisal of Design Documentation and Engineering Survey Results.*

Team of the arch-group Podelniki:
Polina Ivanova
Evgeniy Volkov
Pavel Loginov
Antonina Savilova

Technical consultant in the restoration project:
Tatiana Zubkova

Schusev State Museum of Architecture:
Project leader — Pavel Kuznetsov
Legal support — Emin Mirishli

Development of design concept and adaptation project:
General contractor — Rozhdestvenka Bureau (RDNK):
Narine Tyutcheva, *Head of the Bureau*
Svetlana Aleshina
Elena Kirillova
Sergey Kravchenko
Olga Poteeva
Petr Popov
Daria Razmustova
Kirill Yakushin

Survey of constructions:
Team of survey engineers from LLC ISS-1 LLC under the leadership of Nikolay Kustryo

Technological research on building and finishing materials — Maria Makarova

Mycological research — Irina Saneeva

Engineering solutions in the adaptation project:
Team of engineers from LLC Ivanovorestavration LLC led by Ivan Kornilov

Structural solutions — Evgeny Ivanov

Water supply and sewage — Polina Belova

Heating, ventilation, and air conditioning — Maxim Smirnov

Electrical and communication networks — Alexander Samoylenko, Olga Kuzina

Technical consultants and experts on the adaptation project:
Reinforced concrete structures
Evgeny Redikultsev, *Head of the "Efficient Design" Bureau*

Engineering solutions
Vitalii Prokhorov, *Chief Engineer at LLC InPAD LLC*

Adaptation of the facility
Elena Leontieva, *Expert in accessible environments and universal design*
Ilya Shipilovskikh, *Expert in museum and exhibition spaces*

International experts:
Professor Dr.-Ing. Werner Lorenz, *Honorary Professor for the History of Construction at BTU Cottbus-Senftenberg.*

Prof. Dr.-Ing. Christoph Dauberschmidt, *Professor for Building Materials Science and Structural Conservation at the University of Applied Sciences in Munich.*

Acknowledgments

In this journey, we owe our deepest gratitude to those who believed in the project's potential and lent their support when we applied for the grant in 2019.

Marina Khrustaleva, with her insightful counsel, encouraged us to pursue the grant application, even in the face of past disappointments.

We cannot overlook the invaluable support of **Jean-Louis Cohen** (1949–2023), who visited the White Tower in 2017 and has since supported our project with his immense authority, publicly declaring the international significance of this monument.

Our special thanks extend to **Pavel Kuznetsov**, who not only proposed the participation of the Museum of Architecture but also became a vital partner. His experience with the successful implementation of a Getty grant for the Melnikov House added substantial weight to our endeavor, ultimately making this project a reality.

2

White Tower History: All That We Know

Photo on the previous page: the first photograph of the completed tower, December 14, 1931. *Photo by N. Tatarchenko.*

2.1 Source Review

When we embarked on the tower restoration project, many in the Ekaterinburg architectural community said “nothing is clear” and “no documents can be found”.

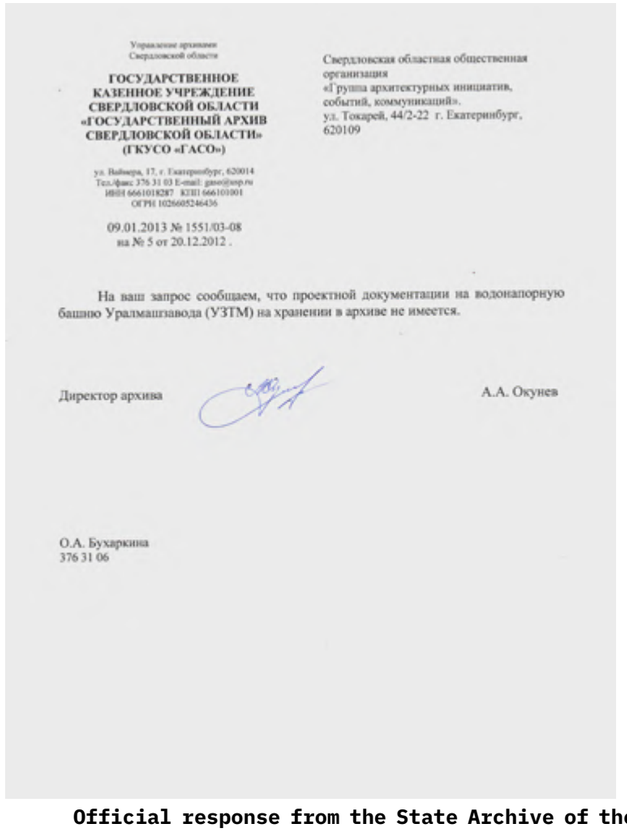
To some extent, this is undoubtedly true. Archives are typically associated with institutions, and the history of the 20th century in Russia did not favor institutional continuity. It is especially challenging to locate archives from the late 1920s and early 1930s. During industrialization, due to tight construction deadlines, design process often occurred simultaneously with construction. This was followed by major purges where the names of many repressed specialists, who had just put all their effort into the grand construction projects, were artificially erased. Furthermore, during transition from the New Economic Policy (NEP) to a strictly centralized command-administrative system, independent creative unions and some project associations were forcibly disbanded and consolidated. For example, the *Techbeton* trust (technical concrete), which produced the main plan for the White Tower, was disbanded in the early 1930s, and researchers have still not found its archive.

Our task was to meticulously gather all information about the tower’s design and construction, as well as its context.

Documentary source

In 2012–13, we sent requests to the archives all across the country, including the State Archive of the Sverdlovsk Region, the State Archive of Administrative Bodies of the Sverdlovsk Region, the State Archive of the Russian Federation, the Russian State Archive of Scientific and Technical Documentation in Samara, and others. However, the responses we received were mostly cliched and negative. [pic.1] This does not necessarily mean that there is no information in the archives. As it became clear later, sometimes the relevant information can be found in less obvious places (for instance, in the personal archive of Boris Zhurin, one of the chief executives at Techbeton). We needed to broaden our search scope to uncover the relevant documents.

Our first major luck was when we discovered a folder with the original blueprints in what might seem obvious but previously inaccessible place to our predecessors. [pic.2] Prior to 1991, the White Tower was part of the Uralmash Plant’s property complex. From 1991 to 1993, it was owned by the insurance company *Belaya Bashnya* (White Tower). It turned out that the company’s



Управление архивами
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**ГОСУДАРСТВЕННОЕ
КАЗЕННОЕ УЧРЕЖДЕНИЕ
СВЕРДЛОВСКОЙ ОБЛАСТИ
«ГОСУДАРСТВЕННЫЙ АРХИВ
СВЕРДЛОВСКОЙ ОБЛАСТИ»
(ГКУСО «ГАСО»)**

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ОГРН 1026605246436

09.01.2013 № 1551/03-08
на № 5 от 20.12.2012 .

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«Группа архитектурных инициатив,
событий, коммуникаций».
ул. Токарей, 44/2-22 г. Екатеринбург,
620109

На ваш запрос сообщаем, что проектной документации на водонапорную башню Уралмашзавода (УЗТМ) на хранении в архиве не имеется.

Директор архива А.А. Окунев

О.А. Бухаркина
376 31 06

[pic.1] **Official response from the State Archive of the Sverdlovsk Region: “In response to your inquiry, we inform you that the design documentation for the water tower of Uralmashzavod (UZTM) is not present in our archive.”**

founder, A. R. Sagalovich, used to work at the Uralmash Plant. Upon leaving it, he took with him a folder containing some crucial blueprints from the Plant archives. This folder was (and still is) kept in A. R. Sagalovich’s office.

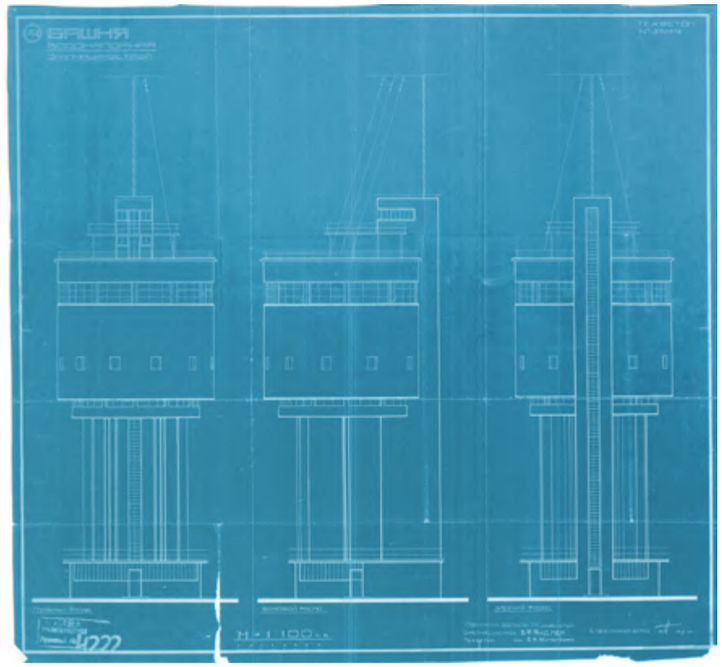
Some other materials were found:

In the Uralmash Museum, where its chief curator, S. S. Ageev, diligently collects memories, documents, and photographs from the entire history of the giant plant.

In the Museum of Architecture and Design at the Ural State Academy of Architecture and Arts, which gets architects’ archives after they pass away.

In the family archive of Moisey Reisher. His heirs (their family name is Kazachinsky) carefully preserve the master’s legacy. We have maintained warm relations with them for years. [pic.3]

In the State Archive of the Sverdlovsk Region, which collects documents from various organizations that operated in the region.



[pic.2] **One of the most important plans of *Techbeton*, found in a folder belonging to the *Belaya Bashnya* insurance company.**

ЗАБЫТАЯ БАШНЯ

ния грязных потоков словно с укором глядят на окружающих.

Между тем башня в печати неоднократно упоминалась и всегда в сопровождении эпитетов: оригинальная, интересная, красивая и т. д. Но меня, как автора ее проекта, заставили взяться за перо другие обстоятельства.

В конце января в газете «Известия» были напечатаны путевые очерки Марианны Шагинян «Три дня из «ФИАТЕ». Автор, в частности, упоминала о водонапорной башне Турина, с которой туристы могут любоваться окрестностями города. Вскоре один мой друг, москвич, видевший нашу башню, спросил меня в письме: предусматривал ли проект возможность обзора свердловских окрестностей. Пришлось сознаться, что башня проектировалась не только как коммунальный объект, но и как архитектурное сооружение в композиции застройки и благоустройства прилегающего района, как обзорная точка, расположенная в самой высокой части рельефа.

Башня имеет удобную лестницу с выходом на плоскую крышу, с которой открываются виды на город, на окружающие окрестности. С нее хорошо просматриваются западные гористые берега озер Балтым и Песчаного, не говоря уже о Верх-Исетском пруде и озере Шарташ. Павильон у подножья башни проектировался с учетом того, что в нем могло разместиться кафе-мороженое.

Это помещение, как и сама лестница, изолированы от технологического оборудования башни. Заложенные в башне большие возможности ее общественно полезного назначения пот уже в течение сорока лет никак не используются.

Не пора ли провести в порядок внешний вид башни и открыть к ней доступ?.. Пусть она станет достопримечательностью парка уралмашевцев, олицетворением архитектурной культуры первых пятилеток.

М. РЕЙШЕР,
архитектор.

На снимке: водонапорная башня Уралмаша. (Снимок 30-х годов).

«Хотите взглянуть на «ФИАТ» с водонапорной башни?» — спросил наш спутник М. Шагинян. «Три дня на «ФИАТЕ». («Известия»).

В ОРДЖОНИКИДЗЕВСКОМ районе, на пересечении двух магистралей — улицы Культуры и улицы Бакинских Комиссаров, на площади перед входом в парк культуры УЗТМ за высокой оградой из колючей проволоки стоит водонапорная башня — памятник первой героической пятилетке нашего города.

Только уж очень неопрятный вид у этого памятника. Грязные обшарпанные стены со следа-

Вечерний Свердловск Завр. 1967 г.

[pic.3] **Newspaper publication about the tower. The clipping is kept in the Reisher’s family archive.**

The sources and testimonies found over the last ten years can be categorized into the following groups:

Based on the source of information
- — Direct sources: author's text, photos, drawings;
- — Indirect sources: interviews, publications by the third-party authors based on their sources.

Based on the time of appearance
- — During development and construction;
- — Modern (measurements, adaptation projects, new photos etc.).

Based on a format
- — Drawing;
- — Text;
- — Photo;
- — Video;
- — Oral testimony.

Publications

Over the years, the White Tower has consistently drawn the interest of authors making books and journalists contributing to magazine and newspaper articles. It stands as a prominent architectural icon and a symbol of the district and the city.

1) **During construction**

- — Uralmash construction veteran V. N. Anfimov shared a detailed chronicle in a handwritten text, which lies in the Uralmash History Museum, and in newspaper articles.

- — Moisey Reisher, the tower's author, and his fellow architects Pyotr Demintsev and Gennady Elagin wrote newspaper articles with memories of the construction.
  You can gather factual data about the construction of the socialist city from publications that accompanied the Uralmash construction process. These include the initial plant project published as a book in 1933 when the plant was launched, edited by Tolokontsev. Furthermore, there were annual "construction industry reviews" that offered detailed insights into the progress of the construction endeavors.

- — The construction of Uralmash facilities, including the White Tower, is referenced in the illustrated magazine *Opyt Stroiki* (Experiences of Construction), which was published in the Urals during the 1930s. [pic.4–5]

2) **After construction**

Following the completion of construction, the tower was featured in specialized reference books on industrial construction and water supply. We managed to collect and digitize such books, including Professor Geniev's 1934 monograph on water supply. In this publication, a photograph of the tower is provided as an example of a reinforced concrete tower.

3) **Publications on technology of the time**

There's a belief that when searching for inspiration for the reinforced concrete tower, Reisher may have consulted reference literature featuring examples

арх. Оранский П. В.

Архитектурная практика Уралмаша

СТРОИТЕЛЬСТВО Уралмаша осуществлялось в период первой пятилетки, на протяжении которой в архитектуре преобладал «коробчатый конструктивистский стиль». Ведущая роль в проектировании промышленных сооружений была часто в руках технологов, которые ни о какой архитектурной грамотности не заботились. Несмотря на увлечение конструктивизмом за этот период на Уралмаше все же было создано прекрасное, правдивое в своей функции и архитектурно выразительное здание водонапорной башни (инж.— арх. Рейшер М. В.).

При проектировании объектов городского строительства по существу было то же положение. Сравнительно молодой коллектив архитекторов Уралмаша не смог здесь вести борьбу со строителями, не понимавшими значения архитектуры. Характерный пример беспомощности архитектора — история с деревянными лестницами в четырехэтажных жилых зданиях. Начальнику участка вздумалось заменить железобетонные лестницы деревянными. Несмотря на протесты архитектора, начальник строительства заменяет лестницы деревянными, объявив это временным мероприятием. Эти «временные» лестницы с 1929-30 г. г. существуют и поныне.

Коллектив Уралмаша в течение всей своей практики занимался комплексным проектированием. Архитектор при этом не гнушался ничем, проектируя и баню на 400 человек, барак и жилой дом на 100 квартир и здание заводоуправления в 60.000 м². При чем каждое здание обрабатывалось во всех деталях и со всей санитехникой и благоустройством.

Не обошлось и без ошибок. Часть из них еще можно исправить, а некоторые непоправимы. Они — пятно на совести коллектива архитекторов Уралмаша. К этим ошибкам относятся: неправильное расположение ряда зданий: гаража, фабрики-кухни, гостиницы, кино, бани и детских ясель. Здесь архитектор проявил полнейшую бесхребетность и уступил деловым соображениям хозяйственника, не смотрящего вперед и живущего только сегодняшним днем.

Отрицательная сторона работы архитекторов Уралмаша в том, что длительное время (вплоть до 1934 г.) несмотря на кажущуюся близость к производству, все же связь с производственниками отсутствовала. Авторы проектов, архитекторы не имели определенных четких прав. Об этом говорит много фактов. Приведем наиболее характерный из них.

В 1931 году был разработан проект двухэтажной бани с пропускной способностью в 400 человек в час при общей кубатуре в 13.000 м³. Стены были запроектированы в 2 ½ кирпича на цементном растворе. Строители внесли однако «рационализаторское» предложение — делать стены пустотелыми с засыпкой шлаком (по типу Герорда), что дает экономию в 100.000 штук кирпича. Предложение дикое, безграмотное. Несмотря на категорический протест автора проекта, это предложение было осуществлено. В результате через год потребовался капитальный ремонт бани, т. к. стены расслоились, рассыпались*).

Подобных фактов можно привести бесчисленное количество.

Сейчас положение несколько улучшилось, но слишком незначительно. Архитектор на Уралмаше все еще бесправен. Каждый из начальников строительства считает себя вправе руководить характером отделки, игнорируя архитектора в части малярных, скульптурных и иных работ. Мастера же подсобных цехов подсовывают строителям все то, что у них накопилось за период их практики, совершенно не считаясь с потребностями строительства, насаждая безвкусицу.

Такой субъективный, деловой подход не двинет нашу архитектуру вперед. Необходима коренная реформа в отношении лица архитектора на стройке. Автор проекта должен пользоваться всеми необходимыми правами на стройке и отвечать за правильное осуществление своего проекта.

Уралмаш.

*) Разрушение стен в данном случае произошло вследствие не по вине неудачного типа кладки, а скорее от неумелого ведения стены, так как при правильном производстве работ конструкция стены типа Герорда не разрушится и в бане. Надо только при этом дать на внутреннюю поверхность стены плотную, водоизолирующую корку. (Ред.).

Рис. 1. Проект жилого дома на 32 квартиры

Арх. Оранский П. В.

Рис. 2. Стадион Уралмаша. Главный вход на трибуны

Архитекторы Безруков В. В. и Оранский П. В.

Рис. 3. Главный вход на стадион

Арх. Оранский П. В.

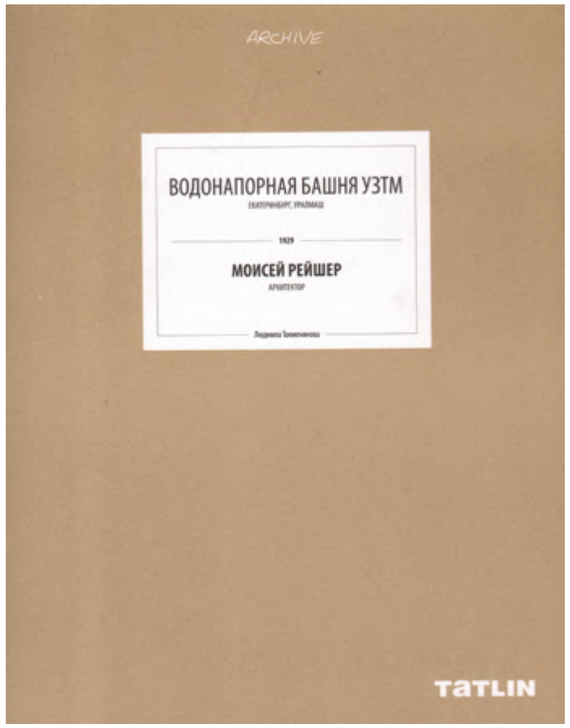
[pic.4–5] **Article by Petr Oransky "Architectural practice of Uralmash" in the *Opyt Stroiki* journal, June 1937. In this issue, permeated with the atmosphere of the Great Terror, the architects repent of their "mistakes" and expose the "saboteurs". Against this background, Oransky gives a particularly flattering description of the White Tower: "Despite the passion for constructivism during this period, Uralmash still created a beautiful, truthful in its function and architecturally expressive water tower building (engineer-architect M. V. Reisher)."**

of such structures. However, at that time, the experience with concrete construction in the USSR was extremely limited. Most of the available literature on the topic was actually translated from German, including guidebooks authored by Saliger, Kersten, and Mersch, which were published in the 1920s.

We've compiled a substantial collection of reference materials related to concrete, featuring both translated works and publications previously unavailable in the USSR. This collection includes the influential book by Hilberseimer, "Beton als Gestalter." However, it's worth mentioning that none of the books we've come across contain anything even remotely resembling the design of the White Tower.

4) **Publications on architecture of Sverdlovsk and Ekaterinburg**

- — One of the first such publications is P. Volodin's book "Sverdlovsk" (1948), published in the series "Architecture of USSR Cities" by the Publishing House of the USSR Academy of Architecture. At that time, constructivism, for ideological reasons, was considered a "formalist"



[pic.6] **Publication by Lyudmila Tokmeninova from the Archive series of the Ekaterinburg publishing house *TATLIN*, 2011.**

movement, and mentioning the tower as a successful example was possible only with reservations about the "mistakes."

— In the 1970s, avant-garde architecture was "rehabilitated." In 1974, a detailed review of Sverdlovsk constructivism was published under the authorship of A. D. Shelushinin, and in 1980, the White Tower appears in a book edited by the founder of the Ural Architectural Institute N. S. Alferov.

5) **New reality**

Since then, interest in the tower and other Sverdlovsk avant-garde works has been growing. With the fall of the Iron Curtain, this interest became international; the tower appeared in reports and publications at international conferences.

Unfortunately, the quantity of publications doesn't necessarily translate into quality. Instead, many researchers find themselves recycling the same information from one publication to another. These repeated passages typically mention that the White Tower's tank was the largest in the world, that it was painted khaki during the war, and that there is a replica of the tower at a northern Chinese dairy plant.

Indeed, a comparison of Budantseva's 2003 dissertation, Tokmeninova's 2011 publication [pic.6], and Skrobov's 1996 newspaper article reveals that the newspaper piece, which falls under the "Local Historian's Trove" section (typically not expected to cite sources), served as the primary source for direct borrowings in texts imitating scholarly approach. It's worth noting that the tank of the Uralmash Plant industrial water supply tower, constructed in the same year, was officially documented with a capacity of 1200 cubic meters (in contrast to the White Tower's 700 cubic meters). Furthermore, a chemical and

technological analysis revealed no traces of green paint layers anywhere on the tower's facade. As for the information about a "replica of the tower at a northern Chinese dairy plant," it's so vague that it's challenging to verify.

Therefore, despite the abundance of modern publications, we prefer to rely solely on publications that include references to documents or those made by direct participants and witnesses of the construction.

Oral Testimonies

Participating in the online workshop organized by the Getty Foundation underscored the importance of collecting oral accounts from those involved in the architectural process. Moisey Reisher passed away in 1980, even before any member of our arch-group was born. However, we had many engaging conversations with his son Boris (1927–2021) and listened to many stories. Some of these conversations were recorded on audio.

Certainly, Boris Reisher was just a kid during the tower's construction, and cannot be considered a primary witness. However, his recollections offer valuable interpretations of his father's stories, heard directly from him.

Today, there are individuals who played a certain role in the tower's history during the 1980s and 1990s. Among them are the architects Khramtsovs, who developed and defended the tower's reconstruction project in 1987. Alexander Sagalovich, the founder of the *Belaya Bashnya* insurance company that owned the tower from 1991 to 1993 and is responsible for several alterations to it.

2.2 Context of the White Tower Construction: Socialist City Uralmash

The White Tower is a water tower in the supply system of the Uralmash socialist city. The Uralmash socialist city was meant to be a residential area related to the Ural Heavy Machinery Plant (UZTM).

UZTM was one of the key projects of the First Five-Year Plan in the USSR. This giant plant was being constructed to produce equipment for metallurgical and mining plants in the Urals, thus providing a powerful impetus for the industrial base in the Urals and Kuznetsk basin.

First, when choosing location for the plant, Sverdlovsk and Chelyabinsk were in competition. Sverdlovsk proved to be more preferable due to the proximity of metallurgical plants in the Middle Urals and the peat deposits near the city, which were considered a source of energy. Furthermore, Sverdlovsk, (which was called Ekaterinburg until 1924), served as the administrative center of the vast Ural region since 1923 and was rapidly growing, and that attracted many engineers, technical specialists and other qualified workers.

In Sverdlovsk, there were two locations to consider. The final choice fell on an area 3.5 kilometers north of the city thanks to its proximity to the railway, to the power station on the Bolshekonny Peninsula, and to the Verkh-Isetsky pond as a source of industrial water supply. Also, it had relatively flat terrain. [pic.7–8]

On September 6, 1927 the Council of Labor and Defense of the RSFSR finally decided on location. The plant's design was carried out by a special branch of the *Uralgipromez* (Ural branch of the State Institute for Design of Metallurgical Plants). The preliminary design was reviewed and approved in May 1928 at the V session of the Institute's technical council in Leningrad. Official construction

[pic.9] **Concept note to the UZTM project, 1926. Cover.**

began on July 15, 1928—on the anniversary of the liberation of the Urals from Kolchak troops during the Russian Civil War.

Along with the plant, they designed a residential settlement for workers. It followed a common urban planning practice in the USSR at that time known as the "Sotsgorod" (socialist city) concept and described later in the book "Sotsgorod: The Problem of Building Socialist Cities" by Nikolai Milyutin. The residential area should have been very close to the industrial area, thus workers did not have to use any means of personal or public transportation. In the preliminary design of the Uralmash socialist city, this idea was implemented quite literally: the main streets radiated from the plant's entrance, forming the shortest paths to the workplace.

According to the 1928 project, population of this socialist city could be up to 25,000 people. However, after the construction started, the production capacity of the plant itself was revised several times. The initial capacity was set at 18,000 tons of produce per year, but it increased to 150,000 tons by the time the plant was launched in 1933. This significant increase reflects the industrial growth of the Ural Heavy Machinery Plant (UZTM) during that period.

As a result, the scale of the city grew. During the plant's construction in 1929, under the leadership of Petr Oransky, a new master plan for the socialist city was developed. It aimed to accomodate much more people. This plan was approved by the Technical Council of the People's Commissariat of Heavy Industry on September 5, 1929. This master plan clearly defined the location of the water tower and highlighted its important role for the settlement's water supply system. [pic.10]

Here's a quote from M. Reisher as published in the newspaper (Porsev, "what did it start with"):

> In 1928, we began making technical and work plans. Petr Vasilievich [Oransky] started revising the drawings of the settlement, proposing a counter-project for the socialist city with 60,000 residents. In his project, the main entrance to the plant stood on the central square. Within a year, four blocks with four-story houses were built along Ilyich Street.

At the same time, as they were building the Plant and the settlement, significant changes were happening in Sverdlovsk itself. In 1927, city planners S. V. Dombrovsky and N. A. Boyno-Radzevich worked on a plan to expand and develop the larger Sverdlovsk area. By 1930, they had finished it. Soon a brochure titled "Greater Sverdlovsk—A Brief Description of the City Plan" was published based on their work. The goal of the Greater Sverdlovsk project was to coordinate the growth of the socialist cities near factories with the overall development of the city, connecting urban development with industrial expansion.

[pic.7] **Option for the northern location of the plant. The plan shows how convenient it was to lay the electric line from the power station on the Big Horse Peninsula on the right bank of the Verkh-Isetsky pond.** *Drawing from the State Archive of the Sverdlovsk Region.*

[pic.8] **Option for the southern location of the plant.** *Drawing from the State Archive of the Sverdlovsk Region.*

[pic.10] **General plan of the UTZM socialist city, architect. P. Oransky, 1929. The red pencil indicates the place of the water tower on the plan.** *Drawing from the State Archive of the Sverdlovsk Region.*

The report-book by Tolokontsev, released to mark the official launch of the plant in 1933, states:

As a result, *Uralmashinostroy*, in collaboration with *Giprogor* (a state design institute for urban planning), based on the data from *Uralplan*, developed a new city project between May and October 1932, designed for 170,000 residents, including 75,000 people of *Uralmashinostroy*. This new city project was not an independent settlement but rather an integral part of the overall Sverdlovsk city complex, closely connected and adhering to the general principles established for Greater Sverdlovsk.

Based on the decision of the government and the party, there emerged a number of new plants in the Sverdlovsk area, which were planned to be built in close proximity to the Ural Heavy Machinery Plant (UZTM). This prompted the city council and *Uralmashinostroy* (Ural Heavy Machinery Construction) to reconsider the Uralmash settlement, taking into account the relocation of not only UZTM workers but also employees from other factories in the area. Therefore, the project for the UZTM worker settlement could not meet the new requirements, and it needed to be in line with the changing times.

The political and social context for the Uralmash Plant construction:

1) Unlike other well-known projects of the Stalin era, the Uralmash Plant was built by former peasants, not by prisoners. They came from all over the country for permanent or seasonal work. They had to live in makeshift huts and barracks, and later, the majority of the residential housing in the socialist city consisted of two-story log and frame-filled houses.

[pic.11] **Construction of a water pipeline. June 8, 1930.** *Photo from the UZTM History Museum photo archive.*

[pic.12] **Panoramic view of the construction of the plant and buildings on Pervoi Pyatiletki Square.** *Photo from the photo archive of the UZTM History Museum.*

[pic.13] **Panoramic view of the construction of the plant and buildings on Pervoi Pyatiletki Square.** *Photo from the photo archive of the UZTM History Museum.*

2) Mechanization of labor left much to be desired, and the major part of the construction was done manually. Resources were limited, it led to experiments with materials and technologies, which were sometimes unsuccessful. For example, one of the Uralmash builders, V. N. Anfimov, who left detailed memories, described how they made slag concrete blocks to use in the construction of the water tower:

Uralmashinostroy was a massive construction project during the First Five-Year Plan. It required a lot of different materials. And there were constant efforts to get these materials. It became clear that our own brick factory couldn't meet the demand for red bricks... We had cement and boiler slag. We made metallic molds 20 × 28 × 40 cm in size and started filling them with a mixture of cement and slag. Thus, we made stones of that size with five through holes. The molds were designed to be disassembled, and after filling them with slag and concrete, they could easily be taken apart. After some curing time, a slag concrete stone was ready for use. In terms of volume, each stone was approximately equal to 10 bricks. This meant that laying one stone was equivalent to laying 10 bricks. The labor productivity increased significantly. According to thermal calculations, a wall made from 1 and a half stones, which was 30 cm thick, provided a normal thermal regime for a building and was equivalent to a wall made from 2 and a half bricks.

3) The Uralmash Plant and the socialist city were designed by architects and engineers from the *Uralmashinostroy* project group. Meanwhile, Chelyabinsk and Stalingrad Tractor Plants were designed by Albert Kahn's bureau, and the socialist cities Orsk and Magnitogorsk were following Ernst May's group designs.

In addition, Uralmash had many foreign specialists among its designers, but the key decisions were made by the Chief Engineer of the plant's construction, V. F. Fidler, along with architects I. Robachevsky, P. Oransky, and other heads of project departments. [pic.14] Béla Scheffler, a Bauhaus graduate,

[pic.14] **P.V. Oransky and the Uralmashinostroy design team at work. Moisey Reisher is in the corner of the photo.**

[pic.15] **Photo of Kultury Boulevard, 1937. In the foreground is the Madrid Hotel, in the background is the White Tower.**

worked as an architect at Uralmash starting from 1932. According to available evidence, he was involved in designing the interiors of public buildings, but there's no strong basis to assert his influence on the architectural and urban development of the area.

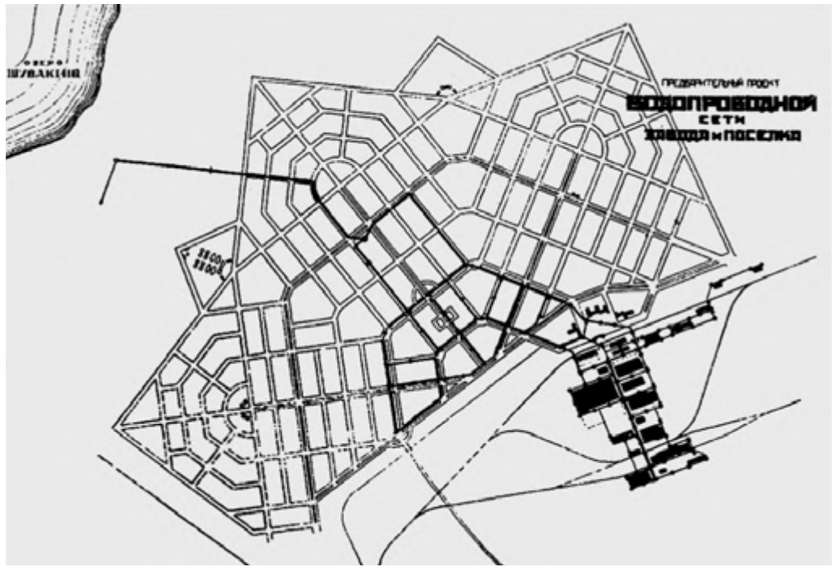
2.3 Shift in the Urban Planning Context

Now, the White Tower serves as a prominent urban landmark in the Uralmash district. It marks an endpoint in the visual perspective of Kultury Boulevard, which stretches from the Pervoi Pyatiletki Square (First Five-Year Plan square). One could see the tower from the Square until the UZTM House of Culture was erected. [pic.15]

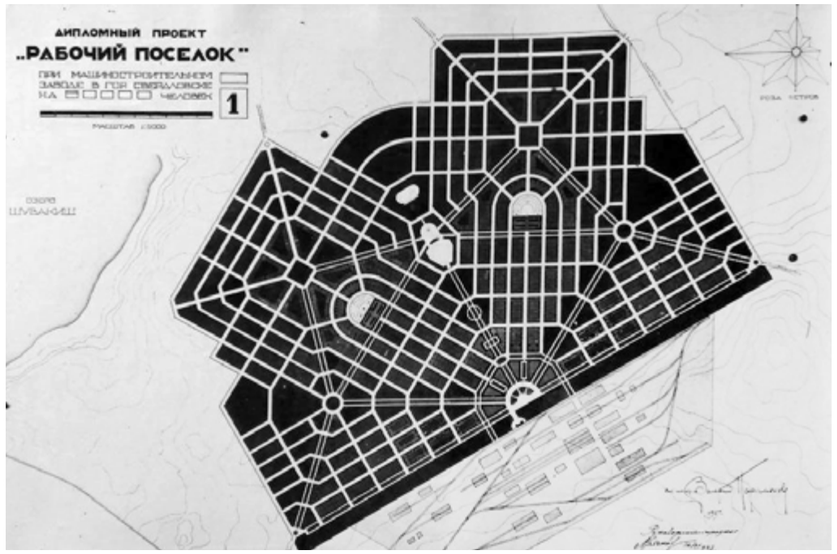
However, this wasn't always the case, and the role of the tower evolved during the construction of the socialist city.

The illustrations in the first UZTM project, designed by *Gipromez* (the State Institute for Design of Metallurgical Plants), include city plan drafts with a radial layout. In the early 1930s, such layouts were typical for workers' settlements, as they were influenced by Ebenezer Howard's concept of a Garden City. [pic.16]

At the same time, we know of a diploma project by a Tomsk architect Paramonov titled "Workers' Settlement." While it's not explicitly labeled



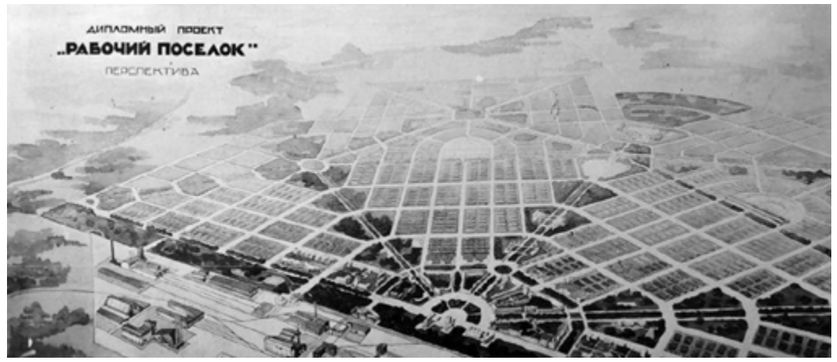
[pic.16] **Water supply plan from the concept note to the Gipromez project. This drawing shows a three-radial diagram, but the area where the lines intersect is not tied to the plant entrance. The location of the water tower is not fixed in urban planning.**



[pic.17] **Diploma project "Workers' village at a machine-building plant in Sverdlovsk for 60,000 people," 1927. V.P. Paramonov. General plan.**

as a plan for Uralmash, the arrangement of the factory and the Shuvakish Lake on the scheme leaves no doubt about its connection to the location.

Paramonov's father was an architect behind the master plan for Sheglovsk, a workers' settlement near the Trans-Siberian Railway station (now Kemerovo). It's challenging to determine the exact relationship between

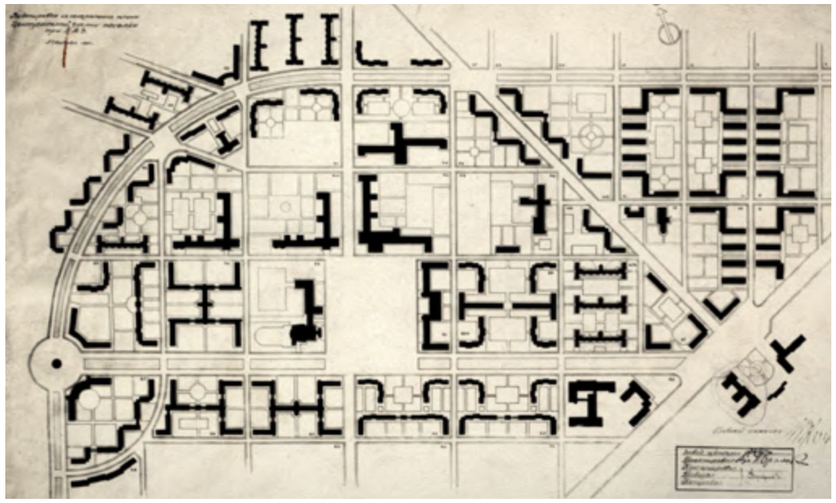


[pic.18] **Diploma project "Workers' village at a machine-building plant in Sverdlovsk for 60,000 people," 1927, V.P. Paramonov. Perspective. Paramonov's project has much in common with pre-revolutionary projects of garden cities with wide radial boulevards and large semicircular squares for markets. As in the Gipromez project, Paramonov's main square is not linked to the entrance to the plant, and the place for the water tower is not fixed in any way in the urban planning composition.**

the *Gipromez* project and Paramonov's diploma. However, in both of them the tower wasn't there yet. [pic.17–18]

In 1927, Petr Oransky became the chief architect for the Uralmash socialist city. His drawings developed the previously established tri-radial layout concept, now it was clearly adapted to location. The apex of this tri-radial plan is the Pervoi Pyatiletki Square. At the end of the primary radial axis, which was Kultury Boulevard, there was the future location of the White Tower. This spot became a central focal point, where significant urban planning axes intersected. [pic.19]

Urban planning drawings from the late 1920s and early 1930s clearly show that Kultury Boulevard played an important role. It was supposed to have a sports park with a stadium and a large square with a House of Culture



[pic.19] **Detailed development project along Kultury Boulevard, arch. P. Oransky, 1930. In the center you can see a large square with a House of Culture.**

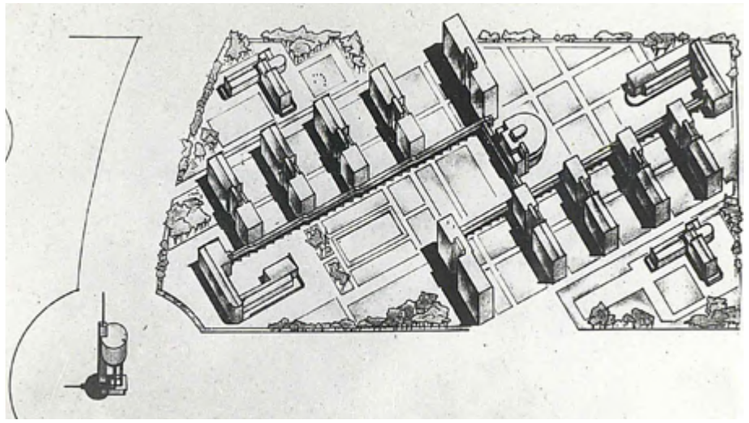
(a community culture club. It seems clear from the plan that they tried to fit in a project by architect Yakov Kornfeld for the Gorbunov Palace of Culture in Moscow, which was also designed by *Techbeton* as well as the Tower).

Though, the House of Culture was not built as planned. Instead, in the latter half of the 1930s, a slightly modified building that was originally a part of the factory-kitchen took on the role of the Culture House. In the late 1960s, the construction of a large modernist Culture House began. It was situated along the axis of Kultury Boulevard in front of the tower. It was completed in 1981.

Kultury Boulevard has always carried the cultural function, although its specific location changed over time. Eventually, the idea of a large square with a standalone building was realized. However, this led to the loss of the originally planned visual perspective of the boulevard, in which the tower was supposed to be a climax.

The sports function also didn't find its place right away. In Oransky's master plan, a stadium stood in the forest park surrounding Shuvakish Lake. Thus, it was located outside the urban development of the socialist city. And the tower played the role of a "bastion," marking this boundary.

However, the stadium was eventually built in a block adjacent to the tower. Initially, this location was designated for a different structure. In 1931, *Techbeton* designed a communal house there; the project was signed off by architects Golosov and Mitelman. In this plan the communal house was to occupy an entire block, its dimensions fitted the Oransky's plan. There the tower is explicitly marked and serves as a prominent site in the entire composition, it stands on the diagonal of the communal house. [pic.20]



[pic.20] **Project of a communal house at Uralmash. Arch. Golosov, Mitelman, 1931. The communal house was supposed to occupy the block that eventually occupied by the stadium. The composition of the communal house is built along a diagonal axis oriented towards the water tower.**

Architect Zaikin published an article in the *Opyt Stroiki* journal in 1934 explaining the concept behind the stadium, which was meant to be situated between the planned House of Culture and the already constructed water tower. [pic.21]

In the end, pre-war construction in this area was limited to the tower and the stadium. For a long time, there stood only wooden barracks at the foot of the tower. After the war, these were replaced with "Khrushchyovkas," and later on, with "Brezhnevkas." (low-cost uniform housing). [pic.22]

Significant urban planning ideas resurfaced in the 1970s. In the 1980s, a project for constructing the Engineering Pedagogical Institute (SIPi) came up. This project was never realized, but it envisioned a semi-circular building

ОПЫТ СТРОЙКИ № 6 9

скве, стадионе им. Петровского в Харькове, Одессе и ряде др. городов.

Урал имеет чрезвычайно ничтожную сеть физкультурных стадионов. Сейчас этот пробел должен быть усиленно заполнен. Это ставит перед строителями и проектировщиками задачу серьезного подхода, начиная с момента выбора места, исходя из природных условий: рельефа местности, обилия водоемов и пр. Близость водоема дает возможность сосредоточить в одном месте всю культурную работу — вплоть до парусного спорта на прудах и озерах. Такой вывод дает возможность зимой избежать наливных катков на футбольных площадках стадионов. Таким образом сохраняется трава на площадках, уничтожающая пыль во время игры. Кроме того экономически удешевляется устройство катка на ледяных покрова водоемов.

Подбор места с соответствующим рельефом дает возможность избежать постройки железо-бетонных трибун, и возможно их из естественном склоне земли. Это дает большую экономию средств в таких остродефицитных материалов как цемент и железо. В архитектурном отношении такой подбор создает сооружения более интересные и положительные с социальной стороны. Одновременно рельеф места дает всему участку физкультурного комплекса более живописный вид как месту основного культурного центра данного района.

При отводе места надо учитывать в рабочих поселках и небольших городах расположение рабочего клуба. Если клуб еще не построен, то желательно совместить летнюю клубную работу с работой стадиона.

Начало осуществления приведенных в настоящей статье моментов было положено при проектировании автором стадиона уральского завода тяжелого машиностроения в гор. Свердловске. Для практической иллюстрации разрешения данных тезисов (не разрешенных в проекте лишь в части водного спорта) даем описание проекта.

◆

Генеральный план. Участок, отведенный под стадион имеет форму треугольника со срезанными острыми углами, вместо которых находится две узловых площади. Первая из них, из которой расположен клуб, имеет

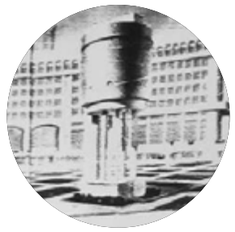
Проект стадиона Уралмашзавода

[pic.21] **Article by architect Zaikin "Uralmash Stadium" in the *Opyt Stroiki* journal, June 1934. The master plan shows the tower, the future stadium and the proposed site of the House of Culture on Kultury Boulevard.**

located on the other side of Bakinskikh Komissarov Street with the White Tower at its center. [pic.23]

The space around the tower remained undeveloped, but the interest in utilizing it was growing. In 2006, the Red Cross, which owned the tower at that time, commissioned a project for a semi-circular shopping center that would create a semi-circular square with the tower at its center.

[pic.22] **View of the tower from Kultury Boulevard. In the foreground there are poorly maintained one-story houses.**



[pic.23] **Urban planning model for the construction of a new building of the Sverdlovsk Engineering and Pedagogical Institute next to the White Tower. 1980s.**

To justify the placement of the mall, the Red Cross initiated and led a security zone regulations project. It was approved in 2009 and imposed height restrictions on the surrounding commercial buildings constructed in the vicinity of the tower.

Construction around the tower continues. The city has expanded beyond the historical boundary of the socialist city, and multi-story development is underway on the northwest side of Bakinskikh Komissarov Street. Some authors of residential complexes play with the image of the tower as an architectural symbol of the district, albeit some of them you may find banal.

Bakinskikh Komissarov Street is laid out in such a way that the roadway and tram tracks curve around the tower. Therefore, the White Tower is positioned within the alignment of the street, and the new development cannot disrupt its most characteristic perspectives.

2.4 Design History

Petr Oransky's general plan designated the water tower with a central urban planning role. This encouraged Uralmash's design department to search for a distinctive architectural embodiment for the future structure.

The head of the design department I. I. Robachevsky initiated a competition. We have limited information regarding this competition. Aside from the location, it's unknown what parameters were specified in the design brief. We can only assume that contestants received hydro-technical requirements for the tank's height and volume, while structure and more specific terms were open to individual invention.

Budantseva and S. Skrobov:

In the late 1928, Ivan Robachevsky, the head of design in Mashinostroy (Machine Construction), despite tight project deadlines and financial constraints, proposed constructing a water tower based on an individual design. The Chief Engineer, V. Fidler approved of his idea. After, an express competition with a one-week deadline was announced for the architects in the design department.

The information regarding the number of projects submitted varies. In 2002 Architect Gennady Elagin wrote an article dedicated to Moisey Reisher (G. Elagin. A Life Dedicated to the City / Construction Complex of the Middle Urals, January, 2002.). There he states the following:

Moisey Veniaminovich dearly remembered the design process of the water tower in the Uralmash socialist city, which was later called the "White Tower". There was a limited time for its design. Many people participated. Various ideas were put forward. Fidler proposed a steel tank on a steel tower, which was like a spatial structure by engineer V. Shukhov (the author of the Shabolovka radio tower in Moscow). Bezrukov envisioned a wooden building that had some living space beneath the tank. Reisher suggested an original cantilevered reinforced concrete structure. It was Reisher's version that was chosen unanimously.

However, G. Elagin (born in 1925) was not an eyewitness to the competition, and his text only retells oral history. In anarticle of November 6, 1996, in the *Vecherny Ekaterinburg* newspaper, Sergey Skrobov lists Oransky, Reisher, and Bezrukov as the competitors. Still, it is unclear on which sources does the author of the article rely.

Moreover, in his handwritten memoirs, Moisey Reisher mentions only himself and Bezrukov as participants. His memoirs lie in the archive of the Museum of UZTM History. Though, Reisher does not share anything about Bezrukov's project. [pic.24]

However, Reisher gives a detailed description of the competition and his work process:

I was given a one-week deadline to create a preliminary design for the tower. Of course, this was done during the non-working hours because during official working hours, which often extended until 8–10 in the evening, there was an overwhelming workload related to the design of the plant's main workshops.

For six days, I didn't touch the paper, but the tower never left my mind, neither during work hours nor during breakfast and lunch, and it almost appeared in my dreams.

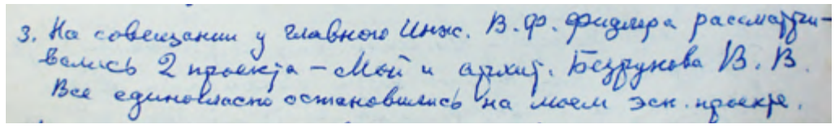
I aimed to make it exceptionally concise, highly expressive, and structurally perfect.

In statics, (which is a section of theoretical mechanics), there is a fundamental principle: "to secure any object in space, it is necessary and sufficient to secure it at three points." This rule inspired a thought: "to place the water tank at a specified height relying on two columns and a stairwell."

The tower's location within the city plan and other considerations suggested adding an observation deck on the roof and a tram stop pavilion at the base.

In the initial sketch, it is written: "a bus stop and a newspaper kiosk." In the executive plan, it says: "bus and tram stop." In reality, the tram line on Bakinskikh Komissarov Street was built in the 1960s.

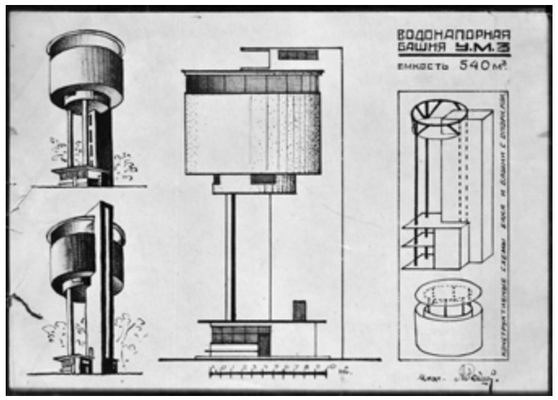
The image of the tower and its structure were so clear in my imagination that when I sat down with the drawings on a Sunday morning and worked continuously until Monday morning, I had completed the sketches for the preliminary project within 24 hours.

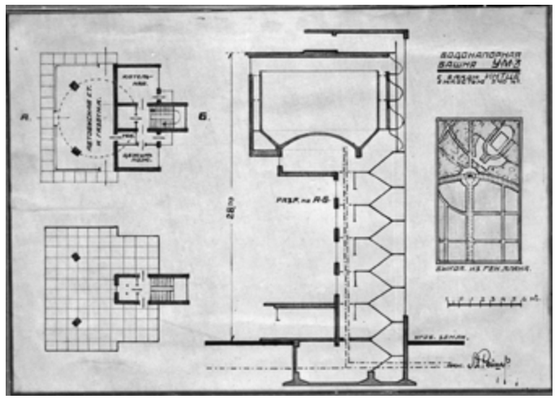


[pic.24] **Handwritten memoirs of Moisey Reisher, where he describes how the key idea for the tower emerged.**

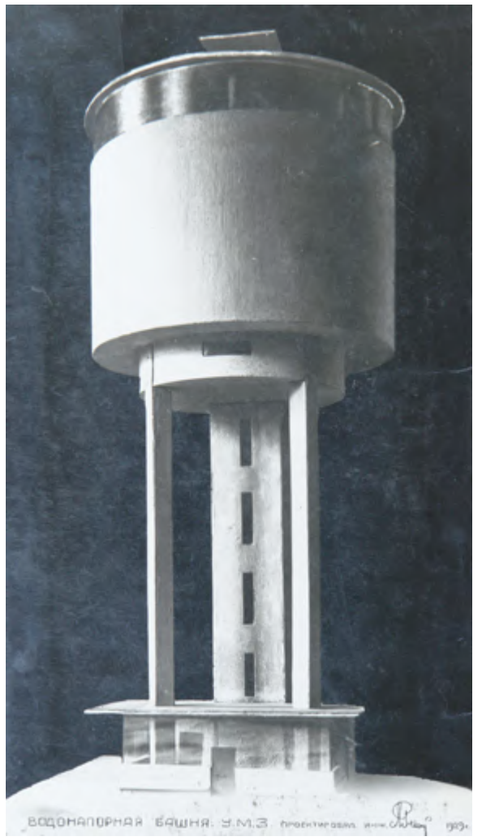
"In a meeting with Chief Engineer V.F. Fidler, two projects were discussed – mine and the one by architect Bezrukov V.V. Everyone unanimously decided to choose my project."

The Museum of Architecture and Design at the Ural State University of Architecture and Art still holds copies of Reisher's initial drawings, along with a photograph of a model dating back to 1929. Most likely, these drawings made up the competition sketch that he completed in one day. Perhaps, the model was created by him later, after winning the competition. [pic.25–27]





[pic.25–26] **Sketches by Moisey Reisher, submitted to the competition in 1929.**



[pic.27] **Sketch by Moisey Reisher, submitted to the competition in 1929. Layout. Reisher's initial sketch provides a clear presentation of all the key ideas: a cylinder composition supported by a staircase and two columns, a reinforced concrete frame with ribbon windows, a public space at ground level and an observation deck.**

Track of changes in the project
Number of supports and tank material

Later, the original Reisher's sketch went through several changes. Firstly, they decided to change material for the tank and add extra supports. Let's turn to Reisher's own recollections:

Chief Engineer Fidler V. F. (a mechanical engineer) didn't believe in concrete at that time; he knew and preferred metal structures. He didn't trust me, a young specialist (I was 26 at the time). When we were developing engineering drawings, he insisted that two additional iron-reinforced concrete pillars must be added, and the concrete tank should be replaced with a metal one.

Surely, this reduced the clarity of the original composition significantly and complicated the structure:

d) In the initial sketch, the tank was covered by a cantilevered flat slab, which through the walls of the tank relied on the small cantilever of the tank's support ring. Only the tank's insulation wall rested on the cantilever with a larger extension.

e) With a metal tank, the cover had to be supported by the external insulation walls of the tank, and it was no longer possible to use a slab. This introduced an arch, added the weight of an additional 2-meter-thick concrete wall, and all of this rested on the cantilevers with a larger extension, which made them very robust.

Indeed, Moisey Reisher's sketch, even though it was completed in the shortest possible time, provided a general understanding of the construction techniques. Hypothetically, Reisher's idea with two columns could be realized. However, it's still an open question regarding how it would have been possible to ensure the rigidity and stability of the tower's framework, considering the slender columns and the quality of concrete and building technologies available at that time.

Nevertheless, in the final project, we do see four columns and a metal tank.

Revisions during the detailed project stage

The Moscow trust *Techbeton* under engineer S. L. Prokhorov's supervision developed an executive project-plan for the tower as well as for several other factory and city buildings of UZTM. In the State Archive of the Sverdlovsk Region (GASO), there is a "Contract in the Memory of Lenin" between Uralmash and *Techbeton*, signed on January 22, 1930, in remembrance of the day when the first leader of the Soviet state passed away. The contract focused on the supervision and support for construction works. It lists ten objects, including the water tower (although it doesn't specify whether it's the tower in the socialist city or at the plant, both are constructed by *Techbeton* anyway). It also references an earlier contract from August 31, 1929, which primarily dealt with creating detailed sketches. Comparing the dates of the contract on the remaining drawings, we can conclude that the design development phase spanned the autumn of 1929 and the spring and summer of 1930. [pic.28]

It is likely that *Techbeton* designed the tower in at least two stages, with changes being made along the process. Some of the available tower drawings (facades, plans, sections, foundation layout) are dated to March and April 1930. These drawings feature extended sketches. [pic.29]

They show insulation layers, elements of supporting framework and fillings, but they lack the level of detail typically found in an execution plan (such as annotations for reinforcement, specifications for masonry, component details, and installation instructions).

Modifications to the initial sketch:

Plan of the ground floor pavilion and in particular, the place of an entrance to the staircase from the ground floor;
Removed an exit to the accessible roof of the ground floor pavilion;
Tank height increased;
Added a row of windows in the cylindrical section;
Fire tower got a new additional level above the tank's roof.

In the plans of spring 1930, the tank's volume was covered not with a dome, but with a flat reinforced concrete slab supported by beams. A metal spiral staircase led to the observation deck. These plans were later published by *Techbeton* in their catalog of standard projects.

Changes in paperwork in summer 1930:

The executive plans significantly differ from the actually built tower.

Presumably, during the final stages, some decisions were reconsidered, leading to the following changes:

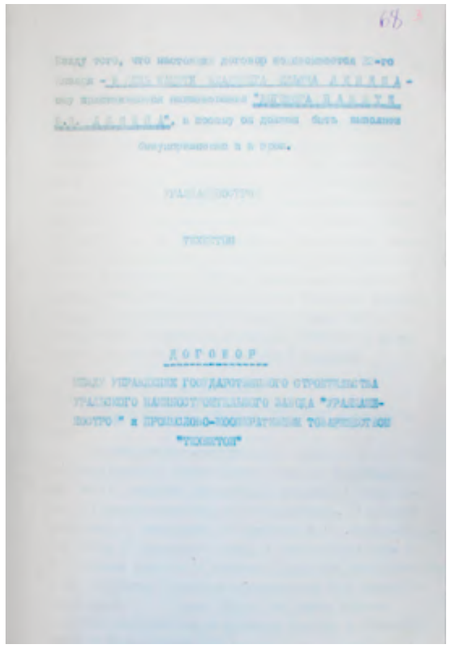
A reinforced concrete dome replaced the flat roof of the tank;
A reinforced concrete staircase with switchback steps used instead of the metal spiral staircase;
The fire tower and the basement plan were altered;
The height of the tank was increased again.

The insurance company *Belaya Bashnya* has preserved some paperwork dated to the summer months of 1930. It's evident that these are the plans that guided the construction, as they precisely match the recent measurements. However, these papers cover specific parts of the tower, including the foundation, staircase, and fire tower. General executive plans (plans, facades, sections) that would fully correspond to the actually constructed tower have not been found yet and, at the moment, represent a missing link in describing the evolution of the tower's design. [pic.30]

Techbeton's role in the tower design

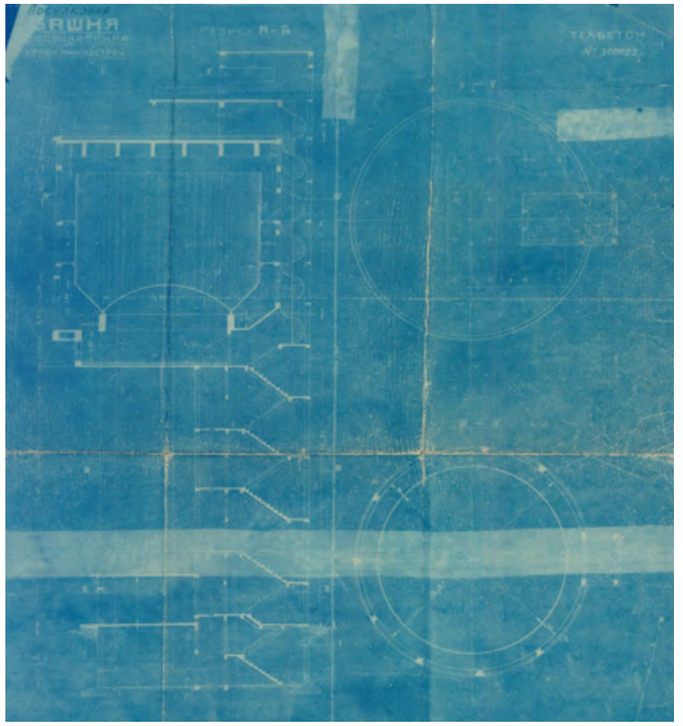
The majority of the *Techbeton* plans are signed by architect B. Y. Mitelman, engineer M. N. Shekhovtsov, and by the head of the trust, S. L. Prokhorov. Additionally, they were revised by V. F. Fidler as the Chief Engineer of *Uralmashinostroy* (he was responsible for approving all plans for construction—this is also documented by Kazus and is explicitly mentioned in an official order).

Igor Aleksandrovich Kazus, who extensively researched the role of *Techbeton* in the design processes of the 1920s and 1930s, provides a detailed description of the relationship between *Techbeton* and *Uralmashstroy* in his publication titled "The *Techbeton* Society and the Development of Constructivist Architecture in the Urals, (in 1920–1930s)" in the "Architectural Heritage" journal, issue 62, in 2015.

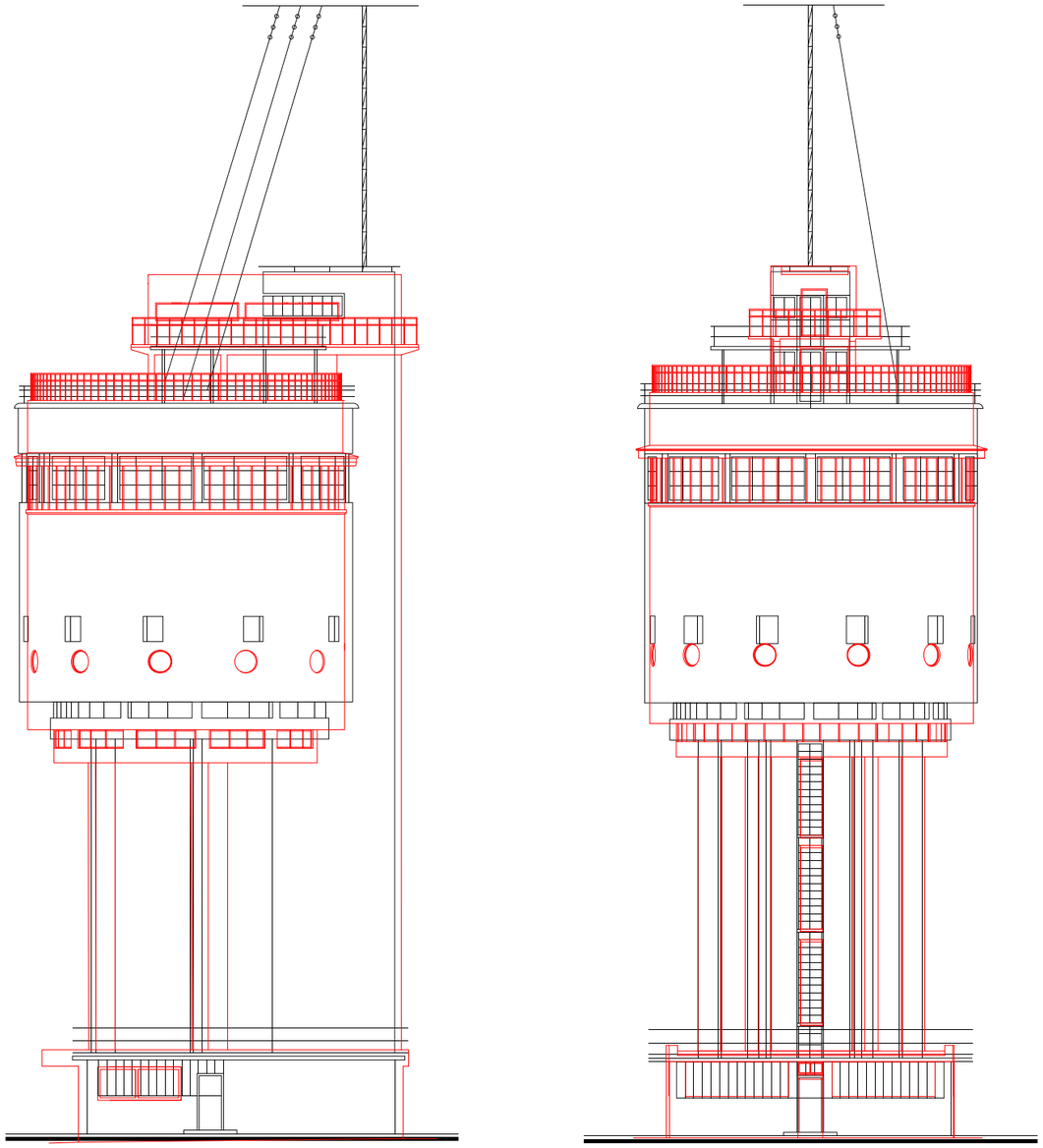


ДОГОВОР

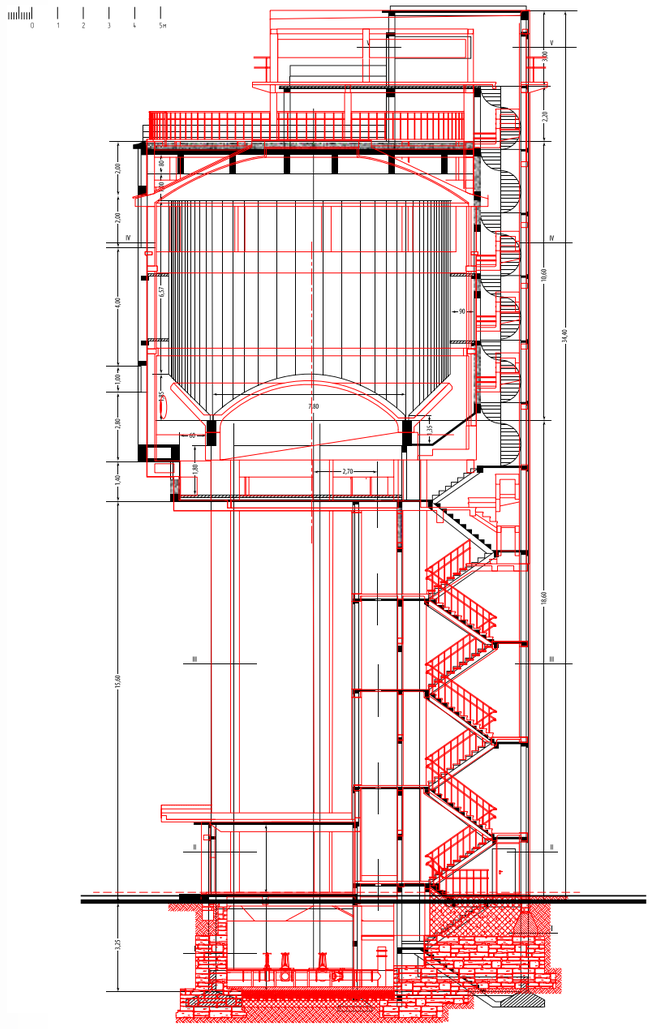
[pic.28] **"Agreement in Memory of Lenin" between *Uralmashinostroy* and *Techbeton*, January 22, 1930.**



[pic.29] **Section and plans made by *Techbeton*. The drawing was signed by architect Boris Mitelman.**

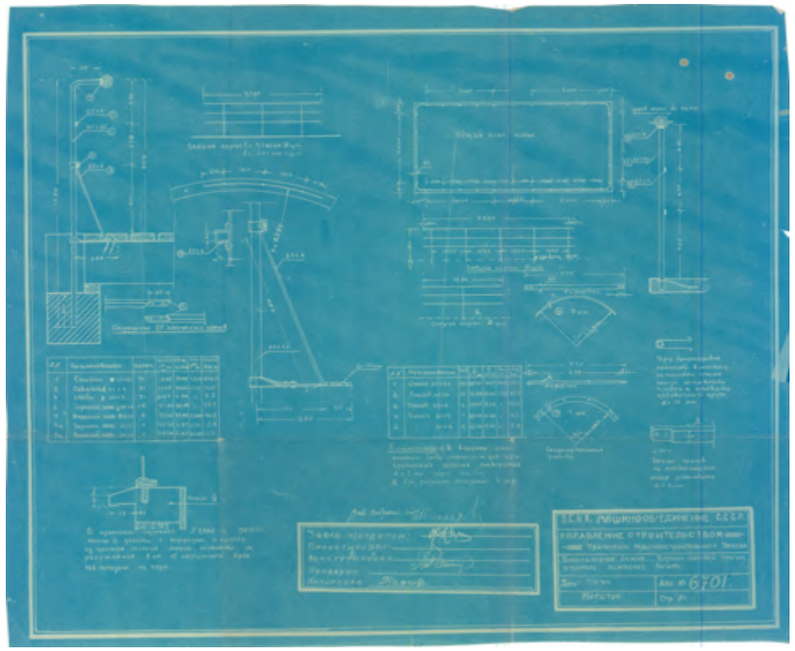


[pic.30] **Comparison of *Techbeton* drawings from 1930 and measurement drawings from 2021, reflecting discrepancies between design and implementation. Red — current state of the Tower, 2021. Black — project documentation for the construction, *Techbeton* 1930.**

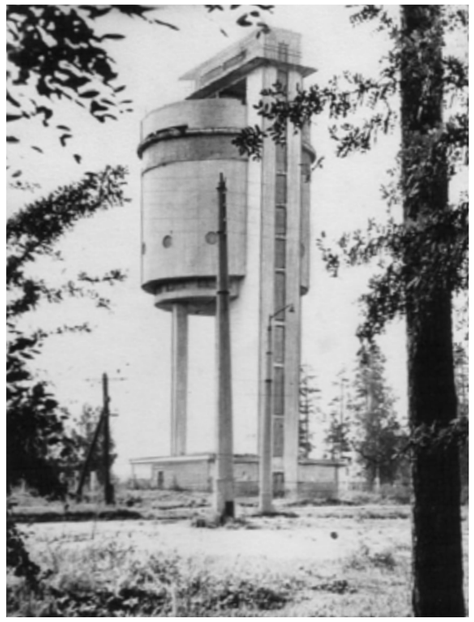


Due to his research focus, Kazus naturally tends to attribute a more significant role to *Techbeton* in the design of the UZTM water tower.

"The comparison between M. V. Reisher's initial sketch and the realized Techbeton-project reveals significant changes made by *Techbeton*, including an increase in the reservoir volume by more than a third—from 540 to 700 m³. This extension required adding supports and making adjustments to the tower's construction. According to M. V. Reisher himself, these were suggested by V. F. Fidler. The increased reservoir volume led to an adjustment in the height of the cylindrical part of the structure, as a result both proportions and the entire silhouette changed. The collaborative creative input of all those involved in the design process gave rise to a different image of the tower, which became several meters taller, more monumental, and rhythmically complex. It also became equal in scale to the unrealized project of the communal house by I. A. Golosov and B. Y. Mitelman. These aspects are often overlooked in existing publications. Therefore, the authors of the tower should be considered not only M. V. Reisher, but also architect B. Y. Mitelman and engineers S. L. Prokhorov, V. F. Fidler, and M. N. Shekhovtsov. This practice aligns with the *Techbeton* tradition, which also worked with such avant-garde masters as M. Y. Ginzburg, I. A. Golosov, and A. V. Kuznetsov."



[pic.31] **Work drawing of the fencing on the observation deck and fire tower, December 13, 1930. Drawings of railings and windows (architectural details not related to the supporting structure) were issued with the stamps of UMS, not *Techbeton* and were developed personally by Reisher, which suggests that he accompanied the entire construction process.**



[pic.32] **A photograph from the Reisher's family archive shows what the architect considered a missing detail—he drew in a cantilever canopy of the fire tower volume with a pencil.**

In practice, B. Y. Mitelman was an independent architect who was involved in developing both detailed plans and his own design projects. For example, in collaboration with I. A. Golosov, he created a project for a communal house next to the UZTM water tower, which was not built.

However, when it comes to the water tower, we do not doubt the primary authorship of Reisher, even as we acknowledge Mitelman's participation. Key decisions, such as the overall character of the composition, the presence of public space in the pavilion on the ground floor, and the observation platform with the rooftop tower, were consistently implemented at all stages of design, stemming from Reisher's initial sketch. Also, M. Reisher supervised the construction of the tower until its completion. Some surviving draft plans even contain Reisher's pencil corrections and notes "follow the corrected version." [pic.31]

Reisher described the division of roles in relation to design decisions in a concept note for a project, when the tower was being adapted for a café in January 1971:

The author of the architectural and construction part (architect M. V. Reisher) prepared the initial design, which served as the basis for developing executive plans, which were prepared by the bureau *Techbeton*, that also carried out the construction of the tower.

During the construction, the author corrected and sometimes adjusted *Techbeton's* plans related to the composition of the structure, without affecting the primary reinforced concrete framework of the building.

It seems that the author was not entirely satisfied with all of the decisions in the executive plan. On some photos of the tower that were found in the Reisher's family archive, and even in his watercolors, he added a cantilevered part of the upper canopy that was originally present in the sketch, but later omitted during construction. [pic.32]

2.5 White Tower in the Water Supply System

In the central part of Sverdlovsk, the water supply system was installed only in 1926. The Uralmash socialist city project was designed to include a centralized water supply system from the very beginning.

Source of water

Modest Onisimovich Kler, a hydrogeologist and son of the founder of the Ural Society of Naturalists, was responsible for exploring artesian water reserves near Lake Shuvakish, which became a crucial source for the Uralmash's water supply.

In the spring of 1930, the construction trust began drilling a percussion well on the shore of Shuvakish. The first well was not successful; the drill bit broke, and they couldn't retrieve it. They had no experience in drilling large-diameter wells, so they turned to the Germans. They signed a contract with them to drill five wells with a diameter of 500 mm and a depth of 80–100 meters. The second well was named № 1a. Professor and hydrogeologist Modest Onisimovich Kler, having monitored the pumping from this well, came to an important conclusion: the designated drilling area was promising and could yield up to 5000 cubic meters of water per day.

Source: S. Ageev, Y. Bril. Unknown Uralmash, 2003

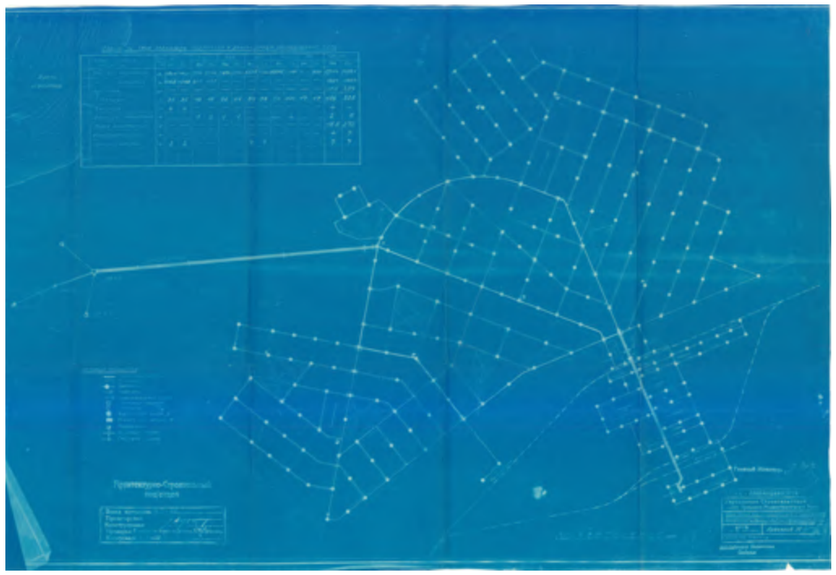
Tolokontsev, in his book dedicated to the launch of the plant in 1933, provides a detailed description of the water supply system in the socialist city:

There were two water supply systems constructed, one for potable water and the other one for general needs like household, sanitary-hygienic, and fire-fighting. This system was also used by the plant's workshops.

The source of this water supply is deep boreholes located on the southeast shore of Lake Shuvakish. Water is extracted from depths of 80–90 meters, from fractured crystalline rock formations. Currently, five boreholes have been drilled, with a borehole diameter of 475 mm. Three of them are equipped with vertical deep-well centrifugal pumps manufactured by the German company Eger, with vertically mounted motors. The remaining two boreholes will also be equipped with vertical pumps of the same type from the Sulzer company.

The total amount of water supplied by the three equipped boreholes currently amounts to up to 5000 cubic meters per day.

The water tower has a Intze water tank with a capacity of 700 cubic meters located at the highest point in the settlement, precisely at an elevation of 291.19 meters. The tank is equipped with inlet and distribution pipes, idle and outlet pipes. The tower is centrally heated. The minimum available domestic water pressure created by the tower ranges from 3 to 4.5 atmospheres.



[pic.33] **General sketch of the water supply system at the Uralmash socialist city. It shows the location of the wells, the first lift pumping station and the water tower.**

This calculation turned out to be overly optimistic. After the plant and settlement construction were complete, Shuvakish lake became shallow and marshy, and Uralmash started sourcing water from the municipal water supply of Sverdlovsk. [pic.33]

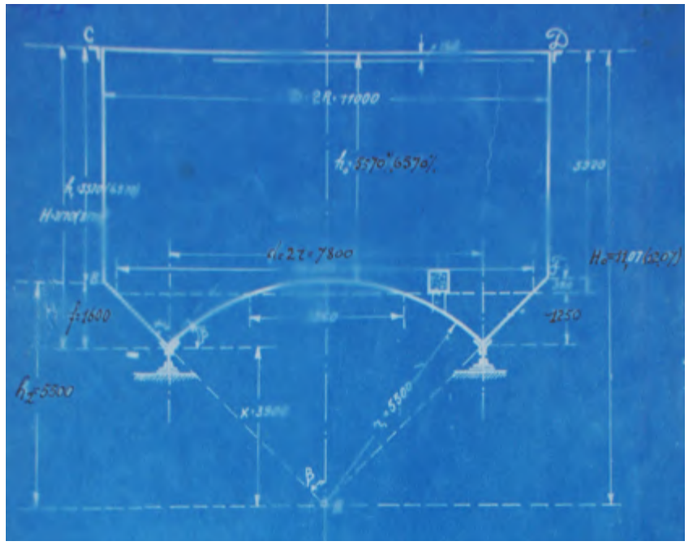
As of 1933, Tolokontsev treated this as a pressing necessity:

It should be noted that due to the expansion of the Ural Machine-Building Plant and the future construction of an excavator plant, the population of the settlement is expected to increase to 170,000 residents by the end of 1937. In this case, the groundwater supply will not be able to meet all the needs of the city and workshops for drinking and sanitary-hygienic water, as the current water consumption from the boreholes has almost reached their design flow rate of 5000 cubic meters per day. In the future, the supply of drinking water to the settlement (city) is planned to be realized by incorporating it into the municipal water supply system of Sverdlovsk.

Intze water tank design

In the State Archive of the Sverdlovsk Region, there is a concept note about the water supply project for the Ural Machine-Building Plant, which includes a hydraulic calculation of the water tower. [pic.34] The tank capacity was determined based on water consumption for the settlement (considering the expected growth) and firefighting needs.

The tank was designed to hold 540 cubic meters of water initially, with a potential for expansion to 700 cubic meters by means of extending the metal tank. The project incorporated a height margin for this purpose. And the construction had to allow this as well. It's likely that the discrepancies in the tank's volume reported by eyewitnesses might be attributed to these modifications. In Reisher's sketch, the tank's volume is 550 cubic meters, while in Tolokontsev's book, it is 700 cubic meters.



[pic.34] **Hydraulic calculation of the Intze system tank from the concept note to the UZTM water supply project.**

Рейшер Моисей Вениаминович

Проектирование з-да велось в филиале проектного ин-та "Типромез".

В 1926г. в этот ин-т поступил 24-хлетний архитектор Р., сразу по окончании Томского технологического ин-та.

Р. создавал арх.-строительные проекты ряда цехов будущего з-да.

Почти никакого справочного материала не было.

За короткий срок Р. были составлены эскизные проекты цехов механического, КПЦ, модельного, металлоконструкций, ремонтно-механического с их габаритами, определение применения стройматериалов на разл. конструкции сооружений.

В мае 1928г. проект закончен.

Р. назначен начальником проектного отдела УМС по созданию рабочих чертежей всех сооружений з-да и его коммуникаций.

Р. находил время и для индивидуального проектирования. Так по конкурсу на создание проекта водонапорной башни в соцгороде, он получил первое место, и по его проекту построена из железобетона элегантное сооружение с баком для воды емкостью 750м3, а в то время самым большим баком был бак в Чикаго- 700м3.

Большой вклад Р. вложил в здание з/у.

[pic.35] **A typewritten description of Reisher, which for the first time compares the White Tower tank with some tank in Chicago.**

"…Reisher found time for individual design. Thus, in a competition for creating a project for a water tower in the soc.city, he took the first place, and based on his design, built an elegant structure with a concrete tank of 700 cubic meters capacity. At the time, the largest tank was in Chicago, with a capacity of 700 cubic meters…"

The tank's design and calculations followed the principles of the German hydraulic engineer Otto Intze. A key feature of Intze tanks is the shape of the bottom: it consists of a concave sphere and a "collar," which is a segment of a cone. Thanks to this, the weight of the water transmits only vertical forces

to the structural elements of the tower, while the horizontal thrust is countered by the tank's structure itself.

UZTM museum holds a typewritten text with a description of M. Reisher. The author of this text is unidentified. The text claims that at the time of the construction of the White Tower, its tank was the largest in the world. [pic.35]

This claim is not credible because simultaneously, an industrial water supply tower was being constructed for the Uralmash Plant, and its tank had a capacity of 1,200 cubic meters (according to *Techbeton*). Moreover, it's impossible to verify the information about the tank in Chicago.

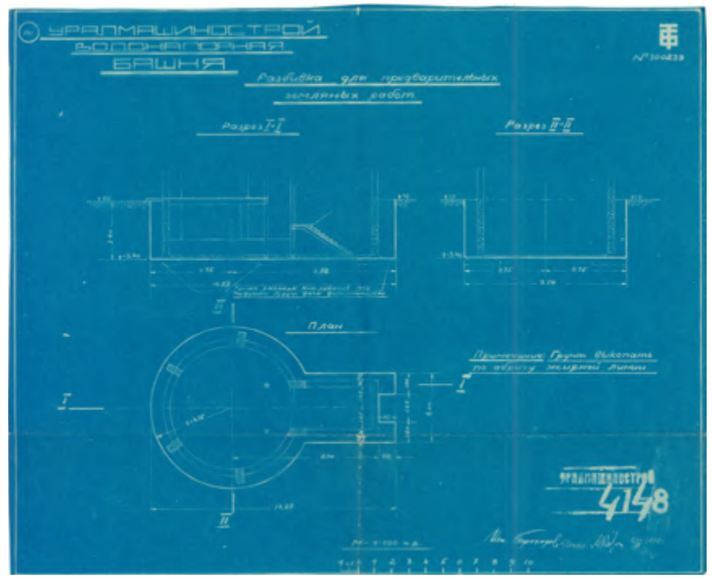
2.6 Construction History

Construction of the tower spanned from April 1930 to December 1931. In order to establish the timeline, it's necessary to cross-reference information from various sources: work plans, photographs, recollections of participants, and progress reports on the UZTM construction.

Foundation

A plan called "Layout for preliminary earthworks" dates back to April 8, 1930. [pic.36] The foundation on this drawing differs from all later versions and the actual foundation. This suggests that the layout plan was issued in advance, before all calculations were complete, in order to start the earthworks as soon as the snow thawed.

Detailed foundation plans dated back to August 1930. Presumably, earthworks and other preparation were carried out during summer, and the construction began in August.



[pic.36] **Layout for preliminary excavation work, April 1930.**

[pic.37] **Construction of the load-bearing frame started. Autumn 1930.** *Photographer N. Tatarchenko.*

Framework

The major work on the construction of the monolithic reinforced concrete frame was done during the cold season in 1930–1931. In the photographs, one can see the winter setting and the construction scaffolding covered with continuous lathing, known as “teplyak” (a temporary heated enclosure). [pic.38]

Carrying out monolithic work during winter was complicated, both then and now, despite modern inventions such as electrical heating of concrete, special additives for improved plasticity and setting at low temperatures. For that time, it was a real challenge.

[pic.38] **Construction of the tower in the winter of 1930–31.** *Photographer N. Tatarchenko.*

According to V. N. Anfimov, the construction workers of the Uralmash Machine-Building Plant received guidance from an engineer representing *Techbeton* on site:

> The tower was constructed under the supervision of the Moscow cooperative design bureau *Techbeton*, which was led by the remarkable engineer Prokhorov. On site, there was an expert engineer, M. Iv. Strukov.

However, in the areas where the load-bearing framework of the tower is visible today, one can easily notice numerous defects resulting from the construction process: exposed reinforcing rods, gaps, and porosity in the concrete elements. The low work quality is believed to be a consequence of the challenging working conditions that the tower’s builders had to face.

In addition, we see no sign of construction machinery in the photographs. Apparently, materials were lifted manually or by means of basic equipment like blocks and winches.

[pic.39] **Construction of the White Tower.** *Photo from the archive of Boris Zhurin.*

Boris Zhurin, who was responsible for administrative and management functions at *Techbeton*, also visited the construction site. In his personal archive, there are photos that he evidently took during his trips there. Unfortunately, these photographs have no dates. [pic.39]

Uralmash’s photographer Nikolay Tatarchenko had pictures taken on December 14, 1931 [pic.40], which show the completed, glazed, and plastered tower without scaffolding. It is crowned with a five-pointed star. A similar star is present on the photographs of some other buildings constructed during this period, such as the “Bolshoi Ural” hotel. It’s likely that this distinctive symbol was an award to the brigade that managed to complete the construction ahead of schedule. Perhaps, the team wanted to finish the White Tower before the New Year, and they managed to meet this deadline.

However, in the photograph taken by N. Tatarchenko, the tower lacks railing for the fire tower and a number of details. This suggests that construction and finishing works were still ongoing in 1931.

[pic.40] **The first photograph of the completed tower, December 14, 1931.** *Photographer N. Tatarchenko.*

Tank

In 1931, it was time to install the engineering equipment, including the metal tank. The detailed work plans for the tank date back to 1931. Uralmash's metal structures bureau under the leadership of S. Korotkov was in charge of the design. [pic.41]

However, during the first test filling on June 5, 1931, it became clear that either calculations or execution had flaws.

[pic.41] **Construction of the White Tower.** *Photo from the archive of Boris Zhurin.*

Here's what V. N. Anfimov writes about this:

The tank had a metal bottom of a spherical shape. It had a special configuration, known as the Intze water tank. When the tower's construction was completed, they began filling the tank with water to test it. Unexpectedly, the bottom started to deform and eventually burst, and all water poured out. It turned out that there was a defect in the metal sheets of the tank's bottom. It was proposed that *Techbeton* should design a new bottom made of reinforced concrete. Engineer Prokhorov was called to Sverdlovsk, and while he was traveling by ship from Nizhny Novgorod to Perm for 4–5 days, he made new calculations, prepared the drawings, and issued a plan for execution. A new bottom was made in an emergency mode, and then the tank was successfully filled with water. [pic.42]

[pic.42] **Intze system tank of "combined design" (reinforced concrete bottom, steel walls).** *The drawing was signed by S. Prokhorov.*

In the archive of the *Belaya Bashnya* insurance company, we found a work plan for the reinforced concrete bottom, which was indeed personally signed by S. Prokhorov and dated July 21, 1931. Moisey Reisher described the replacement of the bottom in detail:

At a technical meeting summoned by the Chief Engineer of Construction, Fidler V. F., it was decided that in order to promptly address the emergency situation, the tank's bottom needed to be made with reinforced concrete. This task had a seven days deadline.

At night, the existing bottom was cut into pieces with an autogenous cutter, and the sections were lowered down.

They brought round timber and boards to construct the formwork. Engineers made calculations and designed the reinforced concrete bottom.

1st day:
a) A team of carpenters set up scaffolding and formwork.
b) A team of ironworkers prepared the reinforcement.

2nd day:
a) Autogenous welders cut holes in the conical part of the bottom to allow for reinforcement.
b) Ironworkers installed the reinforcement for the bottom.
c) Cement, sand, and gravel required for the concrete were delivered.

3rd day:
The bottom was concrete-poured.

4th, 5th, and 6th days:
The concrete was allowed to cure and start hardening. Concrete typically gains its full strength over 28 days.

7th day:
Without removing the formwork and scaffolding, the tank was filled with water to a height of 1 meter, marking the tower's completion.

Each day, more water was gradually added to the tank as the concrete continued to harden.

On the 28th day, the tank was filled to its intended capacity of 550 m^3 of water, and the scaffolding and the bottom formwork were removed.

The structure of the tank turned out to be a unique grotesque combination of materials: with metal walls, a conical bottom out of reinforced concrete, and a spherical part made of pure concrete.

Thus, the construction was completed in 1931. Although, it underwent immediate changes.

2.7 Is the White Tower Unique? Exploring Parallels and Influences

Two interpretations of Moisey Reisher's role

On the White Tower tours visitors often ask if there are similar buildings in the world and who did originally invent such a design.

Quite a few publications address these questions, and two main and mutually exclusive narratives prevail:

1) Reisher was young and inexperienced; he could not have made up this idea entirely "from scratch" in such a short time, and must have been inspired by some model or standard project.

2) Reisher came up with a unique concept and it became so popular that it served as a basis for numerous imitations and references.

Supporters of the first narrative claim that Reisher had borrowed a concept from a certain building — the water tower of the Krasny Gvozdischik factory in St. Petersburg (designed by Yakov Chernikhov) — or perhaps from an unnamed foreign or standard project.

Architectural researcher Igor Kazus, in an article about *Techbeton* projects at Uralmash, writes the following:

It is beyond doubt that when submitting his contest sketch, M.V. Reisher was inspired by the well-known water tower designed by Yakov G. Chernikhov, which was constructed in Leningrad according to a contest project from 1927. The capacity of the reservoir at the Leningrad tower was less than initially required for *Uralmashinostroy*, thus it allowed using only two supporting columns. It served as a model for the young architect and ensured his success in the competition with his colleagues. Naturally, M.V. Reisher could not have overlooked the building structure used by *Techbeton* in their design, which was a reinforced concrete frame filled with hollow concrete blocks.

Former Chief Architect of Sverdlovsk, Gennadiy Belyankin, in his memoir book "Me and the City: The Dominant of My Life," writes:

Several years ago, in the early days of my work at the City Council, we had a visitor from Moscow. He greeted us and mentioned that he was working on a study of architectural objects developed by the Technobeton company that existed in the 1930s. He showed me a series of standard projects developed by this company, including designs for water towers, similar to the ones in Uralmash. A little later, there appeared an article on this subject in the "Architecture of the USSR" journal. Perhaps, there is reason to believe that the role of the architect Reisher in this project was limited to adapting it (standard project) to local conditions.

The second narrative is supported in an article by Tatiana Budantseva from 2003 and a brochure by Lyudmila Tokmeninova from 2011. However, a simple analysis reveals that both materials cite the same newspaper article by Sergey Skorbov in the Vecherniy Ekaterinburg newspaper from 1996 without referencing the source:

From the moment of its opening until the beginning of the war, the White Tower was considered a refined example of industrial architecture in all construction and technical reference books. Thus, it became a prototype for a number of similar-purpose objects. The first analogue was a water tower of the "Krasny Gvozdilshchik" plant in Leningrad (25th Line of Vasilievsky Island, 8), designed by architect Y. Chernikhov. "The White Tower" was also integrated into the project of the "Sredduralmedstroi" plant. The power plant on the territory of Uralmash, built in 1931, formally repeats the white tower's composition. Moreover, examples of borrowing can be found abroad, in particular, at one of the dairy plants in Northern China.

Tower in the architectural process of the 1920–1930s: information environment

In the 1920s, Soviet architecture was part of the global architectural information landscape. From 1926 to 1930, Moisey Ginzburg was publishing a journal called "SA" (*"Sovremennaya Arkhitektura"* or *Contemporary Architecture*) and created OSA (Society of Contemporary Architects). The key projects made by this

society members along with some Western architect's projects were included in the journal. Also, at that time Le Corbusier and Gropius visited Moscow and met with Soviet architects.

Thus, architects in Sverdlovsk (what Ekaterinburg was called from 1924 till 1991) also had numerous opportunities to follow the global architectural trends:

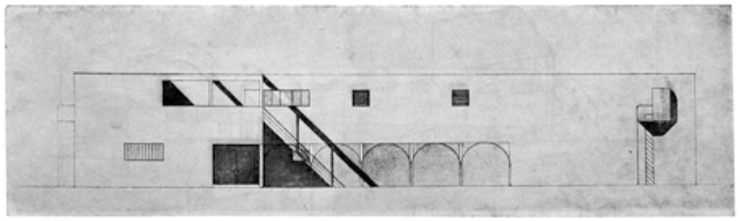
Constructivist architects from Moscow like Ginzburg, Kornfeld, Friedman, and the Vesnins participated in competitions (Synthetic Theater, the ObKom building (regional party committee), the House of Industry) and carried out projects in Sverdlovsk (Construction Workers' Club, the House of Uraloblsovet).

Iosif Robachevsky, the head of the design department at Uralmash, was a leader of the OSA's Ural branch. Local architects Reisher, Oransky, and Balakshina also belonged to that branch. OSA members subscribed to the "SA" journal, participated in OSA summits and other events, and therefore had a good understanding of the contemporary architectural process.

The "SA" journal featured numerous materials about innovative constructions and engineering systems. For instance, in the article "Construction with Hollow Stones," engineer Sergey Prokhorov described in detail a key technology of *Techbeton*. [pic.43]

Delegations of Uralmash leaders, including the plant's chief engineer, Vladimir Fidler, made business trips to machinery manufacturing plants in Germany. Ludmila Tokmeninova in her book tells about a trip of architects and builders from *Gipromez* in 1927, who came to study practices and experience of German urban planners.

In the early years of designing the Uralmash plant, there were many foreign engineers involved. Thus, it makes sense that they contributed some contemporary reference materials to the technical library of Uralmash as well.



A. K. BUROFF. ANSICHT DES ARBEITERKLUBS IN TWER FUR 380 PERSONEN. SKELETTKONSTRUKTION. ZUR ZEIT IN AUSFUHRUNG

ПОСЛЕДНИЕ ДОСТИЖЕНИЯ В СТРОИТЕЛЬСТВЕ ИЗ БЕТОНИТОВЫХ КАМНЕЙ • DIE LETZTEN ERRUNGENSCHAFTEN IM GEBIETE DER BETONITENSTEINE. VORTRAG IN DER KONCTRUKTIONSABTEILUNG DER OSA VON S. L. PROCHOROFF

изоляторами являются рыхлые пористые вещества. При этом совмещение в одном и том же материале и конструктивных и изоляционных свойств весьма затруднительно, так как они взаимно парализуют друг друга: в то время как с увеличением плотности материала увеличивается его прочность, изоляционные свойства его в такой же степени понижаются. Из помещенной ниже таблицы, в которой сопоставлены объемные веса и коэффициенты теплопроводности некоторых материалов, видно, что „удельный" коэффициент теплопроводности, т. е. коэффициент, отнесенный к объемному весу в тонках на 1 куб. м, мало изменяется для отдельных групп материалов.

Таблица I

[pic.43] **Article by Sergei Prokhorov "Latest achievements in construction from betonite stones" in the second issue of the magazine "Modern Architecture" for 1928.**

Bauhaus Architects in the Urals

Architect Béla Scheffler, a graduate of the Bauhaus School, was among those involved into the Uralmash project. He came to the Soviet Union from Germany in 1930 as part of the "Rot Front" brigade led by Hannes Meyer and in 1932 arrived at Uralmash.

By that time, most of the buildings in the historical part of Uralmash were already under construction, meaning that their designs had been completed and approved. According to Oransky, Scheffler only contributed to some public interiors' design.

In the mid-1930s, the USSR began to view foreign specialists not as valuable professionals but as suspicious spies. Scheffler could not return to Germany as he was Jewish and a communist, so he got stuck in a difficult situation. In the Soviet Union, he was arrested twice and eventually executed in 1941.

Many other architects from the Bauhaus school worked in different industrial construction projects during the five-year plans, including those in the Urals — in Orsk, Magnitogorsk, and Berezniki. They did leave their architectural mark in these cities. However, there is no evidence that could prove a direct influence of the Bauhaus school on the Uralmash architecture. Hence, the effect of all the forefront global practices of the time on Uralmash's appearance is solely connected to the integration of Sverdlovsk architects into a unified global discourse.

Tower in the architectural process of the 1920–1930s: techniques

In the 1920s, in order to see a building in another city, an architect needed to plan a visit, personally meet a colleague, or see the project in a printed publication.

Therefore, borrowing and citing can only apply when an architect had an opportunity to explore someone else's project.

It's important to note that in architecture, an analogy doesn't necessarily imply borrowing, and borrowing doesn't imply a lack of authorship.

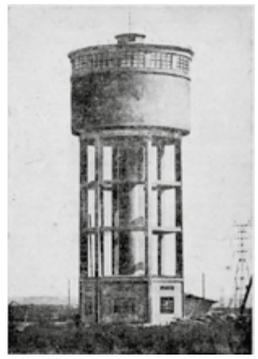
The entire history of architecture represents development and interpretation of recurring architectural techniques. Identical Corinthian capitals or Palladian windows can be found in buildings constructed on every continent and in various eras, from antiquity to the 21st century. A style is a collection of techniques and their application methods, which represents an architectural language of a particular epoch.

Ribbon glazing, flat roofs, elegant supports capable of bearing substantial weight, cantilevers, and round windows, these are the elements commonly associated with modernism worldwide and are, of course, linked to the architectural possibilities of reinforced concrete.

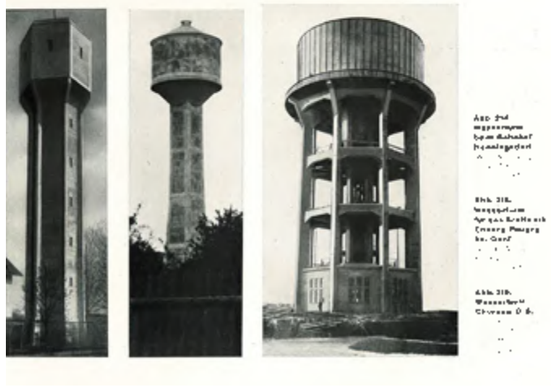
Architectural practice involves solving functional, structural, and aesthetic problems (following Vitruvius' principle firmitas, utilitas, venustas — "strength", "utility", and "beauty"). Any vessel containing water naturally tends to be round in shape, as Pascal's law suggests. That's why most water towers around the world have a circular plan. If different building projects share the same function (water tower), construction material (reinforced concrete), and architectural style (modernism), it's only natural for them to have similarities.

In order to distinguish a borrowing from a mere analogy, one must first identify a particular solution that isn't solely dictated by function, structure, or style but also embodies the creative intent of the architect. Then, discover the reuse of this solution and establish a connection between the original and the derived building.

Comparison of water towers designs in the 1920s and 30s



[pic.44] **Illustration from Kozhinov's 1933 book "Reinforced Concrete Water Towers" with a typical example of a symmetrical tower with a spiral staircase in the middle.**



[pic.45] **Illustration from Ludwig Hilberseimer's 1929 book *Beton als Gestalter* on the expressive properties of reinforced concrete.**

A detailed analysis of Soviet and German literature on reinforced concrete construction in the 1920s leads to a conclusion that there was no prototype for the White Tower in the form of a standard project from a manual.

By 1929, there were handbooks in German by F. Emperger, K. Kersten, E. Mersch, R. Saliger, and D. Bennett (Kersten and Mersch books were translated and published in Russian). Architect Ludwig Hilberseimer published a book "Beton als Gestalter". Soviet authors' handbooks by V. Kozhinov, N. Kashkarov, and V. Tsvetaev were also available. All these sources mentioned two primary types of reinforced concrete towers: those with a circular wall and those with freestanding columns and girders arranged in a circular pattern. Towers were symmetrical, with a staircase in the center.

None of the books contain a project resembling the UZTM water tower with its characteristic asymmetric composition based on the intersection of the tank volume and the stairwell.

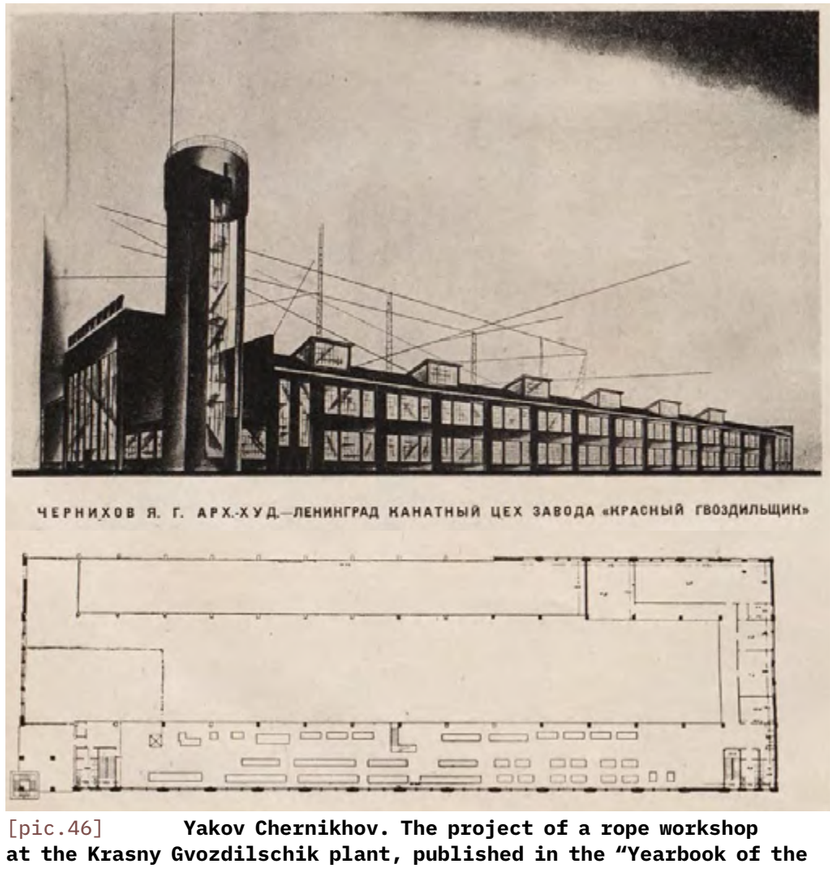
However, there are several towers that are most often compared to the White Tower:

Tower built in the cable factory at the *Krasny Gvozdilshchik* plant on the 25th line of Vasilievsky Island in St. Petersburg.
This is an asymmetric structure and an iconic example of avant-garde architecture. It's also the only realized project by Yakov Chernikhov, who is internationally renowned for his albums of architectural compositions, including "Fundamentals of Contemporary Architecture" (1929–1930), "Construction of Architectural and Machine Forms" (1929–30), and "Architectural Fantasies: 101 Compositions" (1933).

The Act of the State Historical and Cultural Expertise provides a historical and cultural study with references to archives. It shows there were two projects for the workshop with an incorporated water tower.

In one variant the stairwell's volume intersects with the tank's volume, reaching its midpoint, while in the other variant, the staircase volume exceeds the tank volume, allowing access to the roof of the cylindrical part from the staircase. Additionally, the tower's orientation relative to the workshop differs by a 90-degree rotation.

The towers designed by Chernikhov and Reisher do share characteristic features: a cylindrical tank asymmetrically intersects with the rectangular staircase volume and, in addition, relies on two separate columns. The cable factory project was approved on August 2, 1929, and at the end of 1930, its perspective plan was published in the "Yearbook of the Architect Artists' Society." [pic.46]



[pic.46] **Yakov Chernikhov. The project of a rope workshop at the Krasny Gvozdilschik plant, published in the "Yearbook of the Society of Avant-garde Artists" in 1930.**

Construction was taking place in 1930, but the tower ended up different from the published version. [pic.47]

In fact, Reisher submitted his tower design for the competition in 1929, thus he could not have seen Chernikhov's project or its implementation.

While tackling a similar task in a similar context, Reisher and Chernikhov independently arrived at similar solutions.

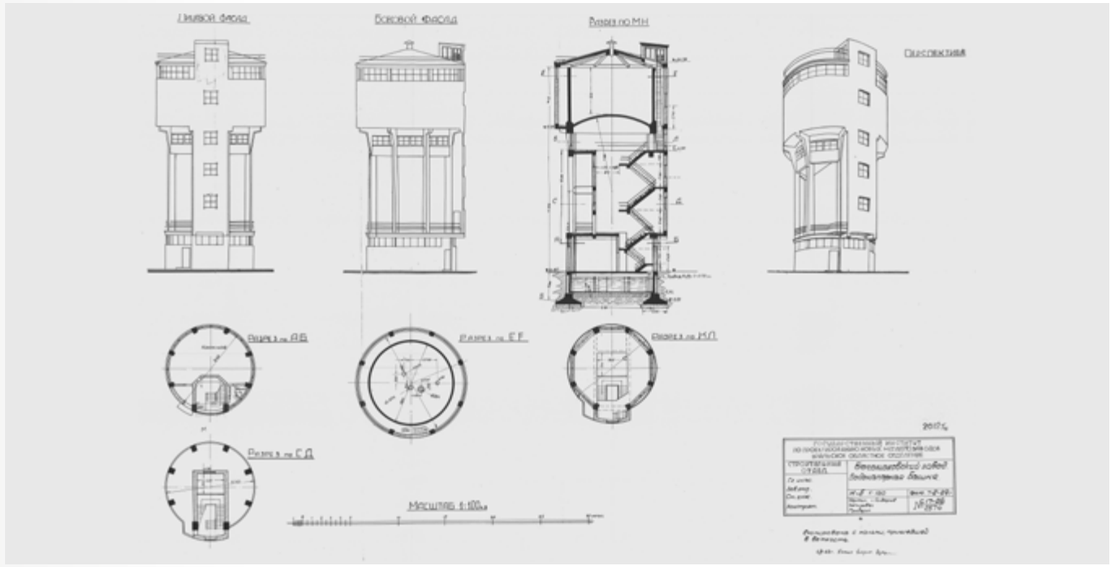
Tower in Krasnouralsk
On the premises of the modern "Svyatogor" metallurgical plant in Krasnouralsk, there is a water tower, which also deserves special attention among all towers in the vicinity.

In terms of composition [pic.48–49], it resembles the White Tower, but its tank is supported by a stairwell and six columns arranged in a circular manner. The volume of the staircase does not intersect with the cylinder of the tank but is incorporated into it, and the first floor has a circular shape.

Krasnouralsk factory and socialist city (which received this name in 1932; before that, it was called *Bogomolovsky* copper ore mine, and later, Uralmedstroy) were built in the late 1920s and early 1930s, roughly at the same time as Uralmash. *Uralgipromez* was in charge of the design. It was also in charge

[pic.47] **The water tower at the rope workshop before the start of restoration.** *Photo by Ilya Astakhov.*

[pic.48] **Photograph of the tower in Krasnouralsk, early 1930s.**

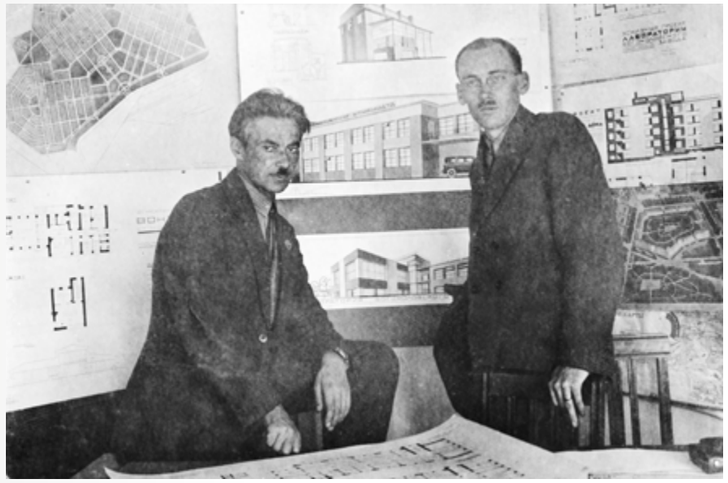


[pic.49] **Working drawing of the tower in Krasnouralsk, *Uralgipromez*, 1929.**

of the preliminary design for UZTM and employed the same designers from Uralmash before the specialized *Uralmashinostroy* trust was organized.

There is a photograph of architects standing against blueprints taken in *Gipromez* in 1927 or 1928. On the left is Iosif Robachevsky, an architect from Leningrad who worked at *Gipromez* and later headed the project department at *Uralmashinostroy*. Next to him is Valeriy Paramonov, a graduate of the Tomsk Technological Institute. Behind them, one can see a general plan of UZTM, which Paramonov defended in Tomsk in December 1927 as his diploma project. Various buildings of the Krasnouralsk plant can be recognized on the adjacent drawings, and some of them have Paramonov's signature. Robachevsky and Paramonov were colleagues of Reisher at Uralmash. Moreover, Reisher and Paramonov arrived in Sverdlovsk at approximately the same time and studied at the same institute, both under professor Kryachkov's supervision. [pic.50]

The archive records at the Krasnouralsk Plant contain plans of the tower's draft and final designs produced by *Gipromez*. These are the copies from



[pic.50] **Iosef Robachevsky and Valery Paramonov against the background of *Uralgipromez* projects.** *Photo from the Reisher's family archive.*

the original documents that have deteriorated over time, and signatures were not transferred during copying. So, the actual authorship remains unknown. A drawing for the foundation dates back to March 1929. It is reasonable to assume that the Krasnouralsk tower may have been designed and potentially started construction roughly a year before the White Tower.

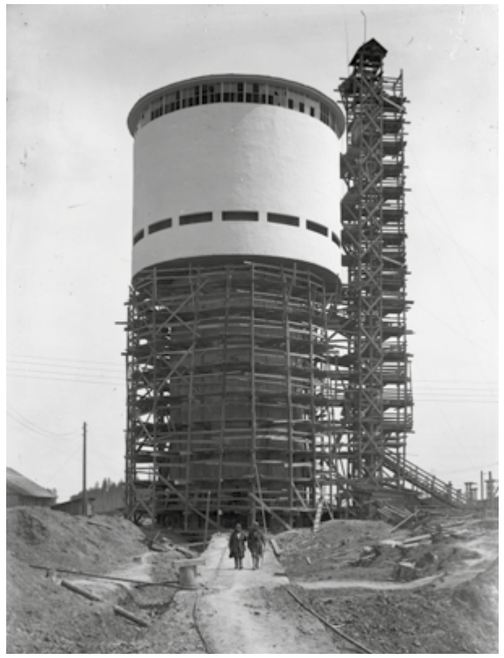
Based on the available pieces of information, it can be suggested that Krasnouralsk tower was designed by Valery Paramonov or another architect from *Gipromez*. Robachevsky, who announced the competition for the UZTM tower design, and Reisher, who won it, might have been familiar with this project. In such a case, Krasnouralsk tower could have served as a prototype from which Reisher took inspiration, but offered his unique composition, architectural concept, and bold construction methods.

The story becomes somewhat complex when we consider that *Techbeton* was clearly involved in the design of the plant in Krasnouralsk as well. The remaining headframe, designed by the leading architect of *Techbeton*, Boris Mitelman, is one of the most vivid examples of constructivist industrial architecture. However, there is no information confirming *Techbeton*'s involvement in the design of the water tower.

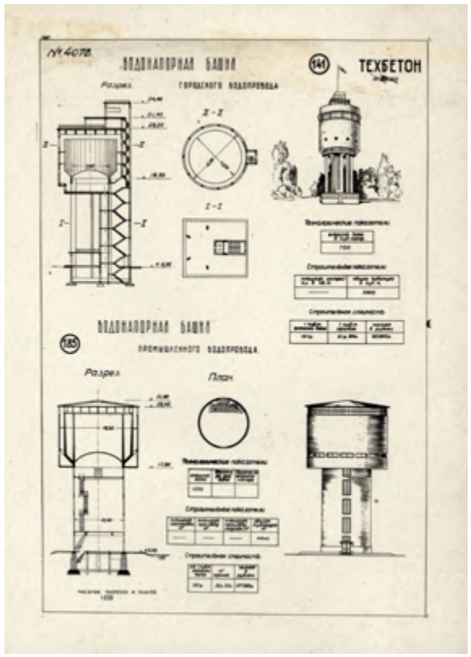
Industrial water supply tower on the territory of UZTM

The Uralmash plant features another water tower that was constructed following the *Techbeton* project, and was running parallel to the residential water supply tower. There is no knowledge of Reisher or other architects contributing to its design. The industrial tower is purely utilitarian, suggesting that no architect capable of understanding the function and structure of the object in the language of architectural composition participated in its design. [pic.51]

It has an Intze system tank divided into two parts by an internal wall, designated for industrial water and firefighting water. The total capacity



[pic.51] **Construction of a water tower next to the plant's thermal power station.**



[pic.52] **Projects №141 (water tower for urban water supply) and №185 (water tower for industrial water supply) in the Techbeton catalog.**

amounts to 1200 cubic meters, significantly exceeding the capacity of the White Tower. This refutes a popular claim that the White Tower's tank was the largest in the world at the time of its construction.

Techbeton included both structures in its catalog of standard projects under numbers 141 and 185. The catalog contained a total of six reinforced concrete towers of various capacities, as well as residential houses, a hotel, two culture clubs, and garages. The catalog was illustrated with designs of actual constructions (for example, standard project for cultural center #174 is the Gorbunov Cultural Center in Moscow, by architect Yakov Kornfeld). Therefore, *Techbeton* did not develop standard projects specifically but sold detailed plans and structural calculations for buildings previously designed for different clients, for reuse. [pic.52–53]

[pic.53] **Catalog of standard projects by *Techbeton*, 1933. Title page.**

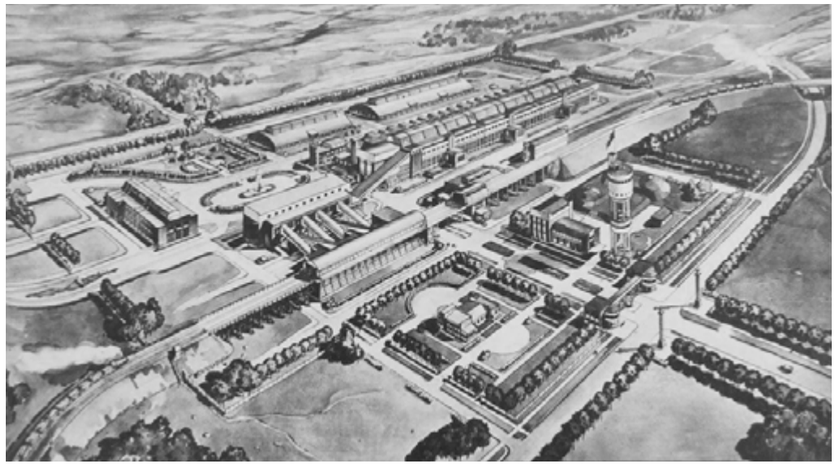
[pic.54] **The White Tower as an illustration in the reference manual by V. N. Pokrovsky "Water supply to industrial enterprises and residential areas."**

Also, the White Tower was featured as an example of a water tower in the books "Water Supply of Cities and Industrial Enterprises" by Professor Geniev and "Water supply to industrial enterprises and residential areas" by V. N. Pokrovsky. Thus, the fact that the White Tower was included in these editions published in the early 1930s may explain its citation in projects from the mid-1930s. [pic.54]

Tower on the territory of the Middle Ural Copper-Smelting Plant

Adjacent to the entrance gate there was a two-story tower—as if two White Towers placed on top of each other. This axonometric illustration is preserved in the archive of the *Promstroyproekt* Institute (Industrial Construction project, now UralNIIproject). The same axonometry is also featured in an article by architect Petr Buklovsky on industrial architecture in issue No. 12 of the journal "Construction Experience" from 1934. According to the biographical directory of the Sverdlovsk Union of Architects, Petr Buklovsky graduated from Vkhutemas in 1933 and started working at Sverdlovsk *Promstroyproekt* in 1934.

The Middle Ural Copper-Smelting Plant began construction in 1932, and the twin-tanked water tower was built in 1937 (though we do not have visual



[pic.55] **Project of a water tower on the territory of the Sreduralmedstroy plant in the city of Revda.** *Photo from the archive of Promstroyproekt.*

documentation of its actual appearance). In this case, it can be confidently stated that here White Tower was being referenced. The design of the already-constructed tower was evidently well-known to the architects at the Sverdlovsk *Promstroyproekt*. Unlike other examples, this project almost precisely reproduces the recognizable form with characteristic details, such as the round windows.

The tower at the Nevinnomyssk Woolen Mill (Stavropol Krai)

This structure entered the mainstream of avant-garde research only a few years ago and received the status of an architectural monument. The water tower here is integrated into the building of the fire station and has two tanks, one above the other — one for supplying water to the plant and the other for fire safety purposes. [pic.56]

Just like the White Tower, the cylindrical tank volume is supported by six reinforced concrete columns, two of which are integrated into the stairwell. The staircase culminates in an expressive cantilevered observation platform (presumably for fire observation). This is a characteristic architectural element that truly resembles the White Tower.

[pic.56] **Photo of the tower in Nevinnomyssk before the war.** *Photo from the archive of negatives at the Schusev Museum of Architecture.*

The tower in Nevinnomyssk suffered significant damage during World War II and was radically reconstructed afterwards. We judge the original appearance of the building based on an archive photograph from the Moscow Museum of Architecture. Date “1930” on the postcard may be approximate and is not confirmed by design sketches. As of the writing of this text, researchers have not found the original project, and, accordingly, there is no information about the authors of the building or the possible involvement of *Techbeton* in the design of the Nevinnomyssk plant. Due to the absence of any reliable information, we can only note the similarity between the two towers, but conclusions about possible borrowings remain in the realm of speculation.

Key Conclusions about Uniqueness of the White Tower

It can be asserted that the White Tower represents a creative work of Moisey Reisher. Similarities with other towers from the same period (primarily with Chernikhov’s tower) can be accounted for the shared tasks, materials, and architectural context.

Apparently, a popular idea that White tower is a modification of a standard project lacks proof. The conversation mentioned at the beginning of this chapter between architect Belyankin and the Moscow guest did occur though; Igor Kazus, who researched *Techbeton’s* legacy in the Urals, confirms the meeting with Belyankin in Sverdlovsk in the 1980s. However, their discussion centered around the *Techbeton* catalog of standard projects, and the tower’s project was included in the catalog after its realization.

“Quotations” of the tower in projects from the second half of the 1930s are possible, but in reality, there is not a single “copy” of the tower, apart from references to “one of the dairy factories in Northern China.”

In conclusion, the White Tower has typological analogues, but its exceptionally successful architectural solution is unique.

2.8 Architect Moisey Reisher

[pic.57] **Architect Moisey Reisher.** *From the Kazachinsky family archives.*

Architect Moisey Veniaminovich Reisher (1902–1980) came to Sverdlovsk to work at *Uralmashstroy* and lived in this city

for 50 years. He professionally dealt with a wide range of architectural forms and contributed to creating many iconic buildings and urban public spaces.

[pic.58] **Family photo. Moisey Reisher stands on the right.** *From the Kazachinsky family archives.*

[pic.59] **Architectural art club class. Moisey Reisher is third from the left in the first row, behind him sits Vadim Mizerov.** *From the Kazachinsky family archives.*

Childhood, education, work

Moisey Reisher was born on January 1 (14), 1902, in Troitsk, Orenburg Governorate, into a Jewish merchant family. His father Veniamin Reisher was involved in trade. Moisey had four brothers—Abram, Amadeus, Nison, and Rafael.

After graduating from the Troitsk Boys' Gymnasium, he moved to Tomsk in 1921 and began studying at the Engineering and Construction Department of the Tomsk (later Siberian) Technological Institute. This institute had long been a center for architectural education in the Ural-Siberian region. There, Reisher studied classical antique and ancient Russian art under the guidance of old-school teachers. He was also part of an architectural and artistic circle led by watercolor artist Vadim Matveevich Mizerov (1889–1954). It was during this time that Reisher developed a love for watercolor painting.

[pic.60] **Decorated window platbands from Reisher's notebook with sketches.** *From the Kazachinsky family archives.*

[pic.61] **Moisey Reisher's graduation project "People's House of Education".** *From the Kazachinsky family archives.*

Shortly after graduating from the institute, Moisey Reisher got married and was soon conscripted into the army along with his graduating class. In 1926–1927, he served in a construction battalion in Krasnoyarsk and later as a sapper in Irkutsk. [pic.58–61]

Sverdlovsk. *Uralmashinostroy*

In 1927, construction engineer Reisher moved to Sverdlovsk with his family upon the invitation from the *Uralmashstroy* trust to work on the design of industrial and residential buildings for the socialist settlement and industrial area of the Ural Heavy Machinery Plant.

Reisher was appointed as the head of the industrial building design department. Together with other architects at *Uralmashstroy*, he participated in the design of the foundry, steelmaking, forging and pressing workshops. In 1929, he won a competition for the design of a water tower at Uralmash, this time as the sole author.

Moreover, Reisher designed residential buildings not only at Uralmash, but also at Elmash for *Turboelectromachinery* and in Vtuzgorodok for the faculty of the Ural Polytechnic Institute (UPI). Also, he created plans for schools, kindergartens, and other social facilities. In addition, Moisey Reisher was involved

in public work as the secretary at the Ural Division of the Society of Modern Architects (UralOSA).

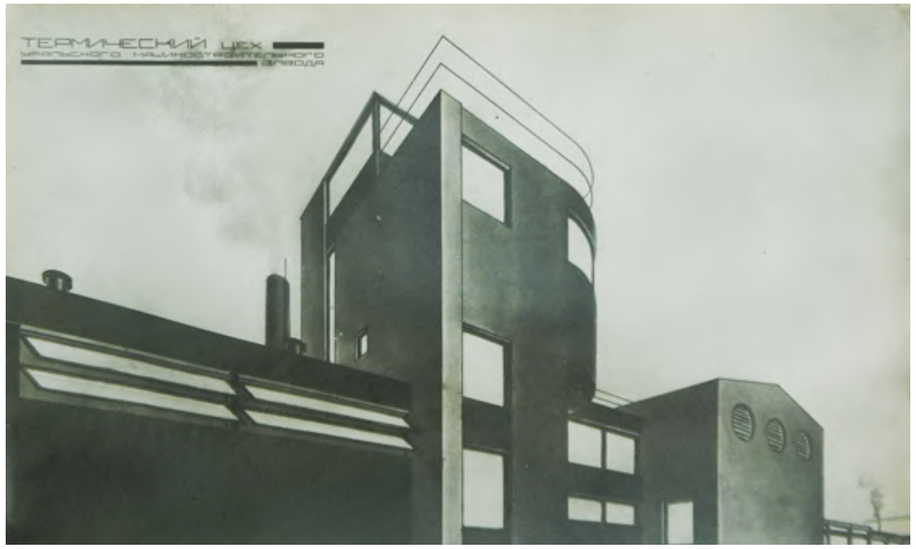
According to his son's recollections, Moisey Reisher was summoned for questioning by the NKVD four times in connection with incidents at Uralmash. Twice it was related to the White Tower: after the tank's rupture and due to a report that the windows of the tower on the northern side were shining in the shape of a cross at night (the vertical glazing of the staircase area intersected with the band glazing of the tank). However, on each occasion, he was found innocent, and managed to avoid repression. [pic.62–65]

Gorproekt. Transition to the Stalinist style

In 1934, after the Uralmash Plant was launched, Moisey Reisher transitioned from *Uralmashstroy* to Gorproekt (later known as *"Sverdlovskgrazhdanproekt"*—Sverdlovsk civil project).

In the early 1930s, Constructivism as a movement began to face criticism, and gradually, architectural design started incorporating luxurious decorative elements. Elements like moldings and columns coexisted with expressive

[pic.62] **UMZ (Ural Machine Building Plant—the first name of Uralmash), forging and pressing workshop.** *From the Uralmash Plant History Museum archives.*



[pic.63] **UMZ, thermal shop.** *From the Uralmash Plant History Museum archives.*

[pic.64] **UMZ, thermal shop.** *From the Uralmash Plant History Museum archives.*

[pic.65] **Residential buildings of Turboelektromashina, demolished.** *From the Kazachinsky family archives.*

volume and spatial compositions characteristic of Constructivism. Many infrastructure projects in the Uralmash socialist city were designed and altered to employ this transitional style.

Such practice that meant to combine styles was called “enrichment”, when decorative elements like columns, ornamental moldings, and brackets were added to existing avant-garde buildings.

In 1932, all creative architect associations, including OSA, were dissolved. They were replaced by the Union of Soviet Architects, which was meant to include all professional designers.

Architecture changed rapidly and dramatically, but Reisher managed to adapt to the new style.

In 1938, he worked on the enrichment for the originally Constructivist “Bolshoi Ural” hotel in the center of Sverdlovsk. The building gained numerous decorative elements, including balconies with ornamental balusters and decorative vases. He also made detailed plans and provided author’s supervision for the enrichment of the City Council building. Initially, the reconstruction was overseen by G. A. Golubev, but after he passed away in 1949, the famous clock tower was completed under Reisher’s guidance.

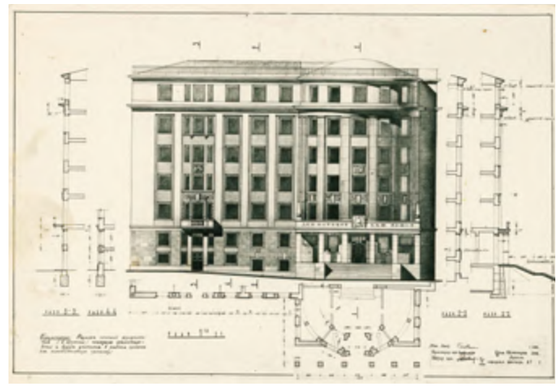
Several pre-revolutionary buildings were also renovated with Reisher’s involvement. [pic.66–69]

Afterwards, Moisey Reisher created many works in the Soviet Neoclassicism style. During this period, he mostly designed multi-story residential buildings and social infrastructure objects, e.g. the Hospital No. 23 (located at 9 Starikh Bolshevikov Street, designed together with I. A. Yugov).

Another area of his work included gentrification projects. In the late 1930s, he designed an entrance group, a ski station, exhibition pavilions, and retail kiosks for the Central Park of Culture and Leisure. Initially, some of these buildings were planned to be made out of wood, but these remained on paper. Another significant urban improvement project was the transformation of the *Gorzelenstroy* nursery into a public dendrological park on Mira Street in the 1950s.

[pic.66] **Cinema “Temp”, demolished.** *From the Kazachinsky family archives.*

[pic.67] **Hotel “Bolshoi Ural”.** *From the funds of the Architecture and Design Museum of the Ural State Academy of Arts and Sciences.*



[pic.68–69] **Enrichment for the House of Justice, not implemented.**

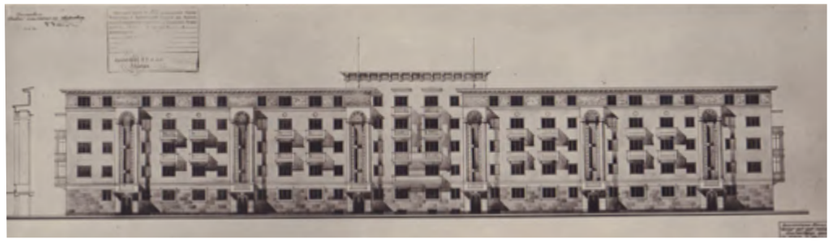
After World War II, Reisher designed several monuments, including a mausoleum for the remains of the first director of the UZTM plant, a pedestal for the last self-propelled gun SU-100 produced at Uralmash, and a monument to the heroes of World War II at the Shirokorechenskoye Cemetery.

In 1964, Moisey Reisher retired. [pic.70–75]

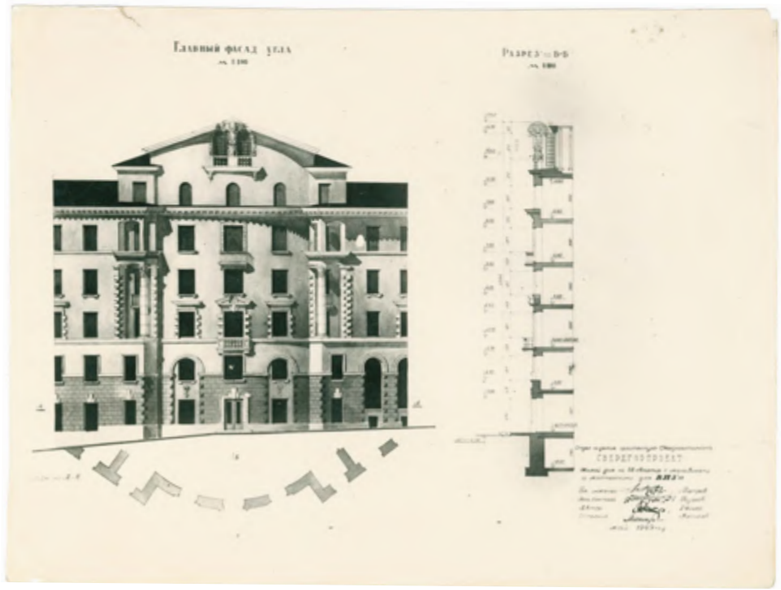
Side activity and interests

Moisey Reisher had a passion for hunting, went to the gym, played tennis, and enjoyed skiing and ice skating. He was also skilled in watercolor painting. During the Great Patriotic War (World War II), he was drafted into the engineering troops. In 1943, he was wounded while building a bridge across the Don River and returned from the front lines. After the war, his primary hobby became gardening, and he cultivated various fruits and berries, amassing a collection of lilacs.

[pic.70] **Central park of Culture and Leisure. Exhibition pavilions and cascade alley.** *From the Kazachinsky family archives.*

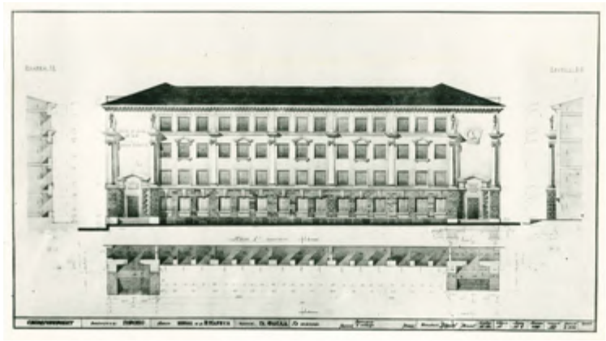


[pic.71] **Residential building for INORS (Foreign Professionals), 1936.** *From the funds of the Architecture and Design Museum of the Ural State Academy of Arts and Sciences.*

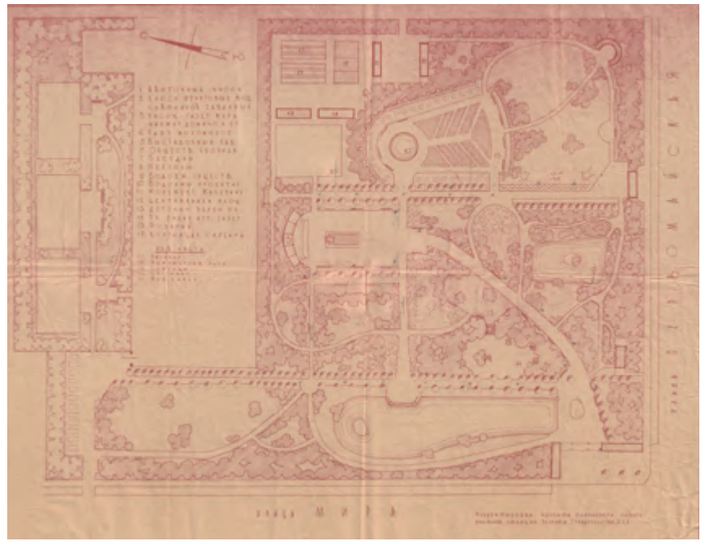


[pic.72] **Residential building for VIZ workers, 1949.**

[pic.73] **Hospital in the Kuibyshevsky district, 1957.**



[pic.74] **School on Karl Marx Street, 5, 1950s.**



[pic.75] **Reconstruction project of the arboretum on Mira Street, 1950s.** *From the funds of the Architecture and Design Museum of the Ural State Academy of Arts and Sciences.*

According to family members, Moisey Veniaminovich taught at an architectural college from 1940, supervised diploma students at the Department of Construction in the Ural Polytechnic Institute (UPI) and the Sverdlovsk Architectural Institute, and was engaged in teaching until 1974. One of his student's diploma paper from the Architectural Institute was the adaptation project of the White Tower in 1972.

In the early 1960s, Reisher became a member of the newly established Technical Council under the Chief of the Department for Construction and Architecture (a precursor to the future Urban Planning Council). The council was meant to review and approve all residential and civil construction projects as well as urban improvement projects. Moisey Reisher wrote comments, objections, and made reviews for the projects, which were already being designed in the new minimalist style of Soviet modernism.

Moisey Veniaminovich Reisher passed away in 1980. Part of his archives is kept in the Museum of Architecture and Design, while the other part remains with his granddaughter, Tatyana Borisovna Kazachinskaya. [pic.76]

[pic.76] **Self-portrait of M. V. Reisher.** *From the Kazachinsky family archives.*

2.9 History of Ownership, Operation, Changes and Losses

In the tower's timeline, there have been five major periods from the end of construction and up to the present day:

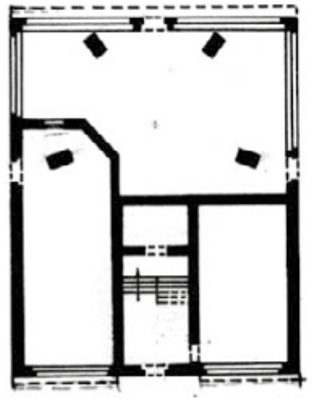
`Operation:`	from 1931 until the late 1960s.
`Conservation and search for a new application:`	from the early 1970s until the late 1980s.
`Reconstruction attempts:`	he early 1990s.
`Period of neglect:`	from 1993 to 2012.
`Revival:`	since 2012.

Operation

Unfortunately, there is little information about this period. Perhaps, the actual use differed significantly from Moisey Reisher's initial concept of combining a technical facility and a public space.

His project suggested that the ground floor would serve as an all-season public transport stop and a newsstand. Therefore, the pavilion had glass windows and entrances on three sides. On the fourth side there was a separate entrance to the staircase. Thus, people could easily access a bus stop, but not the technical rooms.

In fact, photographs from different years reveal that the tower was surrounded by a fence. Public access was prohibited. A caretaker guarded the tower around the clock. Consequently, side entrances to the pavilion were not in demand from the beginning. The space on the ground floor was likely divided by wooden partitions; measurements taken in 1983 hint at that. There might have been a restroom and a caretaker's room. `[pic.77]`



`[pic.77]` **Measurement sketch of 1983 from the passport of a cultural heritage site. The plan of the ground floor shows partitions, the location of which does not correspond to the design sketch.**

In the basement, there was a boiler room. We found a drawing of the heating system in the archives of the *Belaya Bashnya* insurance company. In photographs taken before the 1970s, one can see a chimney running along the front side wall of the stairwell. `[pic.78]`

`[pic.78]` **White Tower in the 1970s. There is a chimney running along the staircase.**

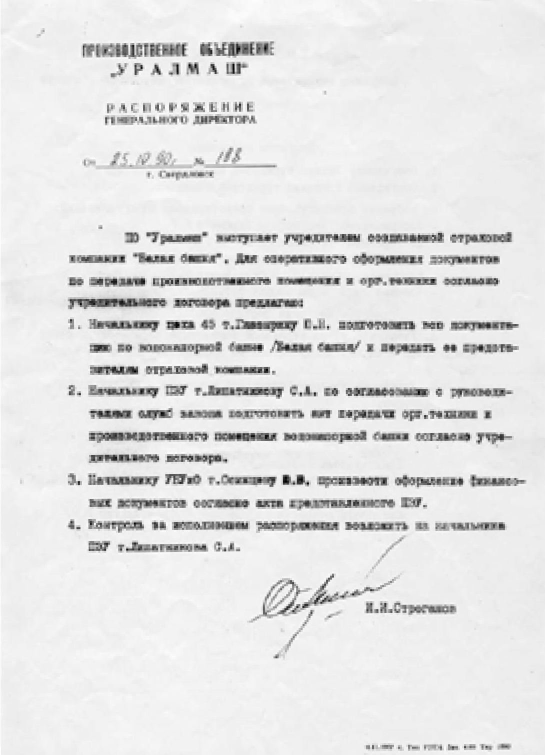
Conservation

Judging by the photos from the 1970s, including those taken by Moisey Reisher himself, it is clear that the tower had fallen into disrepair by the end of its operation. Windows were boarded up with plywood, the facade lost its white finish, and it had not been maintained for a long time. However, the overall appearance did not undergo any significant changes or losses compared to the original design.

Attempts to reconstruct in the early 1990's

Eventually, significant changes to the tower came along with the *Belaya Bashnya* insurance company and took place from 1990 to 1993. The company's director, Alexander Sagalovich, wanted to base their headquarters in the tower. They developed a renovation project, which included additional stairs, floors, and an elevator. Fortunately for the preservation of the monument, this project was not implemented. `[pic.79]`

However, without waiting for approvals, the company started repair work that seemed urgent and necessary from their perspective. The historical walls of the first-floor pavilion made of hollow concrete blocks were dismantled. Instead, new walls were constructed using hollow bricks, and the side entrance doors were sealed. New parapets made of three rows of bricks were added to the roof of the ground floor to ensure waterproofing.



ПРОИЗВОДСТВЕННОЕ ОБЪЕДИНЕНИЕ
„УРАЛМАШ"

РАСПОРЯЖЕНИЕ
ГЕНЕРАЛЬНОГО ДИРЕКТОРА

От 25.10.90 № 188
г. Свердловск

ПО "Уралмаш" выступает учредителем создаваемой страховой компании "Белая башня". Для оперативного оформления документов по передаче производственного помещения и орг.техники согласно учредительного договора предлагаю:

1. Начальнику цеха 45 т.[illegible] подготовить всю документацию по водонапорной башне /Белая башня/ и передать ее представителям страховой компании.
2. Начальнику ПХУ т.Липатникову С.А. по согласованию с руководителями служб завода подготовить акт передачи орг.техники и производственного помещения водонапорной башни согласно учредительного договора.
3. Начальнику УБУиО т.Осинцеву [illegible] произвести оформление финансовых документов согласно акта предоставленного ПХУ.
4. Контроль за исполнением распоряжения возложить на начальника ПХУ т.Липатникова С.А.

Н.И.Строганов

[pic.79] **Order of the General Manager of Uralmash dated October 25, 1990, according to which the water tower is transferred to the insurance company.**

[pic.80] **The new brickwork of the ground floor walls not yet plastered.** *Photo from the early 1990s.*

Repair work also affected the roof of the tank and the fire tower. By the 1990s, the wooden flooring on the observation platform had rotted and was replaced with a metal decking made of perforated sheets, along with the addition of metal beams. Also, they installed an extra row of handrails made from welded pipes. [pic.80]

What's more, the company replaced the original gabled roof of the fire tower, as seen in the original blueprints, with a flat uninsulated reinforced concrete slab. The roof level was raised with three rows of bricks. The installation of the new roof using a construction crane was captured in a television segment where Sagalovich gave an interview at the very top of the tower.

At that time, they also removed the historic water tank, metal access galleries, internal metal staircases, remnants of pipes, and technological equipment, except for the utilities in the basement area.

Abandoned from 1993 till 2012

In 1993, a court deemed the privatization of the tower illegal and seized it for state ownership. Since then, a period of neglect began. Gradually, the tower became filled with trash, especially in the basement, and covered in graffiti. Almost all window frames were broken, and several places had fire damage marks.

The government's first attempt to transfer the tower to a responsible owner dates back to 2008 when a regional branch of the Red Cross became its user. The Red Cross and the *Tatlin* Publishing House organized cleanup efforts in 2011 and 2012 so as to remove the trash and draw attention to the monument. However, the tower's physical condition did not improve significantly then.

Revival since 2012

The most recent period began in 2012 and it is associated with the architectural group PODELNIKI. Firstly, in order to combat vandalism, the group had to restrict uncontrolled access to the tower. In 2013, after a series of cleanups, they installed a fence with an alarm system powered by a battery and a solar panel. All of this made it possible to launch the tower's preservation in order to reopen it to the public.

2.10 Waterless Water Tower: Adaptation Projects and Design Competitions from 1970s to 2010s

Unfortunately, we do not know the exact date when the tower stopped operating. Most likely, this happened in the second half of the 1960s. By that time, nine-story and taller buildings were being constructed in the Uralmash district, and the water pressure from a 29-meter tower was already insufficient for them.

By this point, the district had already been connected to the municipal water supply system. Furthermore, when designing the water supply system for Uralmash, it was already evident that the artesian wells, which provided up to 5,000 cubic meters of water per day, would only suffice for the first decades of the socialist city's existence.

Moisey Reisher's project

On April 3, 1967, Moisey Reisher's article "Forgotten Tower" was published in the *Vecherny Sverdlovsk* newspaper. In this article, he expressed dissatisfaction with the tower's appearance, describing its dirty and shabby walls with traces of dirt streaks that seemed to reproach the passersby. He also brought up an idea of a potential alternative use for the tower.

One of my friends from Moscow, who had seen our tower, asked me in a letter: Did the project envision a possibility to overlook the surroundings of Sverdlovsk? I had to confess that the tower was designed not only as a communal facility but also as an architectural structure in the composition of the adjacent area and landscape, and as an observation point located in the highest part of the terrain.

The tower has a convenient staircase with access to a flat roof, from which a good view of the city and the surroundings opens up. From there, you can see the western hilly shores of Lake Baltyam and Lake Peschany, not to mention the Verkh-Isetskiy Pond and Lake Shartash. The pavilion at the foot of the tower was designed so that it could have an ice cream parlor inside.

This space, like the staircase itself, is isolated from the tower's technical equipment. The extensive potential for its public utility is already embedded in the tower and has remained unused for over forty years. Isn't it the high time to improve the tower's appearance and open public access? Let it become a landmark in the park of the Uralmash workers, embodying the architectural culture of the early Five-Year Plans.

This text doesn't explicitly mention that the tower was not operating. Instead, it focuses on the tower's potential for other uses, like opening a café in the pavilion on the ground floor or opening access to the observation platform without interfering with the technical equipment. [pic.81]

БАШНЮ НАДО СОХРАНИТЬ

В 1967 году в «Вечернем Свердловске» была напечатана моя заметка «Забытая башня», где я писал о безобразном состоянии прекрасного архитектурного и инженерного сооружения первой пятилетки, расположенного на пересечении магистральных улиц Уралмаша — Культуры и Бакинских Комиссаров.

Что изменилось за это время? Ее «раздели» — разбили стекла, переломали переплеты. Меня возмущает отношение к этому сооружению тех, кто отвечает за его сохранность. Из-за их равнодушия гибнет интересный памятник.

покраски, сейчас же нужно заново сделать всю «столярку» и провести остекление. При таком безразличном отношении к сооружению через год, а может, и раньше на месте башни может вообще ничего не остаться.

Нельзя этого допустить!

М. РЕЙШЕР, архитектор.

● ПОСЛЕ КРИТИКИ

«ВРЕМЕННЫЕ НЕУДОБСТВА»

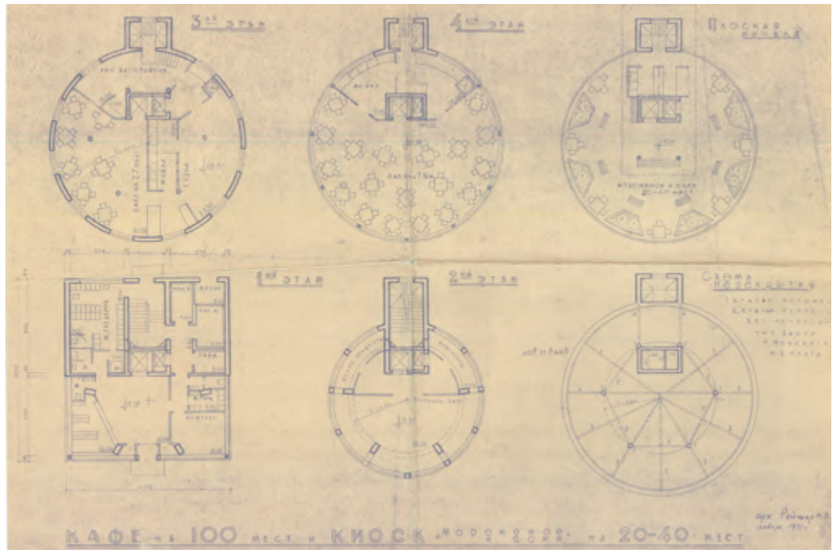
[pic.81] **Note by Moisey Reisher in the newspaper Vecherniy Sverdlovsk dated February 5, 1970, where the author complains about the deteriorating condition of the tower.**

Three years later, on May 15, 1970, another short editorial note titled "Café in the Tower" was published in the *Vecherny Sverdlovsk*:

It has now been decided to restore this monument of the early Five-Year Plans. The tower will be repaired, and the area around it will be improved. The top of the tower has an observation platform, and it has been decided to open a café there. Technical documentation for the upcoming reconstruction has already been ordered.

Apparently, between 1967 and 1970, a decision was made that the technological equipment would no longer be needed and could be dismantled.

The "technical documentation for the upcoming reconstruction," presumably, is the project executed by Reisher himself.



[pic.82] **Project of a cafe with 100 seats and a kiosk "Juice, water, ice cream" for 20-40 seats. Moisey Reisher, 1971.**

In the Reisher family archive, there is an album with sketches for an adaptation project that contained two versions and a detailed concept note. According to this project, a 100-seat cafe and a kitchen could occupy the space of the tank, and the observation deck could have an additional kiosk "Juices, Water, Ice Cream" with 20–40 more seats. [pic.82]

This project introduced changes to the tower's layout and appearance:

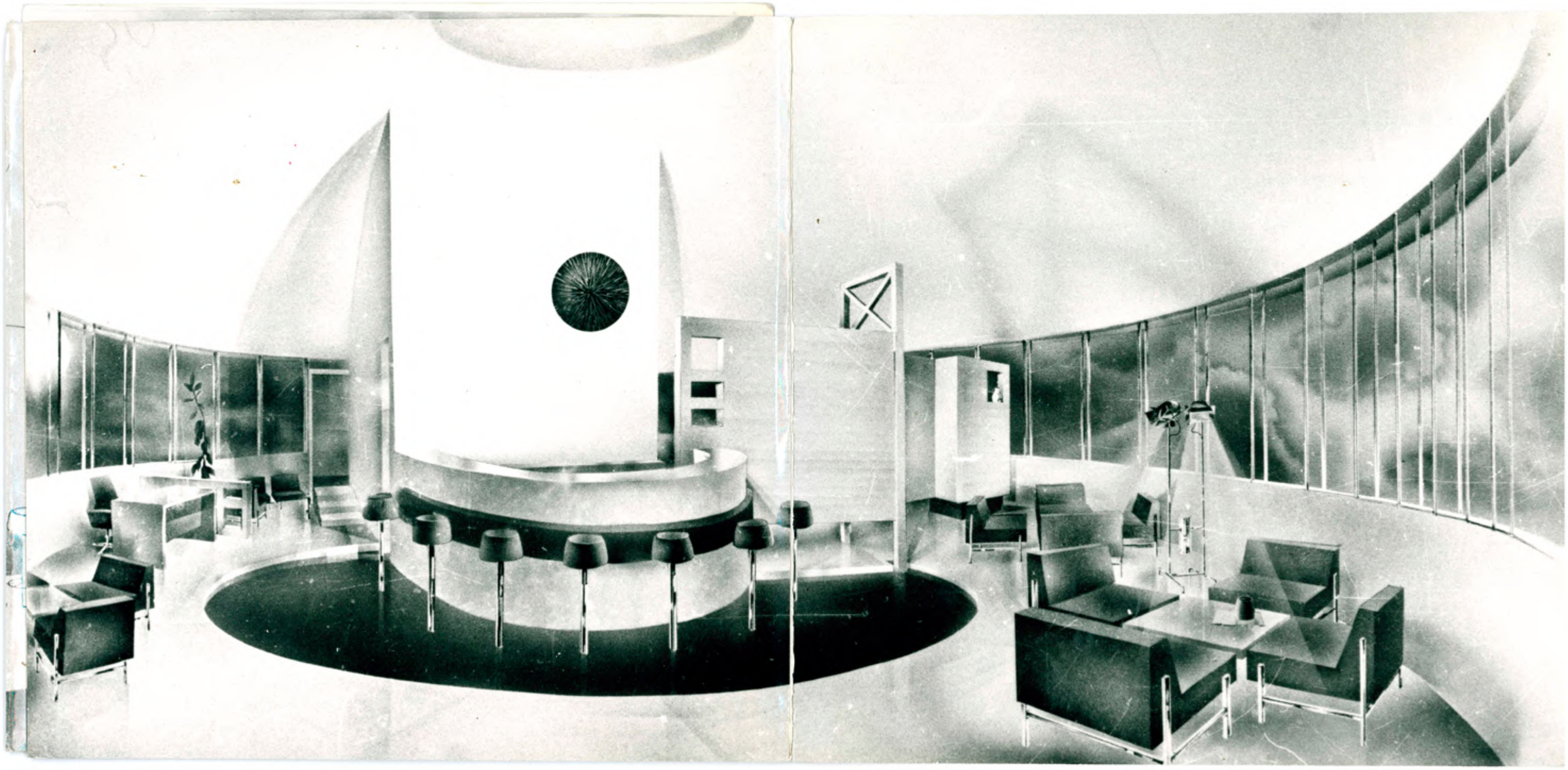
In the technological shaft, where pipes used to be, Reisher wanted to install two elevators—one for passengers and one for goods. Elevators would run through the tank's space and reach the observation platform, yet this alteration would barely influence the tower's external design.

A more noticeable alteration would have been adding large windows in the walls of the cylindrical section to illuminate the cafe.

Such windows simplified the tower's image by mitigating the contrast between the solid wall of the cylinder and the horizontal ribbon window. However, in 1970, Reisher was not formally restricted in any way. Like other constructivist buildings, White Tower was only listed as a historical architectural monument in 1974.

In the end, fire department rejected this project. A report stated that the plan lacked a second evacuation exit. It points to a simple and objective reason why they could not give this idea a go. However, publications often mention another reason—the lack of the chief architect's persistence.

In the newspaper *On Heavy Machinery* dated August 14, 1987, G. Vasiliev wrote an article called "A Café in the White Tower? Sounds good!", which shared a popular idea that the project met all the requirements but, for some uncertain reason, was not realized.



[pic.83] **Interior of a cafe in the White Tower tank. Design by Anatoly Ptashnik and Mikhail Matveev for a adaptation project designed by Moisey Reisher. 1980.** *From the archive of architect Ptashnik.*

The aforementioned project by Reisher may still be gathering dust in the archives of the Uralmash Capital Construction Authority. In its time, it was approved by the Ordzhonikidze District Executive Committee, the UZTM Management, the Society for the Preservation of Architectural Monuments, and was coordinated with the sanitary epidemiological station and the State Fire Safety Service. A group of artists even designed the interior of the café and the tower's lighting for nighttime.

Competition by *Sverdlovskgrazhdanproekt* in 1970s

Multiple sources mention a design competition launched in the late 1970s by *Sverdlovskgrazhdanproekt* design institute.

Architect Petr Demintsev, in an article dedicated to Reisher (*Vecherny Sverdlovsk*, January 5, 1977), writes:

> Now, the tower is over forty years old, but it appears to us as exceptionally modern. Such is the power of genuine architecture. The tower has remained empty for many years. The author himself dreams of giving new life to his brainchild. It is very good that a competition for a re-use project for the tower was held at the *Sverdlovskgrazhdanproekt* institute. In my view, the competition was successful and produced a series of proposals worthy of attention and discussion.

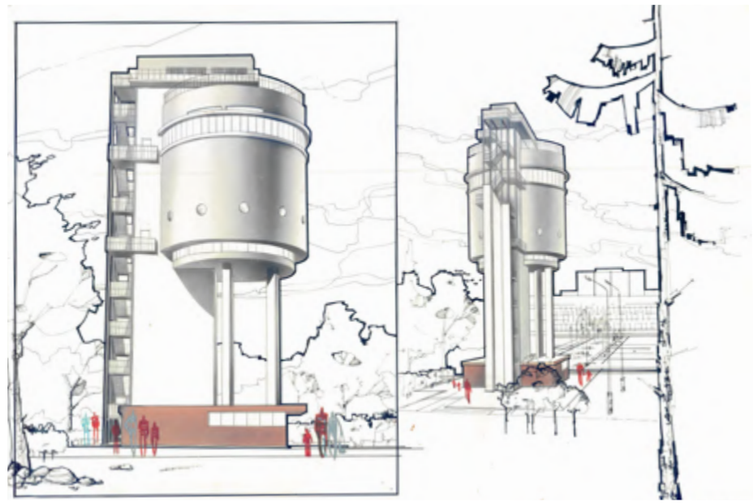
Unfortunately, no materials from this competition were found in the *Sverdlovskgrazhdanproekt* archives.

Project by the Khramtsovs

G. Vasiliev's article (1987) mentions another adaptation idea [pic.84]:

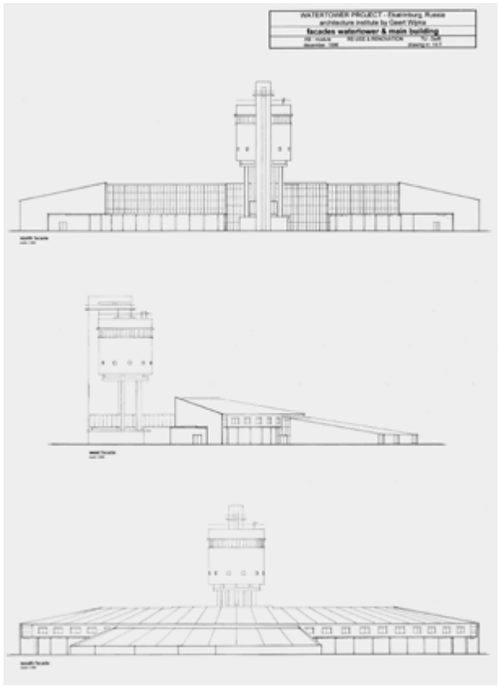
> Recently, I was informed by the Komsomol committee at UZTM that they are planning to take control of this object and adapt the tower for the benefit of the people.

This seems to refer to a project by the architects Khramtsovs developed in 1987. The authors provided us with sketches of the project, which has an extra evacuation staircase attached from the Bakinskikh Komissarov



[pic.84] **Project for adapting the tower into a youth culture center, architects N. and A. Khramtsov.**

[pic.85] **Poster for an exhibition of projects by Russian and Dutch students. 1997.**



[pic.86] **Tower adaptation project designed by a TU Delft student Geert Wiima. December 1996.**

street side. This could have addressed the evacuation issue, but there is no certainty whether heritage protection authorities would have approved of such an option.

Recent time projects and competitions

In the 1990s, when Ekaterinburg was opening up to foreigners, the first publications in English began to emerge. Since then, various groups of Russian and foreign students proposed adaptation projects for the White Tower in different years:

In 1996, students from the Netherlands came to the Ural Academy of Architecture and proposed their projects. [pic.85–86]

In 2010, Dutch and Russian students worked on a joint concept for adapting the tower under the architect Cees Donkers's supervision.

In 2012, a student project competition took place as part of the architectural festival "White Tower" organized by Tatlin Publishing. While earlier competitions focused on the general appearance of the tower, this one was dedicated to interior designs.

After 2012, the architectural group PODELNIKI tested various roles for the White Tower designing its potential future. During this time, the tower was "rediscovered" for the city and became a popular cultural venue.

3

Research and Activity Prior to Restoration

Photo on the previous page: White Tower before conservation, 2013.
From the archives of the arch-group Podelniki.

3.1 Research Made by Students from Russia and Germany in 2013

From the very start, we realized an urging need to make an engineering assessment of the White Tower. However, we lacked the resources to carry out an expensive instrumental study and commission a specialized organization.

We were incredibly lucky to get support from Berlin-based engineer Werner Lorenz. We had got in touch before when assisting with his research on the history of early metal structures in Russia. Professor Lorenz established and headed the only department in Germany that focuses on the history of engineering structures and their preservation methods at the Brandenburg University of Technology. He also led the European Society for the Engineering Structures' Study.

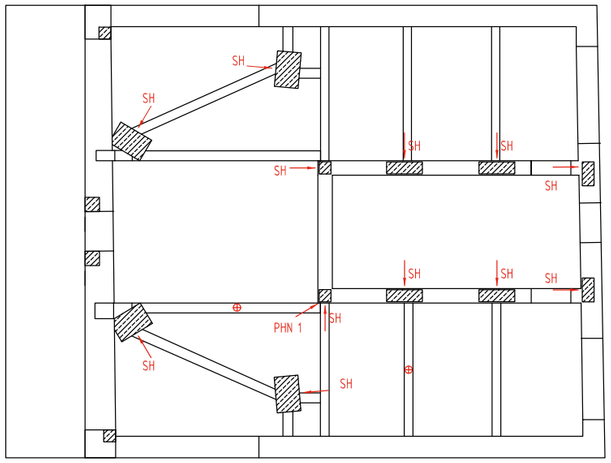
Dr. Lorenz proposed making a student workshop dedicated to the tower's primary engineering assessment. Students participated as volunteers under his supervision, and we managed to cover the expenses by crowdfunding and a grant from Germany.

Soon two students from BTU Cottbus (Brandenburg University of Technology Cottbus-Senftenberg, Germany) came to Ekaterinburg. Data from this workshop was meant for their diploma project. In addition, there were four students from local universities: the Ural Academy of Architecture (now Ural Architectural and Artistic University) and the Ural Polytechnic University (now Ural Federal University).

By the time when the workshop began, we had already found a significant part of archival materials and prepared ready-made plans for the field study. All in all, it lasted a little over a week. Throughout this time, participants used the prearranged plans to map out damages, took photographs and measurements of problematic areas (including the upper part of the façade using an aerial work platform), determined the position of reinforcements, measured surface strength, and assessed concrete carbonation. [pic.1–3]

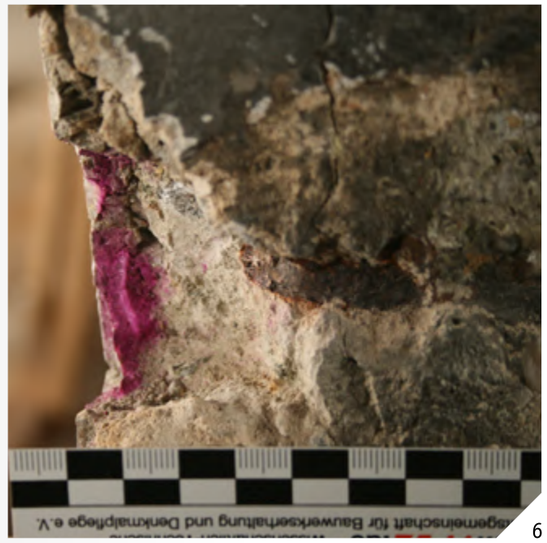
Studying the context and analogical towers was an important part of this workshop. Together we managed to access a restricted area of UZTM and the plant in Krasnouralsk so as to inspect two reinforced concrete water towers built at the same period.

[pic.1] **Measurments and research made at the program Summer at the White Tower.** *From the archive of the arch-group Podelniki 2013.*



SH – Schmidt-Hammer / молоток Шмидта
PHN – Phenolphthalein / фенолфталеин
PM – Profometer / детектор арматуры

[pic.2] **Measurments and research made as part of the program Summer at the White Tower.** *From the archive of the arch-group Podelniki 2013.*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7

[pic.3] **Survey plan for the ground floor structures made as part of the program Summer at the White Tower.** *From the archive of the arch-group Podelniki 2013.*

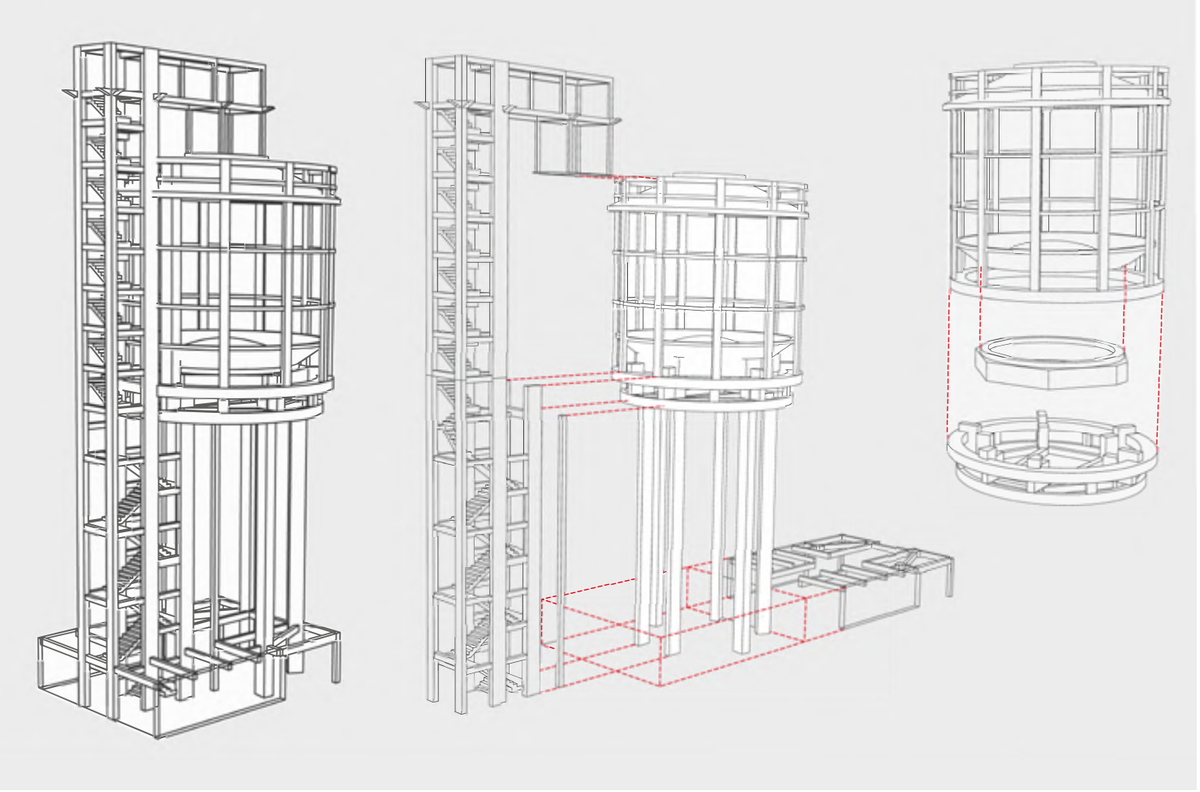
The workshop results included:

An accurate three-dimensional model of the load-bearing structure. [pic.4]

Mapping and classification of damages.

Information on the actual strength of the elements.

A general confirmation that the tower's construction followed the discovered work plans.



[pic.4] **Load-bearing frame of the tower. Model made at the program Summer at the White Tower.** *From the archive of the arch-group Podelniki 2013.*

These results were presented to the public at an exhibition in the Ekaterinburg History Museum, and the entire workshop received extensive coverage on local television. [pic.5]

[pic.5] **Professor Lorenz at the final presentation of the program Summer at the White Tower wearing a promo T-shirt "Let's save the tower".** *2013, photo by Donat Sorokin, justmedia.ru*

Based on the collected data, two of Professor Lorenz's students, Olga Arkhipkina and Georg Albrecht, defended a joint thesis in Cottbus. They developed a computational model of the tower's frame using the finite element method and subjected it to current and hypothetical operational loads, applying both Russian and European standards.

The conclusions drawn from the survey and preliminary calculations were as follows:

The tower's structure has retained its basic functionality.

The tower can be used for guided tours.

The tower requires urgent conservation in order to protect it from further deterioration caused by weather conditions and vandalism.

3.2 Research Made by S. Kudryavtsev (2018)

Professor Lorenz's students thoroughly analyzed the actual condition of the tower. However, from a legal perspective, their diploma could not serve as the basis for creating a plan of urgent repair work.

According to the Russian regulatory requirements, calculations had to be performed by a local licensed engineer. In our case, Sergey Kudryavtsev took on this duty. By that time, he had already surveyed many industrial buildings from the 1920s-1930s in the Urals.

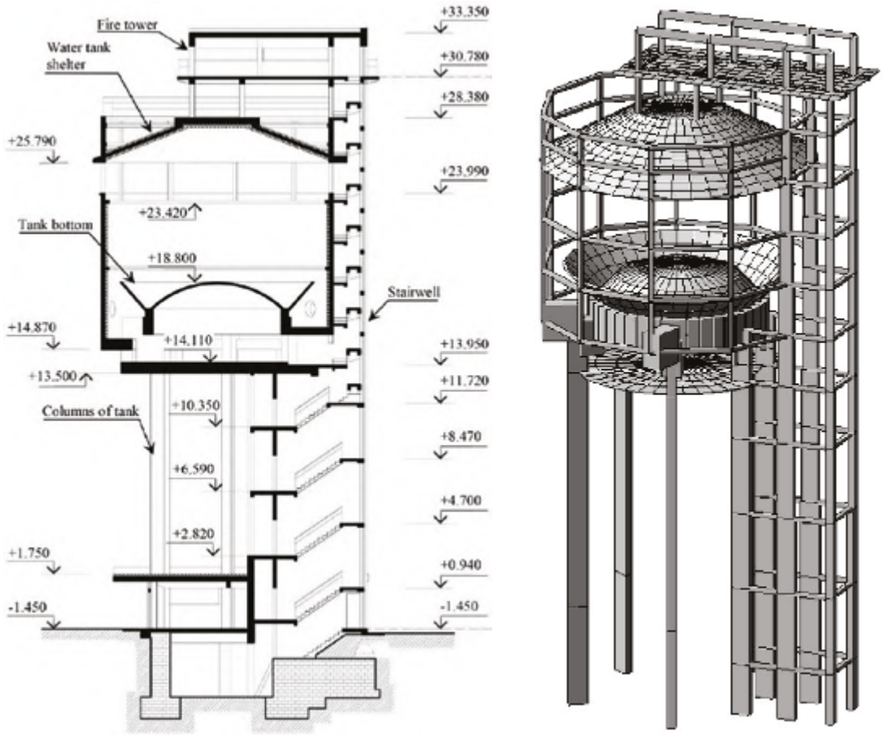
S. Kudryavtsev used the same instrumental methods as Professor Lorenz's students, and the measurement results mostly coincided.

He conducted calculations applying Russian standards and created a computational model using the "LIRA-SAPR" software, based on the finite element method [pic.6]. Two load distribution scenarios were considered: the first scenario corresponded to the tower's current condition, and the second to the projected one when the tower will operate as a museum.

The calculation results showed that the main load-bearing structural elements of the tower have sufficient load-bearing capacity to accommodate a public function inside, provided that damaged elements are repaired and reinforced.

However, Kudryavtsev points out the overloading of the tank columns [pic.7]:

> The loads that will occur in the structure during its operation as a museum are crucial for the fire tower floor, staircase structures, and the tank column. The latter is the weakest part of the entire structure. The calculations performed confirm M. "The loads that will occur in the structure during its operation as a museum are crucial for the fire tower floor, staircase structures, and the tank column. The latter is the weakest part of the entire structure. The calculations performed confirm M. V. Reisher's concerns: back in 1971, when proposing a project to convert the tower into a cafe, he drew attention to the fact that the load from the new floorings inside the tank should be directly transferred to the reinforced concrete columns of the tower, and under no circumstances should it be imposed on the tank walls."



[pic.6] **Cross-section of the tower showing the main structural elements and design plan of the structure.** *By Sergej Kudrjavtsev, MATEC Web of Conferences 146, 02003 (2018).*

Таблица 1. Результаты оценки несущей способности строительных конструкций сооружения.

Элемент	Сечение *h* x *b* и площадь растянутой арматуры	M_x, тм	$M_{ult,x}$, тм	M_y, тм	$M_{ult,y}$, тм	Использование несущей способности, %
Колонны бака	900 мм x 600 мм A_{sx} = 1356 мм² A_{sy} = 1808 мм²	803 877	1101 1204	440 517	844 948	72 73
Колонны шатра	300 мм x 300 мм A_{sx} = 850 мм² A_{sy} = 850 мм²	74 86	124 133	90 110	108 119	83 **92**
Колонны лестницы	900 мм x 300 мм A_{sx} = 850 мм² A_{sy} = 1133 мм²	424 471	588 654	158 184	264 288	72 73
Косоур лестницы	200 мм x 150 мм A_{sx} = 380 мм²	4,5 7,7	11 11,5	–	–	41 67
Колонны пожарной вышки	250 мм x 250 мм A_{sx} = 253 мм² A_{sy} = 253 мм²	26,1 30,7	51,5 56,2	33,9 38,6	46,5 52,0	72 74
Балки пожарной вышки	400 мм x 200 мм A_{sx} = 820 мм²	88,4 136,6	124,4 147,3	–	–	71 **93**
Колонны шатра	1000 мм x 80 мм A_{sx} = 427 мм²	2,48 3,90	4,17 4,17	–	–	59 **94**

[pic.7] **The results of estimating the bearing capacity of structures.** *By Sergej Kudrjavtsev, MATEC Web of Conferences 146, 02003 (2018).*

The results were published in the journal “Academic Bulletin of UralNII-Project RAASN” and later in the follow up works of an international conference in the Czech Republic. Kudryavtsev’s report was included in the project for primary emergency and conservation works approved in 2015.

3.3 Emergency Response: Design and Implementation

Research showed that it was possible to conduct tours and events in the tower if primary emergency and conservation works were carried out to ensure the safety of both the tower and its visitors. Additionally, it was necessary to connect the tower to the electrical grid.

Fortunately, the Russian legislation on the preservation of cultural heritage allows for such an approach. In order to carry out urgent works, it is not required to have an expensive and comprehensive restoration project subject to historical and cultural expertise. It is enough to complete the sections on “Preliminary Studies” and “Preliminary Works.” We prepared this documentation in 2014 together with the *Rozhdestvenka* bureau. Later, thanks to the grant support from the Getty Foundation, *Rozhdestvenka* was able to develop a full-fledged restoration project.

An important feature of conservation works that sets them apart from restoration is the principle of removable improvements. The introduced elements should not affect the genuine structural material, distort, supplement, or imitate it. Conservation has temporary nature and is meant to halt deterioration while more substantial work is being prepared. Conservation changes should be executed in such a way that they can be easily removed without harm when restoration begins. [pic.8]

White Tower Conservation project included the following measures:

`Sealed off all door and window openings.` The primary goal was to protect these openings from precipitation and to prevent accidents such as falls from the stairs. To achieve this, we designed straightforward structures using molded polycarbonate on a wooden frame or metal supports [pic.9]. These barriers were not meant to control temperature differences or create a distinct climate inside the tower; thus, regular hemp was used for sealing. The interior doors were wooden panel doors, while the exterior ones were made of metal.

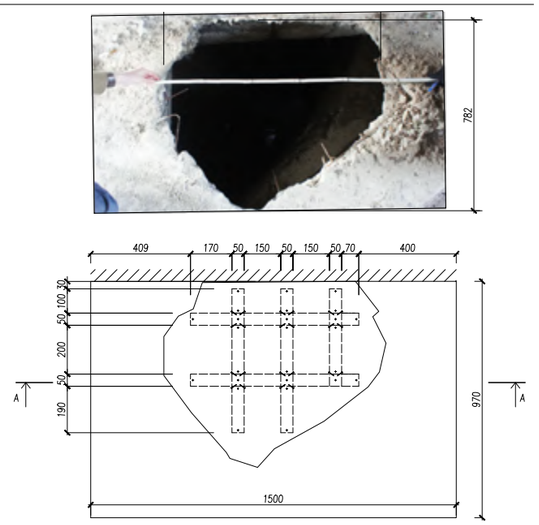
`Waterproofed the roofs on the ground floor, tank, and fire tower.` Roll-on torch waterproofing without insulation was applied to the ground floor pavilion and the fire tower. However, this proved to be temporary, as falling plaster fragments from the upper sections damaged it, leading to new roof leaks. For the tank’s roof waterproofing, we constructed a wooden frame, and a special faux shingle roof made of OSB sheets covered with flexible tiles [pic.10]. On the contrary, this temporary solution demonstrated sufficient durability.

[pic.8] **Emergency work in the tank. Photo taken for author's supervision.** *From the archives of the arch-group Podelniki.*

[pic.9] **Sealing window openings with temporary structures - wooden frames and cast polycarbonate. Photo taken for author's supervision.** *From the archive of the arch-group Podelniki.*

[pic.10] **Photo of the additional OSB structure for waterproofing the dome above the tank.Photo taken for author's supervision.** *From the archives of the arch-group Podelniki.*

Closed the openings in the floor slabs that had appeared in the early 1990s, when the *Belaya Bashnya* insurance company roughly dismantled the vertical pipes running through the entire tower. We sealed the openings with thick plywood sheets. [pic.11]



[pic.11] **Project of plywood structures for closing holes in the tower floors left after dismantling the pipes. Fragment from the conservation project.**

Installed railings on hazardous sections of the staircase using simple metal pipes.

Installed a poured concrete floor on the ground level [pic.12]. This decision represented a deliberate deviation from the principle of removable improvements. Originally, the ground level only had a constructed floor over the basement area, while the remaining space had a compacted soil surface. The ceiling above the basement had numerous openings, and it had significantly deteriorated after several fires. Since the ground-level pavilion is the most frequently visited part of the tower, it required a good quality easily maintainable floor that could be cleaned regularly. Therefore, with the consent of the project's scientific supervisor, a poured concrete floor with a self-supporting reinforced screed was added into the conservation project. It was installed over the existing slab and the ground base, providing a durable and functional solution.

[pic.12] **Floor on the ground level. Photo taken for author's supervision.** *From the archives of the arch-group Podelniki.*

Installed a new staircase and seating inside the tank [pic.13–14]. When the metal tank and the circular gallery with stair access were dismantled for scrap metal in the early 1990s, it became challenging to enter the tank. We introduced a new staircase featuring wooden steps attached to a modular metal stringer. This setup allows visitors to access the tank from below, although it might not be the most convenient means. In the tank space, we also added a separate metal platform fitted with wooden seating for visitors. In the conservation project, these staircase and seating elements are designated as provisional measures to facilitate technical access to the tower's structures. They are not safety measures on their own. Nonetheless, they offer the public a unique opportunity to explore the tower's interior, thereby fostering an understanding of the site's significance and its sense of belonging to the community. Ultimately, this helps in preserving the tower both physically and culturally.

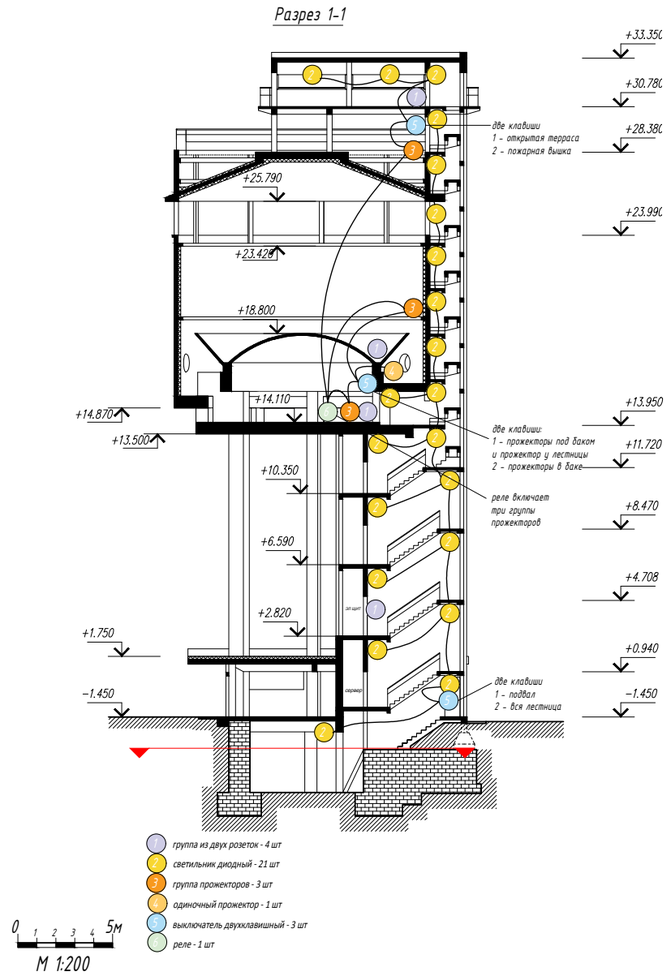
[pic.13] **Photo of the staircase to access the tank.** *From the archives of the arch-group Podelniki.*

[pic.14] **Photo of the stands installed in the tank. Photo taken for author's supervision.** *From the archives of the arch-group Podelniki.*

Connected to electricity and installed internal open electrical wiring. An electrical cable runs underground, enters the tower through the basement, and leads to an electrical panel located in the technical shaft of the stairwell on the second-floor level. There are electrical outlets and lighting fixtures throughout all the tower's spaces. At night, the lights on the staircase and in the tower are automatically turned on and serve as architectural lighting. This communicates to passersby that the tower is alive and kicking. [pic.15]

The conservation work took place in two stages in 2015 and 2016.

Documents were adjusted and approved during the course of work, which is also allowed by the Russian legislation. The scientific supervisor as an author of the project has a right to make additions and changes, whiles new information is discovered during work.



[pic.15] **Plan for electrical kit installation.** *From the archives of the Podelniki arch-group.*

Permanent electricity was only installed in the summer of 2016. In 2015, so as to protect the first conservation results from vandalism, we installed a security alarm system on the ground floor, which operated autonomously using a solar panel on the fire tower.

In August 2016, we opened the tower for regular weekly tours. They occur throughout the warm season (April to November) and have been gaining more and more popularity each year. The tours began after a multimedia installation in the tank spacewas created thanks to a grant from the Vladimir Potanin Foundation.

The surveys revealed that the thin reinforced concrete slab and the supports of the fire tower are in critical state. During conservation, we did not carry out structural reinforcement works, which is why access to the fire tower was restricted. Tour groups were up to 15 people, they concluded their tour at the observation deck, and visitors could only go higher one at a time.

Some work continued even after the main conservation stages were complete. Electrical wiring in the upper part of the tower was only installed in 2018, and lightning protection was added in 2019. Unfortunately, in 2017, the media installation was damaged by a lightning strike during a severe thunderstorm. Installing lightning protection required more approvals of yet another change to the urgent work project.

3.4 White Tower in City Life

In 2012 we formulated the project's initial goal, and it can be summarized as follows: to preserve the tower physically and reintegrate it into the life of the city. From the outset, we understood that it was not enough to focus on the tower's physical condition and its legal status. Our mission was to make a former ruin become a significant public place in the residents' real life and in their perception of the city.

"Activation" of the tower embraces three directions:

1) Transform the tower's image and create a sustainable community around it. The tower had been abandoned for many years, and thus acquired a negative image associated with decay and crime rather than with the city's heritage and architectural uniqueness. It was necessary to shape a collective appreciation for the tower among a wide audience and engage a committed, albeit smaller group in its protection.

2) Explore new scenarios. Previous attempts to reuse the tower had failed, partially due to objective reasons: it is located on the outskirts, and its rooms are unsuitable for the majority of typical functions. Our task was to find realistic use case scenarios, considering all constraints, and test them in practice.

3) Promote the experience and place the tower within the realm of other successful heritage management projects. It was important for us to raise awareness that preserving and adapting complex structures is not a unique act of heroism but a genuine, widespread, and reproducible practice.

Citizens and the Tower: from shovels to tours

In 2011, even before the project officially began, we organized community clean-up days at the tower. The first events were quite challenging, as people had to clear years' worth of construction and household debris. Since then, we have been holding these clean-up days annually, and what started out of necessity has evolved into a tradition and a kind of open-house day when tours are conducted for all attendees. [pic.16]

[pic.16] **Photo from a cleanup day, 2012.** *From the archives of the arch-group Podelniki.*

It was essential to involve people in the project, so that through their contribution they could take "ownership" of the tower. In the first year, we erected a fence around it because there were no clear conservation plans yet. We handed out the keys to the fence to anyone who joined a clean-up day — that's how important it was to keep the tower open [pic.17]. We removed the fence in 2016 as soon as we had taken all conservation measures on the ground floor.

Volunteering

Narrow specialists also lent a hand: industrial climbers voluntarily removed graffiti and plants from the facades, sewage truck operators pumped water out of the basement, and students and professors from historical departments conducted archival research.

In 2016, one of the city's leading designers created a corporate identity for the project, which we still use today. In 2019, professional Wikipedia editors, who typically write corporate articles for money, prepared a Wikipedia page that provides a detailed account of the tower itself and the progress of the project.

[pic.17] **Keys to the fence given out to volunteers.** *2013 From the archives of the arch-group Podelniki.*

Over the course of ten years, we've seen people who initially came to help with rakes and shovels or joined us for their university internships and then have become committed tower volunteers. Moreover, there formed an expert community around the tower, consisting of architects, restorers, local historians, and researchers who provided us with advice and professional consultation. Some specialists have been immersed in the project for many years and have contributed significantly to its development. For example, architect-restorer Narine Tyutcheva and researcher Marina Khrustaleva, as well as some international researchers like Professor Werner Lorenz from Germany.

In 2017, 2021, and 2023, we organized Guide Schools — educational programs for those who wish to become administrators or tour guides at the tower. Currently, 25 active volunteers run the tower by organizing tours, managing the information center, curating souvenirs, running social media accounts and the website, creating annual exhibitions, and handling PR. [pic.18]

[pic.18] **Final point of the tour at the observation deck with volunteers and visitors. 2023** *From the archives of the arch-group Podelniki.*

Crowdfunding
A significant portion of the project's funding came from public donations. Fundraising campaigns engaged many individuals and local businesses in supporting the White Tower. Some of the most notable efforts include:

`For the initial structural survey in 2013:` 80,000 rubles were collected in just five days.

`For conservation:` Approximately 1.8 million rubles were raised over six months in 2014–2015.

`For lightning protection and lights inside the tower:` In 2018, with the support of the *Vnimanie Foundation*, we collected 208,000 rubles. This campaign extended beyond Ekaterinburg and drew nationwide attention to the tower.

The success of crowdfunding actions was inspiring, as they not only provided financial support, but also donation of materials and services, e.g. paint for the clean-up days. This way, the tower has become a place that fosters a sense of belonging to a community of caring individuals, where love for the city can be put into action.

Tower as a venue. From Abandonment to a Laboratory of Cultural Practices

From the very beginning, we recognized the challenges of readapting the tower. It is literally located on the outskirts of the city, beyond the ring road, with a forest at its foothills. We often heard that it is too far away, no one would go there, and it would be of no use to anyone. `[pic.19]`

`[pic.19]` **View from the observation deck.**
From the archives of the arch-group Podelniki.

This made it all the more important to experiment with its possibilities and understand to what extent the tower's spaces can serve and be in demand as an exhibition, performance, or educational venue.

`So, we came up with an extensive project "Cultural Laboratories at the White Tower".` The idea was supported by the Ministry of Culture of the Russian Federation in 2013. The project was started as a practical research on how to draw people's attention to this monument and turn it into a hub of active cultural life in the industrial peripheral district of Ekaterinburg.

The "Cultural Laboratories at the White Tower" was a kind of festival inside the industrial architectural monument. The program presented four sections with activities: exhibition, stage, lectures, and club. We organized three exhibitions, two performances, eight lectures, along with several workshops and club sessions for both adults and children.

The project managed to attract attention to the tower, and we confirmed that people had interest in visiting it. Artists and curators saw it as a cultural platform now. We also worked closely with the local community of Uralmash. The White Tower, which had always been a symbol of the first five-year plans in the Urals, gradually started to be associated with contemporary art and the city's recent history.

`The project "White Tower. The Starting Point"` in 2015 marks the next stage. It involves creating a permanent exhibition. The project received support from the Vladimir Potanin Foundation as part of its "Changing Museum in a Changing World" program.

The "Starting Point" exhibition developed in parallel with the conservation efforts and also served as a "media tugboat." The Potanin Foundation financed a media exhibition, which included the purchase of projectors, servers, specialized software, and the preparation of video content. However, when the foundation approved our application, there were no windows, stairs, or seating in the tower. There was still no electricity. A permanent exhibition inside the tower served as a clear goal with a predetermined deadline for the completion of conservation works `[pic.20]`. This argument convinced sponsors and allowed us to raise funds for the conservation within the necessary timeframe.

`[pic.20]` **Photo of the permanent exhibition on the staircase.**
From the archives of the arch-group Podelniki.

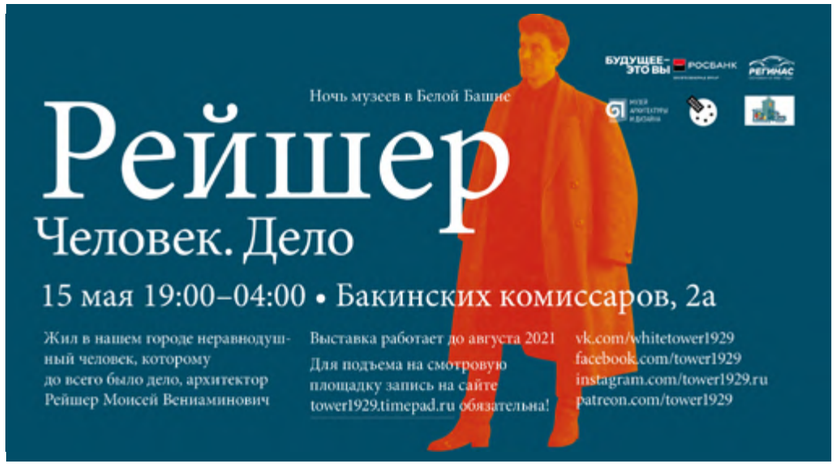
After the conservation work, successful cultural laboratories and opening of the permanent exhibition in 2016, finally, the tower transformed into a cultural space and was a kind of playground for creative experiments. In 2017–2019, concerts of contemporary music, plays, mockumentary tours, performances, private parties, film screenings, photo shoots, and other events of various formats took place in the tower.

These activities were held in different parts of the tower, at various times of the week and day. Thanks to such experiments, we obtained new optimal scenarios for the tower, which we could then incorporate into the future restoration project. [pic.21]

[pic.21] **Photo of a performance by Performative theater “OKOLO” in the tank organised by HUSKY TUNES.** *2021 From the archives of the arch-group Podelniki.*

Since 2017, the tower has participated in the annual “Long Night of Museums” event [pic.22–23]. Each time, it became an opportunity for us to explore new topics related to our project and to test the venue for capacity and the team for resilience. Another challenge of the “Night of Museums” is the annual search for partners (patrons) and collaboration with external artists, researchers, and exhibition designers.

In 2021, the White Tower became a venue for the 6th Ural Industrial Biennial of Contemporary Art, the largest international event in the field of contemporary art held outside the Russian capitals. Thus, the tower emerged as a cultural venue not only on the city map but also on the national and international stages.



[pic.22] **Poster for the opening of a new exhibition on the ground floor of the Tower.** *2021 From the archives of the arch-group Podelniki.*

[pic.23] **Photo of the tower during an UNDARK festival.** *From the archive of the arch-group Podelniki.*

Tower experience. We are not alone

Spreading the word about our experience has always been an important task for us. We want our project to remain in the public eye so that it can serve as an example for other civic initiatives.

From the very beginning, the professional community showed interest in our work. In 2013, the project concept was presented at the "ARCH MOSCOW" forum and the Moscow Urban Forum. In the following years, we were repeatedly invited to relevant events in cities across Russia. In 2016, we shared our successes at the "Urban Forum in Almaty."

Initially, our narrative focused on the uniqueness of the project, presenting the tower as one of a kind. However, we wanted to join our efforts with those facing similar challenges and work out solutions together.

In 2018, we initiated the "Forum of Tower and Underground Keepers," supported by a presidential grant. As part of this project, we conducted research on over 50 structures throughout Russia, including engineering facilities, mines, fortifications, and water towers that have been adapted or are still in use in some way. We invited representatives from 12 actively used towers from across Russia to Ekaterinburg to a two-day forum. During the forum, we discussed the methods and practices of adapting and maintaining such structures.

Up until that point, no one had held similar research, and we simply hadn't known so many possibilities and use cases. It turned out some towers had been adapted back in the Soviet period and have been functioning as cultural and public spaces since the 1970s. Others were adapted in the Russian Federation while complying with modern safety requirements.

Thanks to this exchange of experiences, we gained insights into what project requirements for adapting a tower should look like.

In 2020, our project was awarded a grant from the Getty Foundation. For us, this is not only a great honor and an opportunity to finance the development of a much-needed restoration project but also a significant step in promoting the tower in public opinion. Being one of the two buildings in Russia (together with Melnikov's House in Moscow) to be named a laureate of the *Keeping It Modern* program elevates the tower's importance in the Russian context and aligns it with global modernist masterpieces. Our participation in online workshops with other laureates and the educational course from *the Getty Conservation Institute* opened doors to the best international practices.

3.5 Research Prior to Restoration

Even before the work started, from March to August 2021, a large team of specialists conducted extensive research on the tower as part of the *Rozhdestvenka* bureau's assignment.

These studies went much deeper and broader than the structural surveys and measurements of 2013–2014, helping to track the tower's condition over time.

The new research included engineering, technological, mycological research, as well as archaeological, ecological, geological, and geodetic surveys, along with architectural measurements. In parallel, historical and cultural research was done based on archival documents and publications.

Archaeological, ecological, geological, and geodetic surveys are considered mandatory in any scientific and project documentation, which, according to the Russian laws, is required to make further decisions and obtain approvals.

An archaeological survey with a relevant level of expertise confirmed that there is no valuable cultural layer or artifacts on the territory of the site.

Ecological surveys indicated the absence of soil contaminants that could pose a threat, as well as the absence of unique plants and animals, which means that earthworks and landscape design can be carried out freely.

Geodetic surveys enabled the accurate mapping of the entire site, including underground utilities.

Geological surveys provided information on the composition and bearing capacity of the soils, which is essential for structural calculations.

[pic.24–25] **May 14th, 2021. Excavation under the foundation slab of the basement and under the foundation outside.**

A complex of research on structures and materials (specifically, engineering-technical, technological, mycological research) was led by a subcontractor, LLC *InzhStroyServis*, involving specialized laboratories.

Unlike previous inspections, which employed only visual and non-destructive methods (such as determining the surface strength of concrete using a Schmidt hammer), in 2021, trenching and probing were done for the first time. This provided precise data on the foundations of walls and structure elements. To perform these tests, the research program was specifically coordinated with the monument protection authority.

We found the geodetic benchmark in the base of the tower, we knew about it before only from the documents.

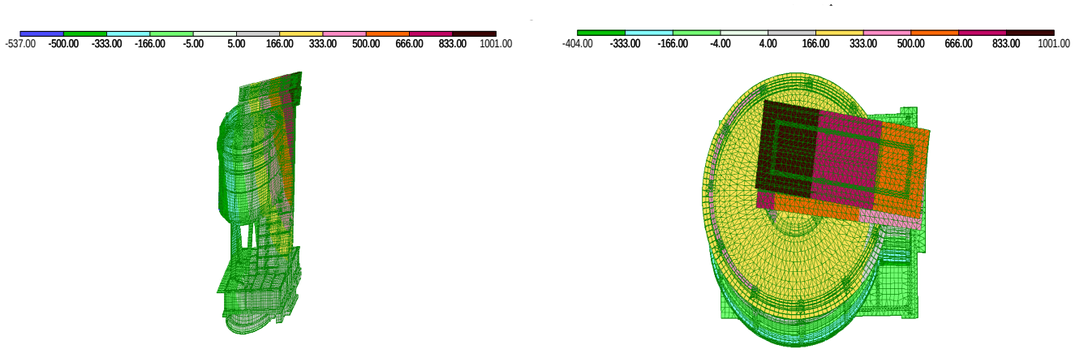
It turned out the reinforced concrete dome covering the tank had a hollow structure.

It was discovered that the exterior walls were constructed using two different types of concrete blocks.

For the first time we obtained precise data on the location of load-bearing elements in the ground floor walls, the support system, structural connections, and the condition of reinforcement.

We determined the exact location of openings that were sealed in the 1990s.

The basement floor was uncovered. [pic.24–25]

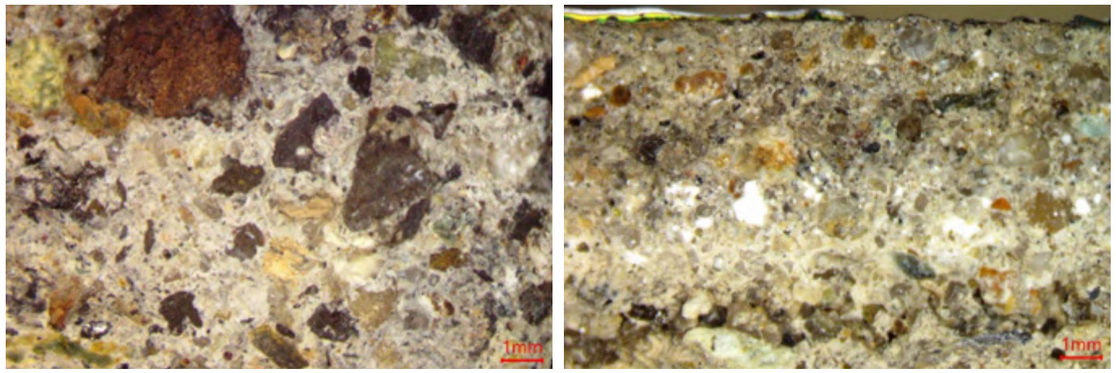


[pic.26–27] **Structural model of the tower examined with different combinations of loads.** *2022 From the technical documentation of the project developed by RDNK.*

To obtain the most complete picture, the engineers from *InzhStroyServis* cross-referenced data collected using various methods. This included comparing information on the concrete's surface strength with the findings from ultrasonic testing that delved into the concrete's internal structural properties. Utilizing these datasets, they developed a finite element analysis model with thorough validation under diverse deformation conditions [pic.26–27]. However, international experts raised doubts about the model's accuracy during a discussion in Yerevan. Their concern primarily stemmed from uncertainties about how effectively the model incorporated the damages that had accumulated over the years of the tower's operation.

The technological research delved into the materials employed in the tower. This analysis extended to the composition of the paint coatings applied to the tower across its history. Definitively, it was established that the tower had never been coated in khaki color, contrary to frequent claims in various publications.

All research endeavors were meticulously documented through extensive photographic records of defect locations, sampling sites, and the specific points of reference on plans. Comprehensive restoration recommendations were coupled with detailed technological process descriptions for each structural element. [pic.28–29]



[pic.28–29] **High-resolution photos of insulation and concrete stone samples.** *2022 From the technical documentation of the project developed by RDNK.*

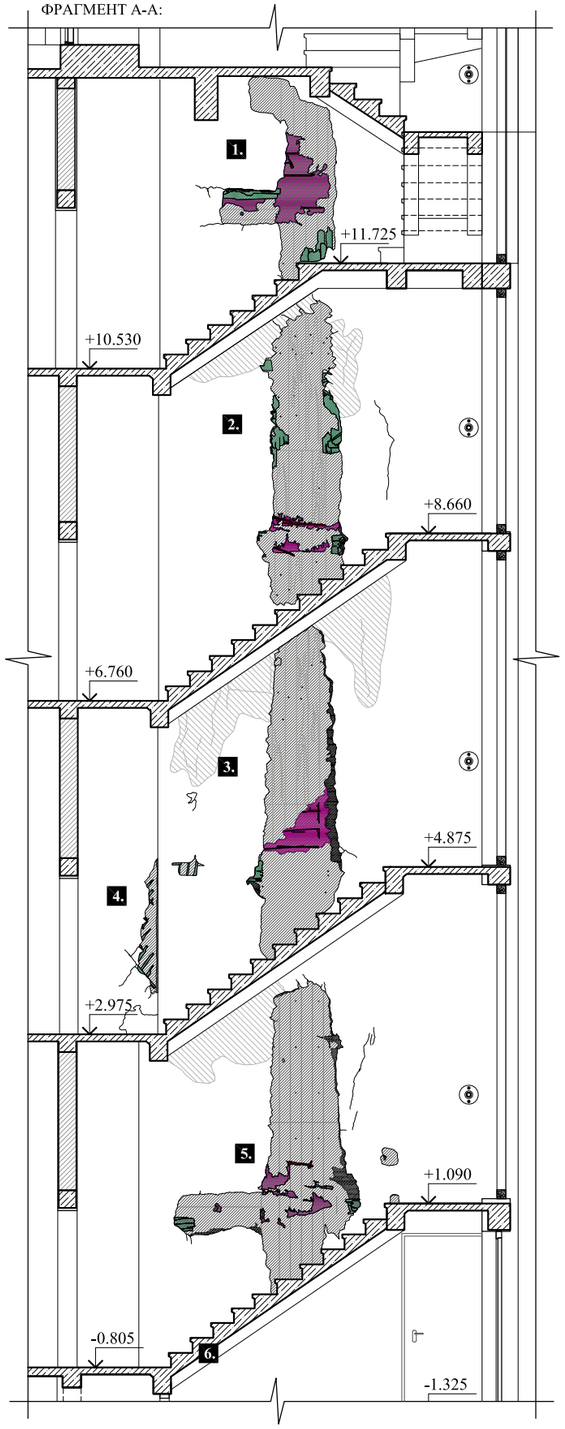
The mycological research centered on the presence of mold fungi within the tower's structures. Unfortunately, organic insulation material inside the tank had been significantly affected by microorganisms. Consequently, most

of it would need replacement during the restoration. In some cases, the issue could be addressed through specialized treatments. Specialists developed recommendations for treating various materials, including mineral ones (plaster layer, brick) and wooden components (formwork, internal wooden elements of the window frames).

The architectural and archaeological measurements were carried out with an unprecedented level of precision, surpassing any previous studies. By utilizing laser scanning technology to capture the tower's exterior surfaces, a point cloud was generated, enabling the creation of accurate 2D and 3D vector models of the object for further work. [pic.30]

Every detail of the tower's damage was meticulously mapped, with each damage accompanied by a detailed photographic documentation. The architectural fieldwork played a pivotal role in analyzing the tower's construction history and validating the authenticity of its architectural elements.

The exceptional quality and precision of these surveys greatly facilitated the formulation of well-informed and highly detailed restoration decisions moving forward.



STAIRCASE

The volume of the staircase connects all the volumes of the Tower together. During the period when the object was abandoned, and the carpentry fillings were dismantled, there were significant collapses of the plaster layers on the fixed formwork of re-inforced concrete columns.

- Exfoliation of the plaster layer
- Exfoliation of the paint layer
- Collapse of the plaster layer
- Lack of a protective layer of concrete
- Destruction of concrete
- Destruction of masonry from cinder blocks
- Rebar denudation
- Formwork biodamage by moldy mushrooms
- Lost original fillings of window and door frames

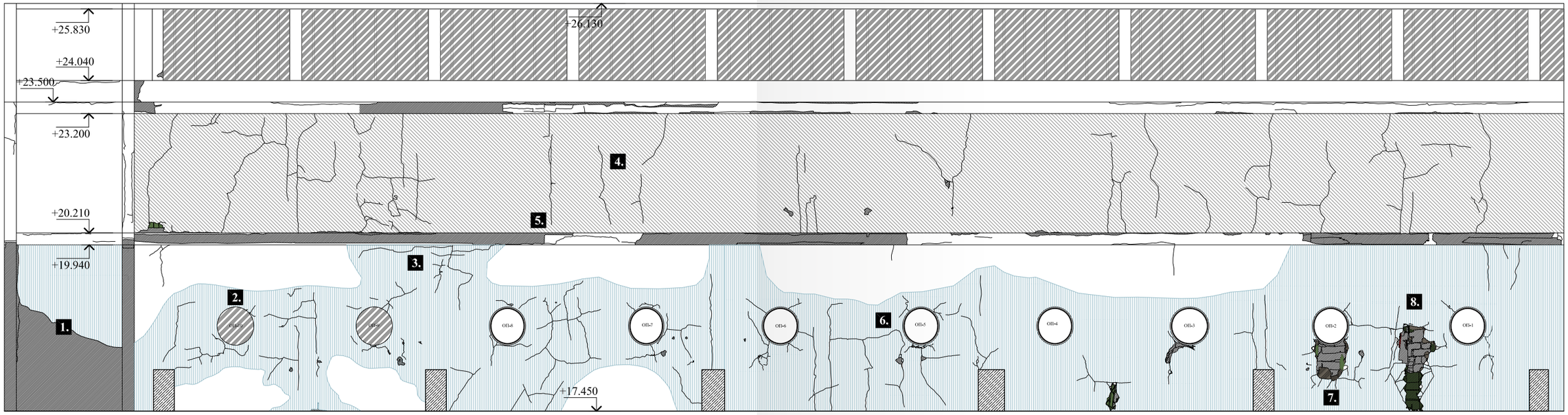
REINFORCED CONCRETE COLUMN OF THE STAIRCASE IN AXIS 6/Ж:

- Collapse of the plaster layer
- Exfoliation of the plaster layer
- Collapse of fixed formwork and shingles
- Lack of a protective layer of concrete
- Rebar denudation and corrosion
-

The reason for the defects: as a result of the lack of window fillings, the wooden formwork and shingles were moistened, as a result of which the finishing layers collapsed. Also, there were significant losses of permanent formwork due to fire.

The absence of a protective layer of concrete is due to the poor quality of concreting during the construction **process.**

[pic.30] **Mapping of damages on the inner side of the staircase.** *2022 From the technical documentation of the project developed by RDNK.*




1.

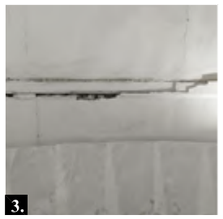
WALLS OF THE OUTER SHELL OF THE TANK IN AXES 5-Ж/Г:

- Collapse and peeling of the plaster layer;
- Irregularities of the plaster layer;
- Collapse of fixed formwork;
- Technological holes in cinder block masonry;;


2.

WINDOW FRAME (ОП-9,10):

- Loss of original carpentry fillings of window openings;


3.

RING BEAM OF THE OUTER SHELL OF THE TANK:

- Collapse and peeling of the plaster layer;
- Collapse of fixed formwork;
- Collapse of a layer of insulation made of crushed wood spilled with an adhesive


4.

WALLS OF THE OUTER SHELL OF THE TANK :

- Large-scale areas of peeling of the plaster layer;
- Numerous cracks in the plaster layer;


6.

WINDOW FRAME ОП-5:

- Cracks in the plaster layer in the place of the window opening;
- Drying of the wood of the original window frame;


7.

WINDOW FRAME ОП-5:

- Collapse of the plaster layer;
- Collapse of fixed formwork;
- Collapse of a layer of insulation made of crushed wood spilled with an adhesive solution;

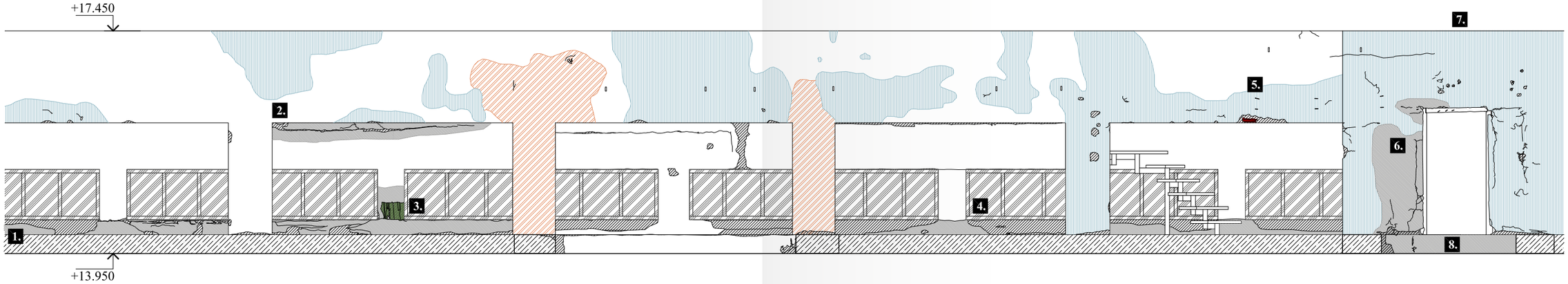
Exfoliation of the plaster layer
Collapse of the plaster layer
Roughness of the plaster layer
Exfoliation of the paint layer
Rebar denudation
Formwork collapse and biodamage
Lost original fillings of window and door frames

The reason for the defects: as a result of the lack of window fillings, the wooden formwork and shingles were moistened, as a result of which the finishing layers collapsed. Wetting of structures was caused by the lack of window fillings in the period from 1994 to 2014.

The joinery in the Tower was lost during the dereliction of the facility. An act of vandalism.
The water pipes were lost along with the walls of the tank during renovations in the 90s.

[pic.31] **Mapping of all damages on the hall under the tank.**
2022 From the technical documentation of the project developed by RDNK.

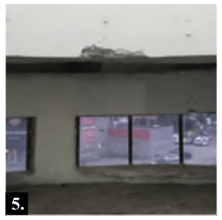
ROOM UNDER THE TANK




1.

CEILING AT MARK +14.230:

- Surface destruction of concrete structures;
- Lost original carpentry window fillings;


5.

CEILING AT MARK +15.785:

- Collapse and peeling of the plaster layer;
- Destruction of the protective layer of concrete;
- Rebar exposure and corrosion;
- Lost original carpentry fillings;

- Exfoliation of the plaster layer
- Collapse of the plaster layer
- Roughness of the plaster layer
- Exfoliation of the paint layer
- Rebar denudation
- Formwork collapse and biodamage
- Lost original fillings of window and door frames


2.

RING BEAM AT MARK +15.170:

- Collapse and peeling of the plaster layer;
- Destruction of the protective layer of concrete;
- Crack along the working reinforcement;


6.

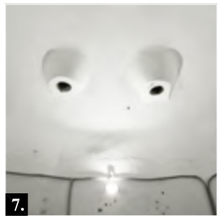
STAIRCASE WALLS IN AXES 5-Ж\Г:

- Technological holes and openings;
- Cracks in the plaster layer
- Irregularities and peeling of the plaster layer
- Lost original carpentry fillings;


3.

RING BEAM AT MARK +14.400:

- Lack of a plaster layer;
- Exposure of fixed formwork;
- Lost original carpentry window fillings;


7.

TANK BOTTOM DOME AT MARK +17.450:

- Technological holes
- Lost water pipes


4.

WALL UNDER THE WINDOW ON MARK +15.170:

- Collapse and peeling of the plaster layer;
- Collapse of fixed formwork;
- Lost original carpentry window fillings;


8.

CEILING AT MARK +15.170:

- Technological openings;
- Lost water pipes;
- Lost original carpentry window fillings;

Cause of defects: multiple cycles of thawing and freezing of monolithic reinforced concrete structures and their finishing. Wetting of structures was caused by the lack of window fillings in the period from 1994 to 2014.

The joinery in the Tower was lost during the dereliction of the facility. An act of vandalism.

The water pipes were lost along with the walls of the tank during renovations in the 90s.

[pic.32] **Mapping of all damages on the hall under the tank.**
2022 From the technical documentation of the project developed by RDNK.

4

Restoration Project

Photo on the previous page: White Tower, 2017. *Photo by Konstantin Antipin.*

4.1 Context of the White Tower Restoration

Work with architectural heritage in Russia has a number of specific features.

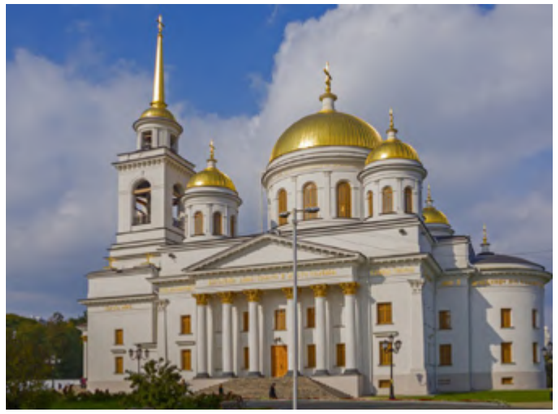
The main one is the deep involvement of the state on all levels. All design decisions for repair, conservation, restoration and adaptation of monuments are strictly monitored by an authorized state body for the protection of heritage sites. Also, all physical interventions, including any kind of research, should be licensed by this body. Only the people and organizations specially certified and licensed by the Ministry of Culture of the Russian Federation can provide expert assessment and conduct construction and redesign works, or even research. In addition, by applying estimated cost standards, the state controls the cost of work. Not to mention the fact that most of the heritage sites themselves (including the White Tower) belong to the state in one way or another. And most often, government agencies act as employers of restoration.

In the recent decades, the construction business has acquired more freedom: in most cases, the construction in Russian cities is carried out by private developers, private bureaus make up projects that undergo private

[pic.1] **Planetarium in Penza. Built in 1928.** *Photographer V. Shelyapin. From Wikipedia archive.*

[pic.2] **Demolition of Penza planetarium in 2021.** *Photographer sergeykaldyrkaev. From Wikipedia archive.*

[pic.3] **Novo-Tikhvinsky convent in Ekaterinburg.** *Color photo 1909, S. M. Prokudin-Gorsky.*



[pic.4] **Golden domes on the restored Alexander Nevsky cathedral at Novo-Tikhvinsky convent in Ekaterinburg.**

expertise. Urban planning regulations, zoning requirements and the need for approvals are kept down to a minimum here. However, the restoration business is still strictly regulated and that limits competition greatly.

In theory, the state wants to filter out unprofessional approach to buildings of cultural value and thus protect the monuments. In practice, unfortunately, we more often see the opposite. The market is monopolized, professional discussion is conducted at a low level, and there is a lack of feedback from society and its influence on decisions. All this leads to sad outcome.

Nowadays, we see examples of barbaric reconstructions under the guise of restoration, though, they are fully authorized and carried out by licensed specialists. E.g the wooden planetarium in Penza [pic.1–2] or the stone Assumption Church of the 18th century in Ekaterinburg. In these buildings, their historical essence was completely destroyed, including the foundation, and instead, a new building was erected. It reminded of the historical one on the outside, but with noticeable distortions.

Sometimes, during such “restoration,” only a small fragment of the original facade or interior would remain, which would be referred to as a “protected object.” This was the case with the Passage commercial building on the main square of Ekaterinburg.

However, even in cases where restoration doesn’t turn into imitation, authentic buildings can be decorated with additional elements that would correspond to an “ideal” historical image rather than be taken from the actual history. Here, a striking example would be the golden domes on the restored Alexander Nevsky Cathedral in Ekaterinburg. Originally, they were green, as one can see in the pre-revolutionary color photographs by famous photographer Sergey Prokudin-Gorsky [pic.3–4]. Or if it becomes necessary to construct a new functional space, a technical building, or a fence within the monument’s territory, they often make it look “historical”, as if following the building’s original style.

The Russian school of restoration developed in the post-war years when the primary task was to save the buildings destroyed during the World War II, e.g. imperial palaces around St. Petersburg. The trauma of wartime destruction in many countries, not only in Russia, led to a “protective reaction”—a desire to restore what was lost to its former glory. This may explain the development of a restoration approach where the integrity of the building’s appearance takes priority over preserving the authenticity of the surviving parts.

We were looking for an architectural studio that has a modern approach and a broad vision, that is sensitive to authentic details, and at the same

time, experienced in working with historical sites in accordance with the strict norms of the Russian legislation. It is both great luck and honor for us that the *Rozhdestvenka* bureau became our partner in the White Tower restoration. Among their exemplarily realized projects there was the Ruin Wing of the Schusev Museum in Moscow. [pic.5]

[pic.5] **Exhibition space in the wing. Ruin. Exhibition “Heavenly Host”, 2002.** *Photographer Shuska.*

However, even for *Rozhdestvenka*, taking on the restoration of the White Tower marked only their second venture into the practical realm of pre-War Soviet avant-garde architecture (after Melnikov’s house in Krivoarbatskiy lane in Moscow). When it comes to name quality execution of avant-garde buildings’ restoration, you can reckon those with just a handful.

One of the most recent examples we could draw upon was the Narkomfin Building in Moscow. What makes this example especially relevant to us is that its first architect was Moisey Ginzburg, and the design project was made by the engineering bureau *Techbeton*, led by the engineer Sergey Prokhorov, thus, in terms of both construction timeline and technology, it closely parallels the White Tower.

The restoration of the Narkomfin Building was overseen by Alexey Ginzburg (the grandson of Moisey Ginzburg) and it serves as a prime illustration of how one can authentically resurrect the historic charm of an iconic building. It’s a case where they’ve paid meticulous attention to historical technology, like using steel for the stained glass windows in the public areas and wooden sliding frames in the residential sections. [pic.6]

In case of the White Tower, the greatest technological challenge for preservation lies in the materials of the walls—plastered slag blocks insulated with reed on the inside. We need to ensure thermal insulation properties and avoid “dew points” within the load-bearing structures without altering the overall wall thickness, so as not to disrupt the general appearance. It is a complex task for the restorers.

Other challenges are associated with the specific legal and organizational aspects of construction business in Russia.

In Russia, restoration and new construction are regulated by different branches of legislation.

Projects for new construction undergo an evaluation to confirm that a future building is safe and suitable. If an evaluation yields a positive outcome, and the project aligns with the specified regulations for the area, then city administration grants permission for construction. After it’s completed, they issue a permit for occupancy.

[pic.6] **The Narkomfin Building after restoration by the Ginzburg bureau.** *Photo by K. Kokoshkin.*

In restoration, construction evaluation is replaced by a historical-cultural assessment, and the construction permit is substituted by a preservation permit. This preservation permit is issued by the regional authority responsible for heritage protection.

Although, there's a third scenario: when some parts of a historical building are in an inoperable condition, or when the proposed redesign fundamentally alters the purpose of the building. In such cases, both sets of approval are required—for restoration and for compliance with safety requirements for new buildings. For the White Tower, this scenario could be detrimental: bringing the tower up to modern regulatory standards would necessitate expanding the staircase and implementing other changes that are incompatible with the tower's protective status.

The path for the project is determined by something called the "Impact Assessment," which is signed by the scientific director of the restoration. In our case, Narine Tyutcheva, who leads the *Rozhdestvenka* bureau, signed off on a negative impact assessment. It means she took responsibility to ensure that the decisions made for adapting the building won't affect its safety. As a result, the project can avoid another evaluation. This way, we've opted for restoration instead of reconstruction.

However, restoration without reconstruction means that no authentic structural element of the tower can be completely replaced with a new one. Even if it's in poor condition and badly needs replacement. Moreover, during a discussion on structural solutions held in February 2023 in Yerevan, Professor Lorenz suggested to remove a damaged column of the fire tower and replace it with a new one that matches the former in size but uses different materials. *Rozhdestvenka* bureau had to reject this idea because a complete replacement of one element would be seen by heritage preservation committee as a reconstruction, which we wanted to avoid.

Also, there are restrictions on the methods of research. During the same conference in Yerevan, Professor Lorenz proposed to assess the condition and durability of the concrete inside the column by drilling through the column and extracting a core sample in order to test it in a laboratory. But from the perspective of the Russian legislation, such an intervention would never get an approval.

Last but not least, let's talk about the project team in the Russian restoration context . *Rozhdestvenka* bureau, being the license holder and the general designer, provides a complete set of documentation covering all sections. However, the contractor has a right to engage subcontractors to carry out works, in addition to the in-house specialists, and these subcontractors, in turn, can bring their own team members. On the one hand, this allows to invite highly skilled experts who may not be part of the staff. On the other hand, there's a risk that decisions made by these experts may not align with the overall context and logic of the project. An external specialist may not see the big picture or understand the entire chain of decisions, constraints, and tasks.

The conference in Yerevan gave us a chance to bring the authors of the project together—the experts, whose opinions we trust, and members of the project team. The organization responsible for structural assessments is based in Moscow, while the bureau developing the project for reinforcement of the structure is located in Ivanovo. Working on different stages of the project, these specialists did not see each other before the meeting in Yerevan. As it turned out during the discussion, the lack of contact caused some disruptions in the decision-making process. Following the conference, these decisions were revised and improved.

4.2 Technical Task for Adaptation

At the heart of any design lies a brief—a design specification that describes how a building can be used and lists some requirements.

Since 2014, the architectural group Podelniki has been experimenting with various ways how to use the space of the Tower. It has been studying the actual demands of visitors and event organizers, and tourism programs. The tower has hosted group and individual tours, exhibitions, concerts, film screenings, immersive performances, music video shoots, presentations, and photo sessions. [pic.7–8]

[pic.7] **Ground floor of the tower, reception area.**

[pic.8] **Concert inside the tower in 2017.**

As a result of their study, the focus shifted on two fundamental scenarios, which formed the adaptation task: guided tours for small groups (basic scenario) and chamber events for a small number of people on the ground floor (event scenario).

Both of these scenarios enable to integrate the tower's new function so that it would comply with the regulatory constraints. Because changing the function during restoration should not compromise the tower's structural integ-

rity and safety. Originally, the tower was a technical facility, not a public space, and it was never intended for the permanent presence of people.

When planning guided tours for a small group, our goal is not to turn the tower into a public building but to allow visitors to explore its architectural beauty. It is assumed that people will spend a limited amount of time inside, thus we can minimize the changes required for the adaptation.

What is going to happen inside the tower after restoration?

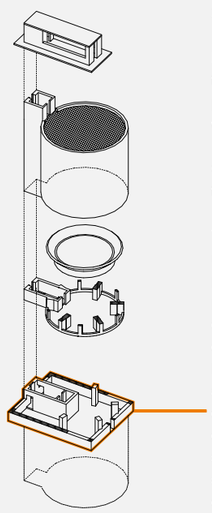
The area at the foot of the tower

Tour scenario: The space is used to gather groups and wait for the tour to begin. Parking for bicycles and scooters is provided.

Event scenario: An example of an outdoor performance: action takes place on the roof of the 1st floor, and the audience is at the foot of the tower. Thus, the area at the entrance must have a firm surface and an electrical outlet for connecting equipment.

Ground floor

On the ground floor, a comfortable temperature from +15 to +18 degrees Celsius is maintained all year round. In the Ural climate, this means heating, not air conditioning.



3. Ground floor

basic scenario is the place where the excursion gathers, the sale of souvenirs, the children's area with Lego and coloring books,
permanent exposition + annual exhibition, a space to explore the tower for those who is unable to rise to the top.

Climate regime
t +15-18 ^{0}C all year round / normal humidity

Technology and equipment
reception desk for 2 administrators with online cash desks, lighting control panel, showcase for souvenirs;
point of water supply and sewerage to the rack for the possibility of connecting a coffee machine;
open mobile wardrobe mobile and cells for personal belongings;
bathroom;
access control (alarm sensors), video surveillance;
demonstration equipment (light, sound);
dimming windows for the projector;
stackable chairs, 30 pieces;
storage place for helmets;
exposition surfaces on walls with local lighting;
wireless phone charging station;

[pic.9] **Fragment of an illustrative technical task with descriptions 2021.** *From the archives of the arch-group Podelniki.*

Tour scenario: Start and finish point for tours. There should be a reception desk with souvenirs, a kids' play area with LEGO and coloring stuff, and a space for those who cannot go upstairs (featuring a tactile model and VR headset). The corridors will host a permanent exhibition showing the tower's history and a temporary exhibition that would change annually. Additionally, there should be restrooms for both visitors and staff, designed to accommodate persons with limited mobility.

Event scenario: Lectures and presentations for 20–30 people can take place here. These events require stackable chairs, a projector, and a retractable screen.

Basement

Currently the access to the basement is obstructed, but after the restoration, we plan to use it.

It will be a place for tour guides to relax and also it will serve as an open archive/mini-library. Visitors can come down here after a tour, stay if they want to read books or look at drawings, and enjoy a cup of coffee. The space can accommodate 3–4 people comfortably. It should have the right temperature, a sink, a coffee machine, and suitable furniture.

Roof of the ground floor

Tour scenario: Does not use the roof. It serves only as a platform to monitor the condition of the roof and to clear snow.

Event scenario: Access to the roof makes it possible to stage outdoor performances.

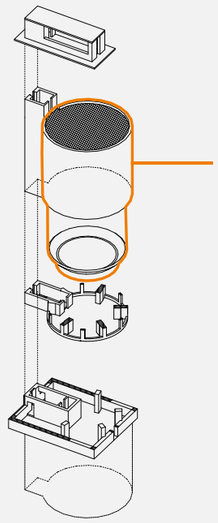
Staircase

Tour scenario: Everything above the first floor is mainly used in the tour scenario. A guide takes a group along the flight of stairs and stops in the middle to draw their attention to some materials on the walls.

After a long debate, architects and experts decided not to heat the staircase, since initially its enclosing structures do not have thermal insulation properties, and heating the staircase would lead to a distortion of its appearance—more on this in section 4.7 "Engineering solutions."

Tank

Tour scenario: From the stairs, tourists come into a round hall under the tank, from where they take the second staircase to the tank. For convenience, it is proposed to make two separate stairs—one up, one down, because the width of one staircase does not allow people to pass by comfortably. We decided to restore the gallery in the tank, which was historically needed to inspect the tank. The bypass gallery will give tourists a vivid experience of watching the space of the tank from above, but the number of people in the gallery at the



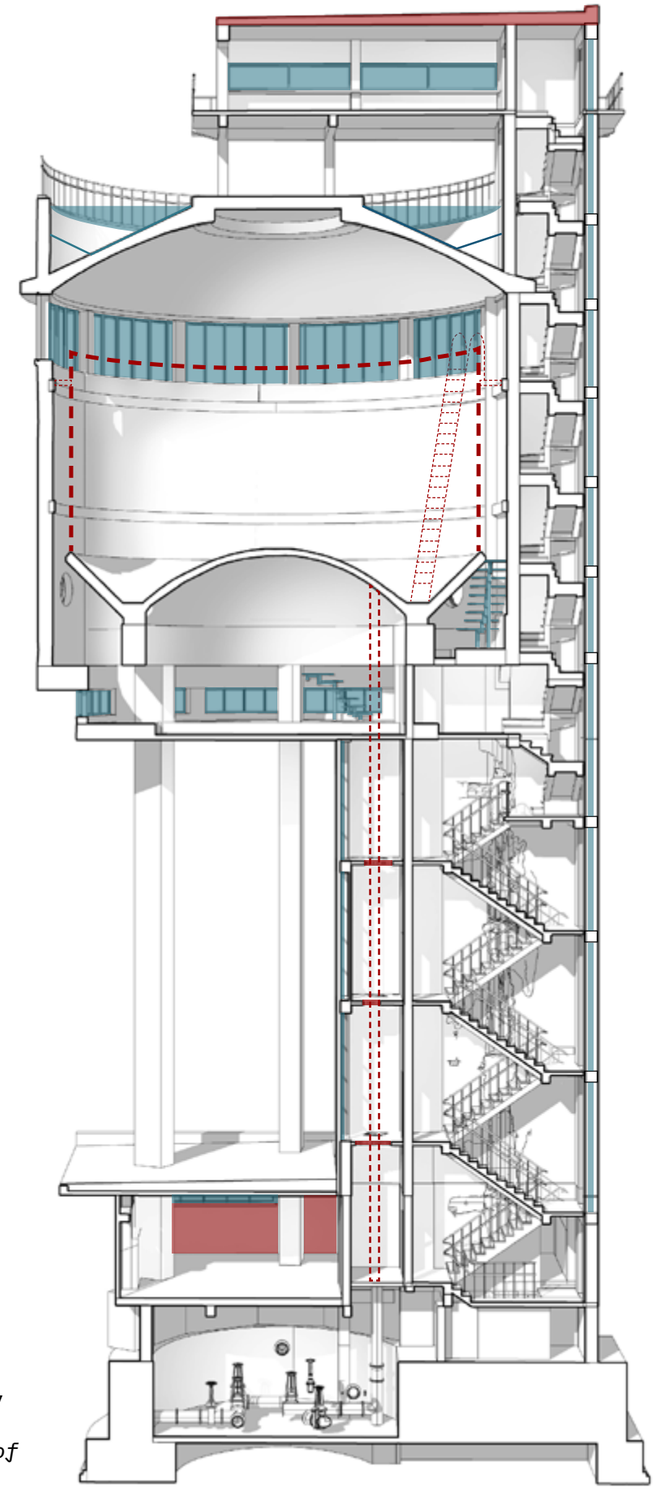
7. Tank

basic scenario - part of the excursion route,
time spent up to 15 minutes, watching a 10-minute movie;
event scenarios - musical performance for 15 people;
film screening, stay time - up to 2 hours (in the warm season).

Climate regime
-5 to +5 ^{0}C in the cold season,
outdoor temperature in the warm season

Technology and equipment
bypass gallery at the level of the tank door;
amphitheater 180 with sockets 5 pcs;
acoustic system;
working lighting with fastening on the bypass gallery;
on the bypass gallery, provide 3 sockets;
provide blackouts on windows with remote control

[pic.10] **Fragment of an illustrative technical task with descriptions 2021.** *From the archives of the arch-group Podelniki.*



[pic.11] **Scheme with history of the building's elements. 2022.**
From the technical documentation of the project developed by RDNK.

HISTORY OF THE BULIDING

1930-1931
Construction of the Water Tower.
Entry into service in 1931.

1960'S
The tower stopped functioning as its original func-tiion of supplying water to the Uralmash microdis-trict and the question arose of adapting it to other needs.

1970'S
The urban role of the tower is highly appreciated, which was expressed in **its acceptance for state protection as a monument of history and culture.**
The architect of the Tower, Reisher M.V.,developed a project to place a cafe in the tower. The project was not implemented.

1990'S
The owners of the tower carried out repair work in order to adapt the building to an office function: the roof construction of the fire tower was replaced, the walls of the 1st floor from building blocks were laid in brick, the wooden flooring of the observation deck was replaced with metal.

During the work, the metal walls of the tank, water pipes in the stairwell were lost.

54 YEARS THE TOWER WAS ABANDONED

2013
The object was transferred to the perpetual use of the archgroup "PODELNIKI".
A group of students from the Brandenburg Technical The university, under the guidance of Professor Werner Lorenz, carried out a survey of the structure.

2014-2018
The archgroup "PODELNIKI", together with the RDNK bureau, developed a project for temporary emergency response work on the tower, implemented by 2018.

2021-2023
Comprehensive scientific research, development of a restoration and adaptation project of the Object of cultural significance Federal Importance White Tower.

same time must be strictly limited. Additionally, during cold weather, the tank and the area beneath it will be maintained at a minimum positive temperature.

Event scenario: During warm seasons, some small events are possible, such as musical performances, roundtable discussions with video streaming, and movie screenings. For these events in the tank space, we will install an amphitheater, electrical outlets, an audio system, lighting fixed on the bypass gallery, and remote-controlled blackout curtains.

Observation deck

Tour scenario: The narrow staircase next to the tank, leading to the observation platform, is not heated and is meant for continuous up and down movement. Visitors may use it to reach the observation platform, which has a perforated metal sheet on the floor. It's a good place for taking photos. There are no specific changes planned in this area, except for adding anchor points for maintenance by industrial climbers and informational signs on the new railings to identify visible landmarks from the observation platform.

Fire tower

Tour scenario: This enclosed space is the last stop on the tour route during bad weather and a relaxation spot when it's nice outside. We plan to install a long window sill along the windows, which can also serve as a bar-style table. Here, this part doesn't have heating, plumbing, or sewage facilities.

4.3 Identifying Value, Restoration Strategy and Tactics

A goal of any restoration is to preserve authenticity and highlight architectural and historical value. But what exactly holds the authenticity in a building that has undergone numerous changes over more than its 90-year lifespan? How do we maintain this authenticity in the long run? Especially, when many technical solutions were experimental at the time and may now be considered erroneous and not durable from today's perspective?

Discussion of these questions accompanied every stage of the project. During the conference in Yerevan in February 2023, Nariné Tyutcheva, the head of Rozhdestvenka bureau and the scientific leader of the restoration, explained her position on the adopted restoration strategy as follows: [pic.12]

We understand that modernist reinforced concrete buildings age differently than, say, preindustrial brick constructions. There's a philosophy of modernist architecture, and a part of that philosophy was the idea that a building should always look new. For us, the most challenging question is how to reconcile two ideas—modernism and historical character. When restoring modernist structures, it's problematic to tolerate visible damage, unlike with buildings from before the 20th century. Modernist buildings made of reinforced concrete age differently than the older pre-industrial brick ones. To address this, we employ different approaches within a single building. One approach highlights genuine historical fragments, while another preserves the overall spirit of modernity embedded in the structure.

Another example is the preserved graffiti on the inner walls of the stairwell. On the one hand, these graffiti have little value, and there is no specific graffiti piece worth preserving individually—but they become valuable all together. On the other hand, they bear witness to one of the longest periods of neglect in the tower's history, and we didn't want to erase the memory of this period. As a result, we decided to save two adjacent walls with graffiti on the staircase, while renovating the two opposite walls. In this way, standing at the same point on the staircase, one can see different perspectives on the object (take photos against the backdrop of the "sterile" and the "abandoned" tower).

Due to a number of alterations in the 1990s, the sense of lightness was lost. [pic.14] The masonry of the ground floor walls was made of bricks, massive pylons popped up on the corner, dividing the ribbon corner window into two regular ones. Two doorways were bricked up along the longitudinal sides of the tower. Most likely, these doors were never used, but they were a testament to the architect's initial intention. Hewanted to place a bus stop pavilion and a newspaper kiosk on the ground floor and, therefore, aimed to make the ground floor as permeable as possible.

According to the restoration project, the later masonry will be removed, and the historical entrances and ribbon corner window will be restored. However, inside the building, the brick masonry from the early 1990s will remain. This way, we will preserve the value of Reisher's avant-garde architectural idea while also acknowledging the building's long history.

Historical sketches and photographs provide insight into the design of the window mullions for window openings, with an exception of the doors on the ground floor—their original appearance is still unknown. Today, almost all of the original window frames have been lost, except for a small window above the door on the ground floor and a few round windows in the tank. In the discussion of the restoration methods for windows and doors, decisions had to be made regarding the material, thermal properties, and mullion design for the new window fillings.

All the new windows and doors will have wooden frames with modern, energy-efficient glazing. Thus, we follow the restoration principle of using authentic materials, because some of the surviving original frames are also wooden. The mullion design will correspond with historical documents but be adjusted to the functional requirements for opening of sashes, when ventilation or access to the roof is necessary. A big exception is the ground floor doors, including those that were bricked up. We have no reliable information on how they looked originally, and speculating would be wrong. The restoration strategy also suggests that the new doors should be made out of the same material as the others but they should have a neutral minimalist design that sets them apart from the restored 1931 windows.

[pic.12] **International conference in Yerevan on restoration methods of the White Tower, 2023.** *From the archives of the Podelniki arch-group.*

[pic.13] **Entrance on the photo of 1931 by Tatarchenko.**

[pic.14] **Entrance on the photo of 1990s.** *From the passport of a cultural heritage site.*

It is essential to preserve all authentic structural elements during restoration. The ICOMOS recommendations for saving the 20th-century heritage place particular emphasis on the value of experimental technologies and materials:

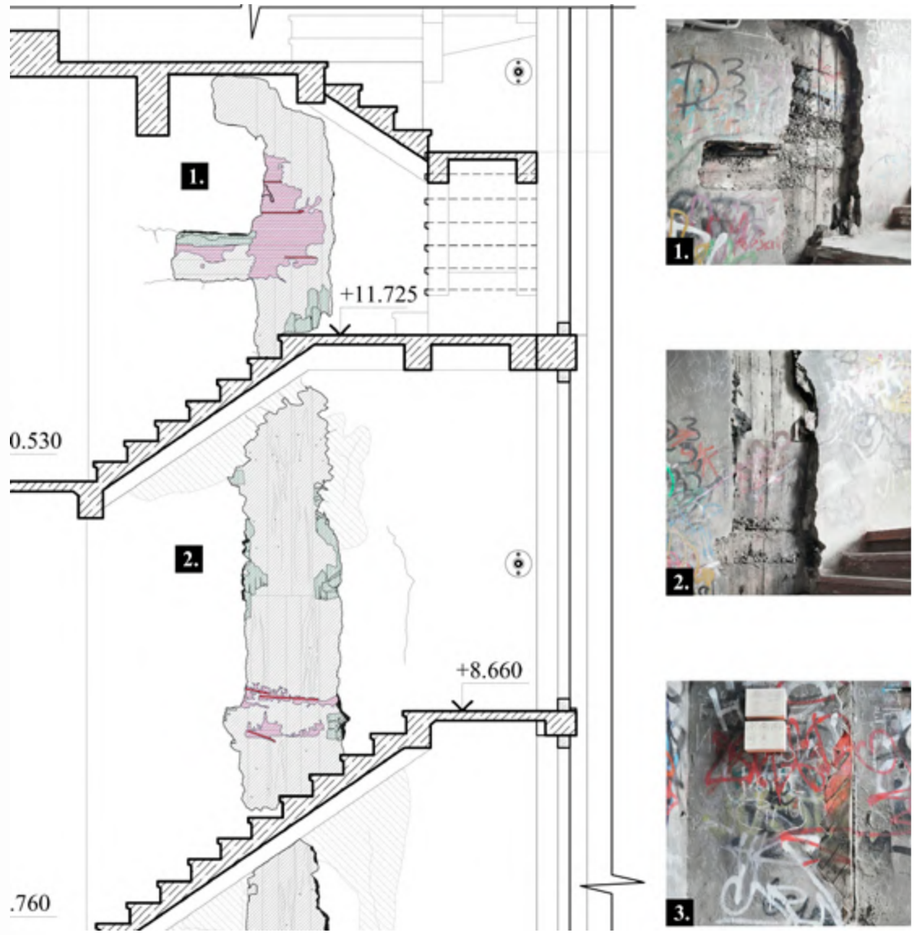
> The twentieth century is characterized by the introduction of innovative forms, structural solutions, construction materials, and techniques, the presence and significance of which should be established and assessed.

The White Tower serves as a prime example of a building constructed using experimental technology of its time. The framework was made from the monolithic reinforced concrete cast inside wooden formwork, which was not removed afterwards but instead plastered and concealed within the wall's thickness. They used smooth reinforcement bars and hooks, rather than welding, connected the reinforcement rods. Compressed wood shavings were out for insulation of the tank space, with the insulating layer located on the interior side of the structure. From a modern perspective, many of these solutions may seem technically flawed, but we see value in preserving and showcasing them, as new construction technologies of the time were a crucial part of the conceptual content of avant-garde architecture.

Localized reinforcements, as described in section 4.6, will primarily be carried out using conventional methods that align with the building's structural principles. We will also preserve areas where the original structures have been exposed due to damage or previous inspections. This approach will turn authentic structures into showcase objects. Unfortunately, the original insulation within the tank, as evident from technological and mycological research results, cannot fulfill its function and must be replaced with a different mineral insulation material. In accordance with ICOMOS recommendations, samples of the authentic material will be preserved separately for display purposes. [pic.16]

> Construction materials and technologies of the 20th century often differ from traditional materials and methods used in the past. ... Difficulties arise from both use of new or experimental materials and simply the lack of specialized professional experience in repairing such structures. If any original / significant materials or components need to be removed, we should document it, and samples should be preserved for storage.

For the White Tower, cast iron water pipes and valves were its key pieces. The original equipment has only survived in the basement, buried under piles of garbage: the pipes above the ground were cut up for scrap metal in the early 1990s. [pic.17]



[pic.15] **A pit under the staircase. 2022.** *From the technical documentation of the project developed by RDNK.*

[pic.16] **Exposed section of the outer wall. 2022.** *From the technical documentation of the project developed by RDNK.*

[pic.17] **Water pipes in the basement.** *From the archive of RDNK surveys.*

In the restoration project, most of the surviving pipes remain in the basement. The floor of the ground floor will be covered with perforated metal on a small elevation so that the original pipes can be seen through the metal mesh, and the space remains usable.

The engineering equipment is also an important part of the tower's material base. Some small fragments of the historical heating systems (hooks on which pipes hung) and electrical systems (insulators to which overhead wiring was attached) have survived. All these elements remain in place, despite the installation of modern concealed wiring and electric heating devices, as proposed in the adaptation.

4.4 Design Solutions for Restoration and Adaptation

Preliminary design of restoration were completed in the first half of 2022. Then, work on the conservation project was followed by the detailed design of individual components and aspects, it involved consultants for structural and engineering solutions. The sketches were published on the project's website and presented to the urban planning community at the construction forum "100+" in October 2022.

Design solutions can be roughly divided into two types: restoration solutions aimed at preserving the building physically, highlighting its architectural and historical value, and adaptation solutions aimed at enabling a modern usage. [pic.18] The basis for making restoration decisions was the strategy described in section 2, while for adaptation decisions, it relied on the detailed technical specifications outlined in section 3.

Restoration measures:

Reconstruct historical carpentry window and door fillings.

Remove later additions that disrupt the historical appearance of the tower.

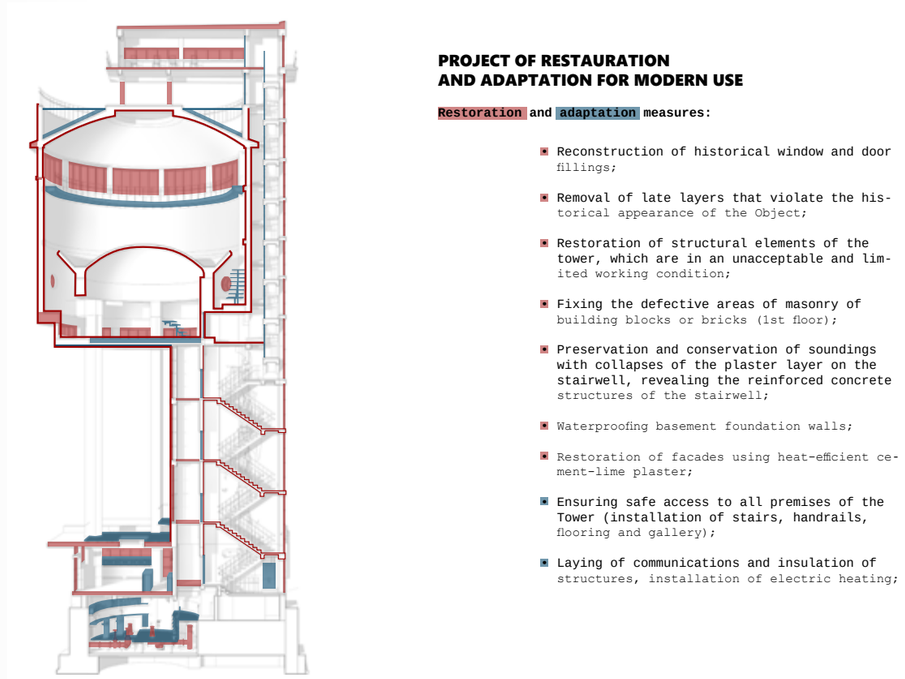
Restore structural elements of the tower in an unacceptable or limited operational state.

Cut out defective sections of masonry enclosing structures made of construction blocks or bricks (1st floor).

Preserve exploratory excavations revealing reinforced concrete structures of the stairwell.

Waterproof basement foundation walls.

Restore facade using thermally efficient cement-lime plaster.



[pic.18] **Illustration made by RDNK bureau, explaining design solutions for restoration and adaptation. 2022.** *From the technical documentation of the project developed by RDNK.*

Adaptation measures:

Install stairs, handrails, floor coverings, and galleries for safe access to all areas of the tower.

Install utilities and insulation of structures, including the installation of electric heating.

Design solutions for restoration and adaptation implemented in different spaces

Basement
Staff room with a library and an archive.

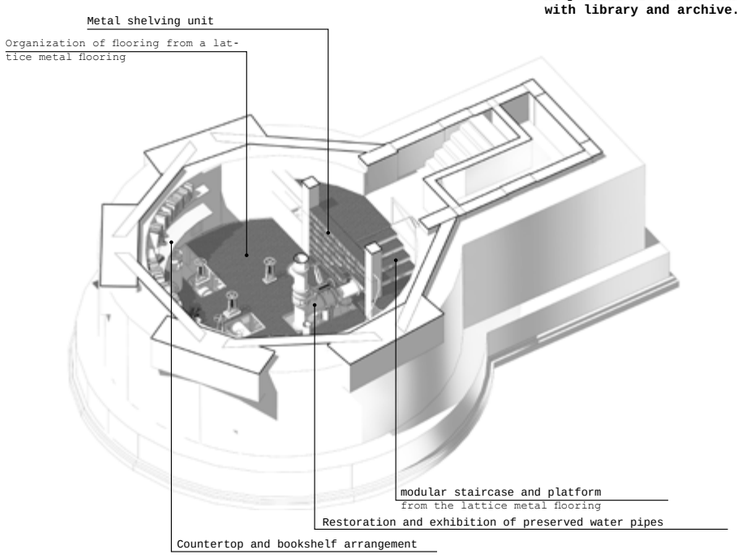
The project includes a new metal staircase and a platform made of pressed steel. Original parts of the plumbing system from the 1930s are preserved. Additions include built-in furniture for storing books and archival materials. [pic.19–20]

Ground floor
Information center and meeting point.

The brickwork will be partially dismantled to restore the historical corner windows and two side exits. The remaining brickwork will be plastered and painted in a light gray color to serve as a neutral background for the exhibits on the first floor. [pic.21,23]

BASEMENT FLOOR

Adaptation of the basement floor for the staff room with library and archive.



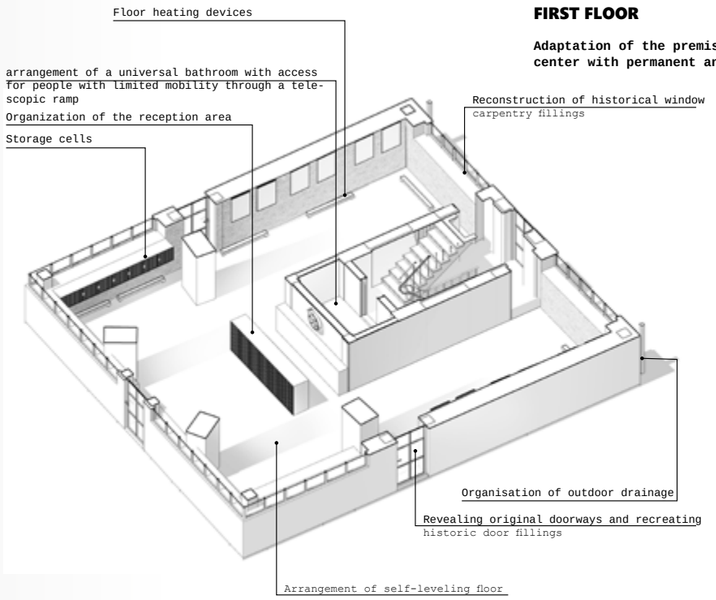
- Cleaning the basement floor from debris and earth, conservation of the original water pipes that have been preserved;
- After clearing the walls and removing the defective wall plaster, repair and inject defective areas, then treat with biocidal and demineralizing compounds;
- Run a new cement-limestone plaster on the walls, leveling the cement-sand screed on the floor;
- Execute a new metal ladder and platform from the press flooring;
- Repair and strengthening of beams and floor slabs (according to the construstion project);

[pic.19] **Axonometric drawing of the basement RDNK. 2022.** *From the technical documentation of the project developed by RDNK.*

[pic.20] **Render of the basement interior. 2022.** *From the technical documentation of the project developed by RDNK.*

FIRST FLOOR

Adaptation of the premises for an information center with permanent and temporary expositions.



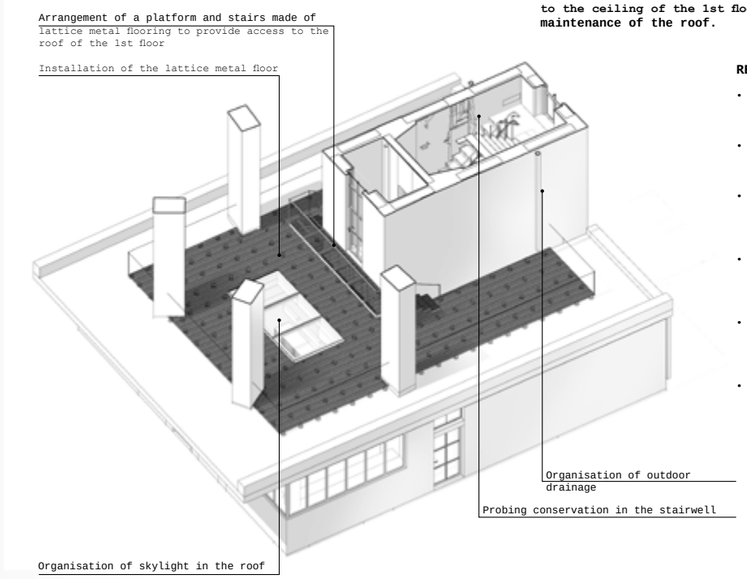
RESTORATION MEASURES

- Repair and restoration of the brickwork of the outer walls with a plaster finish using the plastering method
- Dismantling of the corner piers along the axes 1/A and 1/L, dismantling of the piers of the north-eastern facade adjacent to the right and left of the stairwell, based on historical photographs of the 1930s;
- Repair of beams and floor slabs above the first floor (according to the construction project);
- Injection of cracks in concrete, the opening width of which exceeds 1 mm, with special compounds.
- Reconstruction of lost wooden fillings in existing window and door openings based on archival materials using modern double-glazed windows.

[pic.21] **Axonometric drawing of the ground floor, RDNK. 2022.** *From the technical documentation of the project developed by RDNK.*

FIRST FLOOR ROOF LEVEL

Ensuring an exit from the space of the staircase to the ceiling of the 1st floor for technological maintenance of the roof.



RESTORATION MEASURES

- Repair of beams and floor slabs above the first floor (according to the constructions project);
- Injection of cracks in concrete, the opening width of which exceeds 1 mm, with special compounds.
- Replacing the roof covering with the installation of insulation from mineral plates, slopes for internal drainage and waterproofing;
- Sealing holes in the ceilings of the technological shaft on the staircase, formed during the dismantling of water pipes;
- Restoration of concrete steps of the stairs, handrails of stairs, additional layout of the lost original metal racks and handrails;
- Strengthening the plaster in the places of probing should be carried out in accordance with the recommendations of the technologist-restorer

[pic.22] **Roofing axonometric drawing of the ground floor, RDNK. 2022.** *From the technical documentation of the project developed by RDNK.*

[pic.23] **View of the ground floor from the entrance to the tower. 2022.**
From the technical documentation of the project developed by RDNK.

[pic.24] **Glass ceiling above the ground floor. 2022.** *From the technical documentation of the project developed by RDNK.*

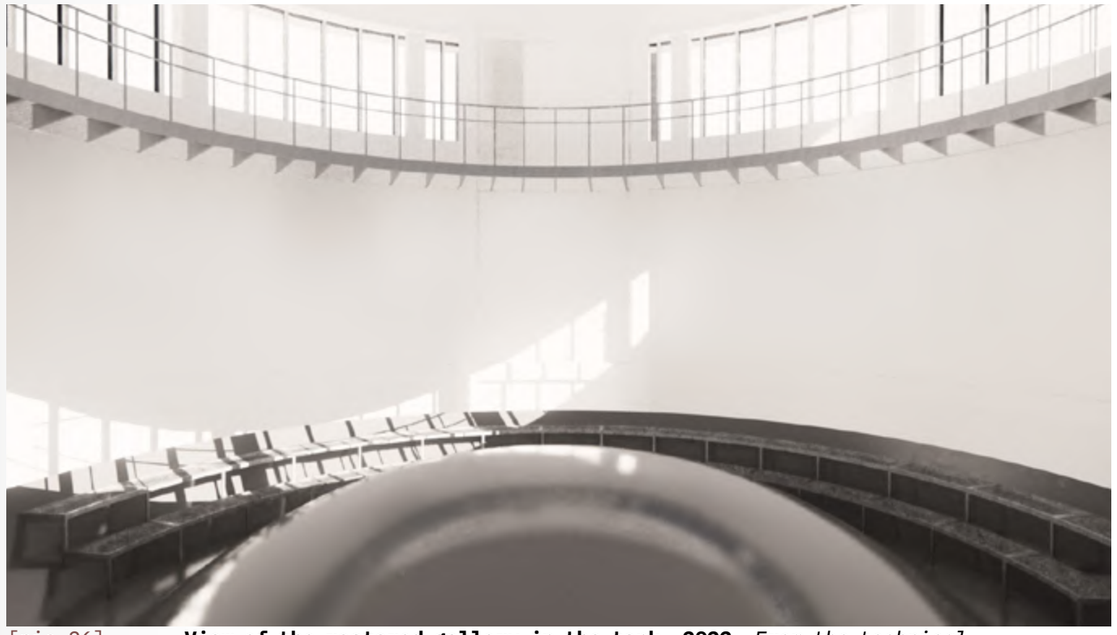
The project includes a bold idea—to install a skylight in the ceiling above the reception area on the ground floor. This will introduce natural light into the deep space with a low ceiling, providing a new perspective on the tank and creating an additional visual connection with the object for visitors who may not have the opportunity to go above the ground floor. [pic.24]

Additionally, there will be an extra rooftop access from the stairwell to facilitate events and provide access for maintenance. [pic.22,25]

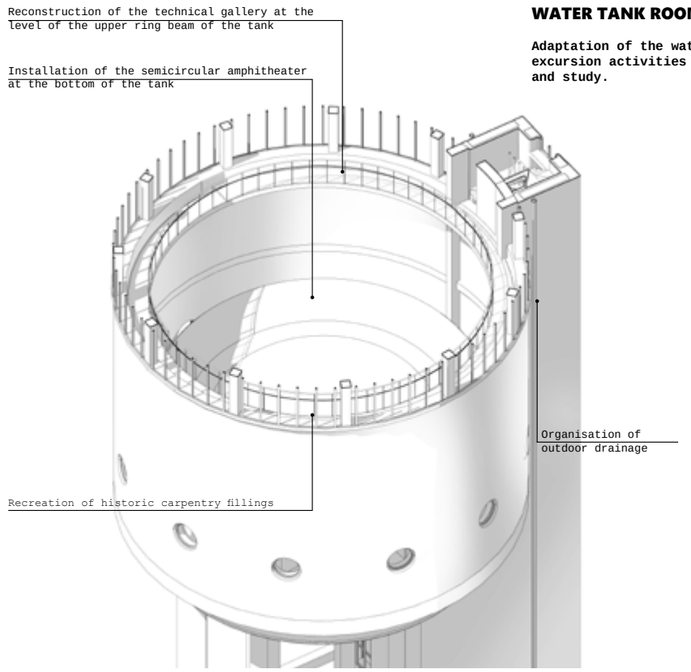
[pic.25] **Exit from the staircase to the roof of the ground level. 2022.**
From the technical documentation of the project developed by RDNK.

Tank

The tank space will have a new bypass gallery instead of the lost one. It was originally located between the outer wall of the tower and the steel wall of the tank, and was purely functional. The gallery will become a new route for visitors and will be used to install light, sound, and other equipment for events. [pic.26–28]



[pic.26] **View of the restored gallery in the tank. 2022.** *From the technical documentation of the project developed by RDNK.*



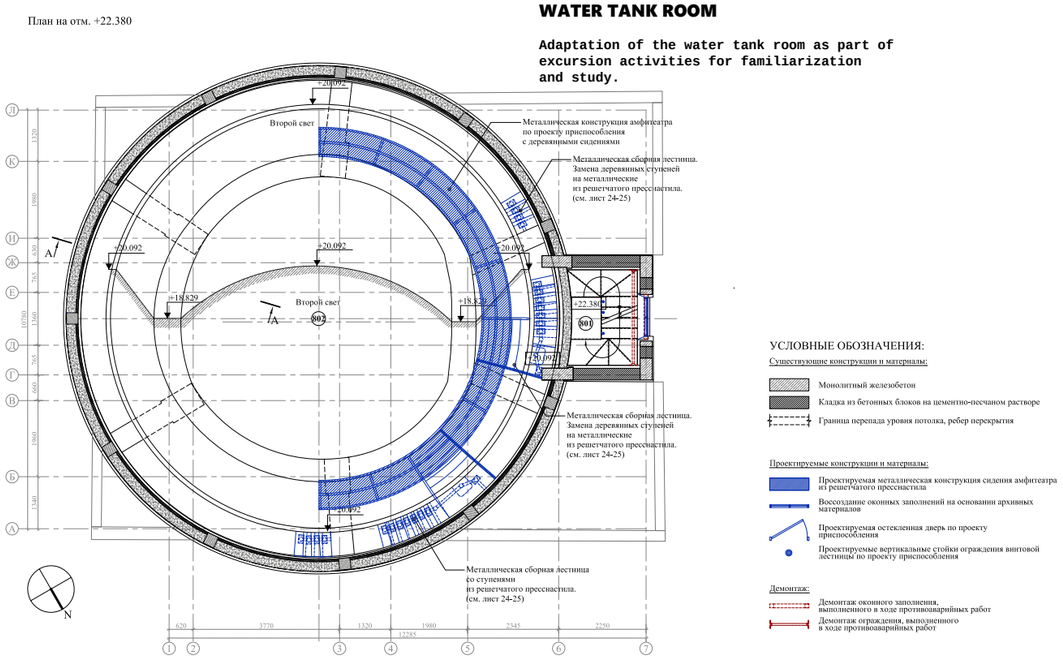
WATER TANK ROOM

Adaptation of the water tank room as part of excursion activities for familiarization and study.

RESTORATION MEASURES

- Tapping and removal of destructive plaster and paint layers;
- Restoration and strengthening of load-bearing reinforced concrete structures;
- Repair of destructed masonry from building blocks by removing masonry from blocks or re-assembly;
- Repair of areas with a lost concrete layer and with fragments of bare reinforcement;
- Restoration of the lost areas of insulation in the walls of the tank with a similar wood-shaving insulation;

[pic.27] **Axonometric drawing of the tank, RDNK, 2022.** *From the technical documentation of the project developed by RDNK.*



WATER TANK ROOM

Adaptation of the water tank room as part of excursion activities for familiarization and study.

[pic.28] **Organization of additional access to the tank. 2022.** *From the technical documentation of the project developed by RDNK.*

Staircase

Some traces from the 1990s and 2000s will be partially preserved: when the tower was accessible to the public and became a symbolic, albeit abandoned, landmark of the district. Residents of Uralmash and city visitors left thousands of their names, important dates, and testimonials from their lives on its walls.

Fire tower

A comfortable final stop on the tour route, where visitors can have a hot beverage or ice cream and enjoy city's views, even in bad weather. [pic.29]

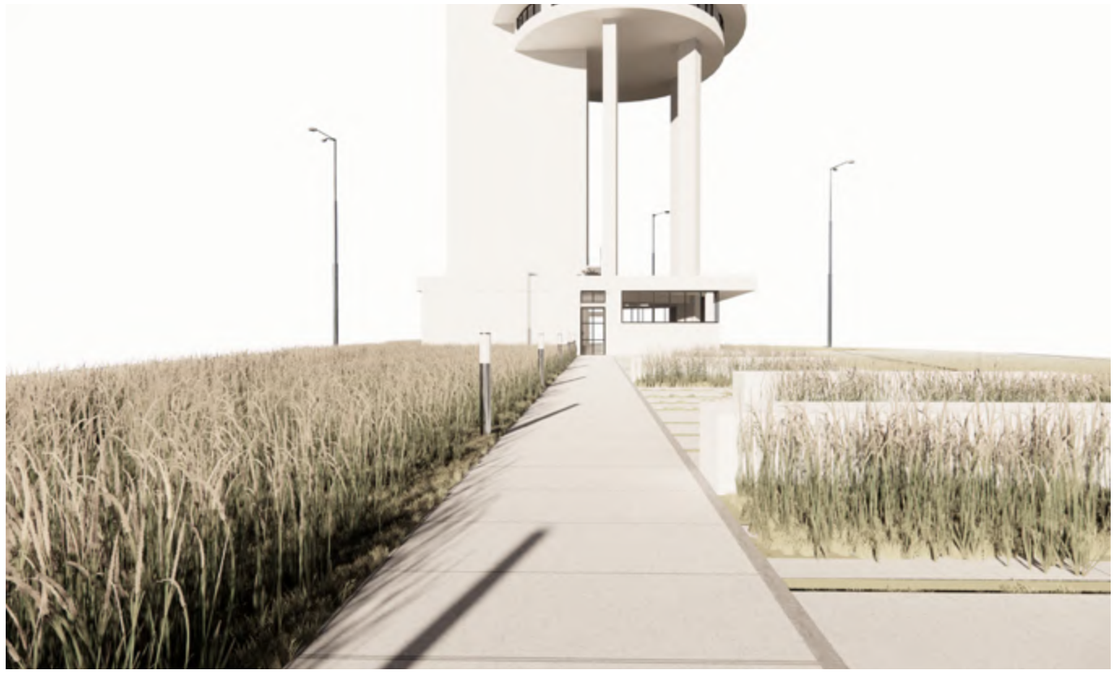
[pic.29] **Render of the fire tower. interior. 2022.**
From the technical documentation of the project developed by RDNK.

Landscape design

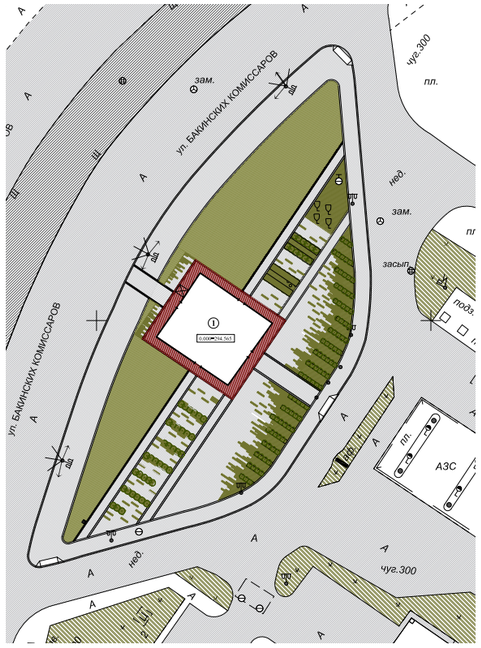
The landscape design was based on archaeological research, which confirmed the absence of cultural deposits in the soil, allowing the project to proceed. The architectural studio RDNC proposed a careful and minimalist design that visually complements the tower's architecture. The solution is based on a combination of large paving stones and areas of tall grass. It caters to all the scenarios: gathering people before tours, providing a place for relaxation after, and hosting events on the roof of the first floor. [pic.30–31]

Street lights

Having considered all the options for architectural lighting, we have chosen the simplest yet the most expressive one: a beam of light directed at the bottom of the cylindrical structure, which sharply emphasizes the purity and contrast of the volumetric composition.



[pic.30] **Render of a landscape design. 2022.** *From the technical documentation of the project developed by RDNK.*



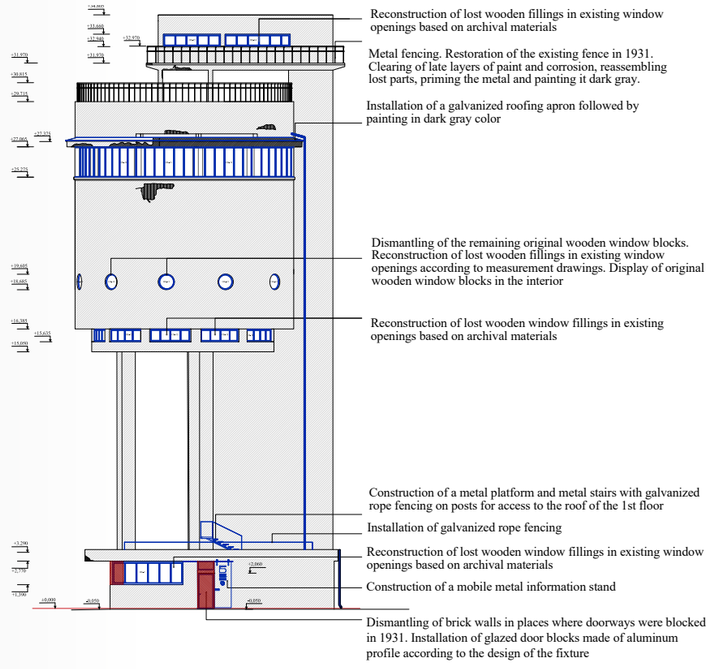
LANDSCAPE DESIGN PROPOSAL

The landscape concept is based on four paths leading to the Tower. Strictly geometric forms in the solution of the general plan emphasize the bright avant-garde architectural solution of the Object.

A part of the territory facing a rather active transport highway is covered by a dense array of high grasses. When approaching the Tower, a screen is formed that softens the influence of the road.

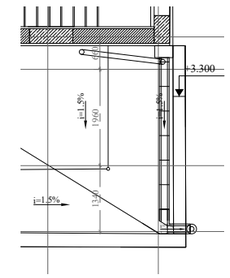
The main approach to the Tower is from the southwestern side - this part of the territory is covered with paving according to the principle of a disappearing module. The missing module is replaced by a lawn.
Thus, on the site covered with paving, you can arrange events, place temporary outdoor furniture, and the lawn area with shrubs again serves as a natural fence from the gas station and its influence.

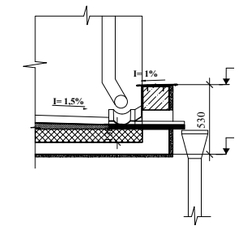
[pic.31] **A version of general plan, RDNK. 2022.** *From the technical documentation of the project developed by RDNK.*



OUTDOOR WATER DRAINAGE

Facing di iculties with laying an internal drainage pipes in the Tower project proposal based on the organization of an outdoor drainage





[pic.32] **Installation of an organized drainage system, RDNK. 2022.** *From the technical documentation of the project developed by RDNK.*

4.5 Adaptation to Special Needs

While designing public spaces, it is essential to make the space universal, which means accessible and comfortable for everyone, including individuals with disabilities.

We have invited Elena Leontieva to join the team as a consultant. She is an expert in accessible architecture and universal design and a leader of the public organization *Svobodnoe Dvizhenie* (Free Movement), which advocates for people with disabilities who use wheelchairs.

Elena has suggested sticking to an approach, in which activities designed for individuals with limited mobility do not disrupt the overall aesthetics of the space or overload it. During reconstruction and adaptation, it is essential to follow the principle of “reasonable accommodation,” as outlined in the “UN Convention on the Rights of Persons with Disabilities.” This implies finding a balanced, appropriate, and suitable solution for each specific case, ensuring that it does not become a “disproportionate or undue burden.”

Entrance and accessibility

All entrances to the building were originally situated at street level, without steps, and are accessible to visitors on wheelchairs. However, there is no technical possibility to provide access to the higher floors. Therefore, we decided to make the first floor as accessible as possible for wheelchair users, fill it with information, and create a skylight in the roof to allow a view of the bottom of the tank.

[pic.33] **General view of the White Tower. 2022.** *From the technical documentation of the project developed by RDNK.*

Bathrooms

Originally, there were no restrooms in the tower. The project included one restroom accessible for visitors with reduced mobility. It occupies the stairwell's technological shaft. The main challenge here is that the floor level of the shaft/restroom is three steps higher than the level of the ground floor.

Elena has proposed several options to overcome this incline:

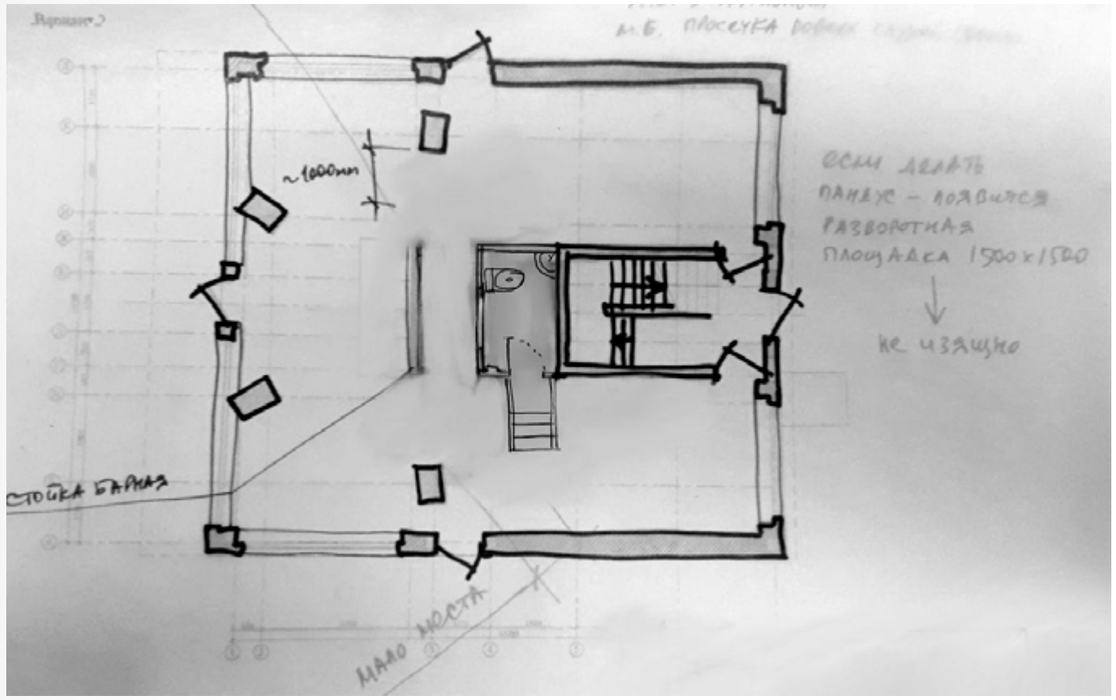
1) Install an inclined lift platform on the three steps of the staircase.

2) Install a concealed lift platform in the floor in front of the three steps of the staircase.

3) Install the FlexStep V2 Lift Up transformer staircase in the open space on the first floor in front of the restroom door, which combines the functions of a staircase with railings and a vertical lift for a wheelchair.

4) Design a separate ramp and staircase for access to the restroom on the first floor.

After discussing these with the architects from *Rozhdestvenka* bureau, it became clear that all of these solutions look bulky and restrict the already limited space on the ground floor or, as in the case of option 1, compromise safety requirements for evacuating people by staircase. [pic.34]



[pic.34] **Bathroom arrangement, option 2.** *From the archives of the arch-group Podelniki.*

However, a simpler solution was found: portable removable devices like telescopic guide rails that allow visitors in wheelchairs to access the restroom with assistance. When needed, staff can bring and install two of these rails on the steps, then assist in navigating the steeper incline than what is typically allowed by construction standards. To ensure that the restroom door does not obstruct the staircase, we should install a sliding door. [pic.35–36]

Features of exposition

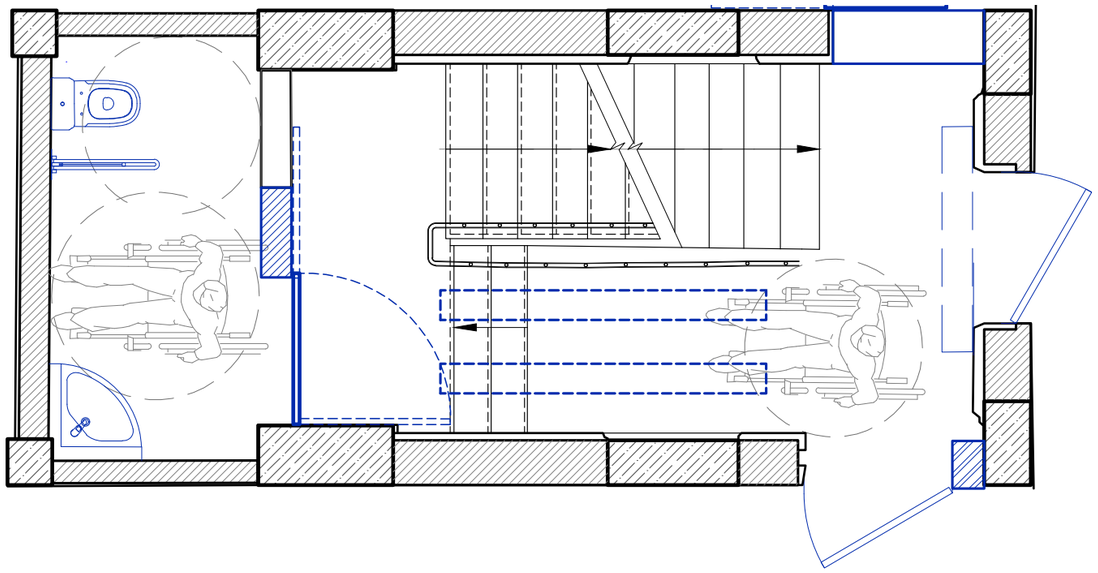
Podelniki (architectural group) have asked Elena Leontieva to expand the exhibition on the ground floor so as to provide an inclusive environment.

For instance, blind visitors who rely on an audio guide may have difficulty fully understanding the appearance of the tower. A tactile tabletop model will allow them to grasp the building's form and structure, and it can also be engaging for other visitors, especially children.

For visitors in wheelchairs who may not have access to certain parts of the tower, it is essential to provide a media exhibition on the first floor using LCD screens and/or virtual reality headsets. The media exhibition can display images of the upper floors, enabling visitors to receive information about the tower on par with other visitors.

Website

People with disabilities typically begin planning their visit by checking the website. Therefore, it is crucial to have a dedicated section on the website that provides information about the conditions for people with various types of disabilities. This section should outline which parts of the building are accessible to specific categories of individuals with disabilities and which are not. This transparency is vital in ensuring that people can plan their visits accordingly and have a positive experience.



[pic.35] **Plan of the ground floor 1 with restrooms.**
From the technical documentation of the project developed by RDNK.

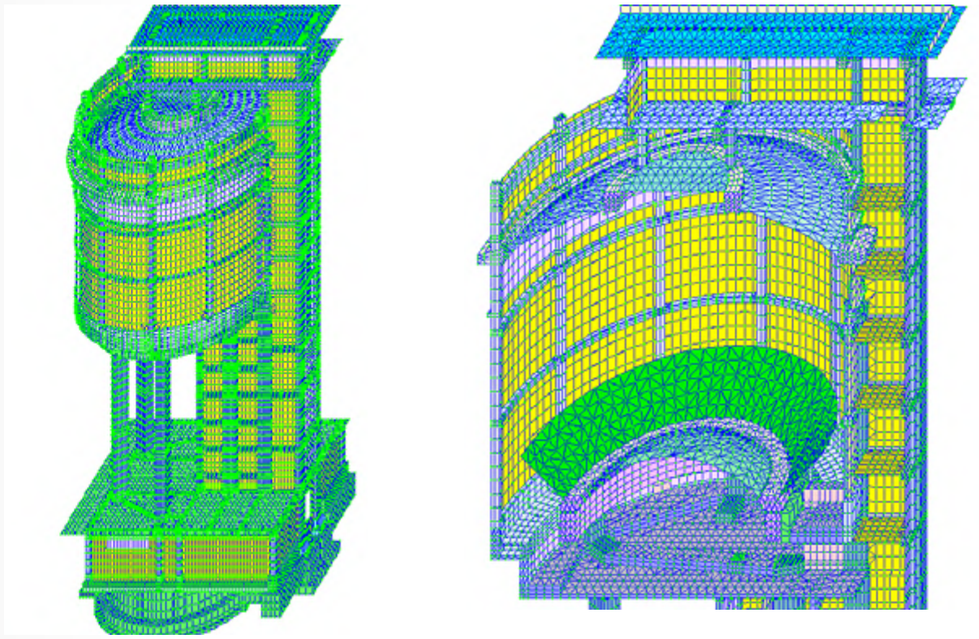
[pic.36] **An example of using a telescopic portable ramp.**

4.6 Construction Solutions

All structural solutions relied on the data about the current load-bearing capacity of the structures. Since 2013 to 2023, there were three inspections with varying attention to detail. The 2021 inspections were carried out by *Inzhstroyservis* bureau on behalf of *Rozhdestvenka* and they were particularly detailed. They included exams of the foundations using trenching, several openings, and laboratory examinations of the samples.

Overall, the results of these inspections back up each other and indicate that the primary structural framework of the tower, designed to withstand the weight of 700 cubic meters of water, is in working condition. Specialists emphasize that certain elements of the tower require significant renovation, such as the floor and ceiling of the ground floor, the pillars of the cylindrical section, columns, and the ceiling of the fire tower.

Later we asked Evgeny Redikultsev, a structural engineer from Ekaterinburg to give his perspective on the results of the inspections and the suggested construction solutions. He knows the tower well and is highly qualified in the field of reinforced concrete structures. It was crucial to both confirm the adequacy of the proposed strengthening measures and ensure their minimal impact and appropriateness in relation to the goal of saving the original structure. This level of expertise and scrutiny is essential for preserving the authenticity and structural integrity of the tower while still making necessary modifications.



[pic.37] **Calculated model of the tower, developed after the 2021.**

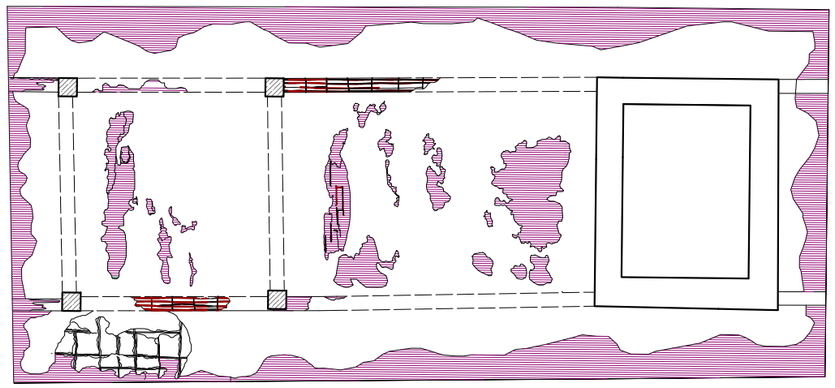
In February 2023, we organized a two-day conference in Yerevan dedicated to the structural and engineering aspects of preserving the White Tower. Members of the *Rozhdestvenka* bureau team, including Nikolai Kustrio who led the inspection, Ivan Kornilov and Evgeny Ivanov responsible for developing strengthening measures, gathered around the same table. Additionally, there were other experts, including Evgeny Redikultsev, Professor Werner Lorenz from Berlin, who conducted the first inspection of the tower in 2013, and his colleague Christoph Dauberschmidt from Munich. This collaborative effort brings together a wealth of knowledge and expertise to ensure the successful preservation of the White Tower.

The discussion started with questioning the results of the inspections and criticizing the structural framework model. Professor Lorenz questioned the calculations because they relied on two assumptions. First, they assumed that the not inspected elements (because they were difficult to reach, such as concrete in the middle of columns and reinforcement inside the ring beam) had the same characteristics as the inspected ones. Second, the assumptions held that damage to the elements did not affect their load-bearing capacity.

In response, Nikolai Kustrio provided justification for the assumptions in the model. Firstly, he explained that the results of instrumental strength measurements on the surface coincided with the data from ultrasonic testing. Secondly, the absence of visible cracks on the surface of the elements indicated the absence of hidden defects within the structure. These points were made to support the reliability of the assumptions made in the structural model. [pic.36]

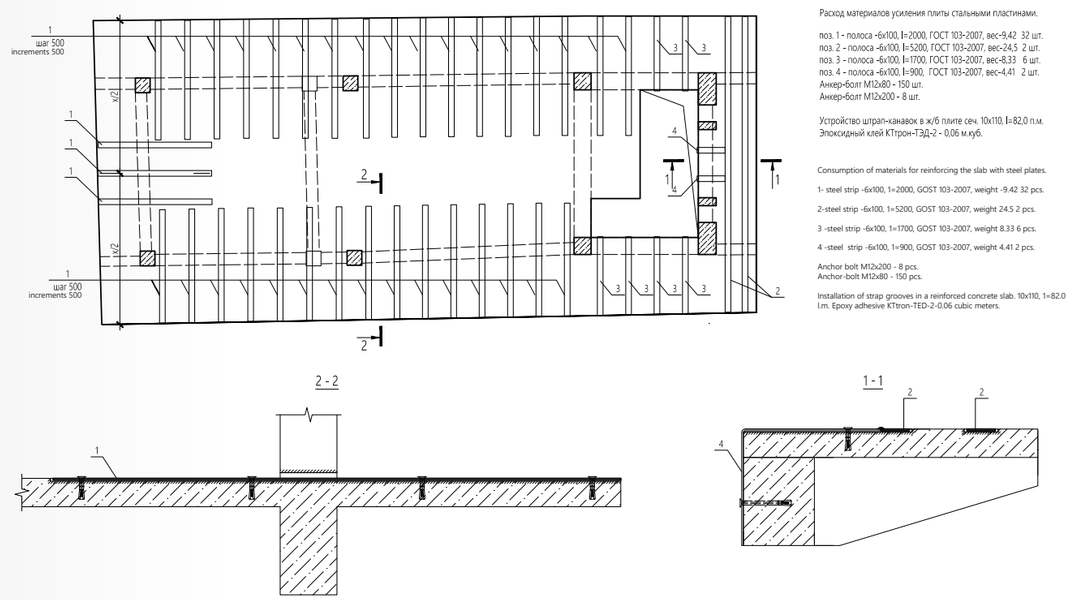
Despite differing opinions on calculations, the experts concurred that the primary load-bearing structure does not raise concerns (which is also supported by the fact that the tower has been standing for over 90 years) and, consequently, does not require reinforcement.

The main discussion revolved around some specific details of the structure where visible damage undoubtedly indicated the need for reinforcement. [pic.38]



[pic.38] **Chart of repair work on reinforced concrete floor slabs (bypass gallery of the fire tower). 2022.** *From the technical documentation of the project developed by RDNK (Ivanovo restoration).*

Originally, the intention was to reinforce the thin beams that bear bending loads with carbon fiber tape. Werner Lorenz and Evgeny Redikultsev raised doubts about the necessity and appropriateness of such a solution. In particular, carbon fiber strips would be distributed evenly, whereas the damage to the structure is not symmetric. For instance, in the coffered ceiling of the first floor, even those sections that, due to their minimal span, cannot experience significant deformations were subject to reinforcement. And on the cantilevered

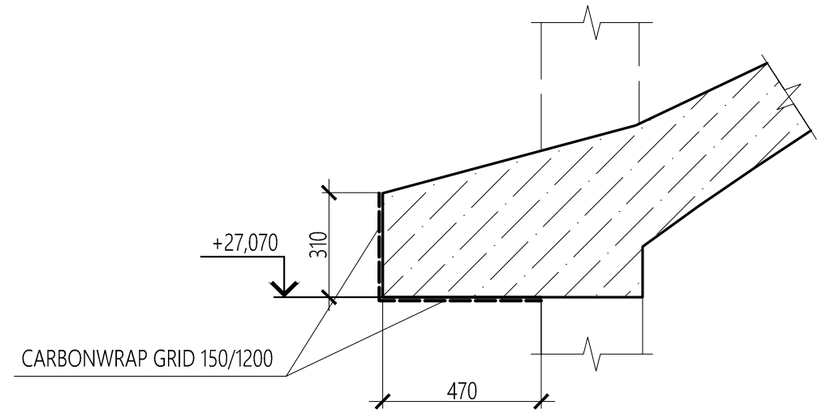


[pic.39] **Reinforcement of the ceiling (bypass gallery of the fire tower) with steel strips. 2022.** *From the technical documentation of the project developed by RDNK (Ivanovo restoration).*

sections of the floors, the lower part of the slab was reinforced, whereas the stretched reinforcement in the uncut slab is located in the upper part.

As a result, the project team completely abandoned the idea of reinforcing the floor structures with carbon fiber. They replaced it with simpler methods that align with the original construction technology: a metal angle bracket to reinforce the damaged beam, load-bearing reinforced strapping for the first-floor slab, and metal strips for the upper stretched reinforcement of the cantilevered sections of the fire tower slab. [pic.39]

Then, the condition of the ring beam encircling the base of the reinforced concrete dome has sparked a significant debate. Despite visible damage on the exterior, its reinforcement was not originally included in the initial project.

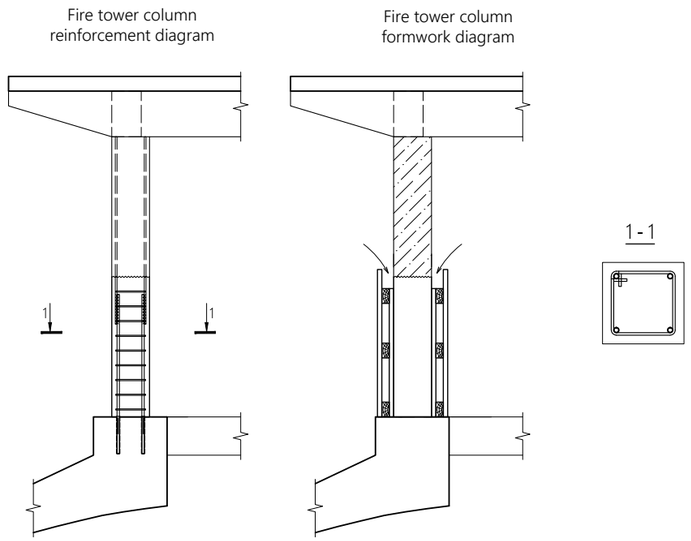


[pic.40] **Reinforcement of the tank dome support ring, detail. 2022.** *From the technical documentation of the project developed by RDNK (Ivanovo restoration).*

The engineers from *Rozhdestvenka* justified this by stating that the external part of the beam does not play a role in the overall structure's load-bearing capacity. And it primarily acts as a cornice to channel water runoff and absorbs horizontal pressure from the dome. In their opinion, restoring the beam's external geometry with repair mortar would be enough. However, experts found these arguments insufficiently grounded. They recommended removing deteriorated sections of plaster through sandblasting and conducting further inspections of the external reinforcement of the ring beam. Professor Dauberschmidt expressed concerns that changes in the temperature regime within the tower could lead to accelerated corrosion of this reinforcement due to the influence of ions from table salt, which was frequently used in concrete during the winter construction in the 1920s and is present in the concrete.

As a result, the experts agreed that a carbon fiber tape, which stretches well, will cope with the task of external reinforcement of the ring beam. [pic.40]

It was also recommended to check some solutions by means of additional calculations. For example, a new bypass gallery in the tank volume will rest on racks and a ring beam of the cylindrical part. Historically, until all metal parts of the tank were removed in the 1990s, this gallery was supported by the walls of the tank. In the new version, the ring beam will experience torsional deformation from the gallery. This does not require reinforcement of the beam, but requires a verification calculation.



[pic.41] **Plan of repair work on a fire tower column, 2022.**
From the technical documentation of the project developed by RDNK (Ivanovo restoration).

Moreover, the discussion at the conference helped to resolve a complex issue of one column (out of four) at the fire tower, which is in disrepair. There were various suggestions: from a carbon fiber cage to complete removal and prosthetics with a new metal stand. As a result, they decided to repair the column: completely clean it of the existing concrete and cover it with new one of increased strength, while maintaining its authentic dimensions. [pic.41]

At the same time, this column will visually stand out from the rest due to the use of white Portland cement.

4.7 Engineering Solutions

One of the objectives of the tower restoration and adaptation is to ensure year-round use according to the scenarios described in the technical specifications. Historically, the water tank was heated to keep water from freezing during winter. However, for more than 50 years, while the tower has not been in operation, the facility had no heating or a closed air circuit. The temperature and humidity inside the room changed simultaneously with the weather outside. This is good for the life span of the structures: this way they do not experience destructive effects from the difference in air parameters inside and outside.

The challenge of our task is precisely to ensure the desired microclimate in the tower without compromising the further safety of the structures. During work on the project, through calculations and related discussions, it became clear that the problem was unsolvable in the way as it was originally posed. We had to adapt technical specifications and abandon an idea of heating the entire staircase. During winter tours, visitors might use blankets when climbing the stairs, but thus the stairwell will not be destroyed by freezing and thawing condensation.

The *Ivanovrestavratsiya* company, subcontractors of *Rozhdestvenka* bureau, was responsible for developing those sections of the project containing engineering solutions. However, in order to evaluate and search for optimal measures, the arch-group considered it necessary to involve a team of engineers from the "InPAD" bureau, led by engineer Vitalii Prokhorov.

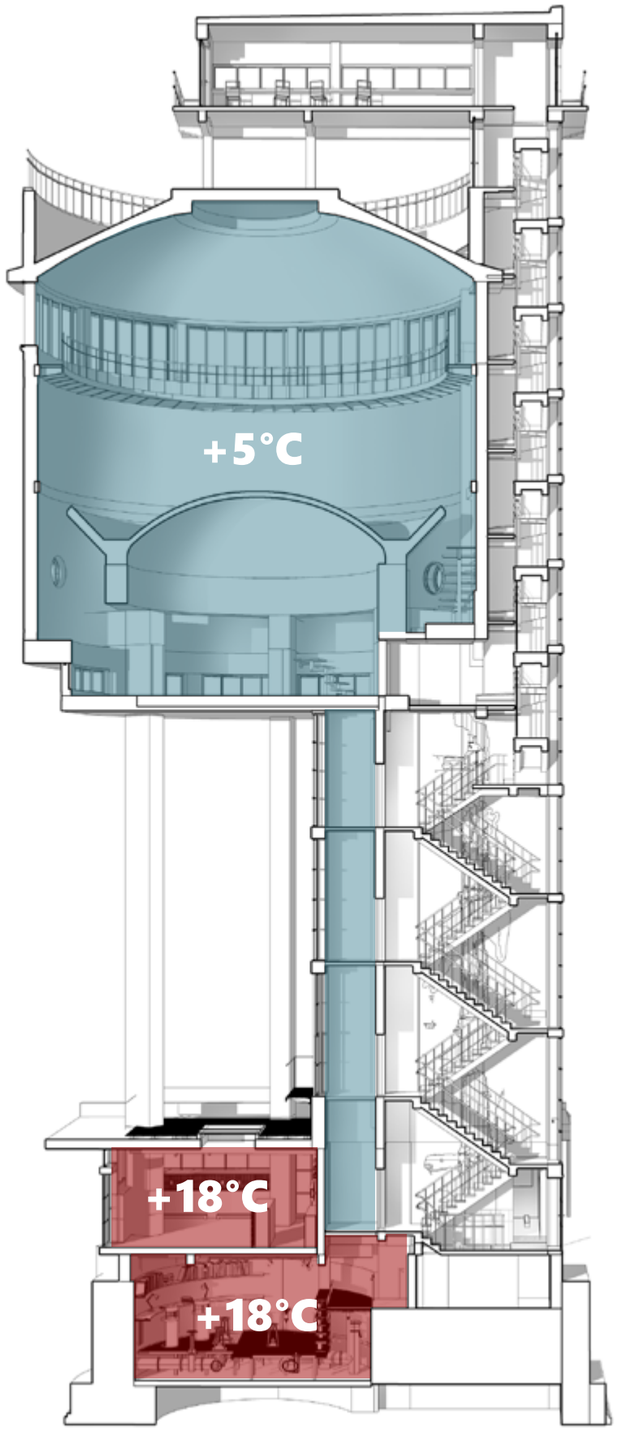
Vitalii Prokhorov also participated in the conference in Yerevan in February 2023, where he gave a detailed report on thermal calculations for the tower and discussed methods of insulation and preservation of structures. Ultimately, InPAD calculations formed the basis for list of approved engineering solutions.

This thermal engineering calculation of all enclosing structures with their actual characteristics (without replacement or additional insulation) was performed in the Auditor OZC 7.0 calculation program. It produced a detailed three-dimensional model indicating various thermal properties of the materials inside the composite structures. The program allows you to make a reliable calculation and, unlike traditional linear calculations, detect critical points that require insulation. [pic.43]

It is technically impossible to connect the building to central heating. The only possible source of heat is electricity, which, in turn, is limited to a power of 90 kW (the maximum possible load on the cable of the existing connection).

As follows from the calculation, this power would not be enough for the total thermal load of the building with the current state of the enclosing structures. At the same time, standard insulation of the building from the outside would be impossible from the point of view of preserving the monument's appearance.

After calculations and modeling the total heat loss, a hybrid tactic was adopted. On the one hand, those parts of the tower that can be insulated without changes in appearance should be insulated. On the other hand, heat losses are curtailed by lowering the calculated temperature and implementing adaptive energy-efficient heating methods, such as the tower's passive mode, which can be shifted to active room heating right before the event, and the distribution of loads (sequential switching) among the heating equipment. [pic.42]



[pic.42] **The final temperature model of the tower in winter. 2023.**
From the examination of the project made by specialists of the InPAD company.

TEMPERATURE AND HUMIDITY REGIME

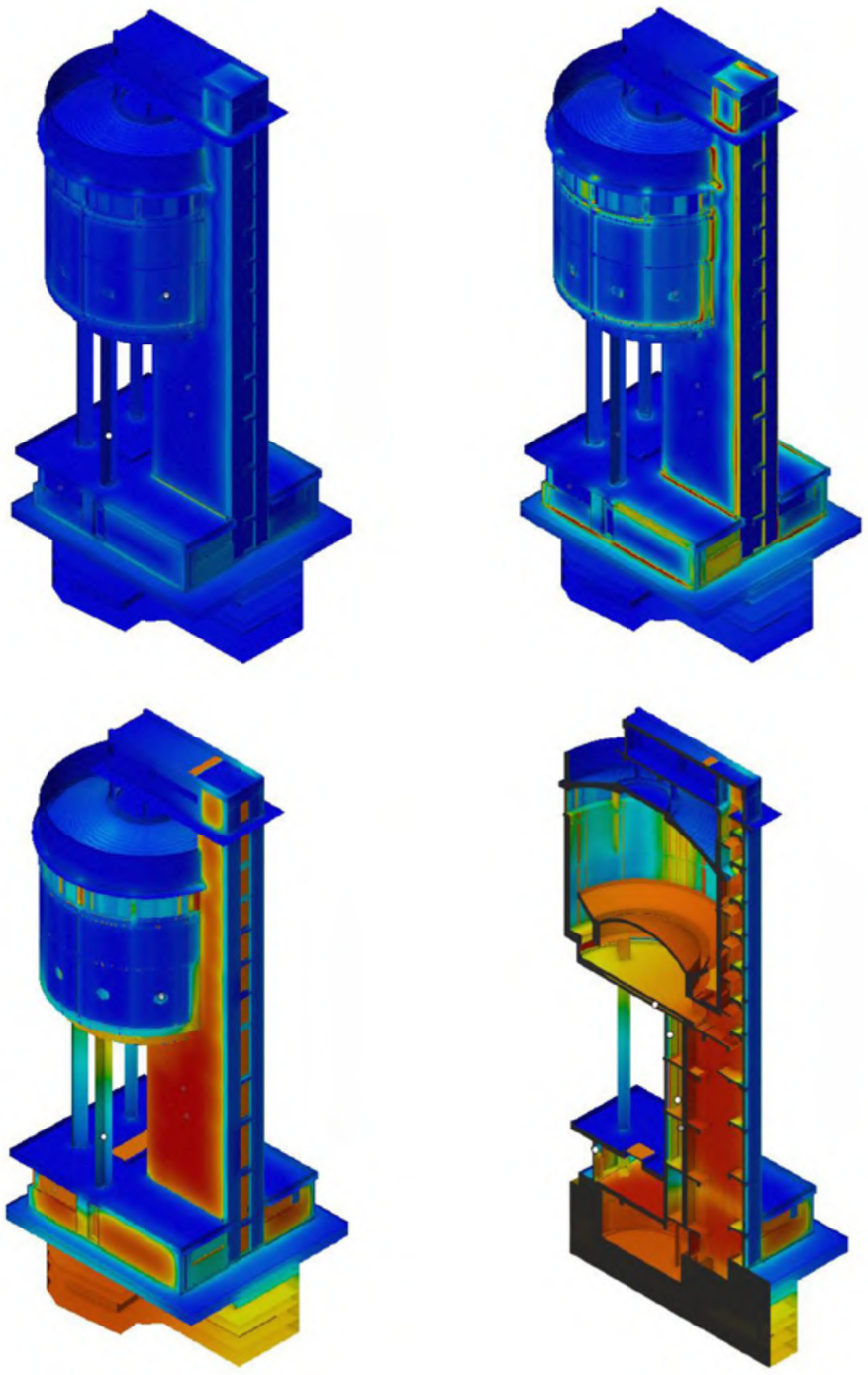
At the moment the building is not connected to the water heating network. In the project of restoration and adaptation, it was decided to give up the idea of the water heating wiring and go the way of heating the Tower with electrical heaters.

Due to the limited capacity of the electric cable running to the Tower (no more than 90 kW), the project provides for the optimization of temperature regimes depending on the character of the using rooms and recommendations for the preservation of structures.

In the basement, it is necessary to constantly maintain temperatures above 15°C to maintain the load-bearing capacity of the foundation walls.

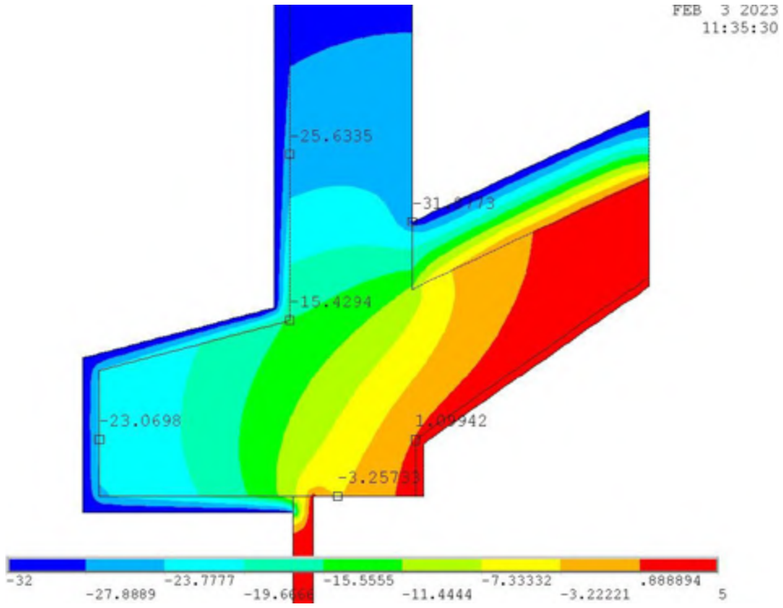
The 1st floor need a comfortable temperature regime as the most actively exploited.
Technological shafts of the stairwell, in which communications are located, require maintaining positive temperatures in the framework of preventing freezing of water supply and sewage pipes.
Today, the water tank room accumulates the largest amount of heat loss from the Object.
Maintaining temperatures at +5°C contributes to the preservation of structures and a more comfortable stay for people during excursions.

All heaters accepted by the project are equipped with an automatic thermostat to provide the ability to control heat transfer.

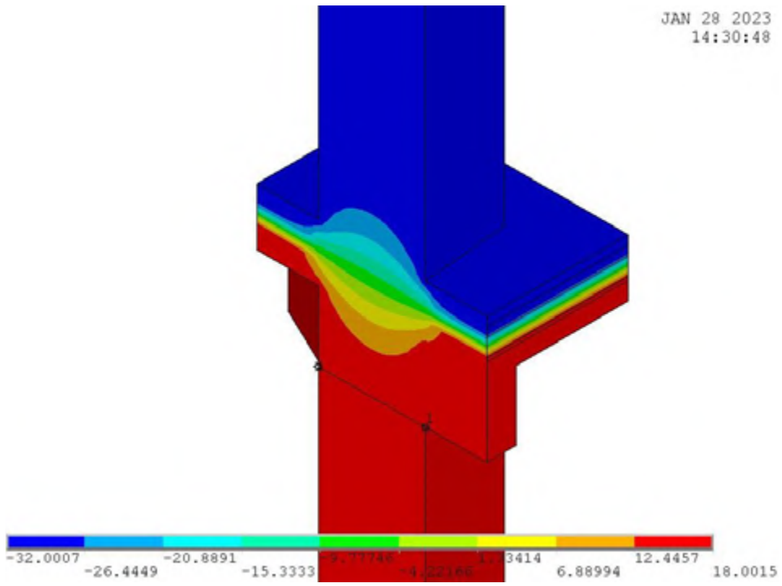


[pic.43] **Heat loss. 2023.** *From the project examination made by specialists of the InPAD company.*

It was important to prevent further destruction. The dew point is one of the factors for destruction, and it becomes decisive in the cold season, when the temperature outside drops below zero, but inside the building it's positive. [pic.44–45]



[pic.44] **Temperature fields in tank dome support structures 2023.** *From the examination of the project made by specialists of the InPAD company.*



[pic.45] **Temperature fields in the structures of tank-supporting columns 2023.** *From the examination of the project made by specialists of the InPAD company.*

There were various insulation options aimed to eliminate the harmful effects of dew point on structures. It is also important to note that the decision must not only be technically correct, but also consistent with the idea of preserving the architectural monument and its subject of protection. The following options were considered:

1) insulation from the inside with mineral wool insulation 50 mm thick with an air gap of 50 mm;

2) insulation from the inside with ceramic paints 2 mm thick;

3) external insulation with mineral wool insulation 50 mm thick;

4) external insulation with mineral wool insulation 10 mm thick or perlite plaster mixtures (insulated plaster).

The calculation shows that the formation of a dew point inside the structure is eliminated only with additional external insulation of the tank wall with a thin layer of heat-efficient plaster. This decision was approved by *Rozhdestvenka* bureau.

In addition, the recommendations of engineer Vitalii Prokhorov, voiced at a conference in Yerevan, concerned additional insulation of individual parts of the structure: for example, between the tank and an unheated staircase and in other places, where calculations showed the danger of freezing. InPAD engineers recommended heating the gutters and taking into account additional infrared heaters in the electrical loads, which will not heat the air, but will increase the comfort of being in the tower. These recommendations were also accepted into the project.

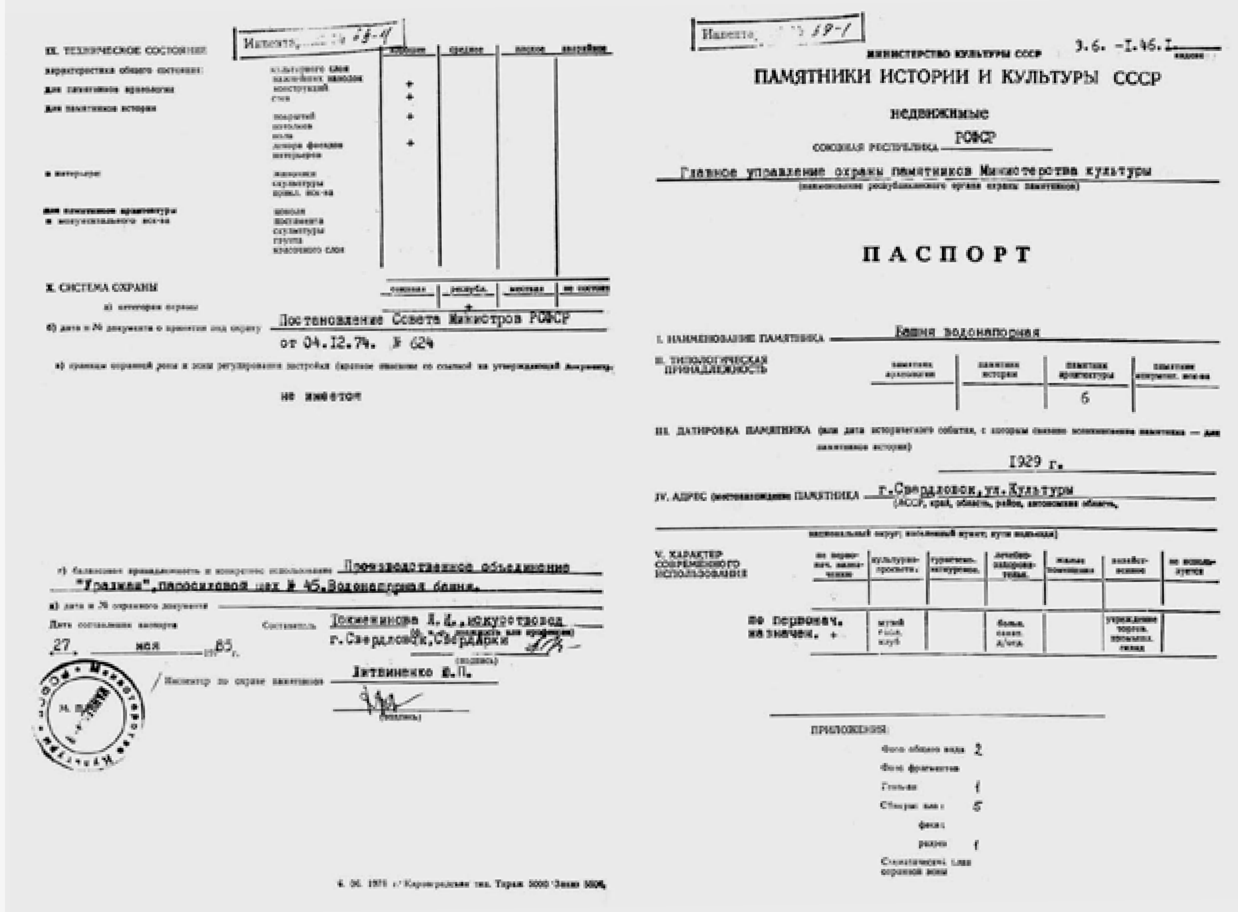
Optimization of technical, functional and operational solutions managed to reduce the design load on the heat supply of the facility from the initial 155 kW to 60 kW, which will allow it to fit into the allocated power and reduce the user's costs for maintaining the tower in winter.

4.8 Paperwork and Approval Process

The Project of Restoration and Adaptation is the most important document that provides the tower with an opportunity for a new life. However, it is by no means the only one. The path to restoring a monument lies through a chain of documents and approvals, in which one paper determines the other.

Some documents existed before Podelniki arch-group began working on the preservation of the tower.

The first one, of course, was a decision No. 636 of the Executive Committee of the Sverdlovsk Regional Council of Workers' Deputies of August 5, 1971. Three years later, it was followed by the Resolution of the Council of Ministers of the RSFSR No. 624 of December 4, 1974. On their basis, the tower was included in the register of historical and cultural monuments of the USSR, not at the regional, but at the all-Union level.



IX. ТЕХНИЧЕСКОЕ СОСТОЯНИЕ

X. СИСТЕМА ОХРАНЫ

Постановление Совета Министров РСФСР от 04.12.74. № 624

не имеется

Производственное объединение "Уралмаш", паросиловой цех № 45. Водонапорная башня.

27 мая 85

МИНИСТЕРСТВО КУЛЬТУРЫ СССР

3.6. -I.46.I

ПАМЯТНИКИ ИСТОРИИ И КУЛЬТУРЫ СССР

недвижимые

СОЮЗНАЯ РЕСПУБЛИКА РСФСР

Главное управление охраны памятников Министерства культуры

ПАСПОРТ

I. НАИМЕНОВАНИЕ ПАМЯТНИКА Башня водонапорная

II. ТИПОЛОГИЧЕСКАЯ ПРИНАДЛЕЖНОСТЬ 6

III. ДАТИРОВКА ПАМЯТНИКА 1929 г.

IV. АДРЕС (местонахождение) ПАМЯТНИКА г.Свердловск, ул.Культуры

V. ХАРАКТЕР СОВРЕМЕННОГО ИСПОЛЬЗОВАНИЯ

по первонач. назначен. +

ПРИЛОЖЕНИЯ:

[pic.46] **The outer side of the architectural monument passport from the USSR, 1985.** *From the archives of the arch-group Podelniki.*

УЧЕТНАЯ КАРТОЧКА (оборотная сторона)

Фото или схематический план

Краткое описание

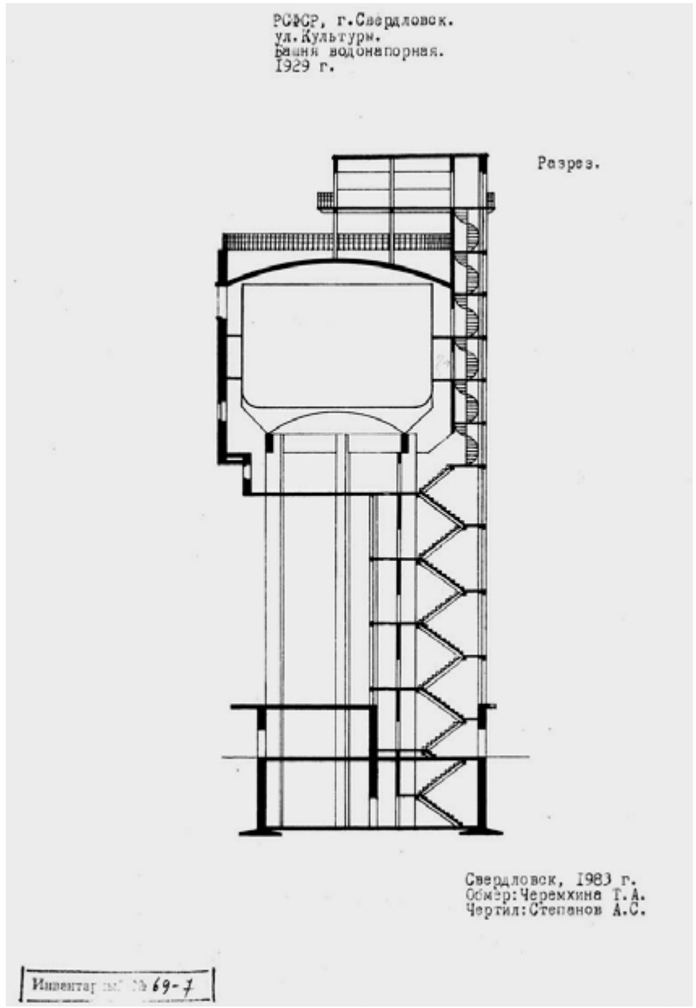
Водонапорная башня возведена в 1929 г.в процессе строительства "соцгородка"Уралмашзавода.Архитектор М.В.Рейшер. Башня находится на окраине соцгородка УЗТМ на опушке лесного массива,хорошо просматривается в свободном пространстве,удачно вписана в перспективу ул.Культуры как высотная доминанта.

Представляет собой оригинальную композицию бака,имеющего форму цилиндра, врезанного в него с северо-запада параллелепипеда лестничной клетки и свободно стоящих опор.Расположение оконных проемов способствует выявлению архитектоники сооружения.

Водонапорная башня является одним из лучших примеров архитектуры советского конструктивизма.

Сухоложская тип. Зак. 6249, тир. 2000. 7. 12. 1982 г.

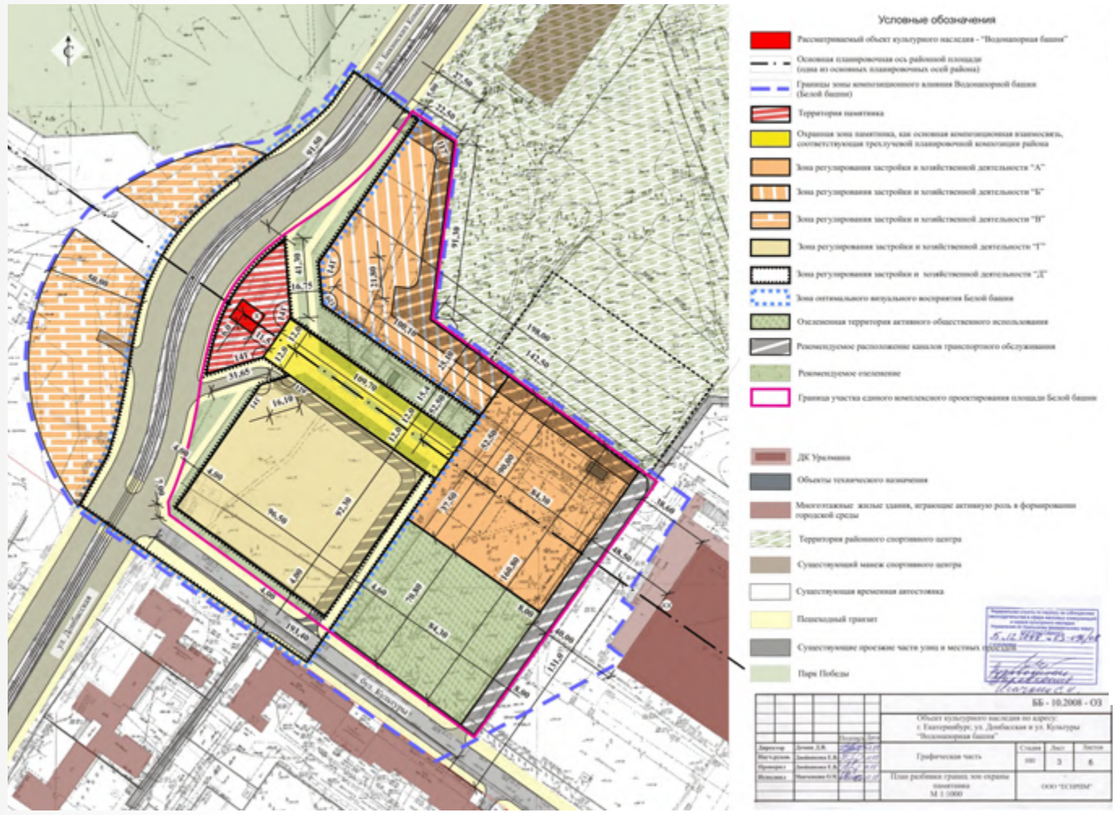
[pic.47] **Reverse side of the cultural heritage object registration card.** *From the archives of the arch-group Podelniki.*



[pic.48] **Section of a tower with a rectangular basement and a metal spiral staircase. Passport of an architectural monument of the USSR. 1985.** *From the archives of the arch-group Podelniki.*

On May 27, 1985, the General Administration for the Protection of Monuments of the v Ministry of Culture issued the Passport of an architectural monument. [pic.46–47] Unfortunately, the art critic who compiled this description of the monument made some serious mistakes. In particular, instead of describing the object itself, he described some available drawings ("the tower has a basement, rectangular in plan"—in fact, round, "a metal spiral staircase"—actually reinforced concrete and with winder steps [pic.48]). And the sketches attached to the passport were called "measurements of 1983", but they also did not correspond to reality. For example, the drawings indicate a metal spiral staircase, which popped up in the design materials of *Techbeton*, but it never actually existed. Apparently, the author of the "measurements" relied on some drawings again, hoping that they coincided with reality, without carrying out field studies.

Errors in the passport of a cultural heritage site led to incorrect factual information about the object that was approved by signatures and seals. Moreover, this incorrect information was copied from one document to another and



[pic.49] **Project of security zones around a cultural heritage site, sheet 3. 2008.** *From the archives of the arch-group Podelniki.*

had formed the basis of subsequent official documents, such as the "object of protection" and the protective commitment. While developing the current scientific and project documentation, we were compelled to initiate the revision of the object of protection to avoid being bound by requirements to preserve something that never actually existed.

In 2009 the project called *Zone for protection* at the cultural heritage site "Water Tower" BB-10-2008-03 was approved by Resolution No. 551-1111 of the Government of the Sverdlovsk Region. The project in question had been developed a year earlier by the LLC "ESNRPM."

The idea of `security zones` is a legacy of the Red Cross, which occupied the tower from 2006 to 2012. The `protected zones` project came into force and became the first approved project of this kind in Ekaterinburg. It is still in effect and imposes significant restrictions on capital construction in the vicinity of monuments. Although in reality, supervisory authorities do not strictly monitor compliance with these restrictions. In particular, both construction and economic activities are often carried out within the boundaries of the protected zones. [pic.49]

All the following documents were directly associated with the activities of the architectural group Podelniki. After signing a contract that allowed us to use the tower, we prepared a technical condition report and took on a protective commitment. In the commitment, we described the parts of the tower that were subject to protection and their condition, which later became part of the approved `object of protection`.

СОГЛАСОВАНО:
Директор
(должность)
Свердловской региональной общественной организации «Группа архитектурных инициатив, событий и коммуникаций»
(наименование организации)
(подпись) П.А. Зиновьева (Ф.И.О.)
"__" 20__ г.
М.П.

УТВЕРЖДАЮ:
И.о. Начальника
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Управления государственной охраны объектов культурного наследия Свердловской области
(наименование органа охраны объектов культурного наследия)
(подпись) А.А. Кульпина (Ф.И.О.)
"__" 20__ г.
М.П.

СОГЛАСОВАНО:
И.о. Директора
(должность)
филиала федерального государственного бюджетного учреждения культуры «Агентство по управлению и использованию памятников истории и культуры» по Уральскому Федеральному округу
(наименование организации)
(подпись) Н.Н. Коротков (Ф.И.О.)
"12" 09 20 20 г.
М.П.

ЗАДАНИЕ
на проведение работ по сохранению объекта культурного наследия, включенного в единый государственный реестр объектов культурного наследия (памятников истории и культуры) народов Российской Федерации, или выявленного объекта культурного наследия

от 23.09.2020 № 38-05-23/18

1. Наименование и категория историко-культурного значения объекта культурного наследия, включенного в единый государственный реестр объектов культурного наследия (памятников истории и культуры) народов Российской Федерации (далее – реестр), или наименование выявленного объекта культурного наследия:

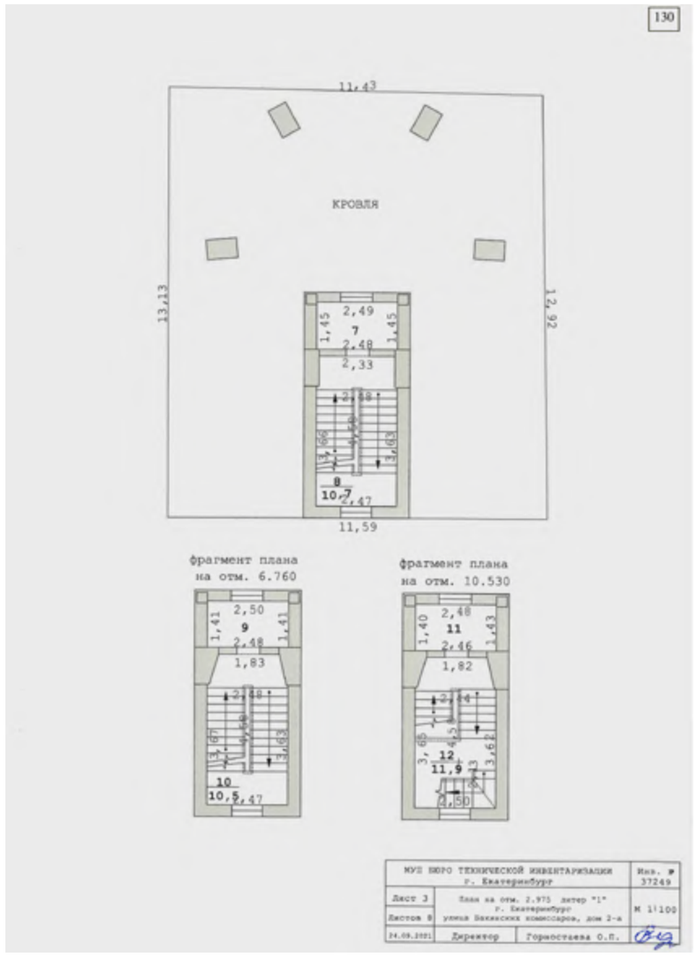
объект культурного наследия федерального значения **«Водонапорная башня»**, включен в список памятников культуры, подлежащих государственной охране объектов культурного наследия (памятников истории и культуры) народов Российской Федерации, решением Исполнительного комитета Свердловского областного Совета депутатов трудящихся от 05.08.1971 №636, постановлением Совета Министров РСФСР 04.12.1974 №624. Регистрационный номер в едином государственном реестре объектов культурного наследия (памятников истории и культуры) народов Российской Федерации 661710802090006.

[pic.50] **Assignment for carrying out work to preserve a cultural heritage site.** *From the archives of the arch-group Podelniki.*

The conservation of the tower in 2015-2016 was duly documented. The work was carried out on the basis of an approved project (Preliminary work, code 01.01.2014-01.PI, books 1.1,1.2,1.3. Priority conservation and emergency measures developed by AB *Rozhdestvenka* LLC, Moscow, 2014) and a permit for works. Upon completion of the work, reports were submitted to the government agency, which were approved in 2017.

At the same time, in 2017, the Department for the Protection of OKN approved the Subject of Protection (Order No. 32 dated 02/02/2022 “On amendments to the order of the Department of State Protection of Cultural Heritage Sites of the Sverdlovsk Region dated 02/09/2017 No. 45 “On approval of the subject of protection of the cultural heritage site of federal significance “Water Tower” at the address: Sverdlovsk region, Ekaterinburg, Bakinskikh komissarov St., 2a”).

Unfortunately, the subject of protection still contained the rudiments of incorrect information inherited from the passport of 1985: in particular, “reinforced concrete supports, square in cross-section,” “flight and spiral staircases.” These errors were corrected during later development of the restoration project.



[pic.51] **Floor plans from documentation of the Technical Inventory Office. 2021.** *From the archives of the Podelniki arch-group.*

The new, most accurate and reliable version of the Object of Protection was approved by the Order No. 32 of 02.02.2022 “On amendments to the order of the Department of State Protection of Cultural Heritage Sites of the Sverdlovsk Region dated 02.09.2017 No. 45 “On approval of the subject of protection of a cultural heritage site.”

Work on the new restoration project began as we received the updated Assignment. Assignment No. 38-05-23/18 dated September 23, 2020 for carrying out work to preserve a cultural heritage site determines the composition and content of scientific and design documentation, the procedure and conditions for approving scientific and design documentation, indicating the approving authorities and organizations. In general, the task represents a state-approved road map for the project. [pic.50]

In 2021, the current technical passport by the Technical Information Bureau was completed; it officially measured the area of the premises before restoration, which should not change after it. [pic.51]

A set of scientific and design documentation that has passed the state historical and cultural examination was sent by the Designer for approval to the Department of State Protection of Cultural Heritage Objects of the Sverdlovsk

Region on October 21, 2022. The examination confirmed that the scope of the developed documentation complies with the requirements of the current standards in the field of preservation of cultural heritage objects.

The Department of State Protection of Cultural Heritage Objects of the Sverdlovsk Region approved scientific and design documentation.

When conducting comprehensive scientific research, archaeological surveys required by law were carried out on the territory of the cultural heritage site. They did not reveal anything that had signs of objects of archaeological heritage (which is confirmed by the State Historical and Cultural Expertise Act, signed by expert L. I. Tokmeninova).

Thus, we were not required to develop documentation confirming preservation of the archaeological layer. However, it was necessary to execute and agree on another document confirming the safety of the tower itself during the work. The document was developed by the Designer and agreed upon; here is the long title: “A project to ensure the safety of a cultural heritage site during the implementation of a project for the installation of permanent communication engineering networks on a land plot within the boundaries of the site, including an assessment of the impact of work on the cultural heritage site”.

The last chain in the design documentation was the budget estimate sent for approval to Rosgosekpertiza.

At the moment, we have gone all the way, which allows us to obtain the final document—permission to carry out works to preserve the Federal cultural heritage site and, if funds are available, to begin restoration.

4.9 Estimated Costs

Budget planning relies on the previous documents, which include all solutions, calculates volumes, and specifies materials and products. For budget planning we also had to refer to the industry standards, such as industry-specific estimate norms and price collections.

The estimate was developed by *Rozhdestvenka* bureau and submitted by the SROO Arch-Group for verification to *Rosgosexpertiza* (State Expertise). Estimates for the following sections are subject to examination:

- Restoration works;
- Design solutions;
- Construction solutions;
- Heating and ventilation;
- Internal water supply and drainage;
- Electrical supply;
- Communication network;
- Architectural lighting;
- External power supply;
- External communication network;
- External water supply and drainage.

Additionally, the estimate takes into account expenses associated with the execution of work, such as costs for temporary buildings and structures, as well as extra expenses when performing work during winter.

Russian certification center *Rosgosexpertiza* conducted an examination for compliance with estimate norms, accuracy in applying correction coefficients, and recalculating base prices to current prices. `The total cost of work was amounted to 60,614,930 Russian rubles.`

5

Spreading the Word

Photo on the previous page: general view of the White Tower, 2022.
From the technical documentation of the project developed by RDNK.

We have always aimed not only to preserve the tower physically, but also to promote an idea that civil society organizations can engage in heritage preservation, mobilize resources for work, and navigate bureaucratic procedures successfully.

That is why, it has always seemed important to share our experience in great detail and thus broadcast it to a vast audience. We reach out to both: to the general public, who may one day follow in our footsteps, and to the professional community including experts and government officials. We are determined to set a new norm for the latter: that ordinary people too can take responsibility for heritage sites and do it right.

The restoration project presented us with another challenge. It mainly engages narrow specialists into the process, however, their work might be interesting to the general public only in a broader context. What does a "restoration project" presuppose as a term and what role does it play in preservation of a monument, all this required extra explanation. In fact, in 2016 when the conservation work was over, we failed to find a source of funding for the restoration. The only viable option was to secure a grant from the Getty Foundation that would specifically address the restoration issues.

Hence, still one of our key objectives is shedding light on the current work in progress — highlighting that everything is possible and showing how it should be done. We've chosen different strategies and communication means for each target audience.

For city residents

Website
On the White Tower website, we've created a dedicated section at https://tower1929.ru/restoration. At first, we provided a popular overview of the research results there. And later, we outlined the guiding principles of the design decisions in the restoration project.

The website itself serves as a comprehensive demo of an entire process of creating a restoration project using the White Tower as an example. Visitors can learn about the milestones of both research and design phases, as well as see a list of necessary approvals and actual timeframes for preparing documents, obtaining these approvals, and undergoing expert evaluations.

Mass media
Local and national media readily cover project-related news, even though it falls within a niche field. In each press release, we thoroughly explain what we are

doing, why we are doing it, the progress we have made at each stage, and the results we have achieved.

Exhibition
In the spring of 2023, we held an exhibition on the ground floor of the tower as part of the “Long Night of Museums”. This exhibition was designed to inform and educate the diverse and numerous audience about the principles of scientific restoration and to introduce them to the restoration project of the White Tower.

For professional community

1) The annual “100+” Construction Forum in Ekaterinburg brings together specialists in the fields of construction, architecture, and urban development. Its logo prominently features the White Tower as a symbol of progress in the construction industry. Traditionally, this Forum attracts a lot of media attention. In 2022, we decided to present the White Tower’s restoration project to the professional community at this event.

Our goal was to gather government officials, journalists, curious citizens, and all those who have been involved in the project’s journey over the years.

Narine Tyutcheva as the project’s scientific supervisor joined the presentation by video, and other local specialists, who were engaged in analyzing and auditing design decisions, participated by commenting and taking questions i.e. expert in constructions Evgeny Redikultsev, engineering expert Vitalii Prokhorov, and universal design expert Elena Leontyeva. Video presentation is available by the following link.

2) From February 16 to 18, 2023, we organized an international conference in a workshop format in Yerevan. This event gathered all authors of the restoration, including architects, restorers, engineers, researchers, and designers, independent specialists, who had reviewed the project, along with foreign experts: Dr. Werner Lorenz and Dr. Christoph Dauberschmidt.

It happened so that in Yerevan all the experts and designers met in person for the first time, and thus, could thoroughly discuss the latest plans of restoration. Their recommendations and feedback were incorporated into the final project.

Moreover, conference attendees visited the House of Writers in Armenia, which had also participated in the Getty Foundation program in 2017. One of this project’s initiators, Ruben Arevshatyan gave a small lecture and shared their team’s insights about work with modernist heritage.

What’s Next

Soon the tower will turn 100 years old. In the utopian and visionary 1920s, the 27-year-old architect Moisey Reisher envisioned it as an architectural “beacon” of the district and a public space. By the 1970s, Reisher had plans to transform the non-functioning tower into a café with an observation terrace. During his lifetime, this vision was not destined to come true; the tower faced a 30-year period of decline and obscurity.

Buildings typically outlive people, and the history of a building can intricately intertwine the lines of several generations. We took on the tower when we were the same age as Reisher was in the late 1920s. After a decade of work, one of our goals — to breathe life back into the White Tower and make it an integral part of the city — has nearly been achieved. The tower is now inhabited, recognized, and embraced by the city’s residents.

The second goal is physical preservation, and it involves bringing to life the restoration project created with the support of the Getty Foundation grant. The project is ready, the budget has been calculated, and all the necessary evaluations and approvals have been obtained.

In November 2023, we are launching a major crowdfunding campaign to raise funds for the tower’s restoration. We do not know what the future holds. Before our eyes, the 21st century has taken a dramatic turn.

However, we hope that our plans will come to fruition against all odds, and the renewed White Tower will become a beacon, which unites people for a creative purpose and illuminates the path for our potential successors.

White Tower. 2020 *Photo by Evgeny Komolov.*